FCC TEST REPORT

CATEGORY	:	Mobile
PRODUCT NAME	:	IEEE 802.11abg 54Mbps Wireless LAN miniPCI Card
FCC ID.	:	PPQ-WN2401A
FILING TYPE	:	Certification
BRAND NAME	:	LITE-ON
MODEL NAME	:	WN2401A
APPLICANT	:	**LITE-ON TECHNOLOGY CORP.** 2F, No. 6, Lane 359, Sec. 2, Chung-Shan Rd., Chung-Ho, Taiwan, R.O.C.
MANUFACTURER	:	**DONG GUAN G-COM COMPUTER CO., LTD.** 1st Row Yin Shan Rd., Yin Hwu Industrial Area, Qingxi Town, Dong Guan City, Guang Dong, China
ISSUED BY	:	**SPORTON INTERNATIONAL INC.** 6F, No. 106, Sec. 1, Hsin Tai Wu Rd., His Chih, Taipei Hsien, Taiwan, R.O.C.

Statements:

Only the test result of 802.11a part is shown in this test report.

The test result in this report refers exclusively to the presented test model / sample.
Without written approval of SPORTON International Inc., the test report shall not be reproduced except in full.

Certificate or Test Report could not be used by the applicant to claim the product endorsement by CNLA, NVLAP or any agency of U.S. government.

The test equipment used to perform the test are calibrated and traceable to NML/ROC or NIST/USA.

1190

ILAC MRA

Table of Contents

History of this test report

Original Report Issue Date: May 28, 2005

Report No.: FR552801

■ No additional attachment.

☐ Additional attachment were issued as following record:

Attachment No.	Issue Date	Description

CERTIFICATE OF COMPLIANCE

with

47 CFR FCC Part 15 Subpart E (Section 15.407)

PRODUCT NAME	:	IEEE 802.11abg 54Mbps Wireless LAN miniPCI Card
BRAND NAME	:	LITE-ON
MODEL NAME	:	WN2401A
APPLICANT	:	**LITE-ON TECHNOLOGY CORP.** 2F, No. 6, Lane 359, Sec. 2, Chung-Shan Rd., Chung-Ho, Taiwan, R.O.C.
MANUFACTURER	:	**DONG GUAN G-COM COMPUTER CO., LTD.** 1st Row Yin Shan Rd., Yin Hwu Industrial Area, Qingxi Town, Dong Guan City, Guang Dong, China

I **HEREBY** CERTIFY THAT:

The measurements shown in this test report were made in accordance with the procedures given in ANSI C63.4 - 2003 and all test are performed according to 47 CFR FCC Part 15. Testing was carried out on Jun. 1, 2005 at SPORTON International Inc. LAB.

Dr. Alan Lane
Vice General Manager
Sporton International Inc.

1. General Description of Equipment under Test

1.1. Applicant

LITE-ON TECHNOLOGY CORP.
2F, No. 6, Lane 359, Sec. 2, Chung-Shan Rd., Chung-Ho, Taiwan, R.O.C.

1.2. Manufacturer

DONG GUAN G-COM COMPUTER CO., LTD.
1st Row Yin Shan Rd., Yin Hwu Industrial Area, Qingxi Town, Dong Guan City, Guang Dong, China

1.3. Basic Description of Equipment under Test

This product is a Wireless LAN mini PCI card with 802.11a/b/g wireless solution. The technical data has been listed on section " Features of Equipment under Test ". This report is for 802.11a configuration only.

1.4. Features of Equipment under Test

Items	Description
Type of Modulation	OFDM (16QAM / 64QAM / DQPSK / DBPSK)
Number of Channels	17
Frequency Band	5150MHz ~ 5250MHz, 5250MHz ~ 5350MHz, 5725MHz ~ 5825MHz
Carrier Frequency	See section 1.6 for details
Data Rate	6, 12,18, 24,36, 48, 54, 108 Mbps
Channel Bandwidth	18MHz
Max. Conducted Output Power	See section 1.7 for details
Antenna Type	See section 1.5 for details
Communication Type	Half-Duplex
Testing Duty Cycle	100.00%
Power Rating (DC/AC, Voltage)	3.3 VDC (from host)
Temperature Range (Operating)	0 ~ 45 °C

1.5. Antenna Description

No.	Antenna Type	Antenna Connector	Gain (dBi)
1	Dipole Antenna	UFL	1.00
2	Dipole Antenna	Reversed SMA or UFL	1.00
3	Dipole Antenna	Reversed SMA or UFL	1.00
4	Dipole Antenna	Reversed SMA or UFL	1.00

1.6. Table for Carrier Frequencies

Normal Mode

Frequency Bands					
5150MHz ~ 5250MHz		**5250MHz ~ 5350MHz**		**5725MHz ~ 5825MHz**	
Channel	**Frequency**	**Channel**	**Frequency**	**Channel**	**Frequency**
36	5180 MHz	52	5260 MHz	149	5745 MHz
40	5200 MHz	56	5280 MHz	153	5765 MHz
44	5220 MHz	60	5300 MHz	157	5785 MHz
48	5240 MHz	64	5320 MHz	161	5805 MHz

Turbo Mode

Frequency Bands					
5150MHz ~ 5250MHz		**5250MHz ~ 5350MHz**		**5725MHz ~ 5825MHz**	
Channel	**Frequency**	**Channel**	**Frequency**	**Channel**	**Frequency**
42	5210 MHz	58	5290 MHz	152	5760 MHz
50	5250 MHz			160	5800 MHz

1.7. Table for Maximum Conducted Output Power

Normal Mode

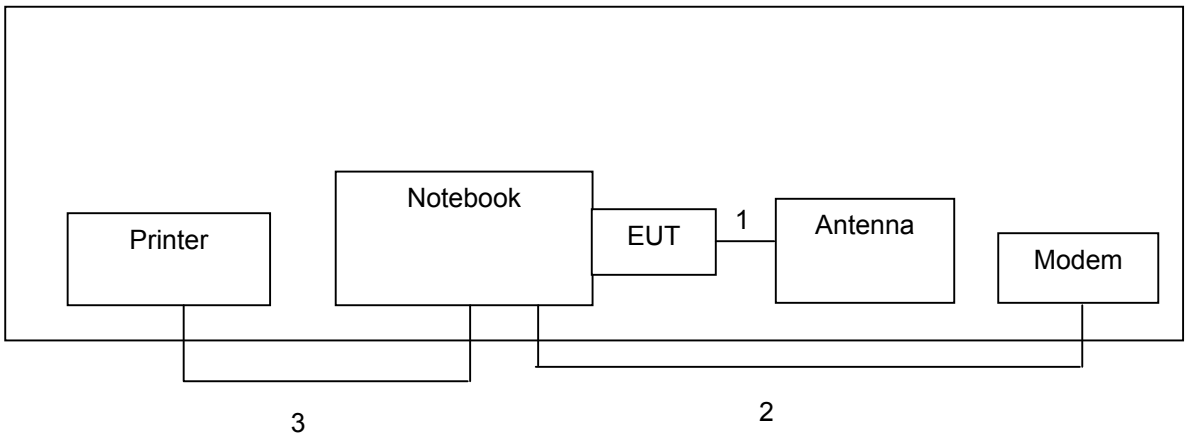
Maximum Conducted Output Power (dBm)		
Frequency Bands 5150MHz ~ 5250MHz	**Frequency Bands 5250MHz ~ 5350MHz**	**Frequency Bands 5725MHz ~ 5825MHz**
15.31	16.17	16.63

Turbo Mode

Maximum Conducted Output Power (dBm)		
Frequency Bands 5150MHz ~ 5250MHz	**Frequency Bands 5250MHz ~ 5350MHz**	**Frequency Bands 5725MHz ~ 5825MHz**
16.56	16.46	16.68

2. Test Configuration of the Equipment under Test

2.1. Connection Diagram of Test System



1. Antenna Cable, 0.1m non-shielding
2. RS232 Cable, 1.7m shielding
3. LPT cable, 1.35m shielding

2.2. The Test Mode Description

1. For OFDM modulation, BPSK (6 Mbps) is the worst case on all test items.
2. According to ANSI C63.4-2003: Frequency range of EUT is more than 10 MHz, we have to test the lowest, middle and highest channels of EUT.
3. Spurious emission below 1GHz is independent of channel selection and modulation types. So only channel 64 with OFDM modulation was tested.
4. AC conduction emission is independent of channel selection and modulation types. So only channel 64 with OFDM modulation was tested.
5. There are 4 antennas filed in this product, but they are all in the same type and with the same antenna gain, so only antenna 1 was performed in this report.

2.3. Description of Test Supporting Units

Support unit	Brand	Model No.	Serial No.	FCC ID	Data cable (m)
Notebook	DELL	PP01L	-	DoC	-
Printer	EPSON	LQ-680	-	DoC	1.35
Modem	ACEEX	DM141	-	IFAXDM141	1.70

3. General Information of Test

3.1. Test Facility

Test Site Location : No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiag, Tao Yuan Hsien, Taiwan, R.O.C.
: TEL 886-3-327-3456
: FAX 886-3-318-0055

Test Site No : 03CH03-HY / TH01-HY / CO04-HY

3.2. Test Conditions

Normal Voltage : 3.3VDC (from host)
Normal Temperature : 20°C
Extreme Temperature : 0 °C and 45 °C

3.3. Standards for Methods of Measurement

Here is the list of the standards followed in this test report.
ANSI C63.4-2003
47 CFR Part 15 Subpart E (Section 15.407)

3.4. Frequency Range Investigated

Radiated emission test: from 9 kHz to 10th carrier harmonic.

3.5. Test Distance

The test distance of radiated emission (9kHz~1GHz) test from antenna to EUT is 3 M.
The test distance of radiated emission (1GHz~10th carrier harmonic) test from antenna to EUT is 3 M.

3.6. Test Software

Executed “ART” to keep receiving signals at fixed frequency.

Normal Mode

Test Software: ART					
Frequency Bands					
5150MHz ~ 5250MHz		5250MHz ~ 5350MHz		5725MHz ~ 5825MHz	
Frequency	Power Setup	Frequency	Power Setup	Frequency	Power Setup
5180 MHz	14.5	5260 MHz	15	5745 MHz	15
5200 MHz	-	5280 MHz	-	5785 MHz	15
5240 MHz	-	5320 MHz	15	5805 MHz	15

Turbo Mode

Frequency Bands					
5150MHz ~ 5250MHz		5250MHz ~ 5350MHz		5725MHz ~ 5825MHz	
Frequency	Power Setup	Frequency	Power Setup	Frequency	Power Setup
5210 MHz	15	5290 MHz	15	5760 MHz	15
5250 MHz	15			5800 MHz	15

4. List of Measurements

4.1. Summary of the Test Results

Applied Standard: 47 CFR Part 15 and Part 2			
Paragraph	**FCC Rule**	**Description of Test**	**Result**
5.1	15.407	26dB Spectrum Bandwidth	Pass
5.2	15.407	Maximum Conducted Output Power	Pass
5.3	15.407	Peak Power Spectral Density	Pass
5.4	15.407	Ratio of the Peak Excursion	Pass
5.5	15.407	Band Edges Emission	Pass
5.6	15.407	Test of Frequency Stability	Pass
5.7	15.407	AC Power Line Conducted Emission	Pass
5.8	15.209/15.407	Spurious Radiated Emission	Pass
5.9	15.203/15.407	Antenna Requirement	Pass
5.10	2.1091	Maximum Permissible Exposure	Pass

5. Test Result

5.1. Test of 26dB Spectrum Bandwidth

5.1.1. Measuring Instruments

Item 18 of the table on section 6.

5.1.2. Test Procedures

1. The transmitter output was connected to the spectrum analyzer through an attenuator.
2. Set RBW of spectrum analyzer to 300KHz and VBW to 1000KHz.
3. The 26dB bandwidth is the spectrum width with level higher than 26dB below the peak level.

5.1.3. Test Setup Layout

Spectrum Analyzer **EUT**

5.1.4. Test Result: See spectrum analyzer plots below

- Temperature: 24°C
- Relative Humidity: 51%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Sam Lee

Normal Mode

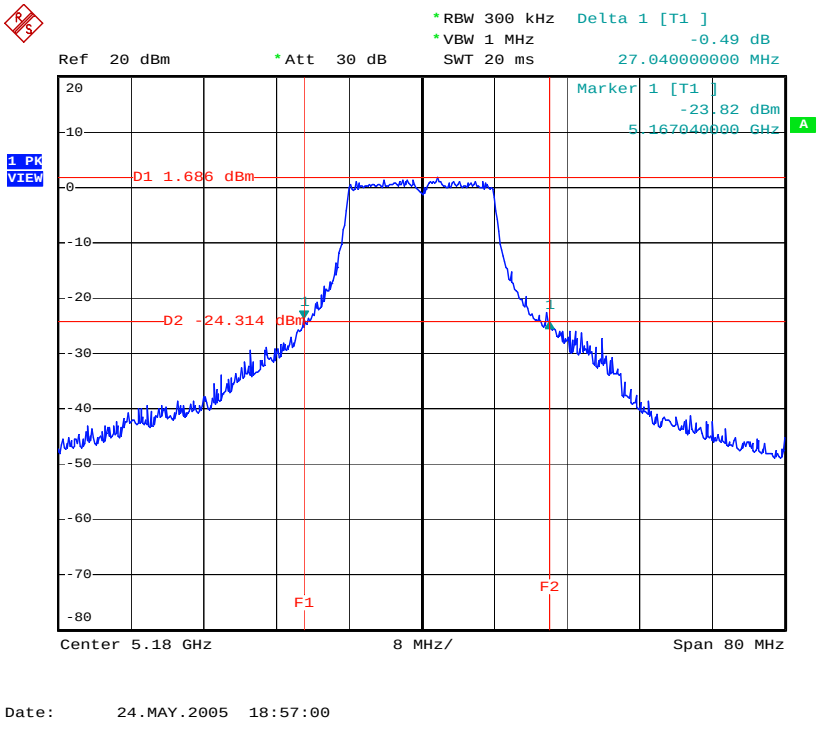
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Calculated Power Limit (dBm)	Applied Power Limit (dBm)
36	5180 MHz	27.04	18.32	17
52	5260 MHz	24.80	24.94	24
64	5320 MHz	25.28	25.03	24
149	5745 MHz	25.60	31.08	30
153	5765 MHz	25.76	31.11	30
161	5805 MHz	26.40	31.12	30

Turbo Mode

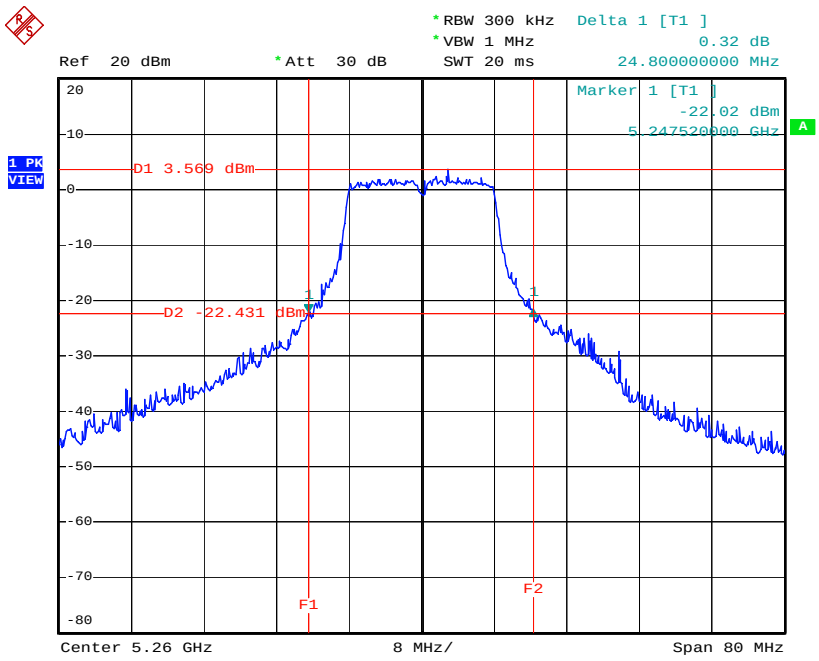
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	Calculated Power Limit (dBm)	Applied Power Limit (dBm)
42	5210 MHz	54.6	21.37	17
50	5250 MHz	56.6	21.53	17
58	5290 MHz	54.8	28.39	24
152	5760 MHz	49.2	33.92	30
160	5800 MHz	46.8	33.70	30

Normal Mode

Channel: 36 / 5180 MHz



Channel: 52 / 5260 MHz



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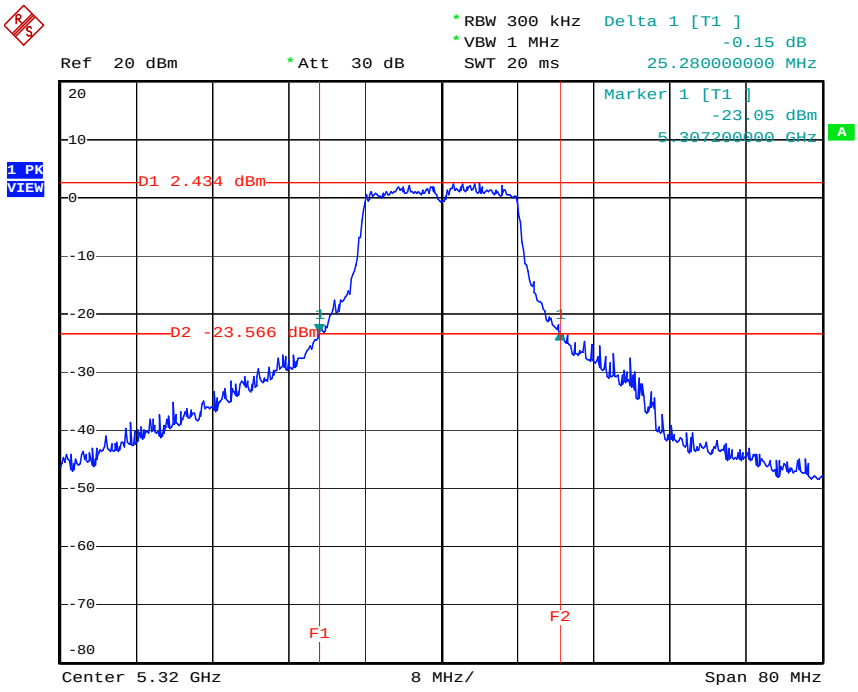
Channel: 64 / 5320 MHz



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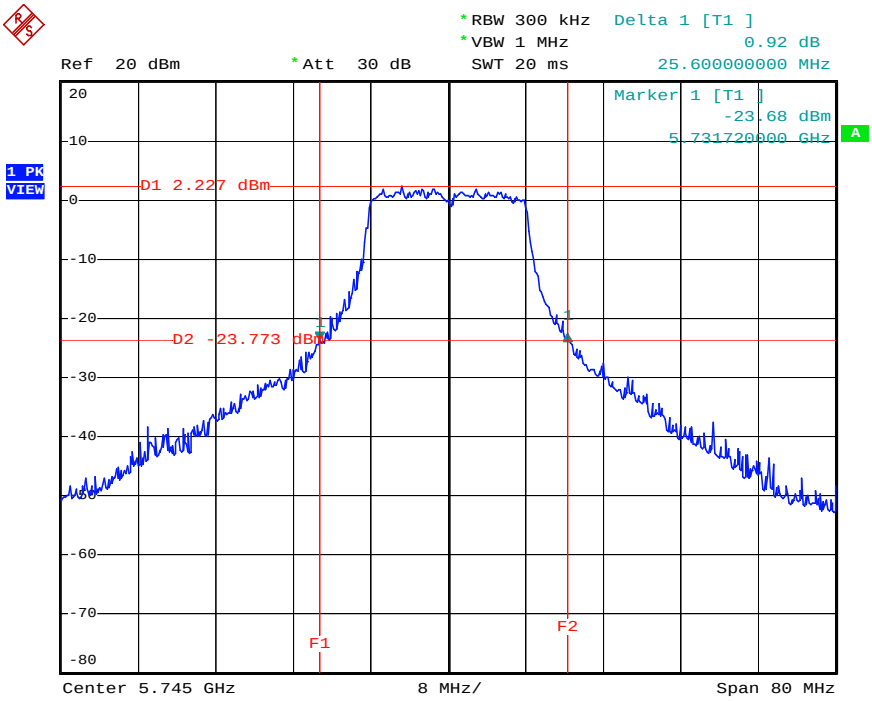
Channel: 149 / 5745 MHz



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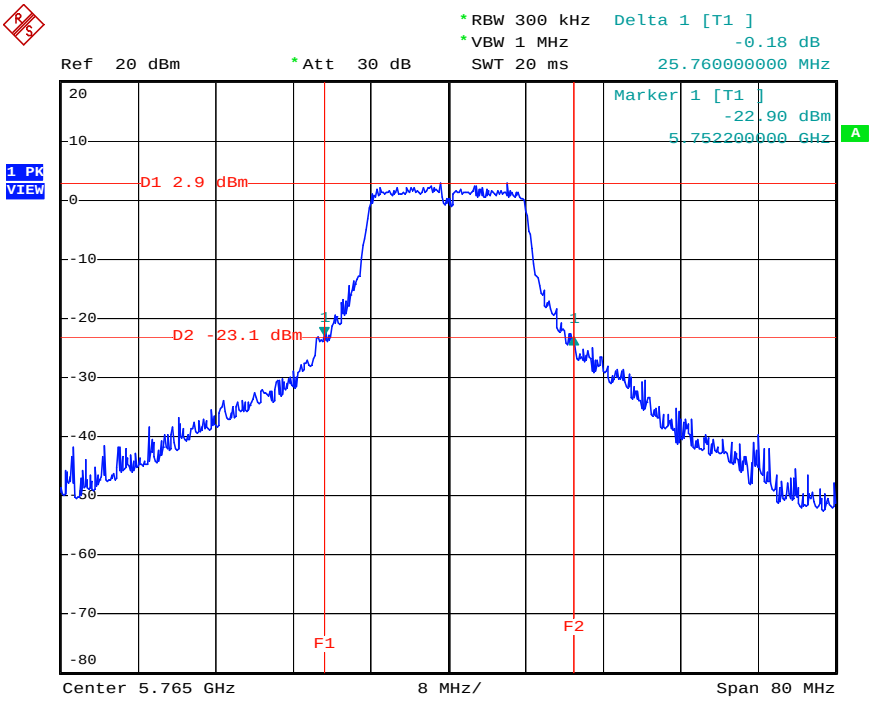
Channel: 153 / 5765MHz



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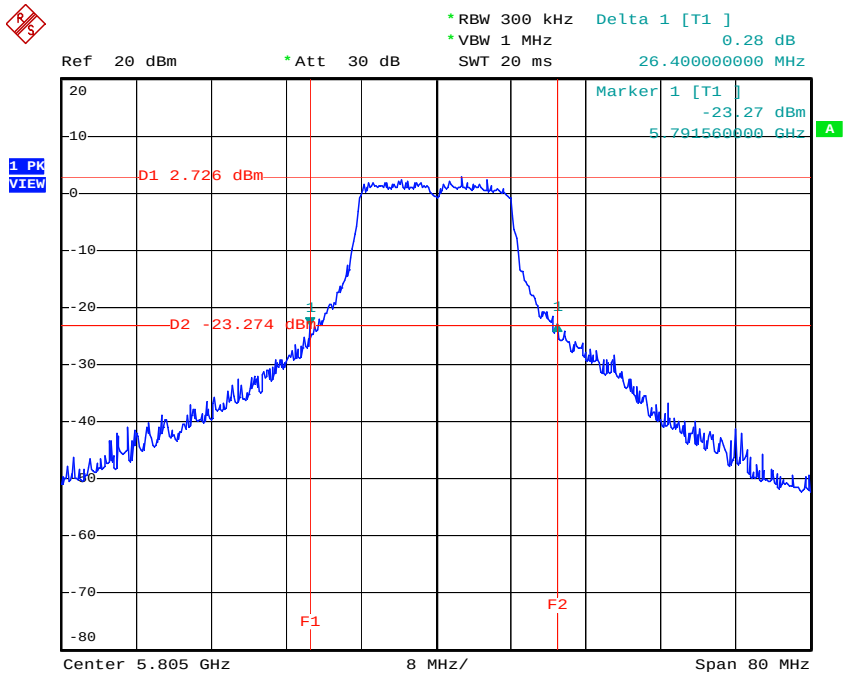
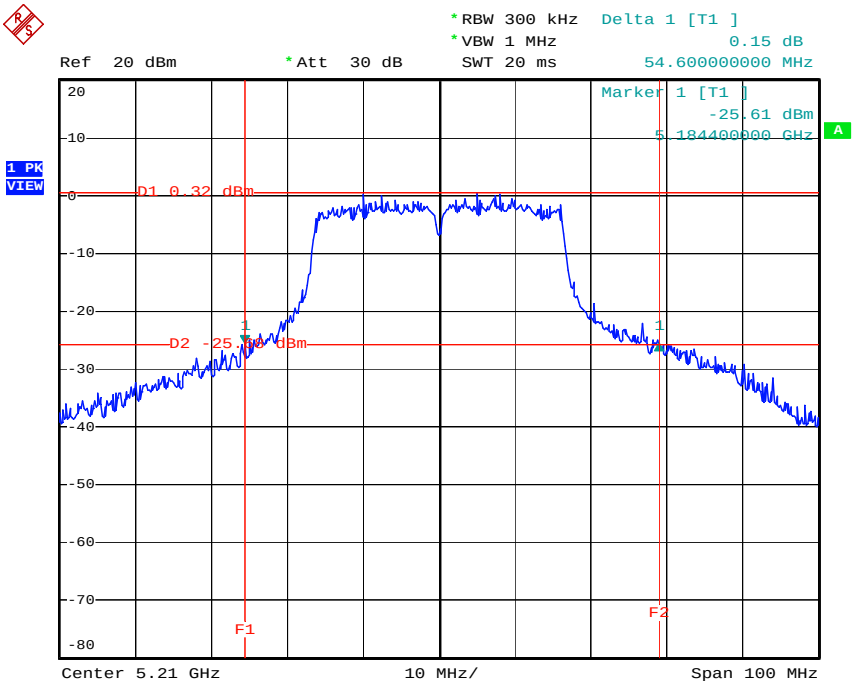
Channel: 161 / 5805 MHz

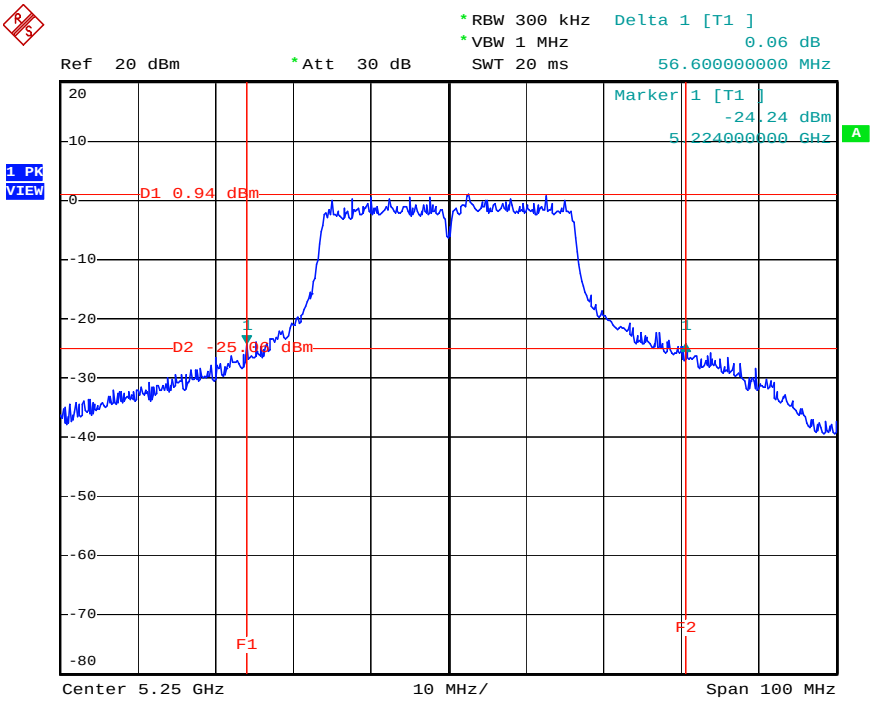


Turbo Mode

Channel: 42 / 5210 MHz



Channel: 50 / 5250 MHz



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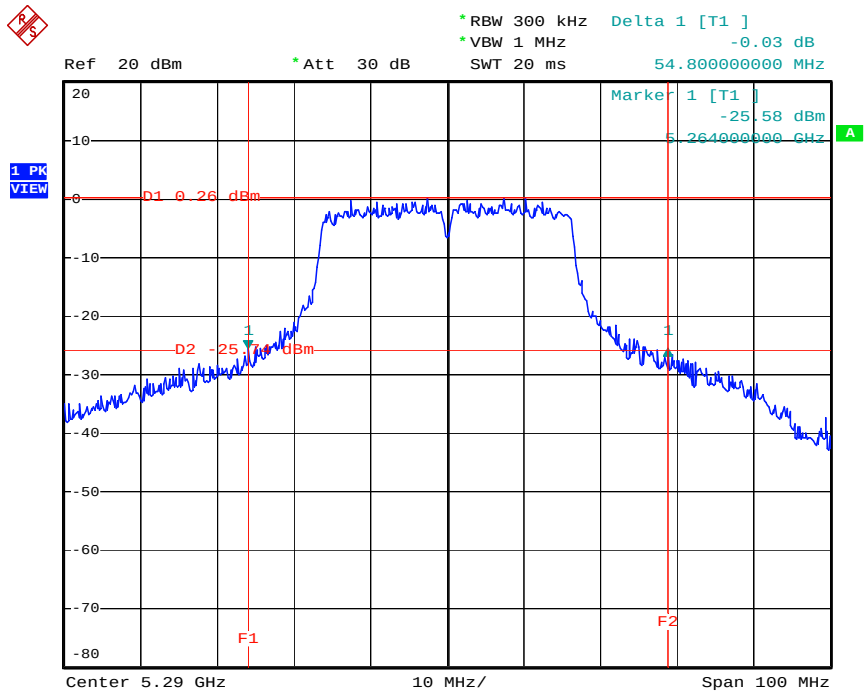
Channel: 58 / 5290 MHz



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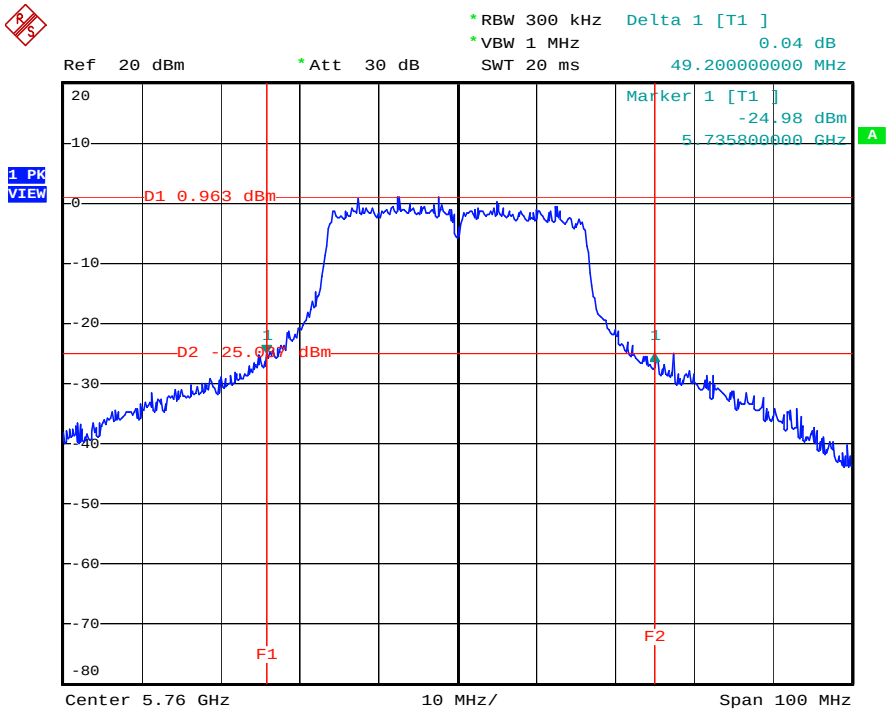
Channel: 152 / 5760 MHz



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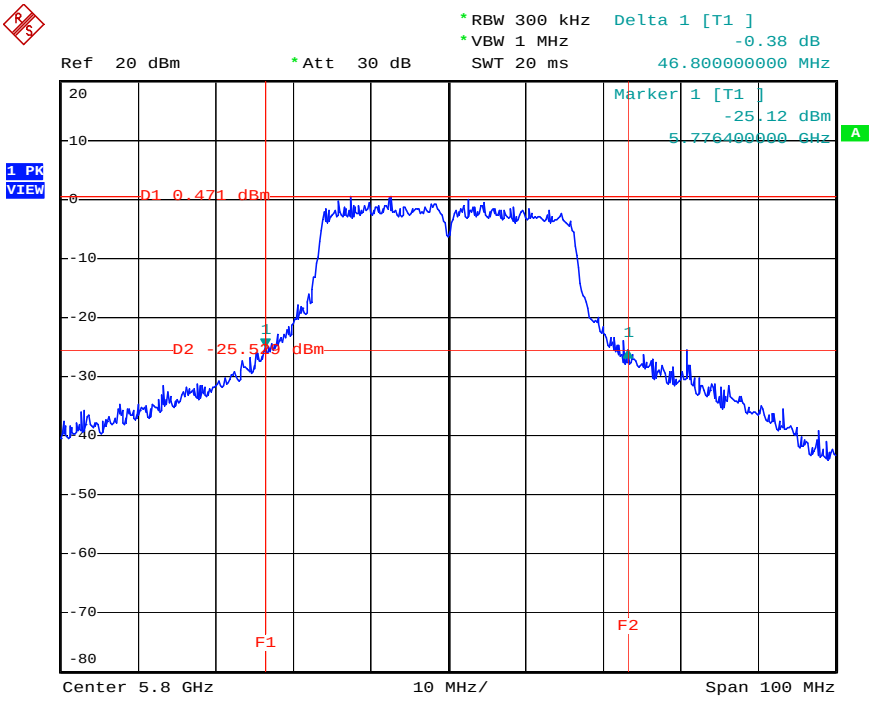
Channel: 160 / 5800 MHz



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5.2. Test of Maximum Conducted Output Power

5.2.1. Measuring Instruments

Item 18 of the table on section 6.

5.2.2. Test Procedures

1. According to FCC DA 02-2138 test procedure, EUT connected to spectrum analyzer, then used the channel power function of spectrum analyzer and calculated total average power with spectrum range more than 26dB bandwidth.
2. Repeated 1 for the middle and highest channel of the EUT.

5.2.3. Test Setup Layout

Spectrum Analyzer **EUT**

5.2.4. Test Result of Conducted Power

- Temperature: 24°C
- Relative Humidity: 51%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Sam Lee

Normal Mode

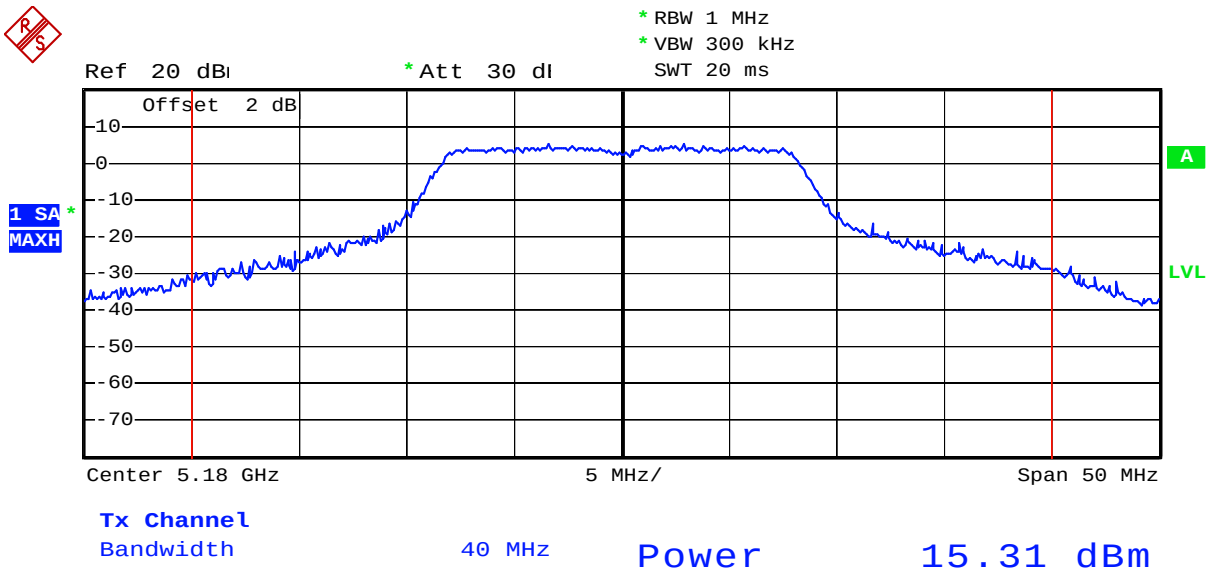
Channel	Frequency (MHz)	Output Power (dBm)	Limits (dBm)
36	5180 MHz	15.31	17
52	5260 MHz	16.12	24
64	5320 MHz	16.17	24
149	5745 MHz	15.80	30
153	5765 MHz	16.63	30
161	5805 MHz	16.10	30

Turbo Mode

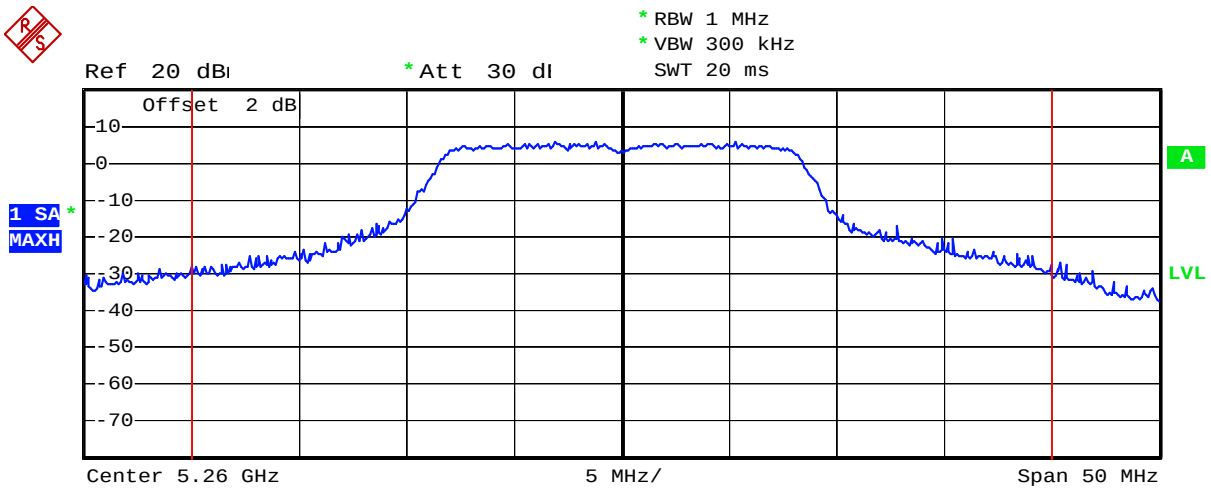
Channel	Frequency (MHz)	Output Power (dBm)	Limits (dBm)
42	5210 MHz	16.22	17
50	5250 MHz	16.56	17
58	5290 MHz	16.46	24
152	5760 MHz	16.68	30
160	5800 MHz	16.25	30

Normal Mode

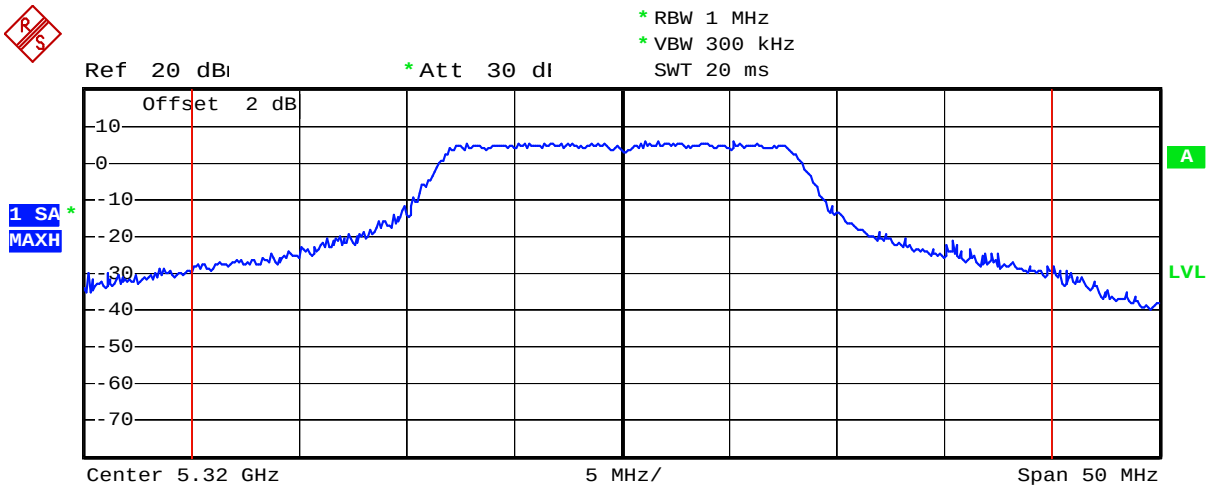
Channel: 36 / 5180 MHz



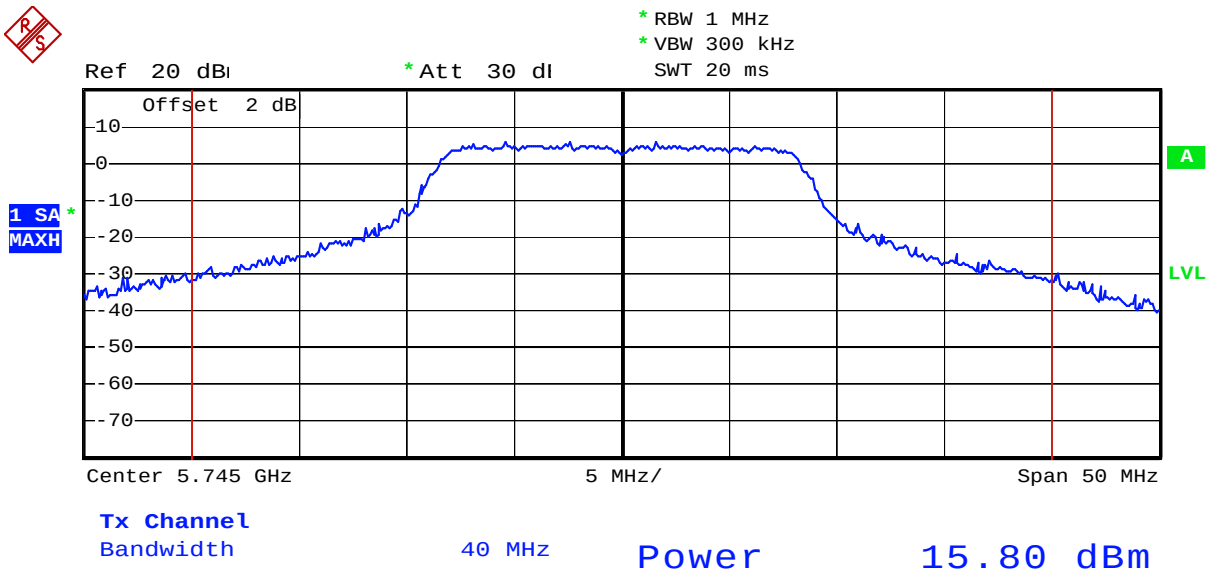
Channel: 52 / 5260 MHz



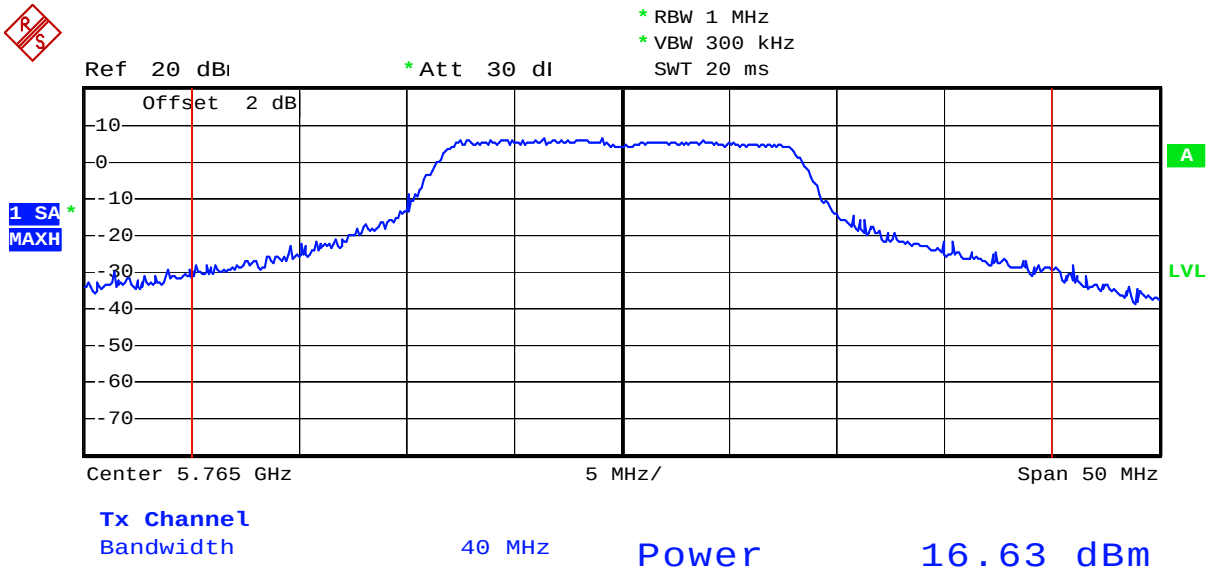
Channel: 64 / 5320 MHz



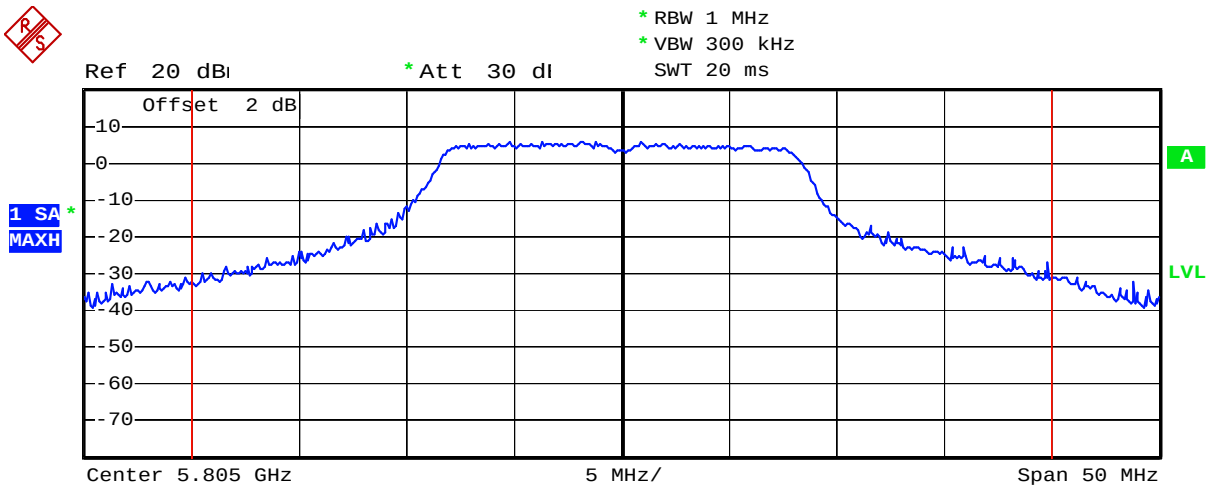
Channel: 149 / 5745 MHz



Channel: 153 / 5765MHz

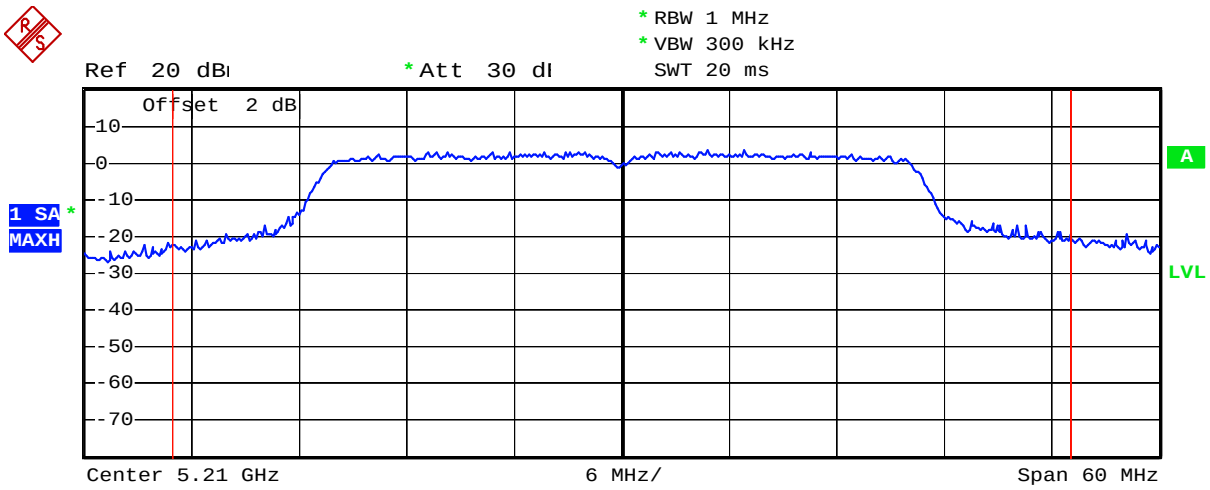


Channel: 161 / 5805 MHz

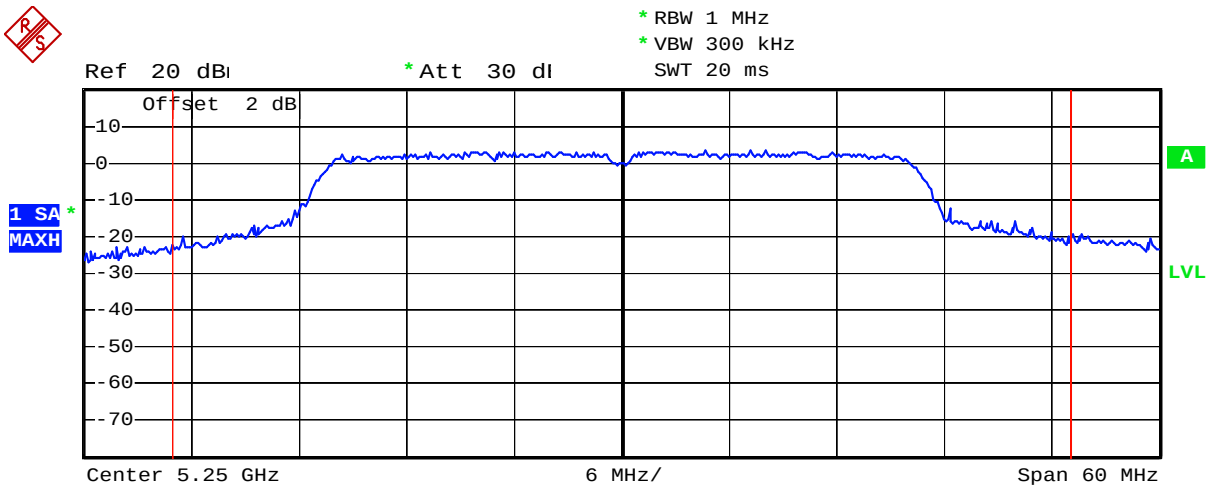


Turbo Mode

Channel: 42 / 5210 MHz

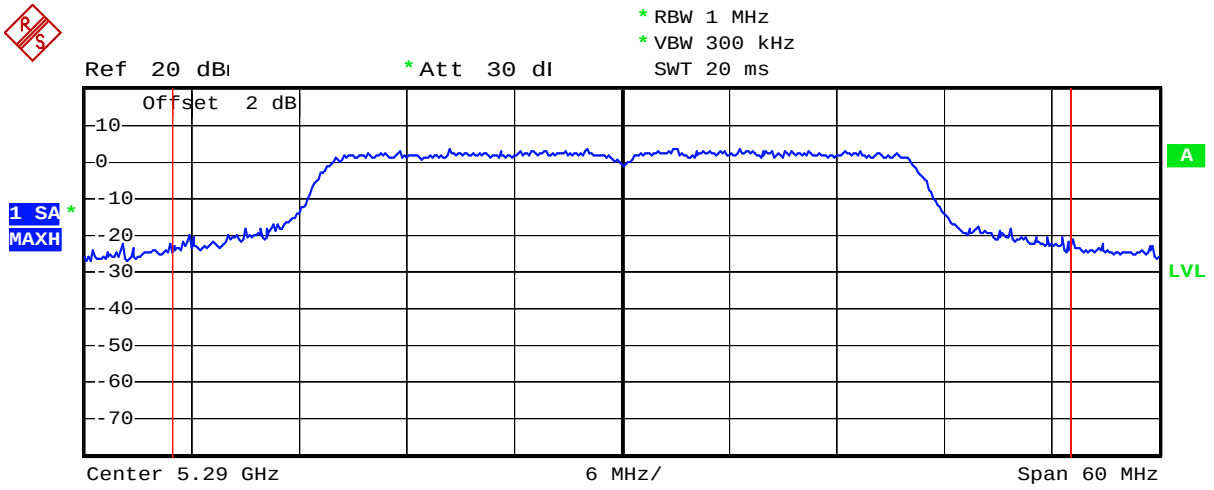


Channel: 50 / 5250 MHz



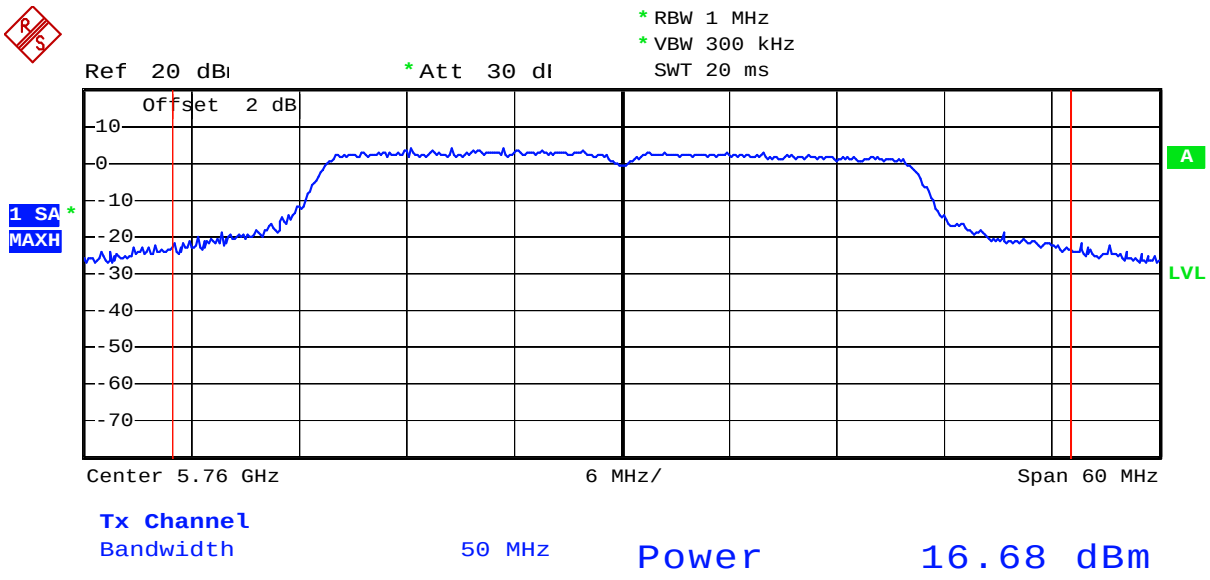
Tx Channel
Bandwidth 50 MHz Power 16.56 dBm

Channel: 58 / 5290 MHz

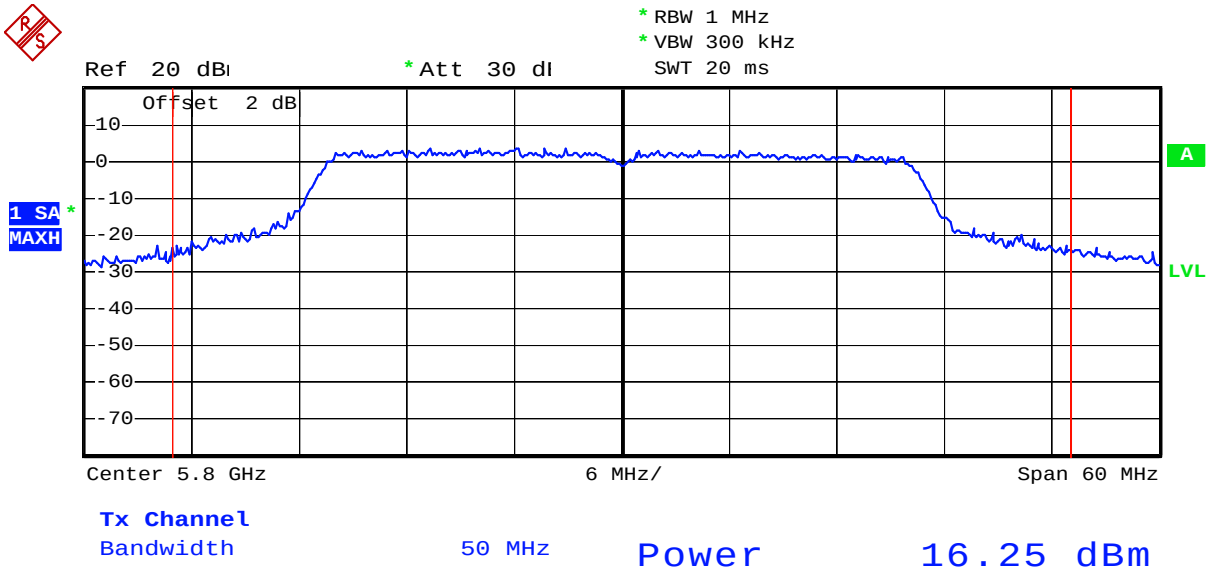


Tx Channel
Bandwidth 50 MHz Power 16.46 dBm

Channel: 152 / 5760 MHz



Channel: 160 / 5800 MHz



5.3. Test of Peak Power Spectral Density

5.3.1. Measuring Instruments

Item 18 of the table on section 6.

5.3.2. Test Procedures

1. According to FCC DA 02-2138 test procedure, EUT connected to spectrum analyzer, then used the same setup as that of power measurement of spectrum analyzer.
2. Repeated 1 for the middle and highest channel of the EUT.

5.3.3. Test Setup Layout

Spectrum Analyzer **EUT**

5.3.4. Test Result of conducted peak power spectral density

- Temperature: 24°C
- Relative Humidity: 51%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Sam Lee

Normal Mode

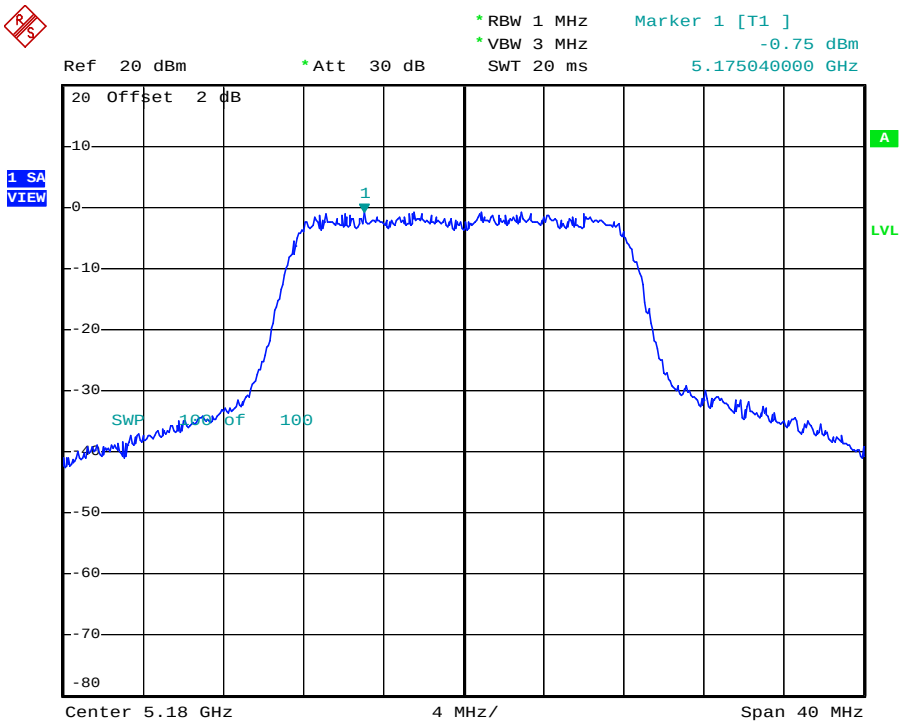
Channel	Frequency (MHz)	Power Density (dBm)	Limits (dBm)
36	5180 MHz	-0.75	4
52	5260 MHz	0.03	4
64	5320 MHz	0.18	11
149	5745 MHz	0.26	17
153	5765 MHz	0.44	17
161	5805 MHz	0.22	17

Turbo Mode

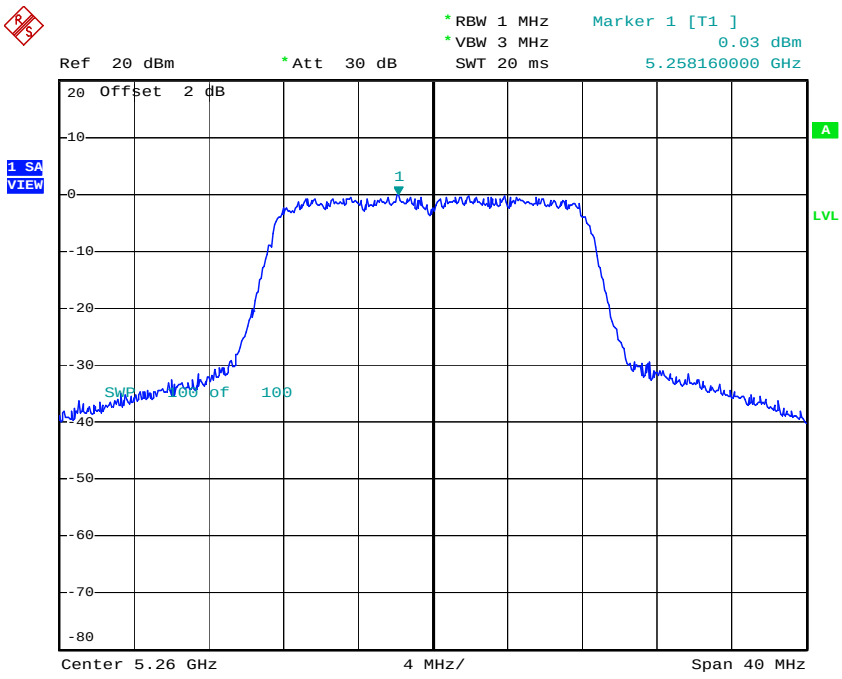
Channel	Frequency (MHz)	Power Density (dBm)	Limits (dBm)
42	5210 MHz	-2.55	4
50	5250 MHz	-2.13	4
58	5290 MHz	-2.85	11
152	5760 MHz	-2.25	17
160	5800 MHz	-2.94	17

Normal Mode

Channel: 36 / 5180 MHz



Channel: 52 / 5260 MHz



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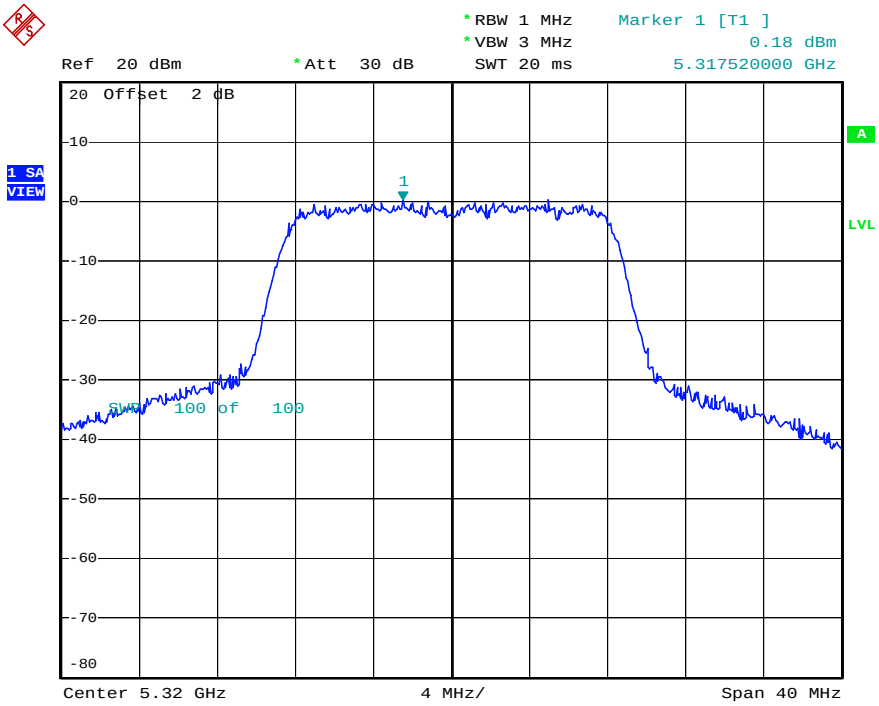
Channel: 64 / 5320 MHz



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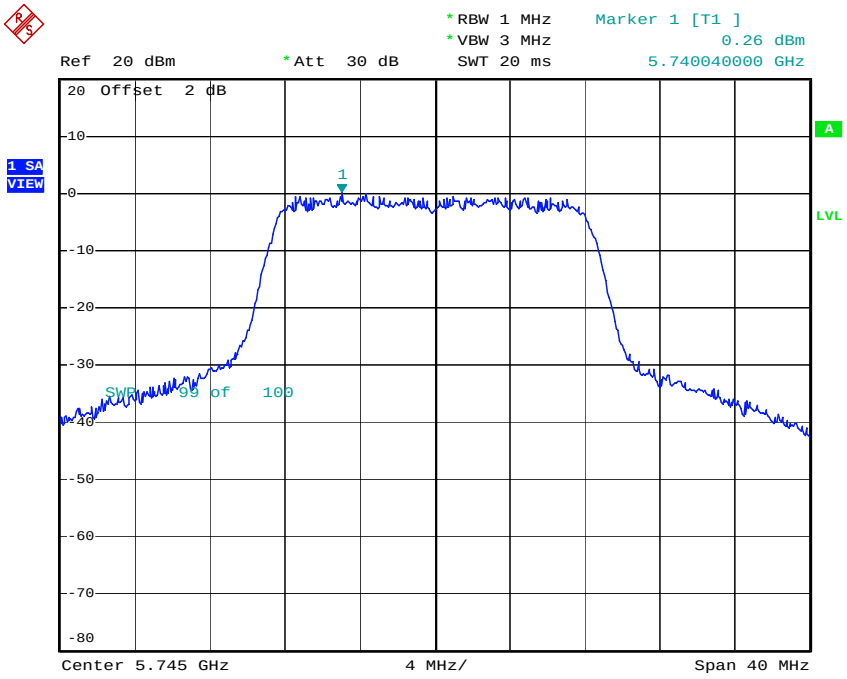
Channel: 149 / 5745 MHz



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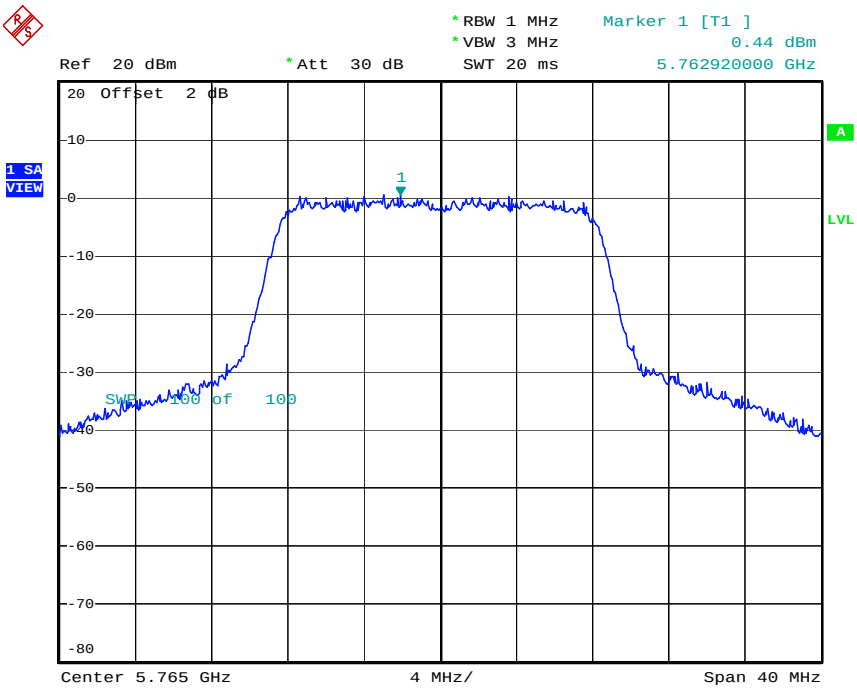
Channel: 153 / 5765MHz



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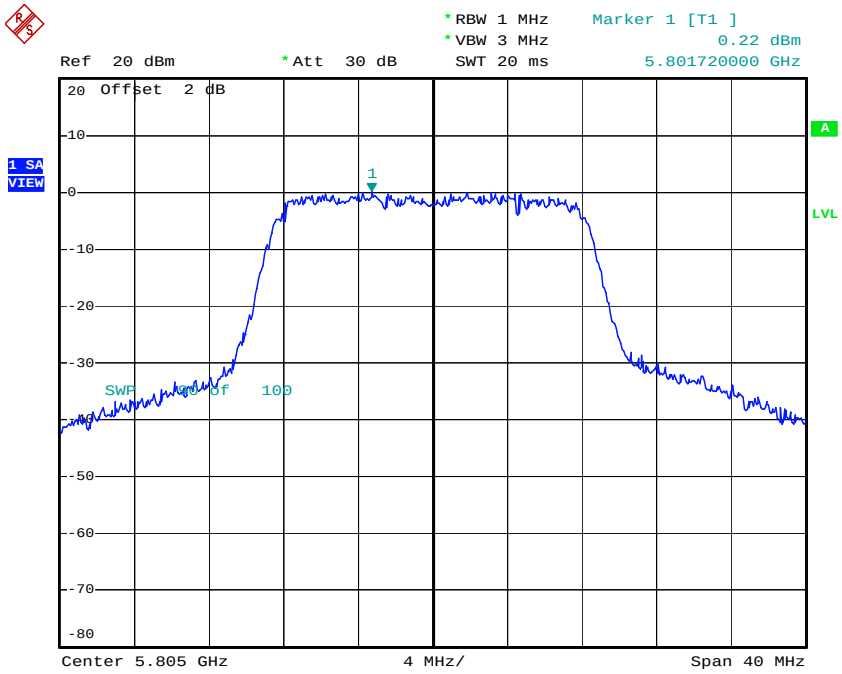
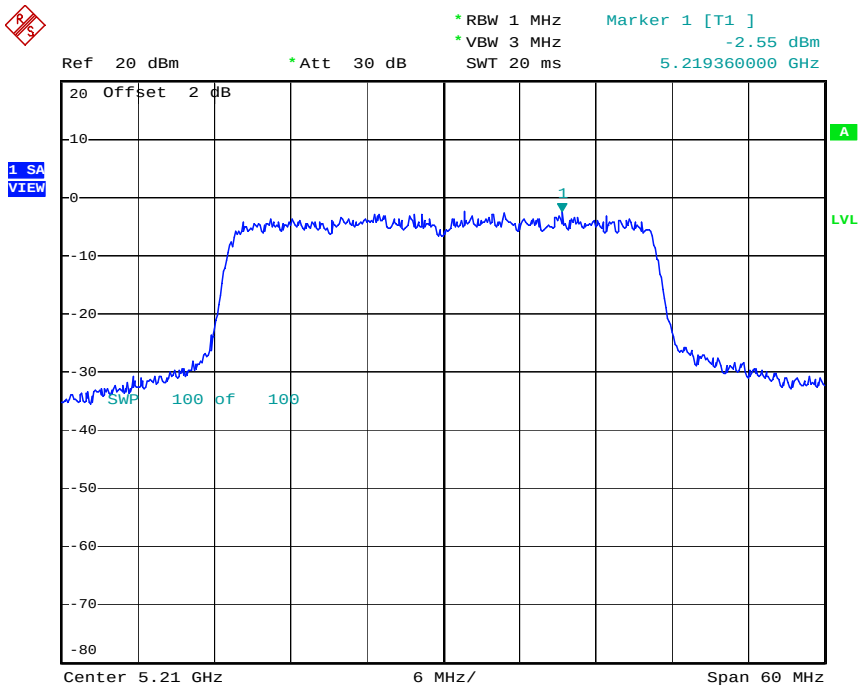
Channel: 161 / 5805 MHz

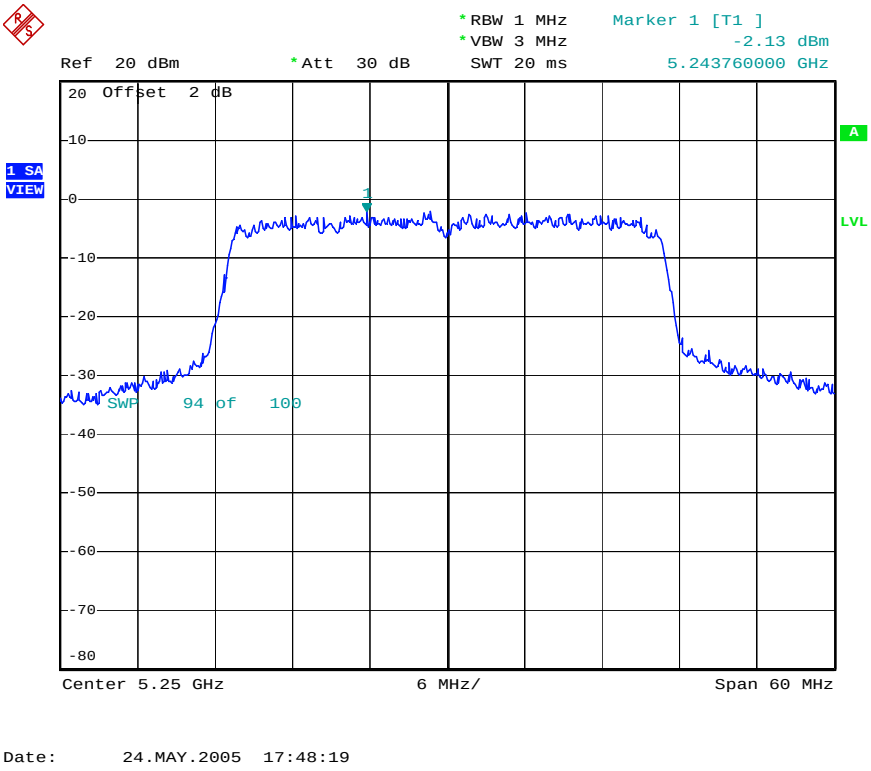


Turbo Mode

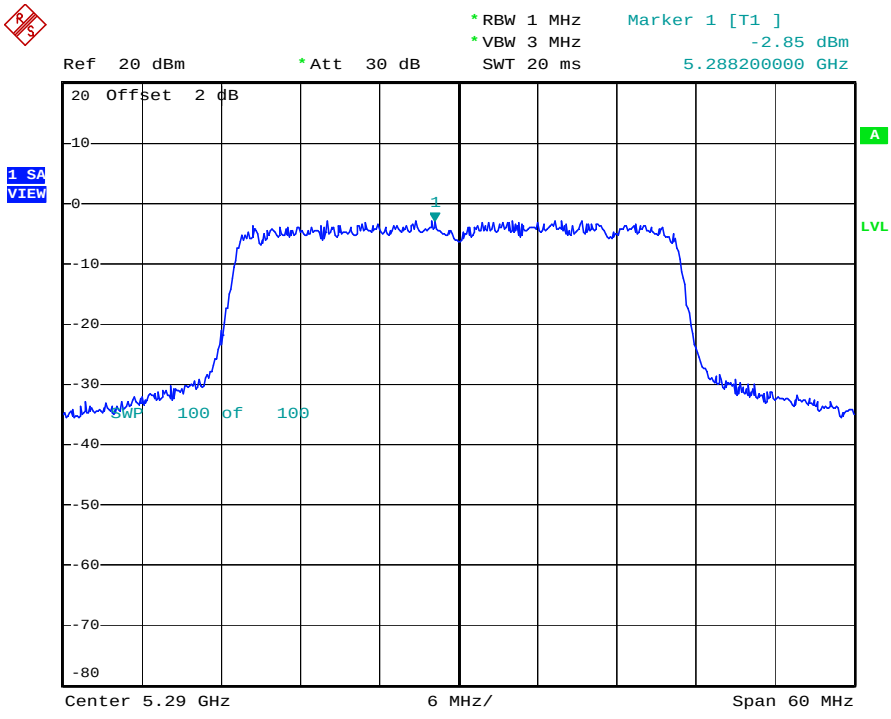
Channel: 42 / 5210 MHz



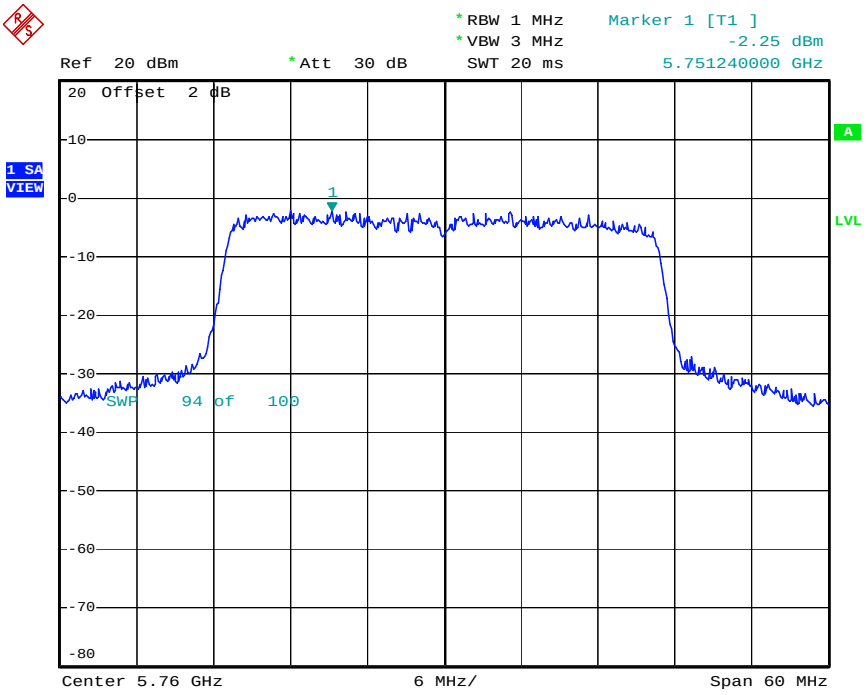
Channel: 50 / 5250 MHz



Channel: 58 / 5290 MHz

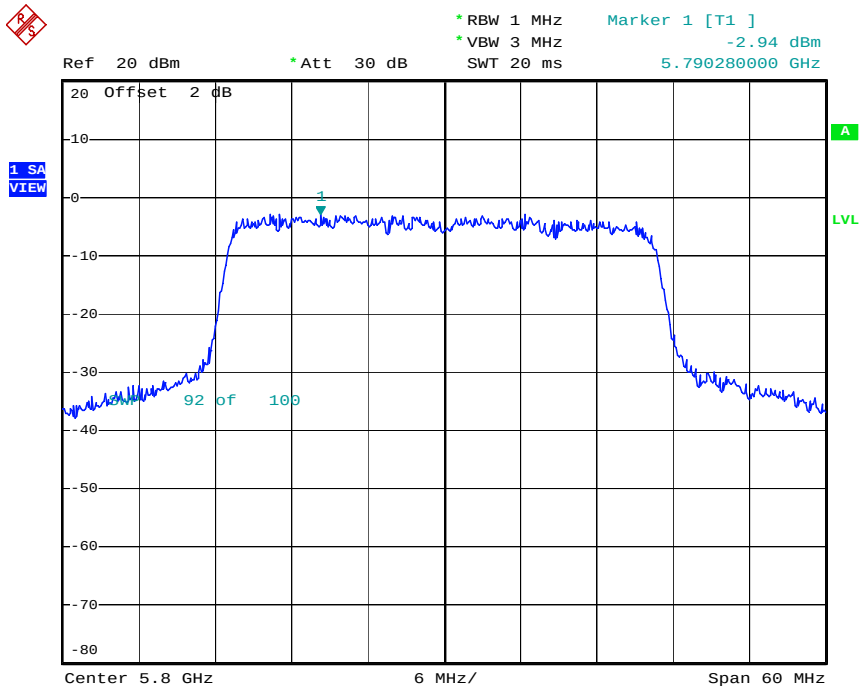


Channel: 152 / 5760 MHz



Date: 24.MAY.2005 17:50:28

Channel: 160 / 5800 MHz



Date: 24.MAY.2005 17:51:36

5.4. Ratio of the Peak Excursion

5.4.1. Measuring Instruments

Item 18 of the table on section 6.

5.4.2. Test Procedures

1. The transmitter output is connected to the spectrum analyzer through an attenuator.
2. Trace 1:Set RBW of spectrum analyzer to 1000kHz and VBW to 3000kHz.
3. Use peak detector mode, Max-hold and search the peak of trace 1.
4. Trace 1:Set RBW of spectrum analyzer to 1000kHz and VBW to 3000kHz.
5. Use sample detector mode, trace max-hold and search the peak of trace 2
6. The delta limits is 13dB between trace 1 and trace 2 of the peak value.

5.4.3. Test Setup Layout

Spectrum Analyzer **EUT**

5.4.4. Test Result of conducted peak power spectral density

- Temperature: 24°C
- Relative Humidity: 51%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Sam Lee

Normal Mode

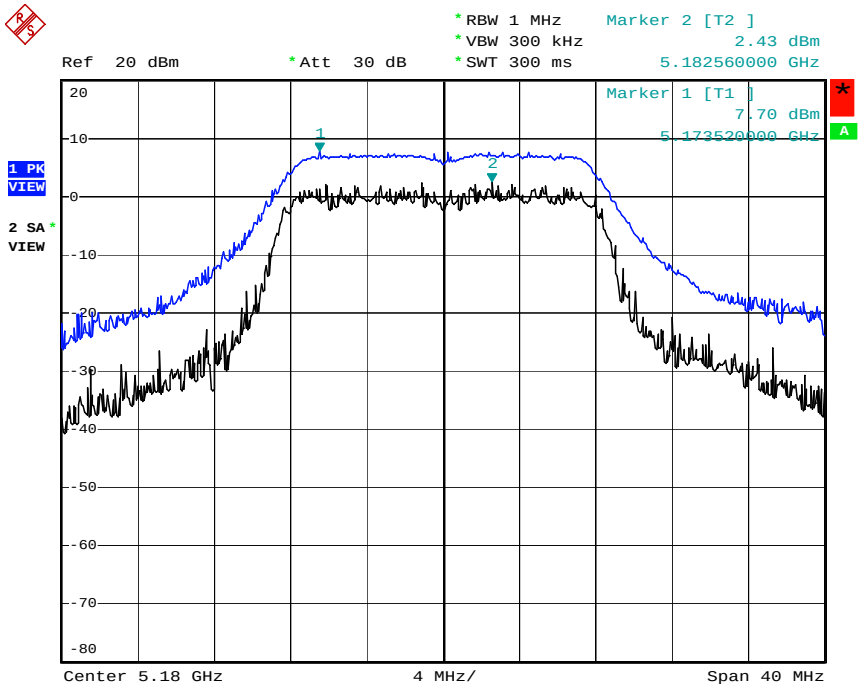
Channel	Frequency (MHz)	Peak Excursion (dB)	Max. Limits (dB)
36	5180 MHz	5.27	13
52	5260 MHz	5.77	13
64	5320 MHz	5.36	13
149	5745 MHz	5.66	13
153	5765 MHz	5.61	13
161	5805 MHz	5.3	13

Turbo Mode

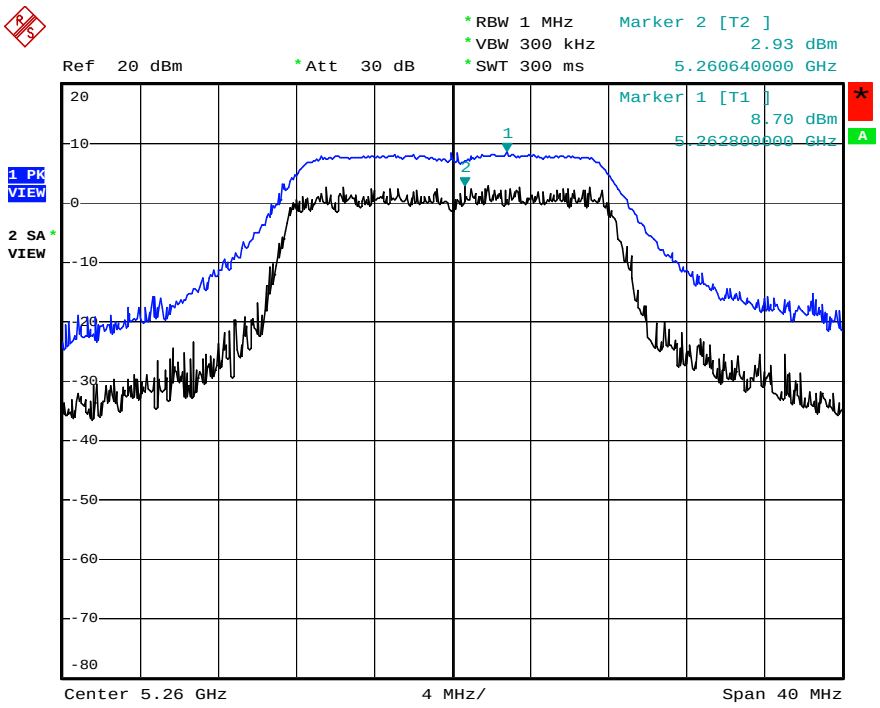
Channel	Frequency (MHz)	Peak Excursion (dB)	Max. Limits (dB)
42	5210 MHz	4.75	13
50	5250 MHz	4.68	13
58	5290 MHz	5.12	13
152	5760 MHz	4.26	13
160	5800 MHz	4.43	13

Normal Mode

Channel: 36 / 5180 MHz

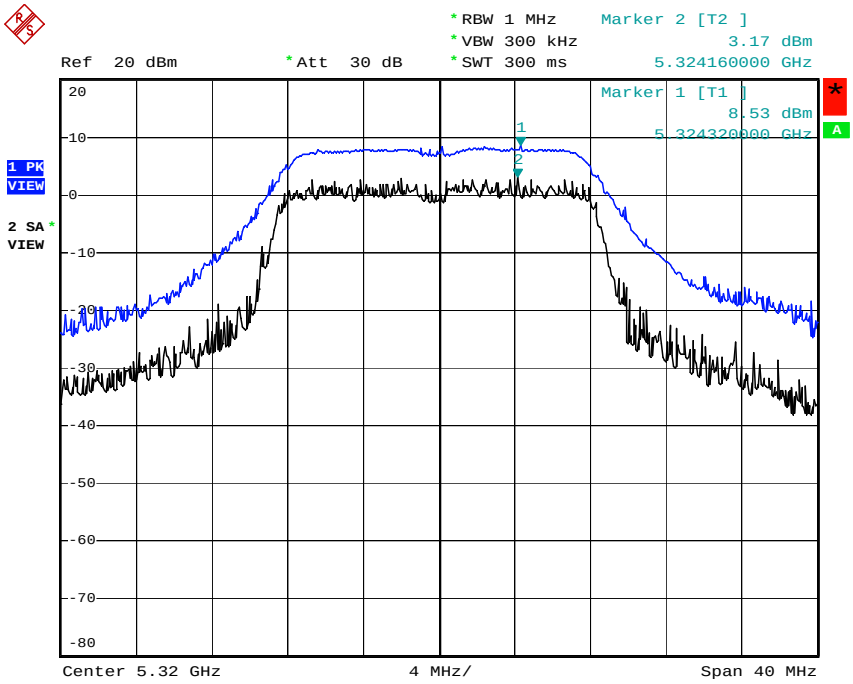


Channel: 52 / 5260 MHz



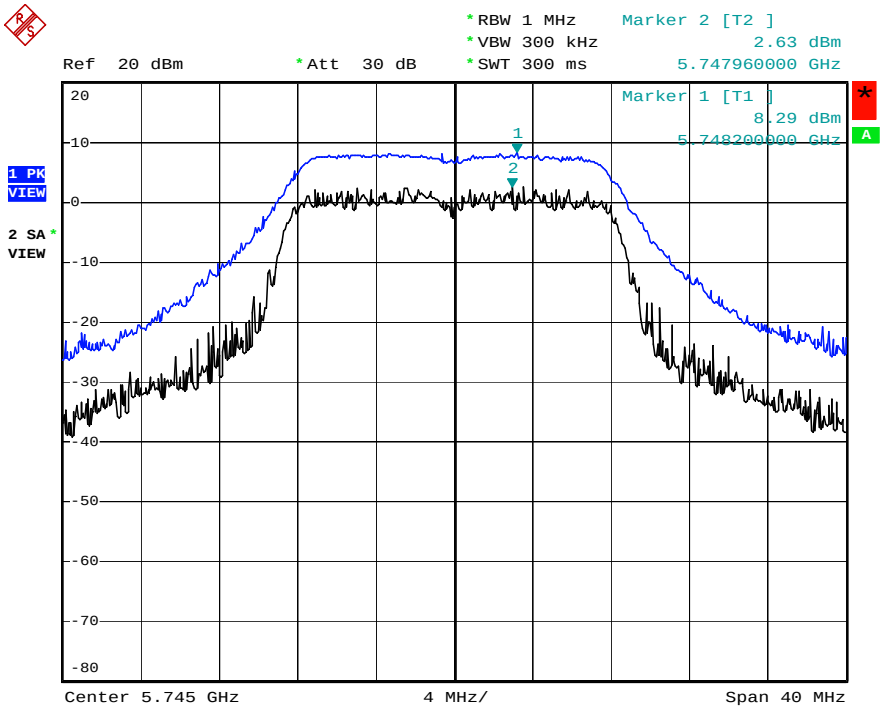
Date: 24.MAY.2005 17:33:10

Channel: 64 / 5320 MHz



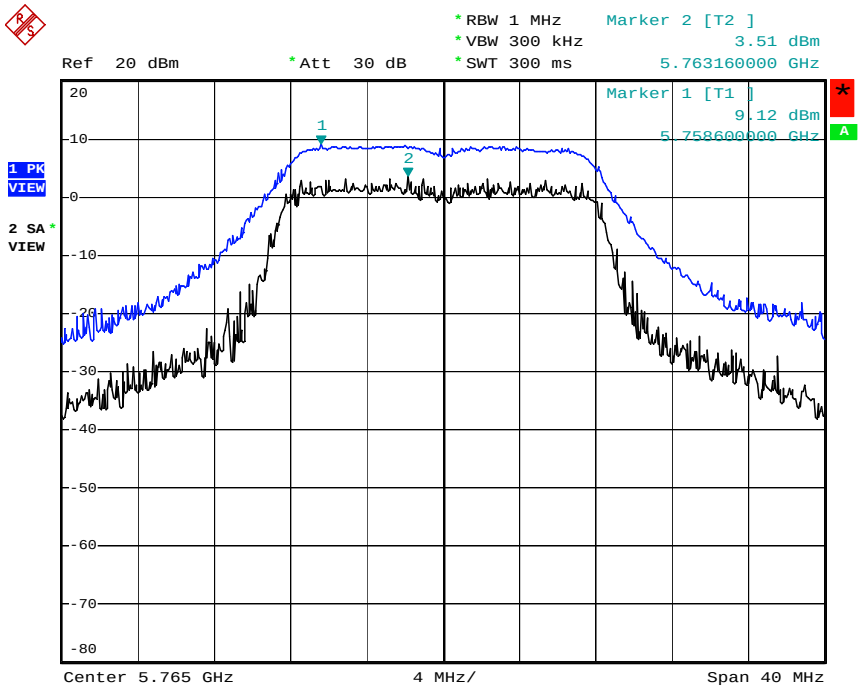
Date: 24.MAY.2005 17:34:19

Channel: 149 / 5745 MHz



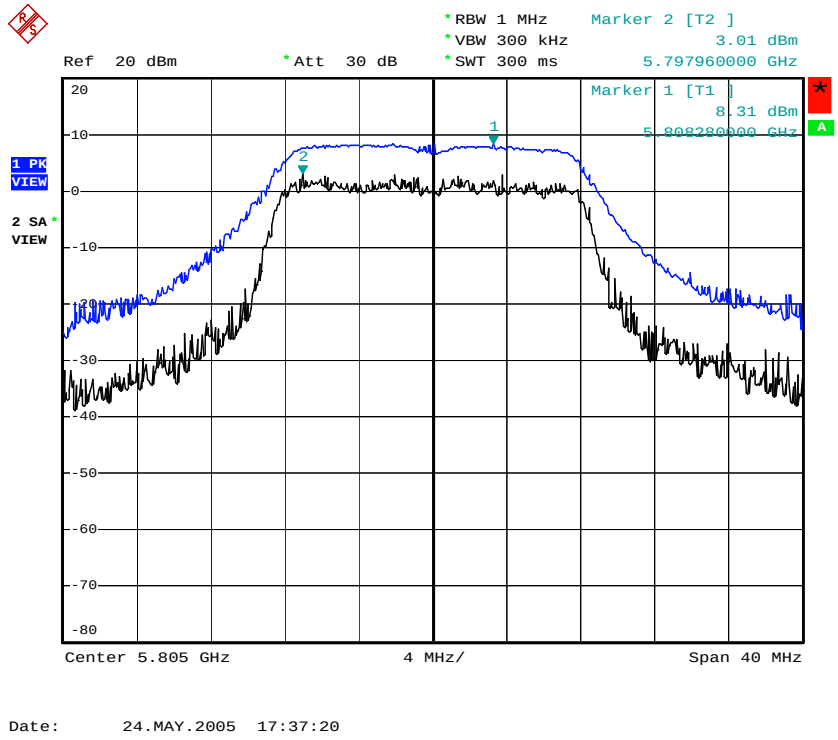
Date: 24.MAY.2005 17:35:21

Channel:153 / 5765MHz



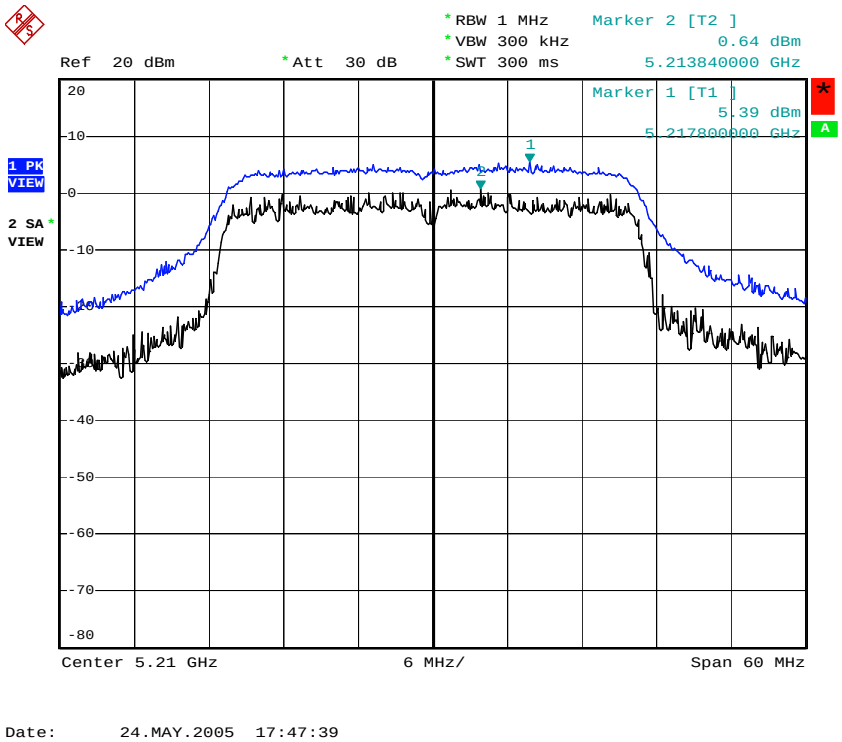
Date: 24.MAY.2005 17:36:23

Channel: 161 / 5805 MHz

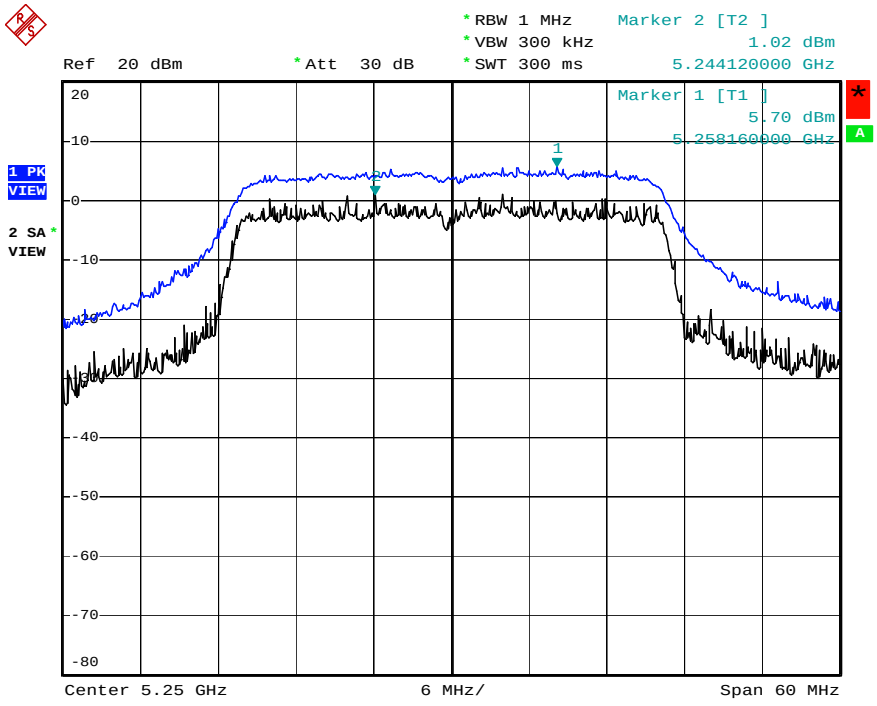


Turbo Mode

Channel: 42 / 5210 MHz

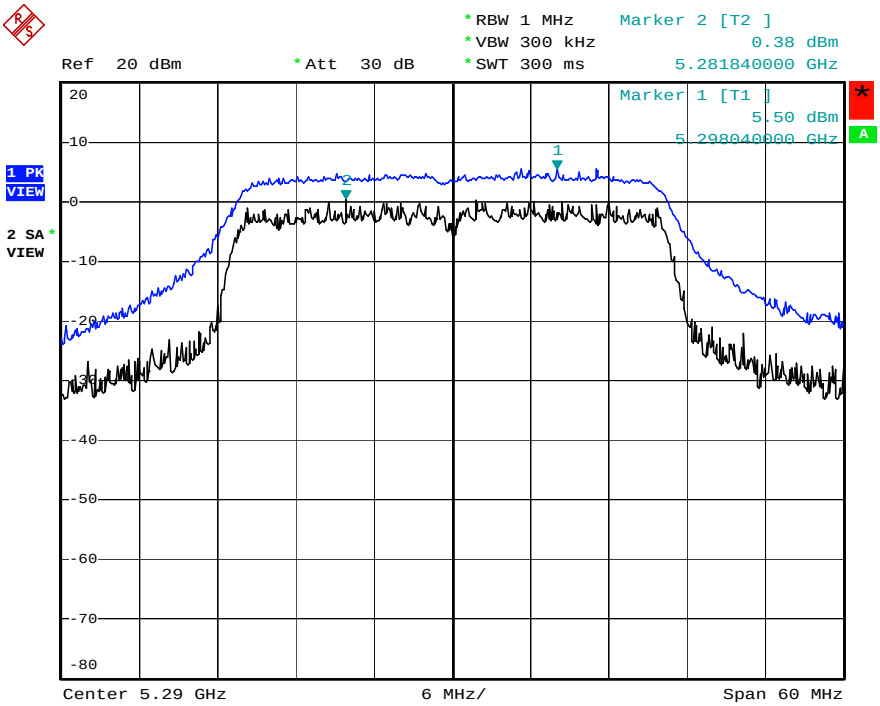


Channel: 50 / 5250 MHz



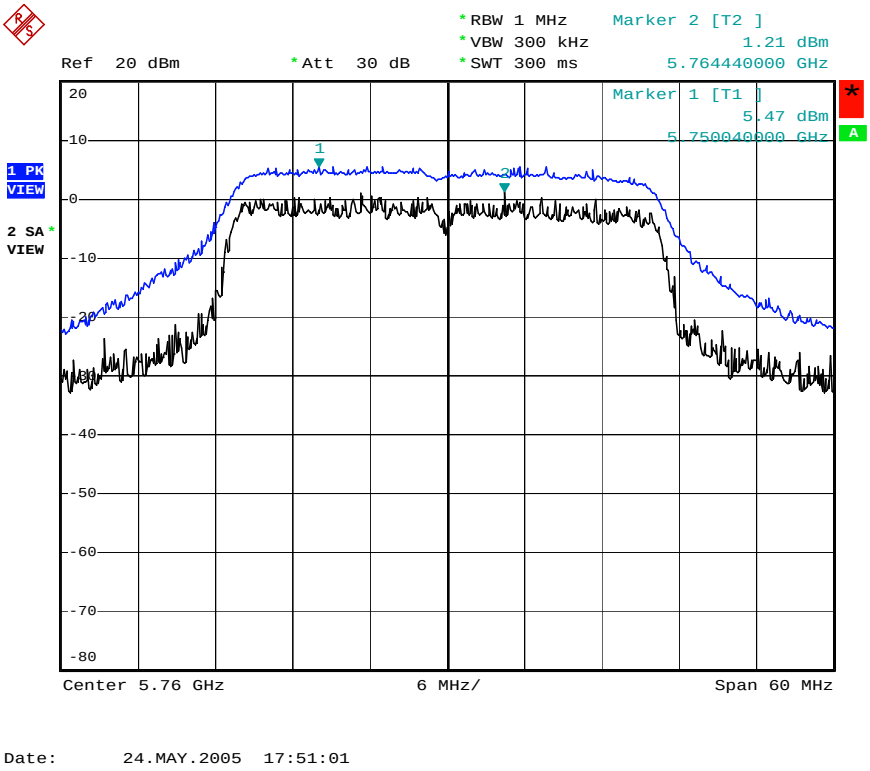
Date: 24.MAY.2005 17:48:50

Channel: 58 / 5290 MHz



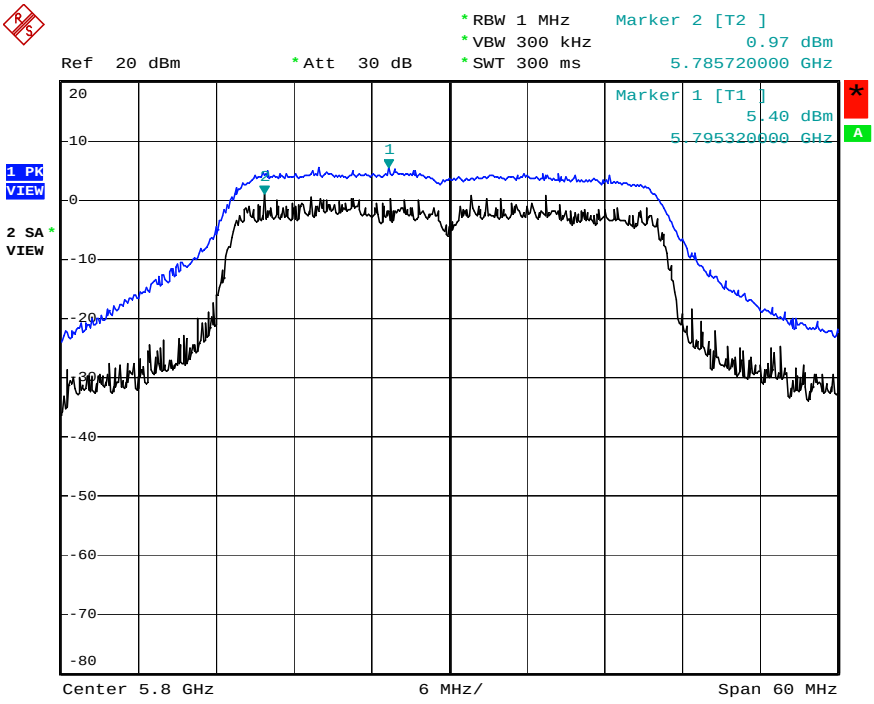
Date: 24.MAY.2005 17:49:51

Channel: 152 / 5760 MHz



Date: 24.MAY.2005 17:51:01

Channel: 160 / 5800 MHz



Date: 24.MAY.2005 17:52:07

5.5. Test of Band Edges Emission

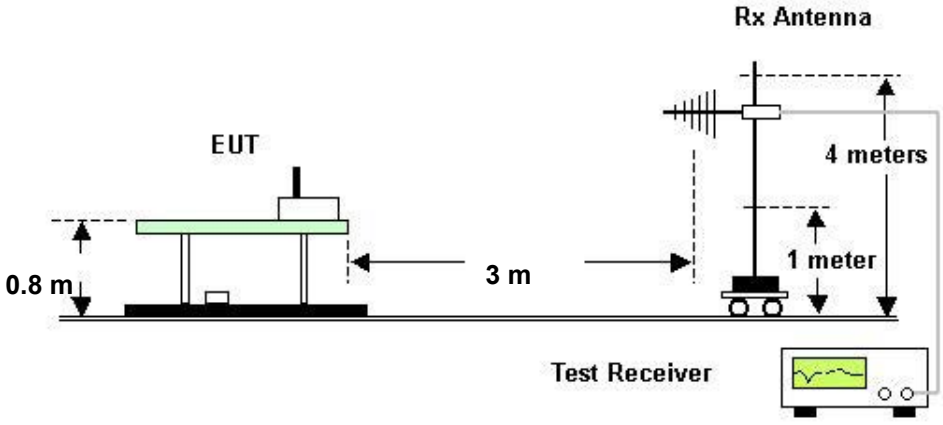
5.5.1. Measuring Instruments

Please reference item 6~17 in chapter 6 for the instruments used for testing.

5.5.2. Test Procedures

1. Configure the EUT according to ANSI C63.4.
2. The EUT was placed on the top of the turntable 0.8 meter above ground.
3. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
4. The transmitter is set to the lowest channel of each band.
5. The turntable was rotated 360 degrees to determine the position of the highest radiation.
6. Set both RBW and VBW of spectrum analyzer to 1MHz with convenient frequency span including 1MHz bandwidth from lower band edge.
7. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emission field strength of both horizontal and vertical polarization. Record the maximum value of band-edge.
8. Remove the transmitter and replace it with a broadband substitution antenna.
9. With the substitution antennas at maximum polarized and with the signal generator tuned to a particular fundamental frequency, raise and lower the test antenna to obtain a maximum reading at the spectrum analyzer. Adjust the level of the signal generator output until the previously recorded maximum reading (item 6). This should be done carefully repeating the adjustment of the test antenna and generator output.
10. Pd(dBm) = Pg(dBm) – cable loss (dB) + antenna gain (dBi). Pd is the dipole equivalent power and Pg is the generator output power into the substitution antenna.
11. The lowest and highest channels of band edges of each band emission was measured and recorded.

5.5.3. Test Setup Layout



5.5.4. Test Result

- Temperature: 24°C
- Relative Humidity: 51%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Sam Lee

Normal Mode

Ant. No.	Gain	Freq. Band	Freq.	Level*	Margin	Limit
	(dBi)	(MHz)	(MHz)	(dBuV/m @ 1m)	(dB)	(dBuV/m @ 1m)
1	1.00	5725~5825	5725	81.15	-7.15	88.3
1	1.00	5725~5825	5715	73.45	-4.85	78.3
1	1.00	5725~5825	5825	81.90	-6.40	88.3
1	1.00	5725~5825	5835	71.20	-7.10	78.3

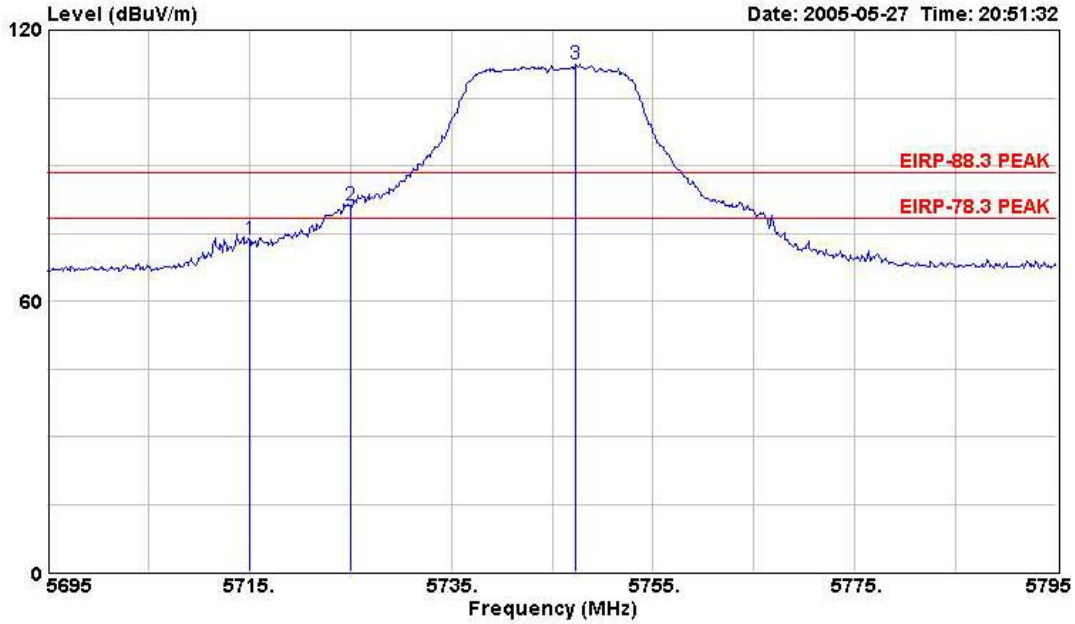
Level*: The max EIRP emission in the band-edge.

Turbo Mode

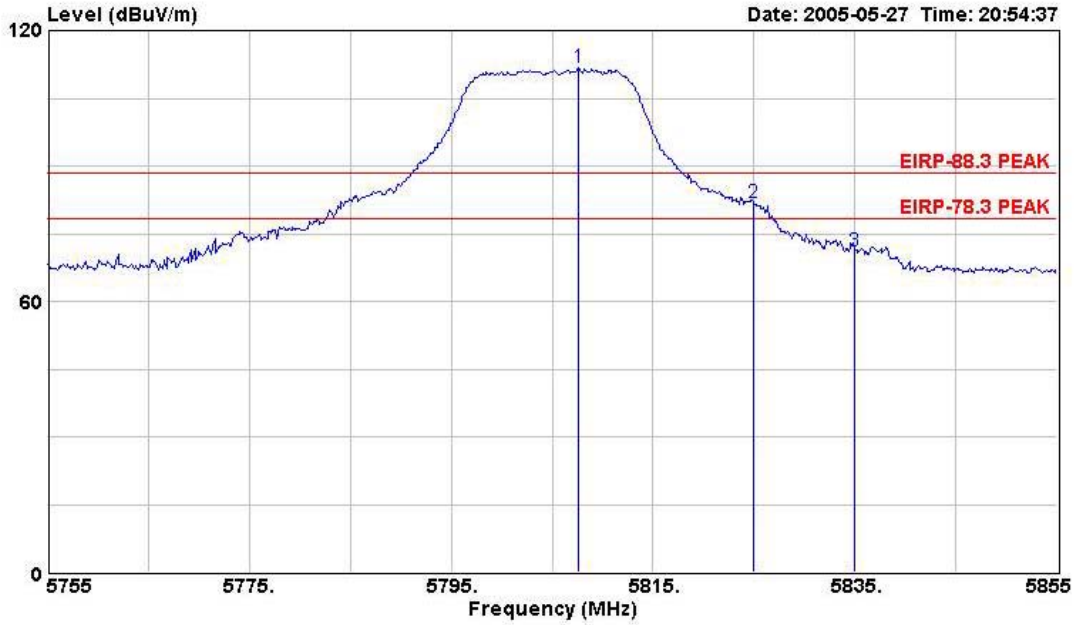
Ant. No.	Gain	Freq. Band	Freq.	Level*	Margin	Limit
	(dBi)	(MHz)	(MHz)	(dBuV/m @ 1m)	(dB)	(dBuV/m @ 1m)
1	1.00	5725~5825	5715	77.12	-1.18	78.3
1	1.00	5725~5825	5725	82.16	-6.14	88.3
1	1.00	5725~5825	5825	81.77	-6.53	88.3
1	1.00	5725~5825	5835	71.37	-6.93	78.3

Normal Mode

Channel: 149 / 5745 MHz

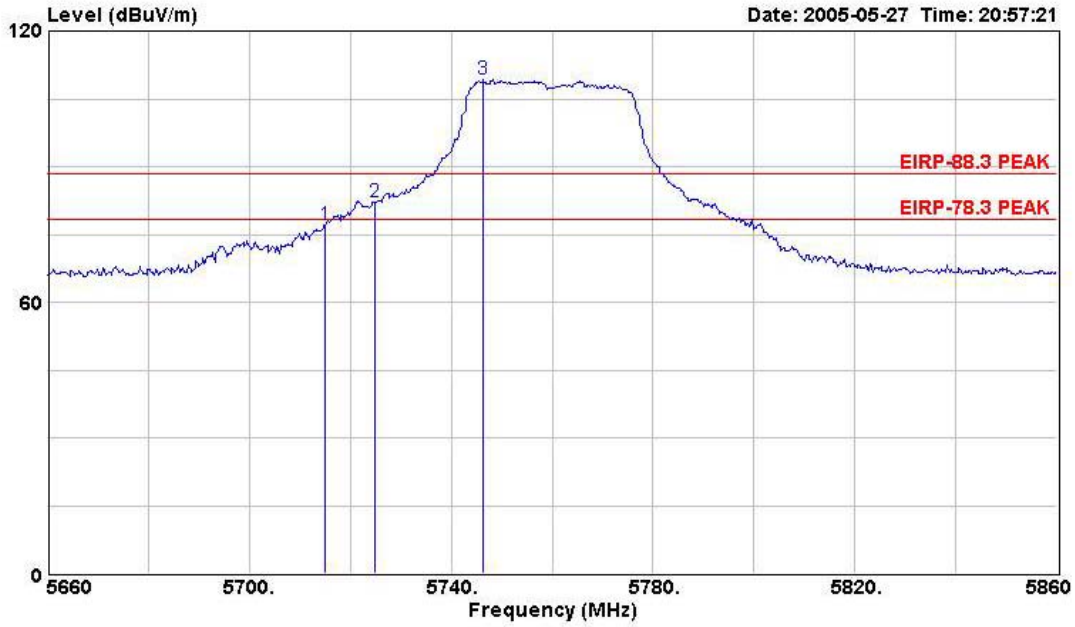


Channel: 161 / 5805 MHz

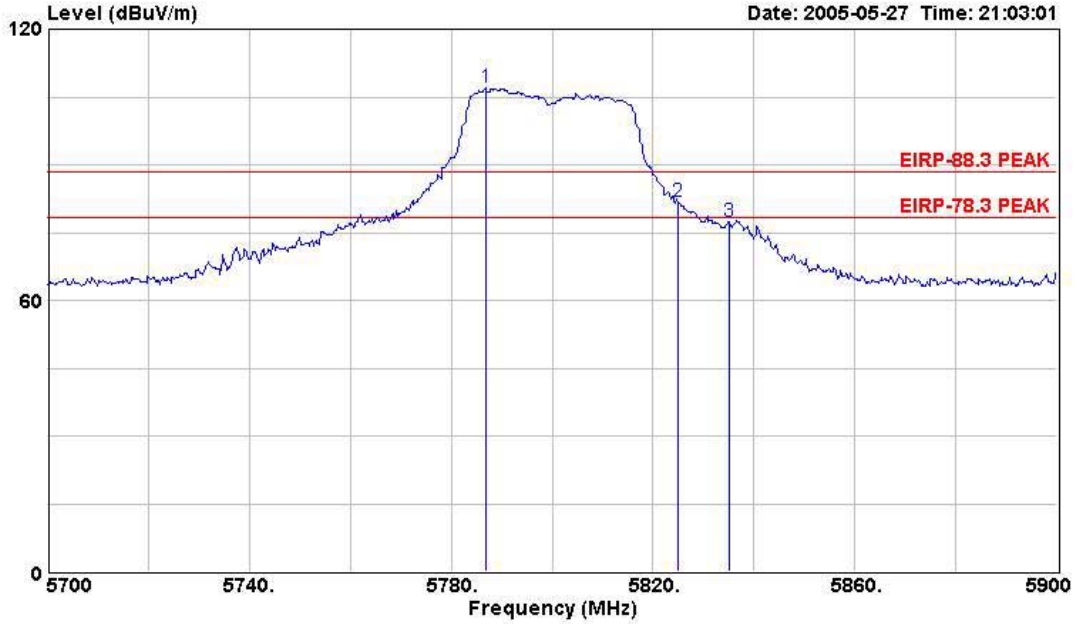


Turbo Mode

Channel: 152 / 5760 MHz



Channel: 160 / 5800 MHz



5.6. Test of Frequency Stability

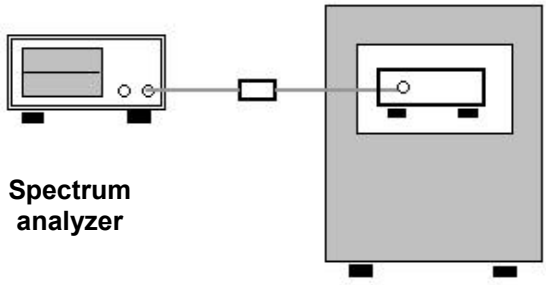
5.6.1. Measuring Instruments

Item 18 of the table on section 6.

5.6.2. Test Procedures

1. The transmitter output is connected to the spectrum analyzer through an attenuator.
2. Set RBW of spectrum analyzer to 10kHz and VBW to 10kHz.
3. Use mark counter function to count the peak un-modulated carrier frequency.
4. The test extreme voltage is, according to 2.1055(d)(1), from 85 to 115 percent of the nominal value.
5. Extreme temperature rule is, according to 2.1055(a)(1), -30˚C~50˚C.

5.6.3. Test Setup Layout



5.6.4. Test Result

- Modulation Type: Un-Modulated Carrier
- Temperature: 24°C
- Relative Humidity: 51 %
- Duty cycle of the equipment during the test: 100%

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)	
(V)	5260.0000	5745.0000
126.50	5260.0130	5745.0110
110.00	5260.0130	5745.0112
93.50	5260.0025	5745.0120
Max. Deviation (MHz)	0.0130	0.0120
Max. Deviation (ppm)	2.47	2.09

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)	
(°C)	5260.0000	5745.0000
-30	5260.0130	5745.0113
-20	5260.0080	5745.0084
-10	5260.0301	5745.0245
0	5260.0288	5745.0222
10	5260.0193	5745.0284
20	5260.008	5745.0110
30	5259.9945	5744.9984
40	5259.9879	5744.9812
50	5259.9906	5744.9921
Max. Deviation (MHz)	0.0301	0.0284
Max. Deviation (ppm)	5.72	4.94

5.7. Test of AC Power Line Conducted Emission

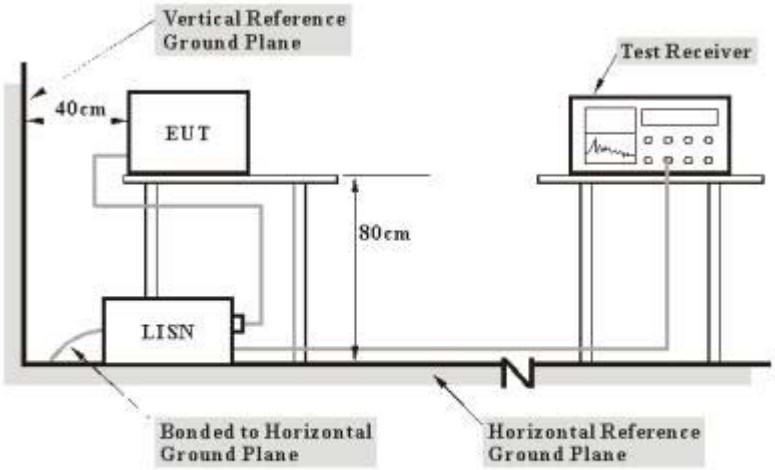
5.7.1. Measuring Instruments

Please reference item 1~5 in chapter 6 for the instruments used for testing.

5.7.2. Test Procedures

1. Configure the EUT according to ANSI C63.4.
2. The EUT has to be placed 0.4 meter far from the conducting wall of the shielding room and at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network (LISN)
4. All the support units are connected to the other LISNs. The LISN should provides 50uH/50ohms coupling impedance.
5. The frequency range from 150 KHz to 30 MHz was searched.
6. Use the Channel & Power Controlling software to make the EUT working on selected channel and expected output power, then use the “H” Patter Generator software to make the supporting equipments stay on working condition.
7. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
8. The measurement has to be done between each power line and ground at the power terminal for each RF channel. Only one RF channel has to be investigated since this test is independent with the RF channel selection.

5.7.3. Test Setup Layout

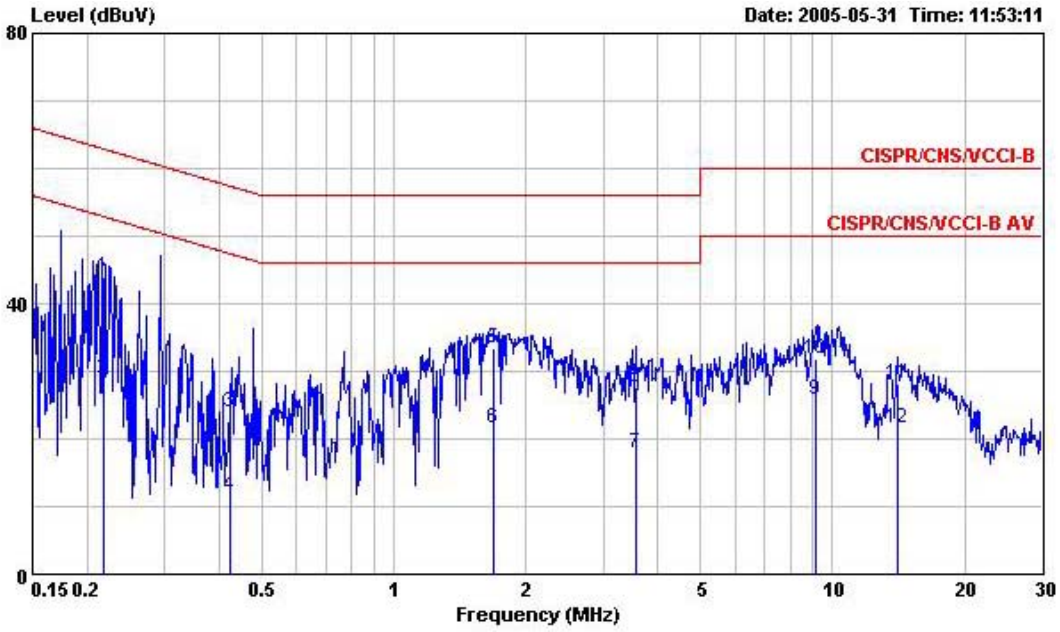


Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

5.7.4. Test Result of Conducted Emission

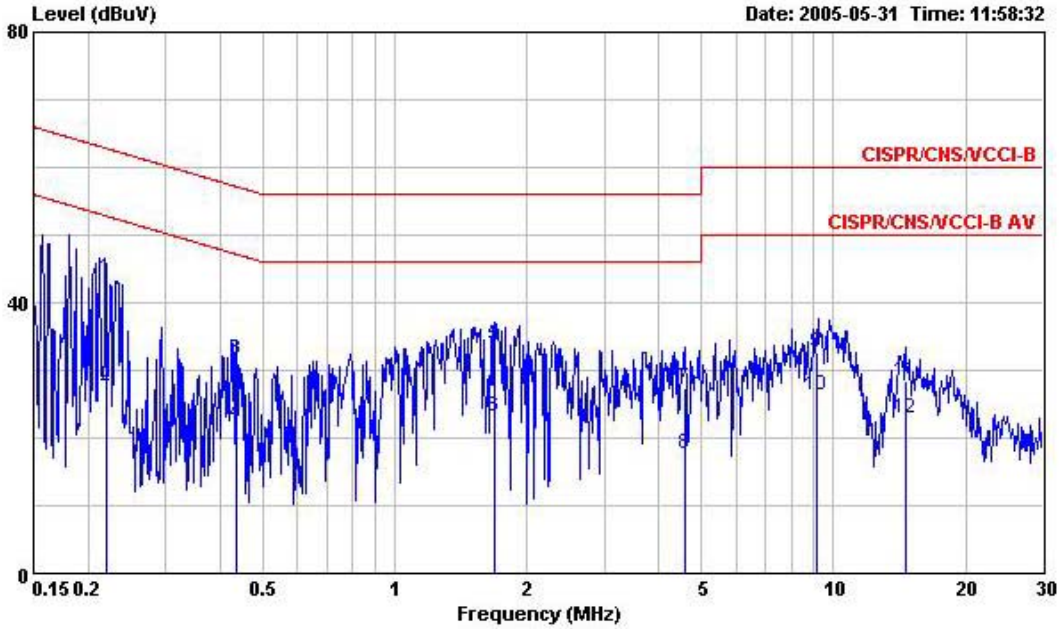
- Temperature: 24°C
- Relative Humidity: 51%
- Test Engineer: Sky Wu

Line to Ground



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.2172880	44.00	-18.92	62.92	43.72	0.06	0.22	QP
2	0.2172880	28.94	-23.98	52.92	28.66	0.06	0.22	Average
3	0.4241490	24.04	-33.33	57.37	23.72	0.06	0.26	QP
4	0.4241490	11.60	-35.77	47.37	11.28	0.06	0.26	Average
5	1.681	33.32	-22.68	56.00	32.88	0.11	0.33	QP
6	1.681	21.60	-24.40	46.00	21.16	0.11	0.33	Average
7	3.571	17.94	-28.06	46.00	17.46	0.19	0.29	Average
8	3.571	27.55	-28.45	56.00	27.07	0.19	0.29	QP
9	9.199	25.87	-24.13	50.00	25.21	0.21	0.45	Average
10	9.199	31.84	-28.16	60.00	31.18	0.21	0.45	QP
11	14.059	28.08	-31.92	60.00	26.69	0.21	1.18	QP
12	14.059	21.63	-28.37	50.00	20.24	0.21	1.18	Average

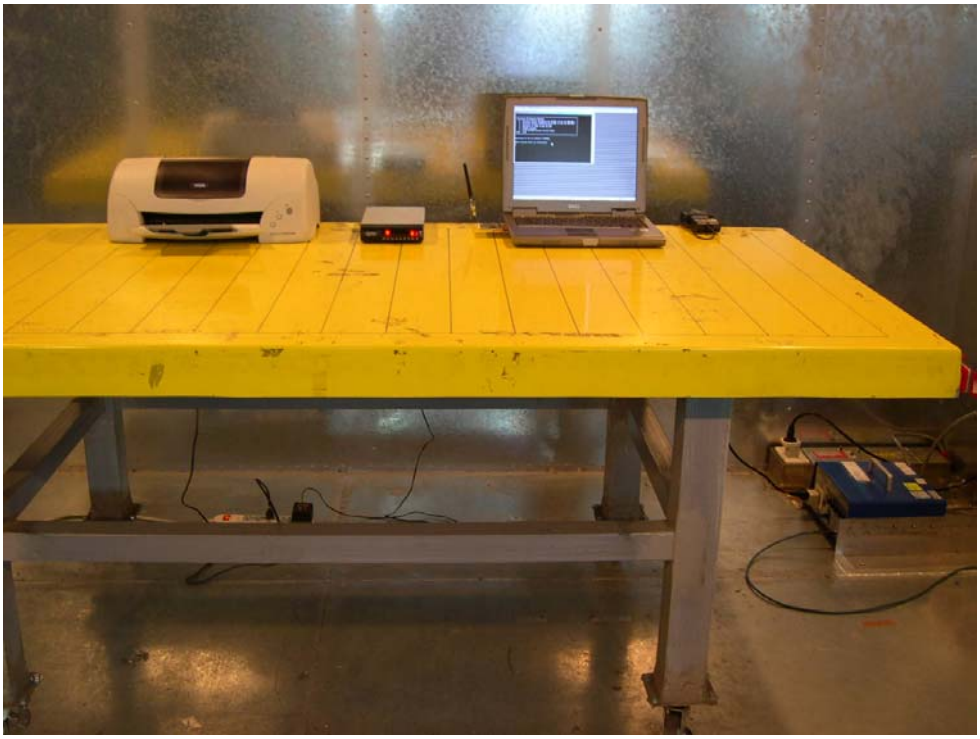
Neutral to Ground



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.2197820	43.72	-19.11	62.83	43.38	0.11	0.23	QP
2	0.2197820	27.56	-25.27	52.83	27.22	0.11	0.23	Average
3	0.4339440	31.52	-25.66	57.18	31.16	0.11	0.25	QP
4	0.4339440	22.11	-25.07	47.18	21.75	0.11	0.25	Average
5	1.690	33.79	-22.21	56.00	33.24	0.23	0.32	QP
6	1.690	23.11	-22.89	46.00	22.56	0.23	0.32	Average
7	4.569	27.31	-28.69	56.00	26.79	0.24	0.28	QP
8	4.569	17.74	-28.26	46.00	17.22	0.24	0.28	Average
9	9.199	32.73	-27.27	60.00	31.96	0.32	0.45	QP
10	9.199	26.23	-23.77	50.00	25.46	0.32	0.45	Average
11	14.591	28.45	-31.55	60.00	27.11	0.33	1.01	QP
12	14.591	22.94	-27.06	50.00	21.60	0.33	1.01	Average

5.7.5. Photographs of Conducted Emission Test Configuration

FRONT VIEW



REAR VIEW

5.8. Test of Spurious Radiated Emission

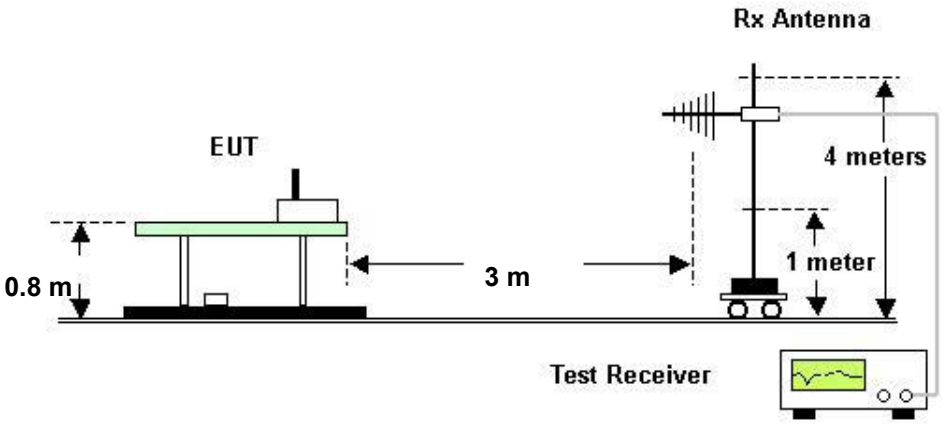
5.8.1. Measuring Instruments

Please reference item 6~17 in chapter 6 for the instruments used for testing.

5.8.2. Test Procedures

1. Configure the EUT according to ANSI C63.4.
2. The EUT was placed on the top of the turn table 0.8 meter above ground.
3. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turn table.
4. Power on the EUT and all the supporting units.
5. The turn table was rotated by 360 degrees to determine the position of the highest radiation.
6. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emission field strength of both horizontal and vertical polarization.
7. For each suspected emission, the antenna tower was scan (from 1 M to 4 M) and then the turn table was rotated (from 0 degree to 360 degrees) to find the maximum reading.
8. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
9. For emission above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
10. If the emission level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz and average method for above the 1GHz. the reported.
11. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB higher than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

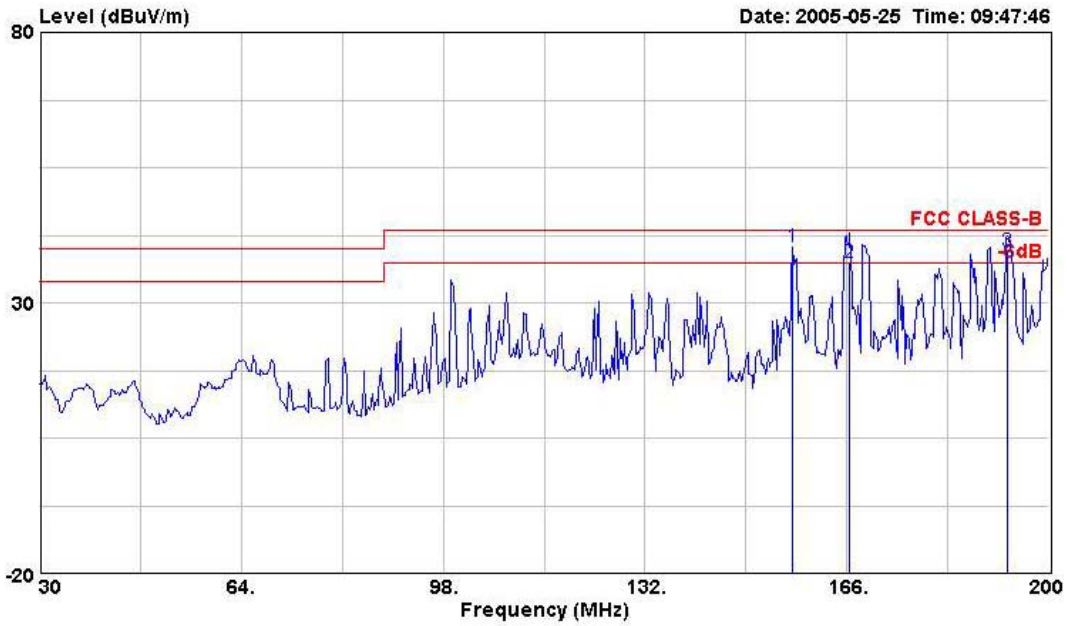
5.8.3. Test Setup Layout



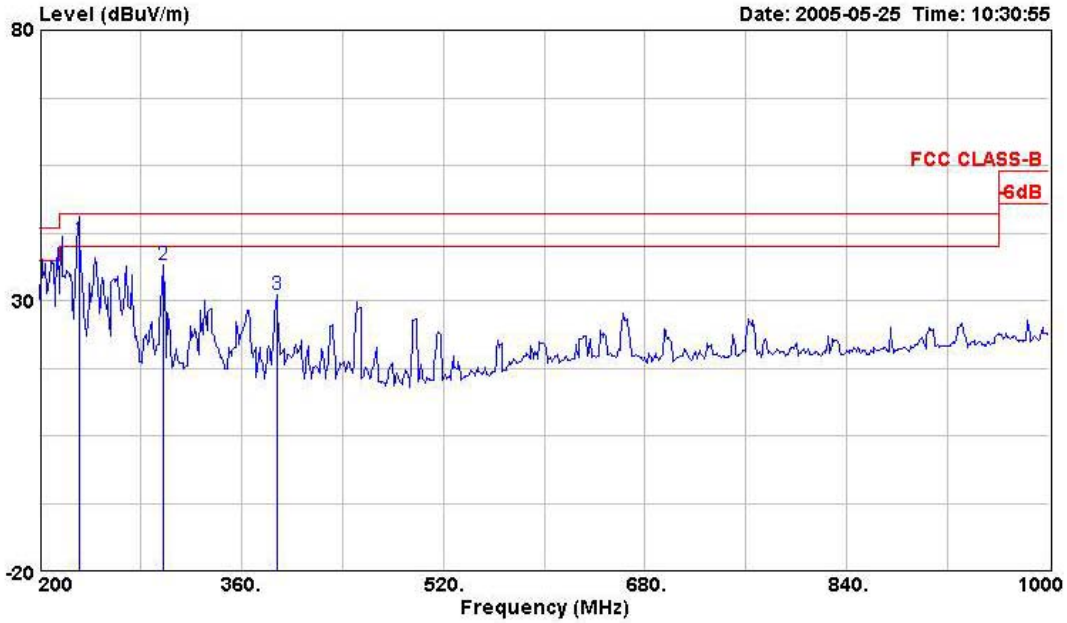
5.8.4. Test Results for CH 64/ 5320 MHz (for emission below 1GHz)

- Temperature: 24°C
- Relative Humidity: 51%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Ted Chiu

(A) Polarization: Horizontal

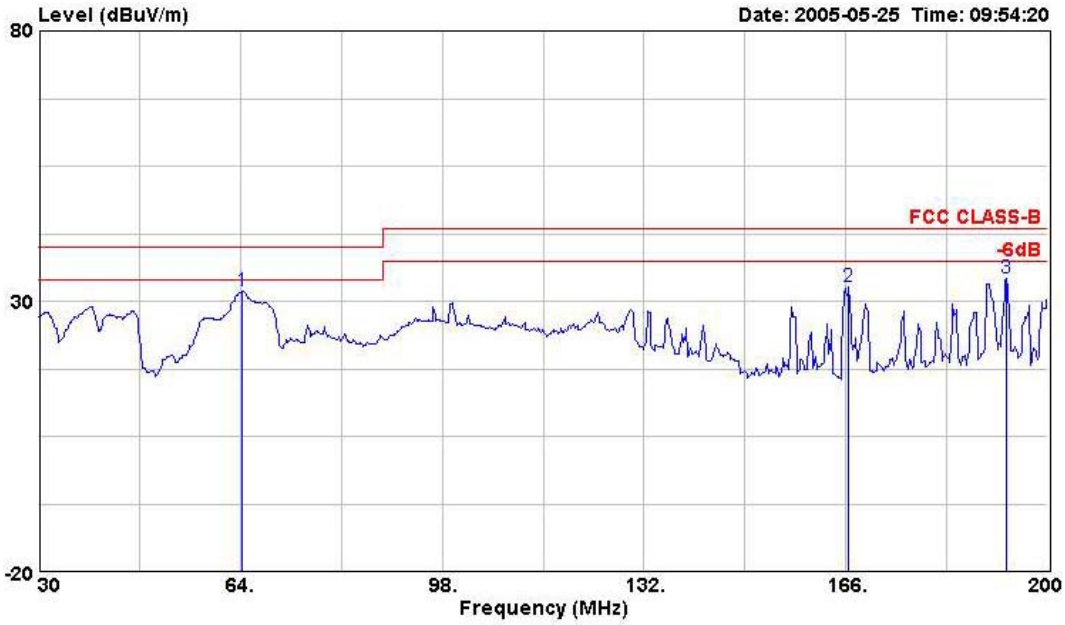


	Freq	Level	Over Limit	Read Level	Limit Line	Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV	dBuV/m	dB	dB	dB	
1 @	156.820	40.17	-3.33	57.00	43.50	-16.83	1.25	30.46	Peak
2	166.510	37.26	-6.24	52.78	43.50	-15.52	1.28	30.11	QP
3 @	193.030	39.40	-4.10	53.25	43.50	-13.85	1.29	30.37	QP

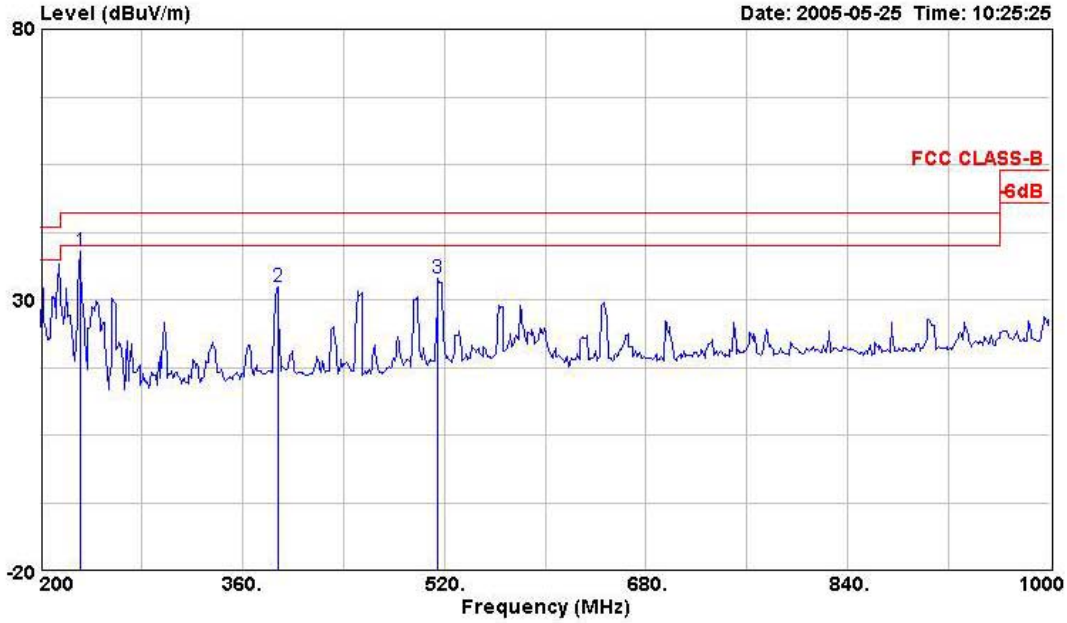


	Freq	Level	Over Limit	Read Level	Limit Line	Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV	dBuV/m	dB	dB	dB	
1 @	231.200	41.24	-4.76	57.29	46.00	-16.05	1.48	31.30	QP
2	297.600	36.66	-9.34	51.84	46.00	-15.18	1.67	30.58	Peak
3	388.000	31.19	-14.81	44.00	46.00	-12.81	1.92	31.19	Peak

(B) Polarization: Vertical



	Freq	Level	Over Limit	Read Level	Limit Line	Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV	dBuV/m	dB	dB	dB	
1	64.340	31.97	-8.03	51.51	40.00	-19.54	0.81	30.54	Peak
2	166.510	32.73	-10.77	48.25	43.50	-15.52	1.28	30.11	Peak
3	193.030	34.13	-9.37	47.98	43.50	-13.85	1.29	30.37	Peak



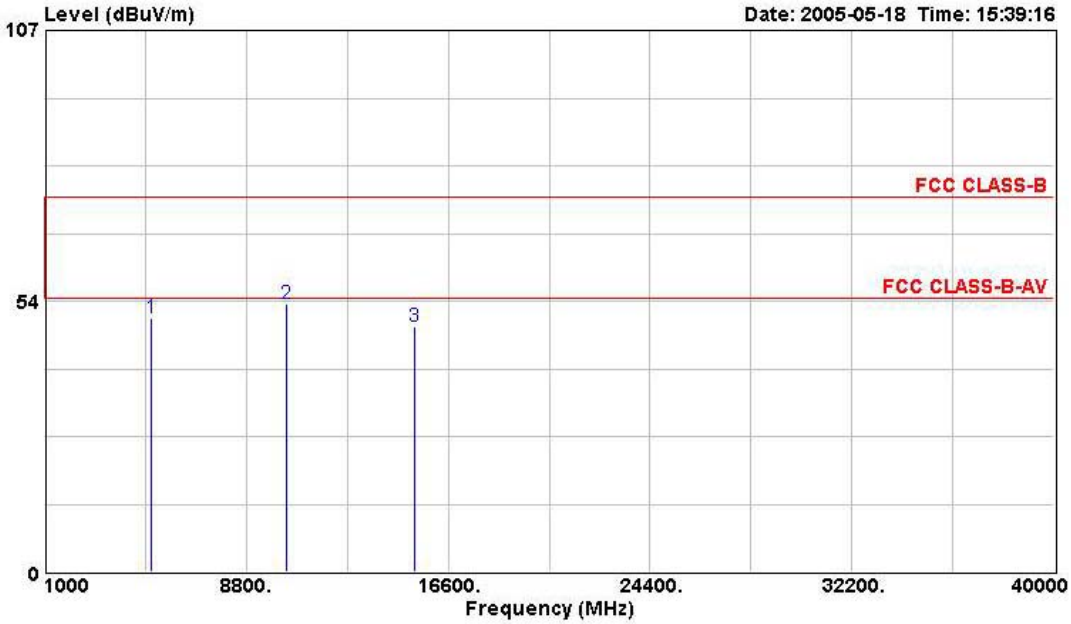
	Freq	Level	Over Limit	Read Level	Limit Line	Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV	dBuV/m	dB	dB	dB	
1	231.200	38.85	-7.15	54.90	46.00	-16.05	1.48	31.30	Peak
2	388.000	32.41	-13.59	45.22	46.00	-12.81	1.92	31.19	Peak
3	515.200	34.08	-11.92	46.03	46.00	-11.95	2.20	30.83	Peak

Note:
Emission level (dBuV/m) = 20 log Emission level (uV/m)
Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

5.8.5. Test Results for CH 36 / 5180 MHz (for emission above 1GHz)

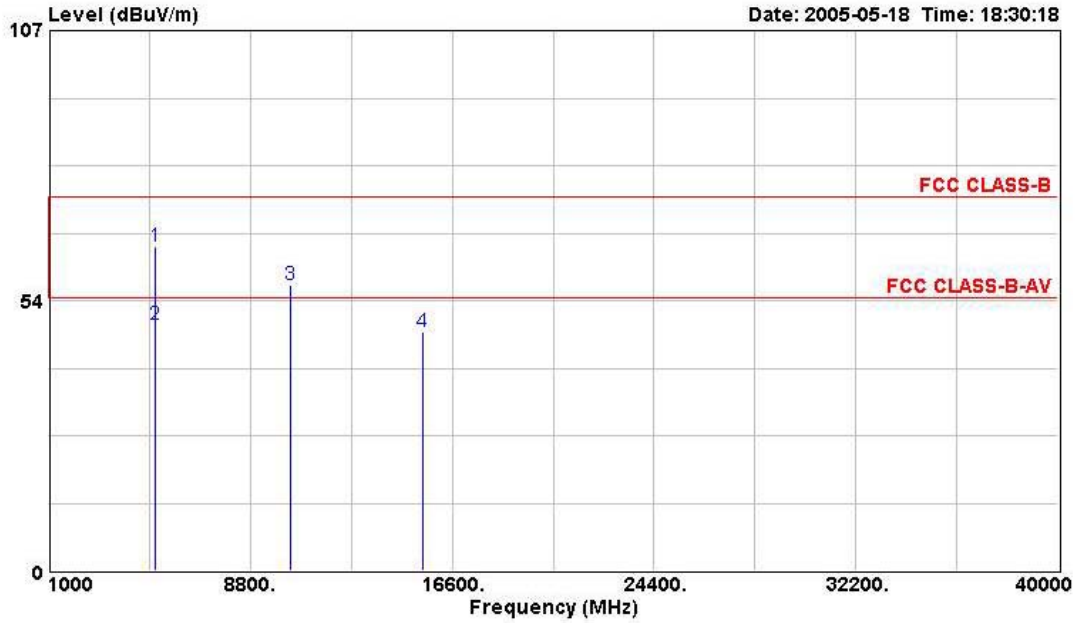
- **Normal Mode**
- Temperature: 24°C
- Relative Humidity: 51%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Ted Chiu

(A) Polarization: Horizontal



	Freq	Level	Over Limit	Read Level	Limit Line	Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV	dBuV/m	dB	dB	dB	
1	5150.000	50.08	-23.92	55.42	74.00	-5.34	2.97	41.95	Peak
2	10360.000	52.86	-21.14	48.58	74.00	4.28	4.27	38.92	Peak
3	15296.000	48.35	-25.65	46.09	74.00	2.26	5.19	41.91	PEAK

(B) Polarization: Vertical



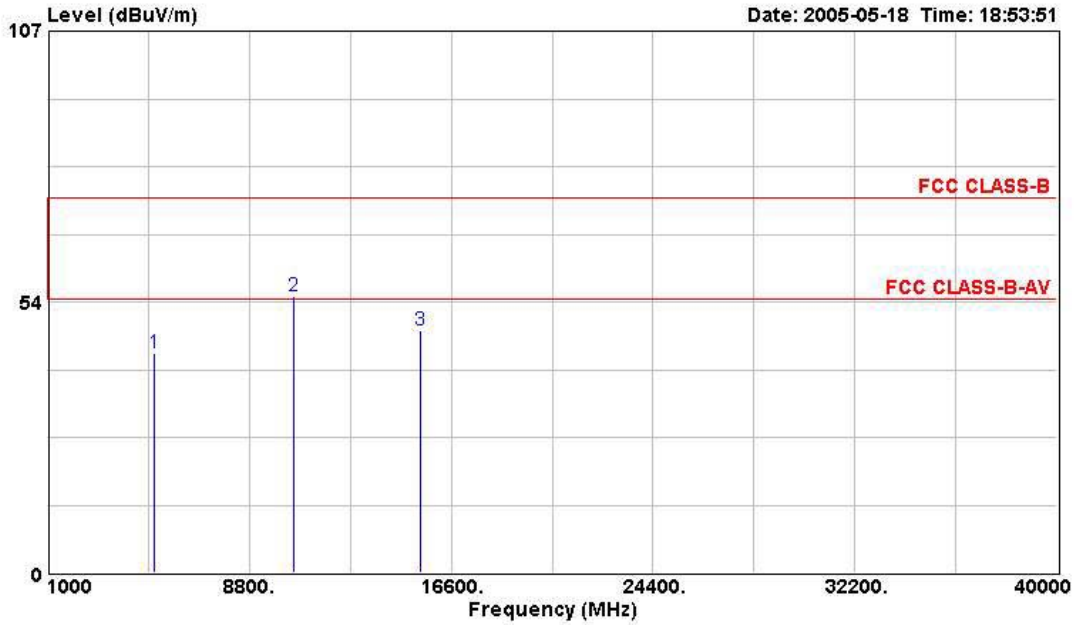
	Freq	Level	Over Limit	Read Level	Limit Line	Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV	dBuV/m	dB	dB	dB	
1	5150.000	64.21	-9.79	69.55	74.00	-5.34	2.97	41.95	Peak
2	5150.000	48.68	-5.32	54.02	54.00	-5.34	2.97	41.95	Average
3	10364.000	56.67	-17.33	52.39	74.00	4.28	4.27	38.92	PEAK
4	15488.000	47.27	-26.73	45.90	74.00	1.37	5.19	41.80	PEAK

Note:
Emission level (dBuV/m) = 20 log Emission level (uV/m)
Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

5.8.6. Test Results for CH 52 / 5260 MHz (for emission above 1GHz)

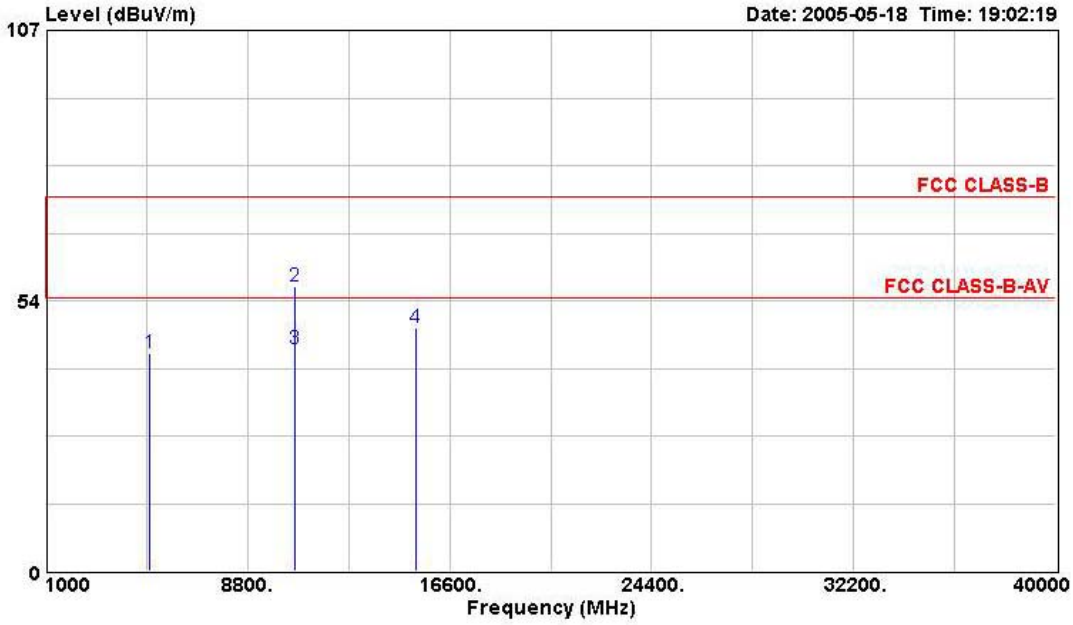
- **Normal Mode**
- Temperature: 24°C
- Relative Humidity: 51%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Ted Chiu

(A) Polarization: Horizontal



	Freq	Level	Over Limit	Read Level	Limit Line	Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV	dBuV/m	dB	dB	dB	
1	5102.700	43.27	-30.73	48.65	74.00	-5.38	2.96	41.90	PEAK
2	10524.000	54.64	-19.36	50.18	74.00	4.46	4.41	38.84	PEAK
3	15408.000	47.93	-26.07	46.24	74.00	1.69	5.19	41.85	PEAK

(B) Polarization: Vertical



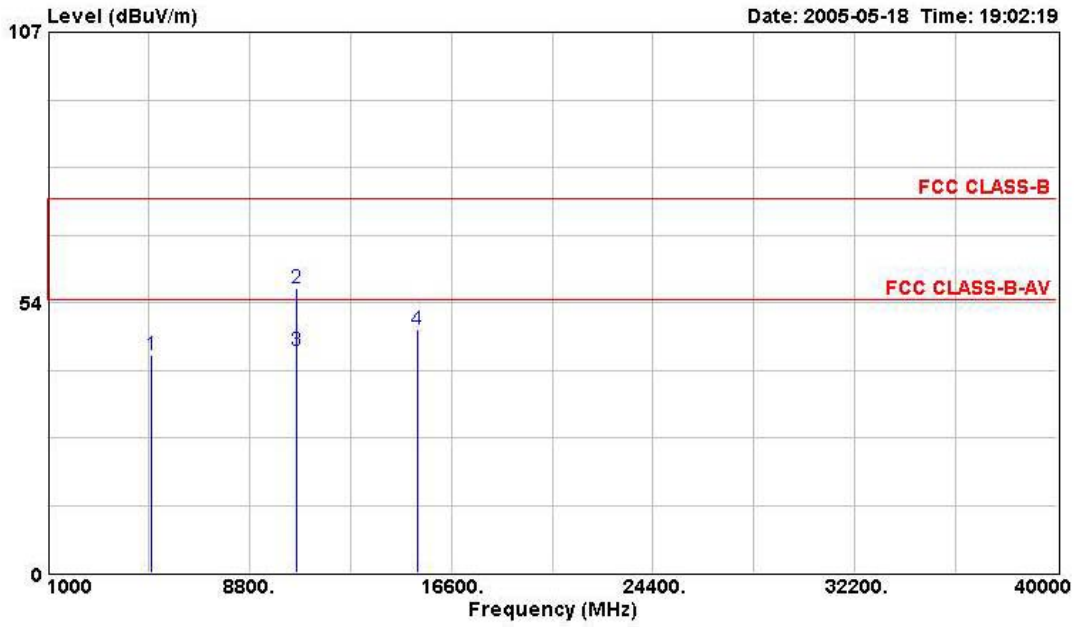
	Freq	Level	Over Limit	Read Level	Limit Line	Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV	dBuV/m	dB	dB	dB	
1	5029.600	43.08	-30.92	48.52	74.00	-5.44	2.94	41.83	PEAK
2	10640.000	56.29	-17.71	51.80	74.00	4.49	4.51	38.83	PEAK
3	10640.000	44.03	-9.97	39.54	54.00	4.49	4.51	38.83	Average
4	15316.000	48.04	-25.96	45.86	74.00	2.17	5.19	41.91	PEAK

Note:
Emission level (dBuV/m) = 20 log Emission level (uV/m)
Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

5.8.7. Test Results for CH 64 / 5320 MHz (for emission above 1GHz)

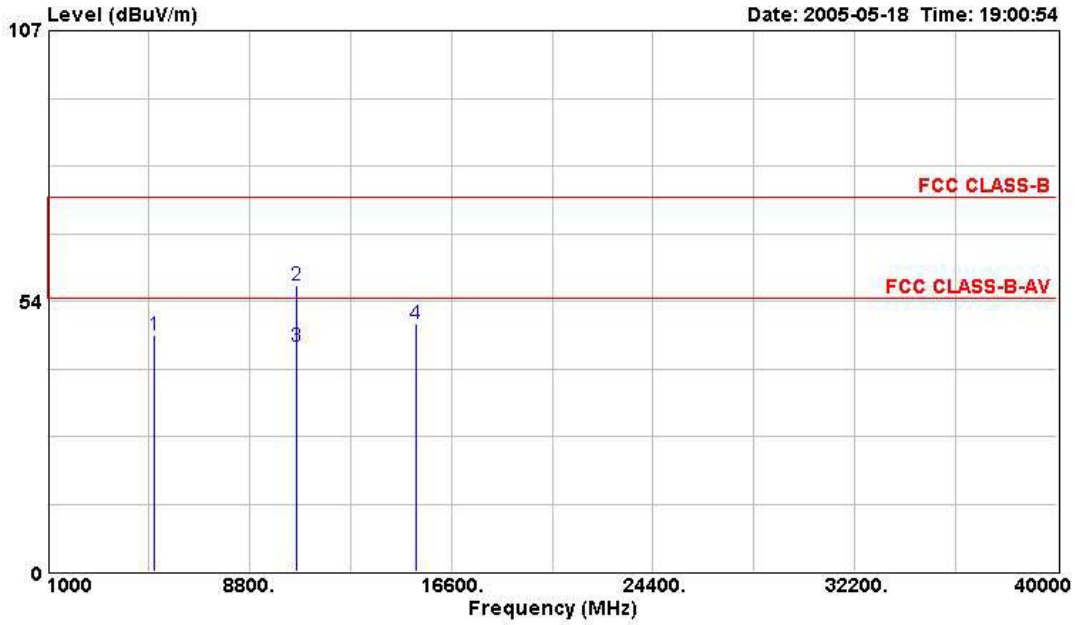
- **Normal Mode**
- Temperature: 24°C
- Relative Humidity: 51%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Ted Chiu

(A) Polarization: Horizontal



	Freq	Level	Over Limit	Read Level	Limit Line	Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV	dBuV/m	dB	dB	dB	
1	5029.600	43.08	-30.92	48.52	74.00	-5.44	2.94	41.83	PEAK
2	10640.000	56.29	-17.71	51.80	74.00	4.49	4.51	38.83	PEAK
3	10640.000	44.03	-9.97	39.54	54.00	4.49	4.51	38.83	Average
4	15316.000	48.04	-25.96	45.86	74.00	2.17	5.19	41.91	PEAK

(B) Polarization: Vertical



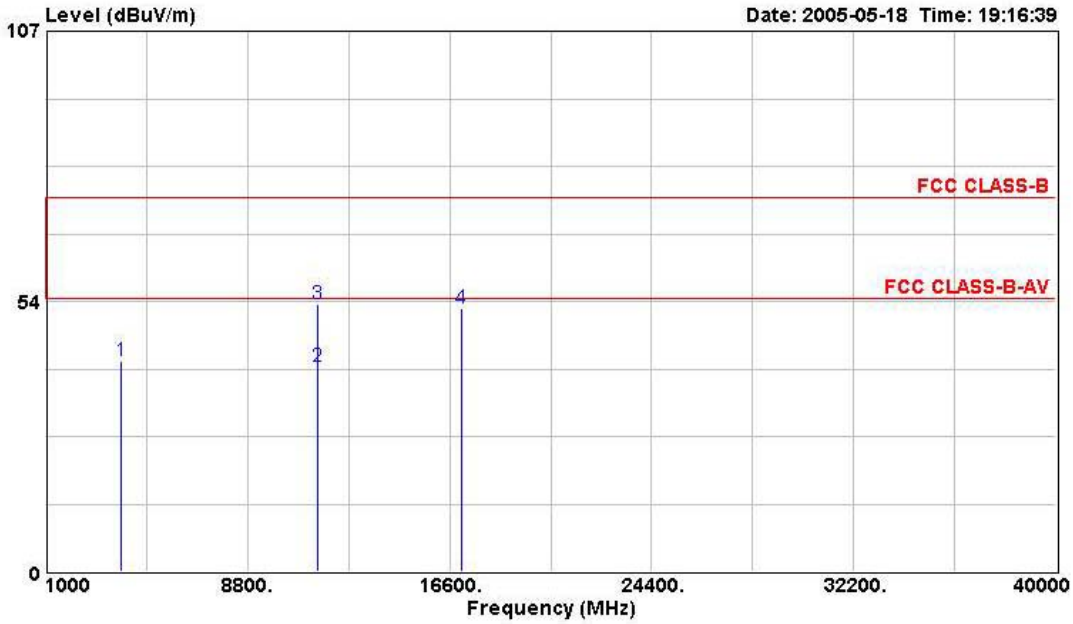
	Freq	Level	Over Limit	Read Level	Limit Line	Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV	dBuV/m	dB	dB	dB	
1	5141.400	46.72	-27.28	52.03	74.00	-5.31	2.97	41.93	PEAK
2	10648.000	56.58	-17.42	52.07	74.00	4.52	4.54	38.83	PEAK
3	10648.000	44.42	-9.58	39.90	54.00	4.52	4.54	38.83	Average
4	15224.000	49.12	-24.88	46.54	74.00	2.58	5.20	41.95	PEAK

Note:
Emission level (dBuV/m) = 20 log Emission level (uV/m)
Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

5.8.8. Test Results for CH 149 / 5745 MHz (for emission above 1GHz)

- **Normal Mode**
- Temperature: 24°C
- Relative Humidity: 51%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Ted Chiu

(A) Polarization: Horizontal

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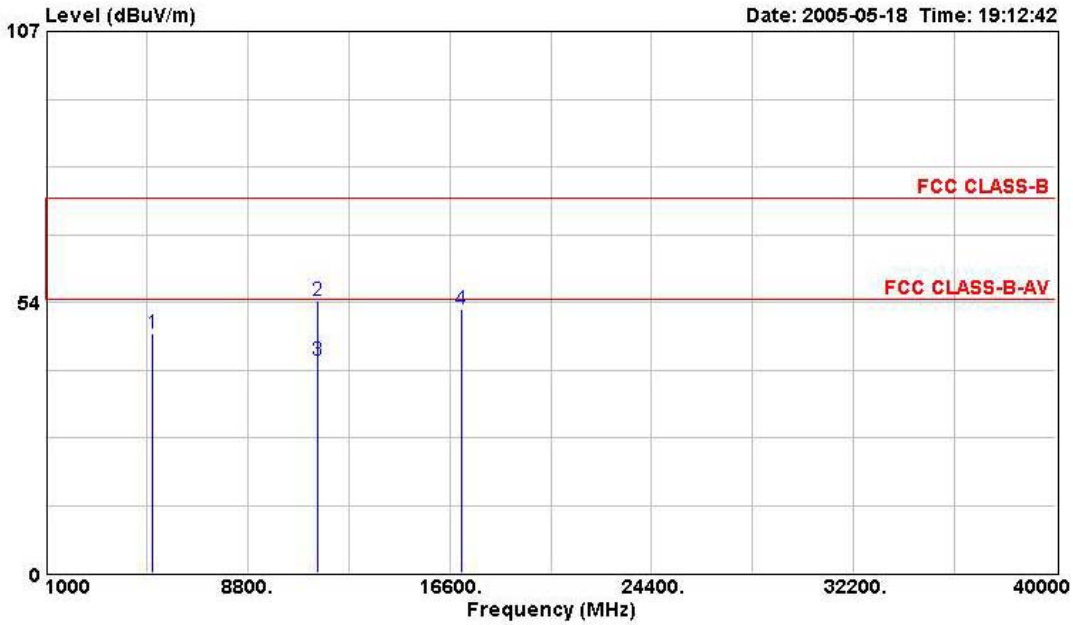
Site      :03CH03-HY
Condition:FCC CLASS-B 3m HORN-ANT-6741-200505 HORIZONTAL
EUT       :WN2401
Power     :For system
Model     :
Memo      :TX 5745MHz 11a
```

	Freq	Level	Over Limit	Read Level	Limit Line	Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV	dBuV/m	dB	dB	dB	
1	3903.000	41.59	-32.41	48.24	74.00	-6.65	2.46	41.47	PEAK
2	11484.000	40.60	-13.40	35.67	54.00	4.93	4.74	39.09	Average
3	11484.000	52.84	-21.16	47.91	74.00	4.93	4.74	39.09	PEAK
4	17048.000	52.14	-21.86	45.96	74.00	6.19	5.31	39.69	PEAK

(B) Polarization: Vertical



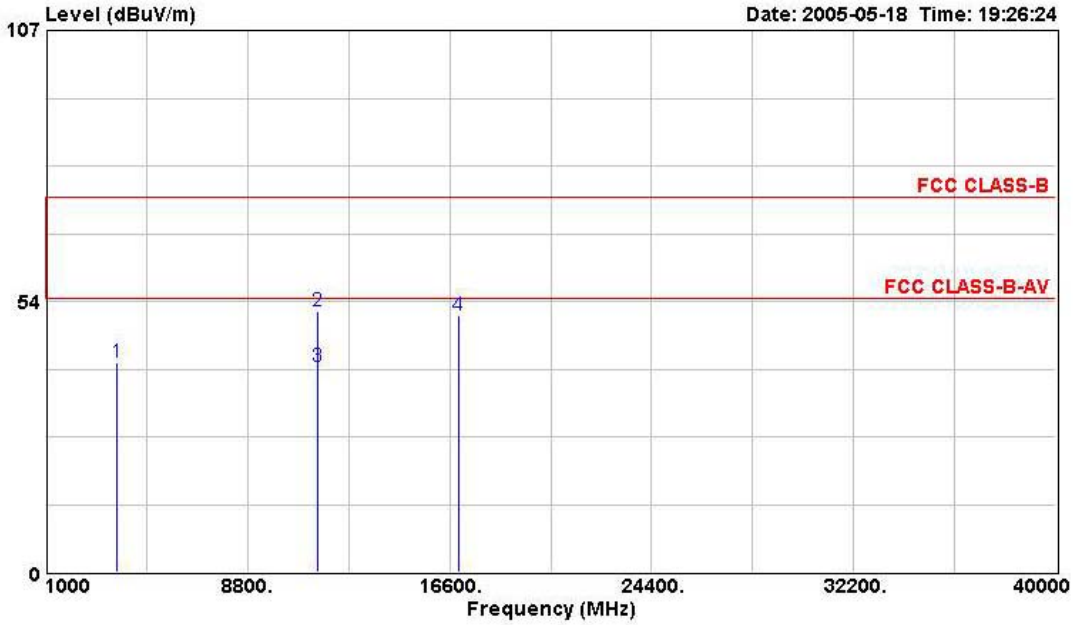
	Freq	Level	Over Limit	Read Level	Limit Line	Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV	dBuV/m	dB	dB	dB	
1	5145.700	47.24	-26.76	52.57	74.00	-5.34	2.97	41.95	PEAK
2	11484.000	53.68	-20.32	48.75	74.00	4.93	4.74	39.09	PEAK
3	11484.000	42.00	-12.00	37.07	54.00	4.93	4.74	39.09	Average
4	17048.000	52.06	-21.94	45.88	74.00	6.19	5.31	39.69	PEAK

Note:
Emission level (dBuV/m) = 20 log Emission level (uV/m)
Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

5.8.9. Test Results for CH 153 / 5765 MHz (for emission above 1GHz)

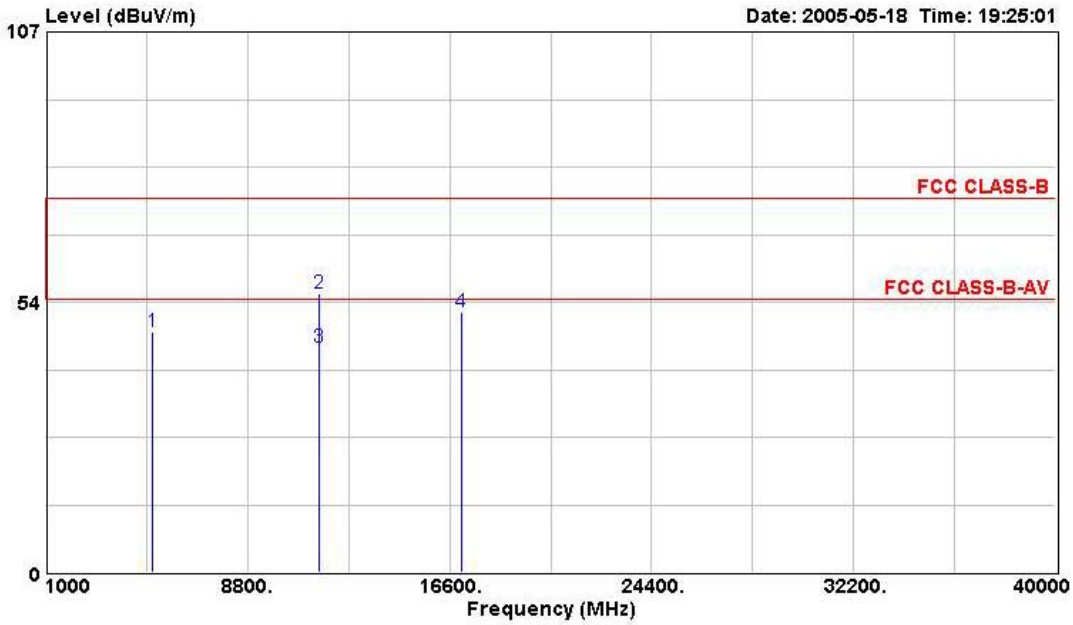
- **Normal Mode**
- Temperature: 24°C
- Relative Humidity: 51%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Ted Chiu

(A) Polarization: Horizontal



	MHz	dBuV/m	dB	dBuV	dBuV/m	dB	dB	dB	
1	3756.800	41.43	-32.57	48.34	74.00	-6.92	2.42	41.27	PEAK
2	11528.000	51.49	-22.51	46.58	74.00	4.90	4.73	39.13	PEAK
3	11528.000	40.47	-13.53	35.57	54.00	4.90	4.73	39.13	Average
4	16964.000	50.74	-23.26	45.43	74.00	5.31	5.05	39.79	PEAK

(B) Polarization: Vertical



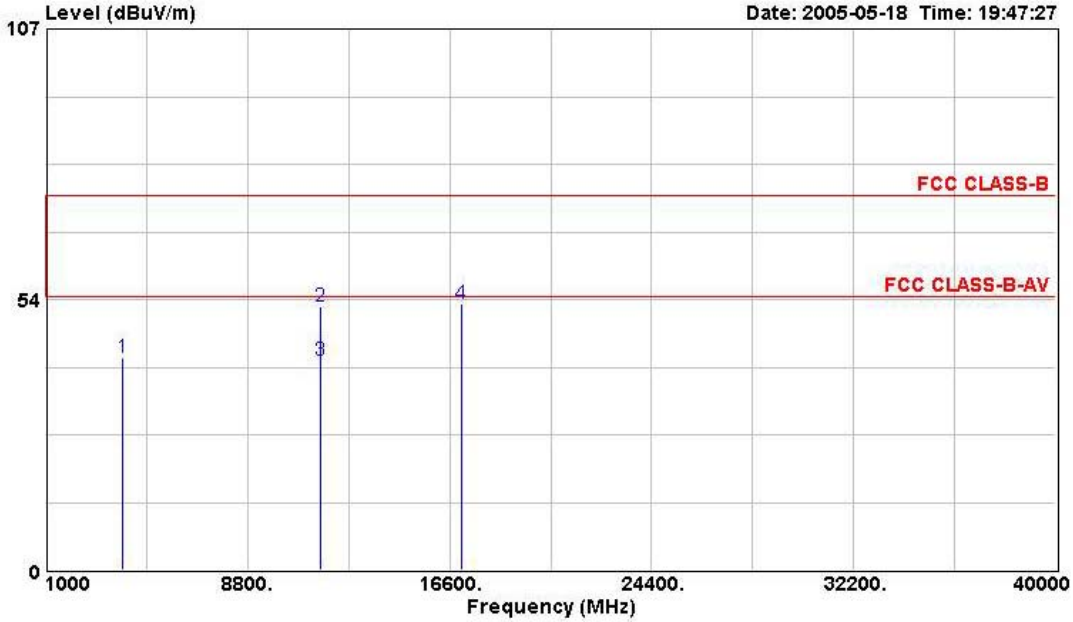
	Freq	Level	Over Limit	Read Level	Limit Line	Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV	dBuV/m	dB	dB	dB	
1	5137.100	47.65	-26.35	53.00	74.00	-5.35	2.96	41.93	PEAK
2	11532.000	55.25	-18.75	50.35	74.00	4.89	4.72	39.13	PEAK
3	11532.000	44.41	-9.59	39.52	54.00	4.89	4.72	39.13	Average
4	17048.000	51.68	-22.32	45.49	74.00	6.19	5.31	39.69	PEAK

Note:
Emission level (dBuV/m) = 20 log Emission level (uV/m)
Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

5.8.10. Test Results for CH 161 / 5805 MHz (for emission above 1GHz)

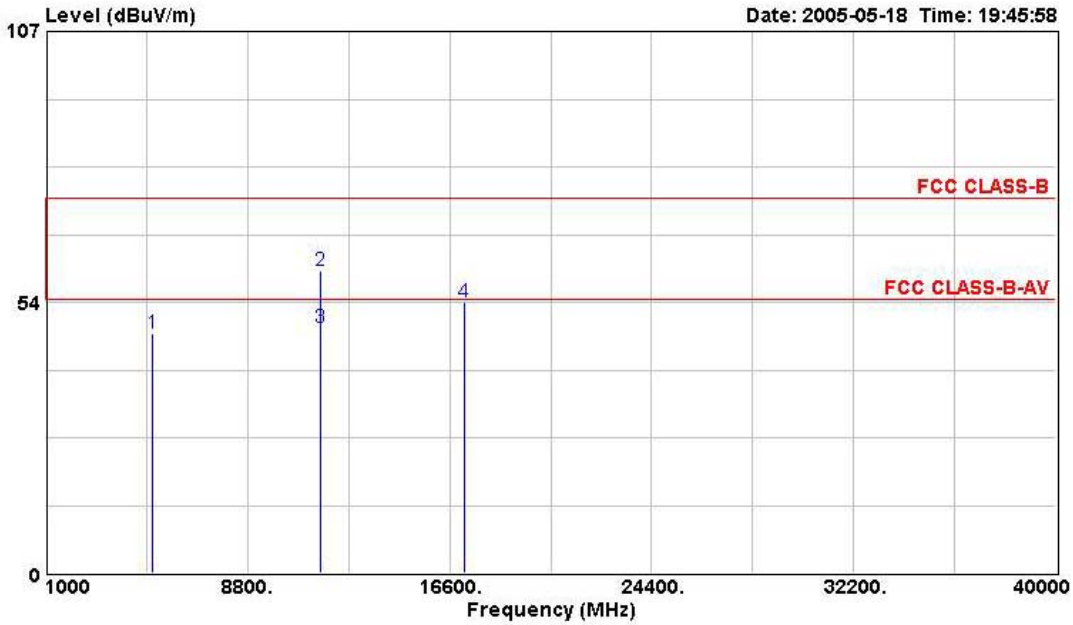
- **Normal Mode**
- Temperature: 24°C
- Relative Humidity: 51%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Ted Chiu

(A) Polarization: Horizontal



	Freq	Level	Over Limit	Read Level	Limit Line	Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV	dBuV/m	dB	dB	dB	
1	3967.500	41.96	-32.04	48.46	74.00	-6.50	2.48	41.53	PEAK
2	11612.000	52.08	-21.92	47.28	74.00	4.80	4.70	39.20	PEAK
3	11612.000	41.43	-12.57	36.63	54.00	4.80	4.70	39.20	Average
4	17080.000	52.59	-21.41	45.87	74.00	6.72	5.57	39.67	PEAK

(B) Polarization: Vertical



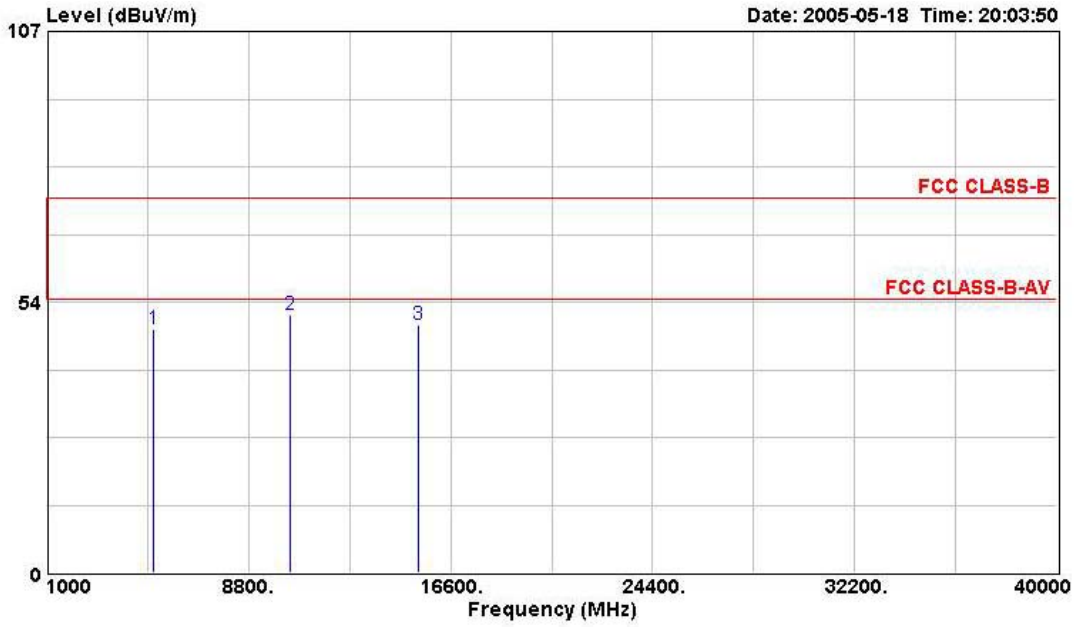
	Freq	Level	Over Limit	Read Level	Limit Line	Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV	dBuV/m	dB	dB	dB	
1	5150.000	47.19	-26.81	52.53	74.00	-5.34	2.97	41.95	PEAK
2	11608.000	59.70	-14.30	54.90	74.00	4.80	4.70	39.20	PEAK
3	11608.000	48.32	-5.68	43.52	54.00	4.80	4.70	39.20	Average
4	17168.000	53.56	-20.44	45.66	74.00	7.90	6.10	39.63	PEAK

Note:
Emission level (dBuV/m) = 20 log Emission level (uV/m)
Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

5.8.11. Test Results for CH 42 / 5210 MHz (for emission above 1GHz)

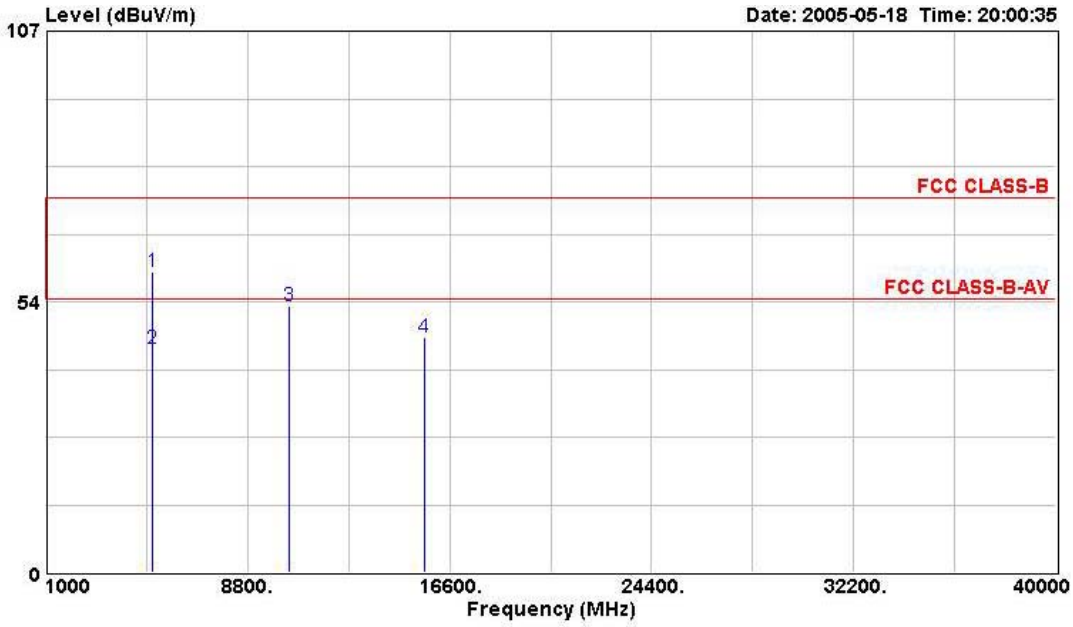
- **Turbo Mode**
- Temperature: 24°C
- Relative Humidity: 51%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Ted Chiu

(A) Polarization: Horizontal



	Freq	Level	Over Limit	Read Level	Limit Line	Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV	dBuV/m	dB	dB	dB	
1	5150.000	48.21	-25.79	53.54	74.00	-5.34	2.97	41.95	PEAK
2	10424.000	50.87	-23.13	46.49	74.00	4.38	4.34	38.88	PEAK
3	15356.000	49.05	-24.95	47.03	74.00	2.02	5.19	41.88	PEAK

(B) Polarization: Vertical



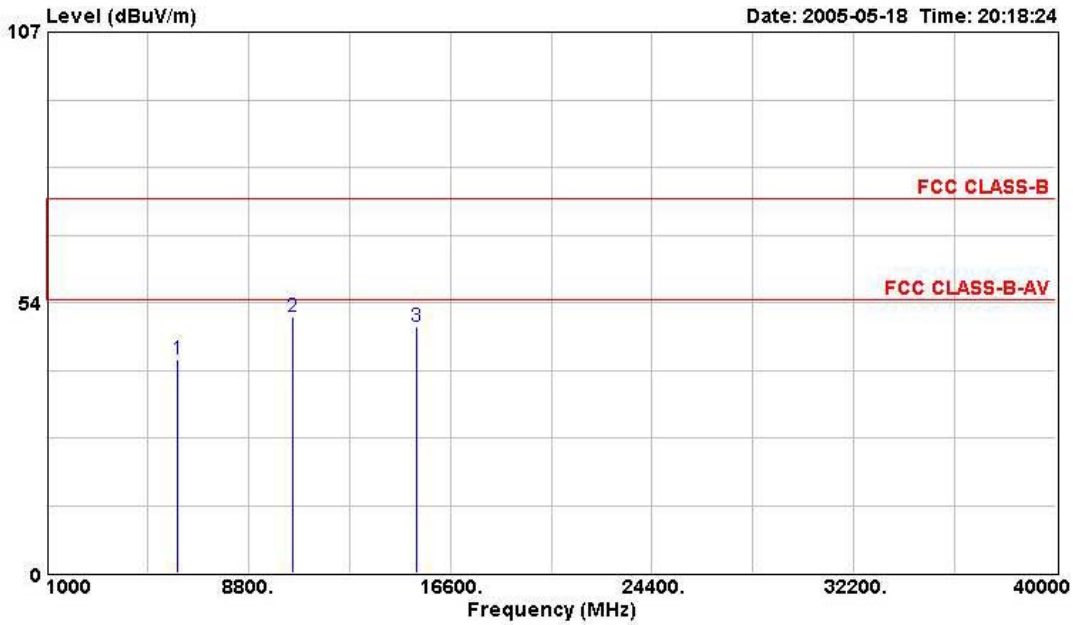
	Freq	Level	Over Limit	Read Level	Limit Line	Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV	dBuV/m	dB	dB	dB	
1	5150.000	59.34	-14.66	64.68	74.00	-5.34	2.97	41.95	PEAK
2	5150.000	44.33	-9.67	49.67	54.00	-5.34	2.97	41.95	Average
3	10424.000	52.66	-21.34	48.28	74.00	4.38	4.34	38.88	PEAK
4	15616.000	46.48	-27.52	45.37	74.00	1.11	5.18	41.76	PEAK

Note:
Emission level (dBuV/m) = 20 log Emission level (uV/m)
Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

5.8.12. Test Results for CH 50 / 5250 MHz (for emission above 1GHz)

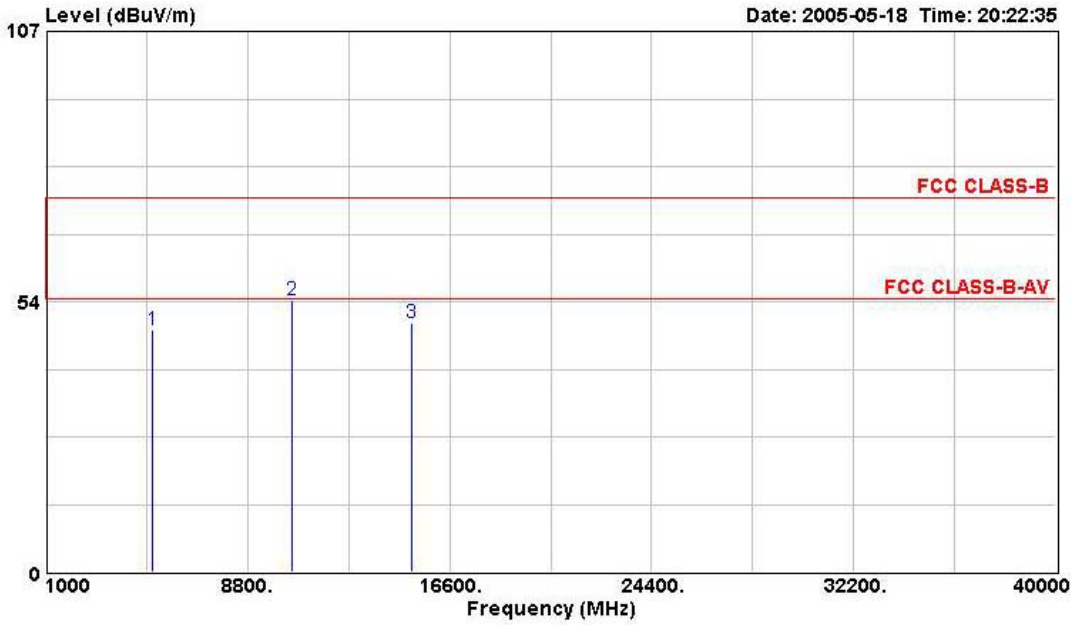
- **Turbo Mode**
- Temperature: 24°C
- Relative Humidity: 51%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Ted Chiu

(A) Polarization: Horizontal



	Freq	Level	Over Limit	Read Level	Limit Line	Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV	dBuV/m	dB	dB	dB	
1	6074.000	42.39	-31.61	47.44	74.00	-5.05	3.28	42.63	PEAK
2	10492.000	50.79	-23.21	46.33	74.00	4.46	4.41	38.85	PEAK
3	15276.000	48.86	-25.14	46.53	74.00	2.34	5.19	41.92	PEAK

(B) Polarization: Vertical



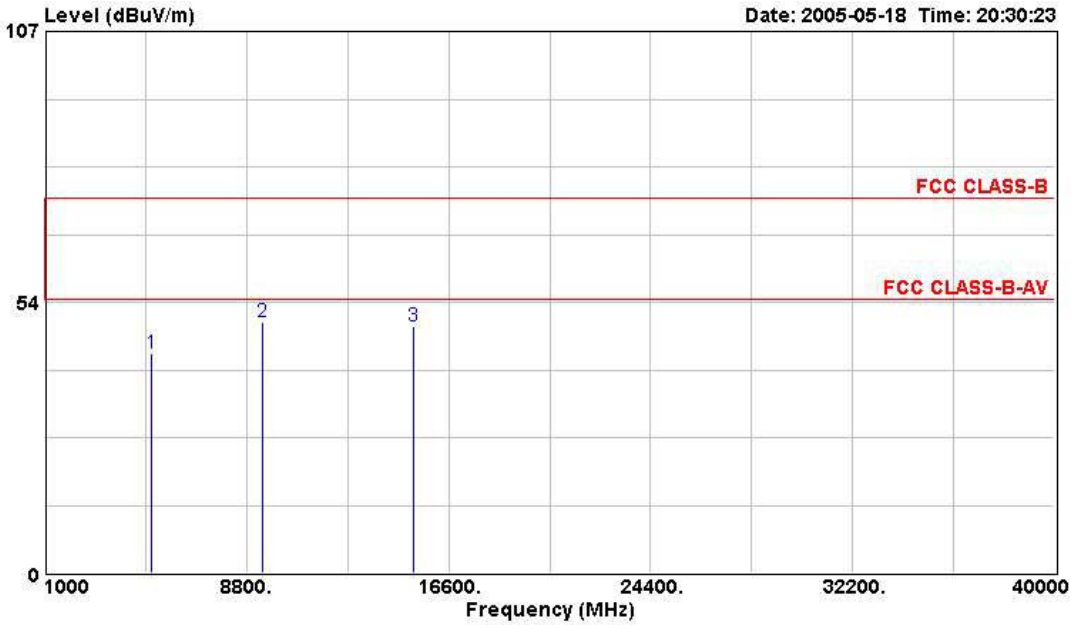
	Freq	Level	Over Limit	Read Level	Limit Line	Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV	dBuV/m	dB	dB	dB	
1	5150.000	47.92	-26.08	53.26	74.00	-5.34	2.97	41.95	PEAK
2	10504.000	53.81	-20.19	49.34	74.00	4.47	4.41	38.84	PEAK
3	15140.000	49.35	-24.65	46.36	74.00	2.99	5.20	41.99	PEAK

Note:
Emission level (dBuV/m) = 20 log Emission level (uV/m)
Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

5.8.13. Test Results for CH 58 / 5290 MHz (for emission above 1GHz)

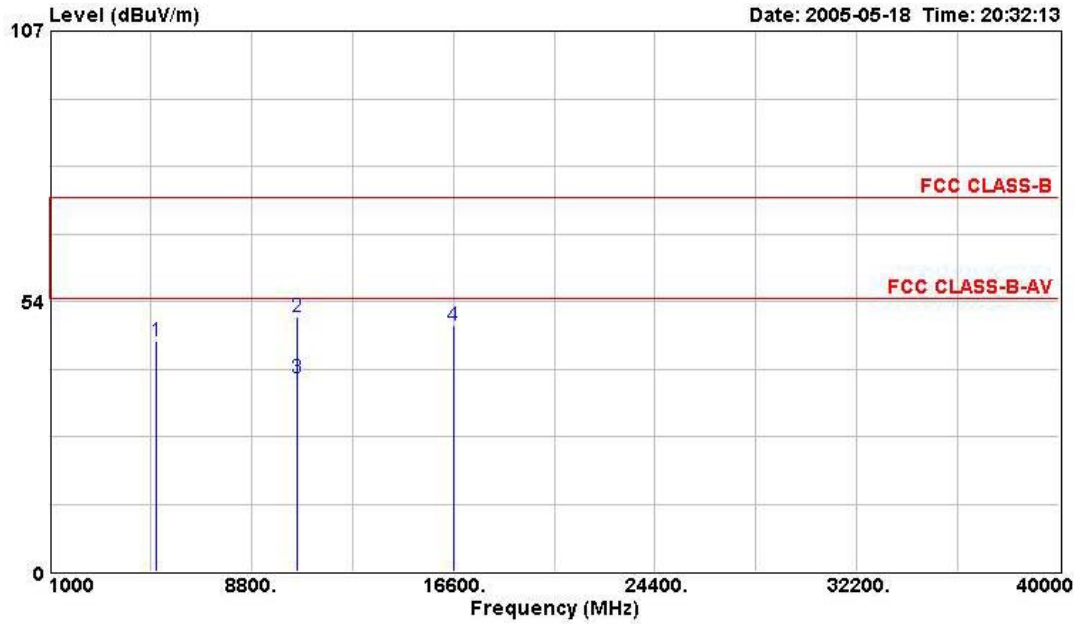
- **Turbo Mode**
- Temperature: 24°C
- Relative Humidity: 51%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Ted Chiu

(A) Polarization: Horizontal



	Freq	Level	Over Limit	Read Level	Limit Line	Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV	dBuV/m	dB	dB	dB	
1	5111.300	43.37	-30.63	48.72	74.00	-5.35	2.96	41.90	PEAK
2	9436.000	49.53	-24.47	46.53	74.00	3.00	4.03	39.10	PEAK
3	15256.000	48.64	-25.36	46.23	74.00	2.41	5.19	41.94	PEAK

(B) Polarization: Vertical



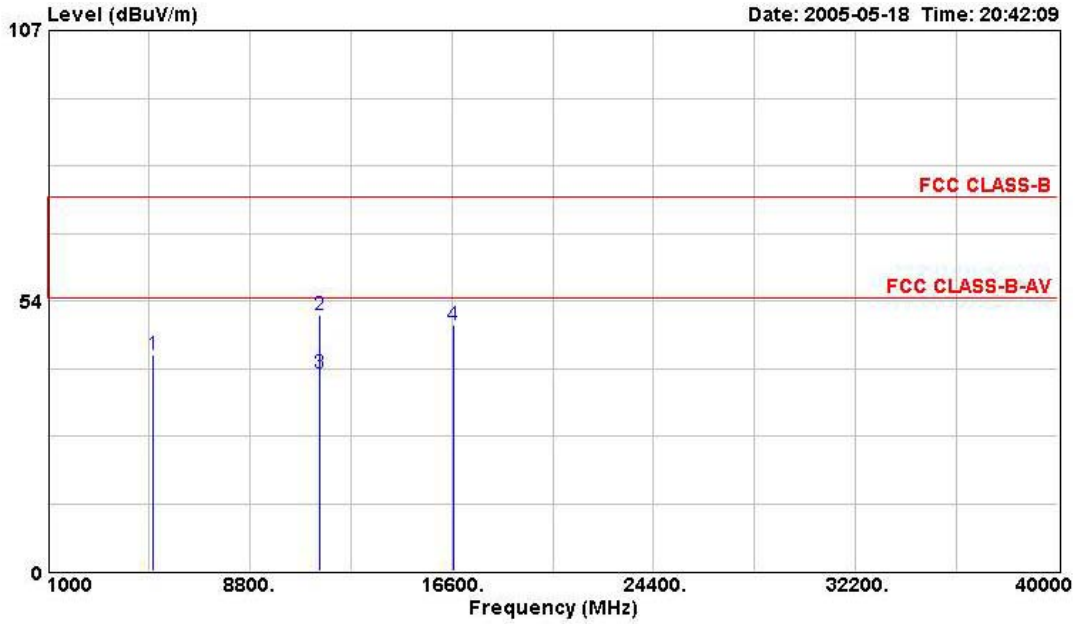
	Freq	Level	Over Limit	Read Level	Limit Line	Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV	dBuV/m	dB	dB	dB	
1	5124.200	45.66	-28.34	51.01	74.00	-5.35	2.96	41.93	PEAK
2	10572.000	50.33	-23.67	45.83	74.00	4.50	4.47	38.84	PEAK
3 @	10572.000	38.32	-15.68	33.82	54.00	4.50	4.47	38.84	Average
4	16612.000	48.85	-25.15	46.08	74.00	2.76	5.09	40.71	PEAK

Note:
Emission level (dBuV/m) = 20 log Emission level (uV/m)
Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

5.8.14. Test Results for CH 152 / 5760 MHz (for emission above 1GHz)

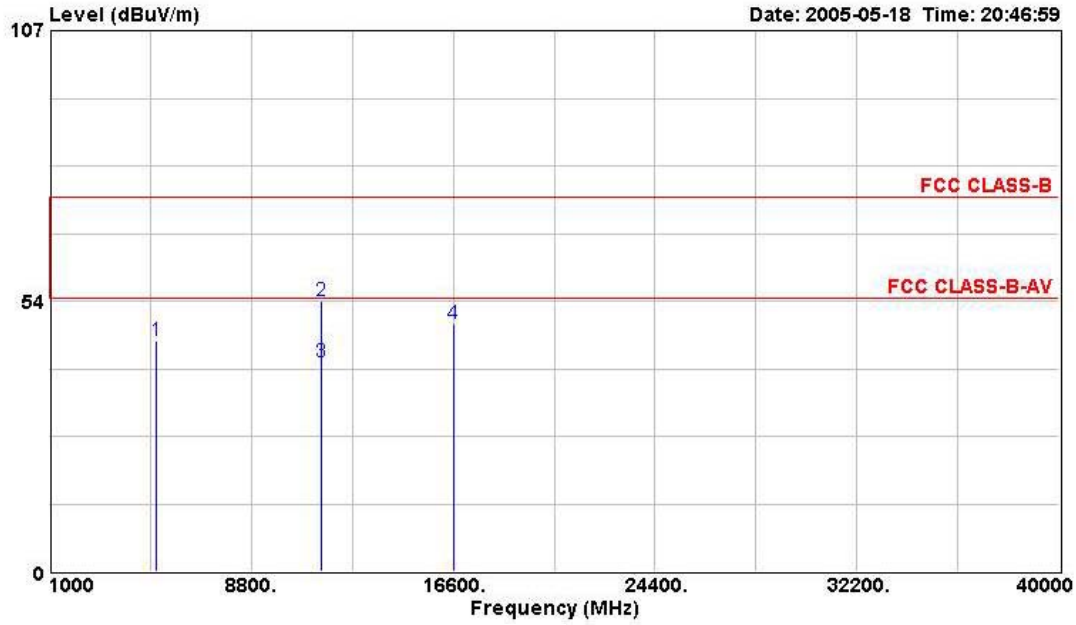
- **Turbo Mode**
- Temperature: 24°C
- Relative Humidity: 51%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Ted Chiu

(A) Polarization: Horizontal



	Freq	Level	Over Limit	Read Level	Limit Line	Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV	dBuV/m	dB	dB	dB	
1	5072.600	42.75	-31.25	48.15	74.00	-5.39	2.95	41.88	PEAK
2	11520.000	50.83	-23.17	45.92	74.00	4.90	4.73	39.13	PEAK
3	11520.000	39.01	-14.99	34.11	54.00	4.90	4.73	39.13	Average
4	16664.000	48.76	-25.24	45.63	74.00	3.13	5.09	40.58	PEAK

(B) Polarization: Vertical



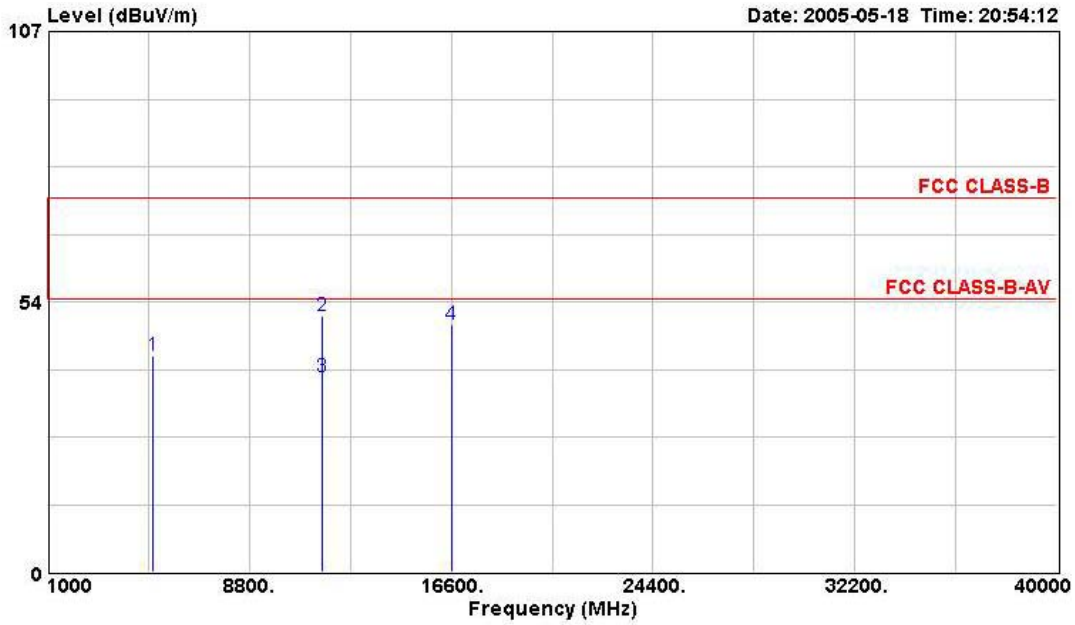
	Freq	Level	Over Limit	Read Level	Limit Line	Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV	dBuV/m	dB	dB	dB	
1	5111.300	45.62	-28.38	50.97	74.00	-5.35	2.96	41.90	PEAK
2	11512.000	53.58	-20.42	48.66	74.00	4.93	4.73	39.10	PEAK
3	11512.000	41.39	-12.61	36.46	54.00	4.93	4.73	39.10	Average
4	16624.000	48.94	-25.06	46.03	74.00	2.91	5.09	40.64	PEAK

Note:
Emission level (dBuV/m) = 20 log Emission level (uV/m)
Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

5.8.15. Test Results for CH 160 / 5800 MHz (for emission above 1GHz)

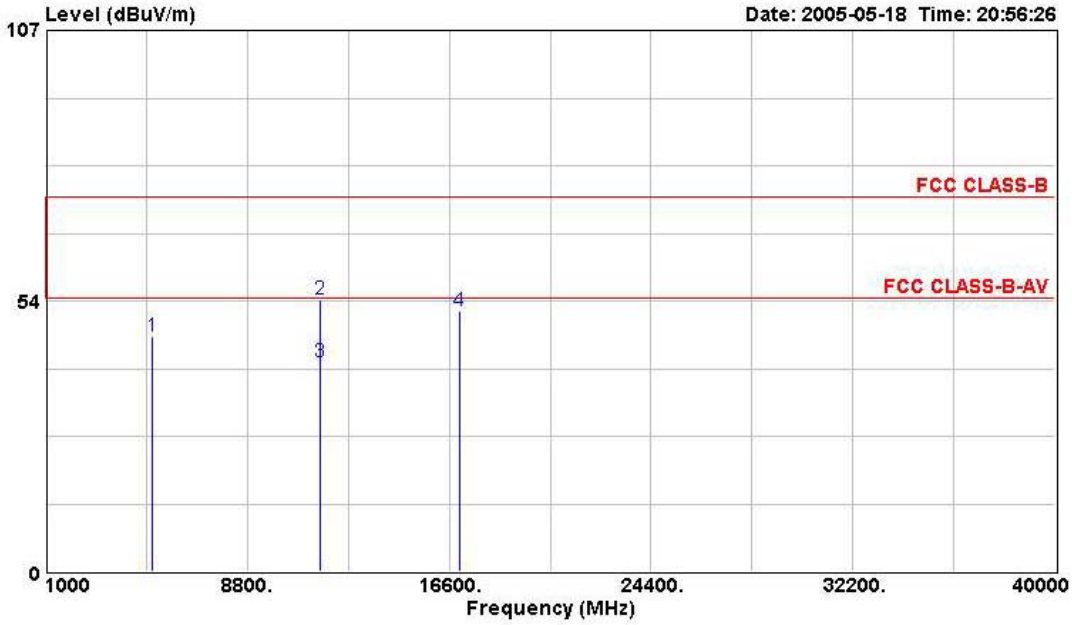
- **Turbo Mode**
- Temperature: 24°C
- Relative Humidity: 51%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Ted Chiu

(A) Polarization: Horizontal



	Freq	Level	Over Limit	Read Level	Limit Line	Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV	dBuV/m	dB	dB	dB	
1	5072.600	42.68	-31.32	48.07	74.00	-5.39	2.95	41.88	PEAK
2	11588.000	50.73	-23.27	45.89	74.00	4.83	4.71	39.18	PEAK
3	11588.000	38.56	-15.44	33.73	54.00	4.83	4.71	39.18	Average
4	16644.000	49.11	-24.89	46.12	74.00	2.99	5.09	40.64	PEAK

(B) Polarization: Vertical

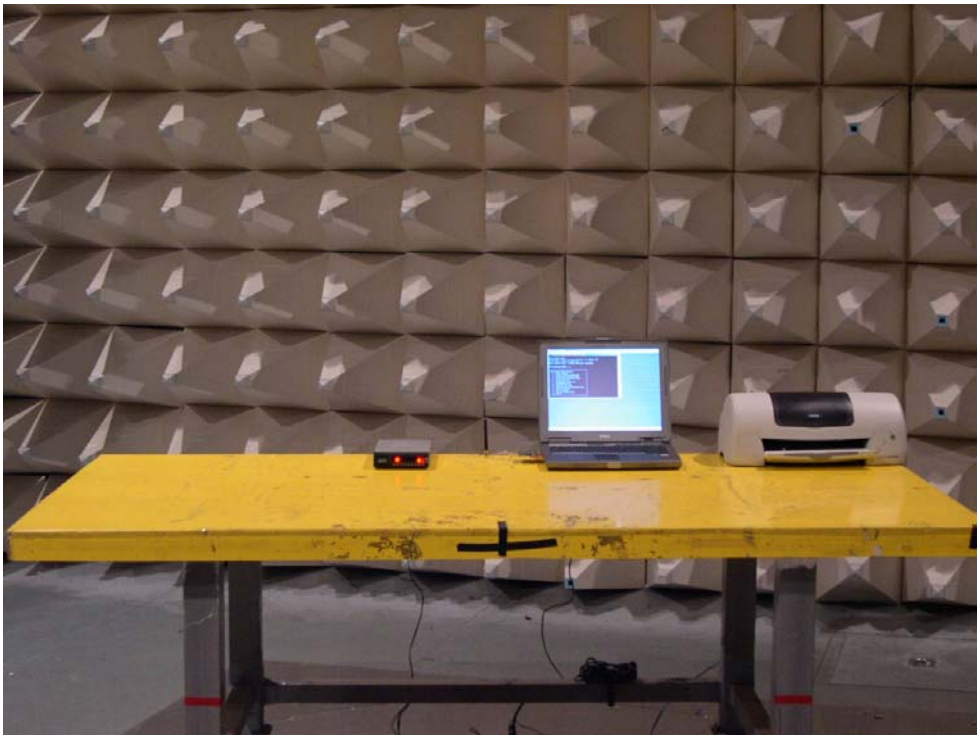


	Freq	Level	Over Limit	Read Level	Limit Line	Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV	dBuV/m	dB	dB	dB	
1	5145.700	46.47	-27.53	51.81	74.00	-5.34	2.97	41.95	PEAK
2	11604.000	53.88	-20.12	49.07	74.00	4.81	4.71	39.20	PEAK
3	11604.000	41.48	-12.52	36.67	54.00	4.81	4.71	39.20	Average
4	17020.000	51.53	-22.47	45.87	74.00	5.67	5.05	39.71	PEAK

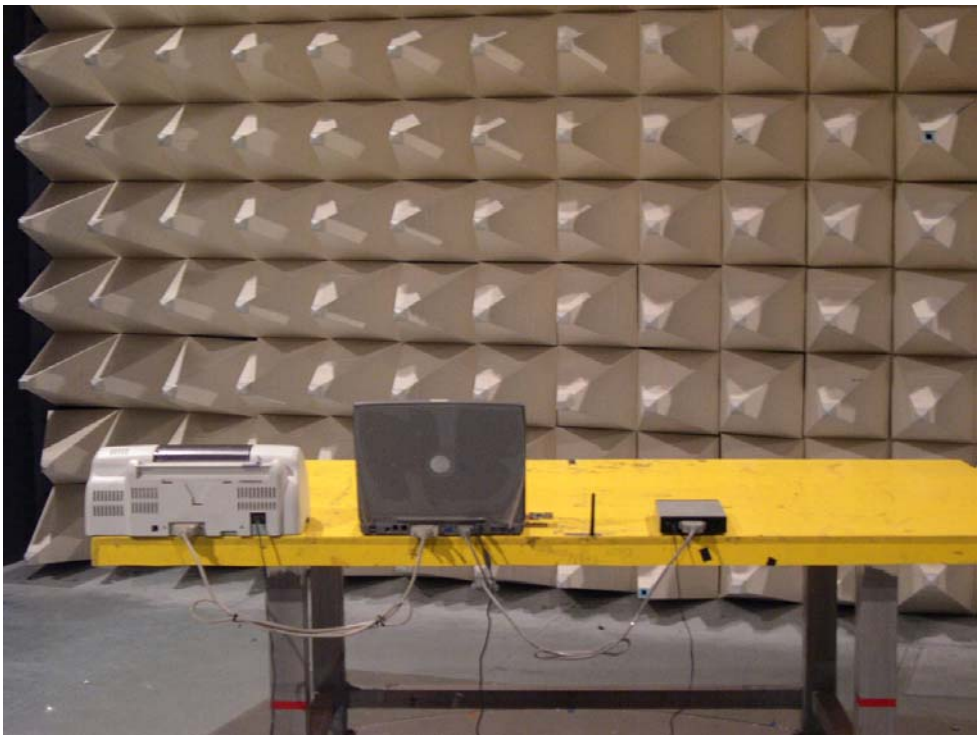
Note:
Emission level (dBuV/m) = 20 log Emission level (uV/m)
Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level

5.8.16. Photographs of Radiated Emission Test Configuration

FRONT VIEW



REAR VIEW



5.9. Antenna Requirements

5.9.1. Standard Applicable

47 CFR Part15 Section 15.203:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

47 CFR Part15 Section 15.407:

If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

If the intentional radiator is used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

5.9.2. Antenna Connected Construction

The connector for dipole antenna is UFL or reversed SMA.

5.10. RF Exposure

5.10.1. Limit For Maximum Permissible Exposure (MPE)

This product can be classified as mobile device, so the 20cm separation distance warning is required. In this section, the power density at 20cm location is calculated to examine if it is lower than the limit.

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm²)	Averaging Time |E|²,|H|² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842 / f	4.89 / f	(900 / f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-100,000			5	6

(B) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm²)	Averaging Time |E|²,|H|² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30

F = frequency in MHz

*Plane-wave equivalent power density

5.10.2. MPE Calculation Method

$$\text{E (V/m)} = \frac{\sqrt{30 \times P \times G}}{d} \qquad \text{Power Density: } Pd \text{ (mW/cm}^2\text{)} = \frac{E^2}{377}$$

E = Electric field (V/m)

P = Peak RF output power (mW)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

$$Pd = \frac{30 \times P \times G}{377 \times d^2}$$

From the peak EUT RF output power, the minimum mobile separation distance, d=20cm, as well as the gain of the used antenna, the RF power density can be obtained.

5.10.3. Calculated Result and Limit

- **Normal Mode**
- Temperature: 24°C
- Relative Humidity: 51%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Sam Lee

Frequency	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm^2)	Limit of Power Density (S) (mW/cm^2)
5180 MHz	1.00	1.00	15.31	33.96	0.0085	1
5260 MHz	1.00	1.00	16.12	40.93	0.0103	1
5320 MHz	1.00	1.00	16.17	41.40	0.0104	1
5745 MHz	1.00	1.00	15.80	38.02	0.0095	1
5785 MHz	1.00	1.00	16.63	46.03	0.0115	1
5805 MHz	1.00	1.00	16.10	40.74	0.0102	1

- **Turbo Mode**
- Temperature: 24°C
- Relative Humidity: 51%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Ted Chiu

Frequency	Antenna Gain (dBi)	Antenna Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (S) (mW/cm^2)	Limit of Power Density (S) (mW/cm^2)
5210 MHz	1.00	2.51	16.22	41.88	0.0105	1
5250 MHz	1.00	2.51	16.56	45.29	0.0114	1
5290 MHz	1.00	2.51	16.46	44.26	0.0111	1
5760 MHz	1.00	2.51	16.68	46.56	0.0117	1
5800 MHz	1.00	2.51	16.25	46.24	0.0116	1

6. List of Measuring Equipments Used

Items	Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
1	EMC Receiver	R&S	ESCS 30	100174	9kHz – 2.75GHz	Feb. 19, 2005	Conduction (CO04-HY)
2	LISN	EMCO	3810/2NM	9703-1839	9kHz – 30MHz	Mar. 15, 2005	Conduction (CO04-HY)
3	LISN (Support Unit)	PIC	NNB-2/16Z	2001/008	9kHz – 30MHz	May 06, 2005	Conduction (CO04-HY)
4	EMI Filter	LINDGREN	LRE-2030	2651	< 450 Hz	N/A	Conduction (CO04-HY)
5	RF Cable-CON	Suhner Switzerland	RG223/U	CB029	9kHz – 30MHz	Dec. 23, 2004	Conduction (CO04-HY)
6	3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30MHz~1GHz 3m	Jun. 21, 2004	Radiation (03CH03-HY)
7	Spectrum Analyzer	R&S	FSP40	100004	9KHZ~4GHz	Aug. 31, 2004	Radiation (03CH03-HY)
8	Amplifier	Schaffner	CPA9231A	18667	9KHz – 2GHz	Jan. 04, 2005	Radiation (03CH03-HY)
9	Biconical Antenna	SCHWARZBECK	VHBB 9124	301	30MHz –200MHz	Jul. 23, 2004	Radiation (03CH03-HY)
10	Log Antenna	SCHWARZBECK	VUSLP 9111	221	200MHz -1GHz	Jul. 23, 2004	Radiation (03CH03-HY)
11	RF Cable-R03m	Jye Bao	RG142	CB021	30MHz~1GHz	Dec. 02, 2004	Radiation (03CH03-HY)
12	Amplifier	MITEQ	AFS44	879984	1GHz~26.5GHz	Mar. 25, 2005	Radiation (03CH03-HY)
13	Horn Antenna	COMPOWER	AH-118	10092	1GHz – 18GHz	Feb. 18, 2005	Radiation (03CH03-HY)
14	Turn Table	HD	DS 420	420/650/00	0 ~ 360 degree	N/A	Radiation (03CH03-HY)
15	Antenna Mast	HD	MA 240	240/560/00	1 m - 4 m	N/A	Radiation (03CH03-HY)
16	Horn Antenna	Schwarzbeck	BBHA9170	154	15GHz~40GHz	Jun. 09, 2004	Radiation (03CH03-HY)
17	RF Cable-HIGH	SUHNER	SUCOFLES 106	SN30094/6	1GHz~26.5GHz	Mar. 05, 2005	Radiation (03CH03-HY)

※ Calibration Interval of instruments listed above is one year.

Items	Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
18	Spectrum Analyzer	R&S	FSP30	100023	9kHz – 30GHz	Aug. 02, 2004	Conducted (TH01-HY)
19	Power Meter	R&S	NRVS	100444	DC – 40GHz	Jun. 15, 2004	Conducted (TH01-HY)
20	Power Sensor	R&S	NRV-Z55	100049	DC – 40GHz	Jun. 15, 2004	Conducted (TH01-HY)
21	Power Sensor	R&S	NRV-Z32	100057	30MHz – 6GHz	Jun. 15, 2004	Conducted (TH01-HY)
22	AC Power Source	HPC	HPA-500W	HPA-9100024	AC 0 – 300V	Jun. 16, 2004	Conducted (TH01-HY)
23	DC Power Source	G.W.	GPC-6030D	C671845	DC 1V – 60V	Dec.. 28, 2004	Conducted (TH01-HY)
24	Temp. and Humidity Chamber	KSON	THS-C3L	612	N/A	Oct. 01, 2004	Conducted (TH01-HY)
25	RF CABLE-1m	Jye Bao	RG142	CB034-1m	20MHz – 7GHz	Jan. 01, 2005	Conducted (TH01-HY)
26	RF CABLE-2m	Jye Bao	RG142	CB035-2m	20MHz – 1GHz	Jan. 01, 2005	Conducted (TH01-HY)
27	Data Generator	Tektronix	J310345	J310345	400Mbps	Dec. 21, 2004	Conducted (TH01-HY)
28	OscilloScope	Tektronix	TDS1012	C038520	100MHz-1Gs/s	Jan. 02, 2005	Conducted (TH01-HY)

※ Calibration Interval of instruments listed above is one year.