TEST REPORT

Reference No......	:	WTX21X12139297W-1
FCC ID	:	2AJWI-GSMSOCUS4GEXA
Applicant	:	Tekview Limited
Address.....	:	Unit 8 George Holmes Business Centre George Holmes Way Swadlincote
Product Name	:	4G Power Socket
Test Model.	:	GSMSOCUS4G (EXA)
Standards	:	FCC Part 22H, FCC Part 24E
Date of Receipt sample	:	Dec. 13, 2021
Date of Test.....	:	Dec. 13, 2021 to Dec. 29, 2021
Date of Issue	:	Dec. 29, 2021
Test Result.....	:	**Pass**

Remarks:
The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

Prepared By:

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Report version

Version No.	Date of issue	Description
Rev.00	Dec. 29, 2021	Original
/	/	/

1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant:	Tekview Limited
Address of applicant:	Unit 8 George Holmes Business Centre George Holmes Way Swadlincote
Manufacturer:	Xiamen SimPal Communication Technology Co., Ltd.
Address of manufacturer:	3F, No 2208, Dianqian Group II, Gaodian Village, Huli District, Xiamen

General Description of EUT:	
Product Name:	4G Power Socket
Trade Name:	/
Model No.:	GSMSOCUS4G (EXA)
Adding Model(s):	SimPal-S460
Rated Voltage:	AC120V
Battery:	/
Adapter Model:	/
Note: The test data is gathered from a production sample provided by the manufacturer. The appearance of others models listed in the report is different from main-test model GSMSOCUS4G (EXA), but the circuit and the electronic construction do not change, declared by the manufacturer.	

Technical Characteristics of EUT:	
3G	
Support Networks:	WCDMA, HSDPA, HSUPA
Support Band:	WCDMA Band 2, WCDMA Band 4, WCDMA Band 5
Uplink Frequency:	WCDMA Band 2: 1850~1910MHz WCDMA Band 4: 1710~1755MHz WCDMA Band 5: 824~849MHz
Downlink Frequency:	WCDMA Band 2: 1930~1990MHz WCDMA Band 4: 2100~2155MHz WCDMA Band 5: 869~894MHz
RF Output Power:	WCDMA Band 2: 22.12dBm, WCDMA Band 4: 22.93dBm, WCDMA Band 5: 22.71dBm
Type of Emission:	WCDMA Band 2: 4M16F9W WCDMA Band 4: 4M14F9W WCDMA Band 5: 4M15F9W
Type of Modulation:	BPSK
Antenna Type:	Integral Antenna
Antenna Gain:	WCDMA Band 2: 2dBi, WCDMA Band 4: 2dBi, WCDMA Band 5: 2dBi

1.2 Test Standards

The tests were performed according to following standards:

FCC Rules Part 2: Frequency Alloca-Tions and Radio Treaty Mat-Ters; General Rules and Reg-Ulations.
FCC Rules Part 22: Private Land Mobile Radio Services.
FCC Rules Part 24: Public Mobile Services.
TIA/EIA 603 E March 2016: Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.
ANSI C63.26-2015: American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services.
KDB 971168 D01 Power Meas License Digital Systems v03r01: Measurement Guidance for Certification of Licensed Digital Transmitters.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission, should be checked to ensure compliance has been maintained.

1.3 Test Methodology

All measurements contained in this report were conducted with TIA/EIA 603 E/ KDB 971168/ ANSI C63.26
The equipment under test (EUT) was configured to measure its highest possible emission level. The test modes were adapted accordingly in reference to the Operating Instructions.

1.4 Test Facility

Address of the test laboratory
Laboratory: Waltek Testing Group (Shenzhen) Co., Ltd.
Address: 1/F., Room 101, Building 1, Hongwei Industrial Park, Liuxian 2nd Road, Block 70 Bao'an District, Shenzhen, Guangdong, China

FCC – Registration No.: 125990
Waltek Testing Group (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintain ed in our files. The Designation Number is CN5010, and Test Firm Registration Number is 125990.

Industry Canada (IC) Registration No.: 11464A
The 3m Semi-anechoic chamber of Waltek Testing Group (Shenzhen) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A.

1.5 EUT Setup and Test Mode

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. All testing shall be performed under maximum output power condition, and to measure its highest possible emissions level, more detailed description as follows:

Test Mode List		
Test Mode	Description	Remark
TM1	WCDMA Band 5	Low, Middle, High Channels
TM2	HSDPA Band 5	Low, Middle, High Channels
TM3	HSUPA Band 5	Low, Middle, High Channels
TM4	WCDMA Band 4	Low, Middle, High Channels
TM5	HSDPA Band 4	Low, Middle, High Channels
TM6	HSUPA Band 4	Low, Middle, High Channels
TM7	WCDMA Band 2	Low, Middle, High Channels
TM8	HSDPA Band 2	Low, Middle, High Channels
TM9	HSUPA Band 2	Low, Middle, High Channels

Testing Configure			
Support Band	Support Standard	Channel Frequency(MHz)	Channel Number
WCDMA Band 5	WCDMA/HSDPA/HSUPA	826.4	4132
		836.6	4183
		846.6	4233
WCDMA Band 4	WCDMA/HSDPA/HSUPA	1712.4	1312
		1732.4	1412
		1752.6	1513
WCDMA Band 2	WCDMA/HSDPA/HSUPA	1852.4	9262
		1880.0	9400
		1907.6	9538
Note: the transmitter has been tested on the communications mode of WCDMA, HSDPA, HSUPA compliance test and record the worst case.			

Test Conditions	
Temperature:	22~25 °C
Relative Humidity:	50~55 %.
ATM Pressure:	1019 mbar

EUT Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
/	/	/	/

Special Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
AC Cable	0.8	Unshielded	Without Ferrite

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
Tungsten lamp	HUASING	250W	/

1.6 Measurement Uncertainty

Measurement uncertainty		
Parameter	Conditions	Uncertainty
RF Output Power	Conducted	±0.42dB
Occupied Bandwidth	Conducted	±1.5%
Frequency Stability	Conducted	2.3%
Transmitter Spurious Emissions	Conducted	±0.42dB
Transmitter Spurious Emissions	Radiated	30-200MHz ±4.52dB
		0.2-1GHz ±5.56dB
		1-6GHz ±3.84dB
		6-18GHz ±3.92dB

1.7 Test Equipment List and Details

No.	Description	Manufacturer	Model	Serial No.	Cal Date	Due. Date
SEMT-1075	Communication Tester	Rohde & Schwarz	CMW500	148650	2021-03-27	2022-03-26
SEMT-1063	GSM Tester	Rohde & Schwarz	CMU200	114403	2021-03-27	2022-03-26
SEMT-1072	Spectrum Analyzer	Agilent	E4407B	MY41440400	2021-03-27	2022-03-26
SEMT-1079	Spectrum Analyzer	Agilent	N9020A	US47140102	2021-03-27	2022-03-26
SEMT-1080	Signal Generator	Agilent	83752A	3610A01453	2021-03-27	2022-03-26
SEMT-1081	Vector Signal Generator	Agilent	N5182A	MY47070202	2021-03-27	2022-03-26
SEMT-1028	Power Divider	Weinschel	1506A	PM204	2021-03-27	2022-03-26
SEMT-1082	Power Divider	RF-Lambda	RFLT4W5M18G	14110400027	2021-03-27	2022-03-26
SEMT-1031	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2021-03-27	2022-03-26
SEMT-1007	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2021-03-27	2022-03-26
SEMT-1008	Amplifier	Agilent	8447F	3113A06717	2021-04-12	2022-04-11
SEMT-1043	Amplifier	C&D	PAP-1G18	2002	2021-04-12	2022-04-11
SEMT-1069	Loop Antenna	Schwarz beck	FMZB 1516	9773	2021-03-19	2023-03-18
SEMT-1068	Broadband Antenna	Schwarz beck	VULB9163	9163-333	2021-03-19	2023-03-18
SEMT-1042	Horn Antenna	ETS	3117	00086197	2021-03-19	2023-03-18
SEMT-1121	Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170582	2021-04-27	2023-04-26
SEMT-1169	Pre-amplifier	Direction Systems Inc.	PAP-2640	14145-14153	2021-04-27	2022-04-26
SEMT-1163	Spectrum Analyzer	Rohde & Schwarz	FSP40	100612	2021-03-27	2022-03-26
SEMT-1166	Power Limiter	Agilent	N9356B	MY45450376	2021-03-27	2022-03-26
SEMT-1076	RF Switcher	Top Precision	RCS03-A2	/	2021-03-19	2023-03-18
SEMT-C001	Cable	Zheng DI	LL142-07-07-10M(A)	/	/	/
SEMT-C002	Cable	Zheng DI	ZT40-2.92J-2.92J-6M	/	/	/
SEMT-C003	Cable	Zheng DI	ZT40-2.92J-2.92J-2.5M	/	/	/
SEMT-C004	Cable	Zheng DI	2M0RFC	/	/	/
SEMT-C005	Cable	Zheng DI	1M0RFC	/	/	/
SEMT-C006	Cable	Zheng DI	1M0RFC	/	/	/

Software List			
Description	**Manufacturer**	**Model**	**Version**
EMI Test Software (Radiated Emission)*	Farad	EZ-EMC	RA-03A1

*Remark: indicates software version used in the compliance certification testing.

2. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test Item	Result
§22.913(a), §24.232(c)	RF Output Power	Compliant
§24.51	Peak-to-average Ratio (PAR) of Transmitter	Compliant
§22.917(b), §24.238(b)	Emission Bandwidth	Compliant
§22.917(a), §24.238(a)	Spurious Emissions at Antenna Terminal	Compliant
§22.917(a), §24.238(a)	Spurious Radiation Emissions	Compliant
§22.917(a), §24.238(a)	Out of Band Emissions	Compliant
§22.355, §24.235	Frequency Stability	Compliant
§2.1047	Modulation characteristics	Compliant

N/A: Not applicable.

3. RF Output Power

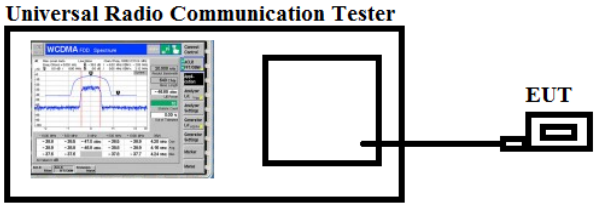
3.1 Standard Applicable

According to §22.913(a)(2), the ERP of mobile and portable stations transmitters and auxiliary test transmitters must not exceed 7 Watts.

According to §24.232 (c), mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

3.2 Test Procedure

- Conducted output power test method:



- Radiated power test method:

1. The setup of EUT is according with per ANSI/TIA Standard 603E and ANSI C63.26 measurement procedure.
2. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.
3. The frequency range up to tenth harmonic of the fundamental frequency was investigated.

4. Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

3.3 Summary of Test Results/Plots

➢ **Max. Radiated Power**

Mode	Channel	Antenna Polar	ERP	Limit (dBm)	Result
WCDMA Band V	4132	V	20.46	<38.45	Pass
		H	16.31		
	4183	V	20.12		
		H	15.41		
	4233	V	20.69		
		H	15.35		

Mode	Channel	Antenna Polar	ERP	Limit (dBm)	Result
WCDMA Band IV	4132	V	19.74	<38.45	Pass
		H	14.35		
	4183	V	20.92		
		H	14.62		
	4233	V	20.13		
		H	15.69		

Mode	Channel	Antenna Polar	EIRP	Limit (dBm)	Result
WCDMA Band II	9262	V	20.65	<33.00	Pass
		H	15.13		
	9400	V	20.71		
		H	14.32		
	9538	V	20.58		
		H	14.62		

Note: Pre-scan mode WCDMA/HSDPA/HSUPA find the worst case at WCDMA mode and recorded in the test report.

- **Max. Conducted Power (Average power)**

Please refer to Appendix A

4. Peak-to-average Ratio (PAR) of Transmitter

4.1 Standard Applicable

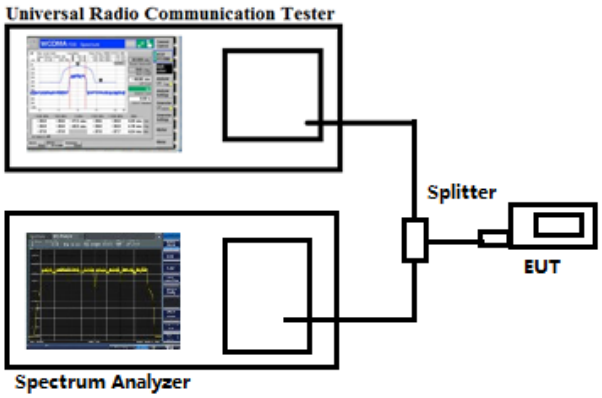
According to §24.232(d), power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (e) of this section. In both instances, equipment employed must be authorized in accordance with the provisions of §24.51, in measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13dB.

4.2 Test Procedure

According with KDB 971168

1. The signal analyzer' s CCDF measurement profile is enabled.
2. Frequency = carrier center frequency.
3. Measurement BW > Emission bandwidth of signal.
4. The signal analyzer was set to collect one million samples to generate the CCDF curve.
5. The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms. For burst transmissions, the spectrum analyzer is set to use an internal " RF Burst" trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the " on time" of one burst to ensure that energy is only captured during a time in which the transmitter is operating at maximum power.

Test Configuration for the emission bandwidth testing:



4.3 Summary of Test Results

Please refer to Appendix B.

5. Emission Bandwidth

5.1 Standard Applicable

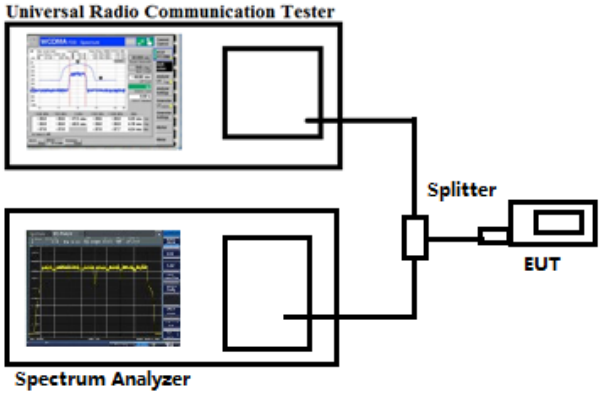
According to §22.917(b), the emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26dB below the transmitter power.

According to §24.238(b), the emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26dB below the transmitter power.

5.2 Test Procedure

The RF output terminal of the transmitter was connected to the input of the spectrum analyzer via a suitable attenuation. The RBW of the spectrum analyzer was set to 10kHz for GSM mode and 100kHz for WCDMA mode, VBW shall be at least 3 times the RBW, and the 26dB bandwidth was recorded.

Test Configuration for the emission bandwidth testing:



5.3 Summary of Test Results/Plots

Please refer to Appendix C

6. Out of Band Emissions at Antenna Terminal

6.1 Standard Applicable

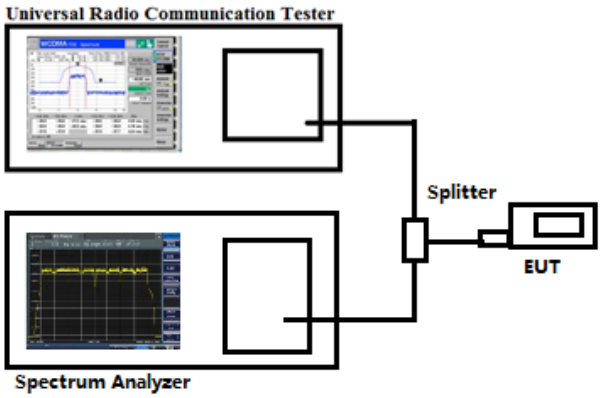
According to §22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

According to §24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

6.2 Test Procedure

The RF output terminal of the transmitter was connected to the input of the spectrum analyzer via a suitable attenuation. The RBW of the spectrum analyzer was set to 100kHz and 1MHz for the scan frequency from 30MHz to 1GHz and the scan frequency from 1GHz to up to 10th harmonic.

Test Configuration for the out of band emissions testing:



6.3 Summary of Test Results/Plots

Note: Pre-scan mode WCDMA/HSDPA/HSUPA find the worst case at WCDMA mode and recorded in the test report.

Please refer to Appendix D

7. Spurious Radiated Emissions

7.1 Standard Applicable

According to §22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

According to §24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

7.2 Test Procedure

1. The setup of EUT is according with per ANSI/TIA Standard 603E and ANSI C63.26 measurement procedure.
2. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.
3. The frequency range up to tenth harmonic of the fundamental frequency was investigated.
4. Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

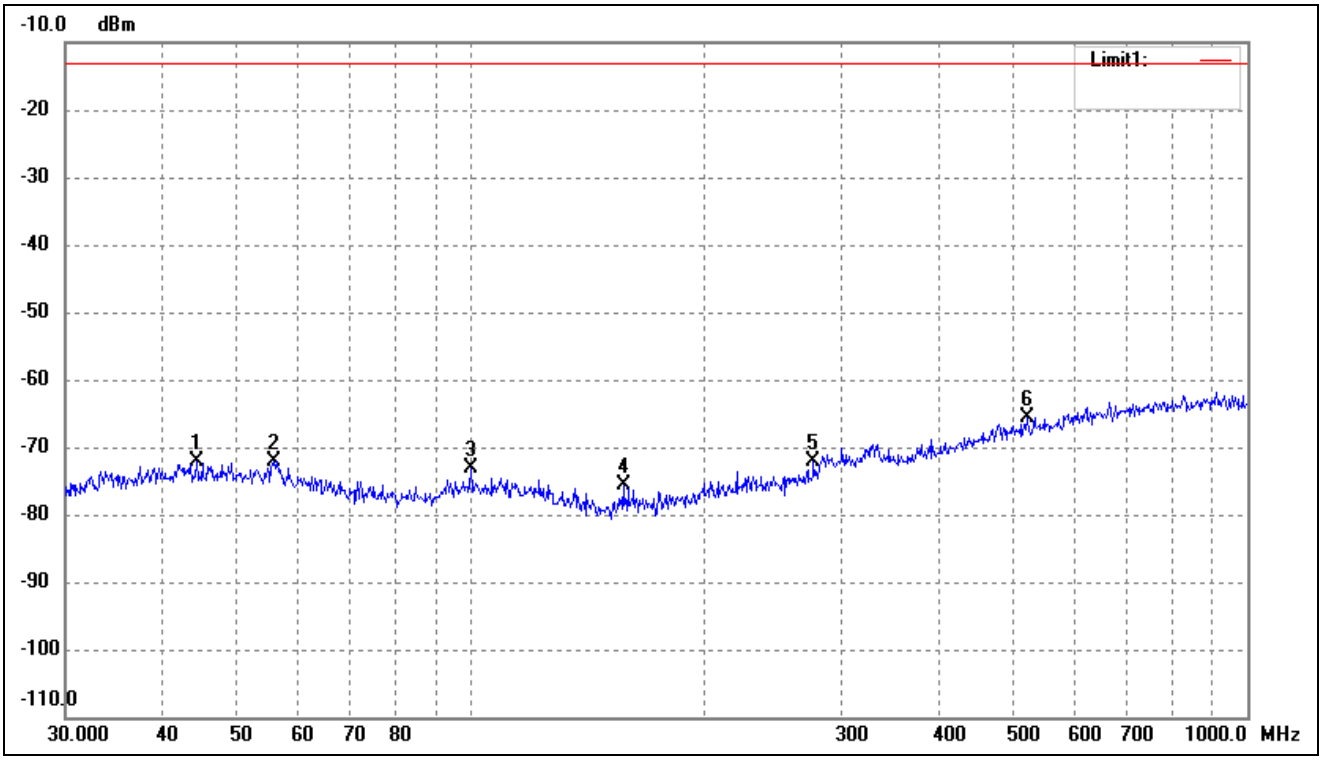
Spurious attenuation limit in dB =43+10 Log_{10} (power out in Watts)

7.3 Summary of Test Results/Plots

Note: this EUT was tested in 3 orthogonal positions and the worst case position data was reported.

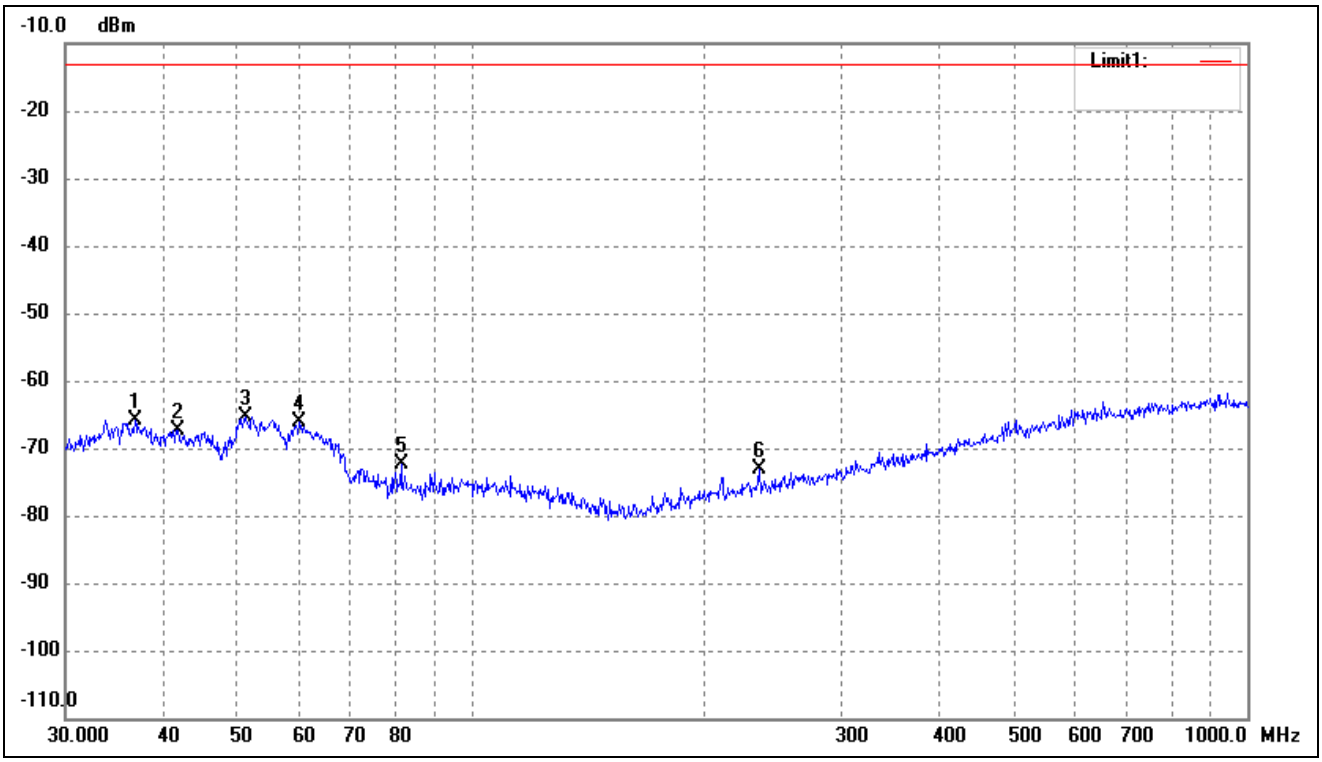
➢ Spurious Emissions Below 1GHz

Test Channel	band 5	Polarity:	Horizontal



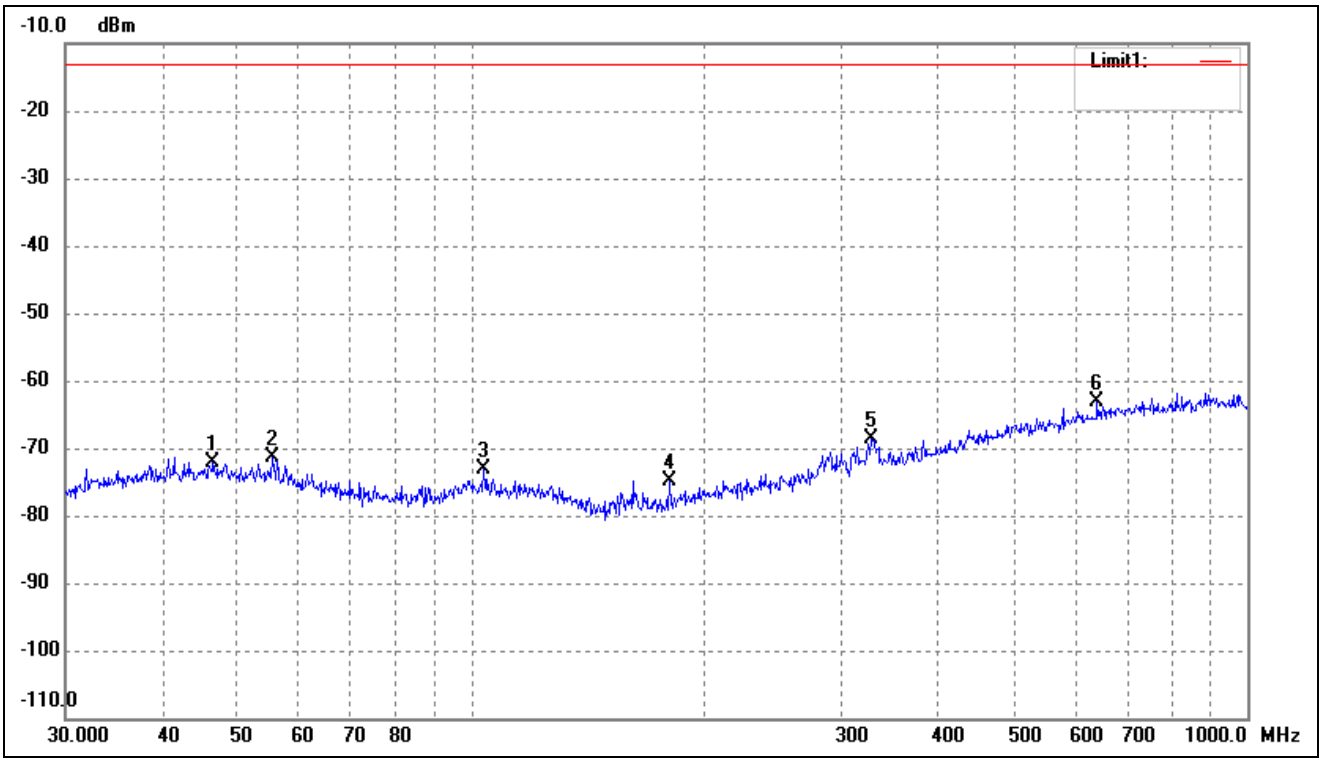
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	( )	(cm)	
1	44.2752	-76.84	4.82	-72.02	-13.00	-59.02	-	-	peak
2	55.8047	-76.14	4.00	-72.14	-13.00	-59.14	-	-	peak
3	99.8777	-76.26	3.05	-73.21	-13.00	-60.21	-	-	peak
4	157.0074	-75.11	-0.49	-75.60	-13.00	-62.60	-	-	peak
5	276.1236	-76.42	4.21	-72.21	-13.00	-59.21	-	-	peak
6	520.8882	-76.38	10.86	-65.52	-13.00	-52.52	-	-	peak

Test Channel	band 5	Polarity:	Vertical



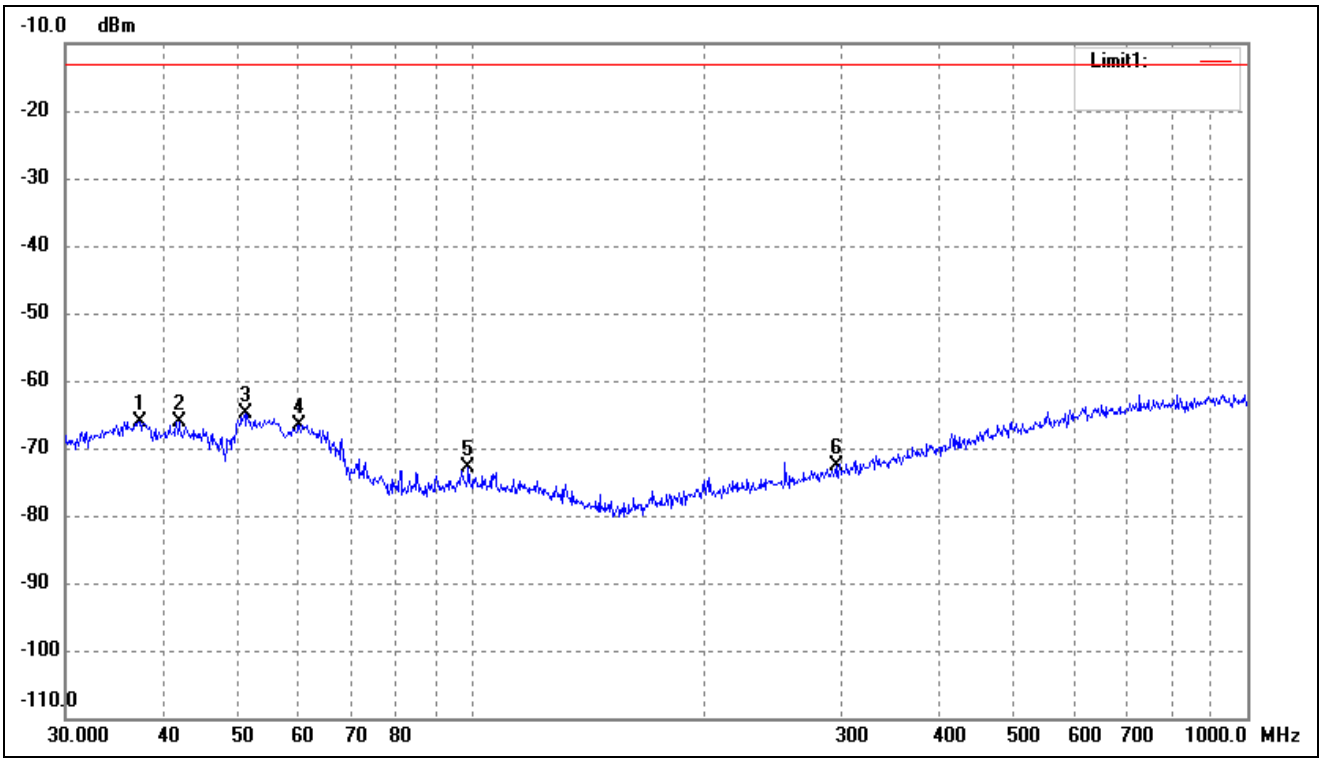
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	( )	(cm)	
1	36.8953	-69.80	4.04	-65.76	-13.00	-52.76	-	-	peak
2	41.8596	-72.12	4.81	-67.31	-13.00	-54.31	-	-	peak
3	51.1209	-70.12	4.68	-65.44	-13.00	-52.44	-	-	peak
4	60.0691	-69.52	3.36	-66.16	-13.00	-53.16	-	-	peak
5	81.2117	-73.56	1.09	-72.47	-13.00	-59.47	-	-	peak
6	234.9909	-76.25	3.06	-73.19	-13.00	-60.19	-	-	peak

Test Channel	band 4	Polarity:	Horizontal



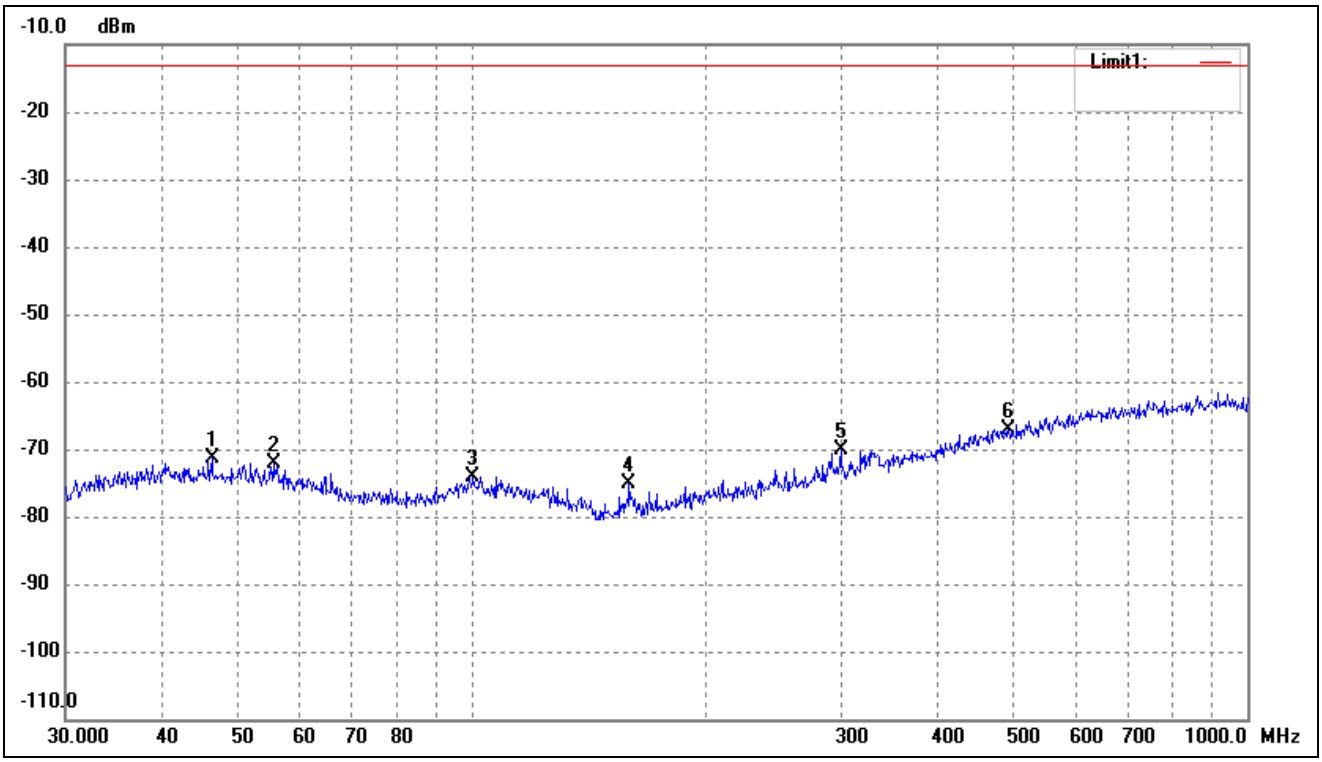
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	( )	(cm)	
1	46.5030	-77.00	4.82	-72.18	-13.00	-59.18	-	-	peak
2	55.4147	-75.36	4.05	-71.31	-13.00	-58.31	-	-	peak
3	103.8055	-76.01	3.01	-73.00	-13.00	-60.00	-	-	peak
4	180.0165	-75.31	0.52	-74.79	-13.00	-61.79	-	-	peak
5	327.8873	-74.34	5.72	-68.62	-13.00	-55.62	-	-	peak
6	640.6110	-75.67	12.62	-63.05	-13.00	-50.05	-	-	peak

Test Channel	band 4	Polarity:	Vertical



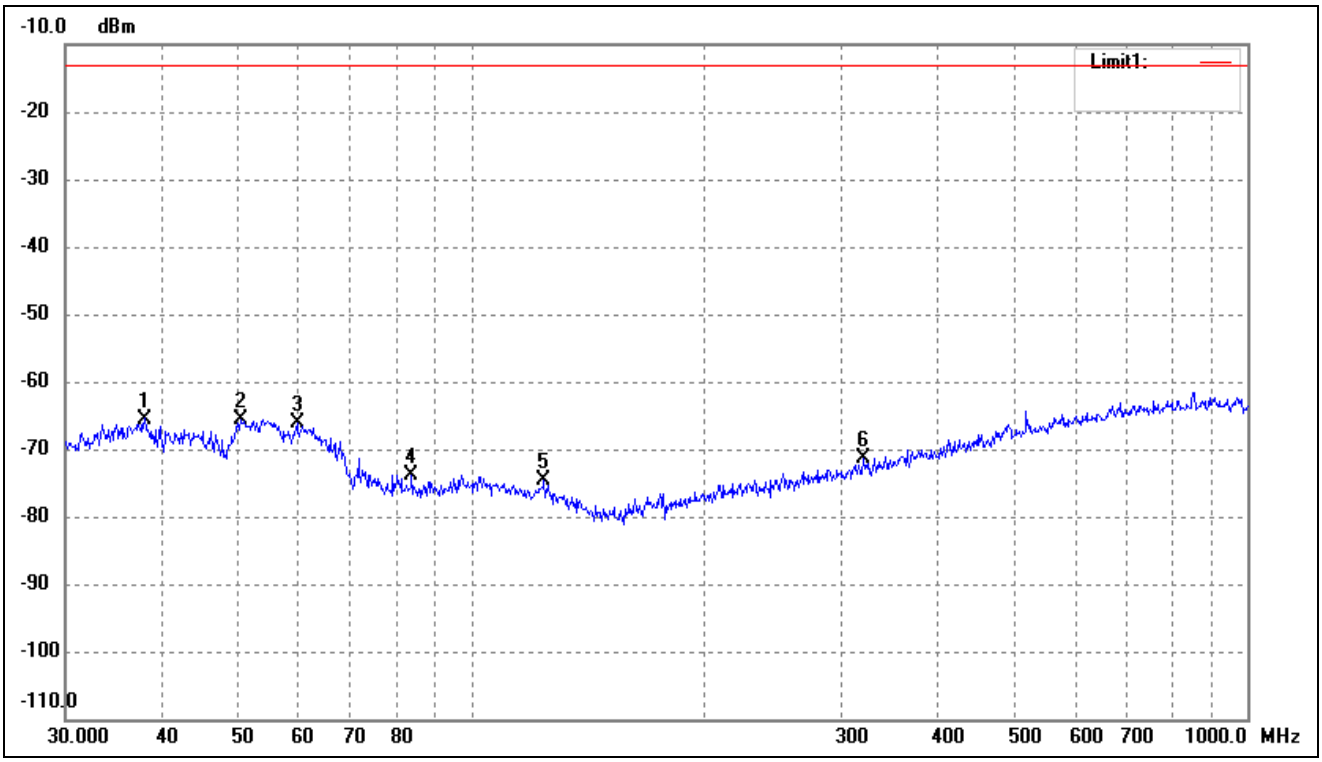
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	( )	(cm)	
1	37.4165	-70.19	4.17	-66.02	-13.00	-53.02	-	-	peak
2	42.0066	-70.83	4.81	-66.02	-13.00	-53.02	-	-	peak
3	51.1209	-69.51	4.68	-64.83	-13.00	-51.83	-	-	peak
4	60.0691	-70.03	3.36	-66.67	-13.00	-53.67	-	-	peak
5	99.1797	-75.88	2.92	-72.96	-13.00	-59.96	-	-	peak
6	295.1469	-77.45	4.71	-72.74	-13.00	-59.74	-	-	peak

Test Channel	band 2	Polarity:	Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	( )	(cm)	
1	46.3402	-76.21	4.83	-71.38	-13.00	-58.38	-	-	peak
2	55.6094	-76.02	4.02	-72.00	-13.00	-59.00	-	-	peak
3	100.5806	-77.24	3.07	-74.17	-13.00	-61.17	-	-	peak
4	159.7844	-74.80	-0.37	-75.17	-13.00	-62.17	-	-	peak
5	299.3158	-74.88	4.82	-70.06	-13.00	-57.06	-	-	peak
6	492.4685	-77.39	10.31	-67.08	-13.00	-54.08	-	-	peak

Test Channel	band 2	Polarity:	Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	( )	(cm)	
1	37.9450	-69.80	4.30	-65.50	-13.00	-52.50	-	-	peak
2	50.4089	-70.48	4.78	-65.70	-13.00	-52.70	-	-	peak
3	59.6493	-69.50	3.43	-66.07	-13.00	-53.07	-	-	peak
4	83.8156	-74.96	1.13	-73.83	-13.00	-60.83	-	-	peak
5	124.1330	-76.07	1.44	-74.63	-13.00	-61.63	-	-	peak
6	319.9370	-76.83	5.46	-71.37	-13.00	-58.37	-	-	peak

Note: Margin= (Reading+ Correct)- Limit

Remark: '-'Means' the test Degree and Height are not recorded by the test software and only show the worst case in the test report.

- Spurious Emissions Above 1GHz
- For WCDMA Band V Mode

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (826.4MHz)						
1652.8	-34.23	4.94	-29.29	-13	-16.29	H
2479.2	-43.75	8.46	-35.29	-13	-22.29	H
1652.8	-37.68	4.94	-32.74	-13	-19.74	V
2479.2	-44.73	8.46	-36.27	-13	-23.27	V
Middle Channel (836.6MHz)						
1672.8	-35.63	5.11	-30.52	-13	-17.52	H
2509.2	-43.6	8.54	-35.06	-13	-22.06	H
1672.8	-34.69	5.11	-29.58	-13	-16.58	V
2509.2	-42.58	8.54	-34.04	-13	-21.04	V
High Channel (846.6MHz)						
1693.2	-35.42	5.25	-30.17	-13	-17.17	H
2539.8	-44.11	8.57	-35.54	-13	-22.54	H
1693.2	-36.17	5.25	-30.92	-13	-17.92	V
2539.8	-42.81	8.57	-34.24	-13	-21.24	V

- For WCDMA Band II Mode

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (1852.4MHz)						
3704.8	-34.61	10.54	-24.07	-13	-11.07	H
5557.2	-39.06	13.37	-25.69	-13	-12.69	H
3704.8	-33.29	10.54	-22.75	-13	-9.75	V
5557.2	-39.33	13.37	-25.96	-13	-12.96	V
Middle Channel (1880MHz)						
3760.8	-35.27	10.64	-24.63	-13	-11.63	H
5640.0	-40.28	13.54	-26.74	-13	-13.74	H
3760.8	-34.19	10.64	-23.55	-13	-10.55	V
5640.0	-39.68	13.54	-26.14	-13	-13.14	V
High Channel (1907.6MHz)						
3815.2	-33.06	10.74	-22.32	-13	-9.32	H
5722.8	-42.05	13.71	-28.34	-13	-15.34	H
3815.2	-34.04	10.74	-23.3	-13	-10.3	V
5722.8	-41.3	13.71	-27.59	-13	-14.59	H

➢ For WCDMA Band IV Mode

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (1712.4MHz)						
3424.8	-41.57	8.65	-32.92	-13	-19.92	H
5137.2	-47.69	12.03	-35.66	-13	-22.66	H
3424.8	-40.47	8.65	-31.82	-13	-18.82	V
5137.2	-48.56	12.03	-36.53	-13	-23.53	V
Middle Channel (1732.4MHz)						
3466.8	-42.77	8.91	-33.86	-13	-20.86	H
5200.2	-48.86	12.29	-36.57	-13	-23.57	H
3466.8	-41	8.91	-32.09	-13	-19.09	V
5200.2	-49.3	12.29	-37.01	-13	-24.01	V
High Channel (1752.6MHz)						
3505.2	-40.73	9.11	-31.62	-13	-18.62	H
5257.8	-48.42	12.56	-35.86	-13	-22.86	H
3505.2	-39.2	9.11	-30.09	-13	-17.09	V
5257.8	-48.31	12.56	-35.75	-13	-22.75	H

Note: Result=Reading+ Correct, Margin= Result- Limit

Note: Testing is carried out with frequency rang 9kHz to the tenth harmonics, other than listed in the table above are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

8. Frequency Stability

8.1 Standard Applicable

According to §22.355, §24.235 the limit is 2.5ppm.

8.2 Test Procedure

According to §2.1055, the following test procedure was performed.
The Frequency Stability is measured directly with a Frequency Domain Analyzer. Frequency Deviation in ppm is calculated from the measured peak to peak value.
The Carrier Frequency Stability over Power Supply Voltage and over Temperature is measured with a Frequency Domain Analyzer in histogram mode.

8.3 Summary of Test Results/Plots

Please refer to Appendix E

9. Modulation characteristics

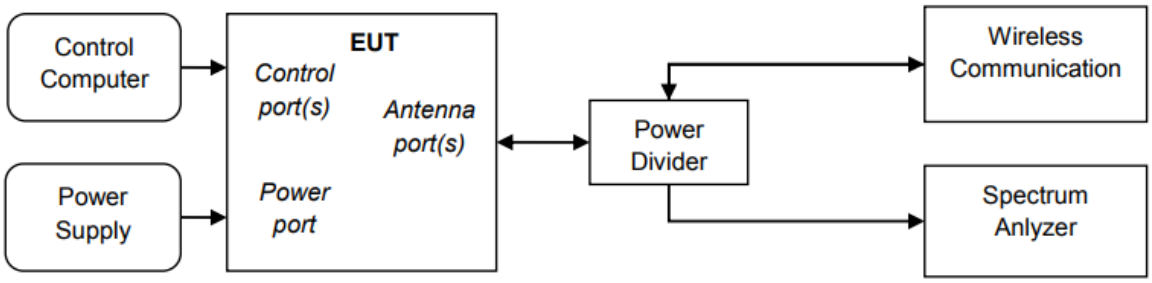
9.1 Standard Applicable

According to §2.1047, measurements required: Modulation characteristics is given below:

(a) Voice modulated communication equipment. A curve or equivalent data showing the frequency response of the audio modulating circuit over a range of 100 to 5000Hz shall be submitted. For equipment required to have an audio low-pass filter, a curve showing the frequency response of the filter, or of all circuitry installed between the modulation limiter and the modulated stage shall be submitted.
(b) Equipment which employs modulation limiting. A curve or family of curves showing the percentage of modulation versus the modulation input voltage shall be supplied. The information submitted shall be sufficient to show modulation limiting capability throughout the range of modulating frequencies and input modulating signal levels employed.
(c) Single sideband and independent sideband radiotelephone transmitters which employ a device or circuit to limit peak envelope power. A curve showing the peak envelope power output versus the modulation input voltage shall be supplied. The modulating signals shall be the same in frequency as specified in paragraph (c) of §2.1049 for the occupied bandwidth tests.
(d) Other types of equipment. A curve or equivalent data which shows that the equipment will meet the modulation requirements of the rules under which the equipment is to be licensed.

9.2 Test Procedure

According to ANSI C63.26-2015 section 5.3.2, the following test setup was performed.



9.3 Summary of Test Results/Plots

Only the worst case was selected to record.

Please refer to Appendix F

APPENDIX SUMMARY

Project No.	WTX21X12139297W	Test Engineer	BAIdi
Start date	2021-12-15	Finish date	2021-12-20
Temperature	24℃	Humidity	48%
RF specifications	WCDMA		

APPENDIX	Description of Test Item	Result
A	RF Output Power	Compliant
B	Peak-to-average Ratio (PAR) of Transmitter	Compliant
C	Emission Bandwidth	Compliant
D	Out of Band Emissions at Antenna Terminal	Compliant
E	Frequency Stability	Compliant
F	Modulation characteristics	Compliant

APPENDIX A

Conducted Average power

Conducted Average power (dBm)						
Band	WCDMA Band V			WCDMA Band II		
Channel	4132	4183	4233	9262	9400	9538
Frequency(MHz)	826.4	836.6	846.6	1852.4	1880.0	1907.6
RMC 12.2k	22.67	22.71	22.67	22.12	21.93	21.47
HSDPA Subtest-1	21.51	21.55	21.63	21.79	21.43	20.92
HSDPA Subtest-2	21.46	21.52	21.61	21.75	21.41	20.89
HSDPA Subtest-3	21.48	21.53	21.62	21.76	21.42	20.87
HSDPA Subtest-4	21.49	21.54	21.63	21.75	21.42	20.89
HSUPA Subtest-1	21.01	21.15	21.13	21.29	20.99	20.45
HSUPA Subtest-2	21.00	21.13	21.10	21.23	20.96	20.43
HSUPA Subtest-3	21.96	21.14	21.09	21.24	20.93	20.41
HSUPA Subtest-4	21.97	21.12	21.08	21.24	20.94	20.42
HSUPA Subtest-5	21.98	21.12	21.09	21.25	20.95	20.42

Conducted Average power (dBm)						
Band	WCDMA Band IV					
Channel	1312	1412	1513			
Frequency(MHz)	1712.4	1733.4	1752.6			
RMC 12.2k	22.87	22.93	22.79			
HSDPA Subtest-1	21.62	21.61	21.70			
HSDPA Subtest-2	21.59	21.58	21.66			
HSDPA Subtest-3	21.58	21.57	21.67			
HSDPA Subtest-4	21.57	21.56	21.68			
HSUPA Subtest-1	21.15	21.24	21.24			
HSUPA Subtest-2	21.13	21.22	21.23			
HSUPA Subtest-3	21.12	21.23	21.20			
HSUPA Subtest-4	21.12	21.21	21.20			
HSUPA Subtest-5	21.13	21.22	21.19			

APPENDIX B

Peak-to-average Ratio (PAR) of Transmitter

WCDMA Band IV				
Test Mode	Channel	Frequency (MHz)	PAR (dB)	Limit (dB)
WCDMA	1312	1712.4	6.69	13
	1412	1733.4	5.71	13
	1513	1752.6	5.93	13

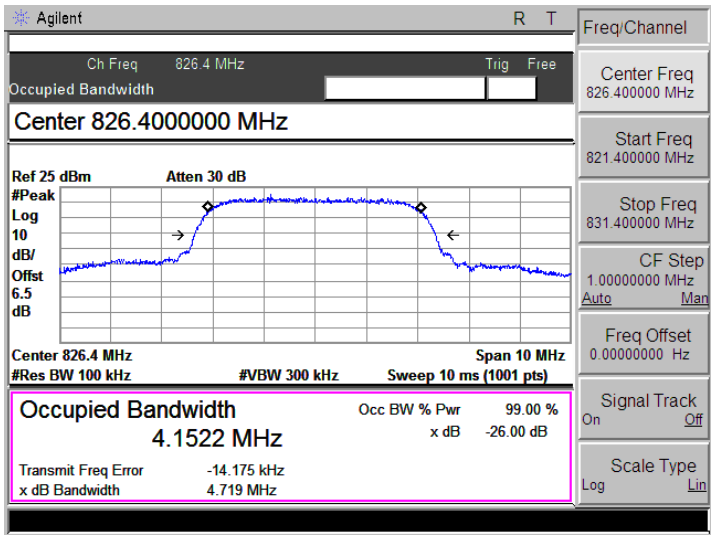
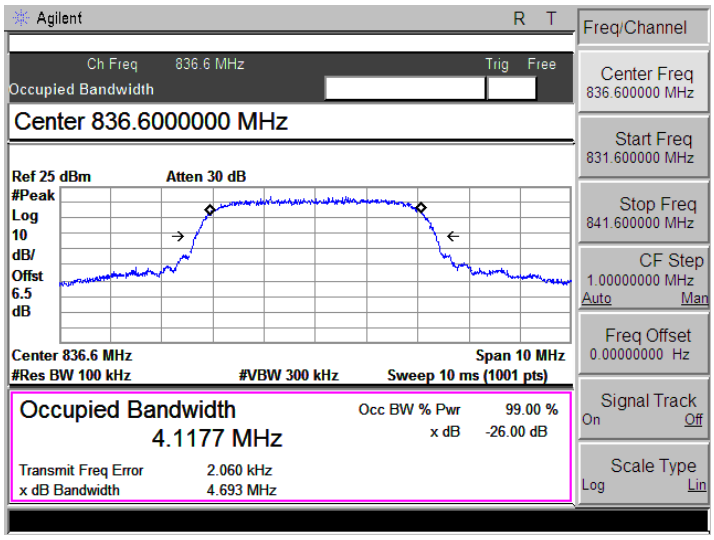
WCDMA Band II				
Test Mode	Channel	Frequency (MHz)	PAR (dB)	Limit (dB)
WCDMA	9262	1852.4	6.06	13
	9400	1880.0	6.54	13
	9538	1907.6	6.13	13

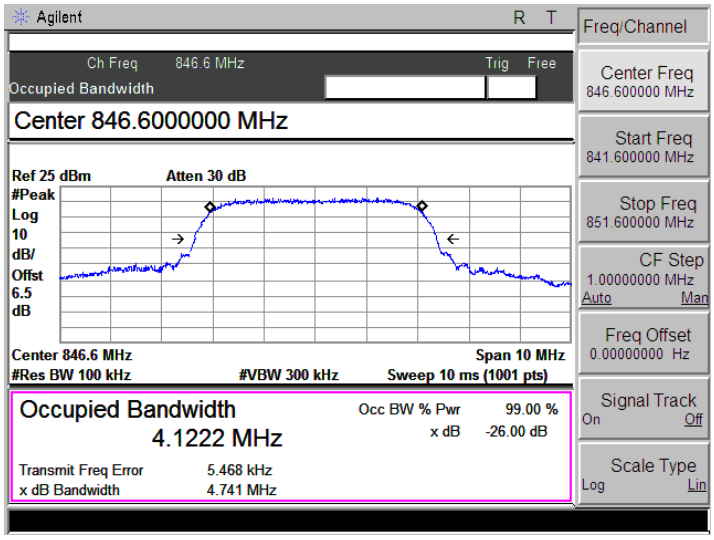
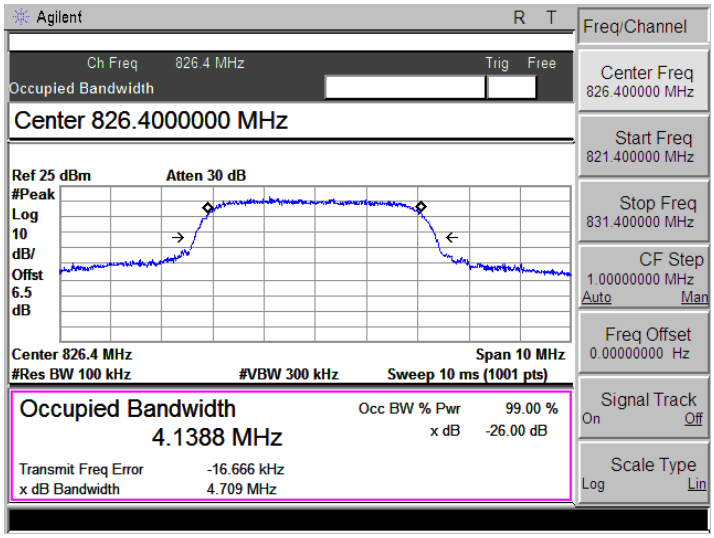
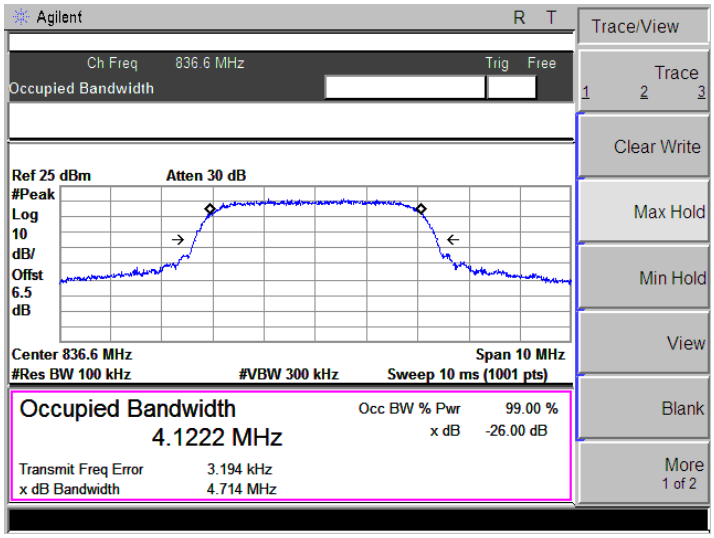
Note: Only the worst case was selected to record.

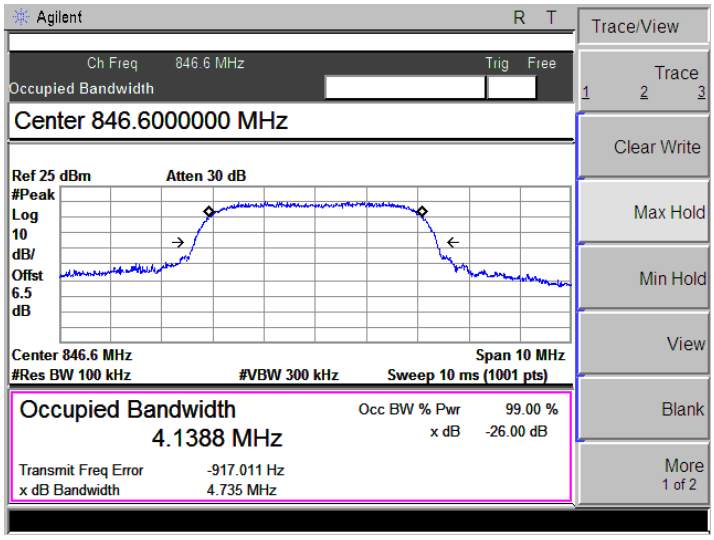
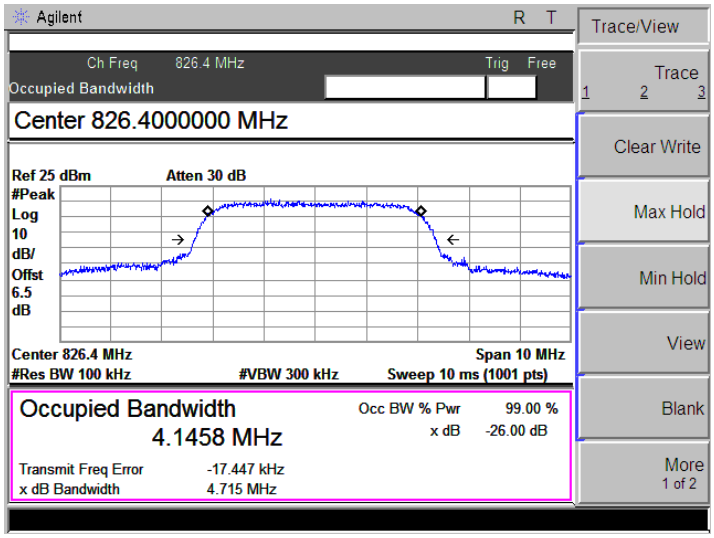
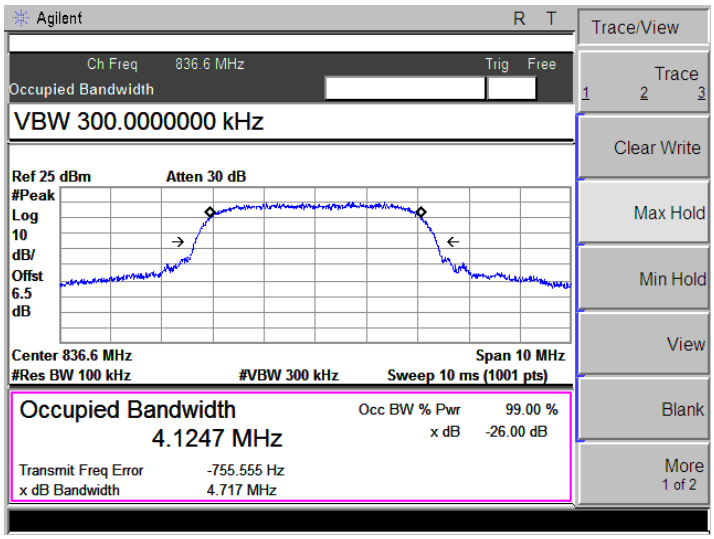
APPENDIX C

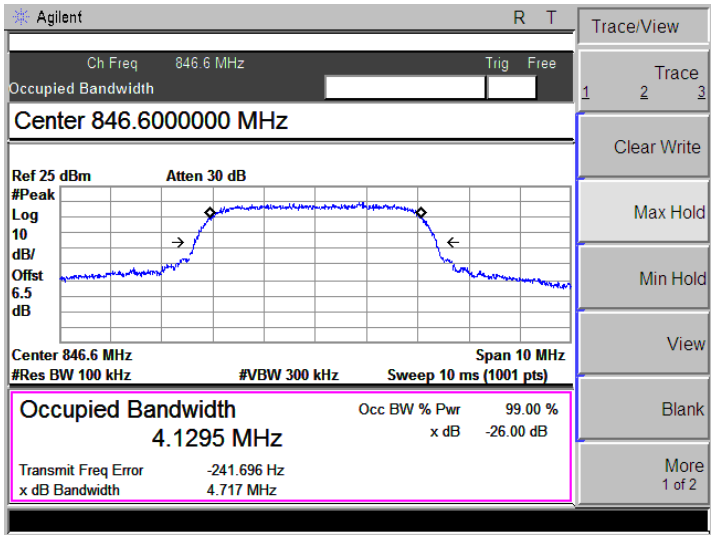
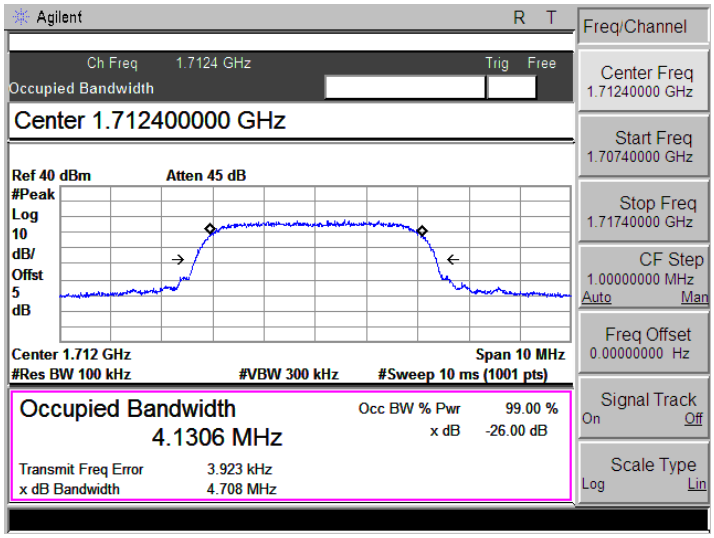
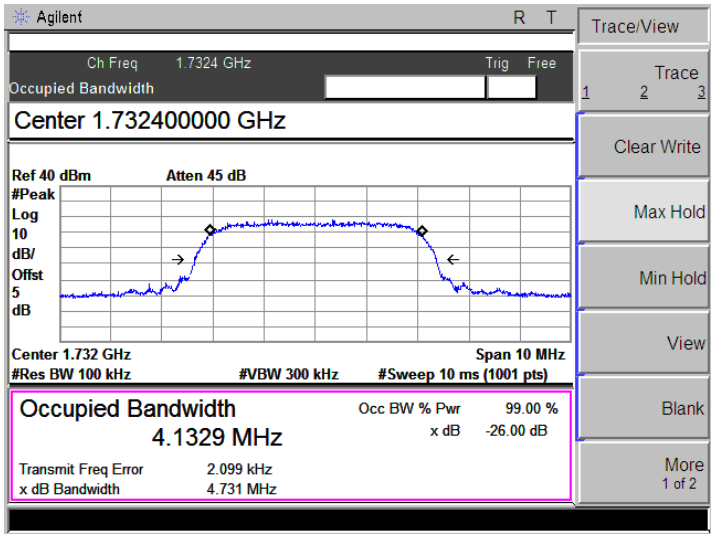
EUT Mode	Channel	Frequency (MHz)	99% Occupy bandwidth (kHz)	-26dB bandwidth (kHz)
WCDMA Band V	4132	826.40	4152.2	4719
	4183	836.60	4117.7	4693
	4233	846.60	4122.2	4741
HSDPA	4132	826.40	4138.8	4709
	4183	836.60	4122.2	4714
	4233	846.60	4138.8	4735
HSUPA	4132	826.40	4145.8	4715
	4183	836.60	4124.7	4717
	4233	846.60	4129.5	4717
WCDMA Band II	9262	1852.40	4143.7	4722
	9400	1880.00	4139.1	4707
	9538	1907.60	4145.2	4774
HSDPA	9262	1852.40	4146.6	4731
	9400	1880.00	4130.8	4710
	9538	1907.60	4163.9	4735
HSUPA	9262	1852.40	4138.8	4730
	9400	1880.00	4137.6	4676
	9538	1907.60	4156.7	4751
WCDMA Band IV	1312	1712.4	4130.6	4708
	1412	1733.4	4132.9	4731
	1513	1752.6	4133.8	4726
HSDPA	1312	1712.4	4136.3	4719
	1412	1733.4	4129.1	4708
	1513	1752.6	4144.0	4729
HSUPA	1312	1712.4	4128.4	4705

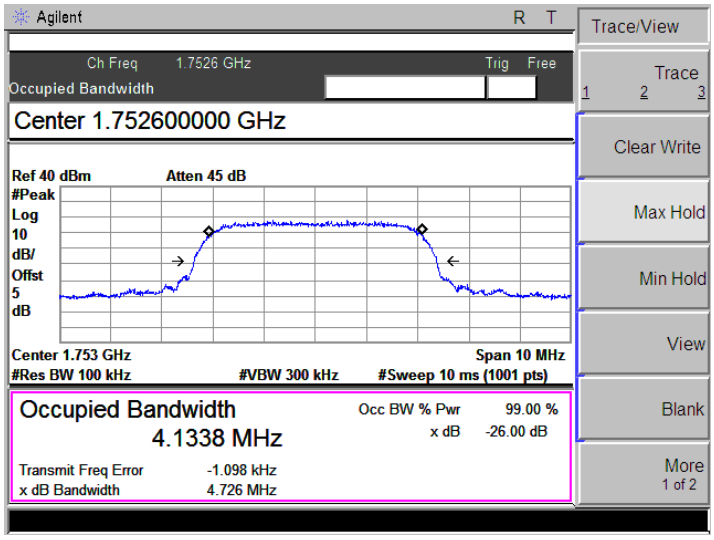
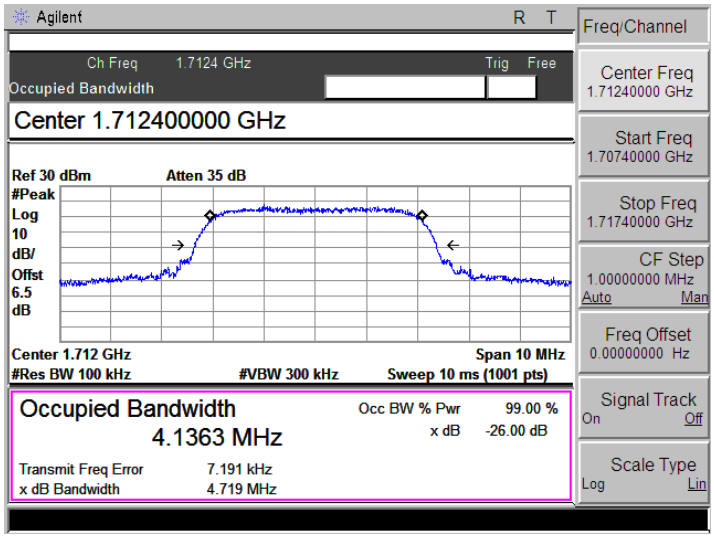
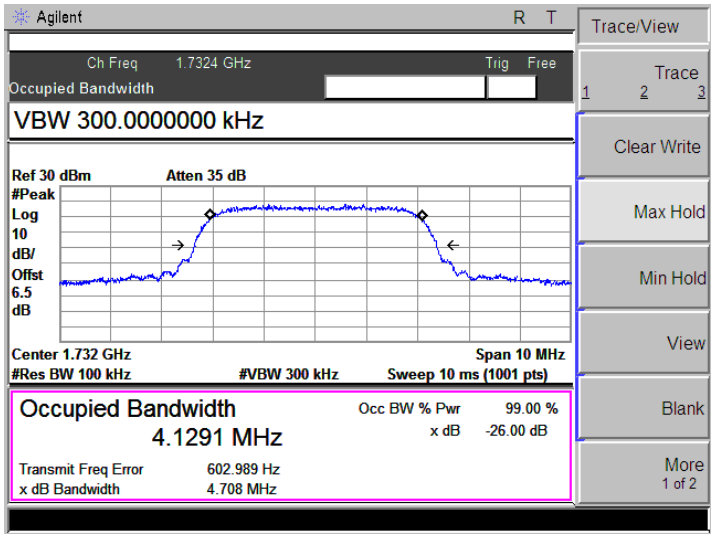
	1412	1733.4	4128.1	4706
	1513	1752.6	4143.1	4731

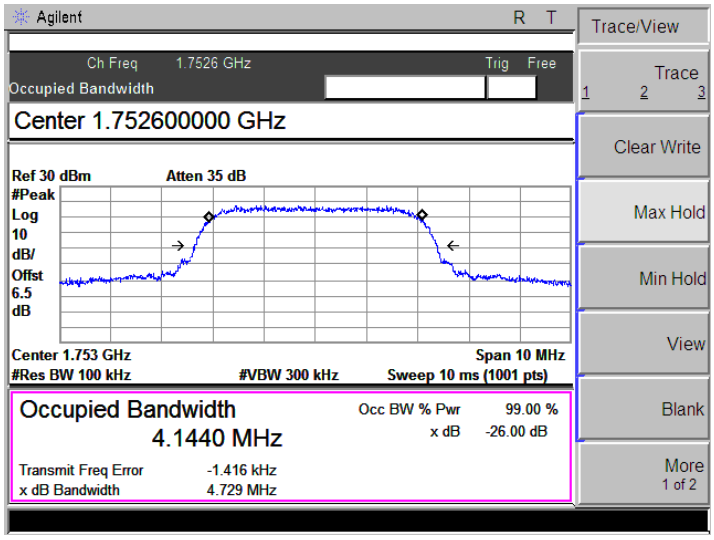
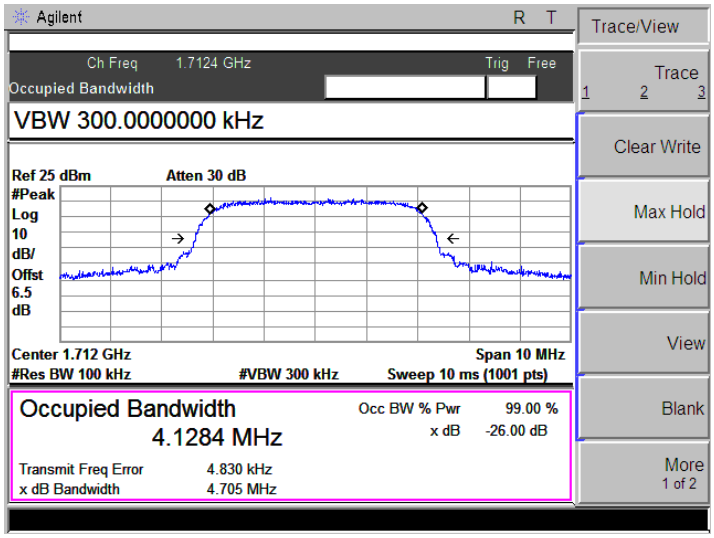
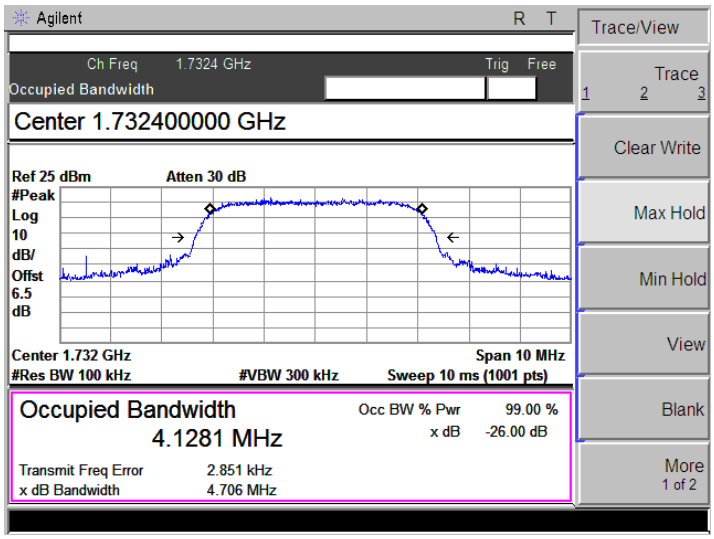
WCDMA Band V-Low	
WCDMA Band V-Middle	

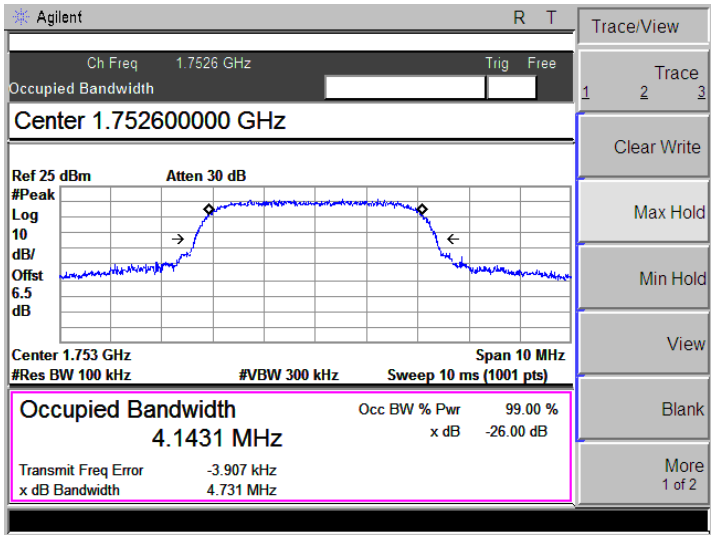
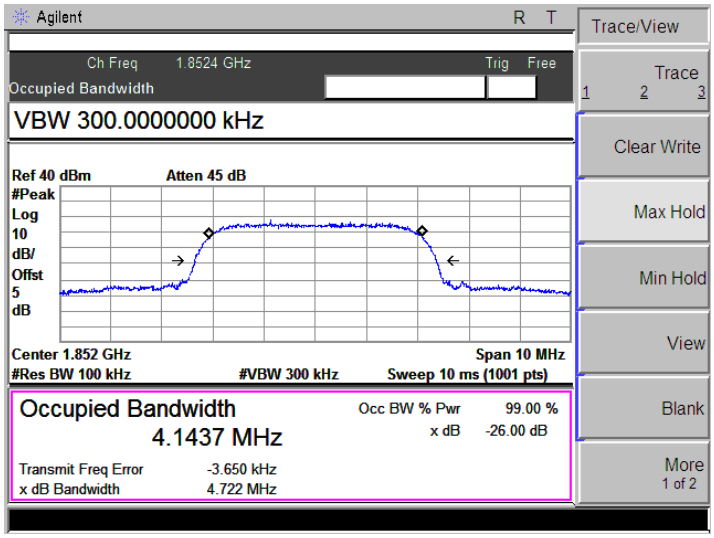
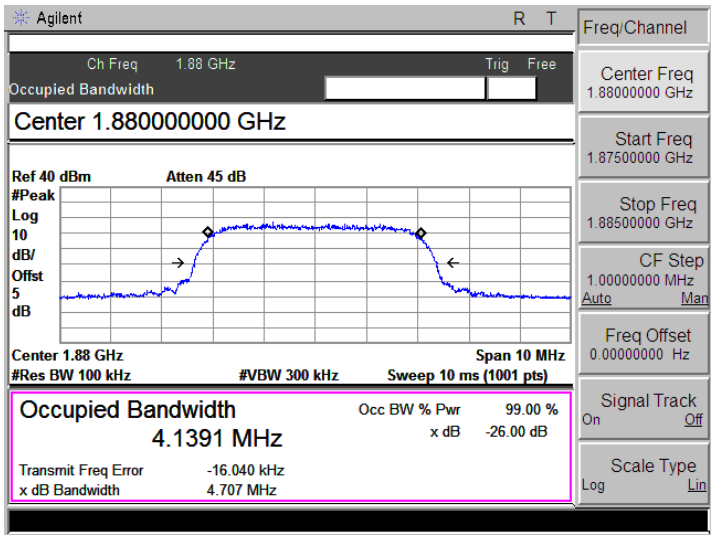
WCDMA Band V-High	
HSDPA-Low	
HSDPA-Middle	

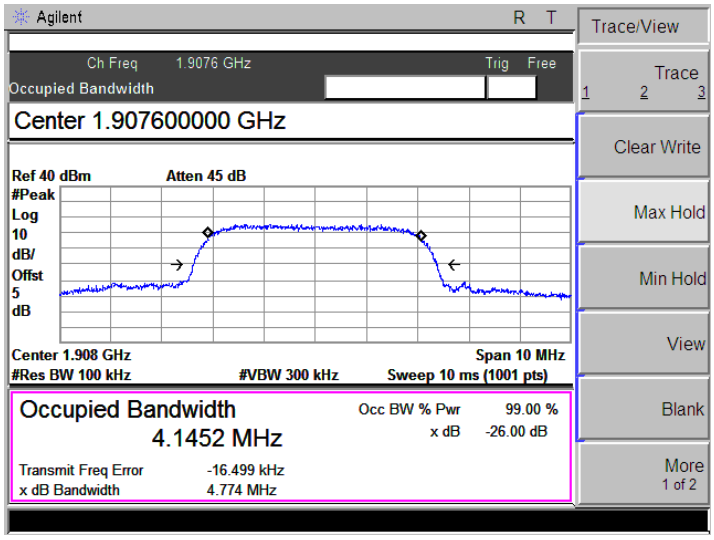
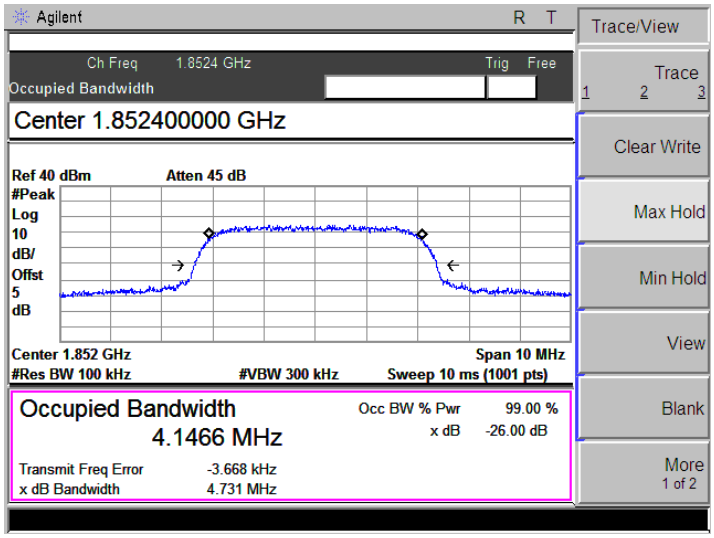
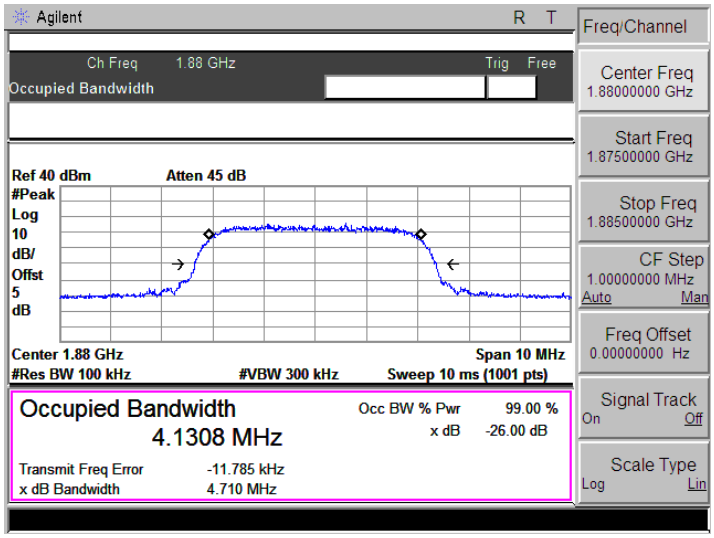
HSDPA-High	
HSUPA-Low	
HSUPA-Middle	

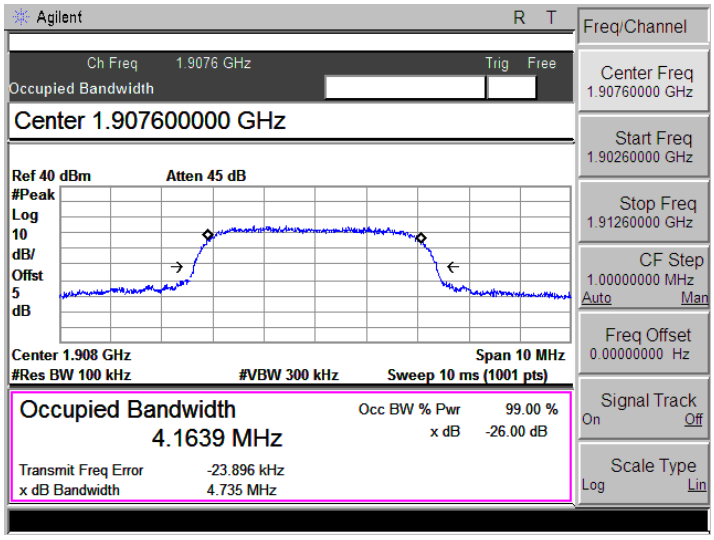
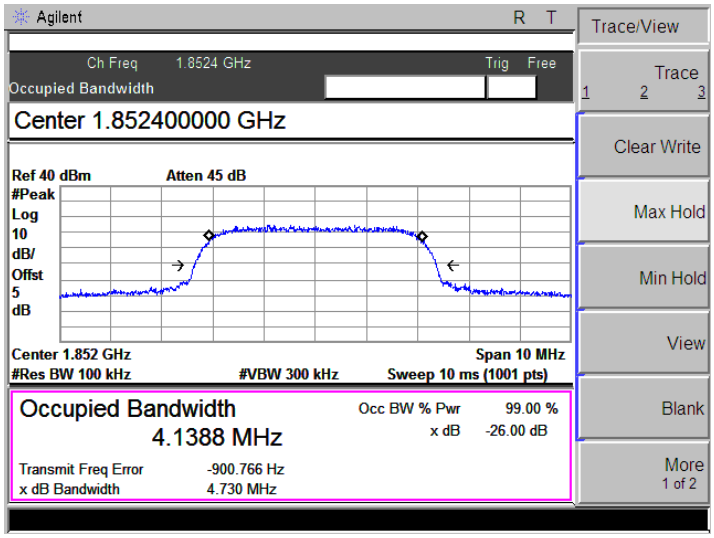
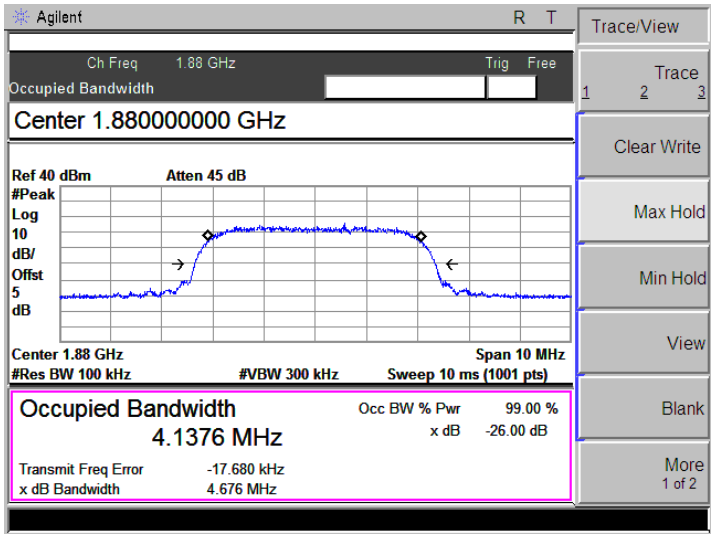
HSUPA-High	
WCDMA Band IV-Low	
WCDMA Band IV-Middle	

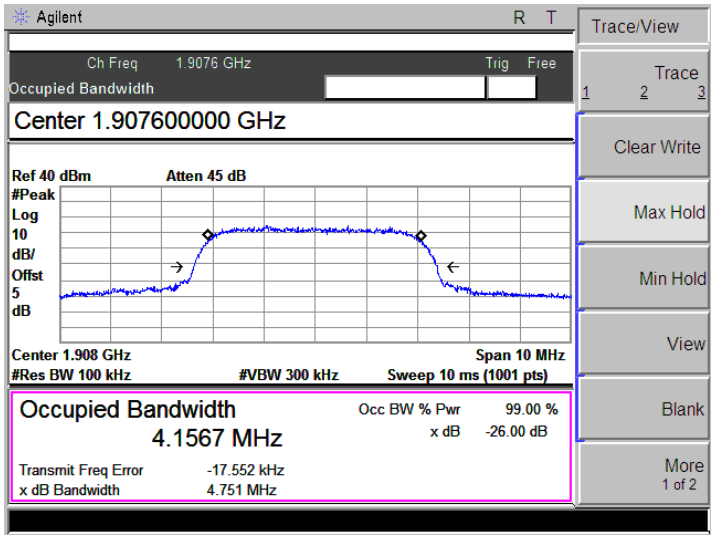
WCDMA Band IV-High	
HSDPA-Low	
HSDPA-Middle	

HSDPA-High	
HSUPA-Low	
HSUPA-Middle	

HSUPA-High	
WCDMA Band II-Low	
WCDMA Band II-Middle	

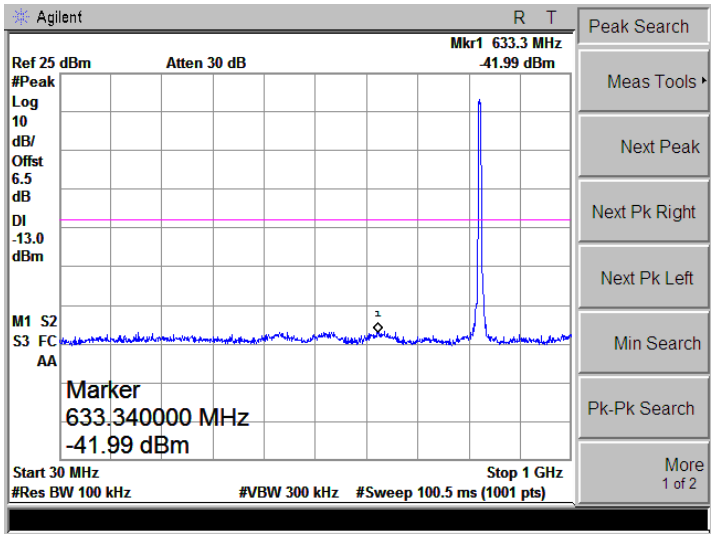
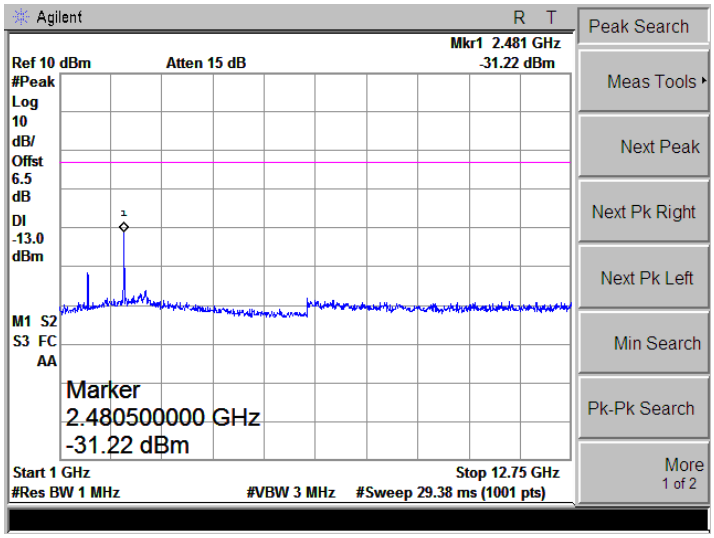
WCDMA Band II-High	
HSDPA-Low	
HSDPA-Middle	

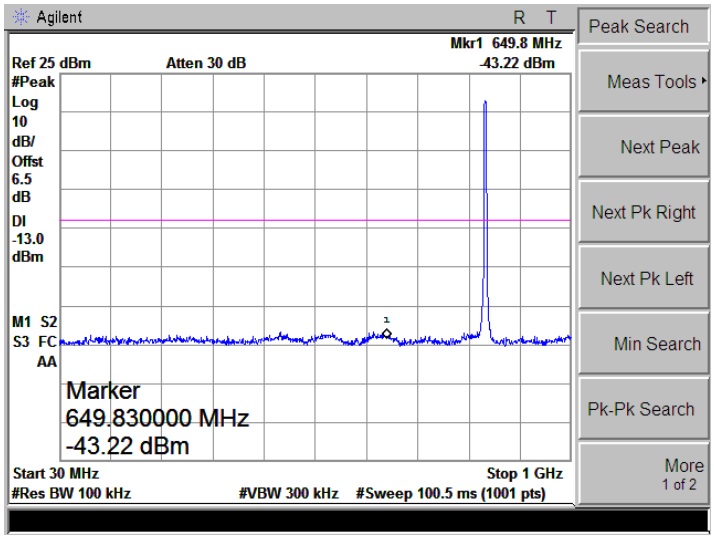
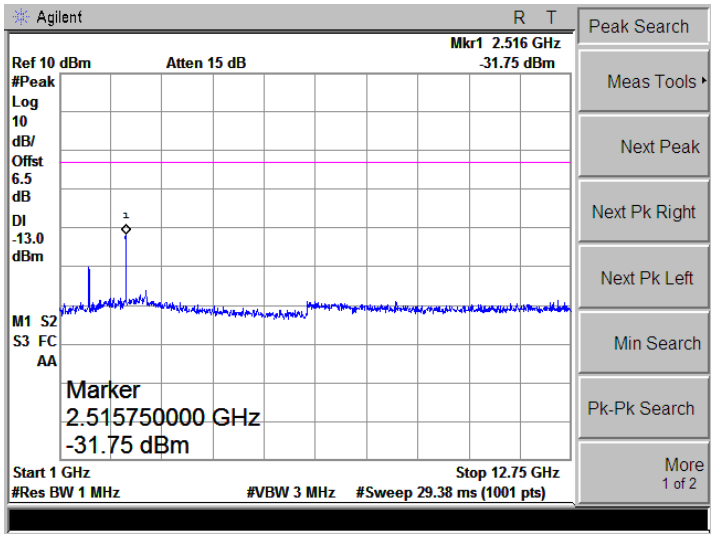
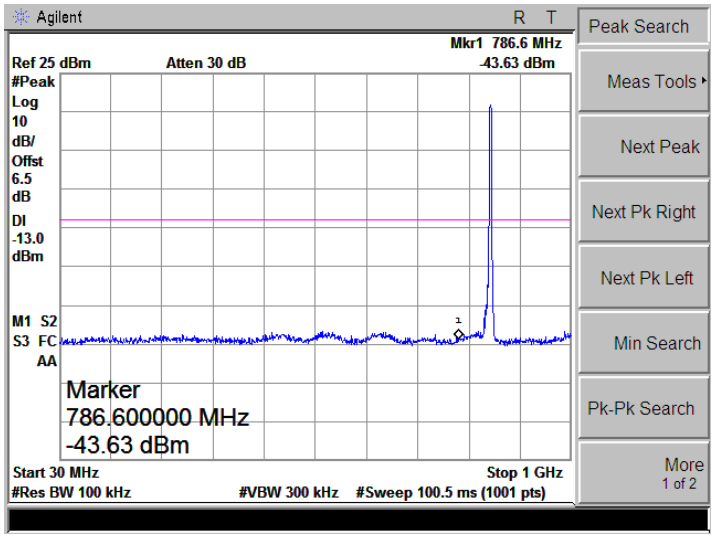
HSDPA-High	
HSUPA-Low	
HSUPA-Middle	

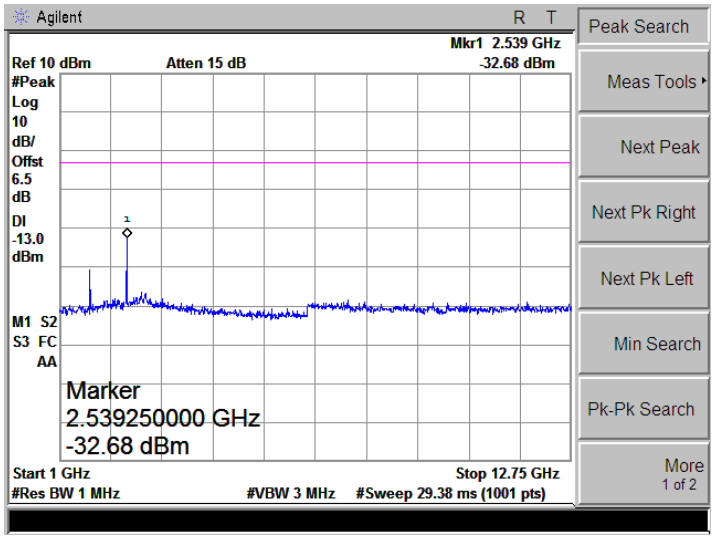
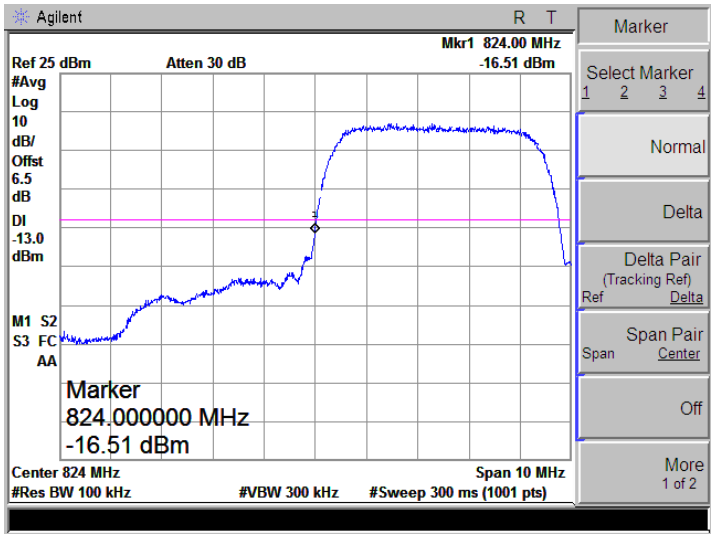
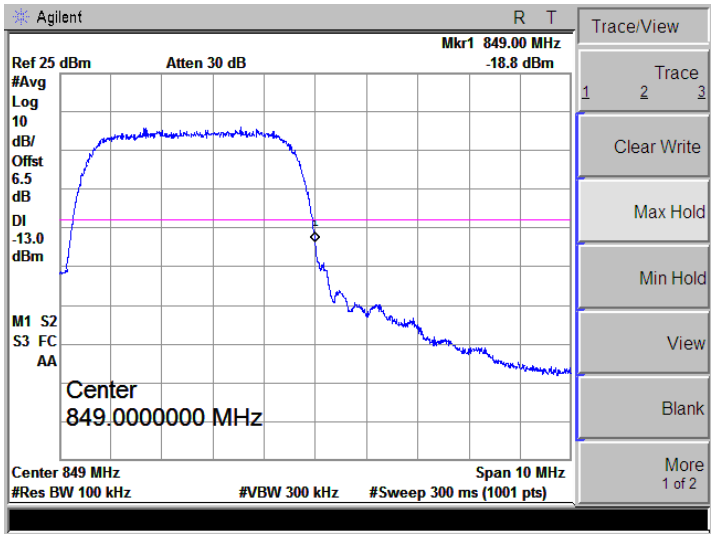
HSUPA-High	 Agilent R T Trace/View Ch Freq 1.9076 GHz Trig Free Occupied Bandwidth Trace 1 2 3 Center 1.907600000 GHz Clear Write Ref 40 dBm Atten 45 dB #Peak Log 10 dB/ Offst 5 dB Max Hold Min Hold View Center 1.908 GHz Span 10 MHz #Res BW 100 kHz #VBW 300 kHz Sweep 10 ms (1001 pts) Occupied Bandwidth 4.1567 MHz Occ BW % Pwr 99.00 % x dB -26.00 dB Blank Transmit Freq Error -17.552 kHz x dB Bandwidth 4.751 MHz More 1 of 2

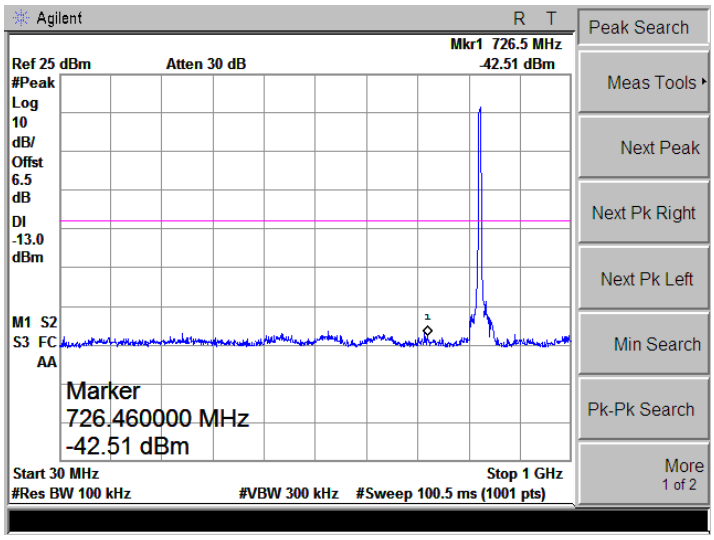
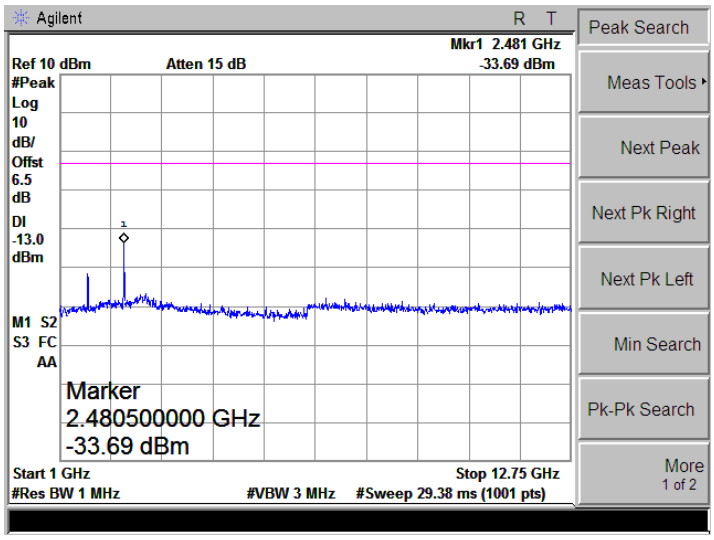
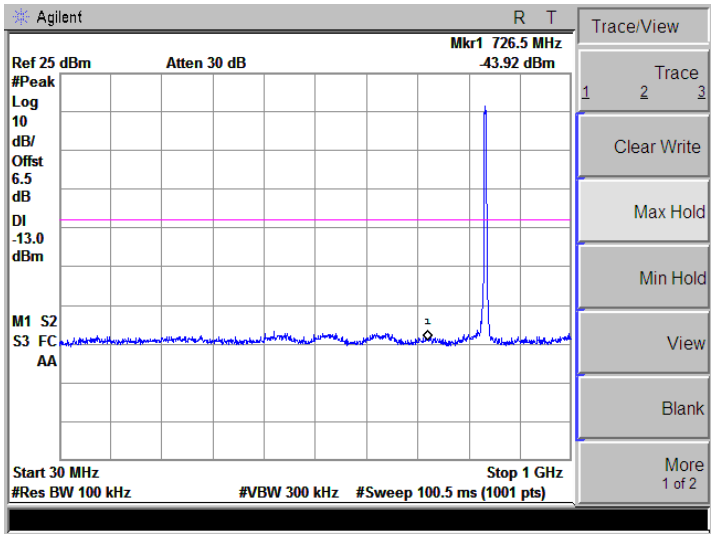
APPENDIX D

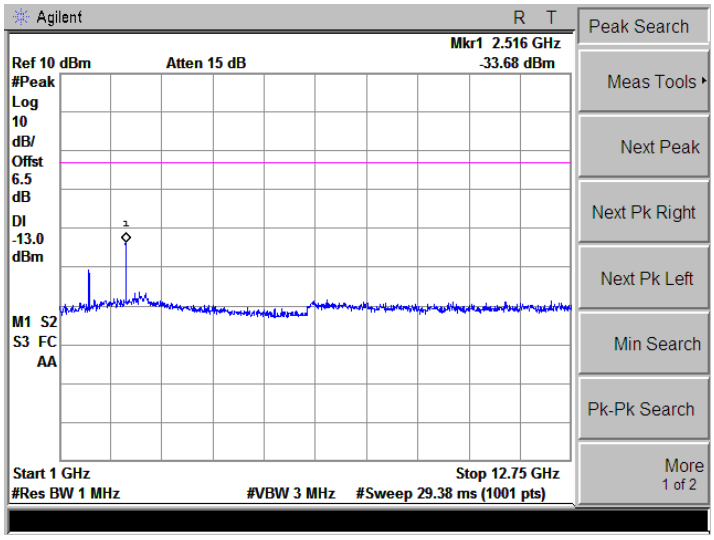
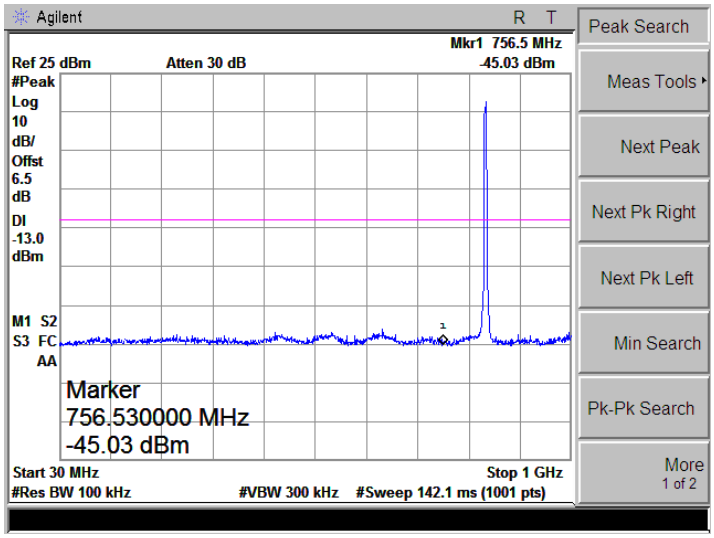
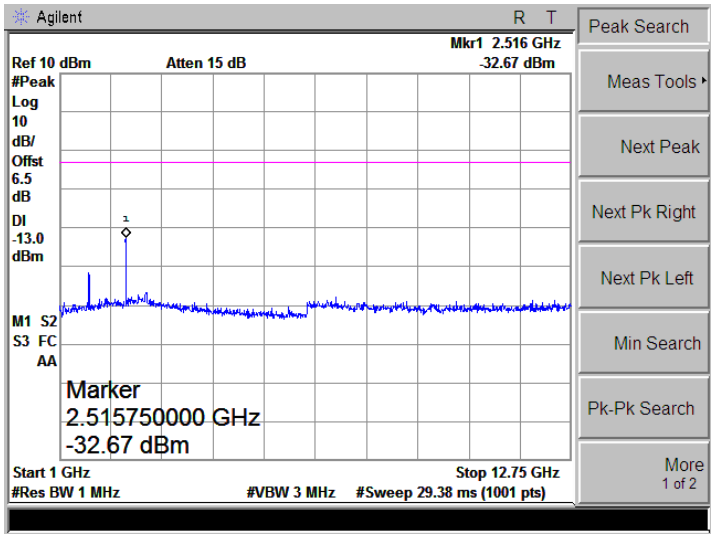
Out of Band Emissions at Antenna Terminal

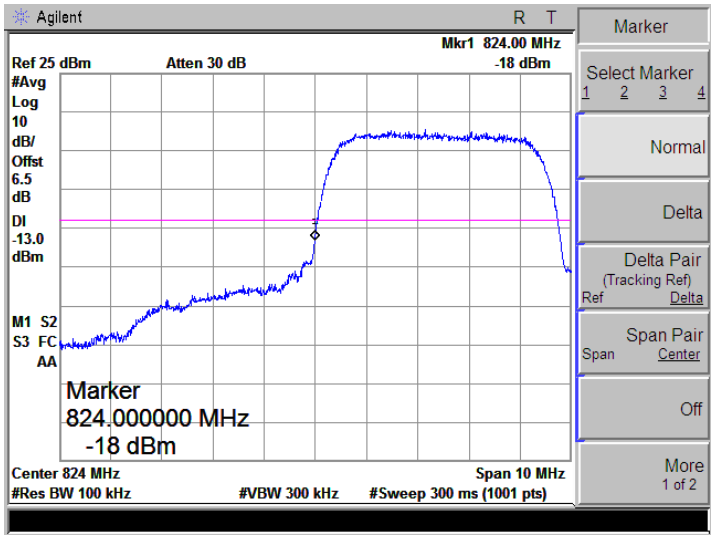
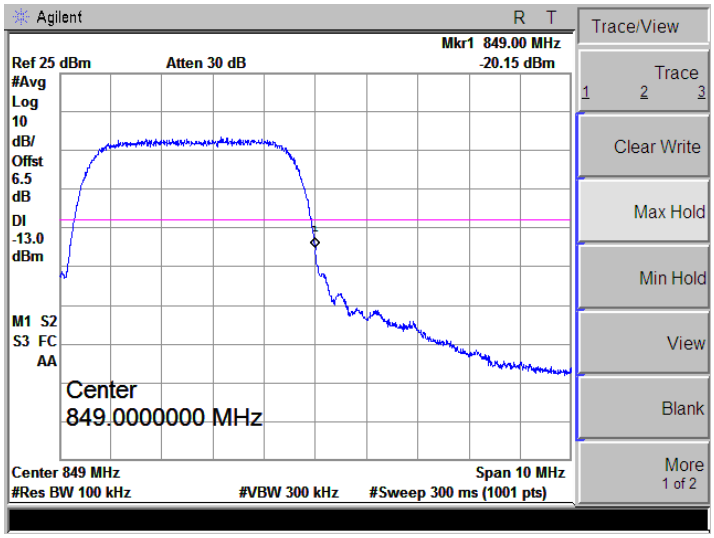
WCDMA Band V-Low	
	

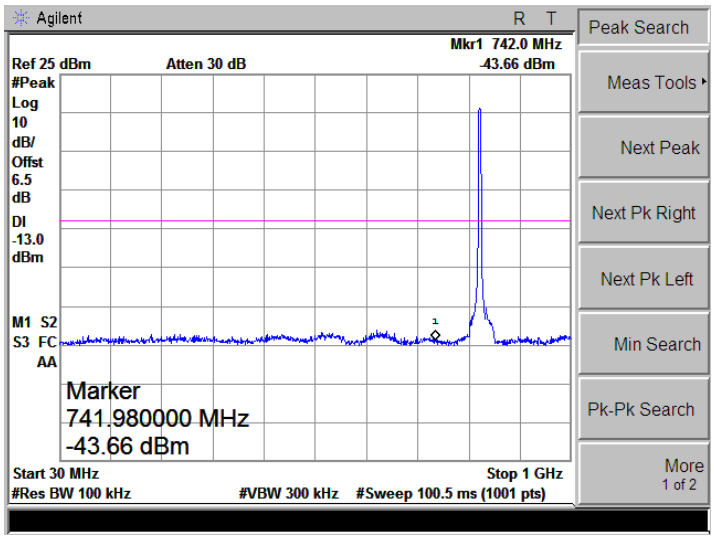
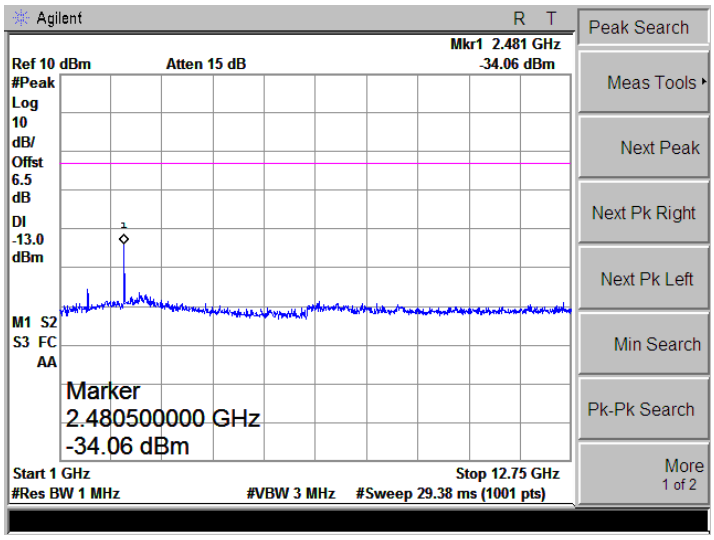
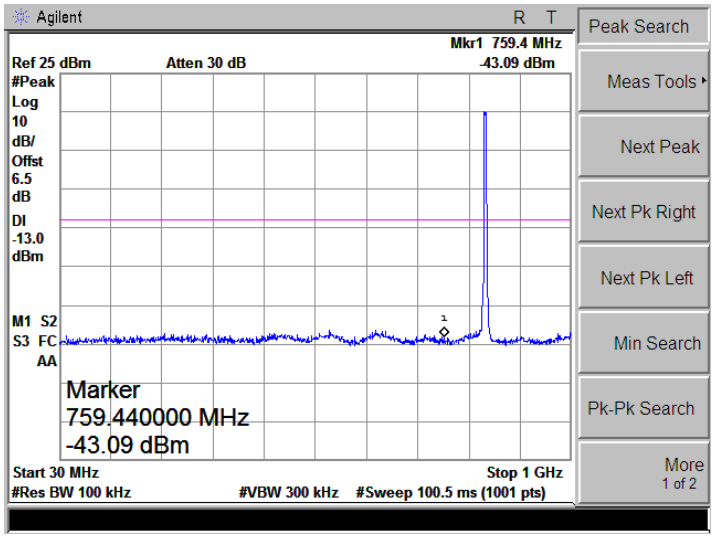
WCDMA Band V-Middle	
	
WCDMA Band V-High	

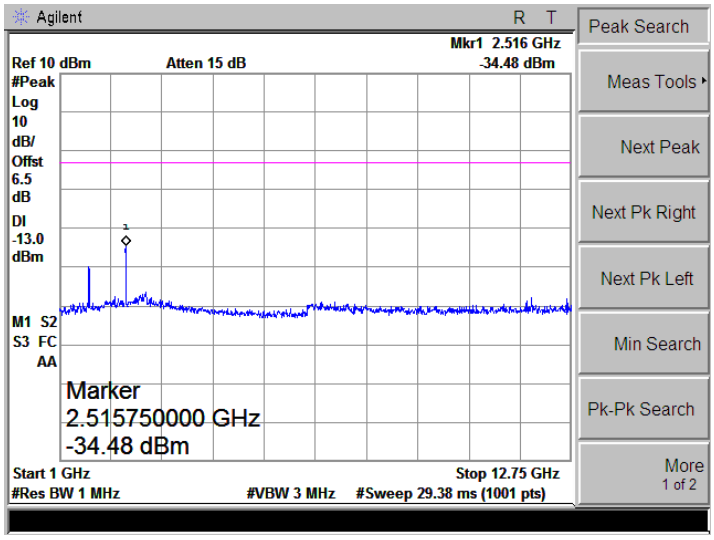
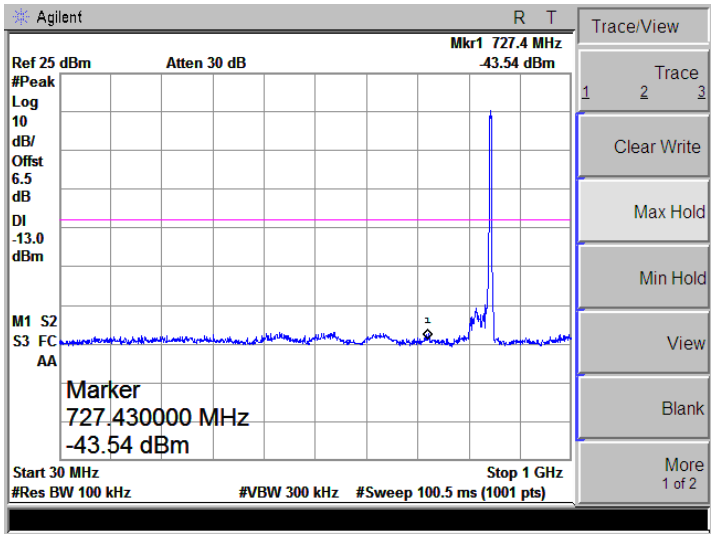
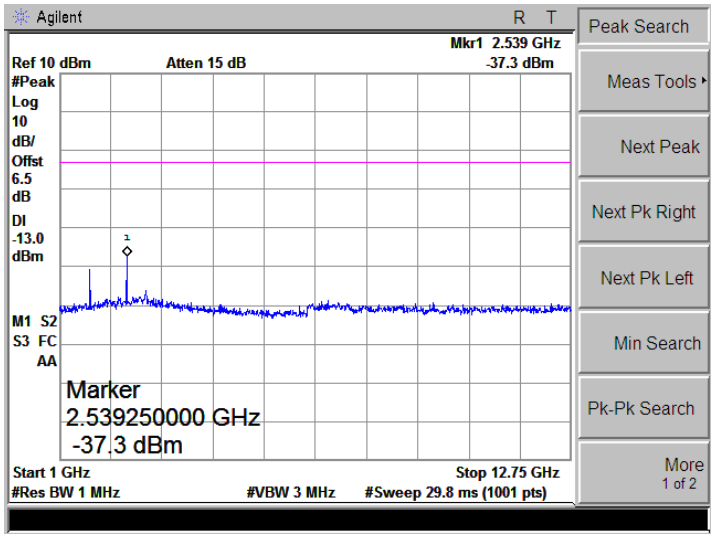
	 Agilent R T Mkr1 2.539 GHz Ref 10 dBm Atten 15 dB -32.68 dBm #Peak Log 10 dB/ Offst 6.5 dB Dl -13.0 dBm M1 S2 S3 FC AA Marker 2.539250000 GHz -32.68 dBm Start 1 GHz Stop 12.75 GHz #Res BW 1 MHz #VBW 3 MHz #Sweep 29.38 ms (1001 pts) Peak Search Meas Tools Next Peak Next Pk Right Next Pk Left Min Search Pk-Pk Search More 1 of 2
Bandedge	 Agilent R T Mkr1 824.00 MHz Ref 25 dBm Atten 30 dB -16.51 dBm #Avg Log 10 dB/ Offst 6.5 dB Dl -13.0 dBm M1 S2 S3 FC AA Marker 824.000000 MHz -16.51 dBm Center 824 MHz Span 10 MHz #Res BW 100 kHz #VBW 300 kHz #Sweep 300 ms (1001 pts) Marker Select Marker 1 2 3 4 Normal Delta Delta Pair (Tracking Ref) Ref Delta Span Pair Span Center Off More 1 of 2
	 Agilent R T Mkr1 849.00 MHz Ref 25 dBm Atten 30 dB -18.8 dBm #Avg Log 10 dB/ Offst 6.5 dB Dl -13.0 dBm M1 S2 S3 FC AA Center 849.0000000 MHz Center 849 MHz Span 10 MHz #Res BW 100 kHz #VBW 300 kHz #Sweep 300 ms (1001 pts) Trace/View Trace 1 2 3 Clear Write Max Hold Min Hold View Blank More 1 of 2

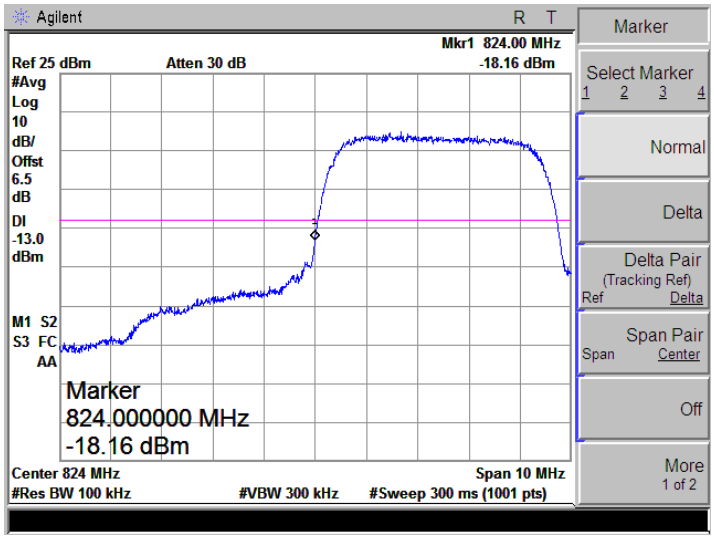
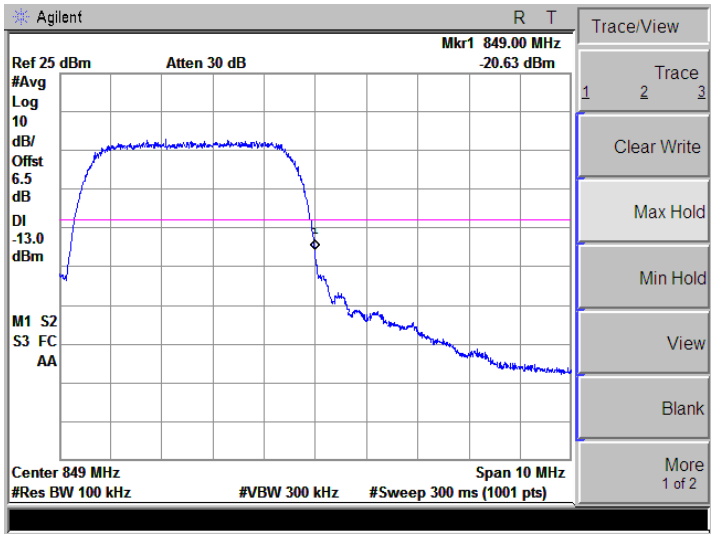
HSDPA Band V-Low	
	
HSDPA Band V-Middle	

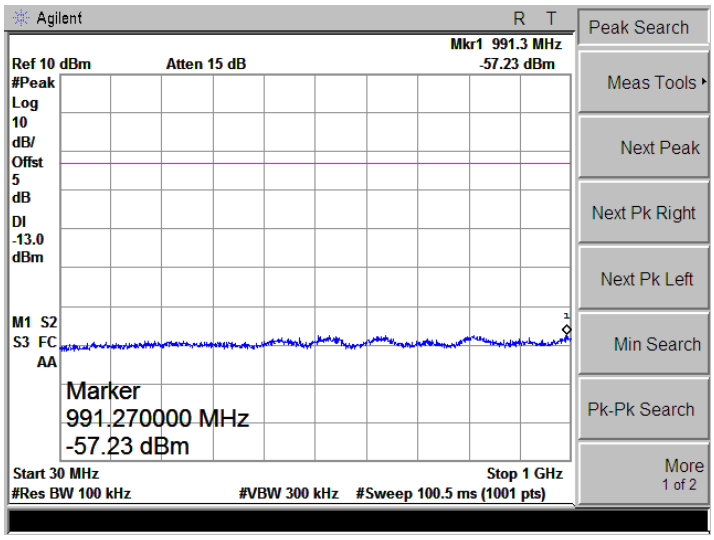
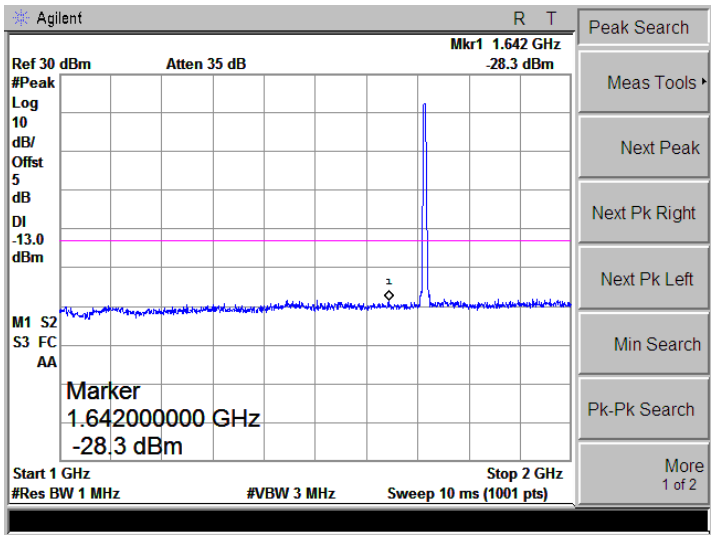
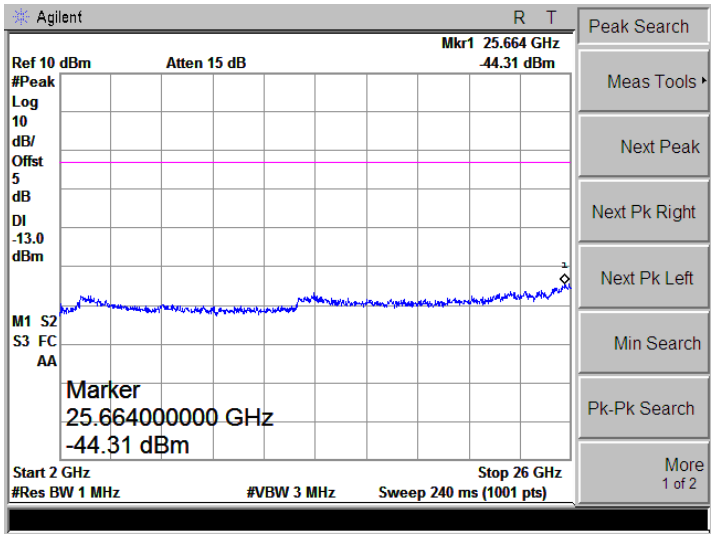
	
HSDPA Band V-High	
	

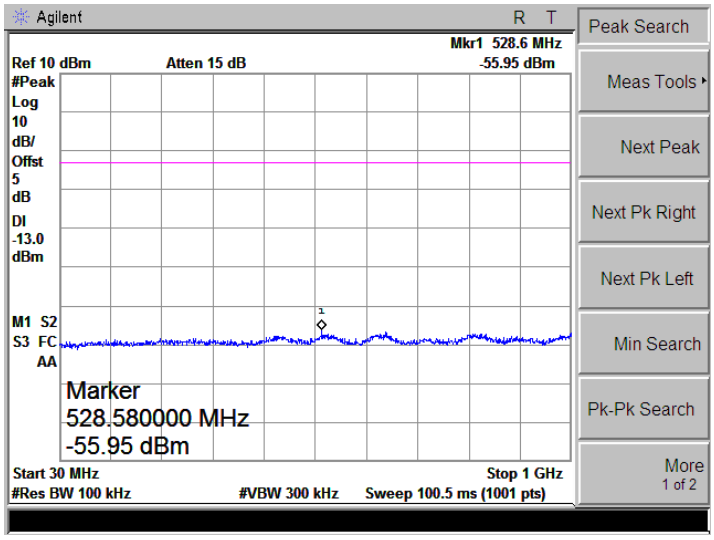
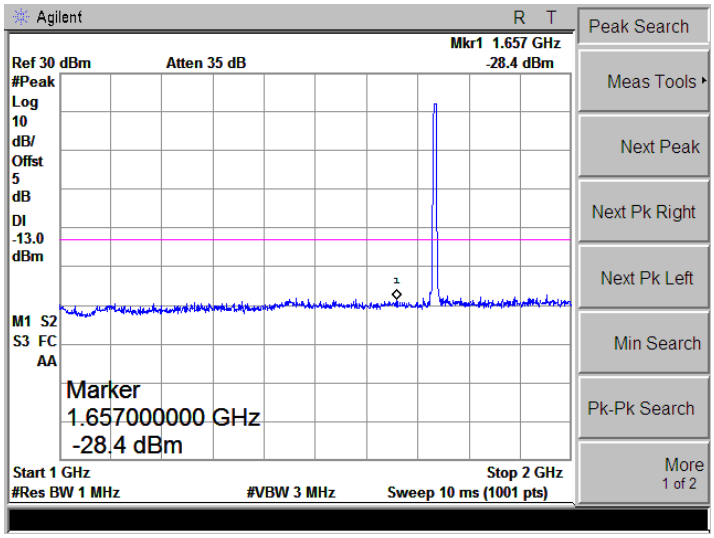
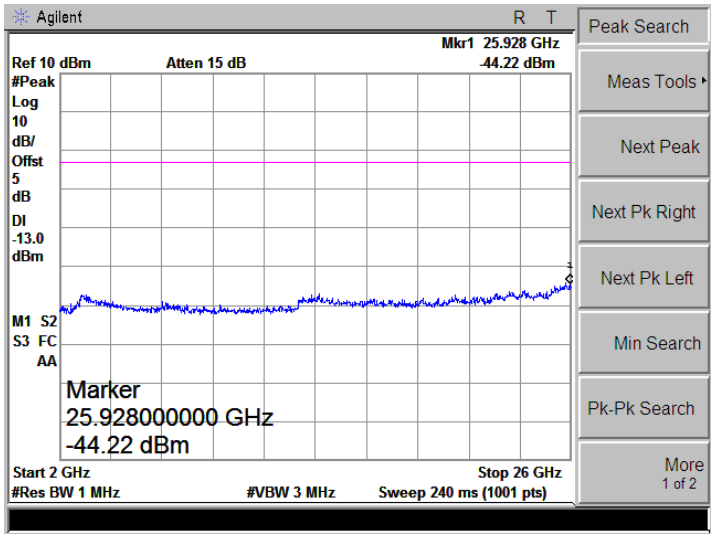
Bandedge	 Agilent R T Mkr1 824.00 MHz Ref 25 dBm Atten 30 dB -18 dBm #Avg Log 10 dB/ Offst 6.5 dB Dl -13.0 dBm M1 S2 S3 FC AA Marker 824.000000 MHz -18 dBm Center 824 MHz Span 10 MHz #Res BW 100 kHz #VBW 300 kHz #Sweep 300 ms (1001 pts) Marker Select Marker 1 2 3 4 Normal Delta Delta Pair (Tracking Ref) Ref Delta Span Pair Span Center Off More 1 of 2
	 Agilent R T Mkr1 849.00 MHz Ref 25 dBm Atten 30 dB -20.15 dBm #Avg Log 10 dB/ Offst 6.5 dB Dl -13.0 dBm M1 S2 S3 FC AA Center 849.0000000 MHz Center 849 MHz Span 10 MHz #Res BW 100 kHz #VBW 300 kHz #Sweep 300 ms (1001 pts) Trace/View Trace 1 2 3 Clear Write Max Hold Min Hold View Blank More 1 of 2

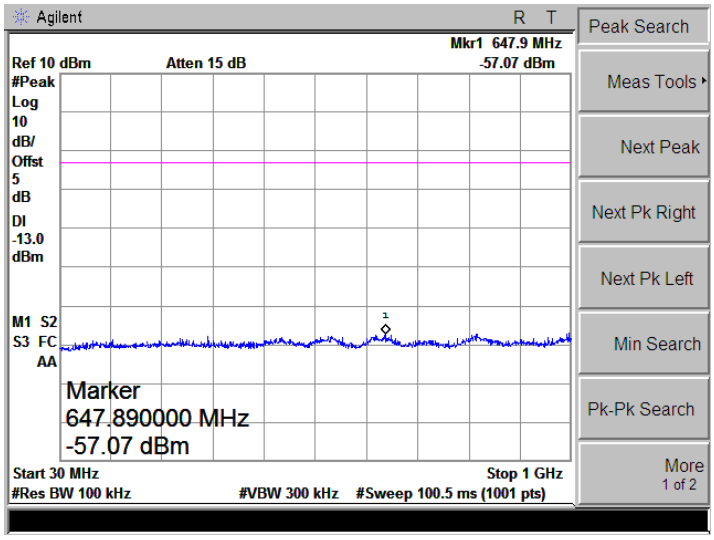
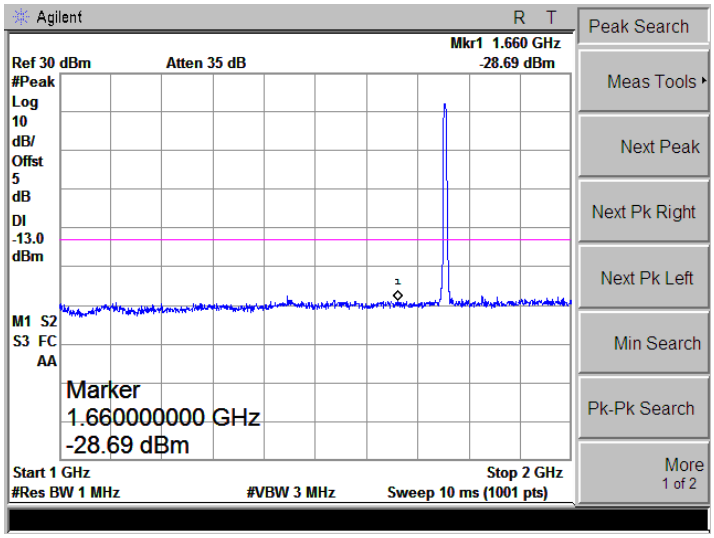
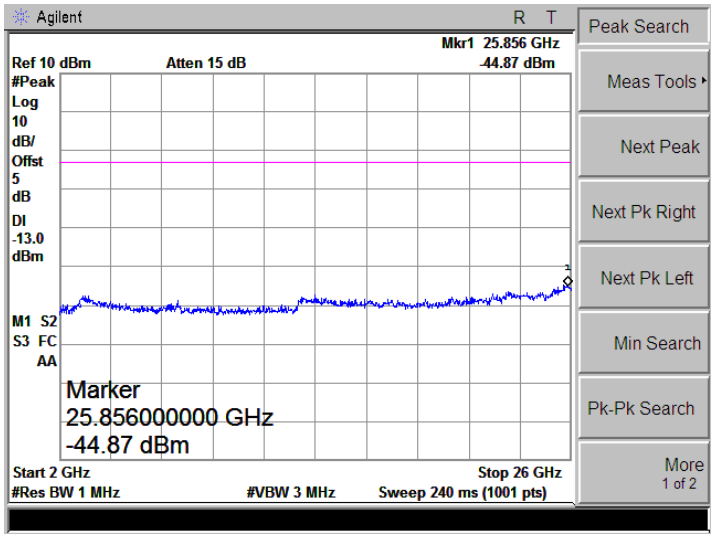
HSUPA Band V-Low	
	
HSUPA Band V-Middle	

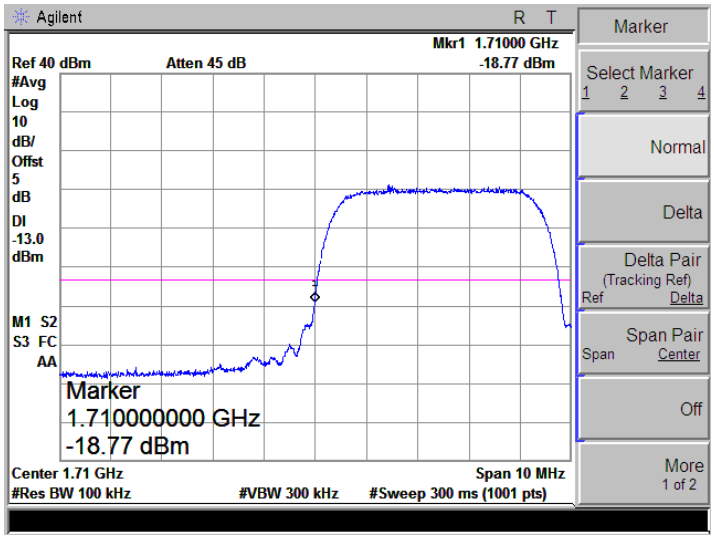
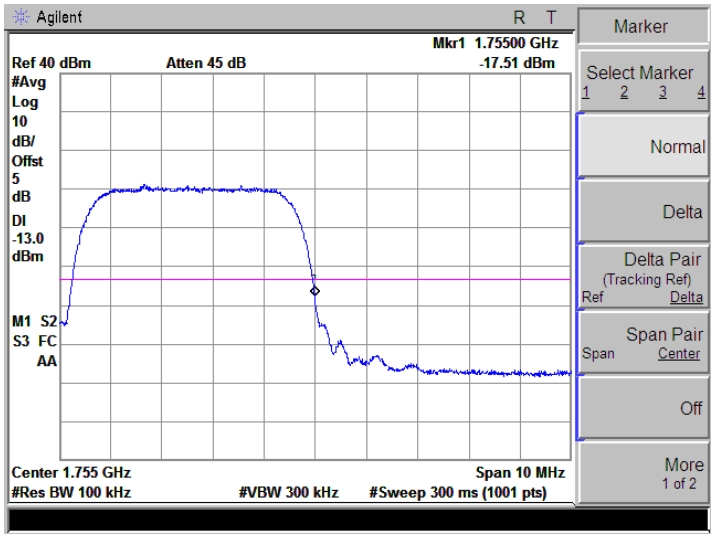
	
HSUPA Band V-High	
	

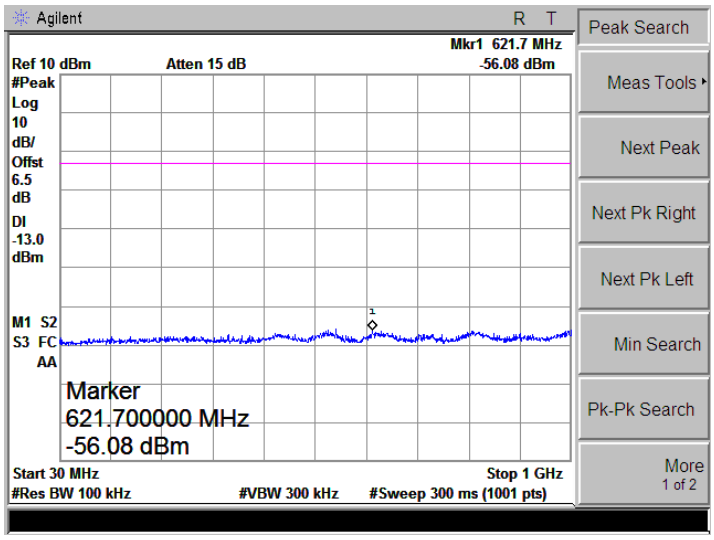
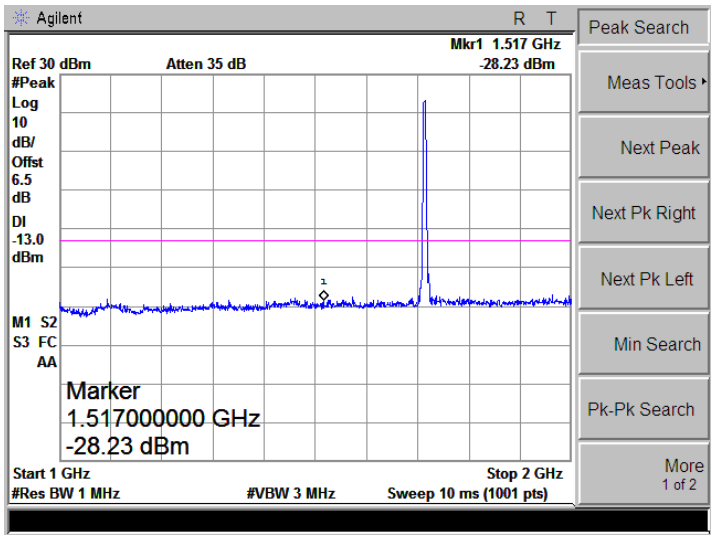
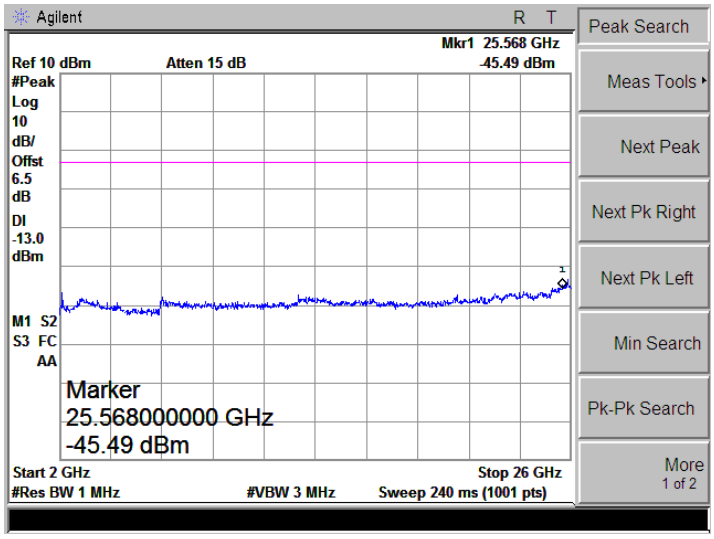
Bandedge	 Agilent R T Mkr1 824.00 MHz Ref 25 dBm Atten 30 dB -18.16 dBm #Avg Log 10 dB/ Offst 6.5 dB Dl -13.0 dBm M1 S2 S3 FC AA Marker 824.000000 MHz -18.16 dBm Center 824 MHz Span 10 MHz #Res BW 100 kHz #VBW 300 kHz #Sweep 300 ms (1001 pts) Marker Select Marker 1 2 3 4 Normal Delta Delta Pair (Tracking Ref) Ref Delta Span Pair Span Center Off More 1 of 2
	 Agilent R T Mkr1 849.00 MHz Ref 25 dBm Atten 30 dB -20.63 dBm #Avg Log 10 dB/ Offst 6.5 dB Dl -13.0 dBm M1 S2 S3 FC AA Center 849 MHz Span 10 MHz #Res BW 100 kHz #VBW 300 kHz #Sweep 300 ms (1001 pts) Trace/View Trace 1 2 3 Clear Write Max Hold Min Hold View Blank More 1 of 2

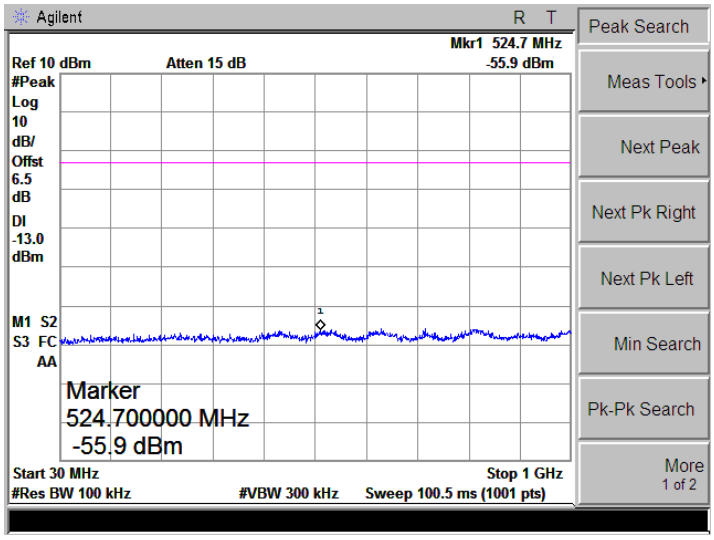
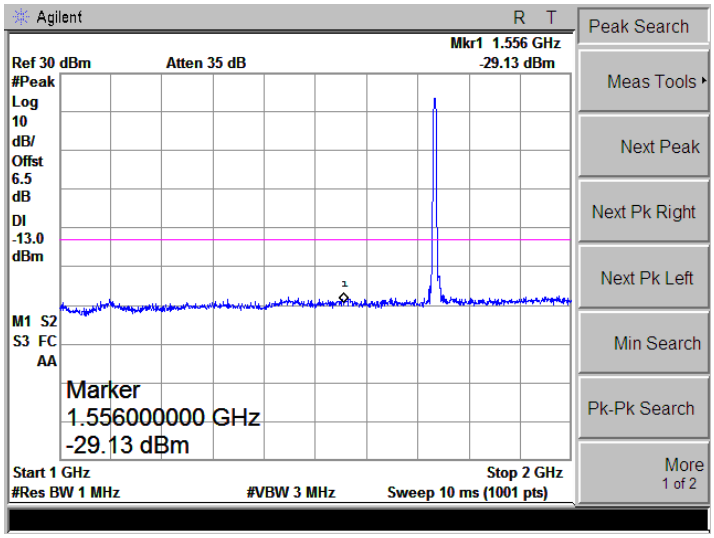
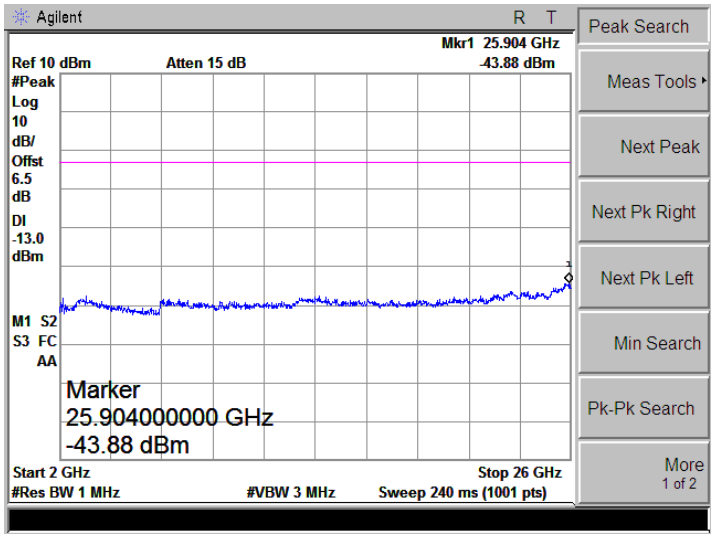
WCDMA Band IV-Low	
	
	

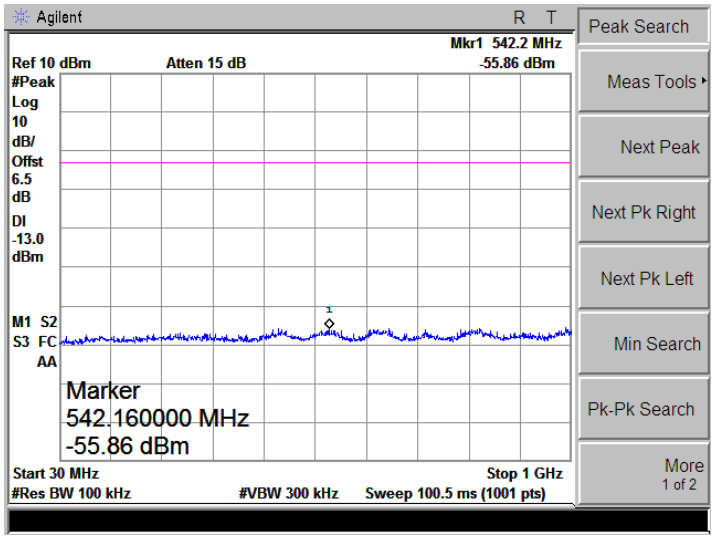
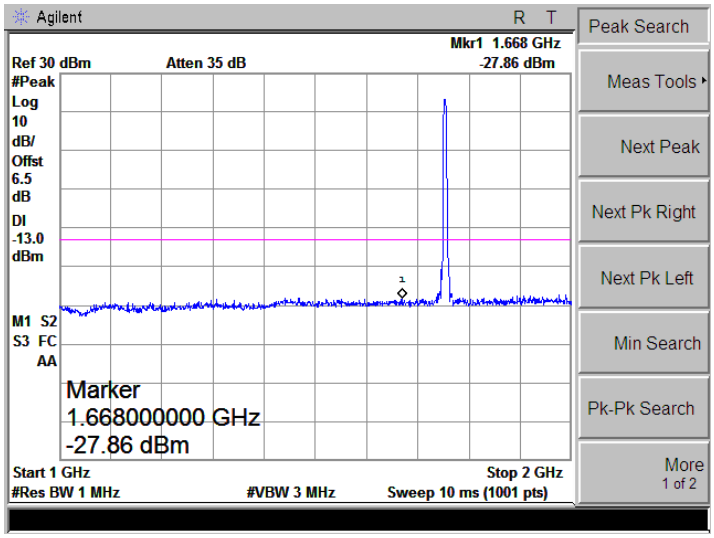
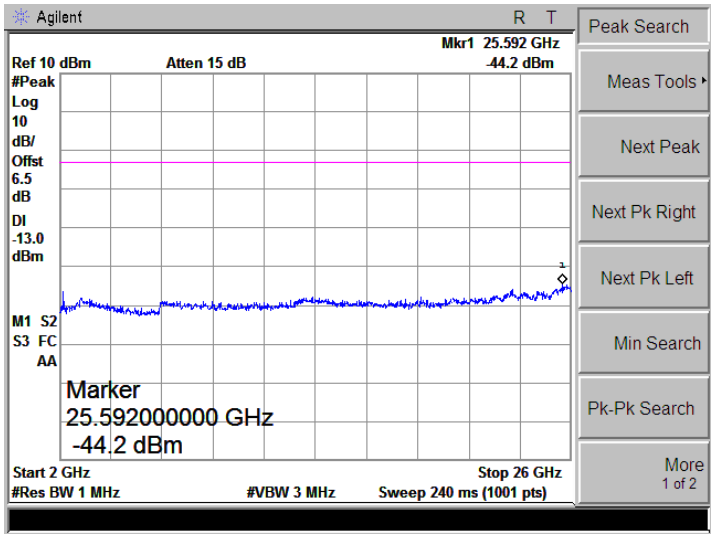
WCDMA Band IV-Middle	
	
	

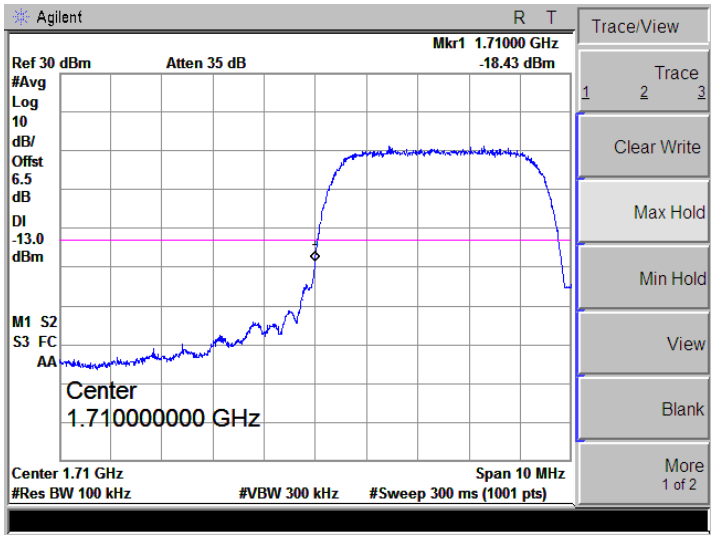
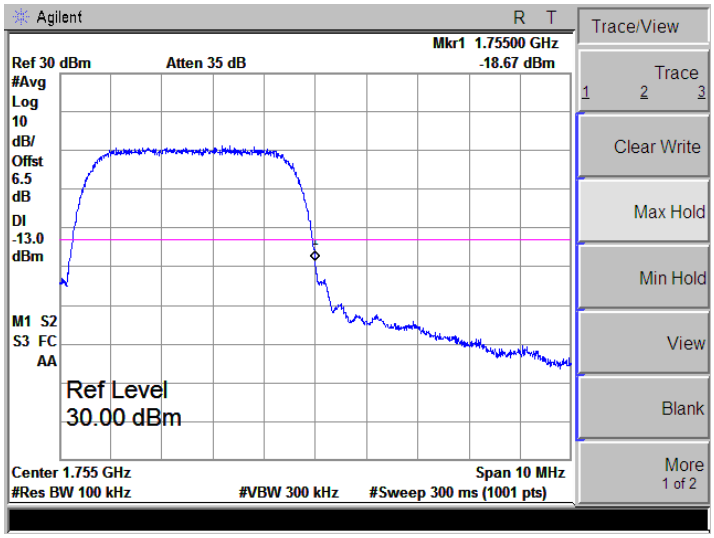
WCDMA Band IV-High	
	
	

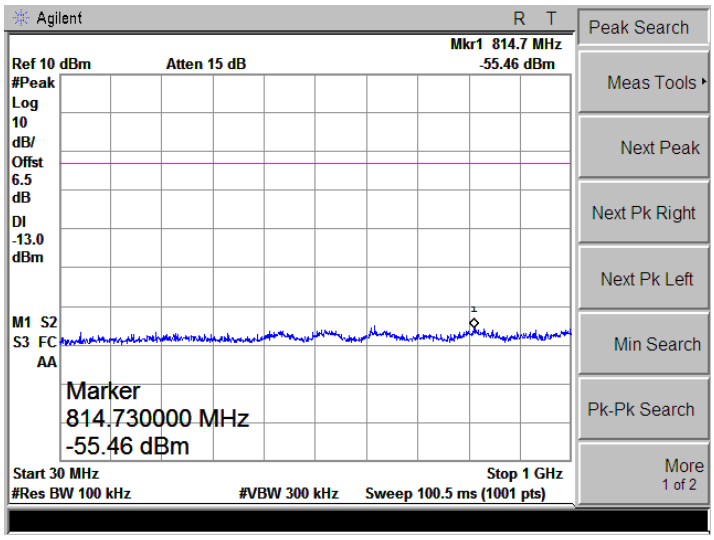
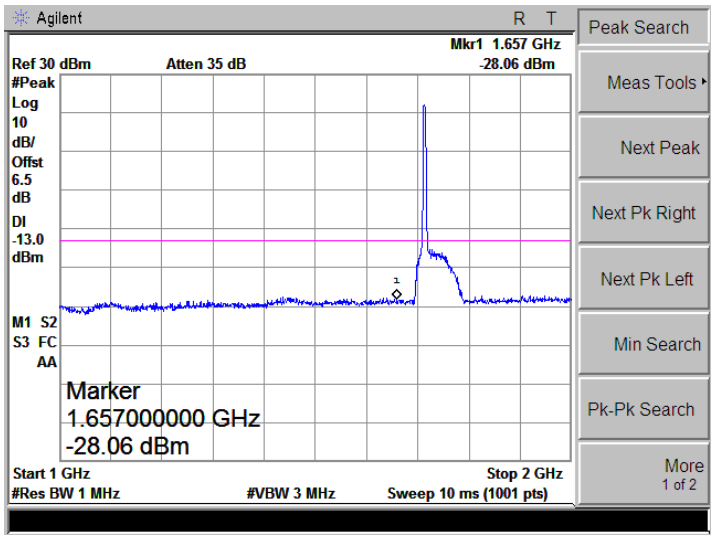
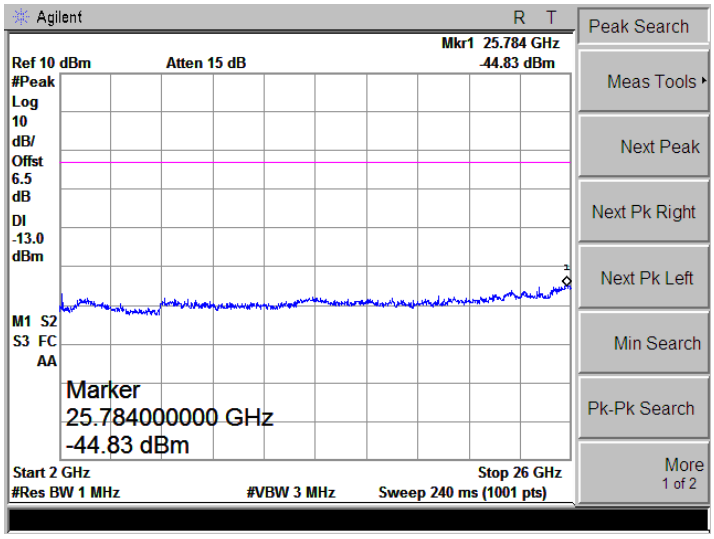
Bandedge	 Agilent R T Mkr1 1.71000 GHz Ref 40 dBm Atten 45 dB -18.77 dBm #Avg Log 10 dB/ Offst 5 dB DI -13.0 dBm M1 S2 S3 FC AA Marker 1.710000000 GHz -18.77 dBm Center 1.71 GHz Span 10 MHz #Res BW 100 kHz #VBW 300 kHz #Sweep 300 ms (1001 pts) Marker Select Marker 1 2 3 4 Normal Delta Delta Pair (Tracking Ref) Ref Delta Span Pair Span Center Off More 1 of 2
	 Agilent R T Mkr1 1.75500 GHz Ref 40 dBm Atten 45 dB -17.51 dBm #Avg Log 10 dB/ Offst 5 dB DI -13.0 dBm M1 S2 S3 FC AA Center 1.755 GHz Span 10 MHz #Res BW 100 kHz #VBW 300 kHz #Sweep 300 ms (1001 pts) Marker Select Marker 1 2 3 4 Normal Delta Delta Pair (Tracking Ref) Ref Delta Span Pair Span Center Off More 1 of 2

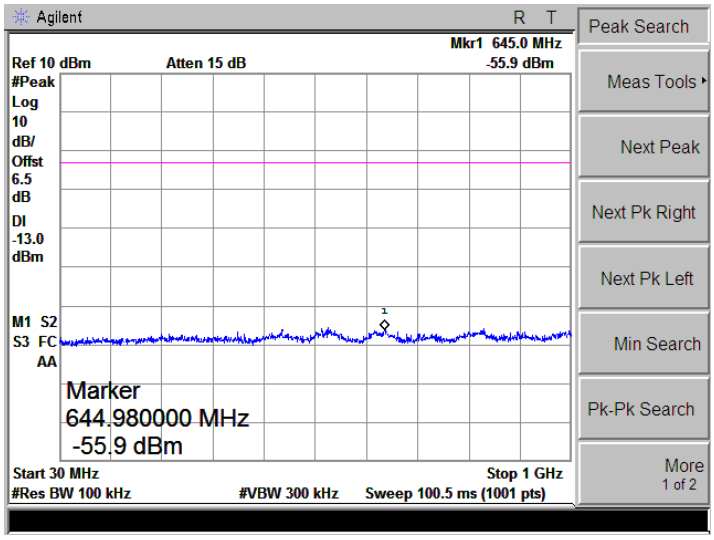
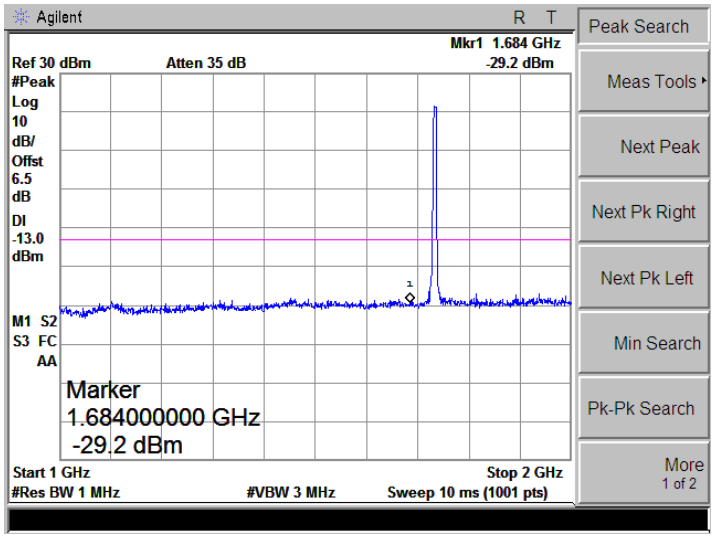
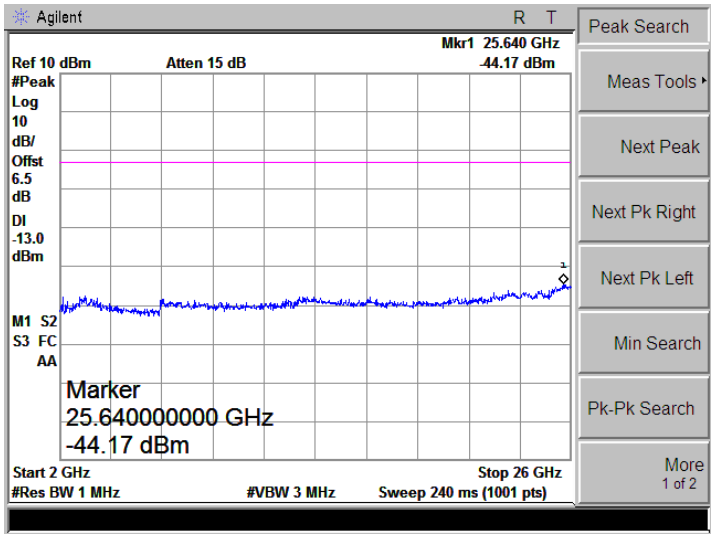
HSDPA Band IV-Low	
	
	

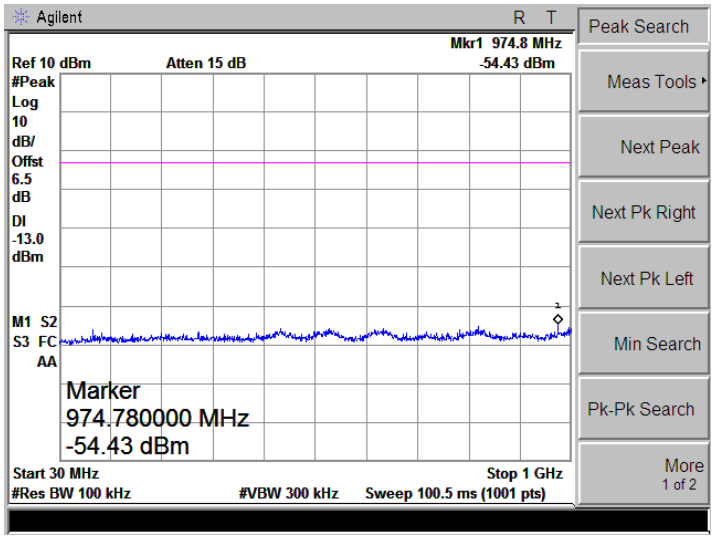
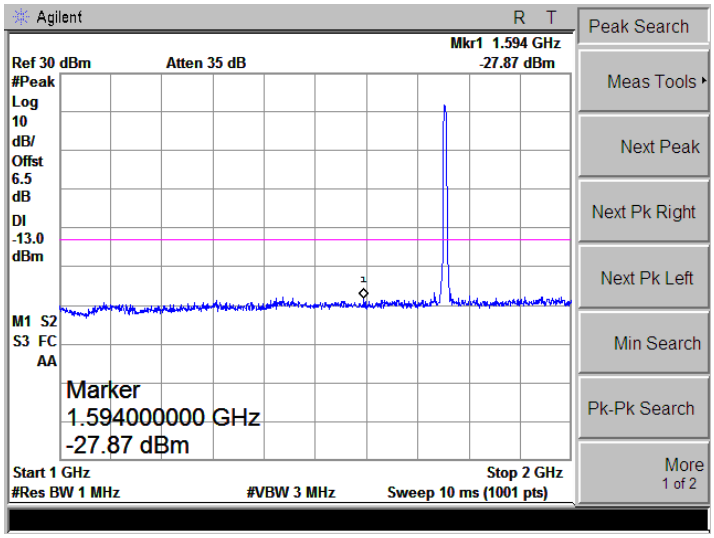
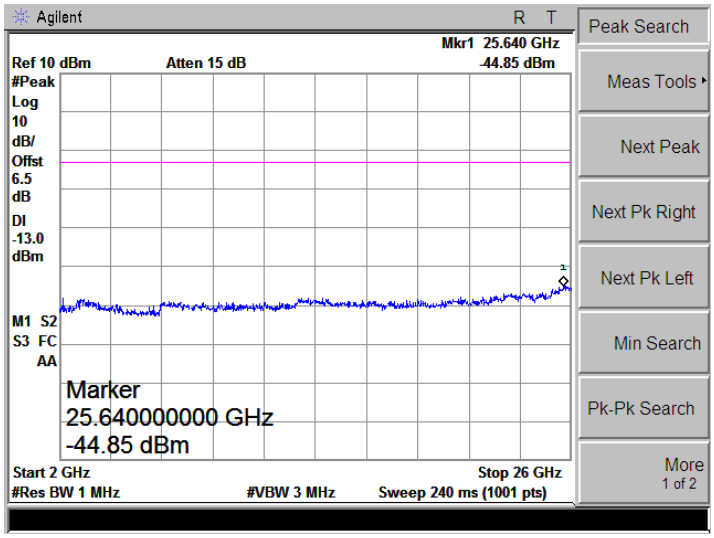
HSDPA Band IV-Middle	
	
	

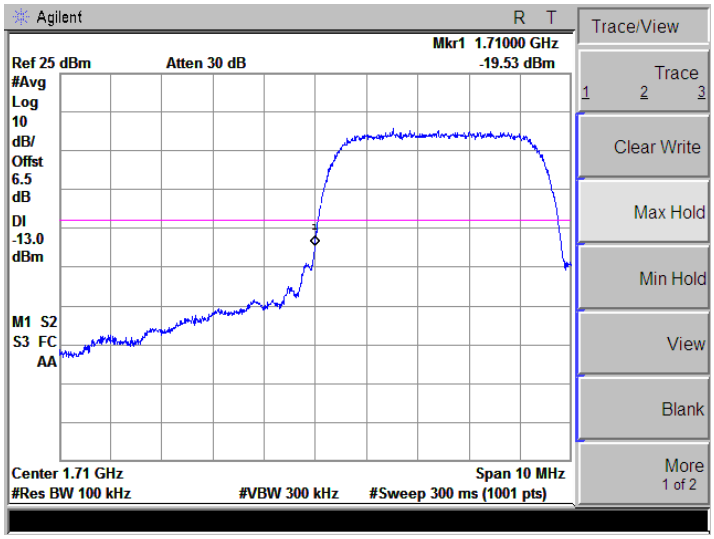
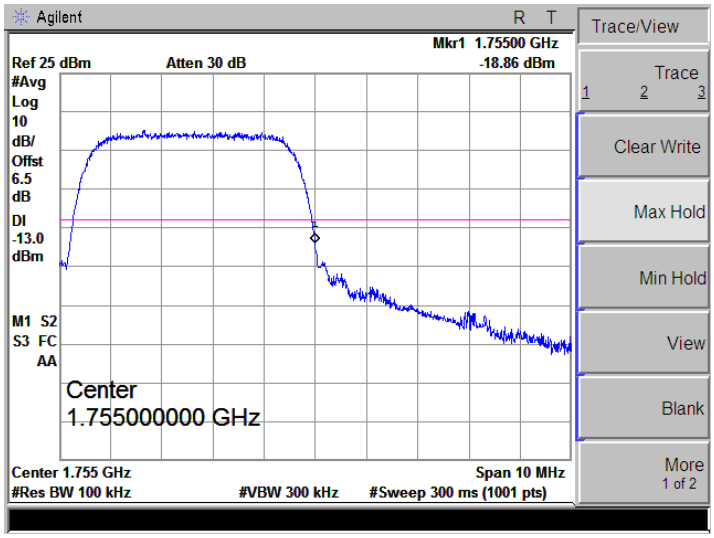
HSDPA Band IV-High	
	
	

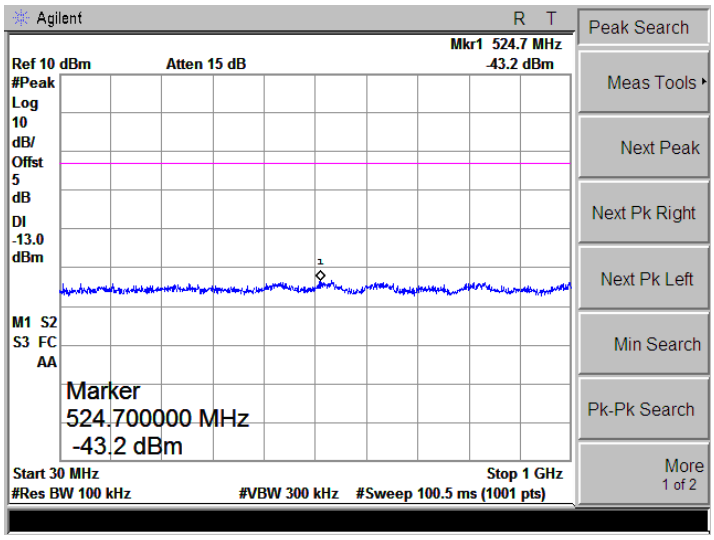
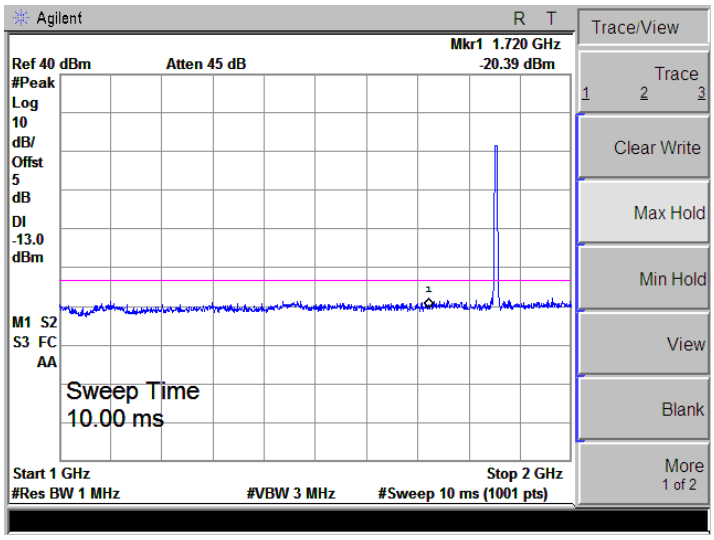
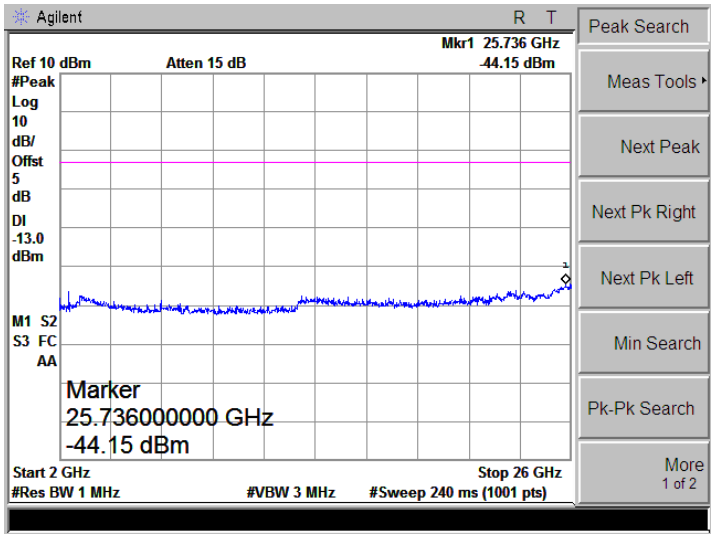
Bandedge	 Agilent R T Mkr1 1.71000 GHz Ref 30 dBm Atten 35 dB -18.43 dBm #Avg Log 10 dB/ Offst 6.5 dB Dl -13.0 dBm M1 S2 S3 FC AA Center 1.710000000 GHz Center 1.71 GHz Span 10 MHz #Res BW 100 kHz #VBW 300 kHz #Sweep 300 ms (1001 pts) Trace/View Trace 1 2 3 Clear Write Max Hold Min Hold View Blank More 1 of 2
	 Agilent R T Mkr1 1.75500 GHz Ref 30 dBm Atten 35 dB -18.67 dBm #Avg Log 10 dB/ Offst 6.5 dB Dl -13.0 dBm M1 S2 S3 FC AA Ref Level 30.00 dBm Center 1.755 GHz Span 10 MHz #Res BW 100 kHz #VBW 300 kHz #Sweep 300 ms (1001 pts) Trace/View Trace 1 2 3 Clear Write Max Hold Min Hold View Blank More 1 of 2

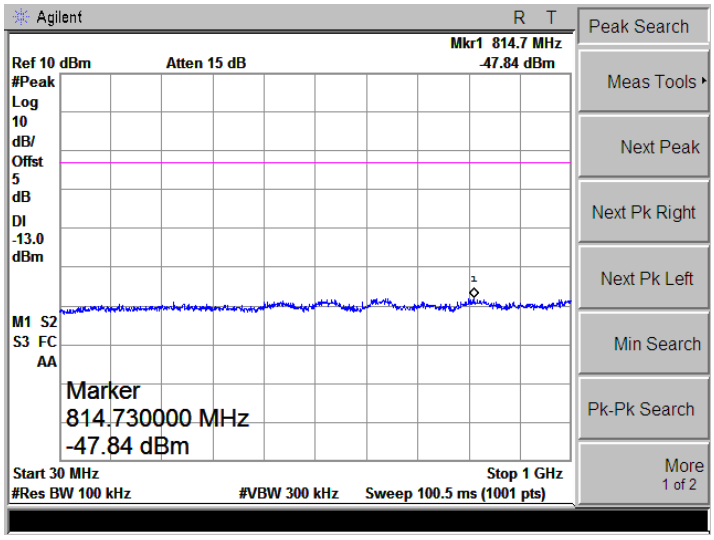
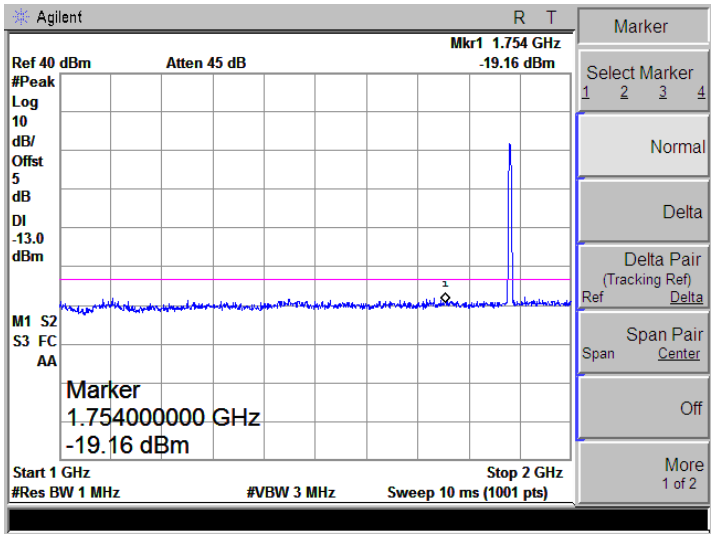
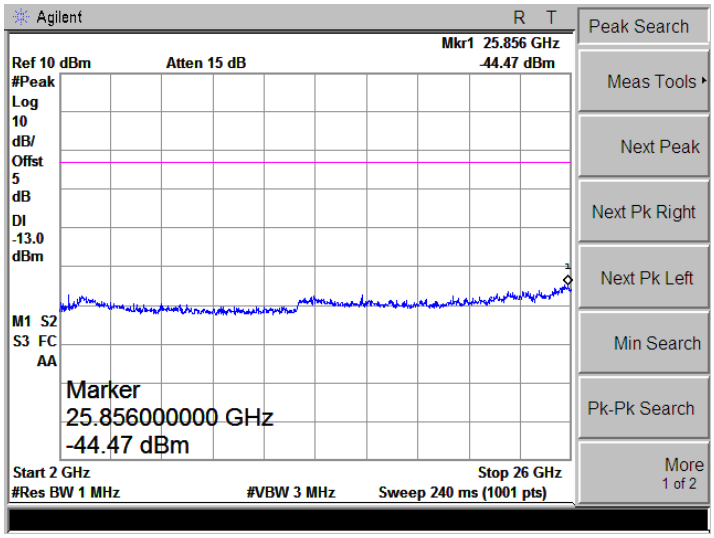
HSUPA Band IV-Low	
	
	

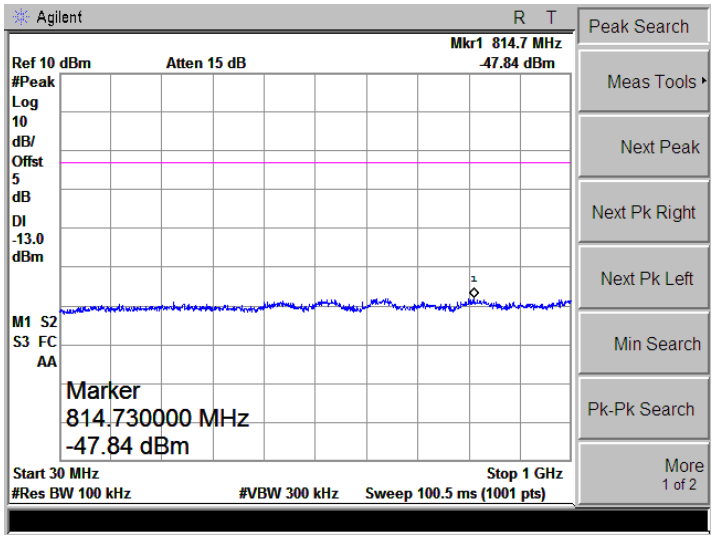
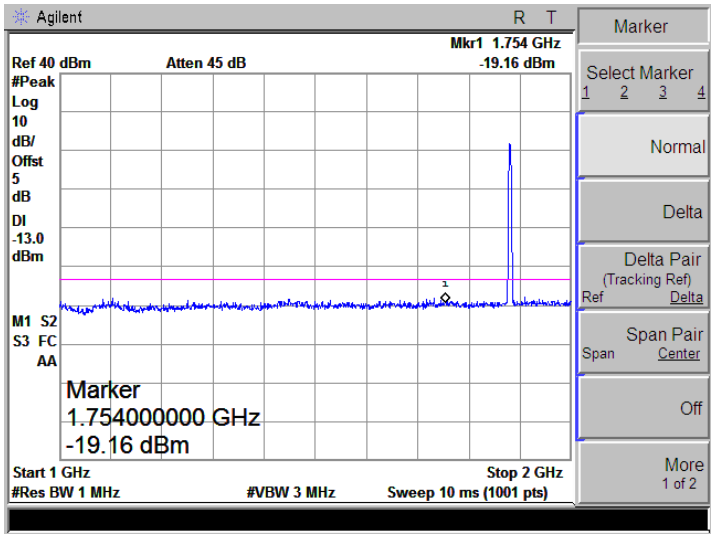
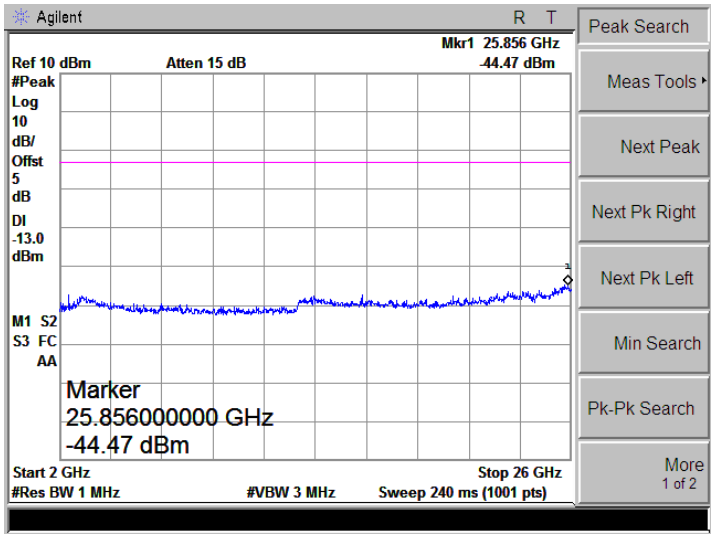
HSUPA Band IV-Middle	
	
	

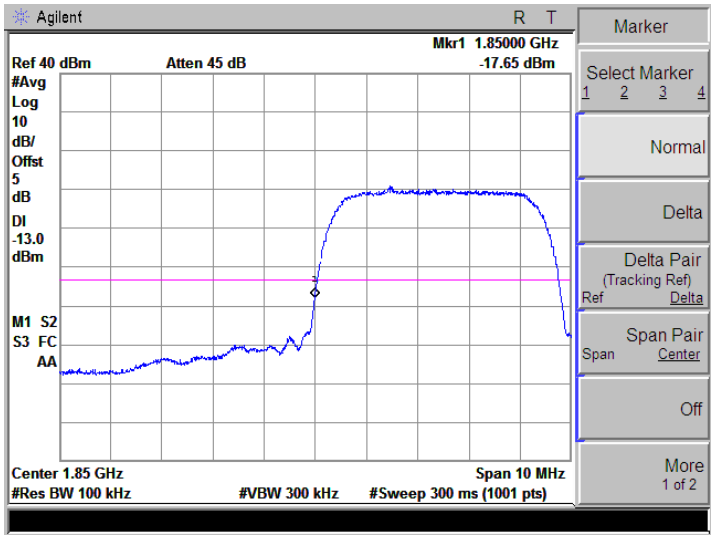
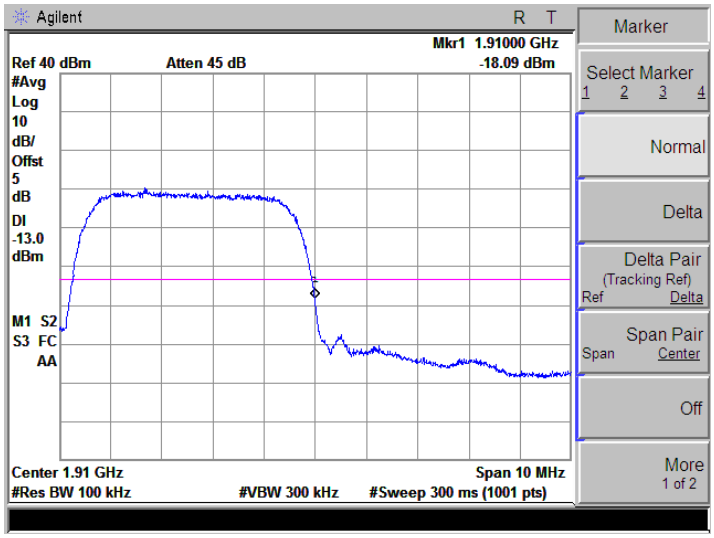
HSUPA Band IV-High	
	
	

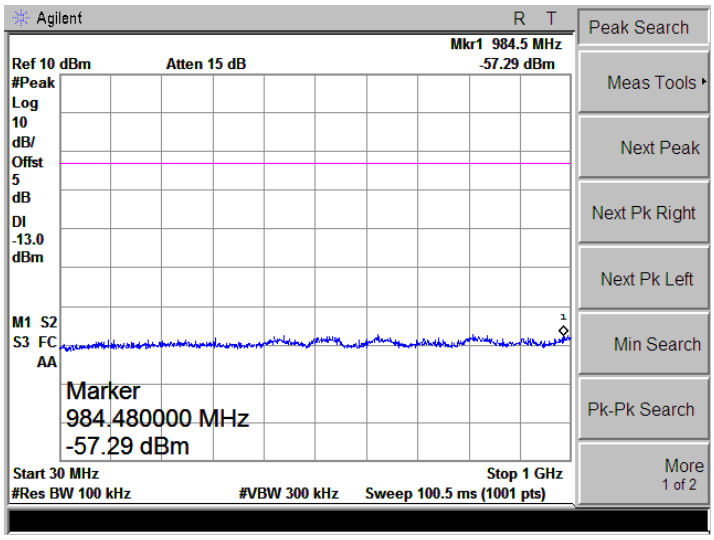
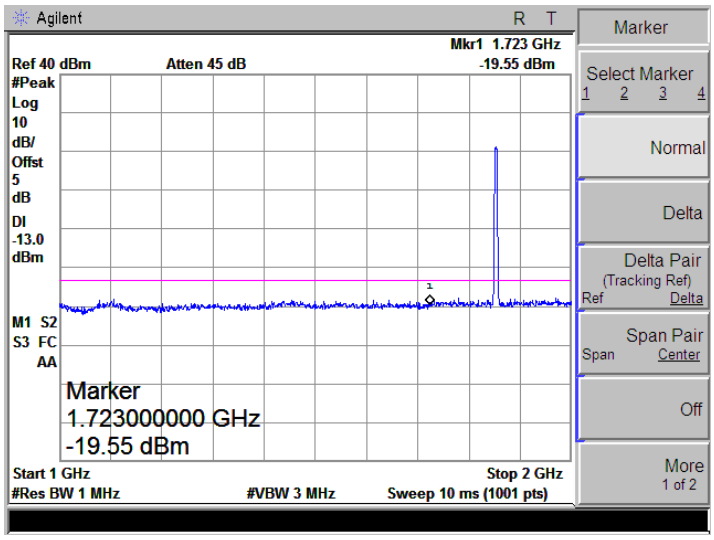
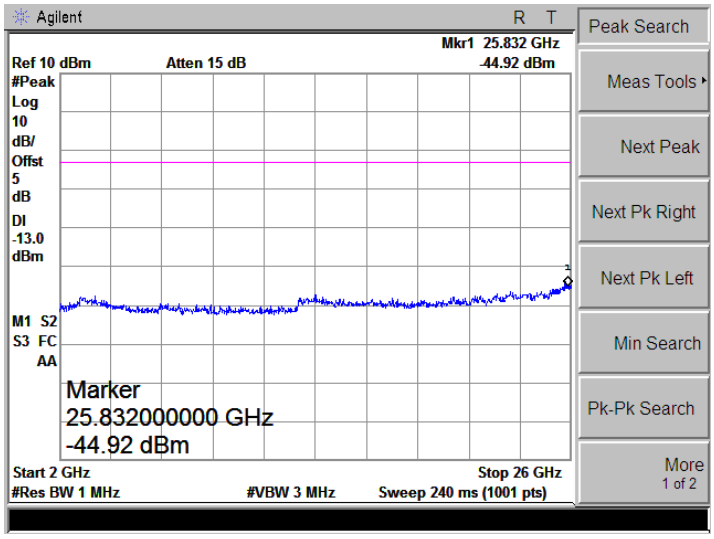
Bandedge	 Agilent R T Mkr1 1.71000 GHz Ref 25 dBm Atten 30 dB -19.53 dBm #Avg Log 10 dB/ Offst 6.5 dB Dl -13.0 dBm M1 S2 S3 FC AA Center 1.71 GHz Span 10 MHz #Res BW 100 kHz #VBW 300 kHz #Sweep 300 ms (1001 pts) Trace/View Trace 1 2 3 Clear Write Max Hold Min Hold View Blank More 1 of 2
	 Agilent R T Mkr1 1.75500 GHz Ref 25 dBm Atten 30 dB -18.86 dBm #Avg Log 10 dB/ Offst 6.5 dB Dl -13.0 dBm M1 S2 S3 FC AA Center 1.755000000 GHz Center 1.755 GHz Span 10 MHz #Res BW 100 kHz #VBW 300 kHz #Sweep 300 ms (1001 pts) Trace/View Trace 1 2 3 Clear Write Max Hold Min Hold View Blank More 1 of 2

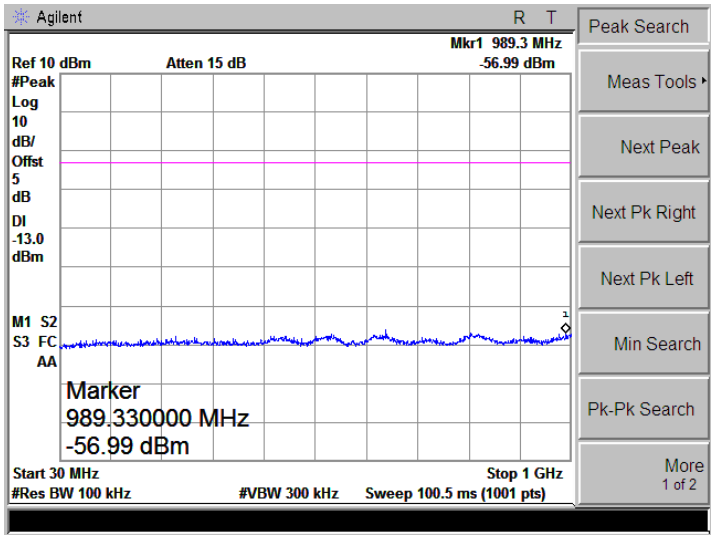
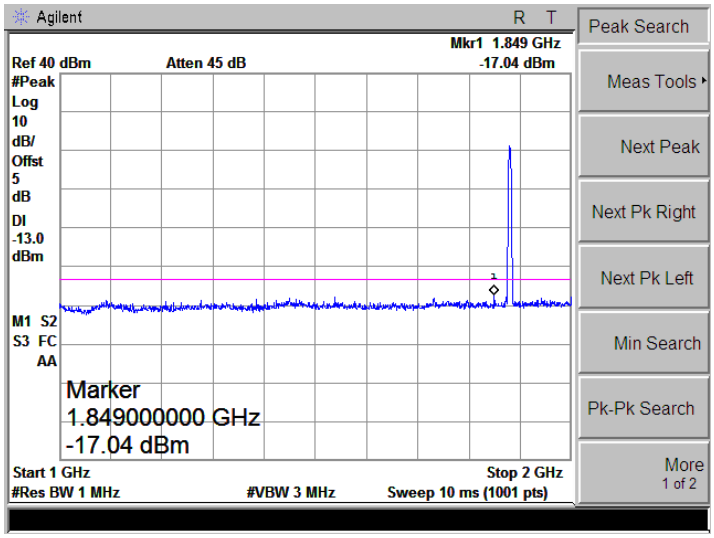
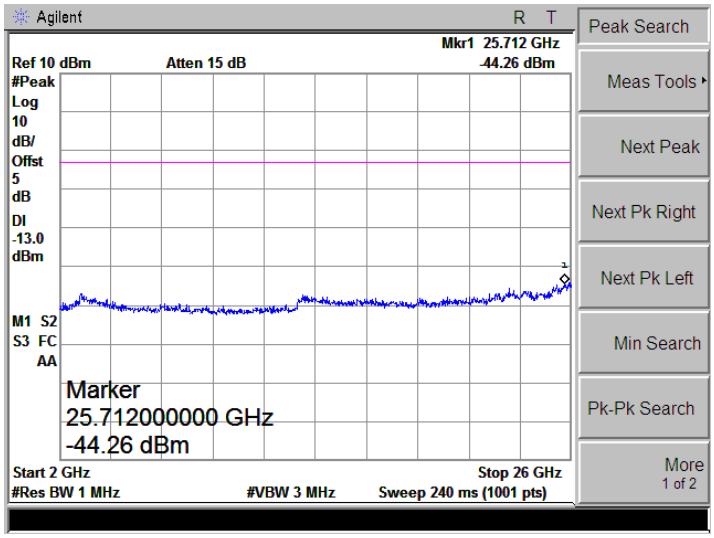
WCDMA Band II-Low	
	
	

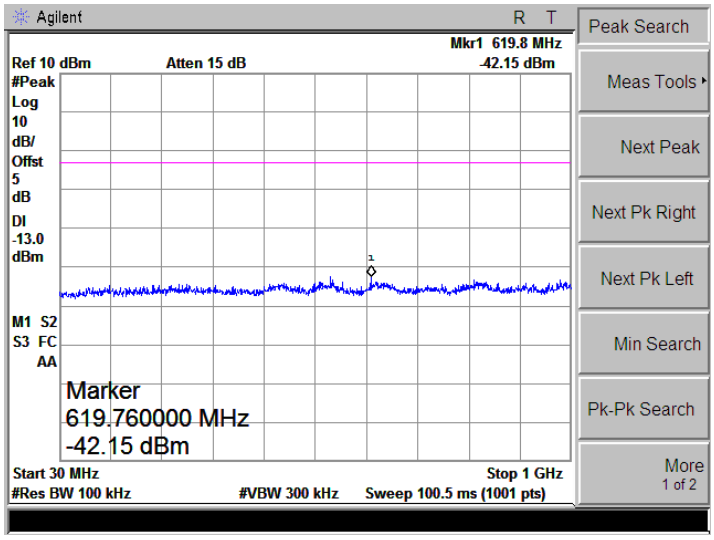
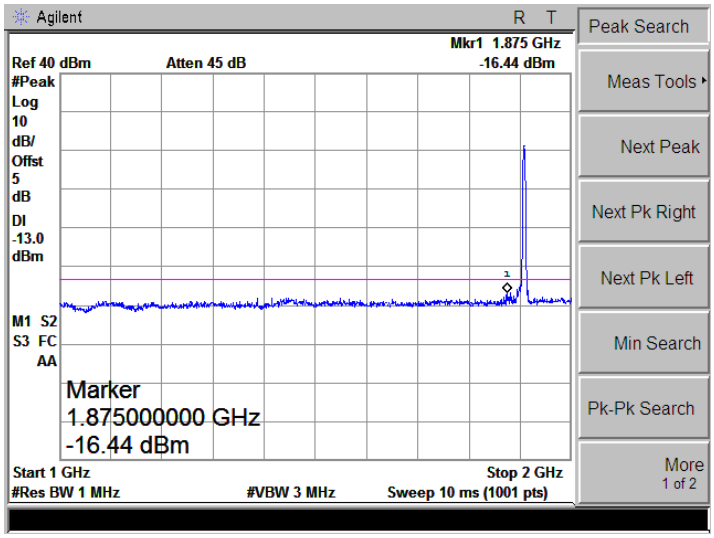
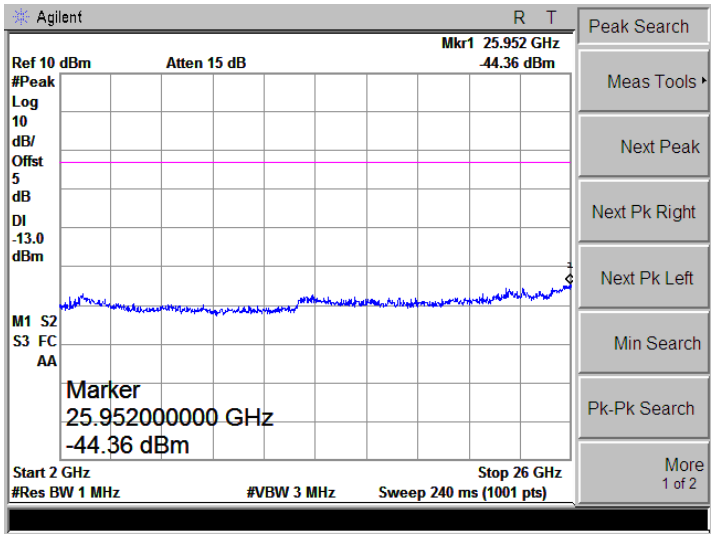
WCDMA Band II-Low	
	
	

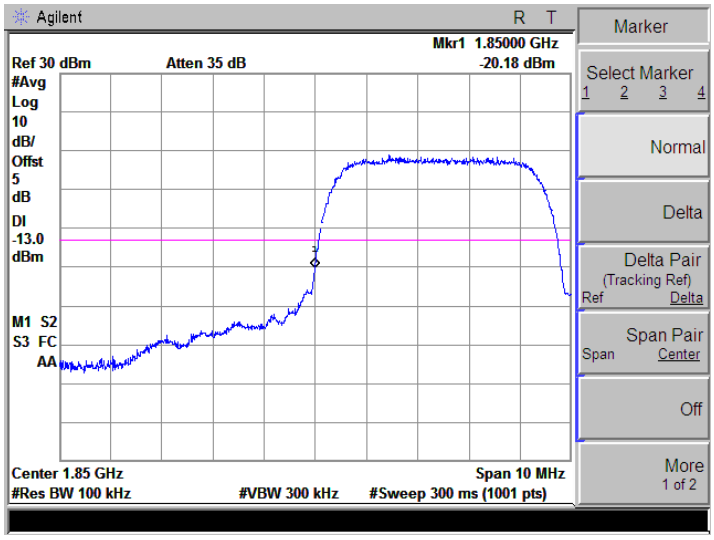
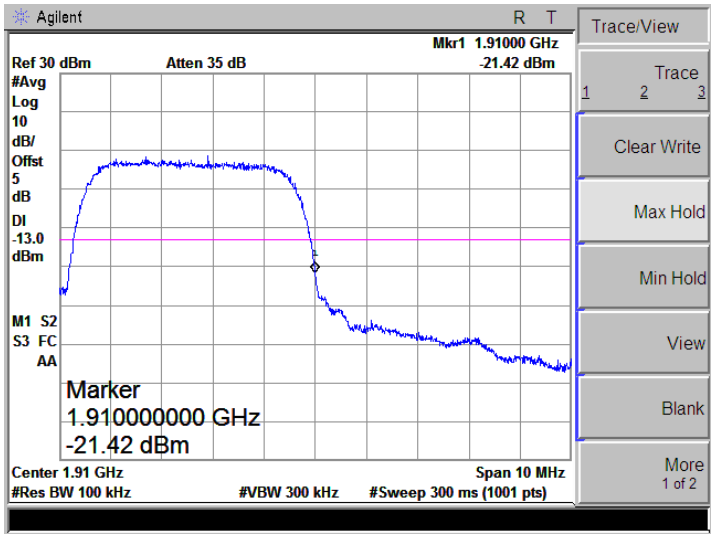
WCDMA Band II-Low	
	
	

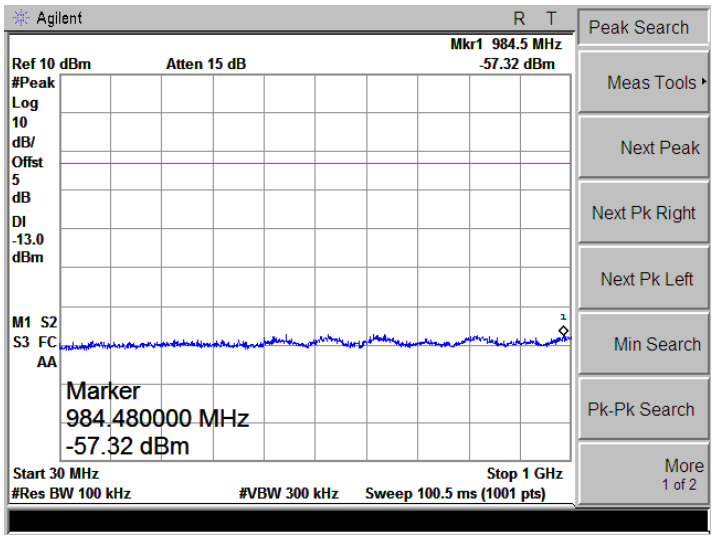
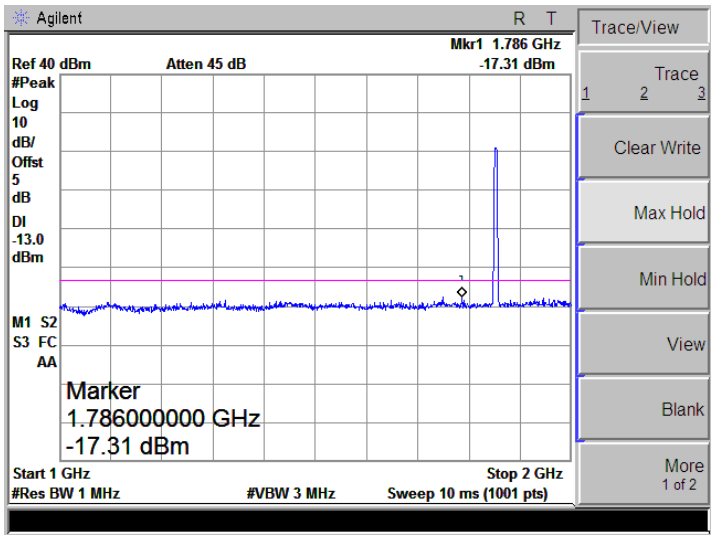
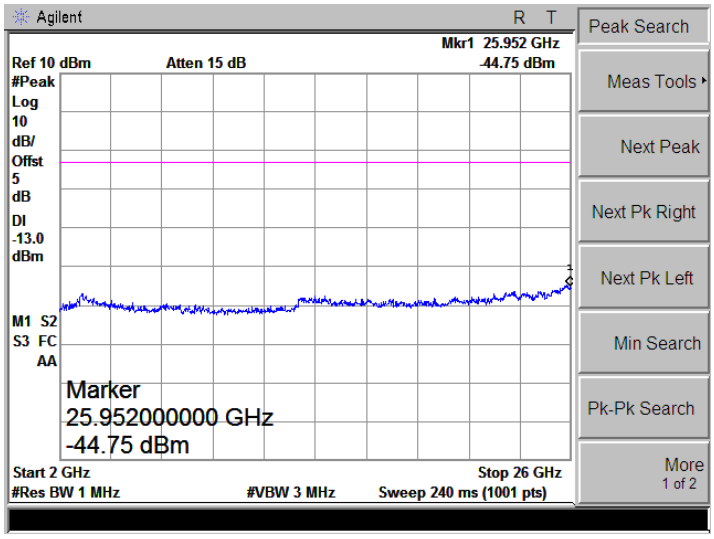
Bandedge	 Agilent R T Mkr1 1.85000 GHz Ref 40 dBm Atten 45 dB -17.65 dBm #Avg Log 10 dB/ Offst 5 dB Dl -13.0 dBm M1 S2 S3 FC AA Center 1.85 GHz Span 10 MHz #Res BW 100 kHz #VBW 300 kHz #Sweep 300 ms (1001 pts) Marker Select Marker 1 2 3 4 Normal Delta Delta Pair (Tracking Ref) Ref Delta Span Pair Span Center Off More 1 of 2
	 Agilent R T Mkr1 1.91000 GHz Ref 40 dBm Atten 45 dB -18.09 dBm #Avg Log 10 dB/ Offst 5 dB Dl -13.0 dBm M1 S2 S3 FC AA Center 1.91 GHz Span 10 MHz #Res BW 100 kHz #VBW 300 kHz #Sweep 300 ms (1001 pts) Marker Select Marker 1 2 3 4 Normal Delta Delta Pair (Tracking Ref) Ref Delta Span Pair Span Center Off More 1 of 2

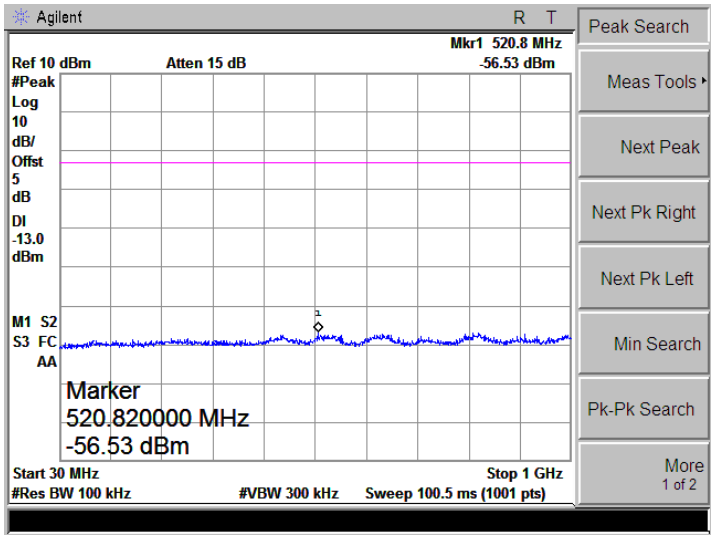
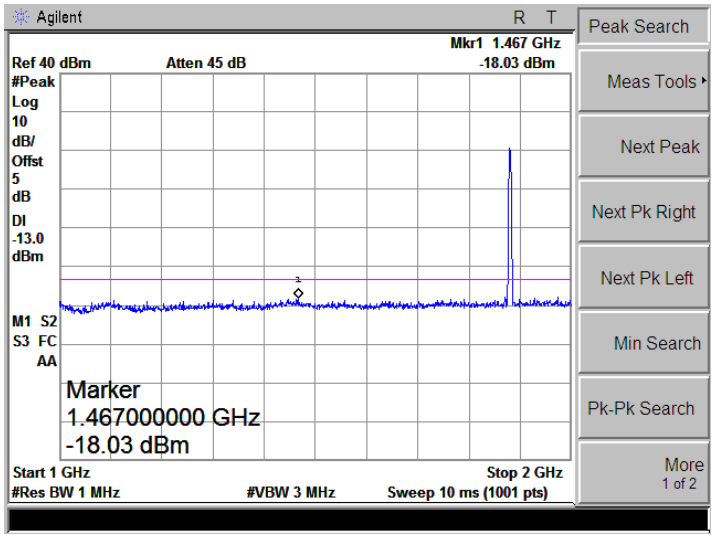
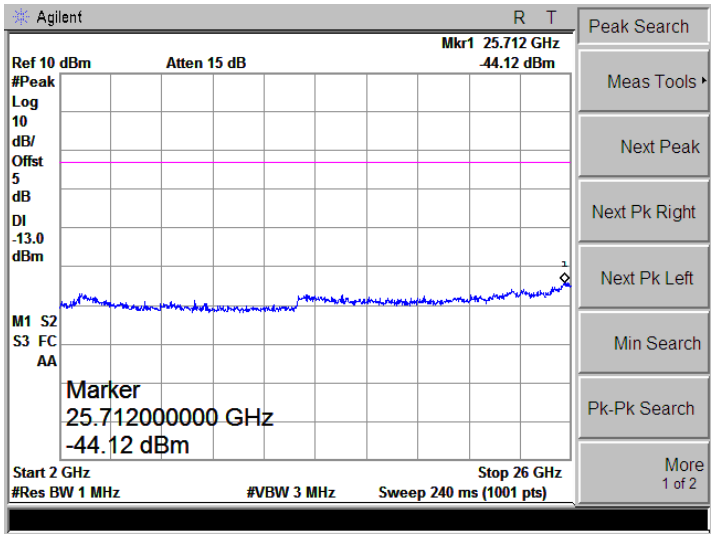
HSDPA Band II-Low	
	
	

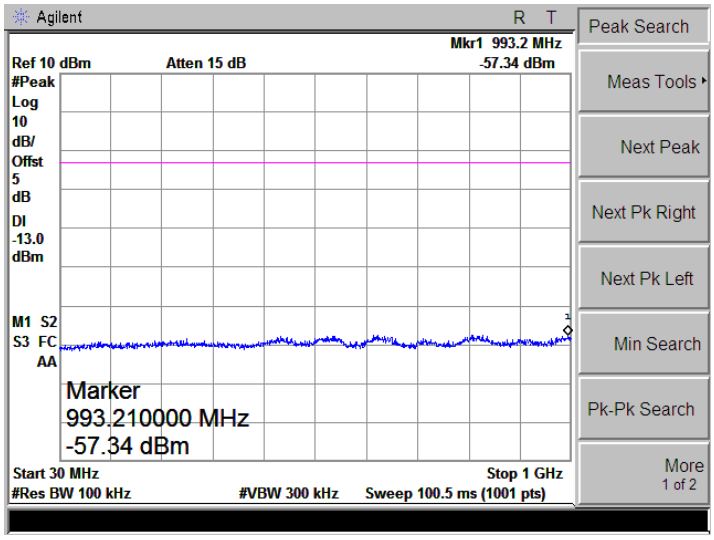
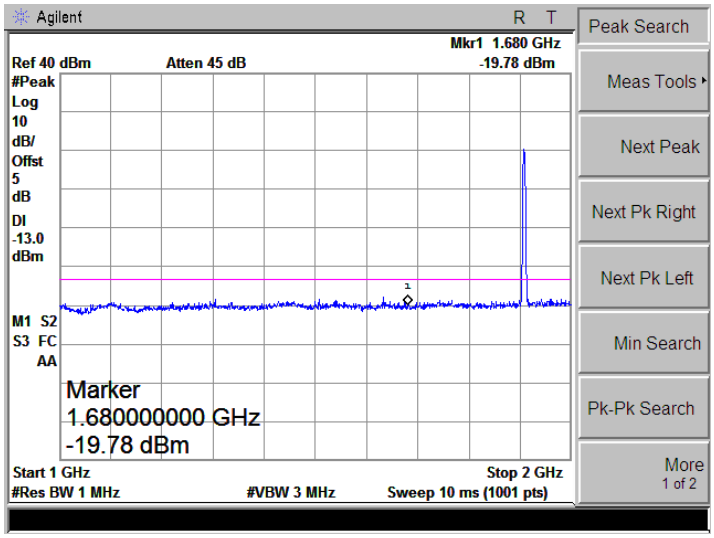
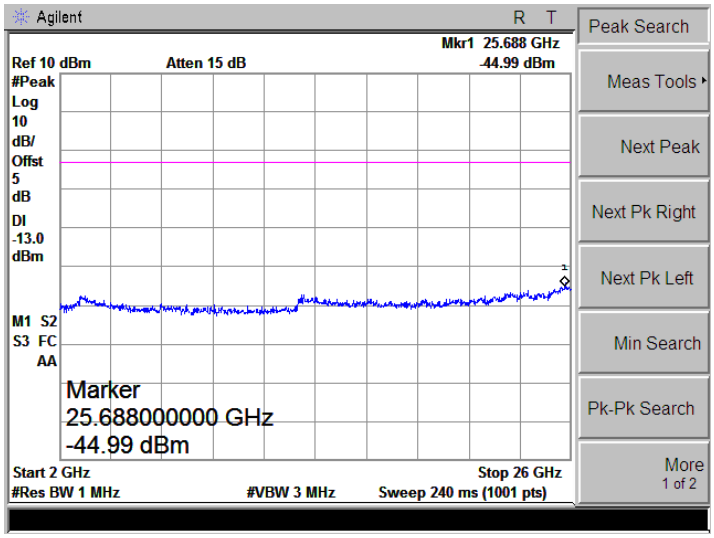
HSDPA Band II-Low	
	
	

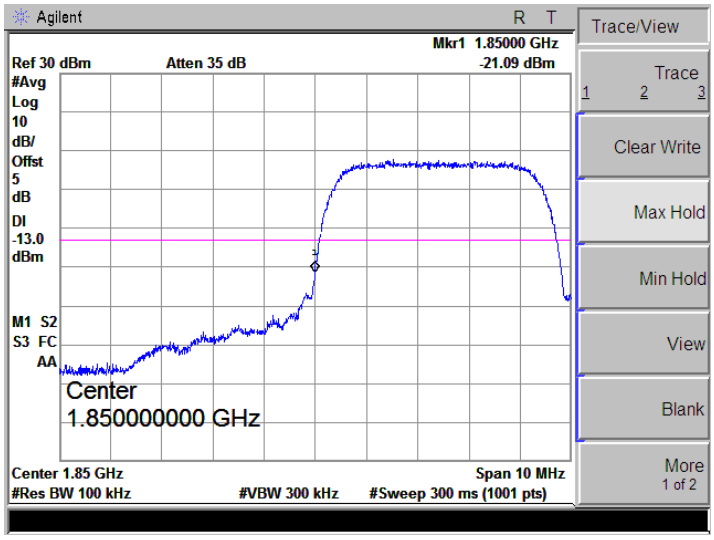
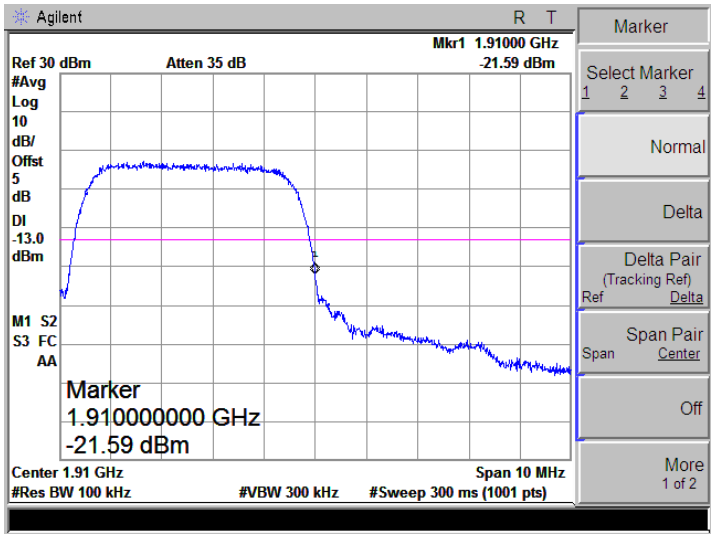
HSDPA Band II-Low	
	
	

Bandedge	 Agilent R T Mkr1 1.85000 GHz Ref 30 dBm Atten 35 dB -20.18 dBm #Avg Log 10 dB/ Offst 5 dB Dl -13.0 dBm M1 S2 S3 FC AA Center 1.85 GHz Span 10 MHz #Res BW 100 kHz #VBW 300 kHz #Sweep 300 ms (1001 pts) Marker Select Marker 1 2 3 4 Normal Delta Delta Pair (Tracking Ref) Ref Delta Span Pair Span Center Off More 1 of 2
	 Agilent R T Mkr1 1.91000 GHz Ref 30 dBm Atten 35 dB -21.42 dBm #Avg Log 10 dB/ Offst 5 dB Dl -13.0 dBm M1 S2 S3 FC AA Marker 1.910000000 GHz -21.42 dBm Center 1.91 GHz Span 10 MHz #Res BW 100 kHz #VBW 300 kHz #Sweep 300 ms (1001 pts) Trace/View Trace 1 2 3 Clear Write Max Hold Min Hold View Blank More 1 of 2

HSUPA Band II-Low	
	
	

HSUPA Band II-Low	
	
	

HSUPA Band II-Low	
	
	

Bandedge	 Agilent R T Mkr1 1.85000 GHz Ref 30 dBm Atten 35 dB -21.09 dBm #Avg Log 10 dB/ Offst 5 dB Dl -13.0 dBm M1 S2 S3 FC AA Center 1.850000000 GHz Center 1.85 GHz Span 10 MHz #Res BW 100 kHz #VBW 300 kHz #Sweep 300 ms (1001 pts) Trace/View Trace 1 2 3 Clear Write Max Hold Min Hold View Blank More 1 of 2
	 Agilent R T Mkr1 1.91000 GHz Ref 30 dBm Atten 35 dB -21.59 dBm #Avg Log 10 dB/ Offst 5 dB Dl -13.0 dBm M1 S2 S3 FC AA Marker 1.910000000 GHz -21.59 dBm Center 1.91 GHz Span 10 MHz #Res BW 100 kHz #VBW 300 kHz #Sweep 300 ms (1001 pts) Marker Select Marker 1 2 3 4 Normal Delta Delta Pair (Tracking Ref) Ref Delta Span Pair Span Center Off More 1 of 2

APPENDIX E

Frequency Stability

Note: 1. Worst case at WCDMA B2/B4/B5 middle channel
2. Normal Voltage NV=AC120V; Low Voltage LV=AC100V;High Voltage HV=AC130V

➢ Frequency stability V.S. Temperature measurement

Reference Frequency: WCDMA Band V Middle channel=4183 channel=836.6MHz					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
NV	-30	60	0.0717	2.50	Pass
	-20	50	0.0598		
	-10	44	0.0524		
	0	36	0.0432		
	10	29	0.0349		
	20	22	0.0267		
	30	28	0.0331		
	40	34	0.0405		
	50	39	0.0469		

Reference Frequency: WCDMA Band IV Middle channel=1412 channel=1733.6MHz					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
NV	-30	58	0.0337	2.50	Pass
	-20	50	0.0288		
	-10	40	0.0231		
	0	35	0.0204		
	10	32	0.0182		
	20	24	0.0138		
	30	29	0.0169		
	40	37	0.0213		
	50	42	0.0244		

Reference Frequency: WCDMA Band II Middle channel=9400 channel=1880MHz					
Power supplied (Vdc)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
NV	-30	55	0.0295	2.50	Pass
	-20	49	0.0262		
	-10	38	0.0205		
	0	32	0.0172		
	10	26	0.0139		
	20	21	0.0110		
	30	27	0.0143		
	40	32	0.0172		
	50	37	0.0196		

➢ Frequency stability V.S. Voltage measurement

Reference Frequency: WCDMA Band V Middle channel=4183 channel=836.6MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm) Result	
		Hz	ppm		
25	HV	48	0.0570	2.50	Pass
	NV	35	0.0414		
	LV	47	0.0561		
Reference Frequency: WCDMA Band IV Middle channel=1412 channel=1733.6MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	HV	57	0.0328	2.50	Pass
	NV	49	0.0284		
	LV	43	0.0248		
Reference Frequency: WCDMA Band II Middle channel=9400 channel=1880MHz					
Temperature (℃)	Power supplied (Vdc)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
25	HV	38	0.0200	2.50	Pass
	NV	22	0.0119		
	LV	27	0.0143		

APPENDIX F

Modulation characteristics

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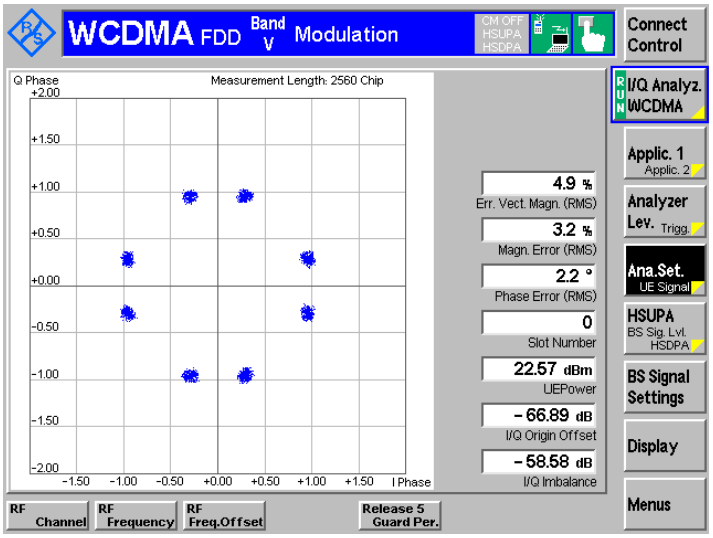
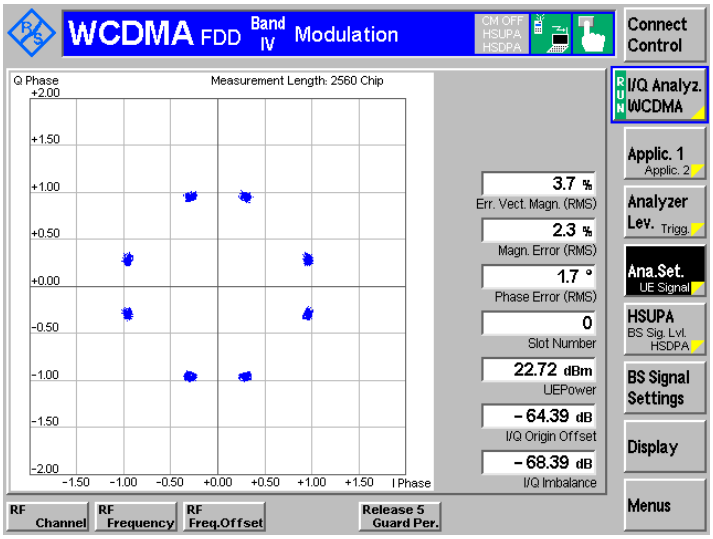
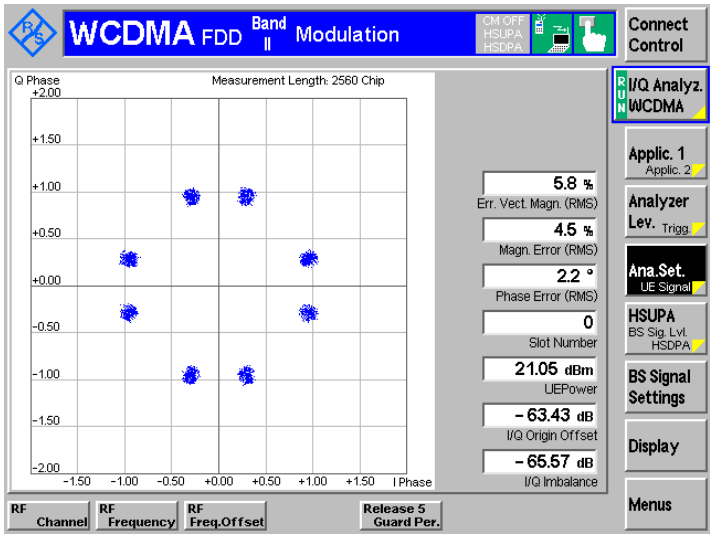
WCDMA B5	
WCDMA B4	

WCDMA B2	 WCDMA FDD Band II Modulation CM OFF HSUPA HSDPA Connect Control I/Q Analyz. WCDMA Applic. 1 Applic. 2 Analyzer Lev. Trigg. Ana.Set. UE Signal HSUPA BS Sig. Lvl. HSDPA BS Signal Settings Display Menus Q Phase Measurement Length: 2560 Chip +2.00 +1.50 +1.00 +0.50 +0.00 -0.50 -1.00 -1.50 -2.00 -1.50 -1.00 -0.50 +0.00 +0.50 +1.00 +1.50 I Phase 5.8 % Err. Vect. Magn. (RMS) 4.5 % Magn. Error (RMS) 2.2 ° Phase Error (RMS) 0 Slot Number 21.05 dBm UEPower -63.43 dB I/Q Origin Offset -65.57 dB I/Q Imbalance RF Channel RF Frequency RF Freq.Offset Release 5 Guard Per.

APPENDIX PHOTOGRAPHS

Please refer to "ANNEX"

******* END OF REPORT *******