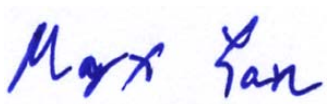
EMC
TEST REPORT

Report No. : **EME-051395**
Model No. : **WCM300C, WCM300U, WMC300E, WCM310C, WCM310U, WCM310E**
Issued Date : **Jan. 9, 2006**

Applicant : **Sertek Incorporated**
10F, 88, Sec.1, Hsin Tai Wu Rd., Hsichih Taipei Hsien 221, Taiwan

Test By : **Intertek Testing Services Taiwan Ltd.**
No. 11, Lane 275, Ko-Nan 1 Street, Chia-Tung Li, Shiang-Shan District, Hsinchu City, Taiwan

Project Engineer



Marx Yan

Reviewed By

Kevin Chen

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Summary of Tests

802.11b/g Mini PCI WLAN Card-Model: WCM300C
FCC ID: TV5WCM300C

Test	Reference	Results
Minimum 6dB Bandwidth test	15.247(a)(2)	Complies
Maximum Output Power test	15.247(b)	Complies
Radiated Spurious Emission test	15.205, 15.209	Complies
Power Spectrum Density test	15.247(e)	Complies
Emission on the Band Edge test	15.247(d)	Complies
AC Power Line Conducted Emission test	15.207	Complies

1. General information

1.1 Identification of the EUT

Applicant	: Sertek Incorporated
Product	: 802.11b/g Mini PCI WLAN Card
Model No.	: WCM300C
FCC ID.	: TV5WCM300C
Frequency Range	: 2412MHz ~ 2462 MHz
Channel Number	: 11 channels
Frequency of Each Channel	: 2412MHz, 2417MHz, 2422MHz, 2427MHz, 2432MHz, 2437MHz, 2442MHz, 2447MHz, 2452MHz, 2457MHz, 2462MHz
Type of Modulation	: DSSS, OFDM
Rated Power	: 3.3Vdc from Notebook PC
Power Cord	: N/A
Sample Received	: Dec. 20, 2005
Test Date(s)	: Dec. 21, 2005 ~ Jan. 9, 2006

A FCC DoC report has been generated for the client.

1.2 Additional information about the EUT

The EUT is an 802.11b/g Mini PCI WLAN Card, and was defined as information technology equipment.

According to the hardware aspect, we verified the models listed as below are series model to WCM300C (EUT), the difference please refer to the following table:

Trade Name	Model No.	Difference
Sertek	WCM300C	Notebook (with sleep mode function, full channel)
	WCM300U	Notebook (with sleep mode function, US)
	WCM300E	Notebook (with sleep mode function, EU)
	WCM310C	ADSL (without sleep mode function, full channel)
	WCM310U	ADSL (without sleep mode function, US)
	WCM310E	ADSL (without sleep mode function, EU)

The EUT meets special requirements for full modular approval on FCC Public Notice DA 00-1407 and the device is only for OEM integrator, please refer the test result in this report.

For more detail features, please refer to User's manual as file name “Installation guide.pdf”

1.3 Antenna description

The EUT has five set of antenna, the antenna are affixed to the EUT using a unique connector, which allows for replacement of a broken antenna, but DOES NOT use a standard antenna jack or electrical connector.

The detail please refer to the following table:

	Set 1	Set 2	Set 3	Set 4	Set 5
Antenna Gain:	2.0dBi max	2.0dBi max	2.0dBi max	2.0dBi max	2.0dBi max
Antenna Type:	Dipole	Dipole	Dipole	Dipole	Dipole
Connector Type:	I-PEX	I-PEX	I-PEX	SMA Reverse	I-PEX

Verifying five set of antenna. The worst case was found at set 3.

1.4 Peripherals equipment

Peripherals	Manufacturer	Product No.	Serial No.	FCC ID
Notebook PC	DELL	PP05L	CN-5G5152-48643-498-6810	FCC DoC Approved
MODEM	LEMEL	MD-56KVT-100	00V230A00078422	FCC DoC Approved
Wirless AP	SMC	SMC2655W	S25028NU05021	FCC DoC Approved
PRINTER	HP	DeskJet 400	TH86I1K30S	FCC DoC Approved

2. Test specifications

2.1 Test standard

The EUT was performed according to the procedures in FCC Part 15 Subpart C Section § 15.205、§15.207、§15.209、§15.247 and ANSI C63.4/2003.

The test of radiated measurements according to FCC Part15 Section 15.33(a) had been conducted and the field strength of this frequency band were all meet limit requirement, thus we evaluate the EUT pass the specified test.

2.2 Operation mode

The EUT was operating in continuously transmitting status during all the tests except conducted emission test during which the EUT was tested in normal operating mode with AP.

2.3 Test equipment

Equipment	Brand	Frequency range	Model No.	Intertek ID No.	Next Cal. Date
EMI Test Receiver	Rohde & Schwarz	9kHz~2.75GHz	ESCS 30	EC303	04/17/2006
EMI Test Receiver	Rohde & Schwarz	20Hz~26.5GHz	ESMI	EC317	08/07/2006
Spectrum Analyzer	Rohde & Schwarz	9kHz~30GHz	FSP 30	EC353	07/24/2006
Spectrum Analyzer	Rohde & Schwarz	20Hz~40GHz	FSEK 30	EC365	11/01/2006
Horn Antenna	SCHWARZBECK	1GHz~18GHz	BBHA 9120 D	EC371	12/22/2007
Horn Antenna	SCHWARZBECK	14GHz~40GHz	BBHA 9170	EC351	07/08/2007
Bilog Antenna	SCHWARZBECK	25MHz~2GHz	VULB 9168	EC347	12/23/2007
Pre-Amplifier	MITEQ	100MHz~26.5GHz	919981	EC373	12/29/2006
Wideband Peak Power Meter/ Sensor	Anritsu	100MHz~18GHz	ML2497A/ MA2491A	EC396	11/10/2006
Controller	HDGmbH	N/A	CM 100	EP346	N/A
Antenna Tower	HDGmbH	N/A	MA 240	EP347	N/A
LISN	Rohde & Schwarz	9KHz~30MHz	ESH3-Z5	EC344	01/13/2006

Note: 1. The above equipments are within the valid calibration period.
2. The test antennas (receiving antenna) are calibration per 3 years.

3. Minimum 6dB Bandwidth test

3.1 Operating environment

Temperature:	20	℃
Relative Humidity:	50	%
Atmospheric Pressure:	1010	hPa

3.2 Test setup & procedure

The minimum 6dB bandwidth per FCC §15.247(a)(2) was measured using a 50 ohm spectrum analyzer with the resolutions bandwidth set at 100kHz, the video bandwidth set at 300kHz, and the SPAN>>RBW. The test was performed at 3 channels (lowest, middle and highest channel). The minimum 6-dB modulation bandwidth is in the following Table.

3.3 Measured data of Minimum 6dB Bandwidth test results

Test Mode: 802.11b (DSSS Modulation) operating mode

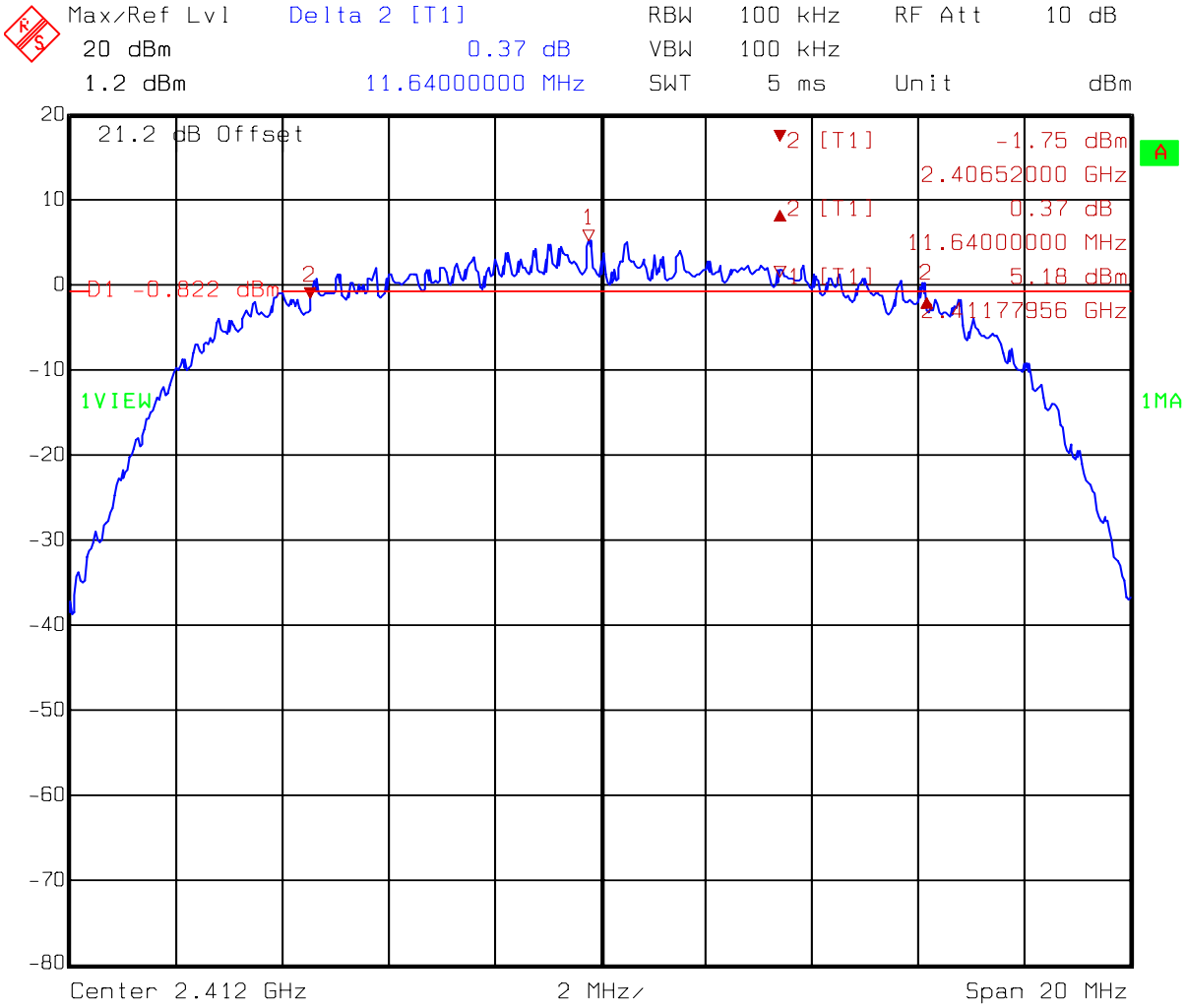
Channel	Frequency (MHz)	Bandwidth (MHz)	Limit
1 (lowest)	2412	11.64	＞500kHz
6 (middle)	2437	11.64	＞500kHz
11 (highest)	2462	11.60	＞500kHz

Test Mode: 802.11g (OFDM Modulation) operating mode

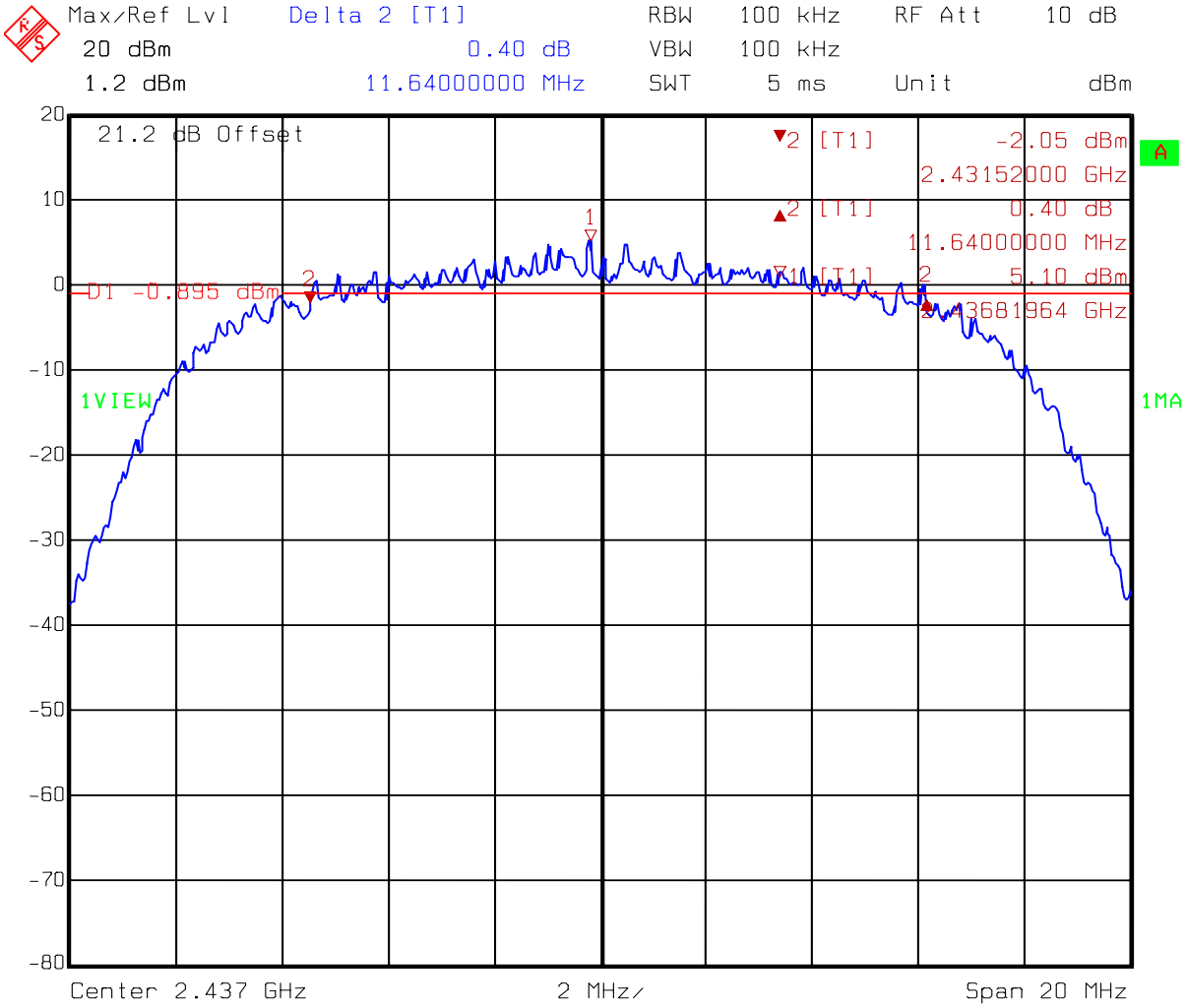
Channel	Frequency (MHz)	Bandwidth (MHz)	Limit
1 (lowest)	2412	15.92	＞500kHz
6 (middle)	2437	15.92	＞500kHz
11 (highest)	2462	15.92	＞500kHz

Please see the plot below.

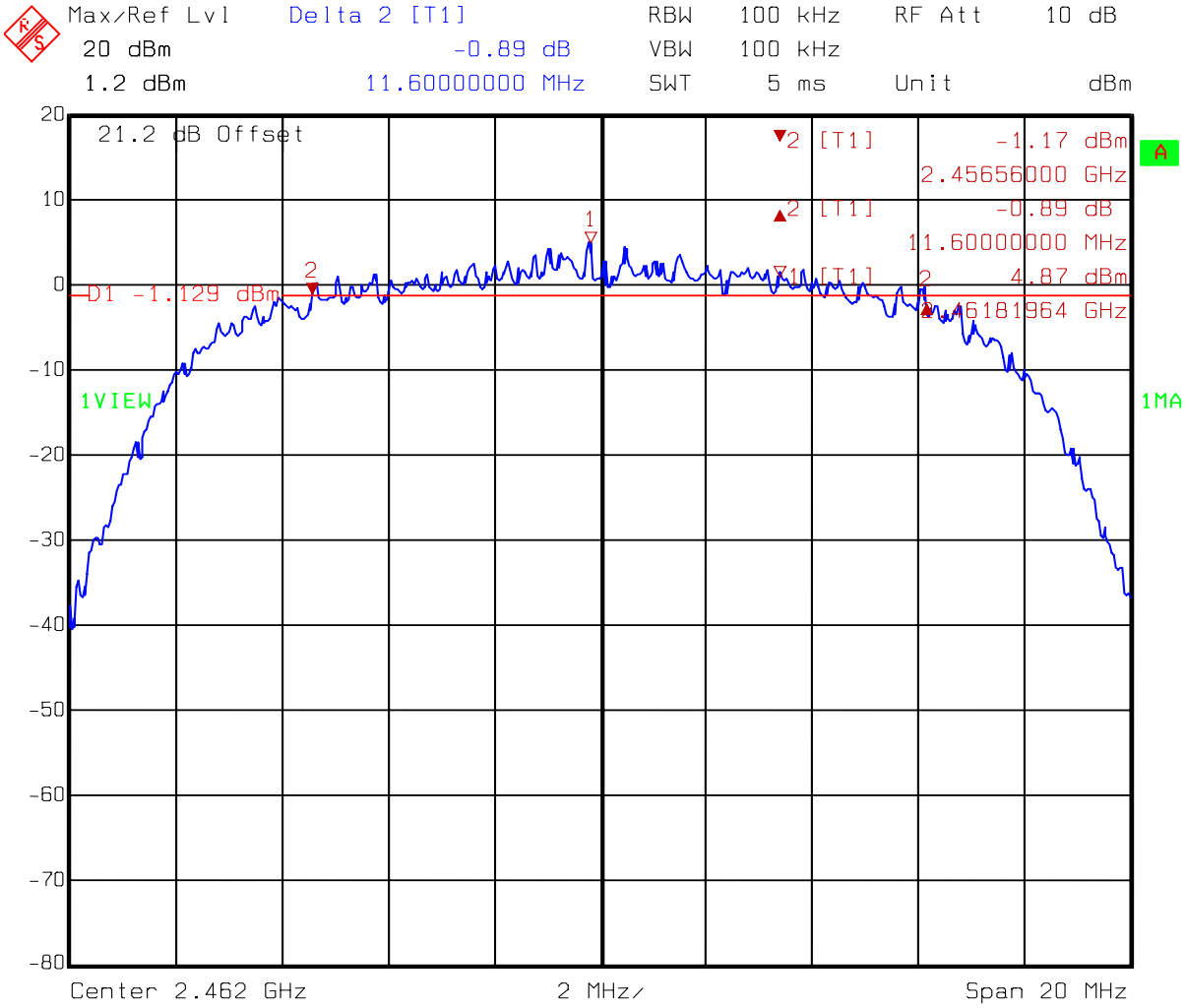
Test Mode: 802.11b(DSSS Modulation) operating mode



Title: 6dB Bandwidth
Comment A: Channel 1 at 802.11b mode
Date: 06.JAN.2006 11:22:53

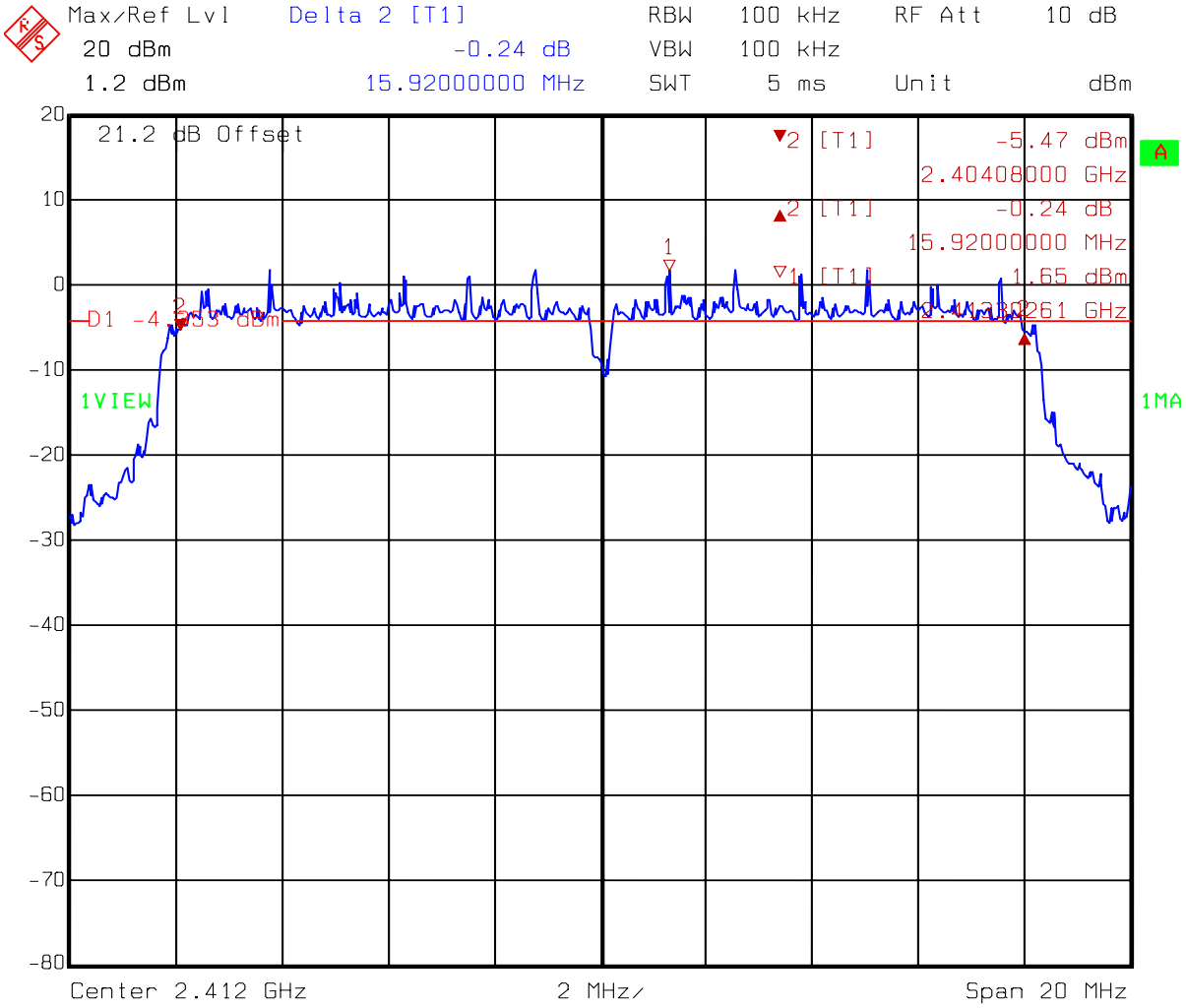


Title: 6dB Bandwidth
Comment A: Channel 6 at 802.11b mode
Date: 06.JAN.2006 11:24:28

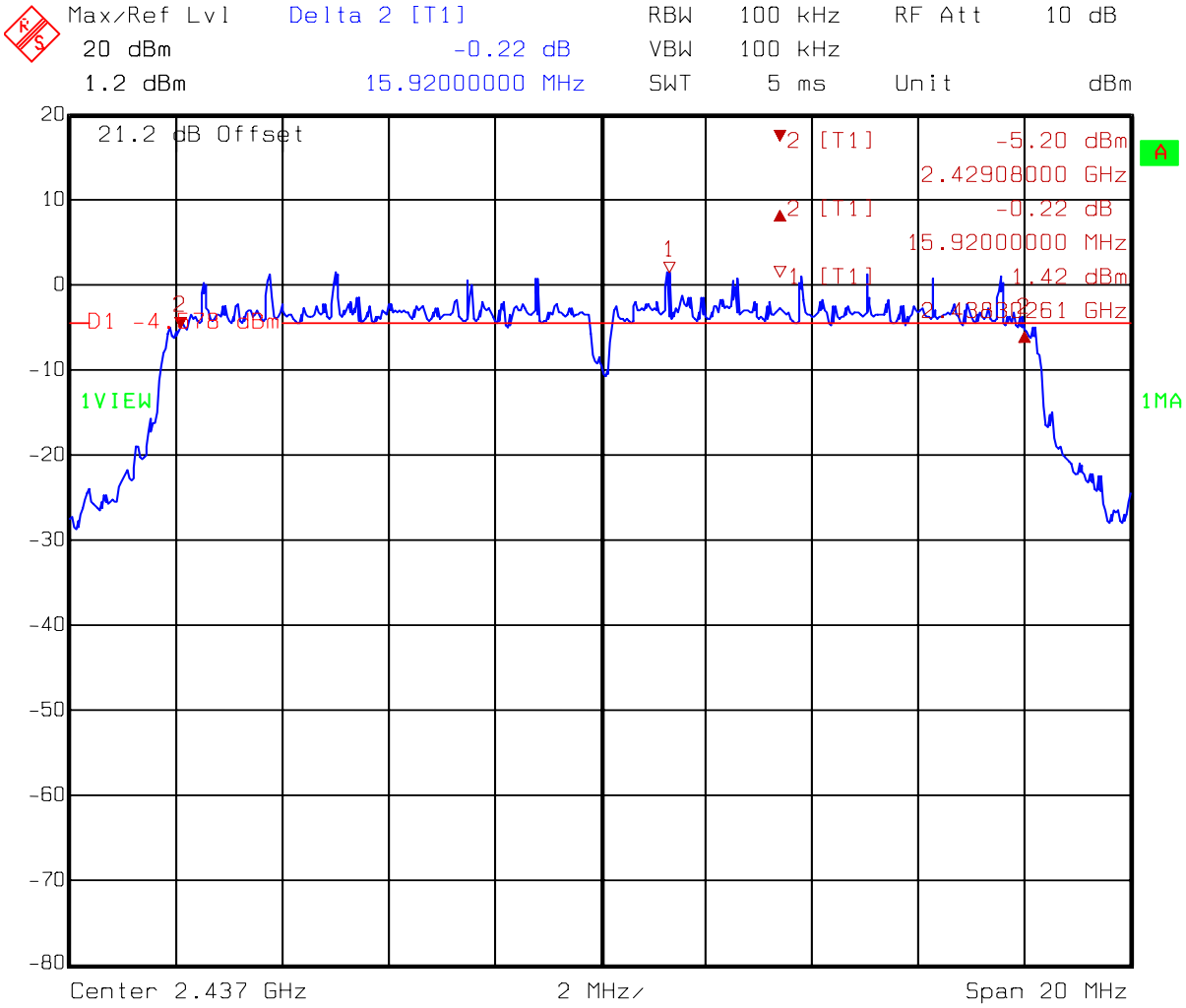


Title: 6dB Bandwidth
Comment A: Channel 11 at 802.11b mode
Date: 06.JAN.2006 11:25:50

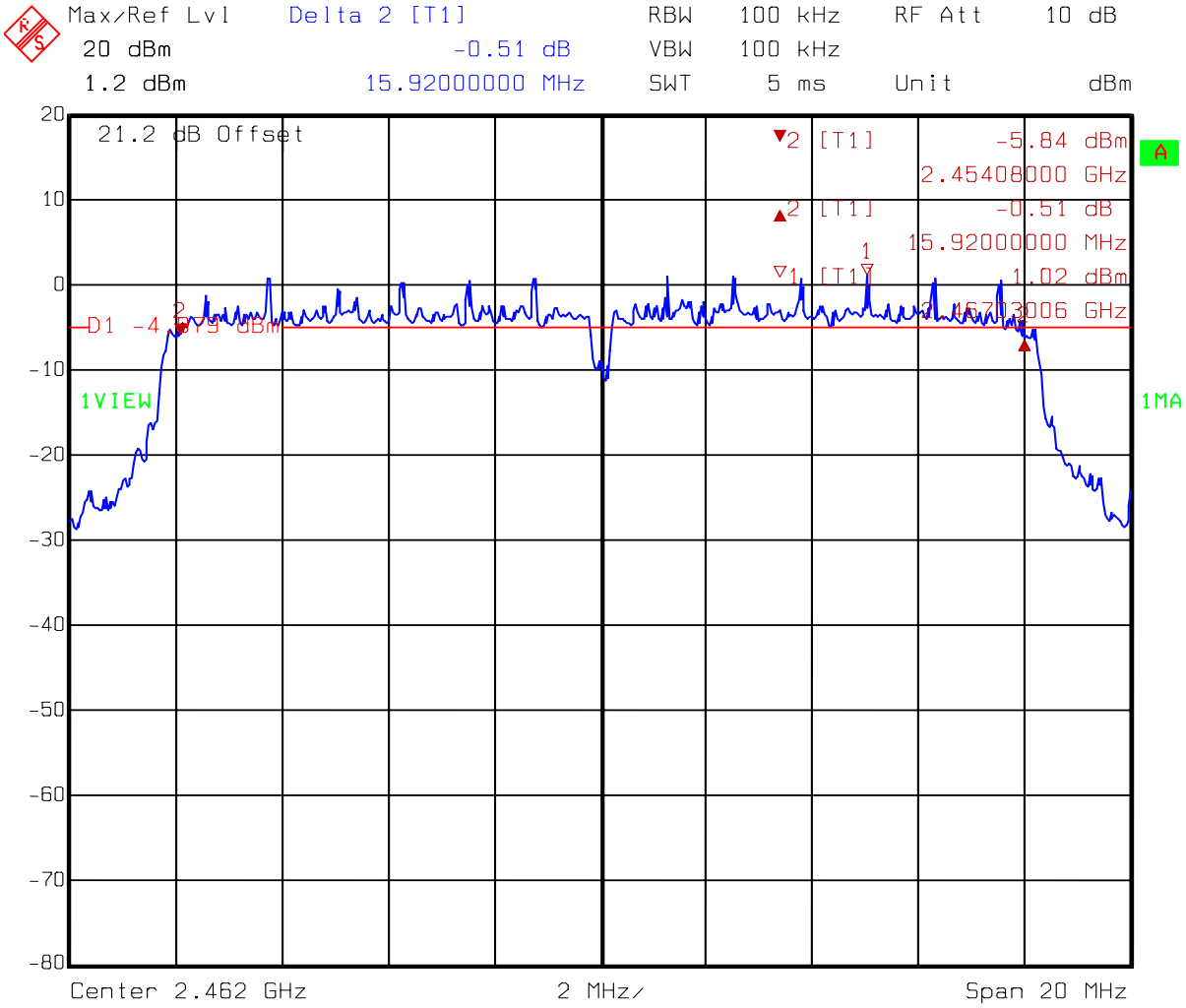
Test Mode: 802.11g(OFDM Modulation) operating mode



Title: 6dB Bandwidth
Comment A: Channel 1 at 802.11g mode
Date: 06.JAN.2006 11:28:04



Title: 6dB Bandwidth
Comment A: Channel 6 at 802.11g mode
Date: 06.JAN.2006 11:30:36



Title: 6dB Bandwidth
Comment A: Channel 11 at 802.11g mode
Date: 06.JAN.2006 11:32:13

4. Maximum Output Power test

4.1 Operating environment

Temperature: 22 ℃
Relative Humidity: 50 %
Atmospheric Pressure: 1010 hPa

4.2 Test setup & procedure

The power output per FCC §15.247(b) was measured on the EUT using a 50 ohm SMA cable connected to peak power meter via power sensor. Power was read directly and cable loss correction (1.2 dB) was added to the reading to obtain power at the EUT antenna terminals. The test was performed at 3 channels (lowest, middle and highest channel).

4.3 Measured data of Maximum Output Power test results

Test Mode: 802.11b (DSSS Modulation) operating mode

Channel	Freq. (MHz)	C.L. (dB)	Reading (dBm)	Conducted Peak Output Power		Limit (W)
				(dBm)	(mW)	
1 (lowest)	2412	1.2	18.03	17.73	59.29	1
6 (middle)	2437	1.2	18.17	17.36	54.45	1
11 (highest)	2462	1.2	18.48	17.13	51.64	1

Remark:

Conducted Peak Output Power = Reading + C.L.

Test Mode: 802.11g (OFDM Modulation) operating mode

Channel	Freq. (MHz)	C.L. (dB)	Reading (dBm)	Conducted Peak Output Power		Limit (W)
				(dBm)	(mW)	
1 (lowest)	2412	1.2	19.57	19.82	95.94	1
6 (middle)	2437	1.2	19.38	19.56	90.36	1
11 (highest)	2462	1.2	19.35	19.25	84.14	1

Remark:

Conducted Peak Output Power = Reading + C.L.

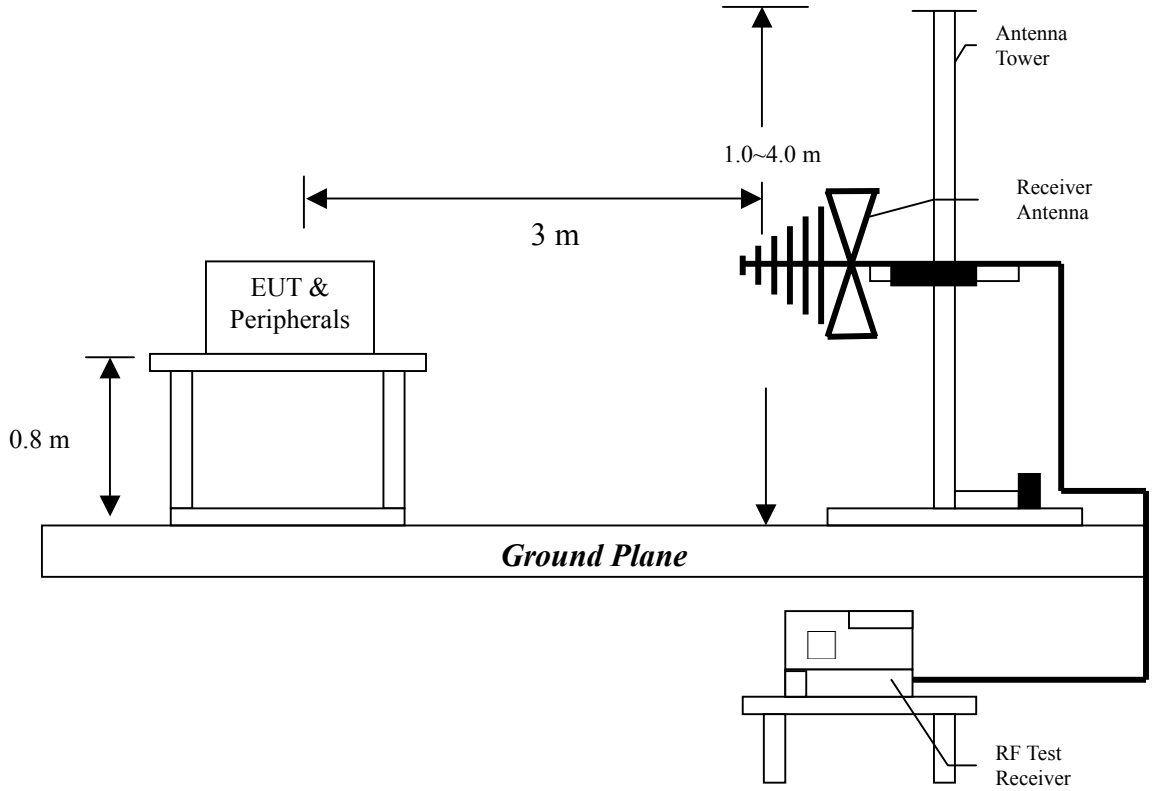
5. Radiated Emission test

5.1 Operating environment

Temperature:	23	℃
Relative Humidity:	53	%
Atmospheric Pressure:	1021	hPa

5.2 Test setup & procedure

The Diagram below shows the test setup, which is utilized to make these measurements.



Radiated emissions were invested cover the frequency range from 30MHz to 1000MHz using a receiver RBW of 120kHz record QP reading, and the frequency over 1GHz using a spectrum analyzer RBW of 1MHz and 10Hz VBW record Average reading. (15.209 paragraph), the Peak reading (1MHz RBW/VBW) recorded also on the report.
The EUT for testing is arranged on a wooden turntable. If some peripherals apply to the EUT, the peripherals will be connected to EUT and the whole system. During the test, all cables were arranged to produce worst-case emissions. The signal is maximized through rotation. The height of antenna and polarization is changing constantly for exploring for maximum signal level. The height of antenna can be up to 4 meters and down to 1 meter.

The measurement for radiated emission will be done at the distance of three meters unless the signal level is too low to measure at that distance. In the case of the reading under noise floor, a pre-amplifier is used and/or the test is conducted at a closer distance. And then all readings are extrapolated back to the equivalent 3meter reading using inverse scaling with distance.

The EUT configuration please refer to the "Spurious set-up photo.pdf".

5.3 Emission limits

The spurious Emission shall test through the 10th harmonic. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

Frequency (MHz)	Limits (dB μ V/m@3m)
30-88	40
88-216	43.5
216-960	46
Above 960	54

Remark:
1. In the above table, the tighter limit applies at the band edges.
2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system

Uncertainty was calculated in accordance with NAMAS NIS 81.
Expanded uncertainty (k=2) of radiated emission measurement is 4.98 dB.

5.4 Radiated spurious emission test data

The radiated spurious emissions at

Frequency(MHz)	Margin
198.780	-1.11
224.000	-4.39
231.760	-4.64
264.740	-3.65
332.640	-3.24
198.780	-2.24
204.600	-4.68
231.760	-4.57
264.740	-4.71
319.060	-4.38
330.700	-4.54
9648	-3.75

are less than uncertainty. This is within the stated measurement uncertainty, this may affect compliance determined in other test arrangements.

5.4.1 Measurement results: frequencies equal to or less than 1 GHz

The test was performed on EUT under 802.11b continuously transmitting mode. Channel 1, 6, 11 were verified. The worst case occurred at 802.11b Tx channel 1.

EUT : WCM300C
Worst Case : 802.11b Tx at channel 1

Antenna Polariz. (V/H)	Freq. (MHz)	Receiver Detector	Corr. Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)	Antenna high (cm)	Turn Table angle (degree)
V	165.800	QP	15.27	18.06	33.33	43.50	-10.17	100	215
V	198.780	QP	11.58	22.50	34.08	43.50	-9.42	100	300
V	231.760	QP	12.19	21.49	33.68	46.00	-12.32	100	295
V	264.740	QP	12.99	21.09	34.08	46.00	-11.92	100	153
V	332.640	QP	14.73	18.45	33.18	46.00	-12.82	100	255
V	664.380	QP	21.73	11.60	33.33	46.00	-12.67	220	335
H	158.040	QP	13.79	24.70	38.49	43.50	-5.01	400	175
H	198.780	QP	10.83	31.56	42.39	43.50	-1.11	400	156
H	224.000	QP	11.67	29.94	41.61	46.00	-4.39	350	249
H	231.760	QP	11.85	29.51	41.36	46.00	-4.64	210	112
H	264.740	QP	13.03	29.32	42.35	46.00	-3.65	202	257
H	332.640	QP	15.07	27.69	42.76	46.00	-3.24	155	241

Remark:
1. Corr. Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Corr. Factor

The test was performed on EUT under 802.11g continuously transmitting mode. Channel 1, 6, 11 were verified. The worst case occurred at 802.11g Tx channel 1.

EUT : WCM300C
Worst Case : 802.11g Tx at channel 1

Antenna Polariz. (V/H)	Freq. (MHz)	Receiver Detector	Corr. Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)	Antenna high (cm)	Turn Table angle (degree)
V	111.480	QP	8.19	23.07	31.26	43.50	-12.24	100	222
V	165.800	QP	15.70	18.10	33.80	43.50	-9.70	100	213
V	198.780	QP	12.00	20.64	32.64	43.50	-10.86	100	266
V	233.700	QP	12.18	19.28	31.46	46.00	-14.54	100	256
V	164.740	QP	15.70	17.50	33.20	43.50	-10.30	100	255
V	330.700	QP	14.98	16.47	31.45	46.00	-14.55	100	279
H	198.780	QP	10.83	30.43	41.26	43.50	-2.24	350	275
H	204.600	QP	10.78	28.05	38.83	43.50	-4.68	330	256
H	231.760	QP	11.74	29.69	41.43	46.00	-4.57	300	266
H	264.740	QP	12.88	28.41	41.29	46.00	-4.71	285	273
H	319.060	QP	14.32	27.31	41.63	46.00	-4.38	250	249
H	330.700	QP	14.40	27.07	41.47	46.00	-4.54	243	255

Remark:

1. Corr. Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Corr. Factor

5.4.2 Measurement results: frequency above 1GHz

EUT : WCM300C
Test Condition : 802.11b Tx at channel 1

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)	Ant. high (cm)	Turn Table angle (degree)
4824	PK	V	36.07	37.77	46.82	48.52	54	-5.48	115	279
9648	PK	V	34.28	48.31	38.22	52.25	74	-21.75	124	295
9648	AV	V	34.28	48.31	36.22	50.25	54	-3.75	124	295

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1GHz to 25GHz.The data value listed above which is higher than the noise floor, the others please refer to noise floor level.

Noise floor level is :

For PK:
1GHz-3GHz: 20dBuV
3GHz-14GHz: 27dBuV
14GHz-26.5GHz: 39dBuV

For AV:
1GHz-3GHz: 10dBuV
3GHz-14GHz: 16dBuV
14GHz-26.5GHz: 28dBuV

EUT : WCM300C
Test Condition : 802.11b Tx at channel 6

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)	Ant. high (cm)	Turn Table angle (degree)
4874	PK	V	36.07	37.77	46.89	48.59	54	-5.41	115	271
4874	PK	H	36.07	37.77	41.98	43.68	54	-10.32	150	135

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1GHz to 25GHz.The data value listed above which is higher than the noise floor, the others please refer to noise floor level.

Noise floor level is:

For PK:
1GHz-3GHz: 20dBuV
3GHz-14GHz: 27dBuV
14GHz-26.5GHz: 39dBuV

For AV:
1GHz-3GHz: 10dBuV
3GHz-14GHz: 16dBuV
14GHz-26.5GHz: 28dBuV

EUT : WCM300C
Test Condition : 802.11b Tx at channel 11

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)	Ant. high (cm)	Turn Table angle (degree)
4924	PK	V	36.07	37.77	49.66	51.36	74	-22.64	112	212
4924	AV	V	36.07	37.77	45.91	47.61	54	-6.39	112	212

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1GHz to 25GHz.The data value listed above which is higher than the noise floor, the others please refer to noise floor level.

Noise floor level is:

For PK:
1GHz-3GHz: 20dBuV
3GHz-14GHz: 27dBuV
14GHz-26.5GHz: 39dBuV

For AV:
1GHz-3GHz: 10dBuV
3GHz-14GHz: 16dBuV
14GHz-26.5GHz: 28dBuV

EUT : WCM300C
Test Condition : 802.11g Tx at channel 1

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)	Ant. high (cm)	Turn Table angle (degree)
4824	PK	V	36.07	37.77	45.62	47.32	54	-6.68	112	260
9648	PK	V	34.28	48.31	39.2	53.23	74	-20.77	115	250
9648	AV	V	34.28	48.31	36.57	50.6	54	-3.4	115	250

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1GHz to 25GHz.The data value listed above which is higher than the noise floor, the others please refer to noise floor level.

Noise floor level is :

For PK:
1GHz-3GHz: 20dBuV
3GHz-14GHz: 27dBuV
14GHz-26.5GHz: 39dBuV

For AV:
1GHz-3GHz: 10dBuV
3GHz-14GHz: 16dBuV
14GHz-26.5GHz: 28dBuV

EUT : WCM300C
Test Condition : 802.11g Tx at channel 6

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)	Ant. high (cm)	Turn Table angle (degree)
4874	PK	V	36.07	37.77	43.51	45.21	54	-8.79	110	235

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1GHz to 25GHz.The data value listed above which is higher than the noise floor, the others please refer to noise floor level.

Noise floor level is:

For PK:
1GHz-3GHz: 20dBuV
3GHz-14GHz: 27dBuV
14GHz-26.5GHz: 39dBuV

For AV:
1GHz-3GHz: 10dBuV
3GHz-14GHz: 16dBuV
14GHz-26.5GHz: 28dBuV

EUT : WCM300C
Test Condition : 802.11g Tx at channel 11

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)	Ant. high (cm)	Turn Table angle (degree)
4924	PK	V	36.07	37.77	50.91	52.61	74	-21.39	110	220
4924	AV	V	36.07	37.77	44.8	46.5	54	-7.5	110	220

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1GHz to 25GHz.The data value listed above which is higher than the noise floor, the others please refer to noise floor level.

Noise floor level is:

For PK:
1GHz-3GHz: 20dBuV
3GHz-14GHz: 27dBuV
14GHz-26.5GHz: 39dBuV

For AV:
1GHz-3GHz: 10dBuV
3GHz-14GHz: 16dBuV
14GHz-26.5GHz: 28dBuV

6. Power Spectrum Density test

6.1 Operating environment

Temperature:	22	℃
Relative Humidity:	50	%
Atmospheric Pressure	1020	hPa

6.2 Test setup & procedure

The power spectrum density per FCC §15.247(e) was measured from the antenna port of the EUT using a 50ohm spectrum analyzer with the resolution bandwidth set at 3kHz, the video bandwidth set at 10kHz, a span of 300kHz, and the sweep time set at 100 seconds. Power Density was read directly correction was added to the reading to obtain power at the EUT antenna terminals. The test was performed at 3 channels (lowest, middle and highest channel). The Power Spectral Density measured result is in the following table.

6.3 Measured data of Power Spectrum Density test results

Test Mode: 802.11b (DSSS Modulation) operating mode

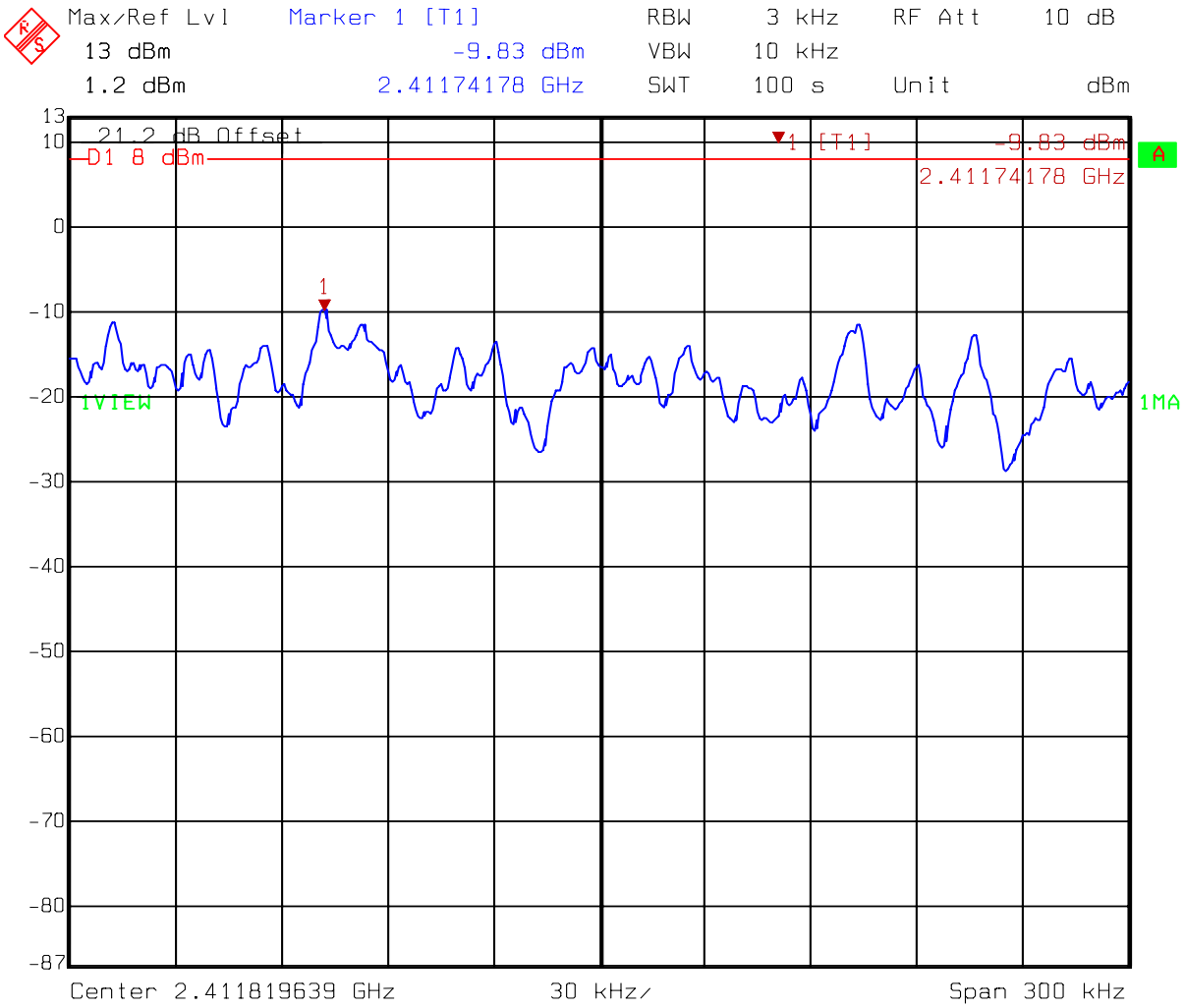
Channel	Frequency (MHz)	Power spectrum density (dBm)	Limit (dBm)
1 (lowest)	2412	-9.83	8
6 (middle)	2437	-10.28	8
11 (highest)	2462	-10.51	8

Test Mode: 802.11g (OFDM Modulation) operating mode

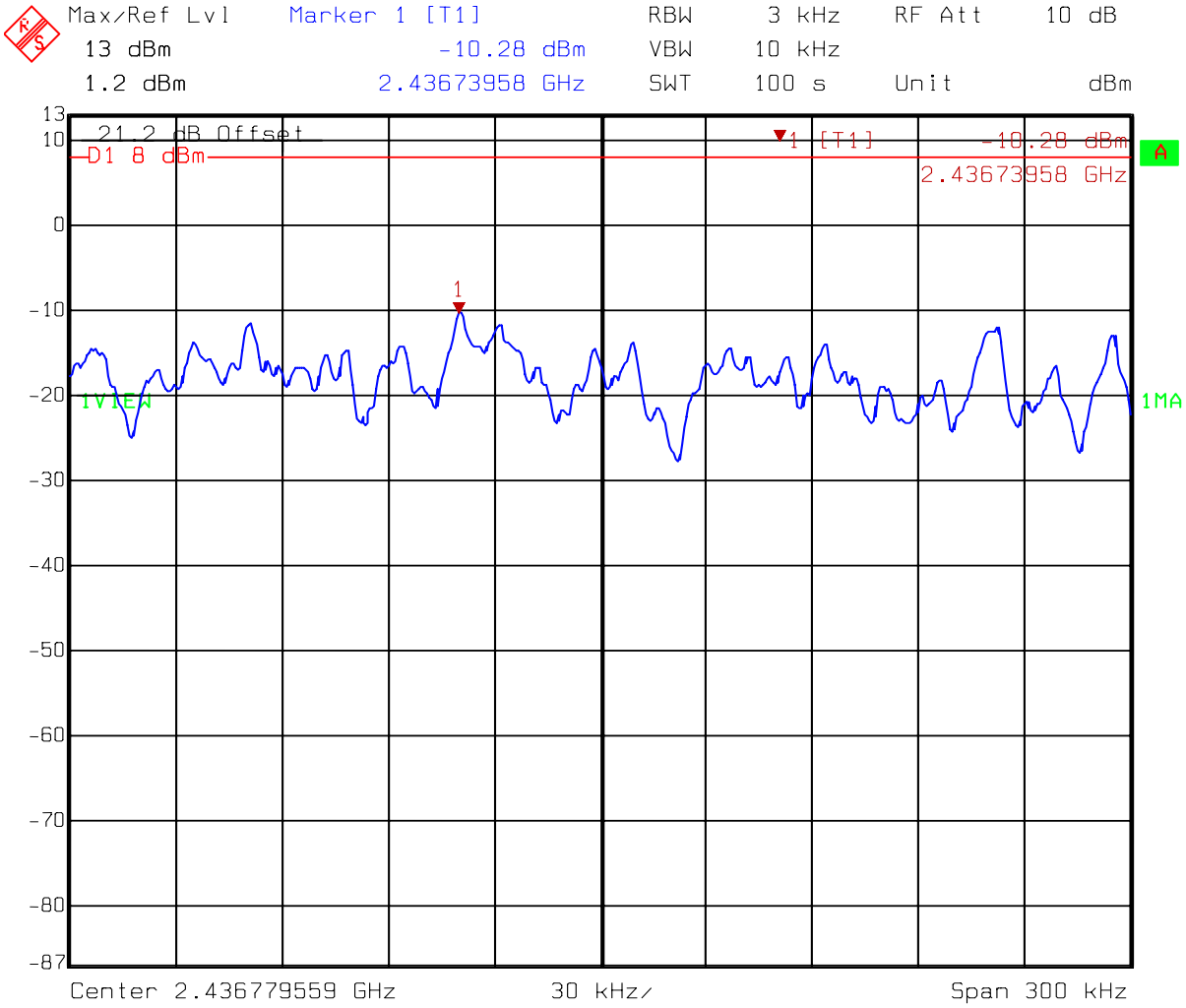
Channel	Frequency (MHz)	Power spectrum density (dBm)	Limit (dBm)
1 (lowest)	2412	-14.03	8
6 (middle)	2437	-14.57	8
11 (highest)	2462	-14.07	8

Please see the plot below.

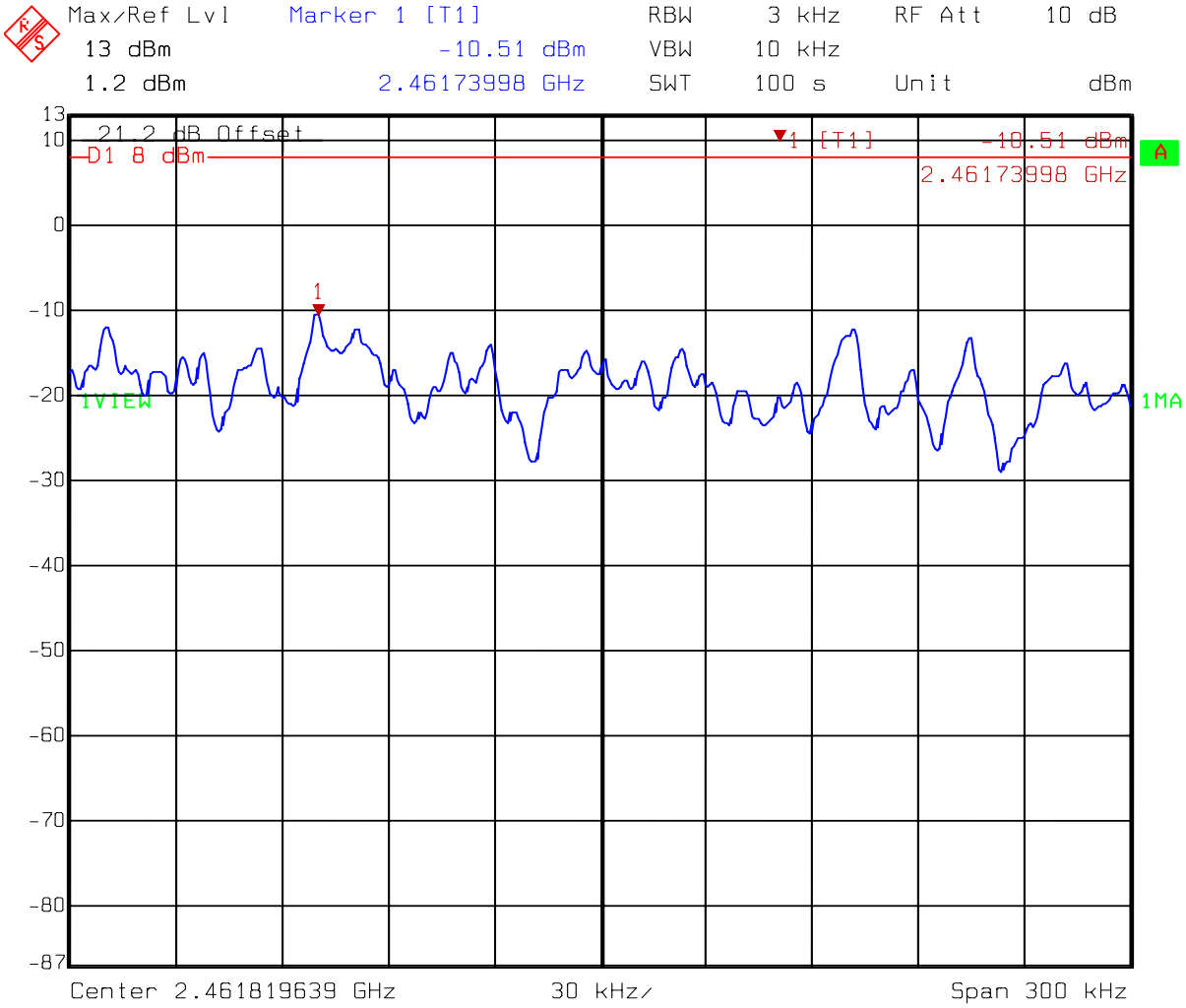
Test Mode: 802.11b (DSSS Modulation) operating mode



Title: Power Spectrum Density
Comment A: Channel 1 at 802.11b mode
Date: 06.JAN.2006 11:23:12

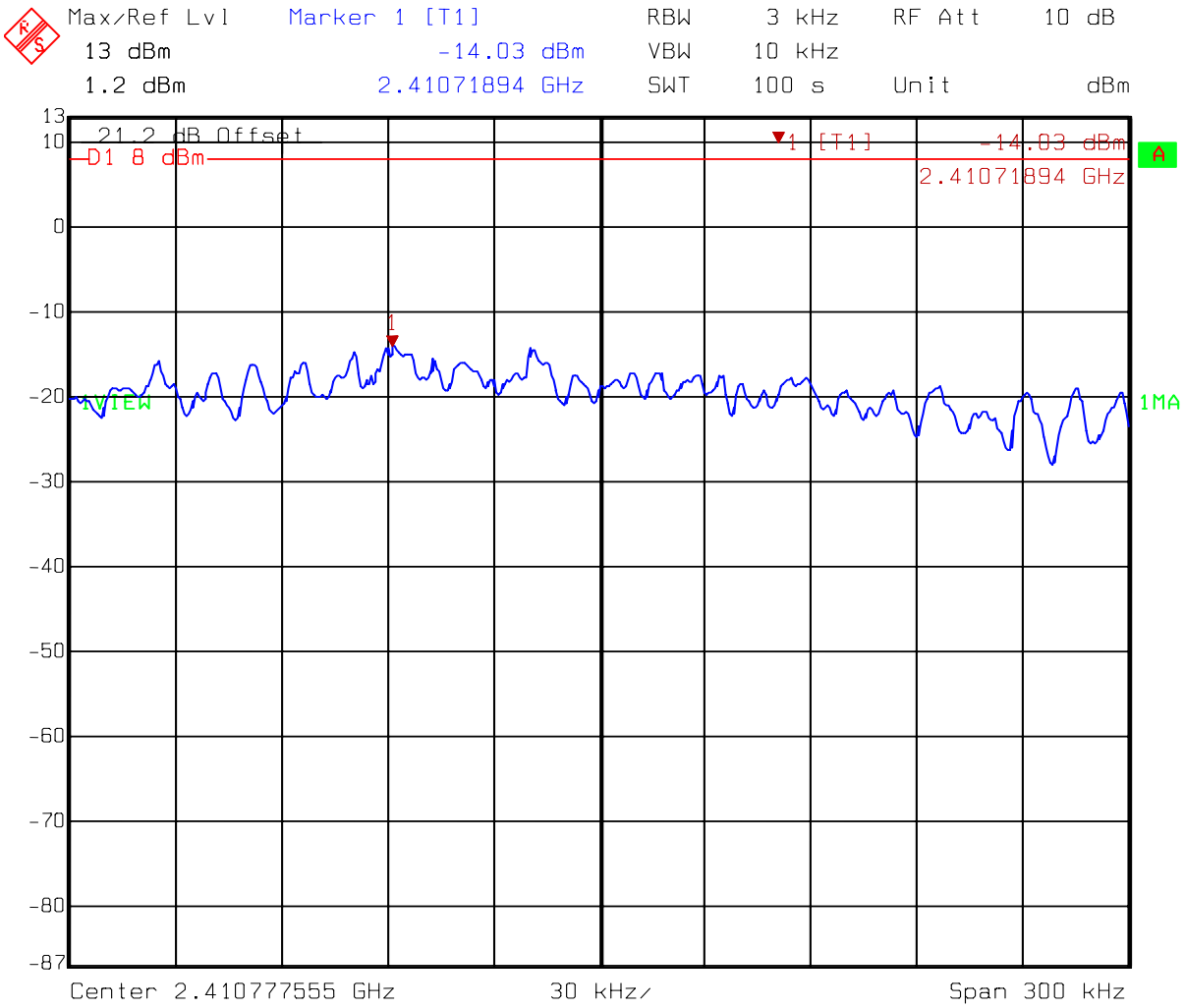


Title: Power Spectrum Density
Comment A: Channel 6 at 802.11b mode
Date: 06.JAN.2006 11:24:47

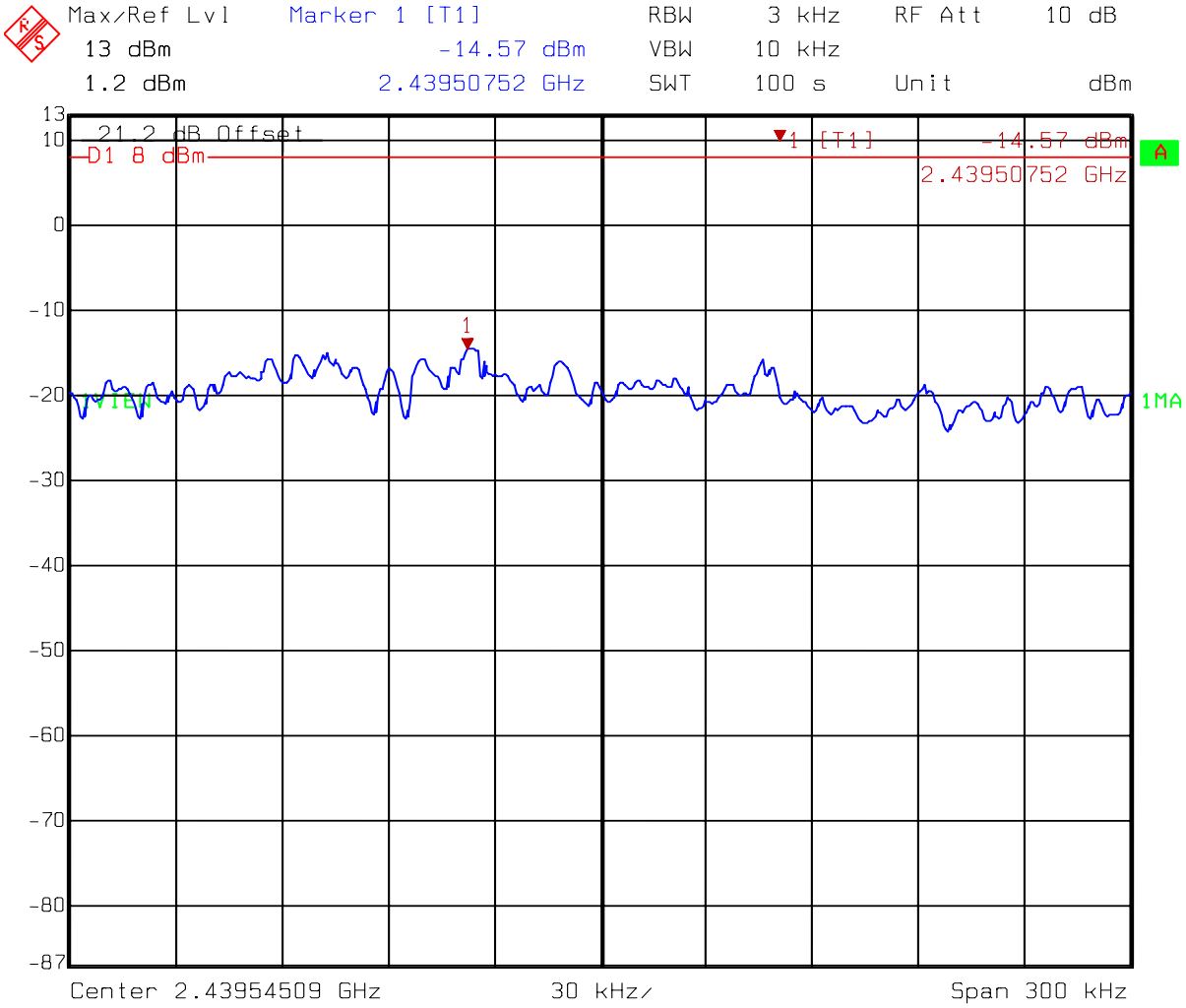


Title: Power Spectrum Density
Comment A: Channel 11 at 802.11b mode
Date: 06.JAN.2006 11:26:09

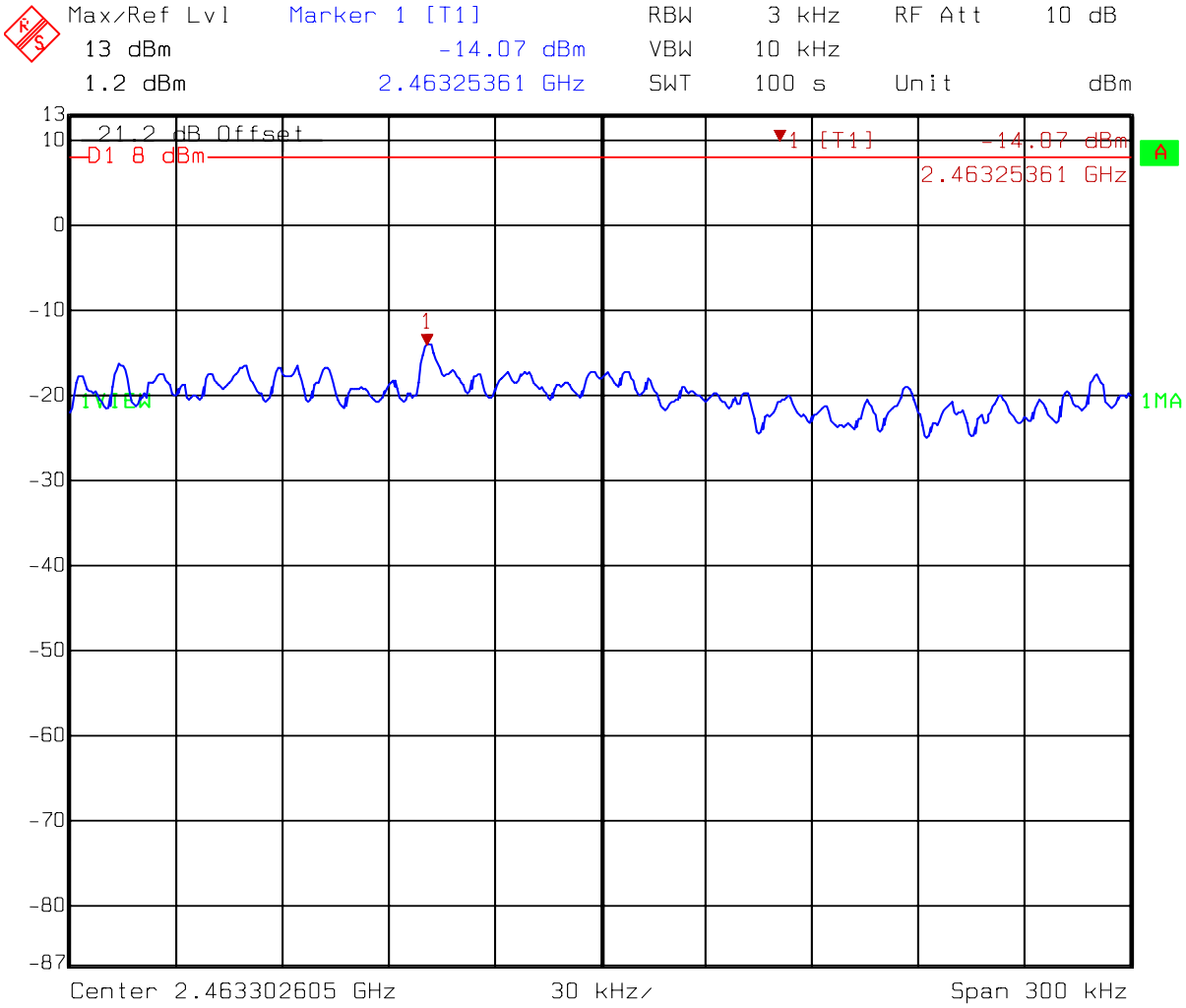
Test Mode: 802.11g (OFDM Modulation) operating mode



Title: Power Spectrum Density
Comment A: Channel 1 at 802.11g mode
Date: 06.JAN.2006 11:28:23



Title: Power Spectrum Density
Comment A: Channel 6 at 802.11g mode
Date: 06.JAN.2006 11:30:55



Title: Power Spectrum Density
Comment A: Channel 11 at 802.11g mode
Date: 06.JAN.2006 11:32:31

7. Emission on the band edge

In any 100kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 KHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

7.1 Operating environment

Temperature:	25	℃
Relative Humidity:	60	%
Atmospheric Pressure	1023	hPa

7.2 Test setup & procedure

The output of EUT was connected to spectrum analyzer via a 50ohm cable.

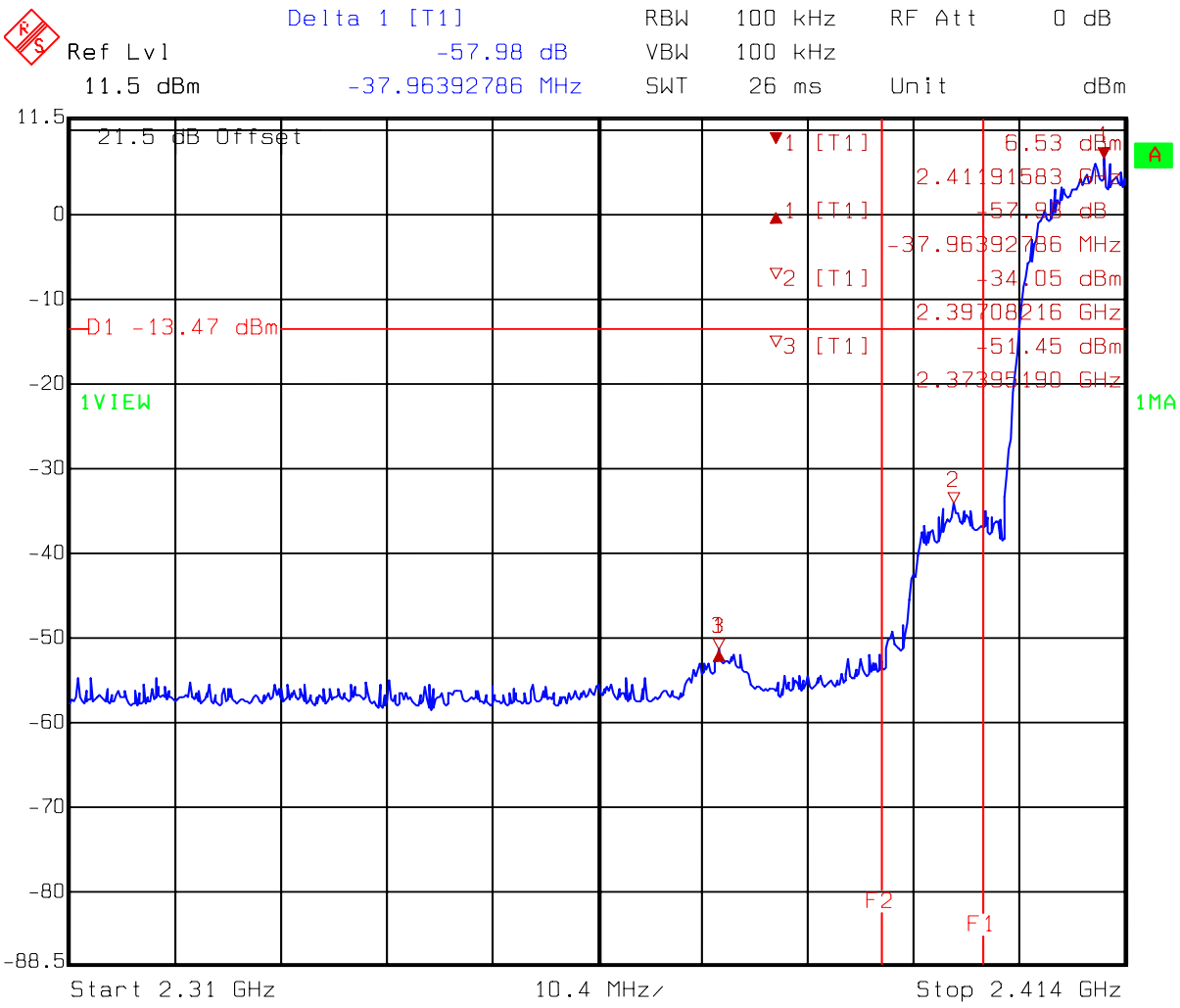
The setting of spectrum analyzer is:

Peak:	RBW = 100kHz ;	VBW = 100kHz
Average:	RBW = 1MHz ;	VBW = 10Hz

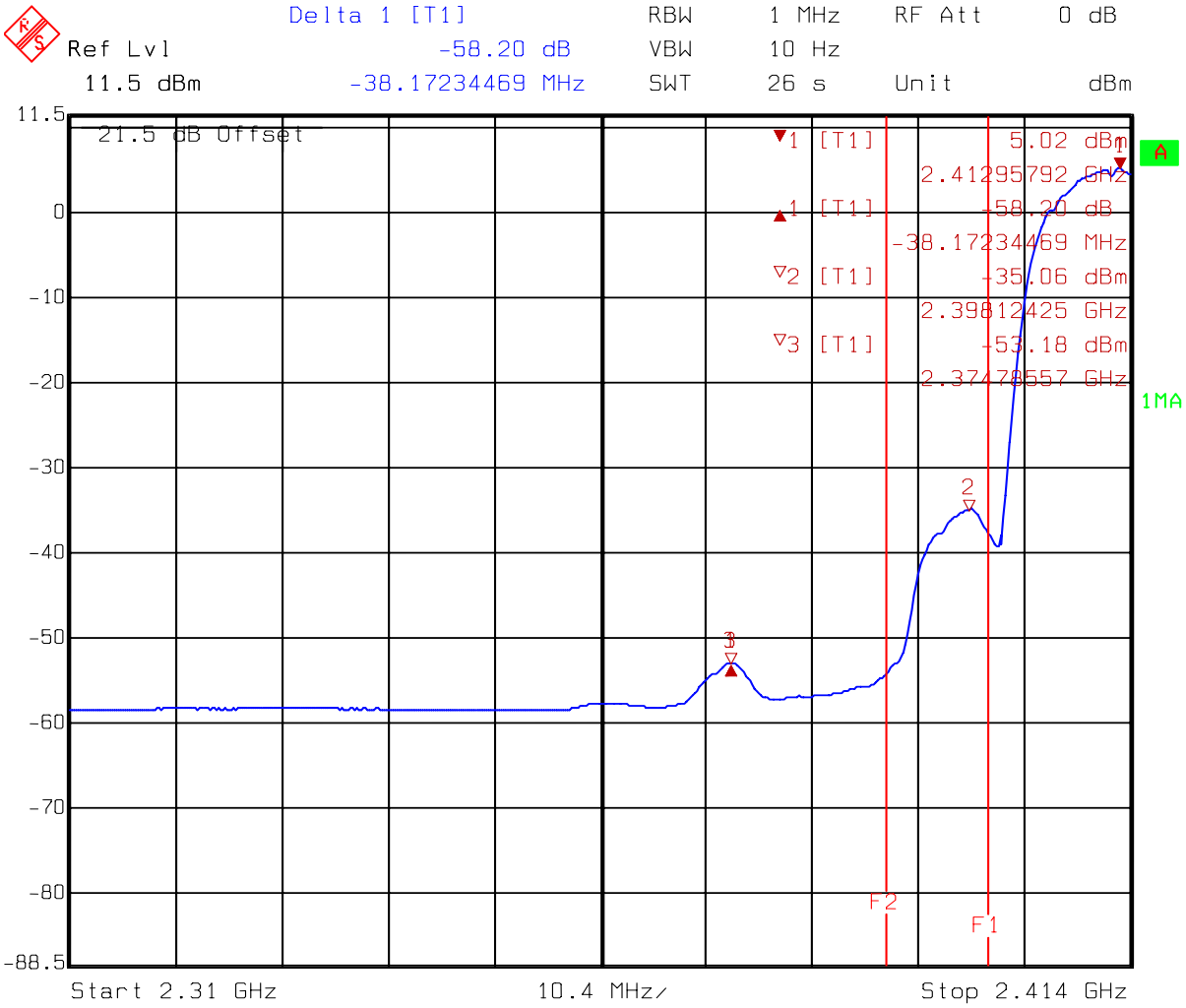
7.3 Test Result

7.3.1 Conducted Method

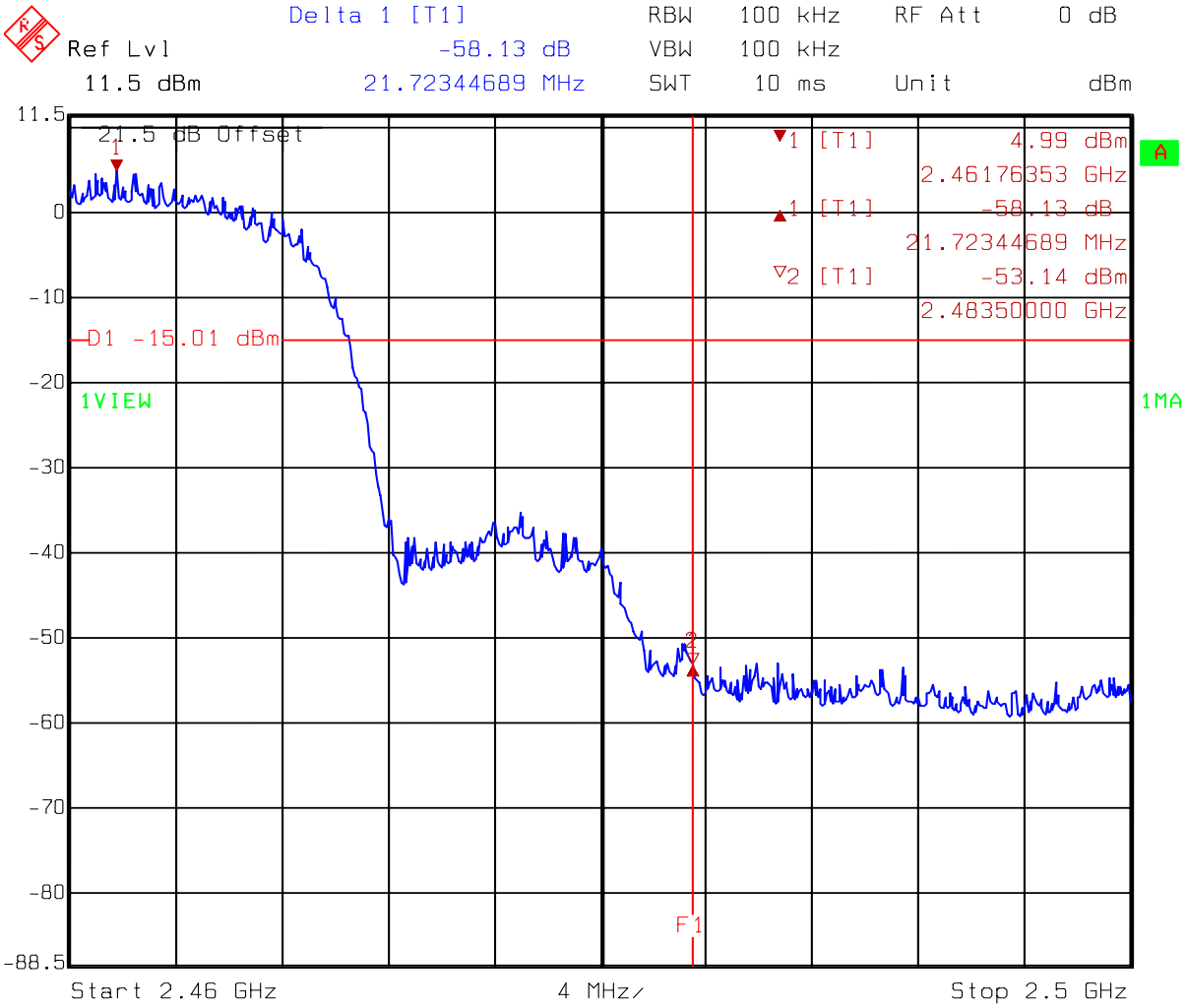
Test Mode: 802.11b(DSSS Modulation) operating mode



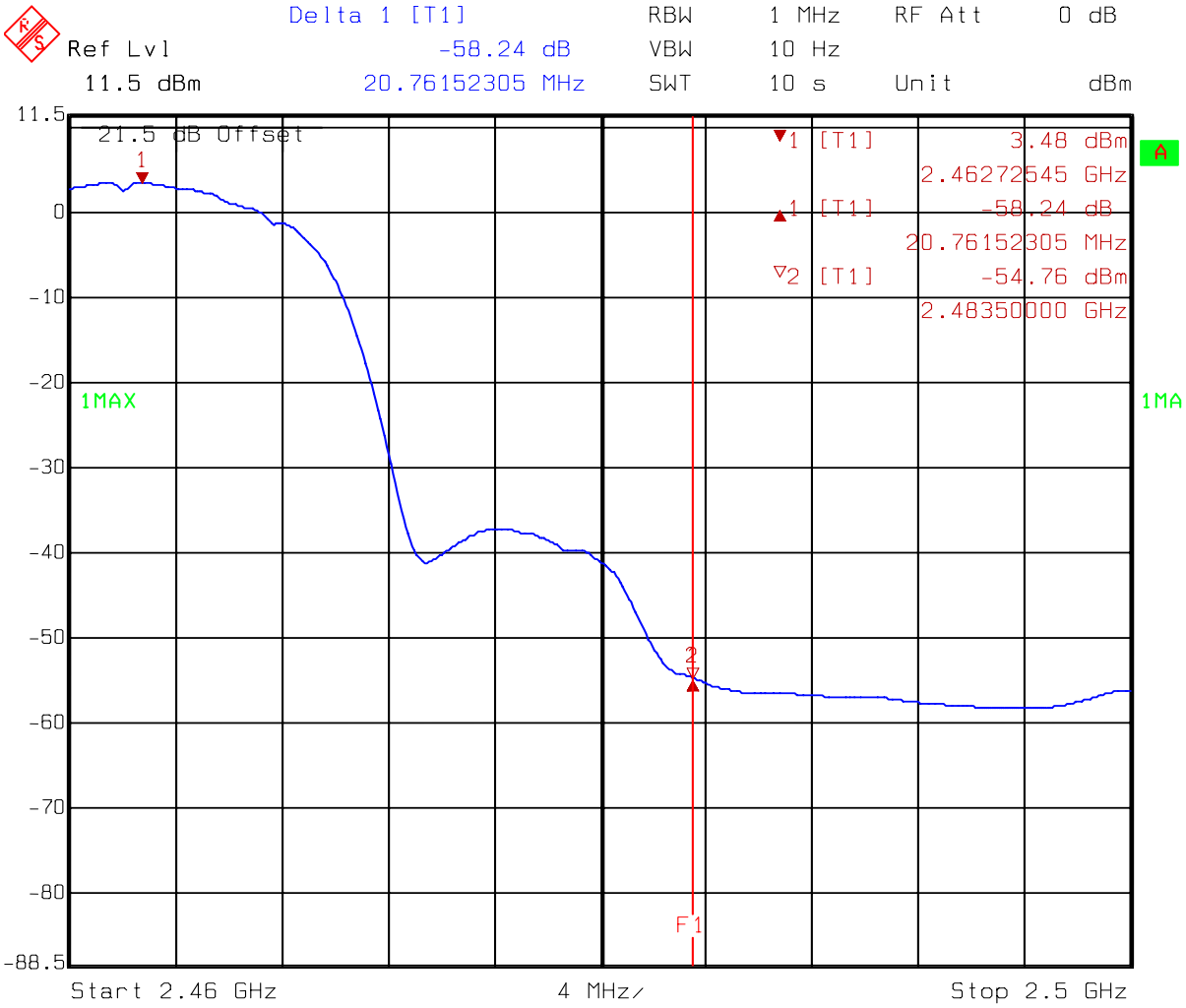
Comment A: Band-edge at low CH
802.11b(PK detect)F1=2400MHz F2=2390MHz
Date: 05.JAN.2006 10:33:19



Comment A: Band-edge at low CH
802.11b(AV detect)F1=2400MHz F2=2390MHz
Date: 05.JAN.2006 10:30:40

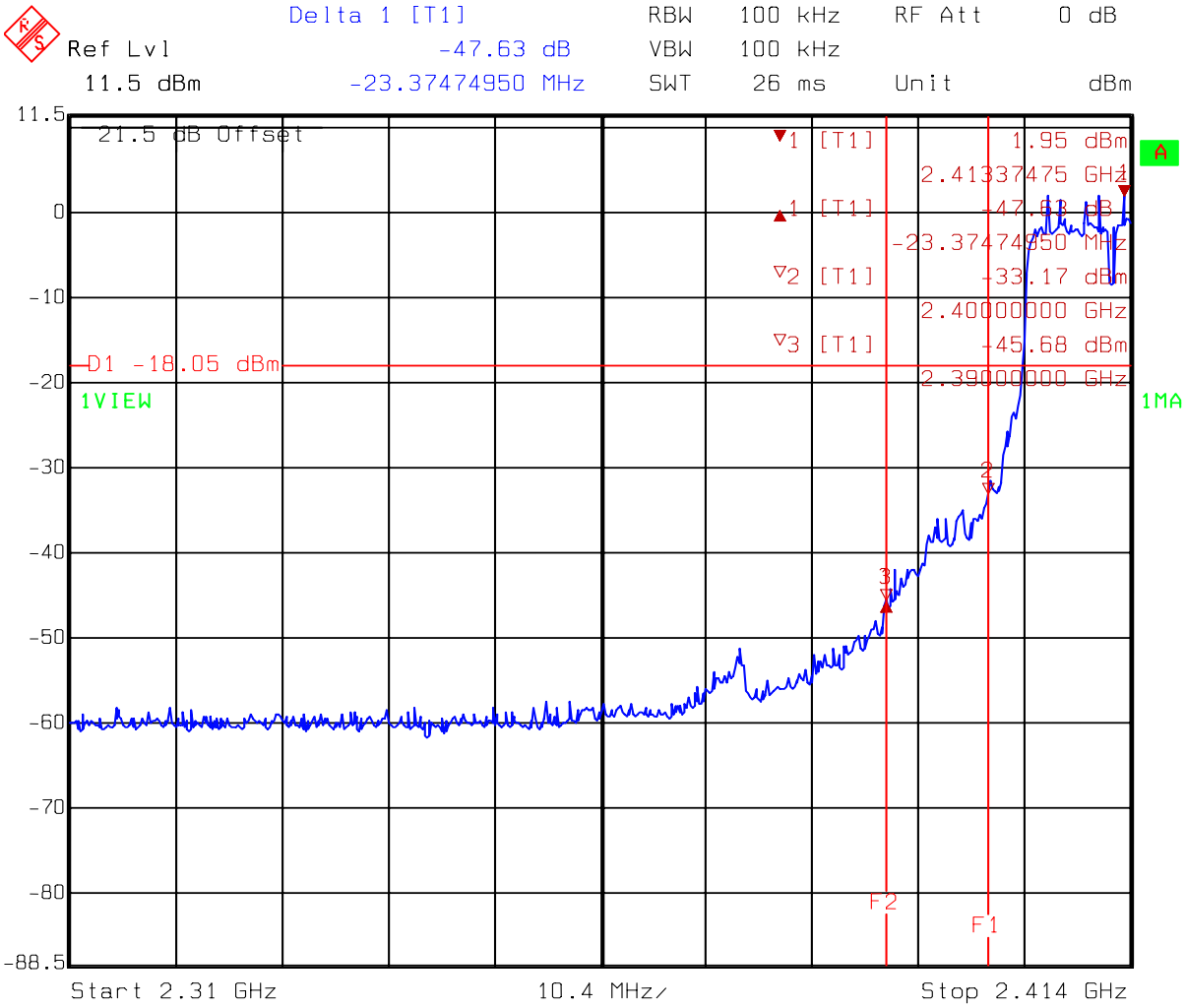


Comment A: Band-edge at high CH
802.11b(PK detect)F1=2483.5MHz
Date: 05.JAN.2006 10:37:15

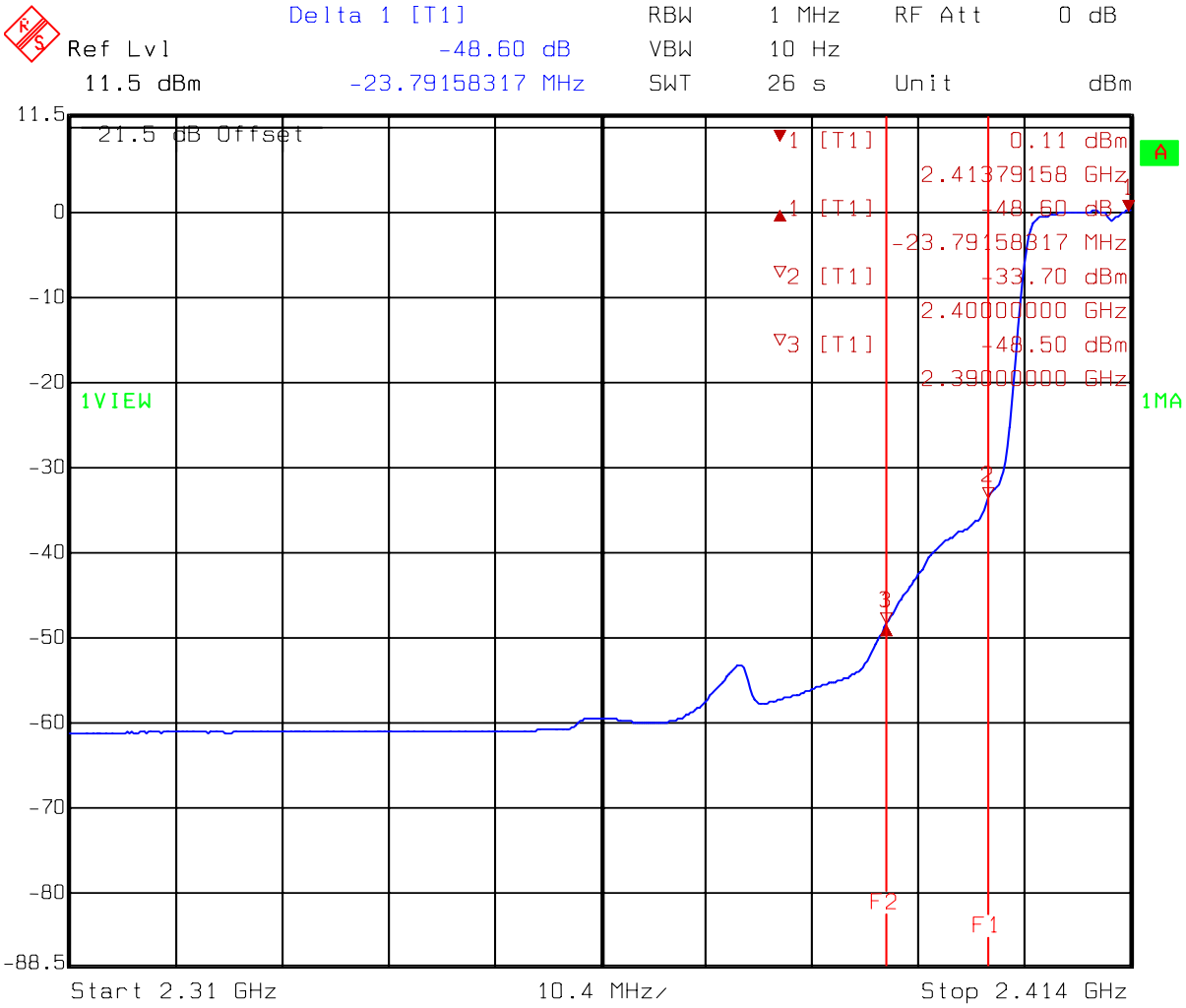


Comment A: Band-edge at high CH
802.11b(AV detect)F1=2483.5MHz
Date: 05.JAN.2006 10:38:54

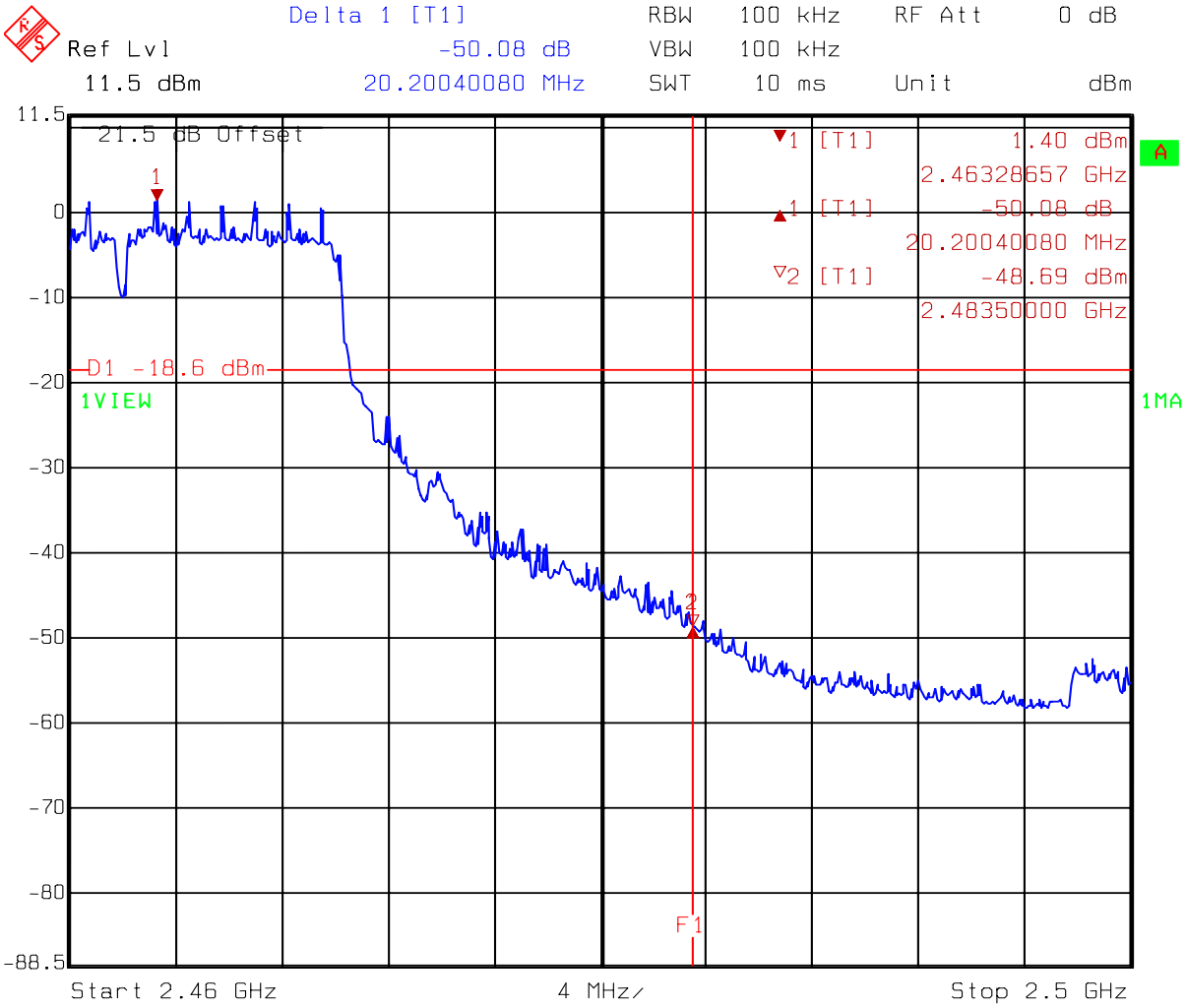
Test Mode: 802.11g(OFDM Modulation) operating mode



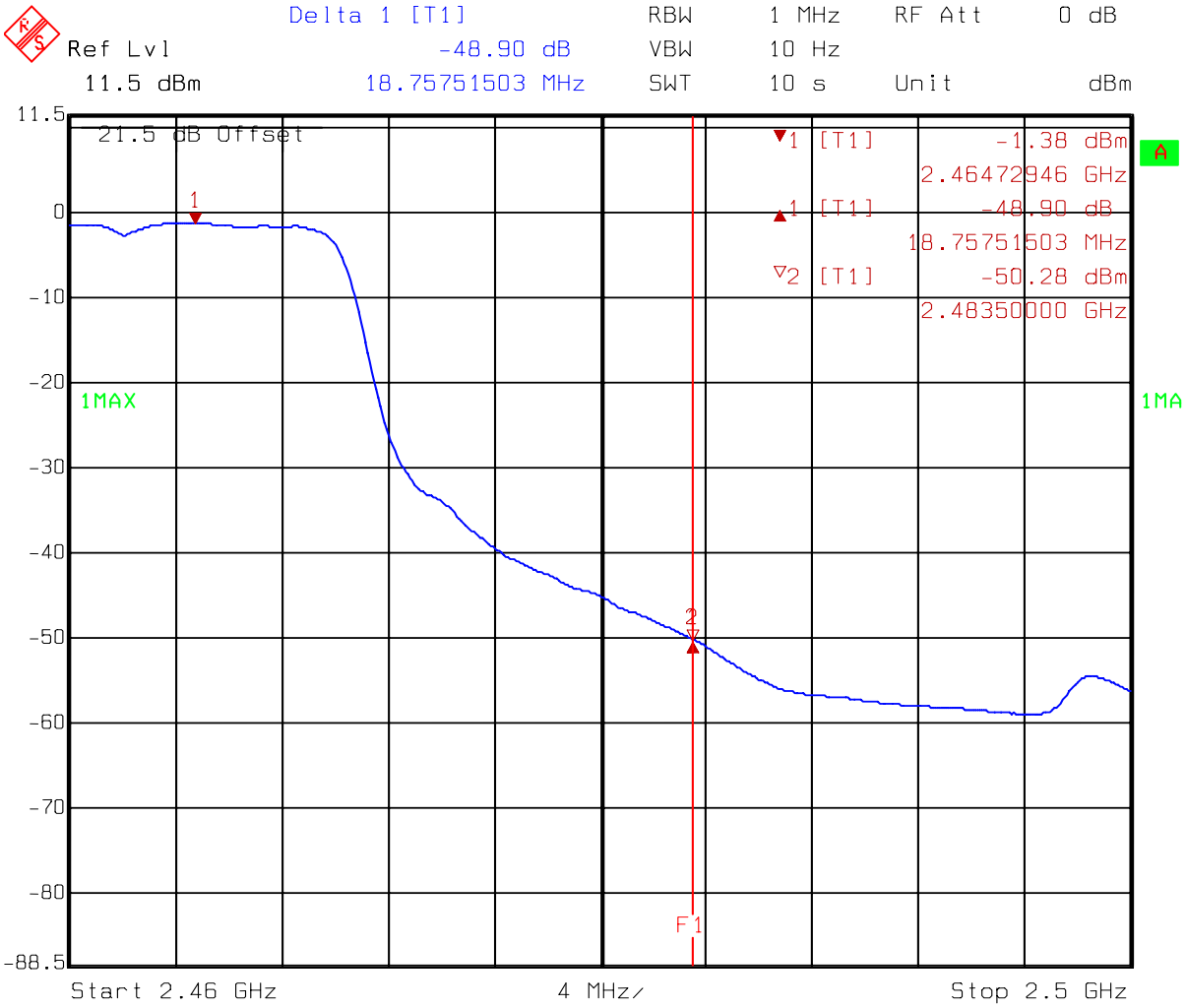
Comment A: Band-edge at low CH
802.11g(PK detect)F1=2400MHz F2=2390MHz
Date: 05.JAN.2006 10:18:36



Comment A: Band-edge at low CH
802.11g(AV detect)F1=2400MHz F2=2390MHz
Date: 05.JAN.2006 10:27:27



Comment A: Band-edge at high CH
802.11g(PK detect)F1=2483.5MHz
Date: 05.JAN.2006 10:47:32



Comment A: Band-edge at high CH
802.11g(AV detect)F1=2483.5MHz
Date: 05.JAN.2006 10:40:32

7.3.2 Radiated Method

Test Mode: 802.11b(DSSS Modulation) operating mode

Channel	Detector	Radiated Method	Conducted Method	The Max. Field Strength in Restrict Band (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
		Max. Field Strength of Fundamental @3m (dBuV/m)	Between Carrier Max. Power and Local Max. Emission in Restrict Band (dBc)			
		A	B	C	D	E
1 (lowest)	PK	112.74	57.98	54.76	74	-19.24
	AV	104.61	58.2	46.41	54	-7.59
11 (highest)	PK	114.54	58.13	56.41	74	-17.59
	AV	106.5	58.24	48.26	54	-5.74

Remark: 1. C = A – B
2. E = C – D

Test Mode: 802.11g(OFDM Modulation) operating mode

Channel	Detector	Radiated Method	Conducted Method	The Max. Field Strength in Restrict Band (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
		Max. Field Strength of Fundamental @3m (dBuV/m)	Between Carrier Max. Power and Local Max. Emission in Restrict Band (dBc)			
		A	B	C	D	E
1 (lowest)	PK	110.17	47.63	62.54	74	-11.46
	AV	99.99	48.6	51.39	54	-2.61
11 (highest)	PK	111.19	50.08	61.11	74	-12.89
	AV	101.36	48.9	52.46	54	-1.54

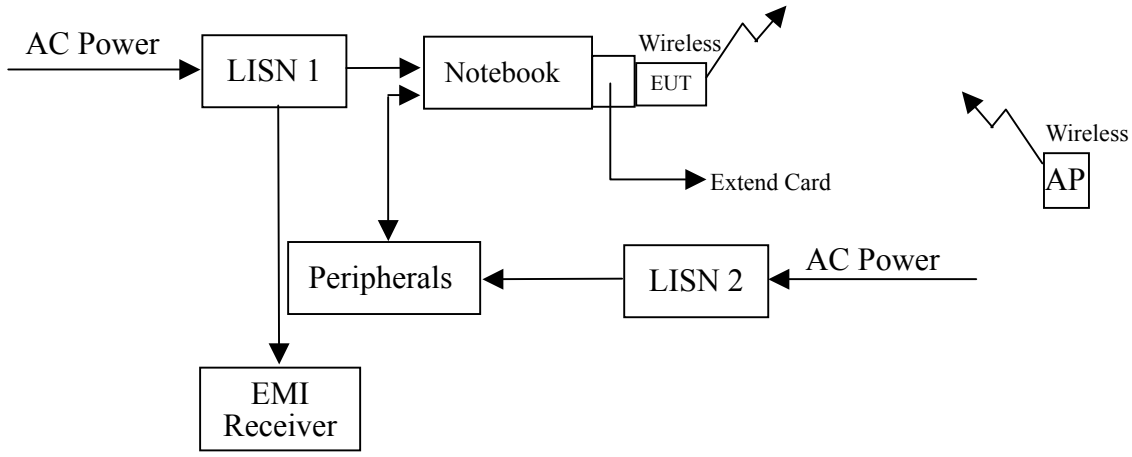
Remark: 1. C = A – B
2. E = C – D

8. Power Line Conducted Emission test §FCC 15.207

8.1 Operating environment

Temperature:	22	℃
Relative Humidity:	53	%
Atmospheric Pressure	1023	hPa

8.2 Test setup & procedure



The EUT are connected to the main power through a line impedance stabilization network (LISN). This provides a 50 ohm/50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination.
Both sides (Line and Neutral) of AC line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4/2003 on conducted measurement.
The bandwidth of the field strength meter (R & S Test Receiver ESCS 30) is set at 9kHz.

The EUT configuration please refer to the “Conducted set-up photo.pdf”.

8.3 Emission limit

Freq. (MHz)	Conducted Limit (dBuV)	
	Q.P.	Ave.
0.15~0.50	66 – 56*	56 – 46*
0.50~5.00	56	46
5.00~30.0	60	50

*Decreases with the logarithm of the frequency.

8.4 Uncertainty of Conducted Emission

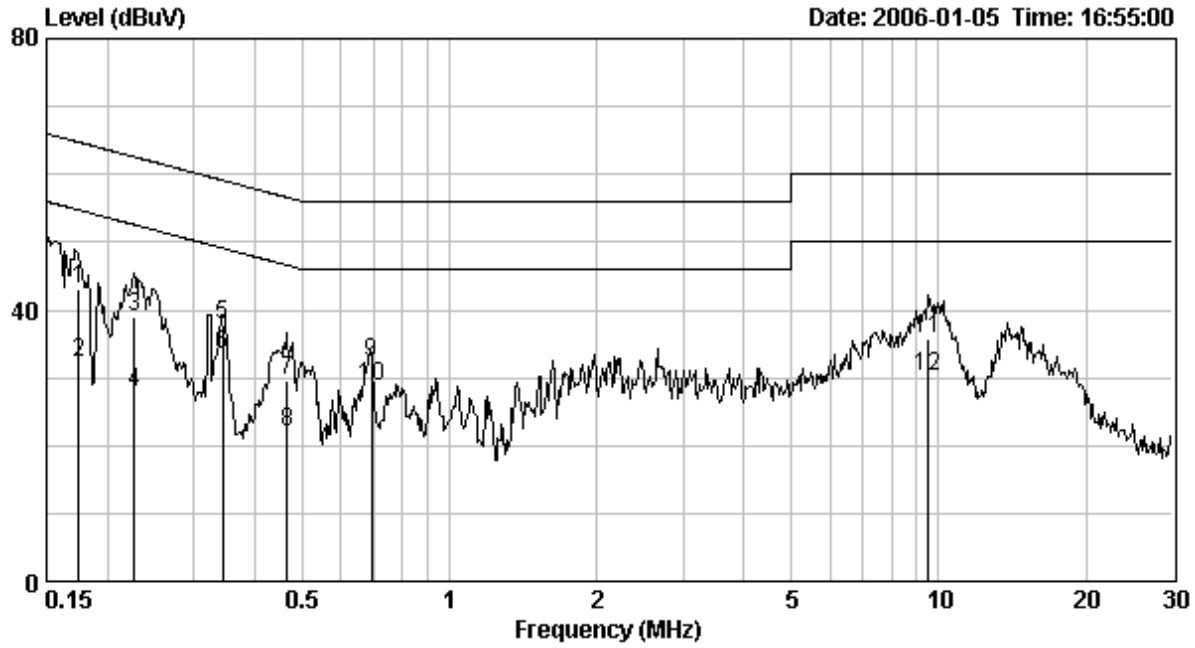
Expanded uncertainty (k=2) of conducted emission measurement is ±2.6 dB.

8.5 Power Line Conducted Emission test data

Phase : Line
EUT : WCM300C
Test Condition : Normal operating mode

Frequency (MHz)	Corr. Factor (dB)	Level Qp (dBuV)	Limit Qp (dBuV)	Level AV (dBuV)	Limit Av (dBuV)	Margin (dB) Qp	Margin (dB) Av
0.175	0.10	43.20	64.74	32.22	54.74	-21.54	-22.52
0.227	0.10	38.99	62.56	27.87	52.56	-23.57	-24.69
0.344	0.10	37.82	59.12	33.50	49.12	-21.30	-15.62
0.465	0.10	29.67	56.60	21.99	46.60	-26.93	-24.61
0.693	0.10	32.15	56.00	28.72	46.00	-23.85	-17.28
9.529	0.38	35.67	60.00	30.31	50.00	-24.33	-19.69

Remark:
1. Correction Factor (dB)= LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Level (dBuV) – Limit (dBuV)



Phase : Neutral
EUT : WCM300C
Test Condition : Normal operating mode

Frequency (MHz)	Corr. Factor (dB)	Level Qp (dBuV)	Limit Qp (dBuV)	Level AV (dBuV)	Limit Av (dBuV)	Margin (dB) Qp	Margin (dB) Av
0.175	0.10	39.85	64.74	29.42	54.74	-24.89	-25.32
0.222	0.10	39.00	62.76	27.09	52.76	-23.76	-25.67
0.344	0.10	37.88	59.12	35.44	49.12	-21.24	-13.68
0.447	0.10	30.25	56.93	21.47	46.93	-26.68	-25.46
0.690	0.10	32.51	56.00	31.04	46.00	-23.49	-14.96
9.529	0.20	35.92	60.00	30.43	50.00	-24.08	-19.57

Remark:
1. Correction Factor (dB)= LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Level (dBuV) – Limit (dBuV)