

FCC TEST REPORT (PART 27)

REPORT NO.: RF961205L15

MODEL NO.: CPEo 25400

RECEIVED: Dec. 06, 2007

TESTED: Jan. 21 ~ Jan. 30, 2008

ISSUED: Feb. 01, 2008

APPLICANT: Motorola Inc.

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1 CERTIFICATION

PRODUCT: 2.5GHz WiMAX Outdoor CPE

MODEL: CPEo 25400

BRAND: MOTOROLA

APPLICANT: Motorola Inc.

TESTED: Jan. 21 ~ Jan. 30, 2008

TEST SAMPLE: ENGINEERING SAMPLE

TEST STANDARDS: FCC Part 27, Subpart C & M

The above equipment (Model no.: CPEo 25400) has been tested by **Advance Data Technology Corporation**, 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 : Rennie Wang , **DATE:** Feb. 01, 2008
Rennie Wang / Senior Specialist

TECHNICAL
ACCEPTANCE : Long Chen , **DATE:** Feb. 01, 2008
Responsible for RF Long Chen / Senior Engineer

APPROVED BY : Gary Chang , **DATE:** Feb. 01, 2008
Gary Chang / Assistant Manager

2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

STANDARD SECTION	TEST TYPE AND LIMIT	RESULT	REMARK
FCC Part 27 & Part 2			
2.1046 27.50(h)(2)	Maximum Peak Output Power Limit: max. 2 watts	PASS	Meet the requirement of limit. Minimum passing margin is 27.05dBm at 2498.5MHz.
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. Minimum passing margin is -2.02dB at 7495.50MHz.

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:

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	9kHz ~ 30MHz	2.44dB
Radiated emissions	30MHz ~ 200MHz	3.19dB
	200MHz ~ 1000MHz	3.21dB
	1GHz ~ 18GHz	2.26dB
	18GHz ~ 40GHz	1.94dB

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

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	2.5GHz WiMAX Outdoor CPE
MODEL NO.	CPEo 25400
FCC ID	PHX-CPE25400
POWER SUPPLY	56Vdc from power adapter
MODULATION TYPE	QPSK, 16QAM, 64QAM (refer to note 2 for mode detail)
CODING RATE	1/2, 2/3, 3/4 (refer to note 2 for mode detail)
MODULATION TECHNOLOGY	OFDMA
MULTIPLE ACCESS METHOD	FDMA
DUPLEX METHOD	TDD
CHANNEL BANDWIDTH	5MHz, 10MHz
MAX. CONDUCTED POWER	27.05dBm
ANTENNA TYPE	Patch Array antenna with 14.46dBi gain (ACON) Patch Array antenna with 14.40dBi gain (WHA YU)
OPERATION TEMPERATURE RANGE	-40°C ~ 55°C
DATA CABLE	1.7m non-shielded RJ45 cable without core
I/O PORTS	RJ45
ASSOCIATED DEVICES	Adapter

NOTE: 1. The EUT was powered by the following adapter:

BRAND:	MOTOROLA
MODEL:	PSI45W-560(MOT)
INPUT:	100-240Vac, 50-60Hz, 1.5A
OUTPUT:	56Vdc, 0.8A
POWER LINE:	DC: 1.8 m non-shielded with one core AC: 1.8 m non-shielded without core

2. For the EUT with modulation type and coding rate:

DOWN LINK		UP LINK	
MODULATION	CODING RATE	MODULATION	CODING RATE
QPSK	1/2	QPSK	1/2
QPSK	3/4	QPSK	3/4
16QAM	1/2	16QAM	1/2
16QAM	3/4	16QAM	3/4
64QAM	1/2		
64QAM	2/3		
64QAM	3/4		

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

3.2 DESCRIPTION OF TEST MODES

Three channels have been tested for each channel bandwidth.

FOR 5MHz CHANNEL BANDWIDTH:

Low channel (L): 2498.5MHz.

Middle channel (M): 2600.0MHz.

High channel (H): 2687.5MHz.

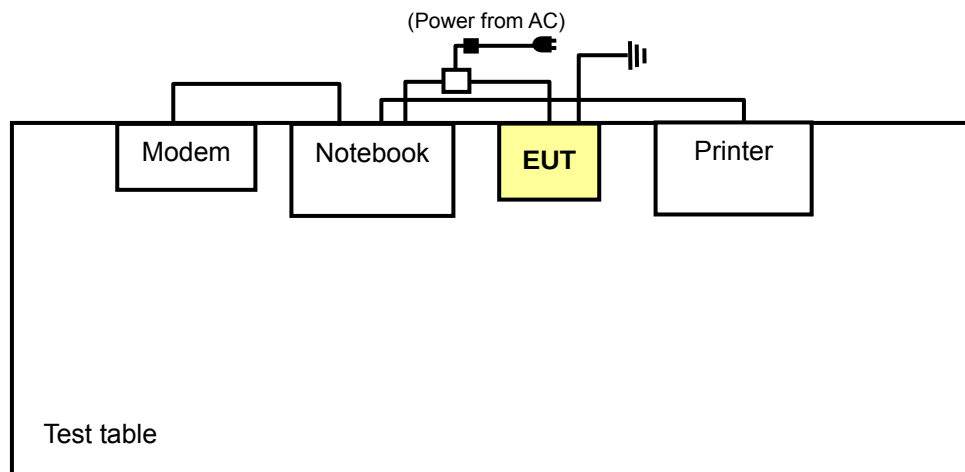
FOR 10MHz CHANNEL BANDWIDTH:

Low channel (L): 2501.0MHz.

Middle channel (M): 2600.0MHz.

High channel (H): 2685.0MHz.

3.2.1 CONFIGURATION OF SYSTEM UNDER TEST



3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	APPLICABLE TO							DESCRIPTION
	OP	FS	EB	CE	CSE	RE<1G	RE≥1G	
A	√	√	√	√	√	√	√	Channel bandwidth: 5MHz
B	√	√	√	√	√	√	√	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, XYZ axis, and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

CONFIGURE MODE	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	CODING RATE
A	L, M, H	OFDMA	QPSK	3/4
B	L, M, H	OFDMA	QPSK	3/4

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.

CONFIGURE MODE	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	CODING RATE
A	L	OFDMA	QPSK	3/4
B	L	OFDMA	QPSK	3/4

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.

CONFIGURE MODE	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	CODING RATE
A	L, M, H	OFDMA	QPSK	3/4
B	L, M, H	OFDMA	QPSK	3/4

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.

CONFIGURE MODE	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	CODING RATE
A	L, M, H	OFDMA	QPSK	3/4
B	L, M, H	OFDMA	QPSK	3/4

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.

CONFIGURE MODE	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	CODING RATE
A	L, M, H	OFDMA	QPSK	3/4
B	L, M, H	OFDMA	QPSK	3/4

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, XYZ axis, and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

CONFIGURE MODE	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	CODING RATE	AXIS
A (ACON Antenna)	L	OFDMA	QPSK	3/4	Z
A (WHA YU Antenna)	L	OFDMA	QPSK	3/4	Z
B (ACON Antenna)	L	OFDMA	QPSK	3/4	Z
B (WHA YU Antenna)	L	OFDMA	QPSK	3/4	Z

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, XYZ axis, and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

CONFIGURE MODE	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	CODING RATE	AXIS
A (ACON Antenna)	L, M, H	OFDMA	QPSK	3/4	Z
A (WHA YU Antenna)	L, M, H	OFDMA	QPSK	3/4	Z
B (ACON Antenna)	L, M, H	OFDMA	QPSK	3/4	Z
B (WHA YU Antenna)	L, M, H	OFDMA	QPSK	3/4	Z

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF product. 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

ANSI/TIA/EIA-603-C-2004

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

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	PP05L	9954115984	E2K24CLNS
2	PRINTER	EPSON	LQ-300+	DCGY047265	FCC DoC Approved
3	MODEM	ACEEX	1414V/3	0401008269	IFAXDM1414

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	1m+1.7m RJ45 cable
2	1.8m braid shielded wire , DB25 connector , w/o core.
3	1.2m braid shielded wire , DB25 & DB9 connector , w/o core.

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

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 “User stations are limited to 2 watts” and 27.50(i) specific that “Peak transmit power must be measure over any interval of continuous transmission using instrumentation calibration in terms of rms-equivalent voltage.”

4.1.2 TEST INSTRUMENTS

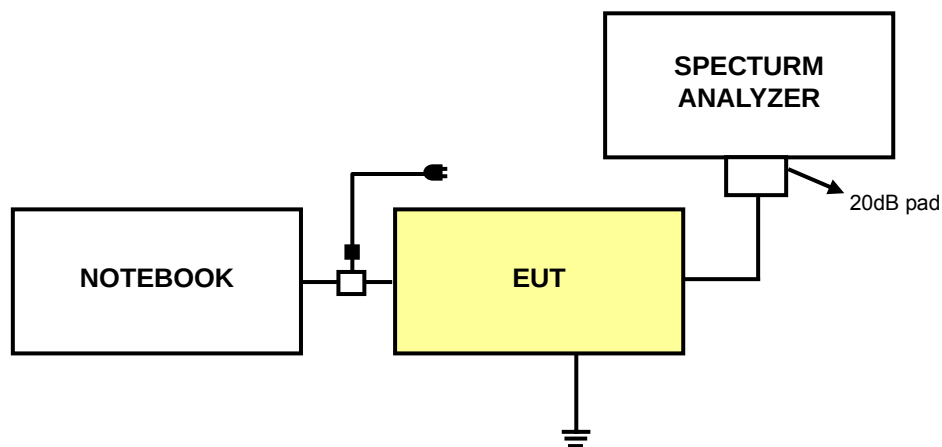
DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESI7	838496/016	Dec. 25, 2008
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Dec. 02, 2008
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Jan. 03, 2009
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-405	Dec. 17, 2008
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170242	Jan. 06, 2009
Preamplifier Agilent	8449B	3008A01910	Sep. 19, 2008
Preamplifier Agilent	8447D	2944A10634	Dec. 12, 2008
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	274397/4	Nov. 07, 2008
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	283401/4	Nov. 07, 2008
Software ADT.	ADT_Radiated_V7.6	NA	NA
Antenna Tower inn-co GmbH	MA 4000	010303	NA
Antenna Tower Controller inn-co GmbH	CO2000	019303	NA
Turn Table ADT.	TT100.	TT93021704	NA
Turn Table Controller ADT.	SC100.	SC93021704	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 test was performed in HwaYa Chamber 4.
3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The IC Site Registration No. is IC3789B-4.

4.1.3 TEST PROCEDURES

- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 100kHz, VBW = 1MHz. Detector mode = Peak.
- Compute power by integrating the spectrum across the 26dB EBW of the signal.
- Record the power level.

4.1.4 TEST SETUP



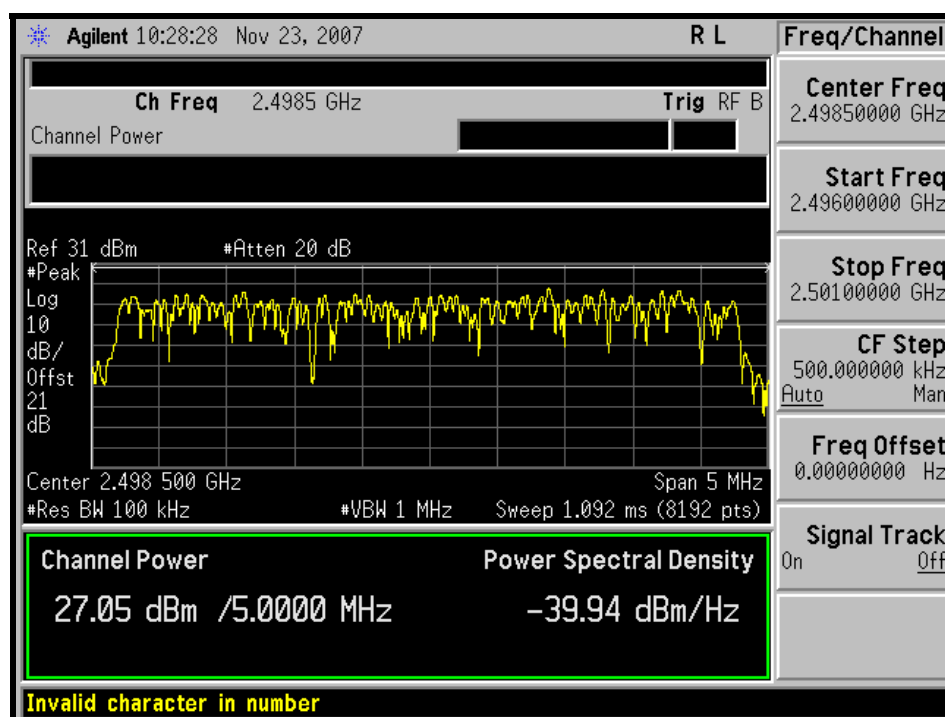
4.1.5 EUT OPERATING CONDITIONS

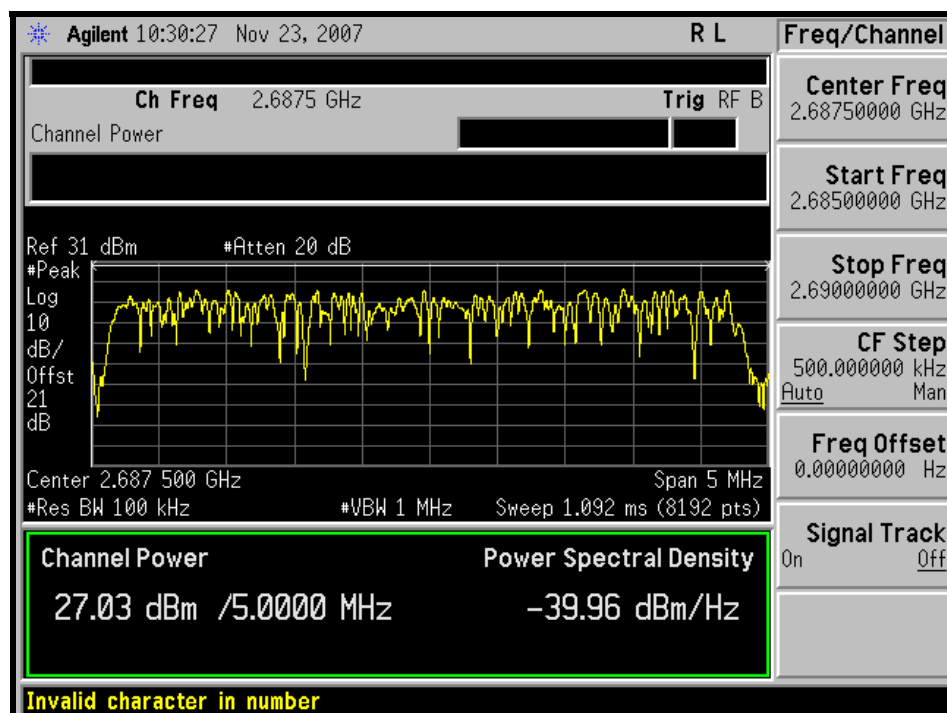
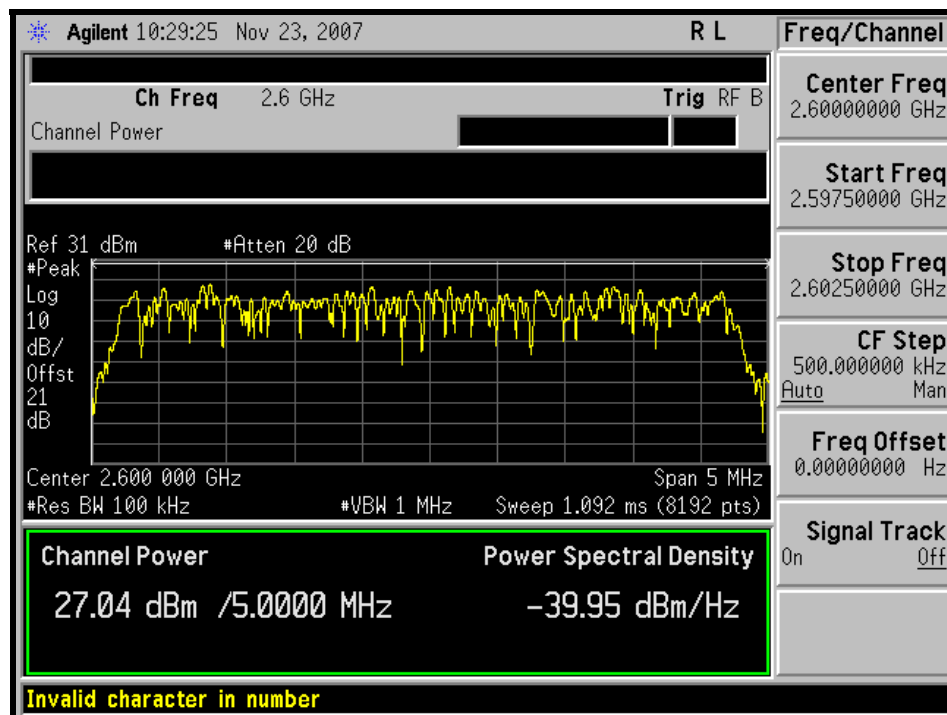
The EUT connected to the notebook. Use software to control the EUT channel and set the transmission power under 100% duty cycle.

4.1.6 TEST RESULTS

INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak
ENVIRONMENTAL CONDITIONS	24deg°C, 60%RH 991hPa	TESTED BY	Brad Wu
TEST MODE	A		

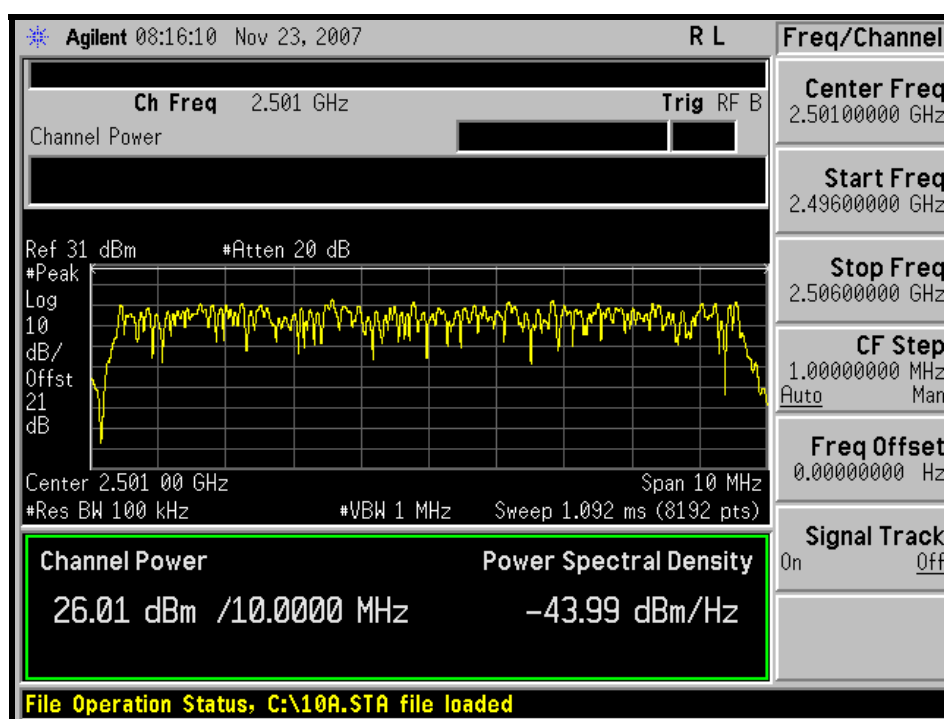
CONDUCTED POWER					
CHANNEL	FREQUENCY (MHz)	S.A READING (dBm)	C.F (dB)	PEAK OUTPUT POWER (dBm)	PEAK OUTPUT POWER (mW)
Low	2498.5	6.05	21.00	27.05	506.99
Middle	2600.0	6.04	21.00	27.04	505.82
High	2687.5	6.03	21.00	27.03	504.66

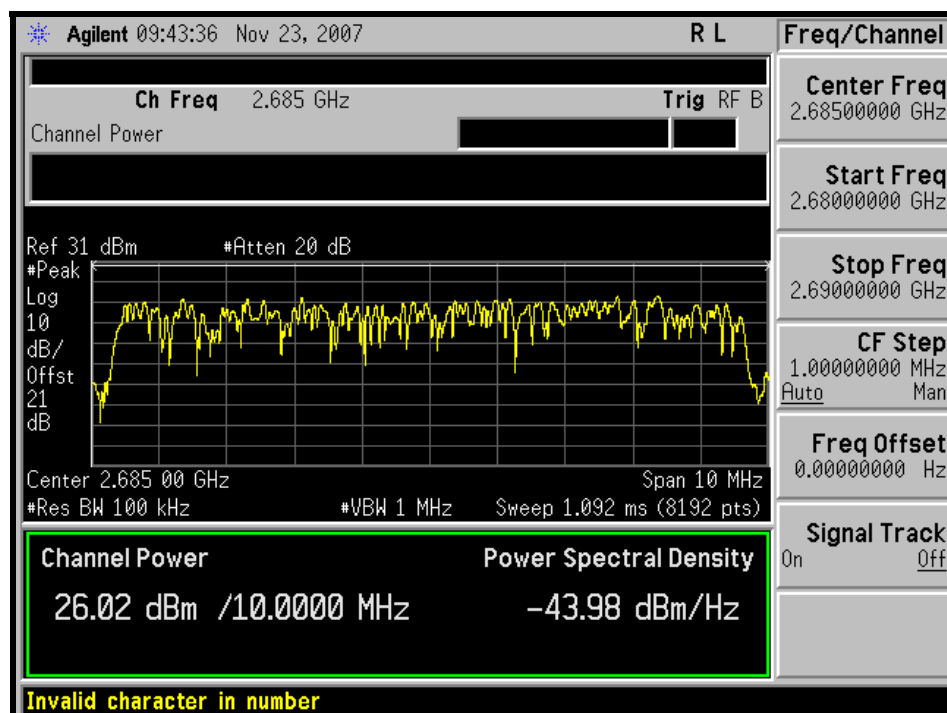
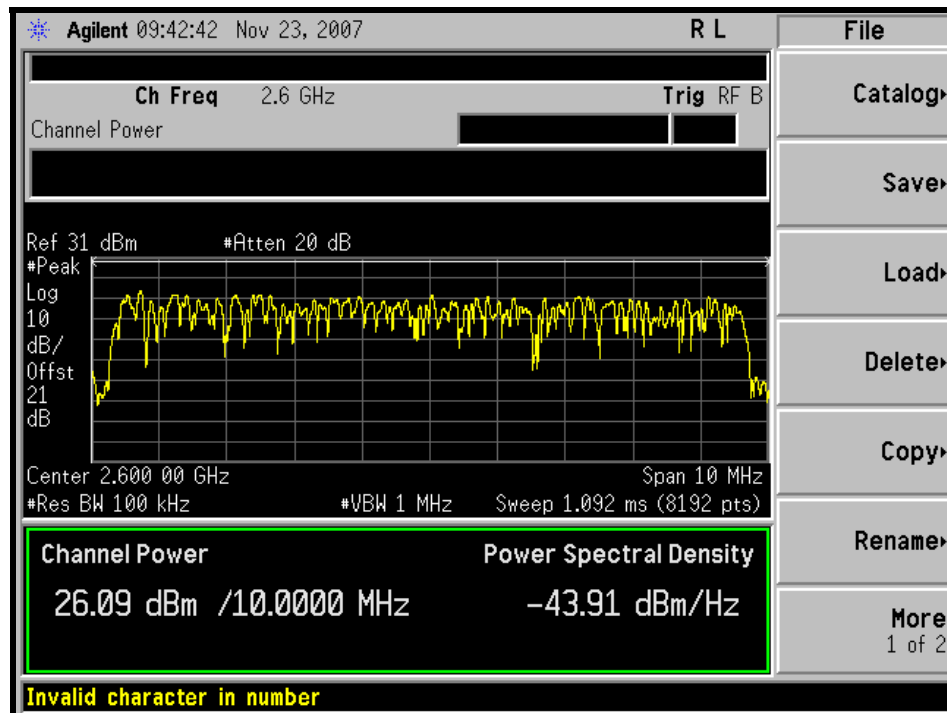




INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak
ENVIRONMENTAL CONDITIONS	24deg°C, 60%RH 991hPa	TESTED BY	Brad Wu
TEST MODE	B		

CONDUCTED POWER					
CHANNEL	FREQUENCY (MHz)	S.A READING (dBm)	C.F (dB)	PEAK OUTPUT POWER (dBm)	PEAK OUTPUT POWER (mW)
Low	2501.0	5.01	21.00	26.01	399.02
Middle	2600.0	5.09	21.00	26.09	406.44
High	2685.0	5.02	21.00	26.02	399.94





4.2 FREQUENCY STABILITY MEASUREMENT

4.2.1 LIMITS OF FREQUENCY STABILITY 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 $-40^{\circ}\text{C} \sim 55^{\circ}\text{C}$.

4.2.2 TEST INSTRUMENTS

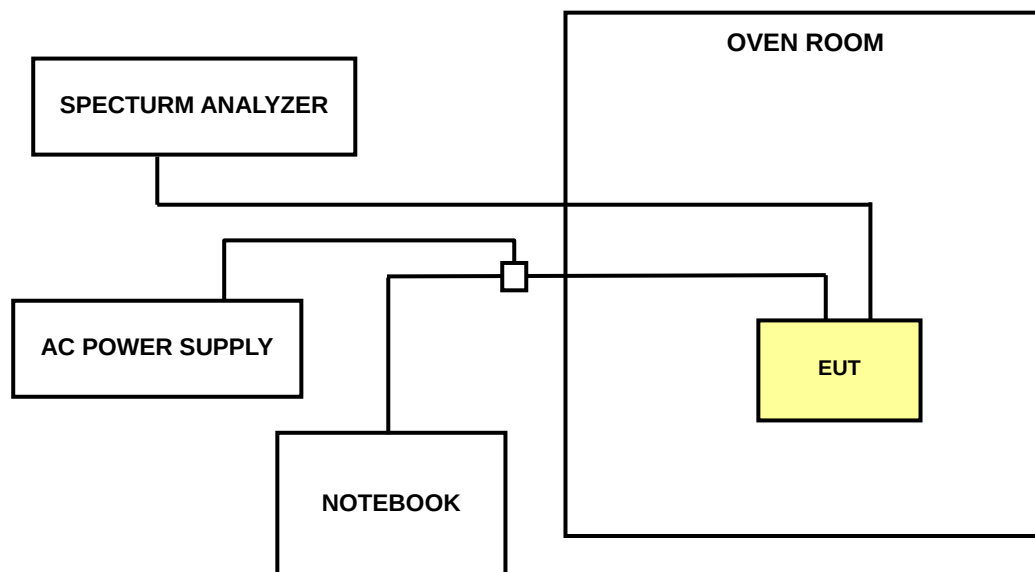
DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
* ROHDE & SCHWARZ Spectrum Analyzer	FSP40	100035	Mar. 25, 2008
* Hewlett Packard RF cable	8120-6192	01428251	NA
* Suhner RF cable	Sucoflex104	204850/4	NA
* WIT Standard Temperature & Humidity Chamber	TH-4S-C	W981030	Jun. 28, 2008

- 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. "*" = These equipments are used for the final measurement.
 3. The test was performed in ADT RF OVEN room.

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 93.5 Volts to 126 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 $\pm 0.5^{\circ}\text{C}$ 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 EUT OPERATING CONDITIONS

The EUT connected to the notebook. Use software to control the EUT channel and transmit a single tone.

4.2.6 TEST RESULTS

MODE	Low channel	INPUT POWER (SYSTEM)	120Vac, 60Hz
ENVIRONMENTAL CONDITIONS	24deg°C, 60%RH 991hPa	TESTED BY	Brad Wu
TEST MODE	A		

AFC FREQUENCY ERROR VS. VOLTAGE		
VOLTAGE (Volts)	FREQUENCY (MHz)	FREQUENCY ERROR (ppm)
126	2498.4947	-2.1212727636
110	2498.4955	-1.8010806484
93.5	2498.4944	-2.2413448069

AFC FREQUENCY ERROR VS. TEMP.		
TEMP. (°C)	FREQUENCY (MHz)	FREQUENCY ERROR (ppm)
55	2498.4976	-0.9605763457
50	2498.4984	-0.6403842306
40	2498.4981	-0.7604562738
30	2498.4963	-1.4808885332
20	2498.4955	-1.8010806484
10	2498.4944	-2.2413448069
0	2498.4958	-1.6810086051
-10	2498.4961	-1.5609365620
-20	2498.4948	-2.0812487493
-30	2498.4940	-2.4014408645
-40	2498.4938	-2.4814888933

MODE	Low channel	INPUT POWER (SYSTEM)	120Vac, 60Hz
ENVIRONMENTAL CONDITIONS	24deg°C, 60%RH 991hPa	TESTED BY	Brad Wu
TEST MODE	B		

AFC FREQUENCY ERROR VS. VOLTAGE		
VOLTAGE (Volts)	FREQUENCY (MHz)	FREQUENCY ERROR (ppm)
126	2500.99544	-1.8232706917
110	2500.99747	-1.0115953619
93.5	2500.99414	-2.3430627750

AFC FREQUENCY ERROR VS. TEMP.		
TEMP. (°C)	FREQUENCY (MHz)	FREQUENCY ERROR (ppm)
55	2500.99854	-0.5837664934
50	2500.99753	-0.9876049580
40	2500.99732	-1.0715713715
30	2500.99796	-0.8156737304
20	2500.99747	-1.0115953619
10	2500.99861	-0.5557776889
0	2500.99639	-1.4434226310
-10	2500.99886	-0.4558176729
-20	2500.99450	-2.1991203519
-30	2500.99407	-2.3710515793
-40	2500.99387	-2.4510195922

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

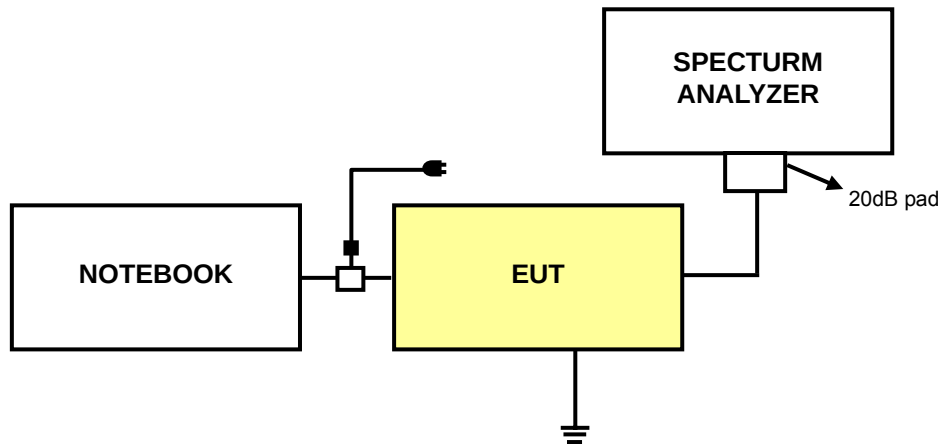
DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
* ROHDE & SCHWARZ Spectrum Analyzer	FSP40	100035	Mar. 25, 2008
* Hewlett Packard RF cable	8120-6192	01428251	NA
* JFW 10dB attenuation	50HF-010-SMA	NA	NA
* Suhner RF cable	Sucoflex104	204850/4	NA

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. "*" = These equipments are used for the final measurement.

4.3.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100 kHz RBW and 300kHz VBW. The 26dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 26dB.

4.3.4 TEST SETUP



4.3.5 EUT OPERATING CONDITIONS

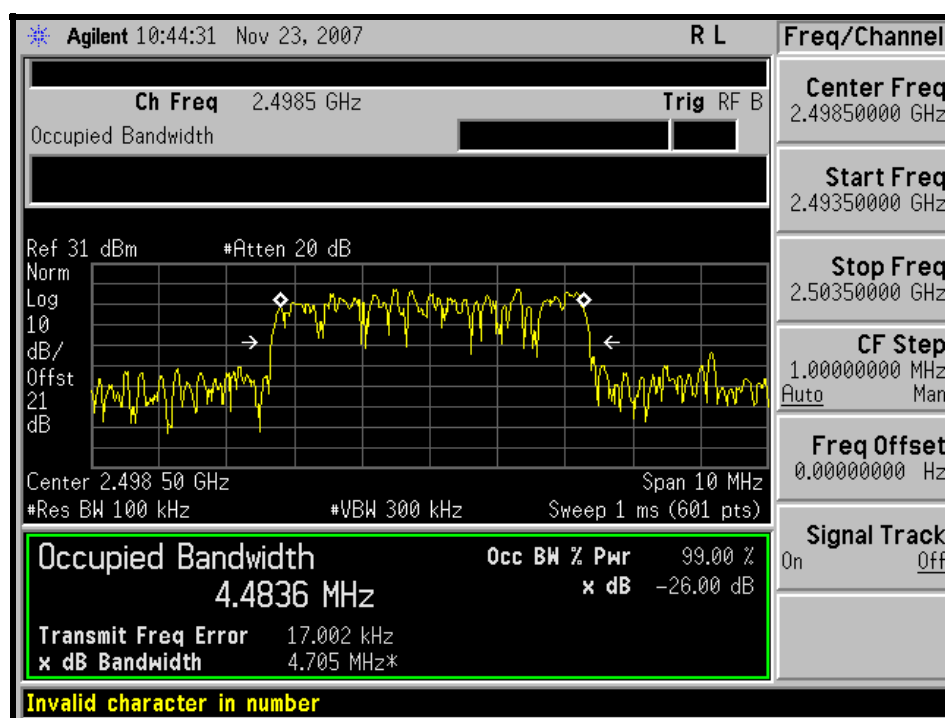
The EUT connected to the notebook. Use software to control the EUT channel and set the transmission power under 100% duty cycle.

4.3.6 TEST RESULTS

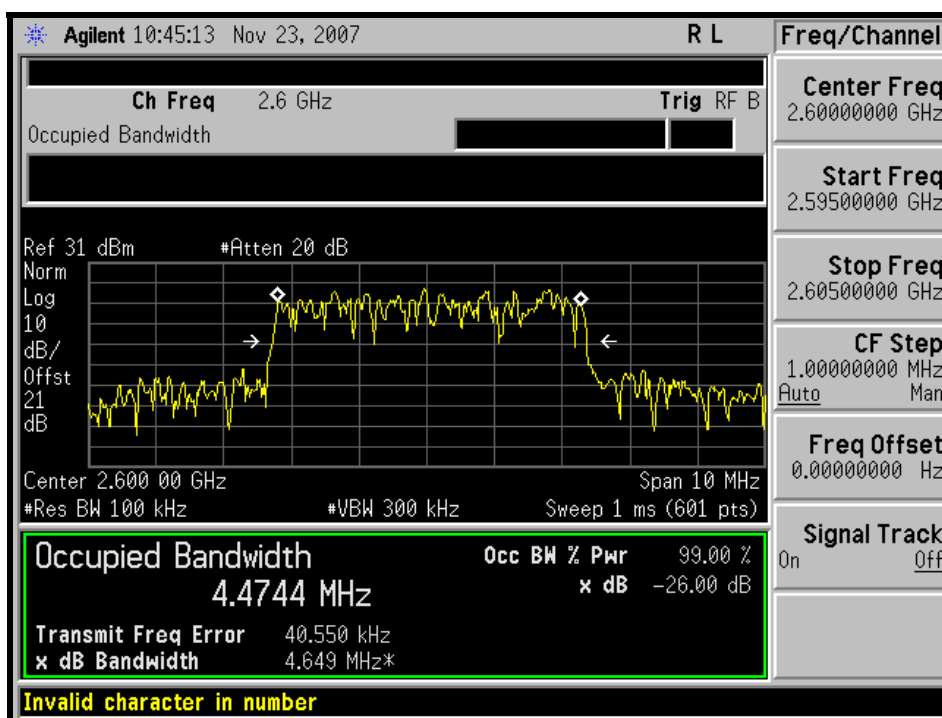
TEST MODE: A

FREQUENCY (MHz)	-26dBc BANDWIDTH (MHz)
2498.5	4.705
2600.0	4.649
2687.5	4.758

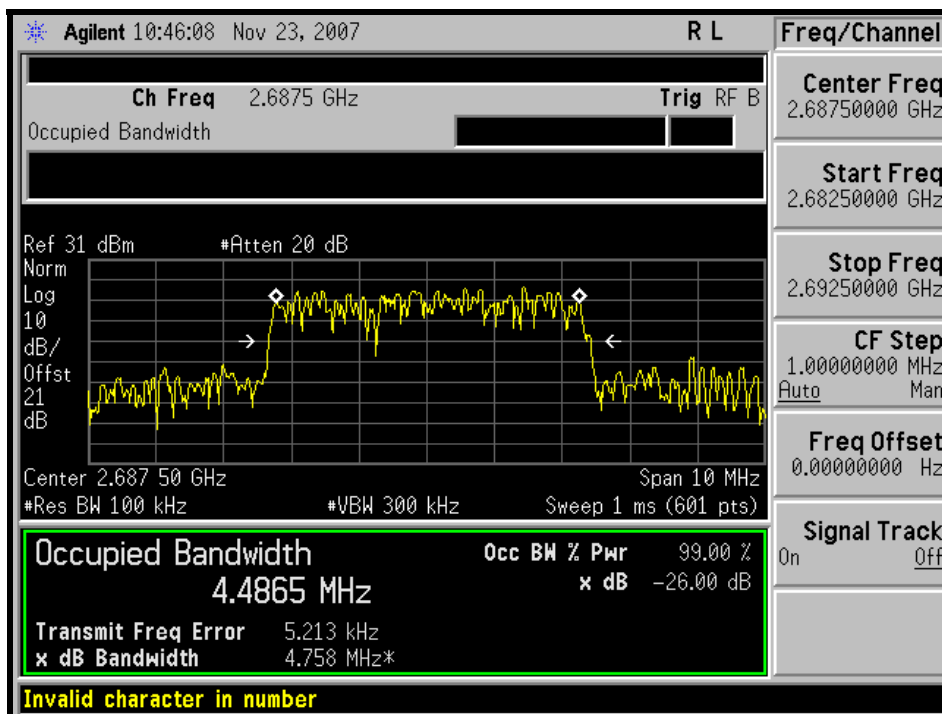
LOW CHANNEL



MIDDLE CHANNEL



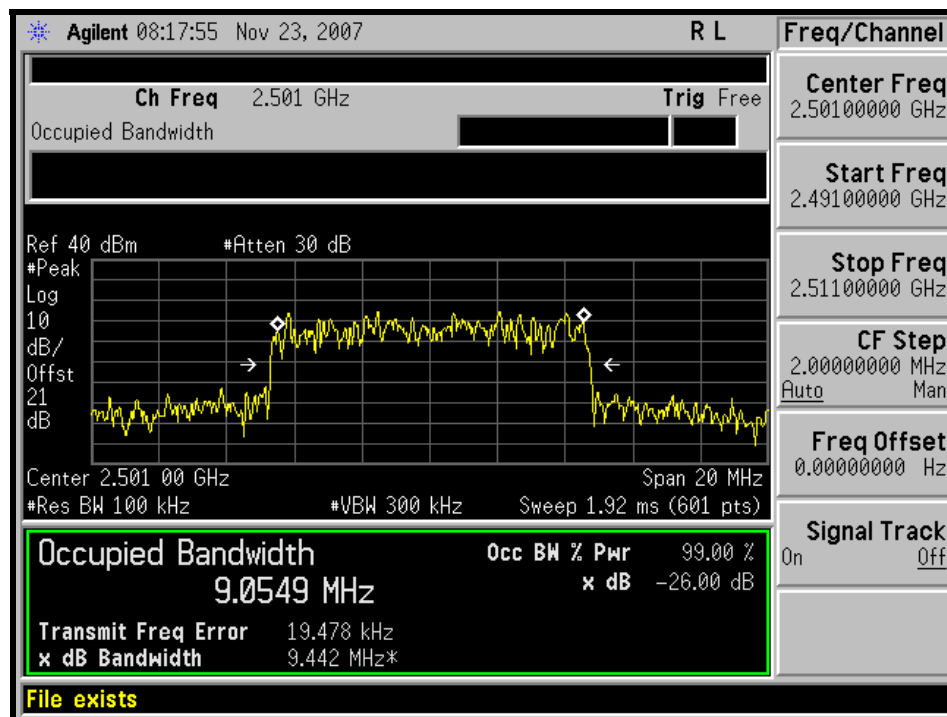
HIGH CHANNEL



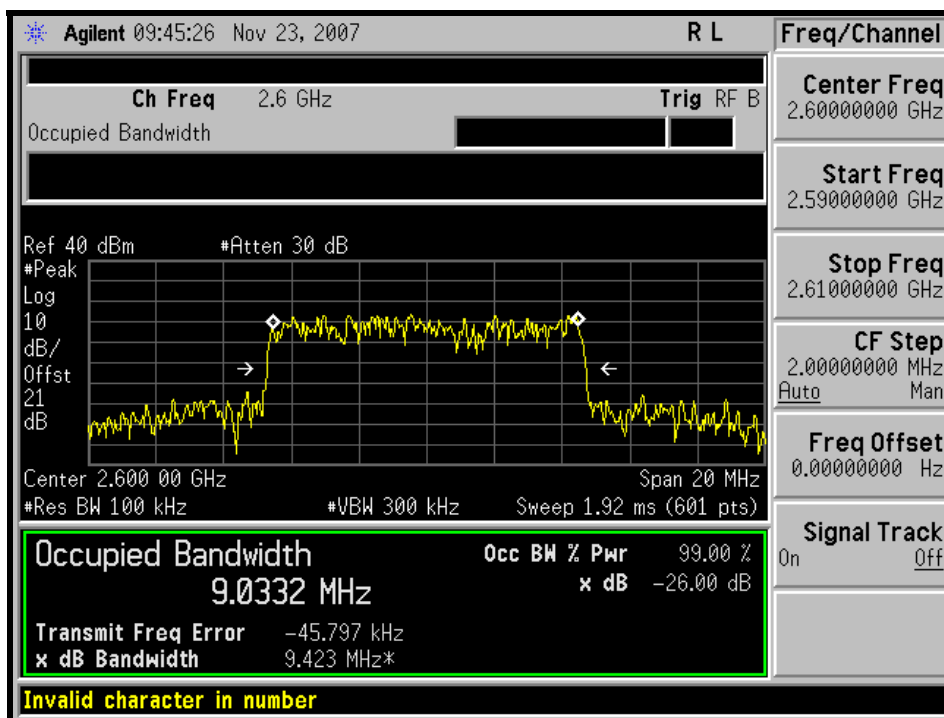
TEST MODE: B

FREQUENCY (MHz)	-26dBc BANDWIDTH (MHz)
2501.0	9.442
2600.0	9.423
2685.0	9.450

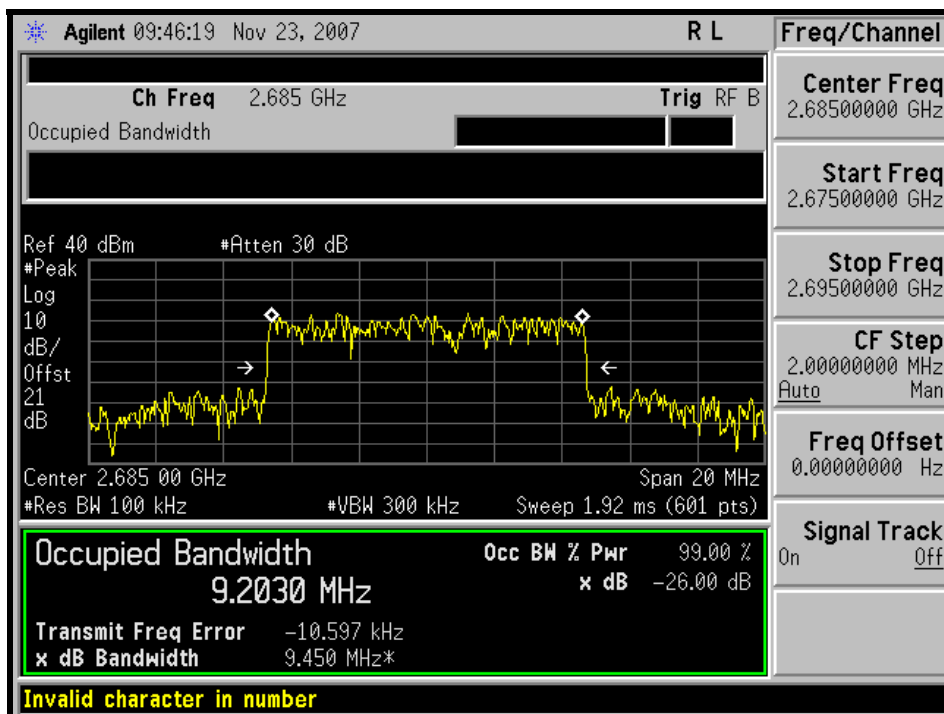
LOW CHANNEL



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. The limit of emission equal to -13 dBm. In the 1 MHz 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 UNTIL
* Agilent Spectrum Analyzer	E4440A	MY46185282	Jun. 13, 2008
* JFW 10dB attenuation	50HF-010-SMA	NA	NA
* Suhner RF cable	Sucoflex104	204850/4	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. "*" = These equipments are used for the final measurement.

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. The center frequency of spectrum is the band edge frequency and span is 20MHz (Test mode A) / 30MHz (Test mode B). RBW of the spectrum is 51kHz (Test mode A) / 100kHz (Test mode B).
- c. Record the max trace plot into the test report.

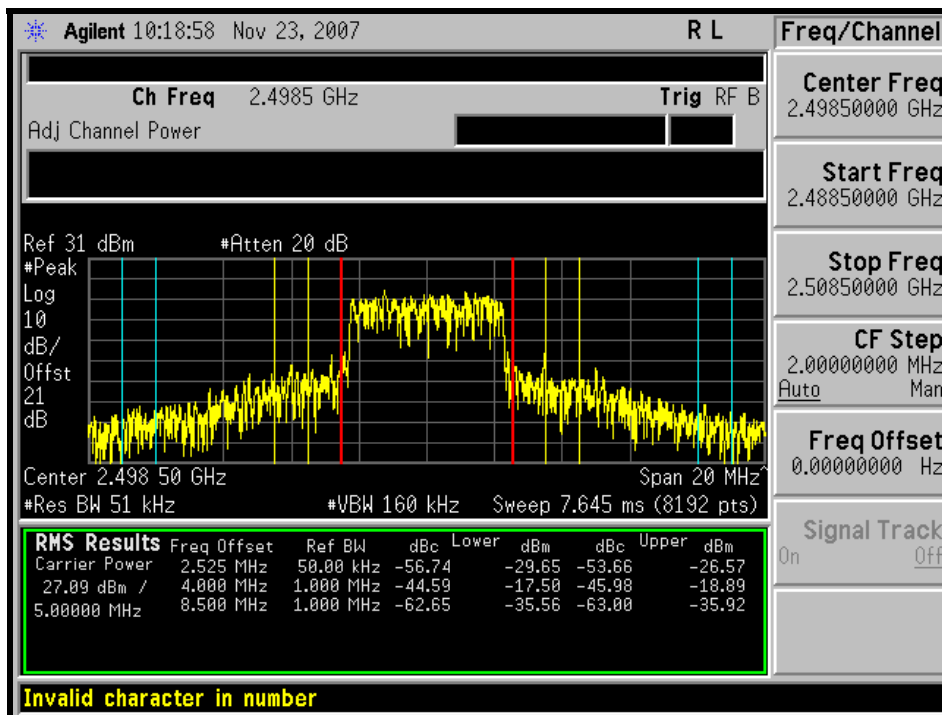
4.4.5 EUT OPERATING CONDITION

The EUT connected to the notebook. Use software to control the EUT channel and set the transmission power under 100% duty cycle.

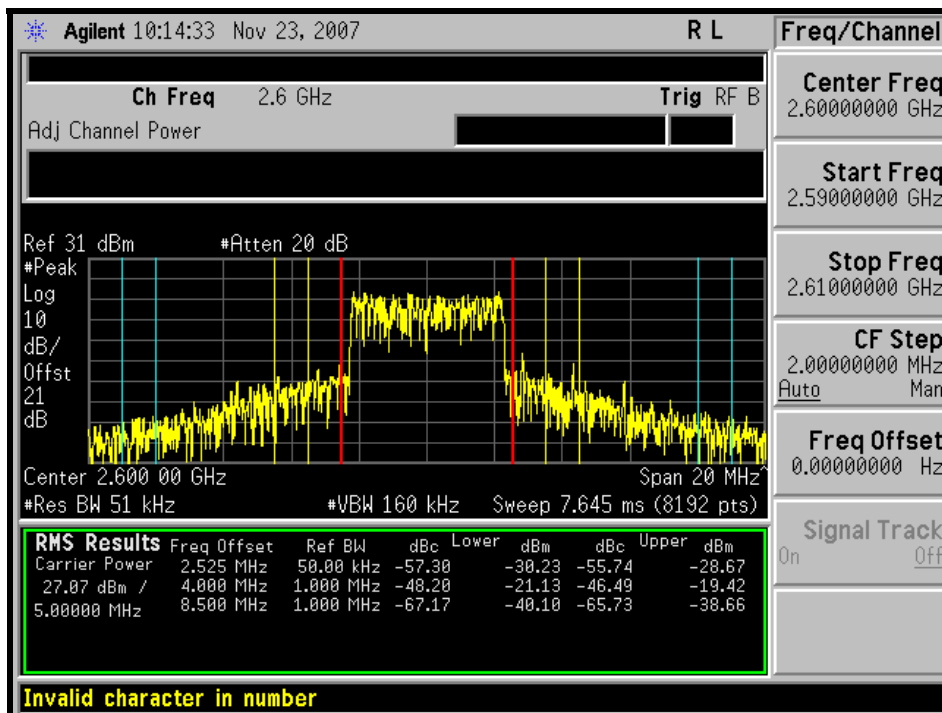
4.4.6 TEST RESULTS

TEST MODE: A

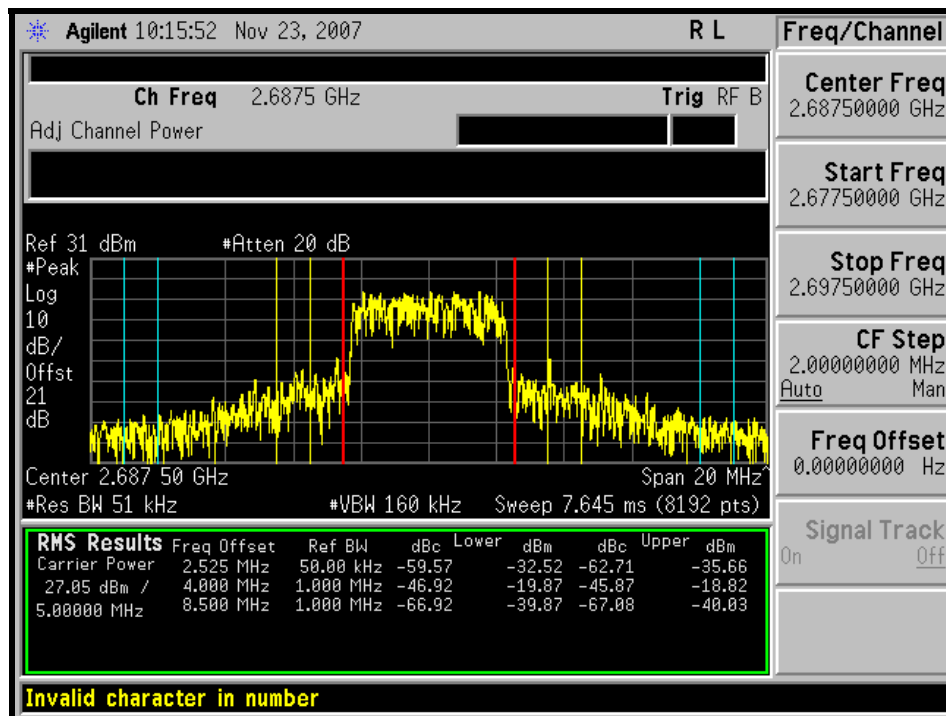
LOW CHANNEL



MIDDLE CHANNEL

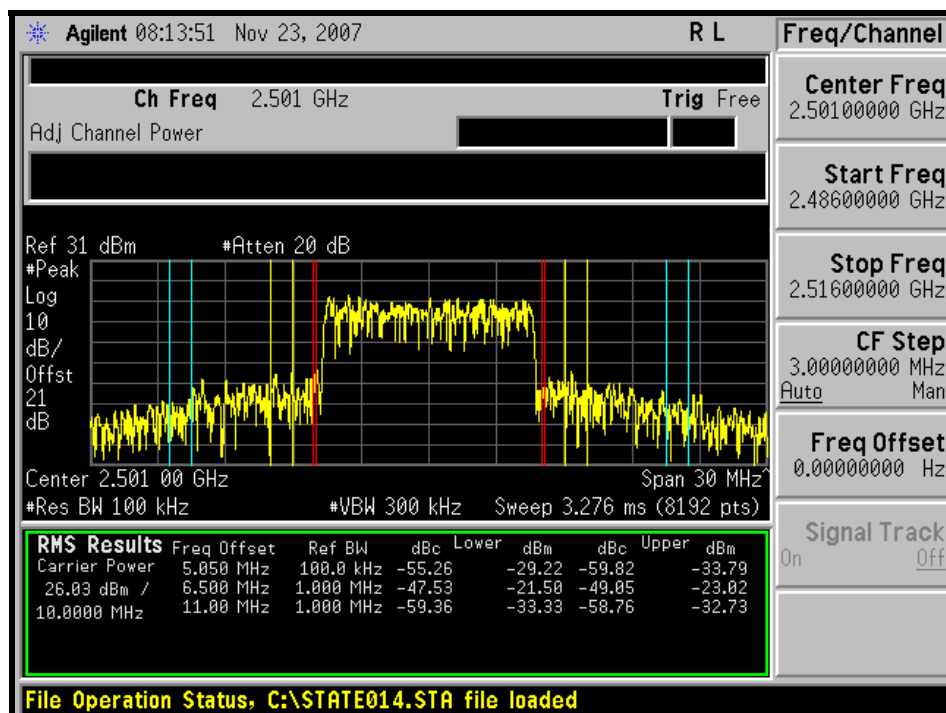


HIGH CHANNEL

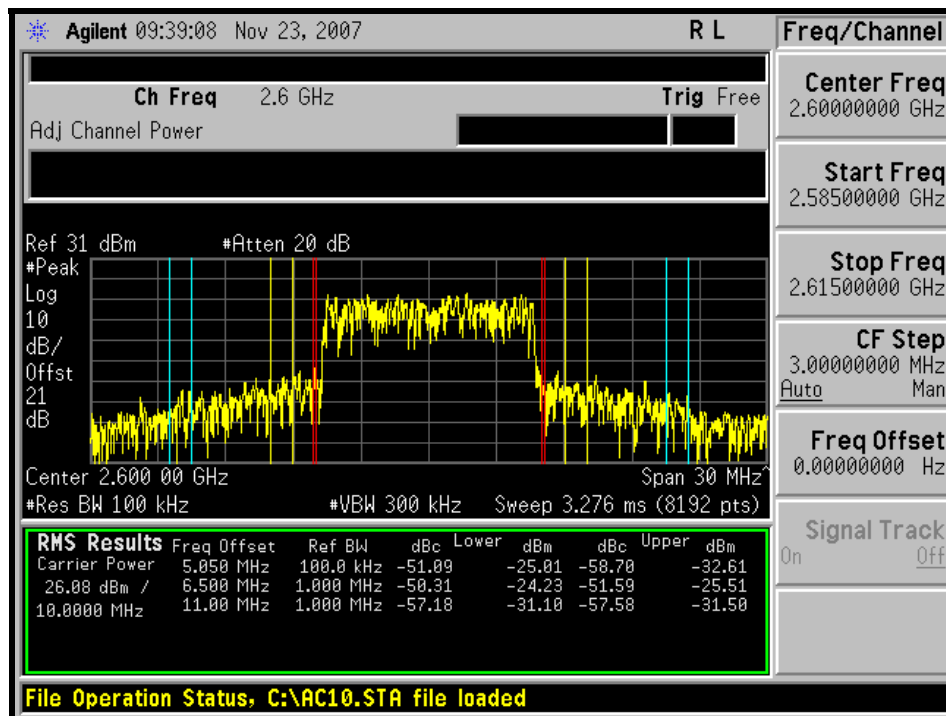


TEST MODE: B

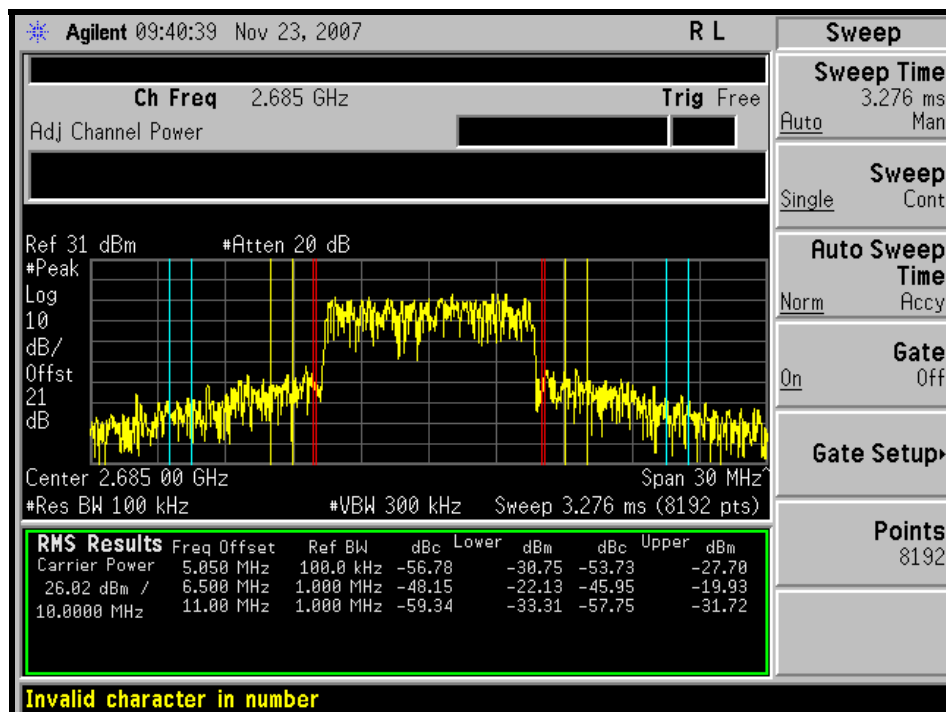
LOW CHANNEL



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. The specified minimum attenuation becomes 43dB and the limit of emission equal to -13 dBm.

4.5.2 TEST INSTRUMENTS

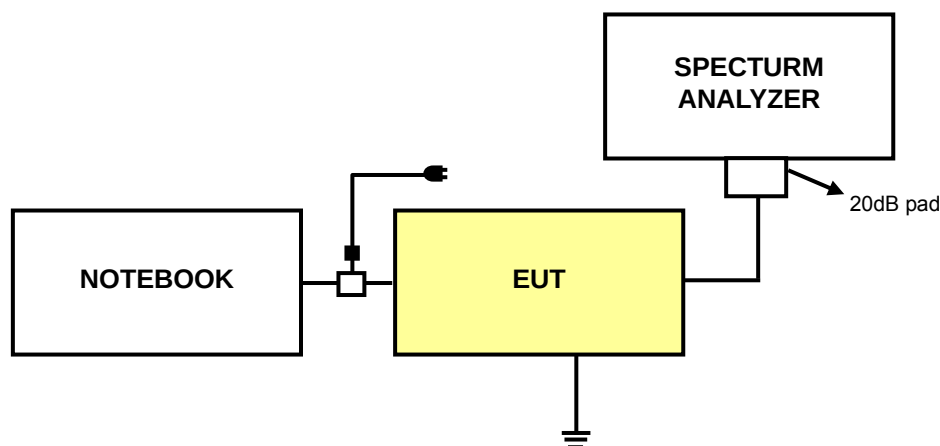
DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
* ROHDE & SCHWARZ Spectrum Analyzer	FSP40	100035	Mar. 25, 2008
* Wainwright Instruments High Pass Filter	WHK3.1/18G-10SS	ZZ-010091	NA
* JFW 10dB attenuation	50HF-010-SMA	NA	NA
* Suhner RF cable	Sucoflex104	204850/4	NA

- 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. "*" = These equipments are used for the final measurement.

4.5.3 TEST PROCEDURE

- a. All measurements were done at 3 channels: low, middle and high operational frequency range.
- b. When the spectrum scanned from 30MHz to 3GHz, it shall be connected to the 20dB pad attenuated the carried frequency. The spectrum set RB = 1MHz, VB = 3MHz.
- c. When the spectrum scanned from 3GHz to 27GHz, it shall be connected to the high pass filter attenuated the carried frequency. The spectrum set RB = 1MHz, VB = 3MHz.

4.5.4 TEST SETUP



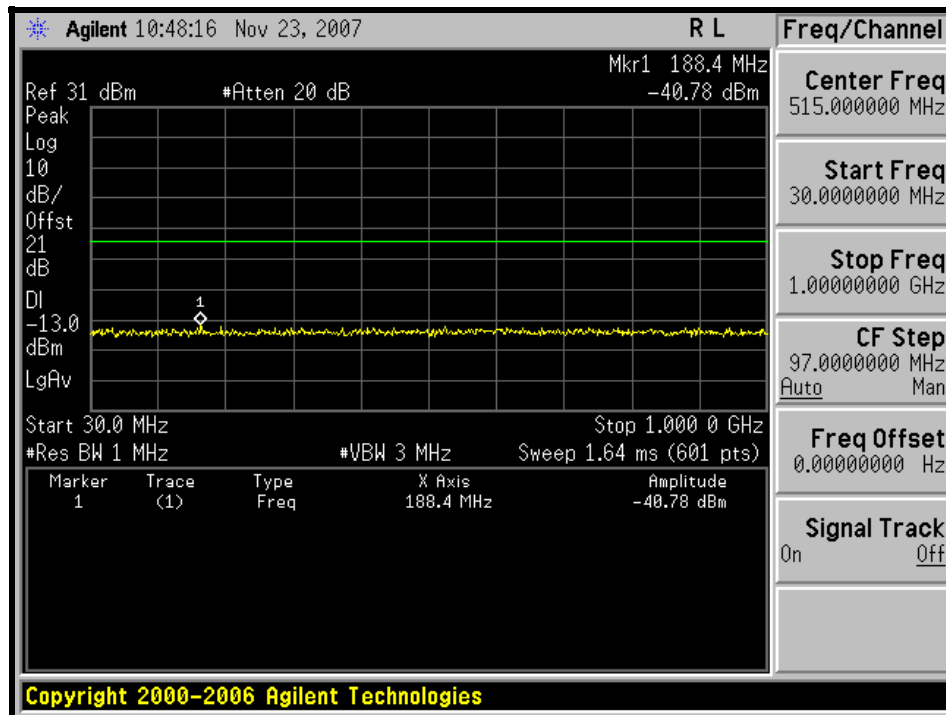
4.5.5 EUT OPERATING CONDITIONS

The EUT connected to the notebook. Use software to control the EUT channel and set the transmission power under 100% duty cycle.

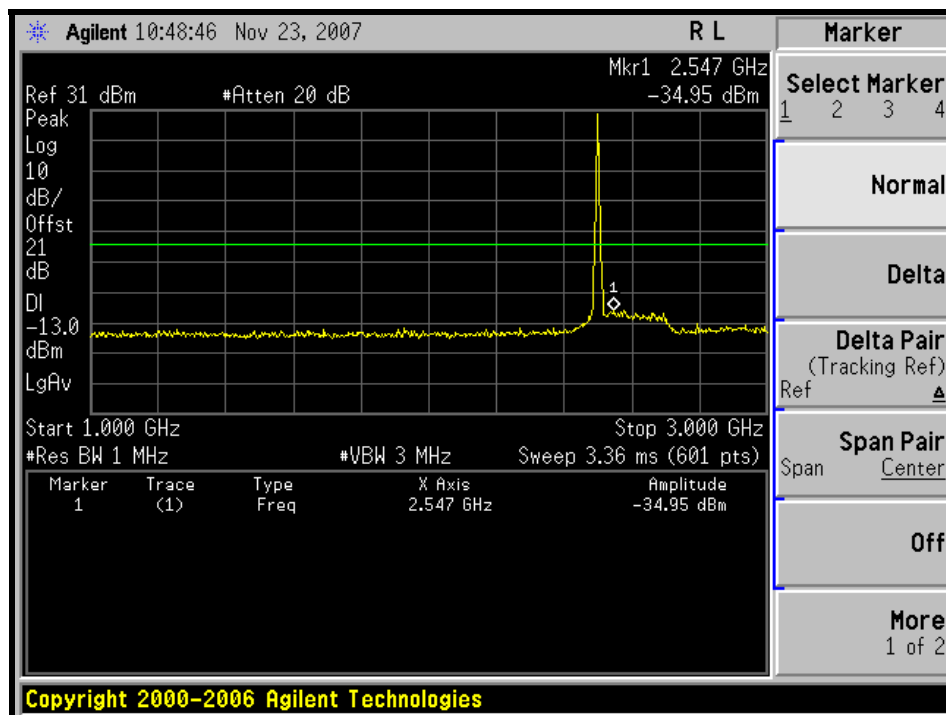
4.5.6 TEST RESULTS

TEST MODE: A

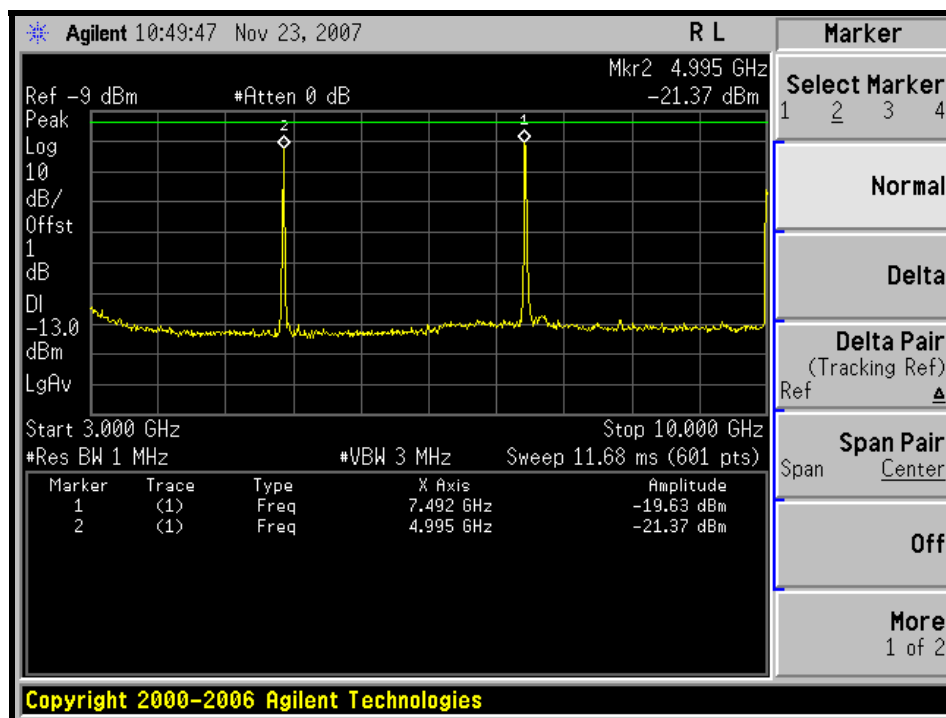
LOW CHANNEL: 30MHz ~ 1GHz:



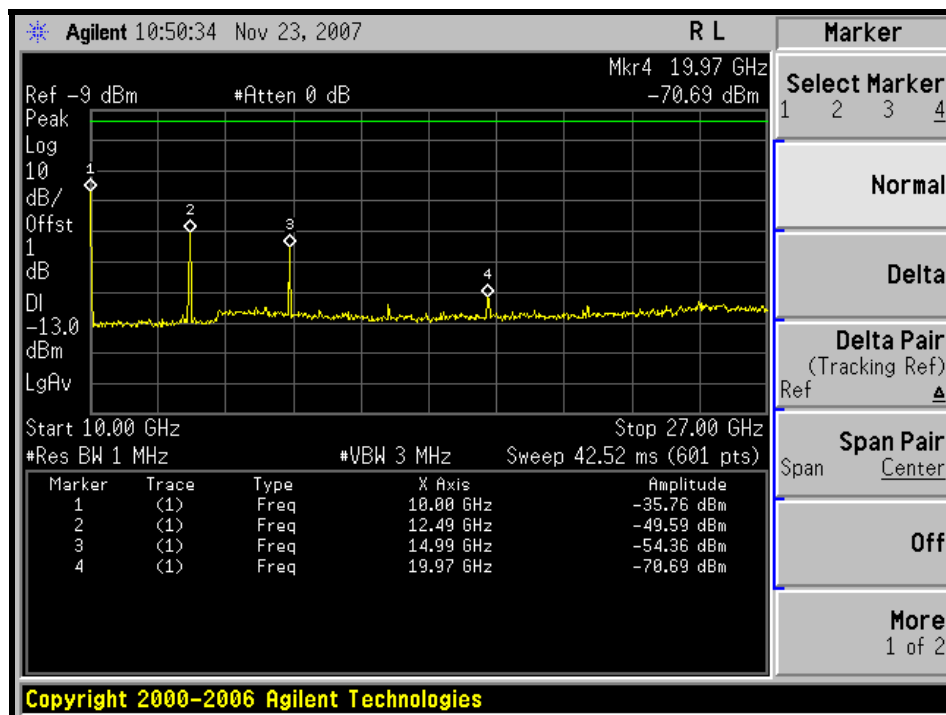
1GHz ~ 3GHz:



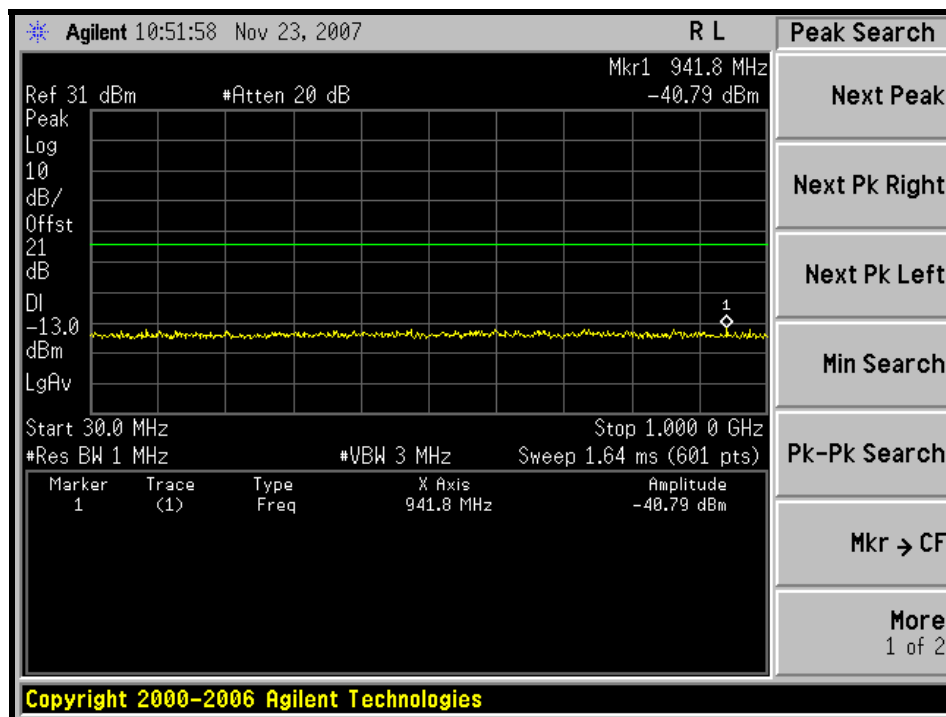
3GHz ~ 10GHz:



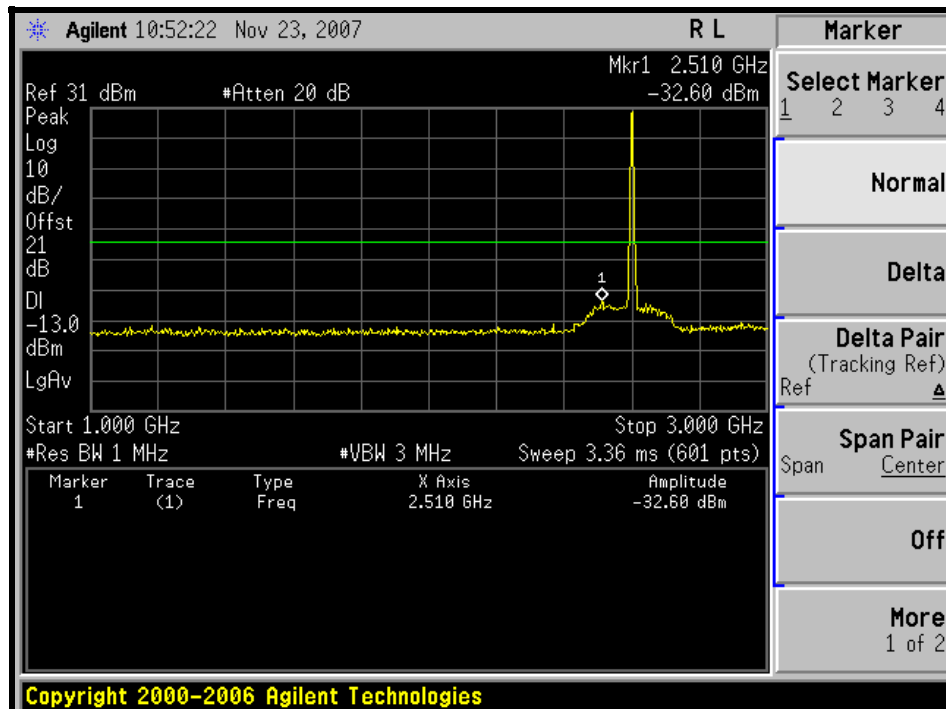
10GHz ~ 27GHz:



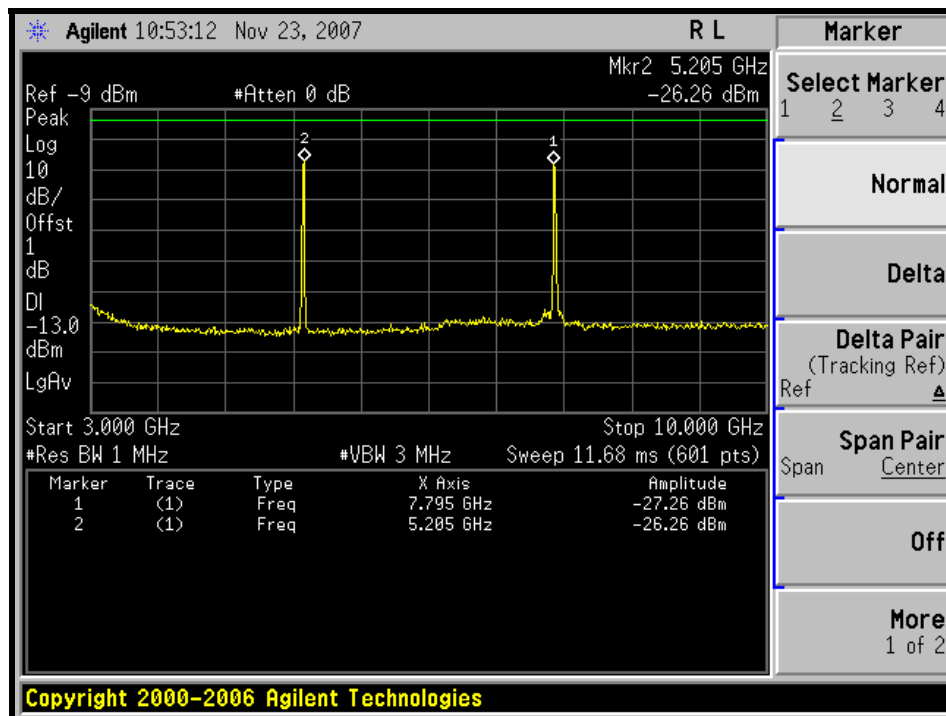
MIDDLE CHANNEL: 30MHz ~ 1GHz:



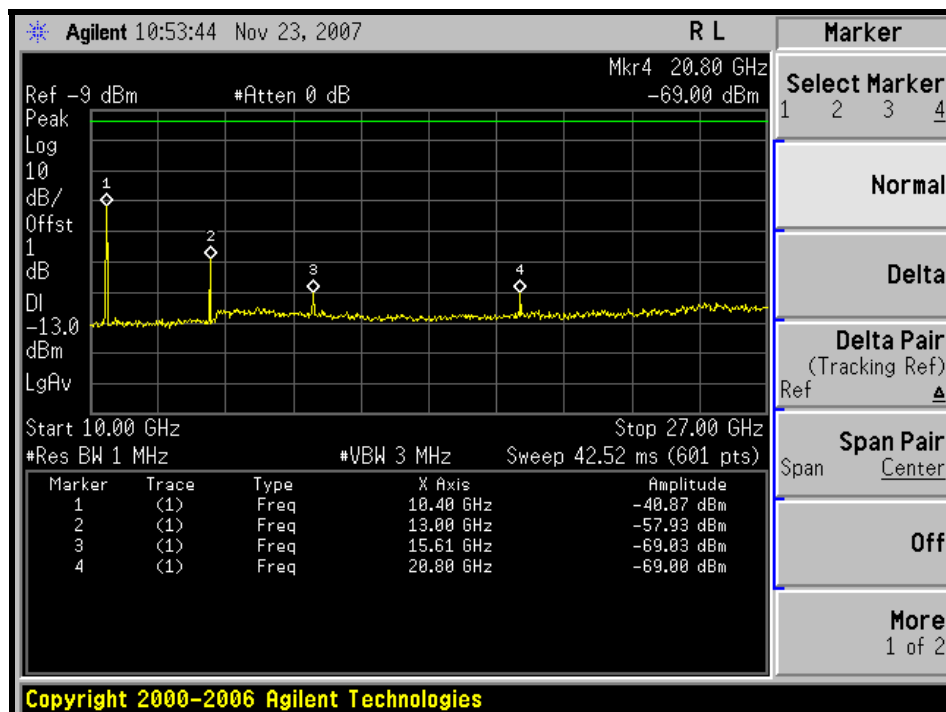
1GHz ~ 3GHz:



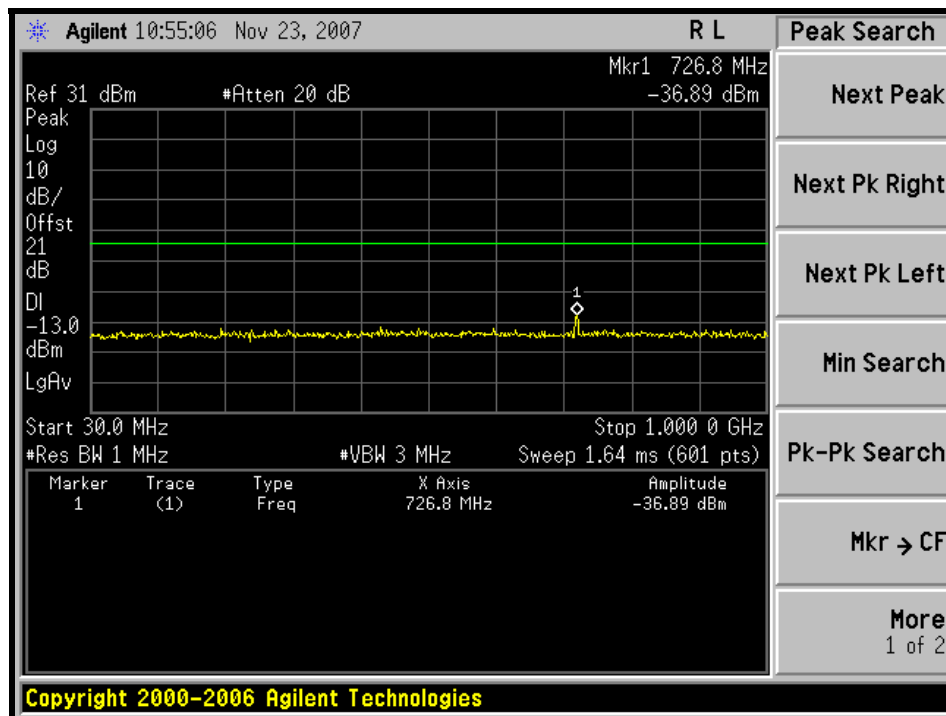
3GHz ~ 10GHz:



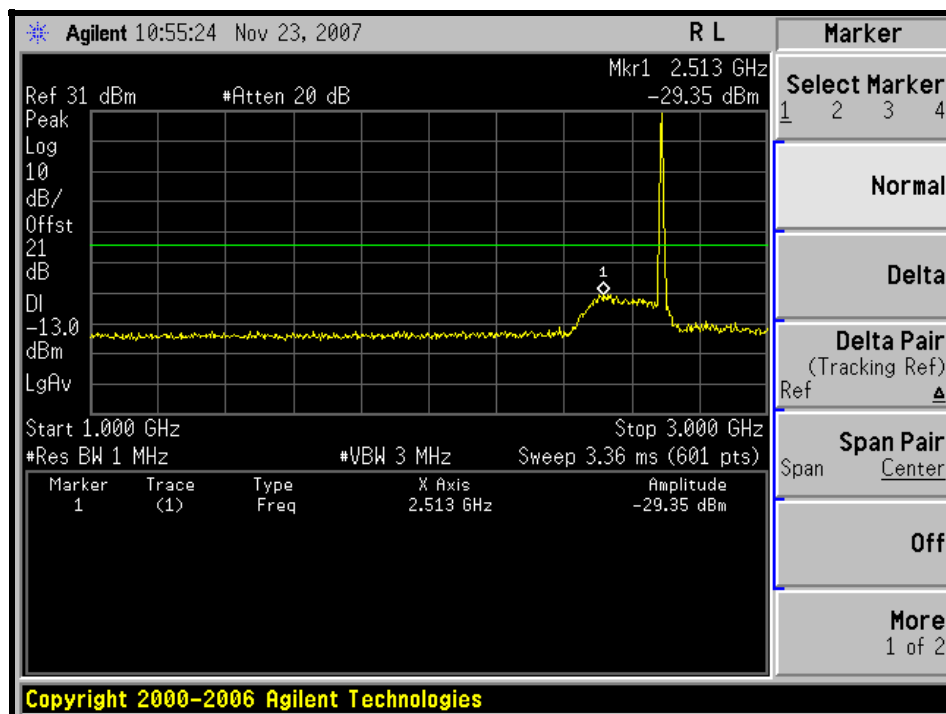
10GHz ~ 27GHz:



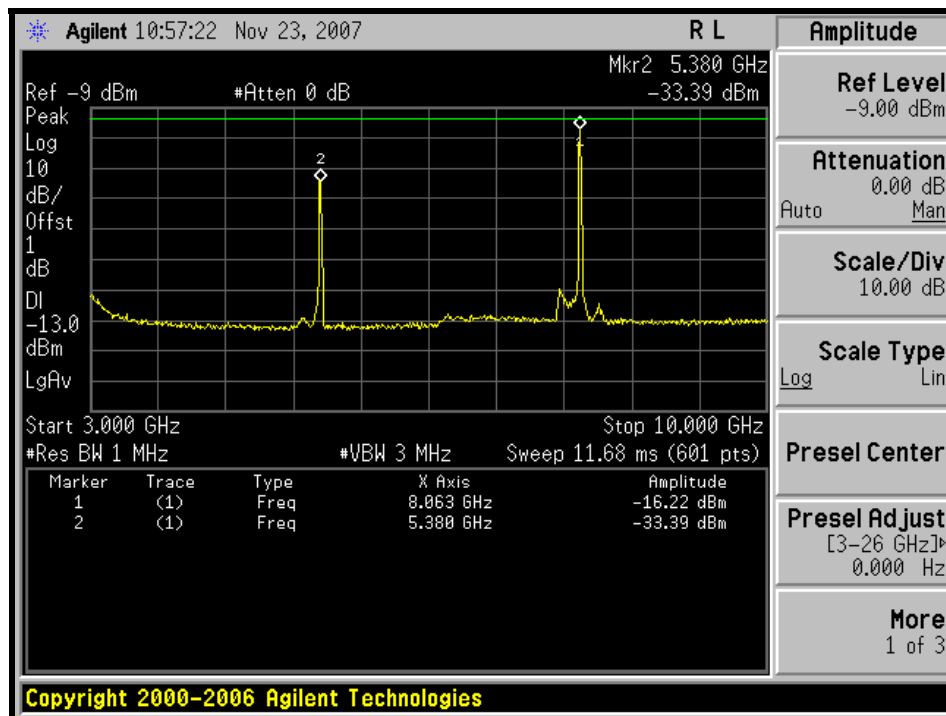
HIGH CHANNEL: 30MHz ~ 1GHz:



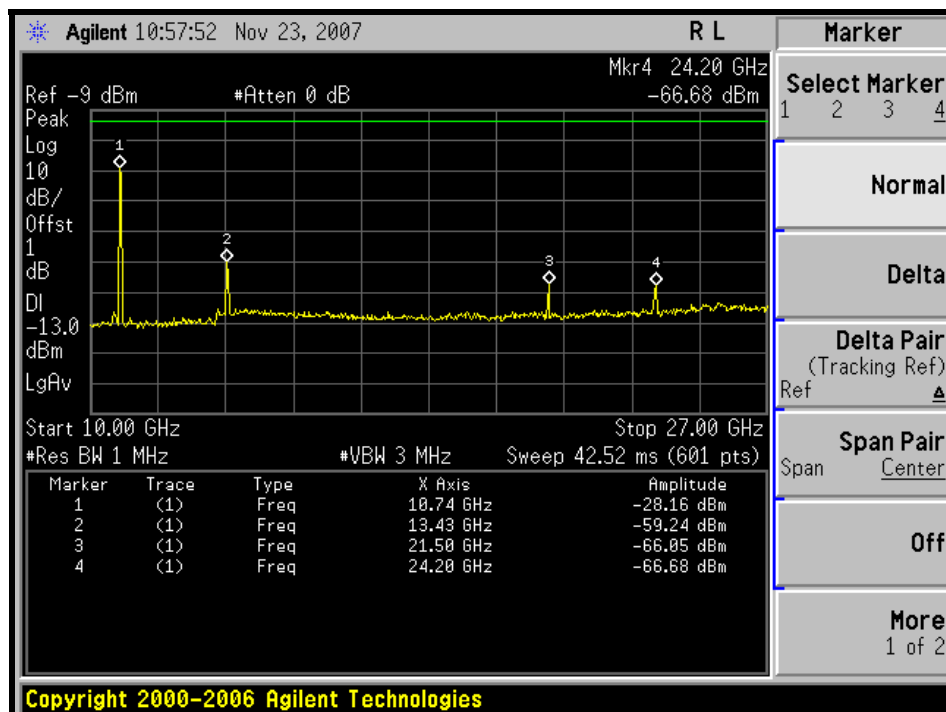
1GHz ~ 3GHz:



3GHz ~ 10GHz:

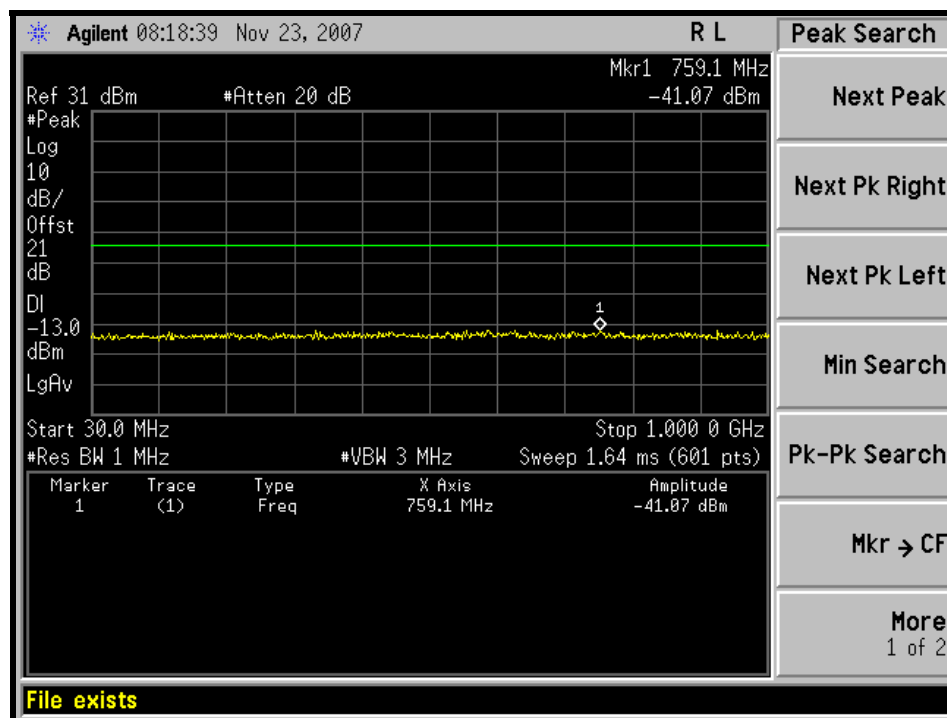


10GHz ~ 27GHz:

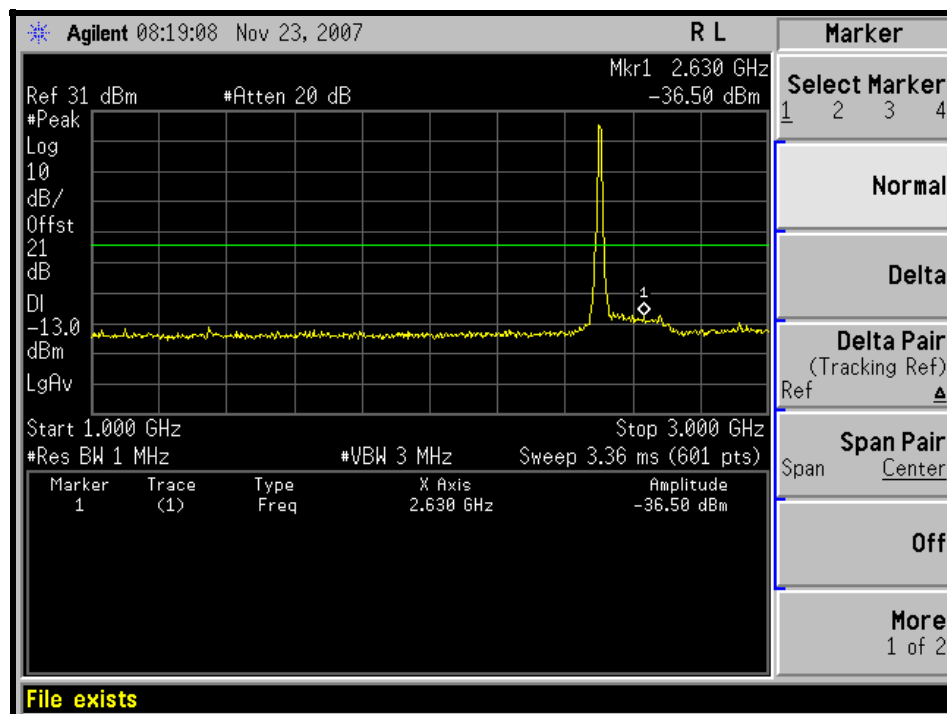


TEST MODE: B

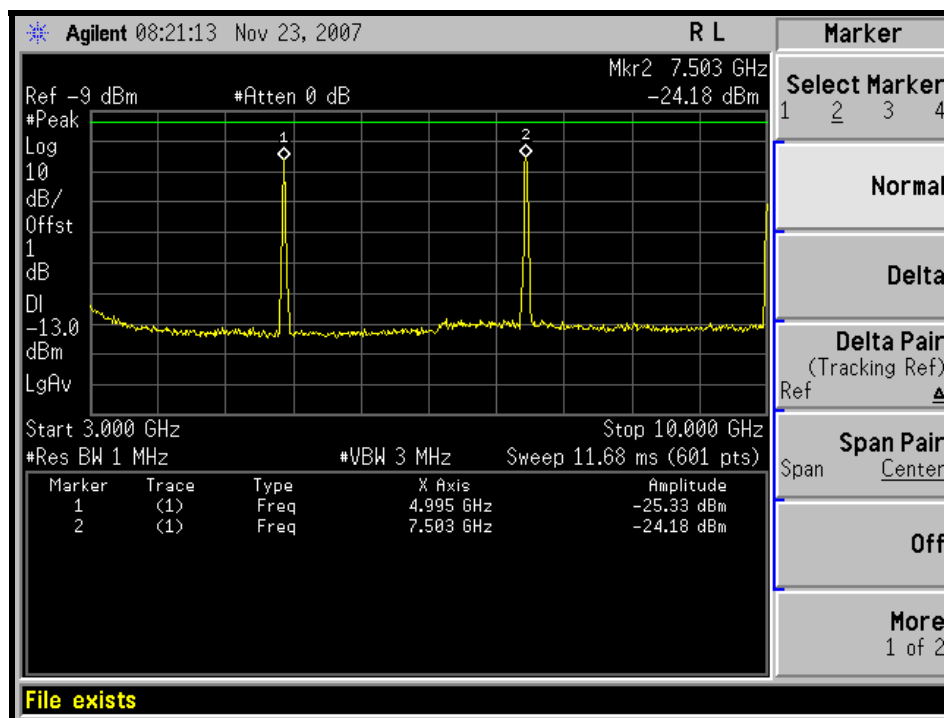
LOW CHANNEL: 30MHz ~ 1GHz:



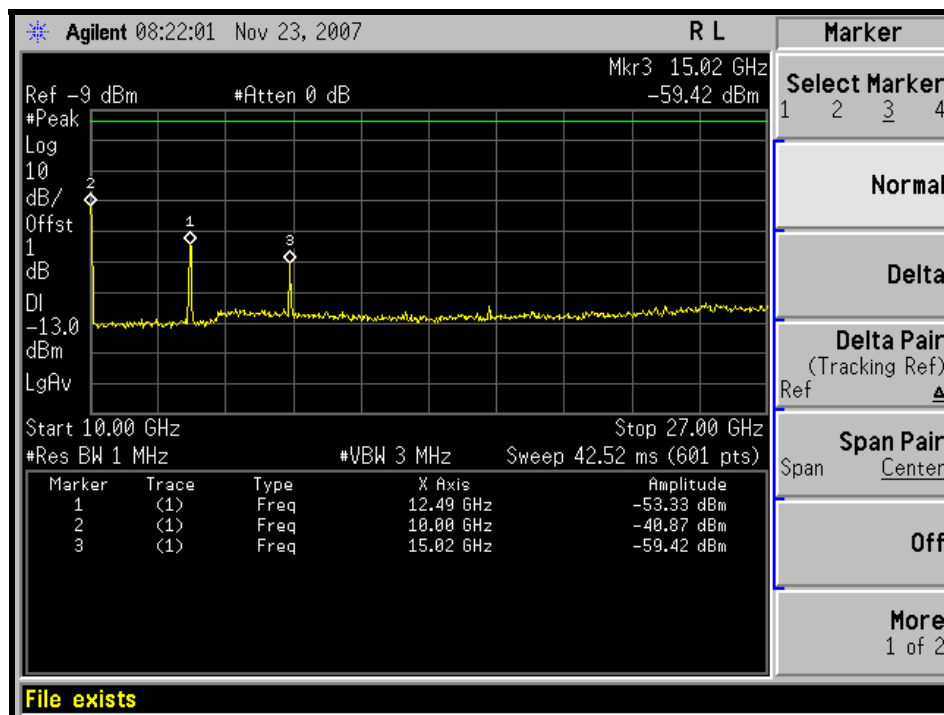
1GHz ~ 3GHz:



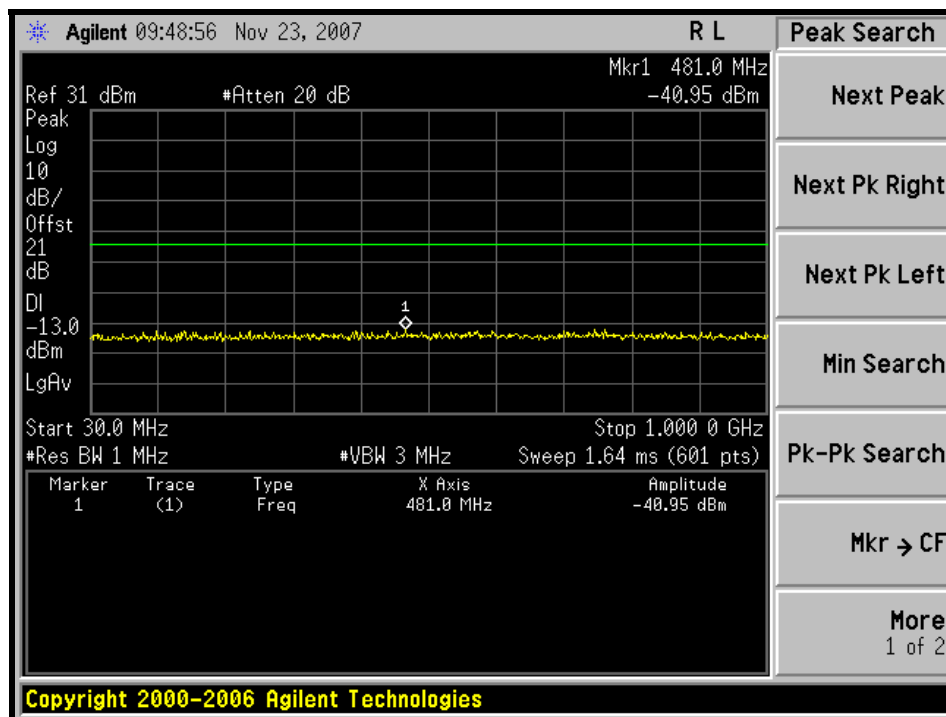
3GHz ~ 10GHz:



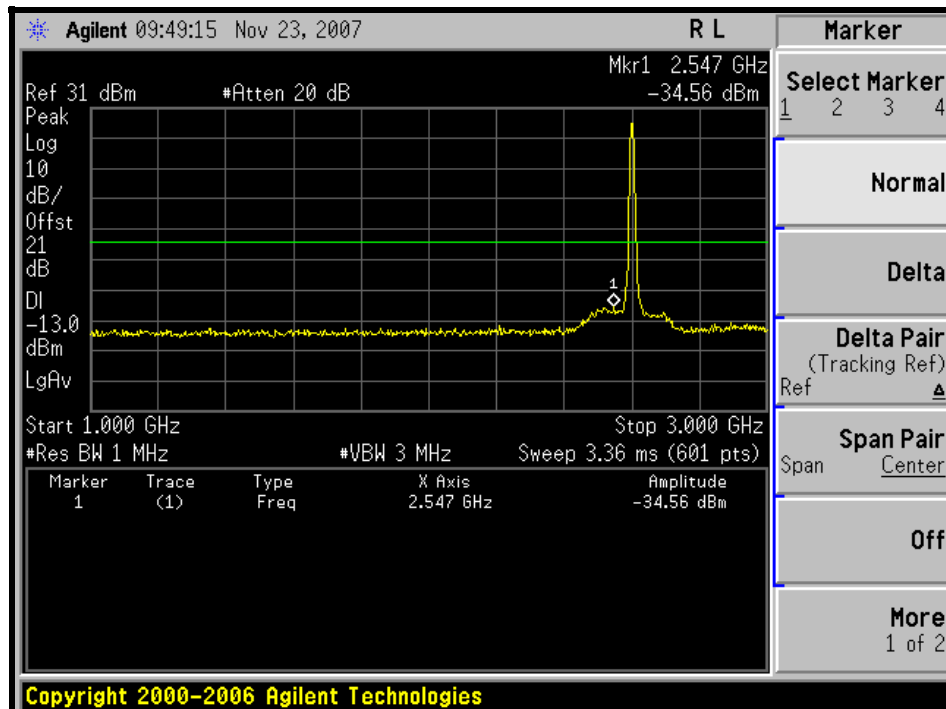
10GHz ~ 27GHz:



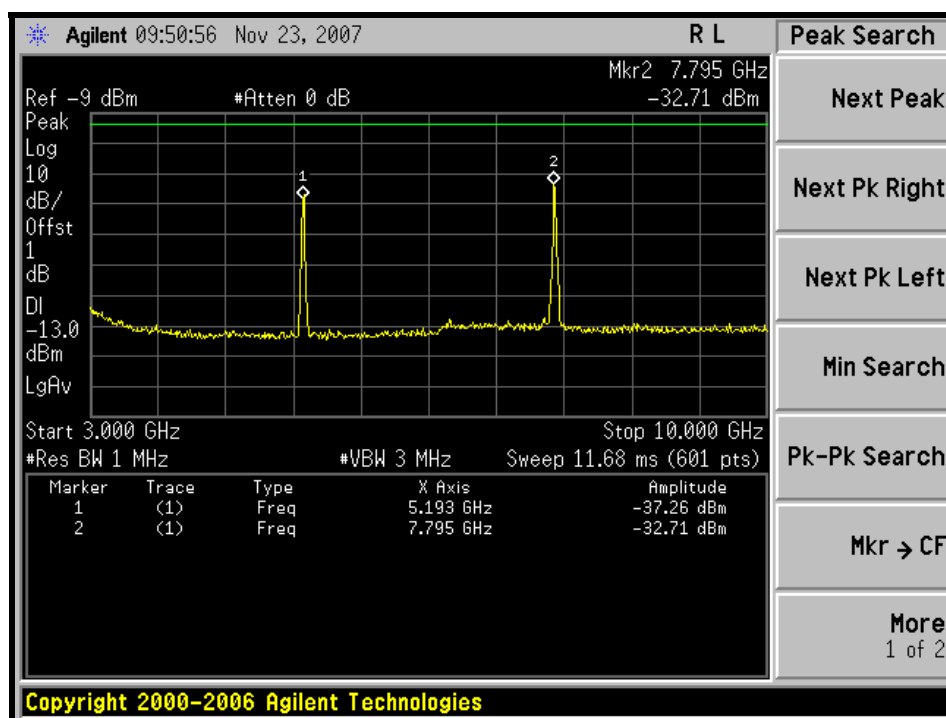
MIDDLE CHANNEL: 30MHz ~ 1GHz:



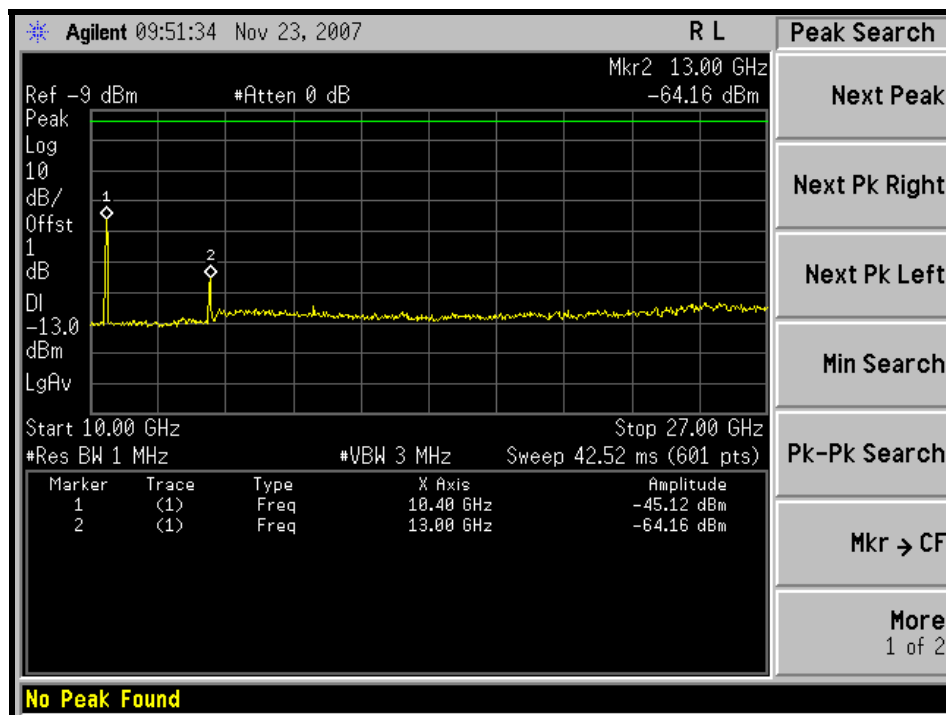
1GHz ~ 3GHz:



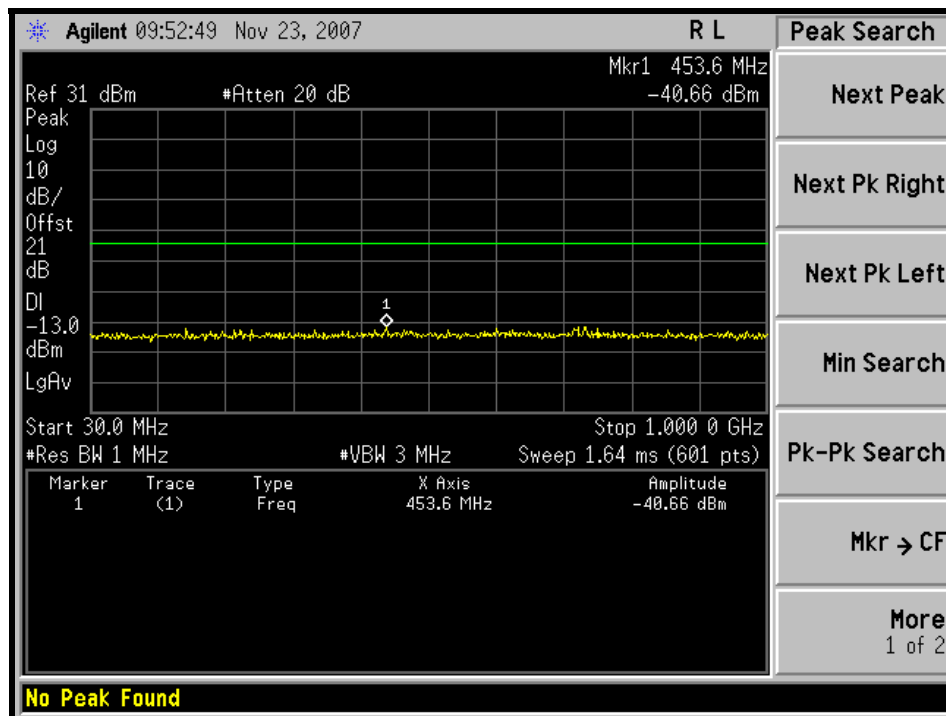
3GHz ~ 10GHz:



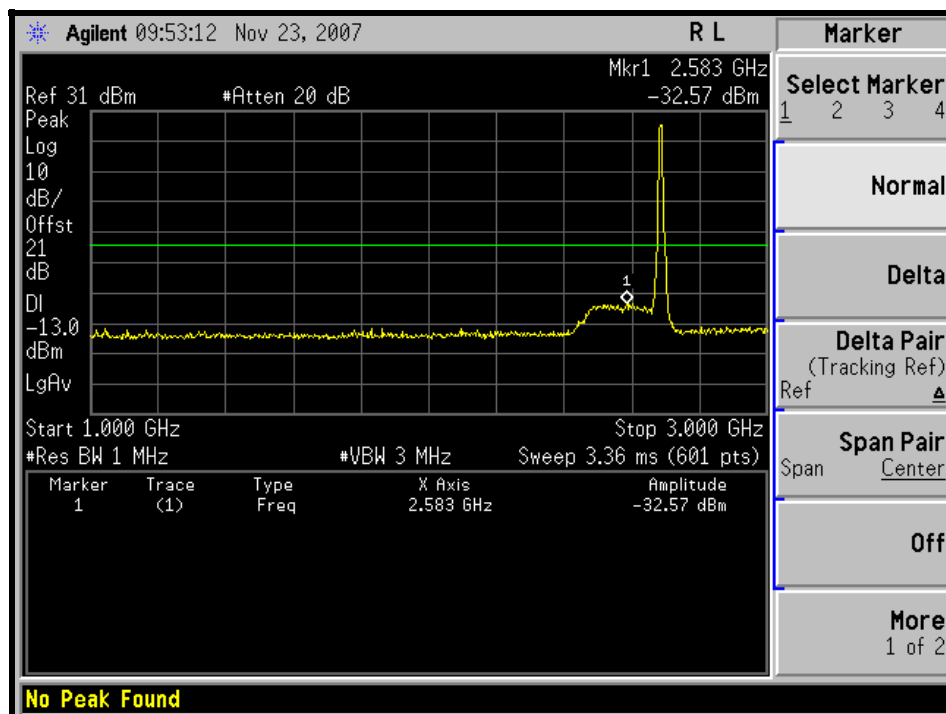
10GHz ~ 27GHz:



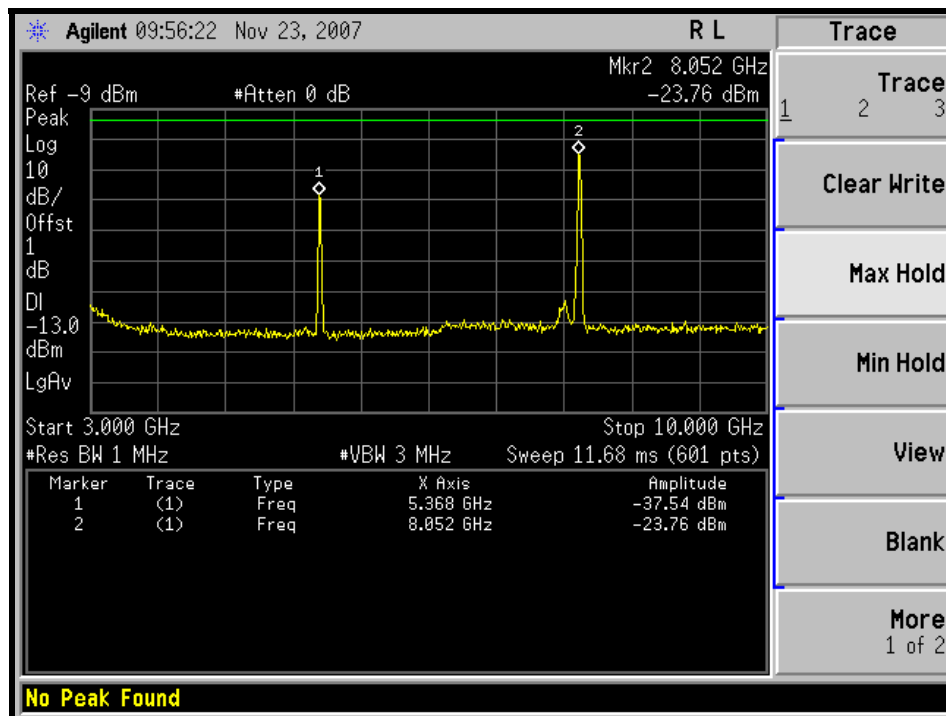
HIGH CHANNEL: 30MHz ~ 1GHz:



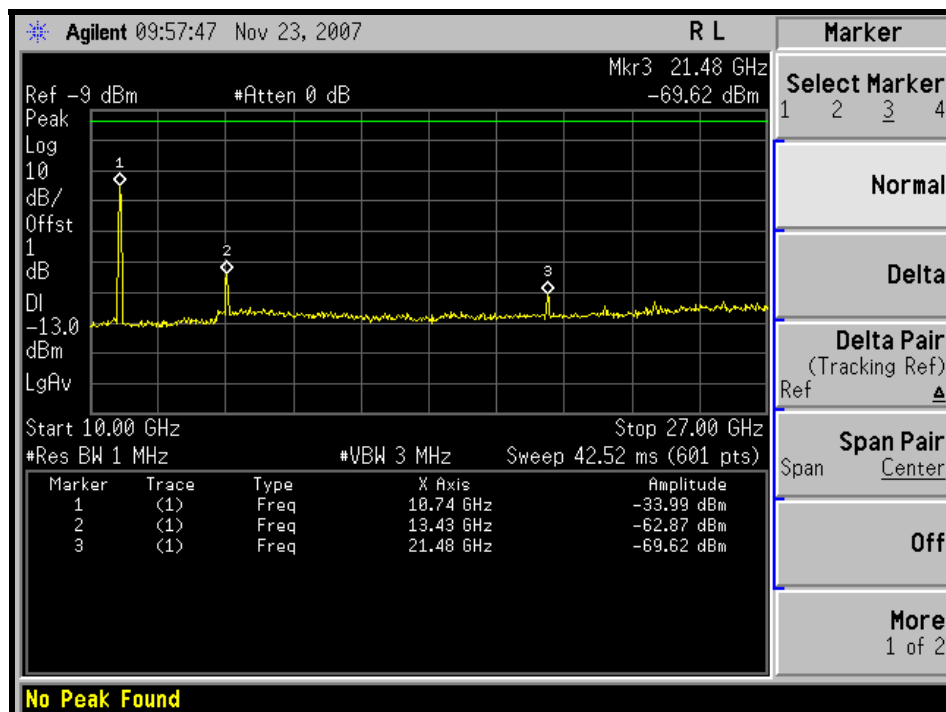
1GHz ~ 3GHz:



3GHz ~ 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. The limit of emission equal to -13 dBm.

4.6.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESI7	838496/016	Dec. 25, 2008
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Dec. 02, 2008
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Jan. 03, 2009
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-405	Dec. 17, 2008
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170242	Jan. 06, 2009
Preamplifier Agilent	8449B	3008A01910	Sep. 19, 2008
Preamplifier Agilent	8447D	2944A10634	Dec. 12, 2008
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	274397/4	Nov. 07, 2008
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	283401/4	Nov. 07, 2008
Software ADT.	ADT_Radiated_V7.6	NA	NA
Antenna Tower inn-co GmbH	MA 4000	010303	NA
Antenna Tower Controller inn-co GmbH	CO2000	019303	NA
Turn Table ADT.	TT100.	TT93021704	NA
Turn Table Controller ADT.	SC100.	SC93021704	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 test was performed in HwaYa Chamber 4.
3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The IC Site Registration No. is IC3789B-4.

4.6.3 TEST PROCEDURES

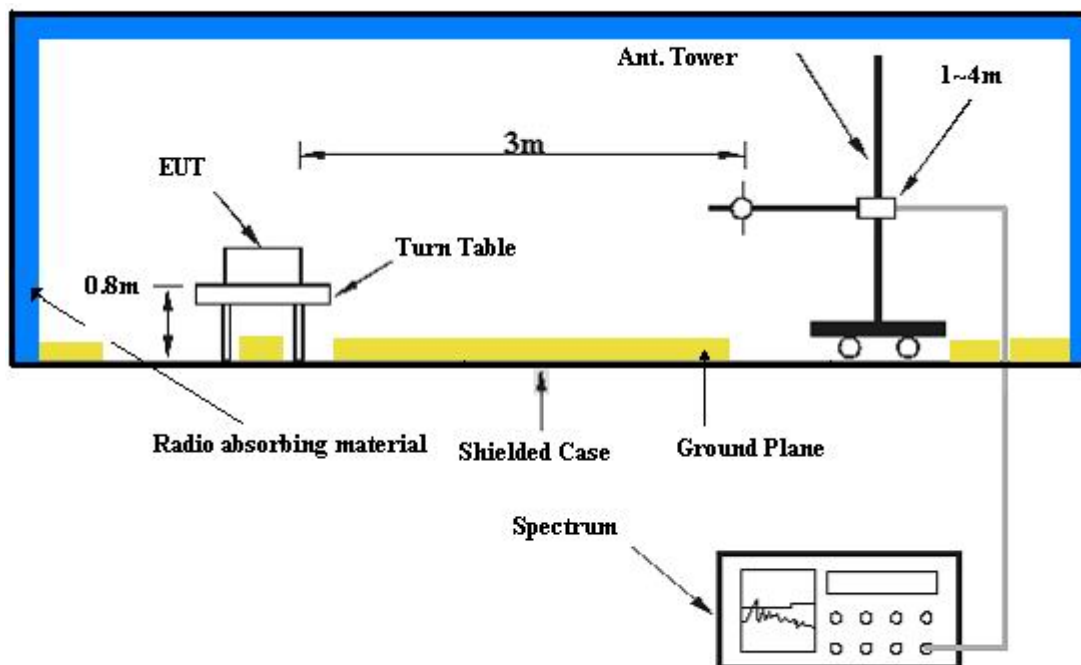
- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the receiving antenna, which was mounted on antenna tower and its position at 0.8 m above the ground.
- c. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading and recorded the value.
- d. The EUT is replaced by a Bi_Log antenna connected to a signal generator tuned to the frequency of emission.
- e. The signal generator level has to be adjusted to have the same emission nature.
- f. The radiated power can be calculated via the factor and antenna gain.
- g. Repeat step a ~ f for horizontal polarization.

NOTE: The resolution bandwidth of spectrum analyzer is 1MHz and the video bandwidth is 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

The EUT connected to the notebook. Use software to control the EUT channel and set the transmission power under 100% duty cycle.

4.6.7 TEST RESULTS

MODE	Low channel	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	24deg°C, 60%RH 991hPa
TEST MODE	A (ACON antenna)	TESTED BY	Brad Wu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	177.74	45.04	-13.00	-43.62	-7.40	-51.02
2	467.37	38.98	-13.00	-49.85	-7.50	-57.35
3	593.73	47.99	-13.00	-40.55	-7.60	-48.15
4	700.64	41.21	-13.00	-47.61	-7.60	-55.21
5	865.87	43.08	-13.00	-45.55	-7.70	-53.25
6	931.96	42.96	-13.00	-45.56	-7.80	-53.36

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	134.97	46.00	-13.00	-42.55	-7.40	-49.95
2	286.59	43.11	-13.00	-45.62	-7.50	-53.12
3	397.39	43.56	-13.00	-44.78	-7.50	-52.28
4	605.39	45.73	-13.00	-43.76	-7.60	-51.36
5	663.71	44.52	-13.00	-43.82	-7.70	-51.52
6	861.98	43.60	-13.00	-45.40	-7.70	-53.10

NOTE: Power Value (dBum) = S.G Power Value (dBm) + Correction Factor (dB).

MODE	Low channel	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	24deg°C, 60%RH 991hPa
TEST MODE	A (WHA YU antenna)	TESTED BY	Brad Wu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	47.49	55.51	-13.00	-33.28	-7.30	-40.58
2	168.02	52.74	-13.00	-36.24	-7.40	-43.64
3	288.54	44.06	-13.00	-44.85	-7.50	-52.35
4	455.71	42.79	-13.00	-44.07	-7.60	-51.67
5	599.56	42.91	-13.00	-43.54	-7.70	-51.24
6	881.42	42.69	-13.00	-43.42	-7.70	-51.12

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	55.27	48.92	-13.00	-40.05	-7.30	-47.35
2	134.97	56.12	-13.00	-32.73	-7.50	-40.23
3	267.15	48.40	-13.00	-40.47	-7.50	-47.97
4	665.65	46.00	-13.00	-40.76	-7.60	-48.36
5	700.64	45.87	-13.00	-40.42	-7.60	-48.02
6	881.42	45.21	-13.00	-40.95	-7.70	-48.65

NOTE: Power Value (dBum) = S.G Power Value (dBm) + Correction Factor (dB).

MODE	Low channel	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	24deg°C, 60%RH 991hPa
TEST MODE	B (ACON antenna)	TESTED BY	Brad Wu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	175.79	44.66	-13.00	-42.10	-7.30	-49.40
2	465.43	39.64	-13.00	-46.99	-7.40	-54.39
3	601.50	49.89	-13.00	-37.36	-7.50	-44.86
4	700.64	41.53	-13.00	-44.85	-7.60	-52.45
5	865.87	42.56	-13.00	-45.73	-7.70	-53.43
6	930.02	42.54	-13.00	-46.08	-7.80	-53.88

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	134.97	46.30	-13.00	-40.25	-7.40	-47.65
2	286.59	43.02	-13.00	-43.96	-7.50	-51.46
3	397.39	46.04	-13.00	-40.02	-7.50	-47.52
4	607.33	45.50	-13.00	-39.64	-7.60	-47.24
5	861.98	43.48	-13.00	-45.95	-7.70	-53.65
6	930.02	42.10	-13.00	-46.44	-7.50	-53.94

NOTE: Power Value (dBum) = S.G Power Value (dBm) + Correction Factor (dB).

MODE	Low channel	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	24deg°C, 60%RH 991hPa
TEST MODE	B (WHA YU antenna)	TESTED BY	Brad Wu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	49.44	53.29	-13.00	-35.58	-7.30	-42.88
2	168.02	50.26	-13.00	-36.76	-7.40	-44.16
3	249.66	42.87	-13.00	-43.54	-7.50	-51.04
4	479.04	37.97	-13.00	-48.46	-7.50	-55.96
5	665.65	40.36	-13.00	-45.93	-7.60	-53.53
6	700.64	40.46	-13.00	-46.00	-7.60	-53.60

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	55.27	47.52	-13.00	-42.22	-7.30	-49.52
2	134.97	56.92	-13.00	-29.61	-7.50	-37.11
3	269.10	47.22	-13.00	-39.21	-7.50	-46.71
4	409.06	41.07	-13.00	-45.42	-7.60	-53.02
5	700.64	44.95	-13.00	-41.85	-7.60	-49.45
6	801.72	39.35	-13.00	-46.81	-7.50	-54.31

NOTE: Power Value (dBum) = 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. The limit of emission equal to -13 dBm.

4.7.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESI7	838496/016	Dec. 25, 2008
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Dec. 02, 2008
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Jan. 03, 2009
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-405	Dec. 17, 2008
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170242	Jan. 06, 2009
Preamplifier Agilent	8449B	3008A01910	Sep. 19, 2008
Preamplifier Agilent	8447D	2944A10634	Dec. 12, 2008
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	274397/4	Nov. 07, 2008
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	283401/4	Nov. 07, 2008
Software ADT.	ADT_Radiated_V7.6	NA	NA
Antenna Tower inn-co GmbH	MA 4000	010303	NA
Antenna Tower Controller inn-co GmbH	CO2000	019303	NA
Turn Table ADT.	TT100.	TT93021704	NA
Turn Table Controller ADT.	SC100.	SC93021704	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 test was performed in HwaYa Chamber 4.
 3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
 4. The IC Site Registration No. is IC3789B-4.

4.7.3 TEST PROCEDURES

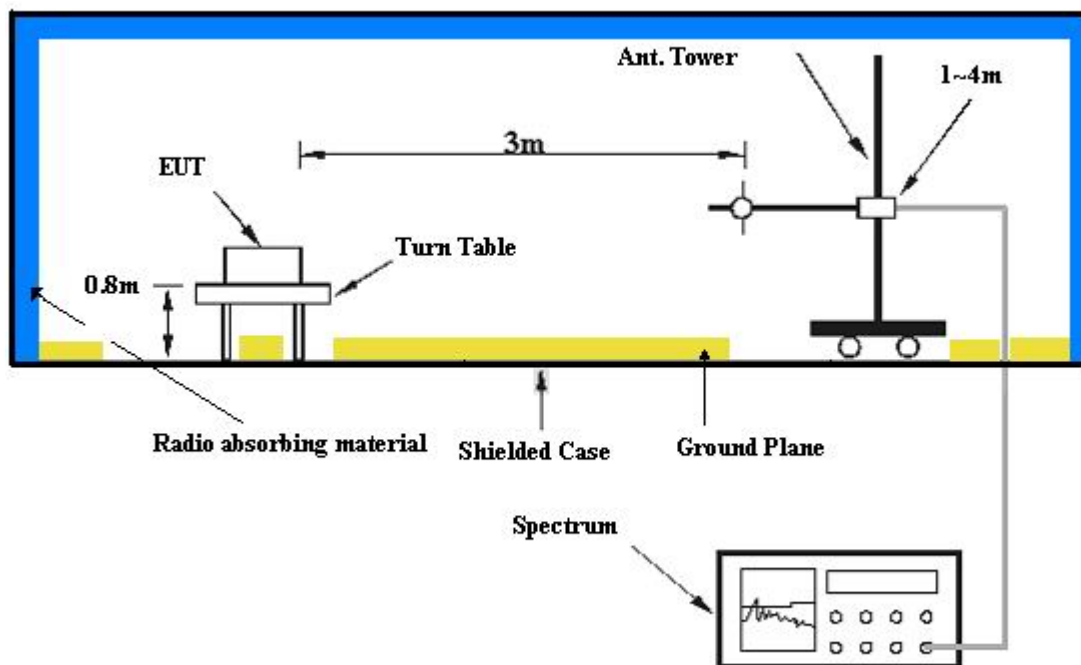
- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the receiving antenna, which was mounted on antenna tower and its position at 0.8 m above the ground.
- c. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading and recorded the value.
- d. The EUT is replaced by a horn antenna connected to a signal generator tuned to the frequency of emission.
- e. The signal generator level has to be adjusted to have the same emission nature.
- f. The radiated power can be calculated via the factor and antenna gain.
- g. Repeat step a ~ f for horizontal polarization.

NOTE: The resolution bandwidth of spectrum analyzer is 1MHz and the video bandwidth is 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

The EUT connected to the notebook. Use software to control the EUT channel and set the transmission power under 100% duty cycle.

4.7.7 TEST RESULTS

MODE	Low channel	FREQUENCY RANGE	Above 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	24deg°C, 60%RH, 991hPa
TEST MODE	A (ACON antenna)	TESTED BY	Brad Wu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	4997.00	67.02	-13.00	-36.85	9.49	-27.36
2	7495.50	79.07	-13.00	-22.55	7.53	-15.02
3	9994.00	58.62	-13.00	-42.89	7.46	-35.43

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	4997.00	74.90	-13.00	-27.94	9.49	-18.45
2	7495.50	74.11	-13.00	-27.71	7.53	-20.18
3	9994.00	58.68	-13.00	-42.31	7.46	-34.85

NOTE: 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	24deg°C, 60%RH, 991hPa
TEST MODE	A (ACON antenna)	TESTED BY	Brad Wu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	5200.00	59.63	-13.00	-44.05	9.60	-34.45
2	7800.00	77.65	-13.00	-23.82	7.34	-16.48
3	10400.00	60.48	-13.00	-40.95	7.12	-33.83

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	5200.00	66.94	-13.00	-37.25	9.60	-27.65
2	7800.00	75.87	-13.00	-24.80	7.34	-17.46
3	10400.00	60.93	-13.00	-39.57	7.12	-32.45

NOTE: Power Value (dBum) = S.G Power Value (dBm) + Correction Factor (dB).

MODE	High channel	FREQUENCY RANGE	Above 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	24deg°C, 60%RH, 991hPa
TEST MODE	A (ACON antenna)	TESTED BY	Brad Wu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	5375.00	59.64	-13.00	-46.49	9.69	-36.80
2	8062.50	75.83	-13.00	-28.10	7.21	-20.89
3	10750.00	64.34	-13.00	-38.46	6.86	-31.60

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	5375.00	65.00	-13.00	-40.90	9.69	-31.21
2	8062.50	74.13	-13.00	-29.66	7.21	-22.45
3	10750.00	66.98	-13.00	-36.30	6.86	-29.44

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

MODE	Low channel	FREQUENCY RANGE	Above 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	24deg°C, 60%RH, 991hPa
TEST MODE	A (WHA YU antenna)	TESTED BY	Brad Wu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	4997.00	69.40	-13.00	-33.85	9.49	-24.36
2	7495.50	75.07	-13.00	-25.55	7.53	-18.02
3	9994.00	59.02	-13.00	-42.89	7.46	-35.43

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	4997.00	75.85	-13.00	-28.74	9.49	-19.25
2	7495.50	65.88	-13.00	-35.57	7.53	-28.04
3	9994.00	57.31	-13.00	-44.17	7.46	-36.71

NOTE: Power Value (dBum) = S.G Power Value (dBm) + Correction Factor (dB).

MODE	Middle channel	FREQUENCY RANGE	Above 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	24deg°C, 60%RH, 991hPa
TEST MODE	A (WHA YU antenna)	TESTED BY	Brad Wu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	5200.00	60.16	-13.00	-44.05	9.60	-34.45
2	7800.00	77.33	-13.00	-23.82	7.34	-16.48
3	10400.00	59.14	-13.00	-40.95	7.12	-33.83

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	5200.00	64.80	-13.00	-38.26	9.60	-28.66
2	7800.00	73.33	-13.00	-27.87	7.34	-20.53
3	10400.00	58.75	-13.00	-42.57	7.12	-35.45

NOTE: Power Value (dBum) = S.G Power Value (dBm) + Correction Factor (dB).

MODE	High channel	FREQUENCY RANGE	Above 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	24deg°C, 60%RH, 991hPa
TEST MODE	A (WHA YU antenna)	TESTED BY	Brad Wu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	5375.00	65.10	-13.00	-41.15	9.69	-31.46
2	8062.50	78.97	-13.00	-24.45	7.21	-17.24
3	10750.00	65.69	-13.00	-38.34	6.86	-31.48

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	5375.00	62.47	-13.00	-43.73	9.69	-34.04
2	8062.50	72.96	-13.00	-29.89	7.21	-22.68
3	10750.00	61.34	-13.00	-42.31	6.86	-35.45

NOTE: Power Value (dBum) = S.G Power Value (dBm) + Correction Factor (dB).

MODE	Low channel	FREQUENCY RANGE	Above 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	24deg°C, 60%RH, 991hPa
TEST MODE	B (ACON antenna)	TESTED BY	Brad Wu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	5002.00	62.60	-13.00	-43.12	9.49	-33.63
2	7503.00	73.96	-13.00	-29.88	7.53	-22.35
3	10004.00	59.44	-13.00	-44.37	7.46	-36.91

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	5002.00	72.32	-13.00	-33.94	9.49	-24.45
2	7503.00	71.50	-13.00	-33.06	7.53	-25.53
3	10004.00	60.08	-13.00	-43.70	7.46	-36.24

NOTE: Power Value (dBum) = S.G Power Value (dBm) + Correction Factor (dB).

MODE	Middle channel	FREQUENCY RANGE	Above 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	24deg°C, 60%RH, 991hPa
TEST MODE	B (ACON antenna)	TESTED BY	Brad Wu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	5200.00	57.03	-13.00	-48.55	9.60	-38.95
2	7800.00	73.32	-13.00	-31.02	7.34	-23.68
3	10400.00	60.13	-13.00	-43.95	7.12	-36.83

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	5200.00	64.67	-13.00	-41.24	9.60	-31.64
2	7800.00	70.74	-13.00	-32.89	7.34	-25.55
3	10400.00	61.02	-13.00	-42.48	7.12	-35.36

NOTE: Power Value (dBum) = S.G Power Value (dBm) + Correction Factor (dB).

MODE	High channel	FREQUENCY RANGE	Above 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	24deg°C, 60%RH, 991hPa
TEST MODE	B (ACON antenna)	TESTED BY	Brad Wu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	5370.00	53.36	-13.00	-49.35	9.39	-39.96
2	8055.00	71.51	-13.00	-29.10	7.22	-21.88
3	10740.00	61.22	-13.00	-39.48	6.86	-32.62

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	5370.00	65.50	-13.00	-39.08	9.39	-29.69
2	7515.00	70.27	-13.00	-31.06	7.22	-23.84
3	10740.00	62.46	-13.00	-38.47	6.86	-31.61

NOTE: Power Value (dBum) = S.G Power Value (dBm) + Correction Factor (dB).

MODE	Low channel	FREQUENCY RANGE	Above 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	24deg°C, 60%RH, 991hPa
TEST MODE	B (WHA YU antenna)	TESTED BY	Brad Wu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	5002.00	61.52	-13.00	-44.27	9.49	-34.78
2	7503.00	69.71	-13.00	-34.14	7.53	-26.61
3	10004.00	58.02	-13.00	-46.79	7.46	-39.33

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	5002.00	68.29	-13.00	-38.16	9.49	-28.67
2	7503.00	67.73	-13.00	-37.84	7.53	-30.31
3	10004.00	58.94	-13.00	-45.70	7.46	-38.24

NOTE: Power Value (dBum) = S.G Power Value (dBm) + Correction Factor (dB).

MODE	Middle channel	FREQUENCY RANGE	Above 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	24deg°C, 60%RH, 991hPa
TEST MODE	B (WHA YU antenna)	TESTED BY	Brad Wu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	5200.00	51.75	-13.00	-51.46	9.60	-41.86
2	7800.00	71.97	-13.00	-29.05	7.34	-21.71
3	10400.00	59.59	-13.00	-41.08	7.12	-33.96

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	5200.00	57.23	-13.00	-45.28	9.60	-35.68
2	7800.00	68.62	-13.00	-32.78	7.34	-25.44
3	10400.00	60.00	-13.00	-42.03	7.12	-34.91

NOTE: Power Value (dBum) = S.G Power Value (dBm) + Correction Factor (dB).

MODE	High channel	FREQUENCY RANGE	Above 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	24deg°C, 60%RH, 991hPa
TEST MODE	B (WHA YU antenna)	TESTED BY	Brad Wu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	5370.00	54.46	-13.00	-52.04	9.39	-42.65
2	8055.00	72.28	-13.00	-31.93	7.22	-24.71
3	10740.00	62.71	-13.00	-40.92	6.86	-34.06

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3m						
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBm)	S.G POWER VALUE (dBm)	CORRECTION FACTOR (dB)	POWER VALUE (dBm)
1	5370.00	54.02	-13.00	-51.35	9.39	-41.96
2	7515.00	66.84	-13.00	-36.70	7.22	-29.48
3	10740.00	60.49	-13.00	-42.72	6.86	-35.86

NOTE: Power Value (dBum) = 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, ADT Corp., were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

USA	FCC, UL, A2LA
GERMANY	TUV Rheinland
JAPAN	VCCI
NORWAY	NEMKO
CANADA	INDUSTRY CANADA , CSA
R.O.C.	TAF, BSMI, NCC
NETHERLANDS	Telefication
SINGAPORE	GOST-ASIA (MOU)
RUSSIA	CERTIS (MOU)

Copies of accreditation 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: 886-2-26051924

Hsin Chu EMC/RF Lab:

Tel: 886-3-5935343

Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety/Telecom Lab: Web Site: www.adt.com.tw

Tel: 886-3-3183232

Fax: 886-3-3185050

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