

Report No.: EH/2011/50010 Issue Date: Jun 08, 2011

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# ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

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

OF

**Product Name:** LTE/HSPA+ VoIP Router

**Brand Name:** BandLuxe

Model Name: R505

Marketing Name: LTE/HSPA+ VoIP Router

**Model Difference:** N/A

FCC ID: UZI-R505

**Report No.:** EH/2011/50010

**Issue Date: Jun. 08, 2011** 

BandRich Inc.

Prepared for: 7F., No.188, Baoqiao Rd., Xindian Dist., New

Taipei City 231, Taiwan (R.O.C.)

SGS Taiwan Ltd.

Prepared by: Electronics & Communication Laboratory

No. 134, Wu Kung Rd., Wuku Industrial

Zone, Taipei County, Taiwan.

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# VERIFICATION OF COMPLIANCE

BandRich Inc.

**Applicant:** 7F., No.188, Baoqiao Rd., Xindian Dist., New Taipei City 231, Taiwan

(R.O.C.)

**Product Name:** LTE/HSPA+ VoIP Router

FCC ID: UZI-R505

**Brand Name:** BandLuxe

Model Name: R505

**Marketing Name:** LTE/HSPA+ VoIP Router

**Model Difference:** N/A

**File Number:** EH/2011/50010

**Date of test:** May.  $10, 2011 \sim \text{Jun. } 08, 2011$ 

**Date of EUT Received:** May. 10, 2011

## We hereby certify that:

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

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

Test By:	Lion Wang	Date:	Jun. 08, 2011	
Prepared By:	Lion Wang / Engineer	Date:	Jun. 08, 2011	
Approved By:	Cherry Chen / Clerk  Jim Chang / Supervisor	Date: 	Jun. 08, 2011	

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# Version

Version No.	Date	Description
00	Jun. 08, 2011	Initial creation of document

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# 1. GENERAL PRODUCT INFORMATION

#### General:

Product Name:	LTE/HSPA+ VoIP Router		
Brand Name:	BandLuxe		
Model Name:	R505		
Marketing Name:	LTE/HSPA+ VoIP Router		
Model Difference:	N/A		
Data Cable:	Model: N/A, Supplier: N/A		
Davyar Cumply	12 Vdc by AC/DC Power Supply		
Power Supply	Adaptor:	Adaptor: Model: SAG024F4, Supplier: CWT	

#### **GSM, WCDMA and LTE:**

	Operating Frequency	Rated Power			
	WCDMA/HSUPA/HSDPA   /HSPA Band II   1852.4MHz – 1907.6MI		23 dBm		
	WCDMA/HSUPA/HSDPA /HSPA Band IV	1712.4MHz – 1752.6MHz	23 dBm		
Cellular Phone Standards Frequency Range and	WCDMA/HSUPA/HSDPA /HSPA Band V	826.4MHz – 846.6MHz	23 dBm		
Power:	5MHz BW LTE-Band 4	1712.5MHz – 1752.5MHz	22.5 dBm		
	10MHz BW LTE-Band 4	1715MHz – 1750MHz	22.5 dBm		
	5MHz BW LTE-Band 17	706.5MHz – 713.5MHz	22.5 dBm		
	10MHz BW LTE-Band 17	709MHz – 711MHz	22.5 dBm		
Hardware Version:	V04				
Software Version:	N/A				
IMEI:	357817040000461				

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

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## Final Amplifier Voltage and Current Information:

Test mode	DC voltage (V)	DC current (mA)
WCDMA B2	12 Vdc	450
WCDMA B4	12 Vdc	430
WCDMA B5	12 Vdc	460
HSUPA B2	12 Vdc	400
HSUPA B4	12 Vdc	480
HUSPA B5	12 Vdc	430
HSDPA B2	12 Vdc	390
HSDPA B4	12 Vdc	510
HUDPA B5	12 Vdc	450
LTE B17 10M QPSK	12 Vdc	470
LTE B17 10M 16QAM	12 Vdc	460
LTE B17 5M QPSK	12 Vdc	470
LTE B17 5M 16QAM	12 Vdc	460
LTE B4 10M QPSK	12 Vdc	490
LTE B4 10M 16QAM	12 Vdc	480
LTE B4 5M QPSK	12 Vdc	490
LTE B4 5M 16QAM	12Vdc	480

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

This submittal(s) (test report) is intended for FCC ID: UZI-R505 filing to comply with Section Part 22 subpart H, Part 24 subpart E and Part27 subpart C & subpart L of the FCC CFR 47 Rules.

## 1.2. Test Methodology

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

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

## 1.3. Test Facility

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

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

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

#### 1.4. Special Accessories

Not available for this EUT intended for grant.

#### 1.5. Equipment Modifications

Not available for this EUT intended for grant.

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#### 2. SYSTEM TEST CONFIGURATION

## 2.1. EUT Configuration

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

#### 2.2. EUT Exercise

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

#### 2.3. Test Procedure

#### 2.3.1 AC Power Line Conducted Emissions

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

#### 2.3.2 Conducted Measurement at Antenna Port:

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

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

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

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# 2.4. Measurement Equipment Used:

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

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

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# 2.5. Configuration of Tested System

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



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

Item	Equipment	Mfr/Brand	Model/ Type No.	Series No.	Data Cable	<b>Power Cord</b>
1.	N/A	CWT	SAG024F4	N/A	Un-shielded	Un-shielded

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# 3. SUMMARY OF TEST RESULTS

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

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#### Max ERP/EIRP measurement result:

	dBm		W
WCDMA Band II	18.24	EIRP	0.067
WCDMA Band IV	19.57	EIRP	0.091
WCDMA Band V	19.29	ERP	0.085
HSDPA Band II	21.94	EIRP	0.156
HSDPA Band IV	23.87	EIRP	0.244
HSDPA Band V	21.02	ERP	0.126
HSUPA Band II	21.79	EIRP	0.151
HSUPA Band IV	20.52	EIRP	0.113
HSUPA Band V	20.38	ERP	0.109
LTE Band 4/5MHz /QPSK RB 1 Offset 24	23.30	EIRP	0.214
LTE Band 4/5MMz /16QAM RB 1 Offset 24	23.34	EIRP	0.216
LTE Band 4/5MHz /QPSK RB 1 Offset 0	23.24	EIRP	0.211
LTE Band 4/5MHz /16QAM RB 1 Offset 0	23.17	EIRP	0.207
LTE Band 4/5MHz /QPSK RB 12 Offset 6	22.25	EIRP	0.168
LTE Band 4/5MHz /16QAM RB 12 Offset 6	23.03	EIRP	0.201
LTE Band 4/5MHz /QPSK RB 25 Offset 0	20.93	EIRP	0.124
LTE Band 4/5MHz /16QAM RB 25 Offset 0	21.41	EIRP	0.138
LTE Band 4/10MHz /QPSK RB 1 Offset 49	21.92	EIRP	0.156
LTE Band 4/10MHz /16QAM RB 1 Offset 49	23.22	EIRP	0.210
LTE Band 4/10MHz /QPSK RB 1 Offset 0	22.41	EIRP	0.174
LTE Band 4/10MHz /16QAM RB 1 Offset 0	23.73	EIRP	0.236
LTE Band 4/10MHz /QPSK RB 25 Offset 12	20.63	EIRP	0.116
LTE Band 4/10MHz /16QAM RB 25 Offset	21.67	EIRP	0.147
LTE Band 4/10MHz /QPSK RB 50 Offset 0	19.75	EIRP	0.094
LTE Band 4/10MHz /16QAM RB 50 Offset 0	20.33	EIRP	0.108

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LTE Band 17/5MHz /16QAM RB 1 Offset	20.52	ERP	0.113
LTE Band 17/5MHz /QPSK RB 1 Offset 0	17.26	ERP	0.053
LTE Band 17/5MHz /16QAM RB 1 Offset 0	19.04	ERP	0.080
LTE Band 17/5MHz/QPSK RB 12 Offset 6	17.69	ERP	0.059
LTE Band 17/5MHz /16QAM RB 12 Offset	19.10	ERP	0.081
LTE Band 17/5MHz /QPSK RB 25 Offset 0	14.81	ERP	0.030
LTE Band 17/5MHz /16QAM RB 25 Offset	13.93	ERP	0.025
LTE Band 17/10MHz /QPSK RB 1 Offset 49	14.93	ERP	0.031
LTE Band 17/10MHz /16QAM RB 1 Offset	16.60	ERP	0.046
LTE Band 17/10MHz /QPSK RB 1 Offset 0	14.93	ERP	0.031
LTE Band 17/10MHz /16QAM RB 1 Offset	16.99	ERP	0.050
LTE Band 17/10MHz /QPSK RB 25 Offset	15.40	ERP	0.035
LTE Band 17/10MHz /16QAM RB 25 Offset	16.55	ERP	0.045
LTE Band 17/10MHz /QPSK RB 50 Offset 0	11.01	ERP	0.013
LTE Band 17/10MHz /16QAM RB 50 Offset	12.95	ERP	0.020

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## 4. DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition.

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

The field strength of spurious radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for GPRS/EDGE, WCDMD/HSDPA/HSUPA Band II/V and LTE Band 4/17 with power adaptor. The worst-case of E2 position for all testing mode were reported.

In comparison among the RSE data of the all modulations (GPRS/EDGE/WCDMA/HSPA) we found that while the radiation is in GPRS mode, the spurious emission is found to be the worst, and therefore documenting the data of radiated spurious emission on GPRS 850/1900 mode would be representative sufficiently.

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

In comparison among all CSE data of the variety of combination on LTE band 4 & 17, respectively. It's found to generate the highest emission at 5MHz, 10 MHz and 20 MHz Transmission Bandwidth while RB size = 1 with 0 offset. Be aware of that only CSE data that yields the worst measurement with supported modulation scheme (QPSK, 16QAM) are shown on the corresponding section.

For Peak to Average Ratio test, all combination (RB arrangement with different modulation scheme) has been evaluated, the data with the following setting: RB number = 25; Offset = 0 for 5MHz with 16QAM, RB number = 50; Offset = 0 for 10MHz with 16QAM and RB number = 100; Offset = 0 for 20MHz are shown as representative plot on the report.

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

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

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

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

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

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## 5. RF POWER OUTPUT MEASUREMENT

## 5.1. Standard Applicable:

According to FCC §2.1046.

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

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

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

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

3GPP Power limitation for HSDPA and HSUPA

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

Sub-test in ta-	Power Class 3		Power Class 4	
ble 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	Power Class 3		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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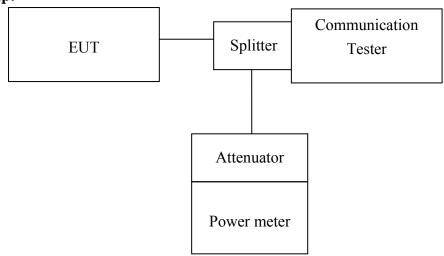
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## 5.2. Test Set-up:



Note: Measurement setup for testing on Antenna connector

#### **5.3.** Measurement Procedure:

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

#### 5.4. Measurement Equipment Used:

Refer to section 2.4 in this report

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5.5. Measurement Result:

5.5.1. RF Conducted Output Power

5.5.1.1.: GPRS mode

Results: N/A

#### **5.5.1.2.: 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:**

EUT Mode	Frequency (MHz)	СН	Peak Power (dBm)	Avg Power (dBm)
WGDM	1852.4	9262	26.01	22.55
WCDMA Band II	1880.0	9400	26.69	23.07
Duild II	1907.6	9538	26.06	22.64

EUT Mode	Frequency (MHz)	СН	Peak Power (dBm)	Avg Power (dBm)
WCD) (A	1712.4	1312	27.12	23.46
WCDMA Band IV	1732.6	1413	27.02	23.25
Duild 1 v	1752.6	1513	27.48	23.78

EUT Mode	Frequency (MHz)	СН	Peak Power (dBm)	Avg Power (dBm)
WCD) (4	826.40	4132	26.06	22.60
WCDMA Band V	836.60	4183	26.26	22.75
Duild V	846.60	4233	25.77	23.02

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EUT Mode	Frequency (MHz)	СН	Peak Power (dBm)	Avg Power (dBm)
Habby	1852.40	9262	26.04	22.31
HSDPA Band II	1880.00	9400	26.18	22.71
2,014 11	1907.60	9538	26.05	22.22

EUT Mode	Frequency (MHz)	СН	Peak Power (dBm)	Avg Power (dBm)
Habby	1712.4	1312	26.95	23.36
HSDPA Band IV	1732.6	1413	26.75	23.10
Build 1	1752.6	1513	27.17	23.66

EUT Mode	Frequency (MHz)	СН	Peak Power (dBm)	Avg Power (dBm)
HSDPA Band V	826.40	4132	26.11	22.44
	836.60	4183	26.19	22.50
Duild V	846.60	4233	25.85	22.14

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EUT Mode	Frequency (MHz)	СН	Peak Power (dBm)	Avg Power (dBm)
HSUPA Band II	1852.40	9262	26.14	22.41
	1880.00	9400	26.38	22.75
Duild II	1907.60	9538	26.15	22.32

EUT Mode	Frequency (MHz)	СН	Peak Power (dBm)	Avg Power (dBm)
	1712.4	1312	26.99	23.40
HSUPA Band IV	1732.6	1413	26.85	23.20
Dallu I V	1752.6	1513	27.28	23.76

EUT Mode	Frequency (MHz)	СН	Peak Power (dBm)	Avg Power (dBm)
HSUPA Band V	826.40	4132	26.15	22.52
	836.60	4183	26.28	22.55
Duna v	846.60	4233	25.99	22.20

B2&B4 offset: 1.2 dB B5 offset: 0.8dB

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

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#### **5.5.1.3.: MPR Table**

#### LTE Band 4 5 MHz

BW	1110 4 _5 WII		Frequency	DD G:	RB	Conducted	Target	MPR Tar-
(MHz)	Modulation	Channel	(MHz)	RB Size	Offset	power(dBm)	Power(dBm)	get(dB)
				1	24	22.59	22.5	0
		10075	1710.5	1	0	22.46	22.5	0
		19975	1712.5	12	6	21.66	22.5	0.5
				25	0	21.78	22.5	0.5
				1	24	22.62	22.5	0
_	ODCIZ	20175	1722 5	1	0	22.41	22.5	0
5	QPSK	20175	1732.5	12	6	21.62	22.5	0.5
			25	0	21.67	22.5	0.5	
			1	24	23.02	22.5	0	
		20375	1752.5	1	0	22.31	22.5	0
				12	6	21.7	22.5	0.5
				25	0	21.71	22.5	0.5
		19975	1712.5	1	24	22.62	22.5	0
				1	0	22.39	22.5	0
		19973	1712.5	12	6	20.75	22.5	0.5
				25	0	21.47	22.5	0.5
				1	24	22.71	22.5	0
5	16 OAM	20175	1722 5	1	0	22.5	22.5	0
3	16 QAM	20175	1732.5	12	6	20.74	22.5	0.5
				25	0	21.36	22.5	0.5
				1	24	23.15	22.5	0
		20275	1752.5	1	0	22.41	22.5	0
		20375		12	6	20.74	22.5	0.5
			25	0	21.45	22.5	0.5	

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## LTE Band 4 10 MHz

BW	anu 4 _10 M		Frequency		RB	Conducted	Target	MPR
(MHz)	Modulation	Channel	(MHz)	RB Size	Offset		Power(dBm)	Target(dB)
			,	1	49	23.24	22.5	0
			1715	1	0	22.76	22.5	0
		2000	1715	25	12	21.66	22.5	0.5
			50	0	21.39	22.5	0.5	
				1	49	23.14	22.5	0
10	ODGIZ	20175	1722.5	1	0	22.78	22.5	0
10	QPSK	20175	1732.5	25	12	21.81	22.5	0.5
				50	0	21.75	22.5	0.5
			1	49	22.83	22.5	0	
		20350	1750	1	0	22.86	22.5	0
				25	12	21.75	22.5	0.5
				50	0	21.73	22.5	0.5
		2000	1515	1	49	22.43	22.5	0.5
				1	0	22.87	22.5	0.5
			1715	25	12	21.03	22.5	1
				50	0	20.61	22.5	1
				1	49	22.34	22.5	0.5
10	16 OAM	20175	1722 5	1	0	22.88	22.5	0.5
10	16 QAM	20175	1732.5	25	12	21.31	22.5	1
				50	0	20.95	22.5	1
		20350		1	49	22.62	22.5	0.5
			1750	1	0	22.59	22.5	0.5
				25	12	21.46	22.5	1
				50	0	20.79	22.5	1

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# LTE Band 17 \_5 MHz

	anu 17_3 N		Г		DD	C 1 4 - 1	Т	MDD
BW	Modulation	Channel	Frequency (MHz)	RB Size	RB	Conducted	Target	MPR
(MHz)			(MHz)		OHISCE		Power(dBm)	
				1	24	22.25	22.5	0
		23755	706.5	1	0	21.83	22.5	0
			706.3	12	6	21.61	22.5	0.5
				25	0	22.06	22.5	0.5
				1	24	21.58	22.5	0
5 QPSK	23790	710	1	0	21.99	22.5	0	
	23/90	/10	12	6	22.51	22.5	0.5	
			25	0	22.06	22.5	0.5	
			1	24	21.44	22.5	0	
		23825	713.5	1	0	22.06	22.5	0
				12	6	20.31	22.5	0.5
				25	0	20.24	22.5	0.5
			7065	1	24	22.76	22.5	0.5
		23755		1	0	22.56	22.5	0.5
		23/33	706.5	12	6	21.8	22.5	1
				25	0	22.19	22.5	1
				1	24	22.31	22.5	0.5
_	160414	22700	710	1	0	22.15	22.5	0.5
5	16 QAM	23790	710	12	6	21.89	22.5	1
				25	0	22.11	22.5	1
		23825		1	24	21.91	22.5	0.5
			712.5	1	0	22.25	22.5	0.5
			713.5	12	6	20.28	22.5	1
				25	0	20.46	22.5	1

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# LTE Band 17 10 MHz

BW	M 114		Frequency	DD G.	RB	Conducted	Target	MPR
(MHz)	Modulation	Channel	(MHz)	RB Size	Offset	power(dBm)	Power(dBm)	Target(dB)
				1	49	21.45	22.5	0
		22700	700	1	0	21.85	22.5	0
		23780	709	25	12	22.08	22.5	0.5
				50	0	21.57	22.5	0.5
				1	49	21.47	22.5	0
10	ODCIZ	22700	710	1	0	21.76	22.5	0
10	QPSK	23790	710	25	12	21.96	22.5	0.5
				50	0	20.93	22.5	0.5
			1	49	21.45	22.5	0	
		23800	711	1	0	21.6	22.5	0
				25	12	21.47	22.5	0.5
				50	0	21.58	22.5	0.5
		23780	709	1	49	21.67	22.5	0.5
				1	0	22.33	22.5	0.5
				25	12	22.22	22.5	1
				50	0	21.72	22.5	1
				1	49	21.74	22.5	0.5
10	16 OAM	23790	710	1	0	22.24	22.5	0.5
10	16 QAM	23/90	/10	25	12	22.14	22.5	1
				50	0	21.25	22.5	1
		23800		1	49	21.72	22.5	0.5
			711	1	0	22.08	22.5	0.5
				25	12	21.77	22.5	1
				50	0	21.35	22.5	1

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#### 5.5.1.4.: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	$oldsymbol{eta_c}$	$eta_{ m d}$	$eta_{ m d} \ (SF)$	$\beta_c/\beta_d$	β <sub>HS</sub> (Note1, Note 2)	<b>CM (dB)</b> ( <i>Note 3</i> )	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 (dBm) Channel			Power Class 3 Limita- tion (dBm)	Comments
		9262	9400	9538	tion (dBin)	
	1	23.17	23.35	23.62	20.3dBm – 25.7dBm	Pass
HSDPA	2	23.34	23.11	23.63	20.3dBm – 25.7dBm	Pass
B2	3	22.69	22.90	23.09	19.8dBm – 25.7dBm	Pass
	4	22.76	22.91	23.21	19.8dBm – 25.7dBm	Pass

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Mode	ode Sub-test RMS Power (dBm) Channel		Bm)	Power Class 3 Limita- tion (dBm)	Comments	
		1312	1413	1513	uon (adm)	
	1	23.17	23.35	23.62	20.3dBm – 25.7dBm	Pass
HSDPA	2	23.34	23.11	23.63	20.3dBm – 25.7dBm	Pass
<b>B4</b>	3	22.69	22.90	23.09	19.8dBm – 25.7dBm	Pass
	4	22.76	22.91	23.21	19.8dBm – 25.7dBm	Pass

Mode Sub-test		RMS	Power (d Channel	Bm)	Power Class 3 Limita-	Comments
		4132	4172	4233	tion (dBm)	
	1	22.39	22.61	22.44	20.3dBm – 25.7dBm	Pass
HSDPA	2	22.53	22.64	22.19	20.3dBm – 25.7dBm	Pass
В5	3	21.93	22.13	21.95	19.8dBm – 25.7dBm	Pass
	4	21.98	22.17	22.01	19.8dBm – 25.7dBm	Pass

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

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

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#### **Results:**

Mode	Sub-test	RMS	S Power (d Channel	Bm)	Power Class 3 Limita-	Comments	
		9262	9400	9538	tion (dBm)	<u> </u>	
	1	22.47	23.05	22.58	17.3dBm – 25.7dBm	Pass	
	2	20.52	21.12	20.62	16.8dBm – 25.7dBm	Pass	
HSUPA	3	21.53	22.07	21.66	17.8dBm – 25.7dBm	Pass	
<b>B2</b>	4	20.65	21.17	20.66	16.8dBm – 25.7dBm	Pass	
	5	22.36	22.91	22.49	17.3dBm – 25.7dBm	Pass	

Mode	Sub-test	RMS	Power (d Channel	Bm)	Power Class 3 Limita-	Comments	
		1312	1413	1513	tion (dBm)		
	1	22.47	23.05	22.58	17.3dBm – 25.7dBm	Pass	
	2	20.52	21.12	20.62	16.8dBm – 25.7dBm	Pass	
HSUPA	3	21.53	22.07	21.66	17.8dBm – 25.7dBm	Pass	
B4	4	20.65	21.17	20.66	16.8dBm – 25.7dBm	Pass	
	5	22.36	22.91	22.49	17.3dBm – 25.7dBm	Pass	

Mode	Sub-test	RMS	Power (d Channel	Bm)	Power Class 3 Limita-	Comments	
		4132	4172	4233	tion (dBm)		
	1	23.38	23.23	23.72	17.3dBm – 25.7dBm	Pass	
	2	21.43	21.30	21.76	16.8dBm – 25.7dBm	Pass	
HSUPA D5	3	22.44	22.25	22.80	17.8dBm – 25.7dBm	Pass	
B5	4	21.56	21.35	21.80	16.8dBm – 25.7dBm	Pass	
	5	23.27	23.09	23.63	17.3dBm – 25.7dBm	Pass	

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#### 6. PEAK TO AVERAGE RATIO

## 6.1. Standard Applicable:

FCC 27.50(i)

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

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

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

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

Refer to section 2.4 in this report

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

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

#### **6.4.** Measurement Result:

Refer to next page for plot.

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Figure 6-1: 5MHz BW LTE-Band 4(16QAM Number: 25 Offset: 0) Channel Low



Figure 6-2: 5MHz BW LTE-Band 4(16QAM Number: 25 Offset: 0) Channel Mid



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Figure 6-3: 5MHz BW LTE-Band 4(16QAM Number: 25 Offset: 0) Channel High



Figure 6-4: 10MHz BW LTE-Band 4(16QAM Number: 50 Offset: 0) Channel Low



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Figure 6-5: 10MHz BW LTE-Band 4(16QAM Number: 50 Offset: 0) Channel Mid

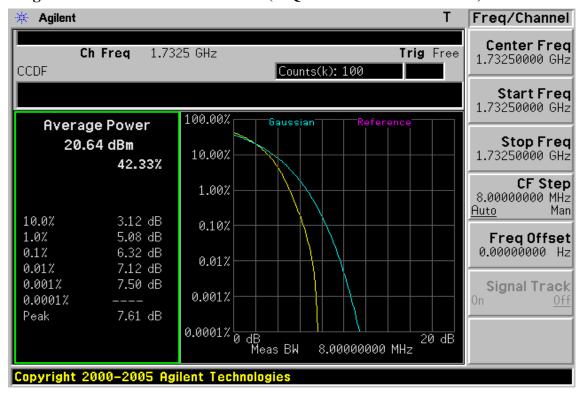


Figure 6-6: 10MHz BW LTE-Band 4(16QAM Number: 50 Offset: 0) Channel High



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Figure 6-7: 5MHz BW LTE-Band 17(16QAM Number: 25 Offset: 0) Channel Low



Figure 6-8: 5MHz BW LTE-Band 17(16QAM Number: 25 Offset: 0) Channel Mid



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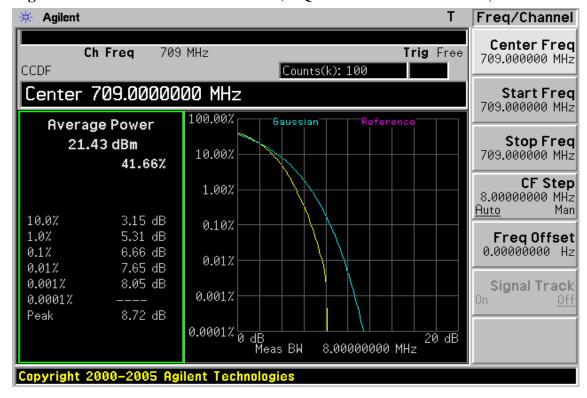
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Figure 6-9: 5MHz BW LTE-Band 17(16QAM Number: 25 Offset: 0) Channel High



Figure 6-10: 10MHz BW LTE-Band 17(16QAM Number: 50 Offset: 0) Channel Low



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Figure 6-11: 10MHz BW LTE-Band 17(16QAM Number: 50 Offset: 0) Channel Mid

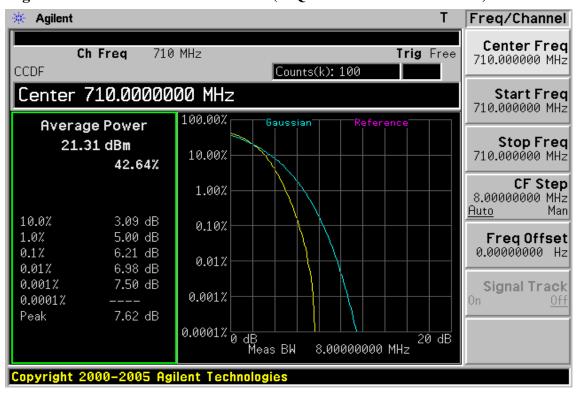
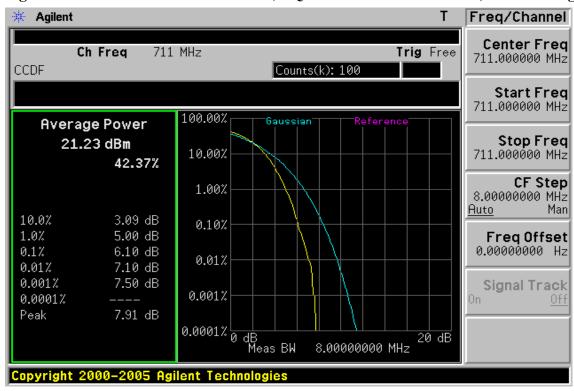


Figure 6-12: 10MHz BW LTE-Band 17(16QAM Number: 50 Offset: 0) Channel High



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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.

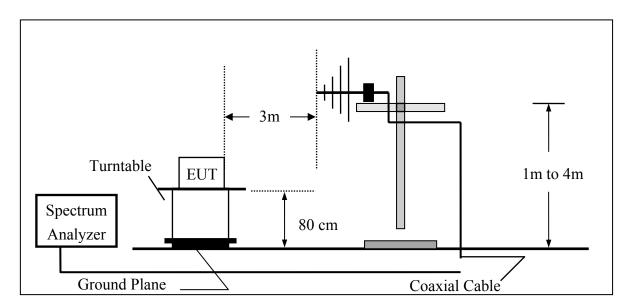
FCC 24.232(b) Mobile station are limited to 2W EIRP.

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

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

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

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



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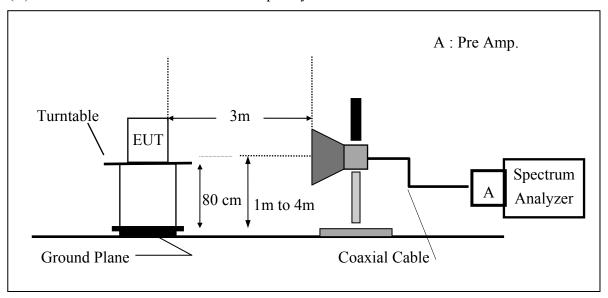
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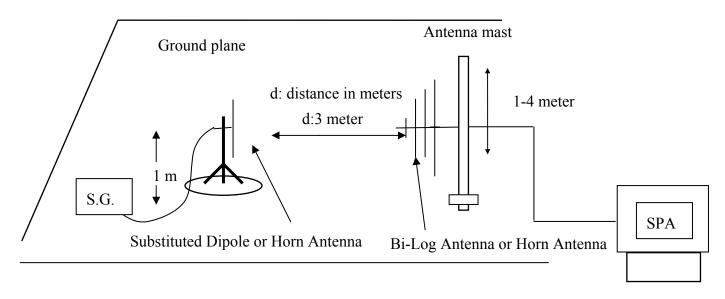
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# (B) Radiated Emission Test Set-UP Frequency Over 1 GHz



## (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 704 - 716MHz, 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 (dBi)	Cable Loss (dB)	EIRP (dBm)	Limit (dBm)
	1852.40	9262	E2	V	109.94	5.56	9.90	5.56	9.89	33.00
	1652.40	9202	1:2	Н	117.25	13.07	9.90	5.84	17.13	33.00
WCDMA II	1880.00	9400	E2	V	111.40	7.04	9.99	5.61	11.42	33.00
W CDMA II	1000.00	9 <del>4</del> 00	1:2	Н	118.01	13.87	9.99	5.61	18.24	33.00
	1907.60	9538	E2	V	111.94	7.61	10.07	5.66	12.02	33.00
	1907.00	9336	EZ	Н	117.92	13.81	10.07	5.66	18.22	33.00

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)
	1712.40	1312	E2	V	110.79	3.77	9.48	5.17	8.09	33.00
	1/12.40	1312	1:2	Н	121.92	14.95	9.90	5.84	19.01	33.00
WCDMA	1732.60	1413	E2	V	112.41	5.40	9.54	5.20	9.74	33.00
IV	1/32.00	1413	EZ	Н	120.67	13.71	9.54	5.20	18.05	33.00
	1752.60	1513	E2	V	113.88	6.88	9.60	5.24	11.25	33.00
	1/32.00	1313	152	Н	122.15	15.20	9.60	5.24	19.57	33.00

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)
	826.40	4132	E2	V	113.14	26.78	-10.02	3.63	13.13	38.45
	620.40	4132	1:2	Н	119.19	32.93	-10.02	3.63	19.29	38.45
WCDMA V	836.60	4183	E2	V	112.60	26.34	-10.02	3.65	12.67	38.45
WCDMA V	830.00	4103	EZ	Н	118.86	32.63	-10.02	3.65	18.96	38.45
	846.60	4233	E2	V	111.94	25.79	-10.02	3.67	12.10	38.45
	040.00	4233	152	Н	118.12	31.92	-10.02	3.67	18.23	38.45

## Remark:

(1) The RBW, VBW of SPA for frequency

RBW = 5MHz, VBW = 8MHz

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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)
	1852.40	9262	E2	V	114.23	9.85	9.90	5.56	14.18	33.00
	1632.40	9202	EZ	Н	121.74	17.56	9.90	5.84	21.62	33.00
HSDPA II	1880.00	9400	E2	V	115.31	10.95	9.99	5.61	15.33	33.00
I I I I I I I I I I I I I I I I I I I	1000.00	9400	EZ	Н	121.71	17.57	9.99	5.61	21.94	33.00
	1907.60	9538	E2	V	115.20	10.87	10.07	5.66	15.28	33.00
	1907.00	7338	EZ	Н	120.70	16.59	10.07	5.66	21.00	33.00

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)
	1712.40	1312	E2	V	117.27	10.25	9.48	5.17	14.57	33.00
	1/12.40	1312	E2	Н	126.78	19.81	9.90	5.84	23.87	33.00
HSDPA IV	1732.60	1413	E2	V	117.52	10.51	9.54	5.20	14.85	33.00
поргату	1/32.00	1413	E2	Н	125.55	18.59	9.54	5.20	22.93	33.00
	1752.60	1513	E2	V	118.01	11.01	9.60	5.24	15.38	33.00
	1/32.00	1313	EZ	Н	125.01	18.06	9.60	5.24	22.43	33.00

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)
	826.40	4132	E2	V	115.37	29.01	-10.02	3.63	15.36	38.45
	020.40	4132	EZ.	Н	120.92	34.66	-10.02	3.63	21.02	38.45
HSDPA V	836.60	4183	E2	V	114.30	28.04	-10.02	3.65	14.37	38.45
порга у	830.00	4103	E2	Н	120.54	34.31	-10.02	3.65	20.64	38.45
	846.60	4233	E2	V	114.21	28.06	-10.02	3.67	14.37	38.45
	040.00	4233	152	Н	120.20	34.00	-10.02	3.67	20.31	38.45

## Remark:

(1) The RBW,VBW of SPA for frequency

RBW = 5MHz, VBW = 8MHz

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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)
	1852.40	9262	E2	V	115.44	11.06	9.90	5.56	15.39	33.00
	1032.40	9202	EZ	Н	121.39	17.21	9.90	5.84	21.27	33.00
HSUPA II	1880.00	9400	E2	V	116.04	11.68	9.99	5.61	16.06	33.00
I I SUPA II	1000.00	9400	EZ	Н	121.30	17.16	9.99	5.61	21.53	33.00
	1907.60	9538	E2	V	117.02	12.69	10.07	5.66	17.10	33.00
	1907.00	9338	E2	Н	121.49	17.38	10.07	5.66	21.79	33.00

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)
	1712.40	1312	E2	V	115.66	8.64	9.48	5.17	12.96	33.00
	1/12.40	1312	EZ	Н	123.43	16.46	9.90	5.84	20.52	33.00
HSUPA IV	1732.60	1413	E2	V	114.97	7.96	9.54	5.20	12.30	33.00
I I SUFA IV	1/32.00	1413	EZ	Н	122.86	15.90	9.54	5.20	20.24	33.00
	1752.60	1513	E2	V	115.33	8.33	9.60	5.24	12.70	33.00
	1/32.00	1313	EZ	Н	122.67	15.72	9.60	5.24	20.09	33.00

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)
	826.40	4132	E2	V	114.01	27.65	-10.02	3.63	14.00	38.45
	020.40	4132	L'Z	Н	120.28	34.02	-10.02	3.63	20.38	38.45
HSUPA V	836.60	4183	E2	V	113.57	27.31	-10.02	3.65	13.64	38.45
IISUFA V	830.00	4103	L2	Н	119.96	33.73	-10.02	3.65	20.06	38.45
	846.60	4233	E2	V	113.25	27.10	-10.02	3.67	13.41	38.45
	0-0.00	7233	L'Z	Н	119.44	33.24	-10.02	3.67	19.55	38.45

## Remark:

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

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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)
	1510.5	10075	E2	V	113.82	9.30	9.48	5.33	13.45	30.00
5MHz BW	1712.5	19975	1:2	Н	123.99	19.66	9.48	5.84	23.30	30.00
LTE-Band 4	1500.5	20155	E2	V	113.78	9.28	9.54	5.37	13.45	30.00
(QPSK RB	1732.5	20175	EZ	Н	122.69	18.38	9.54	5.37	22.56	30.00
1 Offset 24)	)		БЭ	V	113.91	9.43	9.60	5.40	13.63	30.00
	1752.5	20375	E2	Н	121.23	16.94	9.60	5.40	21.15	30.00

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)
	1510.5	10055	E2	V	114.59	10.07	9.48	5.33	14.22	30.00
5MHz BW	1712.5	19975	1:2	Н	124.03	19.70	9.48	5.84	23.34	30.00
LTE-Band 4	1500 5	20155	E2	V	113.85	9.35	9.54	5.37	13.52	30.00
(16QAM RB 1 Offset	1732.5	20175	152	Н	122.80	18.49	9.54	5.37	22.67	30.00
24))	1752 5 2022	20255	E2	V	114.61	10.13	9.60	5.40	14.33	30.00
	1752.5	20375	152	Н	122.16	17.87	9.60	5.40	22.08	30.00

## Remark:

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

RBW = 5MHz, VBW = 8MHz

Detector = Peak

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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)
	1710.5	10075	E2	V	113.77	9.25	9.48	5.33	13.40	30.00
5MHz BW	1712.5	19975	E2	Н	123.93	19.60	9.48	5.84	23.24	30.00
LTE-Band 4		20155	E2	V	113.99	9.49	9.54	5.37	13.66	30.00
(QPSK RB	1732.5	20175	E2	Н	122.82	18.51	9.54	5.37	22.69	30.00
1 Offset 0)	1750 5	20255	E2	V	113.85	9.37	9.60	5.40	13.57	30.00
,	1752.5	20375	E2	Н	121.78	17.49	9.60	5.40	21.70	30.00

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)
5MHz BW	1510.5	10075	E2	V	114.59	10.07	9.48	5.33	14.22	30.00
LTE-Band 4	1712.5	19975	L2	Н	123.86	19.53	9.48	5.84	23.17	30.00
(16QAM		• • • • •	E2	V	114.39	9.89	9.54	5.37	14.06	30.00
RB 1 Offset	1732.5	20175	E2	Н	123.06	18.75	9.54	5.37	22.93	30.00
0)			E2	V	114.69	10.21	9.60	5.40	14.41	30.00
	1752.5	20375	EZ	Н	122.69	18.40	9.60	5.40	22.61	30.00

## Remark:

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

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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)
	1510.5	10075	E2	V	112.94	8.42	9.48	5.33	12.57	30.00
5MHz BW	1712.5	19975	E2	Н	122.94	18.61	9.48	5.84	22.25	30.00
LTE-Band 4	1500.5	20155	E2	V	112.11	7.61	9.54	5.37	11.78	30.00
(QPSK RB	1732.5	20175	EZ	Н	121.64	17.33	9.54	5.37	21.51	30.00
12 Offset 6)	fset 6)		F2	V	113.36	8.88	9.60	5.40	13.08	30.00
	1752.5	20375	E2	Н	121.15	16.86	9.60	5.40	21.07	30.00

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)
	1510.5	10055	E2	V	114.39	9.87	9.48	5.33	14.02	30.00
5MHz BW	1712.5	19975	EZ	Н	123.72	19.39	9.48	5.84	23.03	30.00
LTE-Band 4		20155	E2	V	113.56	9.06	9.54	5.37	13.23	30.00
(16QAM RB 12	1732.5	20175	152	Н	122.52	18.21	9.54	5.37	22.39	30.00
Offset 6)	1550 5	1752 5 20275	E2	V	113.97	9.49	9.60	5.40	13.69	30.00
	1752.5	20375	152	Н	121.20	16.91	9.60	5.40	21.12	30.00

## Remark:

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

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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)
	1510.5	10075	E2	V	111.52	7.00	9.48	5.33	11.15	30.00
5MHz BW	1712.5	19975	1:2	Н	121.62	17.29	9.48	5.84	20.93	30.00
LTE-Band 4	1500.5	20155	E2	V	110.56	6.06	9.54	5.37	10.23	30.00
(QPSK RB	1732.5	20175	E2	Н	119.54	15.23	9.54	5.37	19.41	30.00
25 Offset 0)		20255	E2	V	111.50	7.02	9.60	5.40	11.22	30.00
	1752.5	20375	E2	Н	119.33	15.04	9.60	5.40	19.25	30.00

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)
	1510.5	10075	E2	V	110.91	6.39	9.48	5.33	10.54	30.00
5MHz BW	1712.5	19975	L2	Н	121.42	17.09	9.48	5.84	20.73	30.00
LTE-Band 4			E2	V	112.56	8.06	9.54	5.37	12.23	30.00
(16QAM	1732.5	20175	E2	Н	121.54	17.23	9.54	5.37	21.41	30.00
RB 25 Off-			Е2	V	112.81	8.33	9.60	5.40	12.53	30.00
set 0)	1752.5	20375	E2	Н	120.41	16.12	9.60	5.40	20.33	30.00

## Remark:

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

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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)
	1515	20000	E2	V	111.97	7.45	9.49	5.34	11.60	30.00
10MHz BW	1715	20000	E2	Н	120.39	16.06	9.49	5.84	19.71	30.00
LTE-Band 4			E2	V	113.14	8.64	9.54	5.37	12.81	30.00
(QPSK RB	1732.5	20175	E2	Н	120.66	16.35	9.54	5.37	20.53	30.00
1 Offset 49)			E2	V	114.39	9.91	9.60	5.40	14.11	30.00
	1750	20350	E2	Н	122.01	17.72	9.60	5.40	21.92	30.00

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)
10MHz BW	1515	20000	E2	V	113.02	8.50	9.49	5.34	12.65	30.00
LTE-Band 4	1715	20000	E2	Н	121.25	16.92	9.49	5.84	20.57	30.00
(16QAM	1500.5	20155	E2	V	113.19	8.69	9.54	5.37	12.86	30.00
RB 1 Offset	1732.5	20175	E2	Н	121.17	16.86	9.54	5.37	21.04	30.00
49)	1.50	20250	E2	V	115.88	11.40	9.60	5.40	15.60	30.00
	1750	20350	E2	Н	123.31	19.02	9.60	5.40	23.22	30.00

### Remark:

(1) The RBW, VBW of SPA for frequency

RBW = 10MHz, VBW = 10MHz

Detector = Peak

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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)
	1515	20000	E2	V	112.26	7.74	9.49	5.34	11.89	30.00
10MHz BW	1715	20000	152	Н	120.79	16.46	9.49	5.84	20.11	30.00
LTE-Band 4			E2	V	113.34	8.84	9.54	5.37	13.01	30.00
(QPSK RB	1732.5	20175	E2	Н	121.61	17.30	9.54	5.37	21.48	30.00
1 Offset 0)			E2	V	114.71	10.23	9.60	5.40	14.43	30.00
	1750	20350	E2	Н	122.50	18.21	9.60	5.40	22.41	30.00

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)
10MHz BW	1515	20000	E2	V	113.23	8.71	9.49	5.34	12.86	30.00
LTE-Band 4	1715	20000	E2	Н	121.55	17.22	9.49	5.84	20.87	30.00
(16QAM	1500.5	20155	E2	V	114.11	9.61	9.54	5.37	13.78	30.00
RB 1 Offset	1732.5	20175	E2	Н	121.59	17.28	9.54	5.37	21.46	30.00
0)	4		E2	V	115.58	11.10	9.60	5.40	15.30	30.00
	1750	20350	E2	Н	123.82	19.53	9.60	5.40	23.73	30.00

## Remark:

(1) The RBW, VBW of SPA for frequency

RBW = 10MHz, VBW = 10MHz

Detector = Peak

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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)
	1515	20000	E2	V	109.42	4.90	9.49	5.34	9.05	30.00
10MHz BW	1715	20000	152	Н	118.06	13.73	9.49	5.84	17.38	30.00
LTE-Band 4			F2	V	111.01	6.51	9.54	5.37	10.68	30.00
(QPSK RB	1732.5	20175	E2	Н	118.87	14.56	9.54	5.37	18.74	30.00
25 Offset			F2	V	112.79	8.31	9.60	5.40	12.51	30.00
12)	1750	20350	E2	Н	120.72	16.43	9.60	5.40	20.63	30.00

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)
	1515	•	E2	V	110.87	6.35	9.49	5.34	10.50	30.00
10MHz BW	1715	20000	E2	Н	119.33	15.00	9.49	5.84	18.65	30.00
LTE-Band 4			E2	V	111.97	7.47	9.54	5.37	11.64	30.00
(16QAM	1732.5	20175	E2	Н	119.68	15.37	9.54	5.37	19.55	30.00
RB 25 Off-			Г2	V	113.87	9.39	9.60	5.40	13.59	30.00
set 12)	1750	20350	E2	Н	121.76	17.47	9.60	5.40	21.67	30.00

# Remark:

(1) The RBW, VBW of SPA for frequency

RBW = 10MHz, VBW = 10MHz

Detector = Peak

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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)
	1515	20000	E2	V	108.35	3.83	9.49	5.34	7.98	30.00
10MHz BW	1715	20000	E2	Н	116.55	12.22	9.49	5.84	15.87	30.00
LTE-Band 4			E2	V	109.92	5.42	9.54	5.37	9.59	30.00
(QPSK RB	1732.5	20175	E2	Н	116.98	12.67	9.54	5.37	16.85	30.00
50 Offset 0)			E2	V	111.65	7.17	9.60	5.40	11.37	30.00
	1750	20350	EZ	Н	119.84	15.55	9.60	5.40	19.75	30.00

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)
	1515	•	E2	V	109.34	4.82	9.49	5.34	8.97	30.00
10MHz BW	1715	20000	E2	Н	117.79	13.46	9.49	5.84	17.11	30.00
LTE-Band 4			Е2	V	109.92	5.42	9.54	5.37	9.59	30.00
(16QAM	1732.5	20175	E2	Н	117.83	13.52	9.54	5.37	17.70	30.00
RB 50 Off-			Г2	V	112.46	7.97	9.60	5.40	12.18	30.00
set 0)	1750	20350	E2	Н	120.42	16.13	9.60	5.40	20.33	30.00

## Remark:

(1) The RBW, VBW of SPA for frequency

RBW = 10MHz, VBW = 10MHz

Detector = Peak

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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)
	706.5	22755	E2	V	114.03	24.89	-7.86	3.31	13.72	34.77
5MHz BW	706.5	23755	1:2	Н	120.59	31.74	-7.86	5.84	18.04	34.77
LTE-Band	<b>5</b> 10	22700	E2	V	110.67	21.70	-7.86	3.33	10.51	34.77
17	710	23790	E2	Н	117.30	27.80	-7.86	3.33	16.61	34.77
(QPSK RB		22025	3825 E2 -	V	112.21	23.40	-7.86	3.34	12.20	34.77
1 Offset 24)	713.5	23825	EZ	Н	118.90	28.75	-7.86	3.34	17.54	34.77

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)
5MHz BW	706.5	22755	E2	V	114.80	25.66	-7.86	3.31	14.49	34.77
LTE-Band	706.5	23755	E2	Н	121.60	32.75	-7.86	5.84	19.05	34.77
17	<b>7</b> 10	22700	E2	V	112.59	23.62	-7.86	3.33	12.43	34.77
(16 QAM	710	23790	E2	Н	120.56	31.06	-7.86	3.33	19.87	34.77
RB 1 Offset		22025	E2	V	113.61	24.80	-7.86	3.34	13.60	34.77
24)	713.5	23825	E2	Н	121.88	31.73	-7.86	3.34	20.52	34.77

### Remark:

(1) The RBW, VBW of SPA for frequency

RBW = 5MHz, VBW = 8MHz

Detector = Peak

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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)
5MHz BW	706.5	22755	E2	V	111.00	21.86	-7.86	3.31	10.69	34.77
LTE-Band	706.5	23755	1:2	Н	117.08	28.23	-7.86	5.84	14.53	34.77
17	<b>5</b> 10	22700	E2	V	110.96	21.99	-7.86	3.33	10.80	34.77
(QPSK RB	710	23790	E2	Н	117.95	28.45	-7.86	3.33	17.26	34.77
1 Offset 0)	<b>-10</b> -	22025	E2	V	110.84	22.03	-7.86	3.34	10.83	34.77
	713.5	23825	E2	Н	117.42	27.27	-7.86	3.34	16.06	34.77

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)
5MHz BW	706.5	22755	E2	V	112.15	23.01	-7.86	3.31	11.84	34.77
LTE-Band	706.5	23755	1:2	Н	118.71	29.86	-7.86	5.84	16.16	34.77
17	<b>5</b> 10	22700	E2	V	112.94	23.97	-7.86	3.33	12.78	34.77
(16 QAM	710	23790	E2	Н	119.73	30.23	-7.86	3.33	19.04	34.77
RB 1 Offset		22025	E2	V	112.08	23.27	-7.86	3.34	12.07	34.77
0)	713.5	23825	152	Н	118.98	28.83	-7.86	3.34	17.62	34.77

## Remark:

(1) The RBW, VBW of SPA for frequency

RBW = 5MHz, VBW = 8MHz

Detector = Peak

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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)
5MHz BW	706.5	22755	E2	V	109.07	19.93	-7.86	3.31	8.76	34.77
LTE-Band	706.5	23755	1:2	Н	116.39	27.54	-7.86	5.84	13.84	34.77
17	710	22700	E2	V	111.65	22.68	-7.86	3.33	11.49	34.77
(QPSK RB	710	23790	1:2	Н	118.38	28.88	-7.86	3.33	17.69	34.77
12 Offset 6)	<b>510.5</b>	22025	ЕЭ	V	107.86	19.05	-7.86	3.34	7.85	34.77
	713.5	23825	E2	Н	114.22	24.07	-7.86	3.34	12.86	34.77

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)
5MHz BW	706.5	22755	E2	V	110.71	21.57	-7.86	3.31	10.40	34.77
LTE-Band	706.5	23755	E2	Н	117.52	28.67	-7.86	5.84	14.97	34.77
17	710	22700	E2	V	113.10	24.13	-7.86	3.33	12.94	34.77
(16 QAM	710	23790	Ľ2	Н	119.79	30.29	-7.86	3.33	19.10	34.77
RB 12 Off-			E2	V	109.06	20.25	-7.86	3.34	9.05	34.77
set 6)	713.5	23825	E2	Н	115.31	25.16	-7.86	3.34	13.95	34.77

### Remark:

(1) The RBW, VBW of SPA for frequency

RBW = 5MHz, VBW = 8MHz

Detector = Peak

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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)
	706.5	22755	E2	V	107.47	18.33	-7.86	3.31	7.16	34.77
5MHz BW	706.5	23755	1:2	Н	114.43	25.58	-7.86	5.84	11.88	34.77
LTE-Band	710	22700	E2	V	108.70	19.73	-7.86	3.33	8.54	34.77
17	710	23790	0 E2	Н	115.50	26.00	-7.86	3.33	14.81	34.77
(QPSK RB		22025	3825 E2	V	106.50	17.69	-7.86	3.34	6.49	34.77
25 Offset 0)	713.5	23825	152	Н	112.95	22.80	-7.86	3.34	11.59	34.77

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)
5MHz BW	706.5	22755	E2	V	109.25	20.11	-7.86	3.31	8.94	34.77
LTE-Band	706.5	23755	152	Н	116.11	27.26	-7.86	5.84	13.56	34.77
17	710	22700	E2	V	110.53	21.56	-7.86	3.33	10.37	34.77
(16 QAM	710	23790	1:2	Н	116.97	27.47	-7.86	3.33	16.28	34.77
RB 25 Off-			E2	V	108.85	20.04	-7.86	3.34	8.84	34.77
set 0)	713.5	23825	E2	Н	115.29	25.14	-7.86	3.34	13.93	34.77

### Remark:

(1) The RBW, VBW of SPA for frequency

RBW=5MHz, VBW=8MHz

Detector = Peak

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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)
	700	22700	E2	V	107.26	18.24	-7.86	3.32	7.06	34.77
10MHz BW	709	23780	152	Н	113.03	23.72	-7.86	5.84	10.02	34.77
LTE-Band	<b>-</b> 10		E2	V	107.86	18.89	-7.86	3.33	7.70	34.77
17	710	23790	E2	Н	114.15	24.65	-7.86	3.33	13.46	34.77
(QPSK RB		••••	БЭ	V	109.76	20.83	-7.86	3.33	9.64	34.77
1 Offset 49)	711	23800	E2	Н	115.81	26.12	-7.86	3.33	14.93	34.77

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)
10MHz BW	700	22700	E2	V	108.79	19.77	-7.86	3.32	8.59	34.77
LTE-Band	709	23780	152	Н	115.86	26.55	-7.86	5.84	12.85	34.77
17	710	22700	E2	V	109.79	20.82	-7.86	3.33	9.63	34.77
(16 QAM	710	23790	E2	Н	115.92	26.42	-7.86	3.33	15.23	34.77
RB 1 Offset			Г2	V	111.33	22.40	-7.86	3.33	11.21	34.77
49)	711	23800	E2	Н	117.48	27.79	-7.86	3.33	16.60	34.77

### Remark:

(1) The RBW, VBW of SPA for frequency

RBW = 10MHz, VBW = 10MHz

Detector = Peak

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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)
	700	22700	E2	V	110.82	21.80	-7.86	3.32	10.62	34.77
10MHz BW	709	23780	1:2	Н	116.42	27.11	-7.86	5.84	13.41	34.77
LTE-Band	<b>5</b> 10	22700	E2	V	108.23	19.26	-7.86	3.33	8.07	34.77
17	710	23790	E2	Н	114.89	25.39	-7.86	3.33	14.20	34.77
(QPSK RB	<b>5</b> 11	22000	E2	V	109.76	20.83	-7.86	3.33	9.64	34.77
1 Offset 0)	711	23800	EZ	Н	115.81	26.12	-7.86	3.33	14.93	34.77

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)
10MHz BW	700	22700	E2	V	111.96	22.94	-7.86	3.32	11.76	34.77
LTE-Band	709	23780	E2	Н	118.55	29.24	-7.86	5.84	15.54	34.77
17	<b>7</b> 10	22700	E2	V	110.86	21.89	-7.86	3.33	10.70	34.77
(16 QAM	710	23790	E2	Н	117.59	28.09	-7.86	3.33	16.90	34.77
RB 1 Offset			F2	V	110.90	21.97	-7.86	3.33	10.78	34.77
0)	711	23800	E2	Н	117.87	28.18	-7.86	3.33	16.99	34.77

### Remark:

(1) The RBW, VBW of SPA for frequency

RBW=10MHz, VBW=10MHz

Detector = Peak

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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)
10MHz BW	700	22700	E2	V	109.44	20.42	-7.86	3.32	9.24	34.77
LTE-Band	709	23780	E2	Н	115.46	26.15	-7.86	5.84	12.45	34.77
17	710	22700	E2	V	109.44	20.47	-7.86	3.33	9.28	34.77
(QPSK RB	710	23790	E2	Н	116.09	26.59	-7.86	3.33	15.40	34.77
25 Offset	711 22000	E2	V	108.01	19.08	-7.86	3.33	7.89	34.77	
12)	711	23800	E2	Н	114.64	24.95	-7.86	3.33	13.76	34.77

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)
10MHz BW	700	22700	E2	V	110.41	21.39	-7.86	3.32	10.21	34.77
LTE-Band	709	23780	E2	Н	116.82	27.51	-7.86	5.84	13.81	34.77
17	-10		E2	V	110.76	21.79	-7.86	3.33	10.60	34.77
(16 QAM	710	23790	E2	Н	117.24	27.74	-7.86	3.33	16.55	34.77
RB 25 Off-			F2	V	110.34	21.41	-7.86	3.33	10.22	34.77
set 12)	711	23800	E2	Н	116.76	27.07	-7.86	3.33	15.88	34.77

### Remark:

(1) The RBW, VBW of SPA for frequency

RBW = 10MHz, VBW = 10MHz

Detector = Peak

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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)
	<b>7</b> 00	23780	E2	V	105.02	16.00	-7.86	3.32	4.82	34.77
10MHz BW	709		L2	Н	111.77	22.46	-7.86	5.84	8.76	34.77
LTE-Band	<b>7</b> 10	22700	E2	V	105.08	16.11	-7.86	3.33	4.92	34.77
17	710	23790	E2	Н	111.70	22.20	-7.86	3.33	11.01	34.77
(QPSK RB			E2	V	105.39	16.46	-7.86	3.33	5.27	34.77
50 Offset 0)	711	23800	E2	Н	111.89	22.20	-7.86	3.33	11.01	34.77

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)
10MHz BW	700	22700	E2	V	107.68	18.66	-7.86	3.32	7.48	34.77
LTE-Band	709	23780		Н	114.14	24.83	-7.86	5.84	11.13	34.77
17	710	22700	E2	V	107.17	18.20	-7.86	3.33	7.01	34.77
(16 QAM	710	23790	EZ	Н	113.64	24.14	-7.86	3.33	12.95	34.77
RB 50 Off-		F-2	V	107.13	18.20	-7.86	3.33	7.01	34.77	
set 0)	711	23800	E2	Н	113.70	24.01	-7.86	3.33	12.82	34.77

### Remark:

(1) The RBW, VBW of SPA for frequency

RBW = 10MHz, VBW = 10MHz

Detector = Peak

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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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EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)	
WCDMA II	1852.40	9262	4.1300	
	1880.00	9400	4.1251	
	1907.60	9538	4.1191	

EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
WCDMA IV	1852.40	1312	4.1441
	1880.00	1413	4.1333
	1907.60	1513	4.1432

EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
	826.40	4132	4.1203
WCDMA V	836.00	4180	4.1410
	846.60	4233	4.1181

EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
HSDPA II	1852.4	9262	4.1267
	1880.0	9400	4.1653
	1907.6	9538	4.1599

EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
	1852.4	9262	4.1633
HSDPA IV	1880.0	9400	4.1520
	1907.6	9538	4.1435

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EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
HSDPA V	826.40	4132	4.1534
	836.60	4183	4.1299
	846.60	4233	4.1317

EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
	1852.4	9262	4.1754
HSUPA II	1880.0	9400	4.1464
	1907.6	9538	4.1503

EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
HSUPA IV	1852.4	1312	4.1203
	1880.0	1413	4.1441
	1907.6	1513	4.1480

EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
HSUPA V	826.40	4132	4.1493
	836.60	4183	4.1280
	846.60	4233	4.1110

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EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
5MHz BW	1712.5	19975	4.5116
LTE-Band 4 (QPSK	1732.5	20175	4.5128
RB Number: 25 Offset: 0)	1752.5	20375	4.5041

EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
5MHz BW	1712.5	19975	4.4967
LTE-Band 4 (16QAM	1732.5	20175	4.5064
RB Number: 25 Offset: 0)	1752.5	20375	4.5124

EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
10MHz BW	1715	20000	8.9860
LTE-Band 4 (QPSK	1732.5	20175	8.9668
RB Number: 50 Offset: 0)	1750	20350	8.9702

EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
10MHz BW	1715	20000	8.9690
LTE-Band 4 (16QAM	1732.5	20175	8.9524
RB Number: 50 Offset: 0)	1750	20350	8.9630

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EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
5MHz BW	706.5	23755	4.5183
LTE-Band 17 (QPSK	710	23790	4.4783
RB Number: 25 Offset: 0)	713.5	23835	4.5115

EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
5MHz BW	706.5	23755	4.4961
LTE-Band 17 (16QAM	710	23790	4.4862
RB Number: 25 Offset: 0)	713.5	23835	4.4938

EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
10MHz BW	709	23780	8.9416
LTE-Band 17 (QPSK	710	23790	8.9399
RB Number: 50 Offset: 0)	711	23800	8.9029

EUT Mode	Frequency (MHz)	СН	99% Bandwidth (MHz)
10MHz BW	709	23780	8.9102
LTE-Band 17 (16QAM	710	23790	8.9131
RB Number: 50 Offset: 0)	711	23800	8.8951

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Figure 8-1: WCDMA II Channel Low

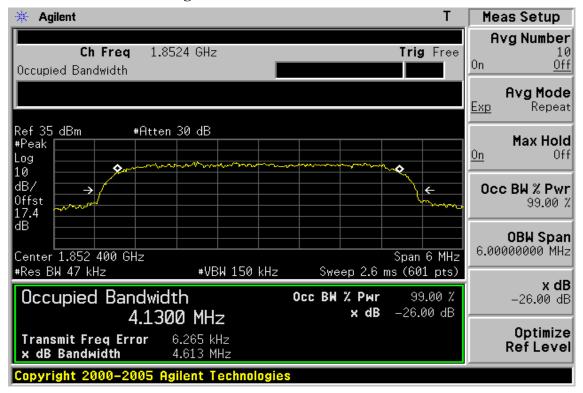
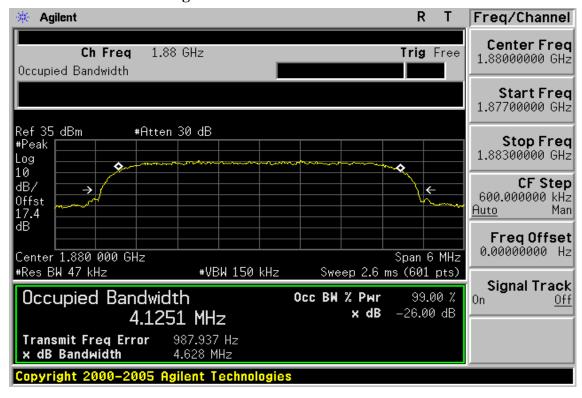


Figure 8-2 WCDMA II Channel Mid



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Figure 8-3: WCDMA II Channel High

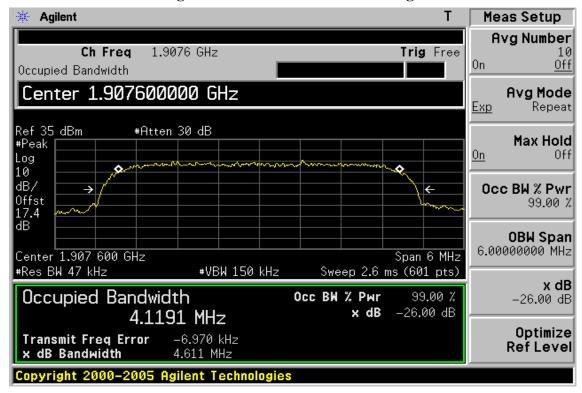
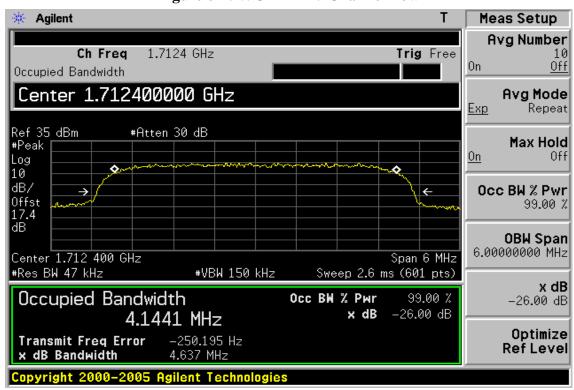


Figure 8-4: WCDMA IV Channel Low



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**Figure 8-5 WCDMA IV Channel Mid** 

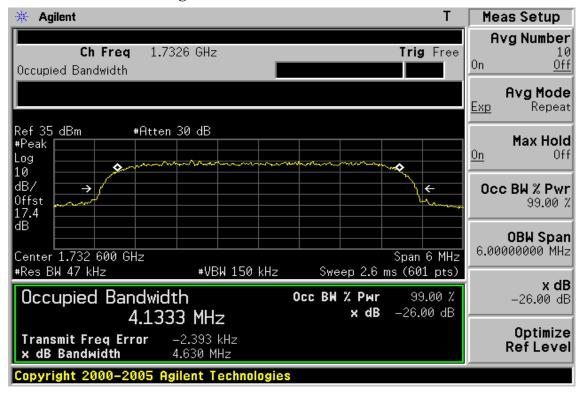
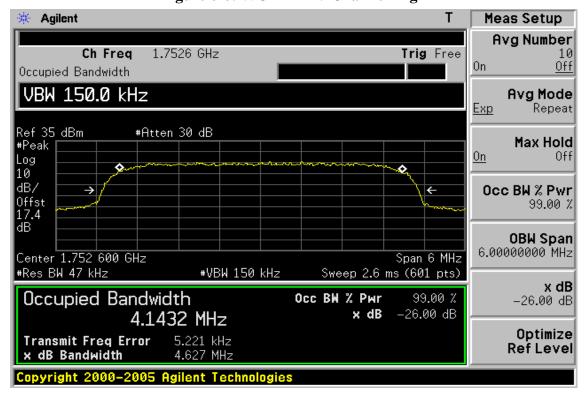


Figure 8-6: WCDMA IV Channel High



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Figure 8-7: WCDMA V Channel Low

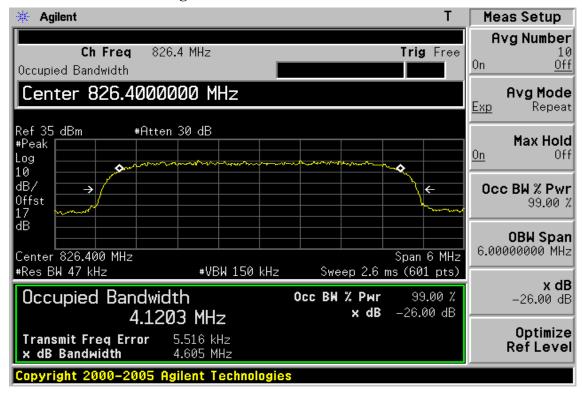
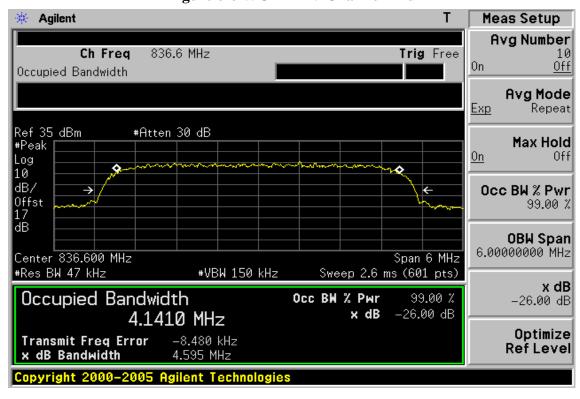


Figure 8-8 WCDMA V Channel Mid



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Figure 8-9: WCDMA V Channel High

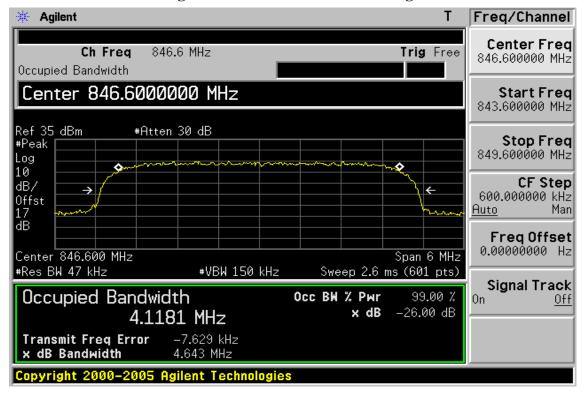
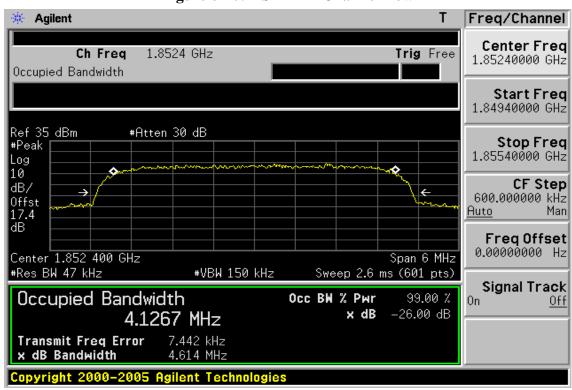


Figure 8-10: HSDPA II Channel Low



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Figure 8-11 HSDPA II Channel Mid

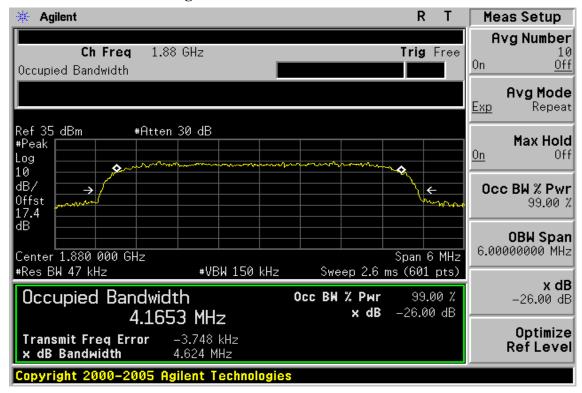
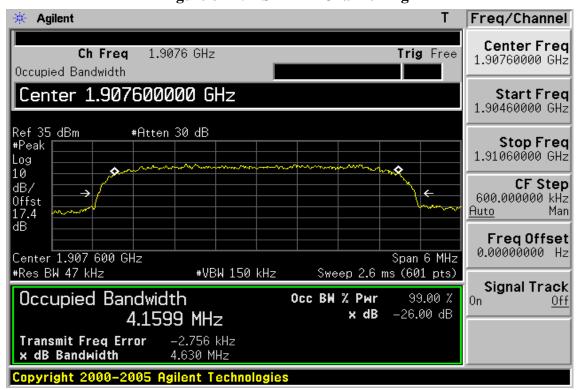


Figure 8-12: HSDPA II Channel High



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Figure 8-13: HSDPA IV Channel Low

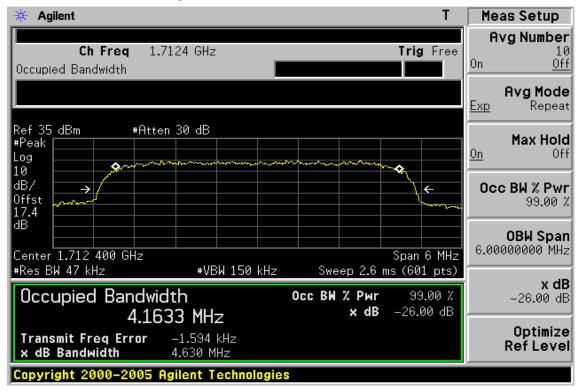
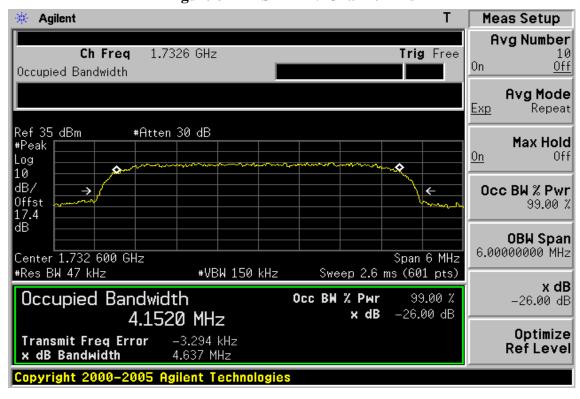


Figure 8-14 HSDPA IV Channel Mid



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Figure 8-15: HSDPA IV Channel High

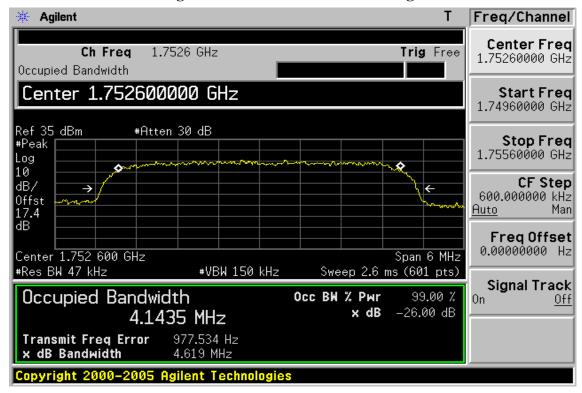
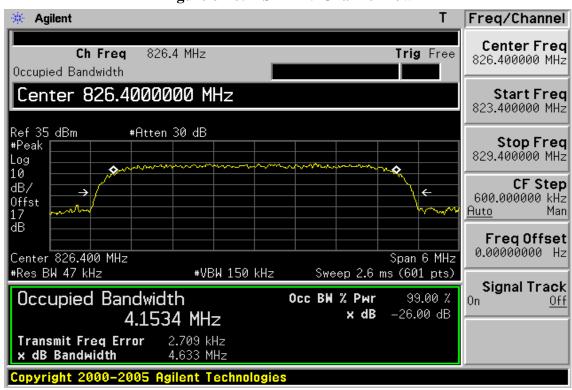


Figure 8-16: HSDPA V Channel Low



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Figure 8-17 HSDPA V Channel Mid

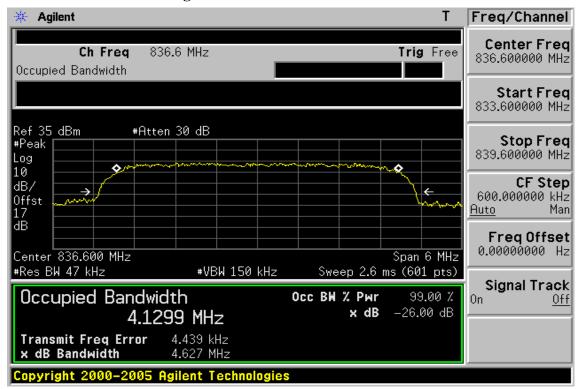
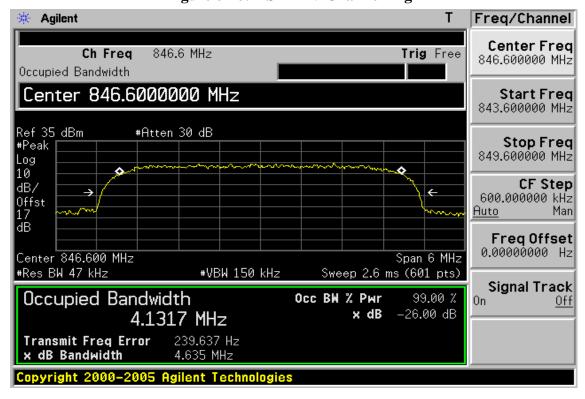


Figure 8-18: HSDPA V Channel High



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Figure 8-19: HSUPA II Channel Low

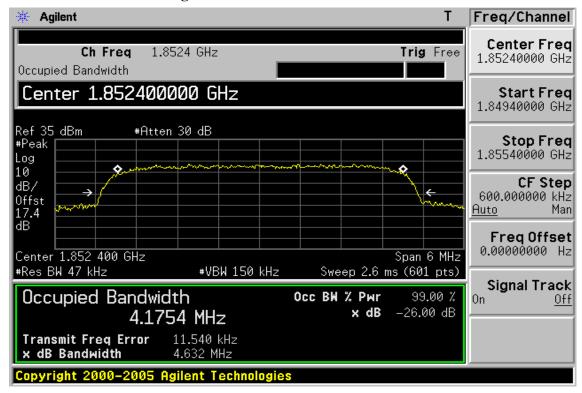
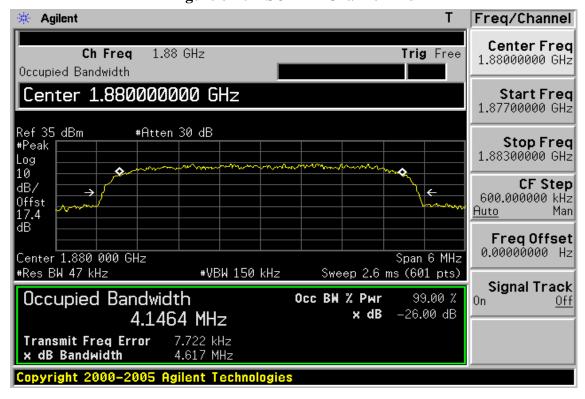


Figure 8-20 HSUPA II Channel Mid



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Figure 8-21: HSUPA II Channel High

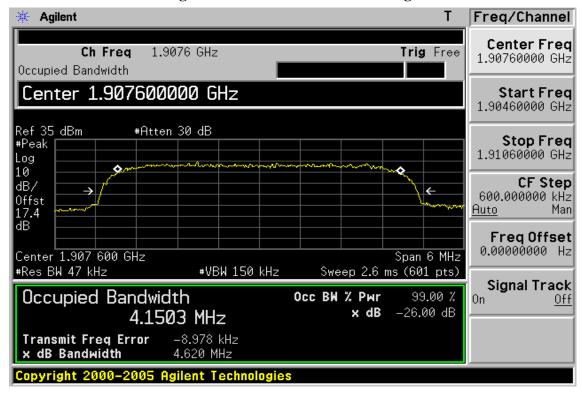
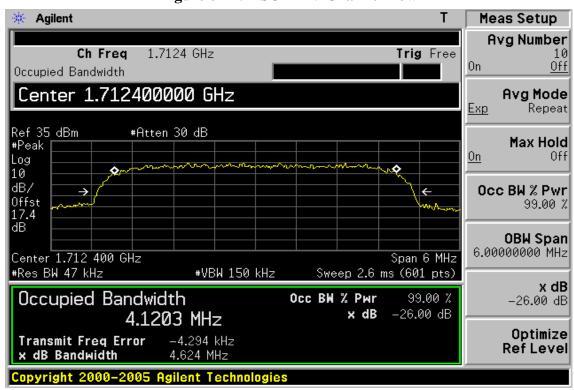


Figure 8-22: HSUPA IV Channel Low



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Figure 8-23 HSUPA IV Channel Mid

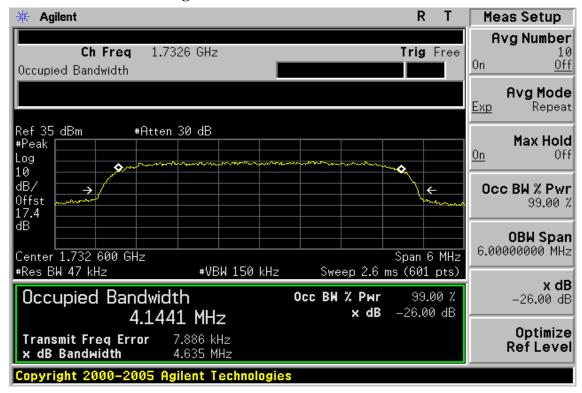
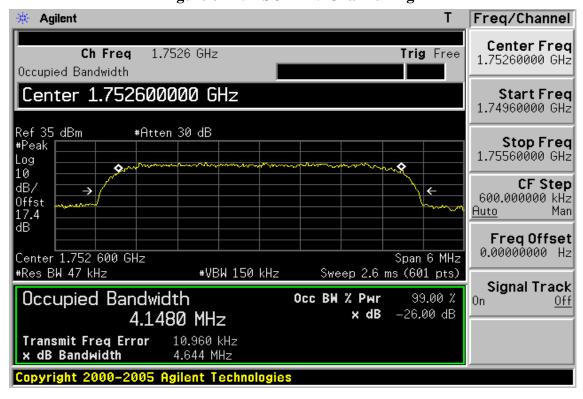


Figure 8-24: HSUPA IV Channel High



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Figure 8-25: HSUPA V Channel Low

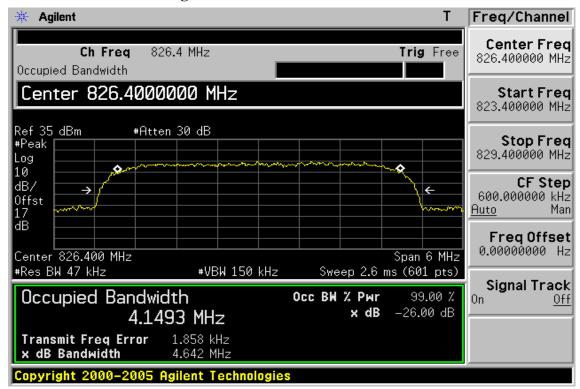
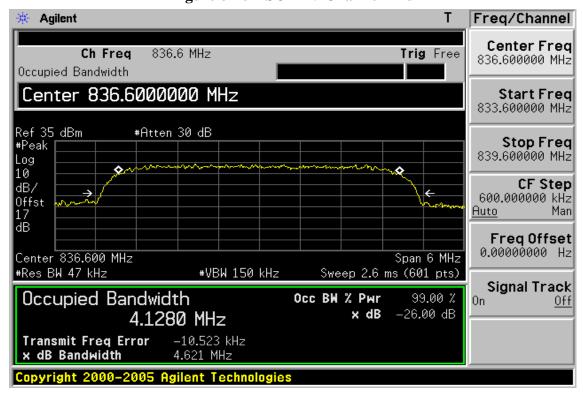


Figure 8-26 HSUPA V Channel Mid



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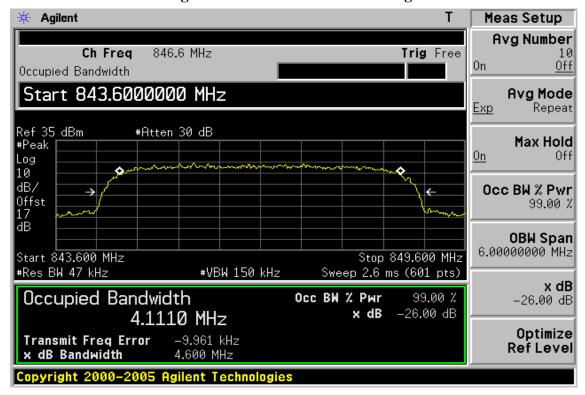
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Figure 8-27: HSUPA V Channel High



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Figure 8-28: 5MHz BW LTE-Band 4(QPSK RB Number: 25 Offset: 0) Channel Low

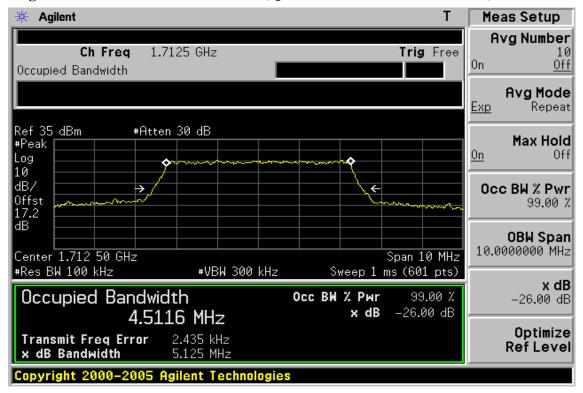
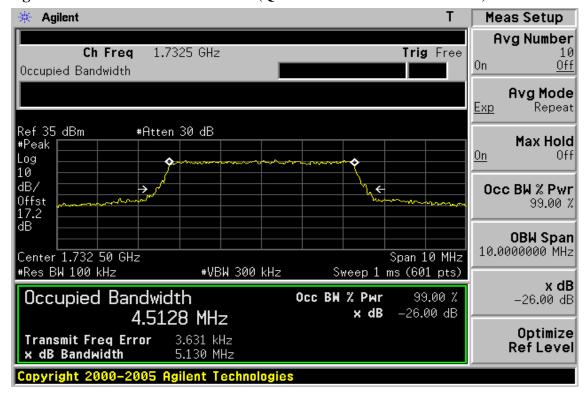


Figure 8-29: 5MHz BW LTE-Band 4(QPSK RB Number: 25 Offset: 0) Channel Mid



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Figure 8-30: 5MHz BW LTE-Band 4(QPSK RB Number: 25 Offset: 0) Channel High

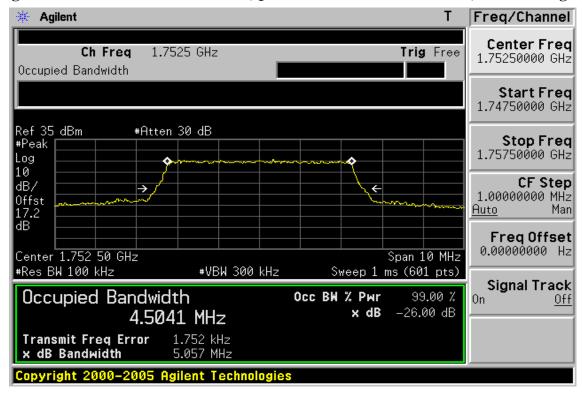
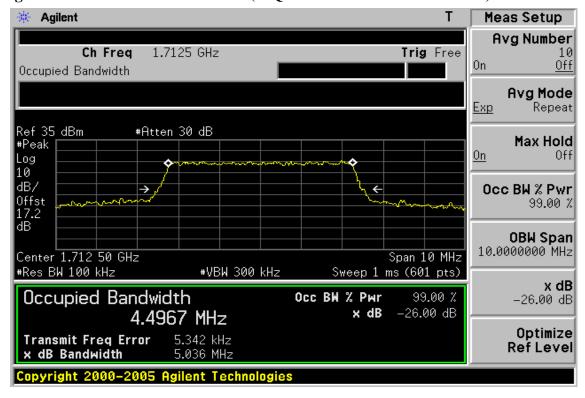


Figure 8-31: 5MHz BW LTE-Band 4(16QAM RB Number: 25 Offset: 0) Channel Low



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Figure 8-32: 5MHz BW LTE-Band 4(16QAM RB Number: 25 Offset: 0) Channel Mid

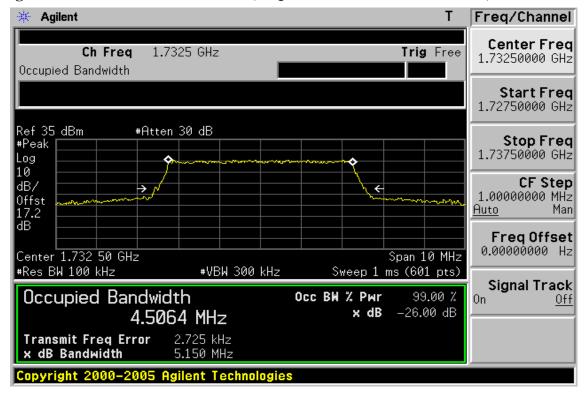
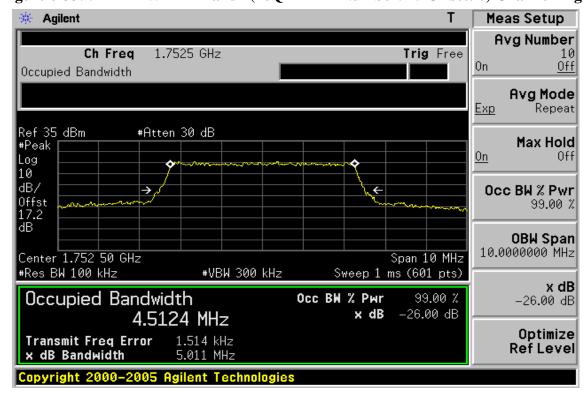


Figure 8-33: 5MHz BW LTE-Band 4(16QAM RB Number: 25 Offset: 0) Channel High



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Figure 8-34: 10MHz BW LTE-Band 4(QPSK RB Number: 50 Offset: 0) Channel Low

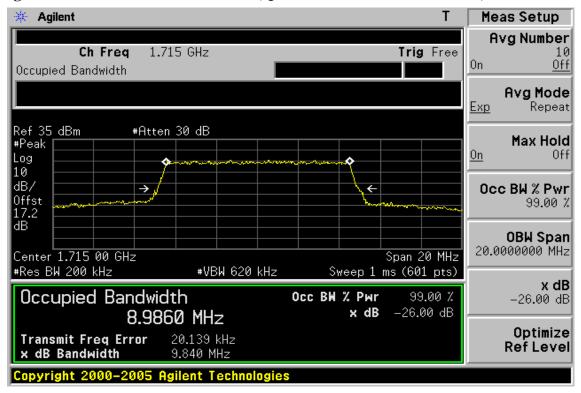
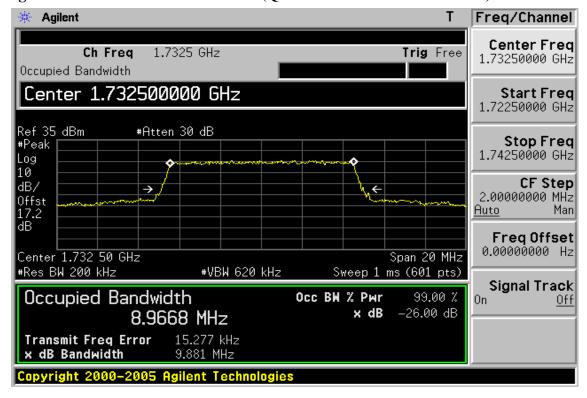


Figure 8-35: 10MHz BW LTE-Band 4(QPSK RB Number: 50 Offset: 0) Channel Mid



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Figure 8-36: 10MHz BW LTE-Band 4(QPSK RB Number: 50 Offset: 0) Channel High

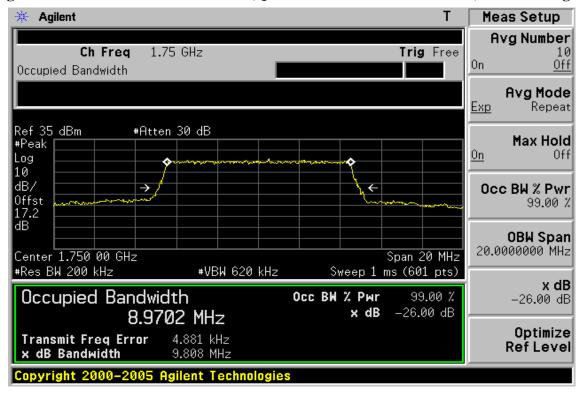
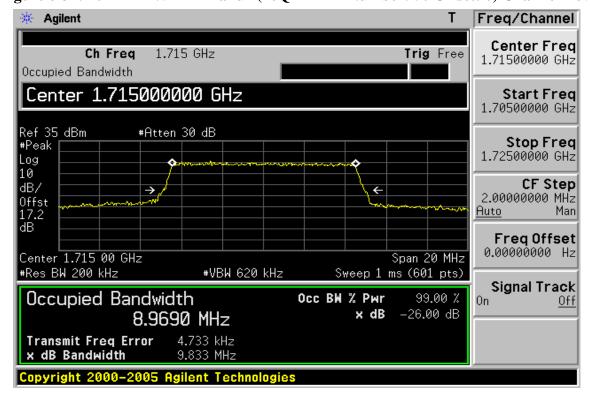


Figure 8-37: 10MHz BW LTE-Band 4(16QAM RB Number: 50 Offset: 0) Channel Low



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Figure 8-38: 10MHz BW LTE-Band 4(16QAM RB Number: 50 Offset: 0) Channel Mid

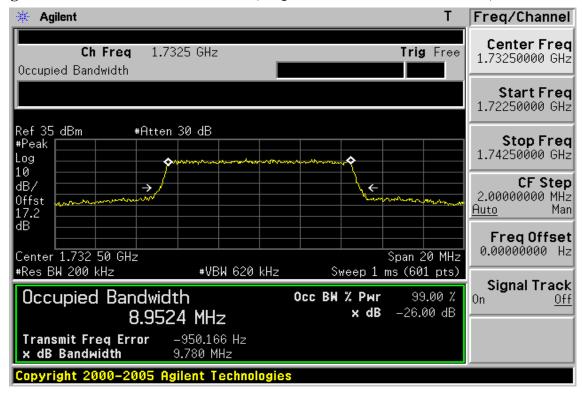
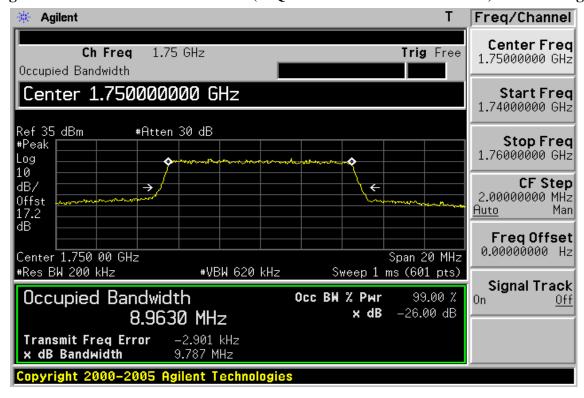


Figure 8-39: 10MHz BW LTE-Band 4(16QAM RB Number: 50 Offset: 0) Channel High



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Figure 8-40: 5MHz BW LTE-Band 17(QPSK RB Number: 25 Offset: 0) Channel Low

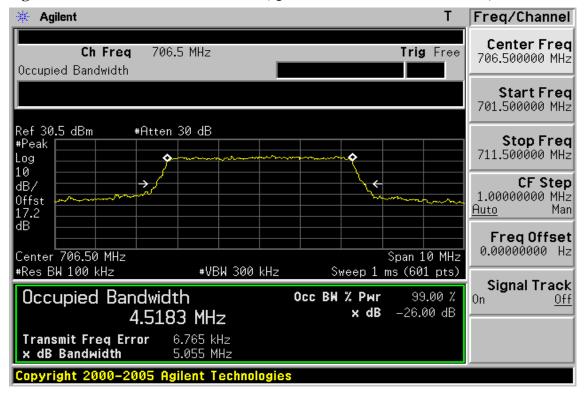
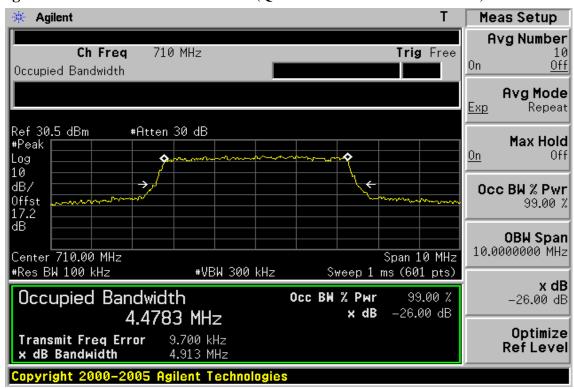


Figure 8-41: 5MHz BW LTE-Band 17(QPSK RB Number: 25 Offset: 0) Channel Mid



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Figure 8-42: 5MHz BW LTE-Band 17(QPSK RB Number: 25 Offset: 0) Channel High

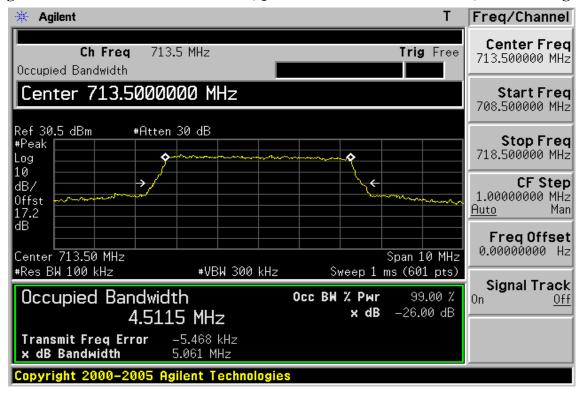
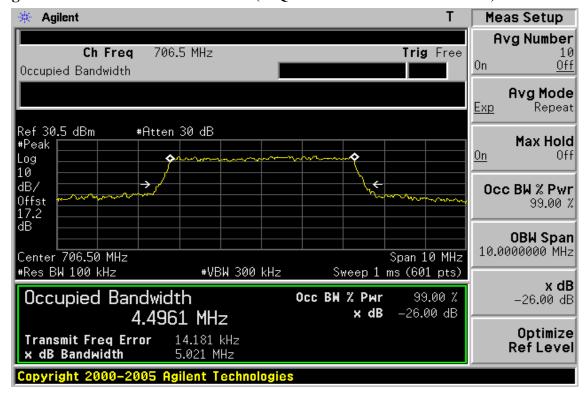


Figure 8-43: 5MHz BW LTE-Band 17(16QAM RB Number: 25 Offset: 0) Channel Low



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Figure 8-44: 5MHz BW LTE-Band 17(16QAM RB Number: 25 Offset: 0) Channel Mid

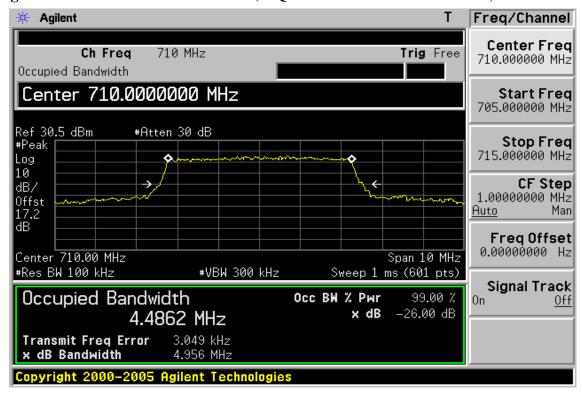
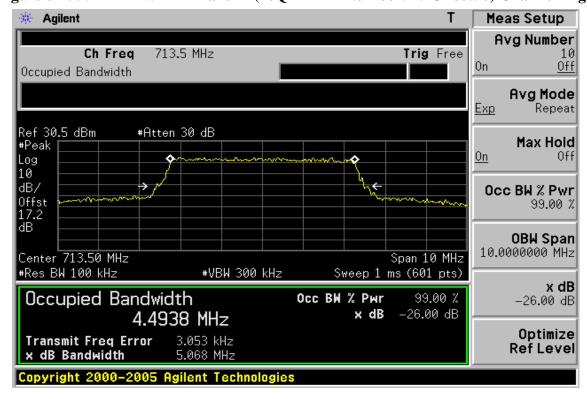


Figure 8-45: 5MHz BW LTE-Band 17(16QAM RB Number: 25 Offset: 0) Channel High



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Figure 8-46: 10MHz BW LTE-Band 17(QPSK RB Number: 50 Offset: 0) Channel Low

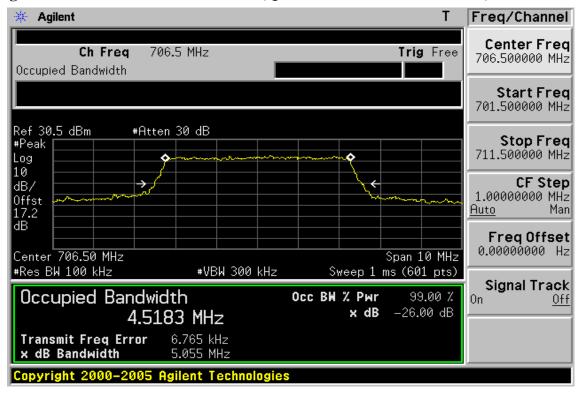
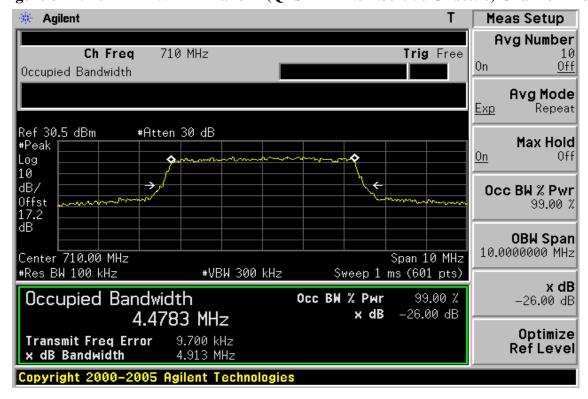


Figure 8-47: 10MHz BW LTE-Band 17(QPSK RB Number: 50 Offset: 0) Channel Mid



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Figure 8-48: 10MHz BW LTE-Band 17(QPSK RB Number: 50 Offset: 0) Channel High

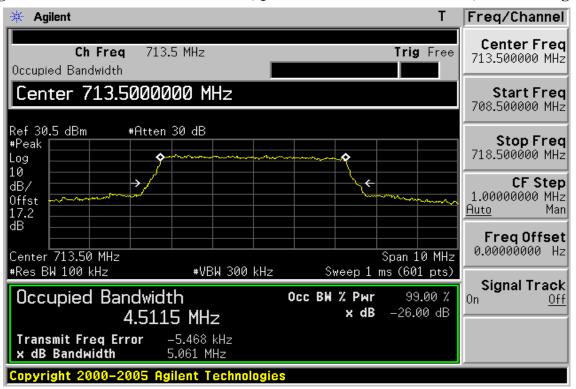
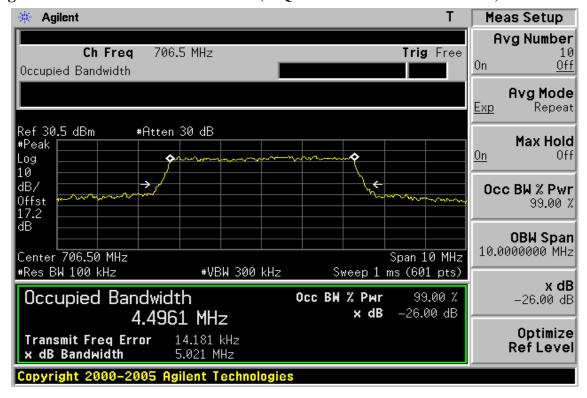


Figure 8-49: 10MHz BW LTE-Band 17(16QAM RB Number: 50 Offset: 0) Channel Low



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Figure 8-50: 10MHz BW LTE-Band 17(16QAM RB Number: 50 Offset: 0) Channel Mid

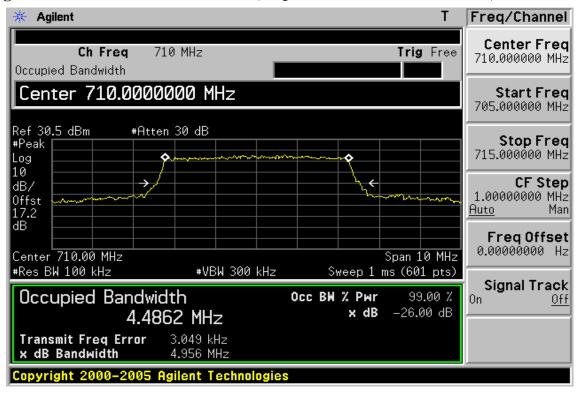
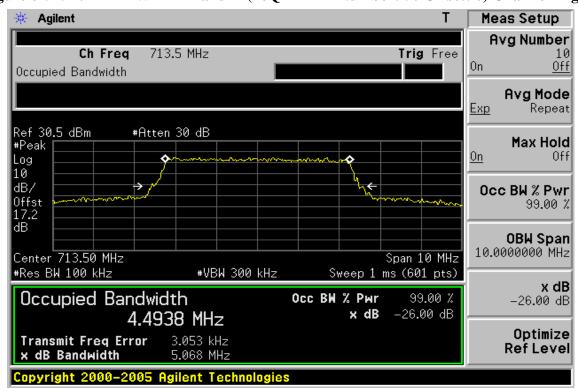


Figure 8-51: 10MHz BW LTE-Band 17(16QAM RB Number: 50 Offset: 0) Channel High



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## 9. OUT OF BAND EMISSION AT ANTENNA TERMINALS

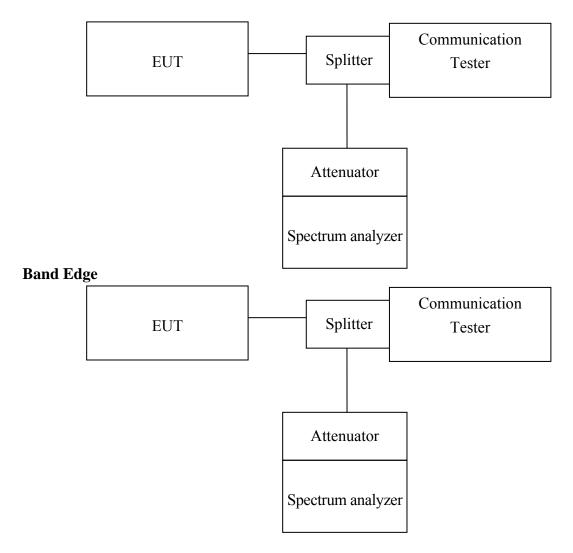
# 9.1. Standard Applicable:

According to FCC §2.1051.

FCC §22.917(a),§24.238(a) , §27.53(g) the magnitude of each spurious and harmonic emission that can be detected when the equipment is operated under the conditions specified in the instruction manual and/ or alignment procedure, shall not be less than 43 + 10 log (mean output power in watts) dBc below the mean power output outside a license's frequency block (-13dBm)

### 9.2. Test SET-UP:

# Out of band emission



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### 9.3. Measurement Procedure:

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

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

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

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

#### **Conducted Emission:**

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

## 9.4. Measurement Equipment Used:

Refer to section 2.4 in this report

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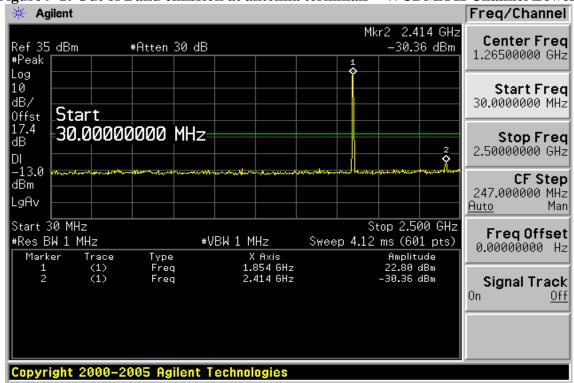


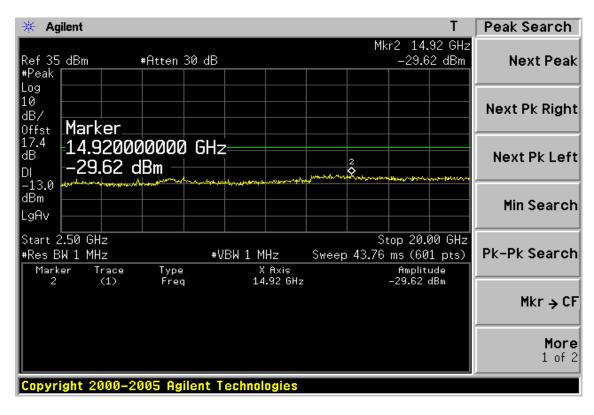
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#### 9.5. Measurement Result:

Figure 9-1: Out of Band emission at antenna terminals – WCDMA II Channel Lowest





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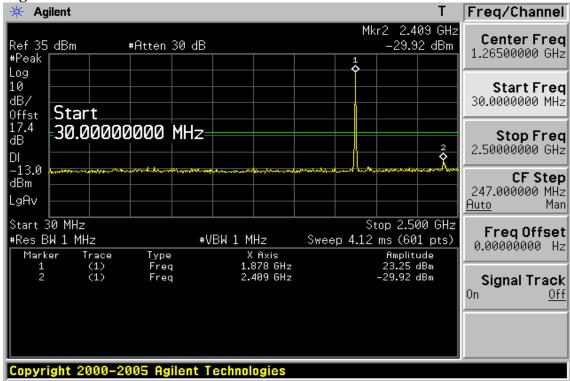
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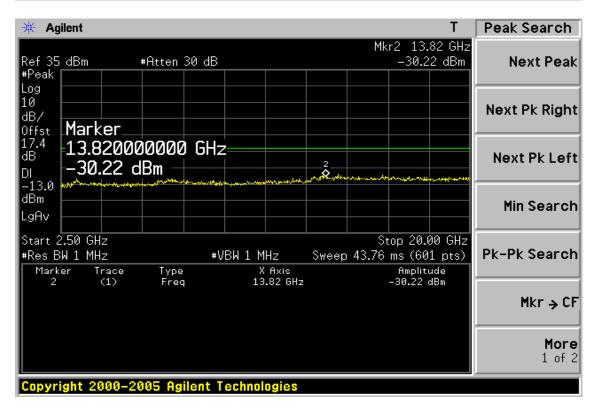


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Figure 9-2: Out of Band emission at antenna terminals – WCDMA II Channel Mid





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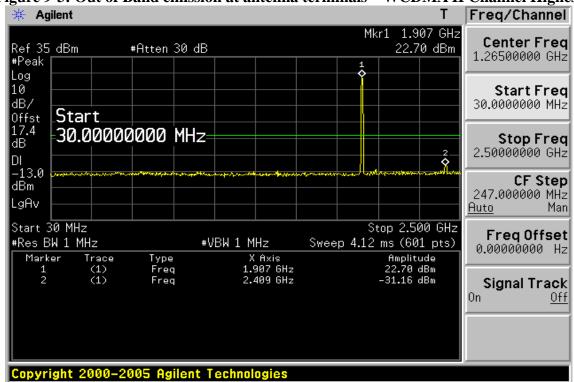
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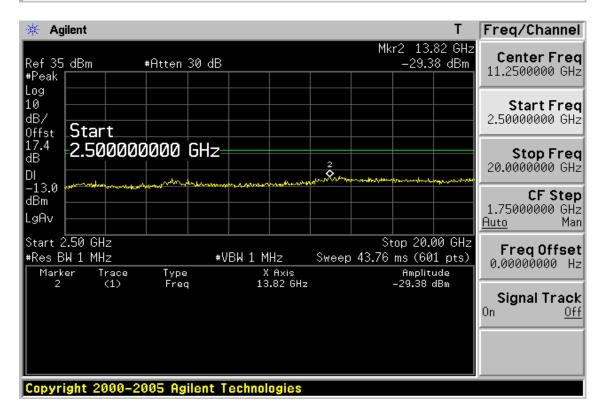


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Figure 9-3: Out of Band emission at antenna terminals – WCDMA II Channel Highest





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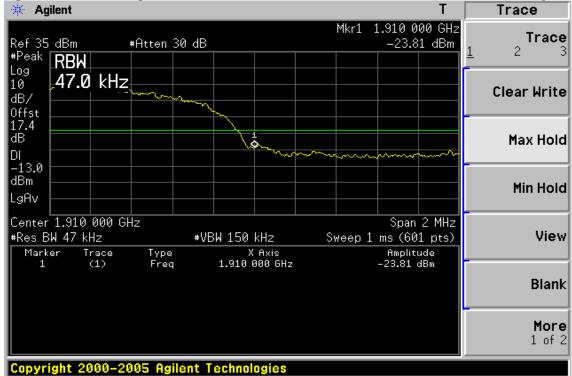
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Figure 9-4: Band edge emission at antenna terminals – WCDMA II Channel Lowest



Figure 9-5: Band edge emission at antenna terminals – WCDMA II Channel Highest



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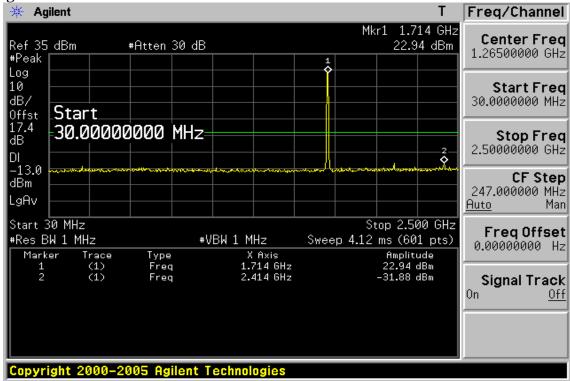
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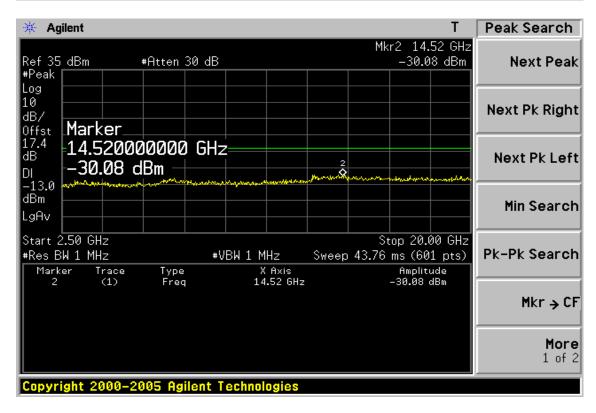


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Figure 9-6: Out of Band emission at antenna terminals – WCDMA IV Channel Lowest





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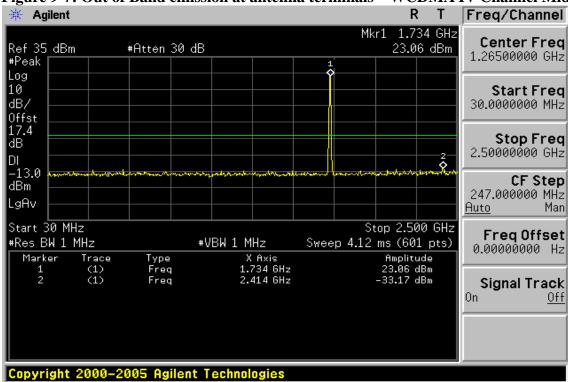
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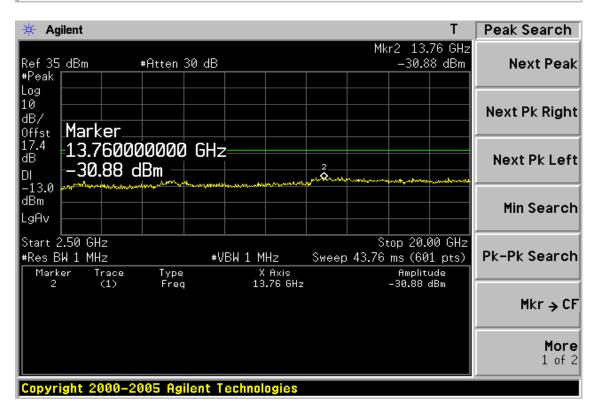


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Figure 9-7: Out of Band emission at antenna terminals – WCDMA IV Channel Mid





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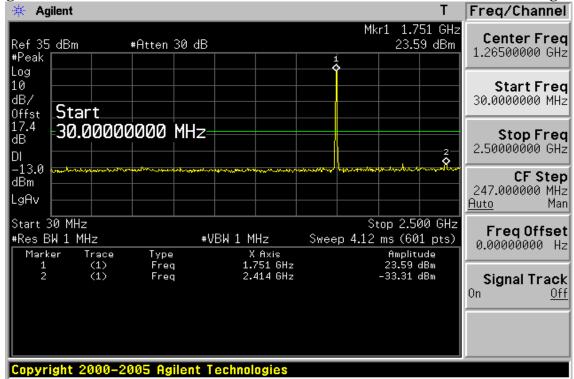
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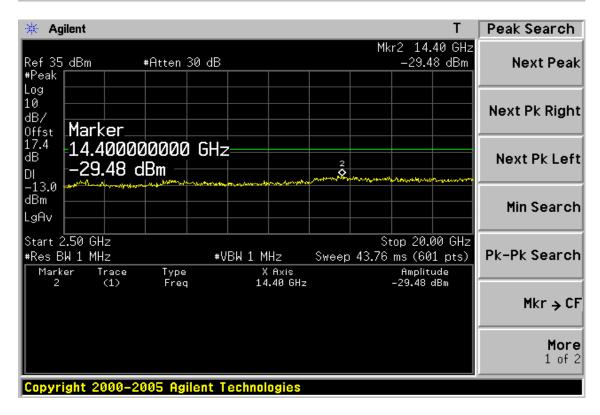


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Figure 9-8: Out of Band emission at antenna terminals – WCDMA IV Channel Highest





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



Figure 9-10: Band edge emission at antenna terminals – WCDMA IV Channel Highest



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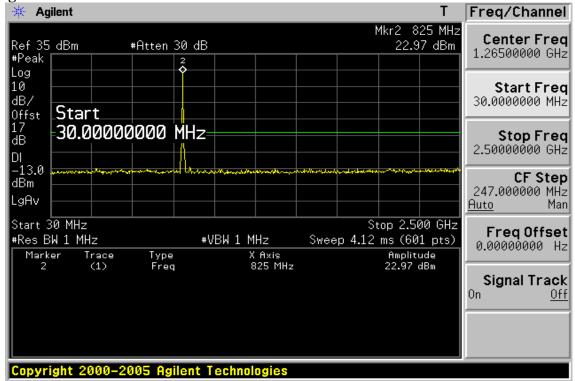
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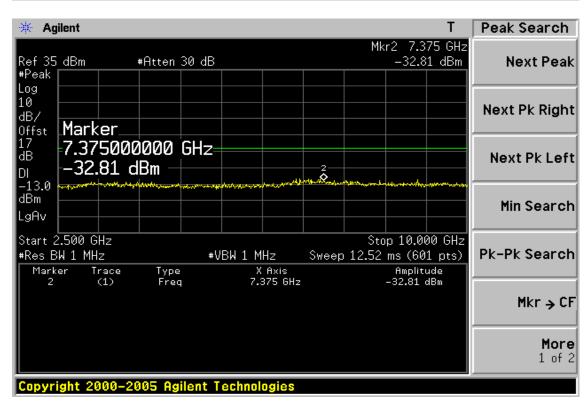


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Figure 9-11: Out of Band emission at antenna terminals – WCDMA V Channel Lowest





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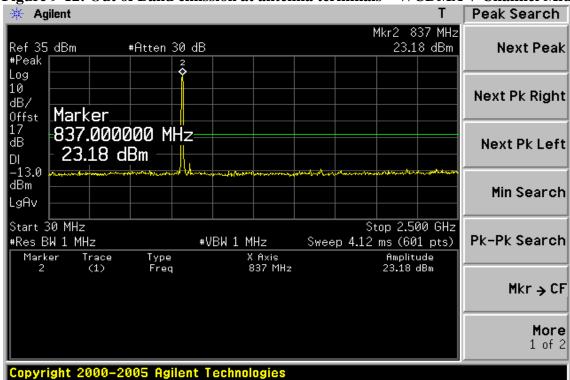
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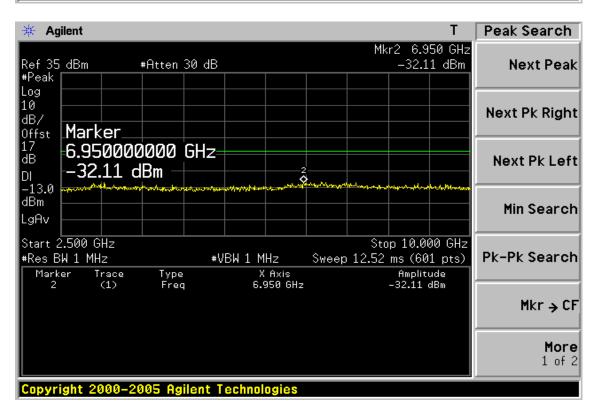


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Figure 9-12: Out of Band emission at antenna terminals – WCDMA V Channel Mid





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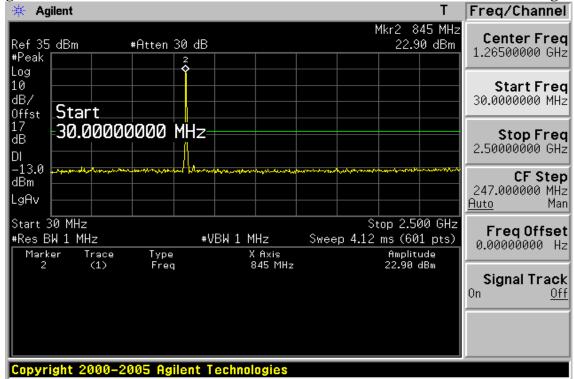
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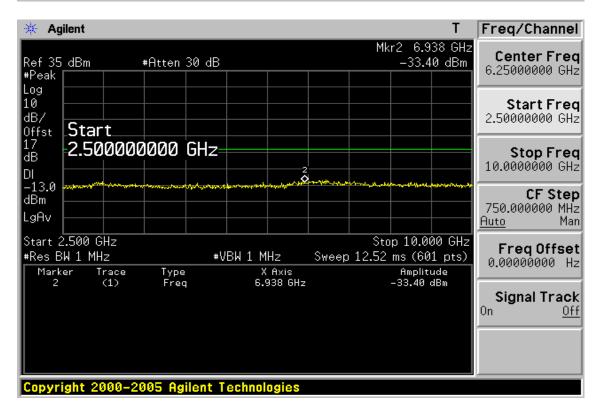


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Figure 9-13: Out of Band emission at antenna terminals – WCDMA V Channel Highest





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Figure 9-14: Band edge emission at antenna terminals – WCDMA V Channel Lowest

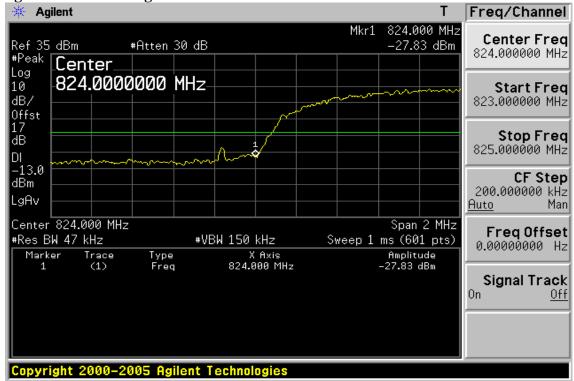
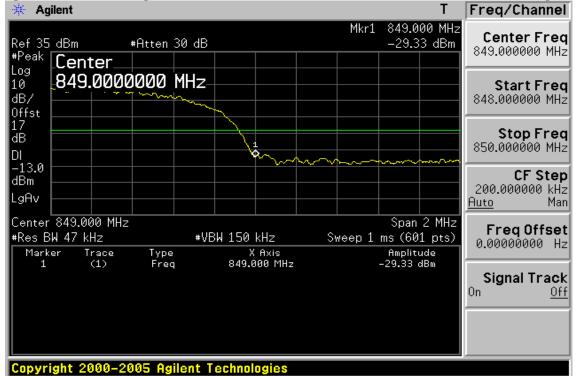


Figure 9-15: Band edge emission at antenna terminals – WCDMA V Channel Highest



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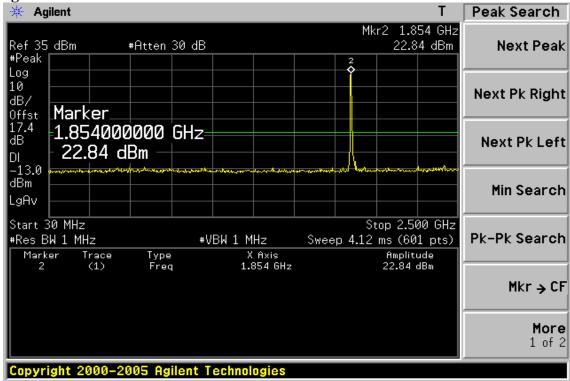
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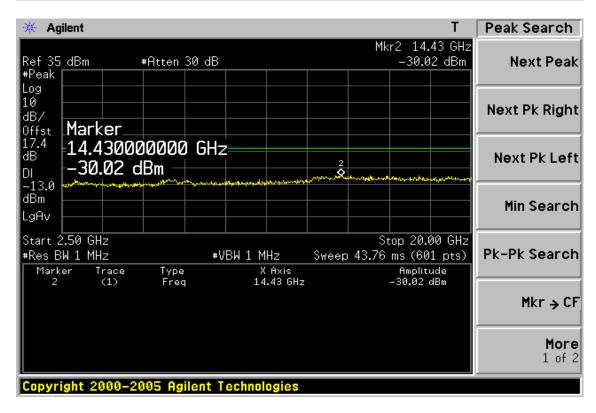


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Figure 9-16: Out of Band emission at antenna terminals – HSDPA II Channel Lowest





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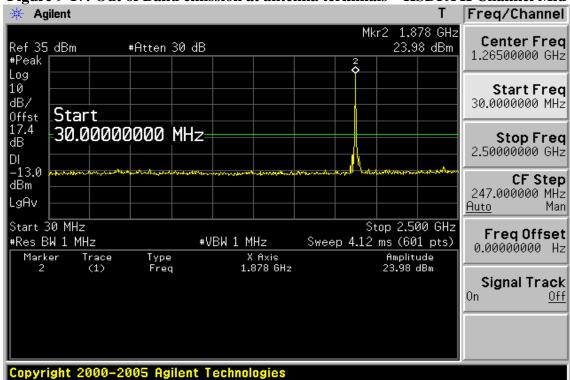
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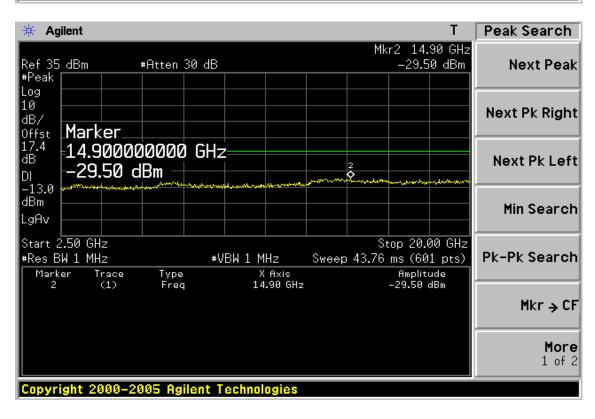


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Figure 9-17: Out of Band emission at antenna terminals – HSDPA II Channel Mid





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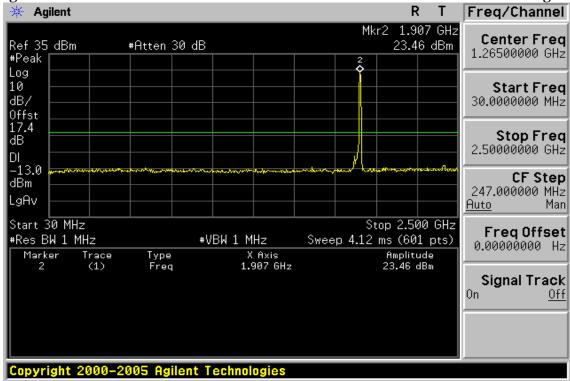
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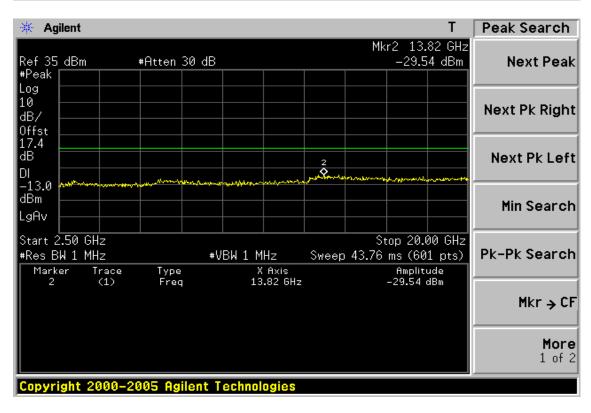


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Figure 9-18: Out of Band emission at antenna terminals – HSDPA II Channel Highest





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Figure 9-19: Band edge emission at antenna terminals – HSDPA II Channel Lowest

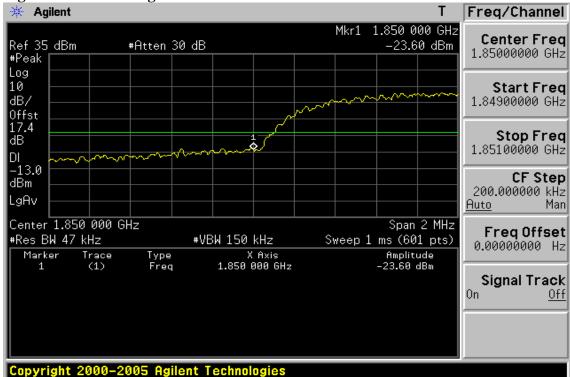
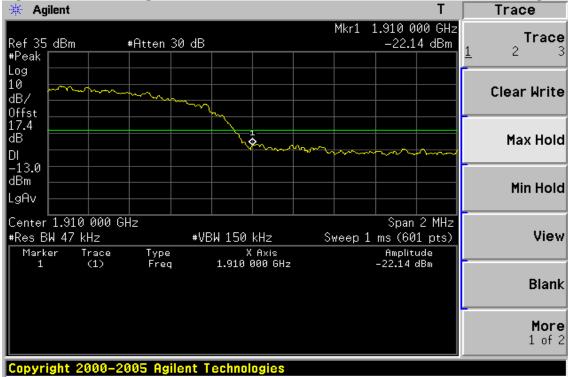


Figure 9-20: Band edge emission at antenna terminals – HSDPA II Channel Highest



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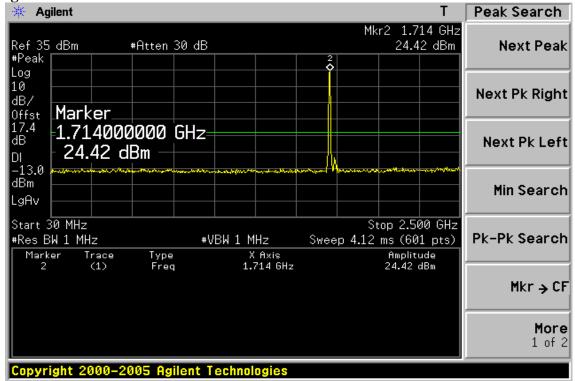
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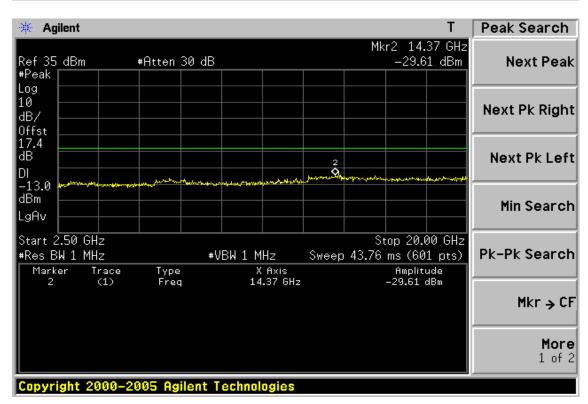


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Figure 9-21: Out of Band emission at antenna terminals – HSDPA IV Channel Lowest





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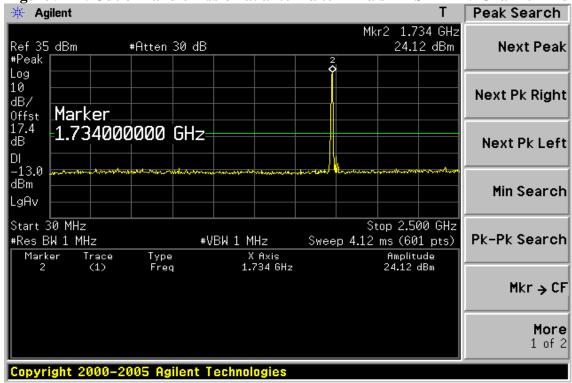
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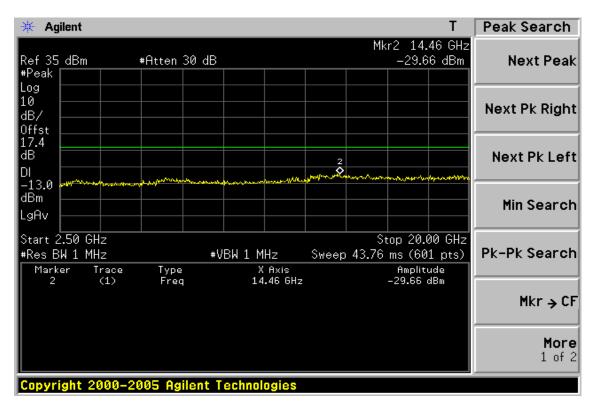


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Figure 9-22: Out of Band emission at antenna terminals – HSDPA IV Channel Mid





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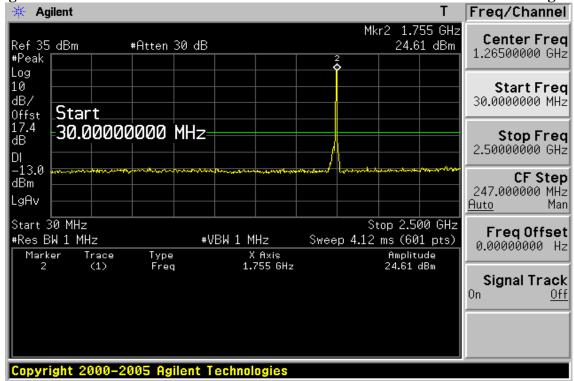
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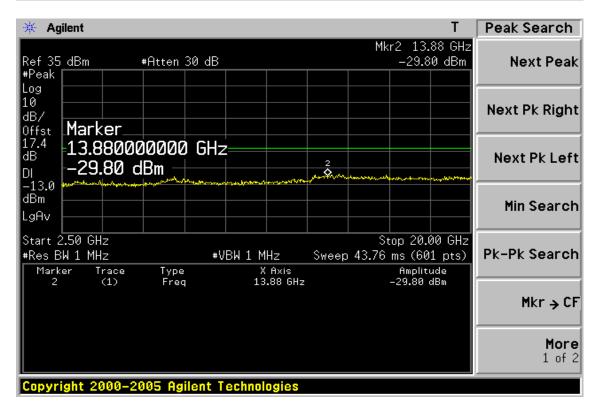


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Figure 9-23: Out of Band emission at antenna terminals – HSDPA IV Channel Highest





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Figure 9-24: Band edge emission at antenna terminals – HSDPA IV Channel Lowest

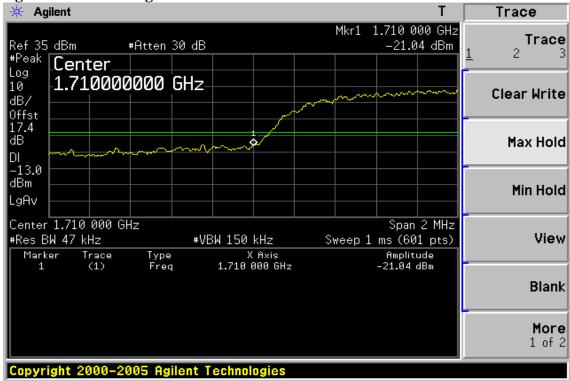
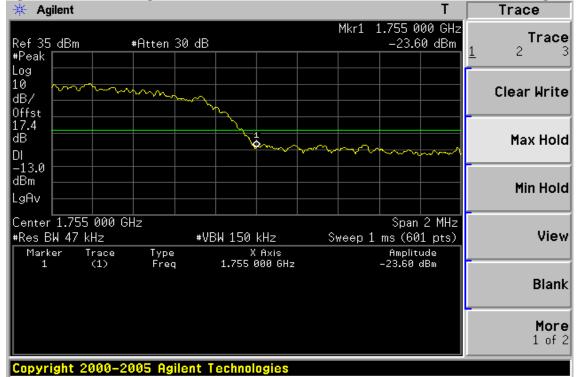


Figure 9-25: Band edge emission at antenna terminals – HSDPA IV Channel Highest



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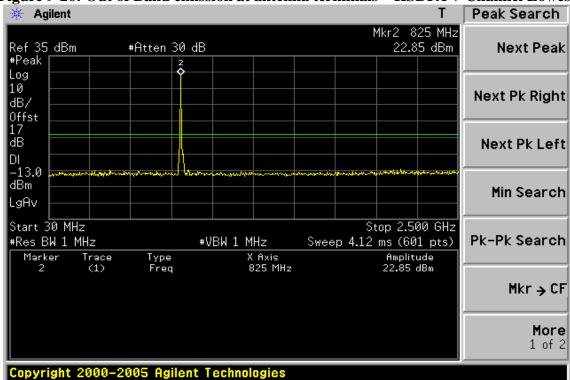
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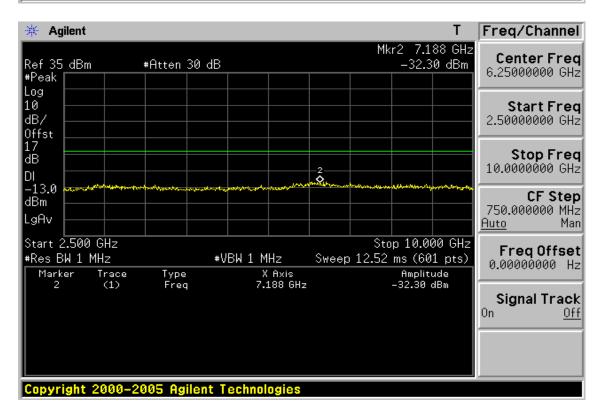


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Figure 9-26: Out of Band emission at antenna terminals – HSDPA V Channel Lowest





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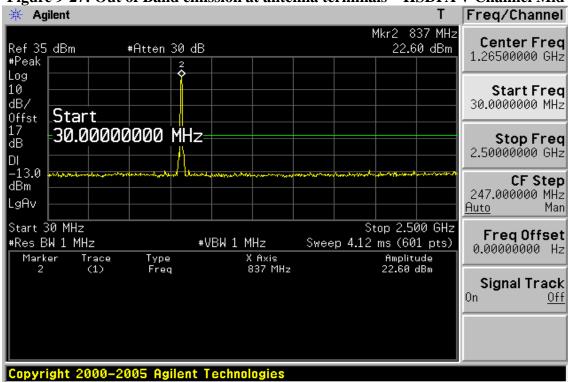
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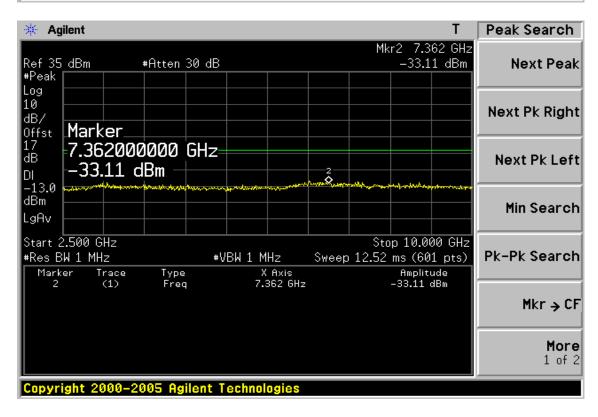


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Figure 9-27: Out of Band emission at antenna terminals – HSDPA V Channel Mid





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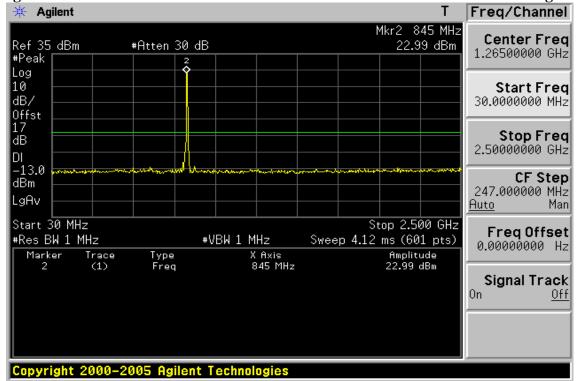
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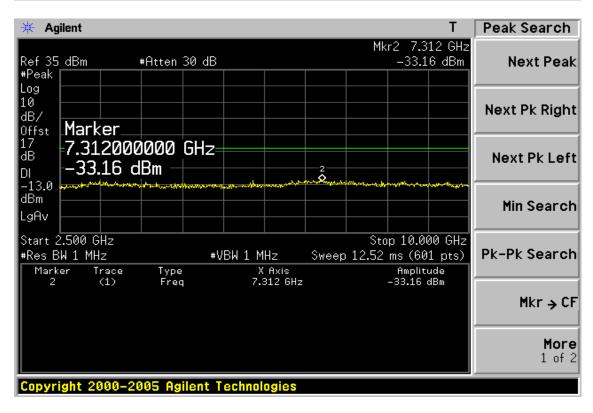


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Figure 9-28: Out of Band emission at antenna terminals – HSDPA V Channel Highest





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Figure 9-29: Band edge emission at antenna terminals – HSDPA V Channel Lowest

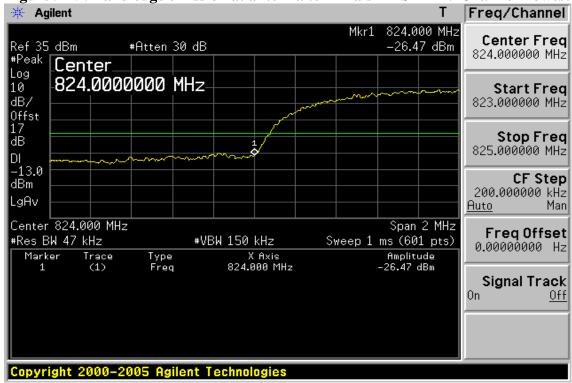
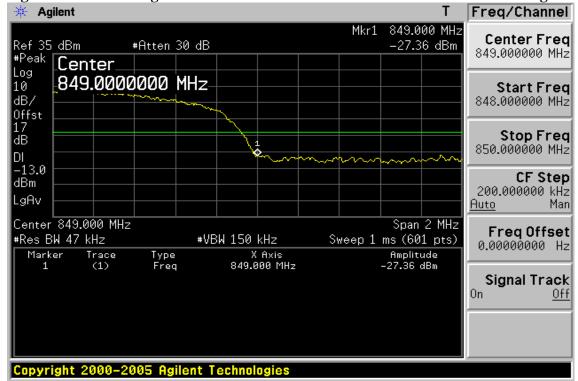


Figure 9-30: Band edge emission at antenna terminals – HSDPA V Channel Highest



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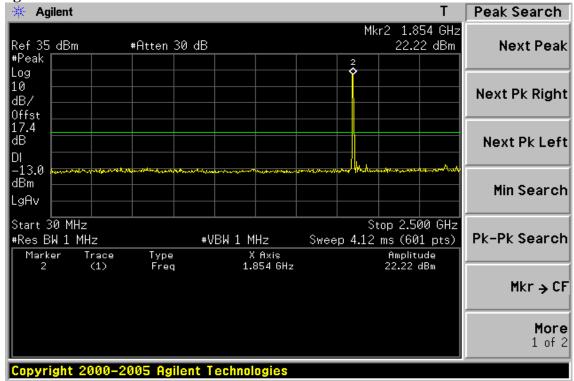
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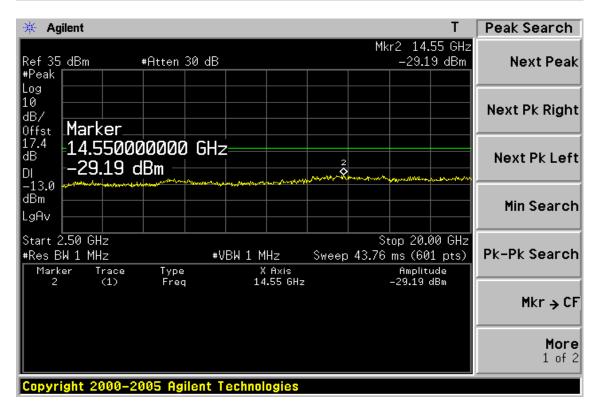


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Figure 9-31: Out of Band emission at antenna terminals – HSUPA II Channel Lowest





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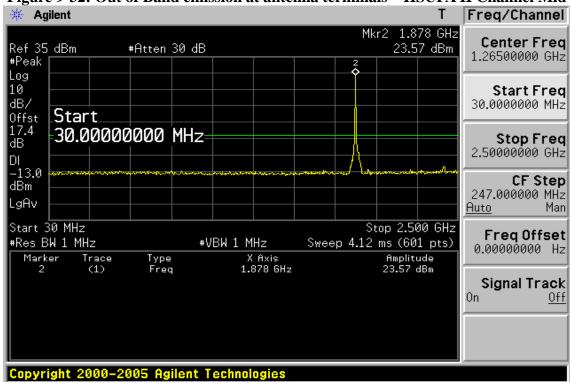
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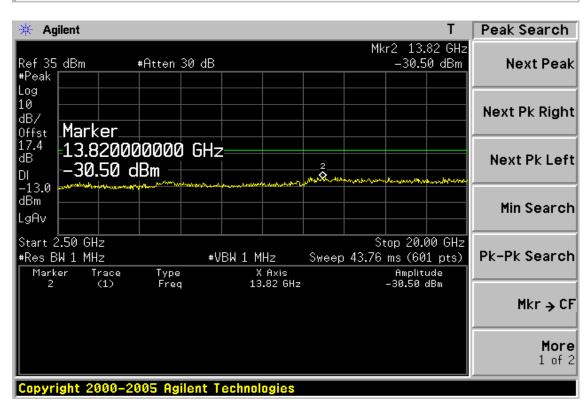


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Figure 9-32: Out of Band emission at antenna terminals – HSUPA II Channel Mid





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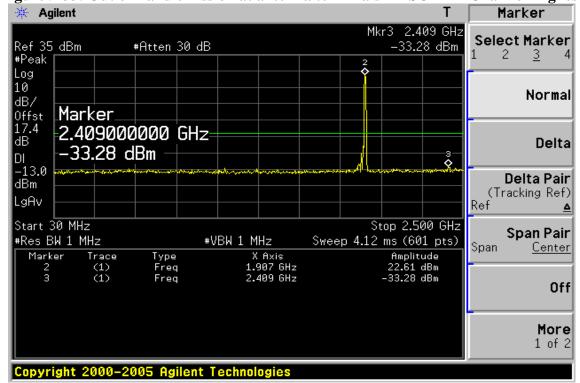
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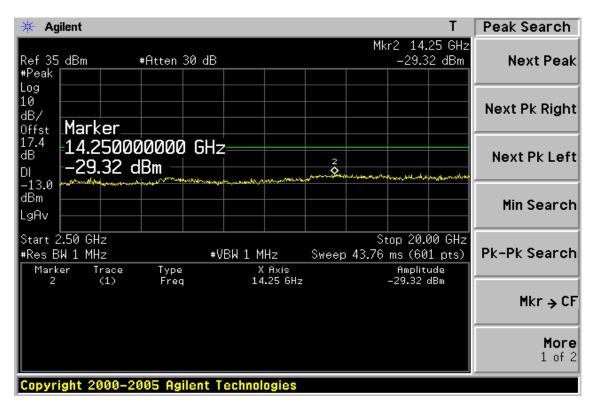


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Figure 9-33: Out of Band emission at antenna terminals – HSUPA II Channel Highest





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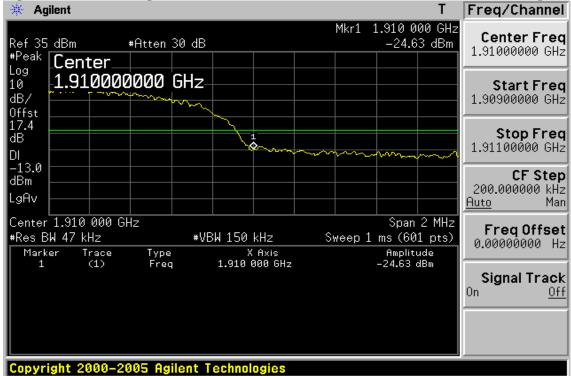
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Figure 9-34: Band edge emission at antenna terminals – HSUPA II Channel Lowest



Figure 9-35: Band edge emission at antenna terminals – HSUPA II Channel Highest



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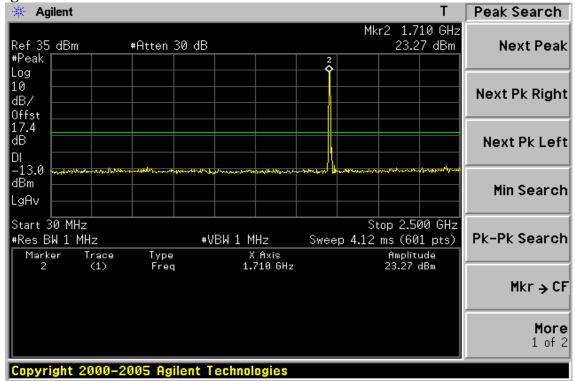
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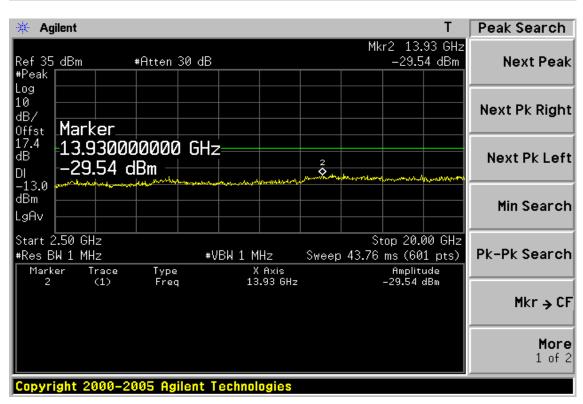


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Figure 9-36: Out of Band emission at antenna terminals – HSUPA IV Channel Lowest





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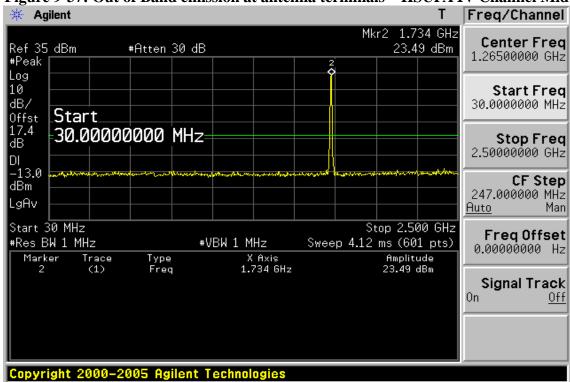
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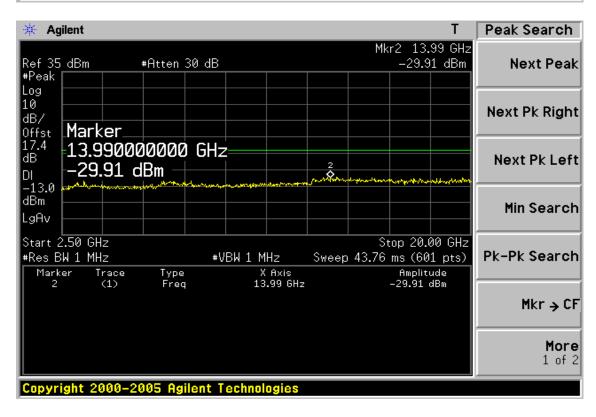


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Figure 9-37: Out of Band emission at antenna terminals – HSUPA IV Channel Mid





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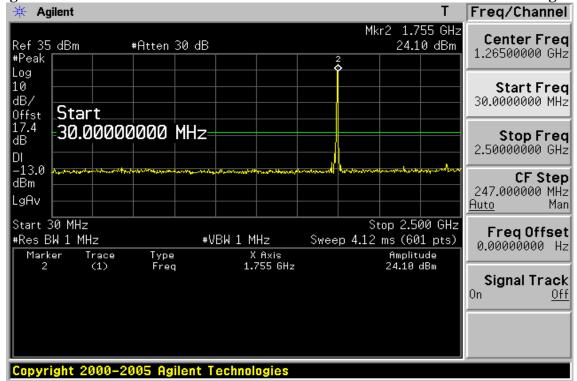
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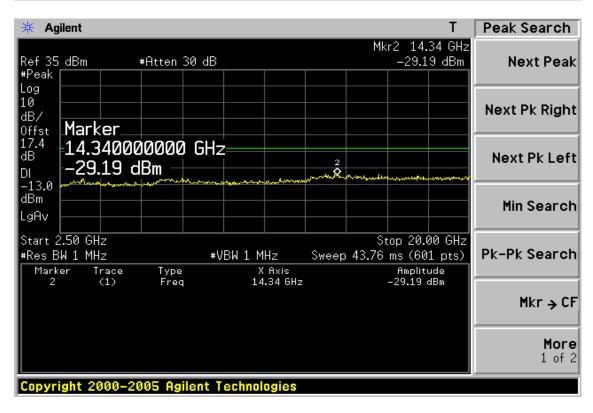


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Figure 9-38: Out of Band emission at antenna terminals – HSUPA IV Channel Highest





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Figure 9-39: Band edge emission at antenna terminals – HSUPA IV Channel Lowest



Figure 9-40: Band edge emission at antenna terminals – HSUPA IV Channel Highest



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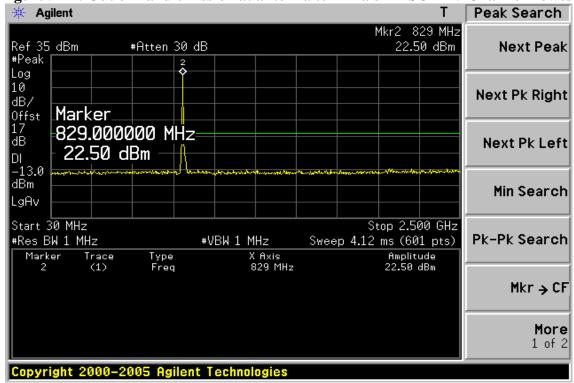
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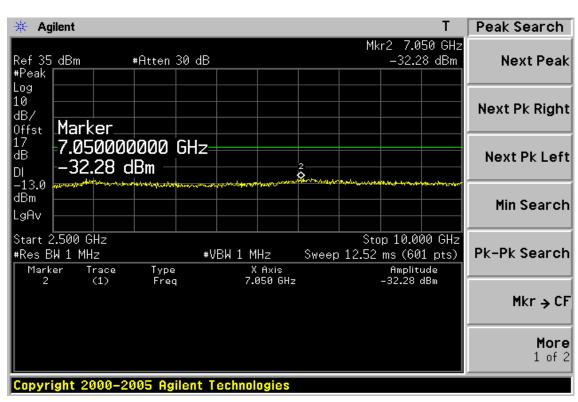


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Figure 9-41: Out of Band emission at antenna terminals – HSUPA V Channel Lowest





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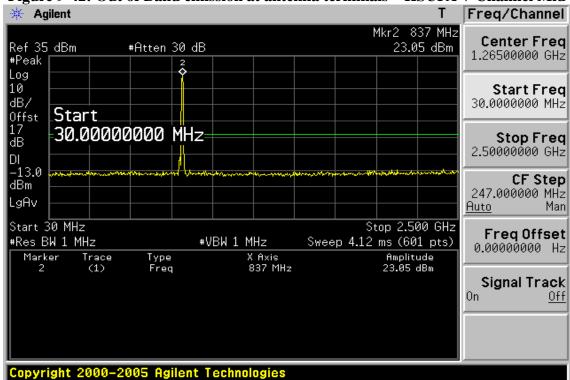
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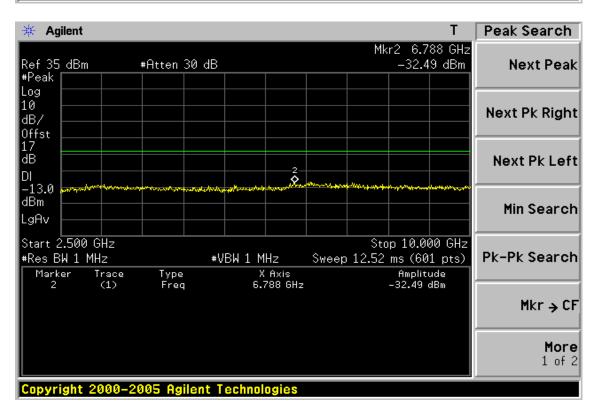


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Figure 9-42: Out of Band emission at antenna terminals – HSUPA V Channel Mid





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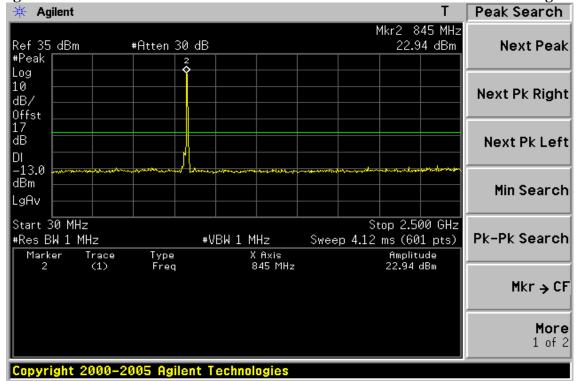
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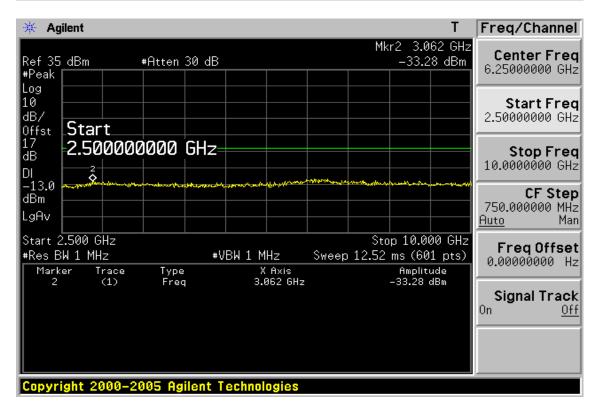


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Figure 9-43: Out of Band emission at antenna terminals – HSUPA V Channel Highest





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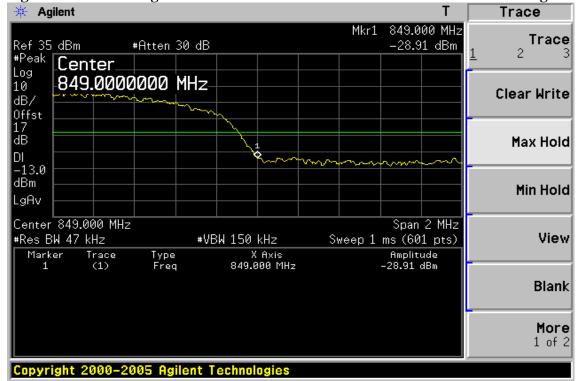
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Figure 9-44: Band edge emission at antenna terminals – HSUPA V Channel Lowest



Figure 9-45: Band edge emission at antenna terminals – HSUPA V Channel Highest



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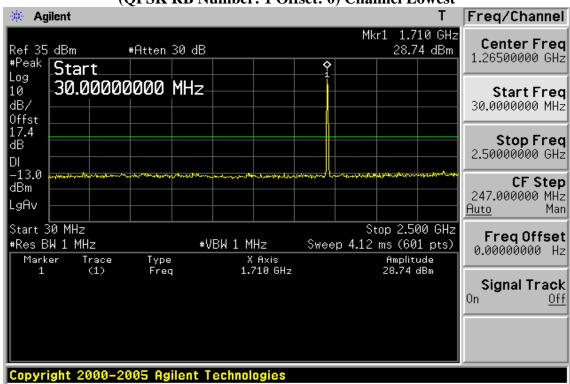
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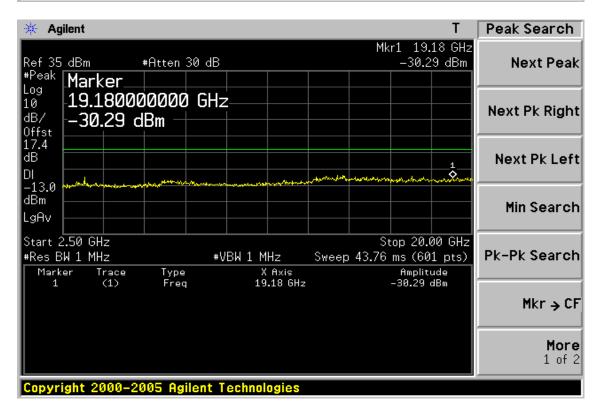


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Figure 9-46: Out of Band emission at antenna terminals-5MHz BW LTE-Band 4 (QPSK RB Number: 1 Offset: 0) Channel Lowest





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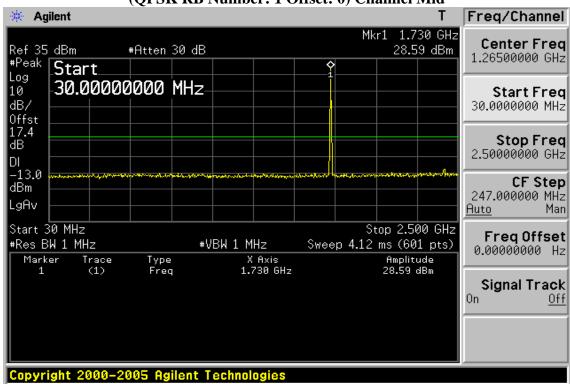
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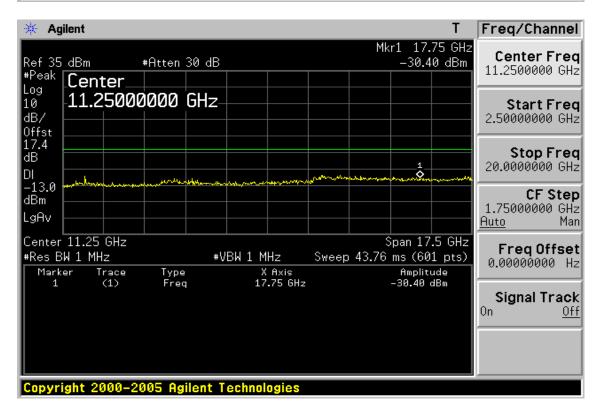


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Figure 9-47: Out of Band emission at antenna terminals –5MHz BW LTE-Band 4 (QPSK RB Number: 1 Offset: 0) Channel Mid





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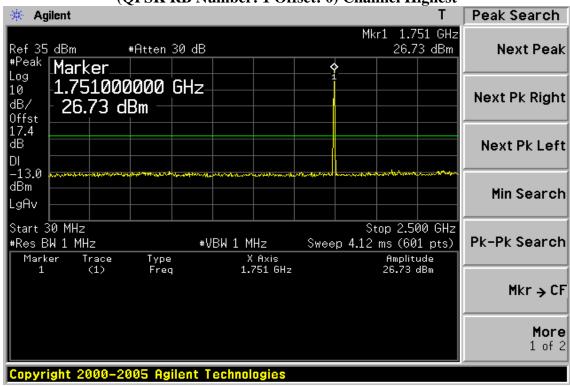
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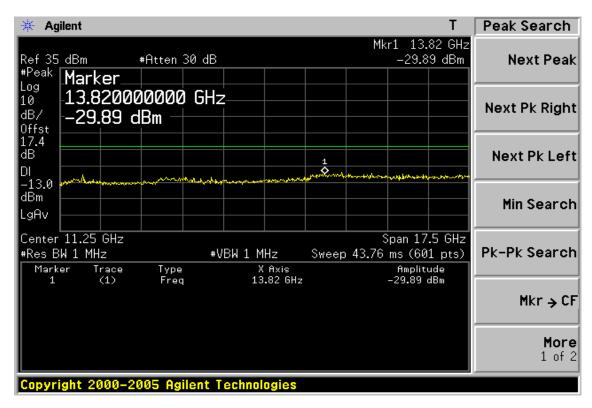


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Figure 9-48: Out of Band emission at antenna terminals-5MHz BW LTE-Band 4 (QPSK RB Number: 1 Offset: 0) Channel Highest





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Figure 9-49: Band edge emission at antenna terminals –5MHz BW LTE-Band 4 (QPSK RB Number: 25 Offset: 0) Channel Lowest

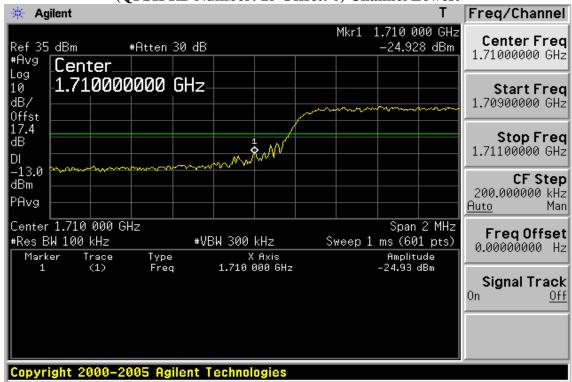


Figure 9-50: Band edge emission at antenna terminals –5MHz BW LTE-Band 4 (QPSK RB Number: 25 Offset: 0) Channel Highest



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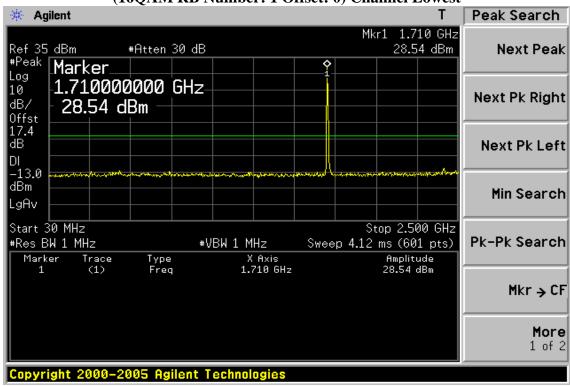
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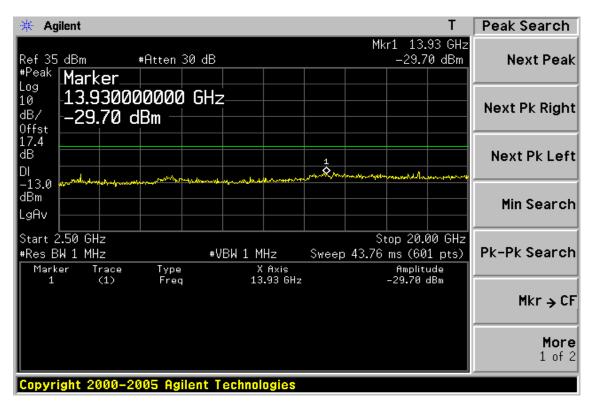


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Figure 9-51: Out of Band emission at antenna terminals-5MHz BW LTE-Band 4 (16QAM RB Number: 1 Offset: 0) Channel Lowest





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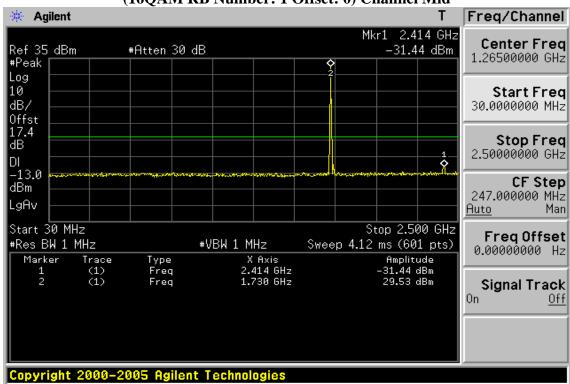
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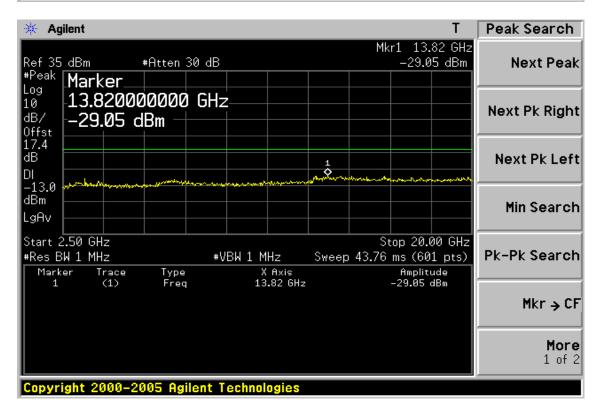


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Figure 9-52: Out of Band emission at antenna terminals –5MHz BW LTE-Band 4 (16QAM RB Number: 1 Offset: 0) Channel Mid





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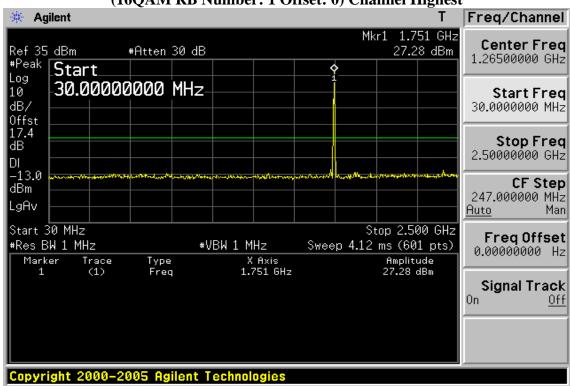
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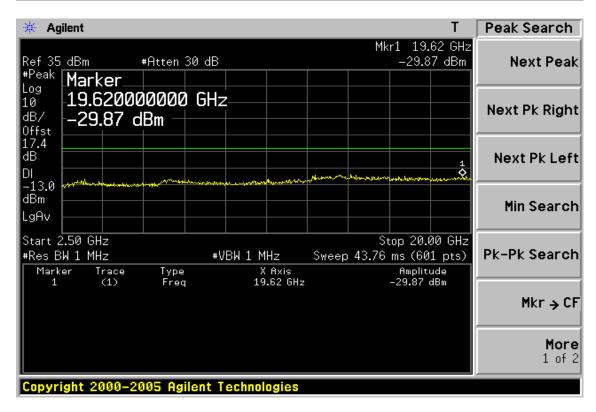


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Figure 9-53: Out of Band emission at antenna terminals–5MHz BW LTE-Band 4 (16QAM RB Number: 1 Offset: 0) Channel Highest





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Figure 9-54: Band edge emission at antenna terminals –5MHz BW LTE-Band 4 (16QAM RB Number: 25 Offset: 0) Channel Lowest



Figure 9-55: Band edge emission at antenna terminals –5MHz BW LTE-Band 4 (16QAM RB Number: 25 Offset: 0) Channel Highest



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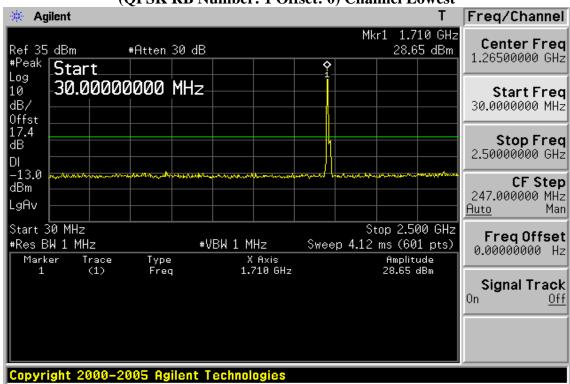
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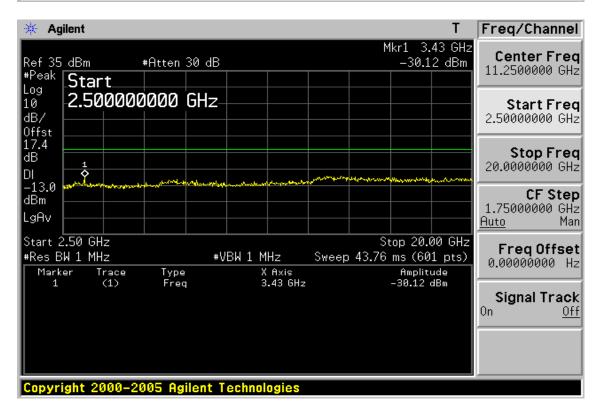


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Figure 9-56: Out of Band emission at antenna terminals-10MHz BW LTE-Band 4 (QPSK RB Number: 1 Offset: 0) Channel Lowest





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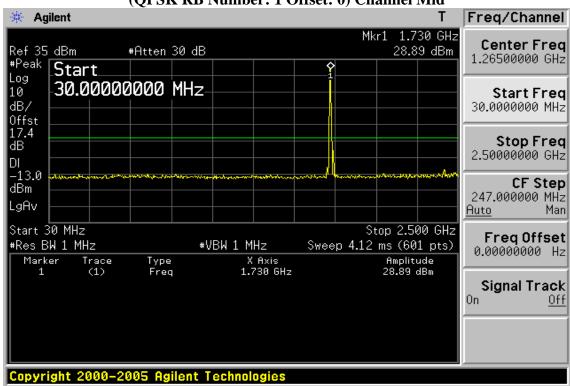
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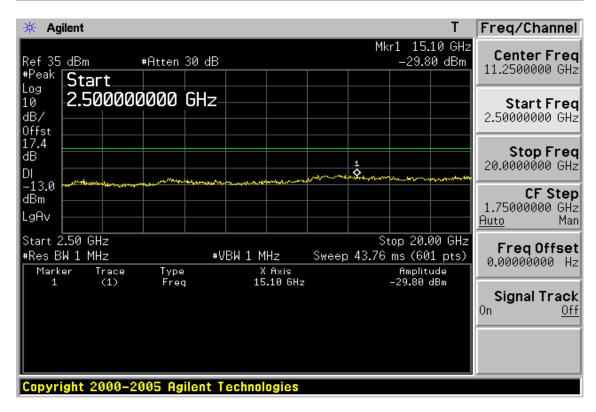


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Figure 9-57: Out of Band emission at antenna terminals –10MHz BW LTE-Band 4 (QPSK RB Number: 1 Offset: 0) Channel Mid





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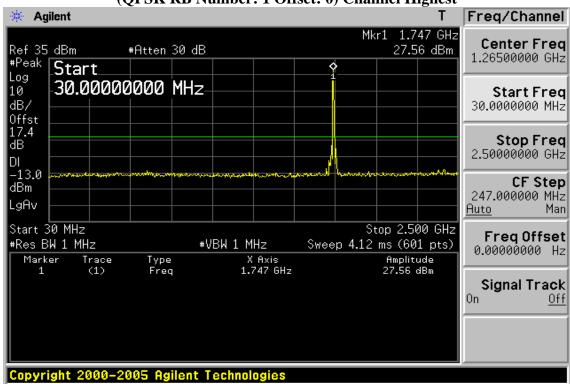
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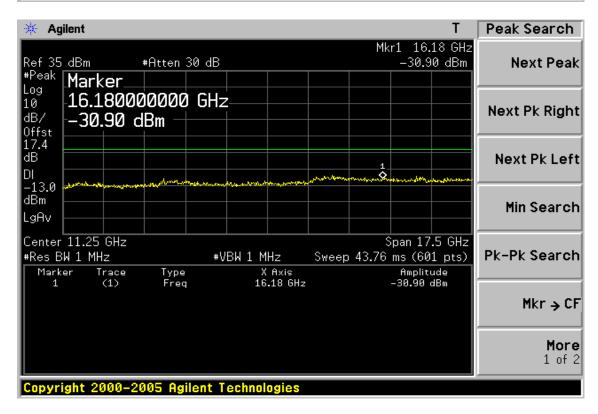


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Figure 9-58: Out of Band emission at antenna terminals-10MHz BW LTE-Band 4 (QPSK RB Number: 1 Offset: 0) Channel Highest





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Figure 9-59: Band edge emission at antenna terminals -10MHz BW LTE-Band 4 (QPSK RB Number: 50 Offset: 0) Channel Lowest

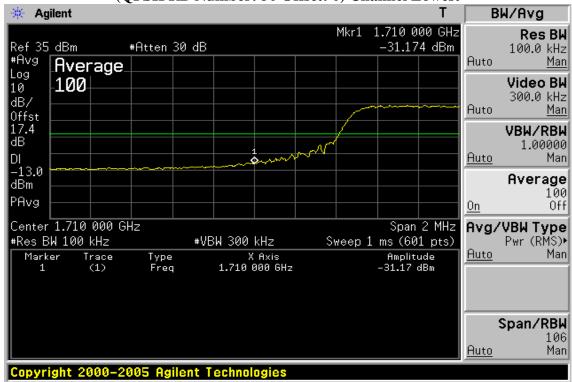


Figure 9-60: Band edge emission at antenna terminals -10MHz BW LTE-Band 4 (QPSK RB Number: 5 0 Offset:0) Channel Highest



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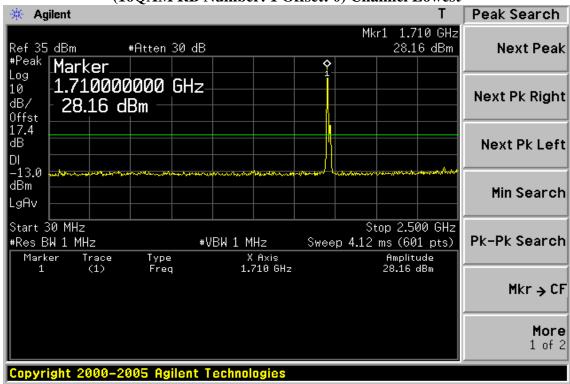
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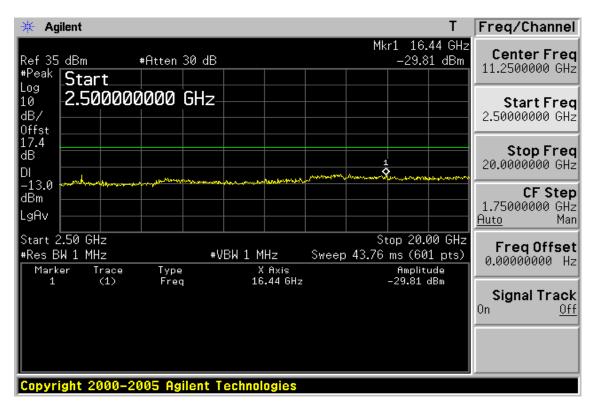


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Figure 9-61: Out of Band emission at antenna terminals-10MHz BW LTE-Band 4 (16QAM RB Number: 1 Offset: 0) Channel Lowest





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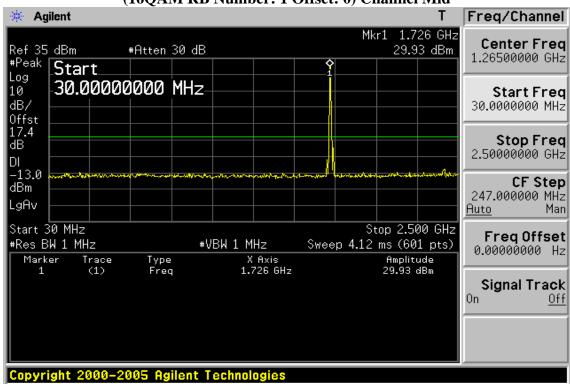
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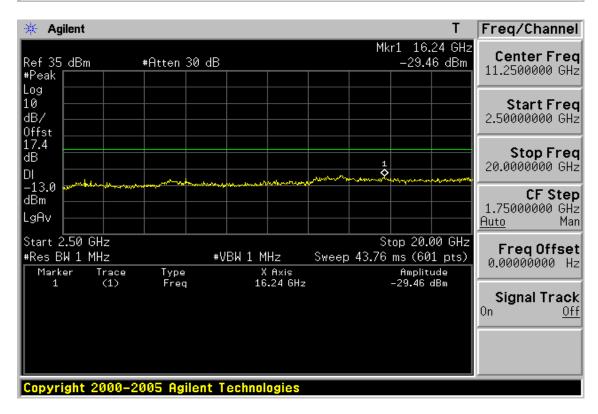


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Figure 9-62: Out of Band emission at antenna terminals –10MHz BW LTE-Band 4 (16QAM RB Number: 1 Offset: 0) Channel Mid





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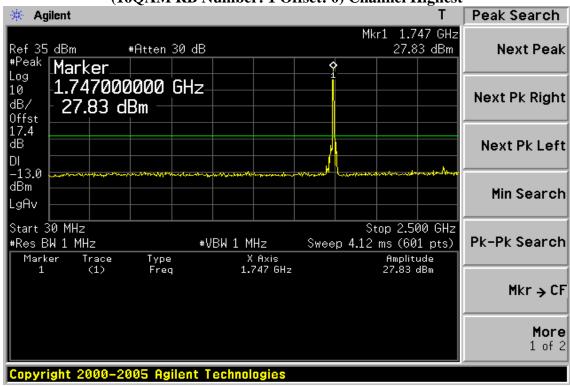
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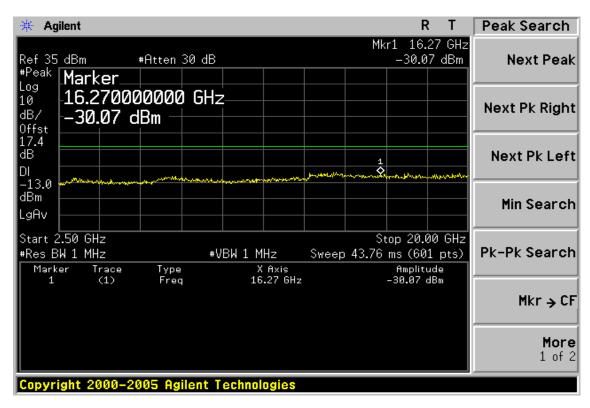


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Figure 9-63: Out of Band emission at antenna terminals-10MHz BW LTE-Band 4 (16QAM RB Number: 1 Offset: 0) Channel Highest





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Figure 9-64: Band edge emission at antenna terminals –10MHz BW LTE-Band 4 (16QAM RB Number: 50 Offset: 0) Channel Lowest



Figure 9-65: Band edge emission at antenna terminals –10MHz BW LTE-Band 4 (16QAM RB Number: 50 Offset: 0) Channel Highest



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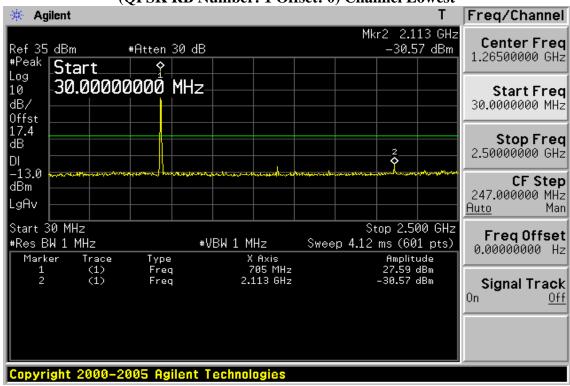
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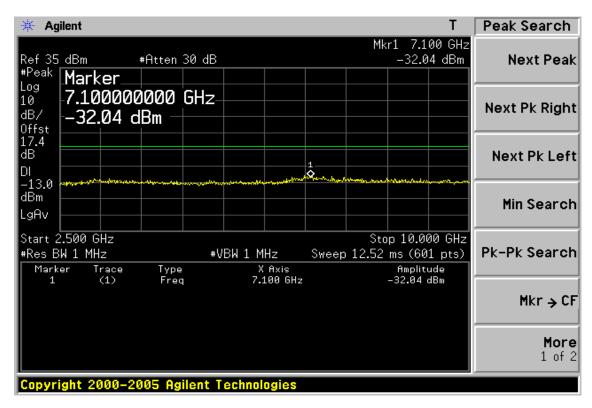


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Figure 9-66: Out of Band emission at antenna terminals-5MHz BW LTE-Band 17 (QPSK RB Number: 1 Offset: 0) Channel Lowest





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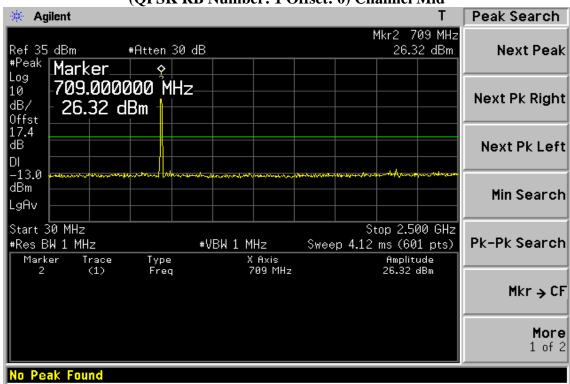
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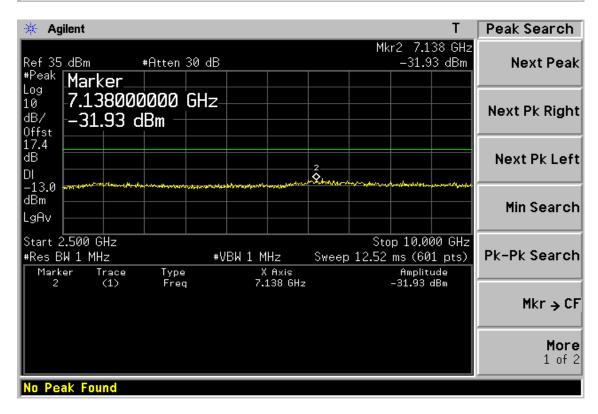


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Figure 9-67: Out of Band emission at antenna terminals –5MHz BW LTE-Band 17 (QPSK RB Number: 1 Offset: 0) Channel Mid





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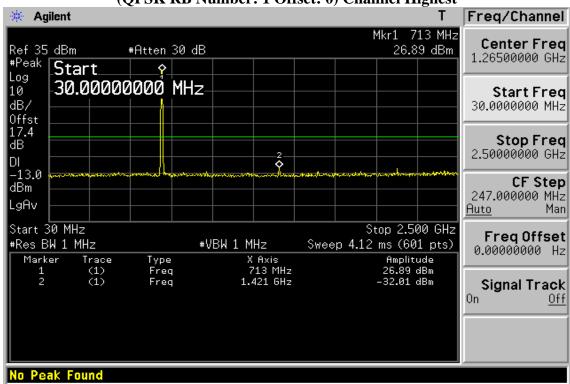
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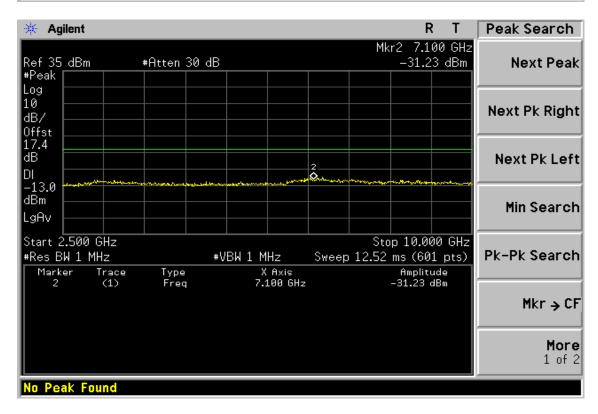


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Figure 9-68: Out of Band emission at antenna terminals–5MHz BW LTE-Band 17 (QPSK RB Number: 1 Offset: 0) Channel Highest





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Figure 9-69: Band edge emission at antenna terminals –5MHz BW LTE-Band 17 (QPSK RB Number: 25 Offset: 0) Channel Lowest

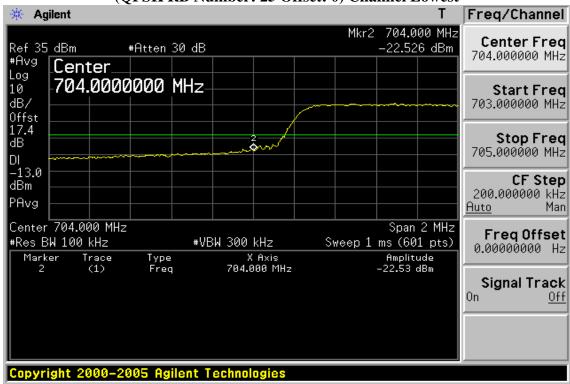


Figure 9-70: Band edge emission at antenna terminals –5MHz BW LTE-Band 17 (QPSK RB Number: 25 Offset: 0) Channel Highest



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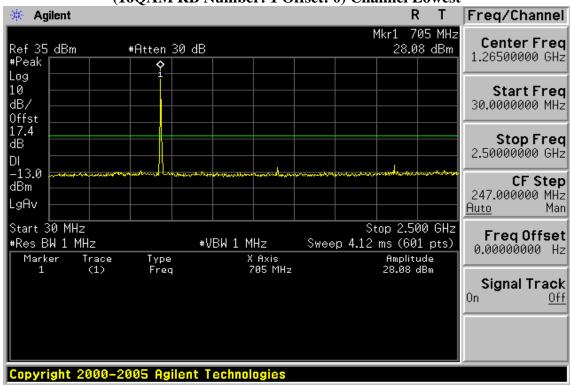
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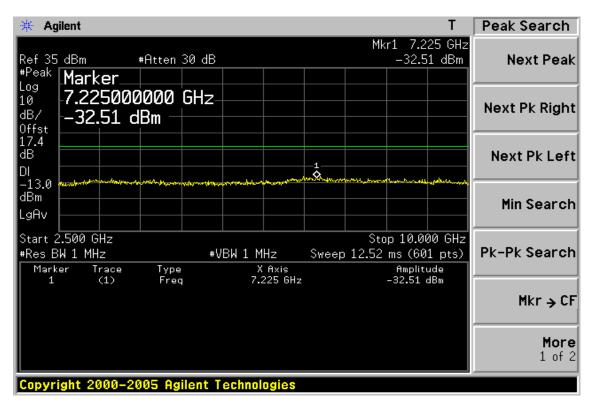


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Figure 9-71: Out of Band emission at antenna terminals-5MHz BW LTE-Band 17 (16QAM RB Number: 1 Offset: 0) Channel Lowest





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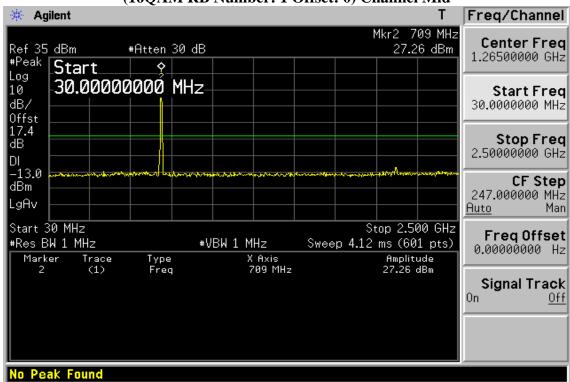
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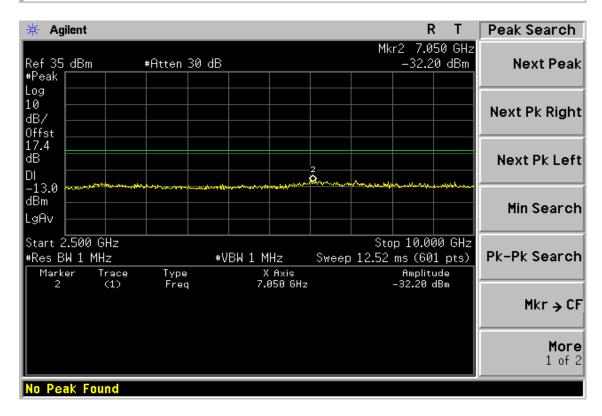


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Figure 9-72: Out of Band emission at antenna terminals –5MHz BW LTE-Band 17 (16QAM RB Number: 1 Offset: 0) Channel Mid





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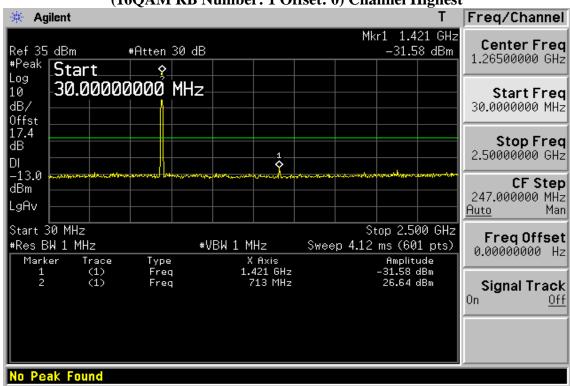
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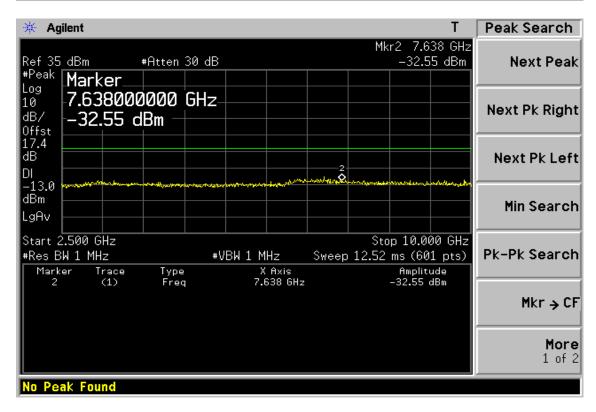


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Figure 9-73: Out of Band emission at antenna terminals–5MHz BW LTE-Band 17 (16QAM RB Number: 1 Offset: 0) Channel Highest





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Figure 9-74 Band edge emission at antenna terminals –5MHz BW LTE-Band 17 (16QAM RB Number: 25 Offset: 0) Channel Lowest

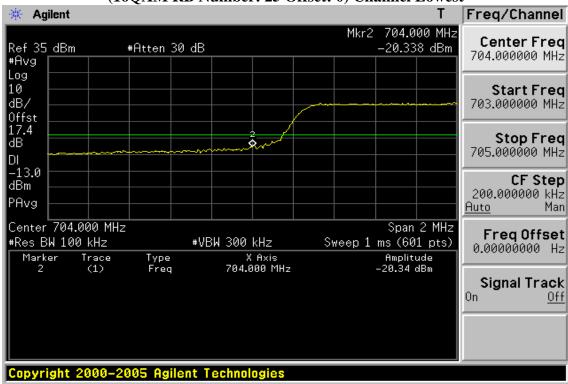


Figure 9-75: Band edge emission at antenna terminals –5MHz BW LTE-Band 17 (16QAM RB Number: 25 Offset: 0) Channel Highest



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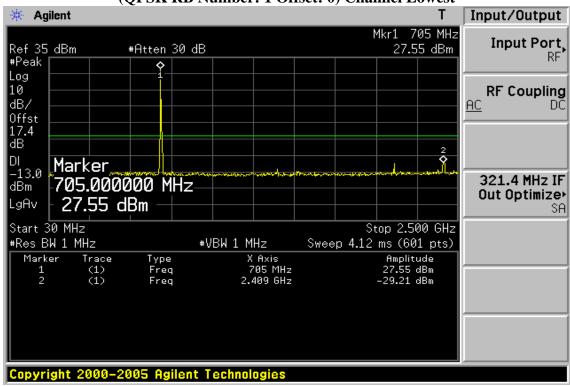
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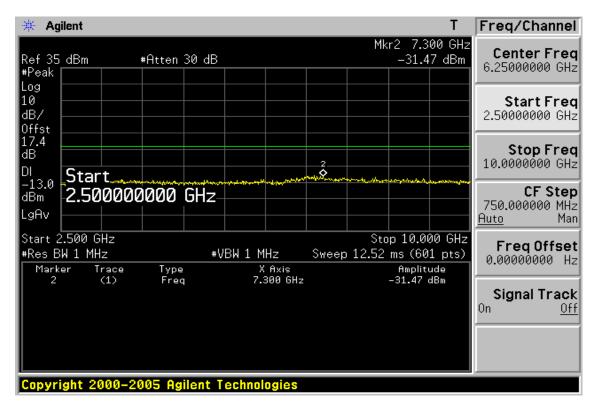


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Figure 9-76: Out of Band emission at antenna terminals-10MHz BW LTE-Band 17 (QPSK RB Number: 1 Offset: 0) Channel Lowest





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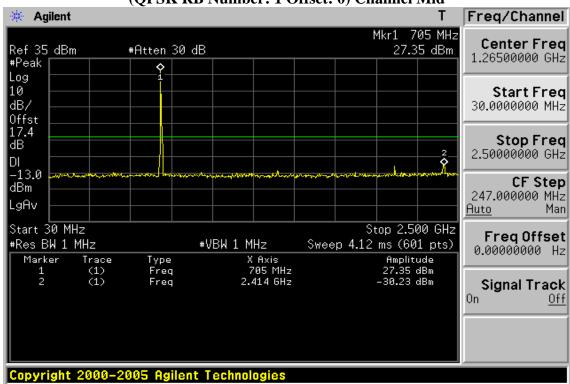
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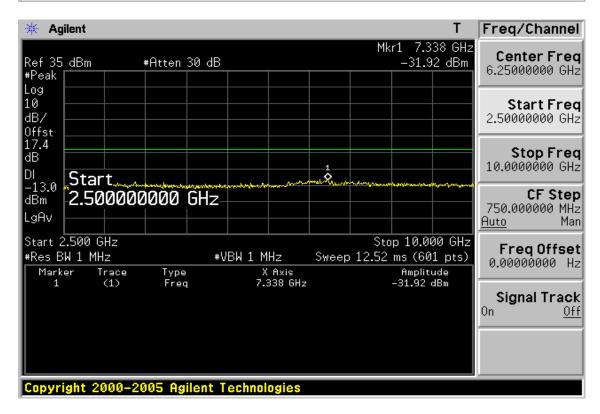


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Figure 9-77: Out of Band emission at antenna terminals –10MHz BW LTE-Band 17 (QPSK RB Number: 1 Offset: 0) Channel Mid





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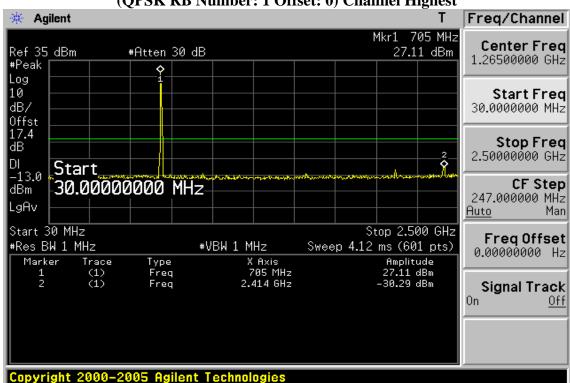
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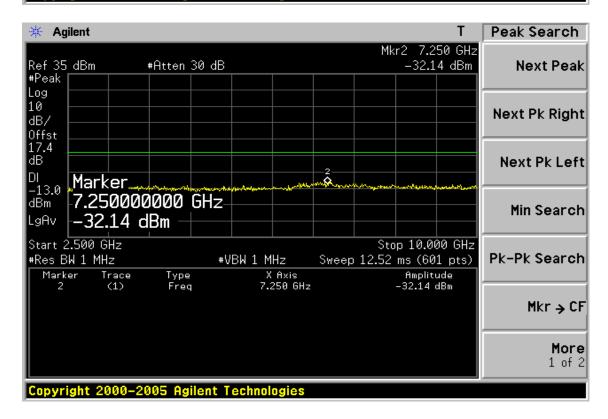


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Figure 9-78: Out of Band emission at antenna terminals-10MHz BW LTE-Band 17 (QPSK RB Number: 1 Offset: 0) Channel Highest





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Figure 9-79: Band edge emission at antenna terminals –10MHz BW LTE-Band 17 (QPSK RB Number: 50 Offset: 0) Channel Lowest

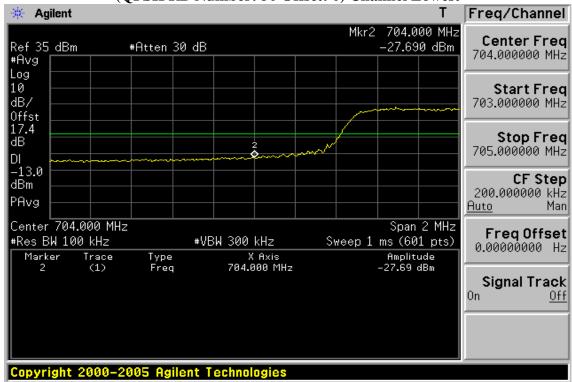


Figure 9-80: Band edge emission at antenna terminals –10MHz BW LTE-Band 17 (QPSK RB Number: 50 Offset: 0) Channel Highest



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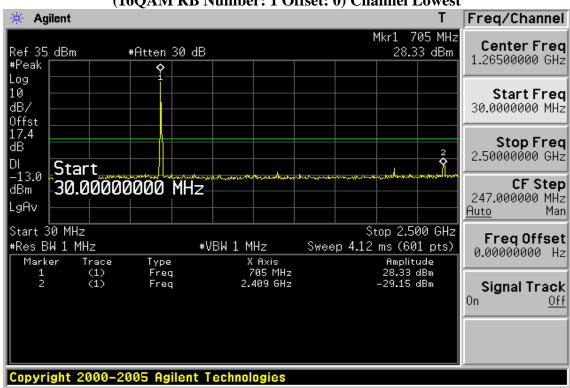
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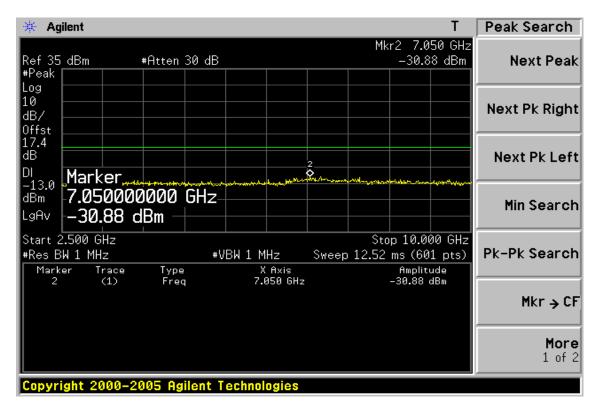


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Figure 9-81: Out of Band emission at antenna terminals-10MHz BW LTE-Band 17 (16QAM RB Number: 1 Offset: 0) Channel Lowest





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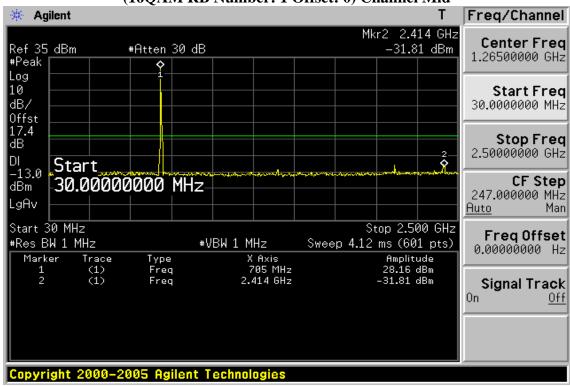
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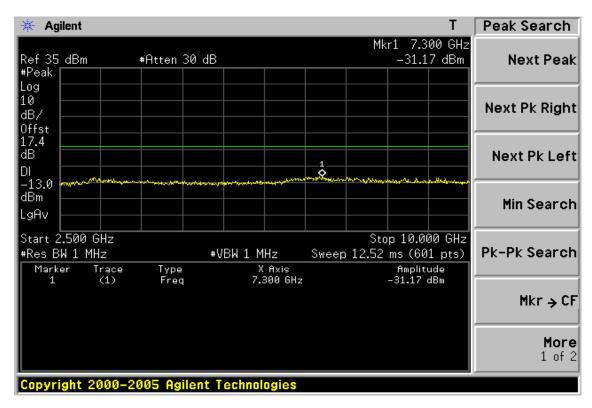


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Figure 9-82: Out of Band emission at antenna terminals –10MHz BW LTE-Band 17 (16QAM RB Number: 1 Offset: 0) Channel Mid





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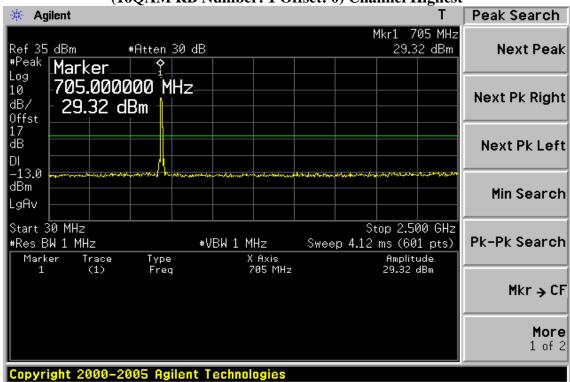
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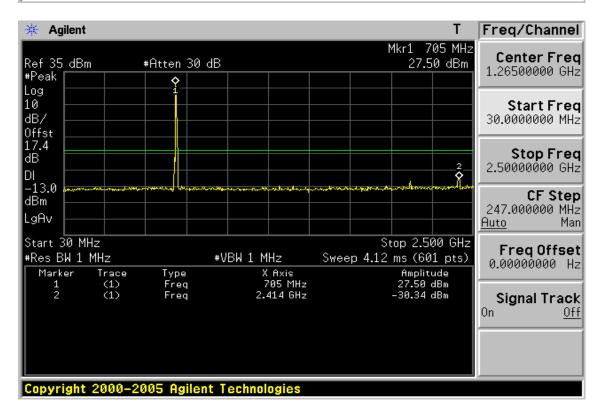


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Figure 9-83: Out of Band emission at antenna terminals—10MHz BW LTE-Band 17 (16QAM RB Number: 1 Offset: 0) Channel Highest





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Figure 9-84: Band edge emission at antenna terminals –10MHz BW LTE-Band 17 (16QAM RB Number: 50 Offset: 0) Channel Lowest

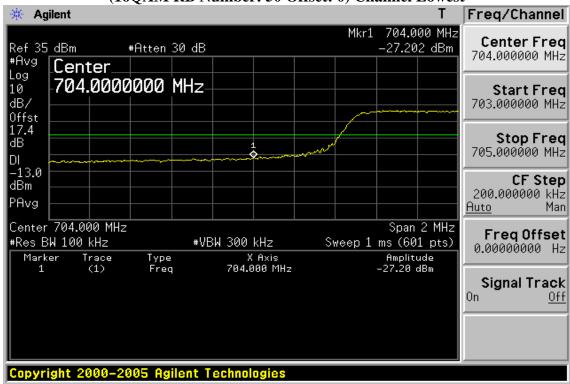


Figure 9-85: Band edge emission at antenna terminals –10MHz BW LTE-Band 17 (16QAM RB Number: 50 Offset: 0) Channel Highest



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## 10. FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT

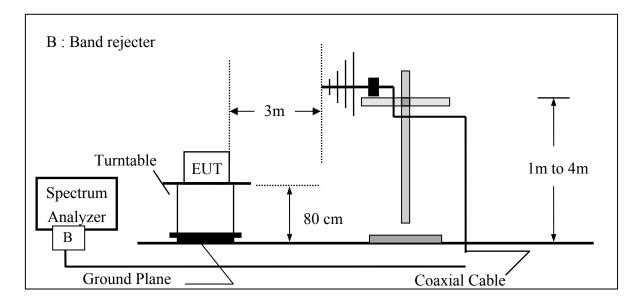
# 10.1. Standard Applicable:

According to FCC §2.1053,

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

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

Radiated Emission Test Set-Up, Frequency Below 1000MHz



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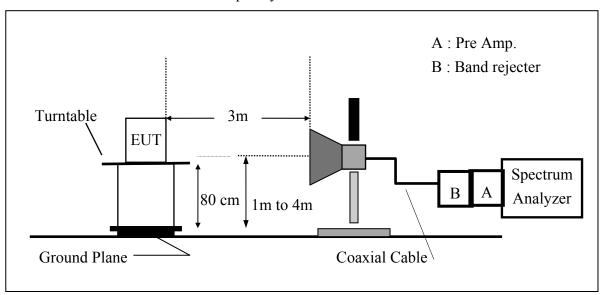
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## Radiated Emission Test Set-UP Frequency Over 1 GHz



### 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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### **Test Result:**

Radiated Spurious Emission Measurement Result: HSDPAII Mode

Operation Mode : TX CH Low Mode Test Date: May 31, 2011

Fundamental Frequency : 1852.4 MHz Test By: Lion Temperature :  $25^{\circ}\text{C}$  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/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
177.44	34.73	V	-65.02	-7.82	1.66	-74.50	-13.00	-61.50
250.19	41.85	V	-58.03	-7.89	1.99	-67.91	-13.00	-54.91
335.55	32.49	V	-65.32	-7.72	2.31	-75.35	-13.00	-62.35
559.62	33.34	V	-58.59	-7.77	2.97	-69.33	-13.00	-56.33
650.80	33.52	V	-55.41	-7.81	3.16	-66.38	-13.00	-53.38
972.84	33.07	V	-51.02	-8.00	3.95	-62.97	-13.00	-49.97
3697.50	42.12	V	-55.82	12.61	8.30	-51.52	-13.00	-38.52
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	

	30MHz - 80MHz: 5.04dB
Measurement uncertainty	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

# 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: May 31, 2011

Fundamental Frequency: 1852.4MHz Test By: Lion Temperature : 25°C Pol: Hor

Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
149.31	33.42	Н	-64.42	-7.80	1.59	-73.81	-13.00	-60.81
250.19	41.17	Н	-58.04	-7.89	1.99	-67.92	-13.00	-54.92
322.94	32.63	Н	-64.82	-7.79	2.26	-74.87	-13.00	-61.87
555.74	33.13	Н	-58.47	-7.76	2.97	-69.20	-13.00	-56.20
655.65	33.71	Н	-55.77	-7.82	3.17	-66.76	-13.00	-53.76
970.90	32.85	Н	-51.23	-8.00	3.94	-63.17	-13.00	-50.17
3697.50	37.68	Н	-60.38	12.61	8.30	-56.07	-13.00	-43.07
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	

	30MHz - 80MHz: 5.04dB
Measurement uncertainty	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

# 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: May 31, 2011

Fundamental Frequency: 1880MHz
Temperature

1880MHz
Test By: Lion
Pol: Ver

Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
150.28	33.10	V	-64.22	-7.80	1.59	-73.61	-13.00	-60.61
250.19	41.83	V	-58.05	-7.89	1.99	-67.93	-13.00	-54.93
338.46	33.19	V	-64.58	-7.70	2.32	-74.60	-13.00	-61.60
558.65	33.06	V	-58.92	-7.77	2.97	-69.66	-13.00	-56.66
665.35	33.04	V	-56.04	-7.83	3.20	-67.06	-13.00	-54.06
963.14	32.75	V	-51.57	-8.00	3.92	-63.48	-13.00	-50.48
3762.50	39.90	V	-57.75	12.60	8.39	-53.54	-13.00	-40.54
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	

	30MHz - 80MHz: 5.04dB
Measurement uncertainty	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

#### 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: May 31, 2011

Fundamental Frequency : 1880 MHz Test By: Lion Temperature :  $25^{\circ}\text{C}$  Pol: Hor

Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
165.80	35.49	Н	-63.51	-7.81	1.63	-72.95	-13.00	-59.95
250.19	40.81	Н	-58.40	-7.89	1.99	-68.28	-13.00	-55.28
322.94	32.99	Н	-64.46	-7.79	2.26	-74.51	-13.00	-61.51
524.70	38.22	Н	-54.38	-7.74	2.88	-64.99	-13.00	-51.99
655.65	33.81	Н	-55.67	-7.82	3.17	-66.66	-13.00	-53.66
932.10	32.68	Н	-51.76	-7.98	3.85	-63.59	-13.00	-50.59
3762.50	38.63	Н	-59.13	12.60	8.39	-54.92	-13.00	-41.92
5640.00		Н		13.36	10.41		-13.00	
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	

	30MHz - 80MHz: 5.04dB
Measurement uncertainty	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

### 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: May 31, 2011

Fundamental Frequency : 1907.6 MHz Test By: Lion Temperature :  $25^{\circ}\text{C}$  Pol: Ver

Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
165.80	36.74	V	-61.97	-7.81	1.63	-71.41	-13.00	-58.41
250.19	41.96	V	-57.92	-7.89	1.99	-67.80	-13.00	-54.80
321.00	33.00	V	-64.99	-7.80	2.25	-75.04	-13.00	-62.04
555.74	33.06	V	-59.09	-7.76	2.97	-69.83	-13.00	-56.83
658.56	33.57	V	-55.44	-7.82	3.18	-66.44	-13.00	-53.44
956.35	33.27	V	-51.20	-8.00	3.90	-63.10	-13.00	-50.10
3808.00	43.25	V	-54.19	12.60	8.46	-50.05	-13.00	-37.05
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	

	30MHz - 80MHz: 5.04dB
Measurement uncertainty	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

#### 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: May 31, 2011

Fundamental Frequency: 1907.6MHz Lion Test By: Pol: Temperature Hor : 25°C

Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
149.31	33.26	Н	-64.58	-7.80	1.59	-73.97	-13.00	-60.97
250.19	41.50	Н	-57.71	-7.89	1.99	-67.59	-13.00	-54.59
335.55	32.54	Н	-64.79	-7.72	2.31	-74.82	-13.00	-61.82
555.74	33.16	Н	-58.44	-7.76	2.97	-69.17	-13.00	-56.17
643.04	33.17	Н	-56.69	-7.81	3.14	-67.64	-13.00	-54.64
970.90	33.36	Н	-50.72	-8.00	3.94	-62.66	-13.00	-49.66
3808.00	36.54	Н	-61.02	12.60	8.46	-56.87	-13.00	-43.87
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	

	30MHz - 80MHz: 5.04dB
Measurement uncertainty	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

#### 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: HSDPA IV Mode

: TX CH Low Mode May 31, 2011 Operation Mode Test Date:

Fundamental Frequency: 1712.4MHz Test By: Lion Temperature : 25°C Pol: Ver

Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
158.04	33.69	V	-64.64	-7.81	1.48	-73.93	-13.00	-60.93
250.19	41.19	V	-59.51	-7.89	1.99	-69.38	-13.00	-56.38
340.40	33.38	V	-64.87	-7.69	2.38	-74.95	-13.00	-61.95
553.80	33.43	V	-59.43	-7.76	2.76	-69.94	-13.00	-56.94
660.50	33.02	V	-57.32	-7.82	3.07	-68.21	-13.00	-55.21
966.05	33.04	V	-51.89	-8.00	3.96	-63.85	-13.00	-50.85
3886.00	49.96	V	-50.76	12.60	8.02	-46.18	-13.00	-33.18
5137.20		V		12.79	9.36		-13.00	
6849.60		V		11.80	10.94		-13.00	
8562.00		V		11.73	12.66		-13.00	
10274.40		V		11.85	13.80		-13.00	
11986.80		V		13.15	15.25		-13.00	
13699.20		V		12.32	16.55		-13.00	
15411.60		V		15.69	18.06		-13.00	
17124.00		V		14.68	19.79		-13.00	

	30MHz - 80MHz: 5.04dB
Measurement uncertainty	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

## 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: May 31, 2011

Fundamental Frequency : 1712.4MHz Test By: Lion Temperature :  $25^{\circ}$ C Pol: Hor

Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
158.04	34.13	Н	-64.97	-7.81	1.48	-74.26	-13.00	-61.26
250.19	41.32	Н	-59.58	-7.89	1.99	-69.45	-13.00	-56.45
330.70	32.87	Н	-65.24	-7.75	2.29	-75.28	-13.00	-62.28
558.65	33.99	Н	-58.16	-7.77	2.78	-68.70	-13.00	-55.70
613.94	33.66	Н	-57.61	-7.80	2.96	-68.37	-13.00	-55.37
951.50	32.58	Н	-52.40	-8.00	3.96	-64.35	-13.00	-51.35
3827.50	49.68	Н	-51.14	12.60	7.93	-46.47	-13.00	-33.47
5137.20		Н		12.79	9.36		-13.00	
6849.60		Н		11.80	10.94		-13.00	
8562.00		Н		11.73	12.66		-13.00	
10274.40		Н		11.85	13.80		-13.00	
11986.80		Н		13.15	15.25		-13.00	
13699.20		Н		12.32	16.55		-13.00	
15411.60		Н		15.69	18.06		-13.00	
17124.00		Н		14.68	19.79		-13.00	

	30MHz - 80MHz: 5.04dB
Measurement uncertainty	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

# 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: May 31, 2011

Fundamental Frequency : 1732.6 MHz Test By: Lion Temperature :  $25^{\circ}\text{C}$  Pol: Ver

Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
165.80	33.77	V	-65.26	-7.81	1.50	-74.57	-13.00	-61.57
250.19	41.43	V	-59.27	-7.89	1.99	-69.14	-13.00	-56.14
301.60	33.75	V	-65.78	-7.91	2.00	-75.69	-13.00	-62.69
524.70	38.68	V	-55.16	-7.74	2.73	-65.63	-13.00	-52.63
650.80	33.53	V	-56.89	-7.81	3.00	-67.71	-13.00	-54.71
963.14	33.27	V	-51.73	-8.00	3.96	-63.69	-13.00	-50.69
3795.00	50.31	V	-50.83	12.60	7.88	-46.11	-13.00	-33.11
5197.80		V		12.85	9.41		-13.00	
6930.40		V		11.72	11.05		-13.00	
8663.00		V		11.77	12.74		-13.00	
10395.60		V		11.75	13.95		-13.00	
12128.20		V		13.35	15.32		-13.00	
13860.80		V		11.98	16.77		-13.00	
15593.40		V		16.35	18.21		-13.00	
17326.00		V		14.02	19.68		-13.00	

	30MHz - 80MHz: 5.04dB
Measurement uncertainty	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

### 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: May 31, 2011

Fundamental Frequency: 1732.6MHz Lion Test By: Pol: Temperature Hor : 25°C

Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
165.80	36.34	Н	-63.26	-7.81	1.50	-72.57	-13.00	-59.57
250.19	41.74	Н	-59.16	-7.89	1.99	-69.03	-13.00	-56.03
322.94	33.54	Н	-64.95	-7.79	2.21	-74.95	-13.00	-61.95
558.65	33.41	Н	-58.74	-7.77	2.78	-69.28	-13.00	-56.28
648.86	32.95	Н	-57.41	-7.81	3.00	-68.22	-13.00	-55.22
968.96	33.09	Н	-51.71	-8.00	3.97	-63.67	-13.00	-50.67
3860.00	49.36	Н	-51.33	12.60	7.98	-46.70	-13.00	-33.70
5197.80		Н		12.85	9.41		-13.00	
6930.40		Н		11.72	11.05		-13.00	
8663.00		Н		11.77	12.74		-13.00	
10395.60		Н		11.75	13.95		-13.00	
12128.20		Н		13.35	15.32		-13.00	
13860.80		Н		11.98	16.77		-13.00	
15593.40		Н		16.35	18.21		-13.00	
17326.00		Н		14.02	19.68		-13.00	

	30MHz - 80MHz: 5.04dB
Measurement uncertainty	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

### 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: May 31, 2011

Fundamental Frequency: 1752.6MHz Lion Test By: Pol: Temperature Ver : 25°C

Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
149.31	33.18	V	-64.51	-7.80	1.46	-73.78	-13.00	-60.78
250.19	41.99	V	-58.71	-7.89	1.99	-68.58	-13.00	-55.58
301.60	36.76	V	-62.77	-7.91	2.00	-72.68	-13.00	-59.68
558.65	33.83	V	-58.78	-7.77	2.78	-69.32	-13.00	-56.32
650.80	33.15	V	-57.27	-7.81	3.00	-68.09	-13.00	-55.09
982.54	33.69	V	-50.80	-7.99	3.97	-62.77	-13.00	-49.77
3827.50	49.77	V	-51.22	12.60	7.93	-46.55	-13.00	-33.55
5257.80		V		12.91	9.46		-13.00	
7010.40		V		11.65	11.14		-13.00	
8763.00		V		11.80	12.82		-13.00	
10515.60		V		11.66	14.08		-13.00	
12268.20		V		13.54	15.39		-13.00	
14020.80		V		11.67	16.95		-13.00	
15773.40		V		16.75	18.27		-13.00	
17526.00		V		13.21	19.62		-13.00	

	30MHz - 80MHz: 5.04dB
Measurement uncertainty	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

#### 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: May 31, 2011

Fundamental Frequency: 1752.6MHz Lion Test By: Pol: Temperature Hor : 25°C

Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
149.31	33.67	Н	-64.97	-7.80	1.46	-74.24	-13.00	-61.24
250.19	42.59	Н	-58.31	-7.89	1.99	-68.18	-13.00	-55.18
330.70	33.53	Н	-64.58	-7.75	2.29	-74.62	-13.00	-61.62
558.65	33.58	Н	-58.57	-7.77	2.78	-69.11	-13.00	-56.11
662.44	33.21	Н	-56.97	-7.82	3.08	-67.87	-13.00	-54.87
930.16	32.81	Н	-52.50	-7.98	3.90	-64.38	-13.00	-51.38
3827.50	50.33	Н	-50.49	12.60	7.93	-45.82	-13.00	-32.82
5257.80		Н		12.91	9.46		-13.00	
7010.40		Н		11.65	11.14		-13.00	
8763.00		Н		11.80	12.82		-13.00	
10515.60		Н		11.66	14.08		-13.00	
12268.20		Н		13.54	15.39		-13.00	
14020.80		Н		11.67	16.95		-13.00	
15773.40		Н		16.75	18.27		-13.00	
17526.00		Н		13.21	19.62		-13.00	

	30MHz - 80MHz: 5.04dB
Measurement uncertainty	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

#### 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: HSDPA V Mode

Operation Mode : TX CH Low Mode Test Date: May 31, 2011

Fundamental Frequency : 826.4 MHz Test By: Lion Temperature :  $25^{\circ}\text{C}$  Pol: Ver

Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
167.74	37.03	V	-61.85	-9.95	1.63	-73.44	-13.00	-60.44
250.19	42.24	V	-57.64	-10.03	1.99	-69.66	-13.00	-56.66
338.46	32.88	V	-64.89	-9.84	2.32	-77.05	-13.00	-64.05
558.65	32.46	V	-59.52	-9.91	2.97	-72.40	-13.00	-59.40
699.30	34.75	V	-54.68	-10.00	3.29	-67.97	-13.00	-54.97
978.66	33.75	V	-50.21	-10.13	3.97	-64.31	-13.00	-51.31
1650.00	38.56	V	-66.02	9.29	5.23	-61.96	-13.00	-48.96
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	

	30MHz - 80MHz: 5.04dB
Measurement uncertainty	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

## 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: May 31, 2011

Fundamental Frequency: 826.4MHz Test By: Lion Temperature : 25°C Pol: Hor

Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
165.80	34.70	Н	-64.30	-9.95	1.63	-75.88	-13.00	-62.88
250.19	41.21	Н	-58.00	-10.03	1.99	-70.02	-13.00	-57.02
332.64	33.31	Н	-64.05	-9.88	2.29	-76.22	-13.00	-63.22
555.74	33.19	Н	-58.41	-9.90	2.97	-71.28	-13.00	-58.28
658.56	33.99	Н	-55.37	-9.96	3.18	-68.51	-13.00	-55.51
982.54	34.06	Н	-49.95	-10.13	3.98	-64.07	-13.00	-51.07
1650.00	45.61	Н	-58.79	9.29	5.23	-54.73	-13.00	-41.73
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	

	30MHz - 80MHz: 5.04dB
Measurement uncertainty	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

# 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: May 31, 2011

Fundamental Frequency: 836.6MHz Lion Test By: Pol: Temperature Ver : 25°C

Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
154.16	33.29	V	-64.37	-9.94	1.60	-75.92	-13.00	-62.92
250.19	42.09	V	-57.79	-10.03	1.99	-69.81	-13.00	-56.81
335.55	32.83	V	-64.98	-9.86	2.31	-77.15	-13.00	-64.15
546.04	32.80	V	-59.82	-9.90	2.95	-72.66	-13.00	-59.66
691.54	34.24	V	-55.11	-9.99	3.27	-68.37	-13.00	-55.37
972.84	34.35	V	-49.74	-10.14	3.95	-63.83	-13.00	-50.83
1682.50	36.62	V	-67.93	9.39	5.28	-63.82	-13.00	-50.82
2508.00		V		10.08	6.58		-13.00	
3344.00		V		12.27	7.79		-13.00	
4180.00		V		12.62	8.93		-13.00	
5016.00		V		12.67	9.81		-13.00	
5852.00		V		13.68	10.62		-13.00	
6688.00		V		11.96	11.39		-13.00	
7524.00		V		11.45	12.20		-13.00	
8360.00		V		11.58	12.81		-13.00	

	30MHz - 80MHz: 5.04dB
Measurement uncertainty	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

### 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: May 31, 2011

Fundamental Frequency: 836.6MHz Lion Test By: Pol: Temperature Hor : 25°C

Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Out- put (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
154.16	33.57	Н	-64.52	-9.94	1.60	-76.07	-13.00	-63.07
250.19	41.74	Н	-57.47	-10.03	1.99	-69.49	-13.00	-56.49
335.55	33.08	Н	-64.25	-9.86	2.31	-76.42	-13.00	-63.42
558.65	34.08	Н	-57.46	-9.91	2.97	-70.34	-13.00	-57.34
694.45	33.92	Н	-53.94	-9.99	3.28	-67.21	-13.00	-54.21
949.56	34.52	Н	-49.70	-10.14	3.88	-63.71	-13.00	-50.71
1682.50	42.95	Н	-61.42	9.39	5.28	-57.31	-13.00	-44.31
2508.00		Н		10.08	6.58		-13.00	
3344.00		Н		12.27	7.79		-13.00	
4180.00		Н		12.62	8.93		-13.00	
5016.00		Н		12.67	9.81		-13.00	
5852.00		Н		13.68	10.62		-13.00	
6688.00		Н		11.96	11.39		-13.00	
7524.00		Н		11.45	12.20		-13.00	
8360.00		Н		11.58	12.81		-13.00	

	30MHz - 80MHz: 5.04dB
Measurement uncertainty	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

### 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: May 31, 2011

Fundamental Frequency: 846.6MHz
Temperature: 25°C
Test By: Lion
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/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
154.16	33.29	V	-64.37	-9.94	1.60	-75.92	-13.00	-62.92
250.19	41.96	V	-57.92	-10.03	1.99	-69.94	-13.00	-56.94
335.55	34.19	V	-63.62	-9.86	2.31	-75.79	-13.00	-62.79
553.80	33.01	V	-59.26	-9.90	2.97	-72.13	-13.00	-59.13
665.35	34.33	V	-54.75	-9.97	3.20	-67.91	-13.00	-54.91
932.10	33.91	V	-50.76	-10.12	3.85	-64.73	-13.00	-51.73
1702.00	37.81	V	-66.72	9.45	5.32	-62.59	-13.00	-49.59
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	

	30MHz - 80MHz: 5.04dB
Measurement uncertainty	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

#### 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: May 31, 2011

Fundamental Frequency : 846.6 MHz Test By: Lion Temperature :  $25 ^{\circ}C$  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/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
154.16	34.29	Н	-63.80	-9.94	1.60	-75.35	-13.00	-62.35
250.19	41.76	Н	-57.45	-10.03	1.99	-69.47	-13.00	-56.47
309.36	33.40	Н	-64.17	-10.01	2.21	-76.39	-13.00	-63.39
559.62	32.50	Н	-59.02	-9.91	2.97	-71.90	-13.00	-58.90
660.50	34.00	Н	-55.28	-9.96	3.19	-68.43	-13.00	-55.43
946.65	33.75	Н	-50.50	-10.14	3.87	-64.51	-13.00	-51.51
1702.00	44.35	Н	-59.99	9.45	5.32	-55.86	-13.00	-42.86
2539.80		Н		10.18	6.62		-13.00	
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	

	30MHz - 80MHz: 5.04dB
Measurement uncertainty	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

#### 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: 5MHz BW LTE-Band 4

(16QAM RB 1 Offset 24) (Worst case for each band)

peration Mode : TX CH Low Mode Test Date: May 31, 2011

Fundamental Frequency: 1712.5MHz Test By: Lion Pol: Ver Temperature : 25°C

Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
151.25	33.63	V	-63.77	-7.80	1.59	-73.17	-13.00	-60.17
250.19	42.32	V	-57.56	-7.89	1.99	-67.44	-13.00	-54.44
321.00	35.83	V	-62.16	-7.80	2.25	-72.21	-13.00	-59.21
558.65	32.93	V	-59.05	-7.77	2.97	-69.79	-13.00	-56.79
660.50	33.26	V	-55.77	-7.82	3.19	-66.78	-13.00	-53.78
978.66	32.55	V	-51.41	-7.99	3.97	-63.37	-13.00	-50.37
3425.00		V		12.45	7.91		-13.00	
3437.50	47.42	V	-51.42	12.47	7.93	-46.88	-13.00	-33.88
5137.50		V		12.79	9.92		-13.00	
6850.00		V		11.80	11.54		-13.00	
8562.50		V		11.73	12.97		-13.00	
10275.00		V		11.85	14.50		-13.00	
11987.50		V		13.16	15.91		-13.00	
13700.00		V		12.32	17.04		-13.00	
15412.50		V		15.70	18.36		-13.00	
17125.00		V		14.67	19.47		-13.00	

	30MHz - 80MHz: 5.04dB				
Measurement uncertainty	80MHz -1000MHz: 3.76dB				
	1GHz - 13GHz: 4.45dB				

## 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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Report No.: EH/2011/50010 Issue Date: Jun 08, 2011

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Operation Mode : TX CH Low Mode Test Date: May 31, 2011

Fundamental Frequency: 1712.5MHz Lion Test By: Pol: Temperature Hor : 25℃

Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
151.25	33.99	Н	-63.88	-7.80	1.59	-73.27	-13.00	-60.27
250.19	40.89	Н	-58.32	-7.89	1.99	-68.20	-13.00	-55.20
332.64	33.12	Н	-64.24	-7.74	2.29	-74.27	-13.00	-61.27
555.74	32.55	Н	-59.05	-7.76	2.97	-69.78	-13.00	-56.78
684.75	32.53	Н	-55.74	-7.84	3.25	-66.83	-13.00	-53.83
961.20	32.83	Н	-51.31	-8.00	3.91	-63.22	-13.00	-50.22
3425.00		Н		12.45	7.91		-13.00	
3437.50	58.13	Н	-40.87	12.47	7.93	-36.32	-13.00	-23.32
5137.50		Н		12.79	9.92		-13.00	
6850.00		Н		11.80	11.54		-13.00	
8562.50		Н		11.73	12.97		-13.00	
10275.00		Н		11.85	14.50		-13.00	
11987.50		Н		13.16	15.91		-13.00	
13700.00		Н		12.32	17.04	_	-13.00	
15412.50		Н		15.70	18.36		-13.00	
17125.00		Н		14.67	19.47		-13.00	

	30MHz - 80MHz: 5.04dB
Measurement uncertainty	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

# 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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Report No.: EH/2011/50010 Issue Date: Jun 08, 2011

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Operation Mode : TX CH Mid Mode Test Date: May 31, 2011

Fundamental Frequency: 1732.5MHz Lion Test By: Pol: Temperature Ver : 25°C

Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
170.65	36.28	V	-62.86	-7.82	1.64	-72.32	-13.00	-59.32
250.19	41.91	V	-57.97	-7.89	1.99	-67.85	-13.00	-54.85
287.05	33.95	V	-64.72	-7.91	2.12	-74.76	-13.00	-61.76
539.25	34.59	V	-58.25	-7.75	2.93	-68.93	-13.00	-55.93
633.34	34.04	V	-55.10	-7.80	3.12	-66.02	-13.00	-53.02
985.45	32.16	V	-51.64	-7.99	3.99	-63.62	-13.00	-50.62
3465.00	49.75	V	-49.09	12.53	7.98	-44.53	-13.00	-31.53
5197.50		V		12.85	9.98		-13.00	
6930.00		V		11.72	11.61		-13.00	
8662.50		V		11.77	13.05		-13.00	
10395.00		V		11.75	14.59		-13.00	
12127.50		V		13.35	16.03		-13.00	
13860.00		V		11.98	17.16		-13.00	
15592.50		V		16.35	18.47		-13.00	
17325.00		V		14.02	19.62		-13.00	

	30MHz - 80MHz: 5.04dB
Measurement uncertainty	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

## 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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Report No.: EH/2011/50010 Issue Date: Jun 08, 2011

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Operation Mode : TX CH Mid Mode Test Date: May 31, 2011

Fundamental Frequency : 1732.5 MHz Test By: Lion Temperature :  $25^{\circ}\text{C}$  Pol: Hor

Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
199.75	37.99	Н	-63.64	-7.84	1.71	-73.19	-13.00	-60.19
250.19	41.25	Н	-57.96	-7.89	1.99	-67.84	-13.00	-54.84
311.30	34.43	Н	-63.13	-7.86	2.21	-73.20	-13.00	-60.20
553.80	33.19	Н	-58.45	-7.76	2.97	-69.18	-13.00	-56.18
687.66	32.56	Н	-55.59	-7.85	3.26	-66.69	-13.00	-53.69
975.75	32.55	Н	-51.51	-7.99	3.96	-63.46	-13.00	-50.46
3465.00	51.12	Н	-47.86	12.53	7.98	-43.30	-13.00	-30.30
5197.50		Н		12.85	9.98		-13.00	
6930.00		Н		11.72	11.61		-13.00	
8662.50		Н		11.77	13.05		-13.00	
10395.00		Н		11.75	14.59		-13.00	
12127.50		Н		13.35	16.03		-13.00	
13860.00		Н		11.98	17.16		-13.00	
15592.50		Н		16.35	18.47		-13.00	
17325.00		Н		14.02	19.62		-13.00	

	30MHz - 80MHz: 5.04dB				
Measurement uncertainty	80MHz -1000MHz: 3.76dB				
	1GHz - 13GHz: 4.45dB				

## 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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Report No.: EH/2011/50010 Issue Date: Jun 08, 2011

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Operation Mode : TX CH High Mode Test Date: May 31, 2011

Fundamental Frequency: 1752.5MHz Lion Test By: Pol: Temperature Ver : 25°C

Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
154.16	33.90	V	-63.76	-7.80	1.60	-73.17	-13.00	-60.17
250.19	42.91	V	-56.97	-7.89	1.99	-66.85	-13.00	-53.85
291.90	33.79	V	-64.73	-7.92	2.14	-74.78	-13.00	-61.78
559.62	32.65	V	-59.28	-7.77	2.97	-70.02	-13.00	-57.02
660.50	32.80	V	-56.23	-7.82	3.19	-67.24	-13.00	-54.24
963.14	32.88	V	-51.44	-8.00	3.92	-63.35	-13.00	-50.35
3505.00	48.08	V	-50.73	12.61	8.04	-46.15	-13.00	-33.15
5257.50		V		12.91	10.04		-13.00	
7010.00		V		11.65	11.69		-13.00	
8762.50		V		11.80	13.13		-13.00	
10515.00		V		11.66	14.68		-13.00	
12267.50		V		13.54	16.14		-13.00	
14020.00		V		11.67	17.28		-13.00	
15772.50		V		16.74	18.60		-13.00	
17525.00		V		13.22	19.76		-13.00	

	30MHz - 80MHz: 5.04dB
Measurement uncertainty	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

### 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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Report No.: EH/2011/50010 Issue Date: Jun 08, 2011

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Operation Mode : TX CH High Mode Test Date: May 31, 2011

Fundamental Frequency : 1752.5 MHz Test By: Lion Temperature :  $25^{\circ}\text{C}$  Pol: Hor

Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
158.04	34.80	Н	-63.59	-7.81	1.61	-73.01	-13.00	-60.01
250.19	40.94	Н	-58.27	-7.89	1.99	-68.15	-13.00	-55.15
330.70	32.79	Н	-64.59	-7.75	2.29	-74.62	-13.00	-61.62
558.65	32.73	Н	-58.81	-7.77	2.97	-69.55	-13.00	-56.55
691.54	32.55	Н	-55.43	-7.85	3.27	-66.55	-13.00	-53.55
982.54	32.44	Н	-51.57	-7.99	3.98	-63.55	-13.00	-50.55
3505.00	49.49	Н	-49.44	12.61	8.04	-44.86	-13.00	-31.86
5257.50		Н		12.91	10.04		-13.00	
7010.00		Н		11.65	11.69		-13.00	
8762.50		Н		11.80	13.13		-13.00	
10515.00		Н		11.66	14.68		-13.00	
12267.50		Н		13.54	16.14		-13.00	
14020.00		Н		11.67	17.28		-13.00	
15772.50		Н		16.74	18.60		-13.00	
17525.00		Н		13.22	19.76		-13.00	

	30MHz - 80MHz: 5.04dB
Measurement uncertainty	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

### 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: 5MHz BW LTE-Band 17

(16QAM RB 1 Offset 24) (Worst case for each band)

peration Mode : TX CH Low Mode Test Date: May 31, 2011

Fundamental Frequency : 706.5 MHz Test By: Lion Temperature :  $25^{\circ}\text{C}$  Pol: Ver

Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
151.25	33.67	V	-63.73	-7.80	1.59	-73.13	-13.00	-60.13
250.19	42.17	V	-57.71	-7.89	1.99	-67.59	-13.00	-54.59
280.26	36.65	V	-62.25	-7.91	2.10	-72.25	-13.00	-59.25
555.74	33.64	V	-58.51	-7.76	2.97	-69.25	-13.00	-56.25
621.70	33.47	V	-55.82	-7.80	3.09	-66.70	-13.00	-53.70
978.66	32.54	V	-51.42	-7.99	3.97	-63.38	-13.00	-50.38
1413.00	44.23	V	-60.86	8.34	4.11	-56.64	-13.00	-43.64
2119.50		V		10.28	5.99		-13.00	
2826.00		V		11.01	7.01		-13.00	
3532.50		V		12.61	8.07		-13.00	
4239.00		V		12.63	9.00		-13.00	
4945.50		V		12.65	9.74		-13.00	
5652.00		V		13.38	10.43		-13.00	
6358.50		V		12.64	11.08		-13.00	
7065.00		V		11.63	11.75		-13.00	

	30MHz - 80MHz: 5.04dB
Measurement uncertainty	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

## 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: May 31, 2011

Fundamental Frequency: 706.5MHz
Temperature: 25°C
Test By: Lion
Pol: Hor

Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
151.25	34.02	Н	-63.85	-7.80	1.59	-73.24	-13.00	-60.24
233.70	41.62	Н	-58.39	-7.87	1.90	-68.16	-13.00	-55.16
335.55	33.17	Н	-64.16	-7.72	2.31	-74.19	-13.00	-61.19
544.10	33.12	Н	-58.80	-7.76	2.94	-69.50	-13.00	-56.50
672.14	33.15	Н	-55.64	-7.83	3.22	-66.69	-13.00	-53.69
975.75	32.62	Н	-51.44	-7.99	3.96	-63.39	-13.00	-50.39
1413.00	53.50	Н	-51.47	8.34	4.11	-47.24	-13.00	-34.24
2119.50		Н		10.28	5.99		-13.00	
2826.00		Н		11.01	7.01		-13.00	
3532.50		Н		12.61	8.07		-13.00	
4239.00		Н		12.63	9.00		-13.00	
4945.50		Н		12.65	9.74		-13.00	
5652.00		Н		13.38	10.43		-13.00	
6358.50		Н		12.64	11.08		-13.00	
7065.00		Н		11.63	11.75		-13.00	

	30MHz - 80MHz: 5.04dB
Measurement uncertainty	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

## 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: May 31, 2011

Fundamental Frequency: 710MHz
Test By: Lion
Temperature: 25°C
Pol: Ver

Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
154.16	33.64	V	-64.02	-7.80	1.60	-73.43	-13.00	-60.43
250.19	42.48	V	-57.40	-7.89	1.99	-67.28	-13.00	-54.28
316.15	33.44	V	-64.61	-7.83	2.23	-74.67	-13.00	-61.67
559.62	32.16	V	-59.77	-7.77	2.97	-70.51	-13.00	-57.51
660.50	33.38	V	-55.65	-7.82	3.19	-66.66	-13.00	-53.66
972.84	33.59	V	-50.50	-8.00	3.95	-62.45	-13.00	-49.45
1420.00	42.02	V	-63.04	8.38	4.18	-58.85	-13.00	-45.85
2130.00		V		10.27	6.01		-13.00	
2840.00		V		11.05	7.03		-13.00	
3550.00		V		12.61	8.10		-13.00	
4260.00		V		12.63	9.02		-13.00	
4970.00		V		12.65	9.76		-13.00	
5680.00		V		13.42	10.45		-13.00	
6390.00		V		12.53	11.11		-13.00	
7100.00		V		11.61	11.78		-13.00	

	30MHz - 80MHz: 5.04dB
Measurement uncertainty	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

## 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: May 31, 2011

Fundamental Frequency: 710MHz Lion Test By: Pol: Temperature Hor : 25°C

Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
199.75	40.23	Н	-61.40	-7.84	1.71	-70.95	-13.00	-57.95
250.19	41.77	Н	-57.44	-7.89	1.99	-67.32	-13.00	-54.32
319.06	36.66	Н	-60.82	-7.81	2.24	-70.88	-13.00	-57.88
559.62	32.79	Н	-58.73	-7.77	2.97	-69.47	-13.00	-56.47
668.26	33.11	Н	-55.85	-7.83	3.21	-66.88	-13.00	-53.88
975.75	33.01	Н	-51.05	-7.99	3.96	-63.00	-13.00	-50.00
1420.00	53.35	Н	-51.59	8.38	4.18	-47.39	-13.00	-34.39
2130.00		Н		10.27	6.01		-13.00	
2840.00		Н		11.05	7.03		-13.00	
3550.00		Н		12.61	8.10		-13.00	
4260.00		Н		12.63	9.02		-13.00	
4970.00		Н		12.65	9.76		-13.00	
5680.00		Н		13.42	10.45		-13.00	
6390.00		Н		12.53	11.11		-13.00	
7100.00		Н		11.61	11.78		-13.00	

	30MHz - 80MHz: 5.04dB
Measurement uncertainty	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

## 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: May 31, 2011

Fundamental Frequency : 713.5MHz Test By: Lion Temperature :  $25^{\circ}$ 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/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
151.25	35.09	V	-62.31	-7.80	1.59	-71.71	-13.00	-58.71
250.19	42.48	V	-57.40	-7.89	1.99	-67.28	-13.00	-54.28
301.60	35.89	V	-62.34	-7.91	2.18	-72.43	-13.00	-59.43
558.65	33.57	V	-58.41	-7.77	2.97	-69.15	-13.00	-56.15
612.00	33.26	V	-56.15	-7.79	3.06	-67.01	-13.00	-54.01
980.60	32.11	V	-51.81	-7.99	3.97	-63.77	-13.00	-50.77
1427.00	44.11	V	-60.93	8.42	4.25	-56.76	-13.00	-43.76
2140.50		V		10.27	6.02		-13.00	
2854.00		V		11.09	7.05		-13.00	
3567.50		V		12.61	8.12		-13.00	
4281.00		V		12.63	9.05		-13.00	
4994.50		V		12.65	9.78		-13.00	
5708.00		V		13.46	10.48		-13.00	
6421.50		V		12.42	11.14		-13.00	
7135.00		V		11.60	11.82		-13.00	

	30MHz - 80MHz: 5.04dB
Measurement uncertainty	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

### 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: May 31, 2011

Fundamental Frequency : 713.5MHz Test By: Lion Temperature :  $25^{\circ}$ C Pol: Hor

Humidity : 65%

Freq. (MHz)	SPA. Reading (dBuV)	Ant.Pol. H/V	S.G Output (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	ERP/ EIRP (dBm)	Limit (dBm)	Safe Margin (dBm)
160.95	35.57	Н	-63.05	-7.81	1.62	-72.47	-13.00	-59.47
250.19	40.67	Н	-58.54	-7.89	1.99	-68.42	-13.00	-55.42
321.00	33.06	Н	-64.41	-7.80	2.25	-74.46	-13.00	-61.46
558.65	33.48	Н	-58.06	-7.77	2.97	-68.80	-13.00	-55.80
670.20	33.03	Н	-55.85	-7.83	3.21	-66.89	-13.00	-53.89
949.56	32.90	Н	-51.32	-8.00	3.88	-63.19	-13.00	-50.19
1427.00	52.96	Н	-51.94	8.42	4.25	-47.78	-13.00	-34.78
2140.50		Н		10.27	6.02		-13.00	
2854.00		Н		11.09	7.05		-13.00	
3567.50		Н		12.61	8.12		-13.00	
4281.00		Н		12.63	9.05		-13.00	
4994.50		Н		12.65	9.78		-13.00	
5708.00		Н		13.46	10.48		-13.00	
6421.50		Н		12.42	11.14		-13.00	
7135.00		Н		11.60	11.82		-13.00	

	30MHz - 80MHz: 5.04dB
Measurement uncertainty	80MHz -1000MHz: 3.76dB
	1GHz - 13GHz: 4.45dB

### 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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# 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

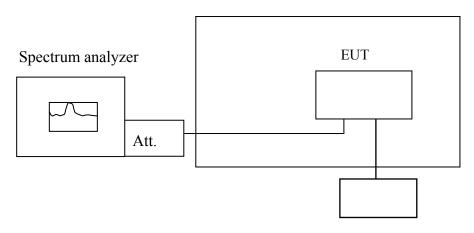
+/-2.5ppm for 1900MHz band

+/-2.5ppm for 1700MHz band

+/-2.5ppm for 700MHz 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  $25^{\circ}$ 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

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## 11.5. Measurement Result:

Reference Frequency: WCDMA II Mid Channel 1880 (ARFCN9400) MHz					
	Limit: +/- 2.5 ppm = 4700 Hz				
Power Supply	Environment	Frequency	Dolto (Uz)	Limit (Hz)	
Vdc	Temperature ( $^{\circ}$ C)	(MHz)	Delta (Hz)	Lillit (HZ)	
12	-30	1880.000009	-5.00	4700	
12	-20	1880.000005	-1.00	4700	
12	-10	1880.000004	0.00	4700	
12	0	1880.000008	-4.00	4700	
12	10	1880.000007	-3.00	4700	
12	20	1880.000003	1.00	4700	
12	30	1880.000004	0.00	4700	
12	40	1880.000006	-2.00	4700	
12	50	1880.000009	-5.00	4700	

Reference Frequency: WCDMA IV Mid Channel 1732.5 (ARFCN1413) MHz @ 20°C				
Limit: $\pm -2.5 \text{ ppm} = 4700 \text{ Hz}$				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature ( $^{\circ}$ C)	(MHz)	Della (112)	Lillit (112)
12	-30	1732.600008	-6.00	4331
12	-20	1732.599996	6.00	4331
12	-10	1732.600004	-2.00	4331
12	0	1732.599995	7.00	4331
12	10	1732.599998	4.00	4331
12	20	1732.600001	1.00	4331
12	30	1732.600002	0.00	4331
12	40	1732.600005	-3.00	4331
12	50	1732.600006	-4.00	4331

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Reference Frequency: WCDMA V Mid Channel 836.6 (ARFCN4183) MHz					
	Limit: +/- 2.5 ppm = 2091 Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)	
Vdc	Temperature (°C)	(MHz)	Della (HZ)	Lillit (HZ)	
12	-30	836.599988	8.00	2091	
12	-20	836.599992	4.00	2091	
12	-10	836.599994	2.00	2091	
12	0	836.599995	1.00	2091	
12	10	836.599998	-2.00	2091	
12	20	836.599999	-3.00	2091	
12	30	836.599996	0.00	2091	
12	40	836.599995	1.00	2091	
12	50	836.599993	3.00	2091	

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Reference Frequency: LTE B4 Mid Channel 1732.5 MHz 5M QPSK CH 20175				
Limit: +/- 2.5 ppm = 4331 Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature ( $^{\circ}$ C)	(MHz)	Delta (112)	Lillit (112)
12	-30	1732.500005	-3.00	4331
12	-20	1732.500003	-1.00	4331
12	-10	1732.500003	-1.00	4331
12	0	1732.500001	1.00	4331
12	10	1732.500004	-2.00	4331
12	20	1732.500002	0.00	4331
12	30	1732.500002	0.00	4331
12	40	1732.500006	-4.00	4331
12	50	1732.500007	-5.00	4331

Reference Frequency: LTE B4 Mid Channel 1732.5 MHz 5M 16QAM CH 20175				
Limit: $\pm -2.5 \text{ ppm} = 4331 \text{ Hz}$				
Power Supply	Environment	Frequency	Dolto (II-)	Limit (II-)
Vdc	Temperature (°C)	(MHz)	Delta (Hz)	Limit (Hz)
12	-30	1732.500012	-10.00	4331
12	-20	1732.500010	-8.00	4331
12	-10	1732.500008	-6.00	4331
12	0	1732.499998	4.00	4331
12	10	1732.500001	1.00	4331
12	20	1732.500002	0.00	4331
12	30	1732.500008	-6.00	4331
12	40	1732.500005	-3.00	4331
12	50	1732.500006	-4.00	4331

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Reference Frequency: LTE B4 Mid Channel 1732.5 MHz 10M QPSK CH 20175				
Limit: +/- 2.5 ppm = 4331 Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature ( $^{\circ}$ C)	(MHz)	Della (112)	Lillit (112)
12	-30	1732.499991	5.00	4331
12	-20	1732.499994	2.00	4331
12	-10	1732.499998	-2.00	4331
12	0	1732.499997	-1.00	4331
12	10	1732.499997	-1.00	4331
12	20	1732.499996	0.00	4331
12	30	1732.499996	0.00	4331
12	40	1732.499999	-3.00	4331
12	50	1732.499999	-3.00	4331

Reference Frequency: LTE B4 Mid Channel 1732.5 MHz 10M 16QAM CH 20175				
Limit: $\pm -2.5 \text{ ppm} = 4331 \text{ Hz}$				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature ( $^{\circ}$ C)	(MHz)	Della (112)	Lillit (112)
12	-30	1732.499998	-6.00	4331
12	-20	1732.499997	-5.00	4331
12	-10	1732.499992	0.00	4331
12	0	1732.499999	-7.00	4331
12	10	1732.499994	-2.00	4331
12	20	1732.499992	0.00	4331
12	30	1732.499997	-5.00	4331
12	40	1732.499993	-1.00	4331
12	50	1732.499985	7.00	4331

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Reference Frequency: LTE B17 Mid Channel 710 MHz @ 5M QPSK CH 23790				
Limit: +/- 2.5 ppm = 1775 Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)
Vdc	Temperature ( $^{\circ}$ C)	(MHz)	Della (112)	Lillit (112)
12	-30	710.000010	-8.00	1775
12	-20	710.000008	-6.00	1775
12	-10	710.000005	-3.00	1775
12	0	710.000004	-2.00	1775
12	10	710.000002	0.00	1775
12	20	710.000002	0.00	1775
12	30	710.000003	-1.00	1775
12	40	710.000006	-4.00	1775
12	50	710.000009	-7.00	1775

Reference Frequency: LTE B17 Mid Channel 710 MHz 5M 16QAM CH 23790					
	Limit: +/- 2.5 ppm = 1775 Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)	
Vdc	Temperature ( $^{\circ}$ C)	(MHz)	Della (HZ)	Lillit (HZ)	
12	-30	709.999991	7.00	1775	
12	-20	709.999993	5.00	1775	
12	-10	709.999997	1.00	1775	
12	0	709.999998	0.00	1775	
12	10	709.999995	3.00	1775	
12	20	709.999998	0.00	1775	
12	30	710.000003	-5.00	1775	
12	40	710.000005	-7.00	1775	
12	50	710.000010	-12.00	1775	

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Reference Frequency: LTE B17 Mid Channel 710 MHz 10M QPSK CH 23790					
	Limit: +/- 2.5 ppm = 1775 Hz				
Power Supply	Environment	Frequency	Dolto (Hz)	Limit (Hz)	
Vdc	Temperature (°C)	(MHz)	Delta (Hz)	Limit (Hz)	
12	-30	710.000005	-4.00	1775	
12	-20	710.000006	-5.00	1775	
12	-10	710.000008	-7.00	1775	
12	0	710.000002	-1.00	1775	
12	10	710.000001	0.00	1775	
12	20	710.000001	0.00	1775	
12	30	710.000004	-3.00	1775	
12	40	710.000005	-4.00	1775	
12	50	710.000006	-5.00	1775	

Reference Frequency: LTE B17 Mid Channel 710 MHz 10M 16QAM CH 23790					
	Limit: +/- 2.5 ppm = 1775 Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)	
Vdc	Temperature ( $^{\circ}$ C)	(MHz)	Della (112)	Limit (112)	
12	-30	710.000007	-6.00	1775	
12	-20	710.000002	-1.00	1775	
12	-10	710.000003	-2.00	1775	
12	0	710.000006	-5.00	1775	
12	10	710.000002	-1.00	1775	
12	20	710.000001	0.00	1775	
12	30	709.999995	6.00	1775	
12	40	709.999993	8.00	1775	
12	50	709.999990	11.00	1775	

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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

+/-2.5ppm for 1700MHz band

+/-2.5ppm for 700MHz band

# 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

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## 12.5. Measurement Result:

Reference Frequency: WCDMA II Mid Channel 1880 (ARFCN9400) MHz					
	Limit: +/- 2.5 ppm = 2091 Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Uz)	
Vdc	Temperature (°C)	(MHz)	Della (HZ)	Limit (Hz)	
13.8	25	1880.000008	-5.00	4700	
12.0	25	1880.000003	0.00	4700	
10.2	25	1879.999995	8.00	4700	
4.2	25	1970 000000	12.00	4700	
(End Point)	25	1879.999990	13.00	4700	

Reference Frequency: WCDMA IV Mid Channel 1732.6 (ARFCN1413) MHz					
	Limit	$\pm +/- 2.5 \text{ ppm} = 470$	00 Hz		
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)	
Vdc	Temperature (°C)	(MHz)	Della (HZ)	Lillit (HZ)	
13.8	25	1732.599998	3.00	4700	
12.0	25	1732.600001	0.00	4700	
10.2	25	1732.599996	5.00	4700	
4.2	25		0.00	4700	
(End Point)	25	1732.599992	9.00	4700	

Reference Frequency: WCDMA V Mid Channel 836.6 (ARFCN4183) MHz					
	Limit: +/- 2.5 ppm = 2091 Hz				
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)	
Vdc	Temperature (°C)	(MHz)	Della (HZ)	Lillit (HZ)	
13.8	25.00	836.600002	-3.00	2091.00	
12.0	25.00	836.599999	0.00	2091.00	
10.2	25.00	836.599995	4.00	2091.00	
4.2	25.00	926 500001	9.00	2001.00	
(End Point)	25.00	836.599991	8.00	2091.00	

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Reference Frequency: LTE B4 Mid Channel 1732.5 MHz @ 25°C 5M QPSK CH 20175						
Reference Prec						
	Limi	t: $\pm -2.5 \text{ ppm} = 43.3$	31 Hz			
Power Supply	Environment	Frequency	Dolto (II-) Limit (II-)			
Vdc	Temperature (°C)	(MHz)	Delta (Hz)	Limit (Hz)		
13.8	25.00	1732.5000030	-1.00	4331		
12.0	25.00	1732.500002	0.00	4331		
10.2	25.00	1732.5000050	-3.00	4331		
4.2	25.00	1722 5000000	7.00	4221		
(End Point)	25.00	1732.5000090	-7.00	4331		

Reference Frequency: LTE B4 Mid Channel 1732.5 MHz @ 25°C 5M 16QAM CH 20175						
	Limit: +/- 2.5 ppm = 4331 Hz					
Power Supply	Environment	Frequency	D k (II)			
Vdc	Temperature (°C)	(MHz)	Delta (Hz)	Limit (Hz)		
13.8	25	1732.4999950	7.00	4331		
12.0	25	1732.500002	0.00	4331		
10.2	25	1732.4999990	3.00	4331		
4.2	25	1722 4000010	11.00	4221		
(End Point)	25	1732.4999910	11.00	4331		

Reference Frequency: LTE B4 Mid Channel 1732.5 MHz @ 25°C 10M QPSK CH 20175						
	Limit: +/- 2.5 ppm = 4331 Hz					
Power Supply	Environment	Frequency	Delta (Hz)	Limit (Hz)		
Vdc	Temperature (°C)	(MHz)	Della (112)	Lillit (112)		
13.8	25.00	1732.5000002	-4.20	4331		
12.0	25.00	1732.499996	0.00	4331		
10.2	25.00	1732.5000005	-4.50	4331		
4.2	25.00	1732.5000090	-13.00	4331		
(End Point)	23.00	1/32.3000090	-15.00	4331		

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Reference Frequency: LTE B4 Mid Channel 1732.5 MHz @ 25°C 10M 16QAM CH 20175					
	Limi	t: $\pm -2.5 \text{ ppm} = 433$	31 Hz		
Power Supply	Environment	Frequency	D 1 (II)		
Vdc	Temperature (°C)	(MHz)	Delta (Hz)	Limit (Hz)	
13.8	25	1732.5000005	-8.50	4331	
12.0	25	1732.499992	0.00	4331	
10.2	25	1732.5000003	-8.30	4331	
4.2 (End Point)	25	1732.5000019	-9.90	4331	

Reference Frequency: LTE B17 Mid Channel 710 MHz @ 25°C 5M QPSK CH 23790					
	Limi	t: +/- 2.5  ppm = 17	75 Hz		
Power Supply	Environment	Frequency	Dolto (Hz)	Limit (Uz)	
Vdc	Temperature (°C)	(MHz)	Delta (Hz)	Limit (Hz)	
13.2	25.00	709.9999991	2.90	1775	
12.0	25.00	710.000002	0.00	1775	
10.8	25.00	710.0000050	-3.00	1775	
4.2	25.00	709.9999900	12.00	1775	
(End Point)					

Reference Frequency: LTE B17 Mid Channel 710 MHz @ 25°C 5M 16QAM CH 23790					
	Limi	$t: +/- 2.5 \text{ ppm} = 17^{\circ}$	75 Hz		
Power Supply	Environment	Frequency	Dolto (Hz)	Limit (Uz)	
Vdc	Temperature (°C)	(MHz)	Delta (Hz)	Limit (Hz)	
13.8	25	710.0000030	-5.00	1775	
12.0	25	709.999998	0.00	1775	
10.2	25	710.0000040	-6.00	1775	
4.2	25	710.0000120	14.00	1775	
(End Point)	23	/10.0000120	-14.00	1//3	

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Reference Free	Reference Frequency: LTE B17 Mid Channel 710 MHz @ 25°C 10M QPSK CH 23790					
	Limi	t: +/- 2.5  ppm = 17	75 Hz			
Power Supply	Environment	Frequency	Dalta (III-)			
Vdc	Temperature (°C)	(MHz)	Delta (Hz)	Limit (Hz)		
13.2	25.00	709.9999950	6.00	1775		
12.0	25.00	710.000001	0.00	1775		
10.8	25.00	710.0000060	-5.00	1775		
4.2	25.00	<b>7</b> 00 000000	11.00	1555		
(End Point)		709.9999900	11.00	1775		

Reference Frequency: LTE B17 Mid Channel 710 MHz @ 25°C 10M 16QAM CH 23790						
	Limit: +/- 2.5 ppm = 1775 Hz					
Power Supply	Environment	Frequency	Dolto (Hz)	Limit (Uz)		
Vdc	Temperature (°C)	(MHz)	Delta (Hz)	Limit (Hz)		
13.2	25	710.0000060	-5.00	1775		
12.0	25	710.000001	0.00	1775		
10.8	25	710.0000030	-2.00	1775		
4.2	25	710 0000150	14.00	1775		
(End Point)	25	710.0000150	-14.00	1775		

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