

MEASUREMENT REPORT

of

2.4G REMOTE POINTER

Applicant : TopSeed Technology Corp.

EUT : Remote Pointer

Model : TSEP-2401

FCC ID : PTITSEP-2401

Tested by :

Training Research Co., Ltd.

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

No. 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 (2003) 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 B (Declaration of Conformity) and C Section 15.247.

Applicant : TopSeed Technology Corp.
Applicant Address : 9F-3, No.16, Jain Ba Rd, Chung Ho, Taipei Hsien, Taiwan
Product Name : Remote Pointer
Model : TSEP-2401
Report No. : AA515050300
Test Date : May 20, 2005

Prepared by: 
Jack Tsai

Approved by: 
Frank Tsai

Conditions of issue :

- (1) *This test report shall not be reproduced except in full, without written approval of TRC. And the test result contained within this report only relate to the sample submitted for testing.*
- (2) *This report must not be used by the client to claim product endorsement by NVLAP or any agency of U.S. Government.*
- (3) *This test report, measurements made by TRC are traceable to the NIST only Conducted and Radiated Method.*

★ NVLAP LAB CODE: 200174-0

Federal Communications Commission **Declaration of Conformity**

for the following equipment:

Product name : Remote Pointer
Trade name : TopSeed; DELL
Model name : TSEP-2401

Is herewith confirmed and found to comply with the requirements of CFR 47 part15 Subpart B - Unintentional Radiators regulation. The results of electromagnetic mission evaluation are shown in the report number : AA515050300

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference received,
including interference that may cause undesired operation

<i>Manufacturer</i>	<i>USA local representative</i>
Company name: Dong Guan Jess-Link Electronics Co., Ltd.	To be determined
Computer address: XiSheng Rd., XiTou Country, HouJie Town, DongGuan City, Canton, P.R.China	
ZIP / Postal code	
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Title:	
Internet e-mail address: bellkao@jpcco.con.cn	
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I . GENERAL

1.1 Introduction

The following measurement report is submitted on behalf of applicant in support that the certification in accordance with Part 2 Subpart J and Part 15 Subpart A, B and C of the Commission's Rules and Regulations.

1.2 Description of EUT

FCC ID	:	PTITSEP-2401
Product Name	:	Remote Pointer
Model Name	:	TSEP-2401
Part No.	:	RCEP0001-2401
Frequency Range	:	2402MHz to 2479MHz
Support Channel	:	78 Channels
Channel Spacing	:	1MHz
Modulation Skill	:	GFSK
Power Type	:	Powered by batteries (AA size x 2)
Data Cable	:	None

1.3 Test method

- 1.3.1 Insert the batteries into the battery cell of EUT.
- 1.3.2 Using the software provided by the manufacturer to control EUT. Press keys control the EUT in the mode of continuous transmission; the test is performed under the specific conditions.
- 1.3.3 Set different data rate and channel (CH01/CH39/CH78) being tested
 - (a) Radiated for Intentional test:
making EUT to the mode of continuous transmission
 - (b) Radiated for unintentional test:
making EUT to the linking mode with far receiver
- 1.3.4 Deviation: No deviation.

1.4 Description of Support Equipment

In order to construct the minimum testing, following equipment were used as the support units.

Notebook : IBM Think Pad X20

Model No. : 2662-11T

Serial No. : FX-1192200/09

FCC ID : N/A, DoC Approved

BSMI : 3892B565

Adaptor : IBM

Model No. : PA2450U

Serial No. : 02K6654

FCC ID : N/A, DoC Approved

Power type : I/P: 100 ~ 240vac, 50 ~ 60 Hz, 0.5A ~ 1.2A; O/P: 16Vdc, 4.5A

Power cord : Non-shielded, 1.80m long, Plastic, with ferrite core

USB Receiver : TopSeed

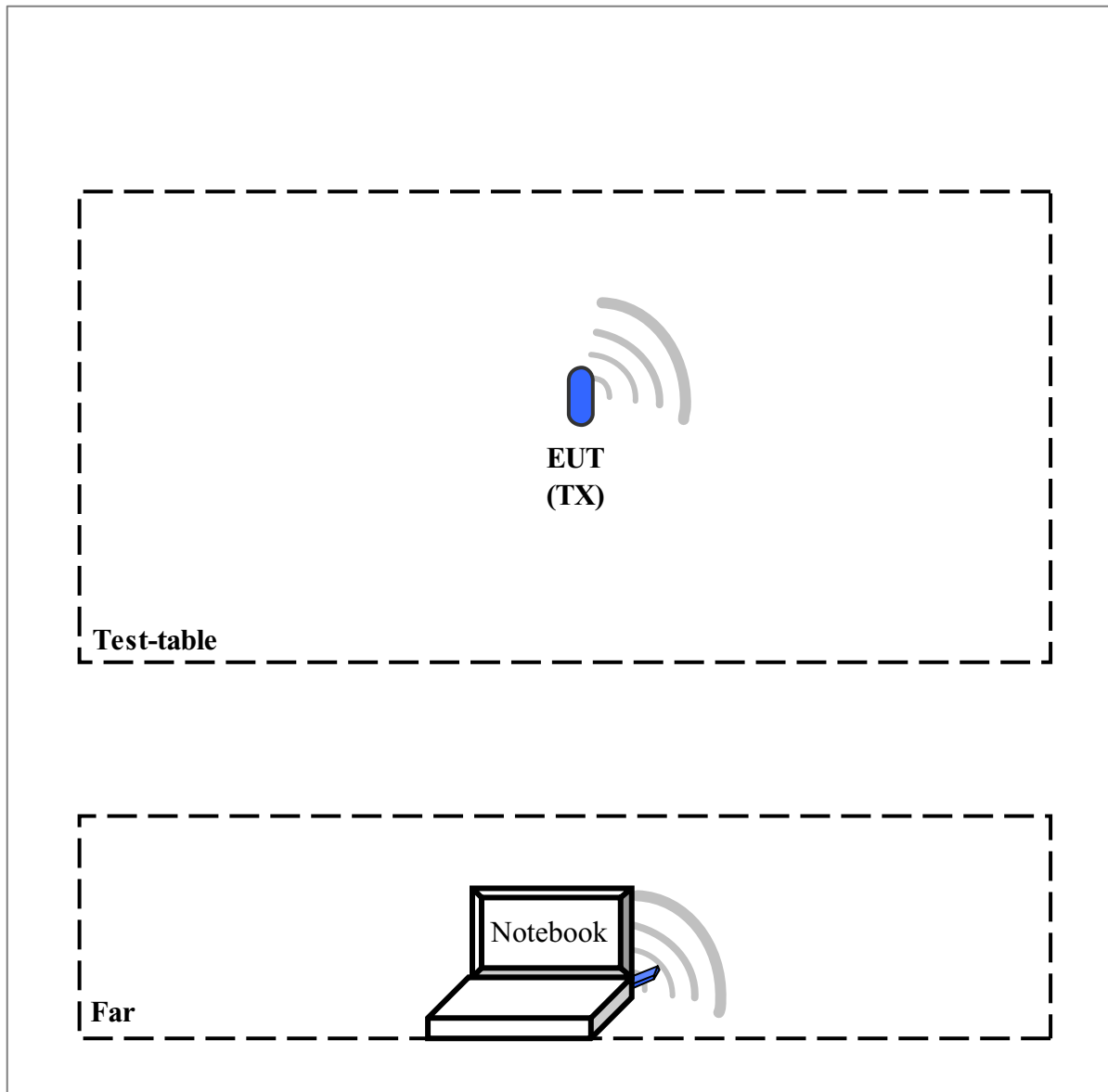
Model No. : TSEQ-2401

Serial No. : 50300007

FCC ID : DoC Approved

1.5 Configuration of System Under Test

1.5.1 Radiated for Unintentional

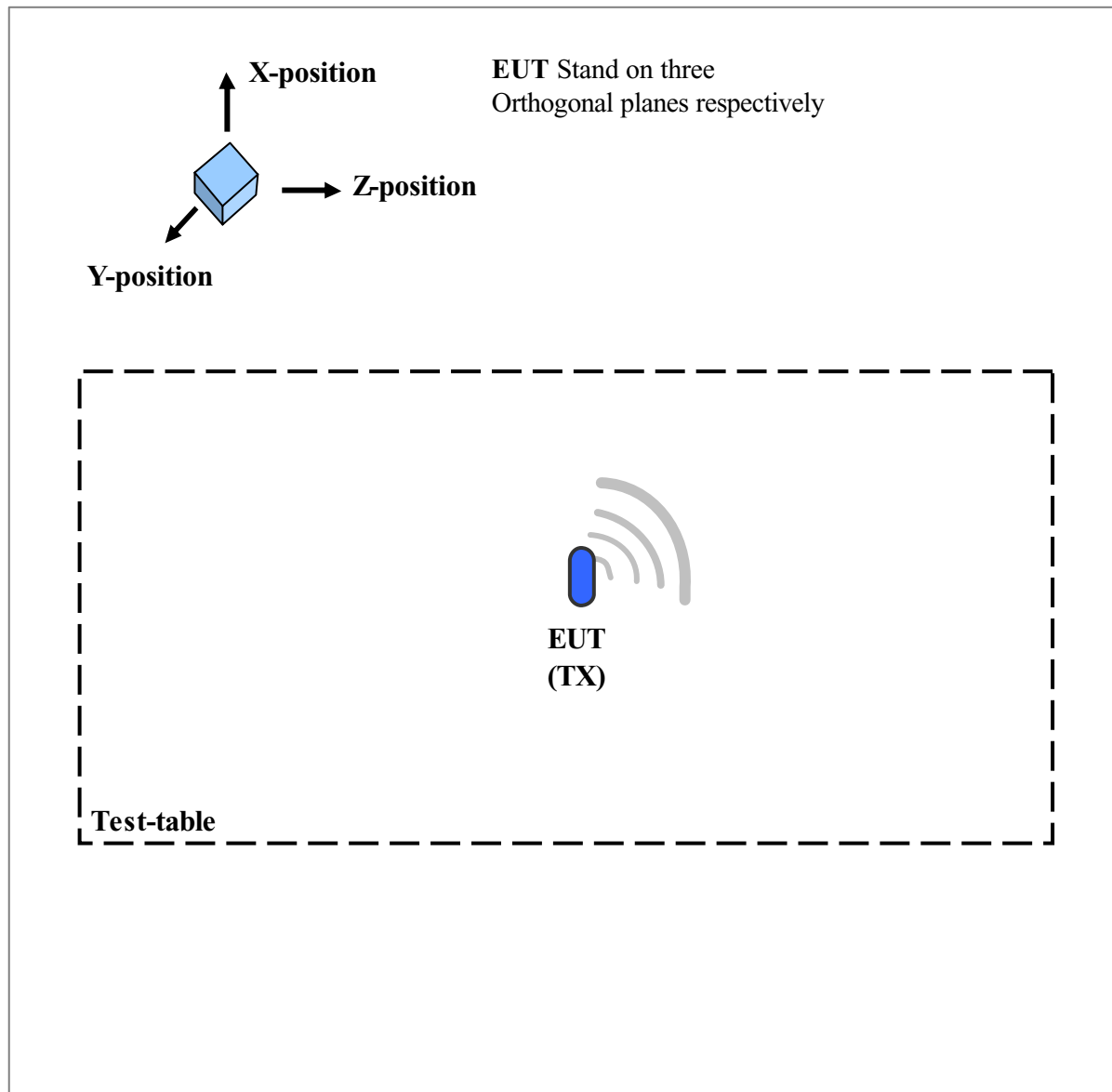


Connections of Computer:

TX (EUT): *Put two AA batteries into the battery cell of remote pointer

RX: *USB Connector --- Plug into the USB port of notebook computer

1.5.2 Radiated Test



The tests below are carried with the EUT transmitter set at high power in TDD mode. The EUT is forced to select of output power level and channel number by notebook computer.

The setting up procedure was recorded in 1.3 test method.

1.6 Verify the Frequency and Channel

CH	0	1	2	3	4	5	6	7	8	9
0		2402	2403	2404	2405	2406	2407	2408	2409	2410
1	2411	2412	2413	2414	2415	2416	2417	2418	2419	2420
2	2421	2422	2423	2424	2425	2426	2427	2428	2429	2430
3	2431	2432	2433	2434	2435	2436	2437	2438	2439	2440
4	2441	2442	2443	2444	2445	2446	2447	2448	2449	2450
5	2451	2452	2453	2454	2455	2456	2457	2458	2459	2460
6	2461	2462	2463	2464	2465	2466	2467	2468	2469	2470
7	2471	2472	2473	2474	2475	2476	2477	2478	2479	

Note:

1. This is for confirming that all frequencies are in 2.400GHz to 2.4835GHz.
2. Section 15.31(m): Measurements on intentional radiators or receivers shall be performed at three frequencies for operating frequency range over 10 MHz
(The locations of these frequencies one near the top, one near the middle and one near the bottom.)
3. After test, the EUT operating frequencies are in 2.402GHz to 2.479GHz. So all the items as followed in testing report are need to test these three frequencies:
Top: Channel – 1; Middle: Channel – 39 Bottom: Channel – 78.

1.7 Test Procedure

All measurements contained in this report were performed mainly according to the techniques described in ANSI C63.4 (2003) and the pre-setup was written on 1.3 test method, the detail setup was written on each test item.

1.8 Location of the Test Site

The radiated emissions measurements required by the rules were performed on the **three-meter, Anechoic Chamber (FCC 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.

1.9 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 computer. The CH01, CH39 and CH78 of EUT were all tested. The setting up procedure is recorded on 1.3 test method.

II. Section 15.101(a): Equipment authorization of unintentional radiators

The EUT equipped with a receiver. It was categorized to all other receivers subject to part 15 as can be operated stand-alone. The authorization requires **Declaration of Conformity (DoC)** and the items required such as Section15.107 (Conducted limits) and Section15.109 (Radiated emission limits) is same as Section15.207 and 15.247(C).

III. Section 15.203: Antenna requirement

The EUT has an integrated antenna permanently attached on the PCB (PCB Track). In addition, there is no external antenna or connector employed. The antenna requirement stated in Section 15.203 is inapplicable to this EUT.

VI. Section 15.207: Power Line Conducted Emissions for AC Powered Units

4.1 Test Condition & Setup

The EUT operates solely by the battery (AA size, 1.5V battery * 2).

According to the rule of section 15.207(c). The EUT exempt to the power line conducted test.

4.2 Test Result of Conducted Emissions

Test Result: N/A (not applicable)

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

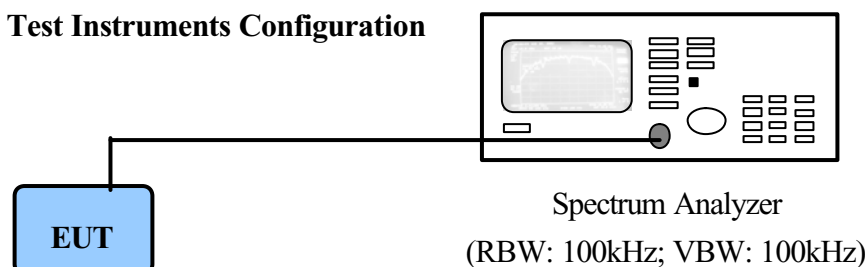
Direct Sequence System is a spread spectrum system in which the carrier has been modulated by a high speed spreading code and an information data stream. The high speed code sequence dominates the “modulating function” and is the direct cause of the wide spreading of the transmitted signal. In the operational 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.

VI. Section 15.247(a)(2): Bandwidth for Direct Sequence System.

6.1 Test Condition & Setup

The transmitter bandwidth measurements were performed by the contact manner. The EUT was set to transmit continuously, also various channels were investigated to find the maximum occupied bandwidth. The output of the EUT was connected to the spectrum analyzer. The bandwidth of the fundamental frequency is observed by the spectrum analyzer with 100kHz RBW and 100kHz VBW.

6.2 Test Instruments Configuration



EUT set testing mode, Press function keys of EUT to control the EUT at maximal power output and channel number

6.3 List of Test Instruments

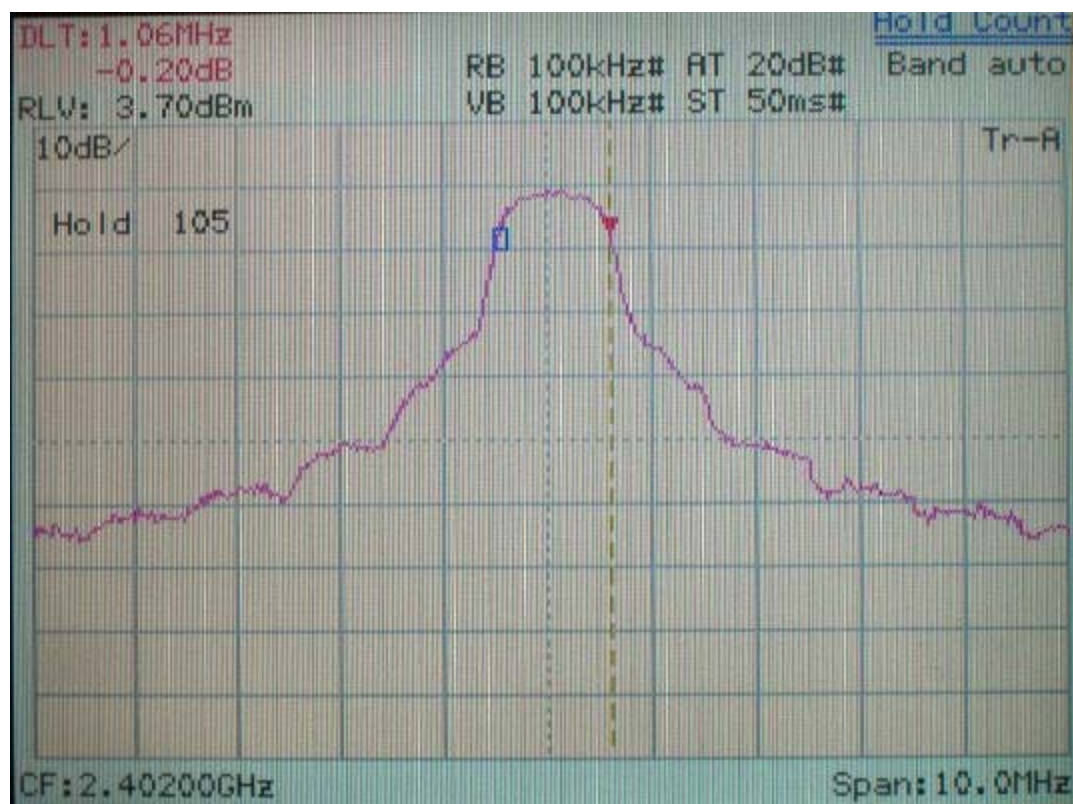
Instrument Name	Model No.	Brand	Serial No.	Next time
Spectrum Analyzer	MS2665C	ANRITSU	6200175476	11/02/05

6.4 Test Result of Bandwidth

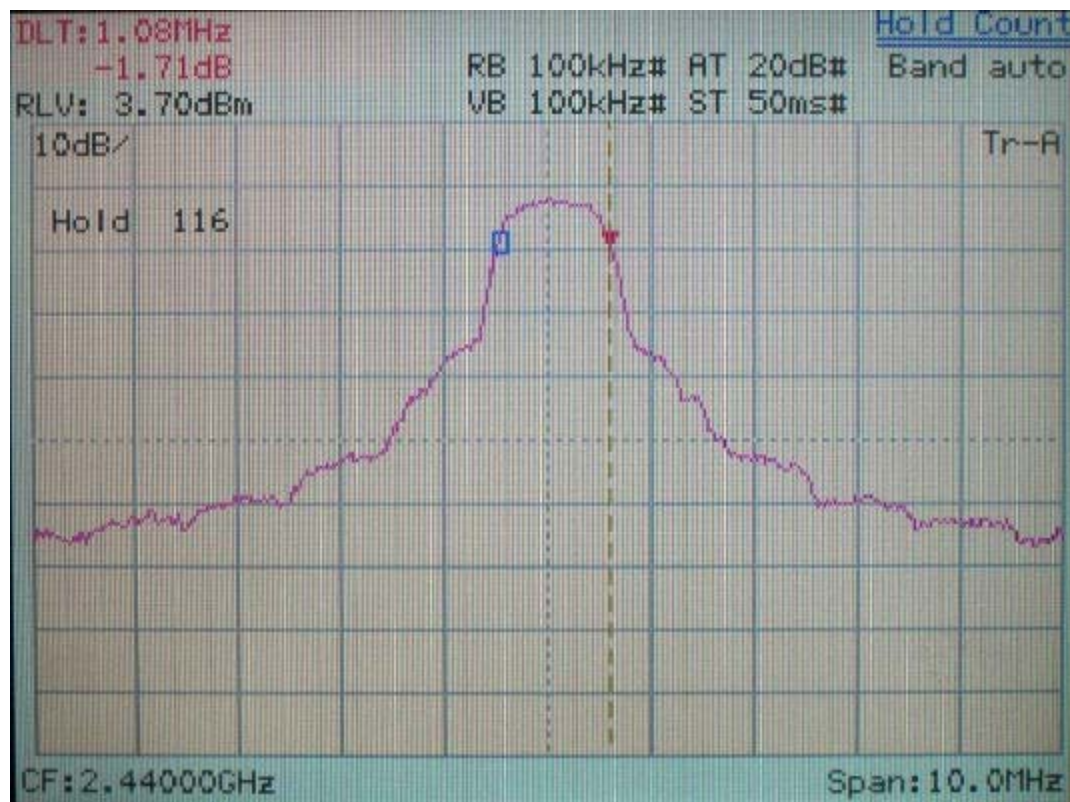
Channel	6dB Bandwidth
01	1.06 MHz
39	1.08 MHz
78	1.08 MHz

- Note: 1. The data in the above table are summarizing the following attachment spectrum analyzer hard copy. According to the guidance, we'd made the measurement with the spectrum analyzer's resolution bandwidth (RBW)=100kHz and set the $span \gg RBW$. The results show the measured 6dB bandwidth comply with the minimum 500kHz requirement.
2. The attachments show these on the following pages.

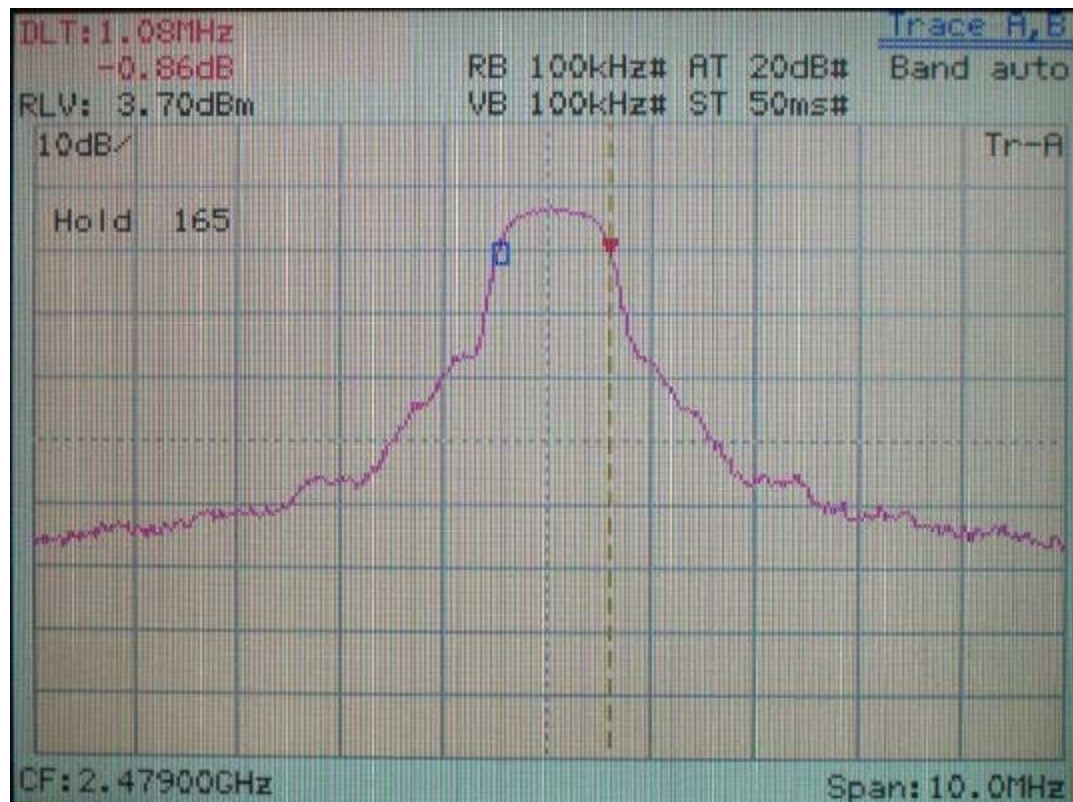
6dB Bandwidth of Channel 01 (The minimum 6dB BW at least 500kHz)



6dB Bandwidth of Channel 39 (The minimum 6dB BW at least 500kHz)

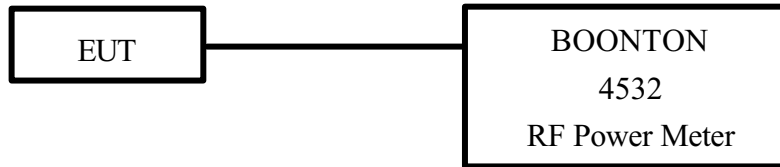


6dB Bandwidth of Channel 78 (The minimum 6dB BW at least 500kHz)



VII. Section 15.247(b): Power Output

7.1 Test Condition & Setup



1. The output of the transmitter is connected to the BOONTON RF Power Meter.
2. The calibration is performed before every test. The values of the output power of the EUT will shown in the dBm directly are the transmitter output peak power. Recording as follows.

7.2 List of Test Instruments

Instrument Name	Model	Brand	Serial No.	Next time
RF Power Meter	4532	BOONTON	117501	04/16/06
Peak Power Sensor	57340	BOONTON	2696	04/21/06

7.3 Test Result

Formula:

$$\text{RF Output of EUT} + |\text{Cable Loss}| = \text{Output Peak Power}$$

Channel	RF Output	Cable Loss	Output Peak Power	
	dBm	dBm	dBm	mW
CH 01	-4.55	1.00	-3.55	0.442
CH 39	-6.91	1.00	-5.91	0.256
CH 78	-9.32	1.00	-8.32	0.147

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

8.1 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 was 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 30MHz to 1000MHz using an Hewlett Packard 85460A EMI Receiver, SCHWARZECK whole range Small Biconical Antenna (Model No.: UBAA9114 & BBVU9135) 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/HP Horn Antenna (Model 3115 / 84125-80008) 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 (CH39) and the other in bottom (CH78). The setting up procedure is recorded on <1.3>

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

$$F_{Ia} \text{ (dBuV/m)} = F_{Ir} \text{ (dBuV)} + \text{Correction Factors}$$

F_{Ia} : Actual Field Intensity

F_{Ir} : Reading of the Field Intensity

$$\text{Correction Factors} = \text{Antenna Factor} + (\text{Cable Loss} - \text{Amplifier Gain}) + \text{Switching Box Loss}$$

For frequency between 1GHz to 25GHz

$$F_{Ia} \text{ (dBuV/m)} = F_{Ir} \text{ (dBuV)} + \text{Correction Factor}$$

F_{Ia} : Actual Field Intensity

F_{Ir} : Reading of the Field Intensity

$$\text{Correction Factors} = \text{Antenna Factor} + (\text{Cable Loss} - \text{Amplifier Gain}) + \text{Switching Box Loss}$$

8.2 List of Test Instruments

Instrument Name	Model	Brand	Serial No.	Calibration Date
				Next time
EMI Receiver	8546A	HP	3520A00242	08/05/05
RF Filter Section	85460A	HP	3448A00217	08/05/05
Small Biconical Antenna	UBAA9114 & BBVU9135	SCHWARZECK	127	10/11/05
Pre-amplifier	PA1F	TRC	1FAC	05/20/05
Auto Switch Box (>30MHz)	ASB-01	TRC	9904-01	05/20/05
Coaxial Cable (Double shielded, 15 meter)	A30A30-0058-50FS-15M	JYEBAO	SMA-01	05/20/05
Coaxial Cable (1.1 meter)	A30A30-0058-50FS-1M	JYEBAO	SMA-02	05/20/05
Spectrum Analyzer	8564E	HP	3720A00840	08/13/05
Microwave Preamplifier	84125C	HP	US36433002	08/13/05
Horn Antenna	3115	EMCO	9104-3668	12/27/05
Standard Guide Horn Antenna	84125-80008	HP	18-26.5GHz	10/15/05
Standard Guide Horn Antenna	84125-80001	HP	26.5-40GHz	10/15/05
Horn Antenna	1196E (3115)	HP (EMCO)	9704-5178	01/11/06
Pre-amplifier	PA2F	TRC	2F1GZ	06/20/05
Coaxial Cable (3 miter)	A30A30-0058-50FST118	JYEBAO	MSA-05	06/20/05
Coaxial Cable (1 meter)	A30A30-0058-50FST118	JYEBAO	MSA-04	06/20/05

8.3 Test Result of Spurious Radiated Emissions

The highest peak values of radiated emissions from the EUT at various antenna heights, antenna polarizations, EUT three orientation, ...etc. Only recorded worse case of orientation on the following.

Test Conditions: Temperature : 24 ° C Humidity : 70 % RH

Test mode: RX mode for 30MHz to 1GHz, X-plane [Horizontal]

Radiated Emission				Correction Factors (dB)	Corrected Amplitude (dBμV/m)	Class B (3 m)	
Frequency (MHz)	Amplitude (dBμV)	Ant. H. (m)	Table (°)			Limit (dBμV/m)	Margin (dB)
39.70	24.59	1.00	210	5.83	30.42	40.00	-9.58
54.25	21.37	1.00	37	3.02	24.39	40.00	-15.61
285.84	22.53	1.00	127	-3.85	18.68	46.00	-27.32
500.45	20.64	1.00	86	2.92	23.56	46.00	-22.44
677.48	20.62	1.00	213	9.08	29.70	46.00	-16.30
887.24	20.12	1.00	323	14.31	34.43	46.00	-11.57

Test mode: RX mode for 30MHz to 1GHz, X-plane [Vertical]

Radiated Emission				Correction Factors (dB)	Corrected Amplitude (dBμV/m)	Class B (3 m)	
Frequency (MHz)	Amplitude (dBμV)	Ant. H. (m)	Table (°)			Limit (dBμV/m)	Margin (dB)
39.70	23.86	1.00	46	5.83	29.69	40.00	-10.31
102.75	23.42	1.00	23	-1.38	22.04	43.50	-21.46
285.84	28.90	1.00	35	-3.85	25.05	46.00	-20.95
348.89	26.94	1.00	197	-2.75	24.19	46.00	-21.81
466.50	22.01	1.00	46	1.63	23.64	46.00	-22.36
750.23	20.20	1.00	305	10.42	30.62	46.00	-15.38

Note:

1. Margin = Amplitude – limit, if margin is minus means under limit.
2. Corrected Amplitude = Reading Amplitude + Correction Factors
3. Correction factor = Antenna factor + (Cable Loss – Amplitude gain) + Switching Box Loss

Test mode: RX mode for 1GHz to 25GHz, Z-plane [Horizontal]

Frequency	Ant. H.	Table	Amplitude		Correction Factor	Corrected Amplitude		Limit		Margin
			Peak / Ave.			Peak / Ave.		Peak / Ave.		
MHz	m	degree	dBμV		dB/m	dBμV/m		dBμV/m		dB
2204.17	1.00	360	32.40	---	5.32	37.72	---	73.96	53.96	-16.24
3946.67	1.00	88	30.24	---	12.24	42.48	---	73.96	53.96	-11.48
7176.67	1.00	295	26.24	---	21.27	47.51	---	73.96	53.96	-6.45
12935.42	1.00	115	30.57	---	20.54	51.11	---	73.96	53.96	-2.85
22653.75	1.00	31	47.82	---	3.82	51.64	---	73.96	53.96	-2.32

Test mode: RX mode for 1GHz to 25GHz, Z-plane [Vertical]

Frequency	Ant. H.	Table	Amplitude		Correction Factor	Corrected Amplitude		Limit		Margin
			Peak / Ave.			Peak / Ave.		Peak / Ave.		
MHz	m	degree	dBμV		dB/m	dBμV/m		dBμV/m		dB
1970.42	1.00	66	33.41	---	3.92	37.33	---	73.96	53.96	-16.63
3656.25	1.00	76	30.74	---	11.03	41.77	---	73.96	53.96	-12.19
6355.00	1.00	0	27.07	---	18.70	45.77	---	73.96	53.96	-8.19
11568.33	1.00	41	28.74	---	21.48	50.22	---	73.96	53.96	-3.74
23656.04	1.00	335	48.49	---	3.23	51.72	---	73.96	53.96	-2.24

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.

Test mode: CH01 for 30MHz to 1GHz, Y-plane [Horizontal]

Radiated Emission				Correction Factors	Corrected Amplitude	Class B (3 m)	
Frequency (MHz)	Amplitude (dBμV)	Ant. H. (m)	Table (°)			Limit (dBμV/m)	Margin (dB)
39.70	25.31	1.00	278	5.83	31.14	40.00	-8.86
285.23	22.58	1.00	202	-3.86	18.72	46.00	-27.28
450.13	22.03	1.00	193	1.01	23.04	46.00	-22.96
550.16	21.31	1.00	232	5.02	26.33	46.00	-19.67
594.42	21.67	1.00	102	6.48	28.15	46.00	-17.85
721.73	21.51	1.00	38	9.94	31.45	46.00	-14.55

Test mode: CH01 for 30MHz to 1GHz, Y-plane [Vertical]

Radiated Emission				Correction Factors	Corrected Amplitude	Class B (3 m)	
Frequency (MHz)	Amplitude (dBμV)	Ant. H. (m)	Table (°)			Limit (dBμV/m)	Margin (dB)
39.70	27.59	1.00	199	5.83	33.42	40.00	-6.58
216.12	23.21	1.00	140	-3.94	19.27	46.00	-26.73
285.23	31.64	1.00	161	-3.86	27.78	46.00	-18.22
450.13	24.14	1.00	345	1.01	25.15	46.00	-20.85
578.66	21.27	1.00	287	5.96	27.23	46.00	-18.77
704.15	21.36	1.00	214	9.65	31.01	46.00	-14.99

Test mode: CH01 for 1GHz to 25GHz, X-plane [Horizontal]

Frequency	Ant. H.	Table	Amplitude		Correction Factor	Corrected Amplitude		Limit		Margin
			Peak / Ave.			Peak / Ave.		Peak / Ave.		
MHz	m	degree	dBμV		dB/m	dBμV/m		dBμV/m		dB
2141.67	1.00	132	34.83	---	8.49	43.32	---	73.96	53.96	-10.64
2754.17	1.00	24	34.83	---	9.97	44.80	---	73.96	53.96	-9.16
7203.54	1.00	212	37.28	---	9.91	47.19	---	73.96	53.96	-6.77
9608.12	1.00	251	36.44	---	11.47	47.91	---	73.96	53.96	-6.05
12012.71	1.00	32	37.77	---	10.01	47.78	---	73.96	53.96	-6.18

Test mode: CH01 for 1GHz to 25GHz, Y-plane [Vertical]

Frequency	Ant. H.	Table	Amplitude		Correction Factor	Corrected Amplitude		Limit		Margin
			Peak / Ave.			Peak / Ave.		Peak / Ave.		
MHz	m	degree	dBμV		dB/m	dBμV/m		dBμV/m		dB
2058.33	1.00	37	34.67	---	8.25	42.92	---	73.96	53.96	-11.04
2706.25	1.00	188	34.16	---	9.88	44.04	---	73.96	53.96	-9.92
7203.54	1.00	197	37.44	---	9.91	47.35	---	73.96	53.96	-6.61
9608.12	1.00	118	35.27	---	11.47	46.74	---	73.96	53.96	-7.22
12012.71	1.00	301	38.10	---	10.01	48.11	---	73.96	53.96	-5.85

Test mode: CH39 for 30MHz to 1GHz, X-plane [Horizontal]

Radiated Emission				Correction Factors	Corrected Amplitude	Class B (3 m)	
Frequency (MHz)	Amplitude (dBμV)	Ant. H. (m)	Table (°)			Limit (dBμV/m)	Margin (dB)
39.09	26.50	1.00	79	5.91	32.41	40.00	-7.59
68.80	20.08	1.00	272	1.45	21.53	40.00	-18.47
197.93	23.01	1.00	176	-3.78	19.23	43.50	-24.27
285.84	23.96	1.00	193	-3.85	20.11	46.00	-25.89
557.44	21.75	1.00	274	5.26	27.01	46.00	-18.99
711.42	21.30	1.00	207	9.77	31.07	46.00	-14.93

Test mode: CH39 for 30MHz to 1GHz, X-plane [Vertical]

Radiated Emission				Correction Factors	Corrected Amplitude	Class B (3 m)	
Frequency (MHz)	Amplitude (dBμV)	Ant. H. (m)	Table (°)			Limit (dBμV/m)	Margin (dB)
39.07	25.00	1.00	281	5.91	30.91	40.00	-9.09
208.24	23.67	1.00	79	-3.88	19.79	43.50	-23.71
285.23	30.16	1.00	15	-3.86	26.30	46.00	-19.70
466.50	22.54	1.00	224	1.63	24.17	46.00	-21.83
653.83	21.03	1.00	97	8.55	29.58	46.00	-16.42
763.56	20.46	1.00	292	10.74	31.20	46.00	-14.80

Test mode: CH39 for 1GHz to 25GHz, X-plane [Horizontal]

Frequency	Ant. H.	Table	Amplitude		Correction Factor	Corrected Amplitude		Limit		Margin
			Peak / Ave.			Peak / Ave.		Peak / Ave.		
MHz	m	degree	dBμV		dB/m	dBμV/m		dBμV/m		dB
2054.17	1.00	215	36.00	---	8.24	44.24	---	73.96	53.96	-9.72
2716.67	1.00	350	34.16	---	9.90	44.06	---	73.96	53.96	-9.90
4877.50	1.00	85	40.27	---	3.97	44.24	---	73.96	53.96	-9.72
7318.33	1.00	326	35.61	---	10.31	45.92	---	73.96	53.96	-8.04
9759.17	1.00	291	36.28	---	11.90	48.18	---	73.96	53.96	-5.78
12200.00	1.00	45	39.78	---	9.77	49.55	---	73.96	53.96	-4.41

Test mode: CH39 for 1GHz to 25GHz, Y-plane [Vertical]

Frequency	Ant. H.	Table	Amplitude		Correction Factor	Corrected Amplitude		Limit		Margin
			Peak / Ave.			Peak / Ave.		Peak / Ave.		
MHz	m	degree	dBμV		dB/m	dBμV/m		dBμV/m		dB
2152.08	1.00	1	36.33	---	8.52	44.85	---	73.96	53.96	-9.11
2760.42	1.00	53	34.50	---	9.98	44.48	---	73.96	53.96	-9.48
7318.33	1.00	77	36.61	---	10.31	46.92	---	73.96	53.96	-7.04
9759.17	1.00	177	35.44	---	11.90	47.34	---	73.96	53.96	-6.62
12200.00	1.00	39	39.78	---	9.77	49.55	---	73.96	53.96	-4.41

Test mode: CH78 for 30MHz to 1GHz, Y-plane [Horizontal]

Radiated Emission				Correction Factors	Corrected Amplitude	Class B (3 m)	
Frequency (MHz)	Amplitude (dBμV)	Ant. H. (m)	Table (°)			Limit (dBμV/m)	Margin (dB)
39.09	24.74	1.00	23	5.91	30.65	40.00	-9.35
76.68	22.32	1.00	307	0.55	22.87	40.00	-17.13
151.86	22.26	1.00	260	-3.20	19.06	43.50	-24.44
285.23	23.06	1.00	100	-3.86	19.20	46.00	-26.80
531.98	21.14	1.00	170	4.25	25.39	46.00	-20.61
727.79	21.34	1.00	83	10.04	31.38	46.00	-14.62

Test mode: CH78 for 30MHz to 1GHz, Y-plane [Vertical]

Radiated Emission				Correction Factors	Corrected Amplitude	Class B (3 m)	
Frequency (MHz)	Amplitude (dBμV)	Ant. H. (m)	Table (°)			Limit (dBμV/m)	Margin (dB)
39.09	27.42	1.00	27	5.91	33.33	40.00	-6.67
213.09	22.15	1.00	145	-3.91	18.24	43.50	-25.26
285.23	30.84	1.00	280	-3.86	26.98	46.00	-19.02
450.13	23.90	1.00	218	1.01	24.91	46.00	-21.09
644.74	20.89	1.00	88	8.27	29.16	46.00	-16.84
769.02	20.52	1.00	337	10.87	31.39	46.00	-14.61

Test mode: CH78 for 1GHz to 25GHz, Y-plane [Horizontal]

Frequency	Ant. H.	Table	Amplitude		Correction Factor	Corrected Amplitude		Limit		Margin
			Peak / Ave.			Peak / Ave.		Peak / Ave.		
MHz	m	degree	dBμV		dB/m	dBμV/m		dBμV/m		dB
2170.83	1.00	179	35.17	---	8.57	43.74	---	73.96	53.96	-10.22
2725.00	1.00	282	34.67	---	9.91	44.58	---	73.96	53.96	-9.38
4956.04	1.00	194	39.44	---	4.23	43.67	---	73.96	53.96	-10.29
7439.17	1.00	321	35.78	---	10.33	46.11	---	73.96	53.96	-7.85
9916.25	1.00	200	36.77	---	11.70	48.47	---	73.96	53.96	-5.49
12393.33	1.00	233	37.44	---	9.05	46.49	---	73.96	53.96	-7.47

Test mode: CH78 for 1GHz to 25GHz, Y-plane [Vertical]

Frequency	Ant. H.	Table	Amplitude		Correction Factor	Corrected Amplitude		Limit		Margin
			Peak / Ave.			Peak / Ave.		Peak / Ave.		
MHz	m	degree	dBμV		dB/m	dBμV/m		dBμV/m		dB
2175.00	1.00	36	36.00	---	8.58	44.58	---	73.96	53.96	-9.38
2691.67	1.00	35	35.00	---	9.85	44.85	---	73.96	53.96	-9.11
4956.04	1.00	272	38.94	---	4.23	43.17	---	73.96	53.96	-10.79
7439.17	1.00	292	35.61	---	10.33	45.94	---	73.96	53.96	-8.02
9916.25	1.00	38	35.44	---	11.70	47.14	---	73.96	53.96	-6.82
12393.33	1.00	85	39.27	---	9.05	48.32	---	73.96	53.96	-5.64

8.4 Test Result of the Bandedge

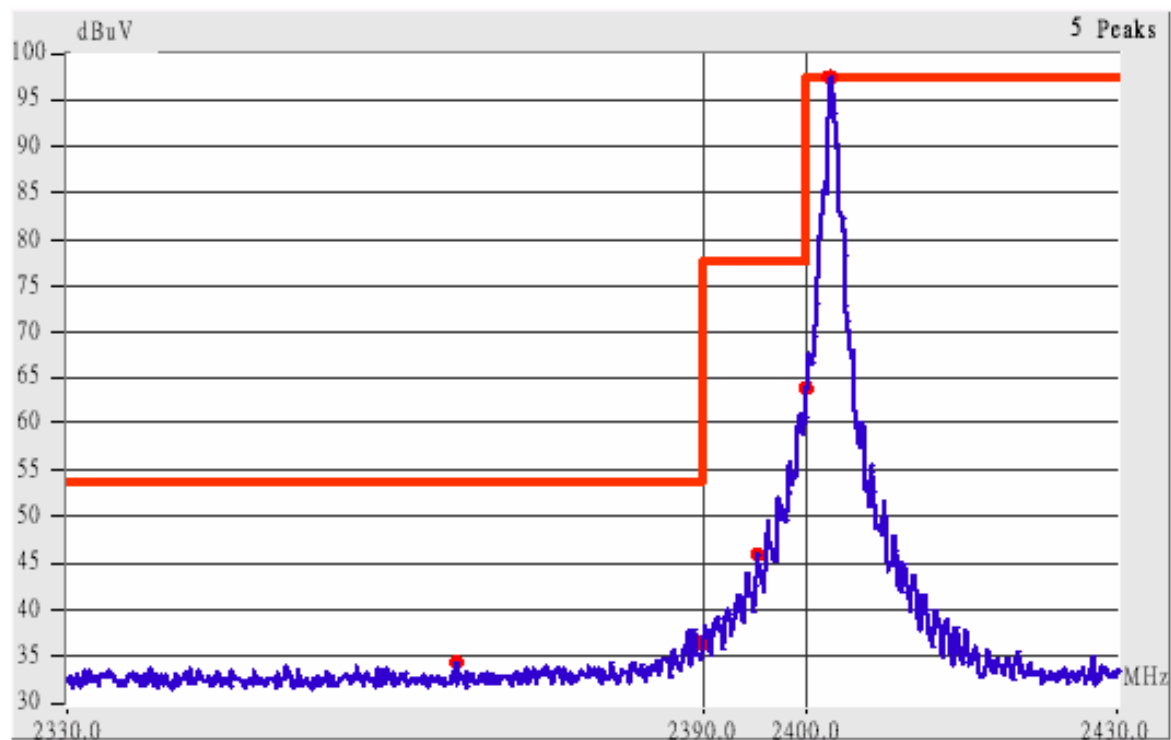
If any 100kHz bandwidth outside these frequency bands, the radio frequency power that is produced by the modulation products of the spreading sequence, the information sequence and the carrier frequency shall be either *at least 20 dB below that in any 100 kHz bandwidth within the band that contains the highest level of the desired power or shall not exceed the general levels specified in §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 Part 15.205(a) must also *comply with the radiated emission limits specified in Part 15.209(a).* (Peak mode: RBW=VBW=1MHz, Average mode: RBW=1MHz; VBW=10Hz)

The following pages show our observations referring to the channel 1 and 78 respectively.

Test Condition & Setup: same as < 8.1 >

Channel 01, X-plane

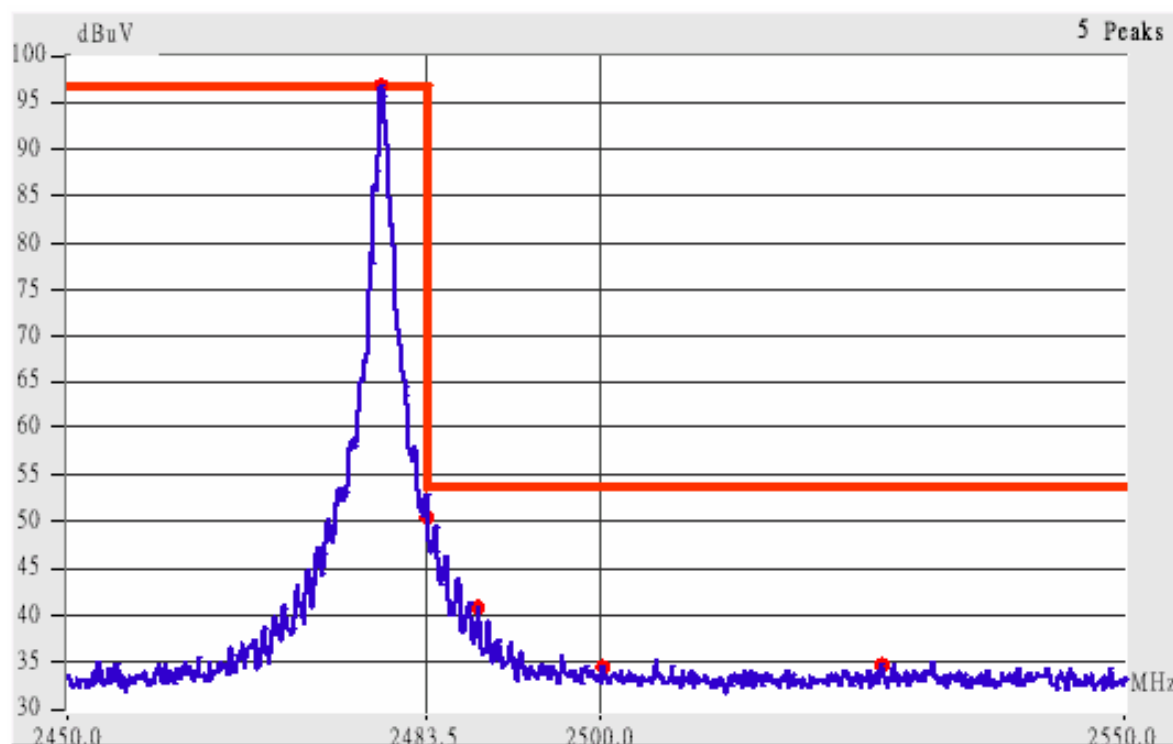


This is the hard copy of our bandedge measurement generated by our bandedge testing program. The plot shown above is the bandedge of channel 1.

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		Class B (3m)		
Frequency (MHz)	Ant. P.	Ant. H. (m)	Table (°)	Factors (dB)	(dBμV/m)		Limit (dBμV/m)		Margin (dB)
					Peak	Average	Peak	Ave.	
2365.32	Hor	1.00	335	9.11	44.45	---	73.96	53.96	-9.51
2382.70	Hor	1.00	162	9.16	45.49	---	73.96	53.96	-8.47
2390.02	Hor	1.00	156	9.18	48.02	---	73.96	53.96	-5.94
2366.94	Ver	1.00	165	9.12	43.78	---	73.96	53.96	-10.18
2381.35	Ver	1.00	129	9.16	44.99	---	73.96	53.96	-8.97
2390.02	Ver	1.00	262	9.18	43.85	---	73.96	53.96	-10.11

Channel 78, X-plane



This is the hard copy of our bandedge measurement generated by our bandedge testing program. The plot shown above is the bandedge of channel 78.

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

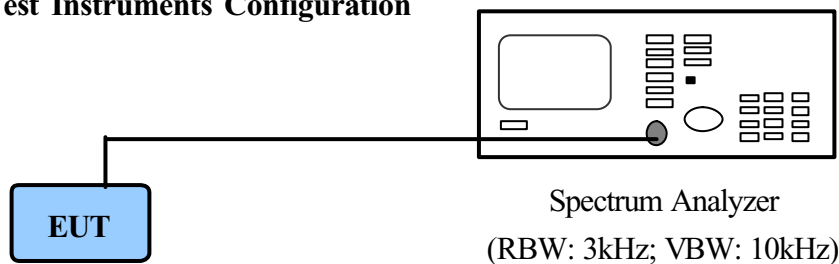
Radiated Emission					Corrected Amplitude		Class B (3m)		
Frequency (MHz)	Ant. P.	Ant. H. (m)	Table (°)	Factors (dB)	(dBμV/m)		Limit (dBμV/m)		Margin (dB)
					Peak	Average	Peak	Ave.	
2482.90	Hor	1.00	67	9.44	61.78	50.27	73.96	53.96	-3.69
2488.98	Hor	1.00	65	9.46	49.96	---	73.96	53.96	-4.00
2500.07	Hor	1.00	176	9.49	42.99	---	73.96	53.96	-10.97
2520.02	Hor	1.00	49	9.53	44.86	---	73.96	53.96	-9.10
2483.50	Ver	1.00	20	9.44	47.11	---	73.96	53.96	-6.85
2493.12	Ver	1.00	18	9.47	44.47	---	73.96	53.96	-9.49
2515.00	Ver	1.00	214	9.52	45.35	---	73.96	53.96	-8.61

IX. Section 15.247(d): Power Spectral Density

9.1 Test Condition & Setup

The tests below are running with the EUT transmitter set at high power in TDD mode. The EUT is needed to force selection of output power level and channel number. While testing, the EUT was set to transmit continuously and to be tested by the contact manner with the spectrum analyzer.

9.2 Test Instruments Configuration



EUT set testing mode, Press function keys of EUT to control the EUT at maximal power output and channel number

9.3 List of Test Instruments

Instrument Name	Model No.	Brand	Serial No.	Next time
Spectrum Analyzer	MS2665C	ANRITSU	6200175476	11/02/05

9.4 Test Result of Power spectral density

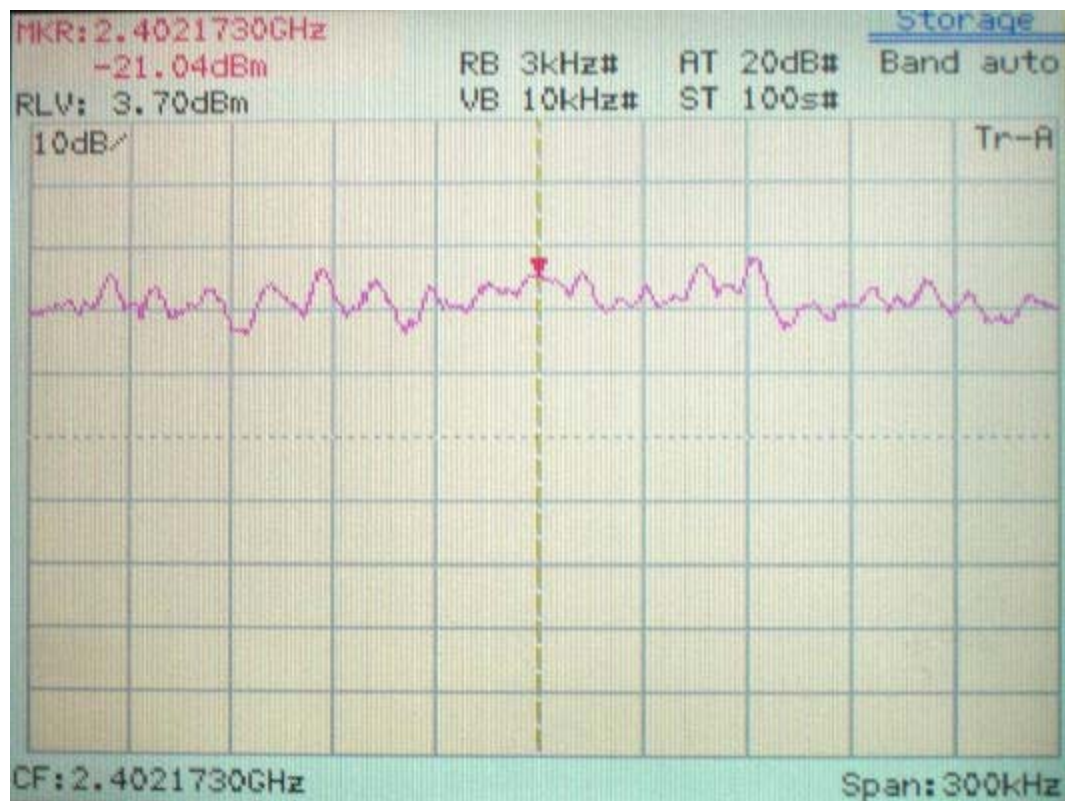
The following table shows a summary of the test results of the Power Spectral Density.

<i>Channel</i>	<i>Ppr (dBm)</i>	<i>Cable Loss (dB)</i>	<i>Ppq (dBm)</i>	<i>Limit (dB)</i>	<i>Margin (dB)</i>
CH 01	-21.04	1.00	-20.04	8.00	-28.04
CH 39	-19.47	1.00	-18.47	8.00	-26.47
CH 78	-20.64	1.00	-19.64	8.00	-27.64

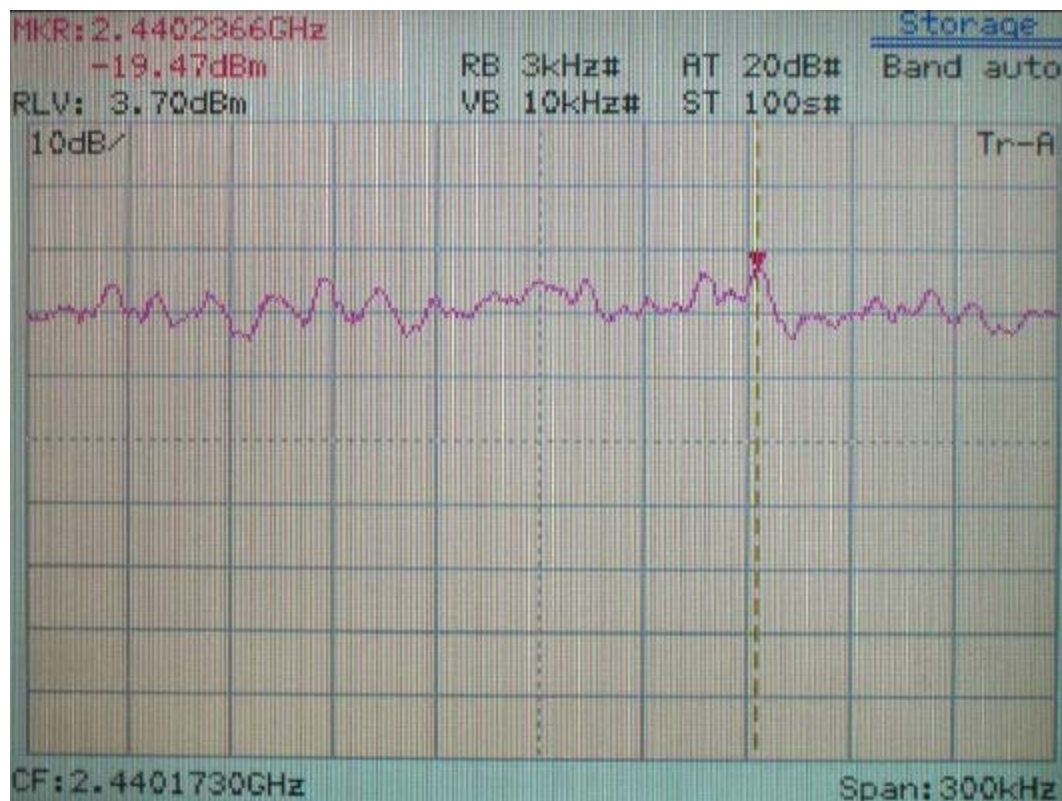
Note:

- The following pages show the results of spectrum reading.
- Ppr: spectrum read power density (using peak search mode),
Ppq: actual peak power density in the spread spectrum band.
- $Ppq = Ppr + |\text{Cable Loss}|$

Power Spectral Density for Channel 01



Power Spectral Density for Channel 39



Power Spectral Density for Channel 78

