FCC REPORT

Applicant: BTI Wireless

Address of Applicant: 6185 Phyllis Dr. Unit D Cypress California 90630 United States

Equipment Under Test (EUT)

Product Name: mBSC-CM RUM

Model No.: mBSC0850i-005-RUCM11, mBSC0850i-002-RUCM11

Trade Mark: BTI WIRELESS™

FCC ID: WBKMBSC850IRUM

Applicable standards: FCC CFR Title 47 Part 2:2016
FCC CFR Title 47 Part 15:2016
FCC CFR Title 47 Part22 Subpart H:2016

Date of sample receipt: April 10, 2016

Date of Test: April 10-25, 2016

Date of report issued: April 25, 2016

Test Result : PASS *

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Robinson Lo
Laboratory Manager

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the GTS product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.
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2 Version

Version No.	Date	Description
00	*April 25, 2016*	*Original*

Prepared By:	Edward.Pan	***Date:***	*April 25, 2016*
	Project Engineer		
Check By:	hank. yan	***Date:***	*April 25, 2016*
	Reviewer		

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4 Test Summary

Test Item	Test Description	Result
Maximum Permissible exposure(MPE)	§ 1.1307(b)(1), § 2.1091	PASS* (Please refer to MPE Report)
RF Output Power	§ 2.1046; § 22.913(a) (2)	PASS
Modulation Characteristics	§ 2.1047	N/A*
Passband Gain and Bandwidth	§ 2.1049 § 22.917	PASS
Spurious Emissions at Antenna Terminal	§ 2.1051; § 22.917(a)	PASS
Intermodulation	§ 2.1051; § 22.917(a)	PASS
Field Strength of Spurious Radiation	§ 2.1053 § 22.917 (a)	PASS
Out of band emission, Band Edge	§ 22.917 (a)	PASS
Frequency stability vs. temperature Frequency stability vs. voltage	§ 2.1055 § 22.355	PASS
Out-of-Band Rejection	---	PASS
AC Power Line Conducted Emission Test	§ 15.207	PASS

Remark:

N/A*: Not application

5 General Information

5.1 Client Information

Applicant:	BTI Wireless
Address of Applicant:	6185 Phyllis Dr. Unit D Cypress California 90630 United States
Manufacturer:	BTI Wireless(ShenZhen)Co.,Ltd.
Address of Manufacturer:	No. 8 Building, The 3rd Zone, Tangtou Industrial Park Shiyan, Baoan District, Shenzhen, China
Factory:	BTI Wireless(ShenZhen)Co.,Ltd.
Address of Factory:	No. 8 Building, The 3rd Zone, Tangtou Industrial Park Shiyan, Baoan District, Shenzhen, China

5.2 General Description of EUT

Product Name:	mBSC-CM RUM	
Model No.:	mBSC0850i-005-RUCM11, mBSC0850i-002-RUCM11	
Power supply:	RPM: Input: AC 120V/60Hz RUM: DC 28V, 3A Max RTM: Input DC 28V / 2.2A Normal test voltage: AC 120V/60Hz	
Operating Temperature:	-20℃ to + 55℃	
Operating Humidity:	up to 95%	
Technical Parameter:		
Frequency Range	Downlink	869MHz~894MHz
	Uplink	824MHz~849MHz
Operating Bandwidth	25MHz	
Multiple Carrier Supported	4	
Channel Spacing(s) / Bandwidth(s)	WCDMA: 5MHz; GSM/EDGE: 200KHz; CDMA/CDMA EV-DO: 1.25MHz; LTE: 1.4M,3M,5M,10M;	
Maximun RF Output Power	Downlink: 37.33dBm(For 5W); 33.76dBm(For 2W); Uplink: 5.45dBm(For 5W); 5.37dBm(For 2W);	
Max Gain	Downlink: 54.35dB; Uplink: 62.31dB	
Type of modulation and Designator	WCDMA(F9W);CDMA/CDMA EV-DO (F9W); GSM/EDGE(GXW); LTE(W7D);	
Antenna Type	External antenna (N female)	
Antenna Gain	Maximum permissible antenna gain is 17dBi.	

5.3 Related Submittal(s) / Grant (s)

Title 47 Part 2	– General Requirements and Information for the Certification of Radio Apparatus
Title 47 Part 15	– General Requirements and Information for the Certification of Radio Apparatus
Title 47 Part 22	– Zone Enhancers for the Land Mobile Service

5.4 Test Methodology

Title 47 Part 2	– General Requirements and Information for the Certification of Radio Apparatus
Title 47 Part 15	– General Requirements and Information for the Certification of Radio Apparatus
Title 47 Part 22	– Zone Enhancers for the Land Mobile Service
KDB	AMPLIFIER, BOOSTER, AND REPEATER REMINDER SHEET
KDB 935210	D01 Signal Booster Definitions v02; D02 Signal Booster Certification v03 D03 Signal Booster Measurements v03 D04 Signal Booster Provider Specific v01r01 D05 Indus Booster Basic Meas v01

5.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

● CNAS —Registration No.: CNAS L5775
CNAS has accredited Global United Technology Services Co., Ltd. to ISO/IEC 17025 General Requirements for the competence of testing and calibration laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

● FCC —Registration No.: 600491
Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fuly described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files. Registration 600491, June 28, 2013.

● Industry Canada (IC)
The 3m Semi-anechoic chamber of China Certification & Inspection Services Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 9079A-2, June 26, 2013.

5.6 Test Location

All tests were performed at:
Global United Technology Services Co., Ltd. Address: No. 301-309, 3/F., Jinyuan Business Building, No.2, Laodong Industrrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102 Tel: 0755-27798480 Fax: 0755-27798960

5.7 Test Instruments list

Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (dd-mm-yy)	Cal.Due date (dd-mm-yy)
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	Mar. 27 2015	Mar. 26 2020
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	Jun. 29, 2015	Jun. 28, 2016
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	Feb. 20 2016	Feb. 19 2017
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	9120D-829	GTS208	June 25 2015	June 24 2016
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
7	Coaxial Cable	GTS	N/A	GTS213	Mar. 26 2016	Mar. 25 2017
8	Coaxial Cable	GTS	N/A	GTS211	Mar. 26 2016	Mar. 25 2017
9	Coaxial cable	GTS	N/A	GTS210	Mar. 26 2016	Mar. 25 2017
10	Coaxial Cable	GTS	N/A	GTS212	Mar. 26 2016	Mar. 25 2017
11	Amplifier(100KHz-5GHz)	HP	8347A	GTS204	Jun. 29, 2015	Jun. 28, 2016
12	Amplifier(2GHz-20GHz)	HP	8349B	GTS206	Jun. 29, 2015	Jun. 28, 2016
13	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June 25 2015	June 24 2016
14	Shielding Room	ZhongYu Electron	7.0(L)x3.0(W)x3.0(H)	GTS264	Sep. 05 2015	Sep. 04 2017
15	EMI Test Receiver	Rohde & Schwarz	ESCS30	GTS223	Jun. 29, 2015	Jun. 28, 2016
16	10dB Pulse Limita	Rohde & Schwarz	N/A	GTS224	Jun. 29, 2015	Jun. 28, 2016
17	LISN	SCHWARZBECK MESS-ELEKTRONIK	NSLK 8127	GTS226	Jun. 29, 2015	Jun. 28, 2016
18	Temp. Humidity/ Barometer	Oregon Scientific	BA-888	GTS248	May 08 2015	May 07 2017
19	Spectrum Analyzer	Agilent	E4440A	GTS 536	Oct.19 2015	Oct.18 2016
20	Spectrum Analyzer	Agilent	E4445A	MY41000047	Sept. 09 2015	Sept. 08 2017
21	Splitter	Agilent	11636B	GTS237	May 08 2015	May 07 2017
22	Signal Generator	Rohde & Schwarz	SML03	GTS236	May 08 2015	May 07 2017
23	Signal Generator	AEROFLEX	IFR3414	341300/019	Sept. 09 2015	Sept. 08 2016
24	Power Meter	Giga-tronics	8541C	1831177	Sept. 09 2015	Sept. 08 2016
25	Power Sensor	Giga-tronics	80601A	1831785	Sept. 09 2015	Sept. 08 2016
26	Power Attenuator	BTI	30dB/250W	040706090	Sept. 09 2015	Sept. 08 2016
27	Power Attenuator	BTI	20dB	040706089	Sept. 09 2015	Sept. 08 2016
28	Power Attenuator	BTI	10dB	040706088	Sept. 09 2015	Sept. 08 2016
29	Signal Generator	Agilent	E4438C	MY45093111	Oct.19 2015	Oct.18 2016
30	Signal Generator	Agilent	4432B	GB40051373	May 08 2015	May 07 2016

6 TEST CONFIGURATION AND CONDITIONS

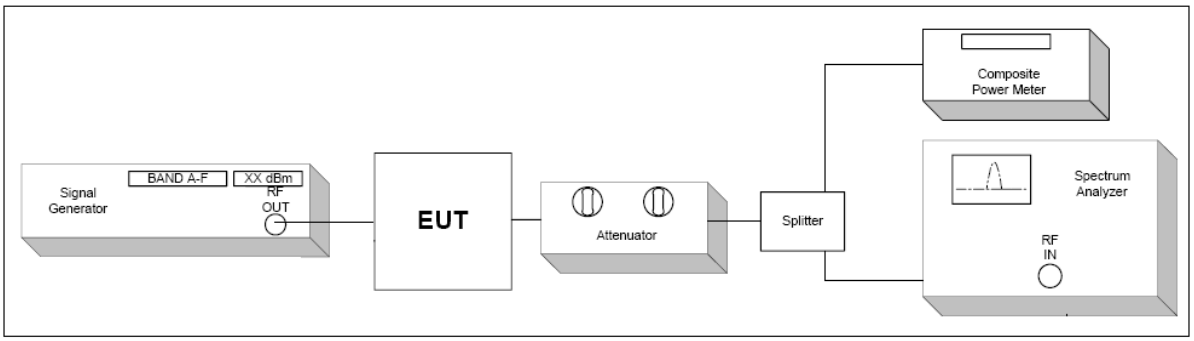
6.1 EUT Configuration

This mBSC0850i-005-RUCM11； mBSC0850i-002-RUCM11 are the Remote Unit on BTI CM system. This remote unit supports 850MHz band with the air standard GSM, EDGE, WCDMA, CDMA, CDMA EV-DO, and LTE. The unit consists of Duplexer, PA and CPU board. This product is designed to operate in an outdoor or indoor environment. The output power of the RUM at Antenna interface port is average 37.33dBm (for 5W) and 33.76dBm (for 2W) for Downlink path with Convection Cooling.

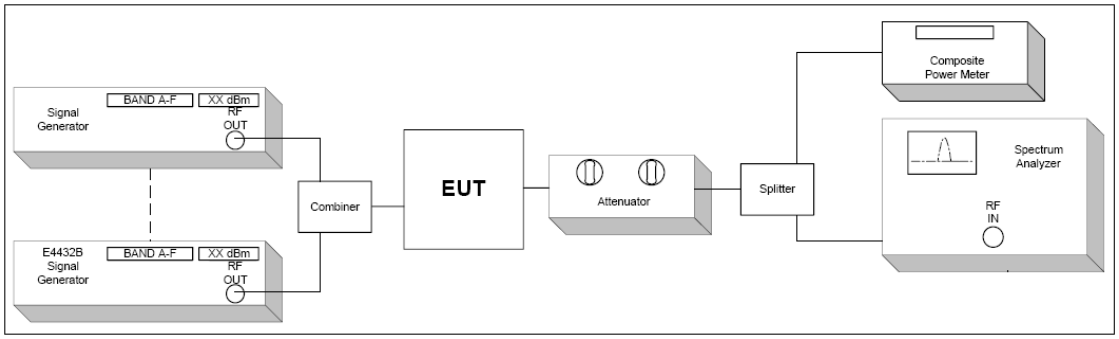
For details, refer to technical document and the user manual.

6.2 Configuration of Tested System

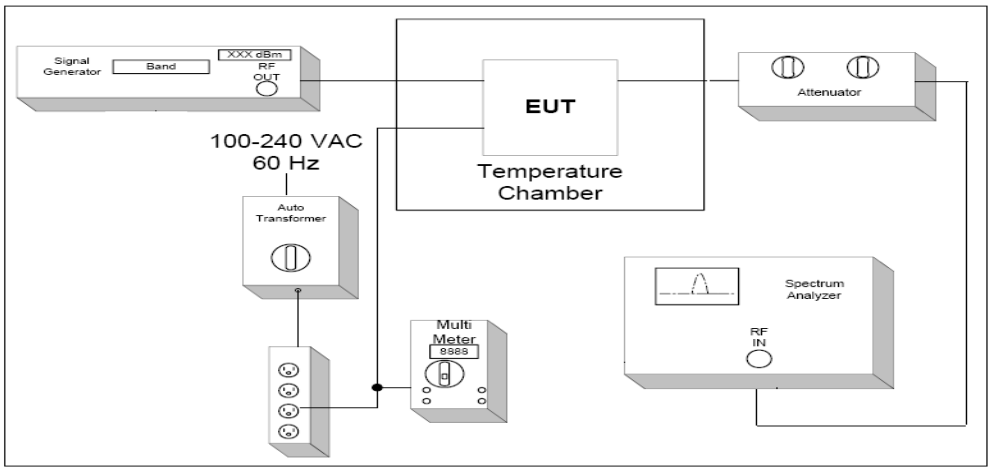
(A) RF Output Power, Occupied Bandwidth, Spurious Emissions at Antenna Terminal, Band Edge, Test Set-UP



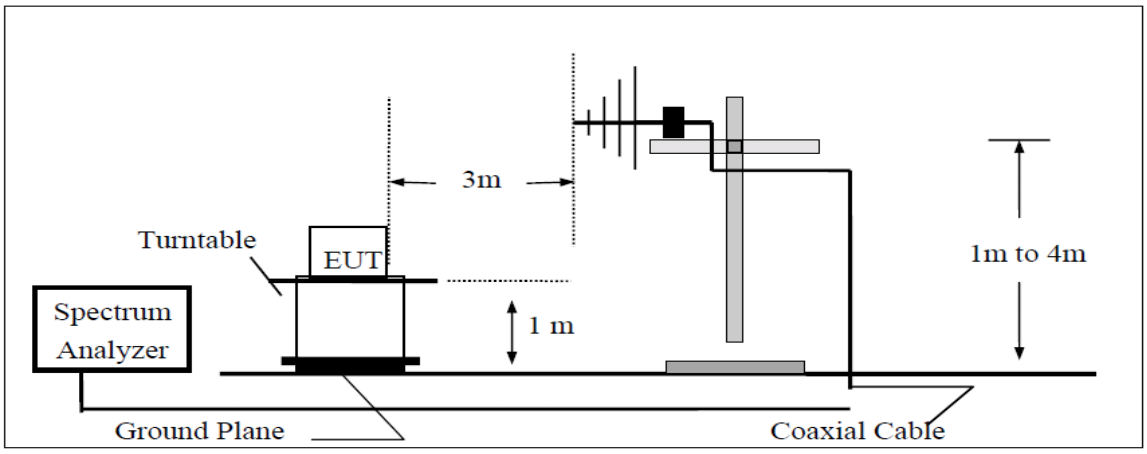
(B) Intermodulation Test Set-UP



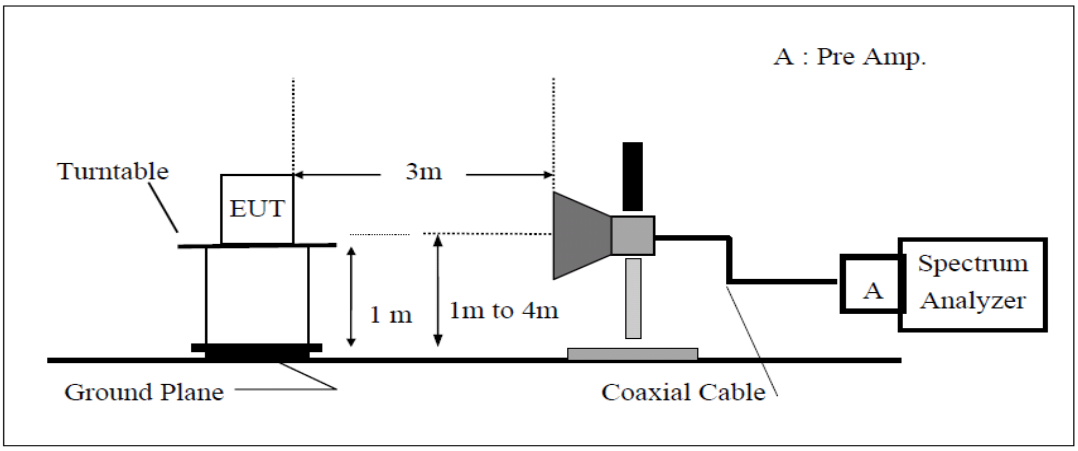
(C)Frequency stability Test Set-UP



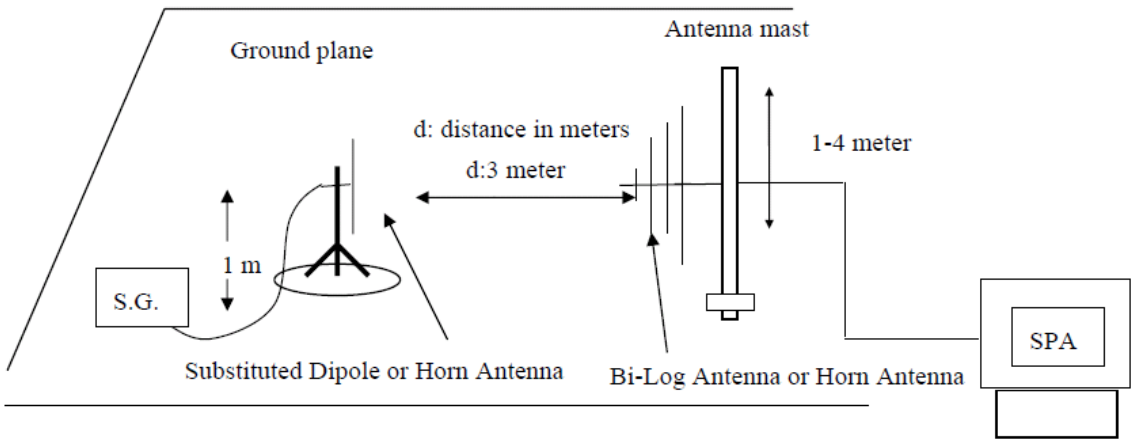
(D) Radiated Emission Test Set-Up, Frequency below 1000MHz



(E) Radiated Emission Test Set-UP Frequency over 1 GHz



(F) Substituted Method Test Set-UP



6.3 Test Environments

Condition	Minimum value	Maximum value
Barometric pressure	86 kPa	106 kPa
Temperature	15°C	30°C
Relative Humidity	20 %	75 %
Power supply range	±5% of rated voltages	
Normal Test Condition	(1).Temperature: +15 °C to +30 °C; (2). voltage is 120V AC.	
Extreme Test Conditions:	(1). Temperatures: -20°C to +55°C. (2). Voltages: 102V AC to 138V AC.	

6.4 Test signal

1: Test signal WCDMA

Signal waveform according to Test Model 1 of standard specification 3GPP TS25.141. Signal modulated with a combination of PCCPCH, SCCPCH and Dedicated Physical Channels specified as test model 1 64 DPCH.

2: Test signal CDMA

Signal waveform according to 3GPP2 C.S0010-C

3: Test signal CDMA EV-DO

Signal waveform according to 3GPP2 C.S0032-B

4: Test signal GSM and EDGE

Signal waveform according to clause 6.4 of standard specification 3GPP TS 151 010-1(2014-11)

5: Test signal LTE:

Signal waveform according to Test Model 1.1, E-TM1.1, clause 6.1.1.1-1, table 6.1.1.1-1 of standard specification 3GPP TS 36.141 V9.3.0 (2010-03).

6: Test signal CW

N/A

6.5 Test frequency selection

Downlink:

Operating Mode(TX)	Channels No. Multi- Carriers	Channels frequency (MHz)		
		Low Ch.	Mid Ch.	High Ch.
WCDMA	Single Carrier	871.40	881.60	891.60
CDMA/CDMA EV-DO	Single Carrier	870.25	881.60	892.75
	Two Carriers	871.50	881.60	891.50
	Three Carrier	872.75	881.60	890.25
	Four Carrier	874.00	881.60	889.00
GSM/EDGE	Single Carrier	869.20	881.60	848.80
	Two Carriers	869.40	881.60	848.60
	Three Carrier	869.60	881.60	848.40
	Four Carrier	869.80	881.60	848.20
LTE 1.4MHz Bandwidth	Single Carrier	869.70	881.60	893.30
LTE 3MHz Bandwidth	Single Carrier	870.50	881.60	892.50
LTE 5MHz Bandwidth	Single Carrier	871.50	881.60	891.50
LTE 10MHz Bandwidth	Single Carrier	874.00	881.60	889.00

Uplink:

Operating Mode(TX)	Channels No. Multi- Carriers	Channels frequency (MHz)		
		Low Ch.	Mid Ch.	High Ch.
WCDMA	Single Carrier	826.40	836.60	846.60
CDMA/CDMA EV-DO	Single Carrier	825.25	836.60	847.75
	Two Carriers	826.50	836.60	846.50
	Three Carrier	827.75	836.60	845.25
	Four Carrier	829.00	836.60	843.00
GSM/EDGE	Single Carrier	824.20	836.60	848.80
	Two Carriers	824.40	836.60	848.60
	Three Carrier	824.60	836.60	848.40
	Four Carrier	824.80	836.60	848.20
LTE 1.4MHz Bandwidth	Single Carrier	824.70	836.60	848.30
LTE 3MHz Bandwidth	Single Carrier	825.50	836.60	847.50
LTE 5MHz Bandwidth	Single Carrier	826.50	836.60	846.50
LTE 10MHz Bandwidth	Single Carrier	829.00	836.60	844.00

6.6 DESCRIPTION OF TEST MODES

Test mode	Detail description of the test mode
Downlink	Downlink (Low channel; middle channel; high channel)
Uplink	Uplink (Low channel; middle channel; high channel)
Multi-carrier	Single Carrier; two carrier; three carrier; four carrier
Multi-bandwidth	WCDMA: 5MHz, CDMA/CDMA EV-DO: 1.25MHz GSM/EDGE: 200KHz, LTE:1.4M, 3M, 5M, 10M.
Modulation type	WCDMA/CDMA/CDMA EV-DO/GSM/EDGE/LTE.

Remark:

1: The EUT was powered by 120VAC.

2: The EUT was configured for maximum gain and maximum ouput power. The input power was the maximum declared by the manufacturer.This is to ensure that the equipment is operating in the linear output range.

3: Signal generator was used to provide the input signals to the EUT. Tests were performed with WCDMA/CDMA/CDMA EV-DO/GSM/EDGE/LTE signal input and multi-carrier signal mode input.

4: Pre-test all test modes as above, only the worst case and typical mode is list in report it.

7 RF POWER OUTPUT MEASUREMENT

7.1 Standard Applicable

According to FCC § 2.1046 and § 22.913(a)(2).

7.2 Test setup

Please refer the section §6.2 Configuration of Tested System.

7.3 Measurement Procedure

1. The output from the EUT t signal shall be increased, antenna connector was connected to the power meter.
2. The level of RF input until the maximum output power per channel, declared by client, is reached.
3. The RF output power was measured at low, middle and high channel with WCDMA/CDMA/CDMA EV-DO/GSM/EDGE/LTE signal.

7.4 Test Result

5W
Downlink:

Test mode	Carrier Conf.	Channel	Average Power（dBm）	Average Power（W）	RF Output Power(W/MHz)	Result
WCDMA	Single Carrier	Low	37.12	5.15	1.03	Compliant
		Middle	37.33	5.41	1.08	Compliant
		High	37.15	5.19	1.04	Compliant
CDMA	Single Carrier	Low	37.10	5.13	4.10	Compliant
		Middle	37.24	5.30	4.24	Compliant
		High	37.11	5.14	4.11	Compliant
	Two Carrier	Low	37.08	5.11	2.04	Compliant
		Middle	37.19	5.24	2.09	Compliant
		High	37.04	5.06	2.02	Compliant
	Three Carrier	Low	37.09	5.12	1.36	Compliant
		Middle	37.15	5.19	1.38	Compliant
		High	37.10	5.13	1.37	Compliant
	Four Carrier	Low	37.02	5.04	1.01	Compliant
		Middle	37.18	5.22	1.04	Compliant
		High	37.09	5.12	1.02	Compliant
CDMA EV-DO	Single Carrier	Low	37.12	5.15	4.12	Compliant
		Middle	37.21	5.26	4.21	Compliant
		High	37.03	5.05	4.04	Compliant
	Two Carrier	Low	37.05	5.07	2.03	Compliant
		Middle	37.15	5.19	2.08	Compliant
		High	37.03	5.05	2.02	Compliant
	Three Carrier	Low	36.98	4.99	1.81	Compliant
		Middle	37.06	5.08	1.85	Compliant
		High	36.99	5.00	1.82	Compliant
	Four Carrier	Low	37.01	5.02	1.00	Compliant
		Middle	37.16	5.20	1.04	Compliant
		High	37.04	5.06	1.01	Compliant

Test mode	Carrier Conf.	Channel	Average Power（dBm）	Average Power（W）	RF Output Power(W/MHz)	Result
GSM	Single Carrier	Low	37.21	5.26	26.30	Compliant
		Middle	37.30	5.37	26.85	Compliant
		High	37.16	5.20	26.00	Compliant
	Two Carrier	Low	37.08	5.11	12.76	Compliant
		Middle	37.21	5.26	13.15	Compliant
		High	37.13	5.16	12.91	Compliant
	Three Carrier	Low	37.15	5.19	8.65	Compliant
		Middle	37.20	5.25	8.75	Compliant
		High	37.14	5.18	8.63	Compliant
	Four Carrier	Low	37.08	5.11	6.38	Compliant
		Middle	37.19	5.24	6.55	Compliant
		High	37.11	5.14	6.43	Compliant
EDGE	Single Carrier	Low	37.20	5.25	26.24	Compliant
		Middle	37.28	5.35	26.73	Compliant
		High	37.15	5.19	25.94	Compliant
	Two Carrier	Low	37.16	5.20	13.00	Compliant
		Middle	37.27	5.33	13.33	Compliant
		High	37.18	5.22	13.06	Compliant
	Three Carrier	Low	37.15	5.19	8.65	Compliant
		Middle	37.24	5.30	8.83	Compliant
		High	37.20	5.25	8.75	Compliant
	Four Carrier	Low	37.13	5.16	6.46	Compliant
		Middle	37.22	5.27	6.59	Compliant
		High	37.10	5.13	6.41	Compliant
LTE 1.4MHz Bandwidth	Single Carrier	Low	37.21	5.26	3.76	Compliant
		Middle	37.29	5.36	3.83	Compliant
		High	37.22	5.27	3.77	Compliant
LTE 3MHz Bandwidth	Single Carrier	Low	37.18	5.22	1.74	Compliant
		Middle	37.27	5.33	1.78	Compliant
		High	37.16	5.20	1.73	Compliant
LTE 5MHz Bandwidth	Single Carrier	Low	37.17	5.21	1.04	Compliant
		Middle	37.26	5.32	1.06	Compliant
		High	37.22	5.27	1.05	Compliant
LTE 10MHz Bandwidth	Single Carrier	Low	37.14	5.18	0.52	Compliant
		Middle	37.25	5.31	0.53	Compliant
		High	37.08	5.26	3.76	Compliant

Uplink:

Test mode	Carrier Conf.	Channel	Average Power（dBm）	Average Power（W）	RF Output Power(W/MHz)	Result
WCDMA	Single Carrier	Low	5.21	0.0033	0.0007	Compliant
		Middle	5.45	0.0035	0.0007	Compliant
		High	5.34	0.0034	0.0007	Compliant
CDMA	Single Carrier	Low	5.22	0.0033	0.0027	Compliant
		Middle	5.41	0.0035	0.0028	Compliant
		High	5.33	0.0034	0.0027	Compliant
	Two Carrier	Low	5.18	0.0033	0.0013	Compliant
		Middle	5.37	0.0034	0.0014	Compliant
		High	5.21	0.0033	0.0013	Compliant
	Three Carrier	Low	5.15	0.0033	0.0009	Compliant
		Middle	5.34	0.0034	0.0009	Compliant
		High	5.23	0.0033	0.0009	Compliant
	Four Carrier	Low	5.13	0.0033	0.0007	Compliant
		Middle	5.32	0.0034	0.0007	Compliant
		High	5.18	0.0033	0.0007	Compliant
CDMA EV-DO	Single Carrier	Low	5.28	0.0034	0.0027	Compliant
		Middle	5.39	0.0035	0.0028	Compliant
		High	5.32	0.0034	0.0027	Compliant
	Two Carrier	Low	5.24	0.0033	0.0013	Compliant
		Middle	5.36	0.0034	0.0014	Compliant
		High	5.21	0.0033	0.0013	Compliant
	Three Carrier	Low	5.18	0.0033	0.0012	Compliant
		Middle	5.34	0.0034	0.0012	Compliant
		High	5.19	0.0033	0.0012	Compliant
	Four Carrier	Low	5.21	0.0033	0.0007	Compliant
		Middle	5.30	0.0034	0.0007	Compliant
		High	5.17	0.0033	0.0007	Compliant

Test mode	Carrier Conf.	Channel	Average Power（dBm）	Average Power（W）	RF Output Power(W/MHz)	Result
GSM	Single Carrier	Low	5.22	0.0033	0.0166	Compliant
		Middle	5.42	0.0035	0.0174	Compliant
		High	5.35	0.0034	0.0171	Compliant
	Two Carrier	Low	5.18	0.0033	0.0082	Compliant
		Middle	5.37	0.0034	0.0086	Compliant
		High	5.30	0.0034	0.0085	Compliant
	Three Carrier	Low	5.12	0.0033	0.0054	Compliant
		Middle	5.33	0.0034	0.0057	Compliant
		High	5.26	0.0034	0.0056	Compliant
	Four Carrier	Low	5.07	0.0032	0.0040	Compliant
		Middle	5.28	0.0034	0.0042	Compliant
		High	5.16	0.0033	0.0041	Compliant
EDGE	Single Carrier	Low	5.24	0.0033	0.0167	Compliant
		Middle	5.39	0.0035	0.0173	Compliant
		High	5.36	0.0034	0.0172	Compliant
	Two Carrier	Low	5.20	0.0033	0.0083	Compliant
		Middle	5.34	0.0034	0.0085	Compliant
		High	5.31	0.0034	0.0085	Compliant
	Three Carrier	Low	5.18	0.0033	0.0055	Compliant
		Middle	5.33	0.0034	0.0057	Compliant
		High	5.27	0.0034	0.0056	Compliant
	Four Carrier	Low	5.15	0.0033	0.0041	Compliant
		Middle	5.30	0.0034	0.0042	Compliant
		High	5.21	0.0033	0.0041	Compliant
LTE 1.4MHz Bandwidth	Single Carrier	Low	5.31	0.0034	0.0024	Compliant
		Middle	5.42	0.0035	0.0025	Compliant
		High	5.34	0.0034	0.0024	Compliant
LTE 3MHz Bandwidth	Single Carrier	Low	5.27	0.0034	0.0011	Compliant
		Middle	5.38	0.0035	0.0012	Compliant
		High	5.29	0.0034	0.0011	Compliant
LTE 5MHz Bandwidth	Single Carrier	Low	5.33	0.0034	0.0007	Compliant
		Middle	5.39	0.0035	0.0007	Compliant
		High	5.27	0.0034	0.0007	Compliant
LTE 10MHz Bandwidth	Single Carrier	Low	5.28	0.0034	0.0003	Compliant
		Middle	5.38	0.0035	0.0003	Compliant
		High	5.26	0.0034	0.0003	Compliant

2W
Downlink:

Test mode	Carrier Conf.	Channel	Average Power（dBm）	Average Power（W）	RF Output Power(W/MHz)	Result
WCDMA	Single Carrier	Low	33.65	2.32	0.46	Compliant
		Middle	33.76	2.38	0.48	Compliant
		High	33.61	2.30	0.46	Compliant
CDMA	Single Carrier	Low	33.62	2.30	1.84	Compliant
		Middle	33.75	2.37	1.90	Compliant
		High	33.59	2.29	1.83	Compliant
	Two Carrier	Low	33.58	2.28	0.91	Compliant
		Middle	33.72	2.36	0.94	Compliant
		High	33.63	2.31	0.92	Compliant
	Three Carrier	Low	33.57	2.28	0.61	Compliant
		Middle	33.68	2.33	0.62	Compliant
		High	33.55	2.26	0.60	Compliant
	Four Carrier	Low	33.54	2.26	0.45	Compliant
		Middle	33.62	2.30	0.46	Compliant
		High	33.53	2.25	0.45	Compliant
CDMA EV-DO	Single Carrier	Low	33.60	2.29	1.83	Compliant
		Middle	33.73	2.36	1.89	Compliant
		High	33.65	2.32	1.85	Compliant
	Two Carrier	Low	33.57	2.28	0.91	Compliant
		Middle	33.72	2.36	0.94	Compliant
		High	33.58	2.28	0.91	Compliant
	Three Carrier	Low	33.52	2.25	0.82	Compliant
		Middle	33.65	2.32	0.84	Compliant
		High	33.49	2.23	0.81	Compliant
	Four Carrier	Low	33.48	2.23	0.45	Compliant
		Middle	33.56	2.27	0.45	Compliant
		High	33.50	2.24	0.45	Compliant

Test mode	Carrier Conf.	Channel	Average Power（dBm）	Average Power（W）	RF Output Power(W/MHz)	Result
GSM	Single Carrier	Low	33.63	2.31	11.53	Compliant
		Middle	33.70	2.34	11.72	Compliant
		High	33.58	2.28	11.40	Compliant
	Two Carrier	Low	33.59	2.29	5.71	Compliant
		Middle	33.67	2.33	5.82	Compliant
		High	33.54	2.26	5.65	Compliant
	Three Carrier	Low	33.56	2.27	3.78	Compliant
		Middle	33.62	2.30	3.84	Compliant
		High	33.49	2.23	3.72	Compliant
	Four Carrier	Low	33.55	2.26	2.83	Compliant
		Middle	33.60	2.29	2.86	Compliant
		High	33.47	2.22	2.78	Compliant
EDGE	Single Carrier	Low	33.61	2.30	11.48	Compliant
		Middle	33.68	2.33	11.67	Compliant
		High	33.57	2.28	11.38	Compliant
	Two Carrier	Low	33.57	2.28	5.69	Compliant
		Middle	33.64	2.31	5.78	Compliant
		High	33.52	2.25	5.62	Compliant
	Three Carrier	Low	33.54	2.26	3.77	Compliant
		Middle	33.63	2.31	3.84	Compliant
		High	33.52	2.25	3.75	Compliant
	Four Carrier	Low	33.50	2.24	2.80	Compliant
		Middle	33.57	2.28	2.84	Compliant
		High	33.48	2.23	2.79	Compliant
LTE 1.4MHz Bandwidth	Single Carrier	Low	33.65	2.32	1.66	Compliant
		Middle	33.72	2.36	1.68	Compliant
		High	33.57	2.28	1.63	Compliant
LTE 3MHz Bandwidth	Single Carrier	Low	33.61	2.30	0.77	Compliant
		Middle	33.69	2.34	0.78	Compliant
		High	33.56	2.27	0.76	Compliant
LTE 5MHz Bandwidth	Single Carrier	Low	33.58	2.28	0.46	Compliant
		Middle	33.70	2.34	0.47	Compliant
		High	33.48	2.23	0.45	Compliant
LTE 10MHz Bandwidth	Single Carrier	Low	33.55	2.26	0.23	Compliant
		Middle	33.64	2.31	0.23	Compliant
		High	33.50	2.24	0.22	Compliant

Uplink:

Test mode	Carrier Conf.	Channel	Average Power （dBm）	Average Power （W）	RF Output Power(W/MHz)	Result
WCDMA	Single Carrier	Low	5.25	0.0033	0.0007	Compliant
		Middle	5.37	0.0034	0.0007	Compliant
		High	5.28	0.0034	0.0007	Compliant
CDMA	Single Carrier	Low	5.21	0.0033	0.0027	Compliant
		Middle	5.35	0.0034	0.0027	Compliant
		High	5.26	0.0034	0.0027	Compliant
	Two Carrier	Low	5.18	0.0033	0.0013	Compliant
		Middle	5.33	0.0034	0.0014	Compliant
		High	5.24	0.0033	0.0013	Compliant
	Three Carrier	Low	5.15	0.0033	0.0009	Compliant
		Middle	5.31	0.0034	0.0009	Compliant
		High	5.21	0.0033	0.0009	Compliant
	Four Carrier	Low	5.12	0.0033	0.0007	Compliant
		Middle	5.24	0.0033	0.0007	Compliant
		High	5.17	0.0033	0.0007	Compliant
CDMA EV-DO	Single Carrier	Low	5.18	0.0033	0.0026	Compliant
		Middle	5.32	0.0034	0.0027	Compliant
		High	5.24	0.0033	0.0027	Compliant
	Two Carrier	Low	5.12	0.0033	0.0013	Compliant
		Middle	5.30	0.0034	0.0014	Compliant
		High	5.16	0.0033	0.0013	Compliant
	Three Carrier	Low	5.10	0.0032	0.0012	Compliant
		Middle	5.24	0.0033	0.0012	Compliant
		High	5.13	0.0033	0.0012	Compliant
	Four Carrier	Low	5.08	0.0032	0.0006	Compliant
		Middle	5.21	0.0033	0.0007	Compliant
		High	5.06	0.0032	0.0006	Compliant

Test mode	Carrier Conf.	Channel	Average Power（dBm）	Average Power（W）	RF Output Power(W/MHz)	Result
GSM	Single Carrier	Low	5.25	0.0033	0.0167	Compliant
		Middle	5.35	0.0034	0.0171	Compliant
		High	5.24	0.0033	0.0167	Compliant
	Two Carrier	Low	5.20	0.0033	0.0083	Compliant
		Middle	5.31	0.0034	0.0085	Compliant
		High	5.18	0.0033	0.0082	Compliant
	Three Carrier	Low	5.14	0.0033	0.0054	Compliant
		Middle	5.24	0.0033	0.0056	Compliant
		High	5.15	0.0033	0.0055	Compliant
	Four Carrier	Low	5.08	0.0032	0.0040	Compliant
		Middle	5.20	0.0033	0.0041	Compliant
		High	5.09	0.0032	0.0040	Compliant
EDGE	Single Carrier	Low	5.21	0.0033	0.0166	Compliant
		Middle	5.33	0.0034	0.0171	Compliant
		High	5.21	0.0033	0.0166	Compliant
	Two Carrier	Low	5.18	0.0033	0.0082	Compliant
		Middle	5.21	0.0033	0.0083	Compliant
		High	5.22	0.0033	0.0083	Compliant
	Three Carrier	Low	5.13	0.0033	0.0054	Compliant
		Middle	5.19	0.0033	0.0055	Compliant
		High	5.06	0.0032	0.0053	Compliant
	Four Carrier	Low	5.07	0.0032	0.0040	Compliant
		Middle	5.13	0.0033	0.0041	Compliant
		High	5.03	0.0032	0.0040	Compliant
LTE 1.4MHz Bandwidth	Single Carrier	Low	5.21	0.0033	0.0024	Compliant
		Middle	5.29	0.0034	0.0024	Compliant
		High	5.15	0.0033	0.0023	Compliant
LTE 3MHz Bandwidth	Single Carrier	Low	5.17	0.0033	0.0011	Compliant
		Middle	5.22	0.0033	0.0011	Compliant
		High	5.13	0.0033	0.0011	Compliant
LTE 5MHz Bandwidth	Single Carrier	Low	5.21	0.0033	0.0007	Compliant
		Middle	5.26	0.0034	0.0007	Compliant
		High	5.16	0.0033	0.0007	Compliant
LTE 10MHz Bandwidth	Single Carrier	Low	5.21	0.0033	0.0003	Compliant
		Middle	5.26	0.0034	0.0003	Compliant
		High	5.19	0.0033	0.0003	Compliant

7.5 Peak to Average Ratio

Downlink:

Test mode	Carrier Conf.	Peak to Average Ratio (dB)			Limit (dB)	Result
		Low Ch.	Middle Ch.	High Ch.		
WCDMA	Single Carrier	5.26	5.14	5.49	13	Compliant
CDMA	Single Carrier	6.35	6.77	6.21	13	Compliant
	Two Carrier	6.56	6.73	6.53	13	Compliant
	Three Carrier	6.19	6.43	6.55	13	Compliant
	Four Carrier	6.38	6.26	6.50	13	Compliant
CDMA EV-DO	Single Carrier	7.02	6.85	6.74	13	Compliant
	Two Carrier	6.93	6.64	6.82	13	Compliant
	Three Carrier	6.58	6.77	6.68	13	Compliant
	Four Carrier	6.72	6.85	6.89	13	Compliant
GSM	Single Carrier	0.67	0.72	0.65	13	Compliant
	Two Carrier	0.47	0.62	0.68	13	Compliant
	Three Carrier	0.77	0.70	0.75	13	Compliant
	Four Carrier	0.65	0.61	0.69	13	Compliant
EDGE	Single Carrier	0.72	0.69	0.67	13	Compliant
	Two Carrier	0.75	0.69	0.62	13	Compliant
	Three Carrier	0.66	0.72	0.69	13	Compliant
	Four Carrier	0.59	0.75	0.66	13	Compliant
LTE 1.4MHz Bandwidth	Single Carrier	7.75	8.02	8.20	13	Compliant
LTE 3MHz Bandwidth	Single Carrier	8.34	8.16	8.13	13	Compliant
LTE 5MHz Bandwidth	Single Carrier	8.19	8.43	8.55	13	Compliant
LTE 10MHz Bandwidth	Single Carrier	8.25	8.28	8.39	13	Compliant

Uplink:

Test mode	Carrier Conf.	Peak to Average Ratio （dB）			Limit （dB）	Result
		Low Ch.	Middle Ch.	High Ch.		
WCDMA	Single Carrier	5.26	5.41	5.07	13	Compliant
CDMA	Single Carrier	6.47	6.38	6.65	13	Compliant
	Two Carrier	6.55	6.46	6.57	13	Compliant
	Three Carrier	6.50	6.64	6.60	13	Compliant
	Four Carrier	6.59	6.43	6.72	13	Compliant
CDMA EV-DO	Single Carrier	7.79	7.86	7.89	13	Compliant
	Two Carrier	7.62	7.82	7.68	13	Compliant
	Three Carrier	7.88	7.64	7.73	13	Compliant
	Four Carrier	7.48	7.69	7.58	13	Compliant
GSM	Single Carrier	0.54	0.61	0.65	13	Compliant
	Two Carrier	0.62	0.58	0.69	13	Compliant
	Three Carrier	0.78	0.72	0.71	13	Compliant
	Four Carrier	0.60	0.68	0.63	13	Compliant
EDGE	Single Carrier	0.59	0.67	0.58	13	Compliant
	Two Carrier	0.59	0.66	0.72	13	Compliant
	Three Carrier	0.62	0.75	0.69	13	Compliant
	Four Carrier	0.71	0.58	0.63	13	Compliant
LTE 1.4MHz Bandwidth	Single Carrier	8.26	8.16	8.28	13	Compliant
LTE 3MHz Bandwidth	Single Carrier	8.45	8.37	8.44	13	Compliant
LTE 5MHz Bandwidth	Single Carrier	8.65	8.54	8.19	13	Compliant
LTE 10MHz Bandwidth	Single Carrier	8.34	8.46	8.08	13	Compliant

8 MEASURING THE EUT AGC THRESHOLD

8.1 Standard Applicable

Please refer the section §3.2 8 MEASURING THE EUT AGC THRESHOLD of D05 Indus Booster Basic Meas v01

8.2 Test setup

Please refer the section §6.2 Configuration of Tested System.

8.3 Test Procedure

Please refer the section §3.2 8 MEASURING THE EUT AGC THRESHOLD of D05 Indus Booster Basic Meas v01

8.4 Test Result

Downlink:

Test mode	Carrier Conf.	AGC threshold level （dB）			Result
		Low Ch.	Middle Ch.	High Ch.	
WCDMA	Single Carrier	39.24	39.33	39.31	Compliant
CDMA	Single Carrier	39.21	39.28	39.23	Compliant
	Two Carrier	39.18	39.21	39.12	Compliant
	Three Carrier	39.15	39.25	39.13	Compliant
	Four Carrier	39.11	39.20	39.08	Compliant
CDMA EV-DO	Single Carrier	39.21	39.32	39.24	Compliant
	Two Carrier	39.19	39.28	39.20	Compliant
	Three Carrier	39.17	39.24	39.14	Compliant
	Four Carrier	39.13	39.20	39.11	Compliant
GSM	Single Carrier	39.21	39.29	39.28	Compliant
	Two Carrier	39.16	39.20	39.24	Compliant
	Three Carrier	39.12	39.15	39.18	Compliant
	Four Carrier	39.11	39.13	39.12	Compliant
EDGE	Single Carrier	39.15	39.21	39.23	Compliant
	Two Carrier	39.14	39.18	39.15	Compliant
	Three Carrier	39.12	39.15	39.12	Compliant
	Four Carrier	39.04	39.13	39.08	Compliant
LTE 1.4MHz Bandwidth	Single Carrier	39.21	39.28	39.16	Compliant
LTE 3MHz Bandwidth	Single Carrier	39.16	39.24	39.13	Compliant
LTE 5MHz Bandwidth	Single Carrier	39.12	39.21	39.08	Compliant
LTE 10MHz Bandwidth	Single Carrier	39.16	39.20	39.10	Compliant

Uplink:

Test mode	Carrier Conf.	AGC threshold level （dB）			Result
		Low Ch.	Middle Ch.	High Ch.	
WCDMA	Single Carrier	7.56	7.71	7.54	Compliant
CDMA	Single Carrier	7.52	7.68	7.53	Compliant
	Two Carrier	7.48	7.65	7.52	Compliant
	Three Carrier	7.56	7.58	7.45	Compliant
	Four Carrier	7.47	7.55	7.42	Compliant
CDMA EV-DO	Single Carrier	7.47	7.55	7.56	Compliant
	Two Carrier	7.46	7.52	7.50	Compliant
	Three Carrier	7.42	7.45	7.45	Compliant
	Four Carrier	7.40	7.41	7.43	Compliant
GSM	Single Carrier	7.53	7.66	7.58	Compliant
	Two Carrier	7.50	5.60	7.52	Compliant
	Three Carrier	7.47	7.56	7.49	Compliant
	Four Carrier	7.43	7.52	7.47	Compliant
EDGE	Single Carrier	7.57	7.66	7.64	Compliant
	Two Carrier	7.53	7.62	7.60	Compliant
	Three Carrier	7.50	7.59	7.58	Compliant
	Four Carrier	7.48	7.54	7.56	Compliant
LTE 1.4MHz Bandwidth	Single Carrier	7.45	7.58	7.53	Compliant
LTE 3MHz Bandwidth	Single Carrier	7.46	7.55	7.51	Compliant
LTE 5MHz Bandwidth	Single Carrier	7.42	7.53	7.47	Compliant
LTE 10MHz Bandwidth	Single Carrier	7.43	7.50	7.48	Compliant

9 PASSBAND GAIN AND 99% OCCUPIED BANDWIDTH

9.1 Standard Applicable

According to FCC § 2.1049 and § 22.917

9.2 Test setup

Please refer the section §6.2 Configuration of Tested System.

9.3 Test Procedure

1. The EUT RF output port was connected to spectrum analyzer.
2. The level of RF input signal shall be increased, until the maximum output power per channel, declared by client, is reached.
3. The spectrum analyzer was setup to measure the Occupied Bandwidth (defined as the 99% Power Bandwidth).
4. The Occupied Bandwidth was measured at the input and output ports of the EUT at low, middle and high channel of each type of modulation and each type of carrier signal.

Spectrum analyzer settings:

Detector: RMS.

WCDMA: RBW= 100 kHz VBW≥RBW Sweep: Auto

CDMA/ CDMA EV-DO: RBW= 30 kHz VBW=100kHz Sweep: Auto

GSM/EDGE: RBW= 1 kHz VBW=3kHz Sweep: Auto

9.4 Test Result

Pass band Gain

Downlink:

Test mode	Carrier Conf.	Channel	Pass band Gain (dB)	Nominal Gain (dB)	Result
WCDMA	Single Carrier	Low	54.24	54±0.5	Compliant
		Middle	54.38		Compliant
		High	54.26		Compliant
CDMA	Single Carrier	Low	54.21		Compliant
		Middle	54.33		Compliant
		High	54.24		Compliant
	Two Carrier	Low	54.18		Compliant
		Middle	54.35		Compliant
		High	54.24		Compliant
	Three Carrier	Low	54.16		Compliant
		Middle	54.28		Compliant
		High	54.19		Compliant
	Four Carrier	Low	54.20		Compliant
		Middle	54.27		Compliant
		High	54.14		Compliant
CDMA EV-DO	Single Carrier	Low	54.14		Compliant
		Middle	54.23		Compliant
		High	54.26		Compliant
	Two Carrier	Low	54.13		Compliant
		Middle	54.19		Compliant
		High	54.22		Compliant
	Three Carrier	Low	54.12		Compliant
		Middle	54.21		Compliant
		High	54.10		Compliant
	Four Carrier	Low	54.08		Compliant
		Middle	54.15		Compliant
		High	54.09		Compliant

Test mode	Carrier Conf.	Channel	Pass band Gain (dB)	Nominal Gain (dB)	Result
GSM	Single Carrier	Low	54.24	54±0.5	Compliant
		Middle	54.33		Compliant
		High	54.25		Compliant
	Two Carrier	Low	54.17		Compliant
		Middle	54.30		Compliant
		High	54.23		Compliant
	Three Carrier	Low	54.19		Compliant
		Middle	54.28		Compliant
		High	54.26		Compliant
	Four Carrier	Low	54.24		Compliant
		Middle	54.29		Compliant
		High	54.18		Compliant
EDGE	Single Carrier	Low	54.21		Compliant
		Middle	54.26		Compliant
		High	54.22		Compliant
	Two Carrier	Low	54.20		Compliant
		Middle	54.28		Compliant
		High	54.17		Compliant
	Three Carrier	Low	54.16		Compliant
		Middle	54.24		Compliant
		High	54.19		Compliant
	Four Carrier	Low	54.15		Compliant
		Middle	54.28		Compliant
		High	54.13		Compliant
LTE 1.4MHz Bandwidth	Single Carrier	Low	54.19		Compliant
		Middle	54.27		Compliant
		High	54.13		Compliant
LTE 3MHz Bandwidth	Single Carrier	Low	54.16		Compliant
		Middle	54.24		Compliant
		High	54.17		Compliant
LTE 5MHz Bandwidth	Single Carrier	Low	54.13		Compliant
		Middle	54.22		Compliant
		High	54.11		Compliant
LTE 10MHz Bandwidth	Single Carrier	Low	54.19		Compliant
		Middle	54.24		Compliant
		High	54.16		Compliant

Uplink:

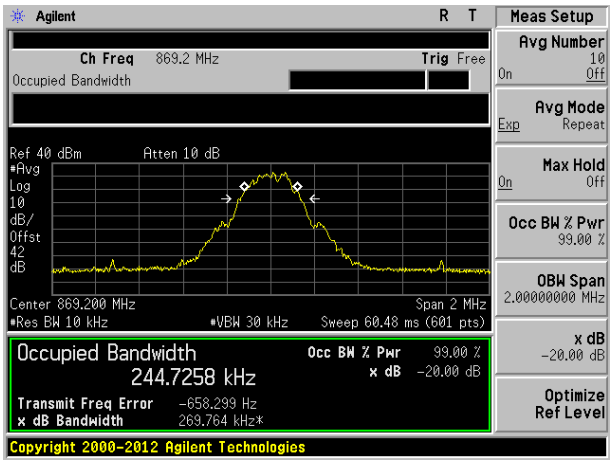
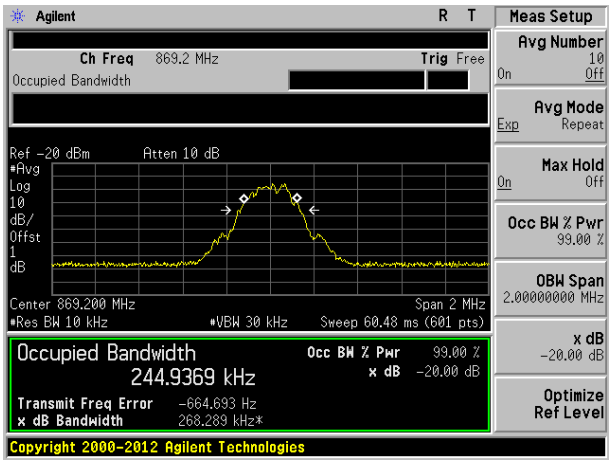
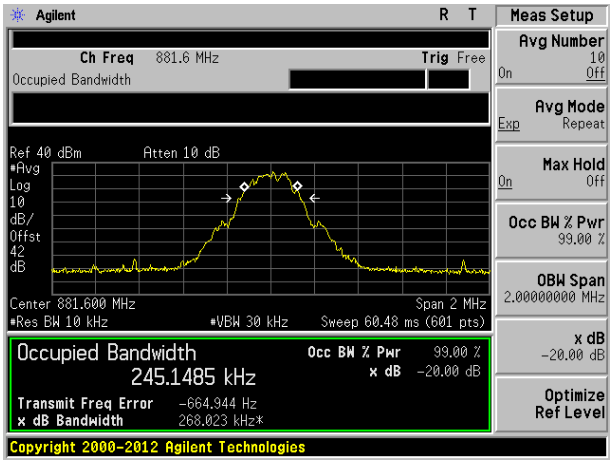
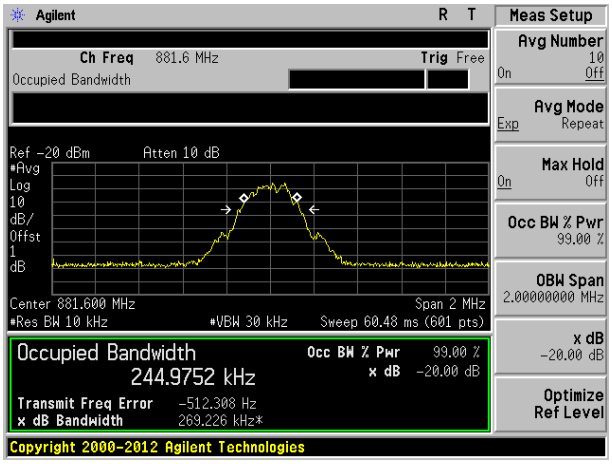
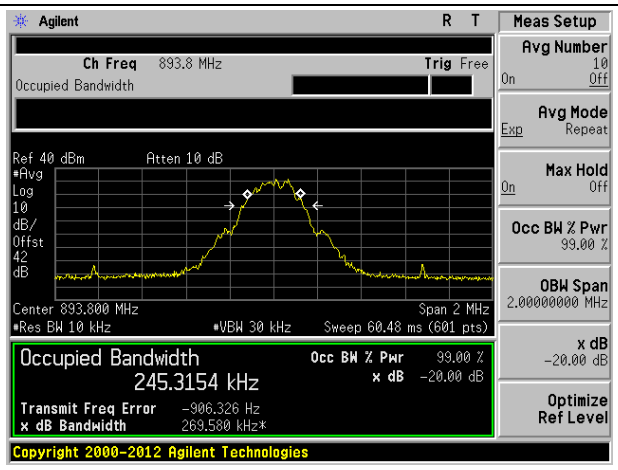
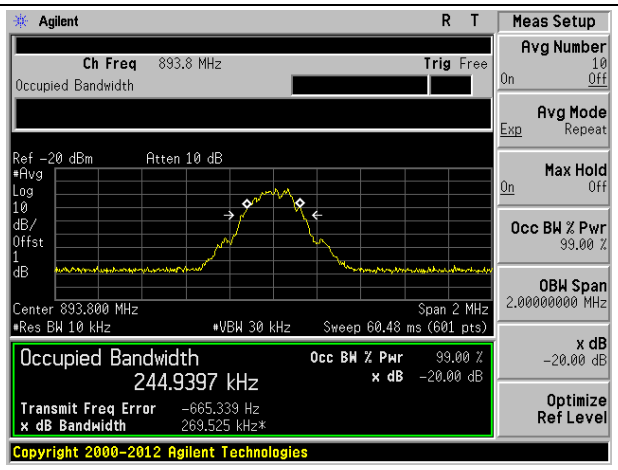
Test mode	Carrier Conf.	Channel	Pass band Gain (dB)	Nominal Gain (dB)	Result
WCDMA	Single Carrier	Low	62.34	62±0.5	Compliant
		Middle	62.42		Compliant
		High	62.33		Compliant
CDMA	Single Carrier	Low	62.27		Compliant
		Middle	62.38		Compliant
		High	62.29		Compliant
	Two Carrier	Low	62.27		Compliant
		Middle	62.39		Compliant
		High	62.32		Compliant
	Three Carrier	Low	62.25		Compliant
		Middle	62.37		Compliant
		High	62.26		Compliant
	Four Carrier	Low	62.30		Compliant
		Middle	62.37		Compliant
		High	62.29		Compliant
CDMA EV-DO	Single Carrier	Low	62.24		Compliant
		Middle	62.38		Compliant
		High	62.21		Compliant
	Two Carrier	Low	62.18		Compliant
		Middle	62.35		Compliant
		High	62.19		Compliant
	Three Carrier	Low	62.14		Compliant
		Middle	62.28		Compliant
		High	62.19		Compliant
	Four Carrier	Low	62.18		Compliant
		Middle	62.24		Compliant
		High	62.15		Compliant

Test mode	Carrier Conf.	Channel	Pass band Gain (dB)	Nominal Gain (dB)	Result
GSM	Single Carrier	Low	62.16	62±0.5	Compliant
		Middle	62.35		Compliant
		High	62.32		Compliant
	Two Carrier	Low	62.24		Compliant
		Middle	62.37		Compliant
		High	62.18		Compliant
	Three Carrier	Low	62.29		Compliant
		Middle	62.37		Compliant
		High	62.18		Compliant
	Four Carrier	Low	62.17		Compliant
		Middle	62.29		Compliant
		High	62.28		Compliant
EDGE	Single Carrier	Low	62.15		Compliant
		Middle	62.24		Compliant
		High	62.19		Compliant
	Two Carrier	Low	62.14		Compliant
		Middle	62.33		Compliant
		High	62.21		Compliant
	Three Carrier	Low	62.15		Compliant
		Middle	62.29		Compliant
		High	62.16		Compliant
	Four Carrier	Low	62.16		Compliant
		Middle	62.28		Compliant
		High	62.13		Compliant
LTE 1.4MHz Bandwidth	Single Carrier	Low	62.11		Compliant
		Middle	62.25		Compliant
		High	62.18		Compliant
LTE 3MHz Bandwidth	Single Carrier	Low	62.13		Compliant
		Middle	62.24		Compliant
		High	62.09		Compliant
LTE 5MHz Bandwidth	Single Carrier	Low	62.24		Compliant
		Middle	62.30		Compliant
		High	62.27		Compliant
LTE 10MHz Bandwidth	Single Carrier	Low	62.26		Compliant
		Middle	62.33		Compliant
		High	62.21		Compliant

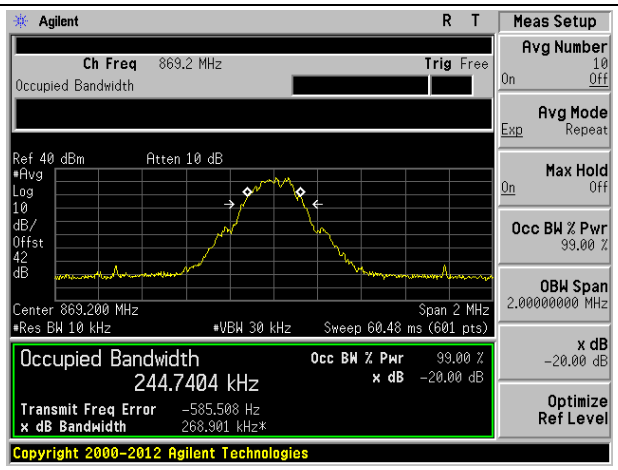
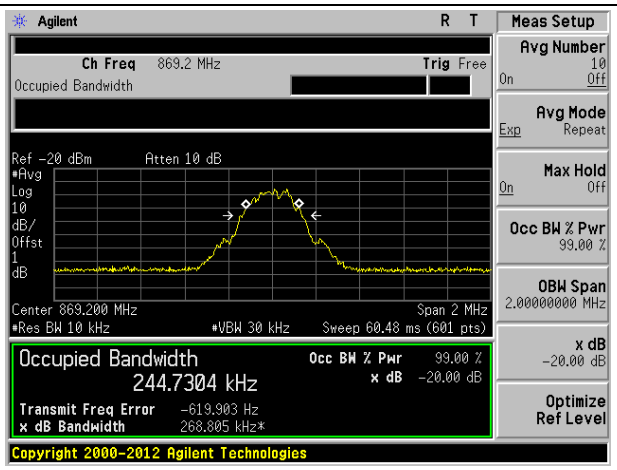
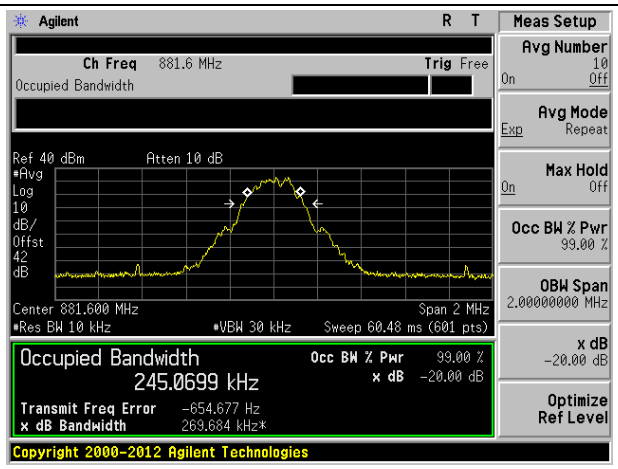
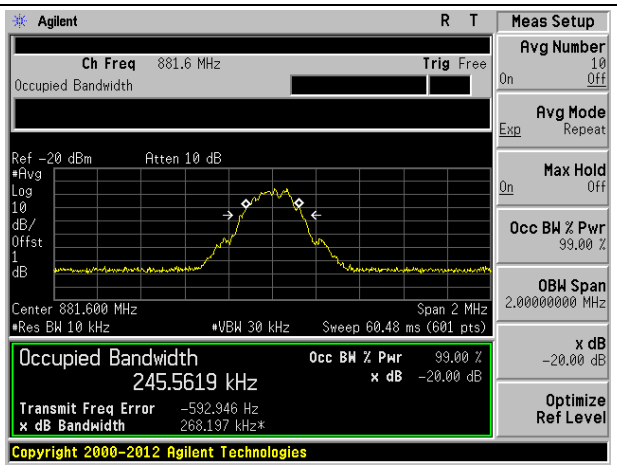
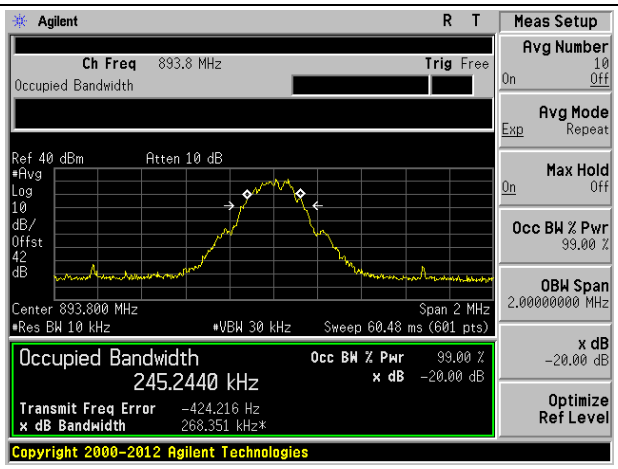
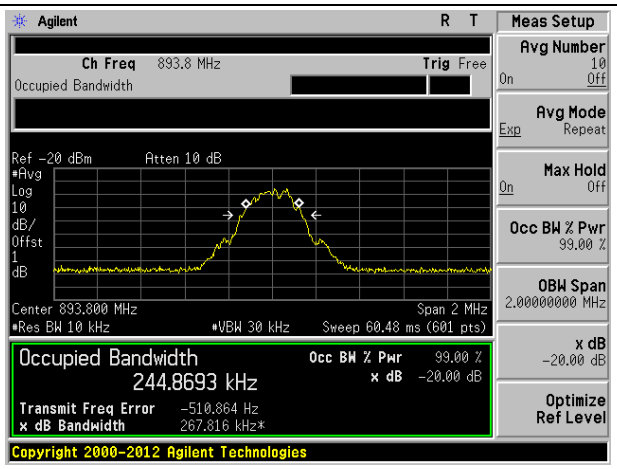
Input/output Bandwidth Comparison

Downlink:

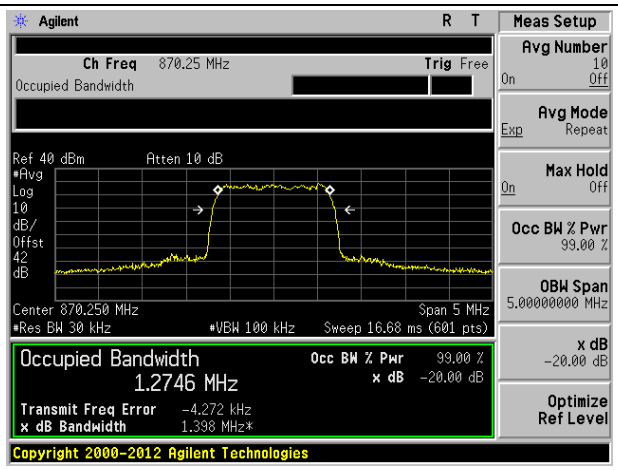
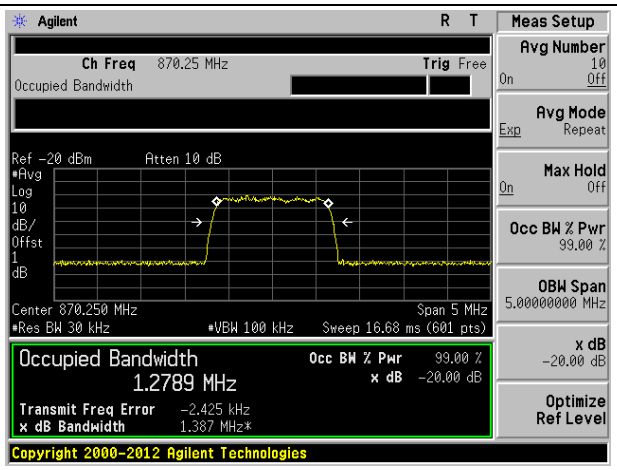
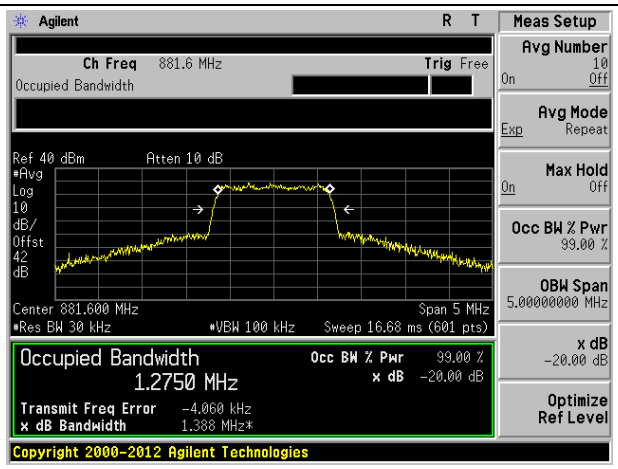
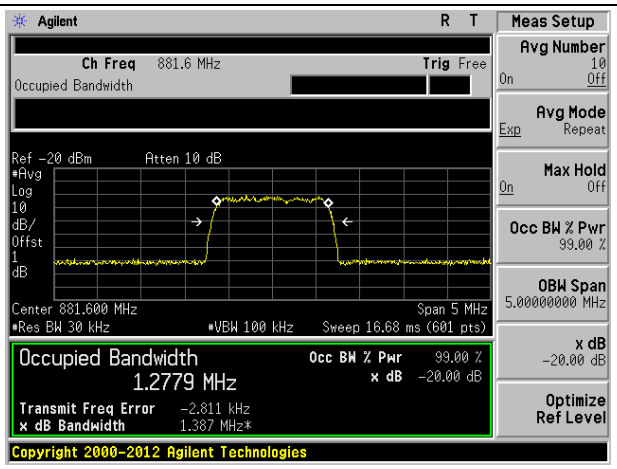
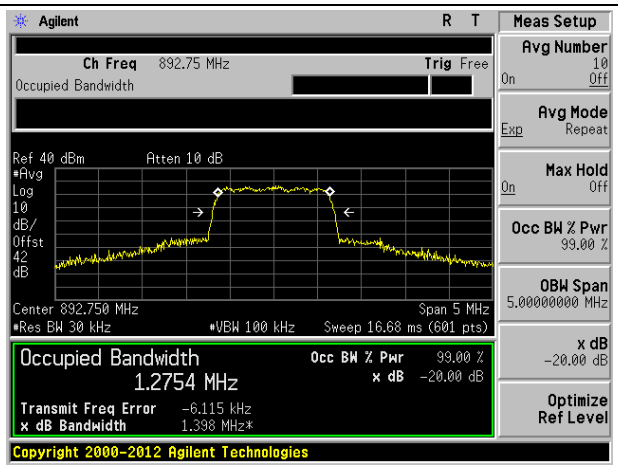
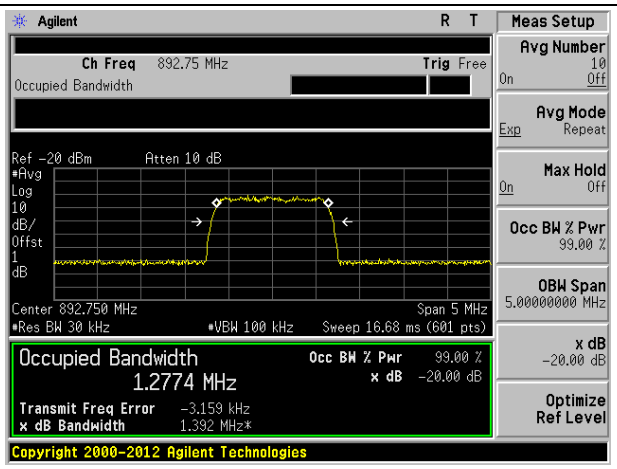
Input/output Bandwidth Comparison for GSM

Output(Lowest channel)	Input(Lowest channel)
	
Output(Middle channel)	Input(Middle channel)
	
Output(Highest channel)	Input(Highest channel)
	

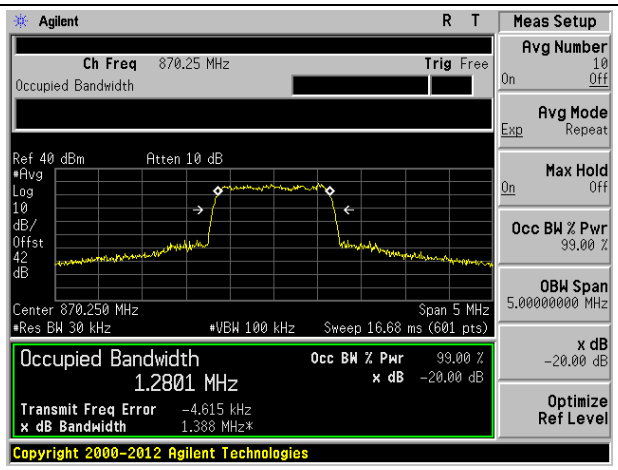
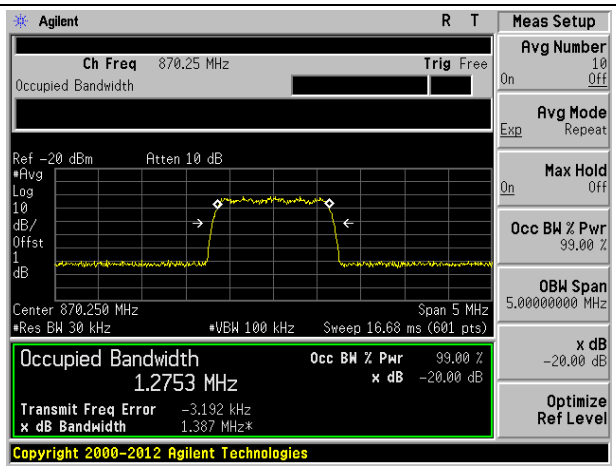
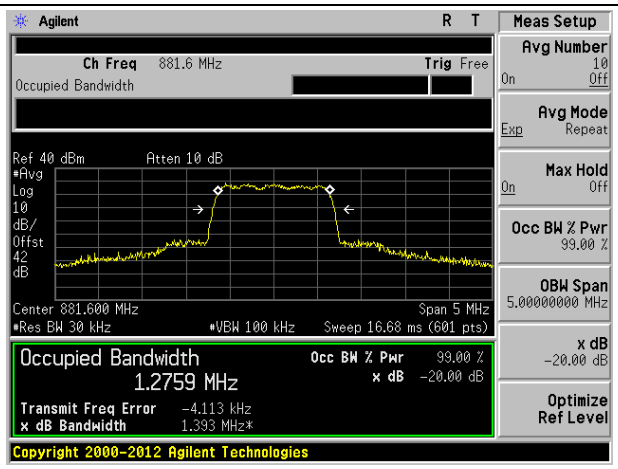
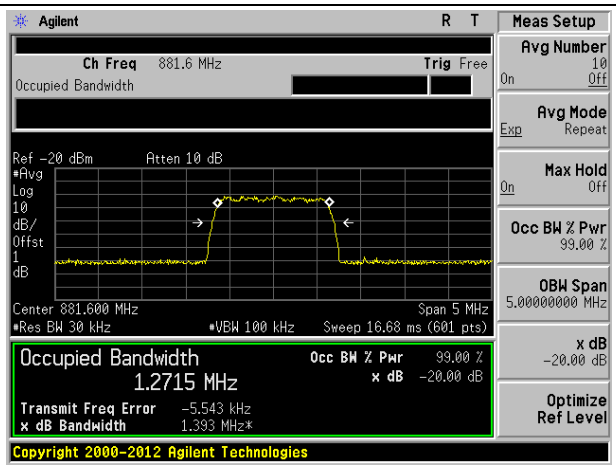
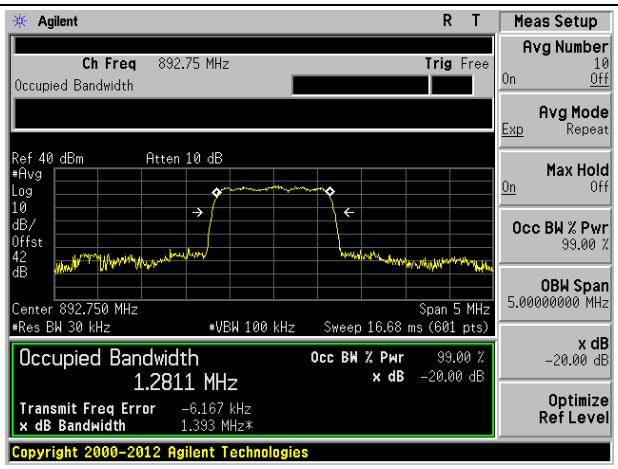
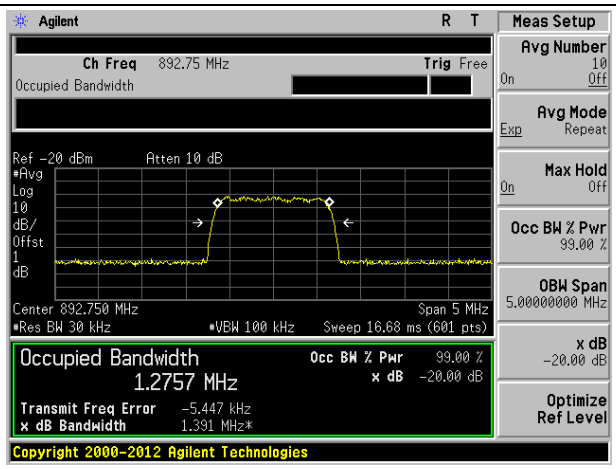
Input/output Bandwidth Comparison for EDGE

Output(Lowest channel)	Input(Lowest channel)
	
Output(Middle channel)	Input(Middle channel)
	
Output(Highest channel)	Input(Highest channel)
	

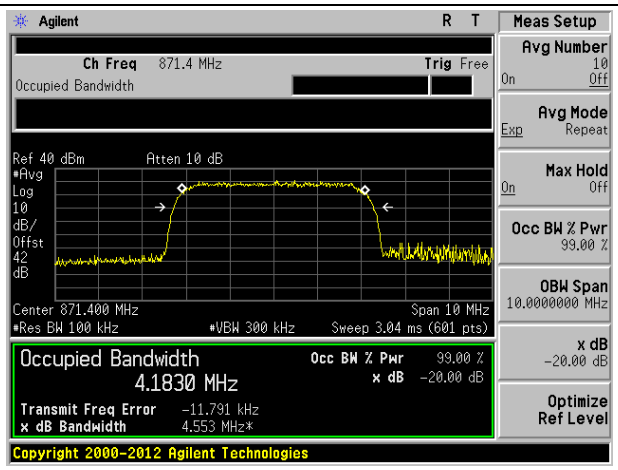
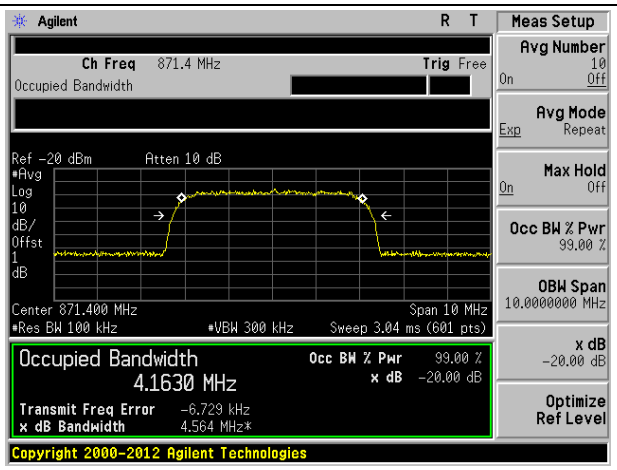
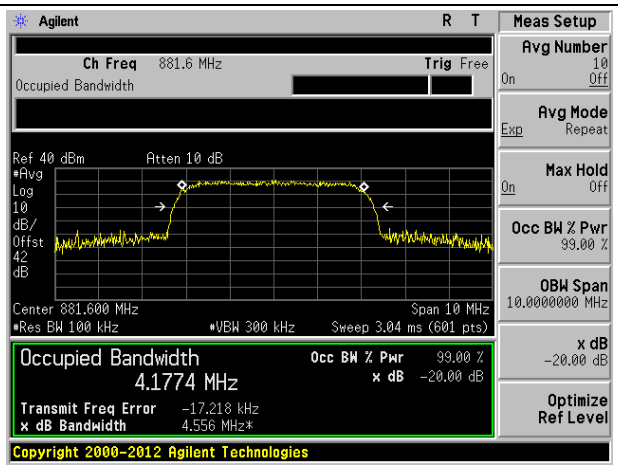
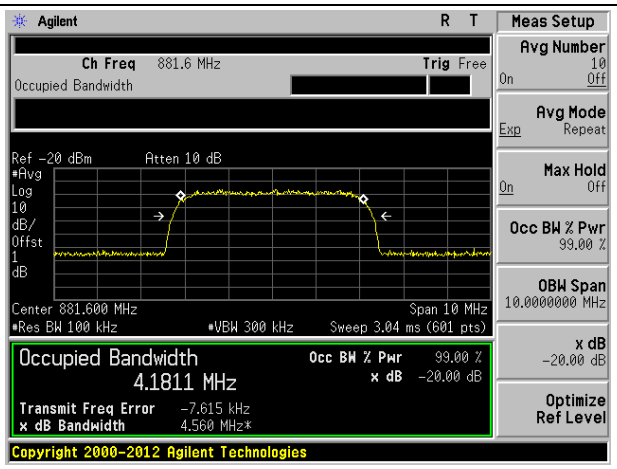
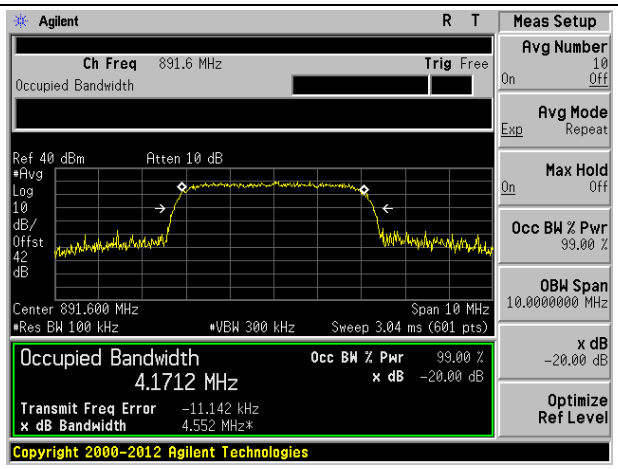
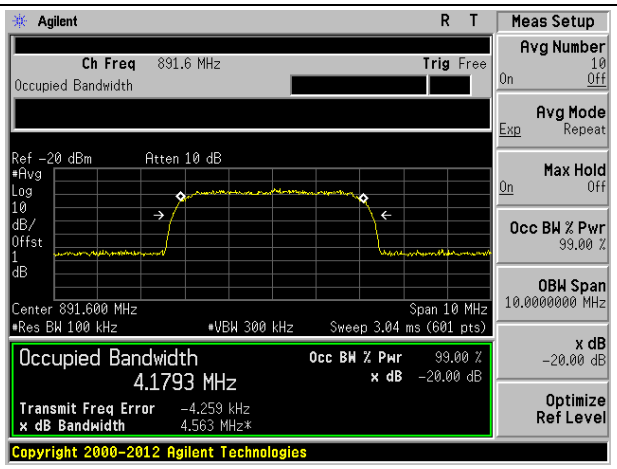
Input/output Bandwidth Comparison for CDMA

Output(Lowest channel)	Input(Lowest channel)
	
Output(Middle channel)	**Input(Middle channel)**
	
Output(Highest channel)	**Input(Highest channel)**
	

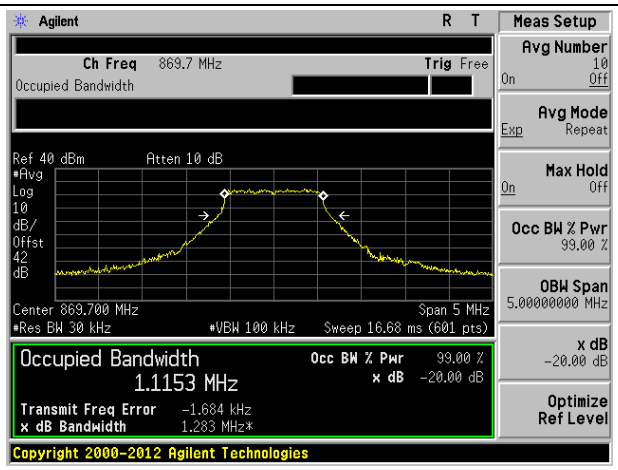
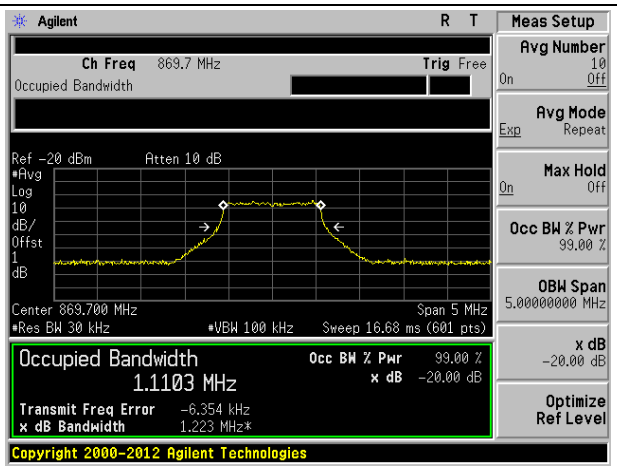
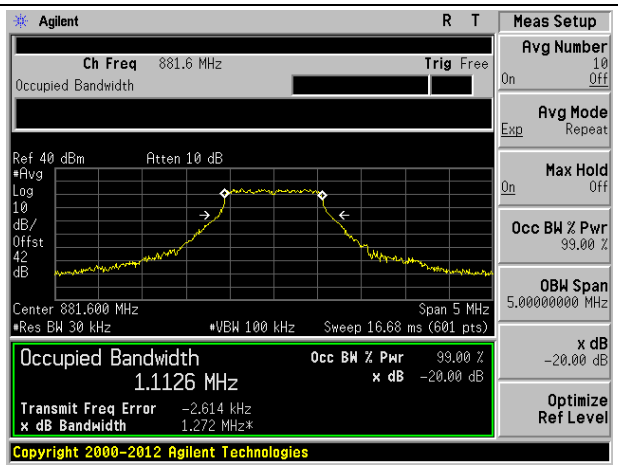
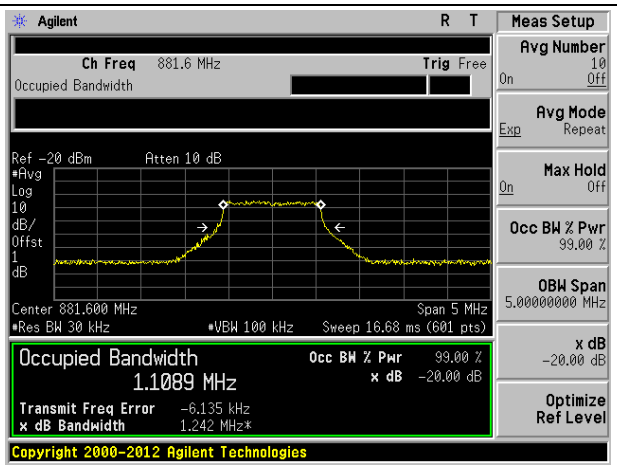
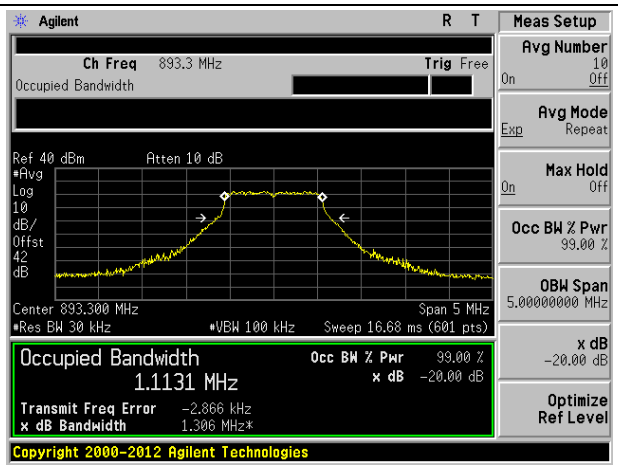
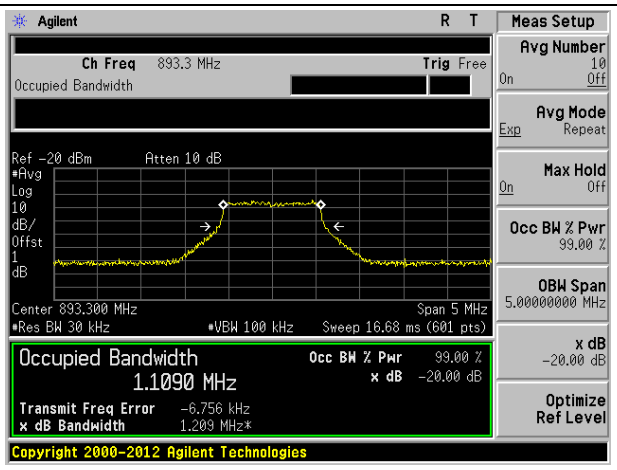
Input/output Bandwidth Comparison for CDMA-EVDO

Output(Lowest channel)	Input(Lowest channel)
	
Output(Middle channel)	**Input(Middle channel)**
	
Output(Highest channel)	**Input(Highest channel)**
	

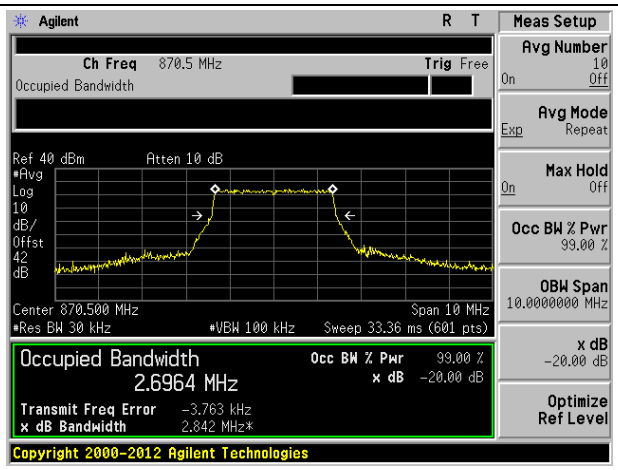
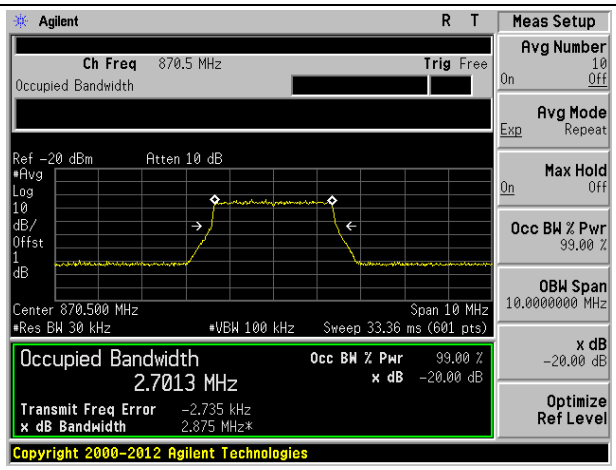
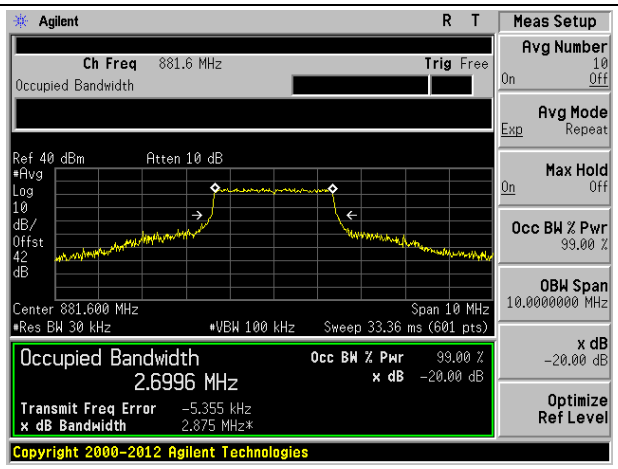
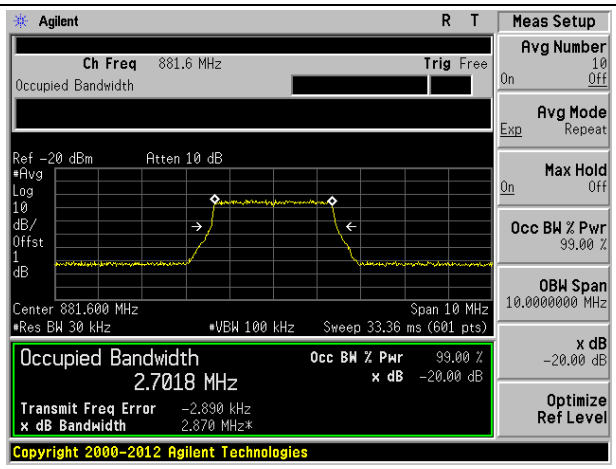
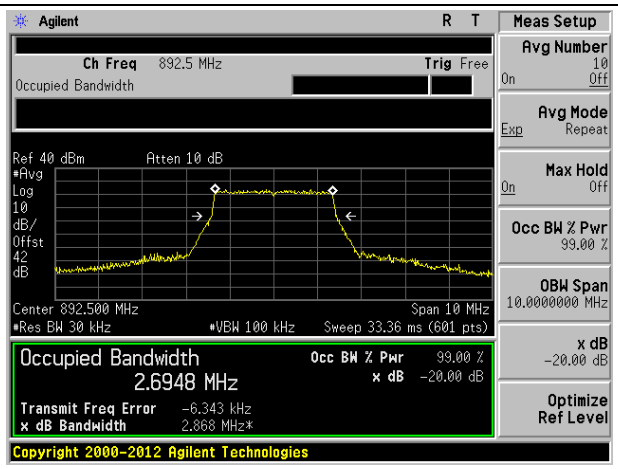
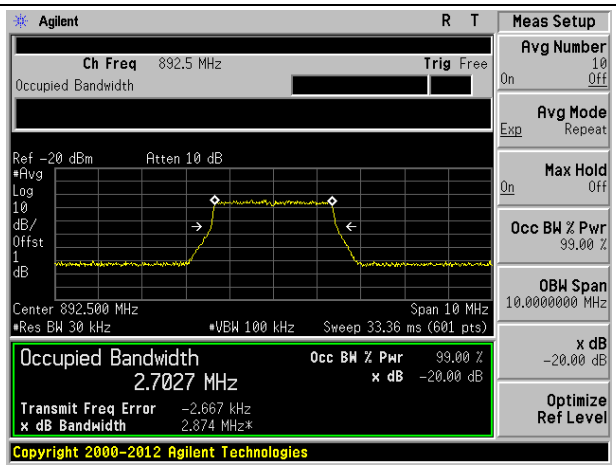
Input/output Bandwidth Comparison for WCDMA

Output(Lowest channel)	Input(Lowest channel)
	
Output(Middle channel)	Input(Middle channel)
	
Output(Highest channel)	Input(Highest channel)
	

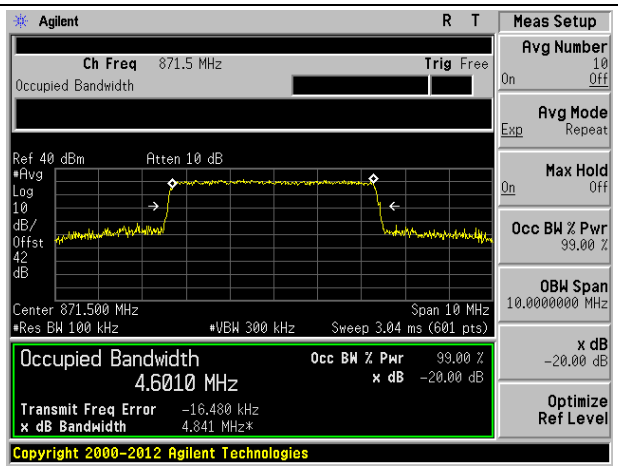
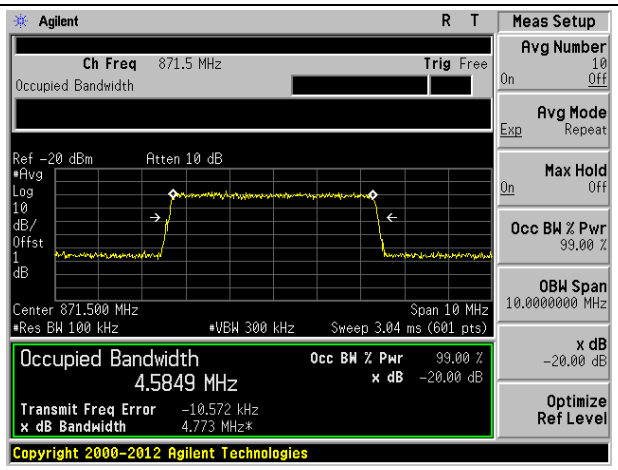
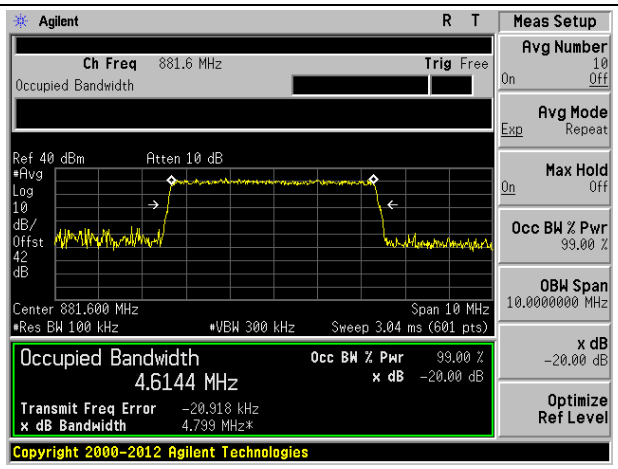
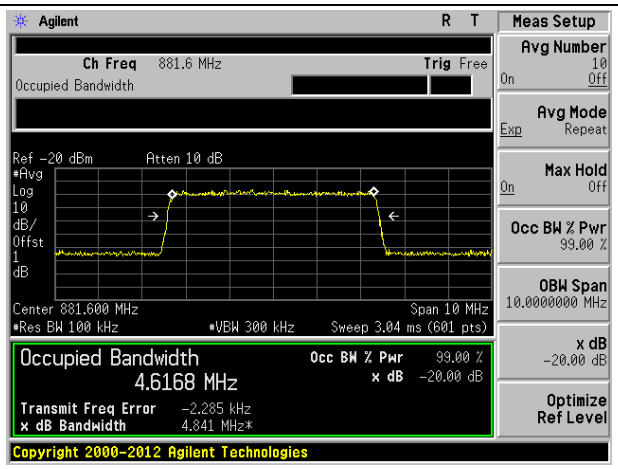
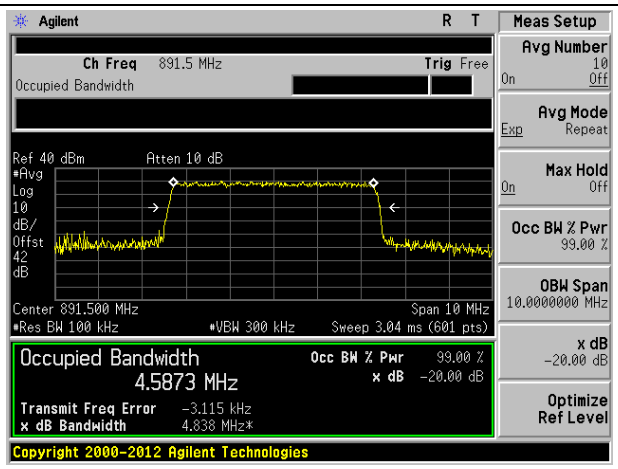
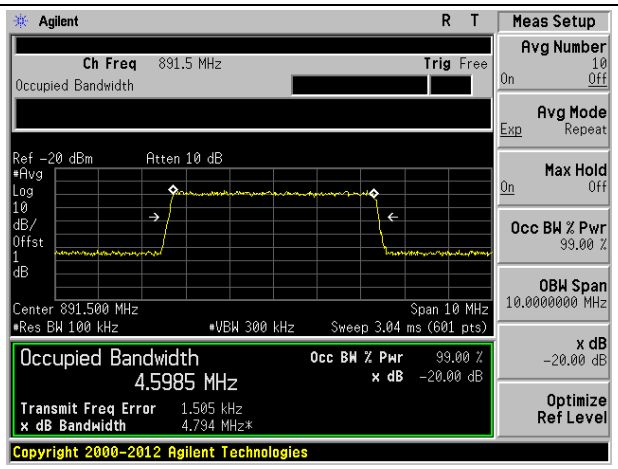
Input/output Bandwidth Comparison for LTE 1.4MHz

Output(Lowest channel)	Input(Lowest channel)
	
Output(Middle channel)	Input(Middle channel)
	
Output(Highest channel)	Input(Highest channel)
	

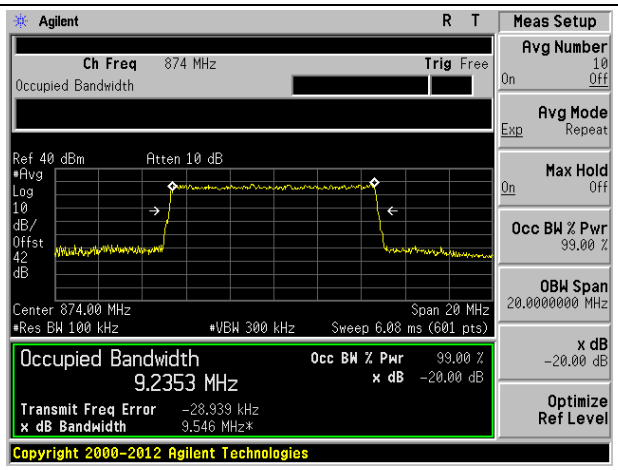
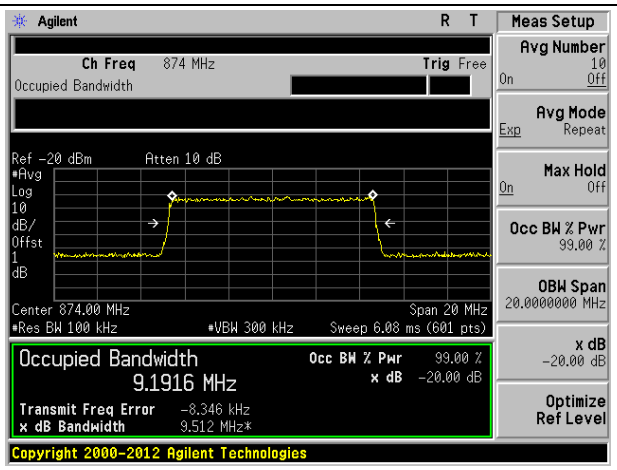
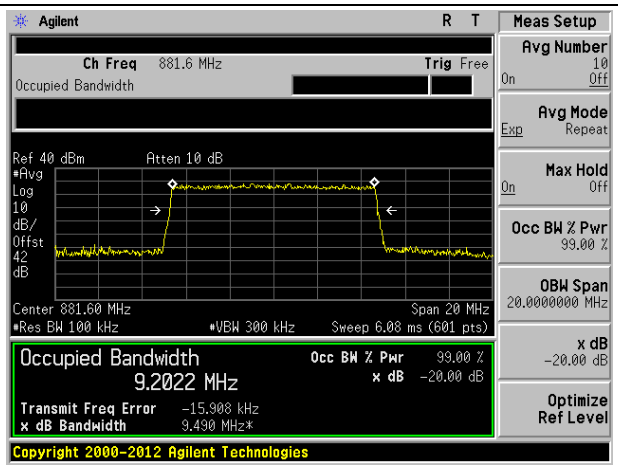
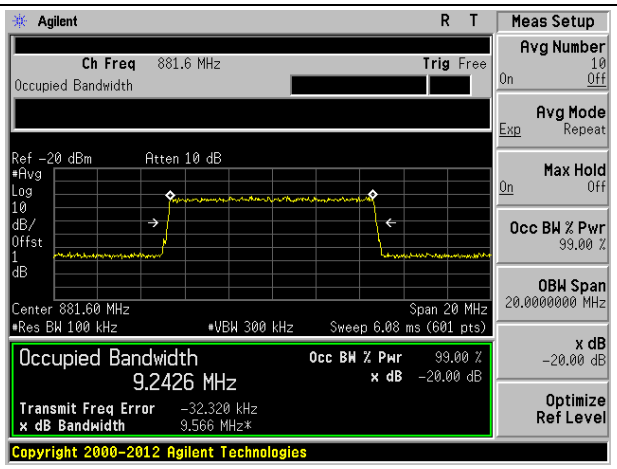
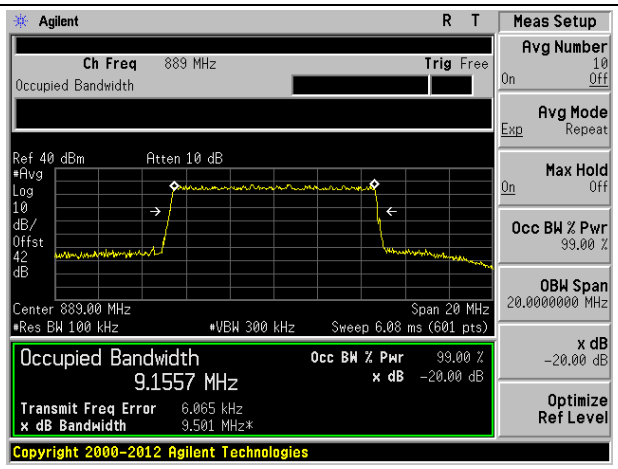
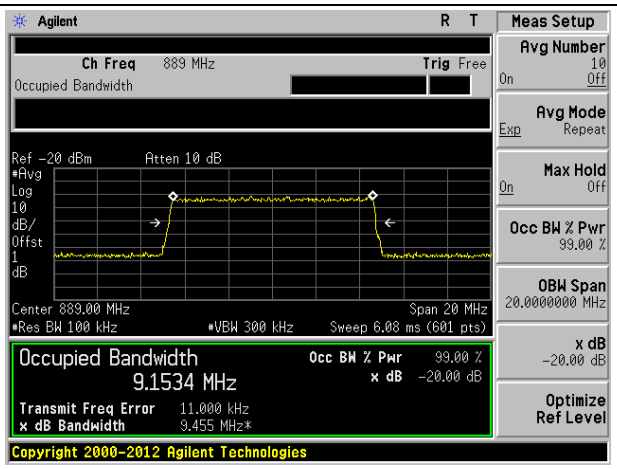
Input/output Bandwidth Comparison for LTE 3MHz

Output(Lowest channel)	Input(Lowest channel)
	
Output(Middle channel)	**Input(Middle channel)**
	
Output(Highest channel)	**Input(Highest channel)**
	

Input/output Bandwidth Comparison for LTE 5MHz

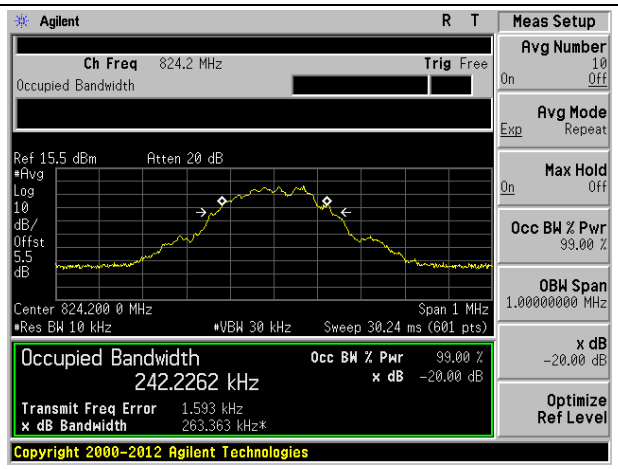
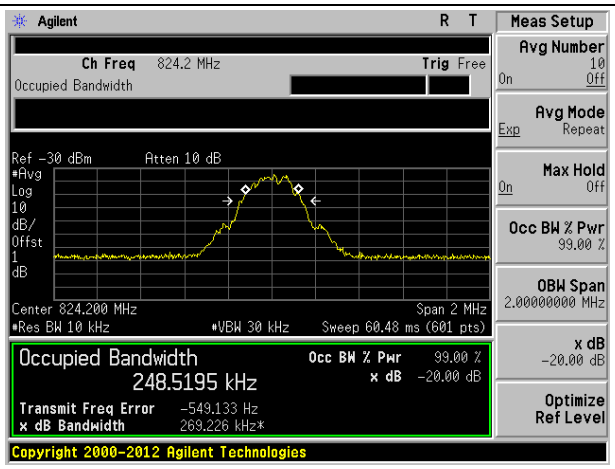
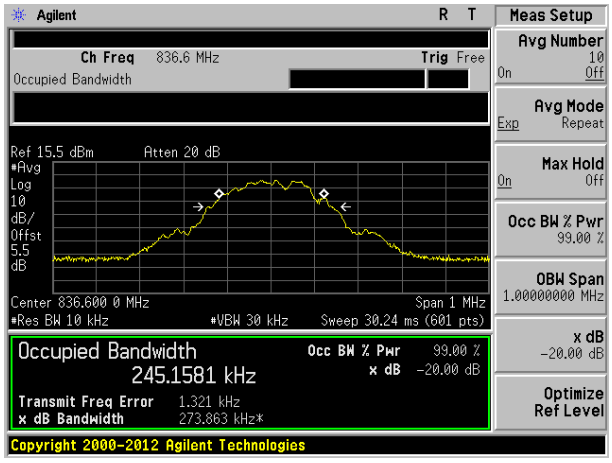
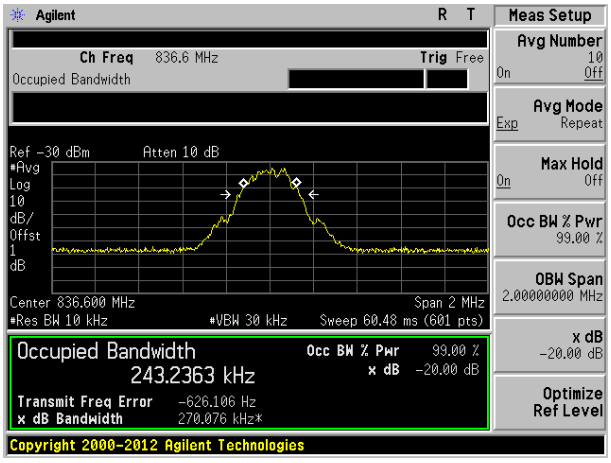
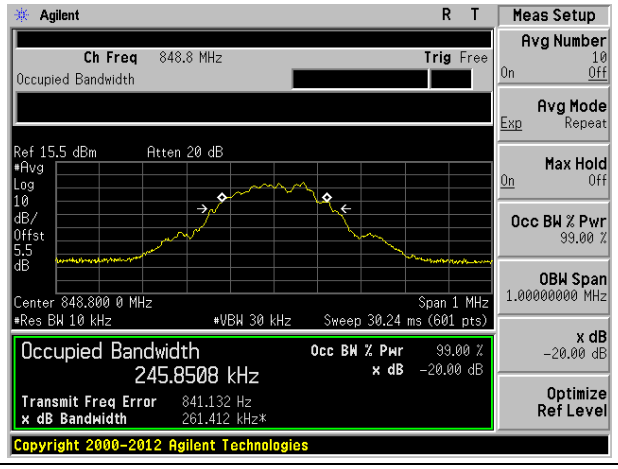
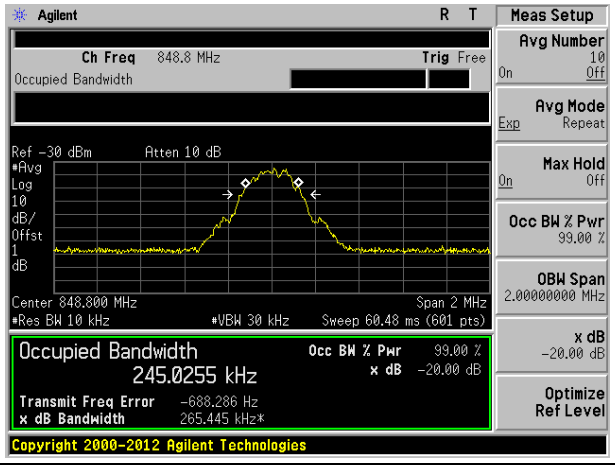
Output(Lowest channel)	Input(Lowest channel)
	
Output(Middle channel)	**Input(Middle channel)**
	
Output(Highest channel)	**Input(Highest channel)**
	

Input/output Bandwidth Comparison for LTE 10MHz

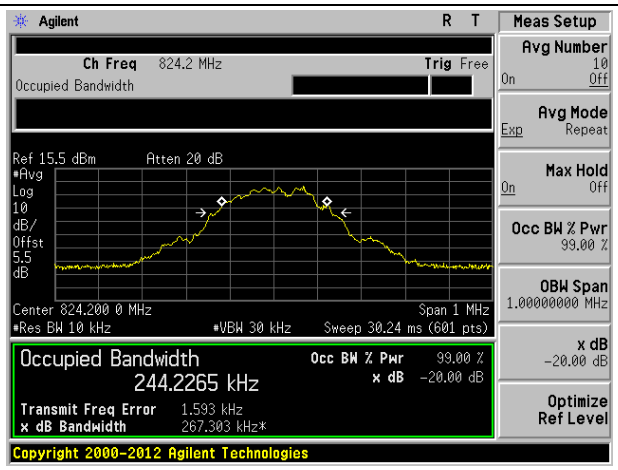
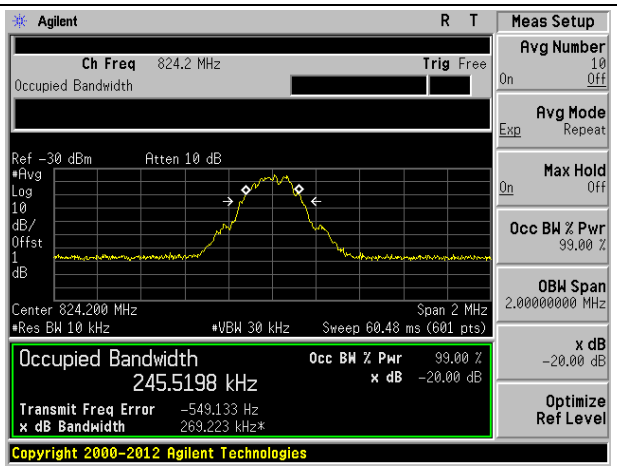
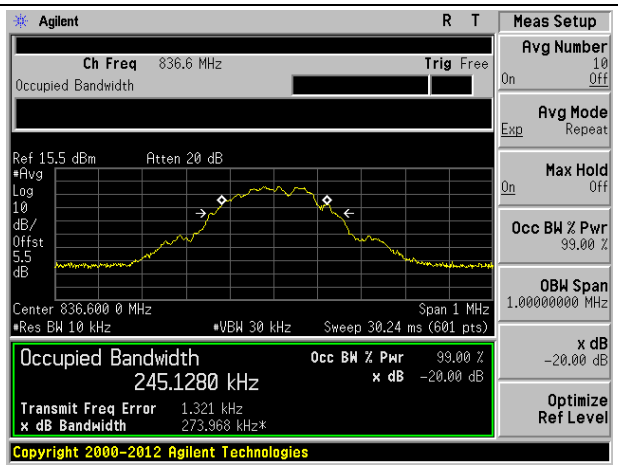
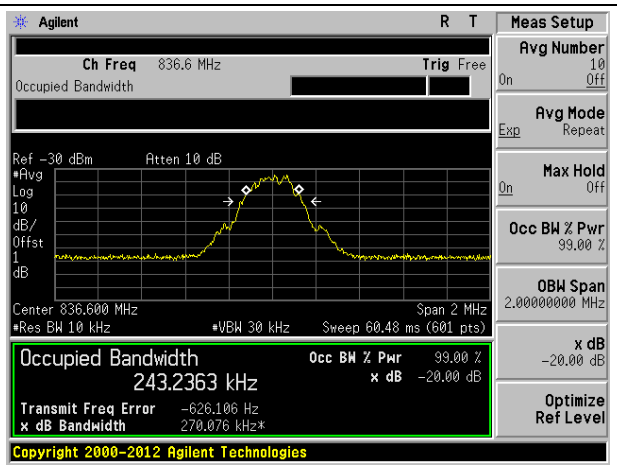
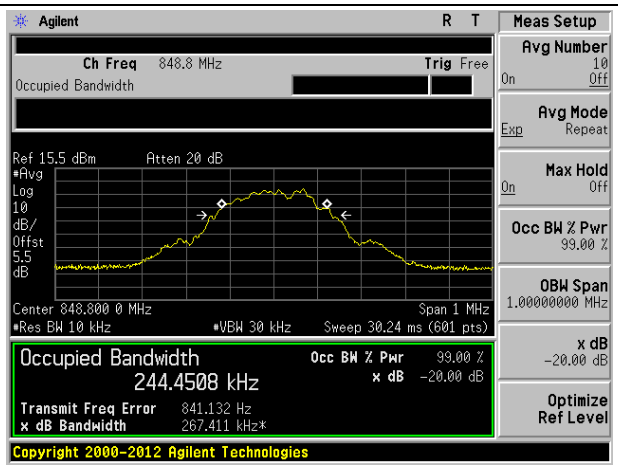
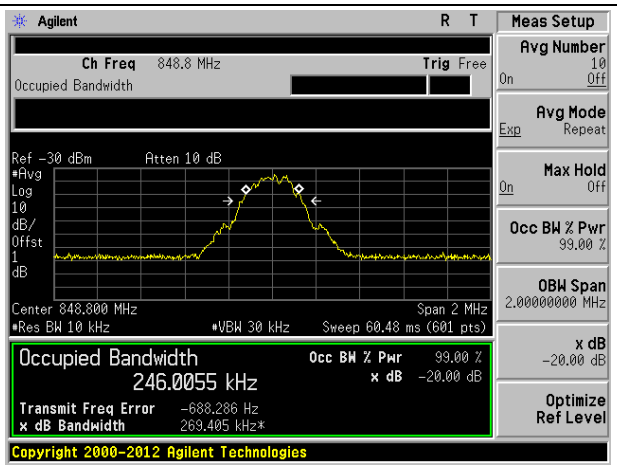
Output(Lowest channel)	Input(Lowest channel)
	
Output(Middle channel)	**Input(Middle channel)**
	
Output(Highest channel)	**Input(Highest channel)**
	

Uplink:

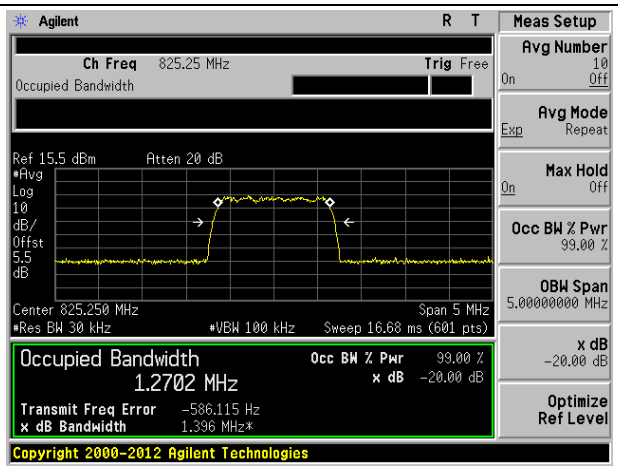
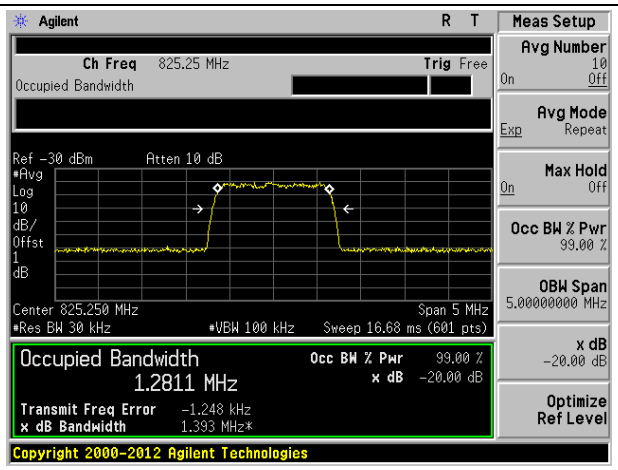
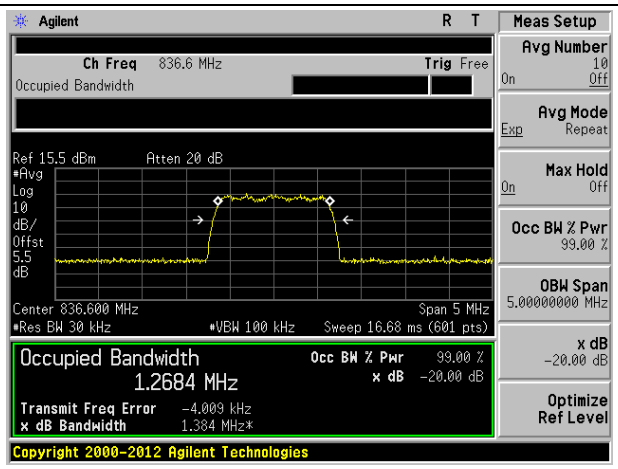
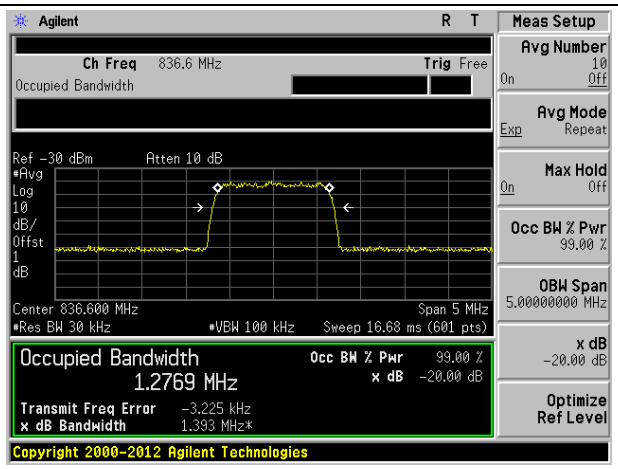
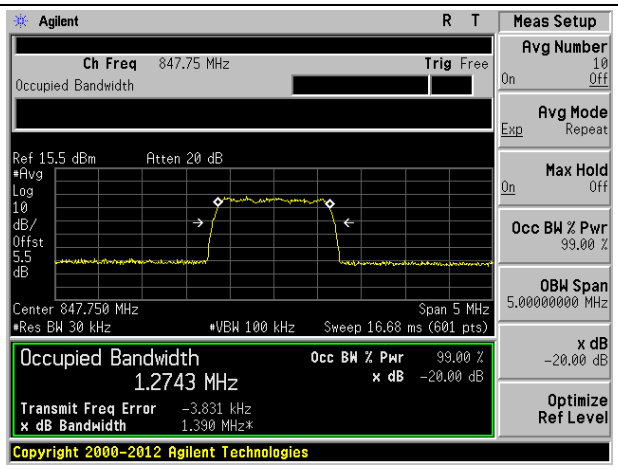
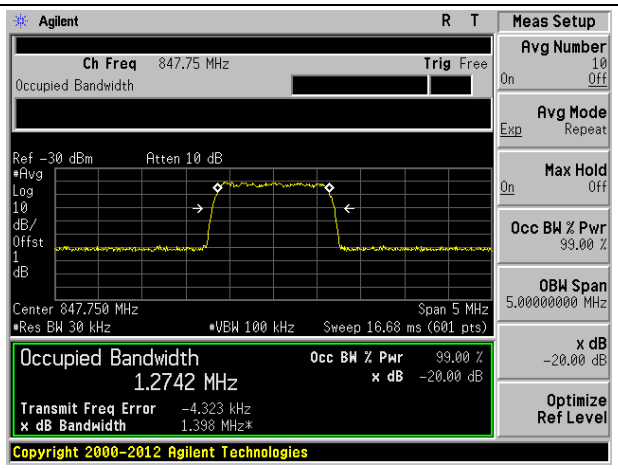
Input/output Bandwidth Comparison for GSM

Output(Lowest channel)	Input(Lowest channel)
	
Output(Middle channel)	Input(Middle channel)
	
Output(Highest channel)	Input(Highest channel)
	

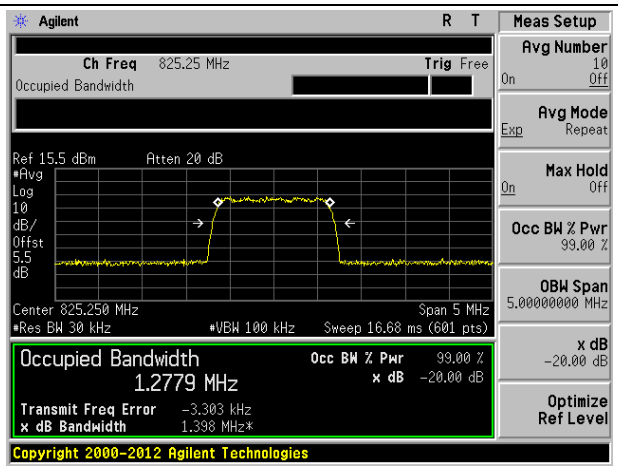
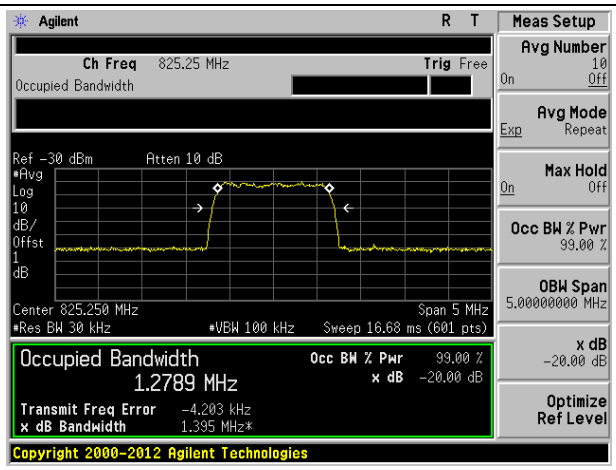
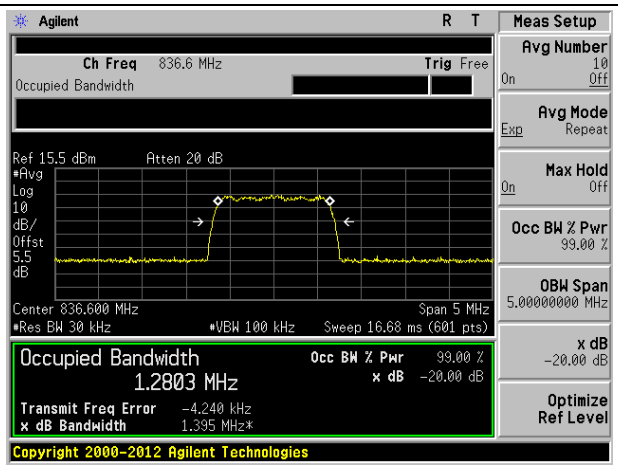
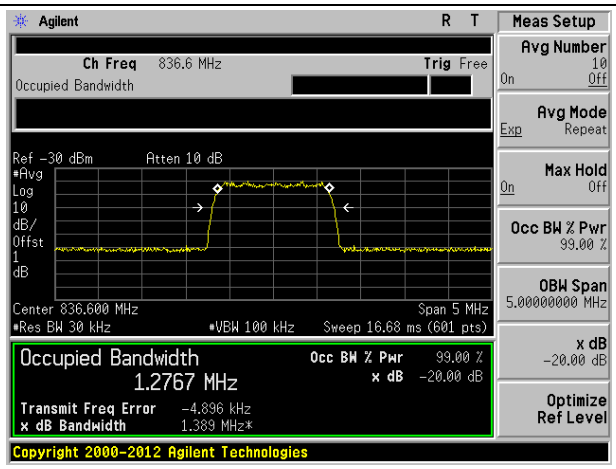
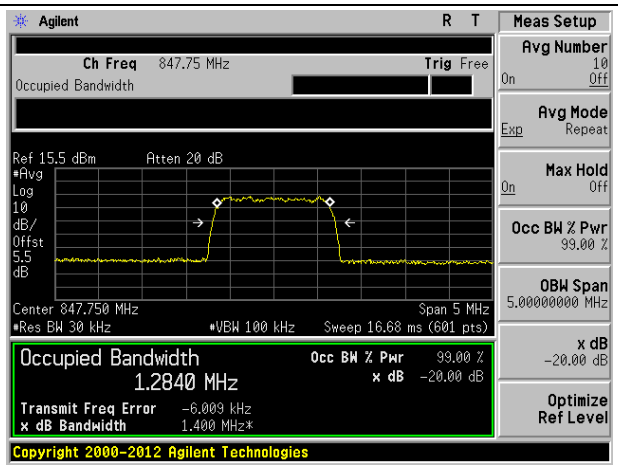
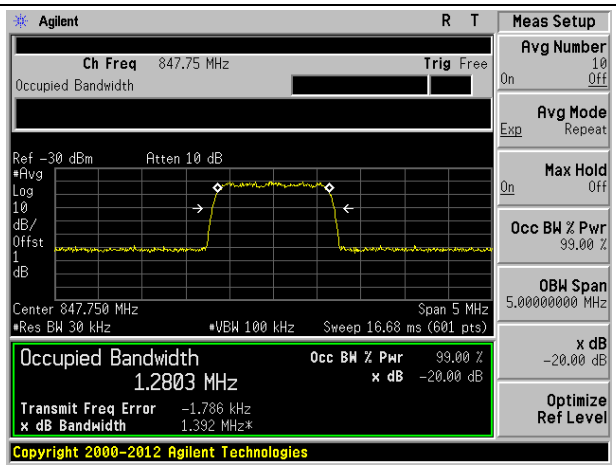
Input/output Bandwidth Comparison for EDGE

Output(Lowest channel)	Input(Lowest channel)
	
Output(Middle channel)	**Input(Middle channel)**
	
Output(Highest channel)	**Input(Highest channel)**
	

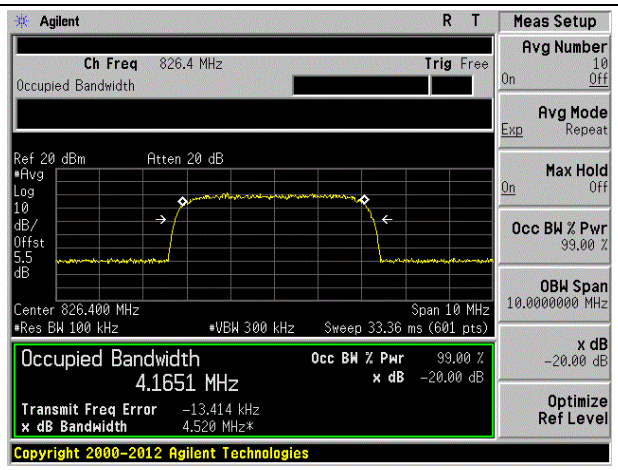
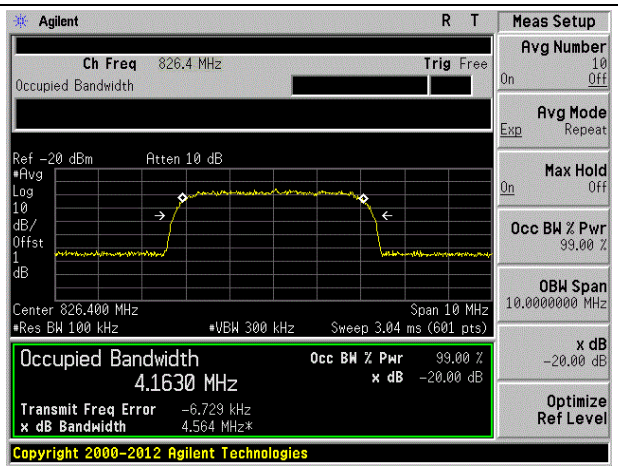
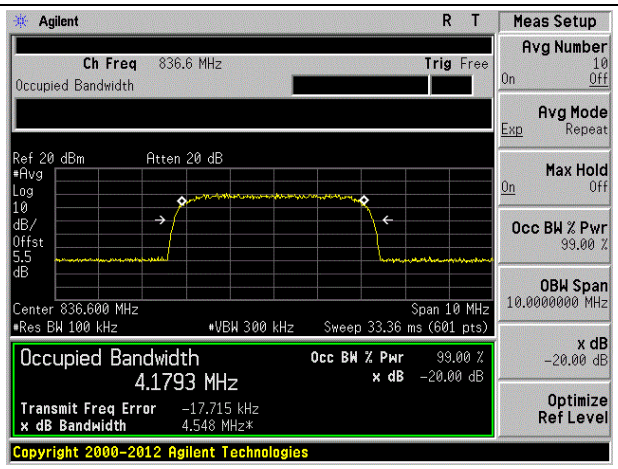
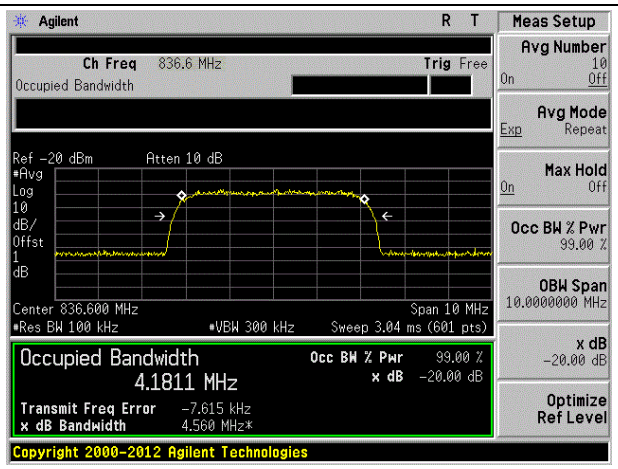
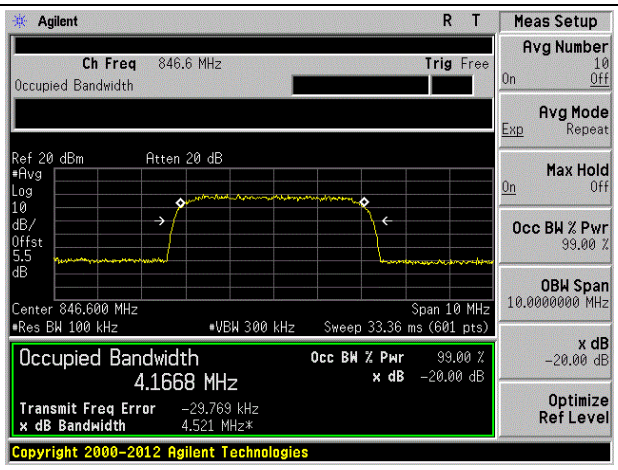
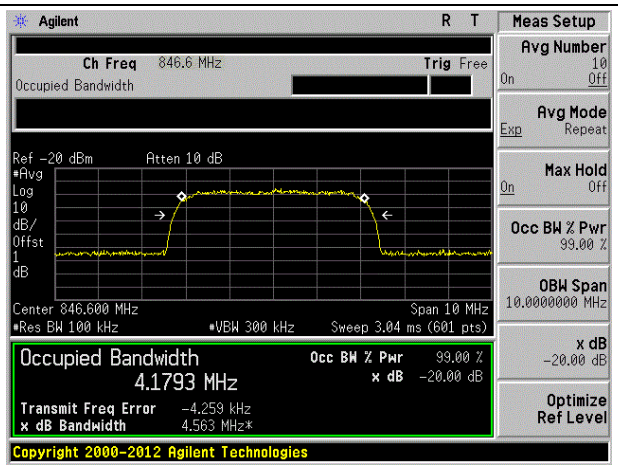
Input/output Bandwidth Comparison for CDMA

Output(Lowest channel)	Input(Lowest channel)
	
Output(Middle channel)	**Input(Middle channel)**
	
Output(Highest channel)	**Input(Highest channel)**
	

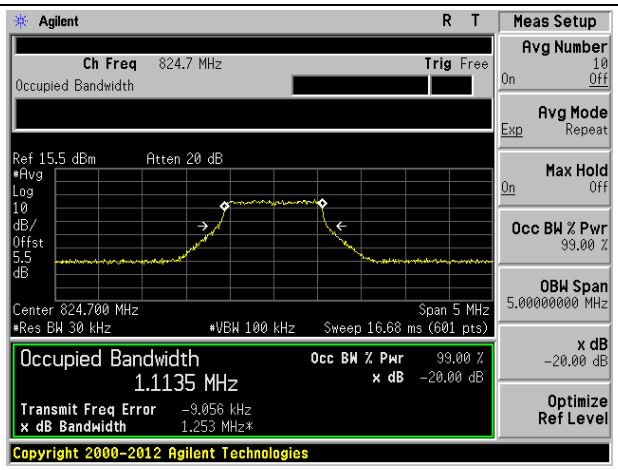
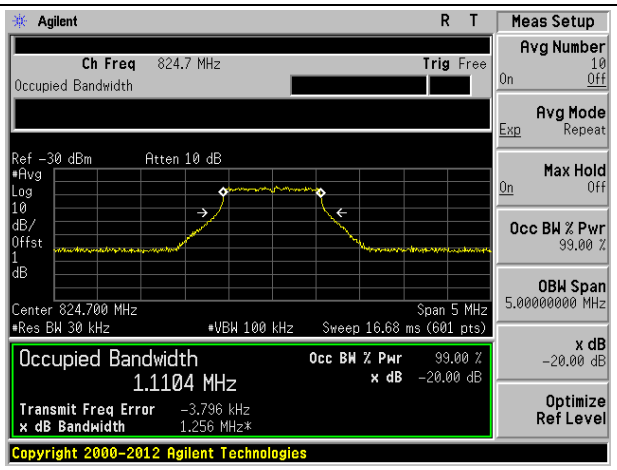
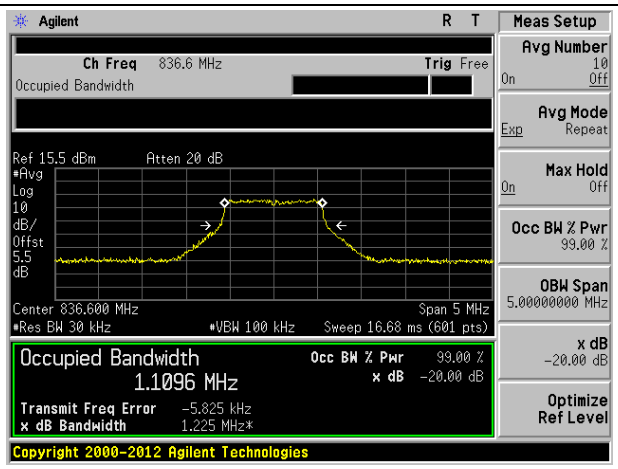
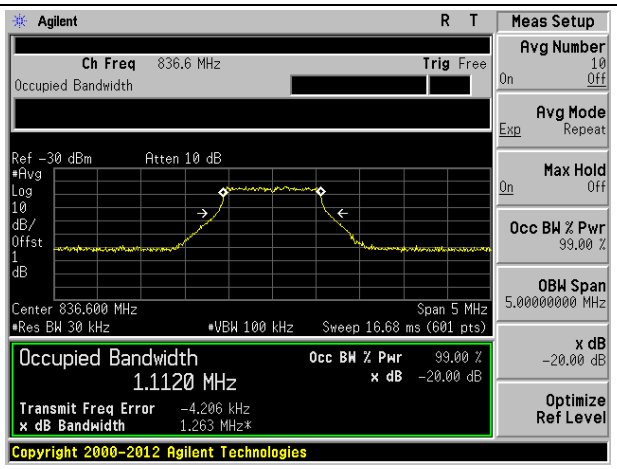
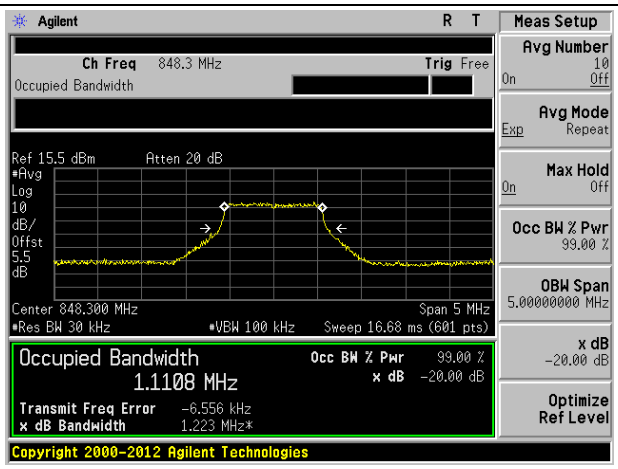
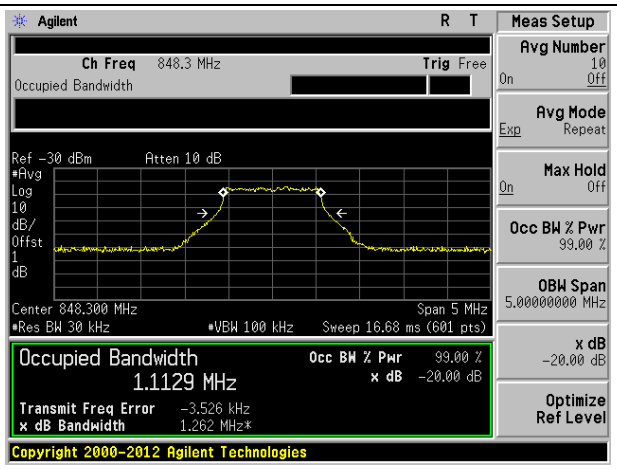
Input/output Bandwidth Comparison for CDMA-EVDO

Output(Lowest channel)	Input(Lowest channel)
	
Output(Middle channel)	**Input(Middle channel)**
	
Output(Highest channel)	**Input(Highest channel)**
	

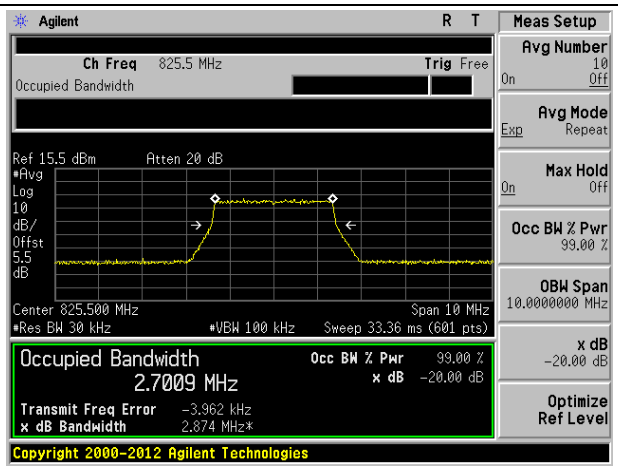
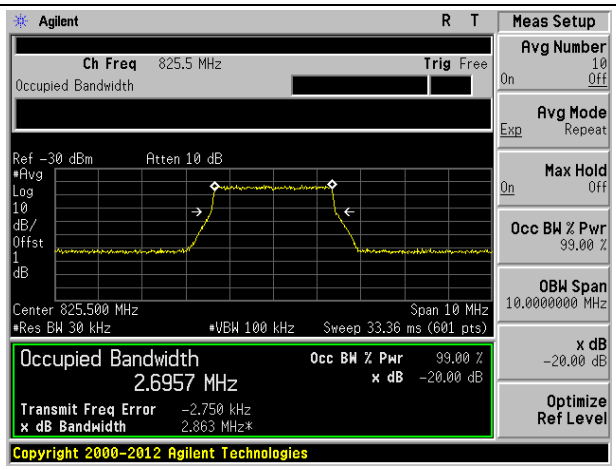
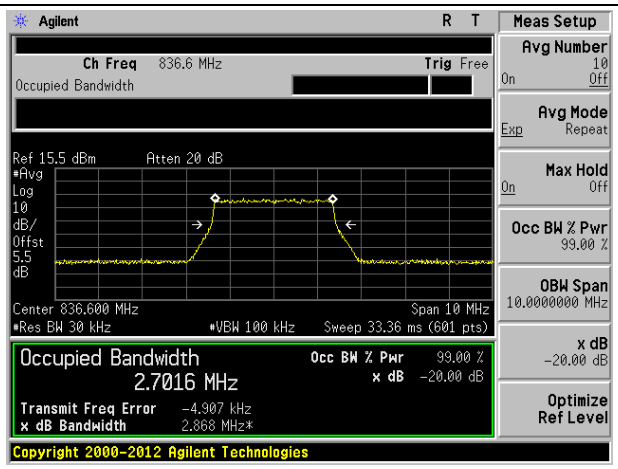
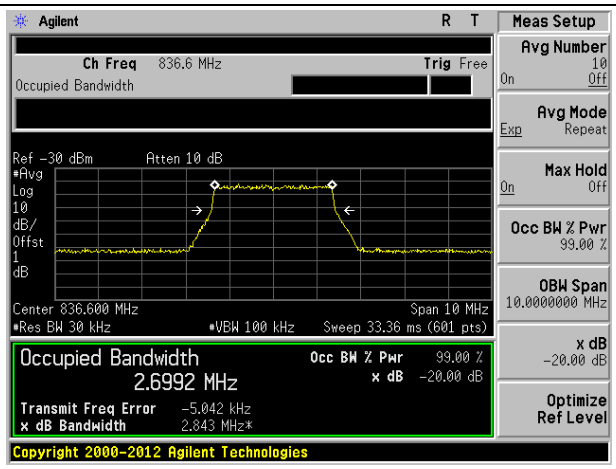
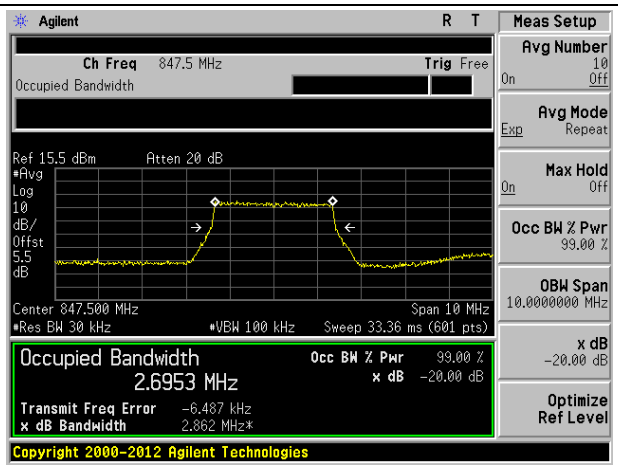
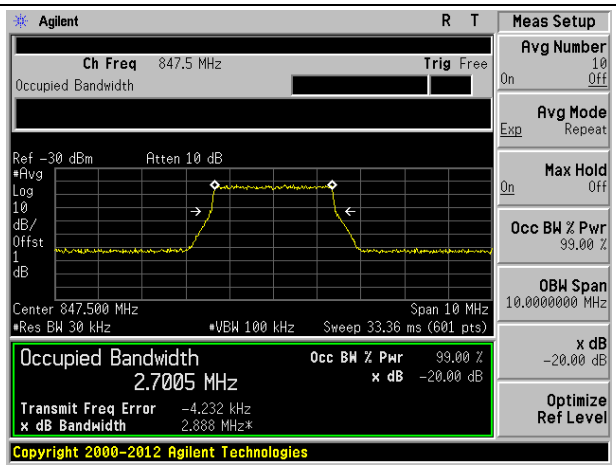
Input/output Bandwidth Comparison for WCDMA

Output(Lowest channel)	Input(Lowest channel)
	
Output(Middle channel)	**Input(Middle channel)**
	
Output(Highest channel)	**Input(Highest channel)**
	

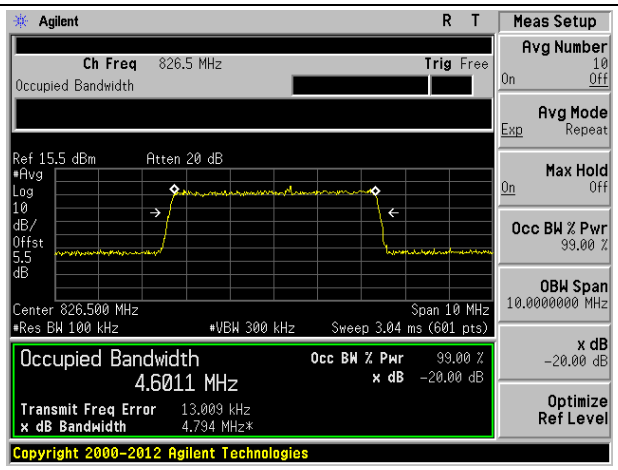
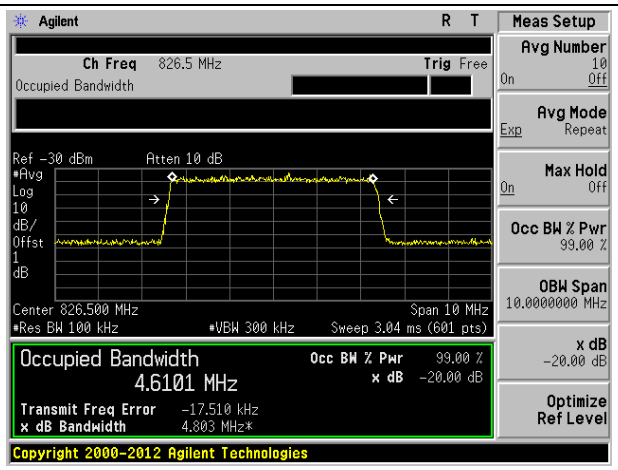
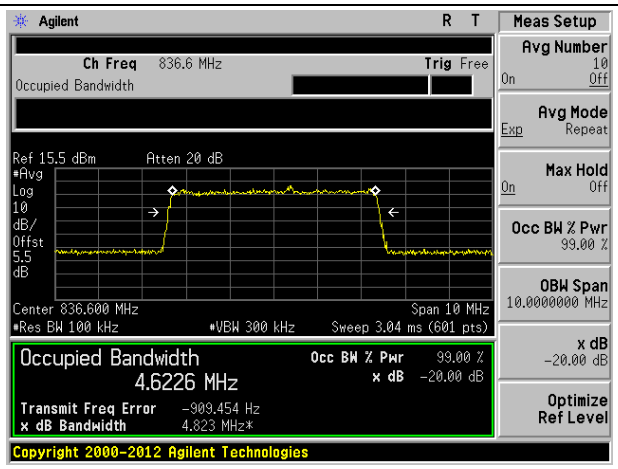
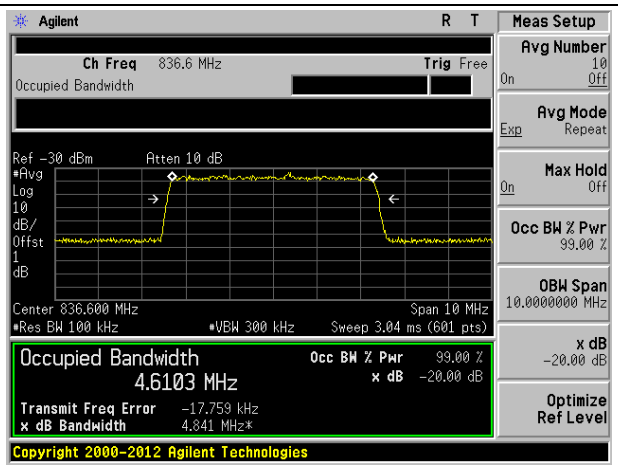
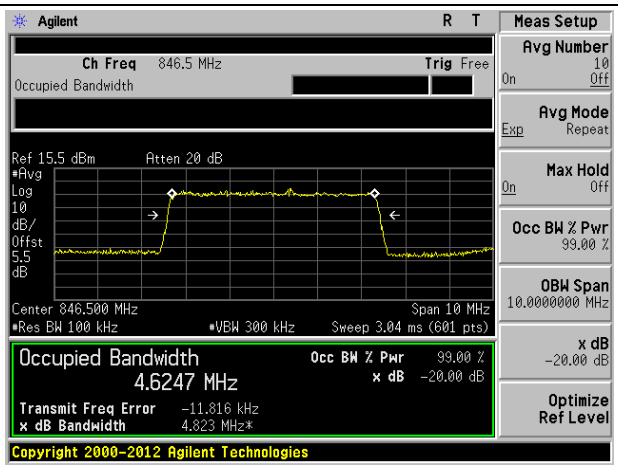
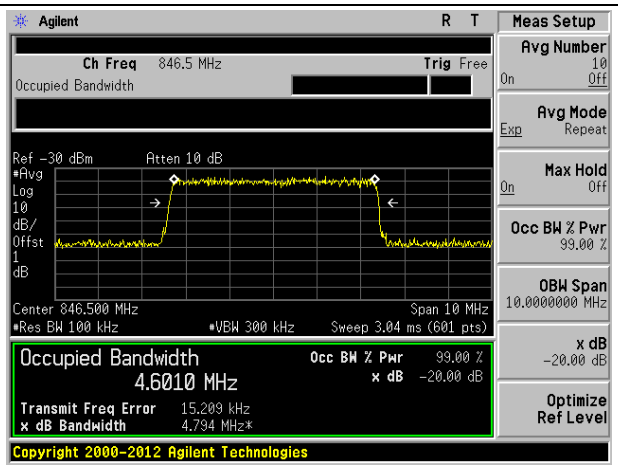
Input/output Bandwidth Comparison for LTE 1.4MHz

Output(Lowest channel)	Input(Lowest channel)
	
Output(Middle channel)	Input(Middle channel)
	
Output(Highest channel)	Input(Highest channel)
	

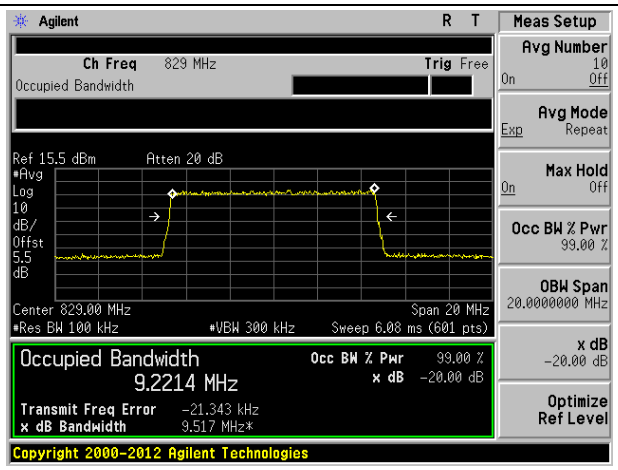
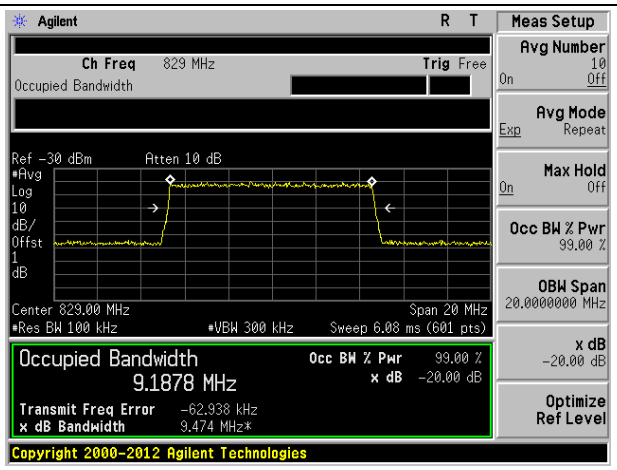
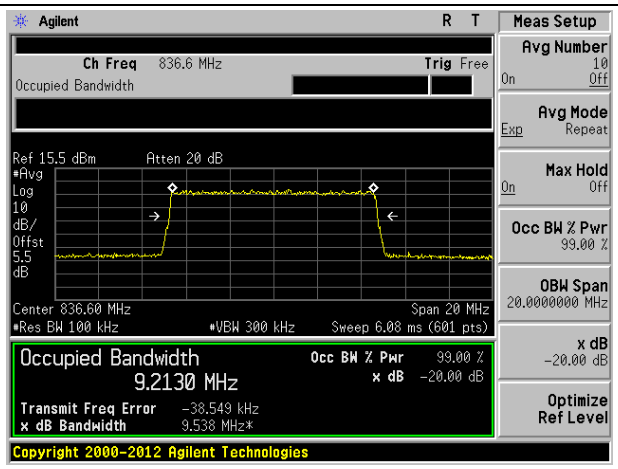
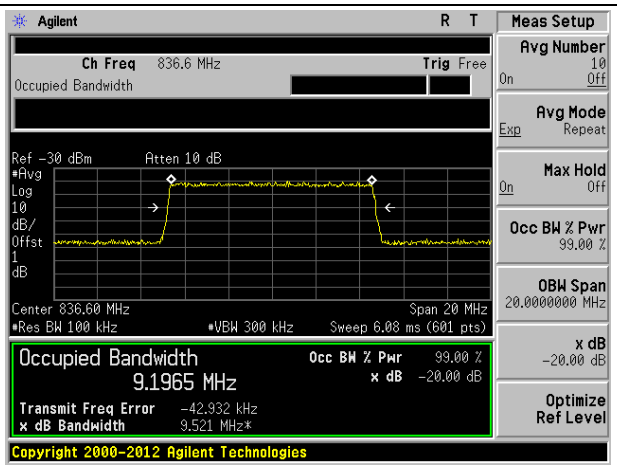
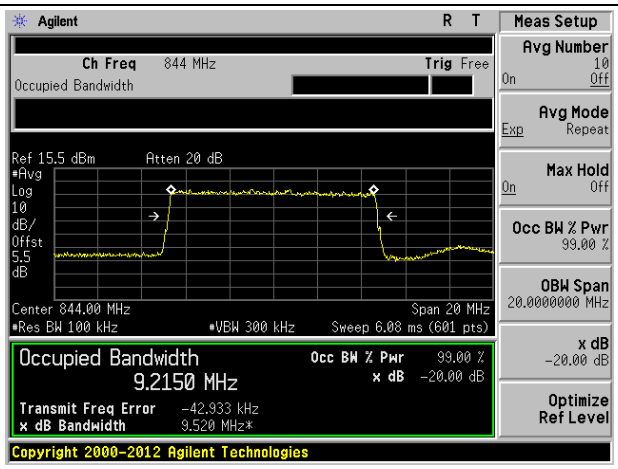
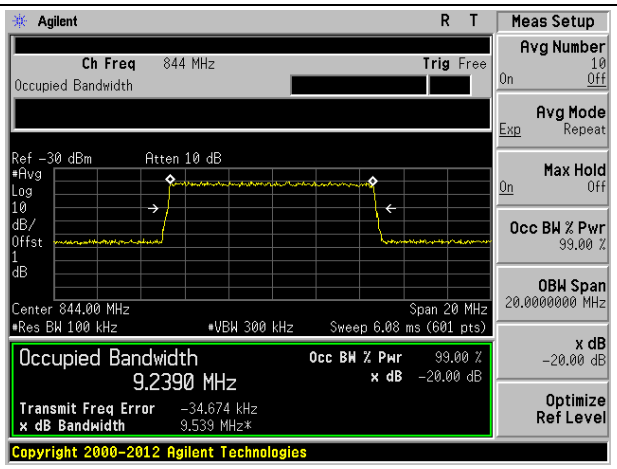
Input/output Bandwidth Comparison for LTE 3MHz

Output(Lowest channel)	Input(Lowest channel)
	
Output(Middle channel)	**Input(Middle channel)**
	
Output(Highest channel)	**Input(Highest channel)**
	

Input/output Bandwidth Comparison for LTE 5MHz

Output(Lowest channel)	Input(Lowest channel)
	
Output(Middle channel)	**Input(Middle channel)**
	
Output(Highest channel)	**Input(Highest channel)**
	

Input/output Bandwidth Comparison for LTE 10MHz

Output(Lowest channel)	Input(Lowest channel)
	
Output(Middle channel)	**Input(Middle channel)**
	
Output(Highest channel)	**Input(Highest channel)**
	

10 OUT OF BAND EMISSION AT ANTENNA TERMINALS

10.1 Standard Applicable

According to FCC § 2.1051 and § 22.917(a)

10.2 Test setup

Please refer the section §6.2 Configuration of Tested System.

10.3 Measurement Procedure

The out of band emissions were measured directly from the EUT antenna output with a spectrum analyzer from 30 MHz to the 10th harmonic of the highest carrier frequency. Test signals used is WCDMA/CDMA/CDMA EV-DO/GSM/EDGE/LTE.The different signals were input one at a time to the EUT. Tests was performed with WCDMA/CDMA/CDMA EV-DO/GSM/EDGE/LTE signal input.

Band edge compliance is also demonstrated using a WCDMA/CDMA/CDMA EV-DO/GSM/EDGE/LTE signal at the upper and lower limits of the band.

1. The EUT RF output port was connected to spectrum analyzer.
2. The level of RF input signal shall be increased, until the maximum output power per channel, declared by client, is reached.
3. The spurious emissions at antenna were measured at the RF output port of the EUT at middle channel of each type of modulation.

Spectrum analyzer settings:

Detector: RMS.

> 1 MHz from Band Edge

Below 1G: RBW=100kHz; Above 1G: RBW=1 MHz ; VBW≥ RBW

< 1 MHz from Band Edge

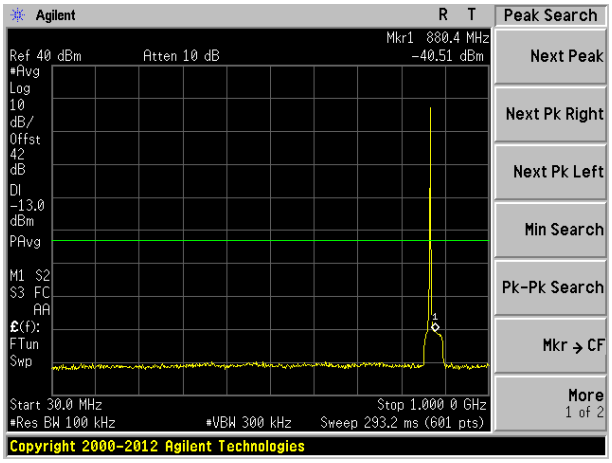
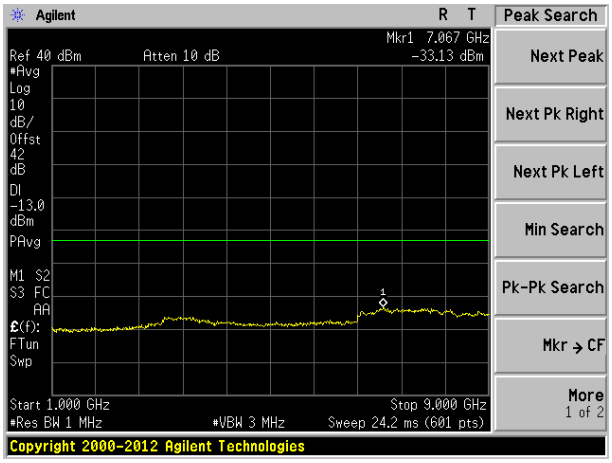
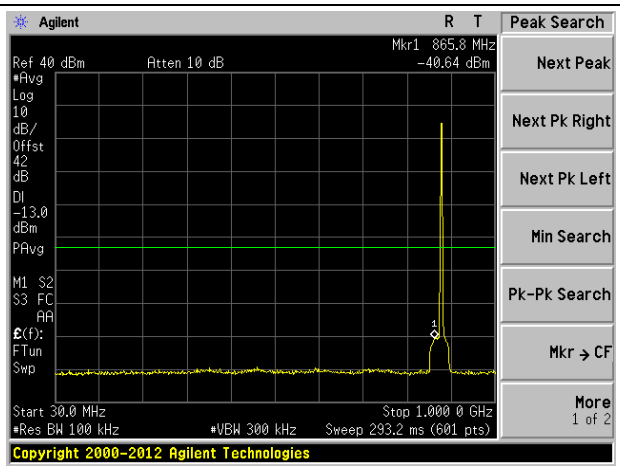
RBW=3 kHz; VBW≥ RBW

10.4 Measurement Result

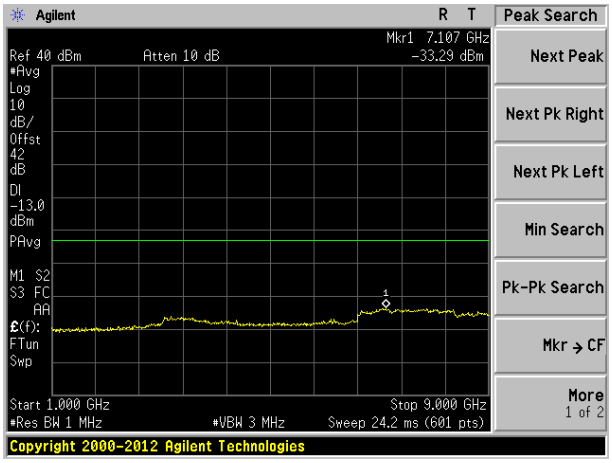
10.4.1 Spurious emission

Downlink:

Spurious emission of GSM

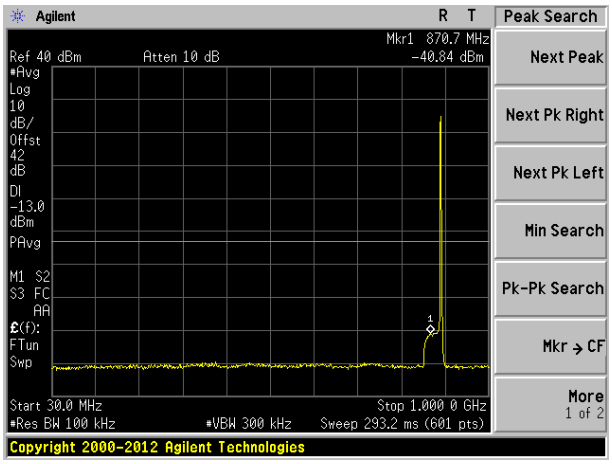
Lowest channel
30MHz-1000MHz

1000MHz-9000MHz

Middle channel
30MHz-1000MHz


1000MHz-9000MHz

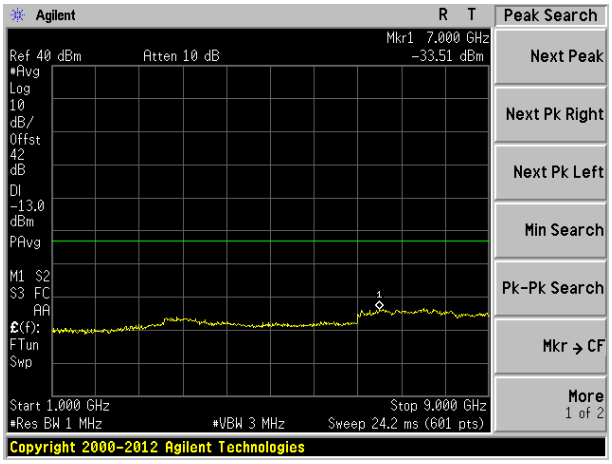


Highest channel

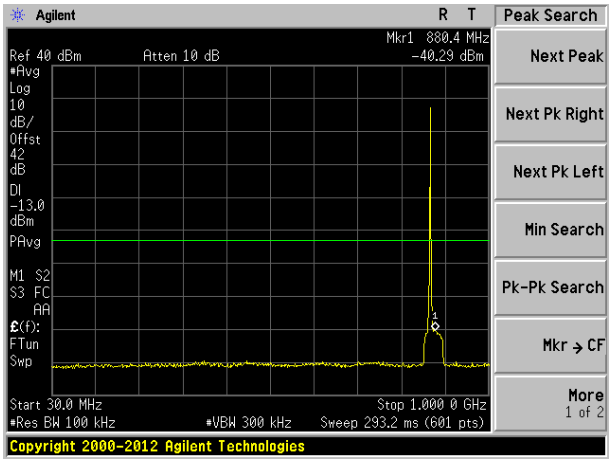
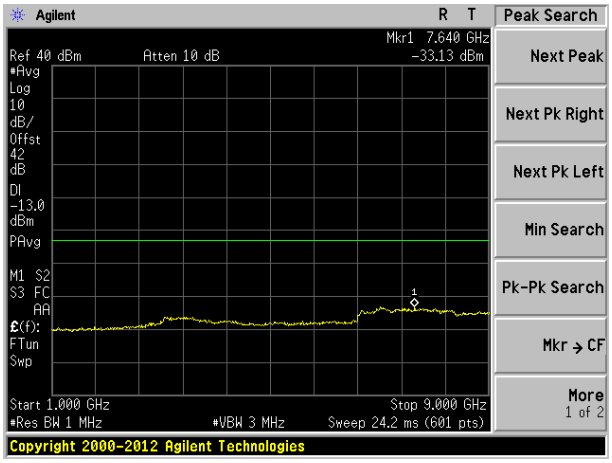
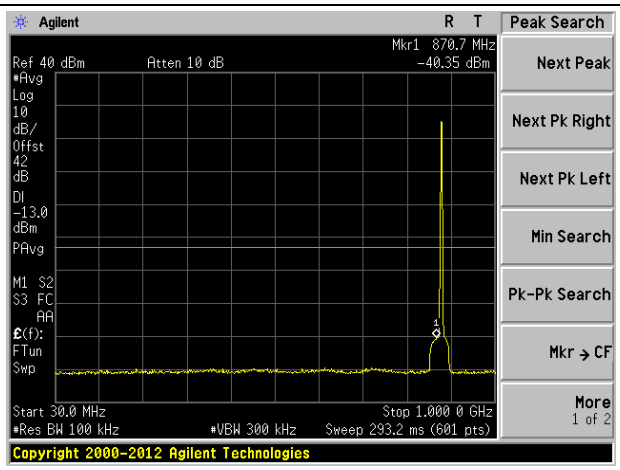
30MHz-1000MHz



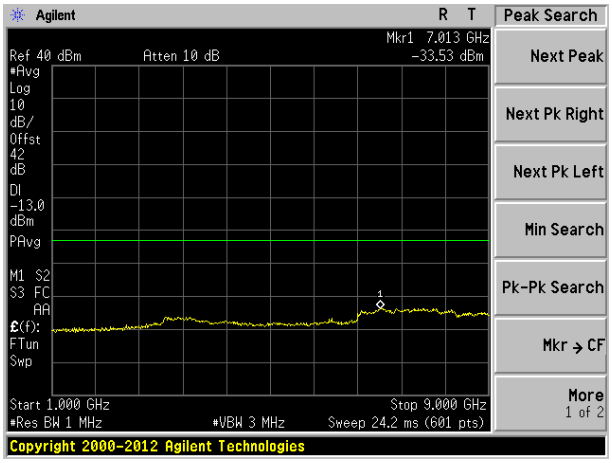
1000MHz-9000MHz



Spurious emission of EDGE

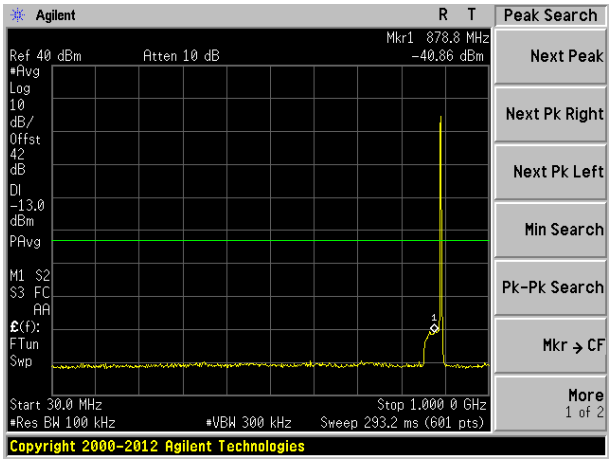
Lowest channel
30MHz-1000MHz

1000MHz-9000MHz

Middle channel
30MHz-1000MHz


1000MHz-9000MHz

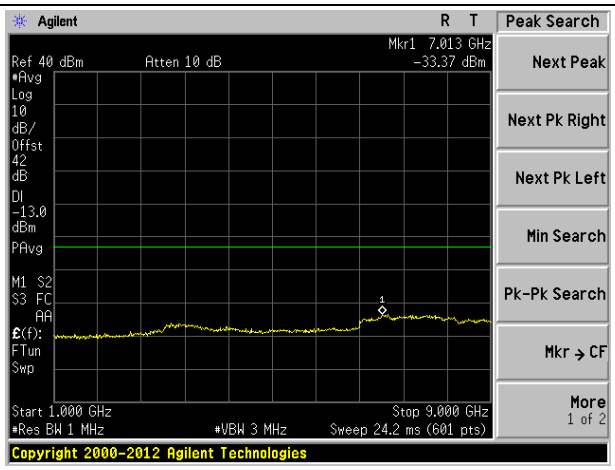


Highest channel

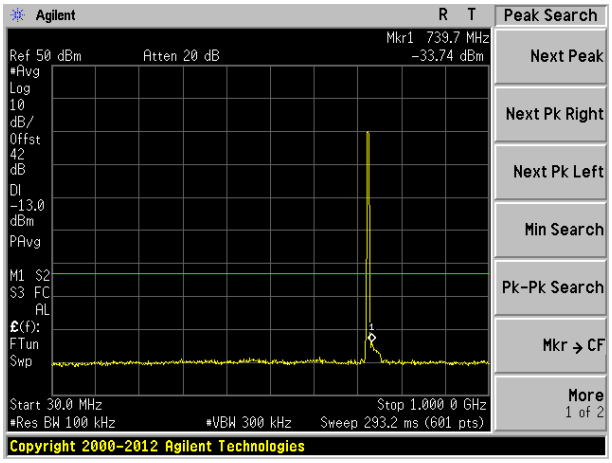
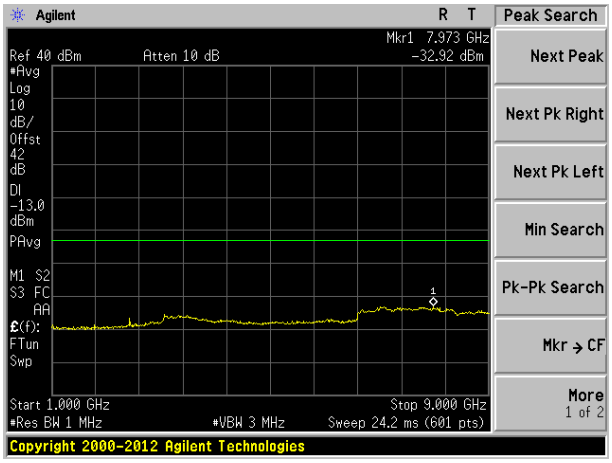
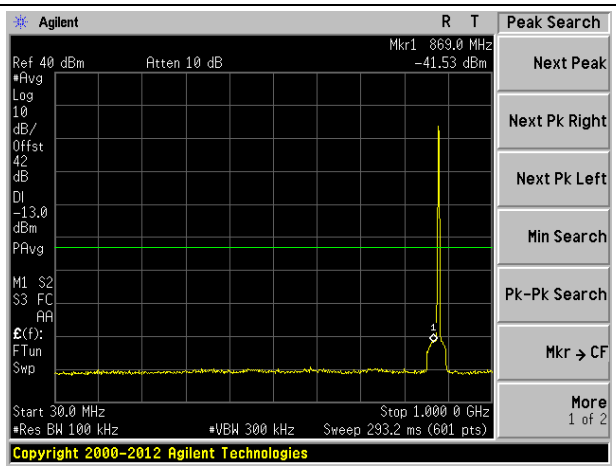
30MHz-1000MHz



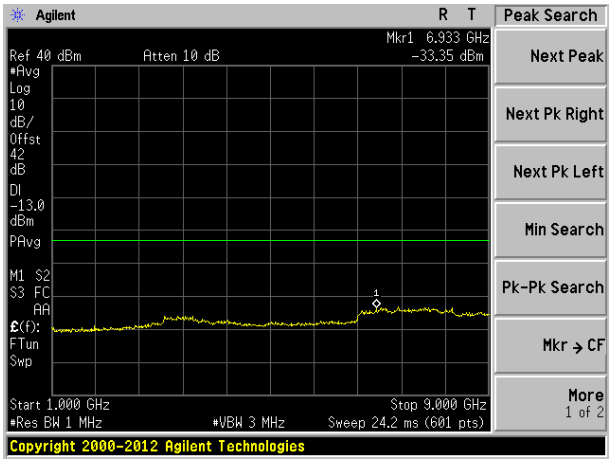
1000MHz-9000MHz



Spurious emission of CDMA

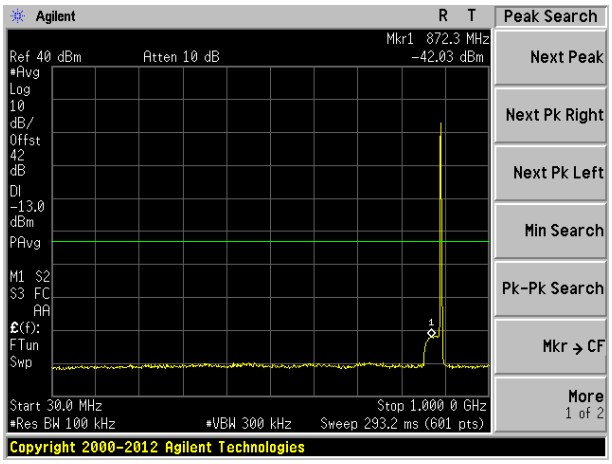
Lowest channel
30MHz-1000MHz

1000MHz-9000MHz

Middle channel
30MHz-1000MHz


1000MHz-9000MHz

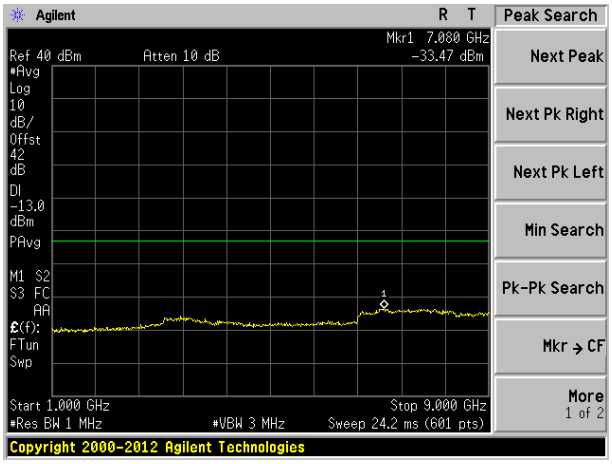


Highest channel

30MHz-1000MHz



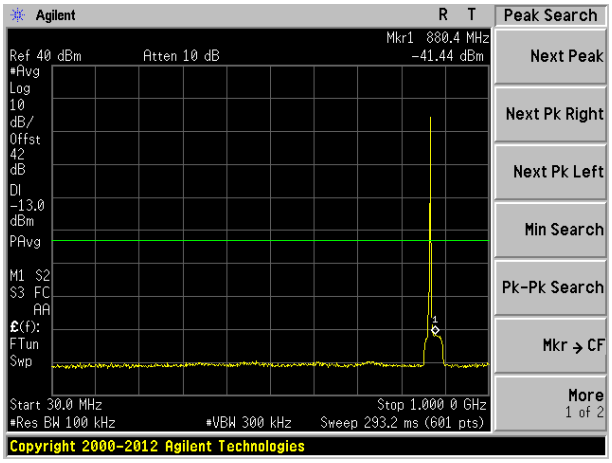
1000MHz-9000MHz



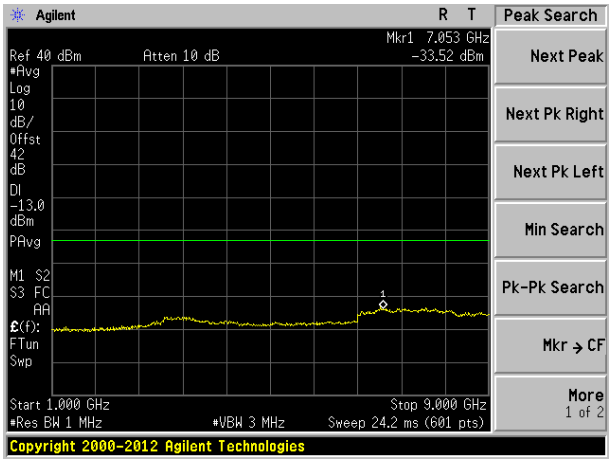
Spurious emission of CDMA-EVDO

Lowest channel

30MHz-1000MHz

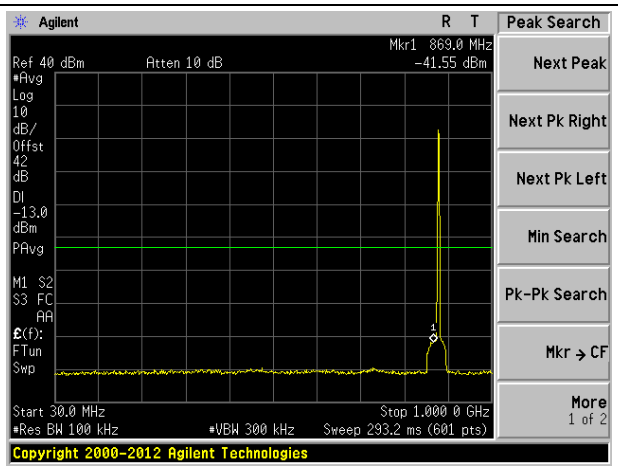


1000MHz-9000MHz

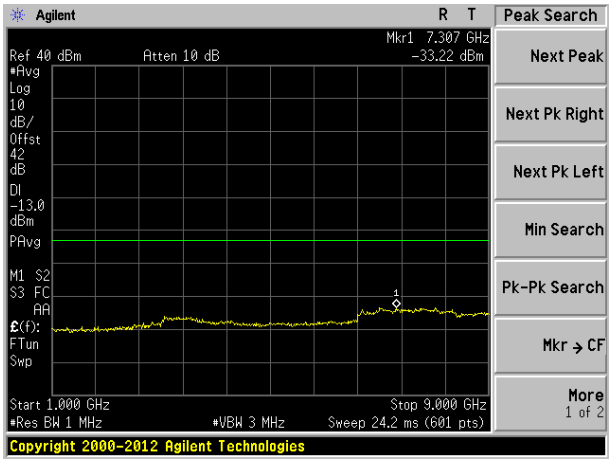


Middle channel

30MHz-1000MHz

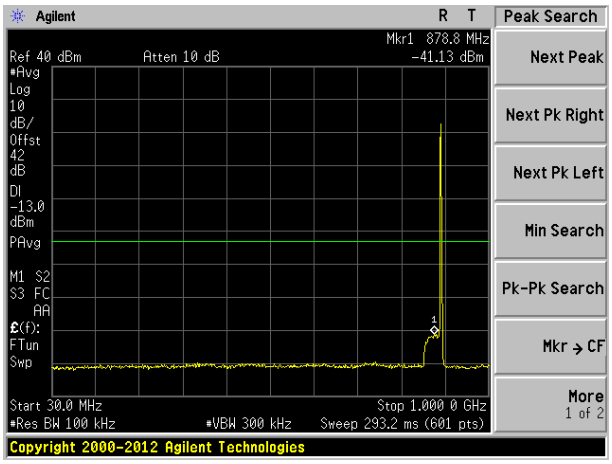


1000MHz-9000MHz

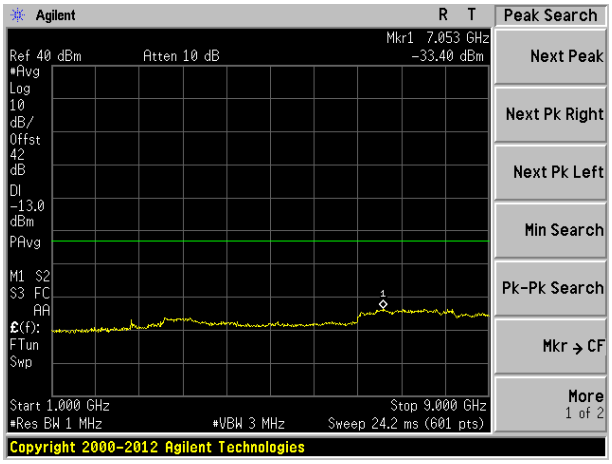


Highest channel

30MHz-1000MHz



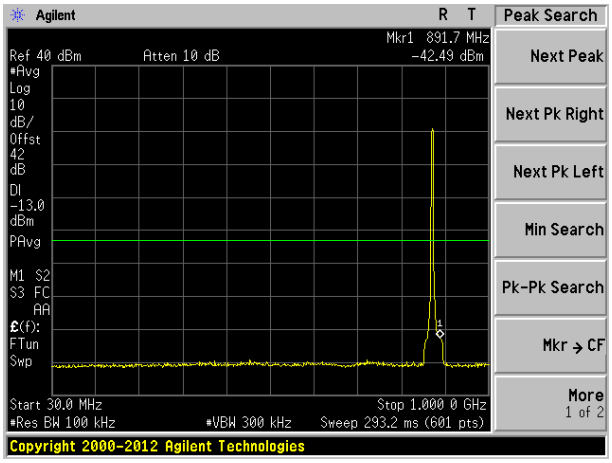
1000MHz-9000MHz



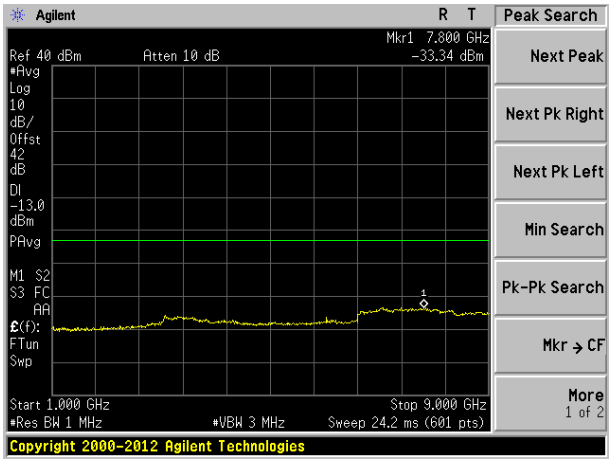
Spurious emission of WCDMA

Lowest channel

30MHz-1000MHz

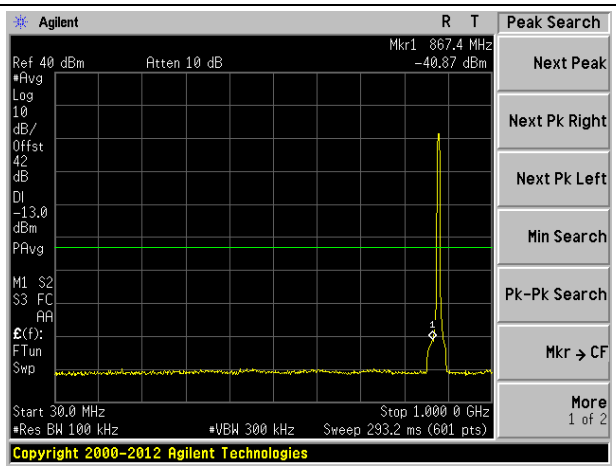


1000MHz-9000MHz

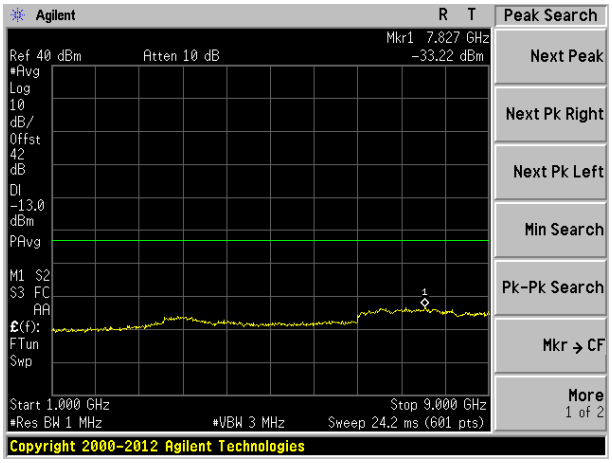


Middle channel

30MHz-1000MHz

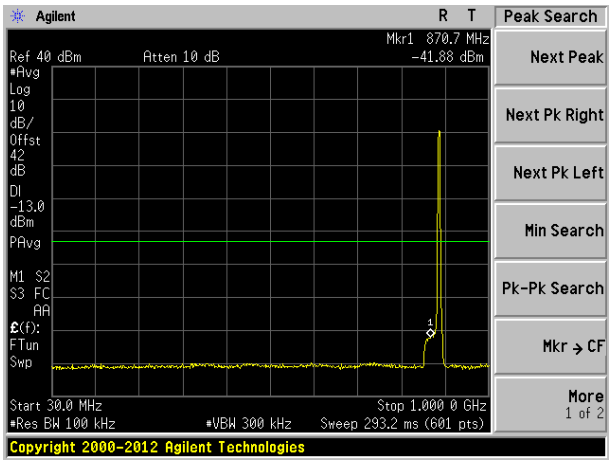


1000MHz-9000MHz

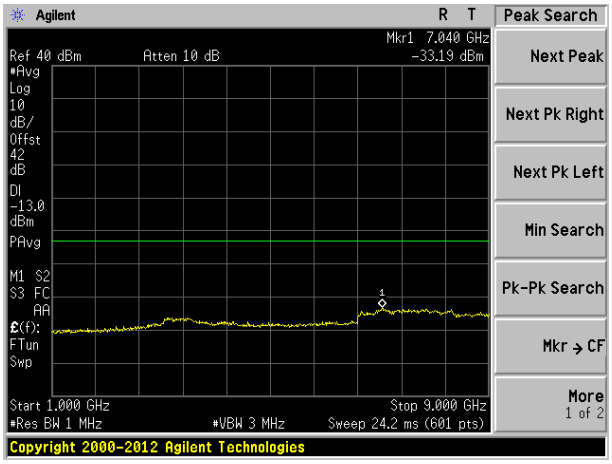


Highest channel

30MHz-1000MHz



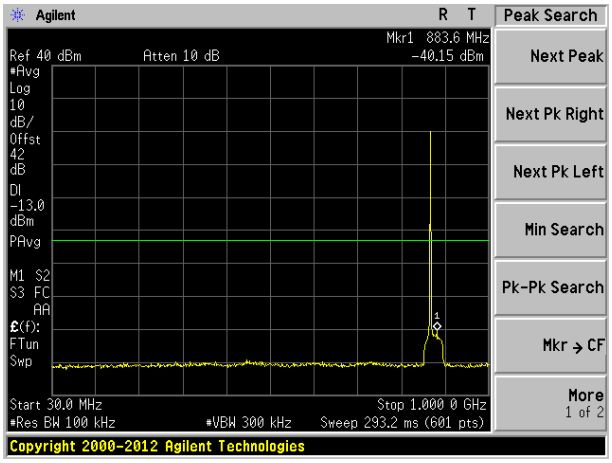
1000MHz-9000MHz



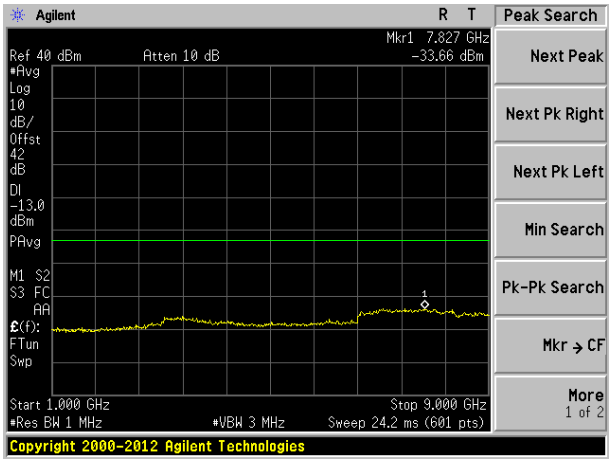
Spurious emission of LTE 1.4MHz Bandwidth

Lowest channel

30MHz-1000MHz

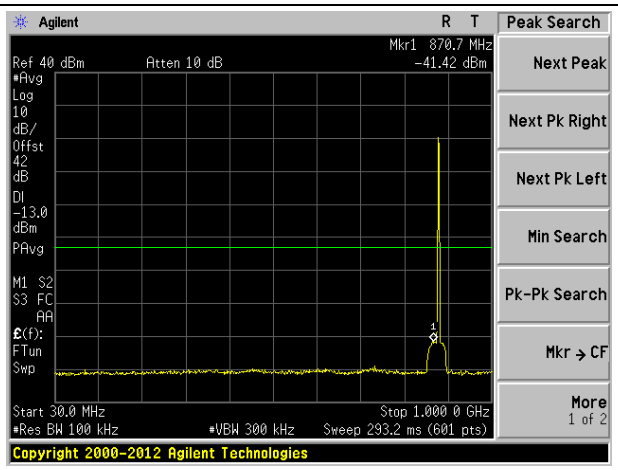


1000MHz-9000MHz

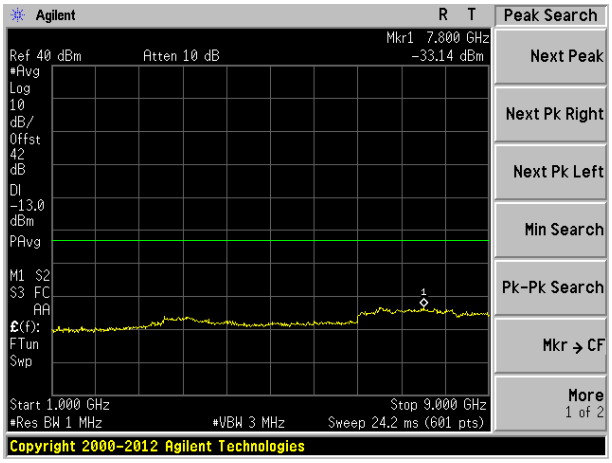


Middle channel

30MHz-1000MHz

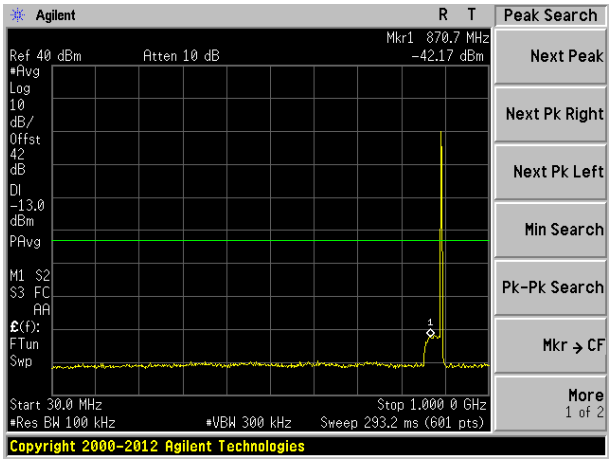


1000MHz-9000MHz

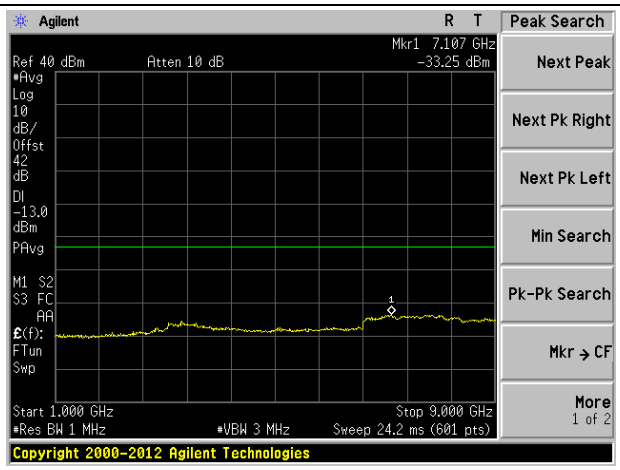


Highest channel

30MHz-1000MHz



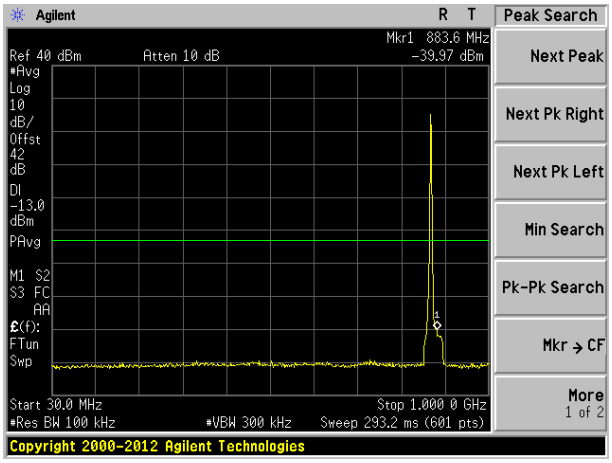
1000MHz-9000MHz



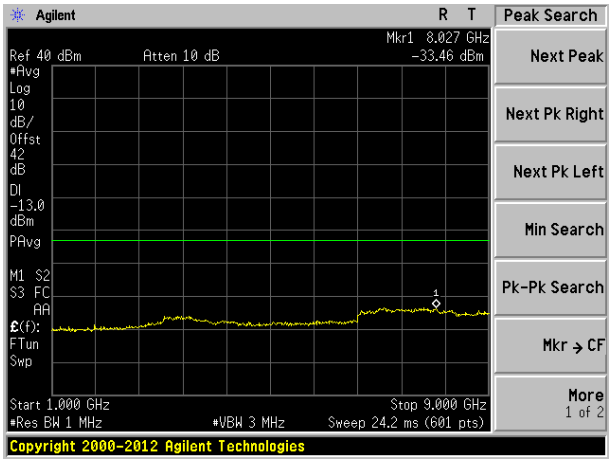
Spurious emission of LTE 3MHz Bandwidth

Lowest channel

30MHz-1000MHz

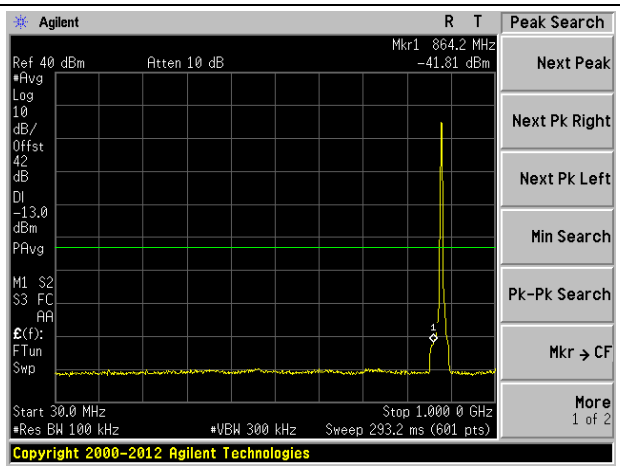


1000MHz-9000MHz

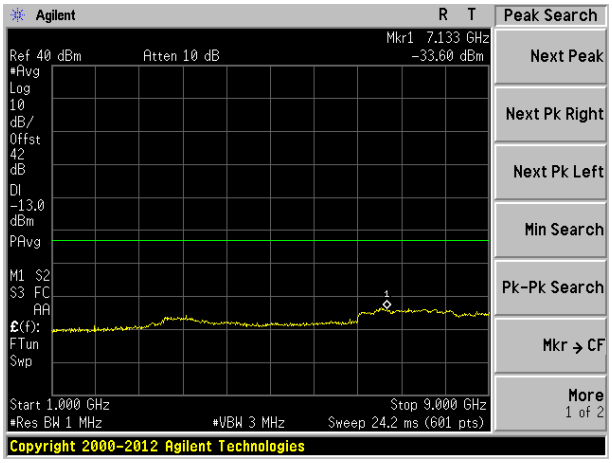


Middle channel

30MHz-1000MHz

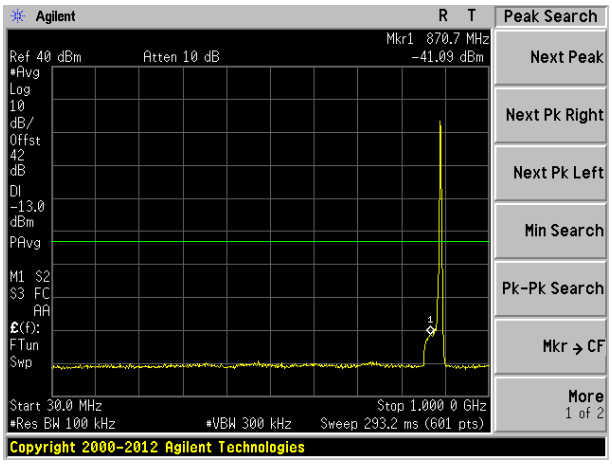


1000MHz-9000MHz

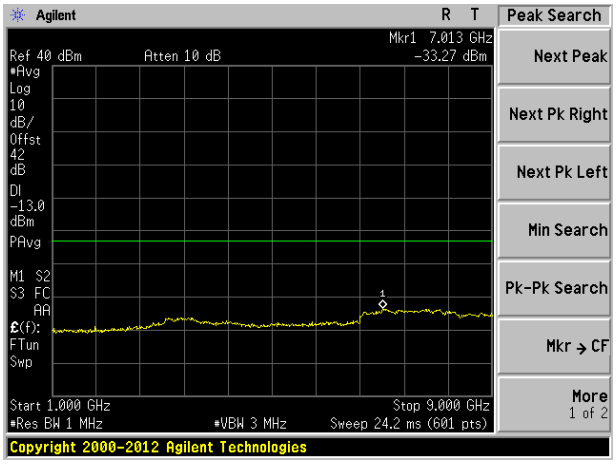


Highest channel

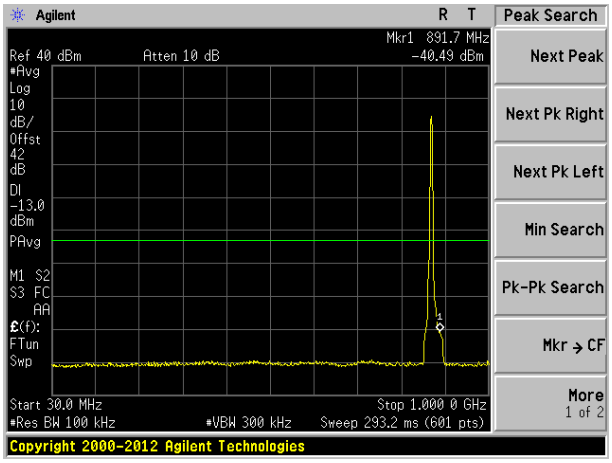
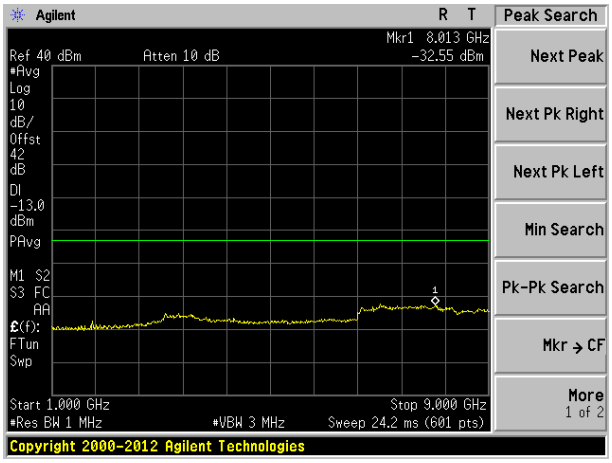
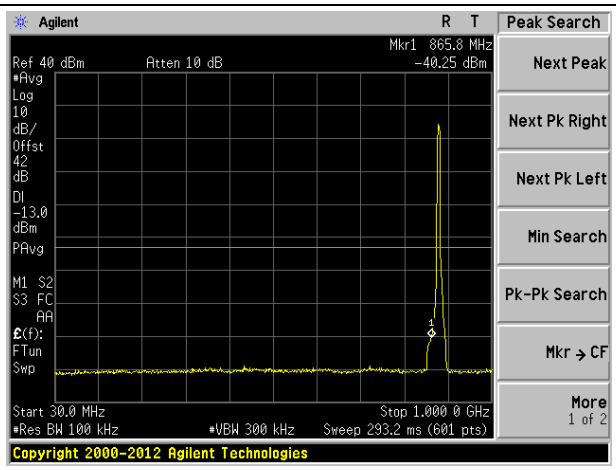
30MHz-1000MHz



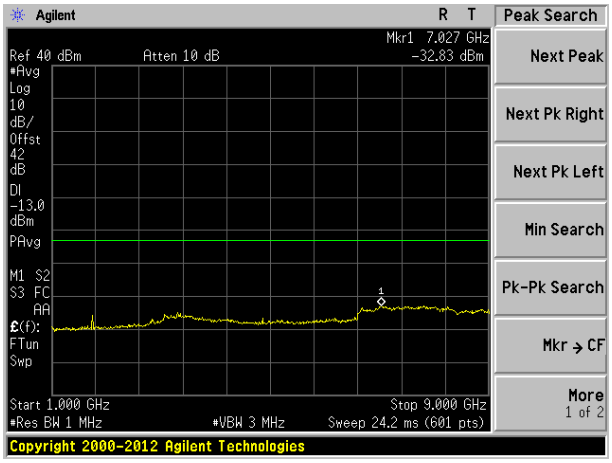
1000MHz-9000MHz



Spurious emission of LTE 5MHz Bandwidth

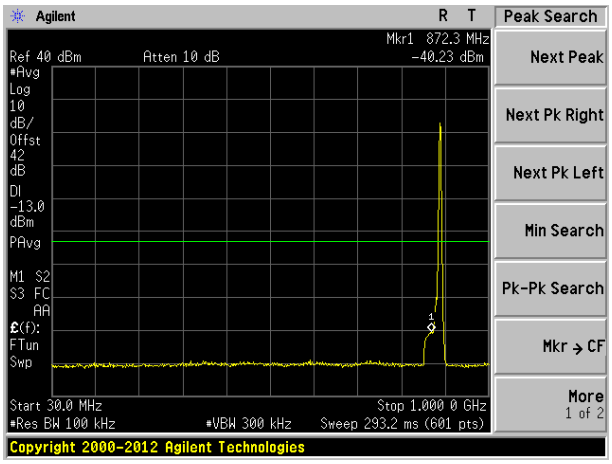
Lowest channel
30MHz-1000MHz

1000MHz-9000MHz

Middle channel
30MHz-1000MHz


1000MHz-9000MHz

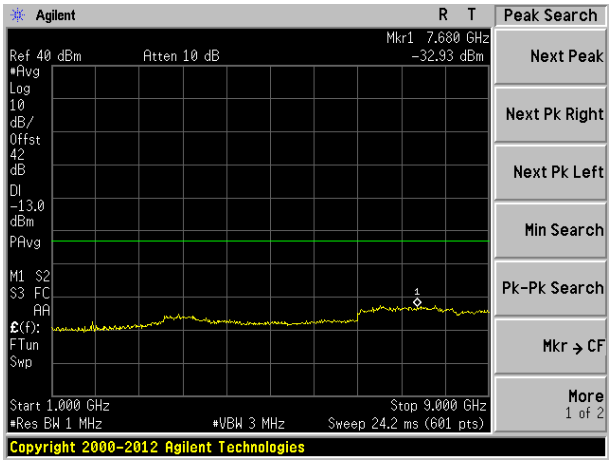


Highest channel

30MHz-1000MHz



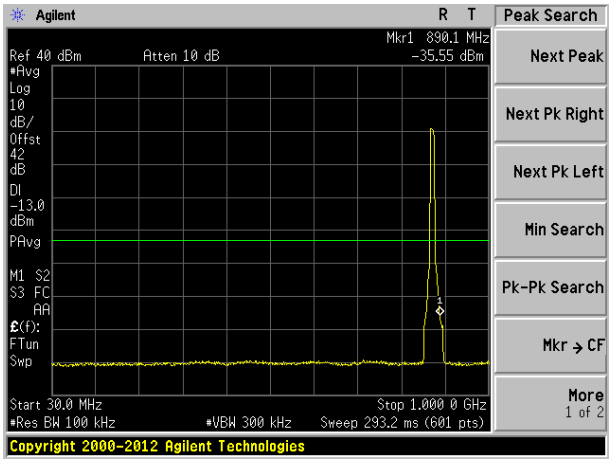
1000MHz-9000MHz



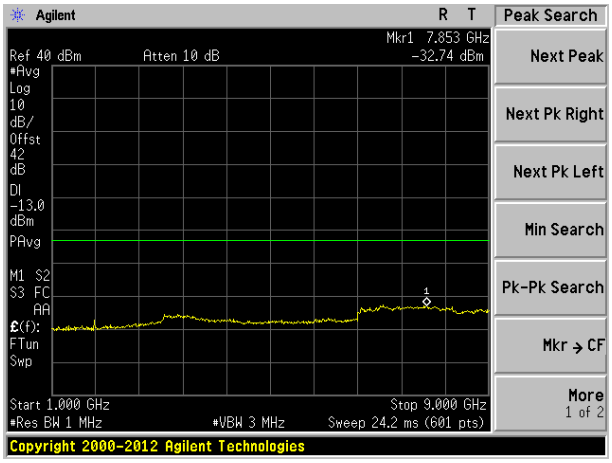
Spurious emission of LTE 10MHz Bandwidth

Lowest channel

30MHz-1000MHz

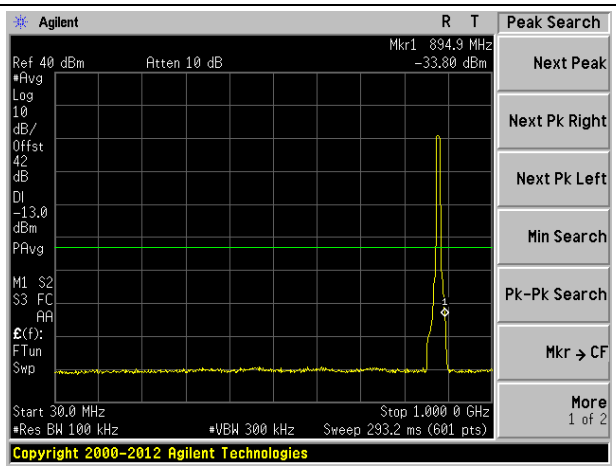


1000MHz-9000MHz

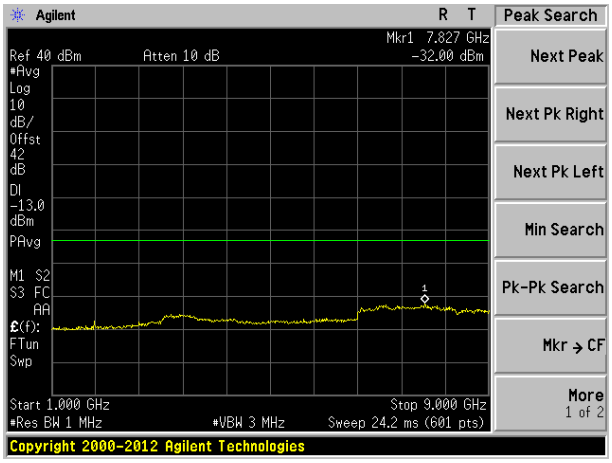


Middle channel

30MHz-1000MHz

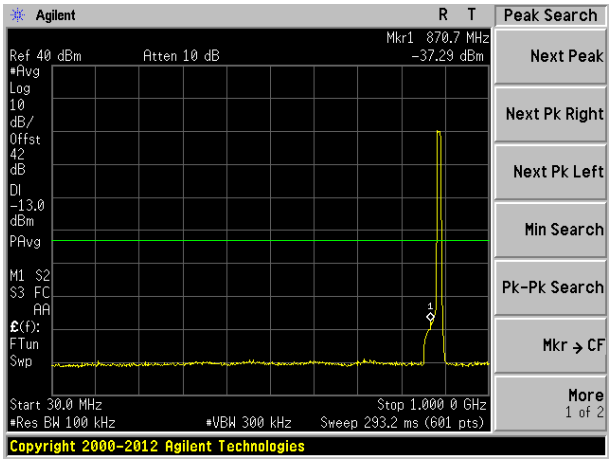


1000MHz-9000MHz

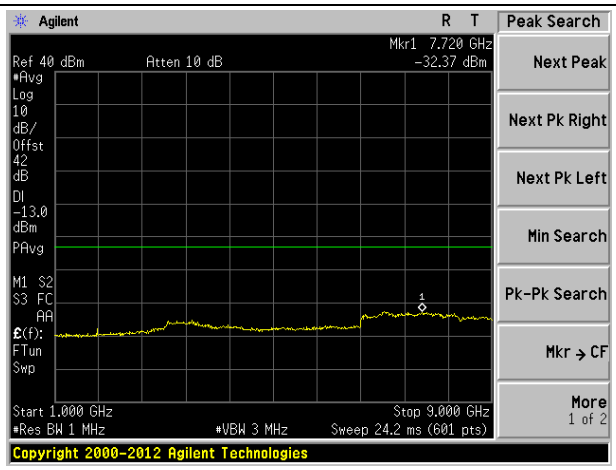


Highest channel

30MHz-1000MHz

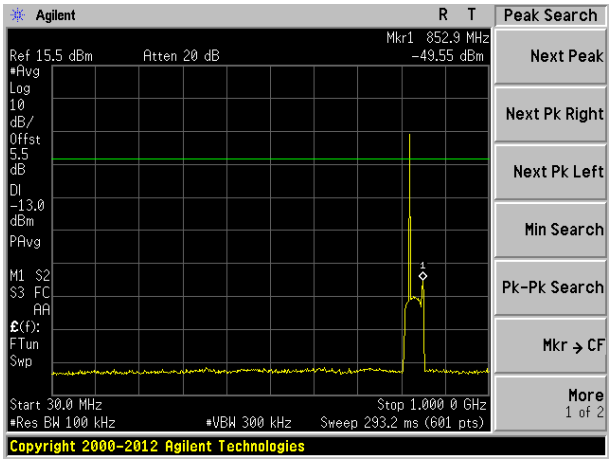
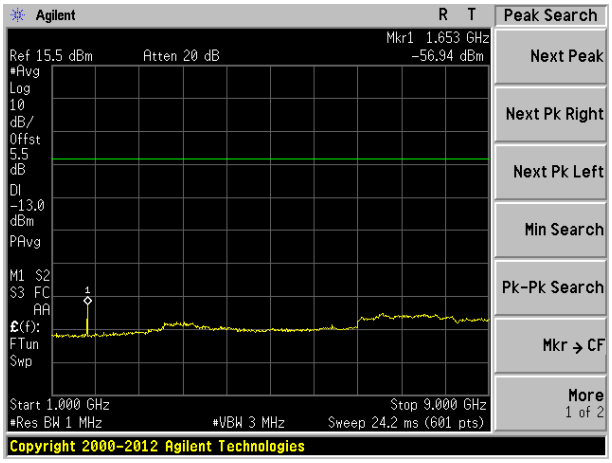
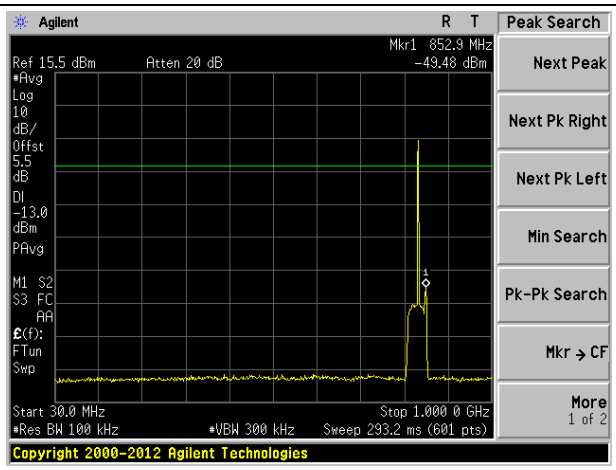


1000MHz-9000MHz

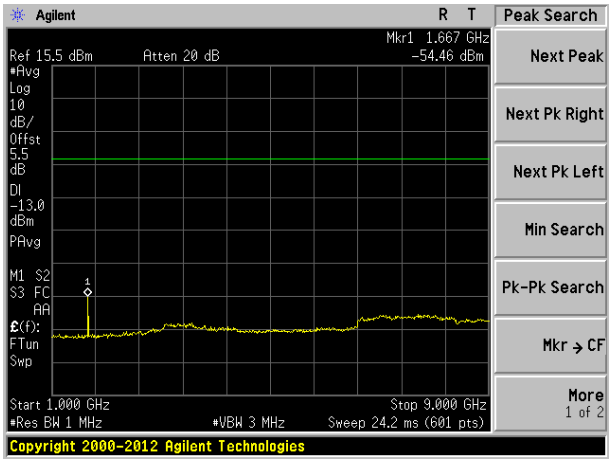


Uplink:

Spurious emission of GSM

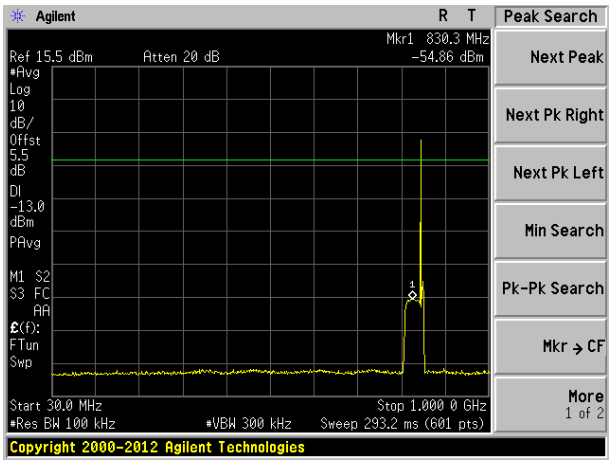
Lowest channel
30MHz-1000MHz

1000MHz-9000MHz

Middle channel
30MHz-1000MHz


1000MHz-9000MHz

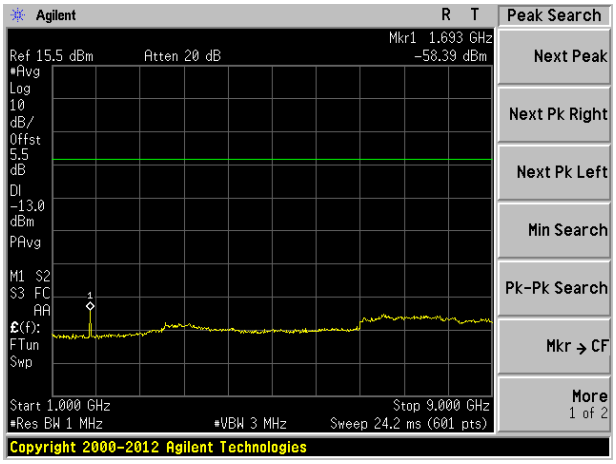


Highest channel

30MHz-1000MHz



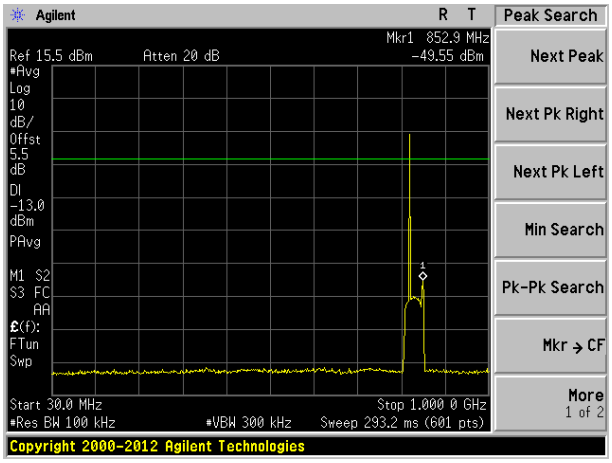
1000MHz-9000MHz



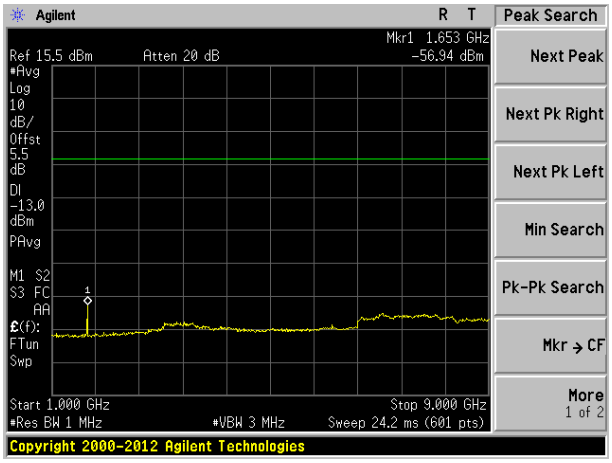
Spurious emission of EDGE

Lowest channel

30MHz-1000MHz

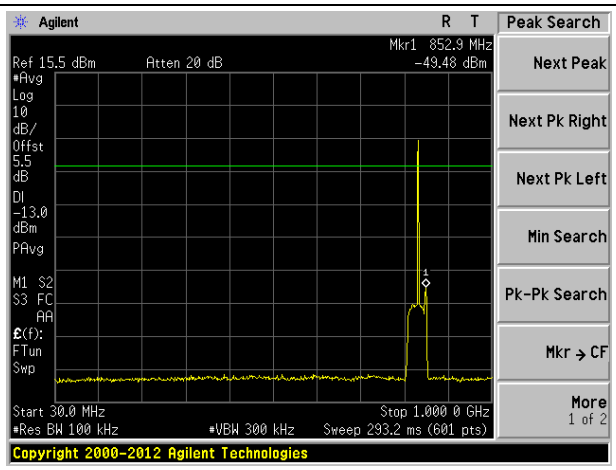


1000MHz-9000MHz

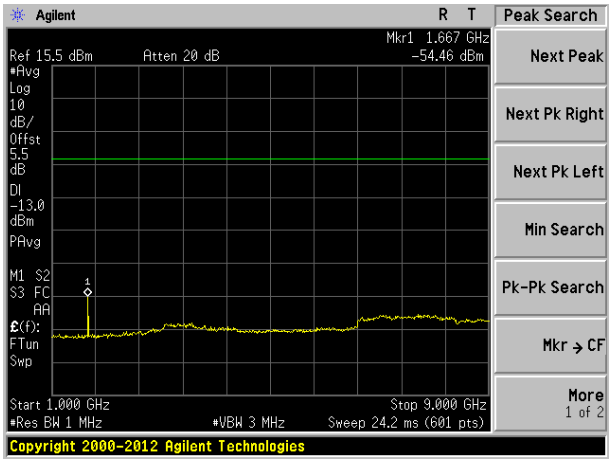


Middle channel

30MHz-1000MHz

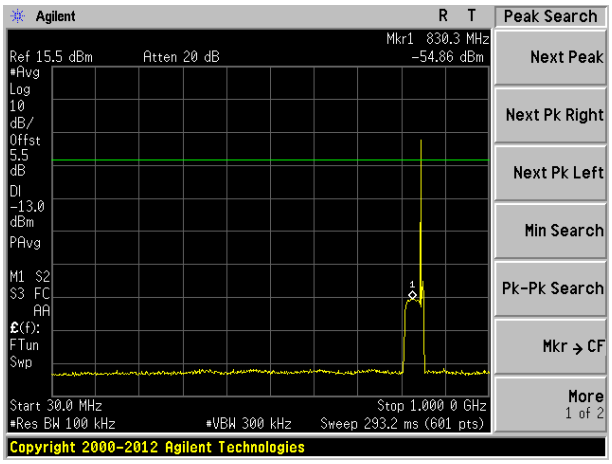


1000MHz-9000MHz

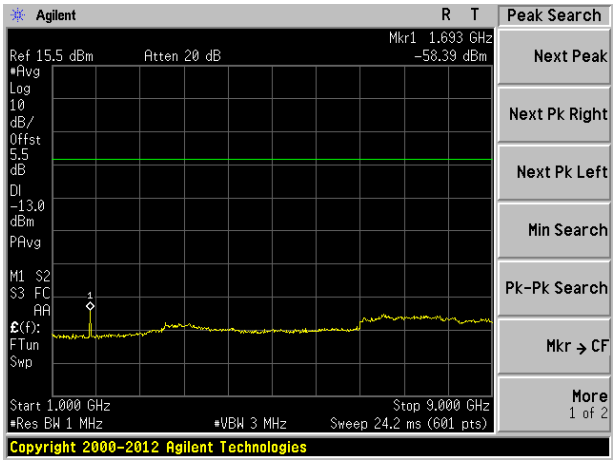


Highest channel

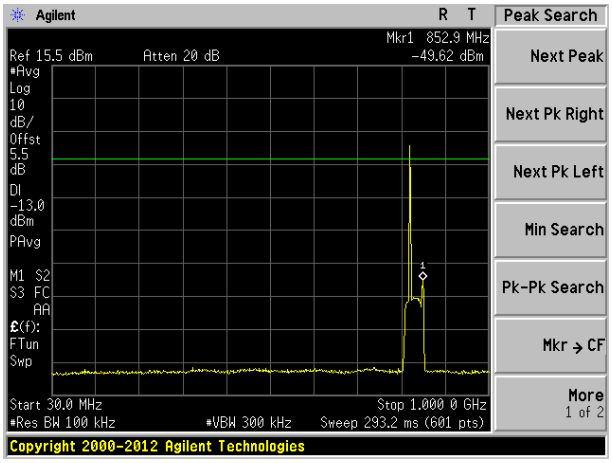
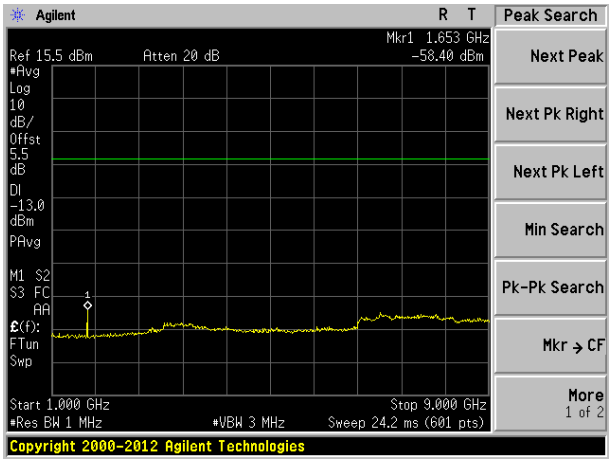
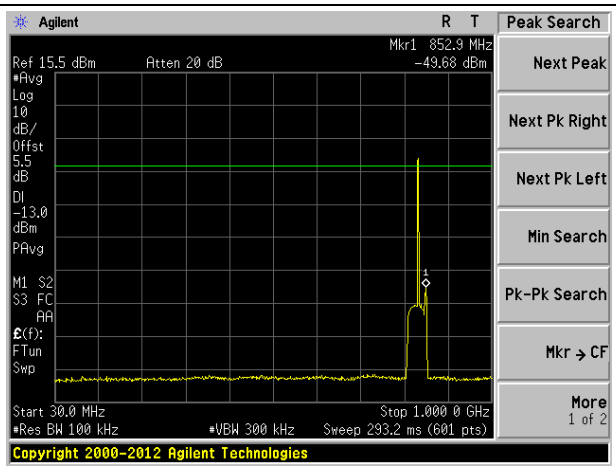
30MHz-1000MHz



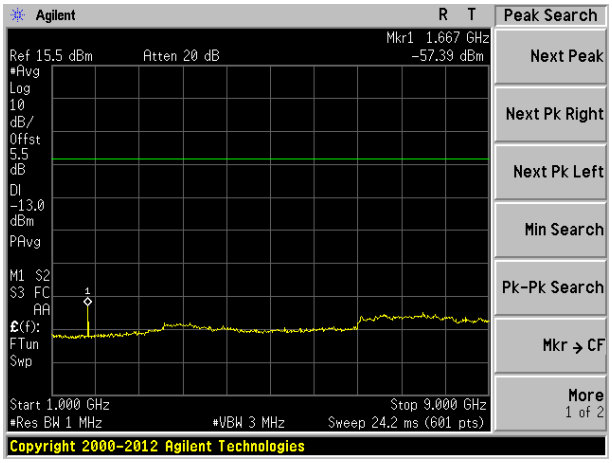
1000MHz-9000MHz



Spurious emission of CDMA

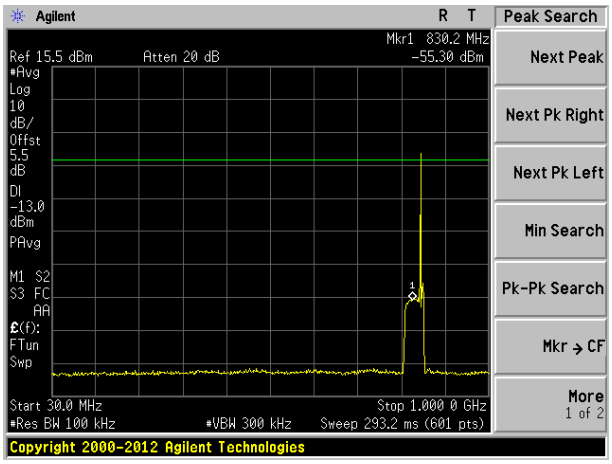
Lowest channel
30MHz-1000MHz

1000MHz-9000MHz

Middle channel
30MHz-1000MHz


1000MHz-9000MHz

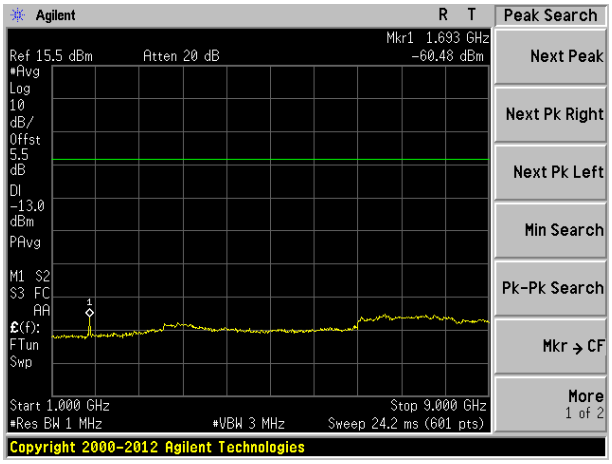


Highest channel

30MHz-1000MHz



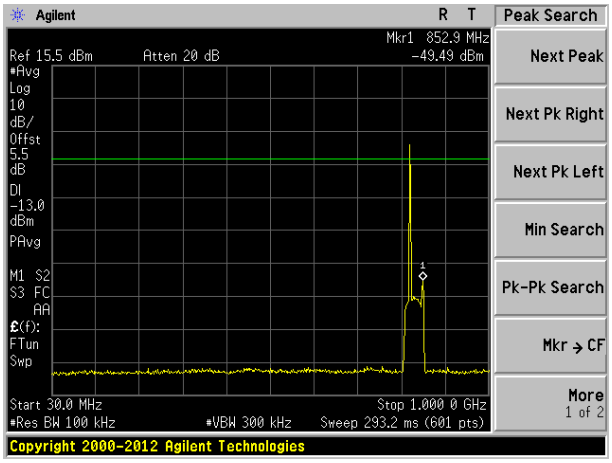
1000MHz-9000MHz



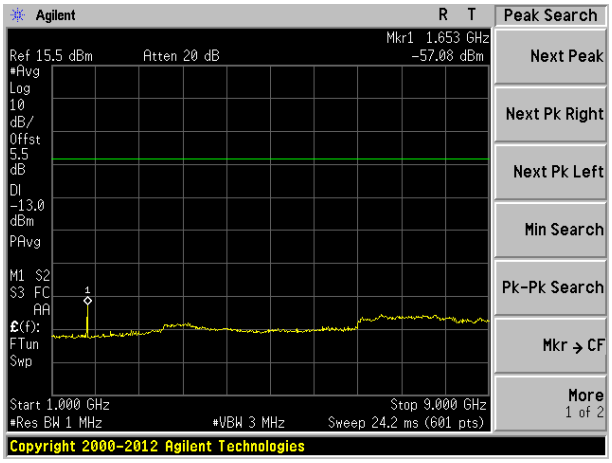
Spurious emission of CDMA-EVDO

Lowest channel

30MHz-1000MHz

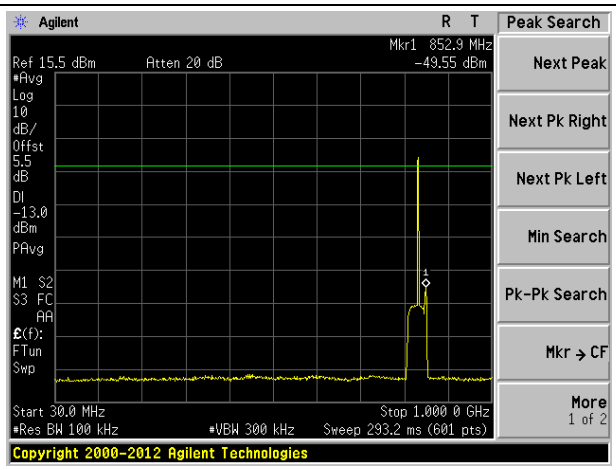


1000MHz-9000MHz

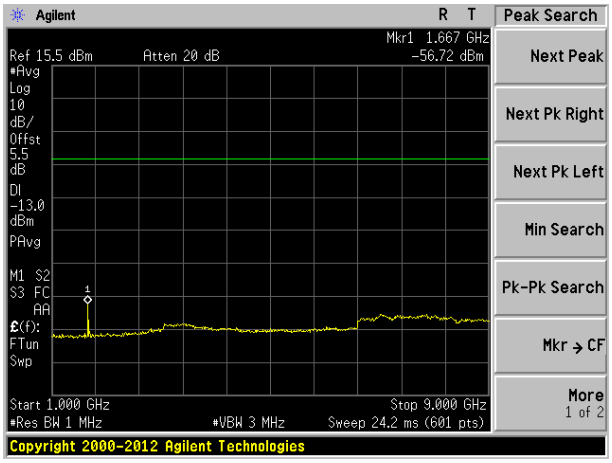


Middle channel

30MHz-1000MHz

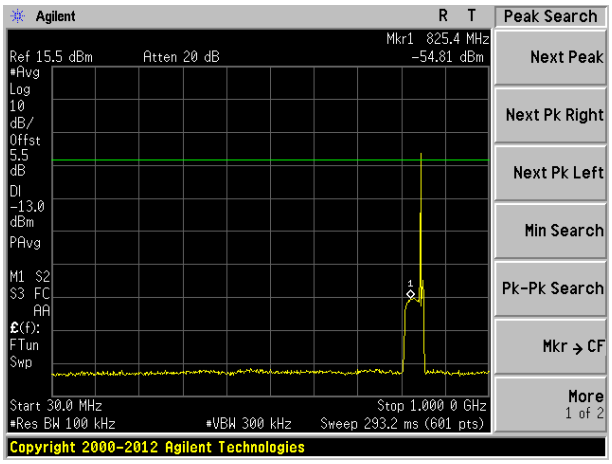


1000MHz-9000MHz

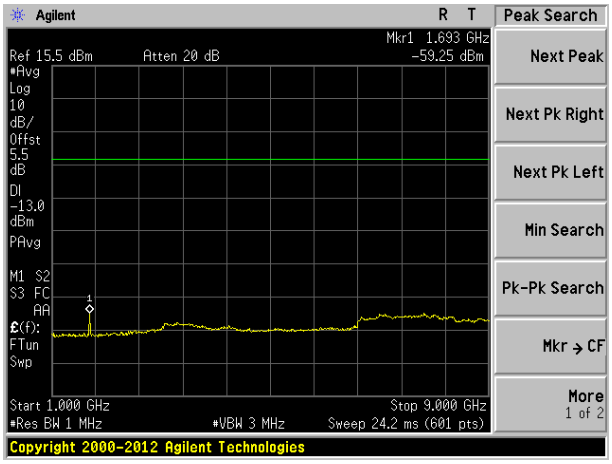


Highest channel

30MHz-1000MHz



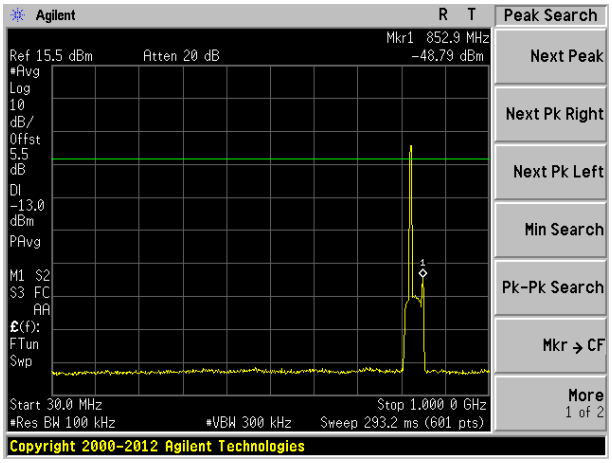
1000MHz-9000MHz



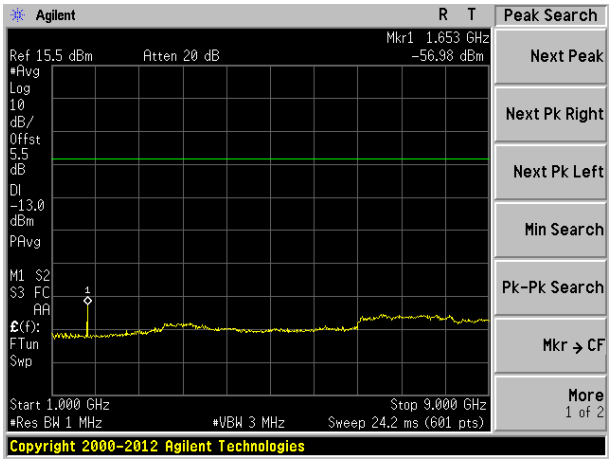
Spurious emission of WCDMA

Lowest channel

30MHz-1000MHz

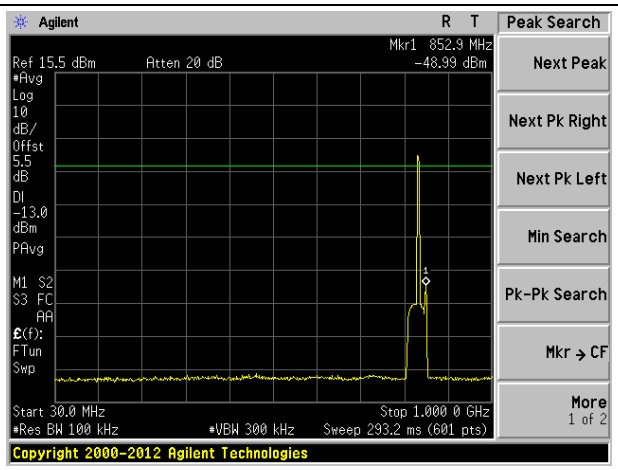


1000MHz-9000MHz

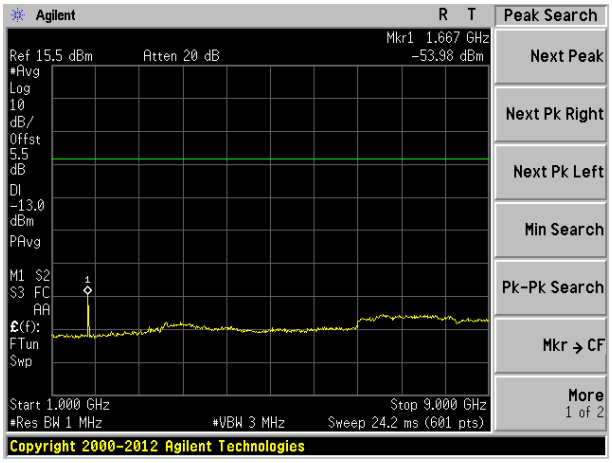


Middle channel

30MHz-1000MHz

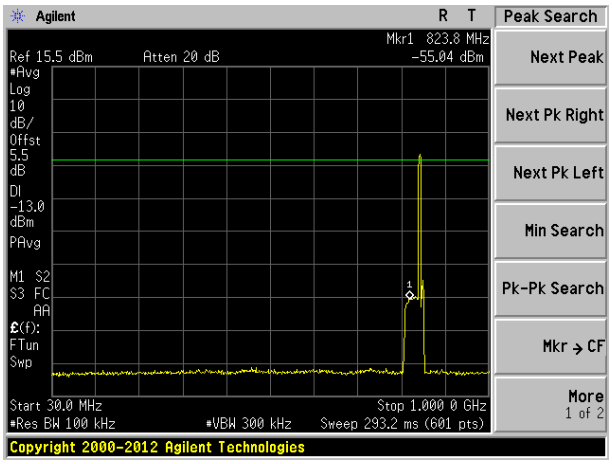


1000MHz-9000MHz

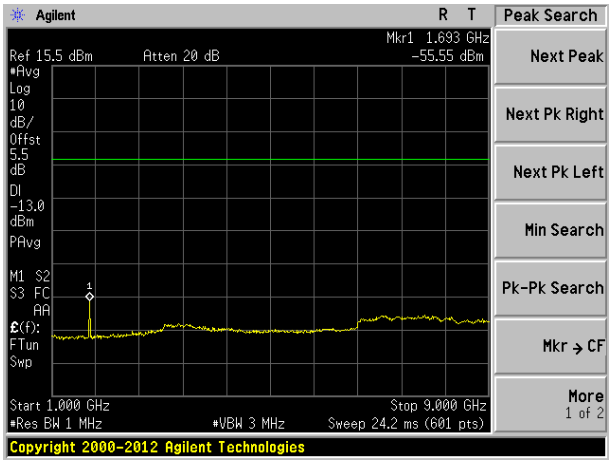


Highest channel

30MHz-1000MHz



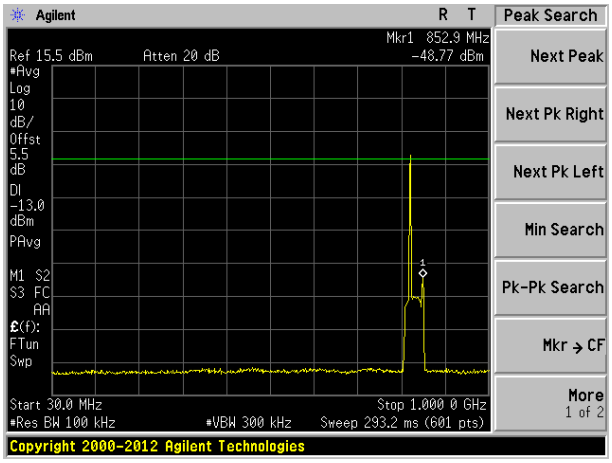
1000MHz-9000MHz



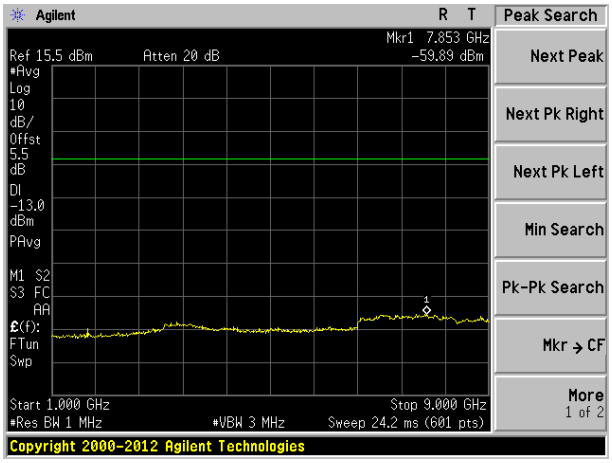
Spurious emission of LTE 1.4MHz Bandwidth

Lowest channel

30MHz-1000MHz

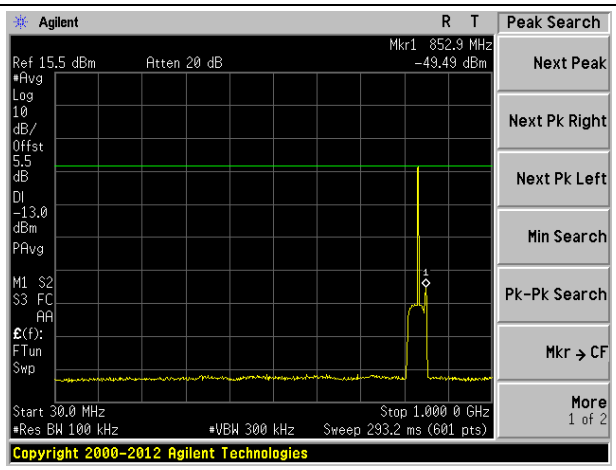


1000MHz-9000MHz

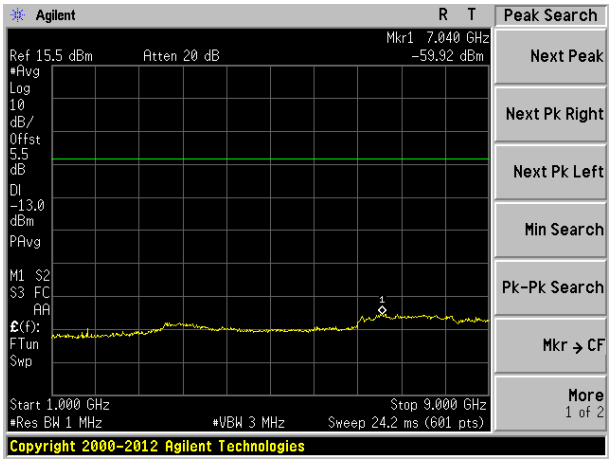


Middle channel

30MHz-1000MHz

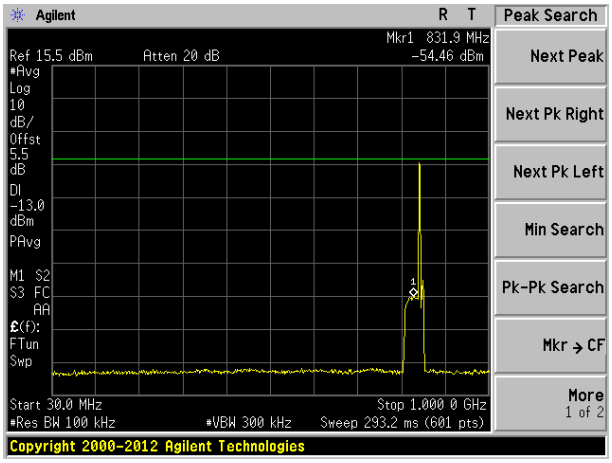


1000MHz-9000MHz

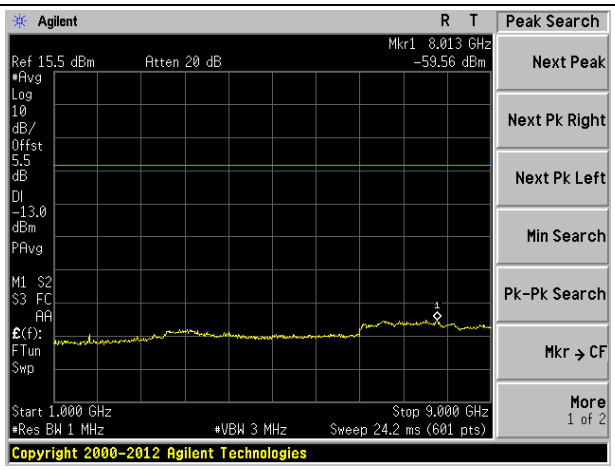


Highest channel

30MHz-1000MHz



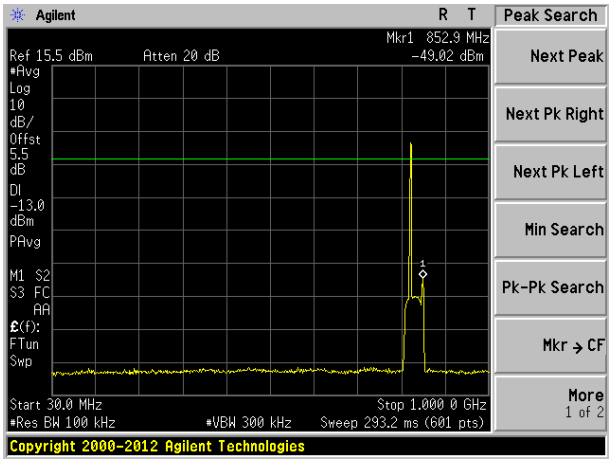
1000MHz-9000MHz



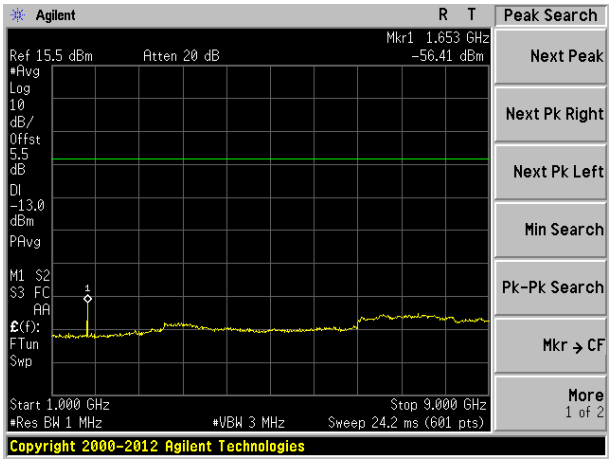
Spurious emission of LTE 3MHz Bandwidth

Lowest channel

30MHz-1000MHz

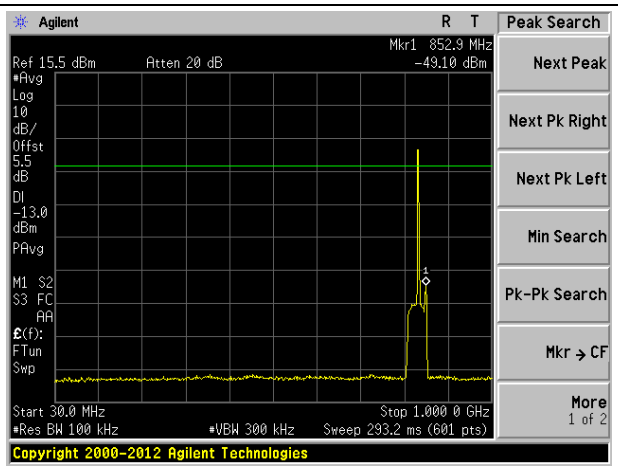


1000MHz-9000MHz

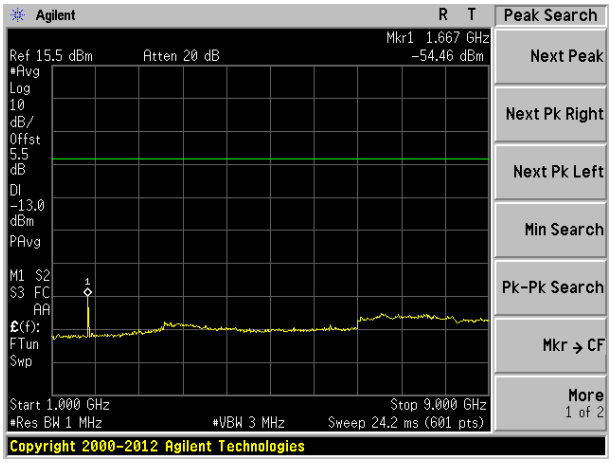


Middle channel

30MHz-1000MHz

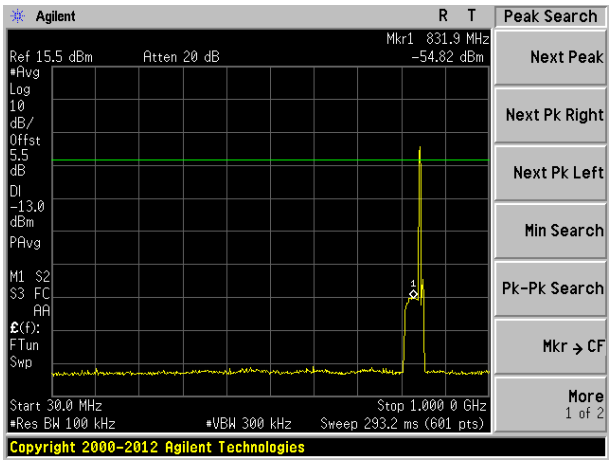


1000MHz-9000MHz

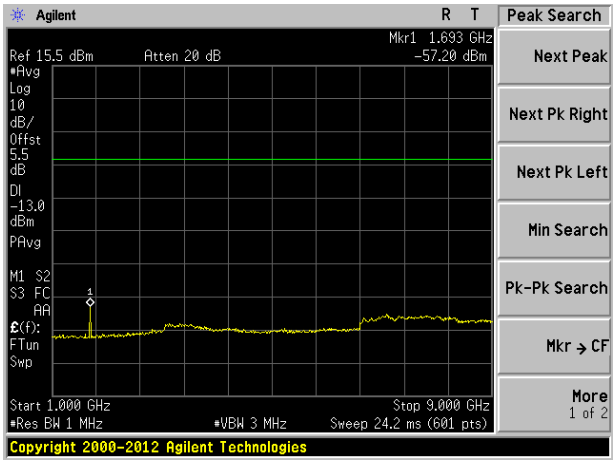


Highest channel

30MHz-1000MHz



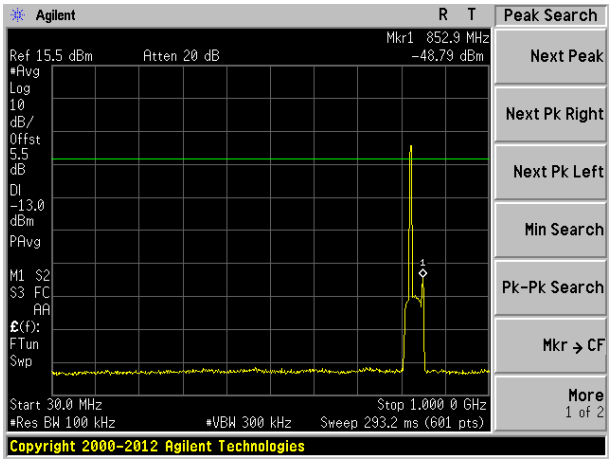
1000MHz-9000MHz



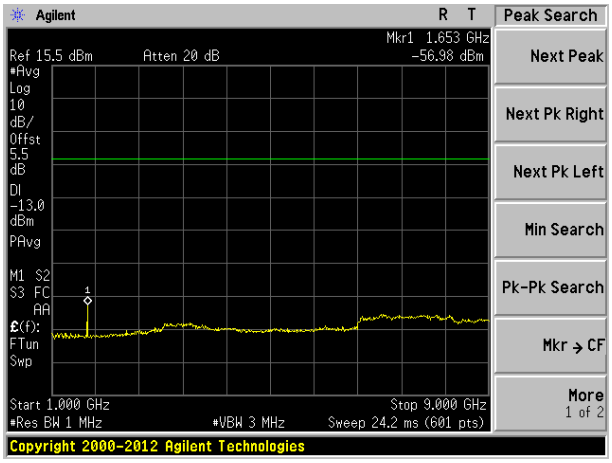
Spurious emission of LTE 5MHz Bandwidth

Lowest channel

30MHz-1000MHz

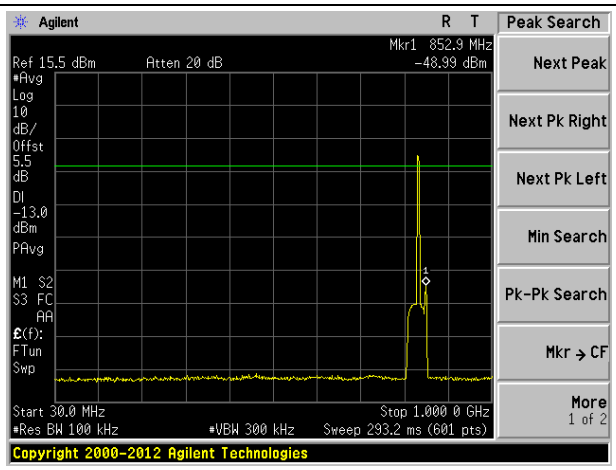


1000MHz-9000MHz

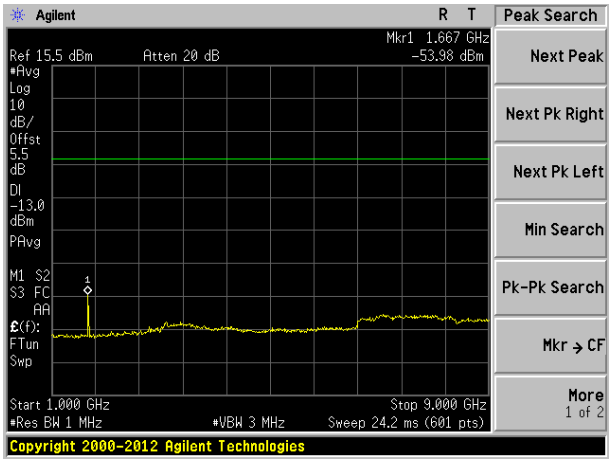


Middle channel

30MHz-1000MHz

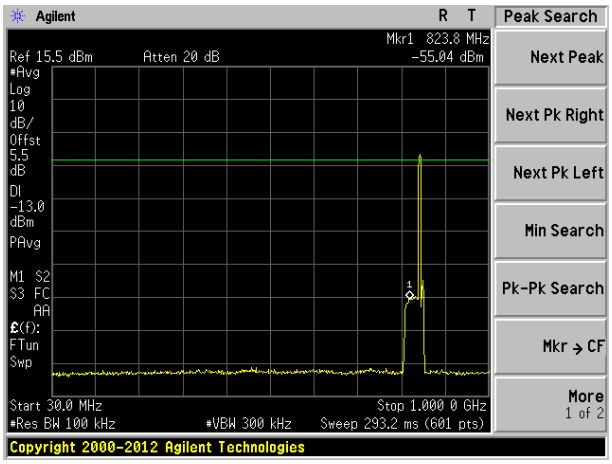


1000MHz-9000MHz

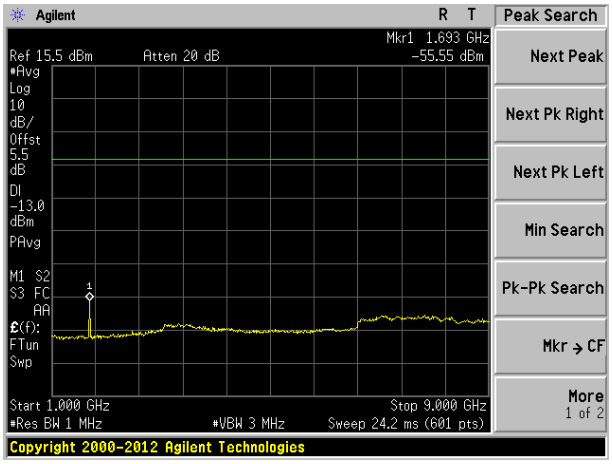


Highest channel

30MHz-1000MHz



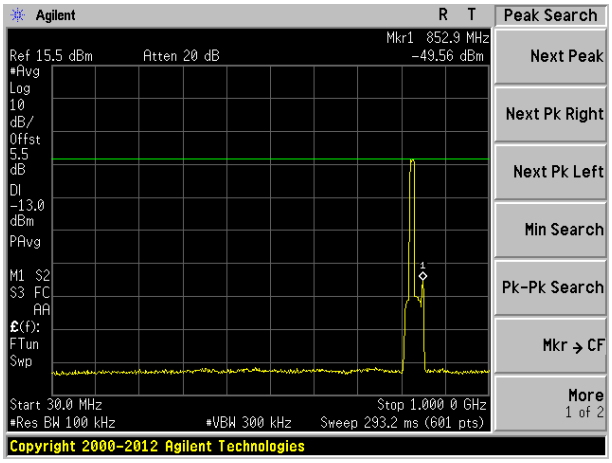
1000MHz-9000MHz



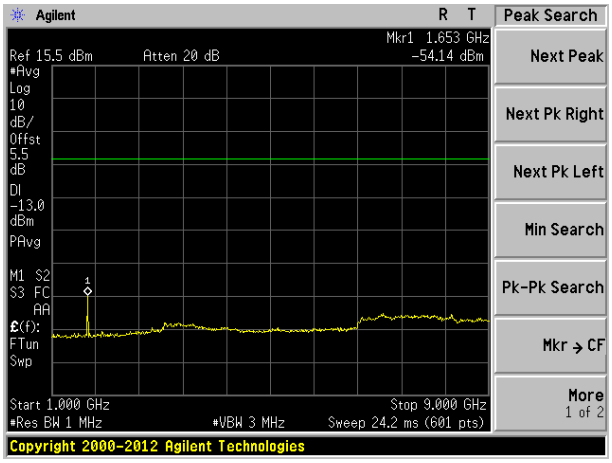
Spurious emission of LTE 10MHz Bandwidth

Lowest channel

30MHz-1000MHz

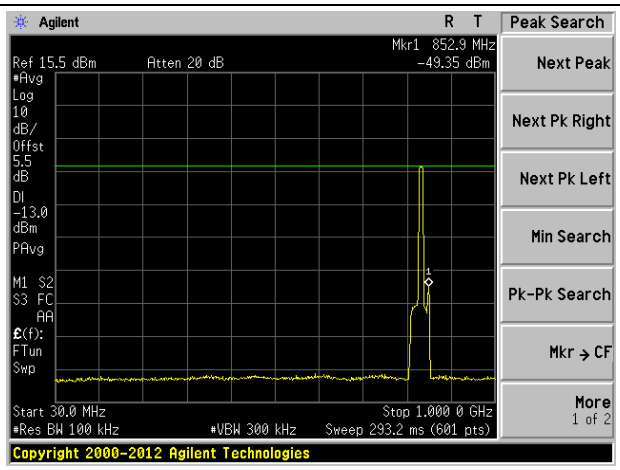


1000MHz-9000MHz

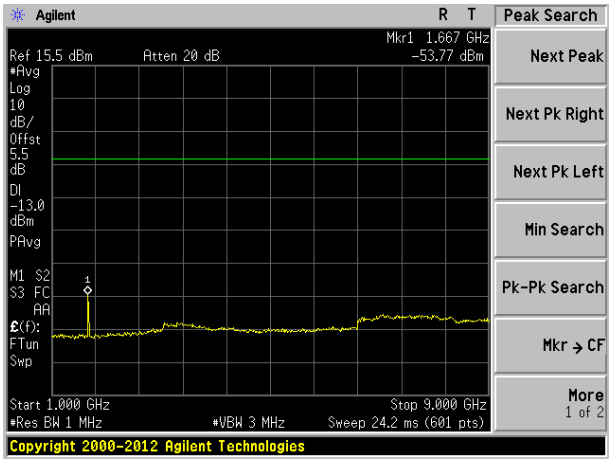


Middle channel

30MHz-1000MHz

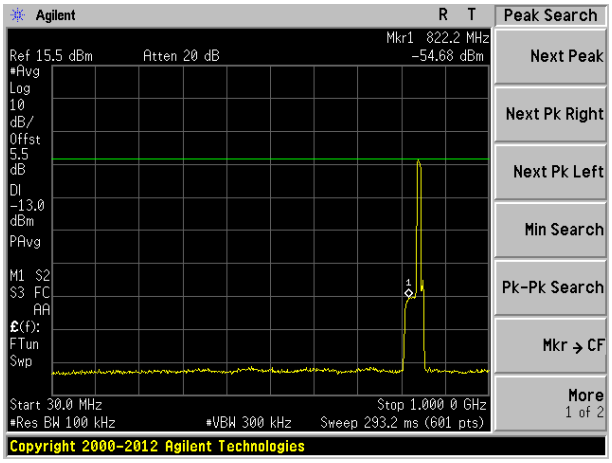


1000MHz-9000MHz

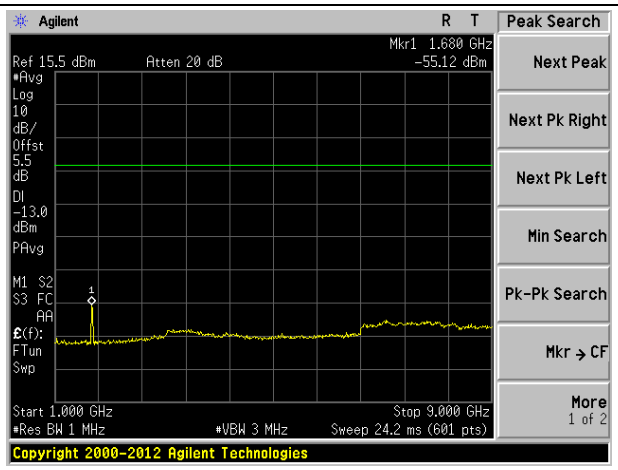


Highest channel

30MHz-1000MHz



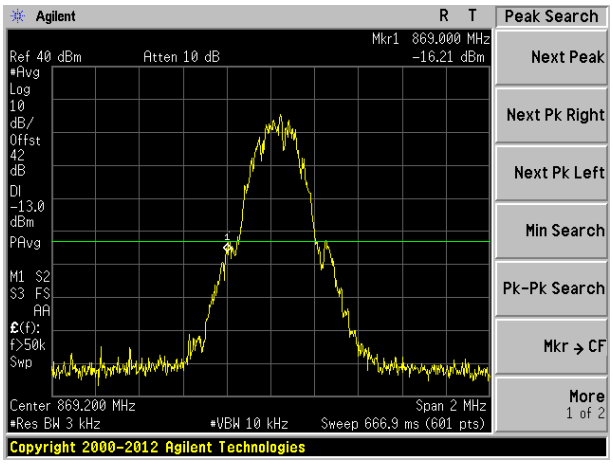
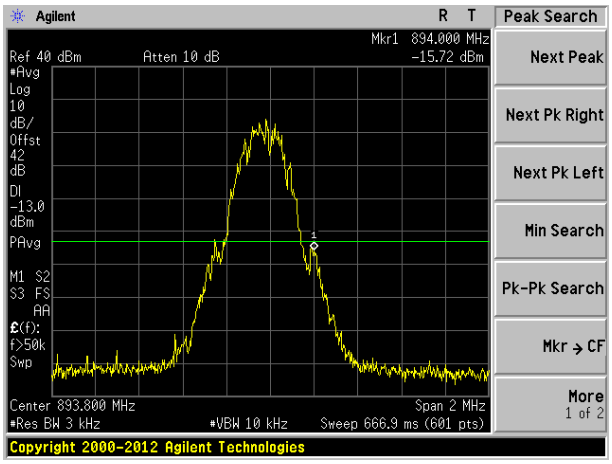
1000MHz-9000MHz



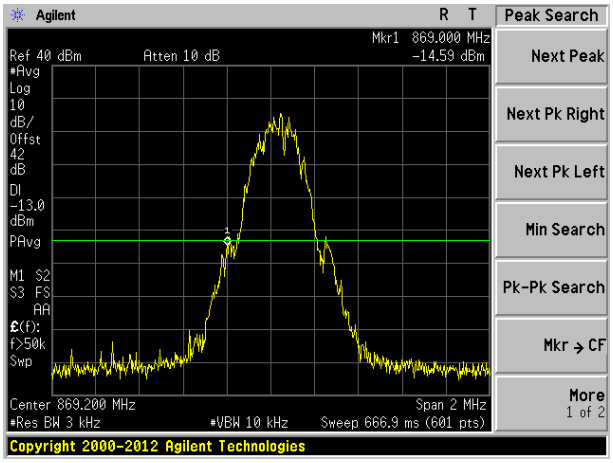
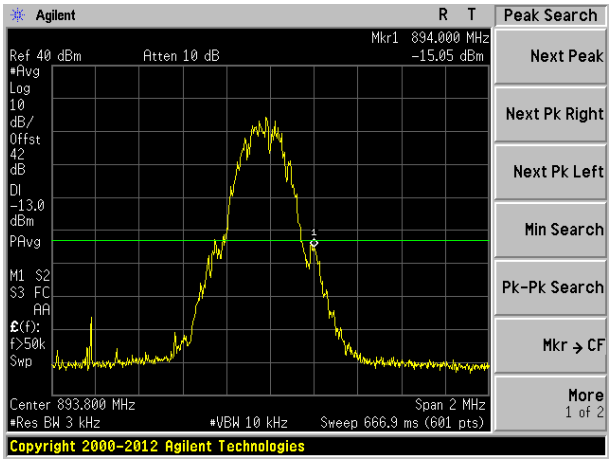
10.4.2 Band edge emission

Downlink:

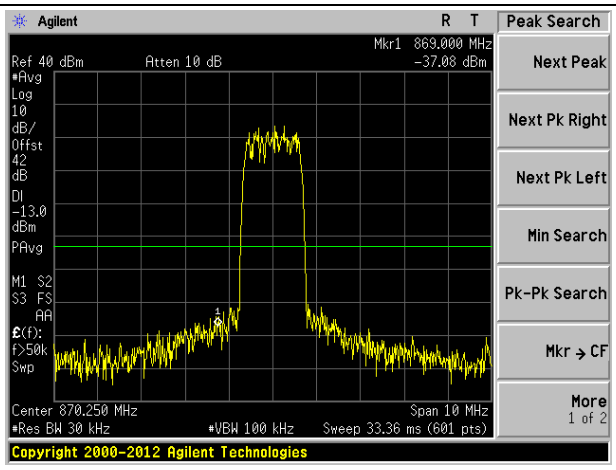
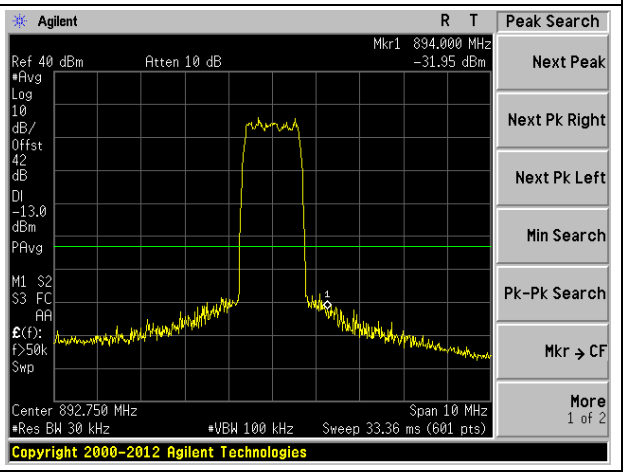
Band edge of GSM

Left edge of band	Right edge of band
	

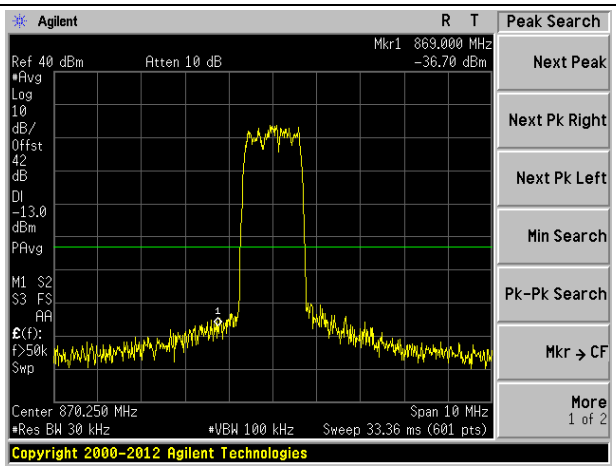
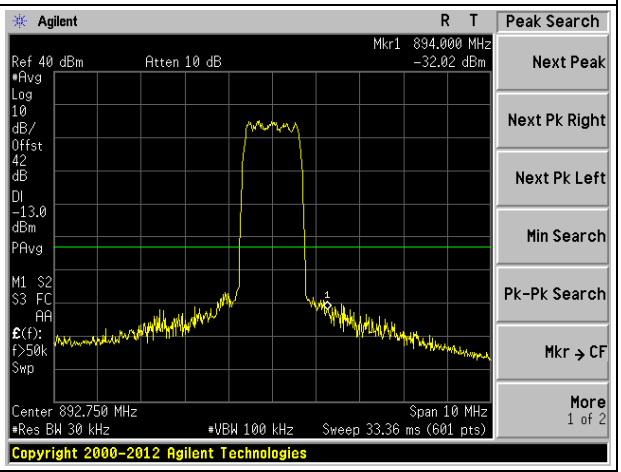
Band edge of EDGE

Left edge of band	Right edge of band
	

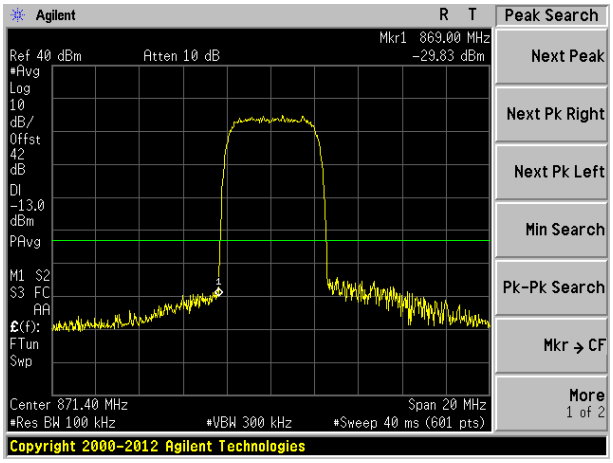
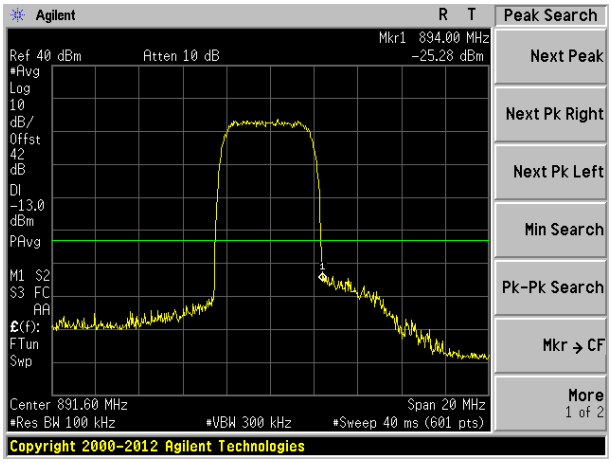
Band edge of CDMA

Left edge of band	Right edge of band
	

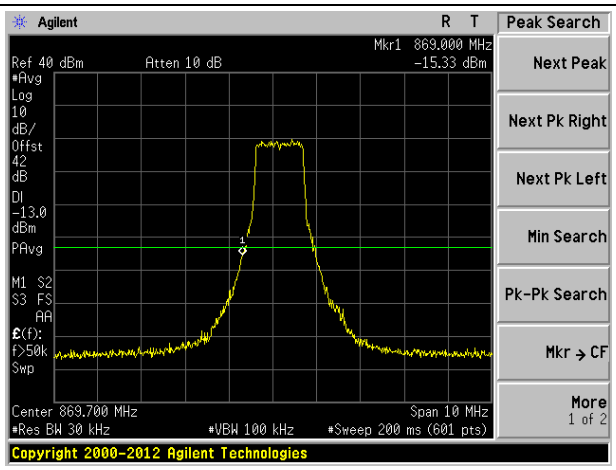
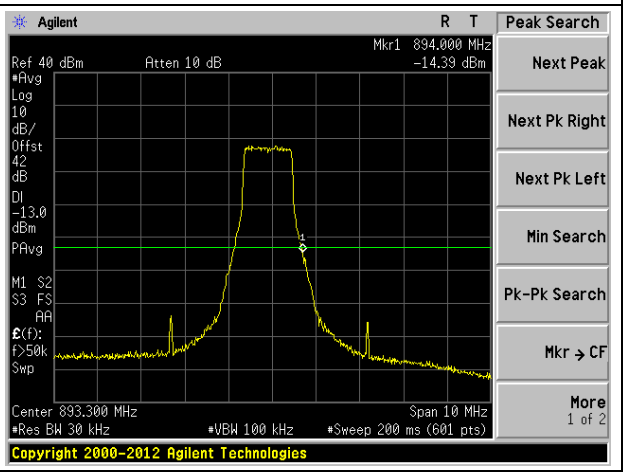
Band edge of CDMA-EVDO

Left edge of band	Right edge of band
	

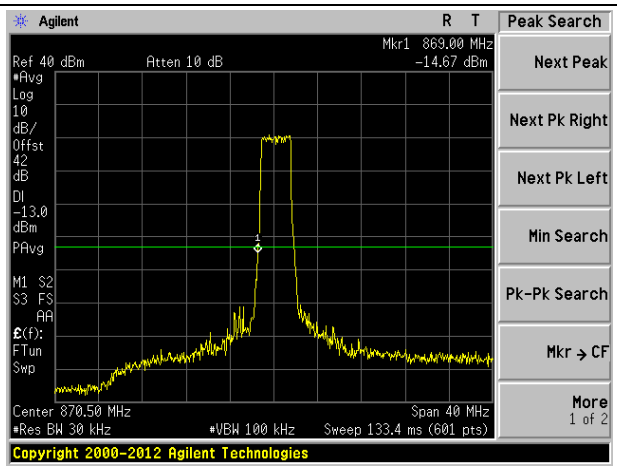
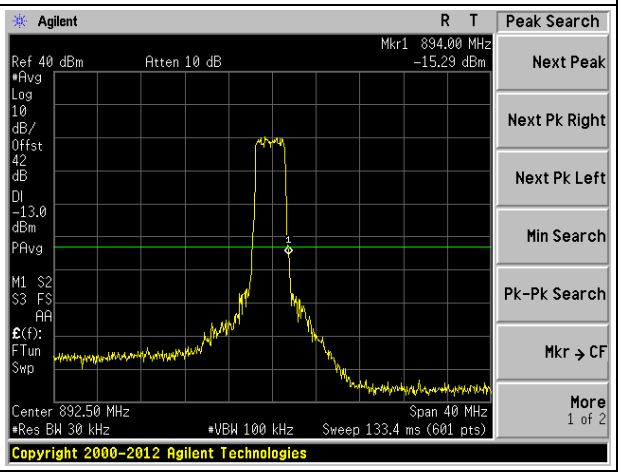
Band edge of WCDMA

Left edge of band	Right edge of band
	

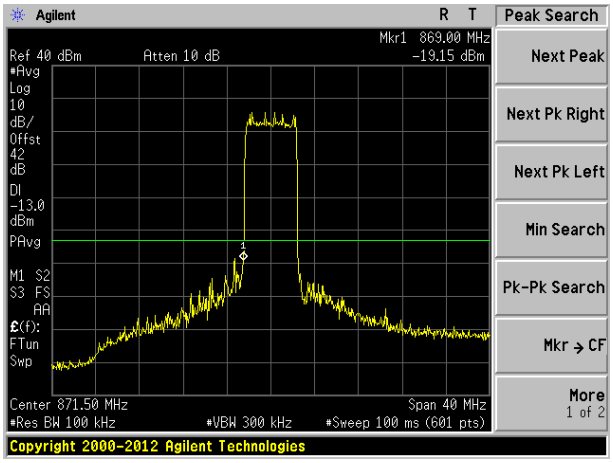
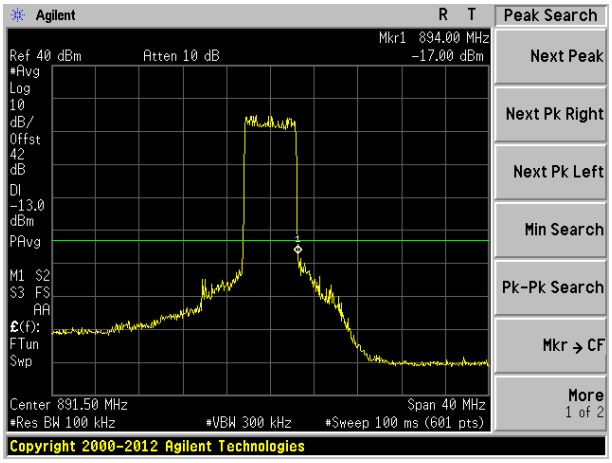
Band edge of LTE 1.4MHz Bandwidth

Left edge of band	Right edge of band
	

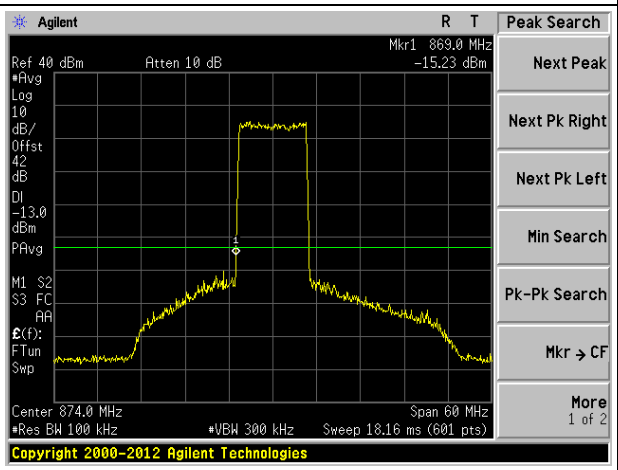
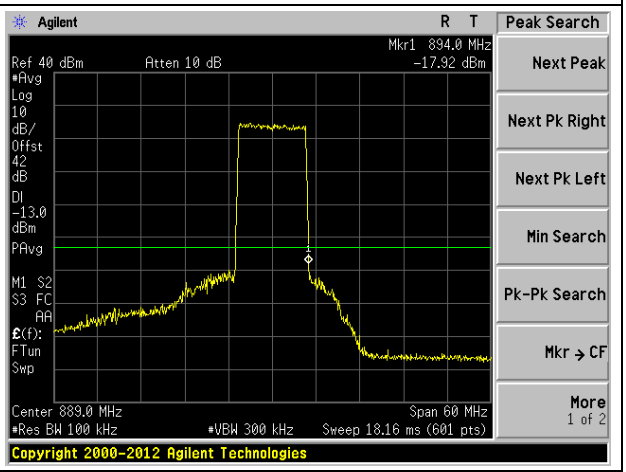
Band edge of LTE 3MHz Bandwidth

Left edge of band	Right edge of band
	

Band edge of LTE 5MHz Bandwidth

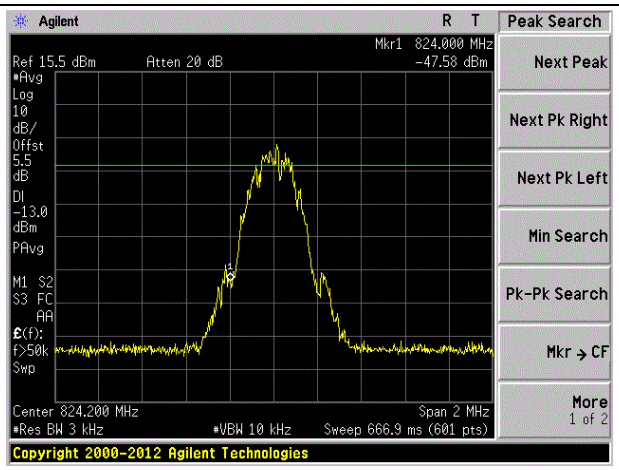
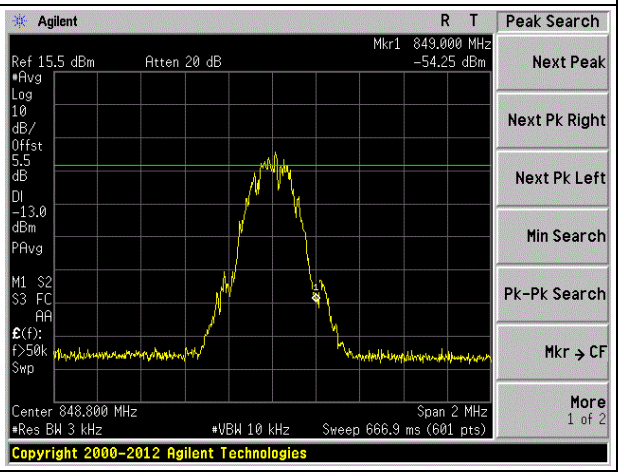
Left edge of band	Right edge of band
	

Band edge of LTE 10MHz Bandwidth

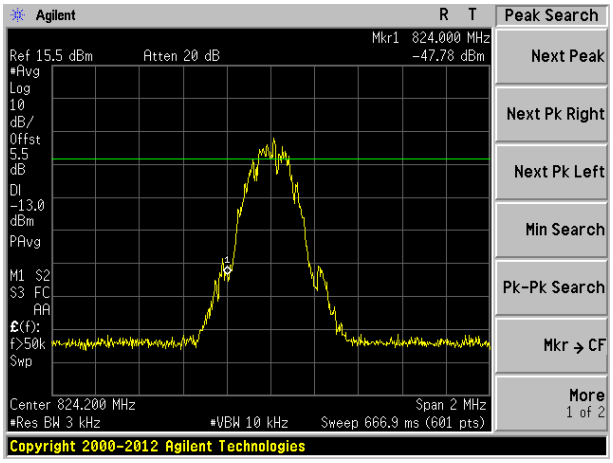
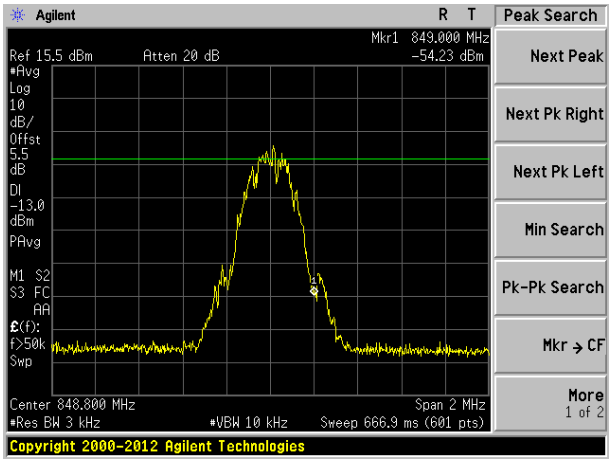
Left edge of band	Right edge of band
	

Uplink:

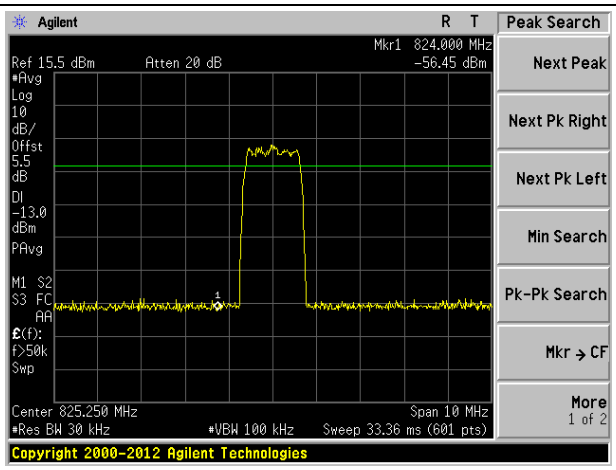
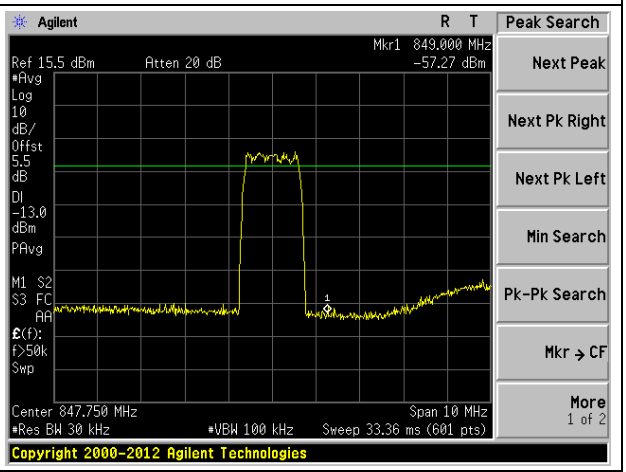
Band edge of GSM

Left edge of band	Right edge of band
	

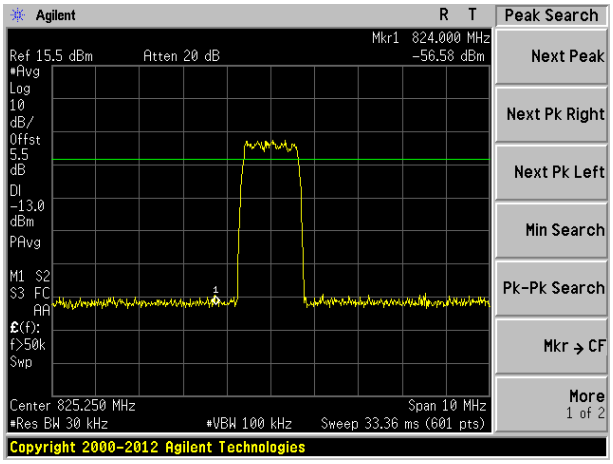
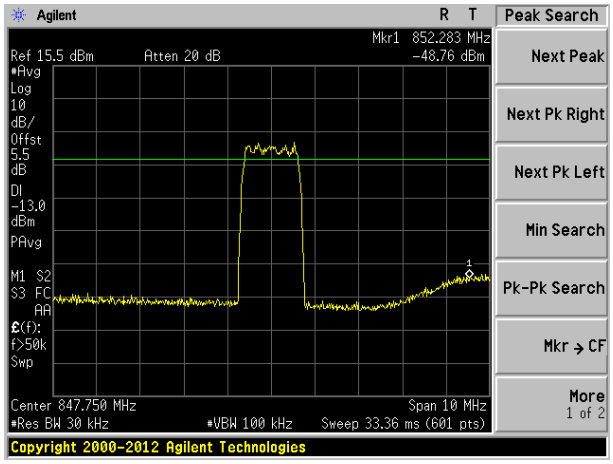
Band edge of EDGE

Left edge of band	Right edge of band
	

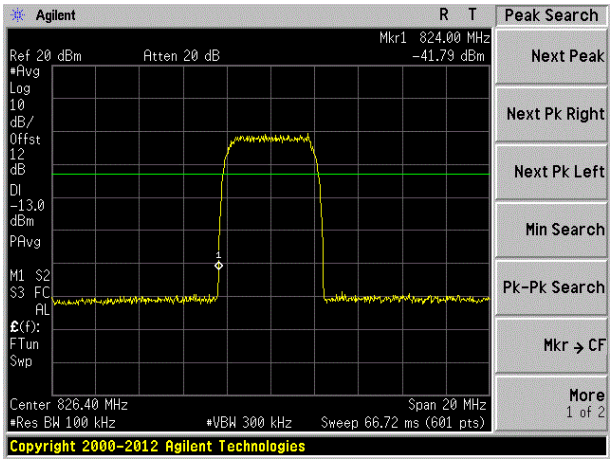
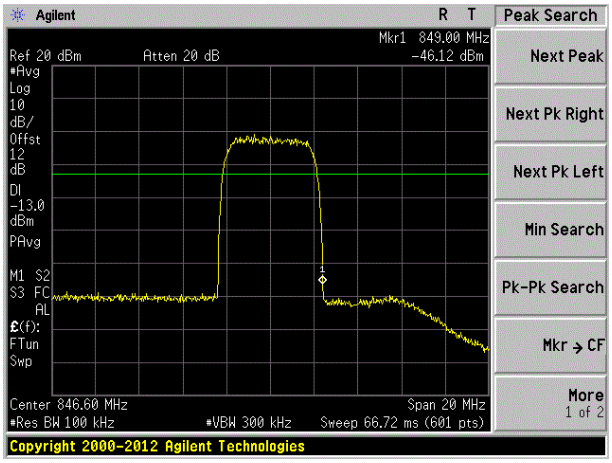
Band edge of CDMA

Left edge of band	Right edge of band
	

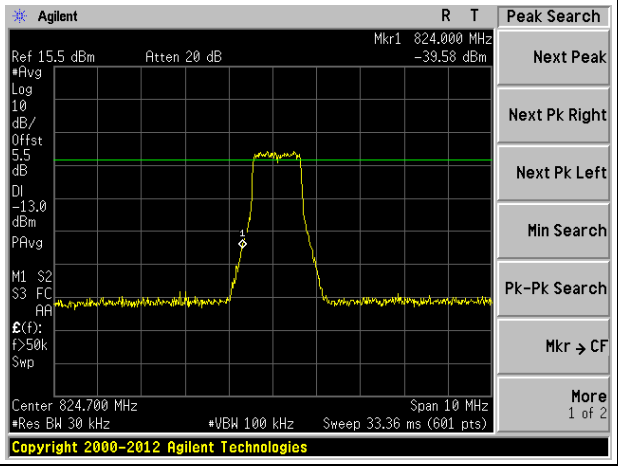
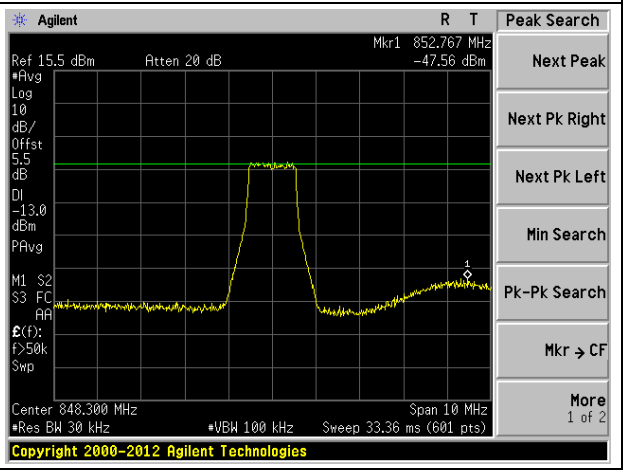
Band edge of CDMA-EVDO

Left edge of band	Right edge of band
	

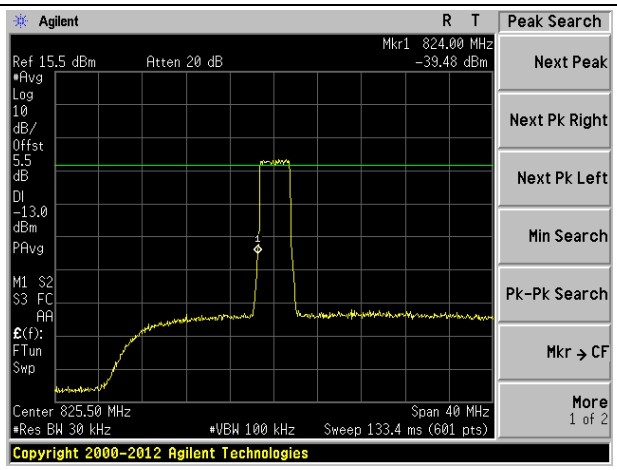
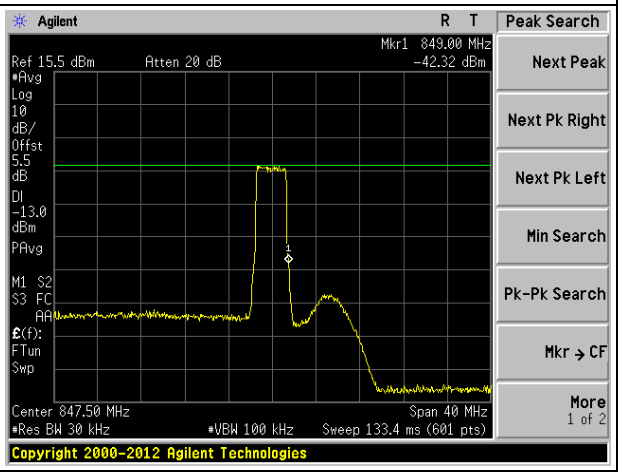
Band edge of WCDMA

Left edge of band	Right edge of band
	

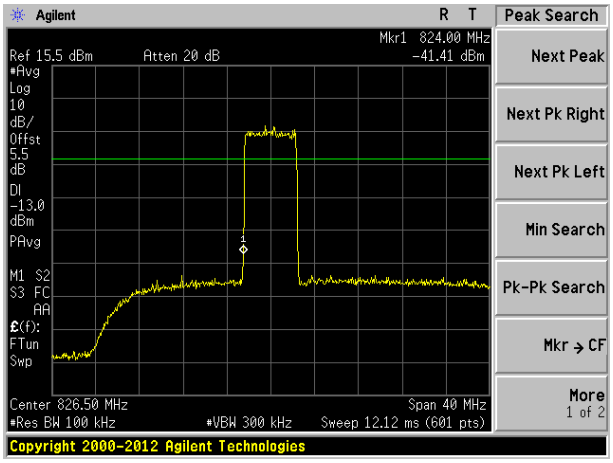
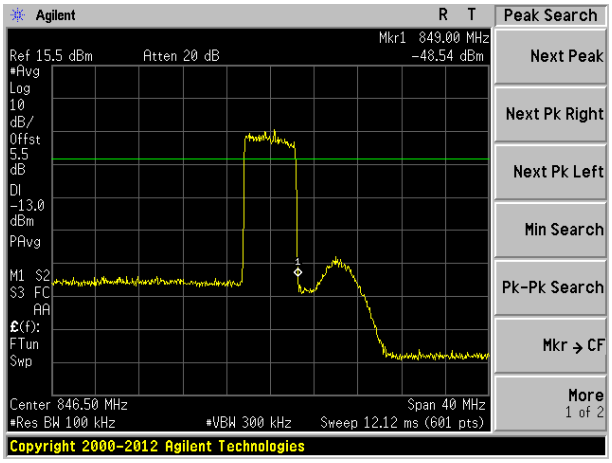
Band edge of LTE 1.4MHz Bandwidth

Left edge of band	Right edge of band
	

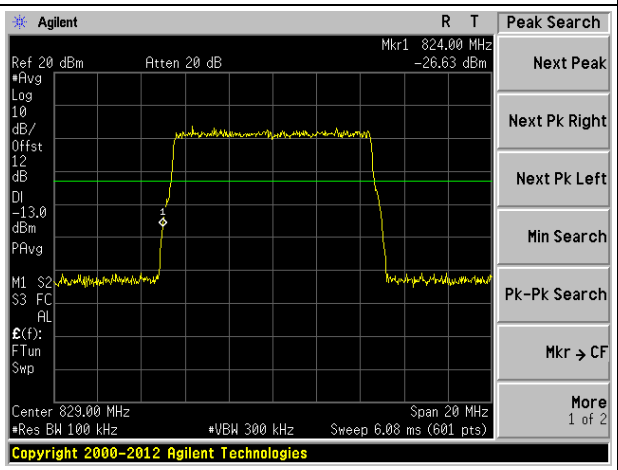
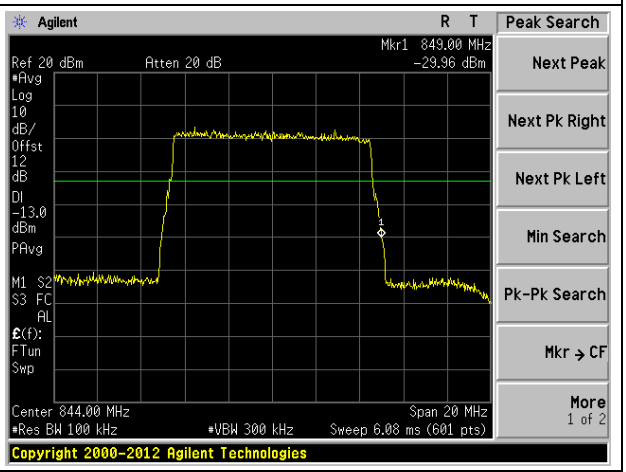
Band edge of LTE 3MHz Bandwidth

Left edge of band	Right edge of band
	

Band edge of LTE 5MHz Bandwidth

Left edge of band	Right edge of band
	

Band edge of LTE 10MHz Bandwidth

Left edge of band	Right edge of band
	

11 INTERMODULATION

11.1 Standard Applicable

According to FCC §2.1051 and §22.917(a).

11.2 Test setup

Please refer the section §6.2 Configuration of Tested System.

11.3 Measurement Procedure

1. The EUT RF output port was connected to spectrum analyzer. The EUT shall be set to maximum gain
   and maximum rated output power per channel.
2. Two continuous sinusoidal RF signals shall be fed to the input antenna port of the repeater using a combining device. The two channels near each other should be separated by at least one operating channel width.
3. The spurious emissions at antenna were measured at the RF output port of the EUT.
4. The modulation types tested is WCDMA/CDMA/CDMA EV-DO/GSM/EDGE/LTE

Spectrum analyzer settings:

Detector: RMS.

Intermodulation:

RBW=100 kHz; VBW≥ RBW

Spurious emissions:

Below 1G: RBW=100kHz; Above 1G: RBW=1 MHz ; VBW≥ RBW

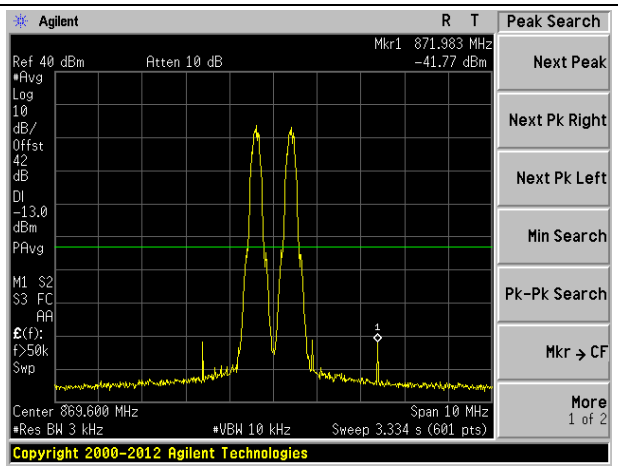
11.4 Test Result

Passed.

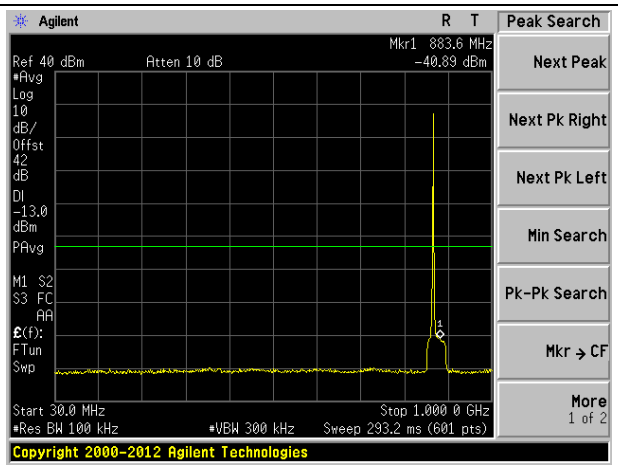
Downlink:

Intermodulation of GSM

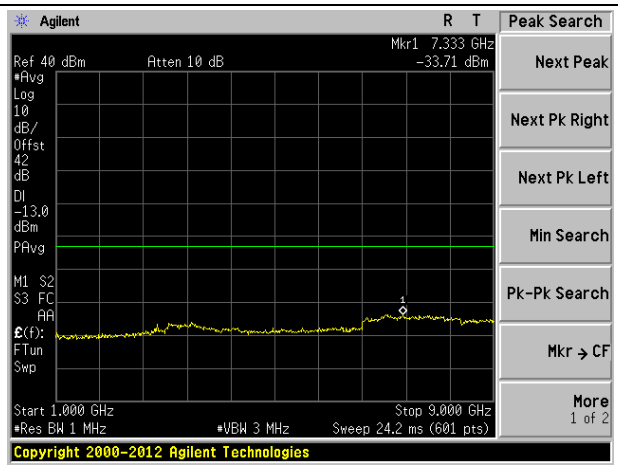
Intermodulation - Low part of band



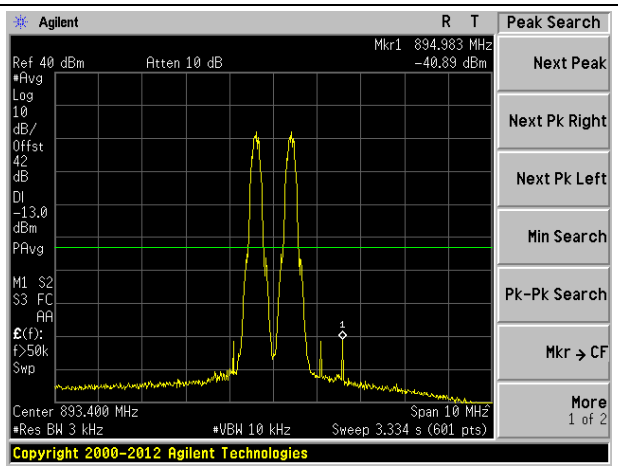
30MHz-1000MHz spurious emissions



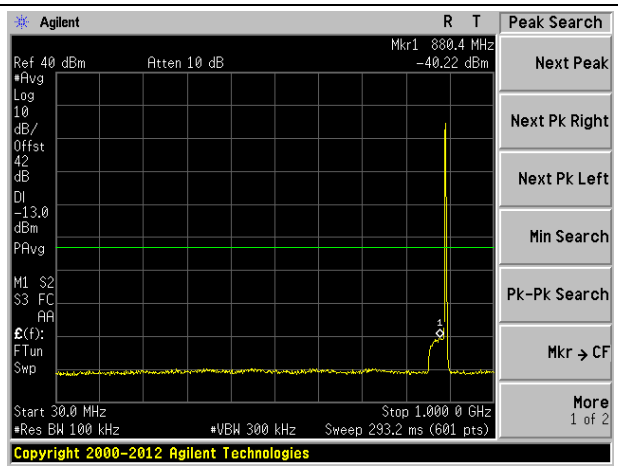
1000MHz-9000MHz spurious emissions



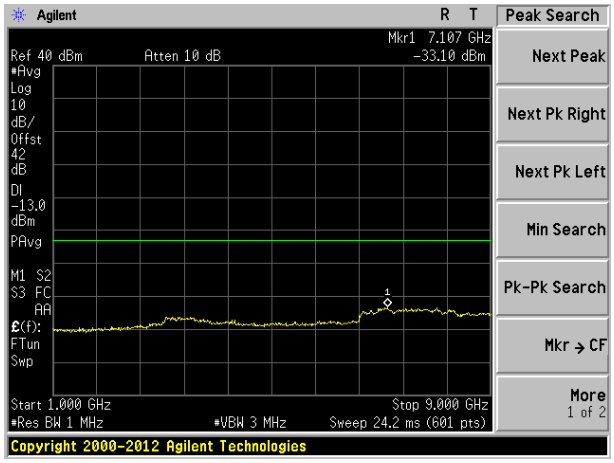
Intermodulation - High part of band



30MHz-1000MHz spurious emissions

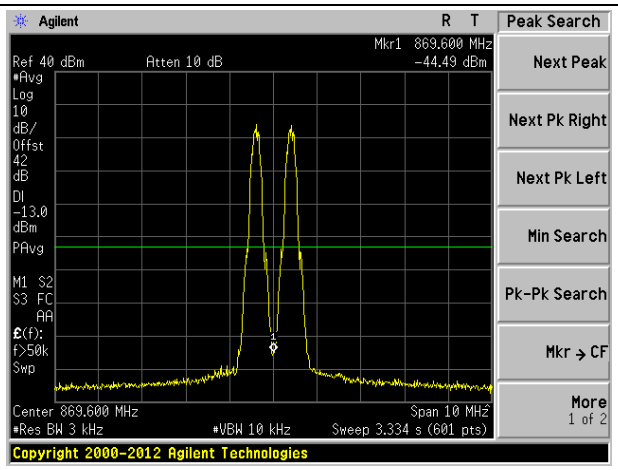


1000MHz-9000MHz spurious emissions

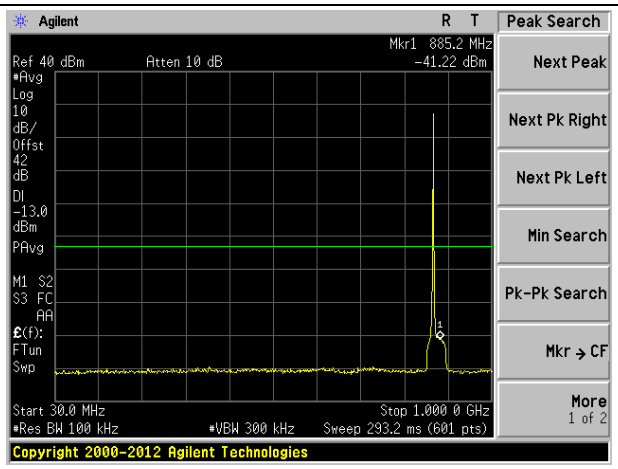


Intermodulation of EDGE

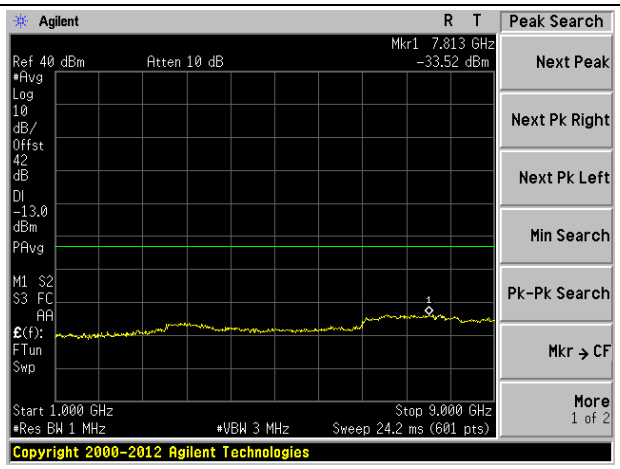
Intermodulation - Low part of band



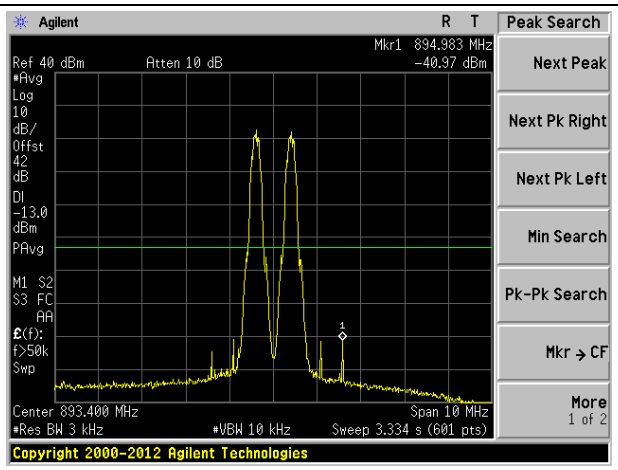
30MHz-1000MHz spurious emissions



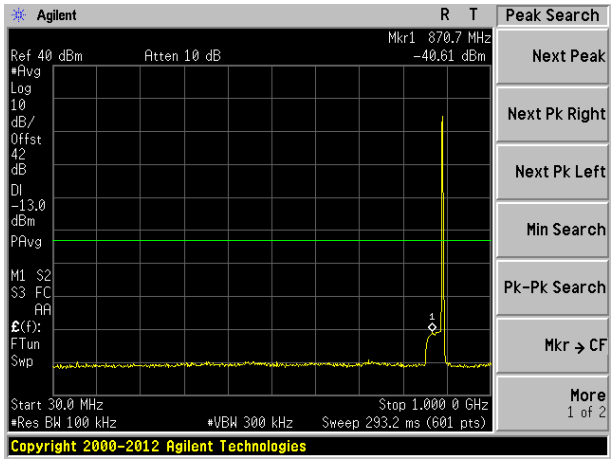
1000MHz-9000MHz spurious emissions



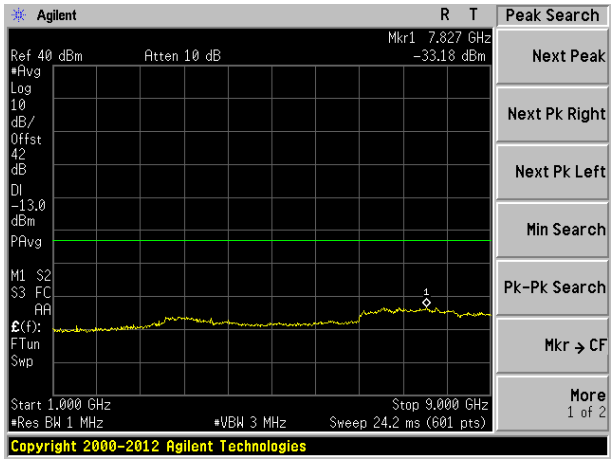
Intermodulation - High part of band



30MHz-1000MHz spurious emissions

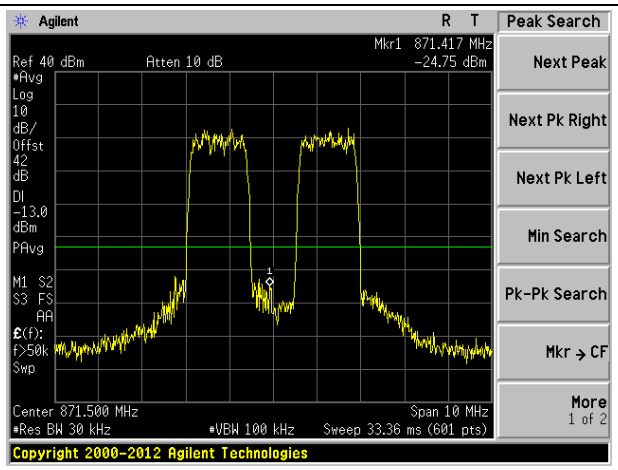


1000MHz-9000MHz spurious emissions

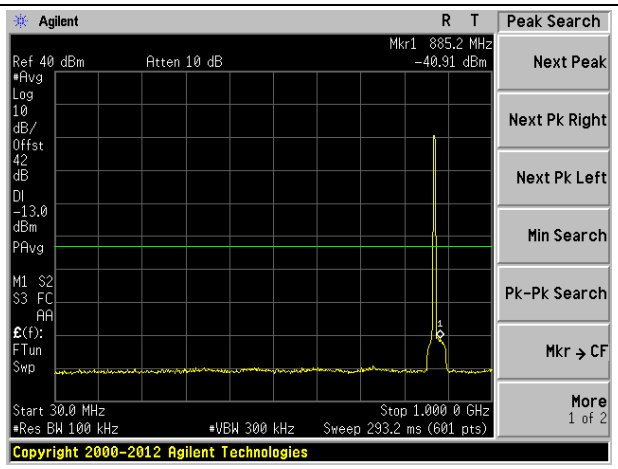


Intermodulation of CDMA

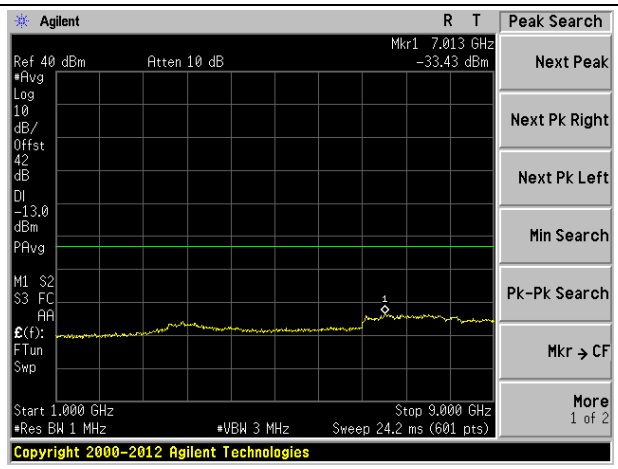
Intermodulation - Low part of band



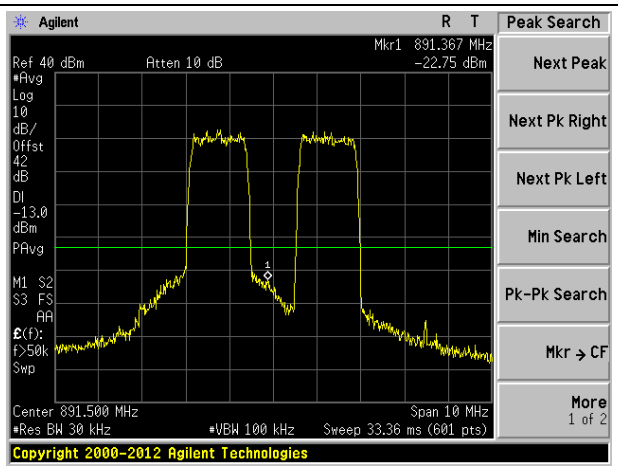
30MHz-1000MHz spurious emissions



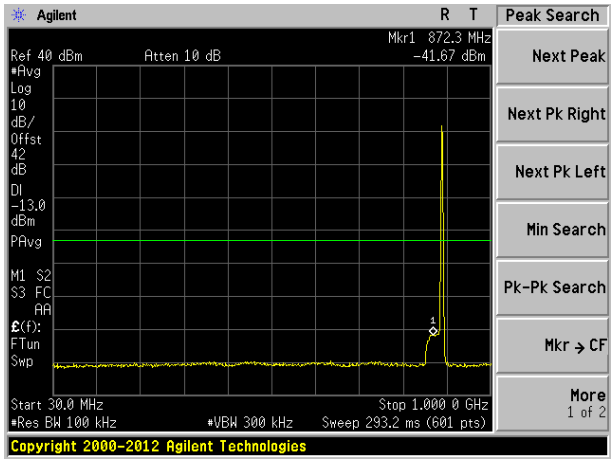
1000MHz-9000MHz spurious emissions



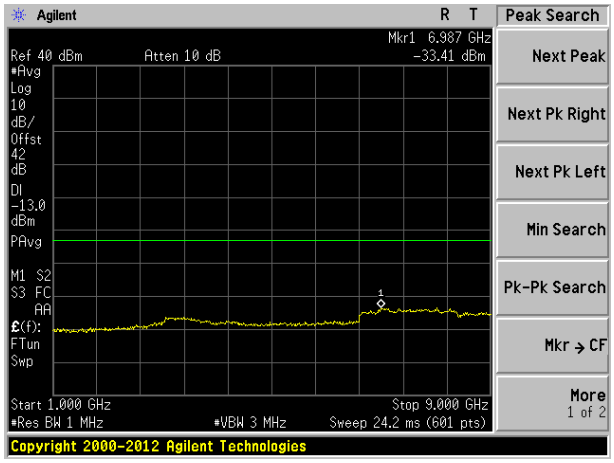
Intermodulation - High part of band



30MHz-1000MHz spurious emissions

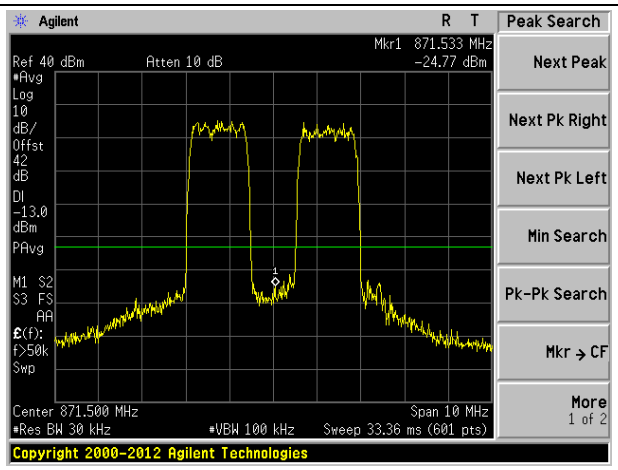


1000MHz-9000MHz spurious emissions

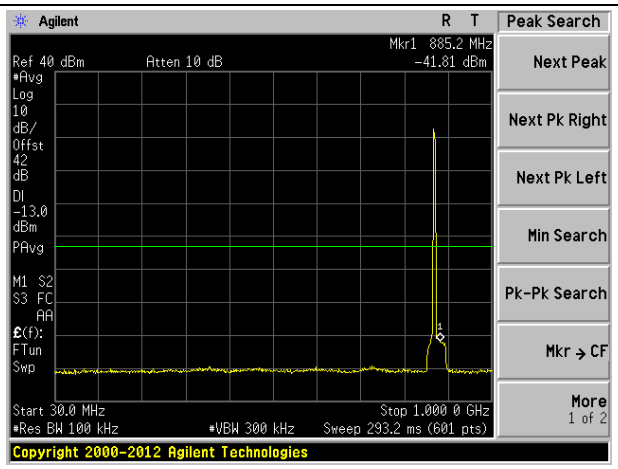


Intermodulation of CDMA-EVDO

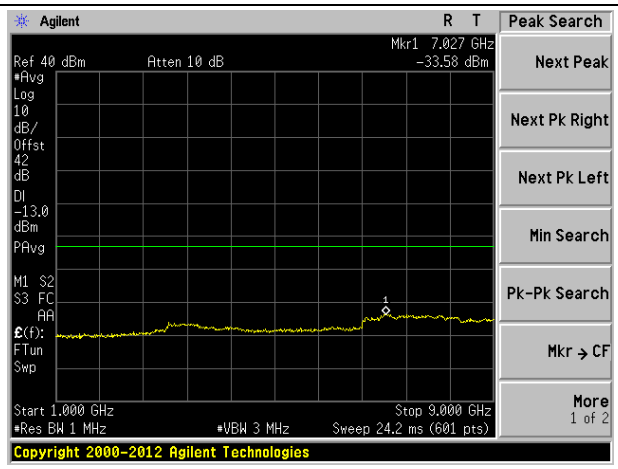
Intermodulation - Low part of band



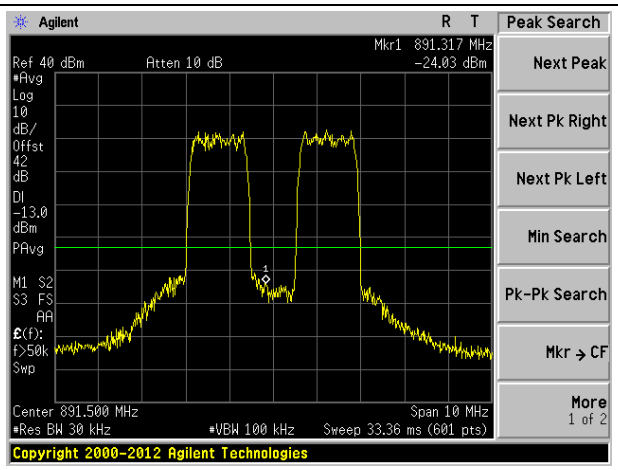
30MHz-1000MHz spurious emissions



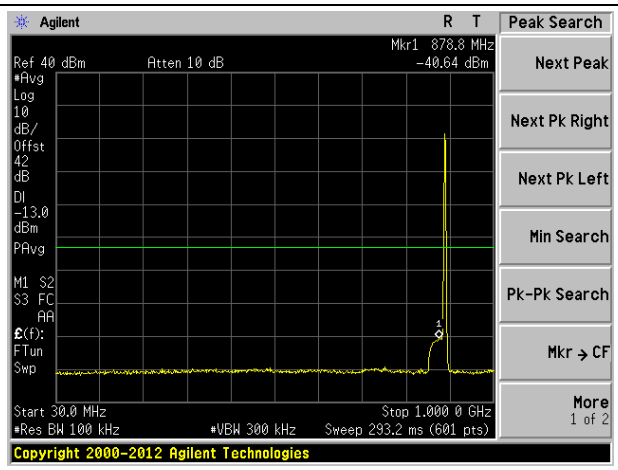
1000MHz-9000MHz spurious emissions



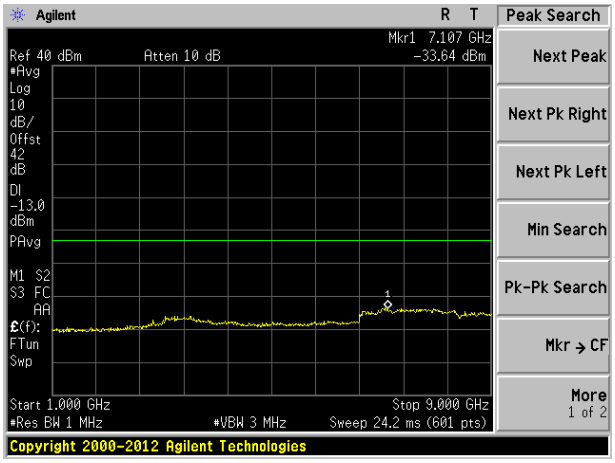
Intermodulation - High part of band



30MHz-1000MHz spurious emissions

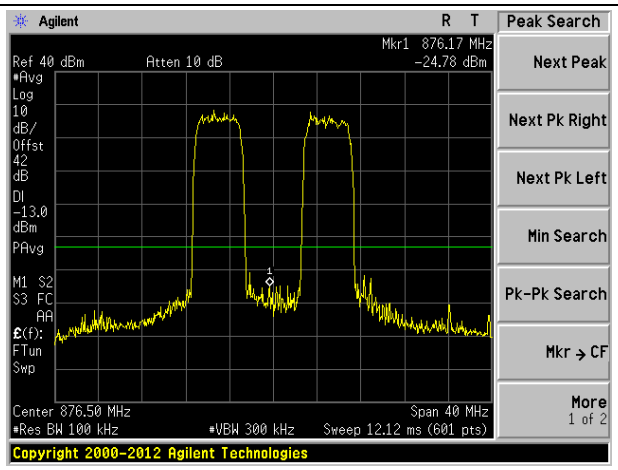


1000MHz-9000MHz spurious emissions

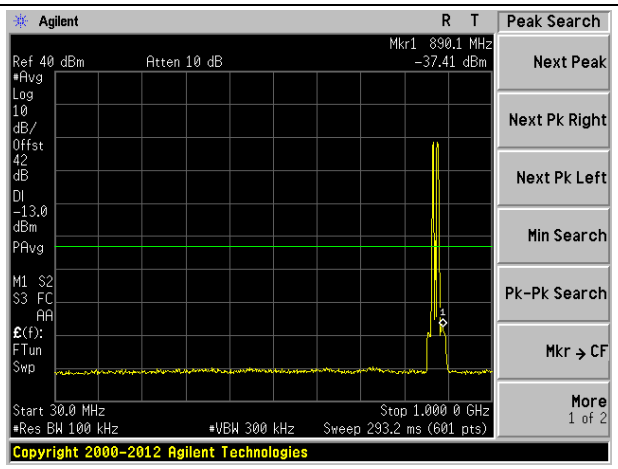


Intermodulation of WCDMA

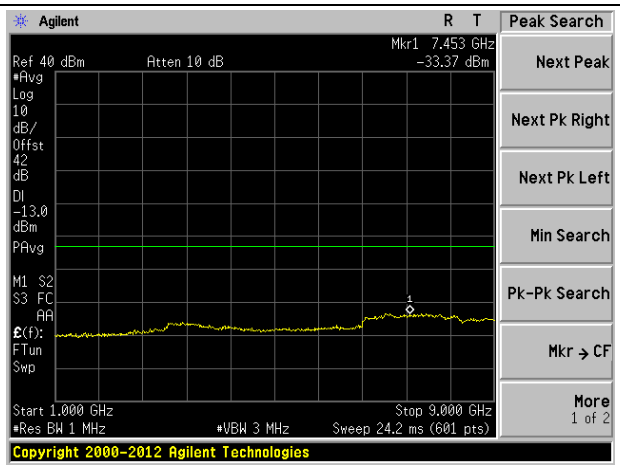
Intermodulation - Low part of band



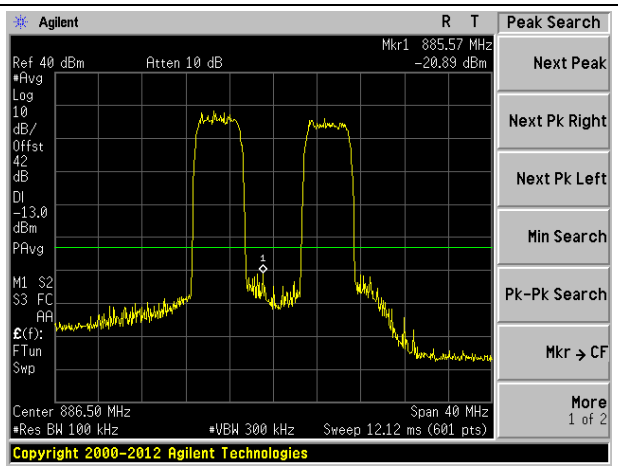
30MHz-1000MHz spurious emissions



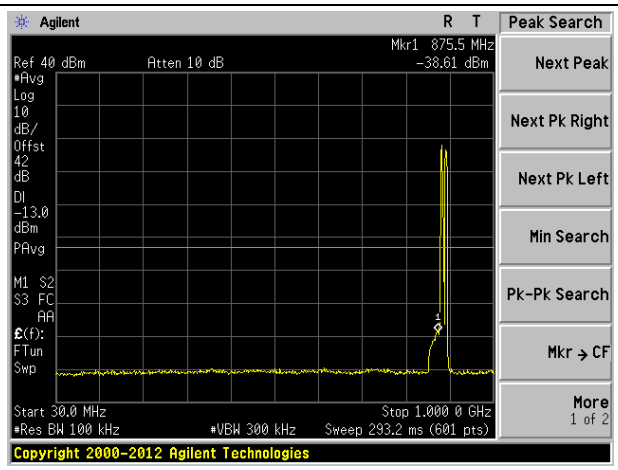
1000MHz-9000MHz spurious emissions



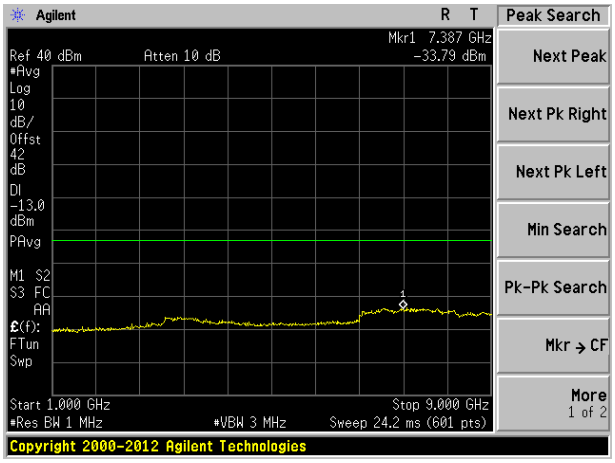
Intermodulation - High part of band



30MHz-1000MHz spurious emissions

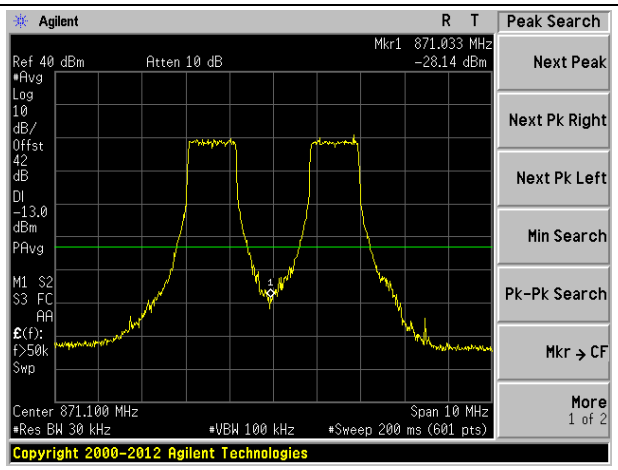


1000MHz-9000MHz spurious emissions

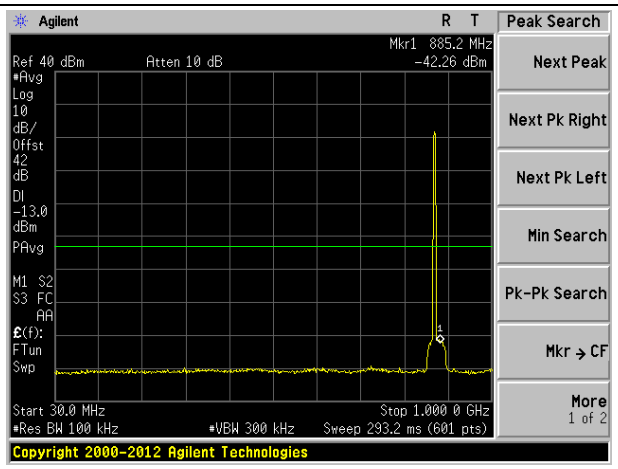


Intermodulation of LTE 1.4MHz Bandwidth

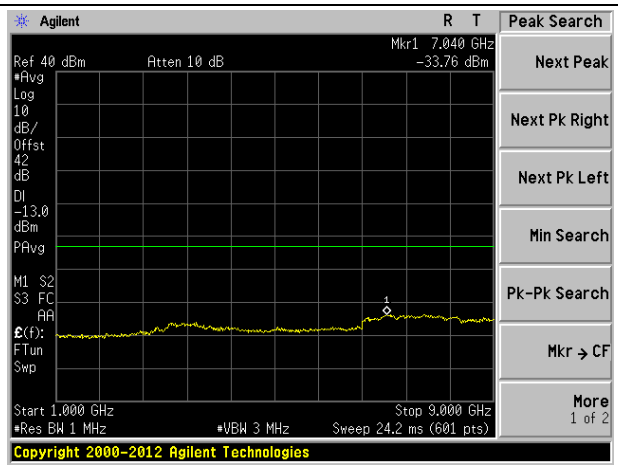
Intermodulation - Low part of band



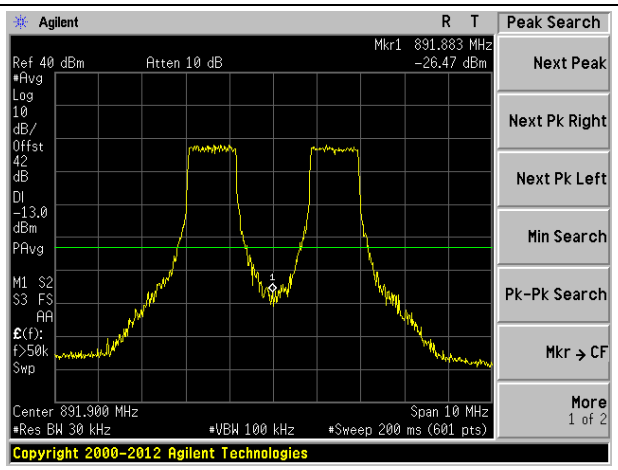
30MHz-1000MHz spurious emissions



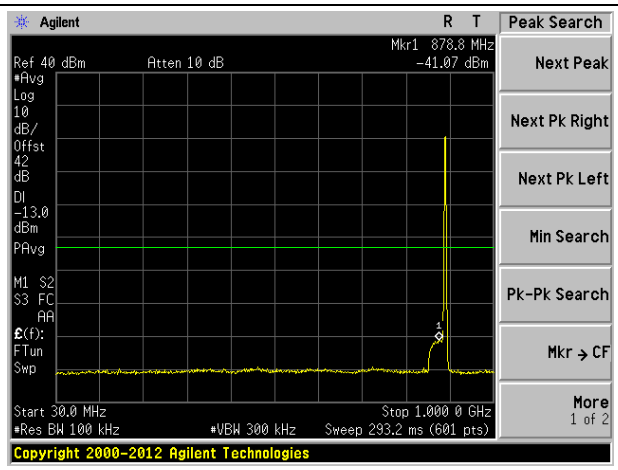
1000MHz-9000MHz spurious emissions



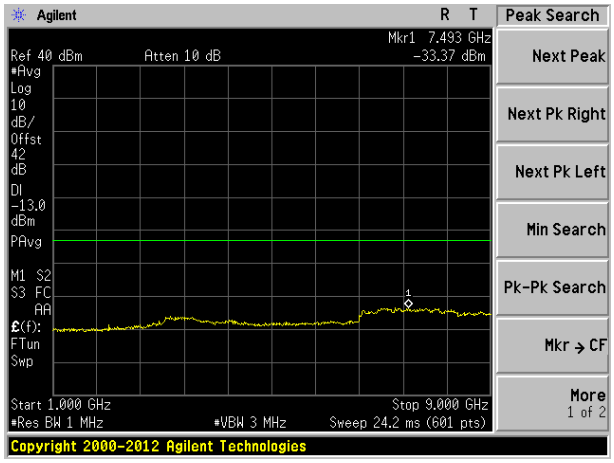
Intermodulation - High part of band



30MHz-1000MHz spurious emissions

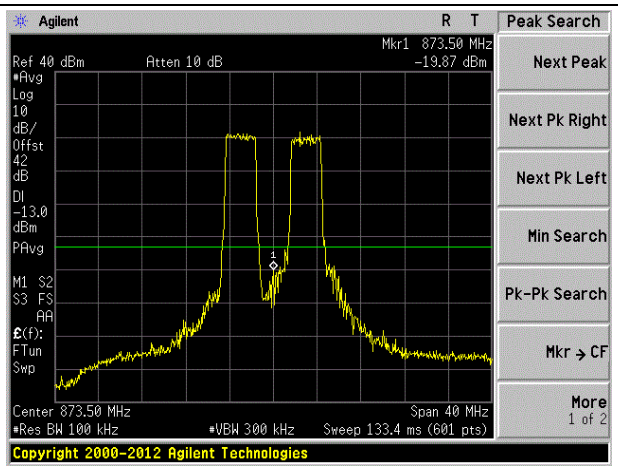


1000MHz-9000MHz spurious emissions

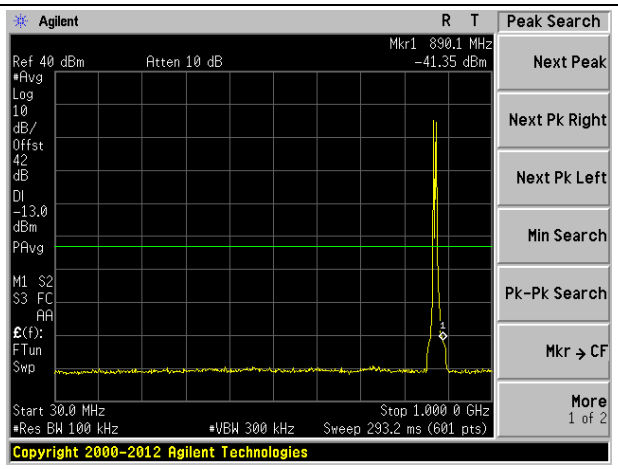


Intermodulation of LTE 3MHz Bandwidth

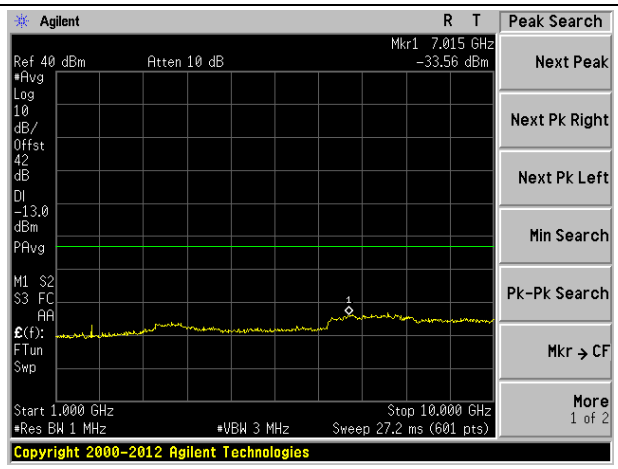
Intermodulation - Low part of band



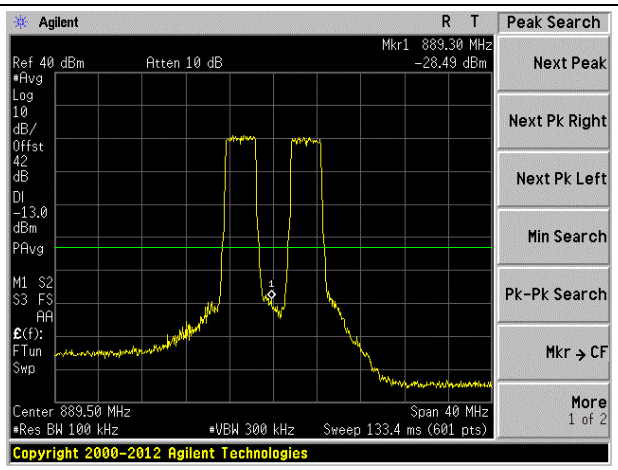
30MHz-1000MHz spurious emissions



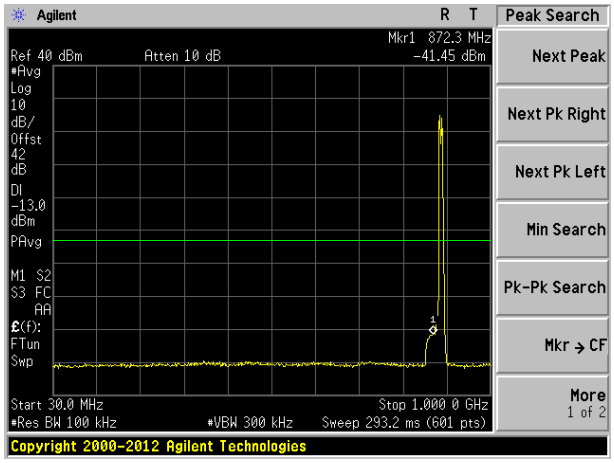
1000MHz-9000MHz spurious emissions



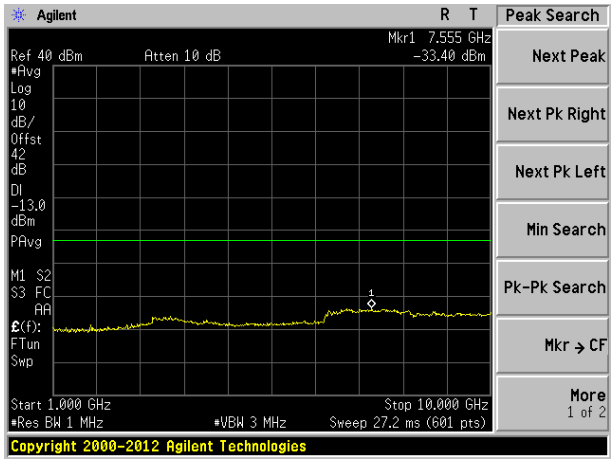
Intermodulation - High part of band



30MHz-1000MHz spurious emissions

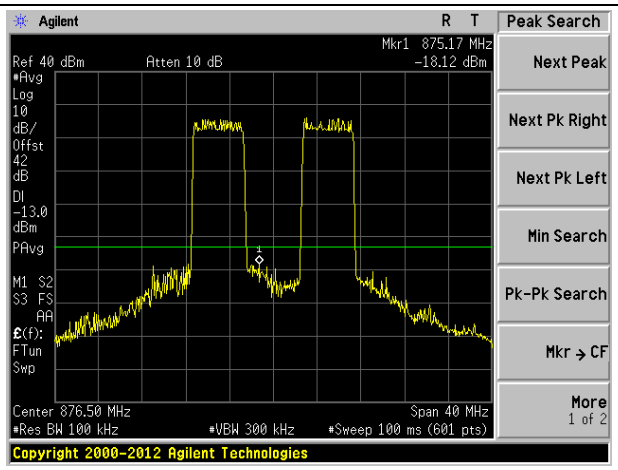


1000MHz-9000MHz spurious emissions

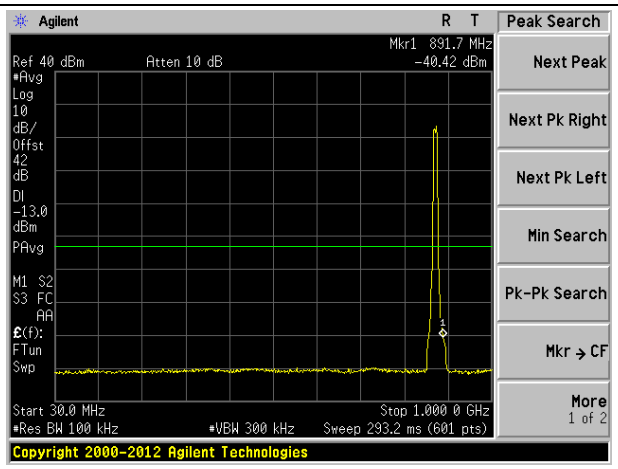


Intermodulation of LTE 5MHz Bandwidth

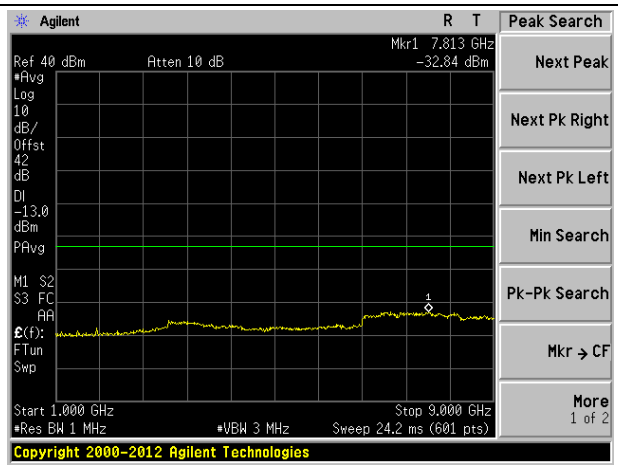
Intermodulation - Low part of band



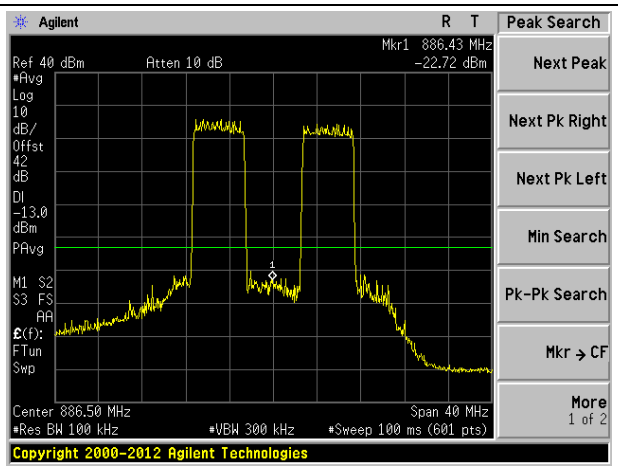
30MHz-1000MHz spurious emissions



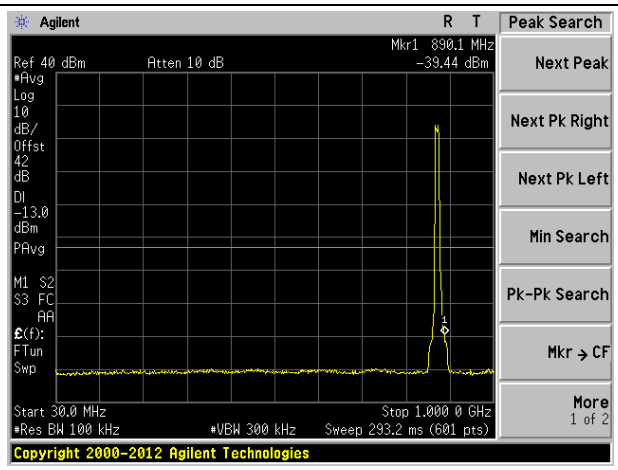
1000MHz-9000MHz spurious emissions



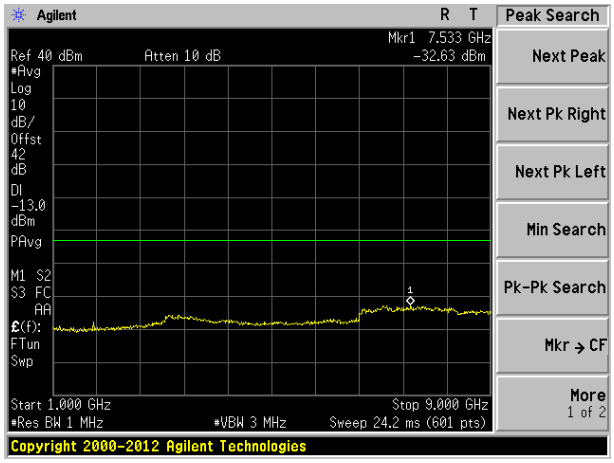
Intermodulation - High part of band



30MHz-1000MHz spurious emissions



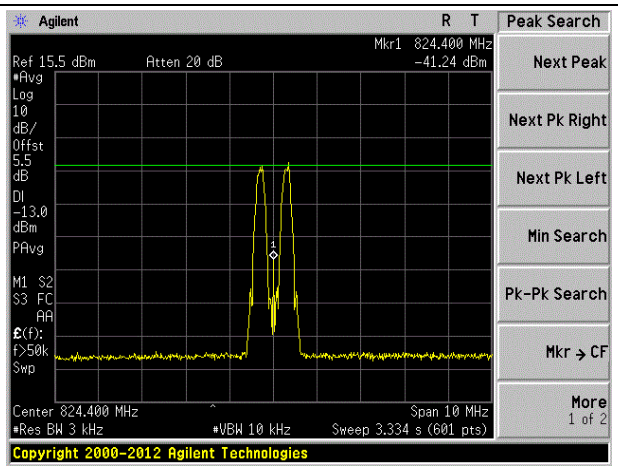
1000MHz-9000MHz spurious emissions



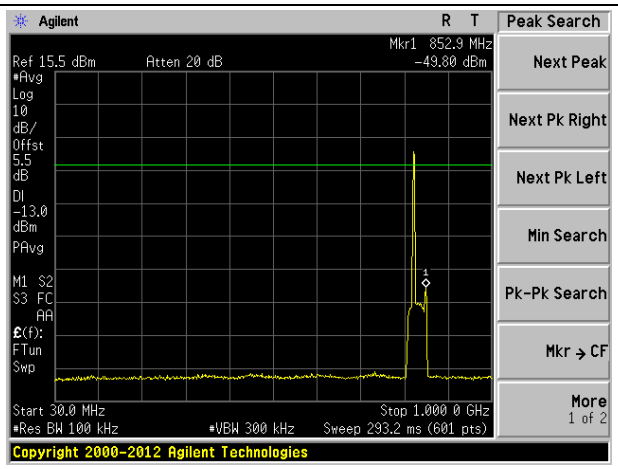
Uplink:

Intermodulation of GSM

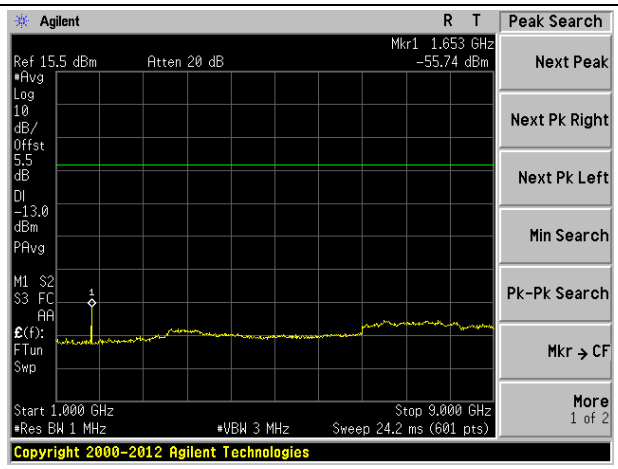
Intermodulation - Low part of band



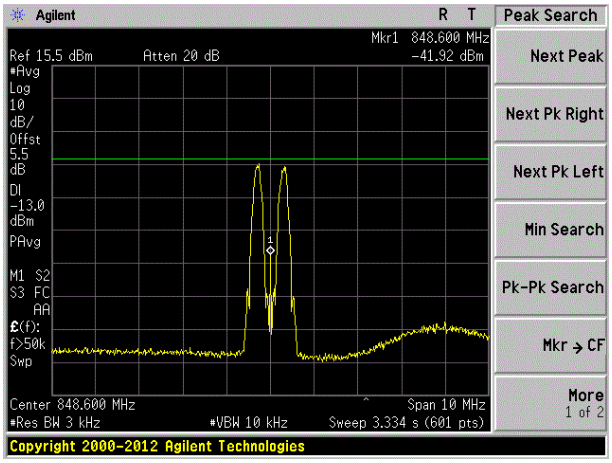
30MHz-1000MHz spurious emissions



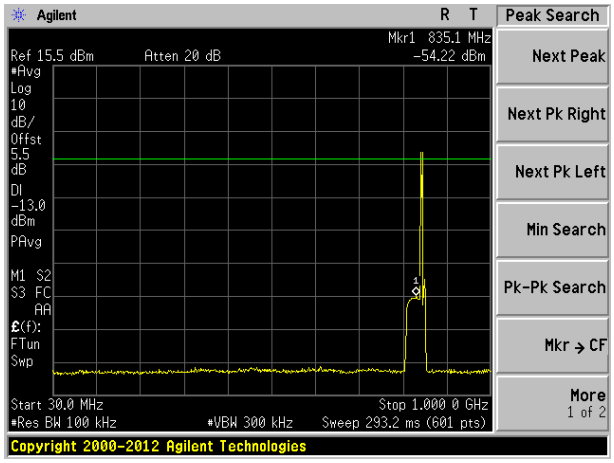
1000MHz-9000MHz spurious emissions



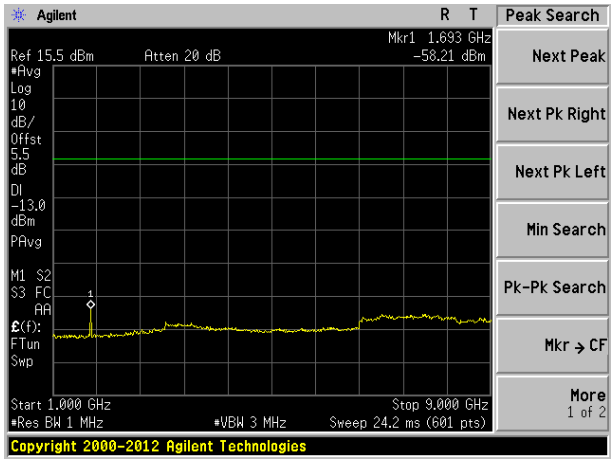
Intermodulation - High part of band



30MHz-1000MHz spurious emissions

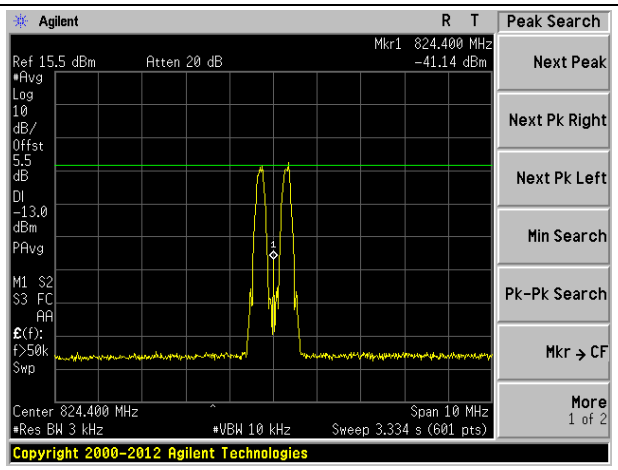


1000MHz-9000MHz spurious emissions

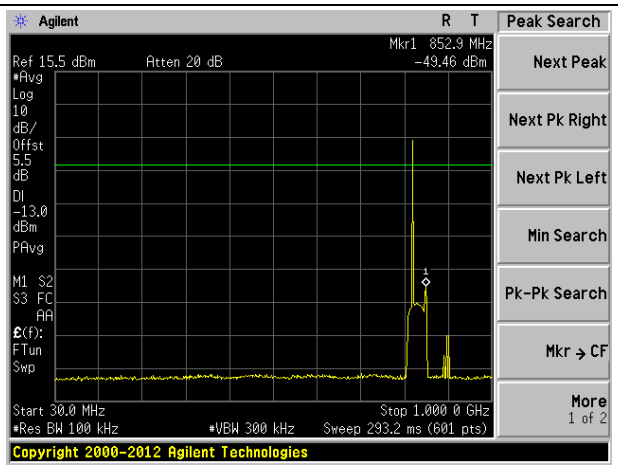


Intermodulation of EDGE

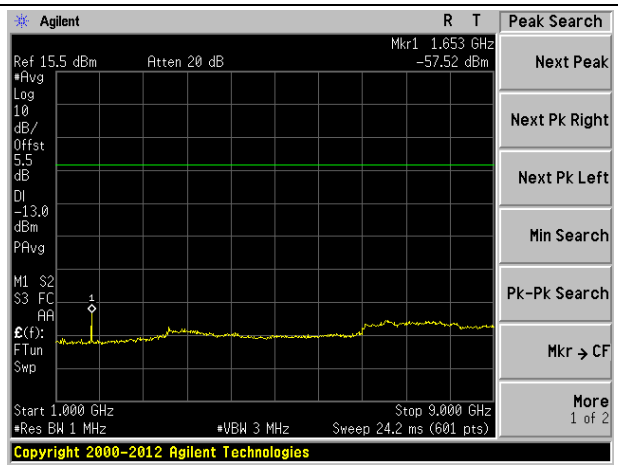
Intermodulation - Low part of band



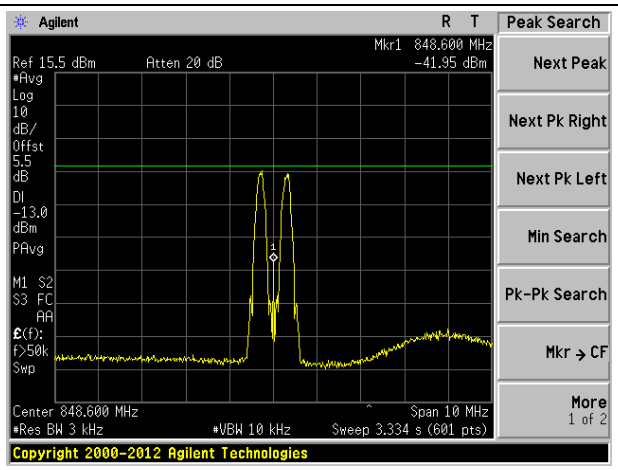
30MHz-1000MHz spurious emissions



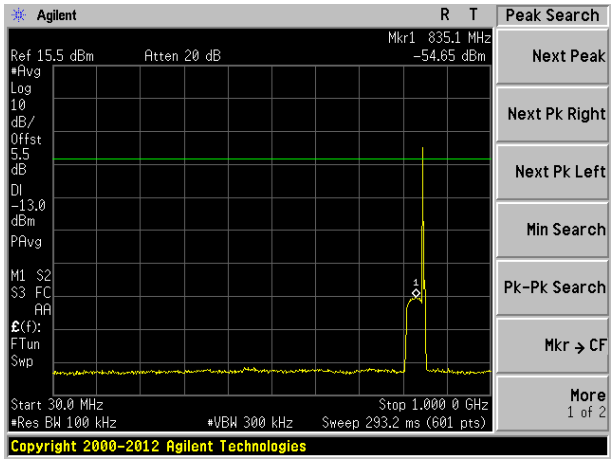
1000MHz-9000MHz spurious emissions



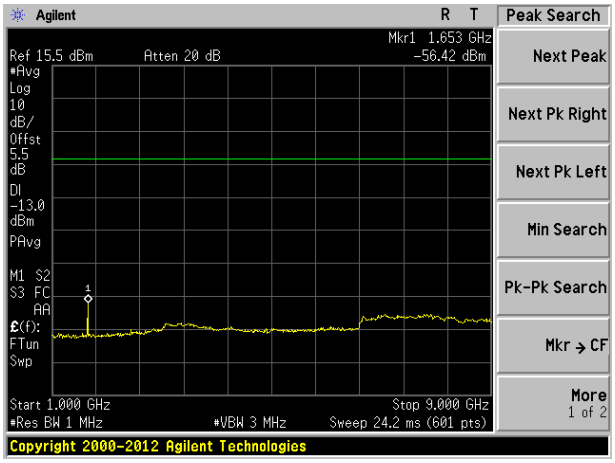
Intermodulation - High part of band



30MHz-1000MHz spurious emissions

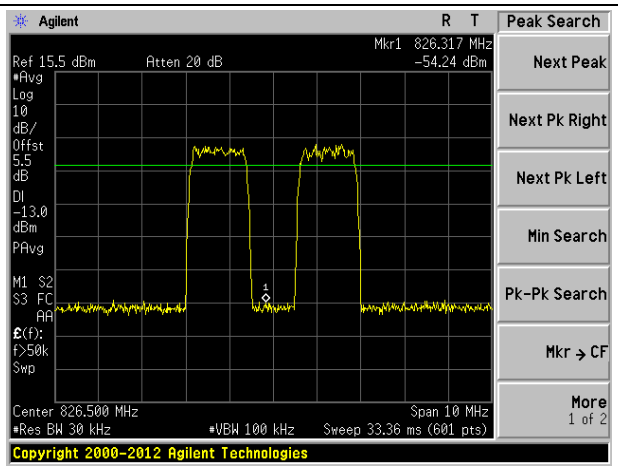


1000MHz-9000MHz spurious emissions

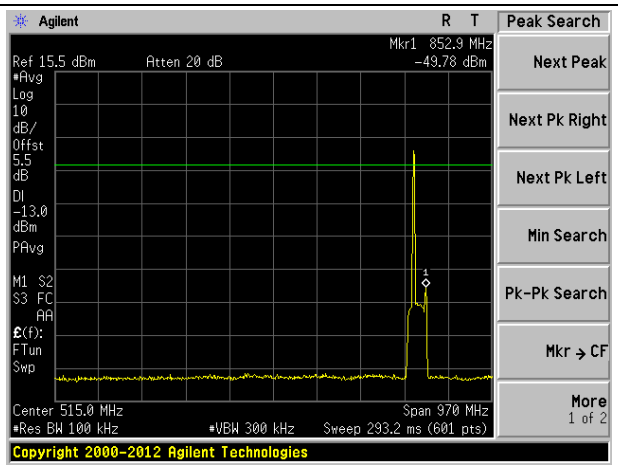


Intermodulation of CDMA

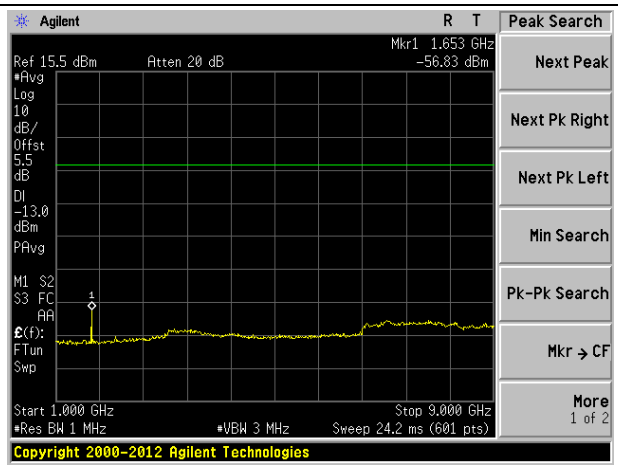
Intermodulation - Low part of band



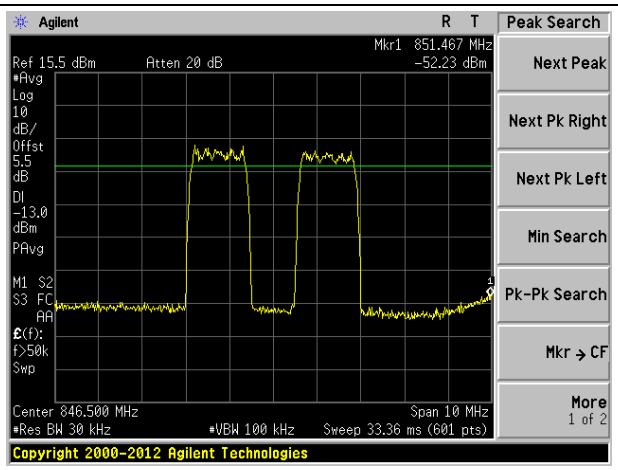
30MHz-1000MHz spurious emissions



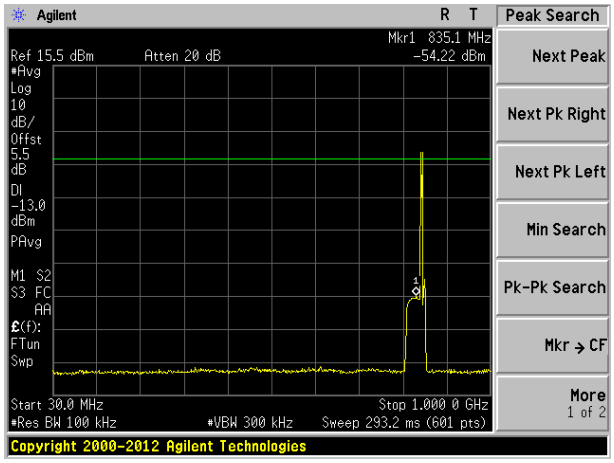
1000MHz-9000MHz spurious emissions



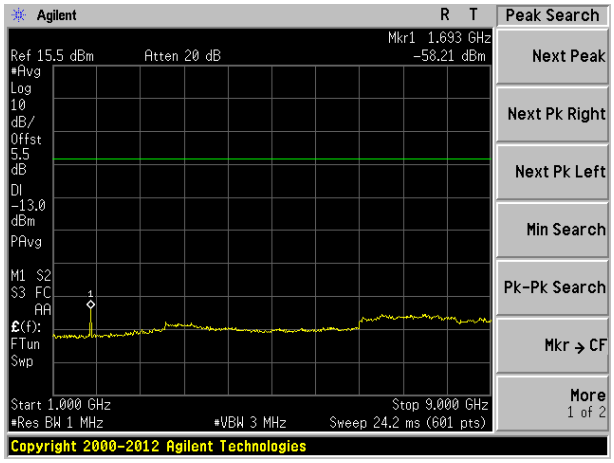
Intermodulation - High part of band



30MHz-1000MHz spurious emissions

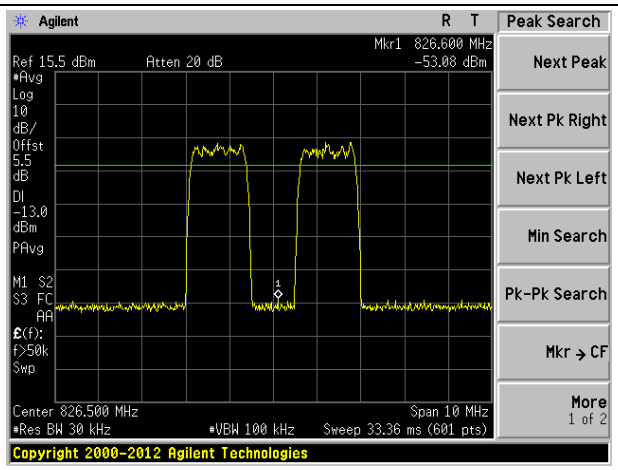


1000MHz-9000MHz spurious emissions

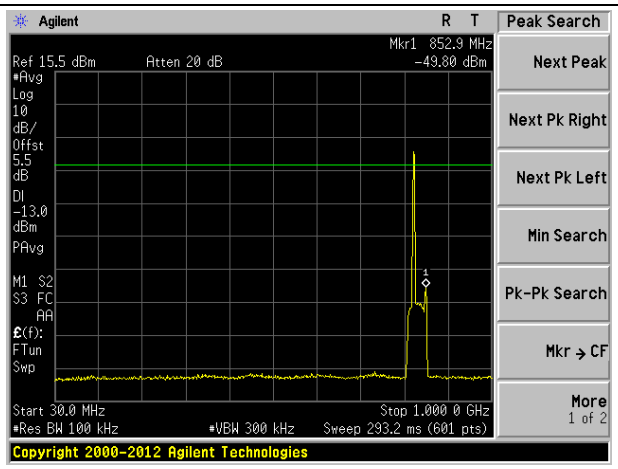


Intermodulation of CDMA-EVDO

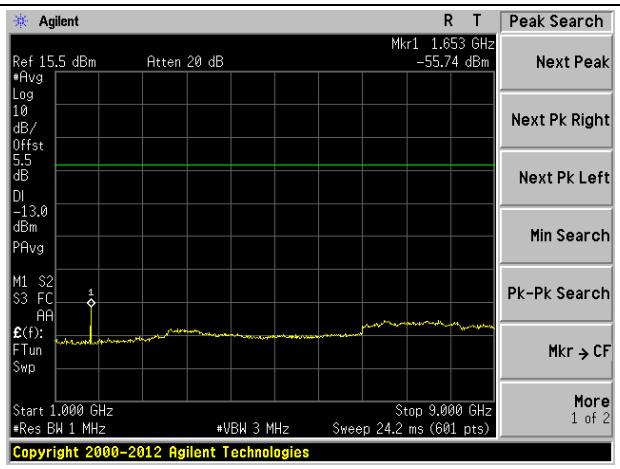
Intermodulation - Low part of band



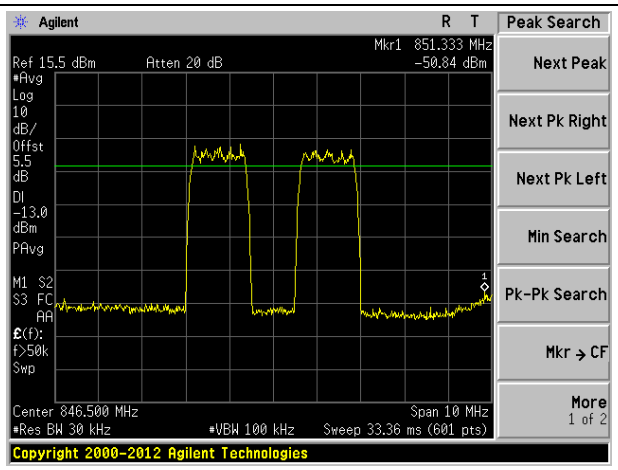
30MHz-1000MHz spurious emissions



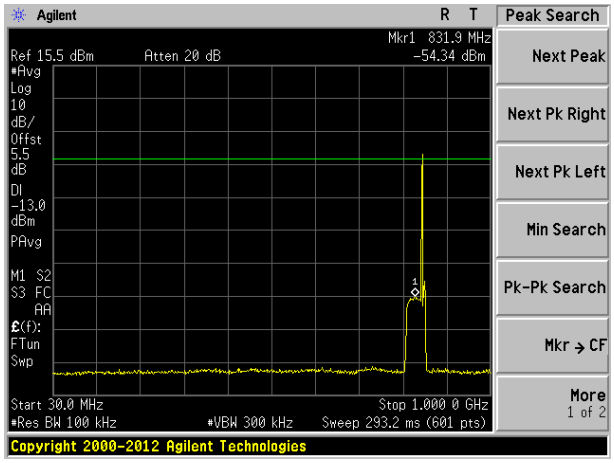
1000MHz-9000MHz spurious emissions



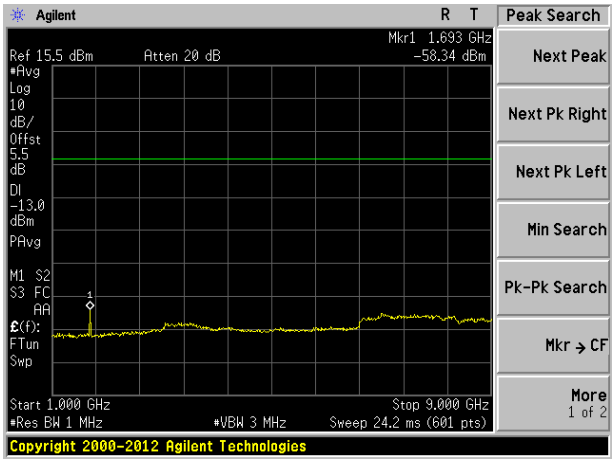
Intermodulation - High part of band



30MHz-1000MHz spurious emissions

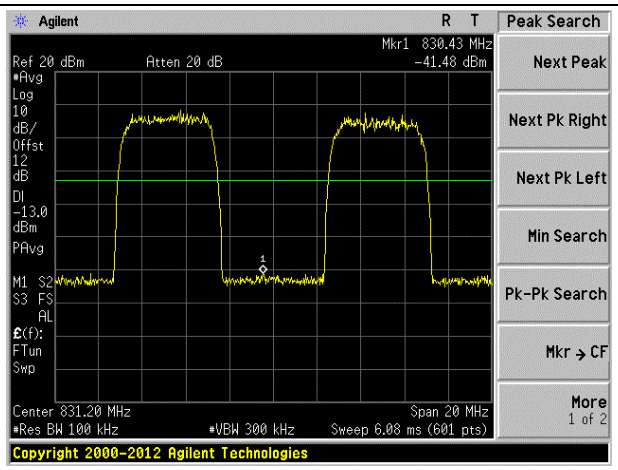


1000MHz-9000MHz spurious emissions

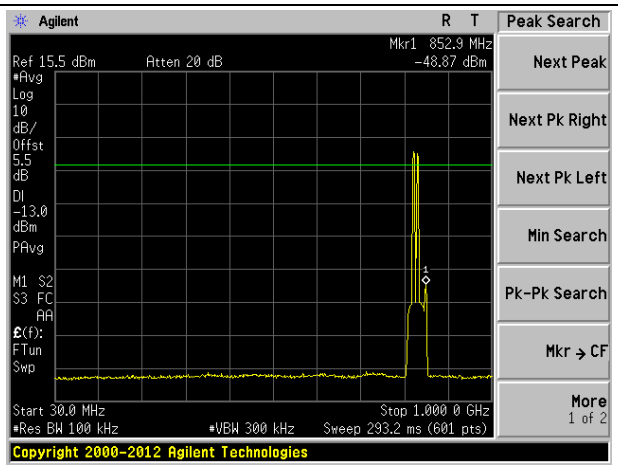


Intermodulation of WCDMA

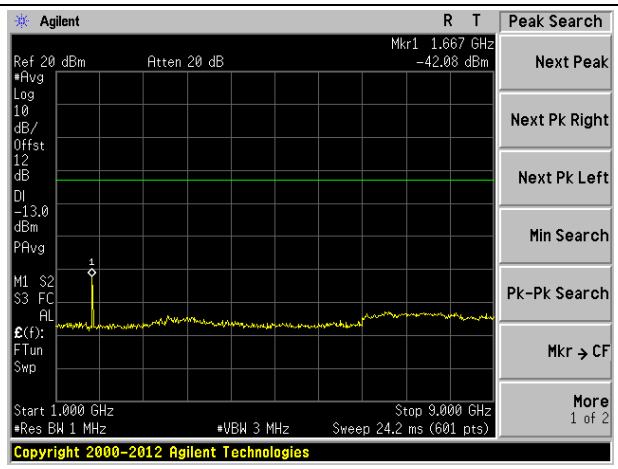
Intermodulation - Low part of band



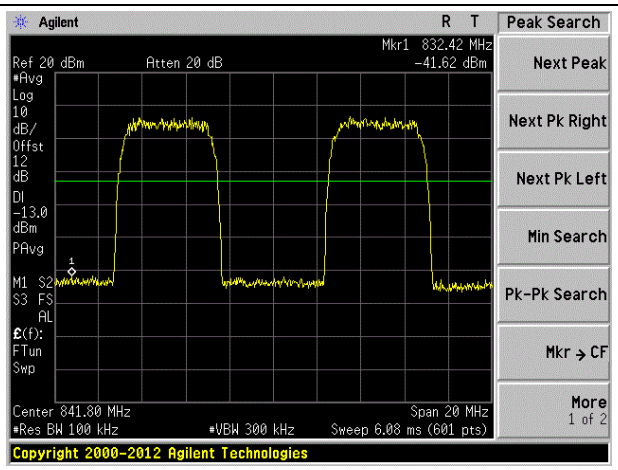
30MHz-1000MHz spurious emissions



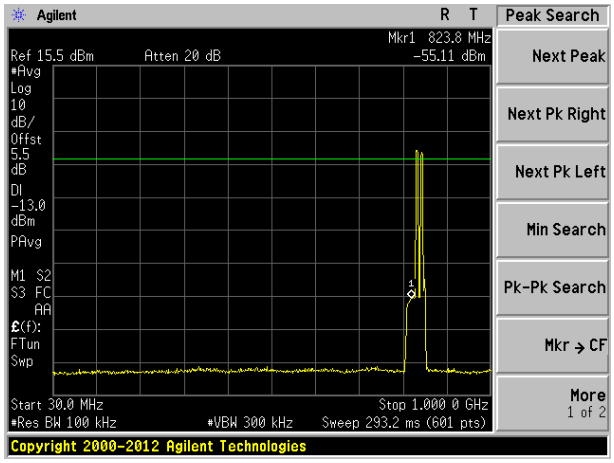
1000MHz-9000MHz spurious emissions



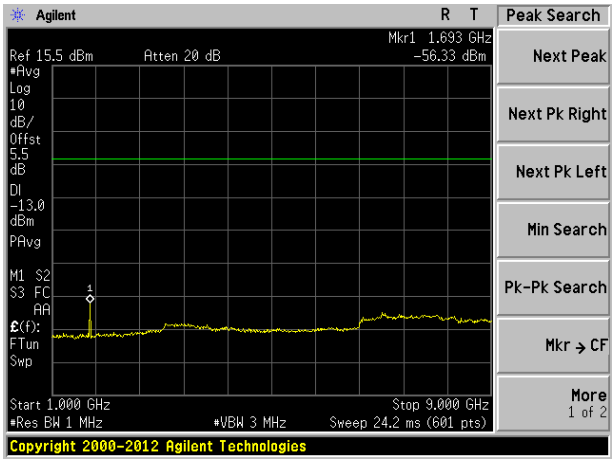
Intermodulation - High part of band



30MHz-1000MHz spurious emissions

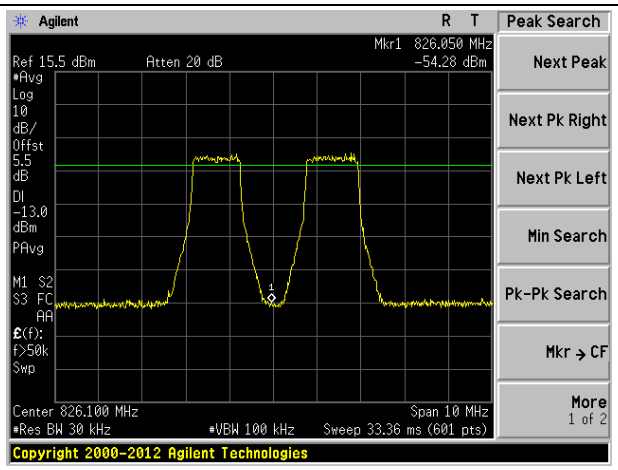


1000MHz-9000MHz spurious emissions

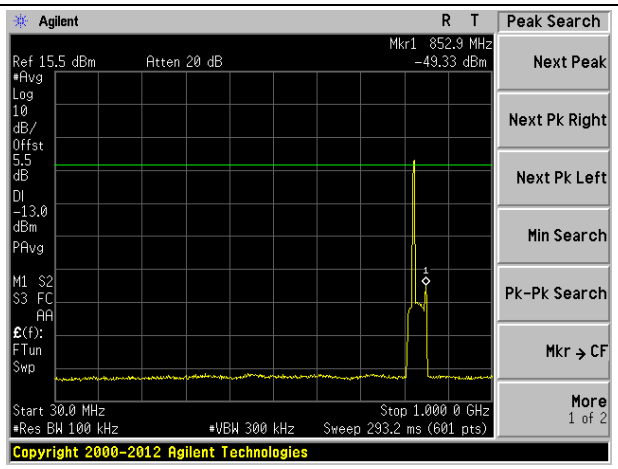


Intermodulation of LTE 1.4MHz Bandwidth

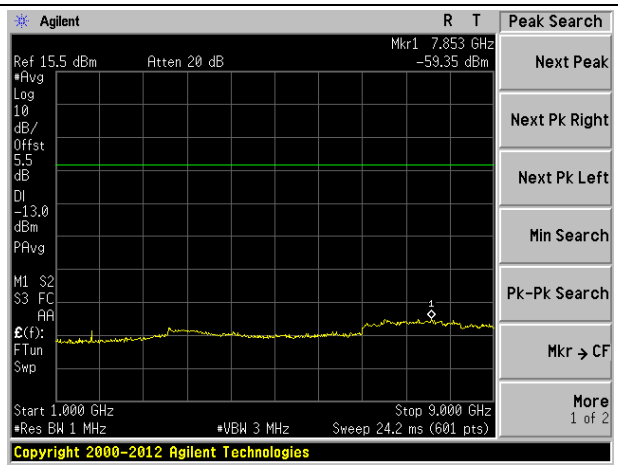
Intermodulation - Low part of band



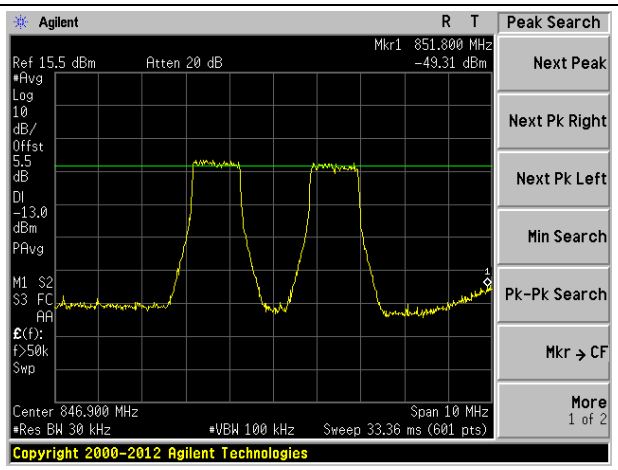
30MHz-1000MHz spurious emissions



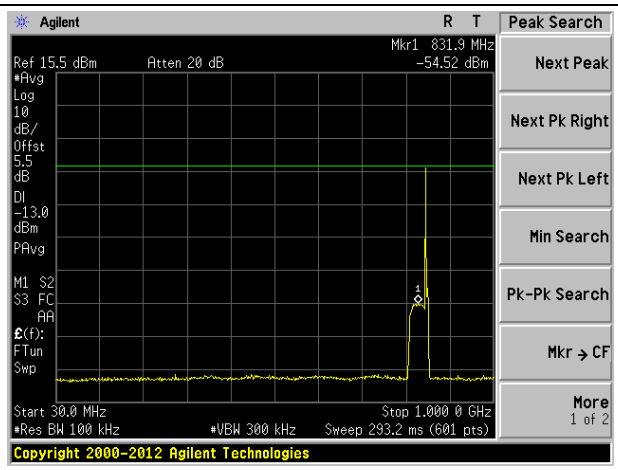
1000MHz-9000MHz spurious emissions



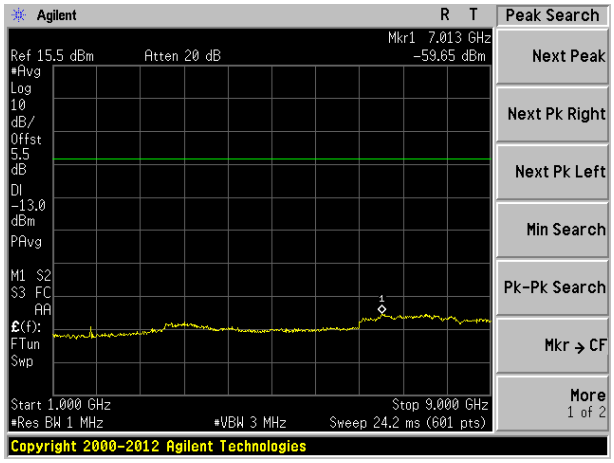
Intermodulation - High part of band



30MHz-1000MHz spurious emissions

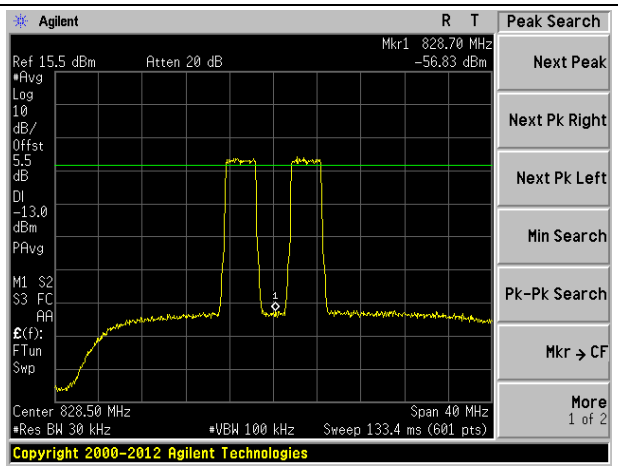


1000MHz-9000MHz spurious emissions

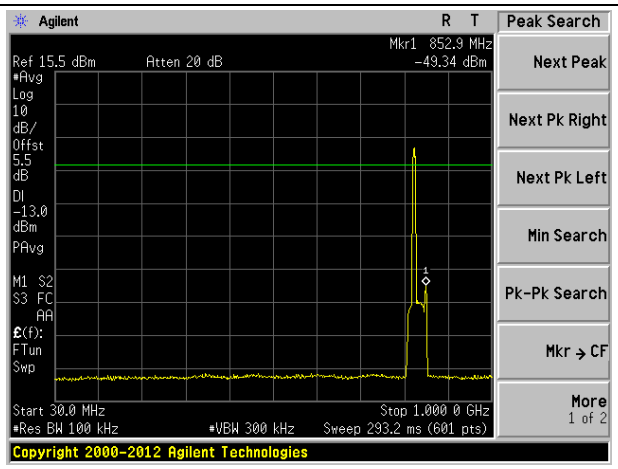


Intermodulation of LTE 3MHz Bandwidth

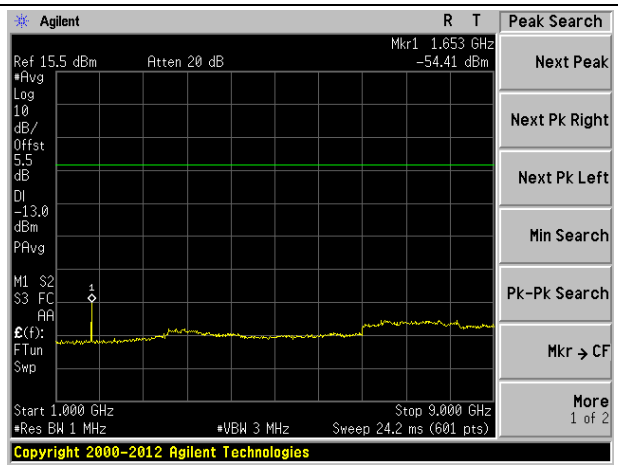
Intermodulation - Low part of band



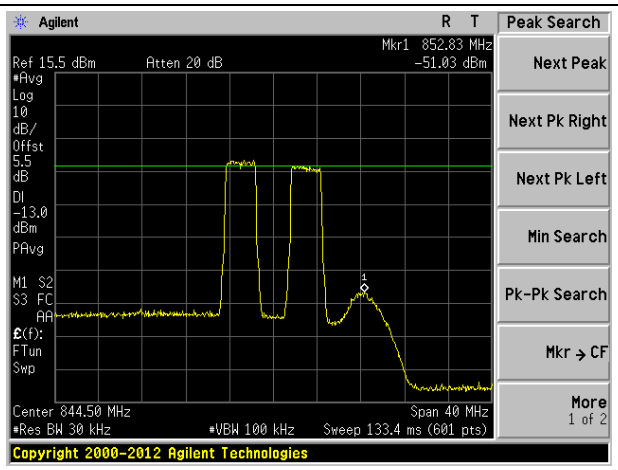
30MHz-1000MHz spurious emissions



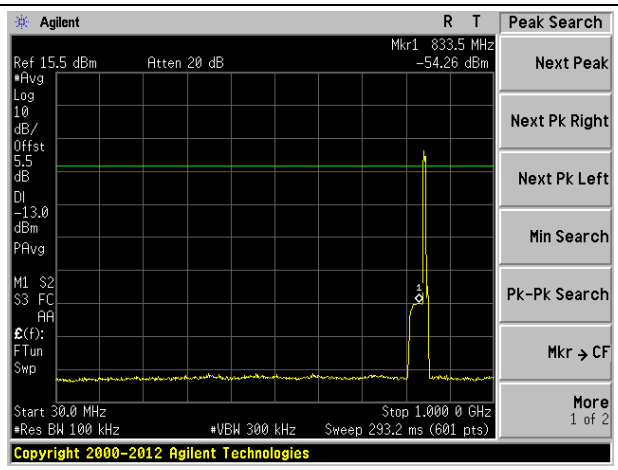
1000MHz-9000MHz spurious emissions



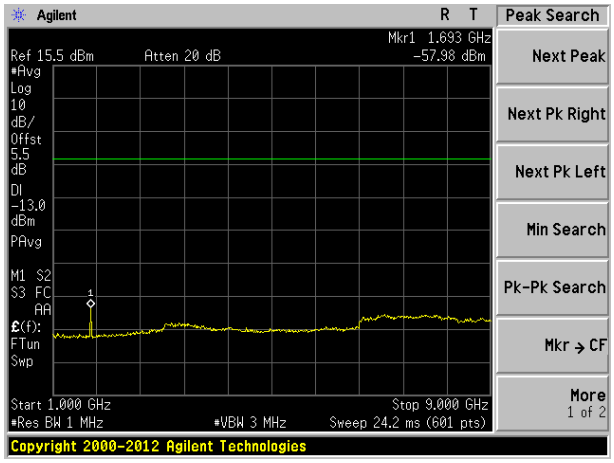
Intermodulation - High part of band



30MHz-1000MHz spurious emissions

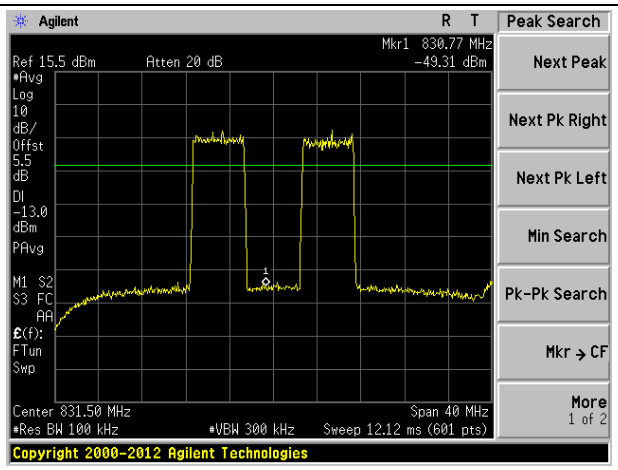


1000MHz-9000MHz spurious emissions

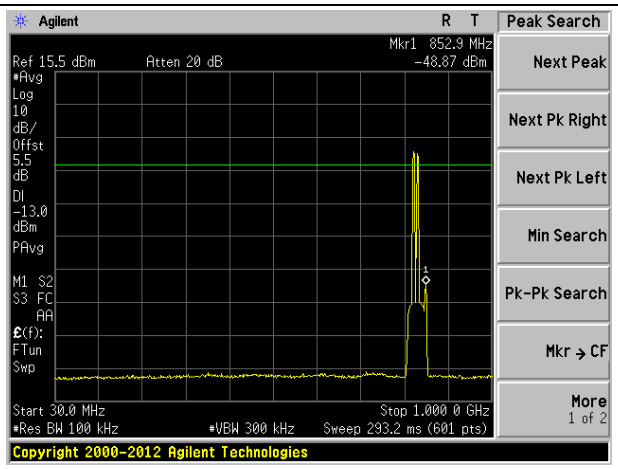


Intermodulation of LTE 5MHz Bandwidth

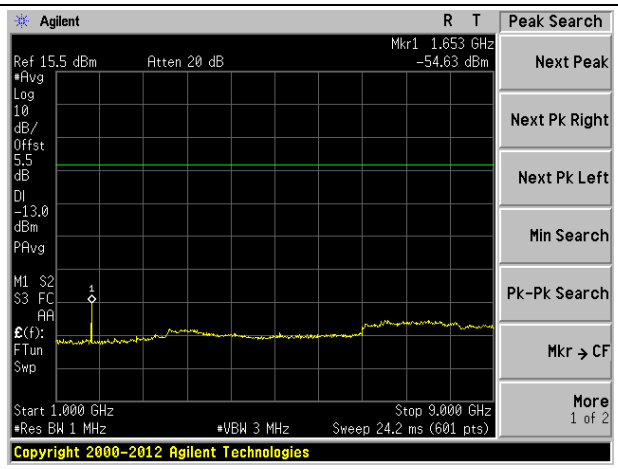
Intermodulation - Low part of band



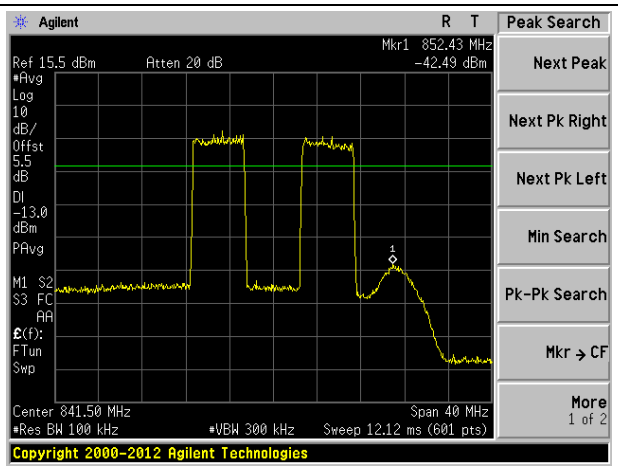
30MHz-1000MHz spurious emissions



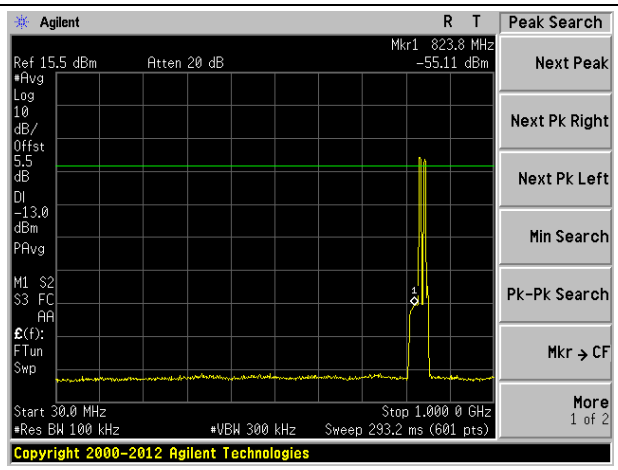
1000MHz-9000MHz spurious emissions



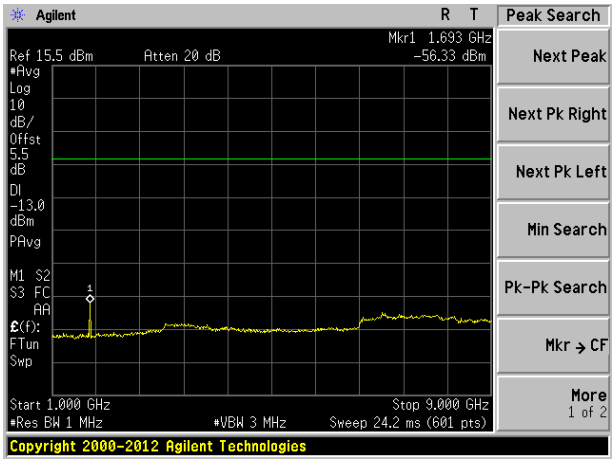
Intermodulation - High part of band



30MHz-1000MHz spurious emissions



1000MHz-9000MHz spurious emissions



12 FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT

12.1 Standard Applicable

According to FCC § 2.1053 and § 22.917(a).

12.2 EUT Setup (Block Diagram of Configuration)

Please refer the section §6.2 Configuration of Tested System.

12.3 Measurement Procedure

1. The EUT RF output port was connected to 50 ohm RF load.
2. The EUT input port was connected to signal generator and was setup to transmit maximum power.
3. The measurement antenna was placed at a distance of 3 meters from the EUT.
4. 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 EUT.
5. The frequency range up to 10-th harmonic of each of the three fundamental frequencies (low, middle and high channels) was investigated. The worst case of emissions was reported.
6. For spurious emissions attenuation, the substitution method was used.
7. The EUT was substituted by a reference antenna (half-wave dipole – below 1 GHz, or Horn antenna – above 1 GHz), connected to a signal generator.
8. The signal generator output level was adjusted to obtain the same reading as from EUT. The EIRP at the spurious emissions frequency was calculated as follows:

   EIRP = S.G. output (dBm) + Antenna Gain(dBi) – Cable Loss (dB)
9. The antenna substitution method is used to determine the equivalent radiated power at spurious frequencies. The spurious emissions are measured at a distance of 3 meters. The EUT is then replaced with a reference substitution antenna with a known gain referenced to a dipole. This antenna is fed with a signal at the spurious frequency. The level of the signal is adjusted to repeat the previously measured level. The resulting eirp is the signal level fed to the reference antenna corrected for gain referenced to an isotropic dipole
10. From KDB (AMPLIFIER, BOOSTER, AND REPEATER REMINDER SHEET): Radiated spurs (enclosure) – Use of CW signal (low, mid. and high freq.) is acceptable rather than all modulations.
11. The maximum RFI field strength was determined during the measurement by rotating the turntable (±180 degrees) and varying the height of the receive antenna (h = 1 ... 4 m) as like defined in ANSI C63.4. A measurement receiver has been used with a RBW 120 kHz up to 1 GHz and 1 MHz above 1 GHz. Steps with during pre measurement was half the RBW.
12. Both, the Fully Anechoic Chamber (FAC) and the Semi Anechoic Chamber (SAC) fulfil the requirements of ANSI C63.4 and CISPR 16-1-4 with regards to NSA and SVSWR.

12.4 Measurement data

Downlink mode

Test mode:	Below 1G		Test channel:	Lowest channel
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
36.95	Vertical	-44.58	-13.00	Pass
72.53	V	-43.92		
232.47	V	-45.47		
522.71	V	-48.55		
628.31	V	---		
776.88	V	---		
41.96	Horizontal	-47.14	-13.00	Pass
75.83	H	-45.10		
126.85	H	-42.96		
455.83	H	-48.57		
742.31	H	---		
828.59	H	---		
Test mode:	**Above 1G**		**Test channel:**	**Lowest channel**
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
2153.00	Vertical	-53.85	-13.00	Pass
3954.00	V	-55.66		
4672.00	V	-54.74		
7231.00	V	---		
8235.00	V	---		
1754.00	Horizontal	-55.36	-13.00	Pass
2395.00	H	-54.61		
3958.00	H	-52.96		
6574.00	H	---		
7395.00	H	---		

Test mode:	Below 1G		Test channel:	Middle channel
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
32.69	Vertical	-42.82	-13.00	Pass
72.58	V	-45.66		
186.47	V	-43.51		
356.41	V	-42.63		
531.34	V	---		
653.45	V	---		
43.56	Horizontal	-45.69	-13.00	Pass
124.71	H	-44.28		
243.85	H	-43.67		
355.75	H	-45.73		
495.81	H	---		
836.59	H	---		
Test mode:	**Above 1G**		**Test channel:**	**Middle channel**
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1645.00	Vertical	-53.85	-13.00	Pass
2649.00	V	-56.55		
4384.00	V	-54.69		
5935.00	V	---		
7341.00	V	---		
1358.00	Horizontal	-58.47	-13.00	Pass
2485.00	H	-55.37		
4352.00	H	-54.85		
5539.00	H	---		
6728.00	H	---		

Test mode:	Below 1G		Test channel:	Highest channel
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
35.75	Vertical	-44.65	-13.00	Pass
69.52	V	-46.76		
212.74	V	-45.82		
395.47	V	-44.93		
573.52	V	---		
655.24	V	---		
42.53	Horizontal	-43.26	-13.00	Pass
146.22	H	-45.86		
385.96	H	-46.93		
425.58	H	-42.75		
638.14	H	---		
715.38	H	---		
Test mode:	**Above 1G**		**Test channel:**	**Highest channel**
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1549.00	Vertical	-52.35	-13.00	Pass
2533.00	V	-54.96		
3869.00	V	-53.97		
5283.00	V	---		
7253.00	V	---		
2534.00	Horizontal	-53.55	-13.00	Pass
3854.00	H	-55.69		
4698.00	H	-52.85		
5863.00	H	---		
7259.00	H	---		

Remark:
1. Remark”---“ means that the emission level is too low to be measured

Uplink mode

Test mode:	Below 1G		Test channel:	Lowest channel
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
33.56	Vertical	-43.68	-13.00	Pass
75.72	V	-45.53		
138.53	V	-42.88		
242.35	V	-46.07		
356.76	V	---		
486.75	V	---		
36.53	Horizontal	-45.27	-13.00	Pass
114.52	H	-44.39		
235.70	H	-42.07		
384.74	H	-45.59		
432.96	H	---		
527.04		---		
Test mode:	**Above 1G)**		**Test channel:**	**Lowest channel**
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1438.00	Vertical	-55.38	-13.00	Pass
2751.00	V	-52.75		
3869.00	V	-56.09		
5782.00	V	---		
7396.00	V	---		
2753.00	Horizontal	-53.96	-13.00	Pass
3869.00	H	-55.27		
4576.00	H	-55.20		
5927.00	H	---		
7356.00	H	---		

Test mode:	Below 1G		Test channel:	Middle channel
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
32.96	Vertical	-45.12	-13.00	Pass
69.69	V	-44.38		
121.35	V	-44.96		
245.28	V	-42.38		
385.27	V	---		
469.58	V	---		
45.25	Horizontal	-42.75	-13.00	Pass
127.65	H	-45.39		
285.70	H	-43.71		
352.89	H	-44.33		
486.41	H	---		
752.36	H	---		
Test mode:	**Aabove 1G**		**Test channel:**	**Middle channel**
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1586.00	Vertical	-56.93	-13.00	Pass
2734.00	V	-57.83		
4375.00	V	-55.22		
5396.00	V	---		
7283.00	V	---		
1539.00	Horizontal	-54.74	-13.00	Pass
3852.00	H	-55.86		
4358.00	H	-56.33		
5374.00	H	---		
6827.00	H	---		

Test mode:	Below 1G		Test channel:	Highest channel
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
35.69	Vertical	-45.36	-13.00	Pass
68.83	V	-44.27		
127.54	V	-45.66		
245.53	V	-46.72		
356.45	V	---		
538.55	V	---		
33.69	Horizontal	-42.37	-13.00	Pass
123.56	H	-46.39		
243.86	H	-44.22		
352.74	H	-43.75		
465.44	H	---		
652.57	H	---		
Test mode:	**Above 1G**		**Test channel:**	**Highest channel**
Frequency (MHz)	Spurious Emission		Limit (dBm)	Result
	Polarization	Level (dBm)		
1955.00	Vertical	-53.58	-13.00	Pass
3568.00	V	-56.38		
4822.00	V	-57.43		
5762.00	V	---		
7531.00	V	---		
2438.00	Horizontal	-55.71	-13.00	Pass
3396.00	H	-53.69		
4826.00	H	-54.57		
5769.00	H	---		
7235.00	H	---		

Remark:
1. Remark”---“ means that the emission level is too low to be measured

13 FREQUENCY STABILITY

13.1 Standard Applicable

According to FCC §2.1055 and §22.355

13.2 Test setup

Please refer the section §6.2 Configuration of Tested System.

13.3 Test Procedure

1. The EUT was placed inside the temperature chamber.
2. The RF output port was connected to a spectrum analyzer.
3. The level of RF input signal shall be increased, until the maximum output power per channel, declared by client, is reached.
4. After the temperature stabilized for approximately 20 min, the transmitting frequency was measured by the spectrum analyzer and recorded.
5. At room temperature, the frequency was measured when EUT was powered with the nominal voltage and with 85% and 115% of the nominal voltage.

13.4 Test Result

Passed.

Downlink:

WCDMA mode					
Reference Frequency: Middle channel=881.6MHz					
Voltage with nominal Voltage	**Power Supplied (VAC)**	**Temperature (℃)**	**Frequency Error (Hz)**	**Frequency Error (ppm)**	**Result**
100%	120V	-40	18	0.0204	Passed
100%		-30	16	0.0181	Passed
100%		-20	14	0.0159	Passed
100%		-10	11	0.0125	Passed
100%		0	9	0.0102	Passed
100%		10	7	0.0079	Passed
100%		20	11	0.0125	Passed
100%		30	16	0.0181	Passed
100%		40	17	0.0193	Passed
100%		50	19	0.0216	Passed
100%		55	20	0.0227	Passed
85%	102V	20	18	0.0204	Passed
115%	138V	20	21	0.0238	Passed

Remark: EUT is specified for outdoor use with temperature range of -40° to +55° C, and was tested with its range.

Uplink:

WCDMA mode					
Reference Frequency: Middle channel=836.6MHz					
Voltage with nominal Voltage	Power Supplied (VAC)	Temperature (℃)	Frequency Error (Hz)	Frequency Error (ppm)	Result
100%	120V	-40	19	0.0227	Passed
100%		-30	16	0.0191	Passed
100%		-20	13	0.0155	Passed
100%		-10	7	0.0084	Passed
100%		0	4	0.0048	Passed
100%		10	12	0.0143	Passed
100%		20	13	0.0155	Passed
100%		30	16	0.0191	Passed
100%		40	18	0.0215	Passed
100%		50	21	0.0251	Passed
100%		55	23	0.0275	Passed
85%	102V	20	18	0.0215	Passed
115%	138V	20	17	0.0203	Passed

Remark: EUT is specified for outdoor use with temperature range of -40° to +55° C, and was tested with its range.

14 OUT-OF-BAND REJECTION

14.1 Standard Applicable

According to KDB (AMPLIFIER, BOOSTER, AND REPEATER REMINDER SHEET):

Out of Band Rejection – Test for rejection of out of band signals. Filter freq. response plots are acceptable.

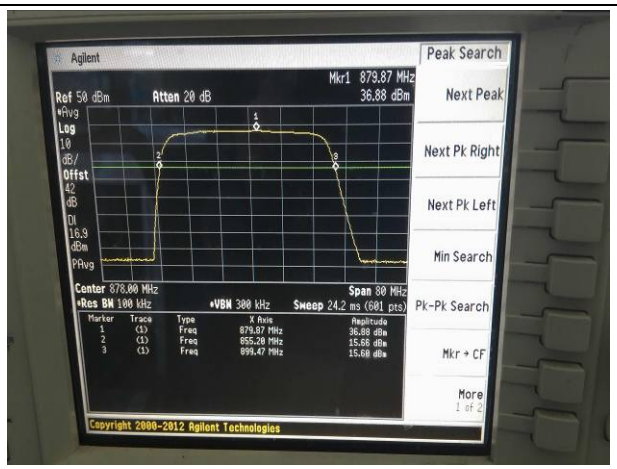
14.2 Test setup

Please refer the section §6.2 Configuration of Tested System.

14.3 Test Procedure

1. The EUT RF output port was connected to spectrum analyzer.
2. The level of RF input signal shall be increased, until the maximum output power per channel, declared by client, is reached.
3. A continuous sinusoidal RF signal shall be fed successively at frequency offsets 100 MHz from the edges of the relevant MS or BTS transmit frequency band into the relevant input port of the repeater.
4. The RF output curve was recorded by spectrum analyzer.

14.4 Test Result

Out-of-Band Rejection	
	
Downlink	Uplink

15 AC POWER LINE CONDUCTED EMISSION TEST

15.1 Standard Applicable

According to FCC §15.207. The emission value for frequency within 150KHz to 30MHz shall not Exceed criteria of below chart.

Frequency range (MHz)	Limits dB(uV)	
	Quasi-peak	Average
0.15 to 0.50	79	66
0.50 to 30	73	60
Note 1.The lower limit shall apply at the transition frequencies 2.The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.		

15.2 Test setup

1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.4-2001.
2. The EUT was plug-in DC power adaptort and was placed on the center of the back edge on the test table. The peripherals like earphone was placed on the side of the EUT. The rear of the EUT and peripherals were placed flushed with the rear of the tabletop.
3. The Power adaptor was connected with 110VAC/60Hz power source.

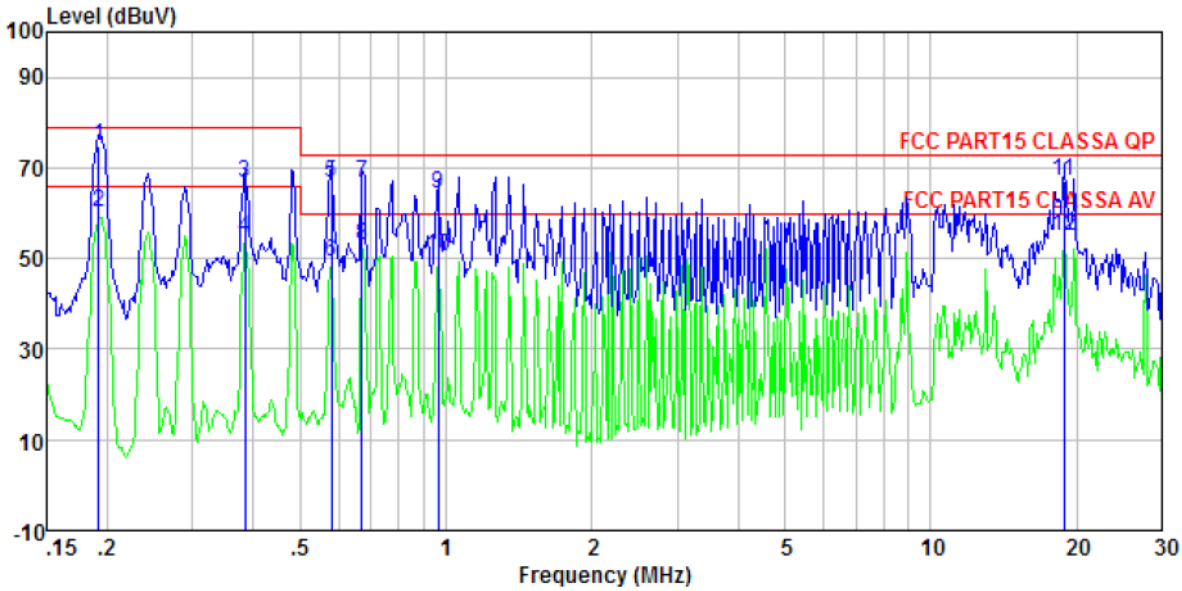
15.3 Test Procedure

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

15.4 Measurement Result

Downlink:

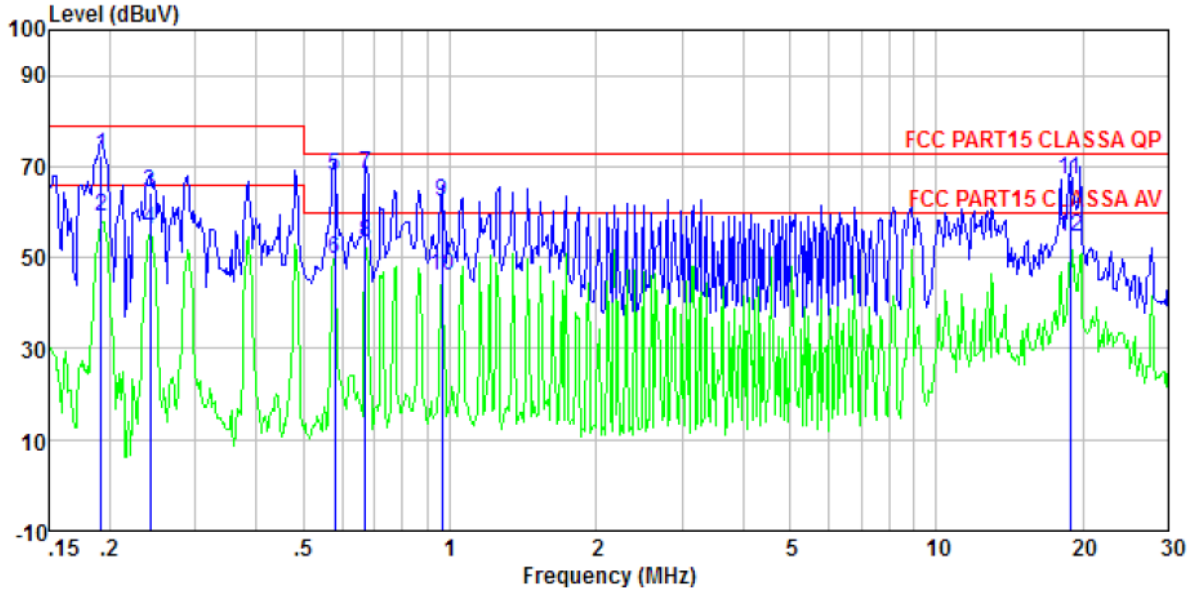
Line:



Site : Shielded room
Condition : FCC PART15 CLASSA QP LISN-2013 LINE
Job No. : 0438
Test mode : Downlink mode
Test Engineer: Sky

	Freq	Read Level	Level	Cable Loss	LISN Factor	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV	dB	dB	dBuV	dB	
1	0.192	74.55	74.82	0.13	0.14	79.00	-4.18	QP
2	0.192	60.02	60.29	0.13	0.14	66.00	-5.71	Average
3	0.385	66.37	66.58	0.10	0.11	79.00	-12.42	QP
4	0.385	54.49	54.70	0.10	0.11	66.00	-11.30	Average
5	0.579	66.35	66.60	0.12	0.13	73.00	-6.40	QP
6	0.579	48.87	49.12	0.12	0.13	60.00	-10.88	Average
7	0.672	66.32	66.59	0.13	0.14	73.00	-6.41	QP
8	0.672	52.80	53.07	0.13	0.14	60.00	-6.93	Average
9	0.963	64.15	64.42	0.13	0.14	73.00	-8.58	QP
10	0.963	50.30	50.57	0.13	0.14	60.00	-9.43	Average
11	18.820	66.54	67.31	0.22	0.55	73.00	-5.69	QP
12	18.820	54.19	54.96	0.22	0.55	60.00	-5.04	Average

Neutral:

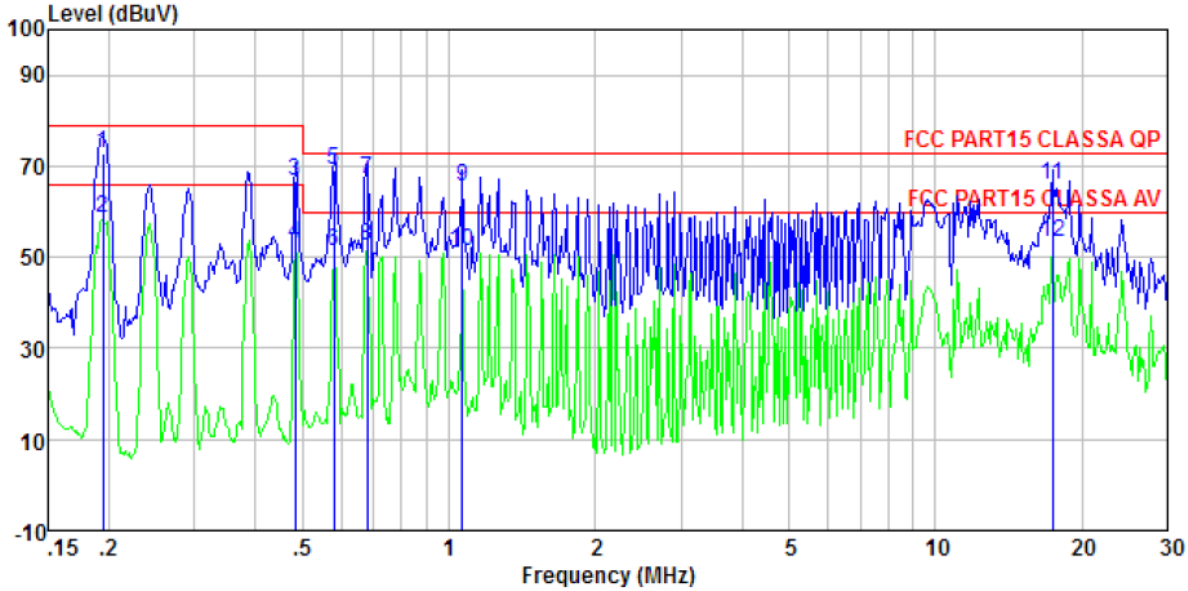


Site : Shielded room
Condition : FCC PART15 CLASSA QP LISN-2013 NEUTRAL
Job No. : 0438
Test mode : Downlink mode
Test Engineer: Sky

	Freq	Read Level	Level	Cable Loss	LISN Factor	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV	dB	dB	dBuV	dB	
1	0.192	72.33	72.53	0.13	0.07	79.00	-6.47	QP
2	0.192	58.64	58.84	0.13	0.07	66.00	-7.16	Average
3	0.242	64.22	64.40	0.12	0.06	79.00	-14.60	QP
4	0.242	55.98	56.16	0.12	0.06	66.00	-9.84	Average
5	0.579	67.54	67.73	0.12	0.07	73.00	-5.27	QP
6	0.579	49.55	49.74	0.12	0.07	60.00	-10.26	Average
7	0.672	68.14	68.34	0.13	0.07	73.00	-4.66	QP
8	0.672	53.17	53.37	0.13	0.07	60.00	-6.63	Average
9	0.963	62.16	62.36	0.13	0.07	73.00	-10.64	QP
10	0.963	45.74	45.94	0.13	0.07	60.00	-14.06	Average
11	18.820	66.35	67.03	0.22	0.46	73.00	-5.97	QP
12	18.820	53.96	54.64	0.22	0.46	60.00	-5.36	Average

Uplink:

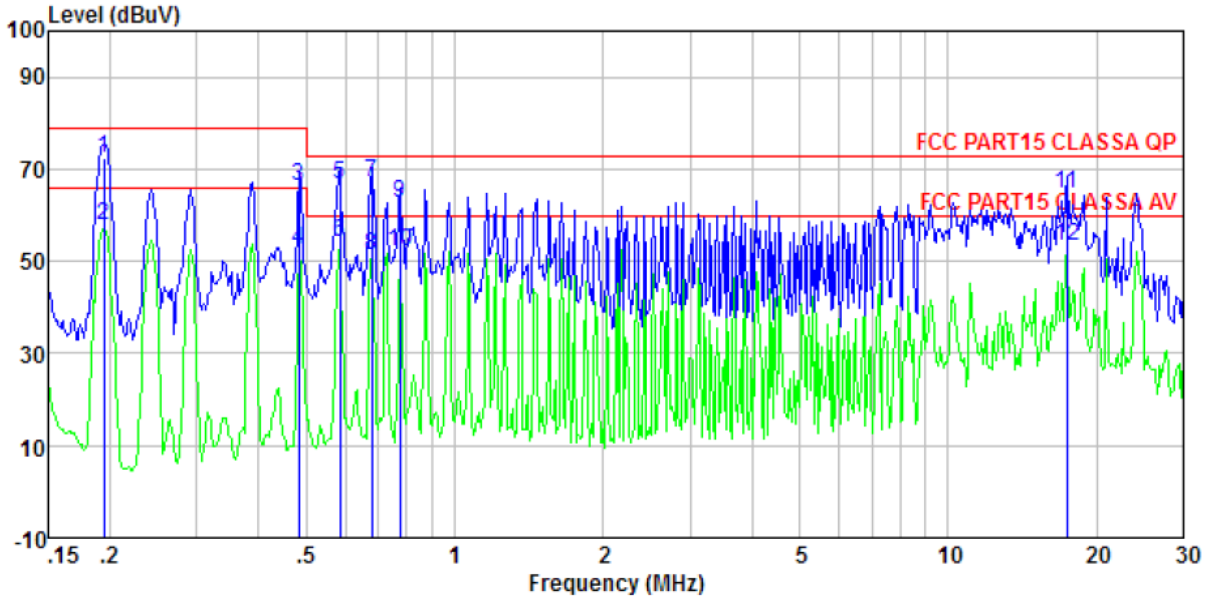
Line:



Site : Shielded room
Condition : FCC PART15 CLASSA QP LISN-2013 LINE
Job No. : 0438
Test mode : Uplink mode
Test Engineer: Sky

	Freq	Read Level	Level	Cable Loss	LISN Factor	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV	dB	dB	dBuV	dB	
1	0.194	72.36	72.63	0.13	0.14	79.00	-6.37	QP
2	0.194	58.34	58.61	0.13	0.14	66.00	-7.39	Average
3	0.484	66.57	66.80	0.11	0.12	79.00	-12.20	QP
4	0.484	52.62	52.85	0.11	0.12	66.00	-13.15	Average
5	0.579	68.99	69.24	0.12	0.13	73.00	-3.76	QP
6	0.579	51.04	51.29	0.12	0.13	60.00	-8.71	Average
7	0.679	66.75	67.02	0.13	0.14	73.00	-5.98	QP
8	0.679	52.42	52.69	0.13	0.14	60.00	-7.31	Average
9	1.065	65.36	65.63	0.13	0.14	73.00	-7.37	QP
10	1.065	50.91	51.18	0.13	0.14	60.00	-8.82	Average
11	17.383	65.21	65.91	0.22	0.48	73.00	-7.09	QP
12	17.383	52.67	53.37	0.22	0.48	60.00	-6.63	Average

Neutral:

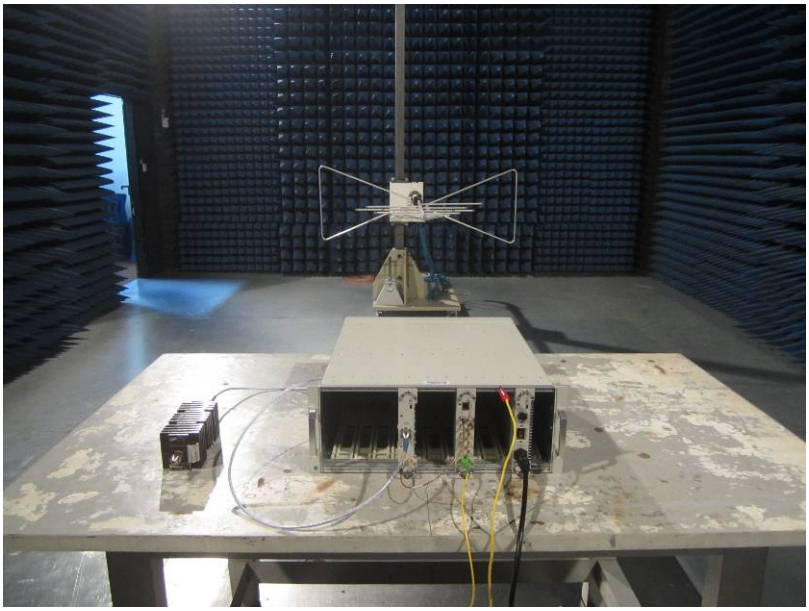


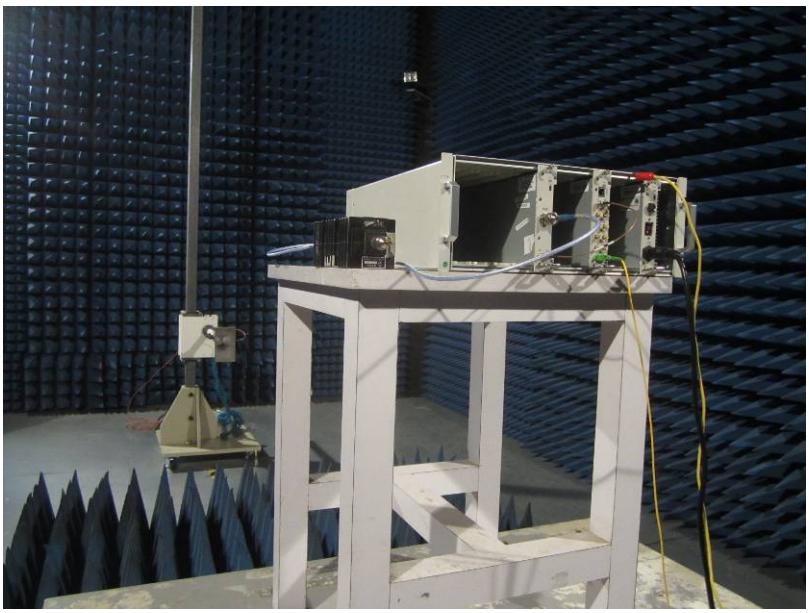
Site : Shielded room
Condition : FCC PART15 CLASSA QP LISN-2013 NEUTRAL
Job No. : 0438
Test mode : Uplink mode
Test Engineer: Sky

	Freq	Read Level	Level	Cable Loss	LISN Factor	Limit Line	Over Limit	Remark
	MHz	dBuV	dBuV	dB	dB	dBuV	dB	
1	0.194	72.36	72.56	0.13	0.07	79.00	-6.44	QP
2	0.194	57.57	57.77	0.13	0.07	66.00	-8.23	Average
3	0.484	65.99	66.16	0.11	0.06	79.00	-12.84	QP
4	0.484	52.48	52.65	0.11	0.06	66.00	-13.35	Average
5	0.585	66.60	66.79	0.12	0.07	73.00	-6.21	QP
6	0.585	53.91	54.10	0.12	0.07	60.00	-5.90	Average
7	0.679	66.78	66.98	0.13	0.07	73.00	-6.02	QP
8	0.679	51.17	51.37	0.13	0.07	60.00	-8.63	Average
9	0.775	62.36	62.56	0.13	0.07	73.00	-10.44	QP
10	0.775	51.75	51.95	0.13	0.07	60.00	-8.05	Average
11	17.383	64.21	64.83	0.22	0.40	73.00	-8.17	QP
12	17.383	52.65	53.27	0.22	0.40	60.00	-6.73	Average

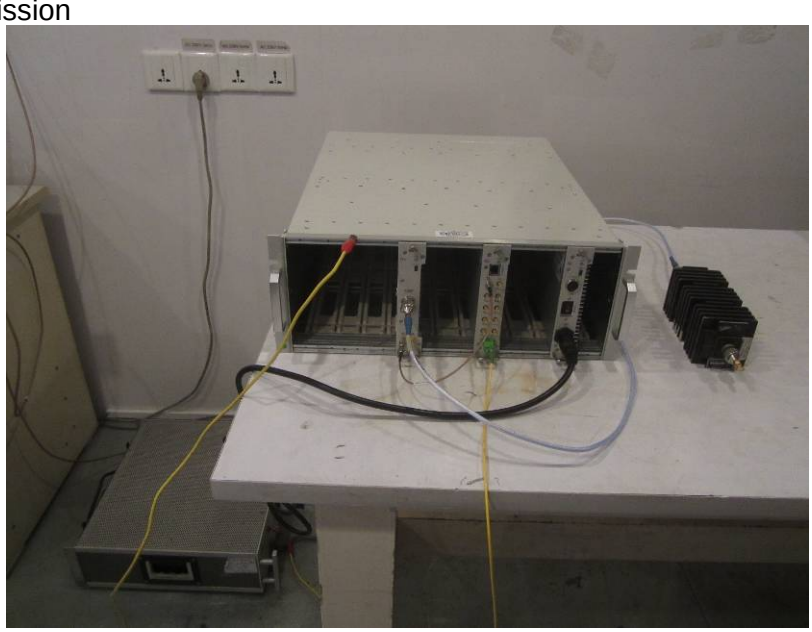
16 Test Setup Photo

Radiated Emission





Conducted Emission

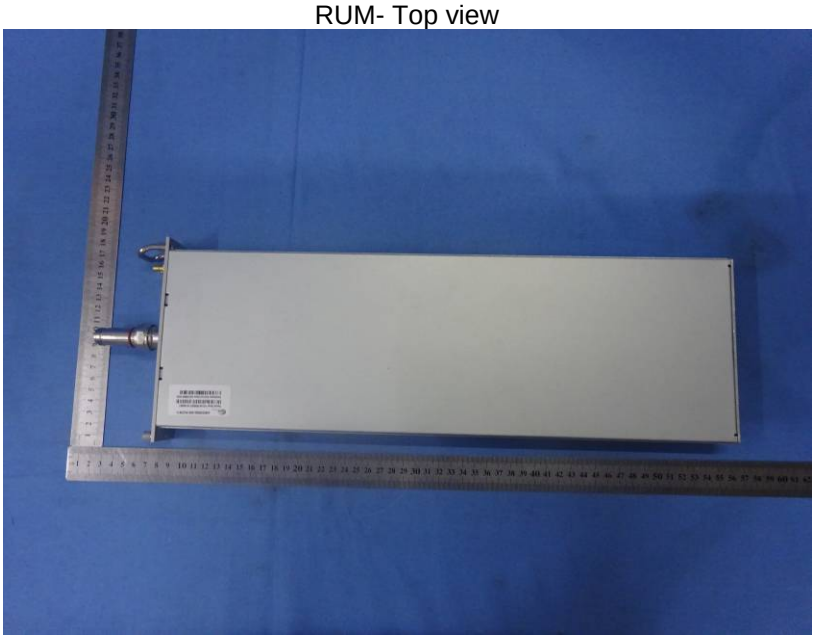


17 EUT Constructional Details

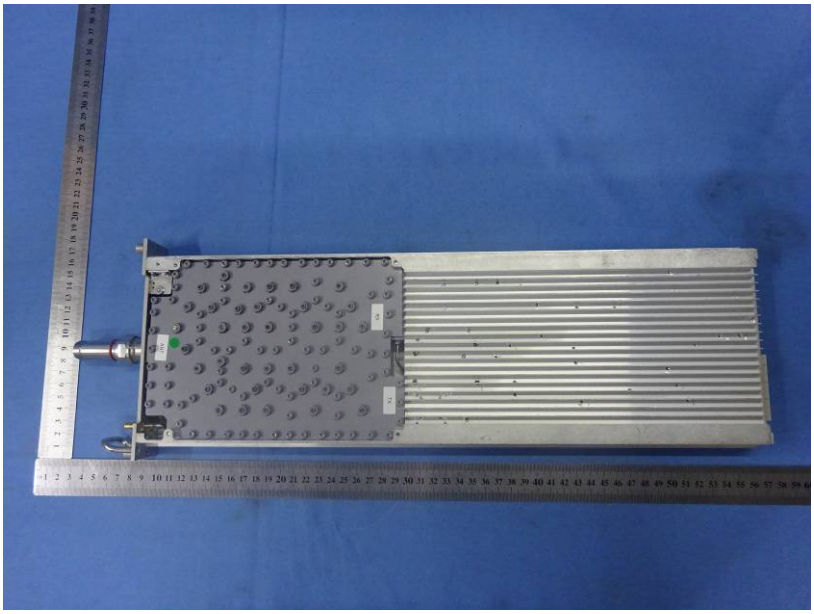
RUM- Front view

RUM- Rear view

RUM- Top view

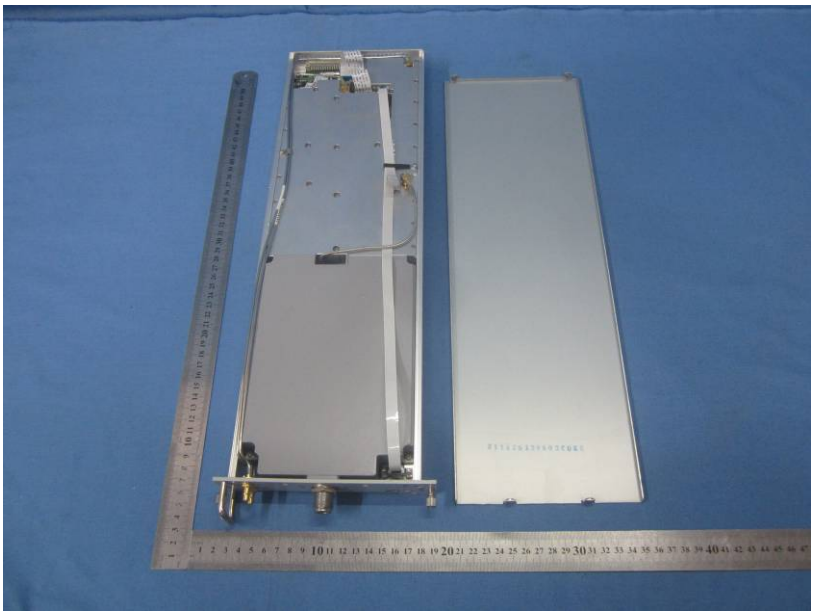


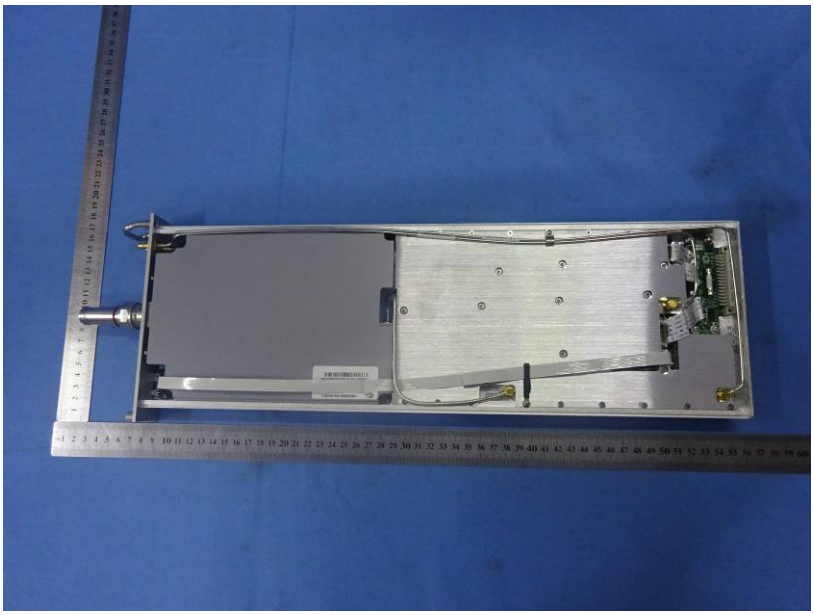
RUM- Bottom view

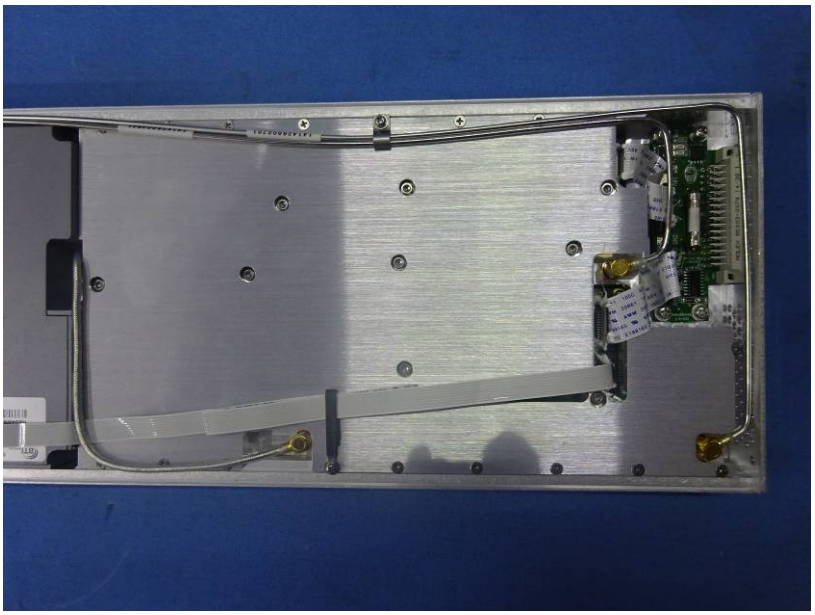


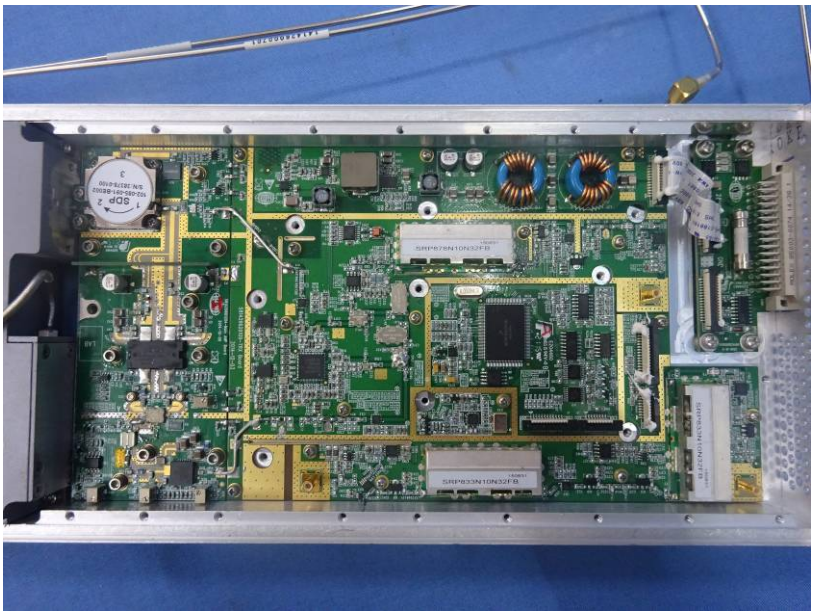
RUM- Left view

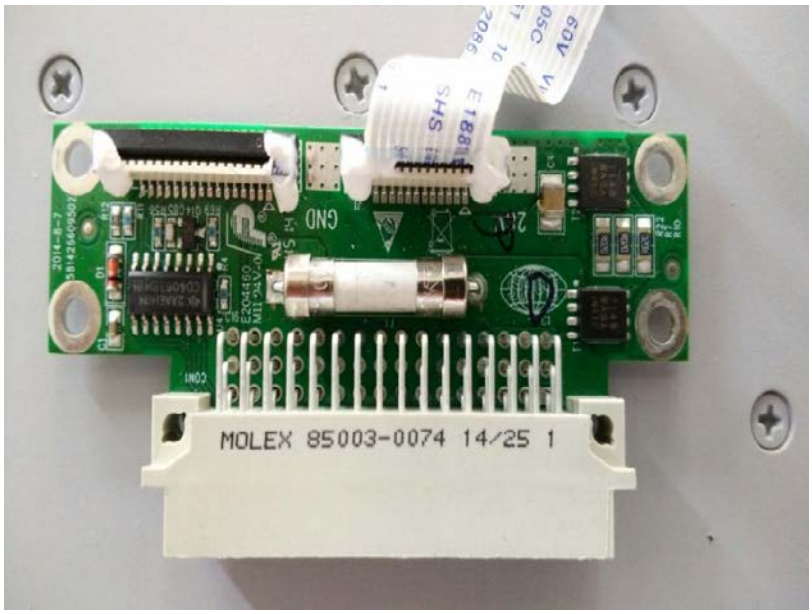
RUM- Right view







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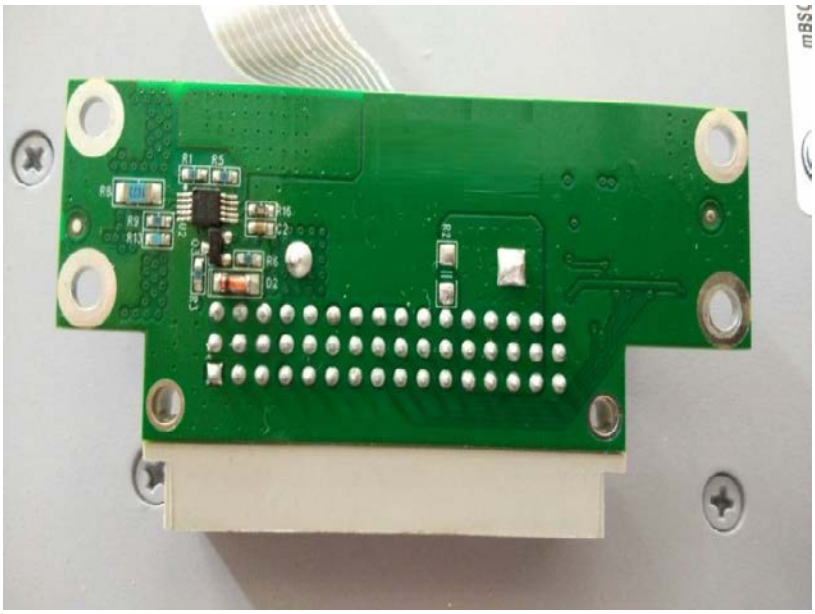

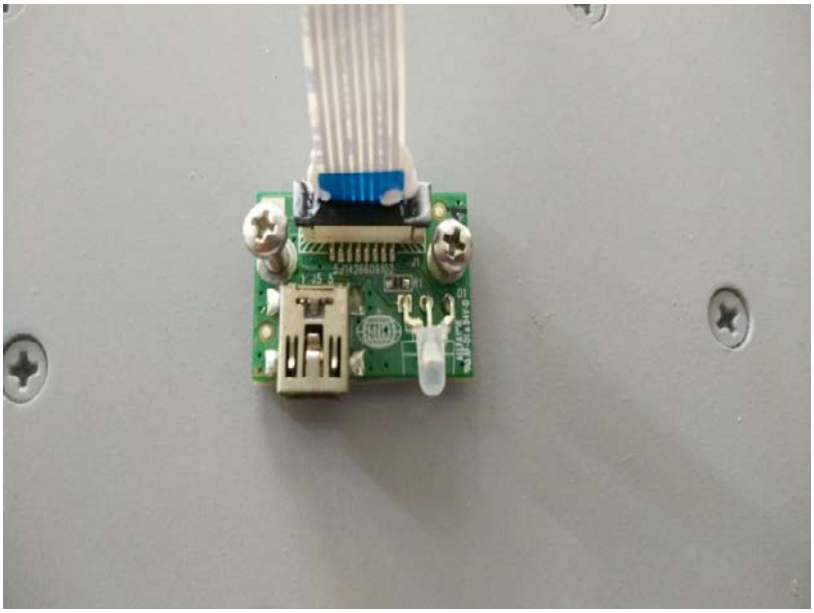

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