

# LECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

## INTENTIONAL RADIATOR CERTIFICATION TO FCC PART 22 SUBPART H, PART 24 SUBPART E

OF

**Product Name:** PDA Phone

**Marketing Name:** ST26i

**Brand Name:** Sony

**Model No.:** PM-0160-BV

**Model Differences:** N/A

**FCC ID:** PY7PM-0160

**Report No.:** EH/2012/60042

**Issue Date:** Aug. 23, 2012

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

**Prepared for:** Sony Mobile Communications AB  
Nya Vattentorget 22188 Lund/SWEDEN

**Prepared by:** SGS Taiwan Ltd.  
Electronics & Communication Laboratory  
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## VERIFICATION OF COMPLIANCE

**Applicant:** Sony Mobile Communications AB  
Nya Vattentorget 22188 Lund/SWEDEN

**Product Name:** PDA Phone

**Brand Name:** Sony

**Marketing Name:** ST26i

**Model No.:** PM-0160-BV

**Model Different:** N/A

**FCC ID:** PY7PM-0160

**File Number:** EH/2012/60042

**Date of test:** Jun. 22, 2012 ~ Jul. 10, 2012

**Date of EUT Received:** Jun. 22, 2012

### 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.

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

**Test By:**



**Date:**

Aug. 23, 2012

**Prepared By:**



**Date:**

Aug. 23, 2012

**Approved By:**



**Date:**

Aug. 23, 2012

**Jim Chang / Supervisor**

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## Version

Version No.	Date	Description
00	Jul. 12, 2012	Initial creation of document
01	Aug. 23, 2012	Updated Hardware Version

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### 1. GENERAL PRODUCT INFORMATION

General:

Product Name:	PDA Phone	
Brand Name:	Sony	
Model No.:	PM-0160-BV	
Model difference:	N/A	
Data Cable (USB):	Model No.: EC450, Supplier: K-one, Part No.: 1262-3995	
Simple Hands-free (SHF):	Model No.: MH410C, Supplier: Foster Electric Type No.: CCA-0004017	
Car Charger:	Model No.: AN400, Supplier: Salcomp, Type No.: CAA-0003013	
Hardware Version:	A	
Software Version:	11.0.A.1.0	
Power Supply:	3.7Vdc form Li-Ion battery or 5Vdc from adapter.	
	Battery:	1. Model No.: BA900, Supplier: SONY Type No.: AB-0500
	Adapter :	1. Model No.: EP800, Supplier: Salcomp Type No.: CAA-0002016-US

GSM & WCDMA:

Cellular Phone Standards Frequency Range and Power:	Operating Frequency		Rated Power
	GSM/GPRS 850, Class 12	824.2 MHz– 848.8 MHz	33 dBm
	EDGE 850, Class 12	824.2 MHz– 848.8 MHz	33 dBm
	GSM/GPRS 1900, Class 12	1850.2MHz – 1909.8MHz	30 dBm
	EDGE 1900, Class 12	1850.2 MHz – 1909.8 MHz	30 dBm
Type of Emission:	GSM850: 246KGXW, GSM1900: 246KGXW GPRS850: 245KGXW, GPRS1900: 248KGXW EDEG850: 247KG7W, EDGE1900: 252KG7W		
IMEI:	004402145580977		

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Final Amplifier Voltage and Current Information:

Test Mode	DC voltage (V)	DC current (mA)
GSM 850	3.7 Vdc	360
GSM 1900	3.7 Vdc	380
GPRS 850	3.7 Vdc	360
GPRS 1900	3.7 Vdc	340
EDGE 850	3.7 Vdc	330
EDGE 1900	3.7 Vdc	360

This test report applies for GSM/GPRS/EDGE /850/1900.

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

This submittal(s) (test report) is intended for **FCC ID: PY7PM-0160** filing to comply with Section Part 22 subpart H, Part 24 subpart E 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.

TS 151 010-1 is used to set, and measure the output power.

### 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 Conducted Measurement at Antenna Port:

According to measurement procured TIA/EIA 603C and RSS-Gen, 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.

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

According to measurement procured TIA/EIA 603C and RSS-Gen, The EUT is a placed on as turn table which is 0.8 m 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 8 and 13 of ANSI C63.4:2003.

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## 2.4. Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Power Sensor	Anritsu	ML2495A	1005007	02/08/2012	02/07/2014
Power Meter	Anritsu	MA2411B	917032	02/08/2012	02/07/2014
Spectrum Analyzer	Agilent	E4446A	MY51100003	04/15/2011	04/14/2013
Spectrum Analyzer	Agilent	E4440A	US41160416	03/17/2012	03/16/2014
Radio Communication Analyzer	R & S	CMU200	102189	08/12/2010	08/11/2012
WIDEB. RADIO COMIN. TESTER	R & S	CMW500	101582	07/12/2012	07/11/2013
Temperature Chamber	TERCHY	MHG-120LF	911009	04/16/2012	04/15/2014
DC Block	Mini-Circuits	BLK-18-S+	1	02/28/2012	02/27/2013
Attenuator	Mini-Circuit	BW-S10W2+	002	02/28/2012	02/27/2013
Splitter	Agilent	11636B	N/A	02/28/2012	02/27/2013
DC Power Supply	Agilent	E3640A	MY40005907	07/15/2011	07/14/2013

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ERP, EIRP MEASUREMENT EQUIPMENT List 966 Chamber					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	Agilent	E4446A	MY51100003	04/15/2011	04/14/2013
EXA Spectrum Analyzer	Agilent	N9010A	MY50420195	02/15/2011	02/14/2013
Spectrum Analyzer	R&S	FSV-30	101398	10/18/2011	10/17/2013
Bilog Antenna	SCHWAZBECK	VULB9168	378	01/10/2012	01/09/2014
Bilog Antenna	SCHWAZBECK	VULB9160	3158	11/24/2011	11/23/2013
Dipole Antenna	SCHWAZBECK	VHAP	908/909	07/17/2012	07/16/2014
Dipole Antenna	SCHWAZBECK	UHAP	891/892	07/17/2010	07/16/2012
Horn antenna	ETS.LINDGREN	3117	123995	05/19/2011	05/18/2013
Horn Antenna	Schwarzbeck	BBHA9170	184	01/17/2012	01/17/2014
Horn Antenna	Schwarzbeck	BBHA9170	185	07/11/2011	07/10/2013
RF amplifier	Miteq	AMF-6F-2600 400-40-8P	971576	12/28/2011	12/27/2012
Signal Generator	R&S	SMR40	100210	02/02/2012	02/01/2014
Signal Generator	Agilent	E4438C	MY45093613	07/15/2011	07/14/2013
Pre-Amplifier	Agilent	8447D	1937A02834	01/04/2012	01/03/2013
Pre-Amplifier	EMC Instruments Corp.	EMC0126530	980038	01/04/2012	01/03/2013
Attenuator	Mini-Circuit	BW-S10W2+	004	02/28/2012	02/27/2013
Radio Communication Analyzer	R & S	CMU200	102189	08/12/2010	08/11/2012
WIDEB. RADIO COMIN. TESTER	R & S	CMW500	101582	07/12/2012	07/11/2014
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	966_Tx	10m	01/04/2012	01/03/2013
Low Loss Cable	HUBER+SUHNER	966_Rx	3m	01/04/2012	01/03/2013
Filter 800-1000	Micro-Tronics	EWT	M2	02/28/2012	02/28/2013
Filter 1800-2000	Micro-Tronics	EWT	M2	02/28/2012	02/28/2013
1GHz High Pass Filter	Micro-Tronics	HPM50108	32	02/28/2012	02/27/2013
2GHz High Pass Filter	Micro-Tronics	HPM50110	36	02/28/2012	02/27/2013
3m Site NSA	SGS	966 chamber	N/A	07/15/2012	07/14/2013

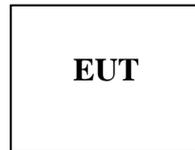
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## 2.5. Configuration of Tested System

Fig. 2-1 Configuration of Tested System



Remote Side

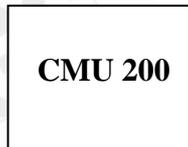


Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model / Type No.	Series No.
1.	Radio Communication Analyzer	R&S	CMU200	102189

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### 3. SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§2.1046(a)	RF Power Output	Compliant
§2.1046(a) §22.913(a)(2) §24.232(c)	ERP/ EIRP measurement	Compliant
§2.1049(h)	99% Occupied Bandwidth	Compliant
§2.1051 §22.917(a) §24.238(a)	Out of Band Emissions at Antenna Terminals and Band Edge	Compliant
§2.1053 §22.917(a) §24.238(a)	Field Strength of Spurious Radiation	Compliant
§2.1055(a)(1) §22.355 §24.235	Frequency Stability vs. Temperature	Compliant
§2.1055(d)(2) §22.355 §24.235	Frequency Stability vs. Voltage	Compliant

Max ERP/EIRP measurement result:

	dBm	dB	W
GSM 850 Band	25.11	ERP	0.324
GSM 1900 Band	31.23	EIRP	1.327
GPRS 850 Band	24.88	ERP	0.308
GPRS 1900 Band	32.24	EIRP	1.675
EDGE 850 Band	22.65	ERP	0.184
EDGE 1900 Band	32.33	EIRP	1.710

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#### 4. DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition.

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

The field strength of spurious radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for GSM/GPRS. The worst-case of H position for GSM 850 and E1 position for EDGE 1900 band were reported.

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

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

Measurement uncertainty (Polarization : <b>Horizontal</b> )	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

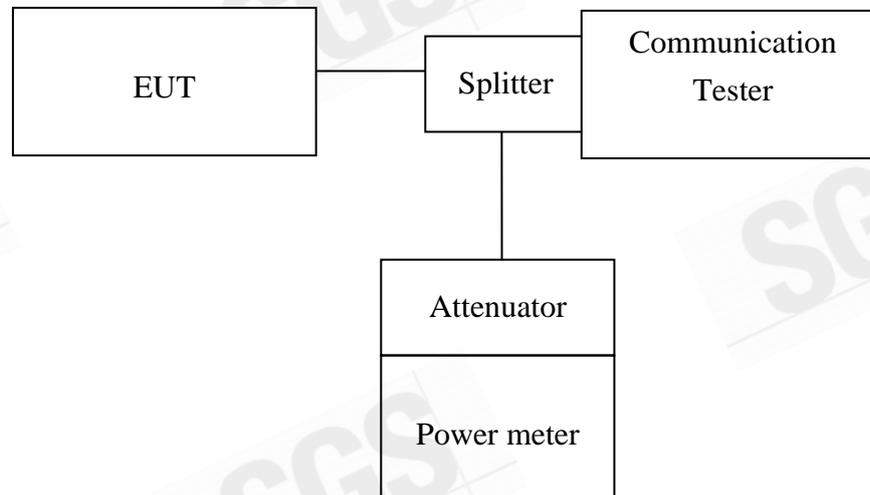
### 6.1. Standard Applicable:

According to FCC §2.1046.

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

FCC 24.232(C) Peak Power Measurement to 2W.

### 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. TS 151 010-1 is referenced to conduct the test measurement of output power.

### 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.: GSM/GPRS/EDGE (GMSK; 8-PSK)**

**Result:**

EUT Mode	Frequency (MHz)	CH	Peak Power (dBm)	Avg. Power (dBm)
GSM 850	824.2	128	34.20	33.80
	836.6	190	34.00	33.70
	848.8	251	34.00	33.60

EUT Mode	Frequency (MHz)	CH	Peak Power (dBm)	Avg. Power (dBm)
GSM 1900	1850.2	512	30.80	30.70
	1880.0	661	30.70	30.50
	1909.8	810	30.60	30.50

EUT Mode	Frequency (MHz)	CH	Peak Power (4DN 1UP) class 8	Avg. Power (4DN 1UP) class 8	Peak Power (4DN 2UP) Class 10	Avg. Power (4DN 2UP) Class 10	Peak Power (4DN 3UP) Class 11	Avg. Power (4DN 3UP) Class 11	Peak Power (4DN 4UP) Class 12	Avg. Power (4DN 4UP) Class 12
			(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)
GPRS 850	824.2	128	34.20	33.90	29.40	29.30	28.20	28.10	28.40	28.20
	836.6	190	34.00	33.70	29.40	29.30	28.40	28.30	28.40	28.30
	848.8	251	34.00	33.60	29.50	29.40	28.50	28.40	28.50	28.40

EUT Mode	Frequency (MHz)	CH	Peak Power (4DN 1UP) class 8	Avg. Power (4DN 1UP) class 8	Peak Power (4DN 2UP) Class 10	Avg. Power (4DN 2UP) Class 10	Peak Power (4DN 3UP) Class 11	Avg. Power (4DN 3UP) Class 11	Peak Power (4DN 4UP) Cass 11	Avg. Power (4DN 4UP) Cass 11
			(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)
GPRS 1900	1850.2	512	31.00	30.80	27.50	27.40	26.40	26.30	25.50	25.40
	1880.0	661	30.90	30.70	27.50	27.40	26.30	26.20	25.50	25.30
	1909.8	810	30.70	30.60	27.40	27.30	26.30	26.10	25.40	25.20

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EUT Mode	Frequency (MHz)	CH	Peak Power (4DN 1UP) class 8	Avg. Power (4DN 1UP) class 8	Peak Power (4DN 2UP) Class 10	Avg. Power (4DN 2UP) Class 10	Peak Power (4DN 3UP) Class 11	Avg. Power (4DN 3UP) Class 11	Peak Power (4DN 4UP) Class 12	Avg. Power (4DN 4UP) Class 12
			(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)
EDGE 850	824.2	128	30.00	26.80	29.00	25.80	29.00	25.80	29.00	25.70
	836.6	190	30.00	26.90	29.10	25.80	29.10	25.80	29.00	25.70
	848.8	251	30.20	27.00	29.20	25.90	29.20	25.90	29.10	25.80

EUT Mode	Frequency (MHz)	CH	Peak Power (4DN 1UP) class 8	Avg. Power (4DN 1UP) class 8	Peak Power (4DN 2UP) Class 10	Avg. Power (4DN 2UP) Class 10	Peak Power (4DN 3UP) Cass 11	Avg. Power (4DN 3UP) Cass 11	Peak Power (4DN 4UP) Class 12	Avg. Power (4DN 4UP) Class 12
			(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)	(dBm)
EDGE 1900	1850.2	512	29.40	26.30	29.00	25.90	29.00	25.90	28.50	25.30
	1880.0	661	29.30	26.20	28.90	25.80	28.90	25.80	28.40	25.20
	1909.8	810	29.20	26.10	28.80	25.70	28.80	25.60	28.30	25.10

GSM 850 cable loss: 0.5 dBm

GSM 1900 cable loss: 0.7 dBm

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**6.5.1.2: Minimum Communications Power Measurement**

**PCS 1900 band**

<b>PCL</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>
Output power (dBm)	30.7	28.2	26.2	24.1	22.1	20	18.1	16.1	14.0
<b>PCL</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>		
Output power (dBm)	12.1	10.1	8.1	6.1	4.1	2.1	0.1		

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

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## 7. ERP, EIRP MEASUREMENT

### 7.1. Standard Applicable:

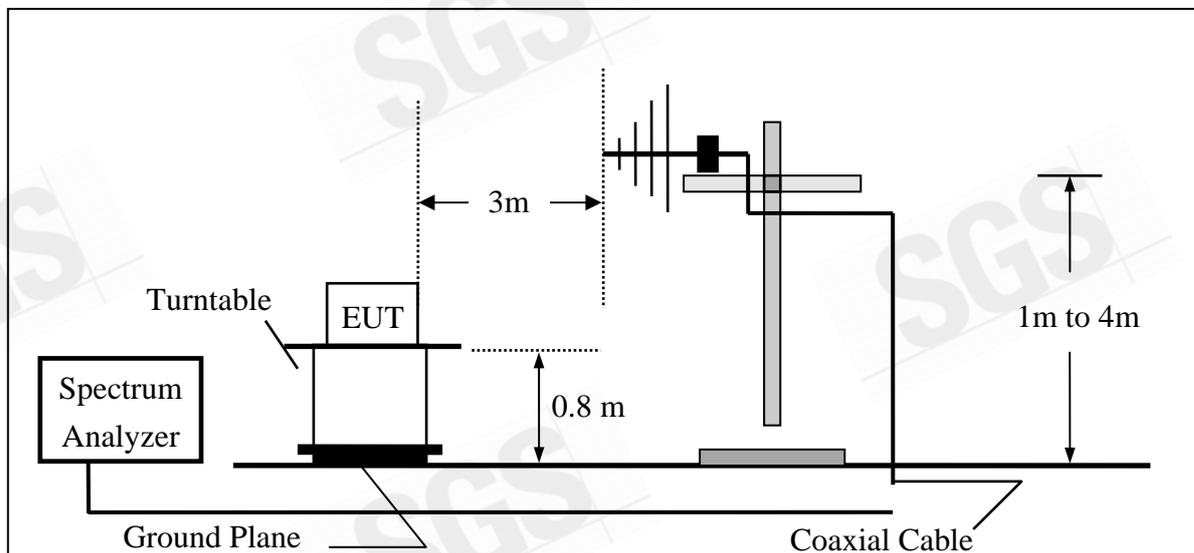
According to FCC §2.1046

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

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

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

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

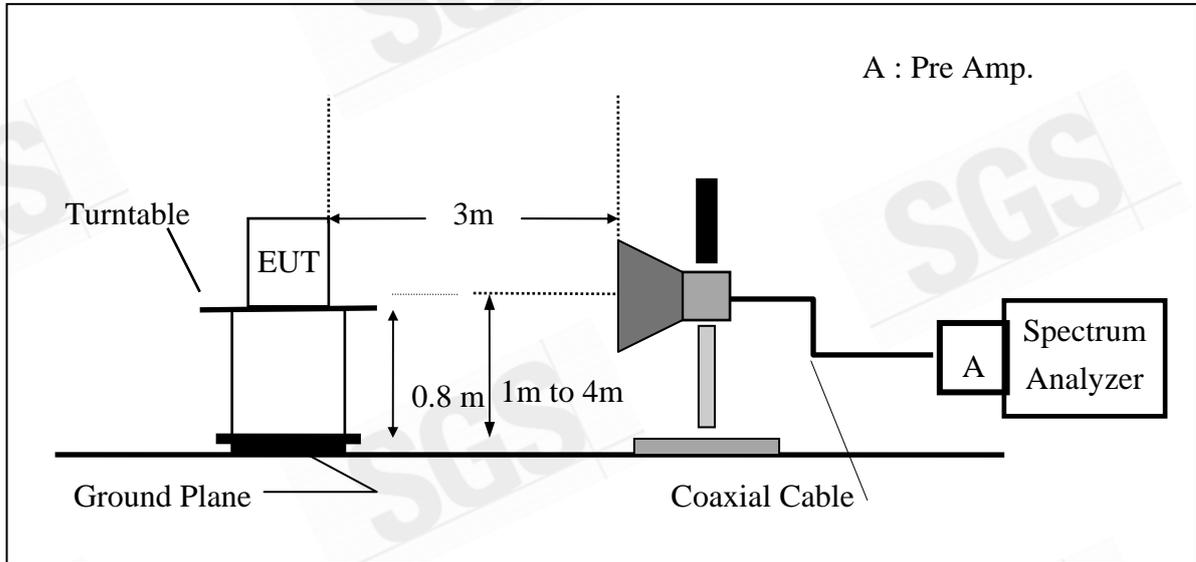


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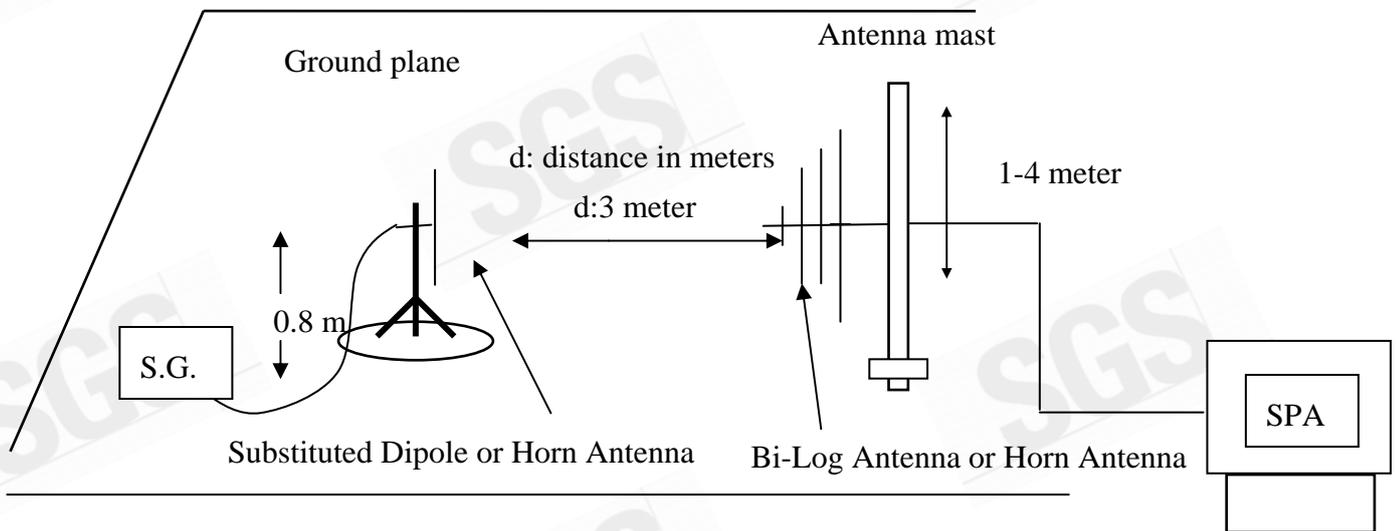
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(B) Radiated Emission Test Set-UP Frequency Over 1 GHz



(C) Substituted Method Test Set-UP



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

EIRP in frequency band 1850.2 –1909.8MHz 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:

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

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

### 7.4. Measurement Equipment Used:

Refer to section 2.4 in this report

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7.5. 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
GSM 850	H	824.20	128	V	20.71	3.96	-4.22	20.45	38.45
				H	24.58	3.96	-4.22	24.32	38.45
		836.60	190	V	25.11	4.00	-4.24	24.87	38.45
				H	21.06	4.00	-4.24	20.82	38.45
		848.80	251	V	21.66	4.03	-4.33	21.36	38.45
				H	25.41	4.03	-4.33	<b>25.11</b>	38.45
	E1	824.20	128	V	17.67	3.96	-4.22	17.41	38.45
				H	22.01	3.96	-4.22	21.75	38.45
		836.60	190	V	18.20	4.00	-4.24	17.96	38.45
				H	21.61	4.00	-4.24	21.37	38.45
		848.80	251	V	20.25	4.03	-4.33	19.95	38.45
				H	21.65	4.03	-4.33	21.35	38.45
	E2	824.20	128	V	23.93	3.96	-4.22	23.67	38.45
				H	22.13	3.96	-4.22	21.87	38.45
		836.60	190	V	24.66	4.00	-4.24	24.42	38.45
				H	21.74	4.00	-4.24	21.5	38.45
		848.80	251	V	24.84	4.03	-4.33	24.54	38.45
				H	22.53	4.03	-4.33	22.23	38.45

Remark :

- (1) The RBW,VBW of SPA for frequency RBW=300 KHz, VBW=1MHz

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EUT				Measurement					
Operation Band	Pol.	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit
		MHz		V/H	dBm	dBi	dB	dBm	dBm
GSM 1900	H	1850.20	512	V	28.43	4.17	-4.62	27.99	33.00
				H	29.01	4.51	-4.62	28.91	33.00
		1880.00	661	V	28.57	4.13	-4.65	28.05	33.00
				H	26.62	4.44	-4.65	26.41	33.00
		1909.80	810	V	27.81	4.09	-4.71	27.20	33.00
				H	29.05	4.36	-4.71	28.71	33.00
	E1	1850.20	512	V	30.34	4.17	-4.62	29.90	33.00
				H	27.64	4.51	-4.62	27.53	33.00
		1880.00	661	V	29.3	4.13	-4.65	28.79	33.00
				H	27.83	4.44	-4.65	27.62	33.00
		1909.80	810	V	31.75	4.09	-4.71	31.14	33.00
				H	27.99	4.36	-4.71	27.65	33.00
	E2	1850.20	512	V	28.92	4.17	-4.62	28.48	33.00
				H	29.18	4.13	-4.65	28.66	33.00
		1880.00	661	V	29.62	4.44	-4.65	29.40	33.00
				H	28.87	4.09	-4.71	28.26	33.00
		1909.80	810	V	29.63	4.36	-4.71	29.29	33.00
				H	31.67	4.17	-4.62	<b>31.23</b>	33.00

**Remark :**

- (1) The RBW,VBW of SPA for frequency RBW=300K, VBW=1MHz

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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
GPRS 850	H	824.20	128	V	20.59	3.96	-4.22	20.33	38.45
				H	24.59	3.96	-4.22	24.33	38.45
		836.60	190	V	21.00	4.00	-4.24	20.76	38.45
				H	25.12	4.00	-4.24	<b>24.88</b>	38.45
		848.80	251	V	21.69	4.03	-4.33	21.39	38.45
				H	25.48	4.03	-4.33	25.18	38.45
	E1	824.20	128	V	17.68	3.96	-4.22	17.42	38.45
				H	21.91	3.96	-4.22	21.65	38.45
		836.60	190	V	18.25	4.00	-4.24	18.01	38.45
				H	21.65	4.00	-4.24	21.41	38.45
		848.80	251	V	20.22	4.03	-4.33	19.92	38.45
				H	21.55	4.03	-4.33	21.25	38.45
	E2	824.20	128	V	23.95	3.96	-4.22	23.69	38.45
				H	22.16	3.96	-4.22	21.90	38.45
		836.60	190	V	24.54	4.00	-4.24	24.30	38.45
				H	21.79	4.00	-4.24	21.55	38.45
		848.80	251	V	24.77	4.03	-4.33	24.47	38.45
				H	22.57	4.03	-4.33	22.27	38.45

**Remark :**

- (1) The RBW,VBW of SPA for frequency RBW=300 KHz, VBW=1MHz

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EUT				Measurement					
Operation Band	Pol.	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit
		MHz		V/H	dBm	dBi	dB	dBm	dBm
GPRS 1900	H	1850.20	512	V	29.85	4.51	-4.62	29.75	33.00
				H	31.97	4.13	-4.65	31.46	33.00
		1880.00	661	V	29.31	4.44	-4.65	29.10	33.00
				H	32.86	4.09	-4.71	<b>32.24</b>	33.00
		1909.80	810	V	28.48	4.36	-4.71	28.14	33.00
				H	31.87	4.17	-4.62	31.43	33.00
	E1	1850.20	512	V	27.49	4.51	-4.62	27.38	33.00
				H	31.00	4.13	-4.65	30.49	33.00
		1880.00	661	V	27.54	4.44	-4.65	27.32	33.00
				H	31.28	4.10	-4.71	30.67	33.00
		1909.80	810	V	26.97	4.36	-4.71	26.62	33.00
				H	29.28	4.17	-4.62	28.84	33.00
	E2	1850.20	512	V	30.57	4.51	-4.62	30.46	33.00
				H	28.36	4.13	-4.65	27.85	33.00
		1880.00	661	V	30.34	4.44	-4.65	30.13	33.00
				H	29.34	4.09	-4.71	28.72	33.00
		1909.80	810	V	30.70	4.36	-4.71	30.36	33.00
				H	27.79	4.17	-4.62	27.35	33.00

**Remark :**

- (1) The RBW,VBW of SPA for frequency RBW=300K, VBW=1MHz

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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
EDGE 850	H	824.20	128	V	15.81	3.96	-4.22	15.55	38.45
				H	21.03	3.96	-4.22	20.77	38.45
		836.60	190	V	16.33	4.00	-4.24	16.09	38.45
				H	22.35	4.00	-4.24	22.11	38.45
		848.80	251	V	17.48	4.03	-4.33	17.18	38.45
				H	22.95	4.03	-4.33	<b>22.65</b>	38.45
	E1	824.20	128	V	13.01	3.96	-4.22	12.75	38.45
				H	17.24	3.96	-4.22	16.98	38.45
		836.60	190	V	13.47	4.00	-4.24	13.23	38.45
				H	17.12	4.00	-4.24	16.88	38.45
		848.80	251	V	15.76	4.03	-4.33	15.46	38.45
				H	17.18	4.03	-4.33	16.88	38.45
	E2	824.20	128	V	19.67	3.96	-4.22	19.41	38.45
				H	17.47	3.96	-4.22	17.21	38.45
		836.60	190	V	20.76	4.00	-4.24	20.52	38.45
				H	17.15	4.00	-4.24	16.91	38.45
		848.80	251	V	21.12	4.03	-4.33	20.82	38.45
				H	18.37	4.03	-4.33	18.07	38.45

**Remark :**

- (1) The RBW,VBW of SPA for frequency RBW=300 KHz, VBW=1MHz

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EUT				Measurement					
Operation Band	Pol.	Fundamental Frequency	CH	Antenna Pol.	S.G. Output	Antenna Gain	Cable Loss	EIRP	Limit
		MHz		V/H	dBm	dBi	dB	dBm	dBm
EDGE 1900	H	1850.20	512	V	29.50	4.51	-4.62	29.39	33.00
				H	26.36	4.13	-4.65	25.84	33.00
		1880.00	661	V	26.07	4.44	-4.65	25.85	33.00
				H	27.70	4.09	-4.71	27.09	33.00
		1909.80	810	V	27.63	4.36	-4.71	27.28	33.00
				H	31.81	4.17	-4.62	31.36	33.00
	E1	1850.20	512	V	23.67	4.51	-4.62	23.57	33.00
				H	30.20	4.13	-4.65	29.68	33.00
		1880.00	661	V	25.92	4.44	-4.65	25.70	33.00
				H	29.74	4.10	-4.71	29.13	33.00
		1909.80	810	V	27.49	4.36	-4.71	27.15	33.00
				H	32.77	4.17	-4.62	<b>32.33</b>	33.00
	E2	1850.20	512	V	29.15	4.51	-4.62	29.04	33.00
				H	30.41	4.13	-4.65	29.89	33.00
		1880.00	661	V	26.84	4.44	-4.65	26.63	33.00
				H	27.65	4.09	-4.71	27.04	33.00
		1909.80	810	V	26.45	4.36	-4.71	26.11	33.00
				H	29.50	4.17	-4.62	29.39	33.00

**Remark :**

- (1) The RBW,VBW of SPA for frequency RBW=300K, VBW=1MHz

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## 8. 99% OCCUPIED BANDWIDTH MEASUREMENT

### 8.1. Standard Applicable:

According to §FCC 2.1049.

### 8.2. Test Set-up:

Refer to section 6.2 in this report

### 8.3. 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.

### 8.4. Measurement Equipment Used:

Refer to section 2.4 in this report

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**8.5. Measurement Result:**

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (kHz)
GSM 850	824.20	128	242.8038
	836.60	190	245.7502
	848.80	251	242.5314

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (kHz)
GSM 1900	1850.20	512	245.8710
	1880.00	661	242.2521
	1909.80	810	248.9338

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (kHz)
GPRS 850	824.20	128	244.1512
	836.60	190	245.1814
	848.80	251	245.1157

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (kHz)
GPRS 1900	1850.20	512	246.2598
	1880.00	661	245.2352
	1909.80	810	247.7656

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EUT Mode	Frequency (MHz)	CH	99% Bandwidth (kHz)
EDGE 850	824.20	128	246.8510
	836.60	190	242.4504
	848.80	251	244.2798

EUT Mode	Frequency (MHz)	CH	99% Bandwidth (kHz)
EDGE 1900	1850.20	512	244.3607
	1880.00	661	241.3466
	1909.80	810	252.2351

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Figure 8-1: GSM 850 Channel Low

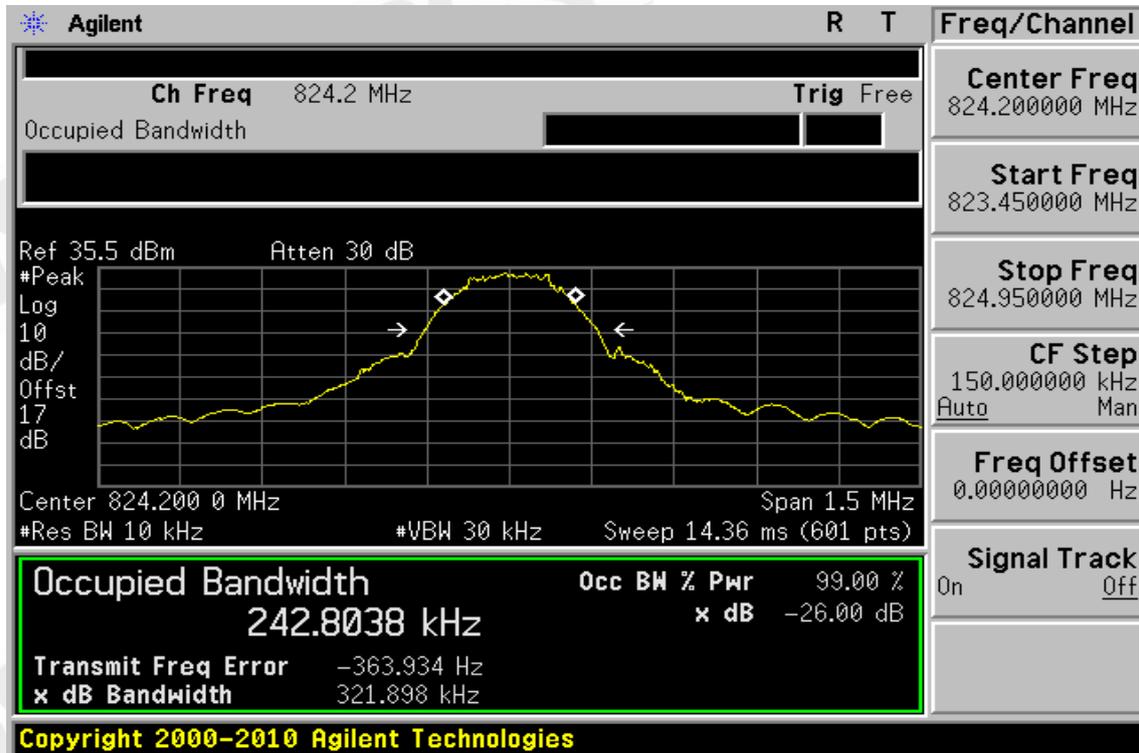
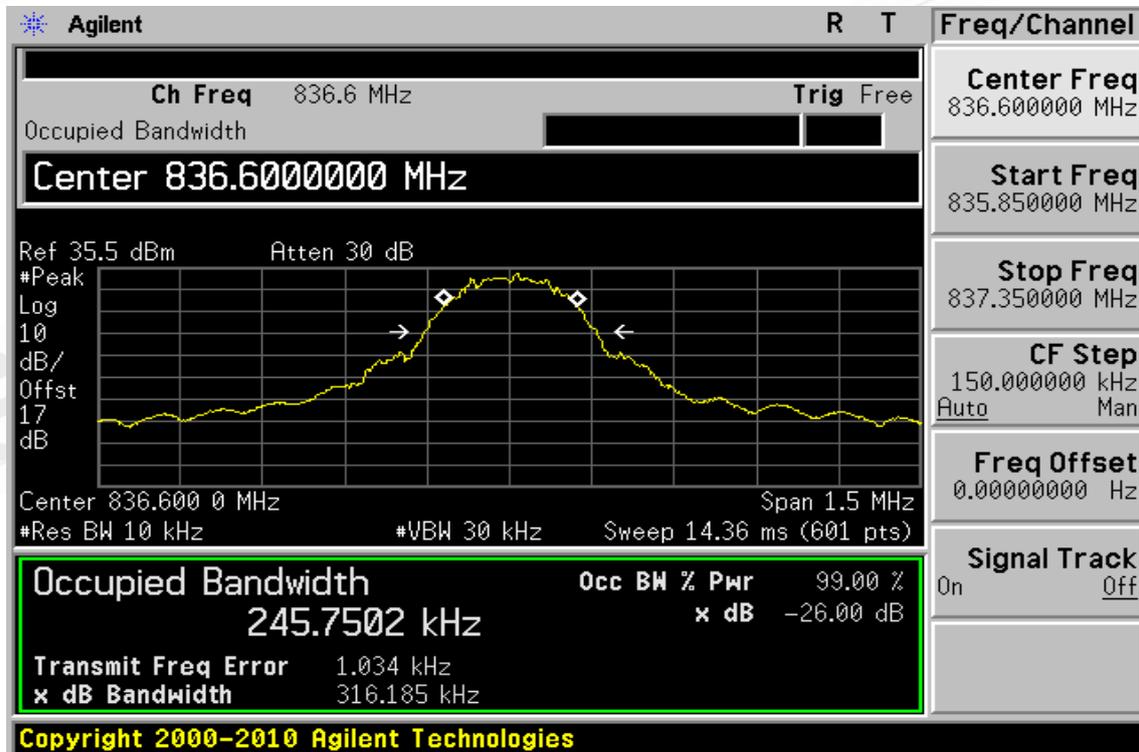


Figure 8-2 GSM 850 Channel Mid



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Figure 8-3: GSM 850 Channel High

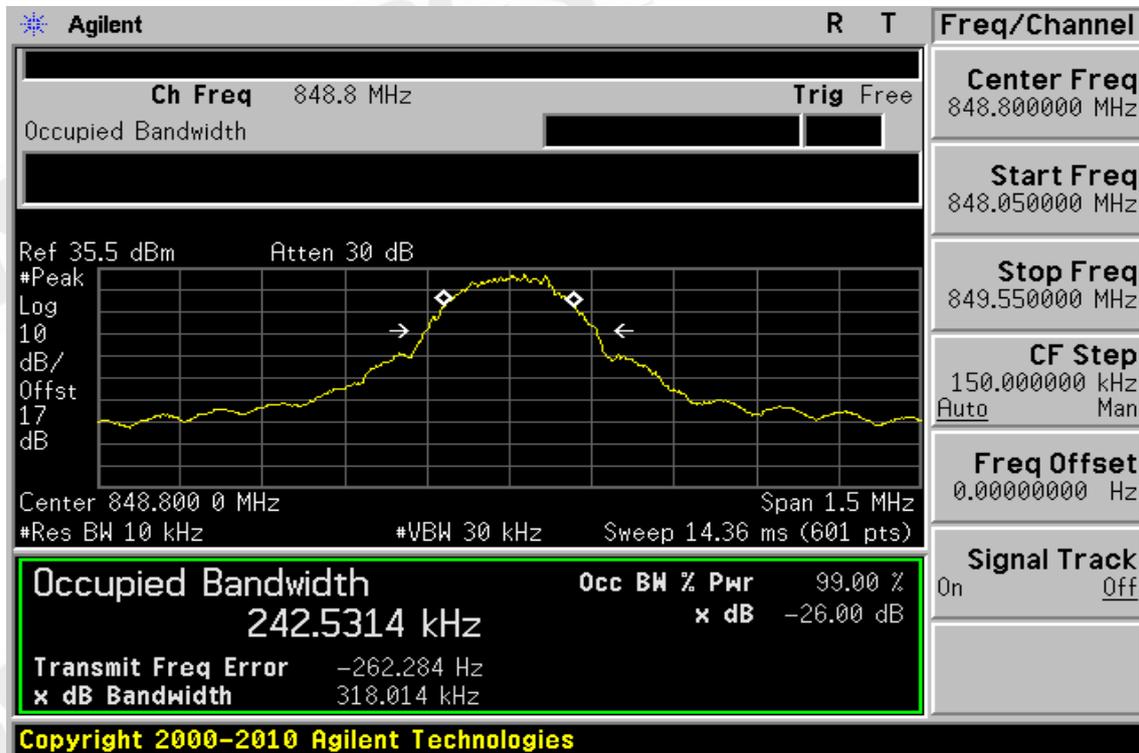
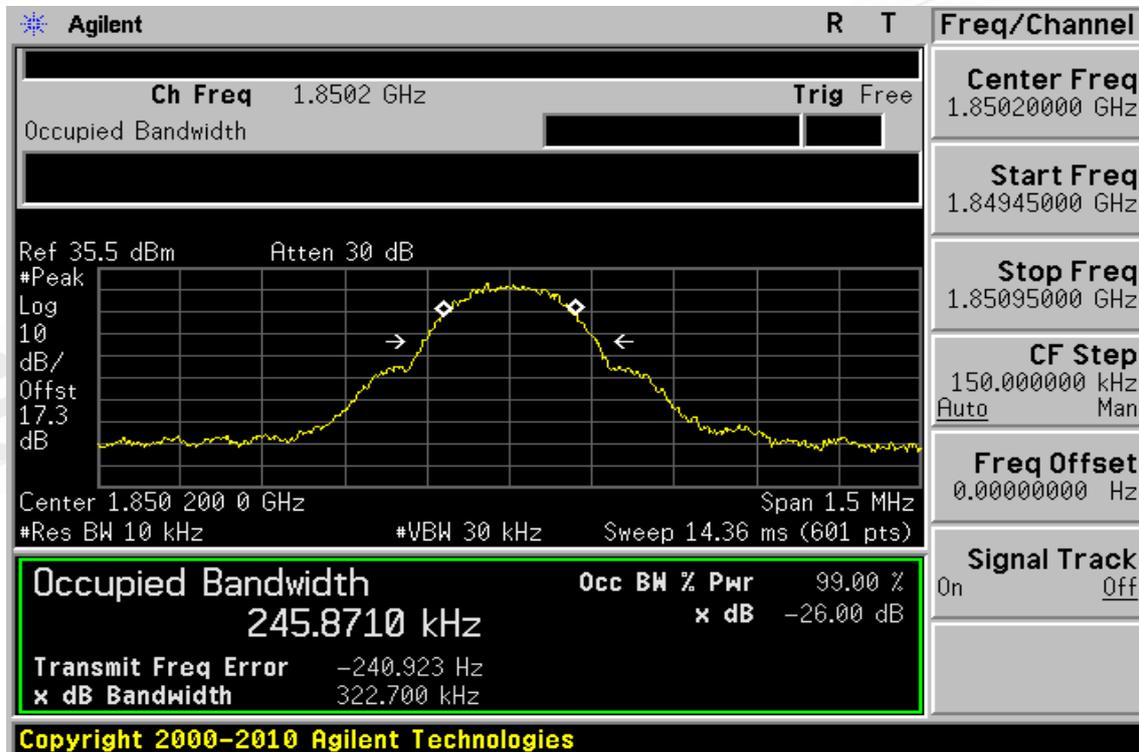


Figure 8-4: GSM 1900 Channel Low



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Figure 8-5 GSM 1900 Channel Mid

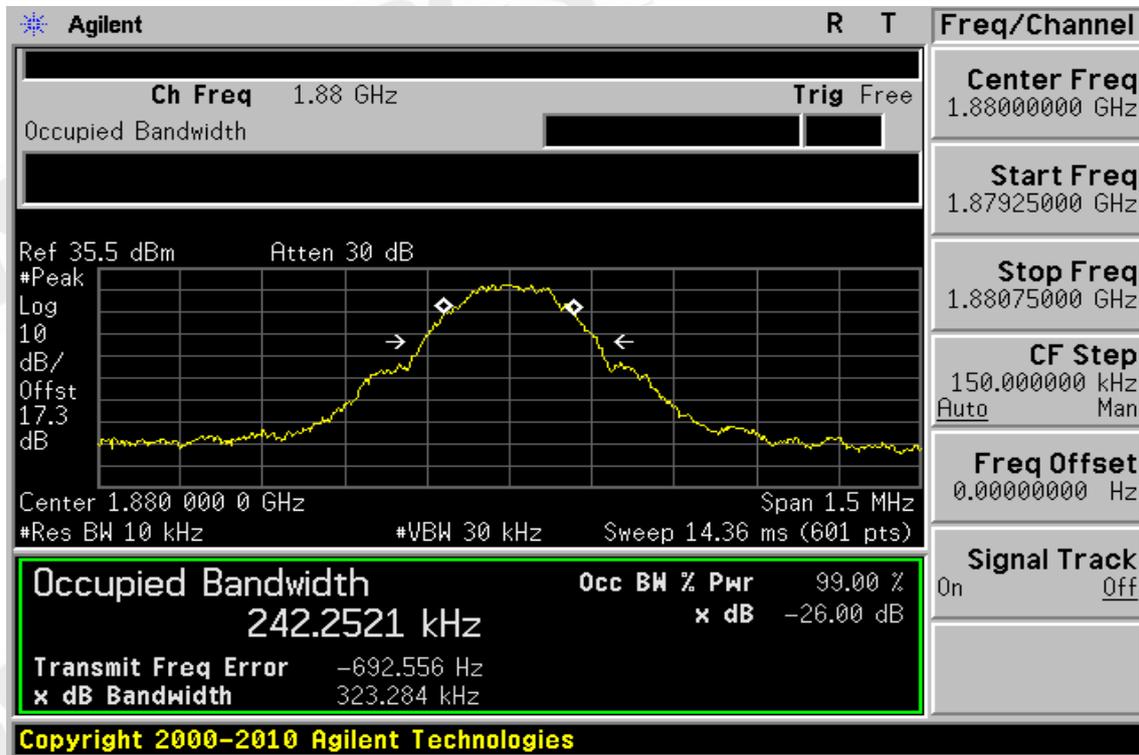
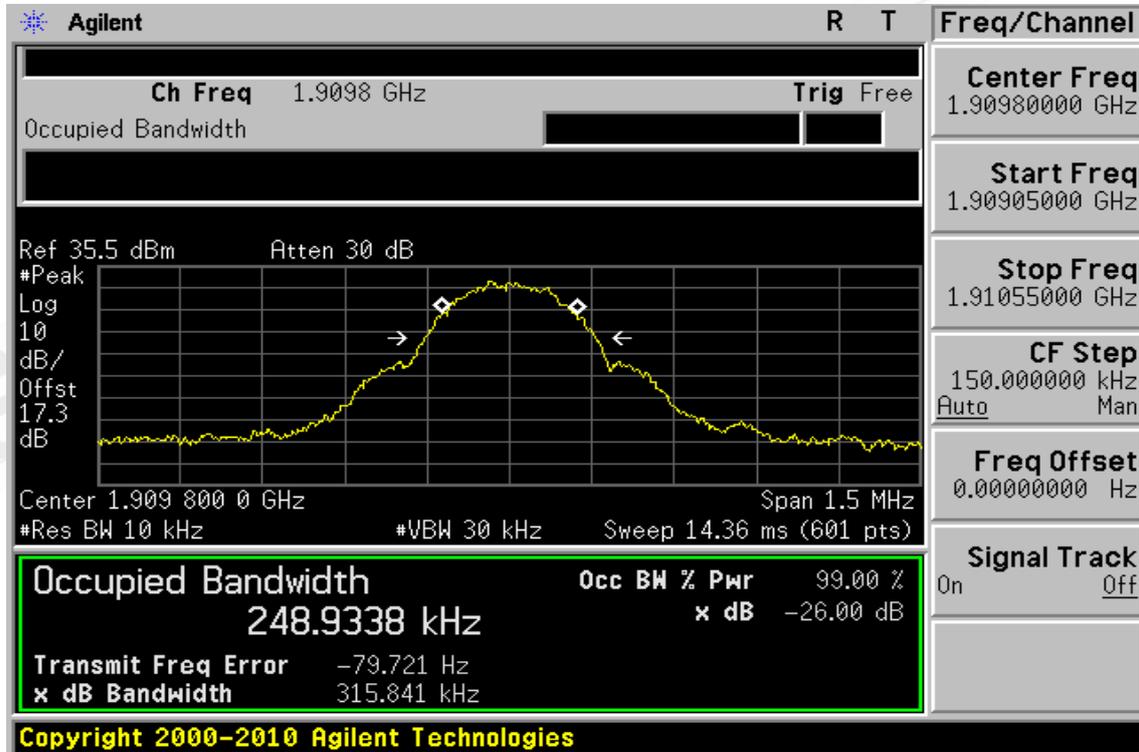


Figure 8-6: GSM 1900 Channel High



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Figure 8-7: GPRS 850 Channel Low

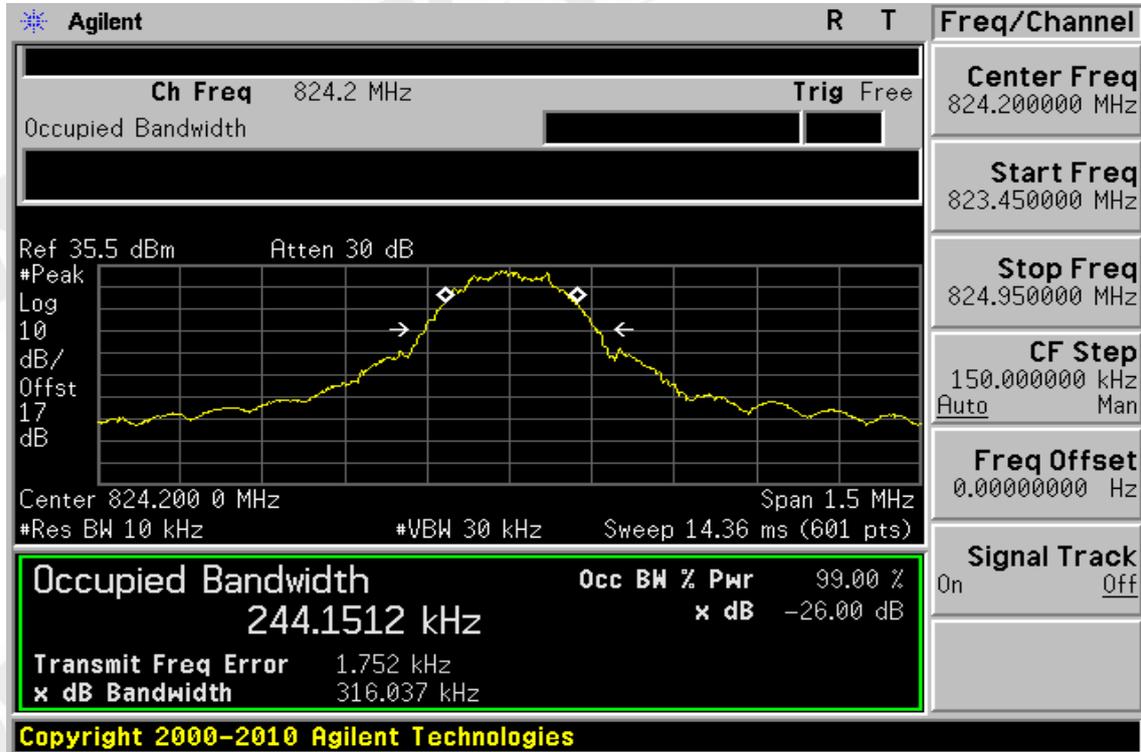
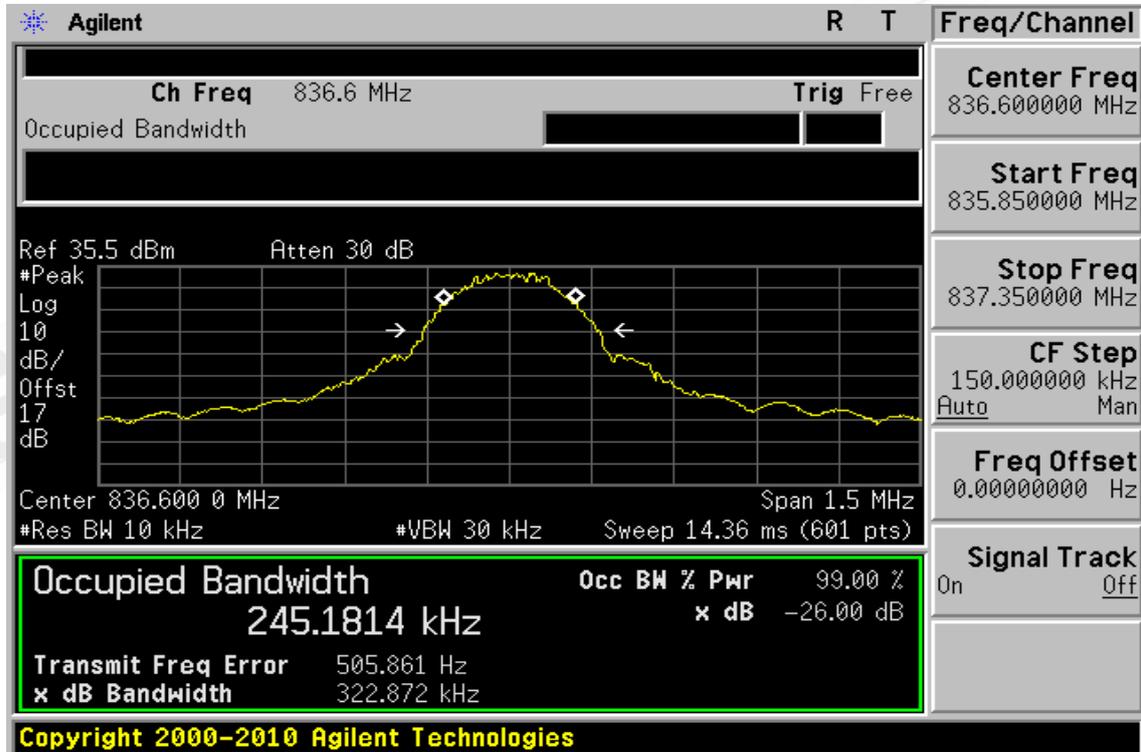


Figure 8-8 GPRS 850 Channel Mid



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Figure 8-9: GPRS 850 Channel High

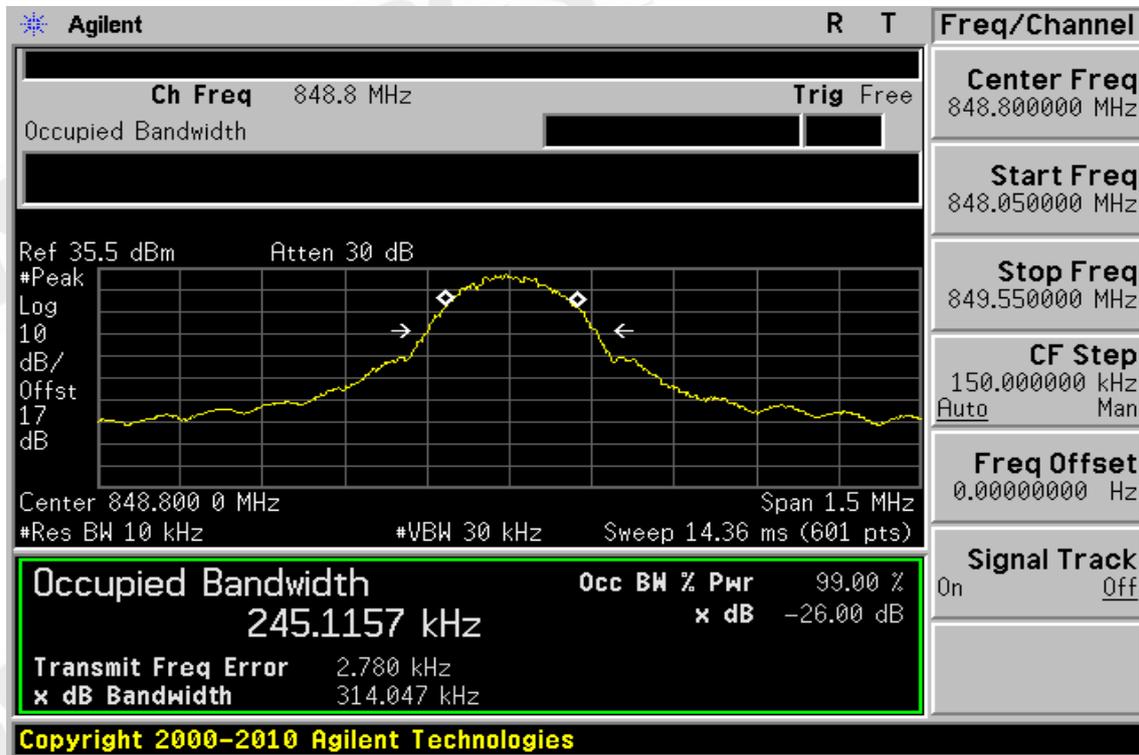
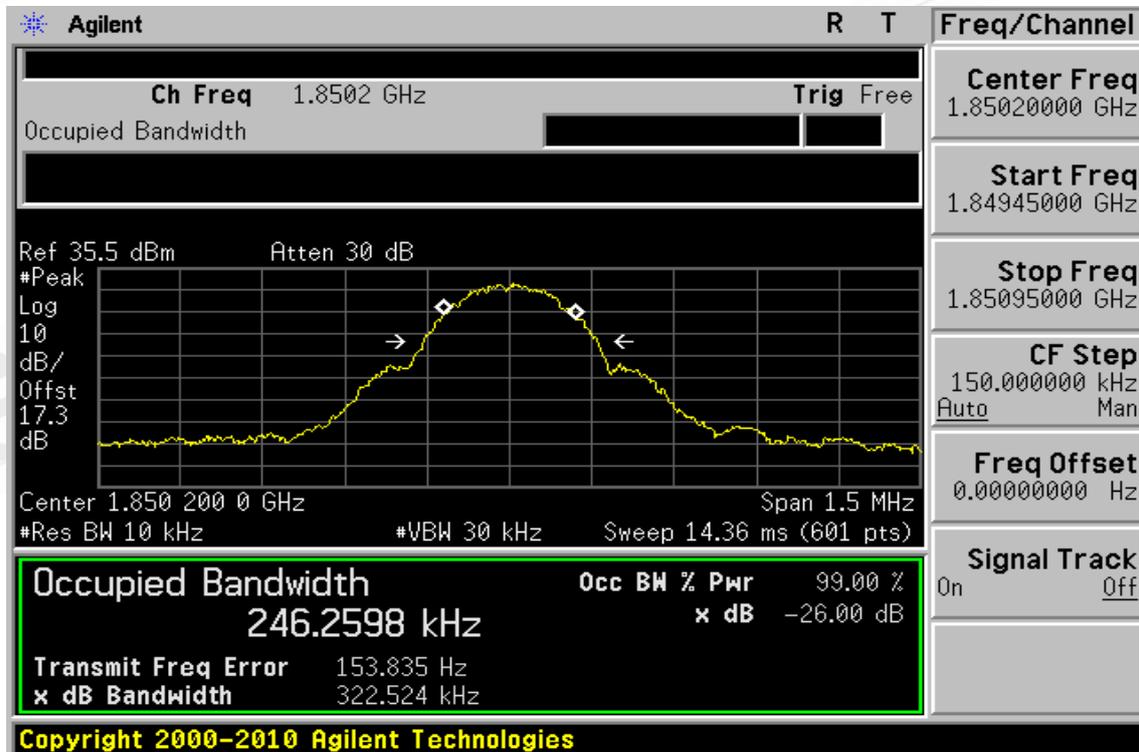


Figure 8-10: GPRS 1900 Channel Low



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Figure 8-11: GPRS 1900 Channel Mid

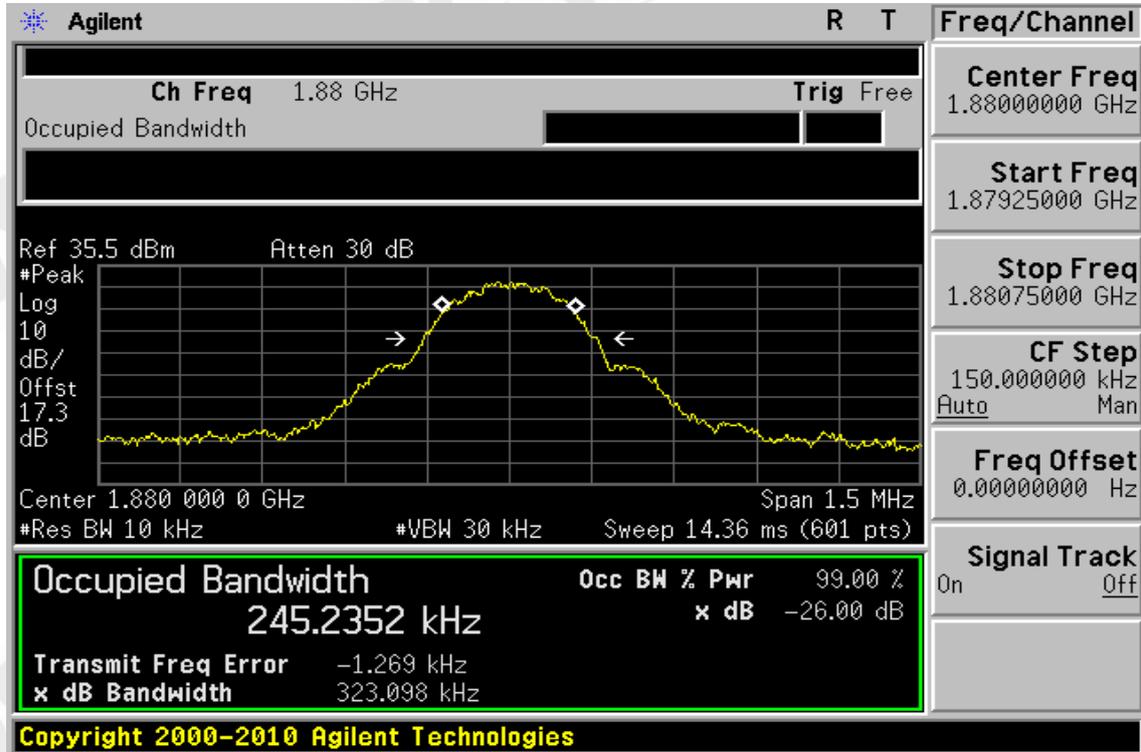
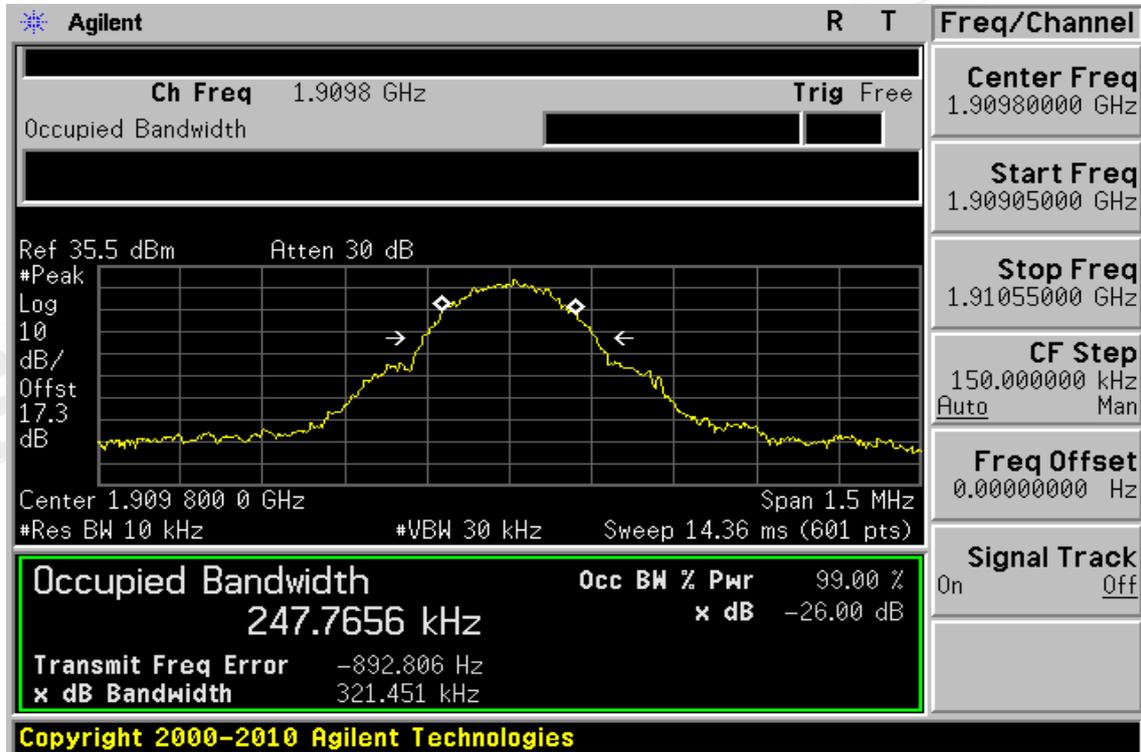


Figure 8-12: GPRS 1900 Channel High



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Figure 8-13 EDGE 850 Channel Low

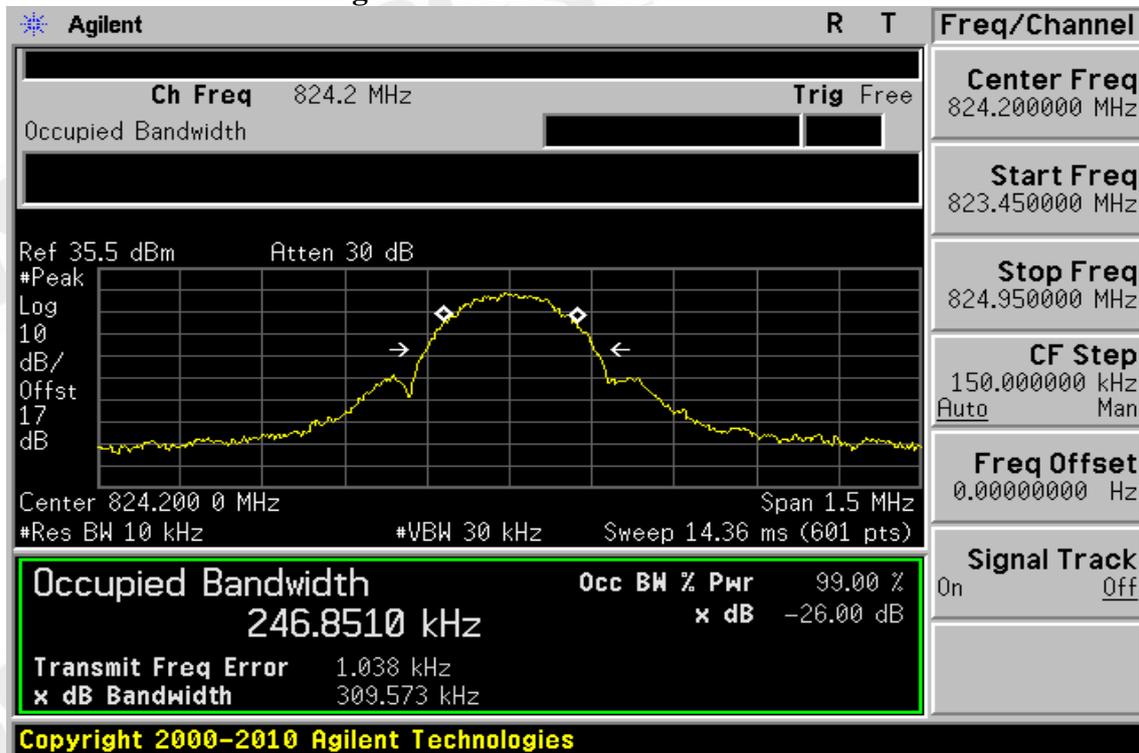
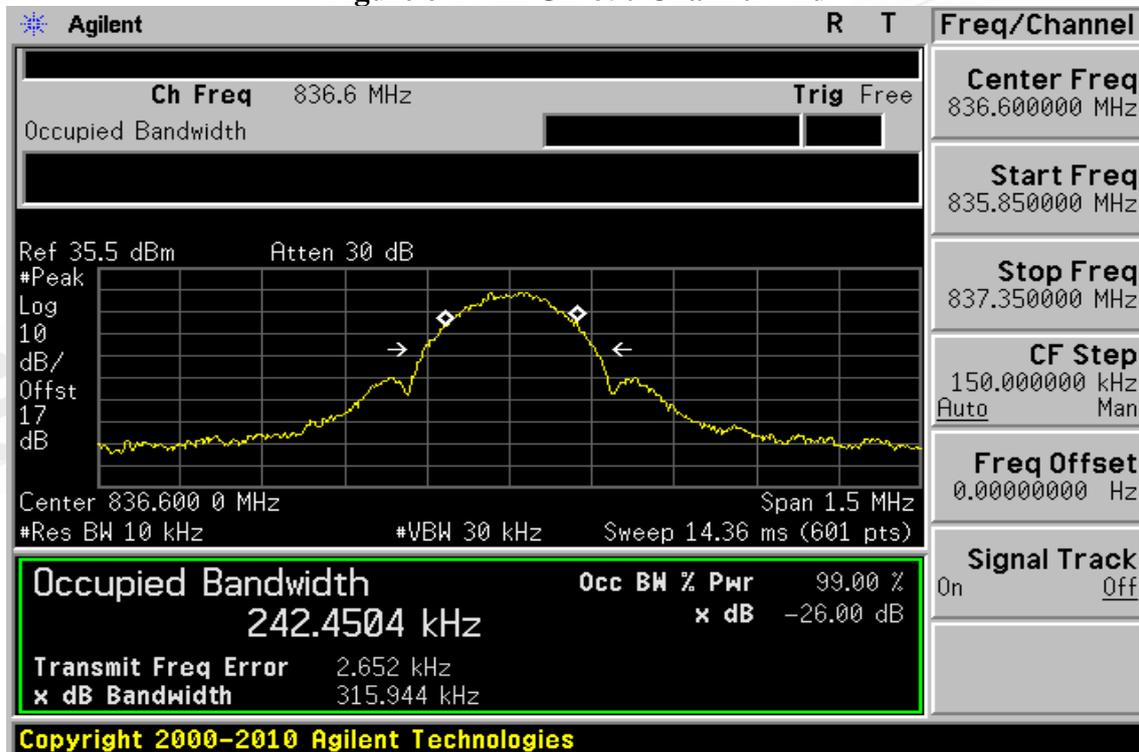


Figure 8-14 EDGE 850 Channel Mid



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Figure 8-15 EDGE 850 Channel High

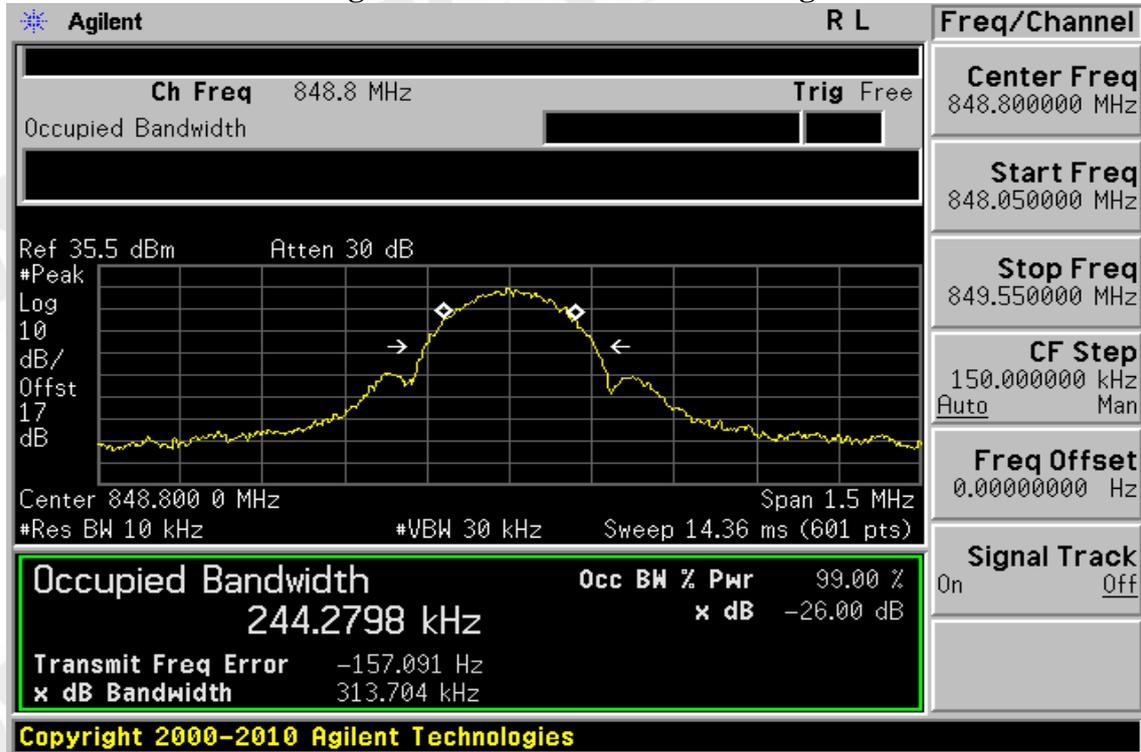
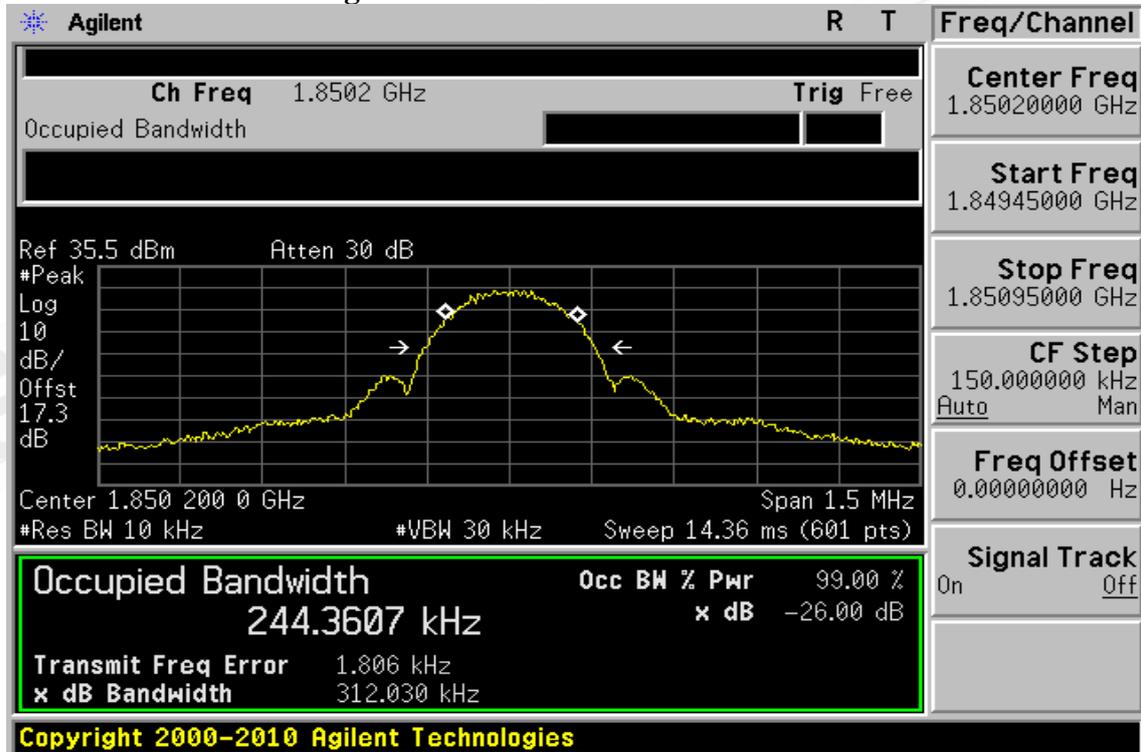


Figure 8-16 EDGE 1900 Channel Low



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Figure 8-17 EDGE 1900 Channel Mid

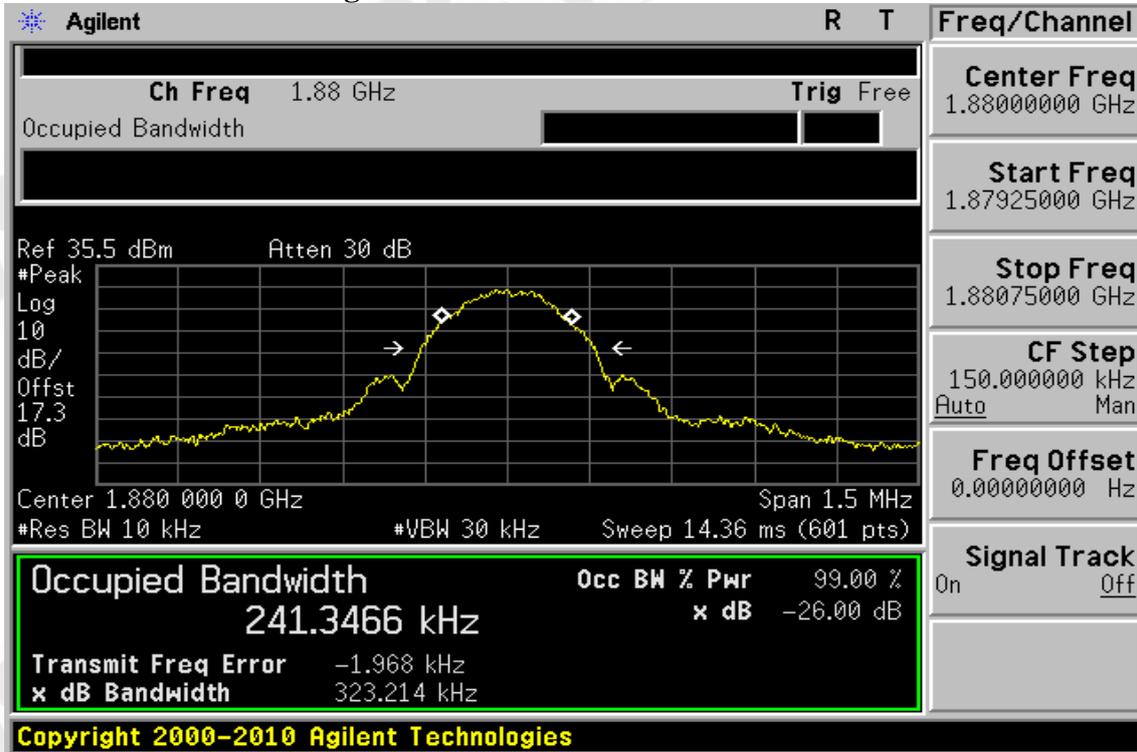
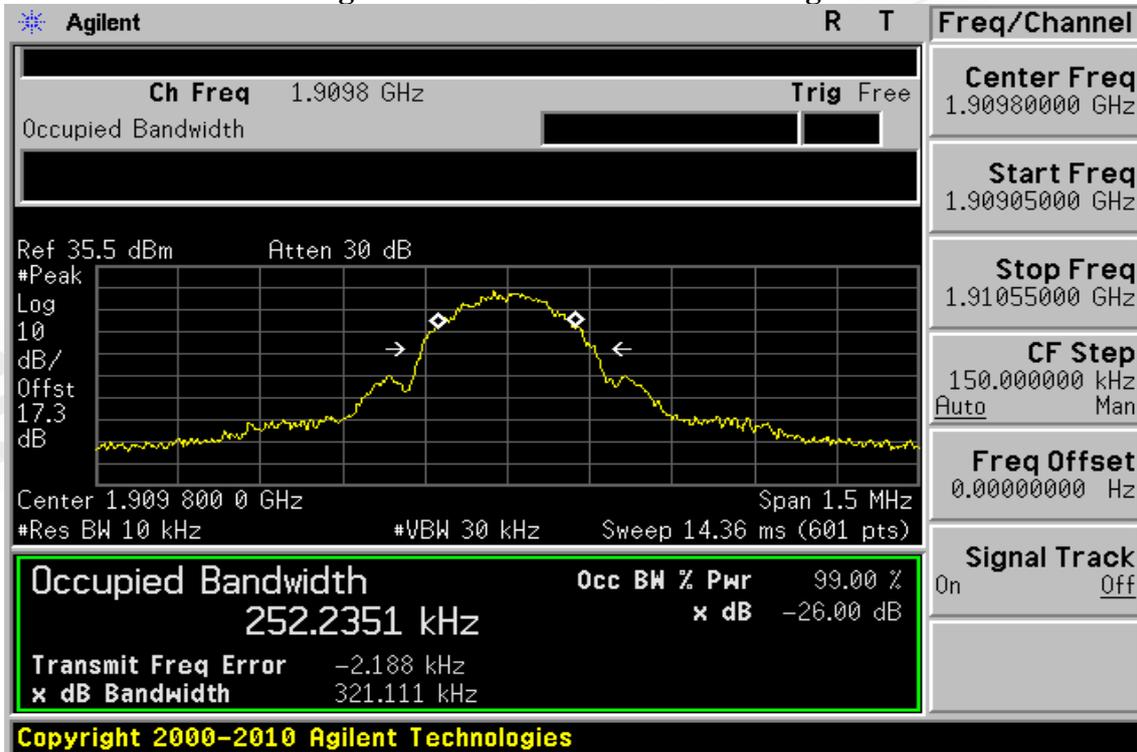


Figure 8-18 EDGE 1900 Channel High



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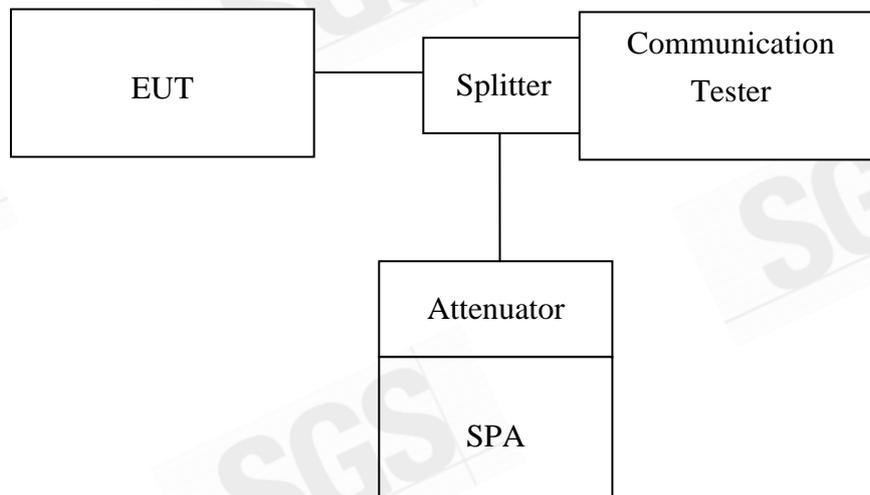
## 9. OUT OF BAND EMISSION AT ANTENNA TERMINALS

### 9.1. Standard Applicable:

According to FCC §2.1051.

FCC §22.917(a), §24.238(a) 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)

### 9.2. Test SET-UP:



*Note: Measurement setup for testing on Antenna connector*

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### 9.3. 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.

### Conducted Emission:

1. To connect Antenna Port of EUT to Spectrum.
2. Set RBW = 100K & VBW = 100K on Spectrum.
3. Sweep the frequency to determine spurious emission as seen on spectrum from span of 30 to 3G, 3G to 8G, 8G to 13G, 13G to 18G and 18G to 26.5GHz
4. Via Software, combine 5 spans of frequency range into one plot

### 9.4. Measurement Equipment Used:

Refer to section 2.4 in this report

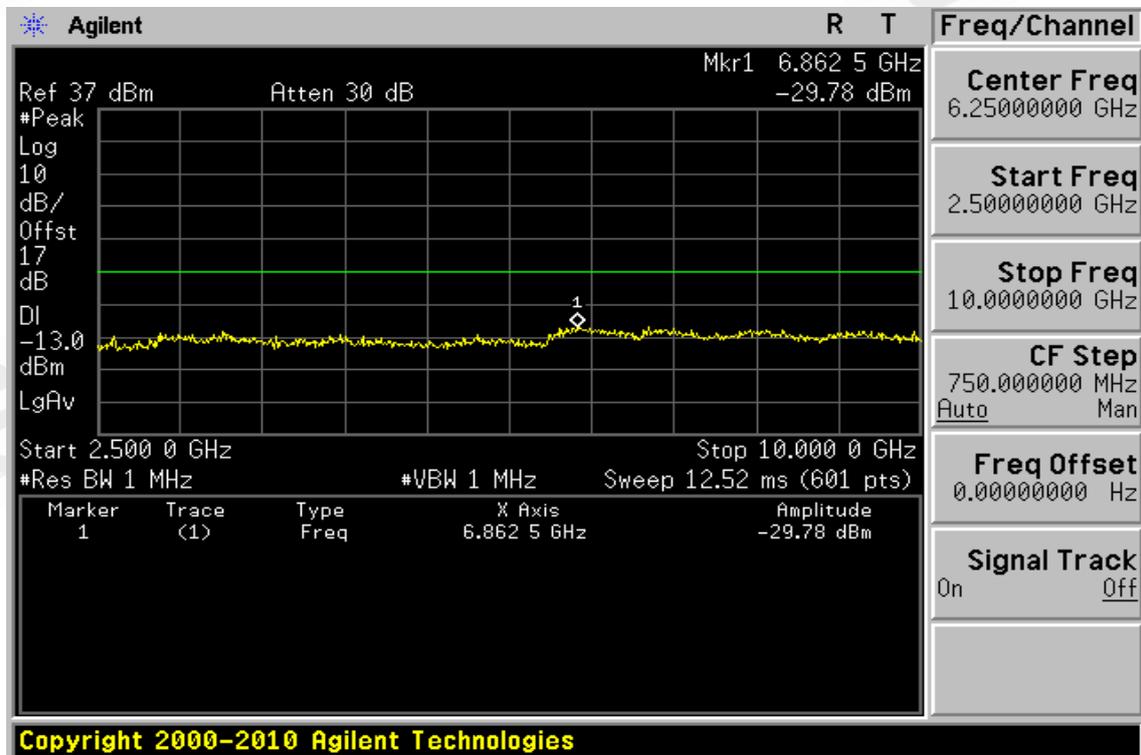
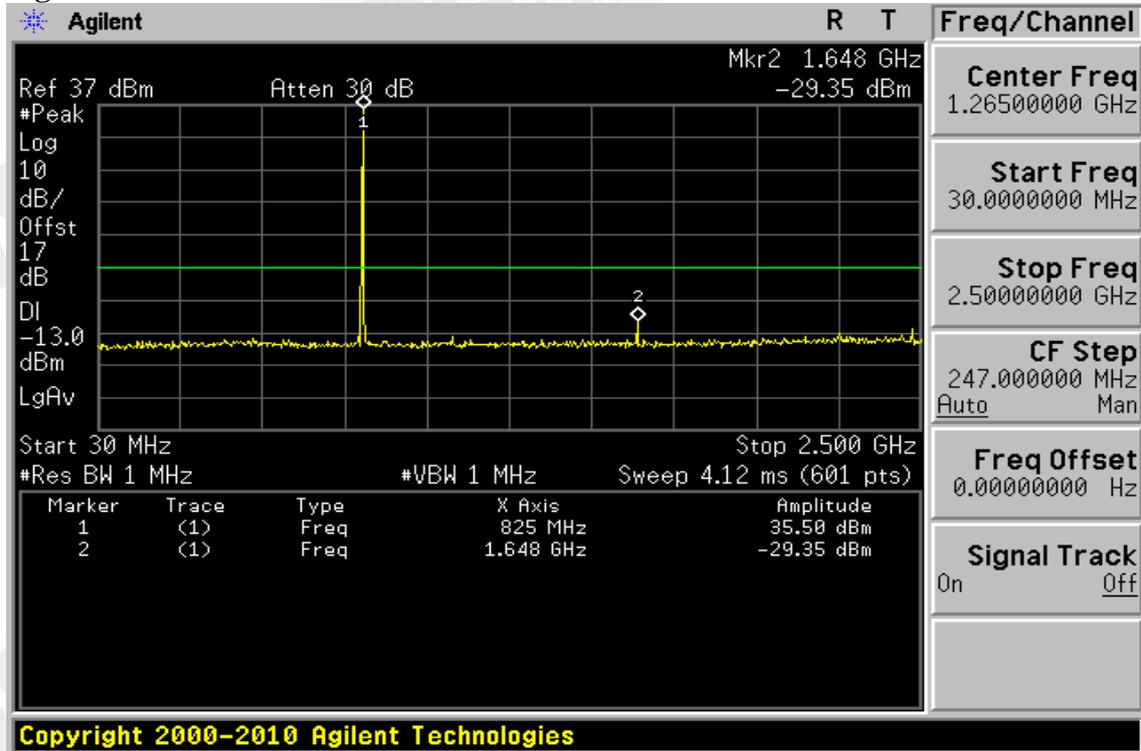
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### 9.5. Measurement Result:

**Figure 9-1: Out of Band emission at antenna terminals – GSM 850 Channel Lowest**

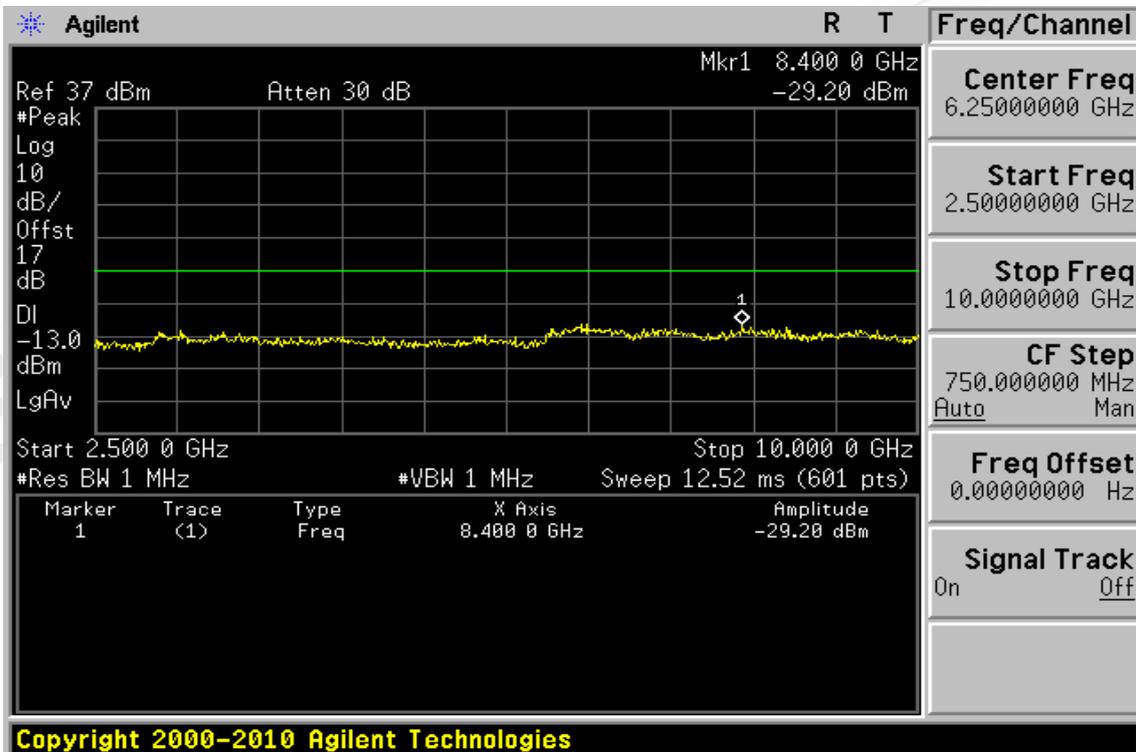
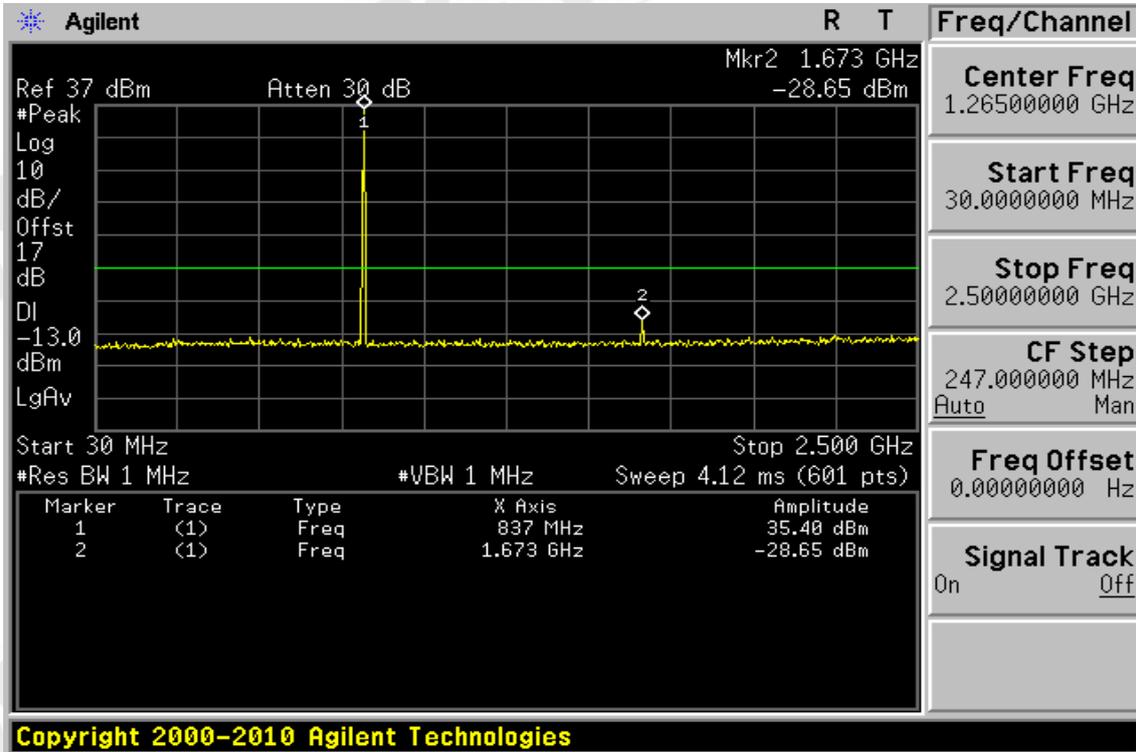


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**Figure 9-2: Out of Band emission at antenna terminals – GSM 850 Channel Mid**

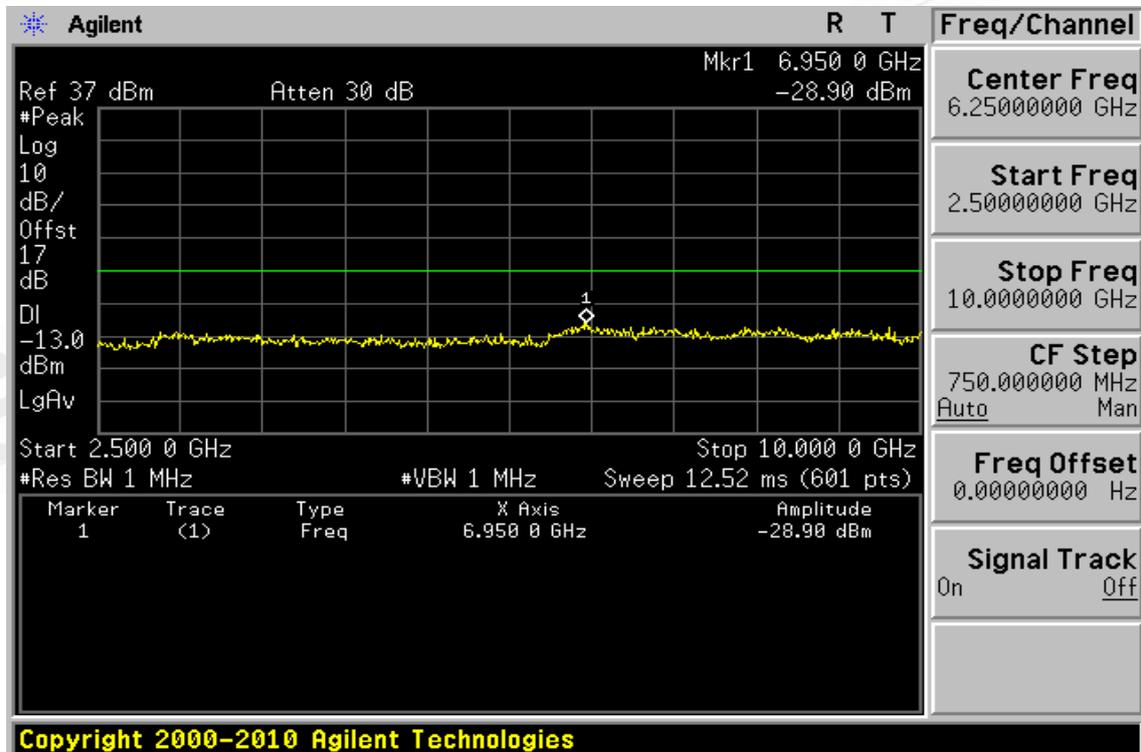
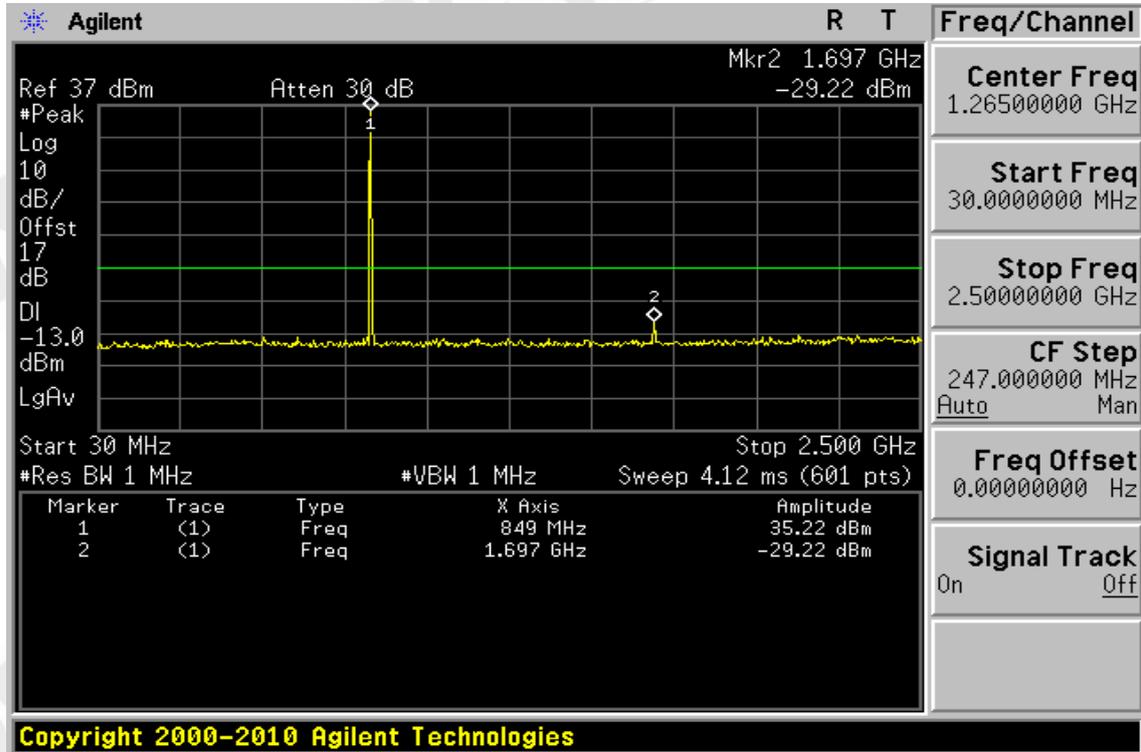


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**Figure 9-3: Out of Band emission at antenna terminals – GSM 850 Channel Highest**



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Fundamental Frequency :824.2 MHz Engineer :Jimmy  
 Operation Mode :TX LOW

Freq.	Note	Reading	Limit	Safe Margin
MHz	F/H/E/S	dBm	dBm	dB
<30	S	---	-13.00	---
30-1000	S	---	-13.00	---
1648.40	H	-29.35	-13.00	16.35
2472.60	H	---	-13.00	---
3296.80	H	---	-13.00	---
4121.00	H	---	-13.00	---
4945.20	H	---	-13.00	---
5769.40	H	---	-13.00	---
6593.60	H	---	-13.00	---
6862.50	S	-29.78	-13.00	16.78
7417.80	H	---	-13.00	---
8242.00	H	---	-13.00	---

Note : "H" : denotes Harmonic Frequency. "S" : denotes Spurious Frequency.  
 "----" : denotes Noise Floor.

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Fundamental Frequency :836.6 MHz Engineer :Jimmy  
 Operation Mode :TX Mid

Freq.	Note	Reading	Limit	Safe Margin
MHz	F/H/E/S	dBm	dBm	dB
<30	S	---	-13.00	---
30-1000	S	---	-13.00	---
1673.20	H	-28.65	-13.00	15.65
2509.80	H	---	-13.00	---
3346.40	H	---	-13.00	---
4183.00	H	---	-13.00	---
5019.60	H	---	-13.00	---
5856.20	H	---	-13.00	---
6692.80	H	---	-13.00	---
7529.40	H	---	-13.00	---
8366.00	H	---	-13.00	---
8400.00	S	-29.20	-13.00	16.20

Note : "H" : denotes Harmonic Frequency. "S" : denotes Spurious Frequency.  
 "----" : denotes Noise Floor.

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Fundamental Frequency :848.8MHz Engineer :Jimmy  
 Operation Mode :TX High

Freq.	Note	Reading	Limit	Safe Margin
MHz	F/H/E/S	dBm	dBm	dB
<30	S	---	-13.00	---
30-1000	S	---	-13.00	---
1697.60	H	-29.22	-13.00	16.22
2546.40	H	---	-13.00	---
3395.20	H	---	-13.00	---
4244.00	H	---	-13.00	---
5092.80	H	---	-13.00	---
5941.60	H	---	-13.00	---
6790.40	H	---	-13.00	---
6950.00	S	-28.90	-13.00	15.90
8488.00	H	---	-13.00	---
1697.60	H	---	-13.00	---

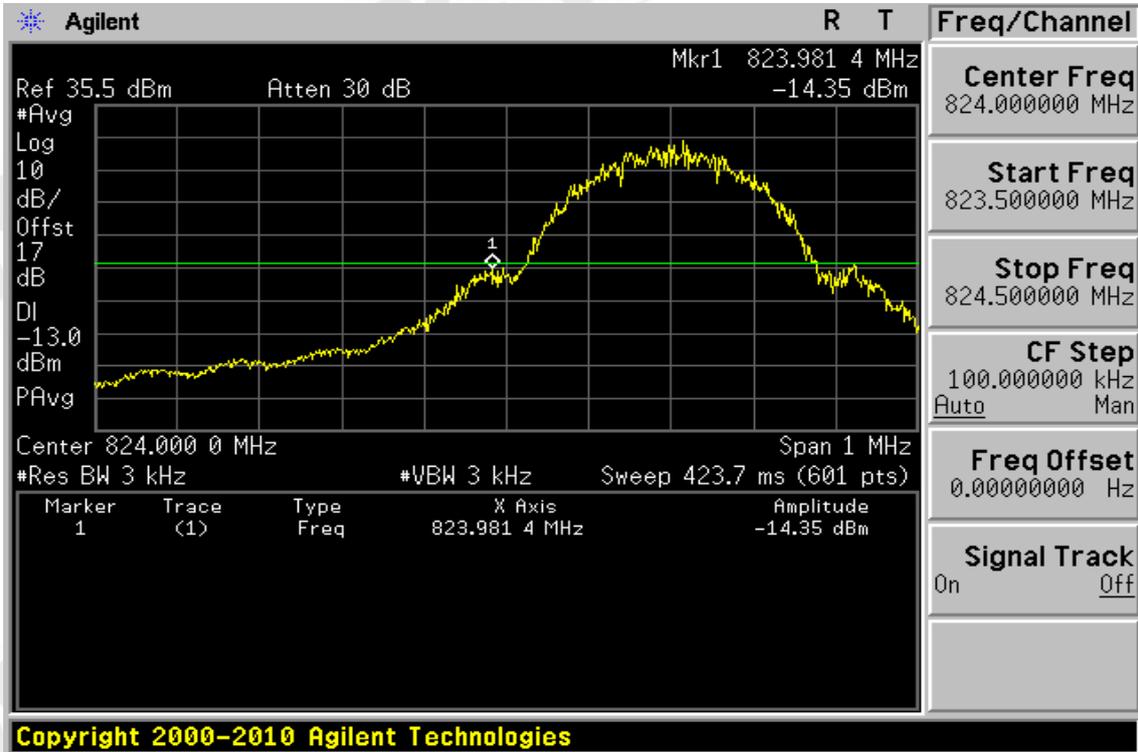
Note : "H" : denotes Harmonic Frequency. "S" : denotes Spurious Frequency.  
 "----" : denotes Noise Floor.

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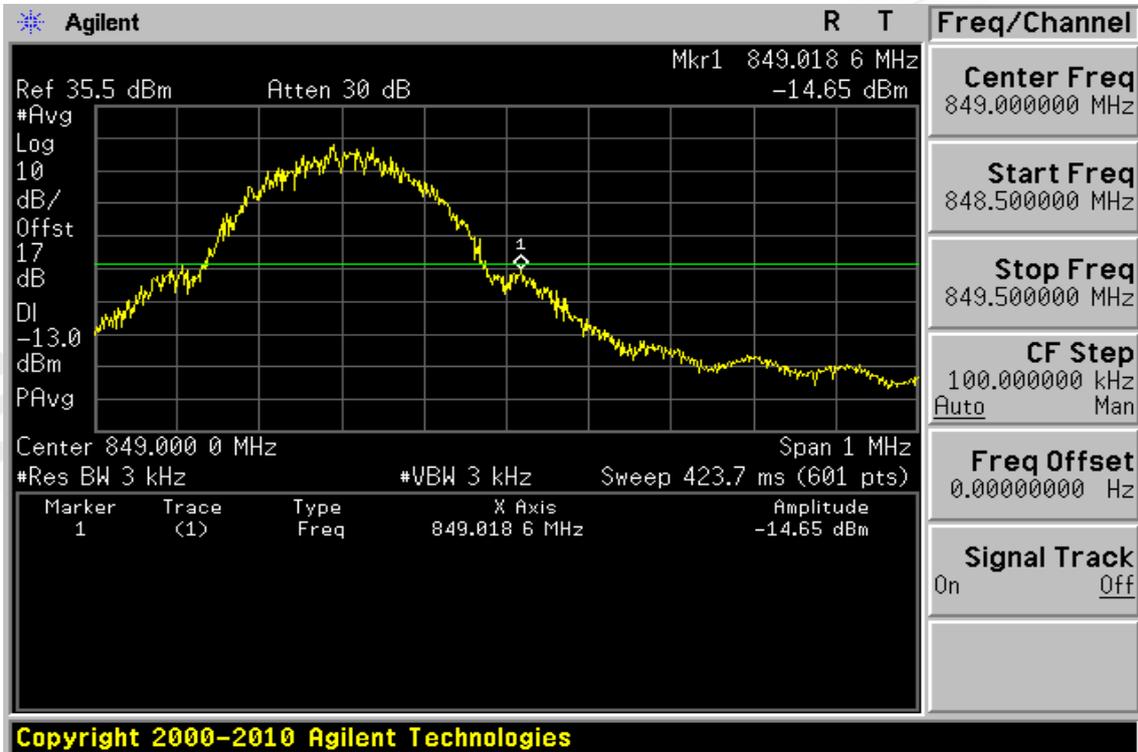
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**Figure 9-4: Band edge emission at antenna terminals – GSM 850 Channel Lowest**



**Figure 9-5: Band edge emission at antenna terminals – GSM 850 Channel Highest**



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**Band Edge Low & High**

Test Mode

GSM 850:

Engineer

:Jimmy

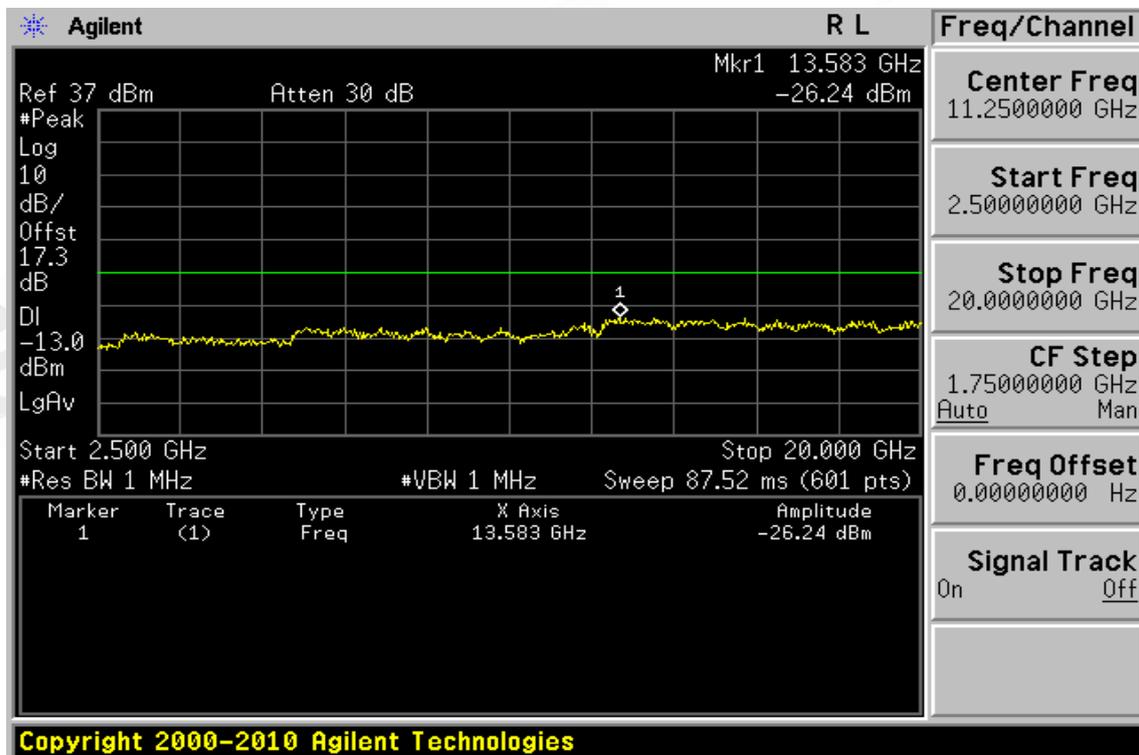
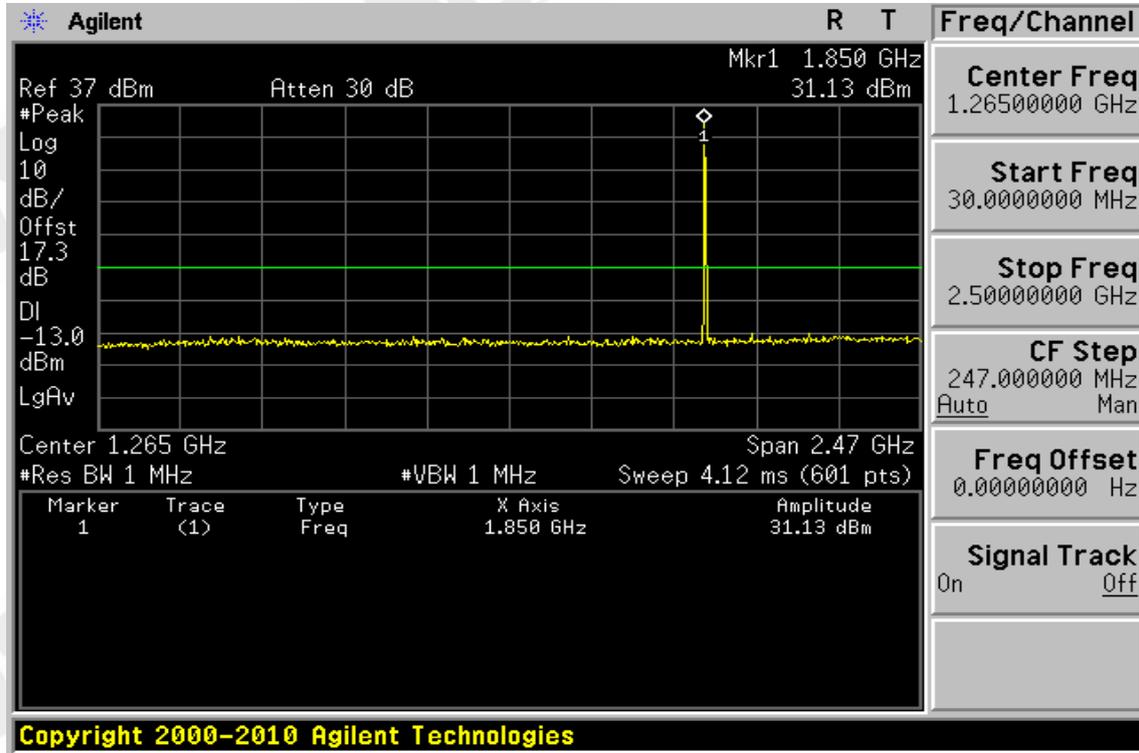
Freq.	Reading	Limit	Safe Margin
MHz	dBm	dBm	dB
823.9814	-14.35	-13.00	1.35
849.0816	-14.65	-13.00	1.65

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Figure 9-6: Out of Band emission at antenna terminals – GSM 1900 Channel Lowest

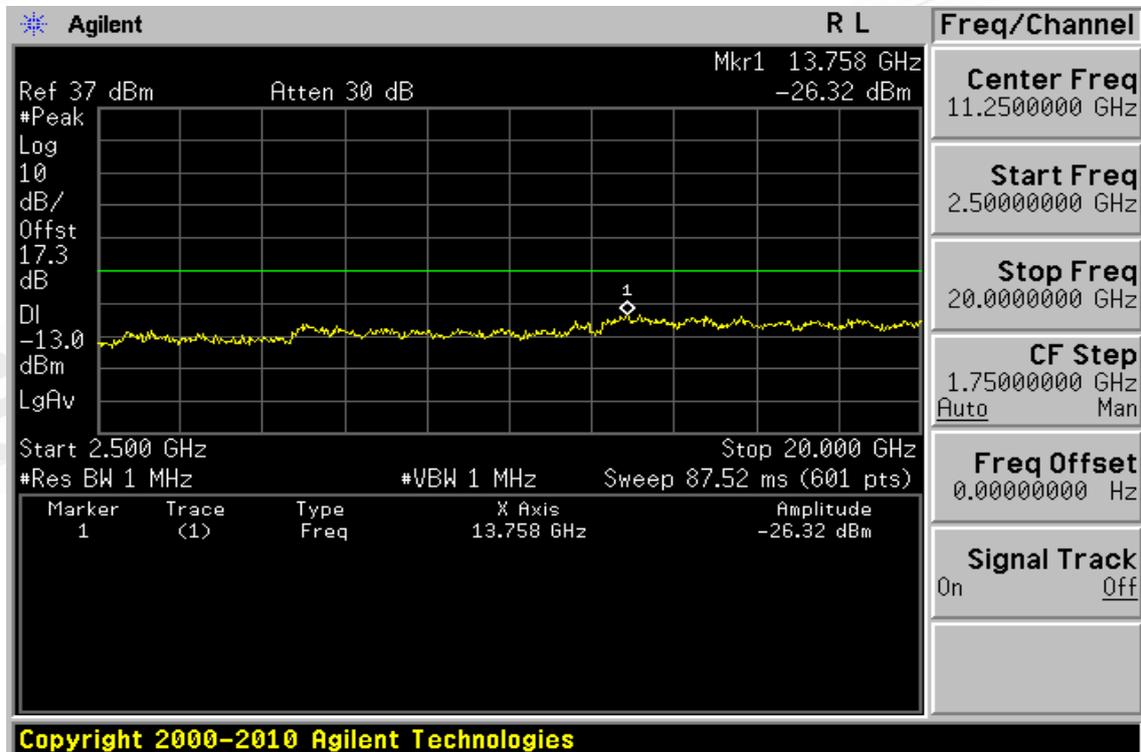
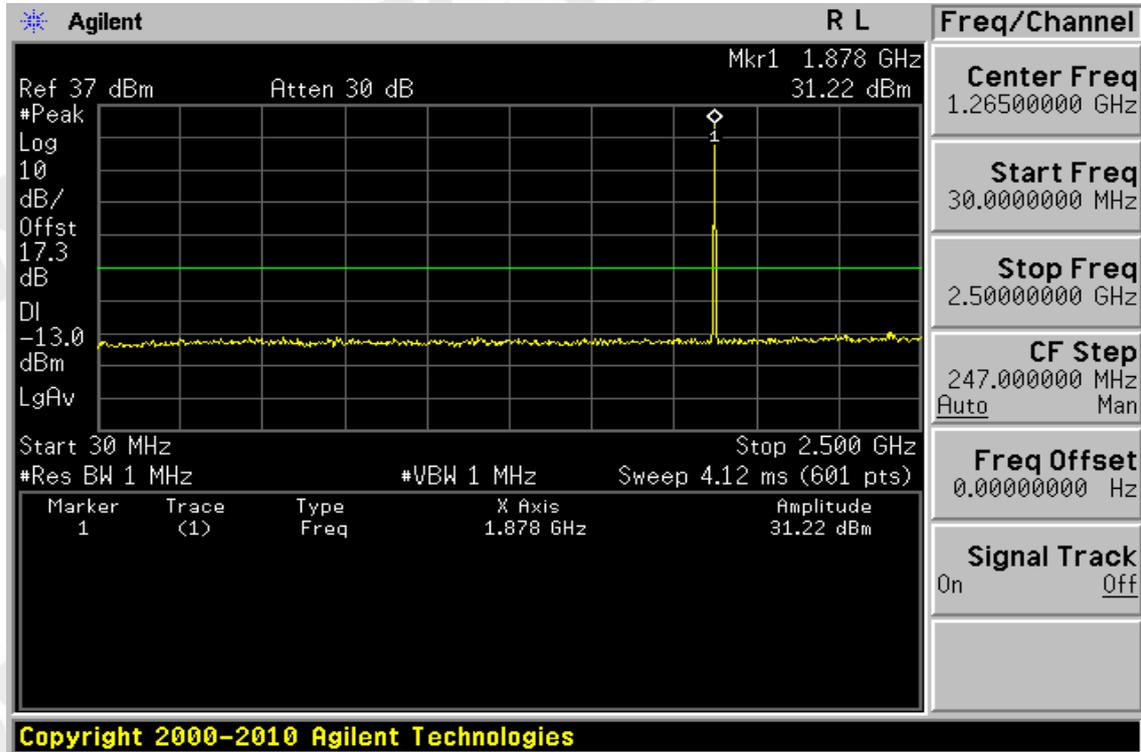


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**Figure 9-7: Out of Band emission at antenna terminals – GSM 1900 Channel Mid**

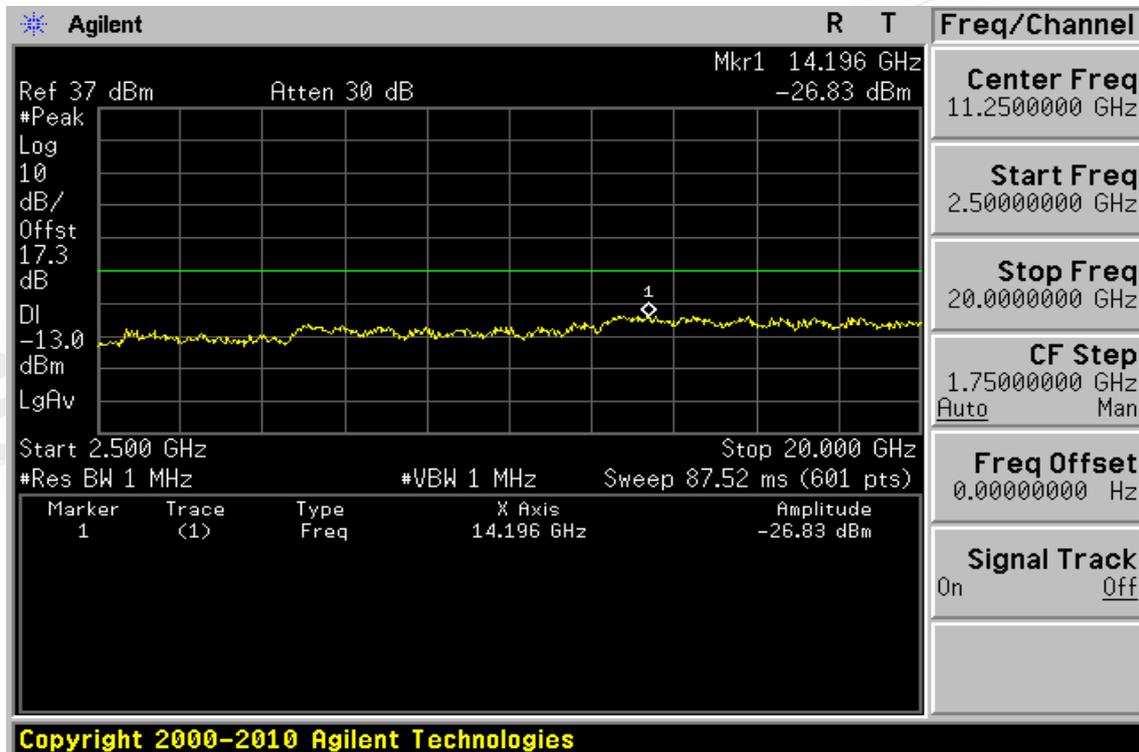
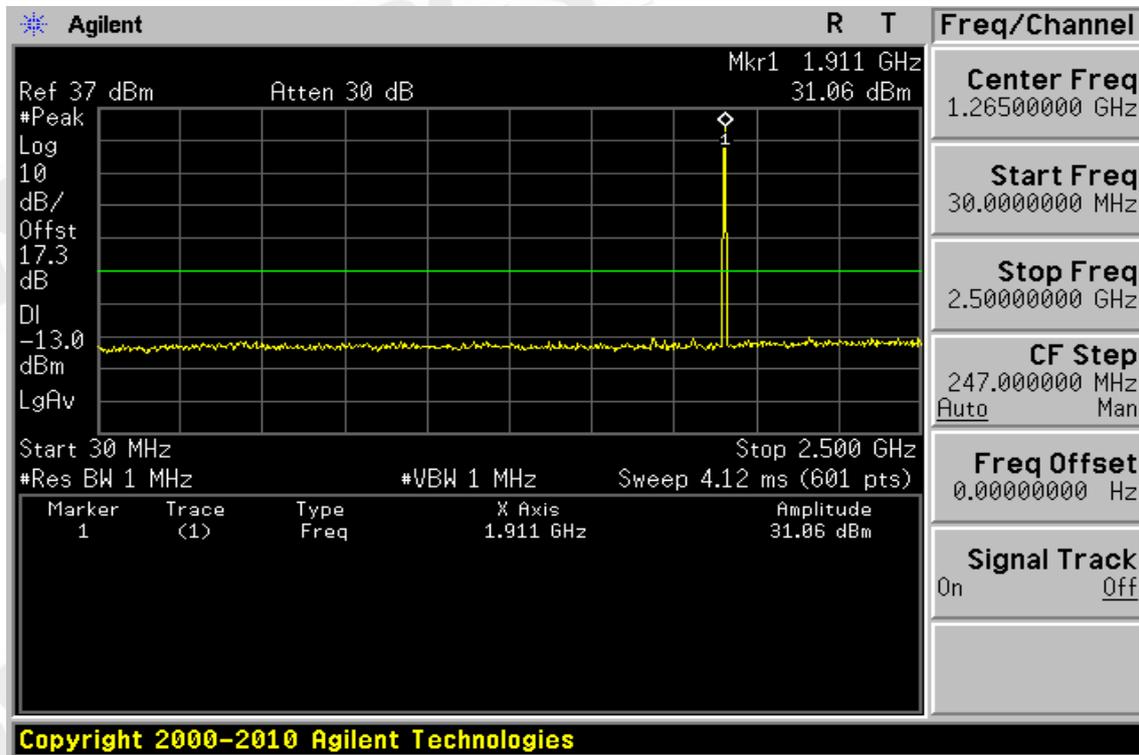


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**Figure 9-8: Out of Band emission at antenna terminals – GSM 1900 Channel Highest**



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Fundamental Frequency :1850.2MHz Engineer :Jimmy  
 Operation Mode :TX LOW

Freq.	Note	Reading	Limit	Safe Margin
MHz	F/H/E/S	dBm	dBm	dB
<30	S	---	-13.00	---
30-1000	S	---	-13.00	---
3700.40	H	---	-13.00	---
5550.60	H	---	-13.00	---
7400.80	H	---	-13.00	---
9251.00	H	---	-13.00	---
11101.20	H	---	-13.00	---
12951.40	H	---	-13.00	---
13583.00	S	-26.24	-13.00	13.24
14801.60	H	---	-13.00	---
18502.00	H	---	-13.00	---

Note : "H" : denotes Harmonic Frequency. "S" : denotes Spurious Frequency.  
 "----" : denotes Noise Floor.

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Fundamental Frequency :1880 MHz Engineer :Jimmy  
 Operation Mode :TX Mid

Freq.	Note	Reading	Limit	Safe Margin
MHz	F/H/E/S	dBm	dBm	Db
<30	S	---	-13.00	---
30-1000	S	---	-13.00	---
3760.00	H	---	-13.00	---
5640.00	H	---	-13.00	---
7520.00	H	---	-13.00	---
9400.00	H	---	-13.00	---
11280.00	H	---	-13.00	---
13160.00	H	---	-13.00	---
13758.00	S	-26.32	-13.00	13.32
15040.00	H	---	-13.00	---
16920.00	H	---	-13.00	---
18800.00	H	---	-13.00	---

Note : "H" : denotes Harmonic Frequency. "S" : denotes Spurious Frequency.  
 "----" : denotes Noise Floor.

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Fundamental Frequency :1909.8MHz Engineer :Jimmy  
 Operation Mode :TX High

Freq.	Note	Reading	Limit	Safe Margin
MHz	F/H/E/S	dBm	dBm	dB
<30	S	---	-13.00	---
30-1000	S	---	-13.00	---
3819.60	H	---	-13.00	---
5729.40	H	---	-13.00	---
7639.20	H	---	-13.00	---
9549.00	H	---	-13.00	---
11458.80	H	---	-13.00	---
13368.60	H	---	-13.00	---
14196.00	S	-26.83	-13.00	13.83
15278.40	H	---	-13.00	---
17188.20	E	---	-13.00	---
19098.00	H	---	-13.00	---

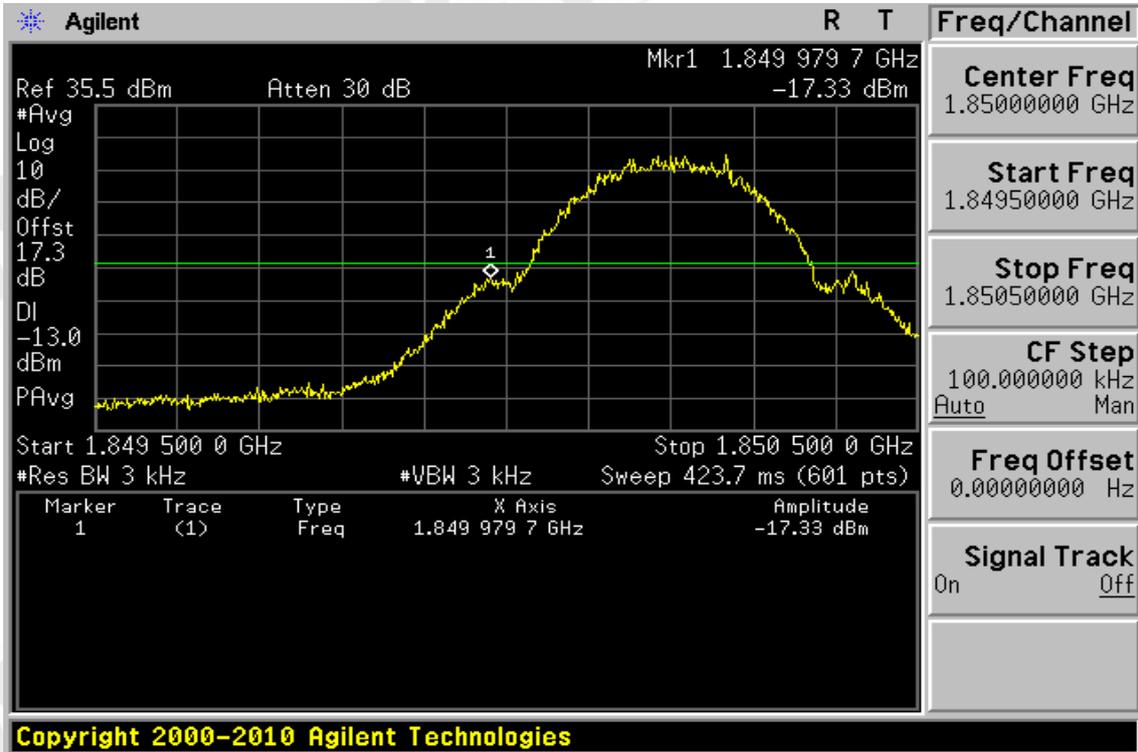
Note : "H" : denotes Harmonic Frequency. "S" : denotes Spurious Frequency.  
 "----" : denotes Noise Floor.

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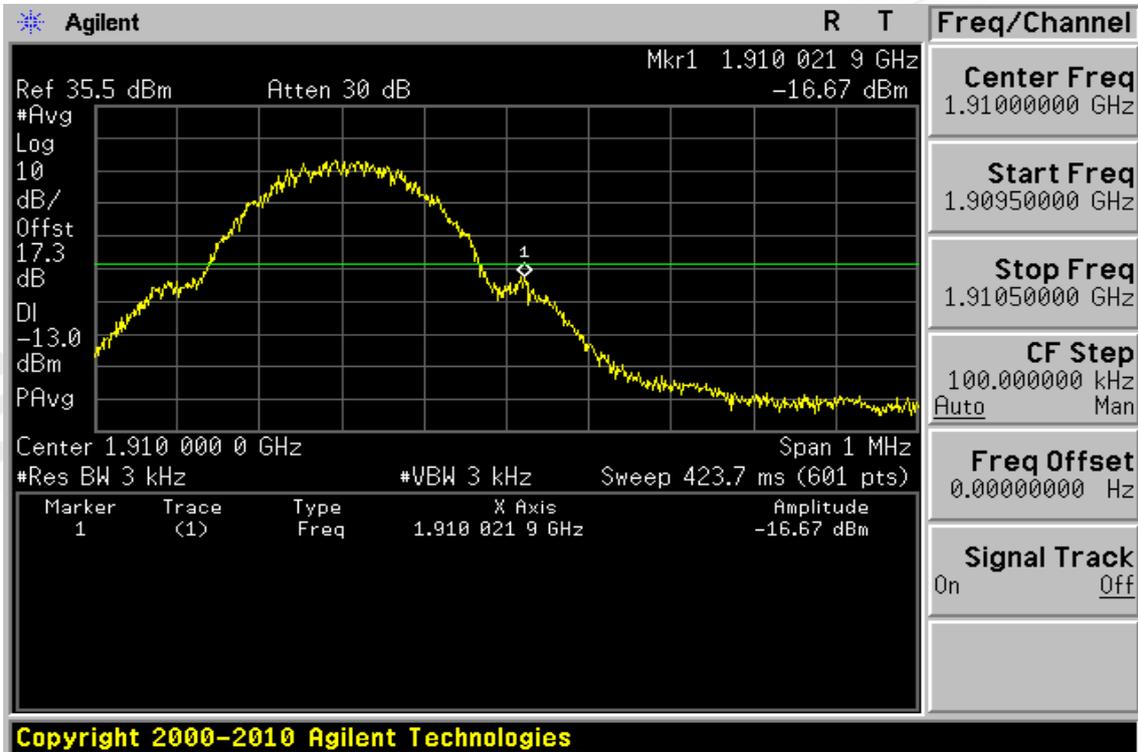
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**Figure 9-9: Band edge emission at antenna terminals – GSM 1900 Channel Lowest**



**Figure 9-10: Band edge emission at antenna terminals – GSM 1900 Channel Highest**



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**Band Edge Low & High**  
Test Mode

GSM 1900

Engineer

:Jimmy

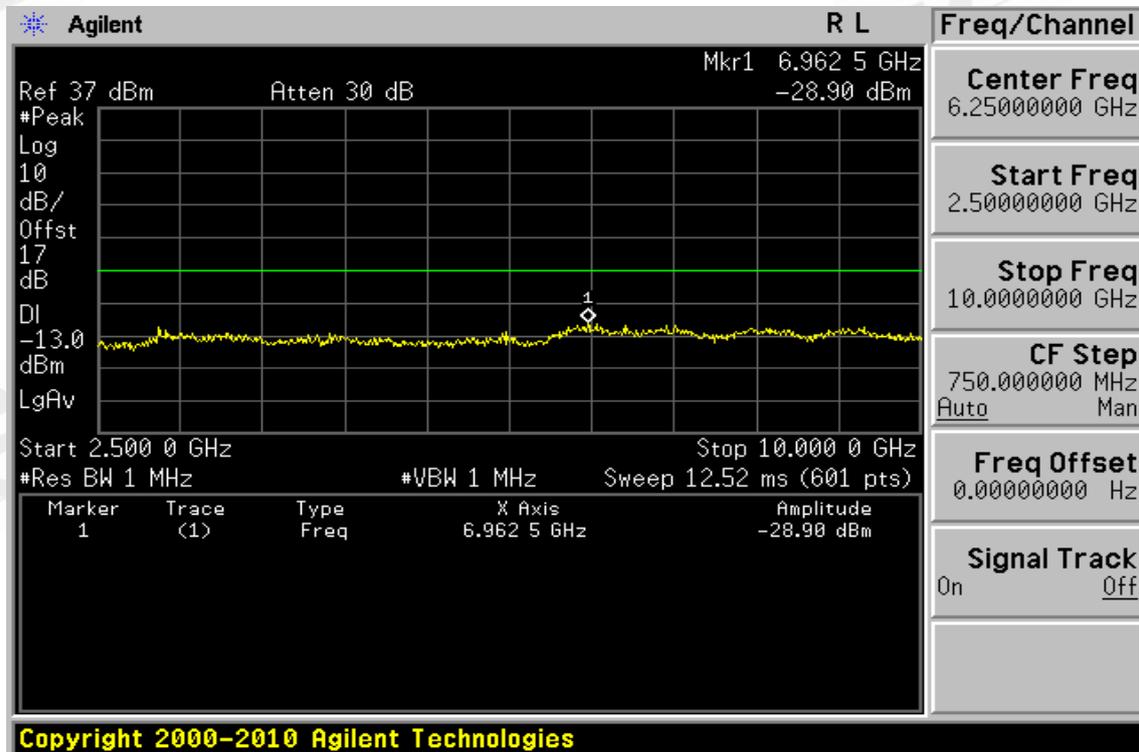
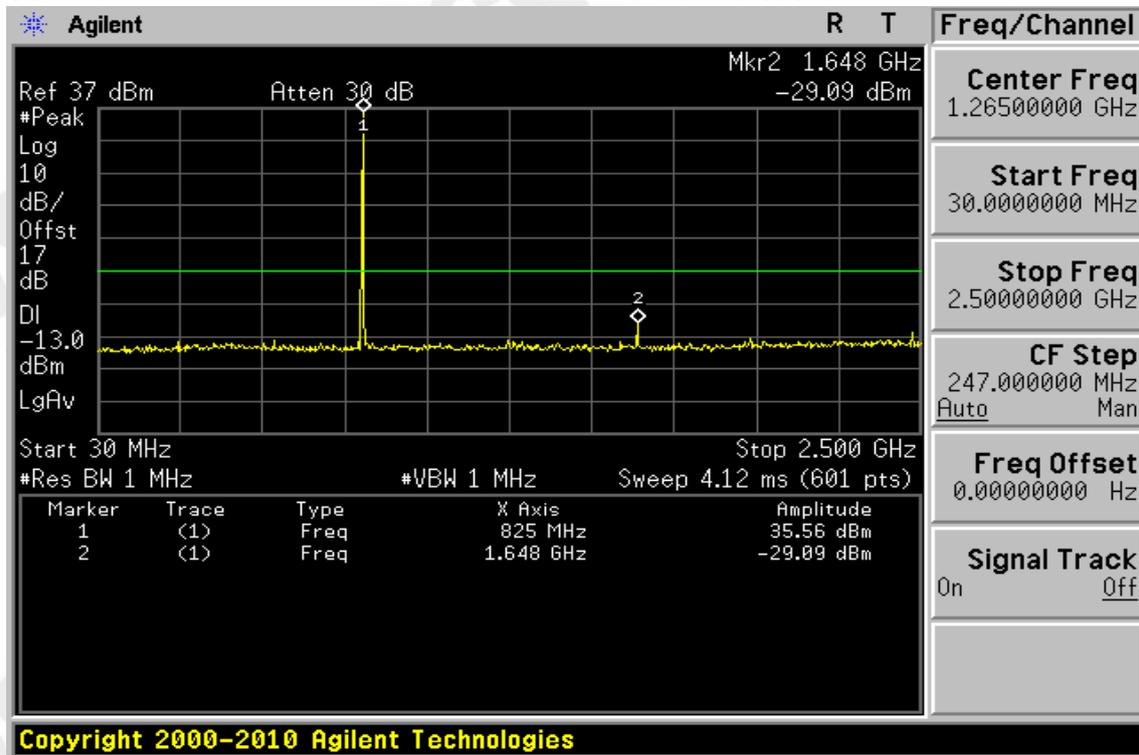
Freq.	Reading	Limit	Safe Margin
MHz	dBm	dBm	dB
1849.9797	-17.33	-13.00	4.33
1910.8219	-16.67	-13.00	3.67

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Figure 9-11: Out of Band emission at antenna terminals – GPRS 850 Channel Lowest

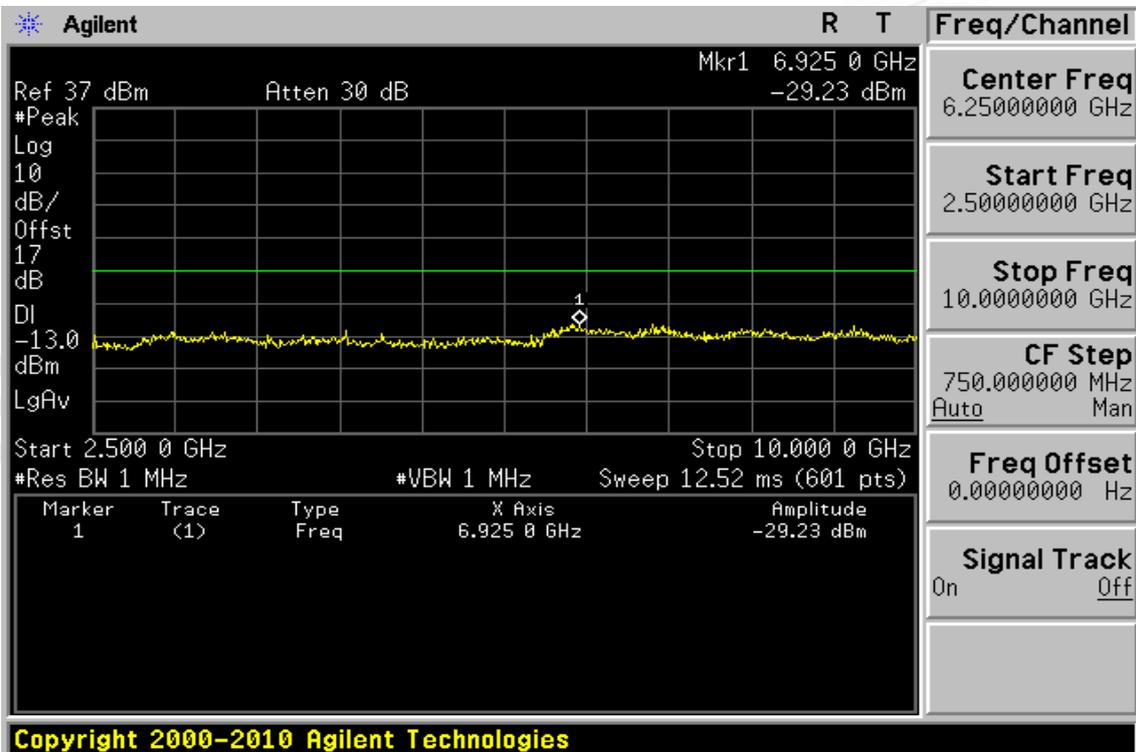
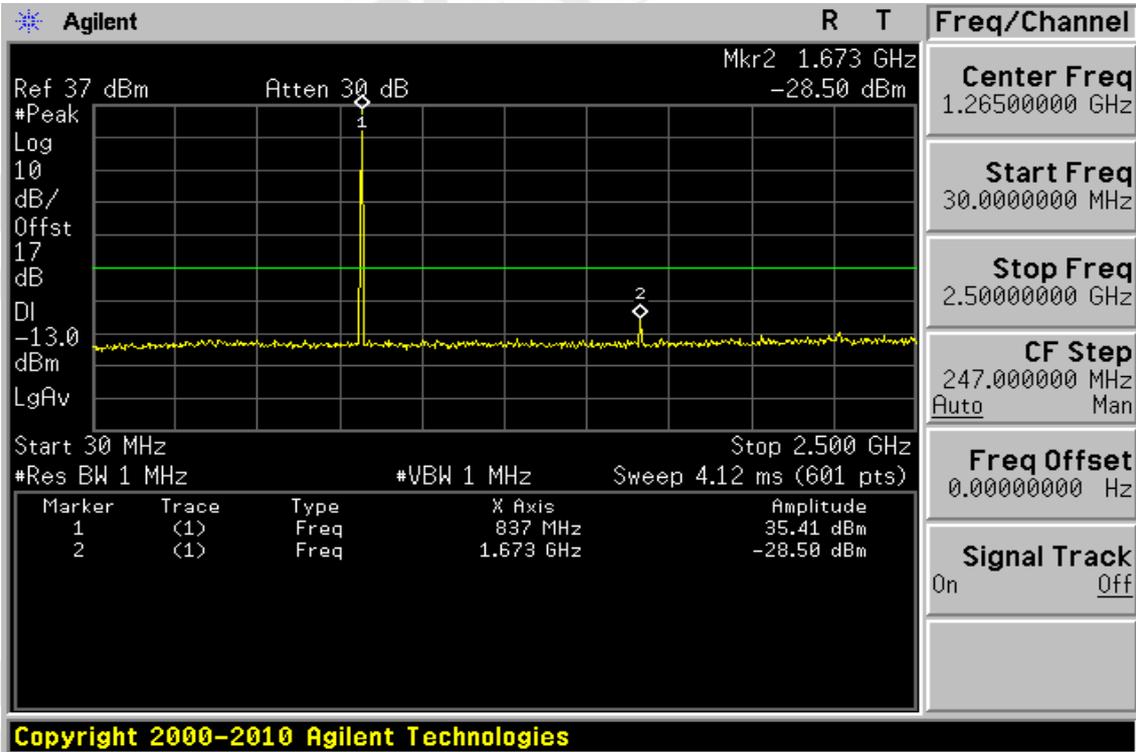


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**Figure 9-12: Out of Band emission at antenna terminals – GPRS 850 Channel Mid**

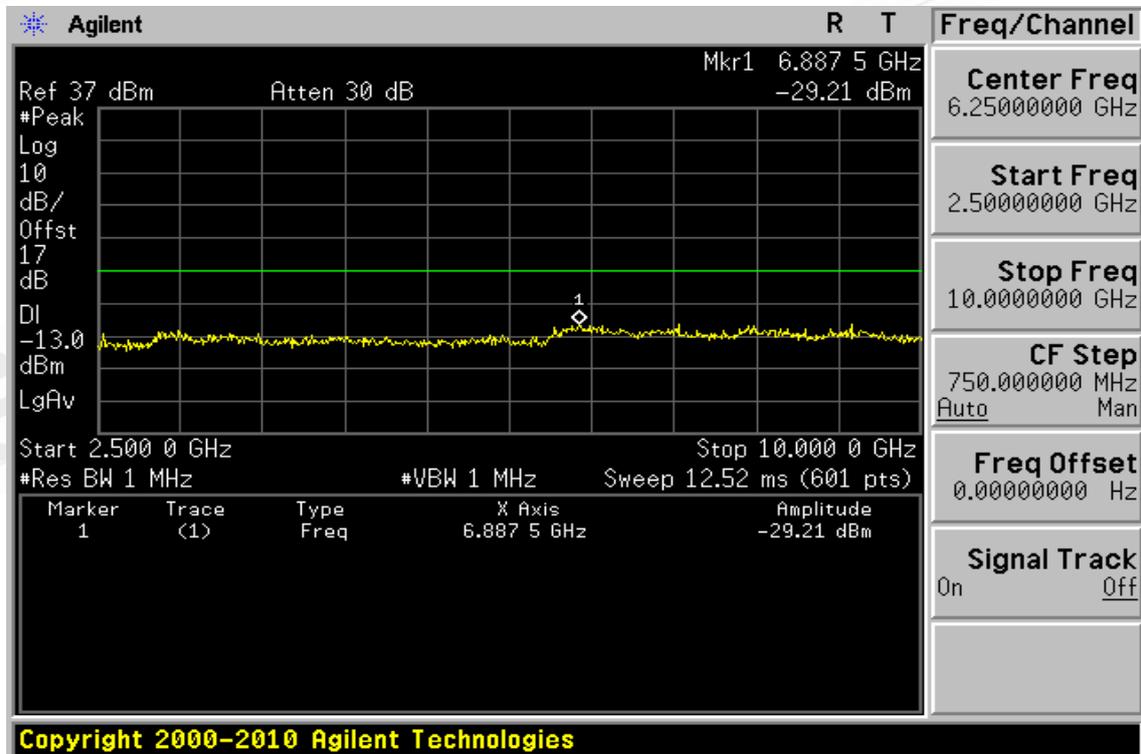
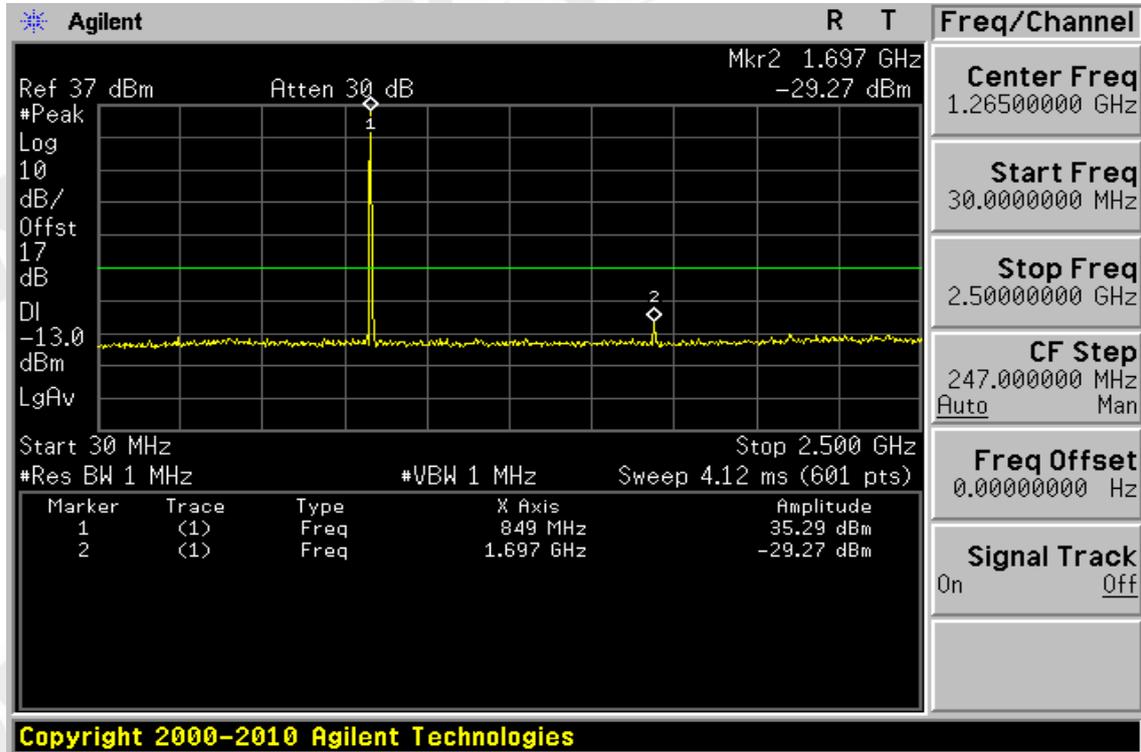


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**Figure 9-13: Out of Band emission at antenna terminals – GPRS 850 Channel Highest**



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Fundamental Frequency :824.2 MHz Engineer :Jimmy  
 Operation Mode :TX LOW

Freq.	Note	Reading	Limit	Safe Margin
MHz	F/H/E/S	dBm	dBm	dB
<30	S	---	-13.00	---
30-1000	S	---	-13.00	---
1648.40	H	-29.09	-13.00	16.09
2472.60	H	---	-13.00	---
3288.00	H	---	-13.00	---
4121.00	H	---	-13.00	---
4945.20	H	---	-13.00	---
5769.40	H	---	-13.00	---
6593.60	H	---	-13.00	---
6962.50	S	-28.90	-13.00	15.90
7417.80	H	---	-13.00	---
8242.00	H	---	-13.00	---

Note : "H" : denotes Harmonic Frequency. "S" : denotes Spurious Frequency.  
 "----" : denotes Noise Floor.

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Fundamental Frequency :836.6 MHz Engineer :Jimmy  
 Operation Mode :TX Mid

Freq.	Note	Reading	Limit	Safe Margin
MHz	F/H/E/S	dBm	dBm	dB
<30	S	---	-13.00	---
30-1000	S	---	-13.00	---
1673.20	H	-28.50	-13.00	15.50
2509.80	H	---	-13.00	---
3346.40	H	---	-13.00	---
4183.00	H	---	-13.00	---
5019.60	H	---	-13.00	---
5856.20	H	---	-13.00	---
6692.80	H	---	-13.00	---
6925.00	S	-29.23	-13.00	16.23
7529.40	H	---	-13.00	---
8366.00	H	---	-13.00	---

Note : "H" : denotes Harmonic Frequency. "S" : denotes Spurious Frequency.  
 "----" : denotes Noise Floor.

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Fundamental Frequency :848.8MHz Engineer :Jimmy  
 Operation Mode :TX High

Freq.	Note	Reading	Limit	Safe Margin
MHz	F/H/E/S	dBm	dBm	dB
<30	S	---	-13.00	---
30-1000	S	---	-13.00	---
1697.60	H	-29.27	-13.00	16.27
2546.40	H	---	-13.00	---
3395.20	H	---	-13.00	---
4244.00	H	---	-13.00	---
5092.80	H	---	-13.00	---
5941.60	H	---	-13.00	---
6790.40	H	---	-13.00	---
6887.50	S	-29.21	-13.00	16.21
8488.00	H	---	-13.00	---

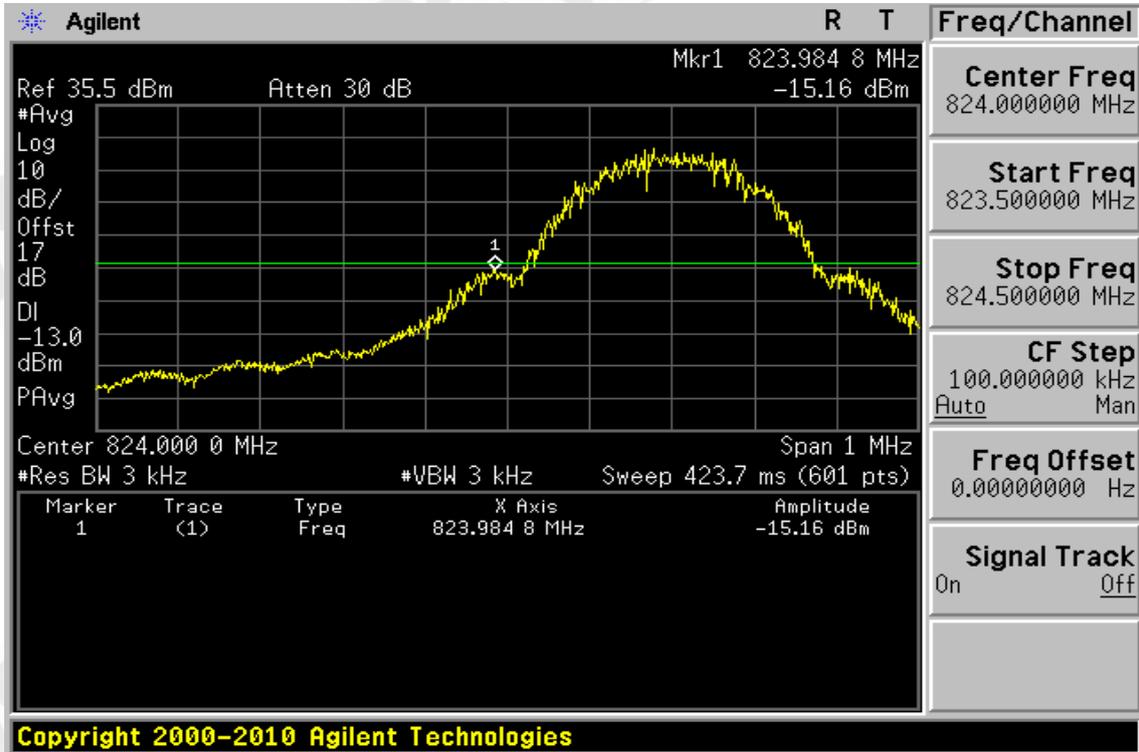
Note : "H" : denotes Harmonic Frequency. "S" : denotes Spurious Frequency.  
 "----" : denotes Noise Floor.

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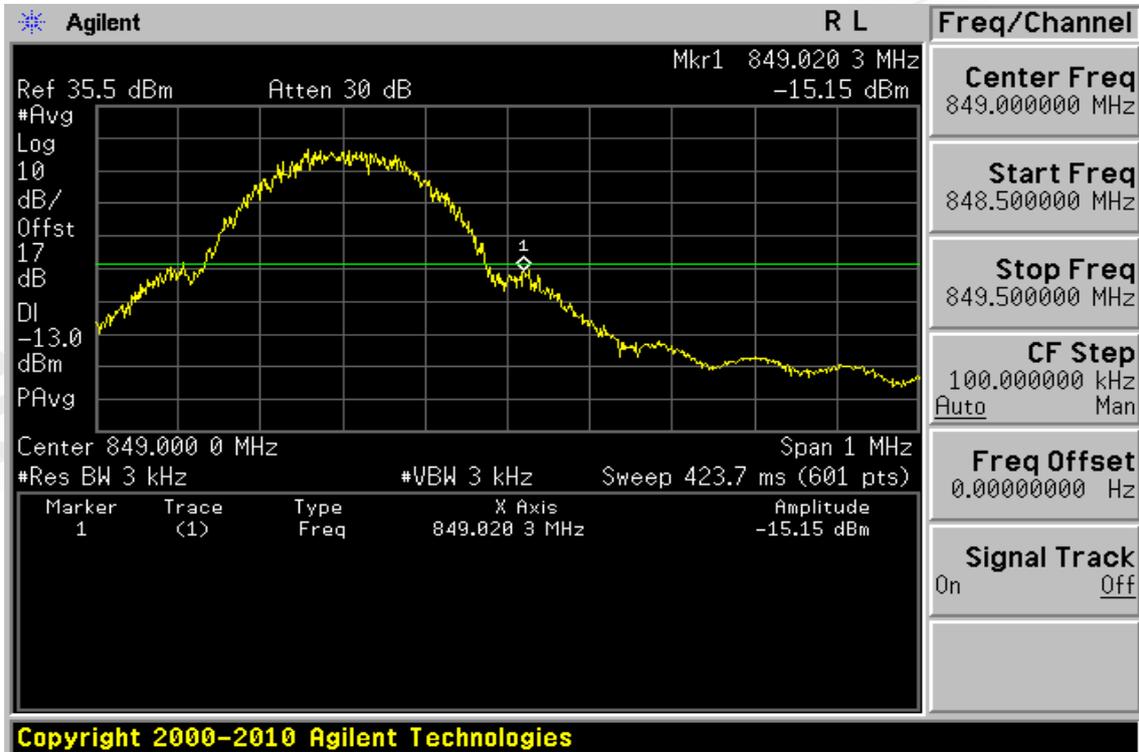
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**Figure 9-14: Band edge emission at antenna terminals – GPRS 850 Channel Lowest**



**Figure 9-15: Band edge emission at antenna terminals – GPRS 850 Channel Highest**



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**Band Edge Low & High**

Test Mode

GPRS 850

Engineer

:Jimmy

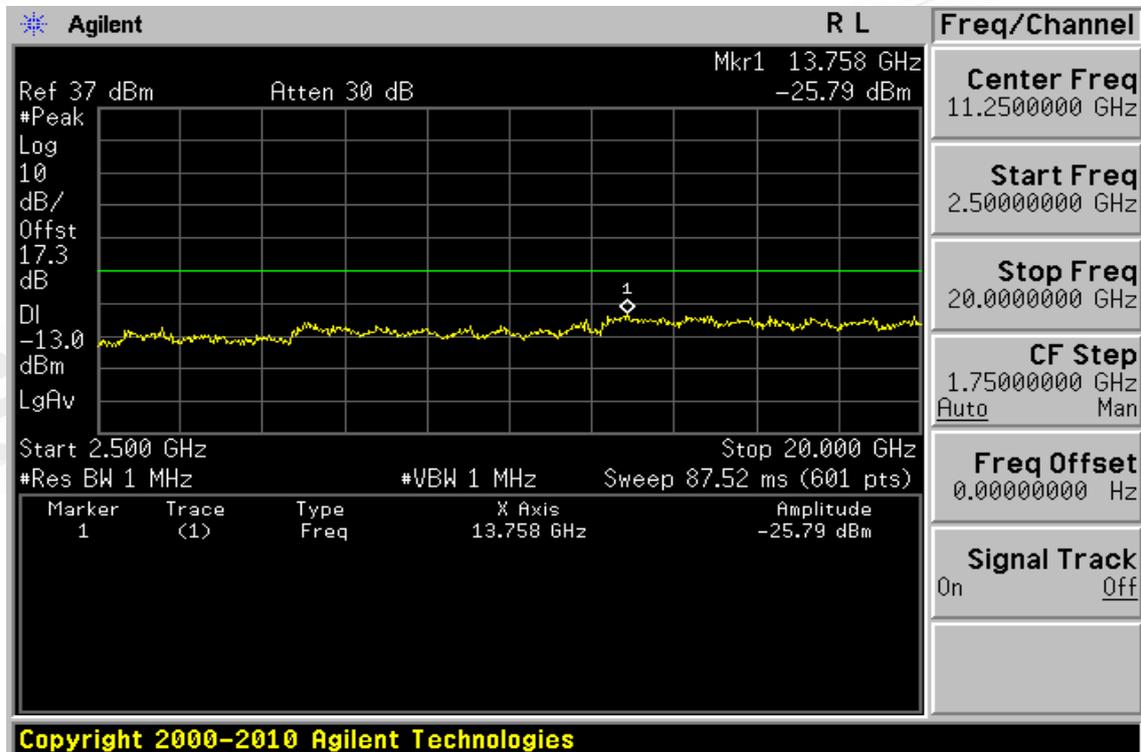
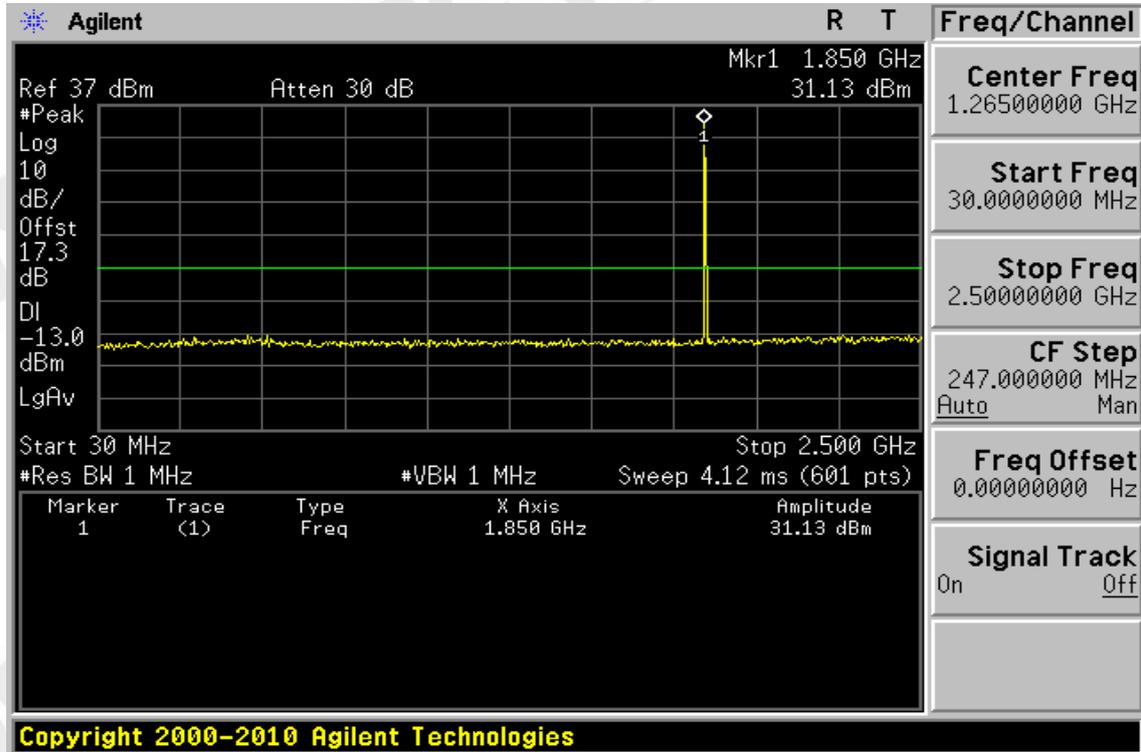
Freq.	Reading	Limit	Safe Margin
MHz	dBm	dBm	dB
823.985	-15.16	-13.00	2.16
849.020	-15.15	-13.00	2.15

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**Figure 9-16: Out of Band emission at antenna terminals – GPRS 1900 Channel Lowest**

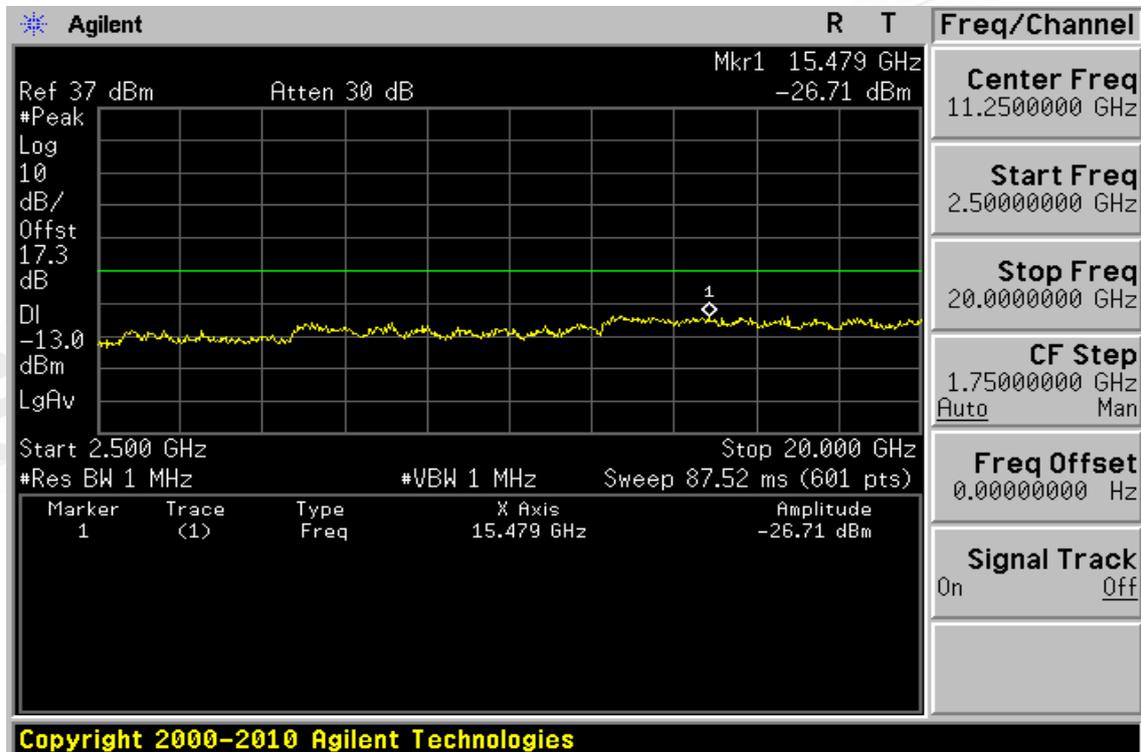
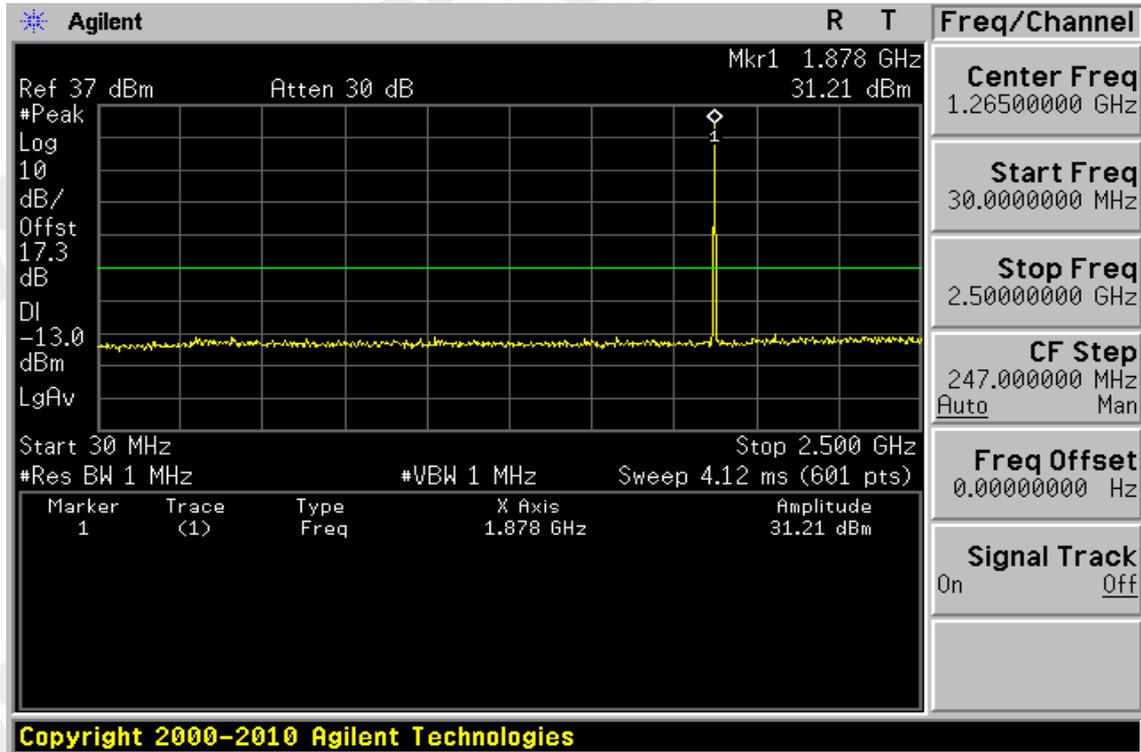


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**Figure 9-17: Out of Band emission at antenna terminals – GPRS 1900 Channel Mid**

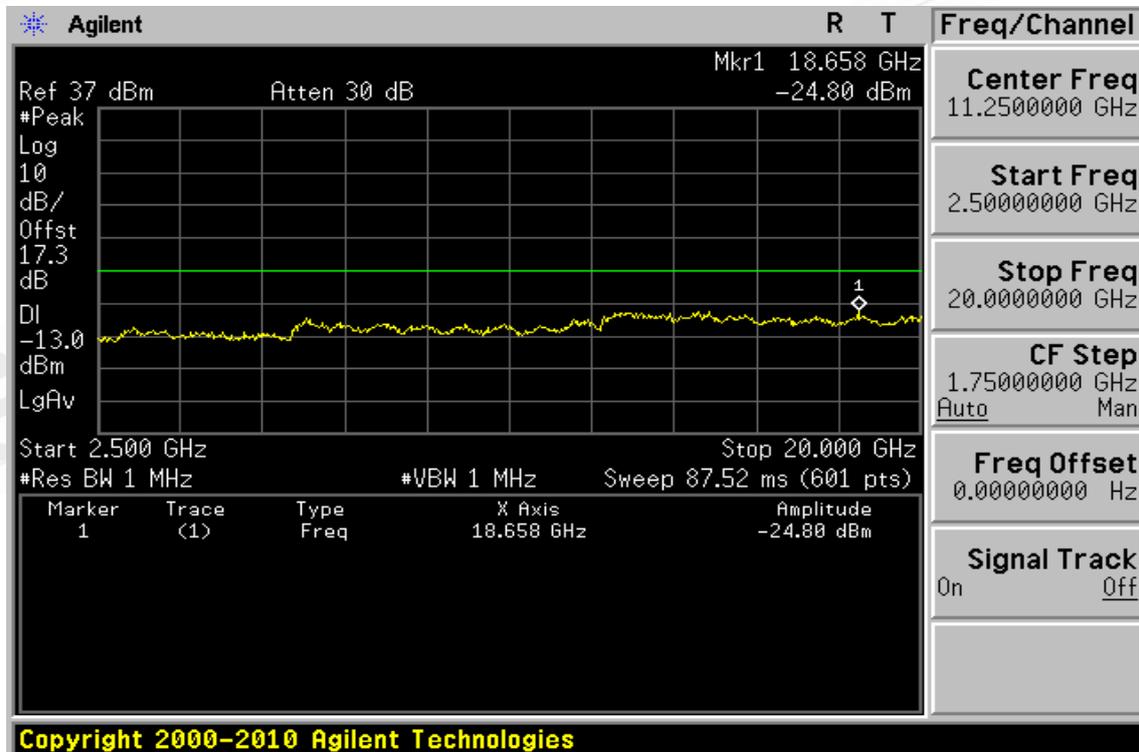
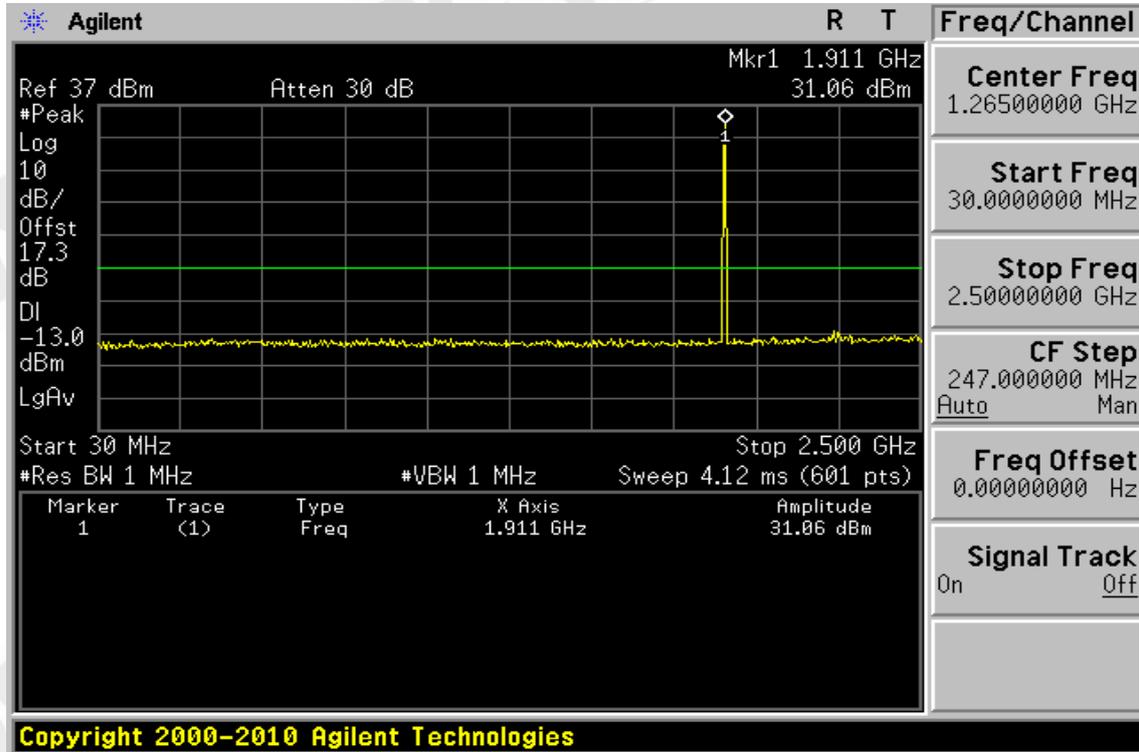


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**Figure 9-18: Out of Band emission at antenna terminals – GPRS 1900 Channel Highest**



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Fundamental Frequency :1850.2MHz Engineer :Jimmy  
 Operation Mode :TX LOW

Freq.	Note	Reading	Limit	Safe Margin
MHz	F/H/E/S	dBm	dBm	Db
<30	S	---	-13.00	---
30-1000	S	---	-13.00	---
3700.40	H	---	-13.00	---
5550.60	H	---	-13.00	---
7400.80	H	---	-13.00	---
9251.00	H	---	-13.00	---
11101.20	H	---	-13.00	---
12951.40	H	---	-13.00	---
13758.00	S	-25.79	-13.00	12.79
14801.60	H	---	-13.00	---
18502.00	H	---	-13.00	---

Note : "H" : denotes Harmonic Frequency. "S" : denotes Spurious Frequency.  
 "----" : denotes Noise Floor.

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Fundamental Frequency :1880 MHz Engineer :Jimmy  
 Operation Mode :TX Mid

Freq.	Note	Reading	Limit	Safe Margin
MHz	F/H/E/S	dBm	dBm	Db
<30	S	---	-13.00	---
30-1000	S	---	-13.00	---
3760.00	H	---	-13.00	---
5640.00	H	---	-13.00	---
7520.00	H	---	-13.00	---
9400.00	H	---	-13.00	---
11280.00	H	---	-13.00	---
13160.00	H	---	-13.00	---
15040.00	H	---	-13.00	---
15479.00	S	-26.71	-13.00	13.71
16920.00	H	---	-13.00	---
18800.00	H	---	-13.00	---

Note : "H" : denotes Harmonic Frequency. "S" : denotes Spurious Frequency.  
 "----" : denotes Noise Floor.

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Fundamental Frequency :1909.8MHz Engineer :Jimmy  
 Operation Mode :TX High

Freq.	Note	Reading	Limit	Safe Margin
MHz	F/H/E/S	dBm	dBm	dB
<30	S	---	-13.00	---
30-1000	S	---	-13.00	---
3819.60	H	---	-13.00	---
5729.40	H	---	-13.00	---
7639.20	H	---	-13.00	---
9549.00	H	---	-13.00	---
11458.80	H	---	-13.00	---
13368.60	H	---	-13.00	---
15278.40	H	---	-13.00	---
17188.20	H	---	-13.00	---
18658.00	S	-24.80	-13.00	11.80
19098.00	H	---	-13.00	---

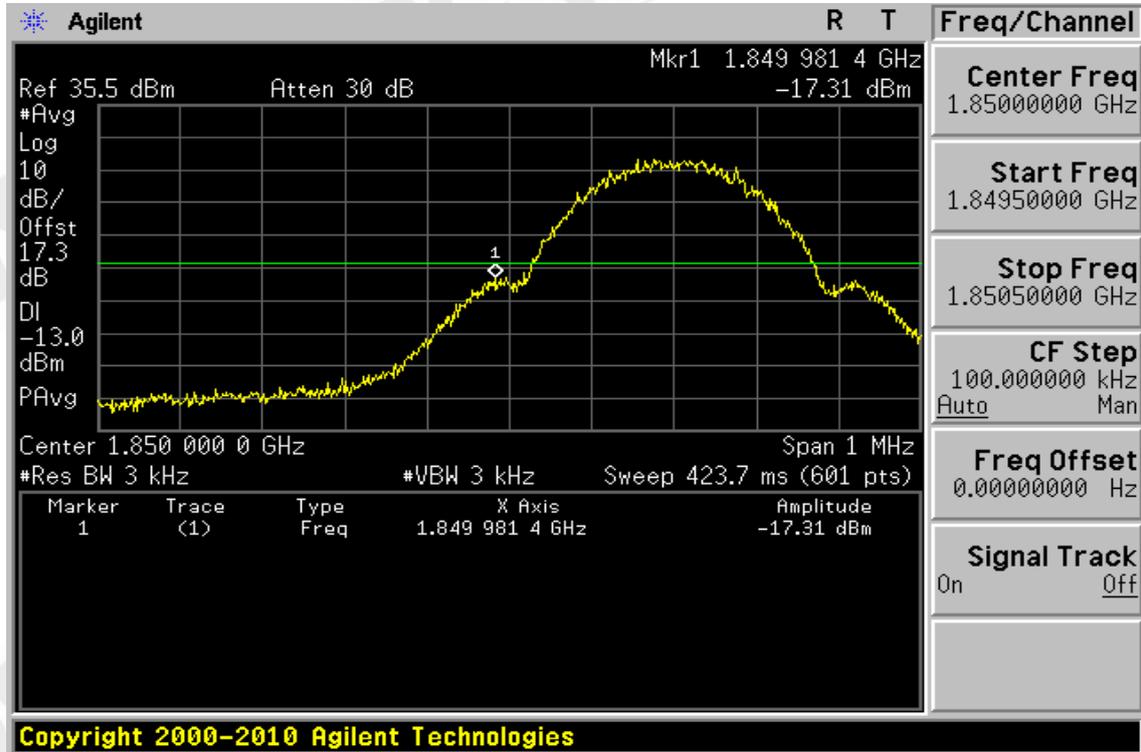
Note : "H" : denotes Harmonic Frequency. "S" : denotes Spurious Frequency.  
 "----" : denotes Noise Floor.

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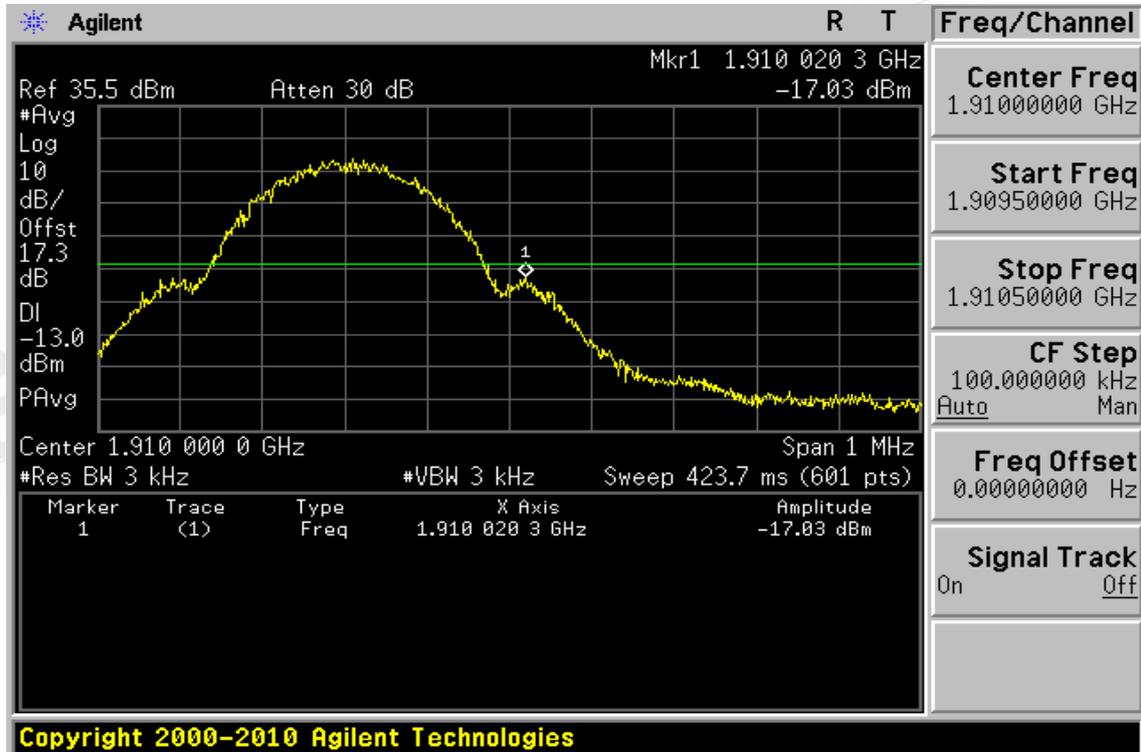
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**Figure 9-19: Band edge emission at antenna terminals – GPRS 1900 Channel Lowest**



**Figure 9-20: Band edge emission at antenna terminals – GPRS 1900 Channel Highest**



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**Band Edge Low & High**

Test Mode

GPRS 1900

Engineer

:Jimmy

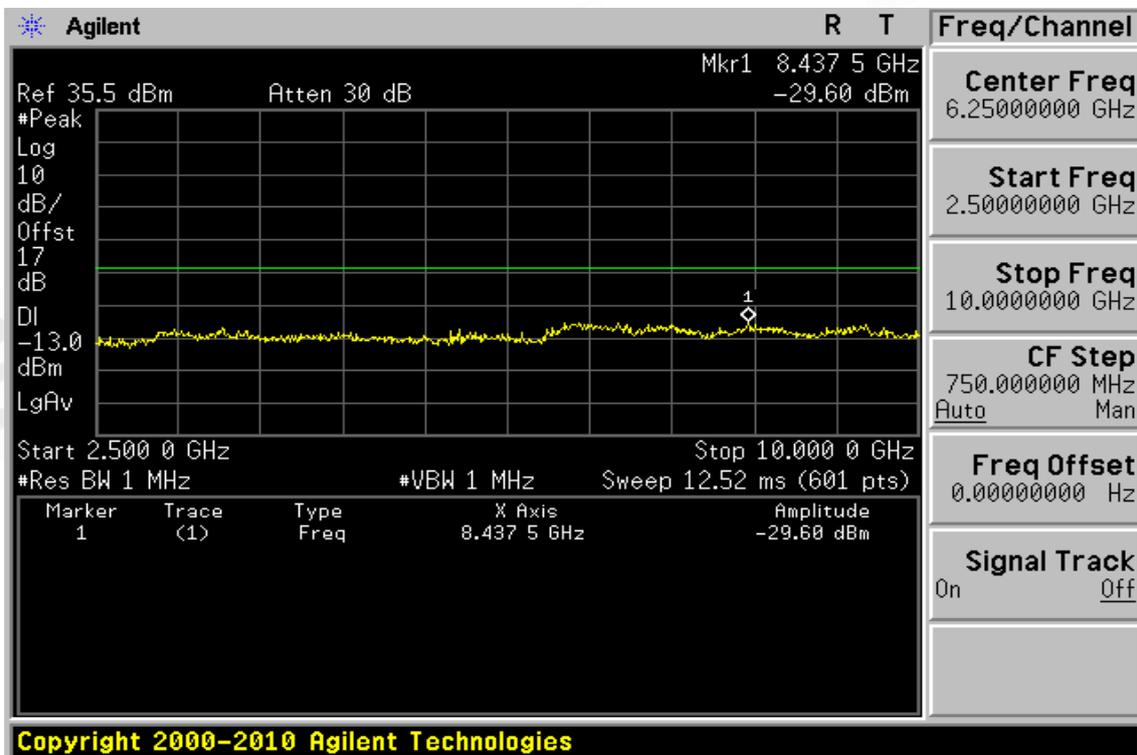
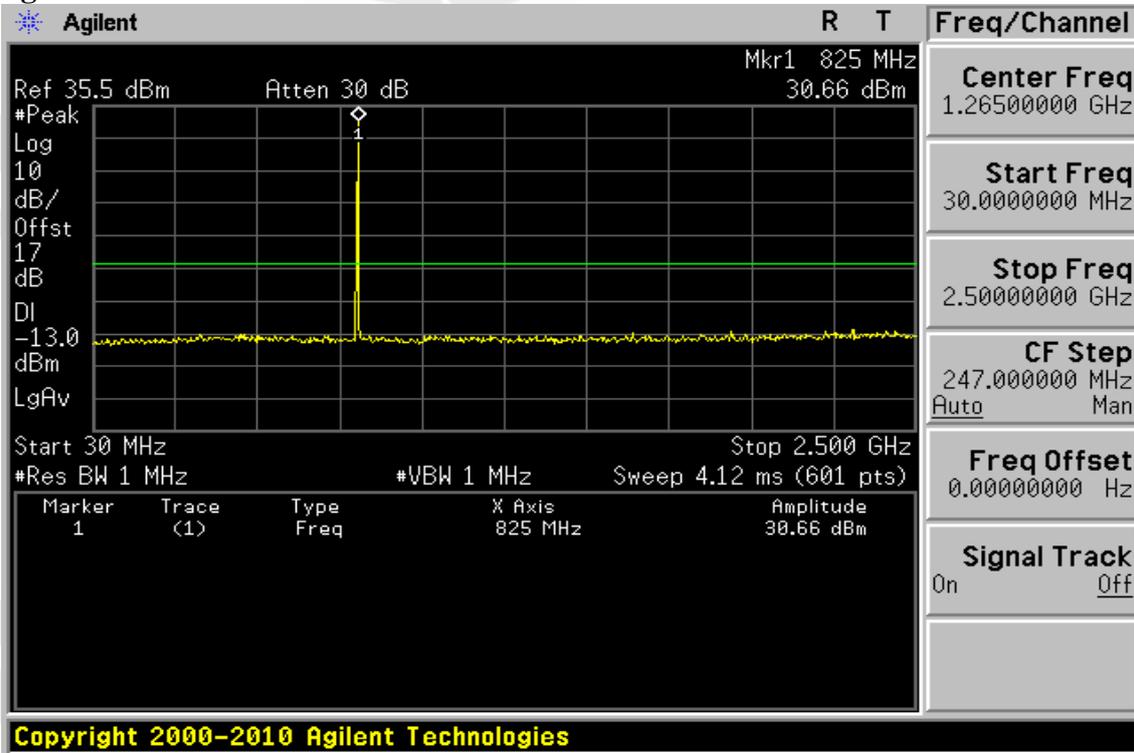
Freq.	Reading	Limit	Safe Margin
MHz	dBm	dBm	dB
1849.981	-17.31	-13.00	4.31
1910.020	-17.03	-13.00	4.03

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**Figure 9-21: Out of Band emission at antenna terminals–EDGE 850 Channel Lowest**

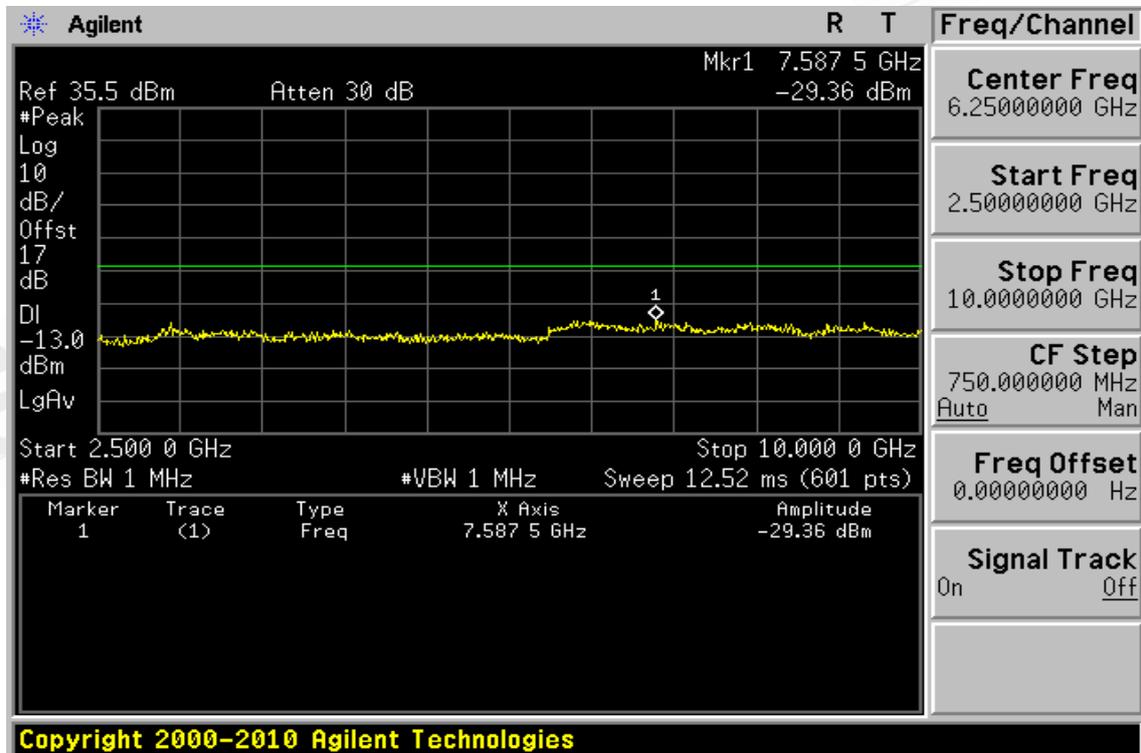
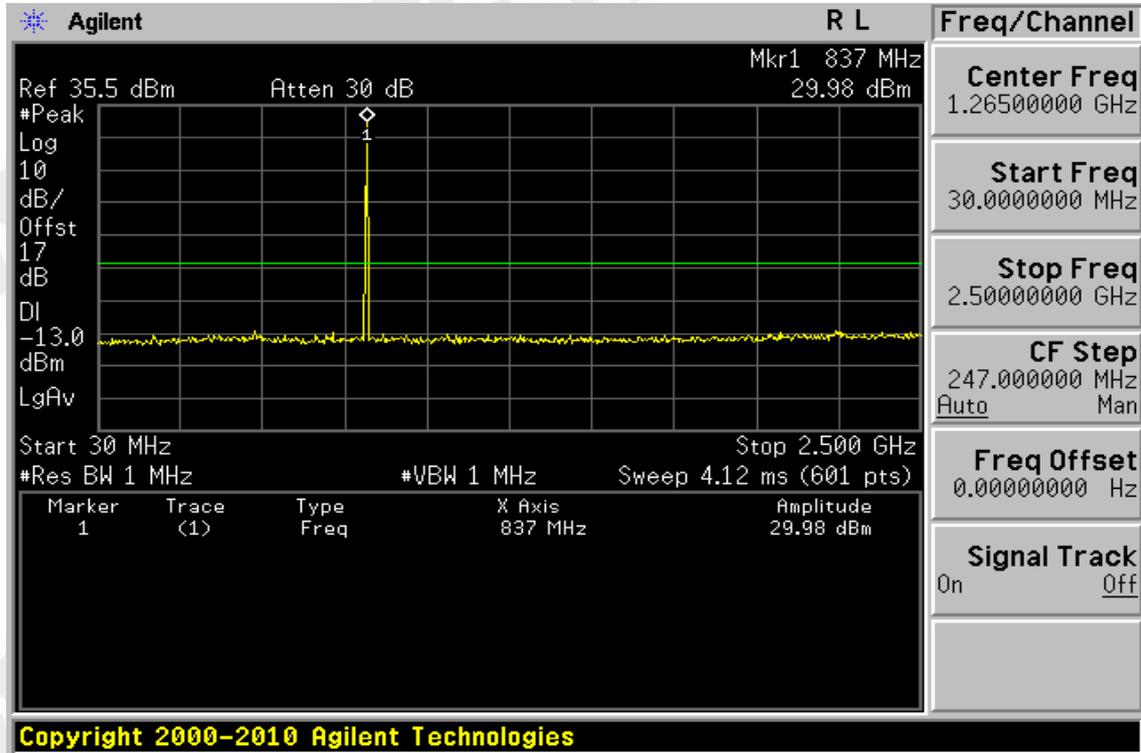


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**Figure 9-22: Out of Band emission at antenna terminals –EDGE 850 Channel Mid**

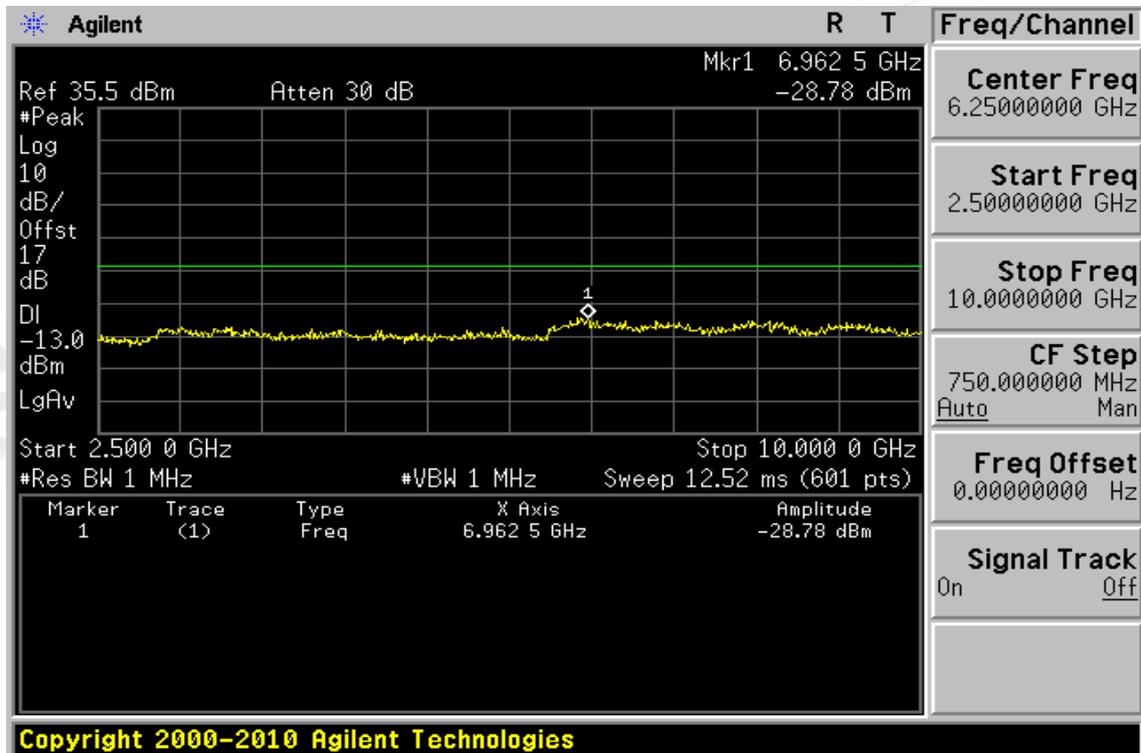
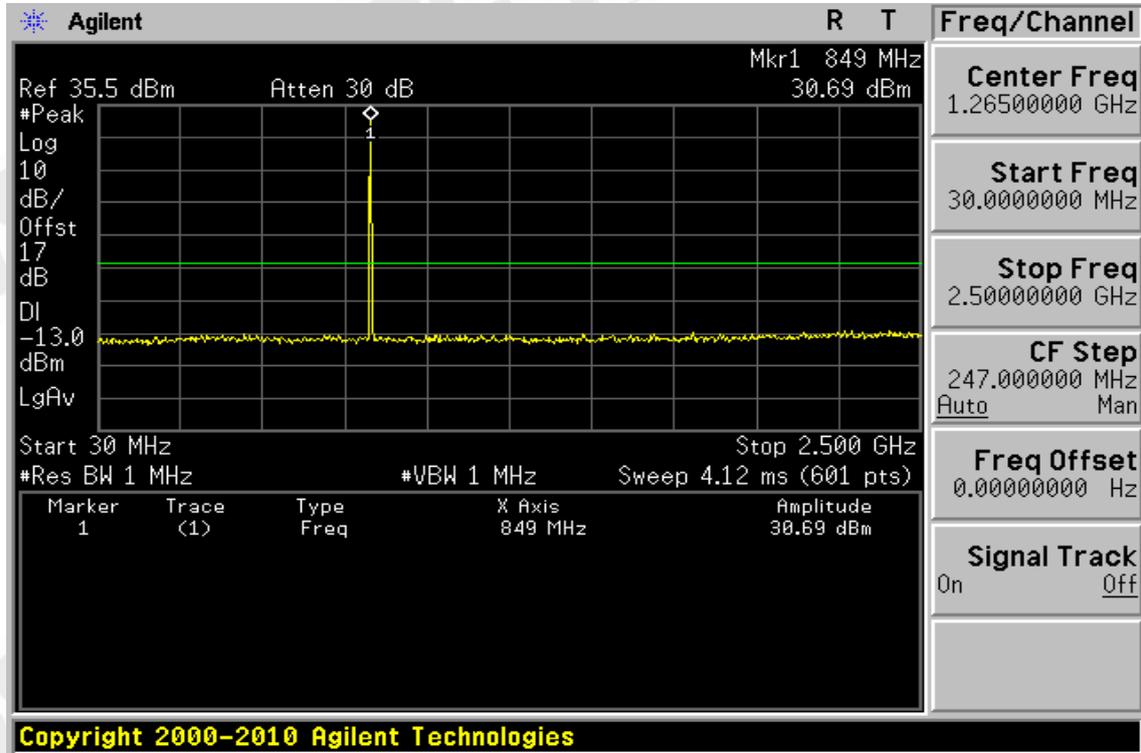


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Figure 9-23: Out of Band emission at antenna terminals–EDGE 850 Channel Highest



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Fundamental Frequency :824.2 MHz Engineer :Jimmy  
 Operation Mode :TX LOW

Freq.	Note	Reading	Limit	Safe Margin
MHz	F/H/E/S	dBm	dBm	Db
<30	S	---	-13.00	---
30-1000	S	---	-13.00	---
1648.40	H	---	-13.00	---
2472.60	H	---	-13.00	---
3288.00	H	---	-13.00	---
4121.00	H	---	-13.00	---
4945.20	H	---	-13.00	---
5769.40	H	---	-13.00	---
6593.60	H	---	-13.00	---
7417.80	H	---	-13.00	---
8242.00	H	---	-13.00	---
8437.50	S	-29.60	-13.00	16.60

Note : "H" : denotes Harmonic Frequency. "S" : denotes Spurious Frequency.  
 "----" : denotes Noise Floor.

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Fundamental Frequency :836.6 MHz Engineer :Jimmy  
 Operation Mode :TX Mid

Freq.	Note	Reading	Limit	Safe Margin
MHz	F/H/E/S	dBm	dBm	Db
<30	S	---	-13.00	---
30-1000	S	---	-13.00	---
1673.20	H	---	-13.00	---
2509.80	H	---	-13.00	---
3346.40	H	---	-13.00	---
4183.00	H	---	-13.00	---
5019.60	H	---	-13.00	---
5856.20	H	---	-13.00	---
6692.80	H	---	-13.00	---
7529.40	H	---	-13.00	---
7587.50	S	-29.36	-13.00	16.36
8366.00	H	---	-13.00	---

Note : "H" : denotes Harmonic Frequency. "S" : denotes Spurious Frequency.  
 "----" : denotes Noise Floor.

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Fundamental Frequency :848.8MHz Engineer :Jimmy  
 Operation Mode :TX High

Freq.	Note	Reading	Limit	Safe Margin
MHz	F/H/E/S	dBm	dBm	dB
<30	S	---	-13.00	---
30-1000	S	---	-13.00	---
1697.60	H	---	-13.00	---
2546.40	H	---	-13.00	---
3395.20	H	---	-13.00	---
4244.00	H	---	-13.00	---
5092.80	H	---	-13.00	---
5941.60	H	---	-13.00	---
6790.40	H	---	-13.00	---
6962.00	S	-28.78	-13.00	15.78
8488.00	H	---	-13.00	---

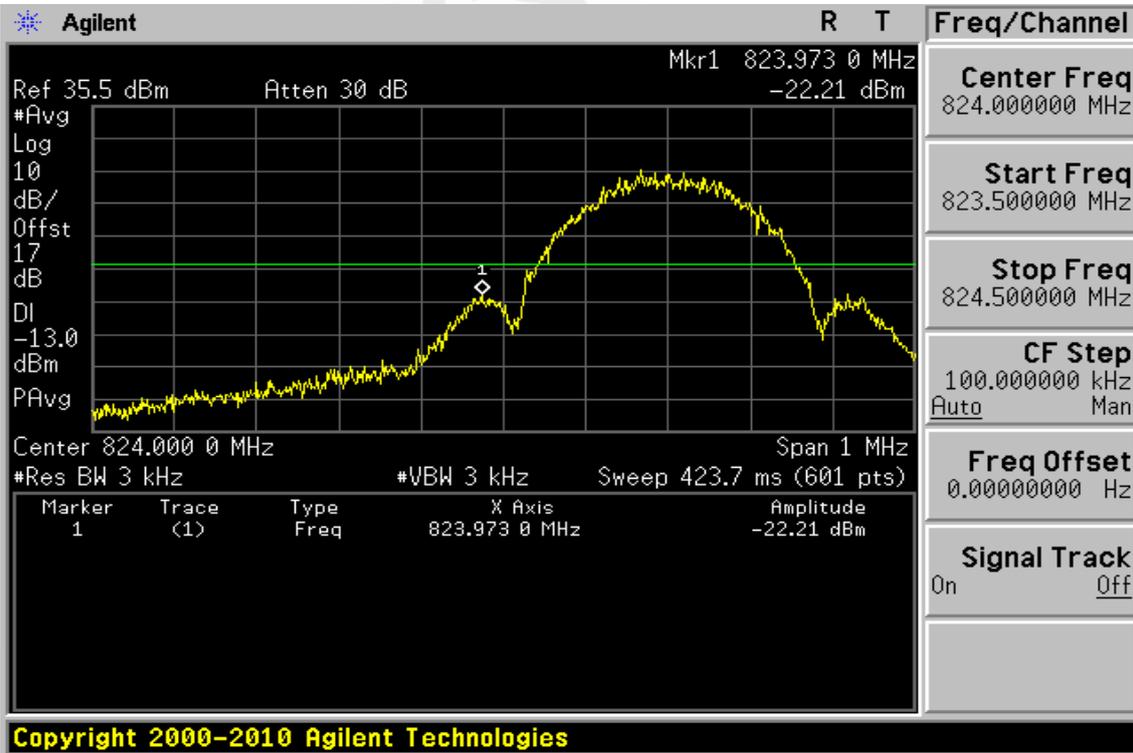
Note : "H" : denotes Harmonic Frequency. "S" : denotes Spurious Frequency.  
 "----" : denotes Noise Floor.

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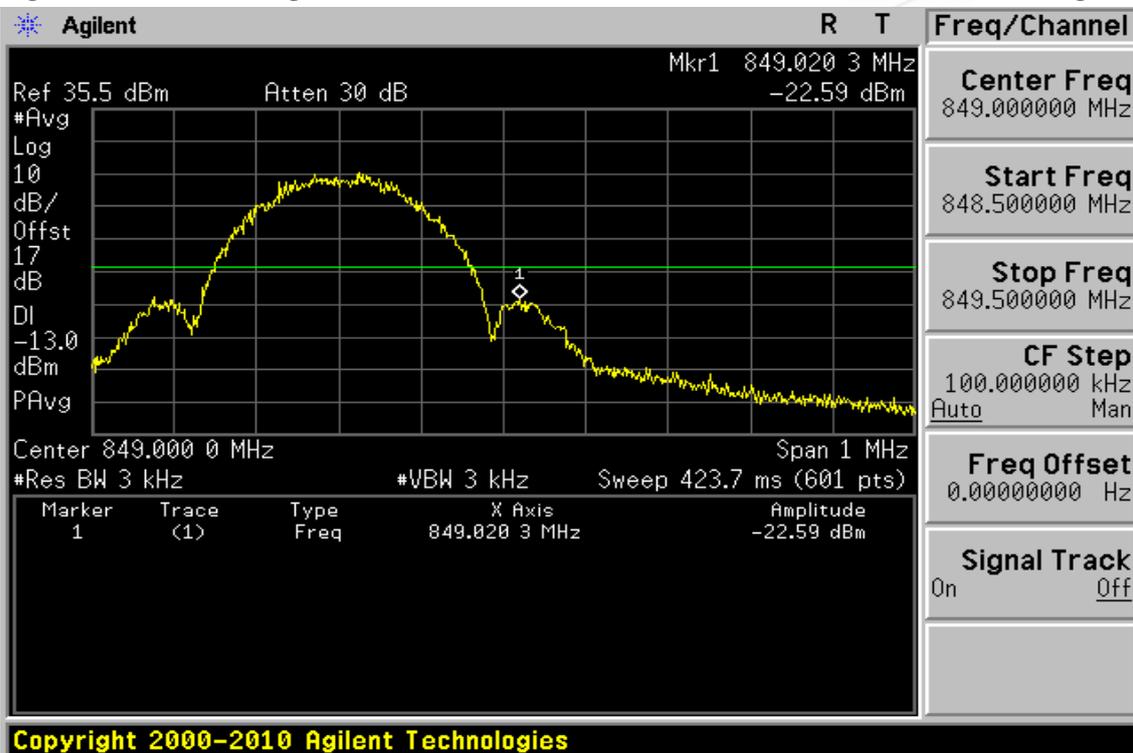
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**Figure 9-24: Bad edge emission at antenna terminals –EDGE 850 Channel Lowest**



**Figure 9-25: Band edge emission at antenna terminals –EDGE 850 Channel Highest**



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**Band Edge Low & High**

Test Mode

EDGE 850

Engineer

:Jimmy

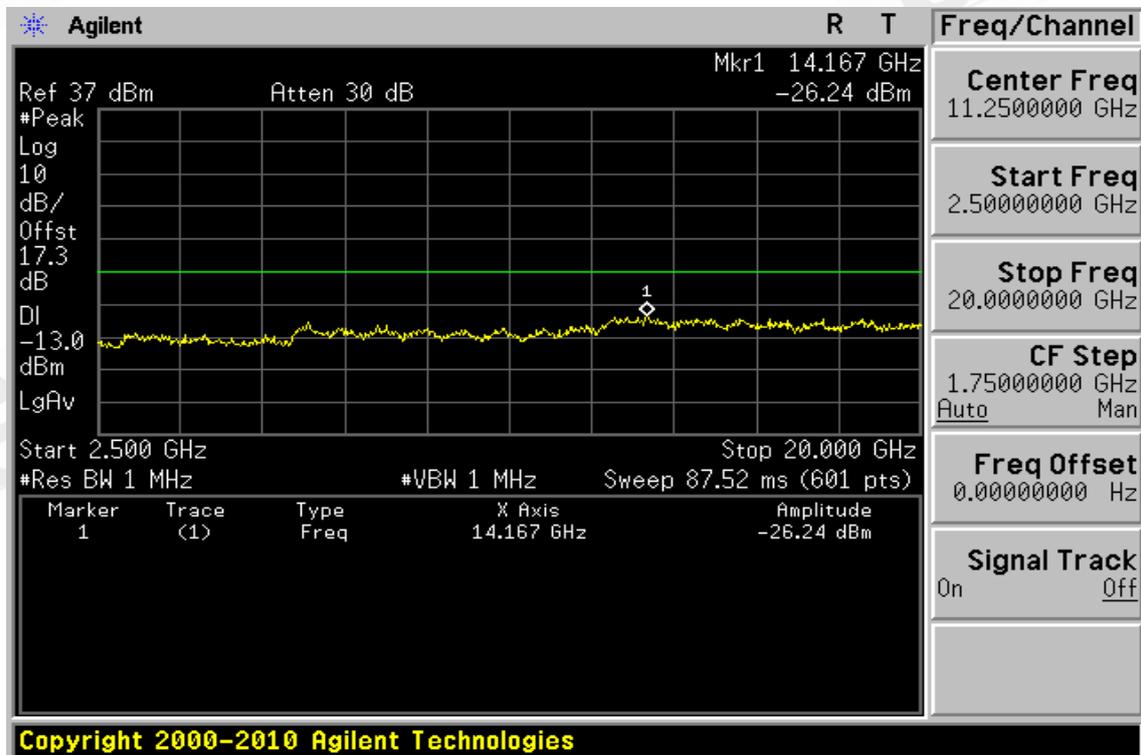
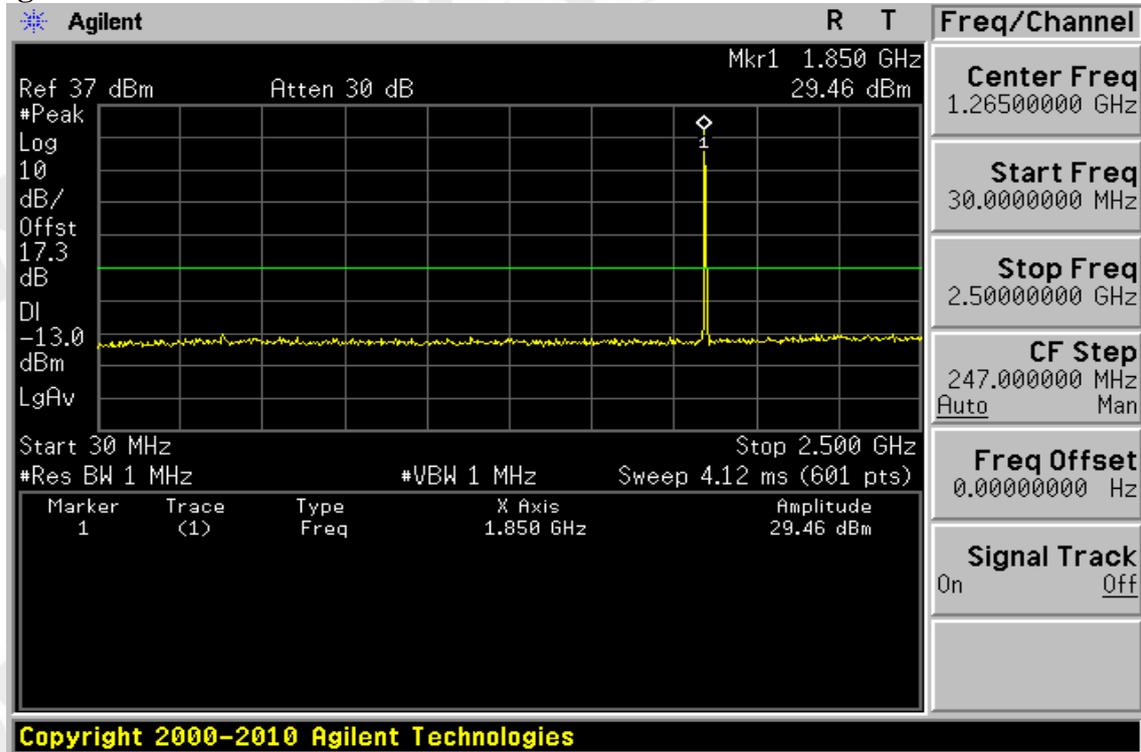
Freq.	Reading	Limit	Safe Margin
MHz	dBm	dBm	dB
823.973	-22.21	-13.00	9.21
849.020	-22.59	-13.00	9.59

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Figure 9-26: Out of Band emission at antenna terminals–EDGE 1900 Channel Lowest

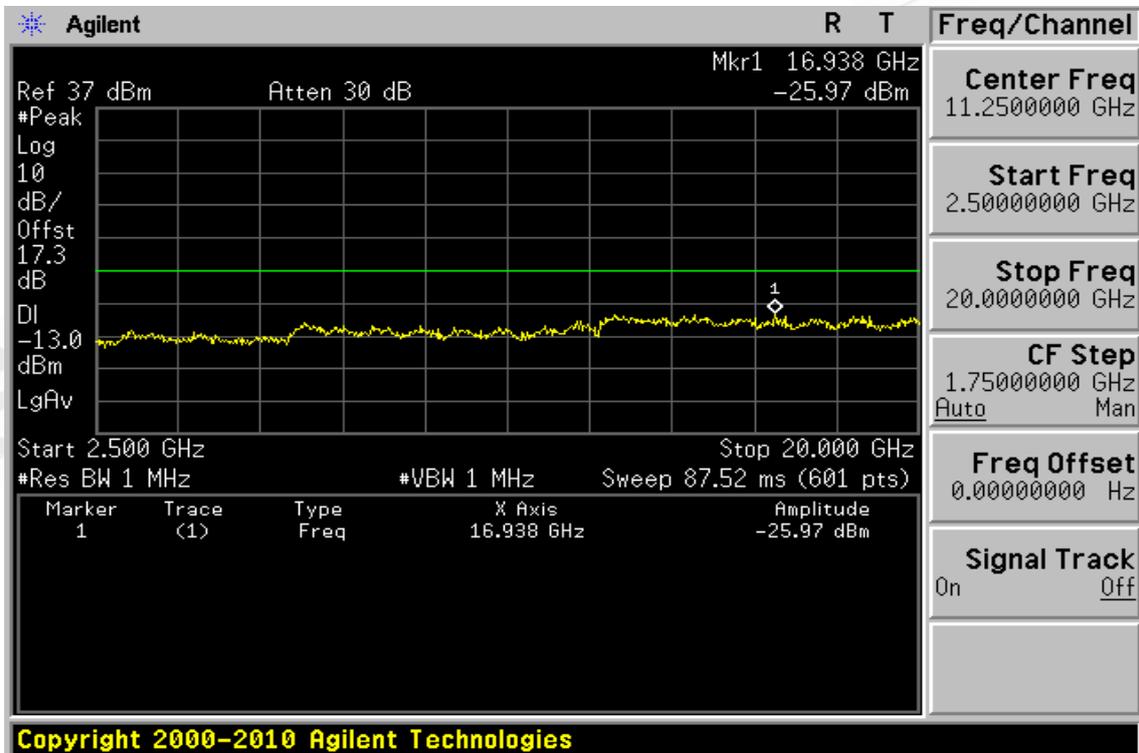
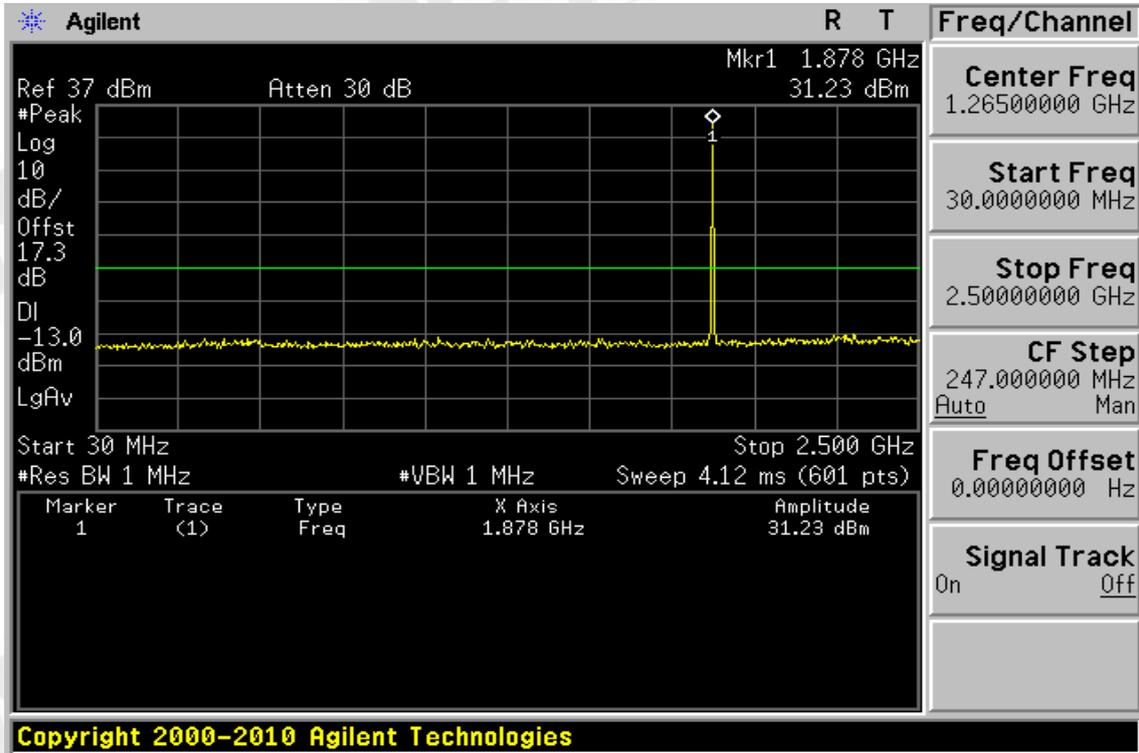


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**Figure 9-27: Out of Band emission at antenna terminals –EDGE 1900 Channel Mid**

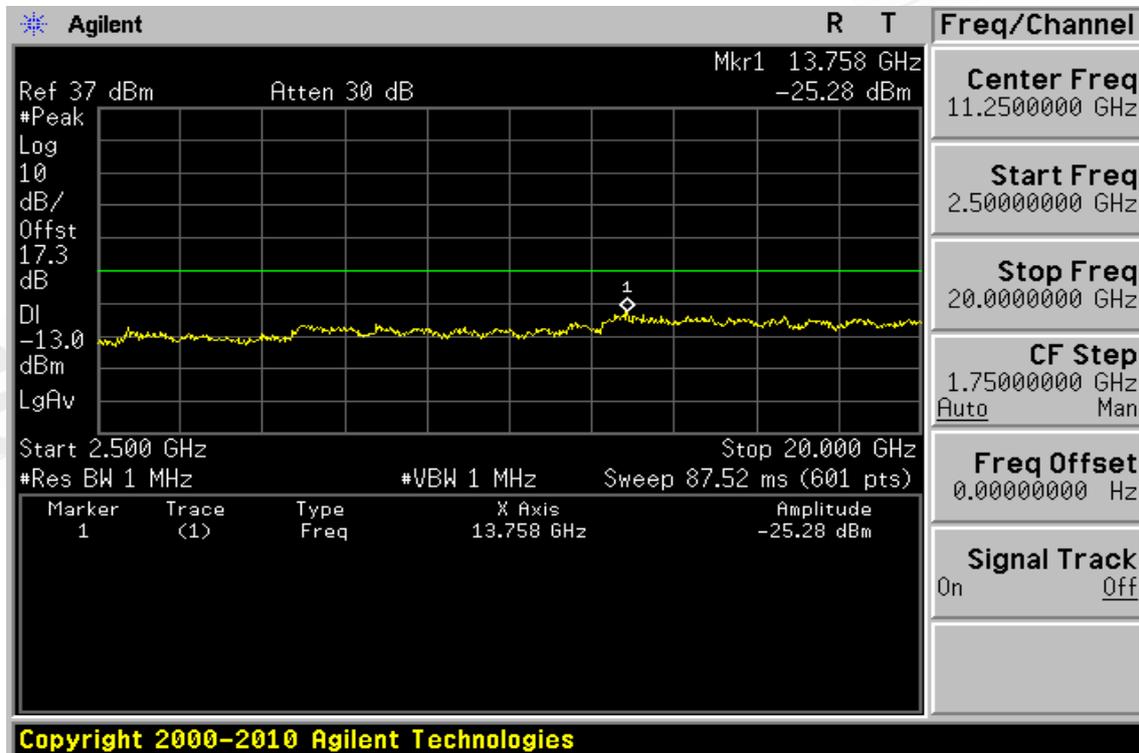
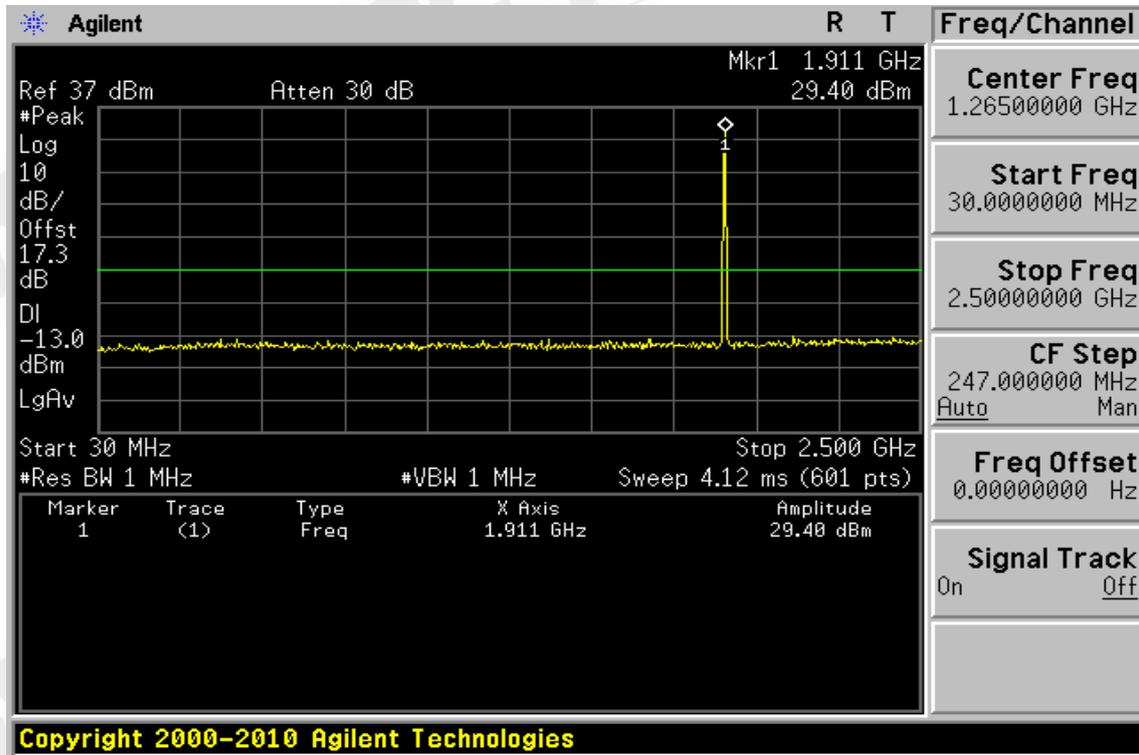


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**Figure 9-28: Out of Band emission at antenna terminals–EDGE 1900 Channel Highest**



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Fundamental Frequency :1850.2MHz Engineer :Jimmy  
 Operation Mode :TX LOW

Freq.	Note	Reading	Limit	Safe Margin
MHz	F/H/E/S	dBm	dBm	dB
<30	S	---	-13.00	---
30-1000	S	---	-13.00	---
3700.40	H	---	-13.00	---
5550.60	H	---	-13.00	---
7400.80	H	---	-13.00	---
9251.00	H	---	-13.00	---
11101.20	H	---	-13.00	---
12951.40	H	---	-13.00	---
14167.00	S	-26.24	-13.00	13.24
14801.60	H	---	-13.00	---
18502.00	H	---	-13.00	---

Note : "H" : denotes Harmonic Frequency. "S" : denotes Spurious Frequency.  
 "----" : denotes Noise Floor.

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Fundamental Frequency :1880 MHz Engineer :Jimmy  
 Operation Mode :TX Mid

Freq.	Note	Reading	Limit	Safe Margin
MHz	F/H/E/S	dBm	dBm	Db
<30	S	---	-13.00	---
30-1000	S	---	-13.00	---
3760.00	H	---	-13.00	---
5640.00	H	---	-13.00	---
7520.00	H	---	-13.00	---
9400.00	H	---	-13.00	---
11280.00	H	---	-13.00	---
13160.00	H	---	-13.00	---
15040.00	H	---	-13.00	---
16920.00	H	---	-13.00	---
16938.00	S	-25.97	-13.00	12.97
18800.00	H	---	-13.00	---

Note : "H" : denotes Harmonic Frequency. "S" : denotes Spurious Frequency.  
 "----" : denotes Noise Floor.

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Fundamental Frequency :1909.8MHz Engineer :Jimmy  
 Operation Mode :TX High

Freq.	Note	Reading	Limit	Safe Margin
MHz	F/H/E/S	dBm	dBm	dB
<30	S	---	-13.00	---
30-1000	S	---	-13.00	---
3819.60	H	---	-13.00	---
5729.40	H	---	-13.00	---
7639.20	H	---	-13.00	---
9549.00	H	---	-13.00	---
11458.80	H	---	-13.00	---
13368.60	H	---	-13.00	---
13758.00	S	-25.28	-13.00	12.28
15278.40	H	---	-13.00	---
17188.20	H	---	-13.00	---
19098.00	H	---	-13.00	---

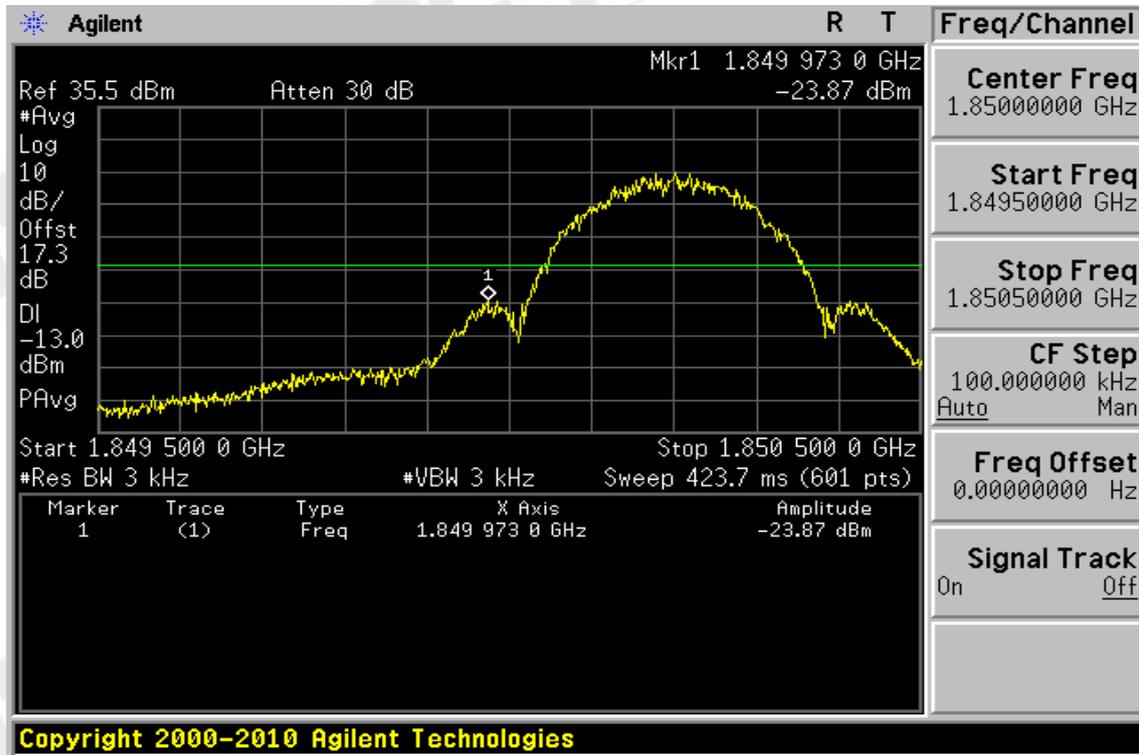
Note : "H" : denotes Harmonic Frequency. "S" : denotes Spurious Frequency.  
 "----" : denotes Noise Floor.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

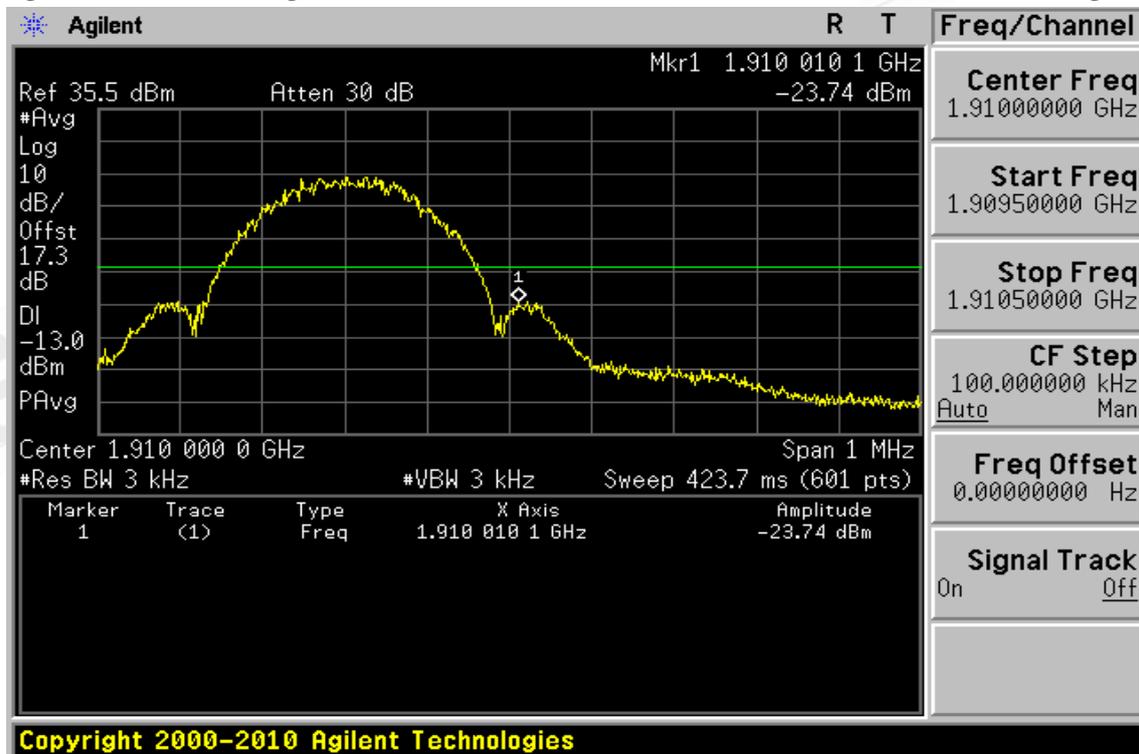
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**Figure 9-29: Bad edge emission at antenna terminals –EDGE 1900 Channel Lowest**



**Figure 9-30: Band edge emission at antenna terminals –EDGE 1900 Channel Highest**



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**Band Edge Low & High**

Test Mode

EDGE 1900

Engineer

:Jimmy

Freq.	Reading	Limit	Safe Margin
MHz	dBm	dBm	dB
1849.973	-23.87	-13.00	10.87
1910.010	-23.74	-13.00	10.74

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## 10. FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT (TX)

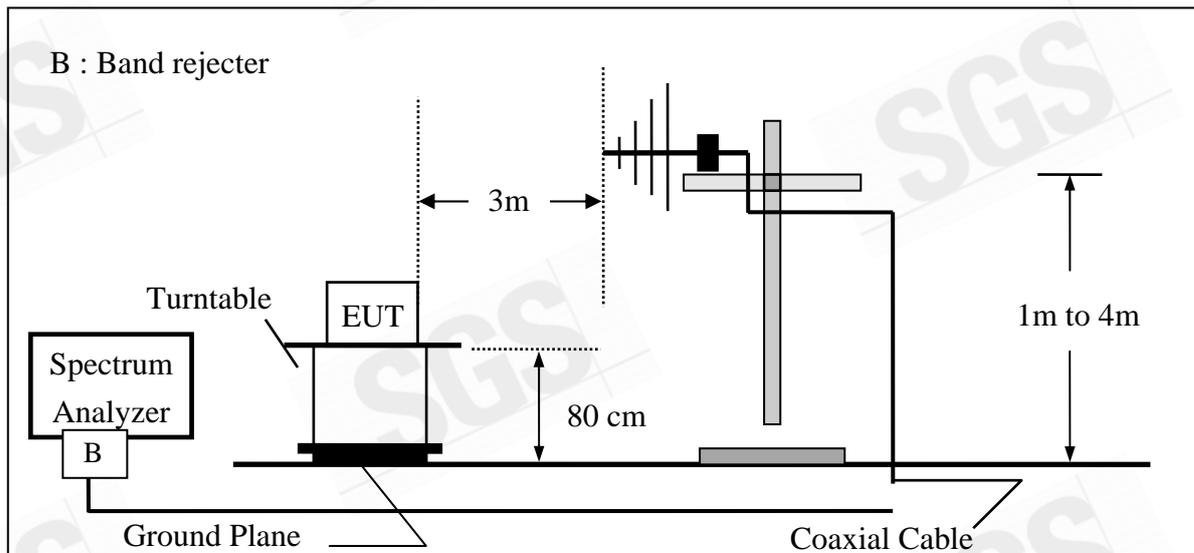
### 10.1. Standard Applicable:

According to FCC §2.1053,

FCC §22.917(a), §24.238(a) 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. EUT Setup (Block Diagram of Configuration):

Radiated Emission Test Set-Up, Frequency Below 1000MHz

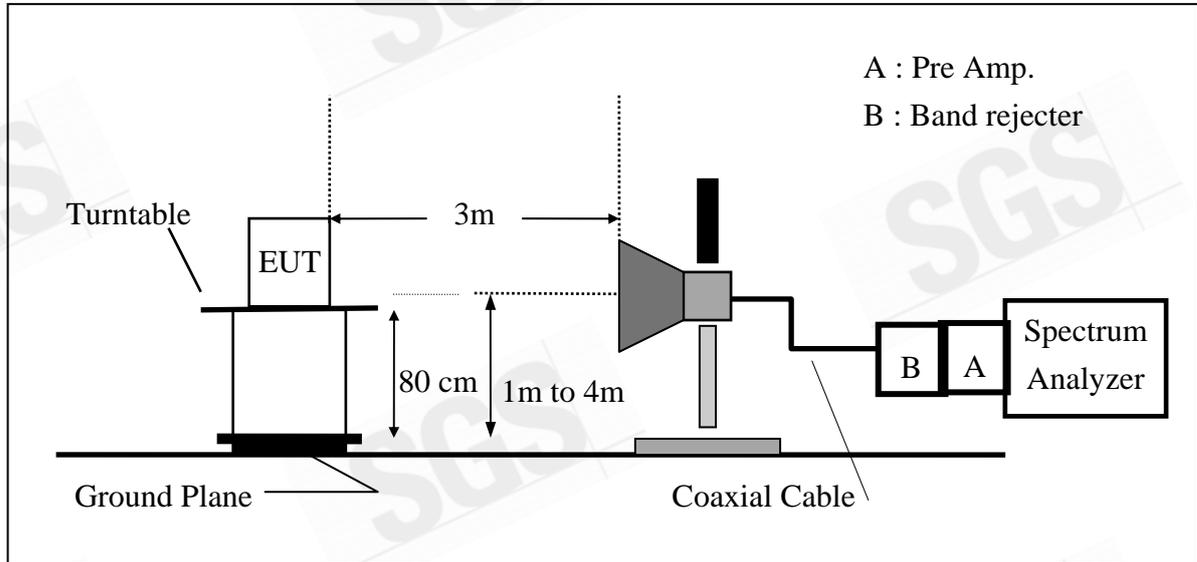


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## Radiated Emission Test Set-UP Frequency Over 1 GHz



### 10.3. 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.

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

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

### 10.4. Measurement Equipment Used:

Refer to section 2.4 in this report

### 10.5. Measurement Result:

Refer to attach tabular data sheets.

For radiated plot of test data, please refer to Appendix 1, page 108.

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## Radiated Spurious Emission Measurement Result: GPRS 850 Mode

Operation Band	:GPRS 850	Test Date	:2012-06-29
ARFCN	:CH 128	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	:824.2 MHz	Engineer	:Jimmy
Operation Mode	:TX LOW		
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Freq.	Note	ERP	SG	Antenna	Cable	Limit	Safe
MHz	F/H/E/S	dBm	Output Level dBm	Gain dBd	Loss dB	dBm	Margin dB
43.58	S	-73.69	-58.22	-12.73	-2.73	-13.00	-60.69
99.84	S	-79.64	-75.93	-0.99	-2.72	-13.00	-66.64
115.36	S	-80.69	-76.69	-1.23	-2.77	-13.00	-67.69
143.49	S	-83.70	-79.65	-1.26	-2.79	-13.00	-70.70
461.65	S	-82.70	-83.50	4.53	-3.72	-13.00	-69.70
712.88	S	-77.65	-77.65	3.99	-3.98	-13.00	-64.65
1648.40	H	-53.54	-50.58	2.39	-5.36	-13.00	-40.54
2472.60	H	-49.71	-46.70	3.14	-6.15	-13.00	-36.71
3288.00	H	-54.09	-51.95	4.70	-6.83	-13.00	-41.09
4121.00	H						
4945.20	H						
5769.40	H						
6593.60	H						
7417.80	H						
8242.00	H						

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

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

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

"---" : denotes Noise Floor.

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Operation Band	:GPRS 850	Test Date	:2012-06-29
ARFCN	:CH 128	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	:824.2 MHz	Engineer	:Jimmy
Operation Mode	:TX LOW		
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Freq. MHz	Note F/H/E/S	ERP dBm	SG Output Level dBm	Antenna Gain dBd	Cable Loss dB	Limit dBm	Safe Margin dB
43.58	S	-86.57	-71.11	-12.73	-2.73	-13.00	-73.57
119.24	S	-87.37	-83.25	-1.35	-2.77	-13.00	-74.37
135.73	S	-87.42	-83.56	-1.08	-2.79	-13.00	-74.42
256.01	S	-86.97	-88.34	4.64	-3.27	-13.00	-73.97
450.98	S	-83.42	-84.19	4.47	-3.70	-13.00	-70.42
711.91	S	-79.71	-79.72	4.00	-3.98	-13.00	-66.71
1648.40	H	-48.31	-45.63	2.68	-5.36	-13.00	-35.31
2472.60	H	-43.79	-41.15	3.52	-6.15	-13.00	-30.79
3288.00	H	-55.01	-52.86	4.68	-6.83	-13.00	-42.01
4121.00	H						
4945.20	H						
5769.40	H						
6593.60	H						
7417.80	H						
8242.00	H						

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

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

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

"---" : denotes Noise Floor.

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Operation Band	:GPRS 850	Test Date	:2012-06-29
ARFCN	:CH 190	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	:836.6 MHz	Engineer	:Jimmy
Operation Mode	:TX MID		
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Freq. MHz	Note F/H/E/S	ERP dBm	SG Output Level dBm	Antenna Gain dBd	Cable Loss dB	Limit dBm	Safe Margin dB
43.58	S	-73.59	-58.13	-12.73	-2.73	-13.00	-60.59
99.84	S	-79.32	-75.61	-0.99	-2.72	-13.00	-66.32
110.51	S	-80.81	-77.01	-1.09	-2.72	-13.00	-67.81
143.49	S	-84.79	-80.74	-1.26	-2.79	-13.00	-71.79
254.07	S	-84.93	-86.32	4.61	-3.23	-13.00	-71.93
713.85	S	-78.39	-78.38	3.97	-3.98	-13.00	-65.39
1673.20	H	-55.59	-52.58	2.33	-5.34	-13.00	-42.59
2509.80	H	-44.46	-41.52	3.19	-6.13	-13.00	-31.46
3346.40	H						
4183.00	H						
5019.60	H						
5856.20	H						
6692.80	H						
7529.40	H						
8366.00	H						

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

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

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

"---" : denotes Noise Floor.

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Operation Band	:GPRS 850	Test Date	:2012-06-29
ARFCN	:CH 190	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	:836.6 MHz	Engineer	:Jimmy
Operation Mode	:TX MID		
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Freq. MHz	Note F/H/E/S	ERP dBm	SG Output Level dBm	Antenna Gain dBd	Cable Loss dB	Limit dBm	Safe Margin dB
50.37	S	-85.37	-71.82	-10.81	-2.73	-13.00	-72.37
112.45	S	-87.50	-83.58	-1.15	-2.77	-13.00	-74.50
159.01	S	-89.00	-85.45	-0.62	-2.93	-13.00	-76.00
329.73	S	-83.68	-84.89	4.65	-3.44	-13.00	-70.68
627.52	S	-80.85	-80.96	4.08	-3.97	-13.00	-67.85
705.12	S	-80.13	-80.23	4.08	-3.98	-13.00	-67.13
1673.20	H	-50.43	-47.75	2.66	-5.34	-13.00	-37.43
2509.80	H	-43.16	-40.58	3.55	-6.13	-13.00	-30.16
3346.40	H						
4183.00	H						
5019.60	H						
5856.20	H						
6692.80	H						
7529.40	H						
8366.00	H						

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

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

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

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Operation Band	:GPRS 850	Test Date	:2012-06-29
ARFCN	:CH 251	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	:848.8 MHz	Engineer	:Jimmy
Operation Mode	:TX HIGH		
EUT Pol.	:H Plan	Measurement Antenna Pol.	:VERTICAL

Freq. MHz	Note F/H/E/S	ERP dBm	SG Output Level dBm	Antenna Gain dBd	Cable Loss dB	Limit dBm	Safe Margin dB
42.61	S	-73.05	-57.40	-12.91	-2.73	-13.00	-60.05
99.84	S	-79.16	-75.45	-0.99	-2.72	-13.00	-66.16
112.45	S	-80.21	-76.29	-1.15	-2.77	-13.00	-67.21
158.04	S	-84.42	-80.82	-0.67	-2.93	-13.00	-71.42
254.07	S	-72.89	-74.27	4.61	-3.23	-13.00	-59.89
622.67	S	-78.15	-78.25	4.07	-3.97	-13.00	-65.15
1697.60	H	-55.59	-52.48	2.29	-5.40	-13.00	-42.59
2546.40	H	-41.45	-38.52	3.30	-6.24	-13.00	-28.45
3395.20	H						
4244.00	H						
5092.80	H						
5941.60	H						
6790.40	H						
7639.20	H						
8488.00	H						

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

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

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

"---" : denotes Noise Floor.

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Operation Band	:GPRS 850	Test Date	:2012-06-29
ARFCN	:CH 251	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	:848.8 MHz	Engineer	:Jimmy
Operation Mode	:TX HIGH		
EUT Pol.	:H Plan	Measurement Antenna Pol.	:HORIZONTAL

Freq. MHz	Note F/H/E/S	ERP dBm	SG Output Level dBm	Antenna Gain dBd	Cable Loss dB	Limit dBm	Safe Margin dB
31.94	S	-84.63	-68.01	-14.15	-2.47	-13.00	-71.63
49.40	S	-85.78	-71.95	-11.10	-2.73	-13.00	-72.78
150.28	S	-84.57	-80.55	-1.09	-2.93	-13.00	-71.57
286.08	S	-86.27	-87.54	4.50	-3.22	-13.00	-73.27
486.87	S	-82.59	-83.54	4.65	-3.70	-13.00	-69.59
709.00	S	-78.98	-79.03	4.04	-3.98	-13.00	-65.98
1697.60	H	-49.96	-47.21	2.65	-5.40	-13.00	-36.96
2546.40	H	-39.62	-37.05	3.66	-6.24	-13.00	-26.62
3395.20	H						
4244.00	H						
5092.80	H						
5941.60	H						
6790.40	H						
7639.20	H						
8488.00	H						

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

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

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

"---" : denotes Noise Floor.

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**Radiated Spurious Emission Measurement Result: EDGE1900 Mode**

Operation Band	:EDGE 1900	Test Date	:2012-06-29
ARFCN	:CH 512	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	:1850.2 MHz	Engineer	:Jimmy
Operation Mode	:TX LOW		
EUT Pol.	:E1 Plan	Measurement Antenna Pol.	:VERTICAL

Freq.	Note	EIRP	SG	Antenna	Cable	Limit	Safe
MHz	F/H/E/S	dBm	Output Level dBm	Gain dBi	Loss dB	dBm	Margin dB
43.58	S	-71.77	-58.46	-10.58	-2.73	-13.00	-58.77
99.84	S	-77.51	-75.95	1.16	-2.72	-13.00	-64.51
114.39	S	-78.43	-76.61	0.95	-2.77	-13.00	-65.43
143.49	S	-81.41	-79.52	0.89	-2.79	-13.00	-68.41
273.47	S	-82.23	-85.67	6.66	-3.22	-13.00	-69.23
459.71	S	-80.44	-83.38	6.67	-3.72	-13.00	-67.44
3700.40	H	-50.61	-51.03	7.40	-6.98	-13.00	-37.61
5550.60	H						
7400.80	H						
9251.00	H						
11101.20	H						
12951.40	H						
14801.60	H						
16651.80	H						
18502.00	H						

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

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

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

"---" : denotes Noise Floor.

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Operation Band	:EDGE 1900	Test Date	:2012-06-29
ARFCN	:CH 512	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	:1850.2 MHz	Engineer	:Jimmy
Operation Mode	:TX LOW		
EUT Pol.	:E1 Plan	Measurement Antenna Pol.	:HORIZONTAL

Freq. MHz	Note F/H/E/S	EIRP dBm	SG Output Level dBm	Antenna Gain dBi	Cable Loss dB	Limit dBm	Safe Margin dB
50.37	S	-83.07	-71.68	-8.66	-2.73	-13.00	-70.07
109.54	S	-84.48	-82.85	1.08	-2.72	-13.00	-71.48
133.79	S	-84.55	-82.96	1.20	-2.79	-13.00	-71.55
286.08	S	-84.77	-88.20	6.65	-3.22	-13.00	-71.77
343.31	S	-82.93	-86.38	6.90	-3.44	-13.00	-69.93
500.45	S	-80.30	-83.47	6.87	-3.70	-13.00	-67.30
3700.40	H	-53.44	-53.38	6.92	-6.98	-13.00	-40.44
5550.60	H						
7400.80	H						
9251.00	H						
11101.20	H						
12951.40	H						
14801.60	H						
16651.80	H						
18502.00	H						

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

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

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

"---" : denotes Noise Floor.

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Operation Band	:EDGE 1900	Test Date	:2012-06-29
ARFCN	:CH 661	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	:1880.0 MHz	Engineer	:Jimmy
Operation Mode	:TX MID		
EUT Pol.	:E1 Plan	Measurement Antenna Pol.	:VERTICAL

Freq. MHz	Note F/H/E/S	EIRP dBm	SG Output Level dBm	Antenna Gain dBi	Cable Loss dB	Limit dBm	Safe Margin dB
43.58	S	-71.89	-58.57	-10.58	-2.73	-13.00	-58.89
99.84	S	-77.85	-76.29	1.16	-2.72	-13.00	-64.85
113.42	S	-79.62	-77.83	0.97	-2.77	-13.00	-66.62
143.49	S	-81.42	-79.53	0.89	-2.79	-13.00	-68.42
286.08	S	-81.48	-84.91	6.65	-3.22	-13.00	-68.48
590.66	S	-76.38	-78.77	6.28	-3.90	-13.00	-63.38
3760.00	H	-50.05	-50.36	7.42	-7.12	-13.00	-37.05
5640.00	H						
7520.00	H						
9400.00	H						
11280.00	H						
13160.00	H						
15040.00	H						
16920.00	H						
18800.00	H						

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

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

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

"---" : denotes Noise Floor.

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Operation Band	:EDGE 1900	Test Date	:2012-06-29
ARFCN	:CH 661	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	:1880.0 MHz	Engineer	:Jimmy
Operation Mode	:TX MID		
EUT Pol.	:E1 Plan	Measurement Antenna Pol.	:HORIZONTAL

Freq. MHz	Note F/H/E/S	EIRP dBm	SG Output Level dBm	Antenna Gain dBi	Cable Loss dB	Limit dBm	Safe Margin dB
45.52	S	-85.07	-72.19	-10.15	-2.73	-13.00	-72.07
138.64	S	-85.92	-84.03	0.89	-2.79	-13.00	-72.92
175.50	S	-81.58	-82.54	3.89	-2.93	-13.00	-68.58
286.08	S	-83.66	-87.09	6.65	-3.22	-13.00	-70.66
469.41	S	-80.99	-83.98	6.71	-3.72	-13.00	-67.99
741.98	S	-77.16	-78.71	5.78	-4.23	-13.00	-64.16
3760.00	H	-51.01	-50.75	6.85	-7.12	-13.00	-38.01
5640.00	H						
7520.00	H						
9400.00	H						
11280.00	H						
13160.00	H						
15040.00	H						
16920.00	H						
18800.00	H						

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

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

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

"---" : denotes Noise Floor.

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Operation Band	:EDGE 1900	Test Date	:2012-06-29
ARFCN	:CH 810	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	:1909.8 MHz	Engineer	:Jimmy
Operation Mode	:TX HIGH		
EUT Pol.	:E1 Plan	Measurement Antenna Pol.	:VERTICAL

Freq. MHz	Note F/H/E/S	EIRP dBm	SG Output Level dBm	Antenna Gain dBi	Cable Loss dB	Limit dBm	Safe Margin dB
44.55	S	-72.92	-59.79	-10.40	-2.73	-13.00	-59.92
99.84	S	-76.92	-75.36	1.16	-2.72	-13.00	-63.92
116.33	S	-80.88	-79.00	0.89	-2.77	-13.00	-67.88
143.49	S	-81.07	-79.17	0.89	-2.79	-13.00	-68.07
174.53	S	-75.31	-76.12	3.74	-2.93	-13.00	-62.31
710.94	S	-76.08	-78.26	6.16	-3.98	-13.00	-63.08
3819.60	H	-51.48	-51.79	7.51	-7.20	-13.00	-38.48
5729.40	H						
7639.20	H						
9549.00	H						
11458.80	H						
13368.60	H						
15278.40	H						
17188.20	H						
19098.00	H						

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

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

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

"---" : denotes Noise Floor.

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Operation Band	:EDGE 1900	Test Date	:2012-06-29
ARFCN	:CH 810	Temp./Humi.	:27 deg_C / 66 RH
Fundamental Frequency	:1909.8 MHz	Engineer	:Jimmy
Operation Mode	:TX HIGH		
EUT Pol.	:E1 Plan	Measurement Antenna Pol.	:HORIZONTAL

Freq. MHz	Note F/H/E/S	EIRP dBm	SG Output Level dBm	Antenna Gain dBi	Cable Loss dB	Limit dBm	Safe Margin dB
43.58	H	-84.94	-71.63	-10.58	-2.73	-13.00	-71.94
137.67	H	-80.23	-78.39	0.95	-2.79	-13.00	-67.23
185.20	H	-84.49	-86.63	5.23	-3.09	-13.00	-71.49
248.25	H	-85.03	-88.47	6.67	-3.23	-13.00	-72.03
282.20	H	-83.27	-86.65	6.60	-3.22	-13.00	-70.27
586.78	H	-79.29	-81.72	6.32	-3.90	-13.00	-66.29
3819.60	H	-52.91	-52.77	7.05	-7.20	-13.00	-39.91
5729.40	H	---					
7639.20	H	---					
9549.00	H	---					
11458.80	H	---					
13368.60	H	---					
15278.40	H	---					
17188.20	H	---					
19098.00	H	---					

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

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

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

"---" : denotes Noise Floor.

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## 11. FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT

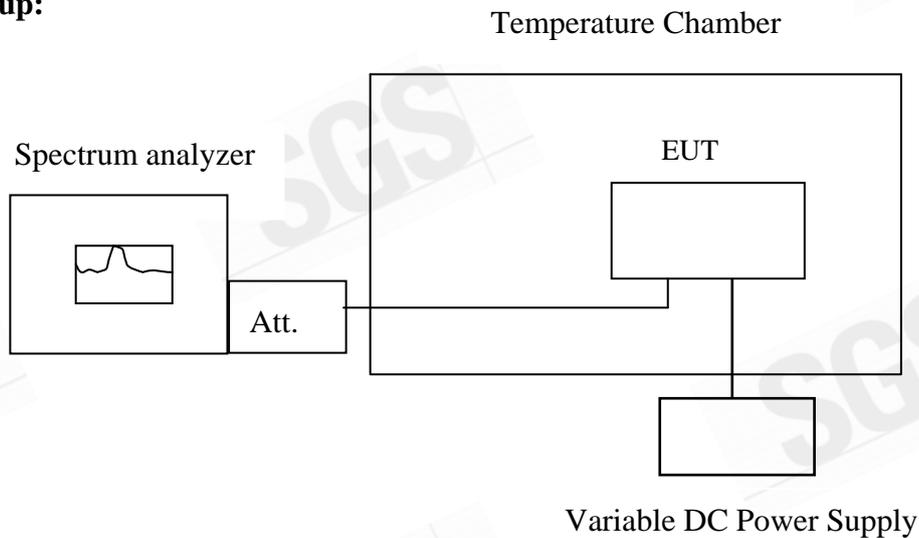
### 11.1. Standard Applicable:

According to FCC §2.1055(a) (1)

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

+/-2.5ppm for 1900MHz band

### 11.2. Test Set-up:



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

### 11.3. 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.

### 11.4. Measurement Equipment Used:

Refer to section 2.4 in this report

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**11.5. Measurement Result:**

Reference Frequency: GPRS 850 Mid Channel 836.6 MHz @ 20				
Limit: +/- 2.5 ppm = 2091 Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature ( )	(MHz)		
3.7	-30	836.599995	2.00	2091
3.7	-20	836.599991	6.00	2091
3.7	-10	836.599996	1.00	2091
3.7	0	836.599990	7.00	2091
3.7	10	836.599994	3.00	2091
3.7	20	836.599997	0.00	2091
3.7	30	836.599996	1.00	2091
3.7	40	836.599991	6.00	2091
3.7	50	836.599990	7.00	2091

Reference Frequency: GPRS 1900 Mid Channel 1880 MHz @ 20				
Limit: +/- 2.5 ppm = 4700 Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature ( )	(MHz)		
3.7	-30	1879.999995	-5.00	4700
3.7	-20	1879.999997	-7.00	4700
3.7	-10	1879.999996	-6.00	4700
3.7	0	1879.999995	-5.00	4700
3.7	10	1879.999991	-1.00	4700
3.7	20	1879.999990	0.00	4700
3.7	30	1879.999995	-5.00	4700
3.7	40	1879.999993	-3.00	4700
3.7	50	1879.999996	-6.00	4700

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## 12. FREQUENCY STABILITY V.S. VOLTAGE MEASUREMENT

### 12.1. Standard Applicable:

According to FCC §2.1055(a) (1)

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

+/-2.5ppm for 1900MHz band

According to RSS-133 §6.3, RSS-132 §4.3

The carrier frequency shall not depart from the reference frequency in excess of  $\pm 2.5$  ppm for mobile stations.

### 12.2. Test Set-up:

Refer to section 11.2 in this report

### 12.3. Measurement Procedure:

Set chamber temperature to 25 . 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.

### 12.4. Measurement Equipment Used:

Refer to section 2.4 in this report

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**12.5. Measurement Result:**

Reference Frequency: GPRS 850 Mid Channel 836.6 MHz				
Limit: +/- 2.5 ppm = 2091 Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature ( )	(MHz)		
4.2	25.00	836.599993	-8.00	2091.00
3.7	25.00	836.599985	0.00	2091.00
3.3	25.00	836.599990	-5.00	2091.00
2.8 (End Point)	25.00	836.599976	9.00	2091.00

Reference Frequency: GPRS 1900 Mid Channel 1880 MHz				
Limit: +/- 2.5 ppm = 4700 Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature ( )	(MHz)		
4.2	25.00	1879.999993	-3.00	4700
3.7	25.00	1879.99999	0.00	4700
3.3	25.00	1879.999985	5.00	4700
2.8 (End Point)	25.00	1879.999996	-6.00	4700

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## APPENDIX 1

# MEASUREMENT PLOT OF RADIATED SPURIOUS EMISSION

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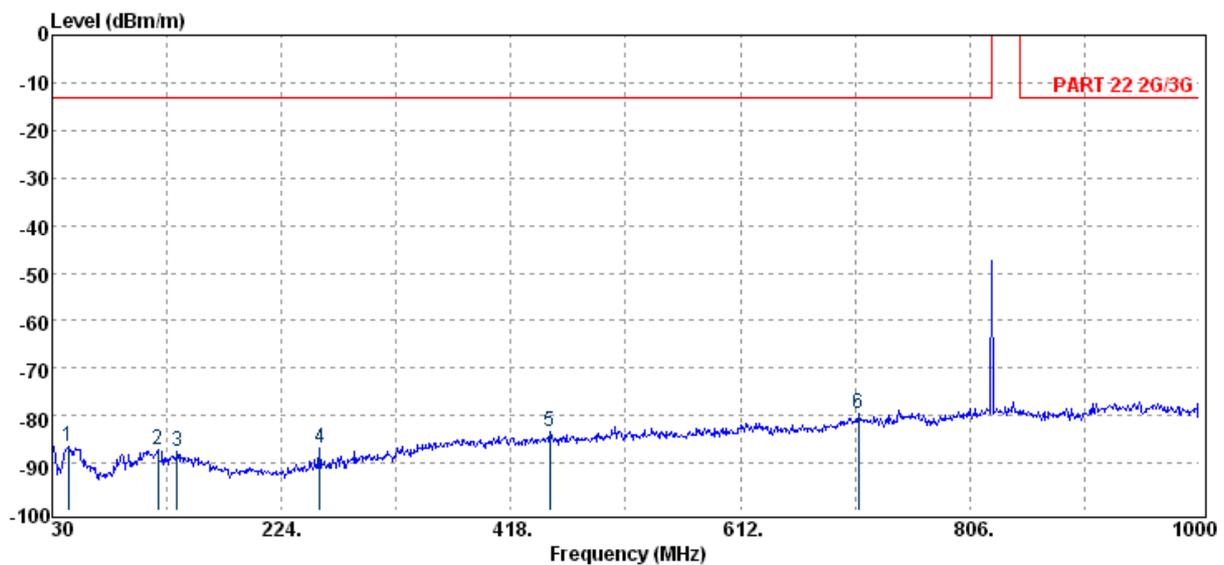
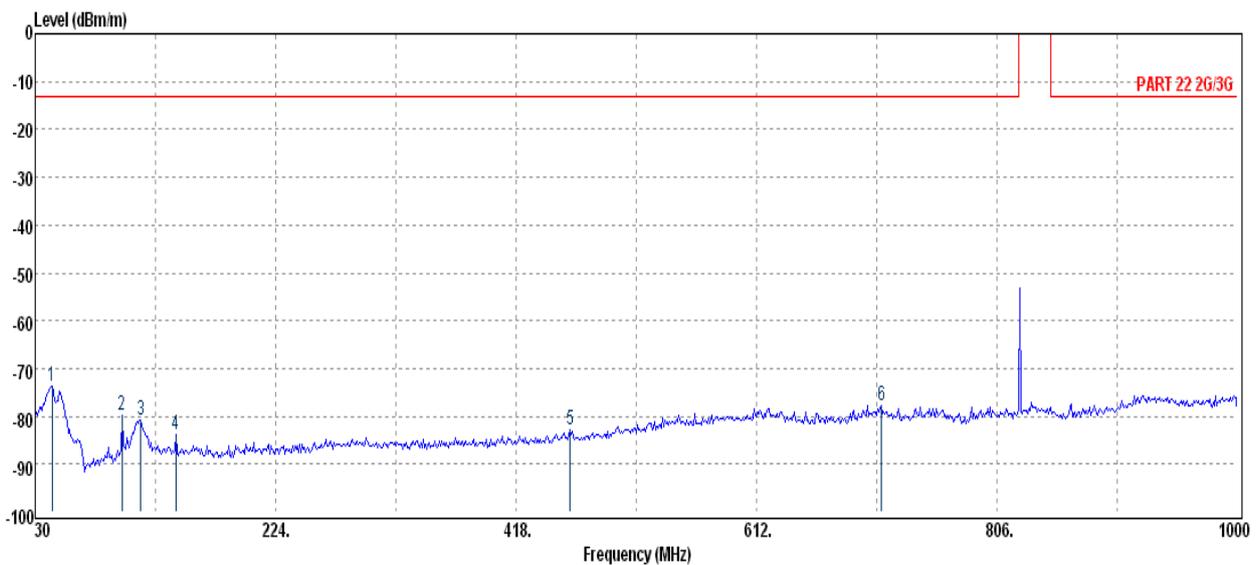
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Operation Band :GPRS 850  
 ARFCN :CH 128  
 Fundamental Frequency :824.2 MHz  
 Operation Mode :TX LOW  
 EUT Pol. :H Plan

Test Date :2012-06-29  
 Temp./Humi. :23 deg\_C / 52 RH  
 Engineer :Jimmy

Measurement Antenna Pol. :Ver. / Hor.



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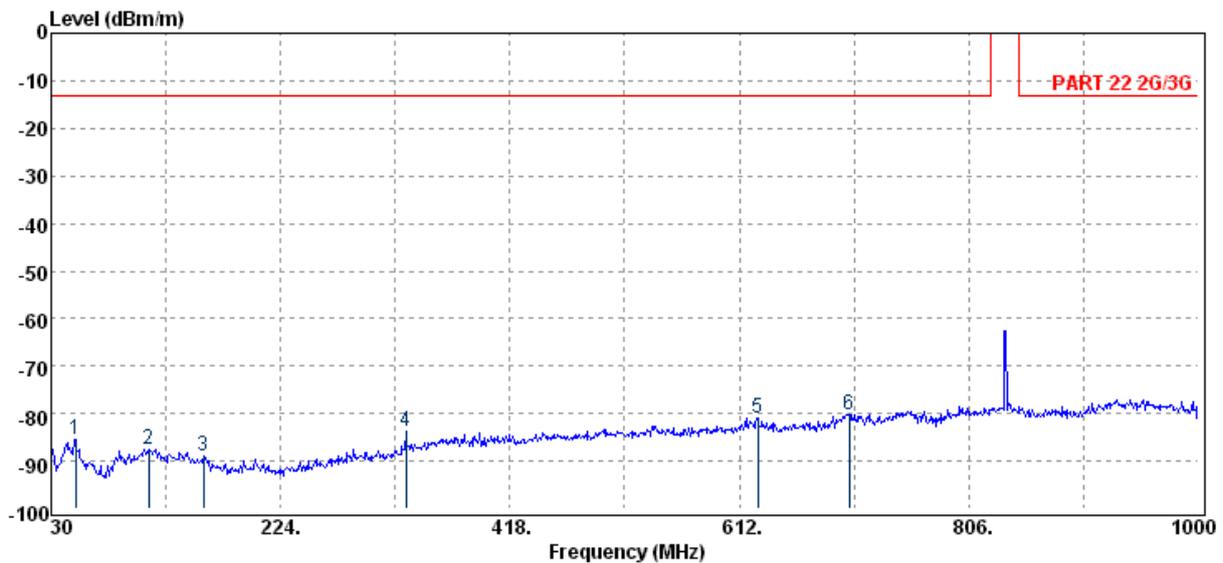
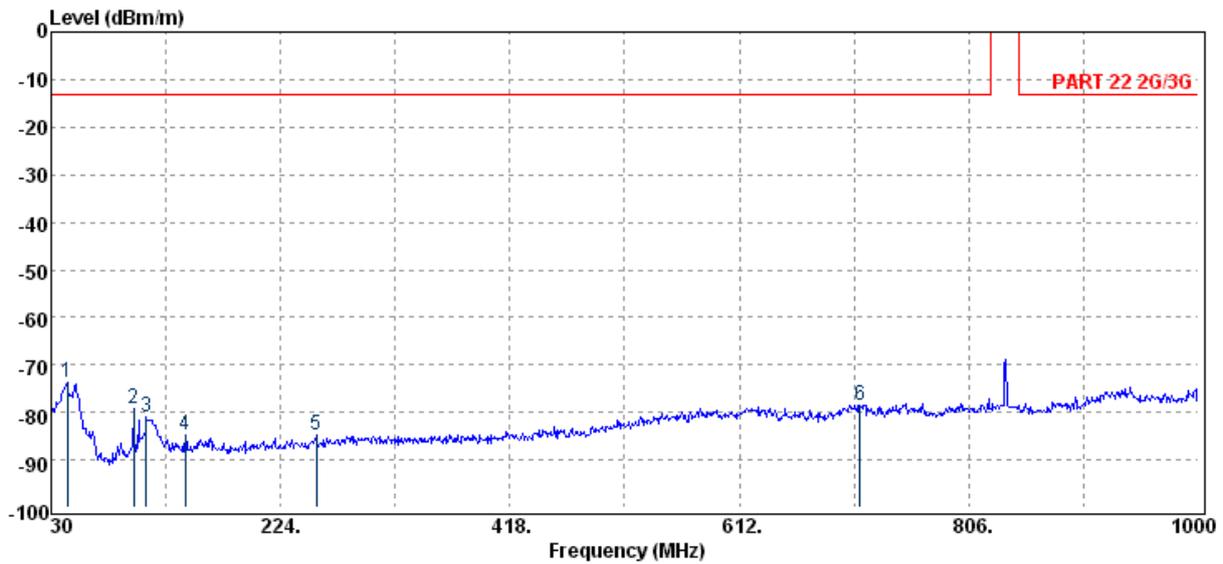
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Operation Band :GPRS 850  
 ARFCN :CH 190  
 Fundamental Frequency :836.6 MHz  
 Operation Mode :TX MID  
 EUT Pol. :H Plan

Test Date :2012-06-29  
 Temp./Humi. :23 deg\_C / 52 RH  
 Engineer :Jimmy

Measurement Antenna Pol. :Ver. / Hor.



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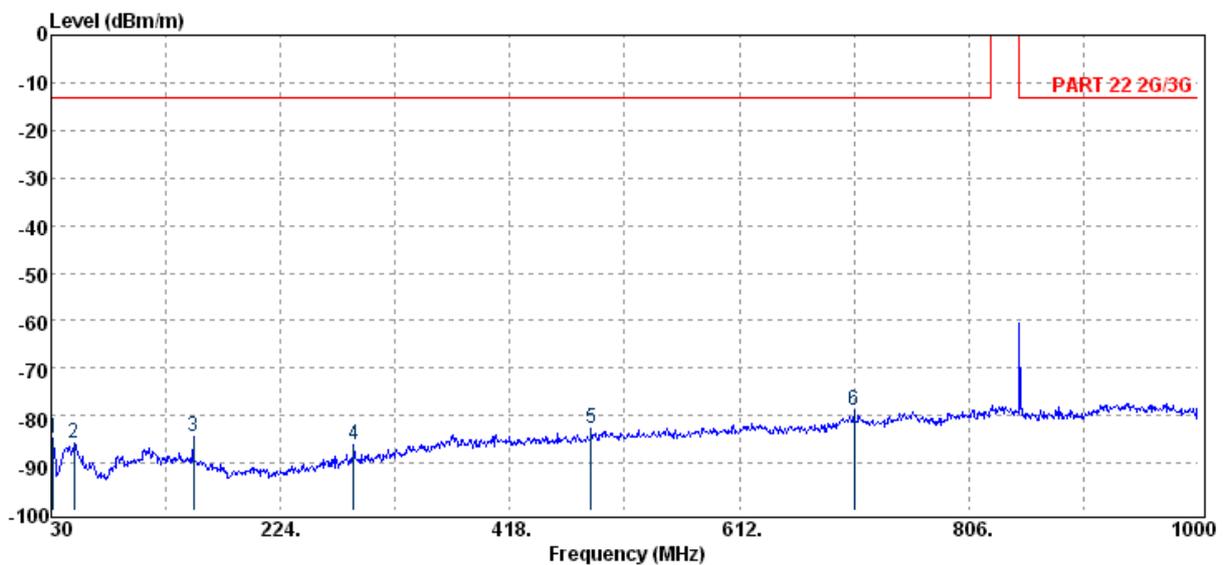
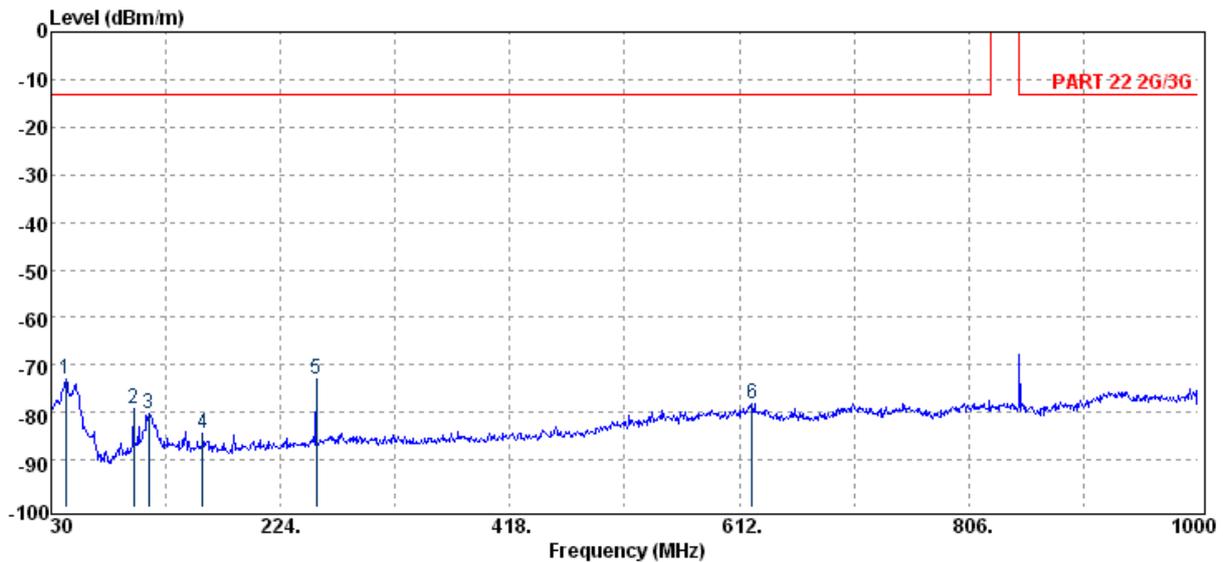
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Operation Band :GPRS 850  
 ARFCN :CH 251  
 Fundamental Frequency :848.8 MHz  
 Operation Mode :TX High  
 EUT Pol. :H Plan

Test Date :2012-06-29  
 Temp./Humi. :23 deg\_C / 52 RH  
 Engineer :Jimmy

Measurement Antenna Pol. :Ver. / Hor.



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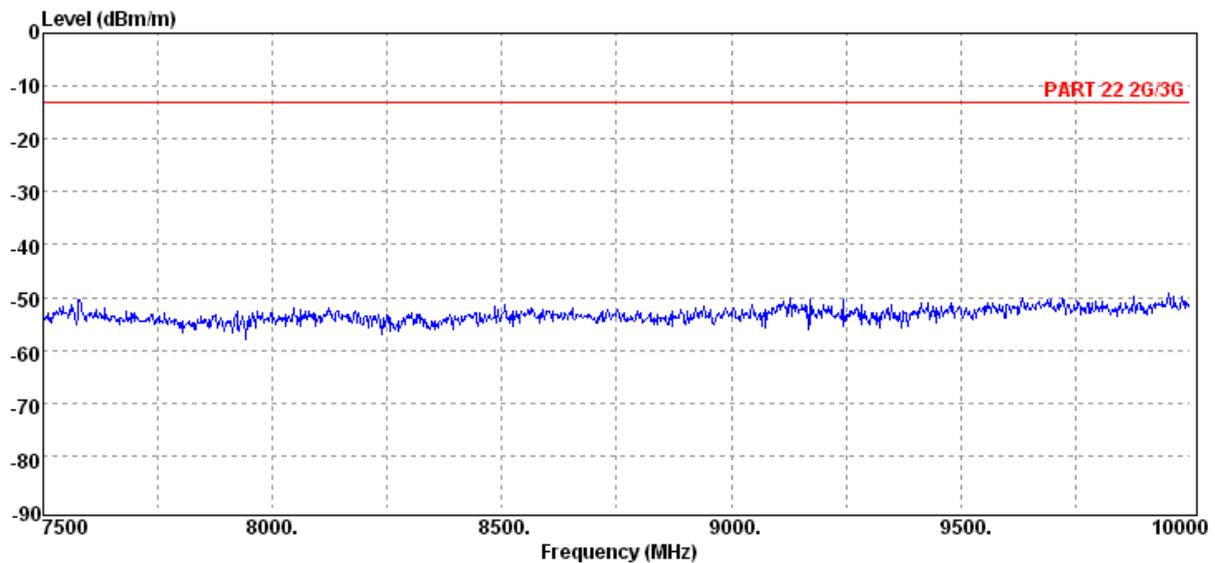
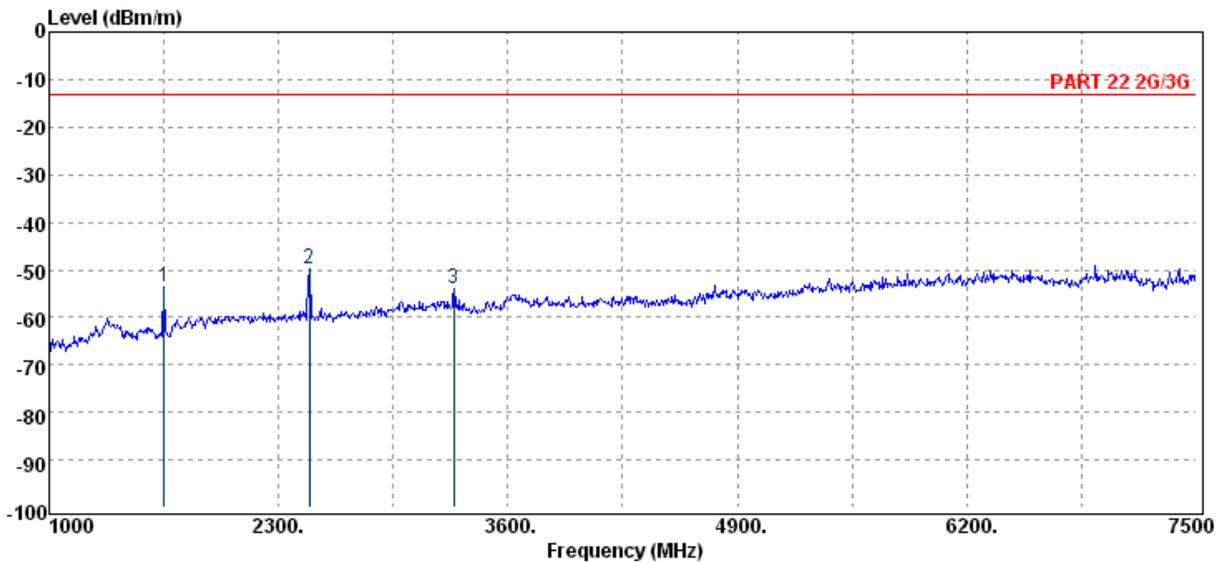
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Operation Band :GPRS 850  
 ARFCN :CH 128  
 Fundamental Frequency :824.2 MHz  
 Operation Mode :TX LOW  
 EUT Pol. :H Plan

Test Date :2012-06-29  
 Temp./Humi. :23 deg\_C / 52 RH  
 Engineer :Jimmy

Measurement Antenna Pol. :VERTICAL



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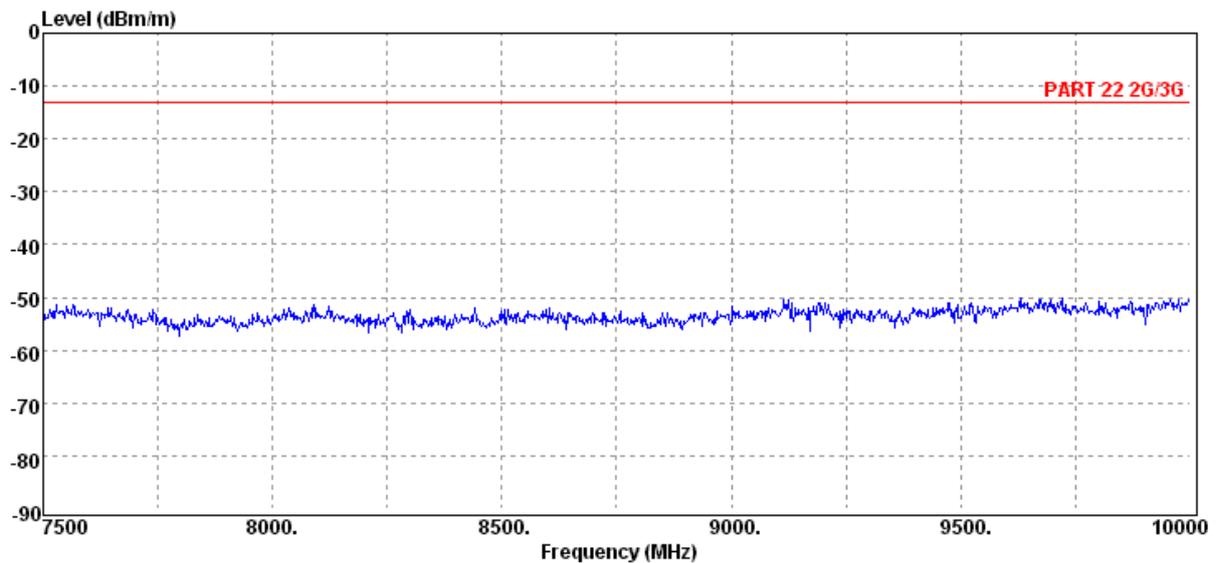
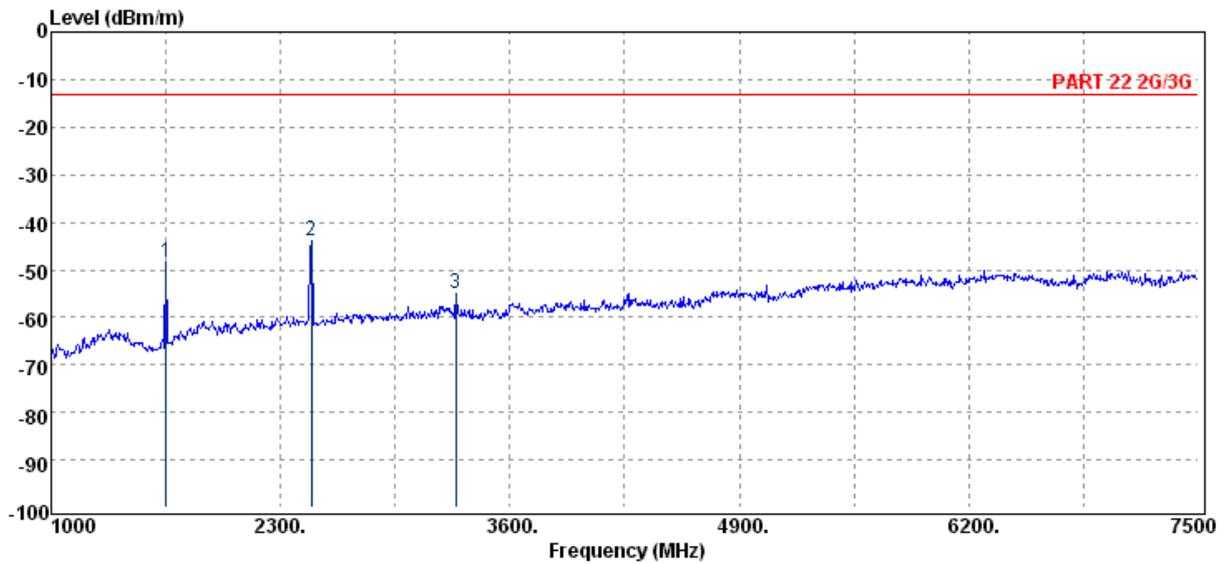
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Operation Band :GPRS 850  
 ARFCN :CH 128  
 Fundamental Frequency :824.2 MHz  
 Operation Mode :TX LOW  
 EUT Pol. :H Plan

Test Date :2012-06-29  
 Temp./Humi. :23 deg\_C / 52 RH  
 Engineer :Jimmy

Measurement Antenna Pol. :HORIZONTAL



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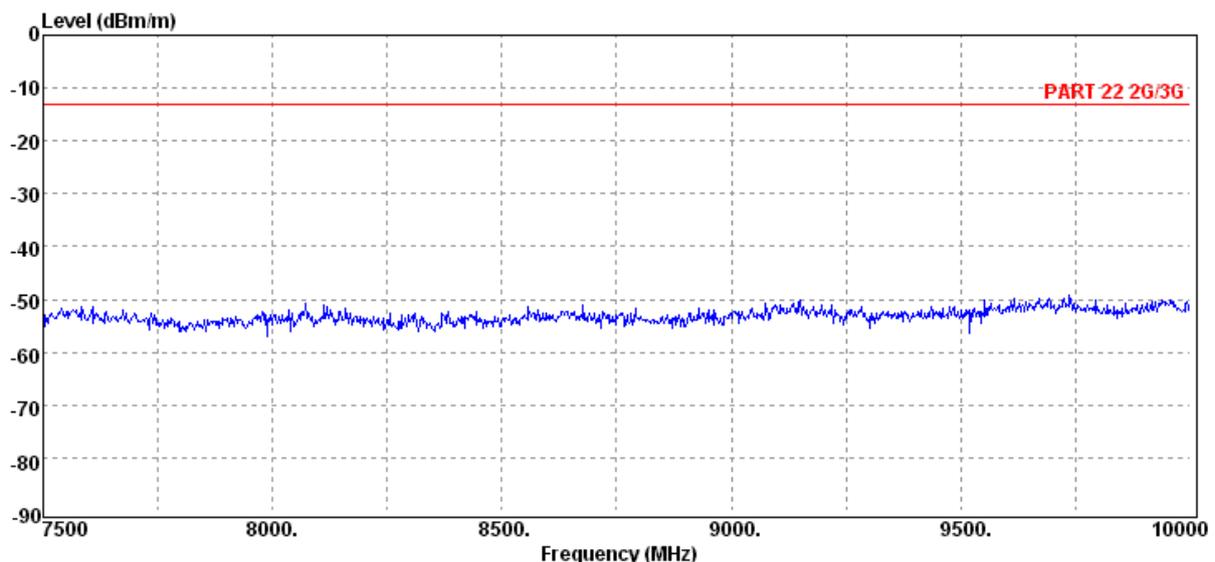
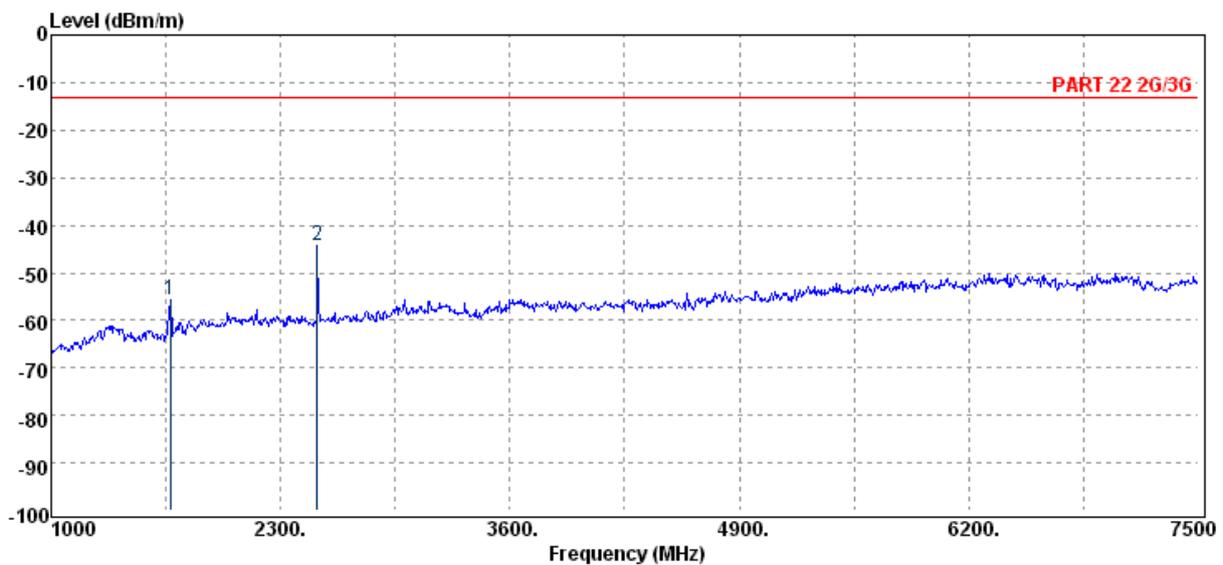
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Operation Band :GPRS 850  
 ARFCN :CH 190  
 Fundamental Frequency :836.6 MHz  
 Operation Mode :TX MID  
 EUT Pol. :H Plan

Test Date :2012-06-29  
 Temp./Humi. :23 deg\_C / 52 RH  
 Engineer :Jimmy

Measurement Antenna Pol. :VERTICAL



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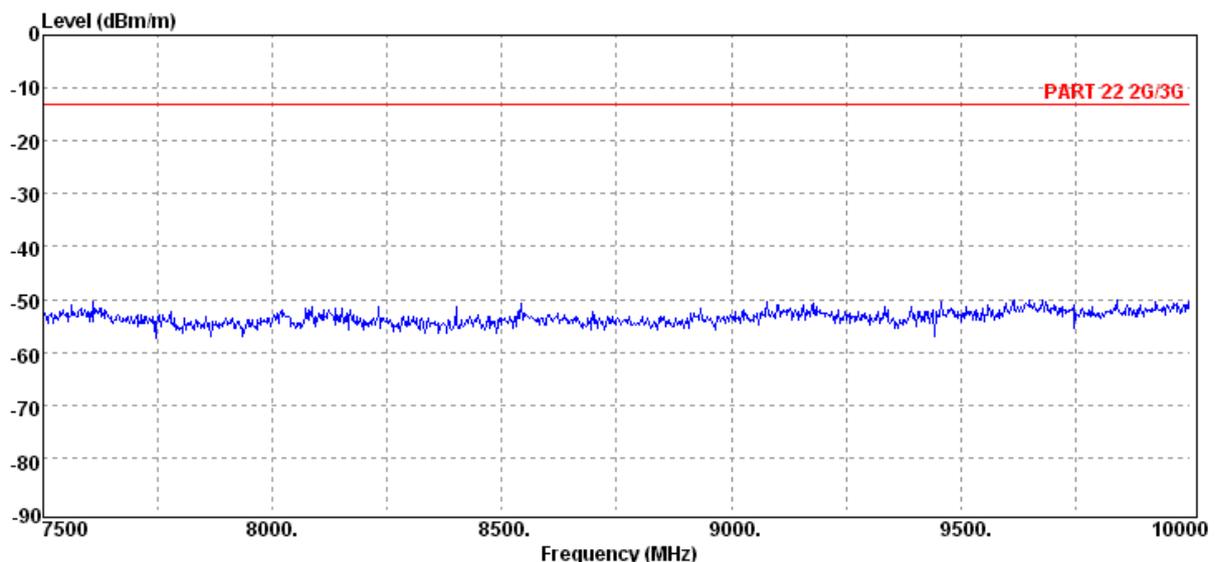
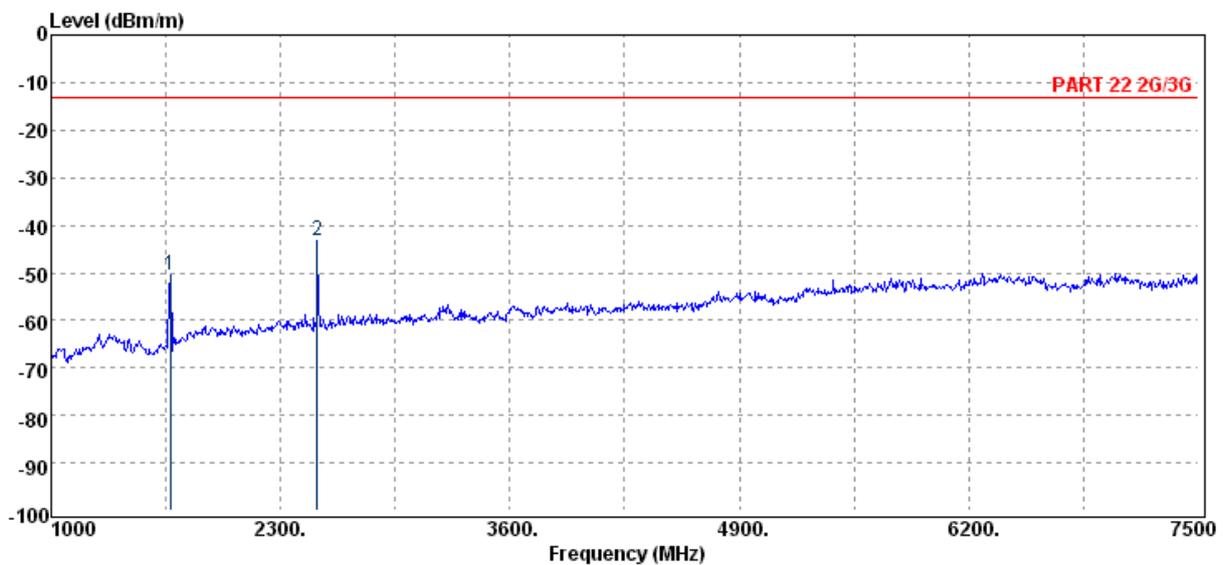
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Operation Band :GPRS 850  
 ARFCN :CH 190  
 Fundamental Frequency :836.6 MHz  
 Operation Mode :TX MID  
 EUT Pol. :H Plan

Test Date :2012-06-29  
 Temp./Humi. :23 deg\_C / 52 RH  
 Engineer :Jimmy

Measurement Antenna Pol. :HORIZONTAL



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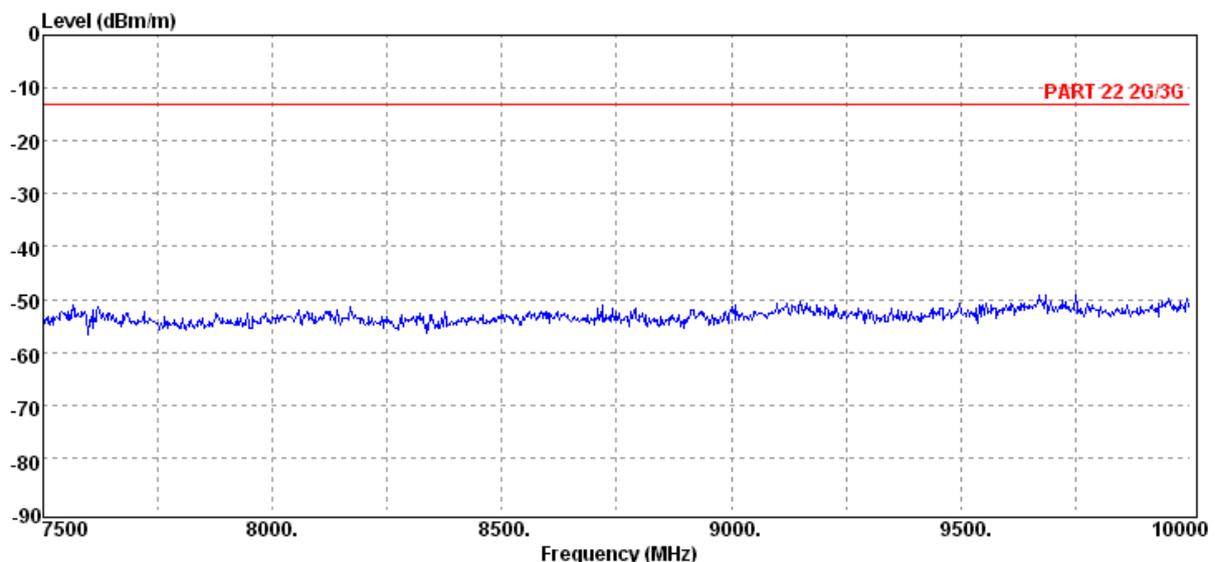
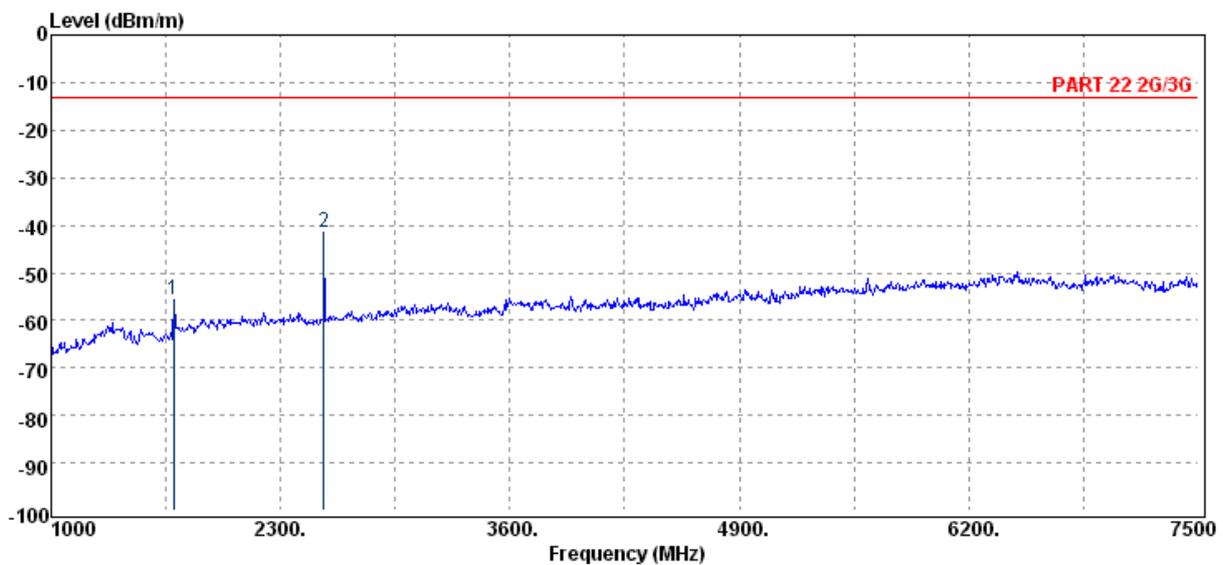
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Operation Band :GPRS 850  
 ARFCN :CH 251  
 Fundamental Frequency :848.8 MHz  
 Operation Mode :TX HIGH  
 EUT Pol. :H Plan

Test Date :2012-06-29  
 Temp./Humi. :23 deg\_C / 52 RH  
 Engineer :Jimmy

Measurement Antenna Pol. :VERTICAL



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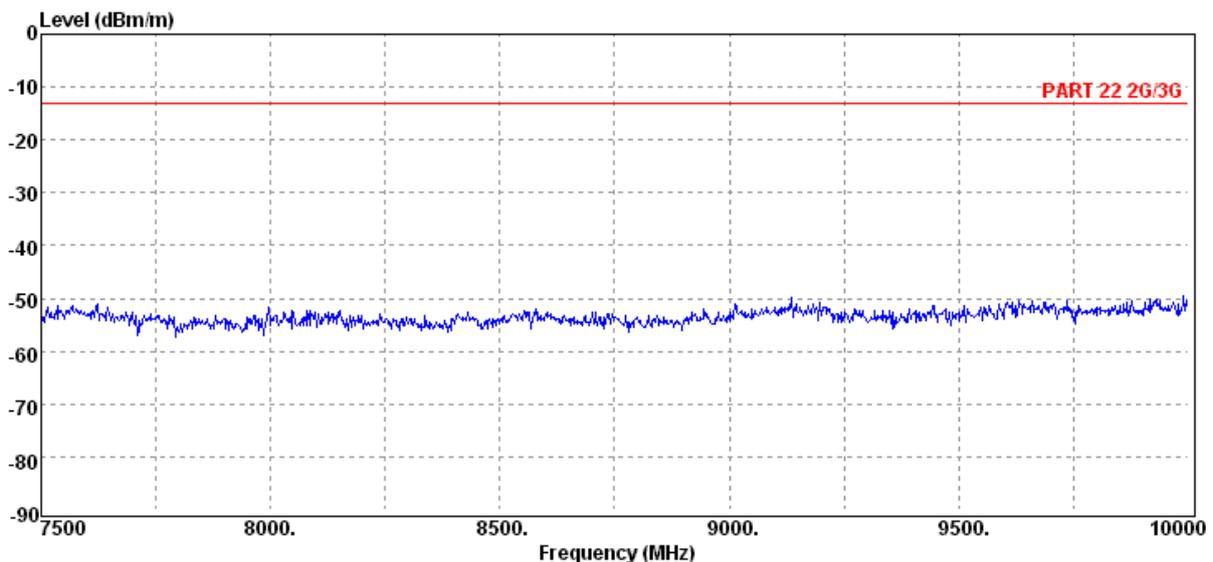
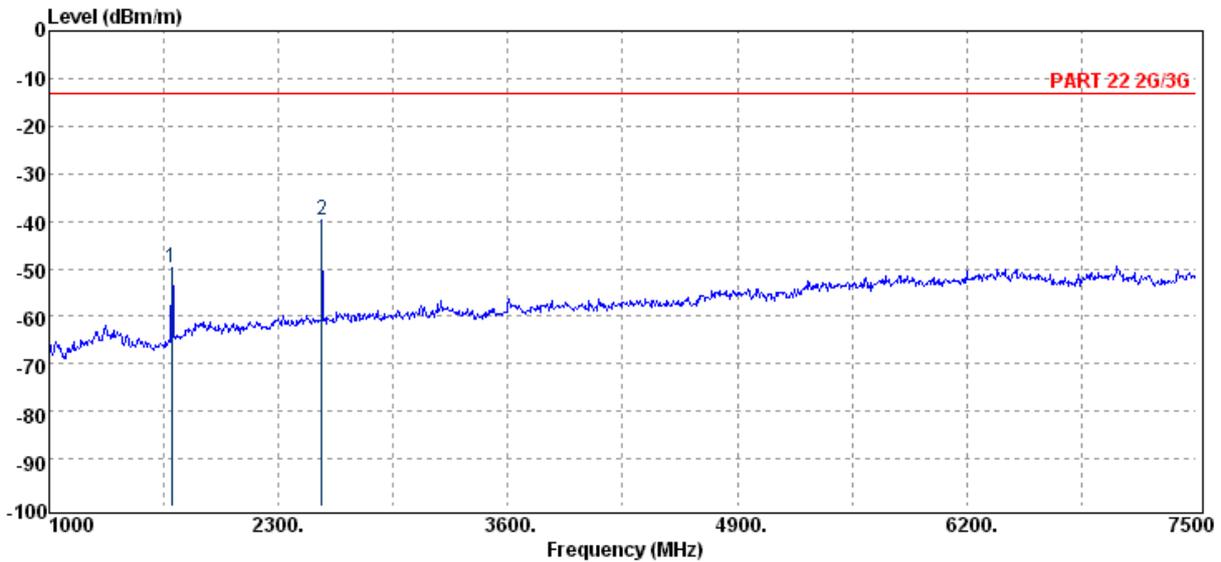
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Operation Band :GPRS 850  
 ARFCN :CH 251  
 Fundamental Frequency :848.8 MHz  
 Operation Mode :TX HIGH  
 EUT Pol. :H Plan

Test Date :2012-06-29  
 Temp./Humi. :23 deg\_C / 52 RH  
 Engineer :Jimmy

Measurement Antenna Pol. :HORIZONTAL



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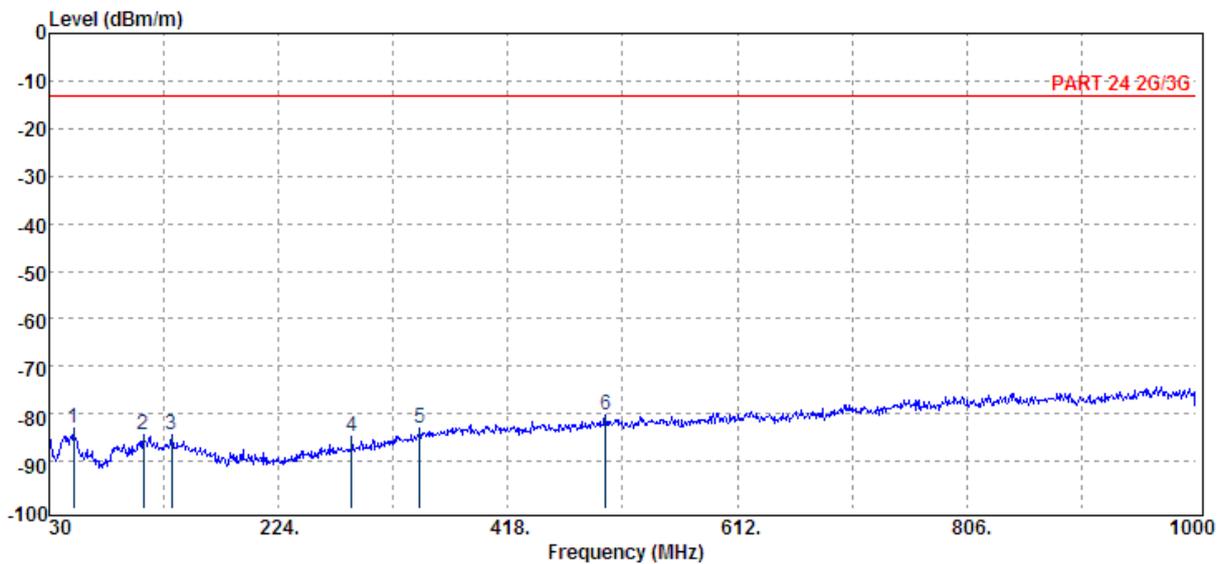
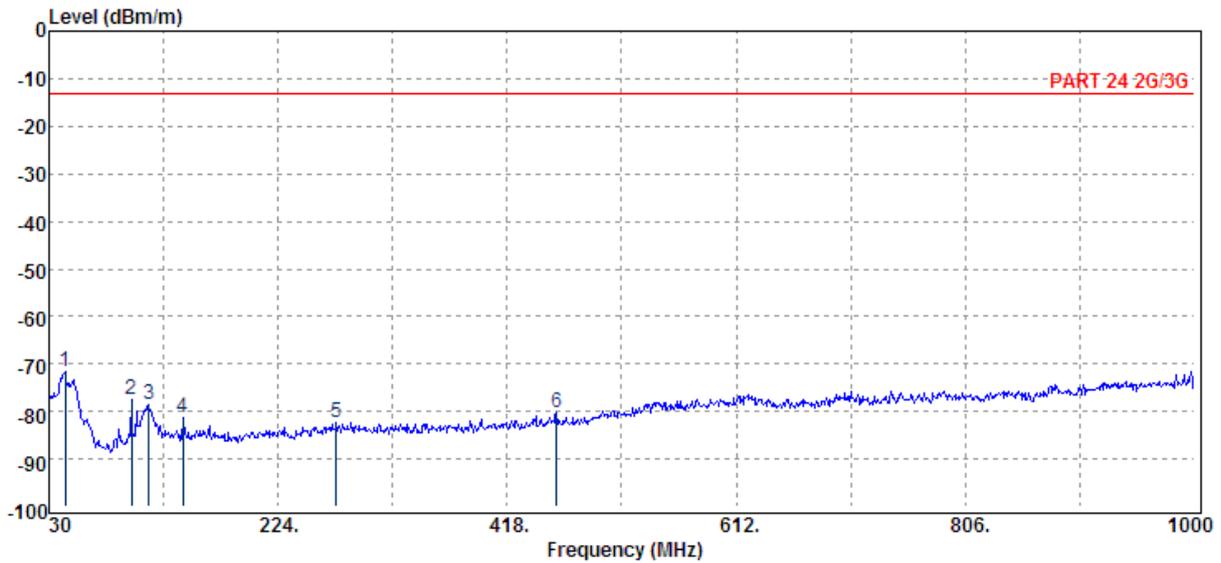
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Operation Band :EDGE 1900  
 ARFCN :CH 512  
 Fundamental Frequency :1850.2 MHz  
 Operation Mode :TX LOW  
 EUT Pol. :E1 Plan

Test Date :2012-06-29  
 Temp./Humi. :23 deg\_C / 52 RH  
 Engineer :Jimmy

Measurement Antenna Pol. :Ver. / Hor.



Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

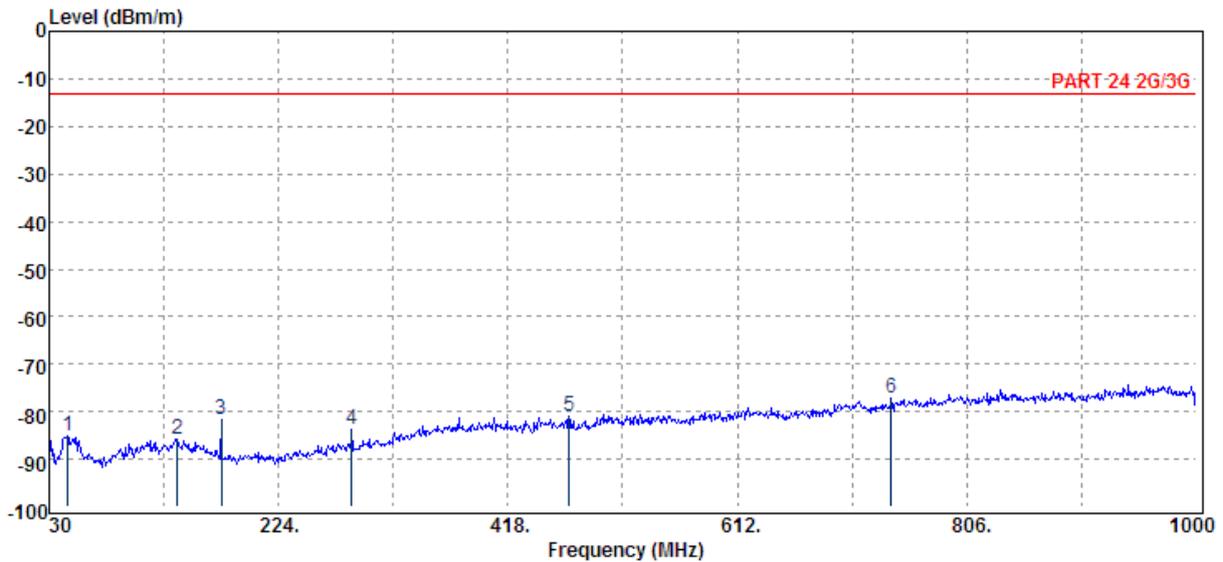
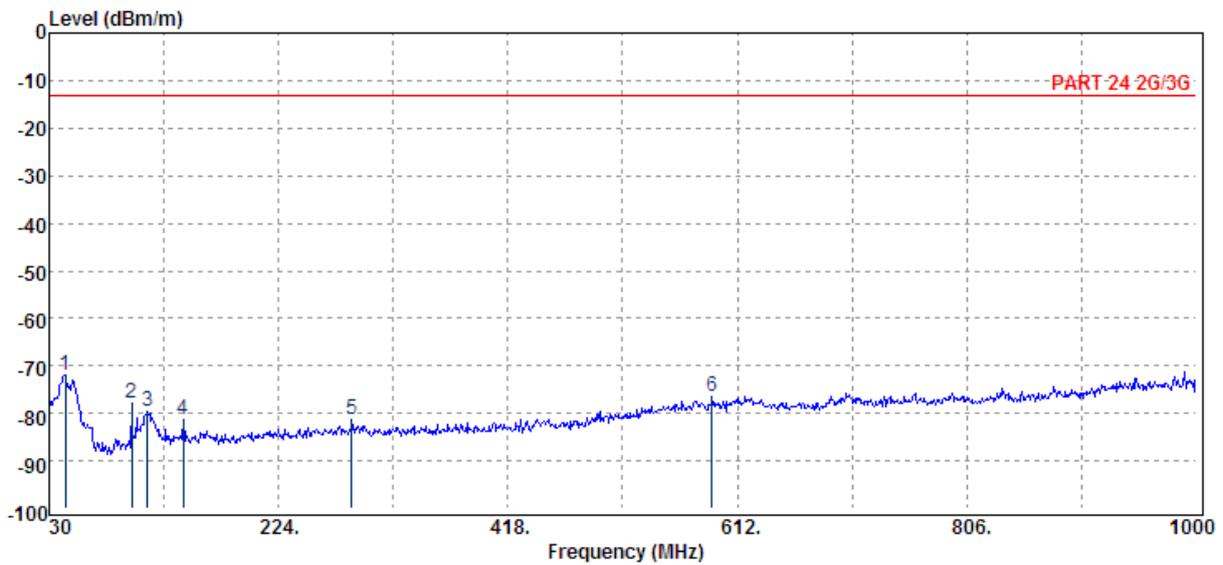
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Operation Band :EDGE 1900  
 ARFCN :CH 661  
 Fundamental Frequency :1880.0 MHz  
 Operation Mode :TX MID  
 EUT Pol. :E1 Plan

Test Date :2012-06-29  
 Temp./Humi. :23 deg\_C / 52 RH  
 Engineer :Jimmy

Measurement Antenna Pol. :Ver. / Hor.



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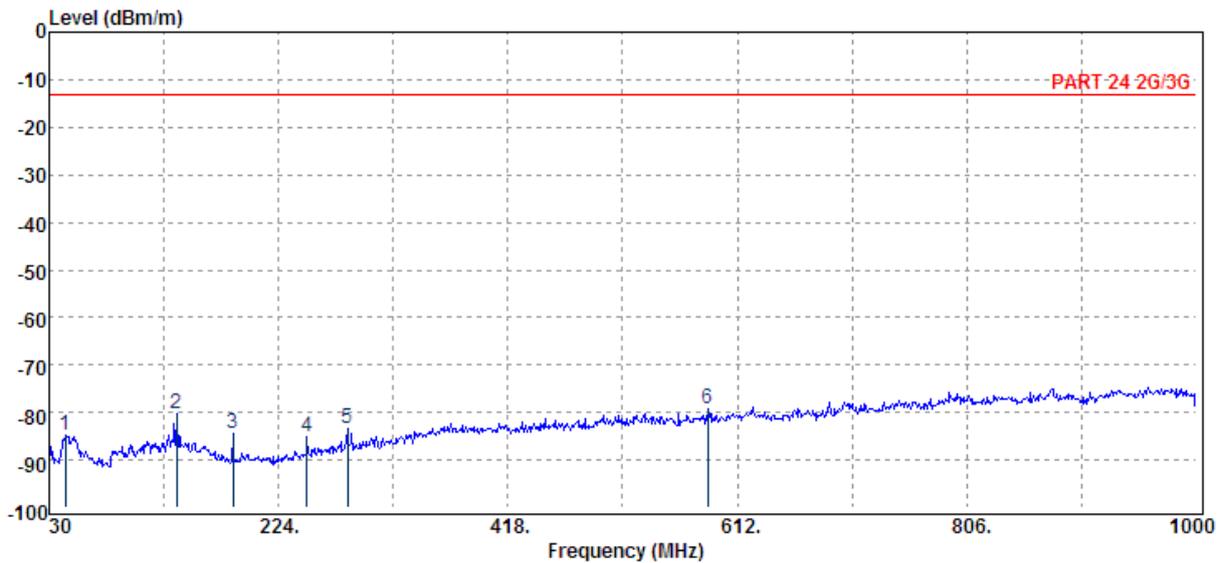
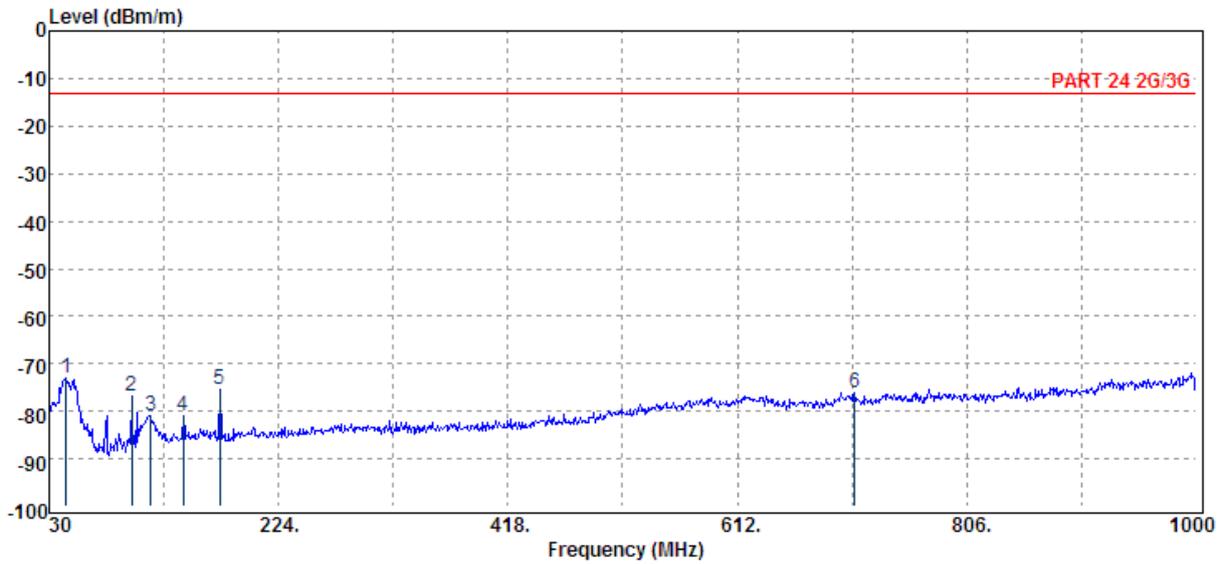
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Operation Band :EDGE 1900  
 ARFCN :CH 810  
 Fundamental Frequency :1909.8 MHz  
 Operation Mode :TX HIGH  
 EUT Pol. :E1 Plan

Test Date :2012-06-29  
 Temp./Humi. :23 deg\_C / 52 RH  
 Engineer :Jimmy

Measurement Antenna Pol. :Ver. / Hor.



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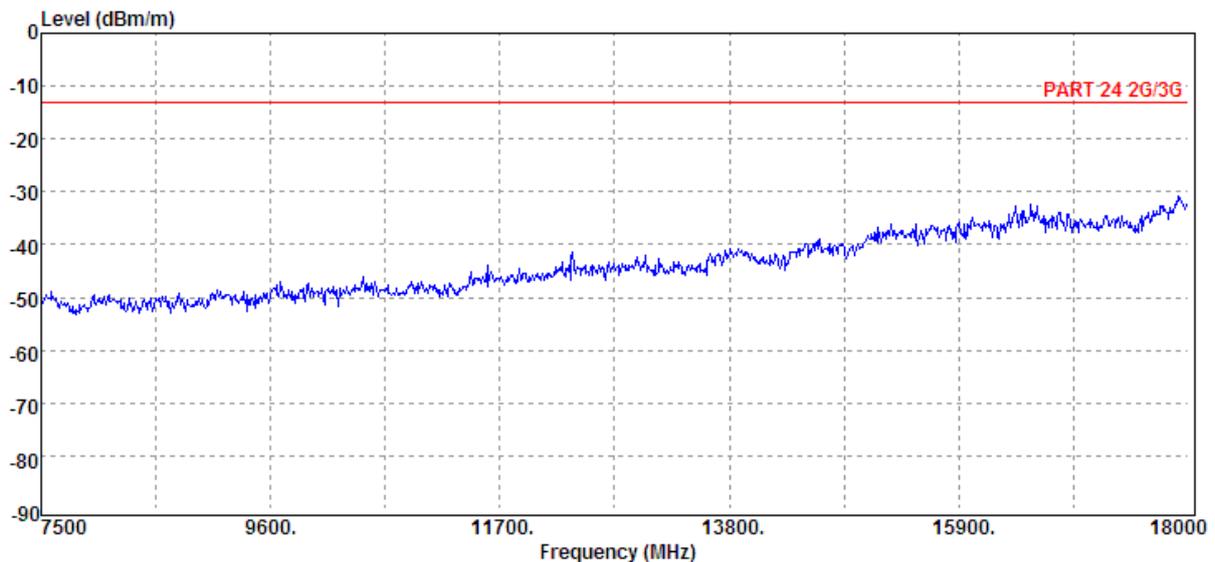
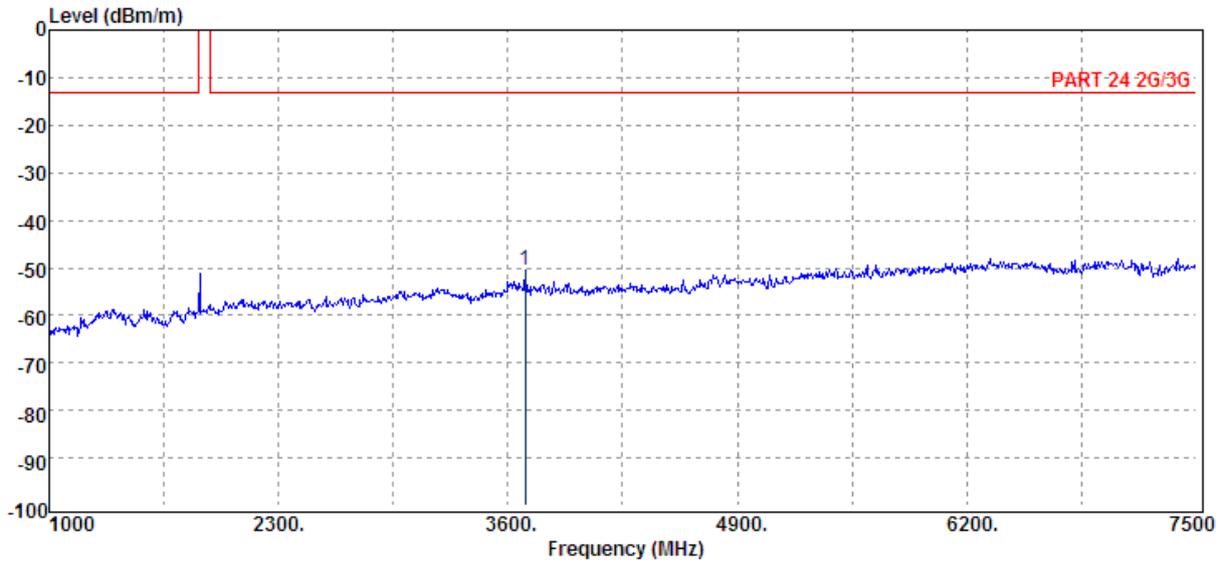
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Operation Band :EDGE 1900  
 ARFCN :CH 512  
 Fundamental Frequency :1850.2 MHz  
 Operation Mode :TX LOW  
 EUT Pol. :E1 Plan

Test Date :2012-06-29  
 Temp./Humi. :23 deg\_C / 52 RH  
 Engineer :Jimmy

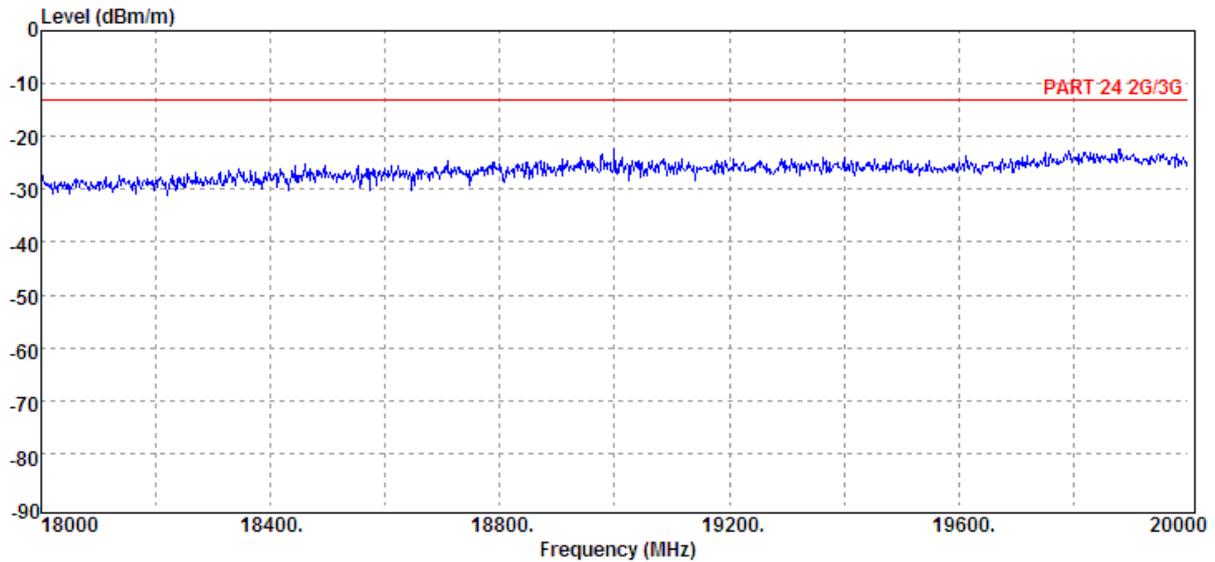
Measurement Antenna Pol. :VERTICAL



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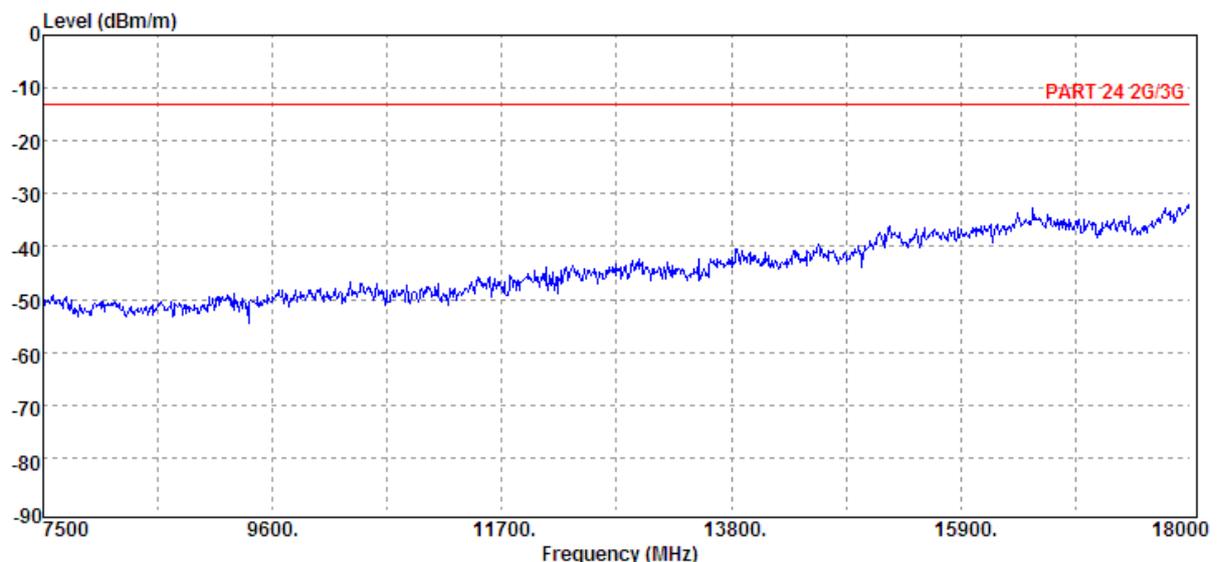
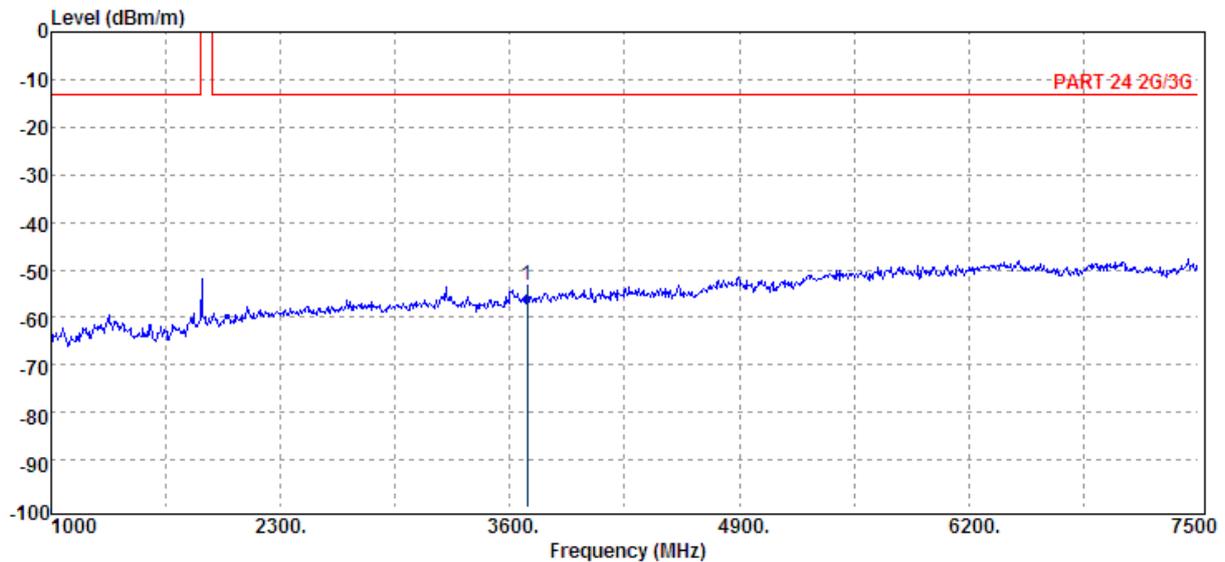
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Operation Band :EDGE 1900  
 ARFCN :CH 512  
 Fundamental Frequency :1850.2 MHz  
 Operation Mode :TX LOW  
 EUT Pol. :E1 Plan

Test Date :2012-06-29  
 Temp./Humi. :23 deg\_C / 52 RH  
 Engineer :Jimmy

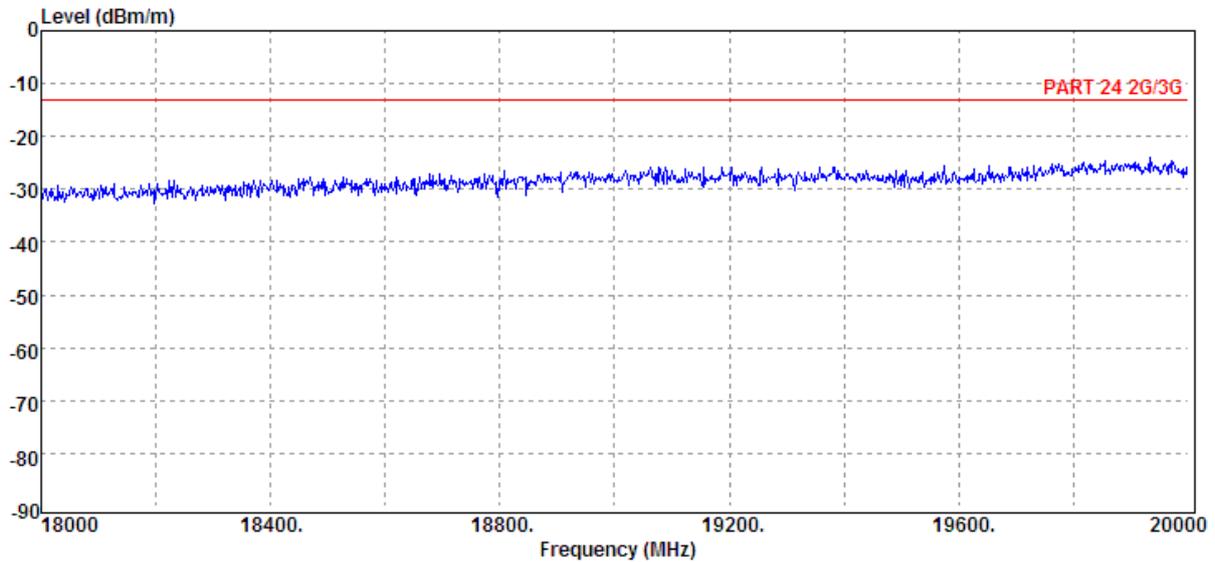
Measurement Antenna Pol. :HORIZONTAL



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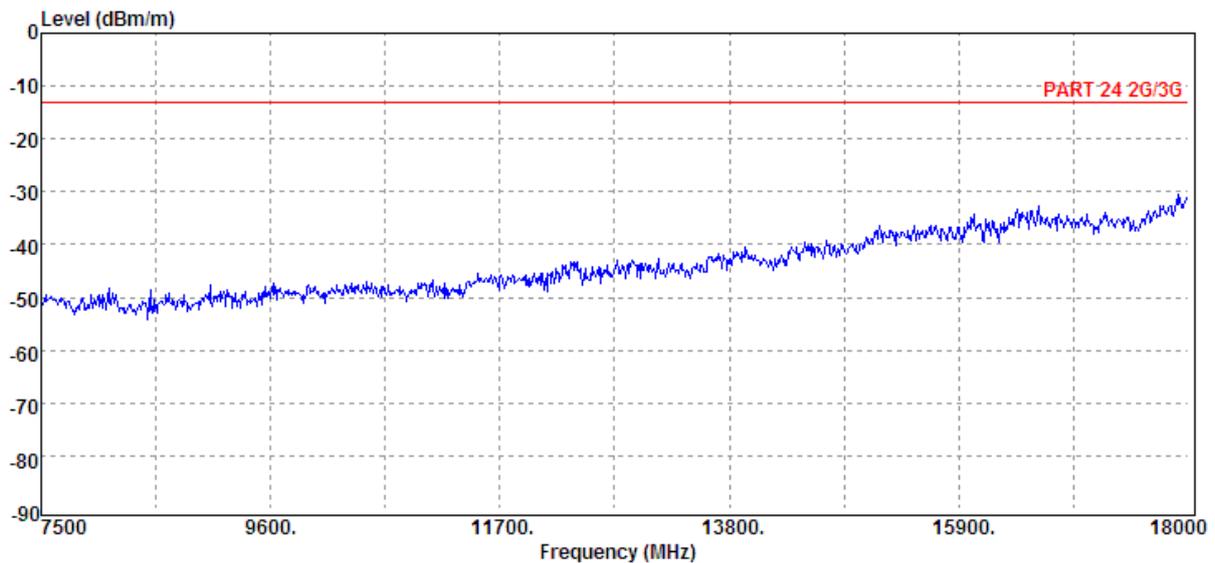
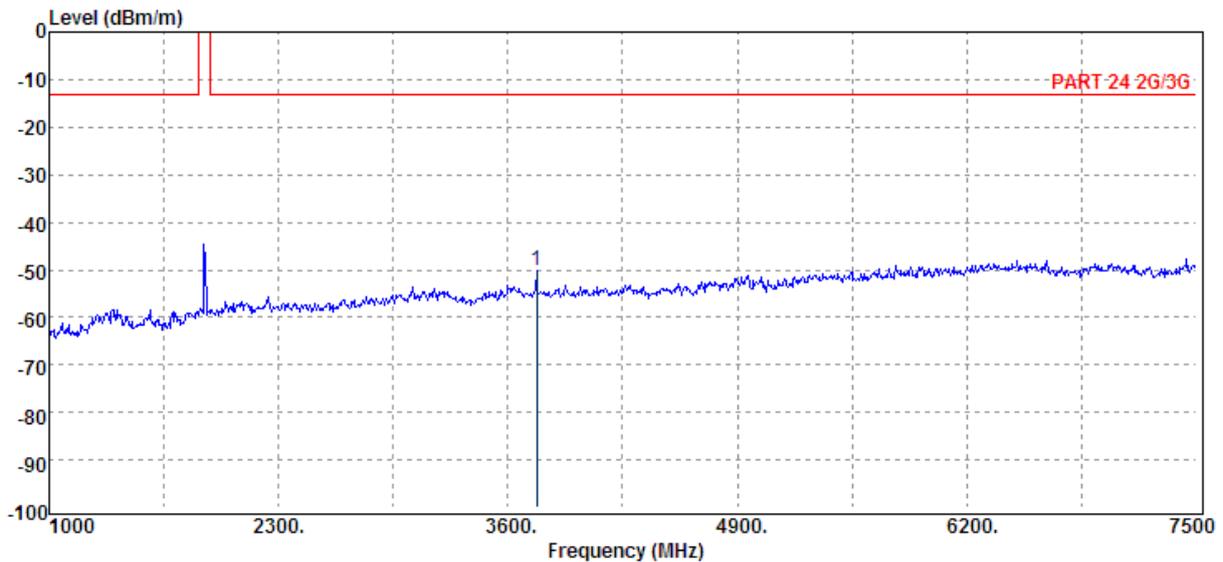
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Operation Band :EDGE 1900  
 ARFCN :CH 661  
 Fundamental Frequency :1880.0 MHz  
 Operation Mode :TX MID  
 EUT Pol. :E1 Plan

Test Date :2012-06-29  
 Temp./Humi. :23 deg\_C / 52 RH  
 Engineer :Jimmy

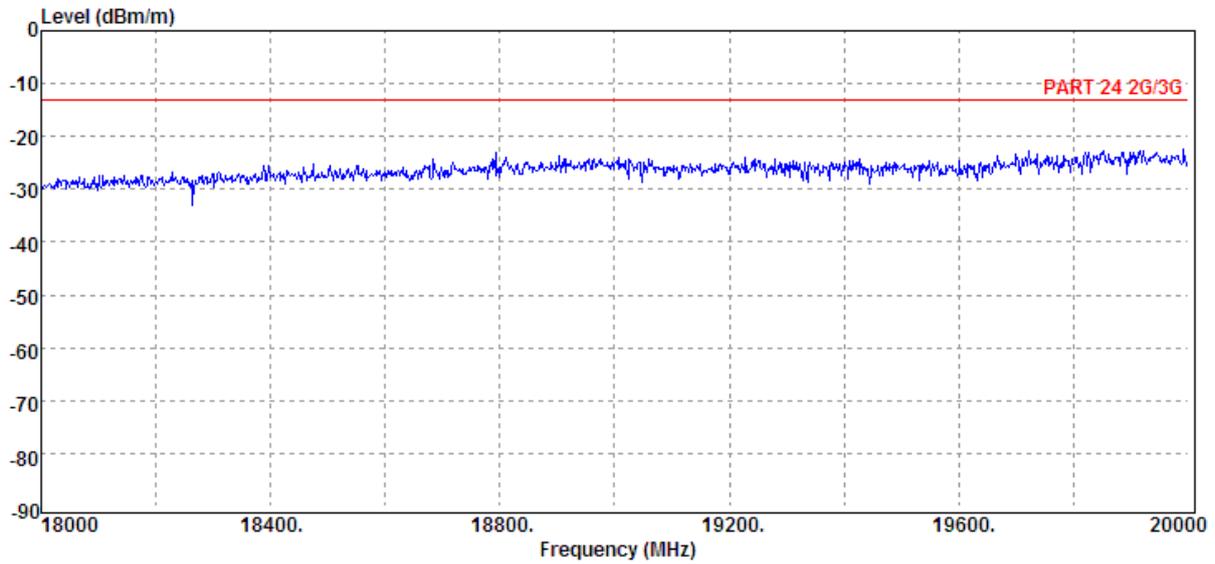
Measurement Antenna Pol. :VERTICAL



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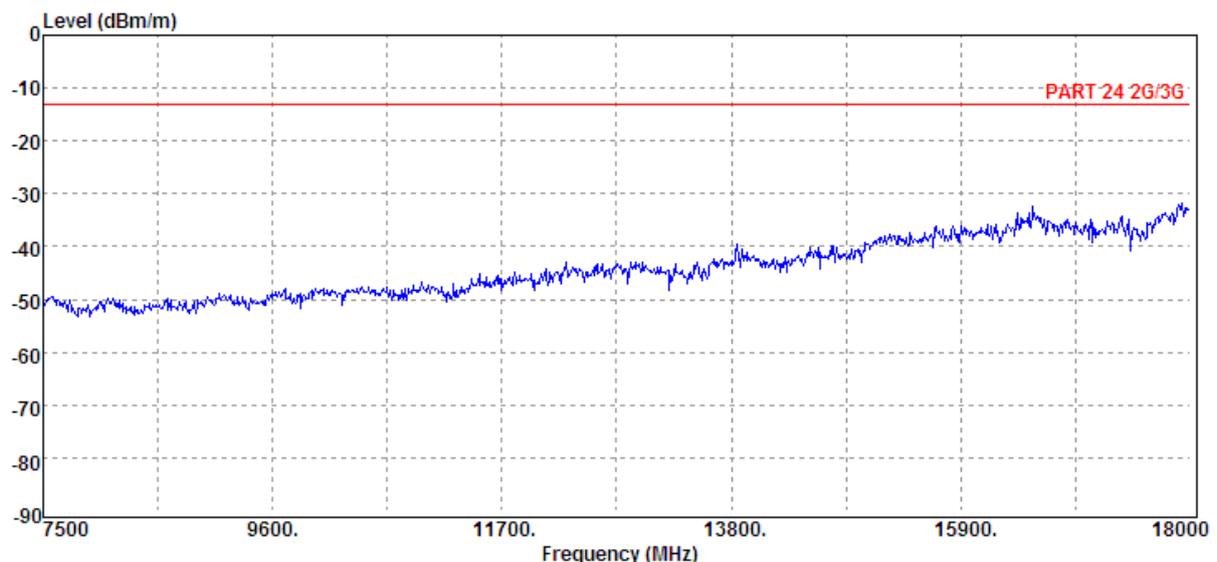
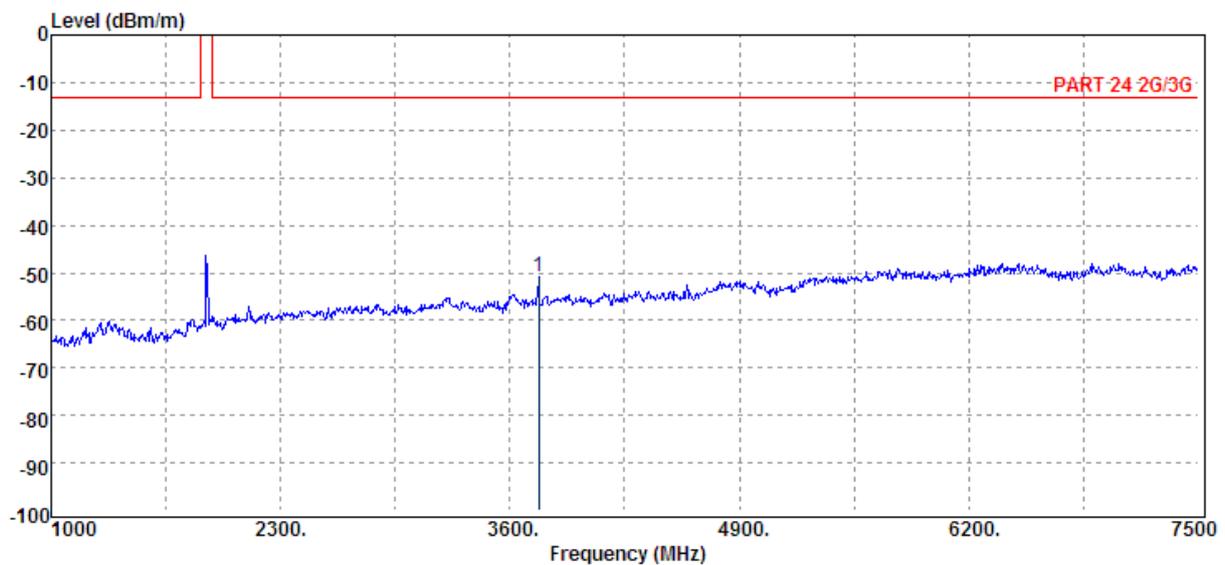
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Operation Band :EDGE 1900  
 ARFCN :CH 661  
 Fundamental Frequency :1880.0 MHz  
 Operation Mode :TX MID  
 EUT Pol. :E1 Plan

Test Date :2012-06-29  
 Temp./Humi. :23 deg\_C / 52 RH  
 Engineer :Jimmy

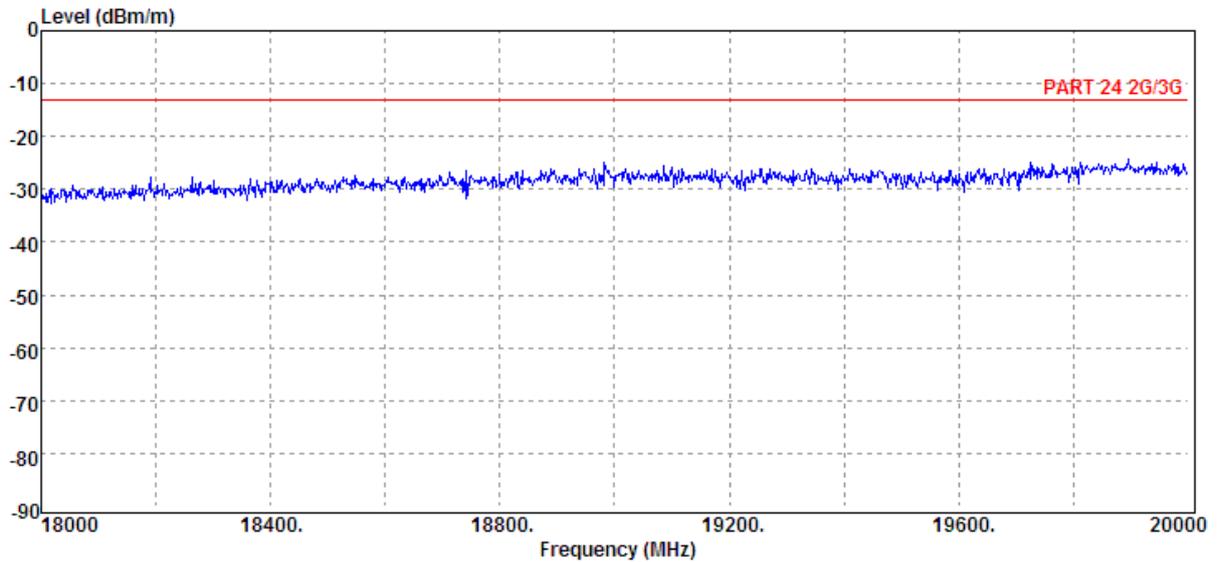
Measurement Antenna Pol. :HORIZONTAL



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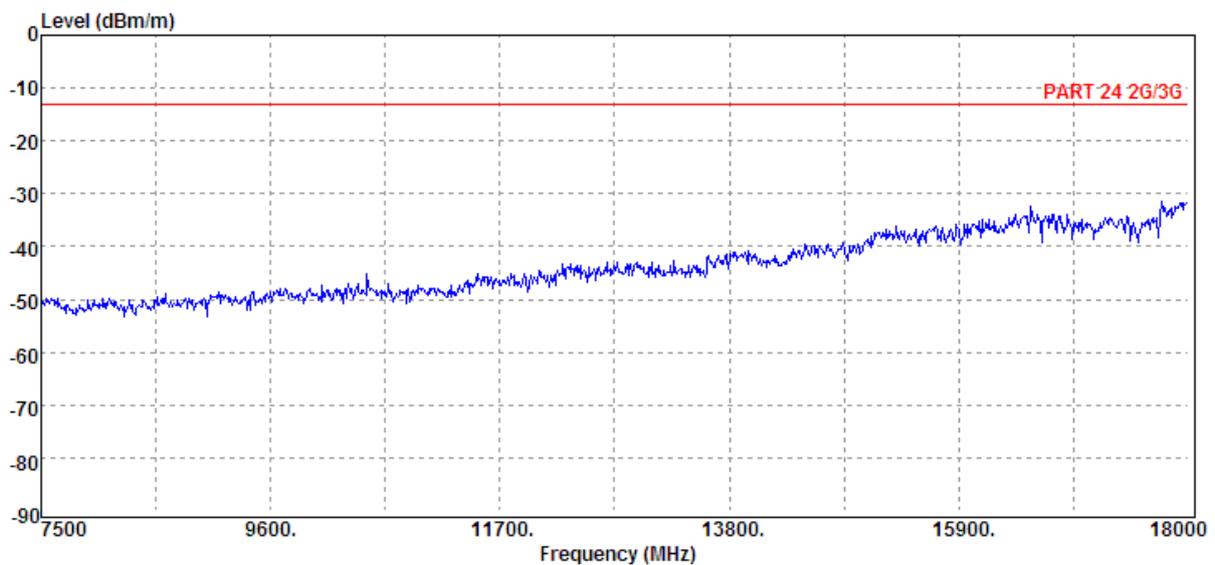
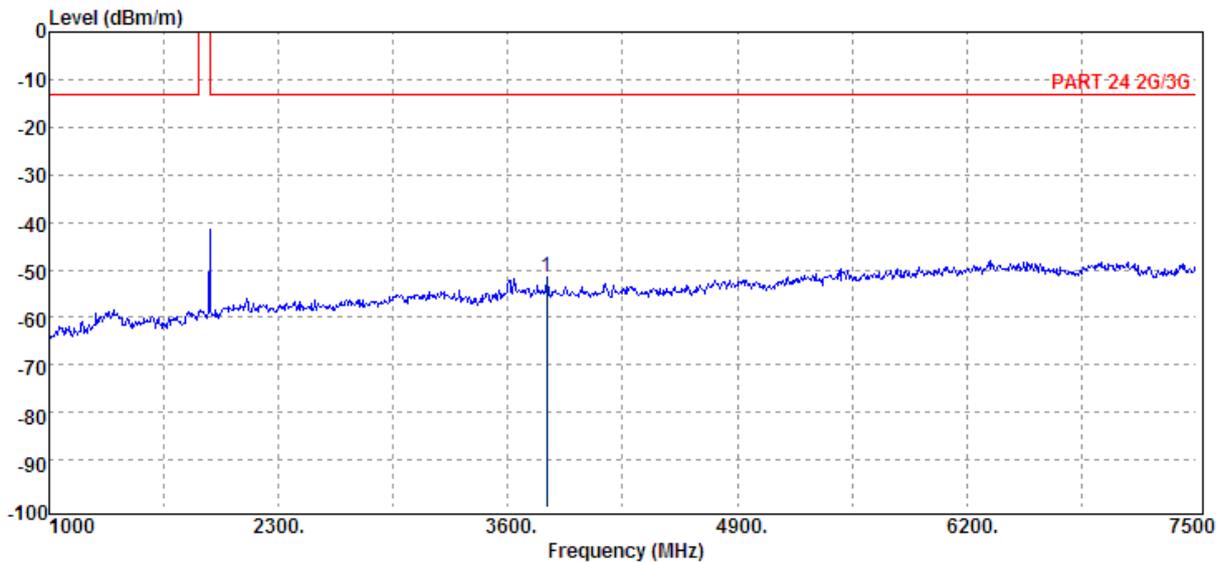
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Operation Band :EDGE 1900  
 ARFCN :CH 810  
 Fundamental Frequency :1909.8 MHz  
 Operation Mode :TX HIGH  
 EUT Pol. :E1 Plan

Test Date :2012-06-29  
 Temp./Humi. :23 deg\_C / 52 RH  
 Engineer :Jimmy

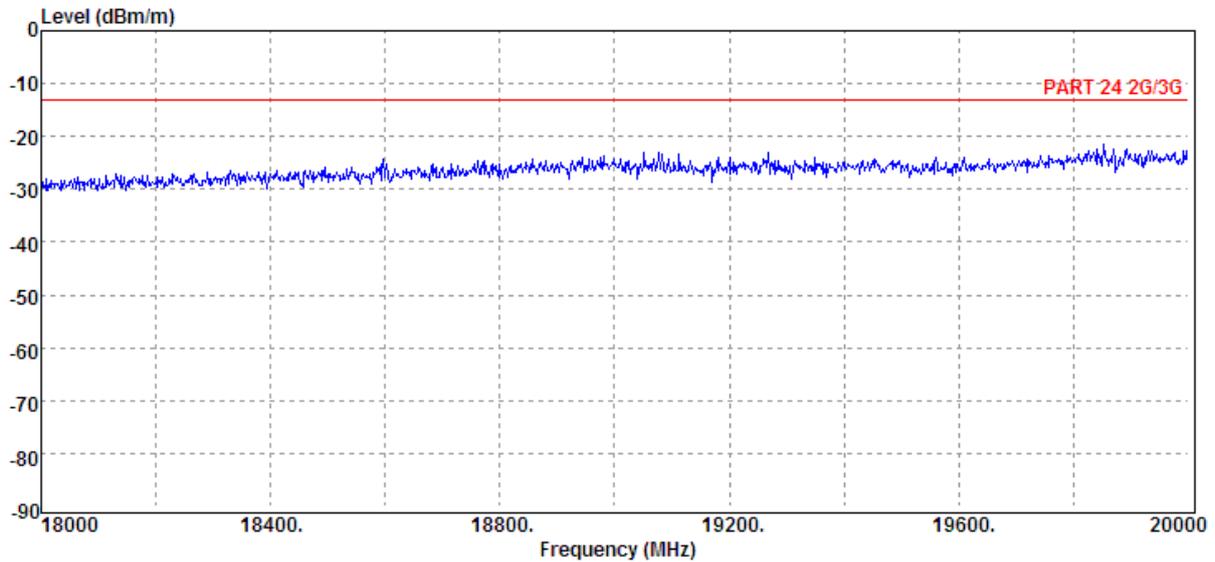
Measurement Antenna Pol. :VERTICAL



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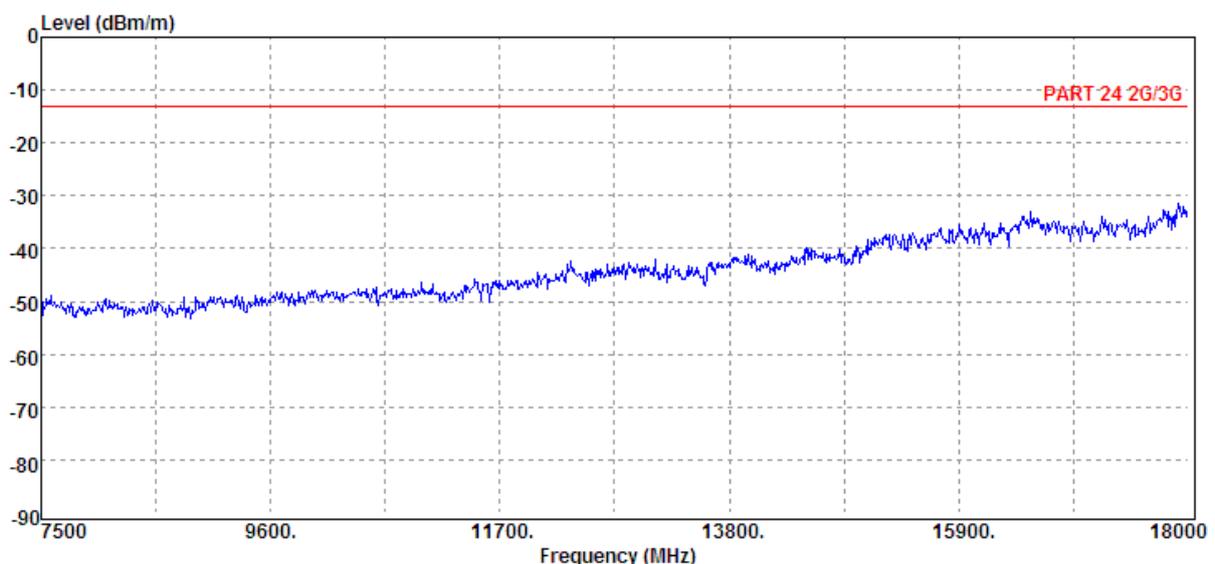
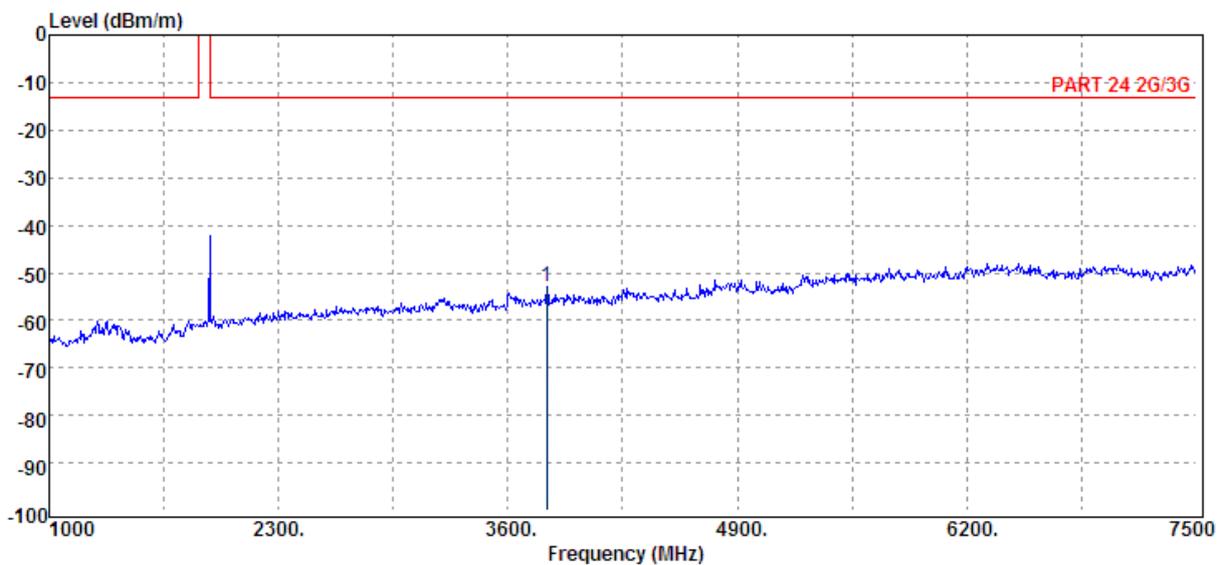
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Operation Band :EDGE 1900  
 ARFCN :CH 810  
 Fundamental Frequency :1909.8 MHz  
 Operation Mode :TX HIGH  
 EUT Pol. :E1 Plan

Test Date :2012-06-29  
 Temp./Humi. :23 deg\_C / 52 RH  
 Engineer :Jimmy

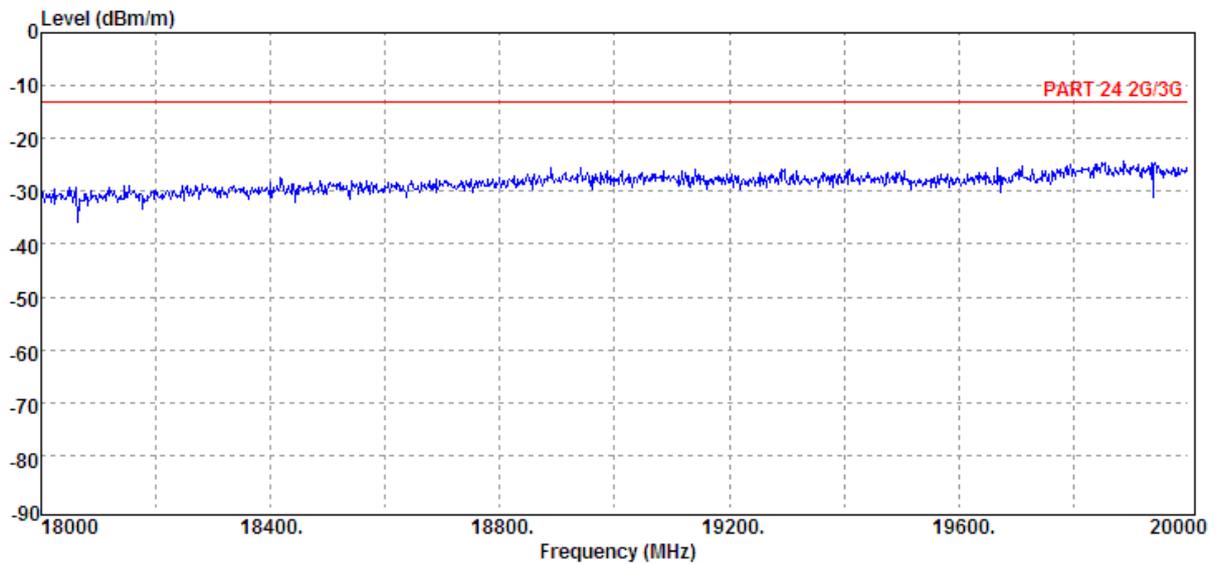
Measurement Antenna Pol. :HORIZONTAL



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