FCC TEST REPORT (PART 27)

REPORT NO.: RF111215E04
MODEL NO.: PXU1960
FCC ID: XCNPXU1960
RECEIVED: Dec. 15, 2011
TESTED: Dec. 27 to 29, 2011
ISSUED: Jan. 06, 2012

APPLICANT: Ubee Interactive Corp.

ADDRESS: 6F-9, No.38, Taiyuan St. Jhubei City Hsinchu County 302, Taiwan.

ISSUED BY : Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF111215E04	Original release	Jan. 06, 2012

1 CERTIFICATION

PRODUCT:	4G Mobile USB
BRAND NAME:	Ubee
MODEL NO.:	PXU1960
TEST SAMPLE:	ENGINEERING SAMPLE
APPLICANT:	Ubee Interactive Corp.
TESTED:	Dec. 27 to 29, 2011
TEST STANDARDS:	FCC 47 CFR Part 2
	FCC 47 CFR Part 27, Subpart C & M
	ANSI/TIA/EIA-603-C-2004

The above equipment (Model No.: PXU1960) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : _____ , **DATE:** *Jan. 06, 2012*
(Claire Kuan, Specialist)

APPROVED BY : _____ , **DATE:** *Jan. 06, 2012*
(May Chen, Deputy Manager)

2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 27 & Part 2			
STANDARD SECTION	**TEST TYPE AND LIMIT**	**RESULT**	**REMARK**
2.1046 27.50(h)(2)	Maximum Peak Output Power Limit: max. 2 watts EIRP power	PASS	Meet the requirement of limit.
2.1055 27.54	Frequency Stability Stay with the authorized bands of operation	PASS	Meet the requirement of limit.
2.1049 27.53(m)(6)	Emission Bandwidth	PASS	Meet the requirement of limit.
2.1051 27.53(m)(4)(6)	Band Edge Measurements	PASS	Meet the requirement of limit.
2.1051 27.53(m)(4)(6)	Conducted Spurious Emissions	PASS	Meet the requirement of limit.
2.1053 27.53(m)(4)(6)	Radiated Spurious Emissions	PASS	Meet the requirement of limit.

2.1 MEASUREMENT UNCERTAINTY

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

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

Measurement	**Value**
Radiated emissions (30MHz-1GHz)	4 dB
Radiated emissions (1GHz -18GHz)	2.49 dB
Radiated emissions (18GHz -40GHz)	2.70 dB

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	4G Mobile USB
MODEL NO.	PXU1960
FCC ID	XCNPXU1960
POWER SUPPLY	DC 5V from host equipment
MODULATION TECHNOLOGY	OFDMA
MODULATION	Up-Link: QPSK-1/2, -3/4, 16QAM-1/2, -3/4, Down-Link: QPSK-1/2, -3/4, 16QAM-1/2, -3/4, 64QAM-1/2, -2/3, -3/4, -5/6
OPERATING FREQUENCY	5MHz: 2498.5 ~ 2687.5MHz 10MHz: 2501 ~ 2685MHz
CHANNEL BANDWIDTH	5MHz & 10MHz
MAX. EIRP POWER	5MHz: 32.5dBm 10MHz: 31.63dBm
MAX. CONDUCTED POWER	5MHz: 23.38dBm 10MHz: 23.36dBm
ANTENNA TYPE	Please see note
DATA CABLE	NA
ASSOCIATED DEVICES	NA

NOTE:

1. There is one antenna provided to this EUT, please refer to the following table:

Antenna Type	Antenna Connector	Antenna Gain (dBi)	Frequency range (MHz)
dual feed, combined monopole	NA	3	2496~2690

2. For the EUT modulation type and coding rate. After pre-testing items of output power and spurious emissions, QPSK-1/2 was found to be 5MHz worst case, QPSK-1/2 was found to be 10MHz worst case, and was selected for the final test configuration.

Up Link		Down Link	
Modulation	Coding rate	Modulation	Coding rate
QPSK	1/2	QPSK	1/2
	3/4		3/4
16QAM	1/2	16QAM	1/2
	3/4		3/4
		64QAM	1/2
			2/3
			3/4
			5/6

3. The EUT incorporates a SIMO function for WiMAX. Physically, the EUT provides one completed transmit and two receivers.

4. The EUT embedded a firmware for testing that needs to control from Notebook computer to let EUT with different DL/UL ration.

5. The device has different DL/UL ration in normal operation. It was tested with (DL:UL= 29:18) duty cycle mode for 5MHz and 10MHz, which is the worse mode, and controlled by software. (The detail duty cycle refer to appendix A).

6. The above EUT information was declared by manufacturer and for more detailed feature descriptions, please refers to the manufacturer's specifications or User's Manual.

3.2 DESCRIPTION OF TEST MODES

The following channels have been tested and presented.

CHANNEL BANDWIDTH: 5MHz

Low channel (L): 2498.5MHz.

Middle channel (M): 2593MHz.

High channel (H): 2687.5MHz.

CHANNEL BANDWIDTH: 10MHz

Low channel (L): 2501MHz.

Middle channel (M): 2593MHz.

High channel (H): 2685MHz.

3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	APPLICABLE TO							DESCRIPTION
	OP	FS	EB	CE	CSE	RE<1G	RE≥1G	
MODE 1	√	√	√	√	√	√	√	Channel Bandwidth: 5MHz
MODE 2	√	-	√	√	√	√	√	Channel Bandwidth: 10MHz

Where **OP:** Output power
FS: Frequency stability
EB: Emission bandwidth
CE: Channel edge
CSE: Conducted spurious emissions
RE<1G: Radiated emission below 1GHz
RE≥1G: Radiated emission above 1GHz

OUTPUT POWER MEASUREMENT:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

TESTED MODE	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE
MODE 1	L, M, H	OFDMA	QPSK
MODE 2	L, M, H	OFDMA	QPSK

FREQUENCY STABILITY MEASUREMENT:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE
M	OFDMA	Un-modulation

EMISSION BANDWIDTH MEASUREMENT:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

TESTED MODE	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE
MODE 1	L, M, H	OFDMA	QPSK
MODE 2	L, M, H	OFDMA	QPSK

CHANNEL EDGE MEASUREMENT:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

TESTED MODE	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE
MODE 1	L, M, H	OFDMA	QPSK
MODE 2	L, M, H	OFDMA	QPSK

CONDUCTED SPURIOUS EMISSIONS MEASUREMENT:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

TESTED MODE	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE
MODE 1	L, M, H	OFDMA	QPSK
MODE 2	L, M, H	OFDMA	QPSK

RADIATED EMISSION MEASUREMENT (BELOW 1 GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

TESTED MODE	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE
MODE 1	H	OFDMA	QPSK
MODE 2	H	OFDMA	QPSK

RADIATED EMISSION MEASUREMENT (ABOVE 1 GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

TESTED MODE	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE
MODE 1	L, M, H	OFDMA	QPSK
MODE 2	L, M, H	OFDMA	QPSK

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT has RF transmitter and receiver. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC 47 CFR Part 2

FCC 47 CFR Part 27, Subpart C & M

ANSI/TIA/EIA-603-C-2004

All test items have been performed and recorded as per the above standards.

NOTE: The EUT has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

3.4 DESCRIPTION OF SUPPORT UNITS

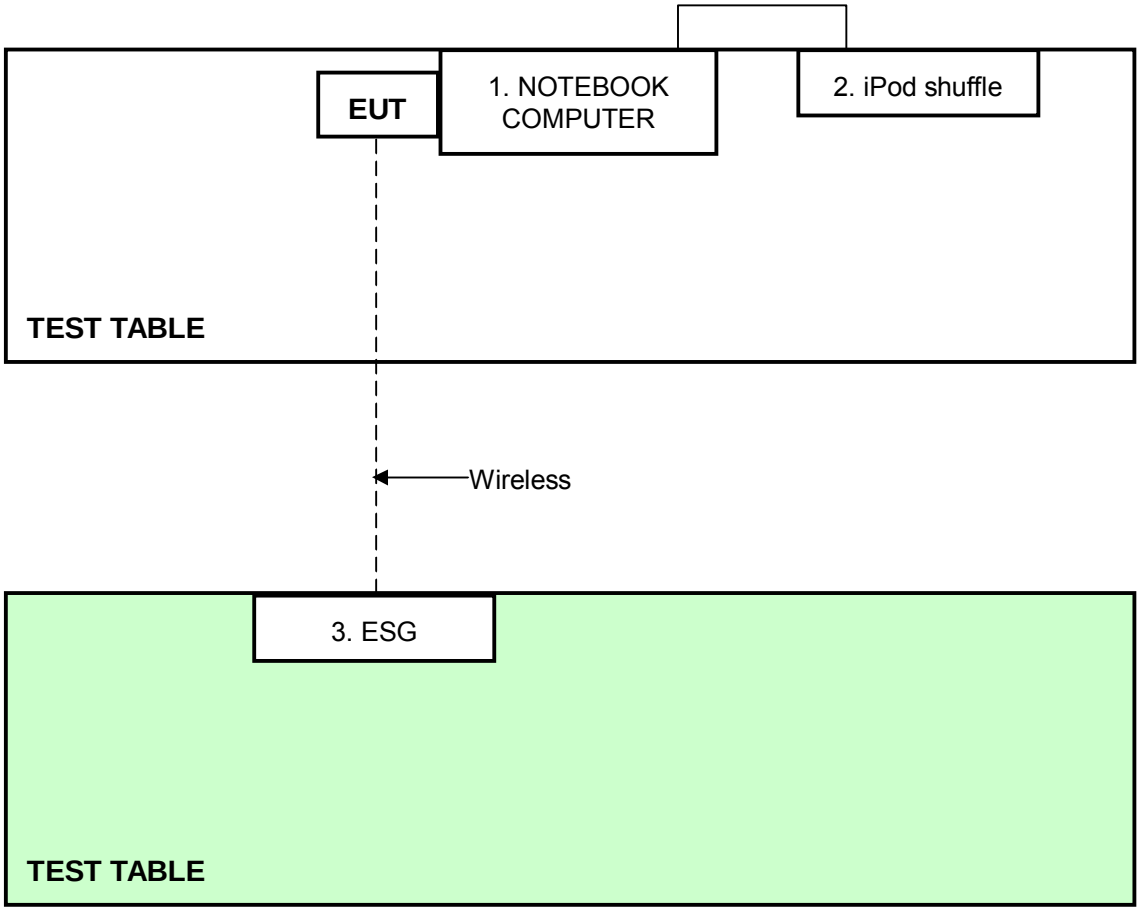
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	DELL	D531	CN-0XM006-48643-86L-4472	QDS-BRCM1019
2	iPod shuffle	Apple	MC749TA/A	CC4DMFJUDFDM	FCC DoC
3	ESG	Agilent	E4438C	MY45094468/005 506 602 UK6 UNJ	NA

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	1.0 m shielded cable, terminated with USB connector, w/o core.
3	NA

NOTE: All power cords of the above support units are non shielded (1.8m).

3.4.1 CONFIGURATION OF SYSTEM UNDER TEST



4 TEST TYPES AND RESULTS

4.1 OUTPUT POWER MEASUREMENT

4.1.1 LIMITS OF OUTPUT POWER MEASUREMENT

The radiated peak output power shall be according to the specific rule Part 27.50(h)(2) that “Mobile stations are limited to 2.0 watts EIRP and 27.50(i) specific that “Peak transmit power shall be measure over any interval of continuous transmission using instrumentation calibration in terms of rms-equivalent voltage.”

4.1.2 TEST INSTRUMENTS

For Conducted Power: (Test date: Dec. 27, 2011)

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Anritsu Power meter	ML2495A	0824006	May 04, 2011	May 03, 2012
JFW 10dB attenuation	50HF-010-SMA	N/A	NA	NA

NOTE:
The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

For EIRP Power: (Test date: Dec. 29, 2011)

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
ROHDE & SCHWARZ Spectrum Analyzer	FSP40	100036	Dec. 14, 2011	Dec. 13, 2012
Agilent PSA Spectrum Analyzer	E4446A	MY48250113	Nov. 30, 2011	Nov. 29, 2012
HP Pre_Amplifier	8449B	300801923	Oct. 31, 2011	Oct. 30, 2012
ROHDE & SCHWARZ Test Receiver	ESCS30	847124/029	Sep. 02, 2011	Sep. 01, 2012
SCHWARZBECK TRILOG Broadband Antenna	VULB 9168	138	Apr. 14, 2011	Apr. 13, 2012
Schwarzbeck Horn_Antenna	BBHA9120	D124	Dec. 16, 2011	Dec. 15, 2012
Schwarzbeck Horn_Antenna	BBHA 9170	BBHA9170153	Jan. 17, 2011	Jan. 16, 2012
RF Switches	EMH-011	1001	Sep. 24, 2011	Sep. 23, 2012
RF CABLE (Chaintek)	Sucoflex 106	RF106-102	Jan. 27, 2011	Jan. 26, 2012
RF Cable	8DFB	STCCAB-30M-1GHz	Sep. 24, 2011	Sep. 23, 2012
Software	ADT_Radiated_V7.6.15.9.2	NA	NA	NA
CT Antenna Tower & Turn Table	NA	NA	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The horn antenna, preamplifier (model: 8449B) and Spectrum Analyzer (model: FSP40) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in Open Site No. C.
4. The FCC Site Registration No. is 656396.
5. The VCCI Site Registration No. is R-1626.
6. The CANADA Site Registration No. is IC 7450G-3.

4.1.3 TEST PROCEDURES

For Conducted Power:

The transmitter output was connected to power meter through an attenuator. The test result was measured and recorded.

For EIRP Power:

a. The power was measured with Spectrum Analyzer. All measurements were done at 3 channels (low, middle and high channel of operational frequency range.)

b. Substitution method is used for EIRP measurement. In the open area test site, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.

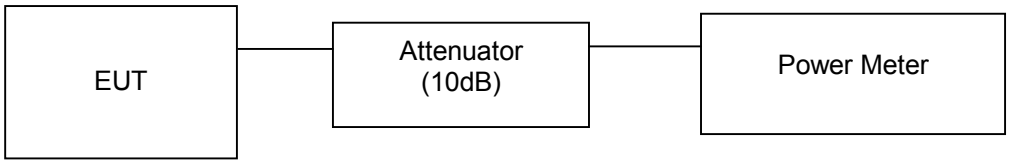
c. The substitution antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a tx cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value “ of step b. Record the power level of S.G

d. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution antenna.

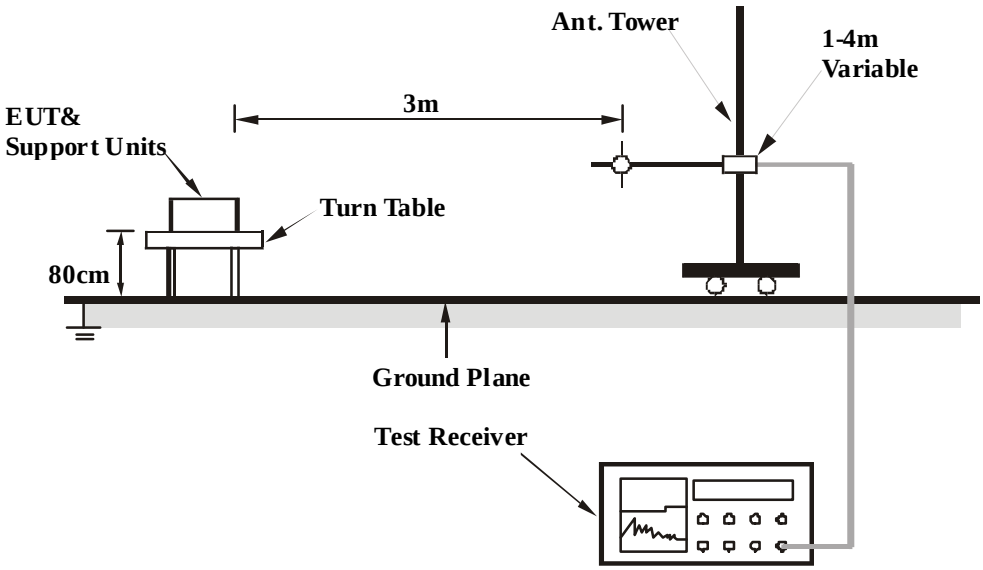
NOTE: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz

4.1.4 TEST SETUP

For Conducted Power:



For EIRP Power:



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

4.1.5 EUT OPERATING CONDITIONS

a. Connect the EUT with the support unit 1 (Notebook Computer) which is placed on a testing table.

b. The support unit 1(Notebook computer) ran test program “MTK RFCAL Toolv1.5.1 b553” to support unit 3 (ESG) via EUT by via one UTP cable and wireless transmission.

4.1.6 TEST RESULTS

CHANNEL BANDWIDTH: 5MHz

INPUT POWER (SYSTEM)	120Vac, 60Hz	**DETECTOR FUNCTION**	RMS
ENVIRONMENTAL CONDITIONS	20deg°C, 60%RH	**TESTED BY**	Frank Liu

EIRP POWER						
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBm)	S.G level (dBm)	C.F. (dB)	Power level (dBm)
1	2498.5	124.30	33	25.85	6.65	32.50
2	2593	123.00	33	23.79	6.74	30.53
3	2687.5	122.90	33	22.90	6.83	29.73
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBm)	S.G level (dBm)	C.F. (dB)	Power level (dBm)
1	2498.5	121.40	33	22.95	6.65	29.60
2	2593	120.00	33	20.79	6.74	27.53
3	2687.5	121.80	33	21.80	6.83	28.63

REMARKS: 1. Power Value(dBm)=S.G Power Value (dBm) + Correction Factor(dB)

CONDUCTED POWER			
CHANNEL	**FREQUENCY (MHz)**	**POWER OUTPUT(mW)**	**POWER OUTPUT(dBm)**
Low	2498.5	208.930	23.20
Middle	2593	197.242	22.95
High	2687.5	213.796	23.38

CHANNEL BANDWIDTH: 10MHz

INPUT POWER (SYSTEM)	120Vac, 60Hz	**DETECTOR FUNCTION**	RMS
ENVIRONMENTAL CONDITIONS	20deg°C, 60%RH	**TESTED BY**	Frank Liu

EIRP POWER						
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBm)	S.G level (dBm)	C.F. (dB)	Power level (dBm)
1	2501	122.70	33	24.25	6.65	30.90
2	2593	124.10	33	24.89	6.74	31.63
3	2685	124.50	33	24.52	6.83	31.35
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBm)	S.G level (dBm)	C.F. (dB)	Power level (dBm)
1	2501	119.40	33	20.95	6.65	27.60
2	2593	120.50	33	21.29	6.74	28.03
3	2685	121.50	33	21.52	6.83	28.35

REMARKS: 1. Power Value(dBm)=S.G Power Value (dBm) + Correction Factor(dB)

CONDUCTED POWER			
CHANNEL	**FREQUENCY (MHz)**	**POWER OUTPUT(mW)**	**POWER OUTPUT(dBm)**
Low	2501	211.349	23.25
Middle	2593	193.642	22.87
High	2685	213.796	23.36

4.2 FREQUENCY STABILITY MEASUREMENT

4.2.1 LIMITS OF FREQUENCY STABILIITY MEASUREMENT

According to the FCC part 2.1055 shall be tested the frequency stability. The rule is defined that" The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block." The test extreme voltage is according to the 2.1055(d)(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment and the extreme temperature rule is comply with specification of EUT -30℃ ~ 50℃.

4.2.2 TEST INSTRUMENTS

Test date: Dec. 27, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100036	Dec. 14, 2011	Dec. 13, 2012
OVEN	MHU-225AU	911033	Dec. 12, 2011	Dec. 11, 2012
HUBER+SUHNER	SUCOFLEX102	36434/2	Jan. 27, 2011	Jan. 26, 2012
AC POWER SOURCE	6205	1140503	NA	NA

NOTE: 1. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.

4.2.3 TEST PROCEDURE

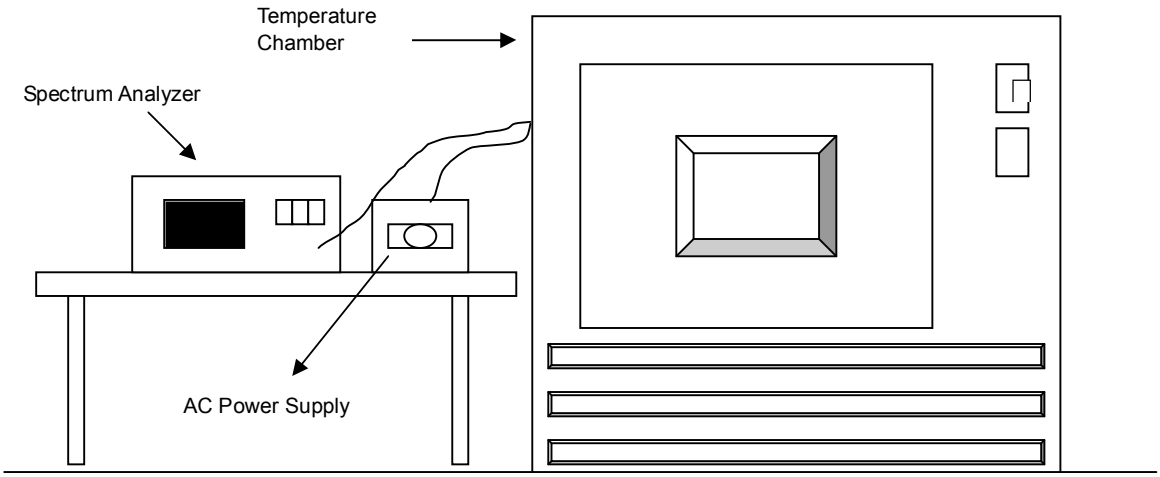
a. Power must be removed when changing from one temperature to another or one voltage to another voltage. Power warm up is at least 15 min and power applied should perform before recording frequency error.

b. EUT is connected the external power supply to control the AC input power. The various Volts from the minimum 102 Volts to 138 Volts. Each step shall be record the frequency error rate.

c. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the ±0.5℃ during the measurement testing.

d. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

4.2.4 TEST SETUP



4.2.5 TEST RESULTS

MODE	Middle channel (2593MHz)	INPUT POWER (SYSTEM)	120Vac, 60Hz
ENVIRONMENTAL CONDITIONS	20deg°C, 60%RH	TESTED BY	Frank Liu

AFC FREQUENCY ERROR VS. VOLTAGE								
VOLTAGE (Volts)	0Minutes		2Minutes		5Minutes		10Minutes	
	FREQUENCY (MHz)	(%)	FREQUENCY (MHz)	(%)	FREQUENCY (MHz)	(%)	FREQUENCY (MHz)	(%)
138	2593.00135	0.000052	2593.00113	0.000044	2593.0013	0.000049	2593.0014	0.000053
120	2593.00103	0.000040	2593.00126	0.000049	2593.0013	0.000051	2593.0014	0.000056
102	2593.00147	0.000057	2593.00126	0.000049	2593.0014	0.000053	2593.0015	0.000056

AFC FREQUENCY ERROR VS. TEMP								
TEMP (℃)	0Minutes		2Minutes		5Minutes		10Minutes	
	FREQUENCY (MHz)	(%)	FREQUENCY (MHz)	(%)	FREQUENCY (MHz)	(%)	FREQUENCY (MHz)	(%)
50	2593.00143	0.000055	2593.00156	0.000060	2593.00166	0.000064	2593.0017	0.000066
40	2593.00123	0.000047	2593.00132	0.000051	2593.00142	0.000055	2593.0016	0.000060
30	2593.00114	0.000044	2593.00122	0.000047	2593.00135	0.000052	2593.0014	0.000056
20	2593.00103	0.000040	2593.00126	0.000049	2593.0013	0.000051	2593.0014	0.000056
10	2593.00084	0.000032	2593.00094	0.000036	2593.00126	0.000049	2593.0013	0.000051
0	2593.00043	0.000017	2593.00043	0.000017	2593.00057	0.000022	2593.0008	0.000032
-10	2593.00096	0.000037	2593.00056	0.000022	2593.0006	0.000024	2593.0007	0.000028
-20	2593.00122	0.000047	2593.00129	0.000050	2593.0013	0.000051	2593.0015	0.000056
-30	2593.0014	0.000055	2593.0016	0.000061	2593.0017	0.000065	2593.0017	0.000067

4.3 EMISSION BANDWIDTH MEASUREMENT

4.3.1 LIMITS OF EMISSION BANDWIDTH MEASUREMENT

According to FCC 27.53(m)(6) specified that emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26dB below the transmitter power.

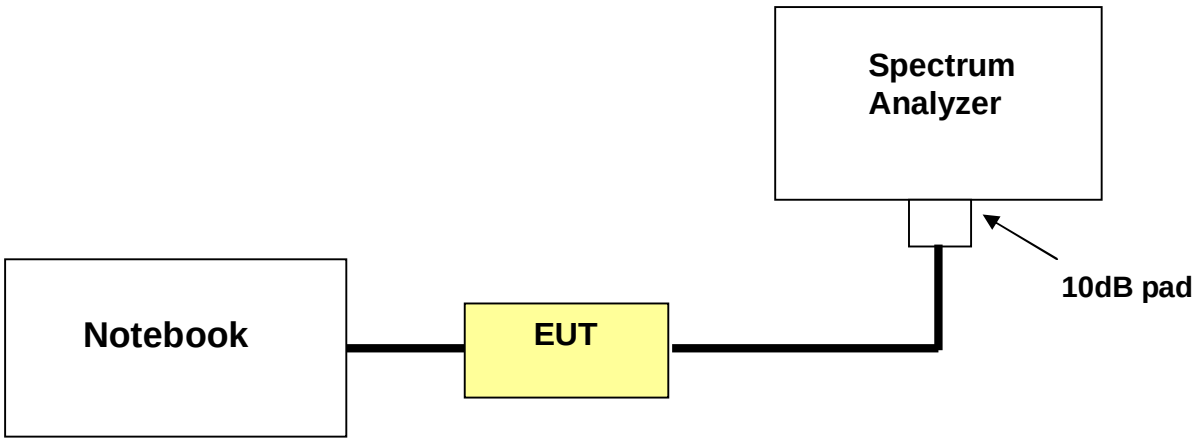
4.3.2 TEST INSTRUMENTS

Test date: Dec.27, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Agilent Spectrum Analyzer	E4446A	MY46180622	Apr. 29, 2011	Apr. 28, 2012
HUBER+SUHNER	SUCOFLEX102	36434/2	Jan. 27, 2011	Jan. 26, 2012
JFW 10dB attenuation	50HF-010-SMA	N/A	N/A	N/A

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.3.3 TEST SETUP



4.3.4 TEST PROCEDURES

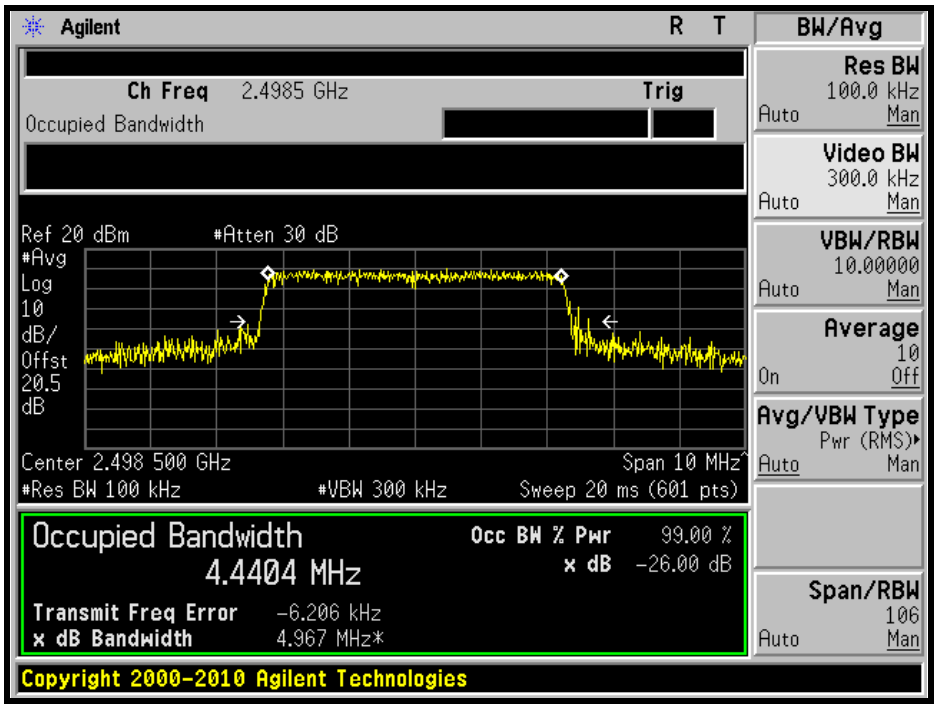
a. The Notebook controlled EUT to export rated output power under transmission mode and specific channel frequency. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100kHz RBW and 300kHz VBW. The 26dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 26dB.

4.3.5 TEST RESULTS

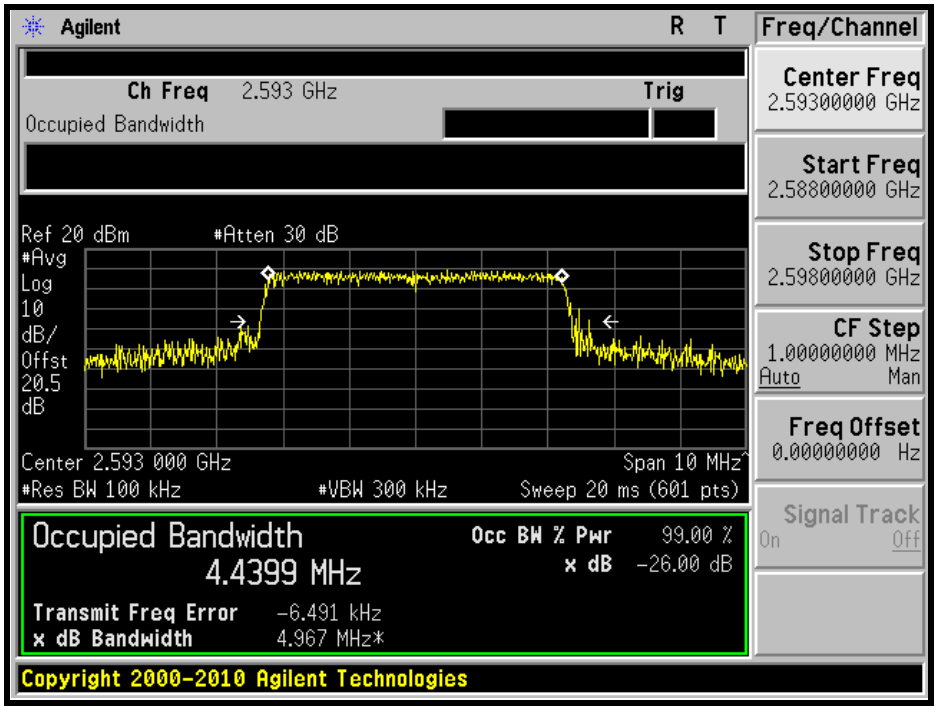
CHANNEL BANDWIDTH: 5MHz

FREQUENCY (MHz)	-26 dBc BANDWIDTH (MHz)
2498.5	4.96
2600	4.96
2687.5	4.96

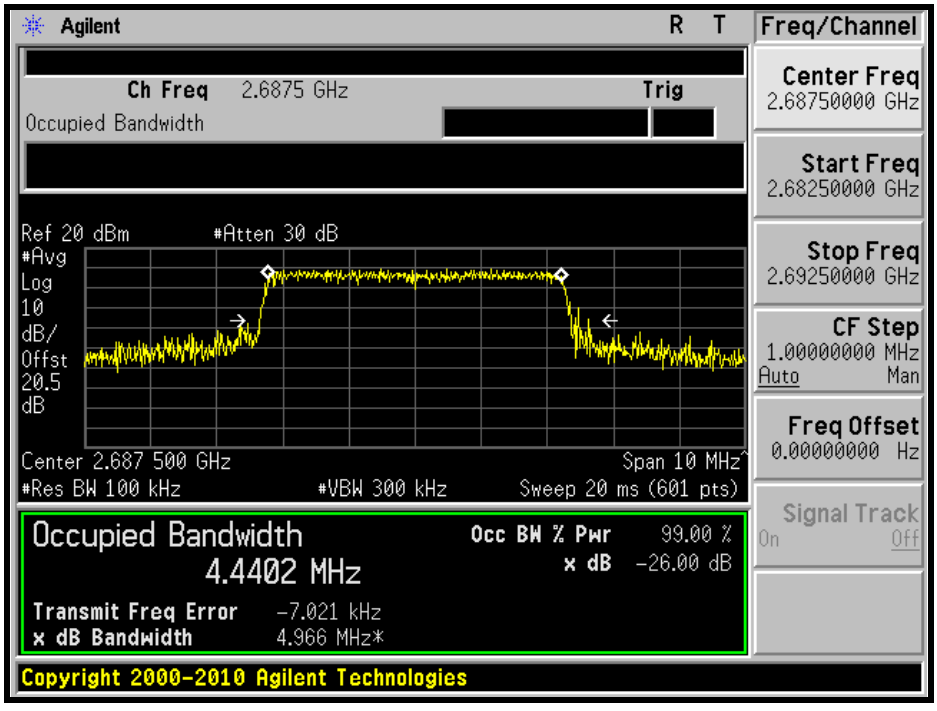
LOW CHANNEL



MIDDLE CHANNEL



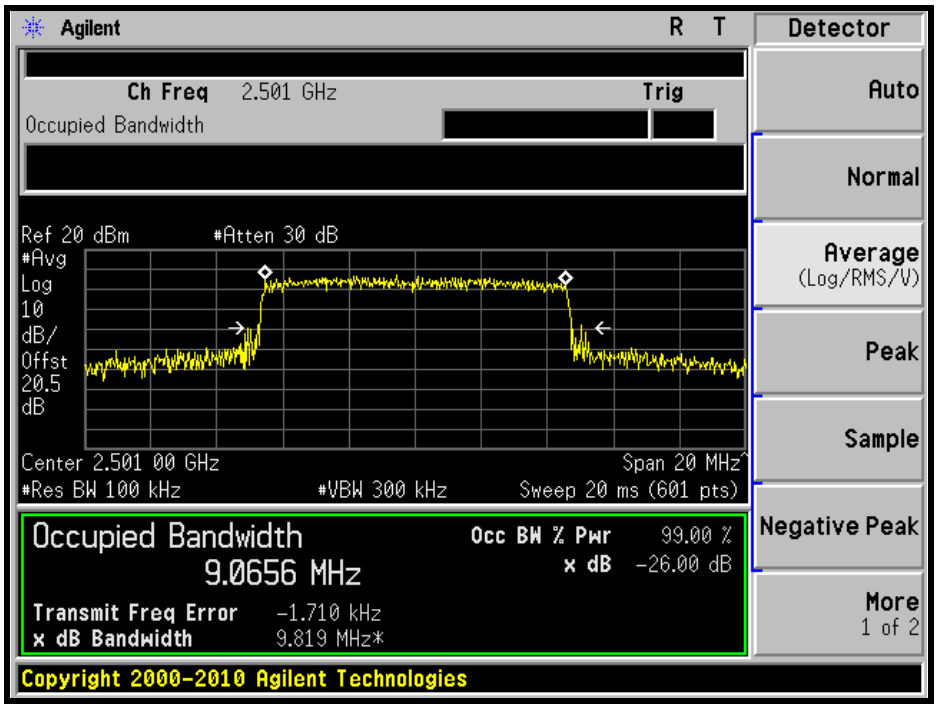
HIGH CHANNEL



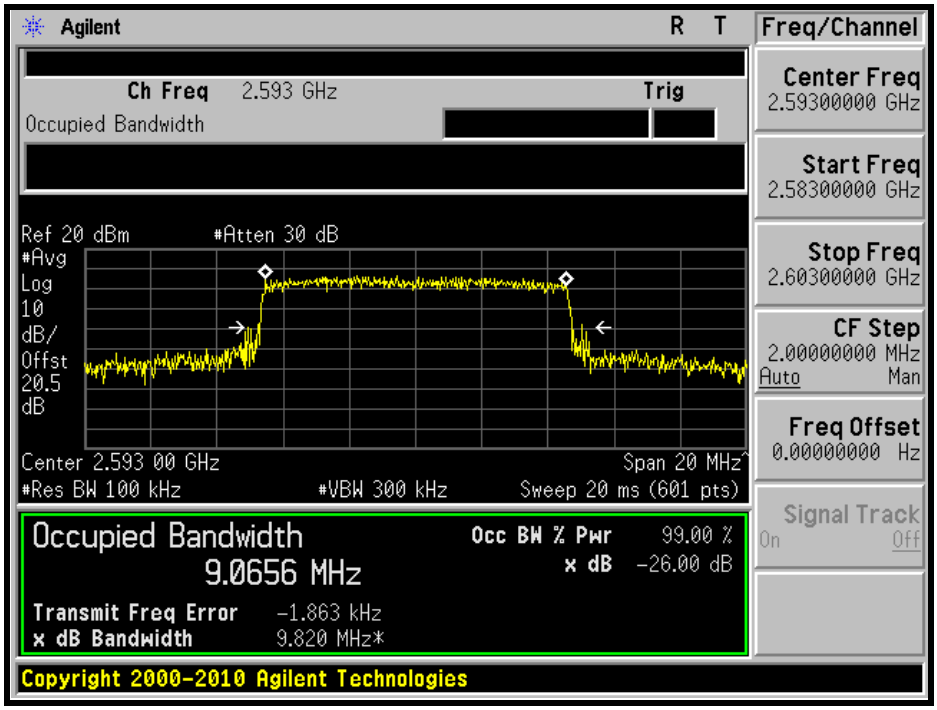
CHANNEL BANDWIDTH: 10MHz

FREQUENCY (MHz)	-26 dBc BANDWIDTH (MHz)
2501	9.81
2593	9.82
2685	9.82

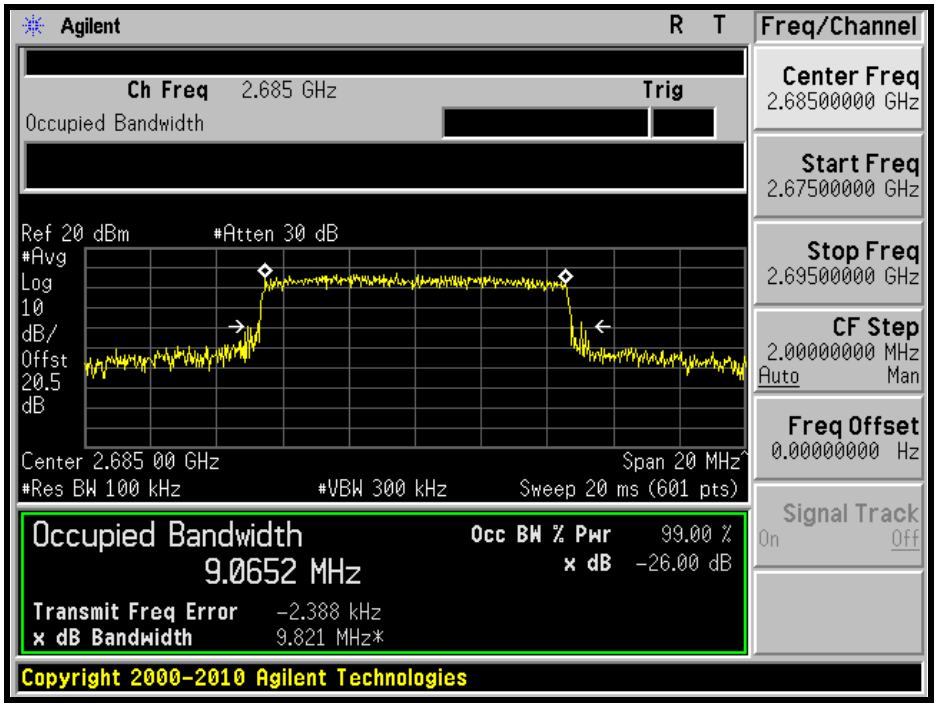
LOW CHANNEL



MIDDLE CHANNEL



HIGH CHANNEL



4.4 CHANNEL EDGE MEASUREMENT

4.4.1 LIMITS OF CHANNEL EDGE MEASUREMENT

According to FCC 27.53(m)(4) specified that power of any emission outside of the channel edge must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P)dB and 55 + 10 log (P) dB at 5.5 MHz from the channel edges. In the 1MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

4.4.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Agilent Spectrum Analyzer	E4446A	MY46180622	Apr. 29, 2011	Apr. 28, 2012
HUBER+SUHNER	SUCOFLEX102	36434/2	Jan. 27, 2011	Jan. 26, 2012
JFW 10dB attenuation	50HF-010-SMA	N/A	N/A	N/A

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.4.3 TEST SETUP

Same as Item 4.3.3

4.4.4 TEST PROCEDURES

a. The EUT was set up for the rated peak power. The power was measured with Spectrum Analyzer. All measurements were done at 3 channels: low, middle and high operational frequency range.

b. For Channel bandwidth: 5 MHz:

The center frequency of spectrum is the band edge frequency and span is 20MHz. RB of the spectrum is 51kHz and VB of the spectrum is 160kHz.

c. For Channel bandwidth: 10 MHz:

The center frequency of spectrum is the band edge frequency and span is 30MHz. RB of the spectrum is 100kHz and VB of the spectrum is 300kHz.

d. Record the max trace plot into the test report.

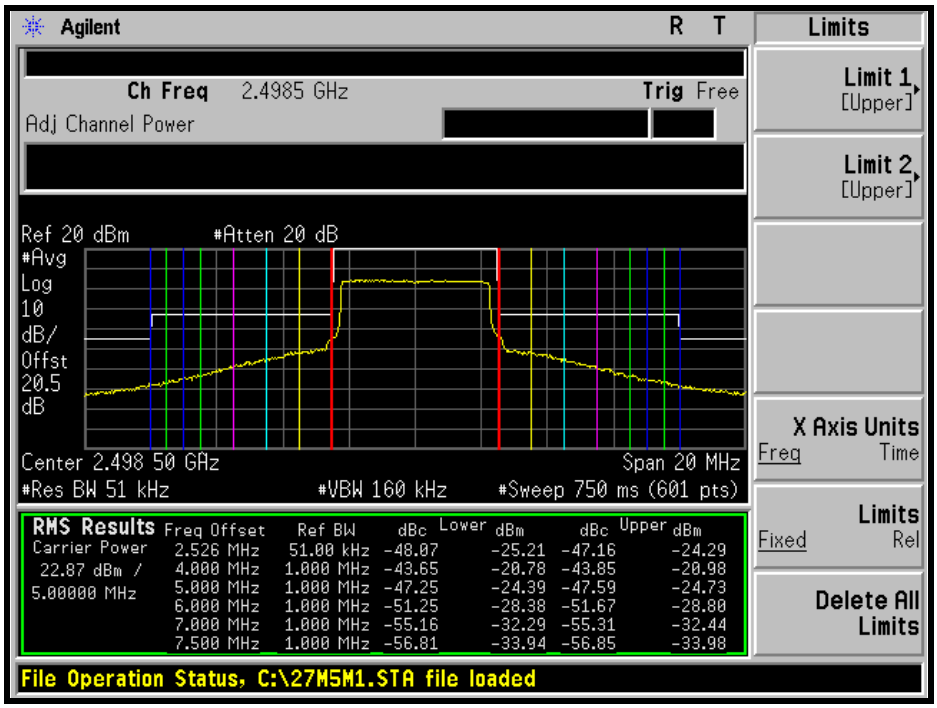
4.4.5 EUT OPERATING CONDITION

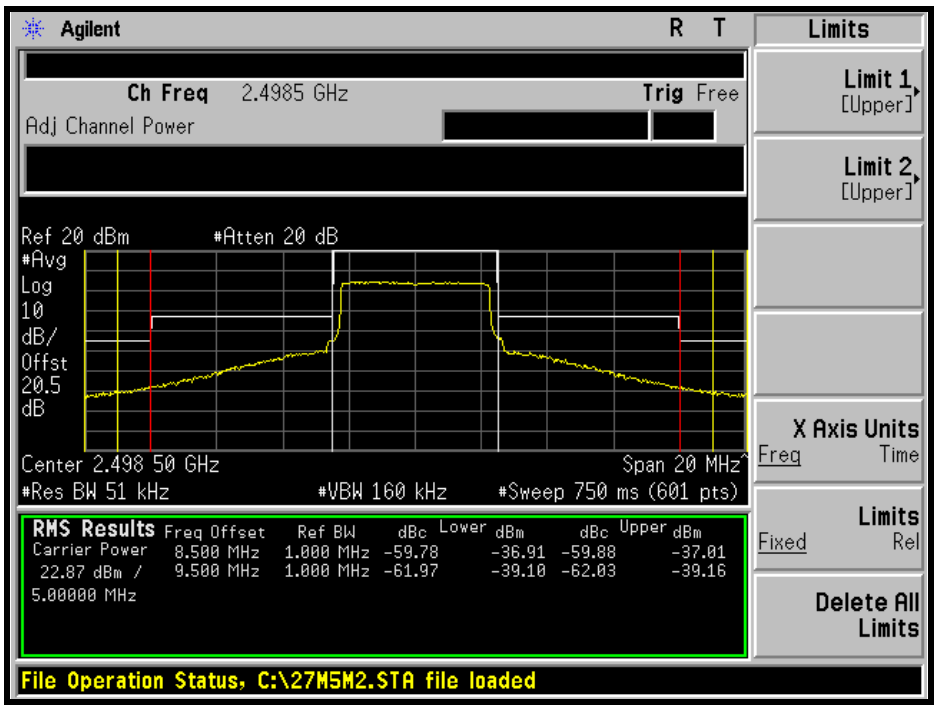
Same as item 4.1.5

4.4.6 TEST RESULTS

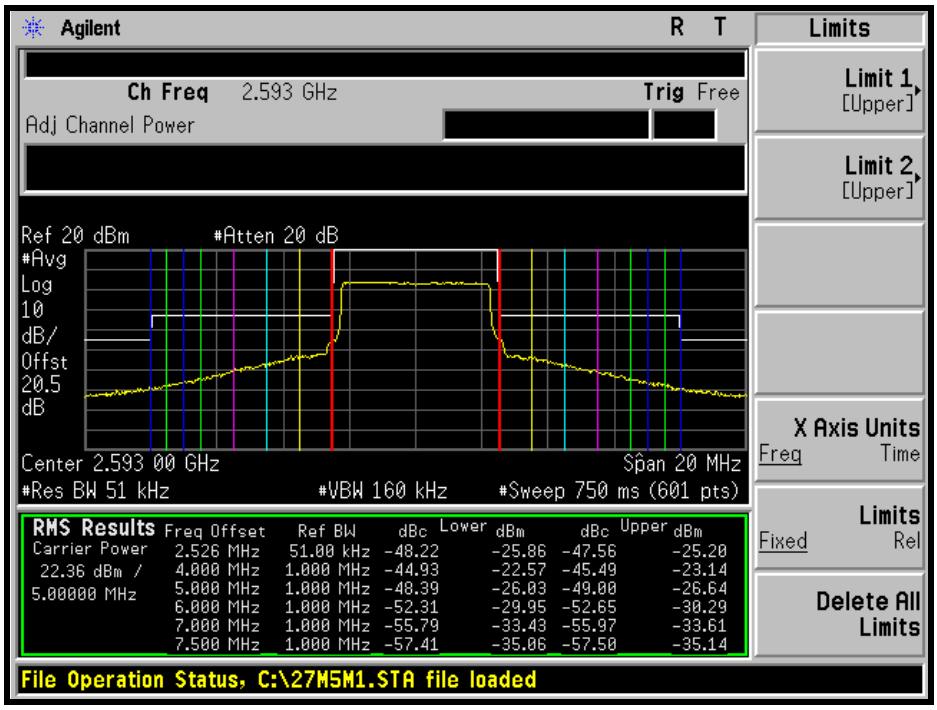
CHANNEL BANDWIDTH: 5MHz

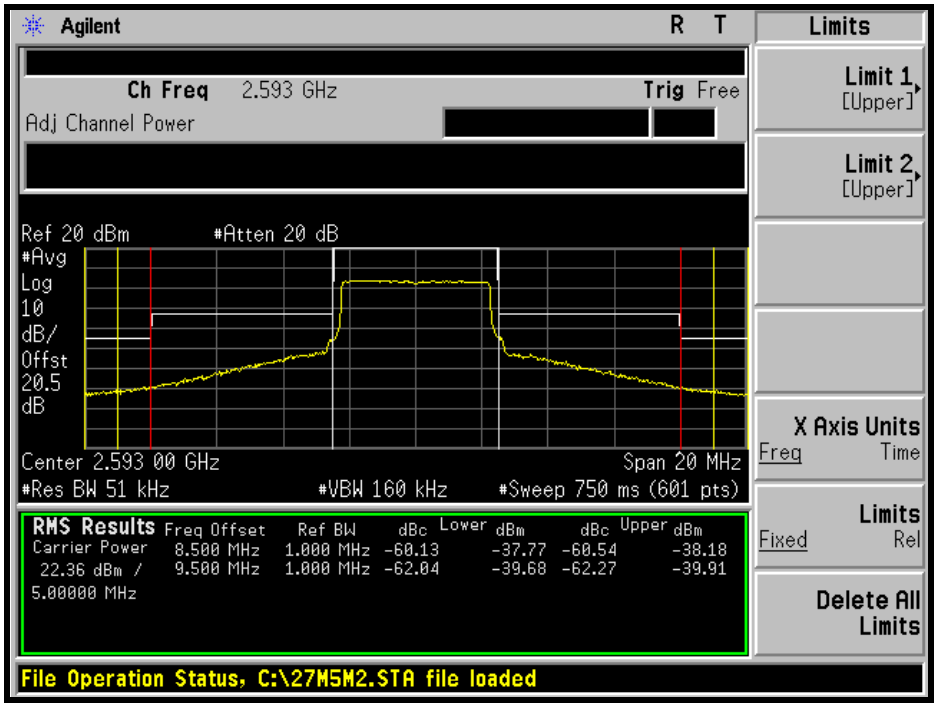
LOW CHANNEL



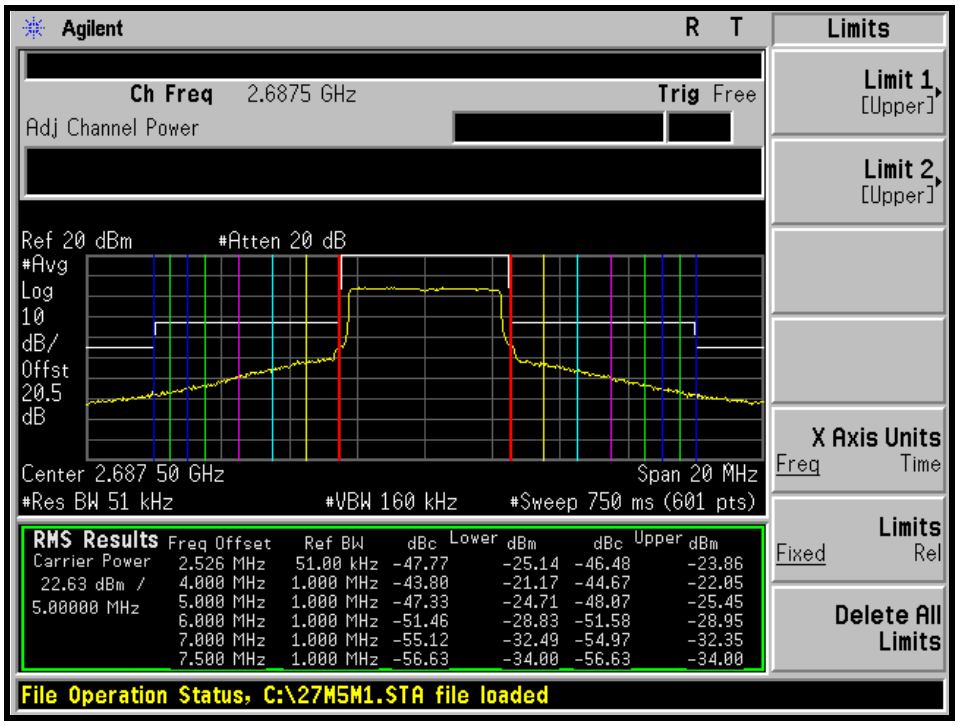


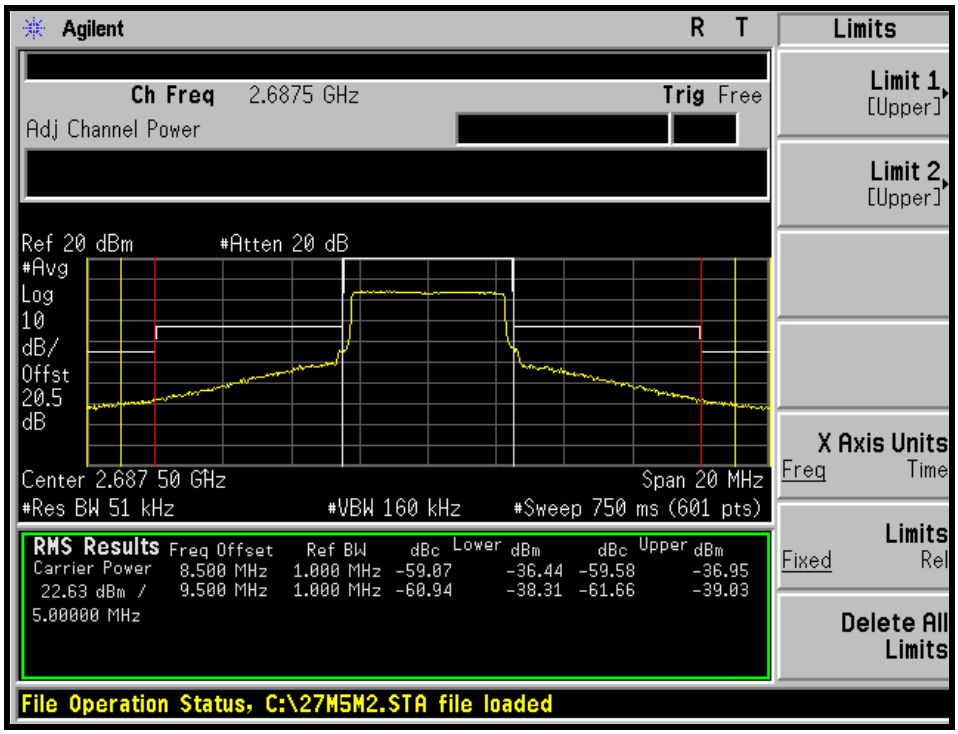
MIDDLE CHANNEL





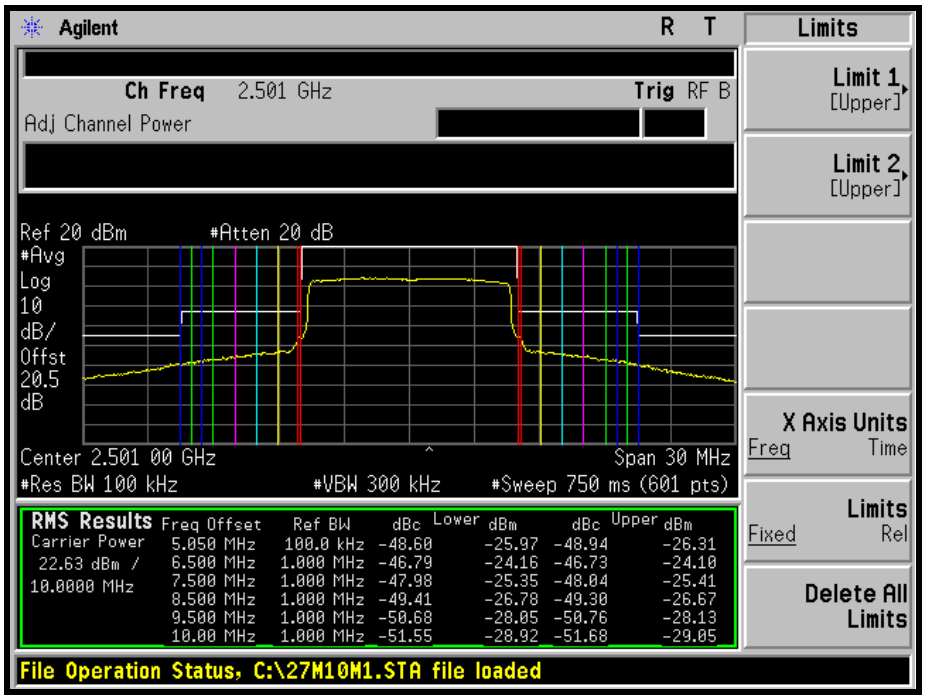
HIGH CHANNEL

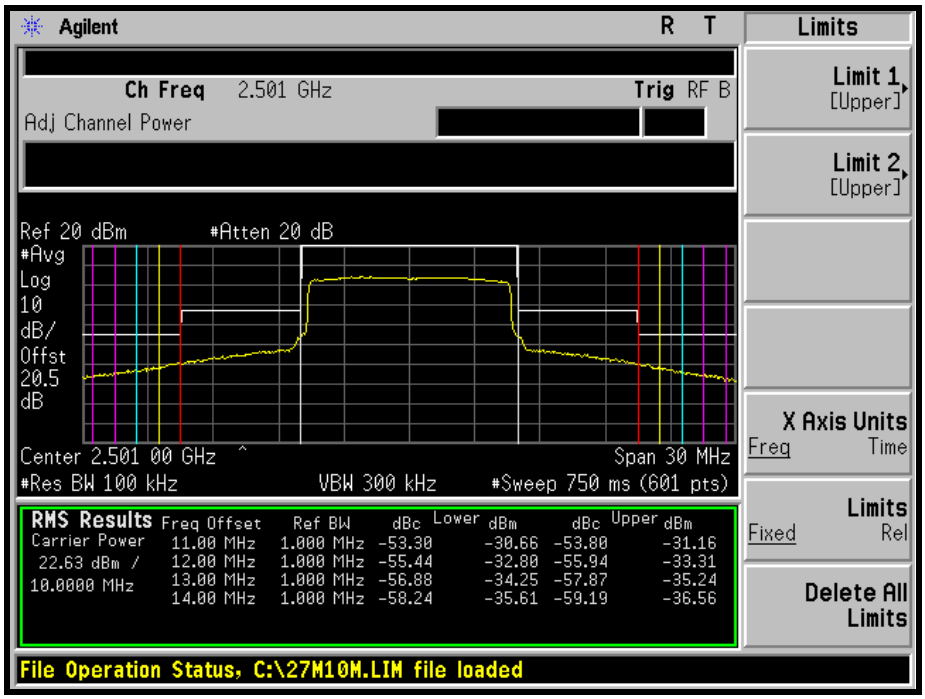




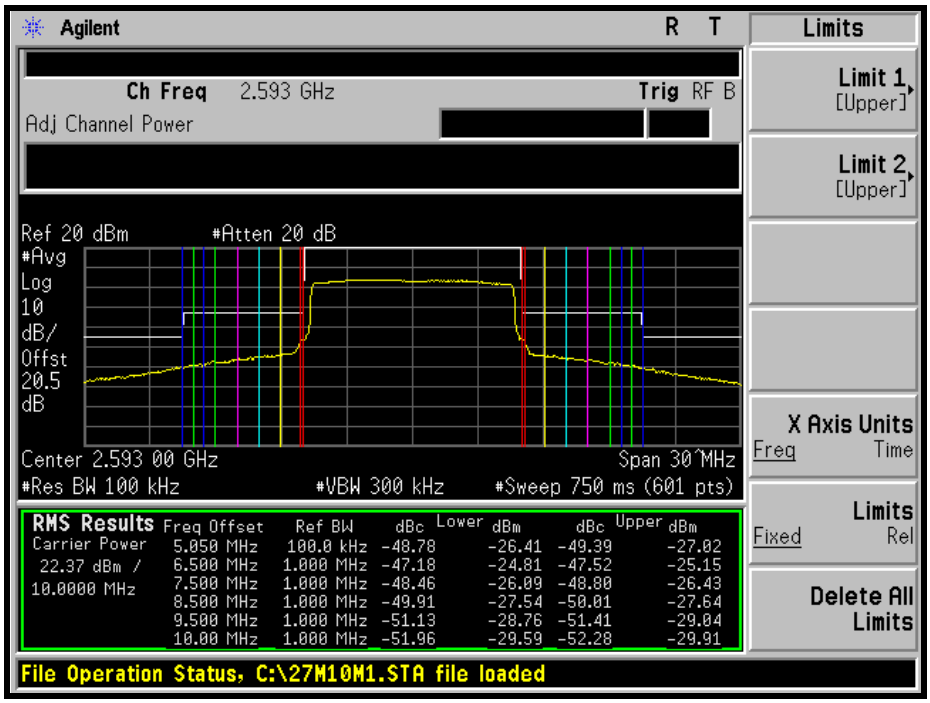
CHANNEL BANDWIDTH: 10MHz

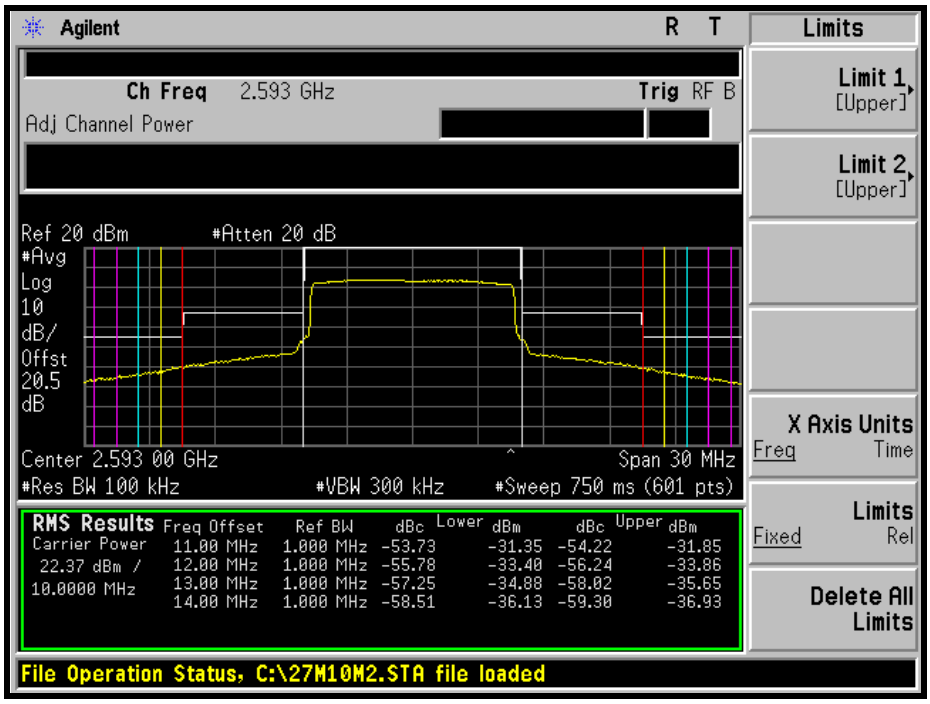
LOW CHANNEL



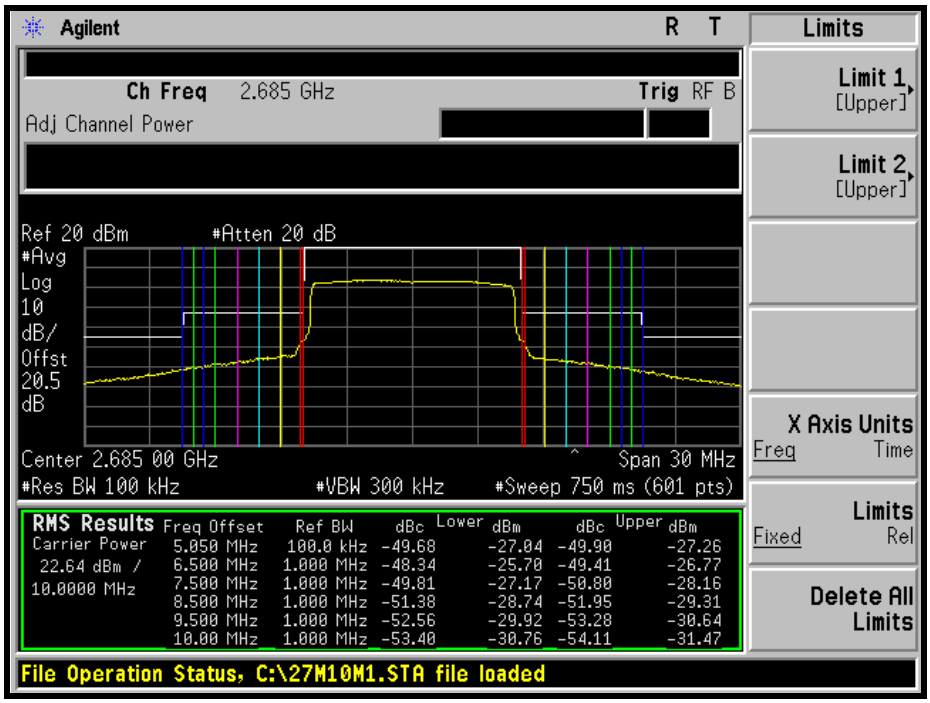


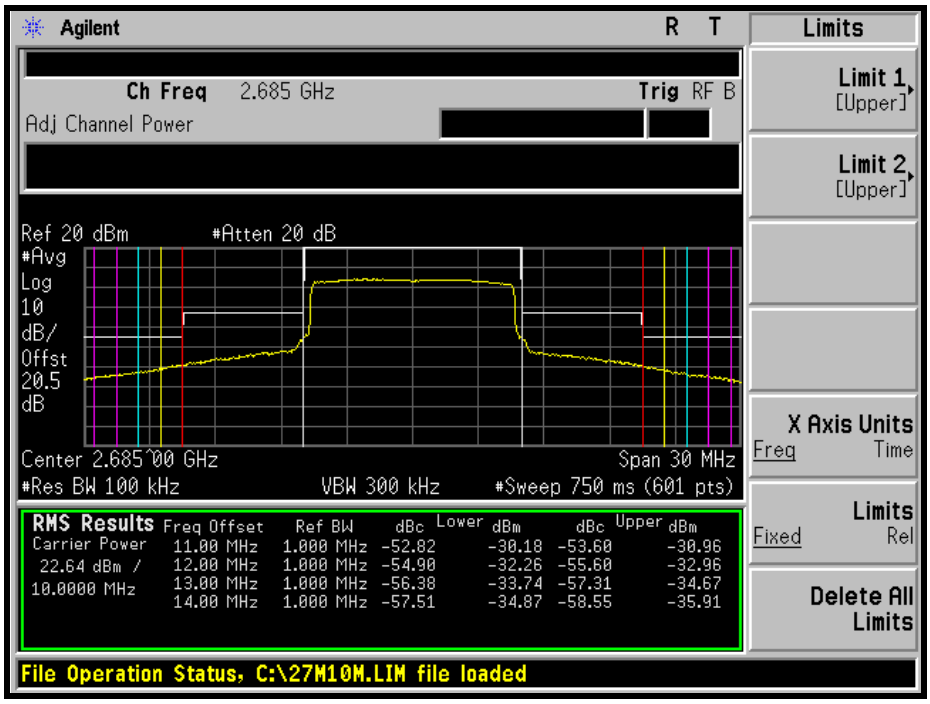
MIDDLE CHANNEL





HIGH CHANNEL





4.5 CONDUCTED SPURIOUS EMISSIONS

4.5.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

In the FCC 27.53(m)(4), On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least 43 +10 log (P)dB and 55 + 10 log (P) dB at 5.5 MHz from the channel edges.

4.5.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Agilent Spectrum Analyzer	E4446A	MY46180622	Apr. 29, 2011	Apr. 28, 2012
HUBER+SUHNER	SUCOFLEX102	36434/2	Jan. 27, 2011	Jan. 26, 2012
JFW 10dB attenuation	50HF-010-SMA	N/A	N/A	N/A

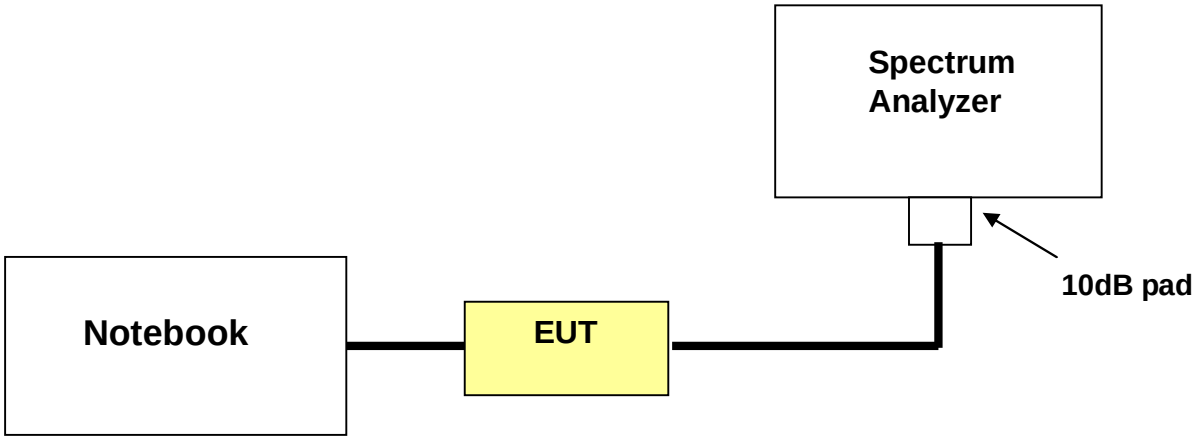
NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.5.3 TEST PROCEDURE

a. The EUT was set up for the rated peak power. The power was measured with Spectrum Analyzer. All measurements were done at 3 channels: low, middle and high operational frequency range.

b. When the spectrum scanned from 30MHz to 26.5GHz, it shall be connected to the 10dB pad attenuated the carried frequency. The spectrum set RB = 1MHz, VB = 3MHz.

4.5.4 TEST SETUP



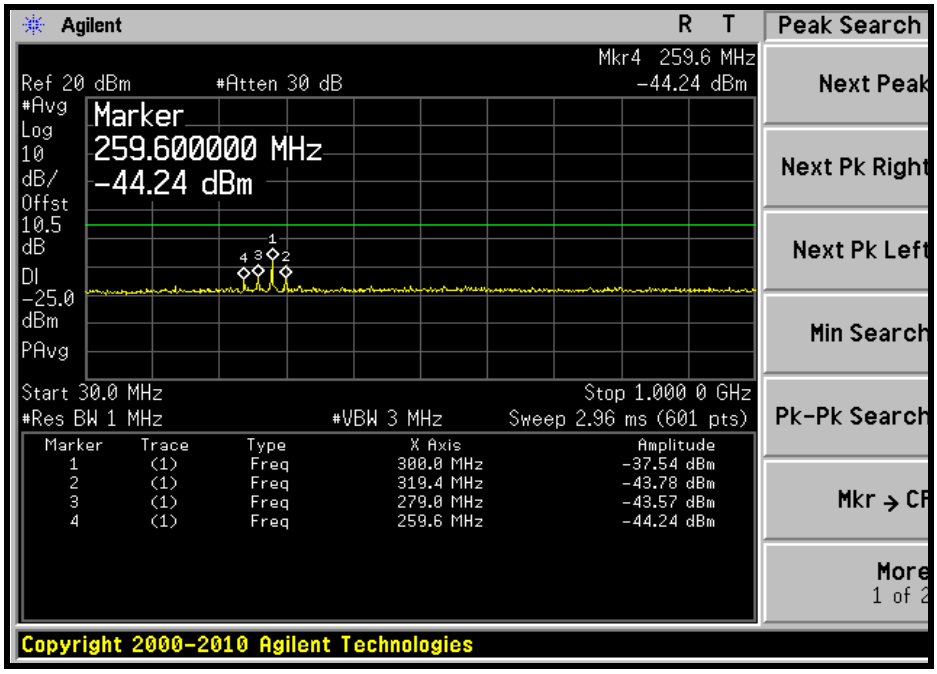
4.5.5 EUT OPERATING CONDITIONS

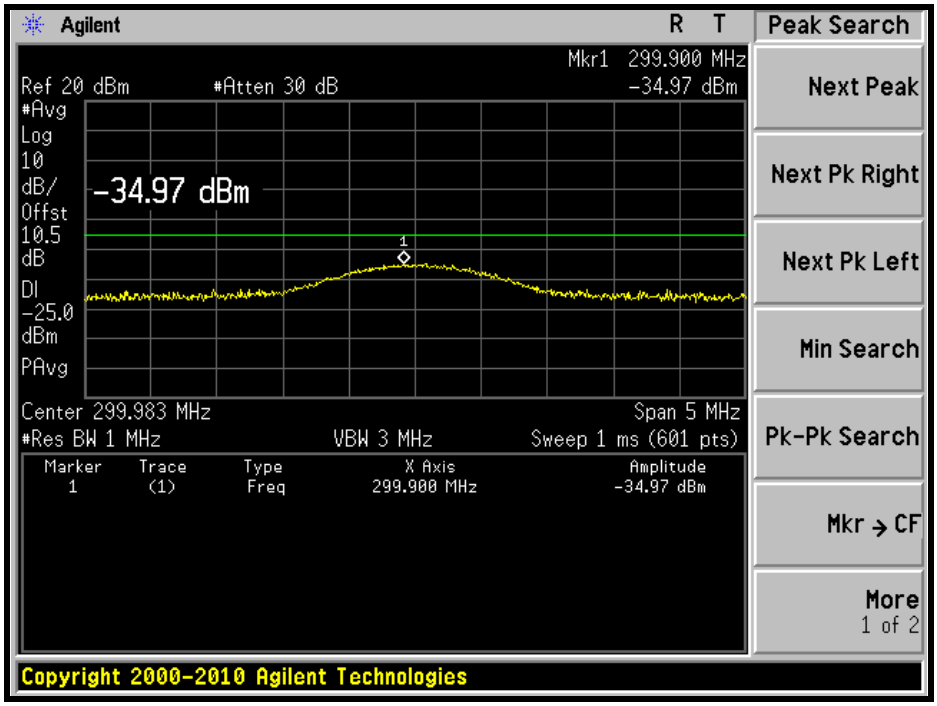
Same as item 4.1.5

4.5.6 TEST RESULTS

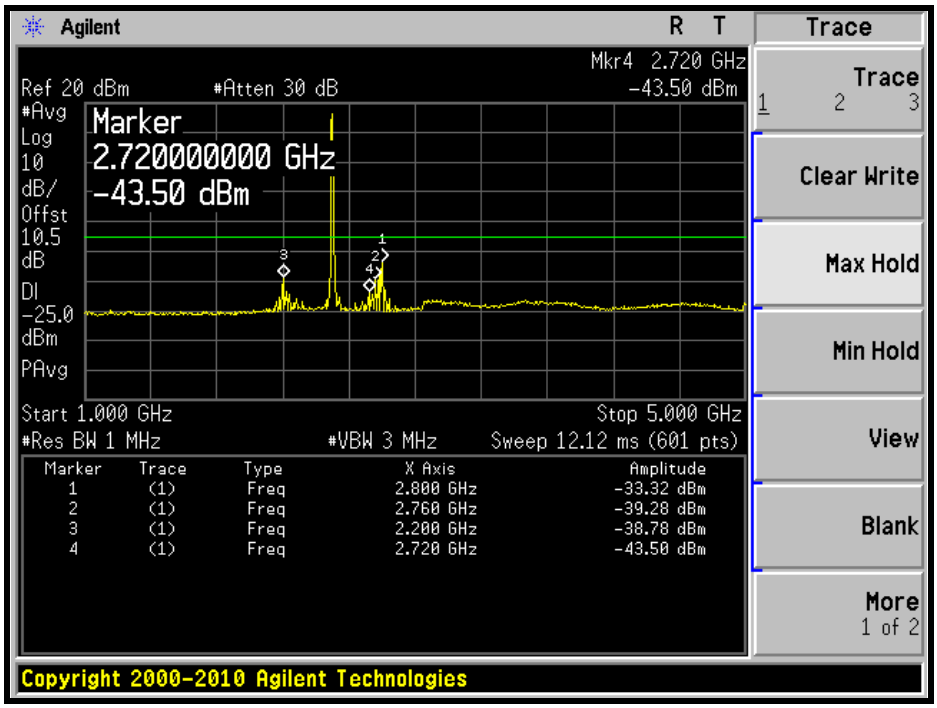
CHANNEL BANDWIDTH: 5MHz

LOW CHANNEL: 30MHz ~ 1GHz:





1GHz ~ 5GHz:


Agilent
R T
Trace
Mkr4 2.720 GHz
Ref 20 dBm
#Atten 30 dB
-43.50 dBm
Trace
1 2 3
#Avg
Log
10
dB/
Offst
10.5
dB
Dl
-25.0
dBm
PAvg
Marker
2.720000000 GHz
-43.50 dBm
Clear Write
Max Hold
Min Hold
View
Blank
More
1 of 2
Start 1.000 GHz
Stop 5.000 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 12.12 ms (601 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.800 GHz -33.32 dBm
2 (1) Freq 2.760 GHz -39.28 dBm
3 (1) Freq 2.200 GHz -38.78 dBm
4 (1) Freq 2.720 GHz -43.50 dBm
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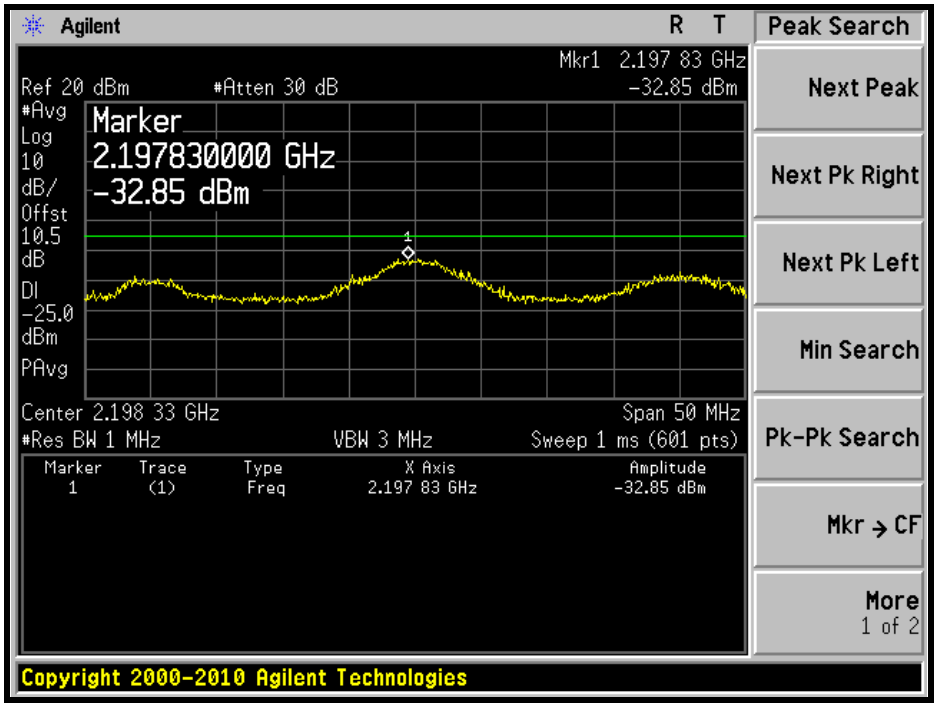
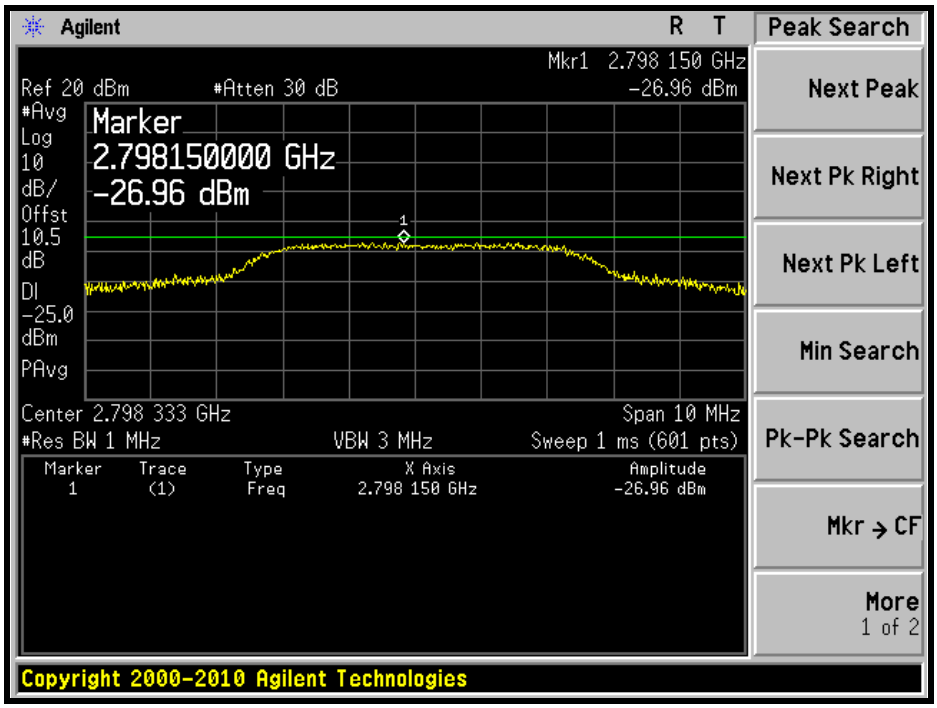
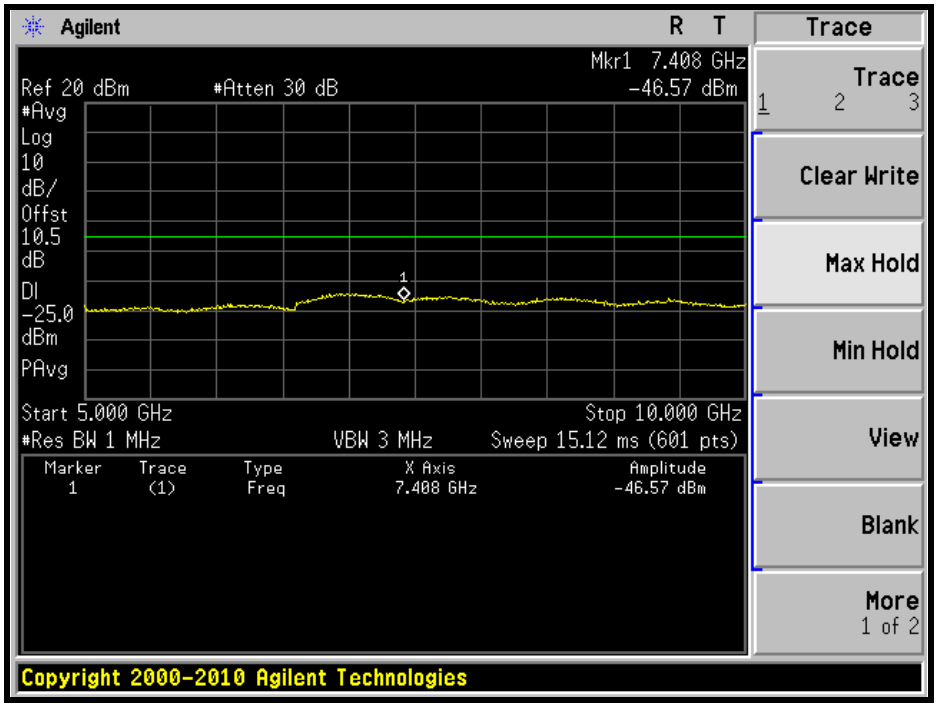
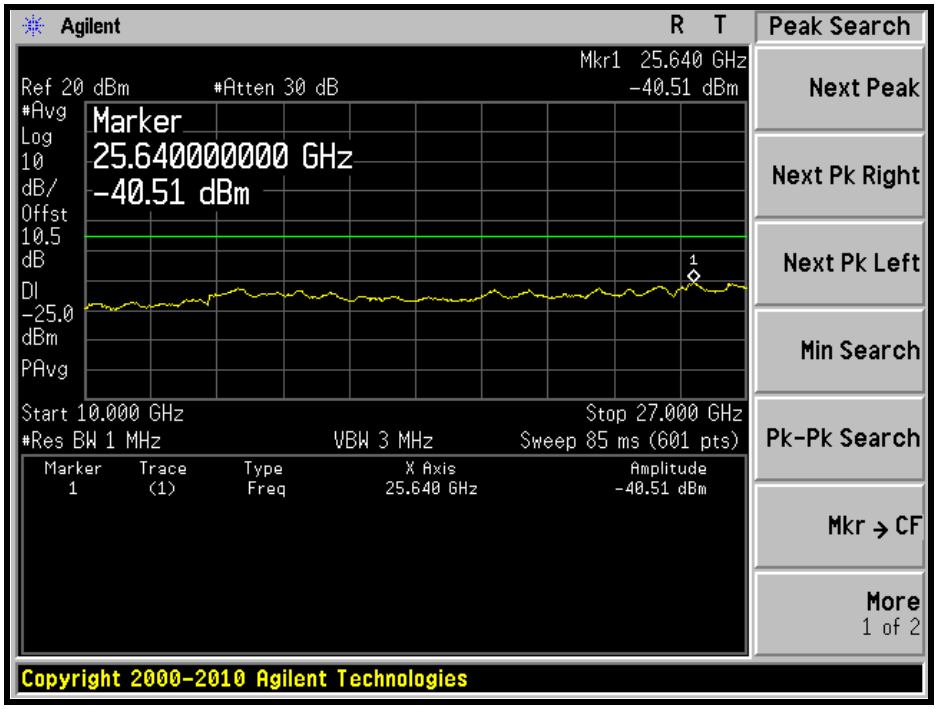

Agilent
R T
Peak Search
Mkr1 2.197 83 GHz
Ref 20 dBm
#Atten 30 dB
-32.85 dBm
Next Peak
#Avg
Log
10
dB/
Offst
10.5
dB
Dl
-25.0
dBm
PAvg
Marker
2.197830000 GHz
-32.85 dBm
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Center 2.198 33 GHz
Span 50 MHz
#Res BW 1 MHz
VBW 3 MHz
Sweep 1 ms (601 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.197 83 GHz -32.85 dBm
Copyright 2000-2010 Agilent Technologies


Agilent
R T
Peak Search
Mkr1 2.798 150 GHz
Ref 20 dBm
#Atten 30 dB
-26.96 dBm
Next Peak
#Avg
Log
10
dB/
Offst
10.5
dB
Marker
2.798150000 GHz
-26.96 dBm
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Center 2.798 333 GHz
Span 10 MHz
#Res BW 1 MHz
VBW 3 MHz
Sweep 1 ms (601 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.798 150 GHz -26.96 dBm
Copyright 2000-2010 Agilent Technologies

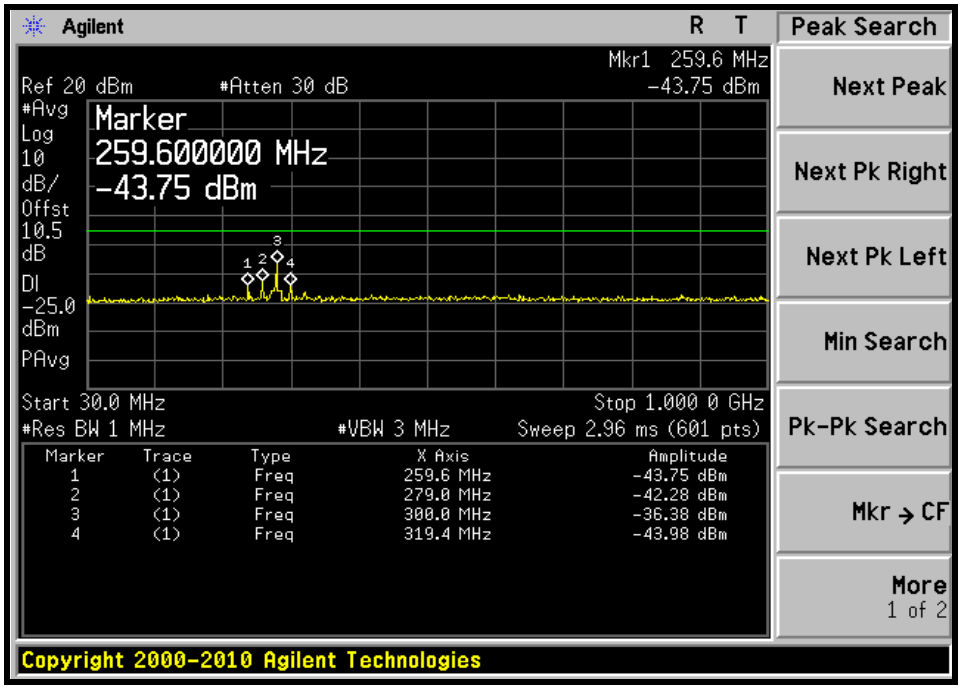
5GHz ~ 10GHz:

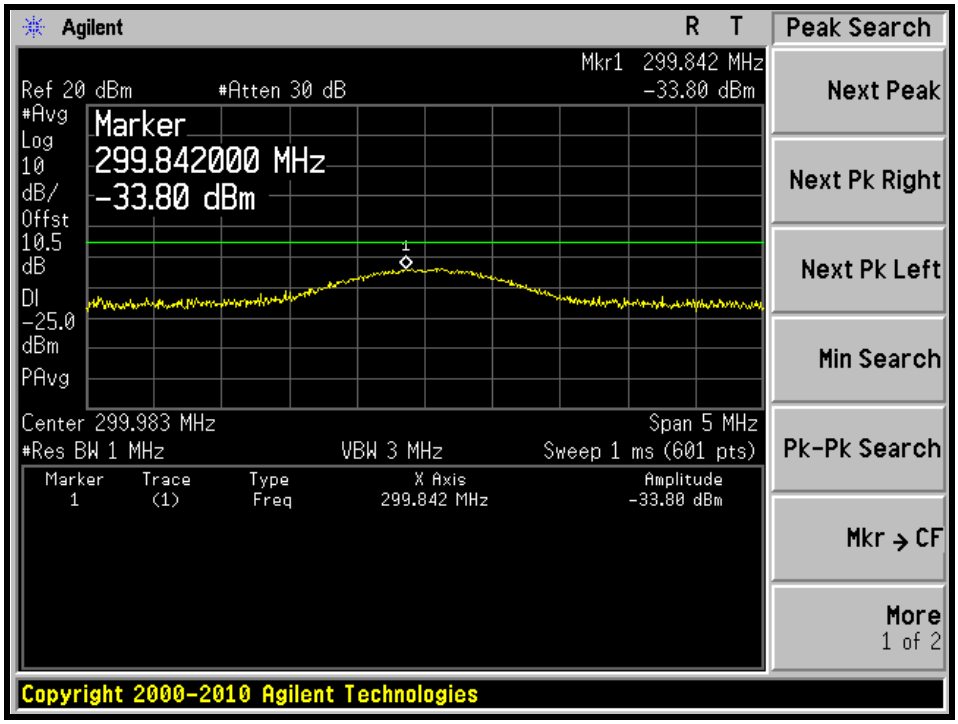


10GHz ~ 27GHz:

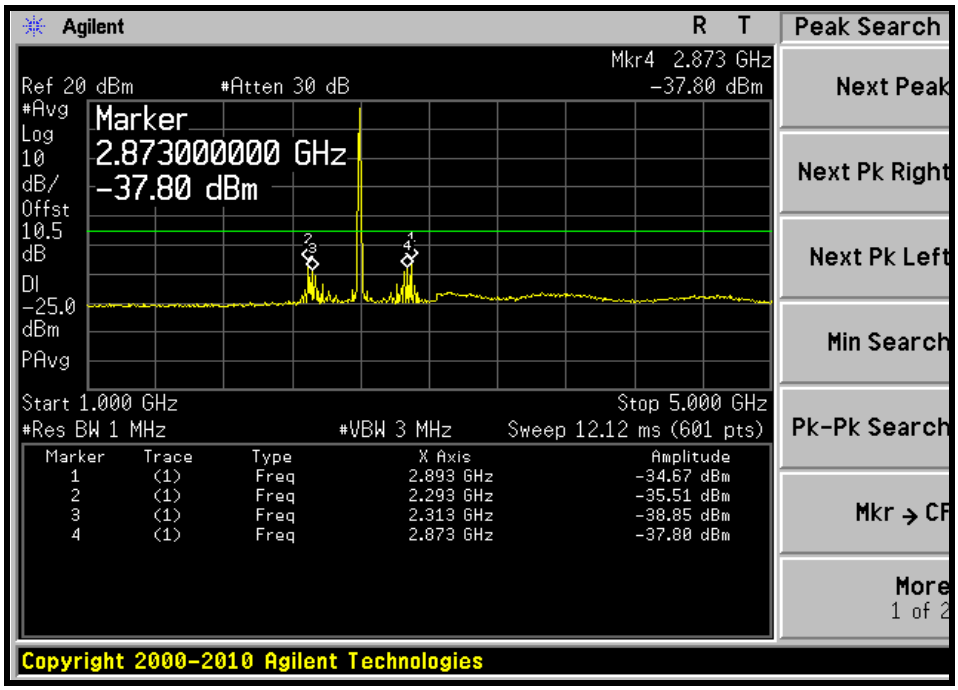


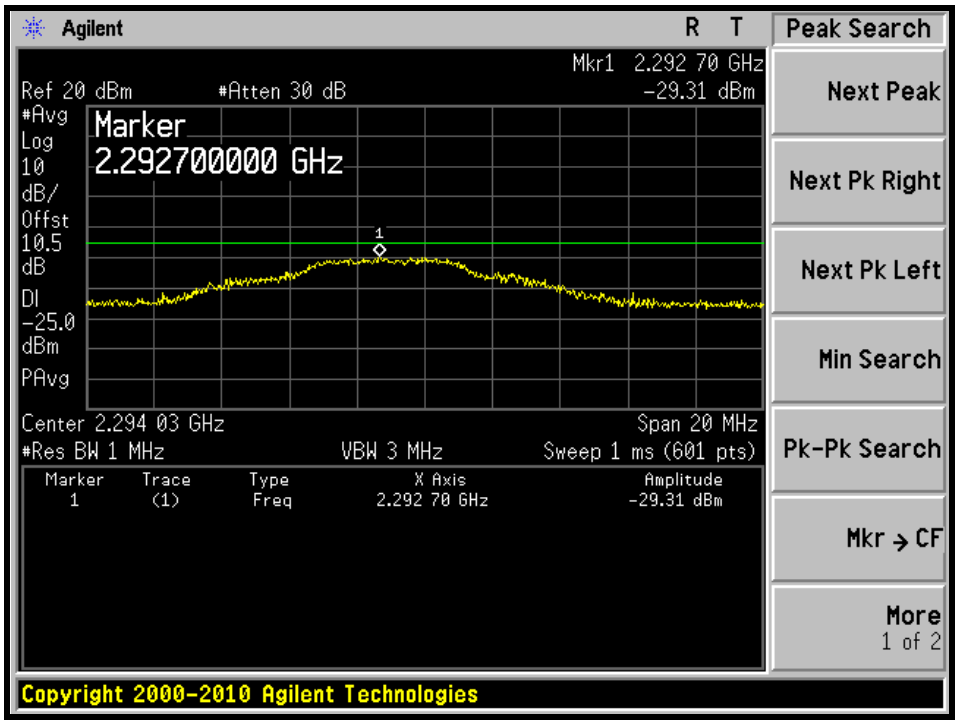
MIDDLE CHANNEL: 30MHz ~ 1GHz:

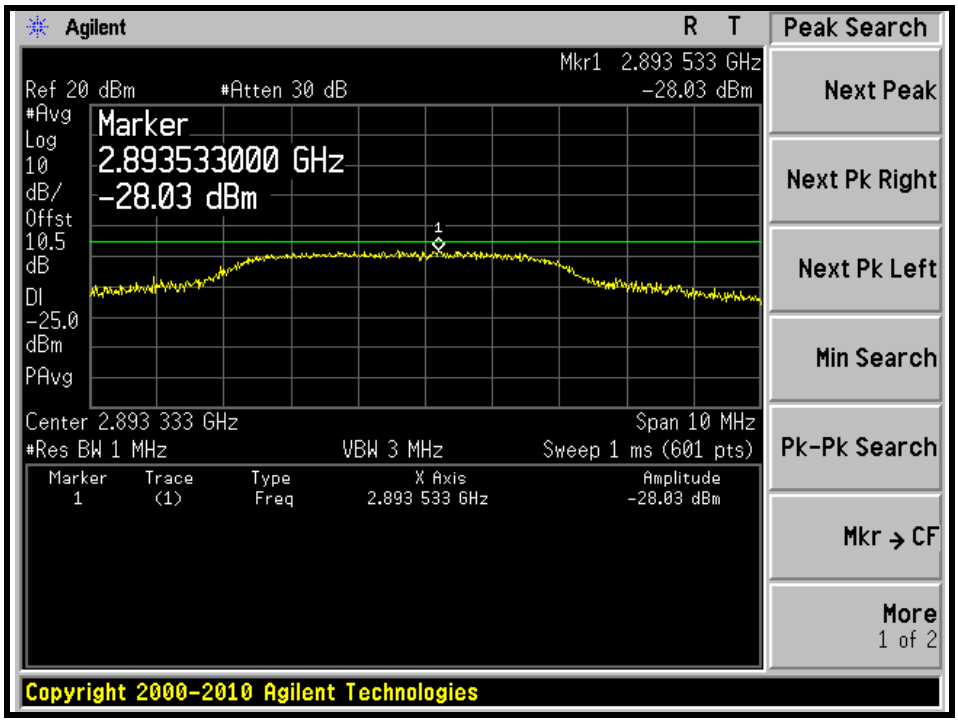




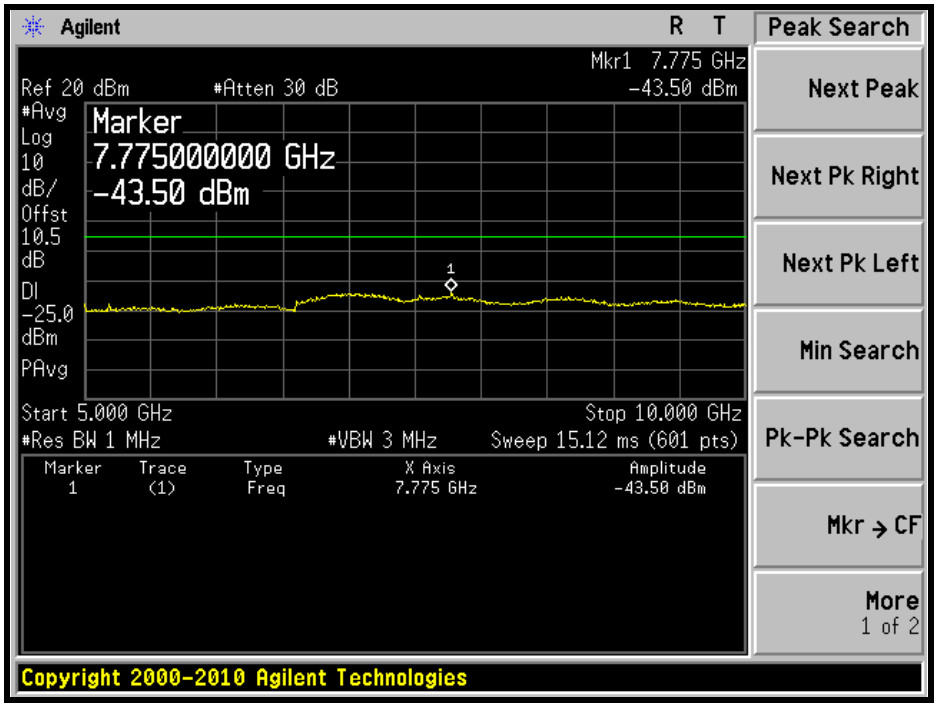
1GHz ~ 5GHz:


Agilent
R T
Peak Search
Mkr4 2.873 GHz
Ref 20 dBm
#Atten 30 dB
-37.80 dBm
Next Peak
#Avg
Log
10
dB/
Offst
10.5
dB
Dl
-25.0
dBm
PAvg
Marker
2.873000000 GHz
-37.80 dBm
Next Pk Right
Next Pk Left
Min Search
Start 1.000 GHz
Stop 5.000 GHz
#Res BW 1 MHz
#VBW 3 MHz
Sweep 12.12 ms (601 pts)
Pk-Pk Search
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.893 GHz -34.67 dBm
2 (1) Freq 2.293 GHz -35.51 dBm
3 (1) Freq 2.313 GHz -38.85 dBm
4 (1) Freq 2.873 GHz -37.80 dBm
Mkr → CF
More
1 of 2
Copyright 2000-2010 Agilent Technologies

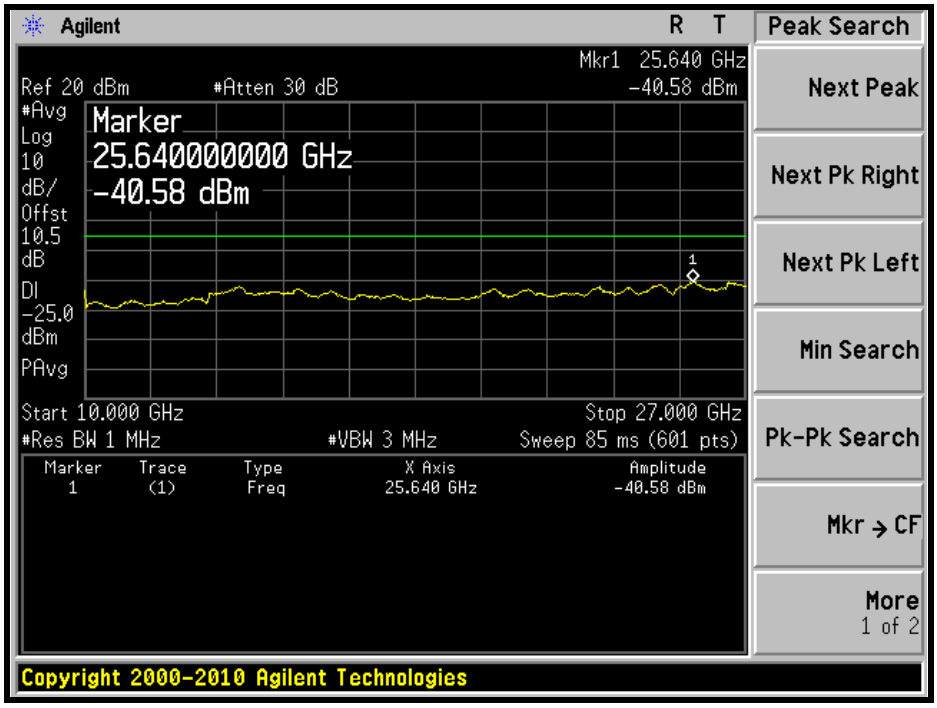

Agilent
R T
Peak Search
Mkr1 2.292 70 GHz
Ref 20 dBm
#Atten 30 dB
-29.31 dBm
Next Peak
#Avg
Log
10
dB/
Offst
10.5
dB
Dl
-25.0
dBm
PAvg
Marker
2.292700000 GHz
Next Pk Right
Next Pk Left
Min Search
Center 2.294 03 GHz
Span 20 MHz
#Res BW 1 MHz
VBW 3 MHz
Sweep 1 ms (601 pts)
Pk-Pk Search
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.292 70 GHz -29.31 dBm
Mkr → CF
More
1 of 2
Copyright 2000-2010 Agilent Technologies


Agilent
R T
Peak Search
Mkr1 2.893 533 GHz
Ref 20 dBm
#Atten 30 dB
-28.03 dBm
Next Peak
#Avg
Log
10
dB/
Offst
10.5
dB
Marker
2.893533000 GHz
-28.03 dBm
Next Pk Right
Next Pk Left
Dl
-25.0
dBm
PAvg
Min Search
Center 2.893 333 GHz
Span 10 MHz
#Res BW 1 MHz
VBW 3 MHz
Sweep 1 ms (601 pts)
Pk-Pk Search
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.893 533 GHz -28.03 dBm
Mkr → CF
More
1 of 2
Copyright 2000-2010 Agilent Technologies

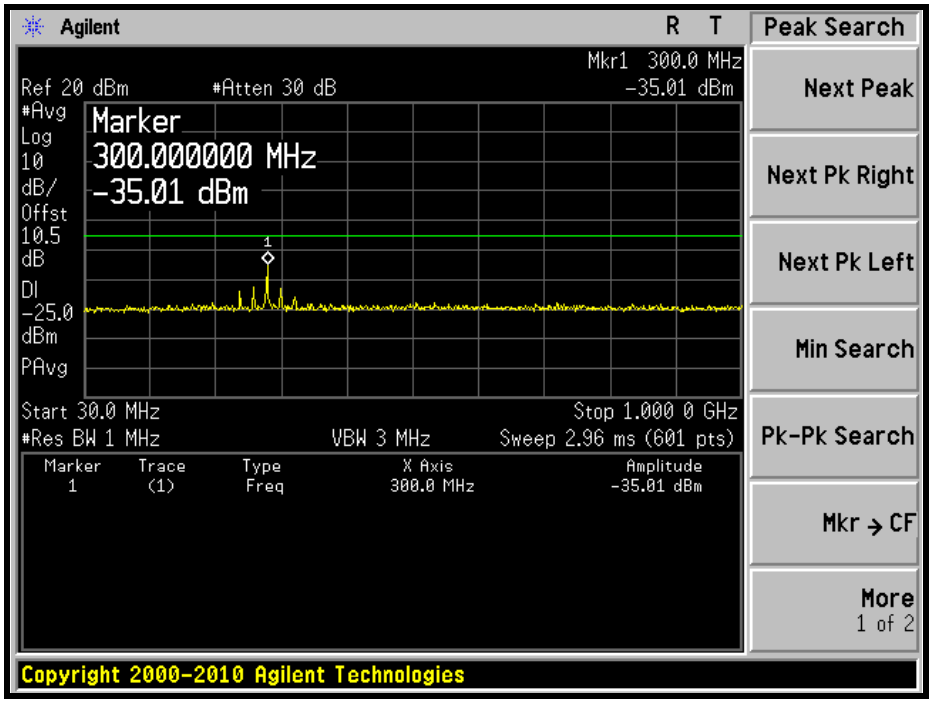
5GHz ~ 10GHz:

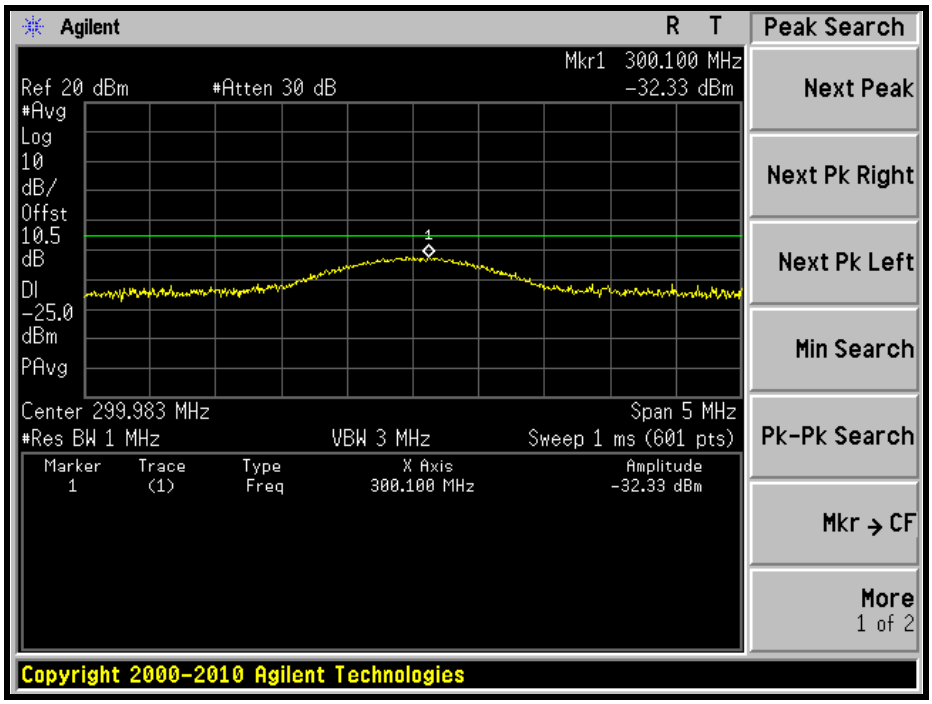


10GHz ~ 27GHz:

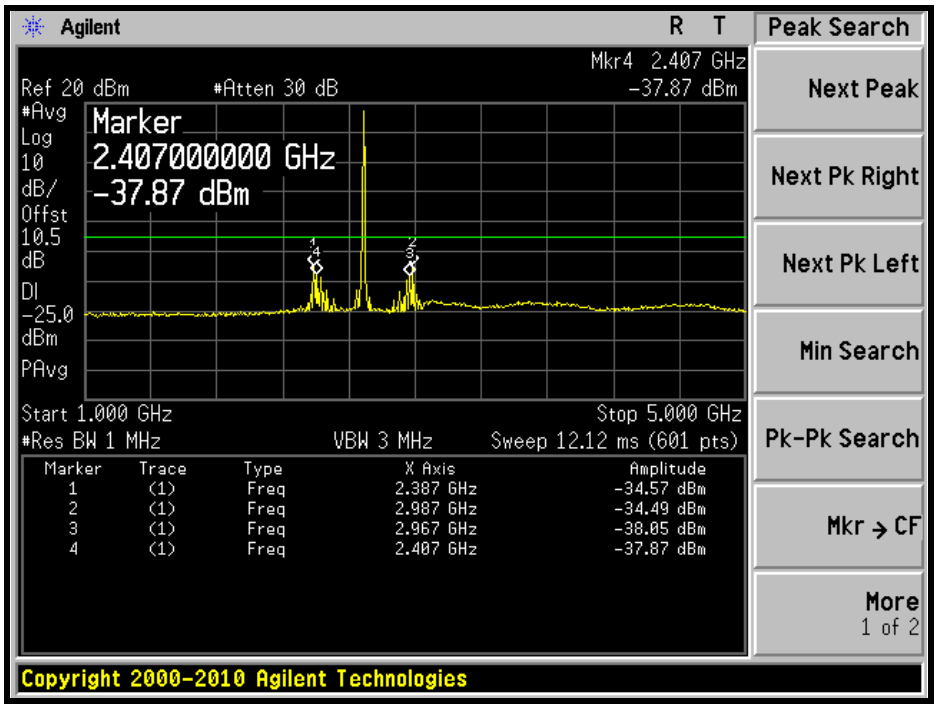


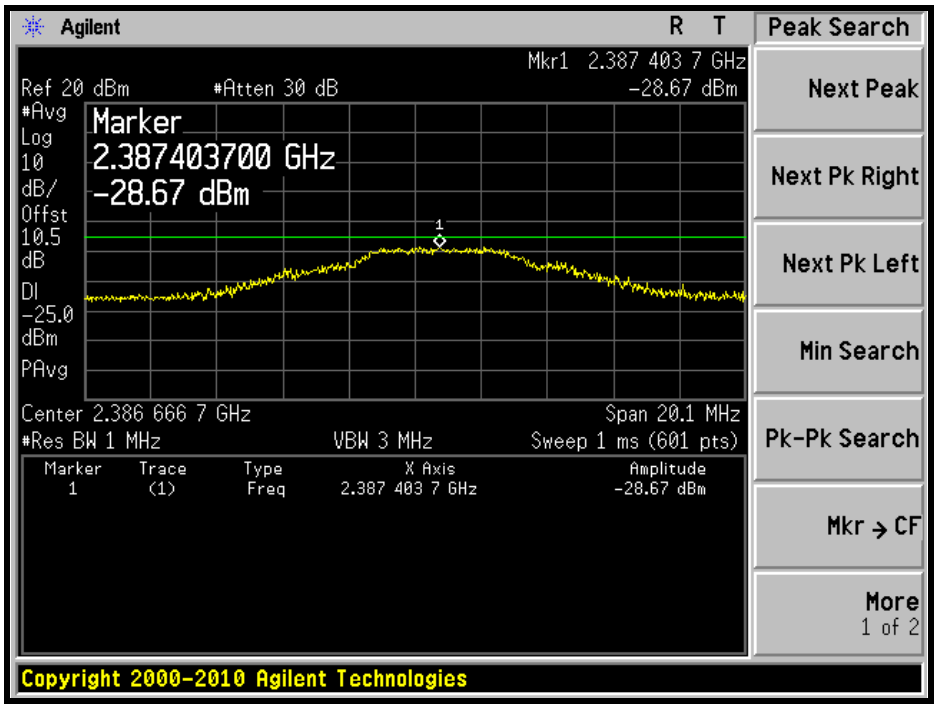
HIGH CHANNEL: 30MHz ~ 1GHz:

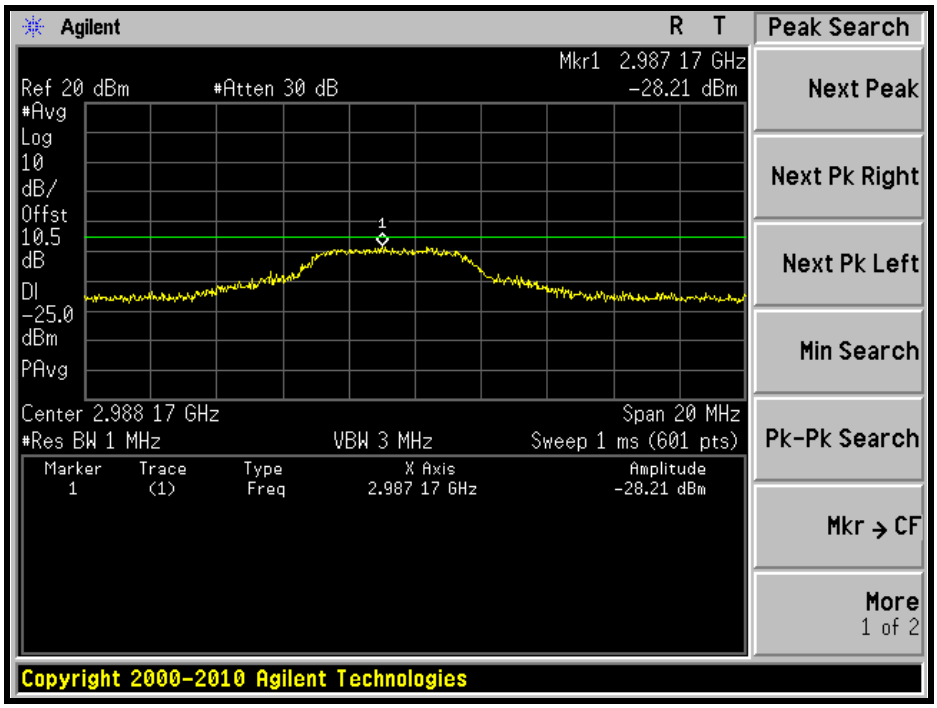




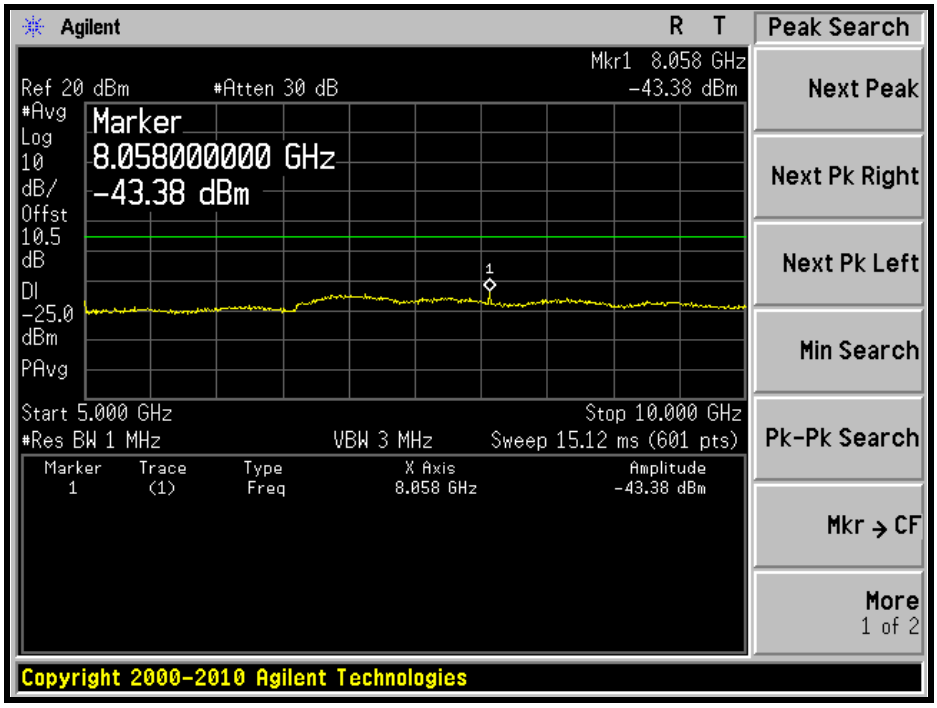
1GHz ~ 5GHz:


Agilent
R T
Peak Search
Mkr4 2.407 GHz
Ref 20 dBm
#Atten 30 dB
-37.87 dBm
Next Peak
#Avg
Log
10
dB/
Offst
10.5
dB
Marker
2.407000000 GHz
-37.87 dBm
Next Pk Right
Next Pk Left
Dl
-25.0
dBm
PAvg
Min Search
Start 1.000 GHz
Stop 5.000 GHz
#Res BW 1 MHz
VBW 3 MHz
Sweep 12.12 ms (601 pts)
Pk-Pk Search
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.387 GHz -34.57 dBm
2 (1) Freq 2.987 GHz -34.49 dBm
3 (1) Freq 2.967 GHz -38.05 dBm
4 (1) Freq 2.407 GHz -37.87 dBm
Mkr → CF
More
1 of 2
Copyright 2000-2010 Agilent Technologies

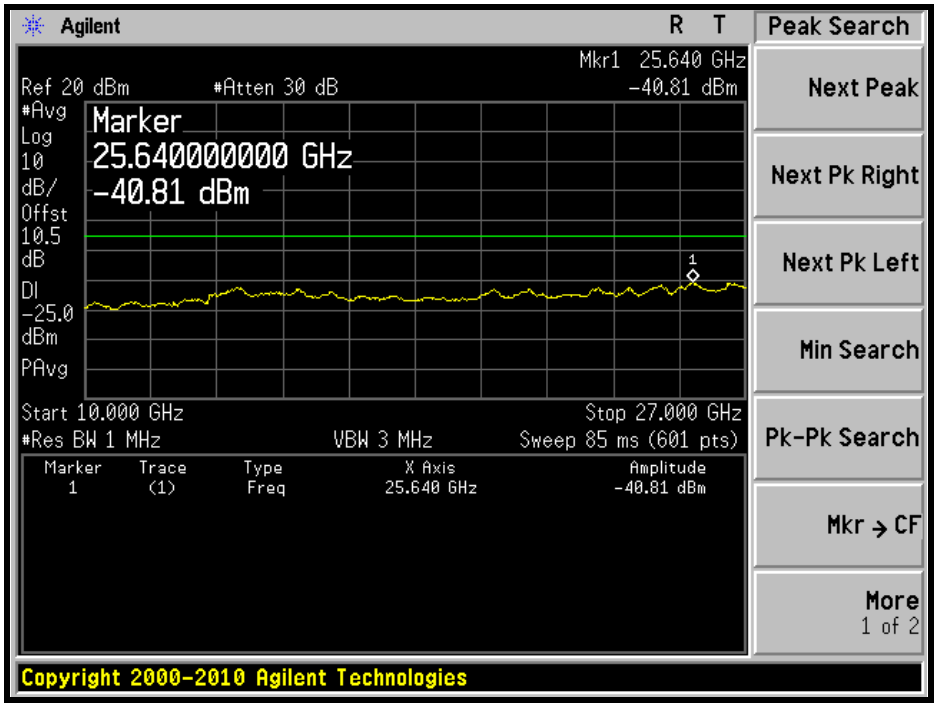

Agilent
R T
Peak Search
Mkr1 2.387 403 7 GHz
Ref 20 dBm
#Atten 30 dB
-28.67 dBm
Next Peak
#Avg
Log
10
dB/
Offst
10.5
dB
Marker
2.387403700 GHz
-28.67 dBm
Next Pk Right
Next Pk Left
Dl
-25.0
dBm
PAvg
Min Search
Center 2.386 666 7 GHz
Span 20.1 MHz
#Res BW 1 MHz
VBW 3 MHz
Sweep 1 ms (601 pts)
Pk-Pk Search
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.387 403 7 GHz -28.67 dBm
Mkr → CF
More
1 of 2
Copyright 2000-2010 Agilent Technologies


Agilent
R T
Peak Search
Mkr1 2.987 17 GHz
Ref 20 dBm
#Atten 30 dB
-28.21 dBm
Next Peak
#Avg
Log
10
dB/
Offst
10.5
dB
Next Pk Right
Next Pk Left
Dl
-25.0
dBm
PAvg
Min Search
Center 2.988 17 GHz
Span 20 MHz
Pk-Pk Search
#Res BW 1 MHz
VBW 3 MHz
Sweep 1 ms (601 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.987 17 GHz -28.21 dBm
Mkr → CF
More
1 of 2
Copyright 2000-2010 Agilent Technologies

5GHz ~ 10GHz:

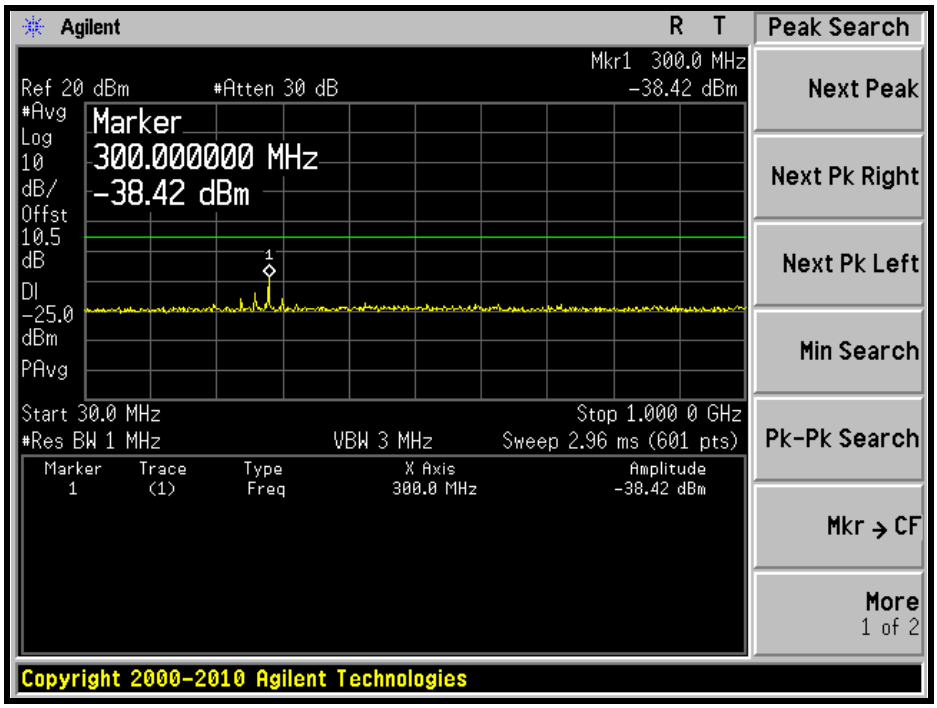


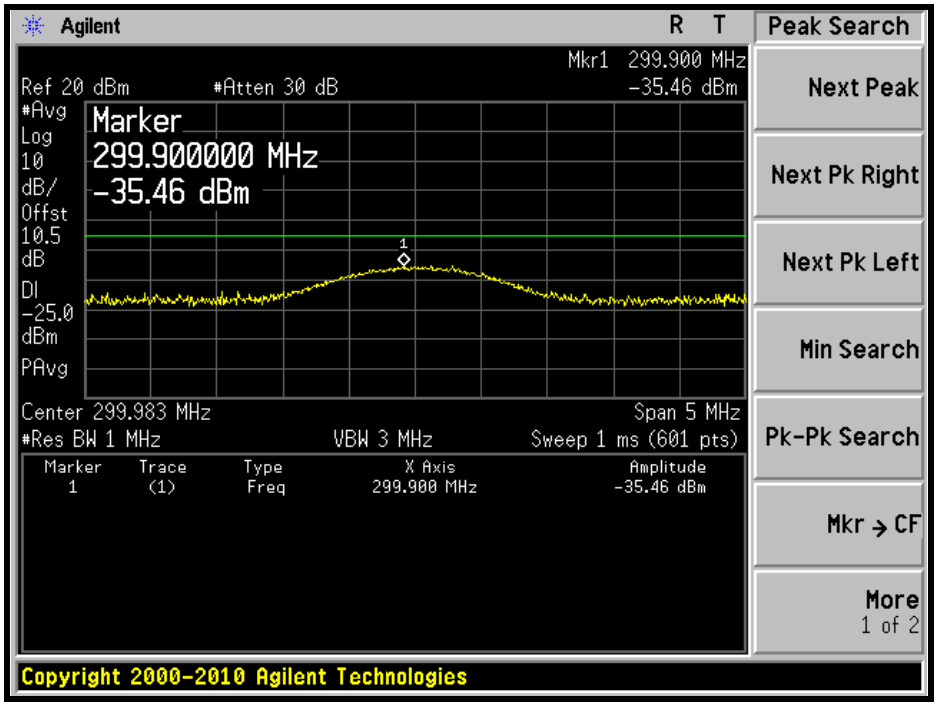
10GHz ~ 27GHz:



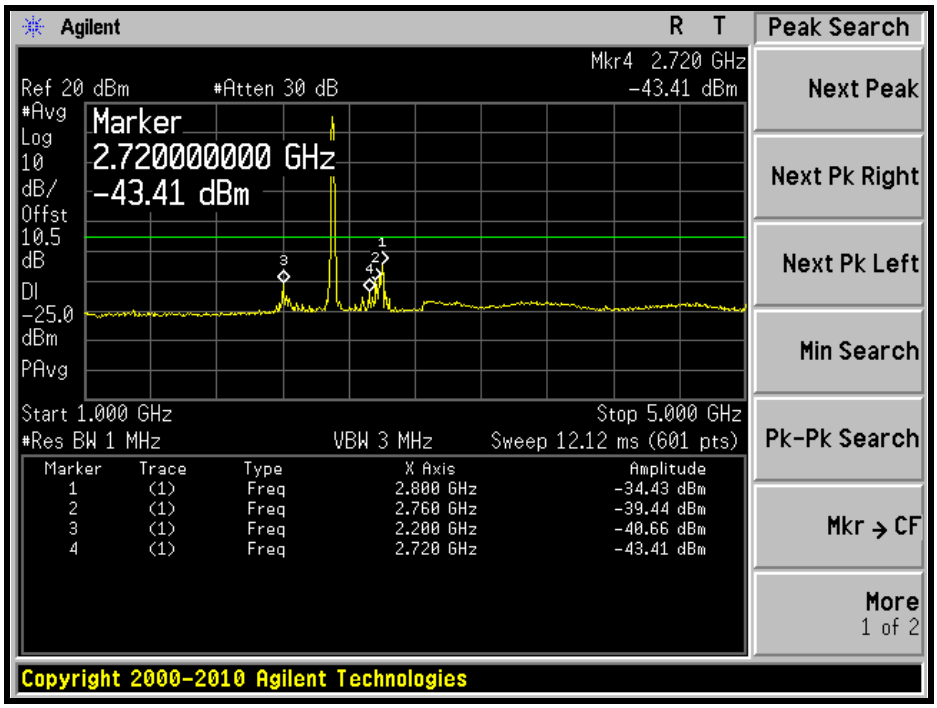
CHANNEL BANDWIDTH: 10MHz

LOW CHANNEL: 30MHz ~ 1GHz:





1GHz ~ 5GHz:


Agilent
R T
Peak Search
Mkr4 2.720 GHz
Ref 20 dBm
#Atten 30 dB
-43.41 dBm
Next Peak
#Avg
Log
10
dB/
Offst
10.5
dB
Dl
-25.0
dBm
PAvg
Marker
2.720000000 GHz
-43.41 dBm
Next Pk Right
Next Pk Left
Min Search
Start 1.000 GHz
Stop 5.000 GHz
#Res BW 1 MHz
VBW 3 MHz
Sweep 12.12 ms (601 pts)
Pk-Pk Search
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.800 GHz -34.43 dBm
2 (1) Freq 2.760 GHz -39.44 dBm
3 (1) Freq 2.200 GHz -40.66 dBm
4 (1) Freq 2.720 GHz -43.41 dBm
Mkr → CF
More
1 of 2
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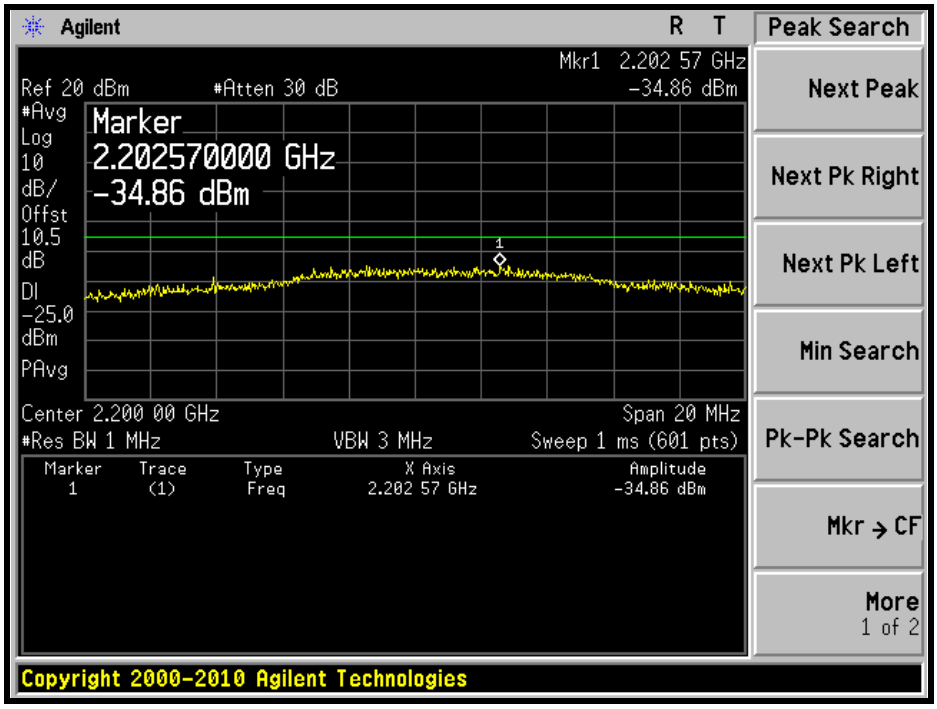
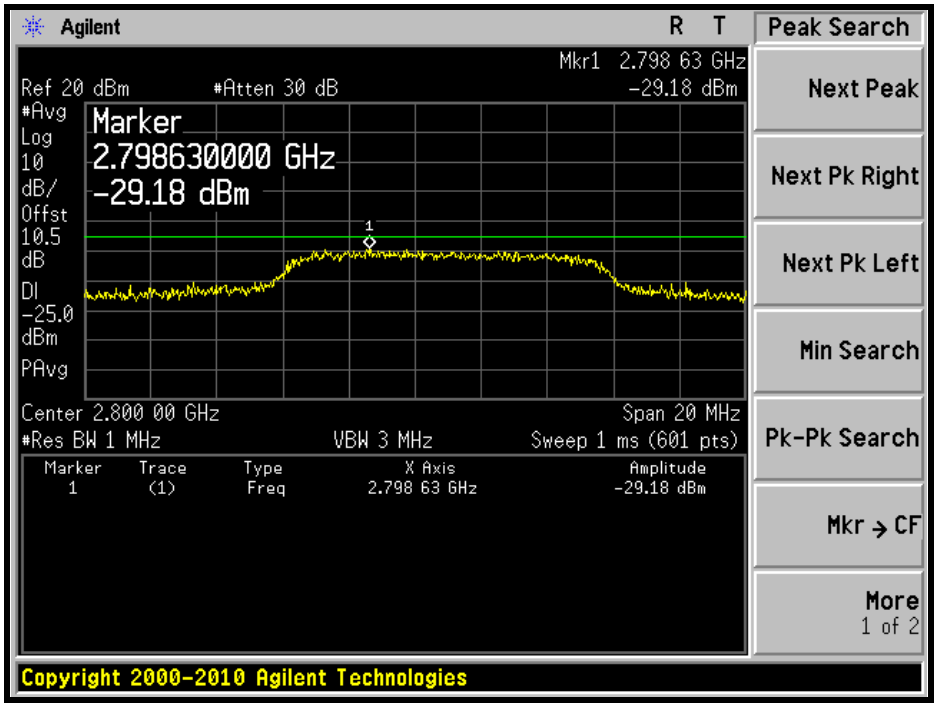
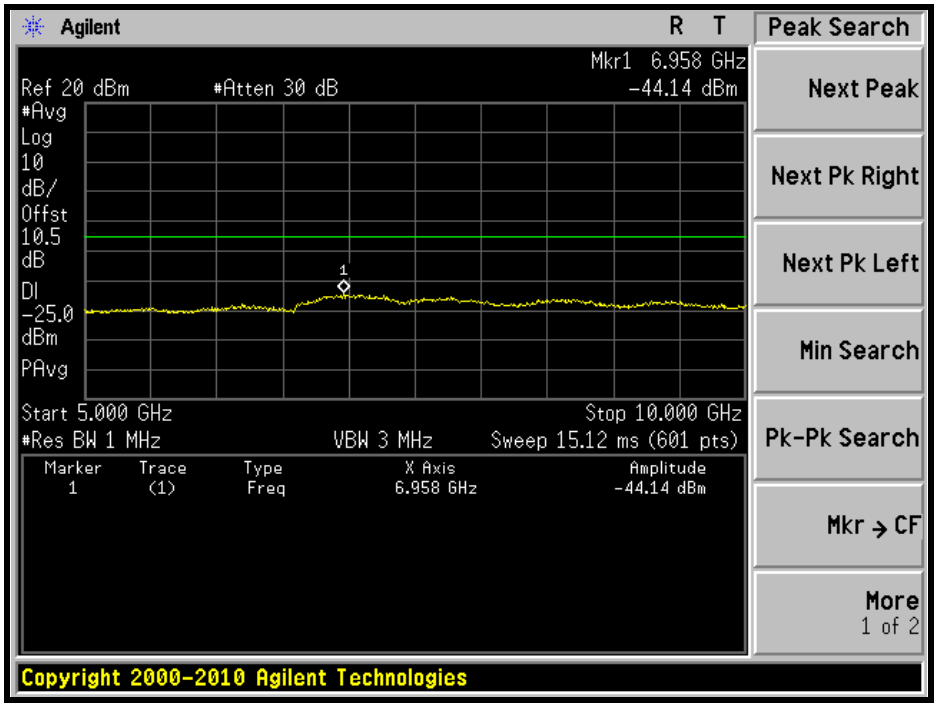
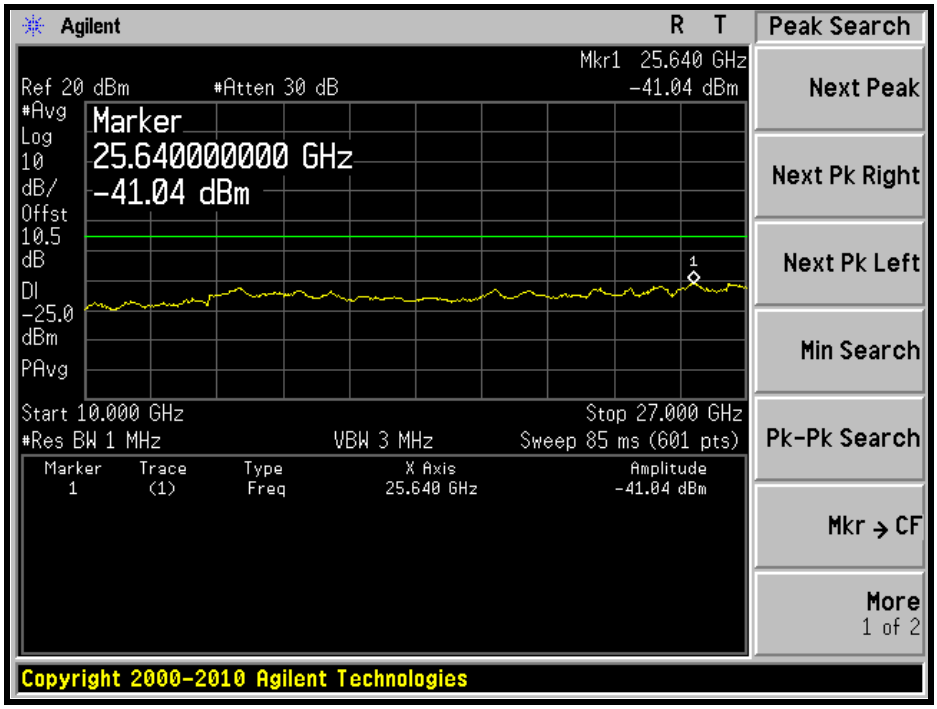

Agilent
R T
Peak Search
Mkr1 2.202 57 GHz
Ref 20 dBm
#Atten 30 dB
-34.86 dBm
Next Peak
#Avg
Log
10
dB/
Offst
10.5
dB
Dl
-25.0
dBm
PAvg
Marker
2.202570000 GHz
-34.86 dBm
Next Pk Right
Next Pk Left
Min Search
Center 2.200 00 GHz
Span 20 MHz
#Res BW 1 MHz
VBW 3 MHz
Sweep 1 ms (601 pts)
Pk-Pk Search
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.202 57 GHz -34.86 dBm
Mkr → CF
More
1 of 2
Copyright 2000-2010 Agilent Technologies


Agilent
R T
Peak Search
Mkr1 2.798 63 GHz
Ref 20 dBm
#Atten 30 dB
-29.18 dBm
Next Peak
#Avg
Log
10
dB/
Offst
10.5
dB
Marker
2.798630000 GHz
-29.18 dBm
Next Pk Right
Next Pk Left
Dl
-25.0
dBm
PAvg
Min Search
Center 2.800 00 GHz
Span 20 MHz
#Res BW 1 MHz
VBW 3 MHz
Sweep 1 ms (601 pts)
Pk-Pk Search
Marker
Trace
Type
X Axis
Amplitude
1
(1)
Freq
2.798 63 GHz
-29.18 dBm
Mkr → CF
More
1 of 2
Copyright 2000-2010 Agilent Technologies

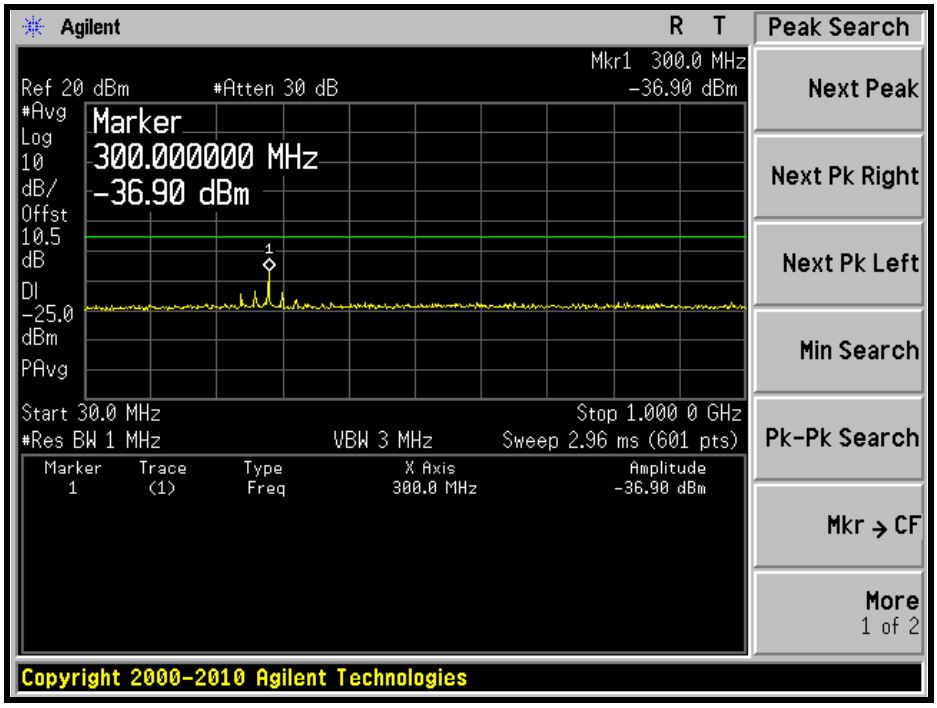
5GHz ~ 10GHz:

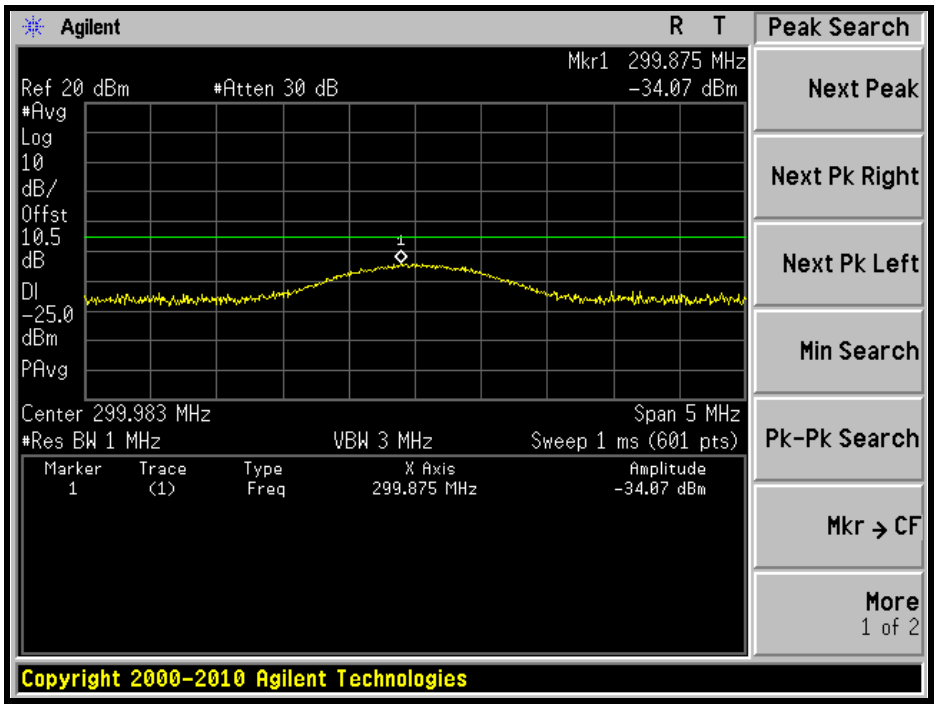


10GHz ~ 27GHz:

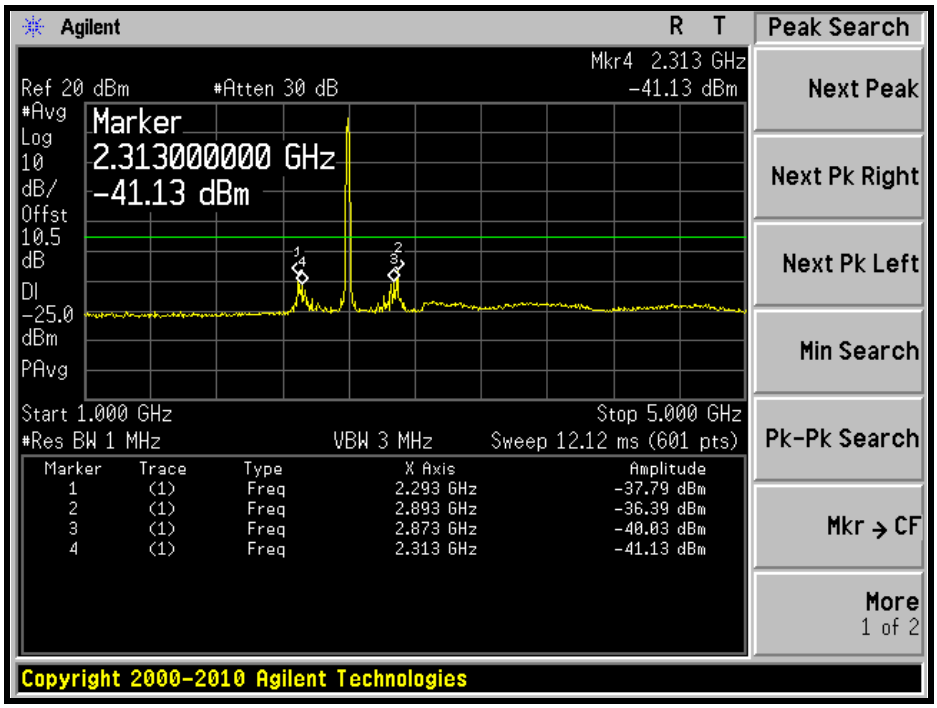


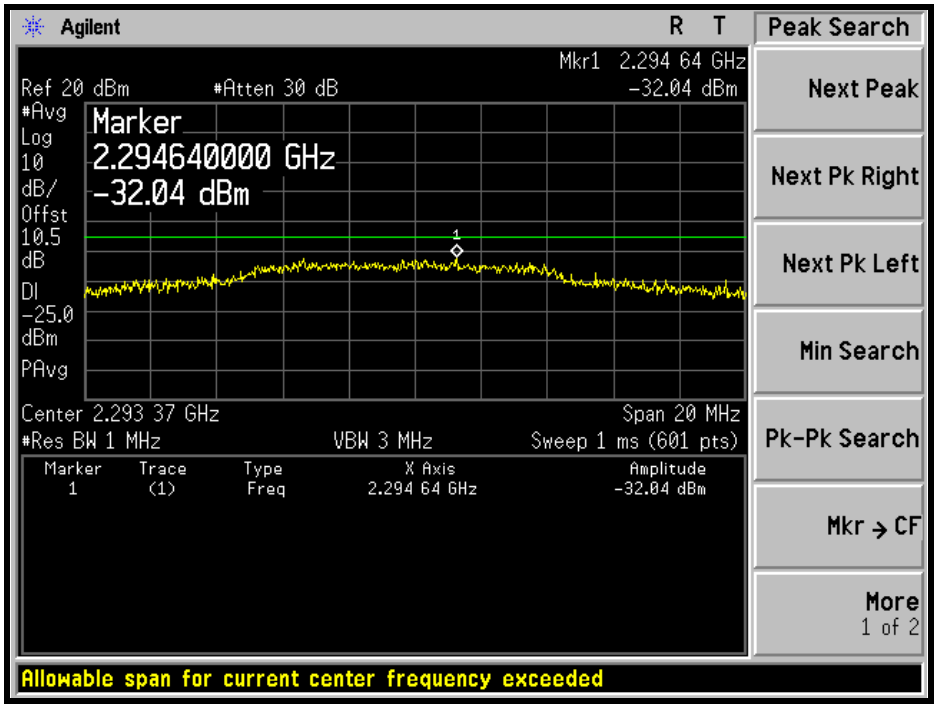
MIDDLE CHANNEL: 30MHz ~ 1GHz:

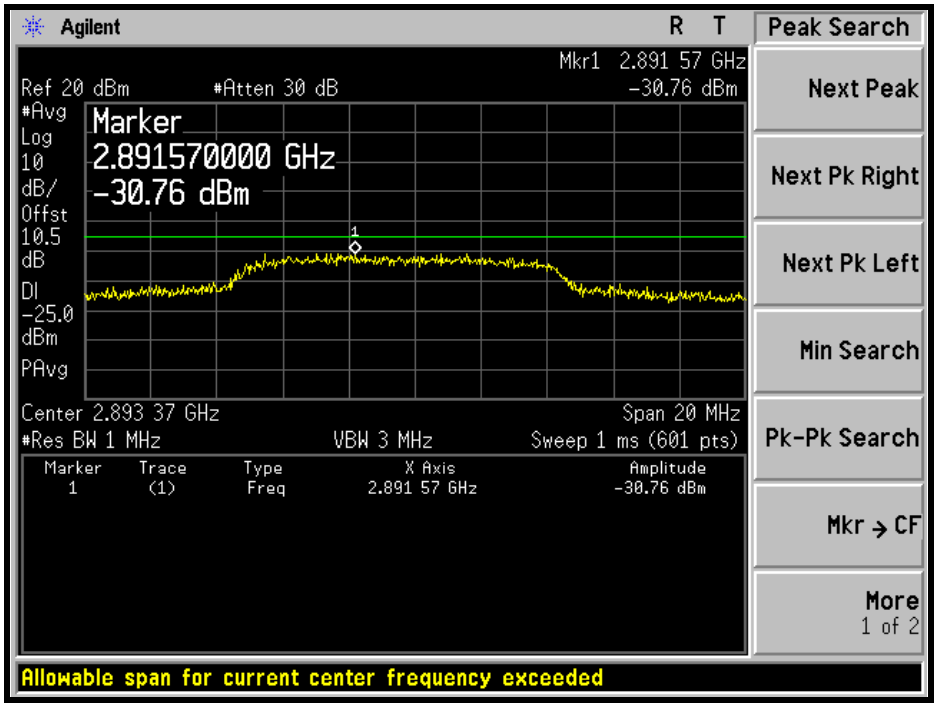




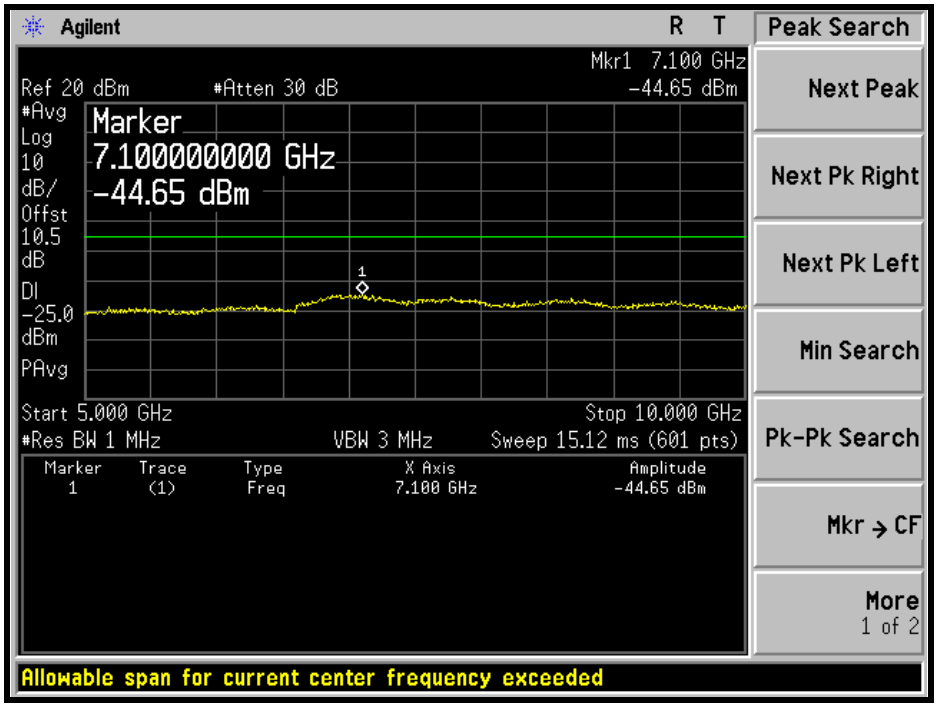
1GHz ~ 5GHz:


Agilent
R T
Peak Search
Mkr4 2.313 GHz
Ref 20 dBm
#Atten 30 dB
-41.13 dBm
Next Peak
#Avg
Log
10
dB/
Offst
10.5
dB
Dl
-25.0
dBm
PAvg
Marker
2.313000000 GHz
-41.13 dBm
Next Pk Right
Next Pk Left
Min Search
Start 1.000 GHz
Stop 5.000 GHz
#Res BW 1 MHz
VBW 3 MHz
Sweep 12.12 ms (601 pts)
Pk-Pk Search
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.293 GHz -37.79 dBm
2 (1) Freq 2.893 GHz -36.39 dBm
3 (1) Freq 2.873 GHz -40.03 dBm
4 (1) Freq 2.313 GHz -41.13 dBm
Mkr → CF
More
1 of 2
Copyright 2000-2010 Agilent Technologies

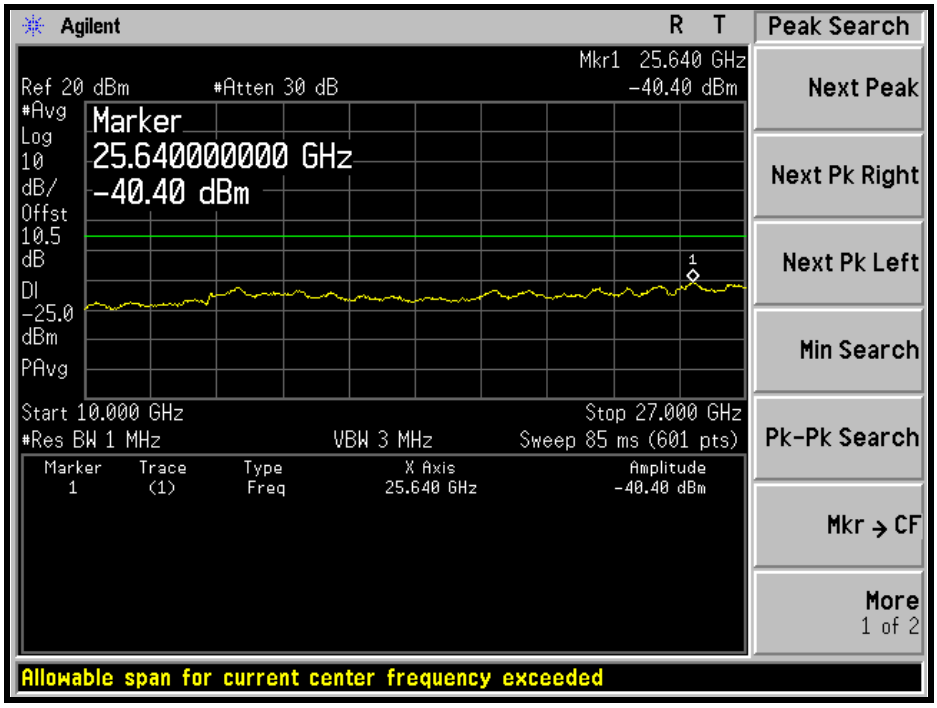

Agilent
R T
Peak Search
Mkr1 2.294 64 GHz
Ref 20 dBm
#Atten 30 dB
-32.04 dBm
Next Peak
#Avg
Log
10
dB/
Offst
10.5
dB
Dl
-25.0
dBm
PAvg
Marker
2.294640000 GHz
-32.04 dBm
Next Pk Right
Next Pk Left
Min Search
Center 2.293 37 GHz
Span 20 MHz
#Res BW 1 MHz
VBW 3 MHz
Sweep 1 ms (601 pts)
Pk-Pk Search
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.294 64 GHz -32.04 dBm
Mkr → CF
More
1 of 2
Allowable span for current center frequency exceeded


Agilent
R T
Peak Search
Mkr1 2.891 57 GHz
Ref 20 dBm
#Atten 30 dB
-30.76 dBm
Next Peak
#Avg
Log
10
dB/
Offst
10.5
dB
Marker
2.891570000 GHz
-30.76 dBm
Next Pk Right
Next Pk Left
Dl
-25.0
dBm
PAvg
Min Search
Center 2.893 37 GHz
Span 20 MHz
#Res BW 1 MHz
VBW 3 MHz
Sweep 1 ms (601 pts)
Pk-Pk Search
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.891 57 GHz -30.76 dBm
Mkr → CF
More
1 of 2
Allowable span for current center frequency exceeded

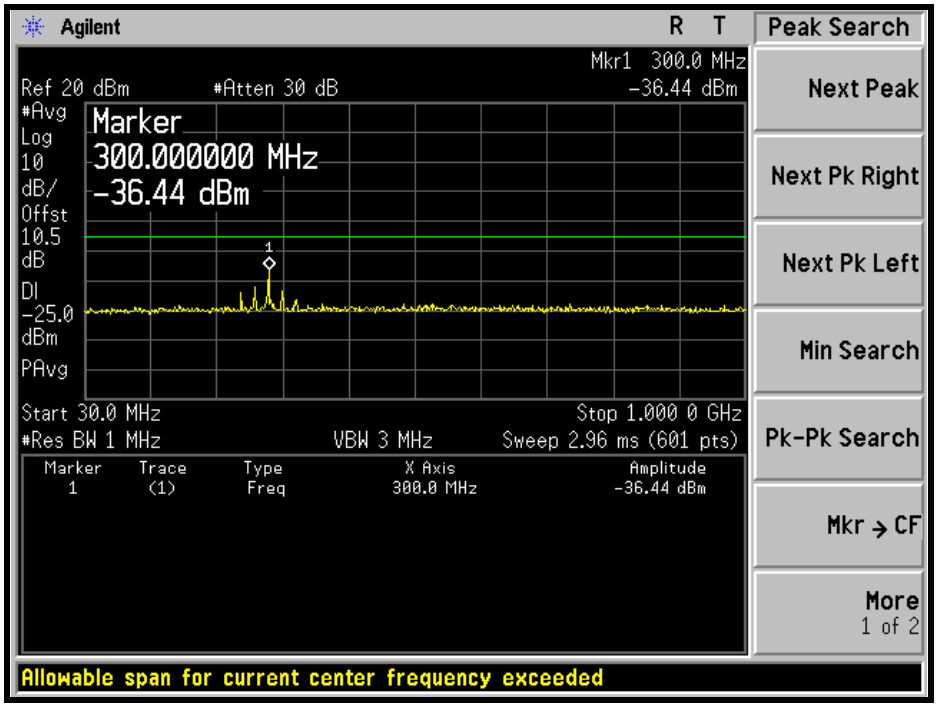
5GHz ~ 10GHz:

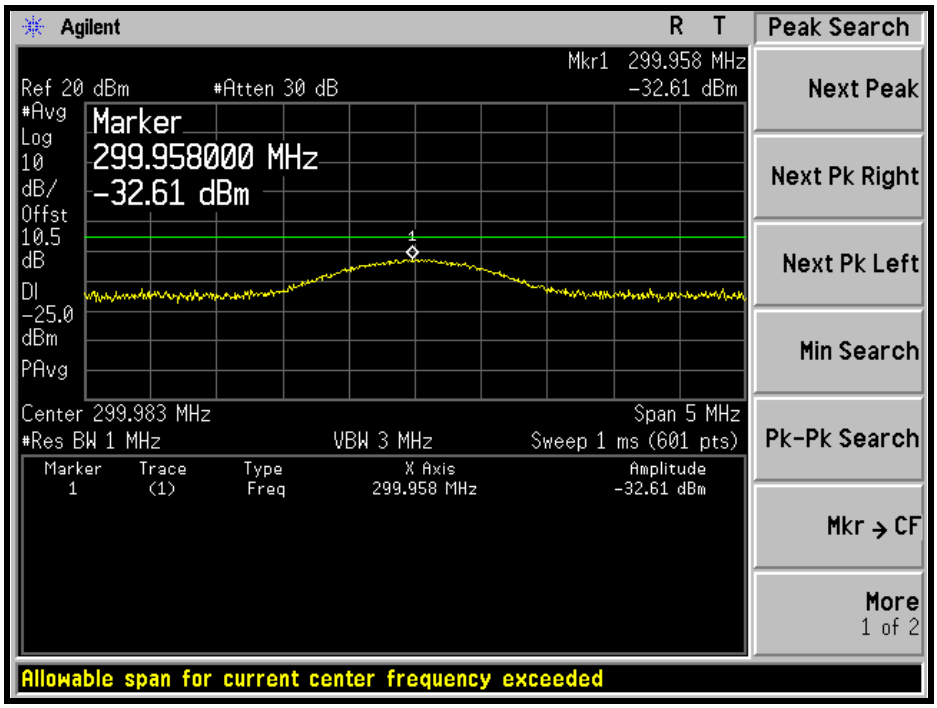


10GHz ~ 27GHz:

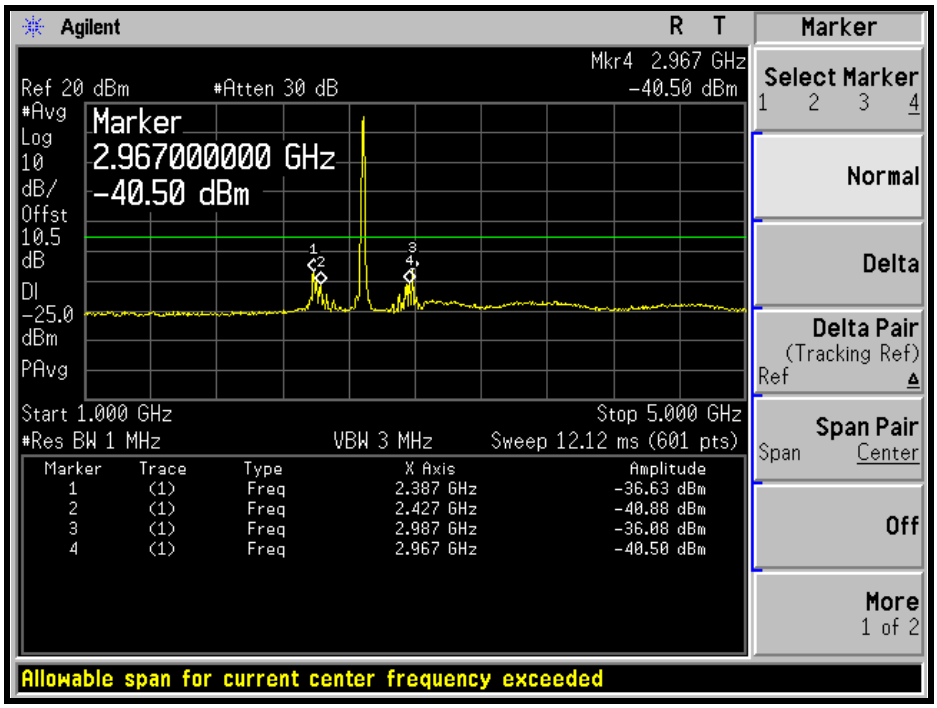


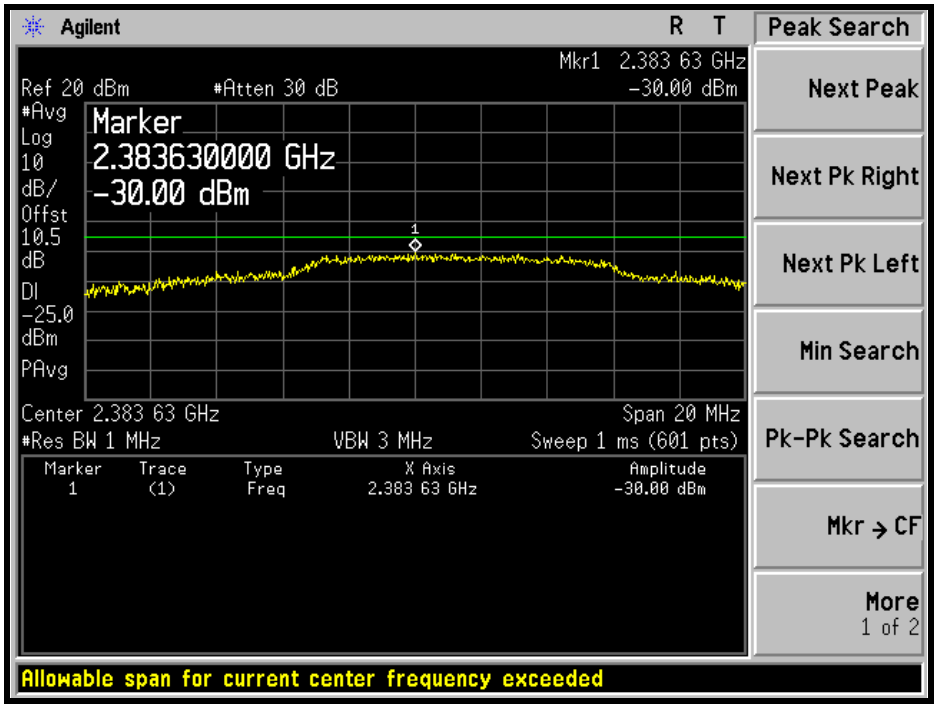
HIGH CHANNEL: 30MHz ~ 1GHz:

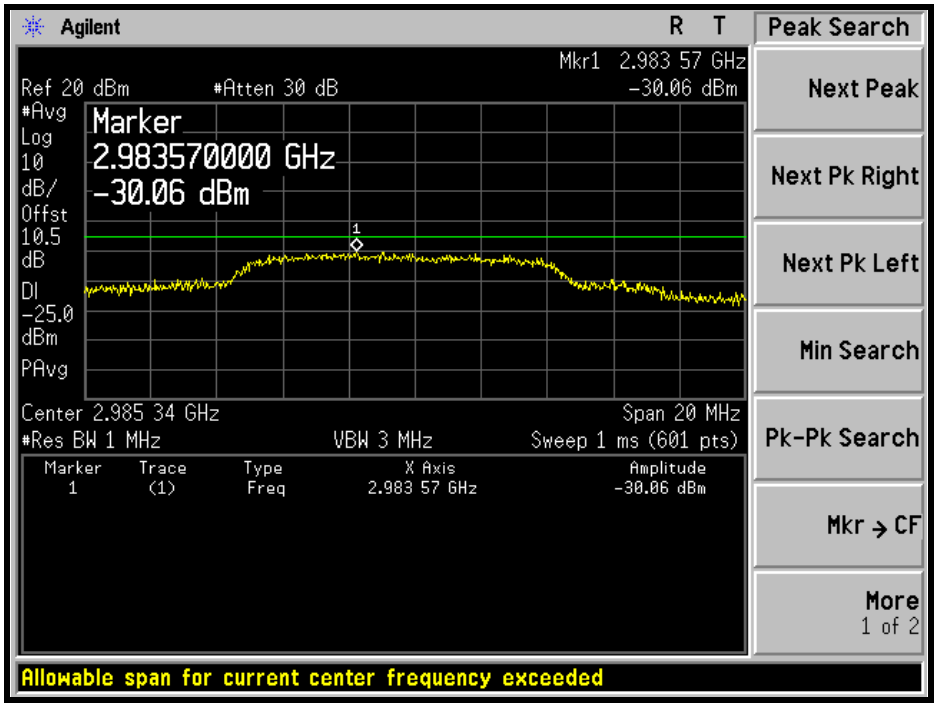




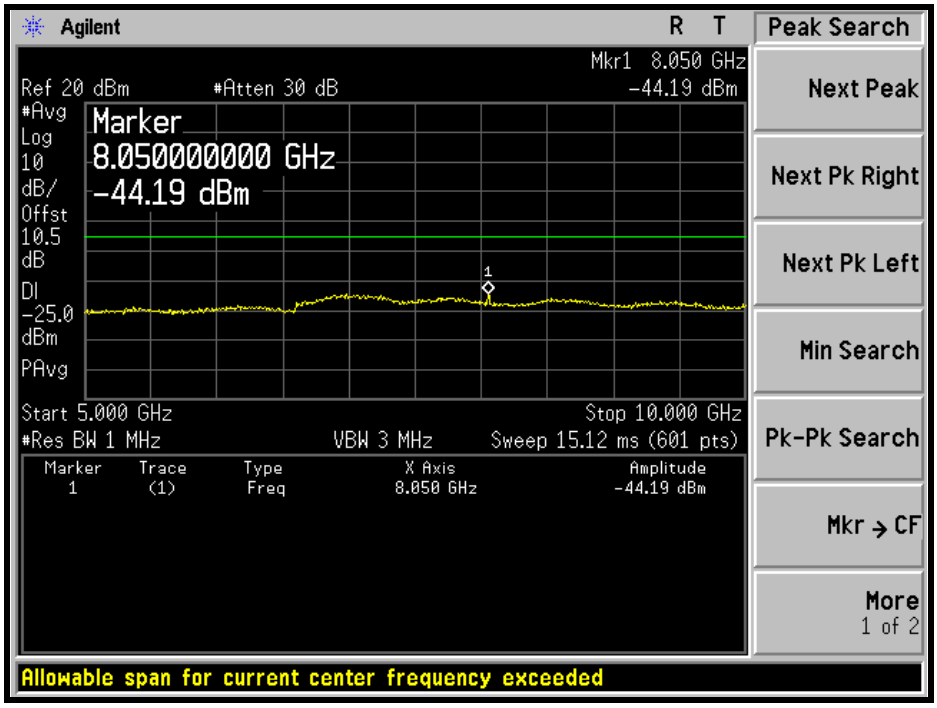
1GHz ~ 5GHz:


Agilent
R T
Marker
Mkr4 2.967 GHz
Ref 20 dBm
#Atten 30 dB
-40.50 dBm
#Avg
Log
10
dB/
Offst
10.5
dB
Dl
-25.0
dBm
PAvg
Marker
2.967000000 GHz
-40.50 dBm
Start 1.000 GHz
Stop 5.000 GHz
#Res BW 1 MHz
VBW 3 MHz
Sweep 12.12 ms (601 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.387 GHz -36.63 dBm
2 (1) Freq 2.427 GHz -40.88 dBm
3 (1) Freq 2.987 GHz -36.08 dBm
4 (1) Freq 2.967 GHz -40.50 dBm
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref
Span Pair
Span Center
Off
More
1 of 2
Allowable span for current center frequency exceeded

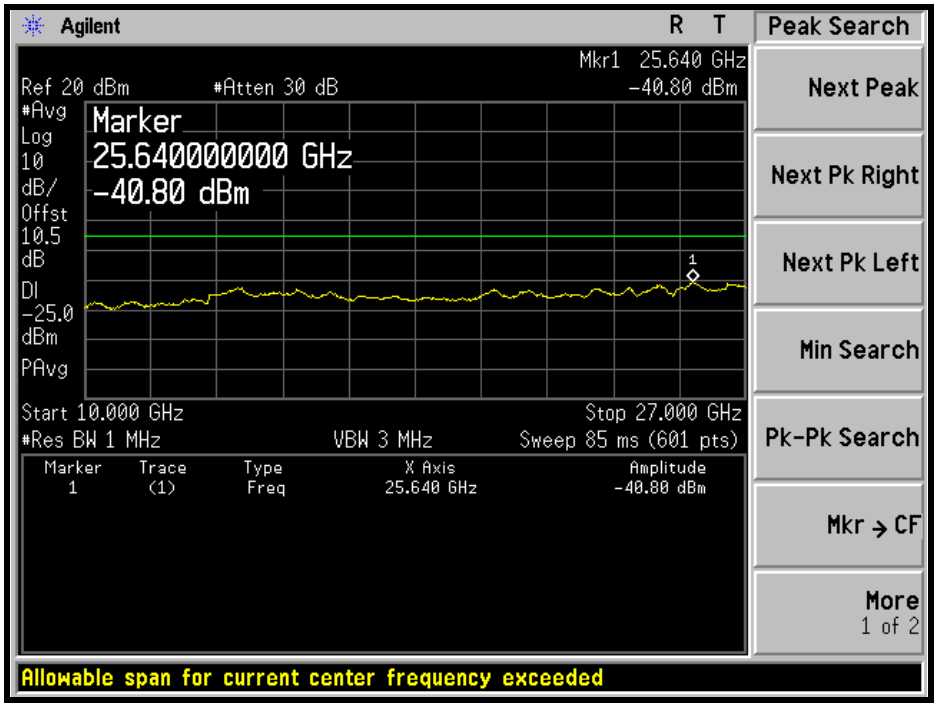

Agilent
R T
Peak Search
Mkr1 2.383 63 GHz
Ref 20 dBm
#Atten 30 dB
-30.00 dBm
#Avg
Log
10
dB/
Offst
10.5
dB
Dl
-25.0
dBm
PAvg
Marker
2.383630000 GHz
-30.00 dBm
Center 2.383 63 GHz
Span 20 MHz
#Res BW 1 MHz
VBW 3 MHz
Sweep 1 ms (601 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.383 63 GHz -30.00 dBm
Next Peak
Next Pk Right
Next Pk Left
Min Search
Pk-Pk Search
Mkr → CF
More
1 of 2
Allowable span for current center frequency exceeded


Agilent
R T
Peak Search
Mkr1 2.983 57 GHz
Ref 20 dBm
#Atten 30 dB
-30.06 dBm
Next Peak
#Avg
Log
10
dB/
Offst
10.5
dB
Marker
2.983570000 GHz
-30.06 dBm
Next Pk Right
Next Pk Left
Dl
-25.0
dBm
PAvg
Min Search
Center 2.985 34 GHz
Span 20 MHz
#Res BW 1 MHz
VBW 3 MHz
Sweep 1 ms (601 pts)
Pk-Pk Search
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.983 57 GHz -30.06 dBm
Mkr → CF
More
1 of 2
Allowable span for current center frequency exceeded

5GHz ~ 10GHz:



10GHz ~ 27GHz:



4.6 RADIATED EMISSION MEASUREMENT (BELOW 1GHz)

4.6.1 LIMITS OF RADIATED EMISSION MEASUREMENT

In the FCC 27.53(m) (4), On any frequency outside a licensee's frequency block the power of any emission shall be attenuated below the transmitter power (P) by at least 43 +10 log (P) dB and 55 + 10 log (P) dB at 5.5 MHz from the channel edges.

4.6.2 TEST INSTRUMENTS

Test date: Dec. 29, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
ROHDE & SCHWARZ Spectrum Analyzer	FSP40	100036	Dec. 14, 2011	Dec. 13, 2012
Agilent PSA Spectrum Analyzer	E4446A	MY48250113	Nov. 30, 2011	Nov. 29, 2012
HP Pre_Amplifier	8449B	300801923	Oct. 31, 2011	Oct. 30, 2012
ROHDE & SCHWARZ Test Receiver	ESCS30	847124/029	Sep. 02, 2011	Sep. 01, 2012
SCHWARZBECK TRILOG Broadband Antenna	VULB 9168	138	Apr. 14, 2011	Apr. 13, 2012
Schwarzbeck Horn_Antenna	BBHA9120	D124	Dec. 16, 2011	Dec. 15, 2012
Schwarzbeck Horn_Antenna	BBHA 9170	BBHA9170153	Jan. 17, 2011	Jan. 16, 2012
RF Switches	EMH-011	1001	Sep. 24, 2011	Sep. 23, 2012
RF CABLE (Chaintek)	Sucoflex 106	RF106-102	Jan. 27, 2011	Jan. 26, 2012
RF Cable	8DFB	STCCAB-30M-1GHz	Sep. 24, 2011	Sep. 23, 2012
Software	ADT_Radiated_V7.6.15.9.2	NA	NA	NA
CT Antenna Tower & Turn Table	NA	NA	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The horn antenna, preamplifier (model: 8449B) and Spectrum Analyzer (model: FSP40) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in Open Site No. C.
4. The FCC Site Registration No. is 656396.
5. The VCCI Site Registration No. is R-1626.
6. The CANADA Site Registration No. is IC 7450G-3.

4.6.3 TEST PROCEDURES

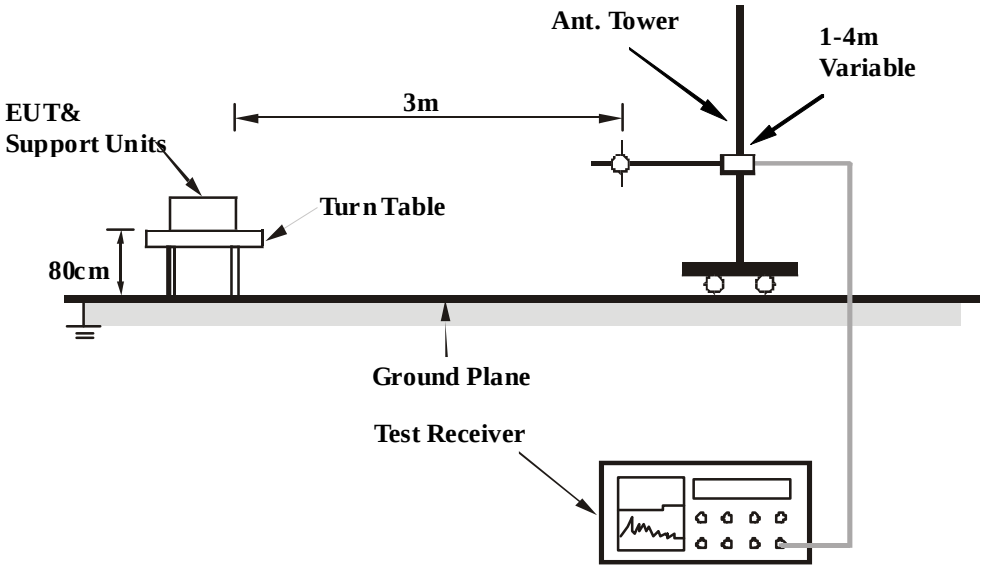
1. The power was measured with Spectrum Analyzer. All measurements were done at the worst channel. (low, middle and high channel of operational frequency range.)
2. Substitution method is used for EIRP measurement. In the open area test site, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.
3. The substitution antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a tx cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value “ of step b. Record the power level of S.G
4. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution antenna.

NOTE: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz

4.6.4 DEVIATION FROM TEST STANDARD

No deviation

4.6.5 TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

4.6.6 EUT OPERATING CONDITIONS

Same as item 4.1.5

4.6.7 TEST RESULTS

CHANNEL BANDWIDTH: 5MHz

MODE	High channel	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	20deg°C, 60%RH
TESTED BY	Moris Lin		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBm)	S.G level (dBm)	C.F. (dB)	Power level (dBm)
1	188.66	29.63	-25	-64.90	3.12	-61.78
2	300	33.33	-25	-62.45	3.71	-58.74
3	360	33.84	-25	-64.02	3.54	-60.48
4	480	29.33	-25	-67.28	2.86	-64.43
5	587	28.01	-25	-66.69	1.98	-64.71
6	1000	37.07	-25	-59.40	0.59	-58.81

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBm)	S.G level (dBm)	C.F. (dB)	Power level (dBm)
1	188.66	30.89	-25	-63.64	3.12	-60.52
2	300	33.38	-25	-62.40	3.71	-58.69
3	360	34.97	-25	-62.89	3.54	-59.35
4	480	33.68	-25	-62.93	2.86	-60.08
5	587	33.99	-25	-60.71	1.98	-58.73
6	1000	32.13	-25	-64.34	0.59	-63.75

REMARKS: 1. Power Value(dBm)=S.G Power Value (dBm) + Correction Factor(dB)

CHANNEL BANDWIDTH: 10MHz

MODE	High channel	**FREQUENCY RANGE**	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	**ENVIRONMENTAL CONDITIONS**	20deg°C, 60%RH
TESTED BY	Moris Lin		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBm)	S.G level (dBm)	C.F. (dB)	Power level (dBm)
1	188.66	30.53	-25	-64.00	3.12	-60.88
2	300	34.66	-25	-61.12	3.71	-57.41
3	360	34.83	-25	-63.03	3.54	-59.49
4	480	31.26	-25	-65.35	2.86	-62.50
5	587	29.37	-25	-65.33	1.98	-63.35
6	1000	38.43	-25	-58.04	0.59	-57.45

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBm)	S.G level (dBm)	C.F. (dB)	Power level (dBm)
1	188.66	31.43	-25	-63.10	3.12	-59.98
2	300	34.56	-25	-61.22	3.71	-57.51
3	360	35.88	-25	-61.98	3.54	-58.44
4	480	34.33	-25	-62.28	2.86	-59.43
5	587	34.73	-25	-59.97	1.98	-57.99
6	1000	33.64	-25	-62.83	0.59	-62.24

REMARKS: 1. Power Value(dBm)=S.G Power Value (dBm) + Correction Factor(dB)

4.7 RADIATED EMISSION MEASUREMENT (ABOVE 1GHz)

4.7.1 LIMITS OF RADIATED EMISSION MEASUREMENT

In the FCC 27.53(m) (4), On any frequency outside a licensee's frequency block the power of any emission shall be attenuated below the transmitter power (P) by at least 43 +10 log (P)dB and 55 + 10 log (P) dB at 5.5 MHz from the channel edges.

4.7.2 TEST INSTRUMENTS

Test date: Dec. 29, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
ROHDE & SCHWARZ Spectrum Analyzer	FSP40	100036	Dec. 14, 2011	Dec. 13, 2012
Agilent PSA Spectrum Analyzer	E4446A	MY48250113	Nov. 30, 2011	Nov. 29, 2012
HP Pre_Amplifier	8449B	300801923	Oct. 31, 2011	Oct. 30, 2012
ROHDE & SCHWARZ Test Receiver	ESCS30	847124/029	Sep. 02, 2011	Sep. 01, 2012
SCHWARZBECK TRILOG Broadband Antenna	VULB 9168	138	Apr. 14, 2011	Apr. 13, 2012
Schwarzbeck Horn_Antenna	BBHA9120	D124	Dec. 16, 2011	Dec. 15, 2012
Schwarzbeck Horn_Antenna	BBHA 9170	BBHA9170153	Jan. 17, 2011	Jan. 16, 2012
RF Switches	EMH-011	1001	Sep. 24, 2011	Sep. 23, 2012
RF CABLE (Chaintek)	Sucoflex 106	RF106-102	Jan. 27, 2011	Jan. 26, 2012
RF Cable	8DFB	STCCAB-30M-1GHz	Sep. 24, 2011	Sep. 23, 2012
Software	ADT_Radiated_ V7.6.15.9.2	NA	NA	NA
CT Antenna Tower & Turn Table	NA	NA	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The horn antenna, preamplifier (model: 8449B) and Spectrum Analyzer (model: FSP40) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in Open Site No. C.
4. The FCC Site Registration No. is 656396.
5. The VCCI Site Registration No. is R-1626.
6. The CANADA Site Registration No. is IC 7450G-3.

4.7.3 TEST PROCEDURES

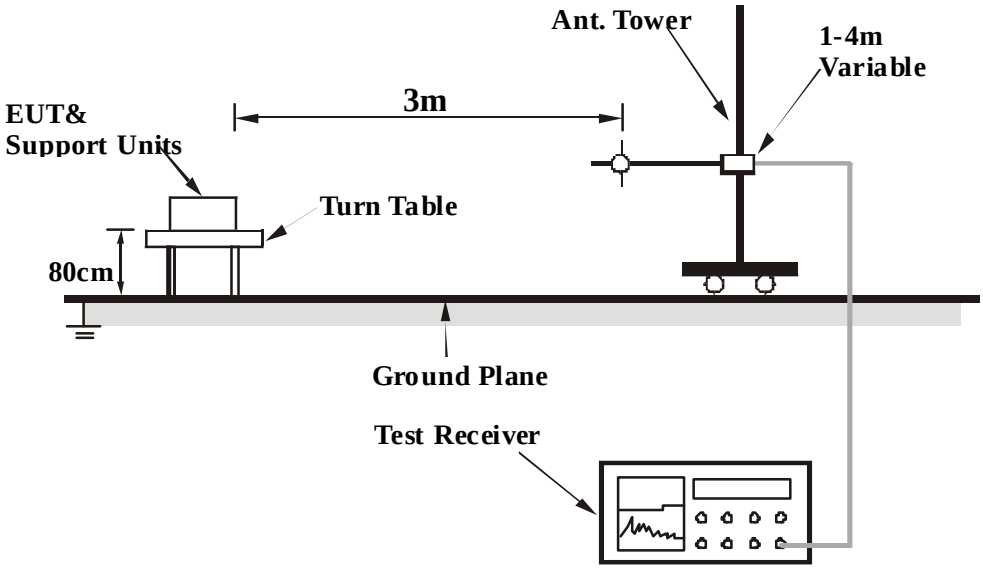
1. The power was measured with Spectrum Analyzer. All measurements were done at 3 channels (low, middle and high channel of operational frequency range.)
2. Substitution method is used for E.I.R.P measurement. In the open area test site, EUT placed on the 0.8m height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.
3. The substitution antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a tx cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value “ of step b. Record the power level of S.G
4. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution antenna.

NOTE: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1MHz/3MHz

4.7.4 DEVIATION FROM TEST STANDARD

No deviation

4.7.5 TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

4.7.6 EUT OPERATING CONDITIONS

Same as item 4.1.5

4.7.7 TEST RESULTS

CHANNEL BANDWIDTH: 5MHz

MODE	Low channel	FREQUENCY RANGE	Above 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	20deg°C, 60%RH
TESTED BY	Moris Lin		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBm)	S.G level (dBm)	C.F. (dB)	Power level (dBm)
1	4997	58.50	-25	-45.73	7.01	-38.72
2	7495.5	49.83	-25	-52.78	4.55	-48.23
3	9994	50.37	-25	-51.19	4.04	-47.15

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBm)	S.G level (dBm)	C.F. (dB)	Power level (dBm)
1	4997	60.00	-25	-44.23	7.01	-37.22
2	7495.5	52.80	-25	-49.81	4.55	-45.26
3	9994	51.86	-25	-49.70	4.04	-45.66

REMARKS: 1. Power Value(dBm)=S.G Power Value (dBm) + Correction Factor(dB)

MODE	Middle channel	**FREQUENCY RANGE**	Above 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	**ENVIRONMENTAL CONDITIONS**	20deg°C, 60%RH
TESTED BY	Moris Lin		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBm)	S.G level (dBm)	C.F. (dB)	Power level (dBm)
1	5186	60.90	-25	-43.61	7.05	-36.56
2	7779	48.81	-25	-53.81	4.31	-49.50
3	10372	50.26	-25	-51.72	3.69	-48.03

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBm)	S.G level (dBm)	C.F. (dB)	Power level (dBm)
1	5186	56.20	-25	-48.31	7.05	-41.26
2	7779	48.75	-25	-53.87	4.31	-49.56
3	10372	51.82	-25	-50.16	3.69	-46.47

REMARKS: 1. Power Value(dBm)=S.G Power Value (dBm) + Correction Factor(dB)

MODE	High channel	**FREQUENCY RANGE**	Above 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	**ENVIRONMENTAL CONDITIONS**	20deg°C, 60%RH
TESTED BY	Moris Lin		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBm)	S.G level (dBm)	C.F. (dB)	Power level (dBm)
1	5375.5	60.80	-25	-43.99	7.09	-36.90
2	8062	50.80	-25	-51.82	4.13	-47.69
3	10750	53.85	-25	-47.99	3.33	-44.65

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBm)	S.G level (dBm)	C.F. (dB)	Power level (dBm)
1	5375.5	56.80	-25	-47.99	7.09	-40.90
2	8062	55.00	-25	-47.62	4.13	-43.49
3	10750	51.82	-25	-50.02	3.33	-46.68

REMARKS: 1. Power Value(dBm)=S.G Power Value (dBm) + Correction Factor(dB)

CHANNEL BANDWIDTH: 10MHz

MODE	Low channel	**FREQUENCY RANGE**	Above 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	**ENVIRONMENTAL CONDITIONS**	20deg°C, 60%RH
TESTED BY	Moris Lin		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBm)	S.G level (dBm)	C.F. (dB)	Power level (dBm)
1	5002	57.60	-25	-46.63	7.01	-39.62
2	7503	52.60	-25	-50.02	4.54	-45.48
3	10004	54.50	-25	-47.06	4.03	-43.03

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBm)	S.G level (dBm)	C.F. (dB)	Power level (dBm)
1	5002	58.50	-25	-45.73	7.01	-38.72
2	7503	54.20	-25	-48.42	4.54	-43.88
3	10004	54.60	-25	-46.96	4.03	-42.93

REMARKS: 1. Power Value(dBm)=S.G Power Value (dBm) + Correction Factor(dB)

MODE	Middle channel	**FREQUENCY RANGE**	Above 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	**ENVIRONMENTAL CONDITIONS**	20deg°C, 60%RH
TESTED BY	Moris Lin		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBm)	S.G level (dBm)	C.F. (dB)	Power level (dBm)
1	5186	55.10	-25	-49.41	7.05	-42.36
2	7779	51.70	-25	-50.92	4.31	-46.61
3	10372	53.50	-25	-48.48	3.69	-44.79

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBm)	S.G level (dBm)	C.F. (dB)	Power level (dBm)
1	5186	54.90	-25	-49.61	7.05	-42.56
2	7779	50.80	-25	-51.82	4.31	-47.51
3	10372	53.30	-25	-48.68	3.69	-44.99

REMARKS: 1. Power Value(dBm)=S.G Power Value (dBm) + Correction Factor(dB)

MODE	High channel	**FREQUENCY RANGE**	Above 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	**ENVIRONMENTAL CONDITIONS**	20deg°C, 60%RH
TESTED BY	Moris Lin		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBm)	S.G level (dBm)	C.F. (dB)	Power level (dBm)
1	5370	56.50	-25	-48.29	7.09	-41.19
2	8055	50.70	-25	-51.92	4.13	-47.79
3	10740	52.30	-25	-49.55	3.34	-46.21

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M						
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBm)	S.G level (dBm)	C.F. (dB)	Power level (dBm)
1	5370	53.40	-25	-51.39	7.09	-44.29
2	8055	54.50	-25	-48.12	4.13	-43.99
3	10740	52.00	-25	-49.85	3.34	-46.51

REMARKS: 1. Power Value(dBm)=S.G Power Value (dBm) + Correction Factor(dB)

5 PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).

6 INFORMATION ON THE TESTING LABORATORIES

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025:

Copies of accreditation and authorization certificates of our laboratories obtained from approval agencies can be downloaded from our web site: www.adt.com.tw/index.5.phtml.
If you have any comments, please feel free to contact us at the following:

Linko EMC/RF Lab:
Tel: 886-2-26052180
Fax: 886-2-26052943

Hsin Chu EMC/RF Lab:
Tel: 886-3-5935343
Fax: 886-3-5935342

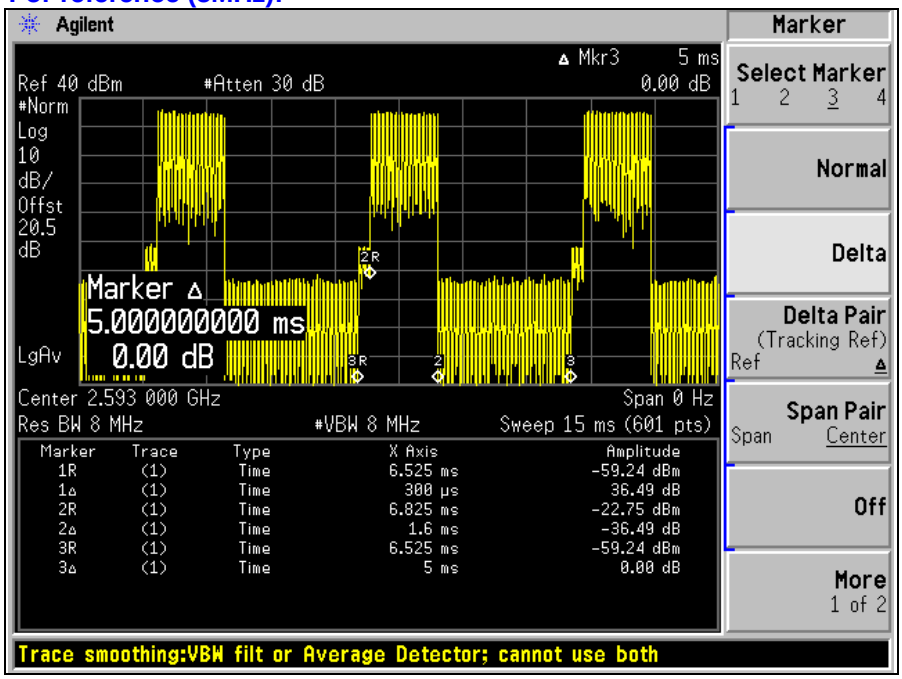
Hwa Ya EMC/RF/Safety/Telecom Lab:
Tel: 886-3-3183232
Fax: 886-3-3185050

Email: service.adt@tw.bureauveritas.com
Web Site: www.adt.com.tw

The address and road map of all our labs can be found in our web site also.

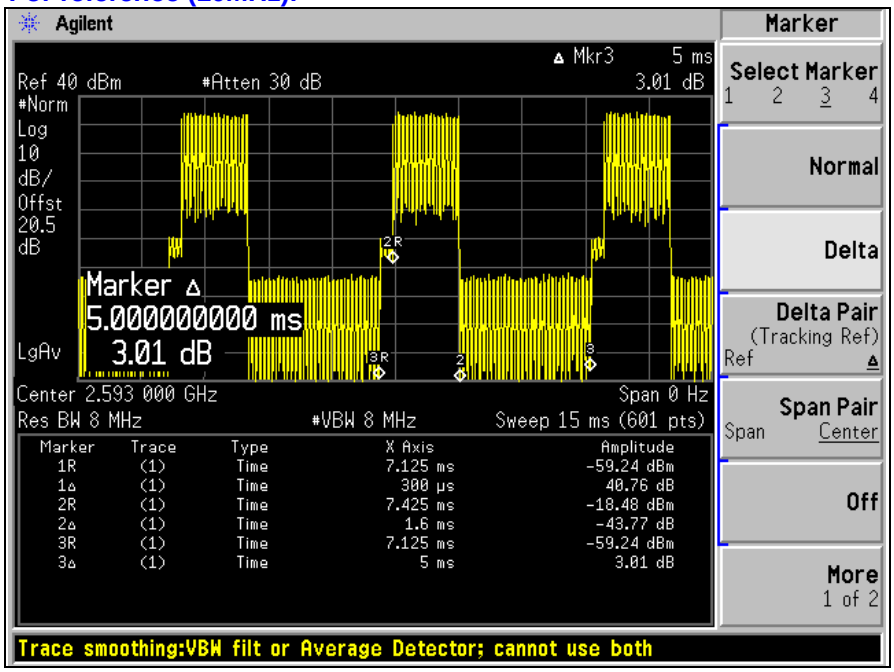
7 APPENDIX- A DL/UL RATION FOR TEST

For reference (5MHz):



Ratio = (1.6 / 5)*% = 32%

For reference (10MHz):



Ratio = (1.6 / 5)*% = 32%

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