TEST REPORT

Reference No.	:	WTS17S1093648-1E
FCC ID	:	2AC88-R1
Applicant	:	HONGKONG UCLOUDLINK NETWORK TECHNOLOGY LIMITED
Address	:	Suite 603, 6/F, Laws Commercial Plaza, 788 Cheung Sha Wan Road, Kowloon, HongKong
Manufacturer	:	Shenzhen uCloudlink Network Technology, Co., Ltd
Address	:	3rd Floor, A Part of Building 1, Shenzhen Software Industry Base, nanshan district xuefu Road Post Code 518057, Shenzhen City, Guangdong Province P.R.China
Product	:	4G modem
Model(s)	:	R1
Brand Name	:	GlocalMe
Standards	:	FCC CFR47 Part 22 Subpart H: 2017 FCC CFR47 Part 24 Subpart E: 2017 FCC CFR47 Part 27 Subpart L: 2017
Date of Receipt sample	:	2017-10-27
Date of Test	:	2017-10-28 to 2017-11-29
Date of Issue	:	2018-02-25
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:
Waltek Services (Shenzhen) Co., Ltd.
Address: 1/F., Fukangtai Building, West Baima Road, Songgang Street, Baoan District, Shenzhen, Guangdong, China
Tel :+86-755-83551033
Fax:+86-755-83552400

Compiled by:

Ford Wang

Ford Wang / Project Engineer

Approved by:

Philo Zhong

Philo Zhong / Manager

2 Laboratories Introduction

Waltek Services (Shenzhen) Co., Ltd is a professional third-party testing and certification laboratory with multi-year product testing and certification experience, established strictly in accordance with ISO/IEC 17025 requirements, and accredited by ILAC (International Laboratory Accreditation Cooperation) member. A2LA (American Association for Laboratory Accreditation) of USA, Meanwhile, Waltek has got recognition as registration and accreditation laboratory from EMSD (Electrical and Mechanical Services Department), and American Energy star, FCC(The Federal Communications Commission), CEC(California energy efficiency), IC(Industry Canada). It's the strategic partner and data recognition laboratory of international authoritative organizations, such as Intertek(ETL-SEMKO), TÜV Rheinland, TÜV SÜD, etc.

Waltek Services (Shenzhen) Co., Ltd is one of the largest and the most comprehensive third party testing laboratory in China. Our test capability covered four large fields: safety test. Electro Magnetic Compatibility (EMC), and energy performance, wireless radio. As a professional, comprehensive, justice international test organization, we still keep the scientific and rigorous work attitude to help each client satisfy the international standards and assist their product enter into globe market smoothly.

Test Facility:

A. Accreditations for Conformity Assessment (International)

Country/Region	Accreditation Body	Scope	Note
USA	**A2LA (Certificate No.: 4243.01)**	FCC ID \ DOC \ VOC	1
Canada		IC ID \ VOC	2
Japan		MIC-T \ MIC-R	-
Europe		EMCD \ RED	-
Taiwan		NCC	-
Hong Kong		OFCA	-
Australia		RCM	-
India	**International Services**	WPC	-
Thailand		NTC	-
Singapore		IDA	-

Note:

1. FCC Designation No.: CN1201. Test Firm Registration No.: 523476.
2. IC Canada Registration No.: 7760A

B. TCBs and Notify Bodies Recognized Testing Laboratory.

Recognized Testing Laboratory of …	Notify body number
TUV Rheinland	Optional.
Intertek	
TUV SUD	
SGS	
Phoenix Testlab GmbH	0700
Element Materials Technology Warwick Ltd	0891
Timco Engineering, Inc.	1177
Eurofins Product Service GmbH	0681

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4 Revision History

Test report No.	Date of Receipt sample	Date of Test	Date of Issue	Purpose	Comment	Approved
WTS17S10936 48-1E	2017-10-27	2017-10-28 to 2017-11-29	2018-02-25	original	-	Valid

5 General Information

5.1 General Description of E.U.T.

Product:	4G modem
Model(s):	R1
Model Description:	N/A
GSM Band(s):	N/A
GPRS/EGPRS Class:	N/A
WCDMA Band(s):	FDD Band I/II/IV/V/VIII
LTE Band(s):	FDD Band 2/4/5/7/17 TDD Band 41
Wi-Fi Specification:	N/A
Bluetooth Version:	N/A
GPS:	N/A
NFC:	N/A
Hardware Version:	R1 MAIN VA
Software Version:	R1_HTSV1.1.005.007.1711130
Highest frequency (Exclude Radio):	580MHz
Storage Location:	Internal Storage
Note:	This EUT has two SIM card slots, and two RF module. We found that RF parameters are the same, when we insert the card 1 and card 2. So we usually performed the test under main card slot 1. Main board (Modem 1): The EUT Main board support WCDMA Band I/II/IV/V/VIII, LTE Band 2/4/5/7/17/41 function. It is intended for speech, Multimedia Message Service (MMS) transmission and 4G free roaming hotspot. It is equipped with Wi-Fi functions. For more information see the following datasheet. Vice board (Modem 2): The EUT Vice board support WCDMA Band I/II/IV/V/VIII, it is intended for system localization.

5.2 Details of E.U.T.

Operation Frequency:	WCDMA Band II: 1850~1910MHz WCDMA Band V: 824~849MHz WCDMA Band IV:1710~1755MHz LTE Band 2: 1850~1910MHz LTE Band 4: 1710~1755MHz LTE Band 5: 824~849MHz LTE Band 7: 2500~2570MHz LTE Band 17: 704~716MHz

	LTE Band 41: 2496~2690MHz
Max. RF output power:	Main Board: WCDMA Band II: 22.89dBm WCDMA Band V: 22.60dBm WCDMA Band IV: 22.61dBm LTE Band 2: 23.09dBm LTE Band 4: 22.92dBm LTE Band 5: 22.63dBm LTE Band 7: 22.04dBm LTE Band 17: 22.85dBm LTE Band 41: 21.74dBm Vice Board: WCDMA Band II: 22.60dBm WCDMA Band V: 22.71dBm WCDMA Band IV: 22.70dBm
Type of Modulation:	WCDMA: BPSK, 16QAM LTE: QPSK, 16QAM
Antenna installation:	WCDMA/LTE: internal permanent antenna
Antenna Gain:	WCDMA Band II: 4.79dBi WCDMA Band V: 1.10dBi WCDMA Band IV: 3.93dBi LTE Band 2: 4.79dBi LTE Band 4: 3.93dBi LTE Band 5: 1.10dBi LTE Band 7: 3.39dBi LTE Band 17: 1.12dBi LTE Band 41: 3.99dBi
Ratings:	DC 12V, 2.0A, charging from adapter (Adapter Input: 100-240V~50/60Hz 0.6A)
Adapter:	Manufacture: Shenzhen Fu Jia Electronic Co., Ltd. Model No.: FJ-SW1202000C
Type of Emission:	WCDMA850: 4M15F9W, WCDMA1900: 4M19F9W, WCDMA1700: 4M16F9W

5.3 Test Mode

All test mode(s) and condition(s) mentioned were considered and evaluated respectively by performing full tests, the worst data were recorded and reported.

Support Band	Test Mode	Channel Frequency	Channel Number
WCDMA Band V	WCDMA/HSUPA/HSDPA	826.4 MHz	4132
		836.6 MHz	4183
		846.6 MHz	4233
WCDMA Band II	WCDMA/HSUPA/HSDPA	1852.4MHz	9262
		1880.0MHz	9400
		1907.6MHz	9538
WCDMA Band IV	WCDMA/HSUPA/HSDPA	1712.4MHz	1313
		1732.6MHz	1413
		1752.6MHz	1512
Remark: All mode(s) were tested and the worst data was recorded.			

6 Test Summary

Test Items	Test Requirement	Result
RF Output Power	2.1046 22.913 (a) 24.232 (c) 27.50(c) 27.50(d)	PASS
Peak-to-Average Ratio	24.232 (d) 27.50(d)	PASS
Bandwidth	2.1049 22.905 22.917 24.238 27.53(a)	PASS
Spurious Emissions at Antenna Terminal	2.1051 22.917 (a) 24.238 (a) 27.53(h)	PASS
Field Strength of Spurious Radiation	2.1053 22.917 (a) 24.238 (a) 27.53(h)	PASS
Out of band emission, Band Edge	22.917 (a) 24.238 (a) 27.53(h)	PASS
Frequency Stability	2.1055 22.355 24.235 27.5(h) 27.54	PASS
Maximum Permissible Exposure (SAR)	1.1307 2.1093	PASS

7 Equipment Used during Test

7.1 Equipments List

Conducted Emissions Test Site 1#						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1.	EMI Test Receiver	R&S	ESCI	100947	2017-09-12	2018-09-11
2.	LISN	R&S	ENV216	101215	2017-09-12	2018-09-11
3.	Cable	Top	TYPE16(3.5M)	-	2017-09-12	2018-09-11
Conducted Emissions Test Site 2#						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1.	EMI Test Receiver	R&S	ESCI	101155	2017-09-12	2018-09-11
2.	LISN	SCHWARZBECK	NSLK 8128	8128-289	2017-09-12	2018-09-11
3.	Limiter	York	MTS-IMP-136	261115-001-0024	2017-09-12	2018-09-11
4.	Cable	LARGE	RF300	-	2017-09-12	2018-09-11
3m Semi-anechoic Chamber for Radiation Emissions Test site 1#						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1	Spectrum Analyzer	R&S	FSP	100091	2017-04-29	2018-04-28
2	Active Loop Antenna	Beijing Dazhi	ZN30900A	-	2017-04-09	2018-04-08
3	Trilog Broadband Antenna	SCHWARZBECK	VULB9163	336	2017-04-09	2018-04-08
4	Coaxial Cable (below 1GHz)	Top	TYPE16(13M)	-	2017-09-12	2018-09-11
5	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	667	2017-04-09	2018-04-08
6	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9170	335	2017-04-09	2018-04-08
7	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	2017-04-13	2018-04-12
8	Coaxial Cable (above 1GHz)	Top	1GHz-25GHz	EW02014-7	2017-04-13	2018-04-12
9	Universal Radio Communication Tester	R&S	CMU 200	112461	2017-04-13	2018-04-12
10	Signal Generator	R&S	SMR20	100046	2017-09-12	2018-09-11
11	Smart Antenna	SCHWARZBECK	HA08	-	2017-04-09	2018-04-08
3m Semi-anechoic Chamber for Radiation Emissions Test site 2#						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No**	**Last Calibration Date**	**Calibration Due Date**

1	Test Receiver	R&S	ESCI	101296	2017-04-13	2018-04-12
2	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3325	2017-04-09	2018-04-08
3	Amplifier	Compliance pirection systems inc	PAP-0203	22024	2017-04-13	2018-04-12
4	Cable	HUBER+SUHNER	CBL2	525178	2017-04-13	2018-04-12
RF Conducted Testing						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1.	EMC Analyzer (9k~26.5GHz)	Agilent	E7405A	MY45114943	2017-09-12	2018-09-11
2.	Spectrum Analyzer (9k-6GHz)	R&S	FSL6	100959	2017-09-12	2018-09-11
3.	Universal Radio Communication Tester	R&S	CMU 200	112461	2017-04-13	2018-04-12
4	Signal Analyzer (9k~26.5GHz)	Agilent	N9010A	MY50520207	2017-09-12	2018-09-11

7.2 Measurement Uncertainty

Parameter	Uncertainty
Conducted Emission	± 3.64 dB(AC mains 150KHz~30MHz)
Radiated Spurious Emissions	± 5.08 dB (Bilog antenna 30M~1000MHz)
	± 5.47 dB (Horn antenna 1000M~25000MHz)
Radio Frequency	± 1 x 10^{-7}Hz
RF Power	± 0.42 dB
RF Power Density	± 0.7dB
Conducted Spurious Emissions	± 2.76 dB (9kHz~26500MHz)
Confidence interval：95%. Confidence factor:k=2	

7.3 Test Equipment Calibration

All the test equipments used are valid and calibrated by CEPREI Certification Body that address is No.110 Dongguan Zhuang RD. Guangzhou, P.R.China.

8 RF OUTPUT POWER

Test Requirement:	FCC Part 2.1046, 22.913 (a), 24.232 (c), 27.50(c.10); 27.50(d.4)
Test Method:	TIA/EIA-603-D:2010
	KDB971168 D01 v02r02
Test Mode:	TX transmitting

8.1 EUT Operation

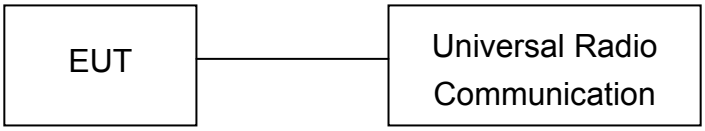
Operating Environment **:**

Temperature:	22.5 °C
Humidity:	52.1 % RH
Atmospheric Pressure:	101.2kPa

8.2 Test Procedure

Conducted method:

The RF output of the transmitter was connected to the wireless test set and the spectrum analyzer through sufficient attenuation.



Radiated method:

1. The setup of EUT is according with per TIA/EIA Standard 603D 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.

8.3 Test Result

Conducted Power

Modem 1

WCDMA - Average Power (dBm)									
Band	**WCDMA Band II**			**WCDMA Band V**			**WCDMA Band IV**		
Channel	**9262**	**9400**	**9538**	**4132**	**4183**	**4233**	**1313**	**1413**	**1512**
Frequency (MHz)	**1852.4**	**1880**	**1907.6**	**826.4**	**836.6**	**846.6**	**1712.4**	**1732.6**	**1752.6**
RMC 12.2k	22.15	22.89	22.40	22.31	22.60	22.55	22.14	22.61	22.55
HSDPA Subtest-1	21.49	21.29	20.90	21.32	21.72	21.40	21.44	21.47	21.03
HSDPA Subtest-2	21.52	21.36	21.32	21.12	21.36	21.40	21.47	21.37	21.38
HSDPA Subtest-3	21.37	21.53	21.48	21.52	21.04	21.27	21.42	21.38	21.40
HSDPA Subtest-4	21.28	21.60	21.48	21.35	21.47	21.25	21.37	21.27	21.45
HSUPA Subtest-1	22.04	21.78	21.49	21.48	21.72	21.46	21.62	21.49	21.49
HSUPA Subtest-2	21.25	21.24	21.28	21.38	21.40	21.45	21.47	21.54	21.29
HSUPA Subtest-3	21.40	21.52	21.47	21.48	21.49	21.52	21.25	21.37	21.37
HSUPA Subtest-4	21.47	21.27	21.40	21.58	21.40	21.28	21.34	21.41	21.29
HSUPA Subtest-5	21.42	21.36	21.27	21.40	21.46	21.41	21.39	21.37	21.29

Modem 2

WCDMA - Average Power (dBm)									
Band	**WCDMA Band II**			**WCDMA Band V**			**WCDMA Band IV**		
Channel	**9262**	**9400**	**9538**	**4132**	**4183**	**4233**	**1313**	**1413**	**1512**
Frequency (MHz)	**1852.4**	**1880**	**1907.6**	**826.4**	**836.6**	**846.6**	**1712.4**	**1732.6**	**1752.6**
RMC 12.2k	22.60	22.48	22.01	22.71	22.39	22.48	22.70	22.18	22.64
HSDPA Subtest-1	21.99	21.71	21.37	21.49	21.84	21.80	21.45	21.47	21.58
HSDPA Subtest-2	21.36	21.35	21.34	21.52	21.30	21.40	21.38	21.42	21.31
HSDPA Subtest-3	21.39	21.36	21.41	21.36	21.37	21.52	21.30	21.23	21.24
HSDPA Subtest-4	21.32	21.60	21.38	21.28	21.36	21.35	21.38	21.40	21.23
HSUPA Subtest-1	21.68	21.35	20.95	21.44	21.69	21.81	21.45	21.05	21.98
HSUPA Subtest-2	21.25	21.40	21.25	21.34	21.36	21.36	21.41	21.37	21.24
HSUPA Subtest-3	21.52	21.40	21.37	21.40	21.34	21.40	21.36	21.32	21.40
HSUPA Subtest-4	21.50	21.40	21.29	21.40	21.31	21.21	21.24	21.60	21.34
HSUPA Subtest-5	21.28	21.36	21.40	21.37	21.36	21.37	21.25	21.29	21.34

Radiated Powe

ERP and EIRP

Modem 1

WCDMA Band V (Part 22H)

Frequency	Receiver Reading	Turn table Angle	RX Antenna		Substituted			Absolute Level	Part 22H	
			Height	Polar	SG Level	Cable	Antenna Gain		Limit	Margin
(MHz)	(dBμV)	Degree	(m)	(H/V)	(dBm)	(dB)	(dB)	(dBm)	(dBm)	(dB)
WCDMA Band V Voice Channel 4132										
826.40	88.52	1	1.2	H	21.49	0.20	0.00	21.29	38.45	-17.16
826.40	89.74	118	2.1	V	22.64	0.20	0.00	22.44	38.45	-16.01
WCDMA Band V Voice Channel 4183										
836.60	88.15	130	1.7	H	21.12	0.20	0.00	20.92	38.45	-17.53
836.60	89.63	27	2.2	V	22.53	0.20	0.00	22.33	38.45	-16.12
WCDMA Band V Voice Channel 4233										
846.60	88.20	105	2.0	H	21.17	0.20	0.00	20.97	38.45	-17.48
846.60	90.14	181	2.1	V	23.04	0.20	0.00	22.84	38.45	-15.61
WCDMA Band V HSDPA Channel 4132										
826.40	89.01	15	1.3	H	21.98	0.20	0.00	21.78	38.45	-16.67
826.40	91.25	297	1.2	V	24.15	0.20	0.00	23.95	38.45	-14.50
WCDMA Band V HSDPA Channel 4183										
836.60	89.61	348	1.7	H	22.58	0.20	0.00	22.38	38.45	-16.07
836.60	91.47	7	1.1	V	24.37	0.20	0.00	24.17	38.45	-14.28
WCDMA Band V HSDPA Channel 4233										
846.60	89.52	91	1.4	H	22.49	0.20	0.00	22.29	38.45	-16.16
846.60	90.47	300	1.6	V	23.37	0.20	0.00	23.17	38.45	-15.28
WCDMA Band V HSUPA Channel 4132										
826.40	89.05	136	1.7	H	22.02	0.20	0.00	21.82	38.45	-16.63
826.40	91.50	270	1.7	V	24.40	0.20	0.00	24.20	38.45	-14.25
WCDMA Band V HSUPA Channel 4183										
836.60	89.57	101	1.4	H	22.54	0.20	0.00	22.34	38.45	-16.11
836.60	91.06	21	2.4	V	23.96	0.20	0.00	23.76	38.45	-14.69
WCDMA Band V HSUPA Channel 4233										
846.60	89.67	158	2.3	H	22.64	0.20	0.00	22.44	38.45	-16.01
846.60	90.54	247	2.3	V	23.44	0.20	0.00	23.24	38.45	-15.21

WCDMA Band II (Part 24E)

Frequency	Receiver Reading	Turn table Angle	RX Antenna		Substituted			Absolute Level	Part 24E	
			Height	Polar	SG Level	Cable	Antenna Gain		Limit	Margin
(MHz)	(dBμV)	Degree	(m)	(H/V)	(dBm)	(dB)	(dB)	(dBm)	(dBm)	(dB)
WCDMA Band II Voice Channel 9262										
1852.40	84.57	191	1.6	H	10.60	0.31	10.40	20.69	33	-12.31
1852.40	86.50	184	1.6	V	13.22	0.31	10.40	23.31	33	-9.69
WCDMA Band II Voice Channel 9400										
1880.00	84.98	101	1.6	H	11.13	0.31	10.40	21.22	33	-11.78
1880.00	85.13	99	1.5	V	12.01	0.31	10.40	22.10	33	-10.90
WCDMA Band II Voice Channel 9538										
1907.60	84.96	29	2.1	H	11.23	0.32	10.40	21.31	33	-11.69
1907.60	86.20	212	1.9	V	13.24	0.32	10.40	23.32	33	-9.68
WCDMA Band II HSDPA Channel 9262										
1852.40	84.20	265	1.1	H	10.23	0.31	10.40	20.32	33	-12.68
1852.40	85.49	293	2.2	V	12.21	0.31	10.40	22.30	33	-10.70
WCDMA Band II HSDPA Channel 9400										
1880.00	84.29	238	2.2	H	10.44	0.31	10.40	20.53	33	-12.47
1880.00	86.94	182	1.3	V	13.82	0.31	10.40	23.91	33	-9.09
WCDMA Band II HSDPA Channel 9538										
1907.60	84.09	321	1.9	H	10.36	0.32	10.40	20.44	33	-12.56
1907.60	85.67	196	2.5	V	12.71	0.32	10.40	22.79	33	-10.21
WCDMA Band II HSUPA Channel 9262										
1852.40	85.14	141	1.5	H	11.17	0.31	10.40	21.26	33	-11.74
1852.40	86.52	67	1.8	V	13.24	0.31	10.40	23.33	33	-9.67
WCDMA Band II HSUPA Channel 9400										
1880.00	84.06	41	2.0	H	10.21	0.31	10.40	20.30	33	-12.70
1880.00	86.46	326	2.3	V	13.34	0.31	10.40	23.43	33	-9.57
WCDMA Band II HSUPA Channel 9538										
1907.60	84.56	49	1.7	H	10.83	0.32	10.40	20.91	33	-12.09
1907.60	86.94	327	2.0	V	13.98	0.32	10.40	24.06	33	-8.94

WCDMA Band IV (Part 27)

Frequency	Receiver Reading	Turn table Angle	RX Antenna		Substituted			Absolute Level	Part 27	
			Height	Polar	SG Level	Cable	Antenna Gain		Limit	Margin
(MHz)	(dBμV)	Degree	(m)	(H/V)	(dBm)	(dB)	(dB)	(dBm)	(dBm)	(dB)
WCDMA Band IV Voice Channel 1313										
1712.40	85.64	123	1.2	H	11.67	0.30	9.40	20.77	30	-9.23
1712.40	86.96	84	2.4	V	12.68	0.30	9.40	21.78	30	-8.22
WCDMA Band IV Voice Channel 1413										
1732.60	86.47	161	1.7	H	12.62	0.30	9.40	21.72	30	-8.28
1732.60	88.91	241	2.4	V	14.79	0.30	9.40	23.89	30	-6.11
WCDMA Band IV Voice Channel 1512										
1752.60	88.52	83	1.6	H	14.79	0.30	9.40	23.89	30	-6.11
1752.60	90.67	94	1.9	V	15.71	0.30	9.40	24.81	30	-5.19
WCDMA Band IV HSDPA Channel 1313										
1712.40	88.96	192	2.3	H	14.99	0.30	9.40	24.09	30	-5.91
1712.40	90.14	297	2.4	V	15.86	0.30	9.40	24.96	30	-5.04
WCDMA Band IV HSDPA Channel 1413										
1732.60	89.60	214	1.2	H	15.75	0.30	9.40	24.85	30	-5.15
1732.60	90.36	73	1.7	V	16.24	0.30	9.40	25.34	30	-4.66
WCDMA Band IV HSDPA Channel 1512										
1752.60	88.57	80	1.6	H	14.84	0.30	9.40	23.94	30	-6.06
1752.60	90.26	188	1.7	V	15.30	0.30	9.40	24.40	30	-5.60
WCDMA Band IV HSUPA Channel 1313										
1712.40	89.63	14	1.8	H	15.66	0.30	9.40	24.76	30	-5.24
1712.40	91.54	26	2.3	V	17.26	0.30	9.40	26.36	30	-3.64
WCDMA Band IV HSUPA Channel 1413										
1732.60	88.32	171	1.9	H	14.47	0.30	9.40	23.57	30	-6.43
1732.60	90.23	327	2.1	V	16.11	0.30	9.40	25.21	30	-4.79
WCDMA Band IV HSUPA Channel 1512										
1752.60	89.74	77	2.1	H	16.01	0.30	9.40	25.11	30	-4.89
1752.60	91.52	180	2.4	V	16.56	0.30	9.40	25.66	30	-4.34

Modem 2

WCDMA Band V (Part 22H)

Frequency	Receiver Reading	Turn table Angle	RX Antenna		Substituted			Absolute Level	Part 22H	
			Height	Polar	SG Level	Cable	Antenna Gain		Limit	Margin
(MHz)	(dBμV)	Degree	(m)	(H/V)	(dBm)	(dB)	(dB)	(dBm)	(dBm)	(dB)
WCDMA Band V Voice Channel 4132										
826.40	88.36	306	1.3	H	21.33	0.20	0.00	21.13	38.45	-17.32
826.40	89.85	287	1.7	V	22.75	0.20	0.00	22.55	38.45	-15.90
WCDMA Band V Voice Channel 4183										
836.60	88.25	128	2.4	H	21.22	0.20	0.00	21.02	38.45	-17.43
836.60	89.67	178	2.0	V	22.57	0.20	0.00	22.37	38.45	-16.08
WCDMA Band V Voice Channel 4233										
846.60	88.21	252	1.2	H	21.18	0.20	0.00	20.98	38.45	-17.47
846.60	90.17	241	1.6	V	23.07	0.20	0.00	22.87	38.45	-15.58
WCDMA Band V HSDPA Channel 4132										
826.40	89.03	42	2.3	H	22.00	0.20	0.00	21.80	38.45	-16.65
826.40	91.26	252	2.1	V	24.16	0.20	0.00	23.96	38.45	-14.49
WCDMA Band V HSDPA Channel 4183										
836.60	89.37	223	1.4	H	22.34	0.20	0.00	22.14	38.45	-16.31
836.60	90.15	59	1.7	V	23.05	0.20	0.00	22.85	38.45	-15.60
WCDMA Band V HSDPA Channel 4233										
846.60	89.14	109	2.2	H	22.11	0.20	0.00	21.91	38.45	-16.54
846.60	90.48	88	1.7	V	23.38	0.20	0.00	23.18	38.45	-15.27
WCDMA Band V HSUPA Channel 4132										
826.40	89.05	195	2.3	H	22.02	0.20	0.00	21.82	38.45	-16.63
826.40	91.76	97	1.7	V	24.66	0.20	0.00	24.46	38.45	-13.99
WCDMA Band V HSUPA Channel 4183										
836.60	89.54	163	1.5	H	22.51	0.20	0.00	22.31	38.45	-16.14
836.60	91.08	232	1.1	V	23.98	0.20	0.00	23.78	38.45	-14.67
WCDMA Band V HSUPA Channel 4233										
846.60	89.62	123	2.0	H	22.59	0.20	0.00	22.39	38.45	-16.06
846.60	90.58	177	2.2	V	23.48	0.20	0.00	23.28	38.45	-15.17

WCDMA Band II (Part 24E)

Frequency	Receiver Reading	Turn table Angle	RX Antenna		Substituted			Absolute Level	Part 24E	
			Height	Polar	SG Level	Cable	Antenna Gain		Limit	Margin
(MHz)	(dBμV)	Degree	(m)	(H/V)	(dBm)	(dB)	(dB)	(dBm)	(dBm)	(dB)
WCDMA Band II Voice Channel 9262										
1852.40	84.51	177	2.0	H	10.54	0.31	10.40	20.63	33	-12.37
1852.40	86.59	163	1.6	V	13.31	0.31	10.40	23.40	33	-9.60
WCDMA Band II Voice Channel 9400										
1880.00	84.52	310	1.3	H	10.67	0.31	10.40	20.76	33	-12.24
1880.00	85.16	11	2.3	V	12.04	0.31	10.40	22.13	33	-10.87
WCDMA Band II Voice Channel 9538										
1907.60	84.85	82	1.9	H	11.12	0.32	10.40	21.20	33	-11.80
1907.60	86.23	267	1.5	V	13.27	0.32	10.40	23.35	33	-9.65
WCDMA Band II HSDPA Channel 9262										
1852.40	84.27	263	1.3	H	10.30	0.31	10.40	20.39	33	-12.61
1852.40	85.47	111	2.4	V	12.19	0.31	10.40	22.28	33	-10.72
WCDMA Band II HSDPA Channel 9400										
1880.00	84.28	287	1.1	H	10.43	0.31	10.40	20.52	33	-12.48
1880.00	86.94	319	1.9	V	13.82	0.31	10.40	23.91	33	-9.09
WCDMA Band II HSDPA Channel 9538										
1907.60	84.07	341	1.8	H	10.34	0.32	10.40	20.42	33	-12.58
1907.60	85.69	278	1.9	V	12.73	0.32	10.40	22.81	33	-10.19
WCDMA Band II HSUPA Channel 9262										
1852.40	85.16	133	2.3	H	11.19	0.31	10.40	21.28	33	-11.72
1852.40	86.54	2	1.1	V	13.26	0.31	10.40	23.35	33	-9.65
WCDMA Band II HSUPA Channel 9400										
1880.00	84.51	102	1.8	H	10.66	0.31	10.40	20.75	33	-12.25
1880.00	86.42	75	1.1	V	13.30	0.31	10.40	23.39	33	-9.61
WCDMA Band II HSUPA Channel 9538										
1907.60	85.59	185	2.2	H	11.86	0.32	10.40	21.94	33	-11.06
1907.60	86.98	233	2.4	V	14.02	0.32	10.40	24.10	33	-8.90

WCDMA Band IV (Part 27)

Frequency	Receiver Reading	Turn table Angle	RX Antenna		Substituted			Absolute Level	Part 27	
			Height	Polar	SG Level	Cable	Antenna Gain		Limit	Margin
(MHz)	(dBμV)	Degree	(m)	(H/V)	(dBm)	(dB)	(dB)	(dBm)	(dBm)	(dB)
WCDMA Band IV Voice Channel 1313										
1712.40	85.20	244	2.1	H	11.23	0.30	9.40	20.33	30	-9.67
1712.40	86.92	59	1.0	V	12.64	0.30	9.40	21.74	30	-8.26
WCDMA Band IV Voice Channel 1413										
1732.60	86.45	204	1.7	H	12.60	0.30	9.40	21.70	30	-8.30
1732.60	88.97	170	1.4	V	14.85	0.30	9.40	23.95	30	-6.05
WCDMA Band IV Voice Channel 1512										
1752.60	88.54	267	2.1	H	14.81	0.30	9.40	23.91	30	-6.09
1752.60	90.68	194	1.6	V	15.72	0.30	9.40	24.82	30	-5.18
WCDMA Band IV HSDPA Channel 1313										
1712.40	88.94	309	1.5	H	14.97	0.30	9.40	24.07	30	-5.93
1712.40	90.15	249	1.5	V	15.87	0.30	9.40	24.97	30	-5.03
WCDMA Band IV HSDPA Channel 1413										
1732.60	89.57	85	2.3	H	15.72	0.30	9.40	24.82	30	-5.18
1732.60	90.35	221	2.2	V	16.23	0.30	9.40	25.33	30	-4.67
WCDMA Band IV HSDPA Channel 1512										
1752.60	88.51	123	1.6	H	14.78	0.30	9.40	23.88	30	-6.12
1752.60	90.37	306	2.4	V	15.41	0.30	9.40	24.51	30	-5.49
WCDMA Band IV HSUPA Channel 1313										
1712.40	89.38	269	1.1	H	15.41	0.30	9.40	24.51	30	-5.49
1712.40	91.25	104	1.8	V	16.97	0.30	9.40	26.07	30	-3.93
WCDMA Band IV HSUPA Channel 1413										
1732.60	88.24	237	2.0	H	14.39	0.30	9.40	23.49	30	-6.51
1732.60	90.25	43	1.6	V	16.13	0.30	9.40	25.23	30	-4.77
WCDMA Band IV HSUPA Channel 1512										
1752.60	89.45	163	1.3	H	15.72	0.30	9.40	24.82	30	-5.18
1752.60	91.53	95	1.8	V	16.57	0.30	9.40	25.67	30	-4.33

9 Peak-to-Average Ratio

Test Requirement: 24.232 (d), 27.50(d)

Test Method: N/A

Test Mode: TX transmitting

9.1 EUT Operation

Operating Environment **:**

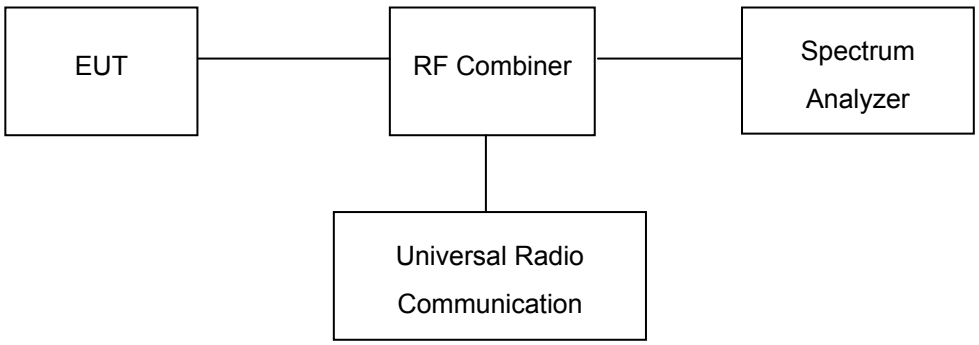
Temperature: 22.5 °C

Humidity: 52.3% RH

Atmospheric Pressure: 101.2kPa

9.2 Test Procedure

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. Set EUT to transmit at maximum output power.
3. When the duty cycle is less than 98%, then signal gating will be implemented on the spectrum analyzer by triggering from the system simulator.
4. Set the CCDF (Complementary Cumulative Distribution Function) option of the spectrum analyzer. Record the maximum PAPR level associated with a probability of 0.1%.



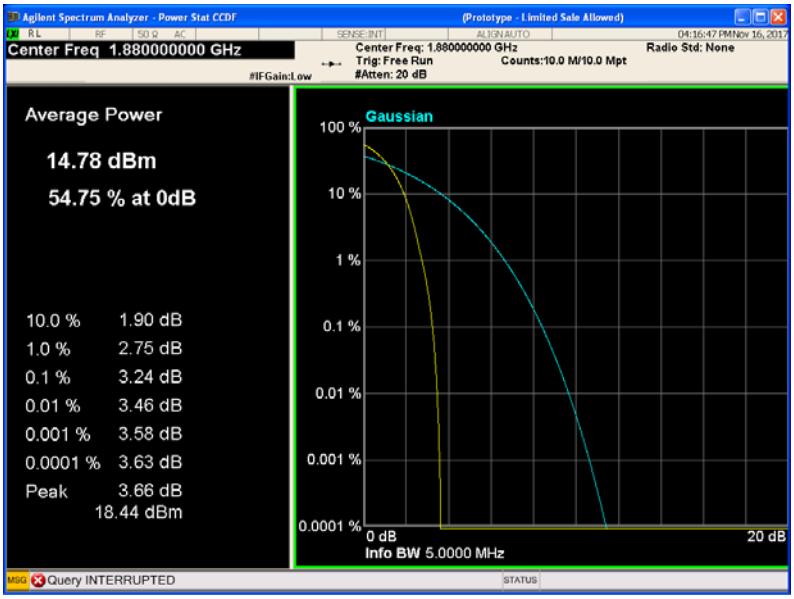
9.3 Test Result

Remark: All test data were reported and only the worst case (middle channel mode) test graphs were showed in test report.

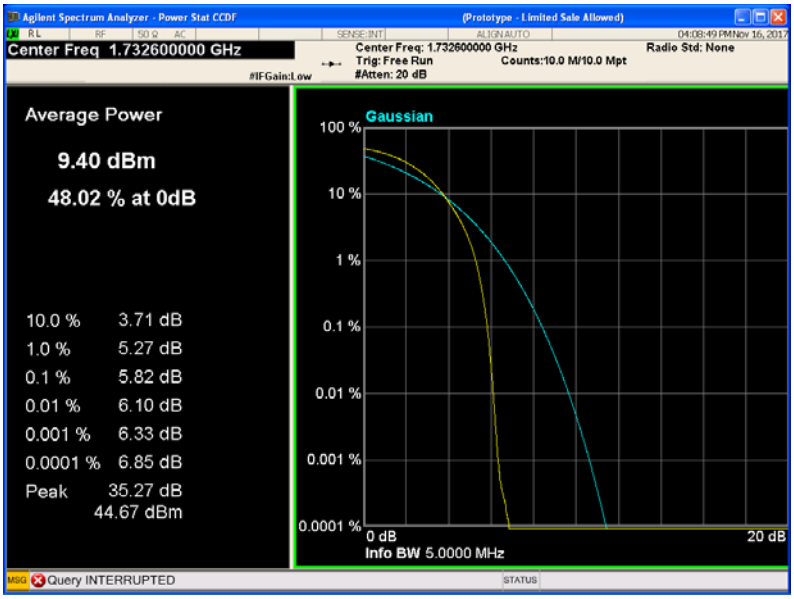
Cellular Band (Part 24E) Modem 1

Mode	WCDMA Band II			WCDMA Band IV			Limit (dB)
Channel	9262	9400	9538	1313	1413	1512	
Frequency (MHz)	1852.4	1880.0	1907.6	1712.4	1732.6	1752.6	
Peak-to-Average Ratio (dB)	3.23	3.24	3.24	5.76	5.82	5.75	13

WCDMA Band II Middle Channel



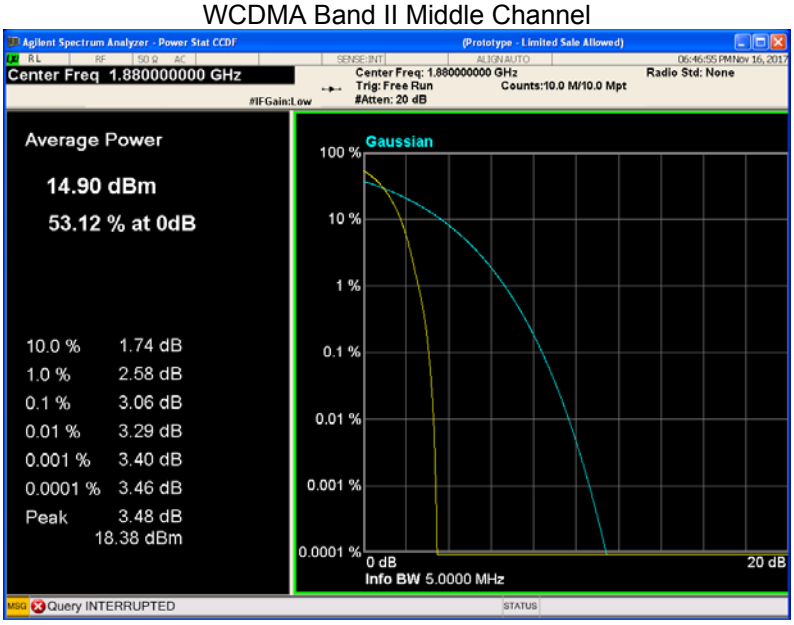
WCDMA Band IV Middle Channel



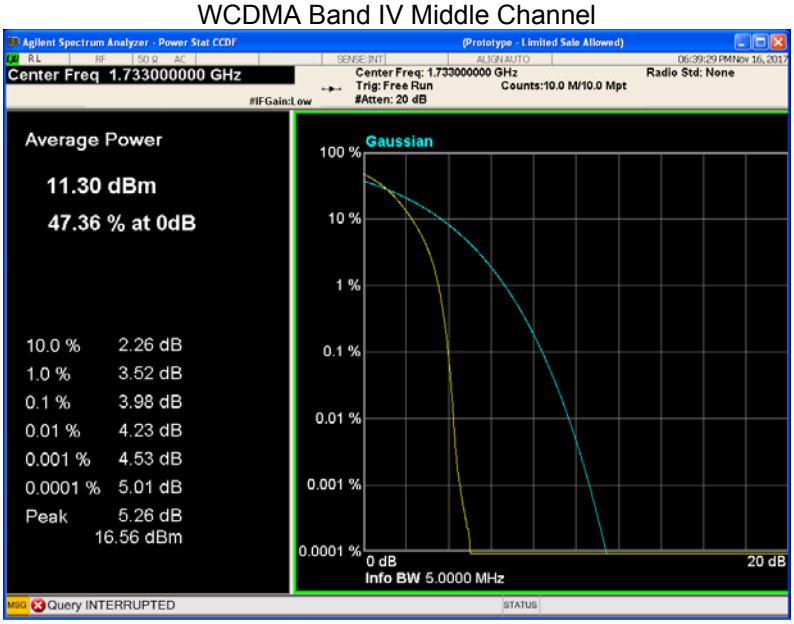
Modem 2

Mode	WCDMA Band II			WCDMA Band IV			Limit (dB)
Channel	9262	9400	9538	1313	1413	1512	
Frequency (MHz)	1852.4	1880.0	1907.6	1712.4	1732.6	1752.6	
Peak-to-Average Ratio (dB)	3.05	3.06	3.04	3.96	3.98	3.97	13

WCDMA Band II Middle Channel



WCDMA Band IV Middle Channel



10 BANDWIDTH

Test Requirement:	FCC Part 2.1049, 22.917, 22.905, 24.238, 27.53(a)
Test Method:	TIA/EIA-603-D:2010
	KDB971168 D01 v02r02
Test Mode:	TX transmitting

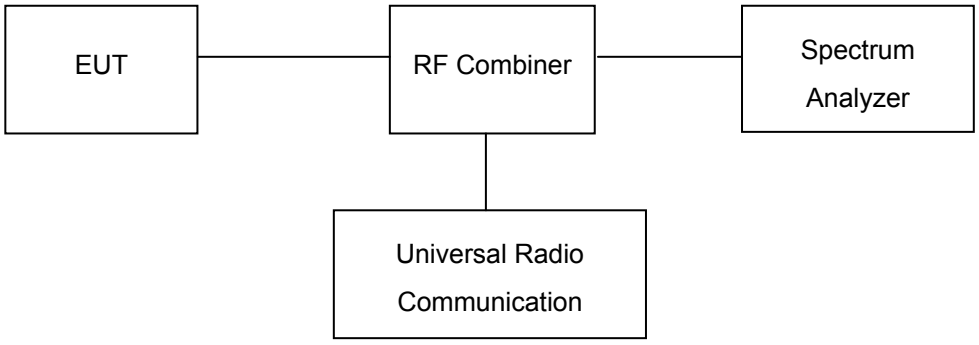
10.1 EUT Operation

Operating Environment **:**

Temperature:	22.5 °C
Humidity:	52.3% RH
Atmospheric Pressure:	101.2kPa

10.2 Test Procedure

The RF output of the transmitter was connected to the wireless test set and the spectrum analyzer through sufficient attenuation.
The resolution bandwidth of the spectrum analyzer was set in the range of 1 to 5 % of the anticipated OBW (Cellular /PCS) and the 26 dB & 99%bandwidth was recorded.



10.3 Test Result

Remark: All test data were reported and only the worst case (middle channel mode) test graphs were showed in test report.

Modem 1

Cellular Band (Part 22H)

Test Mode		Channel	Frequency (MHz)	99% Occupied Bandwidth(MHz)	26 dB Emission Bandwidth(MHz)
WCDMA Band V	RMC12.2k	4132	826.4	4.13	4.68
		4183	836.6	4.14	4.69
		4233	846.6	4.14	4.69
	HSDPA(16QAM)	4132	826.4	4.13	4.68
		4183	836.6	4.14	4.69
		4233	846.6	4.12	4.68
	HSUPA(BPSK)	4132	826.4	4.14	4.68
		4183	836.6	4.15	4.69
		4233	846.6	4.14	4.68

Cellular Band (Part 24E)

Test Mode		Channel	Frequency (MHz)	99% Occupied Bandwidth(MHz)	26 dB Emission Bandwidth(MHz)
WCDMA Band II	RMC12.2k	9262	1852.4	4.19	5.34
		9400	1880.0	4.19	5.36
		9538	1907.6	4.18	5.34
	HSDPA(16QAM)	9262	1852.4	4.15	4.69
		9400	1880.0	4.16	4.69
		9538	1907.6	4.15	4.68
	HSUPA(BPSK)	9262	1852.4	4.14	4.71
		9400	1880.0	4.15	4.72
		9538	1907.6	4.14	4.71

Cellular Band (Part 27)

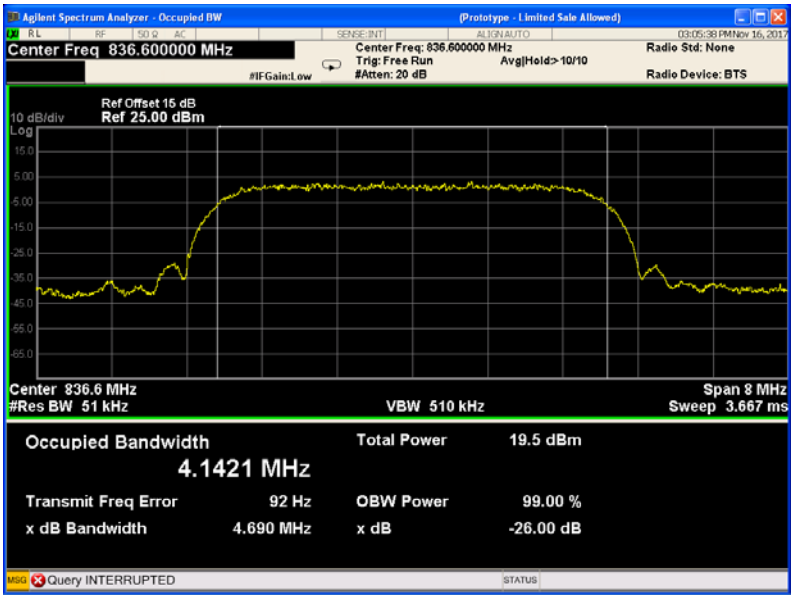
Test Mode		Channel	Frequency (MHz)	99% Occupied Bandwidth(MHz)	26 dB Emission Bandwidth(MHz)
WCDMA Band IV	RMC12.2k	1313	1712.6	4.14	4.67
		1413	1732.6	4.15	4.69
		1512	1752.4	4.15	4.67
	HSDPA	1313	1712.6	4.16	4.58
		1413	1732.6	4.16	4.70
		1512	1752.4	4.15	4.70
	HSUPA	1313	1712.6	4.14	4.55
		1413	1732.6	4.16	4.68
		1512	1752.4	4.15	4.59

Test Plots (worst case)

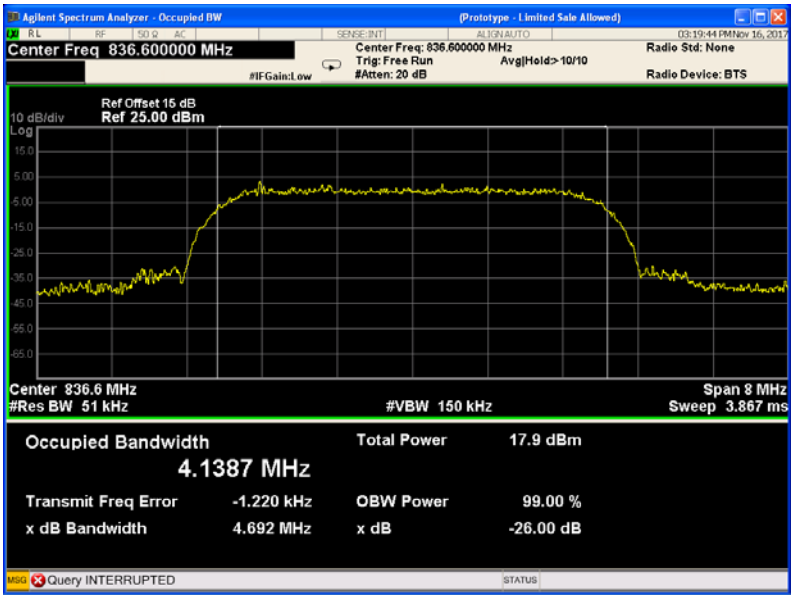
Cellular Band (Part 22H)

WCDMA band V

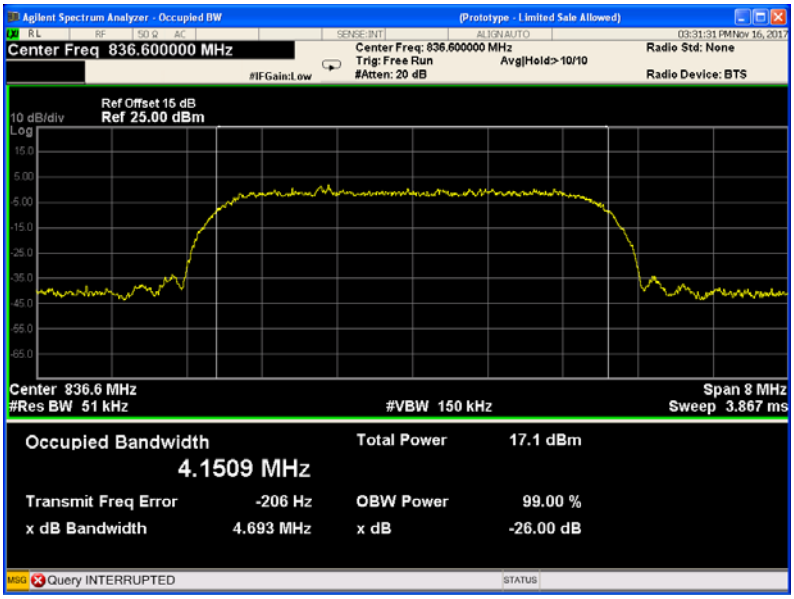
RMC12.2k



HSDPA



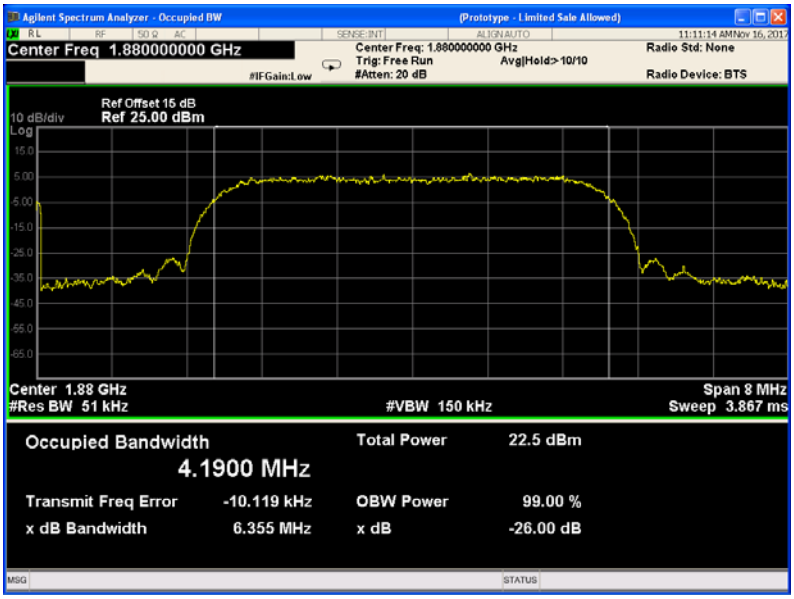
HSUPA



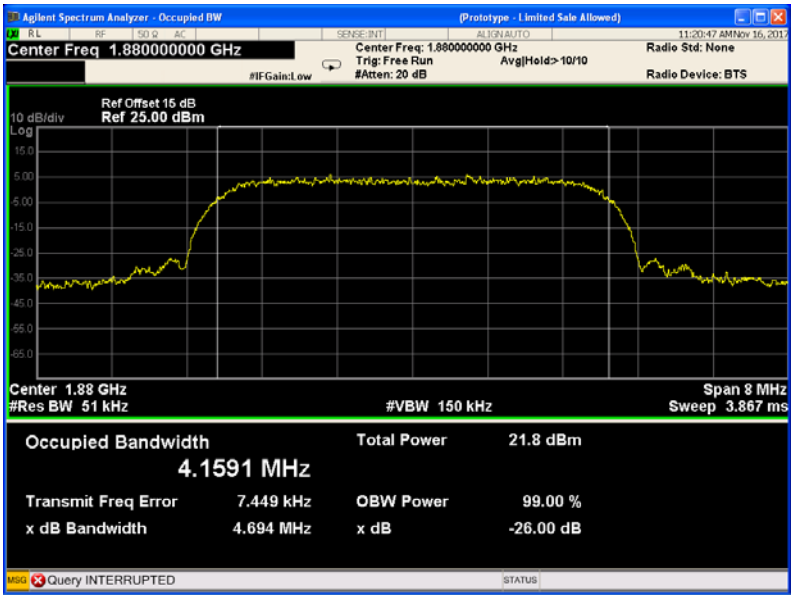
Cellular Band (Part 24E)

WCDMA band II

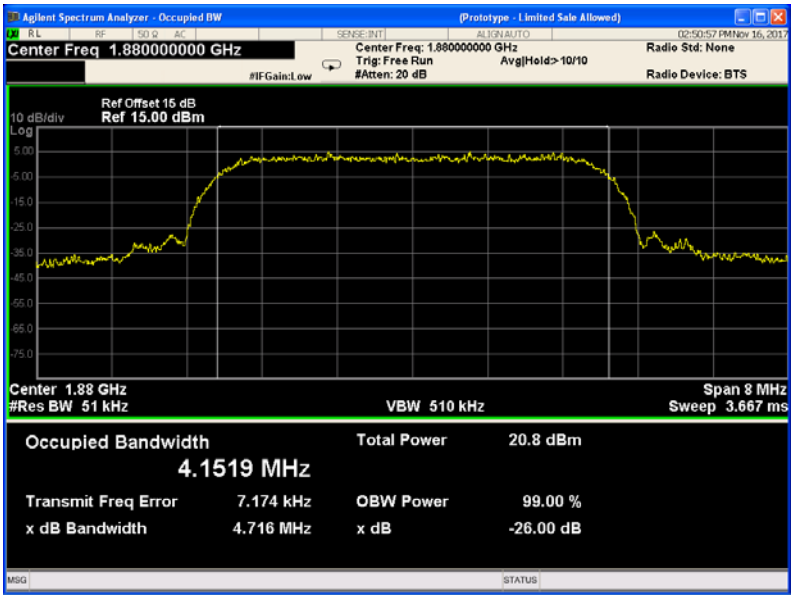
RMC12.2k



HSDPA


Agilent Spectrum Analyzer - Occupied BW
(Prototype - Limited Sale Allowed)
Center Freq 1.880000000 GHz
Center Freq: 1.880000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 20 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
Ref Offset 15 dB
10 dB/div
Ref 25.00 dBm
Log
Center 1.88 GHz
#Res BW 51 kHz
#VBW 150 kHz
Span 8 MHz
Sweep 3.867 ms
Occupied Bandwidth
4.1591 MHz
Total Power
21.8 dBm
Transmit Freq Error
7.449 kHz
OBW Power
99.00 %
x dB Bandwidth
4.694 MHz
x dB
-26.00 dB
Query INTERRUPTED
STATUS

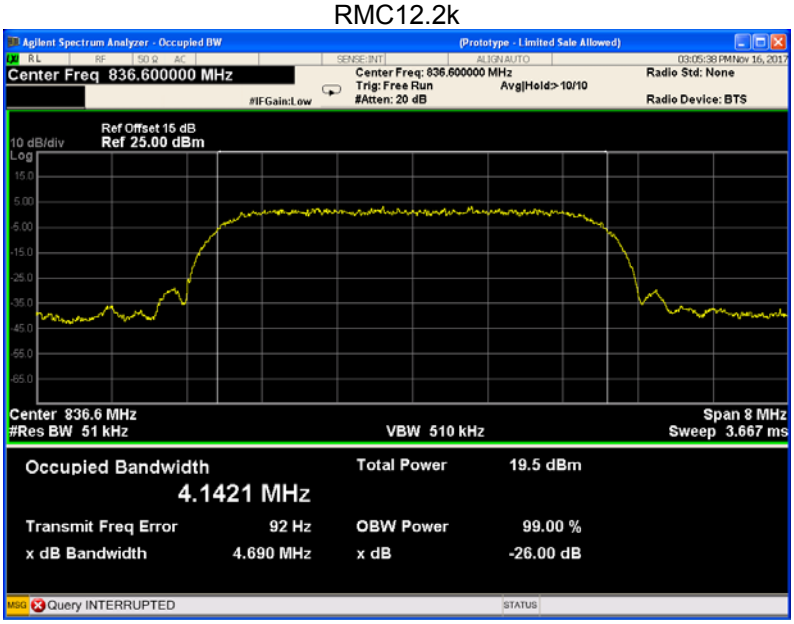
HSUPA


Agilent Spectrum Analyzer - Occupied BW
(Prototype - Limited Sale Allowed)
Center Freq 1.880000000 GHz
Center Freq: 1.880000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 20 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
Ref Offset 15 dB
10 dB/div
Ref 15.00 dBm
Log
Center 1.88 GHz
#Res BW 51 kHz
VBW 510 kHz
Span 8 MHz
Sweep 3.667 ms
Occupied Bandwidth
4.1519 MHz
Total Power
20.8 dBm
Transmit Freq Error
7.174 kHz
OBW Power
99.00 %
x dB Bandwidth
4.716 MHz
x dB
-26.00 dB
STATUS

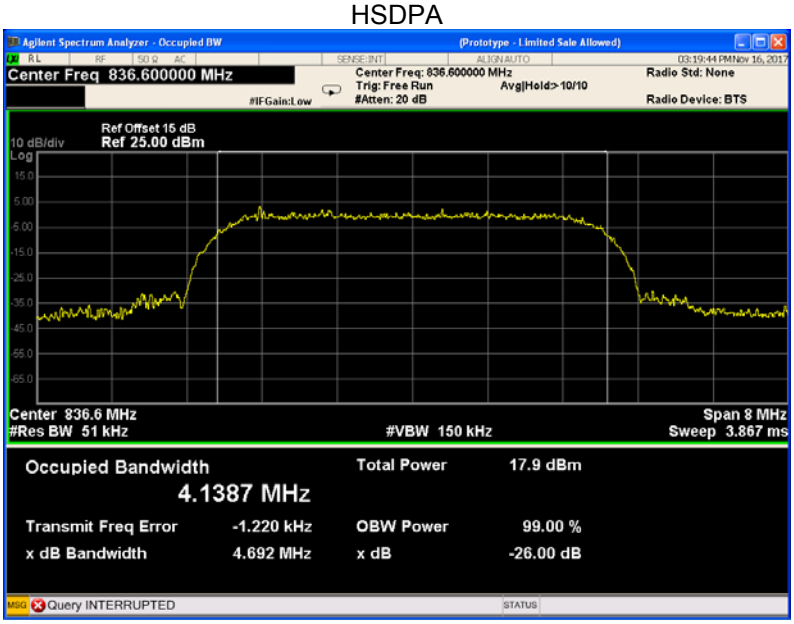
(Part 27)

WCDMA band IV

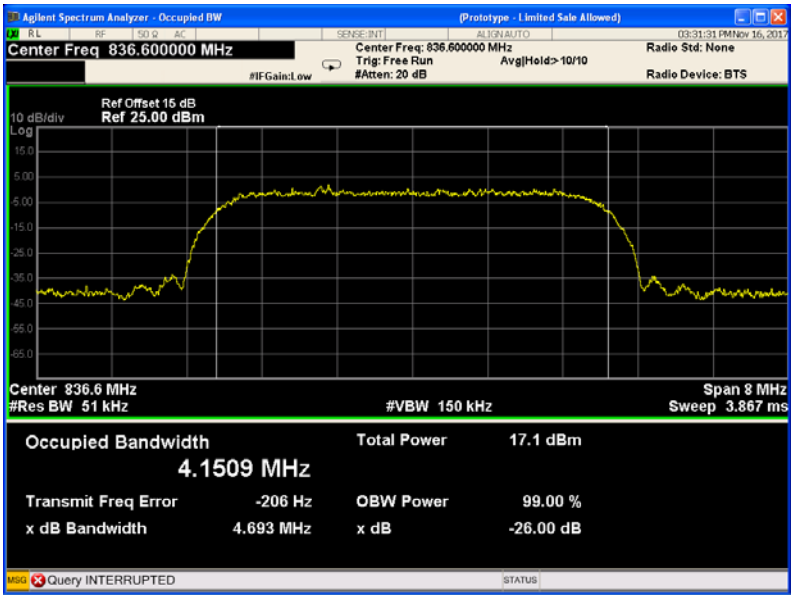
RMC12.2k



HSDPA



HSUPA


Agilent Spectrum Analyzer - Occupied BW
(Prototype - Limited Sale Allowed)
Center Freq 836.600000 MHz
Center Freq: 836.600000 MHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 20 dB
Radio Std: None
Radio Device: BTS
#IFGain:Low
Ref Offset 15 dB
10 dB/div
Ref 25.00 dBm
Log
Center 836.6 MHz
#Res BW 51 kHz
#VBW 150 kHz
Span 8 MHz
Sweep 3.867 ms
Occupied Bandwidth
4.1509 MHz
Total Power
17.1 dBm
Transmit Freq Error
-206 Hz
OBW Power
99.00 %
x dB Bandwidth
4.693 MHz
x dB
-26.00 dB
Query INTERRUPTED
STATUS

Modem 2

Cellular Band (Part 22H)

Test Mode		Channel	Frequency (MHz)	99% Occupied Bandwidth(MHz)	26 dB Emission Bandwidth(MHz)
WCDMA Band V	RMC12.2k	4132	826.4	4.14	4.70
		4183	836.6	4.15	4.71
		4233	846.6	4.13	4.69
	HSDPA(16QAM)	4132	826.4	4.13	4.69
		4183	836.6	4.14	4.70
		4233	846.6	4.13	4.70
	HSUPA(BPSK)	4132	826.4	4.13	4.69
		4183	836.6	4.14	4.69
		4233	846.6	4.14	4.69

Cellular Band (Part 24E)

Test Mode		Channel	Frequency (MHz)	99% Occupied Bandwidth(MHz)	26 dB Emission Bandwidth(MHz)
WCDMA Band II	RMC12.2k	9262	1852.4	4.14	4.69
		9400	1880.0	4.15	4.70
		9538	1907.6	4.15	4.68
	HSDPA(16QAM)	9262	1852.4	4.16	4.70
		9400	1880.0	4.16	4.70
		9538	1907.6	4.16	4.70
	HSUPA(BPSK)	9262	1852.4	4.15	4.69
		9400	1880.0	4.16	4.69
		9538	1907.6	4.16	4.69

Cellular Band (Part 27)

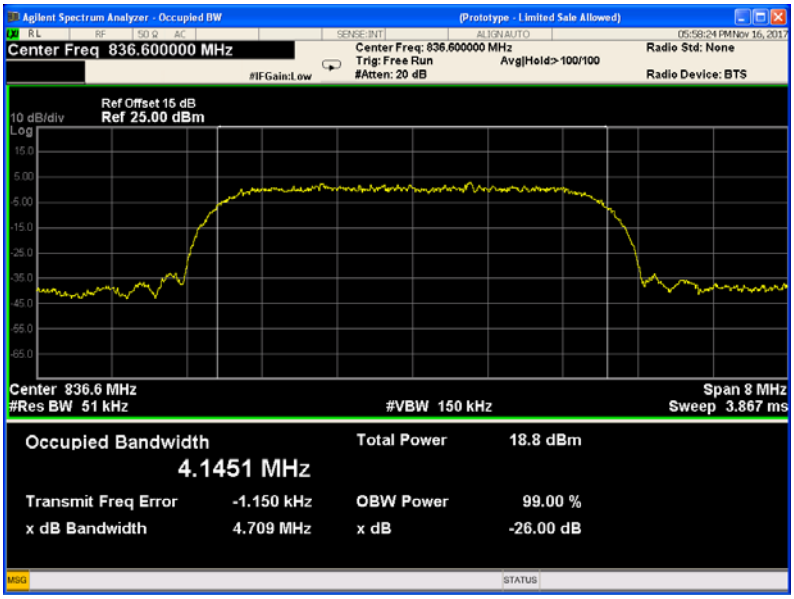
Test Mode		Channel	Frequency (MHz)	99% Occupied Bandwidth(MHz)	26 dB Emission Bandwidth(MHz)
WCDMA Band IV	RMC12.2k	1313	1712.6	4.16	4.54
		1413	1732.6	4.16	4.70
		1512	1752.4	4.15	4.61
	HSDPA	1313	1712.6	4.15	4.58
		1413	1732.6	4.16	4.69
		1512	1752.4	4.14	4.62
	HSUPA	1313	1712.6	4.15	4.56
		1413	1732.6	4.16	4.68
		1512	1752.4	4.15	4.67

Test Plots (worst case)

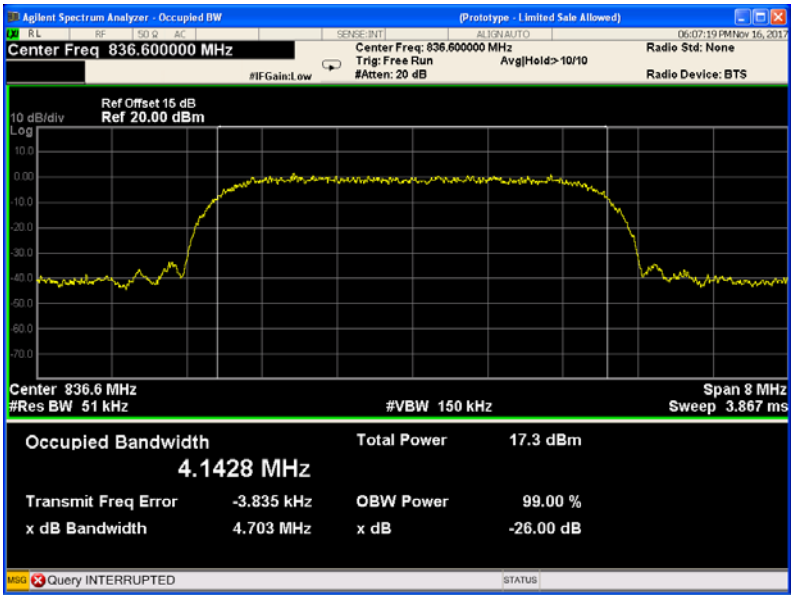
Cellular Band (Part 22H)

WCDMA band V

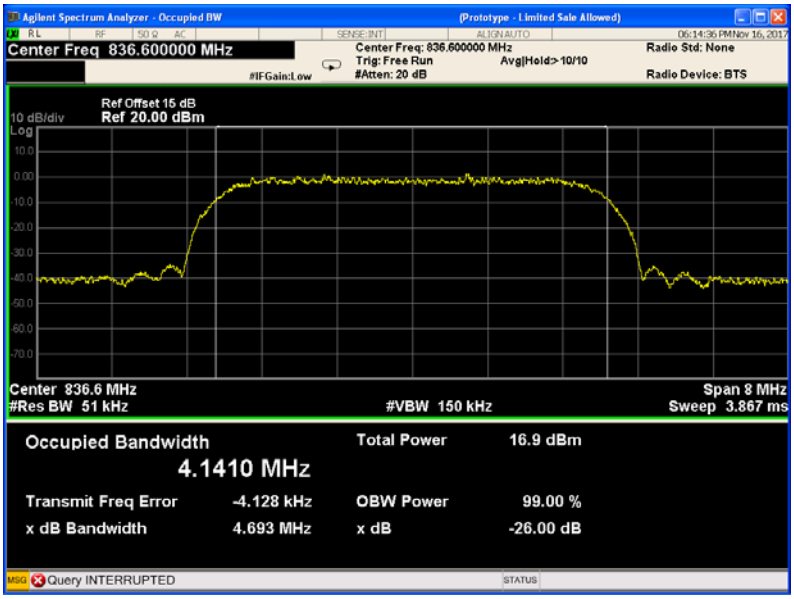
RMC12.2k



HSDPA



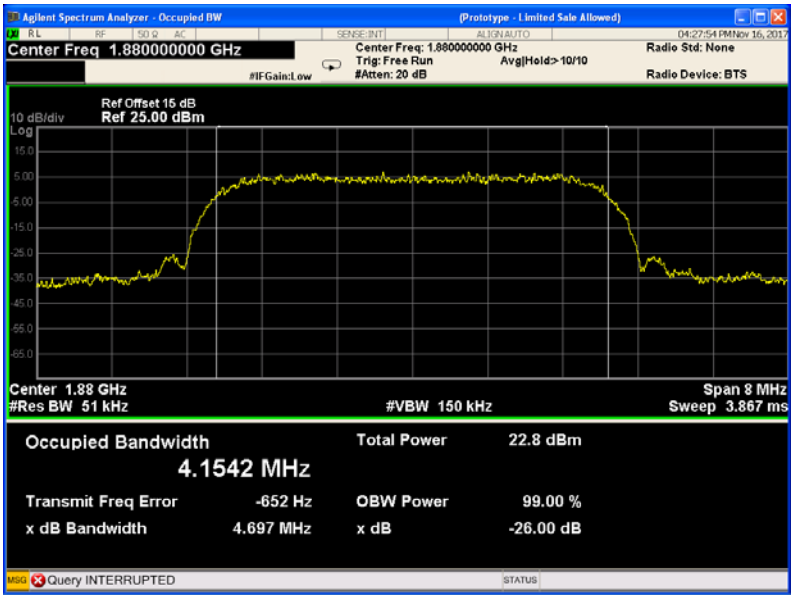
HSUPA



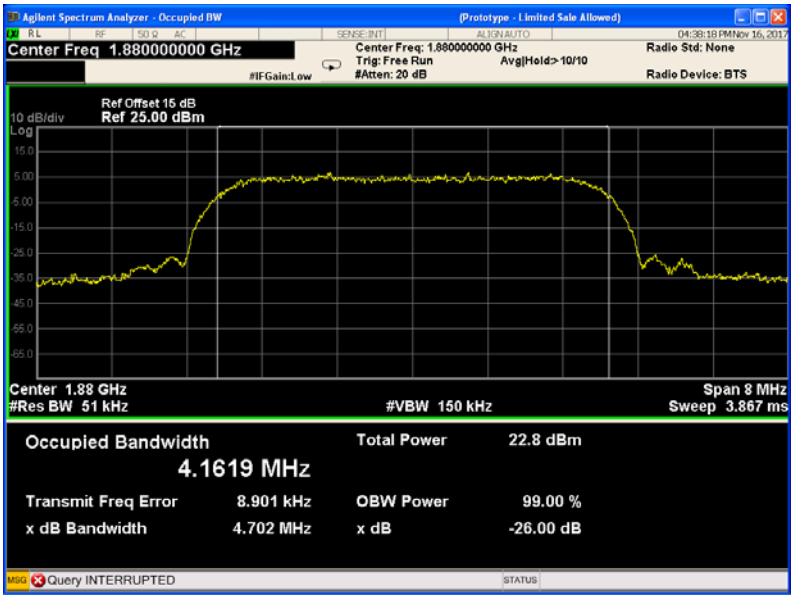
Cellular Band (Part 24E)

WCDMA band II

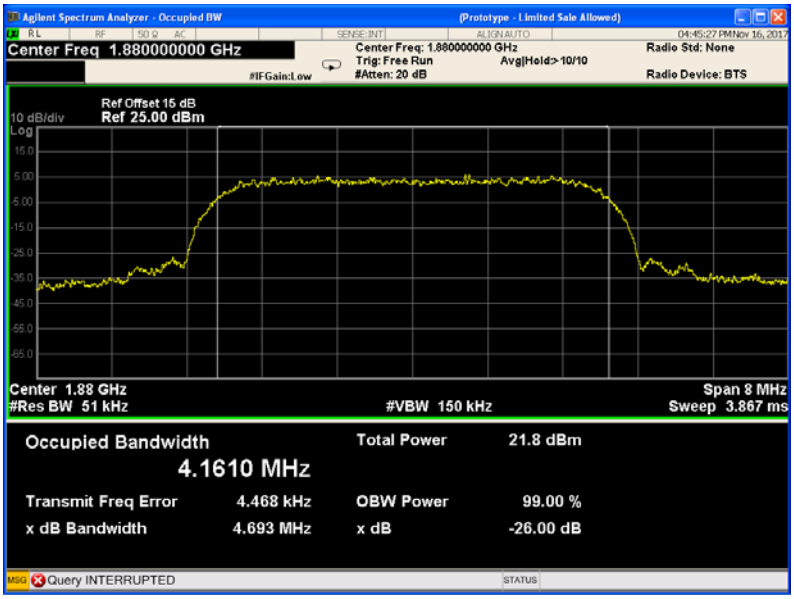
RMC12.2k



HSDPA


Agilent Spectrum Analyzer - Occupied BW
(Prototype - Limited Sale Allowed)
Center Freq 1.880000000 GHz
Center Freq: 1.880000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 20 dB
Radio Std: None
Radio Device: BTS
#IFGain:Low
Ref Offset 15 dB
10 dB/div
Ref 25.00 dBm
Log
Center 1.88 GHz
#Res BW 51 kHz
#VBW 150 kHz
Span 8 MHz
Sweep 3.867 ms
Occupied Bandwidth
4.1619 MHz
Total Power
22.8 dBm
Transmit Freq Error
8.901 kHz
OBW Power
99.00 %
x dB Bandwidth
4.702 MHz
x dB
-26.00 dB
Query INTERRUPTED

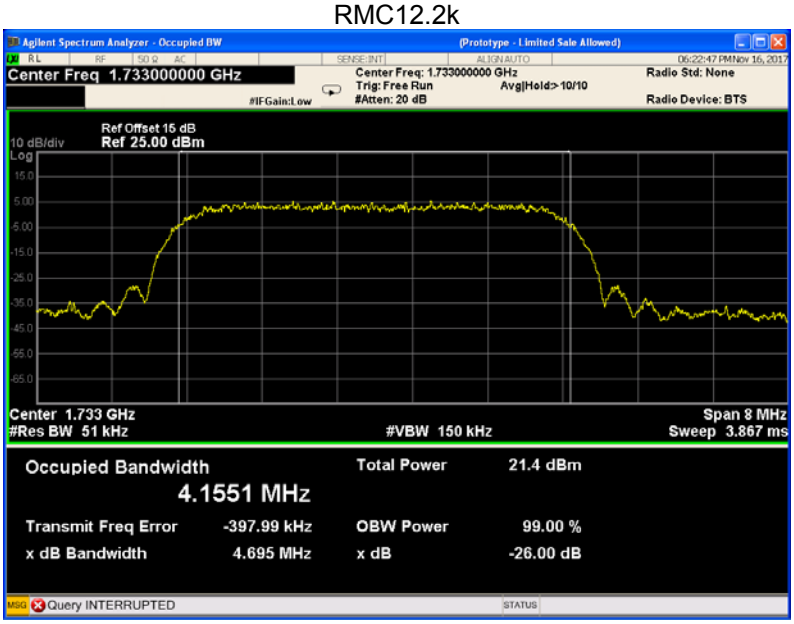
HSUPA


Agilent Spectrum Analyzer - Occupied BW
(Prototype - Limited Sale Allowed)
Center Freq 1.880000000 GHz
Center Freq: 1.880000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 20 dB
Radio Std: None
Radio Device: BTS
#IFGain:Low
Ref Offset 15 dB
10 dB/div
Ref 25.00 dBm
Log
Center 1.88 GHz
#Res BW 51 kHz
#VBW 150 kHz
Span 8 MHz
Sweep 3.867 ms
Occupied Bandwidth
4.1610 MHz
Total Power
21.8 dBm
Transmit Freq Error
4.468 kHz
OBW Power
99.00 %
x dB Bandwidth
4.693 MHz
x dB
-26.00 dB
Query INTERRUPTED

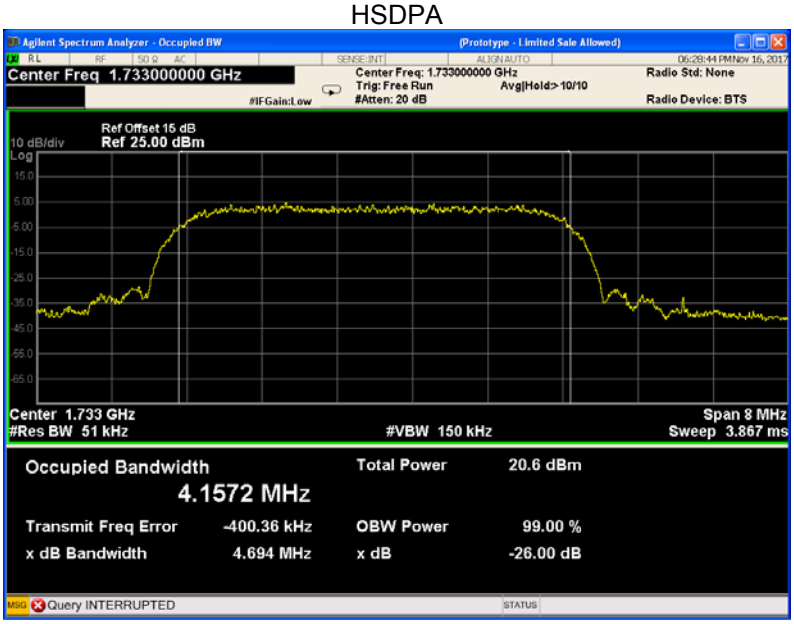
(Part 27)

WCDMA band IV

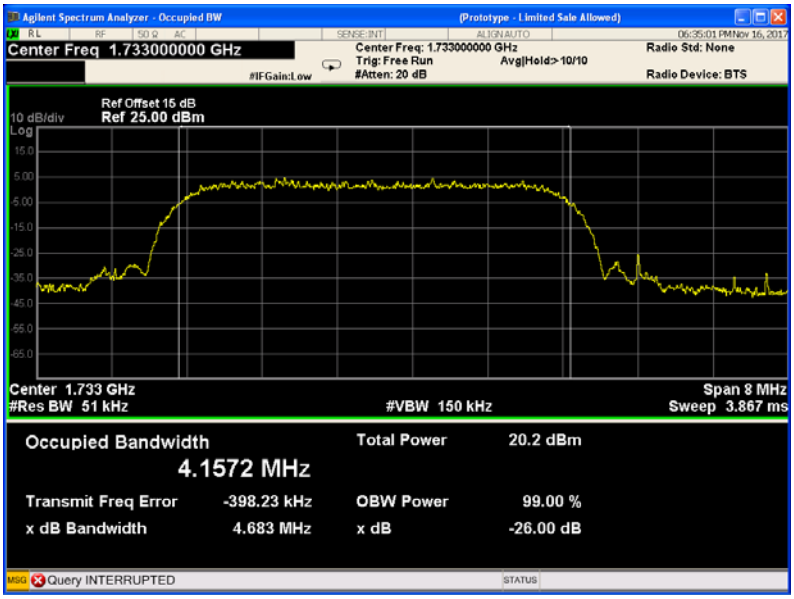
RMC12.2k



HSDPA



HSUPA


Agilent Spectrum Analyzer - Occupied BW
(Prototype - Limited Sale Allowed)
Center Freq 1.733000000 GHz
Center Freq: 1.733000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 20 dB
Radio Std: None
Radio Device: BTS
Ref Offset 15 dB
10 dB/div
Ref 25.00 dBm
Center 1.733 GHz
#Res BW 51 kHz
#VBW 150 kHz
Span 8 MHz
Sweep 3.867 ms
Occupied Bandwidth
4.1572 MHz
Total Power
20.2 dBm
Transmit Freq Error
-398.23 kHz
OBW Power
99.00 %
x dB Bandwidth
4.683 MHz
x dB
-26.00 dB
Query INTERRUPTED

11 SPURIOUS EMISSIONS AT ANTENNA TERMINALS

Test Requirement:	FCC Part 2.1051, 22.917(a), 24.238(a), 27.53(h)
Test Method:	TIA/EIA-603-D:2010
	KDB971168 D01 v02r02
Test Mode:	TX transmitting

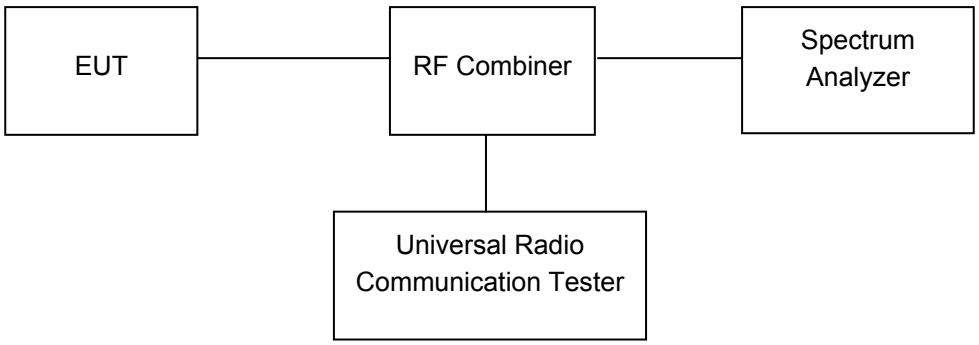
11.1 EUT Operation

Operating Environment **:**

Temperature:	23.5 °C
Humidity:	52.1 % RH
Atmospheric Pressure:	101.3kPa

11.2 Test Procedure

The RF output of the transceiver was connected to a spectrum analyzer and simulator through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 1MHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonics.



11.3 Test Result

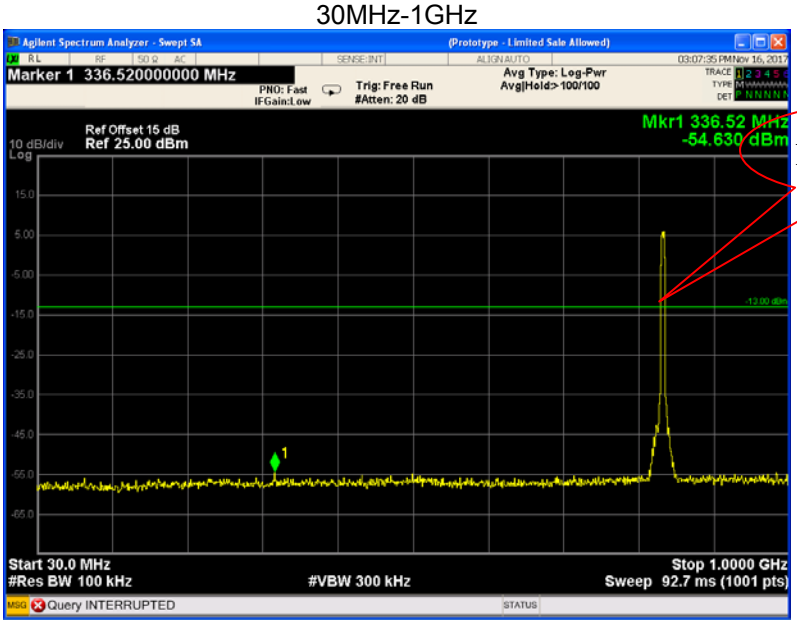
Remark: All test data were reported and only the worst case (middle channel mode) test graphs were showed in test report.

Modem 1

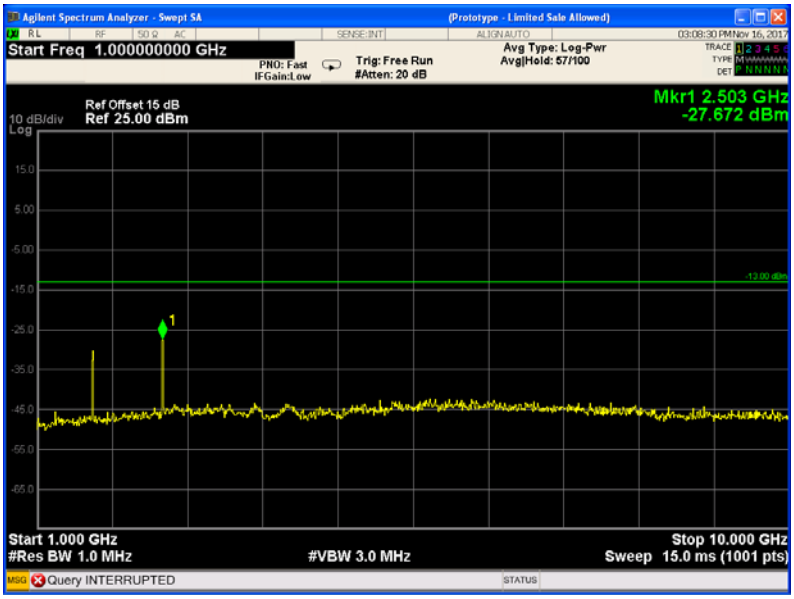
Cellular Band (Part 22H)

WCDMA band V - channel 4183

30MHz-1GHz

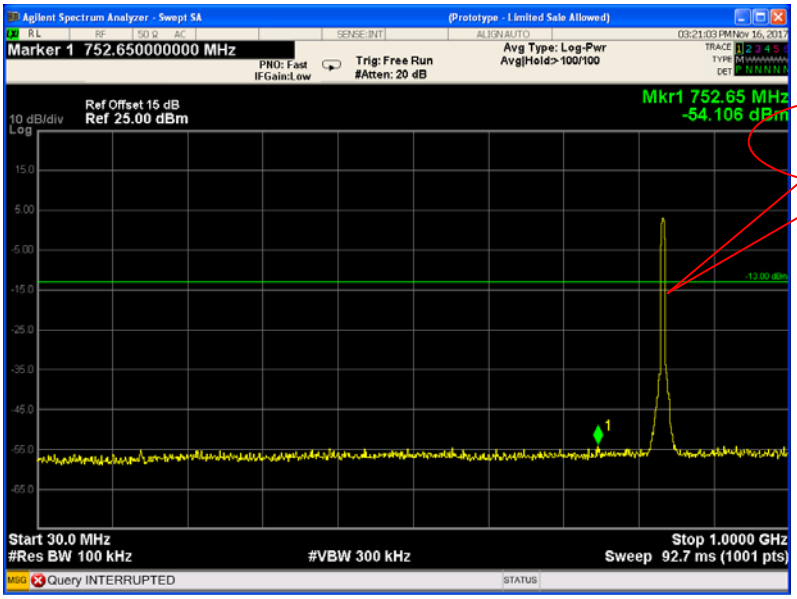


Above 1GHz

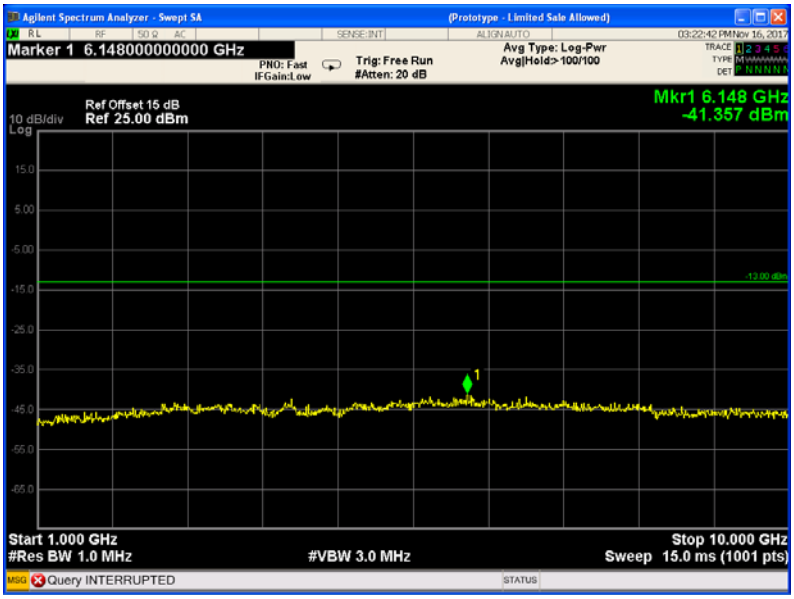


WCDMA band V - channel 4183 (HSDPA)

30MHz-1GHz

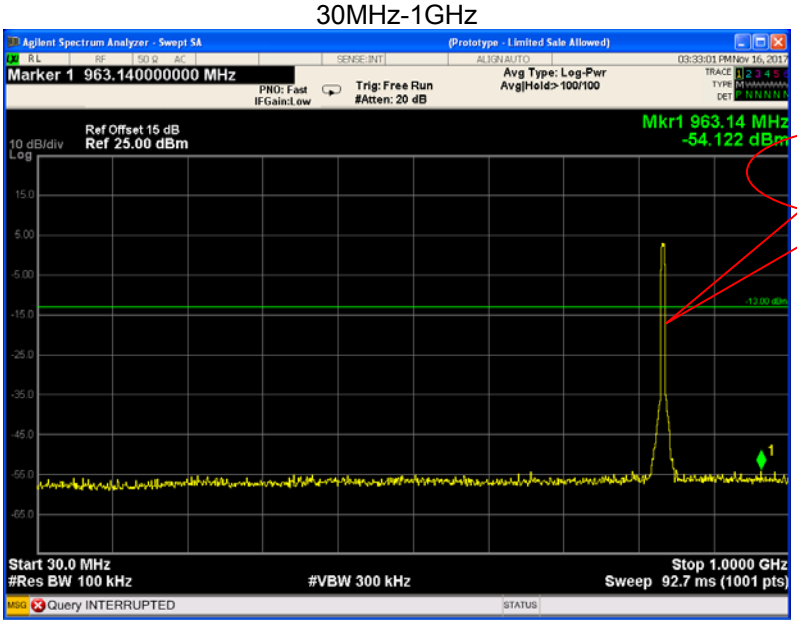


Above 1GHz



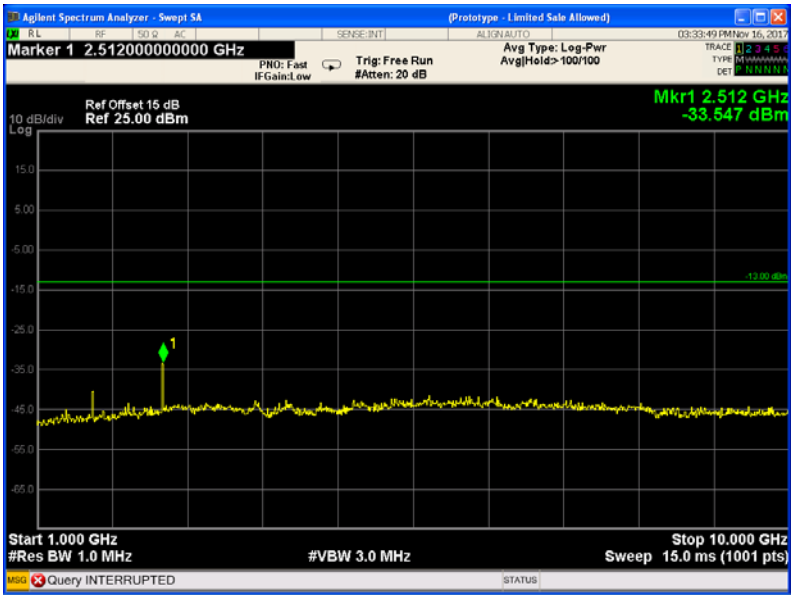
WCDMA band V - channel 4183 (HSUPA)

30MHz-1GHz



Fundamental

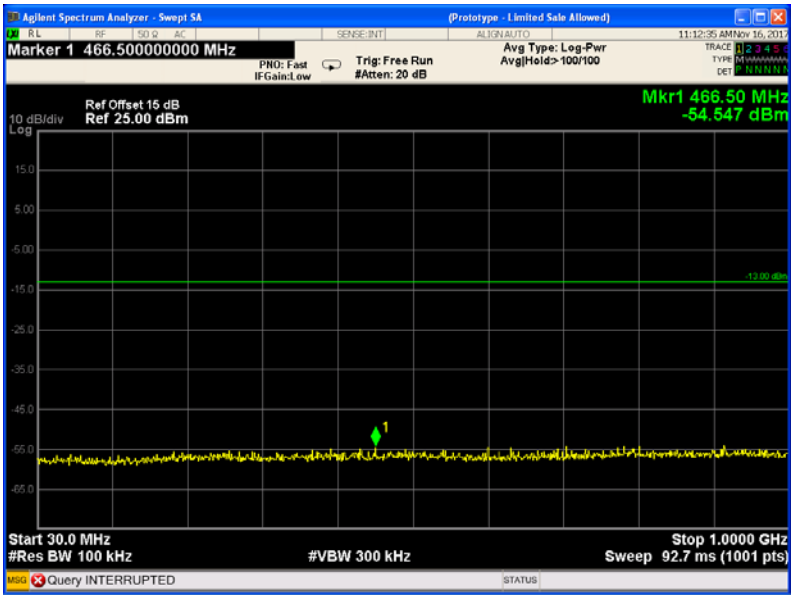
Above 1GHz



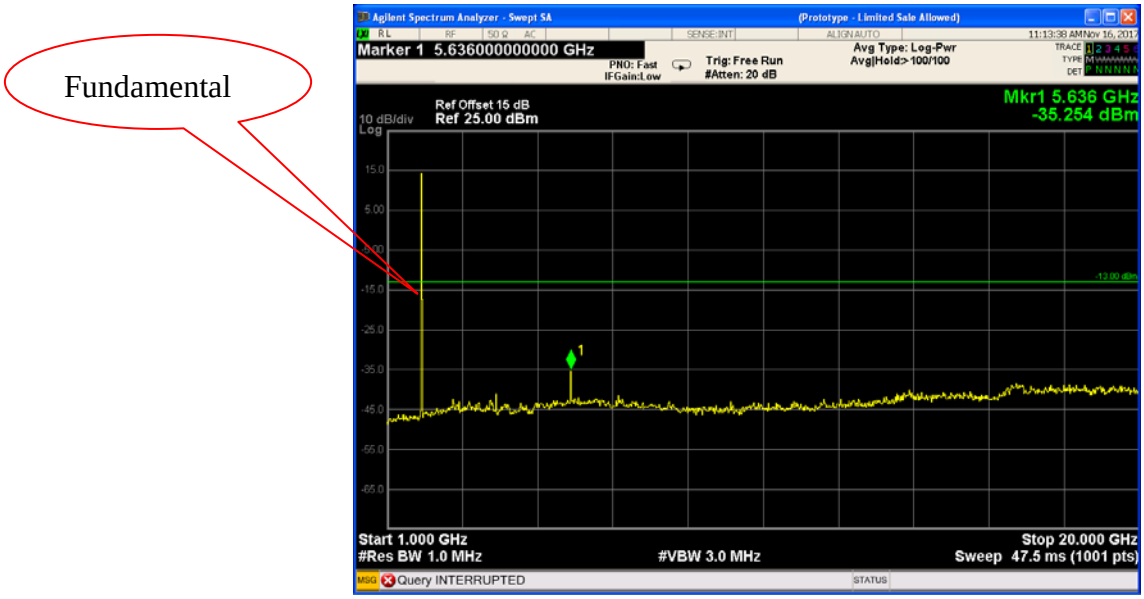
Cellular Band (Part 24E)

WCDMA band II - channel 9400

30MHz-1GHz

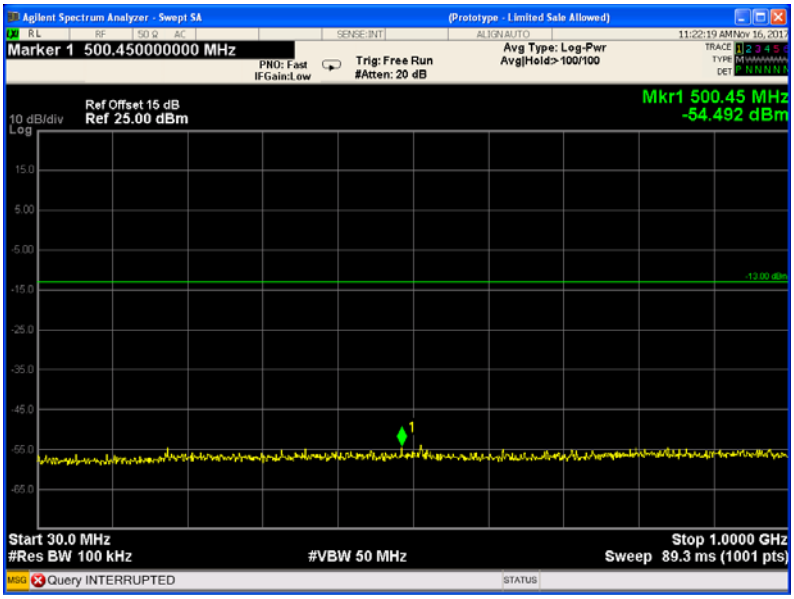


Above 1GHz

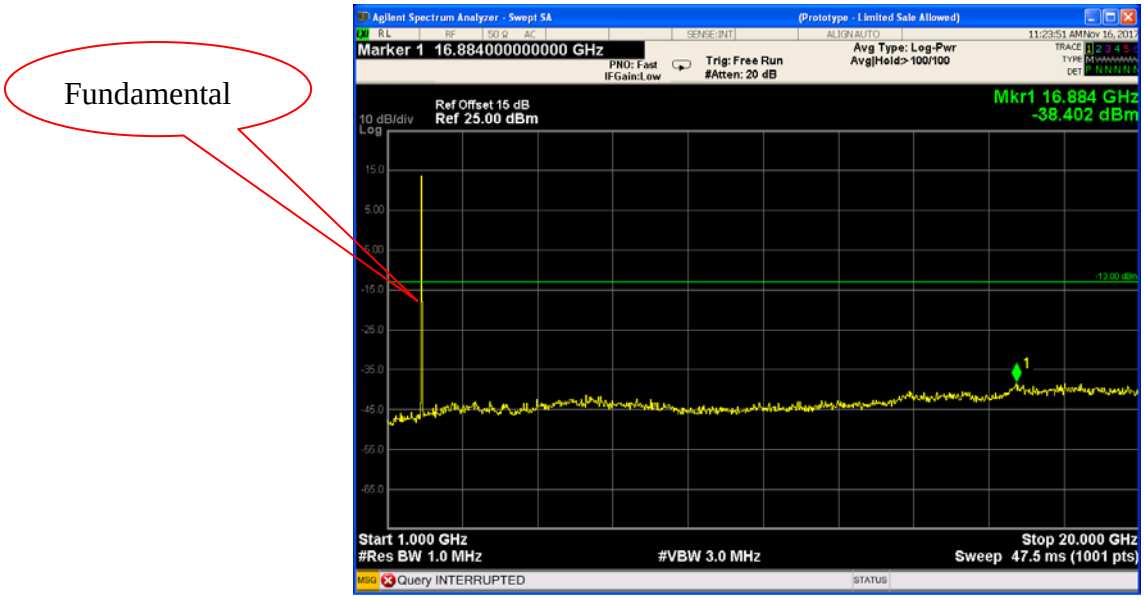


WCDMA band II - channel 9400 (HSDPA)

30MHz-1GHz

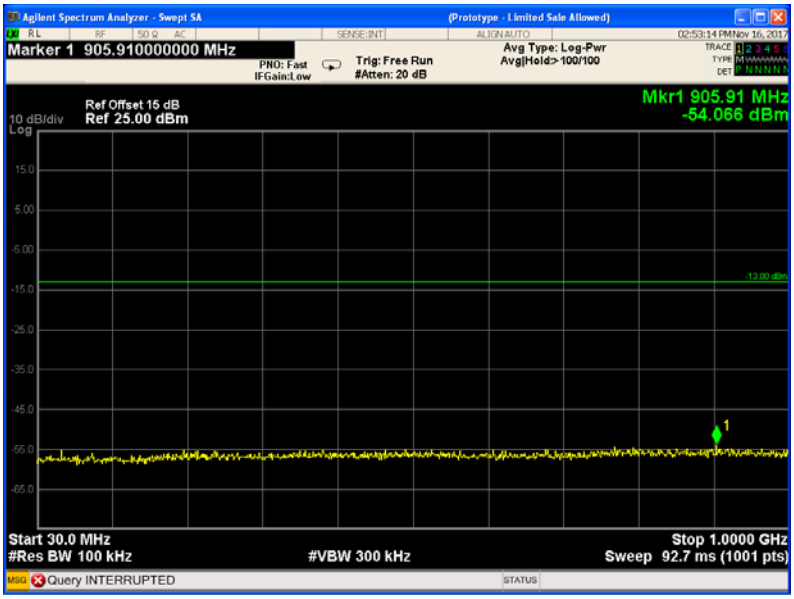


Above 1GHz

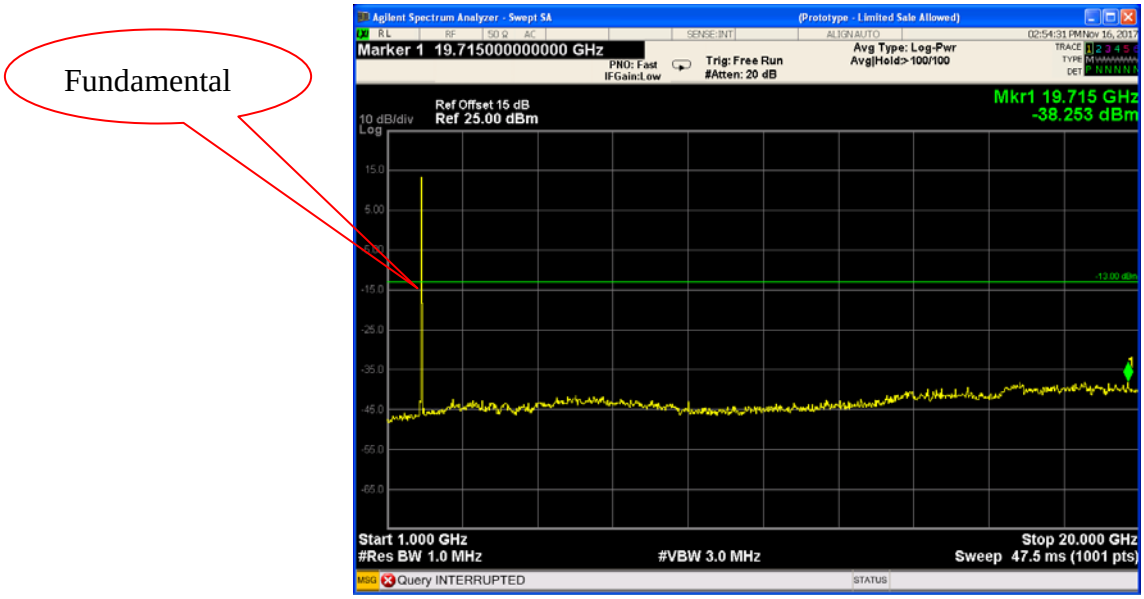


WCDMA band II - channel 9400 (HSUPA)

30MHz-1GHz



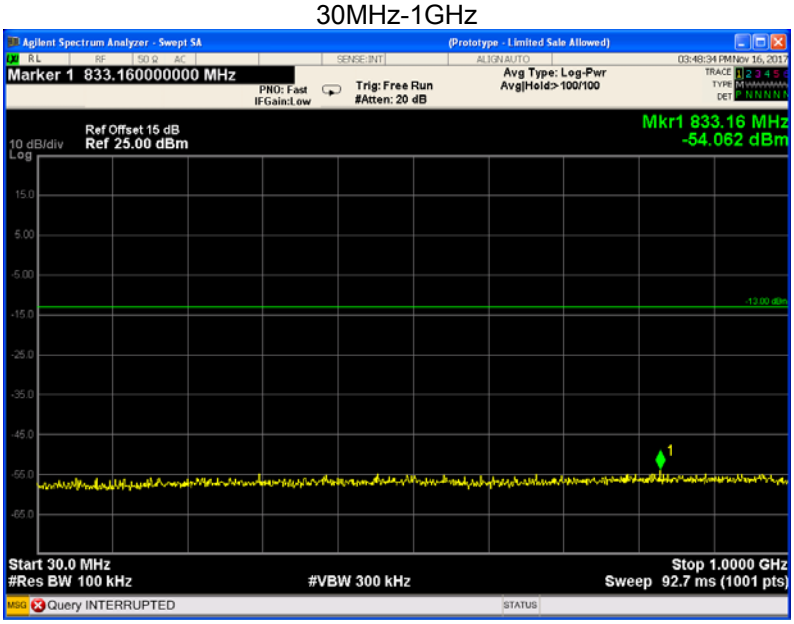
Above 1GHz



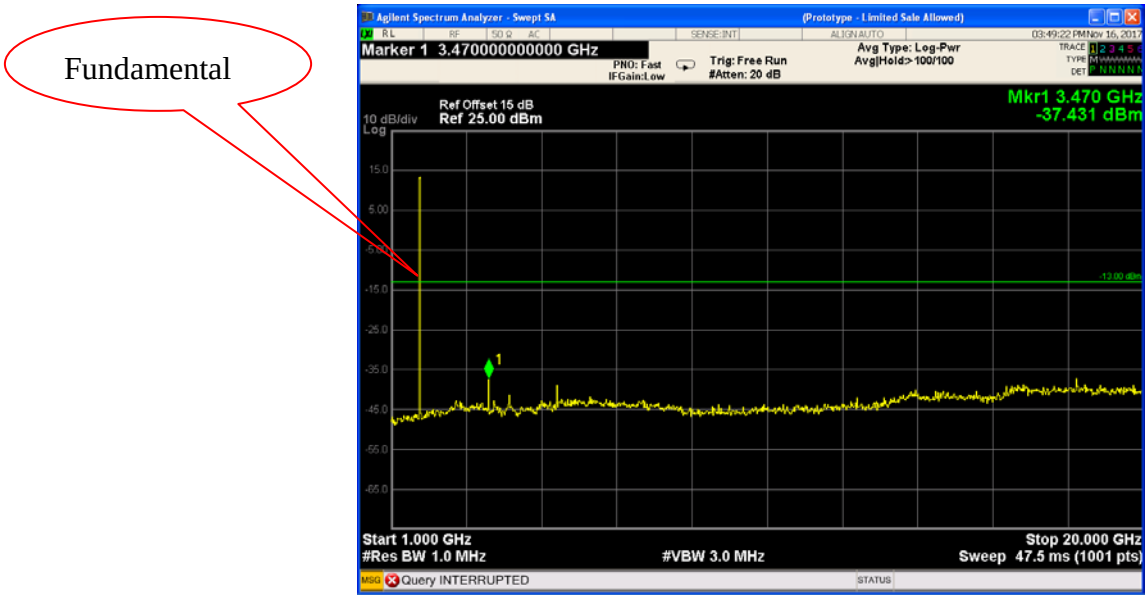
(Part 27)

WCDMA band IV - channel 1413

30MHz-1GHz

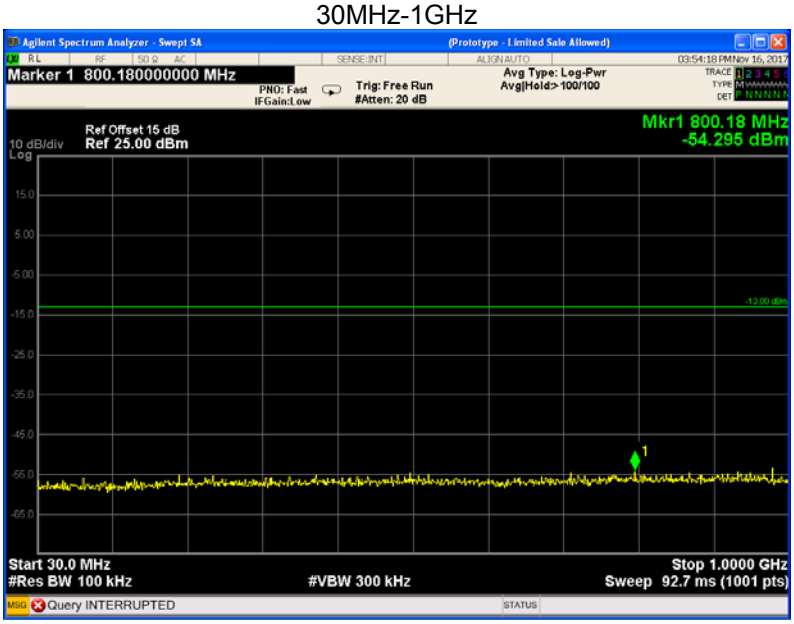


Above 1GHz

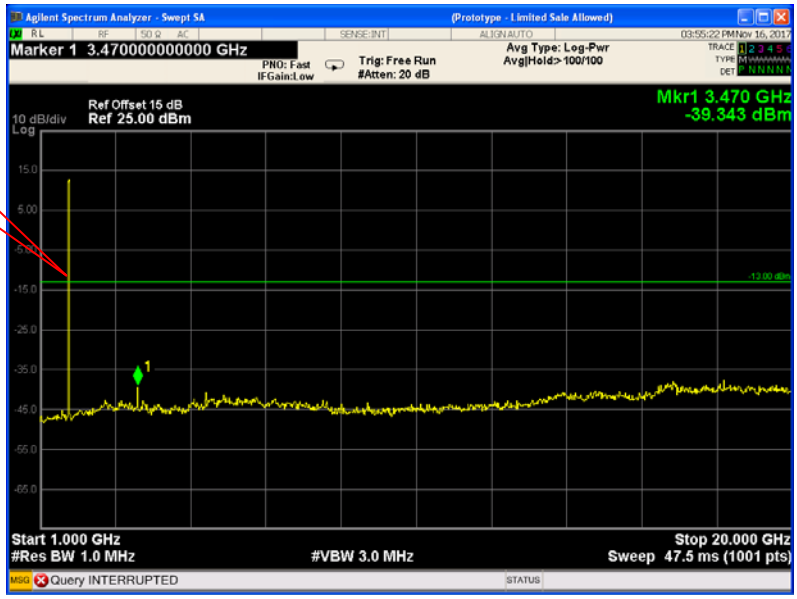


WCDMA band IV - channel 1413 (HSDPA)

30MHz-1GHz



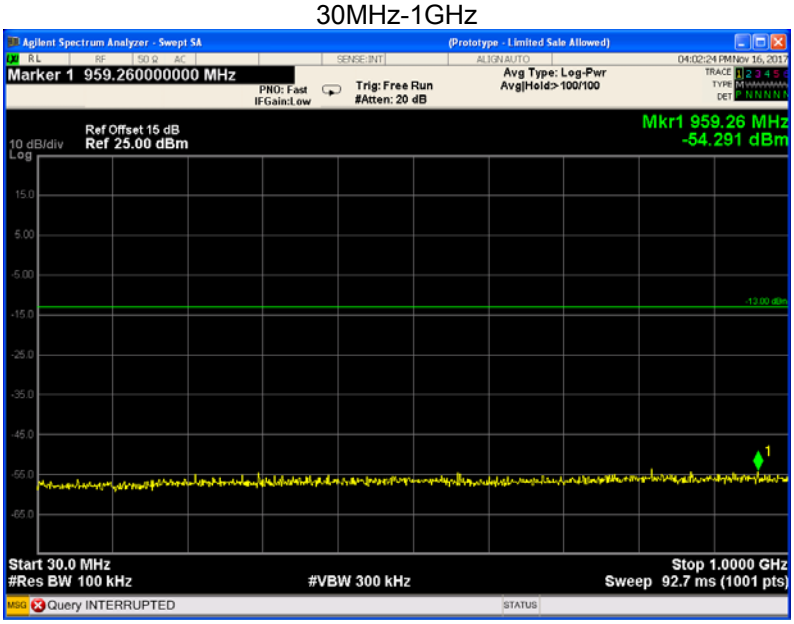
Above 1GHz



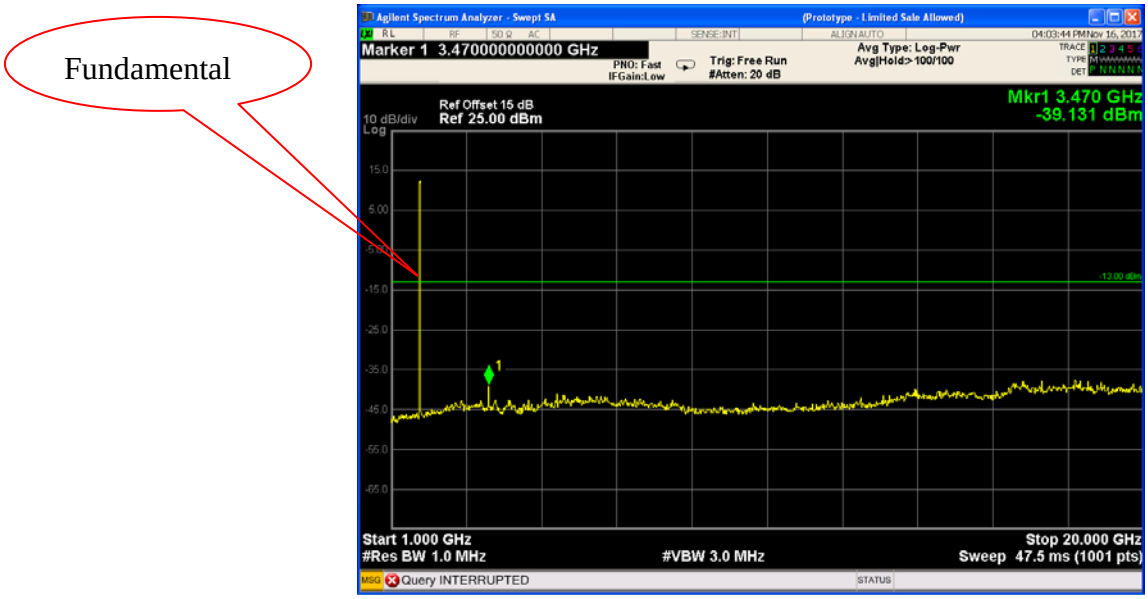
Fundamental

WCDMA band IV - channel 1413 (HSUPA)

30MHz-1GHz



Above 1GHz

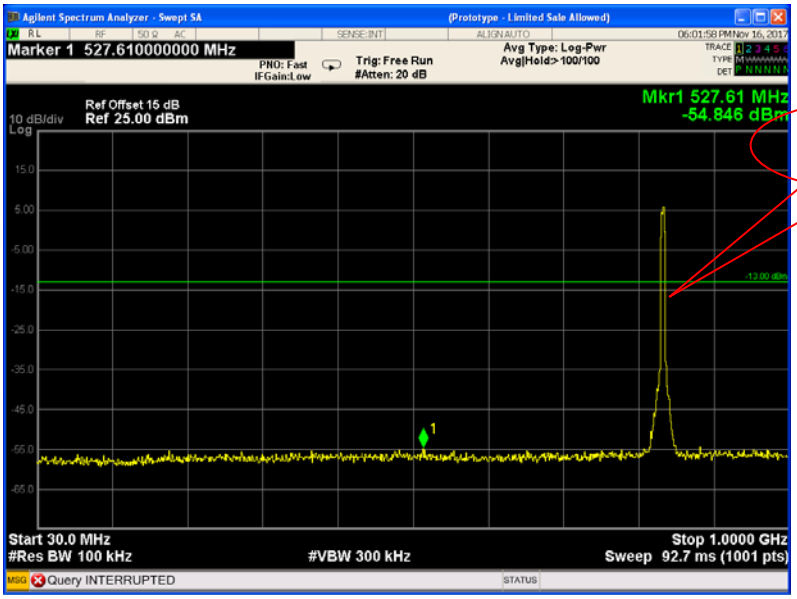


Modem 2

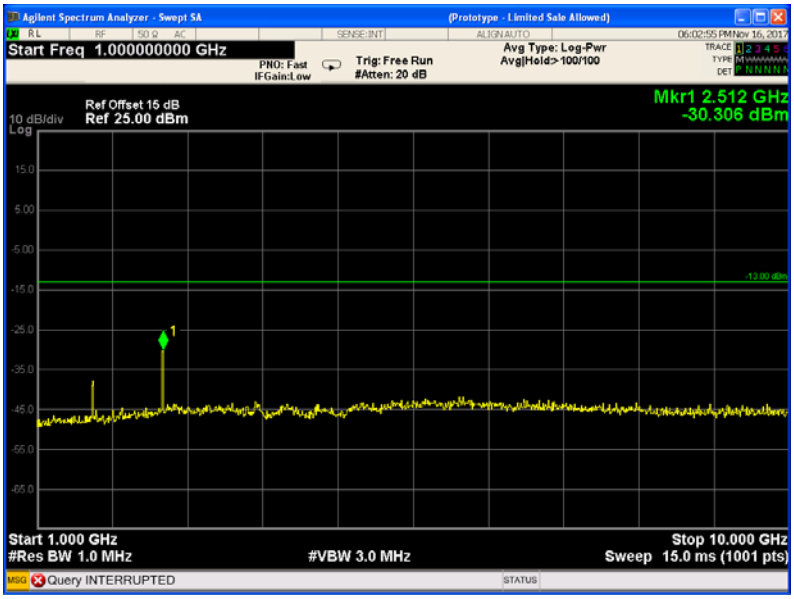
Cellular Band (Part 22H)

WCDMA band V - channel 4183

30MHz-1GHz

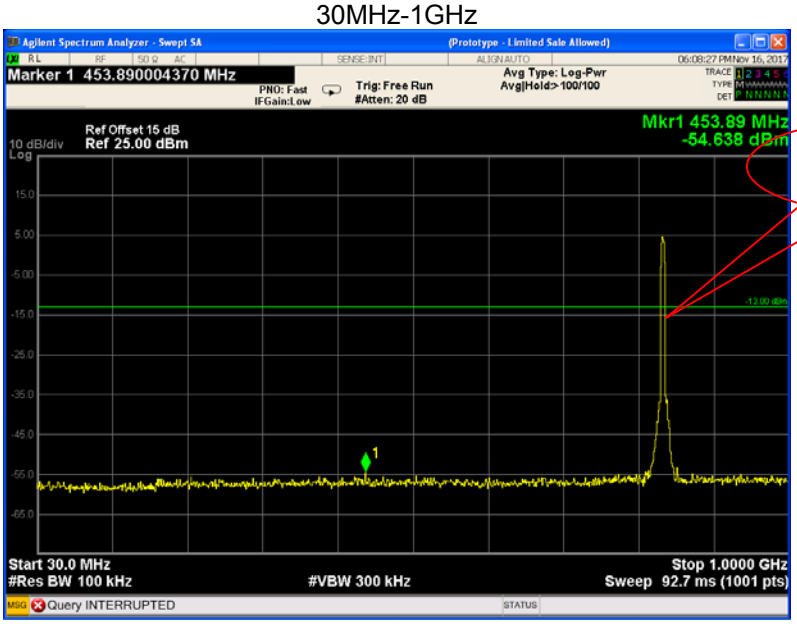


Above 1GHz



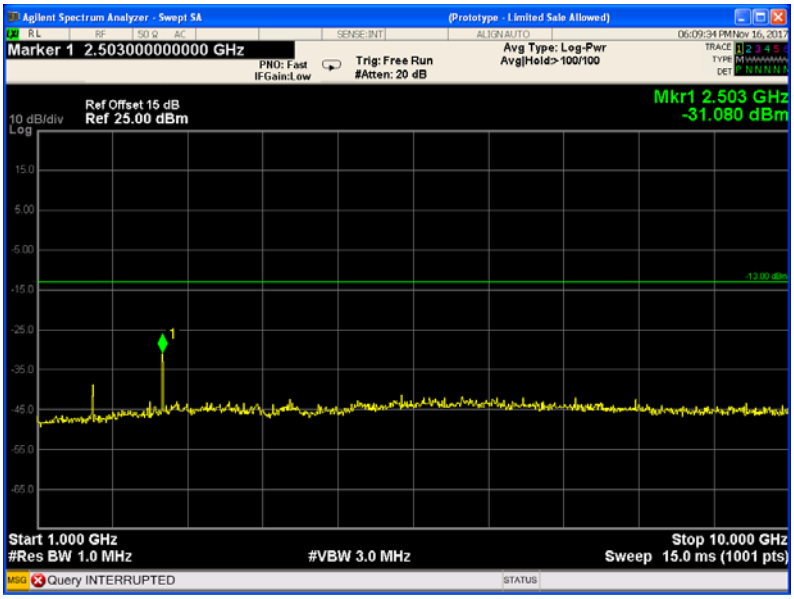
WCDMA band V - channel 4183 (HSDPA)

30MHz-1GHz



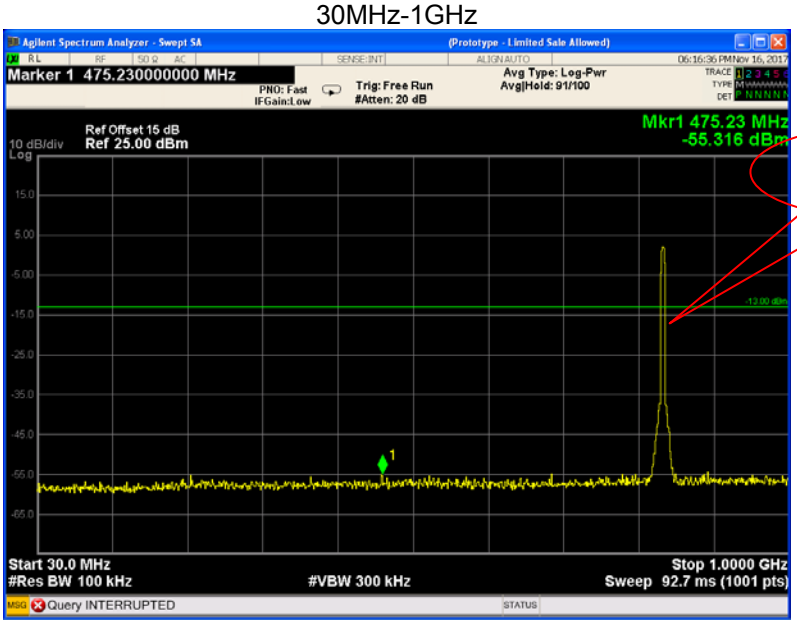
Fundamental

Above 1GHz



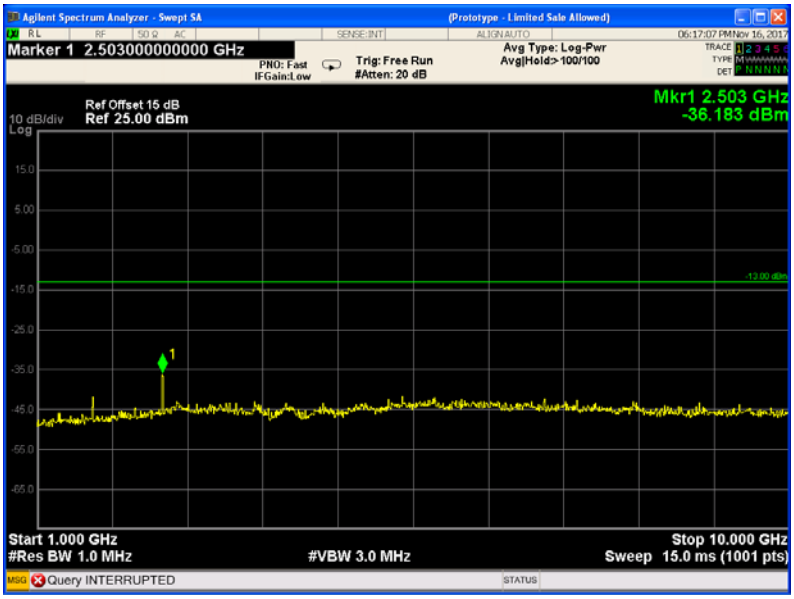
WCDMA band V - channel 4183 (HSUPA)

30MHz-1GHz



Fundamental

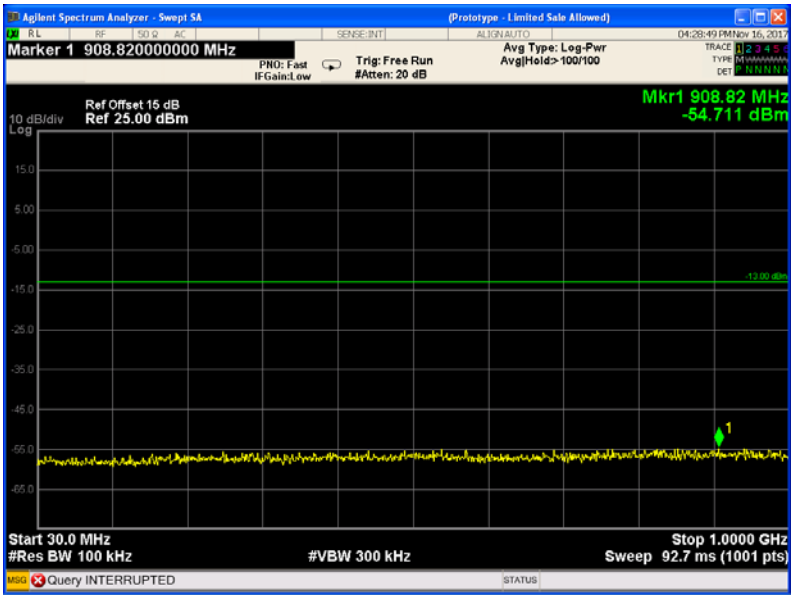
Above 1GHz



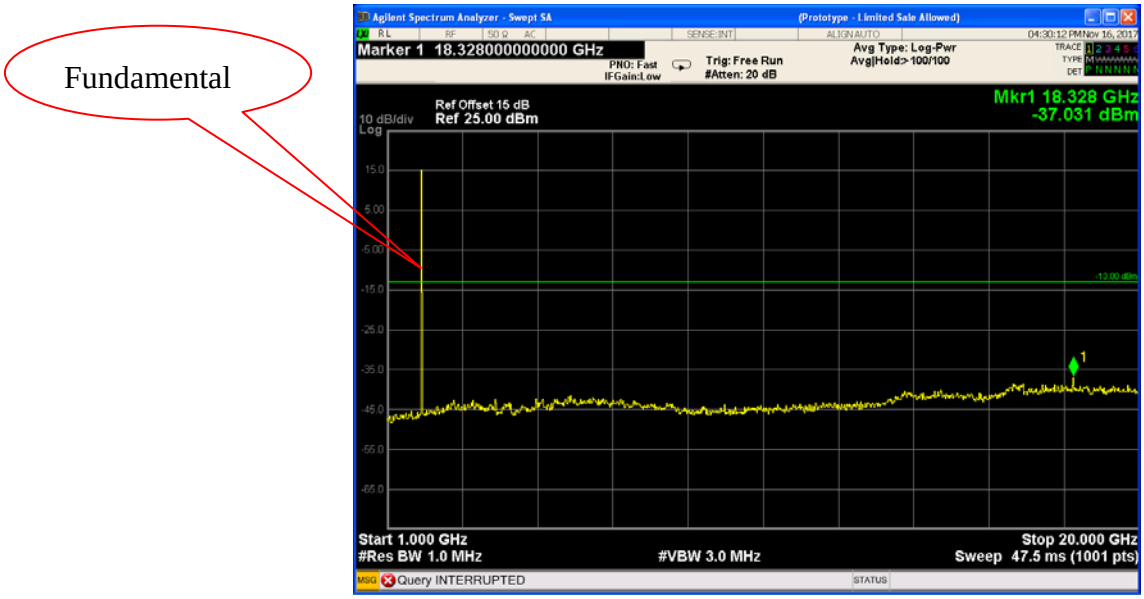
Cellular Band (Part 24E)

WCDMA band II - channel 9400

30MHz-1GHz

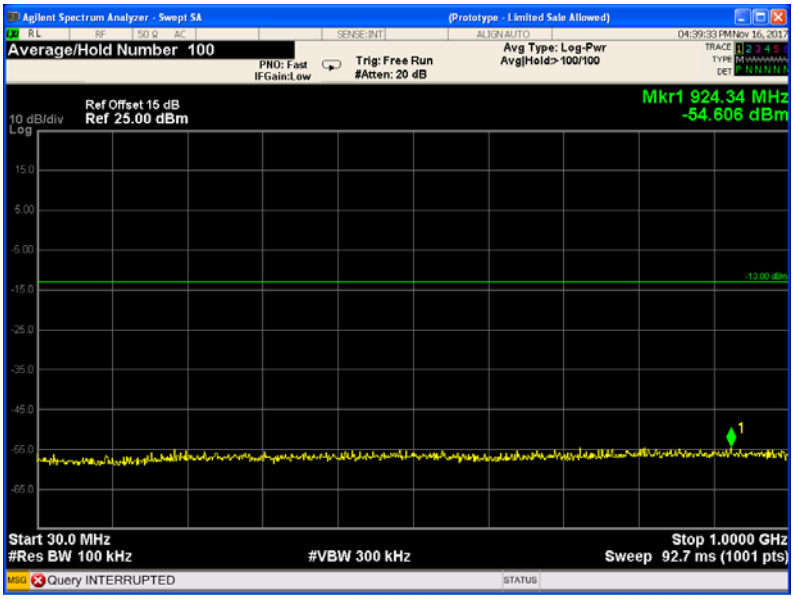


Above 1GHz

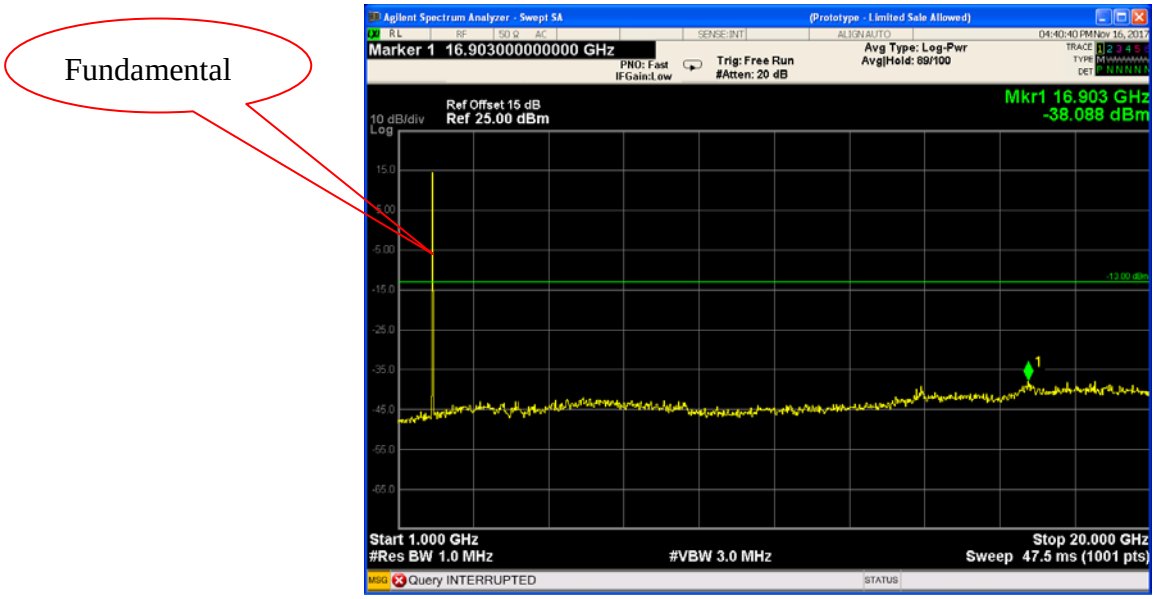


WCDMA band II - channel 9400 (HSDPA)

30MHz-1GHz

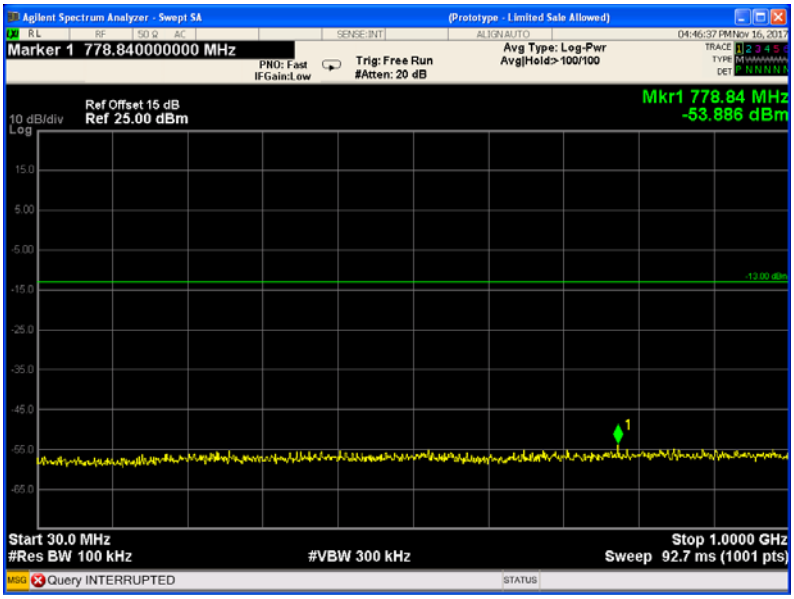


Above 1GHz

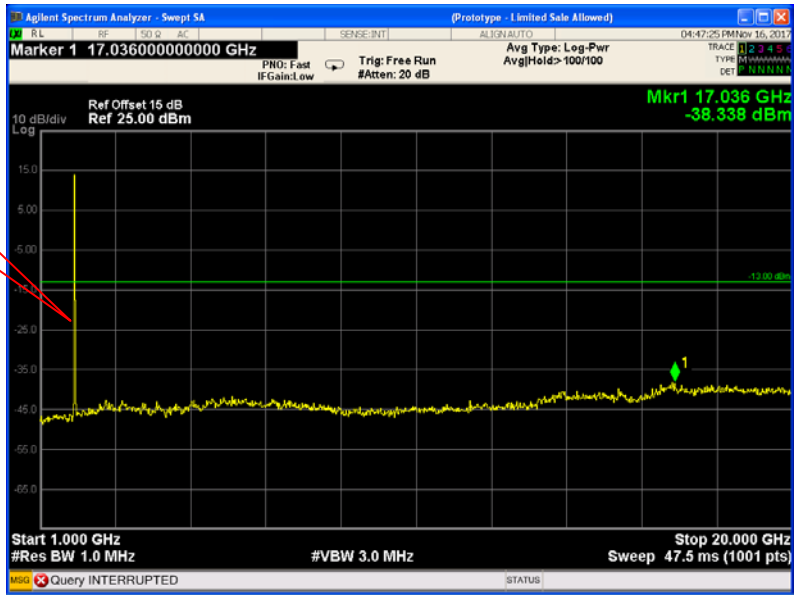


WCDMA band II - channel 9400 (HSUPA)

30MHz-1GHz



Above 1GHz

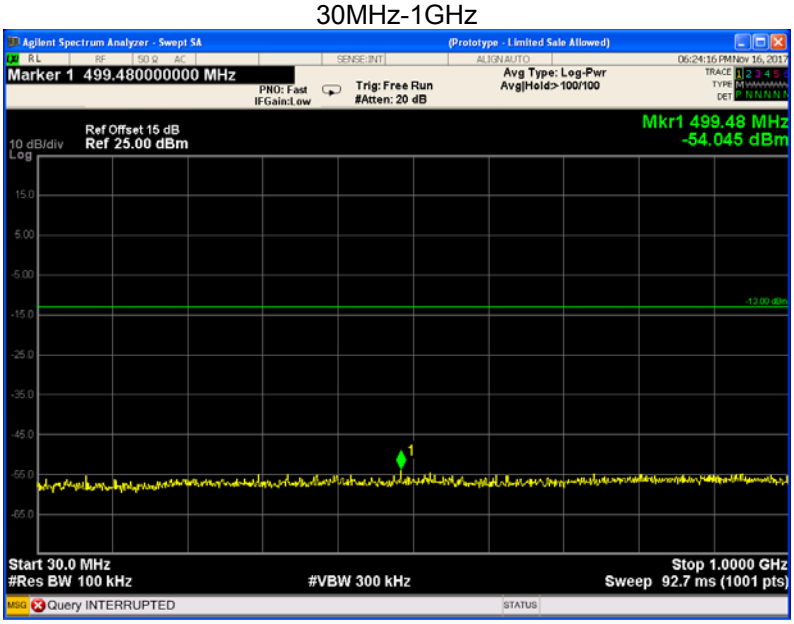


Fundamental

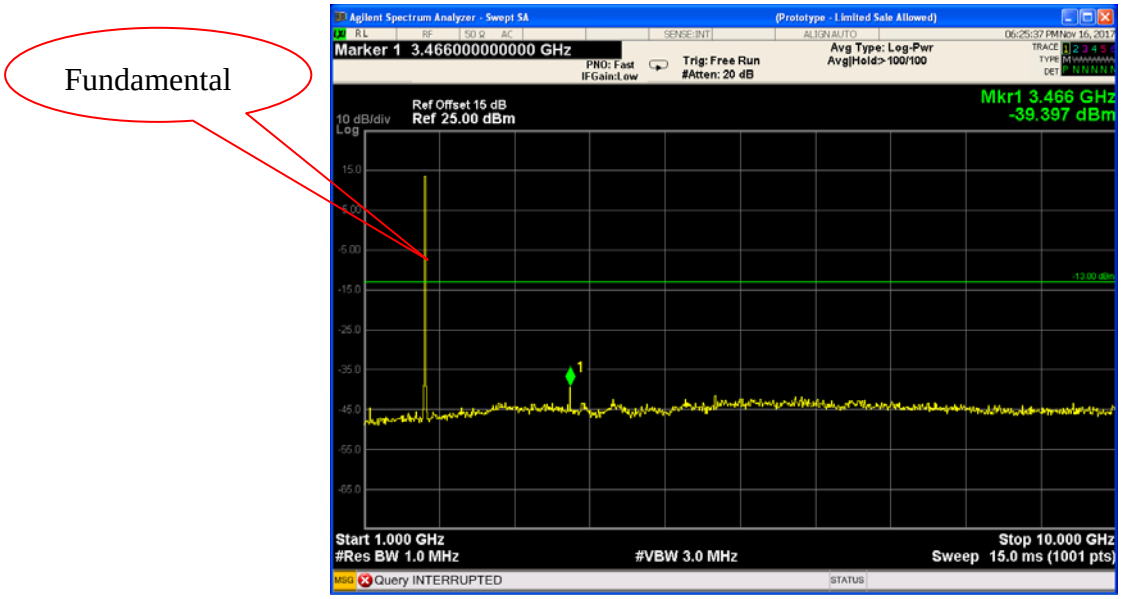
(Part 27)

WCDMA band IV - channel 1413

30MHz-1GHz

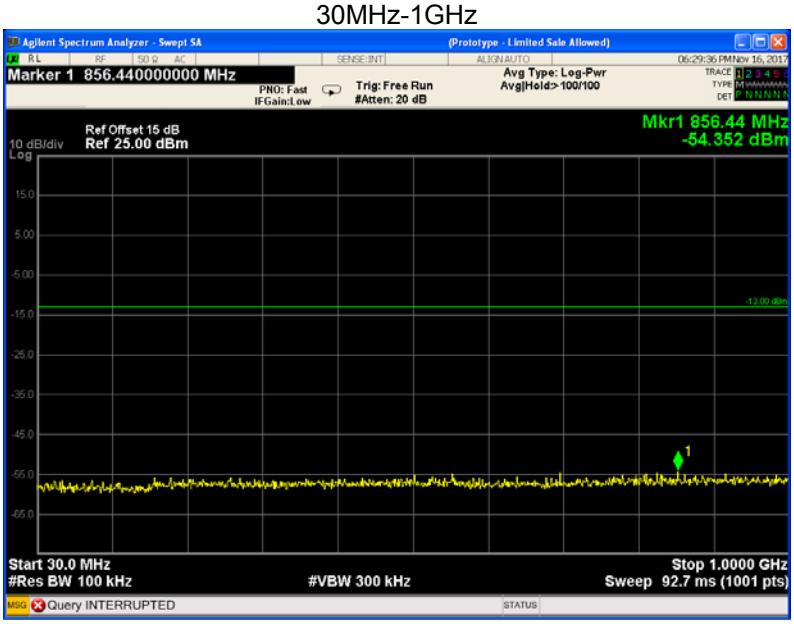


Above 1GHz

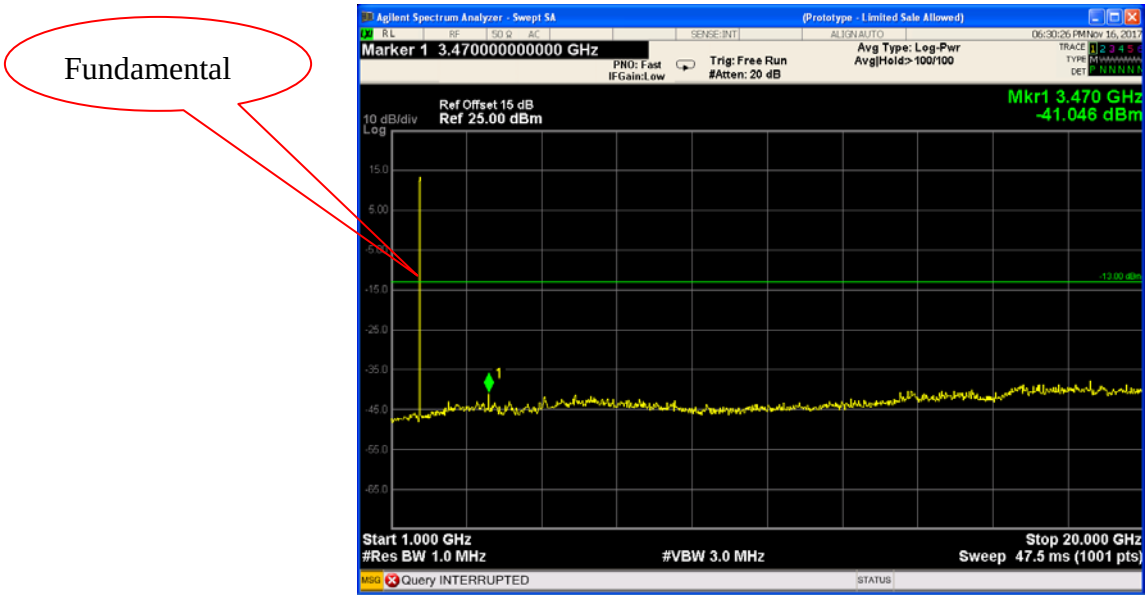


WCDMA band IV - channel 1413 (HSDPA)

30MHz-1GHz

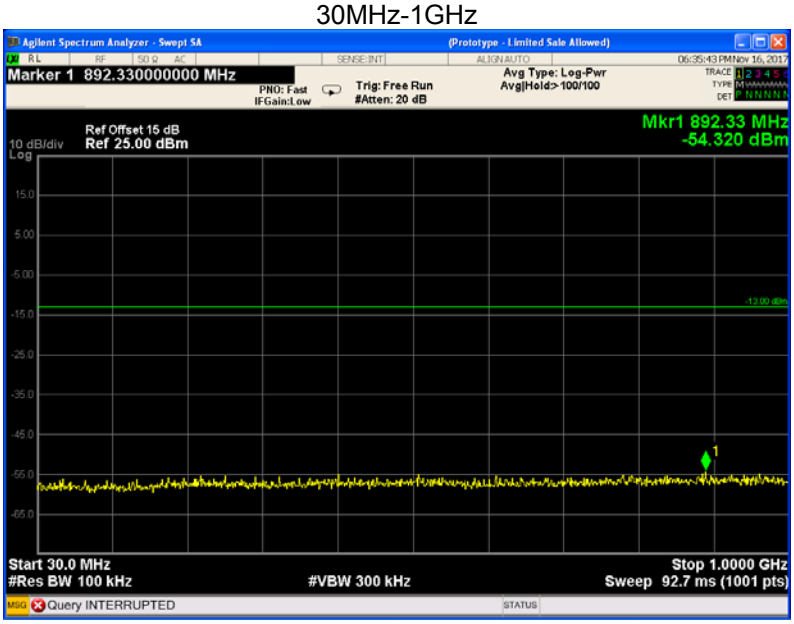


Above 1GHz

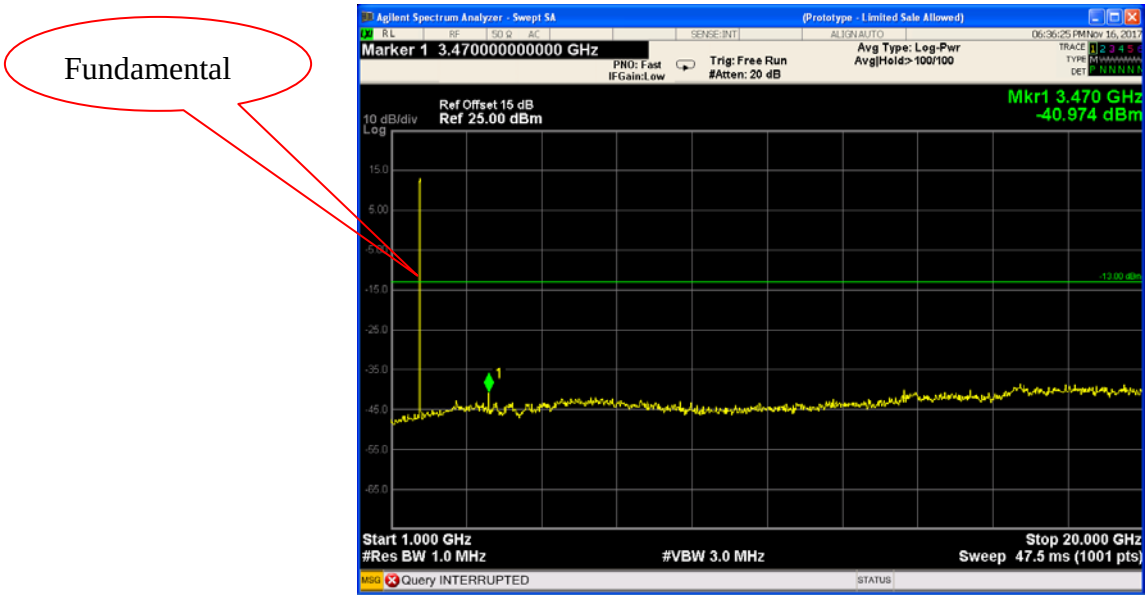


WCDMA band IV - channel 1413 (HSUPA)

30MHz-1GHz



Above 1GHz



12 SPURIOUS RADIATED EMISSIONS

Test Requirement:	FCC Part 2.1053, 22.917, 24.238, 27.53(h)
Test Method:	TIA/EIA-603-D:2010
	KDB971168 D01 v02r02
Test Mode:	TX transmitting

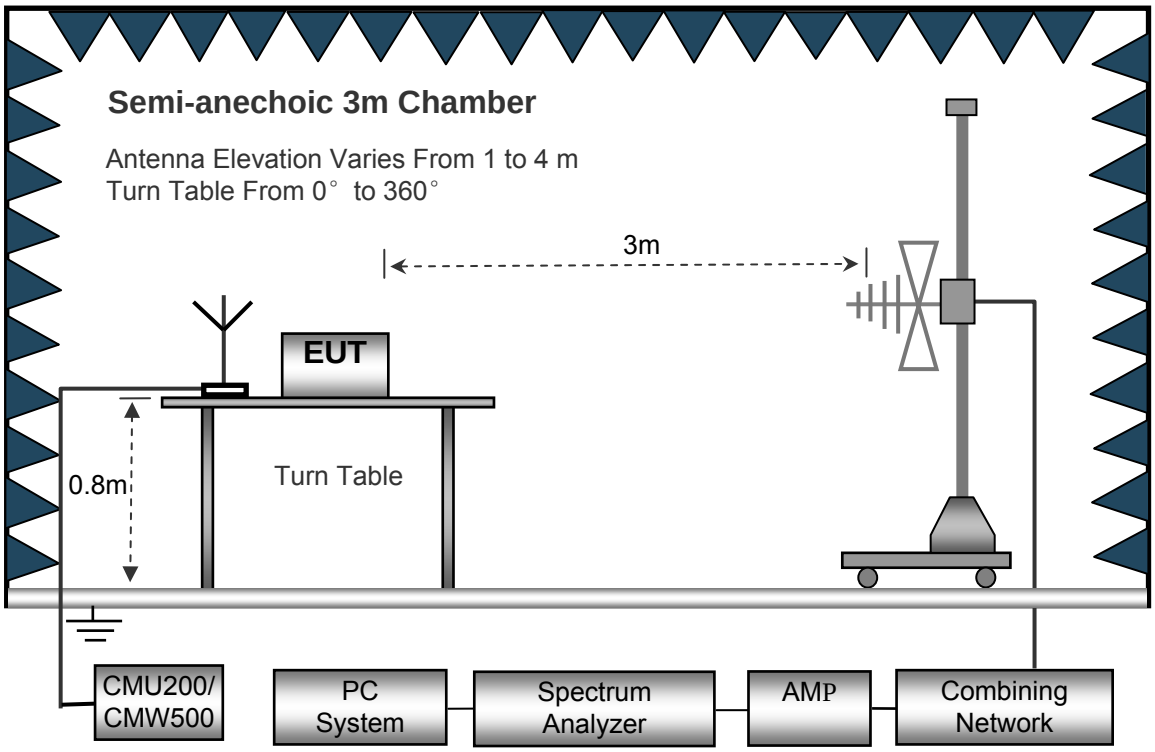
12.1 EUT Operation

Operating Environment **:**

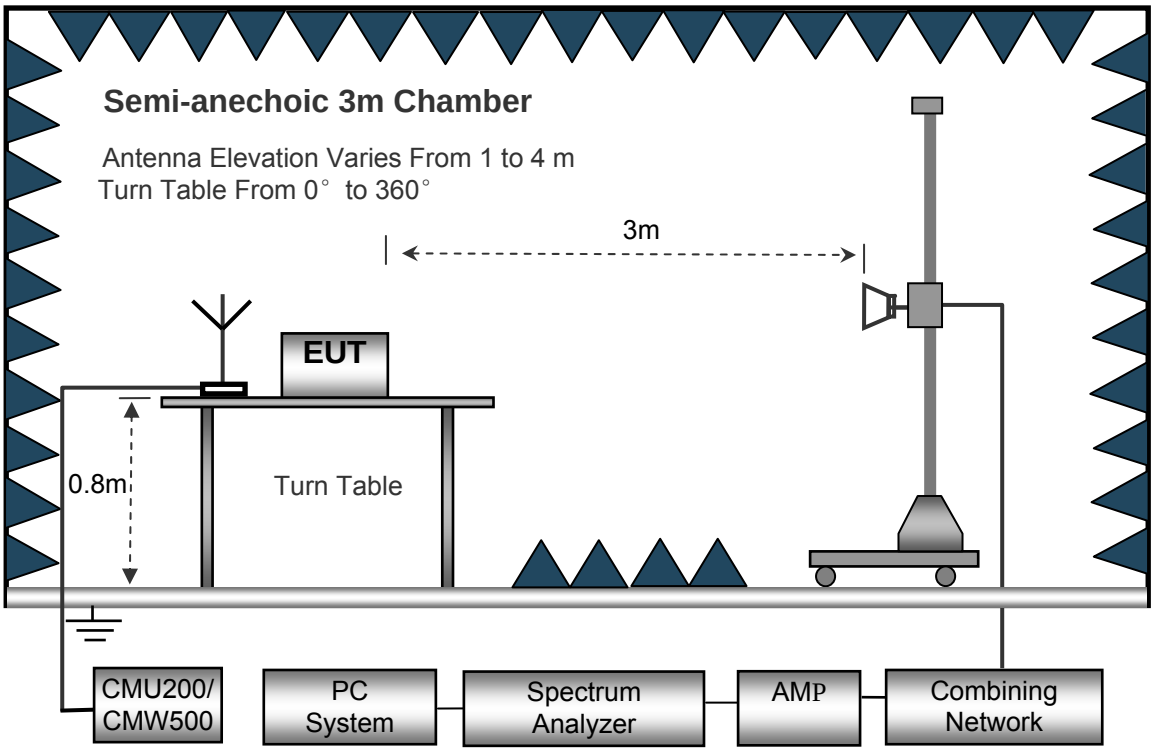
Temperature:	23.5 °C
Humidity:	52.1 % RH
Atmospheric Pressure:	101.2kPa

12.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1 GHz.



12.3 Spectrum Analyzer Setup

30MHz ~ 1GHz

Sweep Speed ..... Auto
Detector ..... PK
Resolution Bandwidth 100kHz
Video Bandwidth 300kHz

Above 1GHz

Sweep Speed ..... Auto
Detector ..... PK
Resolution Bandwidth 1MHz
Video Bandwidth 3MHz
Detector ..... Ave.
Resolution Bandwidth 1MHz
Video Bandwidth 10Hz

12.4 Test Procedure

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions. The spectrum was investigated from 30MHz up to the tenth harmonic of the highest fundamental frequency.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. The radiation measurements are tested under 3-axes(X,Y,Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), After pre-test, It was found that the worse radiation emission was get at the Z position. So the data shown was the Z position only.
7. 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 emissions in dB = 10 lg (TXpwr in Watts/0.001) – the absolute level
   Spurious attenuation limit in dB = 43 + 10 Log10 (power out in Watts)
8. Repeat above procedures until the measurements for all frequencies are completed.

12.5 Summary of Test Results

For 26MHz~30MHz,

The measurements were more than 20 dB below the limit and not reported.

Remark: Test performed from 30MHz to 10th harmonics with low/middle/high channels, only the worst data were recorded.

Modem 1

Cellular Band (Part 22H)

Frequency	Receiver Reading	Turn table Angle	RX Antenna		Substituted			Absolute Level	Result	
			Height	Polar	SG Level	Cable	Antenna Gain		Limit	Margin
(MHz)	(dBμV)	Degree	(m)	(H/V)	(dBm)	(dB)	(dB)	(dBm)	(dBm)	(dB)
WCDMA Band V Channel 4233										
199.38	42.24	230	1.6	H	-68.27	0.15	0.00	-68.42	-13.00	-55.42
199.38	46.50	87	1.6	V	-61.09	0.15	0.00	-61.24	-13.00	-48.24
1693.20	59.40	342	2.0	H	-54.57	0.30	9.40	-45.47	-13.00	-32.47
1693.20	49.40	40	1.7	V	-64.13	0.30	9.40	-55.03	-13.00	-42.03
2539.80	48.09	42	1.9	H	-65.91	0.43	10.60	-55.74	-13.00	-42.74
2539.80	39.03	70	2.1	V	-71.25	0.43	10.60	-61.08	-13.00	-48.08

Cellular Band (Part 24E/27)

Frequency	Receiver Reading	Turn table Angle	RX Antenna		Substituted			Absolute Level	Result	
			Height	Polar	SG Level	Cable	Antenna Gain		Limit	Margin
(MHz)	(dBμV)	Degree	(m)	(H/V)	(dBm)	(dB)	(dB)	(dBm)	(dBm)	(dB)
WCDMA Band II Channel 9400										
199.38	48.87	287	1.7	H	-61.64	0.15	0.00	-61.79	-13.00	-48.79
199.38	37.47	94	2.1	V	-70.12	0.15	0.00	-70.27	-13.00	-57.27
3760.00	58.10	26	1.2	H	-53.44	2.37	12.50	-43.31	-13.00	-30.31
3760.00	53.01	63	1.6	V	-56.80	2.37	12.50	-46.67	-13.00	-33.67
5640.00	47.32	157	1.6	H	-62.29	2.86	12.90	-52.25	-13.00	-39.25
5640.00	37.09	58	1.1	V	-71.79	2.86	12.90	-61.75	-13.00	-48.75
WCDMA Band IV Channel 1313										
199.38	62.64	44	1.4	H	-47.87	0.15	0.00	-48.02	-13.00	-35.02
199.38	48.76	187	1.6	V	-58.83	0.15	0.00	-58.98	-13.00	-45.98
3424.80	53.02	193	1.3	H	-58.52	2.37	12.50	-48.39	-13.00	-35.39
3424.80	45.51	348	1.7	V	-64.30	2.37	12.50	-54.17	-13.00	-41.17
5137.20	39.52	311	2.1	H	-70.09	2.86	12.90	-60.05	-13.00	-47.05
5137.20	32.23	287	2.2	V	-76.65	2.86	12.90	-66.61	-13.00	-53.61

Note: 1) Absolute Level = SG Level - Cable loss + Antenna Gain

2) Margin = Absolute Level - Limit

Modem 2

Cellular Band (Part 22H)

Frequency	Receiver Reading	Turn table Angle	RX Antenna		Substituted			Absolute Level	Result	
			Height	Polar	SG Level	Cable	Antenna Gain		Limit	Margin
(MHz)	(dBμV)	Degree	(m)	(H/V)	(dBm)	(dB)	(dB)	(dBm)	(dBm)	(dB)
WCDMA Band V Channel 4233										
199.38	41.05	226	2.1	H	-69.46	0.15	0.00	-69.61	-13.00	-56.61
199.38	45.10	159	1.9	V	-62.49	0.15	0.00	-62.64	-13.00	-49.64
1693.20	58.13	48	1.4	H	-55.84	0.30	9.40	-46.74	-13.00	-33.74
1693.20	48.59	62	1.3	V	-64.94	0.30	9.40	-55.84	-13.00	-42.84
2539.80	48.54	52	2.1	H	-65.46	0.43	10.60	-55.29	-13.00	-42.29
2539.80	39.58	243	1.1	V	-70.70	0.43	10.60	-60.53	-13.00	-47.53

Cellular Band (Part 24E/27)

Frequency	Receiver Reading	Turn table Angle	RX Antenna		Substituted			Absolute Level	Result	
			Height	Polar	SG Level	Cable	Antenna Gain		Limit	Margin
(MHz)	(dBμV)	Degree	(m)	(H/V)	(dBm)	(dB)	(dB)	(dBm)	(dBm)	(dB)
WCDMA Band II Channel 9400										
199.38	50.24	201	1.3	H	-60.27	0.15	0.00	-60.42	-13.00	-47.42
199.38	39.80	126	1.7	V	-67.79	0.15	0.00	-67.94	-13.00	-54.94
3760.00	59.02	63	1.2	H	-52.52	2.37	12.50	-42.39	-13.00	-29.39
3760.00	52.03	59	2.1	V	-57.78	2.37	12.50	-47.65	-13.00	-34.65
5640.00	46.49	346	1.6	H	-63.12	2.86	12.90	-53.08	-13.00	-40.08
5640.00	37.38	242	2.2	V	-71.50	2.86	12.90	-61.46	-13.00	-48.46
WCDMA Band IV Channel 1313										
199.38	48.78	354	1.5	H	-61.73	0.15	0.00	-61.88	-13.00	-48.88
199.38	40.20	315	1.6	V	-67.39	0.15	0.00	-67.54	-13.00	-54.54
3424.80	51.68	97	1.6	H	-59.86	2.37	12.50	-49.73	-13.00	-36.73
3424.80	45.84	130	2.1	V	-63.97	2.37	12.50	-53.84	-13.00	-40.84
5137.20	38.99	72	2.0	H	-70.62	2.86	12.90	-60.58	-13.00	-47.58
5137.20	29.23	107	2.0	V	-79.65	2.86	12.90	-69.61	-13.00	-56.61

Note: 1) Absolute Level = SG Level - Cable loss + Antenna Gain

2) Margin = Absolute Level - Limit

13 Band Edge Measurement

Test Requirement:	FCC Part 2.1051, 22.917(a), 24.238(a), 27.53(h)
Test Method:	TIA/EIA-603-D:2010
	KDB971168 D01 v02r02
Test Mode:	TX transmitting

13.1 EUT Operation

Operating Environment **:**

Temperature:	23.5 °C
Humidity:	52.3 % RH
Atmospheric Pressure:	101.3kPa

13.2 Test Procedure

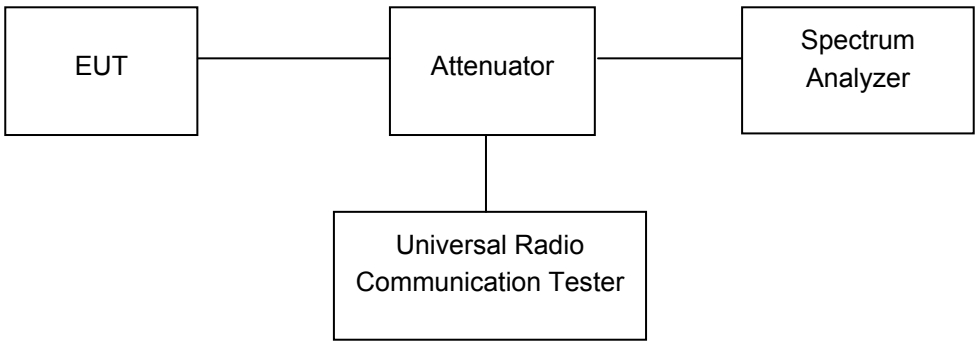
The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

According to FCC Part 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 FCC Part 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.

According to FCC Part 27.53(h), Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 $\log_{10}$ (P) dB.

The center of the spectrum analyzer was set to block edge frequency



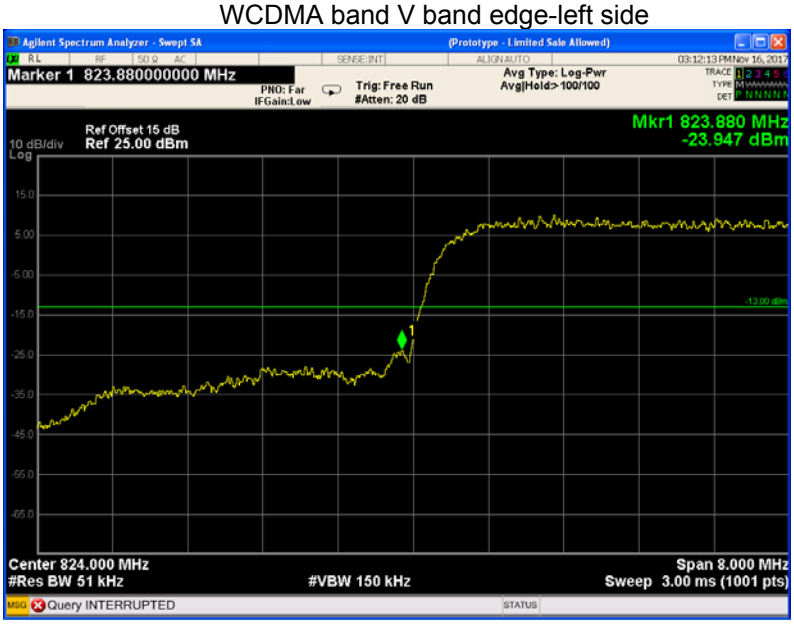
13.3 Test Result

Test plots

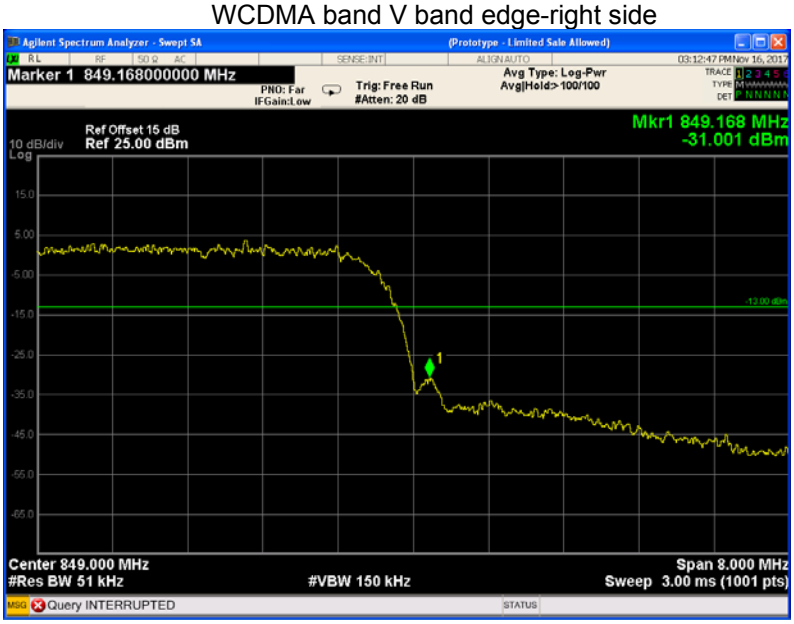
Modem 1

Cellular Band (Part 22H)

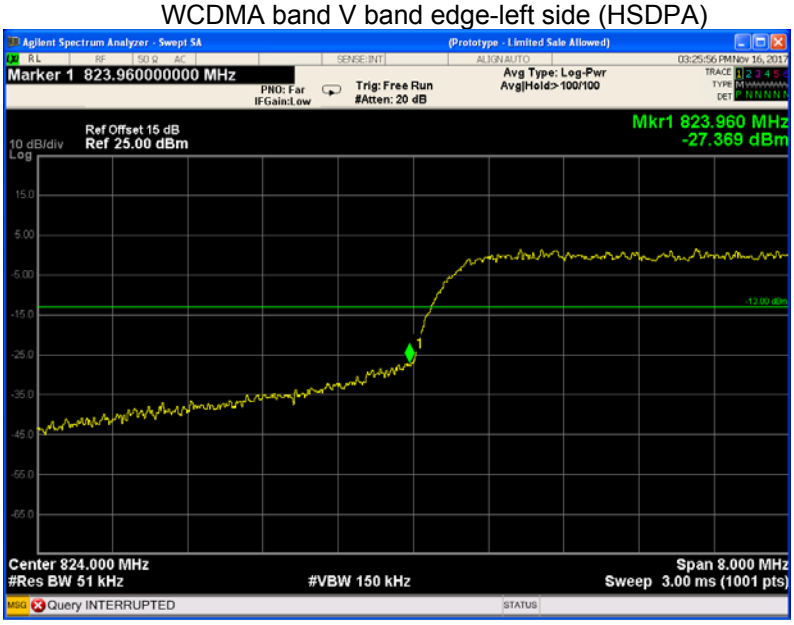
WCDMA band V band edge-left side



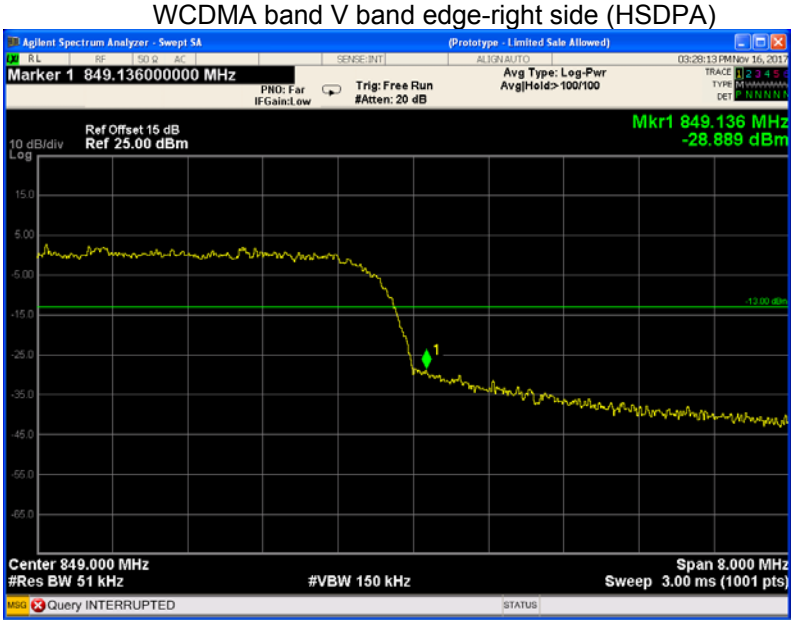
WCDMA band V band edge-right side



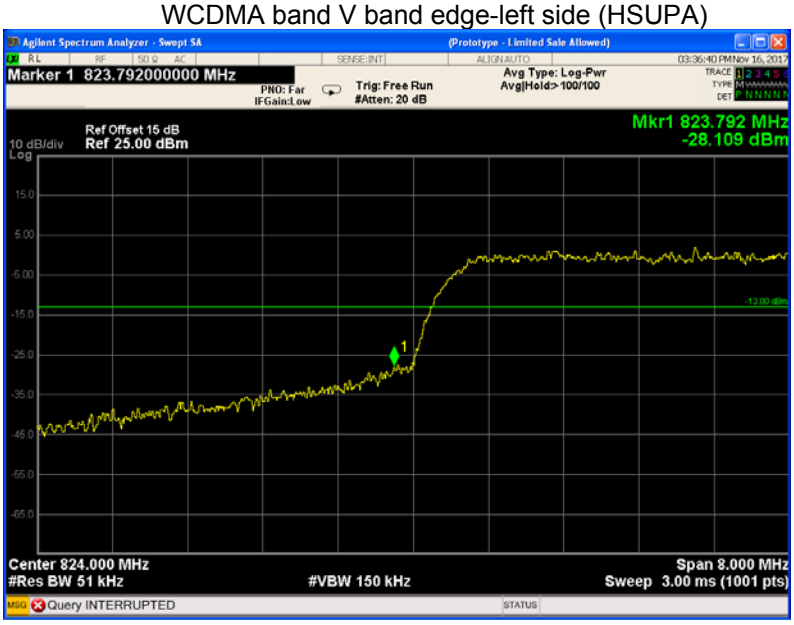
WCDMA band V band edge-left side (HSDPA)



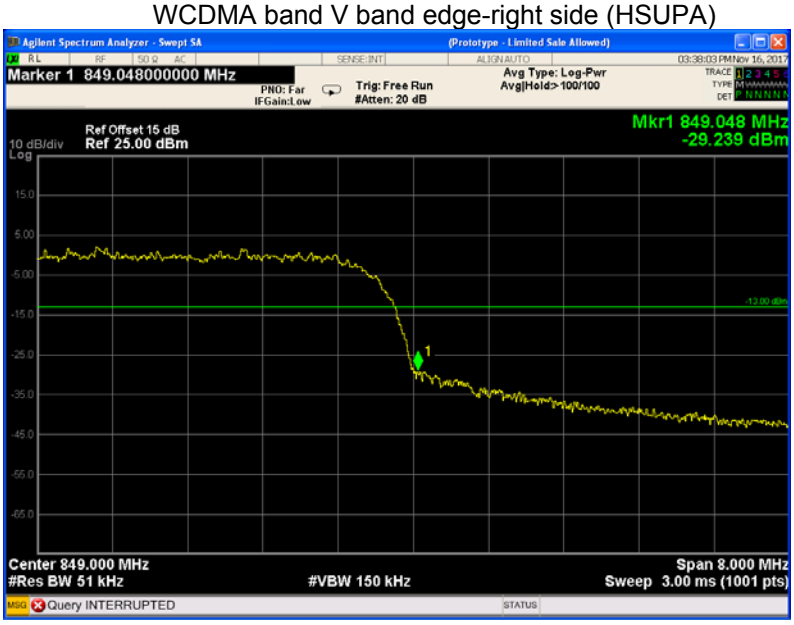
WCDMA band V band edge-right side (HSDPA)



WCDMA band V band edge-left side (HSUPA)

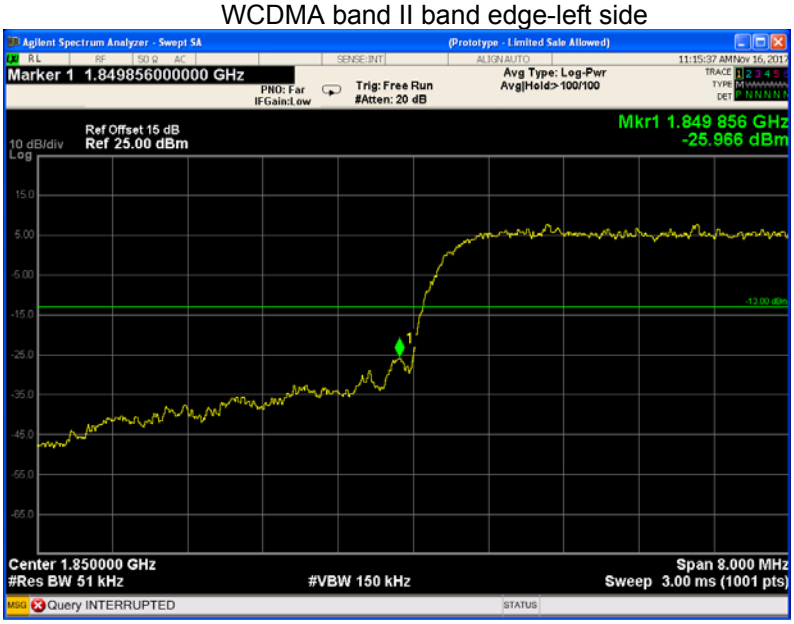


WCDMA band V band edge-right side (HSUPA)

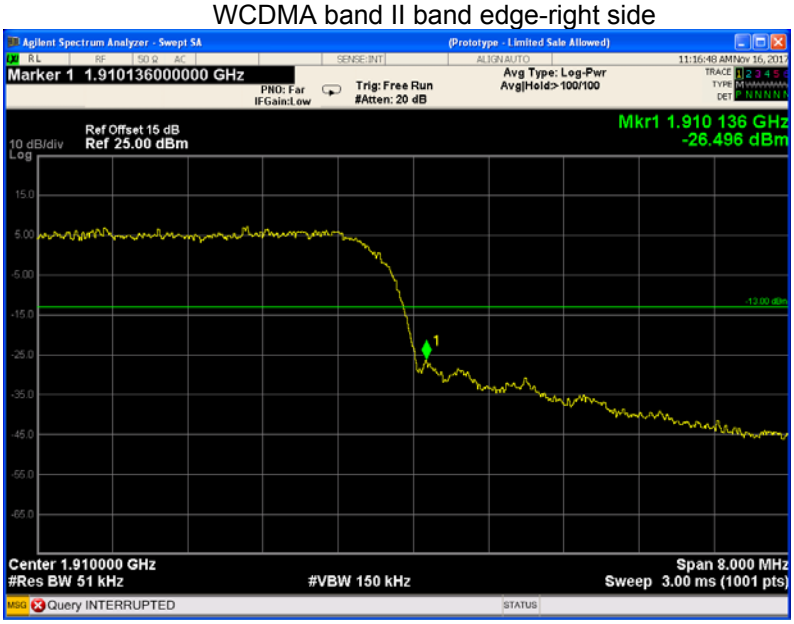


Cellular Band (Part 24E)

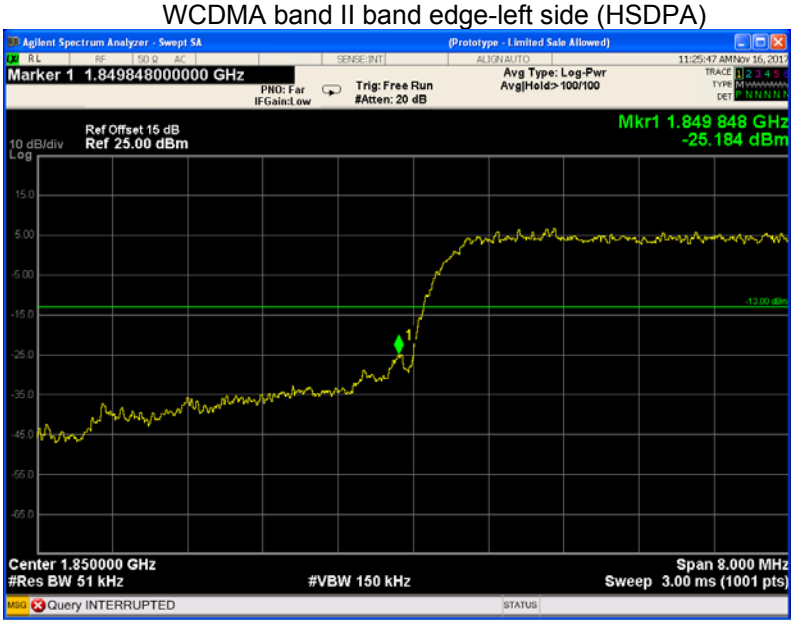
WCDMA band II band edge-left side



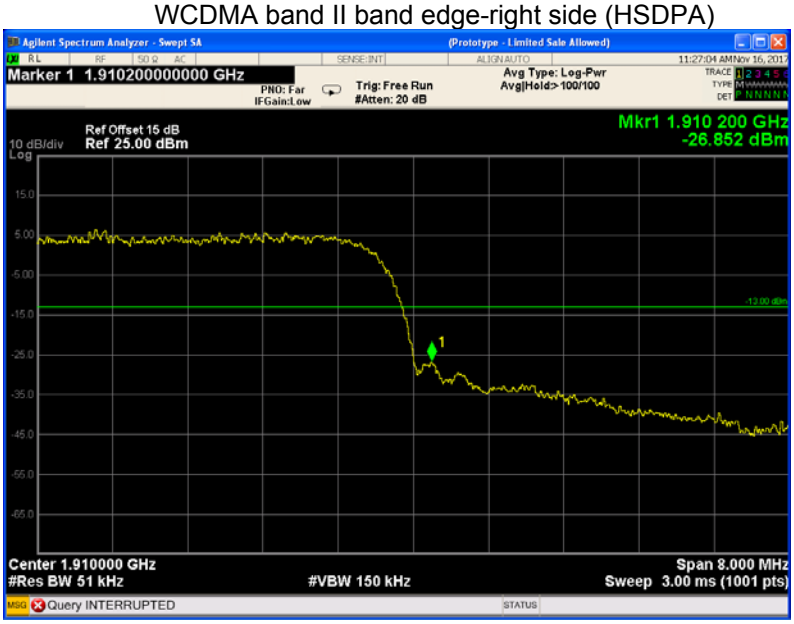
WCDMA band II band edge-right side



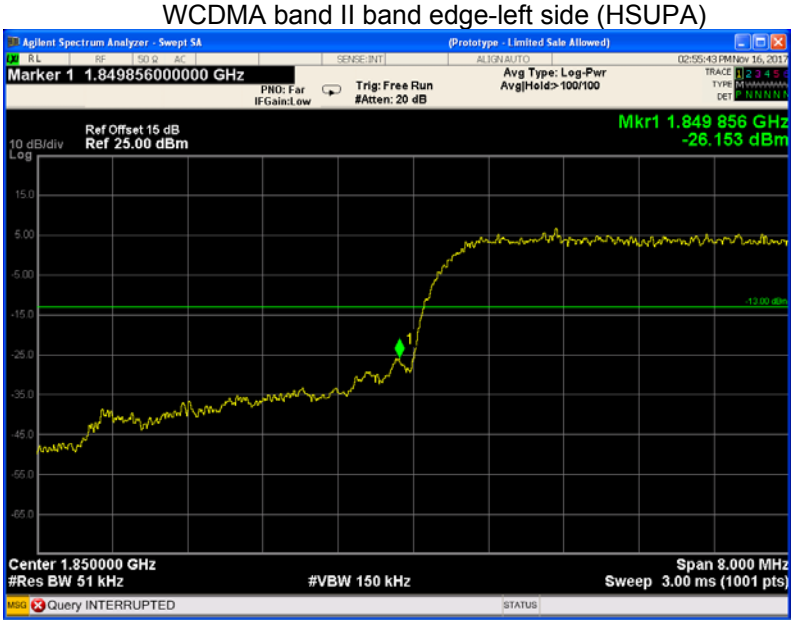
WCDMA band II band edge-left side (HSDPA)



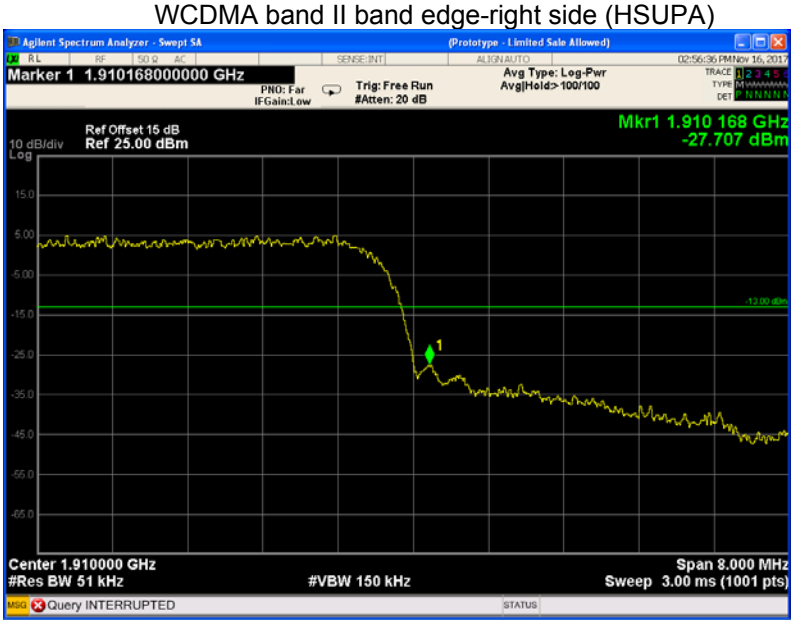
WCDMA band II band edge-right side (HSDPA)



WCDMA band II band edge-left side (HSUPA)

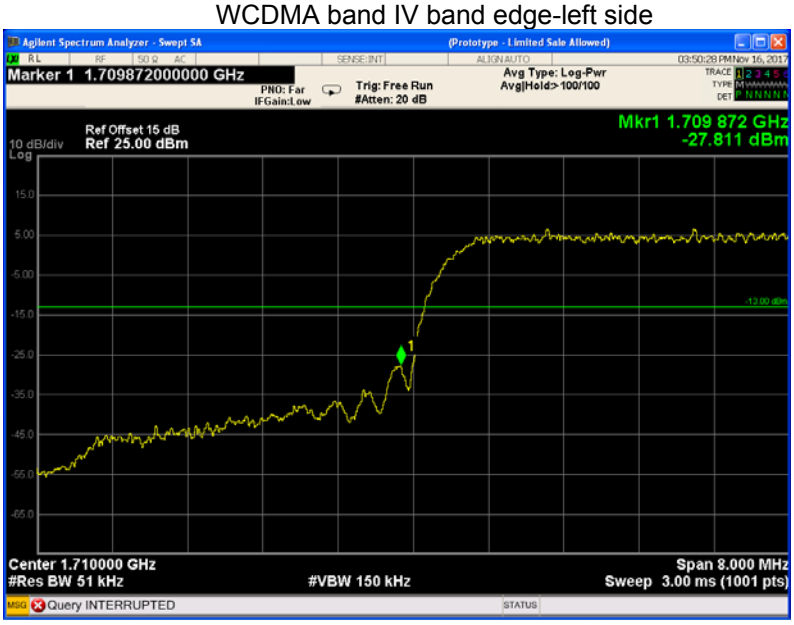


WCDMA band II band edge-right side (HSUPA)

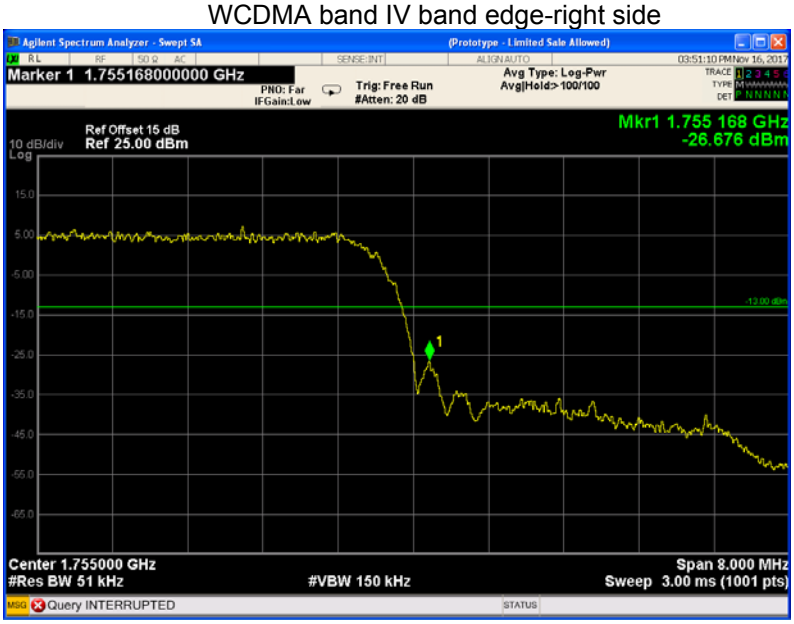


Part 27

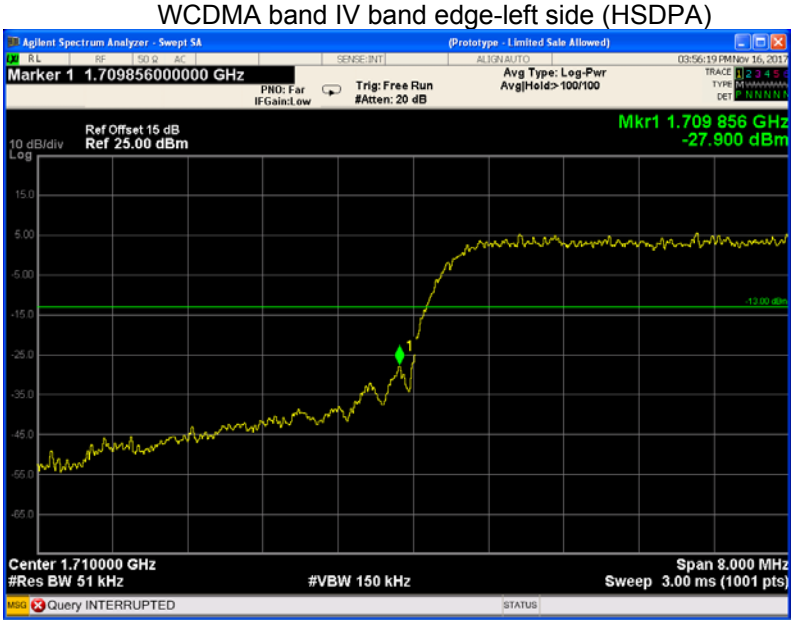
WCDMA band IV band edge-left side



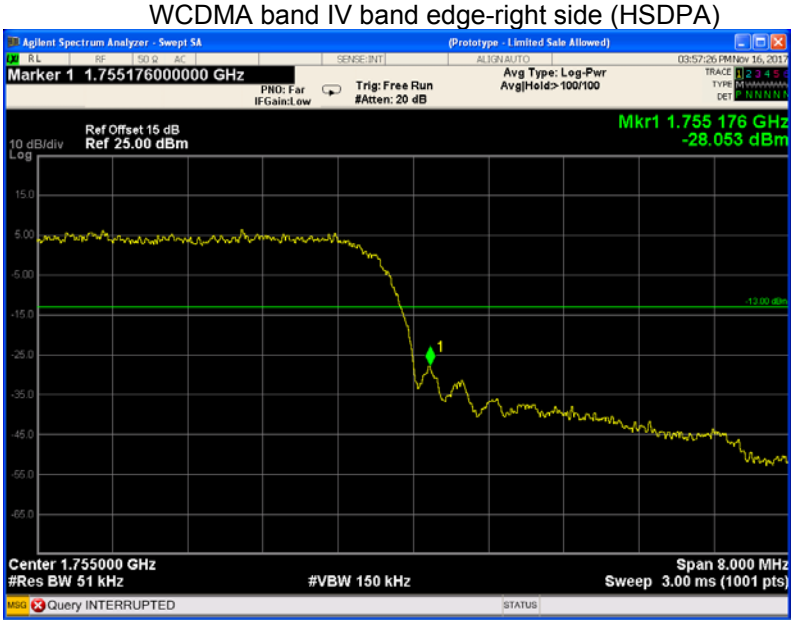
WCDMA band IV band edge-right side



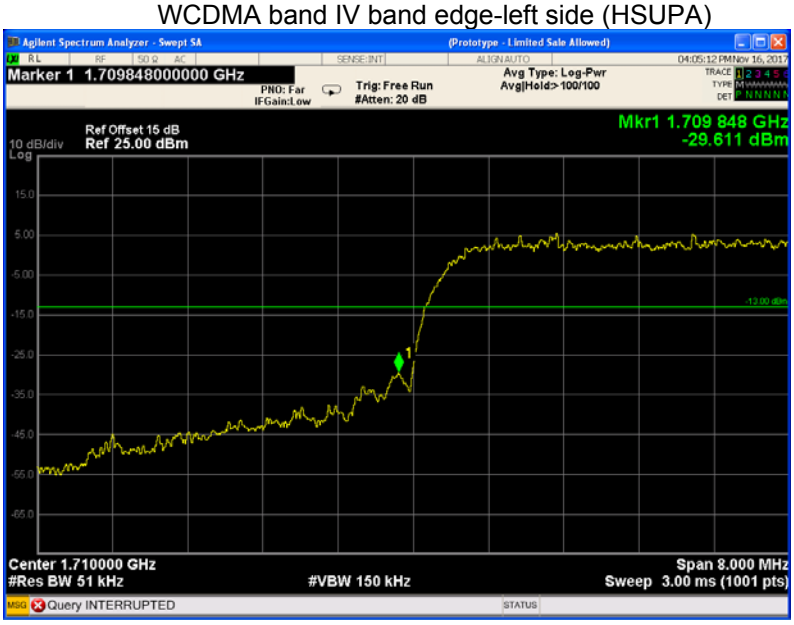
WCDMA band IV band edge-left side (HSDPA)



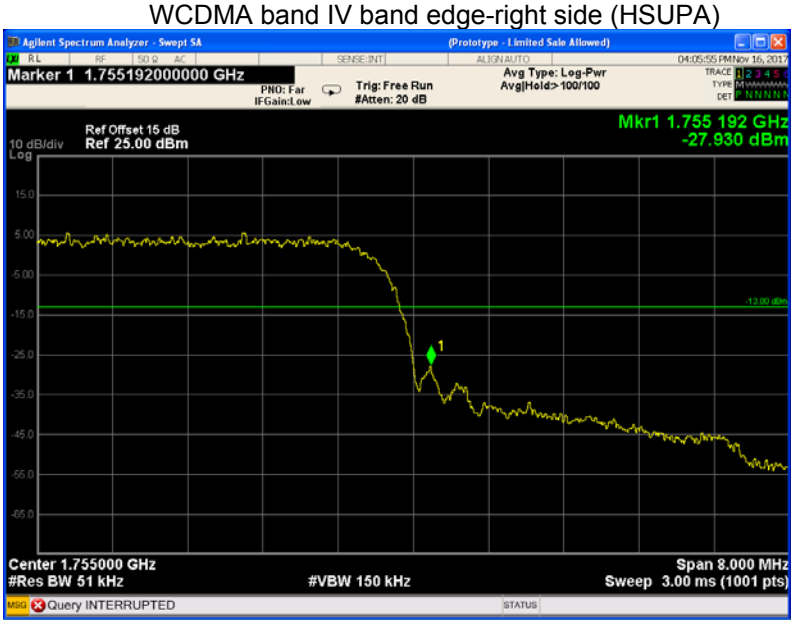
WCDMA band IV band edge-right side (HSDPA)



WCDMA band IV band edge-left side (HSUPA)



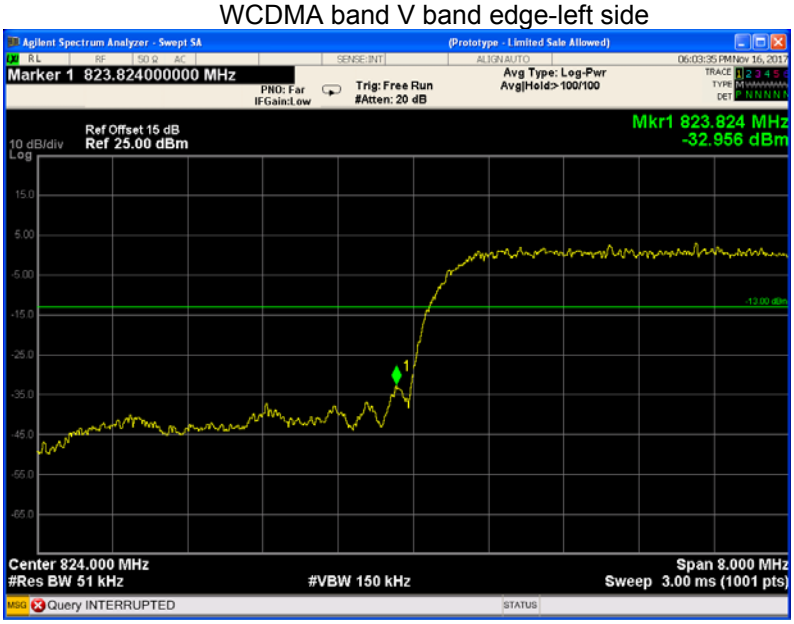
WCDMA band IV band edge-right side (HSUPA)



Modem 2

Cellular Band (Part 22H)

WCDMA band V band edge-left side



WCDMA band V band edge-right side