

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: 1KU1

Brand Name: N/A

Model No.: 1KU1

Model Difference: N/A

FCC ID: HFS1KU1

Report No.: EH/2011/A0010

Issue Date: Oct. 31, 2011

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

Prepared for: Quanta Computer Inc

No.188, 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.188, Wen Hwa 2nd Road , Kuei Shan Hsiang Tao Yuan Shien, Taiwan

Product Name: 1KU1

Brand Name: N/A

Model No.: 1KU1

Model Difference: N/A

FCC ID: HFS1KU1

File Number: EH/2011/A0010

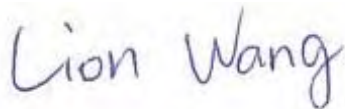
Date of test: May. 11, 2011 ~ Oct. 31, 2011

Date of EUT Received: May. 11, 2011

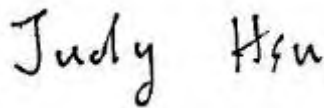
We hereby certify that:

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.

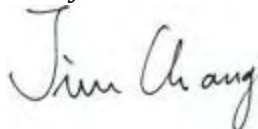
The test results of this report relate only to the tested sample identified in this report.

Test By:**Date:**

Oct. 31, 2011

Lion Wang / Engineer**Prepared By:****Date:**

Oct. 31, 2011

Judy Hsu / Clerk**Approved By:****Date:**

Oct. 31, 2011

Jim Chang / Supervisor

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t (886-2) 2299-3279

f (886-2) 2298-0488

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Version

Version No.	Date	Description
00	Oct. 31, 2011	Initial creation of document

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f (886-2) 2298-0488

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1. GENERAL PRODUCT INFORMATION

General:

Product Name:	1KU1
Brand Name:	N/A
Model Name:	1KU1
Model Difference:	N/A
Power Supply	3.7 Vdc by DC Power Supply

CDMA / LTE:

Cellular Phone Standards Frequency Range:	CDMA 2000 Cellular / EVDO Cellular	824.7MHz – 848.31MHz	24 dBm
	CDMA 2000 PCS / EVDO PCS	1851.25MHz– 1908.75MHz	24 dBm
	5MHz BW LTE-Band 13	779.5MHz – 784.56MHz	23 dBm
	10MHz BW LTE-Band 13	782MHz	23 dBm
Hardware Version:	N/A		
Software Version:	N/A		
IMEI:	004400152020000		

This test report applies for CDMA2000/EVDO Cellular and PCS bands and LTE Band 13.

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Final Amplifier Voltage and Current Information:

Test Mode	DC voltage (V)	DC current (mA)
CDMA Cellular	3.7Vdc	570
EVDO Cellular	3.7Vdc	190
CDMA PCS	3.7Vdc	620
EVDO PCS	3.7Vdc	210
LTE B13 5M QPSK	3.7 Vdc	700
LTE B13 5M 16QAM	3.7 Vdc	660
LTE B13 10M QPSK	3.7 Vdc	720
LTE B13 10M 16QAM	3.7 Vdc	670

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

This submittal(s) (test report) is intended for **FCC ID: HFS1KU1** filing to comply with Section Part 22 subpart H, Part 24 subpart E and Part 27 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 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 TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
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	HP	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 TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	R&S	FSP 40	100034	02/12/2010	02/11/2012
Bilog Antenna	SCHWAZBECK	VULB9160	9160-3136	11/15/2010	11/14/2011
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	11/30/2010	11/29/2011
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	11/08/2010	11/09/2011

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2.5. Configuration of Tested System

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

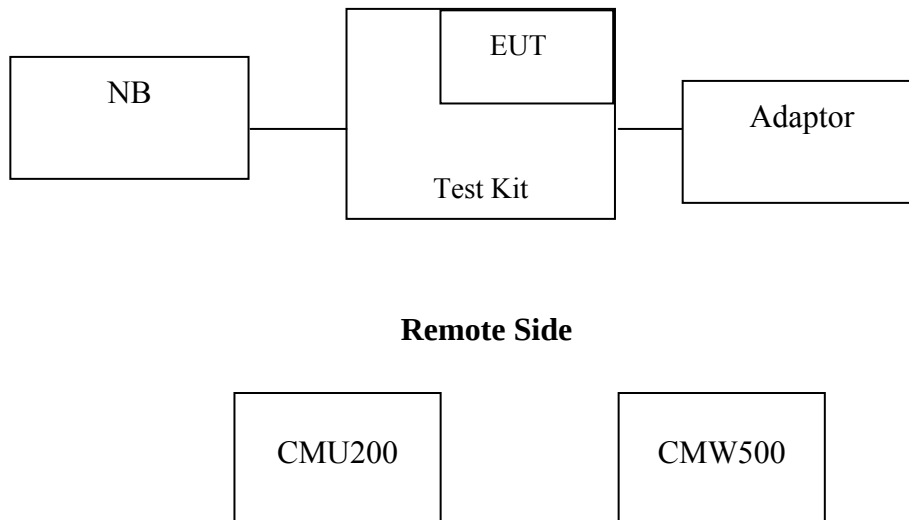


Table 2-1 Equipment Used in Tested System

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.	Universal Radio Communication Tester	R&S	CMW500	12010002K50	shielded	Un-shielded
3.	Notebook	DELL	E5400	3704625136	shielded	Un-shielded
4.	Software	N/A	Hyper terminal	N/A	N/A	N/A
5.	Test kit	N/A	N/A	N/A	N/A	N/A

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3. SUMMARY OF TEST RESULTS

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

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Max ERP/EIRP measurement result:

	dBm		W
CDMA CELL	22.09	ERP	0.162
CDMA PCS	28.44	EIRP	0.698
EVDO CELL	22.95	ERP	0.197
EVDO PCS	29.83	EIRP	0.962
LTE Band 13/5MHz /QPSK RB 12 Offset 6	22.00	ERP	0.158
LTE Band 13/5MHz /16QAM RB 12 Offset 6	23.14	ERP	0.206
LTE Band 13/5MHz /QPSK RB 25 Offset 0	22.34	ERP	0.171
LTE Band 13/5MHz /16QAM RB 25 Offset 0	21.00	ERP	0.126
LTE Band 13/5MHz /QPSK RB 1 Offset 24	22.94	ERP	0.197
LTE Band 13/5MHz /16QAM RB 1 Offset 24	23.47	ERP	0.222
LTE Band 13/5MHz /QPSK RB 1 Offset 0	23.17	ERP	0.207
LTE Band 13/5MHz /16QAM RB 1 Offset 0	24.31	ERP	0.270
LTE Band 13/10MHz /QPSK RB 25 Offset 12	18.78	ERP	0.076
LTE Band 13/10MHz /16QAM RB 25 Offset	20.04	ERP	0.101
LTE Band 13/10MHz /QPSK RB 50 Offset 0	20.29	ERP	0.107
LTE Band 13/10MHz /16QAM RB 50 Offset	18.35	ERP	0.068
LTE Band 13/10MHz /QPSK RB 1 Offset 49	21.81	ERP	0.152
LTE Band 13/10MHz /16QAM RB 1 Offset	23.07	ERP	0.203
LTE Band 13/10MHz /QPSK RB 1 Offset 0	23.59	ERP	0.229
LTE Band 13/10MHz /16QAM RB 1 Offset 0	24.03	ERP	0.253

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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 CDMA2000/ EVDO Cellular and PCS bands, and LTE Band 13 with power supply.

In comparison among the RSE data of the all modulations (CDMA2000/ EVDO) we found that while the radiation is in EVDO mode, the spurious emission is found to be the worst, and therefore documenting the data of radiated spurious emission on EVDO Cellular and PCS mode 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 13, respectively, It's found to generate the highest emission at 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 = 25; Offset = 0 for 5MHz with 16QAM, and RB number = 50; Offset = 0 for 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 13		
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 13		
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

Measurement uncertainty (Polarization : Vertical)	30MHz - 180MHz: 3.37dB
	180MHz -417MHz: 3.19dB
	0.417GHz-1GHz: 3.19dB
	1GHz - 18GHz: 4.04dB
	18GHz - 40GHz: 4.04dB

Measurement uncertainty (Polarization : Horizontal)	30MHz - 167MHz: 4.22dB
	167MHz -500MHz: 3.44dB
	0.5GHz-1GHz: 3.39dB
	1GHz - 18GHz: 4.08dB
	18GHz - 40GHz: 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 table C.10.1.4	Power Class 3		Power Class 4	
	Power (dBm)	Tol (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 C.11.1.3	Power Class 3		Power Class 4	
	Power (dBm)	Tol (dB)	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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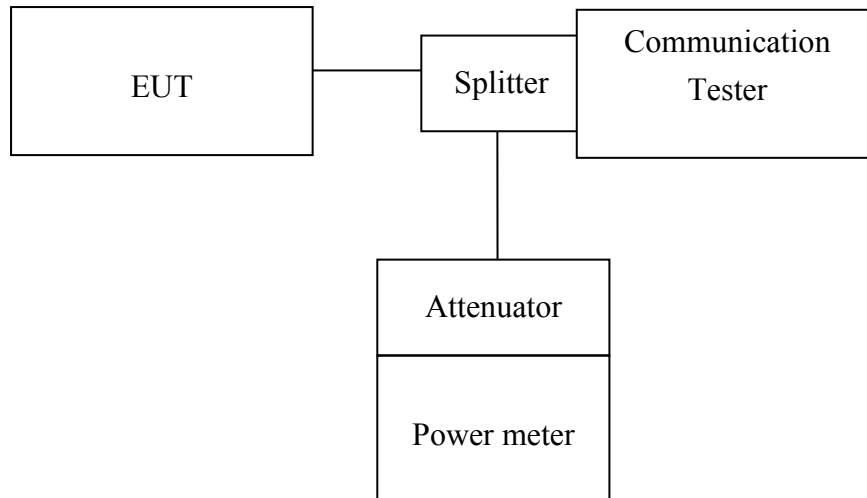
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6.2. Test Set-up:



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:

EUT Mode	Frequency (MHz)	CH	Peak Power (dBm)	Avg. Power (dBm)
CDMA 2000 Cellular	824.70	1013	22.91	22.72
	836.52	384	22.90	22.45
	848.31	777	22.68	22.37

EUT Mode	Frequency (MHz)	CH	Peak Power (dBm)	Avg. Power (dBm)
CDMA 2000 PCS	1851.25	25	23.83	23.51
	1880	600	23.68	23.39
	1908.75	1175	23.00	23.17

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EUT Mode	Frequency (MHz)	CH	Peak Power (dBm)	Avg. Power (dBm)
CDMA 2000	824.70	1013	23.81	23.30
EVDO	836.52	384	23.99	23.36
Cellular	848.31	777	23.47	23.09

EUT Mode	Frequency (MHz)	CH	Peak Power (dBm)	Avg. Power (dBm)
CDMA 2000	1851.25	25	23.46	22.75
EVDO	1880	600	23.14	22.58
PCS	1908.75	1175	23.04	22.51

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

offset : 0.5 dB for CDMA200 PCS; 0.3 dB for CDMA200 CELL

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6.5.1.2.: 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	Channel bandwidth / Transmission bandwidth configuration [RB]						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 13 _5 MHz

BW (MHz)	Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Conducted power(dBm)	Target Power(dBm)	MPR Target(dB)
5	QPSK	23205	779.5	1	24	23	23	0
				1	0	23.17	23	0
				12	6	22.29	22	1
				25	0	22.41	22	1
		23230	782	1	24	22.97	23	0
				1	0	23.24	23	0
				12	6	22.07	22	1
				25	0	22.22	22	1
		23255	784.5	1	24	23.2	23	0
				1	0	23.05	23	0
				12	6	22.12	22	1
				25	0	22.35	22	1
5	16 QAM	23205	779.5	1	24	21.87	22	1
				1	0	22.04	22	1
				12	6	20.9	21.1	2
				25	0	21.54	21.1	2
		23230	782	1	24	21.96	22	1
				1	0	22.34	22	1
				12	6	20.66	21	2
				25	0	21.34	21	2
		23255	784.5	1	24	22.03	22	1
				1	0	21.93	22	1
				12	6	20.65	21	2
				25	0	21.31	21	2

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LTE Band 13 _10 MHz

BW (MHz)	Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Conducted power(dBm)	Target Power(dBm)	MPR Target(dB)
10	QPSK	23230	782	1	49	22.86	23	0
				1	0	23.1	23	0
				25	12	21.89	22	1
				50	0	21.86	22	1
10	16 QAM	23230	782	1	49	21.85	22	1
				1	0	21.95	22	1
				25	12	21.04	21.15	2
				50	0	21.01	21.15	2

Cable Loss = 0.3

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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 $\geq$ 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: 5MHz BW LTE-Band 13(16QAM Number: 25 Offset: 0) Channel Low

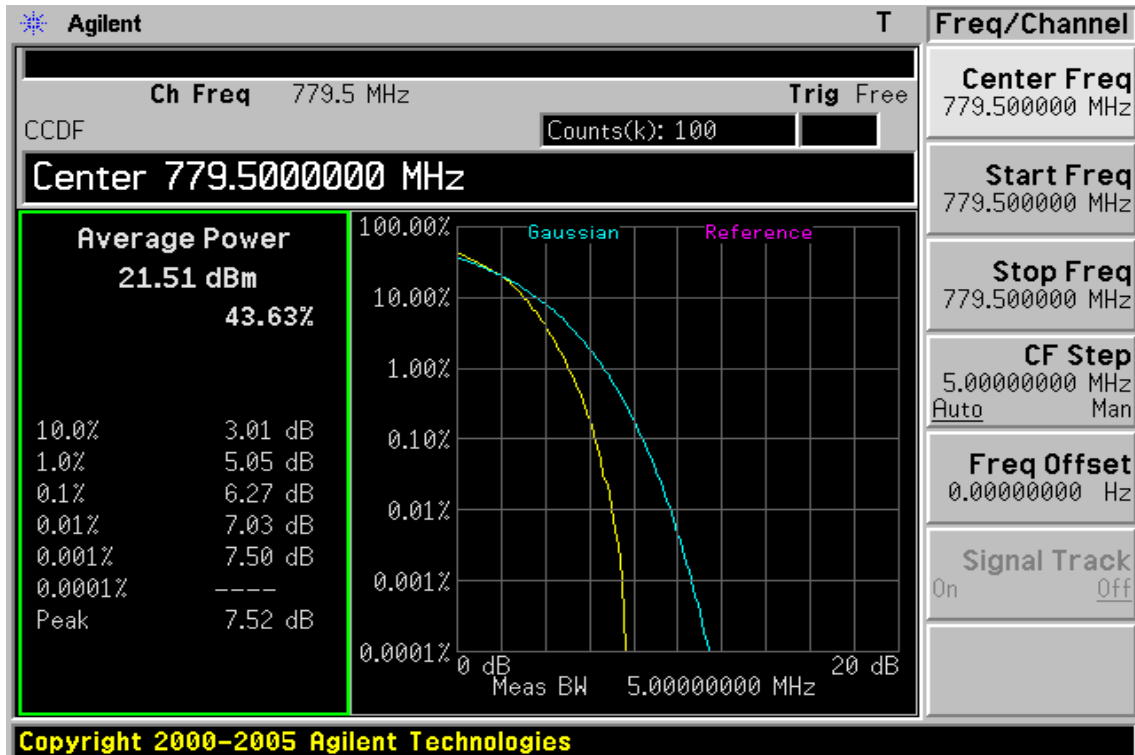
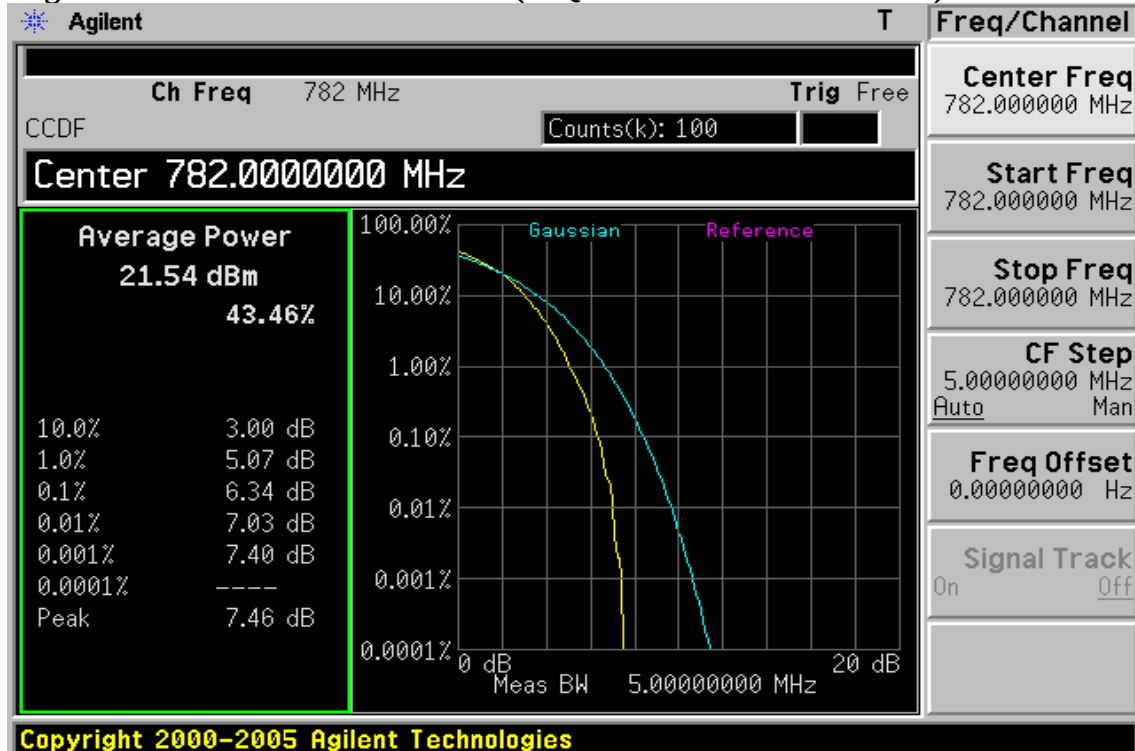


Figure 7-2: 5MHz BW LTE-Band 13(16QAM Number: 25 Offset: 0) Channel Mid



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Figure 7-3: 5MHz BW LTE-Band 13(16QAM Number: 25 Offset: 0) Channel High

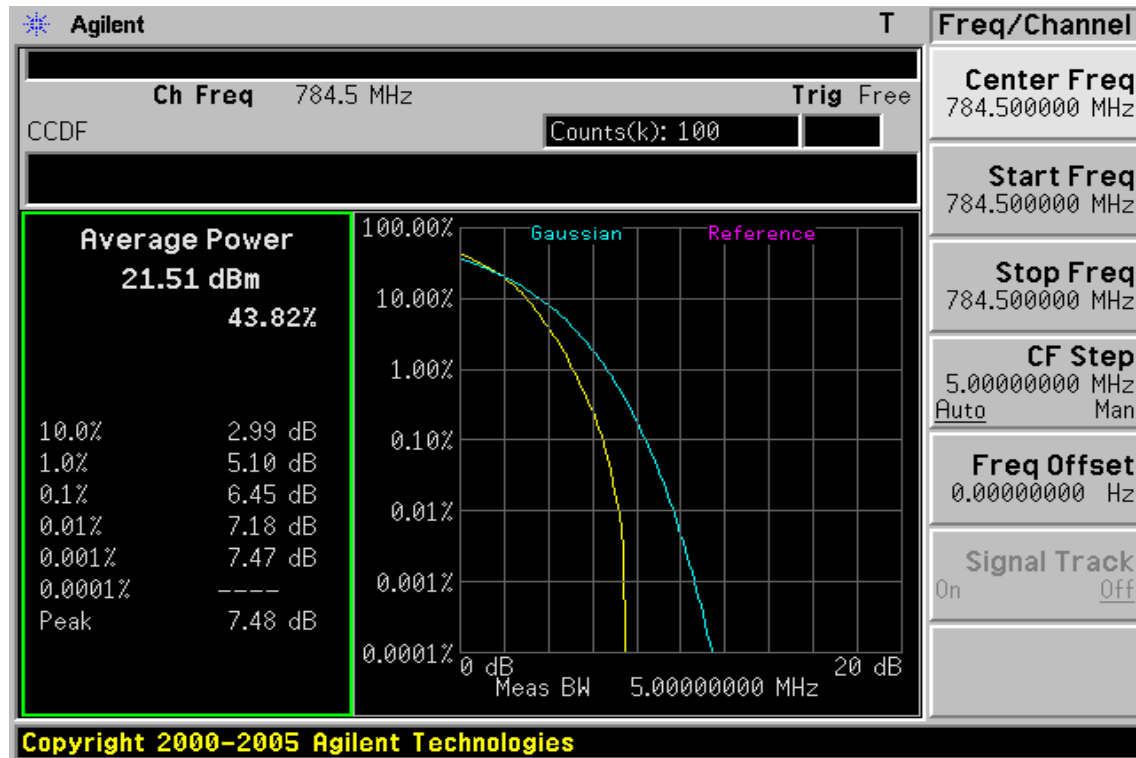
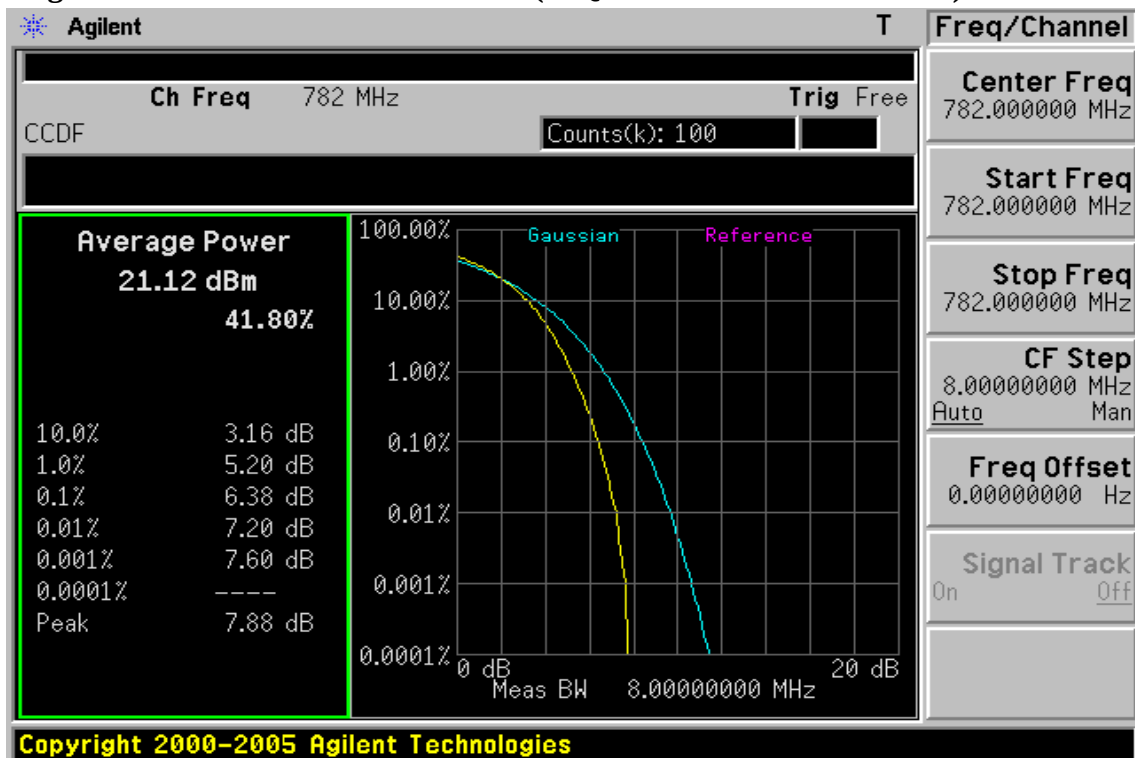


Figure 7-4: 10MHz BW LTE-Band 13(16QAM Number: 50 Offset: 0) Channel Mid



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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.

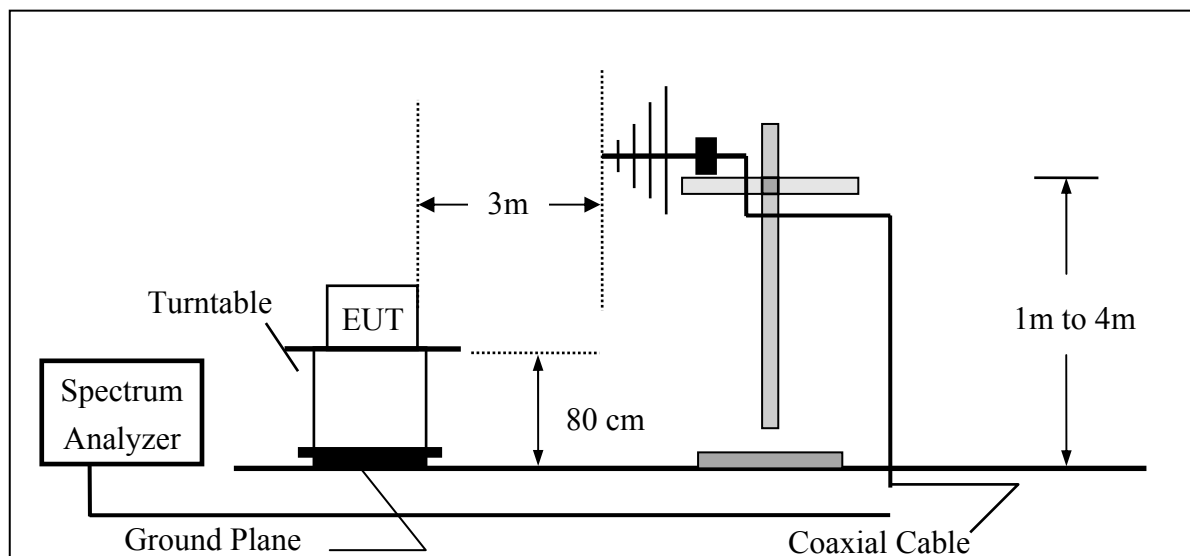
FCC 27.50(d)(2) Fixed, mobile, and portable (hand-held) stations are limited to 1W EIRP.

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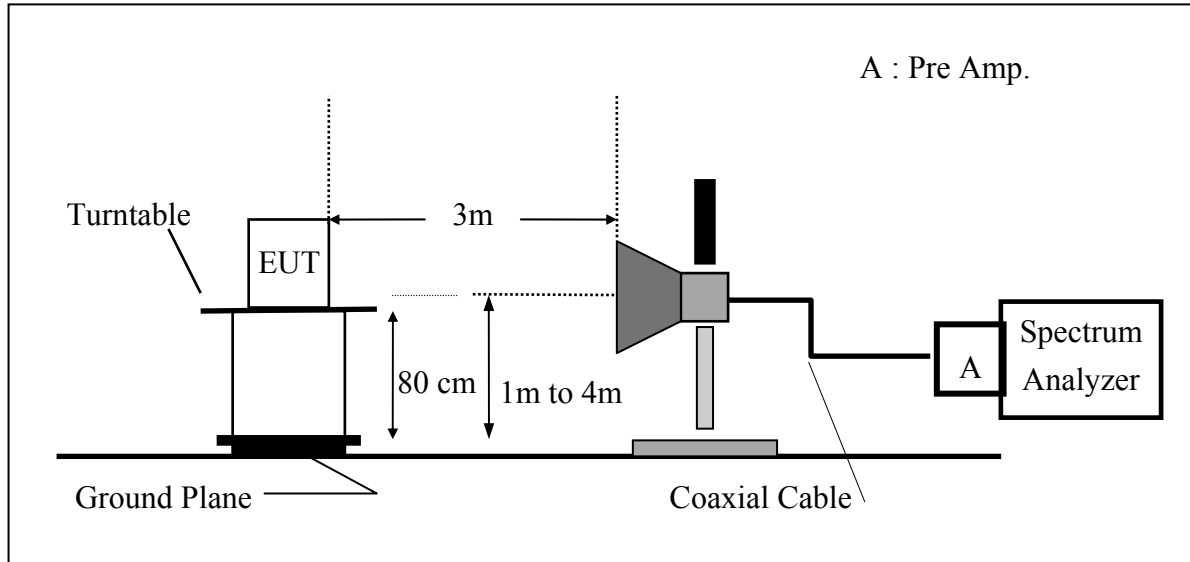
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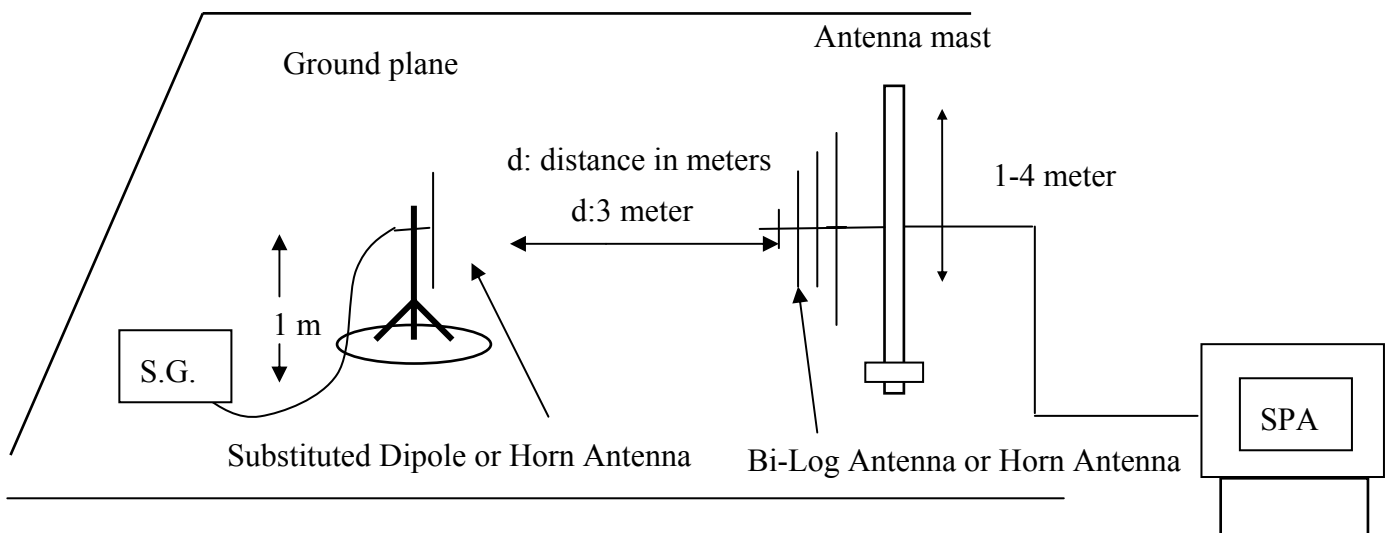
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(B) Radiated Emission Test Set-UP Frequency Over 1 GHz



(C) Substituted Method Test Set-UP



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8.3. Measurement Procedure:

The EUT was placed on a 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:

$$\text{ERP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBd)} - \text{Cable Loss (dB)}$$

$$\text{EIRP} = \text{S.G. output (dBm)} + \text{Antenna Gain (dBi)} - \text{Cable Loss (dB)}$$

8.4. Measurement Equipment Used:

Refer to section 2.4 in this report

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8.5. Measurement Result:

EUT				Measurement					
Operation Band	Pol.	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
		MHz		V/H	dBm	dBd	dB	dBm	dBm
CDMA 2000 Cellular	E2	824.70	1013	V	22.34	3.96	-4.22	22.09	38.45
				H	22.11	3.97	-4.22	21.85	38.45
		836.52	384	V	22.23	4.00	-4.24	21.99	38.45
				H	21.08	4.00	-4.24	20.84	38.45
		848.31	777	V	22.11	4.03	-4.33	21.81	38.45
				H	20.18	4.03	-4.33	19.88	38.45

Remark :

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

EUT				Measurement					
Operation Band	Pol.	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
		MHz		V/H	dBm	dBd	dB	dBm	dBm
CDMA 2000 PCS	E2	1851.25	25	V	29.75	4.17	-5.49	28.44	33.00
				H	26.51	4.51	-5.49	25.53	33.00
		1880.00	600	V	28.36	4.13	-5.56	26.93	33.00
				H	25.98	4.44	-5.56	24.85	33.00
		1908.75	1175	V	28.37	4.10	-5.56	26.91	33.00
				H	25.45	4.37	-5.56	24.26	33.00

Remark :

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

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EUT				Measurement					
Operation Band	Pol.	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
		MHz		V/H	dBm	dBd	dB	dBm	dBm
CDMA 2000 EVDO Cellular	E2	824.70	1013	V	22.92	3.96	-4.22	22.66	38.45
				H	22.98	3.97	-4.22	22.73	38.45
		836.52	384	V	22.81	4.00	-4.24	22.57	38.45
				H	22.55	4.00	-4.24	22.31	38.45
		848.31	777	V	23.25	4.03	-4.33	22.95	38.45
				H	21.47	4.03	-4.33	21.17	38.45

Remark :

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

EUT				Measurement					
Operation Band	Pol.	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	ERP	Limit
		MHz		V/H	dBm	dBd	dB	dBm	dBm
CDMA 2000 EVDO PCS	E2	1851.25	25	V	31.14	4.17	-5.49	29.83	33.00
				H	26.22	4.51	-5.49	25.24	33.00
		1880.00	600	V	29.08	4.13	-5.56	27.65	33.00
				H	26.78	4.44	-5.56	25.66	33.00
		1908.75	1175	V	29.02	4.10	-5.56	27.56	33.00
				H	25.87	4.37	-5.56	24.68	33.00

Remark :

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

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No.134, Wu Kung Road, Wuku Industrial Zone, Taipei County, Taiwan / 台北縣五股工業區五工路 134 號

t (886-2) 2299-3279

f (886-2) 2298-0488

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Measurement Result:

EUT Mode	Frequency (MHz)	CH	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)
5MHz BW LTE-Band 13 (QPSK RB 1 Offset 0)	779.50	23205	E2	V	119.98	33.14	-7.87	3.53	21.74	44.70
				H	117.78	27.08	-7.87	5.84	13.37	44.70
	782.00	23230	E2	V	121.39	34.57	-7.87	3.53	23.17	44.70
				H	118.75	28.58	-7.87	3.53	17.18	44.70
	784.50	23255	E2	V	119.90	33.11	-7.87	3.54	21.70	44.70
				H	117.66	28.02	-7.87	3.54	16.61	44.70

Remark :

- (1) The RBW,VBW of SPA for frequency

RBW= 5MHz , VBW= 8MHz

Detector = Peak

EUT Mode	Frequency (MHz)	CH	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)
5MHz BW LTE-Band 13 (16QAM RB 1 Offset 0)	779.50	23205	E2	V	120.79	33.95	-7.87	3.53	22.55	44.70
				H	118.45	27.75	-7.87	5.84	14.04	44.70
	782.00	23230	E2	V	122.53	35.71	-7.87	3.53	24.31	44.70
				H	118.77	28.60	-7.87	3.53	17.20	44.70
	784.50	23255	E2	V	120.76	33.97	-7.87	3.54	22.56	44.70
				H	118.14	28.50	-7.87	3.54	17.09	44.70

Remark :

- (1) The RBW,VBW of SPA for frequency

RBW= 5MHz , VBW= 8MHz

Detector = Peak

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f (886-2) 2298-0488

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EUT Mode	Frequency (MHz)	CH	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)
5MHz BW LTE-Band 13 (QPSK RB 1 Offset 24)	779.50	23205	E2	V	115.28	28.44	-7.87	3.53	17.04	44.70
				H	113.49	22.79	-7.87	5.84	9.08	44.70
	782.00	23230	E2	V	121.16	34.34	-7.87	3.53	22.94	44.70
				H	118.92	28.75	-7.87	3.53	17.35	44.70
	784.50	23255	E2	V	119.38	32.59	-7.87	3.54	21.18	44.70
				H	117.82	28.18	-7.87	3.54	16.77	44.70

Remark :

- (1) The RBW,VBW of SPA for frequency

RBW= 5MHz , VBW= 8MHz

Detector = Peak

EUT Mode	Frequency (MHz)	CH	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)
5MHz BW LTE-Band 13 (16QAM RB 1 Offset 24)	779.50	23205	E2	V	118.66	31.82	-7.87	3.53	20.42	44.70
				H	120.70	30.00	-7.87	5.84	16.29	44.70
	782.00	23230	E2	V	121.69	34.87	-7.87	3.53	23.47	44.70
				H	119.51	29.34	-7.87	3.53	17.94	44.70
	784.50	23255	E2	V	121.25	34.46	-7.87	3.54	23.05	44.70
				H	119.45	29.81	-7.87	3.54	18.40	44.70

Remark :

- (1) The RBW,VBW of SPA for frequency

RBW= 5MHz , VBW= 8MHz

Detector = Peak

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f (886-2) 2298-0488

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EUT Mode	Frequency (MHz)	CH	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)
5MHz BW LTE-Band 13 (QPSK RB 12 Offset 6)	779.50	23205	E2	V	120.20	33.36	-7.87	3.53	21.96	44.70
				H	117.91	27.21	-7.87	5.84	13.50	44.70
	782.00	23230	E2	V	118.99	32.17	-7.87	3.53	20.77	44.70
				H	114.95	24.78	-7.87	3.53	13.38	44.70
	784.50	23255	E2	V	120.20	33.41	-7.87	3.54	22.00	44.70
				H	118.14	28.50	-7.87	3.54	17.09	44.70

Remark :

- (1) The RBW,VBW of SPA for frequency

RBW= 5MHz , VBW= 8MHz

Detector = Peak

EUT Mode	Frequency (MHz)	CH	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)
5MHz BW LTE-Band 13 (16QAM RB 12 Offset 6)	779.50	23205	E2	V	121.38	34.54	-7.87	3.53	23.14	44.70
				H	119.06	28.36	-7.87	5.84	14.65	44.70
	782.00	23230	E2	V	119.98	33.16	-7.87	3.53	21.76	44.70
				H	115.50	25.33	-7.87	3.53	13.93	44.70
	784.50	23255	E2	V	121.21	34.42	-7.87	3.54	23.01	44.70
				H	118.94	29.30	-7.87	3.54	17.89	44.70

Remark :

- (1) The RBW,VBW of SPA for frequency

RBW= 5MHz , VBW= 8MHz

Detector = Peak

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t (886-2) 2299-3279

f (886-2) 2298-0488

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EUT Mode	Frequency (MHz)	CH	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)
5MHz BW LTE-Band 13 (QPSK RB 25 Offset 0)	779.50	23205	E2	V	117.30	30.46	-7.87	3.53	19.06	44.70
				H	115.39	24.69	-7.87	5.84	10.98	44.70
	782.00	23230	E2	V	120.56	33.74	-7.87	3.53	22.34	44.70
				H	113.52	23.35	-7.87	3.53	11.95	44.70
	784.50	23255	E2	V	117.79	31.00	-7.87	3.54	19.59	44.70
				H	115.81	26.17	-7.87	3.54	14.76	44.70

Remark :

- (1) The RBW,VBW of SPA for frequency

RBW= 5MHz , VBW= 8MHz

Detector = Peak

EUT Mode	Frequency (MHz)	CH	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)
5MHz BW LTE-Band 13 (16QAM RB 25 Offset 0)	779.50	23205	E2	V	118.85	32.01	-7.87	3.53	20.61	44.70
				H	116.71	26.01	-7.87	5.84	12.30	44.70
	782.00	23230	E2	V	118.15	31.33	-7.87	3.53	19.93	44.70
				H	115.14	24.97	-7.87	3.53	13.57	44.70
	784.50	23255	E2	V	119.20	32.41	-7.87	3.54	21.00	44.70
				H	116.87	27.23	-7.87	3.54	15.82	44.70

Remark :

- (1) The RBW,VBW of SPA for frequency

RBW= 5MHz , VBW= 8MHz

Detector = Peak

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t (886-2) 2299-3279

f (886-2) 2298-0488

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EUT Mode	Frequency (MHz)	CH	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)
10MHz BW LTE-Band 13 (QPSK RB 1 Offset 0)	782.00	23230	E2	V	121.81	34.99	-7.87	3.53	23.59	44.70
				H	117.45	27.28	-7.87	3.53	15.88	44.70

Remark :

- (1) The RBW,VBW of SPA for frequency

RBW= 10MHz , VBW= 10MHz

Detector = Peak

EUT Mode	Frequency (MHz)	CH	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)
10MHz BW LTE-Band 13 (16QAM RB 1 Offset 0)	782.00	23230	E2	V	122.25	35.43	-7.87	3.53	24.03	44.70
				H	117.70	27.53	-7.87	3.53	16.13	44.70

Remark :

- (1) The RBW,VBW of SPA for frequency

RBW= 10MHz , VBW= 10MHz

Detector = Peak

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EUT Mode	Frequency (MHz)	CH	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)
10MHz BW LTE-Band 13 (QPSK RB 1 Offset 49)	782.00	23230	E2	V	120.03	33.21	-7.87	3.53	21.81	44.70
				H	119.07	28.90	-7.87	3.53	17.50	44.70

Remark :

- (1) The RBW,VBW of SPA for frequency

RBW= 10MHz , VBW= 10MHz

Detector = Peak

EUT Mode	Frequency (MHz)	CH	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)
10MHz BW LTE-Band 13 (16QAM RB 1 Offset 49)	782.00	23230	E2	V	121.29	34.47	-7.87	3.53	23.07	44.70
				H	118.85	28.68	-7.87	3.53	17.28	44.70

Remark :

- (1) The RBW,VBW of SPA for frequency

RBW= 10MHz , VBW= 10MHz

Detector = Peak

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EUT Mode	Frequency (MHz)	CH	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)
10MHz BW LTE-Band 13 (QPSK RB 25 Offset 12)	782.00	23230	E2	V	117.00	30.18	-7.87	3.53	18.78	44.70
				H	116.54	26.37	-7.87	3.53	14.97	44.70

Remark :

- (1) The RBW,VBW of SPA for frequency

RBW= 10MHz , VBW= 10MHz

Detector = Peak

EUT Mode	Frequency (MHz)	CH	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)
10MHz BW LTE-Band 13 (16QAM RB 25 Offset 12)	782.00	23230	E2	V	118.26	31.44	-7.87	3.53	20.04	44.70
				H	114.32	24.15	-7.87	3.53	12.75	44.70

Remark :

- (1) The RBW,VBW of SPA for frequency

RBW= 10MHz , VBW= 10MHz

Detector = Peak

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f (886-2) 2298-0488

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EUT Mode	Frequency (MHz)	CH	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)
10MHz BW LTE-Band 13 (QPSK RB 50 Offset 0)	782.00	23230	E2	V	118.51	31.69	-7.87	3.53	20.29	44.70
				H	114.71	24.54	-7.87	3.53	13.14	44.70

Remark :

(1) The RBW,VBW of SPA for frequency

RBW= 10MHz , VBW= 10MHz

Detector = Peak

EUT Mode	Frequency (MHz)	CH	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)
10MHz BW LTE-Band 13 (16QAM RB 50 Offset 0)	782.00	23230	E2	V	116.57	29.75	-7.87	3.53	18.35	44.70
				H	111.87	21.70	-7.87	3.53	10.30	44.70

Remark :

(1) The RBW,VBW of SPA for frequency

RBW= 10MHz , VBW= 10MHz

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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f (886-2) 2298-0488

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Measurement Result:

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
CDMA2000 Cellular	824.70	1013	1.2755
	836.52	384	1.2720
	848.31	777	1.2671

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
CDMA2000 PCS	1851.25	25	1.2696
	1880.00	600	1.2689
	1908.75	1175	1.2706

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
EVDO Cellular	824.70	1013	1.2817
	836.52	384	1.2745
	848.31	777	1.2730

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
EVDO PCS	1851.25	25	1.2686
	1880.00	600	1.2649
	1908.75	1175	1.2730

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EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
5MHz BW LTE-Band 13 (QPSK RB 25 Offset 0)	779.50	23205	4.5015
	782.00	20175	4.4894
	784.50	23230	4.4765

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
5MHz BW LTE-Band 13 (16QAM RB 25 Offset 0)	779.50	23205	4.5110
	782.00	20175	4.5160
	784.50	23230	4.5182

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
10MHz BW LTE-Band 13 (QPSK RB 50 Offset 0)	782.00	23230	8.9362

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (MHz)
10MHz BW LTE-Band 13 (16QAM RB 50 Offset 0)	782.00	23230	8.9209

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Figure 9-1: CDMA2000 Cellular Channel Low

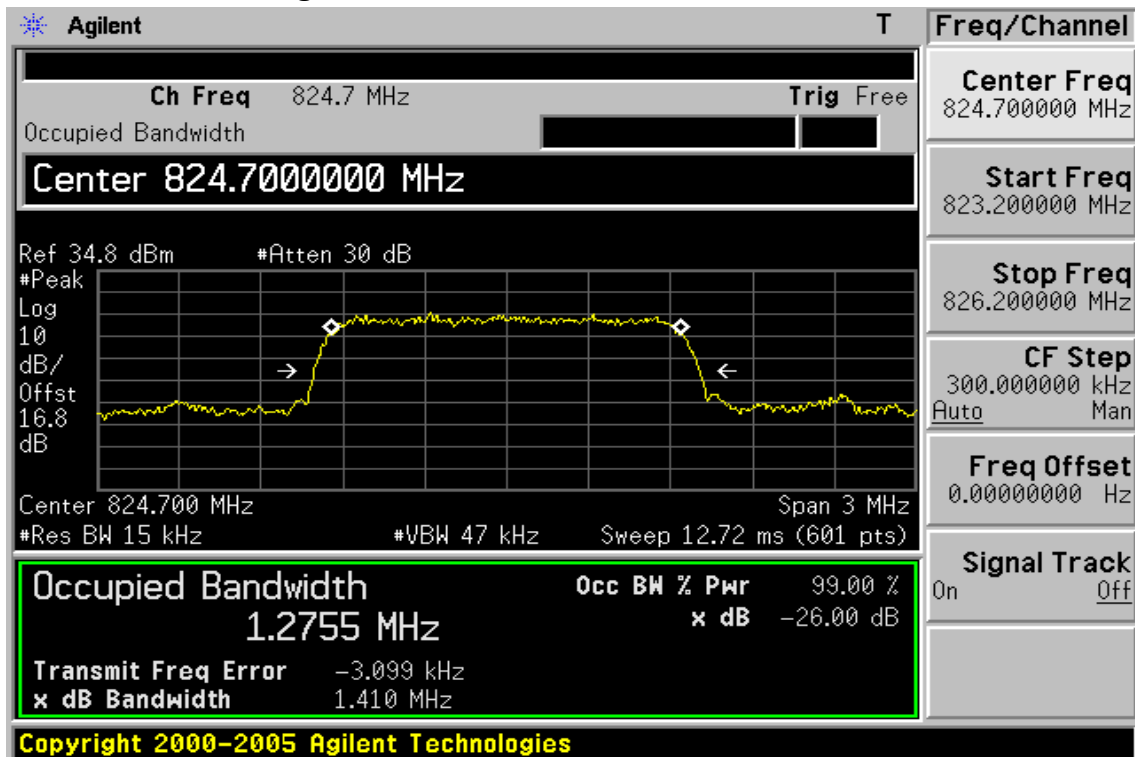
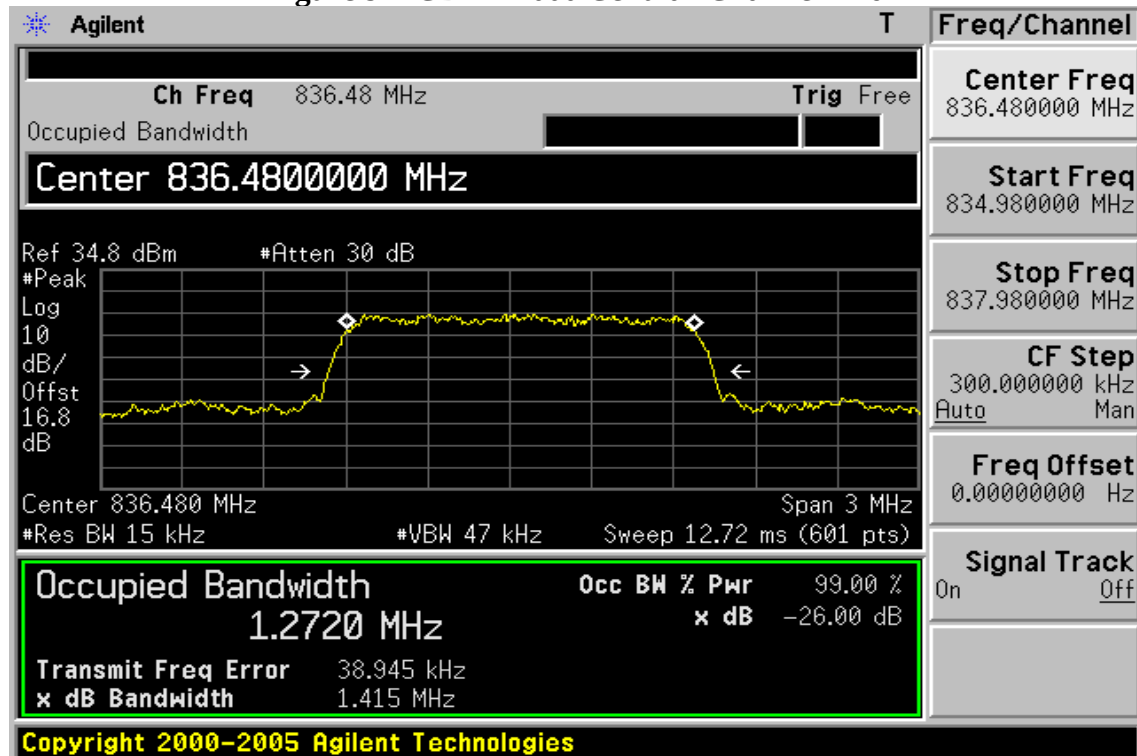


Figure 9-2 CDMA2000 Cellular Channel Mid



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Figure 9-3: CDMA2000 Cellular Channel High

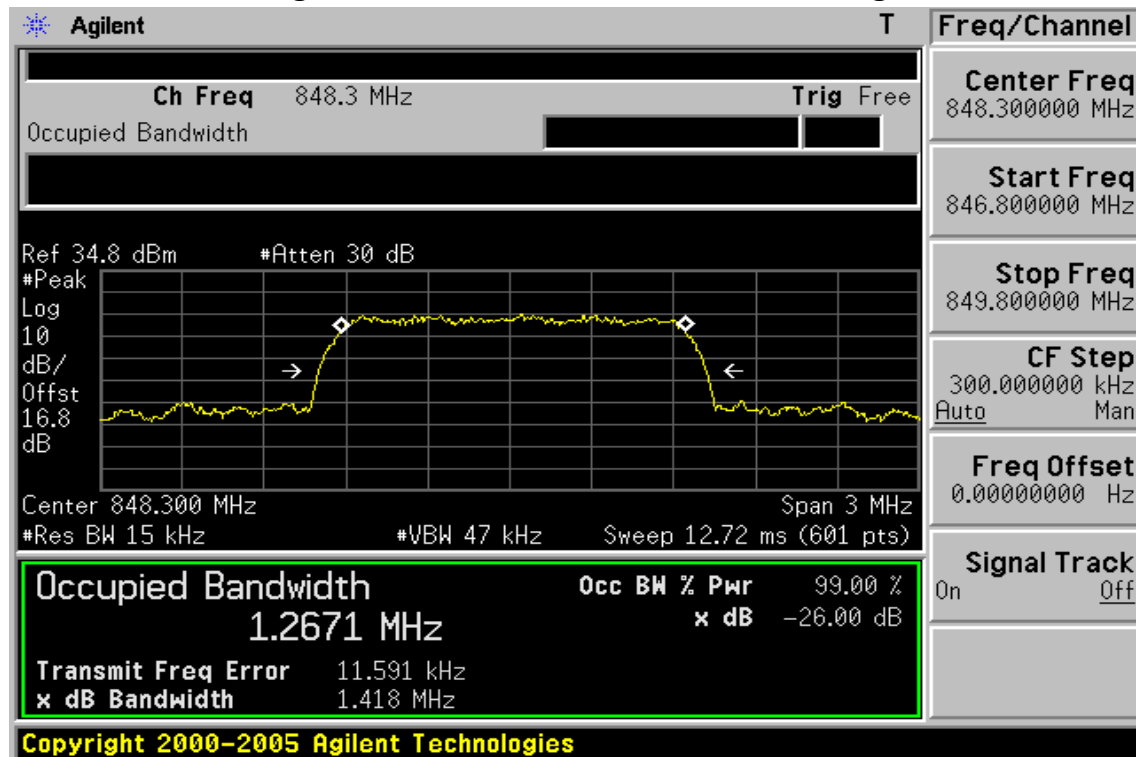
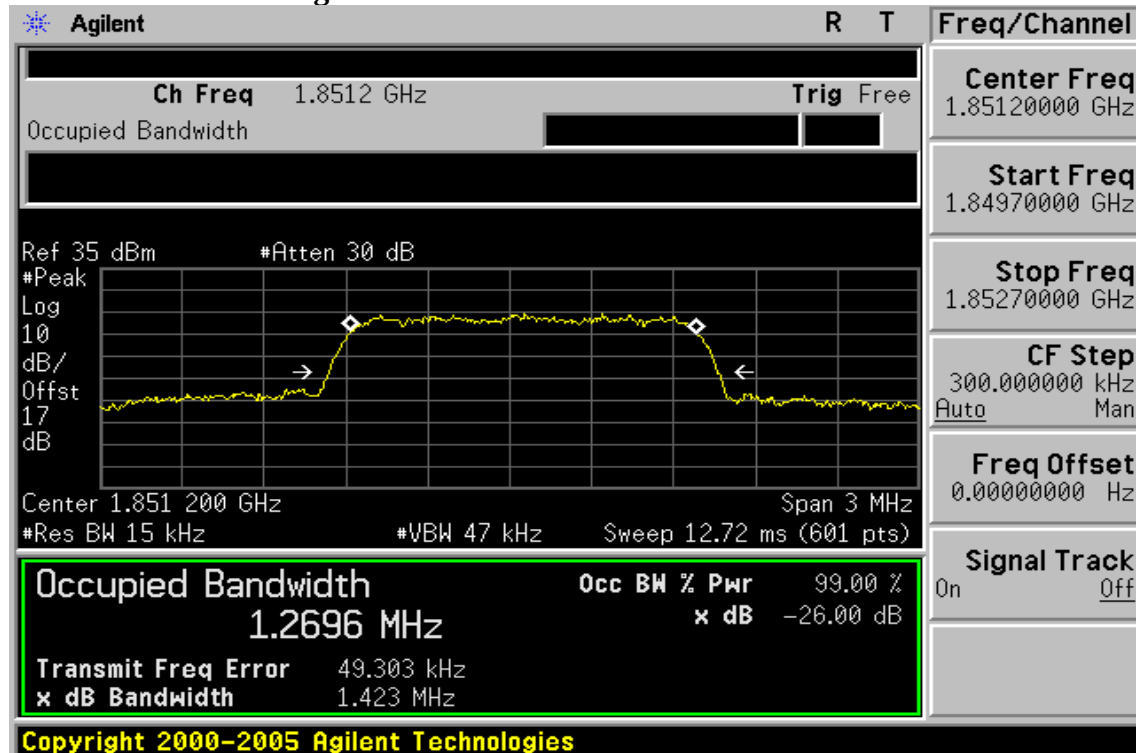


Figure 9-4: CDMA2000 PCS Channel Low



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Figure 9-5 CDMA2000 PCS Channel Mid

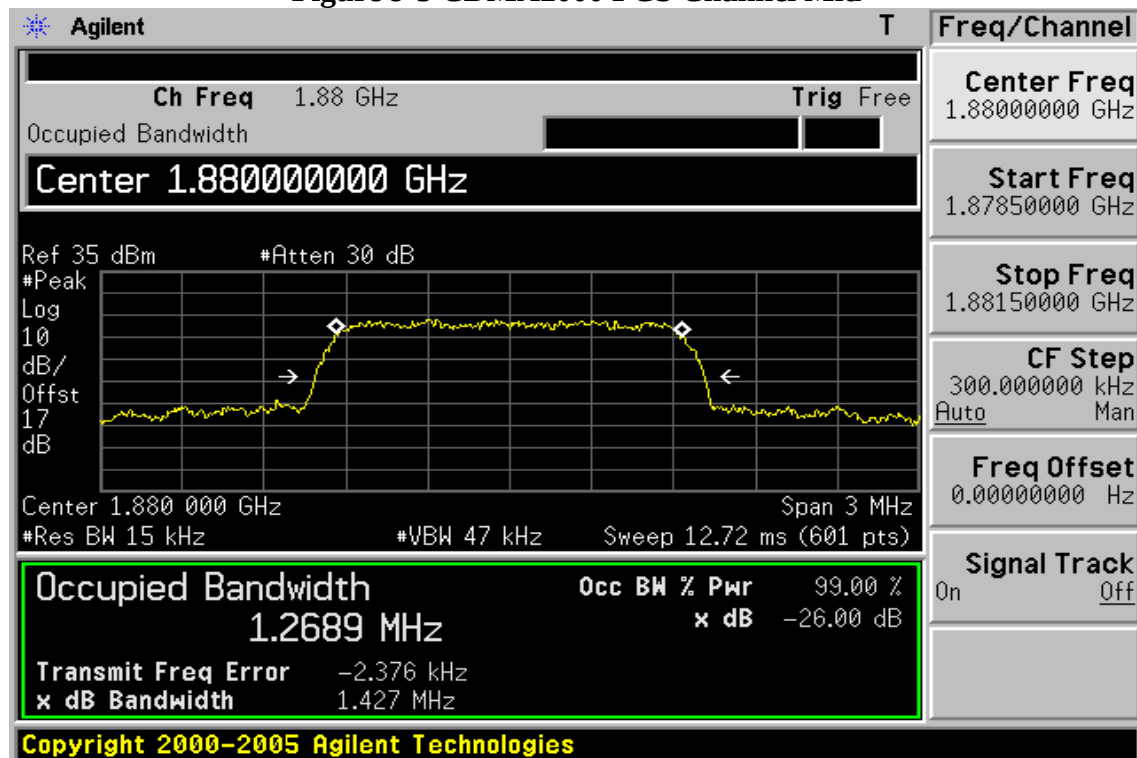
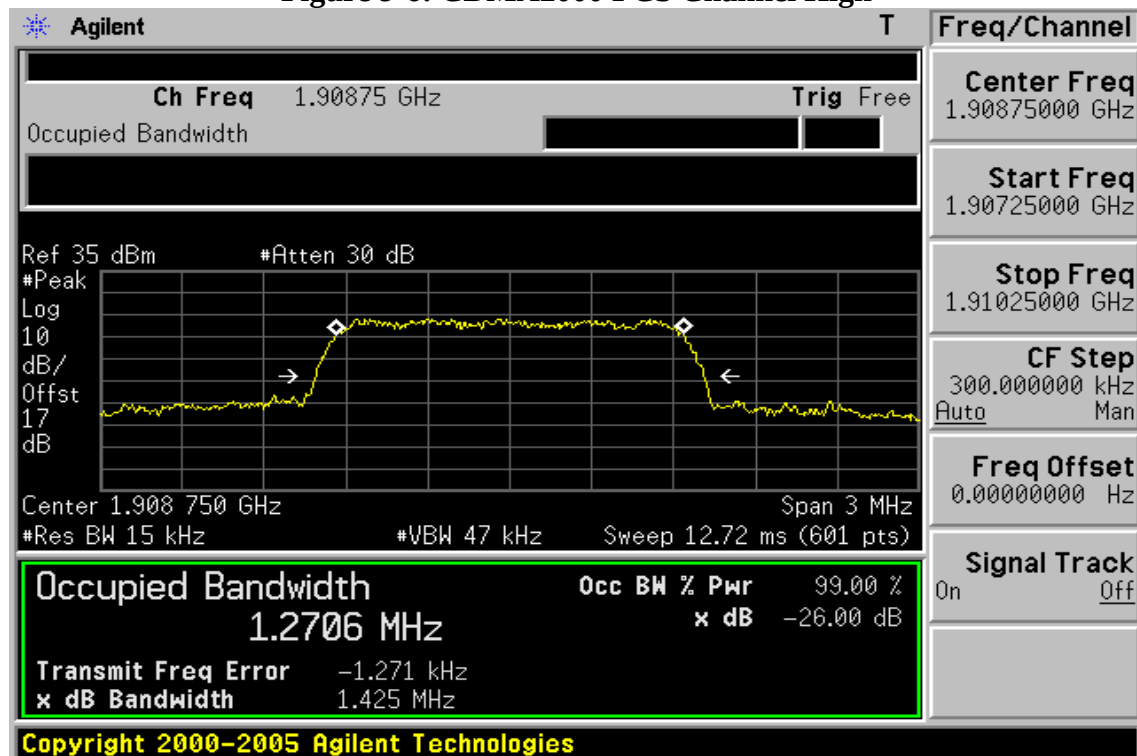


Figure 9-6: CDMA2000 PCS Channel High



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Figure 9-7: EVDO Cellular Channel Low

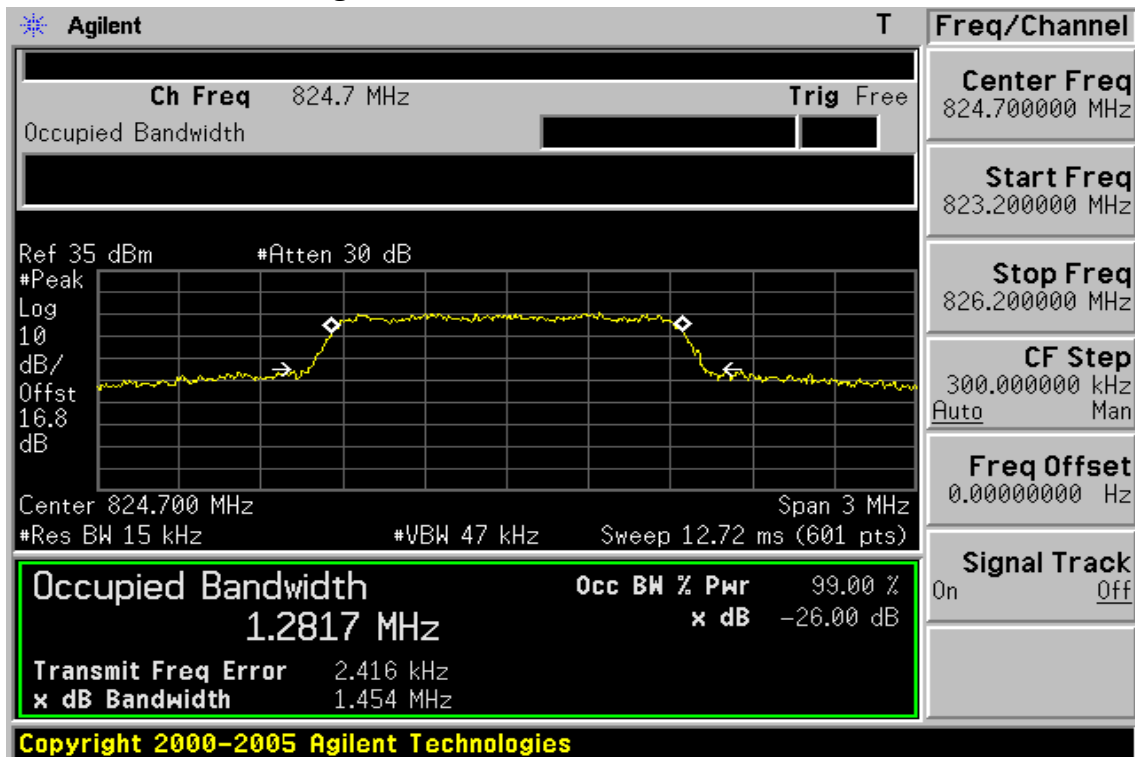
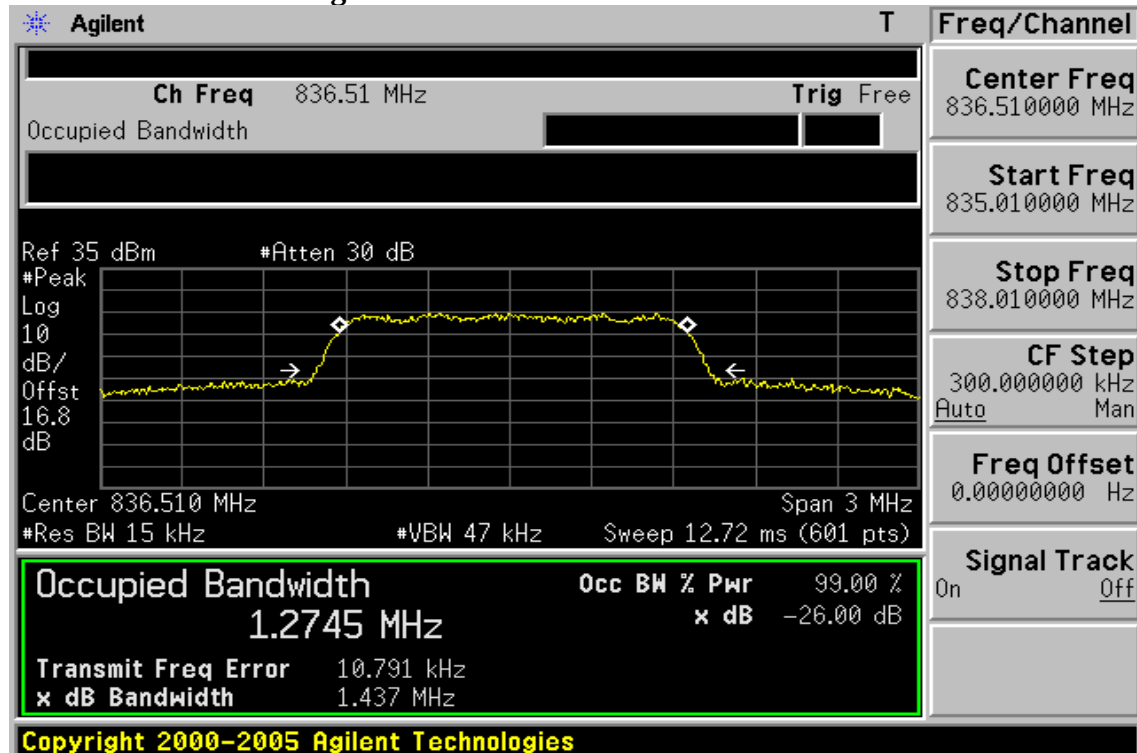


Figure 9-8 EVDO Cellular Channel Mid



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Figure 9-9: EVDO Cellular Channel High

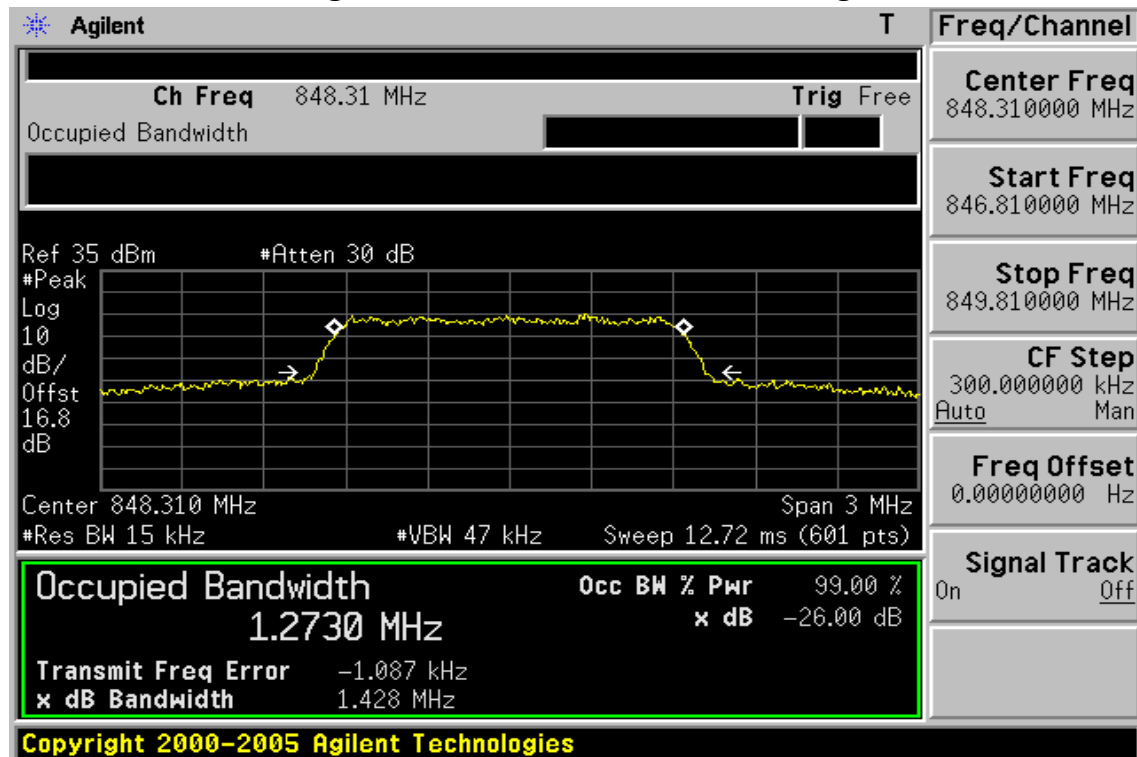
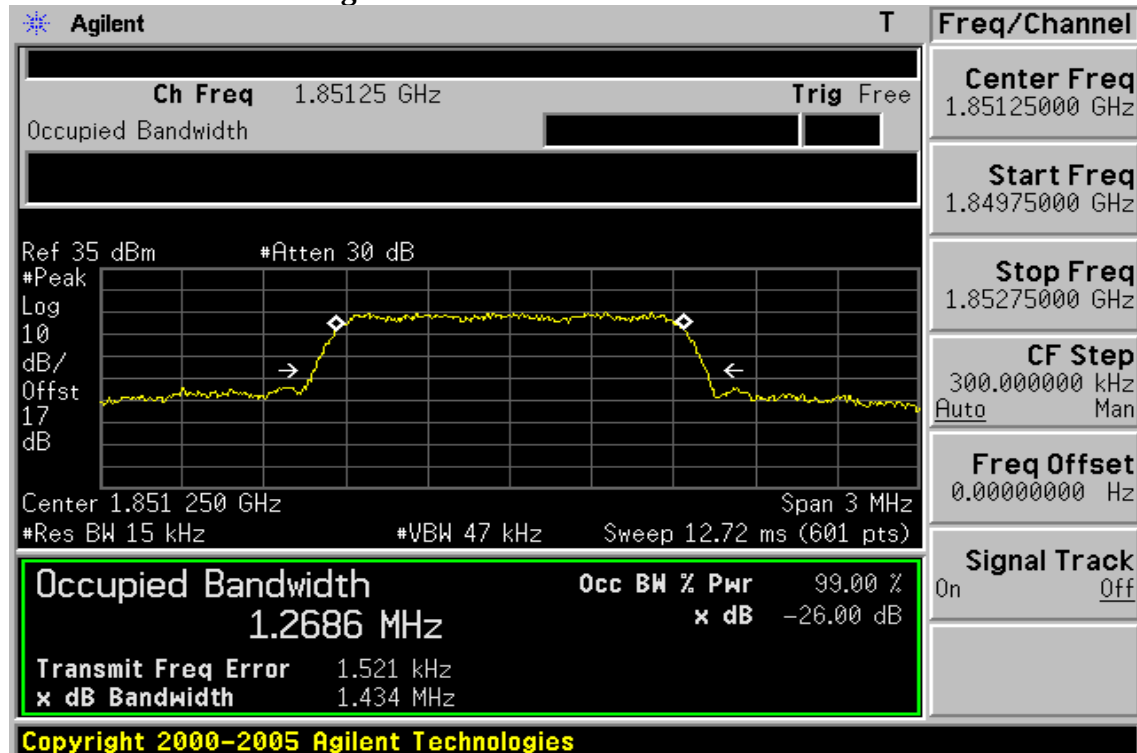


Figure 9-10: EVDO PCS Channel Low



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Figure 9-11 EVDO PCS Channel Mid

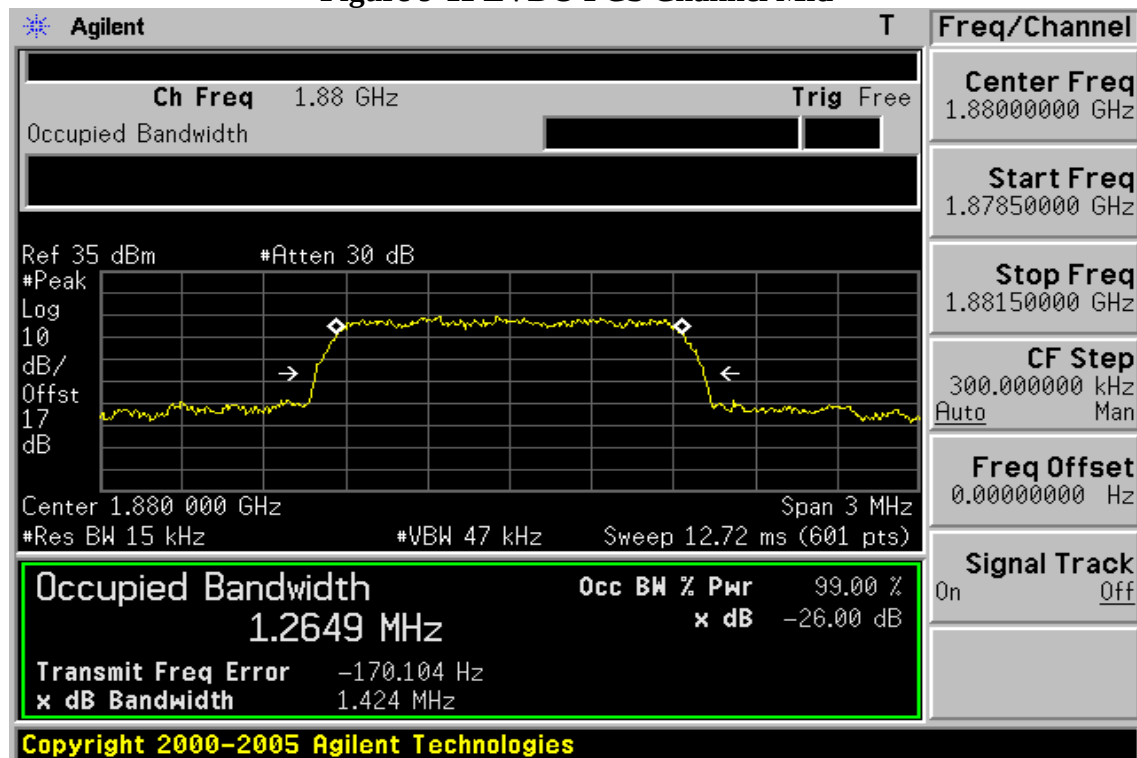
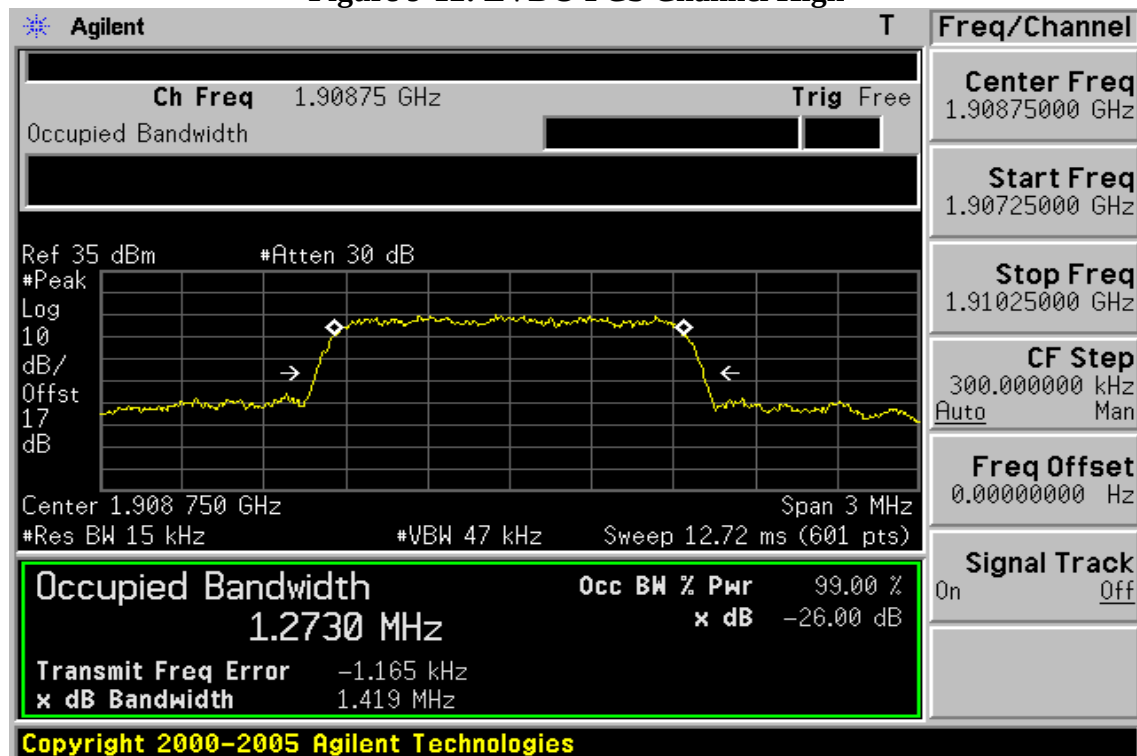


Figure 9-12: EVDO PCS Channel High



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Figure 9-13: 5MHz BW LTE-Band 13(QPSK RB Number: 25 Offset: 0) Channel Low

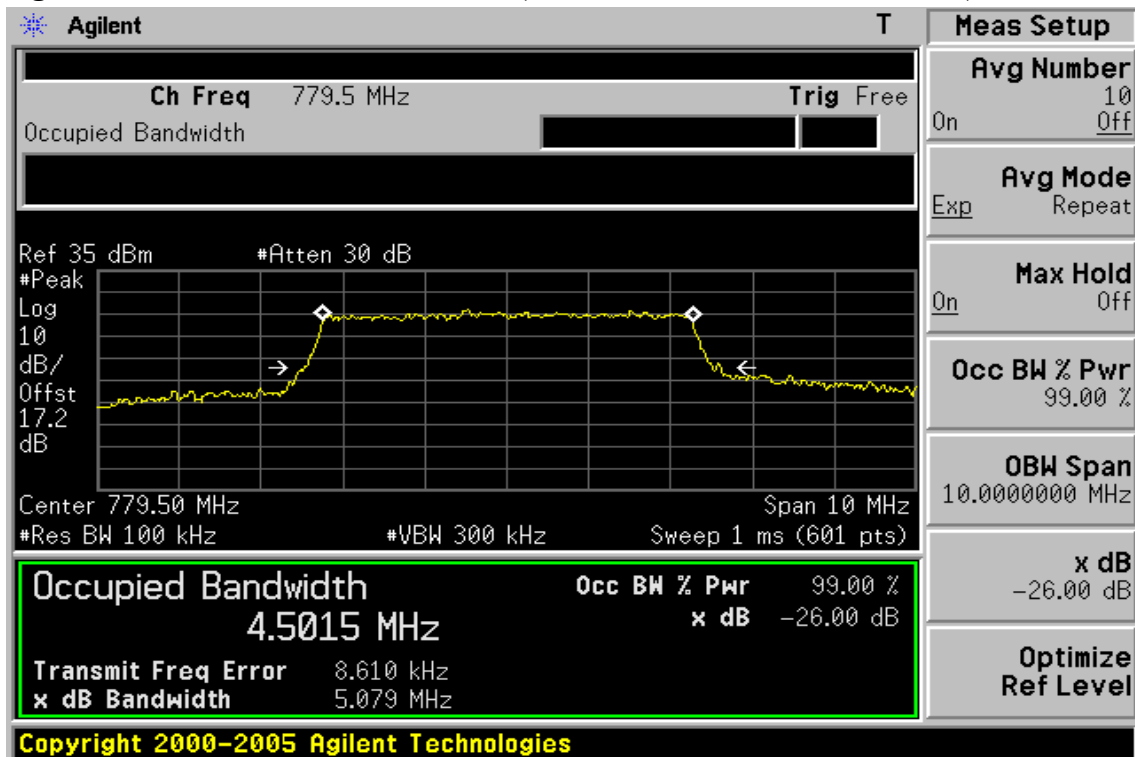
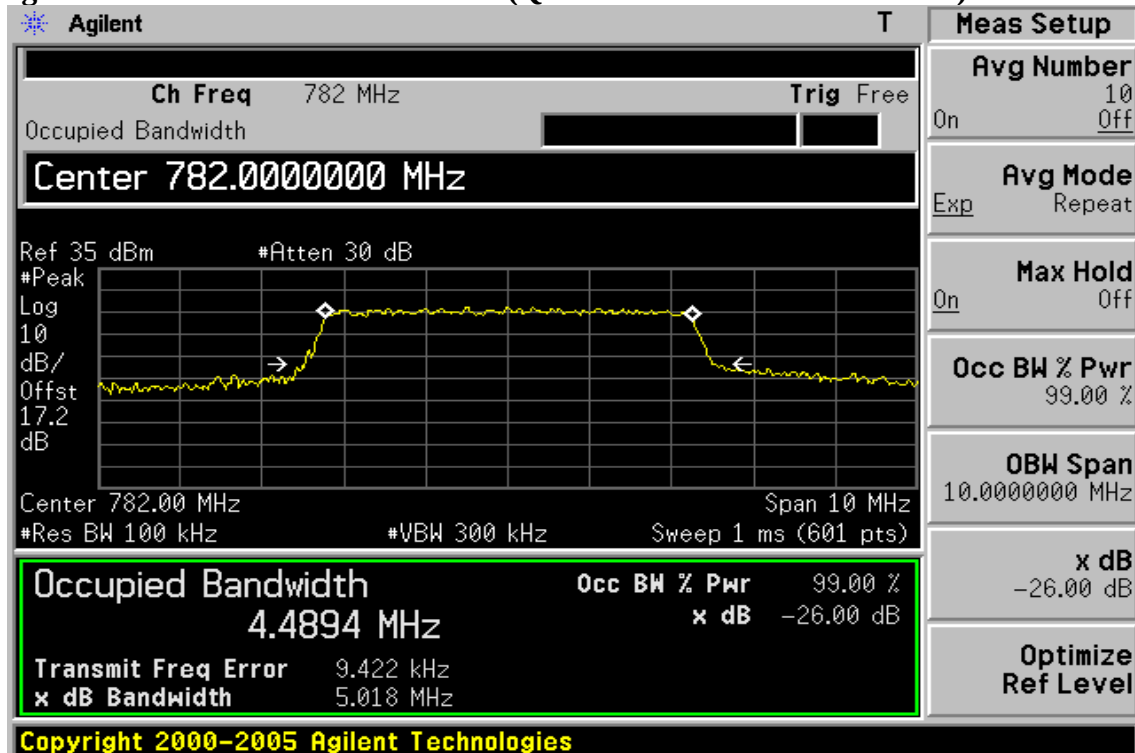


Figure 9-14: 5MHz BW LTE-Band 13(QPSK RB Number: 25 Offset: 0) Channel Mid



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Figure 9-15: 5MHz BW LTE-Band 13(QPSK RB Number: 25 Offset: 0) Channel High

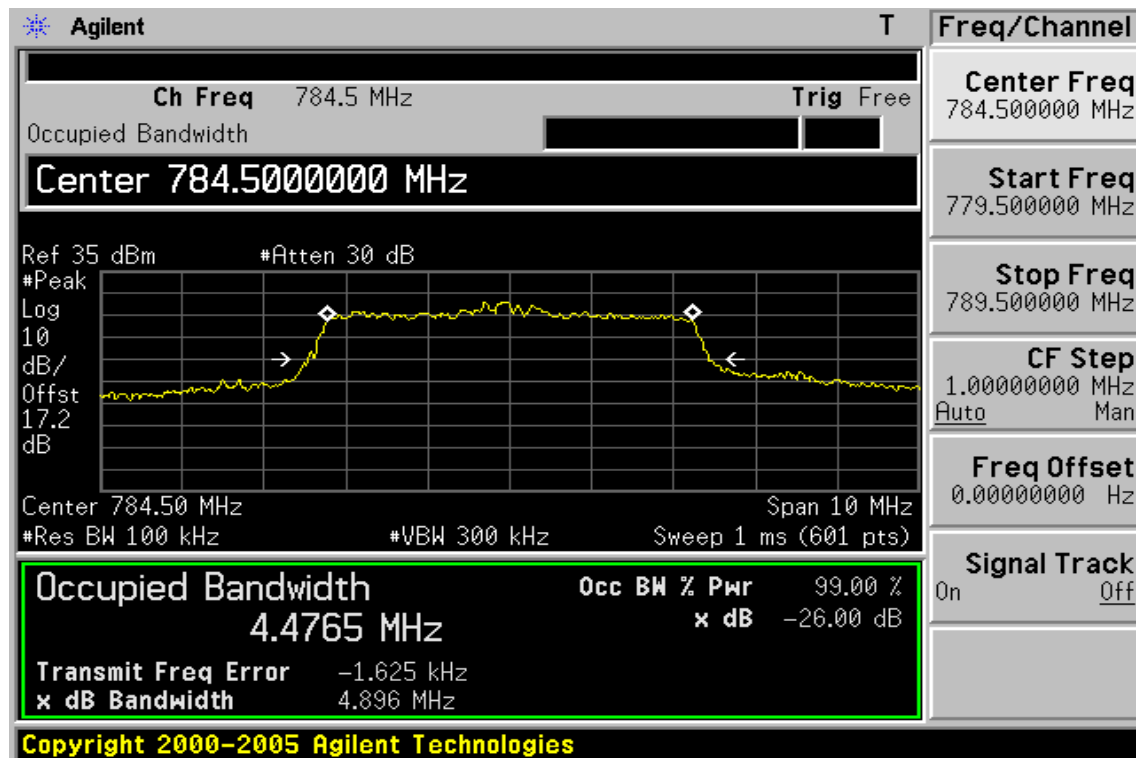
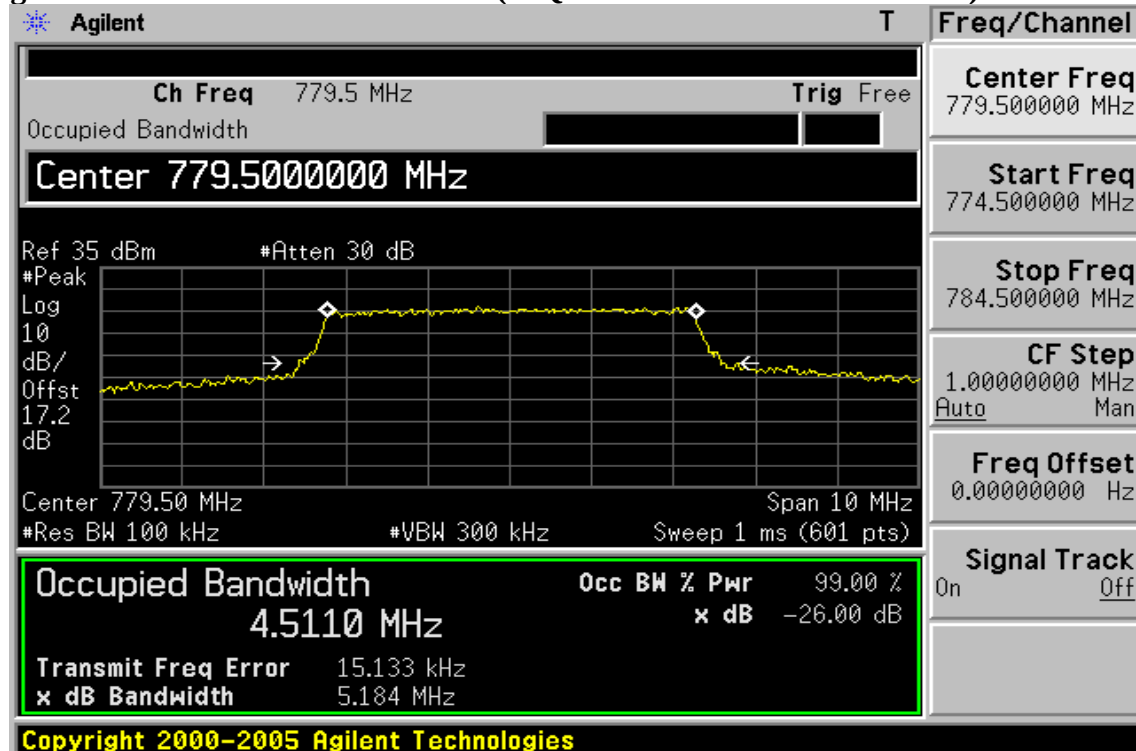


Figure 9-16: 5MHz BW LTE-Band 13(16QAM RB Number: 25 Offset: 0) Channel Low



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Figure 9-17: 5MHz BW LTE-Band 13(16QAM RB Number: 25 Offset: 0) Channel Mid

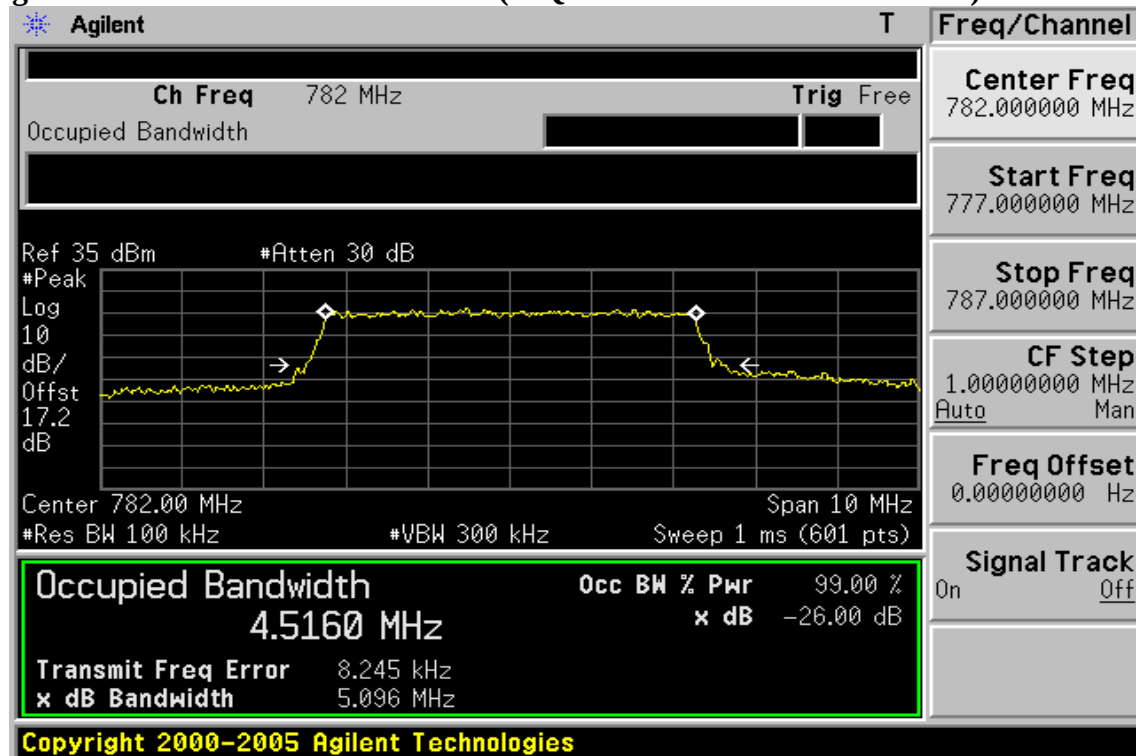
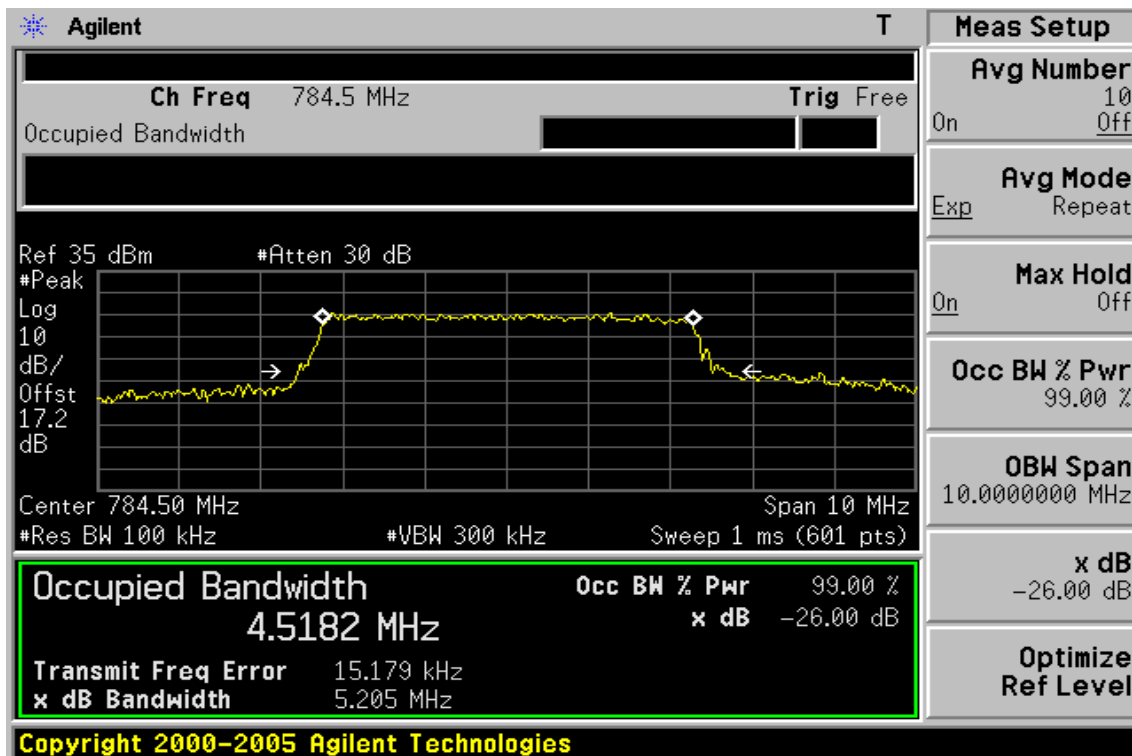


Figure 9-18: 5MHz BW LTE-Band 13(16QAM RB Number: 25 Offset: 0) Channel High



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Figure 9-19: 10MHz BW LTE-Band 13(QPSK RB Number: 50 Offset: 0) Channel Mid

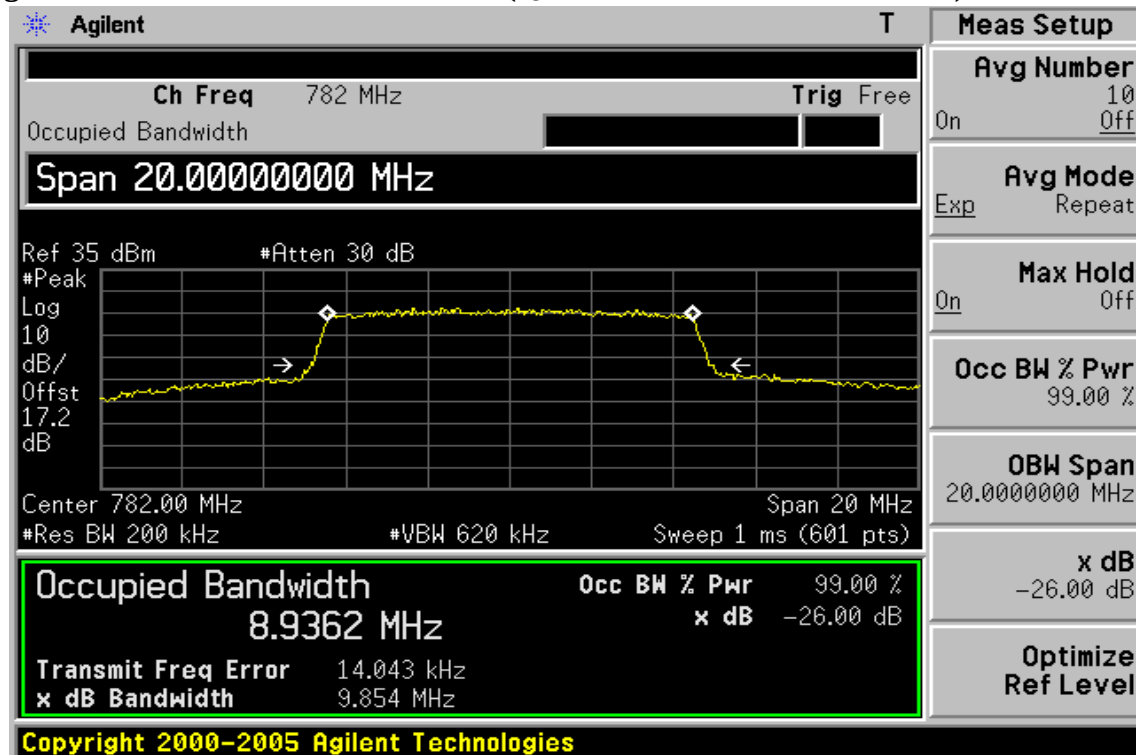
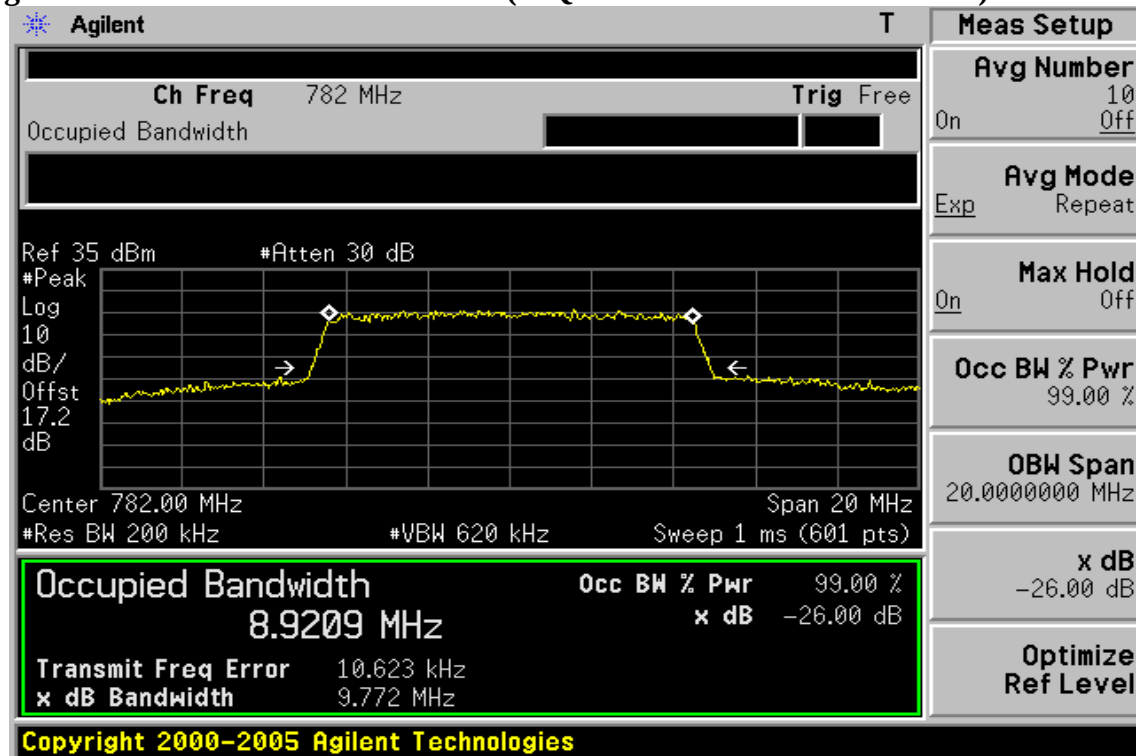


Figure 9-20: 10MHz BW LTE-Band 13(16QAM RB Number: 50 Offset: 0) Channel Mid



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10. OUT OF BAND EMISSION AT ANTENNA TERMINALS

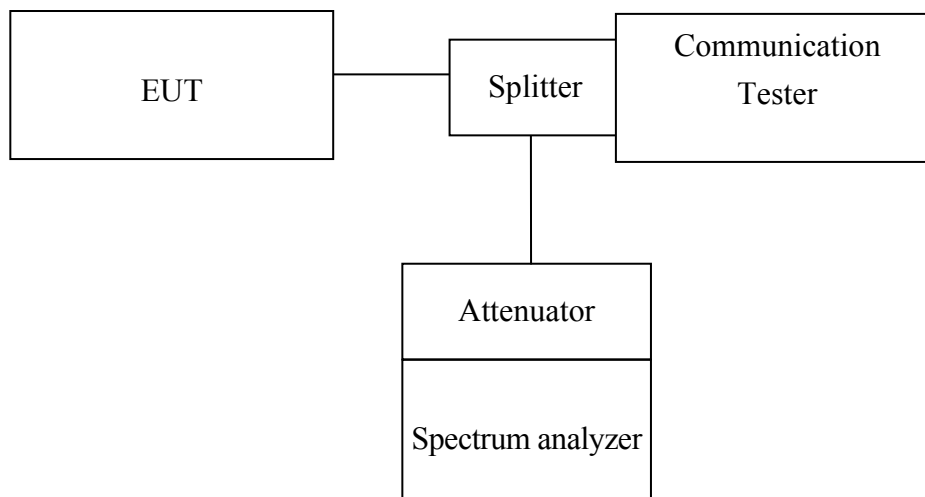
10.1. Standard Applicable:

According to FCC §2.1051.

FCC §22.917(a), §24.238(a), §27.53(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= 10th 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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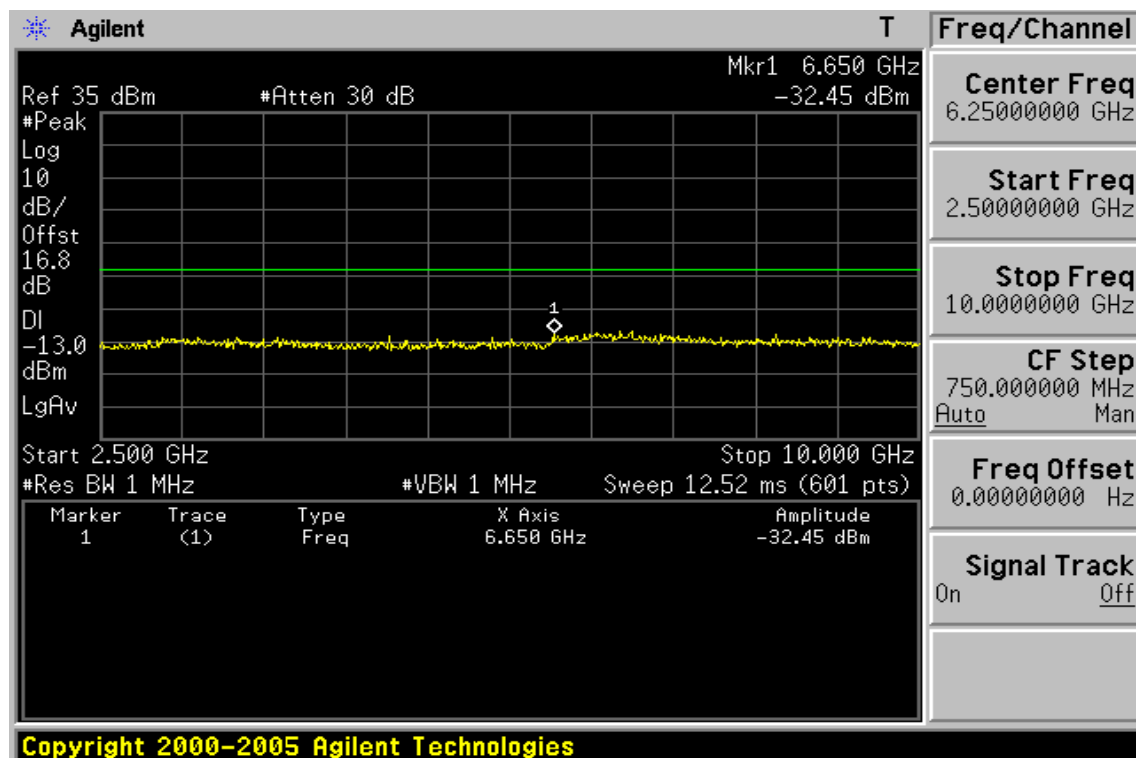
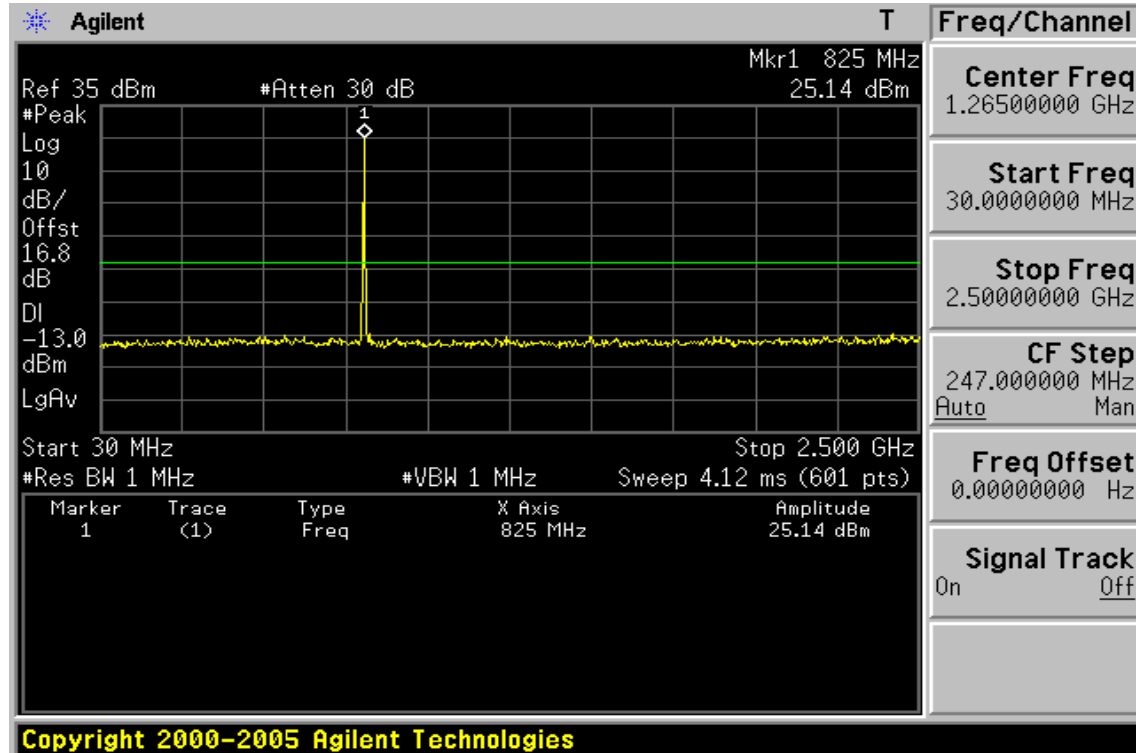
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10.5. Measurement Result:

Figure 10-1: Out of Band emission at antenna terminals–CDMA2000 Cellular Channel Lowest



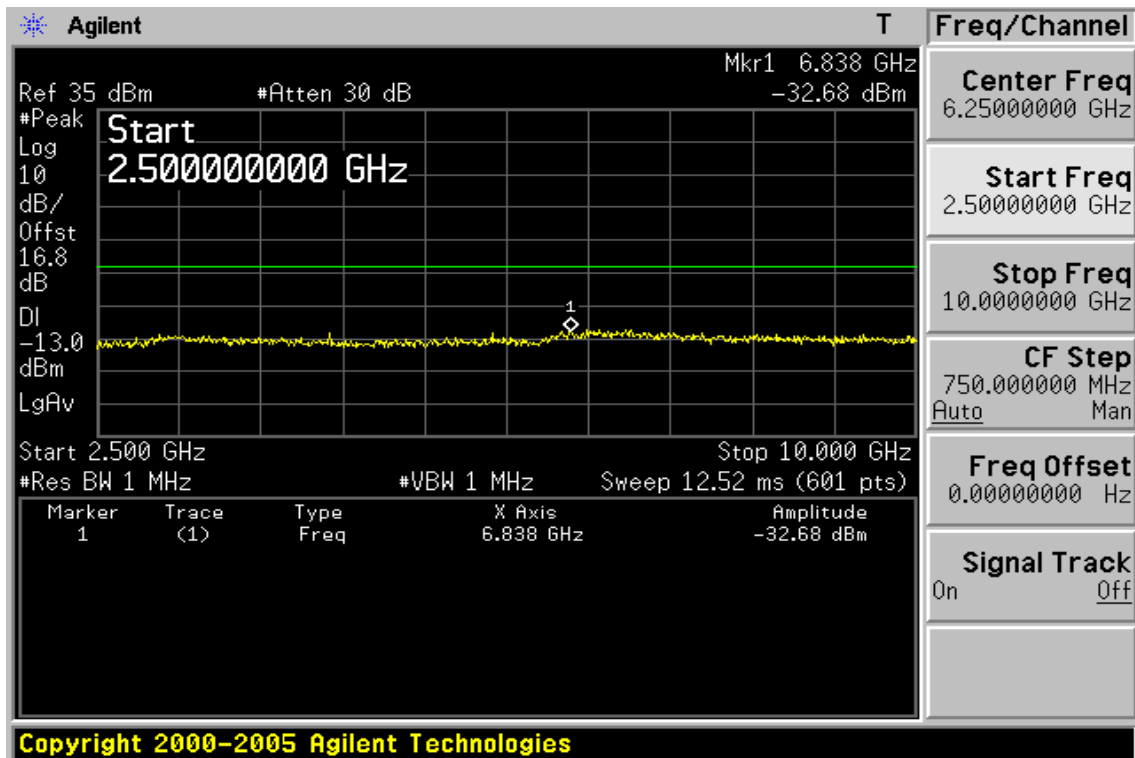
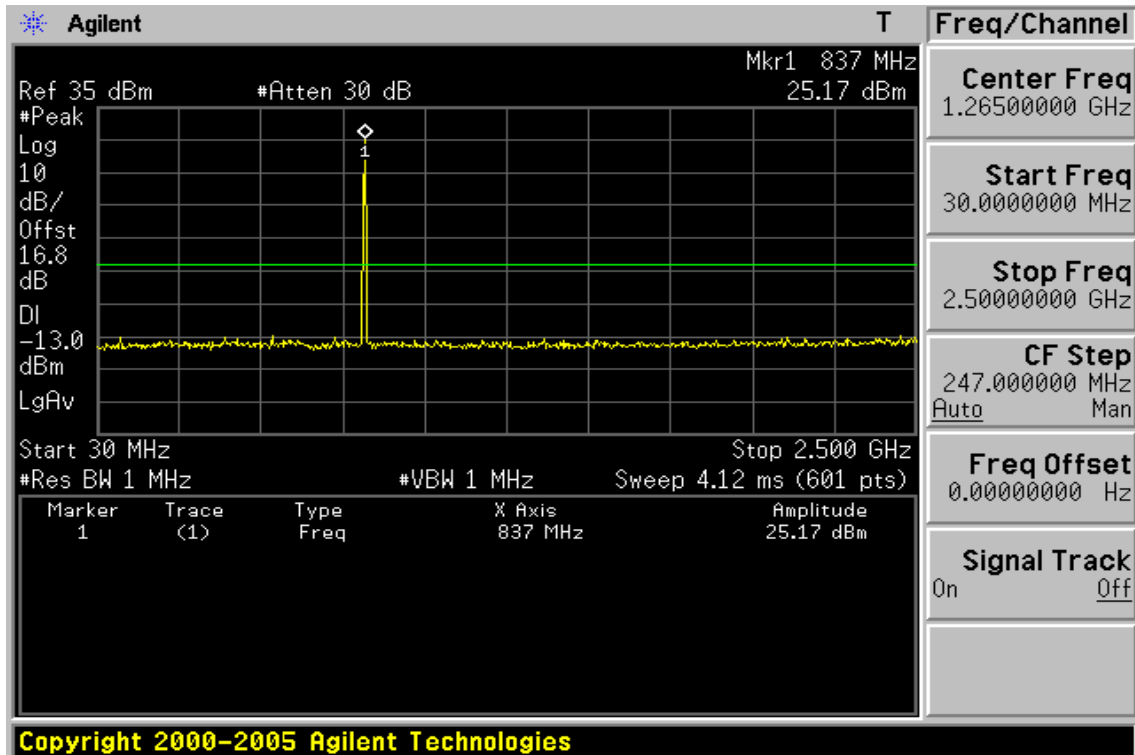
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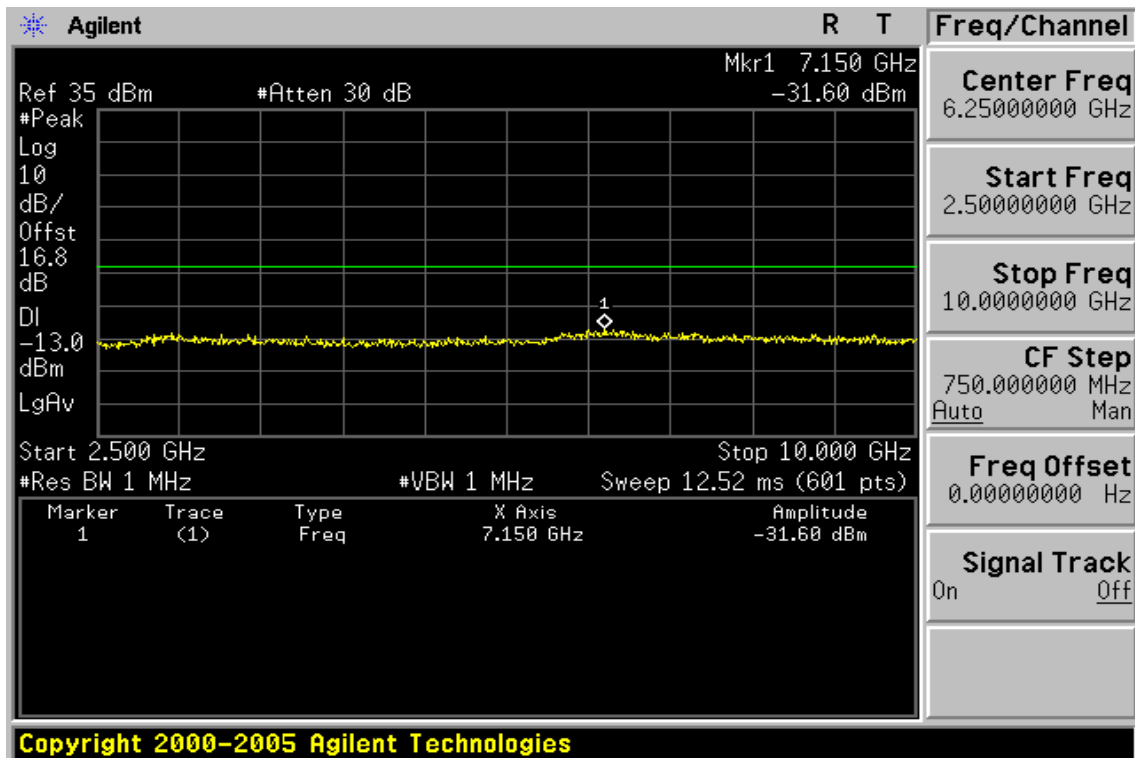
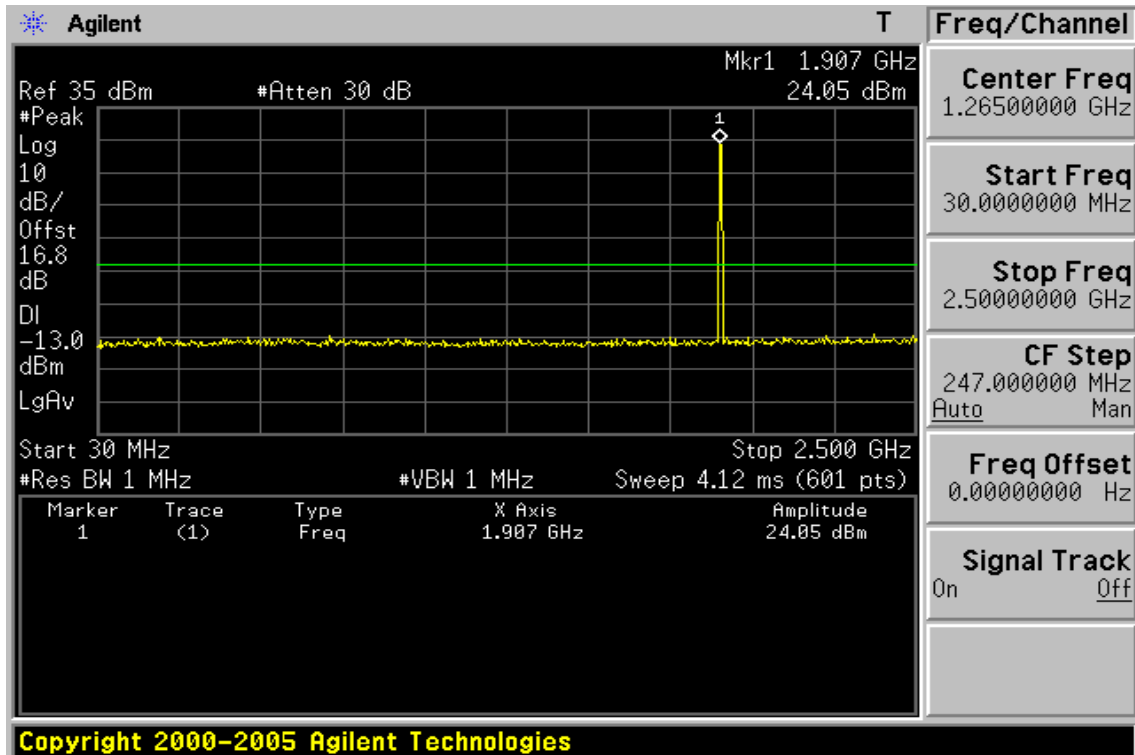
Figure 10-2: Out of Band emission at antenna terminals –CDMA2000 Cellular Channel Mid



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Figure 10-3: Out of Band emission at antenna terminals–CDMA2000 Cellular Channel Highest



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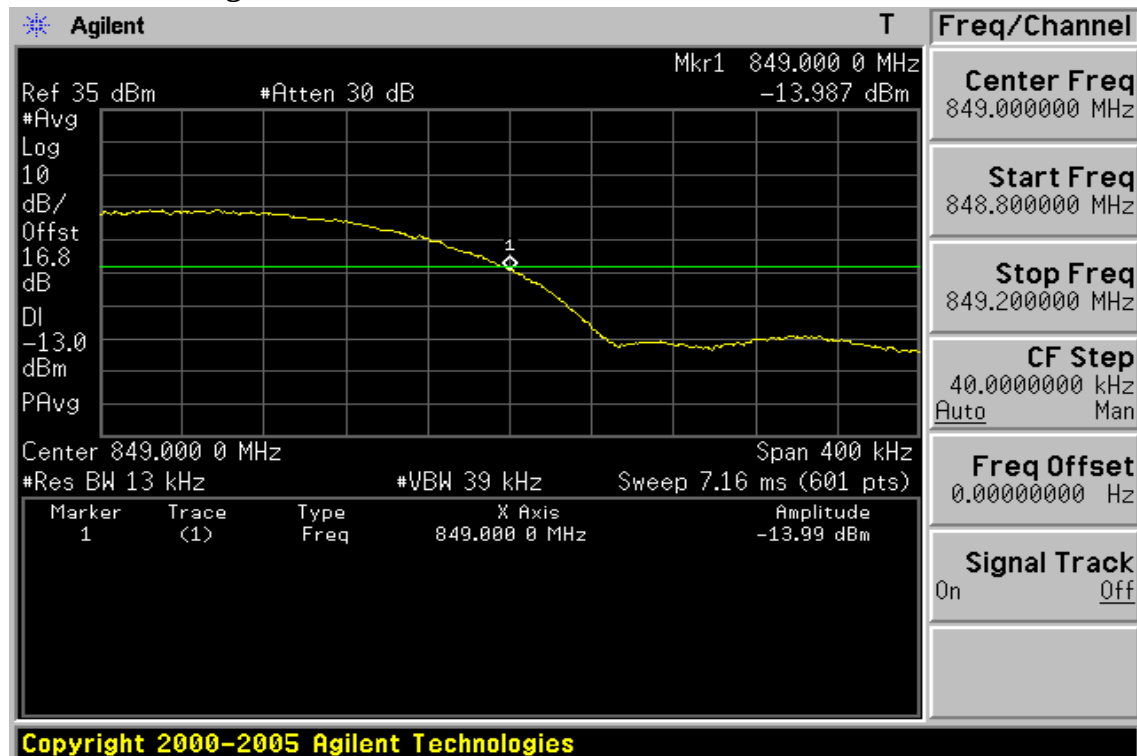
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Figure 10-4: Band edge emission at antenna terminals –CDMA2000 Cellular Channel Lowest



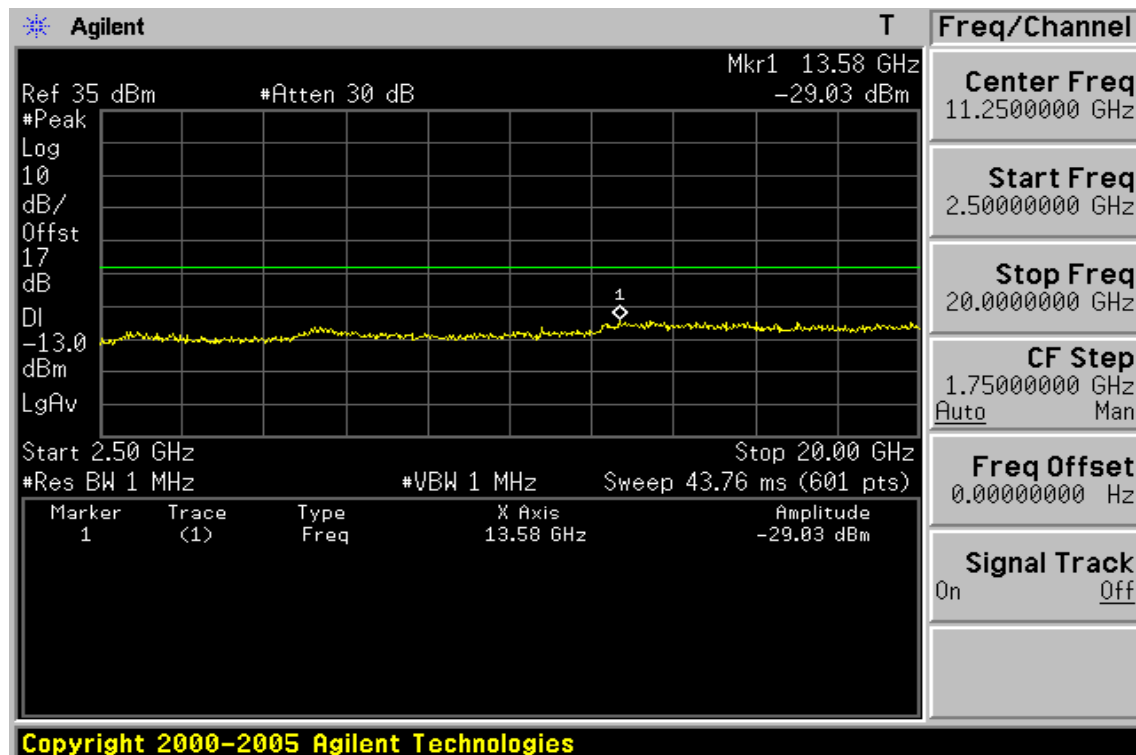
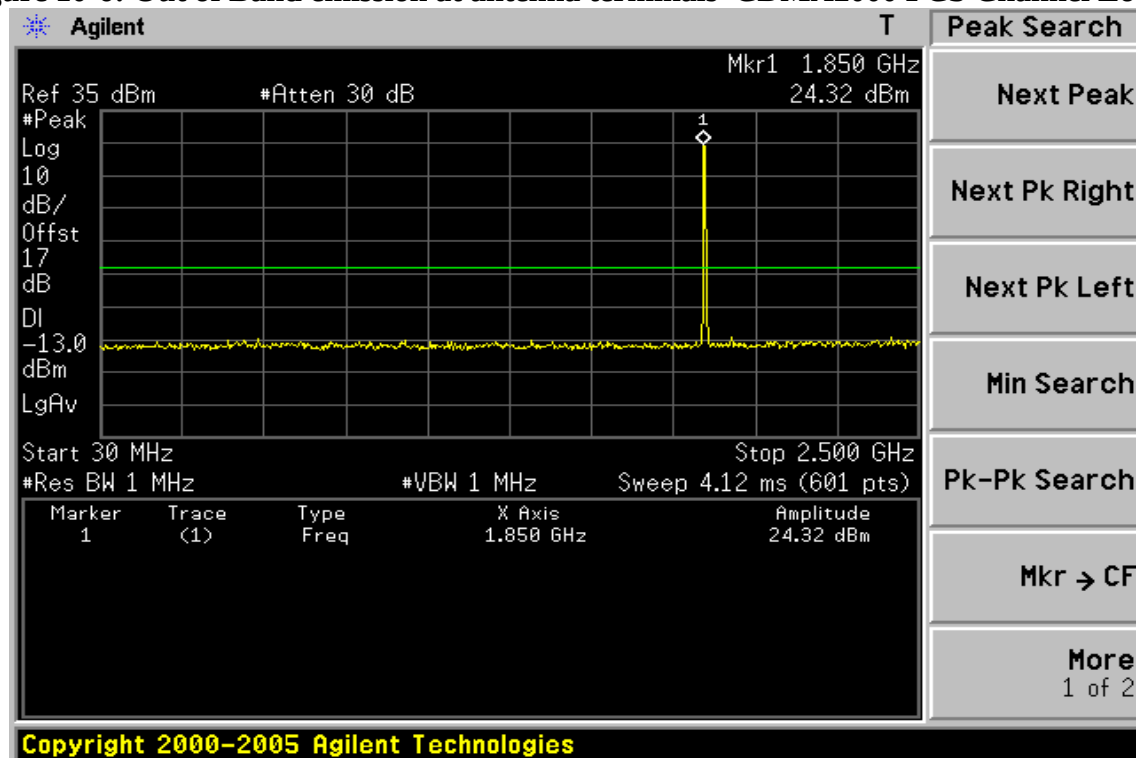
Figure 10-5: Band edge emission at antenna terminals –CDMA2000 Cellular Channel Highest



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Figure 10-6: Out of Band emission at antenna terminals–CDMA2000 PCS Channel Lowest



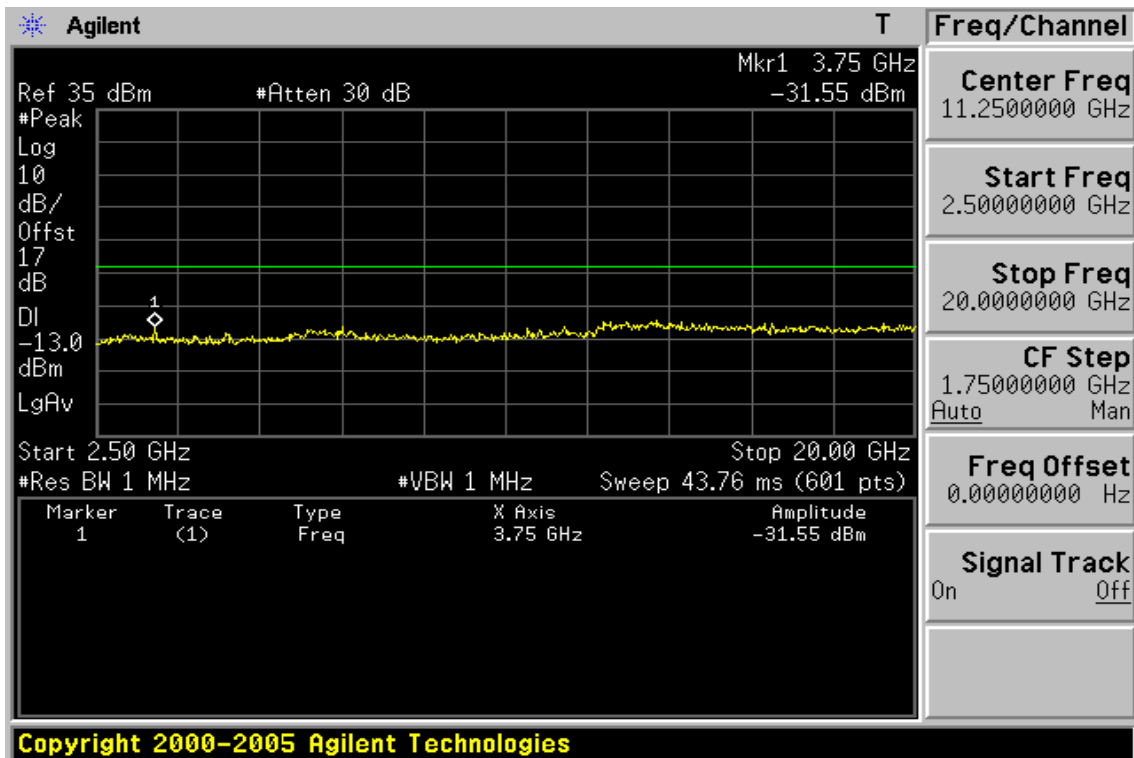
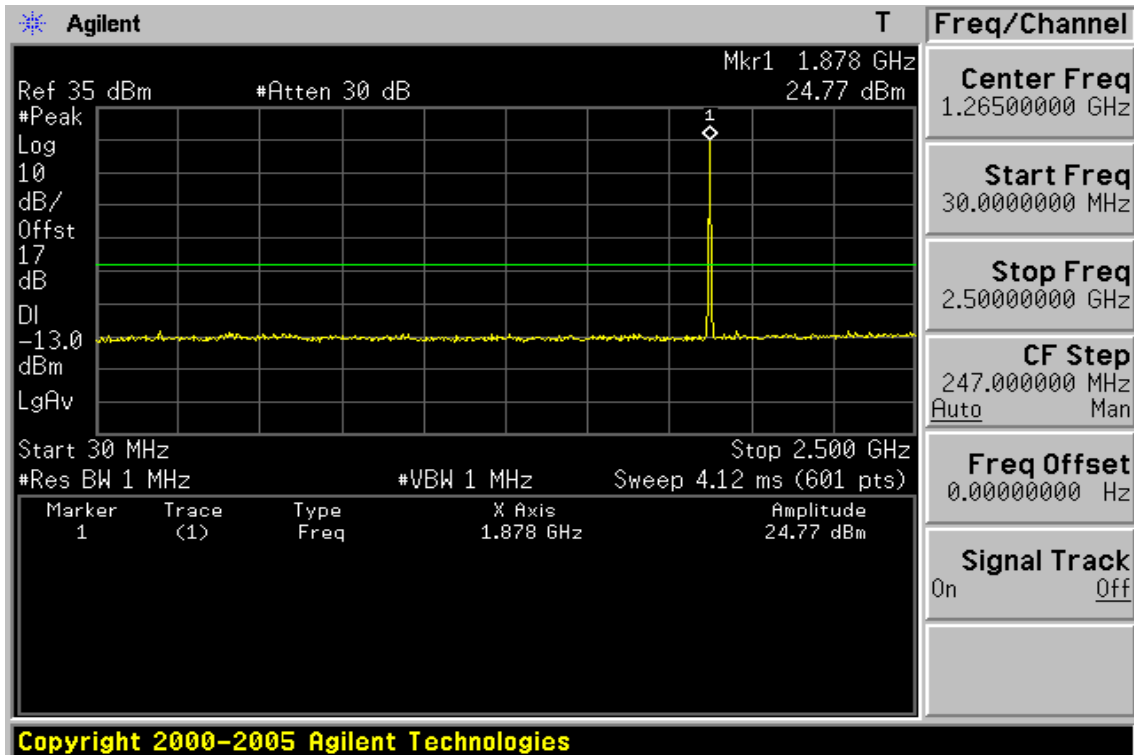
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Figure 10-7: Out of Band emission at antenna terminals –CDMA2000 PCS Channel Mid



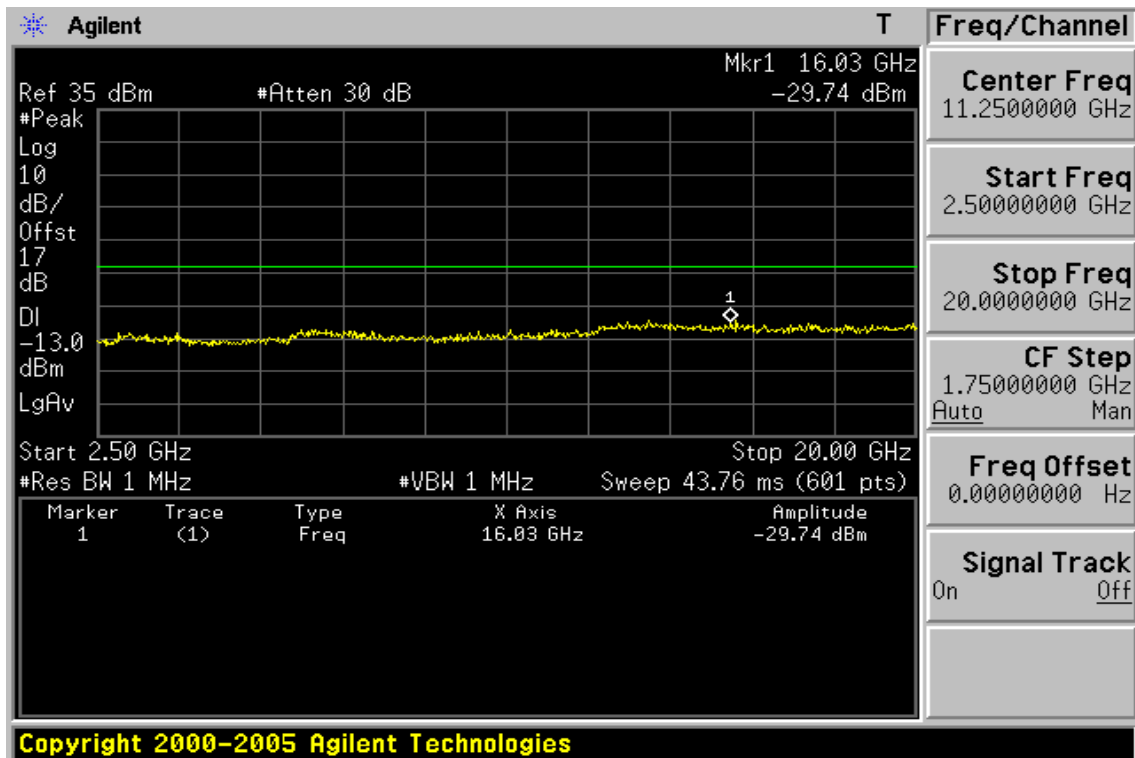
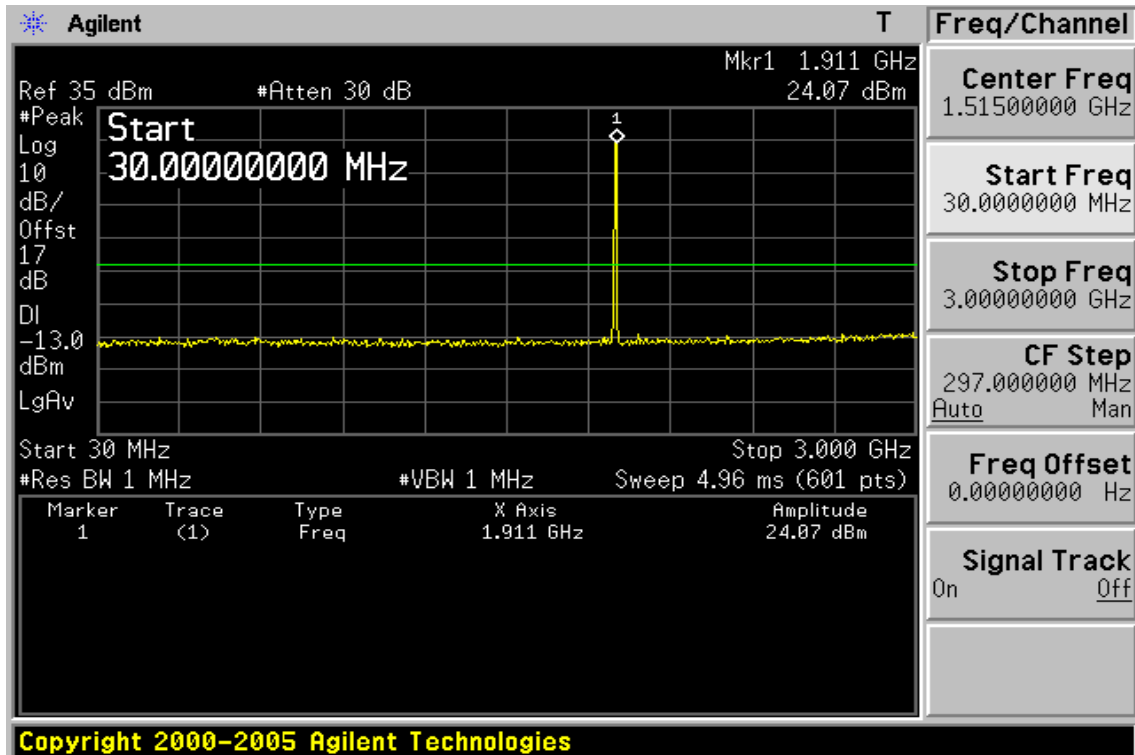
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Figure 10-8: Out of Band emission at antenna terminals –CDMA2000 PCS Channel Highest



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Figure 10-9: Band edge emission at antenna terminals –CDMA2000 PCS Channel Lowest

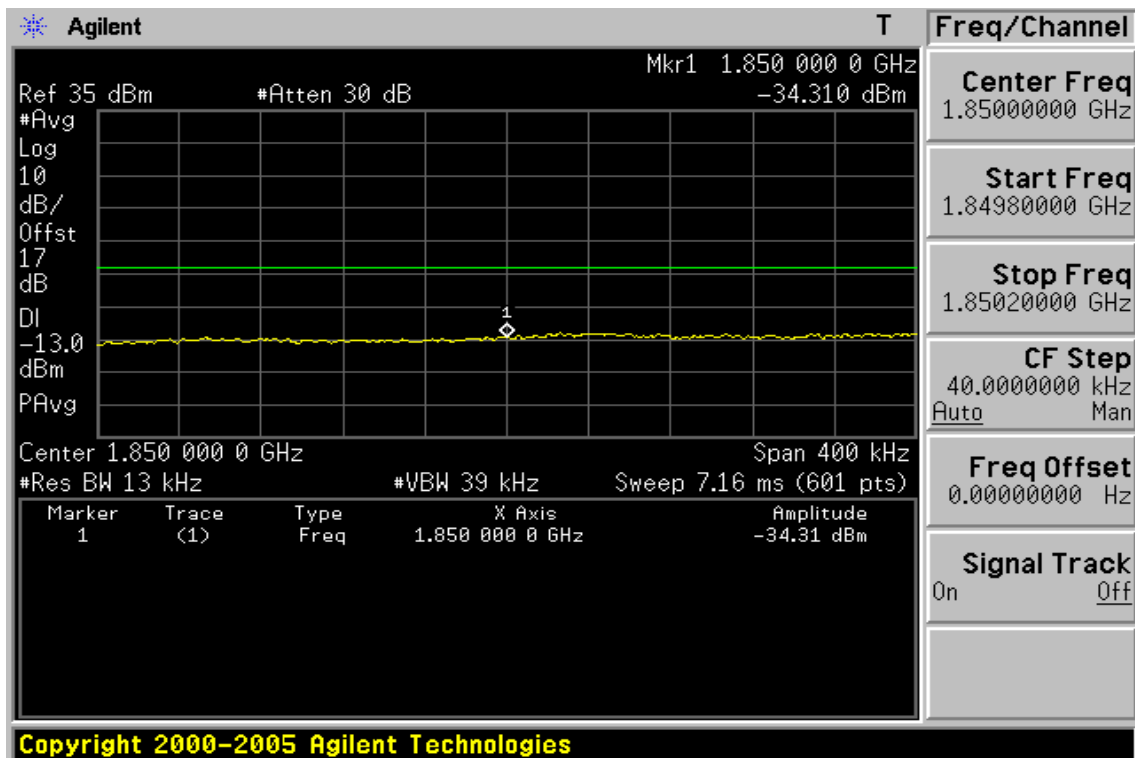
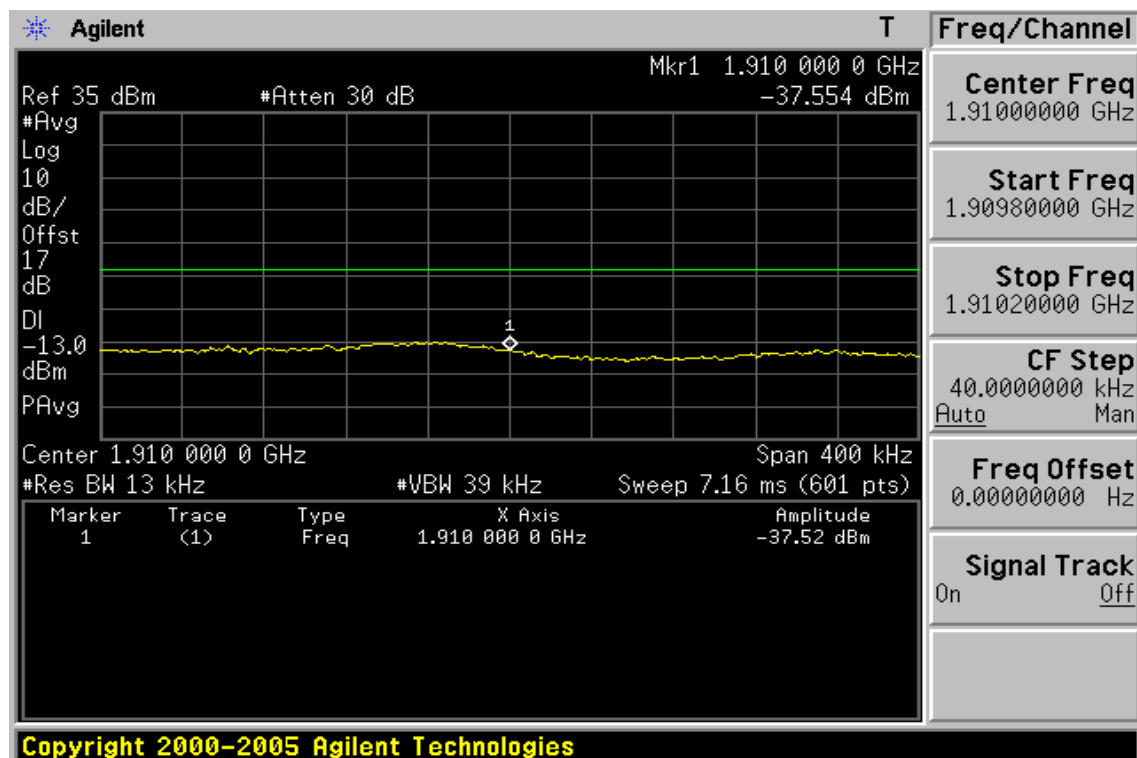


Figure 10-10: Band edge emission at antenna terminals –CDMA2000 PCS Channel Highest



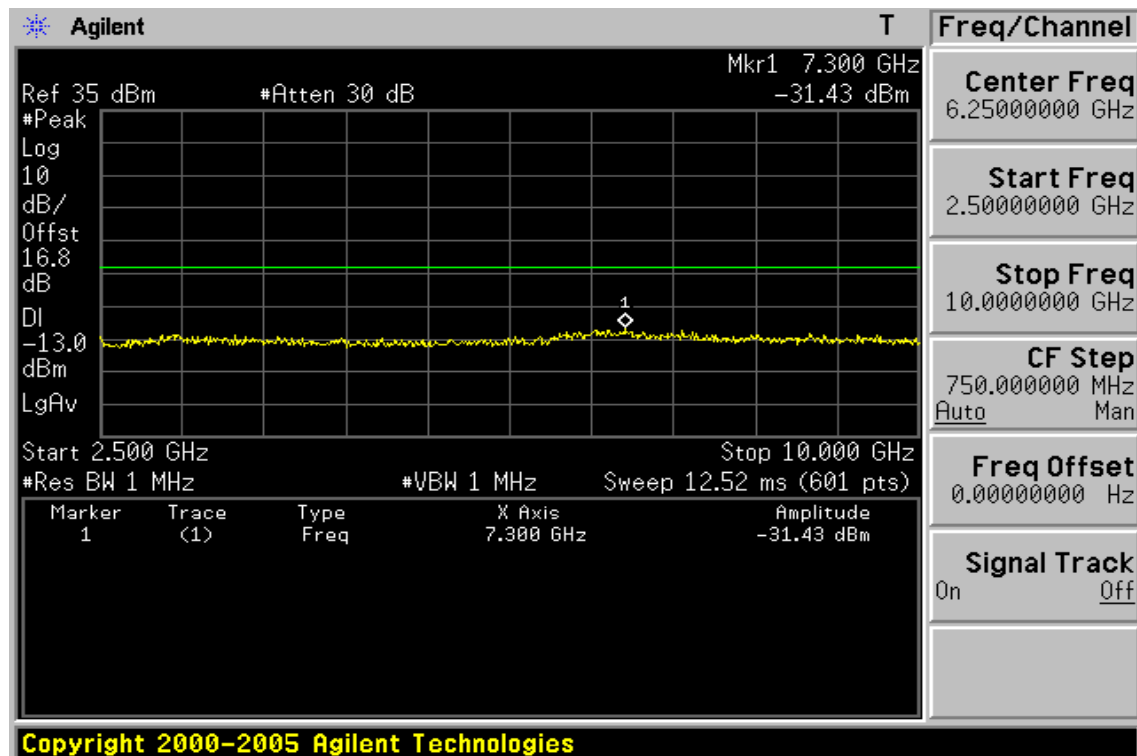
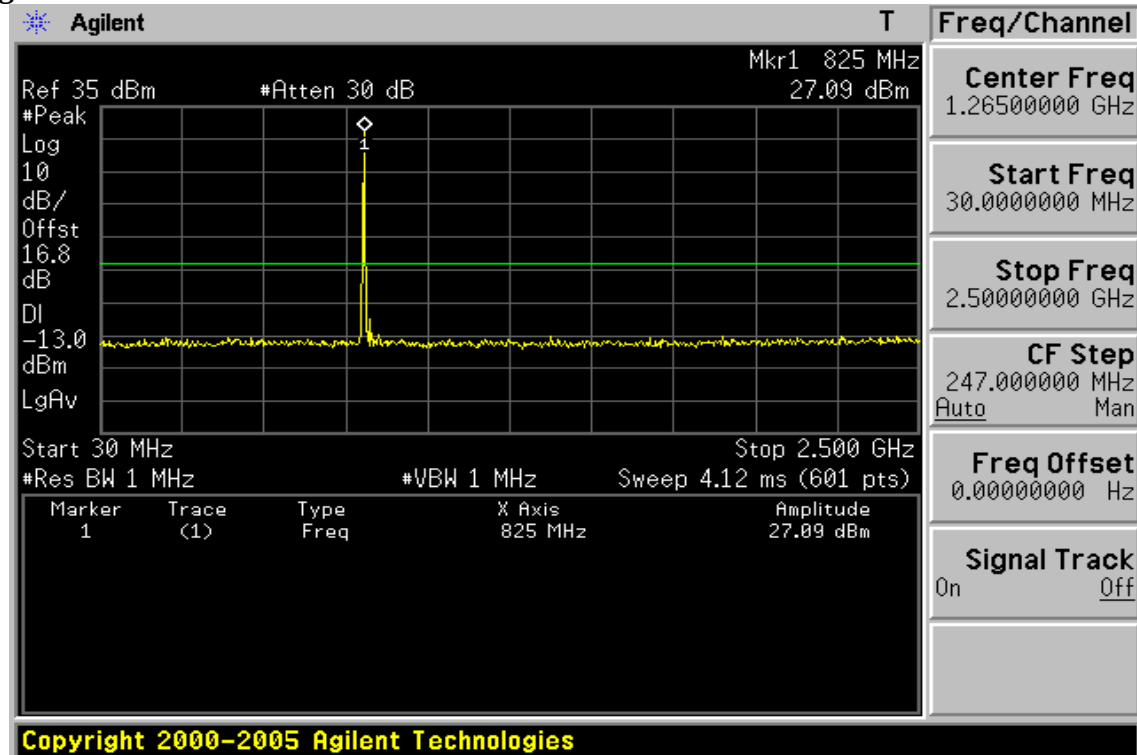
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Figure 10-11: Out of Band emission at antenna terminals–EVDO Cellular Channel Lowest



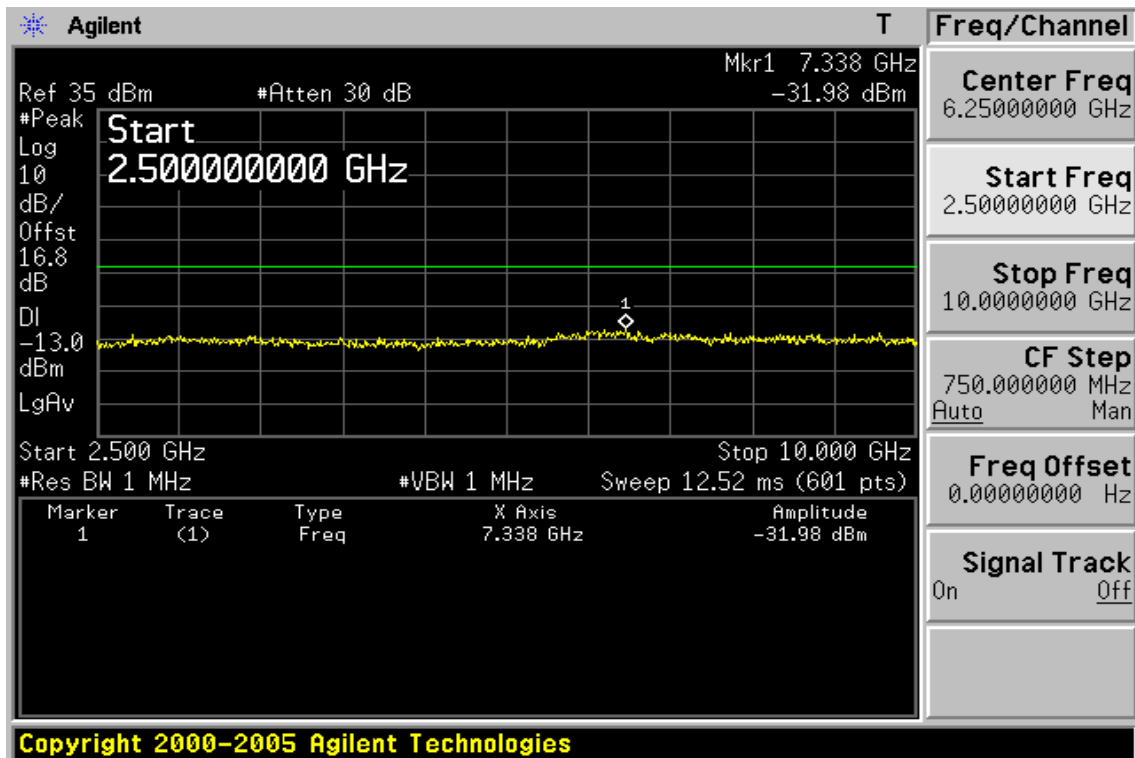
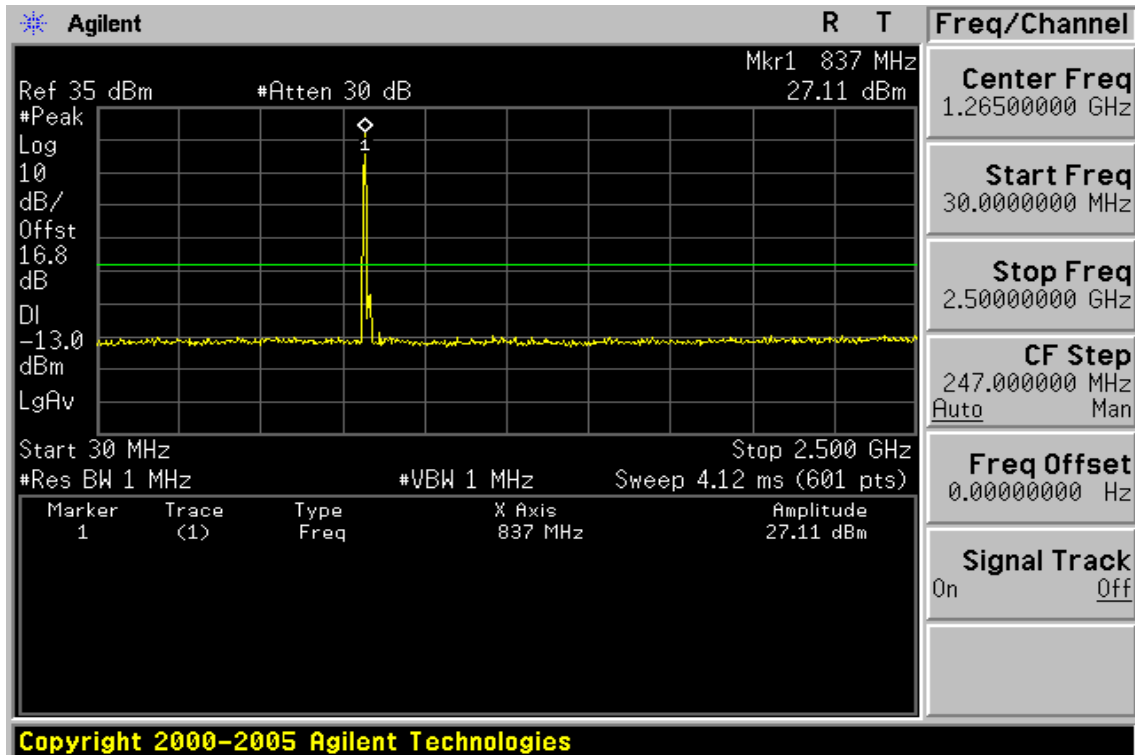
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Figure 10-12: Out of Band emission at antenna terminals –EVDO Cellular Channel Mid



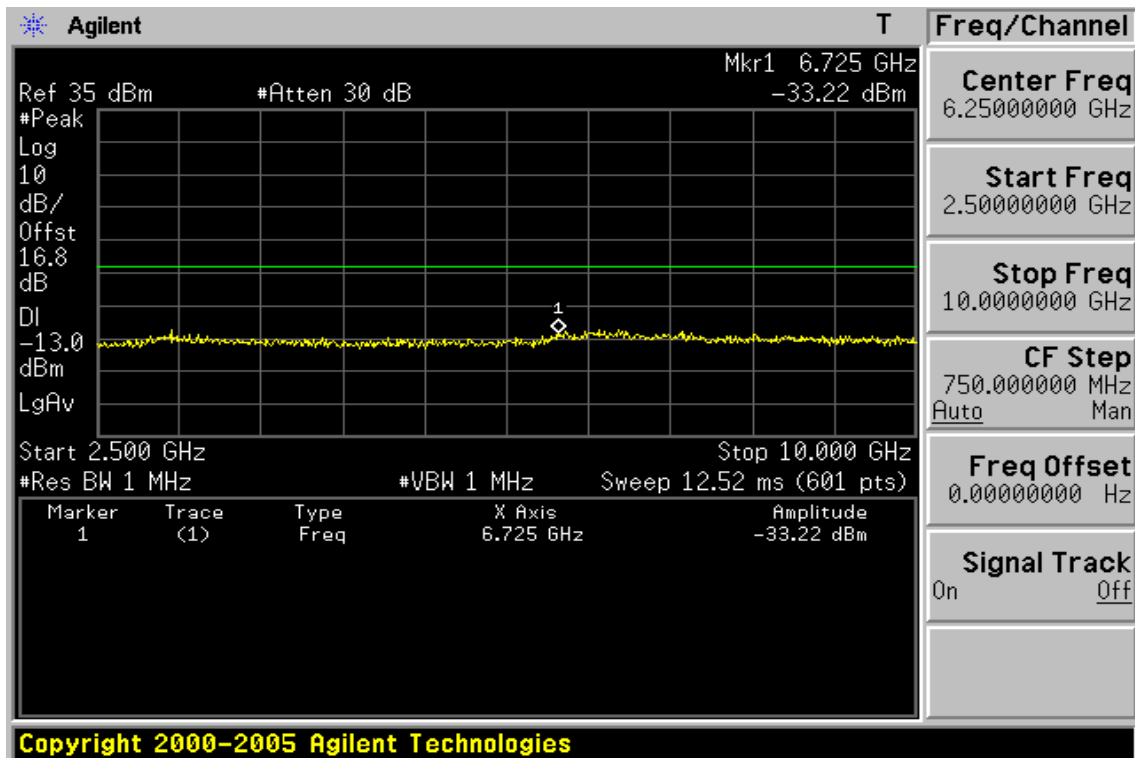
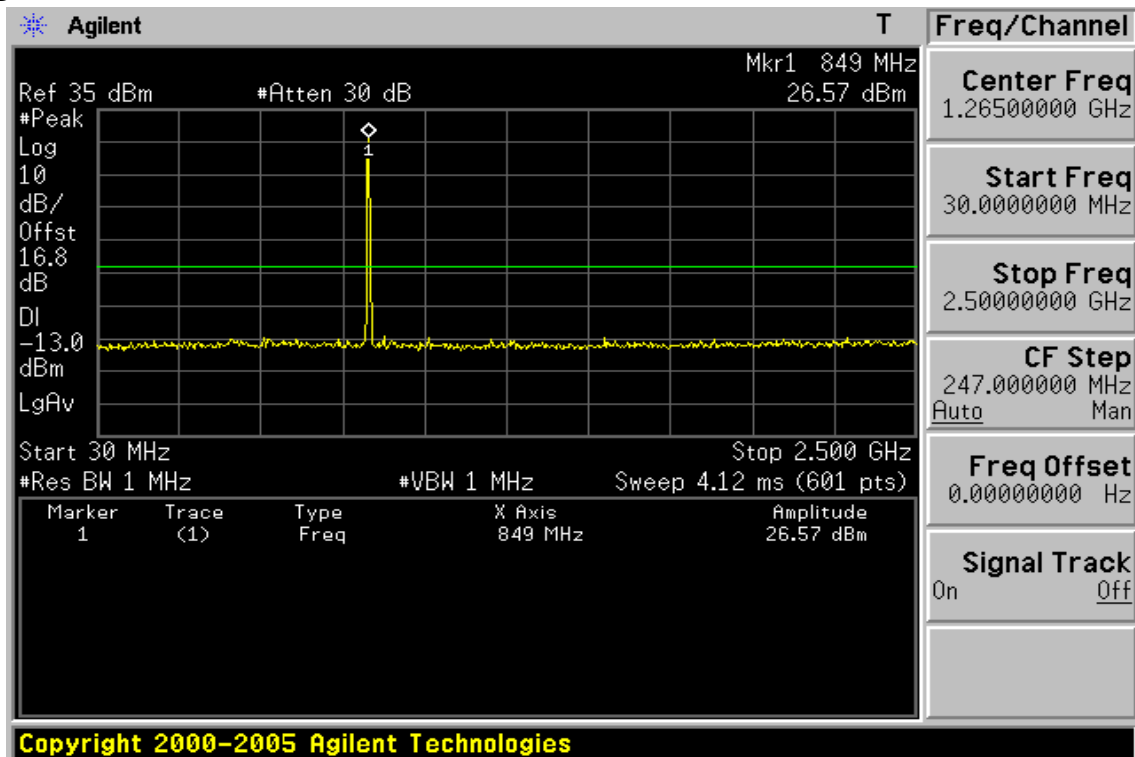
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Figure 10-13: Out of Band emission at antenna terminals–EVDO Cellular Channel Highest



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Figure 10-14: Band edge emission at antenna terminals –EVDO Cellular Channel Lowest

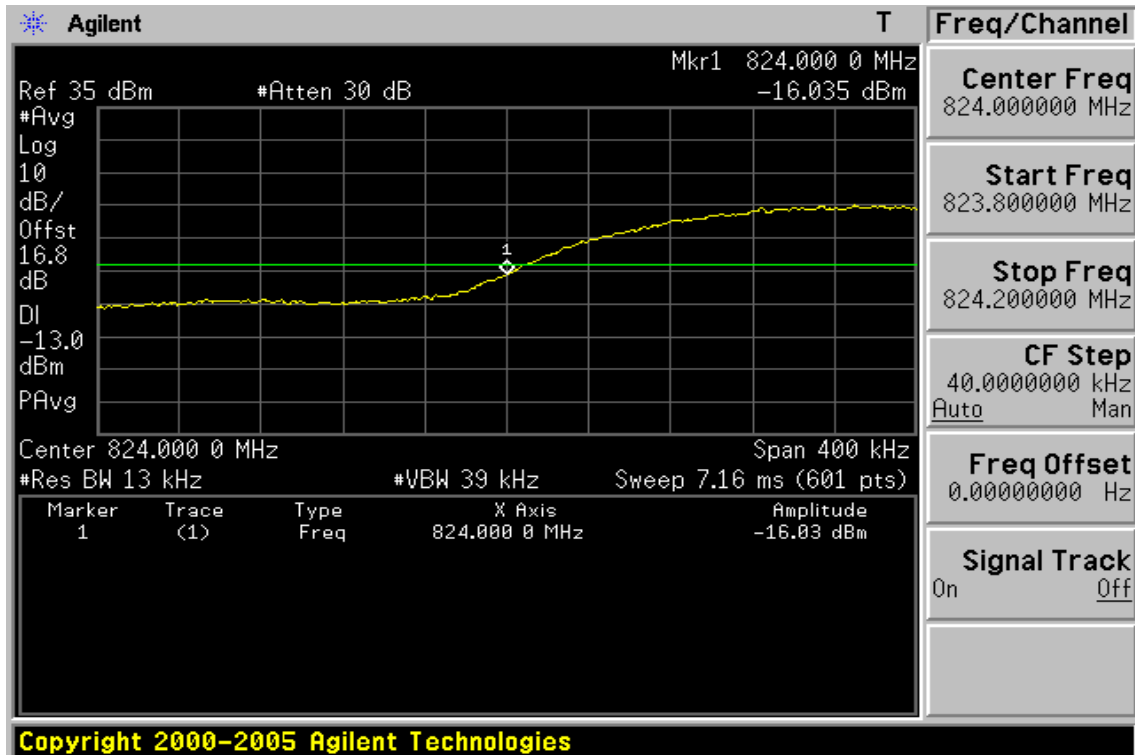
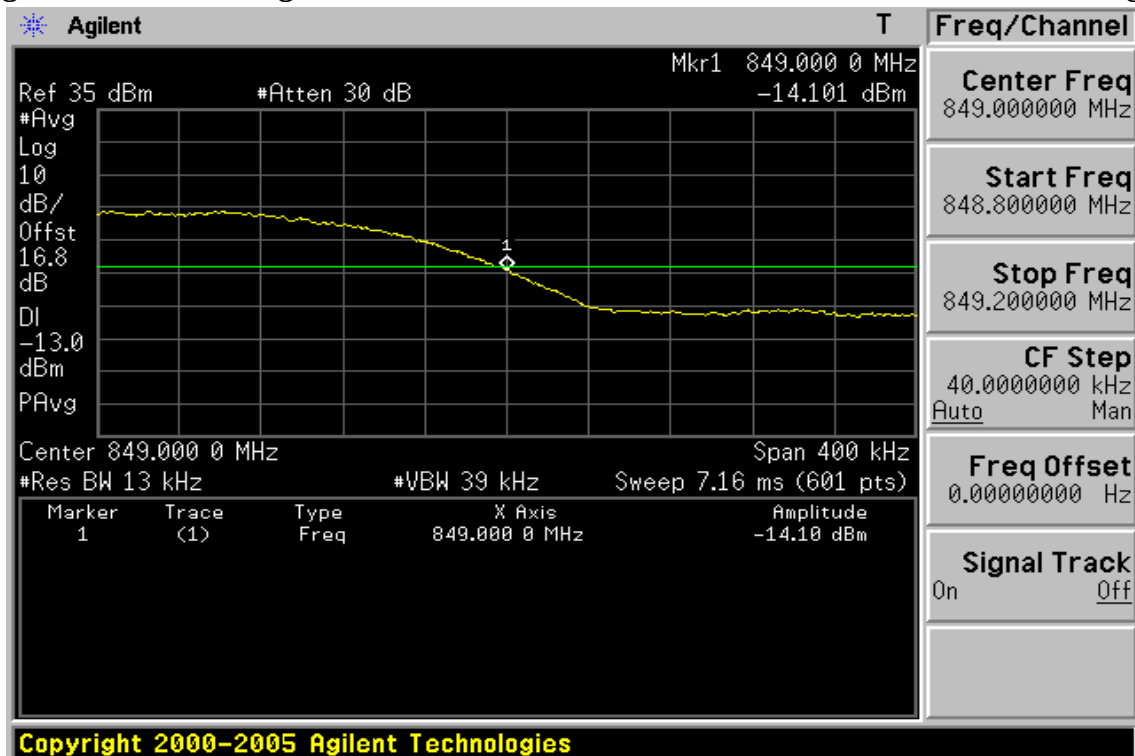


Figure 10-15: Band edge emission at antenna terminals –EVDO Cellular Channel Highest



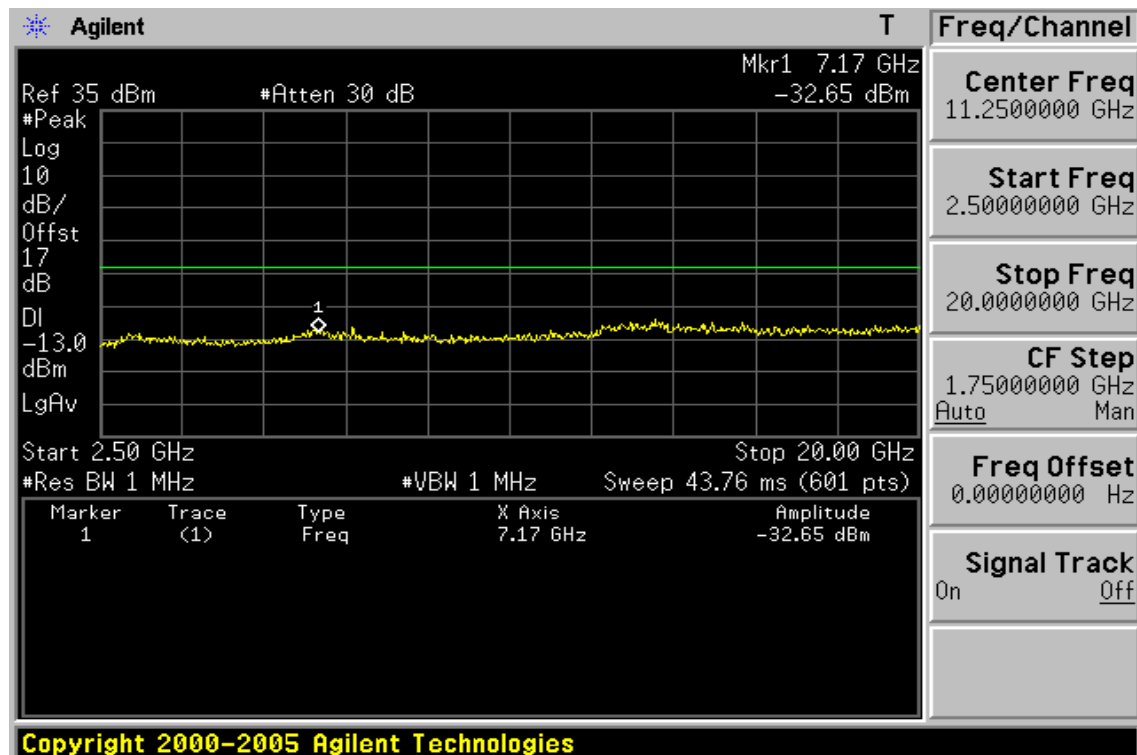
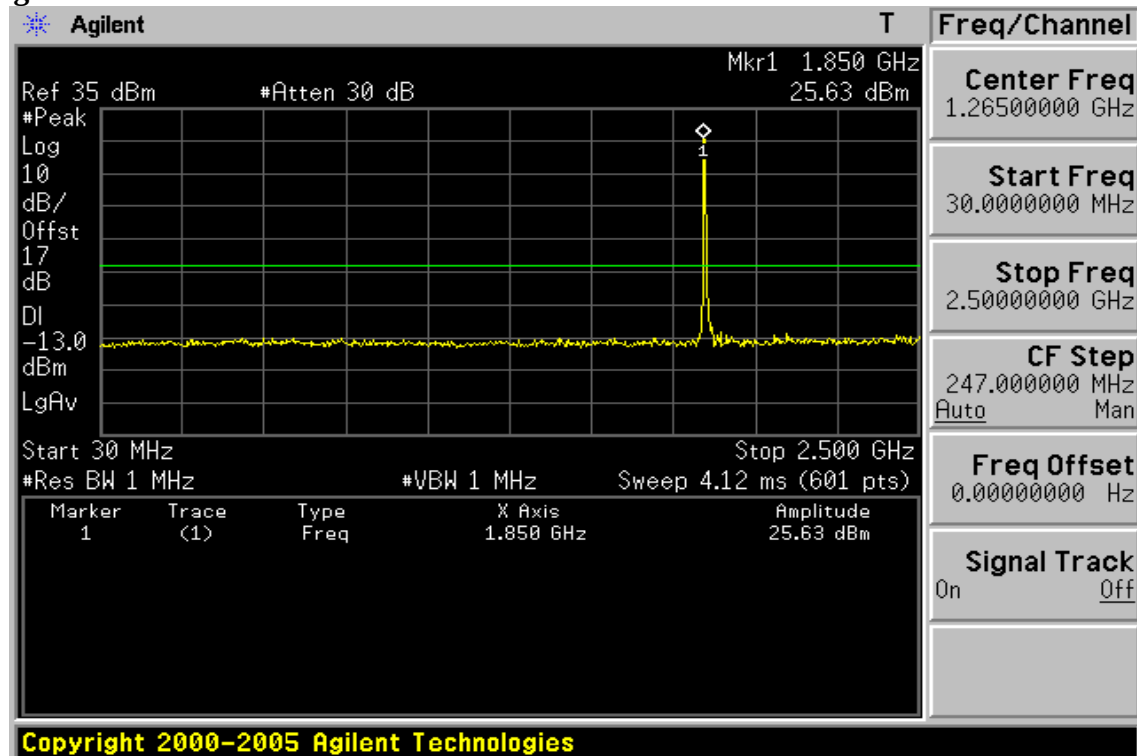
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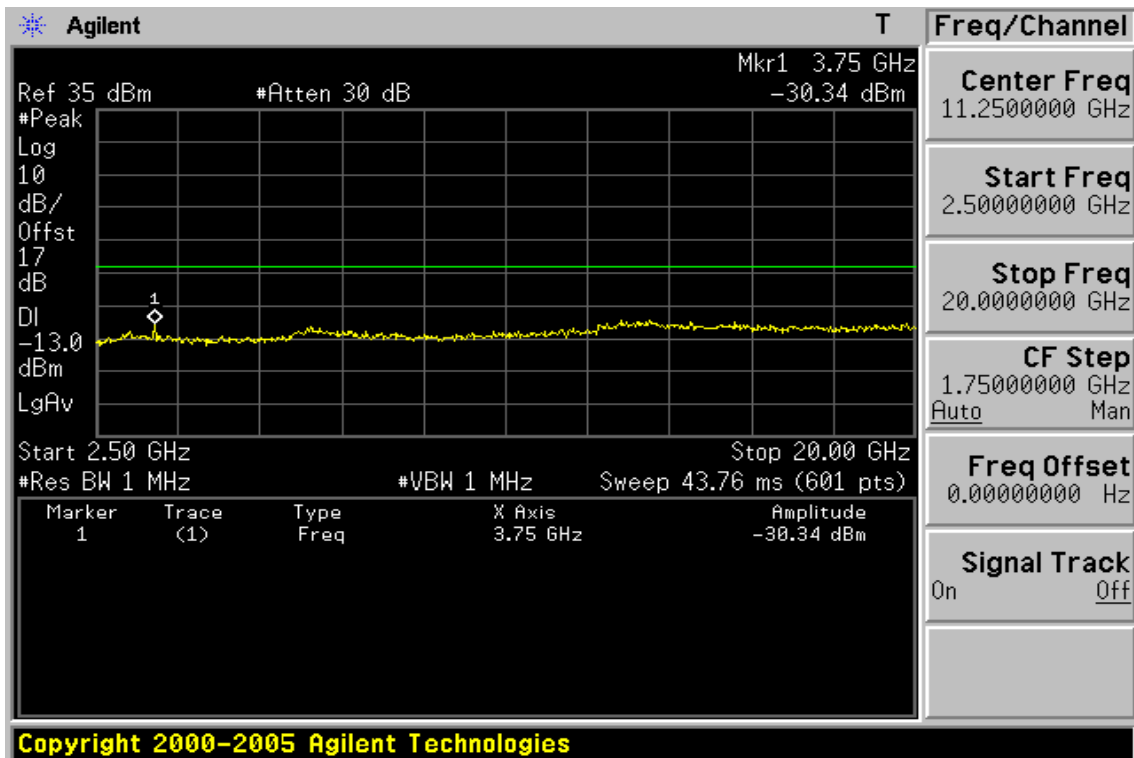
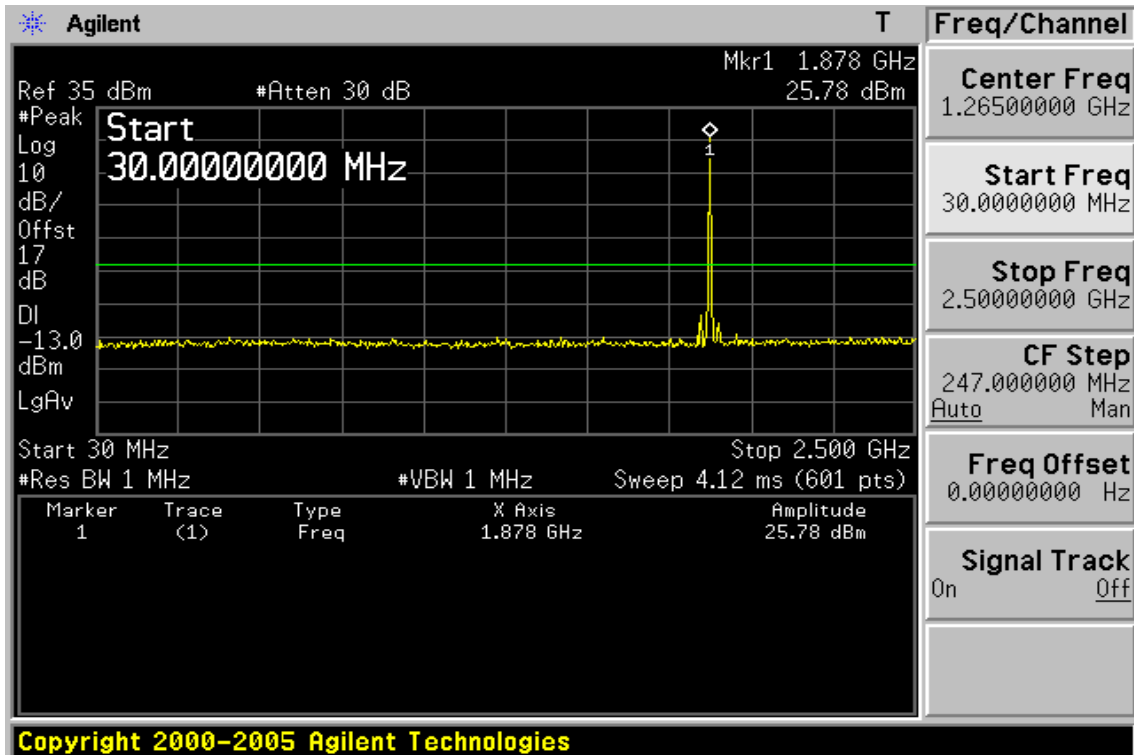
Figure 10-16: Out of Band emission at antenna terminals–EVDO PCS Channel Lowest



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Figure 10-17: Out of Band emission at antenna terminals –EVDO PCS Channel Mid



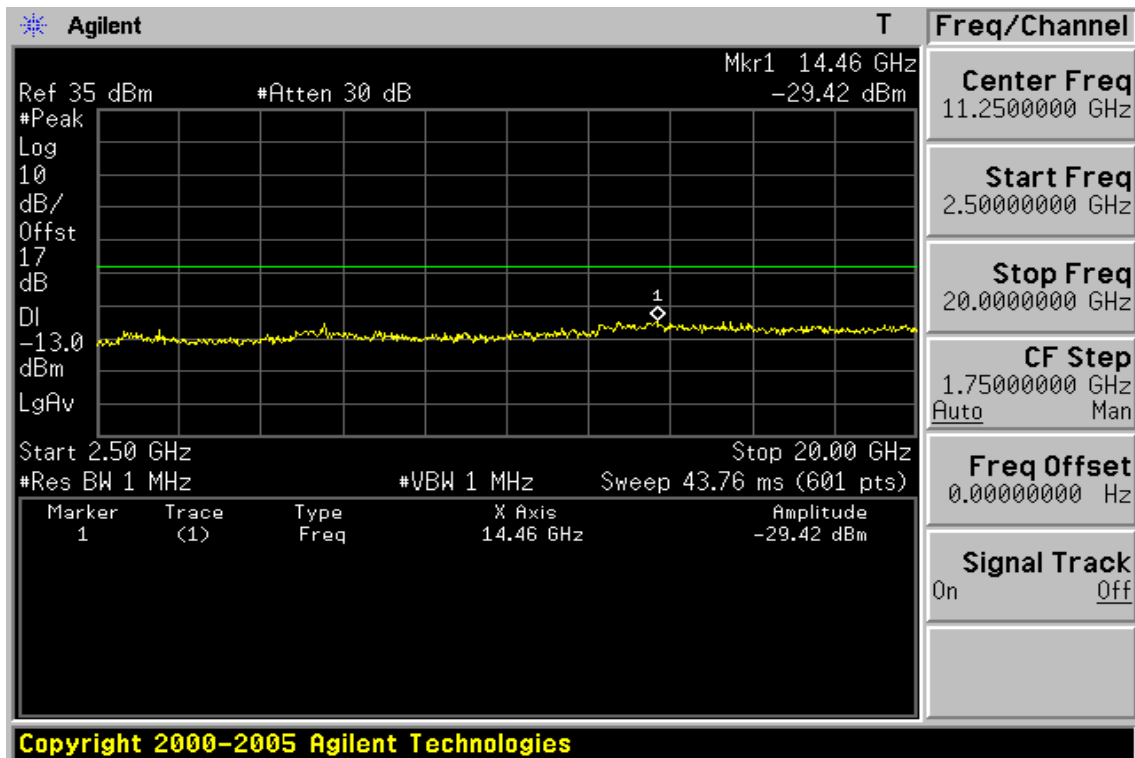
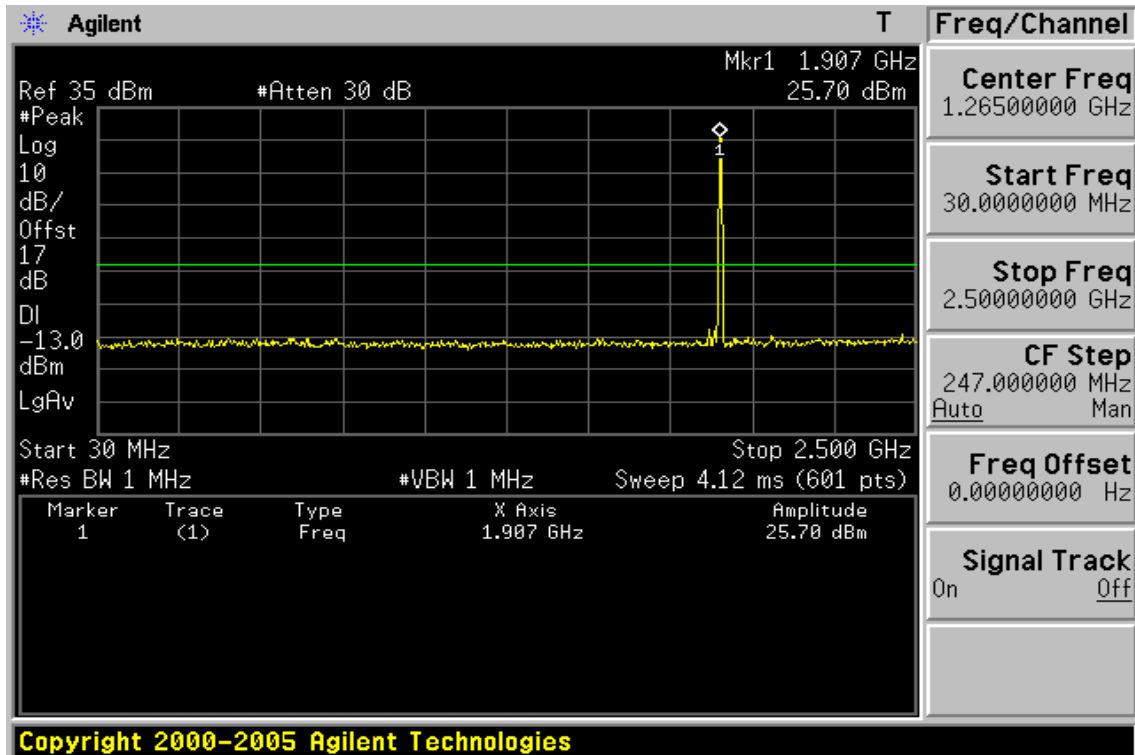
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Figure 10-18: Out of Band emission at antenna terminals–EVDO PCS Channel Highest



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Figure 10-19: Band edge emission at antenna terminals –EVDO PCS Channel Lowest

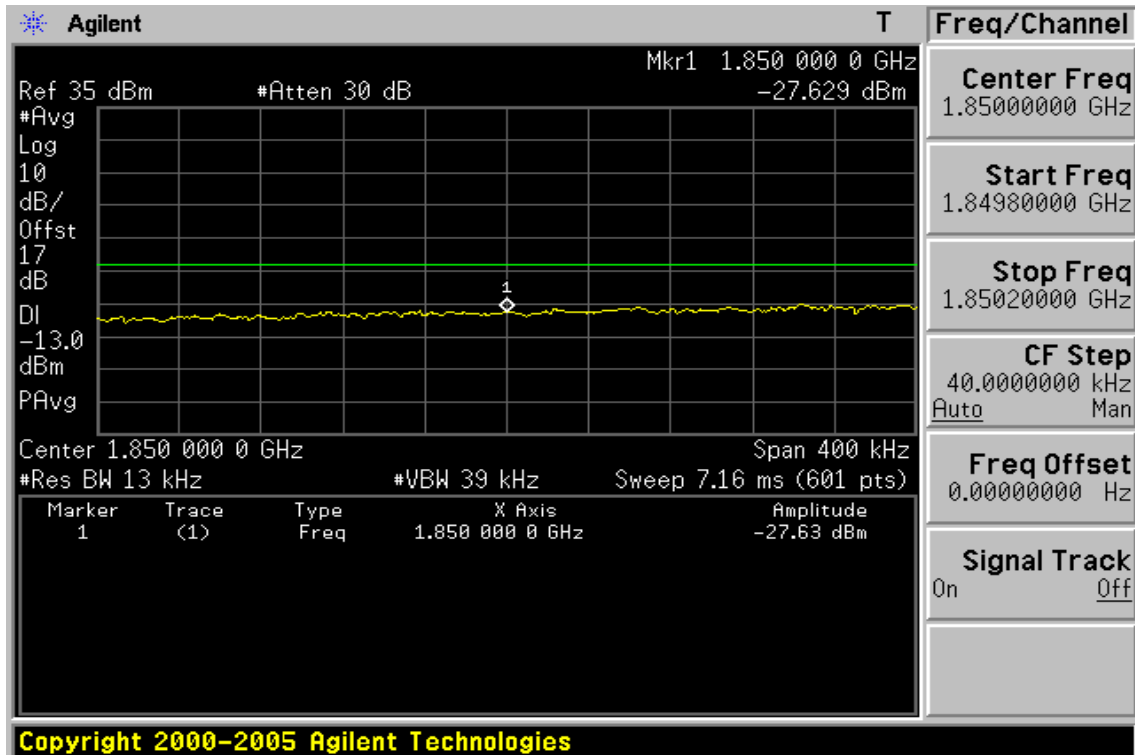
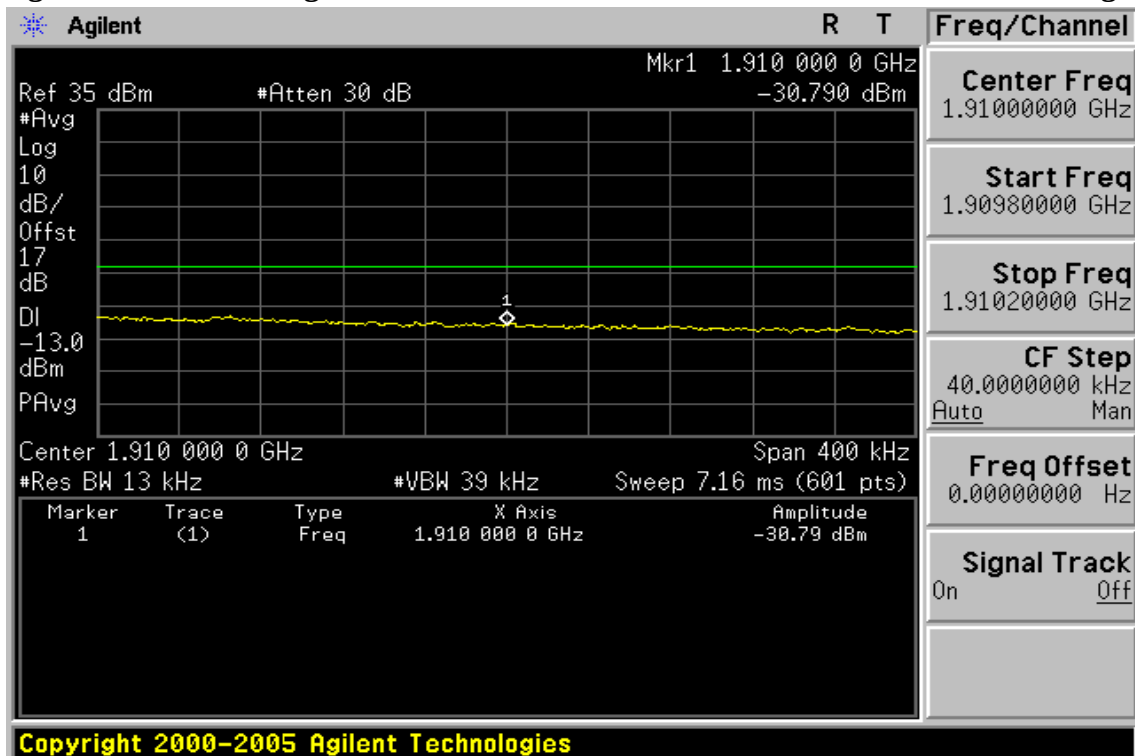


Figure 10-20: Band edge emission at antenna terminals –EVDO PCS Channel Highest



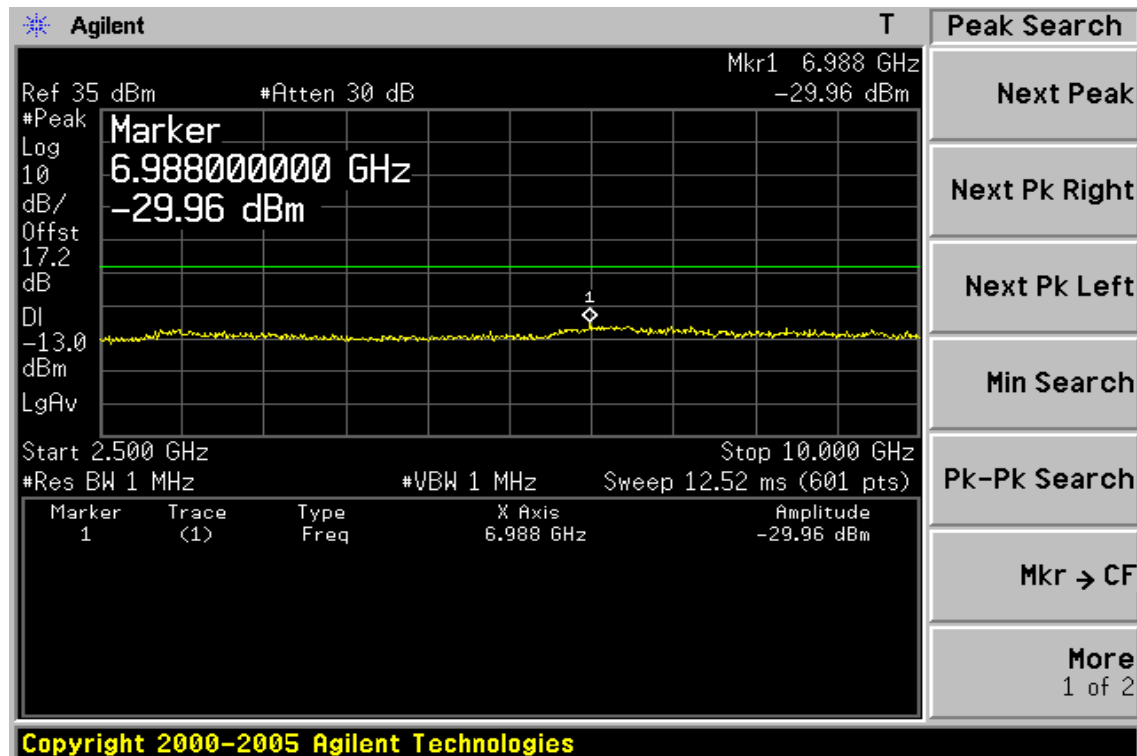
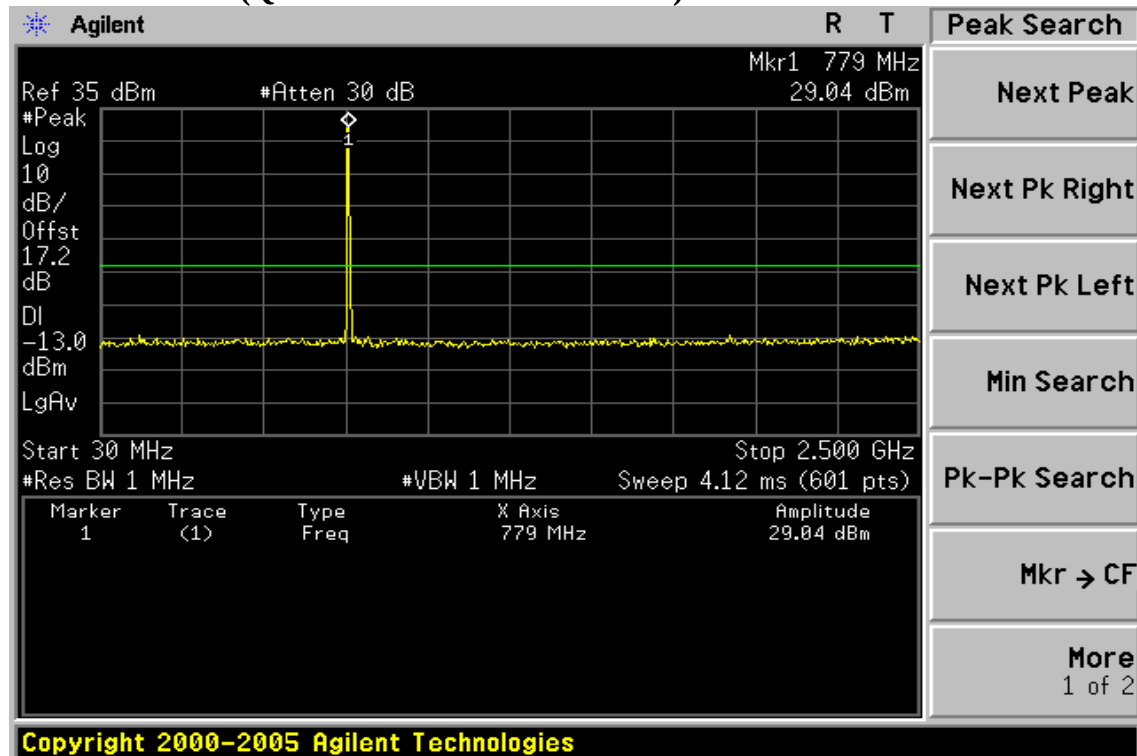
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**Figure 10-21: Out of Band emission at antenna terminals–5MHz BW LTE-Band 13
(QPSK RB Number: 1 Offset: 0) Channel Lowest**



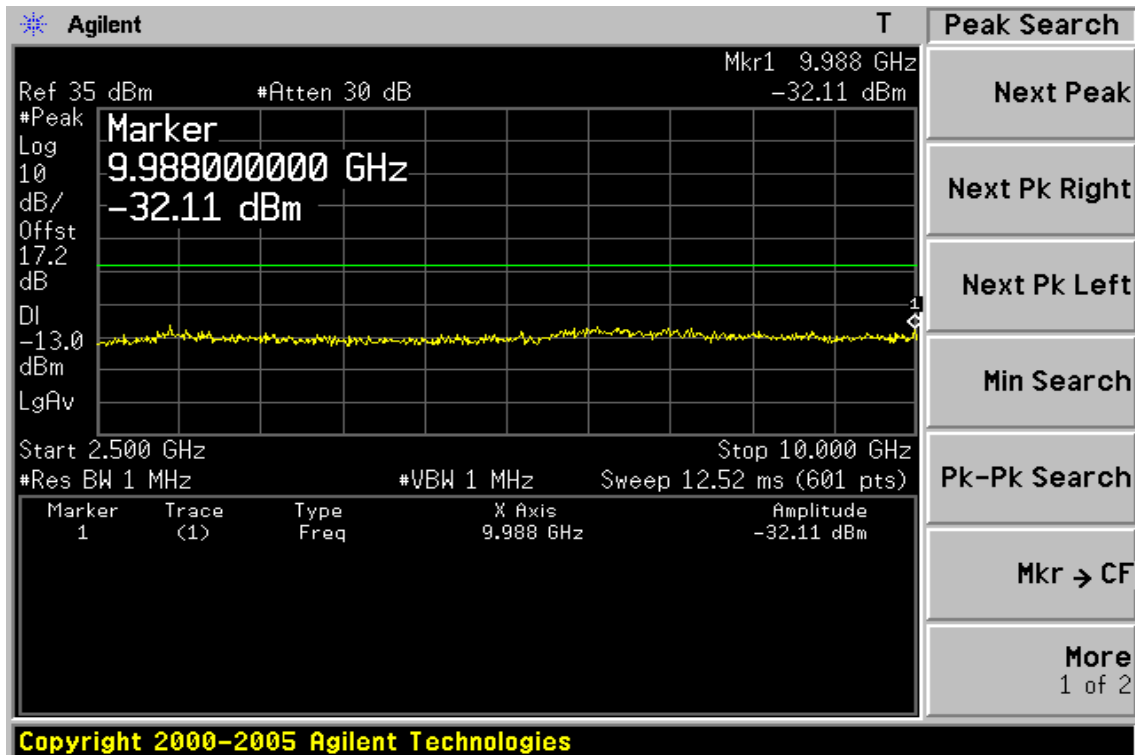
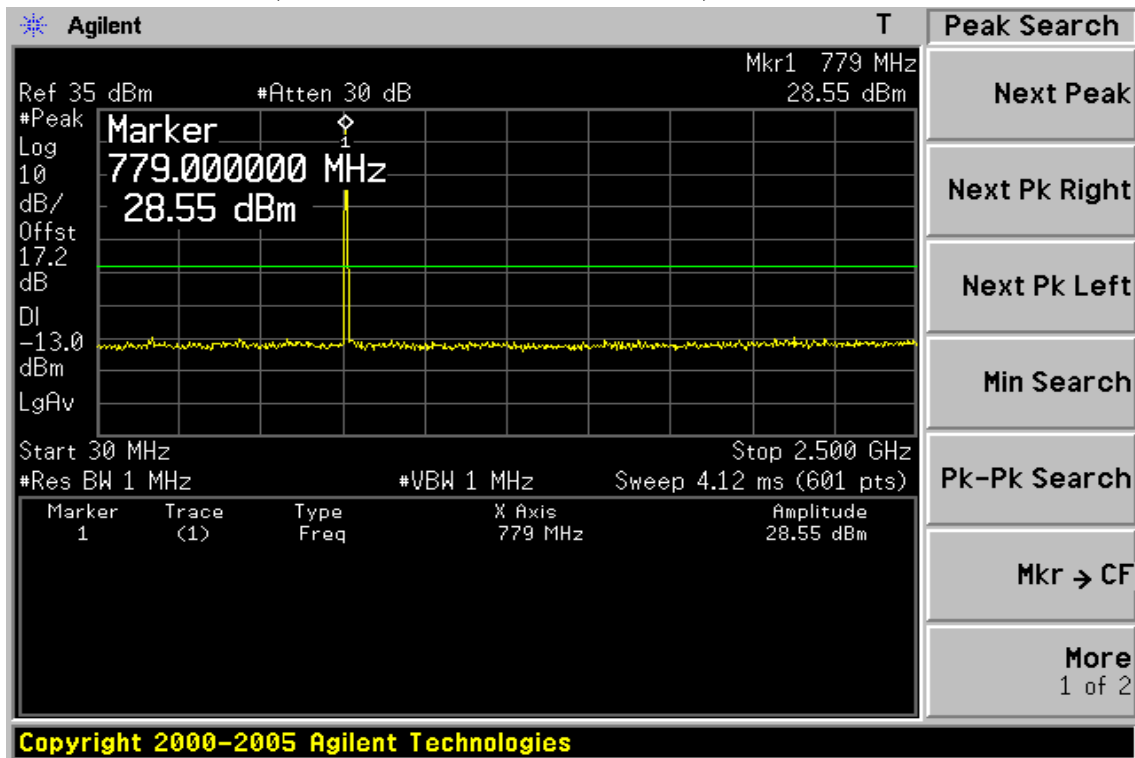
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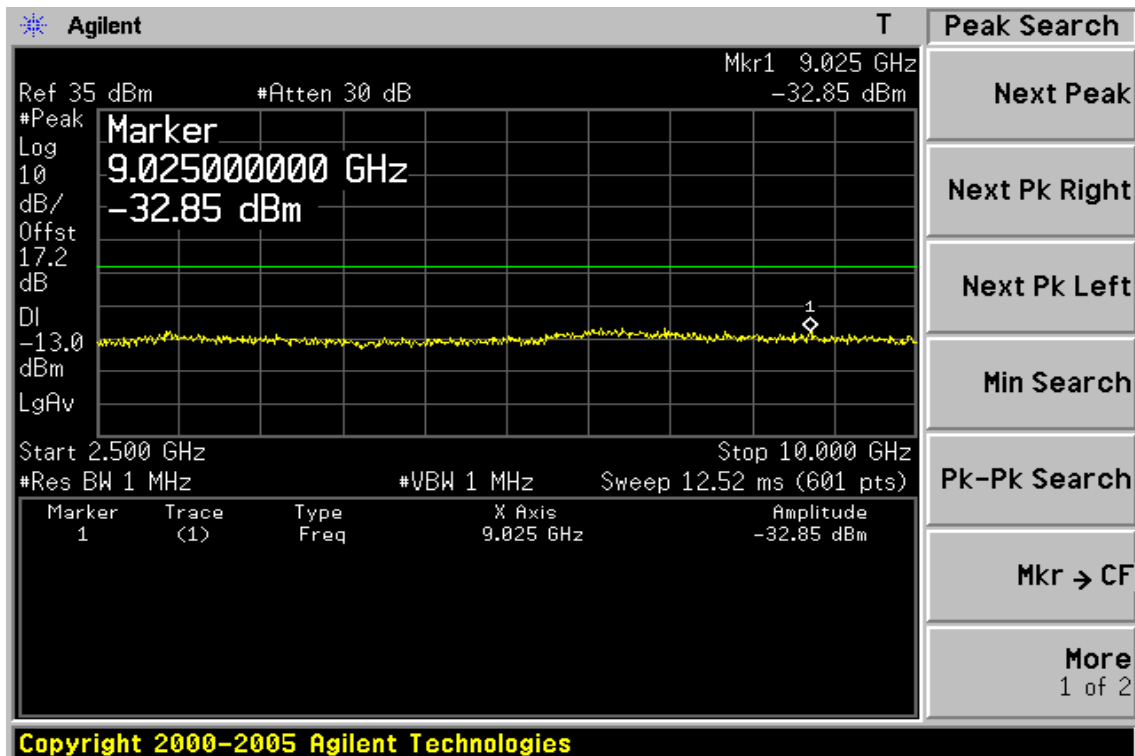
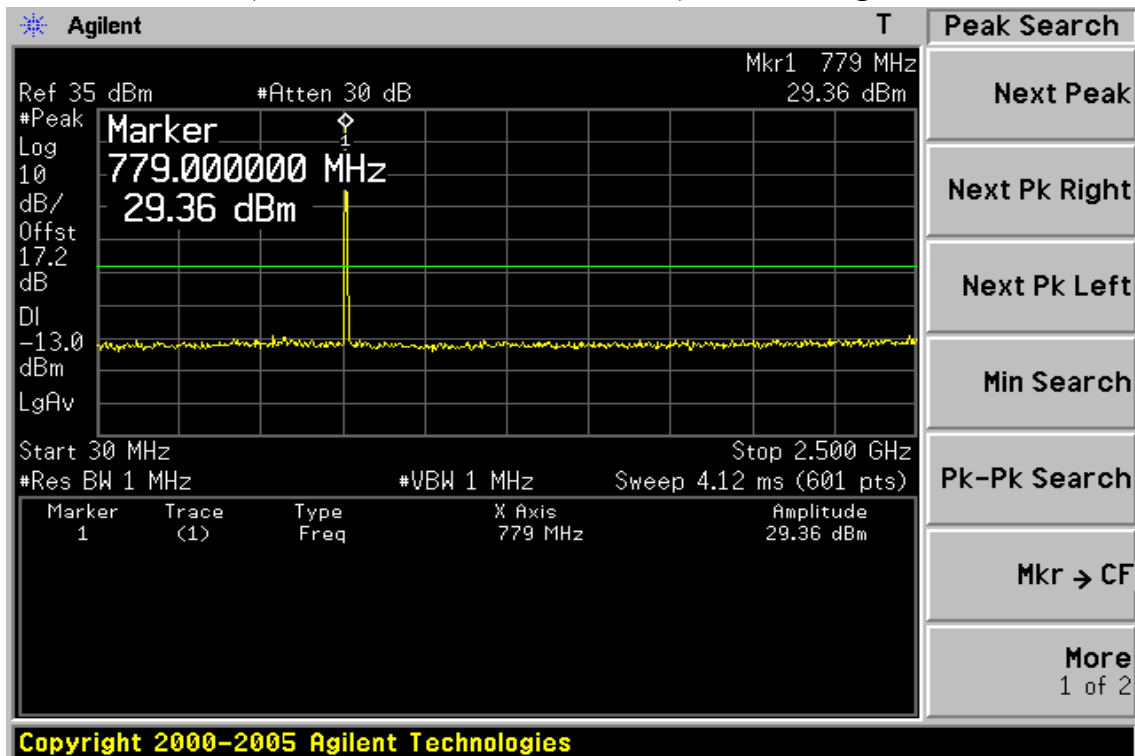
**Figure 10-22: Out of Band emission at antenna terminals –5MHz BW LTE-Band 13
(QPSK RB Number: 1 Offset: 0) Channel Mid**



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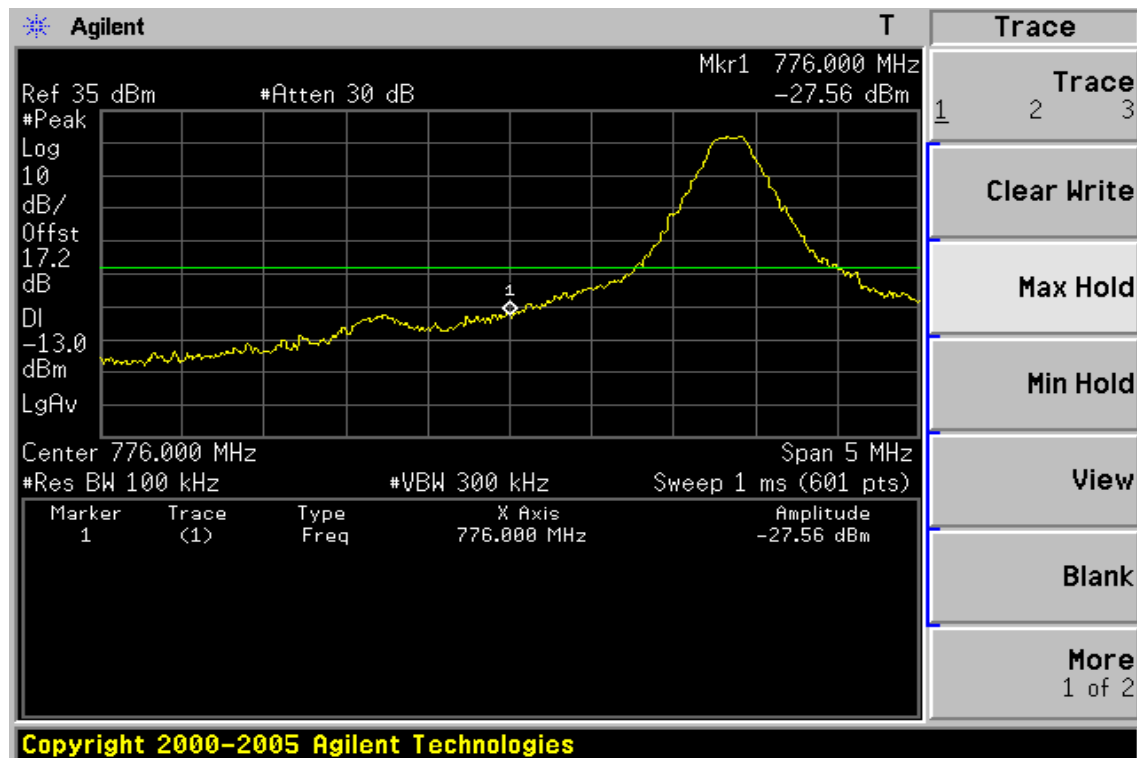
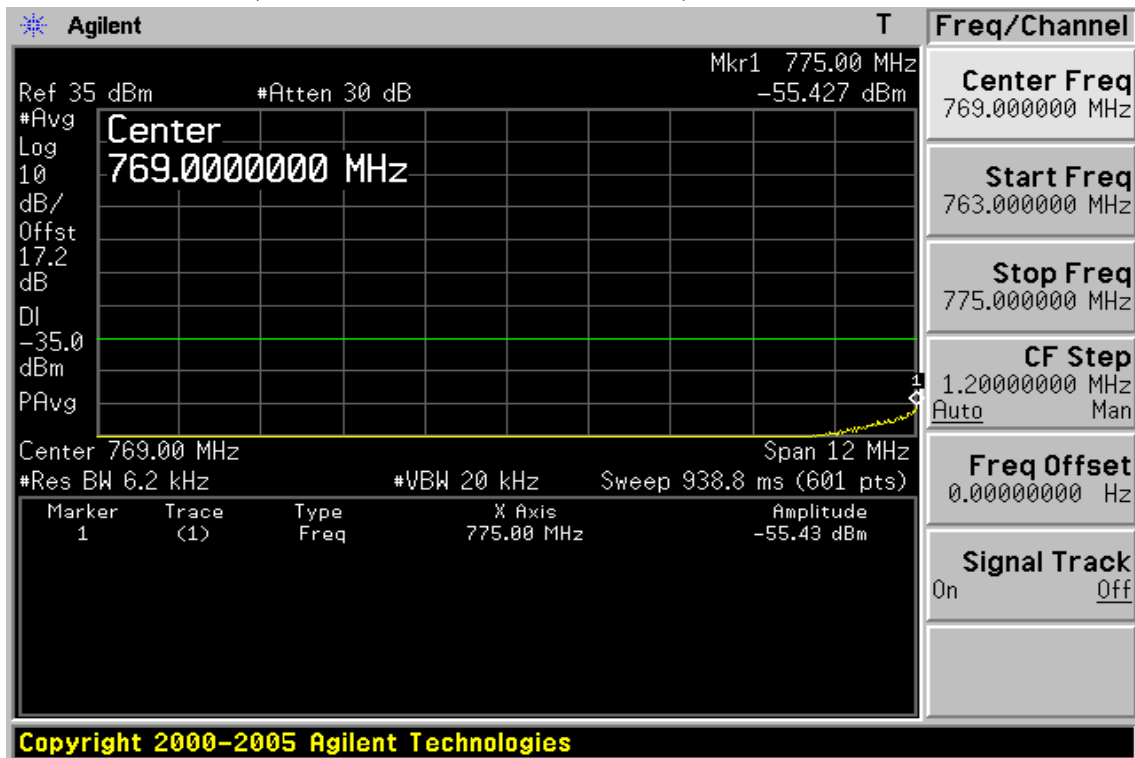
**Figure 10-23: Out of Band emission at antenna terminals–5MHz BW LTE-Band 13
(QPSK RB Number: 1 Offset: 0) Channel Highest**



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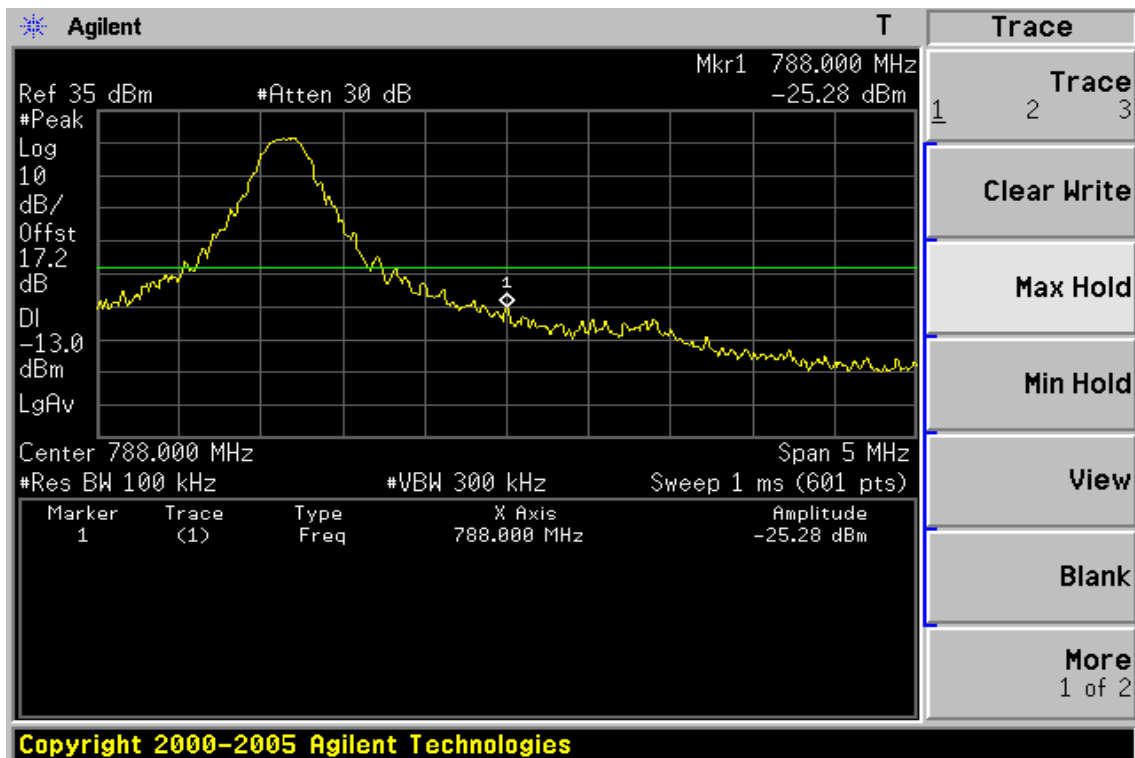
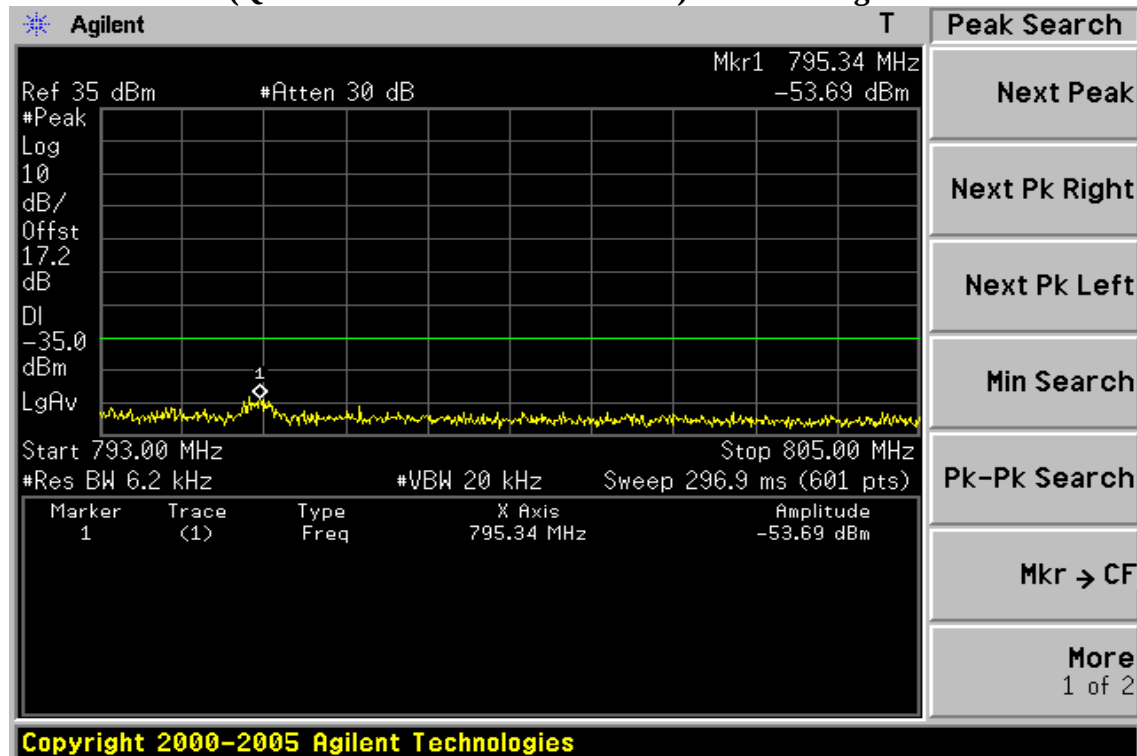
**Figure 10-24: Band edge emission at antenna terminals –5MHz BW LTE-Band 13
(QPSK RB Number: 1 Offset: 0) Channel Lowest**



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**Figure 10-25: Band edge emission at antenna terminals –5MHz BW LTE-Band 13
(QPSK RB Number: 1 Offset: 24) Channel Highest**



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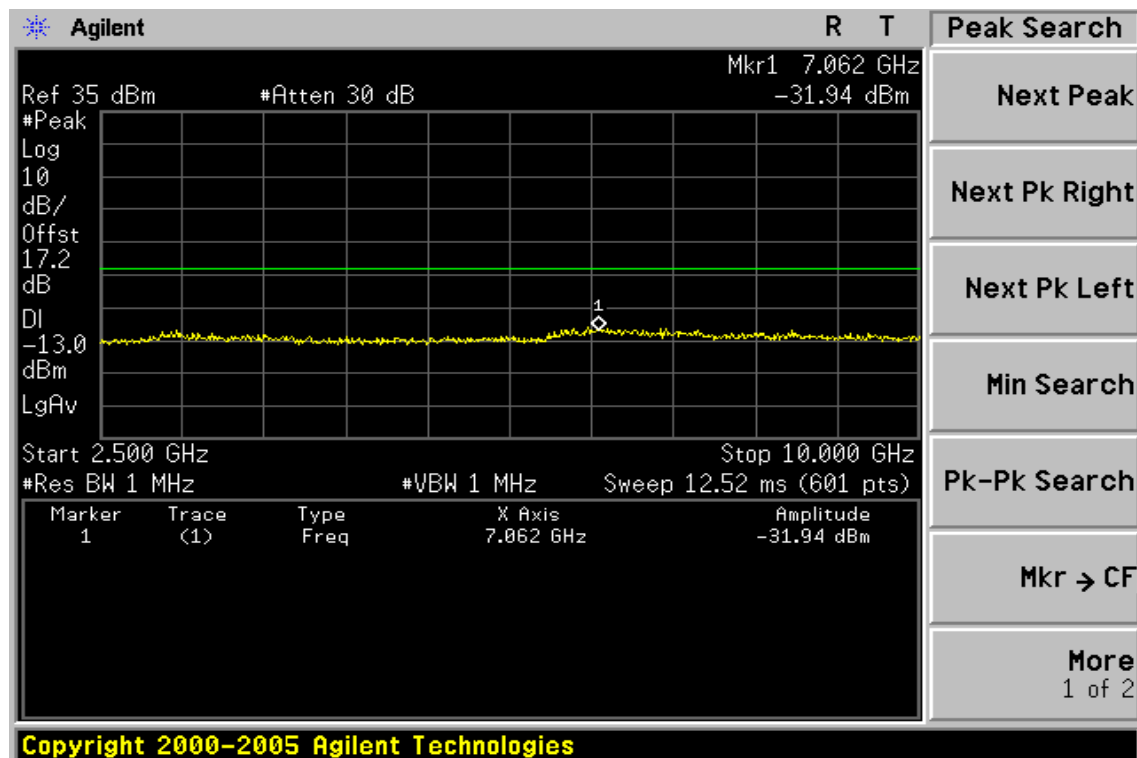
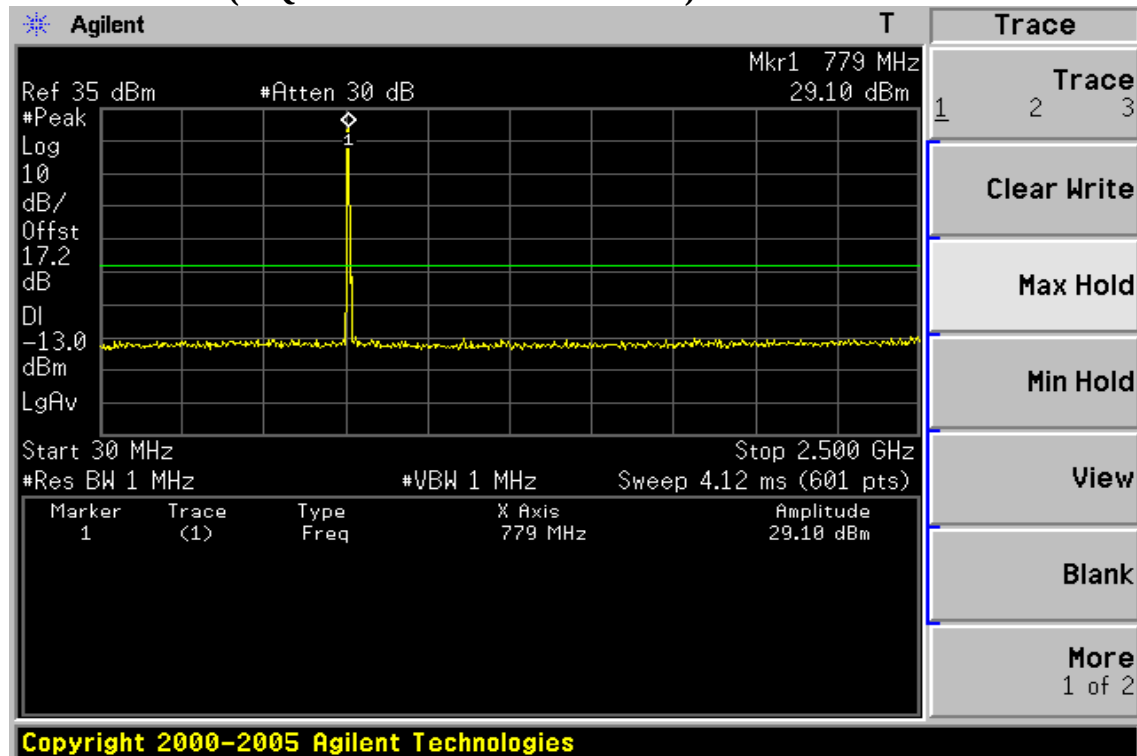
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**Figure 10-26: Out of Band emission at antenna terminals–5MHz BW LTE-Band 13
(16QAM RB Number: 1 Offset: 0) Channel Lowest**



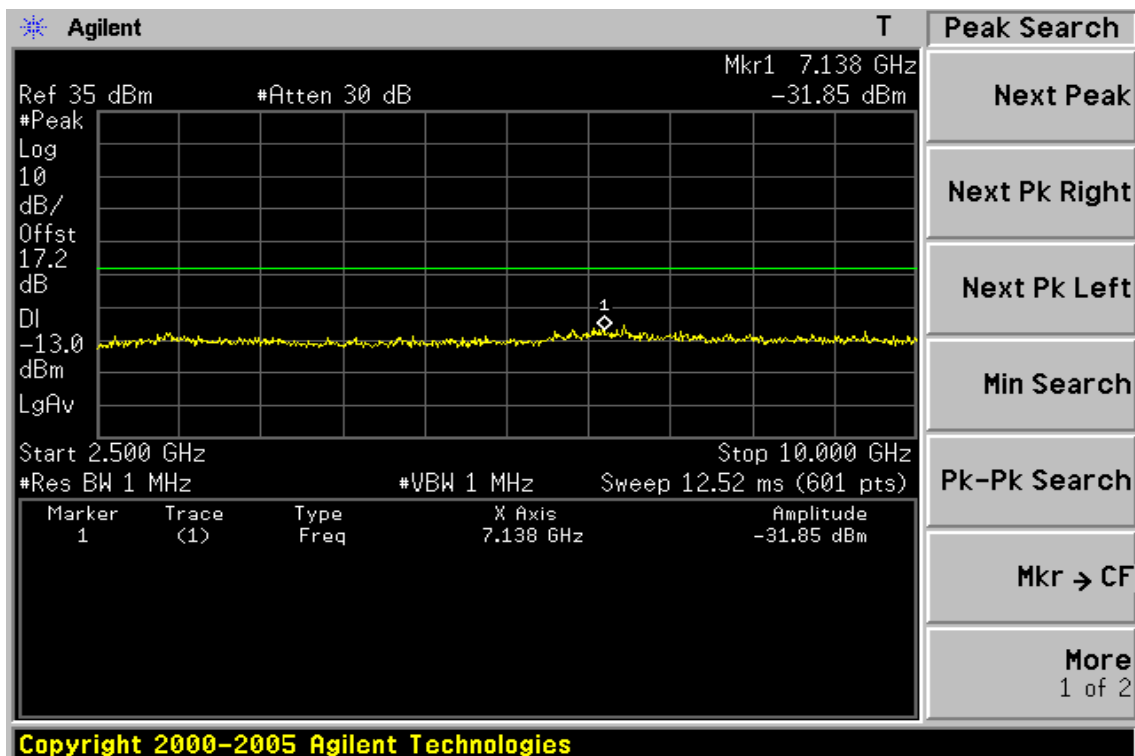
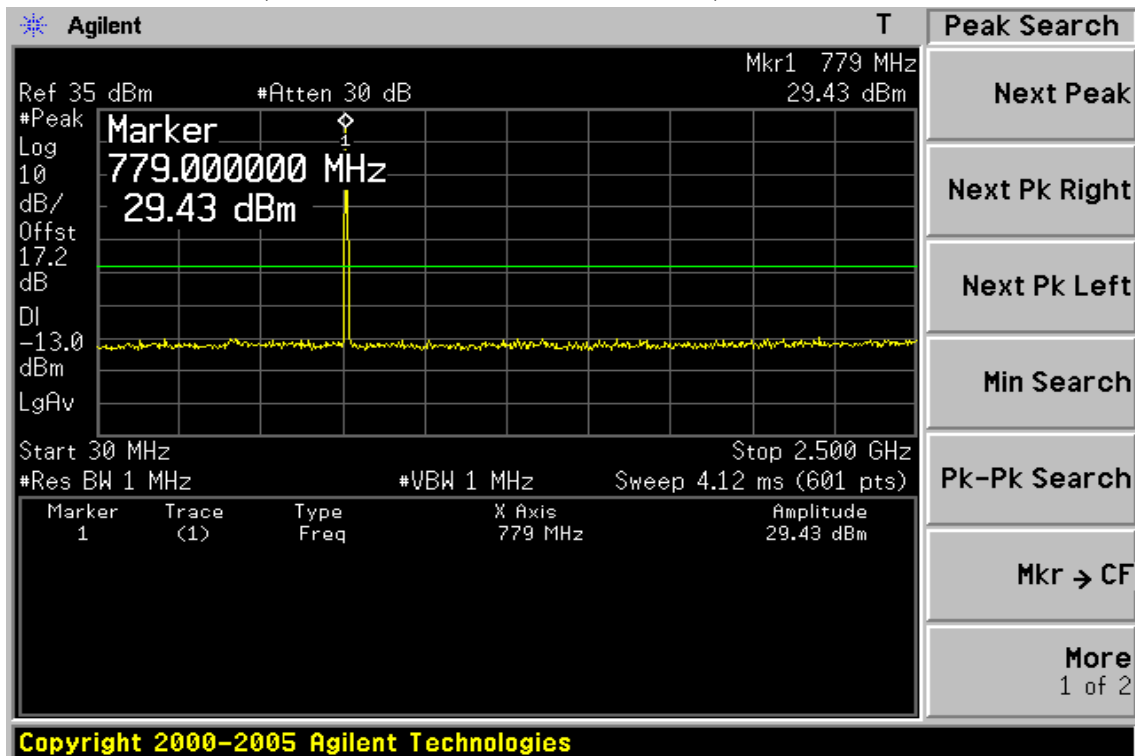
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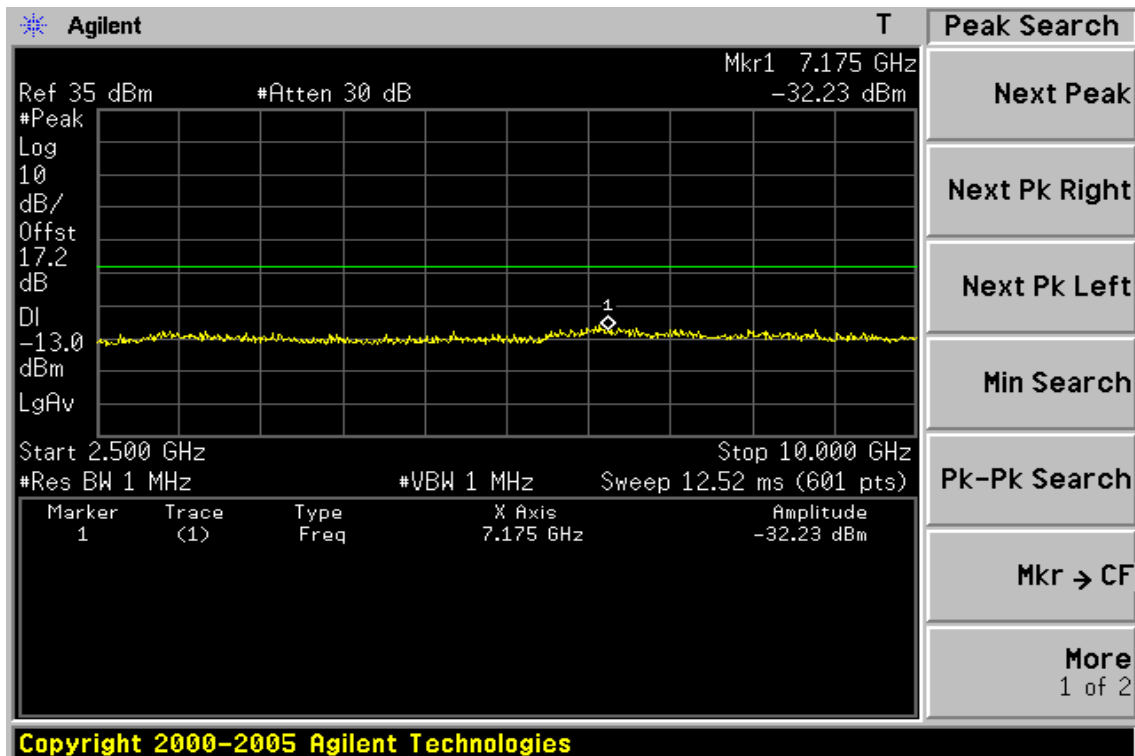
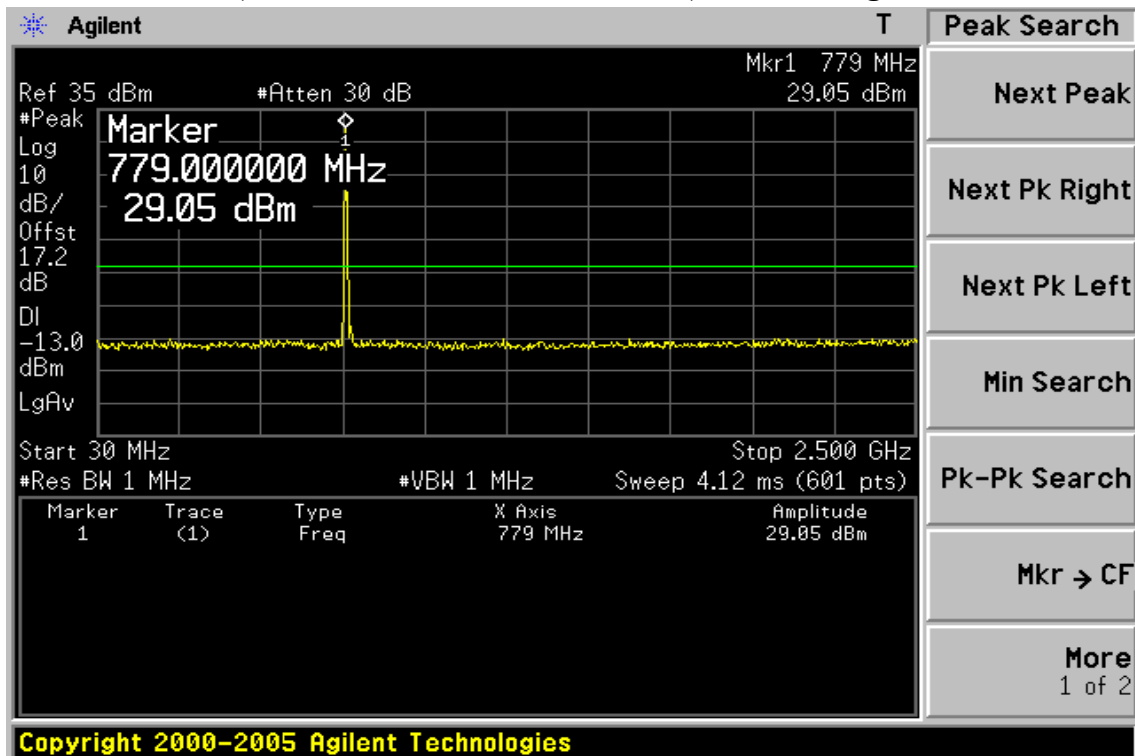
**Figure 10-27: Out of Band emission at antenna terminals –5MHz BW LTE-Band 13
(16QAM RB Number: 1 Offset: 0) Channel Mid**



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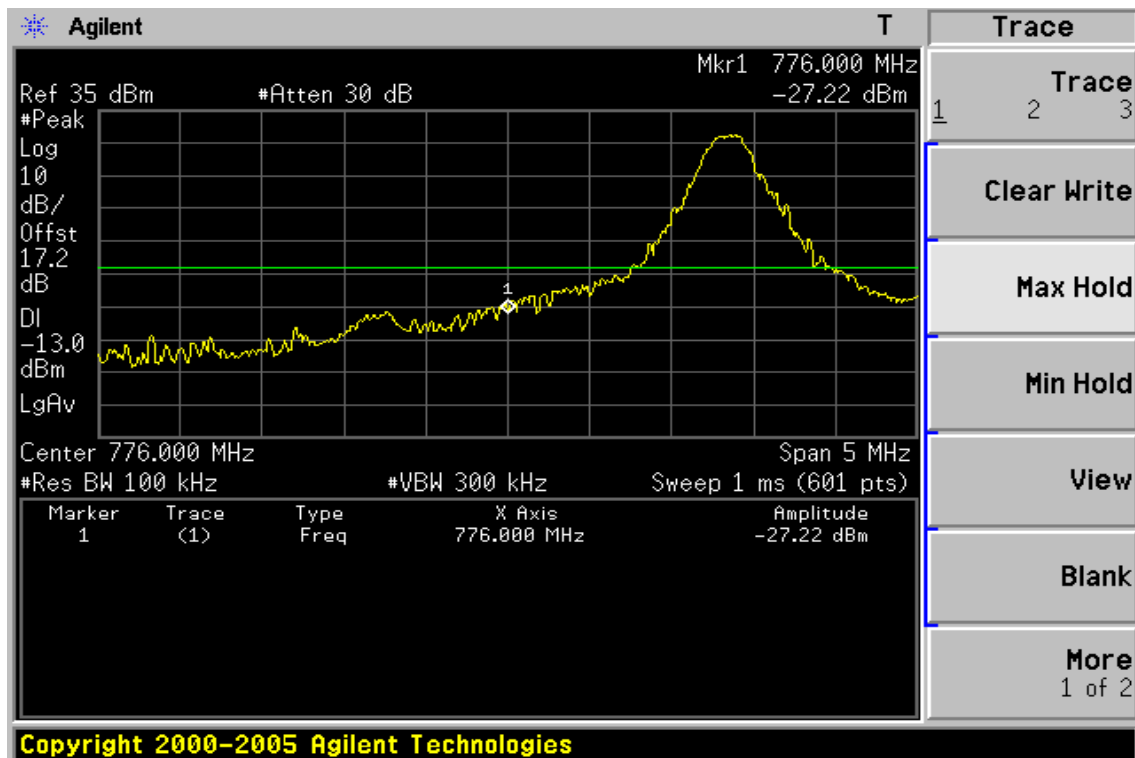
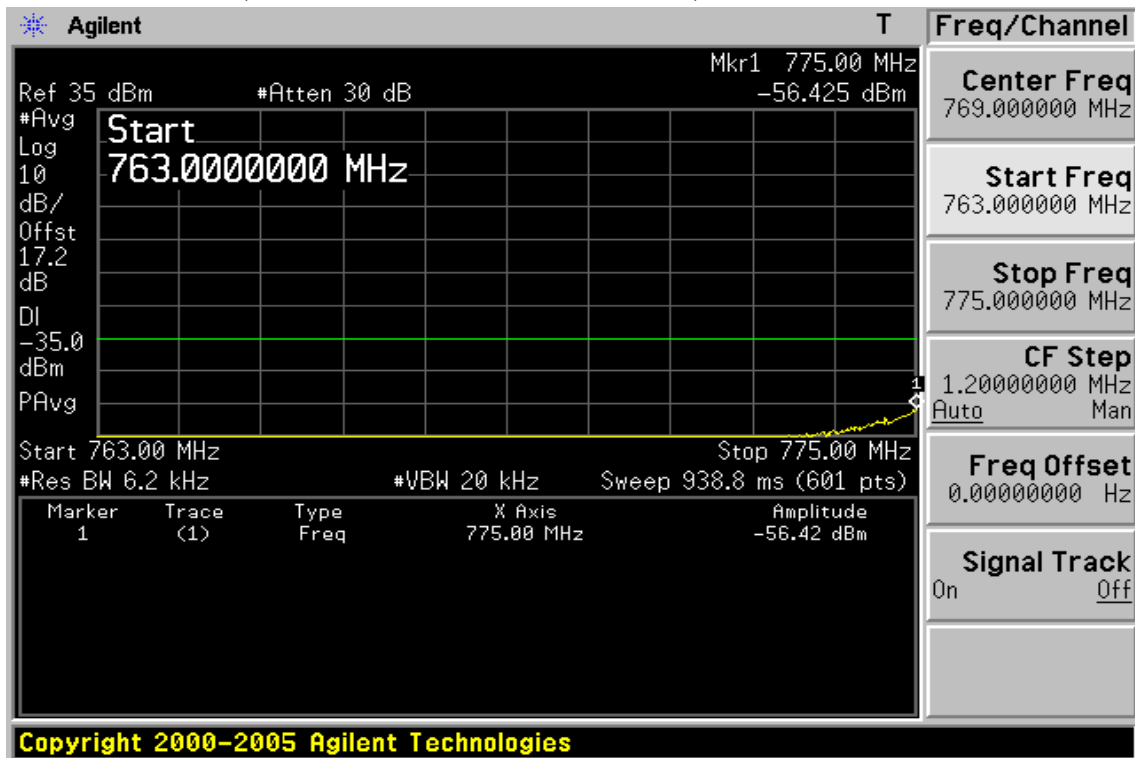
**Figure 10-28: Out of Band emission at antenna terminals–5MHz BW LTE-Band 13
(16QAM RB Number: 1 Offset: 0) Channel Highest**



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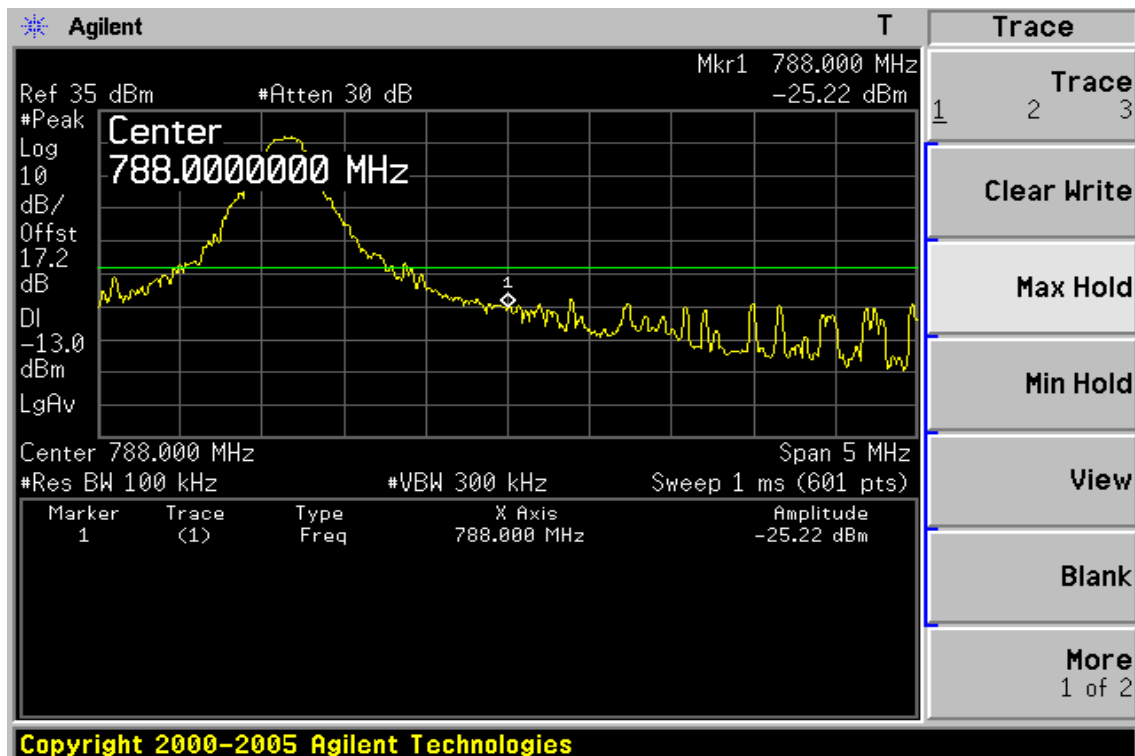
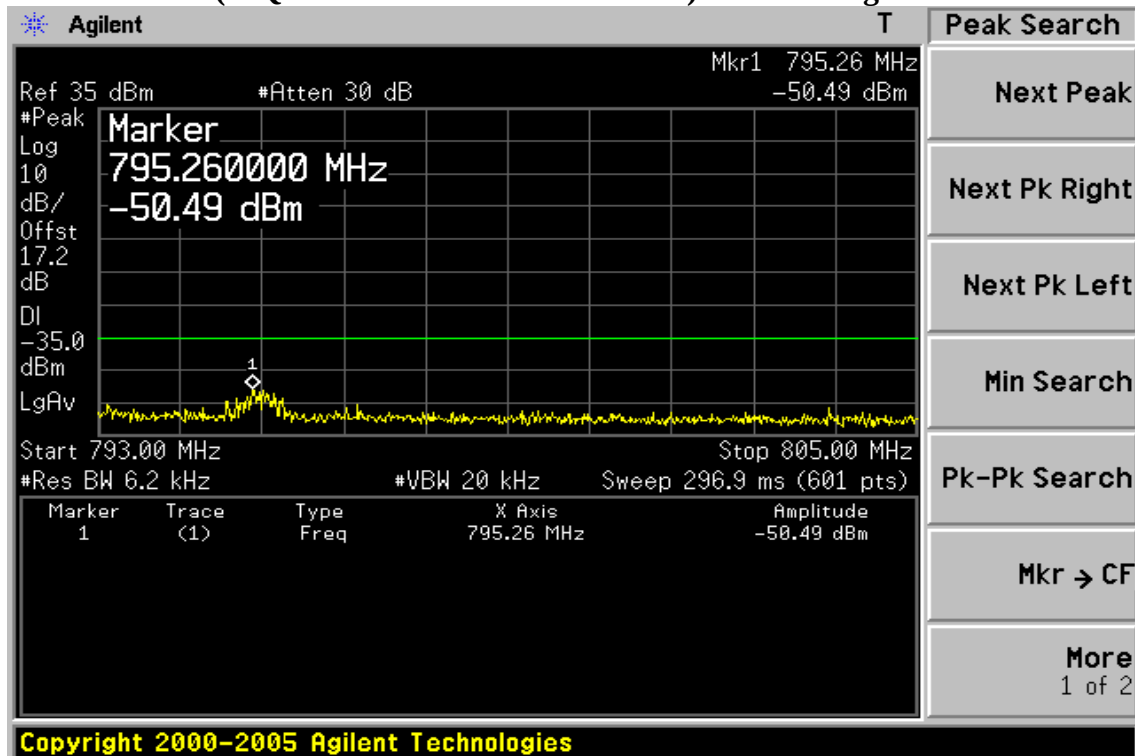
**Figure 10-29: Band edge emission at antenna terminals –5MHz BW LTE-Band 13
(16QAM RB Number: 1 Offset: 0) Channel Lowest**



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Figure 10-30: Band edge emission at antenna terminals –5MHz BW LTE-Band 13 (16QAM RB Number: 1 Offset: 24) Channel Highest



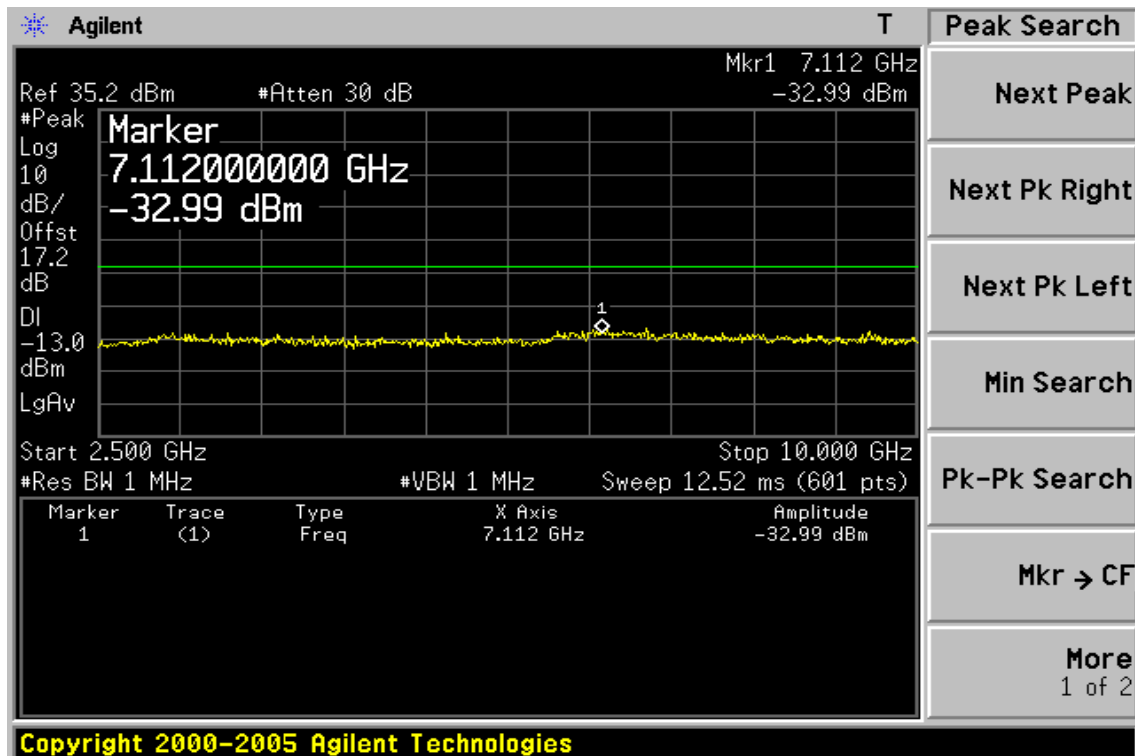
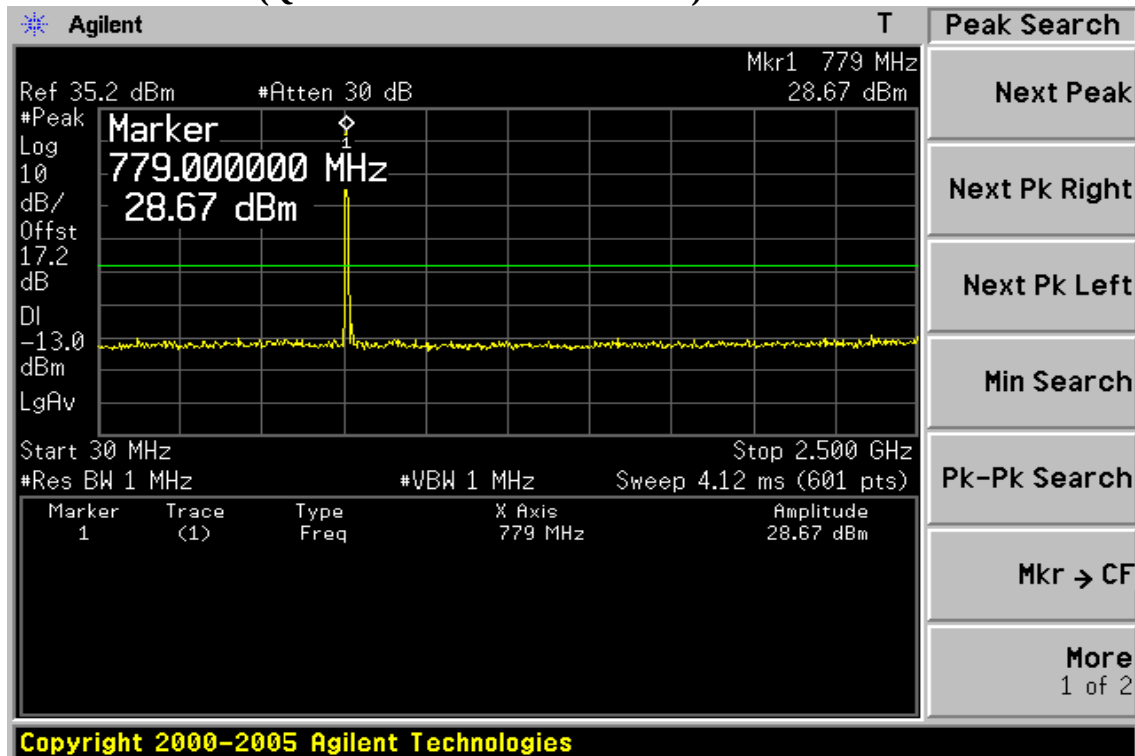
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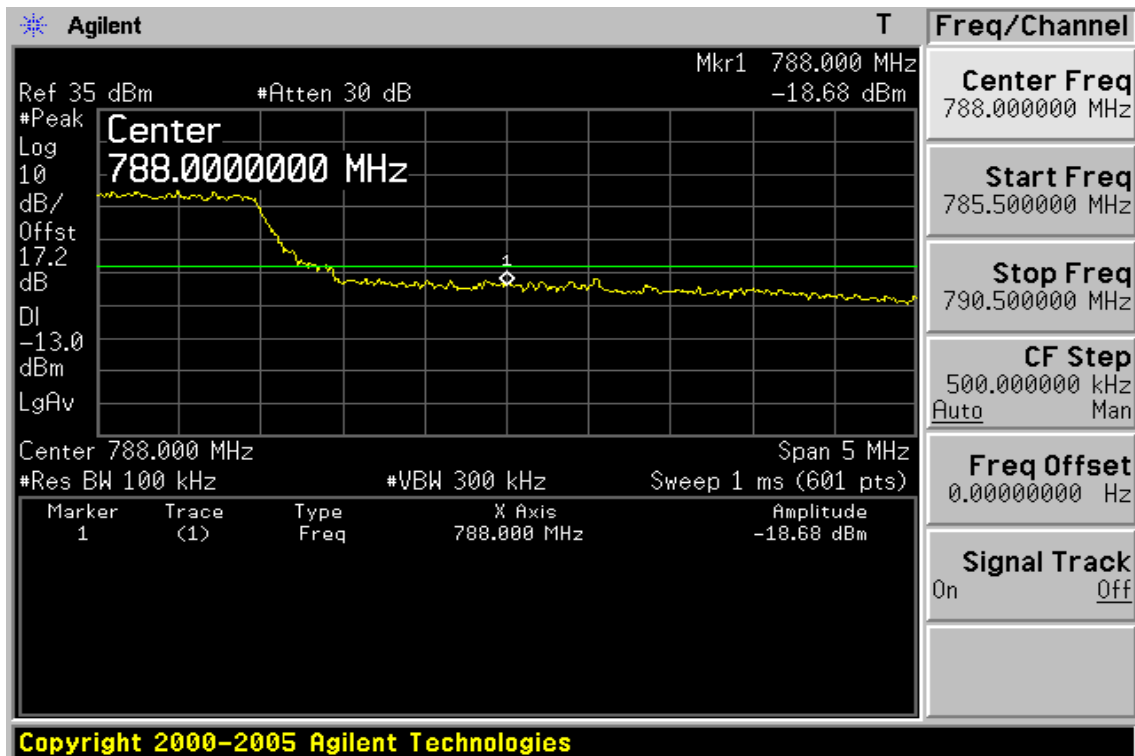
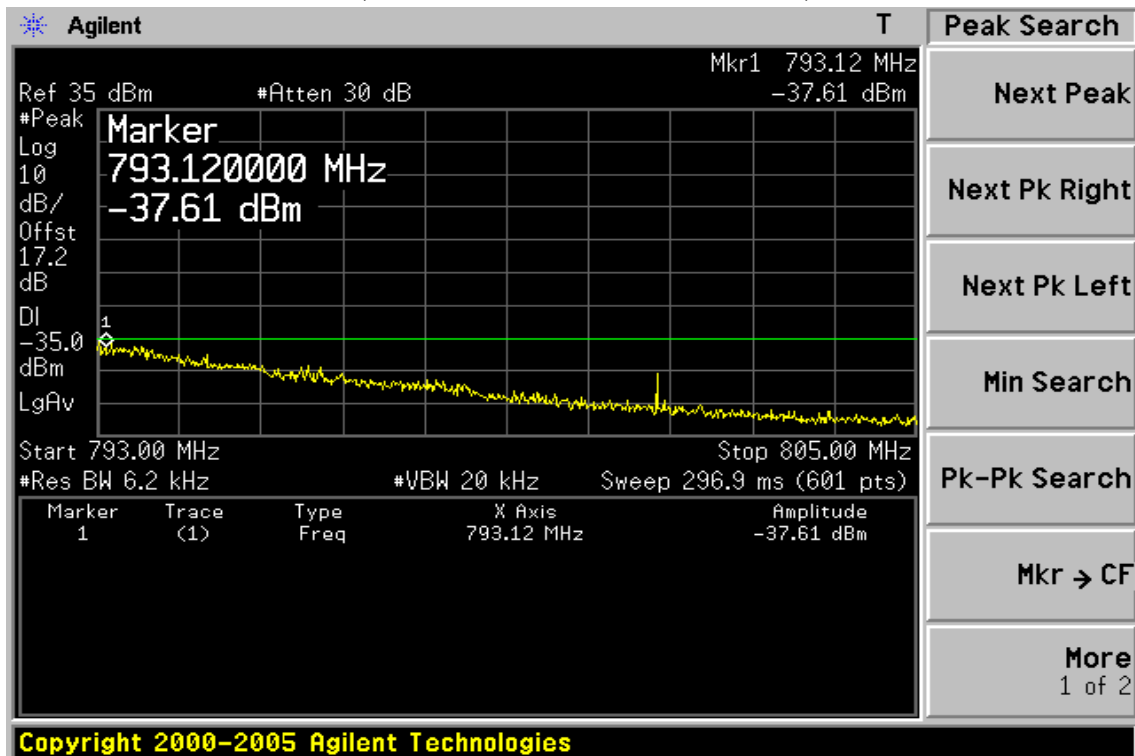
Figure 10-31: Out of Band emission at antenna terminals–10MHz BW LTE-Band 13 (QPSK RB Number: 1 Offset: 0) Channel Mid



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Figure 10-32: Band edge emission at antenna terminals –10MHz BW LTE-Band 13 (QPSK RB Number: 50 Offset: 0)



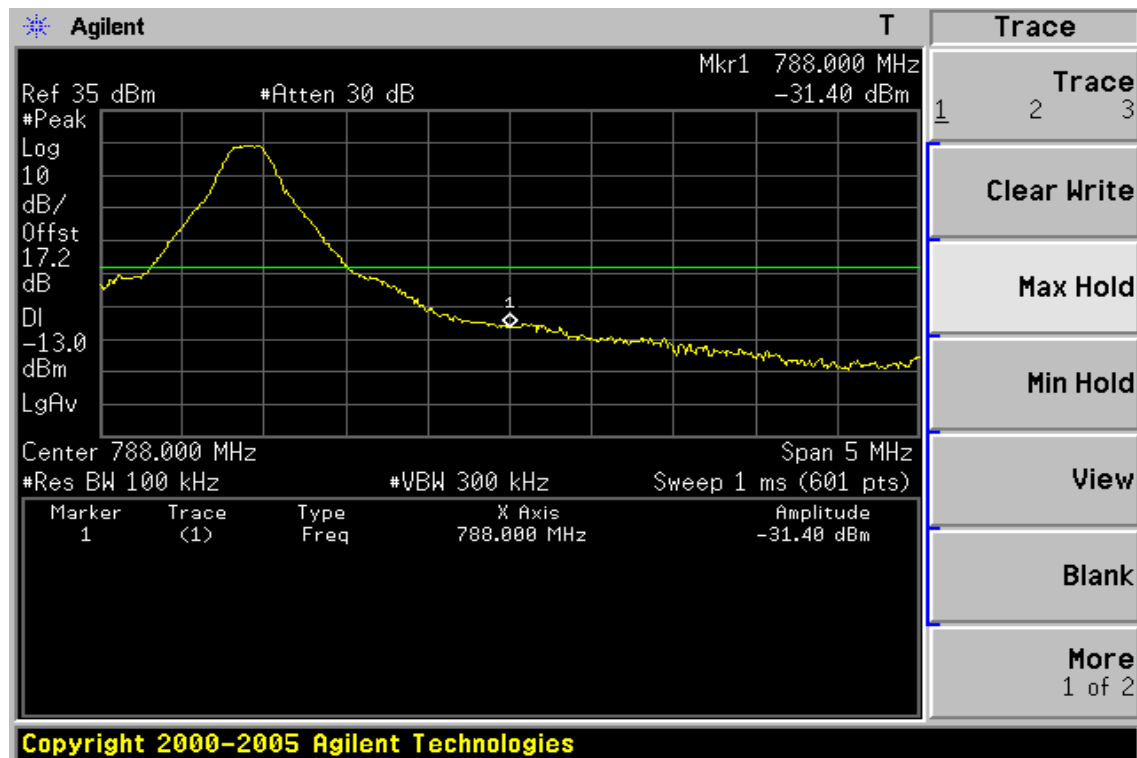
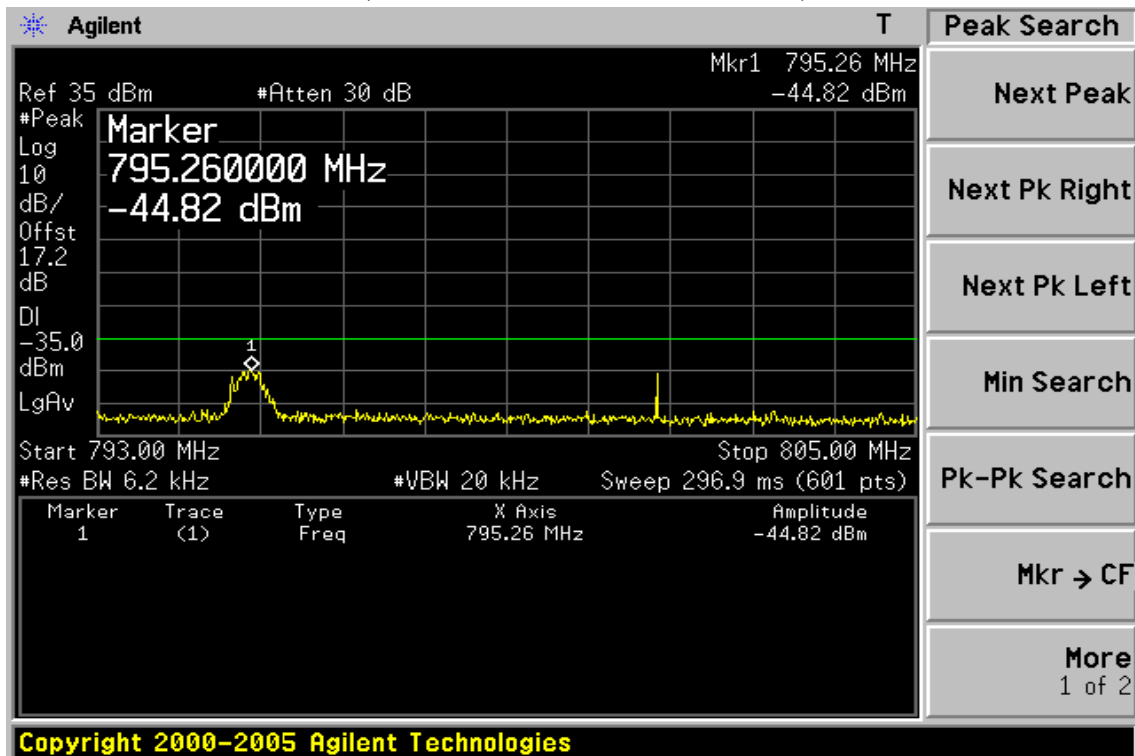
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Figure 10-33: Band edge emission at antenna terminals –10MHz BW LTE-Band 13 (QPSK RB Number: 1 Offset:49)



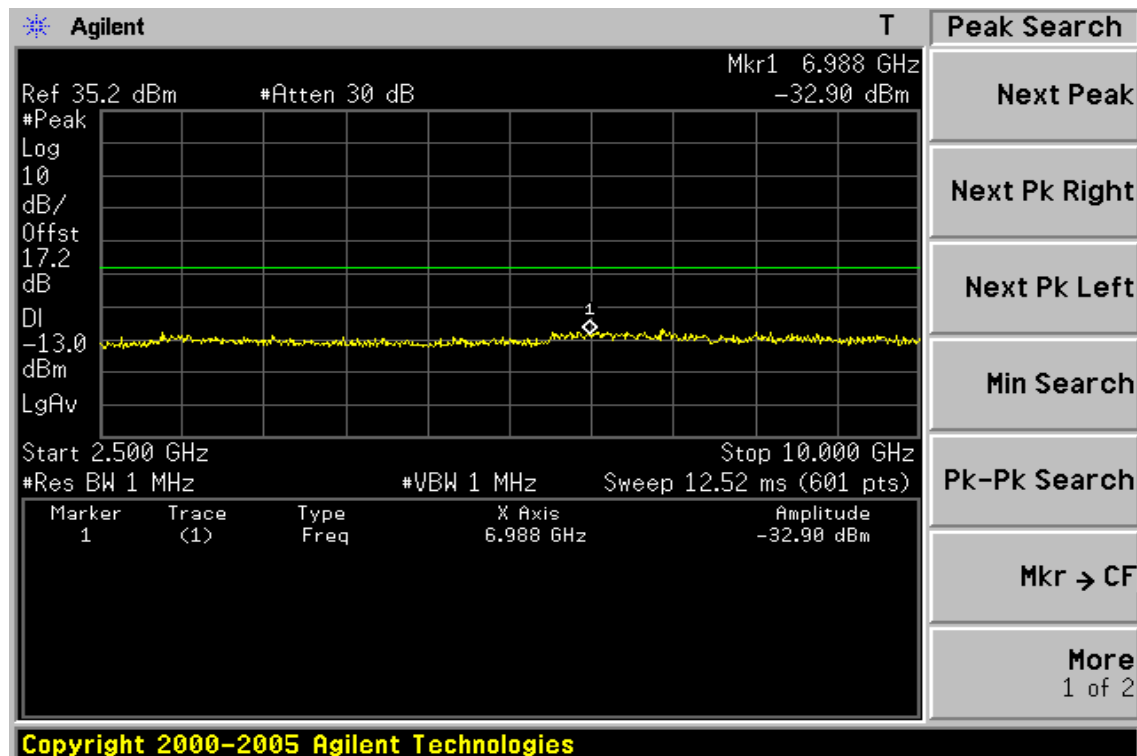
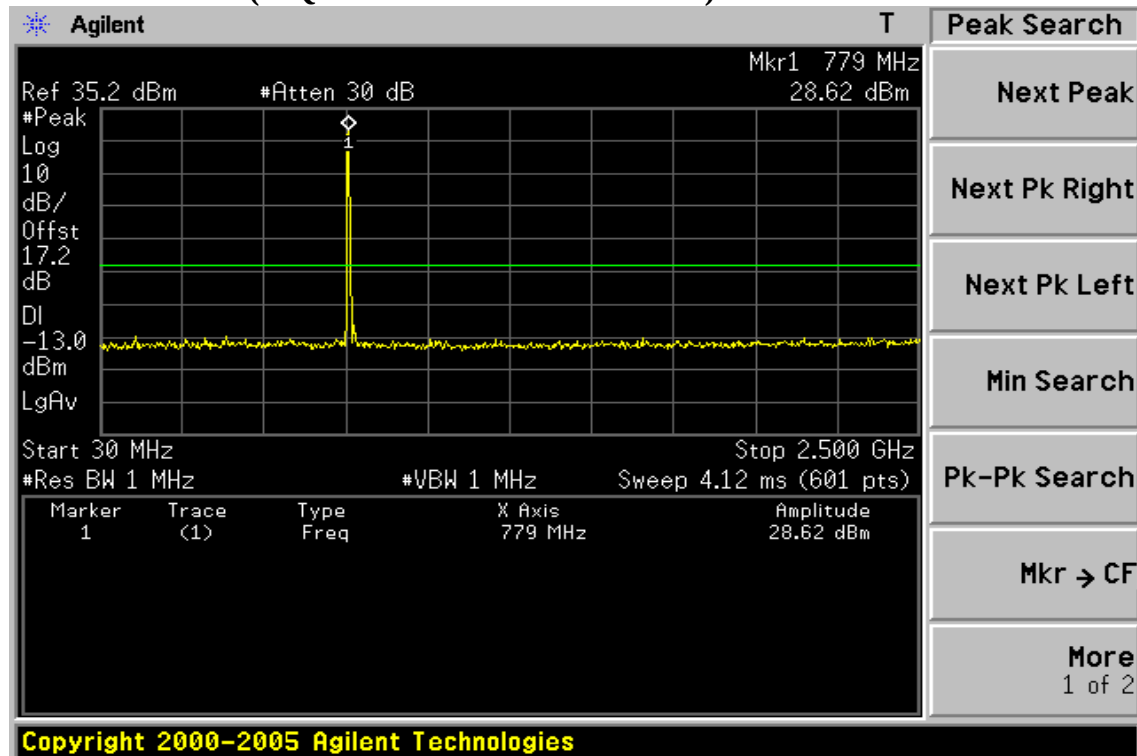
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**Figure 10-34: Out of Band emission at antenna terminals–10MHz BW LTE-Band 13
(16QAM RB Number: 1 Offset: 0) Channel Mid**



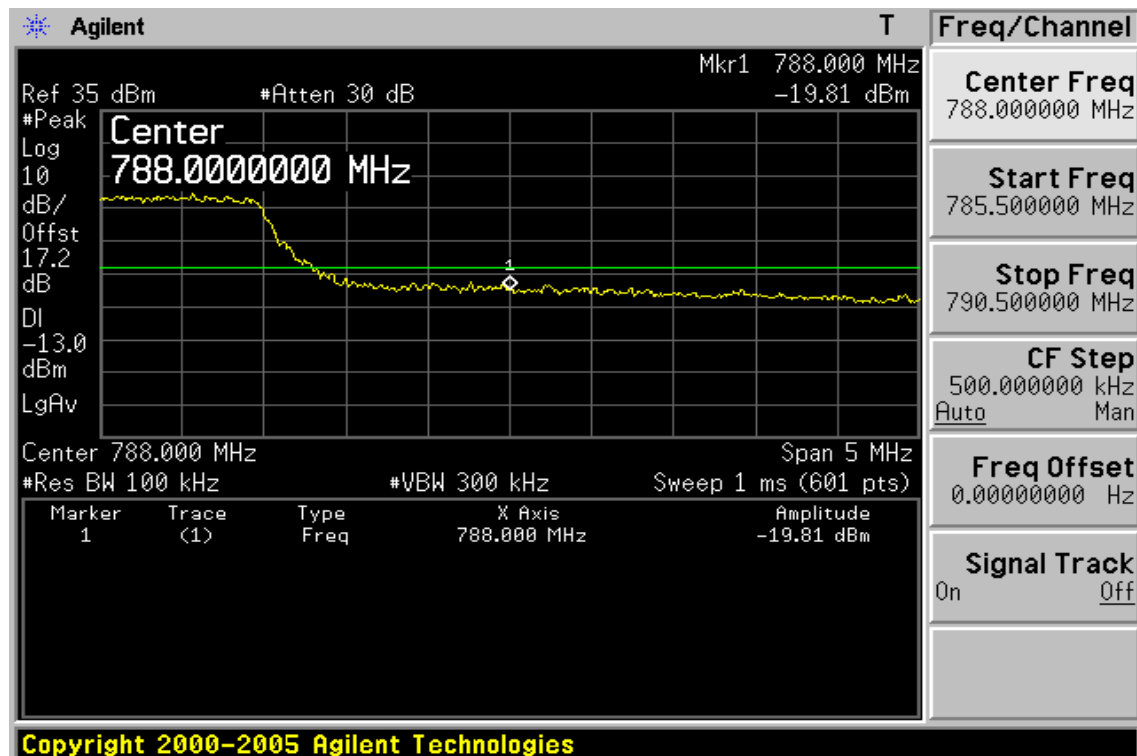
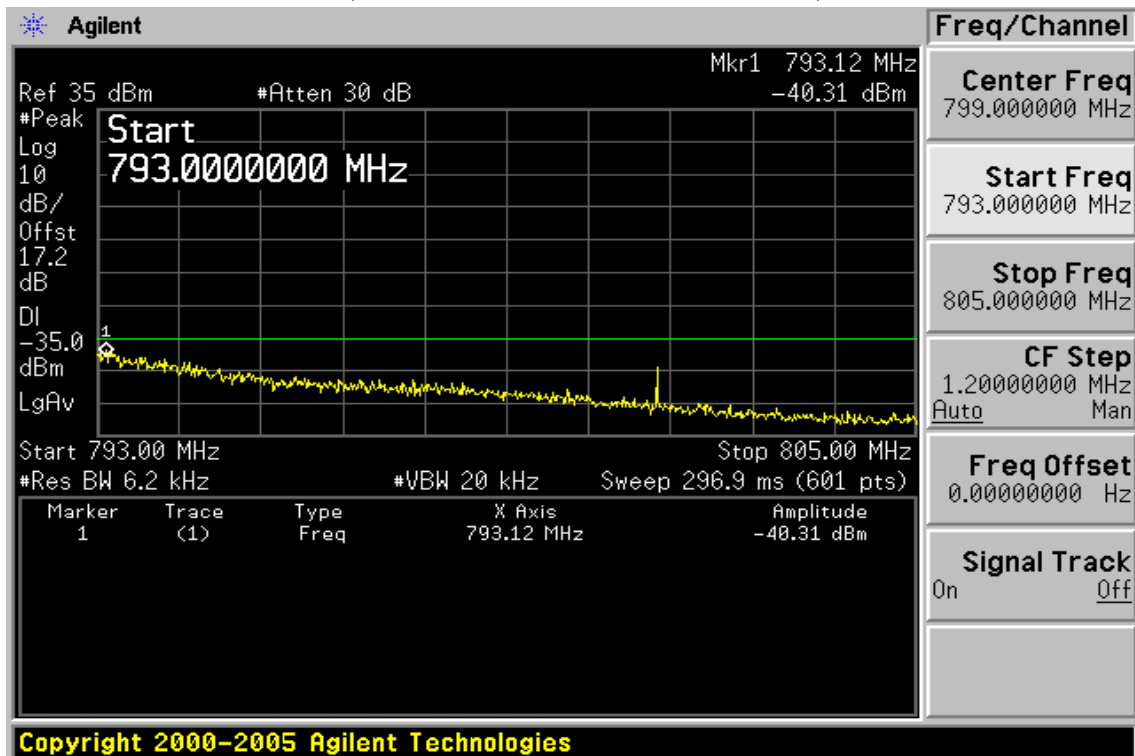
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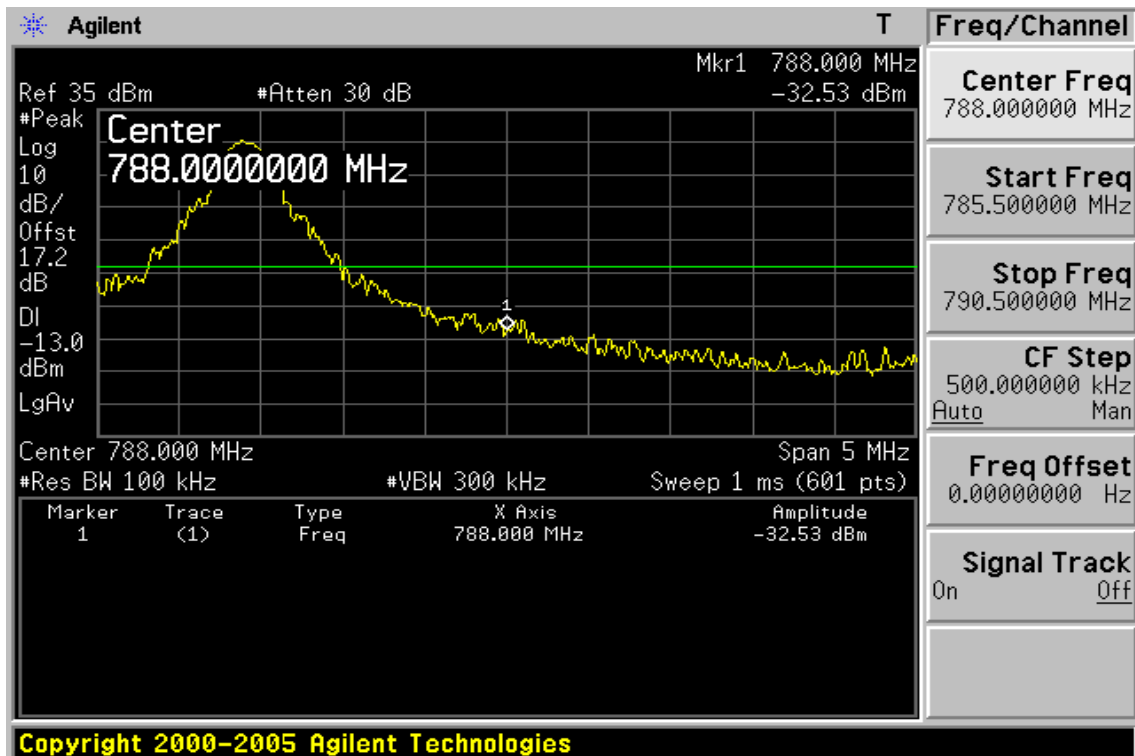
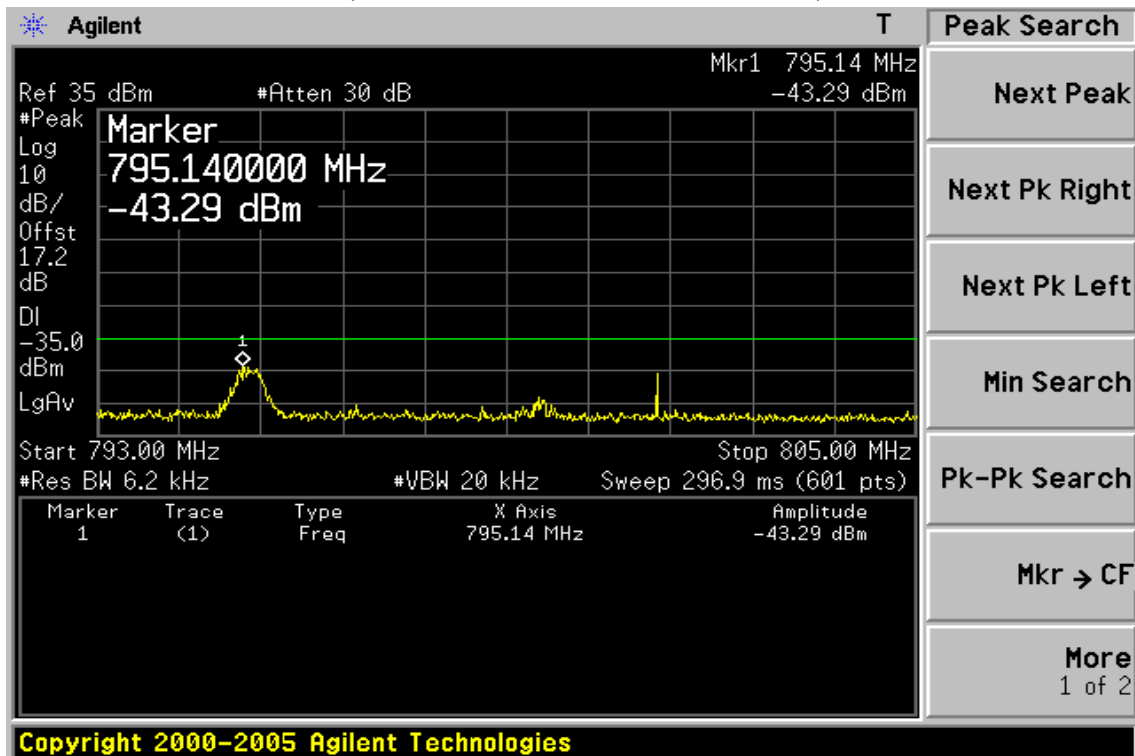
**Figure 10-35: Band edge emission at antenna terminals –10MHz BW LTE-Band 13
(16QAM RB Number: 50 Offset: 0)**



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**Figure 10-36: Band edge emission at antenna terminals –10MHz BW LTE-Band 13
(16QAM RB Number: 1 Offset: 49)**



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11. FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT

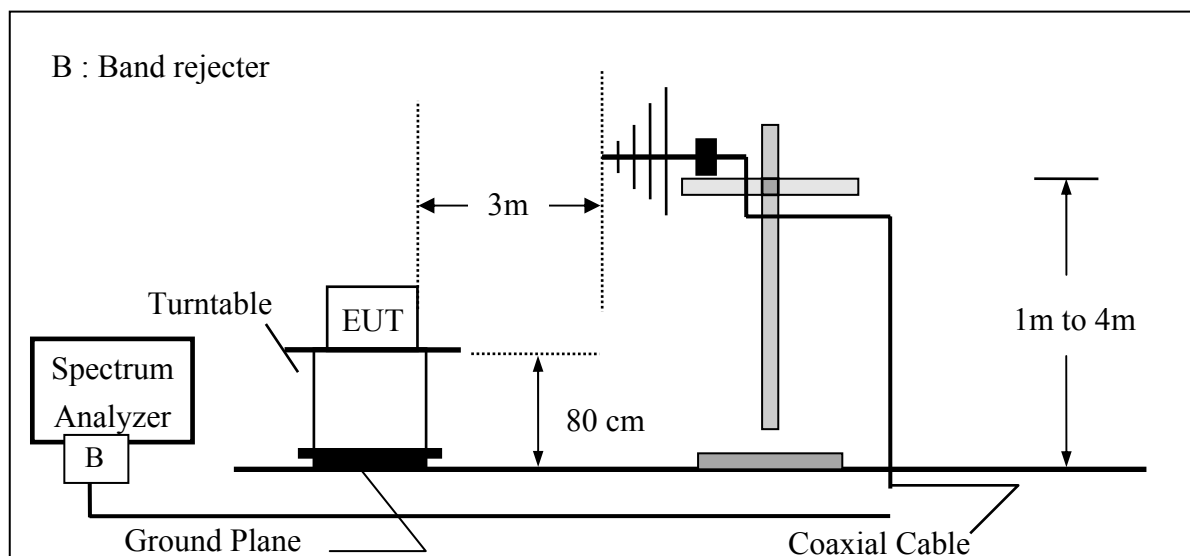
11.1. Standard Applicable:

According to FCC §2.1053,

FCC §22.917(a), §24.238(a), §27.53(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):

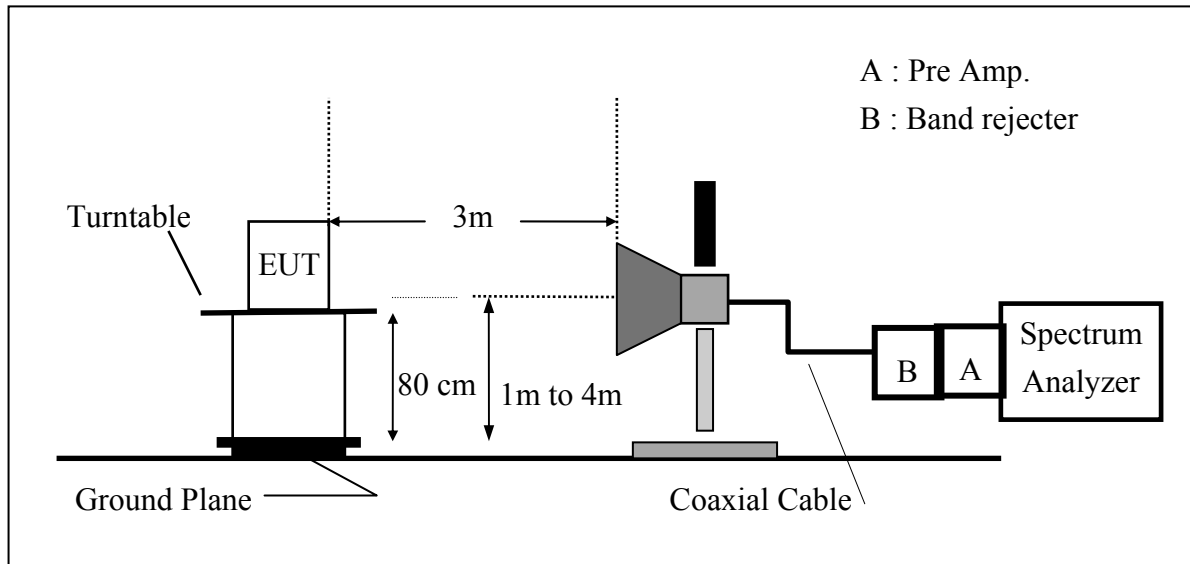
Radiated Emission Test Set-Up, Frequency Below 1000MHz



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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.

$$ERP = \text{S.G. output (dBm)} + \text{Antenna Gain (dBd)} - \text{Cable Loss (dB)}$$

$$EIRP = \text{S.G. output (dBm)} + \text{Antenna Gain (dBi)} - \text{Cable Loss (dB)}$$

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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台灣檢驗科技股份有限公司

No.134, Wu Kung Road, Wuku Industrial Zone, Taipei County, Taiwan / 台北縣五股工業區五工路 134 號

t (886-2) 2299-3279

f (886-2) 2298-0488

www.tw.sgs.com

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Radiated Spurious Emission Measurement Result: EVDO Cellular Mode

Operation Band	: 1xEV-DO Cellular	Test Date	: 2011-10-27
ARFCN	:	Temp./Humi.	: 27 deg_C / 66 RH
Fundamental Frequency	: 824.7	Engineer	: Lion
Operation Mode	: CH LOW		
EUT Pol.	: E2 PLAN	Measurement	: VERTICAL
		Antenna Pol.	

Freq.	Note	ERP	SG	Antenna	Cable	Limit	Safe
MHz	F/H/E/S	dBm	Output Level dBm	Gain dBd	Loss dB	dBm	Margin dB
35.82	S	-73.23	-57.01	-13.77	-2.47	-13.00	-60.23
57.16	S	-73.61	-62.04	-9.00	-2.59	-13.00	-60.61
151.25	S	-75.07	-71.11	-1.04	-2.93	-13.00	-62.07
330.70	S	-74.70	-76.03	4.66	-3.44	-13.00	-61.70
361.74	S	-74.22	-75.59	4.70	-3.43	-13.00	-61.22
576.11	S	-76.31	-76.94	4.29	-3.87	-13.00	-63.31
1649.4	H	-52.14	-49.40	2.39	-5.36	-13.00	-39.14
2474.1	---						
3298.8	---						
4123.5	---						
4948.2	---						
5772.9	---						
6597.6	---						
7422.3	---						
8247	---						

$$\text{ERP(dBm)} = \text{SG Level(dBm)} + \text{Antenna Gain(dBd)} + \text{Cable Loss(dB)}$$

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: EVDO Cellular Mode

Operation Band	: 1xEV-DO Cellular	Test Date	:2011-10-27
ARFCN	:	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	: 824.7	Engineer	:Lion
Operation Mode	: CH LOW		
EUT Pol.	:E2 PLAN	Measurement	:HORIZONTAL
		Antenna Pol.	

Freq.	Note	ERP	SG	Antenna	Cable	Limit	Safe
MHz	F/H/E/S	dBm	Output Level dBm	Gain dBd	Loss dB	dBm	Margin dB
65.89	S	-83.08	-73.74	-6.78	-2.59	-13.00	-70.08
131.85	S	-80.91	-77.30	-0.83	-2.79	-13.00	-67.91
282.20	S	-74.35	-75.64	4.45	-3.22	-13.00	-61.35
327.79	S	-70.06	-71.37	4.64	-3.44	-13.00	-57.06
359.80	S	-73.70	-75.09	4.72	-3.43	-13.00	-60.70
642.07	S	-80.80	-81.37	4.11	-3.98	-13.00	-67.80
1649.4	H	-52.92	-50.47	2.68	-5.36	-13.00	-39.92
2474.1	---						
3298.8	---						
4123.5	---						
4948.2	---						
5772.9	---						
6597.6	---						
7422.3	---						
8247	---						

$$\text{ERP(dBm)} = \text{SG Level(dBm)} + \text{Antenna Gain(dBd)} + \text{Cable Loss(dB)}$$

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

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Radiated Spurious Emission Measurement Result: EVDO Cellular Mode

Operation Band	: 1xEV-DO Cellular	Test Date	:2011-10-27
ARFCN	:	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	: 836.52	Engineer	:Lion
Operation Mode	: CH MID		
EUT Pol.	:E2 PLAN	Measurement	:VERTICAL
		Antenna Pol.	

Freq.	Note	ERP	SG	Antenna	Cable	Limit	Safe
MHz	F/H/E/S	dBm	Output Level dBm	Gain dBd	Loss dB	dBm	Margin dB
35.82	S	-73.88	-57.66	-13.77	-2.47	-13.00	-60.88
57.16	S	-73.50	-61.93	-9.00	-2.59	-13.00	-60.50
152.22	S	-74.67	-70.77	-0.99	-2.93	-13.00	-61.67
259.89	S	-76.59	-78.08	4.70	-3.27	-13.00	-63.59
326.82	S	-75.74	-77.04	4.63	-3.44	-13.00	-62.74
364.65	S	-74.07	-75.42	4.68	-3.43	-13.00	-61.07
1673.04	H	-50.75	-48.02	2.33	-5.34	-13.00	-37.75
2509.56	---						
3346.08	---						
4182.6	---						
5019.12	---						
5855.64	---						
6692.16	---						
7528.68	---						
8365.2	---						

$$\text{ERP(dBm)} = \text{SG Level(dBm)} + \text{Antenna Gain(dBd)} + \text{Cable Loss(dB)}$$

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

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Radiated Spurious Emission Measurement Result: EVDO Cellular Mode

Operation Band	: 1xEV-DO Cellular	Test Date	:2011-10-27
ARFCN	:	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	: 836.52	Engineer	:Lion
Operation Mode	: CH MID		
EUT Pol.	:E2 PLAN	Measurement	:HORIZONTAL
		Antenna Pol.	

Freq.	Note	ERP	SG	Antenna	Cable	Limit	Safe
MHz	F/H/E/S	dBm	Output Level dBm	Gain dBd	Loss dB	dBm	Margin dB
64.92	S	-81.29	-71.71	-7.02	-2.59	-13.00	-68.29
149.31	S	-80.63	-76.59	-1.13	-2.93	-13.00	-67.63
278.32	S	-73.97	-75.26	4.44	-3.22	-13.00	-60.97
328.76	S	-68.85	-70.16	4.65	-3.44	-13.00	-55.85
361.74	S	-70.63	-72.00	4.70	-3.43	-13.00	-57.63
551.86	S	-82.35	-83.24	4.56	-3.85	-13.00	-69.35
1673.04	H	-54.24	-51.84	2.66	-5.34	-13.00	-41.24
2509.56	---						
3346.08	---						
4182.6	---						
5019.12	---						
5855.64	---						
6692.16	---						
7528.68	---						
8365.2	---						

$$\text{ERP(dBm)} = \text{SG Level(dBm)} + \text{Antenna Gain(dBd)} + \text{Cable Loss(dB)}$$

Note : “F” : denotes Fundamental Frequency. ; “H” : denotes Harmonic Frequency.

“E” : denotes Band Edge Frequency. ; “S” : denotes Spurious Frequency.

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Radiated Spurious Emission Measurement Result: EVDO Cellular Mode

Operation Band	: 1xEV-DO Cellular	Test Date	:2011-10-27
ARFCN	:	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	: 848.31	Engineer	:Lion
Operation Mode	: CH HIGH		
EUT Pol.	:E2 PLAN	Measurement	:VERTICAL
		Antenna Pol.	

Freq.	Note	ERP	SG	Antenna	Cable	Limit	Safe
MHz	F/H/E/S	dBm	Output Level dBm	Gain dBd	Loss dB	dBm	Margin dB
35.82	S	-73.75	-57.53	-13.77	-2.47	-13.00	-60.75
57.16	S	-73.55	-61.98	-9.00	-2.59	-13.00	-60.55
140.58	S	-75.55	-71.44	-1.33	-2.79	-13.00	-62.55
328.76	S	-75.30	-76.61	4.65	-3.44	-13.00	-62.30
358.83	S	-74.13	-75.53	4.72	-3.43	-13.00	-61.13
576.11	S	-77.70	-78.32	4.29	-3.87	-13.00	-64.70
1696.62	H	-46.90	-44.06	2.29	-5.40	-13.00	-33.90
2544.93	---						
3393.24	---						
4241.55	---						
5089.86	---						
5938.17	---						
6786.48	---						
7634.79	---						
8483.1	---						

$$\text{ERP(dBm)} = \text{SG Level(dBm)} + \text{Antenna Gain(dBd)} + \text{Cable Loss(dB)}$$

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: EVDO Cellular Mode

Operation Band	: 1xEV-DO Cellular	Test Date	: 2011-10-27
ARFCN	:	Temp./Humi.	: 27 deg_C / 66 RH
Fundamental Frequency	: 848.31	Engineer	: Lion
Operation Mode	: CH HIGH		
EUT Pol.	: E2 PLAN	Measurement	: HORIZONTAL
		Antenna Pol.	

Freq.	Note	ERP	SG	Antenna	Cable	Limit	Safe
MHz	F/H/E/S	dBm	Output Level dBm	Gain dBd	Loss dB	dBm	Margin dB
67.83	S	-82.09	-73.22	-6.30	-2.59	-13.00	-69.09
132.82	S	-80.72	-77.04	-0.89	-2.79	-13.00	-67.72
272.50	S	-72.49	-73.81	4.52	-3.27	-13.00	-59.49
327.79	S	-70.17	-71.48	4.64	-3.44	-13.00	-57.17
362.71	S	-69.94	-71.31	4.70	-3.43	-13.00	-56.94
623.64	S	-81.77	-82.22	4.07	-3.97	-13.00	-68.77
1696.62	H	-53.94	-51.46	2.65	-5.40	-13.00	-40.94
2544.93	---						
3393.24	---						
4241.55	---						
5089.86	---						
5938.17	---						
6786.48	---						
7634.79	---						
8483.1	---						

$$\text{ERP(dBm)} = \text{SG Level(dBm)} + \text{Antenna Gain(dBd)} + \text{Cable Loss(dB)}$$

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: EVDO PCS Mode

Operation Band	: 1xEV-DO PCS	Test Date	:2011-10-27
ARFCN	:	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	: 1851.25	Engineer	:Lion
Operation Mode	: CH LOW		
EUT Pol.	:E2 PLAN	Measurement	:VERTICAL
		Antenna Pol.	

Freq.	Note	EIRP	SG	Antenna	Cable	Limit	Safe
MHz	F/H/E/S	dBm	Output Level dBm	Gain dBi	Loss dB	dBm	Margin dB
35.82	S	-68.96	-54.89	-11.62	-2.47	-13.00	-55.96
149.31	S	-75.36	-73.47	1.02	-2.93	-13.00	-62.36
195.87	S	-74.32	-77.69	6.44	-3.09	-13.00	-61.32
295.78	S	-75.07	-78.60	6.77	-3.25	-13.00	-62.07
327.79	S	-72.98	-76.35	6.79	-3.44	-13.00	-59.98
576.11	S	-75.93	-78.54	6.44	-3.87	-13.00	-62.93
3702.5	H	-47.12	-47.64	7.40	-6.98	-13.00	-34.12
5553.75	---						
7405	H	-45.49	-46.46	10.31	-9.38	-13.00	-32.49
9256.25	---						
11107.5	---						
12958.75	---						
14810	---						
16661.25	---						
18512.5	---						

$$\text{EIRP(dBm)} = \text{SG Level(dBm)} + \text{Antenna Gain(dBi)} + \text{Cable Loss(dB)}$$

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: EVDO PCS Mode

Operation Band	: 1xEV-DO PCS	Test Date	:2011-10-27
ARFCN	:	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	: 1851.25	Engineer	:Lion
Operation Mode	: CH LOW		
EUT Pol.	:E2 PLAN	Measurement	:HORIZONTAL
		Antenna Pol.	

Freq.	Note	EIRP	SG	Antenna	Cable	Limit	Safe
MHz	F/H/E/S	dBm	Output Level dBm	Gain dBi	Loss dB	dBm	Margin dB
57.16	S	-77.04	-67.63	-6.85	-2.59	-13.00	-64.04
160.95	S	-79.08	-77.87	1.72	-2.93	-13.00	-66.08
270.56	S	-69.98	-73.43	6.70	-3.27	-13.00	-56.98
329.73	S	-62.84	-66.23	6.80	-3.44	-13.00	-49.84
361.74	S	-67.66	-71.12	6.85	-3.43	-13.00	-54.66
576.11	S	-77.80	-80.41	6.44	-3.87	-13.00	-64.80
3702.5	H	-47.51	-47.54	6.90	-6.98	-13.00	-34.51
5553.75	---						
7405	H	-46.40	-46.63	9.56	-9.38	-13.00	-33.40
9256.25	---						
11107.5	---						
12958.75	---						
14810	---						
16661.25	---						
18512.5	---						

$$\text{EIRP(dBm)} = \text{SG Level(dBm)} + \text{Antenna Gain(dBi)} + \text{Cable Loss(dB)}$$

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: EVDO PCS Mode

Operation Band	: 1xEV-DO PCS	Test Date	:2011-10-27
ARFCN	:	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	: 1880	Engineer	:Lion
Operation Mode	: CH MID		
EUT Pol.	:E2 PLAN	Measurement	:VERTICAL
		Antenna Pol.	

Freq.	Note	EIRP	SG	Antenna	Cable	Limit	Safe
MHz	F/H/E/S	dBm	Output Level dBm	Gain dBi	Loss dB	dBm	Margin dB
57.16	S	-68.82	-59.42	-6.85	-2.59	-13.00	-55.82
150.28	S	-73.26	-71.40	1.06	-2.93	-13.00	-60.26
191.99	S	-72.18	-75.13	6.02	-3.09	-13.00	-59.18
332.64	S	-71.81	-75.21	6.82	-3.44	-13.00	-58.81
363.68	S	-69.41	-72.86	6.84	-3.43	-13.00	-56.41
576.11	S	-75.36	-77.98	6.44	-3.87	-13.00	-62.36
3760	H	-50.95	-51.55	7.42	-7.12	-13.00	-37.95
5640	---						
7520	---						
9400	---						
11280	---						
13160	---						
15040	---						
16920	---						
18800	---						

$$\text{EIRP(dBm)} = \text{SG Level(dBm)} + \text{Antenna Gain(dBi)} + \text{Cable Loss(dB)}$$

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: EVDO PCS Mode

Operation Band	: 1xEV-DO PCS	Test Date	:2011-10-27
ARFCN	:	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	: 1880	Engineer	:Lion
Operation Mode	: CH MID		
EUT Pol.	:E2 PLAN	Measurement	:HORIZONTAL
		Antenna Pol.	

Freq.	Note	EIRP	SG	Antenna	Cable	Limit	Safe
MHz	F/H/E/S	dBm	Output Level dBm	Gain dBi	Loss dB	dBm	Margin dB
57.16	S	-75.60	-66.19	-6.85	-2.59	-13.00	-62.60
131.85	S	-78.10	-76.64	1.32	-2.79	-13.00	-65.10
264.74	S	-70.10	-73.63	6.78	-3.27	-13.00	-57.10
330.70	S	-62.56	-65.95	6.81	-3.44	-13.00	-49.56
356.89	S	-67.08	-70.57	6.89	-3.43	-13.00	-54.08
576.11	S	-77.65	-80.26	6.44	-3.87	-13.00	-64.65
3760	H	-51.14	-51.17	6.85	-7.12	-13.00	-38.14
5640	---						
7520	---						
9400	---						
11280	---						
13160	---						
15040	---						
16920	---						
18800	---						

$$\text{EIRP(dBm)} = \text{SG Level(dBm)} + \text{Antenna Gain(dBi)} + \text{Cable Loss(dB)}$$

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: EVDO PCS Mode

Operation Band	: 1xEV-DO PCS	Test Date	:2011-10-27
ARFCN	:	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	: 1908.75	Engineer	:Lion
Operation Mode	: CH HIGH		
EUT Pol.	:E2 PLAN	Measurement	:VERTICAL
		Antenna Pol.	

Freq.	Note	EIRP	SG	Antenna	Cable	Limit	Safe
MHz	F/H/E/S	dBm	Output Level dBm	Gain dBi	Loss dB	dBm	Margin dB
35.82	S	-69.34	-55.28	-11.62	-2.47	-13.00	-56.34
57.16	S	-69.99	-60.58	-6.85	-2.59	-13.00	-56.99
149.31	S	-73.20	-71.30	1.02	-2.93	-13.00	-60.20
256.01	S	-74.73	-78.27	6.79	-3.27	-13.00	-61.73
331.67	S	-71.55	-74.94	6.82	-3.44	-13.00	-58.55
360.77	S	-69.03	-72.50	6.86	-3.43	-13.00	-56.03
3817.5	H	-32.94	-33.47	7.50	-7.20	-13.00	-19.94
5726.25	---						
7635	---						
9543.75	---						
11452.5	---						
13361.25	---						
15270	---						
17178.75	---						
19087.5	---						

$$\text{EIRP(dBm)} = \text{SG Level(dBm)} + \text{Antenna Gain(dBi)} + \text{Cable Loss(dB)}$$

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: EVDO PCS Mode

Operation Band	: 1xEV-DO PCS	Test Date	:2011-10-27
ARFCN	:	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	: 1908.75	Engineer	:Lion
Operation Mode	: CH HIGH		
EUT Pol.	:E2 PLAN	Measurement	:HORIZONTAL
		Antenna Pol.	

Freq.	Note	EIRP	SG	Antenna	Cable	Limit	Safe
MHz	F/H/E/S	dBm	Output Level dBm	Gain dBi	Loss dB	dBm	Margin dB
57.16	S	-76.74	-67.33	-6.85	-2.59	-13.00	-63.74
140.58	S	-78.77	-76.81	0.82	-2.79	-13.00	-65.77
191.99	S	-76.50	-79.45	6.02	-3.09	-13.00	-63.50
332.64	S	-63.40	-66.80	6.82	-3.44	-13.00	-50.40
356.89	S	-67.31	-70.80	6.89	-3.43	-13.00	-54.31
576.11	S	-77.96	-80.58	6.44	-3.87	-13.00	-64.96
3817.5	H	-30.02	-30.07	7.03	-7.20	-13.00	-17.02
5726.25	---						
7635	---						
9543.75	---						
11452.5	---						
13361.25	---						
15270	---						
17178.75	---						
19087.5	---						

$$\text{EIRP(dBm)} = \text{SG Level(dBm)} + \text{Antenna Gain(dBi)} + \text{Cable Loss(dB)}$$

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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No.134, Wu Kung Road, Wuku Industrial Zone, Taipei County, Taiwan / 台北縣五股工業區五工路 134 號

t (886-2) 2299-3279

f (886-2) 2298-0488

www.tw.sgs.com

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Radiated Spurious Emission Measurement Result: 5MHz BW LTE-Band 13**(16QAM RB 1 Offset 0)**

Operation Mode : 16QAM LOW Mode

Test Date: May. 26, 2011

Fundamental Frequency : 779.5 MHz

Test By: Lion

Temperature : 25°C

Pol: Ver

Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
165.80	34.44	V	-64.27	-7.81	1.63	-73.71	-13.00	-60.71
250.19	33.32	V	-66.56	-7.89	1.99	-76.44	-13.00	-63.44
340.40	39.08	V	-58.67	-7.69	2.32	-68.69	-13.00	-55.69
350.10	40.90	V	-56.73	-7.64	2.36	-66.73	-13.00	-53.73
658.56	33.42	V	-55.59	-7.82	3.18	-66.59	-13.00	-53.59
959.26	34.34	V	-50.07	-8.00	3.91	-61.97	-13.00	-48.97
1559.00	47.80	V	-56.87	9.02	5.08	-52.93	-13.00	-39.93
2338.50	---	V		10.15	6.32		-13.00	
3118.00	---	V		11.78	7.43		-13.00	
3897.50	---	V		12.60	8.58		-13.00	
4677.00	---	V		12.66	9.47		-13.00	
5456.50	---	V		13.11	10.24		-13.00	
6236.00	---	V		13.07	10.97		-13.00	
7015.50	---	V		11.64	11.70		-13.00	
7795.00	---	V		11.34	12.38		-13.00	

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark"---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4 $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dBd/dBi) - Cable \text{ loss} (dB)$
5. Radiated emissions measured were made with an instrument using Peak detector mode with RBW = 1 MHz, VBW = 1MHz

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No.134, Wu Kung Road, Wuku Industrial Zone, Taipei County, Taiwan / 台北縣五股工業區五工路 134 號

t (886-2) 2299-3279

f (886-2) 2298-0488

www.tw.sgs.com

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Radiated Spurious Emission Measurement Result: 5MHz BW LTE-Band 13**(16QAM RB 1 Offset 0)**

Operation Mode : 16QAM LOW Mode

Test Date: May. 26, 2011

Fundamental Frequency : 779.5 MHz

Test By: Lion

Temperature : 25°C

Pol: Hor

Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out-put (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)	ERP/EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
149.31	37.90	H	-59.94	-7.80	1.59	-69.33	-13.00	-56.33
250.19	38.86	H	-60.35	-7.89	1.99	-70.23	-13.00	-57.23
340.40	45.11	H	-52.18	-7.69	2.32	-62.20	-13.00	-49.20
357.86	48.98	H	-48.10	-7.64	2.38	-58.13	-13.00	-45.13
548.95	38.76	H	-53.00	-7.76	2.96	-63.71	-13.00	-50.71
953.44	33.79	H	-50.40	-8.00	3.89	-62.29	-13.00	-49.29
1559.00	45.63	H	-58.87	9.02	5.08	-54.93	-13.00	-41.93
2338.50	---	H		10.15	6.32		-13.00	
3118.00	---	H		11.78	7.43		-13.00	
3897.50	---	H		12.60	8.58		-13.00	
4677.00	---	H		12.66	9.47		-13.00	
5456.50	---	H		13.11	10.24		-13.00	
6236.00	---	H		13.07	10.97		-13.00	
7015.50	---	H		11.64	11.70		-13.00	
7795.00	---	H		11.34	12.38		-13.00	

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark"---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4 $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dBd/dBi) - Cable \text{ loss} (dB)$
5. Radiated emissions measured were made with an instrument using Peak detector mode with RBW = 1 MHz, VBW = 1MHz

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No.134, Wu Kung Road, Wuku Industrial Zone, Taipei County, Taiwan / 台北縣五股工業區五工路 134 號

t (886-2) 2299-3279

f (886-2) 2298-0488

www.tw.sgs.com

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Radiated Spurious Emission Measurement Result: 5MHz BW LTE-Band 13**(16QAM RB 1 Offset 0)**

Operation Mode : 16QAM MID Mode

Test Date: May. 26, 2011

Fundamental Frequency : 782 MHz

Test By: Lion

Temperature : 25°C

Pol: Ver

Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
163.86	34.00	V	-64.53	-7.81	1.62	-73.97	-13.00	-60.97
250.19	33.92	V	-65.96	-7.89	1.99	-75.84	-13.00	-62.84
338.46	38.49	V	-59.28	-7.70	2.32	-69.30	-13.00	-56.30
354.95	40.80	V	-56.62	-7.64	2.37	-66.64	-13.00	-53.64
697.36	34.58	V	-54.83	-7.86	3.28	-65.97	-13.00	-52.97
968.96	33.72	V	-50.46	-8.00	3.94	-62.40	-13.00	-49.40
1564.40	50.77	V	-53.90	9.03	5.09	-49.95	-13.00	-36.95
2346.60	---	V		10.15	6.34		-13.00	
3128.80	---	V		11.80	7.45		-13.00	
3911.00	---	V		12.60	8.60		-13.00	
4693.20	---	V		12.66	9.49		-13.00	
5475.40	---	V		13.13	10.26		-13.00	
6257.60	---	V		12.99	10.99		-13.00	
7039.80	---	V		11.63	11.72		-13.00	
7822.00	---	V		11.33	12.40		-13.00	

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark"---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4 $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dBd/dBi) - Cable \text{ loss} (dB)$
5. Radiated emissions measured were made with an instrument using Peak detector mode with RBW = 1 MHz, VBW = 1MHz

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f (886-2) 2298-0488

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Radiated Spurious Emission Measurement Result: 5MHz BW LTE-Band 13**(16QAM RB 1 Offset 0)**

Operation Mode : 16QAM MID Mode

Test Date: May. 26, 2011

Fundamental Frequency : 782 MHz

Test By: Lion

Temperature : 25°C

Pol: Hor

Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
151.25	37.28	H	-60.59	-7.80	1.59	-69.98	-13.00	-56.98
250.19	39.15	H	-60.06	-7.89	1.99	-69.94	-13.00	-56.94
296.75	46.03	H	-51.73	-7.92	2.16	-61.81	-13.00	-48.81
354.95	49.16	H	-47.96	-7.64	2.37	-57.98	-13.00	-44.98
553.80	38.28	H	-53.36	-7.76	2.97	-64.09	-13.00	-51.09
985.45	33.58	H	-50.42	-7.99	3.99	-62.40	-13.00	-49.40
1564.40	47.60	H	-56.90	9.03	5.09	-52.95	-13.00	-39.95
2346.60	---	H		10.15	6.34		-13.00	
3128.80	---	H		11.80	7.45		-13.00	
3911.00	---	H		12.60	8.60		-13.00	
4693.20	---	H		12.66	9.49		-13.00	
5475.40	---	H		13.13	10.26		-13.00	
6257.60	---	H		12.99	10.99		-13.00	
7039.80	---	H		11.63	11.72		-13.00	
7822.00	---	H		11.33	12.40		-13.00	

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark"---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4 $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dBd/dBi) - Cable \text{ loss} (dB)$
5. Radiated emissions measured were made with an instrument using Peak detector mode with $RBW = 1 \text{ MHz}$, $VBW = 1 \text{ MHz}$

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f (886-2) 2298-0488

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Radiated Spurious Emission Measurement Result: 5MHz BW LTE-Band 13

(16QAM RB 1 Offset 0)

Operation Mode : 16QAM High Mode

Test Date: May. 26, 2011

Fundamental Frequency : 784.5 MHz

Test By: Lion

Temperature : 25°C

Pol: Ver

Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
173.56	37.28	V	-62.13	-7.82	1.65	-71.59	-13.00	-58.59
238.55	32.97	V	-67.35	-7.88	1.93	-77.16	-13.00	-64.16
338.46	38.75	V	-59.02	-7.70	2.32	-69.04	-13.00	-56.04
350.10	40.93	V	-56.70	-7.64	2.36	-66.70	-13.00	-53.70
700.27	33.39	V	-56.04	-7.86	3.29	-67.19	-13.00	-54.19
972.84	33.94	V	-50.15	-8.00	3.95	-62.10	-13.00	-49.10
1569.00	53.11	V	-51.55	9.05	5.09	-47.60	-13.00	-34.60
2353.50	---	V		10.14	6.35		-13.00	
3138.00	---	V		11.82	7.47		-13.00	
3922.50	---	V		12.60	8.61		-13.00	
4707.00	---	V		12.66	9.50		-13.00	
5491.50	---	V		13.14	10.27		-13.00	
6276.00	---	V		12.93	11.01		-13.00	
7060.50	---	V		11.63	11.74		-13.00	
7845.00	---	V		11.32	12.41		-13.00	

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark"---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4 $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dBd/dBi) - Cable \text{ loss} (dB)$
5. Radiated emissions measured were made with an instrument using Peak detector mode with RBW = 1 MHz, VBW = 1MHz

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t (886-2) 2299-3279

f (886-2) 2298-0488

www.tw.sgs.com

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Radiated Spurious Emission Measurement Result: 5MHz BW LTE-Band 13

(16QAM RB 1 Offset 0)

Operation Mode : 16QAM High Mode

Test Date: May. 26, 2011

Fundamental Frequency : 784.5 MHz

Test By: Lion

Temperature : 25°C

Pol: Hor

Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dBd/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
151.25	37.66	H	-60.21	-7.80	1.59	-69.60	-13.00	-56.60
250.19	38.38	H	-60.83	-7.89	1.99	-70.71	-13.00	-57.71
338.46	45.22	H	-52.09	-7.70	2.32	-62.11	-13.00	-49.11
354.95	49.48	H	-47.64	-7.64	2.37	-57.66	-13.00	-44.66
548.95	38.33	H	-53.43	-7.76	2.96	-64.14	-13.00	-51.14
920.46	34.12	H	-50.47	-7.97	3.83	-62.27	-13.00	-49.27
1569.00	49.16	H	-55.33	9.05	5.09	-51.38	-13.00	-38.38
2353.50	---	H		10.14	6.35		-13.00	
3138.00	---	H		11.82	7.47		-13.00	
3922.50	---	H		12.60	8.61		-13.00	
4707.00	---	H		12.66	9.50		-13.00	
5491.50	---	H		13.14	10.27		-13.00	
6276.00	---	H		12.93	11.01		-13.00	
7060.50	---	H		11.63	11.74		-13.00	
7845.00	---	H		11.32	12.41		-13.00	

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark"---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4 $ERP/EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dBd/dBi) - Cable \text{ loss} (dB)$
5. Radiated emissions measured were made with an instrument using Peak detector mode with $RBW = 1 \text{ MHz}$, $VBW = 1 \text{ MHz}$

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t (886-2) 2299-3279

f (886-2) 2298-0488

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Radiated Spurious Emission Measurement Result: in 1559 – 1610MHz Band

Operation Mode : 5M 16QAM RB1 Offset 0 LOW Mode Test Date: May. 26, 2011
 Fundamental Frequency : 779.5 MHz Test By: Lion
 Temperature : 25°C Pol: Ver/Hor
 Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out-put (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
1574.00	35.50	V	-69.16	9.06	5.10	-65.20	-40.00	-25.20
1574.00	35.66	H	-68.83	9.06	5.10	-64.87	-40.00	-24.87

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark”---“ means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4 $EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dBd/dBi) - Cable \text{ loss} (dB)$
5. Radiated emissions measured were made with an instrument using Peak detector mode with $RBW = 1 \text{ MHz}$, $VBW = 1 \text{ MHz}$

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f (886-2) 2298-0488

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Radiated Spurious Emission Measurement Result: in 1559 – 1610MHz Band

Operation Mode : 5M 16QAM RB1 Offset 0 MID Mode Test Date: May. 26, 2011
 Fundamental Frequency : 782 MHz Test By: Lion
 Temperature : 25°C Pol: Ver/Hor
 Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out-put (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
1574.00	35.11	V	-69.55	9.06	5.10	-65.59	-40.00	-25.59
1574.00	35.10	H	-69.39	9.06	5.10	-65.43	-40.00	-25.43

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark”---“ means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4 $EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dBd/dBi) - Cable \text{ loss} (dB)$
5. Radiated emissions measured were made with an instrument using Peak detector mode with $RBW = 1 \text{ MHz}$, $VBW = 1 \text{ MHz}$

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Radiated Spurious Emission Measurement Result: in 1559 – 1610MHz Band

Operation Mode : 5M 16QAM RB1 Offset 0 HIGH Mode Test Date: May. 26, 2011
Fundamental Frequency : 784.5 MHz Test By: Lion
Temperature : 25°C Pol: Ver/Hor
Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
1574.00	35.91	V	-68.75	9.06	5.10	-64.79	-40.00	-24.79
1574.00	35.03	H	-69.46	9.06	5.10	-65.50	-40.00	-25.50

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark"---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4 $EIRP (dBm) = SG \text{ Setting}(dBm) + Antenna \text{ Gain} (dBd/dBi) - Cable \text{ loss} (dB)$
5. Radiated emissions measured were made with an instrument using Peak detector mode with $RBW = 1 \text{ MHz}$, $VBW = 1 \text{ MHz}$

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12. FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT

12.1. Standard Applicable:

According to FCC §2.1055(a) (1)

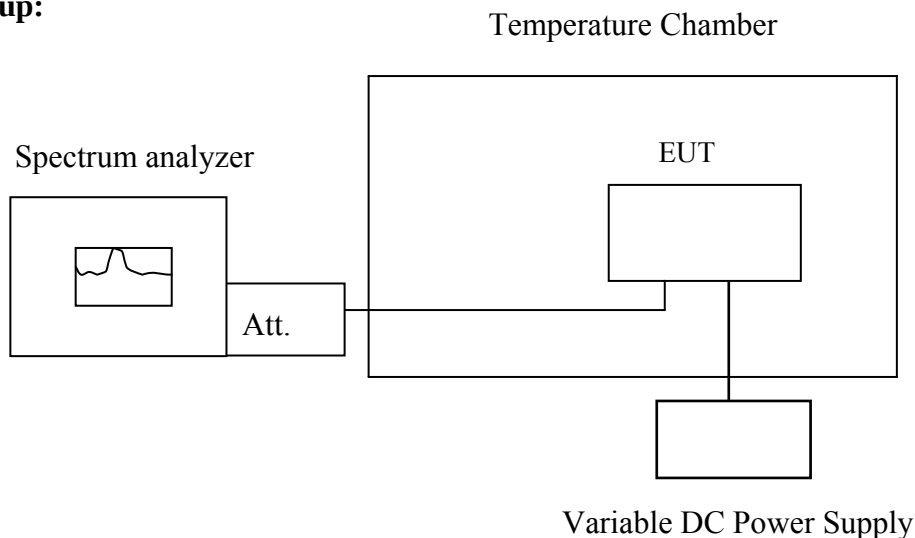
Frequency Tolerance: ± 2.5 ppm for 850MHz band

± 2.5 ppm for 1900MHz band

± 2.5 ppm for 1700MHz band

± 2.5 ppm for 700MHz band

12.2. Test Set-up:



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°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: CDMA 2000 Cell Mid Channel 836.52 MHz				
Limit: +/- 2.5 ppm = 2091 Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature (°C)	(MHz)		
3.7	-30	836.520001	0.00	2091
3.7	-20	836.519999	2.00	2091
3.7	-10	836.519998	3.00	2091
3.7	0	836.520002	-1.00	2091
3.7	10	836.520003	-2.00	2091
3.7	20	836.520001	0.00	2091
3.7	30	836.520000	1.00	2091
3.7	40	836.519998	3.00	2091
3.7	50	836.519999	2.00	2091

Reference Frequency: CDMA 2000 PCS Mid Channel 1880 MHz				
Limit: +/- 2.5 ppm = 4700 Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature (°C)	(MHz)		
3.7	-30	1880.000005	-3.00	4700
3.7	-20	1880.000002	0.00	4700
3.7	-10	1880.000004	-2.00	4700
3.7	0	1880.000002	0.00	4700
3.7	10	1880.000001	1.00	4700
3.7	20	1880.000002	0.00	4700
3.7	30	1879.999998	4.00	4700
3.7	40	1879.999997	5.00	4700
3.7	50	1879.999999	3.00	4700

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t (886-2) 2299-3279

f (886-2) 2298-0488

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Reference Frequency: LTE B13 Mid Channel 782 MHz 5M QPSK CH 23230				
Limit: +/- 2.5 ppm = 1775Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature (°C)	(MHz)		
3.7	-30	782.000004	-5.00	1775
3.7	-20	782.000003	-4.00	1775
3.7	-10	781.999998	1.00	1775
3.7	0	781.999999	0.00	1775
3.7	10	781.999997	2.00	1775
3.7	20	781.999999	0.00	1775
3.7	30	782.000001	-2.00	1775
3.7	40	782.000003	-4.00	1775
3.7	50	782.000002	-3.00	1775

Reference Frequency: LTE B13 Mid Channel 782 MHz 5M 16QAM CH 23230				
Limit: +/- 2.5 ppm = 1775 Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature (°C)	(MHz)		
3.7	-30	781.999995	7.00	1775
3.7	-20	781.999997	5.00	1775
3.7	-10	782.000001	1.00	1775
3.7	0	782.000002	0.00	1775
3.7	10	782.000003	-1.00	1775
3.7	20	782.000002	0.00	1775
3.7	30	781.999998	4.00	1775
3.7	40	781.999997	5.00	1775
3.7	50	781.999993	9.00	1775

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Reference Frequency: LTE B13 Mid Channel 782 MHz 10M QPSK CH 23230				
Limit: +/- 2.5 ppm =1775 Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature (°C)	(MHz)		
3.7	-30	782.000003	-3.00	1775
3.7	-20	782.000002	-2.00	1775
3.7	-10	782.000001	-1.00	1775
3.7	0	782.000001	-1.00	1775
3.7	10	781.999999	1.00	1775
3.7	20	782.000000	0.00	1775
3.7	30	782.000003	-3.00	1775
3.7	40	782.000005	-5.00	1775
3.7	50	782.000004	-4.00	1775

Reference Frequency: LTE B13 Mid Channel 782 MHz 10M 16QAM CH 23230				
Limit: +/- 2.5 ppm =1775 Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature (°C)	(MHz)		
3.7	-30	782.000005	-4.00	1775
3.7	-20	782.000002	-1.00	1775
3.7	-10	782.000003	-2.00	1775
3.7	0	782.000002	-1.00	1775
3.7	10	782.000002	-1.00	1775
3.7	20	782.000001	0.00	1775
3.7	30	782.000003	-2.00	1775
3.7	40	782.000004	-3.00	1775
3.7	50	782.000002	-1.00	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°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: CDMA 2000 Mid Channel 836.52 MHz @ 25°C				
Limit: +/- 2.5 ppm = 2091 Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature (°C)	(MHz)		
4.2	25.00	836.520003	-2.00	2091.00
3.7	25.00	836.520001	0.00	2091.00
3.4	25.00	836.520005	-4.00	2091.00
2.8 (Endpoint)	25.00	836.519995	6.00	2091.00

Reference Frequency: CDMA 2000 PCS Mid Channel 1880 MHz @ 25°C				
Limit: +/- 2.5 ppm = 4700 Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature (°C)	(MHz)		
4.2	25	1880.000001	1.00	4700
3.7	25	1880.000002	0.00	4700
3.4	25	1880.000001	1.00	4700
2.8 (Endpoint)	25	1880.000005	-3.00	4700

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Reference Frequency: LTE B13 Mid Channel 782 MHz @ 25°C 5M QPSK CH 23230				
Limit: +/- 2.5 ppm = 1775Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature (°C)	(MHz)		
4.2	25.00	782.000003	-4.00	1775
3.7	25.00	781.999999	0.00	1775
3.4	25.00	781.999995	4.00	1775
2.8 (End Point)	25.00	781.999996	3.00	1775

Reference Frequency: LTE B13 Mid Channel 782 MHz @ 25°C 5M 16QAM CH 23230				
Limit: +/- 2.5 ppm =1775Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature (°C)	(MHz)		
4.2	25	781.999997	5.00	1775
3.7	25	782.000002	0.00	1775
3.4	25	782.000001	1.00	1775
2.8 (End Point)	25	781.999996	6.00	1775

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Limit: +/- 2.5 ppm =1775Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature (°C)	(MHz)		
4.2	25.00	782.000003	-3.00	1775
3.7	25.00	782.000000	0.00	1775
3.4	25.00	782.000004	-4.00	1775
2.8 (End Point)	25.00	782.000006	-6.00	1775

Reference Frequency: LTE B13 Mid Channel 782 MHz @ 25°C 10M 16QAM CH 23230				
Limit: +/- 2.5 ppm =1775Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature (°C)	(MHz)		
4.2	25	782.000003	-2.00	1775
3.7	25	782.000001	0.00	1775
3.4	25	782.000002	-1.30	1775
2.8 (End Point)	25	782.000003	-2.00	1775

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