MEASUREMENT REPORT
of
WIRELESS LAN
COMPACTFLASH CARD
with
SONY DOG

Applicant : Universal Scientific Industrial Co., Ltd.

Model No. : CF114100 (CF Card)

Granted ID : IXMCF1141000 (CF Card)

EUT : USI 802.11b CompactFlash Card with SONY dog

Report No. : U1315674

Tested by :

Training Research Co., Ltd.

TEL : 886-2-26935155 FAX : 886-2-26934440

255, Nanyang Street, Shijr, Taipei Hsien 221, Taiwan, R.O.C.

CERTIFICATION

We here by verify that:

The test data, data evaluation, test procedures and equipment configurations shown in this report were made mainly in accordance with the procedures given in ANSI C63.4 (1992) as a reference. All test were conducted by ***Training Research Co., Ltd.***, 255, Nanyang Street, Shijr, Taipei Hsien 221, Taiwan, R.O.C. Also, we attest to the accuracy of each.

We further submit that the energy emitted by the sample EUT tested as described in the report is **in compliance with** the technical requirements set forth in the FCC Rules Part 15 Subpart A and C Section 15.247.

Applicant	**:**	Universal Scientific Industrial Co., Ltd.
Model No.	**:**	CF114100 (CF Card)
EUT	**:**	USI 802.11b CompactFlash Card with SONY dog
Report No.	**:**	U1315674
Test Date	**:**	December 20, 2003

Prepared by: *Jack Tsai*

Approved by: *Frank Tsai*

Tested by :

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No. 255, Nanyang Street, Shijr, Taipei Hsien 221, Taiwan, R.O.C.

Tables of Contents

Ⅰ. GENERAL

1.1 Introduction

The following measurement report is submitted on behalf of Applicant in support of a wireless access CompactFlash card with SONY dog certification in accordance with Part2 Subpart J and Part15 Subpart A and C of the Commission's Rules and Regulations.

1.2 Description of EUT

EUT	**:**	USI 802.11b CompactFlash Card with SONY dog
Model No.	**:**	CF114100 (CF Card)
Frequency Range	**:**	2.412 GHz ~ 2.462GHz
Support Channel	**:**	11 Channels
Modulation Skill	**:**	DBPSK, DQPSK, CCK
Interface	**:**	CompactFlash Type II
Power Type	**:**	By CompactFlash slot of SONY dog

1.3 Setting up Procedure

1 The CF card inserted into the CF slot of SONY dog. Using the memory card of SONY dog and software to control the wireless LAN CompactFlash card.

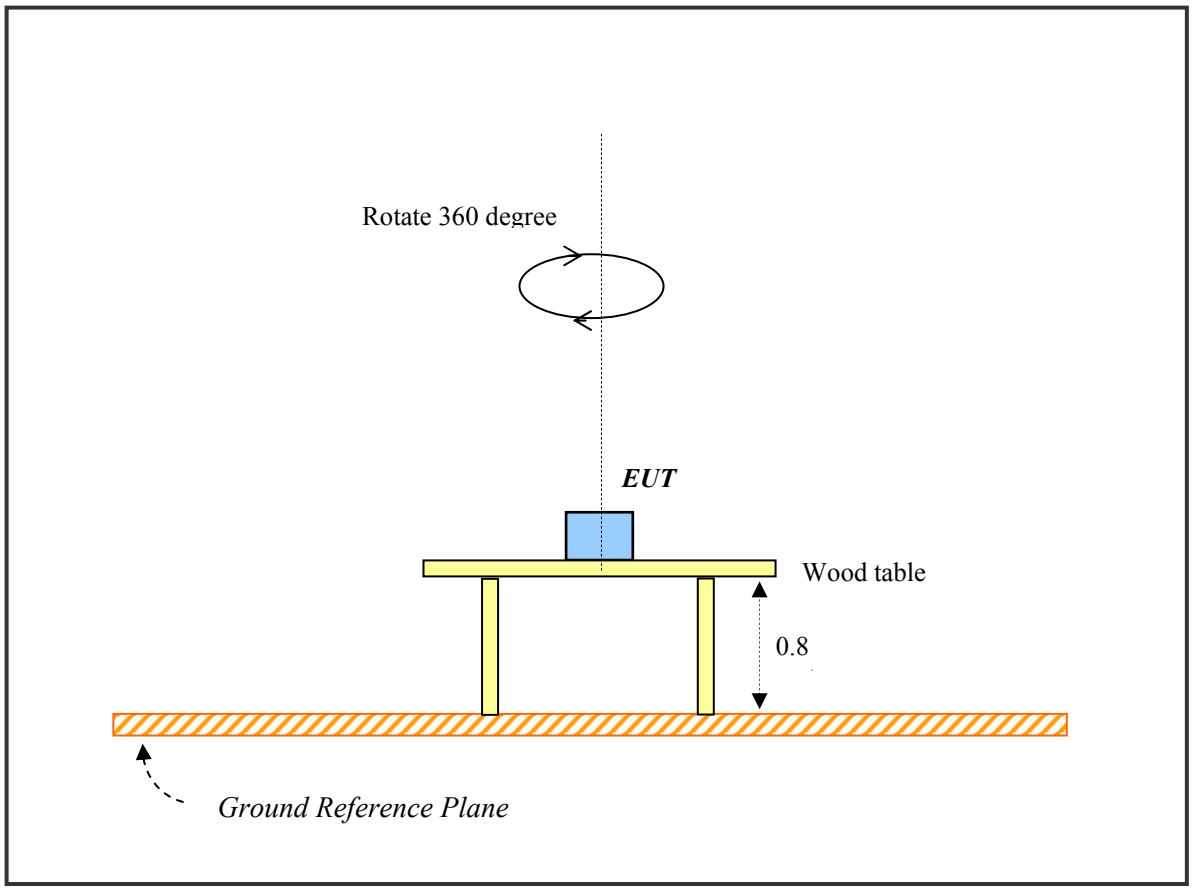
2 Using the software provided by the SONY to control EUT.

3 Set different channel being tested and repeat the procedures above.
Radiated test:
making EUT to the mode of continuous transmission

1.4 Description of Support Equipment

None

1.5 Configuration of System Under Test



The tests below are carried out the EUT transmitter set at high power in TDD mode. The CF card was inserted into the CF slot of SONY dog. The EUT is needed to force selection of channel number.

The setting up procedure was recorded in <<1.3 Test setup procedure> >.

1.6 Test Procedure

All measurements contained in this report were performed mainly according to the techniques described in ANSI C63.4 (1992) and the pre-setup was written on <1.3 Test setup Procedure>, the detail setup was written on each test item.

1.7 Location of the Test Site

The radiated emissions measurements required by the rules were performed on the **three-meter**, **Anechoic Chamber (Registration Number: 93906)** maintained by *Training Research Co., Ltd.* 1F, No. 255, Nanyang Street, Shijr, Taipei Hsien 221, Taiwan, R.O.C. Complete description and measurement data have been placed on file with the commission. The conducted power line emissions tests and other test items were performed in a anechoic chamber also located at Training Research Co., Ltd.

No. 255, Nanyang Street, Shijr, Taipei Hsien 221, Taiwan, R.O.C. *Training Research Co., Ltd.* is listed by the FCC as a facility available to do measurement work for others on a contract basis.

1.8 General Test Condition

The conditions under which the EUT operates were varied to determine their effect on the equipment's emission characteristics. The final configuration of the test system and the mode of operation used during these tests were chosen as that which produced the highest emission levels. However, only those conditions, which the EUT was considered likely to encounter in normal use were investigated.

In test, they were set in high power and continuously transmitting mode that controlled by notebook computer. The ch01, ch06 and ch11 of EUT were all tested. The setting up procedure is recorded on <1.3 Test setup procedure>.

II. Section 15.205 : Restricted Bands of Operation

The CF card inserted into the CF slot of SONY dog. It was categorized to digital device as can be operated stand-alone. The items required such as Section15.207 (Conducted limits) and Section15.109 (Radiated emission limits).

III. Section 15.247 (a): Technical description of the EUT

Based on the Section 2.1, *Direct Sequence System* is a spread spectrum system in which the carrier has been modulated by a high speed spreading code and an information data stream. The high speed code sequence dominates the "modulating function" and is the direct cause of the wide spreading of the transmitted signal. In the Exhibit H, operational description demonstrates the operation principles of the Baseband processor employed by the EUT, shows that which is a complete DSSS baseband processor and meets the definition of the Direct sequence spread spectrum system.

IV. Section 15.247 (C): Spurious Emissions (Radiated)

4.1 Test Condition & Setup

We'd performed the test by the *radiated emission* skill: The EUT was placed in an anechoic chamber, and set the EUT transmitting continuously and scanned at 3-meter distance to determine its emission characteristics. The physical arrangement of the EUT was varied (within the scope of arrangements likely to be encountered in actual use) to determine the effect on the unit's emanations in amplitude, directivity, and frequency. The exact system configuration, which produced the highest emissions were noted so it could be reproduced later during the final tests. For the measurement above 1GHz, according to the guidance we'd set the spectrum analyzer's 6dB bandwidth RBW to 1MHz.

This was done to ensure that the final measurements would demonstrate the worst-case interference potential of the EUT.

Final radiation measurements were made on a three-meter, anechoic chamber. The EUT system was placed on a nonconductive turntable, which is 0.8 meters height, top surface 1.0 x 1.5 meter.

The spectrum was examined from 30 MHz to 1000 MHz using an Hewlett Packard 8546A EMI Receiver, CHASE whole range Bi-log antenna (Model No.: CBL 6141A) is used to measure frequency from 30 MHz to 1GHz. The final test is used the HP 85460A spectrum and 8564E spectrum was examined from 1GHz to 25GHz using an Hewlett Packard Spectrum Analyzer, EMCO/CMT Horn Antenna (Model 3115 / RA42-K-F-4B-C) for 1G - 25GHz.

At each frequency, the EUT was rotated 360 degrees, and the antenna was raised and lowered from one to four meters to find the maximum emission levels. Measurements were taken using both horizontal and vertical antenna polarization.

Appropriate preamplifiers were used for improving sensitivity and precautions were taken to avoid overloading or desensitizing the spectrum analyzer. There are two spectrum analyzers use on this testing, HP 85460A for frequency 30MHz to 1000MHz, and 8564E for frequency 1GHz to 25GHz. No post-detector video filters were used in the test. The spectrum analyzer's 6dB bandwidth was set to 120KHz (spectrum was examined from 30 MHz to 1000 MHz), the spectrum analyzer's 6 dB bandwidth was set to 1 MHz (spectrum was examined from 1GHz to 25GHz) and the analyzer was operated in the maximum hold mode. There is a test condition applies in this test item, the test procedure description as the following:

Three channels were tested, one in the top (CH01), one in the middle (CH06) and the other in bottom (CH11). The setting up procedure is recorded on <1.4 test method >

With the transmitter operating from a AC source and using the internal of EUT, radiates spurious emissions falling within the restricted bands of 15.209 were measured at operating frequencies corresponding to upper, middle and bottom channels in the 2400 ~ 2483.5 MHz band.

The actual field intensity in decibels referenced to 1 microvolt per meter (dBμV/m) is determined by algebraically adding the measured reading in dBμV, the antenna factor (dB), and cable loss (dB) at the appropriate frequency. Since the EUT was set to transmit continuously, no *duty cycle* is present.

For frequency between 30MHz to 1000MHz

FIa (dBuV/m) = FIr (dBμV) + Correction Factors

FIa : Actual Field Intensity

FIr : Reading of the Field Intensity

Correction Factors = Antenna Factor + Cable Loss – Amplifier Gain

For frequency between 1GHz to 25GHz

FIa (dBμV/m) = FIr (dBμV) + Correction Factor

FIa : Actual Field Intensity

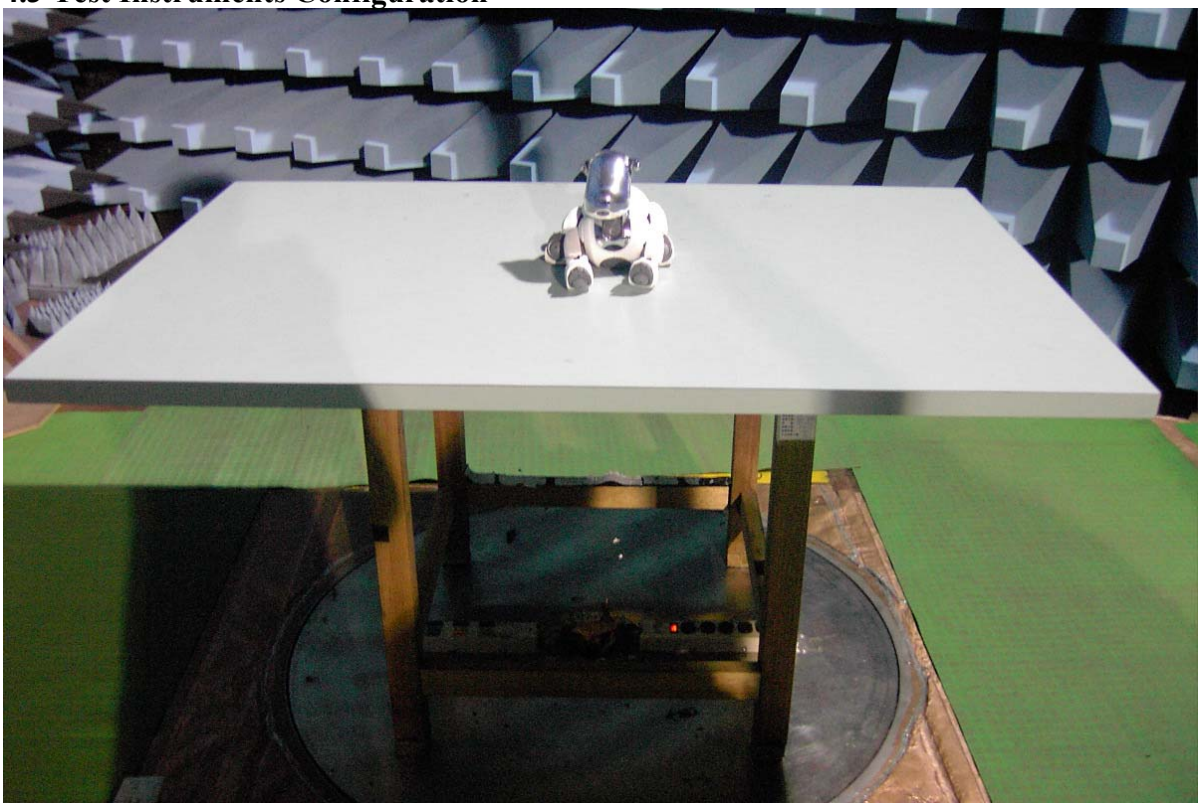
FIr : Reading of the Field Intensity

Correction Factors = Antenna Factor + Cable Loss – Amplifier Gain

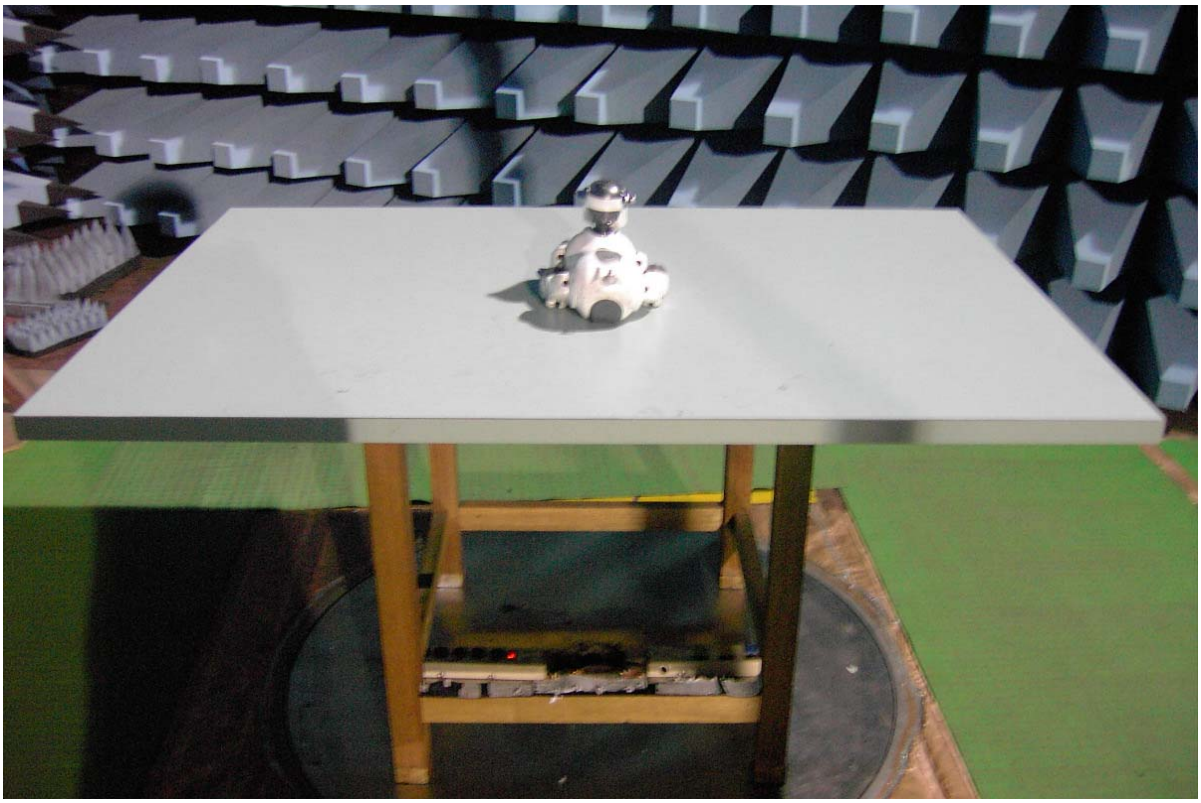
4.2 List of Test Instruments

				Calibration Date	
Instrument Name	Model No.	Brand	Serial No.	Last time	Next time
EMI Receiver	8546A	HP	3520A00242	07/28/03	07/28/04
RF Filter Section	85460A	HP	3448A00217	07/28/03	07/28/04
Small Biconical Antenna	UBAA9114 & BBVU9135	Schwarzeck	127	06/21/03	06/21/04
Pre-amplifier	PA1F	TRC	1FAC	05/20/03	05/20/04
Auto Switch Box (>30MHz)	ASB-01	TRC	9904-01	05/20/03	05/20/04
Coaxial Cable (Double shielded, 15 meter)	A30A30-0058-50FS-15M	Jyebao	SMA-01	05/20/03	05/20/04
Coaxial Cable (1.1 meter)	A30A30-0058-50FS-1M	Jyebao	SMA-02	05/20/03	05/20/04
Spectrum Analyzer	8564E	HP	3720A00840	07/23/03	07/23/04
Microwave Preamplifier	84125C	HP	US36433002	07/30/03	07/30/04
Horn Antenna	3115	EMCO	9104-3668	12/24/02	12/24/03
Standard Guide Horn Antenna	84125-80008	HP	18-26.5GHz	09/18/03	09/18/04
Standard Guide Horn Antenna	84125-80001	HP	26.5-40GHz	09/18/03	09/18/04
Pre-amplifier	84125C	HP	US36433002	11/19/03	11/19/04
Horn Antenna	1196E (3115)	HP (EMCO)	9704-5178	12/12/03	12/12/04
Pre-amplifier	PA2F	TRC	2F1GZ	05/20/03	05/20/04
Coaxial Cable (3 miter)	A30A30-0058-50FST118	Jyebao	MSA-05	05/20/03	05/20/04
Coaxial Cable (1 meter)	A30A30-0058-50FST118	Jyebao	MSA-04	05/20/03	05/20/04

4.3 Test Instruments Configuration



Front View of the Test Configuration



Rear View of the Test Configuration

4.4 Test Result of Spurious Radiated Emissions

The highest peak values of radiated emissions form the EUT at various antenna heights, antenna polarizations, EUT orientation, etc. are recorded on the following.

Test Conditions: Temperature : 25 ° C Humidity : 73 % RH

Channel 1, Radiated Emissions for 30MHz～1GHz [Horizontal]

Radiated Emission				*Correction Factors*	*Corrected Amplitude*	*Class B (3 m)*	
Frequency (MHz)	*Amplitude (dBμV/m)*	*Ant. H. (m)*	*Table ( )*	*(dB)*	*(dBμV/m)*	*Limit (dBμV/m)*	*Margin (dB)*
145.19	33.36	1.00	308	-1.83	31.53	43.50	-11.97
176.71	34.58	1.00	321	-2.65	31.93	43.50	-11.57
193.69	36.11	1.00	300	-2.43	33.68	43.50	-9.82
289.47	44.93	1.00	321	-2.46	42.47	46.00	-3.53
379.20	35.01	1.00	293	-0.16	34.85	46.00	-11.15
481.05	31.35	1.00	280	3.49	34.84	46.00	-11.16

Channel 1, Radiated Emissions for 30MHz～1GHz [Vertical]

Radiated Emission				*Correction Factors*	*Corrected Amplitude*	*Class B (3 m)*	
Frequency (MHz)	*Amplitude (dBμV/m)*	*Ant. H. (m)*	*Table ( )*	*(dB)*	*(dBμV/m)*	*Limit (dBμV/m)*	*Margin (dB)*
145.19	33.26	1.00	260	-1.83	31.43	43.50	-12.07
289.47	33.42	1.00	234	-2.46	30.96	46.00	-15.04
379.20	30.55	1.00	230	-0.16	30.39	46.00	-15.61
540.46	27.57	1.00	360	6.37	33.94	46.00	-12.06
621.70	24.05	1.00	117	9.34	33.39	46.00	-12.61
757.50	22.96	1.00	133	13.45	36.41	46.00	-9.59

Note:

1.Margin = Corrected Amplitude – Limit.

2.Peak Amplitude + Correction Factors = Corrected Amplitude

Channel 6, Radiated Emissions for 30MHz～1GHz [Horizontal]

Radiated Emission				Correction Factors	Corrected Amplitude	Class B (3 m)	
Frequency (MHz)	Amplitude (dBμV/m)	Ant. H. (m)	Table ( )	(dB)	(dBμV/m)	Limit (dBμV/m)	Margin (dB)
176.71	34.95	1.00	304	-2.65	32.30	43.50	-11.20
193.69	36.41	1.00	292	-2.43	33.98	43.50	-9.52
289.47	45.63	1.00	312	-2.46	43.17	46.00	-2.83
380.41	36.04	1.00	297	-0.11	35.93	46.00	-10.07
702.94	24.97	1.00	39	11.77	36.74	46.00	-9.26
757.50	23.88	1.00	68	13.45	37.33	46.00	-8.67

Channel 1, Radiated Emissions for 30MHz～1GHz [Vertical]

Radiated Emission				Correction Factors	Corrected Amplitude	Class B (3 m)	
Frequency (MHz)	Amplitude (dBμV/m)	Ant. H. (m)	Table ( )	(dB)	(dBμV/m)	Limit (dBμV/m)	Margin (dB)
145.19	31.46	1.00	245	-1.83	29.63	43.50	-13.87
289.47	35.38	1.00	242	-2.46	32.92	46.00	-13.08
381.62	31.22	1.00	229	-0.06	31.16	46.00	-14.84
487.11	27.37	1.00	279	3.76	31.13	46.00	-14.87
540.46	28.49	1.00	353	6.37	34.86	46.00	-11.14
757.50	23.66	1.00	154	13.45	37.11	46.00	-8.89

Channel 11, Radiated Emissions for 30MHz～1GHz [Horizontal]

Radiated Emission				Correction Factors	Corrected Amplitude	Class B (3 m)	
Frequency (MHz)	Amplitude (dBμV/m)	Ant. H. (m)	Table ( )	(dB)	(dBμV/m)	Limit (dBμV/m)	Margin (dB)
145.19	32.96	1.00	280	-1.83	31.13	43.50	-12.37
193.69	35.31	1.00	303	-2.43	32.88	43.50	-10.62
289.47	45.11	1.00	310	-2.46	42.65	46.00	-3.35
325.85	38.00	1.00	291	-1.85	36.15	46.00	-9.85
379.20	35.75	1.00	300	-0.16	35.59	46.00	-10.41
481.05	32.07	1.00	311	3.49	35.56	46.00	-10.44

Channel 11, Radiated Emissions for 30MHz～1GHz [Vertical]

Radiated Emission				Correction Factors	Corrected Amplitude	Class B (3 m)	
Frequency (MHz)	Amplitude (dBμV/m)	Ant. H. (m)	Table ( )	(dB)	(dBμV/m)	Limit (dBμV/m)	Margin (dB)
145.19	32.96	1.00	257	-1.83	31.13	43.50	-12.37
177.92	27.02	1.00	241	-2.69	24.33	43.50	-19.17
290.69	33.45	1.00	223	-2.46	30.99	46.00	-15.01
379.20	31.83	1.00	242	-0.16	31.67	46.00	-14.33
433.76	27.11	1.00	264	1.66	28.77	46.00	-17.23
540.46	28.42	1.00	41	6.37	34.79	46.00	-11.21

Channel 1, Radiated Emissions for 1GHz to 25GHz [Horizontal]

Radiated Emission				Corrected Amplitude (dBμV/m)		Class B (3m)		
						Limit (dBμV/m)		
Frequency (MHz)	Ant. H. (m)	Table (°)	Correction Factors (dB)	Peak	Average	Peak	Ave.	Margin (dB)
4825.14	1.00	221	3.76	46.20	---	74.00	53.96	-7.76
7237.78	1.00	176	10.10	46.04	---	74.00	53.96	-7.92
9650.42	1.00	30	11.47	47.58	---	74.00	53.96	-6.38
12059.03	1.00	149	9.81	47.09	---	74.00	53.96	-6.87

Channel 1, Radiated Emissions for 1GHz to 25GHz [Vertical]

Radiated Emission				Corrected Amplitude (dBμV/m)		Class B (3m)		
						Limit (dBμV/m)		
Frequency (MHz)	Ant. H. (m)	Table (°)	Correction Factors (dB)	Peak	Average	Peak	Ave.	Margin (dB)
4825.14	1.00	271	3.76	45.04	---	74.00	53.96	-8.92
7237.78	1.00	339	10.10	45.04	---	74.00	53.96	-8.92
9646.39	1.00	10	11.45	44.39	---	74.00	53.96	-9.57
12059.03	1.00	240	9.81	47.75	---	74.00	53.96	-6.21

Note:

1. Margin = Corrected - Limit.
2. The EUT utilizes a *permanently attached antenna*. In addition the spurious RF radiated emissions levels do comply with the *20dBc limit* both at its bandedges and other spurious emissions.
3. As stated in Section 15.35(b), for any frequencies above 1000MHz, radiated limits shown are based upon the use of measurement instrumentation employing an average detector function. As the results of our test, the peak amplitudes are already below the FCC limit. Thus the average amplitudes of the rest are omitted.

Channel 6, Radiated Emissions for 1GHz to 25GHz [Horizontal]

Radiated Emission				*Corrected Amplitude (dBμV/m)*		*Class B (3m)*		
Frequency (MHz)	*Ant. H. (m)*	*Table ( )*	*Correction Factors (dB)*			*Limit (dBμV/m)*		*Margin (dB)*
				Peak	*Average*	*Peak*	*Ave.*	
4873.47	1.00	17	3.95	44.89	---	74.00	53.96	-9.07
7310.28	1.00	251	10.30	44.90	---	74.00	53.96	-9.06
9751.11	1.00	193	11.90	47.51	---	74.00	53.96	-6.45
12187.92	1.00	97	9.74	48.34	---	74.00	53.96	-5.62

Channel 6, Radiated Emissions for 1GHz to 25GHz [Vertical]

Radiated Emission				*Corrected Amplitude (dBμV/m)*		*Class B (3m)*		
Frequency (MHz)	*Ant. H. (m)*	*Table ( )*	*Correction Factors (dB)*			*Limit (dBμV/m)*		*Margin (dB)*
				Peak	*Average*	*Peak*	*Ave.*	
4873.47	1.00	275	3.95	46.39	---	74.00	53.96	-7.57
7310.28	1.00	349	10.30	45.74	---	74.00	53.96	-8.22
9751.11	1.00	25	11.90	47.51	---	74.00	53.96	-6.45
12183.89	1.00	117	9.72	48.16	---	74.00	53.96	-5.80

Channel 11, Radiated Emissions for 1GHz to 25GHz [Horizontal]

Radiated Emission				Corrected Amplitude (dBμV/m)		Class B (3m) Limit (dBμV/m)		Margin (dB)
Frequency (MHz)	Ant. H. (m)	Table ( )	Correction Factors (dB)	Peak	Average	Peak	Ave.	
4925.84	1.00	85	4.13	47.07	---	74.00	53.96	-6.89
7386.80	1.00	164	10.42	43.19	---	74.00	53.96	-10.77
9847.78	1.00	208	11.93	45.54	---	74.00	53.96	-8.42
12312.78	1.00	46	9.53	45.64	---	74.00	53.96	-8.32

Channel 11, Radiated Emissions for 1GHz to 25GHz [Vertical]

Radiated Emission				Corrected Amplitude (dBμV/m)		Class B (3m) Limit (dBμV/m)		Margin (dB)
Frequency (MHz)	Ant. H. (m)	Table ( )	Correction Factors (dB)	Peak	Average	Peak	Ave.	
4925.84	1.00	250	4.13	47.07	---	74.00	53.96	-6.89
7386.80	1.00	31	10.42	44.03	---	74.00	53.96	-9.93
9851.80	1.00	40	11.93	47.71	---	74.00	53.96	-6.25
12312.78	1.00	207	9.53	44.97	---	74.00	53.96	-8.99

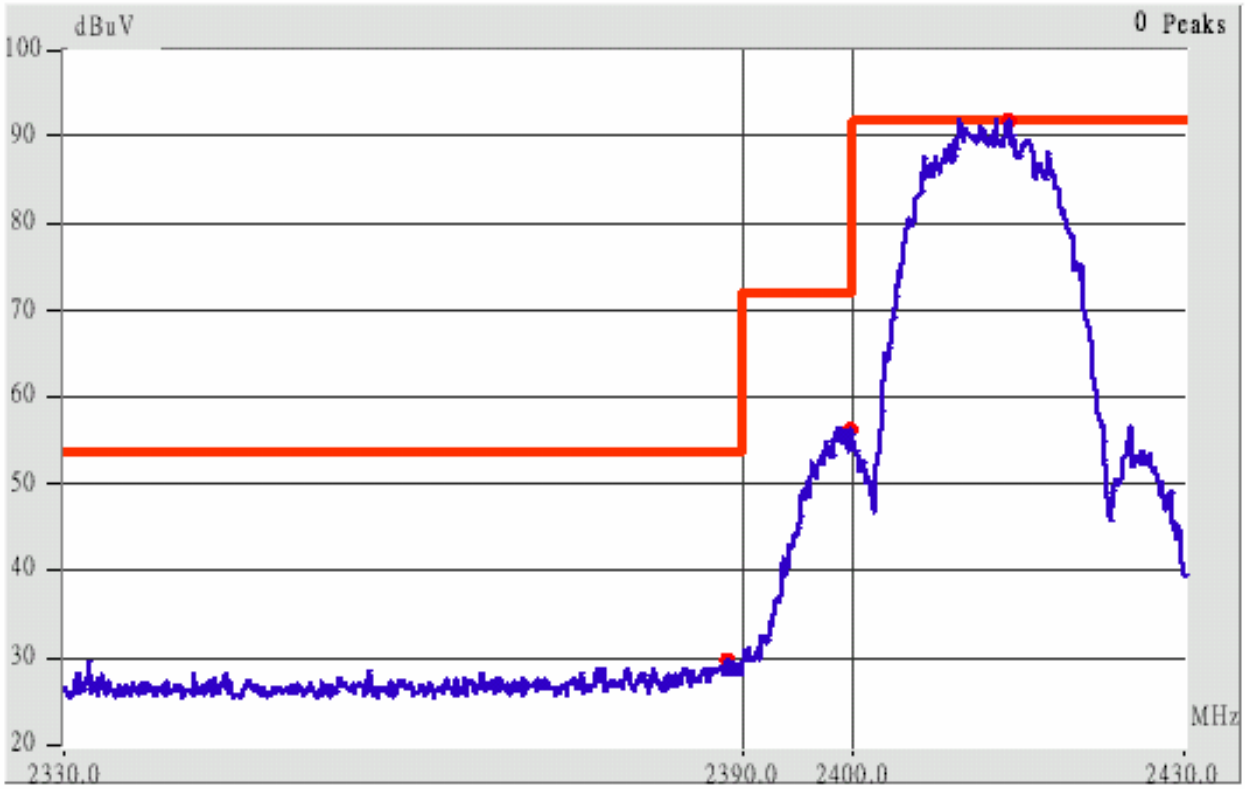
4.5 Test Result of the Bandedge

If any 100 kHz bandwidth outside these frequency bands, the radio frequency power that is produced by the modulation products of the spreading sequence, the information sequence and the carrier frequency shall be either *at least 20 dB below that in any 100 kHz bandwidth within the band that contains the highest level of the desired power or shall not exceed the general levels specified id § 15.209(a)*,

We perform this section by the *radiated manner*, the RBW is set to 100kHz and VBW>RBW. We'd made the observation *up to 10th harmonics and the criterion is all the harmonic/spurious emissions must be 20dB below the highest emission level measured.* If the emissions fall in the restricted bands stated in the Part15.205(a) must also *comply with the radiated emission limits specified in Part15.209(a). (Peak mode: RBW=VBW=1MHz, Average mode: RBW=1MHz; VBW=10Hz)*

The following pages show our observations referring to the channel 1 and 11 respectively.
Test Condition & Setup: same as < 4.1 >

Channel 1

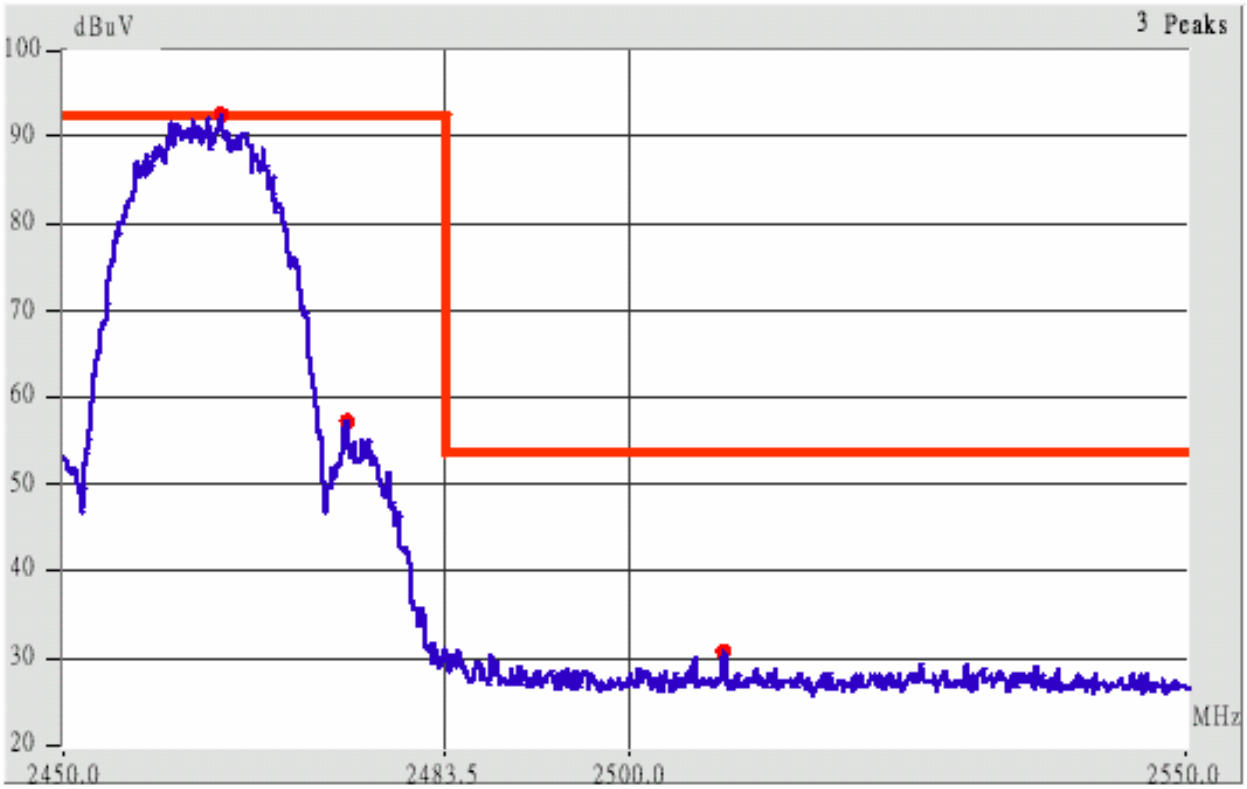


This is the hard copy of our bandedge measurement generated by our bandedge testing program. The plot shown above is the bandedge of channel 1.

1. The lobe left by the fundamental side is already 20dB below the highest emission level.
2. The emissions recorded in the restricted band is do comply with the Part 15.209(a) – as below.

Radiated Emission					*Corrected Amplitude (dBμV/m)*		*Class B (3m)*		
Frequency (MHz)	*Ant. P.*	*Ant. H. (m)*	*Table ( )*	*Factors (dB)*	*Peak*	*Average*	*Limit (dBμV/m) Peak*	*Ave.*	*Margin (dB)*
2482.00	Hor	1.00	58	3.11	40.27	---	74.00	53.96	-13.69
2390.02	Hor	1.00	127	3.13	39.80	---	74.00	53.96	-14.16
2372.30	Ver	1.00	201	3.08	38.74	---	74.00	53.96	-15.22
2390.02	Ver	1.00	37	3.13	38.47	---	74.00	53.96	-15.49

Channel 11



This is the hard copy of our bandedge measurement generated by our bandedge testing program. The plot shown above is the bandedge of channel 11.

1. The lobe right by the fundamental side is already 20dB below the highest emission level.
2. The emissions recorded in the restricted band is do comply with the Part 15.209(a) – as below

Radiated Emission					*Corrected Amplitude (dBμV/m)*		*Class B (3m)*		
Frequency (MHz)	*Ant. P.*	*Ant. H. (m)*	*Table ( )*	*Factors (dB)*	*Peak*	*Average*	*Limit (dBμV/m) Peak*	*Ave.*	*Margin (dB)*
2483.50	Hor	1.00	85	3.45	40.95	---	74.00	53.96	-13.01
2487.35	Hor	1.00	345	3.46	39.79	---	74.00	53.96	-14.17
2508.00	Hor	1.00	151	3.51	39.18	---	74.00	53.96	-14.78
2483.50	Ver	1.00	96	3.45	38.61	---	74.00	53.96	-15.35
2488.17	Ver	1.00	305	3.46	39.79	---	74.00	53.96	-14.17
2522.18	Ver	1.00	201	3.53	39.03	---	74.00	53.96	-14.93