

FCC 47 CFR PART 22 SUBPART H

FCC 47 CFR PART 24 SUBPART E

TEST REPORT

For

Product Name: GPS tracking

Brand Name: ESKY

Model No.: ES320

Series Model: N/A

FCC ID: YR8ES320

Test Report Number:

C170228R01-RP1

Issued for

eSKy Wireless Inc.

22-303,#328 street xinghu, Suzhou, china

Issued by

Compliance Certification Services Inc.

Kun shan Laboratory

**No.10 Weiye Rd., Innovation park, Eco&Tec,
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TESTING CERT #2541.01

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**REVISION HISTORY**

Rev.	Issue Date	Report NO.	Effect Page	Contents
00	April 11, 2017	C170228R01-RP1	ALL	N/A
01	April 14, 2017	C170228R01-RP1	P4,P5,P37 P10	Remove the GPRS information on page4 ; Correct the incorrect information on page5 and page37; Add the measurement site registration code of FCC on page10.

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1 TEST RESULT CERTIFICATION

Product Name:	GPS tracking
Trade Name:	ESKY
Model Name.:	ES320
Series Model:	N/A
Applicant Discrepancy:	Initial
Device Category:	Portable unit
Exposure Category:	GENERAL POPULATION/UNCONTROLLED EXPOSURE
Date of Test:	March 27, 2017 ~ April 10, 2017
Applicant:	eSky Wireless Inc. 22-303,#328 street xinghu, Suzhou, china
Manufacturer:	eSky Wireless Inc. 22-303,#328 street xinghu, Suzhou, china
Application Type:	Certification

APPLICABLE STANDARDS	
STANDARD	TEST RESULT
FCC 47 CFR Part 22 Subpart H FCC 47 CFR Part 24 Subpart E	No non-compliance noted

The above equipment was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10: 2013 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 and PART 24 Subpart E.

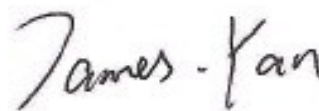
The test results of this report relate only to the tested sample identified in this report.

Approved by:

Tested by:



Jeff.Fang
RF Manager
Compliance Certification Service Inc.



James.yan
Test Engineer
Compliance Certification Service Inc.

2 EUT DESCRIPTION

Product Name:	GPS tracking
Brand Name:	ESKY
Model Name:	ES320
Series Model:	N/A
Model Discrepancy:	N/A
Hardware Version	ES320-MB-H104
Software Version	Apr_05_201721-35-43ES320
Power Supply:	Power supply and ADP (rating) : Model : TS52-501000 Input: 100-240V~ 50/60Hz 0.2A Output: DC5.0V 1000mA Battery (rating) : capacity: 1000mAh 3.7V
Frequency Range:	WCDMA/HSDPA Band II:1852.4~1907.6MHz WCDMA/HSDPA Band V:826.4~846.6 MHz
ERP & EIRP Power	WCDMA Band II: 25.74dBm HSDPA Band II: 25.32 dBm WCDMA Band V: 25.73 dBm HSDPA Band V: 25.37dBm
Modulation Technique:	WCDMA/HSDPA: QPSK
Antenna Gain:	WCDMA : 2.68 dBi
Antenna Type:	WCDMA: PIFA Antenna

Remark:

1. The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.
2. This submittal(s) (test report) is intended for **FCC ID: YR8ES320** filing to comply with Part 22 and Part 24 of the FCC 47 CFR Rules.

3 TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10 2013 and FCC CFR 47, Part 2, PART 22 SUBPART H and PART 24 SUBPART E

3.1. EUT CONFIGURATION

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

3.2. EUT EXERCISE

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

3.3. GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.10 2013 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable 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 maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.10:2013.

3.4. DESCRIPTION OF TEST MODES

The EUT (model: ES320) had been tested under operating condition.

After verification, all tests were carried out with the worst case test modes as shown below except radiated spurious emission below 1GHz and power line conducted emissions below 30MHz, which worst case was in normal link mode only.

EUT staying in continuous transmitting mode was programmed.

WCDMA Band II:

Channel Low (CH9262), Channel Mid (CH9400) and Channel High (CH9538) were chosen for full testing.

HSDPA Band II:

Channel Low (CH9262), Channel Mid (CH9400) and Channel High (CH9538) were chosen for full testing.

WCDMA Band V:

Channel Low (CH4132), Channel Mid (CH4183) and Channel High (CH4233) were chosen for full testing.

HSDPA Band V:

Channel Low (CH4132), Channel Mid (CH4183) and Channel High (CH4233) were chosen for full testing.

4 INSTRUMENT CALIBRATION

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

4.2. MEASUREMENT EQUIPMENT USED

Conducted Emissions Test Site					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Data	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY44020154	2016-9-10	2017-9-9
universal Radio communication tester	R&S	CMU200	109525	2017-1-5	2018-1-4
Power meter	Anritsu	ML2495A	1445010	2016-5-16	2017-5-15
Power sensor	Anritsu	MA2411B	1339220	2016-5-16	2017-5-15
Power SPLITTER	Mini-Circuits	ZN2PD-9G	SF078500430	N.C.R	N.C.R
DC Power Supply	AGILENT	E3632A	MY50340053	N.C.R	N.C.R
Temp. / Humidity Chamber	TERCHY	MHK-120AK	X30109	2016-5-16	2017-5-15

977 Chamber					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Data	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY44020154	2016-9-10	2017-9-9
EMI Test Receiver	R&S	ESCI	101378	2017-1-5	2018-1-4
Spectrum Analyzer	RS	FSU26	200789	2016-1-21	2017-7-20
universal Radio communication tester	R&S	CMU200	109525	2017-1-5	2018-1-4
Pre-Amplifier	MINI	ZFL-1000VH2	070306	2017-1-5	2018-1-4
Pre-Amplifier	Miteq	JS41-00101800-32-10P	1675713	2016-1-21	2017-7-20
Bilog Antenna	Sunol	JB1	A062604	2016-5-29	2017-5-28
Bilog Antenna	Sunol	JB1	A110204-1	2016-5-29	2017-5-28
Loop Antenna	SCHWARZBECK	HXYZ9170	9170-108	2017-3-4	2018-3-3
Horn-antenna	SCHWARZBECK	9120D	266	2017-2-28	2018-2-27
Horn-antenna	SCHWARZBECK	9120D	267	2016-11-10	2017-11-9
Turn Table	CT	CT123	4165	N.C.R	N.C.R
Antenna Tower	CT	CTERG23	3256	N.C.R	N.C.R
Controller	CT	CT100	95637	N.C.R	N.C.R
Test Software			EZ-EMC		

Conducted Emission					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
EMI TEST RECEIVER	R&S	ESCI	100781	2017-2-28	2018-2-27
universal Radio communication tester	R&S	CMU200	109525	2017-1-5	2018-1-4
V (V-LISN)	SCHWARZBECK	NNLK 8129	8129-143	2016-11-1	2017-10-31
LISN (EUT)	FCC	FCC-LISN-50/250-50-2-02	20625	2016-9-10	2017-9-9
Pulse LIMITER	R&S	ESH3-Z2	100524	2017-1-5	2018-1-4
Test Software			EZ-EMC		

Remark: Each piece of equipment is scheduled for calibration once a year.

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency		Uncertainty
Conducted emissions	0.15MHz~30MHz		± 3.43 dB
Measurement	Polarity	Frequency	Uncertainty
Radiated emissions (below 1GHz)	H	30MHz ~ 200MHz	+/- 4.72dB
		200MHz ~1000MHz	+/- 4.72dB
	V	30MHz ~ 200MHz	+/- 4.83dB
		200MHz ~1000MHz	+/- 4.70dB
Radiated emissions (above 1GHz)	H	1000MHz ~5000MHz	+/- 3.94dB
		5000MHz ~6000MHz	+/- 3.94dB
	V	1000MHz ~5000MHz	+/- 3.94dB
		5000MHz ~6000MHz	+/- 3.94dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

5 FACILITIES AND ACCREDITATIONS

5.1. FACILITIES

☒ No.10Weiye Rd, Innovation park, Eco&Tec, Development Zone, Kunshan City, Jiangsu, China.

The sites are constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 22.

5.2. EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

5.3. TABLE OF ACCREDITATIONS AND LISTINGS

The test facilities used to perform radiated and conducted emissions tests are accredited by American Association for Laboratory Accreditation Program for the specific scope accreditation under Lab Code: 200581-0 to perform Electromagnetic Interference tests according to FCC Part 15 and CISPR 22 requirements. In addition, the test facilities are listed with USA, Certification and Engineering Bureau, 424105 for 10m chamber, 238958 for 3m chamber.

6 SETUP OF EQUIPMENT UNDER TEST

6.1. SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix I for the actual connections between EUT and support equipment.

6.2. SUPPORT EQUIPMENT

No.	Device Type	Brand	Model	FCC ID	Series No.	Data Cable	Power Cord
N/A							

Remark:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

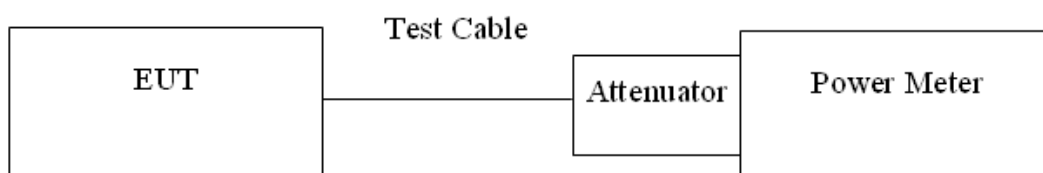
7 FCC PART 22 & 24 REQUIREMENTS

7.1. PEAK POWER

LIMIT

According to FCC §2.1046.

Test Configuration



Remark: Measurement setup for testing on Antenna connector

TEST 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.

TEST RESULTS

No non-compliance noted.

Test Data

Test Mode	CH	Frequency (MHz)	Peak Power (dBm)
WCDMA (BAND II)	9262	1852.4	26.19
	9400	1880.0	26.26
	9538	1907.6	26.43
HSDPA (BAND II)	9262	1852.4	26.29
	9400	1880.0	26.73
	9538	1907.6	26.61

Test Mode	CH	Frequency (MHz)	Peak Power (dBm)
WCDMA (BAND V)	4132	826.40	26.33
	4182	836.40	26.16
	4233	846.60	26.14
HSDPA (BAND V)	4132	826.40	26.74
	4182	836.40	26.57
	4233	846.60	26.39

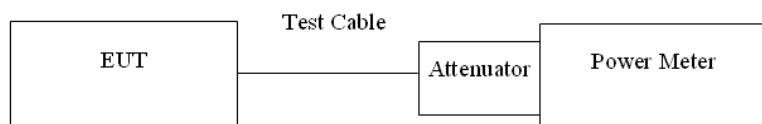
Remark: The value of factor includes both the loss of cable and external attenuator

7.2. AVERAGE POWER

LIMIT

For reporting purposes only.

TEST CONFIGURATION



Remark: Measurement setup for testing on Antenna connector

TEST 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.

TEST RESULTS

No non-compliance noted.

Test Data

Test Mode	CH	Frequency (MHz)	Average Power (dBm)
WCDMA (BAND II)	9262	1852.4	23.24
	9400	1880.0	23.09
	9538	1907.6	23.41
HSDPA (BAND II)	9262	1852.4	22.82
	9400	1880.0	22.66
	9538	1907.6	22.59

Test Mode	CH	Frequency (MHz)	Average Power (dBm)
WCDMA (BAND V)	4132	826.40	22.95
	4182	836.40	22.99
	4233	846.60	23.15
HSDPA (BAND V)	4132	826.40	22.42
	4182	836.40	22.36
	4233	846.60	22.30

Remark: The value of factor includes both the loss of cable and external attenuator

7.3. ERP & EIRP MEASUREMENT

LIMIT

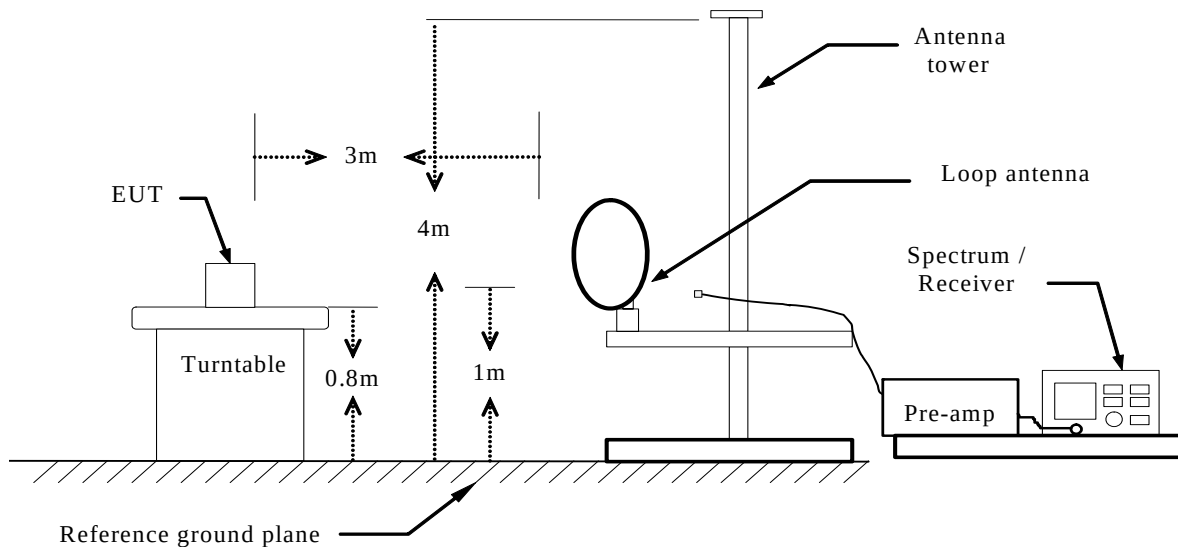
According to FCC §2.1046

FCC 22.913(a): The Effective Radiated Power (ERP) of mobile transmitters must not exceed 7 Watts.

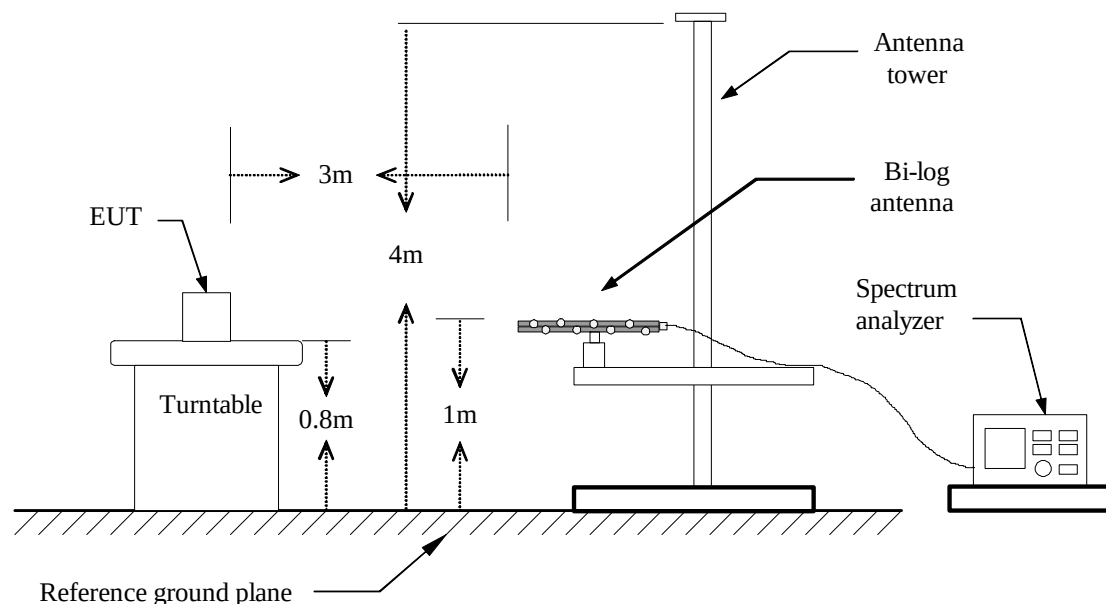
FCC 24.232(b): The equivalent Isotropic Radiated Power (EIRP) must not exceed 2 Watts.

TEST CONFIGURATION

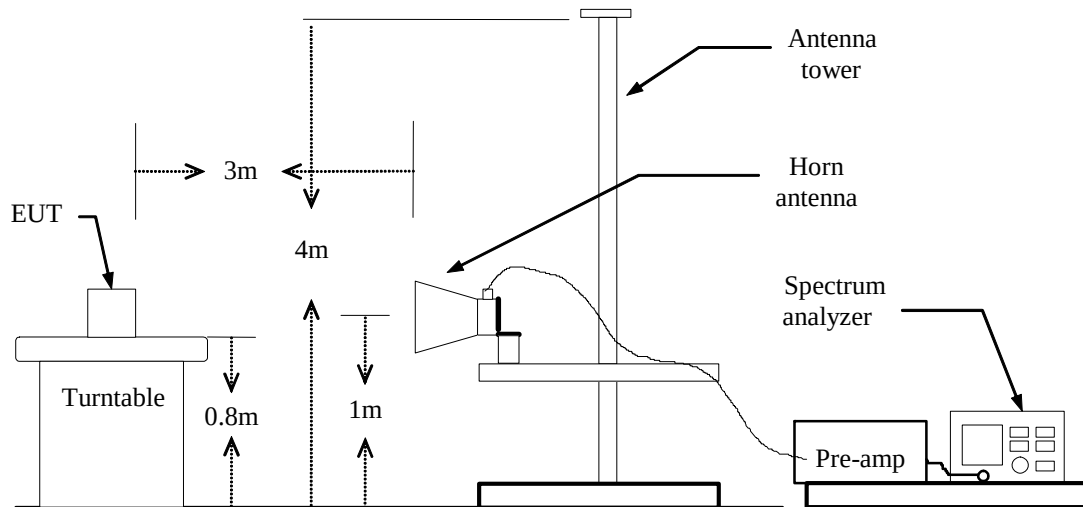
Below 30MHz



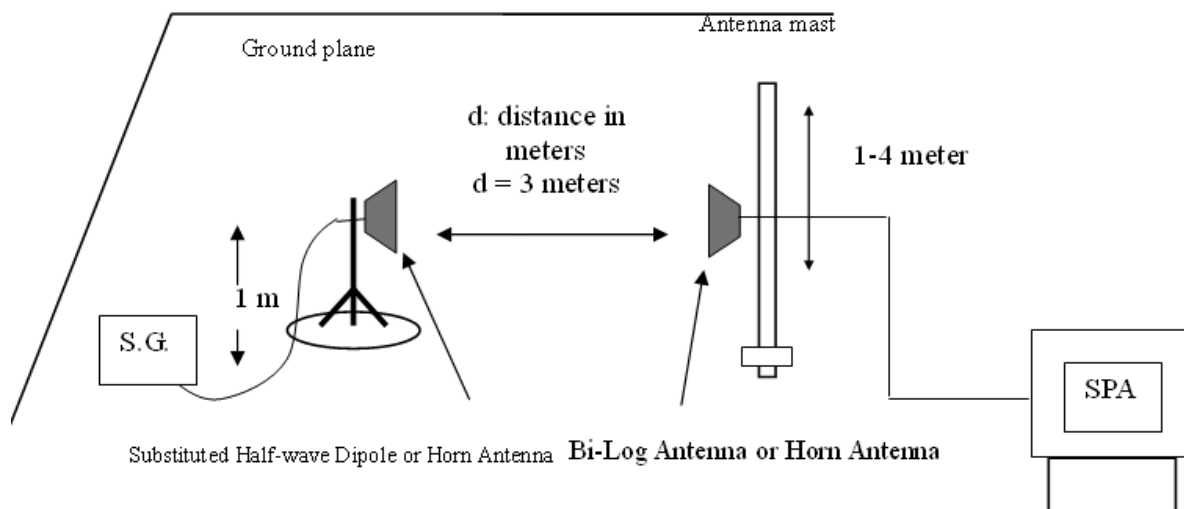
Below 1 GHz



Above 1 GHz



FOR SUBSTITUTED METHOD TEST SET-UP



TEST 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 of the EUT, the resolution bandwidth was set to 3MHz and the average bandwidth was set to 3MHz. The highest emission was recorded with the rotation of the turntable and the lowering of the test antenna. The reading was recorded and the field strength (E in dBuV/m) was calculated.

ERP in frequency band 824-849MHz, and EIRP in frequency band 1851.25 –1910MHz were measured using a substitution method. The EUT was replaced by half-wave dipole (824-849MHz) or horn antenna (1851.25-1910MHz) connected to a signal generator. The spectrum analyzer reading was recorded and ERP/EIRP was calculated as follows:

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

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

TEST RESULTS

No non-compliance noted.

WCDMA BAND II TEST DATA

Mode	Channel	Antenna Pol.	EIRP	Limit(dBm)	Result
WCDMA (BAND II)	9262	V	25.59	33.0	PASS
		H	23.96		
	9400	V	25.66		
		H	24.21		
	9538	V	25.74		
		H	23.65		
HSDPA (BAND II)	9262	V	24.79	33.0	PASS
		H	23.41		
	9400	V	25.32		
		H	23.82		
	9538	V	25.18		
		H	23.45		

WCDMA BAND V TEST DATA

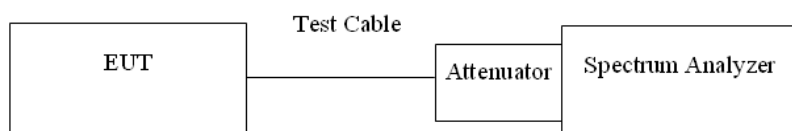
Mode	Channel	Antenna Pol.	ERP	Limit(dBm)	Result
WCDMA (BAND V)	4132	V	25.23	38.5	PASS
		H	22.95		
	4182	V	25.41		
		H	23.06		
	4233	V	25.73		
		H	23.29		
HSDPA (BAND V)	4132	V	24.88	38.5	PASS
		H	22.12		
	4182	V	24.76		
		H	22.44		
	4233	V	25.37		
		H	23.18		

7.4. OCCUPIED BANDWIDTH MEASUREMENT

LIMIT

According to §FCC 2.1049.

TEST CONFIGURATION



Remark: Measurement setup for testing on Antenna connector

TEST PROCEDURE

The EUT's output RF connector was connected with a short cable to the spectrum analyzer, RBW was set to about 1% of emission BW, VBW is set to 3 times the RBW, -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.

TEST RESULTS

No non-compliance noted

Test Data

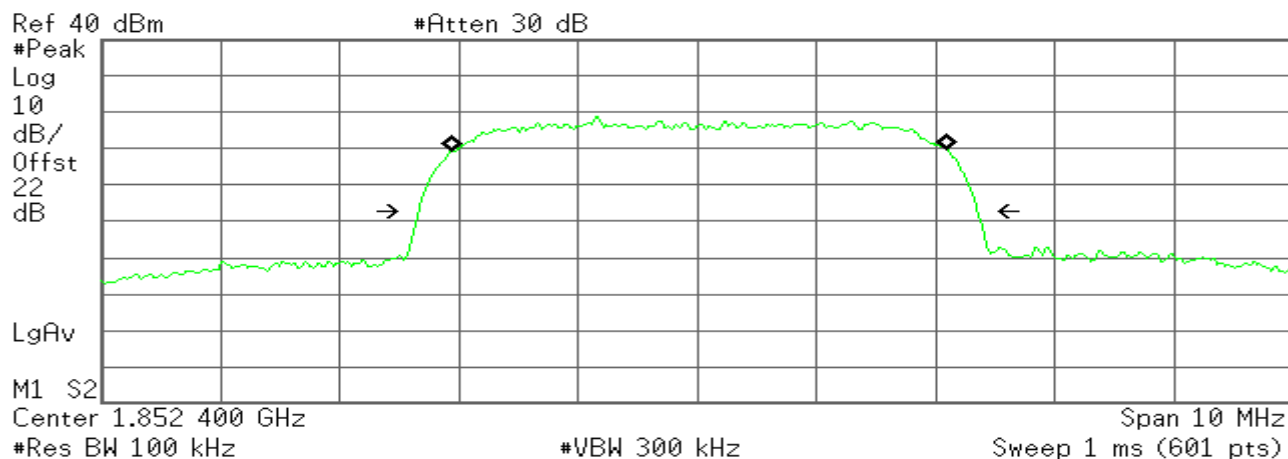
Test Mode	CH	Frequency (MHz)	99% Bandwidth (MHz)	26dB Bandwidth MHz
WCDMA (Band II)	9262	1852.4	4.181	4.703
	9400	1880.0	4.162	4.673
	9538	1907.6	4.160	4.713
HSDPA (BAND II)	9262	1852.4	4.185	4.721
	9400	1880.0	4.172	4.709
	9538	1907.6	4.163	4.708

Test Mode	CH	Frequency (MHz)	99% Bandwidth (MHz)	26dB Bandwidth MHz
WCDMA (Band V)	4132	826.40	4.162	4.704
	4182	836.40	4.183	4.706
	4233	846.60	4.166	4.668
HSDPA (BAND V)	4132	826.40	4.154	4.684
	4182	836.40	4.174	4.715
	4233	846.60	4.145	4.669

Test Plot**WCDMA Band II (CH Low)**

Agilent

R T



Occupied Bandwidth
4.1810 MHz

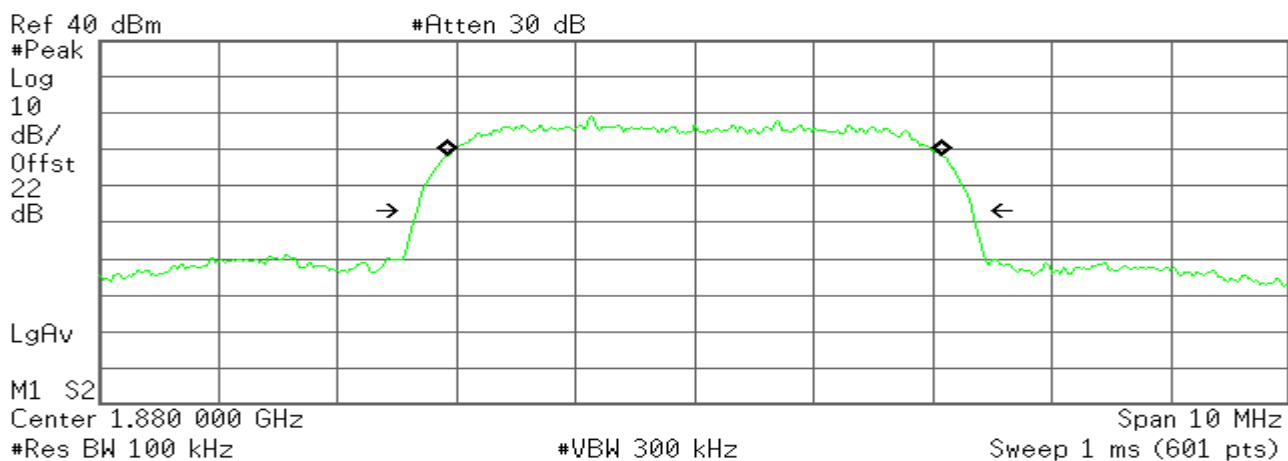
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 16.961 kHz
x dB Bandwidth 4.703 MHz

WCDMA Band II (CH Mid)

Agilent

R T



Occupied Bandwidth
4.1624 MHz

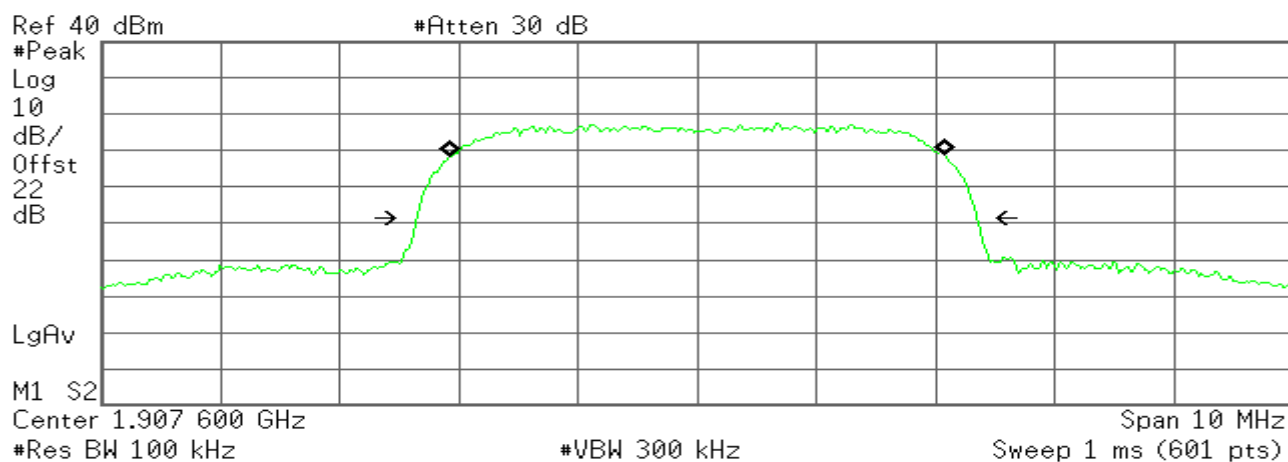
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -3.376 kHz
x dB Bandwidth 4.673 MHz

WCDMA Band II (CH High)

Agilent

R T



Occupied Bandwidth
4.1601 MHz

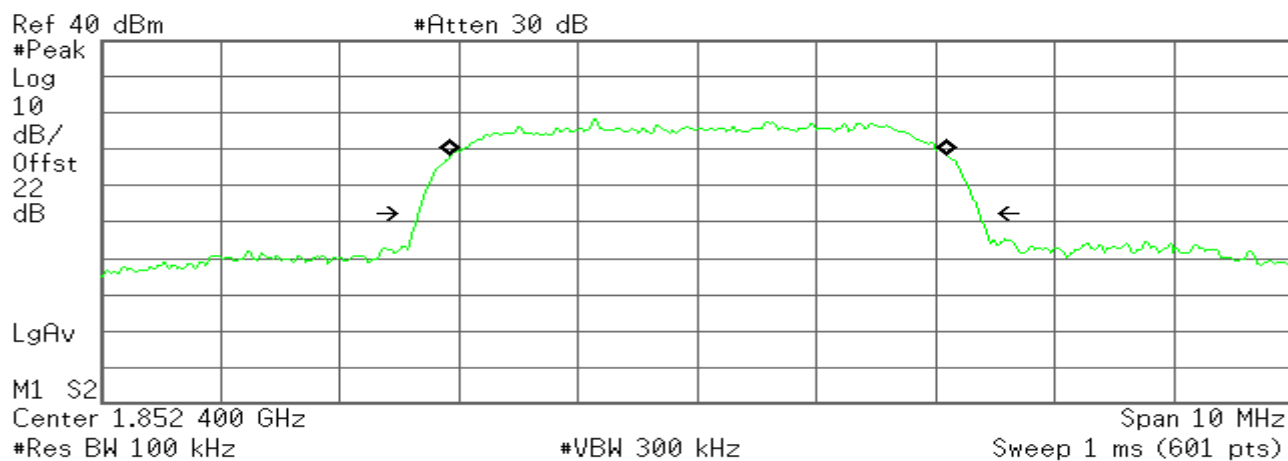
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 419.761 Hz
x dB Bandwidth 4.713 MHz

HSDPA Band II (CH Low)

Agilent

R T



Occupied Bandwidth
4.1848 MHz

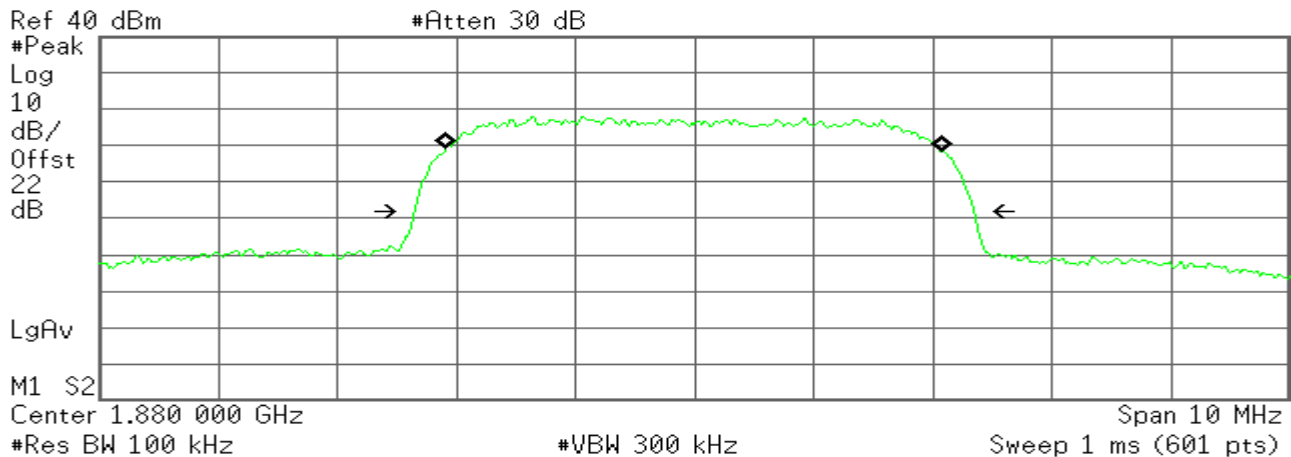
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 15.518 kHz
x dB Bandwidth 4.721 MHz

HSDPA Band II (CH Mid)

Agilent

R T



Occupied Bandwidth
4.1715 MHz

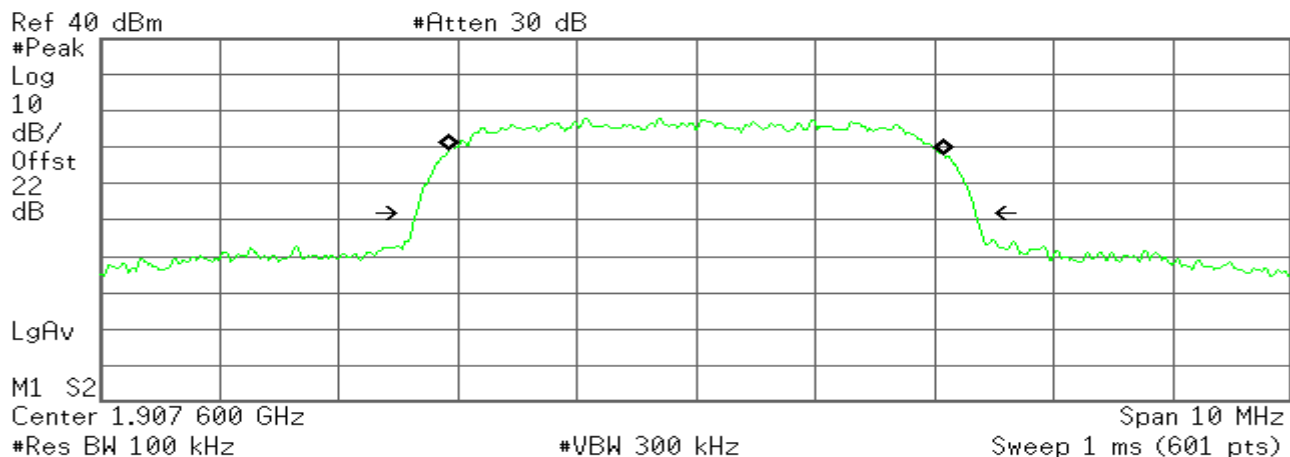
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -10.414 kHz
x dB Bandwidth 4.709 MHz

HSDPA Band II (CH High)

Agilent

R T



Occupied Bandwidth
4.1625 MHz

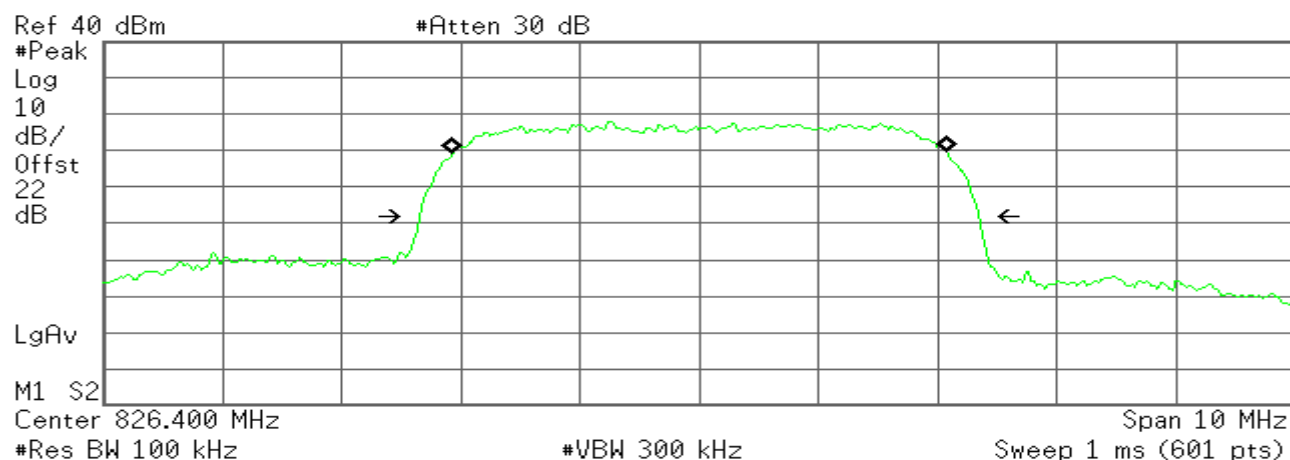
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -4.982 kHz
x dB Bandwidth 4.708 MHz

WCDMA Band V (CH Low)

Agilent

R T

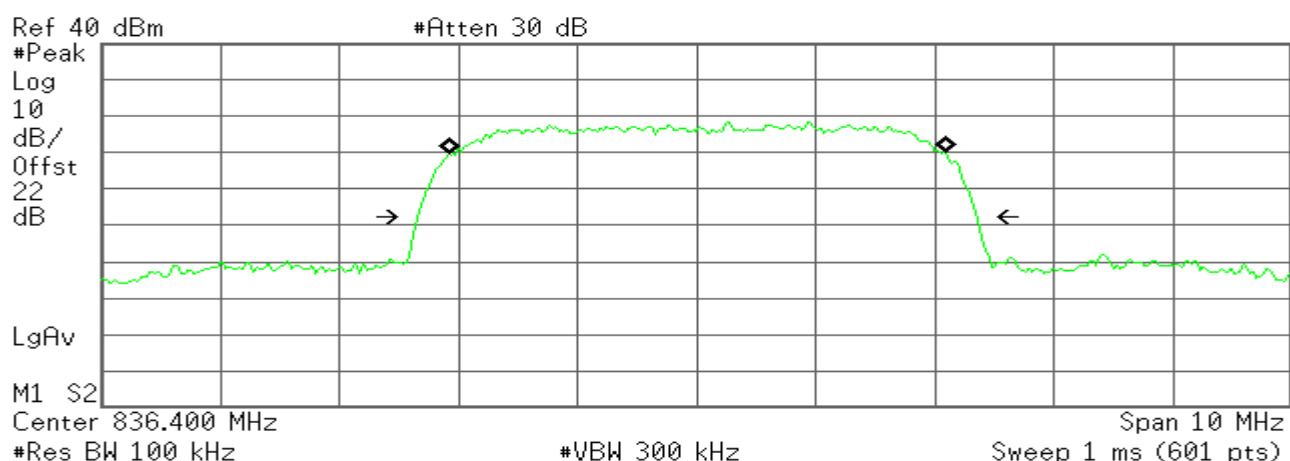


Transmit Freq Error 1.766 kHz
x dB Bandwidth 4.704 MHz

WCDMA Band V (CH Mid)

Agilent

R T

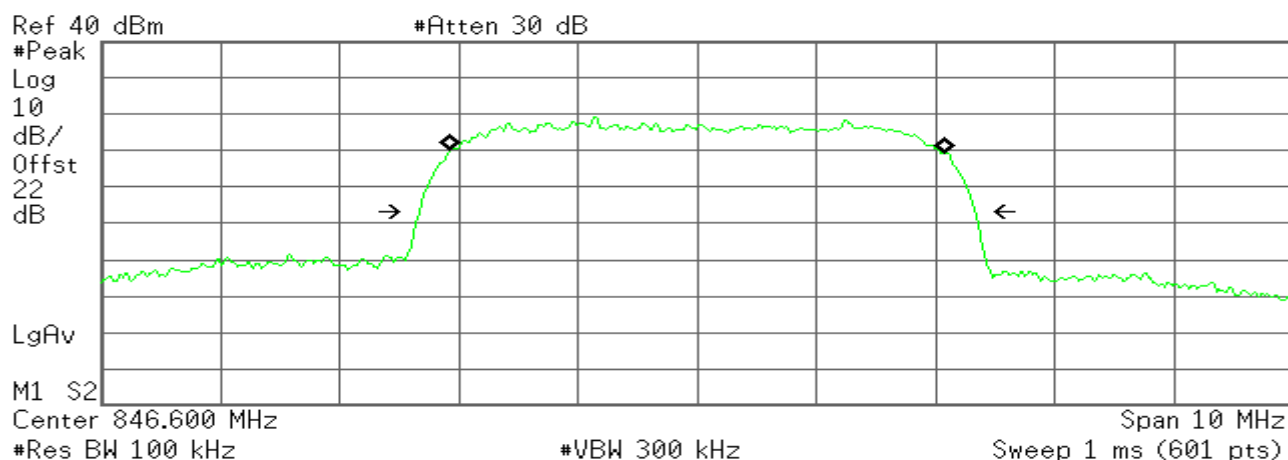


Transmit Freq Error 7.628 kHz
x dB Bandwidth 4.706 MHz

WCDMA Band V (CH High)

Agilent

R T



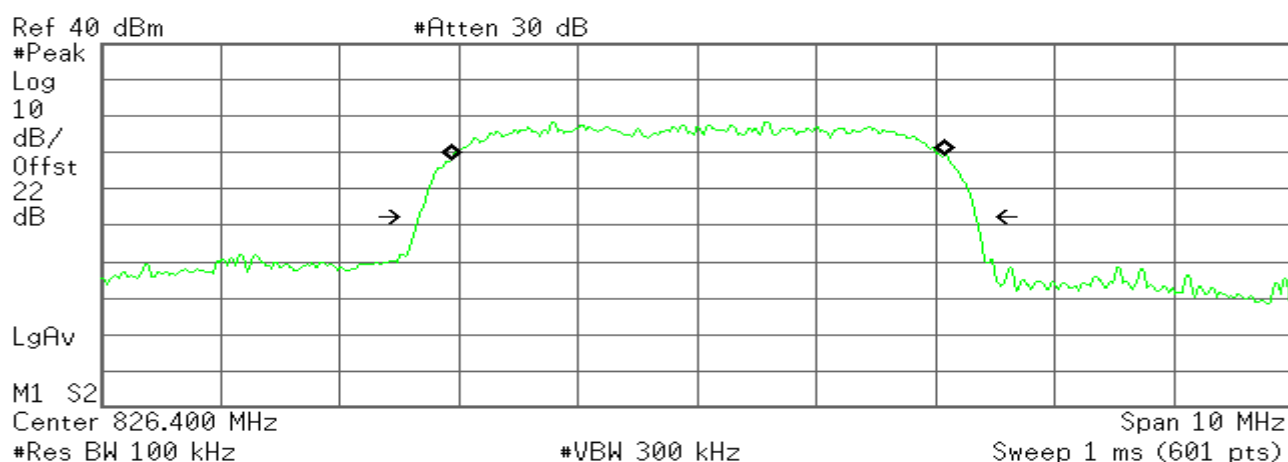
Transmit Freq Error -295.497 Hz

x dB Bandwidth 4.668 MHz

HSDPA Band V (CH Low)

Agilent

R T



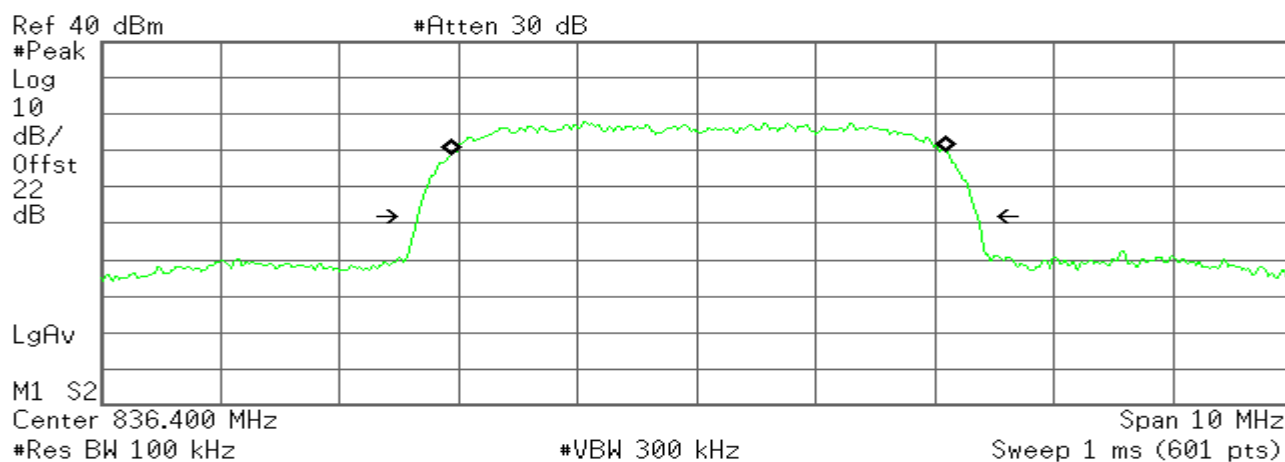
Transmit Freq Error 8.303 kHz

x dB Bandwidth 4.684 MHz

HSDPA Band V (CH Mid)

Agilent

R T



Occupied Bandwidth
4.1737 MHz

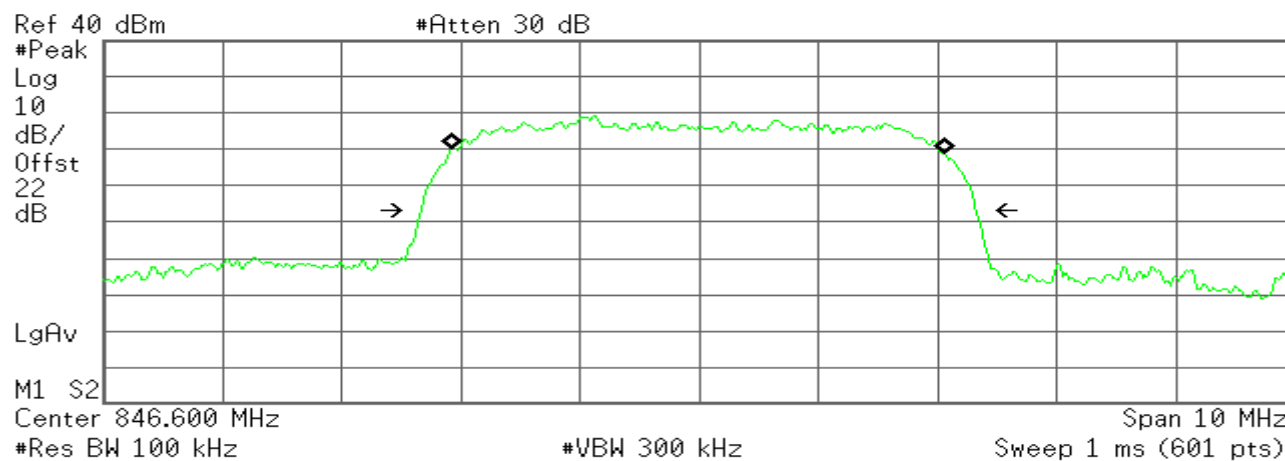
Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error 13.194 kHz
x dB Bandwidth 4.715 MHz

HSDPA Band V (CH High)

Agilent

R T



Occupied Bandwidth
4.1454 MHz

Occ BW % Pwr 99.00 %
x dB -26.00 dB

Transmit Freq Error -9.085 kHz
x dB Bandwidth 4.669 MHz

7.5. OUT OF BAND EMISSION AT ANTENNA TERMINALS

LIMIT

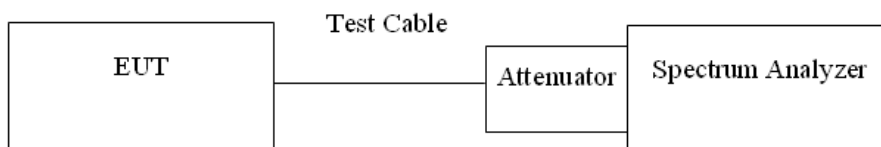
According to FCC §2.1051, FCC §22.917, FCC §24.238(a).

Out of Band Emissions: The mean power of emission must be attenuated below the mean power of the non-modulated carrier (P) on any frequency twice or more than twice the fundamental frequency by at least $43 + 10 \log P$ dB.

Mobile Emissions in Base Frequency Range: The mean power of any emissions appearing in the base station frequency range from cellular mobile transmitters operated must be attenuated to a level not exceed -80 dBm at the transmit antenna connector.

Band Edge Requirements: In the 1MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1% of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the Out of band Emission

TEST CONFIGURATION



TEST PROCEDURE

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

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

Band Edge Requirements (824 MHz and 849 MHz /1850MHz and 1910MHz): 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.

TEST RESULTS

No non-compliance noted.

Test Data

Mode	CH	Location	Description
WCDMA (Band II)	9262	Figure 1-1	Band Edge emissions
	9538	Figure 1-2	Band Edge emissions
Mode	CH	Location	Description
HSDPA (Band II)	9262	Figure 2-1	Band Edge emissions
	9538	Figure 2-2	Band Edge emissions
Mode	CH	Location	Description
WCDMA (Band V)	4132	Figure 3-1	Band Edge emissions
	4233	Figure 3-2	Band Edge emissions
Mode	CH	Location	Description
HSDPA (Band V)	4132	Figure 4-1	Band Edge emissions
	4233	Figure 4-2	Band Edge emissions
Mode	CH	Location	Description
WCDMA (Band II)	9262	Figure 5-1	Conducted spurious emissions, 30MHz - 20GHz
	9400	Figure 5-2	Conducted spurious emissions, 30MHz - 20GHz
	9538	Figure 5-3	Conducted spurious emissions, 30MHz - 20GHz
Mode	CH	Location	Description
HSDPA (Band II)	9262	Figure 6-1	Conducted spurious emissions, 30MHz - 20GHz
	9400	Figure 6-2	Conducted spurious emissions, 30MHz - 20GHz
	9538	Figure 6-3	Conducted spurious emissions, 30MHz - 20GHz
Mode	CH	Location	Description
WCDMA (Band V)	4132	Figure 7-1	Conducted spurious emissions, 30MHz - 9GHz
	4182	Figure 7-2	Conducted spurious emissions, 30MHz - 9GHz
	4233	Figure 7-3	Conducted spurious emissions, 30MHz - 9GHz
Mode	CH	Location	Description
HSDPA (Band V)	4132	Figure 8-1	Conducted spurious emissions, 30MHz - 9GHz
	4182	Figure 8-2	Conducted spurious emissions, 30MHz - 9GHz
	4233	Figure 8-3	Conducted spurious emissions, 30MHz - 9GHz

Test Plot

WCDMA Band II

Figure 1-1: Band Edge emissions –WCDMA CH Low

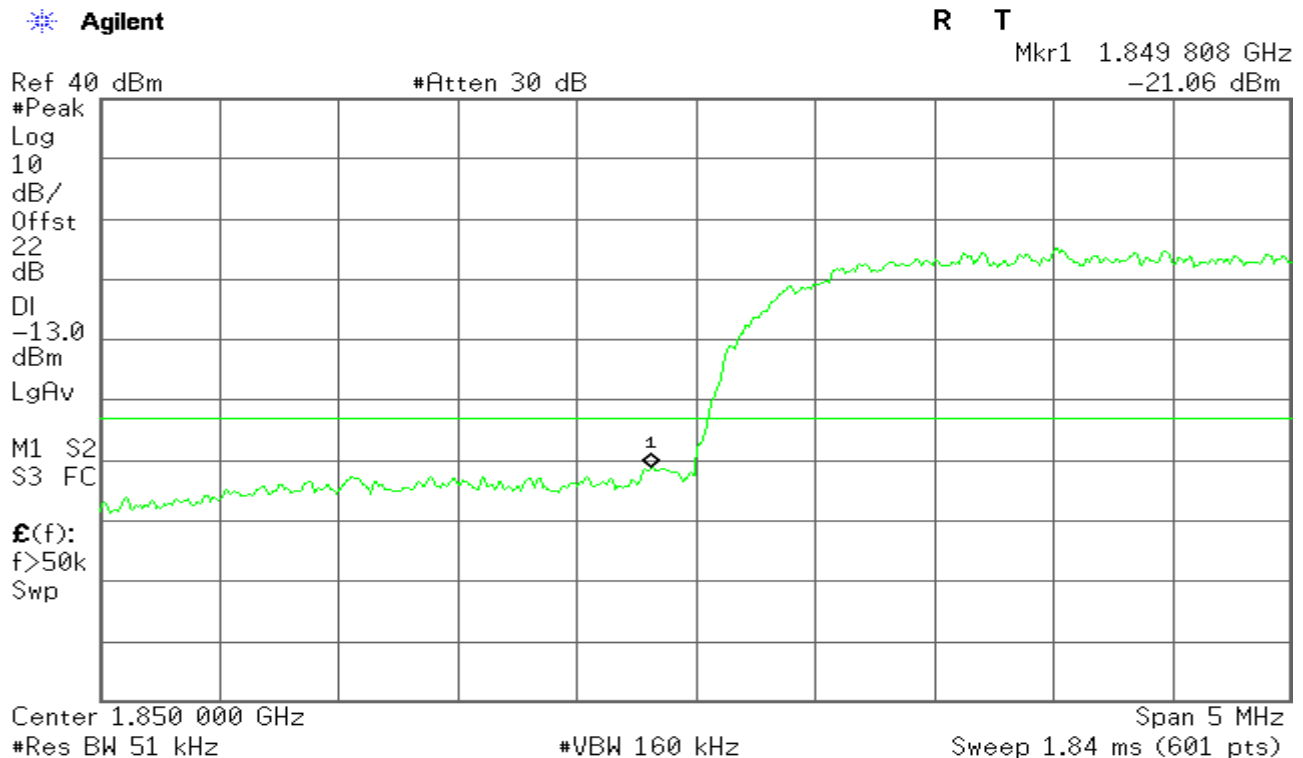
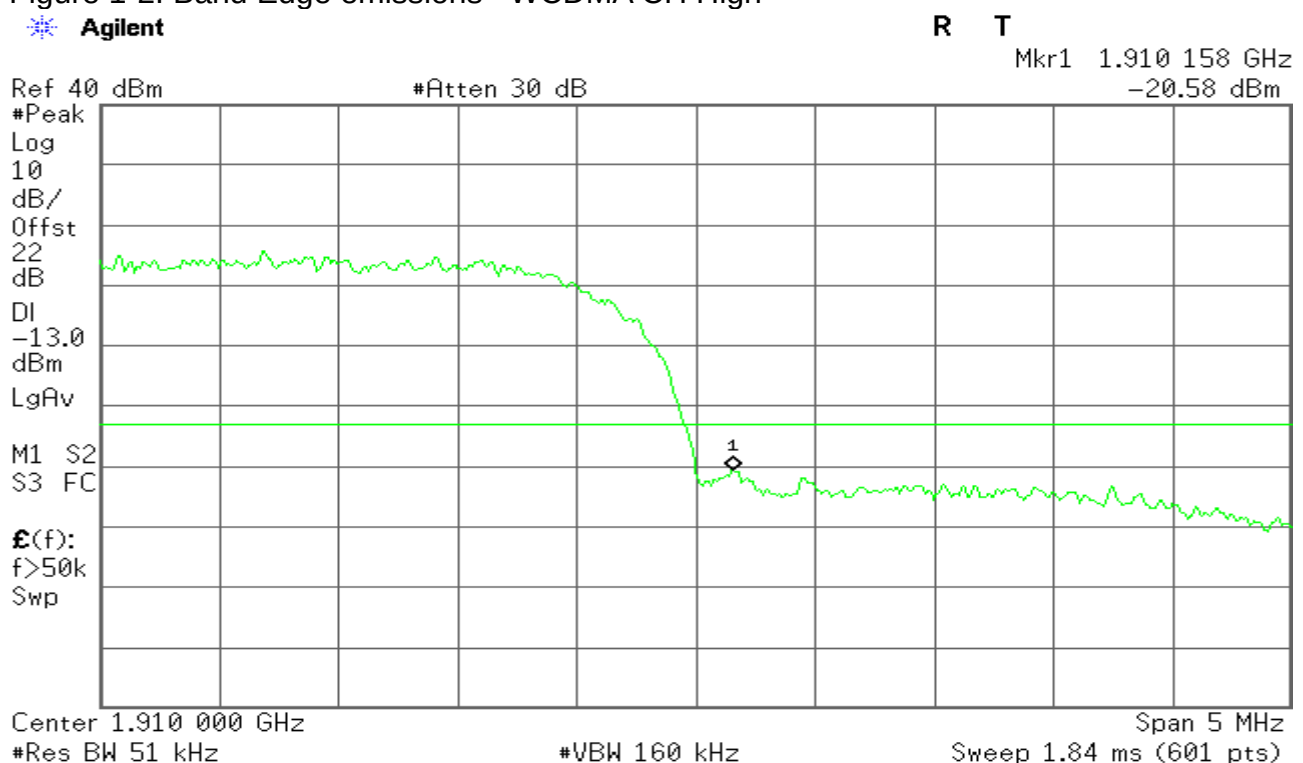


Figure 1-2: Band Edge emissions –WCDMA CH High



WCDMA Band HSDPA II

Figure 2-1: Band Edge emissions –HSDPA CH Low

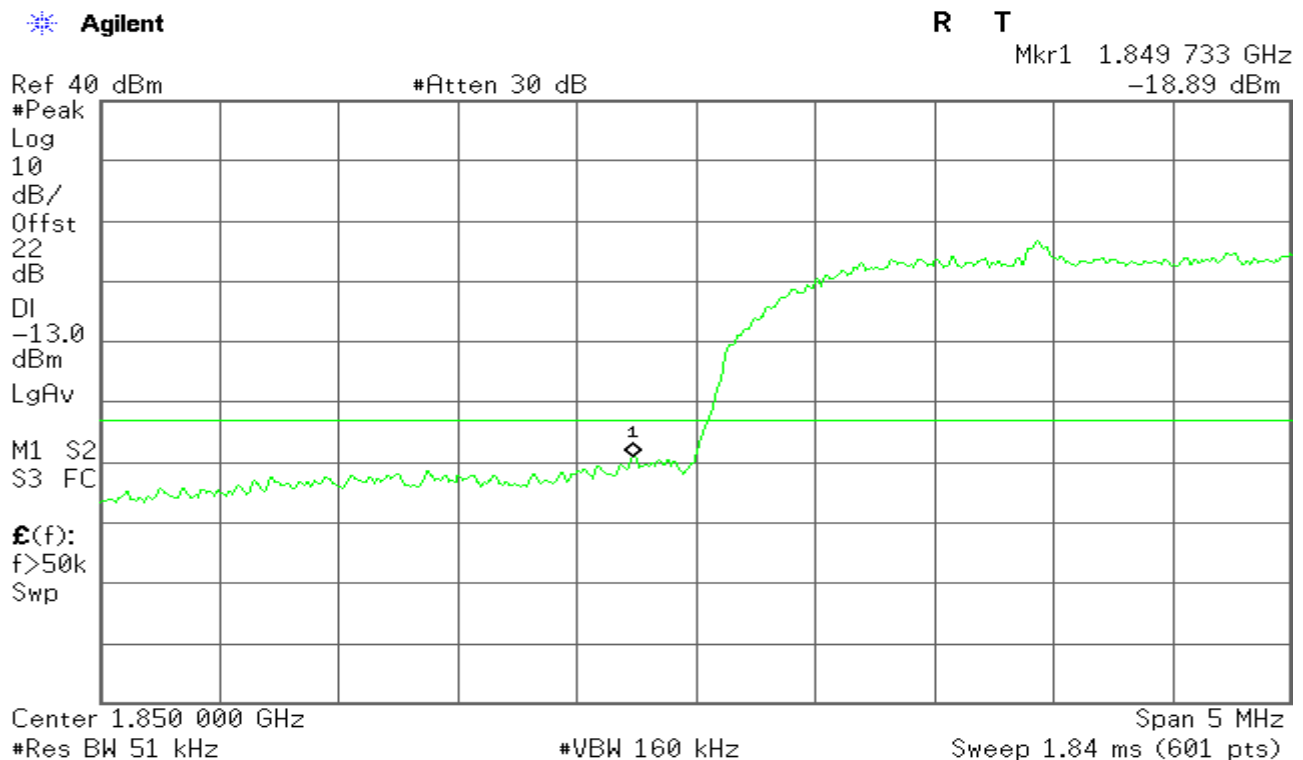
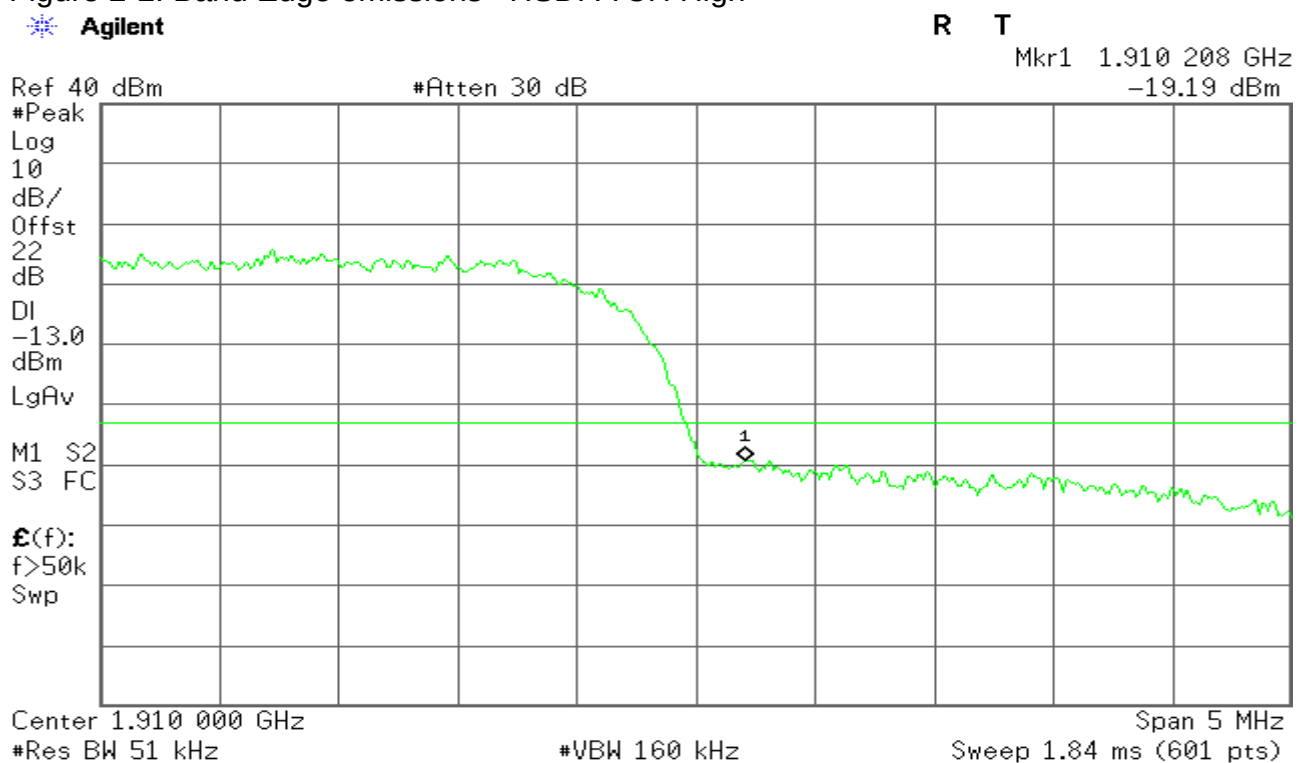


Figure 2-2: Band Edge emissions –HSDPA CH High



WCDMA Band V

Figure 3-1: Band Edge emissions –WCDMA CH Low

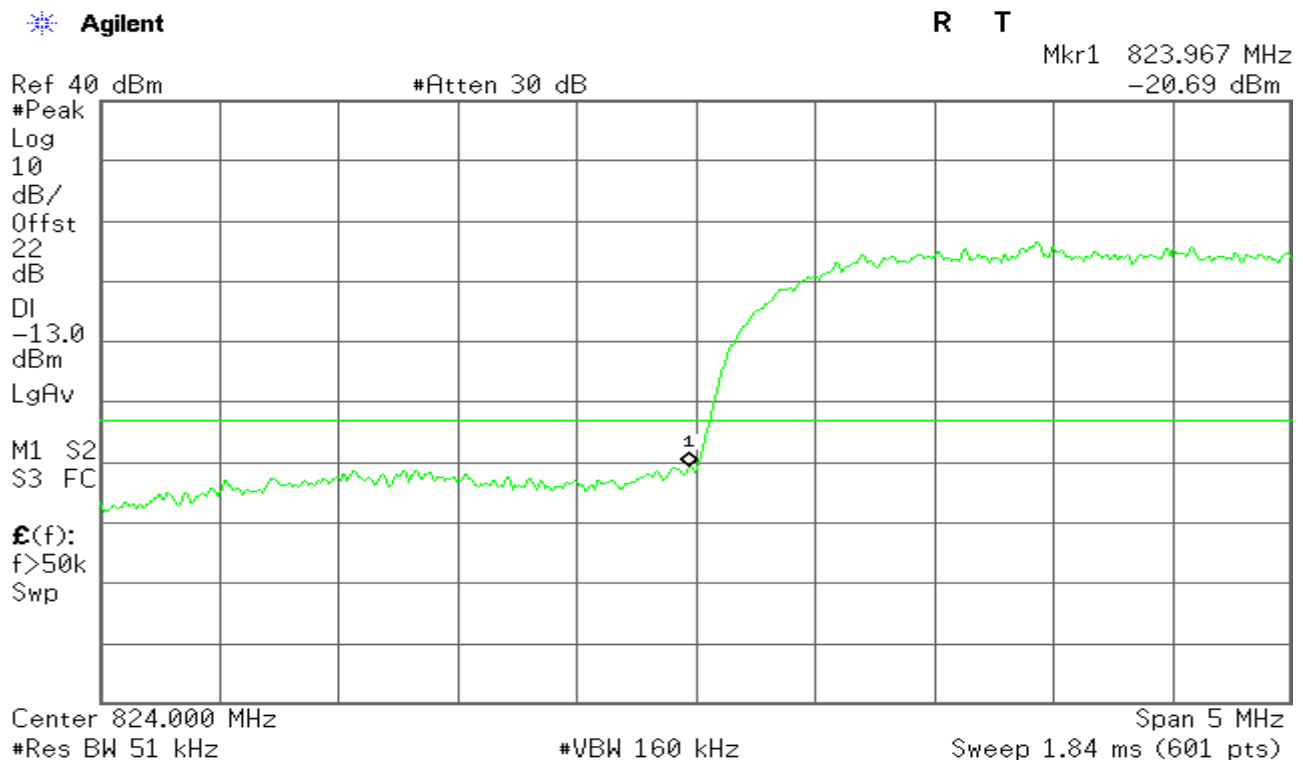
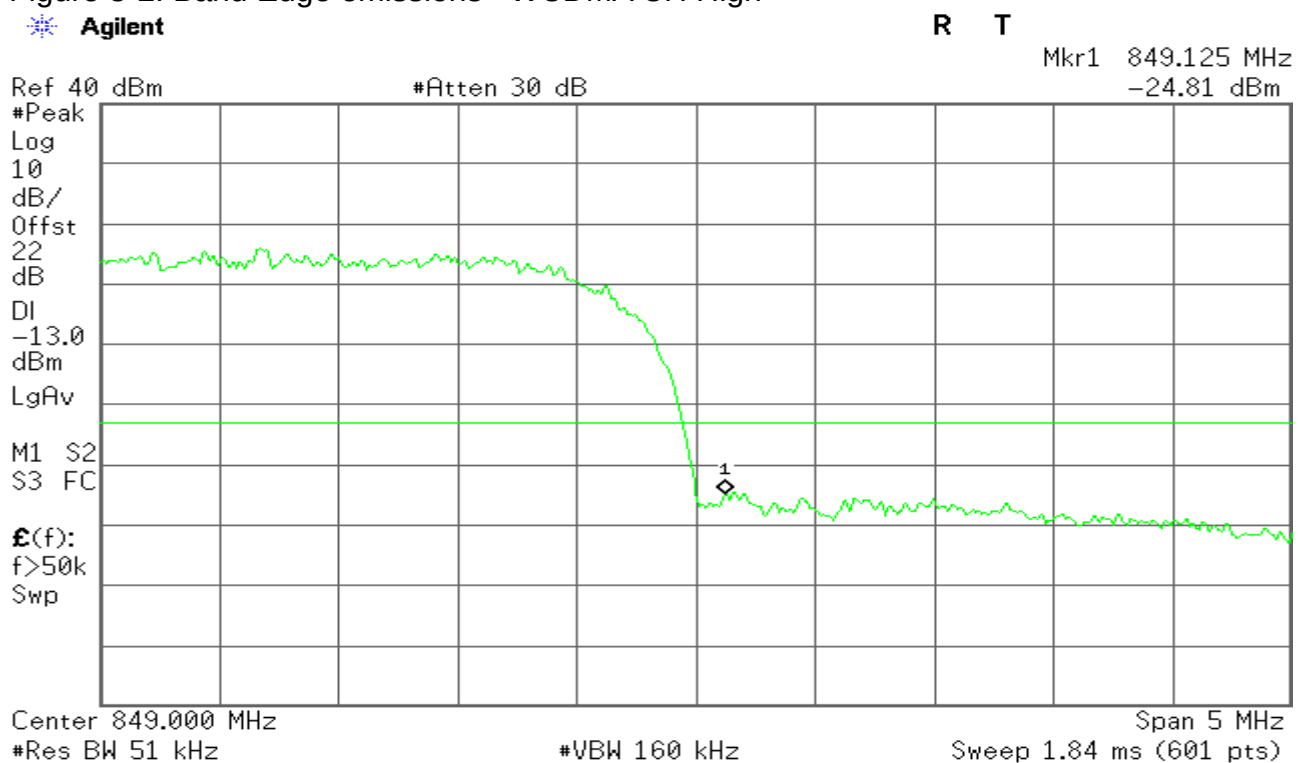


Figure 3-2: Band Edge emissions –WCDMA CH High



WCDMA Band V HSDPA

Figure 4-1: Band Edge emissions –HSDPA CH Low

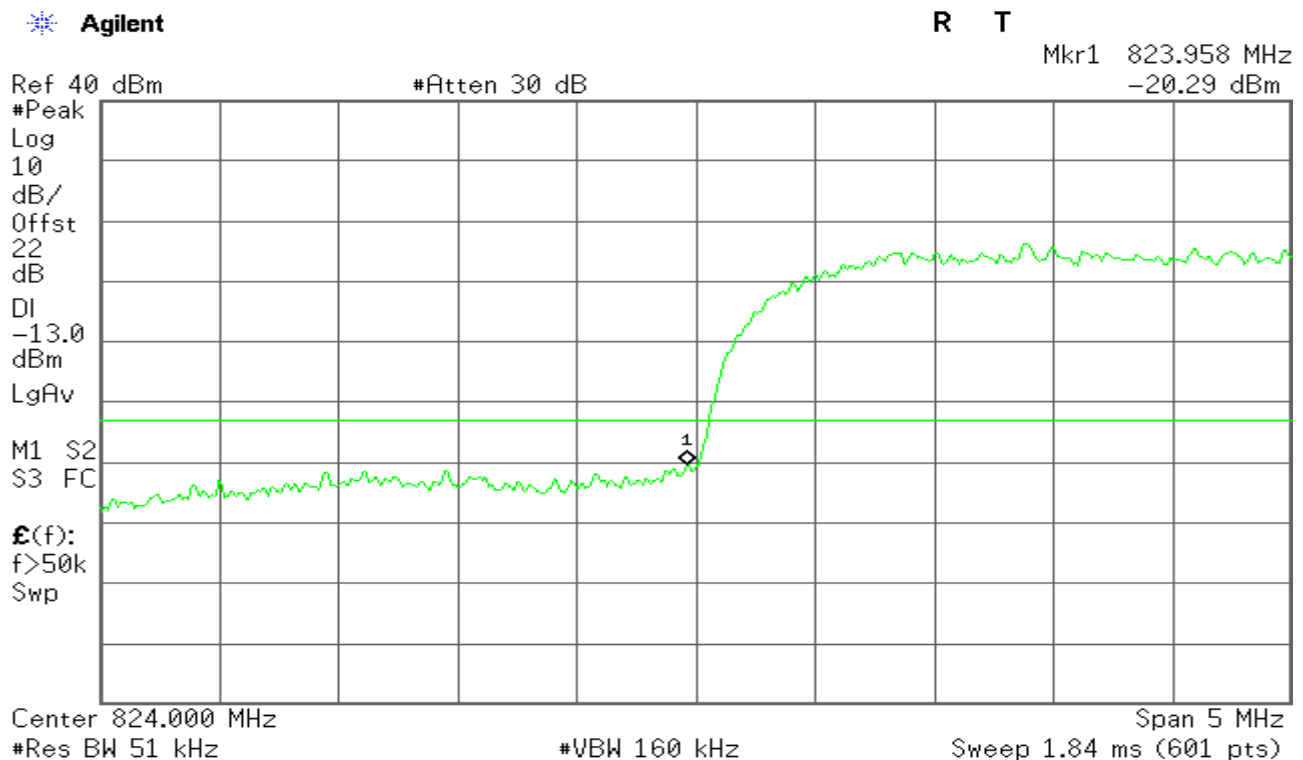
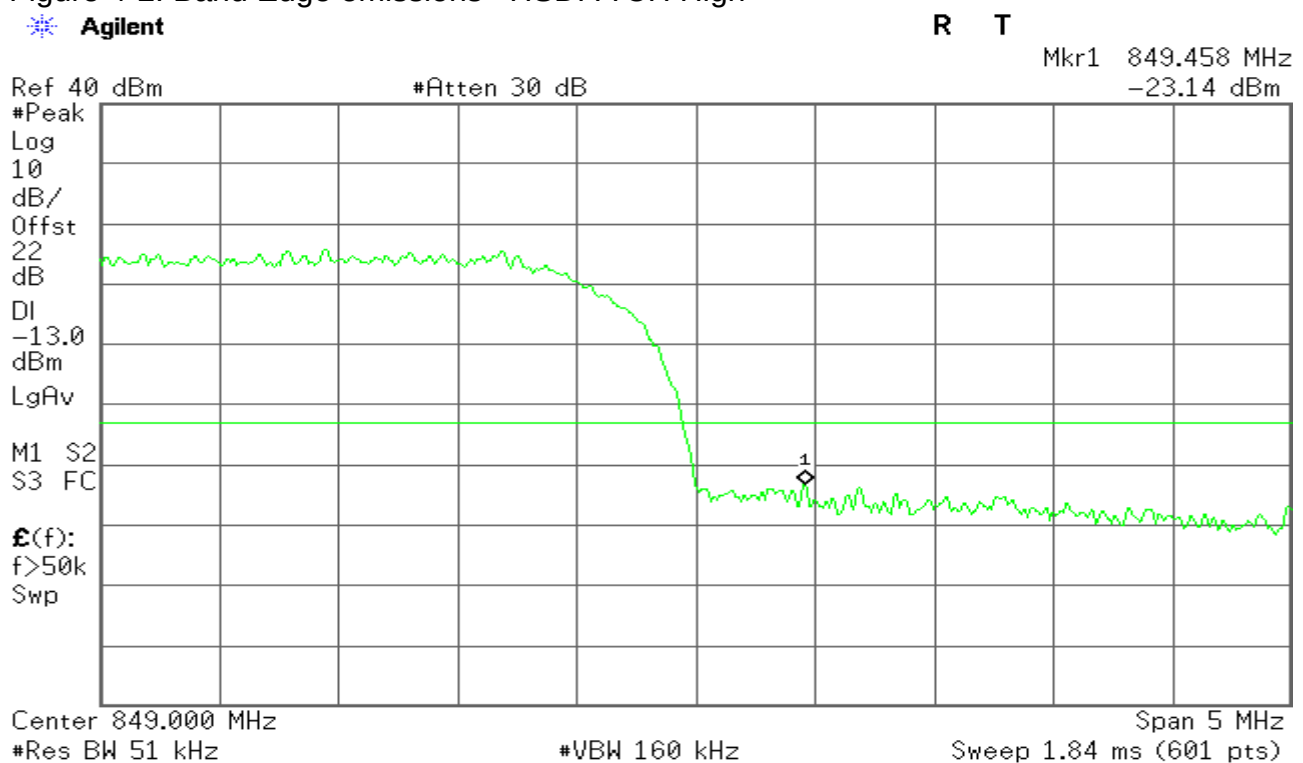


Figure 4-2: Band Edge emissions –HSDPA CH High



WCDMA Band II

Figure 5-1: Out of Band emission at antenna terminals – WCDMA CH Low

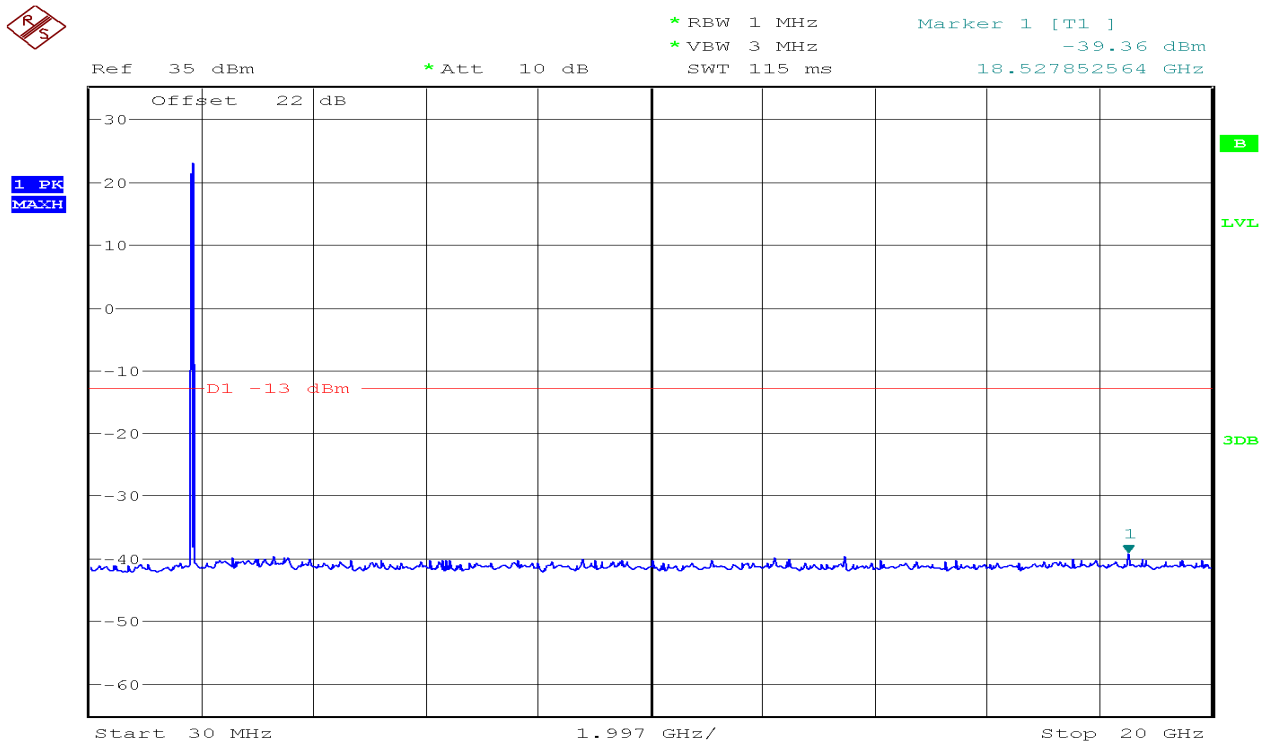


Figure 5-2: Out of Band emission at antenna terminals – WCDMA CH Mid

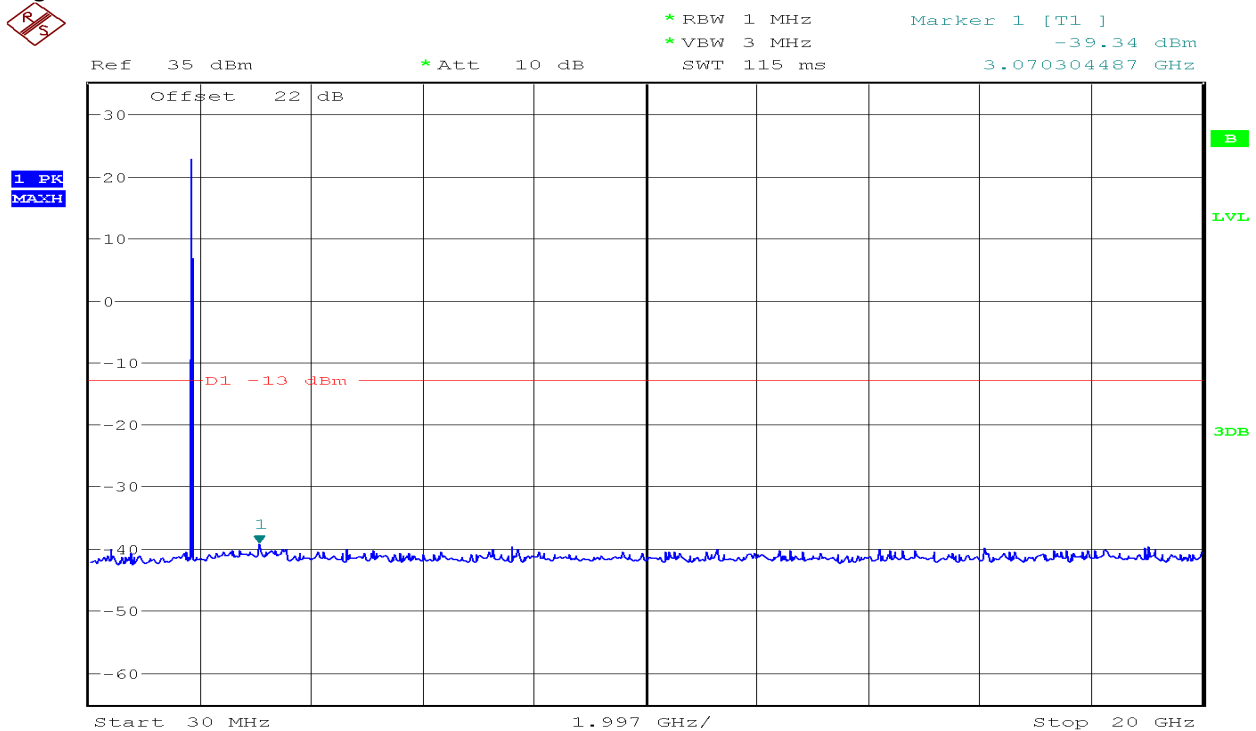
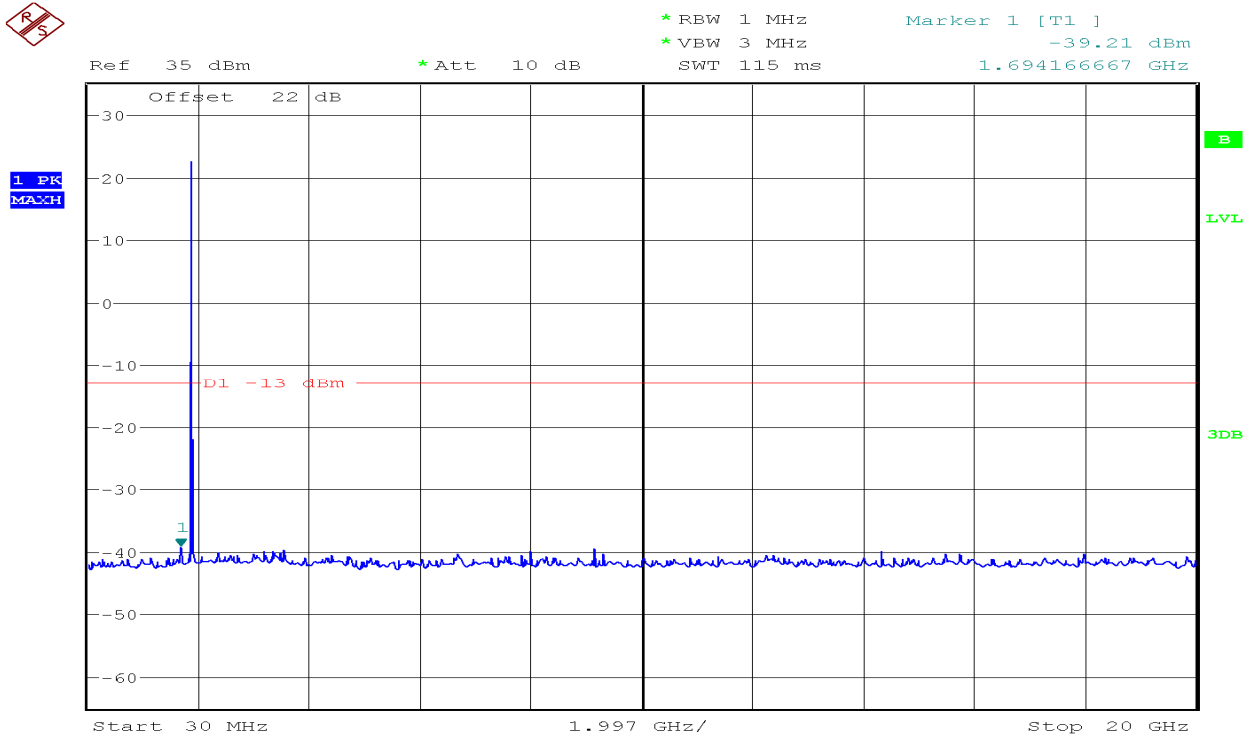


Figure 5-3: Out of Band emission at antenna terminals – WCDMA CH High



HSDPA Band II

Figure 6-1: Out of Band emission at antenna terminals – HSDPA CH Low

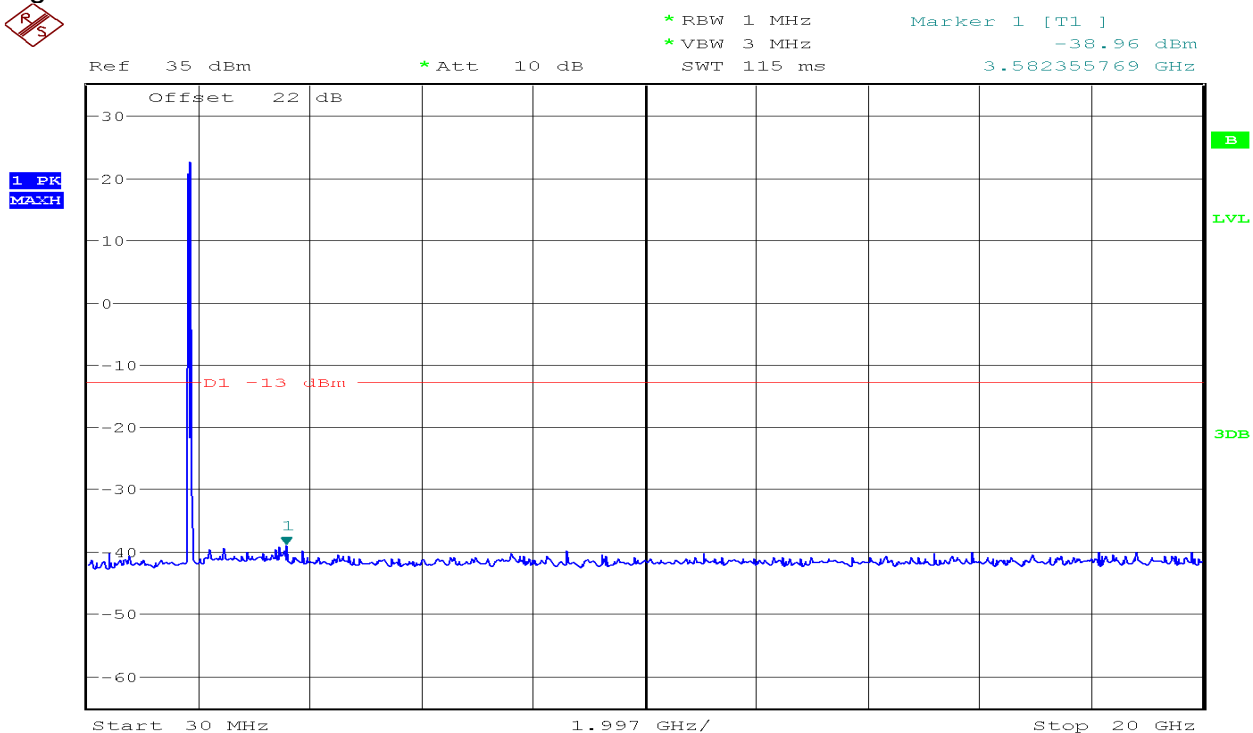


Figure 6-2: Out of Band emission at antenna terminals – HSDPA CH Mid

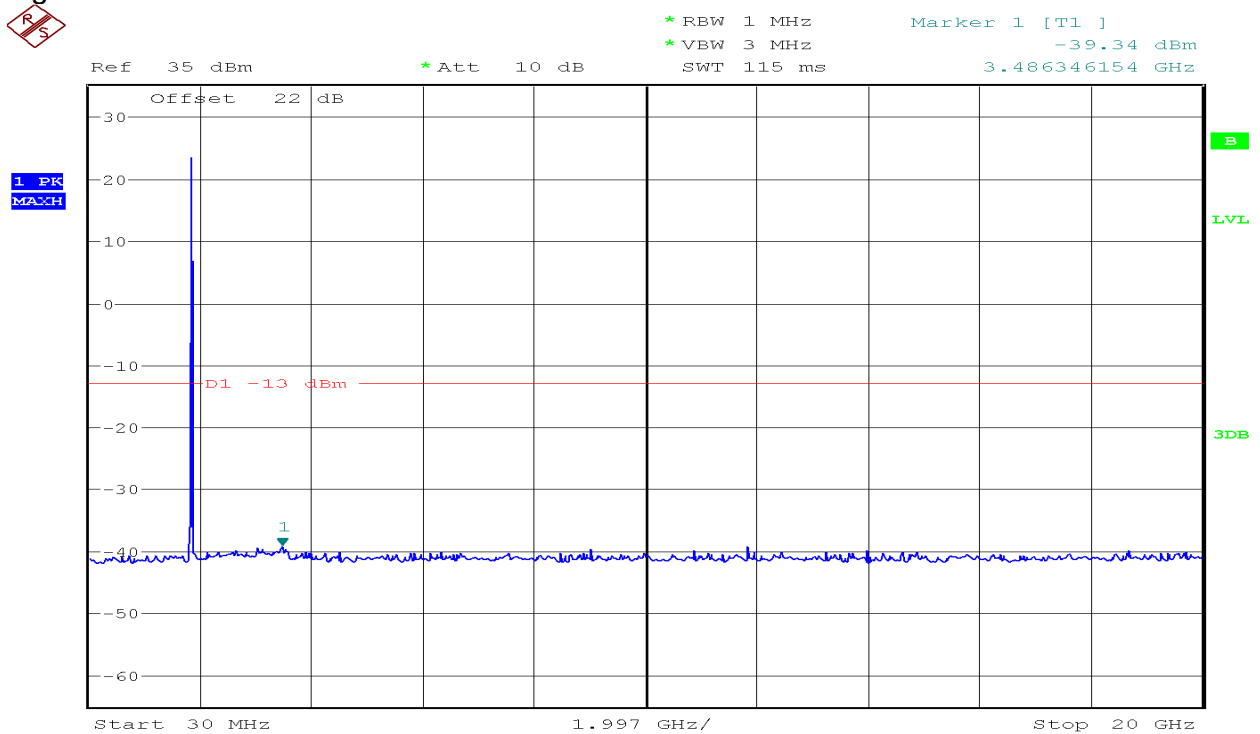
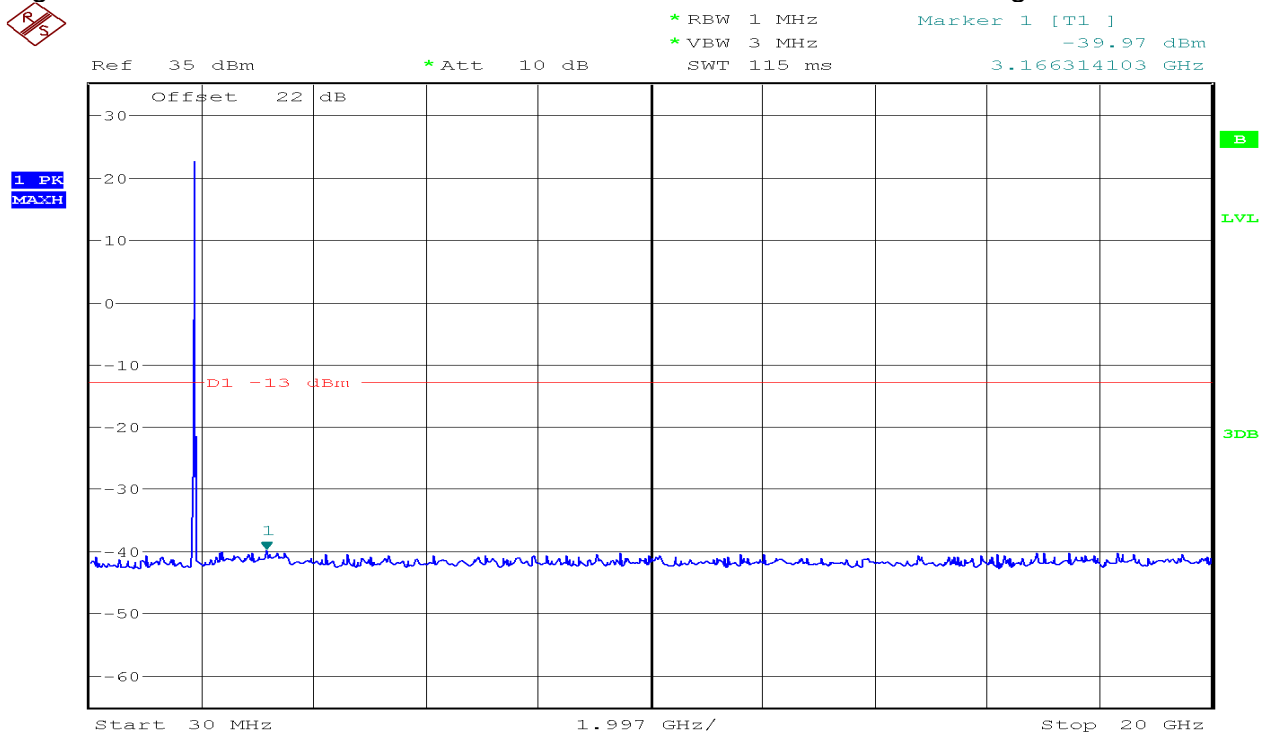


Figure 6-3: Out of Band emission at antenna terminals – HSDPA CH High



WCDMA Band V

Figure 7-1: Out of Band emission at antenna terminals – WCDMA CH Low

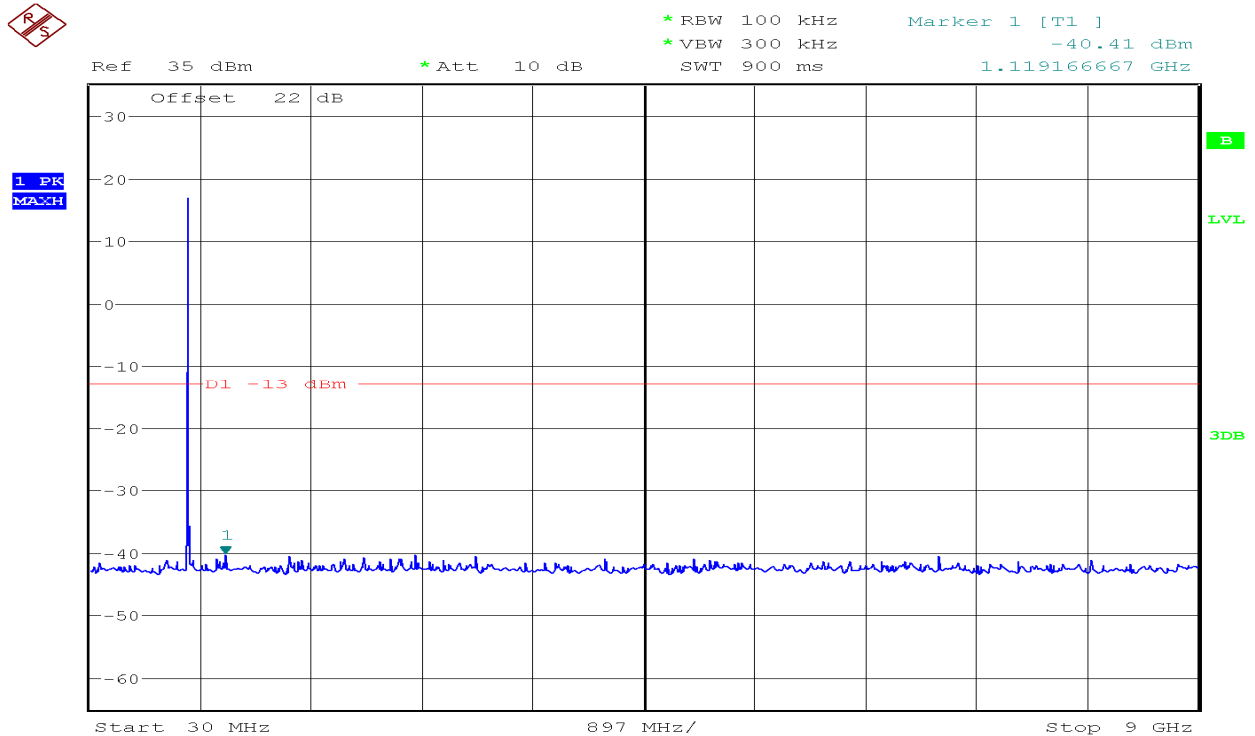


Figure 7-2: Out of Band emission at antenna terminals – WCDMA CH Mid

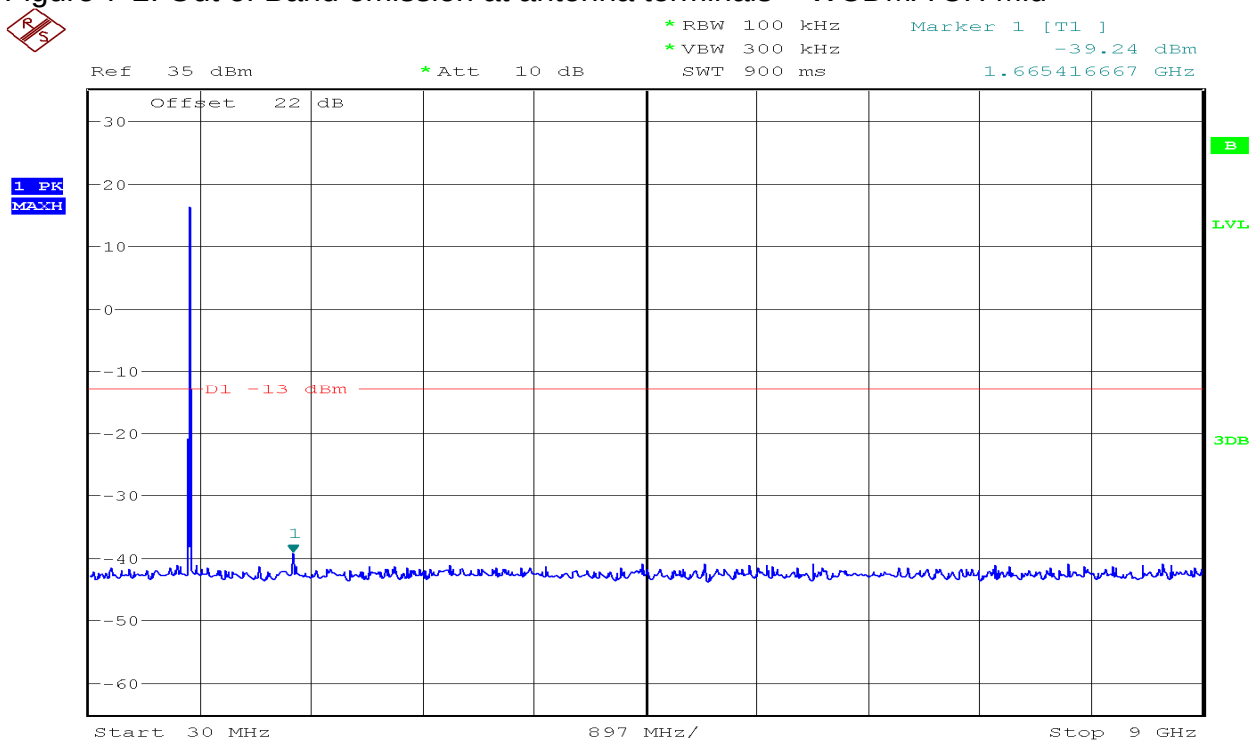
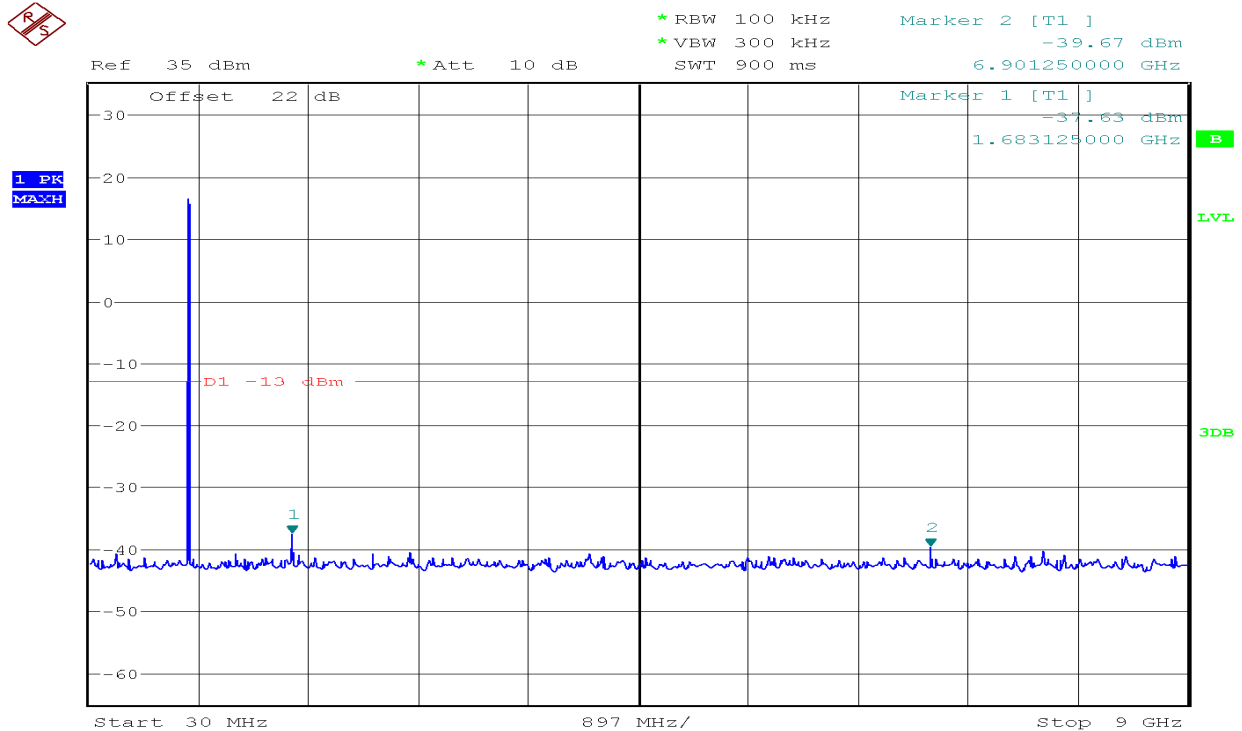


Figure 7-3: Out of Band emission at antenna terminals – WCDMA CH High



HSDPA Band V

Figure 8-1: Out of Band emission at antenna terminals – HSDPA CH Low

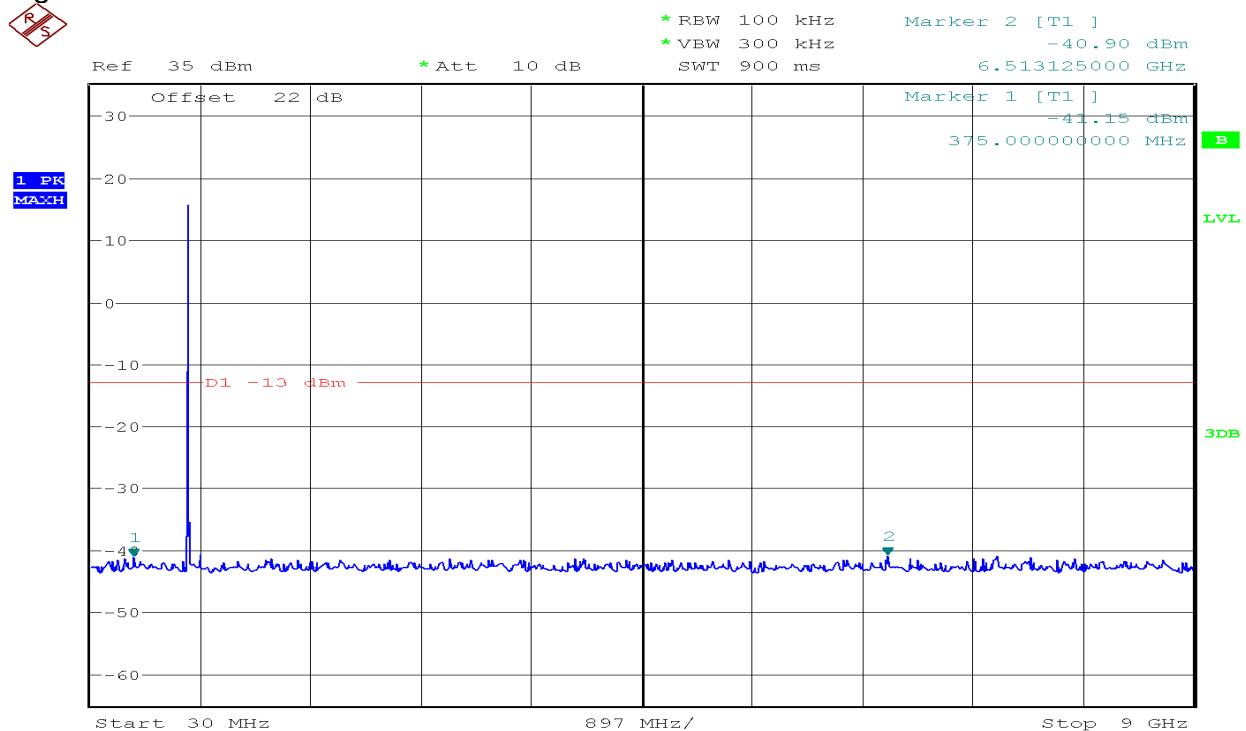


Figure 8-2: Out of Band emission at antenna terminals – HSDPA CH Mid

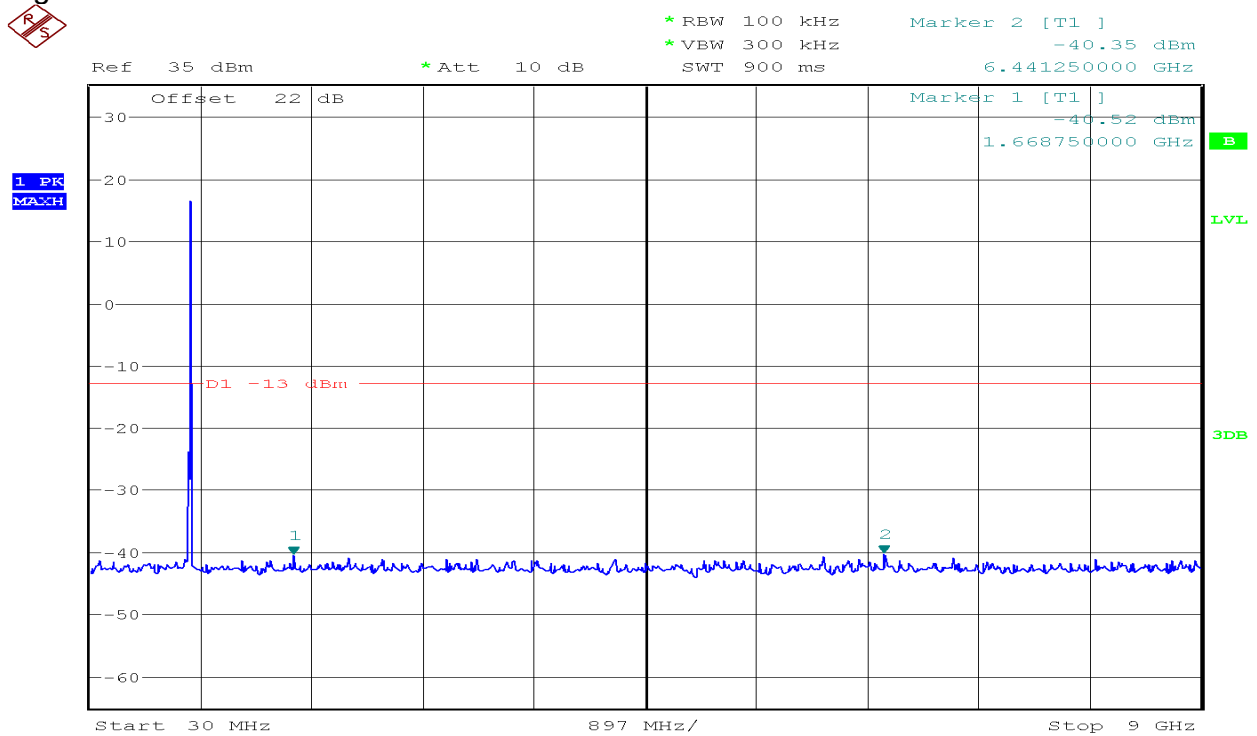
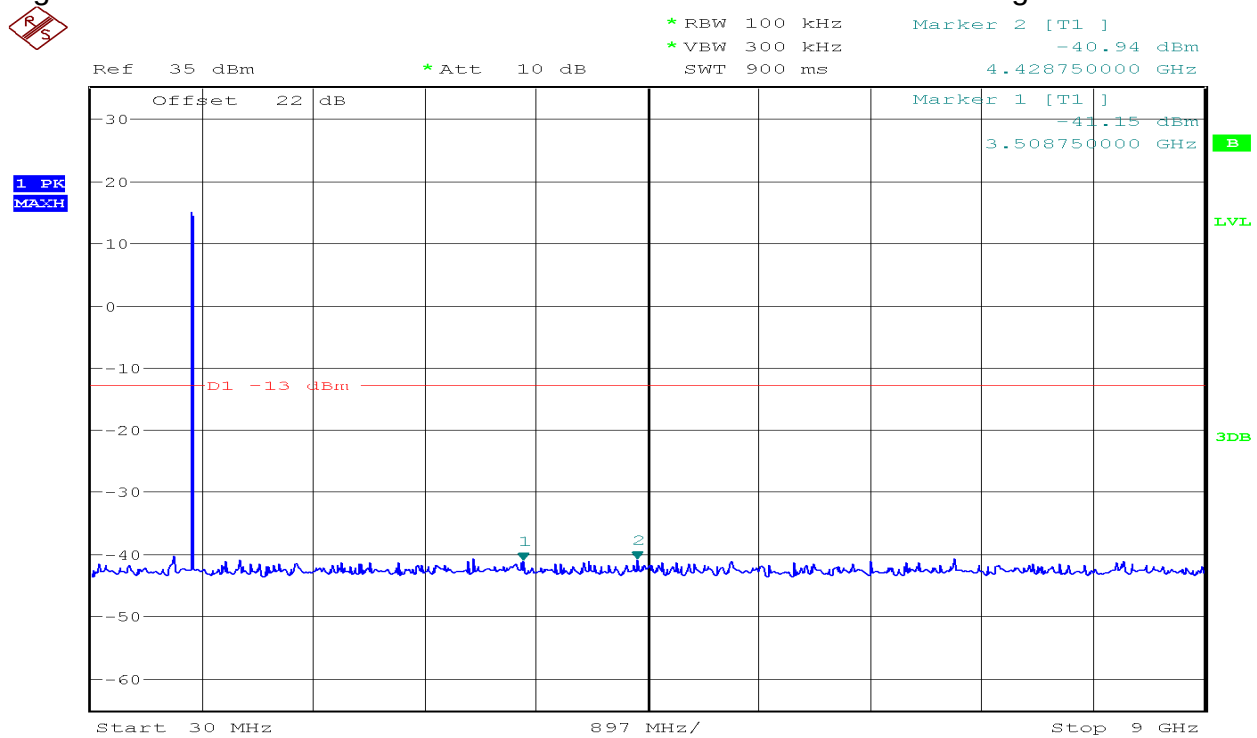


Figure 8-3: Out of Band emission at antenna terminals – HSDPA CH High



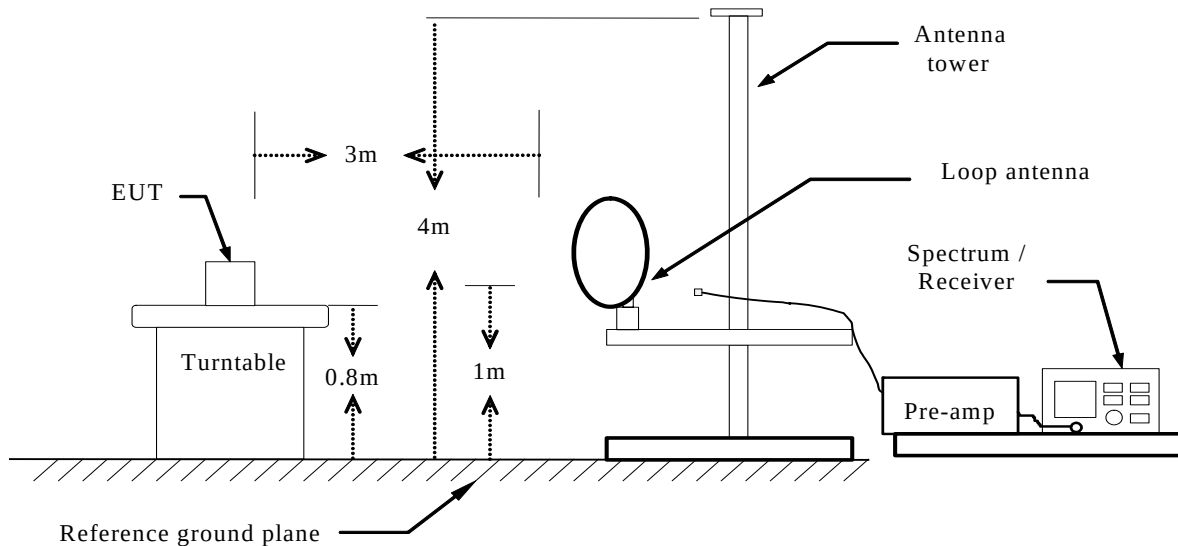
7.6. FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT

LIMIT

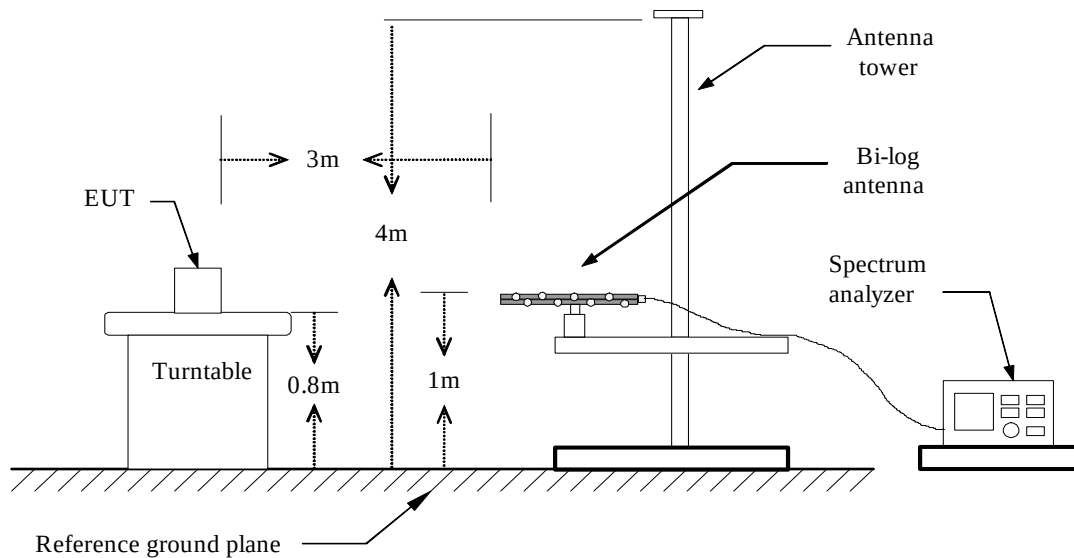
According to FCC §2.1053

TEST CONFIGURATION

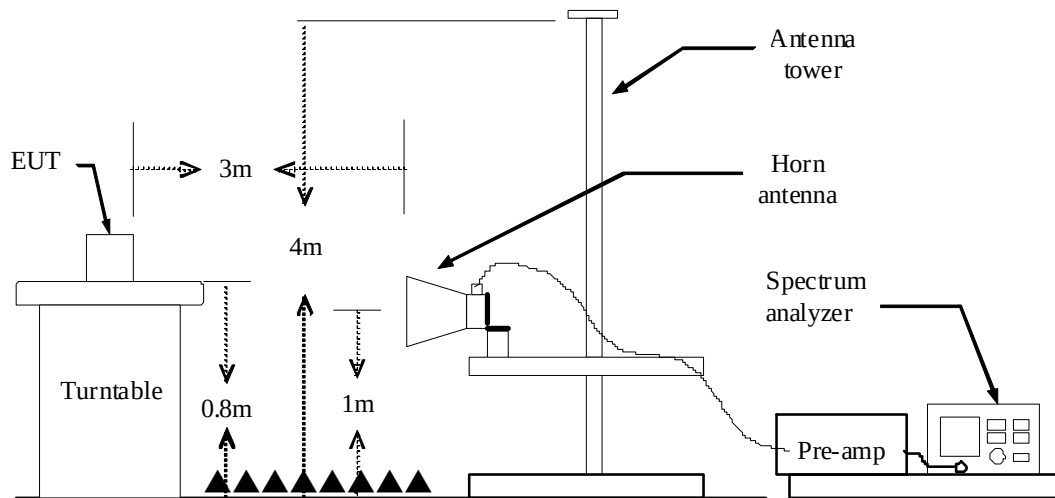
Below 30MHz



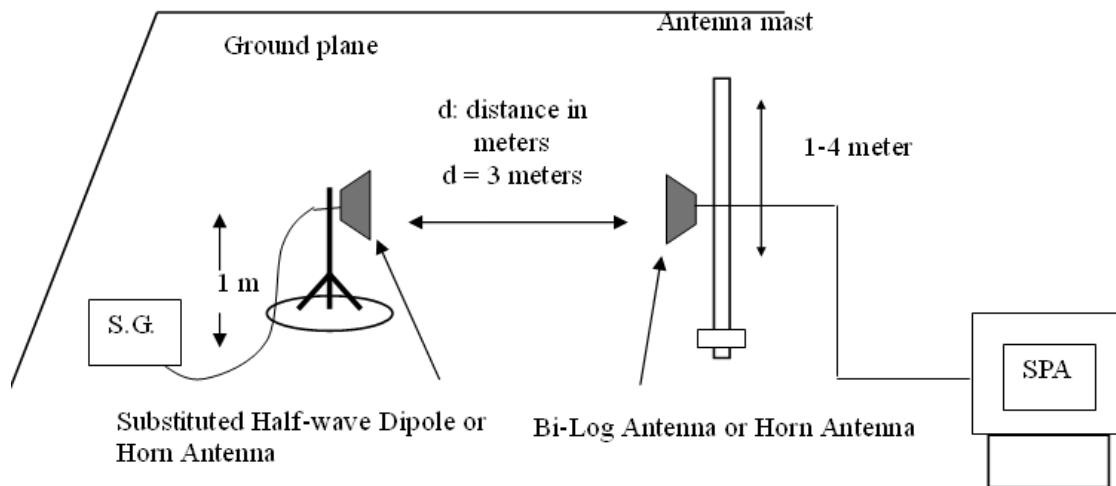
Below 1 GHz



Above 1 GHz



Substituted Method Test Set-up



TEST 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 were identified, the power of the emission was determined using the substitution method.

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

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

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

TEST RESULTS

Refer to the attached tabular data sheets.

Below 30MHz

The interference of the frequency value is lower than the limit below 20 db, measured as the background noise values and will not be recorded.

Radiated Spurious Emission Measurement Result / Below 1GHz

WCDMA Band II					
Channel	Frequency(MHz)	Spurious emission		Limit (dBm)	Result
		Polarization	Level(dBm)		
9262	63.9500	Vertical	-60.07	-13.00	Pass
	97.9000	V	-63.19		
	187.1400	V	-60.07		
	201.6900	V	-63.45		
	N/A	V	--		
	112.4500	Horizontal	-64.68		
	185.2000	H	-64.02		
	249.2200	H	-64.27		
	364.6500	H	-63.78		
	N/A	H	--		
9400	55.2200	Vertical	-61.05	-13.00	Pass
	61.0400	V	-55.43		
	107.6000	V	-52.54		
	184.2300	V	-57.75		
	N/A	V	--		
	107.6000	Horizontal	-62.25		
	195.8700	H	-65.04		
	249.2200	H	-63.96		
	364.6500	H	-63.80		
	N/A	H	--		
9538	58.1300	Vertical	-60.88	-13.00	Pass
	112.4500	V	-56.12		
	189.0800	V	-58.08		
	199.7500	V	-56.14		
	N/A	V	--		
	101.7800	Horizontal	-61.81		
	140.5800	H	-60.84		
	153.1900	H	-63.06		
	249.2200	H	-63.22		
	N/A	H	--		

Remark:

1. The emission behaviour belongs to narrowband spurious emission.
2. "--"means that the emission level is too low to be measured,and the emission level is not exceed the value of -13dBm,and the result is less than the recorded reference levels,so the result is not recorded in the test report.

WCDMA Band II HSDPA					
Channel	Frequency(MHz)	Spurious emission		Limit (dBm)	Result
		Polarization	Level(dBm)		
9262	61.0400	Vertical	-58.96	-13.00	Pass
	66.8600	V	-56.73		
	151.2500	V	-57.74		
	191.0200	V	-60.73		
	N/A	V	--		
	108.5700	Horizontal	-66.98		
	140.5800	H	-64.73		
	249.2200	H	-64.58		
	364.6500	H	-63.91		
	N/A	H	--		
9400	107.6000	Vertical	-55.01	-13.00	Pass
	154.1600	V	-61.63		
	178.4100	V	-59.64		
	185.2000	V	-58.29		
	N/A	V	--		
	109.5400	Horizontal	-64.60		
	153.1900	H	-65.81		
	249.2200	H	-64.36		
	364.6500	H	-64.30		
	N/A	H	--		
9538	61.0400	Vertical	-57.44	-13.00	Pass
	104.6900	V	-59.11		
	183.2600	V	-56.06		
	364.6500	V	-64.84		
	N/A	V	--		
	138.6400	Horizontal	-65.43		
	153.1900	H	-65.47		
	249.2200	H	-64.03		
	364.6500	H	-64.25		
	N/A	H	--		

Remark:

1. The emission behaviour belongs to narrowband spurious emission.
2. "--"means that the emission level is too low to be measured,and the emission level is not exceed the value of -13dBm,and the result is less than the recorded reference levels,so the result is not recorded in the test report.

WCDMA Band V					
Channel	Frequency(MHz)	Spurious emission		Limit (dBm)	Result
		Polarization	Level(dBm)		
4132	63.9500	Vertical	-60.79	-13.00	Pass
	80.4400	V	-58.32		
	170.6500	V	-61.32		
	189.0800	V	-56.79		
	N/A	V	--		
	32.9100	Horizontal	-59.63		
	100.8100	H	-65.33		
	249.2200	H	-64.75		
	364.6500	H	-64.11		
	N/A	H	--		
4182	97.9000	Vertical	-59.22	-13.00	Pass
	109.5400	V	-58.21		
	188.1100	V	-51.39		
	204.6000	V	-58.04		
	N/A	V	--		
	32.9100	Horizontal	-61.43		
	107.6000	H	-60.70		
	137.6700	H	-62.03		
	186.1700	H	-61.27		
	N/A	H	--		
4233	79.4700	Vertical	-58.46	-13.00	Pass
	98.8700	V	-49.35		
	106.6300	V	-53.62		
	199.7500	V	-60.09		
	N/A	V	--		
	32.9100	Horizontal	-59.14		
	101.7800	H	-61.19		
	105.6600	H	-63.36		
	364.6500	H	-64.03		
	N/A	H	--		

Remark:

1. The emission behaviour belongs to narrowband spurious emission.
2. "--"means that the emission level is too low to be measured,and the emission level is not exceed the value of -13dBm,and the result is less than the recorded reference levels,so the result is not recorded in the test report.

WCDMA Band V HSDPA					
Channel	Frequency(MHz)	Spurious emission		Limit (dBm)	Result
		Polarization	Level(dBm)		
4132	101.7800	Vertical	-59.88	-13.00	Pass
	180.3500	V	-60.44		
	186.1700	V	-58.99		
	191.0200	V	-50.73		
	N/A	V	--		
	32.9100	Horizontal	-59.18		
	111.4800	H	-65.69		
	128.9400	H	-63.69		
	249.2200	H	-63.85		
	N/A	H	--		
4182	87.2300	Vertical	-59.70	-13.00	Pass
	104.6900	V	-59.29		
	185.2000	V	-55.46		
	190.0500	V	-58.08		
	N/A	V	--		
	32.9100	Horizontal	-59.20		
	99.8400	H	-57.59		
	249.2200	H	-63.62		
	364.6500	H	-64.05		
	N/A	H	--		
4233	181.3200	Vertical	-56.52	-13.00	Pass
	187.1400	V	-59.35		
	202.6600	V	-61.01		
	364.6500	V	-63.71		
	N/A	V	--		
	32.9100	Horizontal	-59.88		
	104.6900	H	-65.10		
	137.6700	H	-64.61		
	364.6500	H	-63.82		
	N/A	H	--		

Remark:

1. The emission behaviour belongs to narrowband spurious emission.
2. "--"means that the emission level is too low to be measured,and the emission level is not exceed the value of -13dBm,and the result is less than the recorded reference levels,so the result is not recorded in the test report.

Radiated Spurious Emission Measurement Result / Above 1GHz

WCDMA Band II					
Channel	Frequency(MHz)	Spurious emission		Limit (dBm)	Result
		Polarization	Level(dBm)		
9262	2239.000	Vertical	-45.35	-13.00	Pass
	2656.000	V	-46.28		
	3709.000	V	-49.92		
	4812.000	V	-45.56		
	N/A	V	--		
	2629.000	Horizontal	-51.55		
	3709.000	H	-51.63		
	4688.000	H	-48.12		
	5768.000	H	-49.42		
	N/A	H	--		
9400	1186.000	Vertical	-39.02	-13.00	Pass
	1555.000	V	-38.40		
	3760.000	V	-48.28		
	4892.000	V	-40.26		
	N/A	V	--		
	2629.000	Horizontal	-47.04		
	2731.000	H	-38.89		
	3763.000	H	-47.78		
	4664.000	H	-50.16		
	N/A	H	--		
9538	1105.000	Vertical	-52.80	-13.00	Pass
	1381.000	V	-46.80		
	3091.000	V	-55.48		
	3814.000	V	-48.08		
	N/A	V	--		
	1222.000	Horizontal	-40.99		
	2806.000	H	-44.08		
	3814.000	H	-48.23		
	4956.000	H	-46.33		
	N/A	H	--		

Remark:

1. The emission behaviour belongs to narrowband spurious emission.
2. "--" means that the emission level is too low to be measured, and the emission level is not exceed the value of -13dBm, and the result is less than the recorded reference levels, so the result is not recorded in the test report.

WCDMA Band II HSDPA					
Channel	Frequency(MHz)	Spurious emission		Limit (dBm)	Result
		Polarization	Level(dBm)		
9262	2200.000	Vertical	-56.81	-13.00	Pass
	2365.000	V	-45.30		
	2872.000	V	-50.65		
	3706.000	V	-49.05		
	N/A	V	--		
	1132.000	Horizontal	-47.90		
	1486.000	H	-47.94		
	2932.000	H	-48.75		
	3706.000	H	-49.38		
	N/A	H	--		
9400	3061.000	Vertical	-55.20	-13.00	Pass
	3757.000	V	-50.88		
	3961.000	V	-52.99		
	5220.000	V	-50.39		
	N/A	V	--		
	2653.000	Horizontal	-58.56		
	3763.000	H	-51.29		
	4664.000	H	-51.05		
	5116.000	H	-49.03		
	N/A	H	--		
9538	2152.000	Vertical	-45.95	-13.00	Pass
	2359.000	V	-53.41		
	3814.000	V	-49.23		
	5116.000	V	-50.36		
	N/A	V	--		
	1678.000	Horizontal	-43.85		
	3613.000	H	-53.48		
	3814.000	H	-50.23		
	5080.000	H	-48.52		
	N/A	H	--		

Remark:

1. The emission behaviour belongs to narrowband spurious emission.
2. "--"means that the emission level is too low to be measured,and the emission level is not exceed the value of -13dBm,and the result is less than the recorded reference levels,so the result is not recorded in the test report.

WCDMA Band V					
Channel	Frequency(MHz)	Spurious emission		Limit (dBm)	Result
		Polarization	Level(dBm)		
4132	1651.000	Vertical	-48.27	-13.00	Pass
	2911.000	V	-55.70		
	3064.000	V	-55.03		
	5590.000	V	-45.50		
	N/A	V	--		
	1654.000	Horizontal	-53.02		
	2743.000	H	-56.61		
	4830.000	H	-49.15		
	6690.000	H	-47.12		
	N/A	H	--		
4183	1129.000	Vertical	-48.05	-13.00	Pass
	1675.000	V	-49.87		
	1867.000	V	-41.49		
	1882.000	V	-42.38		
	N/A	V	--		
	1375.000	Horizontal	-44.68		
	1408.000	H	-43.88		
	1675.000	H	-54.78		
	2383.000	H	-48.72		
	N/A	H	--		
4233	1462.000	Vertical	-54.63	-13.00	Pass
	1690.000	V	-44.87		
	1813.000	V	-41.27		
	1969.000	V	-54.30		
	N/A	V	--		
	1690.000	Horizontal	-51.65		
	3073.000	H	-55.23		
	3373.000	H	-55.34		
	5030.000	H	-48.53		
	N/A	H	--		

Remark:

1. The emission behaviour belongs to narrowband spurious emission.
2. "--"means that the emission level is too low to be measured,and the emission level is not exceed the value of -13dBm,and the result is less than the recorded reference levels,so the result is not recorded in the test report.

WCDMA Band V HSDPA					
Channel	Frequency(MHz)	Spurious emission		Limit (dBm)	Result
		Polarization	Level(dBm)		
4132	1651.000	Vertical	-48.27	-13.00	Pass
	4705.000	V	-46.12		
	4910.000	V	-43.80		
	5135.000	V	-44.65		
	N/A	V	--		
	1657.000	Horizontal	-52.51		
	2065.000	H	-40.29		
	2119.000	H	-38.66		
	2476.000	H	-39.34		
	N/A	V	--		
4182	1405.000	Vertical	-42.99	-13.00	Pass
	1585.000	V	-37.03		
	1663.000	V	-45.80		
	1978.000	V	-42.44		
	N/A	V	--		
	1675.000	Horizontal	-54.15		
	2665.000	H	-56.46		
	3139.000	H	-54.07		
	5385.000	H	-49.16		
	N/A	H	--		
4233	1690.000	Vertical	-45.08	-13.00	Pass
	3583.000	V	-54.35		
	4945.000	V	-45.99		
	5620.000	V	-41.76		
	N/A	V	--		
	1483.000	Horizontal	-35.61		
	1606.000	H	-37.81		
	1780.000	H	-38.96		
	1882.000	H	-39.20		
	N/A	H	--		

Remark:

1. The emission behaviour belongs to narrowband spurious emission.
2. "--"means that the emission level is too low to be measured,and the emission level is not exceed the value of -13dBm,and the result is less than the recorded reference levels,so the result is not recorded in the test report.

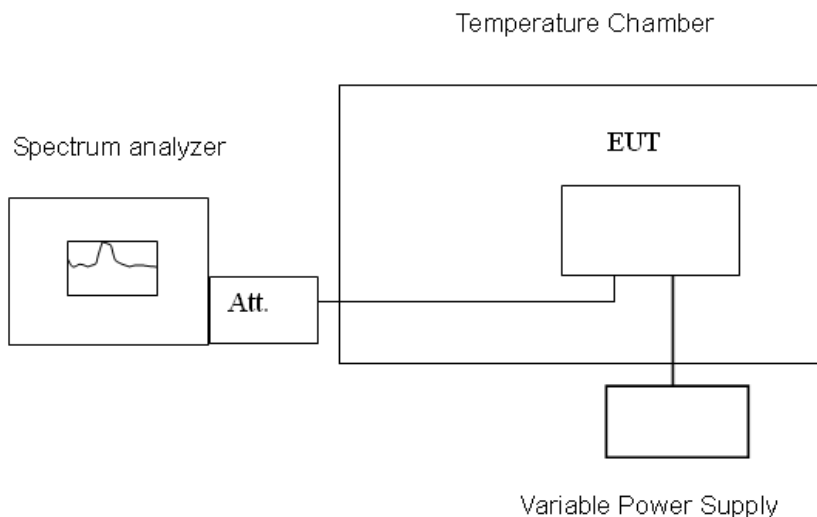
7.7. FREQUENCY STABILITY V.S. TEMPERATURE MEASUREMENT

LIMIT

According to FCC §2.1055, FCC §22.355, .FCC §24.235.

Frequency Tolerance: 2.5 ppm

TEST CONFIGURATION



Remark: Measurement setup for testing on Antenna connector

TEST 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 20°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to -20°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C increased per stage until the highest temperature of +65°C reached.

TEST RESULTS*No non-compliance noted.*

Reference Frequency: WCDMA Band II Mid Channel 1880 MHz @ 20°C				
Limit: +/- 2.5 ppm = 4700 Hz				
Power Supply Vac	Environment Temperature (°C)	Frequency (Hz)	Delta (Hz)	Limit (Hz)
3.7	65	1879999973	27	4700
	60	1879999968	32	
	50	1879999982	18	
	40	1879999985	15	
	30	1879999984	16	
	20	1879999989	11	
	10	1879999979	21	
	0	1879999982	18	
	-10	1879999980	20	
	-20	1879999975	25	

Reference Frequency: HSDPA Band II Mid Channel 1880 MHz @ 20°C				
Limit: +/- 2.5 ppm = 4700 Hz				
Power Supply Vac	Environment Temperature (°C)	Frequency (Hz)	Delta (Hz)	Limit (Hz)
3.7	65	1879999963	37	4700
	60	1879999972	28	
	50	1879999979	21	
	40	1879999980	20	
	30	1879999975	25	
	20	1879999983	17	
	10	1879999976	24	
	0	1879999973	27	
	-10	1879999981	19	
	-20	1879999968	32	

Reference Frequency: WCDMA Band V Mid Channel 836.4 MHz @ 20°C				
Limit: +/- 2.5 ppm = 2091.5 Hz				
Power Supply Vac	Environment Temperature (°C)	Frequency (Hz)	Delta (Hz)	Limit (Hz)
3.7	65	836399970	30	2091.5
	60	836399964	36	
	50	836399968	32	
	40	836399972	28	
	30	836399983	17	
	20	836399985	15	
	10	836399982	18	
	0	836399974	26	
	-10	836399980	20	
	-20	836399977	23	

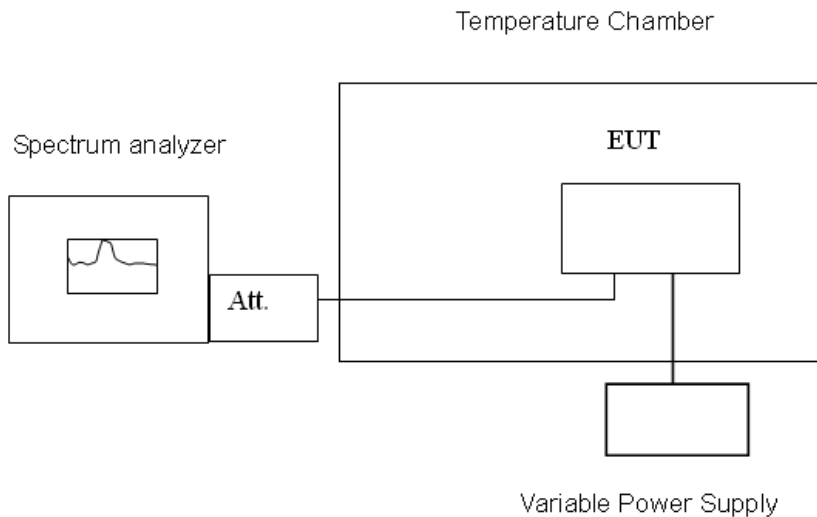
Reference Frequency: HSDPA Band V Mid Channel 836.4 MHz @ 20°C				
Limit: +/- 2.5 ppm = 2091.5 Hz				
Power Supply Vac	Environment Temperature (°C)	Frequency (Hz)	Delta (Hz)	Limit (Hz)
3.7	65	836399966	34	2091.5
	60	836399975	25	
	50	836399972	28	
	40	836399982	18	
	30	836399980	20	
	20	836399984	16	
	10	836399986	14	
	0	836399978	22	
	-10	836399981	19	
	-20	836399974	26	

7.8. REQUENCY STABILITY V.S. VOLTAGE MEASUREMENT

LIMIT

According to FCC §2.1055, FCC §22.355, .FCC §24.235,

TEST CONFIGURATION



Remark: Measurement setup for testing on Antenna connector.

TEST PROCEDURE

Set chamber temperature to 20°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 specify extreme voltage variation ($\pm 10\%$) and endpoint, record the maximum frequency change.

TEST RESULTS*No non-compliance noted.*

Reference Frequency: WCDMA Band II Mid Channel 1880 MHz @ 20°C				
Limit: ± 2.5 ppm = 4700Hz				
Power Supply Vac	Environment Temperature (°C)	Frequency (Hz)	Delta (Hz)	Limit (Hz)
4.2	20	1879999969	31	4700
3.7		1879999983	17	
3.6 end		1879999980	20	

Reference Frequency: HSDPA Band II Mid Channel 1880 MHz @ 20°C				
Limit: ± 2.5 ppm = 4700Hz				
Power Supply Vac	Environment Temperature (°C)	Frequency (Hz)	Delta (Hz)	Limit (Hz)
4.2	20	1879999978	22	4700
3.7		1879999986	14	
3.6 end		1879999984	16	

Reference Frequency: WCDMA Band V Mid Channel 836.4 MHz @ 20°C				
Limit: ± 2.5 ppm = 2091.5Hz				
Power Supply Vac	Environment Temperature (°C)	Frequency (Hz)	Delta (Hz)	Limit (Hz)
4.2	20	836399976	24	2091.5
3.7		836399982	18	
3.6 end		836399983	17	

Reference Frequency: HSDPA Band V Mid Channel 836.4 MHz @ 20°C				
Limit: ± 2.5 ppm = 2091.5Hz				
Power Supply Vac	Environment Temperature (°C)	Frequency (Hz)	Delta (Hz)	Limit (Hz)
4.2	20	836399982	18	2091.5
3.7		836399985	15	
3.6 end		836399976	24	

7.9. POWERLINE CONDUCTED EMISSIONS

LIMIT

For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

Frequency Range (MHz)	Limits (dB μ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

TEST CONFIGURATION

See test photographs attached in Appendix I for the actual connections between EUT and support equipment.

TEST PROCEDURE

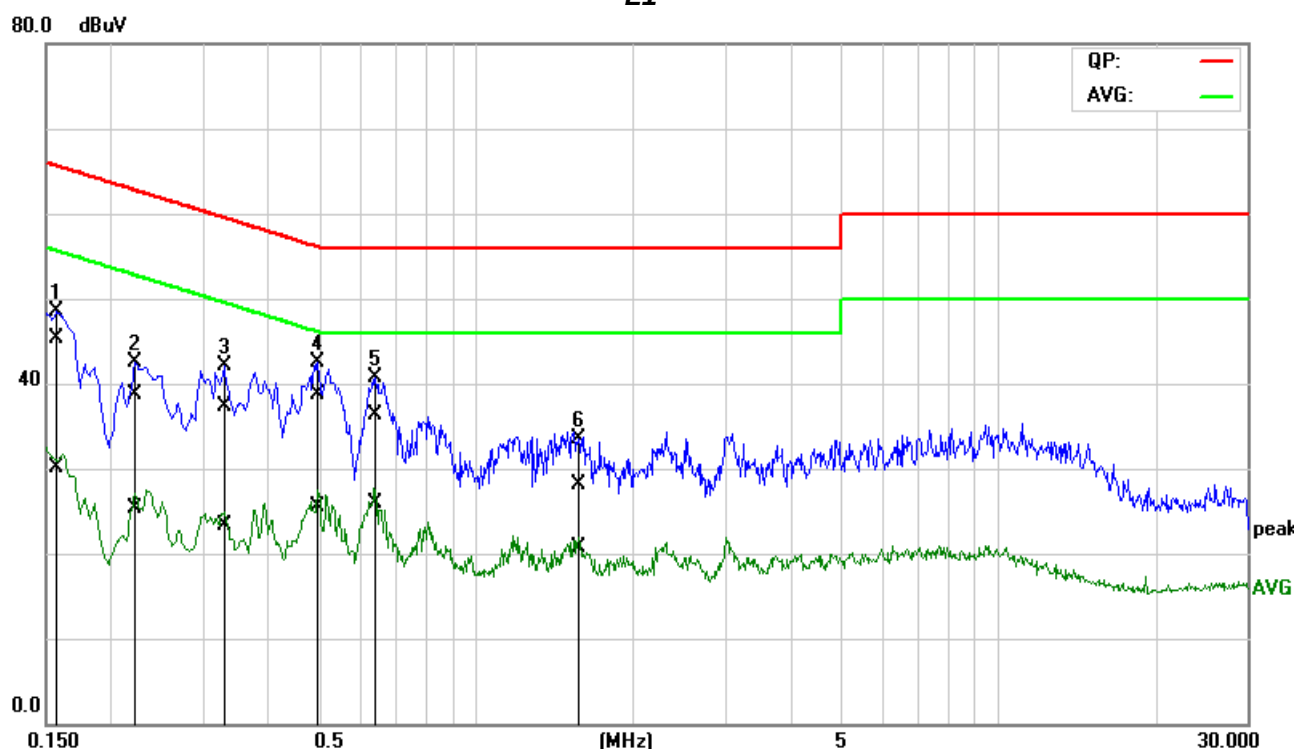
1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

TEST RESULTS

The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. Significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

Job No.:	C170228R01	Date:	2017-4-6
Model No.:	ES320	Time:	PM 05:00:31
Standard:	FCC Class B	Temp.(C)/Hum.(%):	22(C)/48%
Test item:	Conduction test	Test By:	James.Yan
Line:	L1	Test Voltage:	AC 120V/60Hz
Model:		Description:	

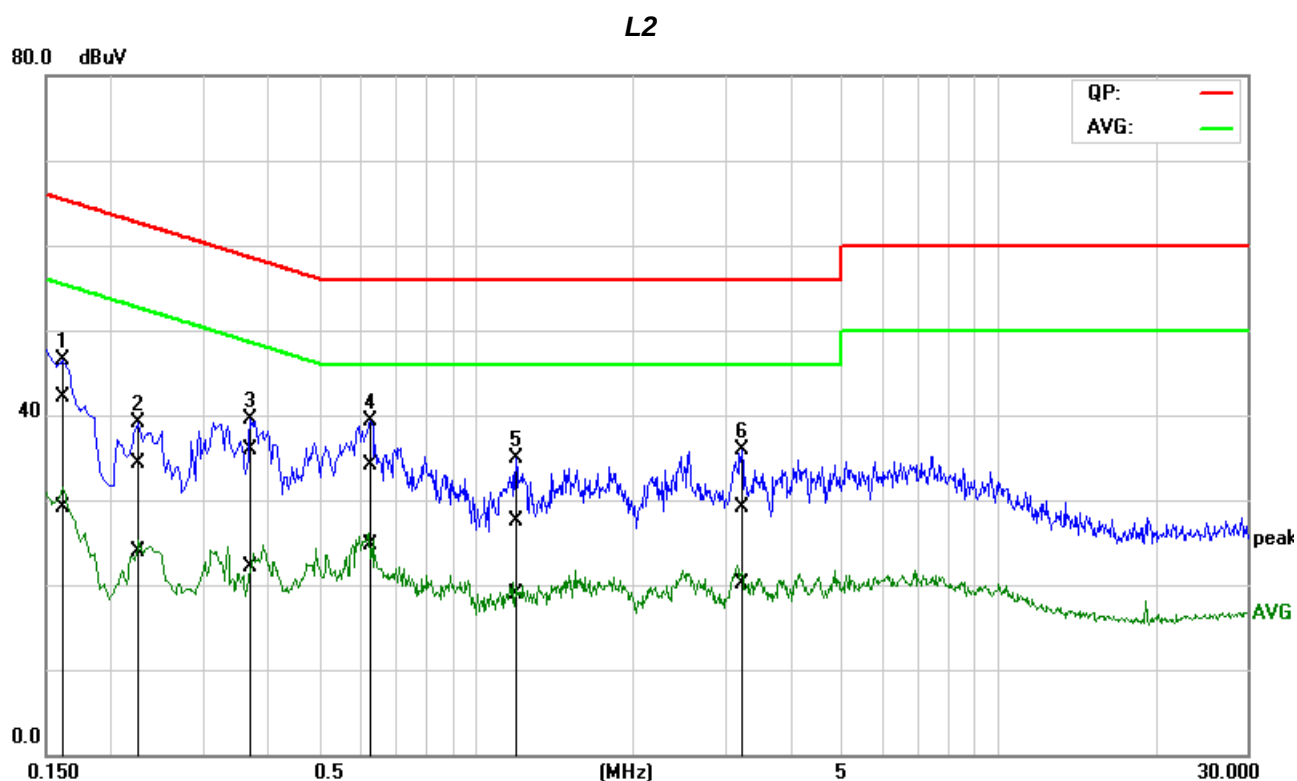
L1



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1	0.1578	25.57	10.35	19.79	45.36	30.14	65.57	55.58	-20.21	-25.44	Pass
2	0.2233	18.90	5.58	19.80	38.70	25.38	62.69	52.70	-23.99	-27.32	Pass
3	0.3303	17.60	3.51	19.80	37.40	23.31	59.44	49.44	-22.04	-26.13	Pass
4*	0.4969	18.81	5.60	19.81	38.62	25.41	56.05	46.05	-17.43	-20.64	Pass
5	0.6334	16.41	6.14	19.80	36.21	25.94	56.00	46.00	-19.79	-20.06	Pass
6	1.5576	8.24	0.84	19.82	28.06	20.66	56.00	46.00	-27.94	-25.34	Pass

Note: 1. L1 = Line One (Live Line) / L2 = Line Two (Neutral Line).

Job No.:	C170228R01	Date:	2017-4-6
Model No.:	ES320	Time:	PM 05:05:21
Standard:	FCC Class B	Temp.(C)/Hum.(%):	22(C)/48%
Test item:	Conduction test	Test By:	James.Yan
Line:	L2	Test Voltage:	AC 120V/60Hz
Model:		Description:	

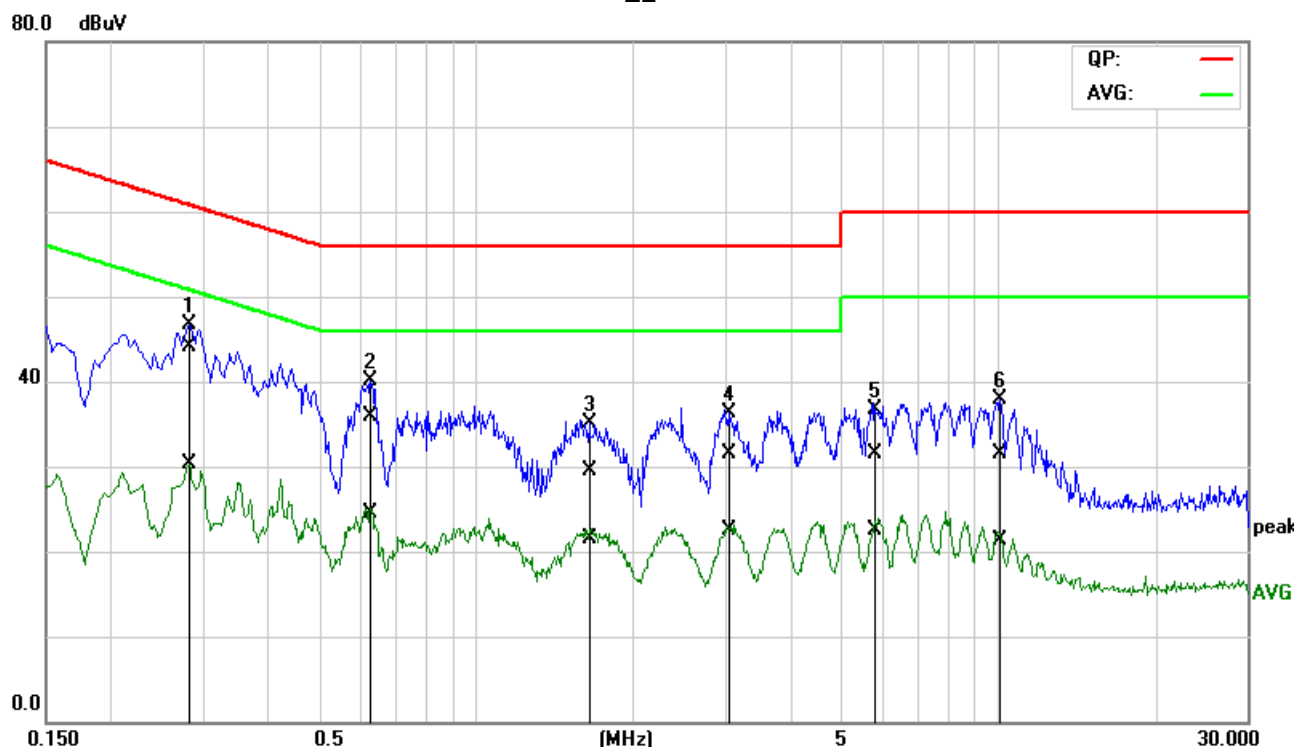


No.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin	Remark
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
1	0.1613	22.43	9.43	19.74	42.17	29.17	65.40	55.40	-23.23	-26.23	Pass
2	0.2265	14.50	4.13	19.75	34.25	23.88	62.58	52.58	-28.33	-28.70	Pass
3	0.3727	16.12	2.35	19.75	35.87	22.10	58.44	48.44	-22.57	-26.34	Pass
4*	0.6216	14.31	5.05	19.75	34.06	24.80	56.00	46.00	-21.94	-21.20	Pass
5	1.1866	7.72	-0.76	19.74	27.46	18.98	56.00	46.00	-28.54	-27.02	Pass
6	3.2027	9.33	0.30	19.79	29.12	20.09	56.00	46.00	-26.88	-25.91	Pass

Note: 1. L1 = Line One (Live Line) / L2 = Line Two (Neutral Line).

Job No.:	C170228R01	Date:	2017-4-6
Model No.:	ES320	Time:	PM 04:49:59
Standard:	FCC Class B	Temp.(C)/Hum.(%):	22(C)/48%
Test item:	Conduction test	Test By:	James.Yan
Line:	L1	Test Voltage:	AC 240V/60Hz
Model:		Description:	

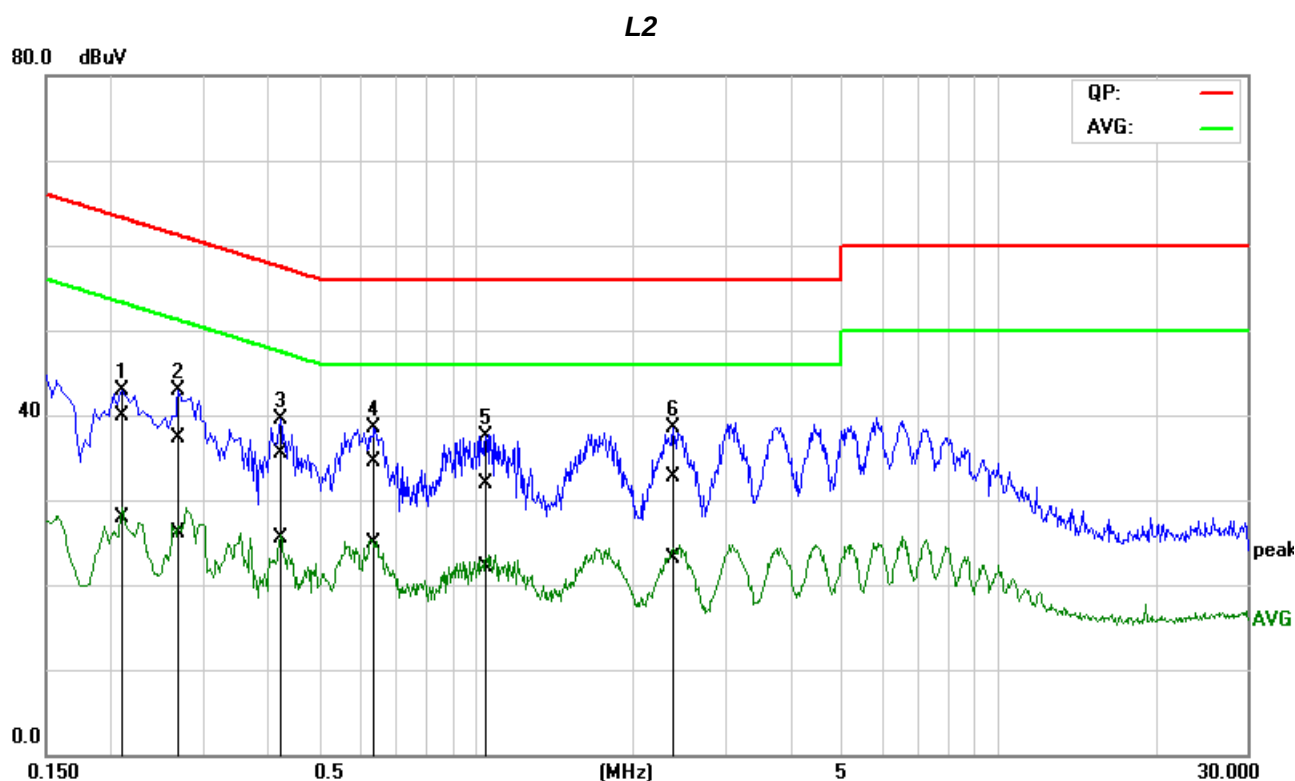
L1



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1*	0.2798	24.25	10.46	19.80	44.05	30.26	60.82	50.82	-16.77	-20.56	Pass
2	0.6227	16.19	4.73	19.80	35.99	24.53	56.00	46.00	-20.01	-21.47	Pass
3	1.6261	9.70	1.67	19.82	29.52	21.49	56.00	46.00	-26.48	-24.51	Pass
4	3.0372	11.53	2.52	19.89	31.42	22.41	56.00	46.00	-24.58	-23.59	Pass
5	5.8309	11.55	2.52	19.93	31.48	22.45	60.00	50.00	-28.52	-27.55	Pass
6	10.0612	11.60	1.39	19.96	31.56	21.35	60.00	50.00	-28.44	-28.65	Pass

Note: 1. L1 = Line One (Live Line) / L2 = Line Two (Neutral Line).

Job No.:	C170228R01	Date:	2017-4-6
Model No.:	ES320	Time:	PM 04:55:24
Standard:	FCC Class B	Temp.(C)/Hum.(%):	22(C)/48%
Test item:	Conduction test	Test By:	James.Yan
Line:	L2	Test Voltage:	AC 240V/60Hz
Model:		Description:	



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1	0.2083	20.23	8.08	19.74	39.97	27.82	63.27	53.27	-23.30	-25.45	Pass
2	0.2680	17.54	6.27	19.75	37.29	26.02	61.18	51.18	-23.89	-25.16	Pass
3	0.4219	15.74	5.70	19.75	35.49	25.45	57.41	47.41	-21.92	-21.96	Pass
4*	0.6410	14.84	5.14	19.75	34.59	24.89	56.00	46.00	-21.41	-21.11	Pass
5	1.0331	12.24	2.31	19.74	31.98	22.05	56.00	46.00	-24.02	-23.95	Pass
6	2.4064	13.02	3.27	19.78	32.80	23.05	56.00	46.00	-23.20	-22.95	Pass

Note: 1. L1 = Line One (Live Line) / L2 = Line Two (Neutral Line).

Remark:

- 1.The measuring frequencies range between 0.15 MHz and 30 MHz.
- 2.The emissions measured in the frequency range between 0.15 MHz and 30MHz were made with an instrument using Quasi-peak detector and Average detector.
- 3.“---” denotes the emission level was or more than 2dB below the Average limit, and no re-check was made.
- 4.The IF bandwidth of SPA between 0.15MHz and 30MHz was 10KHz. The IF bandwidth of Test Receiver between 0.15MHz and 30MHz was 9kHz.

END OF REPORT