Test Report
for
FCC Part 15 Subpart B & C & E

of

Product Name

Notebook Personal Computer

(with Intel PRO/Wireless 2915ABG Network Connection inside)

Model

IX600

(Brand: Itronix)

Applied by:

Itronix Corporation
801 South Stevens Street
Spokane Washington, 99204
U. S. A.

Test Performed by:

International Standards Laboratory

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Lung-Tan Hsiang, Tao Yuan County 325
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1. General

1.1 Certification of Accuracy of Test Data

Standards:	CFR 47 Part 15 Subpart B Class B CFR 47 Part 15 Subpart C (Section 15.247) CFR 47 Part 15 Subpart E (Section 15.407)
Test Procedure:	ANSI C63.4:2003
Equipment Tested:	Notebook Personal Computer
Model:	IX600
Applied by:	Itronix Corporation
Sample received Date:	2005/04/18
Final test Date :	2005/04/11-2005/04/29
Test Result	PASS
Test Site:	Chamber 02, Conduction 02
Temperature	Refer to each site test data
Humidity:	Refer to each site test data
Test Engineer:	Mailes Hsieh

All the tests in this report have been performed and recorded in accordance with the standards described above and performed by an independent electromagnetic compatibility consultant, International Standards Laboratory.

The test results contained in this report accurately represent the measurements of the characteristics and the energy generated by sample equipment under test at the time of the test. The sample equipment tested as described in this report is in compliance with the limits of above standards.

Approve & Signature

Eddy Hsiung/Director

Test results given in this report apply only to the specific sample(s) tested under stated test conditions. This report shall not be reproduced other than in full without the explicit written consent of ISL. This report totally contains 103 pages, including 1 cover page , 3 contents page, and 99 pages for the test description. This report must not be use to claim product endorsement by NVLAP or any agency of the U.S. Government.

This test data shown below is traceable to NIST or national or international standard. International Standards Laboratory certifies that no party to this application has been denied the FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. 853(a).

2. Test Results Summary

The 802.11b functions of EUT has been tested according to the FCC regulations listed below:

Tested Standards: 47 CFR Part 15 Subpart C			
Standard Section	Test Type	Result	Remarks
15.207	AC Power Line Emissions	Pass	
15.247(a)(2)	Spectrum Bandwidth Of DSSS device	Pass	
15.247(b)	Max. Peak Output Power	Pass	
15.247(c)	Radiated Emissions 30MHz – 25 GHz	Pass	
15.247 (c)	Band Edge Measurement	Pass	
15.247(b)(4)	Radiation Exposure	Pass	MPE report attached
15.247 (d)	Power Spectral Density	Pass	

The 802.11g functions of EUT has been tested according to the FCC regulations listed below:

Tested Standards: 47 CFR Part 15 Subpart C			
Standard Section	Test Type	Result	Remarks
15.207	AC Power Line Emissions	Pass	
15.247(a)(2)	Spectrum Bandwidth Of DSSS device	Pass	
15.247(b)	Max. Peak Output Power	Pass	
15.247(c)	Radiated Emissions 30MHz – 25 GHz	Pass	
15.247 (c)	Band Edge Measurement	Pass	
15.247(b)(4)	Radiation Exposure	Pass	MPE report attached
15.247 (d)	Power Spectral Density	Pass	

The 802.11a functions of EUT has been tested to the FCC regulations listed below:

Tested Standards: 47 CFR Part 15 Subpart E			
Standard Section	Test Type	Result	Remarks
15.407 (a)(1)(2)(3)	Peak Transmit Power	Pass	
15.407 (a)(1)(2)(3)	Peak Power Spectral Density	Pass	
15.407 (a)(6)	Peak Power Excursion	Pass	
15.407 (b)(5)	AC Power Line Emissions	Pass	
15.407 (b)(5)	Radiated Emissions 30MHz – 40 GHz	Pass	
15.407(f)	Radiation exposure	Pass	MPE report attached
15.407 (g)	Frequency Stability	Pass	

3. Description of Equipment Under Test (EUT)

EUT

Description:	Notebook Personal Computer (with Intel PRO/Wireless 2915ABG Network Connection inside)
Condition:	Pre-Production
Model:	IX600
FCC ID:	KBCIX600-IWL
Serial Number:	N/A
Brand:	Itronix
Wireless LAN Module:	Intel, Model: WM3B2915ABG
Frequency Range 802.11a:	5150~5350 MHz, 5725~5825 MHz
Frequency Range 802.11b/g:	2400 - 2483.5 MHz
Support channel:	
802.11a Normal mode	12 Channels
802.11b	11 Channels
802.11g	11 Channels
Modulation Skill:	
802.11a Normal mode	OFDM (6 Mbps – 54 Mbps)
802.11b	DBPSK(1Mbps), DQPSK(2Mbps), CCK(5.5/11Mbps)
802.11g	OFDM (6M - 54Mbps)
Antennas Type:	
Main antenna	PIFA(P/N: 25.90215.001), made by Wistron NeWeb Corp.
Aux antenna	PIFA(P/N: 25.90216.001), made by Wistron NeWeb Corp.
Antenna Connected:	Connected to RF connector on the PCB of the 802.11a/b/g WLAN Adapter. The user is not possible to change the antenna without disassembling the notebook computer.
Antenna peak Gain:	
Main antenna	2.41 dBi (11b/g), 2.26 dBi (11a)
Aux antenna	1.53 dBi (11b/g), 0.59 dBi (11a)
Power Type of LAN module:	3.3V DC from Notebook PC

The channel and the operation frequency of 802.11b and 802.11g is listed below:

Channel	Frequency(MHz)	Channel	Frequency(MHz)
01	2412	07	2442
02	2417	08	2447
03	2422	09	2452
04	2427	10	2457
05	2432	11	2462
06	2437		

The channel and the operation frequency of 802.11a Normal Mode is listed below:

Channel	Frequency(MHz)	Channel	Frequency(MHz)
01	5180	07	5300
02	5200	08	5320
03	5220	09	5745
04	5240	10	5765
05	5260	11	5785
06	5280	12	5805

Power Supply Type:	Auto Switching AC Adapter Delta (Model: SADP-65KB D) or Liteon(Model: PA-1700-02)
CPU Type:	Pentium M Dothan 1.8GHz
Hard Disk Device:	HGST (Model: HTS424040M9AT00)
DDR:	512MB Hynix (Model: HYMP564S64P6-C4) or Micron (Model: MT8HTF6464HDY-53EA3) 1024 MB Infineon (Model: HYS64T128021HDL-3.7-A)
DVD-Multi:	TEAC (Model: DW-224E-B83)
DVD-RAM	TEAC(Model: DV-W28EA)
MDC modem:	Liteon (Model: MDC-003#/A1A)
DC-In:	one
VGA Port:	one
USB2.0 Connector:	two
LAN Connector:	one
Modem Port:	one
PCIMCIA Connector:	one
Docking Connector:	one
Line in:	one
Line out:	one

RS-232 Port:	one
Smart Connector :	one
Express Connector :	one
Battery:	Simplo 6 cell Simplo 9 cell
LCD:	Enhanced 14.1” XGA TFT (Model: LTD121EC5S)
Inverter:	Sumida (Model : IV12087/T)
Maximum display Resolution:	1024X786 Non-interlaced

EMI Noise Source:
Crystal: 14.318M (X1),32.768M (X2),32.768M(X3), 24.576M(X4),25M(X5),24.576M(X6)
Clock Generator: U44

EMI Solution:
1.Heatsink add two gaskets
2.HDD DOOR add seven gaskets

4. TEST RESULTS (802.11a)

4.1 Maximum Peak Output Power [Section 15.407 (a)(1)(2)(3)]

4.1.1 Test Procedure

The transmitter output of EUT was connected to the peak power analyzer.

4.1.2 Test Setup

Frequency Band	Limit
5.15 – 5.25 GHz	The lesser of 50mW (17dBm) or 4dBm+10logB
5.25 – 5.35GHz	The lesser of 250mW (24dBm) or 11dBm+10logB
5.725-5.825GHz	The lesser of 1W (30dBm) or 17dBm+10logB

Note: B is the 26dB emission bandwith in MHz

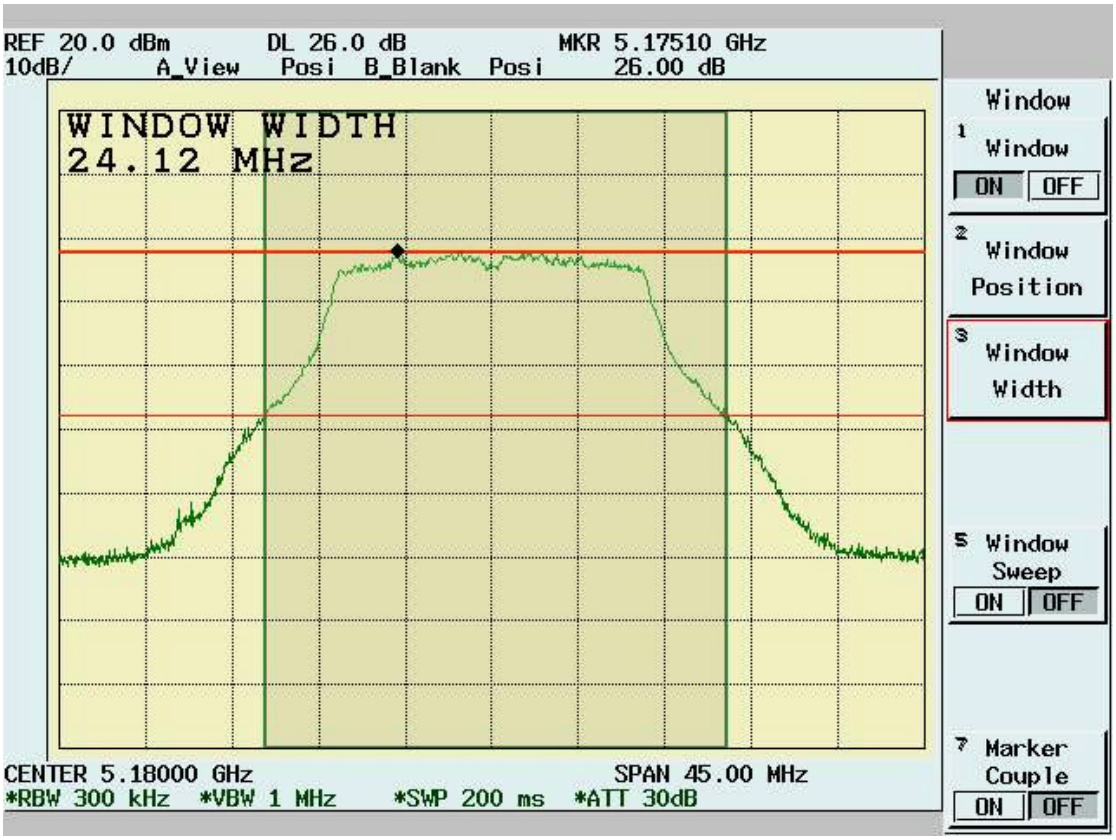
4.1.3 Test Data: (Normal Mode)

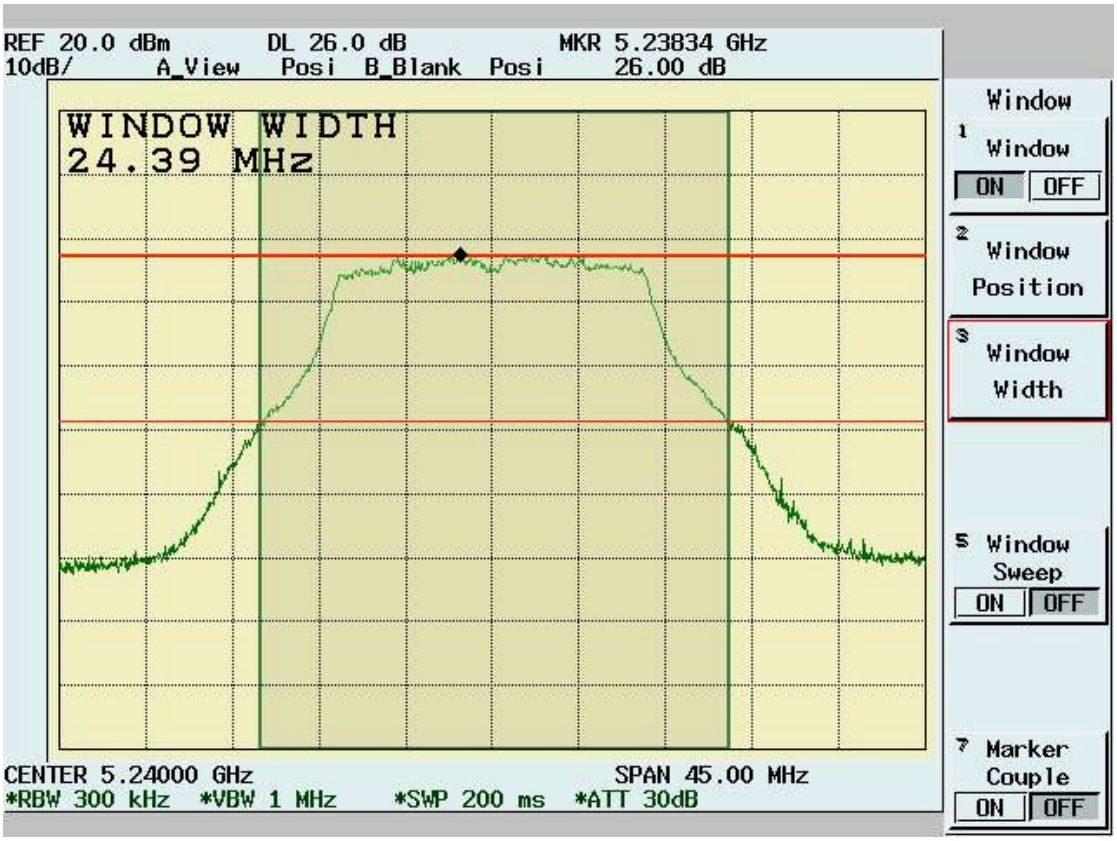
Maximum Peak Output Power

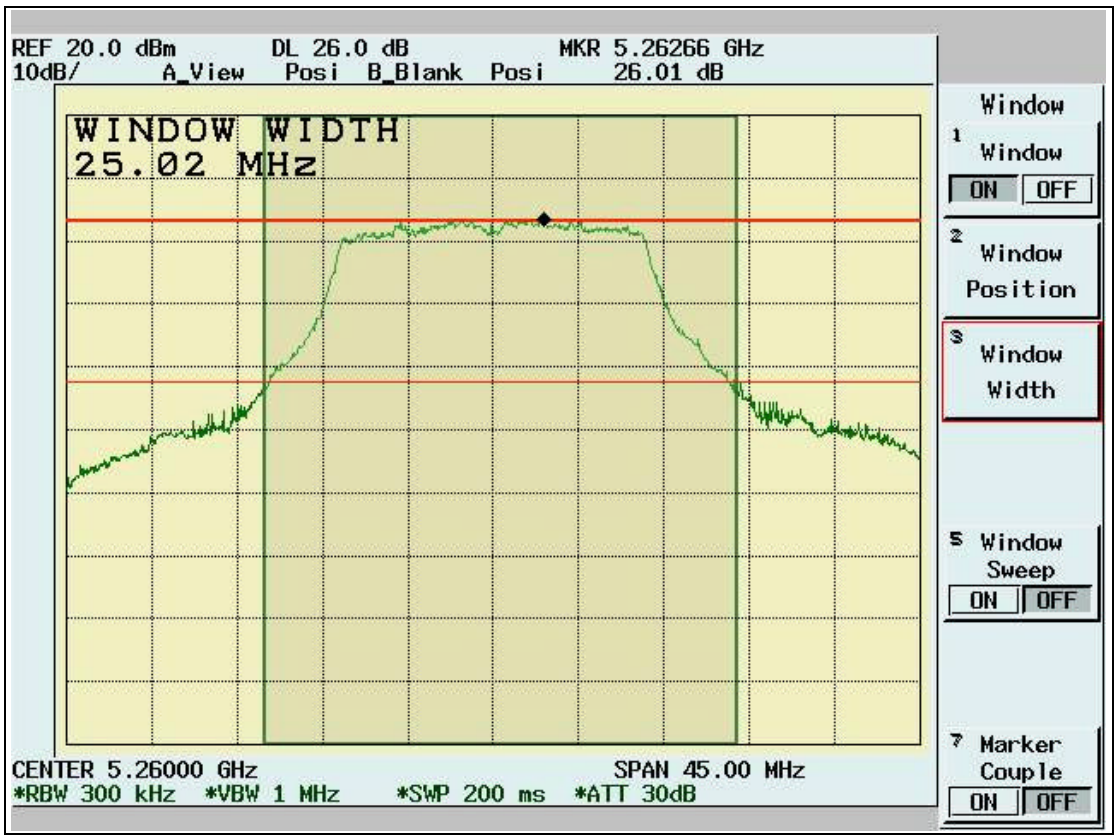
Temperature (°C):24

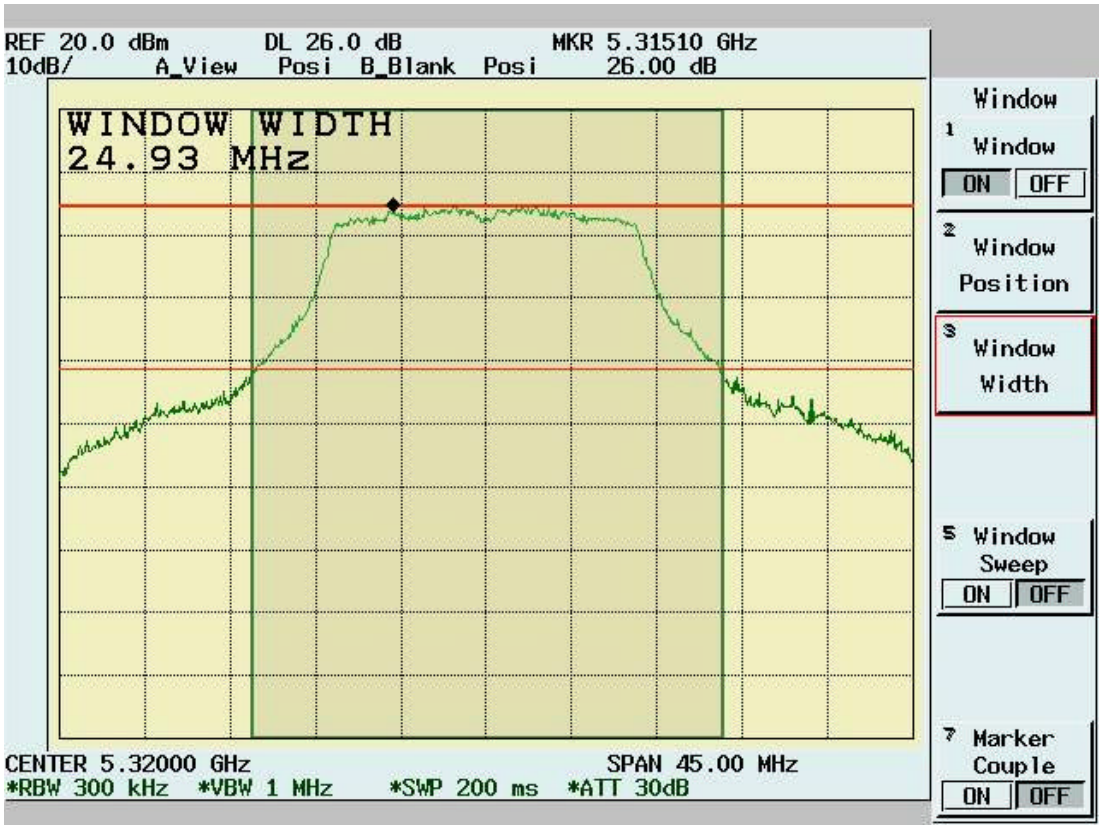
Test Engineer:Mailes Hsieh Humidity (%):54

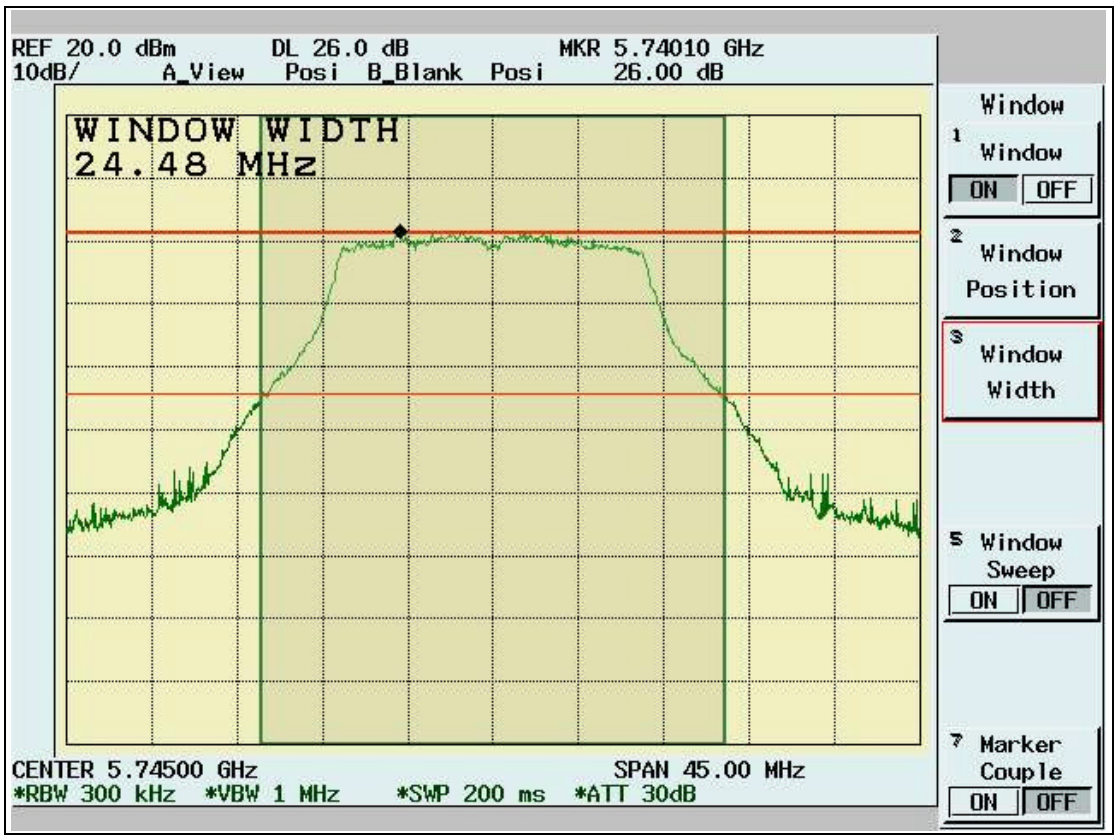
Chennel	Frequency (Mhz)	Peak Power Output (dBm)	26 dBc BW/Limit Mhz/dBm	The lesser Limit (dBm)	Pass/Fail
1	**5180**	12.72	24.12/ 17.82	17	Pass
4	**5240**	12.31	24.39/ 17.87	17	Pass
5	**5260**	18.38	25.02/ 24.98	24	Pass
8	**5320**	20.03	24.93/ 24.97	24	Pass
9	**5745**	17.34	24.48/ 30.89	30	Pass
12	**5805**	17.83	24.21/ 30.84	30	Pass

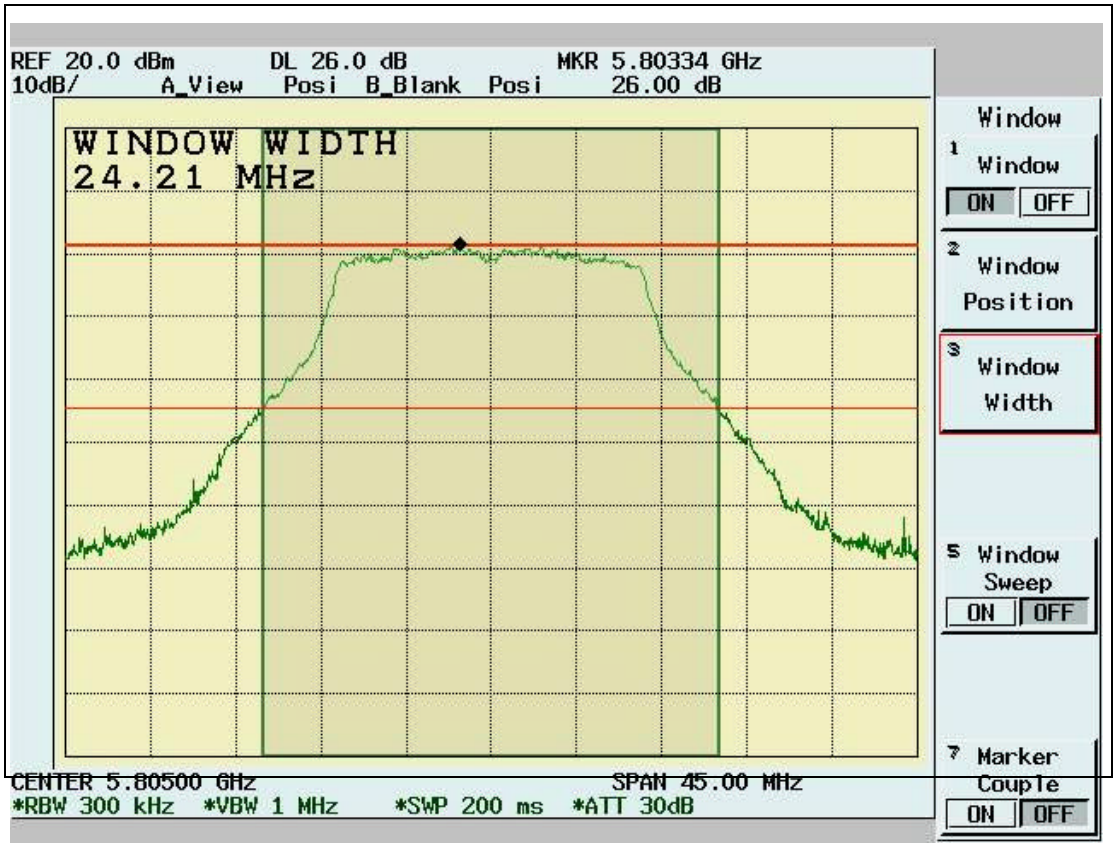

REF 20.0 dBm
DL 26.0 dB
MKR 5.17510 GHz
10dB/
A_View
Posi
B_Blank
Posi
26.00 dB
WINDOW WIDTH
24.12 MHz
Window
1 Window
ON OFF
2 Window Position
3 Window Width
5 Window Sweep
ON OFF
7 Marker Couple
ON OFF
CENTER 5.18000 GHz
SPAN 45.00 MHz
*RBW 300 kHz
*VBW 1 MHz
*SWP 200 ms
*ATT 30dB


REF 20.0 dBm
DL 26.0 dB
MKR 5.23834 GHz
10dB/
A_View
Posi
B_Blank
Posi
26.00 dB
WINDOW WIDTH
24.39 MHz
Window
1 Window
ON OFF
2 Window Position
3 Window Width
5 Window Sweep
ON OFF
7 Marker Couple
ON OFF
CENTER 5.24000 GHz
SPAN 45.00 MHz
*RBW 300 kHz
*VBW 1 MHz
*SWP 200 ms
*ATT 30dB


REF 20.0 dBm
DL 26.0 dB
MKR 5.26266 GHz
10dB/
A_View
Posi
B_Blank
Posi
26.01 dB
WINDOW WIDTH
25.02 MHz
Window
1 Window
ON OFF
2 Window Position
3 Window Width
5 Window Sweep
ON OFF
7 Marker Couple
ON OFF
CENTER 5.26000 GHz
SPAN 45.00 MHz
*RBW 300 kHz
*VBW 1 MHz
*SWP 200 ms
*ATT 30dB


REF 20.0 dBm
DL 26.0 dB
MKR 5.31510 GHz
10dB/
A_View
Posi
B_Blank
Posi
26.00 dB
WINDOW WIDTH
24.93 MHz
Window
1 Window
ON OFF
2 Window Position
3 Window Width
5 Window Sweep
ON OFF
7 Marker Couple
ON OFF
CENTER 5.32000 GHz
SPAN 45.00 MHz
*RBW 300 kHz
*VBW 1 MHz
*SWP 200 ms
*ATT 30dB


REF 20.0 dBm
DL 26.0 dB
MKR 5.74010 GHz
10dB/
A_View
Posi
B_Blank
Posi
26.00 dB
WINDOW WIDTH
24.48 MHz
Window
1 Window
ON OFF
2 Window Position
3 Window Width
5 Window Sweep
ON OFF
7 Marker Couple
ON OFF
CENTER 5.74500 GHz
SPAN 45.00 MHz
*RBW 300 kHz
*VBW 1 MHz
*SWP 200 ms
*ATT 30dB


REF 20.0 dBm
DL 26.0 dB
MKR 5.80334 GHz
10dB/
A_View
Posi
B_Blank
Posi
26.00 dB
WINDOW WIDTH
24.21 MHz
Window
1 Window
ON OFF
2 Window Position
3 Window Width
5 Window Sweep
ON OFF
7 Marker Couple
ON OFF
CENTER 5.80500 GHz
SPAN 45.00 MHz
*RBW 300 kHz
*VBW 1 MHz
*SWP 200 ms
*ATT 30dB

4.2 Peak Power Spectral Density [Section 15.407(a)(1)(2)(3)]

4.2.1 Test Procedure

1. The Transmitter output of EUT was connected to the spectrum analyzer.
   Equipment mode: Spectrum analyzer
   Detector function: Peak mode
   SPAN: 30MHz or 50MHz
   RBW: 1MHz
   VBW: 3MHz
   Sweep time: 30 or 50 sec.
   Center frequency: fundamental frequency tested
2. Peak search was read to the peak power after maximum hold function is completed.

4.2.2 Test Setup

4.2.3 Test Data: (Normal Mode)

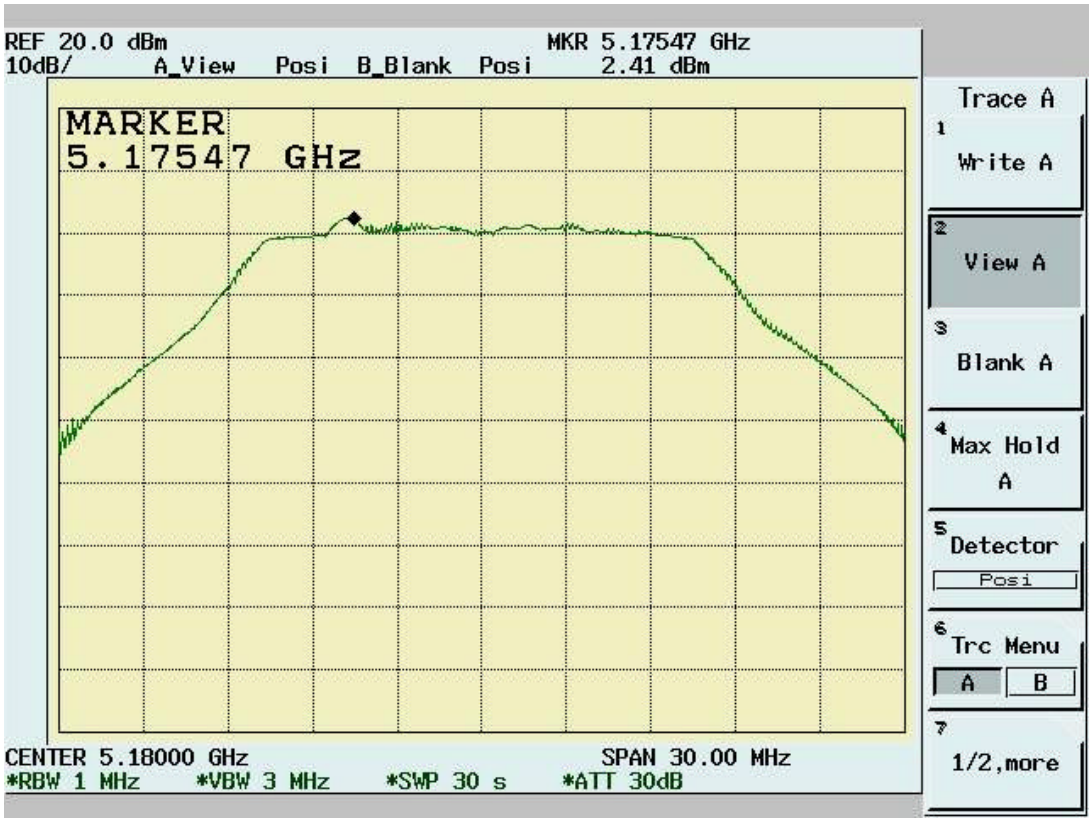
Maximum Peak Output Power Density

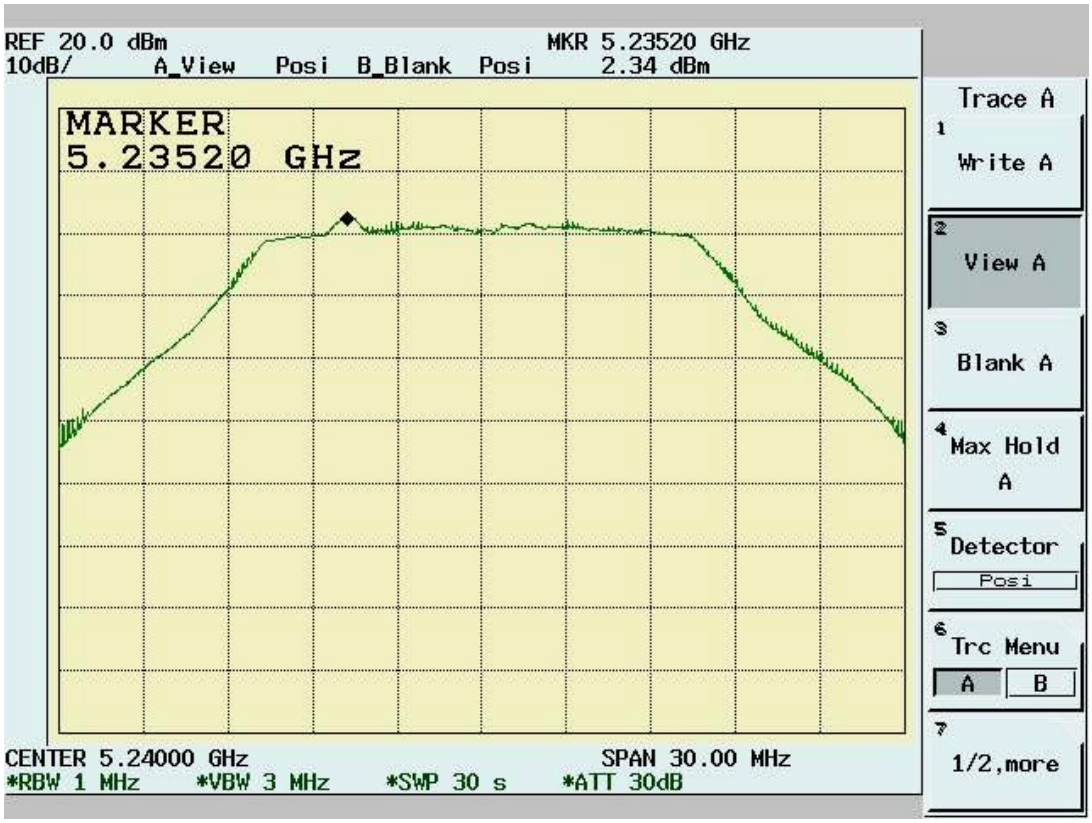
Temperature (℃):24

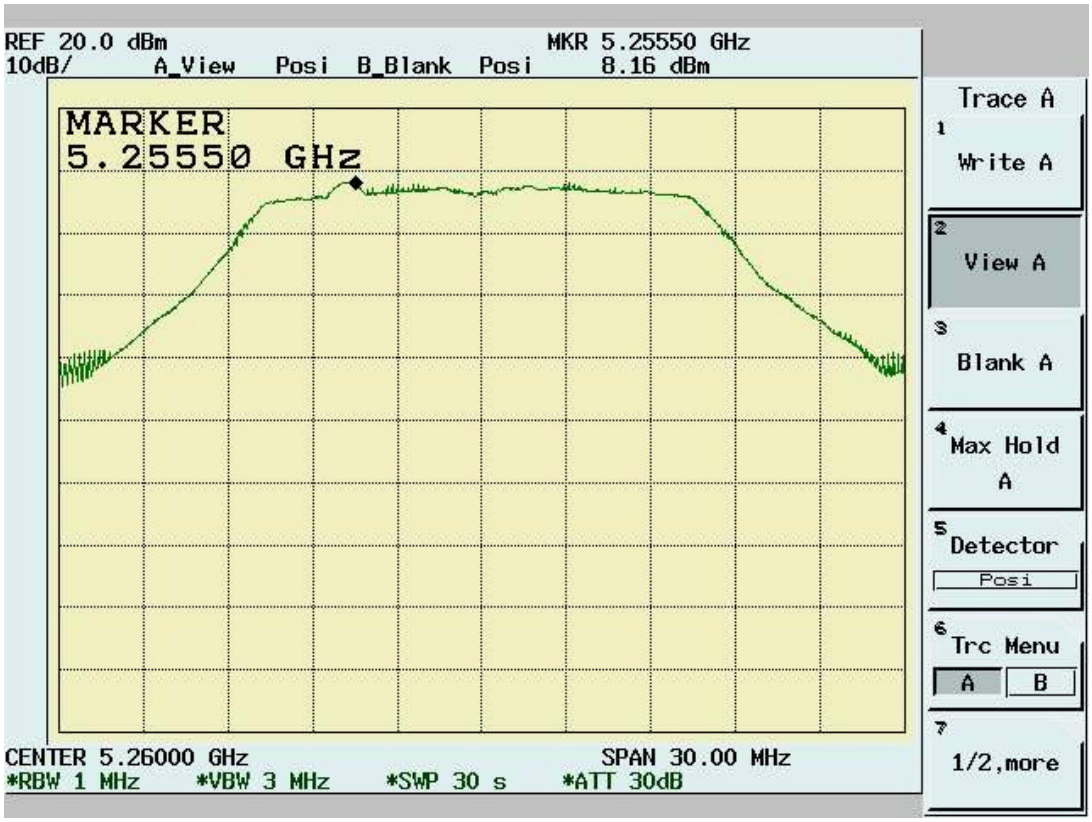
Test Engineer:Mailes Hsieh

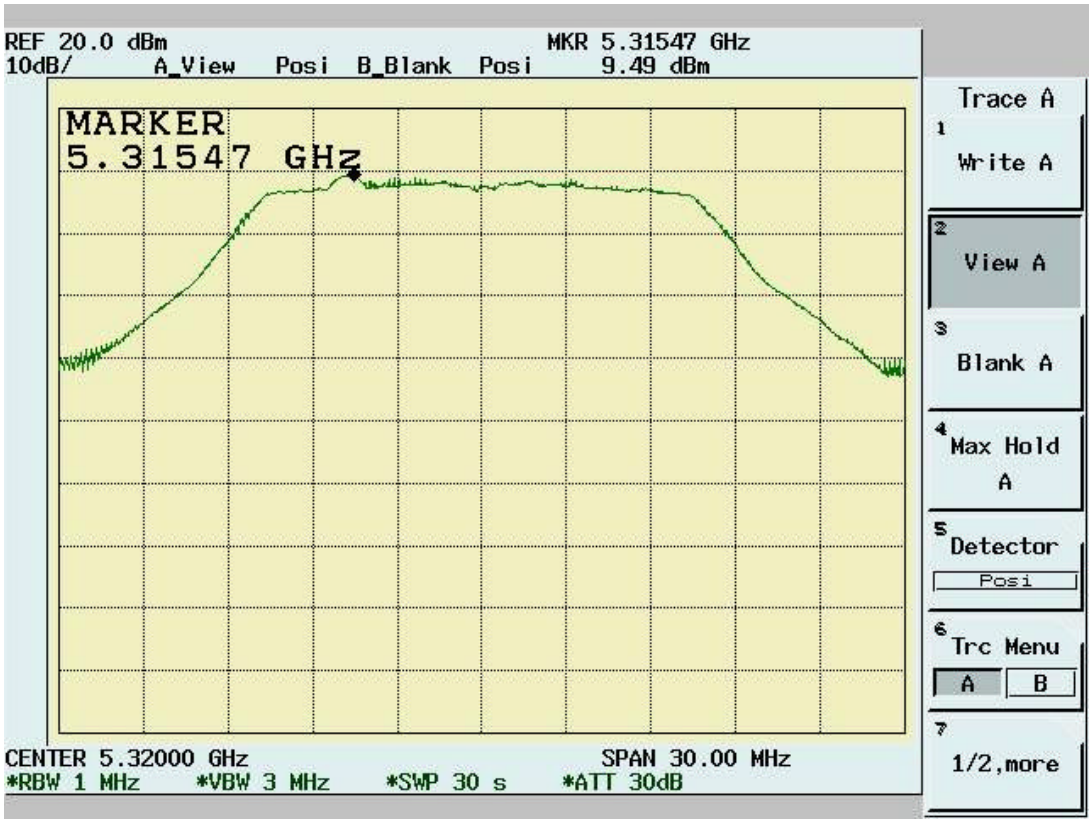
Humidity (%):54

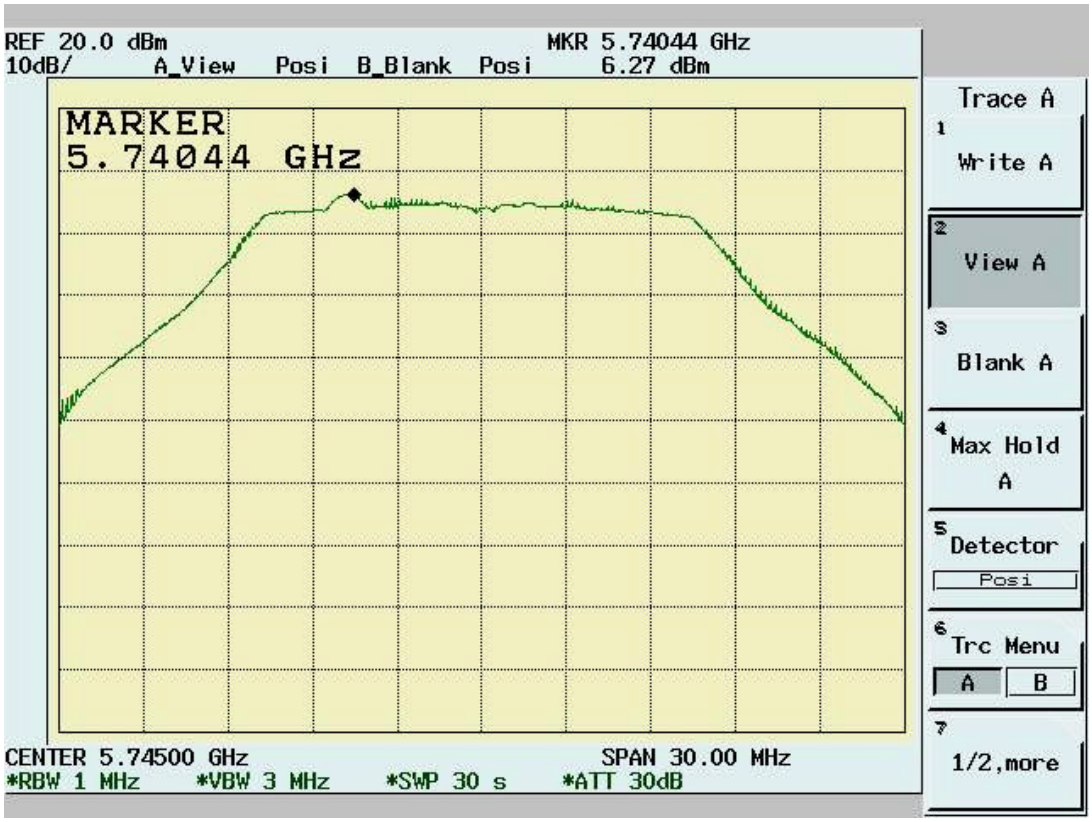
Channel	Frequency (Mhz)	Spectrum Reading (dBm)	Cable Loss(dB)	Peak Power Output dBm/MHz)	Limit (dBm/Mhz)	Pass/Fail
1	**5180**	2.41	1.20	3.61	4	Pass
4	**5240**	2.34	1.20	3.54	4	Pass
5	**5260**	8.16	1.20	9.36	11	Pass
8	**5320**	9.49	1.20	10.69	11	Pass
9	**5745**	6.27	1.20	7.47	17	Pass
12	**5805**	6.51	1.20	7.71	17	Pass

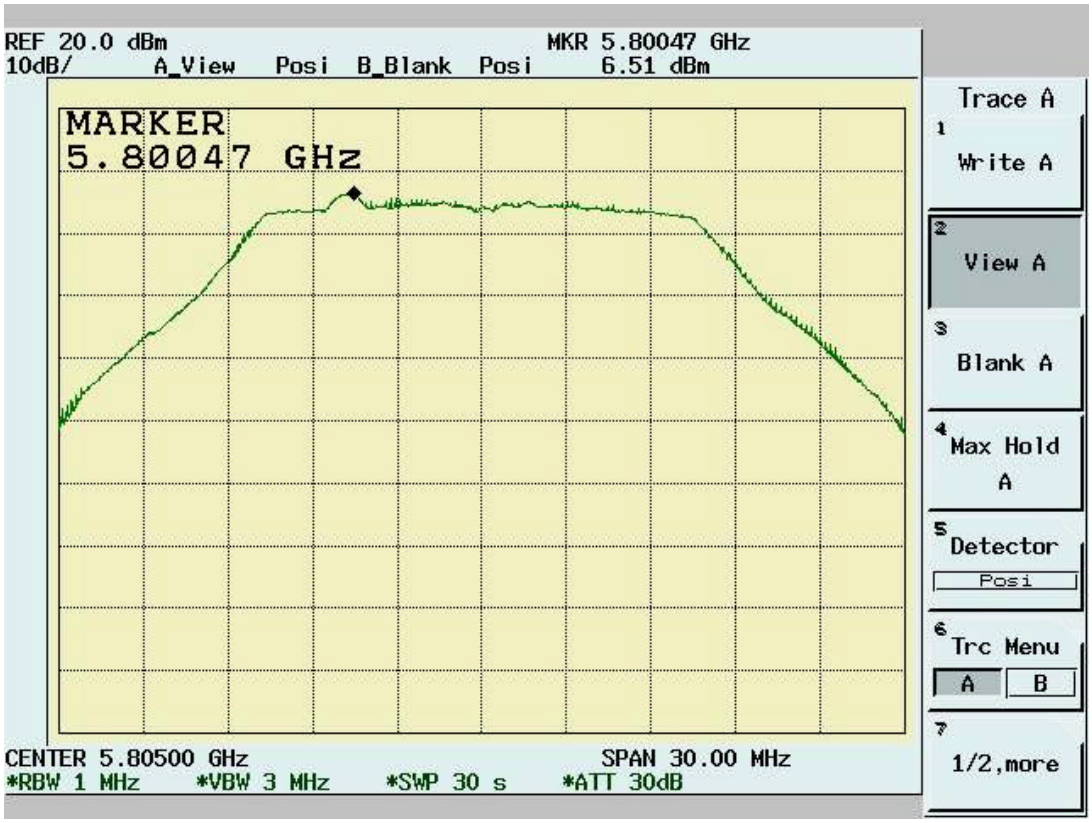

REF 20.0 dBm
10dB/ A_View Posi B_Blank Posi
MKR 5.17547 GHz
2.41 dBm
MARKER
5.17547 GHz
CENTER 5.18000 GHz
SPAN 30.00 MHz
*RBW 1 MHz *VBW 3 MHz *SWP 30 s *ATT 30dB
Trace A
1 Write A
2 View A
3 Blank A
4 Max Hold A
5 Detector Posi
6 Trc Menu A B
7 1/2,more


REF 20.0 dBm
10dB/ A_View Posi B_Blank Posi
MKR 5.23520 GHz
2.34 dBm
MARKER
5.23520 GHz
CENTER 5.24000 GHz
SPAN 30.00 MHz
*RBW 1 MHz *VBW 3 MHz *SWP 30 s *ATT 30dB
Trace A
1 Write A
2 View A
3 Blank A
4 Max Hold A
5 Detector Posi
6 Trc Menu A B
7 1/2,more


REF 20.0 dBm
10dB/ A_View Posi B_Blank Posi
MKR 5.25550 GHz
8.16 dBm
MARKER
5.25550 GHz
CENTER 5.26000 GHz
SPAN 30.00 MHz
*RBW 1 MHz *VBW 3 MHz *SWP 30 s *ATT 30dB
Trace A
1 Write A
2 View A
3 Blank A
4 Max Hold A
5 Detector Posi
6 Trc Menu A B
7 1/2,more


REF 20.0 dBm
10dB/ A_View Posi B_Blank Posi
MKR 5.31547 GHz
9.49 dBm
MARKER
5.31547 GHz
CENTER 5.32000 GHz
SPAN 30.00 MHz
*RBW 1 MHz *VBW 3 MHz *SWP 30 s *ATT 30dB
Trace A
1 Write A
2 View A
3 Blank A
4 Max Hold A
5 Detector Posi
6 Trc Menu A B
7 1/2,more


REF 20.0 dBm
10dB/ A_View Posi B_Blank Posi
MKR 5.74044 GHz
6.27 dBm
MARKER
5.74044 GHz
CENTER 5.74500 GHz
SPAN 30.00 MHz
*RBW 1 MHz *VBW 3 MHz *SWP 30 s *ATT 30dB
Trace A
1 Write A
2 View A
3 Blank A
4 Max Hold A
5 Detector Posi
6 Trc Menu A B
7 1/2,more

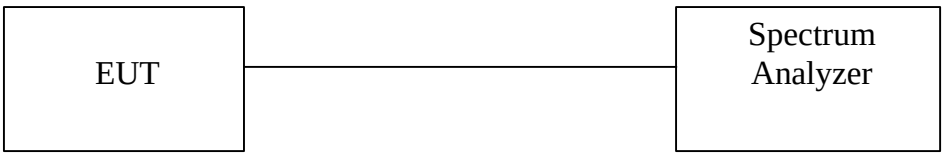

REF 20.0 dBm
10dB/ A_View Posi B_Blank Posi
MKR 5.80047 GHz
6.51 dBm
MARKER
5.80047 GHz
CENTER 5.80500 GHz
SPAN 30.00 MHz
*RBW 1 MHz *VBW 3 MHz *SWP 30 s *ATT 30dB
Trace A
1 Write A
2 View A
3 Blank A
4 Max Hold A
5 Detector Posi
6 Trc Menu A B
7 1/2,more

4.3 Peak Power Excursion Measurement [Section 15.407(a)(6)]

4.3.1 Test Procedure

1. The Transmitter output of EUT was connected to the spectrum analyzer.
1. Frequency SPAN of Spectrum: 30MHz or 50MHz.
2. Trace 1 : RBW: 1MHz, VBW: 3MHz. Using positive detector and Max -hold
3. Trace 2 : RBW: 1MHz, VBW: 3MHz. Using Sample detector and Max-hold
4. Record the largest difference between Trace 1 and Trace 2.

4.3.2 Test Setup



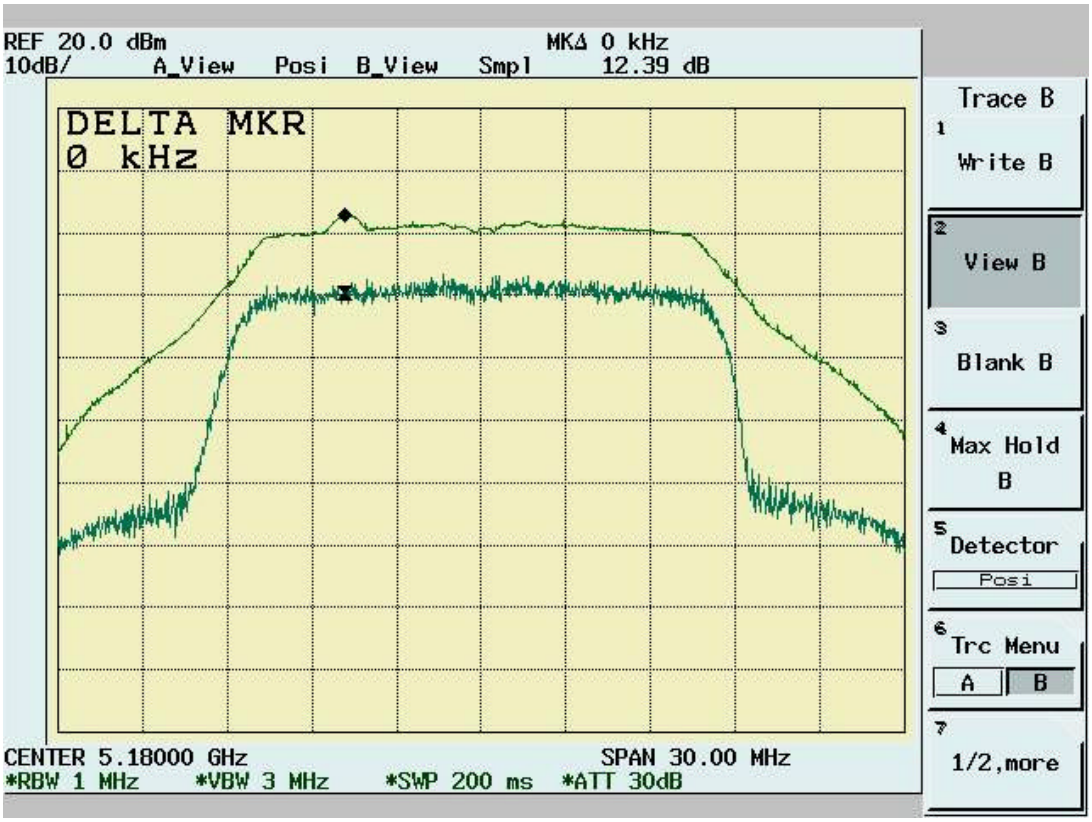
4.3.3 Test Data: (Normal Mode)

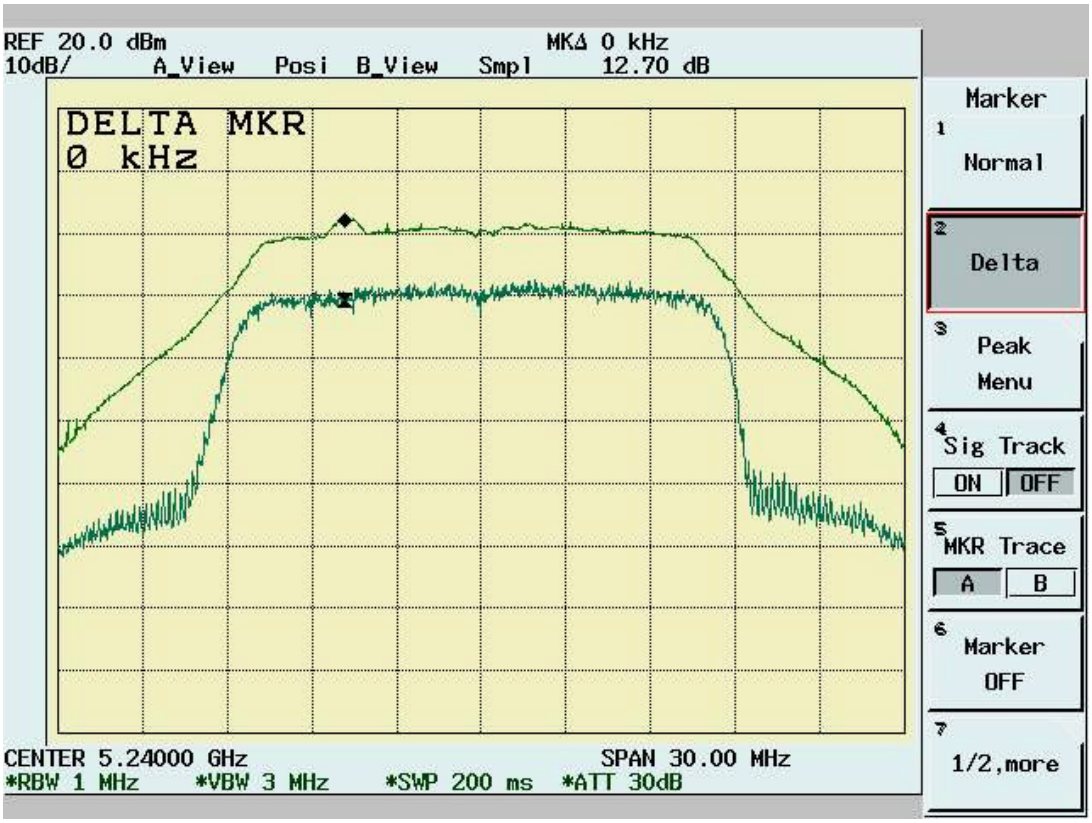
Peak Power Excursion

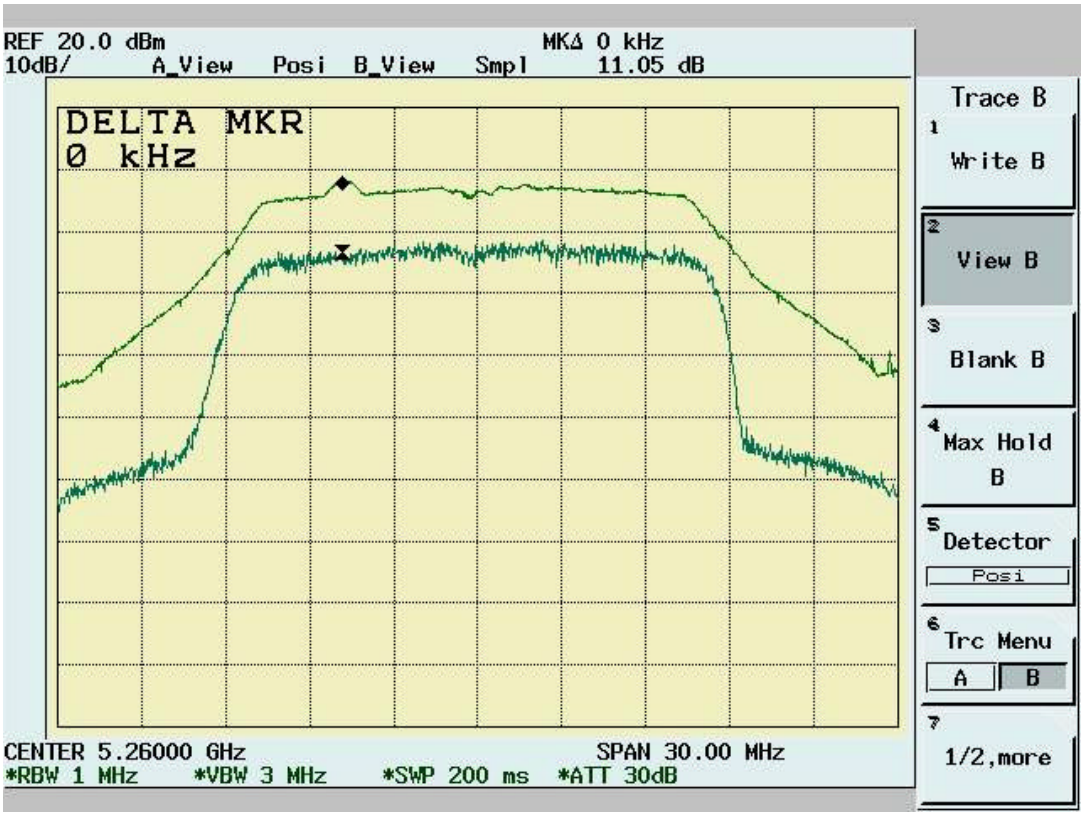
Temperature (℃):24

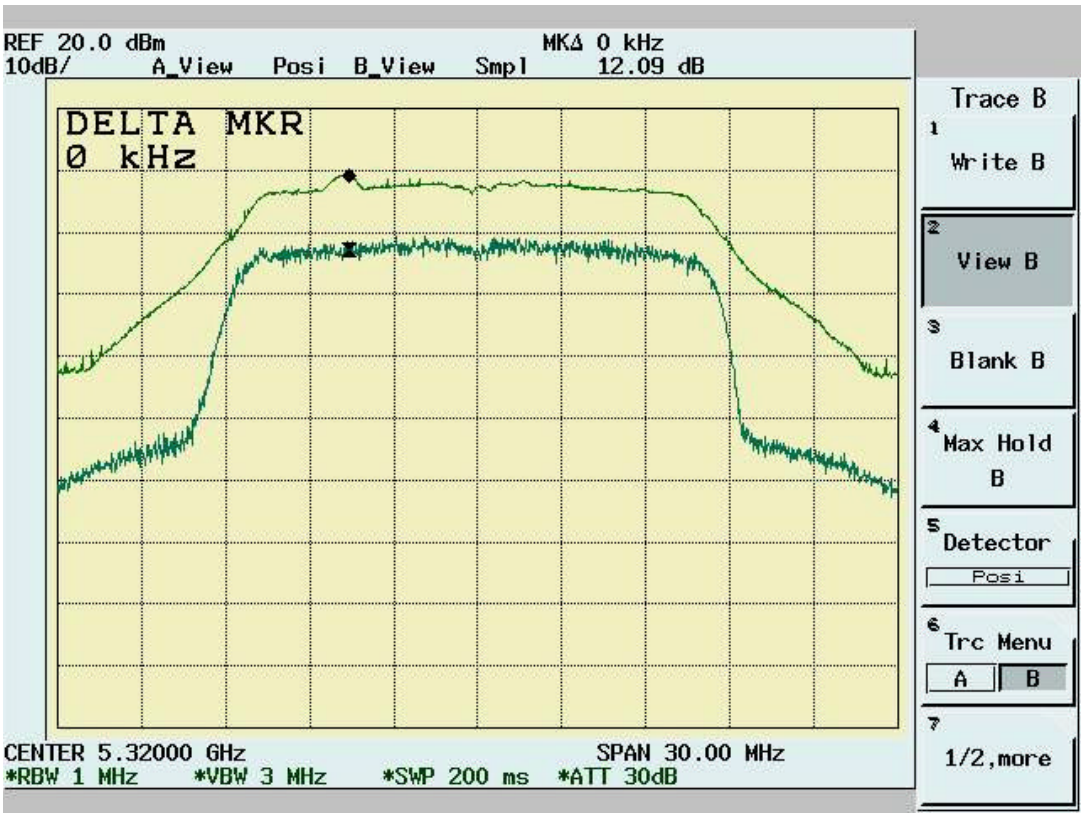
Test Engineer:Mailes Hsieh Humidity (%):54

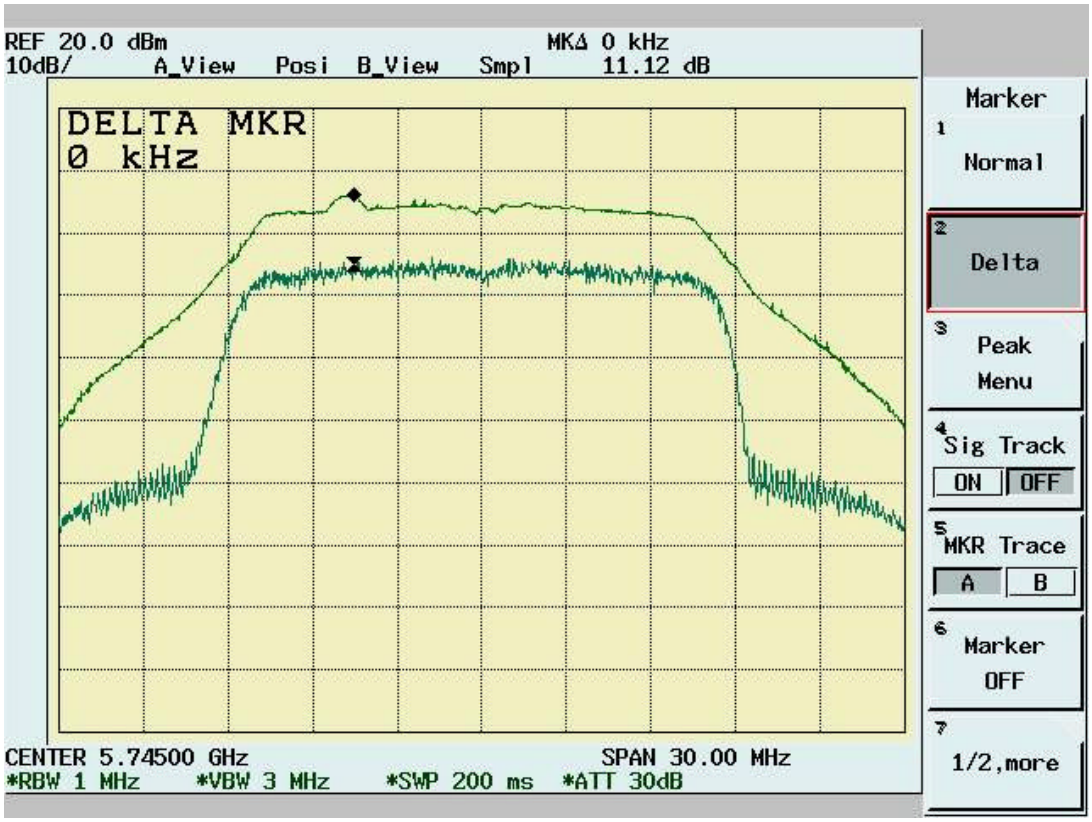
Channel	Frequency (Mhz)	Peak Power Excursion (dBm)	Limit (dBm)	Pass/Fail
1	**5180**	12.39	13	Pass
4	**5240**	12.70	13	Pass
5	**5260**	11.05	13	Pass
8	**5320**	12.09	13	Pass
9	**5745**	11.12	13	Pass
12	**5805**	11.77	13	Pass

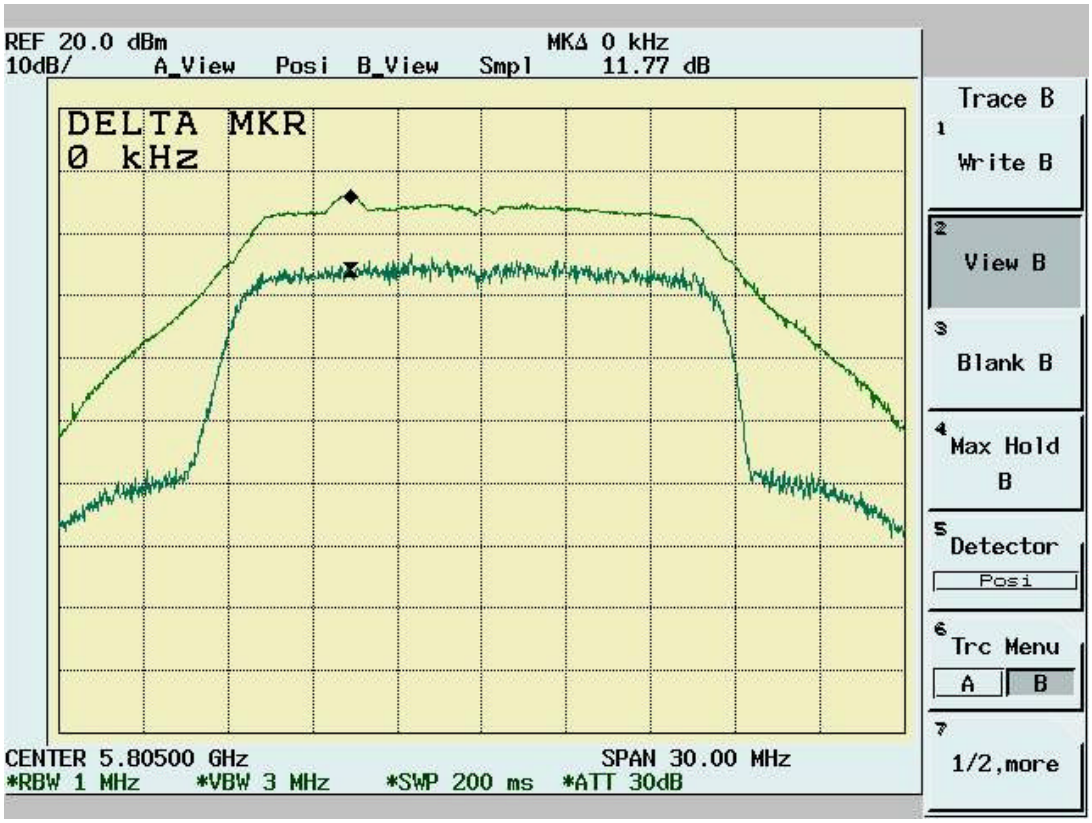

REF 20.0 dBm
MKΔ 0 kHz
10dB/ A_View Posi B_View Smpl 12.39 dB
DELTA MKR
0 kHz
CENTER 5.18000 GHz
SPAN 30.00 MHz
*RBW 1 MHz *VBW 3 MHz *SWP 200 ms *ATT 30dB
Trace B
1 Write B
2 View B
3 Blank B
4 Max Hold B
5 Detector
Posi
6 Trc Menu
A B
7 1/2,more


REF 20.0 dBm
MKΔ 0 kHz
10dB/ A_View Posi B_View Smpl 12.70 dB
DELTA MKR
0 kHz
CENTER 5.24000 GHz
SPAN 30.00 MHz
*RBW 1 MHz *VBW 3 MHz *SWP 200 ms *ATT 30dB
Marker
1 Normal
2 Delta
3 Peak Menu
4 Sig Track
ON OFF
5 MKR Trace
A B
6 Marker OFF
7 1/2,more


REF 20.0 dBm
MKΔ 0 kHz
10dB/ A_View Posi B_View Smpl 11.05 dB
DELTA MKR
0 kHz
Trace B
1 Write B
2 View B
3 Blank B
4 Max Hold B
5 Detector
Posi
6 Trc Menu
A B
7 1/2,more
CENTER 5.26000 GHz
SPAN 30.00 MHz
*RBW 1 MHz *VBW 3 MHz *SWP 200 ms *ATT 30dB


REF 20.0 dBm
MKΔ 0 kHz
10dB/ A_View Posi B_View Smpl 12.09 dB
DELTA MKR
0 kHz
Trace B
1 Write B
2 View B
3 Blank B
4 Max Hold B
5 Detector
Posi
6 Trc Menu
A B
7 1/2,more
CENTER 5.32000 GHz
SPAN 30.00 MHz
*RBW 1 MHz *VBW 3 MHz *SWP 200 ms *ATT 30dB


REF 20.0 dBm
MKΔ 0 kHz
10dB/ A_View Posi B_View Smpl 11.12 dB
DELTA MKR
0 kHz
Marker
1 Normal
2 Delta
3 Peak Menu
4 Sig Track
ON OFF
5 MKR Trace
A B
6 Marker OFF
7 1/2,more
CENTER 5.74500 GHz
SPAN 30.00 MHz
*RBW 1 MHz *VBW 3 MHz *SWP 200 ms *ATT 30dB


REF 20.0 dBm
MKΔ 0 kHz
10dB/ A_View Posi B_View Smpl 11.77 dB
DELTA MKR
0 kHz
Trace B
1 Write B
2 View B
3 Blank B
4 Max Hold B
5 Detector
Posi
6 Trc Menu
A B
7 1/2,more
CENTER 5.80500 GHz
SPAN 30.00 MHz
*RBW 1 MHz *VBW 3 MHz *SWP 200 ms *ATT 30dB

4.4 Powerline Conducted Emissions [Section 15.207 & 15.407 (b)(5)]

4.4.1 EUT Configuration

The EUT was set up on the non-conductive table that is 1.0 by 1.5 meter, 80cm above ground. The wall of the shielded room was located 40cm to the rear of the EUT.

Power to the EUT was provided through the LISN. The impedance vs. frequency characteristic of the LISN is complied with the limit shown on the figure 1 of ANSI C63.4-2001.

Both lines (neutral and hot) were connected to the LISN in series at testing. A coaxial-type connector which provides one 50 ohms terminating impedance was provided for connecting the test instrument. The excess length of the power cord was folded back and forth at the center of the lead so as to form a bundle not exceeding 40cm in length.

Any changes made to the configuration, or modifications made to the EUT, during testing are noted in the following test record.

If the EUT is a Personal Computer or a peripheral of personal computer, and the personal computer has an auxiliary AC outlet which can be used for providing power to an external monitor, then all measurements will be made with the monitor power from first the computer-mounted AC outlet and then a floor-mounted AC outlet.

4.4.2 Test Procedure

The system was set up as described above, with the EMI diagnostic software running. The main power line conducted EMI tests were run on the hot and neutral conductors of the power cord and the results were recorded. The effect of varying the position of the interface cables has been investigated to find the configuration that produces maximum emission.

At the frequencies where the peak values of the emissions were higher than 6dß below the applicable limits, the emissions were also measured with the quasi-peak detectors. At the frequencies where the quasi-peak values of the emissions were higher than 6dß below the applicable average limits, the emissions were also measured with the average detectors.

The highest emissions were analyzed in details by operating the spectrum analyzer in fixed tuned mode to determine the nature of the emissions and to provide information which could be useful in reducing their amplitude.

4.4.3 EMI Receiver/Spectrum Analyzer Configuration (for the frequencies tested)

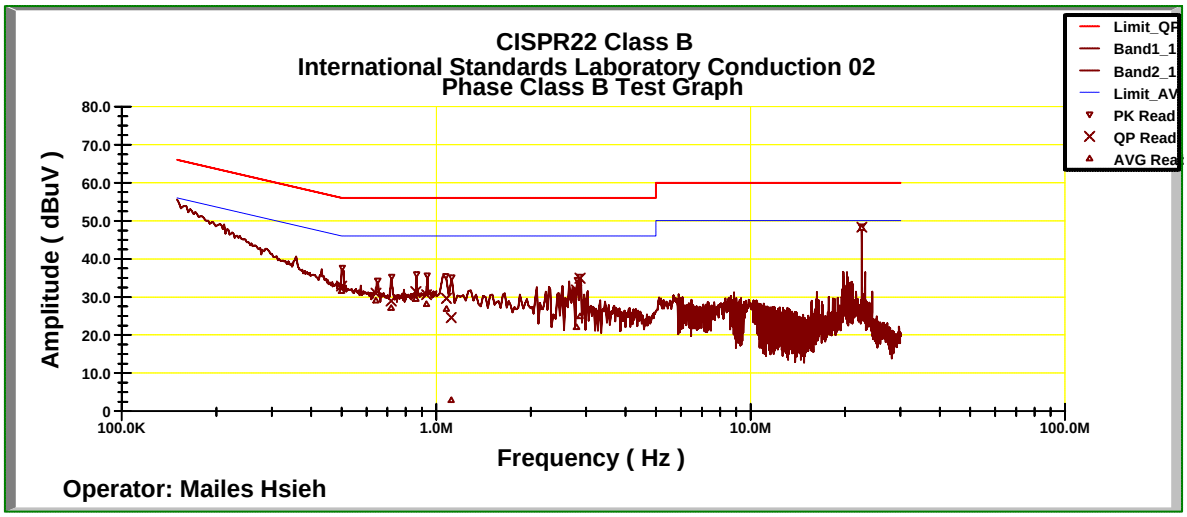
Frequency Range:	150 KHz--30MHz
Detector Function:	Quasi-Peak/Average
Bandwidth (RBW):	9KHz

4.4.4 Test Data:

Power Line Conducted Emissions (Hot)

Operator:MailesHsieh
Temperature(C):25
Humidity(%):57

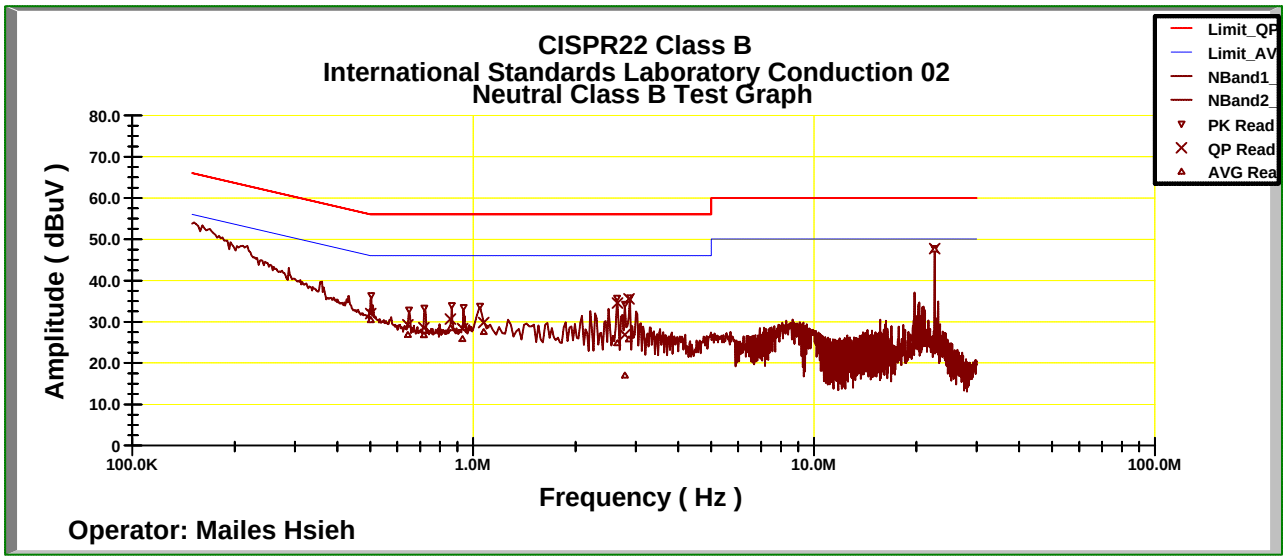
Frequency	LISNLoss	CableLoss	QPCorrct.	QPLimit	QPMargin	AVECorrct.	AVELimit	AVEMargin
MHz	(dB)	(dB)	Amp.(dBuV)	(dBuV)	(dB)	Amp.(dBuV)	(dBuV)	(dB)
0.50013	0.12	0.07	32.84	56.00	-23.16	31.55	46.00	-14.45
0.64341	0.14	0.07	30.95	56.00	-25.05	29.03	46.00	-16.97
0.7193	0.15	0.07	28.93	56.00	-27.07	27.08	46.00	-18.92
0.86178	0.18	0.07	31.40	56.00	-24.60	29.48	46.00	-16.52
0.9313	0.19	0.07	30.57	56.00	-25.43	28.07	46.00	-17.93
1.0779	0.29	0.07	29.58	56.00	-26.42	26.84	46.00	-19.16
1.11671	0.29	0.07	24.56	56.00	-31.44	2.85	46.00	-43.15
2.79315	0.20	0.11	31.82	56.00	-24.18	22.08	46.00	-23.92
2.86564	0.20	0.11	34.92	56.00	-21.08	24.94	46.00	-21.06
22.5697	0.85	0.33	48.32	60.00	-11.68	48.16	50.00	-1.84



Power Line Conducted Emissions (Neutral)

Operator:MailesHsieh
Temperature(C):25
Humidity(%):57

Frequency	LISNLoss	CableLoss	QPCorrct.	QPLimit	QPMargin	AVECorrct.	AVELimit	AVEMargin
MHz	(dB)	(dB)	Amp.(dBuV)	(dBuV)	(dB)	Amp.(dBuV)	(dBuV)	(dB)
0.50155	0.12	0.07	31.96	56.00	-24.04	30.42	46.00	-15.58
0.64428	0.14	0.07	29.28	56.00	-26.72	26.81	46.00	-19.19
0.71793	0.15	0.07	28.54	56.00	-27.46	26.76	46.00	-19.24
0.85901	0.18	0.07	30.65	56.00	-25.35	28.42	46.00	-17.58
0.93126	0.19	0.07	28.28	56.00	-27.72	25.83	46.00	-20.17
1.07578	0.20	0.07	29.81	56.00	-26.19	27.51	46.00	-18.49
2.65024	0.20	0.11	34.55	56.00	-21.45	24.77	46.00	-21.23
2.78998	0.20	0.11	26.82	56.00	-29.18	16.97	46.00	-29.03
2.86603	0.20	0.11	35.56	56.00	-20.44	25.73	46.00	-20.27
22.5694	0.40	0.33	47.70	60.00	-12.30	47.55	50.00	-2.45



* NOTE: During the test, the EMI receiver was set to Max. Hold then switch the EUT between Main antenna , Aux antenna Channel 1 , 4, 5, 8 ,9,12 of Normal
Mode and Channel 1, 2, 3,4,5 of Turbo Mode to get the maximum reading of all these channels.
Margin = Amplitude + Insertion Loss- Limit
A margin of -8dB means that the emission is 8dB below the limit

4.5 Radiated Emission Measurement [Section 15.209 & 15.407(b)(5)]

4.5.1 EUT Configuration

The equipment under test was set up on the 10 meter chamber with measurement distance of 3 meters. The EUT was placed on a non-conductive table 80cm above ground.

Any changes made to the configuration, or modifications made to the EUT, during testing are noted in the following test record.

4.5.2 Test Procedure

The system was set up as described above, with the EMI diagnostic software running. We found the maximum readings by varying the height of antenna and then rotating the turntable. Both polarization of antenna, horizontal and vertical, are measured.

30M to 1GHz: The highest emissions between 30 MHz to 1000 MHz were also analyzed in details by operating the spectrum analyzer and/or EMI receiver in quasi-peak mode to determine the precise amplitude of the emissions. While doing so, the interconnecting cables and major parts of the system were moved around, the antenna height was varied between one and four meters, its polarization was varied between vertical and horizontal, and the turntable was slowly rotated, to maximize the emission.

1GHz – 40GHz: The highest emissions were also analyzed in details by operating the spectrum analyzer and/or EMI receiver in peak mode to determine the precise amplitude of the emission. While doing so, the interconnecting cables and major parts of the system were moved around, the antenna height was varied between one and four meters, its polarization was varied between vertical and horizontal, and the turntable was slowly rotated, to maximize the emission. During test the EMI receiver and spectrum was setup according to para. 6.5.3.

For the test of 2^{nd} to 10^{th} harmonics frequencies , the equipment setup was also refer to para.6.5.3. The frequencies were tested using Peak mode first, if the test data is higher than the emissions limit, an additional measurement using Average mode will be performed and the average reading will be compared to the limit and record in test report.

4.5.3 EMI Receiver/Spectrum Analyzer Configuration

Frequency Range Tested:	30MHz~1000MHz
Detector Function:	Quasi-Peak Mode
Resolution Bandwidth (RBW):	120KHz
Video Bandwidth (VBW)	1MHz
Frequency Range Tested:	1GHz – 40 GHz
Detector Function:	Peak Mode
Resolution Bandwidth (RBW):	1MHz
Video Bandwidth (VBW)	3MHz
Frequency Range Tested:	30MHz – 40 GHz
Detector Function:	Average Mode
Resolution Bandwidth (RBW):	1MHz
Video Bandwidth (VBW)	10 Hz

4.5.4 Test Data (30MHz – 1GHz) .

30M – 1GHz Open Field Radiated Emissions (Horizontal)

Operator:MailesHsieh
Temperature(C):24
Humidity(%):47

Frequency	RxAmp.	AntFact	CableLoss	PreAmpGain	Corrct.Emi.	Limit	Margin	Ant.Pos.	TablePos.
MHz	(dBuV)	(dB/m)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg)
129.91	25.70	11.40	2.16	0.00	39.26	43.50	-4.24	101.00	352.00
231.76	23.14	9.21	2.95	0.00	35.30	46.00	-10.70	101.00	352.00
257.95	18.67	12.63	3.17	0.00	34.48	46.00	-11.52	101.00	53.00
282.20	19.49	13.09	3.39	0.00	35.97	46.00	-10.03	101.00	352.00
292.87	16.13	13.46	3.49	0.00	33.08	46.00	-12.92	101.00	352.00
331.67	16.97	14.04	3.94	0.00	34.95	46.00	-11.05	101.00	352.00
355.92	17.40	14.49	4.15	0.00	36.04	46.00	-9.96	101.00	302.00
432.55	18.47	16.16	4.69	0.00	39.32	46.00	-6.68	101.00	352.00
633.34	8.55	18.97	6.18	0.00	33.70	46.00	-12.30	101.00	352.00
699.30	9.98	19.00	6.62	0.00	35.59	46.00	-10.41	101.00	352.00

30M – 1GHz Open Field Radiated Emissions (Vertical)

Operator:MailesHsieh
Temperature(C):24
Humidity(%):47

Frequency	RxAmp.	AntFact	CableLoss	PreAmpGain	Corrct.Emi.	Limit	Margin	Ant.Pos.	TablePos.
MHz	(dBuV)	(dB/m)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg)
129.91	24.45	11.40	2.16	0.00	38.01	43.50	-5.49	101.00	77.00
366.59	23.49	14.83	4.22	0.00	42.54	46.00	-3.46	101.00	127.00
430.61	20.55	16.14	4.67	0.00	41.36	46.00	-4.64	101.00	45.00
544.10	11.40	18.65	5.49	0.00	35.53	46.00	-10.47	101.00	28.00
563.50	11.69	18.83	5.63	0.00	36.15	46.00	-9.85	101.00	193.00
630.43	14.44	18.96	6.16	0.00	39.56	46.00	-6.44	101.00	12.00
686.69	8.55	19.00	6.53	0.00	34.08	46.00	-11.92	101.00	12.00
696.39	12.84	19.00	6.60	0.00	38.43	46.00	-7.57	101.00	28.00
699.30	14.62	19.00	6.62	0.00	40.23	46.00	-5.77	101.00	12.00
833.16	6.33	20.43	7.71	0.00	34.47	46.00	-11.53	101.00	209.00

* NOTE: During the pre-test, the EUT has been tested for Channel 1, 4, 5, 8, 9, 12 of Normal Mode and Channel 1, 2, 3 ,4, 5 of Turbo mode and transmit from Main and Aux antenna respectively to get all the critical emission frequencies. In the final test all the critical emission frequencies has been tested and the test data are listed above.

Margin=Corrected Amplitude–Limit
Corrected Amplitude = Radiated Amplitude + Antenna Correction Factor + Cable Loss - Pre-Amplifier Gain
A margin of -8dB means that the emission is 8dB below the limit

All frequencies from 30MHz to 1GHz have been tested

4.5.5 Test Data (1GHz – 40 GHz, Transmitting) .

1GHz~ 40 GHz (Horizontal), Normal Mode, Channel 1 : 5180 MHz

Operator:MailesHsieh RBW:1MHz
Humidity(%):47
Temperature(C):26

Frequency	Rx_R.	Ant_F.	Cab_L.	PreAmpl	Emission	Limit	Margin	A.Tower	T.Table
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	cm	deg
1791.21	48.05pk	29.25	2.45	34.77	44.97pk	54.00av	-9.03	100	57
2877.32	47.34pk	31.05	1.43	34.86	44.95pk	54.00av	-9.05	103	318
3017.58	47.56pk	31.11	1.46	34.79	45.35pk	54.00av	-8.65	103	352
3359.24	49.19pk	31.39	1.64	35.53	46.68pk	54.00av	-7.32	103	265

1GHz~ 40 GHz (Vertical), Normal Mode, Channel 1: 5180 MHz

Operator:MailesHsieh RBW:1MHz
Humidity(%):47
Temperature(C):26

Frequency	Rx_R.	Ant_F.	Cab_L.	PreAmpl	Emission	Limit	Margin	A.Tower	T.Table
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	cm	deg
1395.60	51.61pk	26.32	2.22	34.14	46.00pk	54.00av	-8.00	101	85
1837.96	49.75pk	29.64	2.48	34.86	47.01pk	54.00av	-6.99	100	54
2492.51	49.57pk	30.90	1.40	35.20	46.67pk	54.00av	-7.33	101	198
3355.64	47.91pk	31.38	1.63	35.53	45.40pk	54.00av	-8.60	103	266
7469.93	42.81pk	39.85	2.27	36.41	48.52pk	54.00av	-5.48	101	178

Note: " * ": Fundamental Frequency
" pk": peak reading
"av": average reading
The Spectrum noise level+Correction Factor<Limit-6 dB
Margin = Corrected Amplitude – Limit
Corrected Amplitude=Radiated Amplitude+Antenna Correction Factor+Cable Loss-Pre-Amplifier Gain
A margin of -8dB means that the emission is 8dB below the limit.

All frequencies from 1GHz to 40 GHz have been tested.

1GHz~ 40 GHz (Horizontal), Normal Mode, Channel 4: 5240 MHz

Operator:MailesHsieh RBW:1MHz
Humidity(%):47
Temperature(C):26

Frequency	Rx_R.	Ant_F.	Cab_L.	PreAmpl	Emission	Limit	Margin	A.Tower	T.Table
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	cm	deg
1399.20	51.16pk	26.34	2.22	34.15	45.56pk	54.00av	-8.44	101	84
1996.20	47.77pk	30.97	2.60	35.17	46.17pk	54.00av	-7.83	100	43
2488.91	49.21pk	30.90	1.42	35.20	46.33pk	54.00av	-7.67	101	197
3359.24	49.84pk	31.39	1.64	35.53	47.33pk	54.00av	-6.67	103	265

1GHz~ 40 GHz (Vertical), Normal Mode, Channel 4: 5240 MHz

Operator:MailesHsieh RBW:1MHz
Humidity(%):47
Temperature(C):26

Frequency	Rx_R.	Ant_F.	Cab_L.	PreAmpl	Emission	Limit	Margin	A.Tower	T.Table
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	cm	deg
1399.20	51.95pk	26.34	2.22	34.15	46.36pk	54.00av	-7.64	101	84
1841.56	48.96pk	29.67	2.48	34.87	46.24pk	54.00av	-7.76	100	54
2488.91	48.48pk	30.90	1.42	35.20	45.61pk	54.00av	-8.39	101	197
3488.71	48.54pk	31.49	1.70	35.82	45.92pk	54.00av	-8.08	103	231
7462.74	43.27pk	39.84	2.29	36.43	48.97pk	54.00av	-5.03	101	177

Note: " * ": Fundamental Frequency
" pk": peak reading
"av": average reading
The Spectrum noise level+Correction Factor<Limit-6 dB
Margin = Corrected Amplitude – Limit
Corrected Amplitude=Radiated Amplitude+Antenna Correction Factor+Cable Loss-Pre-Amplifier Gain
A margin of -8dB means that the emission is 8dB below the limit.

All frequencies from 1GHz to 40 GHz have been tested.

1GHz~ 40 GHz (Horizontal), Normal Mode, Channel 5 : 5260 MHz

Operator:MailesHsieh

RBW:1MHz
Humidity(%):47
Temperature(C):26

Frequency	Rx_R.	Ant_F.	Cab_L.	PreAmpl	Emission	Limit	Margin	A.Tower	T.Table
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	cm	deg
1399.20	50.69pk	26.34	2.22	34.15	45.10pk	54.00av	-8.90	101	84
2938.46	47.93pk	31.08	1.44	34.81	45.64pk	54.00av	-8.36	103	338
3298.10	48.03pk	31.34	1.61	35.40	45.57pk	54.00av	-8.43	103	280
3355.64	49.20pk	31.38	1.63	35.53	46.69pk	54.00av	-7.31	103	266

1GHz~ 40 GHz (Vertical), Normal Mode, Channel 5 : 5260 MHz

Operator:MailesHsieh

RBW:1MHz
Humidity(%):47
Temperature(C):26

Frequency	Rx_R.	Ant_F.	Cab_L.	PreAmpl	Emission	Limit	Margin	A.Tower	T.Table
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	cm	deg
1061.14	52.47pk	24.78	2.18	33.96	45.46pk	54.00av	-8.54	102	108
1395.60	51.16pk	26.32	2.22	34.14	45.55pk	54.00av	-8.45	101	85
1841.56	48.62pk	29.67	2.48	34.87	45.90pk	54.00av	-8.10	100	54
3503.10	48.76pk	31.50	1.71	35.85	46.13pk	54.00av	-7.87	102	228
7487.91	43.65pk	39.88	2.24	36.38	49.39pk	54.00av	-4.61	101	180

Note: " * ": Fundamental Frequency
" pk": peak reading
"av": average reading
The Spectrum noise level+Correction Factor<Limit-6 dB
Margin = Corrected Amplitude – Limit
Corrected Amplitude=Radiated Amplitude+Antenna Correction Factor+Cable Loss-Pre-Amplifier Gain
A margin of -8dB means that the emission is 8dB below the limit.

All frequencies from 1GHz to 40 GHz have been tested.

1GHz~ 40 GHz (Horizontal), Normal Mode, Channel 8: 5320 MHz

Operator:MailesHsieh RBW:1MHz
Humidity(%):47
Temperature(C):26

Frequency	Rx_R.	Ant_F.	Cab_L.	PreAmpl	Emission	Limit	Margin	A.Tower	T.Table
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	cm	deg
1953.05	46.63pk	30.61	2.57	35.09	44.71pk	54.00av	-9.29	100	46
2111.29	47.43pk	30.98	2.26	35.18	45.48pk	54.00av	-8.52	100	78
2499.70	49.34pk	30.90	1.36	35.20	46.41pk	54.00av	-7.59	101	200
3359.24	49.55pk	31.39	1.64	35.53	47.05pk	54.00av	-6.95	103	265

1GHz~ 40 GHz (Vertical), Normal Mode, Channel 8: 5320 MHz

Operator:MailesHsieh RBW:1MHz
Humidity(%):47
Temperature(C):26

Frequency	Rx_R.	Ant_F.	Cab_L.	PreAmpl	Emission	Limit	Margin	A.Tower	T.Table
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	cm	deg
1841.56	48.73pk	29.67	2.48	34.87	46.01pk	54.00av	-7.99	100	54
2197.60	47.54pk	30.96	2.00	35.19	45.31pk	54.00av	-8.69	101	105
2877.32	48.45pk	31.05	1.43	34.86	46.07pk	54.00av	-7.93	103	318
3355.64	47.59pk	31.38	1.63	35.53	45.09pk	54.00av	-8.91	103	266
7484.32	44.77pk	39.87	2.25	36.39	50.51pk	54.00av	-3.49	101	180

Note: " * ": Fundamental Frequency
" pk": peak reading
"av": average reading
The Spectrum noise level+Correction Factor<Limit-6 dB
Margin = Corrected Amplitude – Limit
Corrected Amplitude=Radiated Amplitude+Antenna Correction Factor+Cable Loss-Pre-Amplifier Gain
A margin of -8dB means that the emission is 8dB below the limit.

All frequencies from 1GHz to 40 GHz have been tested.