

FCC ID: Q2Q-H22-RFID

Report No.: EH/2010/B0045 Issue Date: Aug. 26, 2011 Page 1 of 140

# **ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT**

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

OF						
Product Name:	PDA Phone H-22					
Brand Name:	OPTICON					
Model No.:	H22-EU-QWERTY-1D-RFID(Configuration 1) H22-EU-QWERTY-2D-RFID(Configuration 2) H22-EU-NUM-1D-RFID(Configuration 5) H22-EU-NUM-2D-RFID(Configuration 6)					
Model Differences:	Please see page 8					
FCC ID:	Q2Q-H22-RFID					
Report No.:	EH/2010/B0045					
Issue Date:	Aug. 26, 2011					
FCC Rule Part:	2 , 22H & 24E					
Prepared for:	Opticon Sensors Europe B.V. Opaallaan 35 2132 XV Hoofddorp Netherlands					
Prepared by:	SGS Taiwan Ltd. Electronics & Communication Laboratory No. 134, Wu Kung Rd., Wuku Industrial Zone, Taipei County, Taiwan.					

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FCC ID: Q2Q-H22-RFID

**Report No.: EH/2010/B0045** Issue Date: Aug. 26, 2011 Page 2 of 140

# VERIFICATION OF COMPLIANCE

Applicant:	Opticon Sensors Europe B.V. Opaallaan 35 2132 XV Hoofddorp Netherlands
Product Name:	PDA Phone H-22
Brand Name:	OPTICON
Model No.:	Please see page 1
Model Different:	Please see page 8
FCC ID:	Q2Q-H22-RFID
File Number:	EH/2010/B0045
Date of test:	Apr. 29, 2010 ~ Aug. 25, 2011
Date of EUT Received:	Apr. 29, 2010

### 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:	Nick Lin	Date:	Aug. 26, 2011	
Prepared By:	Nick Lin / Engineer Gigi Jeh	Date:	Aug. 26, 2011	
Approved By:	Gigi Yeh / Clerk Tim Ch ang Jim Chang / Supervisor	Date:	Aug. 26, 2011	

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# Version

Version No.	Date	Description
00	Aug. 26, 2011	Initial creation of document

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# **1. GENERAL PRODUCT INFORMATION**

#### General:

Product Name:	PDA Phone H-22					
Brand Name:	OPTICON					
Model No.:	Please see	Please see page 1				
Model Difference:	Please see page 8					
Data Cable	Model No.: MICRO USB CABLE L=750MM, Supplier: WANSHIH ELECTRONIC CO., LTD N					
	3.7Vdc Lithium Ion battery or 5Vdc by AC/DC power adapter					
Power Supply	Battery:	Model No.: LBP-02 (H-21) BATTERY PACK, Supplier: TD HiTech Energy Inc				
	Adapter:	Model No.: DSA-12CA-05 050200, Supplier: DEE VAN ENTERPRISE CO., LTD.				

### **GSM and WCDMA:**

	Operating Frequency	Rated Power			
	GSM/GPRS 850, Class 10	824.2 MHz- 848.8 MHz	33 dBm		
Cellular Phone Standards	GSM/GPRS 1900, Class 10	1850.2MHz - 1909.8MHz	30 dBm		
Frequency Range and Power:	EDGE 850, Class 12	824.2 MHz- 848.8 MHz	27 dBm		
	EDGE 1900, Class 12	1850.2MHz – 1909.8MHz	26 dBm		
	WCDMA/HSDPA Band II	1852.4MHz – 1907.6MHz	24 dBm		
	WCDMA/HSDPA Band V	826.4MHz - 846.6MHz	24 dBm		
Type of Emission:	GSM850: 246KGXW, GSM1900: 248KGXW GPRS850: 249KGXW, GPRS1900: 252KGXW EDGE 850: 245KG7W, EDGE 1900: 238KG7W WCDMA Band II: 4M19F9W,HSDPA Band II: 4M16F9W HSUPA Band II: 4M18F9W WCDMA Band V: 4M17F9W,HSDPA Band V: 4M19F9W HSUPA Band V: 4M16F9W				
Hardware Version:	DVT				
Software Version:	V0.44				
IMEI:	355310035148380				



Test Mode	DC voltage (V)	DC current (mA)
GSM 850	3.7	695
GSM 1900	3.7	692
GPRS 850	3.7	557
GPRS 1900	3.7	546
EDGE 850	3.7	534
EDGE 1900	3.7	528
WCDMA B2	3.7	983
WCDMA B5	3.7	1002
HSUPA B2	3.7	1012
HSUPA B5	3.7	1053
HSDPA B2	3.7	1024
HSDPA B5	3.7	1032

#### Final Amplifier Voltage and Current Information:

This test report applies for GSM/GPRS/EDGE 850/1900 and WCDMA/HSDPA Bands II, Band V.



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#### Model different declaration

Product I	Diversity Des	scription Table
1. Applicant's name:		
2. Original Model No.:	H22-EU-QWERTY-2D-RFID H22-EU-NUM-1D (Configura	
3. Series Model No.:	H22-EU-QWERTY-1D-RFID H22-EU-NUM-1D-RFID (Co H22-EU-NUM-2D-RFID (Co H22-EU-QWERTY-1D (Con H22-EU-QWERTY-2D (Configur	nfiguration 5) nfiguration 6) figuration 3) figuration 4)
4. Diversity Description:	Hzz-LO-NOW-2D (Comgu	anon oy
	1. Circuit Diagram:	<ul> <li>No</li> <li>Yes,</li> <li>The Keypad, barcode and RFID are difference.</li> </ul>
	2.PCB Layout:	<ul><li>No</li><li>Yes, please list.</li></ul>
	3. Internal Component:	<ul> <li>No</li> <li>Yes,</li> <li>The Keypad, barcode and RFID are difference.</li> </ul>
	4. Appearance:	<ul> <li>No</li> <li>Yes,</li> <li>The Keypad, barcode and RFID are difference.</li> </ul>
	5. Function/Capability:	<ul> <li>No</li> <li>■ Yes, please list.</li> <li>The Configuration 1/2/5/6 with RFID The Configuration 3/4/7/8 without RFID</li> </ul>
	6.Others:	□ No ■ Yes.

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5. Applicant's Signature

6. Date:

2011/8/31

7. Supplement for the model information

	Config 1	Config 2	Config 3	Contig 4	Config 6	Contig 6	Config 7	Config B
RFID	v	v		The same of the set	v	v	The second second	La contra con
Keypad Type	Owerty	Owerty	Owerty	Owerty	Numeric	Numeric	Numeric	Numeric
Barcode Type	1D	2D	1D	2D	1D	2D	1D	2D



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

This submittal(s) (test report) is intended for FCC ID: <u>**O2O-H22-RFID**</u> 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.

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

### 1.3. Test Facility

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

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

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

### **1.4.** Special Accessories

Not available for this EUT intended for grant.

### **1.5. Equipment Modifications**

Not available for this EUT intended for grant.



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## 2. SYSTEM TEST CONFIGURATION

### 2.1. EUT Configuration

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

### 2.2. EUT Exercise

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

### 2.3. Test Procedure

### 2.3.1 AC Power Line Conducted Emissions

The EUT is placed on a turn table which is 0.8 m above ground plane. According to the requirements in TIA/EIA 603C. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz us- ing CISPR Quasi-Peak and Average detector mode.

### 2.3.2 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.

### 2.3.3 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.



## 2.4. Measurement Equipment Used:

Conducted Emission Test Site							
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.		
ТҮРЕ		NUMBER	NUMBER	CAL.			
Spectrum Analyzer	Agilent	E4446A	MY43360126	04/19/2010	04/18/2012		
Spectrum Analyzer	Agilent	E4440A	US41160416	01/23/2010	01/22/2012		
Radio Communication Analyzer	R&S	CMU200	102189	05/13/2010	05/12/2012		
800 – 1000MHz Filter	Micro-Tronics	BRM13462	001	01/05/2011	01/04/2012		
1800 – 2000MHz Filter	Micro-Tronics	BRM13463	001	01/05/2011	01/04/2012		
Temperature Chamber	TERCHY	MHG-120LF	911009	04/14/2010	04/13/2012		
Temperature Chamber	GIANT FORCE	GTH-150-40- CP-AR	MAA0512-018	02/05/2010	02/04/2012		
DC Block	Agilent	BLK-18	155452	07/05/2011	07/04/2012		
Attenuator	Mini-Circuit	BW-S20W5	N/A	07/05/2011	07/04/2012		
Attenuator	Mini-Circuit	BW-S10W5	N/A	07/05/2011	07/04/2012		
Attenuator	Mini-Circuit	BW-S6W5	N/A	07/05/2011	07/04/2012		
Splitter	Agilent	11636B	N/A	07/05/2011	07/04/2012		
DC Power Supply	Chroma	41901	777188	04/17/2010	04/16/2012		



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	966 Chamber								
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.				
ТҮРЕ		NUMBER	NUMBER	CAL.					
Spectrum Analyzer	R&S	FSP 40	100034	02/12/2010	02/11/2012				
Bilog Antenna	SCHWAZBECK	VULB9160	3136	11/19/2010	11/18/2011				
Dipole Antenna	SCHWAZBECK	VHAP	908/909	07/10/2010	07/09/2012				
Dipole Antenna	SCHWAZBECK	UHAP	891/892	07/10/2010	07/09/2012				
Hor.n antenna	SCHWAZBECK	BBHA 9120D	309	01/22/2010	01/21/2012				
Horn antenna	SCHWAZBECK	BBHA 9120D	9120D-673	05/09/2010	05/08/2012				
Signal Generator	R&S	SMR40	100210	01/22/2010	01/21/2012				
Signal Generator	Agilent	E4438C	MY45093613	06/11/2011	06/10/2012				
Pre-Amplifier	Agilent	8447D	1937A02834	11/28/2010	11/27/2011				
Pre-Amplifier	Agilent	8449B	3008A01973	01/05/2010	01/04/2012				
Attenuator	Mini-Circuit	BW-S20W5	001	07/05/2011	07/04/2012				
Attenuator	Mini-Circuit	BW-S10W5	001	07/05/2011	07/04/2012				
Attenuator	Mini-Circuit	BW-S6W5	001	07/05/2011	07/04/2012				
Radio Communication Analyzer	R&S	CMU200	102189	05/13/2010	05/12/2012				
Turn Table	HD	DT420	N/A	N.C.R	N.C.R				
Antenna Tower	HD	MA240-N	240/657	N.C.R	N.C.R				
Controller	HD	HD100	N/A	N.C.R	N.C.R				
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-10M	10m	01/05/2011	01/04/2012				
Low Loss Cable	HUBER+SUHNER	SUCOFLEX 104PEA-3M	3m	01/05/2010	01/04/2012				
Filter 800-1000	Micro-Tronics	BRM13462	1	01/05/2010	01/04/2012				
Filter 1800-2000	Micro-Tronics	BRM13463	1	01/05/2010	01/04/2012				
3m Site	SGS	966 chamber	N/A	11/08/2010	11/09/2011				

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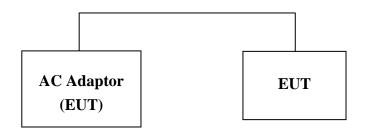
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### 2.5. Configuration of Tested System

### Fig. 2-1 Configuration of Tested System



### **Remote site**



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

Item	Equipment	Mfr/Brand	Model / Type No.	Series No.
1.	Universal Radio Com- munication Tester	R&S	CMU200	102189
2.	Adaptor	DEE	DSA-12CA-05 050200	N/A

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

Max ERP/EIRP measurement result:

	dBm	dB	W
GSM 850 Band	30.93	ERP	1.239
GSM 1900 Band	28.27	EIRP	0.671
EDGE 850 Band	29.04	ERP	0.802
EDGE 1900 Band	28.67	EIRP	0.736
WCDMA Band II	22.42	EIRP	0.175
WCDMA Band V	24.89	ERP	0.308
HSDPA Band II	23.59	EIRP	0.229
HSDPA Band V	24.23	ERP	0.265
HSUPA Band II	24.23	EIRP	0.265
HSUPA Band V	25.42	ERP	0.348



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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/EDGE and WCDMA/HSDPA Band II, V with power adaptor. The worst-case of H position for GSM 850 band, E1 position for GSM 1900, E2 position for HSUPA Band II and E1 position for HSUPA Band V 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				
(i ofulization : vertical)	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		



## 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.

3GPP Power limitation for HSDPA and HSUPA

### Maximum Output Powers for HSDPA

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

### Maximum Output Powers for HSUPA

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

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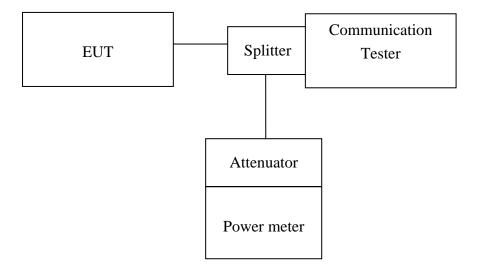
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### 6.2. Test Set-up:



Note: Measurement setup for testing on Antenna connector

### 6.3. Measurement Procedure:

The transmitter output was connected to a calibrated attenuator, the other end of which was connected to a power meter. Transmitter output was read off the power meter in dBm. The power output at the transmitter antenna port was determined by adding the value of the attenuator to the power meter reading. The Procedure of KDB941225 KDB941125 (SAR Measurement Procedures for 3G devices, WCDMA/HSDPA) was used for EUT and Base station setting. RMC 12.2kps is used for this testing

### 6.4. Measurement Equipment Used:

Refer to section 2.4 in this report



## 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)	СН	Peak Power (dBm)	Avg. Power (dBm)
	824.2	128	32.40	32.30
GSM 850	836.6	190	32.30	32.20
	848.8	251	32.10	32.00

EUT Mode	Frequency (MHz)	СН	Peak Power (dBm)	Avg. Power (dBm)
	1850.2	512	28.60	28.50
GSM 1900	1880.0	661	28.50	28.40
	1909.8	810	28.50	28.40

EUT Mode	Frequency (MHz)	СН	Peak Power (1DN 1UP) (dBm)	Avg. Power (1DN 1UP) (dBm)	Peak Power (1DN 2UP) (dBm)	Avg. Power (1DN 2UP) (dBm)
	824.2	128	( <b>ubii</b> ) 32.40	( <b>ubii</b> ) 32.30	( <b>ubii</b> ) 32.40	( <b>ubii</b> ) 32.30
GPRS 850 (Class 10)	836.6	190	32.30	32.20	32.30	32.20
(Cluss 10)	848.8	251	32.10	32.10	32.10	32.10

EUT Mode	Frequency	СН	Peak Power (1DN 1UP)	Avg. Power (1DN 1UP)	Peak Power (1DN 2UP)	Avg. Power (1DN 2UP)
	(MHz)		(dBm)	(dBm)	(dBm)	(dBm)
CDD 0 1000	1850.2	512	28.60	28.50	28.60	28.50
GPRS 1900 (Class 10)	1880.0	661	28.50	28.40	28.50	28.40
(01035 10)	1909.8	810	28.50	28.40	28.50	28.40



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EUT Mode	Frequency (MHz)	СН	Peak Power (1DN 1UP) (dBm)	Avg. Power (1DN 1UP) (dBm)	Peak Power (1DN 2UP) (dBm)	Avg. Power (1DN 2UP) (dBm)	Peak Power (1DN 3UP) (dBm)	Avg. Power (1DN 3UP) (dBm)	Peak Power (1DN 4UP) (dBm)	Avg. Power (1DN 4UP) (dBm)
	824.2	128	30.70	27.50	30.70	27.50	30.70	27.50	30.70	27.50
EDGE 850 (Class 12)	836.6	190	30.50	27.30	30.50	27.30	30.50	27.30	30.50	27.30
()	848.8	251	30.40	27.30	30.40	27.30	30.40	27.30	30.40	27.30
			1						-	-
EUT Mode	Frequency	СН	Peak Power (1DN 1UP)	Avg. Power (1DN 1UP)	Peak Power (1DN 2UP)	Avg. Power (1DN 2UP)	Peak Power (1DN 3UP)	Avg. Power (1DN 3UP)	Peak Power (1DN 4UP)	Avg. Power (1DN 4UP)
	(MHz)		(dBm)							
EDGE 1000	1850.2	512	28.80	25.60	28.80	25.60	28.80	25.60	28.80	25.60
EDGE 1900 (Class 12)	1880.0	661	28.70	25.50	28.70	25.50	28.70	25.50	28.70	25.50
` ´	1909.8	810	28.70	25.50	28.70	25.50	28.70	25.50	28.70	25.50



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### 6.5.1.2.: WCDMA mode

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

### **Results:**

B2	WCI	DMA	HSI	DPA	HSUPA			
	PK	AV	PK	AV	PK	AV		
CH9262	25.23	21.77	25.42	21.61	25.78	21.51		
CH9400	25.81	22.31	26.22	22.23	26.15	22.19		
CH9538	25.43 22.24		25.80	22.21	25.68 22.08			

В5	WCI	DMA	HSI	OPA	HSUPA			
	РК	AV	PK	AV	РК	AV		
CH4132	27.06	23.50	27.12	23.33	26.95	23.08		
CH4183	27.08	23.45	27.01	23.16	26.16	23.27		
CH4233	26.68 23.26		26.87	23.01	26.87	22.93		

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

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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### 6.5.1.3.:HSDPA Release 6 mode

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

### **HSDPA SUB-TEST Setting**

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

Sub-test	β <sub>c</sub>	βa	β <sub>d</sub> (SF)	$\beta_c/\beta_d$	β <sub>HS</sub> (Note1, Note 2)	<b>CM (dB)</b> (Note 3)	MPR (dB) (Note 3)	RMC (Kbps)
1	2/15	15/15	64	2/15	4/15	0.0	0.0	12.2
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0	12.2
3	15/15	8/15	64	15/8	30/15	1.5	0.5	12.2
4	15/15	4/15	64	15/4	30/15	1.5	0.5	12.2

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

**Results:** 

Mode	Sub-test	RMS	Power (d Channel	Bm)	Power Class 3 Limita-	Comments
		9262	9400	9538	tion (dBm)	
	1	22.06	22.57	22.51	20.3dBm - 25.7dBm	Pass
HSDPA	2	21.65	22.17	22.09	20.3dBm $- 25.7$ dBm	Pass
<b>(B2)</b>	3	21.58	22.12	21.98	19.8dBm - 25.7dBm	Pass
	4	21.65	22.13	22.10	19.8dBm - 25.7dBm	Pass

Mode	Sub-test	RMS	Power (d Channel	Bm)	Power Class 3 Limita- tion (dBm)	Comments
		4132	4183	4233		
	1	23.72	23.70	23.45	20.3dBm - 25.7dBm	Pass
HSDPA	2	23.43	23.34	23.13	20.3dBm $- 25.7$ dBm	Pass
<b>(B5)</b>	3	23.26	23.22	22.96	19.8dBm - 25.7dBm	Pass
	4	23.31	23.26	23.02	19.8dBm - 25.7dBm	Pass



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

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

### HSPA SUB-TEST Setting

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

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

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

### **Results:**

N/A, because the EUT does not supports HSUPA function.



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### 6.5.2. Minimum Communications Power Measurement

PCL	0	1	2	3	4	5	6	7	8	
Output power (dBm)	28.2	28.2	28.2	28.2	26.3	25.1	23.1	21.2	19.2	
PCL	9	10	11	12	13	14	15	16	17	18
Output power (dBm)	17.3	15.3	13.3	11.3	9.3	7.3	5.4	3.4	1.3	-0.7

#### PCS 1900 band

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

### WCDMA/HSDPA band II

The EUT output power was controlled by simulator. Set Communication Tester CMU200 function key "UE Power Control" and enter max rated power 24dBm. The EUT is going to be set to max output power to 24dBm. then record the read(see page 19 for measurement data). The min. power was measures by a function key "minimum power" then record the read. It is -52.5dBm. The power variation can be 0.1dB step by setting.



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# 7. ERP, EIRP MEASUREMENT

### 7.1. Standard Applicable:

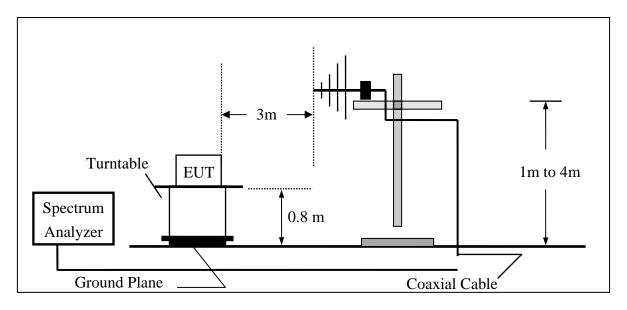
According to FCC §2.1046

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

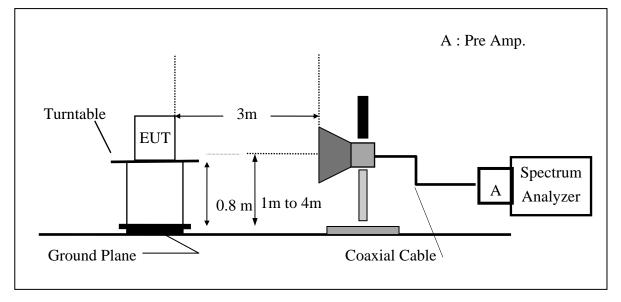


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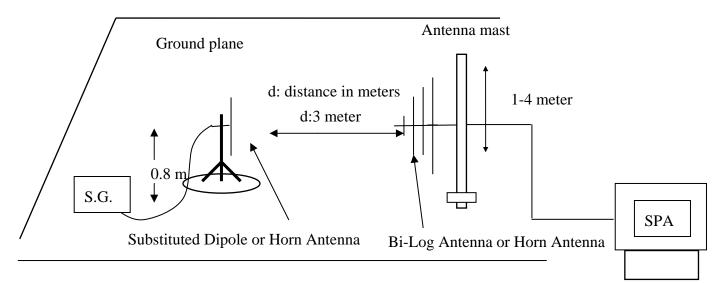


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### (B) Radiated Emission Test Set-UP Frequency Over 1 GHz

### (C) Substituted Method Test Set-UP





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### 7.3. Measurement Procedure:

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

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

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

EIRP in frequency band 1710-1755MHz and 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:

ERP = S.G. output (dBm) + Antenna Gain (dBd) - Cable Loss (dB)EIRP = S.G. output (dBm) + Antenna Gain (dBi) - 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 Mode	Frequency (MHz)	СН	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)
				V	127.57	41.18	-7.87	3.62	29.68	38.45
			Н	Н	120.53	34.26	-7.87	3.62	22.76	38.45
	004.00	100	E1	V	123.17	36.78	-7.87	3.62	25.28	38.45
	824.20	128		Н	128.08	41.81	-7.87	3.62	30.31	38.45
			E2	V	121.15	34.76	-7.87	3.62	23.26	38.45
			E2	Н	127.77	41.50	-7.87	3.62	30.00	38.45
		190	H E1	V	128.18	41.93	-7.88	3.65	30.40	38.45
				Н	120.46	34.23	-7.88	3.65	22.70	38.45
	836.60			V	122.79	36.54	-7.88	3.65	25.01	38.45
GSM 850	830.00	190	EI	Н	128.17	41.94	-7.88	3.65	30.41	38.45
			E2	V	120.97	34.72	-7.88	3.65	23.19	38.45
			EZ	Н	127.64	41.41	-7.88	3.65	29.88	38.45
			п	V	128.61	42.49	-7.88	3.68	30.93	38.45
			Н	Н	120.86	34.67	-7.88	3.68	23.11	38.45
	848.80	251	E1	V	123.36	37.24	-7.88	3.68	25.68	38.45
	040.80	231	E1	Н	128.37	42.18	-7.88	3.68	30.62	38.45
			E2	V	120.41	34.29	-7.88	3.68	22.73	38.45
			E2	Н	127.45	41.26	-7.88	3.68	29.70	38.45

#### Remark :

(1) The RBW, VBW of SPA for frequency

RBW=300 KHz, VBW=1MHz



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### **Measurement Result:**

EUT Mode	Frequency (MHz)	СН	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)
				V	119.67	15.28	9.90	5.56	19.62	33.00
			Н	Н	126.75	22.57	9.90	5.56	26.91	33.00
	1050.00	510	E1	V	128.31	23.92	9.90	5.56	28.26	33.00
	1850.20	512	LI	Н	124.17	19.99	9.90	5.56	24.33	33.00
			E2	V	120.07	15.68	9.90	5.56	20.02	33.00
		E2	Н	124.26	20.08	9.90	5.84	24.14	33.00	
		661	H E1	V	120.19	15.83	9.99	5.61	20.21	33.00
	1880.00			Н	126.06	21.92	9.99	5.61	26.29	33.00
<b>CO</b> ( 1000				V	128.25	23.89	9.99	5.61	28.27	33.00
GSM 1900	1000.00			Н	124.57	20.43	9.99	5.61	24.80	33.00
			E2	V	117.87	13.51	9.99	5.61	17.89	33.00
			E2	Н	125.06	20.92	9.99	5.61	25.29	33.00
			Н	V	120.18	15.85	10.08	5.66	20.27	33.00
			11	Н	125.01	20.90	10.08	5.66	25.32	33.00
	1909.80	810	E1	V	127.73	23.40	10.08	5.66	27.82	33.00
	1202.00	810		Н	125.30	21.19	10.08	5.66	25.61	33.00
			E2	V	119.00	14.67	10.08	5.66	19.09	33.00
				Н	124.34	20.23	10.08	5.66	24.65	33.00

### Remark :

(1)The RBW, VBW of SPA for frequency

RBW=300K, VBW=1MHz



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### **Measurement Result:**

EUT Mode	Frequency (MHz)	СН	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)
				V	125.74	39.35	-7.87	3.62	27.85	38.45
			Н	Н	118.66	32.39	-7.87	3.62	20.89	38.45
	024.20	100	E1	V	121.36	34.97	-7.87	3.62	23.47	38.45
	824.20	128	LI	Н	126.32	40.05	-7.87	3.62	28.55	38.45
			E2	V	119.83	33.44	-7.87	3.62	21.94	38.45
			L2	Н	126.44	40.17	-7.87	3.62	28.67	38.45
		Н	V	126.32	40.07	-7.88	3.65	28.54	38.45	
		190	Н	Н	118.53	32.30	-7.88	3.65	20.77	38.45
	836.60		E1	V	120.84	34.59	-7.88	3.65	23.06	38.45
EDGE 850	050.00	170		Н	126.63	40.40	-7.88	3.65	28.87	38.45
			E2	V	119.81	33.56	-7.88	3.65	22.03	38.45
			E2	Н	126.47	40.24	-7.88	3.65	28.71	38.45
			Н	V	126.88	40.76	-7.88	3.68	29.20	38.45
			11	Н	119.01	32.82	-7.88	3.68	21.26	38.45
8	848.80	251	E1	V	121.27	35.15	-7.88	3.68	23.59	38.45
	040.00	251		Н	126.79	40.60	-7.88	3.68	29.04	38.45
			E2	V	119.07	32.95	-7.88	3.68	21.39	38.45
				Н	126.31	40.12	-7.88	3.68	28.56	38.45

### Remark :

(1)The RBW, VBW of SPA for frequency

RBW=300 KHz, VBW=1MHz



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### **Measurement Result:**

EUT Mode	Frequency (MHz)	СН	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)
				V	120.92	16.53	9.90	5.56	20.87	33.00
			Н	Н	127.28	23.10	9.90	5.56	27.44	33.00
	1050.00	510	E1	V	126.76	22.37	9.90	5.56	26.71	33.00
	1850.20	512		Н	124.93	20.75	9.90	5.56	25.09	33.00
			E2	V	121.43	17.04	9.90	5.56	21.38	33.00
		L2	Н	128.32	24.14	9.90	5.84	28.20	33.00	
		661	H E1	V	120.19	15.83	9.99	5.61	20.21	33.00
				Н	127.36	23.22	9.99	5.61	27.59	33.00
ED CE 1000	1880.00			V	126.62	22.26	9.99	5.61	26.64	33.00
EDGE 1900	1000.00			Н	124.14	20.00	9.99	5.61	24.37	33.00
			E2	V	121.77	17.41	9.99	5.61	21.79	33.00
			E2	Н	128.44	24.30	9.99	5.61	28.67	33.00
			Н	V	120.48	16.15	10.08	5.66	20.57	33.00
			11	Н	126.47	22.36	10.08	5.66	26.78	33.00
:	1909.80	810	E1	V	126.47	22.14	10.08	5.66	26.56	33.00
	1909.00	010		Н	122.88	18.77	10.08	5.66	23.19	33.00
		-	E2	V	122.00	17.67	10.08	5.66	22.09	33.00
				Н	127.81	23.70	10.08	5.66	28.12	33.00

### Remark :

(1)The RBW, VBW of SPA for frequency

RBW=300K, VBW=1MHz



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### **Measurement Result:**

EUT Mode	Frequency (MHz)	СН	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)
				V	116.25	11.87	9.90	5.56	16.20	33.00
			Н	Н	120.47	16.29	9.90	5.56	20.63	33.00
	1052 40	0262	E1	V	122.47	18.09	9.90	5.56	22.42	33.00
	1852.40	9262	LI	Н	120.19	16.01	9.90	5.56	20.35	33.00
			E2	V	117.54	13.16	9.90	5.56	17.49	33.00
				Н	121.74	17.56	9.90	5.84	21.62	33.00
	1880.00	9400	Н	V	116.24	11.88	9.99	5.61	16.26	33.00
				Н	120.80	16.66	9.99	5.61	21.03	33.00
			E1	V	121.92	17.56	9.99	5.61	21.94	33.00
WCDMA II				Н	120.72	16.58	9.99	5.61	20.95	33.00
			E2	V	116.87	12.51	9.99	5.61	16.89	33.00
				Н	121.84	17.70	9.99	5.61	22.07	33.00
		9538	Н	V	116.97	12.64	10.07	5.66	17.05	33.00
	1907.60			Н	120.18	16.07	10.07	5.66	20.48	33.00
			E1	V	121.45	17.12	10.07	5.66	21.53	33.00
				Н	121.04	16.93	10.07	5.66	21.34	33.00
			E2	V	116.33	12.00	10.07	5.66	16.41	33.00
			EZ	Н	121.43	17.32	10.07	5.66	21.73	33.00

### Remark :

(1)The RBW, VBW of SPA for frequency

RBW = 5MHz, VBW = 5MHz



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### **Measurement Result:**

EUT Mode	Frequency (MHz)	СН	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)
				V	122.64	36.28	-7.88	3.63	24.77	38.45
			Н	Н	113.28	27.02	-7.88	3.63	15.52	38.45
	006.40	4120	E1	V	117.53	31.17	-7.88	3.63	19.66	38.45
	826.40	4132	LI	Н	122.36	36.10	-7.88	3.63	24.60	38.45
			E2	V	116.10	29.74	-7.88	3.63	18.23	38.45
				Н	122.47	36.21	-7.88	3.63	24.71	38.45
	836.60	4183	Н	V	121.07	34.82	-7.88	3.65	23.29	38.45
				Н	113.10	26.87	-7.88	3.65	15.34	38.45
			E1	V	116.26	30.01	-7.88	3.65	18.48	38.45
WCDMA V				Н	121.57	35.34	-7.88	3.65	23.81	38.45
			E2	V	114.90	28.65	-7.88	3.65	17.12	38.45
				Н	122.65	36.42	-7.88	3.65	24.89	38.45
		4233	Н	V	121.47	35.32	-7.88	3.67	23.77	38.45
	846.60			Н	114.11	27.91	-7.88	3.67	16.36	38.45
			E1	V	116.80	30.65	-7.88	3.67	19.10	38.45
				Н	121.79	35.59	-7.88	3.67	24.04	38.45
			E2	V	114.66	28.51	-7.88	3.67	16.96	38.45
				Н	121.72	35.52	-7.88	3.67	23.97	38.45

### Remark :

(1)The RBW, VBW of SPA for frequency

RBW = 5MHz, VBW = 5MHz



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### **Measurement Result:**

EUT Mode	Frequency (MHz)	СН	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)
			Н	V	116.37	11.99	9.90	5.56	16.32	33.00
			11	Н	121.62	17.44	9.90	5.56	21.78	33.00
	1852.40	9262	E1	V	123.64	19.26	9.90	5.56	23.59	33.00
	1052.40	9262		Н	122.32	18.14	9.90	5.56	22.48	33.00
			E2	V	115.55	11.17	9.90	5.56	15.50	33.00
			E2	Н	123.04	18.86	9.90	5.84	22.92	33.00
	1880.00	9400	Н Е1 Е2	V	116.76	12.40	9.99	5.61	16.78	33.00
				Н	121.08	16.94	9.99	5.61	21.31	33.00
HSDPA				V	123.12	18.76	9.99	5.61	23.14	33.00
Band II				Н	122.18	18.04	9.99	5.61	22.41	33.00
				V	116.46	12.10	9.99	5.61	16.48	33.00
				Н	122.71	18.57	9.99	5.61	22.94	33.00
		9538	Н	V	117.55	13.22	10.07	5.66	17.63	33.00
	1907.60			Н	119.78	15.67	10.07	5.66	20.08	33.00
			E1	V	122.26	17.93	10.07	5.66	22.34	33.00
				Н	122.21	18.10	10.07	5.66	22.51	33.00
			E2	V	116.78	12.45	10.07	5.66	16.86	33.00
				Н	122.28	18.17	10.07	5.66	22.58	33.00

### Remark :

(1)The RBW, VBW of SPA for frequency

RBW = 5MHz, VBW = 5MHz

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### **Measurement Result:**

EUT Mode	Frequency (MHz)	СН	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)
			Н	V	115.03	10.65	9.90	5.56	14.98	33.00
			11	Н	121.56	17.38	9.90	5.56	21.72	33.00
	826.40	4132	E1	V	123.61	19.23	9.90	5.56	23.56	33.00
	020.40	4132		Н	121.51	17.33	9.90	5.56	21.67	33.00
			E2	V	118.28	13.90	9.90	5.56	18.23	33.00
				Н	124.35	20.17	9.90	5.84	24.23	33.00
	836.60	4183	H E1	V	116.48	12.12	9.99	5.61	16.50	33.00
				Н	121.37	17.23	9.99	5.61	21.60	33.00
HSDPA				V	123.22	18.86	9.99	5.61	23.24	33.00
Band V				Н	122.09	17.95	9.99	5.61	22.32	33.00
			E2	V	118.74	14.38	9.99	5.61	18.76	33.00
				Н	123.29	19.15	9.99	5.61	23.52	33.00
		4233	Н	V	115.75	11.42	10.07	5.66	15.83	33.00
				Н	122.46	18.35	10.07	5.66	22.76	33.00
	846.60		E1	V	122.58	18.25	10.07	5.66	22.66	33.00
	840.00			Н	121.91	17.80	10.07	5.66	22.21	33.00
			E2	V	119.65	15.32	10.07	5.66	19.73	33.00
				Н	122.49	18.38	10.07	5.66	22.79	33.00

### Remark :

(1)The RBW, VBW of SPA for frequency

RBW = 5MHz, VBW = 5MHz



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### **Measurement Result:**

EUT Mode	Frequency (MHz)	СН	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)
			Н	V	115.03	10.65	9.90	5.56	14.98	33.00
			11	Н	121.56	17.38	9.90	5.56	21.72	33.00
	1852.40	9262	E1	V	123.61	19.23	9.90	5.56	23.56	33.00
	1052.40	9262		Н	121.51	17.33	9.90	5.56	21.67	33.00
			E2	V	118.28	13.90	9.90	5.56	18.23	33.00
				Н	124.35	20.17	9.90	5.84	24.23	33.00
	1880.00	9400	Н Е1 Е2	V	116.48	12.12	9.99	5.61	16.50	33.00
				Н	121.37	17.23	9.99	5.61	21.60	33.00
HSUPA				V	123.22	18.86	9.99	5.61	23.24	33.00
Band II				Н	122.09	17.95	9.99	5.61	22.32	33.00
				V	118.74	14.38	9.99	5.61	18.76	33.00
				Н	123.29	19.15	9.99	5.61	23.52	33.00
		9538	Н	V	115.75	11.42	10.07	5.66	15.83	33.00
				Н	122.46	18.35	10.07	5.66	22.76	33.00
	1907.60		E1	V	122.58	18.25	10.07	5.66	22.66	33.00
				Н	121.91	17.80	10.07	5.66	22.21	33.00
			E2	V	119.65	15.32	10.07	5.66	19.73	33.00
				Н	122.49	18.38	10.07	5.66	22.79	33.00

### Remark :

(1)The RBW, VBW of SPA for frequency

RBW = 5MHz, VBW = 5MHz



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# **Measurement Result:**

EUT Mode	Frequency (MHz)	СН	EUT Pol.	Antenna Pol.	SPA Reading (dBuV)	S.G. Output (dBm)	Antenna Gain (dBd)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)			
			Н	V	122.52	36.16	-7.88	3.63	24.65	38.45			
			11	Н	114.75	28.49	-7.88	3.63	16.99	38.45			
	826.40	4132	E1	V	116.39	30.03	-7.88	3.63	18.52	38.45			
	020.40	4152		Н	123.18	36.92	-7.88	3.63	25.42	38.45			
			E2	V	115.51	29.15	-7.88	3.63	17.64	38.45			
			Ľ2	Н	120.60	34.34	-7.88	3.63	22.84	38.45			
						Н	V	120.63	34.38	-7.88	3.65	22.85	38.45
			11	Н	113.60	27.37	-7.88	3.65	15.84	38.45			
HSUPA	836.60 418	4183	E1	V	114.79	28.54	-7.88	3.65	17.01	38.45			
Band V	050.00	4105	LI	Н	121.52	35.29	-7.88	3.65	23.76	38.45			
			E2	V	114.56	28.31	-7.88	3.65	16.78	38.45			
		E2	Н	120.44	34.21	-7.88	3.65	22.68	38.45				
			Н	V	121.25	35.10	-7.88	3.67	23.55	38.45			
	846.60 42	60 4233 E	11	Н	115.01	28.81	-7.88	3.67	17.26	38.45			
			E1	V	115.00	28.85	-7.88	3.67	17.30	38.45			
			EI	Н	121.74	35.54	-7.88	3.67	23.99	38.45			
			E2	V	114.04	27.89	-7.88	3.67	16.34	38.45			
			Liz	Н	120.83	34.63	-7.88	3.67	23.08	38.45			

## **Remark** :

(1)The RBW, VBW of SPA for frequency

RBW = 5MHz, VBW = 5MHz

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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 5.2 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)	СН	99% Bandwidth (kHz)
GSM 850	824.20	128	244.8187
	836.60	190	245.3933
	848.80	251	246.5472

EUT Mode	Frequency (MHz)	СН	99% Bandwidth (kHz)
GSM 1900	1850.20	512	248.1841
	1880.00	661	251.5772
	1909.80	810	245.1866

EUT Mode	Frequency (MHz)	СН	99% Bandwidth (kHz)
	824.20	128	242.6463
GPRS 850	836.60	190	249.0311
	848.80	251	246.2544

EUT Mode	Frequency (MHz)	СН	99% Bandwidth (kHz)
GPRS 1900	1850.20	512	243.1849
	1880.00	661	244.7725
	1909.80	810	252.1624

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EUT Mode	Frequency (MHz)	СН	99% Bandwidth (kHz)
EDGE 850	824.20	128	245.4231
	836.60	190	243.7106
	848.80	251	244.1159

EUT Mode	Frequency (MHz)	СН	99% Bandwidth (kHz)
EDGE 1900	1850.20	512	238.8734
	1880.00	661	237.7531
	1909.80	810	235.2303

EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
WCDMA II	1852.40	9262	4.1936
	1880.00	9400	4.1647
	1907.60	9538	4.1606

EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
WCDMA V	826.40	4132	4.1611
	836.00	4180	4.1653
	846.60	4233	4.1710

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EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
HSDPA II	1852.4	9262	4.1632
	1880.0	9400	4.1580
	1907.6	9538	4.1666

EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
HSDPA V	826.40	4132	4.1596
	836.60	4183	4.1993
	846.60	4233	4.1822

EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
HSUPA II	1852.4	9262	4.1812
	1880.0	9400	4.1726
	1907.6	9538	4.1671

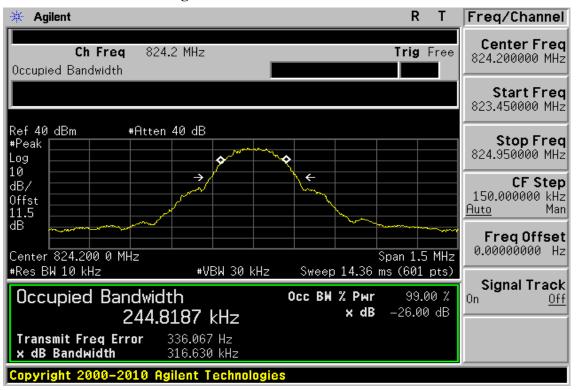
EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
HSUPA V	826.40	4132	4.1621
	836.60	4183	4.1634
	846.60	4233	4.1682

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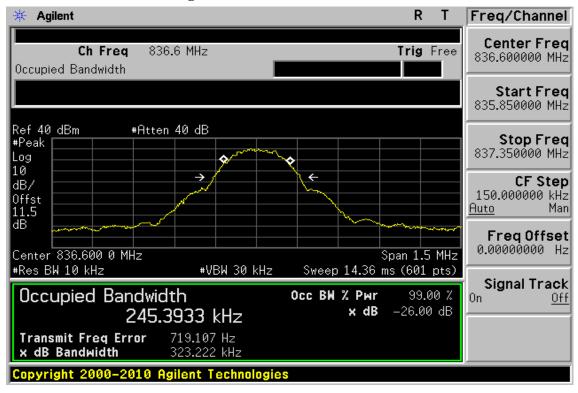


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#### Figure 8-1: GSM 850 Channel Low



## Figure 8-2 GSM 850 Channel Mid

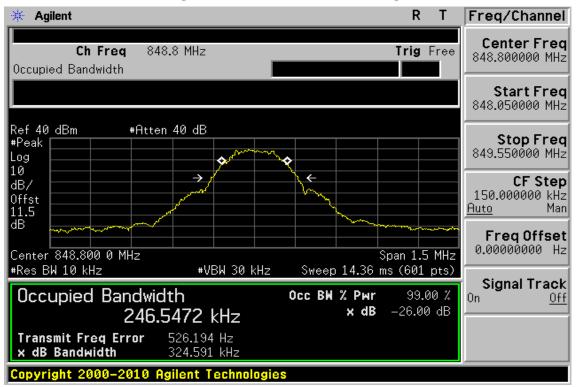


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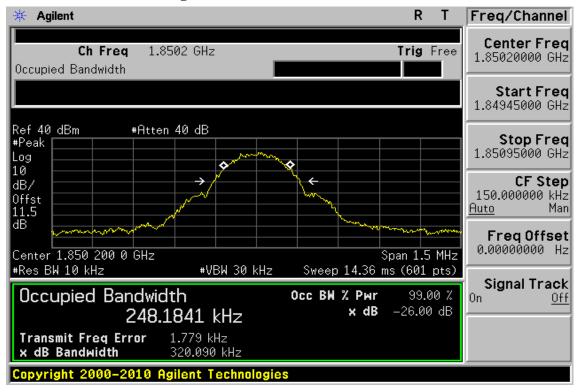


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Figure 8-3: GSM 850 Channel High



## Figure 8-4: GSM 1900 Channel Low

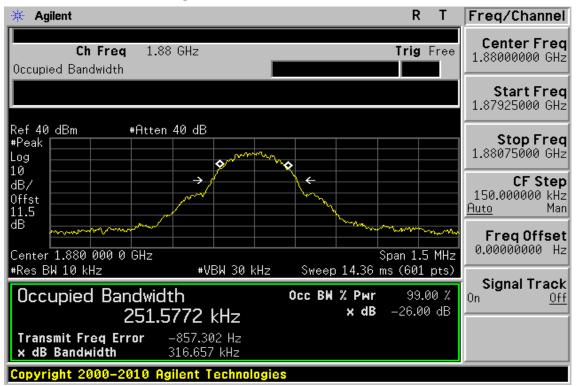


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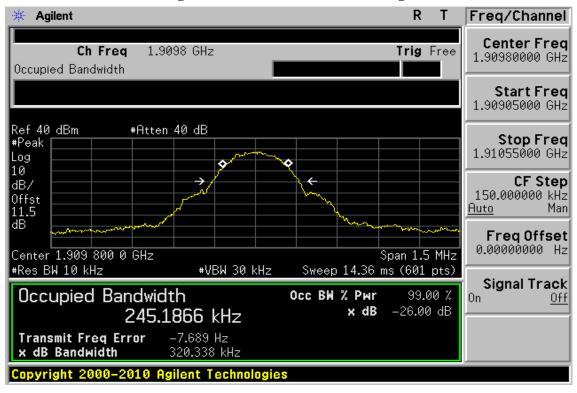


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Figure 8-5 GSM 1900 Channel Mid



## Figure 8-6: GSM 1900 Channel High

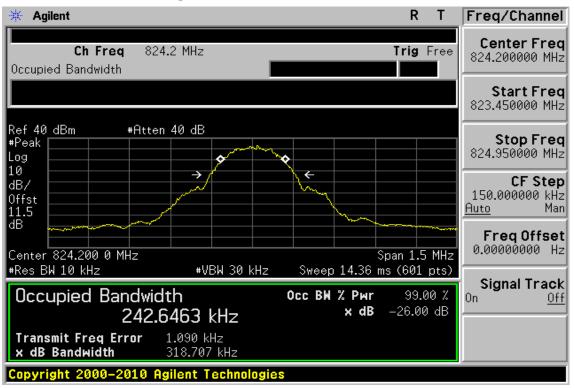


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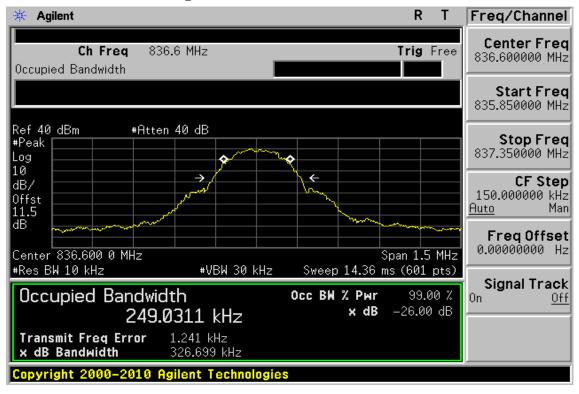


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## Figure 8-7: GPRS 850 Channel Low



#### Figure 8-8 GPRS 850 Channel Mid



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#### Figure 8-9: GPRS 850 Channel High

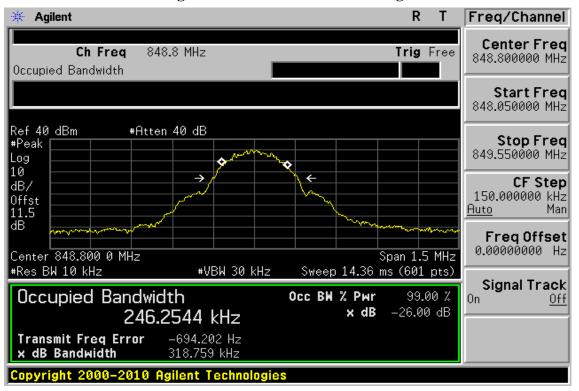
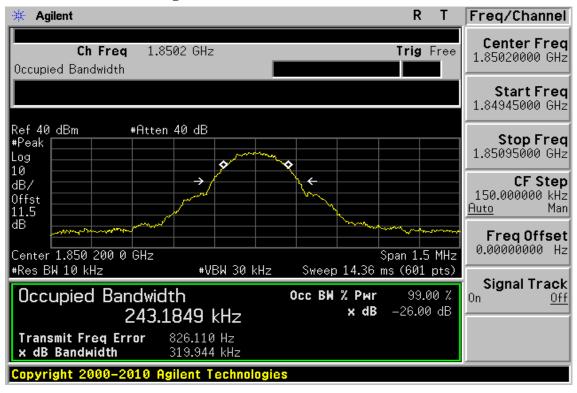


Figure 8-10: GPRS 1900 Channel Low



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Figure 8-11: GPRS 1900 Channel Mid

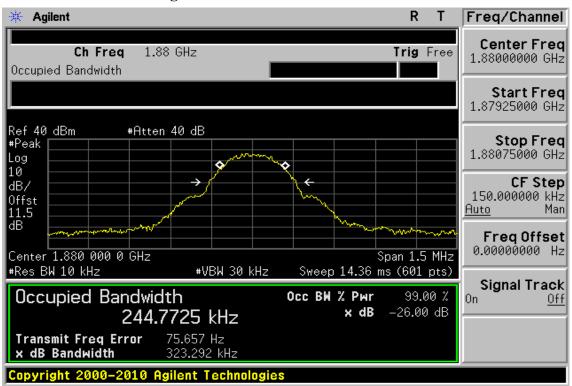
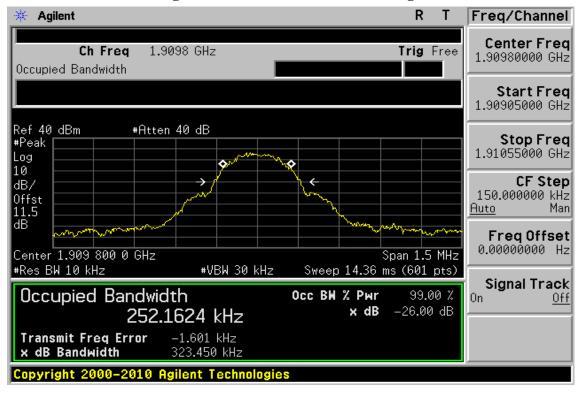


Figure 8-12: GPRS 1900 Channel High

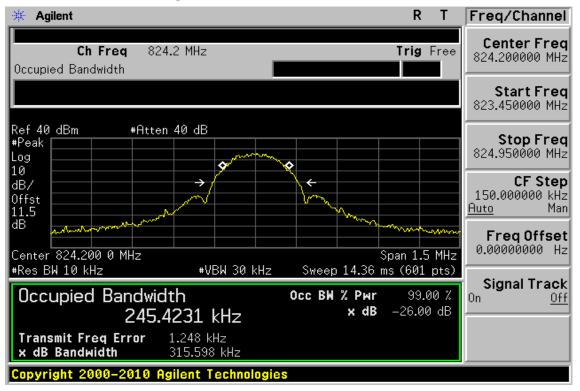


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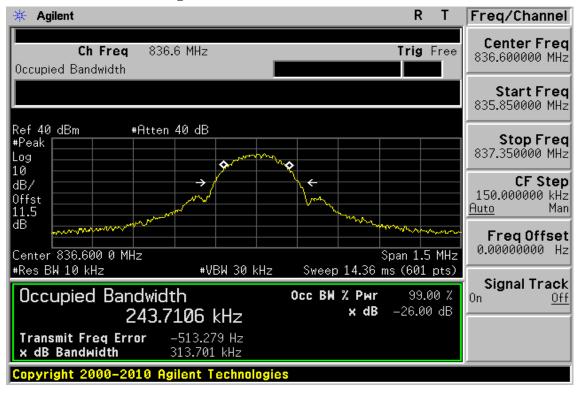


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#### Figure 8-13: EDGE 850 Channel Low



#### Figure 8-14: EDGE 850 Channel Mid



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#### Figure 8-15: EDGE 850 Channel High

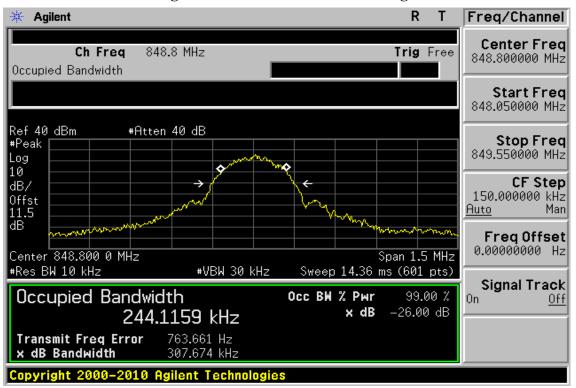
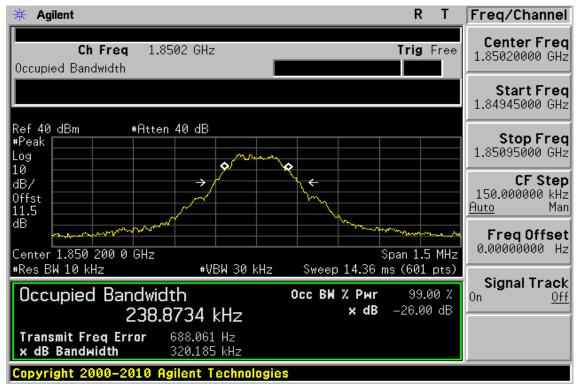


Figure 8-16: EDGE 1900 Channel Low

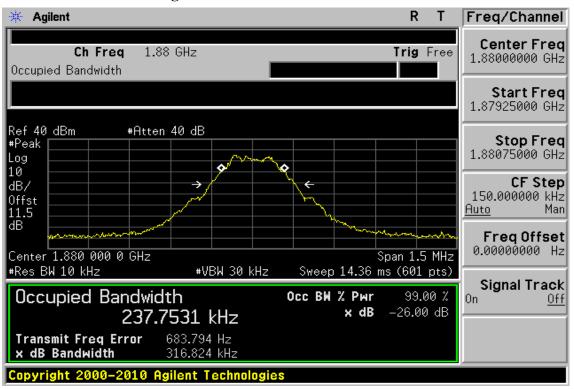


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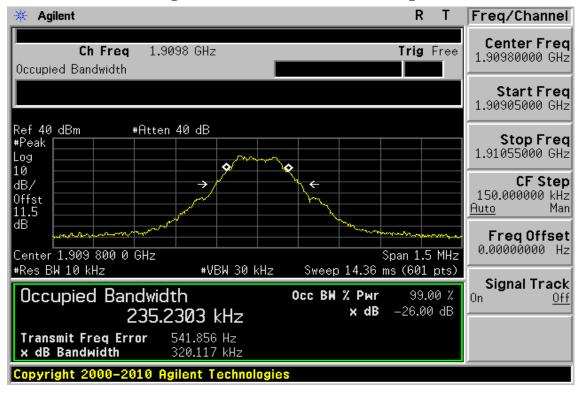


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#### Figure 8-17 EDGE 1900 Channel Mid



#### Figure 8-18: EDGE 1900 Channel High

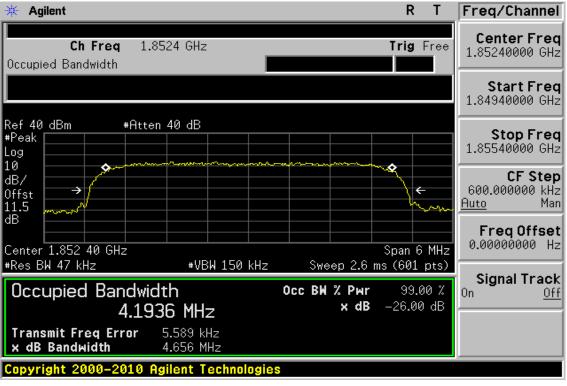


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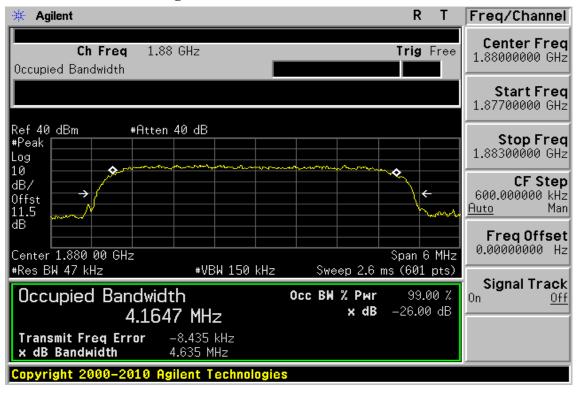


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#### Figure 8-19: WCDMA II Channel Low



#### Figure 8-20 WCDMA II Channel Mid

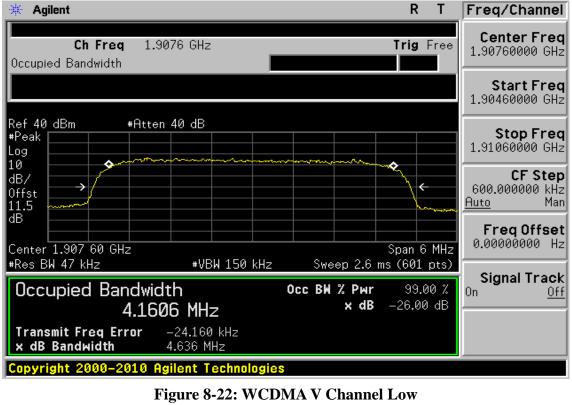


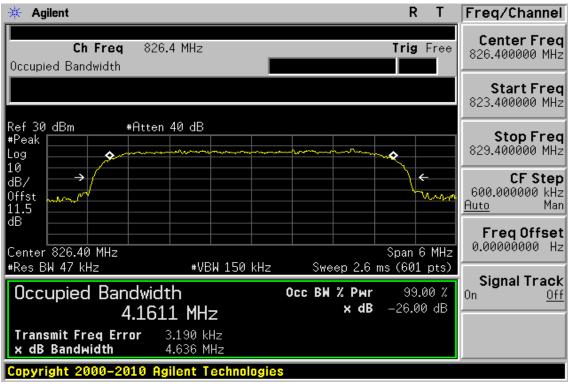
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Figure 8-21: WCDMA II Channel High



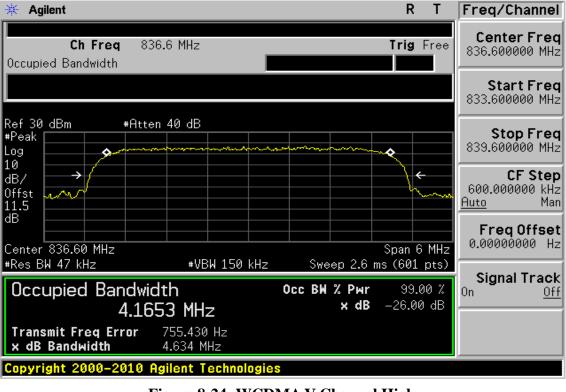


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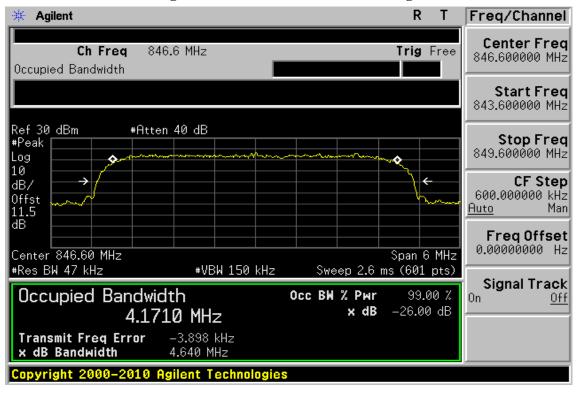


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#### Figure 8-23 WCDMA V Channel Mid



#### Figure 8-24: WCDMA V Channel High

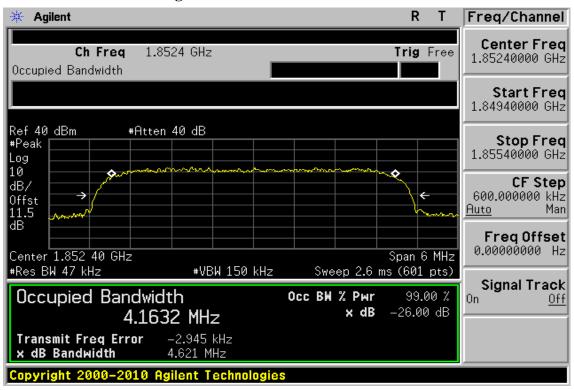


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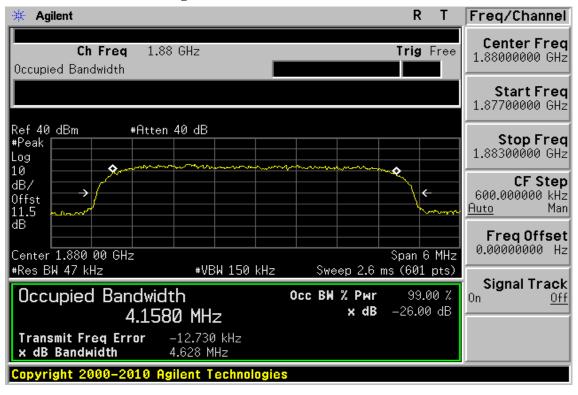


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Figure 8-25: HSDPA II Channel Low



## Figure 8-26 HSDPA II Channel Mid

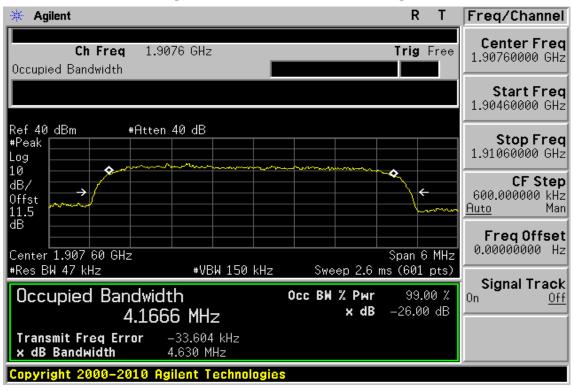


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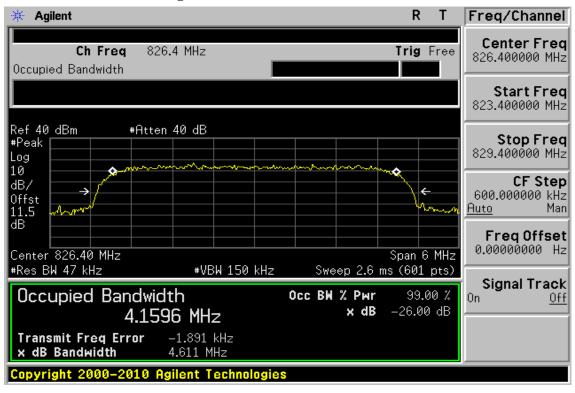


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Figure 8-27: HSDPA II Channel High



## Figure 8-28: HSDPA V Channel Low

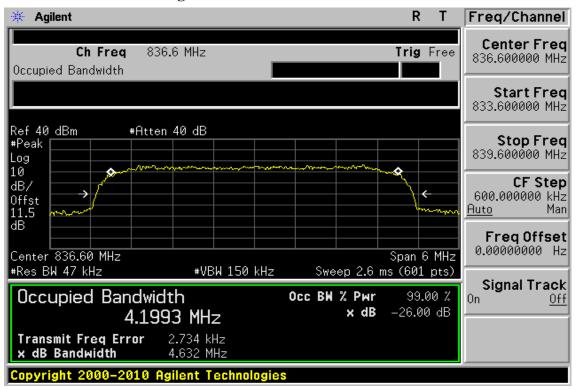


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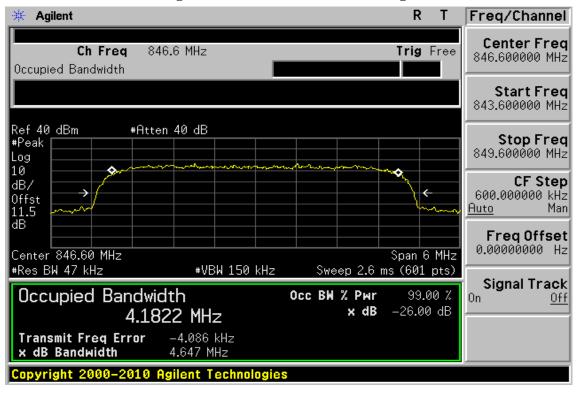


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Figure 8-29: HSDPA V Channel Mid



## Figure 8-30: HSDPA V Channel High

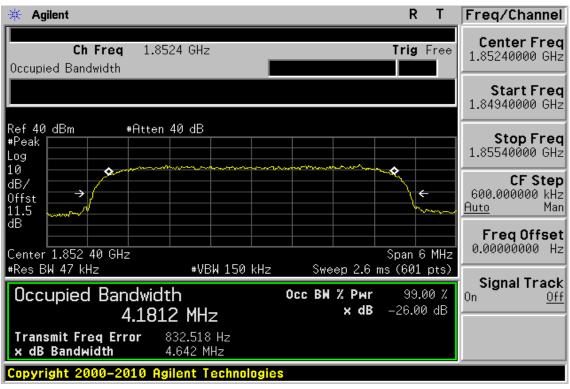


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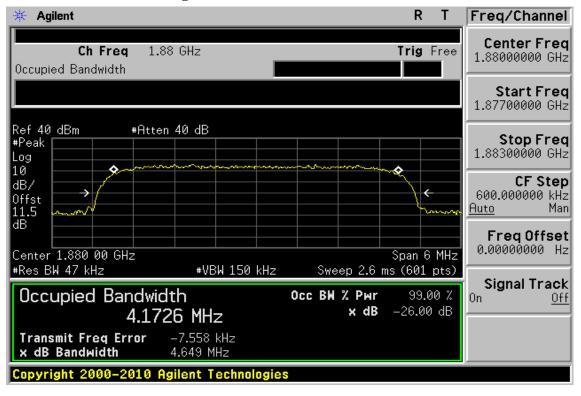


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Figure 8-31: HSUPA II Channel Low



## Figure 8-32 HSUPA II Channel Mid

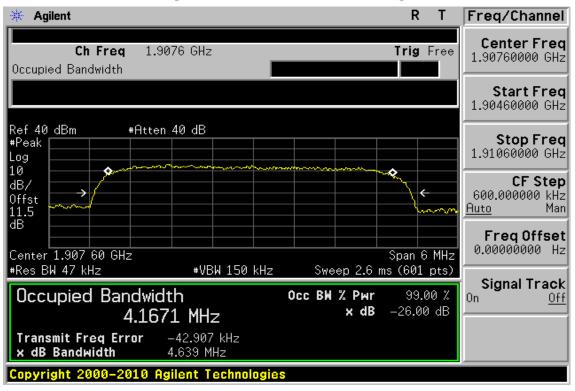


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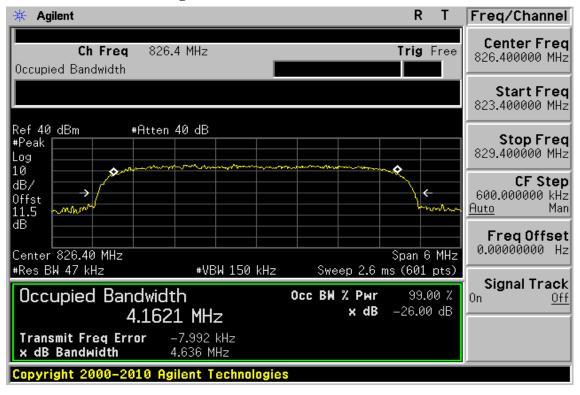


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Figure 8-33: HSUPA II Channel High



## Figure 8-34: HSUPA V Channel Low



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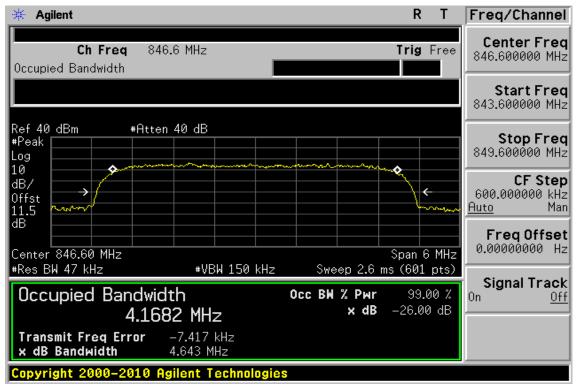


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#### Figure 8-35: HSUPA V Channel Mid



## Figure 8-36: HSUPA V Channel High



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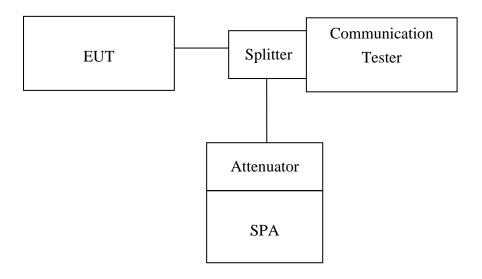
# 9. OUT OF BAND EMISSION AT ANTENNA TERMINALS

# 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= 10 th harmonic. Limit = -13dBm

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

# 9.4. Measurement Equipment Used:

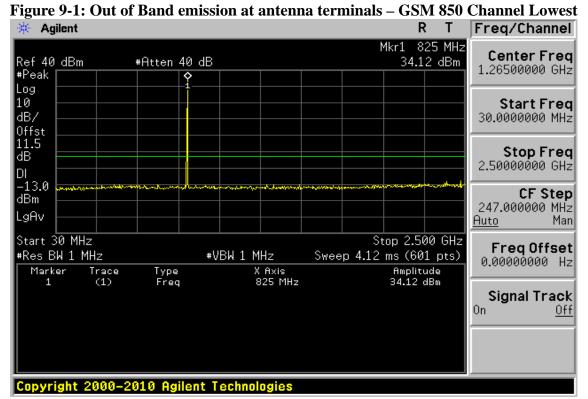
Refer to section 2.4 in this report

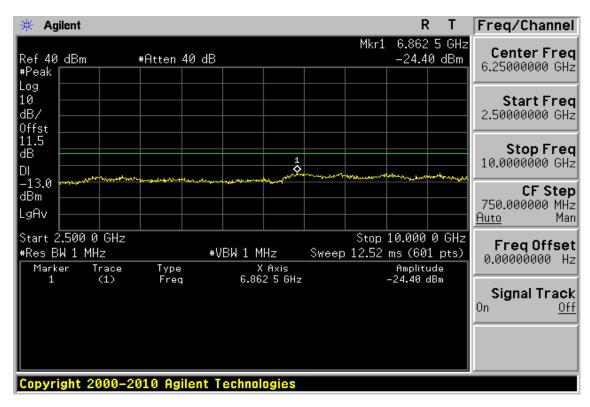
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## 9.5. Measurement Result:





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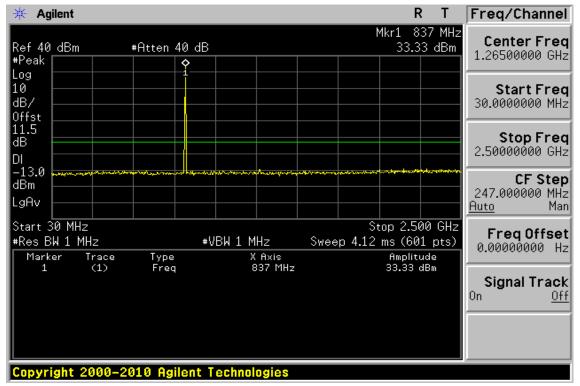
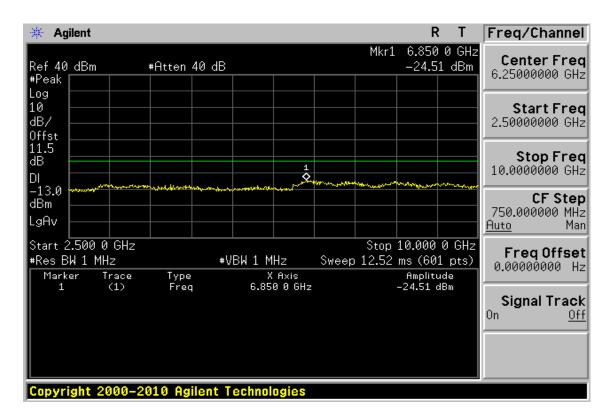


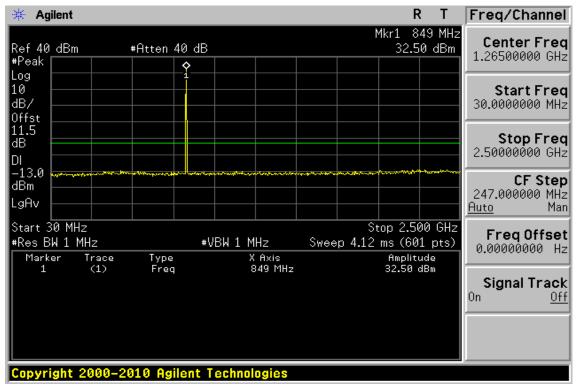
Figure 9-2: Out of Band emission at antenna terminals – GSM 850 Channel Mid



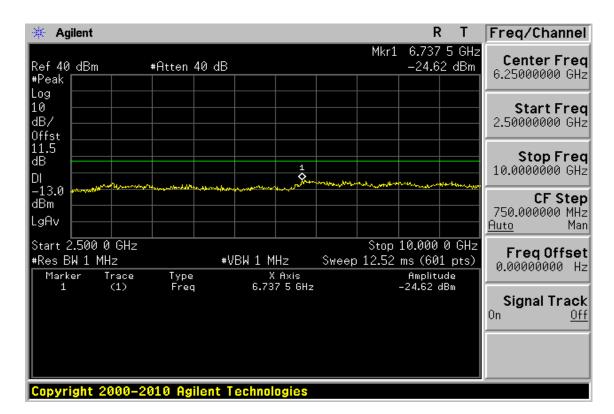
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#### Figure 9-3: Out of Band emission at antenna terminals – GSM 850 Channel Highest



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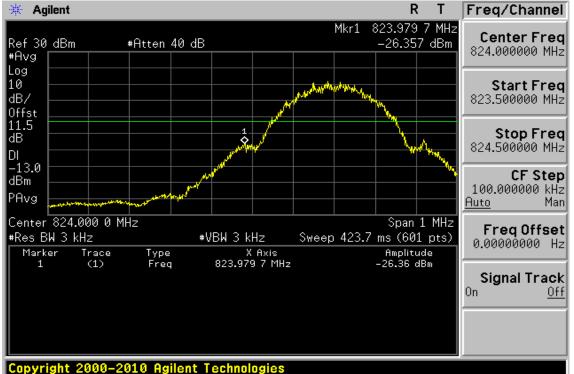
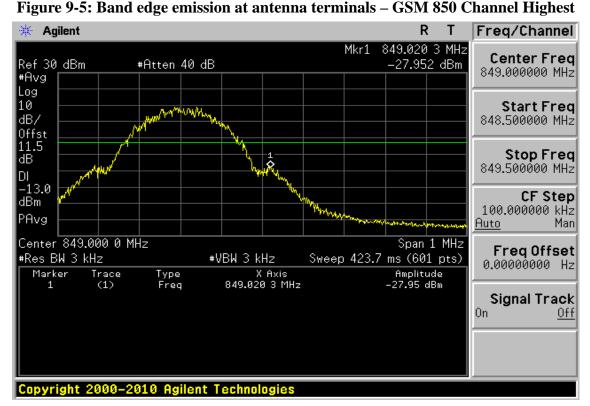


Figure 9-4: Band edge emission at antenna terminals – GSM 850 Channel Lowest





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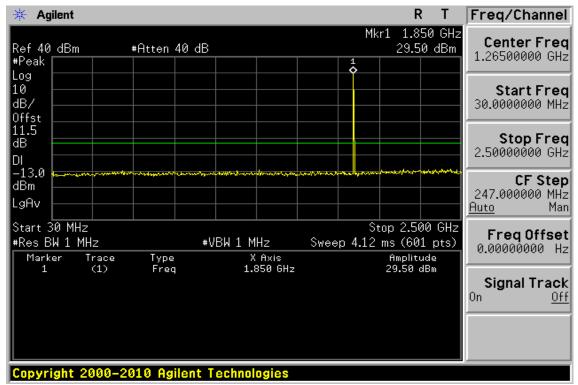
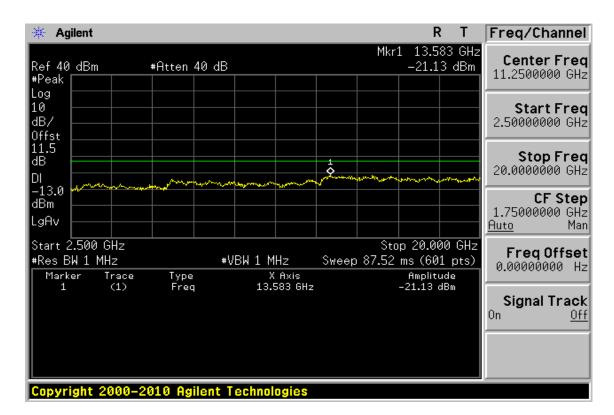


Figure 9-6: Out of Band emission at antenna terminals – GSM 1900 Channel Lowest



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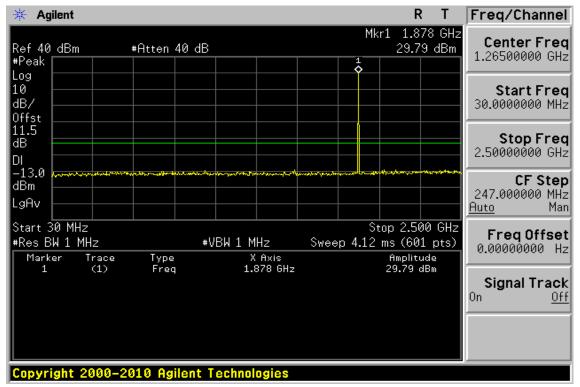
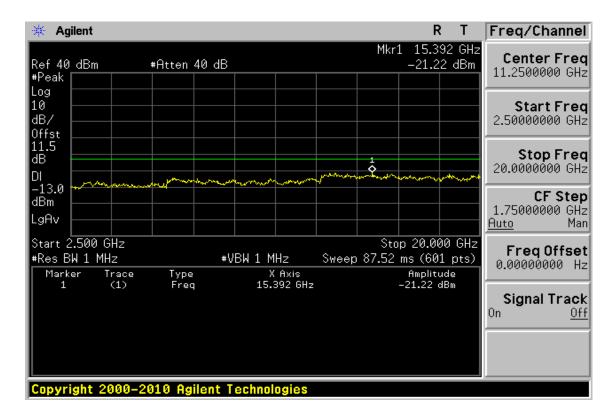


Figure 9-7: Out of Band emission at antenna terminals – GSM 1900 Channel Mid



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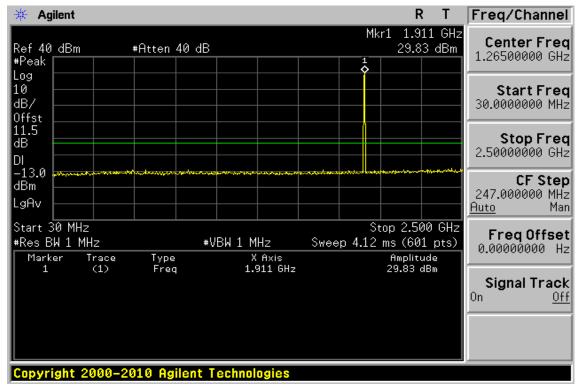
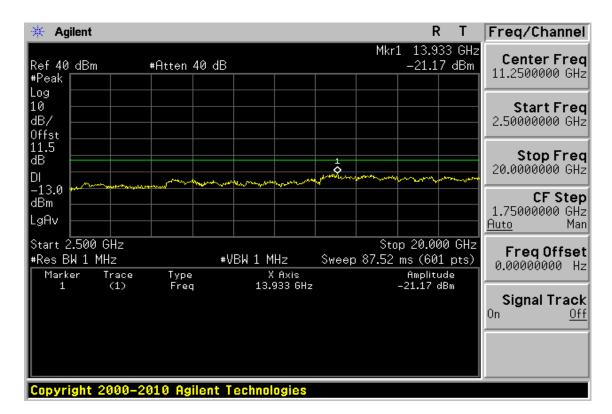


Figure 9-8: Out of Band emission at antenna terminals – GSM 1900 Channel Highest



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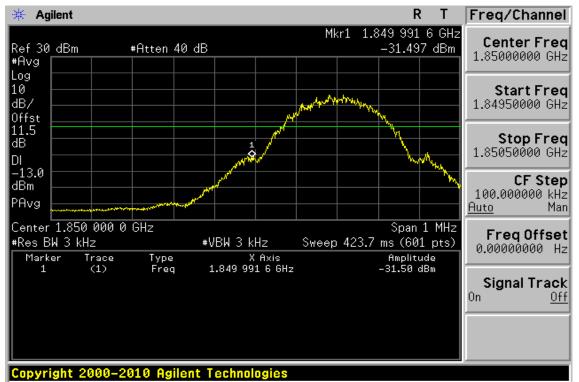
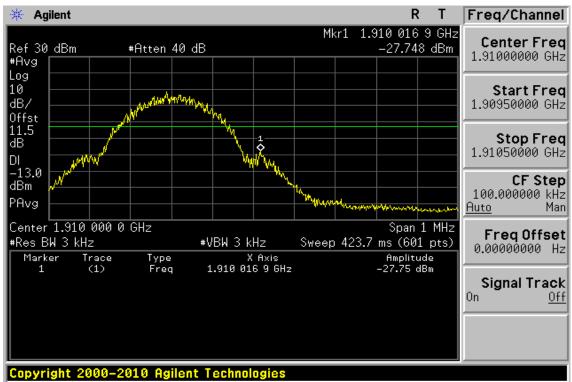


Figure 9-9: Band edge emission at antenna terminals – GSM 1900 Channel Lowest



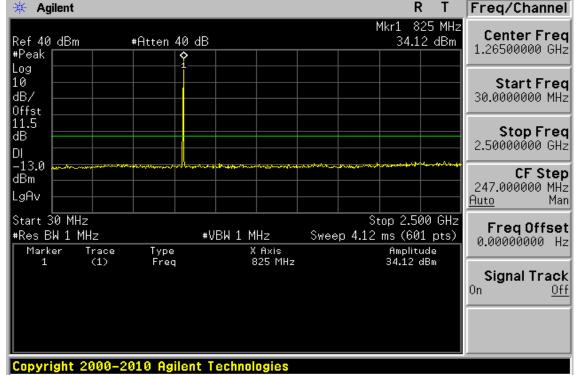


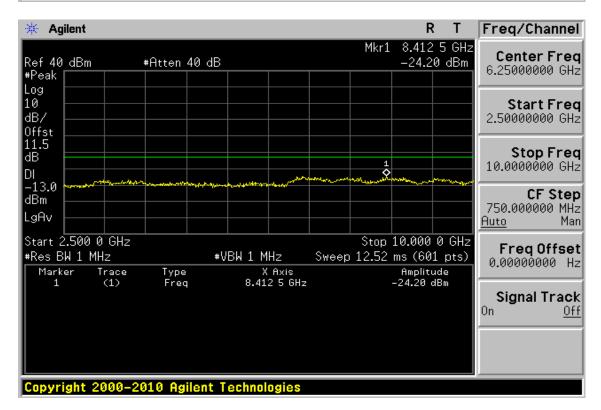
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# Figure 9-11: Out of Band emission at antenna terminals – GPRS 850 Channel Lowest





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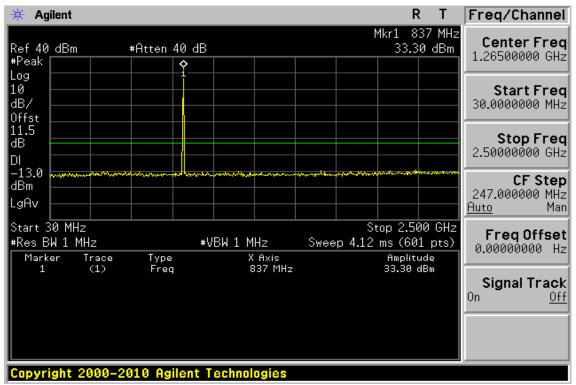
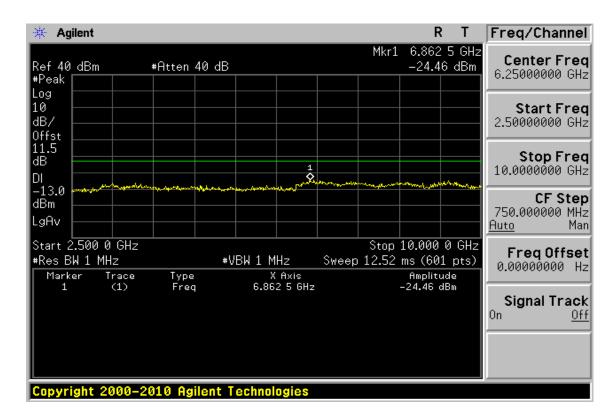


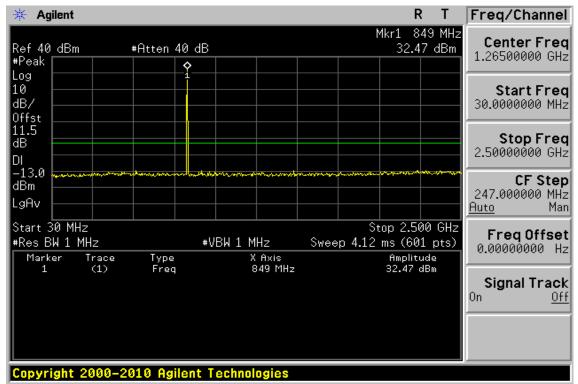
Figure 9-12: Out of Band emission at antenna terminals – GPRS 850 Channel Mid



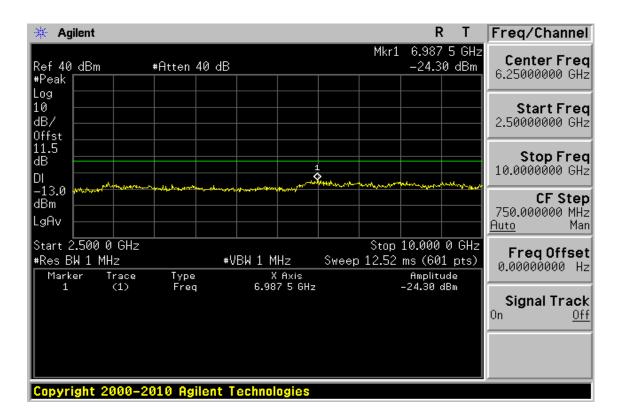
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## Figure 9-13: Out of Band emission at antenna terminals – GPRS 850 Channel Highest



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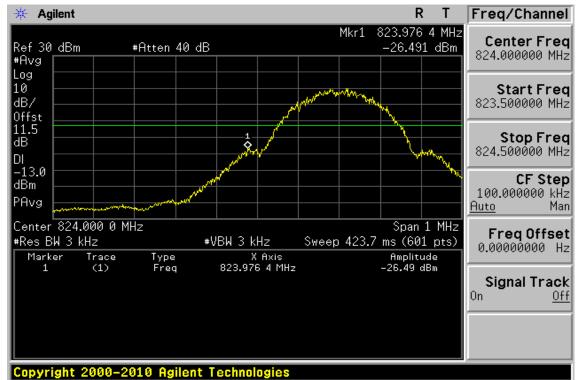
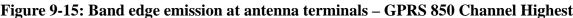
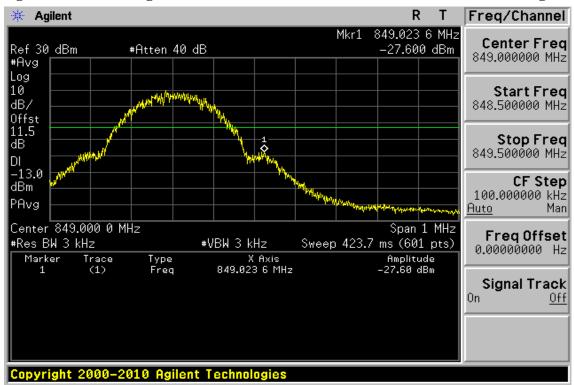


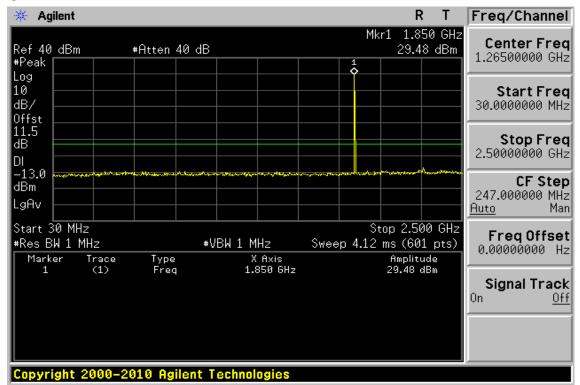
Figure 9-14: Band edge emission at antenna terminals – GPRS 850 Channel Lowest



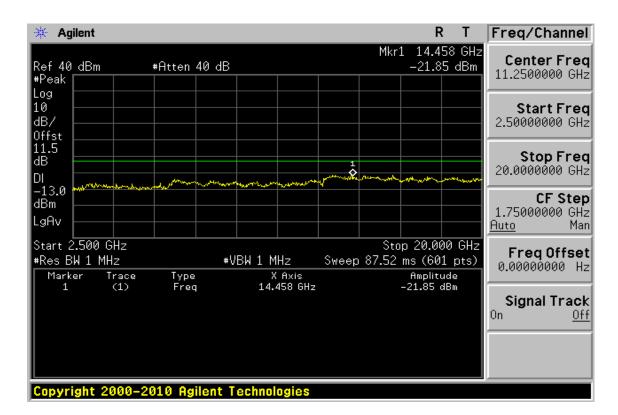




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### Figure 9-16: Out of Band emission at antenna terminals – GPRS 1900 Channel Lowest



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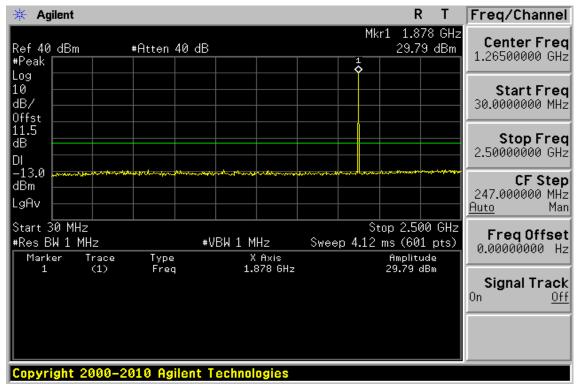
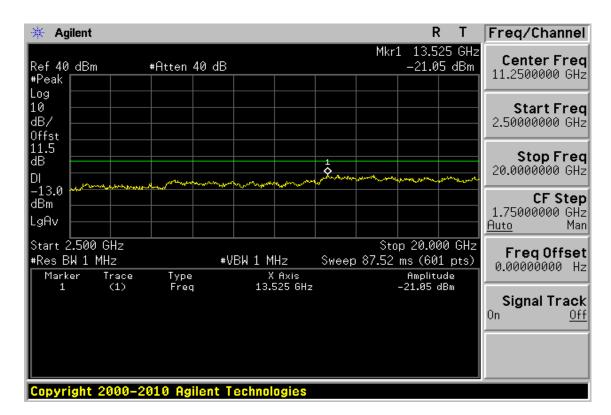


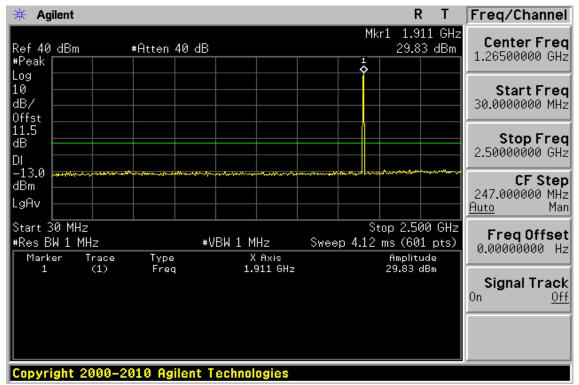
Figure 9-17: Out of Band emission at antenna terminals – GPRS 1900 Channel Mid



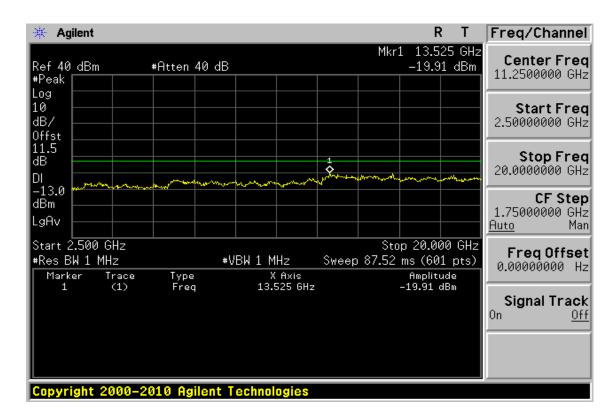
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### Figure 9-18: Out of Band emission at antenna terminals – GPRS 1900 Channel Highest



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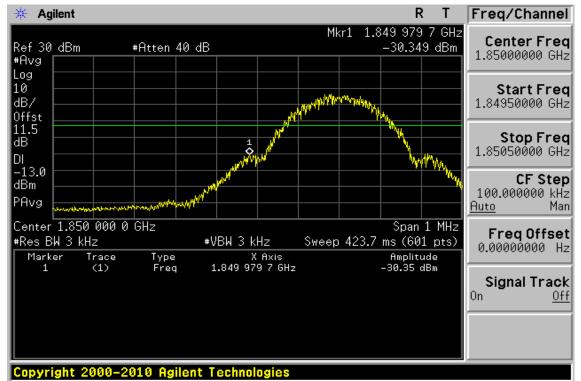
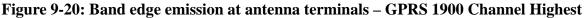
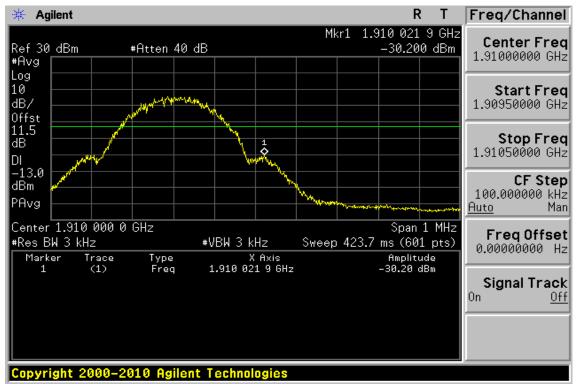


Figure 9-19: Band edge emission at antenna terminals – GPRS 1900 Channel Lowest

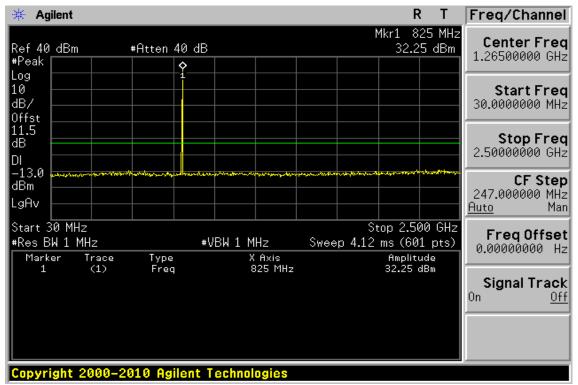




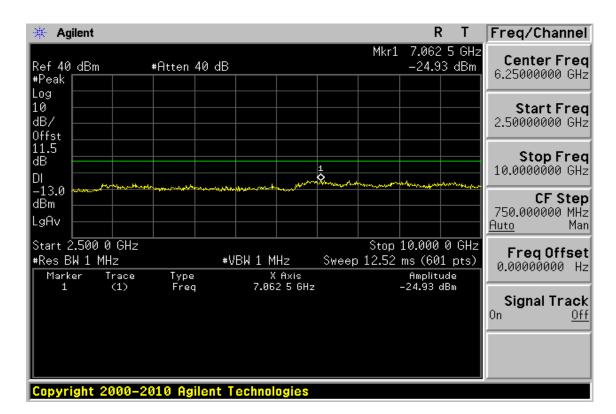
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# Figure 9-21: Out of Band emission at antenna terminals – EDGE 850 Channel Lowest



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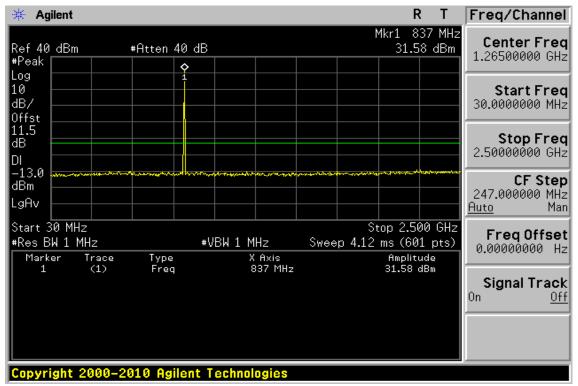
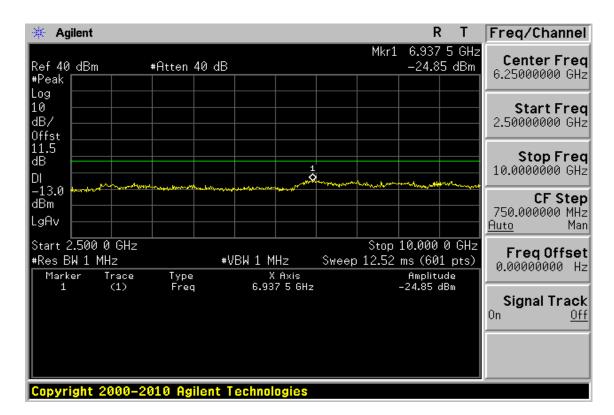


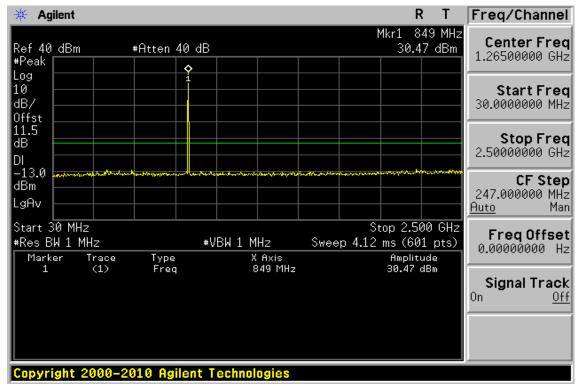
Figure 9-22: Out of Band emission at antenna terminals – EDGE 850 Channel Mid



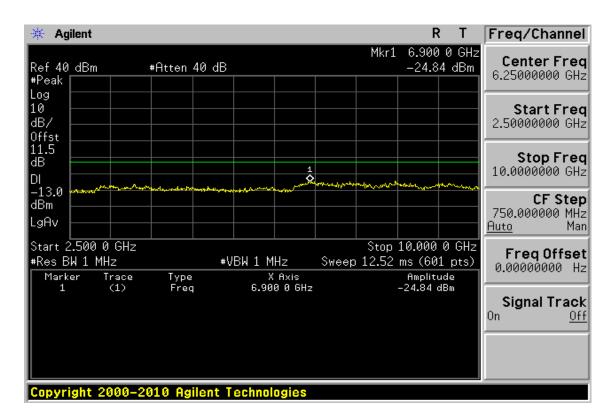
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### Figure 9-23: Out of Band emission at antenna terminals – EDGE 850 Channel Highest



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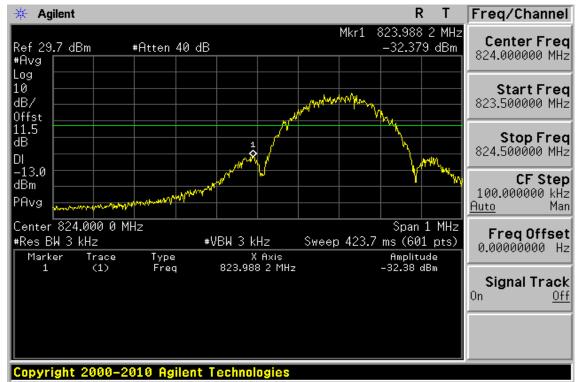
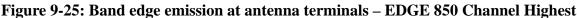
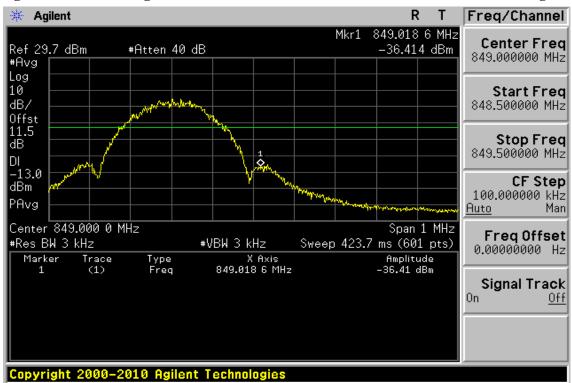


Figure 9-24: Band edge emission at antenna terminals – EDGE 850 Channel Lowest







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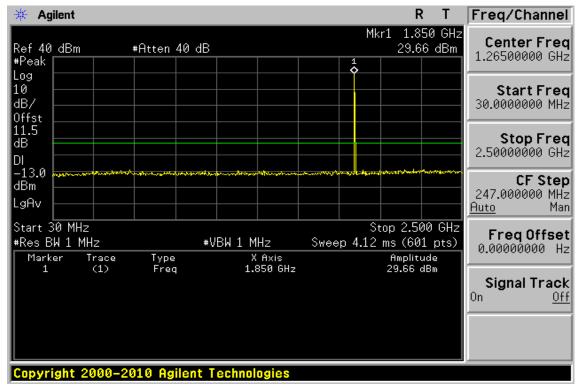
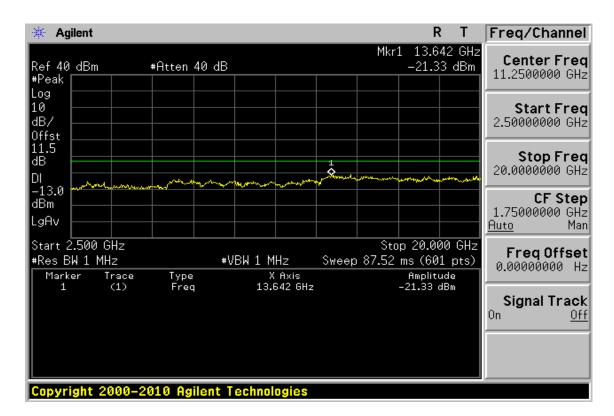


Figure 9-26: Out of Band emission at antenna terminals – EDGE 1900 Channel Lowest



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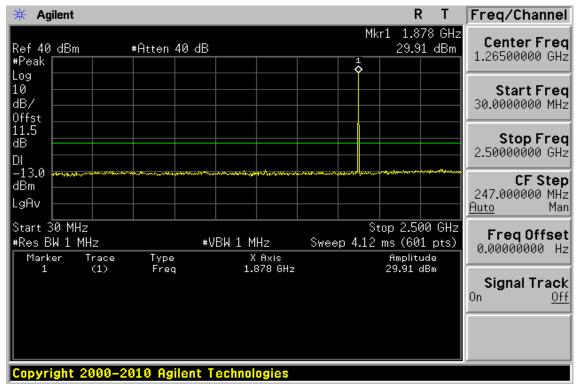
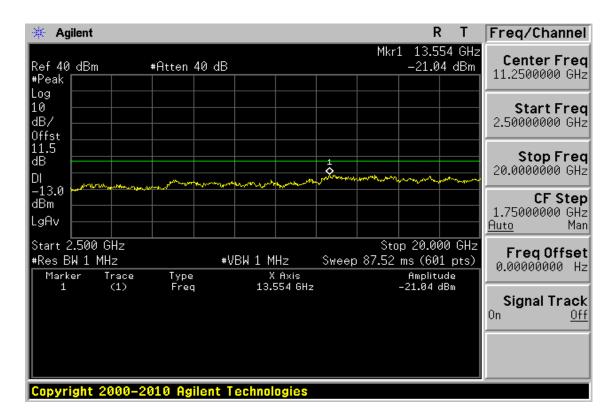


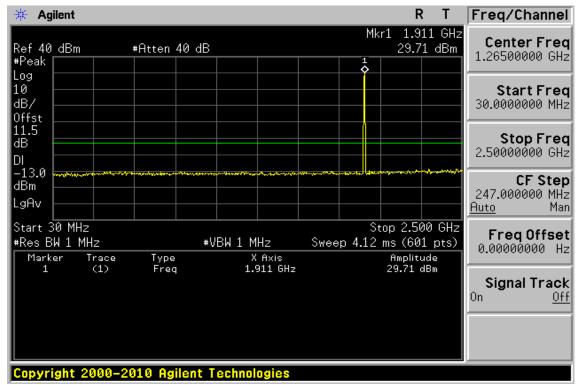
Figure 9-27: Out of Band emission at antenna terminals – EDGE 1900 Channel Mid



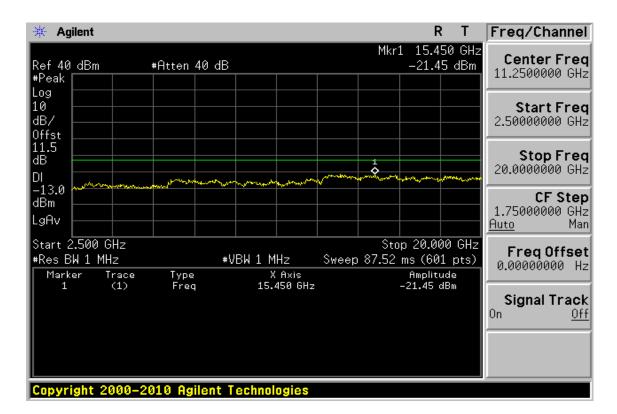
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# Figure 9-28: Out of Band emission at antenna terminals – EDGE 1900 Channel Highest





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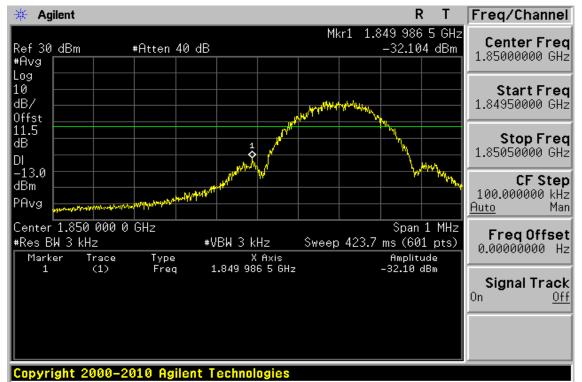
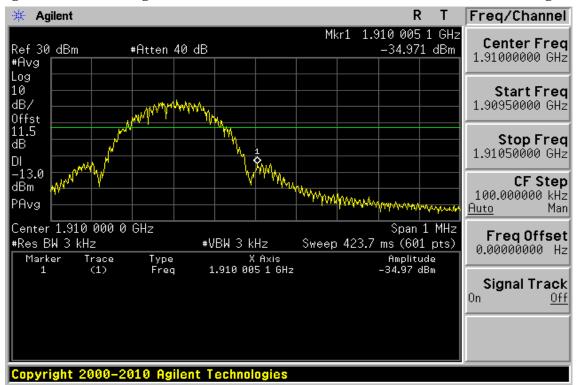


Figure 9-29: Band edge emission at antenna terminals – EDGE 1900 Channel Lowest

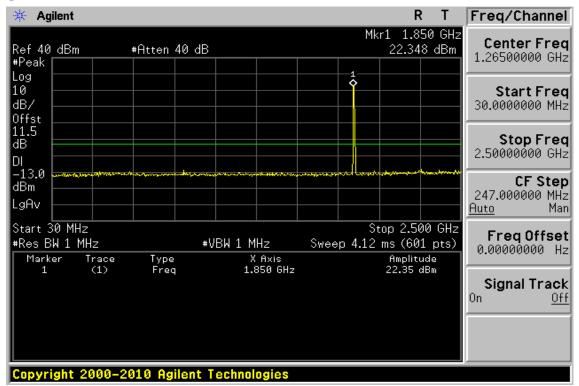
Figure 9-30: Band edge emission at antenna terminals - EDGE 1900 Channel Highest



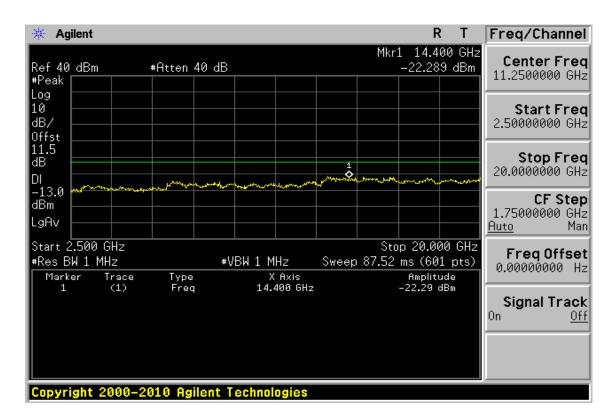
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### Figure 9-31: Out of Band emission at antenna terminals – WCDMA II Channel Lowest





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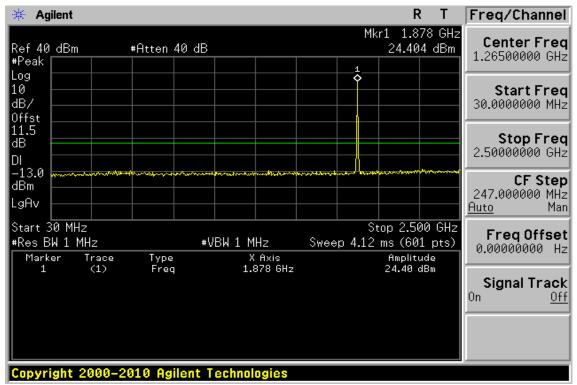
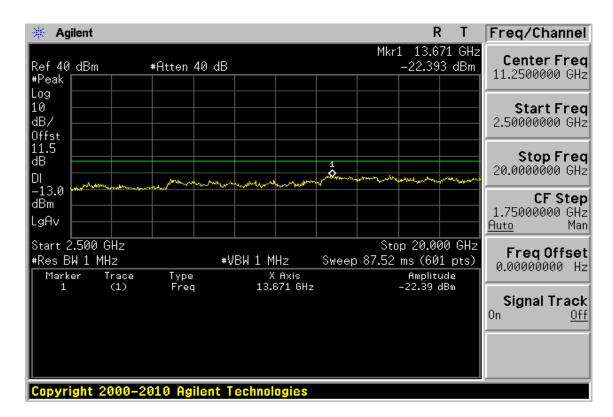


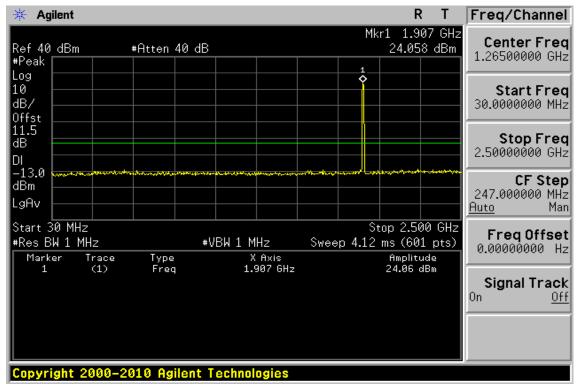
Figure 9-32: Out of Band emission at antenna terminals – WCDMA II Channel Mid



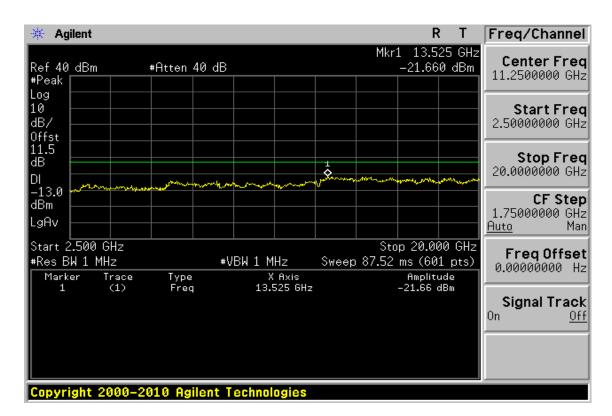
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# Figure 9-33: Out of Band emission at antenna terminals – WCDMA II Channel Highest



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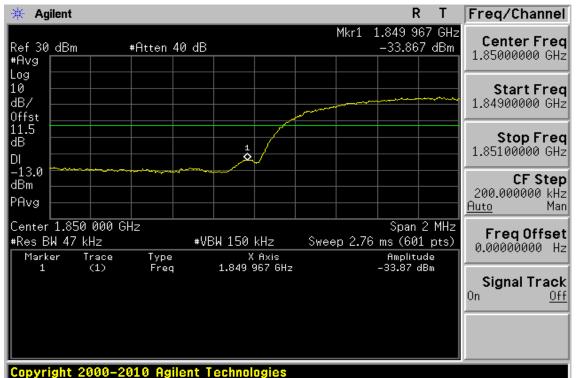
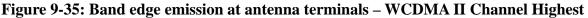
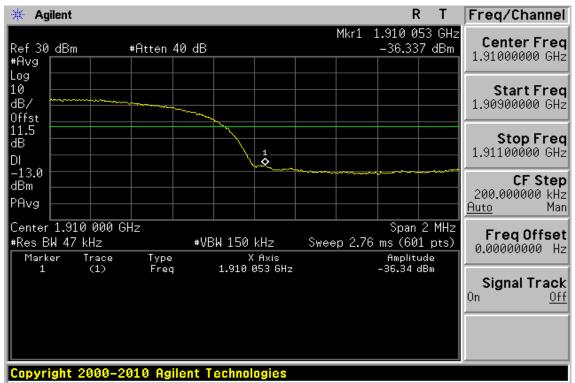


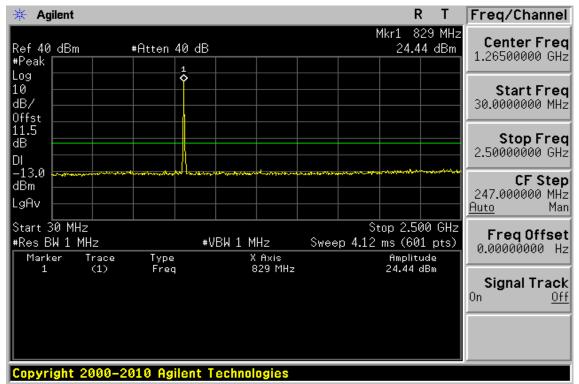
Figure 9-34: Band edge emission at antenna terminals – WCDMA II Channel Lowest



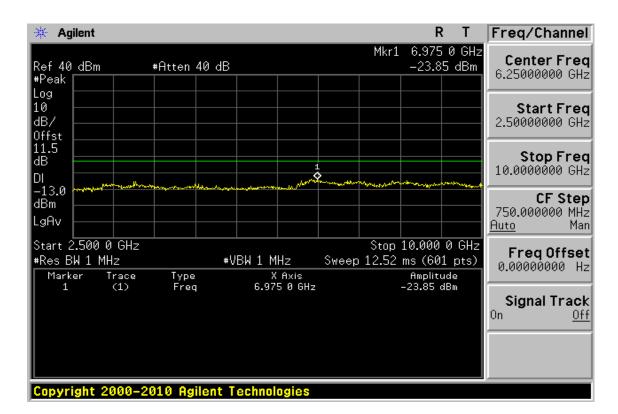




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# Figure 9-36: Out of Band emission at antenna terminals – WCDMA V Channel Lowest





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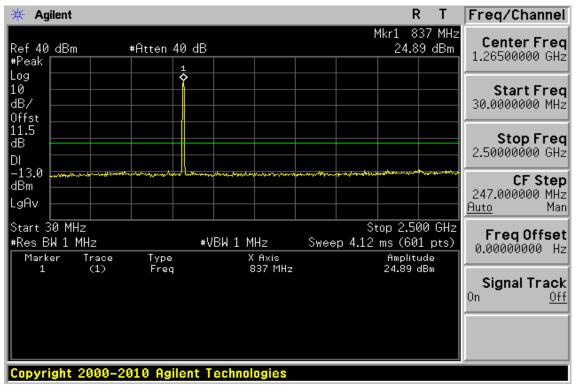
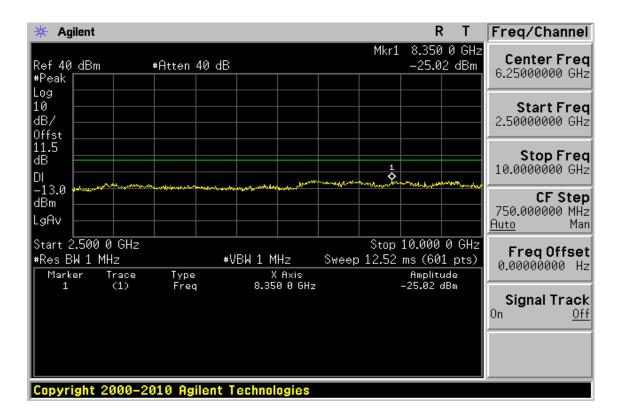


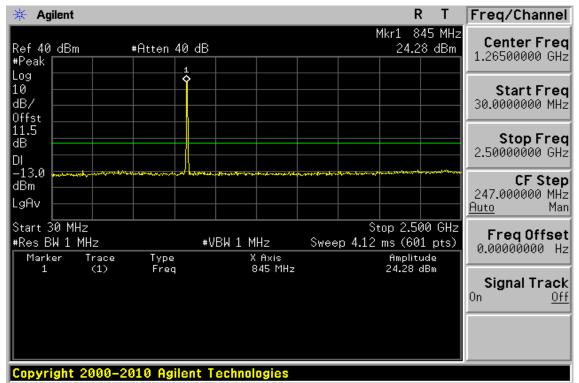
Figure 9-37: Out of Band emission at antenna terminals - WCDMA V Channel Mid



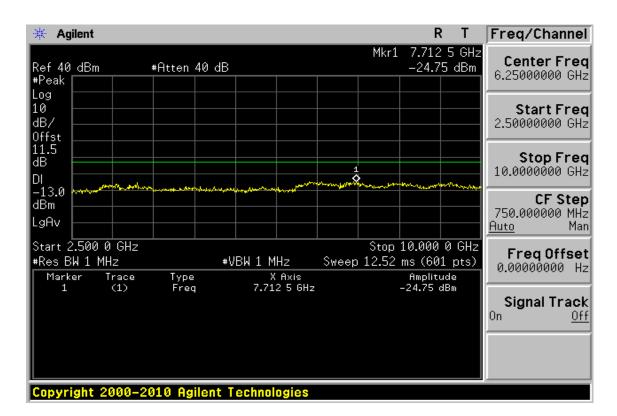
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### Figure 9-38: Out of Band emission at antenna terminals – WCDMA V Channel Highest



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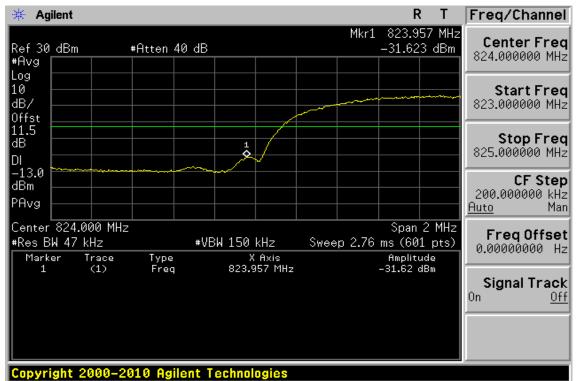
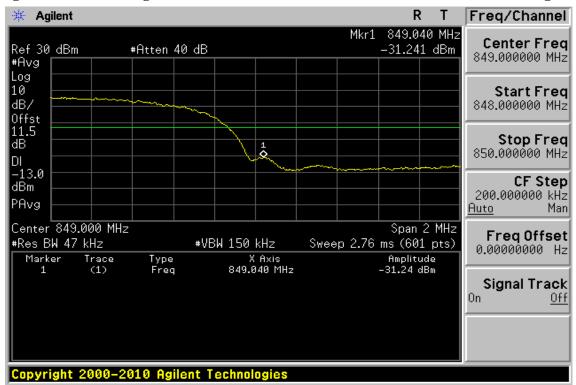


Figure 9-39: Band edge emission at antenna terminals – WCDMA V Channel Lowest

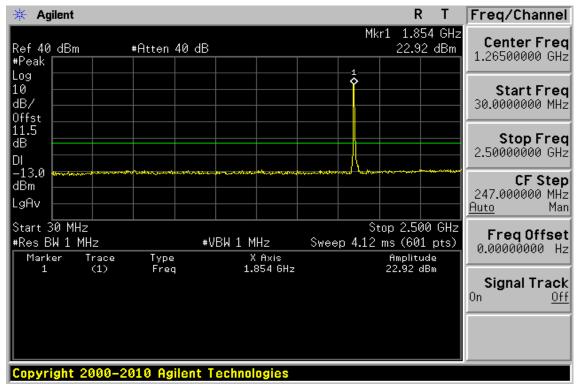
#### Figure 9-40: Band edge emission at antenna terminals – WCDMA V Channel Highest



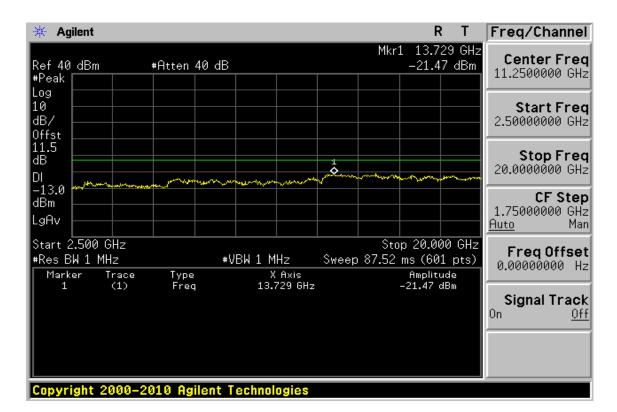
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# Figure 9-41: Out of Band emission at antenna terminals – HSDPA II Channel Lowest



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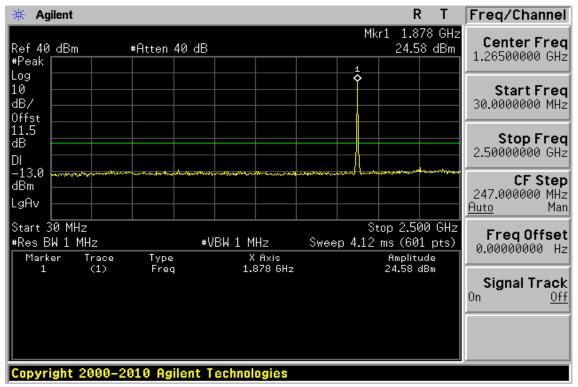
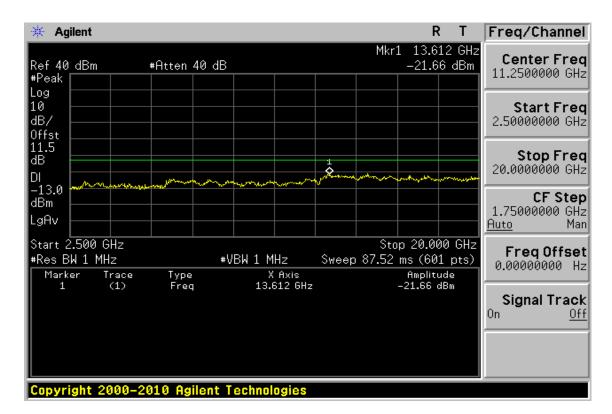


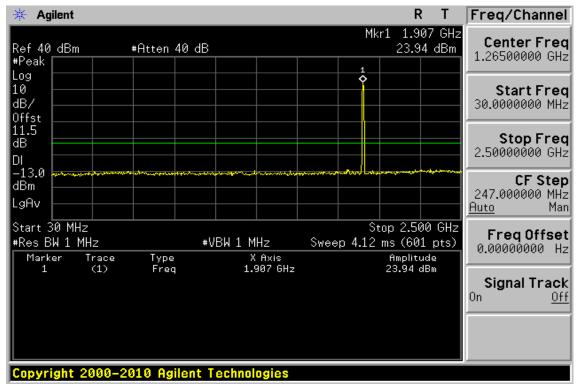
Figure 9-42: Out of Band emission at antenna terminals – HSDPA II Channel Mid



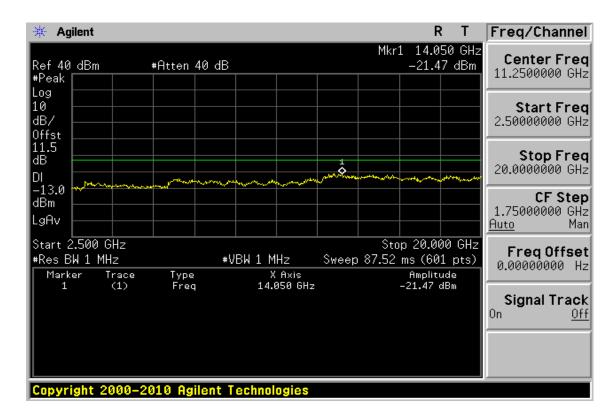
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# Figure 9-43: Out of Band emission at antenna terminals – HSDPA II Channel Highest





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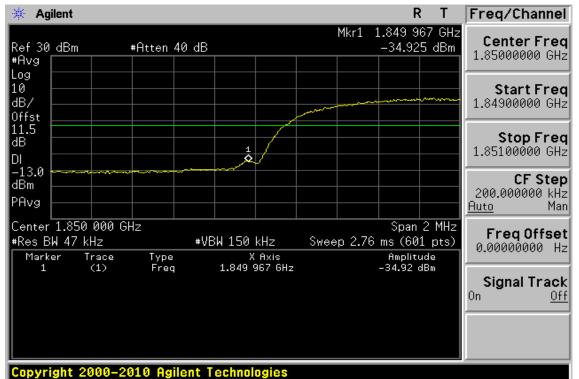
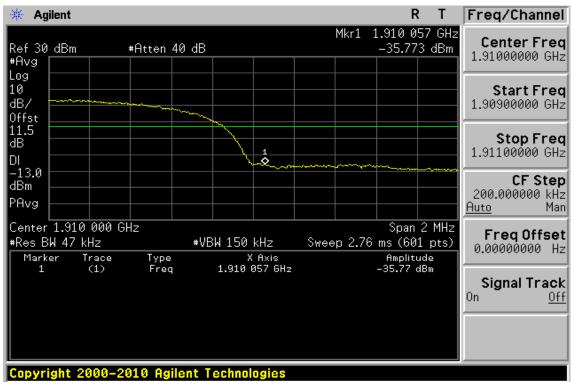


Figure 9-44: Band edge emission at antenna terminals – HSDPA II Channel Lowest

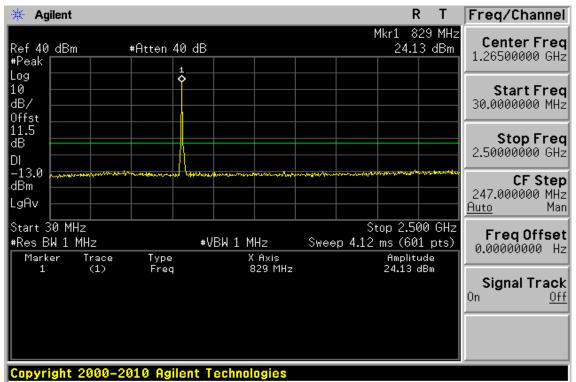




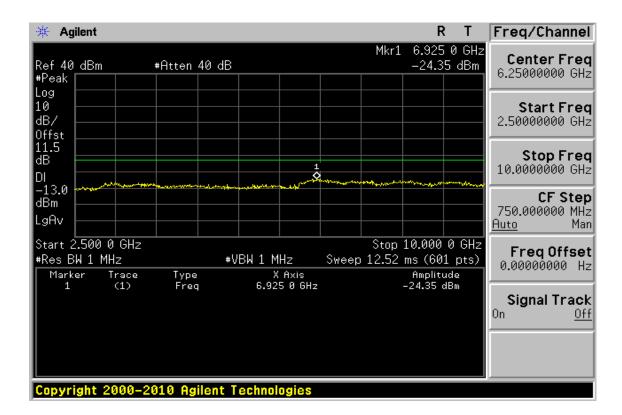
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# Figure 9-46: Out of Band emission at antenna terminals – HSDPA V Channel Lowest



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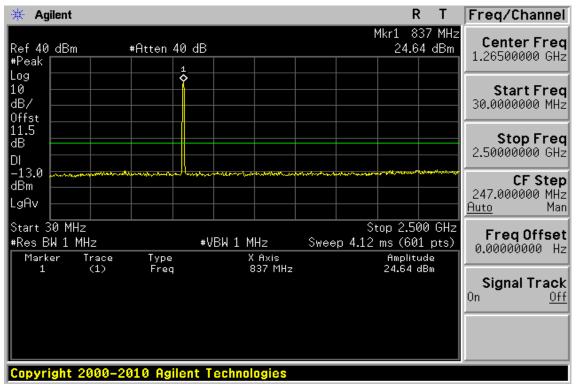
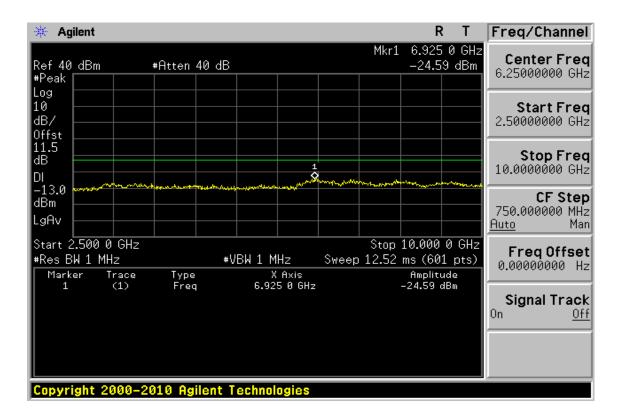


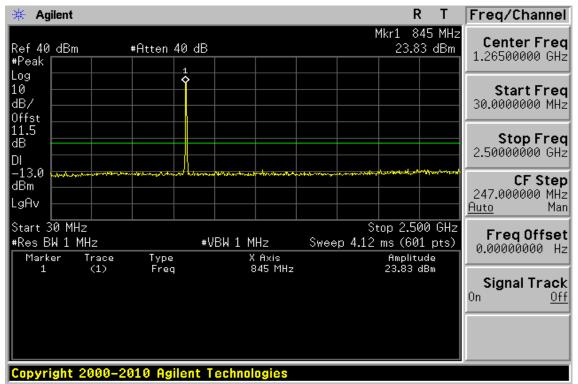
Figure 9-47: Out of Band emission at antenna terminals – HSDPA V Channel Mid



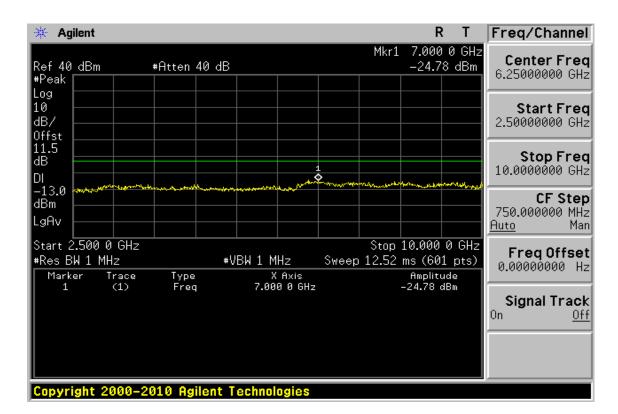
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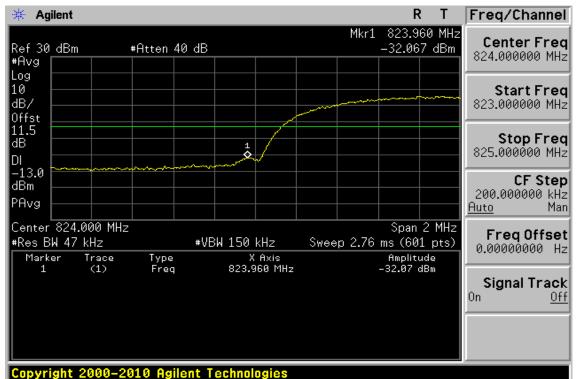


# Figure 9-48: Out of Band emission at antenna terminals – HSDPA V Channel Highest



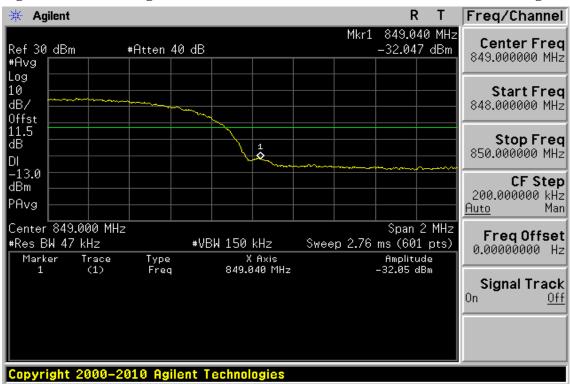


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# Figure 9-49: Band edge emission at antenna terminals – HSDPA V Channel Lowest

#### Figure 9-50: Band edge emission at antenna terminals – HSDPA V Channel Highest



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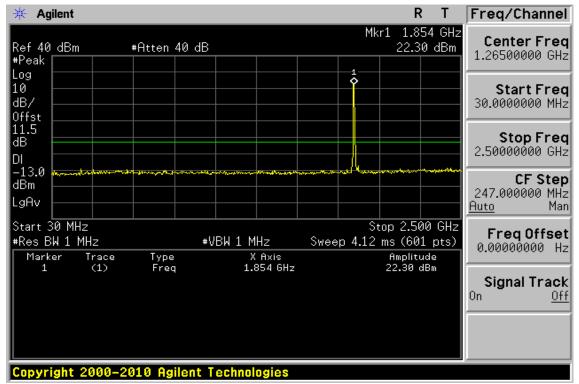
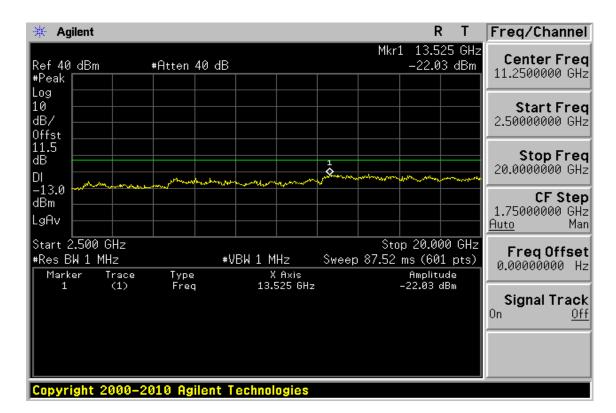


Figure 9-51: Out of Band emission at antenna terminals – HSUPA II Channel Lowest



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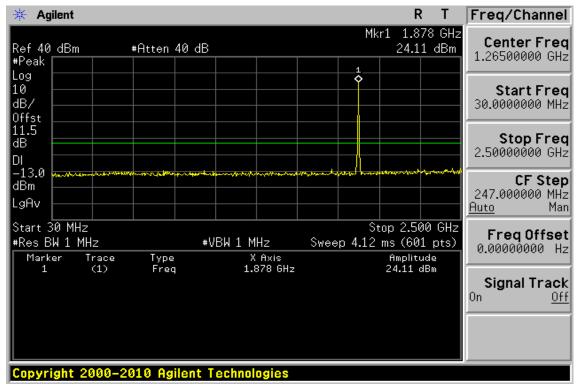
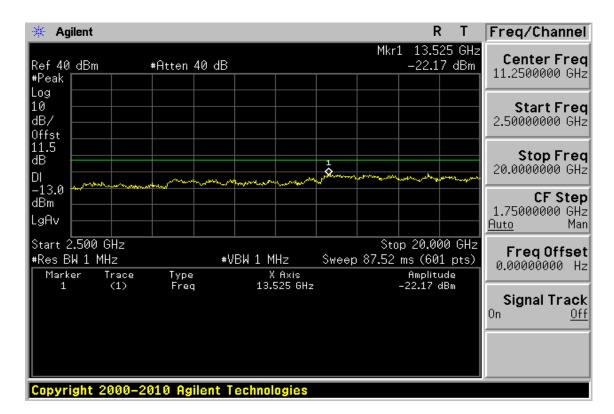


Figure 9-52: Out of Band emission at antenna terminals – HSUPA II Channel Mid



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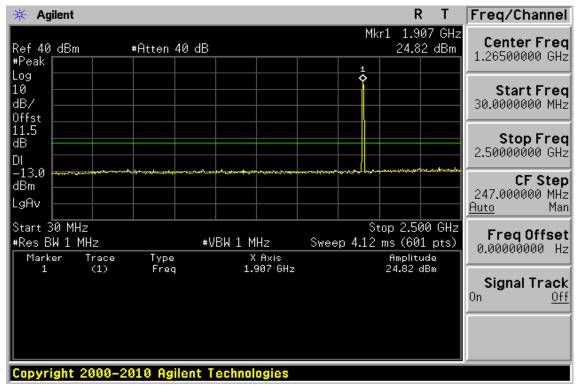
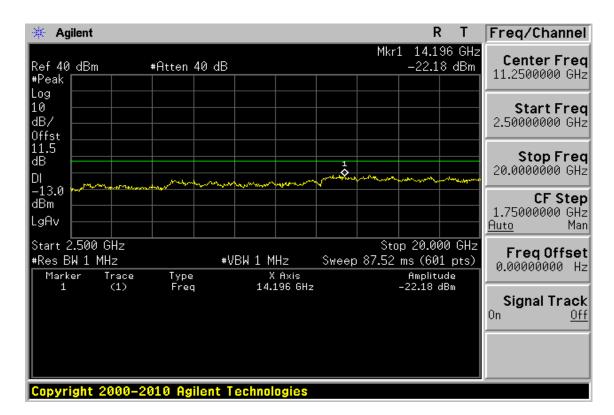


Figure 9-53: Out of Band emission at antenna terminals – HSUPA II Channel Highest



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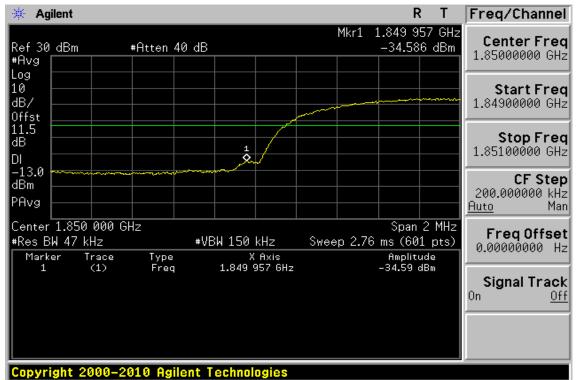
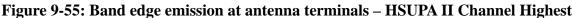
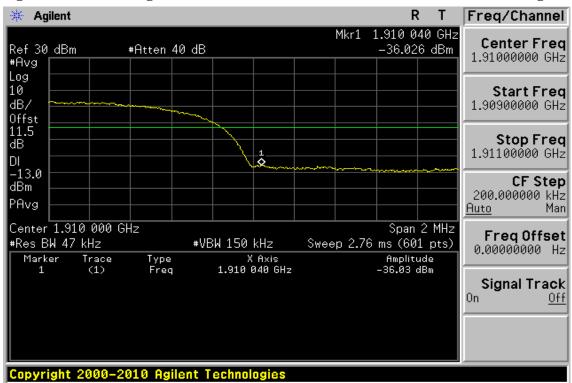


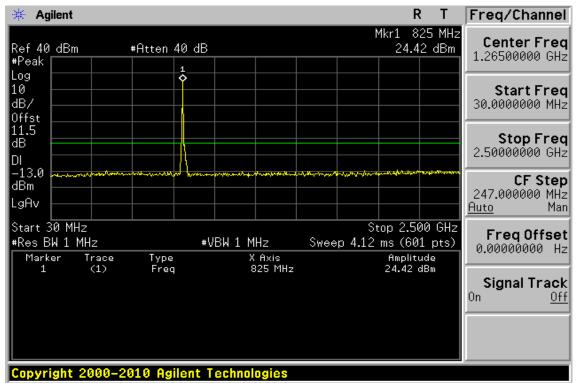
Figure 9-54: Band edge emission at antenna terminals – HSUPA II Channel Lowest



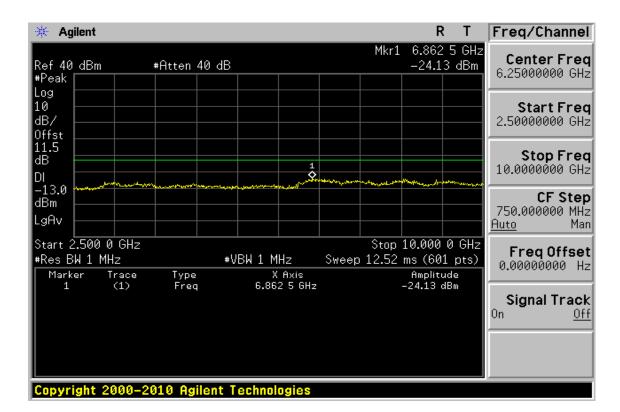




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# Figure 9-56: Out of Band emission at antenna terminals – HSUPA V Channel Lowest





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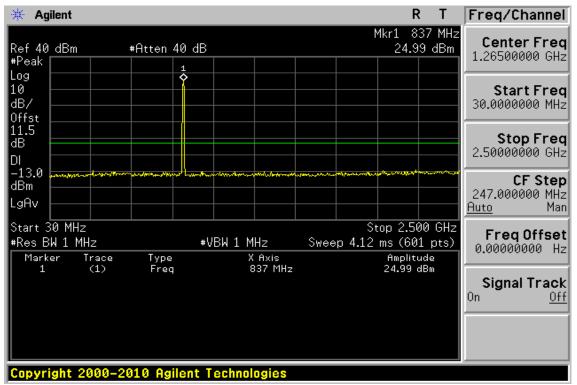
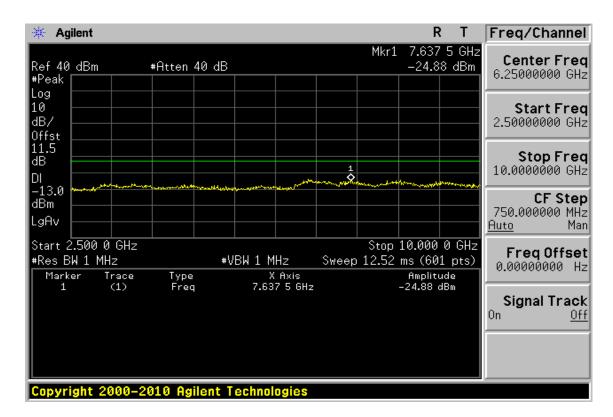


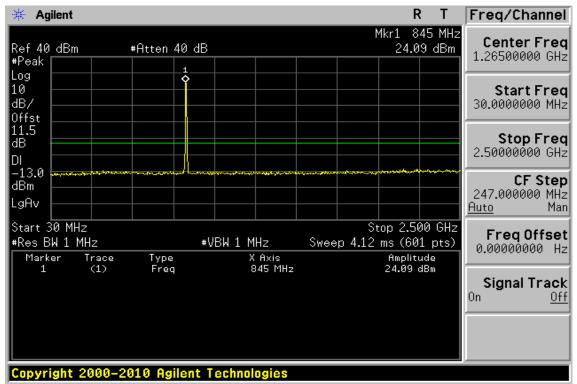
Figure 9-57: Out of Band emission at antenna terminals – HSUPA V Channel Mid



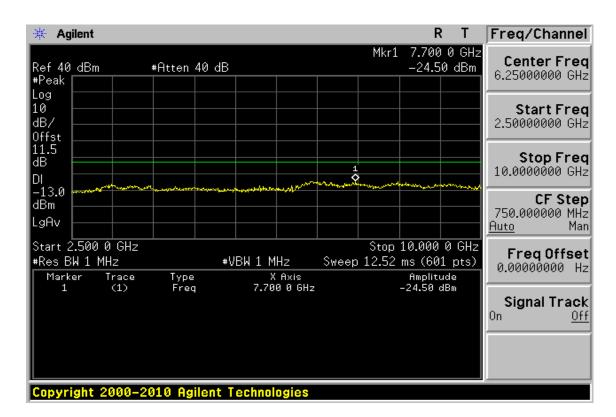
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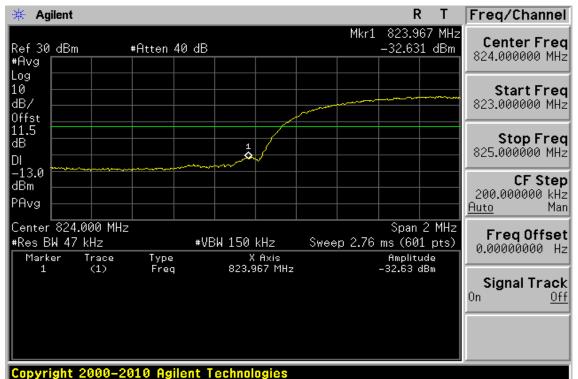
### Figure 9-58: Out of Band emission at antenna terminals – HSUPA V Channel Highest



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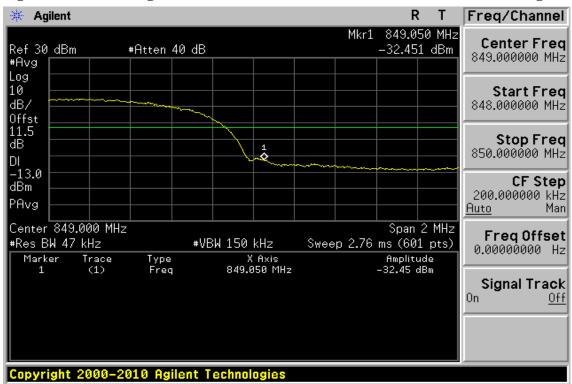


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#### Figure 9-59: Band edge emission at antenna terminals – HSUPA V Channel Lowest

#### Figure 9-60: Band edge emission at antenna terminals – HSUPA V Channel Highest



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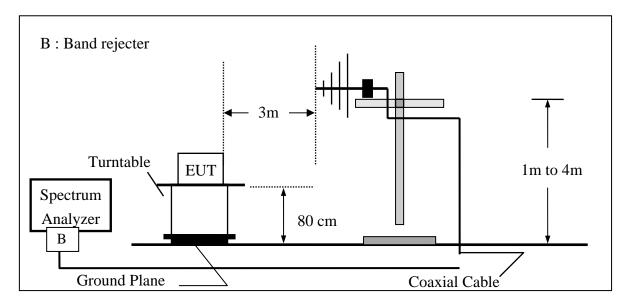
# **10. FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT (TX)**

# **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):**



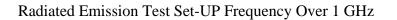
Radiated Emission Test Set-Up, Frequency Below 1000MHz

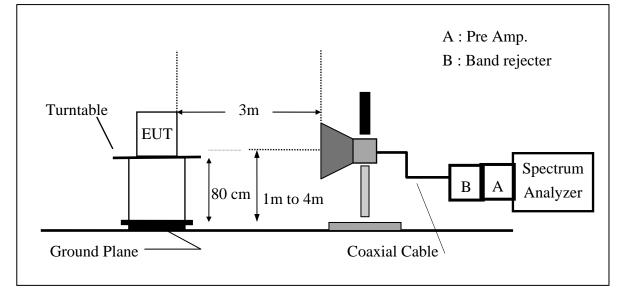
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#### **10.3. Measurement Procedure:**

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

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



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# Radiated Spurious Emission Measurement Result: GSM 850 Mode (The worst case)

Operation Mode	: TX CH Low Mode	Test Date:	Aug. 12, 2011
Fundamental Frequency	: 824.20 MHz	Test By:	Nick
Temperature	: 25°C	Pol:	Ver
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)	Safe Margin (dBm)
183.26	41.08	V	-59.20	-7.83	1.67	-68.69	-13.00	-55.69
199.75	44.64	V	-57.12	-7.84	1.71	-66.67	-13.00	-53.67
233.70	37.31	V	-63.20	-7.87	1.90	-72.97	-13.00	-59.97
321.00	35.44	V	-62.55	-7.80	2.25	-72.60	-13.00	-59.60
555.74	34.07	V	-58.08	-7.76	2.97	-68.82	-13.00	-55.82
645.95	33.54	V	-55.43	-7.81	3.15	-66.39	-13.00	-53.39
1648.40	70.68	V	-33.90	9.29	5.23	-29.84	-13.00	-16.84
2472.60	58.01	V	-43.00	10.08	6.53	-39.45	-13.00	-26.45
3296.80	49.84	V	-49.03	12.17	7.71	-44.58	-13.00	-31.58
4121.00		V		12.61	8.86		-13.00	
4945.20	38.77	V	-53.70	12.65	9.74	-50.79	-13.00	-37.79
5769.40		V		13.55	10.54		-13.00	
6593.60		V		12.05	11.30		-13.00	
7417.80		V		11.49	12.10		-13.00	
8242.00		V		11.48	12.71		-13.00	

Remark:

1 The emission behaviors belong to narrowband spurious emission.

2 Remark "---" means that the emission level is too low to be measured

3 The result basic equation calculation is as follows:

4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) - Cable loss (dB)

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Operation Mode Fundamental Frequency	: TX CH Low Mode : 824.20 MHz	Test Date: Test By:	Aug. 12, 2011 Nick
Temperature	: 25°C	Pol:	Hor
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)	Safe Margin (dBm)
131.85	38.07	Н	-61.60	-7.79	1.51	-70.89	-13.00	-57.89
199.75	43.27	Н	-58.36	-7.84	1.71	-67.91	-13.00	-54.91
241.46	35.20	Н	-64.44	-7.88	1.94	-74.26	-13.00	-61.26
306.45	33.99	Н	-63.61	-7.88	2.19	-73.69	-13.00	-60.69
532.46	33.49	Н	-58.84	-7.75	2.90	-69.49	-13.00	-56.49
697.36	32.79	Н	-54.95	-7.86	3.28	-66.09	-13.00	-53.09
1648.40	70.37	Н	-34.03	9.29	5.23	-29.97	-13.00	-16.97
2472.60	62.12	Н	-38.79	10.08	6.53	-35.24	-13.00	-22.24
3296.80	48.64	Н	-50.46	12.17	7.71	-46.00	-13.00	-33.00
4121.00	38.22	Н	-58.03	12.61	8.86	-54.28	-13.00	-41.28
4945.20	37.81	Н	-54.83	12.65	9.74	-51.91	-13.00	-38.91
5769.40		Н		13.55	10.54		-13.00	
6593.60		Н		12.05	11.30		-13.00	
7417.80		Н		11.49	12.10		-13.00	
8242.00		Н		11.48	12.71		-13.00	

Remark:

1 The emission behaviors belong to narrowband spurious emission.

2 Remark "---" means that the emission level is too low to be measured

3 The result basic equation calculation is as follows:

4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) - Cable loss (dB)

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Operation Mode	: TX CH Mid Mode	Test Date:	Aug. 12, 2011
Fundamental Frequency	: 836.60 MHz	Test By:	Nick
Temperature	: 25°C	Pol:	Ver
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)	Safe Margin (dBm)
131.85	37.49	V	-61.48	-7.79	1.51	-70.77	-13.00	-57.77
199.75	43.31	V	-58.45	-7.84	1.71	-68.00	-13.00	-55.00
233.70	36.61	V	-63.90	-7.87	1.90	-73.67	-13.00	-60.67
340.47	32.42	V	-65.33	-7.69	2.32	-75.35	-13.00	-62.35
561.56	33.59	V	-58.22	-7.77	2.98	-68.97	-13.00	-55.97
655.65	33.61	V	-55.37	-7.82	3.17	-66.36	-13.00	-53.36
1673.20	67.03	V	-37.53	9.36	5.27	-33.43	-13.00	-20.43
2509.80	58.95	V	-41.83	10.09	6.58	-38.33	-13.00	-25.33
3346.40	45.28	V	-53.58	12.28	7.79	-49.10	-13.00	-36.10
4183.00		V		12.62	8.93		-13.00	
5019.60		V		12.67	9.81		-13.00	
5856.20		V		13.68	10.62		-13.00	
6692.80		V		11.95	11.39		-13.00	
7529.40		V		11.45	12.20		-13.00	
8366.00		V		11.59	12.81		-13.00	

Remark:

- 1 The emission behaviors belongs to narrowband spurious emission.
- 2 Remark "---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) Cable loss (dB)



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Operation Mode	: TX CH Mid Mode	Test Date:	Aug. 12, 2011
Fundamental Frequency	: 836.60 MHz	Test By:	Nick
Temperature	: 25°C	Pol:	Hor
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)	Safe Margin (dBm)
138.64	36.37	Н	-62.59	-7.79	1.54	-71.92	-13.00	-58.92
199.75	42.87	Н	-58.76	-7.84	1.71	-68.31	-13.00	-55.31
209.45	42.58	Н	-58.61	-7.85	1.76	-68.22	-13.00	-55.22
233.70	35.17	Н	-64.84	-7.87	1.90	-74.61	-13.00	-61.61
303.54	33.83	Н	-63.80	-7.90	2.18	-73.88	-13.00	-60.88
612.00	34.57	Н	-55.89	-7.79	3.06	-66.75	-13.00	-53.75
1673.20	66.92	Н	-37.46	9.36	5.27	-33.36	-13.00	-20.36
2509.80	60.01	Н	-40.69	10.09	6.58	-37.19	-13.00	-24.19
3346.40	48.39	Н	-50.67	12.28	7.79	-46.19	-13.00	-33.19
4183.00	39.06	Н	-56.97	12.62	8.93	-53.28	-13.00	-40.28
5019.60		Н		12.67	9.81		-13.00	
5856.20		Н		13.68	10.62		-13.00	
6692.80		Н		11.95	11.39		-13.00	
7529.40		Н		11.45	12.20		-13.00	
8366.00		Н		11.59	12.81		-13.00	

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark "---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) Cable loss (dB)



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Operation Mode	: TX CH High Mode	Test Date:	Aug. 12, 2011
Fundamental Frequency	: 848.80 MHz	Test By:	Nick
Temperature	: 25°C	Pol:	Ver
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)	Safe Margin (dBm)
160.95	34.91	V	-63.36	-7.81	1.62	-72.79	-13.00	-59.79
199.75	43.74	V	-58.02	-7.84	1.71	-67.57	-13.00	-54.57
233.70	36.38	V	-64.13	-7.87	1.90	-73.90	-13.00	-60.90
303.54	35.19	V	-63.02	-7.90	2.18	-73.10	-13.00	-60.10
534.40	33.35	V	-59.65	-7.75	2.91	-70.31	-13.00	-57.31
689.60	33.59	V	-55.74	-7.85	3.26	-66.85	-13.00	-53.85
1697.60	67.30	V	-37.24	9.44	5.31	-33.11	-13.00	-20.11
2546.40	56.15	V	-44.49	10.20	6.63	-40.93	-13.00	-27.93
3395.20	44.31	V	-54.54	12.38	7.87	-50.03	-13.00	-37.03
4244.00		V		12.63	9.00		-13.00	
5092.80		V		12.74	9.88		-13.00	
5941.60		V		13.81	10.70		-13.00	
6790.40		V		11.86	11.48		-13.00	
7639.20		V		11.40	12.27		-13.00	
8488.00		V		11.70	12.91		-13.00	

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark "---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) Cable loss (dB)

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Operation Mode	: TX CH High Mode	Test Date:	Aug. 12, 2011
Fundamental Frequency	: 848.80 MHz	Test By:	Nick
Temperature	: 25°C	Pol:	Hor
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)	Safe Margin (dBm)
199.75	43.99	Н	-57.64	-7.84	1.71	-67.19	-13.00	-54.19
219.15	38.99	Н	-61.73	-7.86	1.82	-71.41	-13.00	-58.41
289.96	36.96	Н	-61.01	-7.91	2.13	-71.06	-13.00	-58.06
466.50	35.08	Н	-58.66	-7.71	2.71	-69.08	-13.00	-56.08
524.70	35.67	Н	-56.93	-7.74	2.88	-67.54	-13.00	-54.54
655.65	33.78	Н	-55.70	-7.82	3.17	-66.69	-13.00	-53.69
1697.60	61.73	Н	-42.62	9.44	5.31	-38.49	-13.00	-25.49
2546.40	55.73	Н	-44.87	10.20	6.63	-41.31	-13.00	-28.31
3395.20	50.44	Н	-48.59	12.38	7.87	-44.07	-13.00	-31.07
4244.00		Н		12.63	9.00		-13.00	
5092.80		Н		12.74	9.88		-13.00	
5941.60		Н		13.81	10.70		-13.00	
6790.40		Н		11.86	11.48		-13.00	
7639.20		Н		11.40	12.27		-13.00	
8488.00		Н		11.70	12.91		-13.00	

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark "---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) Cable loss (dB)

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#### Radiated Spurious Emission Measurement Result: EDGE 1900 Mode (The worst case)

Operation Mode	: TX CH Low Mode	Test Date:	Aug. 12, 2011
Fundamental Frequency	: 1850.20MHz	Test By:	Nick
Temperature	: 25°C	Pol:	Ver
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
151.25	33.54	V	-63.86	-7.80	1.59	-73.26	-13.00	-60.26
183.26	35.32	V	-64.96	-7.83	1.67	-74.45	-13.00	-61.45
233.70	37.24	V	-63.27	-7.87	1.90	-73.04	-13.00	-60.04
321.00	34.01	V	-63.98	-7.80	2.25	-74.03	-13.00	-61.03
461.65	33.74	V	-60.24	-7.70	2.69	-70.64	-13.00	-57.64
655.65	33.12	V	-55.86	-7.82	3.17	-66.85	-13.00	-53.85
3700.40	34.41	V	-63.52	12.61	8.31	-59.22	-13.00	-46.22
5550.60		V		13.23	10.33		-13.00	
7400.80		V		11.50	12.08		-13.00	
9251.00		V		11.92	13.50		-13.00	
11101.20		V		11.66	15.11		-13.00	
12951.40		V		13.63	16.60		-13.00	
14801.60		V		12.76	17.95		-13.00	
16651.80		V		15.92	19.14		-13.00	
18502.00		V		18.75	10.40		-13.00	

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark "---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) Cable loss (dB)

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Operation Mode	: TX CH Low Mode	Test Date:	Aug. 12, 2011
Fundamental Frequency	: 1850.20MHz	Test By:	Nick
Temperature	: 25°C	Pol:	Hor
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
149.31	33.75	Н	-64.09	-7.80	1.59	-73.48	-13.00	-60.48
212.36	38.52	Н	-62.53	-7.85	1.78	-72.16	-13.00	-59.16
233.70	38.92	Н	-61.09	-7.87	1.90	-70.86	-13.00	-57.86
325.85	32.89	Н	-64.53	-7.78	2.27	-74.58	-13.00	-61.58
544.10	32.89	Н	-59.03	-7.76	2.94	-69.73	-13.00	-56.73
658.56	33.49	Н	-55.87	-7.82	3.18	-66.87	-13.00	-53.87
3700.40	37.12	Н	-60.92	12.61	8.31	-56.62	-13.00	-43.62
5550.60	36.35	Н	-54.70	13.23	10.33	-51.80	-13.00	-38.80
7400.80		Н		11.50	12.08		-13.00	
9251.00		Н		11.92	13.50		-13.00	
11101.20		Н		11.66	15.11		-13.00	
12951.40		Н		13.63	16.60		-13.00	
14801.60		Н		12.76	17.95		-13.00	
16651.80		Н		15.92	19.14		-13.00	
18502.00		Н		18.75	10.40		-13.00	

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark "---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) Cable loss (dB)

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Operation Mode	: TX CH Mid Mode	Test Date:	Aug. 12, 2011
Fundamental Frequency	: 1880MHz	Test By:	Nick
Temperature	: 25°C	Pol:	Ver
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
183.26	35.36	V	-64.92	-7.83	1.67	-74.41	-13.00	-61.41
216.24	38.28	V	-62.89	-7.86	1.80	-72.54	-13.00	-59.54
233.70	35.64	V	-64.87	-7.87	1.90	-74.64	-13.00	-61.64
311.30	33.72	V	-64.39	-7.86	2.21	-74.46	-13.00	-61.46
548.95	32.66	V	-59.86	-7.76	2.96	-70.58	-13.00	-57.58
645.95	33.46	V	-55.51	-7.81	3.15	-66.47	-13.00	-53.47
3760.00		V		12.60	8.39		-13.00	
5640.00	35.00	V	-55.58	13.36	10.41	-52.63	-13.00	-39.63
7520.00		V		11.45	12.19		-13.00	
9400.00		V		11.93	13.61		-13.00	
11280.00		V		11.92	15.27		-13.00	
13160.00		V		13.33	16.71		-13.00	
15040.00		V		13.76	18.15		-13.00	
16920.00		V		15.27	19.32		-13.00	
18800.00		V		18.68	16.58		-13.00	

Remark:

1 The emission behaviors belong to narrowband spurious emission.

2 Remark "---" means that the emission level is too low to be measured

3 The result basic equation calculation is as follows:

4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) - Cable loss (dB)

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Operation Mode	: TX CH Mid Mode	Test Date:	Aug. 12, 2011
Fundamental Frequency	: 1880MHz	Test By:	Nick
Temperature	: 25°C	Pol:	Hor
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
199.75	38.52	Н	-63.11	-7.84	1.71	-72.66	-13.00	-59.66
204.60	42.40	Н	-59.03	-7.84	1.74	-68.61	-13.00	-55.61
233.70	38.57	Н	-61.44	-7.87	1.90	-71.21	-13.00	-58.21
316.15	34.13	Н	-63.38	-7.83	2.23	-73.44	-13.00	-60.44
534.40	33.50	Н	-58.76	-7.75	2.91	-69.42	-13.00	-56.42
658.56	34.25	Н	-55.11	-7.82	3.18	-66.11	-13.00	-53.11
3760.00		Н		12.60	8.39		-13.00	
5640.00	36.33	Н	-54.42	13.36	10.41	-51.47	-13.00	-38.47
7520.00		Н		11.45	12.19		-13.00	
9400.00		Н		11.93	13.61		-13.00	
11280.00		Н		11.92	15.27		-13.00	
13160.00		Н		13.33	16.71		-13.00	
15040.00		Н		13.76	18.15		-13.00	
16920.00		Н		15.27	19.32		-13.00	
18800.00		Н		18.68	16.58		-13.00	

Remark:

1 The emission behaviors belong to narrowband spurious emission.

2 Remark "---" means that the emission level is too low to be measured

3 The result basic equation calculation is as follows:

4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) - Cable loss (dB)

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Operation Mode	: TX CH High Mode	Test Date:	Aug. 12, 2011
Fundamental Frequency	: 1909.8 MHz	Test By:	Nick
Temperature	: 25°C	Pol:	Ver
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
158.04	36.08	V	-61.93	-7.81	1.61	-71.35	-13.00	-58.35
173.56	36.57	V	-62.84	-7.82	1.65	-72.30	-13.00	-59.30
233.70	35.93	V	-64.58	-7.87	1.90	-74.35	-13.00	-61.35
296.75	37.05	V	-61.31	-7.92	2.16	-71.38	-13.00	-58.38
559.62	33.00	V	-58.93	-7.77	2.97	-69.67	-13.00	-56.67
658.56	33.15	V	-55.86	-7.82	3.18	-66.86	-13.00	-53.86
3819.60		V		12.60	8.47		-13.00	
5729.40	39.79	V	-50.53	13.49	10.50	-47.53	-13.00	-34.53
7639.20		V		11.40	12.27		-13.00	
9549.00		V		11.95	13.74		-13.00	
11458.80		V		12.17	15.43		-13.00	
13368.60		V		12.97	16.82		-13.00	
15278.40		V		15.00	18.29		-13.00	
17188.20		V		14.47	19.52		-13.00	
19098.00		V		18.66	20.78		-13.00	

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark "---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) Cable loss (dB)



Report No.: EH/2010/B0045 Issue Date: Aug. 26, 2011 Page 123 of 140

Operation Mode	: TX CH High Mode	Test Date:	Aug. 12, 2011
Fundamental Frequency	: 1909.8 MHz	Test By:	Nick
Temperature	: 25°C	Pol:	Hor
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
150.28	33.62	Н	-64.17	-7.80	1.59	-73.56	-13.00	-60.56
206.54	39.55	Н	-61.78	-7.85	1.75	-71.38	-13.00	-58.38
233.70	37.68	Н	-62.33	-7.87	1.90	-72.10	-13.00	-59.10
332.64	32.46	Н	-64.90	-7.74	2.29	-74.93	-13.00	-61.93
559.62	32.80	Н	-58.72	-7.77	2.97	-69.46	-13.00	-56.46
650.80	32.65	Н	-57.04	-7.81	3.16	-68.01	-13.00	-55.01
3819.60	38.18	Н	-59.33	12.60	8.47	-55.19	-13.00	-42.19
5729.40		Н		13.49	10.50		-13.00	
7639.20		Н		11.40	12.27		-13.00	
9549.00		Н		11.95	13.74		-13.00	
11458.80		Н		12.17	15.43		-13.00	
13368.60		Н		12.97	16.82		-13.00	
15278.40		Н		15.00	18.29		-13.00	
17188.20		Н		14.47	19.52		-13.00	
19098.00		Н		18.66	20.78		-13.00	

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark "---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) Cable loss (dB)



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# Radiated Spurious Emission Measurement Result: HSUPA II Mode (The worst case)

Operation Mode	: TX CH Low Mode	Test Date:	Aug. 12, 2011
Fundamental Frequency	: 1852.4MHz	Test By:	Nick
Temperature	: 25°C	Pol:	Ver
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
183.26	36.45	V	-63.83	-7.83	1.67	-73.32	-13.00	-60.32
199.75	39.26	V	-62.50	-7.84	1.71	-72.05	-13.00	-59.05
233.70	35.55	V	-64.96	-7.87	1.90	-74.73	-13.00	-61.73
309.36	35.67	V	-62.46	-7.87	2.21	-72.54	-13.00	-59.54
524.70	35.46	V	-57.86	-7.74	2.88	-68.48	-13.00	-55.48
655.65	33.34	V	-55.64	-7.82	3.17	-66.63	-13.00	-53.63
3704.80	39.50	V	-58.41	12.61	8.31	-54.12	-13.00	-41.12
5557.20		V		13.24	10.33		-13.00	
7409.60		V		11.49	12.09		-13.00	
9262.00		V		11.92	13.51		-13.00	
11114.40		V		11.68	15.12		-13.00	
12966.80		V		13.62	16.61		-13.00	
14819.20		V		12.83	17.96		-13.00	
16671.60		V		15.87	19.15		-13.00	
18524.00		V		18.74	10.86		-13.00	

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark "---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) Cable loss (dB)

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Operation Mode	: TX CH Low Mode	Test Date:	Aug. 12, 2011
Fundamental Frequency	: 1852.4MHz	Test By:	Nick
Temperature	: 25°C	Pol:	Hor
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
151.25	33.98	Н	-63.89	-7.80	1.59	-73.28	-13.00	-60.28
206.54	37.12	Н	-64.21	-7.85	1.75	-73.81	-13.00	-60.81
233.70	37.68	Н	-62.33	-7.87	1.90	-72.10	-13.00	-59.10
316.15	33.91	Н	-63.60	-7.83	2.23	-73.66	-13.00	-60.66
555.74	33.07	Н	-58.53	-7.76	2.97	-69.26	-13.00	-56.26
645.95	33.71	Н	-56.09	-7.81	3.15	-67.05	-13.00	-54.05
3704.80	44.84	Н	-53.18	12.61	8.31	-48.89	-13.00	-35.89
5557.20		Н		13.24	10.33		-13.00	
7409.60		Н		11.49	12.09		-13.00	
9262.00		Н		11.92	13.51		-13.00	
11114.40		Н		11.68	15.12		-13.00	
12966.80		Н		13.62	16.61		-13.00	
14819.20		Н		12.83	17.96		-13.00	
16671.60		Н		15.87	19.15		-13.00	
18524.00		Н		18.74	10.86		-13.00	

#### Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark "---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) Cable loss (dB)

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Operation Mode	: TX CH Mid Mode	Test Date:	Aug. 12, 2011
Fundamental Frequency	: 1880MHz	Test By:	Nick
Temperature	: 25°C	Pol:	Ver
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
183.26	36.19	V	-64.09	-7.83	1.67	-73.58	-13.00	-60.58
214.30	37.00	V	-64.24	-7.85	1.79	-73.88	-13.00	-60.88
233.70	35.13	V	-65.38	-7.87	1.90	-75.15	-13.00	-62.15
299.66	34.55	V	-63.71	-7.92	2.17	-73.80	-13.00	-60.80
553.80	33.06	V	-59.21	-7.76	2.97	-69.94	-13.00	-56.94
665.35	33.35	V	-55.73	-7.83	3.20	-66.75	-13.00	-53.75
3760.00	33.72	V	-63.94	12.60	8.39	-59.72	-13.00	-46.72
5640.00		V		13.36	10.41		-13.00	
7520.00		V		11.45	12.19		-13.00	
9400.00		V		11.93	13.61		-13.00	
11280.00		V		11.92	15.27		-13.00	
13160.00		V		13.33	16.71		-13.00	
15040.00		V		13.76	18.15		-13.00	
16920.00		V		15.27	19.32		-13.00	
18800.00		V		18.68	16.58		-13.00	

Remark:

1 The emission behaviors belong to narrowband spurious emission.

2 Remark "---" means that the emission level is too low to be measured

3 The result basic equation calculation is as follows:

4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) - Cable loss (dB)

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Operation Mode	: TX CH Mid Mode	Test Date:	Aug. 12, 2011
Fundamental Frequency	: 1880MHz	Test By:	Nick
Temperature	: 25°C	Pol:	Hor
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
151.25	34.27	Н	-63.60	-7.80	1.59	-72.99	-13.00	-59.99
212.36	45.31	Н	-55.74	-7.85	1.78	-65.37	-13.00	-52.37
233.70	38.25	Н	-61.76	-7.87	1.90	-71.53	-13.00	-58.53
418.00	34.36	Н	-61.16	-7.67	2.56	-71.39	-13.00	-58.39
670.20	33.20	Н	-55.68	-7.83	3.21	-66.72	-13.00	-53.72
946.65	33.24	Н	-51.01	-8.00	3.87	-62.88	-13.00	-49.88
3760.00	38.22	Н	-59.55	12.60	8.39	-55.34	-13.00	-42.34
5640.00		Н		13.36	10.41		-13.00	
7520.00	37.41	Н	-43.23	11.45	12.19	-43.98	-13.00	-30.98
9400.00		Н		11.93	13.61		-13.00	
11280.00		Н		11.92	15.27		-13.00	
13160.00		Н		13.33	16.71		-13.00	
15040.00		Н		13.76	18.15		-13.00	
16920.00		Н		15.27	19.32		-13.00	
18800.00		Н		18.68	16.58		-13.00	

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark "---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) Cable loss (dB)

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Operation Mode	: TX CH High Mode	Test Date:	Aug. 12, 2011
Fundamental Frequency	: 1907.6MHz	Test By:	Nick
Temperature	: 25°C	Pol:	Ver
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
183.26	36.25	v	-64.03	-7.83	1.67	-73.52	-13.00	-60.52
233.70	35.65	V	-64.86	-7.87	1.90	-74.63	-13.00	-61.63
319.06	32.57	V	-65.44	-7.81	2.24	-75.50	-13.00	-62.50
418.00	34.07	V	-60.86	-7.67	2.56	-71.10	-13.00	-58.10
548.95	33.94	V	-58.58	-7.76	2.96	-69.30	-13.00	-56.30
934.04	33.25	V	-51.41	-7.98	3.85	-63.25	-13.00	-50.25
3815.20	39.69	V	-57.72	12.60	8.46	-53.58	-13.00	-40.58
5722.80		V		13.48	10.49		-13.00	
7630.40		V		11.41	12.27		-13.00	
9538.00		V		11.95	13.73		-13.00	
11445.60		V		12.15	15.42		-13.00	
13353.20		V		13.00	16.81		-13.00	
15260.80		V		14.91	18.28		-13.00	
17168.40		V		14.53	19.50		-13.00	
19076.00		V		18.65	20.76		-13.00	

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark "---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) Cable loss (dB)



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Operation Mode	: TX CH High Mode	Test Date:	Aug. 12, 2011
Fundamental Frequency	: 1907.6MHz	Test By:	Nick
Temperature	: 25°C	Pol:	Hor
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
151.25	34.63	Н	-63.24	-7.80	1.59	-72.63	-13.00	-59.63
212.36	38.08	Н	-62.97	-7.85	1.78	-72.60	-13.00	-59.60
233.70	38.73	Н	-61.28	-7.87	1.90	-71.05	-13.00	-58.05
325.85	38.73	Н	-58.69	-7.78	2.27	-68.74	-13.00	-55.74
551.86	36.50	Н	-55.18	-7.76	2.96	-65.91	-13.00	-52.91
621.70	32.91	Н	-57.36	-7.80	3.09	-68.25	-13.00	-55.25
3815.20	44.82	Н	-52.71	12.60	8.46	-48.57	-13.00	-35.57
5722.80		Н		13.48	10.49		-13.00	
7630.40		Н		11.41	12.27		-13.00	
9538.00		Н		11.95	13.73		-13.00	
11445.60		Н		12.15	15.42		-13.00	
13353.20		Н		13.00	16.81		-13.00	
15260.80		Н		14.91	18.28		-13.00	
17168.40		Н		14.53	19.50		-13.00	
19076.00		Н		18.65	20.76		-13.00	

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark "---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) Cable loss (dB)



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# Radiated Spurious Emission Measurement Result: HSUPA V Mode (The worst case)

Operation Mode	: TX CH Low Mode	Test Date:	Aug. 12, 2011
Fundamental Frequency	: 826.4MHz	Test By:	Nick
Temperature	: 25°C	Pol:	Ver
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)	Safe Margin (dBm)
125.06	36.08	V	-63.52	-7.78	1.48	-72.77	-13.00	-59.77
183.26	36.98	V	-63.30	-7.83	1.67	-72.79	-13.00	-59.79
212.36	37.40	V	-63.91	-7.85	1.78	-73.54	-13.00	-60.54
233.70	35.01	V	-65.50	-7.87	1.90	-75.27	-13.00	-62.27
371.44	33.26	V	-63.46	-7.65	2.42	-73.53	-13.00	-60.53
610.06	33.67	V	-55.77	-7.79	3.06	-66.62	-13.00	-53.62
1652.80	41.10	V	-63.48	9.30	5.23	-59.41	-13.00	-46.41
2479.20		V		10.07	6.54		-13.00	
3305.60		V		12.19	7.73		-13.00	
4132.00		V		12.62	8.87		-13.00	
4958.40		V		12.65	9.75		-13.00	
5784.80		V		13.58	10.55		-13.00	
6611.20		V		12.03	11.31		-13.00	
7437.60		V		11.48	12.12		-13.00	
8264.00		V		11.50	12.73		-13.00	

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark "---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) Cable loss (dB)

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Operation Mode	: TX CH Low Mode	Test Date:	Aug. 12, 2011
Fundamental Frequency	: 826.4MHz	Test By:	Nick
Temperature	: 25°C	Pol:	Hor
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)	Safe Margin (dBm)
148.34	34.16	Н	-63.78	-7.80	1.58	-73.16	-13.00	-60.16
214.30	36.82	Н	-64.14	-7.85	1.79	-73.78	-13.00	-60.78
313.24	34.51	Н	-63.03	-7.85	2.22	-73.09	-13.00	-60.09
406.36	34.31	Н	-61.80	-7.67	2.53	-71.99	-13.00	-58.99
534.40	33.87	Н	-58.39	-7.75	2.91	-69.05	-13.00	-56.05
648.86	33.51	Н	-56.23	-7.81	3.16	-67.20	-13.00	-54.20
1652.80	36.07	Н	-68.33	9.30	5.23	-64.26	-13.00	-51.26
2479.20		Н		10.07	6.54		-13.00	
3305.60		Н		12.19	7.73		-13.00	
4132.00		Н		12.62	8.87		-13.00	
4958.40		Н		12.65	9.75		-13.00	
5784.80		Н		13.58	10.55		-13.00	
6611.20		Н		12.03	11.31		-13.00	
7437.60		Н		11.48	12.12		-13.00	
8264.00		Н		11.50	12.73		-13.00	

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark "---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) Cable loss (dB)

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Operation Mode	: TX CH Mid Mode	Test Date:	Aug. 12, 2011
Fundamental Frequency	: 836.6MHz	Test By:	Nick
Temperature	: 25°C	Pol:	Ver
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)	Safe Margin (dBm)
131.85	35.60	V	-63.37	-7.79	1.51	-72.66	-13.00	-59.66
183.26	36.74	V	-63.54	-7.83	1.67	-73.03	-13.00	-60.03
214.30	41.67	V	-59.57	-7.85	1.79	-69.21	-13.00	-56.21
233.70	35.65	V	-64.86	-7.87	1.90	-74.63	-13.00	-61.63
410.24	34.01	V	-61.17	-7.67	2.54	-71.38	-13.00	-58.38
524.70	36.18	V	-57.14	-7.74	2.88	-67.76	-13.00	-54.76
1673.20	41.67	V	-62.89	9.36	5.27	-58.79	-13.00	-45.79
2509.80		V		10.09	6.58		-13.00	
3346.40		V		12.28	7.79		-13.00	
4183.00		V		12.62	8.93		-13.00	
5019.60		V		12.67	9.81		-13.00	
5856.20		V		13.68	10.62		-13.00	
6692.80		V		11.95	11.39		-13.00	
7529.40		V		11.45	12.20		-13.00	
8366.00		V		11.59	12.81		-13.00	

Remark:

1 The emission behaviors belong to narrowband spurious emission.

2 Remark "---" means that the emission level is too low to be measured

3 The result basic equation calculation is as follows:

4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) - Cable loss (dB)

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Operation Mode	: TX CH Mid Mode	Test Date:	Aug. 12, 2011
Fundamental Frequency	: 836.6MHz	Test By:	Nick
Temperature	: 25°C	Pol:	Hor
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)	Safe Margin (dBm)
131.85	35.86	Н	-63.81	-7.79	1.51	-73.10	-13.00	-60.10
183.26	35.23	Н	-65.12	-7.83	1.67	-74.62	-13.00	-61.62
233.70	38.19	Н	-61.82	-7.87	1.90	-71.59	-13.00	-58.59
345.25	34.52	Н	-62.72	-7.67	2.34	-72.73	-13.00	-59.73
427.70	34.35	Н	-60.67	-7.68	2.59	-70.95	-13.00	-57.95
524.70	35.45	Н	-57.15	-7.74	2.88	-67.76	-13.00	-54.76
1673.20	39.27	Н	-65.11	9.36	5.27	-61.01	-13.00	-48.01
2509.80		Н		10.09	6.58		-13.00	
3346.40		Н		12.28	7.79		-13.00	
4183.00		Н		12.62	8.93		-13.00	
5019.60		Н		12.67	9.81		-13.00	
5856.20		Н		13.68	10.62		-13.00	
6692.80		Н		11.95	11.39		-13.00	
7529.40		Н		11.45	12.20		-13.00	
8366.00		Н		11.59	12.81		-13.00	

Remark:

1 The emission behaviors belong to narrowband spurious emission.

2 Remark "---" means that the emission level is too low to be measured

3 The result basic equation calculation is as follows:

4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) - Cable loss (dB)

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Operation Mode	: TX CH High Mode	Test Date:	Aug. 12, 2011
Fundamental Frequency	: 846.6MHz	Test By:	Nick
Temperature	: 25°C	Pol:	Ver
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)	Safe Margin (dBm)
148.34	34.00	v	-63.44	-7.80	1.58	-72.82	-13.00	-59.82
183.26	35.31	V	-64.97	-7.83	1.67	-74.46	-13.00	-61.46
233.70	36.11	V	-64.40	-7.87	1.90	-74.17	-13.00	-61.17
478.14	33.23	V	-60.82	-7.71	2.74	-71.27	-13.00	-58.27
563.50	33.74	V	-57.96	-7.77	2.98	-68.71	-13.00	-55.71
757.50	34.49	V	-52.55	-7.87	3.49	-63.91	-13.00	-50.91
1693.20	39.22	V	-65.32	9.42	5.30	-61.20	-13.00	-48.20
2539.80		V		10.18	6.62		-13.00	
3386.40		V		12.36	7.85		-13.00	
4233.00		V		12.63	8.99		-13.00	
5079.60		V		12.73	9.87		-13.00	
5926.20		V		13.79	10.69		-13.00	
6772.80		V		11.87	11.47		-13.00	
7619.40		V		11.41	12.26		-13.00	
8466.00		V		11.68	12.89		-13.00	

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark "---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) Cable loss (dB)



Report No.: EH/2010/B0045 Issue Date: Aug. 26, 2011 Page 135 of 140

Operation Mode	: TX CH High Mode	Test Date:	Aug. 12, 2011
Fundamental Frequency	: 846.6MHz	Test By:	Nick
Temperature	: 25°C	Pol:	Hor
Humidity	: 65%		

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP (dBm)	Limit (dBm)	Safe Margin (dBm)
156.10	37.32	Н	-60.92	-7.80	1.60	-70.33	-13.00	-57.33
212.36	38.23	Н	-62.82	-7.85	1.78	-72.45	-13.00	-59.45
233.70	37.83	Н	-62.18	-7.87	1.90	-71.95	-13.00	-58.95
451.95	33.35	Н	-60.52	-7.70	2.67	-70.89	-13.00	-57.89
613.94	33.98	Н	-56.45	-7.80	3.07	-67.31	-13.00	-54.31
769.14	33.18	Н	-59.73	-7.87	3.51	-71.11	-13.00	-58.11
1693.20	39.10	Н	-65.25	9.42	5.30	-61.13	-13.00	-48.13
2539.80	40.87	Н	-59.75	10.18	6.62	-56.19	-13.00	-43.19
3386.40		Н		12.36	7.85		-13.00	
4233.00		Н		12.63	8.99		-13.00	
5079.60		Н		12.73	9.87		-13.00	
5926.20		Н		13.79	10.69		-13.00	
6772.80		Н		11.87	11.47		-13.00	
7619.40		Н		11.41	12.26		-13.00	
8466.00		Н		11.68	12.89		-13.00	

Remark:

- 1 The emission behaviors belong to narrowband spurious emission.
- 2 Remark "---" means that the emission level is too low to be measured
- 3 The result basic equation calculation is as follows:
- 4 ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) Cable loss (dB)



# 11. FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT

# **11.1. Standard Applicable:**

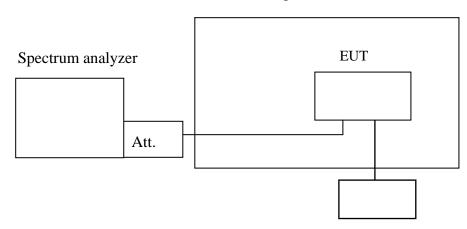
According to FCC §2.1055(a) (1)

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

+/-2.5ppm for 1900MHz band

# 11.2. Test Set-up:

Temperature Chamber



Variable DC Power Supply

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  $-30^{\circ}$ C. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with  $10^{\circ}$ C increased per stage until the highest temperature of  $+50^{\circ}$ C reached.

# 11.4. Measurement Equipment Used:

Refer to section 2.4 in this report



#### **11.5. Measurement Result:**

Reference Frequency: GPRS 850 Mid Channel 836.6 MHz @ 25°C						
	Limit: +/- 2.5 ppm = 2091 Hz					
Power Supply	Environment	Frequency		Dalta (Uz)	Limit (IIa)	
Vdc	Temperature (°C)	(MHz)	Delta (Hz)	Limit (Hz)		
3.7	50	836600035	50	2091		
3.7	40	836600010	25	2091		
3.7	30	836600012	27	2091		
3.7	20	836599985	0	2091		
3.7	10	836600015	30	2091		
3.7	0	836600010	25	2091		
3.7	-10	836600008	23	2092		

Reference Frequency: GPRS 1900 Mid Channel 1880 MHz @ 20°C						
	Limit: +/- 2.5 ppm = 4700 Hz					
Power Supply	Environment	Frequency		Limit (IIa)		
Vdc	Temperature (°C)	(MHz)	Delta (Hz)	Limit (Hz)		
3.7	50	1880000077	112	4700		
3.7	40	1880000058	93	4700		
3.7	30	1880000041	76	4700		
3.7	20	1879999965	0	4700		
3.7	10	1880000055	90	4700		
3.7	0	1880000086	121	4700		
3.7	-10	1880000044	79	4700		



Reference Frequency: WCDMA II Mid Channel 1880 (ARFCN9400) MHz						
	Limit: +/- 2.5 ppm = 4700 Hz					
Power Supply	Environment	Frequency				
Vdc	Temperature (°C)	(MHz)	Delta (Hz)	Limit (Hz)		
3.7	50	1880000003	6	4700		
3.7	40	1880000012	15	4700		
3.7	30	1880000006	9	4700		
3.7	20	1879999997	0	4700		
3.7	10	1880000004	7	4700		
3.7	0	1880000008	11	4700		
3.7	-10	1880000010	13	4700		

Reference Frequency: WCDMA V Mid Channel 836.6 (ARFCN4183) MHz						
	Limit: +/- 2.5 ppm = 2091 Hz					
Power Supply	Environment	Frequency	Dolto (Uz)	Limit (Hz)		
Vdc	Temperature (°C)	(MHz)	Delta (Hz)	Lillint (HZ)		
3.7	50	836600003	8	2091		
3.7	40	836600003	8	2091		
3.7	30	836600007	12	2091		
3.7	20	836599995	0	2091		
3.7	10	836600001	6	2091		
3.7	0	836600006	11	2091		
3.7	-10	836600004	9	2091		

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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 10.2 in this report

#### **12.3. Measurement Procedure:**

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

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

# 12.4. Measurement Equipment Used:

Refer to section 2.4 in this report



#### 12.5. Measurement Result:

Reference Frequency: GPRS 850 Mid Channel 836.6 MHz @ 25°C						
	Limit: +/- 2.5 ppm = 2091 Hz					
Power Supply	Environment	Frequency	Dolto (IIz) Limit (IIz)			
Vdc	Temperature (°C)	(MHz)	Delta (Hz)	Limit (Hz)		
4.4	20	836599981	-4	2091		
3.7	20	836599985	0	2091		
3.5	20	836599976	-9	2091		
3.1 (End Point)	20	836599957	-28	2091		

Reference Frequency: GPRS 1900 Mid Channel 1880 MHz @ $25^{\circ}$ C					
	Limit: +/- 2.5 ppm = 4700 Hz				
Power Supply	Environment	Frequency	Dalta (II-)		
Vdc	Temperature (°C)	(MHz)	Delta (Hz)	Limit (Hz)	
4.4	20	1879999954	-11	4700	
3.7	20	1879999965	0	4700	
3.5	20	1879999962	-3	4700	
3.1 (End Point)	20	1879999948	-17	2091	
(End Point)	_				

Reference Frequency: WCDMA II Mid Channel 1880 (ARFCN9400) MHz					
	Limit: +/- 2.5 ppm = 4700 Hz				
Power Supply	Environment	Frequency	Dolto (IIz) Limit (IIz)		
Vdc	Temperature (°C)	(MHz)	Delta (Hz)	Limit (Hz)	
4.4	20	188000003	6	4700	
3.7	20	1879999997	0	4700	
3.5	20	1879999998	1	4700	
3.1 (End Point)	20	1880000543	546	2091	

Reference Frequency: WCDMA V Mid Channel 836.6 (ARFCN4183) MHz						
	Limit: +/- 2.5 ppm = 2091 Hz					
Power Supply	Environment	Frequency	Dolto (Uz) Limit (Uz)			
Vdc	Temperature (°C)	(MHz)	Delta (Hz)	Limit (Hz)		
4.4	20	836599997	2	2091		
3.7	20	836599995	0	2091		
3.5	20	836600000	5	2091		
3.1	20	826600462	107	2001		
(End Point)	20	836600462	467	2091		