

Report No.: EH/2011/B0022 **Issue Date: Dec. 15, 2011** 

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# ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

# INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 22 SUBPART H, PART 24 SUBPART E and PART 27 SUBPART C & SUBPART L

OF

**Product Name:** 1KU3

**Brand Name:** N/A

Model No.: 1KU3

**Model Difference:** N/A

FCC ID: HFS1KU3

**Report No.:** EH/2011/B0022

**Issue Date:** Dec. 15, 2011

**FCC Rule Part:** 2,22H & 24E & 27

Prepared for: Quanta Computer Inc.

No.211, Wen Hwa 2nd Road, Kuei Shan Hsiang

Tao Yuan Shien, Taiwan

Prepared by: SGS Taiwan Ltd.

**Electronics & Communication Laboratory** 

No. 134, Wu Kung Rd., Wuku Industrial Zone,

Taipei County, Taiwan.

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# VERIFICATION OF COMPLIANCE

**Applicant:** Quanta Computer Inc.

No.211, Wen Hwa 2nd Road, Kuei Shan Hsiang Tao Yuan Shien, Taiwan

**Product Name:** 1KU3

**Brand Name:** N/A

Model No.: 1KU3

**Model Difference:** N/A

FCC ID: HFS1KU3

**File Number:** EH/2011/B0022

**Date of test:** Nov. 23, 2011 ~ Dec. 12, 2011

**Date of EUT Received:** Nov. 23, 2011

# We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Electronics & Communication Laboratory The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in TIA/EIA-603-C-2004 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rule FCC PART 22 subpart H, PART 24 subpart E and PART 27.

The test results of this report relate only to the tested sample identified in this report.

Test By:	Marcus Tseng	Date:	Dec. 15, 2011	
Prepared By:	Marcus Tseng / Engineer  Merry Cherry	Date:	Dec. 15, 2011	
Approved By:	Cherry Chen / Clerk  Jim Chang / Supervisor	Date: 	Dec. 15, 2011	

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# Version

Version No.	Date	Description
00	Dec. 15, 2011	Initial creation of document

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# 1. GENERAL PRODUCT INFORMATION

#### General:

Product Name:	1KU3
Brand Name:	N/A
Model Name:	1KU3
Model Difference:	N/A
Power Supply	3.6 Vdc by DC Power Supply

# WCDMA / LTE:

	Operating Frequency		Rated Power	
	WCDMA/HSUPA/HSDPA Band II	1852.4MHz – 1907.6MHz	23 dBm	
	WCDMA/HSUPA/HSDPA Band IV	1712.4MHz – 1752.6MHz	23 dBm	
Cellular Phone	WCDMA/HSUPA/HSDPA Band V	826.4MHz – 846.6MHz	23 dBm	
Standards Frequency Range:	1.4MHz BW LTE-Band 4	1710.7MHz – 1754.3MHz	22.5 dBm	
quency range.	3MHz BW LTE-Band 4	1711.5MHz – 1753.5MHz	22.5 dBm	
	5MHz BW LTE-Band 4	1712.5MHz – 1752.5MHz	22.5 dBm	
	10MHz BW LTE-Band 4	1715MHz – 1750MHz	22.5 dBm	
	5MHz BW LTE-Band 17	706.5MHz – 713.5MHz	22.5 dBm	
	10MHz BW LTE-Band 17	709MHz – 711MHz	22.5 dBm	
Hardware Version:	G2D			
Software Version:	11111_1KU_M0.50			
IMEI:	004400152020000			

This test report applies for WCDMA/HSUPA/HSDPA Band II/IV/V and LTE Band 4/17.

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Final Amplifier Voltage and Current Information:

<b>Test Mode</b>	DC voltage (V)	DC current (mA)
WCDMA B2	3.6 Vdc	650
HSUPA B2	3.6 Vdc	660
HSDPA B2	3.6 Vdc	680
WCDMA B4	3.6 Vdc	670
HSUPA B4	3.6 Vdc	620
HSDPA B4	3.6 Vdc	660
WCDMA B5	3.6 Vdc	620
HSUPA B5	3.6 Vdc	630
HSDPA B5	3.6 Vdc	650
LTE B4 1.4M QPSK	3.6 Vdc	780
LTE B4 1.4M 16QAM	3.6 Vdc	730
LTE B4 3M QPSK	3.6 Vdc	770
LTE B4 3M 16QAM	3.6 Vdc	730
LTE B4 5M QPSK	3.6 Vdc	770
LTE B4 5M 16QAM	3.6 Vdc	740
LTE B4 10M QPSK	3.6 Vdc	800
LTE B4 10M 16QAM	3.6 Vdc	760
LTE B17 5M QPSK	3.6 Vdc	670
LTE B17 5M 16QAM	3.6 Vdc	660
LTE B17 10M QPSK	3.6 Vdc	620
LTE B17 10M 16QAM	3.6 Vdc	650

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# 1.1. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: HFS1KU3 filing to comply with Section Part 22 subpart H, Part 24 subpart E and Part27 subpart C & subpart L of the FCC CFR 47 Rules.

# 1.2. Test Methodology

Both conducted and radiated testing were performed according to the procedures document of TIA/EIA 603C and FCC CFR 47.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055 and 2.1057.

The Output power Procedure of KDB941225 (SAR Measurement Procedures for 3G devices, WCDMA / HSPA / LTE) was used for EUT and Base station setting.

# 1.3. Test Facility

The measurement facilities used to collect the 3m Radiated Emission and AC power line conducted data are located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei Country, Taiwan which are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2003. FCC Registration Number are: 990257 and 236194, Canada Registration Number: 4620A-4

The 10 m Open Area Test Sites located on the address of SGS Taiwan Ltd. Electronics & Communication Laboratory No. 29, Pau-Tou-Tsuo Valley Chia-Pau Tsuen, Linkou Hsiang, Taipei county, which is constructed and calibrated to meet the CISPR 22/EN 55022 requirements. SGS Site No. 1(3 &10 meters) and FCC Registration Number: 94644.

All equipment is calibrated externally and traceable to SI (International System of Unit).

### 1.4. Special Accessories

Not available for this EUT intended for grant.

#### 1.5. Equipment Modifications

Not available for this EUT intended for grant.

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### 2. SYSTEM TEST CONFIGURATION

# 2.1. EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

### 2.2. EUT Exercise

The EUT (Transmitter) was operated in the engineering mode to fix the Tx frequency which was for the purpose of the measurements.

#### 2.3. Test Procedure

#### 2.3.1 AC Power Line Conducted Emissions

The EUT is placed on a turn table which is 0.8 m above ground plane. According to the requirements in Section 7 and 13 of ANSI C63.4: 2003. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and Average detector mode.

#### 2.3.2 Conducted Measurement at Antenna Port:

According to measurement procured TIA/EIA 603C, the EUT is placed on a turn table which is 0.8 m above ground plane. A low loss of RF cable was used to connect the antenna port of EUT to measurement equipment.

### 2.3.3 Radiated Emissions (ERP/EIRP):

The EUT is a placed on as turn table which is 80 cm above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both Horizontal and Vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna according to the requirements in Section 2 of TIA/EIA 603C.

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# 2.4. Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT	MFR MODEL		SERIAL	LAST	CAL DUE.
TYPE		NUMBER	NUMBER	CAL.	
Spectrum Analyzer	Agilent	E4446A	MY43360126	04/19/2010	04/18/2012
Spectrum Analyzer	Agilent	E4440A	US41160416	01/23/2010	01/22/2012
Radio Communication Analyzer	R&S	CMU200	102189	05/13/2010	05/13/2012
800 – 1000MHz Filter	Micro-Tronics	BRM13462	001	01/05/2011	01/04/2012
1800 – 2000MHz Filter	Micro-Tronics	BRM13463	001	01/05/2011	01/04/2012
Temperature Chamber	TERCHY	MHG-120LF	911009	04/14/2010	04/13/2012
Temperature Chamber	GIANT FORCE	GTH-150-40- CP-AR	MAA0512-018	02/05/2010	02/04/2012
DC Block	Agilent	BLK-18	155452	07/05/2011	07/04/2012
Attenuator	Mini-Circuit	BW-S20W5	N/A	07/05/2011	07/04/2012
Attenuator	Mini-Circuit	BW-S10W5	N/A	07/05/2011	07/04/2012
Attenuator	Mini-Circuit	BW-S6W5	N/A	07/05/2011	07/04/2012
Splitter	Agilent	11636B	N/A	07/05/2011	07/04/2012
DC Power Supply	НР	6038A	2929A-07548	06/27/2011	06/26/2012
DC Power Supply	Topward	3303D	981327	10/26/2011	10/25/2012
Power Meter	Anritsu	ML2495A	1005007	02/17/2010	02/16/2012
Power Sensor	Anritsu	MA2411B	917032	01/21/2010	01/20/2012

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ERP, EIRP MEASUREMENT EQUIPMENT List 966 Chamber					
EQUIPMENT	MFR MOD		SERIAL	LAST	CAL DUE.
ТҮРЕ		NUMBER	NUMBER	CAL.	
Spectrum Analyzer	R&S	FSP 40	100034	02/12/2010	02/11/2012
Bilog Antenna	SCHWAZBECK	VULB9160	9160-3136	11/15/2011	11/14/2012
Dipole Antenna	SCHWAZBECK	VHAP	908/909	07/10/2010	07/09/2012
Dipole Antenna	SCHWAZBECK	UHAP	891/892	07/10/2010	07/09/2012
Horn antenna	SCHWAZBECK	BBHA 9120D	309/320	01/22/2010	01/21/2012
Horn antenna	SCHWAZBECK	BBHA 9120D	9120D-673	05/09/2010	05/08/2012
Signal Generator	R&S	SMR40	100210	01/22/2010	01/21/2012
Signal Generator	Agilent	E4438C	MY45093613	06/11/2011	06/10/2012
Pre-Amplifier	Agilent	8447D	1937A02834	11/30/2011	11/29/2012
Pre-Amplifier	Agilent	8449B	3008A01973	01/05/2011	01/04/2012
Attenuator	Mini-Circuit	BW-S20W5	001	07/05/2011	07/04/2012
Attenuator	Mini-Circuit	BW-S10W5	001	07/05/2011	07/04/2012
Attenuator	Mini-Circuit	BW-S6W5	001	07/05/2011	07/04/2012
Radio Communication Analyzer	R&S	CMU200	102189	05/13/2010	05/12/2012
Turn Table	HD	DT420	N/A	N.C.R	N.C.R
Antenna Tower	HD	MA240-N	240/657	N.C.R	N.C.R
Controller	HD	HD100	N/A	N.C.R	N.C.R
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-10M	10m	01/05/2011	01/04/2012
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-3M	3m	01/05/2011	01/04/2012
Filter 800-1000	Micro-Tronics	BRM13462	1	01/05/2011	01/04/2012
Filter 1800-2000	Micro-Tronics	BRM13463	1	01/05/2011	01/04/2012
3m Site	SGS	966 chamber	N/A	11/08/2011	11/09/2012

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# 2.5. Configuration of Tested System

Fig. 2-1 Configuration of Tested System (Fixed Channel)

**EUT** 

#### Remote Side

**CMU200** 

**CMW500** 

**Table 2-1 Equipment Used in Tested System** 

Item	Equipment	Mfr/Brand	Model/ Type No.	Series No.	Data Cable	Power Cord
1.	Universal Radio Communication Tester	R&S	CMU200	102189	shielded	Un-shielded
2.	Wideb Radio Comzn Tester	R&S	CMW500	101582	shielded	Un-shielded

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# 3. SUMMARY OF TEST RESULTS

FCC Rules	FCC Rules Description Of Test		
§2.1046(a)			
§22.913(a)(2)			
§24.232(c)	RF Power Output	Compliant	
§27.50(c)(10)			
§27.50(d)(4)			
§2.1046(a)			
§22.913(a)(2)			
§24.232(c)	ERP/ EIRP measurement	Compliant	
§27.50(c)(10)			
§27.50(d)(4)			
§2.1049(h)	99% Occupied Bandwidth	Compliant	
§2.1051	Out of Band Emissions at Antenna		
§22.917(a)	Terminals and	Compliant	
§24.238(a)	Band Edge	Comphant	
§27.53(g)	Band Edge		
§2.1053			
§22.917(a)			
§24.238(a)	Field Strength of Spurious Radiation	Compliant	
§27.53(c)(2)	ricid Stielight of Spurious Radiation	Compilant	
§27.53(g)			
§27.53(h)			
§27.50(i)	Peak to Average Ratio	Compliant	
§27.53f	Spurious emission in	Compliant	
	1559 -1610MHz Band	Compilant	
§2.1055(a)(1)			
§22.355	Frequency Stability vs. Temperature	Compliant	
§24.235	rrequency stability vs. reinperature	Compilant	
§27.54			
§2.1055(d)(2)			
§22.355	Frequency Stability vs. Voltage	Compliant	
§24.235	riequency stability vs. voltage	Compnant	
§27.54			

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# Max ERP/EIRP measurement result:

	dBm		W
WCDMA Band II	24.86	EIRP	0.306
HSUPA Band II	25.30	EIRP	0.339
HSDPA Band II	25.29	EIRP	0.338
WCDMA Band IV	25.26	EIRP	0.336
HSUPA Band IV	25.19	EIRP	0.330
HSDPA Band IV	25.01	EIRP	0.317
WCDMA Band V	19.71	ERP	0.094
HSUPA Band V	20.28	ERP	0.107
HSDPA Band V	20.27	ERP	0.106
LTE Band 4/1.4MHz /QPSK RB 1 Offset 5	25.16	EIRP	0.328
LTE Band 4/1.4MHz /16QAM RB 1 Offset 5	24.83	EIRP	0.304
LTE Band 4/1.4MHz /QPSK RB 1 Offset 0	25.11	EIRP	0.324
LTE Band 4/1.4MHz /16QAM RB 1 Offset 0	25.34	EIRP	0.342
LTE Band 4/1.4MHz /QPSK RB 3 Offset 2	22.21	EIRP	0.166
LTE Band 4/1.4MHz /16QAM RB 3 Offset 2	24.26	EIRP	0.267
LTE Band 4/1.4MHz /QPSK RB 6 Offset 0	22.97	EIRP	0.198
LTE Band 4/1.4MHz /16QAM RB 6 Offset 0	24.31	EIRP	0.270
LTE Band 4/3MHz /QPSK RB 1 Offset 14	25.17	EIRP	0.329
LTE Band 4/3MHz /16QAM RB 1 Offset 14	25.31	EIRP	0.340
LTE Band 4/3MHz /QPSK RB 1 Offset 0	24.43	EIRP	0.277
LTE Band 4/3MHz /16QAM RB 1 Offset 0	25.30	EIRP	0.339
LTE Band 4/3MHz /QPSK RB 8 Offset 4	21.11	EIRP	0.129
LTE Band 4/3MHz /16QAM RB 8 Offset 4	22.42	EIRP	0.175
LTE Band 4/3MHz /QPSK RB 15 Offset 0	22.40	EIRP	0.174
LTE Band 4/3MHz /16QAM RB 15 Offset 0	24.38	EIRP	0.274
LTE Band 4/5MHz /QPSK RB 1 Offset 24	24.61	EIRP	0.289
LTE Band 4/5MHz /16QAM RB 1 Offset 24	24.69	EIRP	0.294
LTE Band 4/5MHz /QPSK RB 1 Offset 0	24.80	EIRP	0.302
LTE Band 4/5MHz /16QAM RB 1 Offset 0	24.58	EIRP	0.287
LTE Band 4/5MHz /QPSK RB 12 Offset 6	23.05	EIRP	0.202
LTE Band 4/5MHz /16QAM RB 12 Offset 6	23.51	EIRP	0.224
LTE Band 4/5MHz /QPSK RB 25 Offset 0	24.84	EIRP	0.305
LTE Band 4/5MHz /16QAM RB 25 Offset 0	24.35	EIRP	0.272

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		-	
	dBm		W
LTE Band 4/10MHz /QPSK RB 1 Offset 49	24.00	EIRP	0.251
LTE Band 4/10MHz /16QAM RB 1 Offset 49	25.12	EIRP	0.325
LTE Band 4/10MHz /QPSK RB 1 Offset 0	23.28	EIRP	0.213
LTE Band 4/10MHz /16QAM RB 1 Offset 0	24.48	EIRP	0.281
LTE Band 4/10MHz /QPSK RB 25 Offset 12	23.00	EIRP	0.200
LTE Band 4/10MHz /16QAM RB 25 Offset 12	24.39	EIRP	0.275
LTE Band 4/10MHz /QPSK RB 50 Offset 0	22.65	EIRP	0.184
LTE Band 4/10MHz /16QAM RB 50 Offset 0	24.04	EIRP	0.254
LTE Band 17/5MHz /QPSK RB 1 Offset 24	25.17	ERP	0.055
LTE Band 17/5MHz /16QAM RB 1 Offset 24	25.31	ERP	0.070
LTE Band 17/5MHz /QPSK RB 1 Offset 0	24.43	ERP	0.076
LTE Band 17/5MHz /16QAM RB 1 Offset 0	25.30	ERP	0.073
LTE Band 17/5MHz /QPSK RB 12 Offset 6	21.11	ERP	0.069
LTE Band 17/5MHz /16QAM RB 12 Offset 6	22.42	ERP	0.111
LTE Band 17/5MHz /QPSK RB 25 Offset 0	22.40	ERP	0.092
LTE Band 17/5MHz /16QAM RB 25 Offset 0	24.38	ERP	0.094
LTE Band 17/10MHz /QPSK RB 1 Offset 49	17.04	ERP	0.051
LTE Band 17/10MHz /16QAM RB 1 Offset 49	17.85	ERP	0.061
LTE Band 17/10MHz /QPSK RB 1 Offset 0	17.27	ERP	0.053
LTE Band 17/10MHz /16QAM RB 1 Offset 0	18.13	ERP	0.065
LTE Band 17/10MHz /QPSK RB 25 Offset 12	19.31	ERP	0.085
LTE Band 17/10MHz /16QAM RB 25 Offset 12	19.50	ERP	0.089
LTE Band 17/10MHz /QPSK RB 50 Offset 0	19.02	ERP	0.080
LTE Band 17/10MHz /16QAM RB 50 Offset 0	19.73	ERP	0.094

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### 4. DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition.

EUT staying in continuous transmitting mode. Channel Low, Mid and High for each type band with rated data rate were chosen for full testing.

The field strength of spurious radiation emission was measured as EUT lie down position (E2 mode) for WCDMA/HSUPA/HSDPA Band II/IV/V, and LTE Band 4/17 with power supply.

In comparison among the RSE data of the all modulations (WCDMA/HSUPA/HSDPA) we found that while the radiation is in WCDMA mode, the spurious emission is found to be the worst, and therefore documenting the data of radiated spurious emission on HSUPA Band II, WCDMA Band IV and HSUPA Band V would be representative sufficiently.

The RSE Data for all combinations have been measured, and only the results being measured close to the required limit are shown on the report by correlation.

In comparison among all CSE data of the variety of combination on LTE band 4 and 17, respectively, It's found to generate the highest emission at 1.4 MHz, 3MHz, 5MHz and 10 MHz Transmission Bandwidth while RB size = 1 with 0 offset. Be aware of that only CSE data that yields the worst measurement with supported modulation scheme (QPSK, 16QAM) are shown on the corresponding section.

For Peak to Average Ratio test, all combination (RB arrangement with different modulation scheme) has been evaluated, the data with the following setting: RB number = 6; Offset = 0 for Band4 1.4MHz with 16QAM; RB number = 15; Offset = 0 for Band4 3MHz with 16QAM; RB number = 25; Offset = 0 for Band4 5MHz with 16QAM; RB number = 50; Offset = 0 for Band4 10MHz with 16QAM; RB number = 25; Offset = 0 for Band17 5MHz with 16QAM; RB number = 50; Offset = 0 for Band17 10MHz with 16QAM are shown as representative plot on the report.

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For Band edge, all combinations has been assessed and measured, only data output the emission close to limit are presented on the corresponding section of this report. The following lists the combinational setting of measurement representation as documents on the report.

Band 4						
	QPSK					
	Low Channel	High Channel				
1.4MHz	RB Size = $1$ ; Offset = $0$	RB Size = 1; Offset = 5				
3MHz	RB Size = $1$ ; Offset = $0$	RB Size = 1; Offset = 14				
5MHz	RB Size = $1$ ; Offset = $0$	RB Size = $1$ ; Offset = $24$				
10MHz	RB Size = $1$ ; Offset = $0$	RB Size = $1$ ; Offset = $49$				

Band 4					
	16QAM				
	Low Channel	High Channel			
1.4MHz	RB Size = $1$ ; Offset = $0$	RB Size = $1$ ; Offset = $5$			
3MHz	RB Size = $1$ ; Offset = $0$	RB Size = $1$ ; Offset = $14$			
5MHz	RB Size = $1$ ; Offset = $0$	RB Size = $1$ ; Offset = $24$			
10MHz	RB Size = $1$ ; Offset = $0$	RB Size = $1$ ; Offset = $49$			

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Band 17					
	QPSK Low Channel	High Channel			
5MHz	RB Size = $1$ ; Offset = $0$	RB Size = $1$ ; Offset = $24$			
10MHz	RB Size = $1$ ; Offset = $0$	RB Size = $1$ ; Offset = $49$			

Band 17					
16QAM					
	Low Channel	High Channel			
5MHz	RB Size = $1$ ; Offset = $0$	RB Size = $1$ ; Offset = $24$			
10MHz	RB Size = $1$ ; Offset = $0$	RB Size = $1$ ; Offset = $49$			

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# 5. MEASUREMENT UNCERTAINTY FOR FIELD STRENGTH OF **SPURIOUS RADIATION**

	30MHz - 180MHz: 3.37dB		
Measurement uncertainty	180MHz -417MHz: 3.19dB		
(Polarization : Vertical)	0.417GHz-1GHz: 3.19dB		
(1 olumburon : v er ereur)	1GHz - 18GHz: 4.04dB		
	18GHz - 40GHz: 4.04dB		
	30MHz - 167MHz: 4.22dB		
Massayaantaantainta	167MHz -500MHz: 3.44dB		
Measurement uncertainty (Polarization : <b>Horizontal</b> )	0.5GHz-1GHz: 3.39dB		
	1GHz - 18GHz: 4.08dB		
(Foranzadon : Horizontal)	1GHz - 18GHz: 4.08dB		

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# 6. RF POWER OUTPUT MEASUREMENT

## 6.1. Standard Applicable:

According to FCC §2.1046.

FCC 22.913(a) Mobile station are limited to 7W.

FCC 24.232(c) Peak Power Measurement limited to 2W

Part 27, 50(c)(10) Portable stations are limited to 3W

Part 27, 50(d)(4) Portable stations are limited to 1W

FCC 27.50(b)(10) Mobile station are limited to 30W ERP.

According to IC RSS-133 §6.4

The peak e.i.r.p. for transmitters operating in the band 1850-1910 MHz shall not exceed the limits 2W which given in SRSP-510.

According to issue 2 of RSS 132, section 4.4. The transmitter output power shall not exceed the limits given in SRSP-503.

3GPP Power limitation for HSDPA and HSUPA

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### **Maximum Output Powers for HSDPA**

Sub-test in ta-	Power (	Class 3	Power Class 4		
ble C.10.1.4	Power Tol (dBm) (dB)		Power (dBm)	Tol (dB)	
1	+24	+1.7/-3.7	+21	+2.7/-2.7	
2	+24	+1.7/-3.7	+21	+2.7/-2.7	
3	+23.5	+2.2/-3.7	+20.5	+3.2/-2.7	
4	+23.5	+2.2/-3.7	+20.5	+3.2/-2.7	

### **Maximum Output Powers for HSUPA**

Sub-test in table	Power	Class 3	Power	Class 4
C.11.1.3	Power (dBm)			Tol (dB)
1	+24	+1.7/-6.7	+21	+2.7/-5.7
2	+22	+3.7/-5.2	+19	+4.7/-4.2
3	+23	+2.7/-5.2	+20	+3.7/-4.2
4	+22	+3.7/-5.2	+19	+4.7/-4.2
5	+24	+1.7/-6.7	+21	+2.7/-5.7

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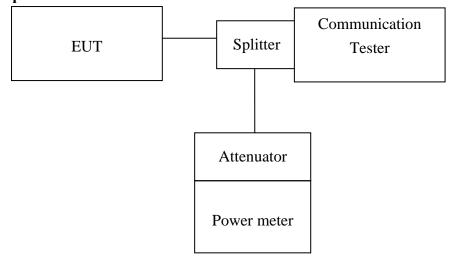
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#### 6.2. Test Set-up:



Note: Measurement setup for testing on Antenna connector

### **6.3.** Measurement Procedure:

The transmitter output was connected to a calibrated attenuator, the other end of which was connected to a power meter. Transmitter output was read off the power meter in dBm. The power output at the transmitter antenna port was determined by adding the value of the attenuator to the power meter reading. The Procedure of KDB941225 (SAR Measurement Procedures for 3G devices, WCDMA/HSPA/LTE) was used for EUT and Base station setting. RMC 12.2kps is used for this testing

## 6.4. Measurement Equipment Used:

Refer to section 2.4 in this report

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#### 6.5. Measurement Result:

# 6.5.1. RF Conducted Output Power

### 6.5.1.1.: WCDMA mode

The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1 V8.4.0 specification. The EUT supports power Class 3, which has a nominal maximum output power of 24 dBm (+1.7/-3.7). RMC 12.2kps is used for this testing.

### **Results:**

UMTS B2	WCDMA		HSDPA		HSUPA	
	PK(dBm) AV(dBm)		PK(dBm)	AV(dBm)	PK(dBm)	AV(dBm)
CH 9262	26.38	23.43	26.06	22.48	24.33	20.61
CH 9400	26.49	23.37	25.94	22.18	24.34	20.40
CH 9538	26.30	23.32	25.91	22.34	24.39	20.76

UMTS B4	WCDMA		ITS B4 WCDMA HSDPA		HSUPA	
PK(dBm) AV(dBm		AV(dBm)	PK(dBm)	AV(dBm)	PK(dBm)	AV(dBm)
CH 1312	26.89	23.98	26.39	23.20	26.45	22.78
CH 1413	26.93	23.82	26.90	23.35	27.04	22.90
CH 1513	26.74	23.87	26.53	23.21	26.53	23.01

UMTS B5	WCDMA		HSDPA		HSUPA	
	PK(dBm) AV(dBm)		PK(dBm)	AV(dBm)	PK(dBm)	AV(dBm)
CH 4132	CH 4132 27.35 24.29		27.09	23.75	26.36	22.91
CH 4183	H 4183 27.44 24.4		27.22	23.83	26.58	23.08
CH 4233	27.38	24.22	27.48	23.89	26.54	22.98

Note: The results above reflect max power with all up bits.

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#### 6.5.1.2: HSDPA Release 6 mode

The following 4 Sub-Tests were completed according to the test requirements outlined in section 5.2A of the 3GPP TS34.121-1 V8.4.0 specification. All TX power requirements for Power Class 3 were met according to table 5.2AA.5 and 5.2B.5 All UE channels and power ratio's are set according to table C10.1.4 & C11.1.3 in the 3GPP TS34.121-1 V8.4.0. RMC 12.2kps is used for this testing

# **HSDPA SUB-TEST Setting**

Table C.10.1.4: β values for transmitter characteristics tests with HS-DPCCH(FOR HSDPA)

Sub-test	βς	βа	β <sub>d</sub> (SF)	βc/βd	βнs (Note1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)	RMC (Kbps)
1	2/15	15/15	64	2/15	4/15	0.0	0.0	12.2
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0	12.2
3	15/15	8/15	64	15/8	30/15	1.5	0.5	12.2
4	15/15	4/15	64	15/4	30/15	1.5	0.5	12.2

Note: The recommended HSDPA MPRs are implemented as per following sub-tests.

Result: Please refer to next page for test result.

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### **Results:**

Mode	Sub-test	Transmi	tter Powe Channel	r (dBm)	Power Class 3 Limita-	Comments
		9262	9400	9538	tion (dBm)	0 0
	1	23.72	23.63	23.59	20.3dBm – 25.7dBm	Pass
HSDPA	2	23.31	23.23	23.17	20.3dBm – 25.7dBm	Pass
<b>(B2)</b>	3	23.24	23.18	23.06	19.8dBm – 25.7dBm	Pass
	4	23.31	23.19	23.18	19.8dBm – 25.7dBm	Pass

Mode	Sub-test		tter Powe Channel	r (dBm)	Power Class 3 Limita-	Comments	
		1312	1413	1513	tion (dBm)		
	1	23.69	23.92	23.71	20.3dBm – 25.7dBm	Pass	
HSDPA	2	23.86	23.68	23.72	20.3dBm – 25.7dBm	Pass	
(B4)	3	23.21	23.47	23.18 19.8dBm – 25.7dBm		Pass	
	4	23.28	23.48	23.30	19.8dBm – 25.7dBm	Pass	

Mode	Sub-test	Transmi	tter Powe Channel	r (dBm)	Power Class 3 Limita-	Comments	
		4132	4183	4233	tion (dBm)		
	1	24.51	24.68	24.41	24.41 20.3dBm – 25.7dBm		
HSDPA	2	24.22	24.32	24.09	20.3dBm – 25.7dBm	Pass	
<b>(B5)</b>	3	24.05	24.20	23.92	19.8dBm – 25.7dBm	Pass	
	4	24.10	24.24	23.98	19.8dBm – 25.7dBm	Pass	

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# 6.5.1.3: HSPA (HSDPA & HSUPA) Release 6 mode

The following 5 Sub-Tests were completed according to the test requirements outlined in section 5.2A of the 3GPP TS34.121-1 V8.4.0 specification. All TX power requirements for Power Class 3 were met according to table 5.2AA.5 and 5.2B.5 All UE channels and power ratio's are set according to table C11.1.3 in the 3GPP TS34.121-1 V8.4.0. RMC 12.2kps is used for this testing

# **HSPA SUB-TEST Setting**

Table C.11.1.3: β values for transmitter characteristics tests with HS-DPCCH and E-DCH(FOR HSUPA)

Sub- test	β <sub>c</sub>	$eta_{ m d}$	β <sub>d</sub> (SF)	$\beta_c/\beta_d$	$\beta_{HS}$	$eta_{ m ec}$	$eta_{ m ed}$	β <sub>ed</sub> (SF)	β <sub>ed</sub> (Codes)	CM (dB)	MPR (dB)	AG Index	E-TFCI	RMC (Kbps)
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/22	1309/225	4	1	1.0	0.0	20	75	12.2
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67	12.2
3	15/15	9/15	64	15/9	30/15	30/15	β <sub>ed</sub> 1: 47/15 β <sub>ed</sub> 2: 47/15	4 4	2	2.0	1.0	15	92	12.2
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71	12.2
5	15/15 (Note 4)	15/15 (Note 4)	64	15/15 (Note 4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81	12.2

Note: The recommended HSUPA are implemented as per following sub-tests.

Results: Please refer to next page for test result.

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### **Result:**

Mode	Sub-test	TX	Power (dI Channel	Bm)	Power Class 3 Limita-	Comments
		9262	9400	9538	tion (dBm)	
	1	23.35	23.35	23.20	18.8dBm – 25.7dBm	Pass
	2	21.37	21.31	21.24	16.8dBm – 25.7dBm	Pass
HSUPA(B2)	3	22.28	22.23	22.21	17.8dBm – 25.7dBm	Pass
	4	21.49	21.45	21.24	16.8dBm – 25.7dBm	Pass
	5	23.21	23.23	23.11	18.8dBm – 25.7dBm	Pass

Mode	Sub-test	TX	Power (dI Channel	Bm)	Power Class 3 Limita-	Comments
		1312	1413	1513	tion (dBm)	
	1	23.90	23.80	23.81	18.8dBm – 25.7dBm	Pass
	2	21.95	21.87	21.85	16.8dBm – 25.7dBm	Pass
HSUPA(B4)	3	22.96	22.82	22.89	17.8dBm – 25.7dBm	Pass
	4	22.08	21.92	21.89	16.8dBm – 25.7dBm	Pass
	5	23.79	23.66	23.72	18.8dBm – 25.7dBm	Pass

Mode	Sub-test	TX	Power (dF Channel	Bm)	Power Class 3 Limita- tion (dBm)	Comments	
		4132	4183	4233	uon (udm)		
	1	24.25	24.36	24.13	18.8dBm – 25.7dBm	Pass	
	2	22.31	22.44	22.17	16.8dBm – 25.7dBm	Pass	
HSUPA(B5)	3	23.22	23.42	23.16	17.8dBm – 25.7dBm	Pass	
	4	22.36	22.50	22.25	16.8dBm – 25.7dBm	Pass	
	5	24.11	24.19	24.02	18.8dBm – 25.7dBm	Pass	

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### 6.5.1.4: Minimum Communications Power Measurement:

PCS 1900 band: N/A for this test item.

Note: The EUT output power was controlled by simulator. Set Communication Tester CMU200 PCL as above, and get the mobile phone output power reading.

### WCDMA/HSDPA/HSUPA band II/IV/V

The EUT output power was controlled by simulator. Set Communication Tester CMU200 function key "UE Power Control" and enter max rated power 24dBm. The EUT is going to be set to max output power to 24dBm. then record the read(see page 22 for measurement data). The min. power was measures by a function key "minimum power" then record the read. It is -52.5dBm. The power variation can be 0.1dB step by setting.

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# 6.5.1.5.: MPR Table

#### 6.2.3.3 Minimum conformance requirements

For UE Power Class 3, the allowed Maximum Power Reduction (MPR) for the maximum output power in Table 6.2.2.3-1 due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3.3-1.

Table 6.2.3.3-1: Maximum Power Reduction (MPR) for Power Class 3

Modulation	Channe	MPR (dB)					
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	> 5	>4	> 8	> 12	> 16	> 18	≤1
16 QAM	≤ 5	≤4	≤8	≤ 12	≤ 16	≤ 18	≤1
16 QAM	> 5	>4	> 8	> 12	> 16	> 18	≤2

For the UE maximum output power modified by MPR, the power limits specified in subclause 6.2.5.3 apply.

The normative reference for this requirement is TS 36.101 clause 6.2.3.

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# LTE Band 4 1.4 MHz

BW	ang 4 _ 1.4 N		Frequency	DD ~:	RB	Conducted	Target	MPR Tar-
(MHz)	Modulation	Channel	(MHz)	RB Size	Offset	power(dBm)	Power(dBm)	get(dB)
				1	5	23.67	24	0
		10055	15105	1	0	23.70	24	0
		19957	1710.7	3	2	22.78	24	1
				6	0	22.74	24	1
	1.4 QPSK			1	5	23.69	24	0
1 4		20175	1722.5	1	0	23.65	24	0
1.4	QPSK	20175	1732.5	3	2	22.63	24	1
				6	0	22.80	24	1
				1	5	23.65	24	0
		20202	17542	1	0	23.72	24	0
		20393	1754.3	3	2	22.95	24	1
				6	0	22.75	24	1
			1710.7	1	5	23.05	24	1
		19957		1	0	23.03	24	1
		19937		3	2	22.67	24	2
				6	0	22.52	24	2
				1	5	23.10	24	1
1.4	16 QAM	20175	1732.5	1	0	23.15	24	1
1.4	10 QAM	20173	1/32.3	3	2	22.70	24	2
	_			6	0	22.49	24	2
				1	5	23.09	24	1
	20202	175/12	1	0	23.15	24	1	
		20393	1754.3	3	2	22.98	24	2
				6	0	22.41	24	2

Cable loss: 0.84 dB

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# LTE Band 4 3 MHz

BW	M - 4-1-4		Frequency	DD C:	RB	Conducted	Target	MPR Tar-
(MHz)	Modulation	Channel	(MHz)	RB Size	Offset	power(dBm)	Power(dBm)	get(dB)
				1	14	23.60	24	0
		10065	1711 5	1	0	23.57	24	0
		19965	1711.5	8	4	22.77	24	1
				15	0	22.79	24	1
	3 QPSK 201			1	14	23.65	24	0
2		20175	1722.5	1	0	23.53	24	0
3	QPSK	20175	1732.5	8	4	22.71	24	1
				15	0	22.88	24	1
				1	14	23.65	24	0
		20205	1752.5	1	0	23.63	24	0
		20385	1753.5	8	4	22.85	24	1
				15	0	22.80	24	1
			1511.5	1	14	23.08	24	1
		10065		1	0	23.10	24	1
		19965	1711.5	8	4	22.75	24	2
				15	0	22.72	24	2
				1	14	23.25	24	1
2	16 O A M	20175	1722 5	1	0	23.03	24	1
3	16 QAM	20175	1732.5	8	4	22.05	24	2
	20385			15	0	22.08	24	2
				1	14	22.75	24	1
		20205	1752 5	1	0	22.98	24	1
		20385	1753.5	8	4	22.12	24	2
			15	0	21.85	24	2	

Cable loss: 0.84 dB

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# LTE Band 4 5 MHz

BW	M - 4-1-4		Frequency	DD C:	RB	Conducted	Target	MPR Tar-
(MHz)	Modulation	Channel	(MHz)	RB Size	Offset	power(dBm)	Power(dBm)	get(dB)
				1	24	23.50	24	0
		10075	1710.5	1	0	23.60	24	0
		19975	1712.5	12	6	22.85	24	1
	5 ODSW 20			25	0	22.97	24	1
				1	24	23.75	24	0
_		20175	1722.5	1	0	23.78	24	0
5	QPSK	QPSK 20175	1732.5	12	6	22.75	24	1
				25	0	22.64	24	1
				1	24	23.65	24	0
		20275	1750 5	1	0	23.60	24	0
		20375	1752.5	12	6	22.70	24	1
				25	0	22.93	24	1
			1710.5	1	24	22.63	24	1
		10075		1	0	22.90	24	1
		19975	1712.5	12	6	22.32	24	2
				25	0	22.79	24	2
				1	24	22.87	24	1
_	16 O A M	20175	1722 5	1	0	22.99	24	1
5	16 QAM	20175	1732.5	12	6	21.63	24	2
	_			25	0	22.07	24	2
				1	24	22.50	24	1
	20275	1753.5	1	0	22.59	24	1	
	20375	20375	1752.5	12	6	22.23	24	2
				25	0	22.46	24	2

Cable loss: 0.84 dB

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# LTE Band 4 10 MHz

BW	111u 4 _10 W		Frequency	DD G:	RB	Conducted	Target	MPR Tar-
(MHz)	Modulation	Channel	(MHz)	RB Size	Offset	power(dBm)	Power(dBm)	get(dB)
				1	49	23.58	24	0
		20000	1715	1	0	23.65	24	0
		20000	1715	25	12	23.54	24	1
				50	0	23.38	24	1
				1	49	23.78	24	0
10		20175	1720 5	1	0	23.56	24	0
10		20175	1732.5	25	12	23.44	24	1
				50	0	23.35	24	1
	20250			1	49	23.51	24	0
		20350	1750	1	0	23.60	24	0
			1750	25	12	23.23	24	1
				50	0	23.21	24	1
		20000	1715	1	49	23.10	24	1
				1	0	23.15	24	1
		20000		25	12	22.70	24	2
				50	0	22.77	24	2
				1	49	23.01	24	1
10	16 OAM	20175	1722.5	1	0	23.14	24	1
10	16 QAM	20173	1732.5	25	12	22.88	24	2
				50	0	23.03	24	2
				1	49	23.20	24	1
		20350	1750	1	0	23.05	24	1
				25	12	22.31	24	2
				50	0	22.50	24	2

Cable loss: 0.84 dB

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# LTE Band 17 5 MHz

BW	Madulation		Frequency	DD Ci-a	RB	Conducted	Target	MPR Tar-
(MHz)	Modulation	Channel	(MHz)	RB Size	Offset	power(dBm)	Power(dBm)	get(dB)
5	QPSK	23755	706.5	1	24	22.77	23	0
				1	0	23.34	23	0
				12	6	22.40	23	1
				25	0	22.54	23	1
		23790	710	1	24	22.77	23	0
				1	0	22.70	23	0
				12	6	22.65	23	1
				25	0	22.64	23	1
		23825	713.5	1	24	22.89	23	0
				1	0	22.80	23	0
				12	6	22.66	23	1
				25	0	22.65	23	1
5	16 QAM	23755	706.5	1	24	22.24	23	1
				1	0	22.28	23	1
				12	6	21.41	23	2
				25	0	22.20	23	2
		23790	710	1	24	22.71	23	1
				1	0	22.38	23	1
				12	6	21.34	23	2
				25	0	21.97	23	2
		23825	713.5	1	24	21.83	23	1
				1	0	22.39	23	1
				12	6	21.90	23	2
				25	0	21.49	23	2

Cable loss: 0.52 dB

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# LTE Band 17 10 MHz

BW	1114 17 _ 10 .	Channel	Frequency (MHz)	RB Size	RB	Conducted	Target	MPR Tar-
(MHz)	Modulation				Offset	power(dBm)	Power(dBm)	get(dB)
10	QPSK	23780	709	1	49	22.93	23	0
				1	0	23.14	23	0
				25	12	22.51	23	1
				50	0	22.48	23	1
		23790	710	1	49	22.90	23	0
				1	0	23.35	23	0
				25	12	22.62	23	1
				50	0	22.59	23	1
		23800	711	1	49	22.92	23	0
				1	0	22.66	23	0
				25	12	22.59	23	1
				50	0	22.43	23	1
10	16 QAM	23780	709	1	49	23.10	23	1
				1	0	22.75	23	1
				25	12	21.70	23	2
				50	0	21.80	23	2
		23790	710	1	49	22.65	23	1
				1	0	22.53	23	1
				25	12	21.81	23	2
				50	0	21.77	23	2
		23800	711	1	49	22.02	23	1
				1	0	22.25	23	1
				25	12	21.85	23	2
				50	0	21.62	23	2

Cable loss: 0.52 dB

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# 7. PEAK TO AVERAGE RATIO

# 7.1. Standard Applicable:

FCC 27.50(i)

Peak transmit power shall be measured over any interval of continuous transmission using instrumentation calibrated in terms of rms-equivalent voltage.

The measurement results shall be properly adjusted for any instrument limitations, such as detector response times, limited resolution bandwidth capability when compared to the emission bandwidth, etc., so as to obtain a true peak measurement for the emission in question over the full bandwidth of the channel.

To measure transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission shall not exceed 13 dB

# 7.2. Test SET-UP (Block Diagram of Configuration):

Refer to section 2.4 in this report

#### 7.3. Measurement Procedure:

Set resolution/measurement bandwidth ≥ signal's occupied bandwidth; Set the number of counts to a value that stabilizes the measured CCDF curve;

#### 7.4. Measurement Result:

Refer to next page for plot.

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Figure 7-1: 1.4MHz BW LTE-Band 4(16QAM Number: 6 Offset: 0) Channel Low

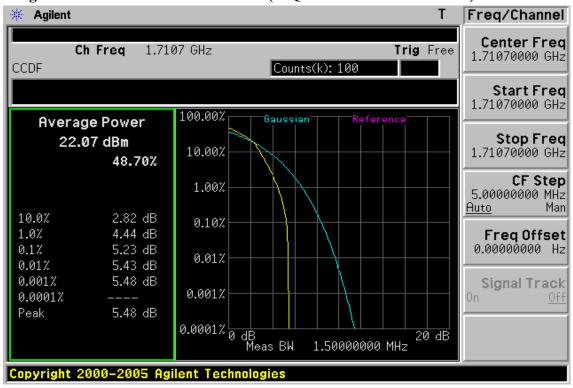
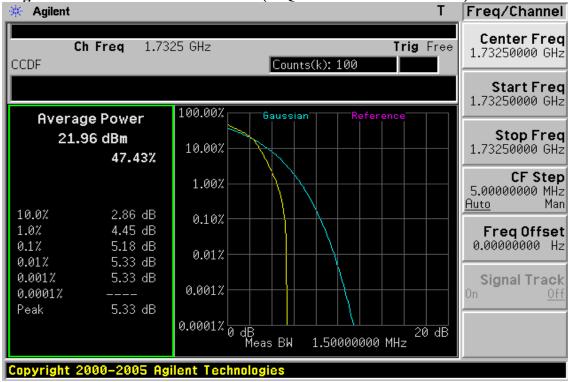


Figure 7-2: 1.4MHz BW LTE-Band 4(16QAM Number: 6 Offset: 0) Channel Mid



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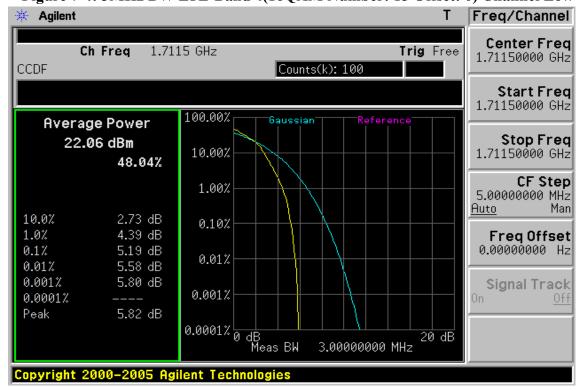
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Figure 7-3: 1.4MHz BW LTE-Band 4(16QAM Number: 6 Offset: 0) Channel High



Figure 7-4: 3MHz BW LTE-Band 4(16QAM Number: 15 Offset: 0) Channel Low



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Figure 7-5: 3MHz BW LTE-Band 4(16QAM Number: 15 Offset: 0) Channel Mid



Figure 7-6: 3MHz BW LTE-Band 4(16QAM Number: 15 Offset: 0) Channel High



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Figure 7-7: 5MHz BW LTE-Band 4(16QAM Number: 25 Offset: 0) Channel Low

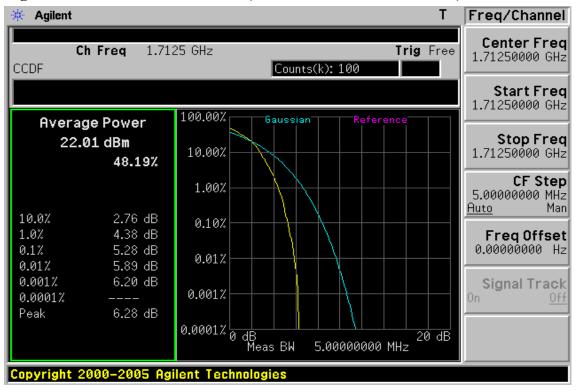


Figure 7-8: 5MHz BW LTE-Band 4(16QAM Number: 25 Offset: 0) Channel Mid



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Figure 7-9: 5MHz BW LTE-Band 4(16QAM Number: 25 Offset: 0) Channel High

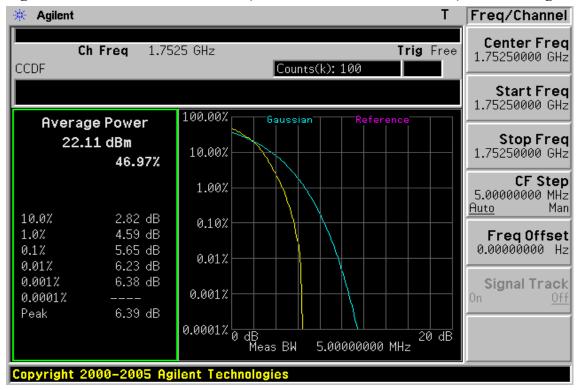


Figure 7-10: 10MHz BW LTE-Band 4(16QAM Number: 50 Offset: 0) Channel Low



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Figure 7-11: 10MHz BW LTE-Band 4(16QAM Number: 50 Offset: 0) Channel Mid



Figure 7-12: 10MHz BW LTE-Band 4(16QAM Number: 50 Offset: 0) Channel High



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Figure 7-13: 5MHz BW LTE-Band 17(16QAM Number: 25 Offset: 0) Channel Low



Figure 7-14: 5MHz BW LTE-Band 17(16QAM Number: 25 Offset: 0) Channel Mid



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Figure 7-15: 5MHz BW LTE-Band 17(16QAM Number: 25 Offset: 0) Channel High



Figure 7-16: 10MHz BW LTE-Band 17(16QAM Number: 50 Offset: 0) Channel Low



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Figure 7-17: 10MHz BW LTE-Band 17(16QAM Number: 50 Offset: 0) Channel Mid



Figure 7-18: 10MHz BW LTE-Band 17(16QAM Number: 50 Offset: 0) Channel High



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# 8. ERP, EIRP MEASUREMENT

## 8.1. Standard Applicable:

According to FCC §2.1046

FCC 22.913(a) Mobile station are limited to 7W ERP.

FCC 24.232(b) Mobile station are limited to 2W EIRP.

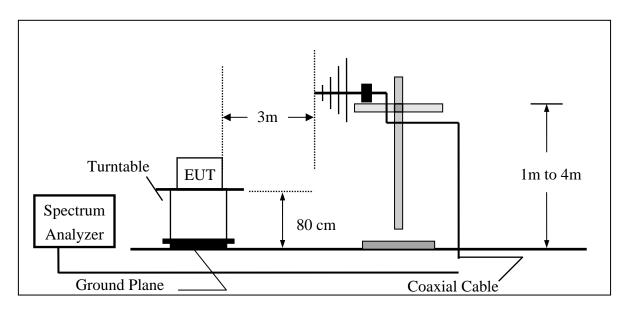
FCC 27.50(d)(2) Fixed, mobile, and portable (hand-held) stations are limited to 1W EIRP.

FCC 27.50(c)(10) Portable station are limited to 3W ERP.

FCC 27.50(b)(10) Mobile station are limited to 30W ERP.

## 8.2. Test SET-UP (Block Diagram of Configuration):

(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



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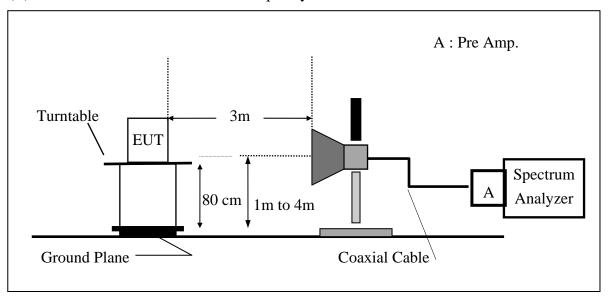
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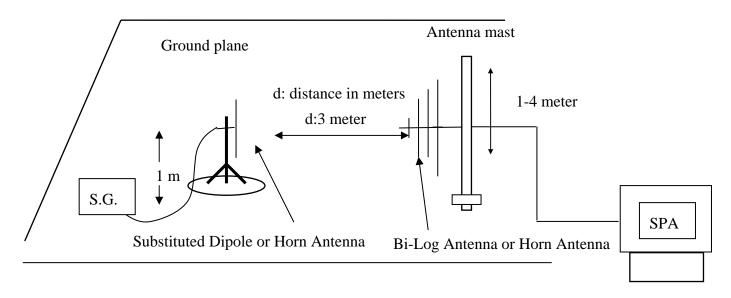
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## (B) Radiated Emission Test Set-UP Frequency Over 1 GHz



## (C) Substituted Method Test Set-UP



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#### **8.3.** Measurement Procedure:

The EUT was placed on an non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer.

During the measurement, the EUT was communication with the station. The highest emission was recorded with the rotation of the turntable and the lowering of the test antenna from 4m to 1m. The reading was recorded and the field strength (E in dBuV/m) was calculated.

ERP in frequency band 779.5MHz, - 784.56MHz, 824.2 –848.80MHz were measured using a substitution method. The EUT was replaced by dipole antenna connected, the S.G. output was recorded and ERP was calculated as follows:

EIRP in frequency band 1851.25 –1908.75MHz were measured using a substitution method. The EUT was replaced by a horn antenna connected, the S.G. output was recorded and EIRP was calculated as follows:

ERP = S.G. output (dBm) + Antenna Gain (dBd) - Cable Loss (dB)

EIRP = S.G. output (dBm) + Antenna Gain <math>(dBi) - Cable Loss (dB)

## 8.4. Measurement Equipment Used:

Refer to section 2.4 in this report

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#### 8.5. Measurement Result:

## WCDM A/HSUPA/HSDPA Band II

	EUT			N	Ieasurem	ent		
Operation Band	Fundamental Frequency	СН	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP I	imit
	MHz	V/	H	dBm	dBd	dB	dBm	dBm
	1852.40	9262	V	24.73	4.17	-5.49	23.41	33.00
	1632.40	9202	Н	25.83	4.51	-5.49	24.85	33.00
WCDMA	1880.00	9400	V	24.62	4.14	-5.56	23.19	33.00
Band II	1880.00	9400	Н	24.82	4.44	-5.56	23.70	33.00
	1907.60	9538	V	26.32	4.10	-5.56	24.86	33.00
	1907.00	9336	Н	20.43	4.37	-5.56	19.24	33.00
	1852.40	9262	V	23.88	4.17	-5.49	22.57	33.00
	1652.40	9202	Н	23.82	4.51	-5.49	22.84	33.00
HSUPA	1880.00	9400	V	22.67	4.14	-5.56	21.25	33.00
Band II	1880.00	9400	Н	23.13	4.44	-5.56	22.00	33.00
	1907.60	9538	V	26.83	4.10	-5.62	25.30	33.00
	1907.00	9336	Н	22.88	4.37	-5.56	21.69	33.00
	1852.40	9262	V	23.87	4.17	-5.49	22.55	33.00
	1032.40	9202	Н	24.15	4.51	-5.49	23.17	33.00
HSDPA	1880.00	9400	V	23.41	4.14	-5.56	21.98	33.00
Band II	1000.00	<del>3400</del>	Н	23.54	4.44	-5.56	22.42	33.00
	1907.60	9538	V	26.82	4.10	-5.62	25.29	33.00
	1507.00	9330	Н	22.88	4.37	-5.56	21.69	33.00

## Remark:

(1) The RBW, VBW of SPA for frequency RBW= 5MHz, VBW= 8MHz

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## WCDMA/HSUPA/HSDPA Band IV

	EUT			N	leasurem	ent		
Operation Band	Fundamental Frequency	СН	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP I	imit
	MHz	V/	H	dBm	dBd	dB	dBm	dBm
	1712.40	1312	V	24.69	4.40	-5.40	23.69	33.00
	1712.40	1312	Н	21.96	4.79	-5.40	21.35	33.00
WCDMA	1732.60	1413	V	23.57	4.78	-5.42	22.92	33.00
Band IV	1732.00	1413	Н	26.34	4.35	-5.42	25.26	33.00
	1752.60	1513	V	23.10	4.31	-5.44	21.97	33.00
	1732.00	1313	Н	22.01	4.77	-5.44	21.34	33.00
	1712.40	1312	V	24.76	4.40	-5.40	23.75	33.00
	1712.40	1312	Н	22.21	4.79	-5.40	21.60	33.00
HSUPA	1732.60	1413	V	26.26	4.35	-5.42	25.19	33.00
Band IV	1732.00	1413	Н	23.95	4.78	-5.42	23.31	33.00
	1752.60	1513	V	23.19	4.31	-5.44	22.06	33.00
	1732.00	1313	Н	21.95	4.77	-5.44	21.27	33.00
	1712.40	1312	V	24.88	4.40	-5.40	23.88	33.00
	1712.40	1312	Н	22.25	4.79	-5.40	21.64	33.00
HSDPA	1732.60	1413	V	26.08	4.35	-5.42	25.01	33.00
Band IV	1752.00	1713	Н	23.98	4.78	-5.42	23.33	33.00
	1752.60	1513	V	23.24	4.31	-5.44	22.12	33.00
	1732.00	1313	Н	21.88	4.77	-5.44	21.20	33.00

#### Remark:

(1) The RBW, VBW of SPA for frequency RBW= 5MHz, VBW= 8MHz

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## WCDMA/HSUPA/HSDPA Band V

	EUT			N	leasurem	ent		
Operation Band	Fundamental Frequency	СН	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP L	imit
	MHz	<b>V</b> /.	H	dBm	dBd	dB	dBm	dBm
	826.40	4132	V	19.34	3.97	-4.22	19.09	38.45
	820.40	4132	Н	19.20	3.97	-4.22	18.94	38.45
WCDMA	836.60	4183	V	14.44	3.99	-4.24	14.20	38.45
Band V	830.00	4103	Н	19.24	3.99	-4.24	18.99	38.45
	846.60	4233	V	13.01	4.02	-4.24	12.79	38.45
	840.00	4233	Н	19.93	4.02	-4.24	19.71	38.45
	826.40	4132	V	19.77	3.97	-4.22	19.52	38.45
	820.40	4132	Н	19.57	3.97	-4.22	19.32	38.45
HSUPA	836.60	4183	V	15.96	3.99	-4.24	15.72	38.45
Band V	830.00	4103	Н	19.54	3.99	-4.24	19.30	38.45
	846.60	4233	V	17.42	4.02	-4.24	17.21	38.45
	840.00	4233	Н	20.50	4.02	-4.24	20.28	38.45
	826.40	4132	V	19.78	3.97	-4.22	19.53	38.45
	020.40	4132	Н	19.55	3.97	-4.22	19.30	38.45
HSDPA	836.60	4183	V	16.16	3.99	-4.24	15.92	38.45
Band V	030.00	+103	Н	19.36	3.99	-4.24	19.12	38.45
	846.60	4233	V	17.13	4.02	-4.24	16.92	38.45
	040.00	4233	Н	20.48	4.02	-4.24	20.27	38.45

## Remark:

(1) The RBW, VBW of SPA for frequency RBW= 2MHz, VBW= 6MHz

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# LTE 1.4MHz/QPSK Band 4

	EUT					Measurer	nent					
Channel	Frequency (MHz)	RB Size	RB Offset	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit			
			V/H		dBm	dBi	dB	dBm	dBm			
		1	5	V	26.15	4.40	-5.40	25.16	33.00			
		1	3	Н	18.12	4.79	-5.40	17.51	33.00			
		1	0	V	26.11	4.40	-5.40	25.11	33.00			
19957	1710.7	1	Ü	Н	18.22	4.79	-5.40	17.61	33.00			
19957	1710.7	3	2	V	21.40	4.40	-5.40	20.40	33.00			
			2	Н	15.40	4.79	-5.40	14.79	33.00			
		6	0	V	21.36	4.40	-5.40	20.36	33.00			
			Ů	Н	15.37	4.79	-5.40	14.77	33.00			
		1	5	V	26.13	4.35	-5.42	25.05	33.00			
		1	3	Н	23.81	4.78	-5.42	23.17	33.00			
		1	0	V	25.96	4.35	-5.42	24.89	33.00			
20175	1732.5		Ů	Н	24.07	4.78	-5.42	23.42	33.00			
20175	1732.5	1732.5	1732.5	1732.5	3	2	V	23.28	4.35	-5.42	22.21	33.00
		3	2	Н	16.77	4.78	-5.42	16.13	33.00			
		6	0	V	24.04	4.35	-5.42	22.97	33.00			
			ŭ	Н	17.60	4.78	-5.42	16.96	33.00			
		1	5	V	24.74	4.31	-5.44	23.62	33.00			
				Н	22.29	4.76	-5.44	21.62	33.00			
		1	0	V	25.38	4.31	-5.44	24.25	33.00			
20393	1754.3	1	, j	Н	22.07	4.76	-5.44	21.39	33.00			
	3	2	V	20.06	4.31	-5.44	18.93	33.00				
		3	2	Н	14.13	4.76	-5.44	13.45	33.00			
		6	0	V	20.04	4.31	-5.44	18.91	33.00			
Damani		<u> </u>	J	Н	14.09	4.76	-5.44	13.41	33.00			

## Remark:

(1) The RBW, VBW of SPA for frequency RBW= 1.4MHz, VBW= 4.2MHz

Detector = Peak

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# LTE 1.4MHz/16QAM Band 4

Channel	Frequency (MHz)	RB Size	RB Offset	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit
			V/H		dBm	dBi	dB	dBm	dBm
		1	5	V	25.83	4.40	-5.40	24.83	33.00
		1	3	Н	20.21	4.79	-5.40	19.60	33.00
		1	0	V	26.34	4.40	-5.40	25.34	33.00
19957	1710.7	1	O	Н	20.11	4.79	-5.40	19.50	33.00
17737	1710.7	3	2	V	22.40	4.40	-5.40	21.40	33.00
			2	Н	18.78	4.79	-5.40	18.17	33.00
		6	0	V	24.38	4.40	-5.40	23.38	33.00
			Ü	Н	18.63	4.79	-5.40	18.02	33.00
		1	5	V	25.59	4.35	-5.42	24.52	33.00
		1	3	Н	21.06	4.78	-5.42	20.42	33.00
		1	0	V	25.40	4.35	-5.42	24.33	33.00
20175	1732.5	1	Ŭ	Н	21.16	4.78	-5.42	20.51	33.00
20175	1702.0	3	2	V	21.49	4.31	-5.44	20.36	33.00
			2	Н	15.6	4.76	-5.44	14.92	33.00
		6	0	V	23.02	4.31	-5.44	21.89	33.00
			ŭ	Н	17.23	4.76	-5.44	16.55	33.00
		1	5	V	25.71	4.31	-5.44	24.58	33.00
		1	3	Н	18.50	4.76	-5.44	17.82	33.00
		1	0	V	25.84	4.31	-5.44	24.71	33.00
20393	1754.3	754.3		Н	18.69	4.76	-5.44	18.01	33.00
20373	20393 1754.3	3	2	V	25.33	4.35	-5.42	24.26	33.00
		3		Н	19.43	4.78	-5.42	18.79	33.00
		6	6 0 -	V	25.38	4.35	-5.42	24.31	33.00
D		<u> </u>		Н	19.36	4.78	-5.42	18.72	33.00

## Remark:

(1) The RBW,VBW of SPA for frequency RBW= 1.4MHz , VBW= 4.2MHz

Detector = Peak

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# LTE 3MHz/QPSK Band 4

Channel	Frequency (MHz)	RB Size	RB Offset	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit	
			V/H		dBm	dBi	dB	dBm	dBm	
		1	14	V	26.06	4.40	-5.40	25.05	33.00	
		1	14	Н	19.18	4.79	-5.40	18.57	33.00	
		1	0	V	25.43	4.40	-5.40	24.43	33.00	
19965	1711.5		U	Н	19.02	4.79	-5.40	18.41	33.00	
17703	1711.5	8	4	V	22.11	4.40	-5.40	21.11	33.00	
			7	Н	16.20	4.79	-5.40	15.59	33.00	
		15	0	V	21.62	4.40	-5.40	20.62	33.00	
		13	U	Н	15.77	4.79	-5.40	15.16	33.00	
		1	14	V	26.25	4.35	-5.42	25.17	33.00	
		1	17	Н	21.47	4.78	-5.42	20.82	33.00	
		1	0	V	25.47	4.36	-5.42	24.41	33.00	
20175	1732.5	1	Ü	Н	21.82	4.78	-5.42	21.18	33.00	
20173	1732.3	8.5	4	V	21.16	4.35	-5.42	20.09	33.00	
			8	Ü	7	Н	17.82	4.78	-5.42	17.18
		15	0	V	23.47	4.35	-5.42	22.40	33.00	
		13	Ü	Н	17.68	4.78	-5.42	17.04	33.00	
		1	14	V	25.40	4.31	-5.44	24.27	33.00	
		1	17	Н	18.41	4.76	-5.44	17.74	33.00	
		1	0	V	24.76	4.31	-5.44	23.63	33.00	
20385	1753 5	1 1 253.5	Ü	Н	18.91	4.77	-5.44	18.24	33.00	
20303	20385 1753.5	8	4	V	20.35	4.31	-5.44	19.22	33.00	
		8	·	Н	15.49	4.76	-5.44	14.82	33.00	
		15	0	V	17.50	4.31	-5.44	16.38	33.00	
D		13		Н	14.97	4.76	-5.44	14.29	33.00	

## Remark:

(1) The RBW, VBW of SPA for frequency RBW= 3MHz, VBW= 8MHz

Detector = Peak

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## LTE 3MHz/16QAM Band 4

Channel	Frequency (MHz)	RB Size	RB Offset	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit
			V/H		dBm	dBi	dB	dBm	dBm
		1	14	V	26.44	4.31	-5.44	25.31	33.00
		1	14	Н	24.81	4.76	-5.44	24.13	33.00
		1	0	V	25.42	4.31	-5.44	24.29	33.00
19965	1711.5		U	Н	24.57	4.77	-5.44	23.91	33.00
17703	1711.5	8	4	V	23.42	4.40	-5.40	22.42	33.00
			7	Н	17.62	4.79	-5.40	17.02	33.00
		15	0	V	23.61	4.40	-5.40	22.61	33.00
		13	U	Н	17.86	4.79	-5.40	17.25	33.00
		1	14	V	25.62	4.35	-5.42	24.55	33.00
		1	17	Н	21.90	4.78	-5.42	21.25	33.00
		1	0	V	25.83	4.36	-5.42	24.77	33.00
20175	1732.5	1	Ü	Н	22.05	4.78	-5.42	21.41	33.00
20173	1732.3	8	8 4	V	24.72	4.35	-5.42	23.65	33.00
			o	•	Н	18.83	4.78	-5.42	18.18
		15	0	V	25.45	4.35	-5.42	24.38	33.00
		13	Ü	Н	24.71	4.78	-5.42	24.06	33.00
		1	14	V	25.99	4.40	-5.40	24.99	33.00
		1	17	Н	18.44	4.79	-5.40	17.83	33.00
		1	0	V	26.30	4.40	-5.40	25.30	33.00
20385	1753 5	.5	O .	Н	19.50	4.79	-5.40	18.89	33.00
20303	20385 1753.5	8	4	V	21.85	4.31	-5.44	20.73	33.00
		8	-T	Н	16.95	4.76	-5.44	16.27	33.00
		15	5 0 -	V	22.24	4.31	-5.44	21.12	33.00
D		13		Н	17.15	4.76	-5.44	16.47	33.00

## Remark:

(1) The RBW, VBW of SPA for frequency RBW= 3MHz, VBW= 8MHz

Detector = Peak

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# LTE 5MHz/QPSK Band 4

Channel	Frequency (MHz)	RB Size	RB Offset	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit	
			V/H		dBm	dBi	dB	dBm	dBm	
		1	24	V	23.98	4.39	-5.40	22.97	33.00	
		1	24	Н	21.08	4.79	-5.40	20.47	33.00	
		1	0	V	24.68	4.40	-5.40	23.69	33.00	
19975	1712.5	1	U	Н	19.88	4.79	-5.40	19.27	33.00	
19973	1/12.3	12	6	V	21.46	4.40	-5.40	20.45	33.00	
		12	U	Н	15.71	4.79	-5.40	15.10	33.00	
		25	0	V	25.49	4.40	-5.40	24.49	33.00	
		23	U	Н	18.08	4.79	-5.40	17.47	33.00	
		1	24	V	21.36	4.35	-5.42	20.28	33.00	
			24	Н	19.19	4.78	-5.42	18.54	33.00	
		1 0	1 0	V	20.59	4.36	-5.42	19.52	33.00	
20175	1732.5		Ü	Н	18.98	4.78	-5.42	18.34	33.00	
20173	1732.3	12	12	6	V	24.12	4.35	-5.42	23.05	33.00
		12	O	Н	18.24	4.78	-5.42	17.60	33.00	
		25	0	V	24.54	4.35	-5.42	23.47	33.00	
			Ü	Н	18.66	4.78	-5.42	18.02	33.00	
		1	24	V	25.74	4.31	-5.44	24.61	33.00	
		1	2-7	Н	18.14	4.76	-5.44	17.47	33.00	
		1	0	V	25.92	4.32	-5.44	24.80	33.00	
20375	1752 5	1	Ü	Н	18.85	4.77	-5.44	18.18	33.00	
20313	1732.3	1752.5	6	V	19.90	4.31	-5.44	18.77	33.00	
			Ü	Н	14.88	4.76	-5.44	14.21	33.00	
			0 -	V	25.97	4.31	-5.44	24.84	33.00	
Remarl			U	Н	23.03	4.76	-5.44	22.35	33.00	

#### Remark:

(1) The RBW, VBW of SPA for frequency RBW= 5MHz, VBW= 8MHz

Detector = Peak

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# LTE 5MHz/16QAM Band 4

Channel	Frequency (MHz)	RB Size	RB Offset	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit	
			V/H		dBm	dBi	dB	dBm	dBm	
		1	24	V	22.69	4.39	-5.40	21.68	33.00	
		1	24	Н	21.13	4.79	-5.40	20.52	33.00	
		1	0	V	23.32	4.40	-5.40	22.32	33.00	
19975	1712.5	1	U	Н	20.83	4.79	-5.40	20.22	33.00	
19973	1/12.3	12	6	V	23.38	4.40	-5.40	22.38	33.00	
		12	U	Н	17.51	4.79	-5.40	16.91	33.00	
		25	0	V	24.32	4.40	-5.40	23.32	33.00	
		23	U	Н	20.01	4.79	-5.40	19.40	33.00	
		1	24	V	23.14	4.35	-5.42	22.07	33.00	
		1	24	Н	20.93	4.78	-5.42	20.29	33.00	
		1	1 0	0	V	23.08	4.36	-5.42	22.02	33.00
20175	1732 5		U	Н	20.68	4.78	-5.42	20.04	33.00	
20173	1732.5	1732.3	6	V	24.58	4.35	-5.42	23.51	33.00	
		12	U	Н	18.62	4.78	-5.42	17.97	33.00	
		25	0	V	25.42	4.35	-5.42	24.35	33.00	
		23	U	Н	19.35	4.78	-5.42	18.71	33.00	
		1	24	V	25.82	4.31	-5.44	24.69	33.00	
			24	Н	19.51	4.76	-5.44	18.83	33.00	
		1	0	V	25.70	4.31	-5.44	24.58	33.00	
20375	1752.5	1 0 752.5 12 6	Н	20.49	4.77	-5.44	19.82	33.00		
20313	1132.3		6	V	22.75	4.31	-5.44	21.62	33.00	
			U	Н	17.70	4.77	-5.44	17.03	33.00	
	25	0	V	22.69	4.31	-5.44	21.56	33.00		
Domari		23	J	Н	17.47	4.76	-5.44	16.80	33.00	

#### Remark:

(1) The RBW, VBW of SPA for frequency RBW= 5MHz, VBW= 8MHz

Detector = Peak

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# LTE 10MHz/QPSK Band 4

Channel	Frequency (MHz)	RB Size	RB Offset	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit
			V/H		dBm	dBi	dB	dBm	dBm
		1	49	V	22.25	4.38	-5.40	21.23	33.00
		1	49	Н	20.57	4.79	-5.40	19.96	33.00
		1	0	V	23.54	4.40	-5.40	22.54	33.00
20000	1715	1	U	Н	19.22	4.79	-5.40	18.61	33.00
20000	1713	25	12	V	23.61	4.39	-5.40	22.60	33.00
		23	12	Н	17.81	4.79	-5.40	17.20	33.00
		50	0	V	22.48	4.39	-5.40	21.48	33.00
		30	U	Н	22.46	4.79	-5.40	21.85	33.00
		1	49	V	22.90	4.34	-5.42	21.82	33.00
		1	77	Н	19.59	4.78	-5.42	18.94	33.00
		1 0 1732.5 25 12	0	V	22.05	4.36	-5.40	21.01	33.00
20175	1732 5		Ü	Н	18.79	4.78	-5.40	18.17	33.00
20175			12	V	24.07	4.35	-5.42	23.00	33.00
			12	Н	18.58	4.78	-5.42	17.94	33.00
		50	0	V	23.72	4.35	-5.42	22.65	33.00
			Ü	Н	17.26	4.78	-5.42	16.61	33.00
		1	49	V	25.13	4.31	-5.44	24.00	33.00
			.,	Н	17.86	4.76	-5.44	17.19	33.00
		1	0	V	24.38	4.32	-5.42	23.28	33.00
20350	1750	1 0 25 12 50 0	Ü	Н	19.34	4.77	-5.42	18.69	33.00
20000	1,50		12	V	22.15	4.31	-5.44	21.03	33.00
			12	Н	16.46	4.77	-5.44	15.80	33.00
			0	V	20.85	4.31	-5.44	19.73	33.00
D	  -	20	J	Н	22.17	4.77	-5.44	21.50	33.00

## Remark:

(1) The RBW,VBW of SPA for frequency RBW= 10MHz, VBW= 8MHz

Detector = Peak

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# LTE 10MHz/16QAM Band 4

Channel	Frequency (MHz)	RB Size	RB Offset	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit
			V/H		dBm	dBi	dB	dBm	dBm
		1	49	V	23.52	4.38	-5.40	22.51	33.00
		1	49	Н	20.76	4.79	-5.40	20.15	33.00
		1	0	V	25.44	4.40	-5.40	24.44	33.00
20000	1715	1	U	Н	20.68	4.79	-5.40	20.08	33.00
20000	1/13	25	12	V	24.96	4.39	-5.40	23.95	33.00
			12	Н	19.01	4.79	-5.40	18.40	33.00
		50	0	V	24.32	4.39	-5.40	23.31	33.00
		30	U	Н	17.90	4.79	-5.40	17.29	33.00
		1	49	V	23.49	4.35	-5.42	22.41	33.00
			77	Н	20.94	4.78	-5.42	20.30	33.00
		1	0	V	22.81	4.36	-5.40	21.77	33.00
20175	1732.5	1	- O	Н	19.92	4.78	-5.40	19.30	33.00
20175	1732.3	25	12	V	25.46	4.35	-5.42	24.39	33.00
		23	12	Н	19.52	4.78	-5.42	18.88	33.00
		50	0	V	24.91	4.35	-5.42	23.84	33.00
			Ů	Н	24.69	4.78	-5.42	24.04	33.00
		1	49	V	26.24	4.31	-5.44	25.12	33.00
		1	77	Н	19.21	4.76	-5.44	18.53	33.00
		1	0	V	25.58	4.32	-5.42	24.48	33.00
20350	1750		0	Н	20.51	4.77	-5.42	19.86	33.00
20330		25	12	V	23.69	4.31	-5.44	22.56	33.00
		25	12	Н	17.67	4.77	-5.44	17.01	33.00
		50	0	V	22.39	4.32	-5.44	21.27	33.00
Domari				Н	16.67	4.77	-5.44	16.01	33.00

#### Remark:

(1) The RBW, VBW of SPA for frequency RBW= 10MHz, VBW= 8MHz

Detector = Peak

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# LTE 5MHz/QPSK Band 17

Channel	Frequency (MHz)	RB Size	RB Offset	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP L	imit		
			V/H		dBm	dBd	dB	dBm	dBm		
		1	24	V	14.40	4.05	-3.98	14.46	38.45		
		1	24	Н	15.77	4.05	-3.98	15.84	38.45		
		1	0	V	14.53	4.10	-4.07	14.56	38.45		
23755	706.5	1	U	Н	15.12	4.10	-4.07	15.16	38.45		
23733	700.3	12	6	V	14.80	4.08	-3.98	14.89	38.45		
		12	U	Н	15.88	4.07	-3.98	15.97	38.45		
		25	0	V	16.99	4.07	-3.98	17.08	38.45		
		23	U	Н	16.98	4.07	-3.98	17.06	38.45		
		1	24	V	13.95	4.01	-3.98	13.97	38.45		
			24	Н	16.07	4.01	-3.98	16.09	38.45		
		1	1	1	0	V	14.44	4.06	-3.98	14.52	38.45
23790	710		Ů	Н	15.68	4.06	-3.98	15.76	38.45		
23170	710	12	6	V	15.14	4.03	-3.98	15.19	38.45		
		12	Ü	Н	16.99	4.03	-3.98	17.03	38.45		
		25	0	V	17.90	4.01	-3.98	17.93	38.45		
			Ů	Н	19.06	4.03	-3.98	19.11	38.45		
		1	24	V	16.64	3.97	-3.98	16.63	38.45		
		1	2-7	Н	17.40	3.96	-3.98	17.38	38.45		
		1	0	V	15.36	4.02	-3.98	15.39	38.45		
23825	713.5	1		Н	18.78	4.02	-3.98	18.81	38.45		
23023	713.5	6	V	18.40	3.99	-3.98	18.40	38.45			
		12 6	Н	16.54	3.99	-3.98	16.54	38.45			
		0	V	18.36	3.98	-3.98	18.35	38.45			
Domari				Н	19.62	3.98	-3.98	19.62	38.45		

#### Remark:

(1) The RBW, VBW of SPA for frequency RBW= 5MHz, VBW= 8MHz

Detector = Peak

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# LTE 5MHz/16 QAM Band 17

Channel	Frequency (MHz)	RB Size	RB Offset	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP L	imit
			V/H		dBm	dBd	dB	dBm	dBm
		1	24	V	17.30	4.05	-3.98	17.36	38.45
		1	24	Н	18.40	4.05	-3.98	18.46	38.45
		1	0	V	17.22	4.10	-4.07	17.26	38.45
23755	706.5	1	U	Н	18.48	4.11	-4.07	18.52	38.45
23133	700.3	12	6	V	18.64	4.08	-3.98	18.73	38.45
		12	U	Н	20.37	4.08	-3.98	20.46	38.45
		25	0	V	17.69	4.07	-3.98	17.78	38.45
		23	U	Н	18.84	4.07	-3.98	18.92	38.45
		1	24	V	17.09	4.00	-3.98	17.11	38.45
		1	24	Н	18.43	4.01	-3.98	18.45	38.45
	1	1	1 0	V	16.90	4.06	-3.98	16.98	38.45
23790	710	1	O	Н	17.80	4.06	-3.98	17.88	38.45
23170	710	12	2 6	V	17.32	4.03	-3.98	17.37	38.45
		12		Н	19.11	4.03	-3.98	19.15	38.45
		25	0	V	17.18	4.03	-3.98	17.23	38.45
		25	O	Н	19.66	4.03	-3.98	19.71	38.45
		1	24	V	17.12	3.97	-3.98	17.11	38.45
		1	24	Н	18.08	3.96	-3.98	18.06	38.45
		1	0	V	17.33	4.02	-3.98	17.37	38.45
23825	713.5	1	U	Н	18.57	4.02	-3.98	18.61	38.45
	/13.3	12	6	V	17.96	3.98	-3.98	17.96	38.45
		12	U	Н	19.08	3.99	-3.98	19.08	38.45
		25	0	V	18.28	3.98	-3.98	18.27	38.45
Domarl		23	U	Н	19.35	3.98	-3.98	19.35	38.45

#### Remark:

(1) The RBW, VBW of SPA for frequency RBW= 5MHz, VBW= 8MHz

Detector = Peak

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## LTE 10MHz/QPSK Band 17

Channel	Frequency (MHz)	RB Size	RB Offset	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP L	imit
			V/H		dBm	dBd	dB	dBm	dBm
		1	49	V	15.22	3.99	-3.98	15.23	38.45
		1	49	Н	16.84	3.99	-3.98	16.85	38.45
		1	0	V	16.35	4.10	-3.98	16.46	38.45
23780	709	1	U	Н	17.13	4.10	-3.98	17.24	38.45
23780	709	25	12	V	16.70	4.04	-3.98	16.76	38.45
		23	12	Н	19.27	4.02	-3.98	19.31	38.45
		50	0	V	16.51	4.04	-3.98	16.57	38.45
		30	U	Н	17.98	4.03	-3.98	18.02	38.45
		1	49	V	15.65	3.98	-3.98	15.65	38.45
		1	49	Н	17.05	3.98	-3.98	17.04	38.45
		710	0	V	15.87	4.09	-3.98	15.97	38.45
23790	710			Н	17.06	4.09	-3.98	17.17	38.45
23170	/10	25	12	V	17.14	4.02	-3.98	17.18	38.45
				Н	18.89	4.03	-3.98	18.93	38.45
		50	0	V	18.38	4.02	-3.98	18.42	38.45
			O	Н	18.98	4.02	-3.98	19.02	38.45
		1	49	V	15.42	3.97	-3.98	15.40	38.45
			77	Н	16.72	3.97	-3.98	16.70	38.45
		1	0	V	15.92	4.07	-3.98	16.01	38.45
23800	711	1	Ü	Н	17.18	4.07	-3.98	17.27	38.45
23000	/11	25	12	V	16.40	4.01	-3.98	16.43	38.45
			12	Н	18.93	4.02	-3.98	18.96	38.45
		50	0	V	16.31	4.01	-3.98	16.34	38.45
D		50	J	Н	17.78	4.01	-3.98	17.80	38.45

## Remark:

(1) The RBW,VBW of SPA for frequency RBW= 10MHz, VBW= 8MHz

Detector = Peak

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## LTE 10MHz/16 QAM Band 17

Channel	Frequency (MHz)	RB Size	RB Offset	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP L	imit
			V/H		dBm	dBd	dB	dBm	dBm
		1	49	V	16.33	3.99	-3.98	16.34	38.45
		1	49	Н	17.68	3.99	-3.98	17.68	38.45
		1	0	V	16.79	4.10	-4.07	16.83	38.45
23780	709	1	U	Н	17.84	4.10	-4.07	17.88	38.45
23760	709	25	12	V	18.06	4.04	-3.98	18.11	38.45
		23	12	Н	19.35	4.04	-3.98	19.40	38.45
		50	0	V	19.05	4.03	-3.98	19.10	38.45
		30	U	Н	18.93	4.03	-3.98	18.98	38.45
		1	49	V	16.64	3.98	-3.98	16.64	38.45
		1	49	Н	17.80	3.98	-3.98	17.80	38.45
	1	1	1 0	V	17.61	4.09	-3.98	17.71	38.45
23790	710	1		Н	17.57	4.08	-3.98	17.67	38.45
23190	/10		12	V	18.36	4.02	-3.98	18.40	38.45
			12	Н	19.46	4.02	-3.98	19.50	38.45
		50	0	V	17.44	4.02	-3.98	17.48	38.45
		30	U	Н	19.32	4.03	-3.98	19.36	38.45
		1	49	V	16.70	3.96	-3.98	16.68	38.45
		1	77	Н	17.87	3.97	-3.98	17.85	38.45
		1	0	V	16.95	4.07	-3.98	17.04	38.45
23800	711	1	U	Н	18.04	4.08	-3.98	18.13	38.45
23000	/11	25	12	V	18.98	4.00	-3.98	19.00	38.45
		23	12	Н	19.10	4.01	-3.98	19.12	38.45
		50	0	V	19.71	4.01	-3.98	19.73	38.45
		30	U	Н	18.88	4.00	-3.98	18.90	38.45

## Remark:

(1) The RBW, VBW of SPA for frequency RBW= 10MHz, VBW= 8MHz

Detector = Peak

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## 9. 99% OCCUPIED BANDWIDTH MEASUREMENT

# 9.1. Standard Applicable:

According to §FCC 2.1049.

## 9.2. Test Set-up:

Refer to section 5.2 in this report

#### 9.3. Measurement Procedure:

The EUT's output RF connector was connected with a short cable to the spectrum analyzer, RBW (10/30KHz) was set to about 1% of emission BW, VBW= 3 times RBW(30/100KHz), -26dBc display line was placed on the screen (or 99% bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace.

## 9.4. Measurement Equipment Used:

Refer to section 2.4 in this report

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## Measurement Result:

EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
WCDMA II	1852.40	9262	4.1490
	1880.00	9400	4.1422
	1907.60	9538	4.1503

EUT Mode	Frequency (MHz)	СН	99 % Bandwidth (MHz)
HSUPA II	1852.40	9262	4.1457
	1880.00	9400	4.1496
	1907.60	9538	4.1570

EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
HSDPA II	1852.40	9262	4.1419
	1880.00	9400	4.1295
	1907.60	9538	4.1584

EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
WCDMA IV	1712.40	1312	4.1447
	1732.60	1413	4.1498
	1752.60	1513	4.1315

EUT Mode	Frequency (MHz)	СН	99 % Bandwidth (MHz)
HSUPA IV	1712.40	1312	4.1457
	1732.60	1413	4.1311
	1752.60	1513	4.1370

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EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
	1712.40	1312	4.1331
HSDPA IV	1732.60	1413	4.1620
	1752.60	1513	4.1292

EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
WCDMA V	826.40	4132	4.1229
	836.60	4183	4.1337
	846.60	4233	4.1332

EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
HSUPA V	826.40	4132	4.1375
	836.60	4183	4.1431
	846.60	4233	4.1450

EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
HSDPA V	826.40	4132	4.1511
	836.60	4183	4.1373
	846.60	4233	4.1374

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EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
1.4MHz BW	1710.7	19957	1.3289
LTE-Band 4 (QPSK RB 6	1732.5	20175	1.3142
Offset 0)	1754.3	20393	1.3195

EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
1.4MHz BW	1710.7	19957	1.3207
LTE-Band 4 (16QAM RB 6	1732.5	20175	1.3008
Offset 0)	1754.3	20393	1.3135

EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
3MHz BW	1711.5	19965	2.8598
LTE-Band 4 (QPSK RB 15	1732.5	20175	2.8528
Offset 0)	1753.5	20385	2.8454

EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
3MHz BW	1711.5	19965	2.8457
LTE-Band 4 (16QAM RB 15	1732.5	20175	2.8410
Offset 0)	1753.5	20385	2.8298

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EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
5MHz BW	1712.5	19975	4.5054
LTE-Band 4 (QPSK RB 25	1732.5	20175	4.5090
Offset 0)	1752.5	20375	4.5073

EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
5MHz BW	1712.5	19975	4.5151
LTE-Band 4 (16QAM RB 25	1732.5	20175	4.5205
Offset 0)	1752.5	20375	4.5090

EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
10MHz BW	1715	20000	8.9985
LTE-Band 4 (QPSK RB 50	1732.5	20175	8.9528
Offset 0)	1750	20350	8.9475

EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
10MHz BW	1715	20000	8.9470
LTE-Band 4 (16QAM RB 50	1732.5	20175	8.9468
Offset 0)	1750	20350	8.9455

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EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
5MHz BW	706.5	23755	4.5048
LTE-Band 17 (QPSK RB 25	710	23790	4.5006
Offset 0)	713.5	23825	4.5069

EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
5MHz BW	706.5	23755	4.5057
LTE-Band 17 (16QAM RB 25	710	23790	4.5103
Offset 0)	713.5	23825	4.5085

EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
10MHz BW	709	23780	8.9046
LTE-Band 17 (QPSK RB 50	710	23790	8.8939
Offset 0)	711	23800	8.9677

EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
10MHz BW	709	23780	8.9435
LTE-Band 17 (16QAM RB 50	710	23790	8.8858
Offset 0)	711	23800	8.8665

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Figure 9-1: WCDMA Band II Channel Low

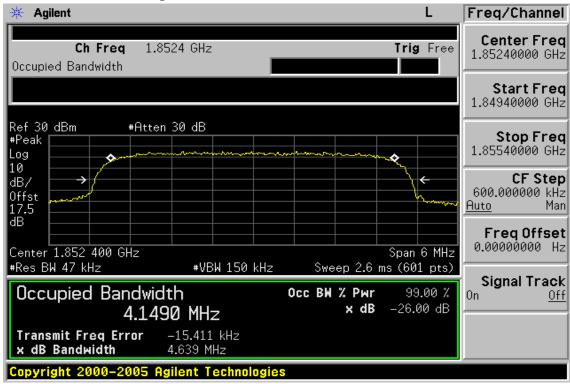
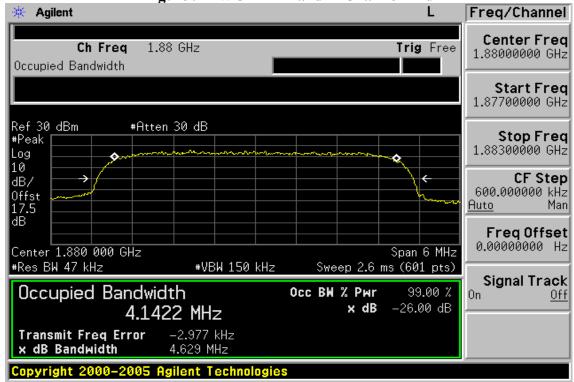


Figure 9-2 WCDMA Band II Channel Mid



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Figure 9-3: WCDMA Band II Channel High

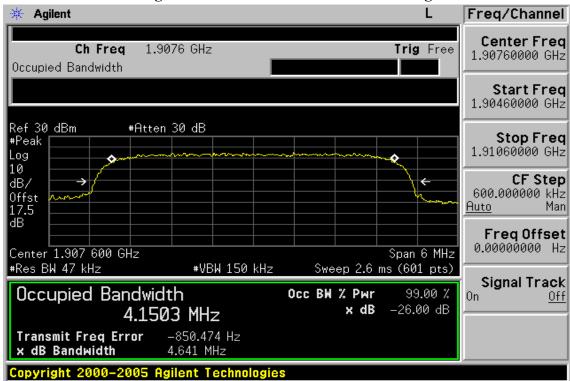
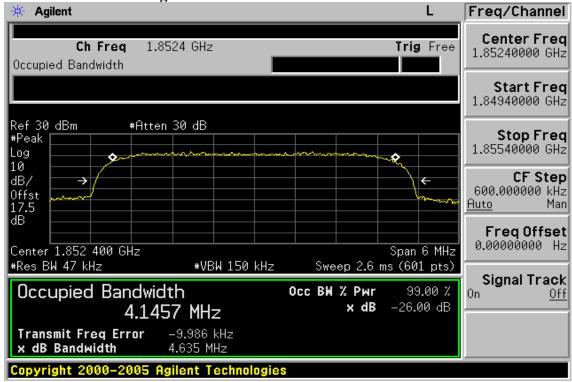


Figure 9-4: HSUPA Band II Channel Low



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Figure 9-5 HSUPA Band II Channel Mid

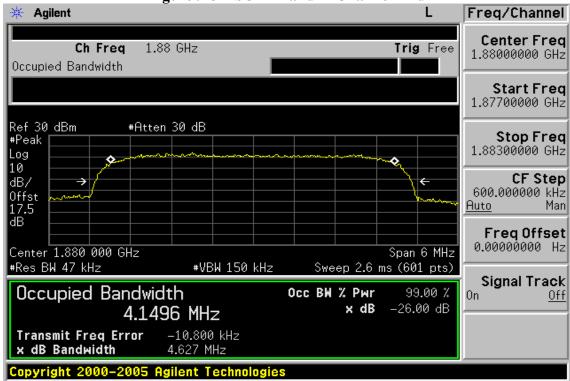
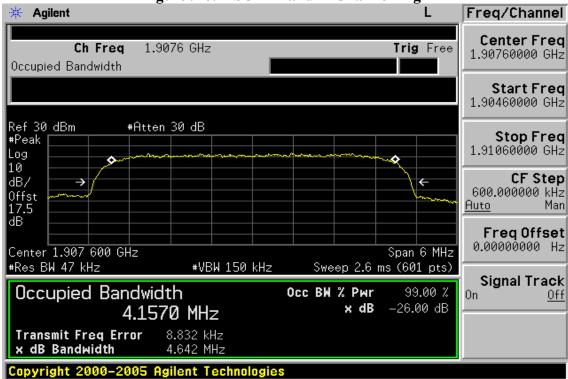


Figure 9-6: HSUPA Band II Channel High



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Figure 9-7: HSDPA Band II Channel Low

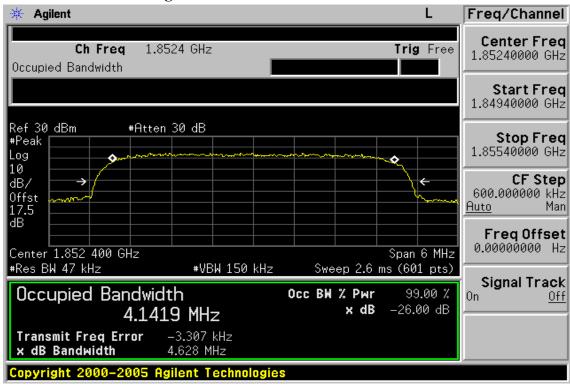
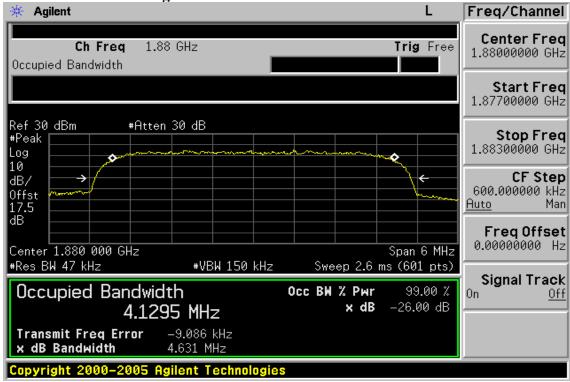


Figure 9-8 HSDPA Band II Channel Mid



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Figure 9-9: HSDPA Band II Channel High

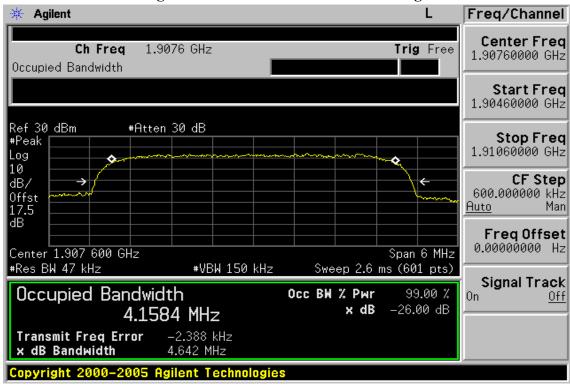
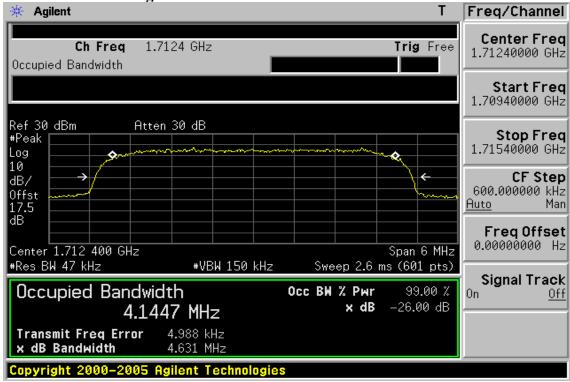


Figure 9-10: WCDMA Band IV Channel Low



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Figure 9-11 WCDMA Band IV Channel Mid

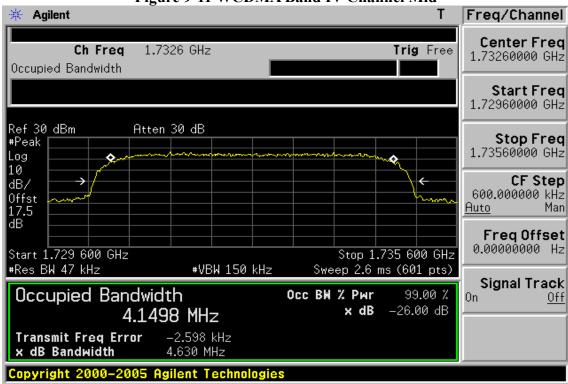
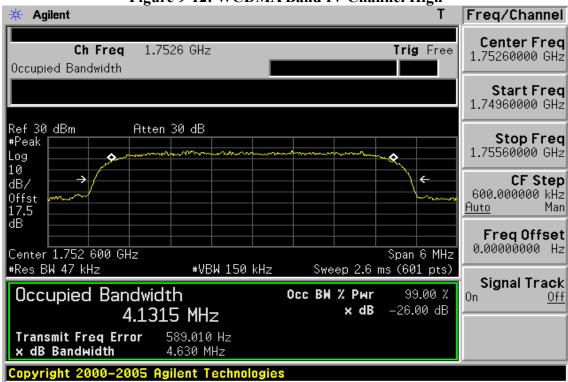


Figure 9-12: WCDMA Band IV Channel High



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Figure 9-13: HSUPA Band IV Channel Low

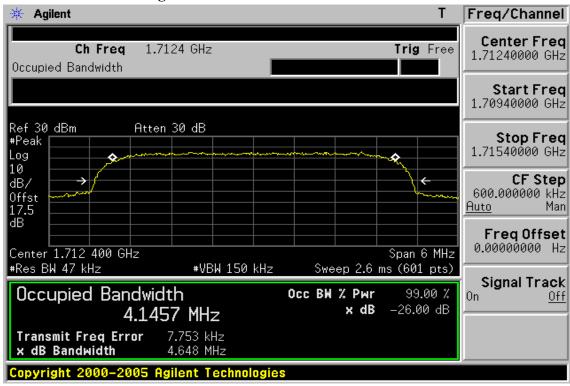
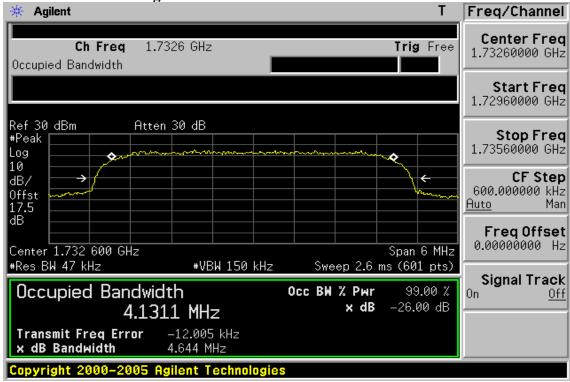


Figure 9-14: HSUPA Band IV Channel Mid



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Figure 9-15: HSUPA Band IV Channel High

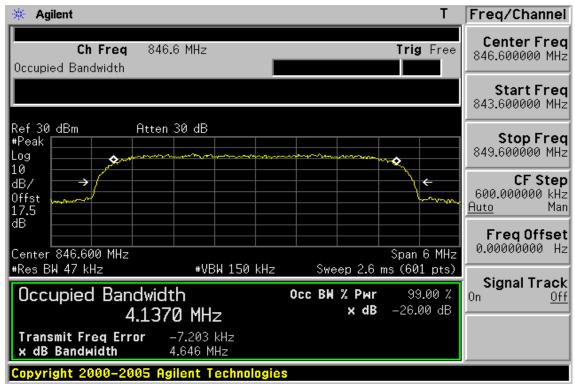
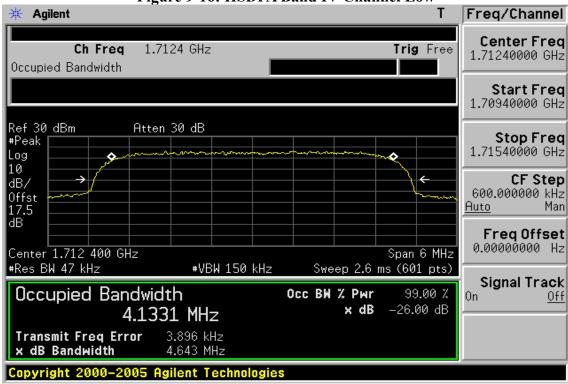


Figure 9-16: HSDPA Band IV Channel Low



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Figure 9-17: HSDPA Band IV Channel Mid

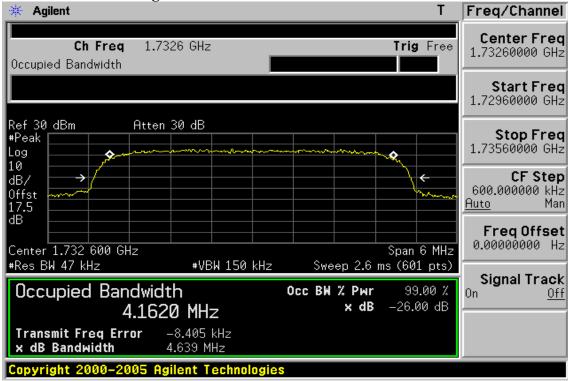
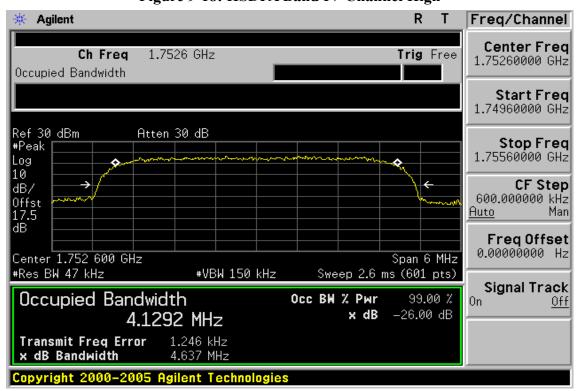


Figure 9-18: HSDPA Band IV Channel High



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Figure 9-19: WCDMA Band V Channel Low

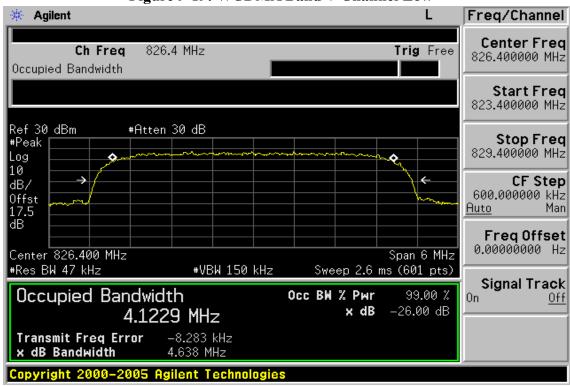
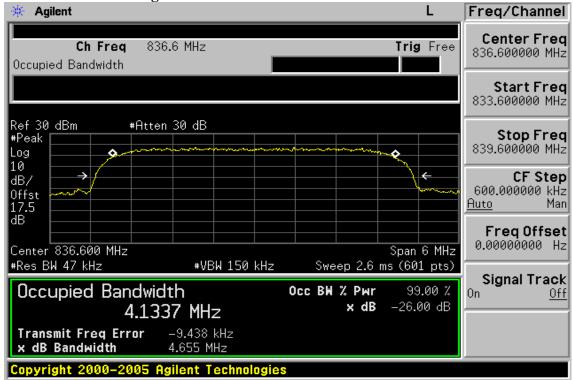


Figure 9-20: WCDMA Band V Channel Mid



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Figure 9-21: WCDMA Band V Channel High

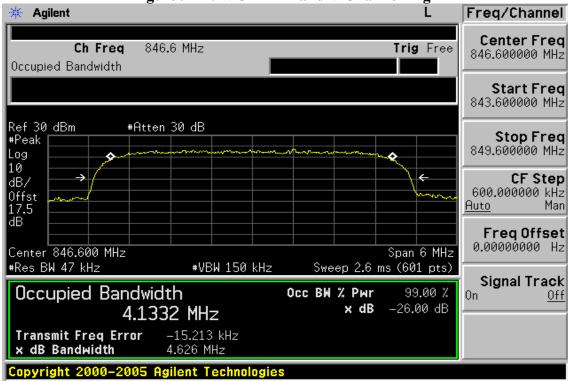
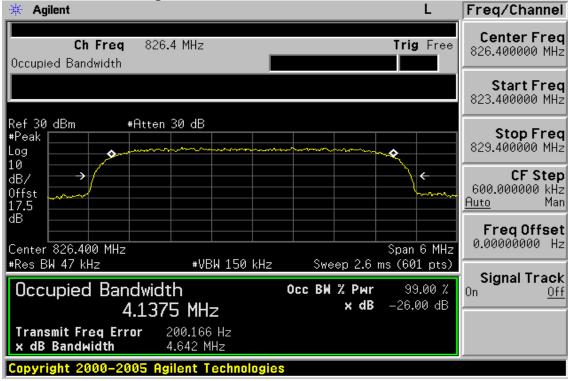


Figure 9-22: HSUPA Band V Channel Low



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Figure 9-23 HSUPA Band V Channel Mid

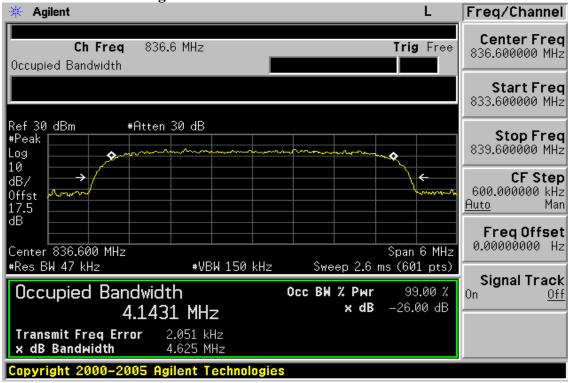
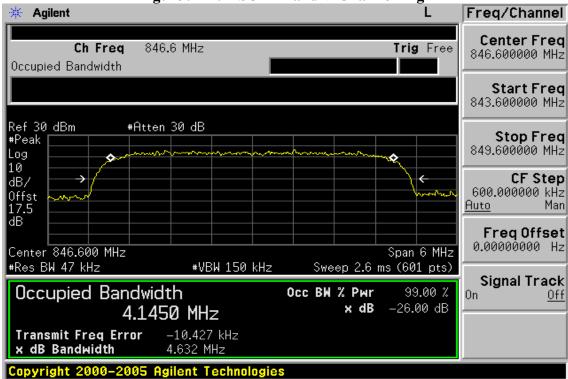


Figure 9-24: HSUPA Band V Channel High



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Figure 9-25: HSDPA Band V Channel Low

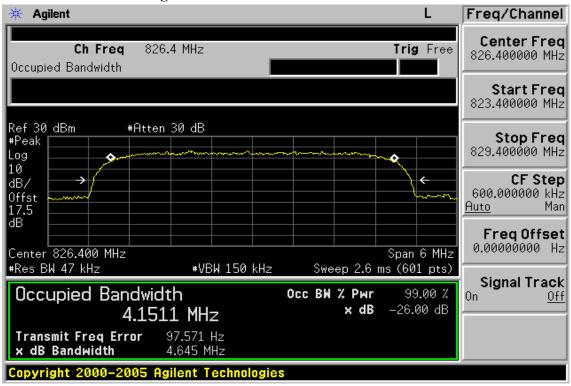
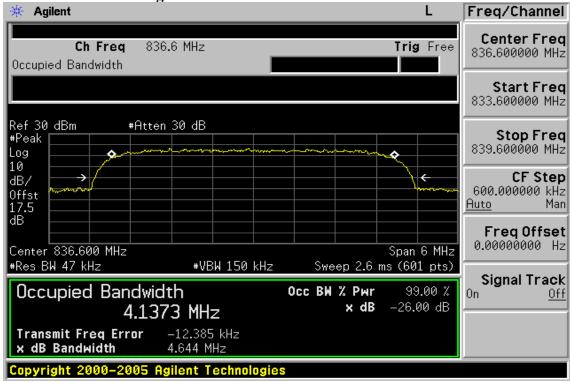


Figure 9-26: HSDPA Band V Channel Mid



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Figure 9-27: HSDPA Band V Channel High

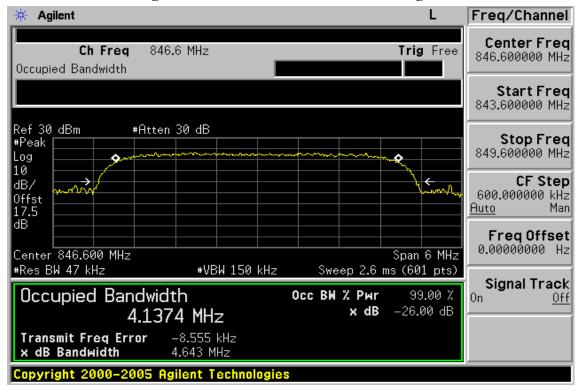
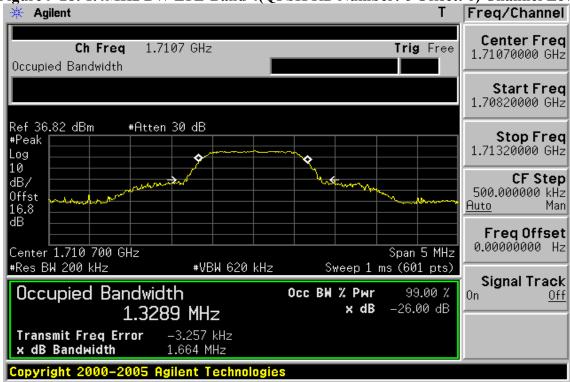


Figure 9-28: 1.4MHz BW LTE-Band 4(QPSK RB Number: 6 Offset: 0) Channel Low



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Figure 9-29: 1.4MHz BW LTE-Band 4(QPSK RB Number: 6 Offset: 0) Channel Mid

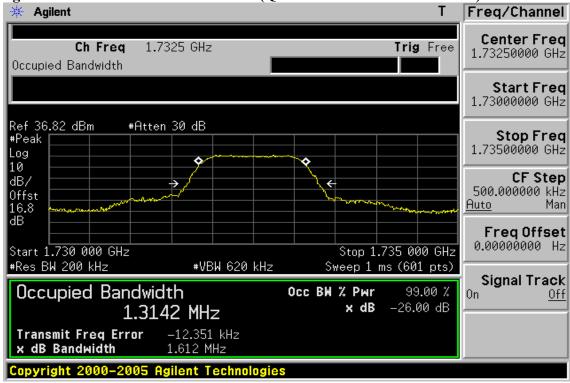
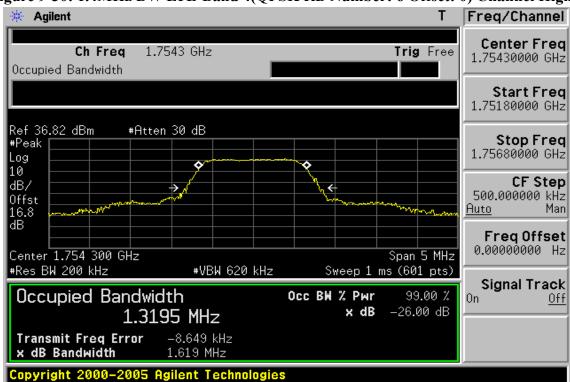


Figure 9-30: 1.4MHz BW LTE-Band 4(QPSK RB Number: 6 Offset: 0) Channel High



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Figure 9-31: 1.4MHz BW LTE-Band 4(16QAM RB Number: 6 Offset: 0) Channel Low

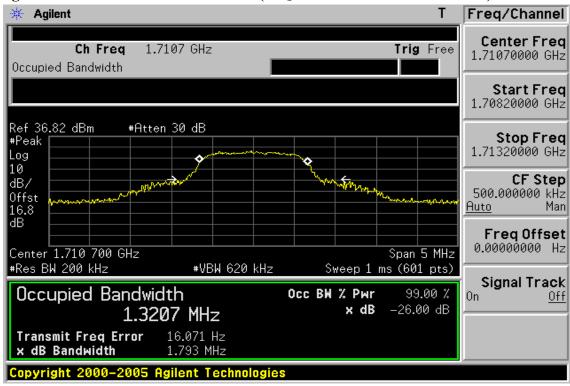
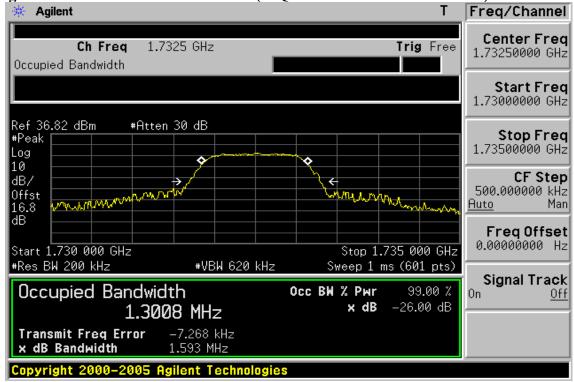


Figure 9-32: 1.4MHz BW LTE-Band 4(16QAM RB Number: 6 Offset: 0) Channel Mid



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Figure 9-33: 1.4MHz BW LTE-Band 4(16QAM RB Number: 6 Offset: 0) Channel High

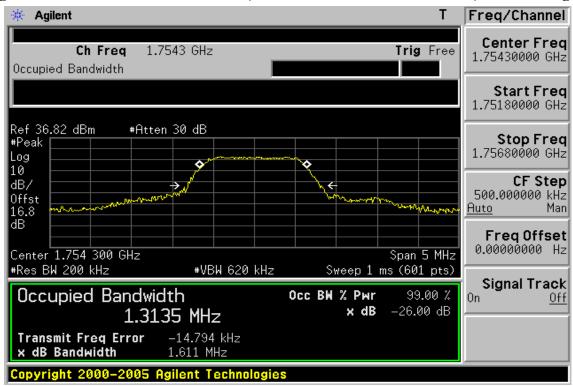
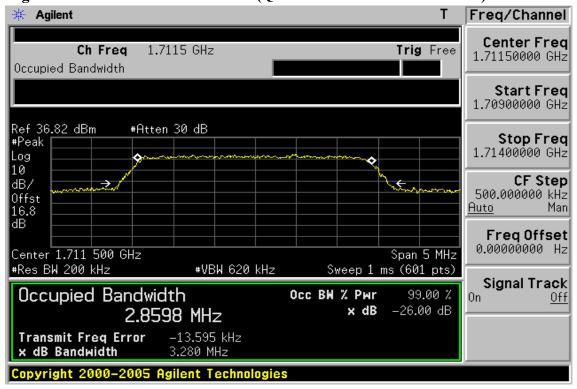


Figure 9-34: 3MHz BW LTE-Band 4(QPSK RB Number: 15 Offset: 0) Channel Low



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Figure 9-35: 3MHz BW LTE-Band 4(QPSK RB Number: 15 Offset: 0) Channel Mid

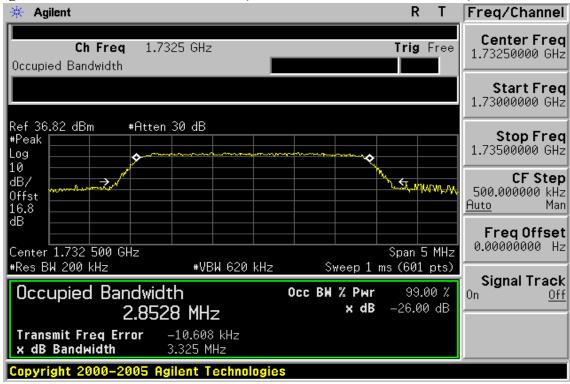
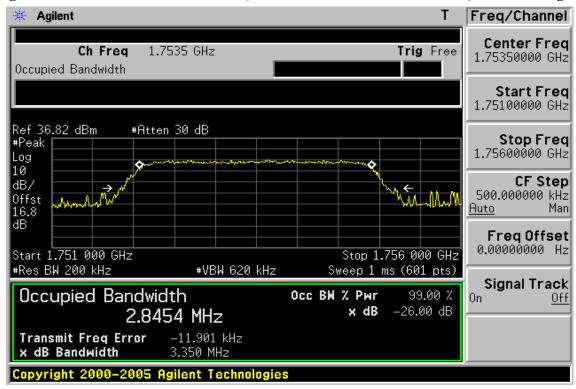


Figure 9-36: 3MHz BW LTE-Band 4(QPSK RB Number: 15 Offset: 0) Channel High



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Figure 9-37: 3MHz BW LTE-Band 4(16QAM RB Number: 15 Offset: 0) Channel Low

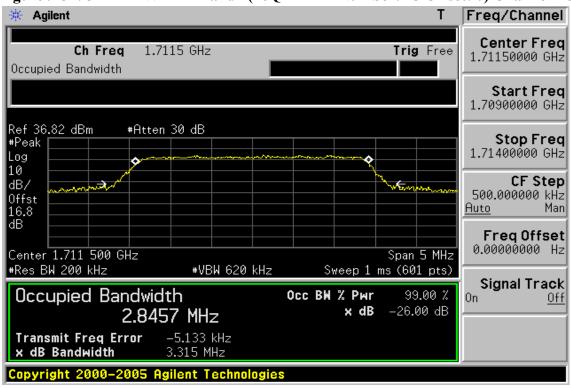
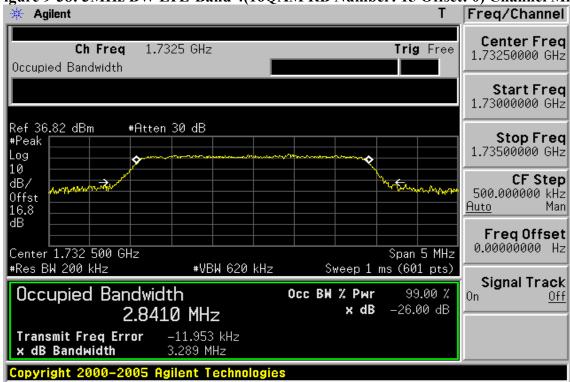


Figure 9-38: 3MHz BW LTE-Band 4(16QAM RB Number: 15 Offset: 0) Channel Mid



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Figure 9-39: 3MHz BW LTE-Band 4(16QAM RB Number: 15 Offset: 0) Channel High

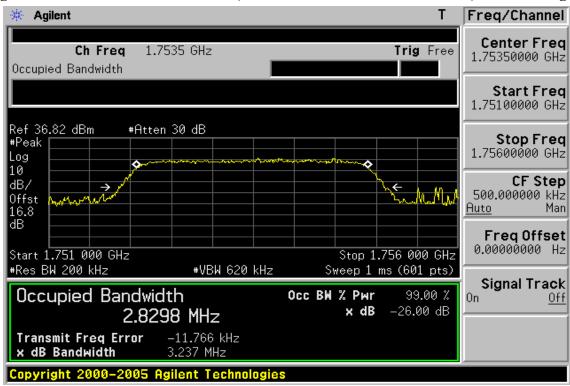
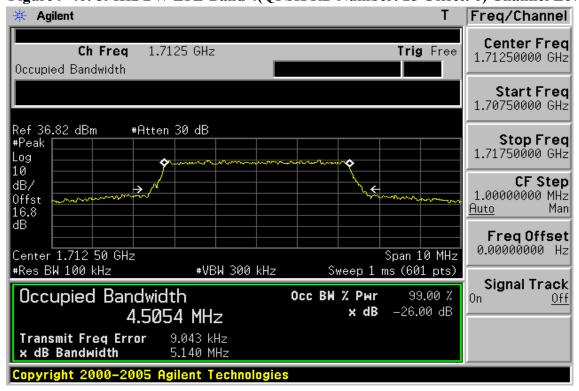


Figure 9-40: 5MHz BW LTE-Band 4(QPSK RB Number: 25 Offset: 0) Channel Low



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Figure 9-41: 5MHz BW LTE-Band 4(QPSK RB Number: 25 Offset: 0) Channel Mid

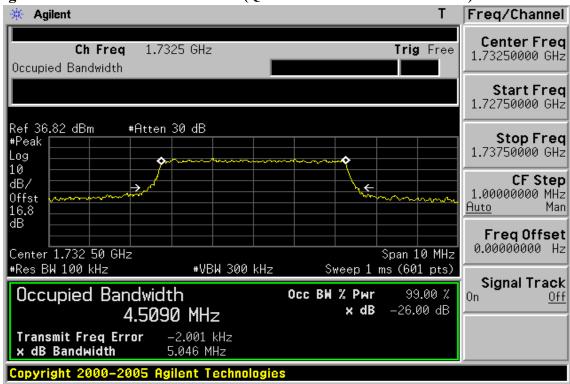
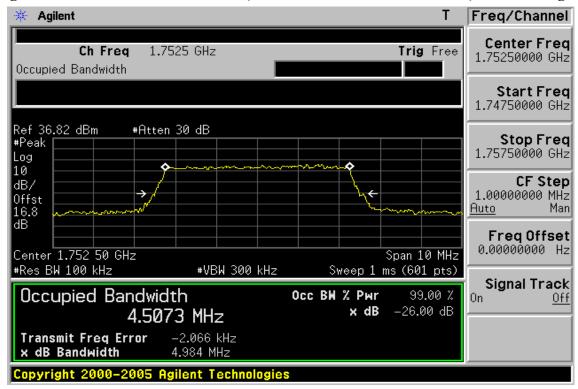


Figure 9-42: 5MHz BW LTE-Band 4(QPSK RB Number: 25 Offset: 0) Channel High



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Figure 9-43: 5MHz BW LTE-Band 4(16QAM RB Number: 25 Offset: 0) Channel Low

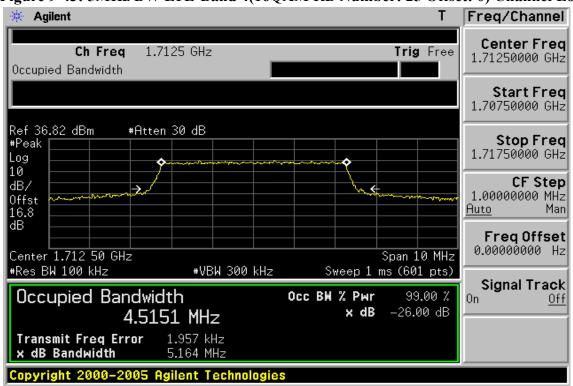
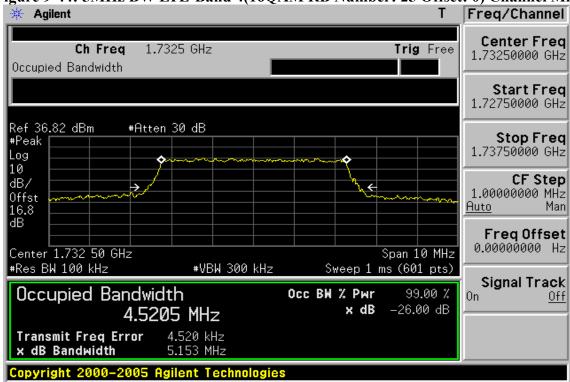


Figure 9-44: 5MHz BW LTE-Band 4(16QAM RB Number: 25 Offset: 0) Channel Mid



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Figure 9-45: 5MHz BW LTE-Band 4(16QAM RB Number: 25 Offset: 0) Channel High

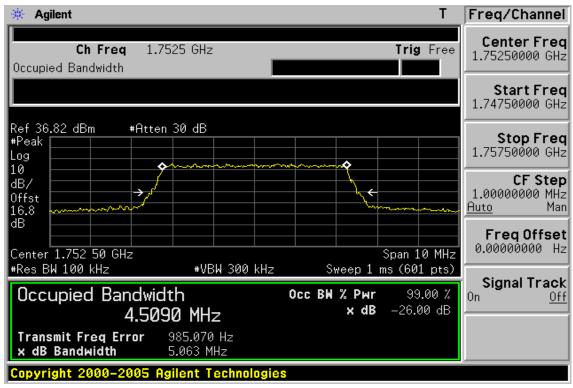
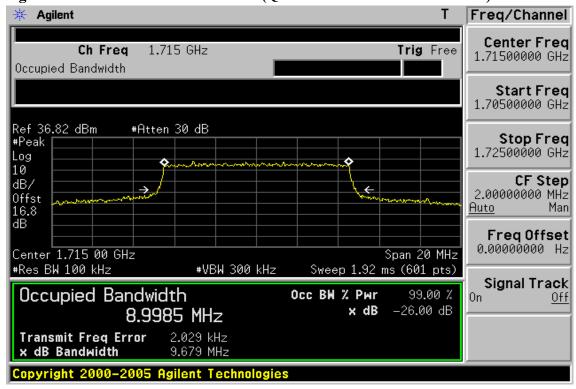


Figure 9-46: 10MHz BW LTE-Band 4(QPSK RB Number: 50 Offset: 0) Channel Low



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Figure 9-47: 10MHz BW LTE-Band 4(QPSK RB Number: 50 Offset: 0) Channel Mid

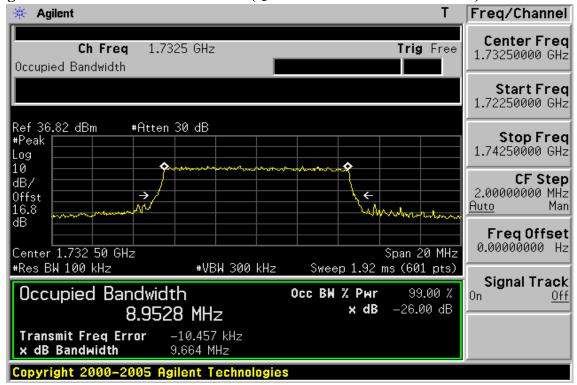
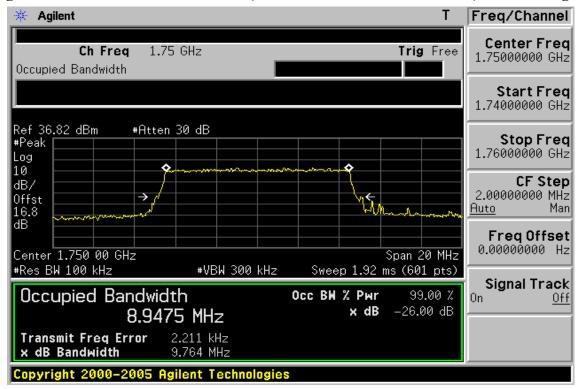


Figure 9-48: 10MHz BW LTE-Band 4(QPSK RB Number: 50 Offset: 0) Channel High



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Figure 9-49: 10MHz BW LTE-Band 4(16QAM RB Number: 50 Offset: 0) Channel Low

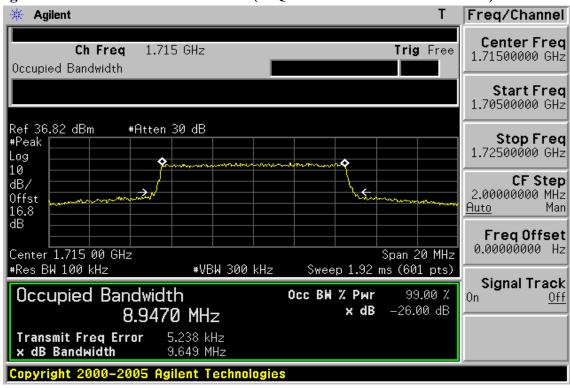
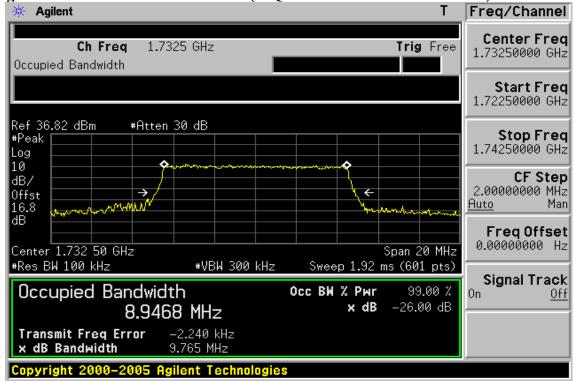


Figure 9-50: 10MHz BW LTE-Band 4(16QAM RB Number: 50 Offset: 0) Channel Mid



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Figure 9-51: 10MHz BW LTE-Band 4(16QAM RB Number: 50 Offset: 0) Channel High

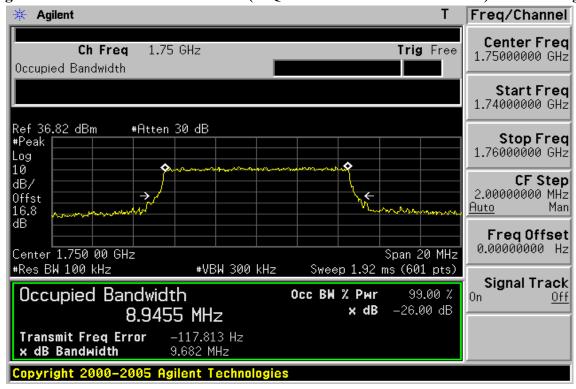
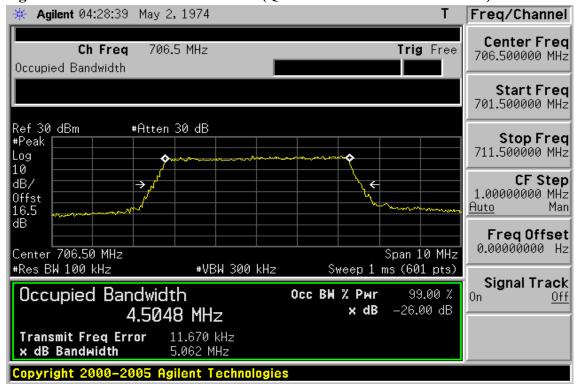


Figure 9-52: 5MHz BW LTE-Band 17(QPSK RB Number: 25 Offset: 0) Channel Low



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Figure 9-53: 5MHz BW LTE-Band 17(QPSK RB Number: 25 Offset: 0) Channel Mid

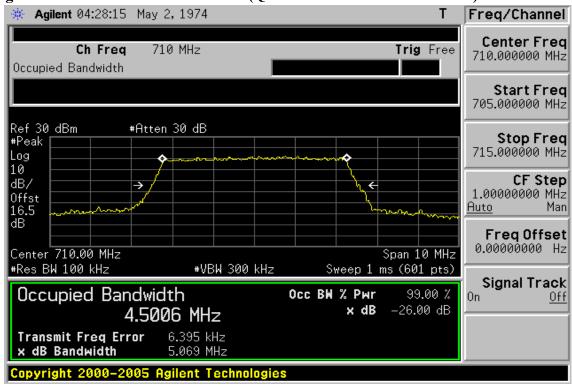
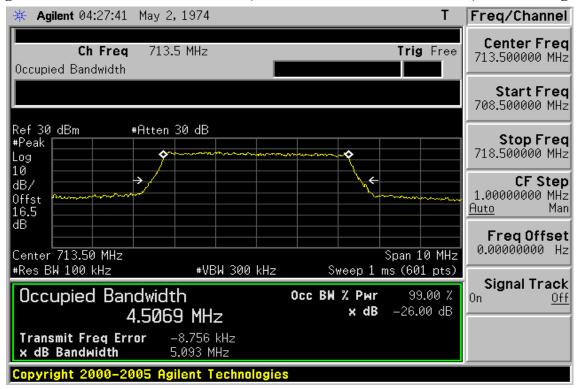


Figure 9-54: 5MHz BW LTE-Band 17(QPSK RB Number: 25 Offset: 0) Channel High



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Figure 9-55: 5MHz BW LTE-Band 17(16QAM RB Number: 25 Offset: 0) Channel Low

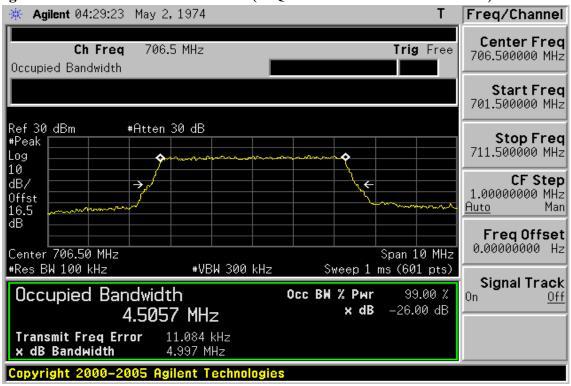
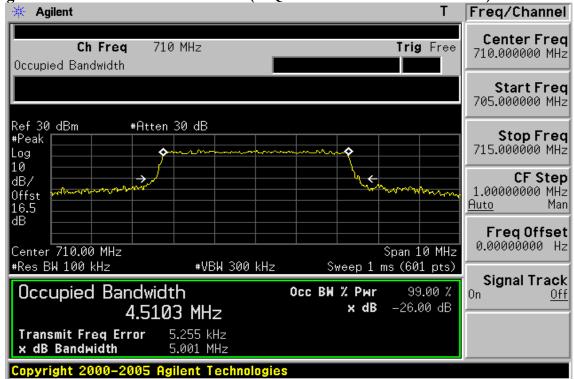


Figure 9-56: 5MHz BW LTE-Band 17(16QAM RB Number: 25 Offset: 0) Channel Mid



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Figure 9-57: 5MHz BW LTE-Band 17(16QAM RB Number: 25 Offset: 0) Channel High

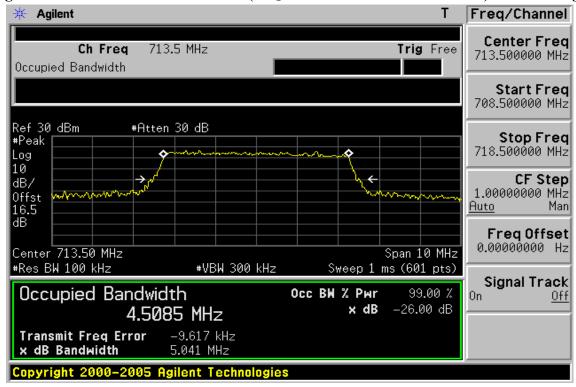
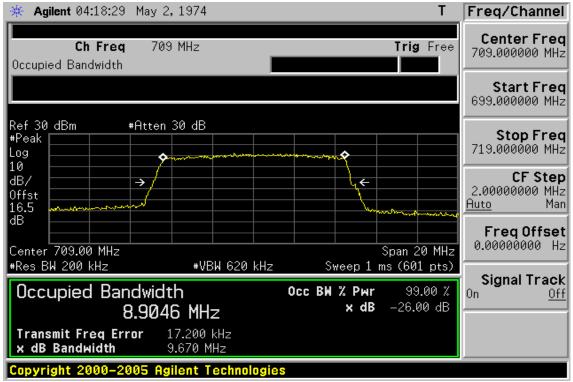


Figure 9-58: 10MHz BW LTE-Band 17(QPSK RB Number: 50 Offset: 0) Channel Low



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Figure 9-59: 10MHz BW LTE-Band 17(QPSK RB Number: 50 Offset: 0) Channel Mid

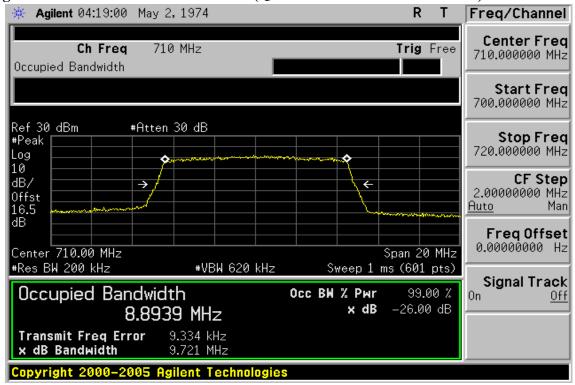
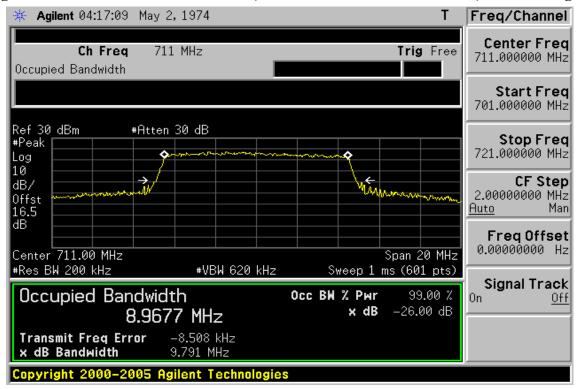


Figure 9-60: 10MHz BW LTE-Band 17(QPSK RB Number: 50 Offset: 0) Channel High



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Figure 9-61: 10MHz BW LTE-Band 17(16QAM RB Number: 50 Offset: 0) Channel Low

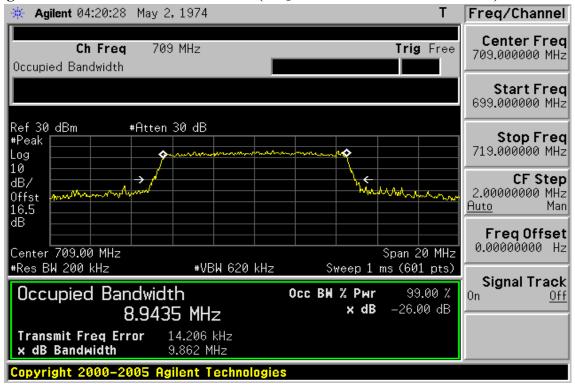
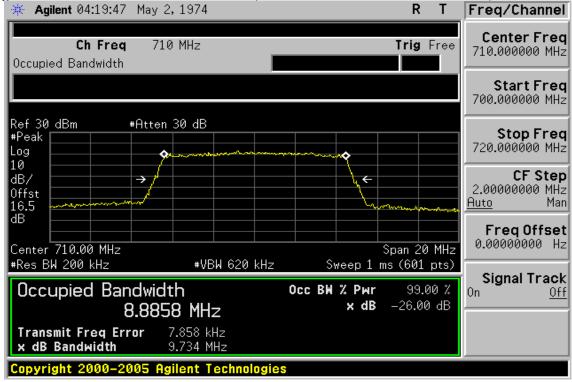


Figure 9-62: 10MHz BW LTE-Band 17(16QAM RB Number: 50 Offset: 0) Channel Mid



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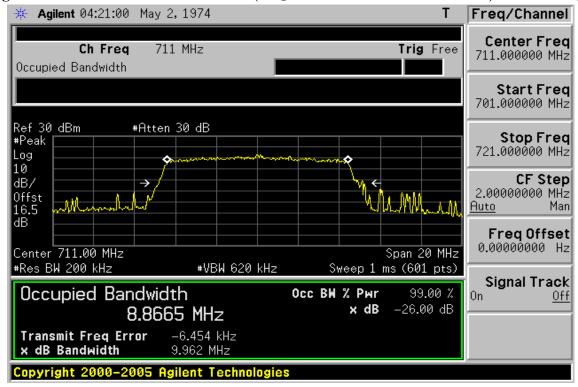
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Figure 9-63: 10MHz BW LTE-Band 17(16QAM RB Number: 50 Offset: 0) Channel High



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### 10. OUT OF BAND EMISSION AT ANTENNA TERMINALS

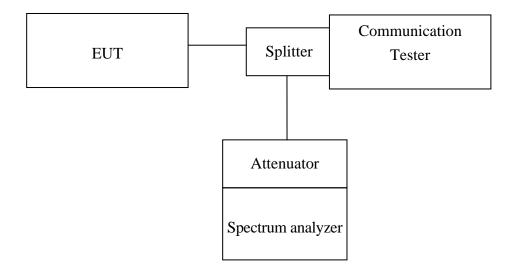
# 10.1. Standard Applicable:

According to FCC §2.1051.

FCC  $\S22.917(a),\S24.238(a)$ ,  $\S27.53(e)(2)$  the magnitude of each spurious and harmonic emission that can be detected when the equipment is operated under the conditions specified in the instruction manual and/ or alignment procedure, shall not be less than  $43 + 10 \log$  (mean output power in watts) dBc below the mean power output outside a license's frequency block (-13dBm)

### 10.2. Test SET-UP:

## Out of band emission /Band Edge



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#### 10.3. Measurement Procedure:

The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation The resolution bandwidth of the spectrum analyzer was set at 1MHz, sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic.

For the out of band: Set the RBW, VBW = 1MHz, Start=30MHz, Stop= 10 th harmonic. Limit = -13dBm

Band Edge Requirements: In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions. Limit, -13dBm.

For operations in the 698–746 MHz band, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed. Limit, -13dBm.

### **Conducted Emission:**

- 1 · To connect Antenna Port of EUT to Spectrum.
- 2 \ Set RBW = 1MHz & VBW = 1MHz on Spectrum.
- 3 · Sweep the frequency to determine spurious emission as seen on spectrum from span of 30 to 1G, 1G to 2.5G, 2.5G to 7.5G, 7.5G to 10G, 10G to 15G and 15G to 20GHz
- 4 Via Software, combine 6 spans of frequency range into one plot

### 10.4. Measurement Equipment Used:

Refer to section 2.4 in this report

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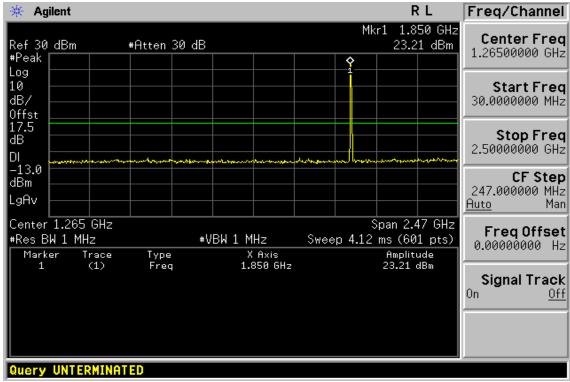


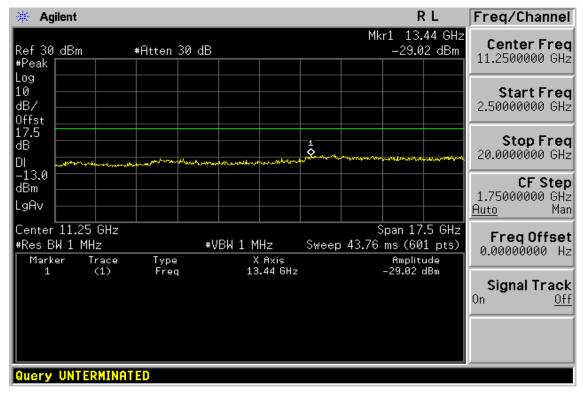
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### 10.5. Measurement Result:

Figure 10-1: Out of Band emission at antenna terminals-WCDMA Band II Channel Lowest





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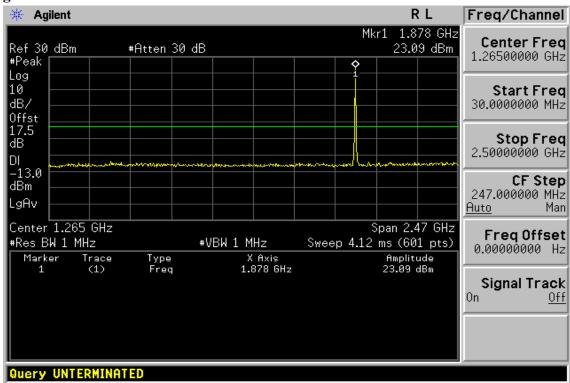
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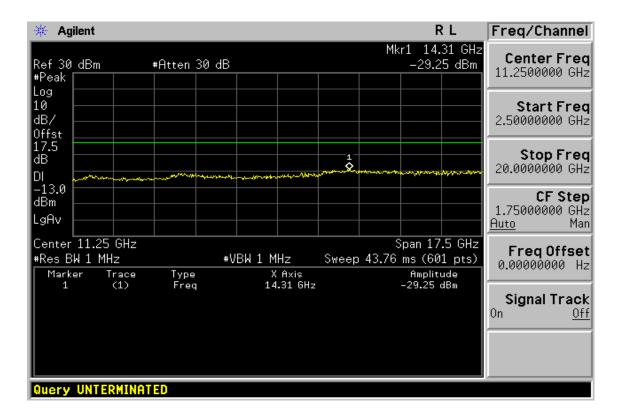


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Figure 10-2: Out of Band emission at antenna terminals -WCDMA Band II Channel Mid





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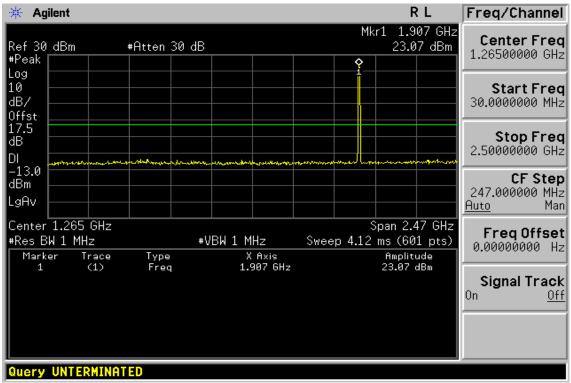
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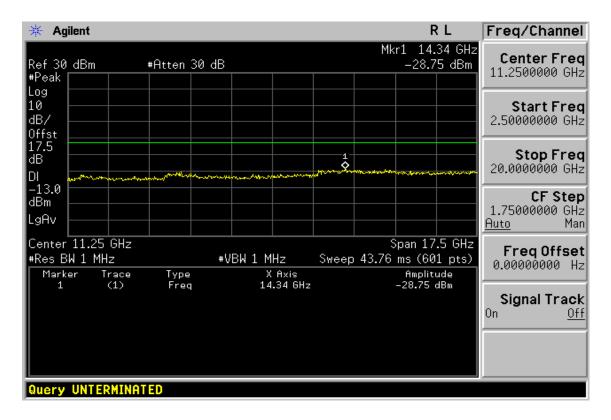


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Figure 10-3: Out of Band emission at antenna terminals-WCDMA Band II Channel Highest





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Figure 10-4: Band edge emission at antenna terminals -WCDMA Band II Channel Lowest

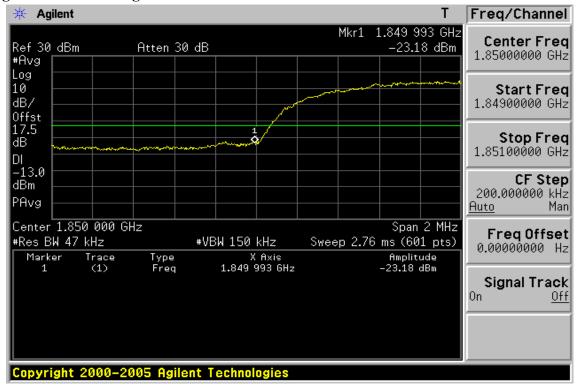


Figure 10-5: Band edge emission at antenna terminals –WCDMA Band II Channel Highest



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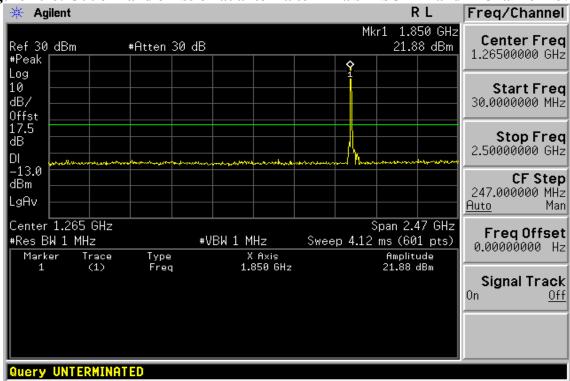
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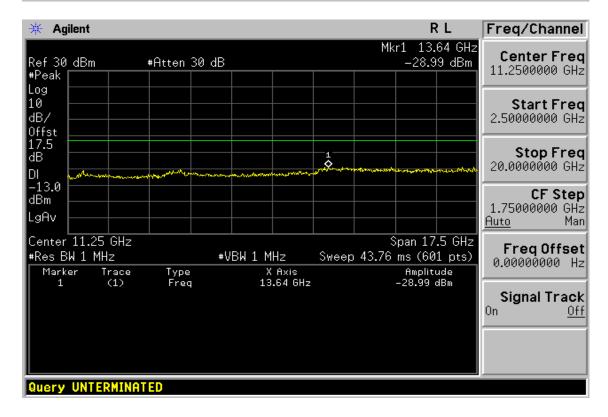


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Figure 10-6: Out of Band emission at antenna terminals-HSUPA Band II Channel Lowest





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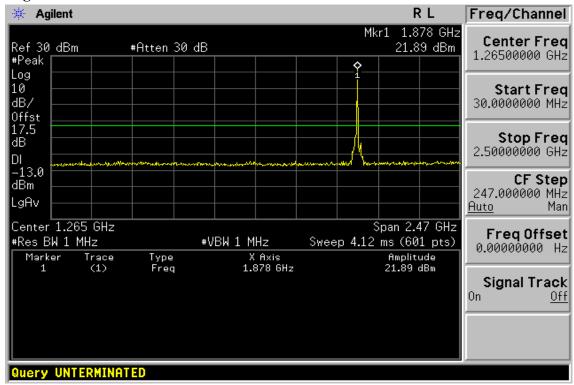
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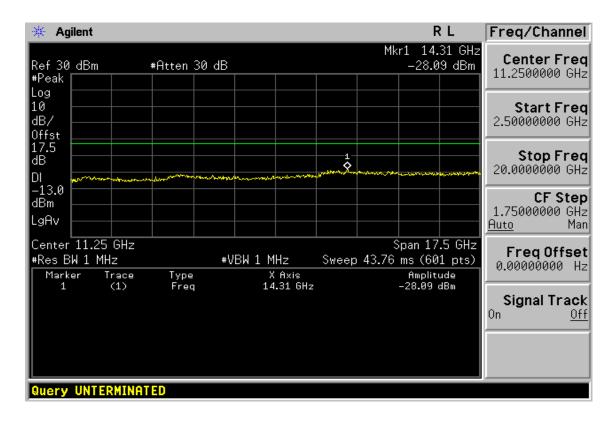


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Figure 10-7: Out of Band emission at antenna terminals –HSUPA Band II Mid





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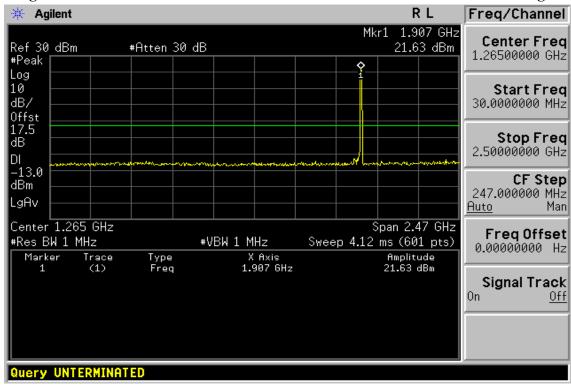
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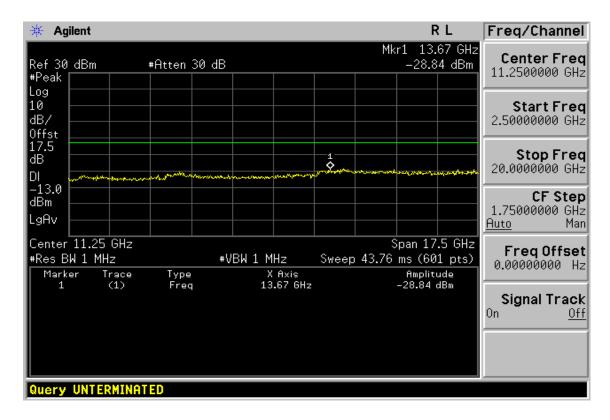


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Figure 10-8: Out of Band emission at antenna terminals -HSUPA Band II Highest





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Figure 10-9: Band edge emission at antenna terminals -HSUPA Band II Lowest

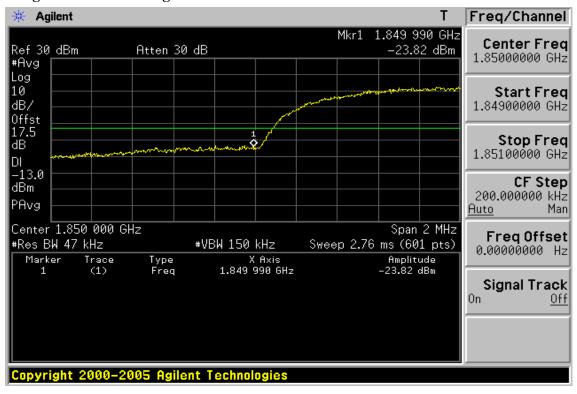


Figure 10-10: Band edge emission at antenna terminals –HSUPA Band II Highest



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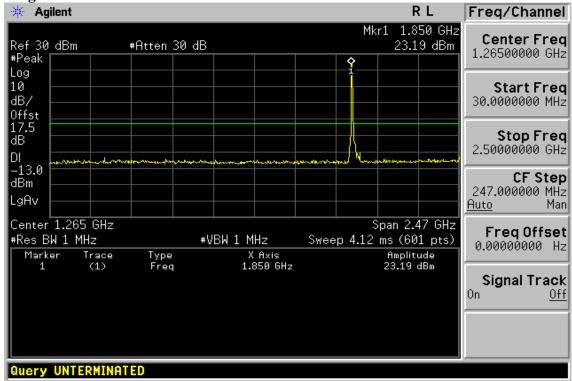
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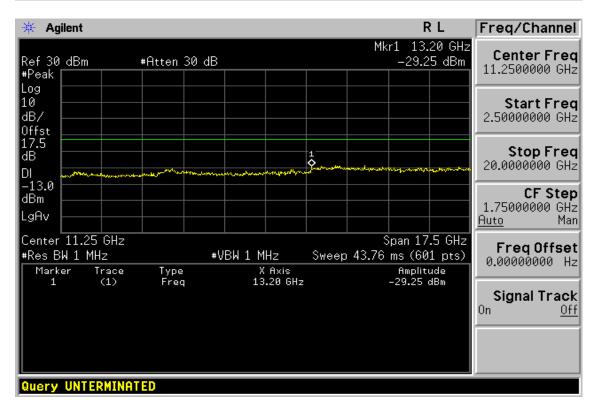


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Figure 10-11: Out of Band emission at antenna terminals-HSDPA Band II Lowest





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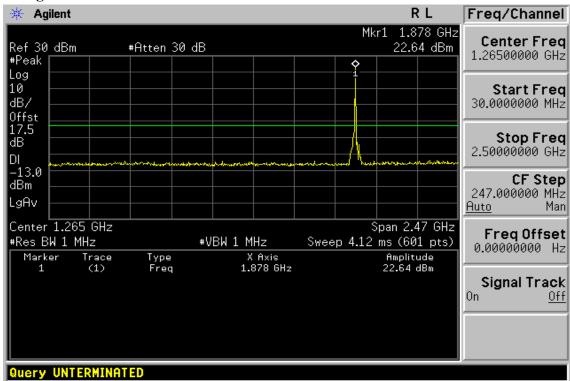
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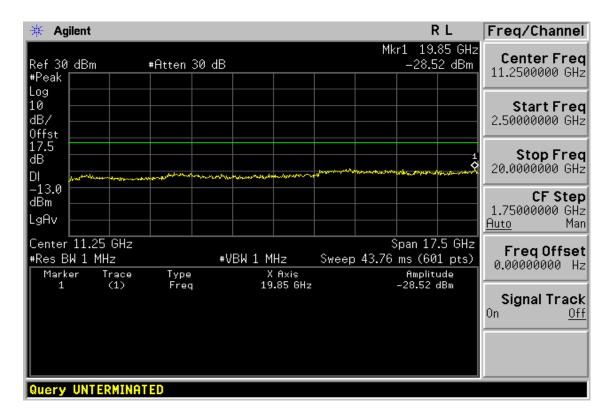


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Figure 10-12: Out of Band emission at antenna terminals –HSDPA Band II Mid





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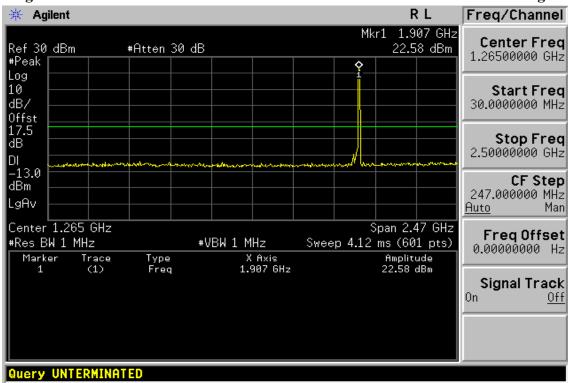
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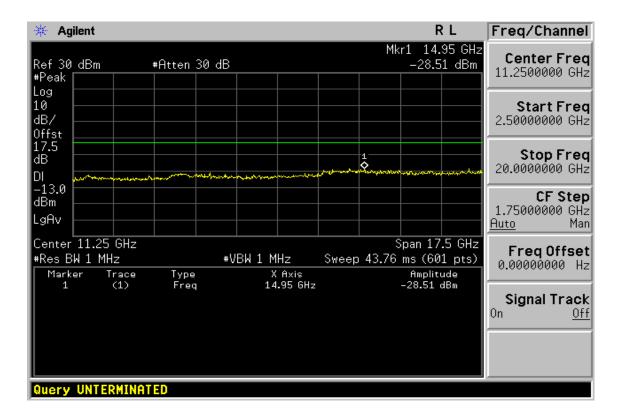


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Figure 10-13: Out of Band emission at antenna terminals-HSDPA Band II Highest





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Figure 10-14: Band edge emission at antenna terminals –HSDPA Band II Lowest

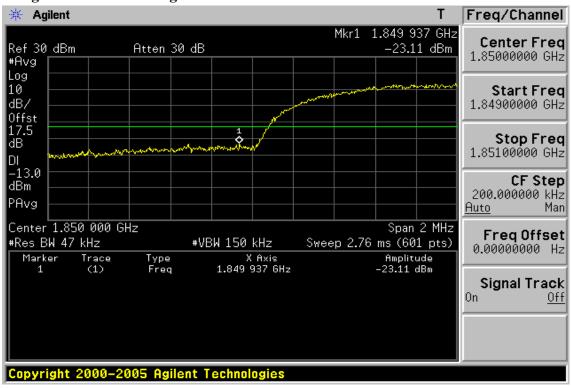
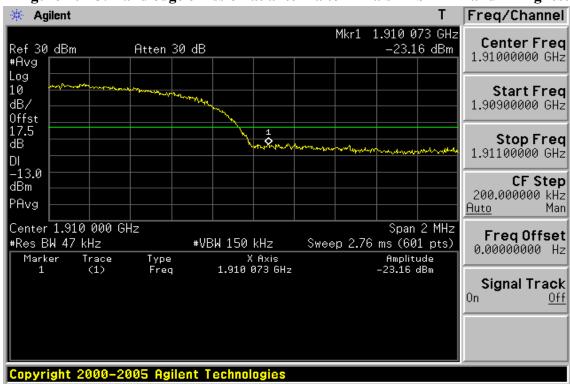


Figure 10-15: Band edge emission at antenna terminals –HSDPA Band II Highest



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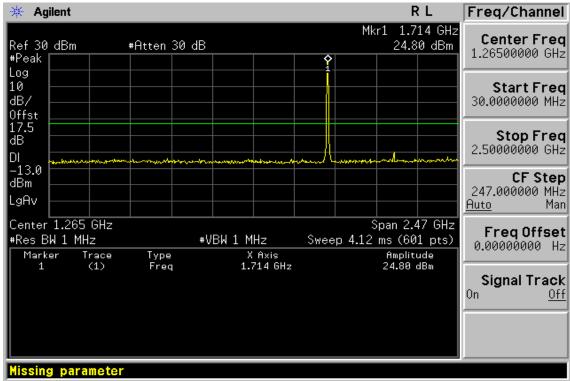
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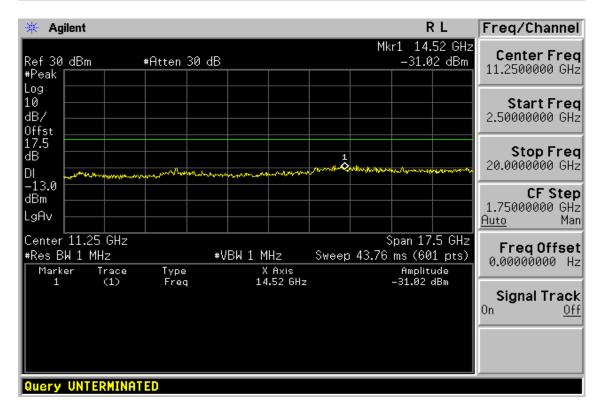


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Figure 10-16: Out of Band emission at antenna terminals-WCDMA Band IV Channel Lowest





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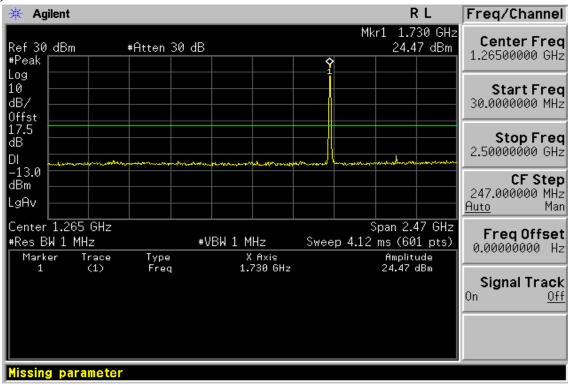
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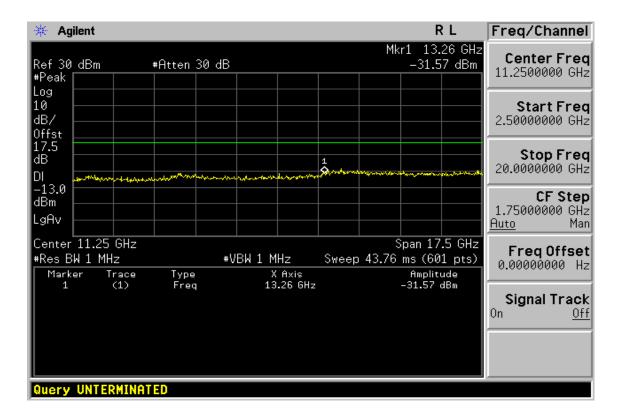


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Figure 10-17: Out of Band emission at antenna terminals -WCDMA Band IV Channel Mid





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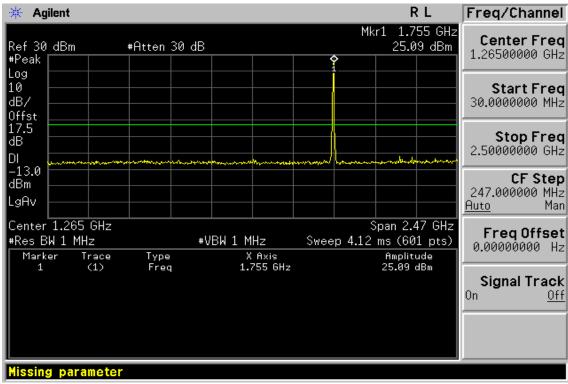
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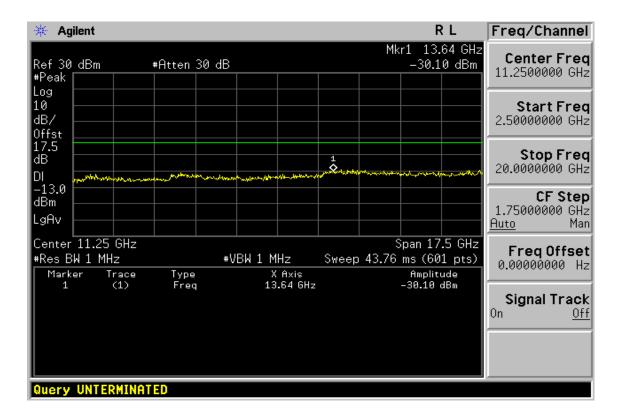


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Figure 10-18: Out of Band emission at antenna terminals-WCDMA Band IV Channel Highest





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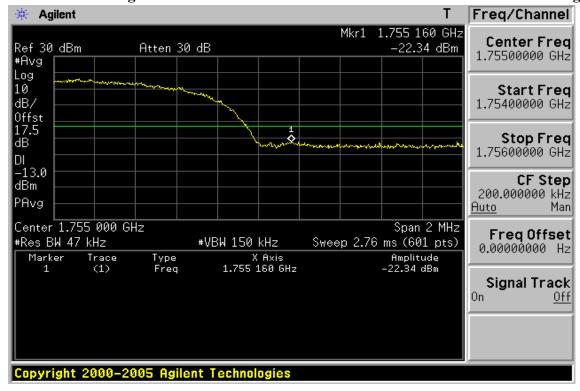
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Figure 10-19: Band edge emission at antenna terminals -WCDMA Band IV Channel Lowest



Figure 10-20: Band edge emission at antenna terminals –WCDMA Band IV Channel Highest



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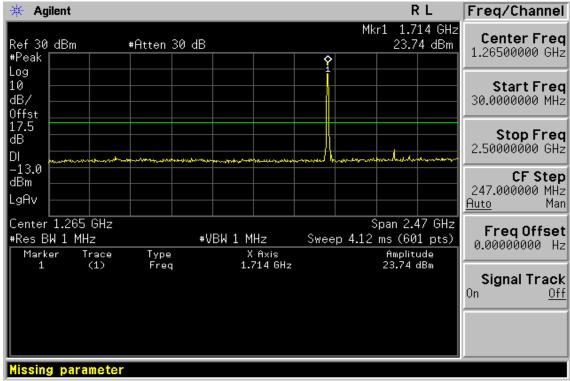
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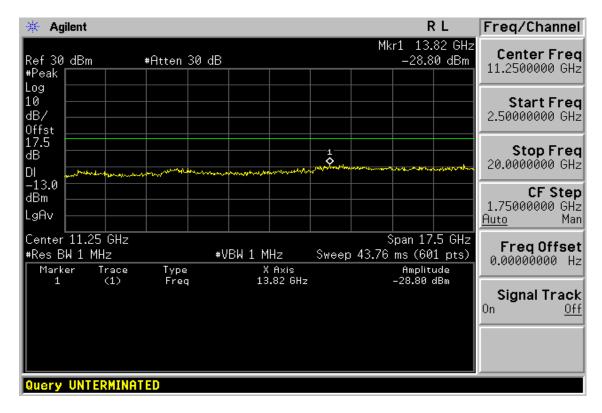


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Figure 10-21: Out of Band emission at antenna terminals-HSUPA Band IV Channel Lowest





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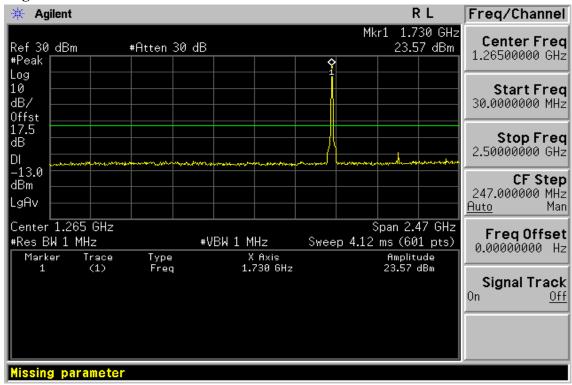
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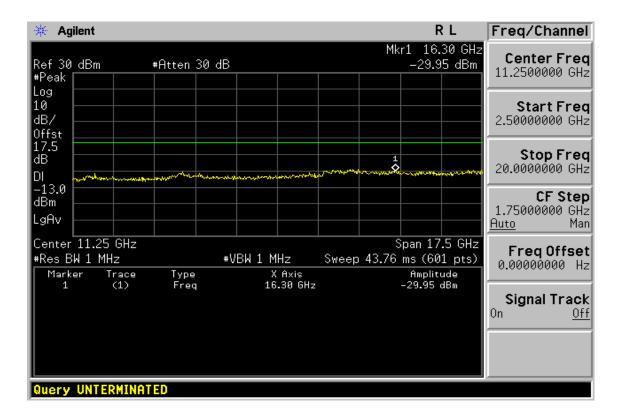


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Figure 10-22: Out of Band emission at antenna terminals –HSUPA Band IV Mid





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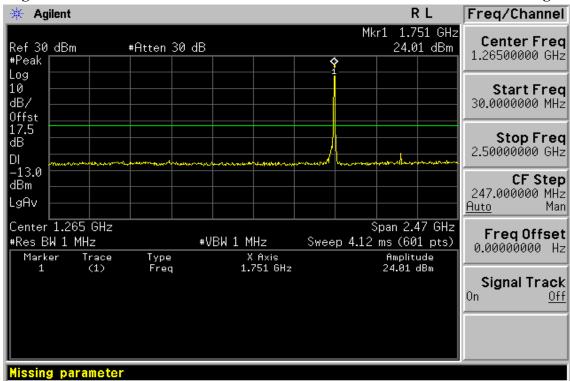
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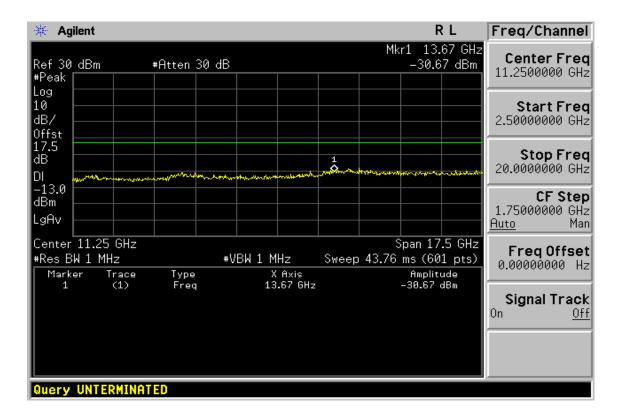


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Figure 10-23: Out of Band emission at antenna terminals -HSUPA Band IV Highest





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Figure 10-24: Band edge emission at antenna terminals –HSUPA Band IV Lowest

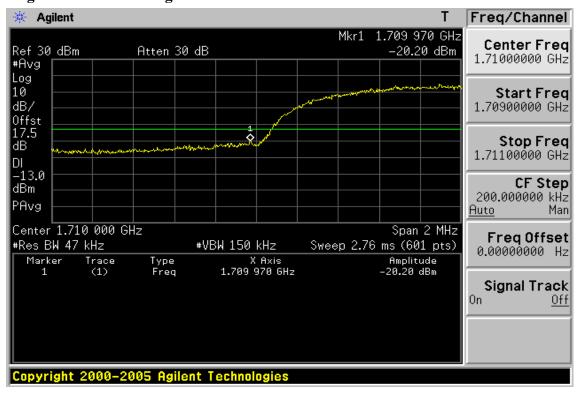
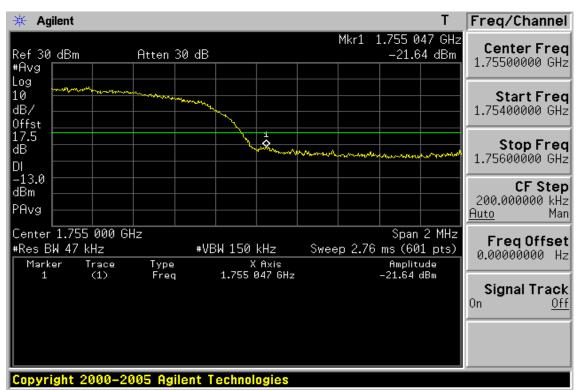


Figure 10-25: Band edge emission at antenna terminals –HSUPA Band IV Highest



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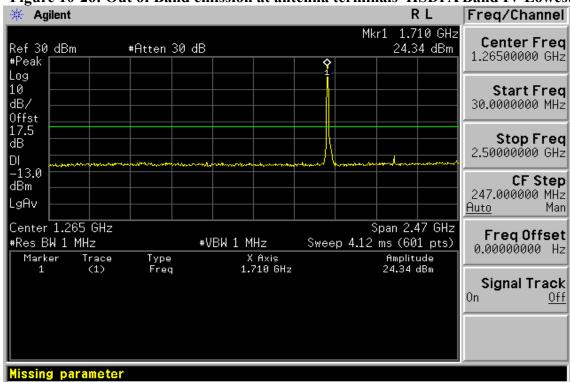
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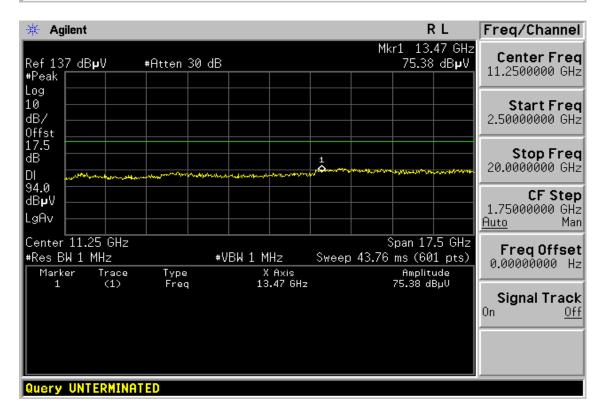


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Figure 10-26: Out of Band emission at antenna terminals-HSDPA Band IV Lowest





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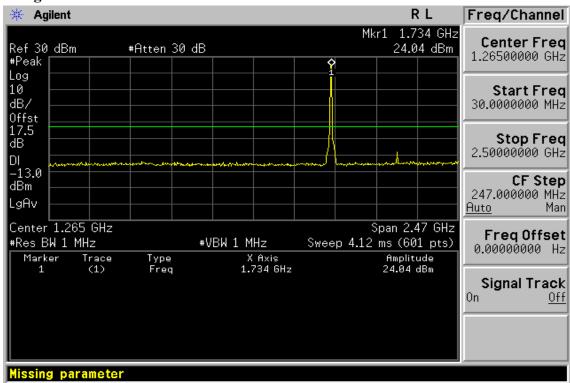
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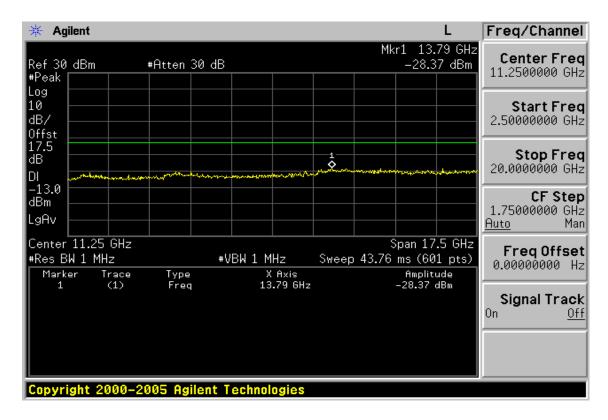


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Figure 10-27: Out of Band emission at antenna terminals –HSDPA Band IV Mid





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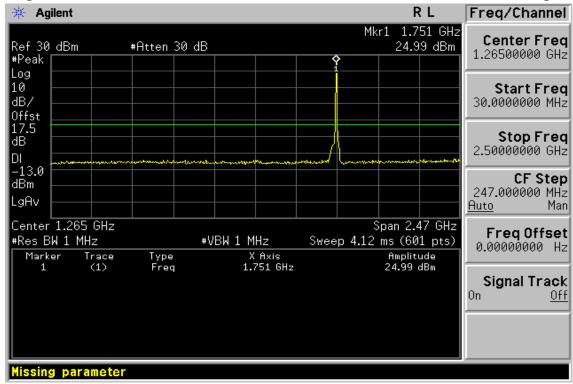
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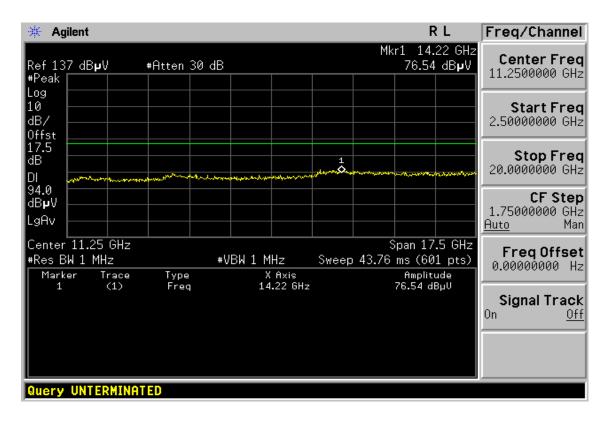


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Figure 10-28: Out of Band emission at antenna terminals-HSDPA Band IV Highest





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Figure 10-29: Band edge emission at antenna terminals –HSDPA Band IV Lowest

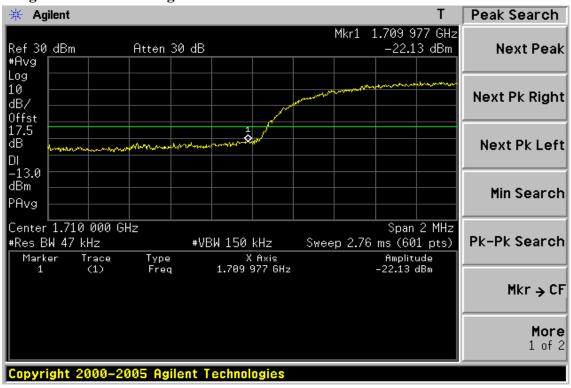


Figure 10-30: Band edge emission at antenna terminals –HSDPA Band IV Highest



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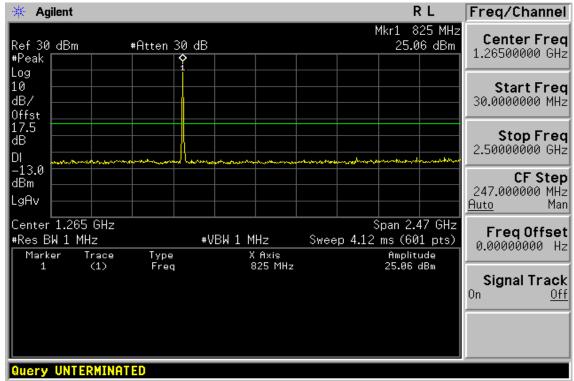
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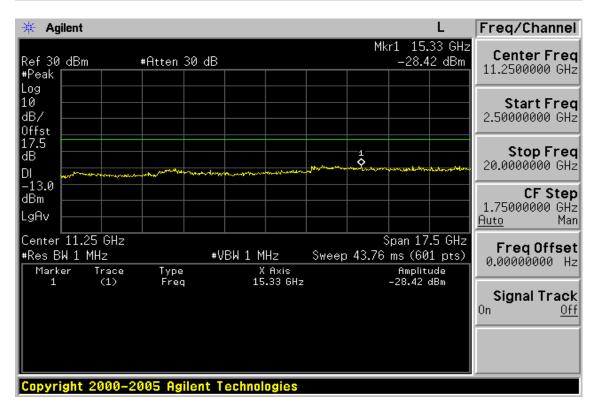


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Figure 10-31: Out of Band emission at antenna terminals-WCDMA Band V Channel Lowest





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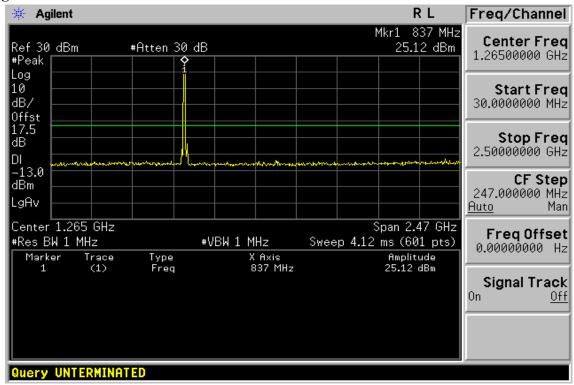
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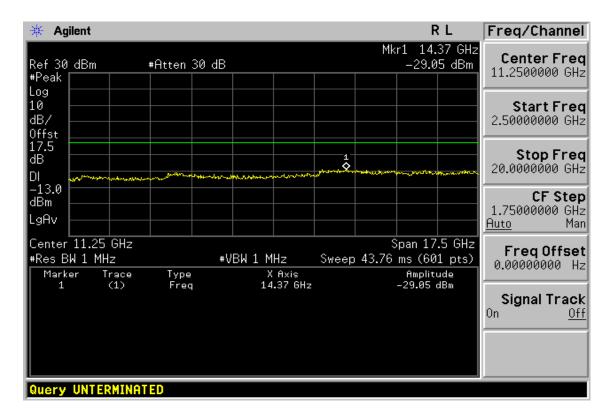


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Figure 10-32: Out of Band emission at antenna terminals -WCDMA Band V Channel Mid





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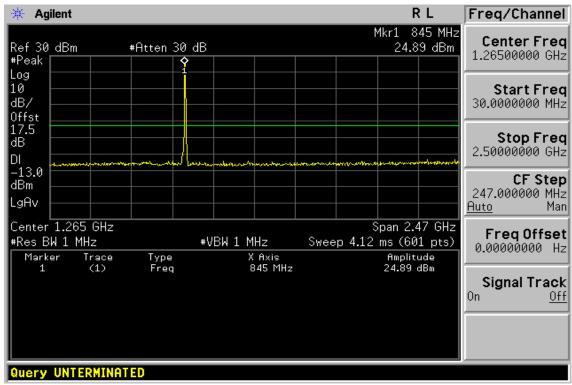
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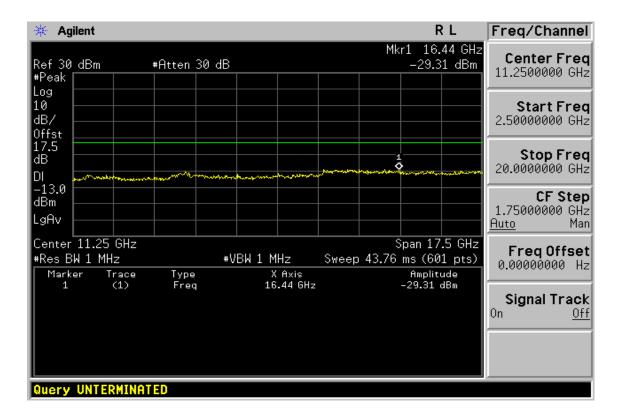


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Figure 10-33: Out of Band emission at antenna terminals-WCDMA Band V Channel Highest





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Figure 10-34: Band edge emission at antenna terminals -WCDMA Band V Channel Lowest

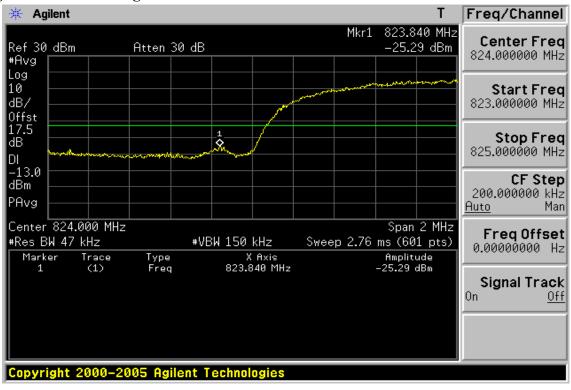


Figure 10-35: Band edge emission at antenna terminals –WCDMA Band V Highest



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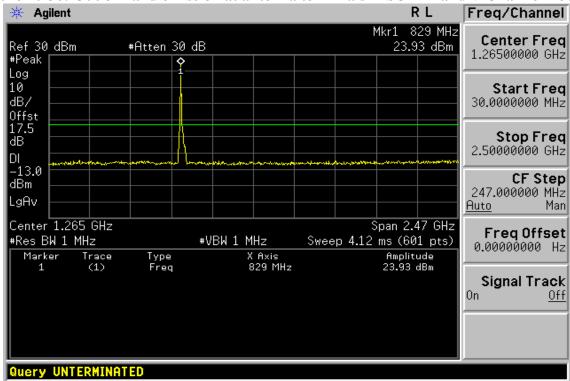
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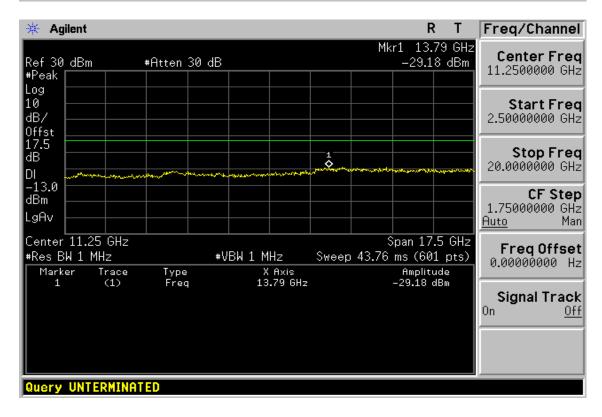


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Figure 10-36: Out of Band emission at antenna terminals-HSUPA Band V Channel Lowest





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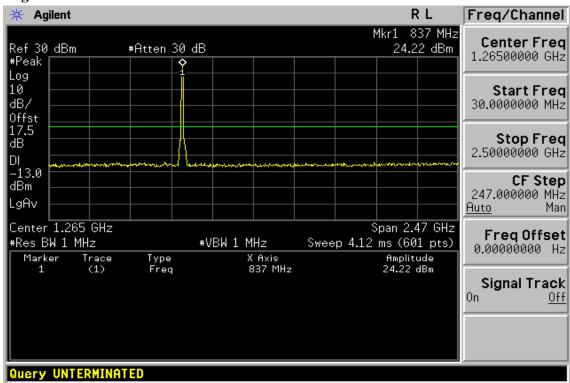
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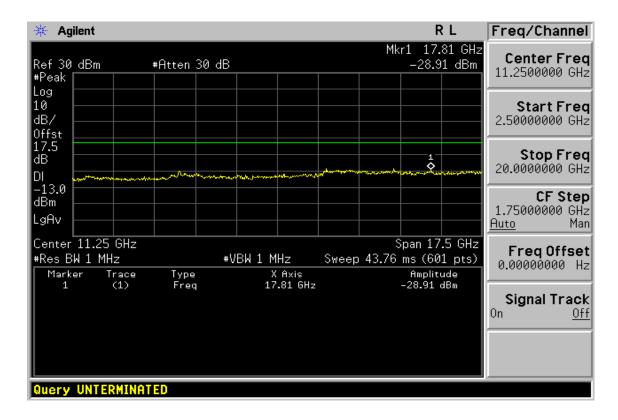


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Figure 10-37: Out of Band emission at antenna terminals –HSUPA Band V Mid





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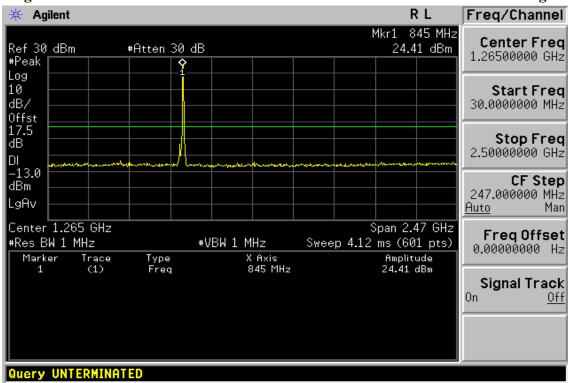
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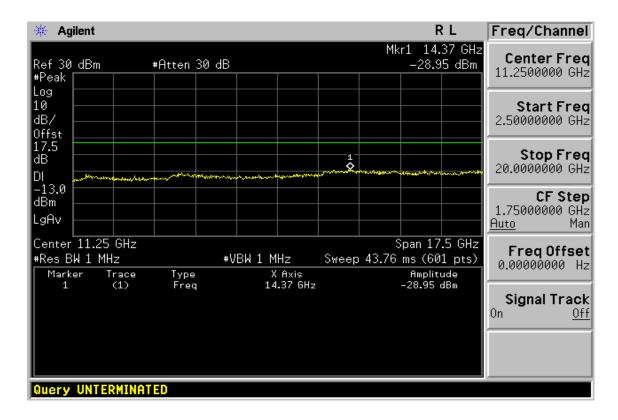


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Figure 10-38: Out of Band emission at antenna terminals -HSUPA Band V Highest





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Figure 10-39: Band edge emission at antenna terminals –HSUPA Band V Lowest

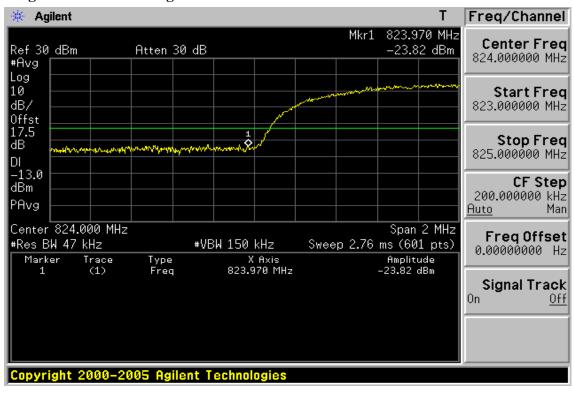
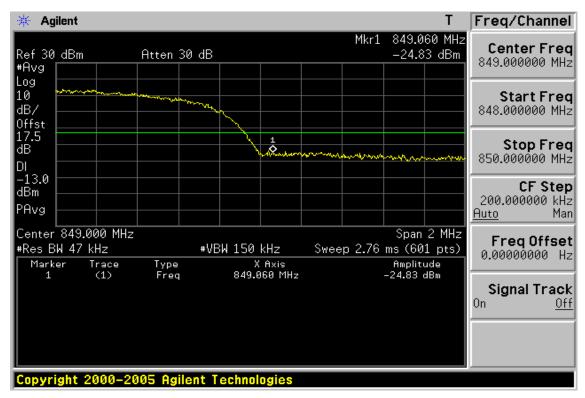


Figure 10-40: Band edge emission at antenna terminals –HSUPA Band V Highest



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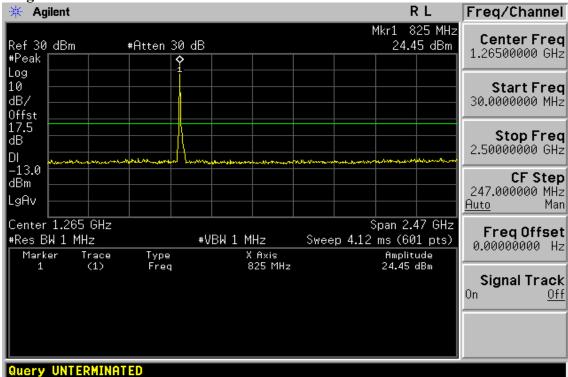
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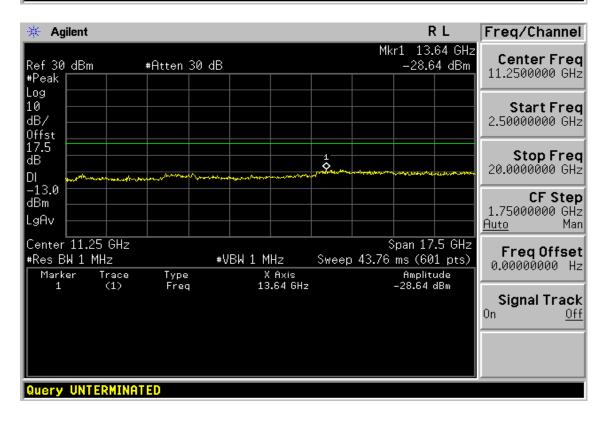


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Figure 10-41: Out of Band emission at antenna terminals-HSDPA Band V Lowest





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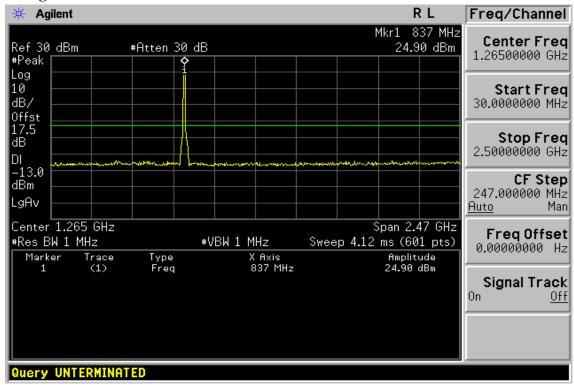
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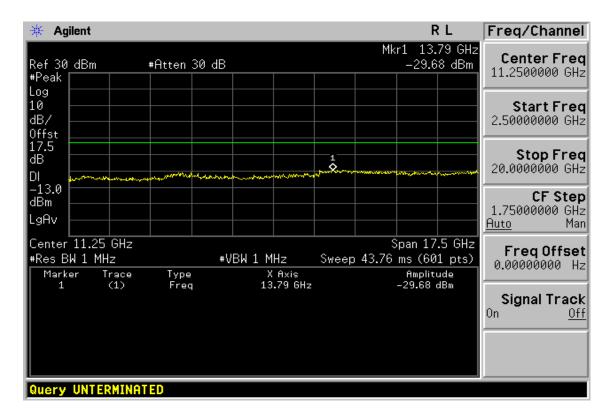


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Figure 10-42: Out of Band emission at antenna terminals –HSDPA Band V Mid





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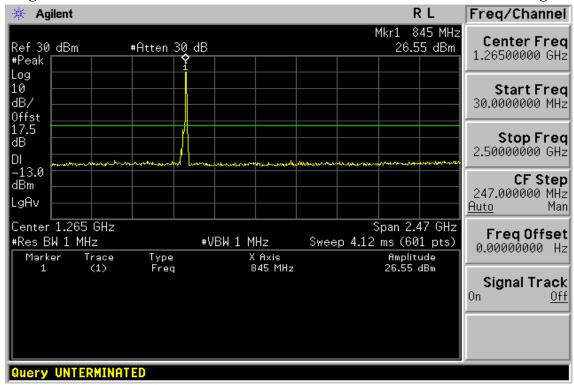
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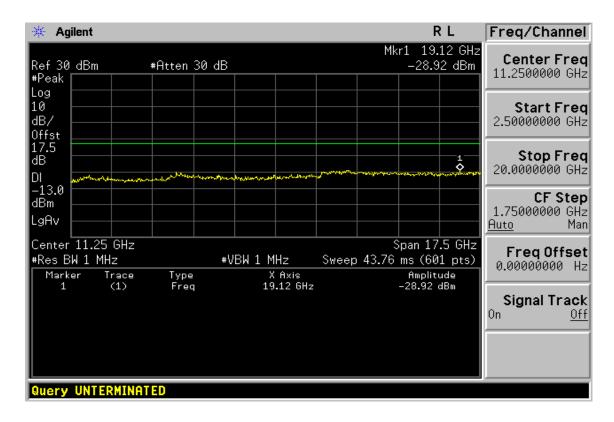


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Figure 10-43: Out of Band emission at antenna terminals-HSDPA Band V Highest





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Figure 10-44: Band edge emission at antenna terminals –HSDPA Band V Lowest

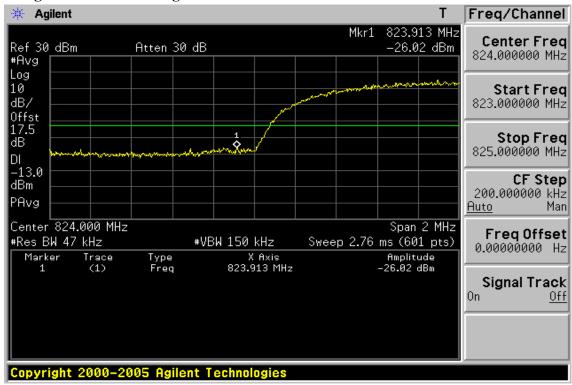
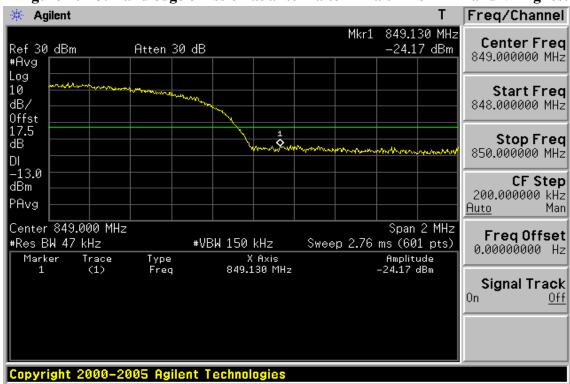


Figure 10-45: Band edge emission at antenna terminals –HSDPA Band V Highest



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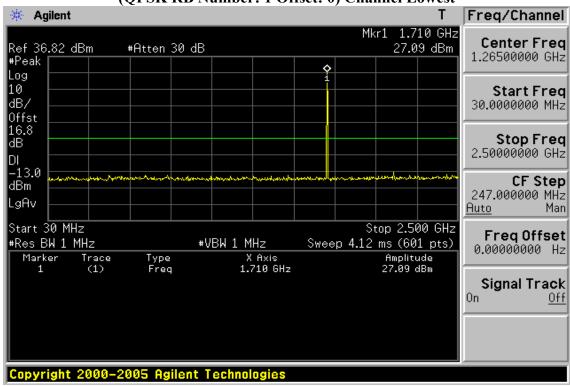
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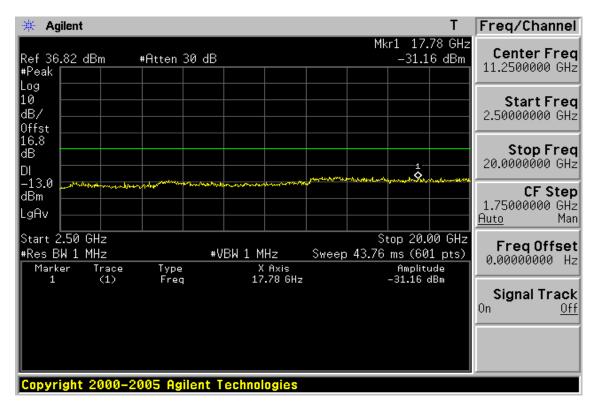


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Figure 10-46: Out of Band emission at antenna terminals—1.4MHz BW LTE-Band 4 (QPSK RB Number: 1 Offset: 0) Channel Lowest





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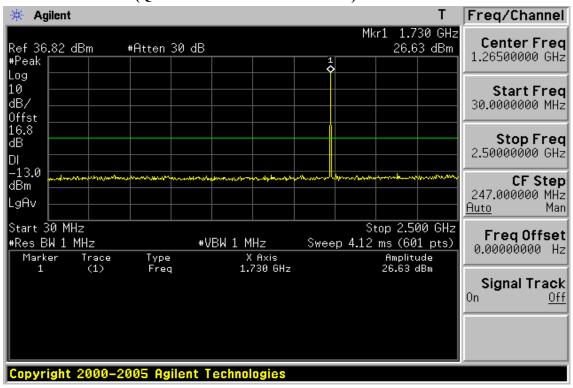
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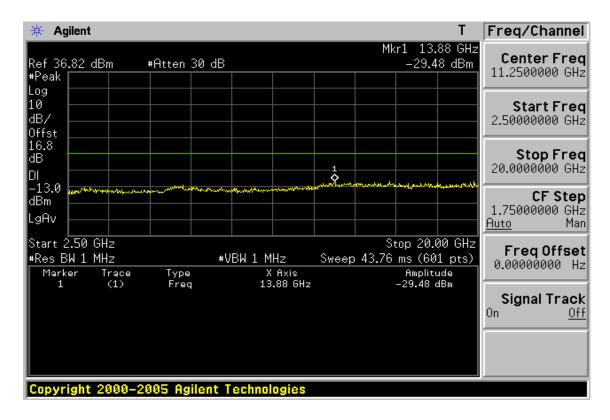


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Figure 10-47: Out of Band emission at antenna terminals –1.4MHz BW LTE-Band 4 (QPSK RB Number: 1 Offset: 0) Channel Mid





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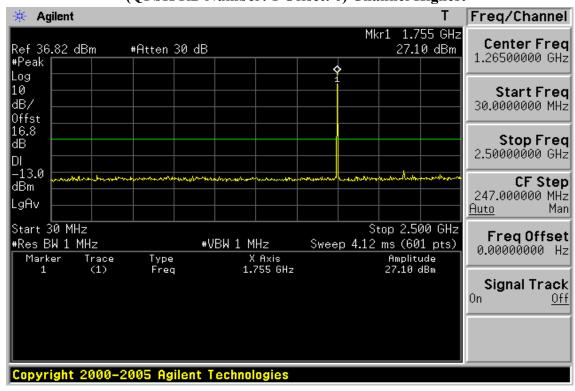
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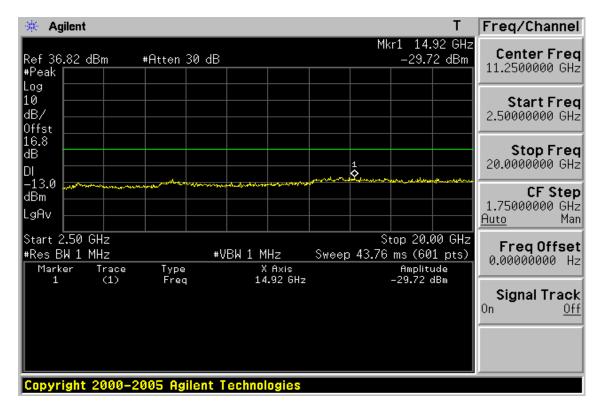


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Figure 10-48: Out of Band emission at antenna terminals –1.4MHz BW LTE-Band 4 (QPSK RB Number: 1 Offset: 0) Channel Highest





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Figure 10-49: Band edge emission at antenna terminals –1.4MHz BW LTE-Band 4 (QPSK RB Number: 1 Offset: 0) Channel Lowest

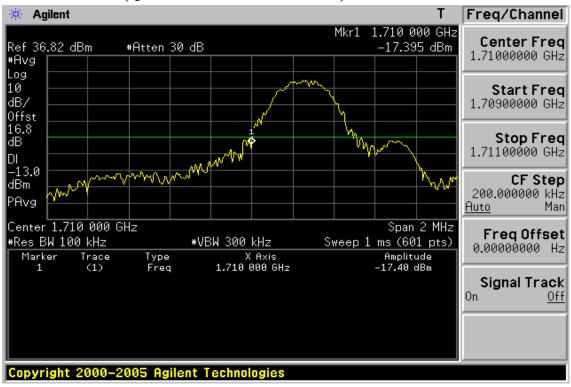


Figure 10-50: Band edge emission at antenna terminals –1.4MHz BW LTE-Band 4 (QPSK RB Number: 1 Offset: 5) Channel Highest



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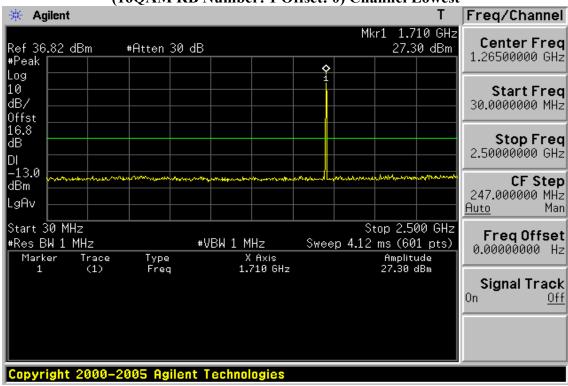
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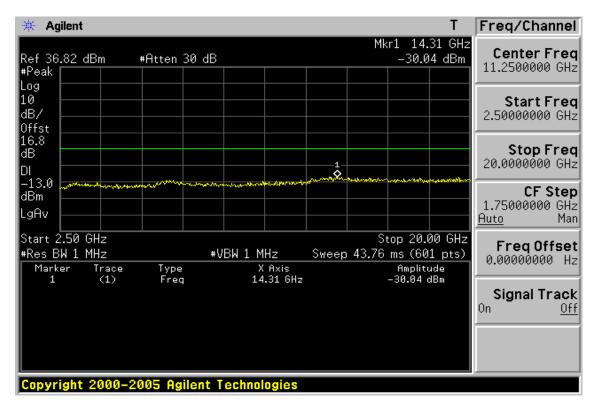


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Figure 10-51: Out of Band emission at antenna terminals—1.4MHz BW LTE-Band 4 (16QAM RB Number: 1 Offset: 0) Channel Lowest





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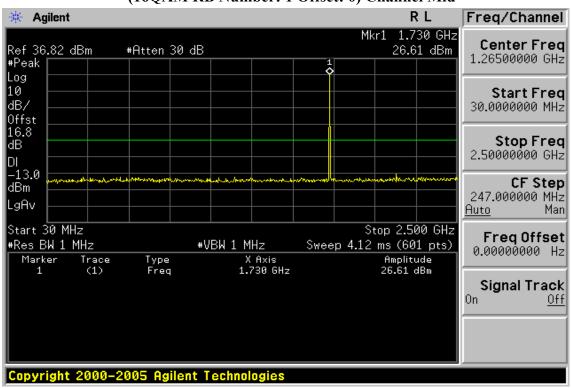
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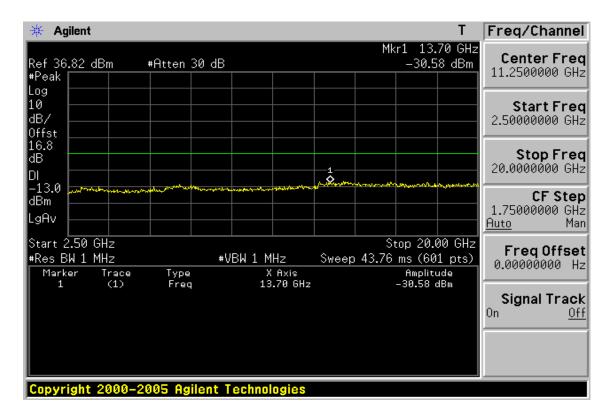


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Figure 10-52: Out of Band emission at antenna terminals –1.4MHz BW LTE-Band 4 (16QAM RB Number: 1 Offset: 0) Channel Mid





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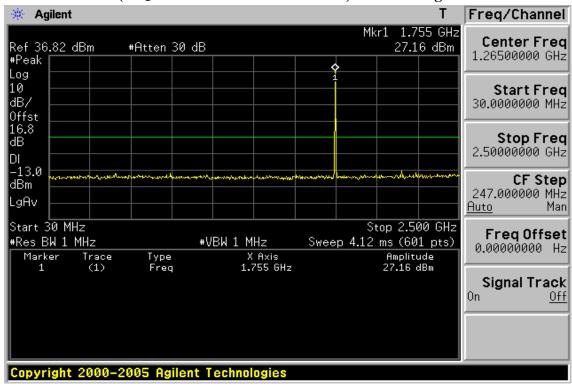
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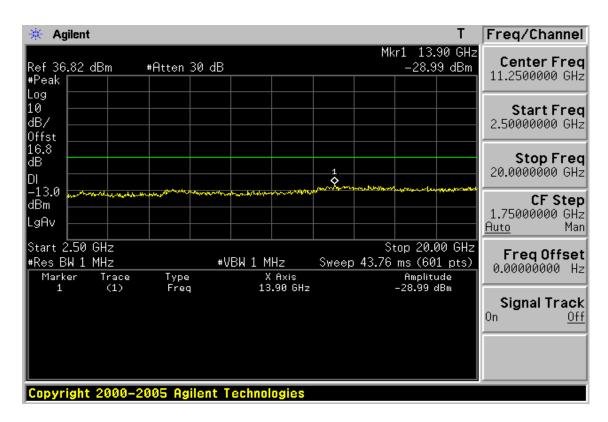


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Figure 10-53: Out of Band emission at antenna terminals –1.4MHz BW LTE-Band 4 (16QAM RB Number: 1 Offset: 0) Channel Highest





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Figure 10-54: Band edge emission at antenna terminals –1.4MHz BW LTE-Band 4 (16QAM RB Number: 1 Offset: 0) Channel Lowest

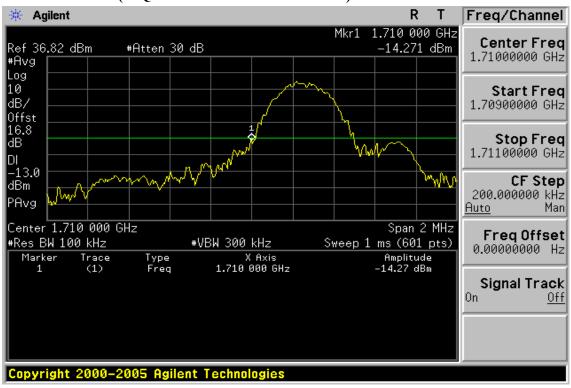
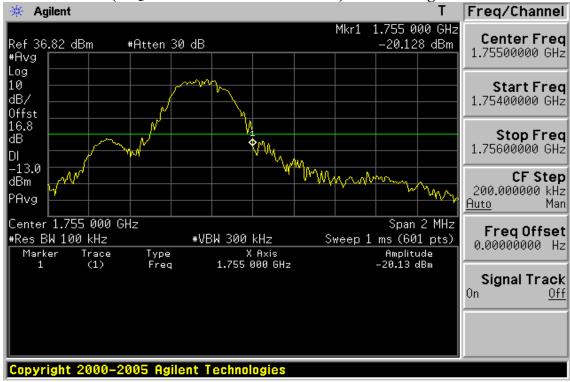


Figure 10-55: Band edge emission at antenna terminals –1.4MHz BW LTE-Band 4 (16QAM RB Number: 1 Offset: 5) Channel Highest



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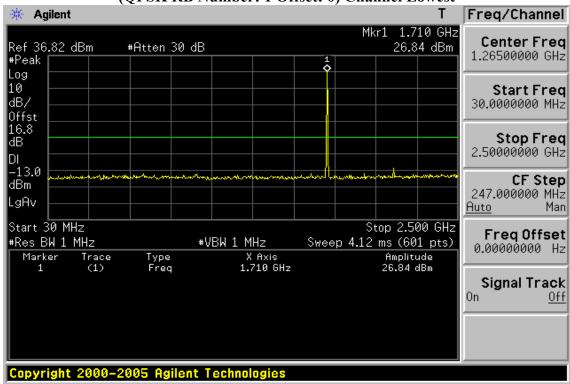
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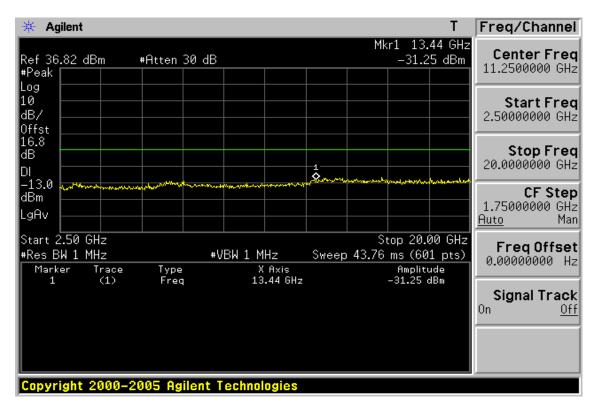


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Figure 10-56: Out of Band emission at antenna terminals—3MHz BW LTE-Band 4 (QPSK RB Number: 1 Offset: 0) Channel Lowest





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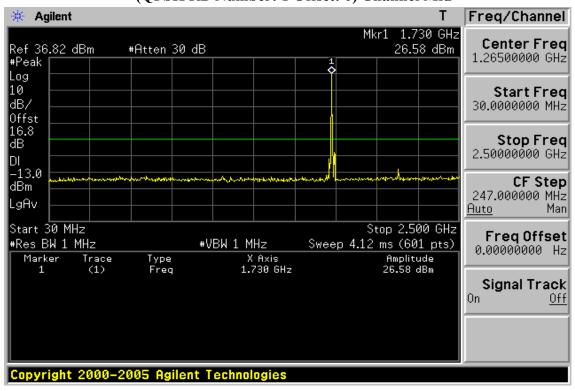
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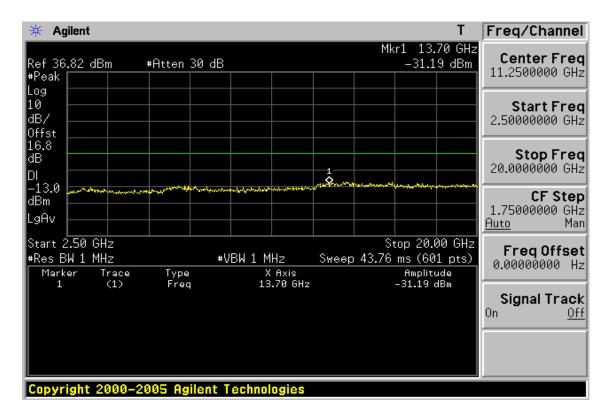


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Figure 10-57: Out of Band emission at antenna terminals—3MHz BW LTE-Band 4 (QPSK RB Number: 1 Offset: 0) Channel Mid





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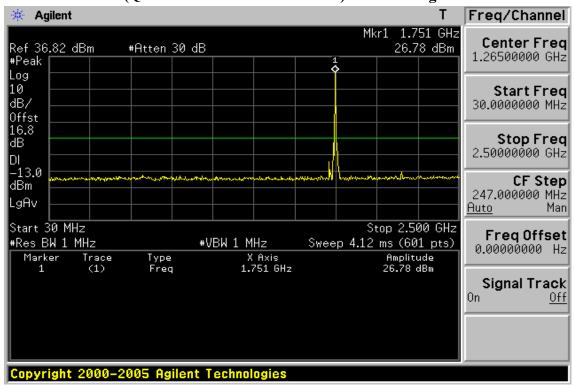
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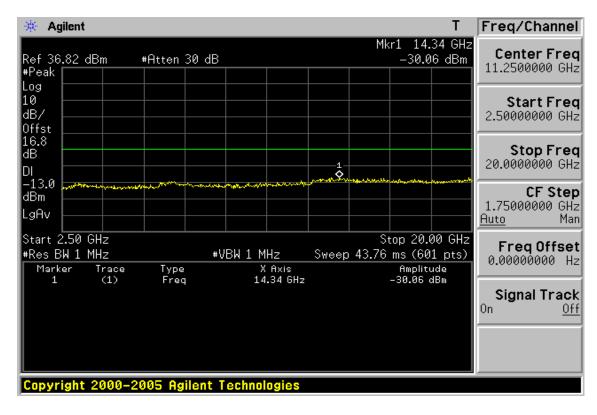


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Figure 10-58: Out of Band emission at antenna terminals—3MHz BW LTE-Band 4 (QPSK RB Number: 1 Offset: 0) Channel Highest





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Figure 10-59: Band edge emission at antenna terminals –3MHz BW LTE-Band 4 (QPSK RB Number: 1 Offset: 0) Channel Lowest

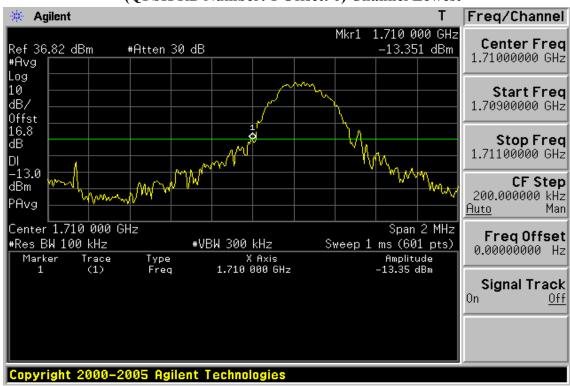
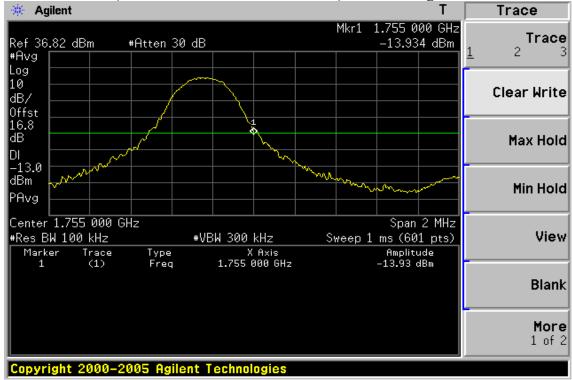


Figure 10-60: Band edge emission at antenna terminals –3MHz BW LTE-Band 4 (QPSK RB Number: 1 Offset: 14) Channel Highest



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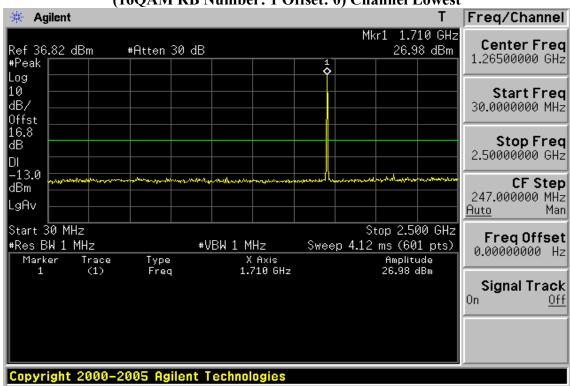
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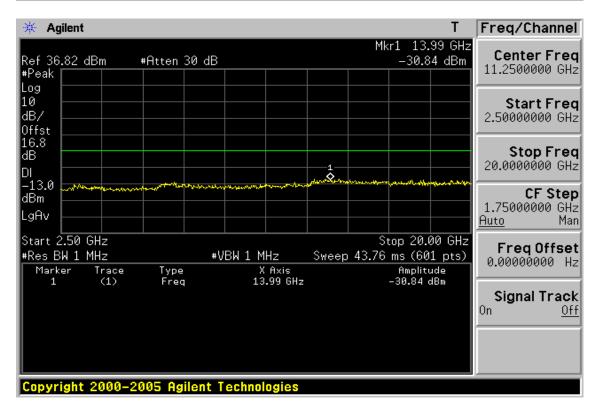


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Figure 10-61: Out of Band emission at antenna terminals-3MHz BW LTE-Band 4 (16QAM RB Number: 1 Offset: 0) Channel Lowest





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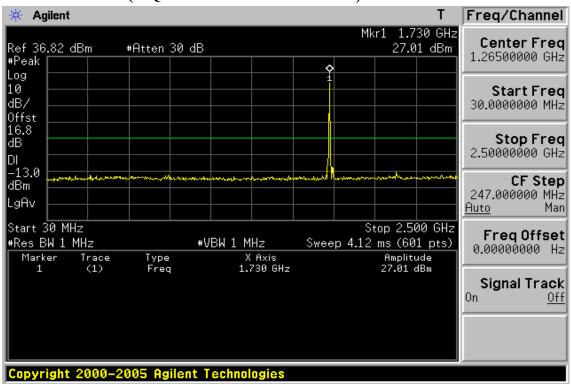
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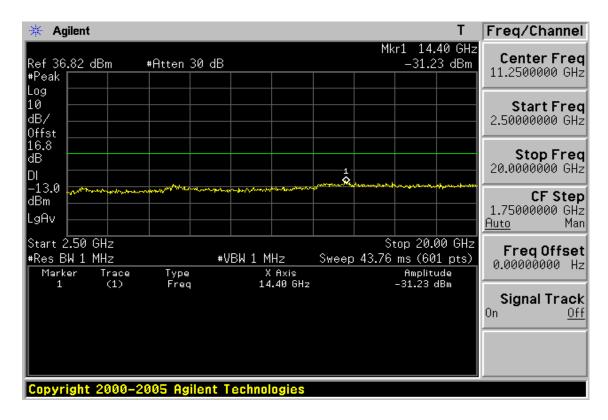


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Figure 10-62: Out of Band emission at antenna terminals—3MHz BW LTE-Band 4 (16QAM RB Number: 1 Offset: 0) Channel Mid





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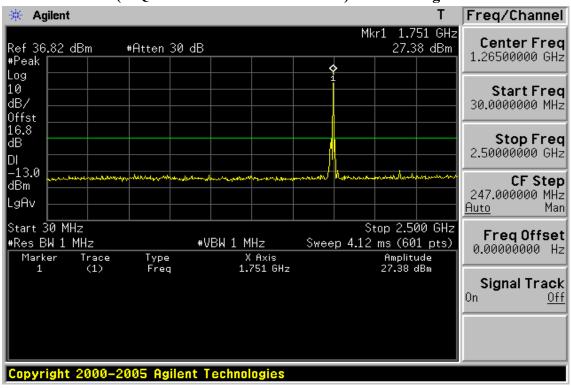
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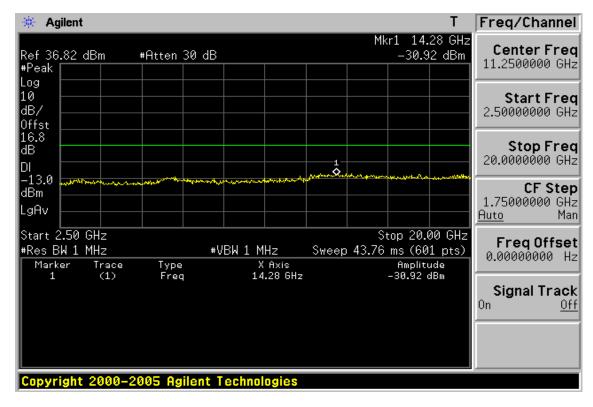


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Figure 10-63: Out of Band emission at antenna terminals—3MHz BW LTE-Band 4 (16QAM RB Number: 1 Offset: 0) Channel Highest





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Figure 10-64: Band edge emission at antenna terminals –3MHz BW LTE-Band 4 (16QAM RB Number: 1 Offset: 0) Channel Lowest

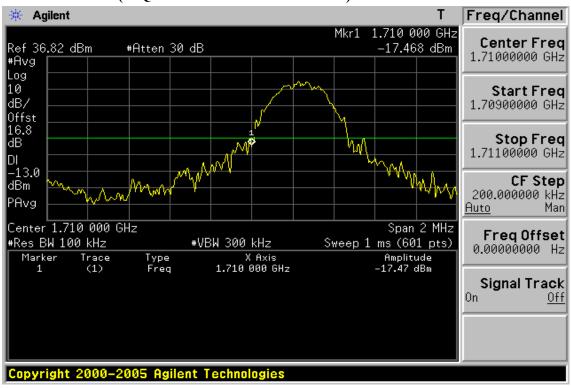


Figure 10-65: Band edge emission at antenna terminals –3MHz BW LTE-Band 4 (16QAM RB Number: 1 Offset: 14) Channel Highest



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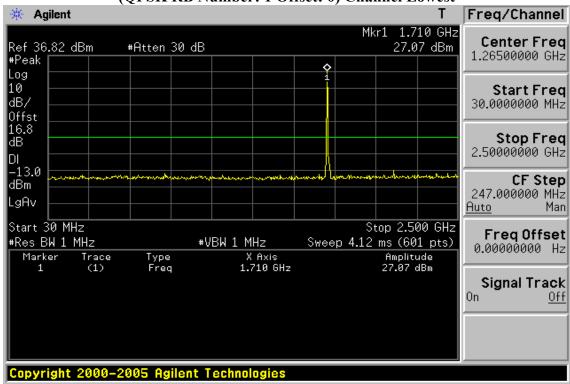
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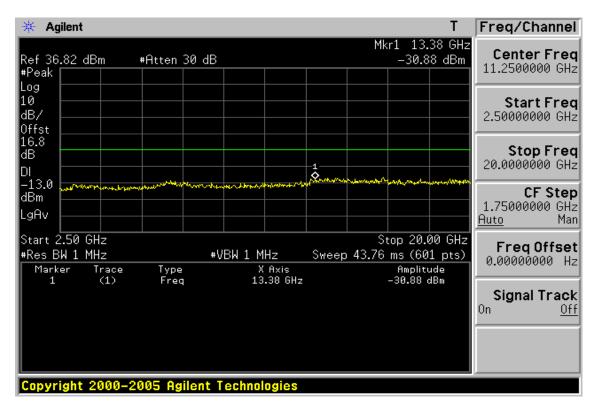


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Figure 10-66: Out of Band emission at antenna terminals–5MHz BW LTE-Band 4 (QPSK RB Number: 1 Offset: 0) Channel Lowest





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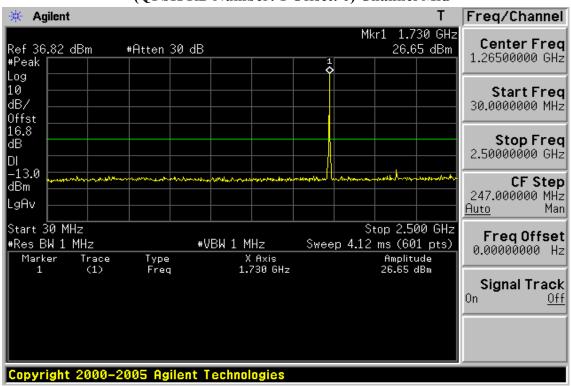
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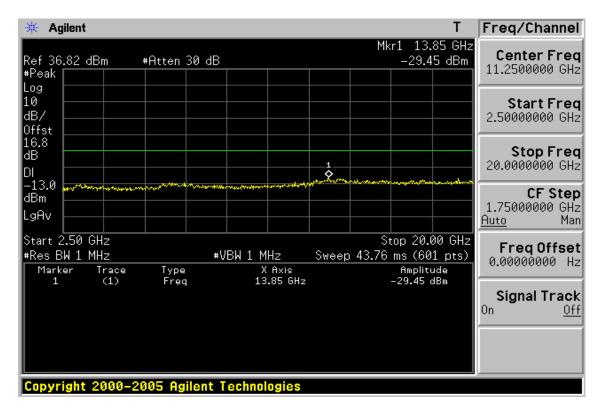


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Figure 10-67: Out of Band emission at antenna terminals–5MHz BW LTE-Band 4 (QPSK RB Number: 1 Offset: 0) Channel Mid





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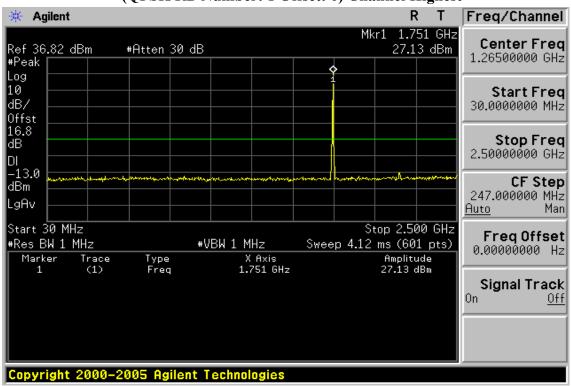
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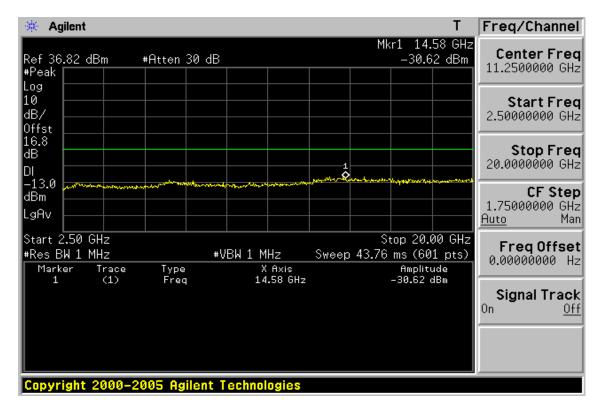


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Figure 10-68: Out of Band emission at antenna terminals–5MHz BW LTE-Band 4 (QPSK RB Number: 1 Offset: 0) Channel Highest





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Figure 10-69: Out of Band emission at antenna terminals–5MHz BW LTE-Band 4 (QPSK RB Number: 1 Offset: 0) Channel Lowest

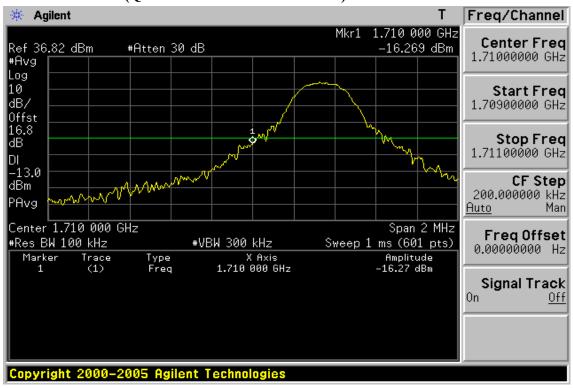
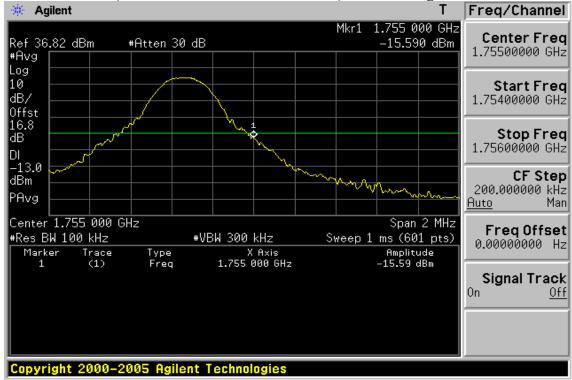


Figure 10-70: Out of Band emission at antenna terminals—5MHz BW LTE-Band 4 (QPSK RB Number: 1 Offset: 24) Channel Highest



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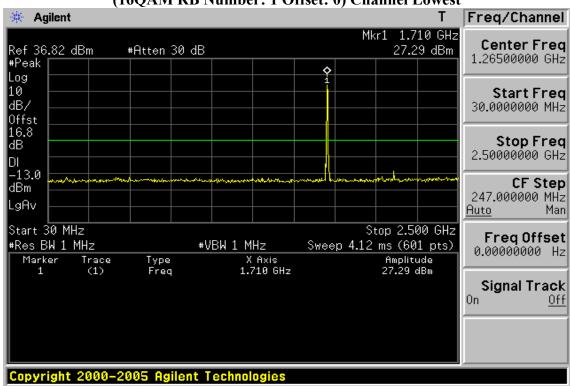
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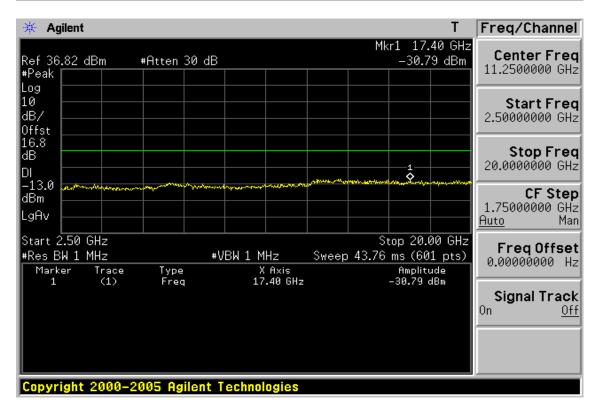


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Figure 10-71: Out of Band emission at antenna terminals–5MHz BW LTE-Band 4 (16QAM RB Number: 1 Offset: 0) Channel Lowest





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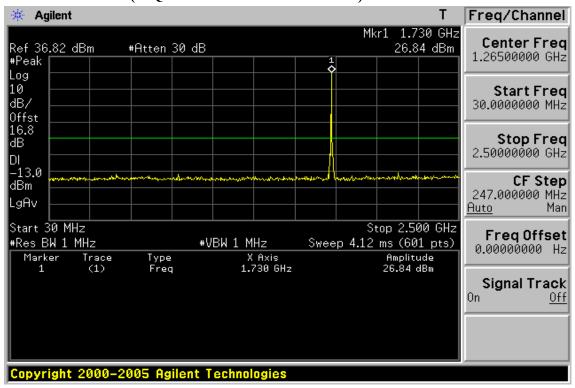
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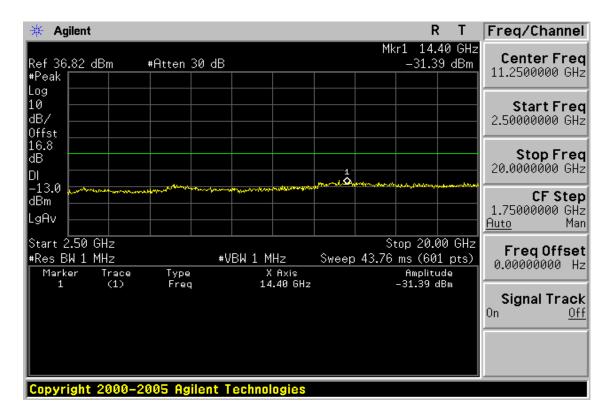


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Figure 10-72: Out of Band emission at antenna terminals—5MHz BW LTE-Band 4 (16QAM RB Number: 1 Offset: 0) Channel Mid





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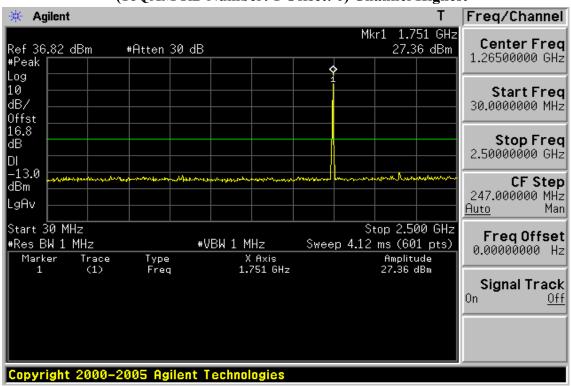
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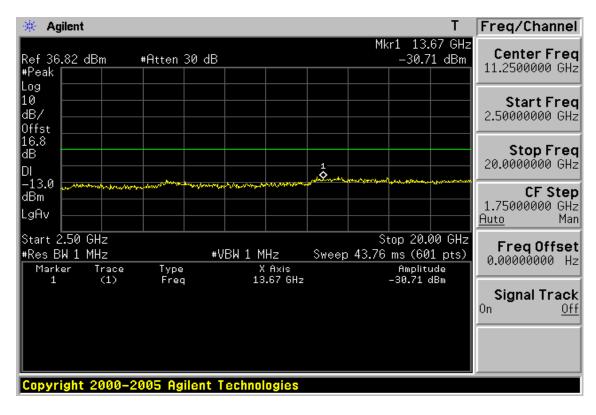


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Figure 10-73: Out of Band emission at antenna terminals–5MHz BW LTE-Band 4 (16QAM RB Number: 1 Offset: 0) Channel Highest





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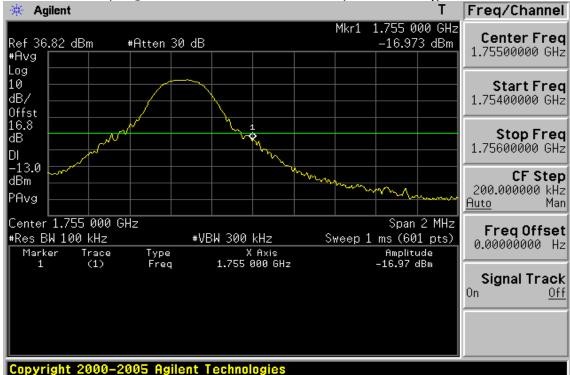
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Figure 10-74: Band edge emission at antenna terminals –5MHz BW LTE-Band 4 (16QAM RB Number: 1 Offset: 0) Channel Lowest



Figure 10-75: Band edge emission at antenna terminals –3MHz BW LTE-Band 4 (16QAM RB Number: 1 Offset: 24) Channel Highest



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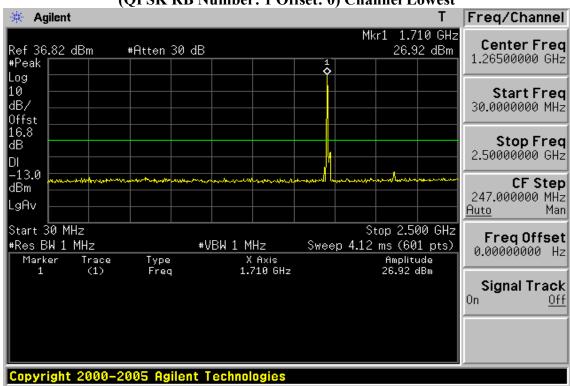
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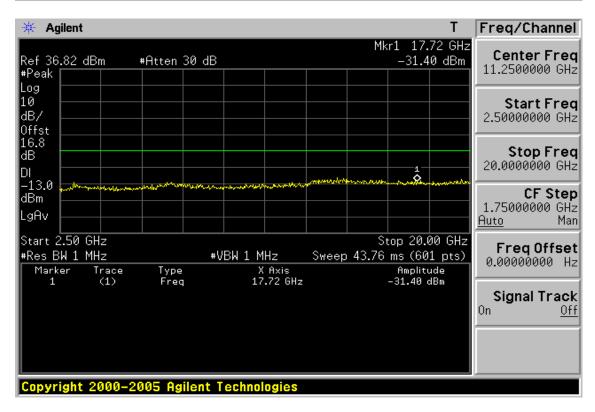


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Figure 10-76: Out of Band emission at antenna terminals—10MHz BW LTE-Band 4 (QPSK RB Number: 1 Offset: 0) Channel Lowest





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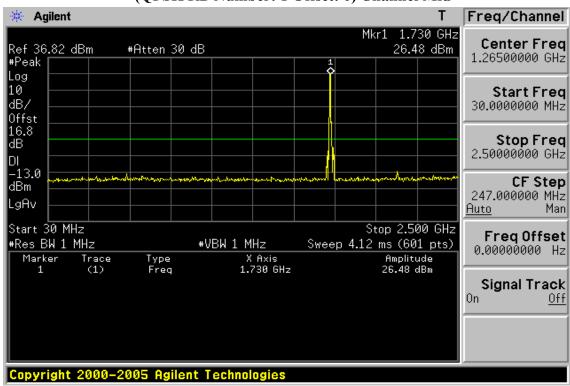
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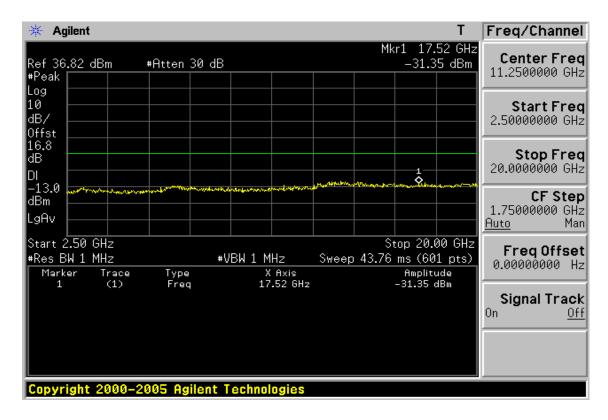


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Figure 10-77: Out of Band emission at antenna terminals—10MHz BW LTE-Band 4 (QPSK RB Number: 1 Offset: 0) Channel Mid





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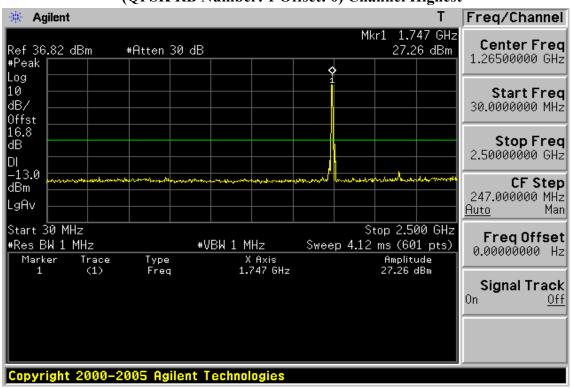
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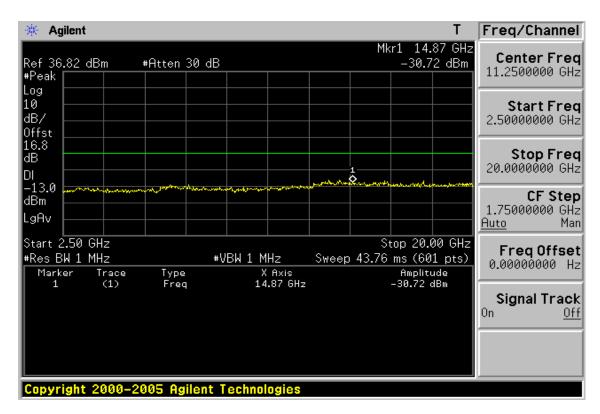


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Figure 10-78: Out of Band emission at antenna terminals—10MHz BW LTE-Band 4 (QPSK RB Number: 1 Offset: 0) Channel Highest





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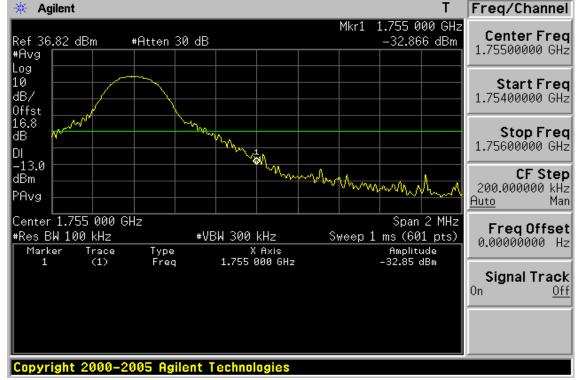
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Figure 10-79: Band edge emission at antenna terminals –10MHz BW LTE-Band 4 (QPSK RB Number: 1 Offset: 0) Channel Lowest



Figure 10-80: Band edge emission at antenna terminals –10MHz BW LTE-Band 4 (QPSK RB Number: 1 Offset: 49) Channel Highest



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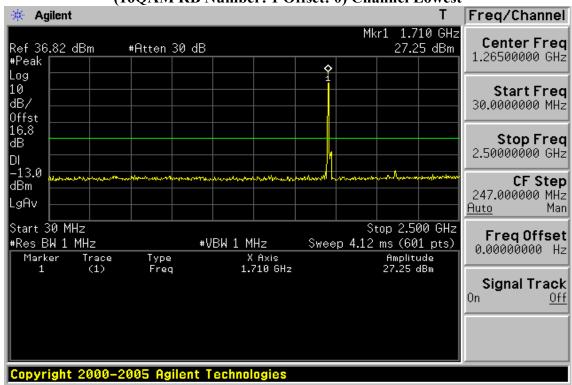
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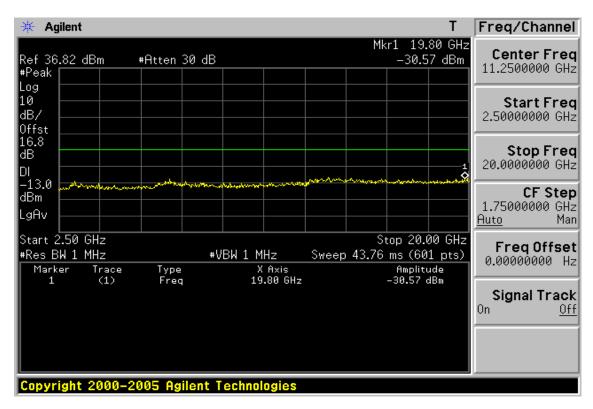


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Figure 10-81: Out of Band emission at antenna terminals—10MHz BW LTE-Band 4 (16QAM RB Number: 1 Offset: 0) Channel Lowest





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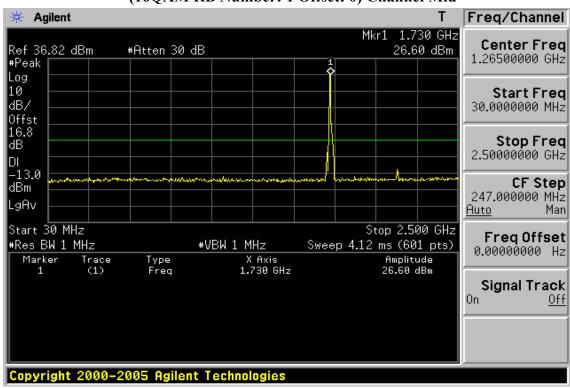
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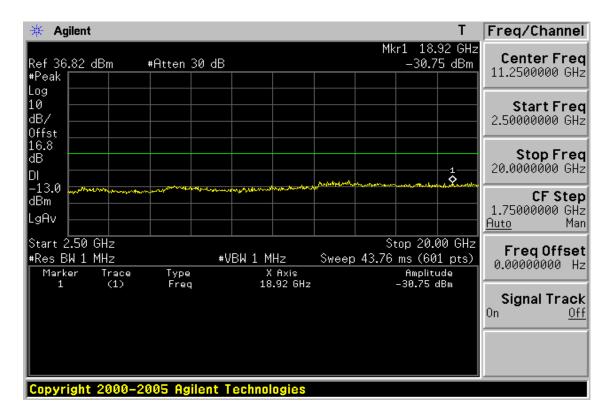


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Figure 10-82: Out of Band emission at antenna terminals—10MHz BW LTE-Band 4 (16QAM RB Number: 1 Offset: 0) Channel Mid





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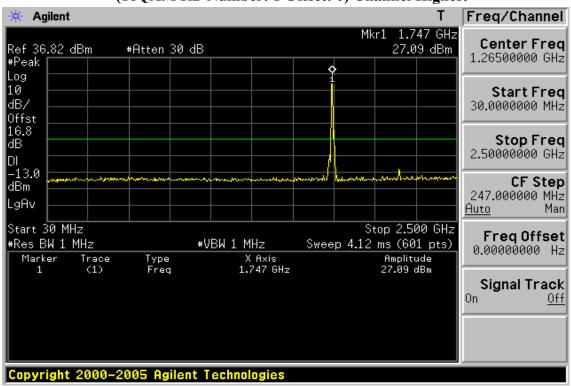
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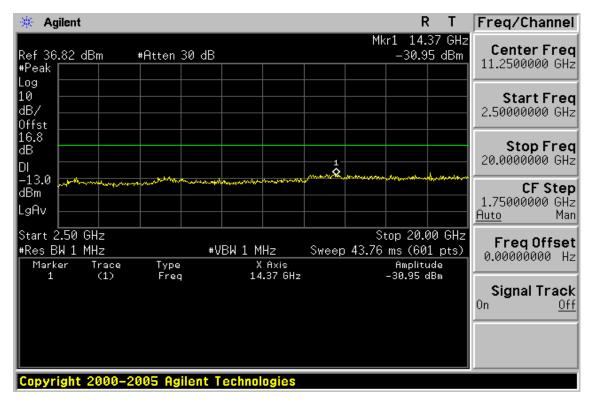


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Figure 10-83: Out of Band emission at antenna terminals—10MHz BW LTE-Band 4 (16QAM RB Number: 1 Offset: 0) Channel Highest





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Figure 10-84: Band edge emission at antenna terminals –10MHz BW LTE-Band 4 (16QAM RB Number: 1 Offset: 0) Channel Lowest



Figure 10-85: Band edge emission at antenna terminals -10MHz BW LTE-Band 4 (16QAM RB Number: 1 Offset: 49) Channel Highest



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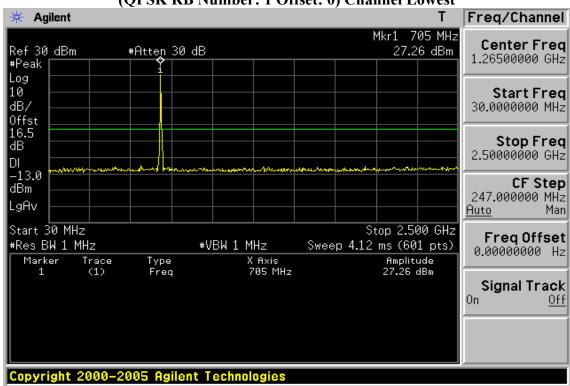
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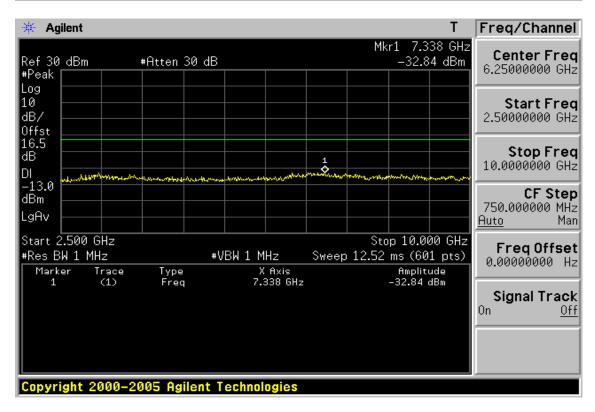


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Figure 10-86: Out of Band emission at antenna terminals—5MHz BW LTE-Band 17 (QPSK RB Number: 1 Offset: 0) Channel Lowest





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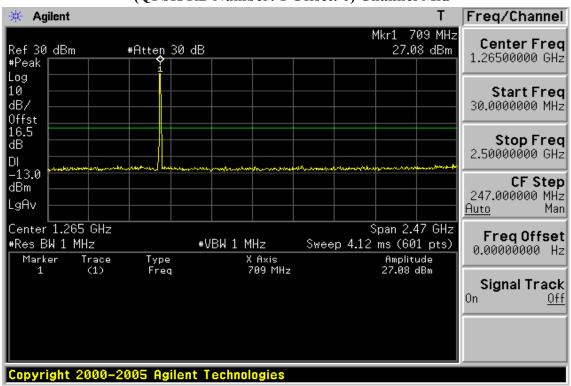
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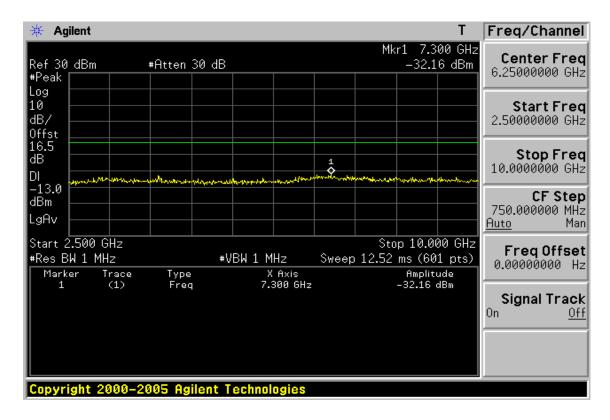


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Figure 10-87: Out of Band emission at antenna terminals—5MHz BW LTE-Band 17 (QPSK RB Number: 1 Offset: 0) Channel Mid





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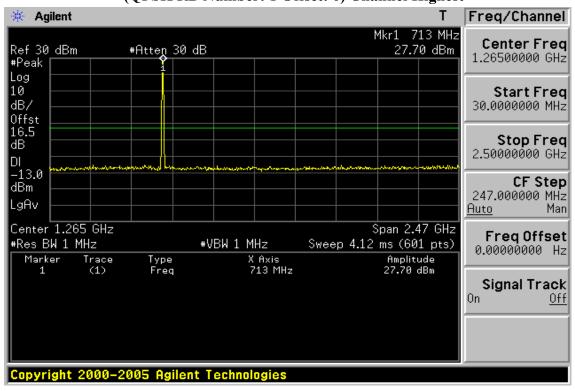
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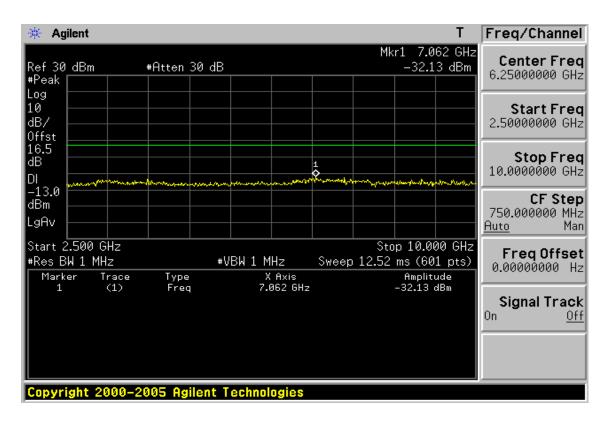


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Figure 10-88: Out of Band emission at antenna terminals—5MHz BW LTE-Band 17 (QPSK RB Number: 1 Offset: 0) Channel Highest





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Figure 10-89: Band edge emission at antenna terminals –5MHz BW LTE-Band 17 (QPSK RB Number: 1 Offset: 0) Channel Lowest

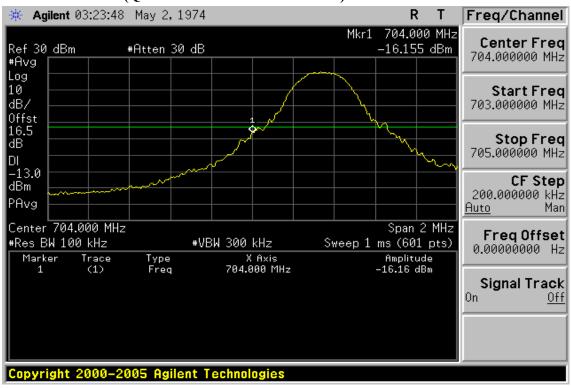
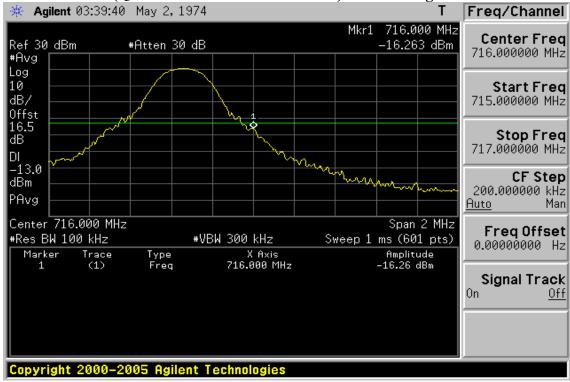


Figure 10-90: Band edge emission at antenna terminals –5MHz BW LTE-Band 17 (QPSK RB Number: 1 Offset: 24) Channel Highest



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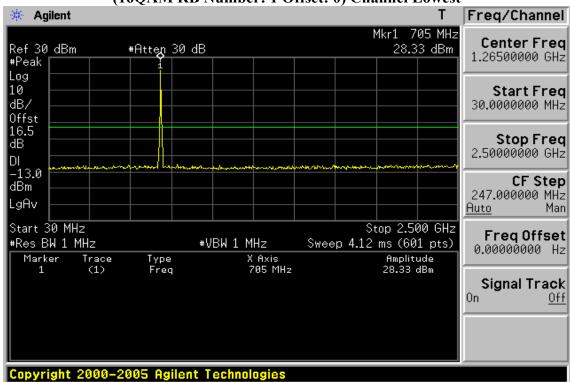
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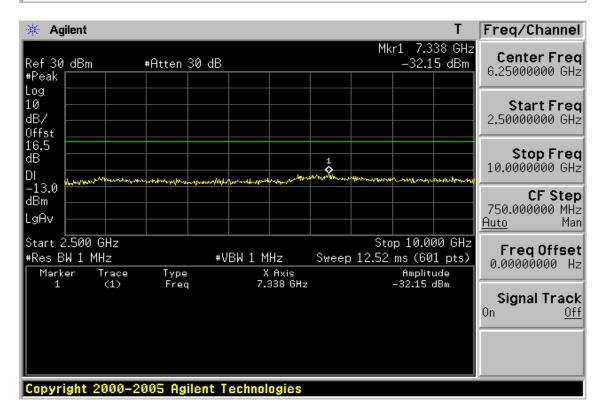


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Figure 10-91: Out of Band emission at antenna terminals—5MHz BW LTE-Band 17 (16QAM RB Number: 1 Offset: 0) Channel Lowest





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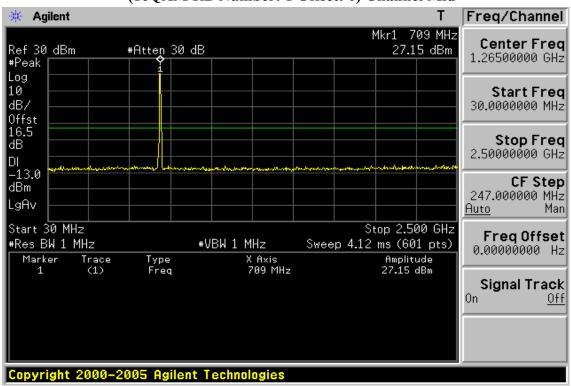
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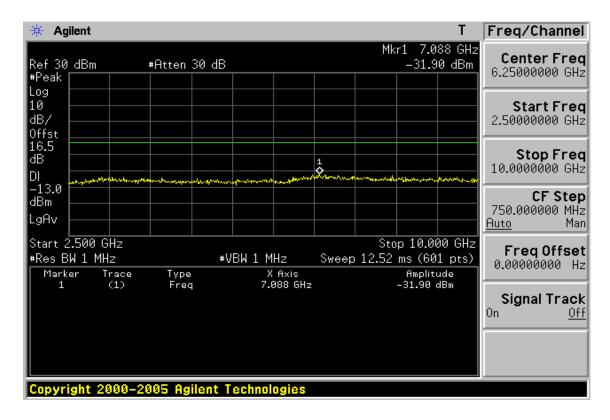


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Figure 10-92: Out of Band emission at antenna terminals-5MHz BW LTE-Band 17 (16QAM RB Number: 1 Offset: 0) Channel Mid





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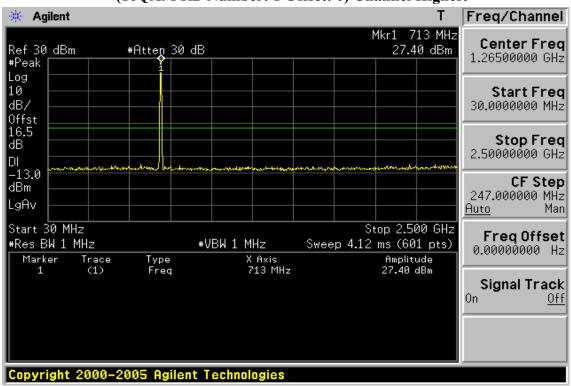
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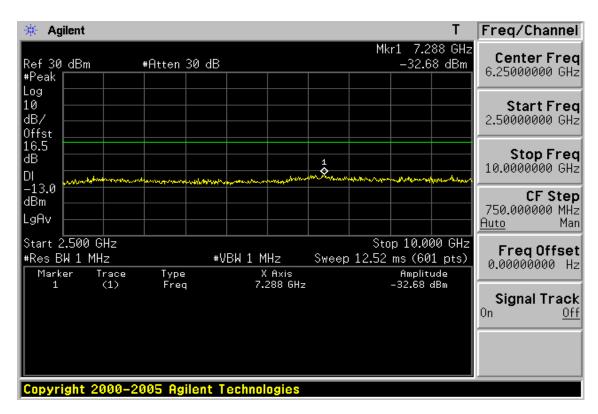


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Figure 10-93: Out of Band emission at antenna terminals—5MHz BW LTE-Band 17 (16QAM RB Number: 1 Offset: 0) Channel Highest





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Figure 10-94: Band edge emission at antenna terminals –5MHz BW LTE-Band 17 (16QAM RB Number: 1 Offset: 0) Channel Lowest

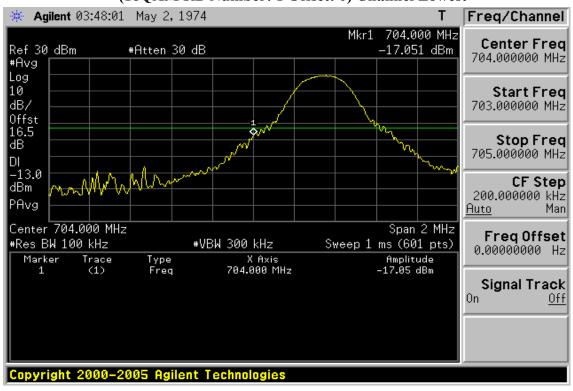
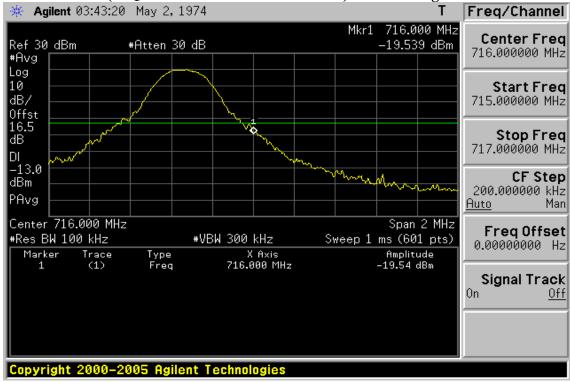


Figure 10-95: Band edge emission at antenna terminals –5MHz BW LTE-Band 17 (16QAM RB Number: 1 Offset: 24) Channel Highest



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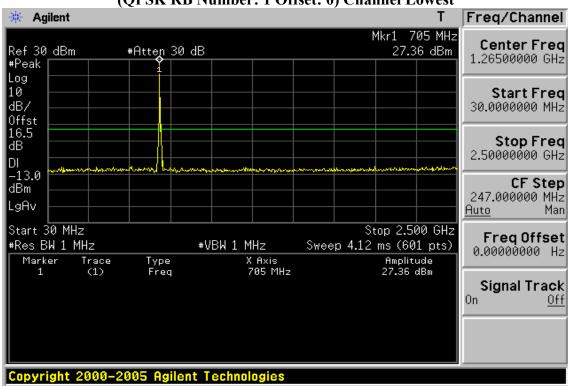
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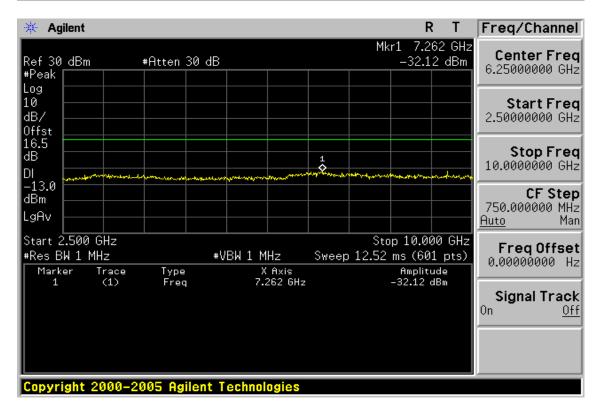


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Figure 10-96: Out of Band emission at antenna terminals—10MHz BW LTE-Band 17 (QPSK RB Number: 1 Offset: 0) Channel Lowest





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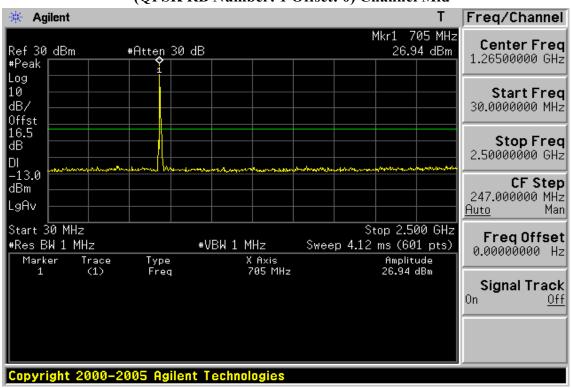
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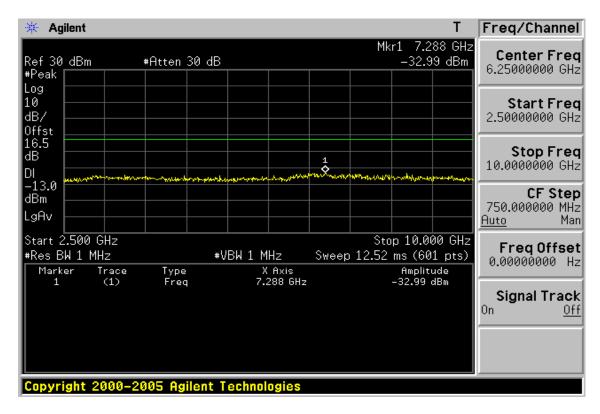


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Figure 10-97: Out of Band emission at antenna terminals—10MHz BW LTE-Band 17 (QPSK RB Number: 1 Offset: 0) Channel Mid





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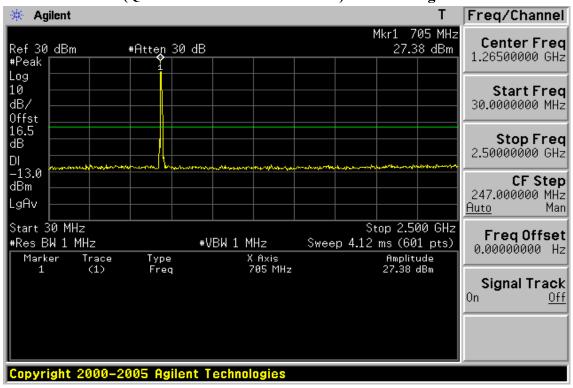
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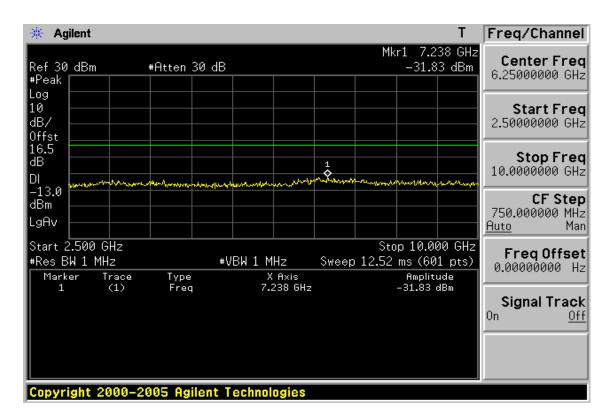


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Figure 10-98: Out of Band emission at antenna terminals—10MHz BW LTE-Band 17 (QPSK RB Number: 1 Offset: 0) Channel Highest





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Figure 10-99: Out of Band emission at antenna terminals—10MHz BW LTE-Band 17 (QPSK RB Number: 1 Offset: 0) Channel Lowest

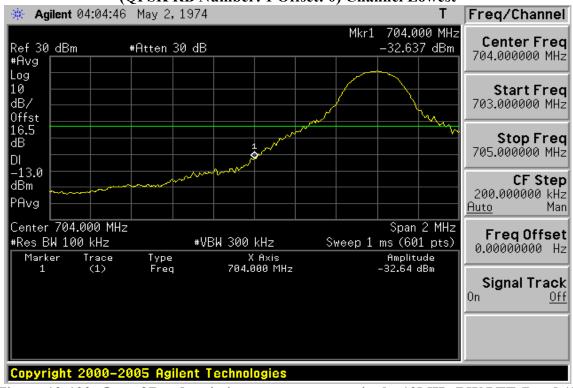
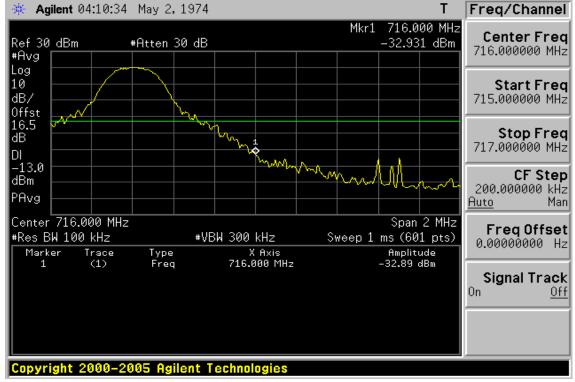


Figure 10-100: Out of Band emission at antenna terminals—10MHz BW LTE-Band 17 (QPSK RB Number: 1 Offset: 49) Channel Highest



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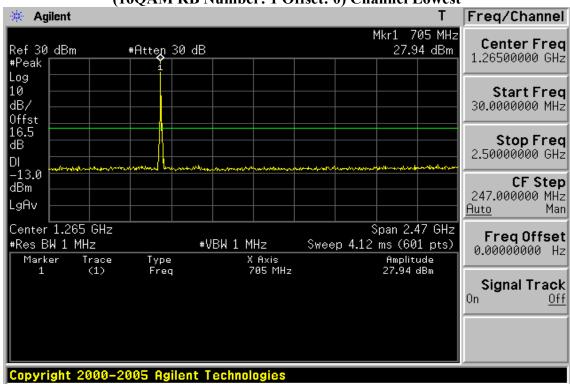
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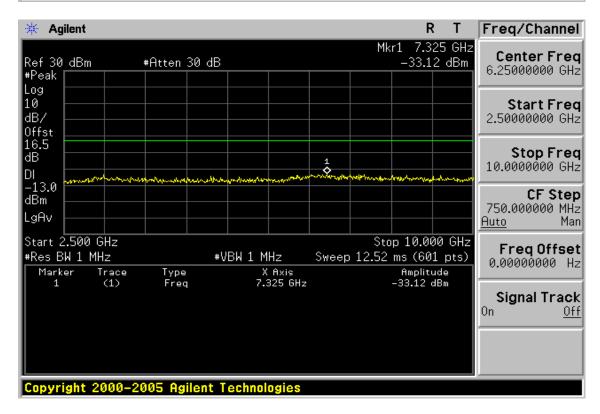


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Figure 10-101: Out of Band emission at antenna terminals—10MHz BW LTE-Band 17 (16QAM RB Number: 1 Offset: 0) Channel Lowest





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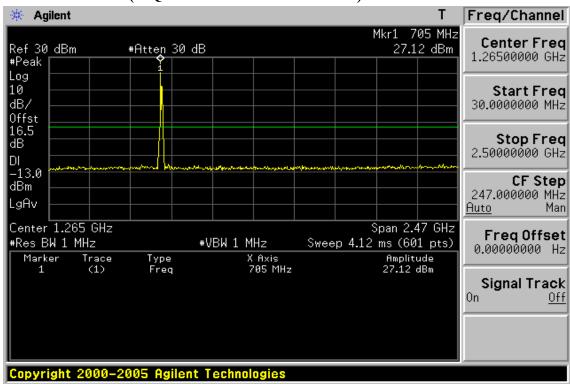
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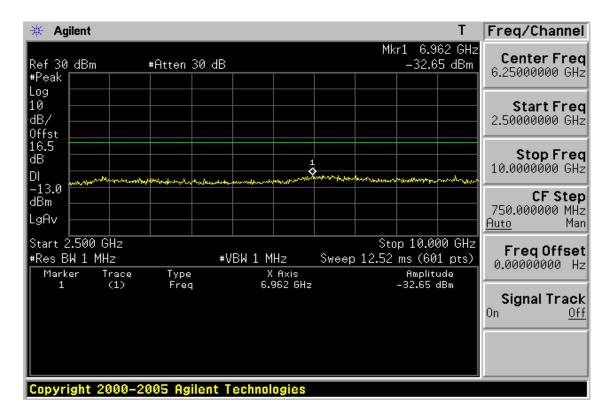


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Figure 10-102: Out of Band emission at antenna terminals—10MHz BW LTE-Band 17 (16QAM RB Number: 1 Offset: 0) Channel Mid





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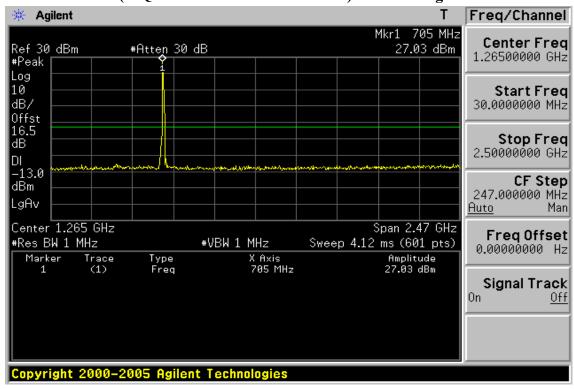
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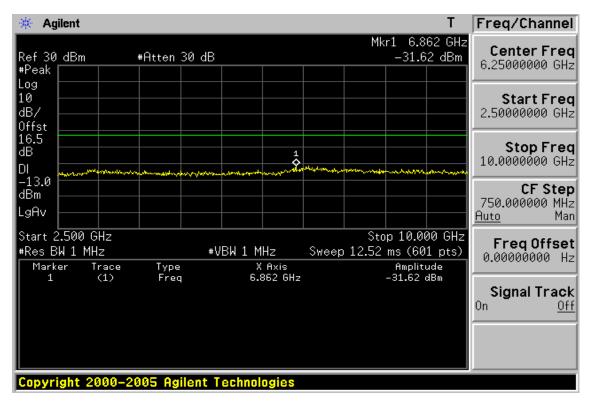


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Figure 10-103: Out of Band emission at antenna terminals—10MHz BW LTE-Band 17 (16QAM RB Number: 1 Offset: 0) Channel Highest





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Figure 10-104: Out of Band emission at antenna terminals—10MHz BW LTE-Band 17 (16QAM RB Number: 1 Offset: 0) Channel Lowest

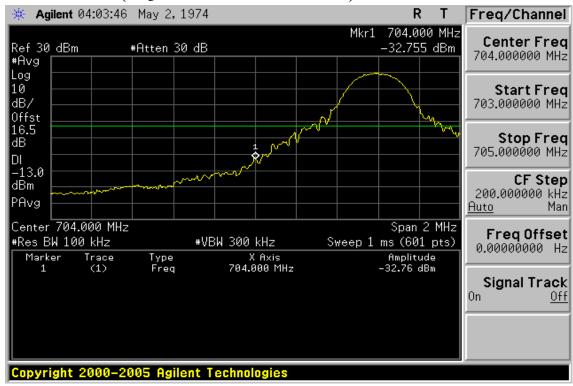
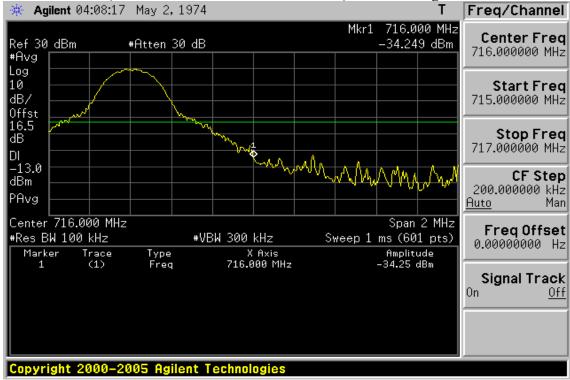


Figure 10-105: Out of Band emission at antenna terminals—10MHz BW LTE-Band 17 (16QAM RB Number: 1 Offset: 49) Channel Highest



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#### 11. FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT

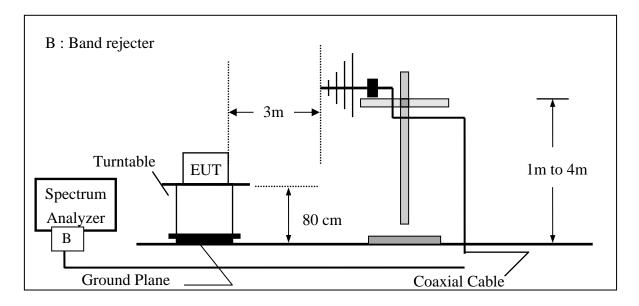
# 11.1. Standard Applicable:

According to FCC §2.1053,

FCC  $\S22.917(a),\S24.238(a)$ ,  $\S27.53(g)$  the magnitude of each spurious and harmonic emission that can be detected when the equipment is operated under the conditions specified in the instruction manual and/ or alignment procedure, shall not be less than  $43 + 10 \log$  (mean output power in watts) dBc below the mean power output outside a license's frequency block (-13dBm)

#### 11.2. EUT Setup (Block Diagram of Configuration):

Radiated Emission Test Set-Up, Frequency Below 1000MHz



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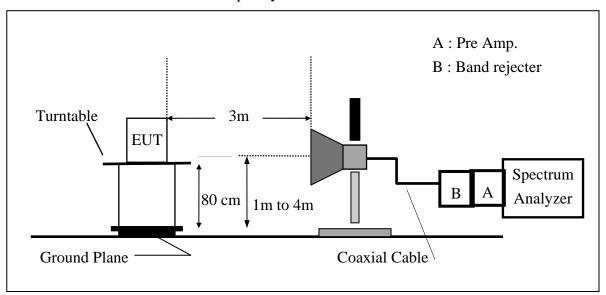
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#### Radiated Emission Test Set-UP Frequency Over 1 GHz



#### 11.3. Measurement Procedure:

The EUT was placed on a non-conductive; The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

The frequency range up to tenth harmonic was investigated for each of three fundamental frequency (low, middle and high channels). Once spurious emission was identified, the power of the emission was determined using the substitution method.

The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and the spurious emissions frequency.

ERP= S.G. output (dBm) + Antenna Gain (dBd) – Cable Loss (dB)

EIRP = S.G. output (dBm) + Antenna Gain(dBi) – Cable Loss (dB)

#### 11.4. Measurement Equipment Used:

Refer to section 2.4 in this report

#### 11.5. Measurement Result:

Refer to attach tabular data sheets.

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# Radiated Spurious Emission Measurement Result: HSUPA Band II Mode

Operation Band :HSUPA B2 Test Date :2011-12-01

ARFCN :9262 Temp./Humi. :27 deg\_C / 66 RH

Fundamental Frequency: 1852.4 MHZ Engineer: Marcus

Operation Mode :TX LOW

EUT Pol. :E2 Pol. :VERTICAL

Freq.	Note	EIRP	SG	Antenna	Cable	Limit	Safe
			Output Level	Gain	Loss		Margin
MHz	F/H/E/S	dBm	dBm	dBd	dB	dBm	dB
199.75	S	-70.73	-74.51	6.85	-3.09	-13.00	-57.73
288.99	S	-69.42	-72.90	6.68	-3.22	-13.00	-56.42
368.53	S	-65.71	-69.12	6.81	-3.43	-13.00	-52.71
443.22	S	-79.08	-82.06	6.65	-3.70	-13.00	-66.08
805.03	S	-76.59	-78.52	6.06	-4.20	-13.00	-63.59
3704.80	Н	-50.54	-51.07	7.40	-6.98	-13.00	-37.54
5557.20							
7409.60							
9262.00							
11114.40							
12966.80							
14819.20							
16671.60							
18524.00							

EIRP(dBm) = SG Level(dBm) + Antenna Gain(dBd) + Cable Loss(dB)

Note: "F": denotes Fundamental Frequency.; "H": denotes Harmonic Frequency.

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

"---": denotes Noise Floor.

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## Radiated Spurious Emission Measurement Result: HSUPA Band II Mode

Operation Band :HSUPA B2 Test Date :2011-12-01

ARFCN :9262 Temp./Humi. :27 deg\_C / 66 RH

Fundamental Frequency: 1852.4 MHZ Engineer: Marcus

Operation Mode :TX LOW

EUT Pol. :E2 Pol. :HORIZONTAL

Freq.	Note	EIRP	SG	Antenna	Cable	Limit	Safe
			Output Level	Gain	Loss		Margin
MHz	F/H/E/S	dBm	dBm	dBd	dB	dBm	dB
35.82	S	-73.95	-59.88	-11.62	-2.47	-13.00	-60.95
127.00	S	-76.33	-74.81	1.25	-2.77	-13.00	-63.33
288.02	S	-69.77	-73.24	6.67	-3.22	-13.00	-56.77
375.32	S	-71.35	-74.71	6.76	-3.43	-13.00	-58.35
440.31	S	-75.65	-78.64	6.66	-3.70	-13.00	-62.65
623.64	S	-76.72	-79.02	6.22	-3.97	-13.00	-63.72
3704.80	Н	-53.89	-53.91	6.90	-6.98	-13.00	-40.89
5557.20							
7409.60							
9262.00							
11114.40							
12966.80							
14819.20							
16671.60							
18524.00							

EIRP(dBm) = SG Level(dBm) + Antenna Gain(dBd) + Cable Loss(dB)

Note: "F": denotes Fundamental Frequency.; "H": denotes Harmonic Frequency.

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

"---": denotes Noise Floor.

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# Radiated Spurious Emission Measurement Result: HSUPA Band II Mode

Operation Band :HSUPA B2 Test Date :2011-12-01

ARFCN :9400 Temp./Humi. :27 deg\_C / 66 RH

Fundamental Frequency: 1880.0 MHZ Engineer: Marcus

Operation Mode :TX MID

EUT Pol. :E2 Pol. :VERTICAL

Freq.	Note	EIRP	SG	Antenna	Cable	Limit	Safe
			Output Level	Gain	Loss		Margin
MHz	F/H/E/S	dBm	dBm	dBd	dB	dBm	dB
35.82	S	-73.65	-59.59	-11.62	-2.47	-13.00	-60.65
64.92	S	-72.32	-64.89	-4.87	-2.59	-13.00	-59.32
288.02	S	-70.58	-74.04	6.67	-3.22	-13.00	-57.58
375.32	S	-70.47	-73.83	6.76	-3.43	-13.00	-57.47
441.28	S	-76.62	-79.61	6.66	-3.70	-13.00	-63.62
625.58	S	-76.74	-79.05	6.23	-3.97	-13.00	-63.74
3760.00	Н	-49.81	-50.41	7.42	-7.12	-13.00	-36.81
5640.00	Н	-45.98	-46.87	9.01	-8.26	-13.00	-32.98
7520.00							
9400.00							
11280.00							
13160.00							
15040.00							
16920.00							
18800.00							

EIRP(dBm) = SG Level(dBm) + Antenna Gain(dBd) + Cable Loss(dB)

Note: "F": denotes Fundamental Frequency.; "H": denotes Harmonic Frequency.

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

"---": denotes Noise Floor.

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# Radiated Spurious Emission Measurement Result: HSUPA Band II Mode

Operation Band :HSUPA B2 Test Date :2011-12-01

ARFCN :9400 Temp./Humi. :27 deg\_C / 66 RH

Fundamental Frequency: 1880.0 MHZ Engineer: Marcus

Operation Mode :TX MID

EUT Pol. :E2 Pol. :HORIZONTAL

Freq.	Note	EIRP	SG	Antenna	Cable	Limit	Safe
			Output Level	Gain	Loss		Margin
MHz	F/H/E/S	dBm	dBm	dBd	dB	dBm	dB
144.46	S	-80.55	-78.68	0.91	-2.79	-13.00	-67.55
217.21	S	-77.42	-81.28	6.99	-3.14	-13.00	-64.42
290.93	S	-69.29	-72.75	6.71	-3.25	-13.00	-56.29
374.35	S	-65.61	-68.98	6.76	-3.43	-13.00	-52.61
446.13	S	-77.75	-80.72	6.64	-3.70	-13.00	-64.75
538.28	S	-79.67	-82.71	6.76	-3.77	-13.00	-66.67
3760.00	Н	-53.44	-53.47	6.85	-7.12	-13.00	-40.44
5640.00							
7520.00							
9400.00							
11280.00							
13160.00							
15040.00							
16920.00							
18800.00							

EIRP(dBm) = SG Level(dBm) + Antenna Gain(dBd) + Cable Loss(dB)

Note: "F": denotes Fundamental Frequency.; "H": denotes Harmonic Frequency.

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

"---": denotes Noise Floor.

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# Radiated Spurious Emission Measurement Result: HSUPA Band II Mode

Operation Band :HSUPA B2 Test Date :2011-12-01

ARFCN :9538 Temp./Humi. :27 deg\_C / 66 RH

Fundamental Frequency: 1907.6MHZ Engineer: Marcus

Operation Mode :TX HIGH

EUT Pol. :E2 Pol. :VERTICAL

Freq.	Note	EIRP	SG	Antenna	Cable	Limit	Safe
			Output Level	Gain	Loss		Margin
MHz	F/H/E/S	dBm	dBm	dBd	dB	dBm	dB
35.82	S	-73.93	-59.87	-11.62	-2.47	-13.00	-60.93
284.14	S	-69.66	-73.08	6.62	-3.22	-13.00	-56.66
375.32	S	-70.72	-74.08	6.76	-3.43	-13.00	-57.72
443.22	S	-76.40	-79.38	6.65	-3.70	-13.00	-63.40
636.25	S	-76.33	-78.65	6.25	-3.98	-13.00	-63.33
707.06	S	-76.46	-78.75	6.21	-3.98	-13.00	-63.46
3815.20	Н	-50.29	-50.81	7.50	-7.20	-13.00	-37.29
5722.80	Н	-43.76	-44.52	9.02	-8.44	-13.00	-30.76
7630.40							
9538.00							
11445.60							
13353.20							
15260.80							
17168.40							
19076.00							

EIRP(dBm) = SG Level(dBm) + Antenna Gain(dBd) + Cable Loss(dB)

Note: "F": denotes Fundamental Frequency.; "H": denotes Harmonic Frequency.

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

"---": denotes Noise Floor.

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## Radiated Spurious Emission Measurement Result: HSUPA Band II Mode

Operation Band :HSUPA B2 Test Date :2011-12-01

ARFCN :9538 Temp./Humi. :27 deg\_C / 66 RH

Fundamental Frequency: 1907.6MHZ Engineer: Marcus

Operation Mode :TX HIGH

EUT Pol. :E2 Pol. :HORIZONTAL

Freq.	Note	EIRP	SG	Antenna	Cable	Limit	Safe
			Output Level	Gain	Loss		Margin
MHz	F/H/E/S	dBm	dBm	dBd	dB	dBm	dB
143.49	S	-79.60	-77.71	0.89	-2.79	-13.00	-66.60
215.27	S	-77.67	-81.51	6.98	-3.14	-13.00	-64.67
287.05	S	-68.47	-71.92	6.66	-3.22	-13.00	-55.47
370.47	S	-66.18	-69.57	6.79	-3.43	-13.00	-53.18
444.19	S	-78.64	-81.61	6.65	-3.70	-13.00	-65.64
622.67	S	-79.27	-81.57	6.22	-3.97	-13.00	-66.27
3815.20							
5722.80	Н	-47.84	-47.90	8.33	-8.49	-13.00	-34.84
7630.40							
9538.00							
11445.60							
13353.20							
15260.80							
17168.40							
19076.00							

EIRP(dBm) = SG Level(dBm) + Antenna Gain(dBd) + Cable Loss(dB)

Note: "F": denotes Fundamental Frequency.; "H": denotes Harmonic Frequency.

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

"---": denotes Noise Floor.

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## Radiated Spurious Emission Measurement Result: WCDMA Band IV Mode

Operation Band :WCDMA B4 Test Date :2011-12-12

ARFCN :1312 Temp./Humi. :27 deg\_C / 66 RH

Fundamental Frequency: 1712.4 MHZ Engineer: Marcus

Operation Mode :TX LOW

EUT Pol. :E2 Pol. :VERTICAL

Freq.	Note	EIRP	SG	Antenna	Cable	Limit	Safe
			Output Level	Gain	Loss		Margin
MHz	F/H/E/S	dBm	dBm	dBd	dB	dBm	dB
39.70	S	-83.27	-69.25	-11.30	-2.73	-13.00	-70.27
201.69	S	-79.89	-83.65	6.89	-3.14	-13.00	-66.89
246.31	S	-76.05	-79.49	6.64	-3.23	-13.00	-63.05
359.80	S	-72.45	-75.92	6.87	-3.43	-13.00	-59.45
519.85	S	-78.55	-81.67	6.81	-3.74	-13.00	-65.55
842.86	S	-75.22	-77.23	6.16	-4.24	-13.00	-62.22
3424.80	Н	-42.91	-43.56	7.20	-6.89	-13.00	-29.91
5137.20							
6849.60							
8562.00							
10274.40							
11986.80							
13699.20							
15411.60							

EIRP(dBm) = SG Level(dBm) + Antenna Gain(dBd) + Cable Loss(dB)

Note: "F": denotes Fundamental Frequency.; "H": denotes Harmonic Frequency.

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

"---": denotes Noise Floor.

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## Radiated Spurious Emission Measurement Result: WCDMA Band IV Mode

Operation Band :WCDMA B4 Test Date :2011-12-12

ARFCN :1312 Temp./Humi. :27 deg\_C / 66 RH

Fundamental Frequency: 1712.4 MHZ Engineer: Marcus

Operation Mode :TX LOW

EUT Pol. :E2 Pol. :HORIZONTAL

Freq.	Note	EIRP	SG	Antenna	Cable	Limit	Safe
			Output Level	Gain	Loss		Margin
MHz	F/H/E/S	dBm	dBm	dBd	dB	dBm	dB
67.83	S	-85.69	-78.98	-4.15	-2.59	-13.00	-72.69
247.28	S	-75.77	-79.22	6.66	-3.23	-13.00	-62.77
322.94	S	-76.73	-80.15	6.77	-3.39	-13.00	-63.73
396.66	S	-75.61	-79.00	6.91	-3.56	-13.00	-62.61
625.58	S	-80.47	-82.78	6.23	-3.97	-13.00	-67.47
847.71	S	-76.90	-78.84	6.17	-4.33	-13.00	-63.90
3424.80	Н	-44.32	-44.91	7.15	-6.89	-13.00	-31.32
5137.20							
6849.60							
8562.00							
10274.40							
11986.80							
13699.20							
15411.60							

EIRP(dBm) = SG Level(dBm) + Antenna Gain(dBd) + Cable Loss(dB)

Note: "F": denotes Fundamental Frequency.; "H": denotes Harmonic Frequency.

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

"---": denotes Noise Floor.

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## Radiated Spurious Emission Measurement Result: WCDMA Band IV Mode

Operation Band :WCDMA B4 Test Date :2011-12-01

ARFCN :1413 Temp./Humi. :27 deg\_C / 66 RH

Fundamental Frequency: 1732.6 MHZ Engineer: Marcus

Operation Mode :TX MID

EUT Pol. :E2 Pol. :VERTICAL

Freq.	Note	EIRP	SG	Antenna	Cable	Limit	Safe
			Output Level	Gain	Loss		Margin
MHz	F/H/E/S	dBm	dBm	dBi	dB	dBm	dB
36.79	S	-82.05	-68.07	-11.54	-2.47	-13.00	-69.05
143.49	S	-80.91	-79.02	0.89	-2.79	-13.00	-67.91
246.31	S	-76.05	-79.49	6.64	-3.23	-13.00	-63.05
283.17	S	-76.58	-79.99	6.61	-3.22	-13.00	-63.58
364.65	S	-77.64	-81.07	6.83	-3.43	-13.00	-64.64
519.85	S	-78.55	-81.67	6.81	-3.74	-13.00	-65.55
3464.80	Н	-39.12	-39.66	7.31	-6.99	-13.00	-26.12
5197.20							
6929.60							
8662.00							
10394.40							
12126.80							
13859.20							
15591.60							
17324.00							

EIRP(dBm) = SG Level(dBm) + Antenna Gain(dBd) + Cable Loss(dB)

Note: "F": denotes Fundamental Frequency.; "H": denotes Harmonic Frequency.

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

"---": denotes Noise Floor.

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## Radiated Spurious Emission Measurement Result: WCDMA Band IV Mode

Operation Band :WCDMA B4 Test Date :2011-12-01

ARFCN :1413 Temp./Humi. :27 deg\_C / 66 RH

Fundamental Frequency: 1732.6 MHZ Engineer: Marcus

Operation Mode :TX MID

EUT Pol. :E2 Pol. : HORIZONTAL

Freq.	Note	EIRP	SG	Antenna	Cable	Limit	Safe
			Output Level	Gain	Loss		Margin
MHz	F/H/E/S	dBm	dBm	dBd	dB	dBm	dB
67.83	S	-85.69	-78.98	-4.15	-2.59	-13.00	-72.69
184.23	S	-79.41	-81.45	5.11	-3.09	-13.00	-66.41
246.31	S	-73.44	-76.87	6.64	-3.23	-13.00	-60.44
316.15	S	-73.13	-76.56	6.79	-3.39	-13.00	-60.13
355.92	S	-72.24	-75.74	6.90	-3.43	-13.00	-59.24
853.53	S	-76.31	-78.23	6.15	-4.33	-13.00	-63.31
3464.80	Н	-40.47	-40.94	7.24	-6.99	-13.00	-27.47
5197.20							
6929.60							
8662.00							
10394.40							
12126.80							
13859.20							
15591.60							
17324.00							

EIRP(dBm) = SG Level(dBm) + Antenna Gain(dBd) + Cable Loss(dB)

Note: "F": denotes Fundamental Frequency.; "H": denotes Harmonic Frequency.

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

"---": denotes Noise Floor.

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## Radiated Spurious Emission Measurement Result: WCDMA Band IV Mode

Operation Band :WCDMA B4 Test Date :2011-12-01

ARFCN :1513 Temp./Humi. :27 deg\_C / 66 RH

Fundamental Frequency: 1752.6 MHZ Engineer: Marcus

Operation Mode :TX HIGH

EUT Pol. :E2 Pol. :VERTICAL

Freq.	Note	EIRP	SG	Antenna	Cable	Limit	Safe
			Output Level	Gain	Loss		Margin
MHz	F/H/E/S	dBm	dBm	dBi	dB	dBm	dB
38.73	S	-82.16	-68.33	-11.38	-2.47	-13.00	-69.16
143.49	S	-80.91	-79.02	0.89	-2.79	-13.00	-67.91
246.31	S	-76.05	-79.49	6.64	-3.23	-13.00	-63.05
364.65	S	-77.64	-81.07	6.83	-3.43	-13.00	-64.64
612.00	S	-76.75	-79.08	6.20	-3.92	-13.00	-63.75
841.89	S	-76.76	-78.76	6.16	-4.24	-13.00	-63.76
3505.20	Н	-35.78	-36.58	7.40	-6.99	-13.00	-22.78
5257.80							
7010.40							
8763.00							
10515.60							
12268.20							
14020.80							
15773.40							
17526.00							

EIRP(dBm) = SG Level(dBm) + Antenna Gain(dBd) + Cable Loss(dB)

Note: "F": denotes Fundamental Frequency.; "H": denotes Harmonic Frequency.

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

"---": denotes Noise Floor.

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## Radiated Spurious Emission Measurement Result: WCDMA Band IV Mode

Operation Band :WCDMA B4 Test Date :2011-12-01

ARFCN :1513 Temp./Humi. :27 deg\_C / 66 RH

Fundamental Frequency: 1752.6 MHZ Engineer: Marcus

Operation Mode :TX HIGH

EUT Pol. :E2 Pol. : HORIZONTAL

Freq.	Note	EIRP	SG	Antenna	Cable	Limit	Safe
			Output Level	Gain	Loss		Margin
MHz	F/H/E/S	dBm	dBm	dBd	dB	dBm	dB
67.83	S	-85.69	-78.98	-4.15	-2.59	-13.00	-72.69
184.23	S	-79.41	-81.45	5.11	-3.09	-13.00	-66.41
246.31	S	-73.44	-76.87	6.64	-3.23	-13.00	-60.44
357.86	S	-72.16	-75.65	6.88	-3.43	-13.00	-59.16
516.94	S	-80.67	-83.79	6.82	-3.74	-13.00	-67.67
913.67	S	-74.09	-75.55	5.79	-4.42	-13.00	-61.09
3505.20	Н	-36.45	-37.14	7.30	-6.99	-13.00	-23.45
5257.80							
7010.40							
8763.00							
10515.60							
12268.20							
14020.80							
15773.40							
17526.00							

EIRP(dBm) = SG Level(dBm) + Antenna Gain(dBd) + Cable Loss(dB)

Note: "F": denotes Fundamental Frequency.; "H": denotes Harmonic Frequency.

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

"---": denotes Noise Floor.

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# Radiated Spurious Emission Measurement Result: HSUPA Band V Mode

Operation Band : HSUPA B5 Test Date : 2011-12-01

ARFCN : 4132 Temp./Humi. : 27 deg\_C / 66 RH

Fundamental Frequency: 826.4 MHZ Engineer: Marcus

Operation Mode : TX LOW

EUT Pol. : E2 PLAN Pol. : VERTICAL

Freq.	Note	ERP	SG	Antenna	Cable	Limit	Safe
			Output Level	Gain	Loss		Margin
MHz	F/H/E/S	dBm	dBm	dBi	dB	dBm	dB
64.92	S	-74.76	-65.18	-7.02	-2.59	-13.00	-61.76
107.60	S	-75.04	-71.27	-1.05	-2.72	-13.00	-62.04
168.71	S	-73.72	-71.49	0.68	-2.93	-13.00	-60.72
199.75	S	-73.51	-75.18	4.70	-3.09	-13.00	-60.51
287.05	S	-72.07	-73.43	4.51	-3.22	-13.00	-59.07
360.77	S	-72.15	-73.54	4.71	-3.43	-13.00	-59.15
1652.80	Н	-58.88	-56.22	2.38	-5.29	-13.00	-45.88
2479.20							
3305.60							
4132.00							
4958.40							
5784.80							
6611.20							
7437.60							
8264.00							

ERP(dBm) = SG Level(dBm) + Antenna Gain(dBi) + Cable Loss(dB)

Note: "F": denotes Fundamental Frequency.; "H": denotes Harmonic Frequency.

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

"---": denotes Noise Floor.

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## Radiated Spurious Emission Measurement Result: HSUPA Band V Mode

Operation Band : HSUPA B5 Test Date : 2011-12-01

ARFCN : 4132 Temp./Humi. : 27 deg\_C / 66 RH

Fundamental Frequency: 826.4 MHZ Engineer: Marcus

Operation Mode : TX LOW

EUT Pol. : E2 PLAN Pol. : HORIZONTAL

Freq.	Note	ERP	SG	Antenna	Cable	Limit	Safe
			Output Level	Gain	Loss		Margin
MHz	F/H/E/S	dBm	dBm	dBi	dB	dBm	dB
143.49	S	-81.91	-77.88	-1.26	-2.79	-13.00	-68.91
219.15	S	-79.65	-81.37	4.85	-3.17	-13.00	-66.65
288.02	S	-70.80	-72.17	4.52	-3.22	-13.00	-57.80
367.56	S	-66.20	-67.54	4.66	-3.43	-13.00	-53.20
691.54	S	-79.57	-80.50	4.15	-4.07	-13.00	-66.57
824.43	S	-71.97	-72.84	3.96	-4.22	38.40	-110.37
1652.80	Н	-60.44	-58.07	2.67	-5.29	-13.00	-47.44
2479.20							
3305.60							
4132.00							
4958.40							
5784.80							
6611.20							
7437.60							
8264.00							

ERP(dBm) = SG Level(dBm) + Antenna Gain(dBi) + Cable Loss(dB)

Note: "F": denotes Fundamental Frequency.; "H": denotes Harmonic Frequency.

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

"---": denotes Noise Floor.

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## Radiated Spurious Emission Measurement Result: HSUPA Band V Mode

Operation Band : HSUPA B5 Test Date : 2011-12-01

ARFCN : 4183 Temp./Humi. : 27 deg\_C / 66 RH

Fundamental Frequency: 836.6 MHZ Engineer: Marcus

Operation Mode : TX MID

EUT Pol. : E2 PLAN Pol. : VERTICAL

Freq.	Note	ERP	SG	Antenna	Cable	Limit	Safe
			Output Level	Gain	Loss		Margin
MHz	F/H/E/S	dBm	dBm	dBi	dB	dBm	dB
35.82	S	-76.72	-60.50	-13.77	-2.47	-13.00	-63.72
126.03	S	-78.72	-74.99	-0.97	-2.77	-13.00	-65.72
286.08	S	-71.51	-72.85	4.50	-3.22	-13.00	-58.51
371.44	S	-72.88	-74.18	4.63	-3.43	-13.00	-59.88
440.31	S	-78.41	-79.33	4.51	-3.70	-13.00	-65.41
839.95	S	-75.71	-76.61	4.00	-4.24	38.40	-114.11
1673.20	Н	-57.31	-54.64	2.35	-5.29	-13.00	-44.31
2509.80							
3346.40							
4183.00							
5019.60							
5856.20							
6692.80							
7529.40							
8366.00							

ERP(dBm) = SG Level(dBm) + Antenna Gain(dBi) + Cable Loss(dB)

Note: "F": denotes Fundamental Frequency.; "H": denotes Harmonic Frequency.

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

"---": denotes Noise Floor.

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## Radiated Spurious Emission Measurement Result: HSUPA Band V Mode

Operation Band : HSUPA B5 Test Date : 2011-12-01

ARFCN : 4183 Temp./Humi. : 27 deg\_C / 66 RH

Fundamental Frequency: 836.6 MHZ Engineer: Marcus

Operation Mode : TX MID

EUT Pol. : E2 PLAN Pol. : HORIZONTAL

Freq.	Note	ERP	SG	Antenna	Cable	Limit	Safe
			Output Level	Gain	Loss		Margin
MHz	F/H/E/S	dBm	dBm	dBi	dB	dBm	dB
143.49	S	-81.90	-77.86	-1.26	-2.79	-13.00	-68.90
217.21	S	-79.05	-80.80	4.84	-3.14	-13.00	-66.05
289.96	S	-70.62	-72.01	4.55	-3.22	-13.00	-57.62
361.74	S	-67.36	-68.73	4.70	-3.43	-13.00	-54.36
445.16	S	-79.58	-80.49	4.49	-3.70	-13.00	-66.58
625.58	S	-79.93	-80.40	4.08	-3.97	-13.00	-66.93
1673.20	Н	-59.88	-57.53	2.66	-5.29	-13.00	-46.88
2509.80							
3346.40							
4183.00							
5019.60							
5856.20							
6692.80							
7529.40							
8366.00							

ERP(dBm) = SG Level(dBm) + Antenna Gain(dBi) + Cable Loss(dB)

Note: "F": denotes Fundamental Frequency.; "H": denotes Harmonic Frequency.

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

"---": denotes Noise Floor.

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## Radiated Spurious Emission Measurement Result: HSUPA Band V Mode

Operation Band : HSUPA B5 Test Date : 2011-12-01

ARFCN : 4233 Temp./Humi. : 27 deg\_C / 66 RH

Fundamental Frequency: 846.6 MHZ Engineer: Marcus

Operation Mode : TX HIGH

EUT Pol. : E2 PLAN Pol. : VERTICAL

Freq.	Note	ERP	SG	Antenna	Cable	Limit	Safe
			Output Level	Gain	Loss		Margin
MHz	F/H/E/S	dBm	dBm	dBi	dB	dBm	dB
35.82	S	-75.59	-59.37	-13.77	-2.47	-13.00	-62.59
123.12	S	-77.01	-73.09	-1.16	-2.77	-13.00	-64.01
184.23	S	-70.37	-70.27	2.96	-3.09	-13.00	-57.37
288.02	S	-72.21	-73.58	4.52	-3.22	-13.00	-59.21
373.38	S	-72.44	-73.72	4.62	-3.43	-13.00	-59.44
442.25	S	-79.70	-80.63	4.50	-3.70	-13.00	-66.70
1693.20	Н	-57.45	-54.69	2.30	-5.34	-13.00	-44.45
2539.80							
3386.40							
4233.00							
5079.60							
5926.20							
6772.80							
7619.40							
8466.00							

ERP(dBm) = SG Level(dBm) + Antenna Gain(dBi) + Cable Loss(dB)

Note: "F": denotes Fundamental Frequency.; "H": denotes Harmonic Frequency.

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

"---": denotes Noise Floor.

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## Radiated Spurious Emission Measurement Result: HSUPA Band V Mode

Operation Band : HSUPA B5 Test Date : 2011-12-01

ARFCN : 4233 Temp./Humi. : 27 deg\_C / 66 RH

Fundamental Frequency: 846.6 MHZ Engineer: Marcus

Operation Mode : TX HIGH

EUT Pol. : E2 PLAN Pol. : HORIZONTAL

Freq.	Note	ERP	SG	Antenna	Cable	Limit	Safe
			Output Level	Gain	Loss		Margin
MHz	F/H/E/S	dBm	dBm	dBi	dB	dBm	dB
144.46	S	-82.60	-78.59	-1.24	-2.79	-13.00	-69.60
217.21	S	-80.08	-81.83	4.84	-3.14	-13.00	-67.08
287.05	S	-70.43	-71.78	4.51	-3.22	-13.00	-57.43
373.38	S	-67.78	-69.07	4.62	-3.43	-13.00	-54.78
446.13	S	-80.90	-81.81	4.49	-3.70	-13.00	-67.90
847.71	S	-75.07	-75.91	4.02	-4.33	38.40	-113.47
1693.20	Н	-56.30	-53.81	2.65	-5.40	-13.00	-43.30
2539.80							
3386.40							
4233.00							
5079.60							
5926.20							
6772.80							
7619.40							
8466.00							

ERP(dBm) = SG Level(dBm) + Antenna Gain(dBi) + Cable Loss(dB)

Note: "F": denotes Fundamental Frequency.; "H": denotes Harmonic Frequency.

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

"---": denotes Noise Floor.

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## Radiated Spurious Emission Measurement Result: 1.4MHz BW LTE-Band 4

Operation Band :BAND 4 16 QAM 1.4BW Test Date :2011-12-09

ARFCN :RB SIZE / RB OFFSET :1 0 Temp./Humi. :27 deg\_C / 66 RH

Fundamental Frequency: 1710.7 MHZ Engineer: Marcus

Operation Mode :TX CH 19957

EUT Pol. :E2 Pol. :VERTICAL

Freq.	Note	EIRP	SG	Antenna	Cable	Limit	Safe
			Output Level	Gain	Loss		Margin
MHz	F/H/E/S	dBm	dBm	dBi	dB	dBm	dB
110.51	S	-78.37	-6.98	1.06	-2.72	-13.00	-65.37
184.23	S	-73.82	-6.78	5.11	-3.09	-13.00	-60.82
275.41	S	-75.81	-6.51	6.63	-3.22	-13.00	-62.81
369.50	S	-75.25	-6.19	6.80	-3.43	-13.00	-62.25
702.21	S	-75.95	0.41	6.27	-4.07	-13.00	-62.95
939.86	S	-72.26	5.08	5.78	-4.51	-13.00	-59.26
3421.40	Н	-46.73	15.83	7.19	-6.89	-13.00	-33.73
5132.10							
6842.80							
8553.50							
10264.20							
11974.90							
13685.60							
15396.30							
17107.00							

EIRP(dBm) = SG Level(dBm) + Antenna Gain(dBd) + Cable Loss(dB)

Note: "F": denotes Fundamental Frequency.; "H": denotes Harmonic Frequency.

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

"---": denotes Noise Floor.

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## Radiated Spurious Emission Measurement Result: 1.4MHz BW LTE-Band 4

Operation Band :BAND 4 16 QAM 1.4BW Test Date :2011-12-09

ARFCN :RB SIZE / RB OFFSET :1 0 Temp./Humi. :27 deg\_C / 66 RH

Fundamental Frequency: 1710.7 MHZ Engineer: Marcus

Operation Mode :TX CH 19957

EUT Pol. :E2 Pol. :HORIZONTAL

Freq.	Note	EIRP	SG	Antenna	Cable	Limit	Safe
			Output Level	Gain	Loss		Margin
MHz	F/H/E/S	dBm	dBm	dBi	dB	dBm	dB
108.57	S	-82.51	-8.43	1.09	-2.72	-13.00	-69.51
184.23	S	-75.42	-11.06	5.11	-3.09	-13.00	-62.42
275.41	S	-73.75	-10.97	6.63	-3.22	-13.00	-60.75
374.35	S	-69.71	-6.50	6.76	-3.43	-13.00	-56.71
818.61	S	-76.96	0.89	6.10	-4.22	-13.00	-63.96
892.33	S	-75.43	1.78	5.86	-4.34	-13.00	-62.43
3421.40	Н	-46.74	14.68	7.14	-6.89	-13.00	-33.74
5132.10							
6842.80							
8553.50							
10264.20							
11974.90							
13685.60							
15396.30							
17107.00							

ERP(dBm) = SG Level(dBm) + Antenna Gain(dBd) + Cable Loss(dB)

Note: "F": denotes Fundamental Frequency.; "H": denotes Harmonic Frequency.

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

"---": denotes Noise Floor.

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## Radiated Spurious Emission Measurement Result: 1.4MHz BW LTE-Band 4

Operation Band :BAND 4 16 QAM 1.4BW Test Date :2011-12-09

ARFCN :RB SIZE / RB OFFSET :1 0 Temp./Humi. :27 deg\_C / 66 RH

Fundamental Frequency: 1732.5 MHZ Engineer: Marcus

Operation Mode :TX CH 20175

EUT Pol. :E2 Pol. :VERTICAL

Freq.	Note	EIRP	SG	Antenna	Cable	Limit	Safe
			Output Level	Gain	Loss		Margin
MHz	F/H/E/S	dBm	dBm	dBi	dB	dBm	dB
106.63	S	-79.47	-6.98	1.11	-2.72	-13.00	-66.47
143.49	S	-79.73	-3.53	0.89	-2.79	-13.00	-66.73
226.91	S	-73.68	-7.67	6.84	-3.17	-13.00	-60.68
369.50	S	-75.39	-6.19	6.80	-3.43	-13.00	-62.39
800.18	S	-75.55	1.40	6.05	-4.20	-13.00	-62.55
922.40	S	-73.64	4.45	5.79	-4.50	-13.00	-60.64
3465.00	Н	-42.88	16.44	7.31	-6.99	-13.00	-29.88
5197.50							
6930.00							
8662.50							
10395.00							
12127.50							
13860.00							
15592.50							
17325.00							

EIRP(dBm) = SG Level(dBm) + Antenna Gain(dBd) + Cable Loss(dB)

Note: "F": denotes Fundamental Frequency.; "H": denotes Harmonic Frequency.

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

"---": denotes Noise Floor.

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## Radiated Spurious Emission Measurement Result: 1.4MHz BW LTE-Band 4

Operation Band :BAND 4 16 QAM 1.4BW Test Date :2011-12-09

ARFCN :RB SIZE / RB OFFSET :1 0 Temp./Humi. :27 deg\_C / 66 RH

Fundamental Frequency: 1732.5 MHZ Engineer: Marcus

Operation Mode :TX CH 20175

EUT Pol. :E2 Pol. :HORIZONTAL

Freq.	Note	EIRP	SG	Antenna	Cable	Limit	Safe
			Output Level	Gain	Loss		Margin
MHz	F/H/E/S	dBm	dBm	dBi	dB	dBm	dB
107.60	S	-83.67	-8.43	1.10	-2.72	-13.00	-70.67
146.40	S	-81.95	-4.56	0.96	-2.79	-13.00	-68.95
234.67	S	-69.90	-13.17	6.66	-3.17	-13.00	-56.90
375.32	S	-69.84	-6.50	6.76	-3.43	-13.00	-56.84
817.64	S	-76.45	0.89	6.10	-4.22	-13.00	-63.45
962.17	S	-75.27	3.44	5.87	-4.45	-13.00	-62.27
3465.00	Н	-45.15	15.23	7.24	-6.99	-13.00	-32.15
5197.50							
6930.00							
8662.50							
10395.00							
12127.50							
13860.00							
15592.50							
17325.00							

EIRP(dBm) = SG Level(dBm) + Antenna Gain(dBd) + Cable Loss(dB)

Note: "F": denotes Fundamental Frequency.; "H": denotes Harmonic Frequency.

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

"---": denotes Noise Floor.

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## Radiated Spurious Emission Measurement Result: 1.4MHz BW LTE-Band 4

Operation Band :BAND 4 16 QAM 1.4BW Test Date :2011-12-09

ARFCN :RB SIZE / RB OFFSET :1 0 Temp./Humi. :27 deg\_C / 66 RH

Fundamental Frequency: 1754.3 MHZ Engineer: Marcus

Operation Mode :TX CH 20393

EUT Pol. :E2 Pol. :VERTICAL

Freq.	Note	EIRP	SG	Antenna	Cable	Limit	Safe
			Output Level	Gain	Loss		Margin
MHz	F/H/E/S	dBm	dBm	dBi	dB	dBm	dB
109.54	S	-79.60	-6.98	1.08	-2.72	-13.00	-66.60
143.49	S	-79.35	-3.53	0.89	-2.79	-13.00	-66.35
273.47	S	-76.67	-6.51	6.66	-3.22	-13.00	-63.67
369.50	S	-75.45	-6.19	6.80	-3.43	-13.00	-62.45
800.18	S	-75.75	1.40	6.05	-4.20	-13.00	-62.75
967.99	S	-73.48	4.75	5.92	-4.45	-13.00	-60.48
3508.60	Н	-38.19	16.27	7.40	-6.99	-13.00	-25.19
5262.90							
7017.20							
8771.50							
10525.80							
12280.10							
14034.40							
15788.70							
17543.00							

EIRP(dBm) = SG Level(dBm) + Antenna Gain(dBd) + Cable Loss(dB)

Note: "F": denotes Fundamental Frequency.; "H": denotes Harmonic Frequency.

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

"---": denotes Noise Floor.

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## Radiated Spurious Emission Measurement Result: 1.4MHz BW LTE-Band 4

Operation Band :BAND 4 16 QAM 1.4BW Test Date :2011-12-09

ARFCN :RB SIZE / RB OFFSET :1 0 Temp./Humi. :27 deg\_C / 66 RH

Fundamental Frequency: 1754.3 MHZ Engineer: Marcus

Operation Mode :TX CH 20393

EUT Pol. :E2 Pol. :HORIZONTAL

Freq.	Note	EIRP	SG	Antenna	Cable	Limit	Safe
			Output Level	Gain	Loss		Margin
MHz	F/H/E/S	dBm	dBm	dBi	dB	dBm	dB
107.60	S	-79.74	-8.43	1.10	-2.72	-13.00	-66.74
199.75	S	-72.67	-11.06	6.85	-3.09	-13.00	-59.67
226.91	S	-65.96	-13.17	6.84	-3.17	-13.00	-52.96
376.29	S	-69.96	-6.50	6.77	-3.43	-13.00	-56.96
809.88	S	-76.38	0.89	6.08	-4.20	-13.00	-63.38
967.02	S	-73.82	3.44	5.91	-4.45	-13.00	-60.82
3508.60	Н	-39.74	15.38	7.31	-6.99	-13.00	-26.74
5262.90							
7017.20							
8771.50							
10525.80							
12280.10							
14034.40							
15788.70							
17543.00							

EIRP(dBm) = SG Level(dBm) + Antenna Gain(dBd) + Cable Loss(dB)

Note: "F": denotes Fundamental Frequency.; "H": denotes Harmonic Frequency.

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

"---": denotes Noise Floor.

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## Radiated Spurious Emission Measurement Result: 5MHz BW LTE-Band 17

Operation Band :BAND 17 16QAM 5BW Test Date :2011-12-09

ARFCN :RB SIZE / RB OFFSET :12 6 Temp./Humi. :27 deg\_C / 66 RH

Fundamental Frequency :706.5 MHZ Engineer :Marcus

Operation Mode :TX CH 23755

EUT Pol. :E2 Pol. :VERTICAL

Freq.	Note	ERP	SG	Antenna	Cable	Limit	Safe
			Output Level	Gain	Loss		Margin
MHz	F/H/E/S	dBm	dBm	dBd	dB	dBm	dB
105.66	S	-90.57	-86.82	-1.04	-2.72	-13.00	-77.57
159.98	S	-86.98	-83.48	-0.57	-2.93	-13.00	-73.98
249.22	S	-85.90	-87.21	4.54	-3.23	-13.00	-72.90
462.62	S	-83.77	-84.58	4.53	-3.72	-13.00	-70.77
587.75	S	-78.87	-79.13	4.16	-3.90	-13.00	-65.87
961.20	S	-75.40	-74.66	3.71	-4.45	-13.00	-62.40
1413.00	Н	-61.95	-58.88	2.07	-5.14	-13.00	-48.95
2119.50							
2826.00							
3532.50							
4239.00							
4945.50							
5652.00							
6358.50							
7065.00							

ERP(dBm) = SG Level(dBm) + Antenna Gain(dBd) + Cable Loss(dB)

Note: "F": denotes Fundamental Frequency.; "H": denotes Harmonic Frequency.

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

"---": denotes Noise Floor.

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## Radiated Spurious Emission Measurement Result: 5MHz BW LTE-Band 17

Operation Band :BAND 17 16QAM 5BW Test Date :2011-12-09

ARFCN :RB SIZE / RB OFFSET :12 6 Temp./Humi. :27 deg\_C / 66 RH

Fundamental Frequency :706.5 MHZ Engineer :Marcus

Operation Mode :TX CH 23755

EUT Pol. :E2 Pol. :HORIZONTAL

Freq.	Note	ERP	SG	Antenna	Cable	Limit	Safe
			Output Level	Gain	Loss		Margin
MHz	F/H/E/S	dBm	dBm	dBd	dB	dBm	dB
115.36	S	-90.33	-86.33	-1.23	-2.77	-13.00	-77.33
158.04	S	-87.56	-83.95	-0.67	-2.93	-13.00	-74.56
249.22	S	-85.92	-87.23	4.54	-3.23	-13.00	-72.92
463.59	S	-83.22	-84.03	4.54	-3.72	-13.00	-70.22
597.45	S	-79.33	-79.47	4.06	-3.92	-13.00	-66.33
962.17	S	-75.02	-74.29	3.72	-4.45	-13.00	-62.02
1413.00	Н	-64.30	-61.22	2.07	-5.14	-13.00	-51.30
2119.50							
2826.00							
3532.50							
4239.00							
4945.50							
5652.00							
6358.50							
7065.00							

ERP(dBm) = SG Level(dBm) + Antenna Gain(dBd) + Cable Loss(dB)

Note: "F": denotes Fundamental Frequency.; "H": denotes Harmonic Frequency.

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

"---": denotes Noise Floor.

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## Radiated Spurious Emission Measurement Result: 5MHz BW LTE-Band 17

Operation Band :BAND 17 16QAM 5BW Test Date :2011-12-09

ARFCN :RB SIZE / RB OFFSET :12 6 Temp./Humi. :27 deg\_C / 66 RH

Fundamental Frequency :710.0 MHZ Engineer :Marcus

Operation Mode :TX CH 23790

EUT Pol. :E2 Pol. :VERTICAL

Freq.	Note	ERP	SG	Antenna	Cable	Limit	Safe
			Output Level	Gain	Loss		Margin
MHz	F/H/E/S	dBm	dBm	dBd	dB	dBm	dB
88.20	S	-90.14	-86.19	-1.29	-2.67	-13.00	-77.14
146.40	S	-87.09	-83.12	-1.19	-2.79	-13.00	-74.09
272.50	S	-85.54	-86.80	4.52	-3.27	-13.00	-72.54
376.29	S	-84.66	-85.85	4.62	-3.43	-13.00	-71.66
575.14	S	-80.90	-81.32	4.30	-3.87	-13.00	-67.90
939.86	S	-74.99	-74.11	3.63	-4.51	-13.00	-61.99
1420.00	Н	-62.26	-59.24	2.12	-5.14	-13.00	-49.26
2130.00							
2840.00							
3550.00							
4260.00							
4970.00							
5680.00							
6390.00							
7100.00							

ERP(dBm) = SG Level(dBm) + Antenna Gain(dBd) + Cable Loss(dB)

Note: "F": denotes Fundamental Frequency.; "H": denotes Harmonic Frequency.

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

"---": denotes Noise Floor.

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#### Radiated Spurious Emission Measurement Result: 5MHz BW LTE-Band 17

Operation Band :BAND 17 16QAM 5BW Test Date :2011-12-09

ARFCN :RB SIZE / RB OFFSET :12 6 Temp./Humi. :27 deg\_C / 66 RH

Fundamental Frequency:710.0 MHZ Engineer: Marcus

Operation Mode :TX CH 23790

EUT Pol. :E2 Pol. :HORIZONTAL

Freq.	Note	ERP	SG	Antenna	Cable	Limit	Safe
			Output Level	Gain	Loss		Margin
MHz	F/H/E/S	dBm	dBm	dBd	dB	dBm	dB
101.78	S	-89.72	-86.00	-1.00	-2.72	-13.00	-76.72
159.98	S	-86.85	-83.35	-0.57	-2.93	-13.00	-73.85
256.01	S	-85.46	-86.83	4.64	-3.27	-13.00	-72.46
466.50	S	-84.01	-84.84	4.55	-3.72	-13.00	-71.01
621.70	S	-79.01	-79.11	4.07	-3.97	-13.00	-66.01
995.15	S	-74.68	-74.16	3.97	-4.49	-13.00	-61.68
1420.00	Н	-63.67	-60.65	2.12	-5.14	-13.00	-50.67
2130.00							
2840.00							
3550.00							
4260.00							
4970.00							
5680.00							
6390.00							
7100.00							

ERP(dBm) = SG Level(dBm) + Antenna Gain(dBd) + Cable Loss(dB)

Note: "F": denotes Fundamental Frequency.; "H": denotes Harmonic Frequency.

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

"---": denotes Noise Floor.

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# Radiated Spurious Emission Measurement Result: 5MHz BW LTE-Band 17

Operation Band :BAND 17 16QAM 5BW Test Date :2011-12-09

ARFCN :RB SIZE / RB OFFSET :12 6 Temp./Humi. :27 deg\_C / 66 RH

Fundamental Frequency:713.5 MHZ Engineer: Marcus

Operation Mode :TX CH 23825

EUT Pol. :E2 Pol. :VERTICAL

Freq.	Note	ERP	SG	Antenna	Cable	Limit	Safe
			Output Level	Gain	Loss		Margin
MHz	F/H/E/S	dBm	dBm	dBd	dB	dBm	dB
107.60	S	-89.43	-85.67	-1.05	-2.72	-13.00	-76.43
160.95	S	-86.48	-83.12	-0.43	-2.93	-13.00	-73.48
268.62	S	-84.90	-86.21	4.58	-3.27	-13.00	-71.90
470.38	S	-83.61	-84.47	4.57	-3.70	-13.00	-70.61
624.61	S	-79.18	-79.28	4.08	-3.97	-13.00	-66.18
937.92	S	-75.84	-74.96	3.63	-4.51	-13.00	-62.84
1427.00	Н	-63.44	-60.53	2.18	-5.09	-13.00	-50.44
2140.50							
2854.00							
3567.50							
4281.00							
4994.50							
5708.00							
6421.50							
7135.00							

ERP(dBm) = SG Level(dBm) + Antenna Gain(dBd) + Cable Loss(dB)

Note: "F": denotes Fundamental Frequency.; "H": denotes Harmonic Frequency.

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

"---": denotes Noise Floor.

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# Radiated Spurious Emission Measurement Result: 5MHz BW LTE-Band 17

Operation Band :BAND 17 16QAM 5BW Test Date :2011-12-09

ARFCN :RB SIZE / RB OFFSET :12 6 Temp./Humi. :27 deg\_C / 66 RH

Fundamental Frequency:713.5 MHZ Engineer: Marcus

Operation Mode :TX CH 23825

EUT Pol. :E2 Pol. :HORIZONTAL

Freq.	Note	ERP	SG	Antenna	Cable	Limit	Safe
			Output Level	Gain	Loss		Margin
MHz	F/H/E/S	dBm	dBm	dBd	dB	dBm	dB
108.57	S	-90.14	-86.36	-1.06	-2.72	-13.00	-77.14
163.86	S	-86.57	-83.63	-0.01	-2.93	-13.00	-73.57
228.85	S	-85.43	-86.90	4.65	-3.17	-13.00	-72.43
462.62	S	-84.22	-85.03	4.53	-3.72	-13.00	-71.22
611.03	S	-78.82	-78.94	4.05	-3.92	-13.00	-65.82
981.57	S	-74.94	-74.32	3.87	-4.49	-13.00	-61.94
1427.00	Н	-63.67	-60.76	2.18	-5.09	-13.00	-50.67
2140.50							
2854.00							
3567.50							
4281.00							
4994.50							
5708.00							
6421.50							
7135.00							

ERP(dBm) = SG Level(dBm) + Antenna Gain(dBd) + Cable Loss(dB)

Note: "F": denotes Fundamental Frequency.; "H": denotes Harmonic Frequency.

"E": denotes Band Edge Frequency.; "S": denotes Spurious Frequency.

"---": denotes Noise Floor.

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# 12. FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT

# 12.1. Standard Applicable:

According to FCC §2.1055(a) (1)

Frequency Tolerance: +/-2.5ppm for 850MHz band

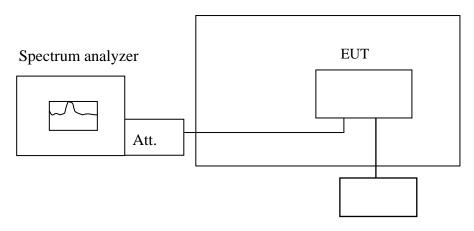
+/-2.5ppm for 1900MHz band

+/-2.5ppm for 1700MHz band

+/-2.5ppm for 700MHz band

## 12.2. Test Set-up:

### Temperature Chamber



Variable DC Power Supply

**Note:** Measurement setup for testing on Antenna connector

#### 12.3. Measurement Procedure:

The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 25°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to  $-30^{\circ}$ C. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached.

# 12.4. Measurement Equipment Used:

Refer to section 2.4 in this report

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#### 12.5. Measurement Result:

Reference Frequency: WCDMA II Mid Channel 1880 (ARFCN9400) MHz							
	Limit: +/- 2.5 ppm = 4700 Hz						
Power Supply	Environment	Frequency	Dalta (II-)	I imit (II-)			
Vdc	Temperature ( $^{\circ}$ C)	(MHz)	Delta (Hz)	Limit (Hz)			
3.6	-30	1879.999997	6.00	4700			
3.6	-20	1879.999999	4.00	4700			
3.6	-10	1880.000004	-1.00	4700			
3.6	0	1880.000009	-6.00	4700			
3.6	10	1880.000006	-3.00	4700			
3.6	20	1880.000003	0.00	4700			
3.6	30	1880.000008	-5.00	4700			
3.6	40	1879.999993	10.00	4700			
3.6	50	1879.999996	7.00	4700			

Reference Frequency: WCDMA IV Mid Channel 1732.6(ARFCN1413) MHz @ 25°C								
	Limit: +/- 2.5 ppm = 4331 Hz							
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)				
Vdc	Temperature (°ℂ)	(MHz)	Betta (112)	Ziiiiit (112)				
3.6	-30	1732.599996	8.00	4331				
3.6	-20	1732.599998	6.00	4331				
3.6	-10	1732.599994	10.00	4331				
3.6	0	1732.599997	7.00	4331				
3.6	10	1732.600008	-4.00	4331				
3.6	20	1732.600004	0.00	4331				
3.6	30	1732.600007	-3.00	4331				
3.6	40	1732.600009	-5.00	4331				
3.6	50	1732.600012	-8.00	4331				

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Reference	Reference Frequency: WCDMA V Mid Channel 836.6 MHz (ARFCN4183)						
	Limit: +/- 2.5 ppm = 2091 Hz						
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)			
Vdc	Temperature (°C)	(MHz)	Della (HZ)	Lilliit (HZ)			
3.6	-30	836.599999	3.00	2091			
3.6	-20	836.599994	8.00	2091			
3.6	-10	836.599998	4.00	2091			
3.6	0	836.600004	-2.00	2091			
3.6	10	836.600006	-4.00	2091			
3.6	20	836.600002	0.00	2091			
3.6	30	836.600008	-6.00	2091			
3.6	40	836.599992	10.00	2091			
3.6	50	836.599988	14.00	2091			

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Refere	Reference Frequency: LTE B4 Mid Channel 1732.5 MHz 1.4M QPSK CH 20175						
		Limit: +/- 2.5 ppm =	Hz				
Power Supply	Environment	Frequency	D. I. (II.)	1 (11)			
Vdc	Temperature (°C)	(MHz)	Delta (Hz)	Limit (Hz)			
3.6	-20	1732.500006	-2.00	4331			
3.6	-10	1732.500003	1.00	4331			
3.6	0	1732.500004	0.00	4331			
3.6	10	1732.500002	2.00	4331			
3.6	20	1732.500004	0.00	4331			
3.6	30	1732.500005	-1.00	4331			
3.6	40	1732.500002	2.00	4331			
3.6	50	1732.500021	-17.00	4331			
3.6	60	1732.500039	-35.00	4332			

Referen	Reference Frequency: LTE B4 Mid Channel 1732.5 MHz 1.4M 16QAM CH 20175						
		Limit: +/- 2.5 ppm =	Hz				
Power Supply	Environment	Frequency	D-14- (II-)	Limit (II-)			
Vdc	Temperature (°C)	(MHz)	Delta (Hz)	Limit (Hz)			
3.6	-20	1732.500005	-7.00	4331			
3.6	-10	1732.500003	-5.00	4331			
3.6	0	1732.500004	-6.00	4331			
3.6	10	1732.499997	1.00	4331			
3.6	20	1732.499998	0.00	4331			
3.6	30	1732.499995	3.00	4331			
3.6	40	1732.499990	8.00	4331			
3.6	50	1732.499981	17.00	4331			
3.6	60	1732.499965	33.00	4332			

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Refer	ence Frequency: L'	TE B4 Mid Channel 173	2.5 MHz 3M QPSK 0	CH 20175
		Limit: +/- 2.5 ppm =	Hz	
Power Supply	Environment	Frequency	D 1( (II )	
Vdc	Temperature $(^{\circ}\mathbb{C})$	(MHz)	Delta (Hz)	Limit (Hz)
3.6	-20	1732.500003	2.00	4331
3.6	-10	1732.500005	0.00	4331
3.6	0	1732.500004	1.00	4331
3.6	10	1732.500003	2.00	4331
3.6	20	1732.500005	0.00	4331
3.6	30	1732.500007	-2.00	4331
3.6	40	1732.500005	0.00	4331
3.6	50	1732.500018	-13.00	4331
3.6	60	1732.500028	-23.00	4332

Refere	Reference Frequency: LTE B4 Mid Channel 1732.5 MHz 3M 16QAM CH 20175						
	Limit: +/- 2.5 ppm = Hz						
Power Supply	Environment	Frequency	Dalta (II-)	Limit (II-)			
Vdc	Temperature (°C)	(MHz)	Delta (Hz)	Limit (Hz)			
3.6	-20	1732.499995	1.00	4331			
3.6	-10	1732.499994	2.00	4331			
3.6	0	1732.499996	0.00	4331			
3.6	10	1732.499998	-2.00	4331			
3.6	20	1732.499996	0.00	4331			
3.6	30	1732.499997	-1.00	4331			
3.6	40	1732.499990	6.00	4331			
3.6	50	1732.500015	-19.00	4331			
3.6	60	1732.500036	-40.00	4332			

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Ref	Reference Frequency: LTE B4 Mid Channel 1732.5 MHz 5M QPSK CH 20175						
		Limit: +/- 2.5 ppm =	Hz				
Power Supply	Environment	Frequency	Dolto (Hz)	Limit (Hg)			
Vdc	Temperature ( $^{\circ}$ C)	(MHz)	Delta (Hz)	Limit (Hz)			
3.6	-20	1732.500040	-37.00	4331			
3.6	-10	1732.500003	0.00	4331			
3.6	0	1732.499998	5.00	4331			
3.6	10	1732.499999	4.00	4331			
3.6	20	1732.500003	0.00	4331			
3.6	30	1732.500004	-1.00	4331			
3.6	40	1732.500009	-6.00	4331			
3.6	50	1732.499987	16.00	4331			
3.6	60	1732.499975	28.00	4332			

Reference Frequency: LTE B4 Mid Channel 1732.5 MHz 5M 16QAM CH 20175							
Limit: +/- 2.5 ppm = Hz							
Power Supply	Environment	Frequency					
Vdc	Temperature (°C)	(MHz)	Delta (Hz)	Limit (Hz)			
3.6	-20	1732.499996	-1.00	4331			
3.6	-10	1732.499997	-2.00	4331			
3.6	0	1732.500003	-8.00	4331			
3.6	10	1732.500001	-6.00	4331			
3.6	20	1732.499995	0.00	4331			
3.6	30	1732.499994	1.00	4331			
3.6	40	1732.499997	-2.00	4331			
3.6	50	1732.499980	15.00	4331			
3.6	60	1732.499963	32.00	4332			

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Refere	Reference Frequency: LTE B4 Mid Channel 1732.5 MHz 10M QPSK CH 20175				
	Limit: +/- 2.5 ppm = Hz				
Power Supply	Environment	Frequency			
Vdc	Temperature (°C)	(MHz)	Delta (Hz)	Limit (Hz)	
3.6	-20	1732.500005	-3.00	4331	
3.6	-10	1732.500004	-2.00	4331	
3.6	0	1732.500002	0.00	4331	
3.6	10	1732.500003	-1.00	4331	
3.6	20	1732.500002	0.00	4331	
3.6	30	1732.500003	-1.00	4331	
3.6	40	1732.500004	-2.00	4331	
3.6	50	1732.500011	-9.00	4331	
3.6	60	1732.500037	-35.00	4331	

Referer	Reference Frequency: LTE B4 Mid Channel 1732.5 MHz 10M 16QAM CH 20175				
	Limit: $\pm -2.5$ ppm = Hz				
Power Supply	Environment	Frequency			
Vdc	Temperature (°C)	(MHz)	Delta (Hz)	Limit (Hz)	
3.6	-20	1732.500008	-5.00	4331	
3.6	-10	1732.500006	-3.00	4331	
3.6	0	1732.499997	6.00	4331	
3.6	10	1732.500002	1.00	4331	
3.6	20	1732.500003	0.00	4331	
3.6	30	1732.500005	-2.00	4331	
3.6	40	1732.500007	-4.00	4331	
3.6	50	1732.500016	-13.00	4331	
3.6	60	1732.500025	-22.00	4332	

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Reference Frequency: LTE B17 Mid Channel 710 MHz @ 5M QPSK CH 23790					
	Limit: +/- 2.5 ppm = Hz				
Power Supply	Environment	Frequency	Delta (Hz)		
Vdc	Temperature (°C)	(MHz)		Limit (Hz)	
3.6	-20	710.000003	1.00	1775	
3.6	-10	710.000004	0.00	1775	
3.6	0	710.000001	3.00	1775	
3.6	10	710.000002	2.00	1775	
3.6	20	710.000004	0.00	1775	
3.6	30	710.000003	1.00	1775	
3.6	40	710.000005	-1.00	1775	
3.6	50	710.000008	-4.00	1775	
3.6	60	710.000018	-14.00	1775	

Ref	Reference Frequency: LTE B17 Mid Channel 710 MHz 5M 16QAM CH 23790				
	Limit: $\pm -2.5$ ppm = Hz				
Power Supply	Environment	Frequency	Dalta (II-)	Limit (Hz)	
Vdc	Temperature ( $^{\circ}$ C)	(MHz)	Delta (Hz)		
3.6	-20	709.999997	6.00	1775	
3.6	-10	709.999998	5.00	1775	
3.6	0	709.999997	6.00	1775	
3.6	10	709.999999	4.00	1775	
3.6	20	710.000003	0.00	1775	
3.6	30	710.000003	0.00	1775	
3.6	40	710.000006	-3.00	1775	
3.6	50	710.000010	-7.00	1775	
3.6	60	710.000021	-18.00	1776	

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Refer	Reference Frequency: LTE B17 Mid Channel 710 MHz 10M QPSK CH 23790				
	Limit: +/- 2.5 ppm = Hz				
Power Supply	Environment	Frequency	D 1( (H )		
Vdc	Temperature (°C)	(MHz)	Delta (Hz)	Limit (Hz)	
3.6	-20	710.000004	-5.00	1775	
3.6	-10	710.000001	-2.00	1775	
3.6	0	709.999999	0.00	1775	
3.6	10	710.000001	-2.00	1775	
3.6	20	709.999999	0.00	1775	
3.6	30	710.000002	-3.00	1775	
3.6	40	710.000004	-5.00	1775	
3.6	50	710.000003	-4.00	1775	
3.6	60	710.000020	-21.00	1775	

Reference Frequency: LTE B17 Mid Channel 710 MHz 10M 16QAM CH 23790					
	Limit: $\pm -2.5$ ppm = Hz				
Power Supply	Environment	Frequency	Dolto (II-)	I imit (III-)	
Vdc	Temperature (°C)	(MHz)	Delta (Hz)	Limit (Hz)	
3.6	-20	710.000003	-6.00	1775	
3.6	-10	709.999998	-1.00	1775	
3.6	0	710.000000	-3.00	1775	
3.6	10	709.999999	-2.00	1775	
3.6	20	709.999997	0.00	1775	
3.6	30	709.999996	1.00	1775	
3.6	40	709.999998	-1.00	1775	
3.6	50	709.999996	1.00	1775	
3.6	60	709.999981	16.00	1775	

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# 13. FREQUENCY STABILITY V.S. VOLTAGE MEASUREMENT

#### 13.1. Standard Applicable:

According to FCC §2.1055(a) (1)

Frequency Tolerance: +/-2.5ppm for 850MHz band

+/-2.5ppm for 1900MHz band

+/-2.5ppm for 1700MHz band

+/-2.5ppm for 700MHz band

#### 13.2. Test Set-up:

Refer to section 10.2 in this report

#### 13.3. Measurement Procedure:

Set chamber temperature to  $25^{\circ}$ C. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.

Reduce the input voltage to specified extreme voltage variation (+/- 15%) and endpoint, record the maximum frequency change.

### 13.4. Measurement Equipment Used:

Refer to section 2.4 in this report

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#### 13.5. Measurement Result:

Reference Frequency: WCDMA II Mid Channel 1880 (ARFCN9400) MHz						
	Limit	:: +/- 2.5 ppm = 470	00 Hz			
Power Supply	Power Supply Environment Frequency					
Vdc	Temperature (°C)	(MHz)	Delta (Hz)	Limit (Hz)		
4.2	25	1880.0000060	-3.00	4700		
3.6	25	1880.0000030	0.00	4700		
3.3	25	1880.0000160	-13.00	4700		
2.9	25	1070 000000	21.00	4700		
(Endpoint)	25	1879.9999820	21.00	4700		

Reference Frequency: WCDMA IV Mid Channel 1732.6 MHz(ARFCN1413) @ 25°C						
	Limit: +/- 2.5 ppm = 4331 Hz					
Power Supply	Power Supply Environment Frequency D					
Vdc	Temperature (°C)	mperature (°C) (MHz) Delta (Hz)		Limit (Hz)		
4.2	25	1732.6000020	2.00	4331		
3.6	25	1732.6000040	0.00	4331		
3.3	25	1732.5999960	8.00	4331		
2.9	25	1722 (000500	54.00	4221		
(Endpoint)	25	1732.6000580	-54.00	4331		

Reference Frequency: WCDMA V Mid Channel 836.6 MHz @ 25°C						
	Limit: +/- 2.5 ppm = 2091 Hz					
Power Supply	Power Supply Environment Frequency					
Vdc	Temperature (°C) (MHz) Del		Delta (Hz)	Limit (Hz)		
4.2	25.00	836.6000080	-6.00	2091.00		
3.6	25.00	836.6000020	0.00	2091.00		
3.3	25.00	836.5999960	6.00	2091.00		
2.9	25.00	026 6000020	1.00	2001.00		
(Endpoint)	25.00	836.6000030	-1.00	2091.00		

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Reference I	Reference Frequency: LTE B4 Mid Channel 1732.5 MHz @ 25°C 1.4M QPSK CH				
		20175			
		Limit: $\pm -2.5$ ppm = I	Hz		
Power Supply Environment Frequency					
Vdc	Temperature $(^{\circ}\mathbb{C})$	(MHz)	Delta (Hz)	Limit (Hz)	
3.6	25.00	1732.500004	0.00	4331	
4.0	25.00	1732.500001	3.00	4331	
3.3	25.00	1732.500007	-3.00	4331	
2.8 (End Point)	25.00	1732.500070	-66.00	4331	

Reference F	Reference Frequency: LTE B4 Mid Channel 1732.5 MHz @ 25°C 1.4M 16QAM CH				
		20175			
		Limit: $\pm$ 2.5 ppm = $\pm$ 1	Hz		
Power Supply	ly Environment Frequency				
Vdc	Temperature $(^{\circ}\mathbb{C})$	(MHz)	Delta (Hz)	Limit (Hz)	
3.6	25	1732.499998	0.00	4331	
4.0	25	1732.500003	-5.00	4331	
3.3	25	1732.499997	1.00	4331	
2.8 (End Point)	25	1732.499960	38.00	4331	

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Reference Fre	Reference Frequency: LTE B4 Mid Channel 1732.5 MHz @ 25°C 3M QPSK CH 20175				
	Limit: +/- 2.5 ppm = Hz				
Power Supply	Environment	Frequency			
Vdc	Temperature $(^{\circ}\mathbb{C})$	(MHz)	Delta (Hz)	Limit (Hz)	
3.6	25.00	1732.499995	0.00	4331	
4.0	25.00	1732.499998	-3.00	4331	
3.3	25.00	1732.499996	-1.00	4331	
2.8 (End Point)	25.00	1732.499950	45.00	4331	

Reference I	Reference Frequency: LTE B4 Mid Channel 1732.5 MHz @ 25°C 3M 16QAM CH					
		20175				
		Limit: $\pm$ 2.5 ppm = H	łz			
Power Supply	ower Supply Environment Frequency					
Vdc	Temperature $(^{\circ}\mathbb{C})$	(MHz)	Delta (Hz)	Limit (Hz)		
3.6	25	1732.499996	0.00	4331		
4.0	25	1732.499998	-2.00	4331		
3.3	25	1732.500004	-8.00	4331		
2.8 (End Point)	25	1732.500060	-64.00	4331		

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Reference Fre	Reference Frequency: LTE B4 Mid Channel 1732.5 MHz @ 25°C 5M QPSK CH 20175				
		Limit: $\pm -2.5$ ppm = $\pm 1$	łz		
Power Supply	Environment	Frequency			
Vdc	Temperature (°C)	(MHz)	Delta (Hz)	Limit (Hz)	
3.6	25.00	1732.500003	0.00	4331	
4.0	25.00	1732.500002	1.00	4331	
3.3	25.00	1732.500005	-2.00	4331	
2.8 (End Point)	25.00	1732.500090	-87.00	4331	

Reference Frequency: LTE B4 Mid Channel 1732.5 MHz @ 25°C 5M 16QAM CH					
		20175			
		Limit: $\pm -2.5$ ppm = $\pm 1$	Hz		
Power Supply	Environment	Frequency			
Vdc	Temperature (°C)	(MHz)	Delta (Hz)	Limit (Hz)	
3.6	25.00	1732.499995	0.00	4331	
4.0	25.00	1732.500002	-7.00	4331	
3.3	25.00	1732.499999	-4.00	4331	
2.8 (End Point)	25.00	1732.499970	25.00	4331	

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Reference Free	Reference Frequency: LTE B4 Mid Channel 1732.5 MHz @ 25°C 10M QPSK CH 20175				
	Limit: +/- 2.5 ppm = Hz				
Power Supply	Environment	Frequency		1 (11.)	
Vdc	Temperature $(^{\circ}\mathbb{C})$	(MHz)	Delta (Hz)	Limit (Hz)	
3.6	25.00	1732.500002	0.00	4331	
4.0	25.00	1732.500005	-3.00	4331	
3.3	25.00	1732.500003	-1.00	4331	
2.8 (End Point)	25.00	1732.500060	-58.00	4331	

Reference F	Reference Frequency: LTE B4 Mid Channel 1732.5 MHz @ 25°C 10M 16QAM CH				
		20175			
		Limit: $\pm$ 2.5 ppm = H	Hz		
Power Supply Environment Frequency					
Vdc	Temperature $(^{\circ}\mathbb{C})$	(MHz)	Delta (Hz)	Limit (Hz)	
3.6	25	1732.500003	0.00	4331	
4.0	25	1732.500004	-1.00	4331	
3.3	25	1732.500002	1.00	4331	
2.8 (End Point)	25	1732.500080	-77.00	4331	

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Reference Frequency: LTE B17 Mid Channel 710 MHz @ 25°C 5M QPSK CH 23790					
	Limit: +/- 2.5 ppm = Hz				
Power Supply	Environment	Frequency			
Vdc	Temperature (°C)	(MHz)	Delta (Hz)	Limit (Hz)	
3.6	25.00	710.000004	0.00	1775	
4.0	25.00	710.000002	2.00	1775	
3.3	25.00	710.000001	3.00	1775	
2.8 (End Point)	25.00	709.999970	34.00	1775	

Reference Frequency: LTE B17 Mid Channel 710 MHz @ 25°C 5M 16QAM CH				
		23790		
		Limit: +/- 2.5 ppn	n = Hz	
Power Supply	Environment	Frequency		
Vdc	Temperature (°C)	(MHz)	Delta (Hz)	Limit (Hz)
3.6	25.00	710.000003	0.00	1775
4.0	25.00	710.000001	2.00	1775
3.3	25.00	710.000002	1.00	1775
2.8 (End Point)	25.00	709.999960	43.00	1775

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Reference Frequency: LTE B17 Mid Channel 710 MHz @ 25°C 10M QPSK CH				
		23790		
		Limit: +/- 2.5 ppn	n = Hz	
Power Supply Environment Frequency				
Vdc	Temperature $(^{\circ}\mathbb{C})$	(MHz)	Delta (Hz)	Limit (Hz)
3.6	25.00	709.999999	0.00	1775
4.0	25.00	710.000003	-4.00	1775
3.3	25.00	710.000005	-6.00	1775
2.8 (End Point)	25.00	709.999970	29.00	1775

Reference Frequency: LTE B17 Mid Channel 710 MHz @ 25°C 10M 16QAM CH				
		23790		
		Limit: +/- 2.5 ppn	n = Hz	
Power Supply	Environment	Frequency	Dolto (Uz.)	Limit (IIa)
Vdc	Temperature $(^{\circ}\mathbb{C})$	(MHz)	Delta (Hz)	Limit (Hz)
3.6	25	709.999997	0.00	1775
4.0	25	710.000001	-4.00	1775
3.3	25	710.000002	-5.00	1775
2.8 (End Point)	25	709.999960	37.00	1775

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