

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

of

Product Name

802.11 a+b+g Wireless Cardbus Adapter

Model

PH52ABG

Applied by:

PacketHop Inc.
1301 Shoreway Road, Suite 200,
Belmont, CA 94002
U.S.A.

Test Performed by:

International Standards Laboratory

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HC LAB:NVLAP:200234-0;VCCI: R-341,C-354;NEMKO:ELA 113a,113c;BSMI:SL2-IN-E-0037;SL2-R1-E-0037;CNLA:1178

LT LAB:NVLAP:200234-0;VCCI: R-1435,C-1440;NEMKO:ELA 113b,113d;BSMI:SL2-IN-E-0013;CNLA:0997

ISL-T10-R29-1

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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: 802.11 a+b+g Wireless Cardbus Adapter

Model: PH52ABG

Applied by: PacketHop Inc.

Sample received Date: 2005/07/27


Final test Date : 2005/08/15- 2005/08/26

Test Result PASS

Test Site: Chamber 02, Conduction 02

Temperature Refer to each site test data

Humidity: Refer to each site test data



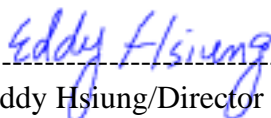
 Jerry Chiou

Test Engineer:

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

<p>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 127 pages, including 1 cover page , 3 contents page, and 123 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.</p>
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<p>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).</p>
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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	SAR 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	SAR 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	SAR report attached
15.407 (g)	Frequency Stability	Pass	

3. Description of Equipment Under Test (EUT)

Description: 802.11a+b+g WIRELESS CARDBUS ADAPTER
 Model No.: PH52ABG
 FCC ID: TCB-PH52ABG
 Frequency Range 802.11a: 5150~5350 MHz, 5725 ~ 5825MHz
 Frequency Range 802.11b/g: 2400~2483.5 MHz
 Support channel:
 802.11a 12 Channels
 802.11a Turbo mode 5 Channels
 802.11b/g 11 Channels

Modulation Skill:
 802.11a Normal mode OFDM (6 Mbps – 54 Mbps)
 802.11a Turbo mode OFDM (12 Mbps – 108 MBps)
 802.11b DBPSK(1Mbps), DQPSK(2Mbps),
 CCK(5.5/11Mbps)
 802.11g OFDM (6M - 54Mbps)

Antennas Type:
 Left ANT : Dual band printed IFA type
 made by Wistron NeWeb Corp.
 Right ANT: Dual band printed IFA type
 made by Wistron NeWeb Corp.

Antenna Connected: The Antenna is layout in the PCB of the WLAN module, the user is not possible to change the antenna.

Antenna peak Gain:
 Left antenna -2.9 dB (11b/g), 0.65 dB (11a)
 Right antenna 1.5 dB (11b/g), 1.06 dB (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

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

Channel	Frequency(MHz)	Channel	Frequency(MHz)
01	5210	04	5760
02	5250	05	5800
03	5290		

PCMCIA Connector: one 68 pins

EMI Noise Source:

Crystal: 40MHz (Y2)

EMI Solution:

1. add two gaskets upon RF shield cover to contact metal casing.

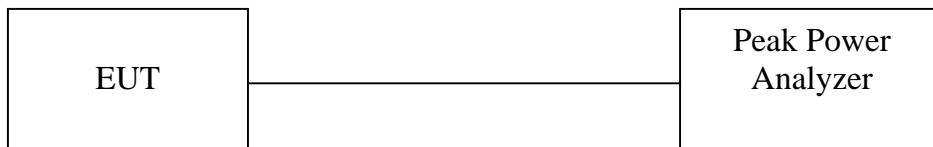
4. TEST RESULTS (802.11a)

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 bandwidth in MHz

4.1.3 Test Data: (Normal Mode)

Maximum Peak Output Power

Temperature ():25

Test Engineer:Jerry Chiou

Humidity (%):50

Chennel	Frequency (Mhz)	Peak Power Output (dBm)	26 dBc BW/Limit Mhz/dBm	The lesser Limit (dBm)	Pass/Fail
1	5180	15.30	28.07/ 18.48	17	Pass
4	5240	15.07	26.88/ 18.29	17	Pass
5	5260	15.73	28.21/ 25.50	24	Pass
8	5320	14.76	27.37/ 25.37	24	Pass
9	5745	13.05	28.91/ 31.61	30	Pass
10	5765	13.99	28.91/ 31.31	30	Pass
12	5805	14.07	26.32/ 31.20	30	Pass

4.1.4 Test Data: (Turbo Mode)

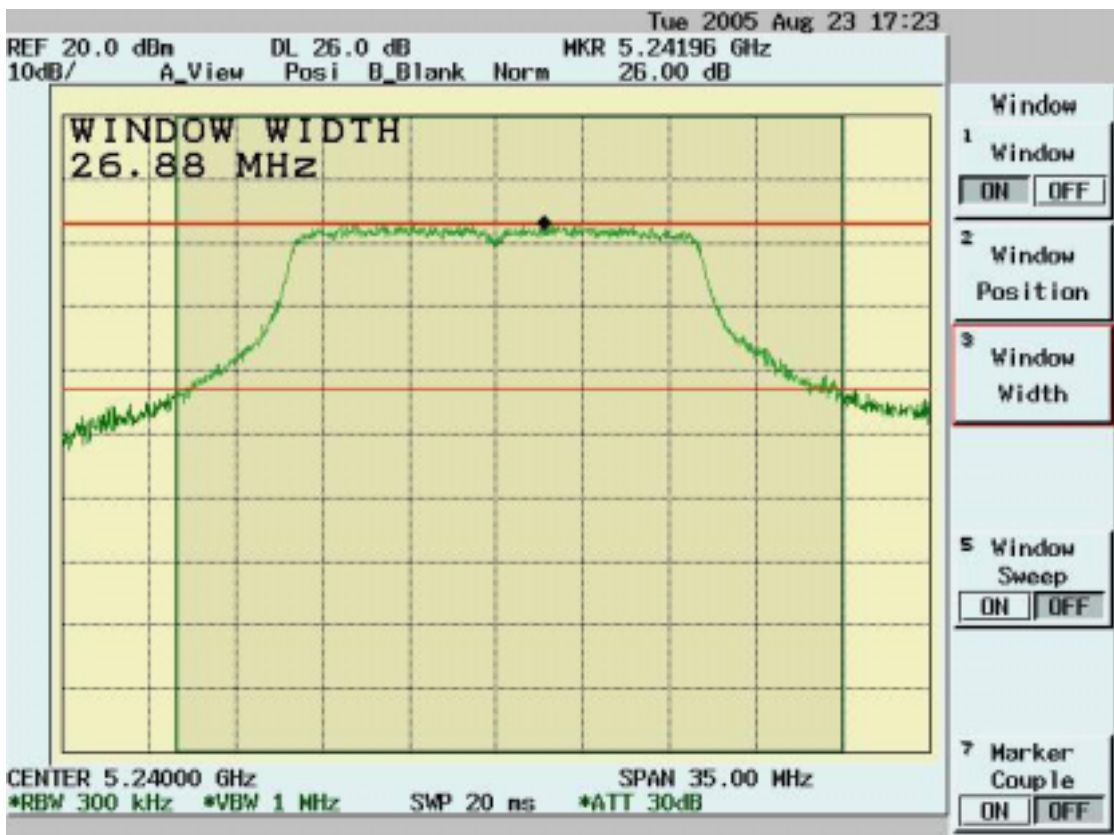
Maximum Peak Output Power

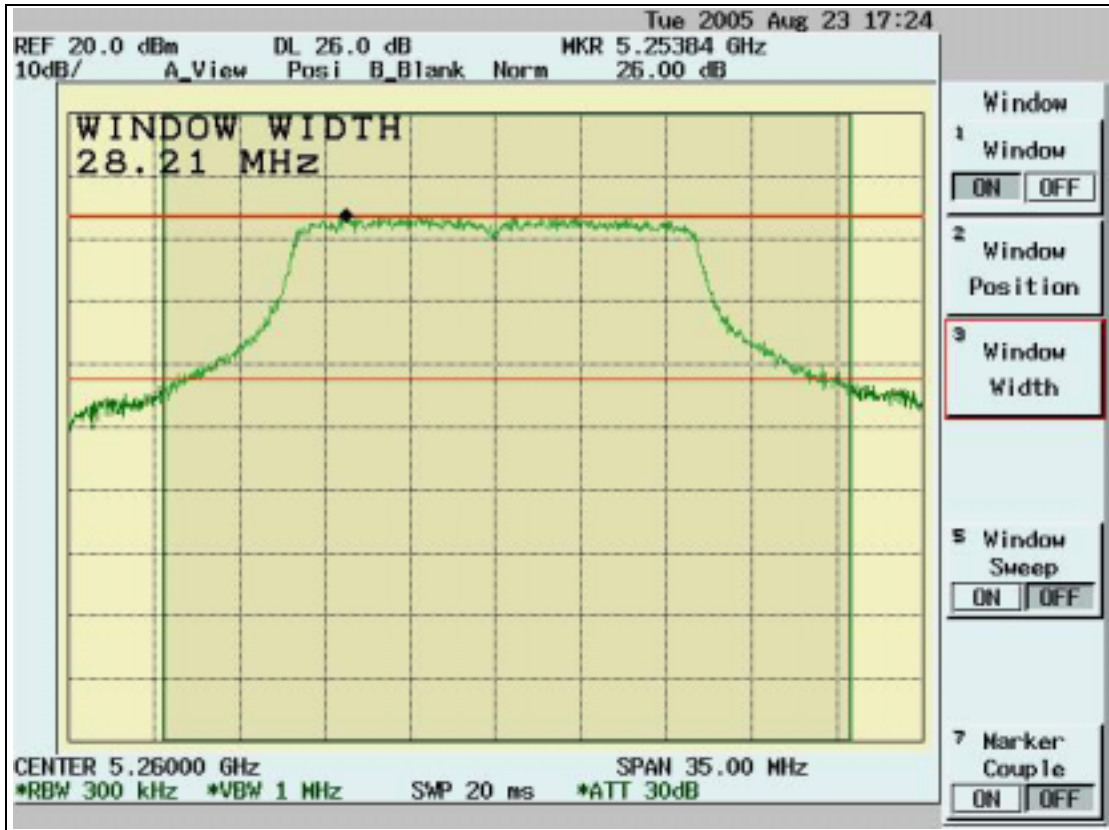
Temperature ():25

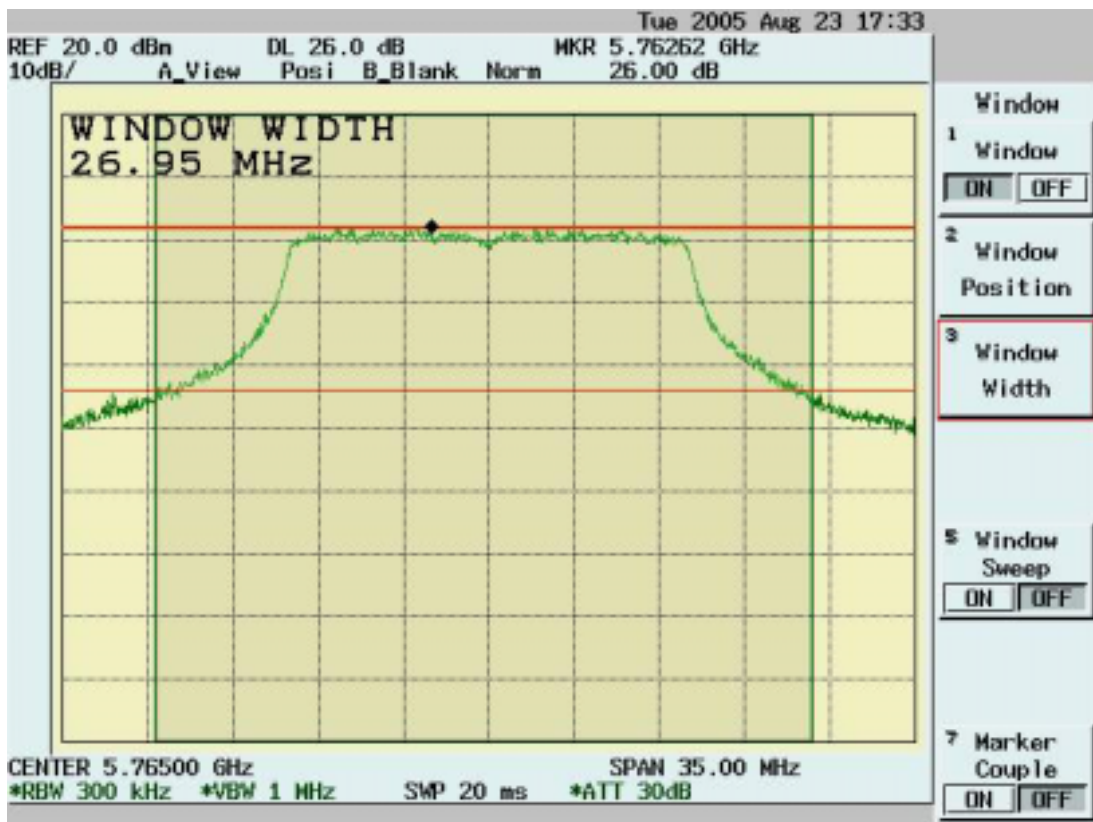
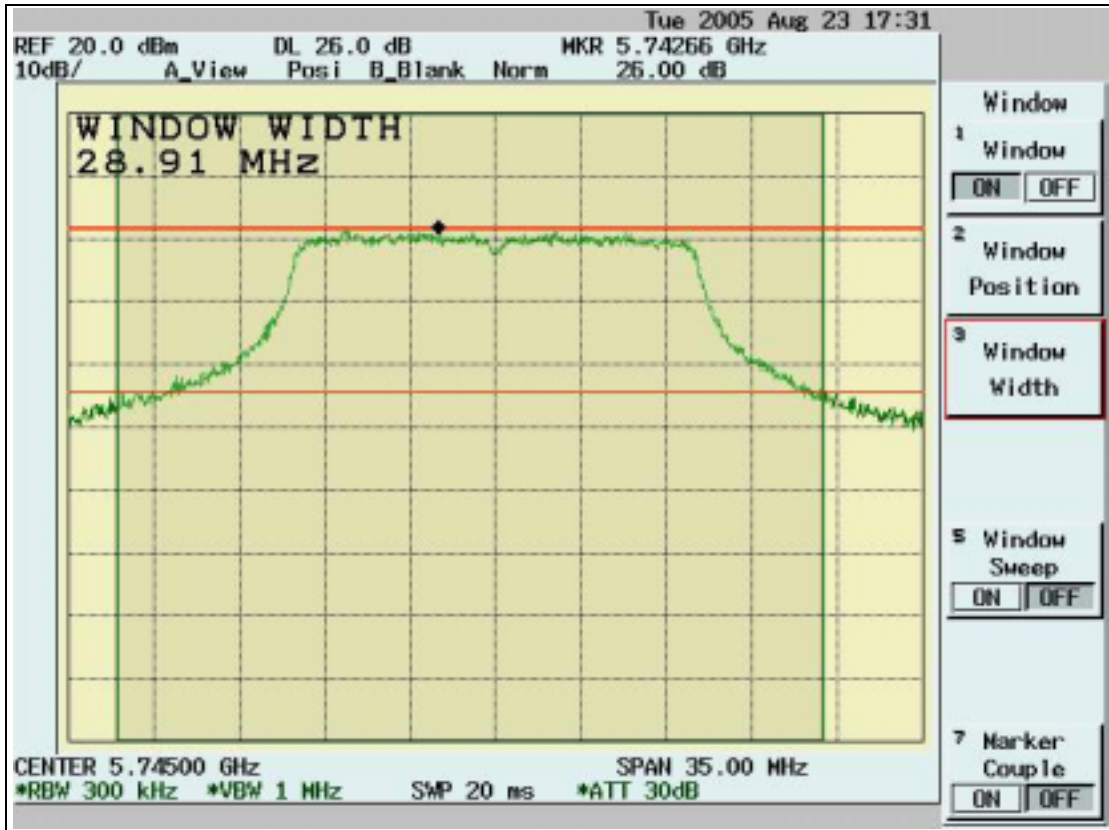
Test Engineer:Jerry Chiou

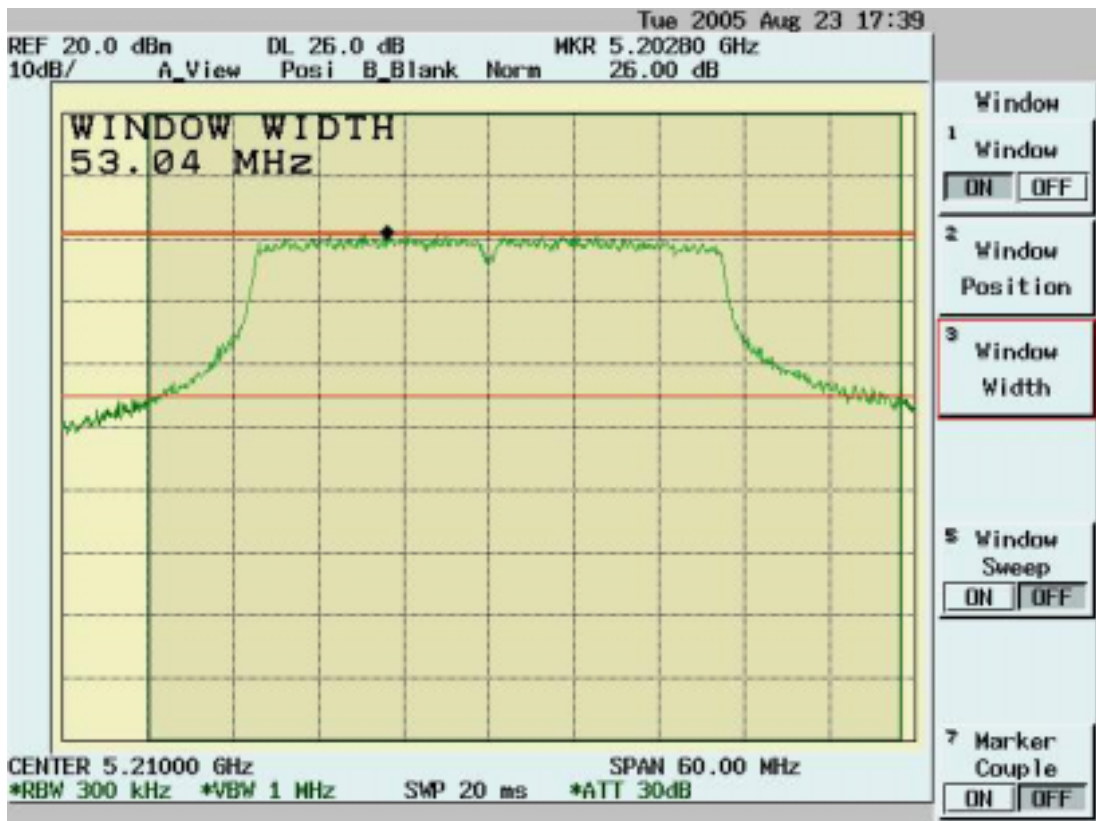
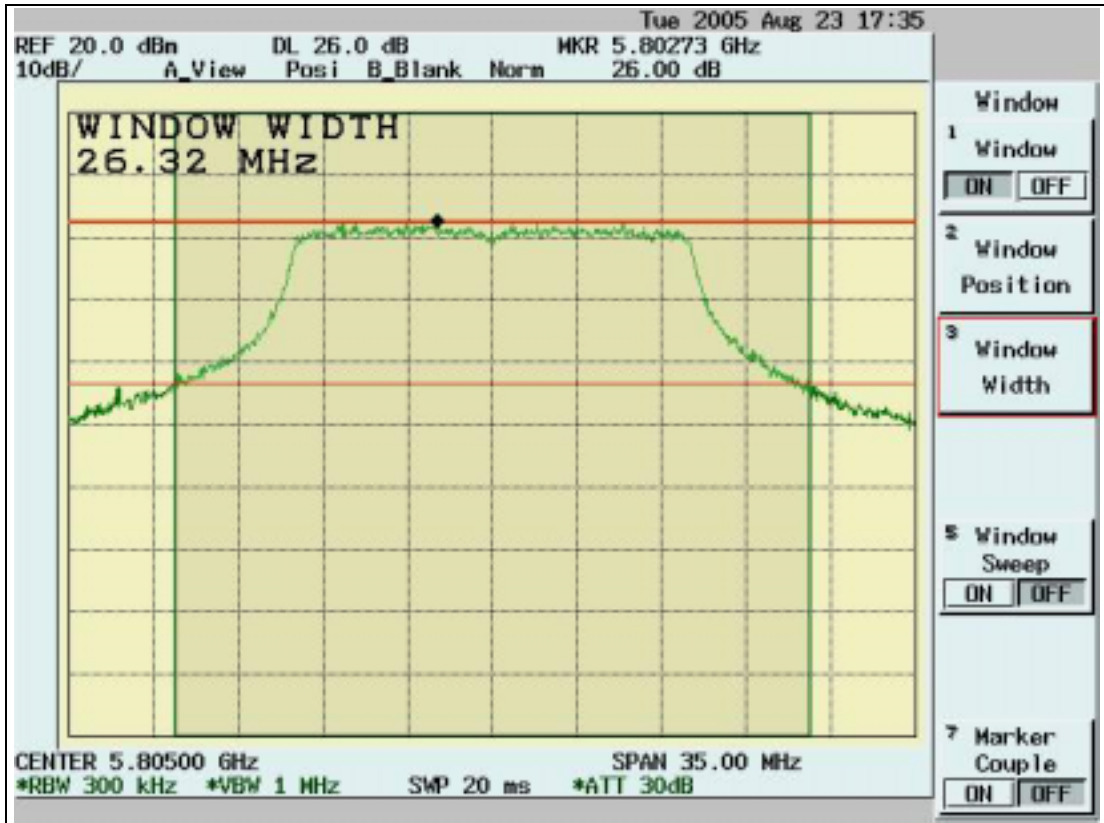
Humidity (%):50

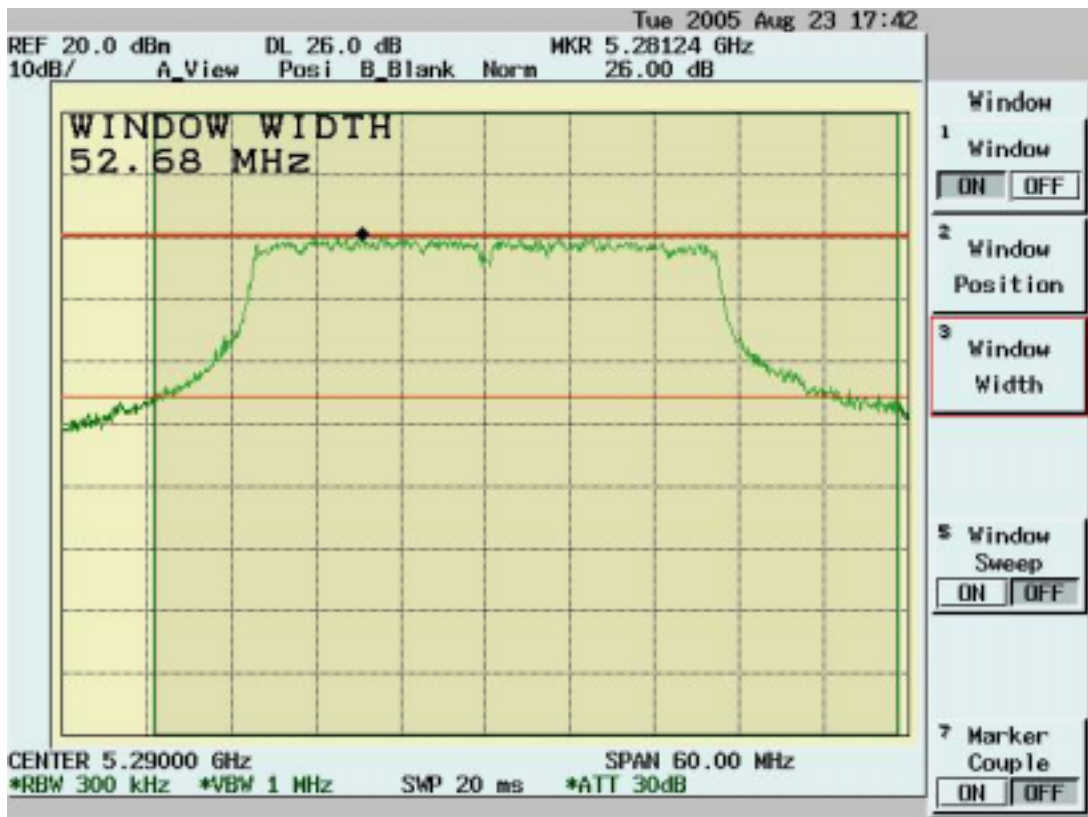
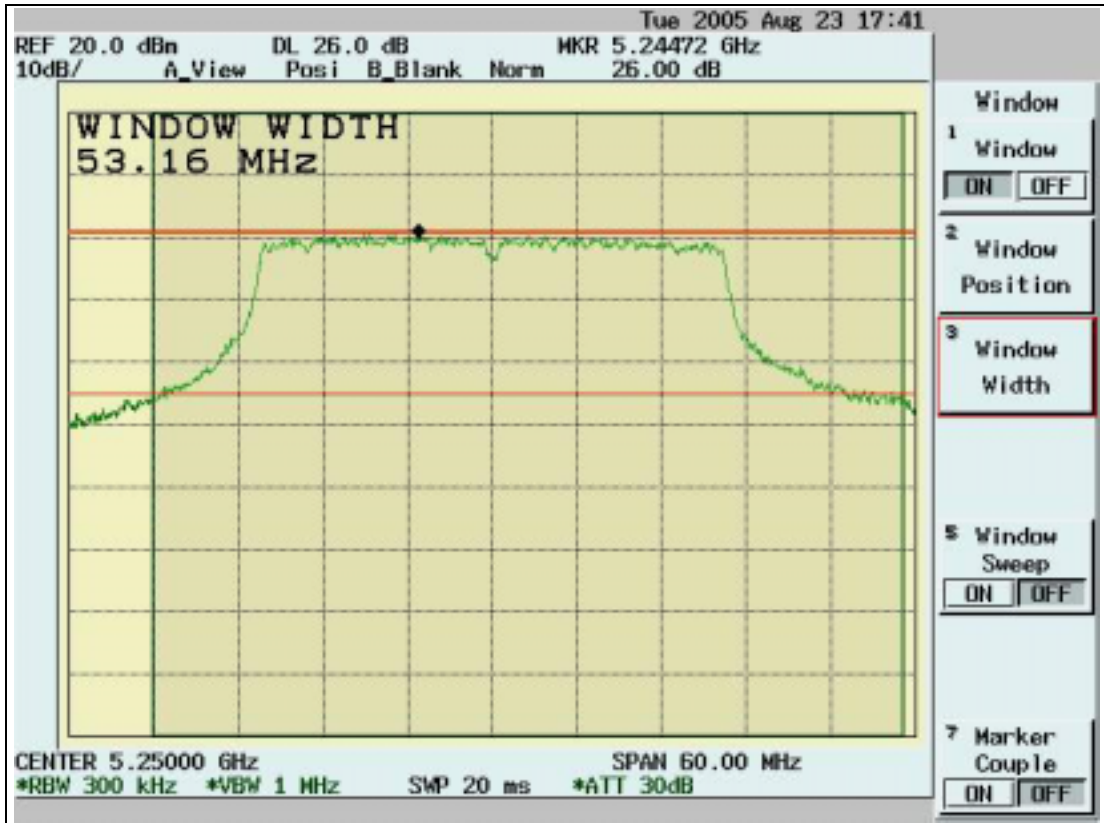
Chennel	Frequency (Mhz)	Peak Power Output (dBm)	26 dBc BW/Limit Mhz/dBm	The lesser Limit (dBm)	Pass/Fail
1	5210	15.39	53.04/ 21.25	17	Pass
2	5250	14.76	53.16/ 21.26	17	Pass
3	5290	13.84	52.68/ 28.22	24	Pass
4	5760	13.09	52.56/ 34.21	30	Pass
5	5800	8.85	51.48/ 34.12	30	Pass

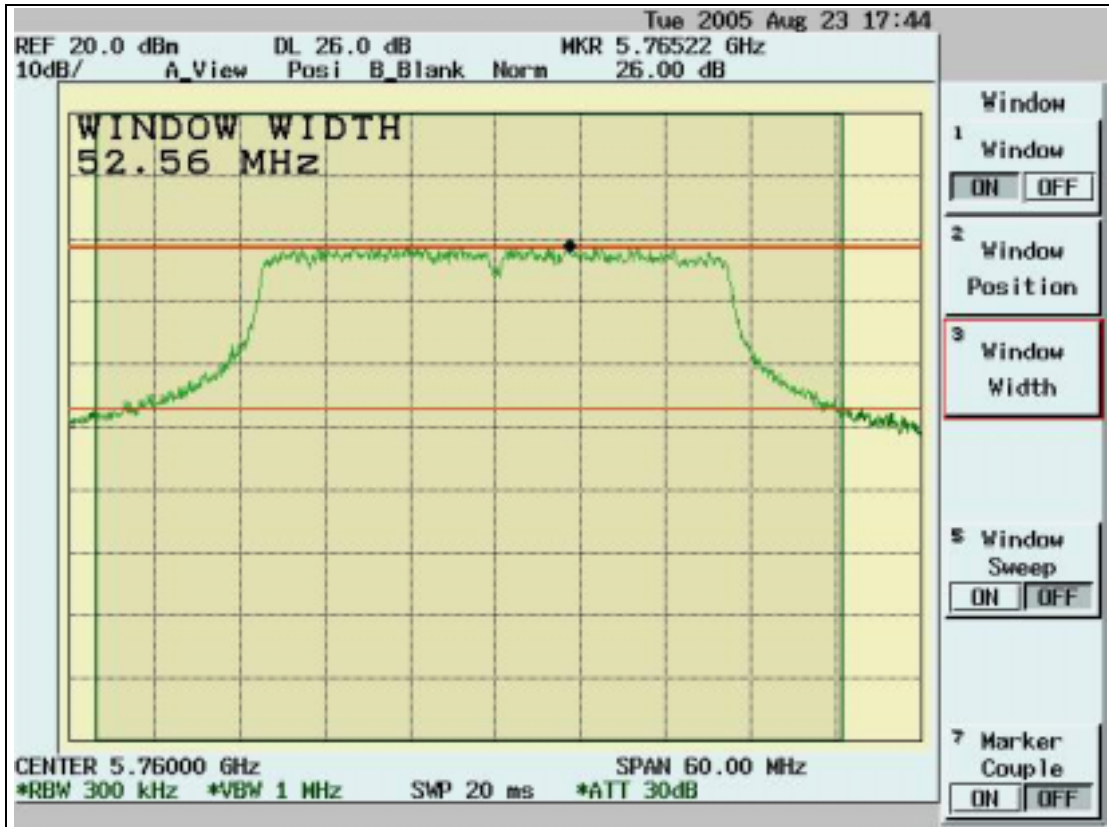










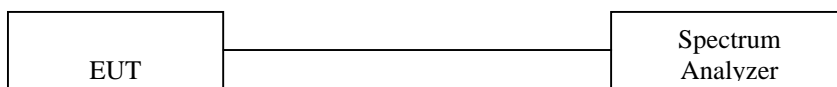


4.2 Peak Power Spectral Density [Section 15.407(a)(1)(2)(3)]

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 ():25

Test Engineer:Jerry Chiou

Humidity (%):50

Channel	Frequency (Mhz)	Spectrum Reading (dBm)	Cable Loss(dB)	Peak Power Output dBm/MHz)	Limit (dBm/Mhz)	Pass/Fail
1	5180	-2.97	1.80	-1.17	4	Pass
4	5240	-2.92	1.80	-1.12	4	Pass
5	5260	-3.10	1.80	-1.30	11	Pass
8	5320	-4.18	1.80	-2.38	11	Pass
9	5745	-5.48	1.80	-3.68	17	Pass
10	5765	-4.81	1.80	-3.01	17	Pass
12	5805	-5.15	1.80	-3.35	17	Pass

4.2.4 Test Data: (Turbo Mode)

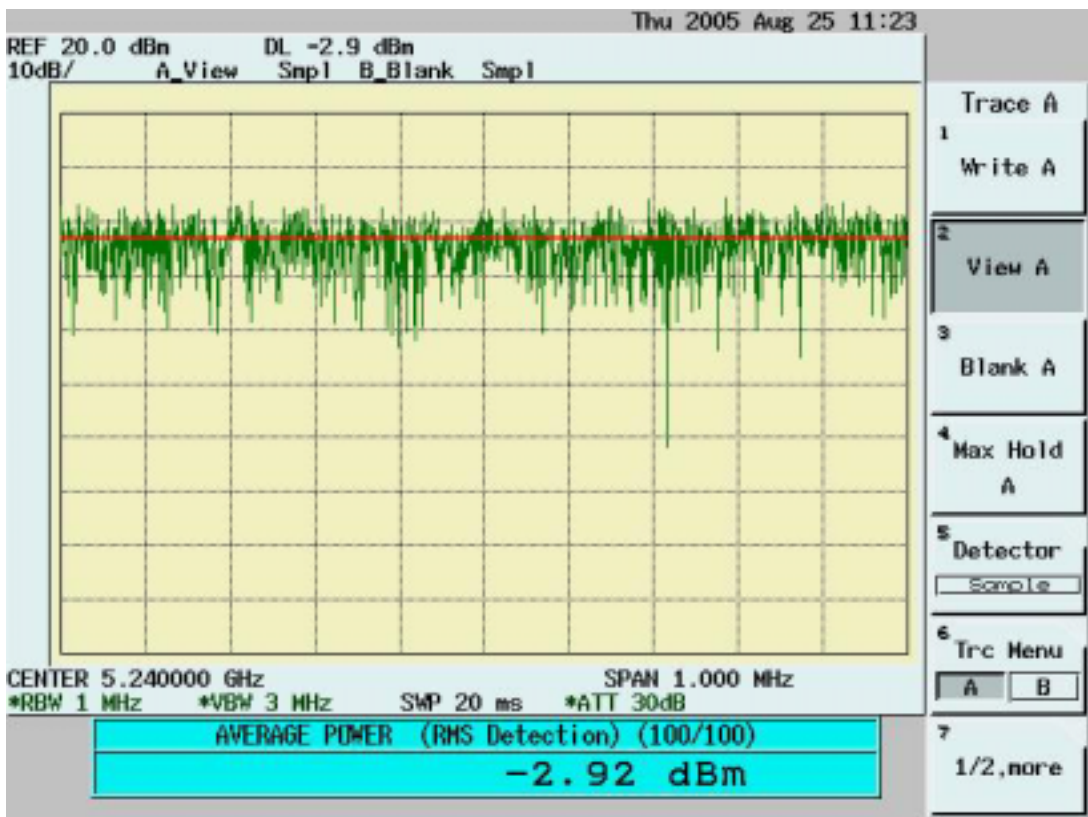
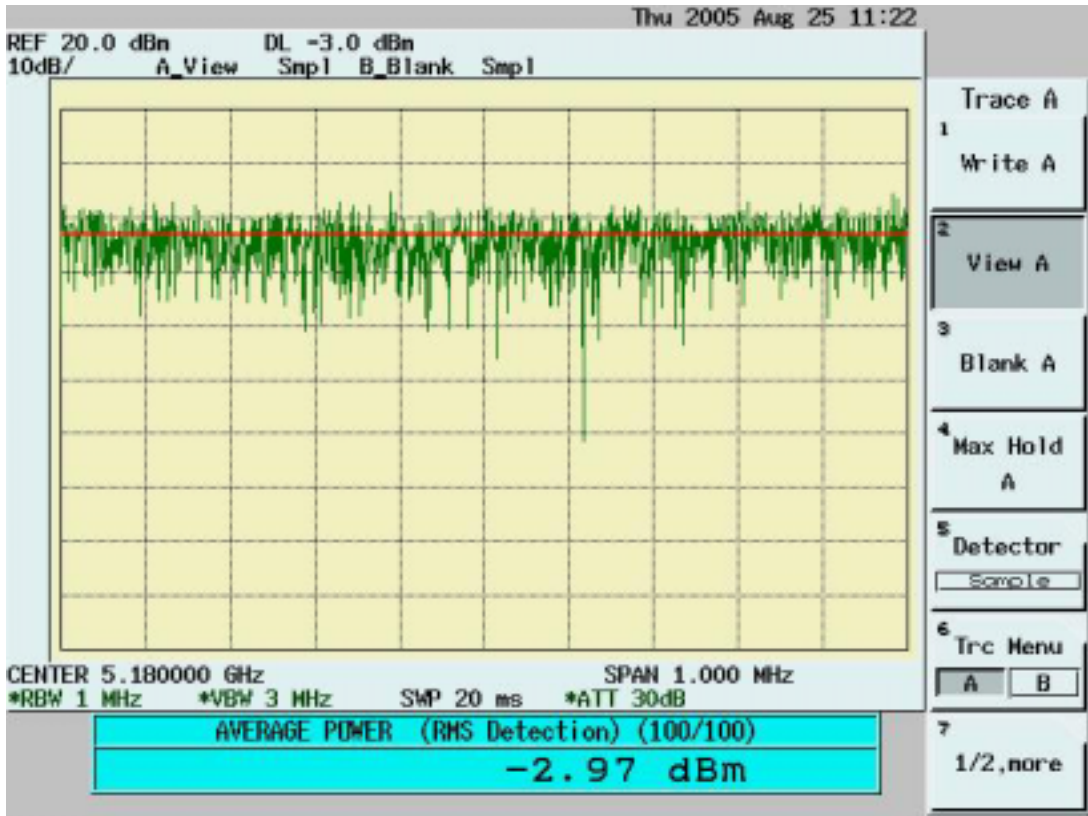
Maximum Peak Output Power Density

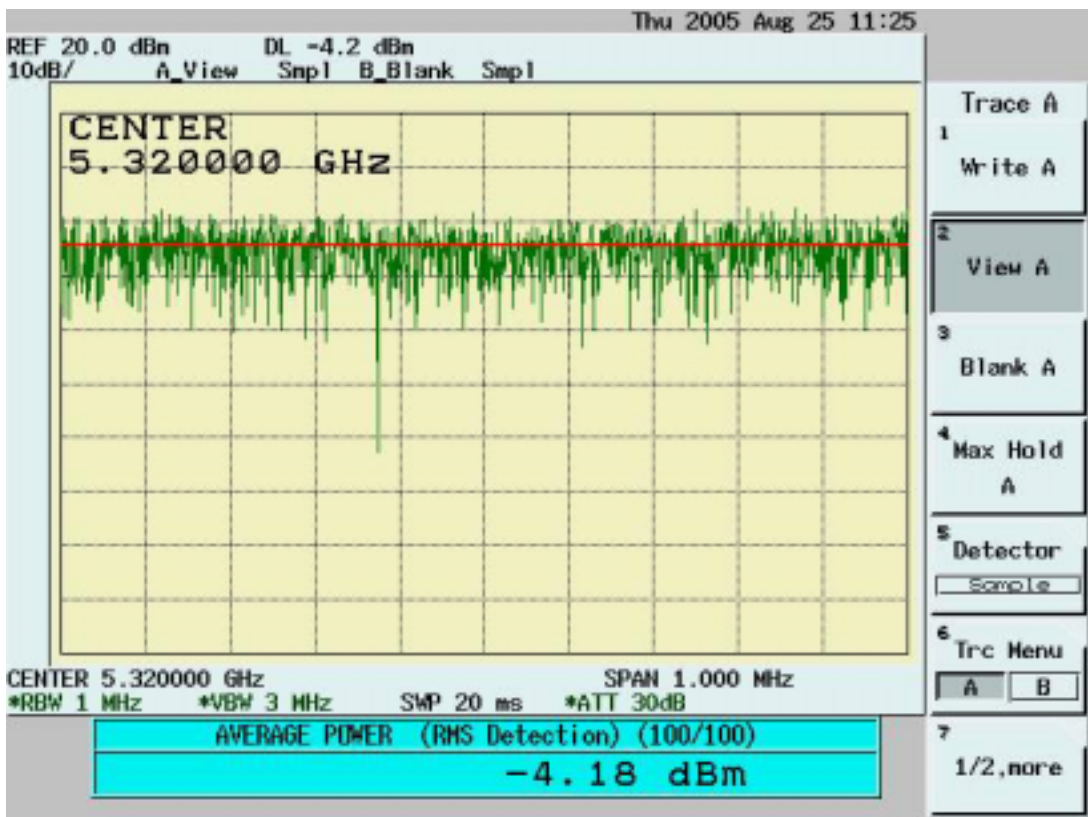
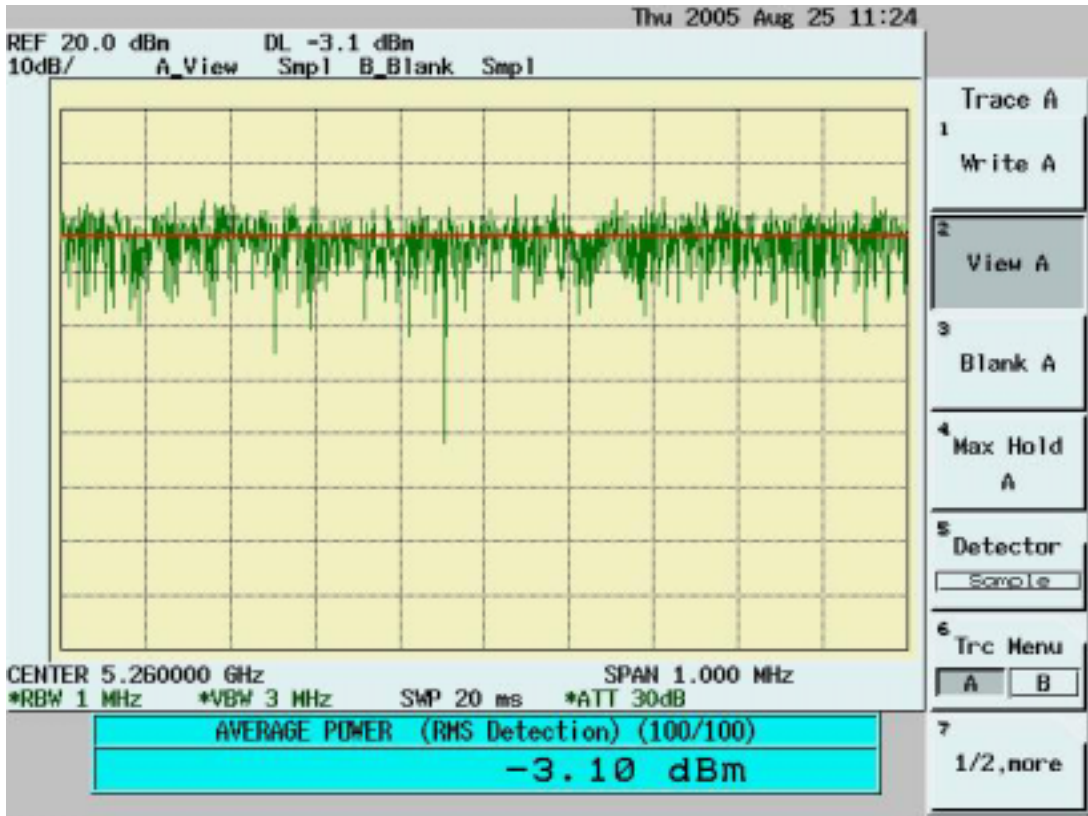
Temperature ():25

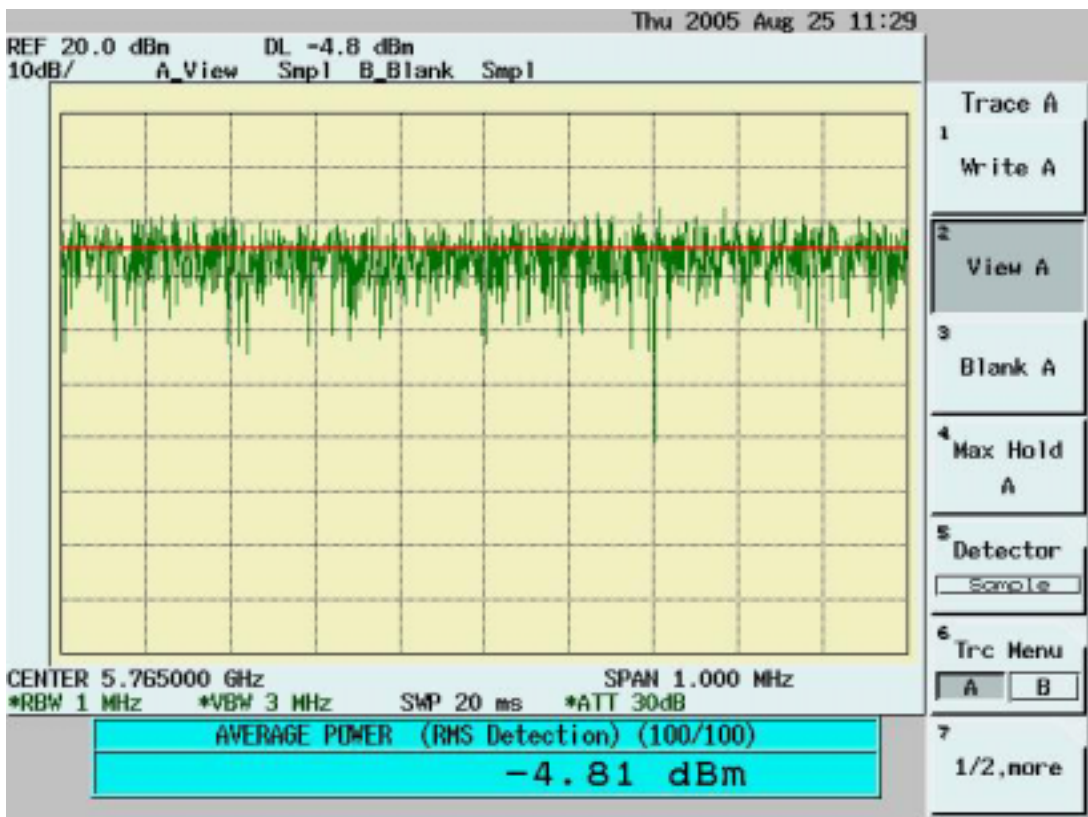
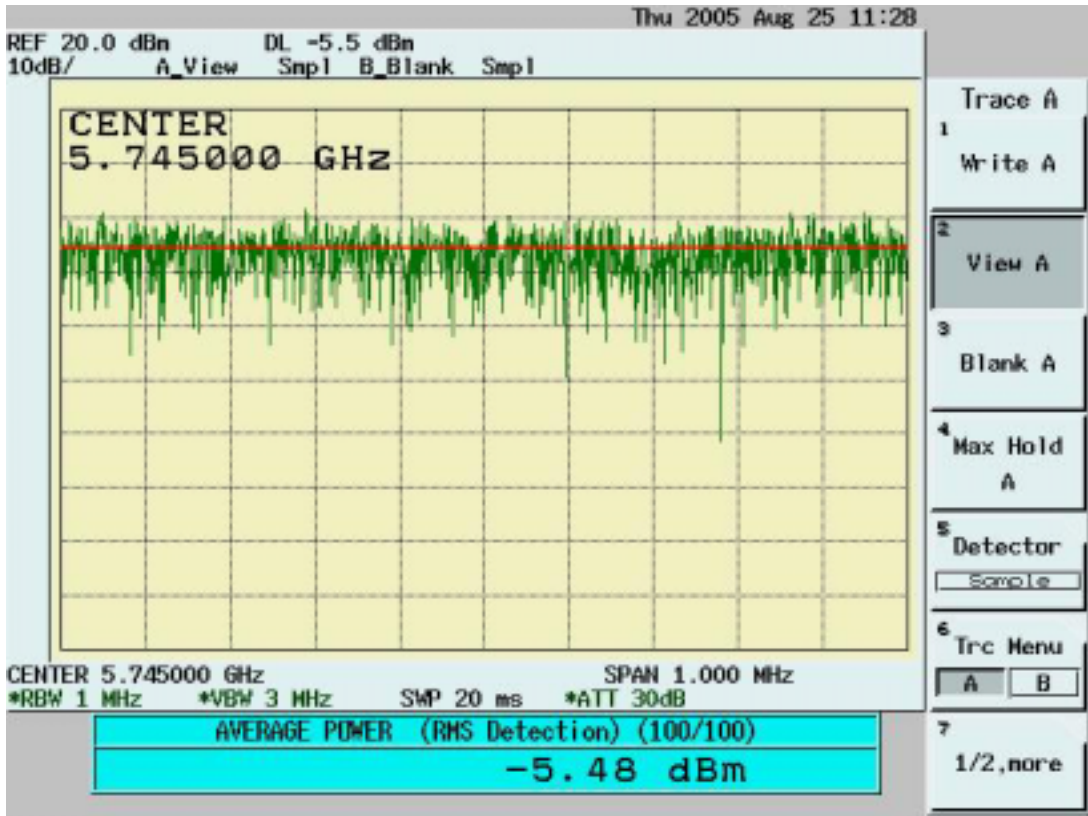
Test Engineer:Jerry Chiou

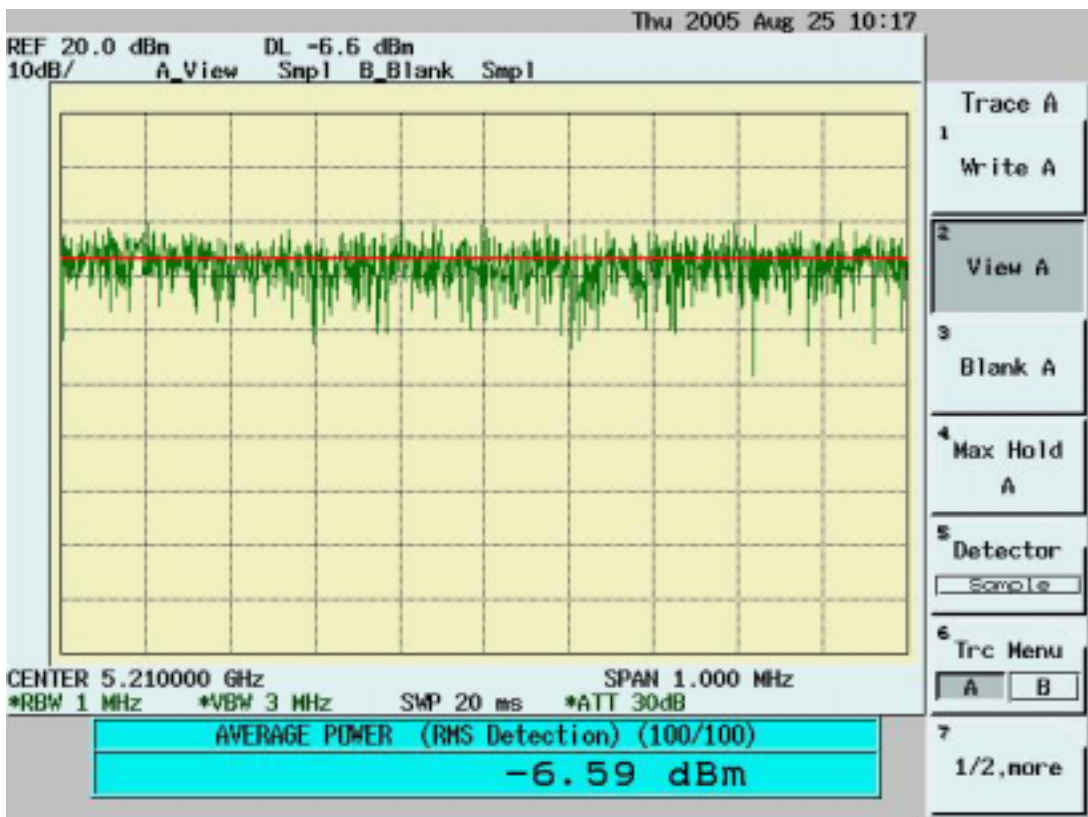
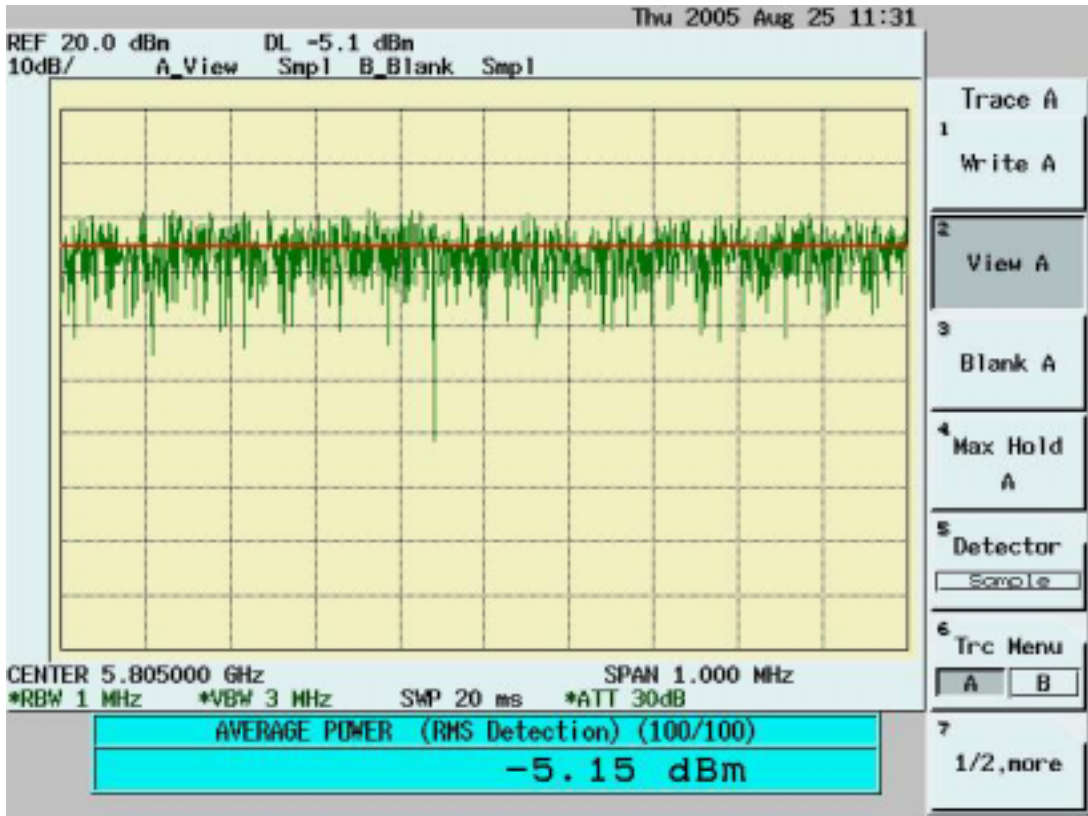
Humidity (%):50

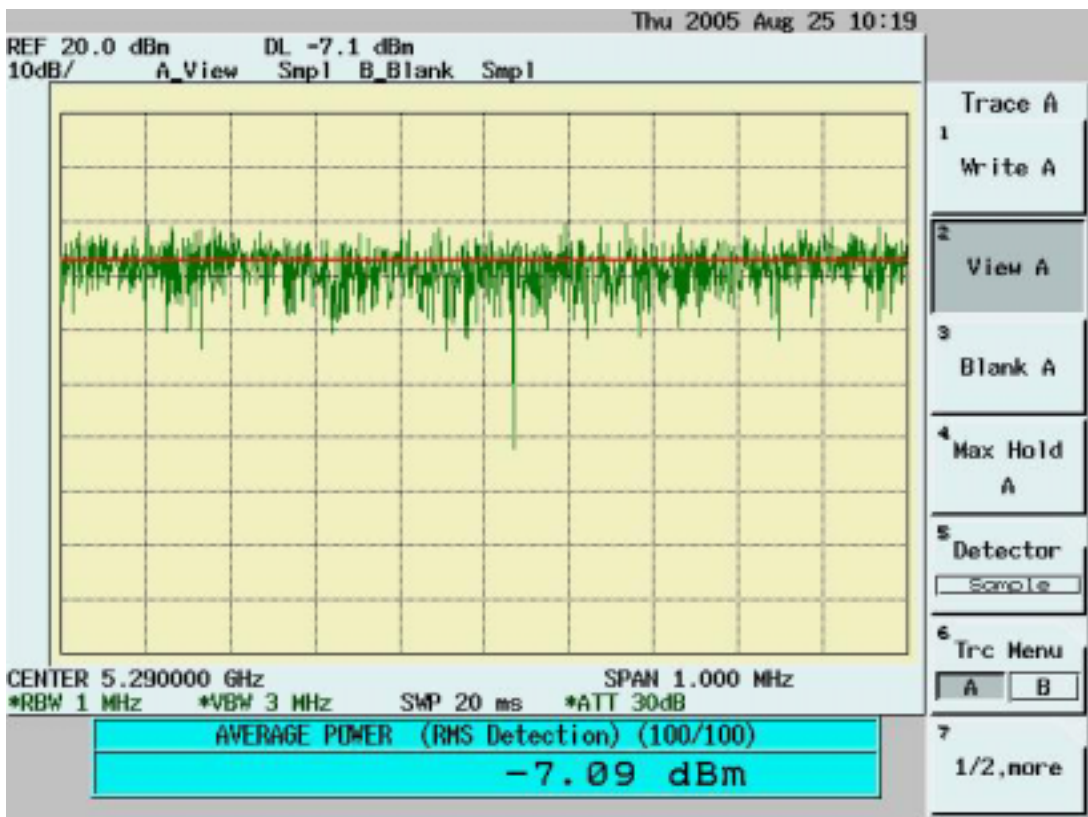
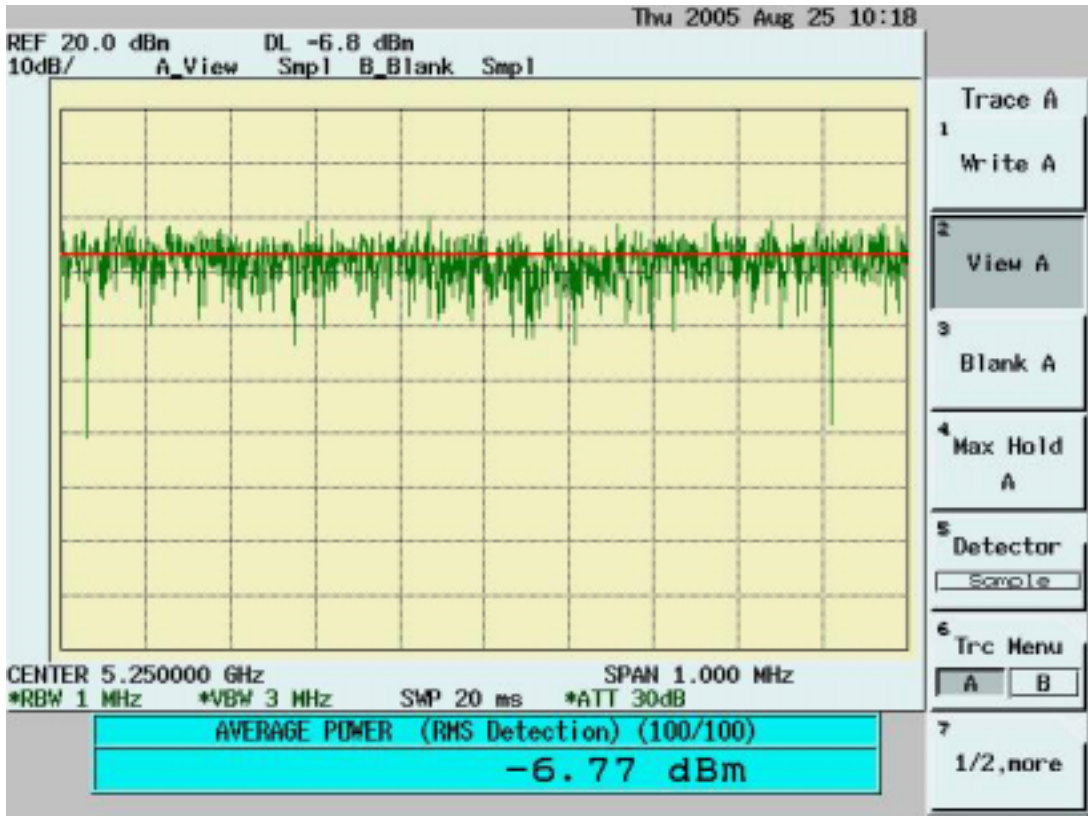
Channel	Frequency (Mhz)	Spectrum Reading (dBm)	Cable Loss(dB)	Peak Power Output dBm/MHz)	Limit (dBm/Mhz)	Pass/Fail
1	5210	-6.59	1.80	-4.79	4	Pass
2	5250	-6.77	1.80	-4.97	4	Pass
3	5290	-7.09	1.80	-5.29	11	Pass
4	5760	-8.45	1.80	-6.65	11	Pass
5	5800	-14.21	1.80	-12.41	17	Pass

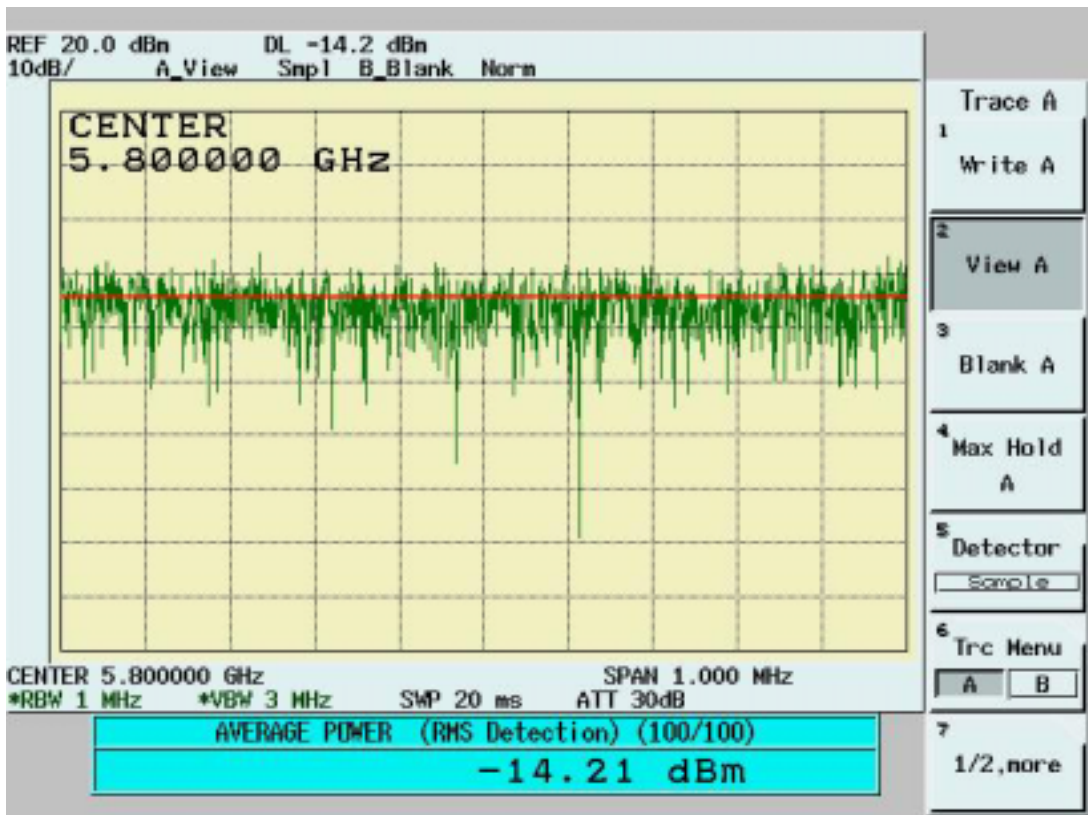
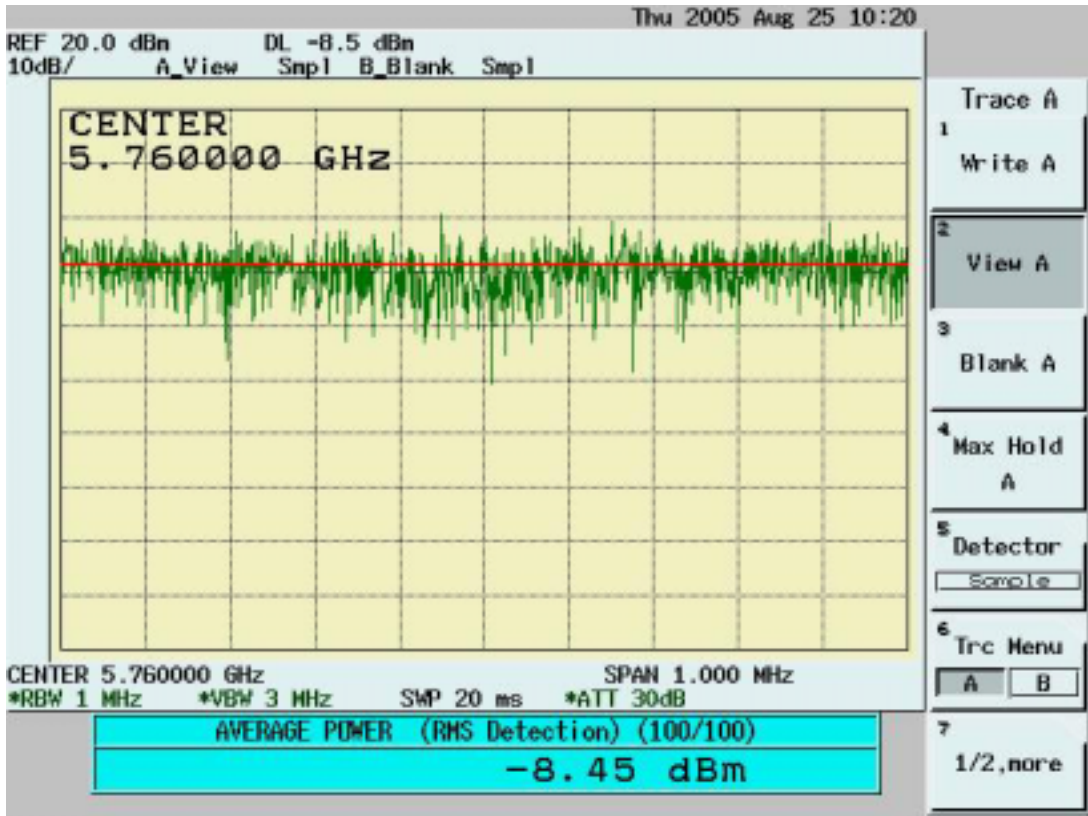










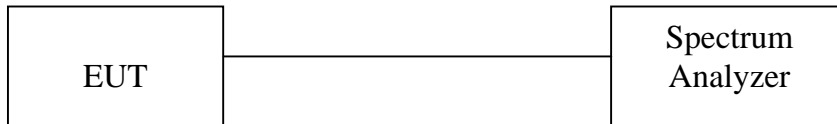


4.3 Peak Power Excursion Measurement [Section 15.407(a)(6)]

4.3.1 Test Procedure

1. The Transmitter output of EUT was connected to the spectrum analyzer.
2. Frequency SPAN of Spectrum: 30MHz or 50MHz.
3. Trace 1 : RBW: 1MHz, VBW: 3MHz. Using positive detector and Max -hold
4. Trace 2 : RBW: 1MHz, VBW: 3MHz. Using Sample detector and Max-hold
5. 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 ():25

Test Engineer:Jerry Chiou

Humidity (%):50

Channel	Frequency (Mhz)	Peak Power Excursion (dBm)	Limit (dBm)	Pass/Fail
1	5180	9.43	13	Pass
4	5240	9.29	13	Pass
5	5260	9.76	13	Pass
8	5320	9.44	13	Pass
9	5745	9.93	13	Pass
10	5765	9.82	13	Pass
12	5805	9.82	13	Pass

4.3.4 Test Data: (Turbo Mode)

Peak Power Excursion

Temperature ():25

Test Engineer:Jerry Chiou

Humidity (%):50

Channel	Frequency (Mhz)	Peak Power Excursion (dBm)	Limit (dBm)	Pass/Fail
1	5210	10.98	13	Pass
2	5250	10.09	13	Pass
3	5290	10.20	13	Pass
4	5760	9.98	13	Pass
5	5800	9.80	13	Pass

