Test Report

FOR

FCC Part 15 Subpart C

of

Notebook Personal Computer

(with PRO/Wireless 2200BG Network Connection
and Ambit Bluetooth Wireless Card T60M665 inside)

Model

TravelMate C300

(Brand: acer)

Applied by:

Wistron Corporation

21F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien 221,
Taiwan, R.O.C.

Test Performed by:

International Standards Laboratory

No. 120, Lane 180, San Ho Tsuen, Hsin Ho Rd.
Lung-Tan Hsiang, Tao Yuan County 325
Taiwan, R.O.C.
Tel:(03)407-1718 Fax:(03)407-1738

Report Number: 03LR031FC **Test Date: 2004/1/03**

NVLAP Lab. Code: 200234-0; VCCI: R-1435, C-1440; NEMKO Aut. No: ELA 113; BSMI Lab. Code: SL2-IN-E-0013

Contents of Report

1. . General

1.1 Certification of Accuracy of Test Data

The electromagnetic interference tests which this report describes were conducted by an independent electromagnetic compatibility consultant, International Standards Laboratory in accordance with the test procedure specified in CFR 47 Part 15 Subpart C (Section 15.247) , and ANSI C63.4 Rules.

The test results contained in this report accurately represent the measurements of the EMC characteristics and the energy generated by sample equipment under test at the time of the test.

Equipment Tested: Notebook Personal Computer
(with PRO/Wireless 2200BG Network Connection
& Ambit Bluetooth Wireless Card T60M665 inside)
Model: TravelMate C300
Applied by Wistron Corporation

Sample received Date: 2003/12/20

Final test Date : 2004/01/02

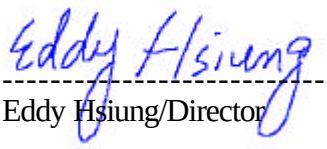
Test Site: Chamber 02, Conduction 02

Temperature	22º C(Conduction Test);	20º C (Radiation Test)
Humidity:	58% (Conduction Test);	46% (Radiation Test)

Test Engineer: Jerry Chiou

The results show that the sample equipment tested as described in this report is in compliance with the Class B conducted and radiated emission limits of FCC Rules Part 15 Subpart B, and the limit of Part Subpart C Sec. 15.247.

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 87 pages, including 1 cover page , 2 contents page, and 84 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 and 802.11g functions of EUT has been tested 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 Bluetooth of EUT has been tested to the FCC regulations listed below:

Tested Standards: 47 CFR Part 15 Subpart C
Please see the bluetooth test report

3. Description of Equipment Under Test (EUT)

Description:	Notebook Personal Computer (with PRO/Wireless 2200BG Network Connection & Ambit Bluetooth Wireless Card T60M665 inside)
Model No.:	TravelMate C300
FCC ID:	PU5MS2140BG
Brand:	acer
Wireless LAN Module:	Intel, Model: WM3B2200BG
Bluetooth Wireless Card:	Ambit, Model: T60M665
Frequency Range 802.11b/g:	2412 - 2462 MHz
Frequency Range of bluetooth:	2402 - 2480 MHz
Support channel:	
802.11b/g	11 Channels
bluetooth	79 Channels
Modulation Skill:	
802.11b	DBPSK(1Mbps), DQPSK(2Mbps), CCK(5.5/11Mbps)
802.11g	OFDM (6M - 54Mbps)
bluetooth	GFSK
Antennas Type:	PIFA Type in Meta made by Hannatar
Antenna Connected:	Connected to RF connector on the PCB of the 802.11b/g WLAN Adapter and bluetooth card. The user is not possible to change the antenna without disassembling the notebook computer.
Antenna peak Gain:	
Main antenna	2.42 dBi (11b,11g)
AUX antenna	0.91 dBi (11b,11g)
Bluetooth antenna	-0.268dBi
Power Type of wireless 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 bluetooth is listed below:

Channel	Frequency(MHz)	Channel	Frequency(MHz)
00	2402	01	2403
02	2404	03	2405
. .....			
. ...			
77	2479	78	2480

The notebook with this bluetooth card had been tested and granted , the FCC ID is MCLT60M665, please see the attached report R0301173 & R0309231.

In this report about bluetooth, we will show the peak output power of the bluetooth card. Then, the Radiated Emission above1GHz and the Radiated Band-Edge are also shown when the bluetooth device is co-located with the WLAN device.

Adapter Type:	Liteon 70W(Model:PA-1700-02) 3pins
SDRAM:	Nanya 128MB (Model: NT128D64SH4BBGM-6K) or Infineon 256MB (Model: HYS64D32020GDL-6-B) or Nanya 256MB (Model: NT256D64SH8BAGM-6K) or Elpida 256MB (Model: W30256AAEP1652A) or Micron 256MB (Model: MT8VDDT3264HDG-335C3) or Infineon 512MB (Model: HYS64D64020GBDL-6-B) or Elpida 512MB (Model: EBD52UC8AARA6B) or Micron 512MB (Model: MT16VDDF6464HG-335C2)
Hard Disk Driver:	HGST 20G (Model: IC25N020ATMR04-0) or HGST 30G (Model: IC25N030ATMR04-0) or HGST 40G (Model: IC25N040ATMR04-0) or HGST 60G (Model: IC25N060ATMR04-0) or HGST 80G (Model: IC25N080ATMR04-0) or Toshiba 30GB (Model: MK3021GAS) or Toshiba 40GB (Model: MK4021GAS) or Toshiba 60GB (Model: MK6021GAS)

DVD-ROM:	MKE (Model: SR-8177-BAA3) or Liteon (Model: XJ-SD081D)
CD-ROM:	Mitsumi (Model: SR244W1 A6) or
Combo:	Sony (Model: CRX-830) or QSI (Model: SBW-242U) or Pioneer (Model: DVR-K12D)
FDD Driver:	Y-E Data(Model:YD-8U10) (Optional module)
Modem Module:	Ambit (Model: T60M283.10) or
Battery:	Sanyo 8 cell Li+ (Model:BTP-63D1)
Power In Port:	one
USB Port:	two 4-pin (USB 2.0)
VGA Port:	one
TV-Out Port	one
1394 Connecter:	one 4-pin
Line Out Port:	one
Line In Port:	one
LAN Connector:	one 8-pin (10Mbps/100Mbps)
Modem Connector:	one
PCMCIA:	one
Mini-PCI:	one
Port Replicator:	one 100-pin
Power Cord:	Shielded
LCD:	CMO 14.1" XGA (Model: CHIME/N141X9-L01) or AU 14.1" XGA (Model: B141XG08)

3.1 Test Standards and Procedure

Test Specification:	FCC Part 15 subpart C (Section 15.247) and subpart B and/or CISPR 22/EN55022, RSS210
Test Procedure:	ANSI C63.4, CFR 47 Sec. 15.247 as detailed in Appendices

3.2 General Test Conditions

1. During the test, the EUT was set in continuously transmitting mode with a duty cycle of 99% (maximum allowed).
2. The channel 1, 6, 11 of of 802.11b and 802.11g of EUT were all tested.
3. Both Main antenna and Aux antenna of EUT are able to be used as the Transmitting Antenna. Both antennas have been tested respectively, and the worst data is showed in the report.

4. TEST RESULTS (802.11b)

4.1 Powerline Conducted Emissions [Section 15.207]

4.1.1 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.

4.1.2 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.

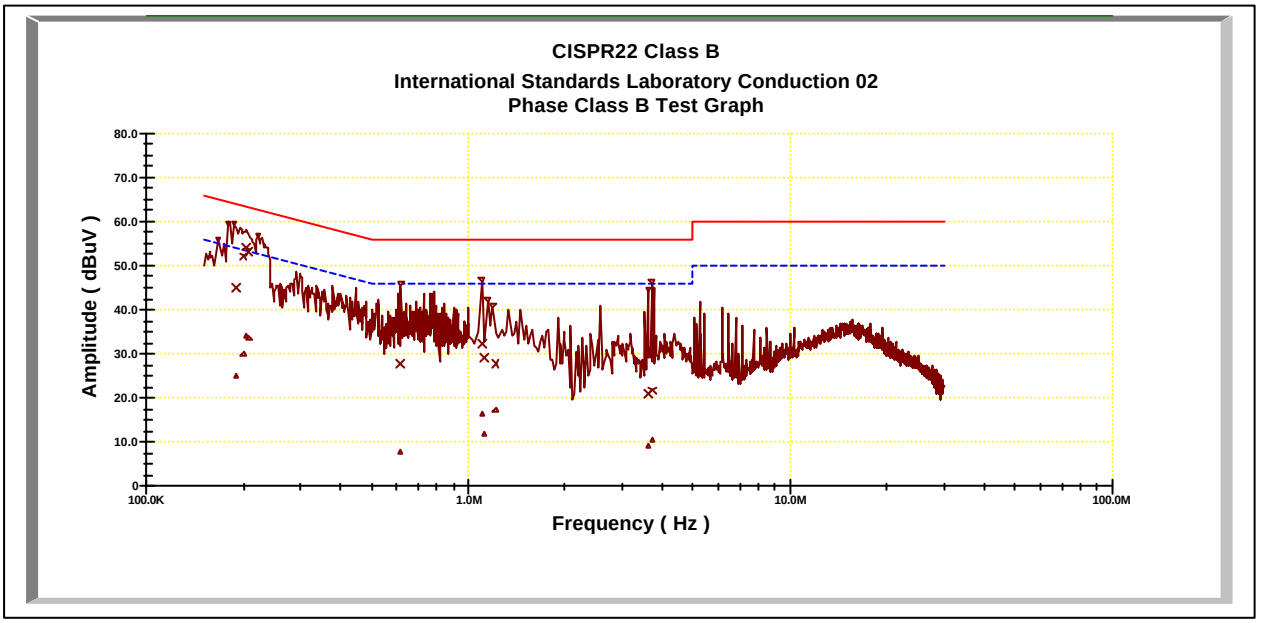
4.1.3 EMI Receiver/Spectrum Analyzer Configuration (for the frequencies tested)

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

4.1.4 Test Data:

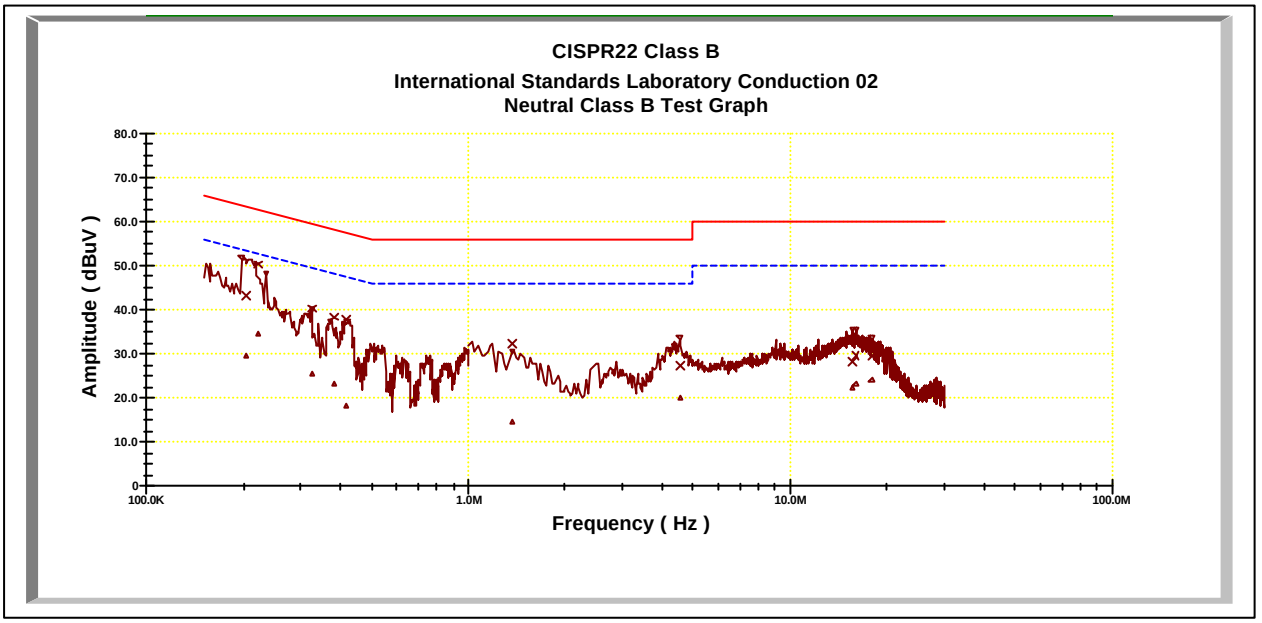
Power Line Conducted Emissions (Hot) Channel 1, 6, 11

	Corrective Factor		Quasi-Peak			Average		
Frequency (MHz)	LISN Loss (dB)	Cable Loss (dB)	Corrected Amplitude (dBuV)	Limit (dBuV)	Margin (dB)	Corrected Amplitude (dBuV)	Limit (dBuV)	Margin (dB)
0.18973	0.10	0.02	45.13	64.86	-19.73	24.99	54.86	-29.88
0.19956	0.10	0.02	52.03	64.58	-12.55	30.12	54.58	-24.46
0.20413	0.10	0.02	54.26	64.45	-10.19	33.87	54.45	-20.59
0.20815	0.10	0.02	53.18	64.34	-11.16	33.65	54.34	-20.69
0.61091	0.14	0.04	27.64	56.00	-28.36	7.61	46.00	-38.39
1.10537	0.47	0.07	32.32	56.00	-23.68	16.50	46.00	-29.50
1.12408	0.46	0.07	28.97	56.00	-27.03	11.91	46.00	-34.09
1.21298	0.44	0.08	27.82	56.00	-28.18	17.09	46.00	-28.91
3.61353	0.28	0.12	21.08	56.00	-34.92	9.13	46.00	-36.87
3.71214	0.29	0.12	21.66	56.00	-34.34	10.44	46.00	-35.56



Power Line Conducted Emissions (Neutral) Channel 1, 6, 11

	Corrective Factor		Quasi-Peak			Average		
Frequency (MHz)	LISN Loss (dB)	Cable Loss (dB)	Corrected Amplitude (dBuV)	Limit (dBuV)	Margin (dB)	Corrected Amplitude (dBuV)	Limit (dBuV)	Margin (dB)
0.20425	0.10	0.02	43.28	64.45	-21.17	29.38	54.45	-25.07
0.22233	0.10	0.02	50.20	63.93	-13.73	34.39	53.93	-19.54
0.32623	0.10	0.02	40.27	60.96	-20.69	25.39	50.96	-25.58
0.3825	0.10	0.02	38.38	59.36	-20.97	23.07	49.36	-26.29
0.41891	0.10	0.03	37.73	58.32	-20.59	18.27	48.32	-30.05
1.37226	0.26	0.08	32.17	56.00	-23.83	14.35	46.00	-31.65
4.54836	0.21	0.13	27.26	56.00	-28.74	19.95	46.00	-26.05
15.5918	0.41	0.30	28.31	60.00	-31.69	22.09	50.00	-27.91
15.9642	0.42	0.29	29.58	60.00	-30.42	23.30	50.00	-26.70
17.8958	0.46	0.28	29.32	60.00	-30.68	24.03	50.00	-25.97



* NOTE: During the test, the EMI receiver was set to Max. Hold then switch the EUT Channel between 1 , 6, 11 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

4.2 Bandwidth for DSSS [Section 15.247 (a)(2)]

4.2.1 Test Procedure

The Transmitter output of EUT was connected to the spectrum analyzer. The 6 dB bandwidth of the fundamental frequency was measured. The setting of spectrum analyzer is as follows

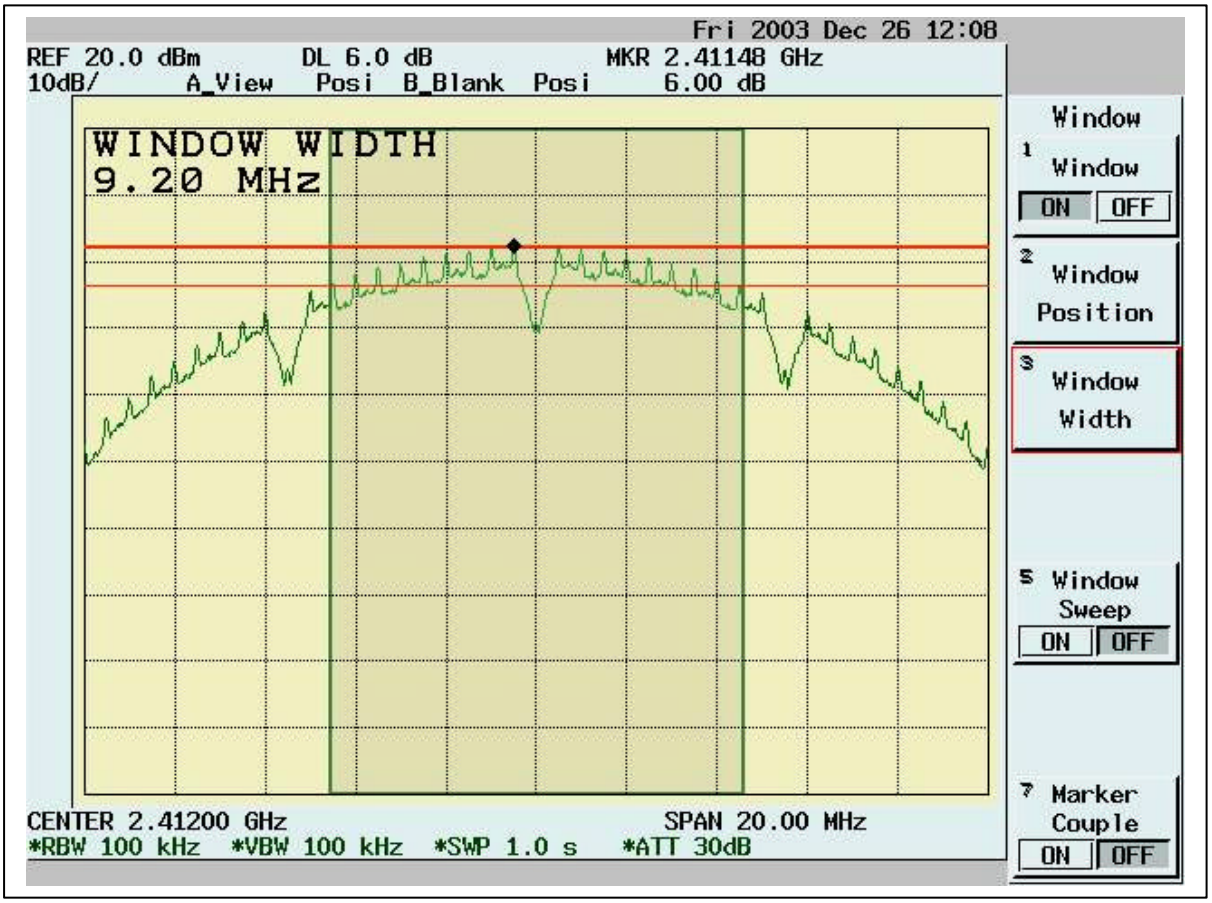
Equipment mode: Spectrum analyzer
Detector function: Peak mode
RBW: 100KHz
VBW: 100KHz

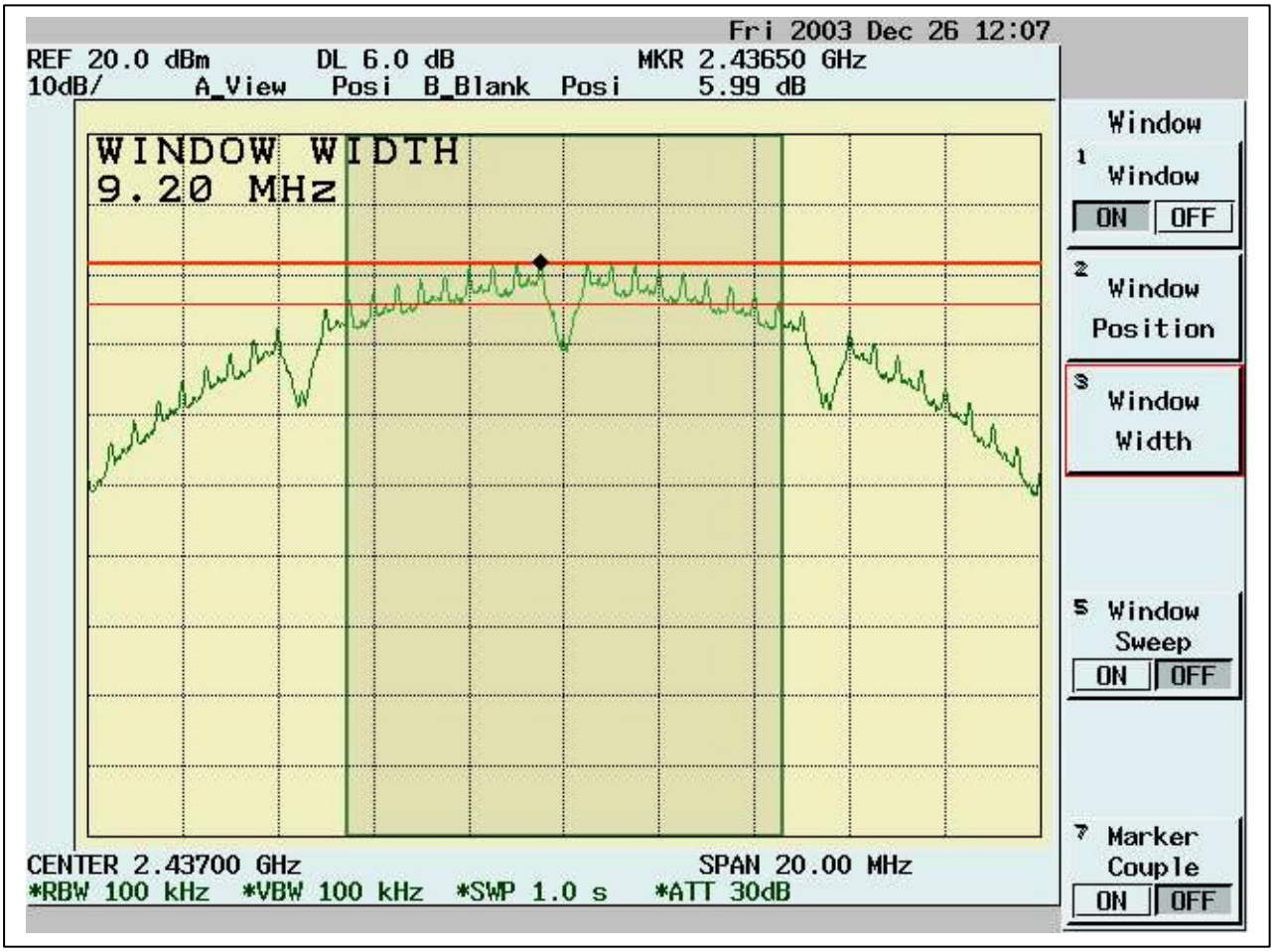
4.2.2 Test Setup

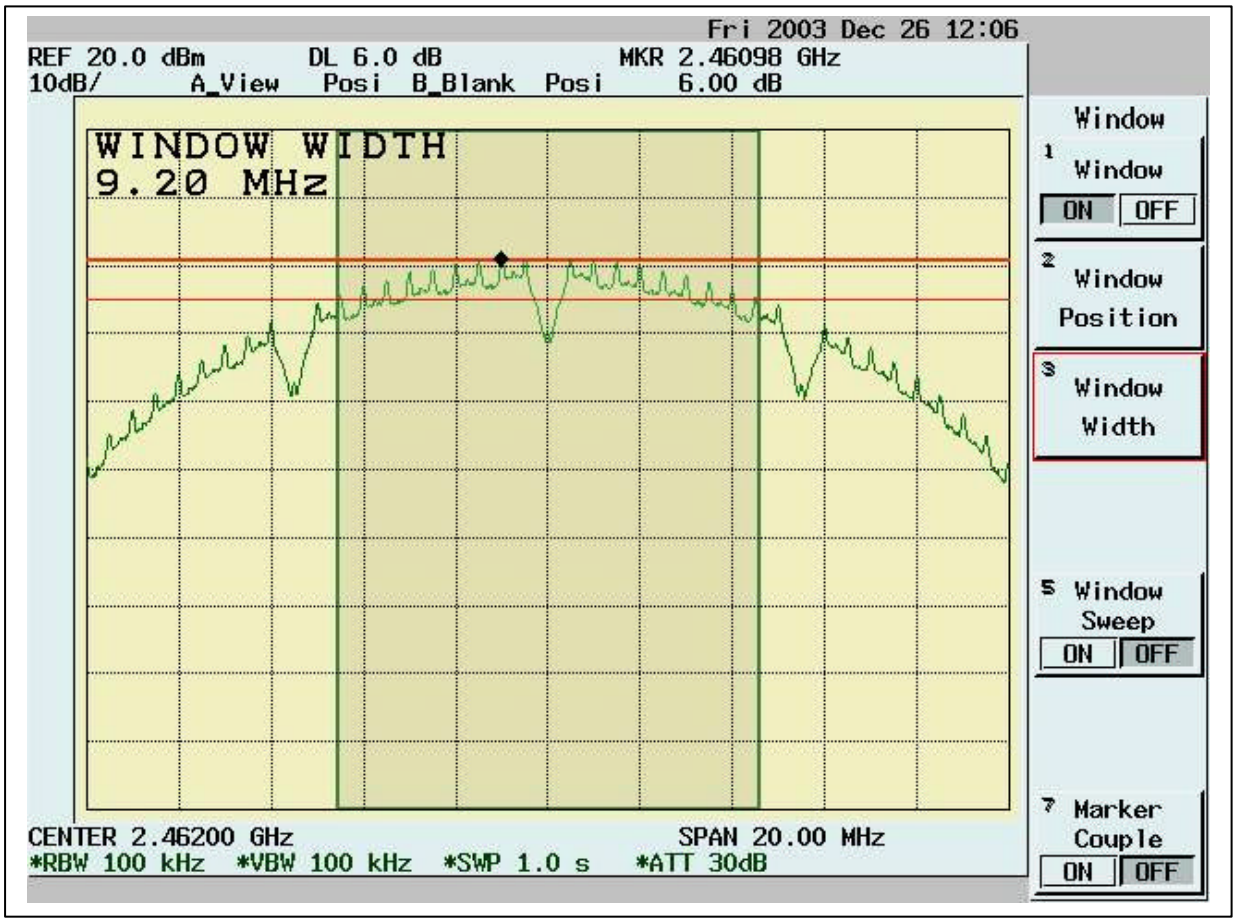
4.2.3 Test Data

Table 6dB Bandwidth

Chennel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Pass/Fail
1	2412	9.20	0.5	Pass
6	2437	9.20	0.5	Pass
11	2462	9.20	0.5	Pass


Fri 2003 Dec 26 12:08
REF 20.0 dBm
DL 6.0 dB
MKR 2.41148 GHz
10dB/
A_View
Posi
B_Blank
Posi
6.00 dB
WINDOW WIDTH
9.20 MHz
Window
1 Window
ON OFF
2 Window Position
3 Window Width
5 Window Sweep
ON OFF
7 Marker Couple
ON OFF
CENTER 2.41200 GHz
SPAN 20.00 MHz
*RBW 100 kHz
*VBW 100 kHz
*SWP 1.0 s
*ATT 30dB


Fri 2003 Dec 26 12:07
REF 20.0 dBm
DL 6.0 dB
MKR 2.43650 GHz
10dB/
A_View
Posi
B_Blank
Posi
5.99 dB
WINDOW WIDTH
9.20 MHz
Window
1 Window
ON
OFF
2 Window Position
3 Window Width
5 Window Sweep
ON
OFF
7 Marker Couple
ON
OFF
CENTER 2.43700 GHz
SPAN 20.00 MHz
*RBW 100 kHz
*VBW 100 kHz
*SWP 1.0 s
*ATT 30dB


Fri 2003 Dec 26 12:06
REF 20.0 dBm
DL 6.0 dB
MKR 2.46098 GHz
10dB/
A_View
Posi
B_Blank
Posi
6.00 dB
WINDOW WIDTH
9.20 MHz
Window
1 Window
ON
OFF
2 Window Position
3 Window Width
5 Window Sweep
ON
OFF
7 Marker Couple
ON
OFF
CENTER 2.46200 GHz
SPAN 20.00 MHz
*RBW 100 kHz
*VBW 100 kHz
*SWP 1.0 s
*ATT 30dB

4.3 DSSS Maximum Peak Output Power [Section 15.247 (b)(1)]

4.3.1 Test Procedure

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

4.3.2 Test Setup

4.3.3 Test Data:

Maximum Peak Output Power

Chennel	Frequency (MHz)	Analyzer Reading (dBm)	Cable Loss (dB)	Peak Power Output (mW)	Peak Power Output (dBm)	Limit (dBm)	Pass/Fail
1	2412	15.125	1.1	41.92	16.225	30	Pass
6	2437	14.562	1.1	36.82	15.662	30	Pass
11	2462	14.312	1.1	34.76	15.412	30	Pass

4.4 Radiated Emission Measurement [Section [15.247(c)(4)]

4.4.1 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.

4.4.2 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 – 25GHz: 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 *EMI Receiver/Spectrum Analyzer Configuration*.
For the test of 2^{nd} to 10^{th} harmonics frequencies , the equipment setup was also refer to *EMI Receiver/Spectrum Analyzer Configuration*. 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.

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

Frequency Range Tested:	30MHz~1000MHz
Detector Function:	Quasi-Peak Mode
Resolution Bandwidth (RBW):	120KHz
Video Bandwidth (VBW)	1MHz

Frequency Range Tested:	1GHz – 25 GHz
Detector Function:	Peak Mode
Resolution Bandwidth (RBW):	1MHz
Video Bandwidth (VBW)	1MHz

Frequency Range Tested:	1GHz – 25 GHz
Detector Function:	Average Mode
Resolution Bandwidth (RBW):	1MHz
Video Bandwidth (VBW)	10 Hz

4.4.4 Test Data (30MHz – 1GHz) :.

30M – 1GHz Open Field Radiated Emissions (Horizontal) Channel 1, 6, 11

Meter Reading		Correction Factor			Corrected Emissions			Antenna	Turntable
Freq. (MHz)	Ampl. (dBuV)	Ant. (dB/m)	Cable (dB)	Pre-Ampl. (dB)	Ampl. (dBuV/m)	Limit (dBuV/m)	Margin* (dB)	Height (cm)	Position (°)
42.61	16.84	11.04	1.76	0.00	29.64	40.00	-10.36	150.00	72.00
333.61	13.31	13.54	4.78	0.00	31.63	46.00	-14.37	200.00	23.00
431.58	11.12	15.85	5.39	0.00	32.36	46.00	-13.64	100.00	88.00
455.83	12.57	16.13	5.52	0.00	34.22	46.00	-11.78	200.00	250.00
719.67	6.53	19.18	6.86	0.00	32.57	46.00	-13.43	100.00	169.00
815.7	12.88	19.86	7.34	0.00	40.08	46.00	-5.92	100.00	169.00
833.16	3.78	19.93	7.40	0.00	31.11	46.00	-14.89	100.00	217.00
864.2	3.91	20.06	7.50	0.00	31.47	46.00	-14.53	150.00	284.00
911.73	14.12	20.27	7.72	0.00	42.10	46.00	-3.90	100.00	234.00
944.71	3.03	20.47	7.83	0.00	31.33	46.00	-14.67	200.00	349.00

30M – 1GHz Open Field Radiated Emissions (Vertical) Channel 1, 6, 11

Meter Reading		Correction Factor			Corrected Emissions			Antenna	Turntable
Freq. (MHz)	Ampl. (dBuV)	Ant. (dB/m)	Cable (dB)	Pre-Ampl. (dB)	Ampl. (dBuV/m)	Limit (dBuV/m)	Margin* (dB)	Height (cm)	Position (°)
106.63	15.59	11.20	2.74	0.00	29.52	43.50	-13.98	150.00	253.00
194.9	18.29	8.75	3.72	0.00	30.76	43.50	-12.74	100.00	156.00
431.58	10.87	15.85	5.39	0.00	32.11	46.00	-13.89	100.00	352.00
455.83	17.40	16.13	5.52	0.00	39.05	46.00	-6.95	200.00	285.00
497.54	10.04	17.05	5.77	0.00	32.86	46.00	-13.14	100.00	301.00
601.33	7.91	18.31	6.33	0.00	32.55	46.00	-13.45	100.00	285.00
635.28	7.54	18.58	6.48	0.00	32.60	46.00	-13.40	100.00	320.00
719.67	8.15	19.18	6.86	0.00	34.18	46.00	-11.82	100.00	320.00
815.7	10.01	19.86	7.34	0.00	37.21	46.00	-8.79	100.00	220.00
911.73	14.11	20.27	7.72	0.00	42.10	46.00	-3.90	150.00	139.00

* NOTE:
During the test, the EUT was set to Channel 1 , 6, 11 respectively to get the maximum reading of all the critical emission frequencies.
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

4.4.5 Test Data (1GHz – 25 GHz, Transmitting from Main antenna) .

1GHz~ 25 GHz (Horizontal), Channel 1 : 2412 MHz (RBW=1MHz VBW=1MHz)

Meter Reading		Correction Factor			Corrected Emissions			Antenna	Turntable
Freq. (MHz)	Ampl. (dBuV) (pk)	Ant. (dB/m)	Cable (dB)	Pre-Ampl. (dB)	Ampl. (dBuV/m)	Limit (dBuV/m) (av)	Margin (dB)	Height (cm)	Position (°)
7147.85	43.16	39.82	2.35	46.24	39.09	54.00	-14.91	109	312
11512.5	25.32	42.39	3.03	41.62	29.12	54.00	-24.88	101	264
13227.8	26.13	41.52	3.26	41.93	28.98	54.00	-25.02	100	174
14688.3	30.18	44.22	3.43	42.34	35.50	54.00	-18.50	100	359
15316.7	25.77	43.09	3.50	43.22	29.14	54.00	-24.86	101	224
15690.3	26.27	43.41	3.54	42.16	31.06	54.00	-22.94	101	158

‘ pk’ ---- peak, ‘ av’ ----average

1GHz~ 25 GHz (Vertical), Channel 1 : 2412 MHz (RBW=1MHz VBW=1MHz)

Meter Reading		Correction Factor			Corrected Emissions			Antenna	Turntable
Freq. (MHz)	Ampl. (dBuV) (pk)	Ant. (dB/m)	Cable (dB)	Pre-Ampl. (dB)	Ampl. (dBuV/m)	Limit (dBuV/m) (av)	Margin (dB)	Height (cm)	Position (°)
3275.72	42.20	31.13	1.44	46.62	28.15	54.00	-25.85	100	294
7164.83	42.32	39.80	2.35	46.24	38.23	54.00	-15.77	100	164
7946.05	29.59	41.01	2.49	44.00	29.09	54.00	-24.91	100	288
11376.6	25.59	41.93	3.01	41.32	29.21	54.00	-24.79	101	208
14688.3	29.41	44.22	3.43	42.34	34.73	54.00	-19.27	103	121
15282.7	26.26	43.15	3.49	43.30	29.60	54.00	-24.40	100	335

‘ pk’ ---- peak, ‘ av’ ----average

Note:

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 25 GHz have been tested.

1GHz~ 25 GHz (Horizontal), Channel 6 : 2437 MHz (RBW=1MHz VBW=1MHz)

Meter Reading		Correction Factor			Corrected Emissions			Antenna	Turntable
Freq. (MHz)	Ampl. (dBuV) (pk)	Ant. (dB/m)	Cable (dB)	Pre-Ampl. (dB)	Ampl. (dBuV/m)	Limit (dBuV/m) (av)	Margin (dB)	Height (cm)	Position (°)
7164.83	41.68	39.80	2.35	46.24	37.59	54.00	-16.41	100	262
11529.5	25.52	42.38	3.03	41.66	29.28	54.00	-24.72	100	203
11920.1	26.67	42.15	3.08	42.56	29.35	54.00	-24.65	101	296
14688.3	30.23	44.22	3.43	42.34	35.55	54.00	-18.45	100	112
15299.7	26.24	43.12	3.50	43.26	29.60	54.00	-24.40	101	291
15673.3	27.30	43.35	3.54	42.21	31.98	54.00	-22.02	101	176

‘ pk’ ---- peak, ‘ av’ ----average

1GHz~ 25 GHz (Vertical), Channel 6 : 2437 MHz (RBW=1MHz VBW=1MHz)

Meter Reading		Correction Factor			Corrected Emissions			Antenna	Turntable
Freq. (MHz)	Ampl. (dBuV) (pk)	Ant. (dB/m)	Cable (dB)	Pre-Ampl. (dB)	Ampl. (dBuV/m)	Limit (dBuV/m) (av)	Margin (dB)	Height (cm)	Position (°)
7164.83	41.72	39.80	2.35	46.24	37.63	54.00	-16.37	101	276
7521.48	34.72	39.48	2.41	45.99	30.62	54.00	-23.38	101	349
11427.6	26.27	42.12	3.02	41.43	29.98	54.00	-24.02	100	264
14688.3	29.99	44.22	3.43	42.34	35.31	54.00	-18.69	107	119
15282.7	26.06	43.15	3.49	43.30	29.40	54.00	-24.60	104	352
15690.3	26.60	43.41	3.54	42.16	31.39	54.00	-22.61	100	232

‘ pk’ ---- peak, ‘ av’ ----average

Note:

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 25 GHz have been tested.

1GHz~ 25 GHz (Horizontal), Channel 11: 2462 MHz (RBW=1MHz VBW=1MHz)

Meter Reading		Correction Factor			Corrected Emissions			Antenna	Turntable
Freq. (MHz)	Ampl. (dBuV) (pk)	Ant. (dB/m)	Cable (dB)	Pre-Ampl. (dB)	Ampl. (dBuV/m)	Limit (dBuV/m) (av)	Margin (dB)	Height (cm)	Position (°)
7164.83	41.51	39.80	2.35	46.24	37.42	54.00	-16.58	101	114
11155.8	25.89	41.09	2.98	40.85	29.12	54.00	-24.88	101	110
12582.4	27.14	41.53	3.17	42.79	29.05	54.00	-24.95	100	347
14059.9	26.84	43.10	3.36	42.73	30.57	54.00	-23.43	100	224
14688.3	29.46	44.22	3.43	42.34	34.78	54.00	-19.22	100	118
15690.3	26.25	43.41	3.54	42.16	31.04	54.00	-22.96	100	329

‘ pk’ ---- peak, ‘ av’ ----average

1GHz~ 25 GHz (Vertical), Channel 11 : 2462 MHz (RBW=1MHz VBW=1MHz)

Meter Reading		Correction Factor			Corrected Emissions			Antenna	Turntable
Freq. (MHz)	Ampl. (dBuV) (pk)	Ant. (dB/m)	Cable (dB)	Pre-Ampl. (dB)	Ampl. (dBuV/m)	Limit (dBuV/m) (av)	Margin (dB)	Height (cm)	Position (°)
7164.83	41.30	39.80	2.35	46.24	37.21	54.00	-16.79	100	264
9831.17	28.55	39.20	2.80	41.58	28.97	54.00	-25.03	102	225
10595.4	26.49	39.61	2.90	40.76	28.24	54.00	-25.76	101	282
11410.6	25.85	42.06	3.01	41.40	29.53	54.00	-24.47	100	220
14688.3	29.52	44.22	3.43	42.34	34.83	54.00	-19.17	100	165
15316.7	25.88	43.09	3.50	43.22	29.24	54.00	-24.76	102	263

‘ pk’ ---- peak, ‘ av’ ----averag

Note:

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 25 GHz have been tested.

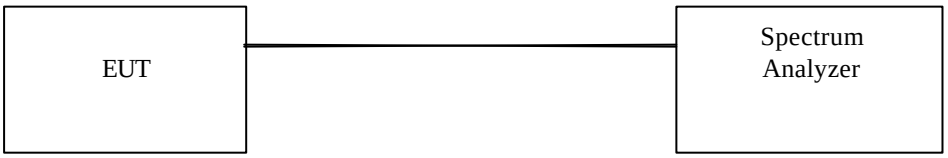
4.5 Band Edge Measurement

4.5.1 Test Procedure (Conducted)

1. The Transmitter output of EUT was connected to the spectrum analyzer.
   Equipment mode: Spectrum analyzer
   Detector function: Peak mode
   SPAN: 100MHz
   RBW: 100KHz
   VBW: 100KHz
   Center frequency: 2.412GHz, 2.462GHz.
   Sweep time= 200ms sec.

2. Using Peak Search to read the peak power of Carrier frequencies after Maximum Hold function is completed.
3. Find the next peak frequency outside the operation frequency band.

4.5.2 Test Setup (Conducted)



4.5.3 Test Data:

Table Band Edge measurement (Conducted)

Channel	Frequency (MHz)	Spectrum Reading (dBuV)	Carrier - Outsideband Limit: > 20dB (dB)	Pass/Fail
1	2411.5	108.66	---	---
Outside band	2399.5	72.30	36.36	Pass
11	2463.0	107.92	---	---
Outside band	2474.5	72.55	35.37	Pass

.

Band Edge Conducted measurement

Band Edge Conducted Measurement

4.5.4 Band Edge measurement Test Procedure (Radiated)

1. Antenna and Turntable test procedure same as *Radiated Emission Measurement*
   Equipment mode: Spectrum analyzer
   Detector function: Peak mode
   SPAN:100MHz
   RBW: 1MHz
   VBW: 1MHz
   Center frequency: 2.395GHz, 2.48 GHz.

2. Using Peak Search to read the peak power of Carrier frequencies after Maximum Hold function is completed.
3. Find the next peak frequency outside the operation frequency band.

4. For peak frequency emission level measurement in Restricted Band ,
   Change RBW: 1MHz ,
   VBW: 10Hz,
   Span: 100MHz.
5. Get the spectrum reading after Maximum Hold function is completed.

4.5.5 Test Setup (Radiated)

Same as *Radiated Emission Measurement*

4.5.6 Test Data:

Table Band Edge measurement (Radiated)

Channel	Frequency (MHz)	Spectrum Reading (dBuV)	Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit: > 20dB (dBC)	Limit (dBuV/m)	Equip. Setup VBW	Pass or Fail
1(peak mode)	2411.2	66.59	31.67	98.26	---	---	1MHz	---
Outside band	2399.4	32.99	31.67	64.66	33.60	---	1MHz	Pass
1(average mode)	2412.8	60.78	31.67	92.45	---	---	10Hz	---
Restricted band	2385.7	9.31	31.67	40.98	-----	54	10Hz	Pass
11(peak mode)	2461.3	64.30	31.64	95.94	----	---	1MHz	---
Outside band	2474.7	31.38	31.64	63.02	32.92	---	1MHz	Pass
11(average mode)	2462.8	58.90	31.64	90.54	----	---	10Hz	---
Restricted band	2488.4	9.13	31.64	40.77	-----	54	10Hz	Pass

Note: The Spectrum plot of emission level measurement in Restricted band is attached.
Emission Level = Spectrum Reading + Correction Factor
Correction Factor = Antenna Factor + cable loss – amplifier gain

Band Edge measurement for radiated emission in Restricted Band(Radiated)

Peak Mode (Channel 1)

Band Edge measurement for radiated emission in Restricted Band(Radiated)

Average Mode (Channel 1)

Band Edge measurement for radiated emission in Ristricted Band(Radiated)

Peak Mode (Channel 11)

Band Edge measurement for radiated emission in Restricted Band(Radiated)

Average Mode (Channel 11)

4.6 RF Exposure Measurement [Section 15.247(b)(4) & 1.1307(b)]

See the SAR report

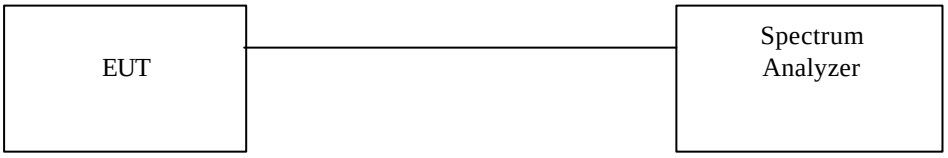
4.7 DSSS Peak Power Spectral Density [Section 15.247(d)]

4.7.1 Test Procedure

1. The Transmitter output of EUT was connected to the spectrum analyzer.
   Equipment mode: Spectrum analyzer
   Detector function: Peak mode
   SPAN:1.5MHz
   RBW: 3KHz
   VBW: 30KHz
   Center frequency: fundamental frequency tested.
   Sweep time= 500 sec.

2. Using Peak Search to read the peak power after Maximum Hold function is completed.

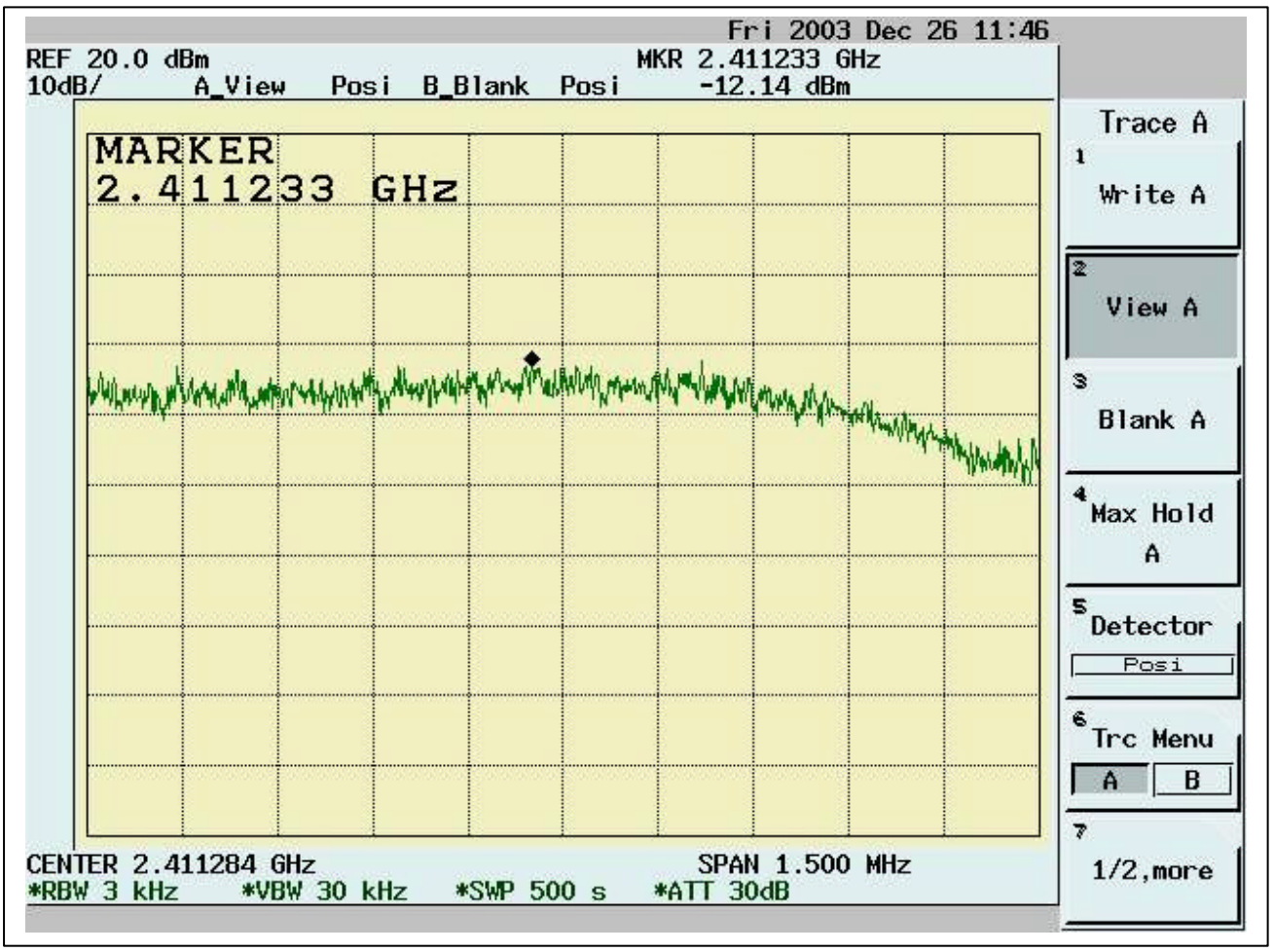
4.7.2 Test Setup

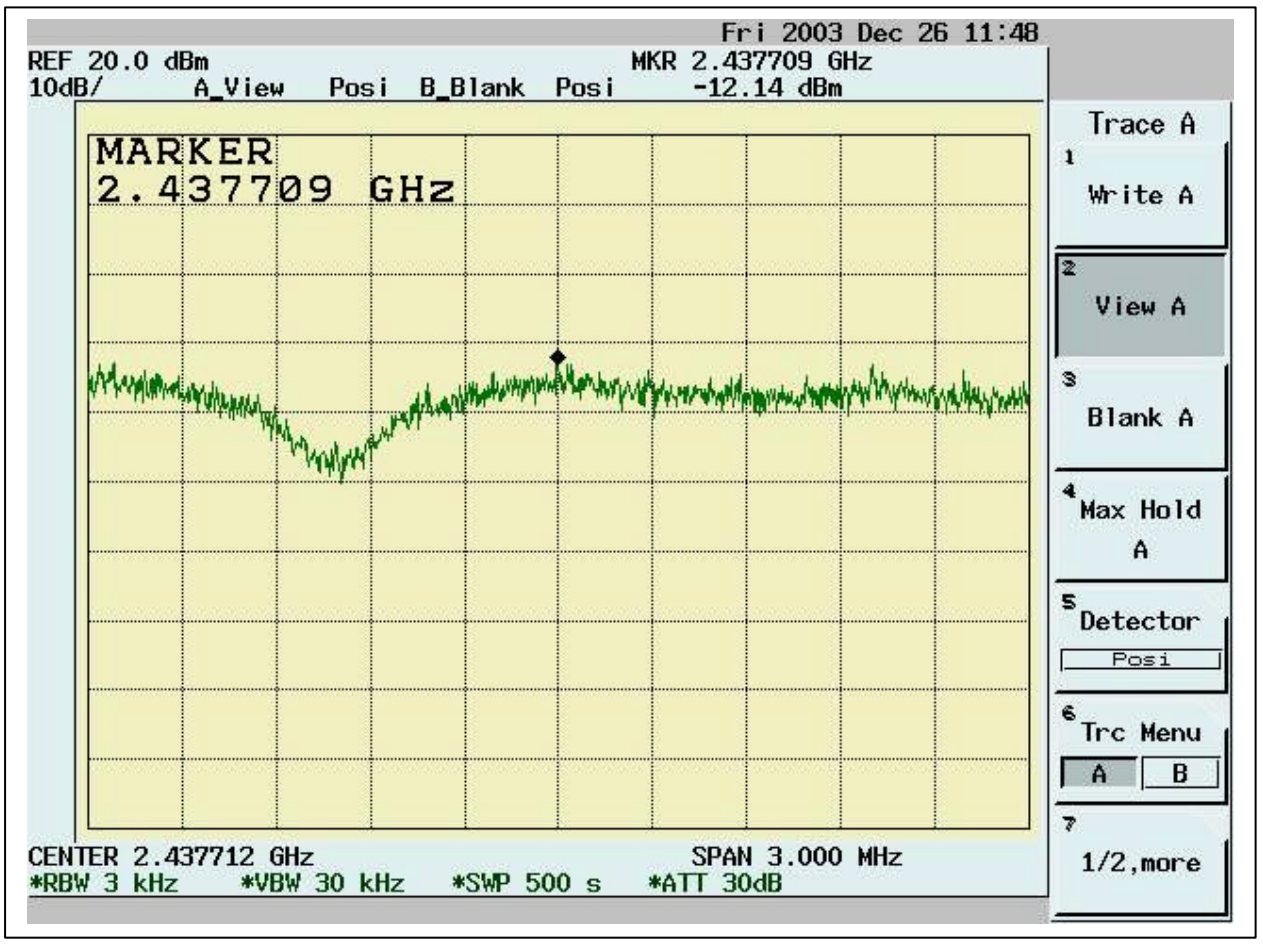


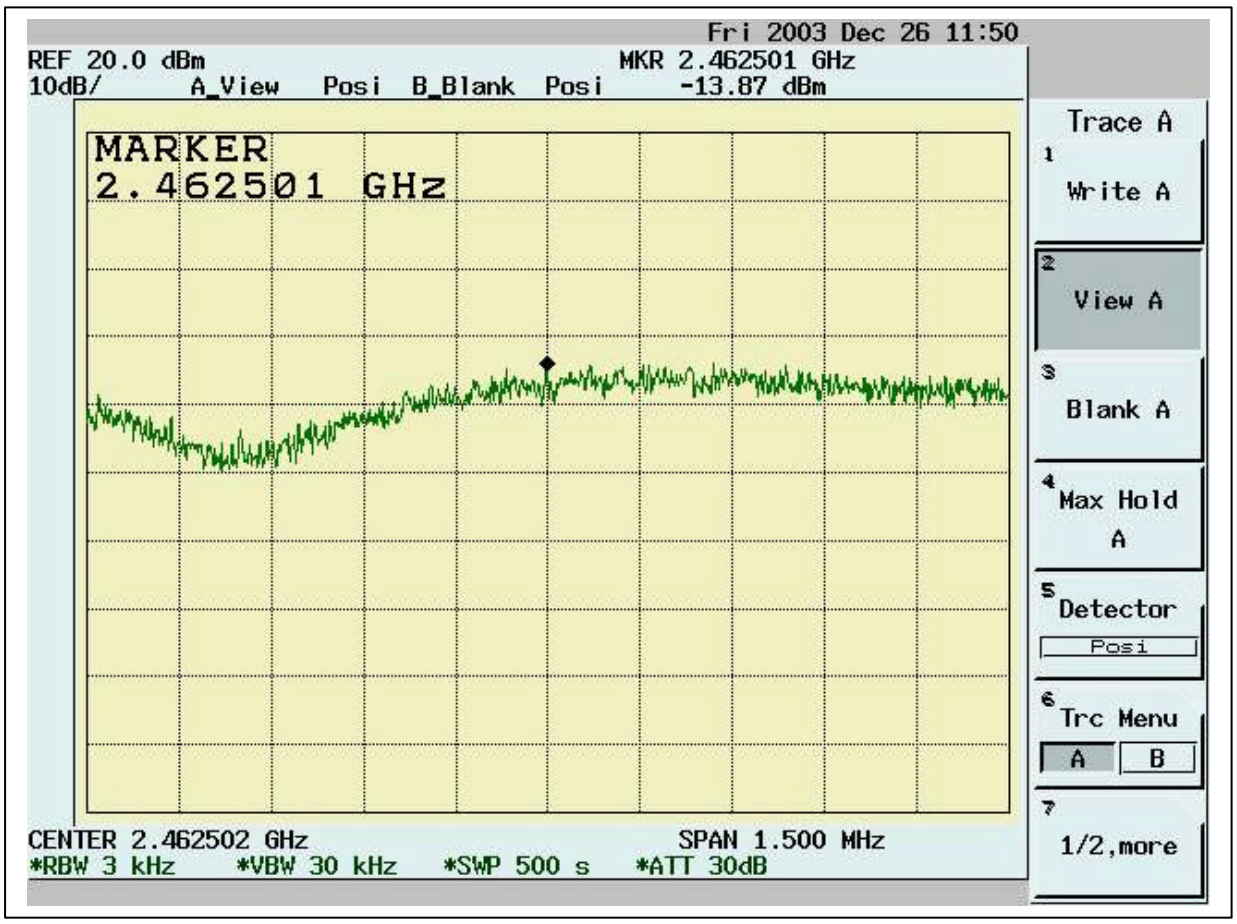
4.7.3 Test Data:

Table Maximum Peak Output Power Density

Chennel	Spectrum Reading (dBm/3KHz)	Cable Loss (dB)	Peak Power Output (dBm/3KHz)	Limit (dBm/3KHz)	Pass/Fail
1	-12.14	1.1	-11.04	8	Pass
6	-12.14	1.1	-11.04	8	Pass
11	-13.87	1.1	-12.77	8	Pass


Fri 2003 Dec 26 11:46
REF 20.0 dBm
MKR 2.411233 GHz
10dB/ A_View Posi B_Blank Posi -12.14 dBm
MARKER
2.411233 GHz
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
CENTER 2.411284 GHz
SPAN 1.500 MHz
*RBW 3 kHz *VBW 30 kHz *SWP 500 s *ATT 30dB


Fri 2003 Dec 26 11:48
REF 20.0 dBm
MKR 2.437709 GHz
10dB/ A_View Posi B_Blank Posi -12.14 dBm
MARKER
2.437709 GHz
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
CENTER 2.437712 GHz
SPAN 3.000 MHz
*RBW 3 kHz *VBW 30 kHz *SWP 500 s *ATT 30dB


Fri 2003 Dec 26 11:50
REF 20.0 dBm
10dB/
A_View
Posi
B_Blank
Posi
MKR 2.462501 GHz
-13.87 dBm
MARKER
2.462501 GHz
CENTER 2.462502 GHz
SPAN 1.500 MHz
*RBW 3 kHz
*VBW 30 kHz
*SWP 500 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

5. TEST RESULTS (802.11g)

5.1 Powerline Conducted Emissions [Section 15.207]

5.1.1 EUT Configuration

The conducted emission test setups are in accordance with Figs 9, 10(a) and 10(b) of ANSI C63.4-2001, CFR 47 Part 15 Subpart B; or EN55022:1994/ A1:1995/A2:1997; CISPR 22:1993/A1:1995/A2:1996.

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.

5.1.2 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.

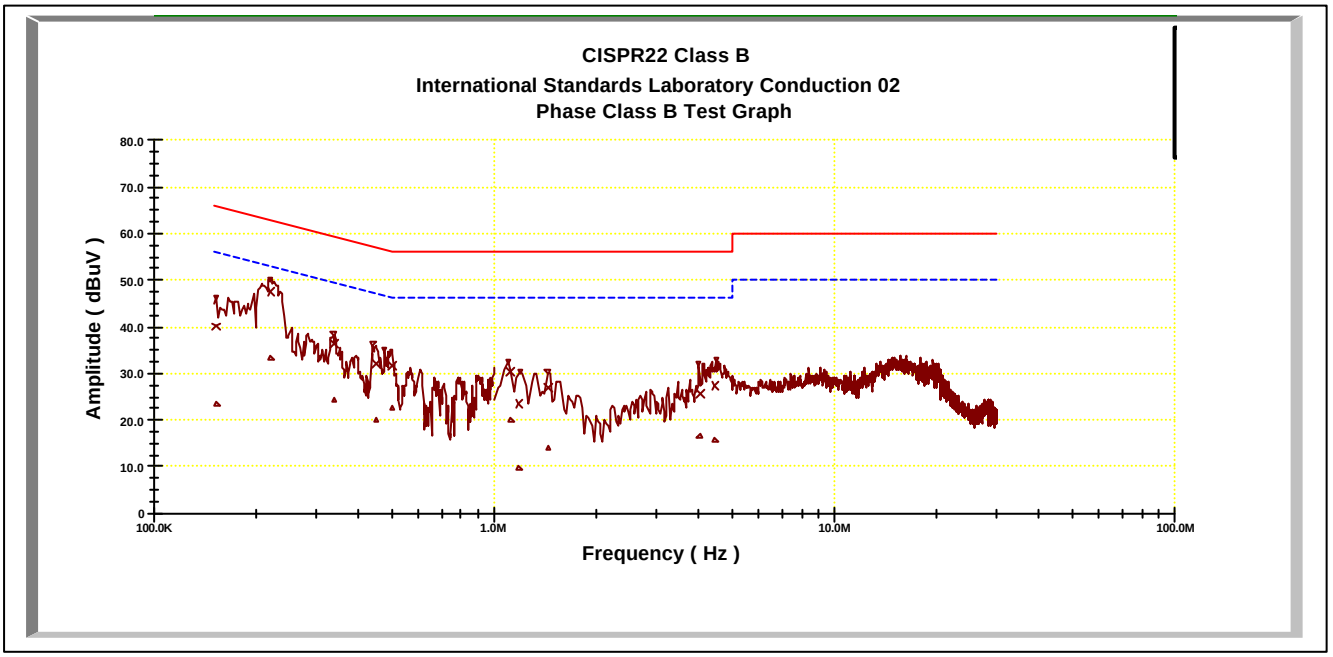
5.1.3 EMI Receiver/Spectrum Analyzer Configuration (for the frequencies tested)

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

5.1.4 Test Data:

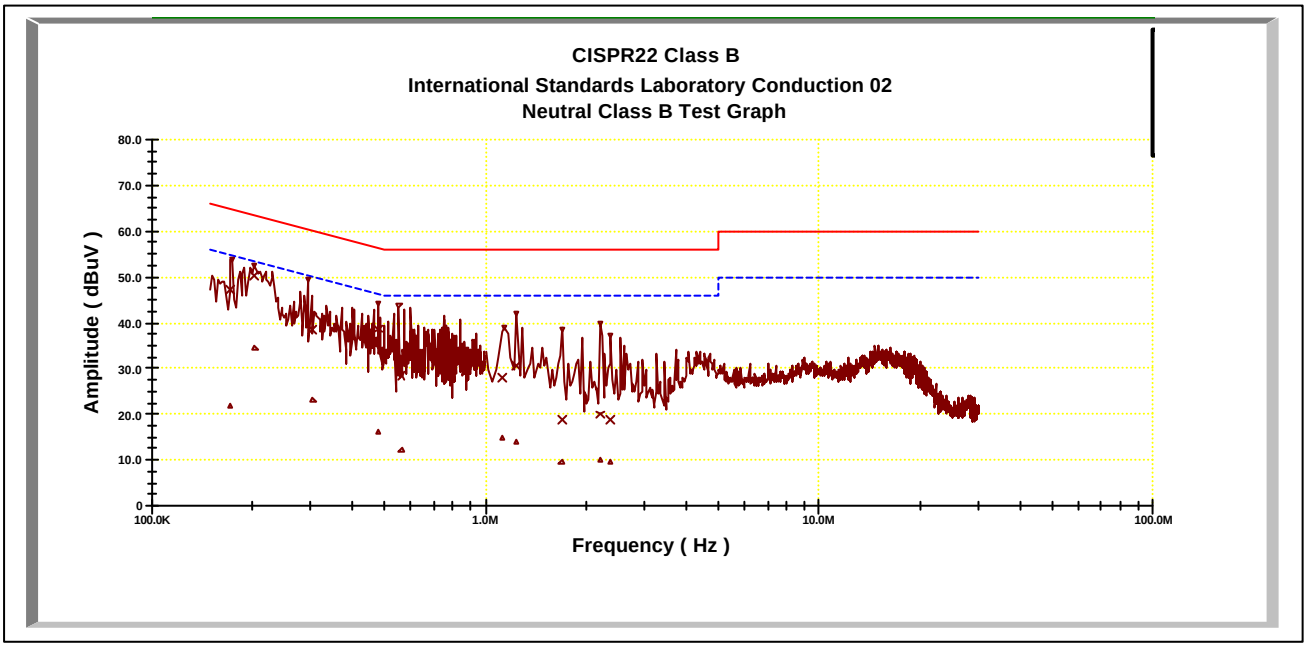
Power Line Conducted Emissions (Hot) Channel 1, 6, 11

	Corrective Factor		Quasi-Peak			Average		
Frequency (MHz)	LISN Loss (dB)	Cable Loss (dB)	Corrected Amplitude (dBuV)	Limit (dBuV)	Margin (dB)	Corrected Amplitude (dBuV)	Limit (dBuV)	Margin (dB)
0.15355	0.10	0.02	39.99	65.90	-25.91	23.25	55.90	-32.65
0.22141	0.10	0.02	47.56	63.96	-16.40	33.45	53.96	-20.51
0.3388	0.10	0.02	36.29	60.61	-24.31	24.06	50.61	-26.55
0.45096	0.11	0.03	32.00	57.40	-25.41	20.18	47.40	-27.23
0.50035	0.12	0.03	31.72	56.00	-24.28	22.59	46.00	-23.41
1.12074	0.46	0.07	30.47	56.00	-25.53	19.97	46.00	-26.03
1.18501	0.44	0.08	23.63	56.00	-32.37	9.50	46.00	-36.50
1.44798	0.37	0.08	26.84	56.00	-29.16	13.95	46.00	-32.05
4.01594	0.30	0.12	25.56	56.00	-30.44	16.76	46.00	-29.24
4.46538	0.32	0.12	27.29	56.00	-28.71	15.74	46.00	-30.26



Power Line Conducted Emissions (Neutral) Channel 1, 6, 11

	Corrective Factor		Quasi-Peak			Average		
Frequency (MHz)	LISN Loss (dB)	Cable Loss (dB)	Corrected Amplitude (dBuV)	Limit (dBuV)	Margin (dB)	Corrected Amplitude (dBuV)	Limit (dBuV)	Margin (dB)
0.17213	0.10	0.02	47.24	65.37	-18.13	21.59	55.37	-33.78
0.20448	0.10	0.02	50.13	64.44	-14.31	34.45	54.44	-19.99
0.3047	0.10	0.02	38.45	61.58	-23.13	23.24	51.58	-28.34
0.48041	0.11	0.03	38.67	56.56	-17.89	16.05	46.56	-30.51
0.56018	0.13	0.03	28.46	56.00	-27.54	12.31	46.00	-33.69
1.12513	0.29	0.07	28.06	56.00	-27.94	14.78	46.00	-31.22
1.23837	0.28	0.08	30.76	56.00	-25.24	14.08	46.00	-31.92
1.69236	0.23	0.09	18.91	56.00	-37.09	9.37	46.00	-36.63
2.20878	0.20	0.10	19.88	56.00	-36.12	10.16	46.00	-35.84
2.36903	0.20	0.10	18.93	56.00	-37.07	9.40	46.00	-36.60



* NOTE: During the test, the EMI receiver was set to Max. Hold then switch the EUT Channel between 1 , 6, 11 to get the maximum reading of all these channels.
Two type of antennas have been test, and the worse data show above.
Margin = Amplitude + Insertion Loss- Limit
A margin of -8dB means that the emission is 8dB below the limit

5.2 Bandwidth for DSSS [Section 15.247 (a)(2)]

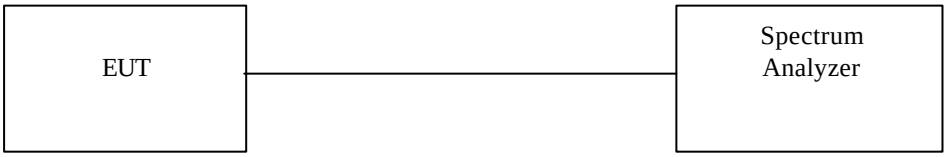
5.2.1 Test Procedure

5.3

The Transmitter output of EUT was connected to the spectrum analyzer. The 6 dB bandwidth of the fundamental frequency was measured. The setting of spectrum analyzer is as follows

Equipment mode: Spectrum analyzer
Detector function: Peak mode
RBW: 100KHz
VBW: 100KHz

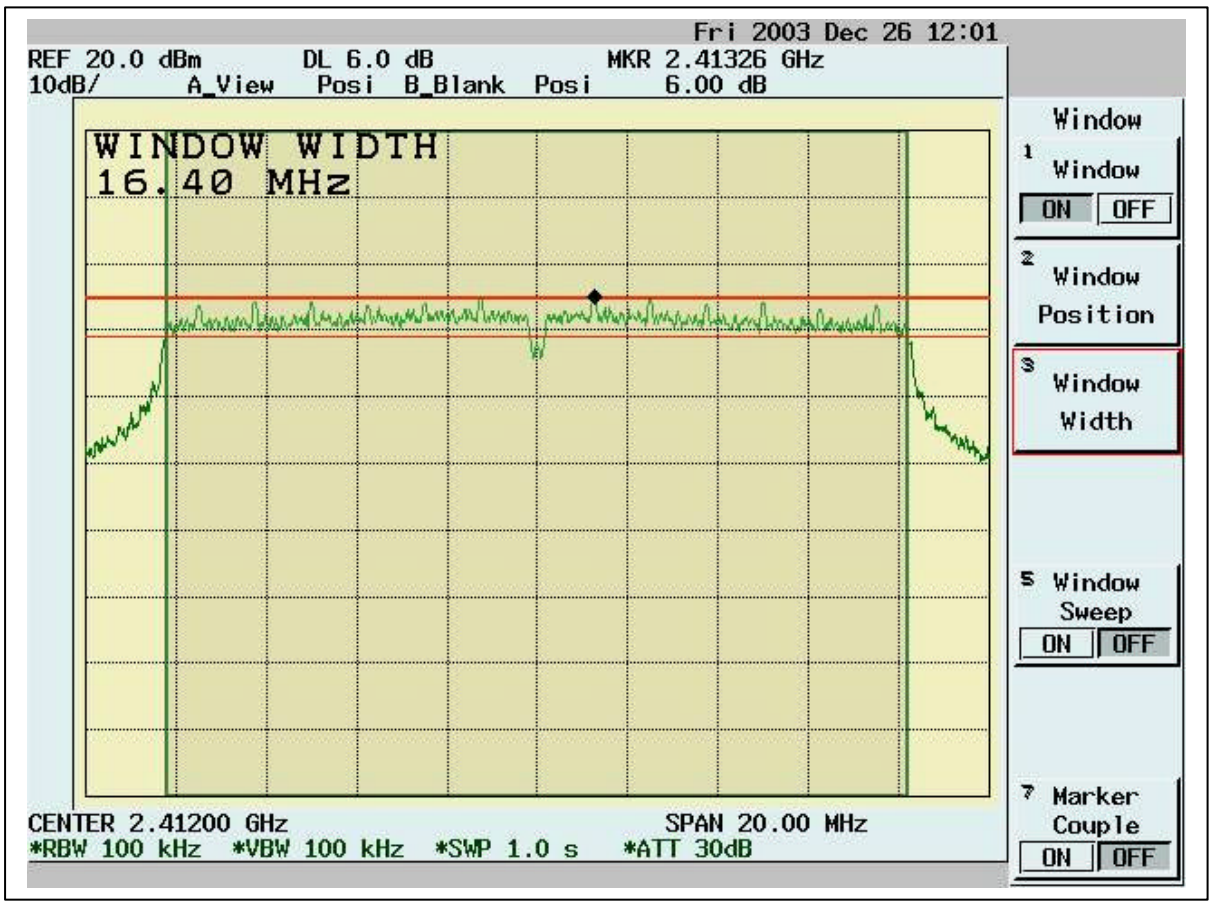
5.3.1 Test Setup

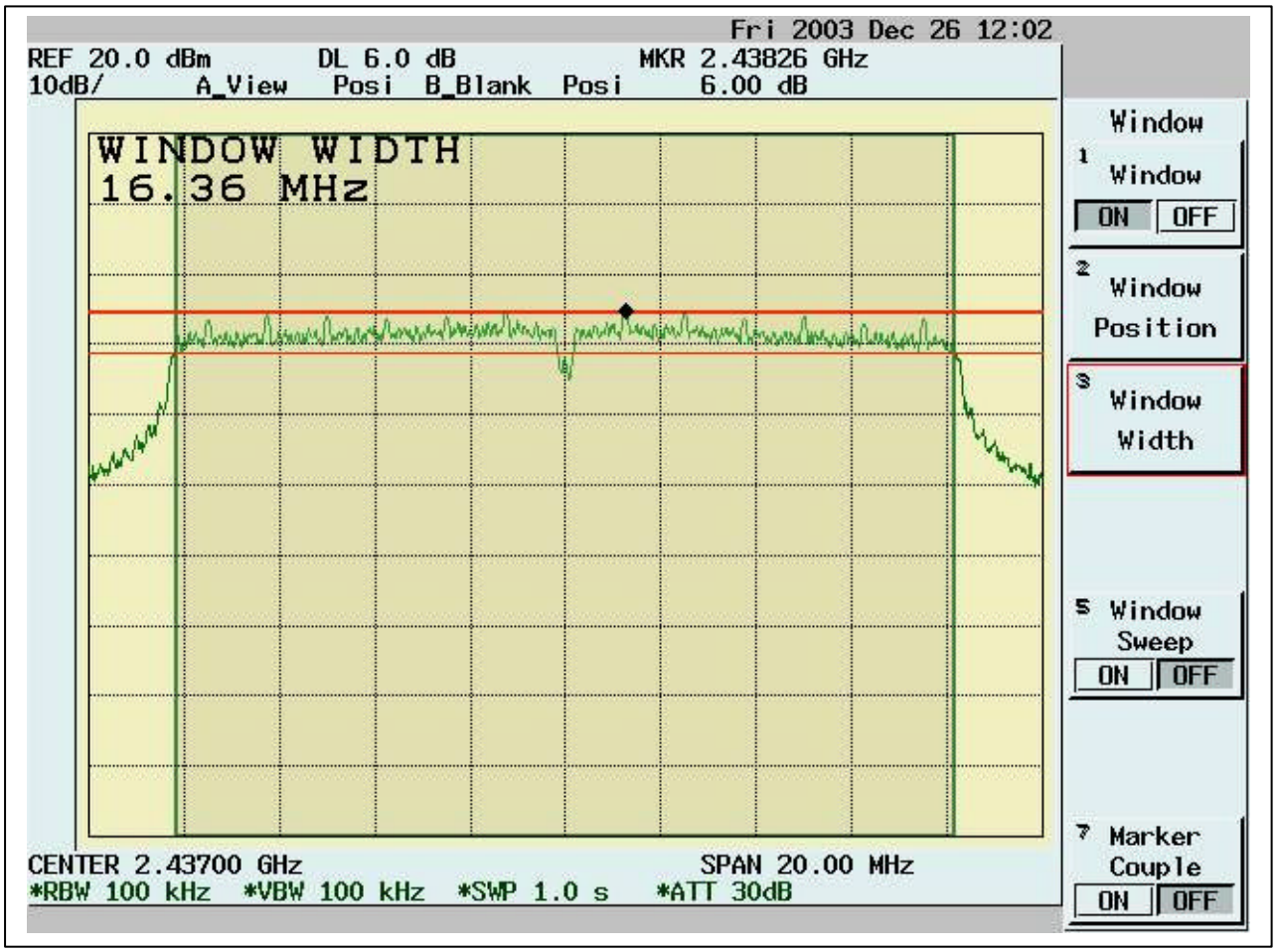


5.3.2 Test Data:

Table 6dB Bandwidth

Chennel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Pass/Fail
1	2412	16.40	0.5	Pass
6	2437	16.36	0.5	Pass
11	2462	16.40	0.5	Pass


Fri 2003 Dec 26 12:01
REF 20.0 dBm
DL 6.0 dB
MKR 2.41326 GHz
10dB/
A_View
Posi
B_Blank
Posi
6.00 dB
WINDOW WIDTH
16.40 MHz
Window
1 Window
ON OFF
2 Window Position
3 Window Width
5 Window Sweep
ON OFF
7 Marker Couple
ON OFF
CENTER 2.41200 GHz
SPAN 20.00 MHz
*RBW 100 kHz
*VBW 100 kHz
*SWP 1.0 s
*ATT 30dB


Fri 2003 Dec 26 12:02
REF 20.0 dBm
DL 6.0 dB
MKR 2.43826 GHz
10dB/
A_View
Posi
B_Blank
Posi
6.00 dB
WINDOW WIDTH
16.36 MHz
Window
1 Window
ON
OFF
2 Window Position
3 Window Width
5 Window Sweep
ON
OFF
7 Marker Couple
ON
OFF
CENTER 2.43700 GHz
SPAN 20.00 MHz
*RBW 100 kHz
*VBW 100 kHz
*SWP 1.0 s
*ATT 30dB


Fri 2003 Dec 26 12:03
REF 20.0 dBm
DL 6.0 dB
MKR 2.46326 GHz
10dB/
A_View
Posi
B_Blank
Posi
6.00 dB
WINDOW WIDTH
16.40 MHz
Window
1 Window
ON
OFF
2 Window Position
3 Window Width
5 Window Sweep
ON
OFF
7 Marker Couple
ON
OFF
CENTER 2.46200 GHz
SPAN 20.00 MHz
*RBW 100 kHz
*VBW 100 kHz
*SWP 1.0 s
*ATT 30dB

5.4 DSSS Maximum Peak Output Power [Section 15.247 (b)(1)]

5.4.1 Test Procedure

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

5.4.2 Test Setup

5.4.3 Test Data:

Maximum Peak Output Power

Chennel	Frequency (MHz)	Analyzer Reading (dBm)	Cable Loss (dB)	Peak Power Output (mW)	Peak Power Output (dBm)	Limit (dBm)	Pass/Fail
1	2412	15.843	1.1	49.46	16.943	30	Pass
6	2437	15.562	1.1	45.70	16.662	30	Pass
11	2462	15.406	1.1	44.73	16.506	30	Pass

5.5 Radiated Emission Measurement [Section [15.247(c)(4)]

5.5.1 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.

5.5.2 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 – 25GHz: 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 *EMI Receiver/Spectrum Analyzer Configuration*.
For the test of 2^{nd} to 10^{th} harmonics frequencies , the equipment setup was also refer to *EMI Receiver/Spectrum Analyzer Configuration*. 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.

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

Frequency Range Tested:	30MHz~1000MHz
Detector Function:	Quasi-Peak Mode
Resolution Bandwidth (RBW):	120KHz
Video Bandwidth (VBW)	1MHz

Frequency Range Tested:	1GHz – 25 GHz
Detector Function:	Peak Mode
Resolution Bandwidth (RBW):	1MHz
Video Bandwidth (VBW)	1MHz

Frequency Range Tested:	1GHz – 25 GHz
Detector Function:	Average Mode
Resolution Bandwidth (RBW):	1MHz
Video Bandwidth (VBW)	10 Hz

5.5.4 Test Data (30MHz – 1GHz) :.

30M – 1GHz Open Field Radiated Emissions (Horizontal) Channel 1, 6, 11

Meter Reading		Correction Factor			Corrected Emissions			Antenna	Turntable
Freq. (MHz)	Ampl. (dBuV)	Ant. (dB/m)	Cable (dB)	Pre-Ampl. (dB)	Ampl. (dBuV/m)	Limit (dBuV/m)	Margin* (dB)	Height (cm)	Position (°)
42.61	14.40	11.04	1.76	0.00	27.20	40.00	-12.80	100.00	105.00
333.61	13.23	13.54	4.78	0.00	31.54	46.00	-14.46	200.00	56.00
431.58	10.23	15.85	5.39	0.00	31.47	46.00	-14.53	100.00	40.00
455.83	11.19	16.13	5.52	0.00	32.84	46.00	-13.16	150.00	186.00
719.67	6.96	19.18	6.86	0.00	33.00	46.00	-13.00	100.00	105.00
766.23	4.25	19.66	7.09	0.00	31.01	46.00	-14.99	100.00	153.00
815.7	13.11	19.86	7.34	0.00	40.31	46.00	-5.69	200.00	121.00
836.07	3.87	19.94	7.41	0.00	31.23	46.00	-14.77	100.00	170.00
864.2	3.77	20.06	7.50	0.00	31.32	46.00	-14.68	100.00	218.00
911.73	14.91	20.27	7.72	0.00	42.90	46.00	-3.10	100.00	170.00

30M – 1GHz Open Field Radiated Emissions (Vertical) Channel 1, 6, 11

Meter Reading		Correction Factor			Corrected Emissions			Antenna	Turntable
Freq. (MHz)	Ampl. (dBuV)	Ant. (dB/m)	Cable (dB)	Pre-Ampl. (dB)	Ampl. (dBuV/m)	Limit (dBuV/m)	Margin* (dB)	Height (cm)	Position (°)
169.68	16.73	8.61	3.48	0.00	28.82	43.50	-14.68	100.00	24.00
211.39	18.74	8.57	3.87	0.00	31.18	43.50	-12.32	100.00	258.00
233.7	19.17	9.97	4.10	0.00	33.24	46.00	-12.76	200.00	225.00
434.49	11.37	15.88	5.40	0.00	32.65	46.00	-13.35	150.00	346.00
455.83	15.98	16.13	5.52	0.00	37.64	46.00	-8.36	105.00	41.00
597.45	8.33	18.30	6.31	0.00	32.93	46.00	-13.07	100.00	346.00
635.28	9.30	18.58	6.48	0.00	34.36	46.00	-11.64	100.00	62.00
768.17	4.54	19.67	7.11	0.00	31.32	46.00	-14.68	100.00	41.00
815.7	10.73	19.86	7.34	0.00	37.93	46.00	-8.07	150.00	274.00
911.73	13.20	20.27	7.72	0.00	41.19	46.00	-4.81	100.00	193.00

* NOTE:
During the Pre-test, the EUT has been tested for Channel 1 , 6, 11 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

5.5.5 Test Data (1GHz – 25 GHz) .

1GHz~ 25 GHz (Horizontal), Channel 1 : 2412 MHz (RBW=1MHz VBW=1MHz)

Meter Reading		Correction Factor			Corrected Emissions			Antenna	Turntable
Freq. (MHz)	Ampl. (dBuV) (pk)	Ant. (dB/m)	Cable (dB)	Pre-Ampl. (dB)	Ampl. (dBuV/m)	Limit (dBuV/m) (av)	Margin (dB)	Height (cm)	Position (°)
3326.67	41.94	31.19	1.46	46.63	27.96	54.00	-26.04	100	221
7130.87	42.15	39.84	2.34	46.25	38.08	54.00	-15.92	100	175
7861.14	31.98	40.70	2.47	44.40	30.76	54.00	-23.24	101	174
11342.7	25.63	41.80	3.00	41.25	29.19	54.00	-24.81	100	276
12395.6	25.91	41.70	3.15	42.89	27.87	54.00	-26.13	104	118
14688.3	30.02	44.22	3.43	42.34	35.34	54.00	-18.66	101	231

‘ pk’ ---- peak, ‘ av’ ----average

1GHz~ 25 GHz (Vertical), Channel 1 : 2412 MHz (RBW=1MHz VBW=1MHz)

Meter Reading		Correction Factor			Corrected Emissions			Antenna	Turntable
Freq. (MHz)	Ampl. (dBuV) (pk)	Ant. (dB/m)	Cable (dB)	Pre-Ampl. (dB)	Ampl. (dBuV/m)	Limit (dBuV/m) (av)	Margin (dB)	Height (cm)	Position (°)
7130.8	42.69	39.84	2.34	46.25	38.62	54.00	-15.38	100	322
7606.3	35.05	39.78	2.43	45.59	31.67	54.00	-22.33	100	359
7895.1	31.80	40.82	2.48	44.24	30.87	54.00	-23.13	100	158
11546.5	26.15	42.37	3.03	41.70	29.86	54.00	-24.14	101	222
14688.3	29.91	44.22	3.43	42.34	35.22	54.00	-18.78	102	208
15690.3	26.90	43.41	3.54	42.16	31.69	54.00	-22.31	101	332

‘ pk’ ---- peak, ‘ av’ ----average

Note:

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 25 GHz have been tested.

1GHz~ 25 GHz (Horizontal), Channel 6 : 2437 MHz (RBW=1MHz VBW=1MHz)

Meter Reading		Correction Factor			Corrected Emissions			Antenna	Turntable
Freq. (MHz)	Ampl. (dBuV) (pk)	Ant. (dB/m)	Cable (dB)	Pre-Ampl. (dB)	Ampl. (dBuV/m)	Limit (dBuV/m) (av)	Margin (dB)	Height (cm)	Position (°)
7130.87	42.24	39.84	2.34	46.25	38.18	54.00	-15.82	101	326
7623.38	34.30	39.84	2.43	45.51	31.07	54.00	-22.93	101	248
11767.2	26.12	42.24	3.06	42.20	29.21	54.00	-24.79	100	284
13618.4	25.90	42.14	3.31	42.00	29.34	54.00	-24.66	102	118
14688.3	29.51	44.22	3.43	42.34	34.83	54.00	-19.17	101	276
15282.7	26.55	43.15	3.49	43.30	29.89	54.00	-24.11	100	131

‘ pk’ ---- peak, ‘ av’ ----average

1GHz~ 25 GHz (Vertical), Channel 6 : 2437 MHz (RBW=1MHz VBW=1MHz)

Meter Reading		Correction Factor			Corrected Emissions			Antenna	Turntable
Freq. (MHz)	Ampl. (dBuV) (pk)	Ant. (dB/m)	Cable (dB)	Pre-Ampl. (dB)	Ampl. (dBuV/m)	Limit (dBuV/m) (av)	Margin (dB)	Height (cm)	Position (°)
7164.83	41.93	39.80	2.35	46.24	37.84	54.00	-16.16	101	266
11393.6	25.63	42.00	3.01	41.36	29.27	54.00	-24.73	101	203
13448.6	25.86	41.83	3.29	41.76	29.22	54.00	-24.78	100	293
14688.3	30.05	44.22	3.43	42.34	35.36	54.00	-18.64	100	291
14926.1	27.04	43.75	3.46	43.58	30.66	54.00	-23.34	100	230
15282.7	26.82	43.15	3.49	43.30	30.16	54.00	-23.84	106	359

‘ pk’ ---- peak, ‘ av’ ----average

Note:

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 25 GHz have been tested.

1GHz~ 25 GHz (Horizontal), Channel 11: 2462 MHz (RBW=1MHz VBW=1MHz)

Meter Reading		Correction Factor			Corrected Emissions			Antenna	Turntable
Freq. (MHz)	Ampl. (dBuV) (pk)	Ant. (dB/m)	Cable (dB)	Pre-Ampl. (dB)	Ampl. (dBuV/m)	Limit (dBuV/m) (av)	Margin (dB)	Height (cm)	Position (°)
7164.8	41.41	39.80	2.35	46.24	37.32	54.00	-16.68	102	110
11393.6	25.86	42.00	3.01	41.36	29.51	54.00	-24.49	101	347
13669.3	25.91	42.24	3.32	42.13	29.34	54.00	-24.66	100	18
14688.3	30.64	44.22	3.43	42.34	35.96	54.00	-18.04	102	191
15282.7	26.29	43.15	3.49	43.30	29.63	54.00	-24.37	101	345
15673.3	27.63	43.35	3.54	42.21	32.31	54.00	-21.69	106	339

‘ pk’ ---- peak, ‘ av’ ----average

1GHz~ 25 GHz (Vertical), Channel 11 : 2462 MHz (RBW=1MHz VBW=1MHz)

Meter Reading		Correction Factor			Corrected Emissions			Antenna	Turntable
Freq. (MHz)	Ampl. (dBuV) (pk)	Ant. (dB/m)	Cable (dB)	Pre-Ampl. (dB)	Ampl. (dBuV/m)	Limit (dBuV/m) (av)	Margin (dB)	Height (cm)	Position (°)
7130.87	42.74	39.84	2.34	46.25	38.68	54.00	-15.32	100	284
11444.6	25.49	42.19	3.02	41.47	29.23	54.00	-24.77	100	186
13635.4	25.97	42.17	3.31	42.04	29.41	54.00	-24.59	100	167
14688.3	30.10	44.22	3.43	42.34	35.42	54.00	-18.58	100	109
15282.7	25.91	43.15	3.49	43.30	29.25	54.00	-24.75	107	133
15673.3	26.73	43.35	3.54	42.21	31.40	54.00	-22.60	102	239

‘ pk’ ---- peak, ‘ av’ ----averag

Note:

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 25 GHz have been tested.

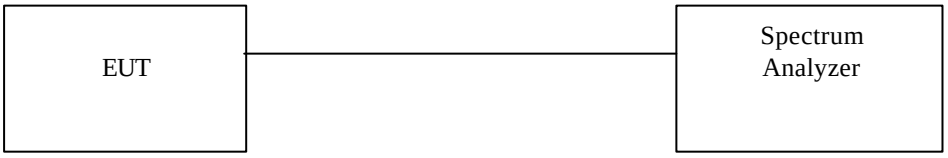
5.6 Band Edge Measurement

5.6.1 Test Procedure (Conducted)

1. The Transmitter output of EUT was connected to the spectrum analyzer.
   Equipment mode: Spectrum analyzer
   Detector function: Peak mode
   SPAN: 100MHz
   RBW: 100KHz
   VBW: 100KHz
   Center frequency: 2.4GHz, 2.4835GHz.

2. Using Peak Search to read the peak power of Carrier frequencies after Maximum Hold function is completed.
3. Find the next peak frequency outside the operation frequency band.

5.6.2 Test Setup (Conducted)



5.6.3 Test Data:

Band Edge measurement (Conducted)

Channel	Frequency (MHz)	Spectrum Reading (dBuV)	Carrier - Outsideband Limit: > 20dB (dB)	Pass/Fail
1	2413.2	102.44	---	---
Outside band	2400	73.04	29.40	Pass
11	2463.2	101.68	---	---
Outside band	2475.1	70.59	31.09	Pass

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