MEASUREMENT REPORT
of
Wireless Audio Receiver
(Frequency Hopping Spectrum System)

Applicant	**:**	TopSeed Technology Corp.
EUT	**:**	Wireless Audio Receiver
Model No.	**:**	TSFX-2401
FCC ID	**:**	PTITSFX-2401
Report No.	**:**	AA515060526

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 (1992) as a reference. All test were conducted by ***Training Research Co., Ltd.***, No. 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 Road, Chung Ho City, Taipei Hsien, Taiwan 235
Product Name	**:**	Wireless Audio Receiver
Model Name	**:**	TSFX-2401
FCC ID	**:**	PTITSFX-2401
Report No.	**:**	AA515060526
Test Date	**:**	August 31, 2006 ~ September 22, 2006

Prepared by: Jack Tsai *Jack Tsai* **Approved by:** Frank Tsai *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.

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Federal Communications Commission
Declaration of Conformity
(DoC)

For the Following Equipment:

Product name : Wireless Audio Receiver
Model name : TSFX-2401
Trade name : Topseed

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 : AA515060526

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

Manufacturer	***USA local representative***
Company name: Dong Guan Topseed Electronics Co., Ltd.	To be determined
Computer address: XiZhong Rd., XiTou Country, HouJie Town, Dong Guan City, Ganton, China	
ZIP / Postal code:	
Contact person:	
Title:	
Internet e-mail address: bellkao@jpcco.con.cn	
Tel / Fax: (0769)-85969500 / (0769)-85969522	

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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	**:**	PTITSFX-2401
Product Name	**:**	Wireless Audio Receiver
Model Name	**:**	TSFX-2401
Frequency Range	**:**	2404MHz to 2472MHz
Support Channel	**:**	35 Channels
Channel Spacing	**:**	2 MHz
Modulation Skill	**:**	GFSK
Power Type	**:**	(1) Battery-powered byaaa*2, or (2) USB of Notebook PC or (3) Power adapter Model: JTA0402C-C I/P: 100-240VAC, 50-60Hz, 0.25A； O/P: 5VDC, 1.0A Power cable: (USB cable) 100cm length, shielded, without ferrite core
Data Cable	**:**	USB cable*1: (USB to mini USB) 100cm length, shielded, without ferrite core Audio-out cable*1: 200cm length, non-shielded, Plastic hood, without ferrite core Audio-in cable*1: 214cm length, non-shielded, Plastic hood, without ferrite core

Description of Test Item:

The FCC ID: PTITSGD-2401 together with the FCC ID: PTITSFX-2401 (EUT) is a complete system for one-way wireless digital audio transfer from an audio source to an audio recipient. A 3.5mm jack on the FCC ID: PTITSGD-2401 unit connects to an audio source like e.g. a CD player of notebook PC or MP3 player. A 3.5mm jack on the FCC ID: PTITSFX-2401 (EUT) unit is used for connection to headphones or speakers.

Theory of Operation:

The system is based on one-way wireless digital audio transfer from an audio source to an audio recipient. The application consists of an FCC ID: PTITSGD-2401 (audio source) and an FCCID PTITSFX-2401 (audio receiver). Figure 1 shows the application hardware and communication principle.

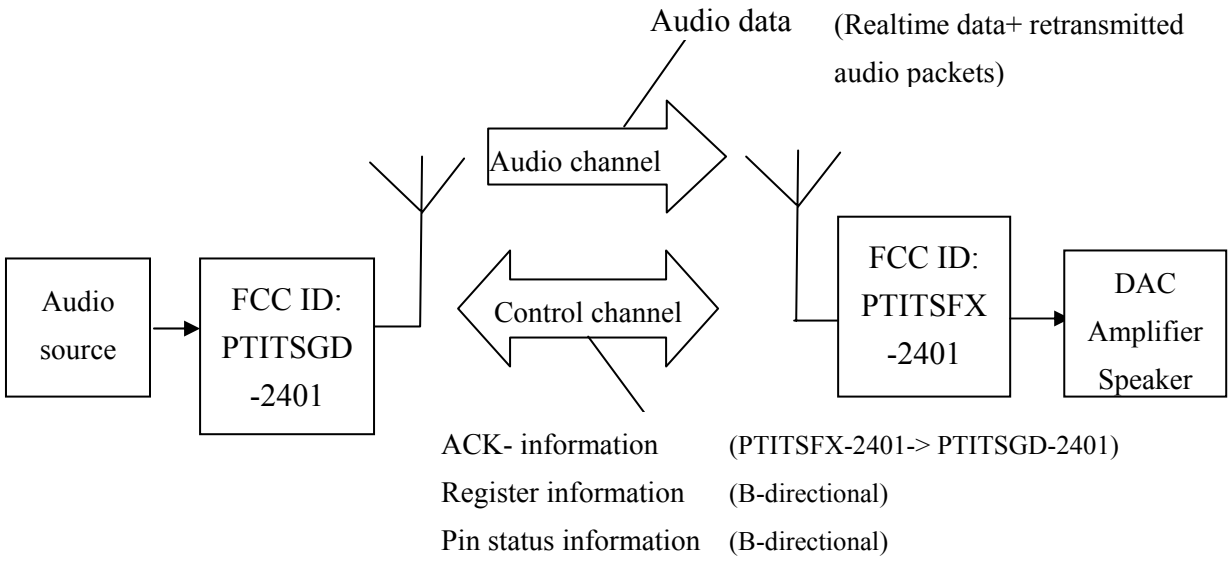


Fig 1. nRF24Z1 (Chip set) based audio streamer application

It is noted that communication between FCC ID: PTITSGD-2401 and FCC ID: PTITSFX-2401 are based on half-duplex transmission, where the following actions take place on a cyclic basis:

1.The FCC ID: PTITSGD-2401 transmits the audio and control data in a data frame to the FCC ID: PTITSFX-2401 (EUT)

(FCC ID: PTITSGD-2401-Transmit, FCC ID: PTITSFX-2401-Receive)

2.The PTITSFX-2401 responds to the PTITSGD-2401 with an ACK-packet

(FCC ID: PTITSFX-2401-Transmit, FCC ID: PTITSGD-2401-Receive)

3.FCC ID: PTITSFX-2401 and FCC ID: PTITSFX-2401 changes frequency according to AFH-algorithm

4.Step 1 thru 3 are repeated

If reception conditions are poor, the FCC ID: PTITSFX-2401 requests retransmission of corrupt audio data packets (their sequence number and ID is relayed back to the FCC ID: PTITSGD-2401 via the ACK-packet). These retransmitted packets are added to the nominal FCC ID: PTITSGD-2401 dataframe illustrated in Figure 2. The application is a FHSS system where only one dataframe is sent at a given frequency location before hopping to the next.

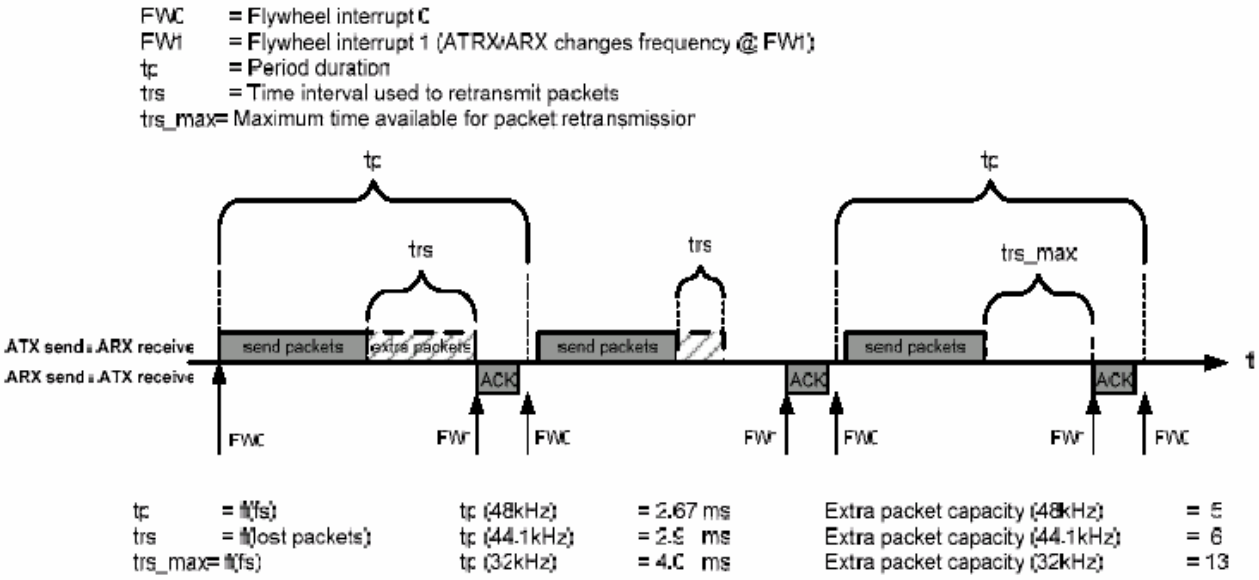


Fig 2. nRF24Z1 half duplex communication principle

1.3 Test method

A) *EUT connected to Notebook by USB cable:*

(1) The POWER jack (Mini USB connector) of EUT is connected with the USB of Notebook PC via a USB cable.
(2) The Line IN jack of EUT is connected with the walkman.
(3) The Line OUT jack of EUT is connected with the speaker.

B) *EUT with AC Adaptor:*

(1) The POWER jack (Mini USB connector) of EUT is connected with the AC power source via a power adaptor.
(2) The Line IN jack of EUT is connected with the walkman.
(3) The Line OUT jack of EUT is connected with the speaker.

Notes: A, B modes were pre-tested, the A mode worst case one, was chosen for final test.

Test setting:

(1) The test fixture is connected to FCC ID: PTITSGD-2401 and setting test channel by cable, and then test fixture is removed which connected to EUT and setting test mode for conducted and radiated of intentional test.
(2) Between EUT and FCC ID: PTITSGD-2401 is linking mode via notebook PC playing audio for conducted and radiated for unintentional test..
(3) Set different channel (CH1/CH18/CH35) being tested and repeat the procedures above.
    (a) Radiated for intentional test:
        making EUT to the mode of continuous TX or RX
    (b) Conducted and radiated for unintentional test:
        making EUT to the linking mode with FCC ID: PTITSGD-2401.

1.4 Description of Support Equipment

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

Notebook PC	**:**	**IBM**
Model No.	:	2373-IMV
Serial No.	:	99R3H1H
FCC ID	:	N/A, DoC (Declaration of Confirmation) Approved
BSMI	:	R33026
DGT	:	92LP0137
Power adaptor	**:**	**IBM**
Part No.	:	08K8202
Serial No.	:	11S08K8202Z1Z6LR459001A REV 06
BSMI	:	D33190
Power type	:	100 ~ 240VAC / 50 ~ 60Hz, 1.5 ~ 0.5A, Switching
Power cord	:	Primary: Non-shielded, 1.0m length, Plastic hood, No ferrite core Secondary: Shielded, 1.84m length, Plastic hood, ferrite core

Printer	**:**	**HP**
Model No.	:	C6464A
Serial No.	:	TH16LEB5PK
FCC ID	:	N/A, DoC Approved
BSMI	:	3892H381
Power type	:	Switching adaptor
Power cord	:	Non-shielded, 173cm long, No ferrite core (between adaptor and AC source) Non-shielded, 180cm long, with ferrite core (between printer and adaptor)
Data cable	:	Shielded, 1.70m long, No ferrite core

Wireless Audio Transmitter : Topseed

Model No.	:	TSGD-2401
FCC ID	:	PTITSGD-2401

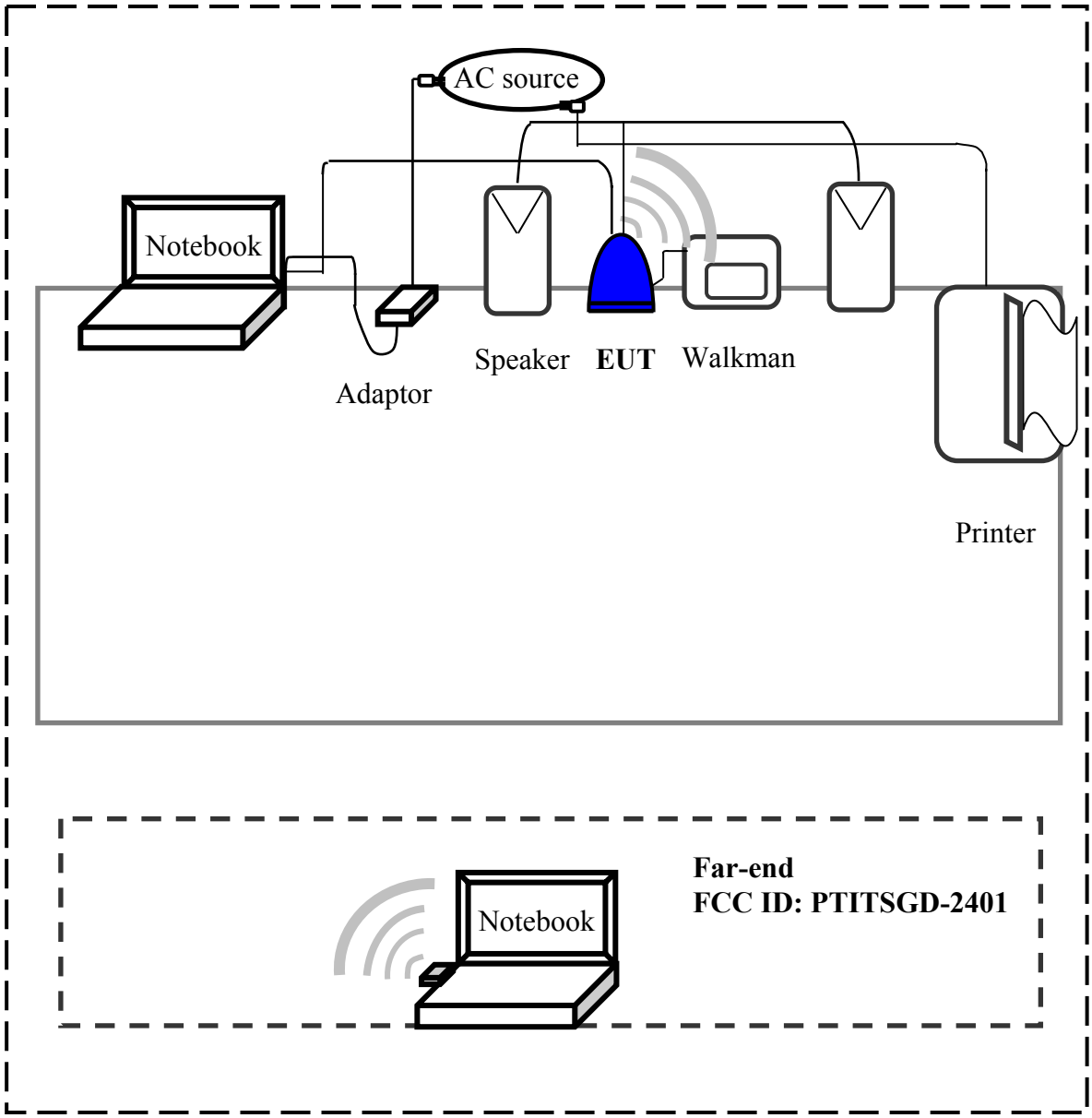
Notebook PC	**:**	**IBM ThinkPad T43**
Model No.	:	2668-IVE
Serial No.	:	L3TGYY
FCC ID	:	N/A, DoC (Declaration of Confirmation) Approved
BSMI	:	R33B65
DGT	:	ETC093LPD0126, CTL093LPD0257
Power adaptor	**:**	**IBM**
Part No.	:	92P1018
Serial No.	:	11S92P1018Z1ZAPU57M9W6 REV: D
BSMI	:	D33030
Power type	:	100 ~ 240VAC / 50 ~ 60Hz, 1.0 ~ 0.4A, Switching
Power cord	:	Primary: Non-shielded, 1.0m length, Plastic hood, No ferrite core Secondary: Shielded, 1.84m length, Plastic hood, ferrite core

Walkman	**:**	**A.S.**
Serial No.	:	96371
Model No.	:	AS-390
Power type	:	Batteries by DC 3V
Data Line	:	Non-shielded, 214cm length, Plastic hood, without ferrite core

Speaker	**:**	**KINYO**
Part No.	:	PS-285
Serial No.	:	8807145
BSMI	:	4903A002
Power type	:	120VAC / 60Hz, 100mA
Power cord	:	Non-shielded, 139cm length, Plastic hood, without ferrite core
Data Line	:	Speaker to Speaker– Non-shielded, 96cm length, Plastic hood, without ferrite core. Speaker to Audio out– Non-shielded, 118cm length, Plastic hood, without ferrite core.

1.5 Configuration of System Under Test

1.5.1 Conducted and Radiated of test mode A



Connections of Equipment

Notebook: *Parallel Port --- a printer

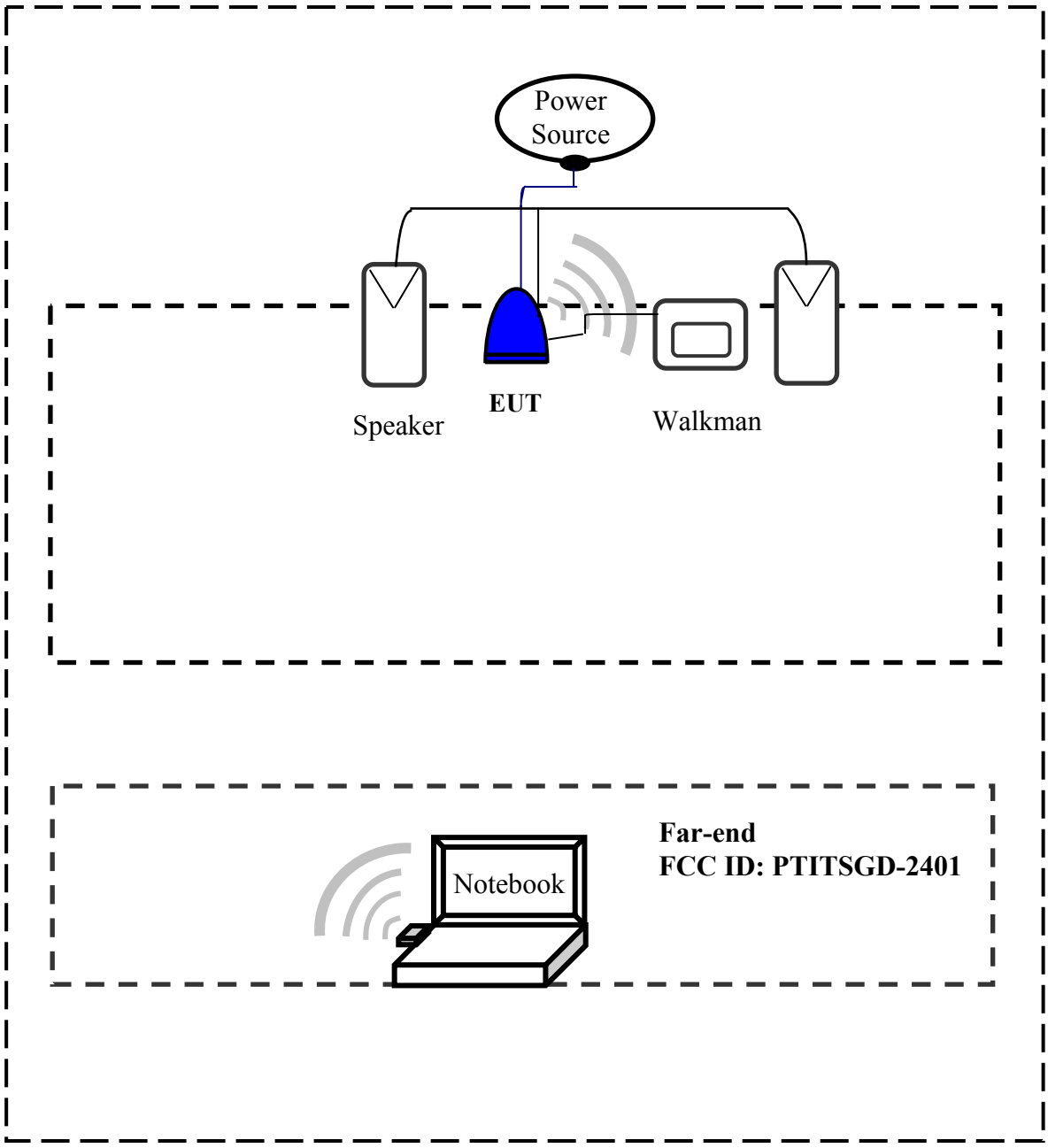
*USB Port --- **EUT**

EUT:

Line In: * Line In Port --- a walkman

Line Out: * Line Out Port --- a speaker

1.5.2 Conducted and Radiated of test mode B



1.6 Verify the Frequency and Channel

CH	0	1	2	3	4	5	6	7	8	9
0		2404	2406	2408	2410	2412	2414	2416	2418	2420
1	2422	2424	2426	2428	2430	2432	2434	2436	2438	2440
2	2442	2444	2446	2448	2450	2452	2454	2456	2458	2460
3	2462	2464	2466	2468	2470	2472				

Note:

1. This is for confirming that all frequencies are in 2.404GHz to 2.472GHz.
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 2.404GHz to 2.472GHz. So all the items as followed in testing report are need to test these three frequencies:
   Top: Channel – 01; Middle: Channel – 18; Bottom: Channel – 35.

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.

There is a test condition apply in this test item, the test procedure description as <1.3 test method>. Three channels were tested, one in the top (CH1), one in the middle (CH18) and the other in bottom (CH35).

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

The EUT equipped with a USB interface and should be operated with the computer. It was categorized to *Class B personal computers and peripherals* as cannot be operated stand-alone. The authorization requires **Declaration of Conformity (DoC)** and the items required such as Section 15.107 (Conducted limits) and Section 15.109 (Radiated emission limits) is same as Section 15.207 and 15.247(C).

III. Section 15.203: Antenna requirement

The EUT has an integrated antenna permanently attached on the PCB, which inside the housing. In addition, there is no external antenna or connector employed. The antenna requirement stated in Sect.15.203 is inapplicable to this EUT.

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

4.1 Test Condition & Setup

The power line conducted emission measurements were performed in an anechoic chamber. The EUT was assembled on a wooden table, which is 80 centimeters high, was placed 40 centimeters from the backwall and at least 1 meter from the sidewall.

Power was fed to the EUT from the public utility power grid through a line filter and Line Impedance Stabilization Networks (LISNs). The LISN housing, measuring instrumentation case, ground plane, etc., were electrically bonded together at the same RF potential. The Spectrum analyzer (or EMI receiver) was connected to the AC line through an isolation transformer. The 50-ohm output of the LISN was connected to the spectrum analyzer directly. Conducted emission levels were in the CISPR quasi-peak and average detection mode. The analyzer's 6 dB bandwidth was set to 9 KHz. No post-detector video filter was used.

The spectrum was scanned from 150KHz to 30MHz. The physical arrangement of the test system and associated cabling 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 and frequency. All spurious emission frequencies were observed. The highest emission amplitudes relative to the appropriate limit were measured and have been recorded in paragraph 4.3

There is a test condition apply in this test item, the test procedure description as <1.3 test method>. Three channels were tested, one in the top (CH1), one in the middle (CH18) and the other in bottom (CH35).

4.2 List of Test Instruments

Calibration Date

Instrument Name	Model	Brand	Serial No.	Next time
EMI Receiver	8546A	HP	3520A00242	09/06/07
RF Filter Section	85460A	HP	3448A00217	09/06/07
LISN (EUT)	LISN-01	TRC	99-05	12/10/06
LISN (Support E.)	LISN-01	TRC	9912-03, 04	11/26/06
Pre-amplifier	15542 ZFL-500	Mini – Circuits	0 0117	05/20/07
6dB Attenuator	MCL BW-S6W2	Mini – Circuits	9915 – Conducted	05/20/07
10dB Attenuator	A5542 VAT010	Mini – Circuits	0215 – Conducted	05/20/07
Coaxial Cable (2 meter)	A30A30-0058-50FS-2M	Jyebao	SMA-08	05/20/07
Coaxial Cable (1.1 meter)	A30A30-0058-50FS-1M	Jyebao	SMA-09	05/20/07
Coaxial Cable (20 meter)	RG-214/U	Jyebao	NP-01	05/20/07
Coaxial Cable (20 meter)	RG-214/U	Jyebao	NP-02	05/20/07
Auto Switch Box (< 30MHz)	ASB-01	TRC	9904-01	05/20/07

4.3 Test Results of Conducted Emissions

The following table shows a summary of the highest emissions of power line conducted emissions on the LIVE and NETURAL conductors of the EUT power cord. The test data only recorded worst case in report.

Test Conditions: Temperature : 25.0 °C Humidity : 73.0 % RH

Test Mode: RX

Power Connected Emissions					***FCC Class B***		
Conductor	***Frequency (KHz)***	***Peak (dBμV)***	***QP (dBμV)***	***Average (dBμV)***	***QP-limit (dBμV)***	***AVG-limit (dBμV)***	***Margin (dB)***
Line 1	182.000	45.16	---	---	65.09	55.09	-9.93
	240.000	45.69	---	---	63.43	53.43	-7.74
	364.650	55.47	52.75	36.62	59.83	49.83	-7.08
	544.255	46.78	43.76	27.73	56.00	46.00	-12.24
	1088.840	46.73	43.44	26.41	56.00	46.00	-12.56
	1629.000	41.81	---	---	56.00	46.00	-4.19
	3189.000	37.33	---	---	56.00	46.00	-8.67
	6170.000	30.55	---	---	60.00	50.00	-19.45
	24320.000	32.07	---	---	60.00	50.00	-17.93
Line 2	177.000	42.45	---	---	65.23	55.23	-12.78
	240.000	44.95	---	---	63.43	53.43	-8.48
	363.945	56.94	52.73	40.98	59.91	49.91	-7.18
	481.215	48.23	43.27	30.85	56.57	46.57	-13.30
	1090.325	47.29	43.29	30.06	56.00	46.00	-12.71
	1682.815	45.07	30.63	15.94	56.00	46.00	-25.37
	5910.000	30.41	---	---	60.00	50.00	-19.59
	23960.000	31.05	---	---	60.00	50.00	-18.95

NOTE:

(1)Margin = Peak Amplitude – Limit, *The reading amplitudes are all under limit.*

(2)A "+" sign in the margin column means the emission is OVER the Class B Limit and "–" sign of means UNDER the Class B limit

Test Mode: CH01

Power Connected Emissions					*FCC Class B*		
Conductor	***Frequency (KHz)***	***Peak (dBμV)***	***QP (dBμV)***	***Average (dBμV)***	***QP-limit (dBμV)***	***AVG-limit (dBμV)***	***Margin (dB)***
Line 1	180.000	45.97	---	---	65.14	55.14	-9.17
	363.455	56.48	54.48	45.38	60.03	50.03	-4.65
	664.310	49.06	45.26	35.18	56.00	46.00	-10.74
	1086.905	47.13	43.69	33.45	56.00	46.00	-12.31
	1566.000	41.58	---	---	56.00	46.00	-4.42
	2286.000	41.88	---	---	56.00	46.00	-4.12
	4571.000	36.65	---	---	56.00	46.00	-9.35
	10030.000	41.23	---	---	60.00	50.00	-8.77
	24800.000	33.08	---	---	60.00	50.00	-16.92
Line 2	180.000	42.14	---	---	65.14	55.14	-13.00
	363.990	53.41	50.84	39.49	59.91	49.91	-9.07
	663.665	45.44	41.72	28.71	56.00	46.00	-14.28
	1145.755	44.04	39.93	27.43	56.00	46.00	-16.07
	1566.000	40.28	---	---	56.00	46.00	-5.72
	2051.000	40.40	---	---	56.00	46.00	-5.60
	4809.000	33.95	---	---	56.00	46.00	-12.05
	11000.000	41.39	---	---	60.00	50.00	-8.61
	24560.000	32.67	---	---	60.00	50.00	-17.33

Test Mode: CH18

Power Connected Emissions					*FCC Class B*		
Conductor	***Frequency (KHz)***	***Peak (dBμV)***	***QP (dBμV)***	***Average (dBμV)***	***QP-limit (dBμV)***	***AVG-limit (dBμV)***	***Margin (dB)***
Line 1	182.000	45.30	---	---	65.09	55.09	-9.79
	300.000	48.07	---	---	61.71	51.71	-3.64
	362.370	56.27	54.23	46.41	59.91	49.91	-3.50
	602.635	46.31	43.19	34.21	56.00	46.00	-11.79
	724.135	48.85	45.00	35.10	56.00	46.00	-10.90
	1147.015	45.93	42.74	33.95	56.00	46.00	-12.05
	1505.790	45.81	41.05	30.72	56.00	46.00	-14.95
	1994.000	41.32	---	---	56.00	46.00	-4.68
	4571.000	37.19	---	---	56.00	46.00	-8.81
Line 2	180.000	41.67	---	---	65.14	55.14	-13.47
	363.585	52.75	50.40	39.98	59.91	49.91	-9.51
	662.945	44.60	41.40	30.10	56.00	46.00	-14.60
	1081.000	42.00	---	---	56.00	46.00	-4.00
	1503.000	41.58	---	---	56.00	46.00	-4.42
	2415.000	37.33	---	---	56.00	46.00	-8.67
	5360.000	30.34	---	---	60.00	50.00	-19.66
	24560.000	34.71	---	---	60.00	50.00	-15.29

Test Mode: CH35

Power Connected Emissions					*FCC Class B*		
Conductor	***Frequency (KHz)***	***Peak (dBμV)***	***QP (dBμV)***	***Average (dBμV)***	***QP-limit (dBμV)***	***AVG-limit (dBμV)***	***Margin (dB)***
Line 1	180.000	45.86	---	---	65.14	55.14	-9.28
	301.685	50.61	46.57	34.84	61.66	51.66	-15.09
	363.185	56.27	54.44	46.32	60.03	50.03	-3.71
	644.835	48.55	45.48	36.00	56.00	46.00	-10.00
	1085.555	46.99	43.84	34.24	56.00	46.00	-11.76
	1566.810	47.36	42.67	32.08	56.00	46.00	-13.33
	4619.000	36.84	---	---	56.00	46.00	-9.16
	12250.000	32.29	---	---	60.00	50.00	-17.71
	23960.000	33.88	---	---	60.00	50.00	-16.12
Line 2	182.000	41.28	---	---	65.09	55.09	-13.81
	362.510	53.06	50.86	39.88	60.03	50.03	-9.17
	724.000	42.52	---	---	56.00	46.00	-3.48
	1198.000	41.19	---	---	56.00	46.00	-4.81
	1503.000	41.74	---	---	56.00	46.00	-4.26
	2532.000	37.75	---	---	56.00	46.00	-8.25
	4249.000	33.13	---	---	56.00	46.00	-12.87
	24560.000	33.95	---	---	60.00	50.00	-16.05

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

Based on the Section 2.1, *Frequency Hopping Spectrum System* is a spread spectrum system in which the carrier has been modulated by a *high speed spreading code* and an *information data stream* with its *known hopping algorithm* and *avoidance method.* 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 base-band processor employed by the EUT, shows that which is a complete FHSS base-band processor and meets the definition of the *Frequency Hopping Spectrum System.*

VI. Section 15.247(a)(1): Carrier Frequency Separation

6.1 Test Condition

The EUT must have its hopping function enabled. Use the following spectrum analyzer setting

Span = wide enough to capture the peaks of two adjacent channels

Resolution (or IF) bandwidth (RBW) ≧ 1% of the span

Video (or Average) Bandwidth (VBW) ≧ RBW

Sweep = Auto

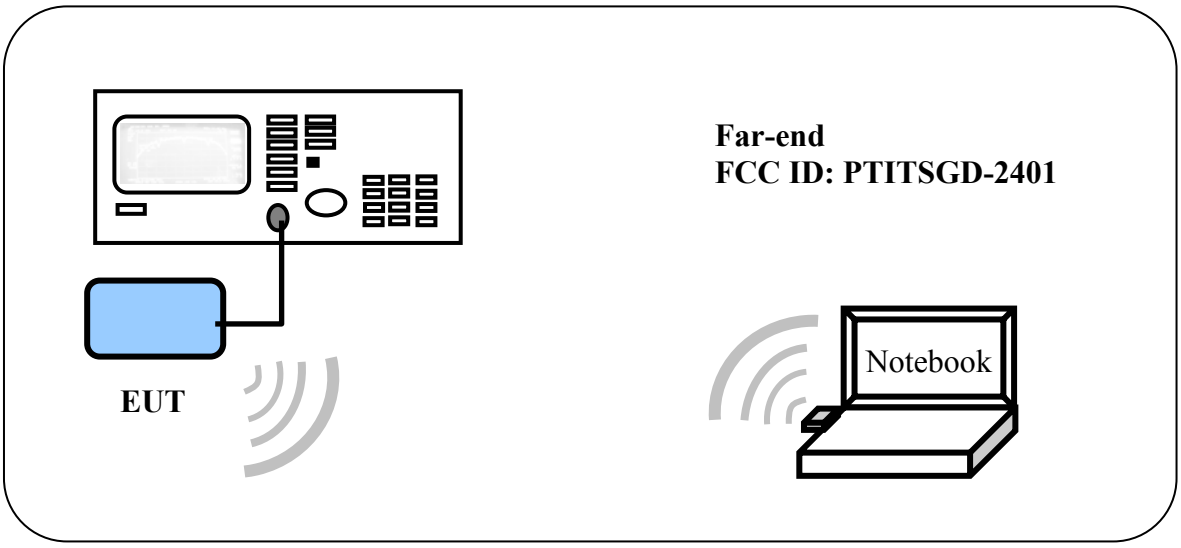
Detector Function = peak

Trace = max hold

Setting up procedure is written on 1.3 test method.

Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channel. The limit is specified in one of the subparagraphs of this section. Submit this plot.

6.2 Test Instruments Configuration



Test Configuration of carrier frequency separation

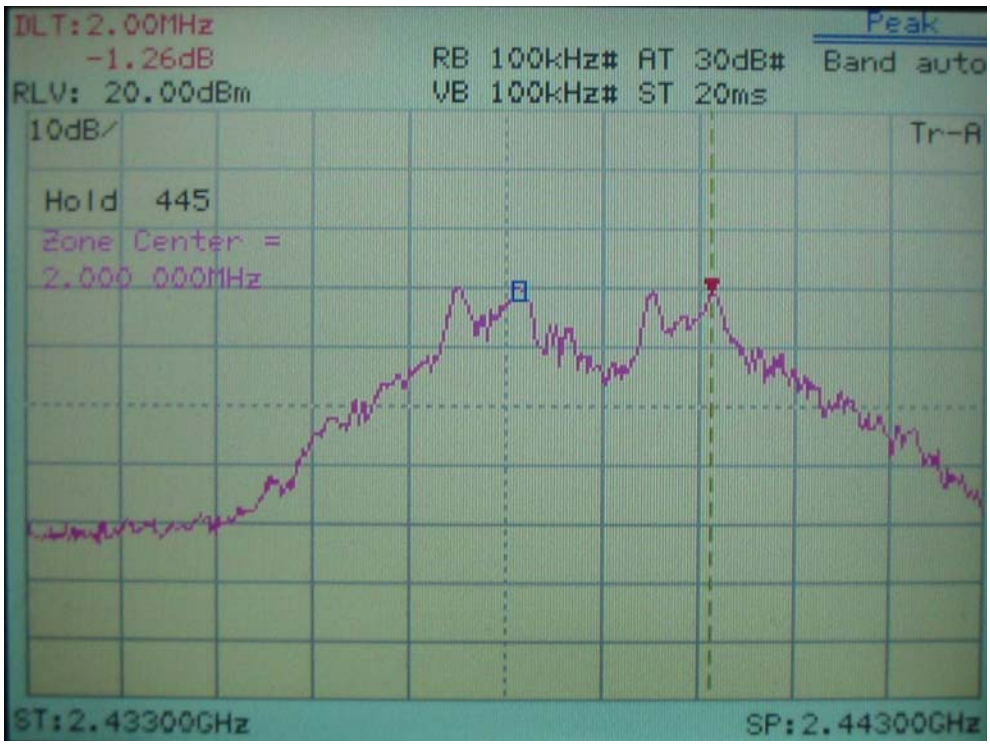
6.3 List of Test Instruments

Instrument Name	Model No.	Brand	Serial No.	Next time
Spectrum Analyzer	MS2665C	ANRITSU	6200175476	11/15/06

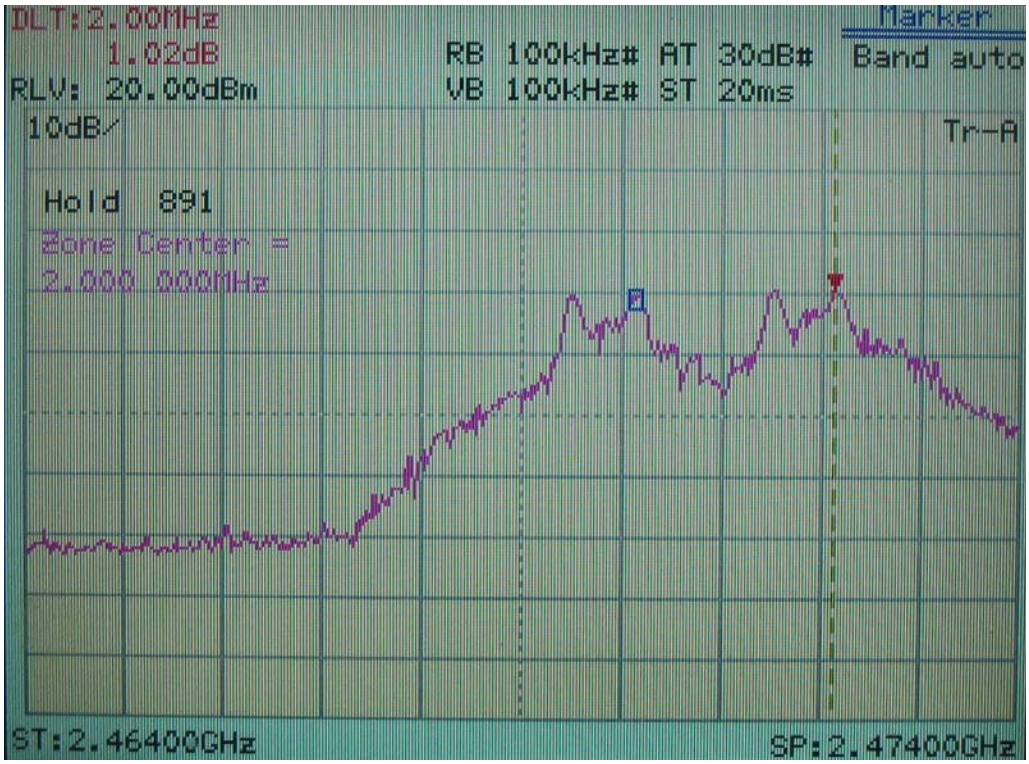
6.4 Test Results

Channel	Separation (MHz)	20dB bandwidth (MHz)	Limit: >25kHz or 2/3 of the 20dB bandwidth (MHz)
01	2.00	2.17	1.45
18	2.00	2.33	1.55
35	2.00	2.24	1.49

Channel 01



Channel 18


DLT:2.00MHz
1.02dB
RLV: 20.00dBm
RB 100kHz# AT 30dB#
VB 100kHz# ST 20ms
Marker
Band auto
10dB/
Tr-A
Hold 891
Zone Center =
2.000 000MHz
ST:2.46400GHz
SP:2.47400GHz

Channel 35

Ⅶ. Section 15.247(a)(1)(ii) Number of Hopping Frequencies

7.1 Test Condition

The EUT must have its Hopping function enabled. Use the following spectrum analyzer setting:

Span = the frequency band of operation

RBW ≧ 1% of the span

VBW ≧ RBW

Sweep = auto

Detector function = peak

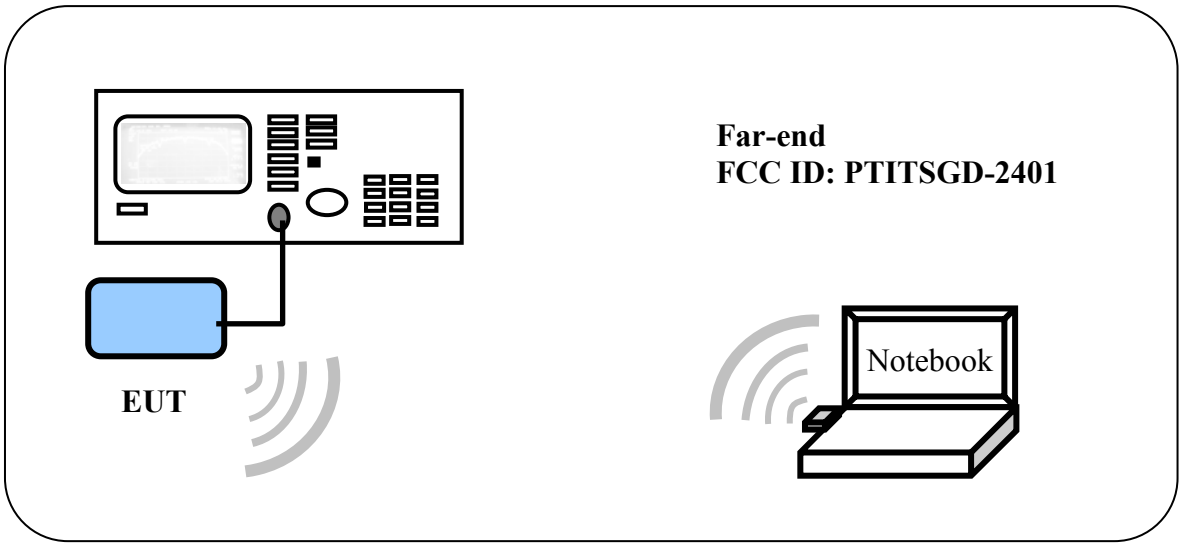
Trace = max hold

Allow the trace to stabilize. It may prove necessary to break the span up to sections. In order to clearly show all of the hopping frequencies. The limit is specified in one of the subparagraphs of this section. Submit this plots.

7.2 List of Test Instruments

				Calibration Date
Instrument Name	Model No.	Brand	Serial No.	Next time
Spectrum Analyzer	MS2665C	ANRITSU	6200175476	11/15/06

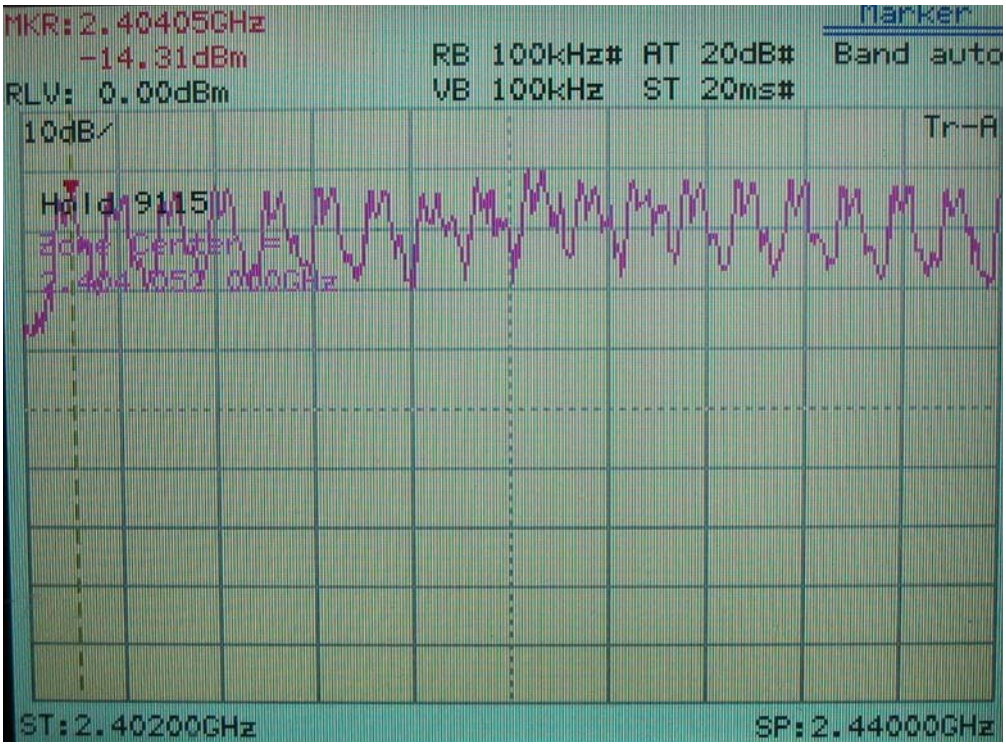
7.3 Test Instruments Configuration

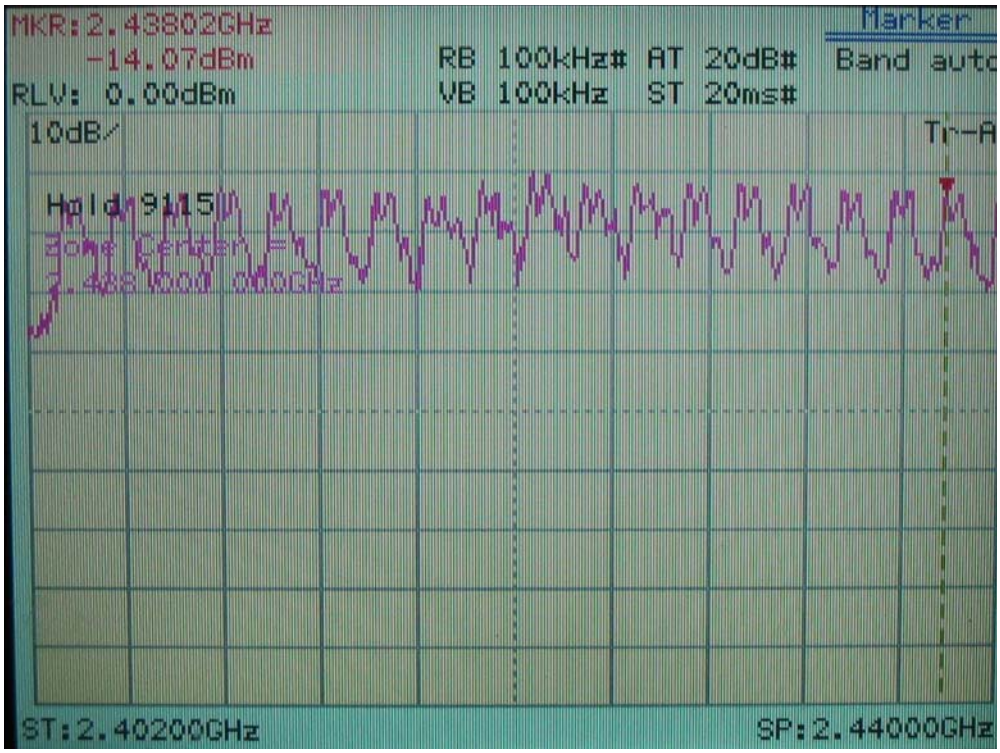


Test Configuration for number of hopping frequencies

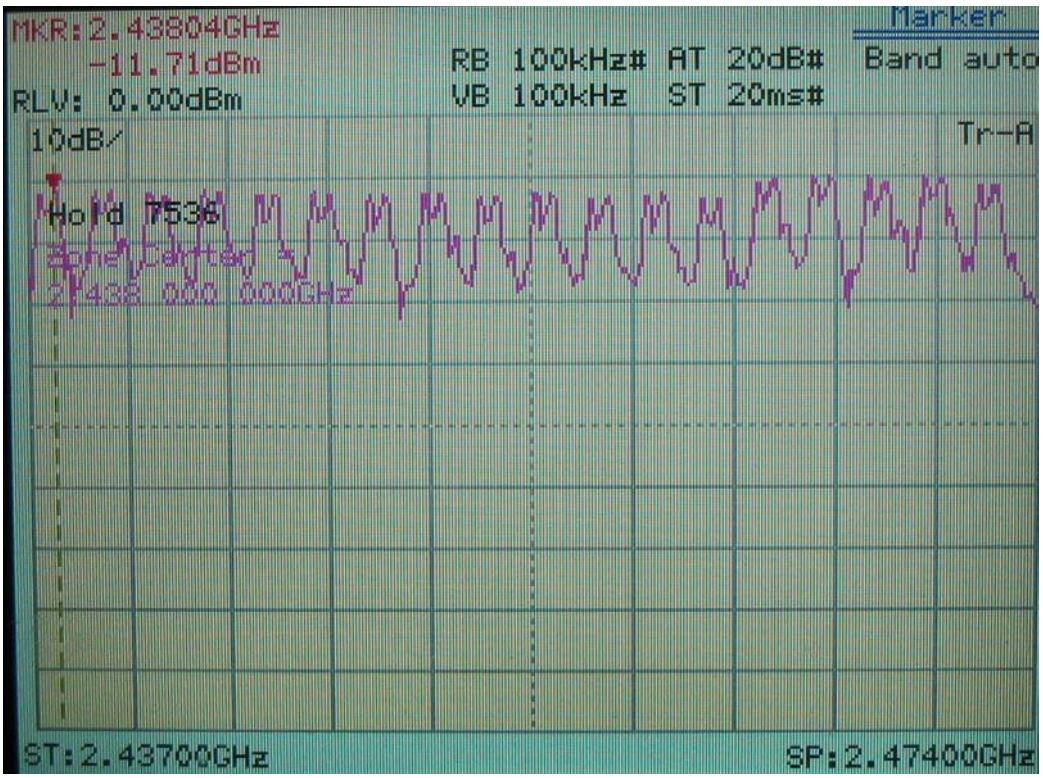
7.4 Test Results

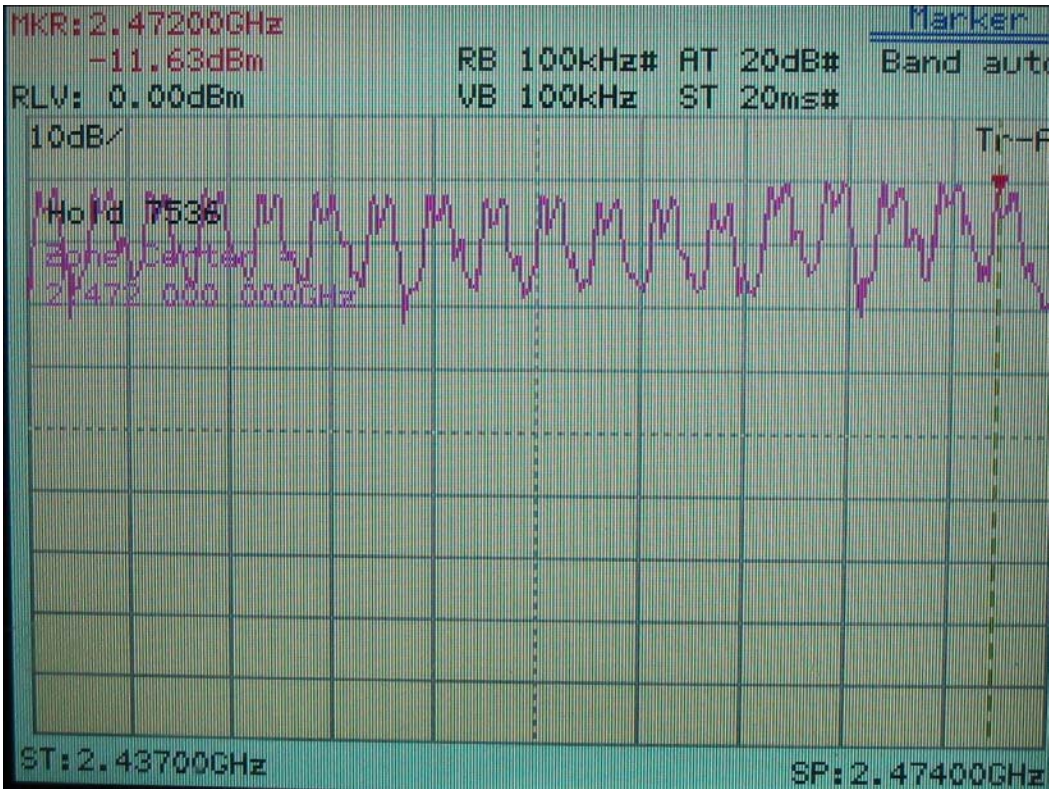
Frequency: 2404 ~ 2440





Frequency: 2437 ~ 2472





VIII. Section 15.247(a)(1)(ii) Time of Occupancy

8.1 Test Condition

The EUT must have its hopping function enabled. Use the following spectrum analyzer setting:

Span = zero span, centered on a hopping channel

RBW = 1M

VBW ≧ RBW

Sweep = as necessary to capture the entire dwell time per hopping channel

Detector function = peak

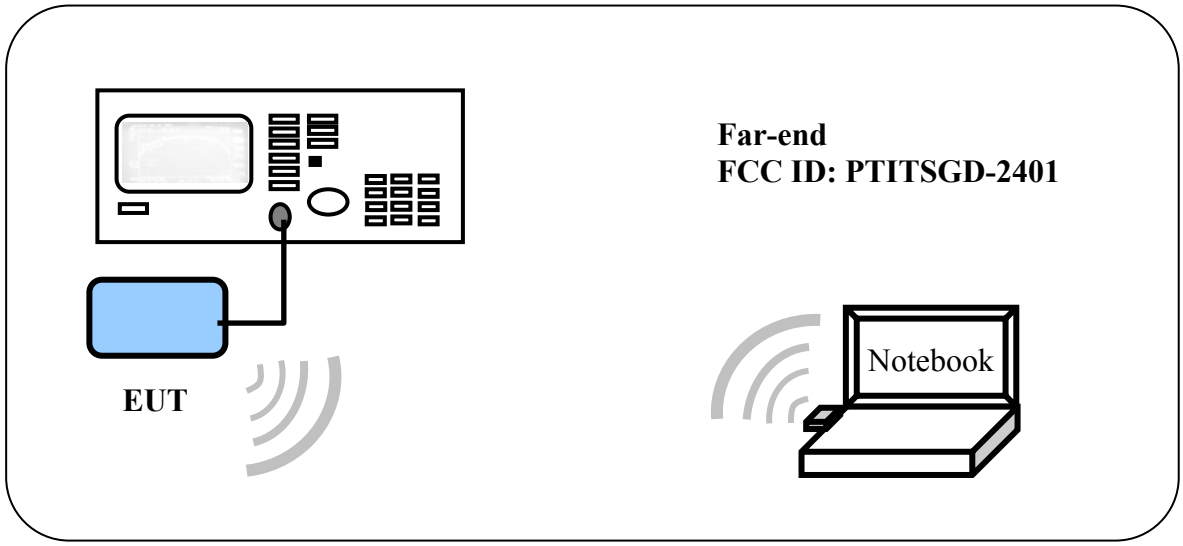
Trace = max hold

If possible, use the marker-delta function to determine the dwell time. If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation. The limit is specified in one of the subparagraphs of this section. Submit this plot(s). An oscilloscope may be used instead of a spectrum analyzer.

8.2 List of Test Instruments

				Calibration Date
Instrument Name	Model No.	Brand	Serial No.	Next time
Spectrum Analyzer	MS2665C	ANRITSU	6200175476	11/15/06

8.3 Test Instruments Configuration



8.4 Test Results

RF burst pr channel: 171.0 μs

Time between each RF burst on same RF channel: 53.4 ms

Show as following page.

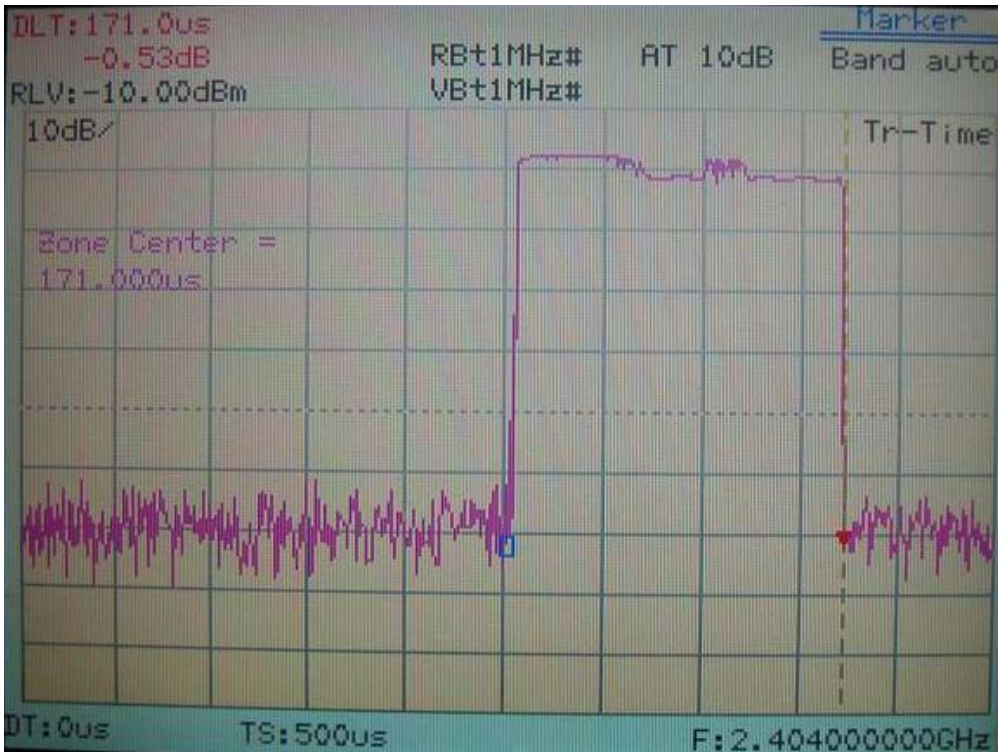
Number of channel: 35

Time of occupancy ((171.0 μs / 53.4 ms) * 0.4s *35) s = 0.045 sec

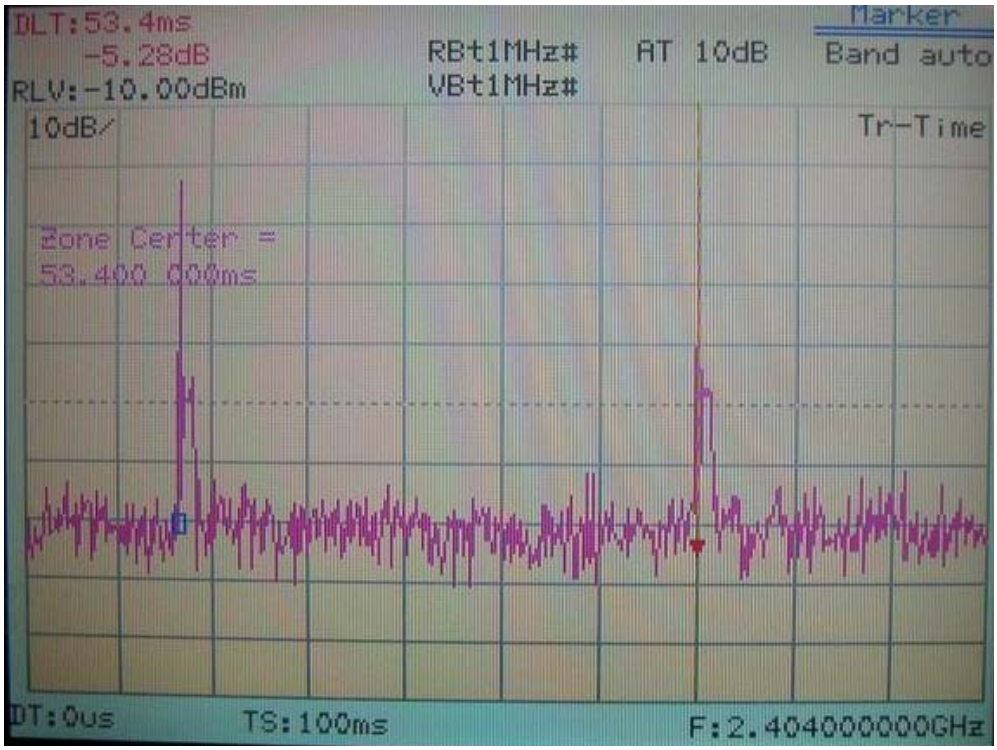
Requirements:

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. No requirements for Digital Transmission Systems.

RF burst pr channel：



Time between each RF burst on same RF channel:



IX. Transmitter Duty Cycle Measurements

9.1 Test Condition and Setup

The duty cycle measurements were performed in a shielded enclosure. The EUT was placed on a wooded table which is 0.8 meters height and a bi-log periodic antenna was used distance about 3 meters for receiving. While testing EUT was set to transmit continuously. Various key configurations were also investigated to find the maximum duty cycle.

The resolution bandwidth and video bandwidth of the spectrum analyzer was all set to 1MHz to encompass all significant spectral components during the test. The analyzer operated in linear scale and zero span mode after tuning to the transmitter carrier frequency. The spectrum analyzer measured pules width. The pulse width was determined by the difference between the two half voltage points on a pulse.

The duty cycle was determined by the following equation:

$$\text{Duty Cycle (\%)} = \frac{\text{Total on interval in a complete pulse train}}{\text{Length of a complete pulse train}} \text{ X } 100\%$$

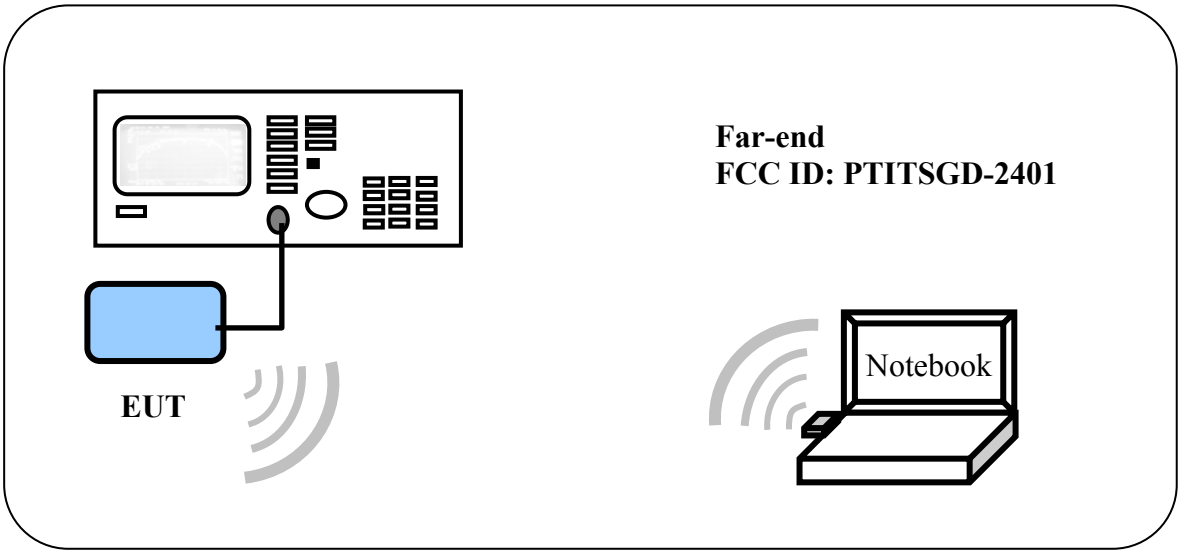
To calculate the actual field intensity, the duty cycle correction factor in decibel is needed for later use and be obtained from following conversion:

Duty Cycle Correction Factor (dB) = 20 X Log_{10} Duty Cycle

9.2 List of Test Instruments

				Calibration Date
Instrument Name	Model No.	Brand	Serial No.	Next time
Spectrum Analyzer	MS2665C	ANRITSU	6200175476	11/15/06

9.3 Test Instruments Configuration



9.4 Test Result

Following is the test result, which produce maximum duty cycle:

Total on interval in a complete pulse train

= 169μs

Length of a complete pulse train

= 2.65ms

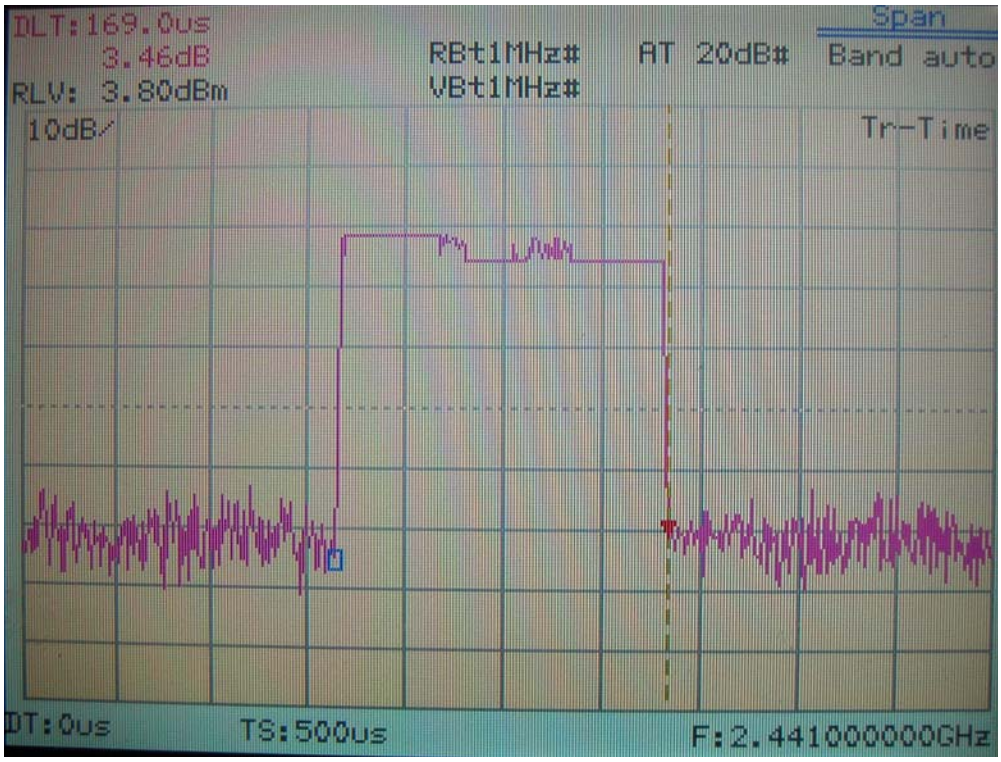
Duty Cycle (%) = 0.169ms / 2.65ms * 100% = 0.064

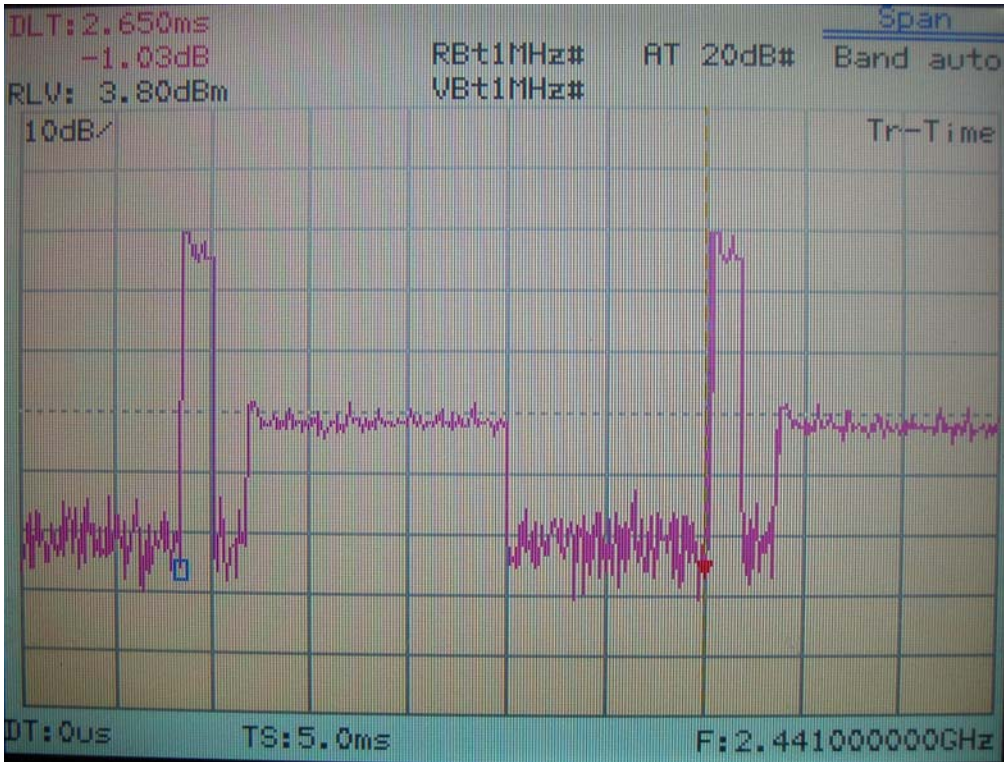
Duty Cycle Correction Factor (dB) = 20 * Log (0.064) = -23.88

Maximum duty cycle according to FCC part 15.35(b): -20dB

A plot is attached on the following page.

Duty Cycle Test Picture





X. Section 15.247(a)(1)(ii) 20dB Bandwidth

10.1 Test Condition

Use the following spectrum analyzer setting:

Span = the frequency band of operation

RBW ≧ 1% of the emission bandwidth

VBW ≧ RBW

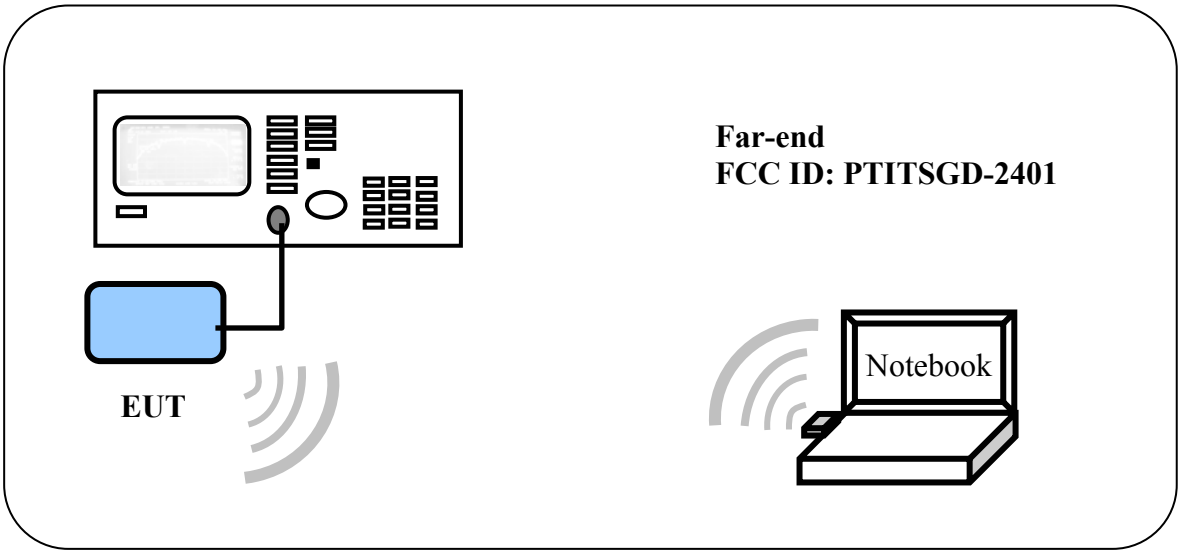
Sweep = auto

Detector function = peak

Trace = max hold

The EUT should be transmitting at its maximum data rate. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of emission. Use the marker-delta function to measure 20dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 20dB bandwidth of the emission. If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation. The limit is specified in one of the subparagraphs of this section. Submit this plot(s).

10.2 Test Instruments Configuration



Test Configuration of Bandwidth for Frequency Hopping Spread Spectrum System

10.3 List of Test Instruments

Calibration Date

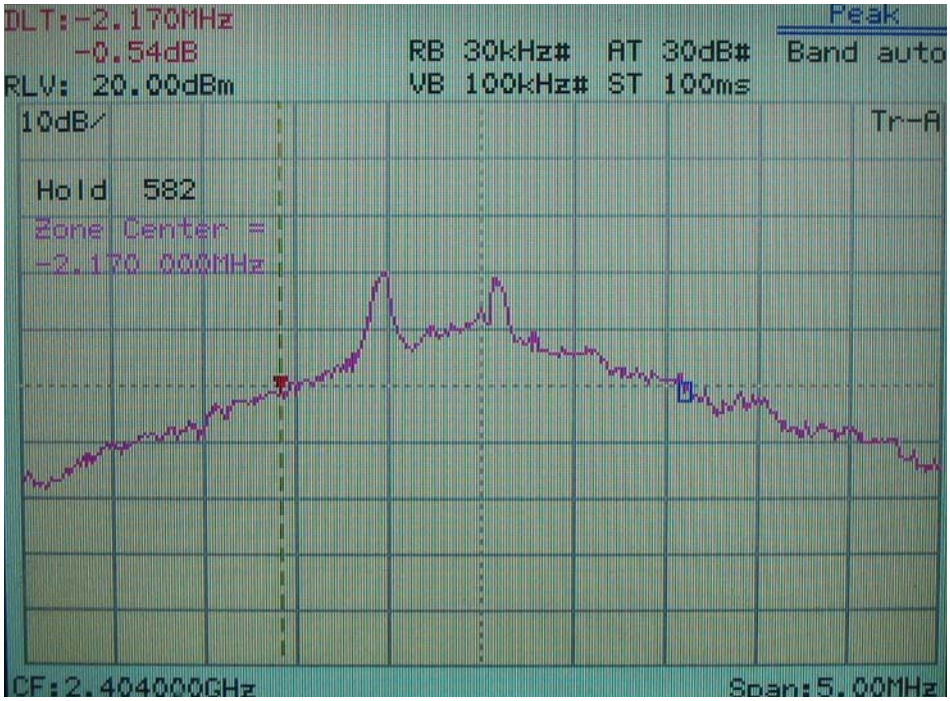
Instrument Name	Model No.	Brand	Serial No.	Next time
Spectrum Analyzer	MS2665C	ANRITSU	6200175476	11/15/06

10.4 Test Results

Channel	20dB Bandwidth
01	2.17 MHz
18	2.33 MHz
35	2.24 MHz

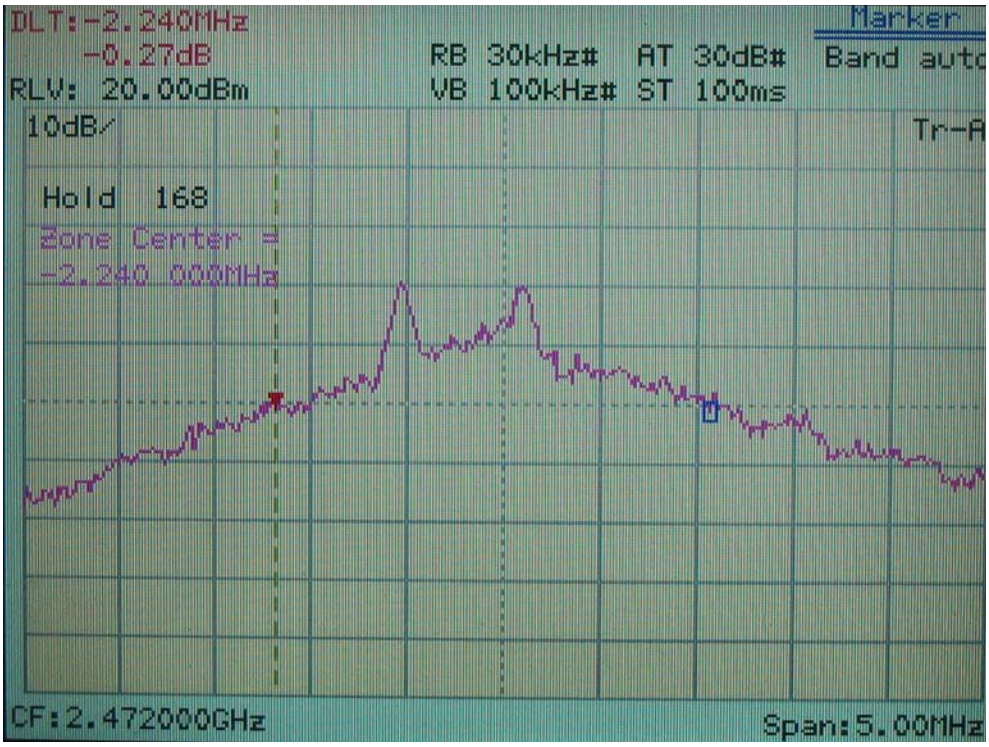
Note: The data in the above table are summarizing the following attachment spectrum analyzer.

Bandwidth of Channel 1:



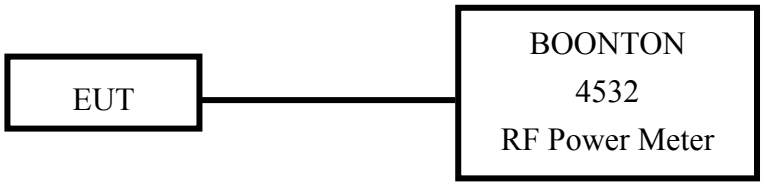
Bandwidth of Channel 18:

Bandwidth of Channel 35:



XI. Section 15.247(b) Peak Output Power

11.1 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.

11.2 List of Test Instruments

				Calibration Date
Instrument Name	Model	Brand	Serial No.	Next time
RF Power Meter	4532	BOONTON	117501	05/18/07
Peak Power Sensor	57340	BOONTON	2698	05/18/07

11.3 Test Result

Formula:
RF output power of EUT + |Cable loss| = Output peak power

Channel	**RF Output**	**Cable Loss**	**Output Peak Power**	
	dBm	**dBm**	**dBm**	**mW**
CH01	7.726	1.00	8.73	7.46
CH18	8.297	1.00	9.30	8.51
CH35	8.923	1.00	9.92	9.82

XII. Section 15.247(c) Band-edge Compliance

12.1 Test Condition

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)*

12.2 List of Test Instruments

Instrument Name	Model No	Brand	Serial No.	Next time
Spectrum Analyzer	8564E	H P	3720A00840	11/07/06
Microwave Preamplifier	84125C	HP	US36433002	11/07/06
Horn Antenna	3115	EMCO	9704 – 5178	01/26/07

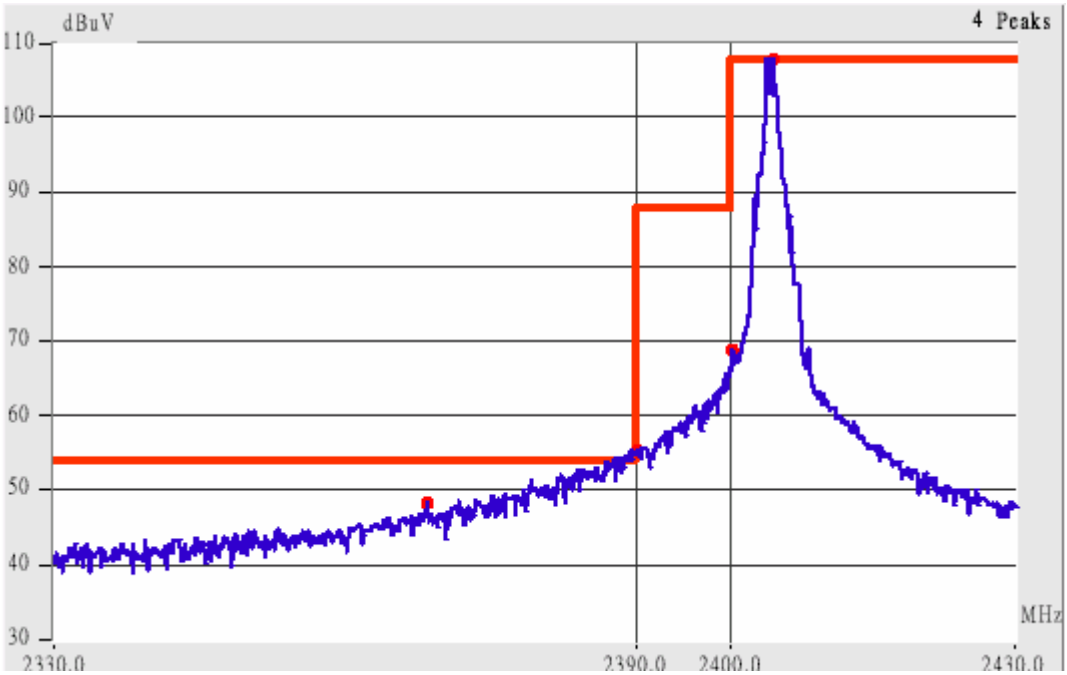
12.3 Test Instruments Configuration

Same as section 13.1.

12.4 Test Result of the Bandedge

The following pages show our observations referring to the channel 1 and 35 respectively.

Lowest

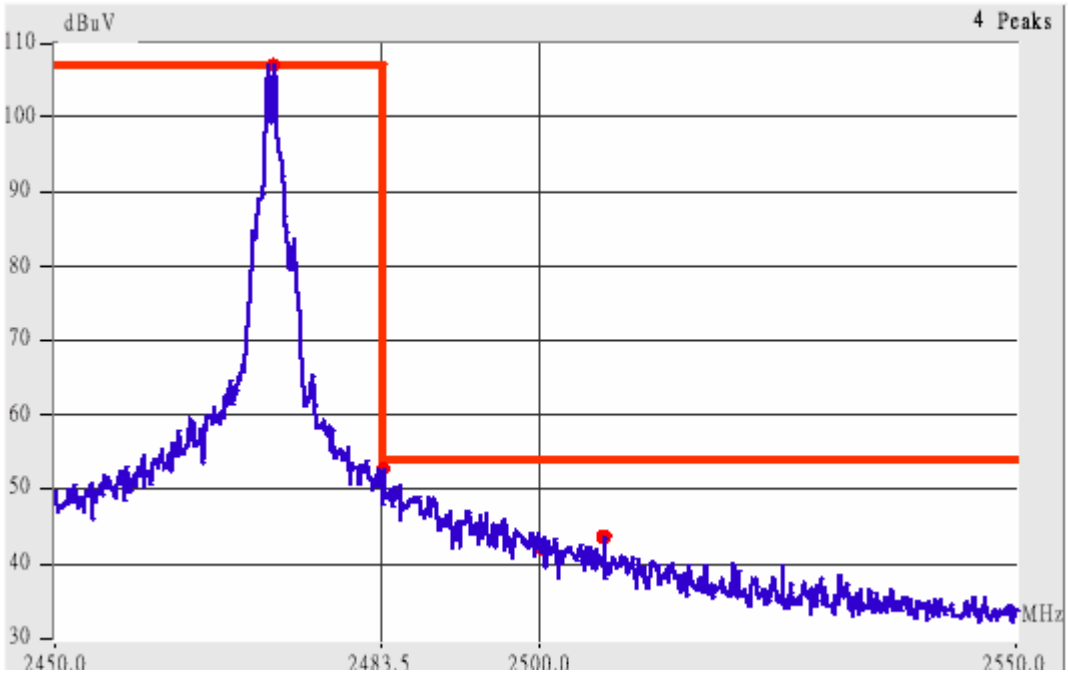


This is the hard copy of our bandedge measurement generated by our bandedge testing program. The plot shown above is the bandedge of channel 1.

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				*CF*	*Peak Value*	*Duty Cycle*	*True Value*	*FCC Class B*	
Frequency (MHz)	Ant. P.	Ant. H. (m)	Angle	(dB)	(dBμV/m)	(dB)	(dBμV/m)	Limit (Avg.) (dBμV/m)	Margin (dB)
2386.01	Hor	1.00	73	9.17	69.17	-20.00	49.17	53.96	-4.79
2390.02	Hor	1.00	109	9.18	69.68	-20.00	49.68	53.96	-4.28
2386.17	Ver	1.00	38	9.17	62.67	-20.00	42.67	53.96	-11.29
2390.02	Ver	1.00	24	9.18	64.02	-20.00	44.02	53.96	-9.94

Highest



This is the hard copy of our bandedge measurement generated by our bandedge testing program. The plot shown above is the bandedge of channel 35.

3. The lobe left 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				*CF*	*Peak Value*	*Duty Cycle*	*True Value*	*FCC Class B*	
Frequency (MHz)	Ant. P.	Ant. H. (m)	Angle	(dB)	(dBμV/m)	(dB)	(dBμV/m)	Limit (Avg.) (dBμV/m)	Margin (dB)
2483.50	Hor	1.00	220	9.44	67.61	-20.00	47.61	53.96	-6.35
2488.69	Hor	1.00	287	9.46	67.29	-20.00	47.29	53.96	-6.67
2500.01	Hor	1.00	288	9.49	61.82	-20.00	41.82	53.96	-12.14
2511.73	Hor	1.00	282	9.51	58.51	-20.00	38.51	53.96	-15.45
2483.50	Ver	1.00	272	9.44	56.11	-20.00	36.11	53.96	-17.85
2487.12	Ver	1.00	349	9.45	59.12	-20.00	39.12	53.96	-14.84
2500.01	Ver	1.00	339	9.49	48.16	-20.00	28.16	53.96	-25.80
2506.95	Ver	1.00	348	9.50	50.50	-20.00	30.50	53.96	-23.46

XIII. Section 15.247(c) Spurious Radiated Emissions

13.1 Test Condition and 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 30 MHz to 1000 MHz 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, stand on three orthogonal planes respectively 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 (CH1), one in the middle (CH18) and the other in bottom (CH35). The setting up procedure is recorded on <1.3 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

13.2 List of Test Instruments

Calibration Date

Instrument Name	Model	Brand	Serial No.	Next time
EMI Receiver	8546A	HP	3520A00242	09/06/07
RF Filter Section	85460A	HP	3448A00217	09/06/07
Small Biconical Antenna	UBAA9114 & BBVU9135	SCHWARZECK	127	11/17/06
Pre-amplifier	PA1F	TRC	1FAC	05/20/07
Auto Switch Box (>30MHz)	ASB-01	TRC	9904-01	05/20/07
Coaxial Cable (Double shielded, 15 meter)	A30A30-0058-50FS-15M	JYEBAO	SMA-01	05/20/07
Coaxial Cable (1.1 meter)	A30A30-0058-50FS-1M	JYEBAO	SMA-02	05/20/07
Spectrum Analyzer	8564E	HP	3720A00840	11/07/06
Microwave Preamplifier	84125C	HP	US36433002	11/07/06
Horn Antenna	3115	EMCO	9104-3668	01/23/07
Standard Guide Horn Antenna	84125-80008	HP	18-26.5GHz	11/09/06
Standard Guide Horn Antenna	84125-80001	HP	26.5-40GHz	11/09/06
Pre-amplifier	84125C	HP	US36433002	11/07/06
Horn Antenna	1196E (3115)	HP (EMCO)	9704-5178	01/26/07
Pre-amplifier	PA2F	TRC	2F1GZ	06/20/07
Coaxial Cable (3 miter)	A30A30-0058-50FS T118	JYEBAO	MSA-05	06/20/07
Coaxial Cable (1 meter)	A30A30-0058-50FS T118	JYEBAO	MSA-04	06/20/07

13.3 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. (worst case)

Test Conditions: Temperature : 25.0 ° C Humidity : 73.0 % RH

Test mode: RX mode for 30MHz to 25GHz [Horizontal](Power by adaptor)

Radiated Emission				CF	Peak Value	Duty Cycle	True Value	FCC Class B	
Frequency (MHz)	Amplitude (dBμV)	Ant. H. (m)	Angle	(dB)	(dBμV/m)	(dB)	(dBμV/m)	Limit (Avg.) (dBμV/m)	Margin (dB)
211.87	36.07	1.00	248	-3.96	32.11	---	32.11	43.50	-11.39
501.87	26.45	1.00	53	2.41	28.86	---	28.86	46.00	-17.14
565.92	34.08	1.00	326	5.12	39.20	---	39.20	46.00	-6.80
799.94	21.33	1.00	48	12.00	33.33	---	33.33	46.00	-12.67
10675.83	24.41	1.00	103	22.43	46.84	---	46.84	53.96	-7.12
21913.54	46.32	1.00	129	3.06	49.38	---	49.38	53.96	-4.58
24541.46	47.32	1.00	97	2.44	49.76	---	49.76	53.96	-4.20

Test mode: RX mode for 30MHz to 25GHz [Vertical] (Power by adaptor)

Radiated Emission				CF	Peak Value	Duty Cycle	True Value	FCC Class B	
Frequency (MHz)	Amplitude (dBμV)	Ant. H. (m)	Angle	(dB)	(dBμV/m)	(dB)	(dBμV/m)	Limit (Avg.) (dBμV/m)	Margin (dB)
39.70	26.38	1.00	3	5.57	31.95	---	31.95	40.00	-8.05
211.87	36.86	1.00	271	-3.96	32.90	---	32.90	43.50	-10.60
565.92	31.71	1.00	51	5.12	36.83	---	36.83	46.00	-9.17
798.72	22.06	1.00	185	11.95	34.01	---	34.01	46.00	-11.99
9932.08	24.57	1.00	256	23.01	47.58	---	47.58	53.96	-6.38
22427.08	46.32	1.00	98	3.74	50.06	---	50.06	53.96	-3.90
24803.54	47.82	1.00	5	2.21	50.03	---	50.03	53.96	-3.93

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 30MHz to 25GHz [Horizontal] (Power by USB of notebook PC))

Radiated Emission				CF	Peak Value	Duty Cycle	True Value	FCC Class B	
Frequency (MHz)	Amplitude (dBμV)	Ant. H. (m)	Angle	(dB)	(dBμV/m)	(dB)	(dBμV/m)	Limit (Avg.) (dBμV/m)	Margin (dB)
211.87	36.58	1.00	241	-3.96	32.62	---	32.62	43.50	-10.88
368.29	35.22	1.00	215	-2.15	33.07	---	33.07	46.00	-12.93
502.87	30.38	1.00	50	2.41	32.79	---	32.79	46.00	-13.21
565.92	32.75	1.00	325	5.12	37.87	---	37.87	46.00	-8.13
798.72	21.87	1.00	204	11.95	33.82	---	33.82	46.00	-12.18
9117.50	22.07	1.00	292	22.95	45.02	---	45.02	53.96	-8.94
22735.21	45.34	1.00	235	3.92	49.26	---	49.26	53.96	-4.70
24676.04	46.34	1.00	45	3.02	49.36	---	49.36	53.96	-4.60

Test mode: RX mode for 30MHz to 25GHz [Vertical] (Power by USB of notebook PC))

Radiated Emission				CF	Peak Value	Duty Cycle	True Value	FCC Class B	
Frequency (MHz)	Amplitude (dBμV)	Ant. H. (m)	Angle	(dB)	(dBμV/m)	(dB)	(dBμV/m)	Limit (Avg.) (dBμV/m)	Margin (dB)
51.83	25.55	1.00	130	3.57	29.12	---	29.12	40.00	-10.88
153.68	38.52	1.00	323	-3.58	34.94	---	34.94	43.50	-8.56
215.51	37.48	1.00	183	-3.98	33.50	---	33.50	43.50	-10.00
501.66	32.54	1.00	240	2.36	34.90	---	34.90	46.00	-11.10
565.92	32.05	1.00	195	5.12	37.17	---	37.17	46.00	-8.83
6248.75	25.91	1.00	235	18.69	44.60	---	44.60	53.96	-9.36
19923.12	47.49	1.00	302	1.97	49.46	---	49.46	53.96	-4.50
24417.50	46.99	1.00	64	3.05	50.04	---	50.04	53.96	-3.92

Test mode: CH01 for 30MHz to 1GHz [Horizontal]

Radiated Emission				Correction Factors	Corrected Amplitude	Class B (3 m)	
Frequency (MHz)	Amplitude (dBμV)	Ant. H. (m)	Table (°)	(dB)	(dBμV/m)	Limit (dBμV/m)	Margin (dB)
200.96	33.32	1.00	230	-3.50	29.82	43.50	-13.68
371.92	30.85	1.00	267	-2.04	28.81	46.00	-17.19
436.19	30.44	1.00	113	0.28	30.72	46.00	-15.28
462.86	29.37	1.00	277	1.22	30.59	46.00	-15.41
502.87	29.95	1.00	27	2.41	32.36	46.00	-13.64
565.92	30.23	1.00	309	5.12	35.35	46.00	-10.65

Test mode: CH01 for 30MHz to 1GHz [Vertical]

Radiated Emission				Correction Factors	Corrected Amplitude	Class B (3 m)	
Frequency (MHz)	Amplitude (dBμV)	Ant. H. (m)	Table (°)	(dB)	(dBμV/m)	Limit (dBμV/m)	Margin (dB)
40.91	27.84	1.00	307	5.35	33.19	40.00	-6.81
110.02	37.79	1.00	63	-1.87	35.92	43.50	-7.58
141.55	36.65	1.00	102	-3.00	33.65	43.50	-9.85
505.30	30.70	1.00	198	2.52	33.22	46.00	-12.78
567.14	29.37	1.00	154	5.16	34.53	46.00	-11.47
940.59	20.46	1.00	353	15.55	36.01	46.00	-9.99

Test mode: CH01 for 1GHz to 25GHz [Horizontal]

Radiated Emission				CF	Peak Value	Duty Cycle	True Value	FCC Class B	
Frequency (MHz)	Amplitude (dBμV)	Ant. H. (m)	Angle	(dB)	(dBμV/m)	(dB)	(dBμV/m)	Limit (Avg.) (dBμV/m)	Margin (dB)
1689.58	42.84	1.00	220	12.93	55.77	-20.00	35.77	53.96	-18.19
2160.42	44.00	1.00	121	8.54	52.54	-20.00	32.54	53.96	-21.42
2535.42	38.66	1.00	35	9.56	48.22	-20.00	28.22	53.96	-25.74
12018.75	38.11	1.00	173	9.98	48.09	-20.00	28.09	53.96	-25.87
19232.50	46.82	1.00	321	1.60	48.42	-20.00	28.42	53.96	-25.54
21637.29	45.16	1.00	16	2.81	47.97	-20.00	27.97	53.96	-25.99

Test mode: CH01 for 1GHz to 25GHz [Vertical]

Radiated Emission				CF	Peak Value	Duty Cycle	True Value	FCC Class B	
Frequency (MHz)	Amplitude (dBμV)	Ant. H. (m)	Angle	(dB)	(dBμV/m)	(dB)	(dBμV/m)	Limit (Avg.) (dBμV/m)	Margin (dB)
1997.92	39.50	1.00	259	8.12	47.62	-20.00	27.62	53.96	-26.34
4805.00	43.94	1.00	28	3.69	47.63	-20.00	27.63	53.96	-26.33
9614.17	36.27	1.00	184	11.43	47.70	-20.00	27.70	53.96	-26.26
19232.50	46.49	1.00	229	1.60	48.09	-20.00	28.09	53.96	-25.87
21637.29	45.66	1.00	318	2.81	48.47	-20.00	28.47	53.96	-25.49
24038.54	45.82	1.00	219	3.26	49.08	-20.00	29.08	53.96	-24.88

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: CH18 for 30MHz to 1GHz [Horizontal]

Radiated Emission				Correction Factors	Corrected Amplitude	Class B (3 m)	
Frequency (MHz)	Amplitude (dBμV)	Ant. H. (m)	Table (°)	(dB)	(dBμV/m)	Limit (dBμV/m)	Margin (dB)
65.16	32.94	1.00	20	1.68	34.62	40.00	-5.38
211.87	36.80	1.00	261	-3.96	32.84	43.50	-10.66
288.26	40.56	1.00	63	-3.82	36.74	46.00	-9.26
565.92	33.52	1.00	325	5.12	38.64	46.00	-7.36
672.62	24.72	1.00	83	8.63	33.35	46.00	-12.65
940.59	25.35	1.00	322	15.55	40.90	46.00	-5.10

Test mode: CH18 for 30MHz to 1GHz [Vertical]

Radiated Emission				Correction Factors	Corrected Amplitude	Class B (3 m)	
Frequency (MHz)	Amplitude (dBμV)	Ant. H. (m)	Table (°)	(dB)	(dBμV/m)	Limit (dBμV/m)	Margin (dB)
39.70	27.20	1.00	295	5.57	32.77	40.00	-7.23
436.19	32.48	1.00	203	0.28	32.76	46.00	-13.24
460.44	31.87	1.00	164	1.15	33.02	46.00	-12.98
501.66	31.69	1.00	187	2.36	34.05	46.00	-11.95
565.92	31.62	1.00	45	5.12	36.74	46.00	-9.26
940.59	28.83	1.00	240	15.55	44.38	46.00	-1.62

Test mode: CH18 for 1GHz to 25GHz [Horizontal]

Radiated Emission				CF	Peak Value	Duty Cycle	True Value	FCC Class B	
Frequency (MHz)	Amplitude (dBμV)	Ant. H. (m)	Angle	(dB)	(dBμV/m)	(dB)	(dBμV/m)	Limit (Avg.) (dBμV/m)	Margin (dB)
1668.75	43.50	1.00	312	13.26	56.76	-20.00	36.76	53.96	-17.20
1906.42	43.16	1.00	349	8.71	51.87	-20.00	31.87	53.96	-22.09
2202.08	46.50	1.00	312	8.66	55.16	-20.00	35.16	53.96	-18.80
9753.12	37.77	1.00	90	11.90	49.67	-20.00	29.67	53.96	-24.29
12187.92	42.10	1.00	79	9.74	51.84	-20.00	31.84	53.96	-22.12
21941.87	46.49	1.00	232	3.09	49.58	-20.00	29.58	53.96	-24.38

Test mode: CH18 for 1GHz to 25GHz [Vertical]

Radiated Emission				CF	Peak Value	Duty Cycle	True Value	FCC Class B	
Frequency (MHz)	Amplitude (dBμV)	Ant. H. (m)	Angle	(dB)	(dBμV/m)	(dB)	(dBμV/m)	Limit (Avg.) (dBμV/m)	Margin (dB)
1962.50	39.83	1.00	324	8.68	48.51	-20.00	28.51	53.96	-25.45
9753.12	40.94	1.00	15	11.90	52.84	-20.00	32.84	53.96	-21.12
12187.92	41.60	1.00	336	9.74	51.34	-20.00	31.34	53.96	-22.62
19505.21	47.32	1.00	204	1.70	49.02	-20.00	29.02	53.96	-24.94
21941.87	46.16	1.00	272	3.09	49.25	-20.00	29.25	53.96	-24.71
24378.54	45.83	1.00	173	3.29	49.12	-20.00	29.12	53.96	-24.84

Test mode: CH35 for 30MHz to 1GHz [Horizontal]

Radiated Emission				Correction Factors	Corrected Amplitude	Class B (3 m)	
Frequency (MHz)	Amplitude (dBμV)	Ant. H. (m)	Table (°)	(dB)	(dBμV/m)	Limit (dBμV/m)	Margin (dB)
210.66	38.43	1.00	273	-3.95	34.48	43.50	-9.02
370.71	32.96	1.00	257	-2.08	30.88	46.00	-15.12
436.19	31.98	1.89	67	0.28	32.26	46.00	-13.74
501.66	29.28	1.00	350	2.36	31.64	46.00	-14.36
565.92	33.57	1.00	326	5.12	38.69	46.00	-7.31
884.81	22.42	1.00	165	14.25	36.67	46.00	-9.33

Test mode: CH35 for 30MHz to 1GHz [Vertical]

Radiated Emission				Correction Factors	Corrected Amplitude	Class B (3 m)	
Frequency (MHz)	Amplitude (dBμV)	Ant. H. (m)	Table (°)	(dB)	(dBμV/m)	Limit (dBμV/m)	Margin (dB)
62.74	30.78	1.00	347	1.87	32.65	40.00	-7.35
214.30	36.34	1.00	112	-3.97	32.37	43.50	-11.13
501.66	31.40	1.00	188	2.36	33.76	46.00	-12.24
565.92	32.07	1.00	42	5.15	37.22	46.00	-8.78
672.62	25.57	1.00	142	8.63	34.20	46.00	-11.80
798.72	22.10	1.00	87	11.95	34.05	46.00	-11.95

Test mode: CH35 for 1GHz to 25GHz [Horizontal]

Radiated Emission				CF	Peak Value	Duty Cycle	True Value	FCC Class B	
Frequency (MHz)	Amplitude (dBμV)	Ant. H. (m)	Angle	(dB)	(dBμV/m)	(dB)	(dBμV/m)	Limit (Avg.) (dBμV/m)	Margin (dB)
1668.75	43.33	1.00	342	13.26	56.59	-20.00	36.59	53.96	-17.37
1737.50	44.83	1.00	35	12.19	57.02	-20.00	37.02	53.96	-16.94
2152.08	45.16	1.00	293	8.52	53.68	-20.00	33.68	53.96	-20.28
2210.42	46.33	1.00	263	8.68	55.01	-20.00	35.01	53.96	-18.95
9886.04	37.27	1.00	127	11.88	49.15	-20.00	29.15	53.96	-24.81
24718.54	46.32	1.00	135	2.67	48.99	-20.00	28.99	53.96	-24.97

Test mode: CH35 for 1GHz to 25GHz [Vertical]

Radiated Emission				CF	Peak Value	Duty Cycle	True Value	FCC Class B	
Frequency (MHz)	Amplitude (dBμV)	Ant. H. (m)	Angle	(dB)	(dBμV/m)	(dB)	(dBμV/m)	Limit (Avg.) (dBμV/m)	Margin (dB)
1656.25	38.67	1.00	357	13.45	52.12	-20.00	32.12	53.96	-21.84
1958.33	40.33	1.00	357	8.74	49.07	-20.00	29.07	53.96	-24.89
7415.00	36.28	1.00	2	10.37	46.65	-20.00	26.65	53.96	-27.31
19777.92	47.49	1.00	196	1.90	49.39	-20.00	29.39	53.96	-24.57
22246.46	45.16	1.00	325	3.39	48.55	-20.00	28.55	53.96	-25.41
24718.54	47.65	1.00	85	2.67	50.32	-20.00	30.32	53.96	-23.64