

TEST REPORT

Report No.: 6208F
Date: 11th August 2006
Applicant: TOSHIBA CORPORATION Digital Media Network Company
2-9, Suehiro-cho, Ome, Tokyo 198-8710, Japan
EUT: HDD portable audio player
FCC ID: CJ6UMK30AWL
Model No.: 1091 (Radiation Emission) 1089 (Conducted Emission)
Serial No.: Keel-CS-T1 (Radiation Emission), Keel-CS-FB-31 (Conducted Emission)
Receipt date of tested sample: 22nd August 2006
Date of measurement: 23rd, 24th, 25th, 26th, 27th, August 2006 (Radiated Emission)
2nd August 2006 (Conducted Emission)
Test location: TAIYO YUDEN CO., LTD. EMC Center
5607-2, Nakamuroda, Haruna-machi,
Gunma-Gun, Gunma, 370-3347, Japan.
Applied standard: FCC 47 CFR Part 15 Subpart C Section 15.247 (10-1-05 Edition)
Procedure: ANSI C63.4-2003
FCC Document "Measurement of Transmission Systems
Operating under Section 15.247" (23rd March, 2005)
Test results: PASS (Partially)

Approved by:

Manager / Kenzo Furuta

Reviewed by:

Chief Engineer / Takeshi Matsumura

Tested by:

Engineer / Yukihiro Minegishi

:

Assistant / Yasuko Hirata



NVLAP LAB CODE 200607-0

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Revised Record

Revised Record				
Number of Revised time	Date	Person in Charge	Detail of Revision	Approved by
Initial	11 th August 2006	Y.Hirata	-	-

1 Test report

- (1) This report summarizes the result of a single investigation and test result relate only to tested sample.
- (2) The report shall not be reproduced except in full without the written approval of the TAIYO YUDEN CO., LTD.
- (3) This test report must not be used by the client to claim product endorsement by any government agency.
- (4) We hereby certify that no party to the applications authorized hereunder is subject to a denial of benefits, including FCC benefits, pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C 853(a).

2 General Information

2.1 Product Description

EUT:	HDD portable audio player
Model No.:	1091 (Radiation Emission), 1089 (Conducted Emission) *1
Serial No.:	Keel-CS-T1 (Radiation Emission), Keel-CS-FB-31 (Conducted Emission)
FCC ID:	CJ6UMEK30AWL
Production stage:	Pre-Production
Summary of EUT:	HDD portable audio player that have 1.8"HDD, 3.0inch low temperature polysilicone TFT LCD, FM tuner, and IEEE 802.11b/g wireless LAN. EUT operates in the unlicensed 2.4GHz ISM (Industrial Scientific Medical) band.
Type of wide band Modulation:	DSSS for 11b, OFDM for 11g
Type of Modulation:	DBPSK (1Mbps), DQPSK (2Mbps) and CCK (5.5/11Mbps) for 11b BPSK (6/9Mbps), QPSK (12/18Mbps), 16QAM (24/36Mbps) and 64QAM (48/54Mbps) for 11g
Power supply:	DC5.0V via USB port. Nominal DC 3.7V Battery (Lithium)
Weight:	161g
Dimensions of EUT:	W63.0mm × D17.0mm × H113.0mm
Max antenna gain:	2.00dBi
The clock frequencies used in this EUT:	32.768kHz 19.2MHz 27MHz 528MHz 2.4GHz

*1:please refer to Appendix 1

2.2 Summary of Test and Inspection Result

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst Margin	Results
1	AC Powerline Conducted Emission	ANSI C63.4: 2003 47CFR15.247	15.207	-	N/A	7.8 dB Transmitting mode: 2437MHz Frequency: 1.289MHz Power line: VB	Pass
2	6 dB Bandwidth		15.247(a)(2)	Conducted	N/A	-	Pass
3	Maximum peak Output Power		15.247(b)(3)		N/A	-	1
4	Band Edge Compliance		15.247(d)		N/A	-	Pass
5	Power Spectral Density		15.247(e)		N/A	-	Pass
6	Radiated Emission		15.247(d)	Radiated	N/A	6.0dB Transmitting mode: 2412MHz Frequency: 264.004MHz Axial Direction: ZX-Plane Antenna Polarization: Horizontal	Pass

1: This test have been Conducted separately. Please refer to test report issued by JQA (Report No. KL80060216)

2.3 Test Methodology

Interference measurements were made in accordance with ANSI C63.4-2003 Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

2.4 Test Facility

1. FCC 47CFR, Part 15, Section 15.247 regulation test was performed on the shielded room and radiated interference field strength test was performed on the 10 meter semi-anechoic chamber located at Taiyo Yuden Co., LTD. EMC Center, 5607-2 Nakamuroda Haruna-Machi Gunma-Gun Gunma, 370-3347 Japan.
2. This Laboratory is accredited under the National Voluntary Laboratory Accreditation Program (NVLAP) by United States Department of Commerce, National Institute of Standard and Technology (NIST) for satisfactory compliance with criteria established in Title 15, Part 285 Code of Federal Regulations.
3. These criteria encompass the requirements of ISO/IEC 17025:1999 and the relevant requirements of ISO 9002:1994 as suppliers of calibration or test results. Accreditation awarded for specific services, listed on the Scope of Accreditation for: ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS FCC. (NVLAP LAB CODE: 200607-0). Refer the certificate of the accreditation to Appendix 2.

3 System Test Configuration

3.1 Justification

1. Emission tests were performed with no deviation from the ANSI C63.4-2003 and FCC 47CFR, Part 15, Section 15.247 regulation tests were performed with no deviation from the FCC Documents "Measurement of Digital Transmission Systems Operating under Section 15.247" March 23, 2005.
2. The system was configured for testing a typical fashion. (as a customer would normally use it.)
3. Radiate testing in the range of 1 GHz to 25 GHz was investigated with the spectrum (peak detector function) under the FCC regulation section 15.209 (e) and 15.35 (b). The test performed at an antenna to EUT distance of 1 meter. The level of any unwanted emissions from EUT did not exceed the level of the fundamental emission (Compliance with 15.209 (c)). And test result found to be compliance with FCC regulation section 15.209 (a) Radiated emission limits (500 micro-volts/meter). Data is presented for the "worst case" measurements, that E.U.T was normal operated.
4. Radiate testing in the range of 30 MHz to 1000 MHz was performed at an antenna to EUT distance of 3 meters under the 15.209 (e) and 15.31(f)(1).
5. All tests were performed with the representative channel operation as follows.
 - a. Lowest frequency channel: CH1 2412MHz
 - b. Middle frequency channel: CH6 2437MHz
 - c. Highest frequency channel: CH11 2462MHz

3.2 Operating modes

Modulation: DBPSK (1Mbps) for IEEE 802.11b (DSSS)
 BPSK (6Mbps) for IEEE 802.11g (OFDM)
 Representative channel: CH1 2412MHz (Lowest frequency channel)
 CH6 2437MHz (Middle frequency channel)
 CH11 2462MHz (Highest frequency channel)

Remarks:

Software (controller): KS79xxTestSerial Ver.0.4.7 software supplied by Key Stream was used to set up to the Wireless LAN operating mode.

3.3 List of accessories

	Product name	M/N	S/N	Manufacturer	Notes	FCC ID / DoC
a	Personal Computer	PSJ60N	36023351J	TOSHIBA	-	DoC
b	AC Adaptor	PA3282U-2ACA	0042402	TOSHIBA	-	-

3.4 Interface cable

	Cable Type	M/N	Connection	Shielded	Ferrite core	Material of connector	Length	Treatment for the extra length
1	USB cable	-	EUT a (Radiated, Conducted)	Yes	No	Metal	1.21m	Folded back and forth in the center
2	DC cable	-	a b	No	No	Metal	1.78m	-
3	AC cable	-	b AC	No	No	Plastic	2.06m	-
4	Headphone cable	-	EUT	No	No.	Plastic	1.36m	-
5	AC cable	-	LISN AC	No	No	Plastic	1.8m	-

3.5 Special Accessories

Nothing.

3.6 Equipment Modifications

No modification has been carried out by the test laboratory.

3.7 Configuration of Tested System

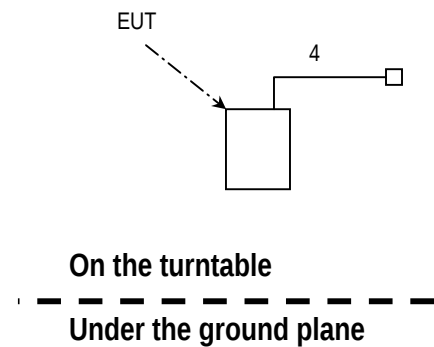
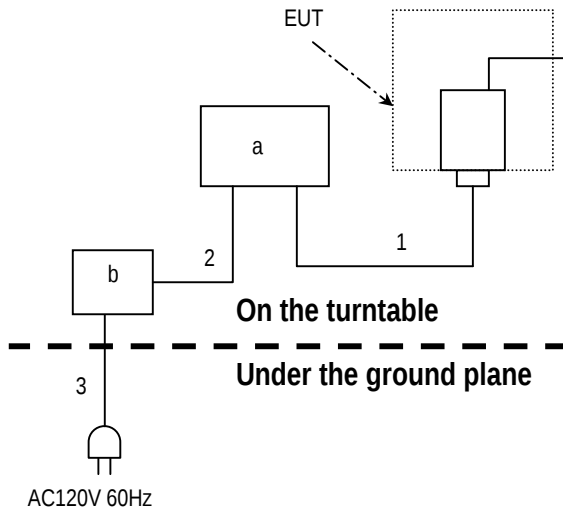
(1) Radiated Emission Test

These numbers and the marks in the picture are corresponding to the numbers and the marks in Tables shown at the Section 3.3 and 3.4.

USB Power Supply

Power supply of EUT: DC5.0V from Personal Computer "a" through the USB cable "1"

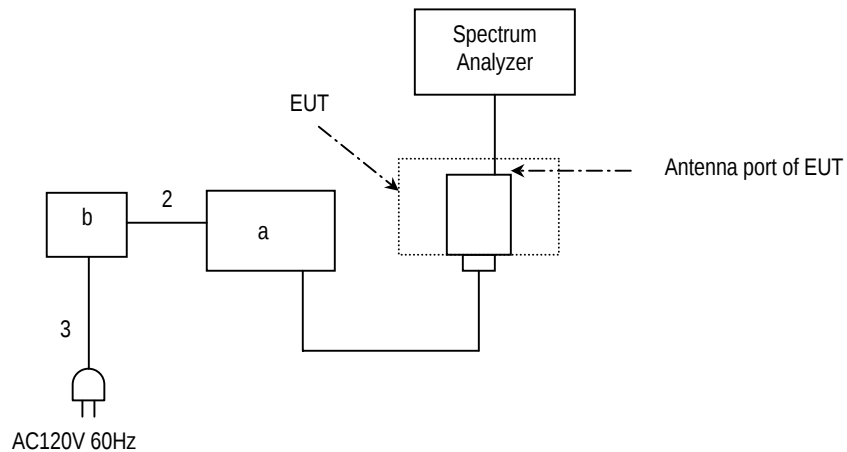
Battery Power Supply



(2) Conducted Emission Test

These numbers and the marks in the picture are corresponding to the numbers and the marks in Tables shown at the Section 3.3 and 3.4.

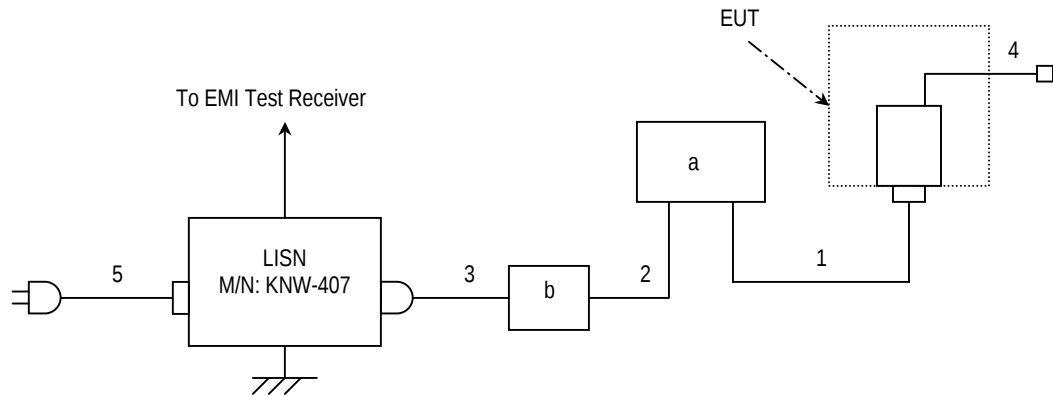
Power supply of EUT: DC5.0V from Personal Computer "a" through the USB cable "1"



(3) AC Powerline Conducted Emission Test

These numbers and the marks in the picture are corresponding to the numbers and the marks in Tables shown at the Section 3.3 and 3.4.

Power supply of EUT: DC5.0V from Personal Computer "a" through the USB cable "1"



4 Antenna Requirement

The EUT provides a permanently attached antenna and it was found to be compliant with FCC regulation section 15.203.

Antenna type: Helical antenna
Model No.: AF216M245001
Antenna gain: 2.00dBi

5 AC Powerline Conducted Emission Test

Preliminary test has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates.

5.1 Test Setup

Conducted emission measurements were performed from 150kHz to 30 MHz.

The test setup was made according to ANSI STD C63.4-2001 clause 7 in the Shielded room.

The rear of non-conductive wooden table top was placed 0.4 m from a vertical metal reference plane that one of the wall.

Rears of the peripherals were all aligned and flush with rear of non-conductive wooden tabletop.

The height of this table was 0.8 m and 1.5 m wide x 1.0 m deep size.

The spacing between the each equipment was 10 cm.

Connection of the PC connected EUT USB Adaptor to the artificial mains network (LISN) was required.

The distance between the closet surface of the EUT and the closet surface of the artificial mains network (LISN) was 0.8 m.

Connection of the all other equipment to the second artificial mains network (LISN) was required. The distance between the peripherals and the closet surface of the second artificial mains network (LISN) was minimum 0.8 m.

The second artificial mains network is terminated with 50ohm terminator.

Where a mains flexible cord is provided by the manufacture this is 2.0 m long and excess cable was folded back and forth as far as possible to 0.8 m so as to form a bundle not exceeding 0.4 m in length.

Interconnecting cables of table top equipment that hang closer than 0.4 m to the floor ground plane were folded back and forth forming a bundle 30 to 40 cm long, hanging approximately in the middle between ground plane and table.

The measurement has been conducted with both VA and VB neutral power supply polarization.

The maximum voltage emission was verified with the cable routing and the location of the peripherals.

The highest voltage emission has been recorded.

For further description of the configuration refer to the photographs of this report.

Test Receiver Setting

150kHz~30MHz	Detector: Quasi-Peak and Average Bandwidth: 10kHz
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5.2 Test Instrumentation

Facility/ Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Next Calibration Due	Note
Shielded room	TDK Co., Ltd	DA-06912	-	-	-	-
EMI Test Receiver	R&S	ESHS 10	100005	10 th . 8. 2005	9 th . 8. 2006	-
LISN	KYORITSU ELECTRICAL WORK	KNW-407	8-680-1	13 th . 3. 2006	12 th . 3. 2007	-
Cable	SUHNER	RG223	CE-1	12 th . 5. 2006	11 th . 5. 2007	-
		RG223	CE-2	12 th . 5. 2006	11 th . 5. 2007	-
		RG2214	CE-3	12 th . 5. 2006	11 th . 5. 2007	-
Attenuator	KYORITSU	KPD-602	5K325	12 th . 5. 2006	11 th . 5. 2007	-
RF Selector	TDK Co., Ltd	NS4900	0302-009	12 th . 5. 2006	11 th . 5. 2007	-
Software	TOYO Corporation	EP5/CE Ver.2.0	0208085	-	-	-

5.3 Conducted Emission Calculation

The basic equation with a sample calculation is as follows:

$$\begin{aligned} \text{c.f.} &= \text{CF} + \text{AL} \\ \text{CE} &= \text{RA} + \text{c.f.} \end{aligned}$$

Where c.f. = Correction Factor [dB/m]
 CE = Conducted Emission (Emission Level - Result) [dBuV]
 RA = Receiver Amplitude (Reading Level) [dBuV]
 CF = Cable Attenuation Loss [dB]
 AL = Attenuator Loss [dB]

Assume a receiver reading of 27.3 dBuV is obtained.

The Factor of 3.4dB is added, giving a terminal voltage of 30.7 dBuV. The 30.7 dBuV value was mathematically converted to its corresponding level in uV.

$$\text{CE} = 27.3 + 3.4 = 30.7 \text{ dBuV}$$

Level in uV = Common Antilogarithm: $(30.7 \text{ dBuV})/20 = 34.3 \text{ uV}$

5.4 Test Results

AC Powerline Conducted Emission 2412MHz

Serial No.: Keel-CS-T1
 Power: AC120V, 60Hz
 Mode: Transmitting mode
 BPSK (6Mbps) for IEEE 802.11g (OFDM)
 Temperature: 23
 Humidity: 67%

VA

Frequency [MHz]	Meter Reading [dB(uV)]		Factor [dB]	Conducted Emission [dB(uV)]		Limits [dB(uV)]		Margin [dB]	
	QP	AV		QP	AV	QP	AV	QP	AV
801.11g Mode									
0.191	41.6	29.7	3.4	45.0	33.1	64.0	54.0	19.0	20.9
0.514	35.1	32.8	3.3	38.4	36.1	56.0	46.0	17.6	9.9
0.902	35.0	32.0	3.3	38.3	35.3	56.0	46.0	17.7	10.7
1.096	35.7	32.0	3.3	39.0	35.3	56.0	46.0	17.0	10.7
1.289	35.7	31.7	3.4	39.1	35.1	56.0	46.0	16.9	10.9
1.483	35.9	31.0	3.3	39.2	34.3	56.0	46.0	16.8	11.7

VB

Frequency [MHz]	Meter Reading [dB(uV)]		Factor [dB]	Conducted Emission [dB(uV)]		Limits [dB(uV)]		Margin [dB]	
	QP	AV		QP	AV	QP	AV	QP	AV
801.11g Mode									
0.191	41.8	32.5	3.4	45.2	35.9	64.0	54.0	18.8	18.1
0.514	35.1	32.7	3.3	38.4	36.0	56.0	46.0	17.6	10.0
0.912	35.1	32.0	3.3	38.4	35.3	56.0	46.0	17.6	10.7
1.160	33.6	26.3	3.3	36.9	29.6	56.0	46.0	19.1	16.4
1.289	36.0	32.2	3.4	39.4	35.6	56.0	46.0	16.6	10.4
1.483	36.1	31.8	3.3	39.4	35.1	56.0	46.0	16.6	10.9

AC Powerline Conducted Emission 2437MHz

Serial No.: Keel-CS-T1
 Power: AC120V, 60Hz
 Mode: Transmitting mode
 BPSK (6Mbps) for IEEE 802.11g (OFDM)
 Temperature: 23
 Humidity: 67%

VA

Frequency [MHz]	Meter Reading [dB(μV)]		Factor [dB]	Conducted Emission [dB(μV)]		Limits [dB(μV)]		Margin [dB]	
	QP	AV		QP	AV	QP	AV	QP	AV
801.11g Mode									
0.191	42.1	33.0	3.4	45.5	36.4	64.0	54.0	18.5	17.6
0.321	34.0	29.0	3.3	37.3	32.3	59.7	49.7	22.4	17.4
0.514	34.8	33.7	3.3	38.1	37.0	56.0	46.0	17.9	9.0
0.902	35.1	32.2	3.3	38.4	35.5	56.0	46.0	17.6	10.5
1.095	35.8	34.4	3.3	39.1	37.7	56.0	46.0	16.9	8.3
1.679	35.2	34.0	3.4	38.6	37.4	56.0	46.0	17.4	8.6

VB

Frequency [MHz]	Meter Reading [dB(μV)]		Factor [dB]	Conducted Emission [dB(μV)]		Limits [dB(μV)]		Margin [dB]	
	QP	AV		QP	AV	QP	AV	QP	AV
801.11g Mode									
0.191	42.0	32.7	3.4	45.4	36.1	64.0	54.0	18.6	17.9
0.514	35.2	32.7	3.3	38.5	36.0	56.0	46.0	17.5	10.0
0.901	35.1	33.9	3.3	38.4	37.2	56.0	46.0	17.6	8.8
1.161	33.6	27.2	3.3	36.9	30.5	56.0	46.0	19.1	15.5
1.289	36.0	34.8	3.4	39.4	38.2	56.0	46.0	16.6	7.8
1.483	36.1	34.8	3.3	39.4	38.1	56.0	46.0	16.6	7.9

AC Powerline Conducted Emission 2462MHz

Serial No.: Keel-CS-T1
 Power: AC120V, 60Hz
 Mode: Transmitting mode
 BPSK (6Mbps) for IEEE 802.11g (OFDM)
 Temperature: 23
 Humidity: 67%

VA

Frequency [MHz]	Meter Reading [dB(μV)]		Factor [dB]	Conducted Emission [dB(μV)]		Limits [dB(μV)]		Margin [dB]	
	QP	AV		QP	AV	QP	AV	QP	AV
801.11g Mode									
0.192	41.5	29.5	3.4	44.9	32.9	63.9	53.9	19.0	21.0
0.320	34.0	29.1	3.3	37.3	32.4	59.7	49.7	22.4	17.3
0.515	35.1	32.8	3.3	38.4	36.1	56.0	46.0	17.6	9.9
0.708	34.0	31.1	3.3	37.3	34.4	56.0	46.0	18.7	11.6
1.096	35.7	32.7	3.3	39.0	36.0	56.0	46.0	17.0	10.0
1.289	35.7	31.8	3.4	39.1	35.2	56.0	46.0	16.9	10.8

VB

Frequency [MHz]	Meter Reading [dB(μV)]		Factor [dB]	Conducted Emission [dB(μV)]		Limits [dB(μV)]		Margin [dB]	
	QP	AV		QP	AV	QP	AV	QP	AV
801.11g Mode									
0.191	41.6	29.6	3.4	45.0	33.0	64.0	54.0	19.0	21.0
0.321	33.6	28.9	3.3	36.9	32.2	59.7	49.7	22.8	17.5
0.514	35.2	32.8	3.3	38.5	36.1	56.0	46.0	17.5	9.9
0.902	35.1	31.6	3.3	38.4	34.9	56.0	46.0	17.6	11.1
1.096	36.0	32.6	3.3	39.3	35.9	56.0	46.0	16.7	10.1
1.483	36.1	31.7	3.3	39.4	35.0	56.0	46.0	16.6	11.0

6 Radiated Emission Test

6.1 Test Setup

The test setup was made according to ANSI STD C63.4-2003 clause 8 on the 10 meter semi-anechoic chamber, which allows a 3 or 1 m distance measurement.

EUT was placed on non-conductive table (foam polystyrene). The height of this table was 0.8 m.

The measurement has been conducted with both horizontal and vertical antenna polarization.

The turntable has been fully rotated. The highest radiation of the equipment has been recorded.

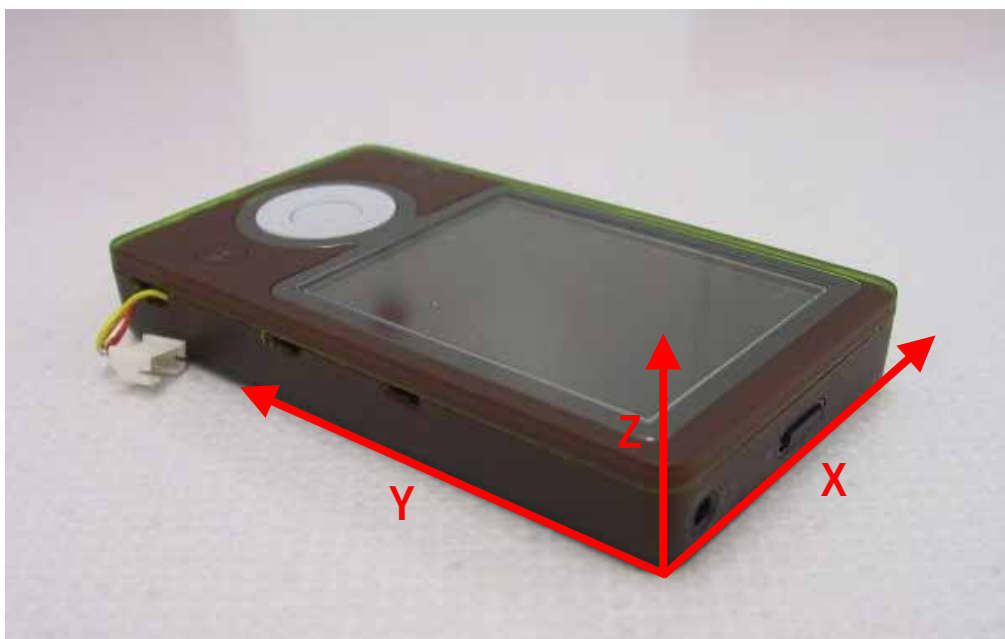
For further description of the configuration refer to the pictures of this report.

Distance between equipment and antenna: 3m (30MHz to 18GHz)
: 1m (18GHz to 25GHz)

Spectrum Analyzer Setting

30 ~ 1000MHz	Detector: Quasi-Peak Bandwidth: 120kHz
1 ~ 25GHz	Detector: Peak and Average Bandwidth: 1MHz

Axial Direction



6.2 Test Instrumentation

Facility/ Equipment	Manufacturer	Model No.	Serial No.	Frequency Range	Calibration Date	Next Calibration Due
10m anechoic chamber	TDK Co., Ltd	DA-06912	-	-	13 th -17 th .3.2006.	12 th .3.2007.
EMI Test Receiver	R&S	ESCS 30	100148	30-1000MHz	11 th .8.2005.	10 th .8.2006.
Spectrum Analyzer	Agilent Technologies	8563E	3416A02230	30-1000MHz	12 th .4.2006.	11 th .4.2007.
Amplifier		E4446A	US42070181	1-40GHz	14 th .11.2005.	13 th .11.2006.
		83017A	3950M00169	1-26.5GHz	25 th .4.2006.	24 th .4.2007.
		8447D	2944A06812	30-1000MHz	13 th .2.2006.	12 th .2.2007.
Tunable filter	TOYO Corporation	NF-49BT	No.1	1-6GHz	6 th .3.2006.	5 th .3.2006.
RF filter	Microtronics	ERM50702-01	020	6-18GHz	25 th .4.2006.	24 th .4.2007.
RF Selector	TDK Co., Ltd	NS4900	0302-010	-	13 th .2.2006.	12 th .2.2007.
RF Cable	SUHNER	RG214	RG 1	30-1000MHz	13 th .2.2006.	12 th .2.2007.
		RG214	RG 3	30-1000MHz	13 th .2.2006.	12 th .2.2007.
		RG214	RG 8	30-1000MHz	13 th .2.2006.	12 th .2.2007.
		RG214	RG 5	30-1000MHz	25 th .4.2006.	24 th .4.2007.
		RG214	RG 6	30-1000MHz	25 th .4.2006.	24 th .4.2007.
		SUCOFLEX 106	SU1	1-18GHz	25 th .4.2006.	24 th .4.2007.
		SUCOFLEX 104	SU4	1-18GHz	25 th .4.2006.	24 th .4.2007.
	HP	85381C	No.3	18-25GHz	25 th .4.2006.	24 th .4.2007.
		85381C	No.5	18-25GHz	25 th .4.2006.	24 th .4.2007.
Attenuator	KYORITSU	KPD-602	220142	30-1000MHz	13 th .2.2006.	12 th .2.2007.
Antenna	Schwarzbeck	BBA9106	No.4	30-300MHz	25 nd .2.2006.	24 th .2.2007.
		UHALP9108-A	160	300-1000MHz	25 nd .2.2006.	24 th .2.2007.
	EMCO	3115	9403-4232	1-18GHz	1 st .4.2005.	31 st .3.2007.
		3116	9311-2227	18-40GHz	1 st .4.2005.	31 st .3.2007.
Software	TOYO Corporation	EP5/RE Ver.2.0	0208086	-	-	-

6.3 Radiated Emission Calculation

The field strength is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain (if any) from the measured reading.

The basic equation with a sample calculation is as follows:

$$\begin{aligned} \text{c.f.} &= \text{AF} + \text{CF} + \text{AL} - \text{AG} - \text{DF} \\ \text{RE} &= \text{RA} + \text{c.f.} \end{aligned}$$

Where

- c.f. = Correction Factor [dB/m]
- RE = Radiated Emission (Emission Level - Result) [dB(uV/m)]
- RA = Receiver Amplitude (Reading Level) [dBuV]
- AF = Antenna Factor [dB/m]
- CF = Cable Attenuation Loss [dB]
- AG = Amplifier Gain [dB]
- AL = Attenuator Loss [dB]
- DF = Distance Factor
 - Distance between equipment and antenna: 3m = 0 [dB]
 - Distance between equipment and antenna: 1m = 9.5 [dB]

Assume a receiver reading of 43.4 dBuV is obtained. The Correction Factor of -10.2 dB/m is added, giving a Radiated Emission of 33.2 dBuV/m. The 33.2 dBuV/m value was mathematically converted to its corresponding level in uV/m.

$$\begin{aligned} \text{RE} &= 43.4 + (-10.2) = 33.2 \text{ dBuV/m} \\ \text{Level in uV/m} &= \text{Common Antilogarithm } [(33.2 \text{ dBuV/m})/20] = 45.7 \text{ uV/m} \end{aligned}$$

6.4 Test Results

Spurious Emission (Radiated) 2412MHz <USB Power Supply>

Serial No.: Keel-CS-T1
 Power: AC120V, 60Hz
 Mode: Transmitting mode
 DBPSK (1Mbps) for IEEE 802.11b (DSSS)
 BPSK (6Mbps) for IEEE 802.11g (OFDM)
 Temperature: Below 1GHz: 25
 Above 1GHz: 25
 Humidity: Below 1GHz: 68%
 Above 1GHz: 63%

Axial Direction: XY-Plane

Below 1GHz

Below 1GHz						
Frequency [MHz]	Antenna Polarization	Meter Reading [dBuV]	Factor [dB/m]	Emission Level [dB(uV/m)]	Limits [dB(uV/m)]	Margin [dB]
		QP		QP		
801.11b Mode						
264.005	Vertical	33.2	-1.6	31.6	46.0	14.4
801.11g Mode						
280.502	Horizontal	33.1	-0.3	32.8	46.0	13.2

Above 1GHz

above 1GHz

Frequency [MHz]	Antenna Polarization	Meter Reading [dB(μV)]		Factor [dB/m]	Emission Level [dB(μV/m)]		Limits [dB(μV/m)]		Margin [dB]	
		Average	Peak		Average	Peak	Average	Peak	Average	Peak
801.11b Mode										
1055.642	Vertical	50.8	56.1	-11.4	39.4	44.7	54.0	74.0	14.6	29.3
1680.083	Vertical	42.0	49.2	-7.1	34.9	42.1	54.0	74.0	19.1	31.9
2376.792	Horizontal	44.3	50.8	-3.5	40.8	47.3	54.0	74.0	13.2	26.7
4824.000	Horizontal	37.6	45.9	3.3	40.9	49.2	54.0	74.0	13.1	24.8
4824.050	Vertical	41.4	47.0	3.3	44.7	50.3	54.0	74.0	9.3	23.7
7236.000	Horizontal	<37.8	<48.1	3.5	<41.3	<51.6	54.0	74.0	>12.7	>22.4
801.11g Mode										
1056.025	Vertical	53.7	56.8	-11.3	42.4	45.5	54.0	74.0	11.6	28.5
1584.017	Horizontal	46.8	51.6	-7.9	38.9	43.7	54.0	74.0	15.1	30.3
4824.002	Vertical	39.7	45.4	3.3	43.0	48.7	54.0	74.0	11.0	25.3
7236.000	Horizontal	<37.8	<48.1	3.5	<41.3	<51.6	54.0	74.0	>12.7	>22.4
9648.000	Horizontal	<32.0	<43.2	6.1	<38.1	<49.3	54.0	74.0	>15.9	>24.7

The Mark "<", ">" in the table each means floor noise data and the data is below or over the shown value.

Axial Direction: YZ-Plane

Below 1GHz

Below 1GHz						
Frequency [MHz]	Antenna Polarization	Meter Reading [dBuV]	Factor [dB/m]	Emission Level [dB(uV/m)]	Limits [dB(uV/m)]	Margin [dB]
		QP		QP		
801.11b Mode						
264.002	Horizontal	37.2	-1.6	35.6	46.0	10.4
801.11g Mode						
280.504	Horizontal	32.1	-0.3	31.8	46.0	14.2

Above 1GHz

above 1GHz

Frequency [MHz]	Antenna Polarization	Meter Reading [dB(μV)]		Factor [dB/m]	Emission Level [dB(μV/m)]		Limits [dB(μV/m)]		Margin [dB]	
		Average	Peak		Average	Peak	Average	Peak	Average	Peak
801.11b Mode										
1055.775	Horizontal	52.9	56.5	-11.4	41.5	45.1	54.0	74.0	12.5	28.9
1680.200	Vertical	46.3	52.1	-7.1	39.2	45.0	54.0	74.0	14.8	29.0
2375.842	Vertical	45.1	51.5	-3.5	41.6	48.0	54.0	74.0	12.4	26.1
4823.950	Horizontal	39.1	46.0	3.3	42.4	49.3	54.0	74.0	11.6	24.7
4824.130	Vertical	41.3	47.3	3.3	44.6	50.6	54.0	74.0	9.4	23.4
7236.000	Horizontal	<37.8	<48.1	3.5	<41.3	<51.6	54.0	74.0	>12.7	>22.4
801.11g Mode										
1056.000	Horizontal	53.1	57.0	-11.3	41.8	45.7	54.0	74.0	12.2	28.4
1584.033	Vertical	48.9	52.7	-7.9	41.0	44.8	54.0	74.0	13.0	29.2
4823.992	Horizontal	40.1	46.4	3.3	43.4	49.7	54.0	74.0	10.6	24.3
4824.000	Vertical	42.2	47.7	3.3	45.5	51.0	54.0	74.0	8.5	23.0
7236.000	Horizontal	<37.8	<48.1	3.5	<41.3	<51.6	54.0	74.0	>12.7	>22.4
9648.000	Horizontal	<32.0	<43.2	6.1	<38.1	<49.3	54.0	74.0	>15.9	>24.7

The Mark "<", ">" in the table each means floor noise data and the data is below or over the shown value.

Axial Direction: ZX-Plane

Below 1GHz

Frequency [MHz]	Antenna Polarization	Meter Reading [dBuV]	Factor [dB/m]	Emission Level [dB(uV/m)]	Limits [dB(uV/m)]	Margin [dB]
		QP		QP		
801.11b Mode						
264.004	Horizontal	41.6	-1.6	40.0	46.0	6.0
801.11g Mode						
280.505	Horizontal	32.2	-0.3	31.9	46.0	14.1

Above 1GHz

Frequency [MHz]	Antenna Polarization	Meter Reading		Factor [dB/m]	Emission Level		Limits		Margin [dB]	
		[dB(uV)]			[dB(uV/m)]		[dB(uV/m)]			
		Average	Peak		Average	Peak	Average	Peak	Average	Peak
801.11b Mode										
1056.191	Vertical	55.2	59.1	-11.3	43.9	47.8	54.0	74.0	10.1	26.2
1680.330	Horizontal	41.7	49.5	-7.1	34.6	42.4	54.0	74.0	19.4	31.6
2375.375	Horizontal	44.7	51.2	-3.5	41.2	47.7	54.0	74.0	12.8	26.3
4823.780	Vertical	42.2	47.2	3.3	45.5	50.5	54.0	74.0	8.5	23.5
4823.950	Horizontal	43.9	47.6	3.3	47.2	50.9	54.0	74.0	6.8	23.1
7236.000	Horizontal	<37.8	<48.1	3.5	<41.3	<51.6	54.0	74.0	>12.7	>22.4
801.11g Mode										
1056.008	Horizontal	49.3	55.0	-11.3	38.0	43.7	54.0	74.0	16.0	30.4
1056.025	Vertical	55.9	58.7	-11.3	44.6	47.4	54.0	74.0	9.4	26.6
1584.008	Horizontal	45.9	50.8	-7.9	38.0	42.9	54.0	74.0	16.0	31.1
4823.983	Vertical	36.8	44.9	3.3	40.1	48.2	54.0	74.0	13.9	25.8
4823.992	Horizontal	42.0	46.6	3.3	45.3	49.9	54.0	74.0	8.7	24.1
7236.000	Horizontal	<37.8	<48.1	3.5	<41.3	<51.6	54.0	74.0	>12.7	>22.4
9648.000	Horizontal	<32.0	<43.2	6.1	<38.1	<49.3	54.0	74.0	>15.9	>24.7

The Mark "<", ">" in the table each means floor noise data and the data is below or over the shown value.

Spurious Emission (Radiated) 2437MHz <USB Power Supply>

Serial No.: Keel-CS-T1
 Power: AC120V, 60Hz
 Mode: Transmitting mode
 DBPSK (1Mbps) for IEEE 802.11b (DSSS)
 BPSK (6Mbps) for IEEE 802.11g (OFDM)
 Temperature: Below 1GHz: 25
 Above 1GHz: 25
 Humidity: Below 1GHz: 68%
 Above 1GHz: 63%

Axial Direction: XY-Plane

Below 1GHz

Below 1GHz

Frequency [MHz]	Antenna Polarization	Meter Reading [dBuV]	Factor [dB/m]	Emission Level [dB(uV/m)]	Limits [dB(uV/m)]	Margin [dB]
		QP		QP		
801.11b Mode						
264.006	Vertical	30.4	-1.6	28.8	46.0	17.2
801.11g Mode						
280.505	Horizontal	32.5	-0.3	32.2	46.0	13.8

Above 1GHz

Frequency [MHz]	Antenna Polarization	Meter Reading		Factor [dB/m]	Emission Level		Limits		Margin [dB]	
		[dB(uV)]			[dB(uV/m)]		[dB(uV/m)]			
		Average	Peak		Average	Peak	Average	Peak	Average	Peak
801.11b Mode										
1056.112	Horizontal	50.3	55.6	-11.3	39.0	44.3	54.0	74.0	15.0	29.7
1680.058	Vertical	43.1	50.1	-7.1	36.0	43.0	54.0	74.0	18.0	31.0
2375.783	Vertical	44.5	50.9	-3.5	41.0	47.4	54.0	74.0	13.0	26.6
4873.842	Vertical	39.2	45.9	3.5	42.7	49.4	54.0	74.0	11.3	24.6
7311.000	Horizontal	<38.3	<48.3	3.9	<42.2	<52.2	54.0	74.0	>11.8	>21.8
801.11g Mode										
1056.025	Vertical	53.2	56.4	-11.3	41.9	45.1	54.0	74.0	12.1	29.0
1584.003	Horizontal	46.5	51.5	-7.9	38.6	43.6	54.0	74.0	15.4	30.4
4873.983	Vertical	40.5	46.5	3.5	44.0	50.0	54.0	74.0	10.0	24.0
7311.000	Horizontal	<38.3	<48.3	3.9	<42.2	<52.2	54.0	74.0	>11.8	>21.8
9748.000	Horizontal	<36.8	<47.4	6.1	<42.9	<53.5	54.0	74.0	>11.1	>20.5

Axial Direction: YZ-Plane

Below 1GHz

Below 1GHz						
Frequency [MHz]	Antenna Polarization	Meter Reading [dBuV]	Factor [dB/m]	Emission Level [dB(uV/m)]	Limits [dB(uV/m)]	Margin [dB]
		QP		QP		
801.11b Mode						
264.003	Horizontal	35.1	-1.6	33.5	46.0	12.5
801.11g Mode						
280.504	Horizontal	31.5	-0.3	31.2	46.0	14.8

Above 1GHz

above 1GHz

Frequency [MHz]	Antenna Polarization	Meter Reading [dB(μV)]		Factor [dB/m]	Emission Level [dB(μV/m)]		Limits [dB(μV/m)]		Margin [dB]	
		Average	Peak		Average	Peak	Average	Peak	Average	Peak
801.11b Mode										
1055.875	Horizontal	53.6	57.5	-11.3	42.3	46.2	54.0	74.0	11.7	27.8
1680.067	Vertical	41.1	49.1	-7.1	34.0	42.0	54.0	74.0	20.0	32.0
2376.025	Vertical	42.1	49.5	-3.5	38.6	46.0	54.0	74.0	15.4	28.0
4873.708	Vertical	40.8	46.7	3.5	44.3	50.2	54.0	74.0	9.7	23.8
4873.792	Horizontal	42.2	47.2	3.5	45.7	50.7	54.0	74.0	8.3	23.3
7311.000	Horizontal	<38.3	<48.3	3.9	<42.2	<52.2	54.0	74.0	>11.8	>21.8
801.11g Mode										
1056.042	Horizontal	52.2	55.6	-11.3	40.9	44.3	54.0	74.0	13.1	29.7
1584.017	Vertical	47.6	51.9	-7.9	39.7	44.0	54.0	74.0	14.3	30.0
4874.008	Vertical	42.0	47.2	3.5	45.5	50.7	54.0	74.0	8.5	23.3
7311.000	Horizontal	<38.3	<48.3	3.9	<42.2	<52.2	54.0	74.0	>11.8	>21.8
9748.000	Horizontal	<36.8	<47.4	6.1	<42.9	<53.5	54.0	74.0	>11.1	>20.5

The Mark "<", ">" in the table each means floor noise data and the data is below or over the shown value.

Axial Direction: ZX-Plane

Below 1GHz

Below 1GHz						
Frequency [MHz]	Antenna Polarization	Meter Reading [dBuV]	Factor [dB/m]	Emission Level [dB(uV/m)]	Limits [dB(uV/m)]	Margin [dB]
		QP		QP		
801.11b Mode						
264.003	Vertical	40.5	-1.6	38.9	46.0	7.1
801.11g Mode						
280.504	Horizontal	31.6	-0.3	31.3	46.0	14.7

Above 1GHz

Frequency [MHz]	Antenna Polarization	Meter Reading		Factor [dB/m]	Emission Level		Limits		Margin [dB]	
		[dB(μV)]			[dB(μV/m)]		[dB(μV/m)]			
		Average	Peak		Average	Peak	Average	Peak	Average	Peak
801.11g Mode										
1056.125	Vertical	52.9	57.5	-11.3	41.6	46.2	54.0	74.0	12.4	27.8
1680.008	Horizontal	43.3	50.4	-7.1	36.2	43.3	54.0	74.0	17.8	30.7
2376.217	Horizontal	46.6	52.3	-3.5	43.1	48.8	54.0	74.0	10.9	25.2
4873.933	Horizontal	42.0	47.2	3.5	45.5	50.7	54.0	74.0	8.5	23.3
4873.950	Vertical	38.0	46.4	3.5	41.5	49.9	54.0	74.0	12.5	24.1
7311.000	Horizontal	<38.3	<48.3	3.9	<42.2	<52.2	54.0	74.0	>11.8	>21.8
801.11g Mode										
1056.017	Vertical	53.3	56.5	-11.3	42.0	45.2	54.0	74.0	12.0	28.8
1584.000	Horizontal	47.1	51.2	-7.9	39.2	43.3	54.0	74.0	14.8	30.7
4873.983	Horizontal	41.9	47.0	3.5	45.4	50.5	54.0	74.0	8.6	23.5
7311.000	Horizontal	<38.3	<48.3	3.9	<42.2	<52.2	54.0	74.0	>11.8	>21.8
9748.000	Horizontal	<36.8	<47.4	6.1	<42.9	<53.5	54.0	74.0	>11.1	>20.5

The Mark "<", ">" in the table each means floor noise data and the data is below or over the shown value.

Spurious Emission (Radiated) 2462MHz <USB Power Supply>

Serial No.: Keel-CS-T1
 Power: AC120V, 60Hz
 Mode: Transmitting mode
 DBPSK (1Mbps) for IEEE 802.11b (DSSS)
 BPSK (6Mbps) for IEEE 802.11g (OFDM)
 Temperature: Below 1GHz: 23
 Above 1GHz: 25
 Humidity: Below 1GHz: 71%
 Above 1GHz: 63%

Axial Direction: XY-Plane

Below 1GHz

Below 1GHz						
Frequency [MHz]	Antenna Polarization	Meter Reading [dBuV]	Factor [dB/m]	Emission Level [dB(uV/m)]	Limits [dB(uV/m)]	Margin [dB]
		QP		QP		
801.11b Mode						
264.004	Vertical	33.0	-1.6	31.4	46.0	14.6
801.11g Mode						
280.504	Horizontal	31.5	-0.3	31.2	46.0	14.8

Above 1GHz

Below 1GHz

Frequency [MHz]	Antenna Polarization	Meter Reading [dB(μV)]		Factor [dB/m]	Emission Level [dB(μV/m)]		Limits [dB(μV/m)]		Margin [dB]	
		Average	Peak		Average	Peak	Average	Peak	Average	Peak
801.11b Mode										
1055.833	Horizontal	52.3	56.4	-11.4	40.9	45.0	54.0	74.0	13.1	29.0
1679.925	Horizontal	43.2	50.6	-7.1	36.1	43.5	54.0	74.0	17.9	30.5
2376.233	Vertical	45.8	51.9	-3.5	42.3	48.4	54.0	74.0	11.7	25.6
4924.083	Horizontal	35.9	44.7	3.7	39.6	48.4	54.0	74.0	14.4	25.6
4924.183	Vertical	41.1	46.4	3.7	44.8	50.1	54.0	74.0	9.2	23.9
7386.000	Horizontal	<38.5	<48.3	4.3	<42.8	<52.6	54.0	74.0	>11.2	>21.4
801.11g Mode										
1056.008	Vertical	53.8	56.7	-11.3	42.5	45.4	54.0	74.0	11.5	28.6
1584.008	Horizontal	46.2	51.1	-7.9	38.3	43.2	54.0	74.0	15.7	30.8
4923.992	Vertical	39.0	45.6	3.7	42.7	49.3	54.0	74.0	11.3	24.7
7386.000	Horizontal	<38.5	<48.3	4.3	<42.8	<52.6	54.0	74.0	>11.2	>21.4
9848.000	Horizontal	<36.8	<47.1	6.4	<43.2	53.5	54.0	74.0	>10.8	>20.5

The Mark "<", ">" in the table each means floor noise data and the data is below or over the shown value.

Axial Direction: YZ-Plane
Below 1GHz

Frequency [MHz]	Antenna Polarization	Meter Reading [dBuV]	Factor [dB/m]	Emission Level [dB(uV/m)]	Limits [dB(uV/m)]	Margin [dB]
		QP		QP		
801.11b Mode						
264.006	Horizontal	34.6	-1.6	33.0	46.0	13.0
801.11g Mode						
280.510	Horizontal	34.8	-0.3	34.5	46.0	11.5

Above 1GHz

above 1GHz

Frequency [MHz]	Antenna Polarization	Meter Reading [dB(μV)]		Factor [dB/m]	Emission Level [dB(μV/m)]		Limits [dB(μV/m)]		Margin [dB]	
		Average	Peak		Average	Peak	Average	Peak	Average	Peak
801.11b Mode										
1055.892	Horizontal	53.6	57.3	-11.3	42.3	46.0	54.0	74.0	11.7	28.0
1680.175	Vertical	44.7	50.6	-7.1	37.6	43.5	54.0	74.0	16.4	30.5
2376.008	Vertical	43.1	50.1	-3.5	39.6	46.6	54.0	74.0	14.4	27.4
4923.875	Horizontal	41.0	47.0	3.7	44.7	50.7	54.0	74.0	9.3	23.3
4924.142	Vertical	41.4	46.6	3.7	45.1	50.3	54.0	74.0	8.9	23.7
7386.000	Horizontal	<38.5	<48.3	4.3	<42.8	<52.6	54.0	74.0	>11.2	>21.4
801.11g Mode										
1056.008	Horizontal	41.4	45.1	-11.3	41.4	45.1	54.0	74.0	12.6	28.9
1584.000	Vertical	46.8	51.6	-7.9	38.9	43.7	54.0	74.0	15.1	30.3
4923.983	Vertical	43.1	47.2	3.7	46.8	50.9	54.0	74.0	7.2	23.1
7386.000	Horizontal	<38.5	<48.3	4.3	<42.8	<52.6	54.0	74.0	>11.2	>21.4
9848.000	Horizontal	<36.8	<47.1	6.4	<43.2	53.5	54.0	74.0	>10.8	>20.5

The Mark "<", ">" in the table each means floor noise data and the data is below or over the shown value.

Axial Direction: ZX-Plane

Below 1GHz

Frequency [MHz]	Antenna Polarization	Meter Reading [dBuV]	Factor [dB/m]	Emission Level [dB(uV/m)]	Limits [dB(uV/m)]	Margin [dB]
		QP		QP		
801.11b Mode						
264.006	Horizontal	40.7	-1.6	39.1	46.0	6.9
801.11g Mode						
280.505	Horizontal	31.6	-0.3	31.3	46.0	14.7

Above 1GHz

Below 1GHz

Frequency [MHz]	Antenna Polarization	Meter Reading [dB(μV)]		Factor [dB/m]	Emission Level [dB(μV/m)]		Limits [dB(μV/m)]		Margin [dB]	
		Average	Peak		Average	Peak	Average	Peak	Average	Peak
801.11b Mode										
1055.859	Vertical	53.2	57.9	-11.3	41.9	46.6	54.0	74.0	12.1	27.4
1679.958	Horizontal	42.5	49.6	-7.1	35.4	42.5	54.0	74.0	18.6	31.5
2375.592	Horizontal	42.9	50.2	-3.5	39.4	46.7	54.0	74.0	14.6	27.3
4924.075	Vertical	38.1	45.1	3.7	41.8	48.8	54.0	74.0	12.2	25.2
4924.192	Horizontal	43.0	48.2	3.7	46.7	51.9	54.0	74.0	7.3	22.1
7386.000	Horizontal	<38.5	<48.3	4.3	<42.8	<52.6	54.0	74.0	>11.2	>21.4
801.11g Mode										
1056.017	Vertical	55.7	58.8	-11.3	44.4	47.5	54.0	74.0	9.6	26.5
1584.025	Horizontal	46.6	51.5	-7.9	38.7	43.6	54.0	74.0	15.3	30.4
4924.025	Horizontal	42.5	46.8	3.7	46.2	50.5	54.0	74.0	7.8	23.5
7386.000	Horizontal	<38.5	<48.3	4.3	<42.8	<52.6	54.0	74.0	>11.2	>21.4
9848.000	Horizontal	<36.8	<47.1	6.4	<43.2	53.5	54.0	74.0	>10.8	>20.5

The Mark "<", ">" in the table each means floor noise data and the data is below or over the shown value.

Spurious Emission (Radiated) 2412MHz (Battery Power Supply)

Serial No.: Keel-CS-T1
 Battery voltage: Before test 4.17V
 After test 3.74V
 Mode: Transmitting mode
 DBPSK (1Mbps) for IEEE 802.11b (DSSS)
 BPSK (6Mbps) for IEEE 802.11g (OFDM)
 Temperature: Below 1GHz: 23
 Above 1GHz: 23 (11b), 24 (11g)
 Humidity: Below 1GHz: 71%
 Above 1GHz: 71% (11b), 71% (11g)

Axial Direction: XY-Plane

Below 1GHz

Frequency [MHz]	Antenna Polarization	Meter Reading [dBuV]	Factor [dB/m]	Emission Level [dB(uV/m)]	Limits [dB(uV/m)]	Margin [dB]
		QP		QP		
801.11b Mode						
280.505	Horizontal	39.4	-0.3	39.1	46.0	6.9
801.11g Mode						
280.507	Horizontal	36.8	-0.3	36.5	46.0	9.5

Above 1GHz

Frequency [MHz]	Antenna Polarization	Meter Reading [dB(uV)]		Factor [dB/m]	Emission Level [dB(uV/m)]		Limits [dB(uV/m)]		Margin [dB]	
		Average	Peak		Average	Peak	Average	Peak	Average	Peak
801.11b Mode										
1056.510	Vertical	50.8	55.8	-11.4	39.5	44.5	54.0	74.0	14.5	29.5
1583.950	Horizontal	49.7	54.1	-7.9	41.8	46.2	54.0	74.0	12.1	27.8
4823.750	Horizontal	36.3	44.9	3.3	39.6	48.2	54.0	74.0	14.4	25.8
4823.770	Vertical	41.0	47.1	3.3	44.3	50.4	54.0	74.0	9.7	23.6
7236.000	Horizontal	<37.8	<48.1	3.5	<41.3	<51.6	54.0	74.0	>12.7	>22.4
9648.000	Horizontal	<32.0	<43.2	6.1	<38.1	<49.3	54.0	74.0	>15.9	>24.7
801.11g Mode										
1056.120	Vertical	51.2	55.8	-11.3	39.9	44.5	54.0	74.0	14.1	29.5
1583.667	Horizontal	49.2	53.4	-7.9	41.3	45.5	54.0	74.0	12.7	28.5
4823.233	Vertical	36.2	45.2	3.3	39.5	48.5	54.0	74.0	14.5	25.5
7236.000	Horizontal	<37.8	<48.1	3.5	<41.3	<51.6	54.0	74.0	>12.7	>22.4
9648.000	Horizontal	<32.0	<43.2	6.1	<38.1	<49.3	54.0	74.0	>15.9	>24.7

The Mark "<", ">" in the table each means floor noise data and the data is below or over the shown value.

Axial Direction: YZ-Plane

Below 1GHz

Below 1GHz						
Frequency [MHz]	Antenna Polarization	Meter Reading [dBuV]	Factor [dB/m]	Emission Level [dB(uV/m)]	Limits [dB(uV/m)]	Margin [dB]
		QP		QP		
801.11b Mode						
280.508	Horizontal	38.5	-0.3	38.2	46.0	7.8
801.11g Mode						
280.511	Horizontal	35.1	-0.3	34.8	46.0	11.2

Above 1GHz

Below 1GHz

Frequency [MHz]	Antenna Polarization	Meter Reading [dB(uV)]		Factor [dB/m]	Emission Level [dB(uV/m)]		Limits [dB(uV/m)]		Margin [dB]	
		Average	Peak		Average	Peak	Average	Peak	Average	Peak
801.11b Mode										
1055.820	Horizontal	54.5	57.5	-11.4	43.1	46.1	54.0	74.0	10.9	27.9
1584.010	Vertical	50.6	54.5	-7.9	42.7	46.6	54.0	74.0	11.3	27.4
4824.030	Horizontal	42.7	47.7	3.3	46.0	51.0	54.0	74.0	8.0	23.0
4824.100	Vertical	41.8	47.4	3.3	45.1	50.7	54.0	74.0	8.9	23.3
7236.000	Horizontal	<37.8	<48.1	3.5	<41.3	<51.6	54.0	74.0	>12.7	>22.4
9648.000	Horizontal	<32.0	<43.2	6.1	<38.1	<49.3	54.0	74.0	>15.9	>24.7
801.11g Mode										
1056.033	Horizontal	53.7	57.2	-11.3	42.4	45.9	54.0	74.0	11.6	28.1
1583.853	Vertical	50.3	54.2	-7.9	42.4	46.3	54.0	74.0	11.6	27.7
4824.008	Vertical	41.2	47.2	3.3	44.5	50.5	54.0	74.0	9.5	23.5
4824.217	Horizontal	40.0	46.2	3.3	43.3	49.5	54.0	74.0	10.7	24.5
7236.000	Horizontal	<37.8	<48.1	3.5	<41.3	<51.6	54.0	74.0	>12.7	>22.4
9648.000	Horizontal	<32.0	<43.2	6.1	<38.1	<49.3	54.0	74.0	>15.9	>24.7

The Mark "<", ">" in the table each means floor noise data and the data is below or over the shown value.

Axial Direction: ZX-Plane

Below 1GHz

Below 1GHz						
Frequency [MHz]	Antenna Polarization	Meter Reading [dBuV]	Factor [dB/m]	Emission Level [dB(uV/m)]	Limits [dB(uV/m)]	Margin [dB]
		QP		QP		
801.11b Mode						
280.512	Horizontal	38.6	-0.3	38.3	46.0	7.7
801.11g Mode						
280.498	Horizontal	38.7	-0.3	38.4	46.0	7.6

Above 1GHz

Below 1GHz

Frequency [MHz]	Antenna Polarization	Meter Reading [dB(uV)]		Factor [dB/m]	Emission Level [dB(uV/m)]		Limits [dB(uV/m)]		Margin [dB]	
		Average	Peak		Average	Peak	Average	Peak	Average	Peak
801.11b Mode										
1056.320	Vertical	53.9	57.7	-11.3	42.6	46.4	54.0	74.0	11.4	27.6
1584.120	Horizontal	48.2	53.0	-7.9	40.3	45.1	54.0	74.0	13.7	28.9
4824.100	Vertical	40.0	46.1	3.3	43.3	49.4	54.0	74.0	10.7	24.6
4824.120	Horizontal	42.3	47.4	3.3	45.6	50.7	54.0	74.0	8.4	23.3
7236.000	Horizontal	<37.8	<48.1	3.5	<41.3	<51.6	54.0	74.0	>12.7	>22.4
9648.000	Horizontal	<32.0	<43.2	6.1	<38.1	<49.3	54.0	74.0	>15.9	>24.7
801.11g Mode										
1056.008	Vertical	54.3	57.5	-11.3	43.0	46.2	54.0	74.0	11.0	27.8
1583.950	Horizontal	46.7	51.6	-7.9	38.8	43.7	54.0	74.0	15.2	30.3
4823.875	Horizontal	43.2	47.9	3.3	46.5	51.2	54.0	74.0	7.5	22.8
4824.217	Vertical	36.4	44.9	3.3	39.7	48.2	54.0	74.0	14.3	25.8
7236.000	Horizontal	<37.8	<48.1	3.5	<41.3	<51.6	54.0	74.0	>12.7	>22.4
9648.000	Horizontal	<32.0	<43.2	6.1	<38.1	<49.3	54.0	74.0	>15.9	>24.7

The Mark "<", ">" in the table each means floor noise data and the data is below or over the shown value.

Spurious Emission (Radiated) 2437MHz <Battery Power Supply>

Serial No.: Keel-CS-T1
 Battery voltage: Before test 4.17V
 After test 3.74V
 Mode: Transmitting mode
 DBPSK (1Mbps) for IEEE 802.11b (DSSS)
 BPSK (6Mbps) for IEEE 802.11g (OFDM)
 Temperature: Below 1GHz: 23
 Above 1GHz: 23 (11b), 24 (11g)
 Humidity: Below 1GHz: 71%
 Above 1GHz: 71% (11b), 71% (11g)

Axial Direction: XY-Plane

Below 1GHz

Below 1GHz

Frequency [MHz]	Antenna Polarization	Meter Reading [dBuV]	Factor [dB/m]	Emission Level [dB(uV/m)]	Limits [dB(uV/m)]	Margin [dB]
		QP		QP		
801.11b Mode						
280.505	Horizontal	36.8	-0.3	36.5	46.0	9.5
801.11g Mode						
280.507	Horizontal	39.1	-2.0	37.1	46.0	8.9

Above 1GHz

Frequency [MHz]	Antenna Polarization	Meter Reading		Factor [dB/m]	Emission Level		Limits		Margin [dB]	
		[dB(uV)]			[dB(uV/m)]		[dB(uV/m)]			
		Average	Peak		Average	Peak	Average	Peak	Average	Peak
801.11b Mode										
1055.830	Horizontal	51.5	55.9	-11.4	40.1	44.5	54.0	74.0	13.9	29.5
1583.850	Horizontal	47.8	52.5	-7.9	39.9	44.6	54.0	74.0	14.1	29.4
4873.800	Vertical	40.3	46.8	3.5	43.8	50.3	54.0	74.0	10.2	23.7
7311.000	Horizontal	<38.3	<48.3	3.9	<42.2	<52.2	54.0	74.0	>11.8	>21.8
9748.000	Horizontal	<36.8	<47.4	6.1	<42.9	<53.5	54.0	74.0	>11.1	>20.5
801.11g Mode										
1056.050	Horizontal	51.4	55.5	-11.3	40.1	44.2	54.0	74.0	13.9	29.8
1584.208	Horizontal	47.5	52.4	-7.9	39.6	44.5	54.0	74.0	14.4	29.5
4874.067	Vertical	38.9	46.7	3.5	42.4	50.2	54.0	74.0	11.6	23.8
7311.000	Horizontal	<38.3	<48.3	3.9	<42.2	<52.2	54.0	74.0	>11.8	>21.8
9748.000	Horizontal	<36.8	<47.4	6.1	<42.9	<53.5	54.0	74.0	>11.1	>20.5

The Mark "<", ">" in the table each means floor noise data and the data is below or over the shown value.

Axial Direction: YZ-Plane

Below 1GHz

Frequency [MHz]	Antenna Polarization	Meter Reading [dBuV]	Factor [dB/m]	Emission Level [dB(uV/m)]	Limits [dB(uV/m)]	Margin [dB]
		QP		QP		
801.11b Mode						
280.503	Horizontal	37.7	-0.3	37.4	46.0	8.6
801.11g Mode						
280.510	Horizontal	39.6	-0.3	39.3	46.0	6.7

Above 1GHz

Frequency [MHz]	Antenna Polarization	Meter Reading [dB(uV)]		Factor [dB/m]	Emission Level [dB(uV/m)]		Limits [dB(uV/m)]		Margin [dB]	
		Average	Peak		Average	Peak	Average	Peak	Average	Peak
801.11b Mode										
1055.580	Horizontal	53.8	57.0	-11.4	42.4	45.6	54.0	74.0	11.6	28.4
1583.720	Vertical	50.8	55.1	-7.9	42.9	47.2	54.0	74.0	11.1	26.8
4873.930	Horizontal	42.1	47.7	3.5	45.6	51.2	54.0	74.0	8.4	22.8
4874.170	Vertical	39.5	45.5	3.5	43.0	49.0	54.0	74.0	11.0	25.0
7311.000	Horizontal	<38.3	<48.3	3.9	<42.2	<52.2	54.0	74.0	>11.8	>21.8
9748.000	Horizontal	<36.8	<47.4	6.1	<42.9	<53.5	54.0	74.0	>11.1	>20.5
801.11g Mode										
1056.108	Horizontal	53.8	57.2	-11.3	42.5	45.9	54.0	74.0	11.5	28.1
1584.033	Vertical	48.1	53.0	-7.9	40.2	45.1	54.0	74.0	13.8	28.9
4873.767	Vertical	41.4	47.4	3.5	44.9	50.9	54.0	74.0	9.1	23.1
4873.942	Horizontal	40.5	46.9	3.5	44.0	50.4	54.0	74.0	10.0	23.6
7311.000	Horizontal	<38.3	<48.3	3.9	<42.2	<52.2	54.0	74.0	>11.8	>21.8
9748.000	Horizontal	<36.8	<47.4	6.1	<42.9	<53.5	54.0	74.0	>11.1	>20.5

The Mark "<", ">" in the table each means floor noise data and the data is below or over the shown value.

Axial Direction: ZX-Plane

Below 1GHz

Frequency [MHz]	Antenna Polarization	Meter Reading [dBuV]	Factor [dB/m]	Emission Level [dB(uV/m)]	Limits [dB(uV/m)]	Margin [dB]
		QP		QP		
801.11b Mode						
280.510	Vertical	38.8	-0.3	38.5	46.0	7.5
801.11g Mode						
280.510	Horizontal	39.8	-0.3	39.5	46.0	6.5

Above 1GHz

above 1GHz

Frequency [MHz]	Antenna Polarization	Meter Reading [dB(uV)]		Factor [dB/m]	Emission Level [dB(uV/m)]		Limits [dB(uV/m)]		Margin [dB]	
		Average	Peak		Average	Peak	Average	Peak	Average	Peak
801.11g Mode										
1055.733	Vertical	53.5	57.5	-11.4	42.1	46.1	54.0	74.0	11.9	27.8
1583.917	Horizontal	47.0	52.0	-7.1	39.1	44.1	54.0	74.0	14.9	29.9
4874.000	Horizontal	43.3	48.3	3.5	46.8	51.8	54.0	74.0	7.2	22.2
4874.308	Vertical	38.2	45.9	3.5	41.7	49.4	54.0	74.0	12.3	24.6
7311.000	Horizontal	<38.3	<48.3	3.9	<42.2	<52.2	54.0	74.0	>11.8	>21.8
9748.000	Horizontal	<36.8	<47.4	6.1	<42.9	<53.5	54.0	74.0	>11.1	>20.5
801.11g Mode										
1055.975	Vertical	55.6	58.7	-11.3	44.3	47.4	54.0	74.0	9.7	26.6
1056.200	Horizontal	49.2	54.7	-11.3	37.9	43.4	54.0	74.0	16.1	30.6
1583.875	Horizontal	46.6	52.0	-7.9	38.7	44.1	54.0	74.0	15.3	29.9
4873.658	Vertical	35.3	45.0	3.5	38.8	48.5	54.0	74.0	15.2	25.5
4874.242	Horizontal	43.4	48.7	3.5	46.9	52.2	54.0	74.0	7.1	21.8
7311.000	Horizontal	<38.3	<48.3	3.9	<42.2	<52.2	54.0	74.0	>11.8	>21.8
9748.000	Horizontal	<36.8	<47.4	6.1	<42.9	<53.5	54.0	74.0	>11.1	>20.5

The Mark "<", ">" in the table each means floor noise data and the data is below or over the shown value.

Spurious Emission (Radiated) 2462MHz <Battery Power Supply>

Serial No.: Keel-CS-T1
 Battery voltage: Before test 4.17V
 After test 3.74V
 Mode: Transmitting mode
 DBPSK (1Mbps) for IEEE 802.11b (DSSS)
 BPSK (6Mbps) for IEEE 802.11g (OFDM)
 Temperature: Below 1GHz: 23
 Above 1GHz: 23 (11b), 24 (11g)
 Humidity: Below 1GHz: 71%
 Above 1GHz: 71% (11b), 71% (11g)

Axial Direction: XY-Plane

Below 1GHz

Below 1GHz						
Frequency [MHz]	Antenna Polarization	Meter Reading [dBuV]	Factor [dB/m]	Emission Level [dB(uV/m)]	Limits [dB(uV/m)]	Margin [dB]
		QP		QP		
801.11b Mode						
280.510	Horizontal	38.4	-0.3	38.1	46.0	7.9
801.11g Mode						
280.510	Horizontal	39.8	-0.3	39.5	46.0	6.5

Above 1GHz

Frequency [MHz]	Antenna Polarization	Meter Reading [dB(μV)]		Factor [dB/m]	Emission Level [dB(μV/m)]		Limits [dB(μV/m)]		Margin [dB]	
		Average	Peak		Average	Peak	Average	Peak	Average	Peak
801.11b Mode										
1056.075	Horizontal	51.8	55.8	-11.3	40.5	44.5	54.0	74.0	13.5	29.5
1584.267	Horizontal	49.3	53.8	-7.9	41.4	45.9	54.0	74.0	12.6	28.1
4924.075	Horizontal	35.2	44.8	3.7	38.9	48.5	54.0	74.0	15.1	25.5
4924.300	Vertical	41.2	47.0	3.7	44.9	50.7	54.0	74.0	9.1	23.3
7386.000	Horizontal	<38.5	<48.3	4.3	<42.8	<52.6	54.0	74.0	>11.2	>21.4
9848.000	Horizontal	<36.8	<47.1	6.4	<43.2	<53.5	54.0	74.0	>10.8	>20.5
801.11g Mode										
1055.858	Horizontal	51.7	55.9	-11.3	40.4	44.6	54.0	74.0	13.6	29.4
1583.850	Horizontal	47.1	52.5	-7.9	39.2	44.6	54.0	74.0	14.8	29.4
4923.792	Horizontal	33.8	44.2	3.7	37.5	47.9	54.0	74.0	16.5	26.1
4924.033	Vertical	40.8	47.7	3.7	44.5	51.4	54.0	74.0	9.5	22.6
7386.000	Horizontal	<38.5	<48.3	4.3	<42.8	<52.6	54.0	74.0	>11.2	>21.4
9848.000	Horizontal	<36.8	<47.1	6.4	<43.2	<53.5	54.0	74.0	>10.8	>20.5

The Mark "<", ">" in the table each means floor noise data and the data is below or over the shown value.

Axial Direction: YZ-Plane

Below 1GHz

Frequency [MHz]	Antenna Polarization	Meter Reading [dBuV]	Factor [dB/m]	Emission Level [dB(uV/m)]	Limits [dB(uV/m)]	Margin [dB]
		QP		QP		
801.11b Mode						
280.505	Horizontal	36.8	-0.3	36.5	46.0	9.5
801.11g Mode						
280.498	Horizontal	39.6	-0.3	39.3	46.0	6.7

Above 1GHz

Frequency [MHz]	Antenna Polarization	Meter Reading [dB(uV)]		Factor [dB/m]	Emission Level [dB(uV/m)]		Limits [dB(uV/m)]		Margin [dB]	
		Average	Peak		Average	Peak	Average	Peak	Average	Peak
801.11b Mode										
1055.792	Horizontal	53.8	58.1	-11.4	42.4	46.7	54.0	74.0	11.6	27.3
1584.292	Vertical	50.9	55.2	-7.9	43.0	47.3	54.0	74.0	11.0	26.7
4923.992	Vertical	40.8	47.6	3.7	44.5	51.3	54.0	74.0	9.5	22.7
4924.175	Horizontal	40.9	47.5	3.7	44.6	51.2	54.0	74.0	9.4	22.8
7386.000	Horizontal	<38.5	<48.3	4.3	<42.8	<52.6	54.0	74.0	>11.2	>21.4
9848.000	Horizontal	<36.8	<47.1	6.4	<43.2	<53.5	54.0	74.0	>10.8	>20.5
801.11g Mode										
1055.900	Horizontal	53.2	57.0	-11.3	41.9	45.7	54.0	74.0	12.6	28.3
1584.242	Vertical	48.7	53.5	-7.9	40.8	45.6	54.0	74.0	13.2	28.4
4923.883	Horizontal	39.1	45.6	3.7	42.8	49.3	54.0	74.0	11.2	24.7
4923.958	Vertical	42.7	47.4	3.7	46.4	51.1	54.0	74.0	7.6	22.9
7386.000	Horizontal	<38.5	<48.3	4.3	<42.8	<52.6	54.0	74.0	>11.2	>21.4
9848.000	Horizontal	<36.8	<47.1	6.4	<43.2	<53.5	54.0	74.0	>10.8	>20.5

The Mark "<", ">" in the table each means floor noise data and the data is below or over the shown value.

Axial Direction: ZX-Plane

Below 1GHz

Below 1GHz						
Frequency [MHz]	Antenna Polarization	Meter Reading [dBuV]	Factor [dB/m]	Emission Level [dB(uV/m)]	Limits [dB(uV/m)]	Margin [dB]
		QP		QP		
801.11b Mode						
280.509	Horizontal	41.2	-2.0	39.2	46.0	6.8
801.11g Mode						
280.499	Horizontal	40.4	-2.0	38.4	46.0	7.6

Above 1GHz

Below 1GHz

Frequency [MHz]	Antenna Polarization	Meter Reading [dB(uV)]		Factor [dB/m]	Emission Level [dB(uV/m)]		Limits [dB(uV/m)]		Margin [dB]	
		Average	Peak		Average	Peak	Average	Peak	Average	Peak
801.11b Mode										
1055.850	Vertical	55.2	58.4	-11.3	43.9	47.1	54.0	74.0	10.1	26.9
1584.108	Horizontal	46.8	52.3	-7.9	38.9	44.4	54.0	74.0	15.1	29.6
4923.933	Vertical	36.3	45.9	3.7	40.0	49.6	54.0	74.0	14.0	24.4
4924.067	Horizontal	43.7	48.5	3.7	47.4	52.2	54.0	74.0	6.6	21.8
7386.000	Horizontal	<38.5	<48.3	4.3	<42.8	<52.6	54.0	74.0	>11.2	>21.4
9848.000	Horizontal	<36.8	<47.1	6.4	<43.2	<53.5	54.0	74.0	>10.8	>20.5
801.11g Mode										
1055.983	Vertical	52.5	56.6	-11.3	41.2	45.3	54.0	74.0	12.8	28.7
1584.367	Horizontal	48.1	52.7	-7.9	40.2	44.8	54.0	74.0	13.8	29.2
4923.967	Horizontal	43.2	48.6	3.7	46.9	52.3	54.0	74.0	7.1	21.7
4924.042	Vertical	35.1	44.8	3.7	38.8	48.5	54.0	74.0	15.2	25.5
7386.000	Horizontal	<38.5	<48.3	4.3	<42.8	<52.6	54.0	74.0	>11.2	>21.4
9848.000	Horizontal	<36.8	<47.1	6.4	<43.2	<53.5	54.0	74.0	>10.8	>20.5

The Mark "<", ">" in the table each means floor noise data and the data is below or over the shown value.

7 6dB Bandwidth

7.1 Test Setup

The spectrum analyzer was connected to the transmitter output port through the RF cable.

Spectrum analyzer setting:

DETECTOR MODE: PEAK
 RBW: 100kHz
 VBW: 100kHz
 SPAN: 20MHz
 SWEEP TIME: AUTO

7.2 Test Instrument

Equipment	Manufacture	Model No.	Serial No.	Calibration Date	Next Calibration Due
Spectrum Analyzer	Rohde & Schwarz	FSIQ26	840061/0004	10 th .2.2006	9 th .2.2007
RF Cable	SUHNER	SUCOFLEX 104E	RF2-2	4 th .7.2006	3 rd .7.2007
Multi Meter	R6451A	67840312	Advantest	15 th .6.2006	14 th .6.2007

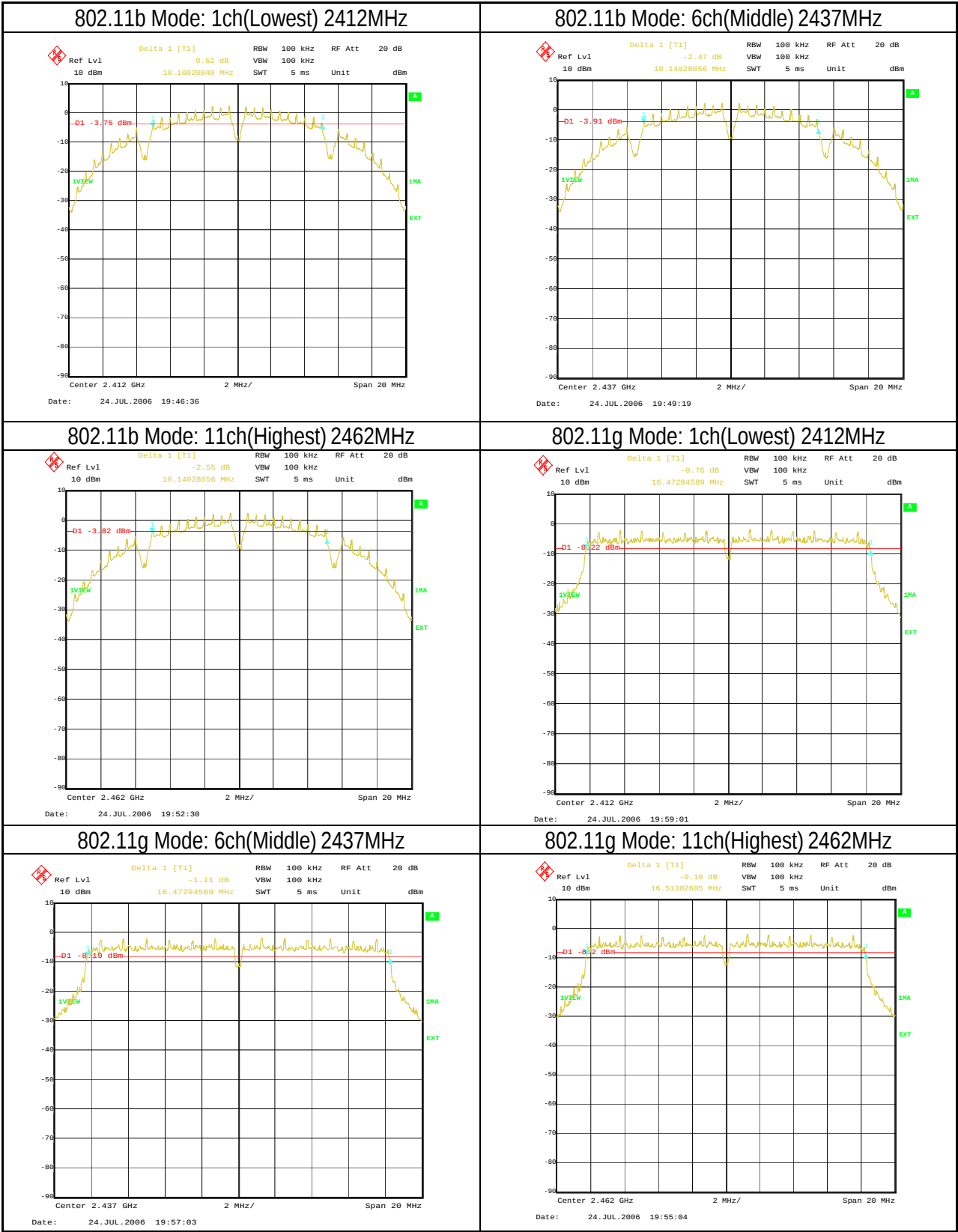
7.3 Test Results

Serial No.: Keel-CS-FB-31
 Power: DC5.0V via USB port.
 Mode: Transmitting mode, (1CH, 6CH, 11CH)
 DBPSK (1Mbps) for IEEE 802.11b (DSSS)
 BPSK (6Mbps) for IEEE 802.11g (OFDM)
 Temperature: 21.3
 Humidity: 62.0 %
 Regulation: FCC Part15 C §15.247 (a)(2)

CH	Frequency [MHz]	6dB Bandwidth [MHz]	Limit [MHz]
802.11b Mode DBPSK (1Mbps)			
1ch (Lowest)	2412.0	10.10	>=0.5
6ch (Middle)	2437.0	10.14	>=0.5
11ch (Highest)	2462.0	10.14	>=0.5
802.11g Mode BPSK (6Mbps)			
1ch (Lowest)	2412.0	16.47	>=0.5
6ch (Middle)	2437.0	16.47	>=0.5
11ch (Highest)	2462.0	16.51	>=0.5

The spectrum data are attached next page. Display line indicates the 6dB offset below highest level. It shows compliance with the requirement in part 15.247(a)(2).

Data of 6dB Bandwidth



8 Maximum Peak Output Power

This test have been conducted in JQA(Japan Quality Assurance Organization) KITA-KANSAI Testing Center separately.

The summary of test results : -

CH	Frequency [MHz]	Result [mW]	Margin [dBm]
802.11b Mode			
11ch(Highest)	2462.0	28.2	15.5
802.11g Mode			
11ch(Highest)	2462.0	144.5	8.4

For more detail, please refer to test report issued by JQA. (Report No. KL8006216)

9 Peak Power Spectral Density

9.1 Test Setup

The test is performed in accordance with FCC Document "Measurement of Transmission Systems Operating under section 15.247". PSD Option1 is used.

The spectrum analyzer was connected to the transmitter output port through the RF cable.

Spectrum analyzer setting:

DETECTOR MODE: PEAK
 RBW: 3kHz
 VBW: 10kHz
 SPAN: 300kHz
 SWEEP TIME: 100s

9.2 Test Instrument

Equipment	Manufacture	Model No.	Serial No.	Calibration Date	Next Calibration Due
Spectrum Analyzer	Rohde & Schwarz	FSIQ26	840061/0004	10 th .2.2006	9 th .2.2007
RF Cable	SUHNER	SUCOFLEX 104E	RF2-2	4 th .7.2006	3 rd .7.2007
Multi Meter	R6451A	67840312	Advantest	15 th .6.2006	14 th .6.2007

9.3 Test Results

Serial No.: Keel-CS-FB-31
 Power: DC5.0V via USB port.
 Mode: Transmitting mode (1CH, 6CH, 11CH)
 DBPSK (1Mbps) for IEEE 802.11b (DSSS)
 BPSK (6Mbps) for IEEE 802.11g (OFDM)
 Temperature: 21.3
 Humidity: 62.0 %
 Regulation: FCC Part15 C. §15.247 (e)

CH	Frequency [MHz]	Reading [dBm]	Cable Loss1 [dB]	Cable Loss2 [dB]	Result [dBm]	Limit [dBm/3kHz]
802.11b Mode DBPSK (1Mbps)						
1ch(Lowest)	2412.0	-10.34	0.60	0.75	-8.99	<=8
6ch(Middle)	2437.0	-10.32	0.57	0.78	-8.97	<=8
11ch(Highest)	2462.0	-10.40	0.65	0.89	-8.86	<=8
802.11g Mode BPSK (6Mbps)						
1ch(Lowest)	2412.0	-18.07	0.60	0.75	-16.72	<=8
6ch(Middle)	2437.0	-17.98	0.57	0.78	-16.63	<=8
11ch(Highest)	2462.0	-18.16	0.65	0.89	-16.62	<=8

Result = Reading + Cable Loss

Note: Cable Loss1: RF2-2

Cable Loss2: Conversion cable used for connecting to SMA type

The spectrum data are attached next page.

802.11b Mode: 1ch(Lowest) 2412MHz

Ref Lvl 10 dBm Marker 1 [T1] -10.34 dBm RBW 3 kHz RF Att 20 dB
2.41260490 GHz VBW 10 kHz Unit dBm
SWT 100 s

Center 2.412674944 GHz 30 kHz/ Span 300 kHz
Date: 2.AUG.2006 11:41:56

802.11b Mode: 6ch(Middle) 2437MHz

Ref Lvl 10 dBm Marker 1 [T1] -10.32 dBm RBW 3 kHz RF Att 20 dB
2.43636551 GHz VBW 10 kHz Unit dBm
SWT 100 s

Center 2.436295466 GHz 30 kHz/ Span 300 kHz
Date: 2.AUG.2006 11:47:13

802.11b Mode: 11ch(Highest) 2462MHz

Ref Lvl 10 dBm Marker 1 [T1] -10.40 dBm RBW 3 kHz RF Att 20 dB
2.46260460 GHz VBW 10 kHz Unit dBm
SWT 100 s

Center 2.462605586 GHz 30 kHz/ Span 300 kHz
Date: 2.AUG.2006 11:51:30

802.11g Mode: 1ch(Lowest) 2412MHz

Ref Lvl 10 dBm Marker 1 [T1] -18.07 dBm RBW 3 kHz RF Att 20 dB
2.40980594 GHz VBW 10 kHz Unit dBm
SWT 100 s

Center 2.409806237 GHz 30 kHz/ Span 300 kHz
Date: 2.AUG.2006 11:56:05

802.11g Mode: 6ch(Middle) 2437MHz

Ref Lvl 10 dBm Marker 1 [T1] -17.98 dBm RBW 3 kHz RF Att 20 dB
2.43480594 GHz VBW 10 kHz Unit dBm
SWT 100 s

Center 2.434806237 GHz 30 kHz/ Span 300 kHz
Date: 2.AUG.2006 11:59:41

802.11g Mode: 11ch(Highest) 2462MHz

Ref Lvl 10 dBm Marker 1 [T1] -18.16 dBm RBW 3 kHz RF Att 20 dB
2.45980534 GHz VBW 10 kHz Unit dBm
SWT 100 s

Center 2.459806237 GHz 30 kHz/ Span 300 kHz
Date: 2.AUG.2006 12:03:04

10 Band Edge Compliance

10.1 Test Setup

The spectrum analyzer was connected to the transmitter output port through the RF cable.

Spectrum analyzer setting:

DETECTOR MODE: PEAK
RBW: 100kHz
VBW: 300kHz
Start Frequency: 50MHz
SWEEP TIME: AUTO

10.2 Test Instrument

Equipment	Manufacture	Model No.	Serial No.	Calibration Date	Next Calibration Due
Spectrum Analyzer	Rohde & Schwarz	FSIQ26	840061/0004	10 th .2.2006	9 th .2.2007
RF Cable	SUHNER	SUCOFLEX 104E	RF2-2	4 th .7.2006	3 rd .7.2007
Multi Meter	R6451A	67840312	Advantest	15 th .6.2006	14 th .6.2007

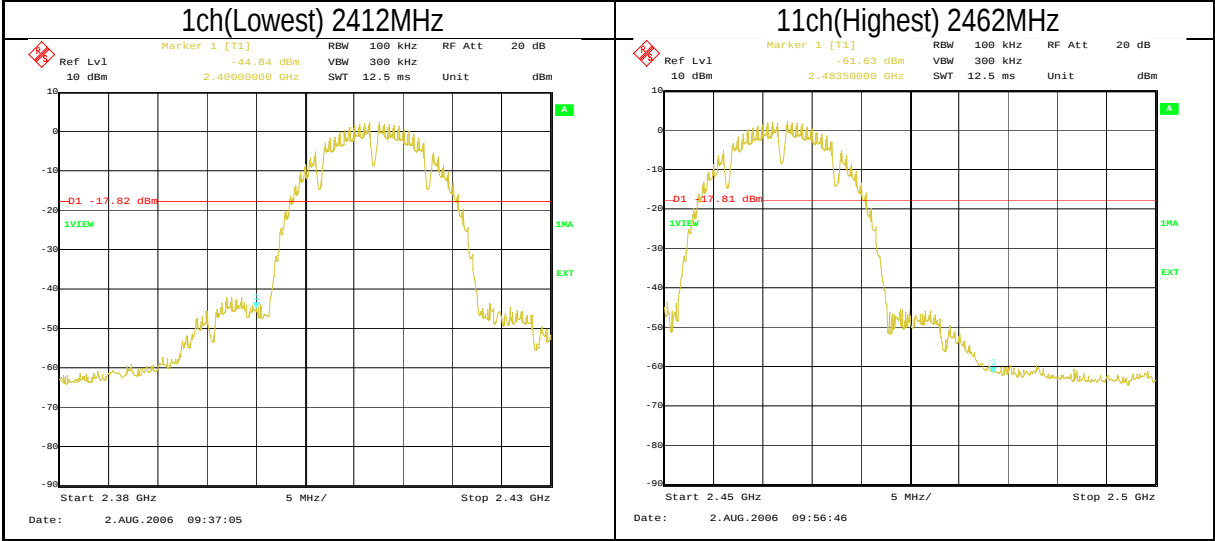
10.3 Test Results

Serial No.: Keel-CS-FB-31
Power: DC5.0V via USB port.
Mode: Transmitting mode, (1CH,11CH)
DBPSK (1Mbps) for IEEE 802.11b (DSSS)
BPSK (6Mbps) for IEEE 802.11g (OFDM)
Temperature: 21.3
Humidity: 62.0 %
Regulation: FCC Part15 C. §15.247 (d)

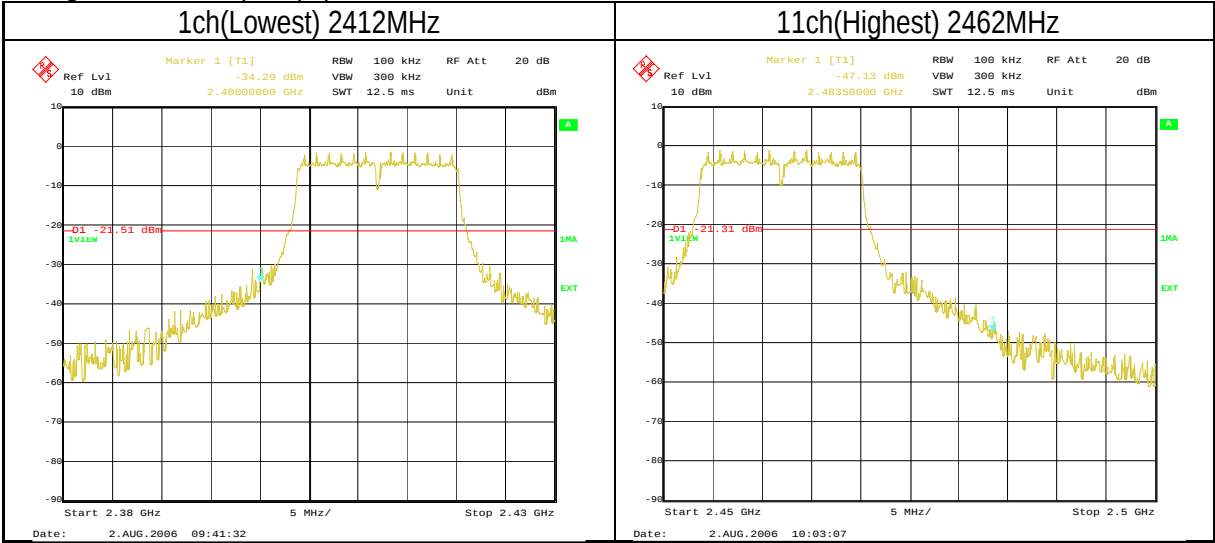
The spectrum data are attached next page. Display line indicates the 20dB offset below highest level.
It shows compliance with the requirement in part 15.247(d)

Data of Band Edge Compliance

802.11b Mode DBPSK (1Mbps)



802.11g Mode BPSK (6Mbps)



11 Spurious RF Conducted Emission

11.1 Test Setup

The spectrum analyzer was connected to the transmitter output port through the RF cable.

Spectrum analyzer setting:

DETECTOR MODE: PEAK
RBW: 100kHz
VBW: 300kHz
SWEEP TIME: AUTO

11.2 Test Instrument

Equipment	Manufacture	Model No.	Serial No.	Calibration Date	Next Calibration Due
Spectrum Analyzer	Rohde & Schwarz	FSIQ26	840061/0004	10 th .2.2006	9 th .2.2007
RF Cable	SUHNER	SUCOFLEX 104E	RF2-2	4 th .7.2006	3 rd .7.2007
Multi Meter	R6451A	67840312	Advantest	15 th .6.2006	14 th .6.2007

11.3 Test Results

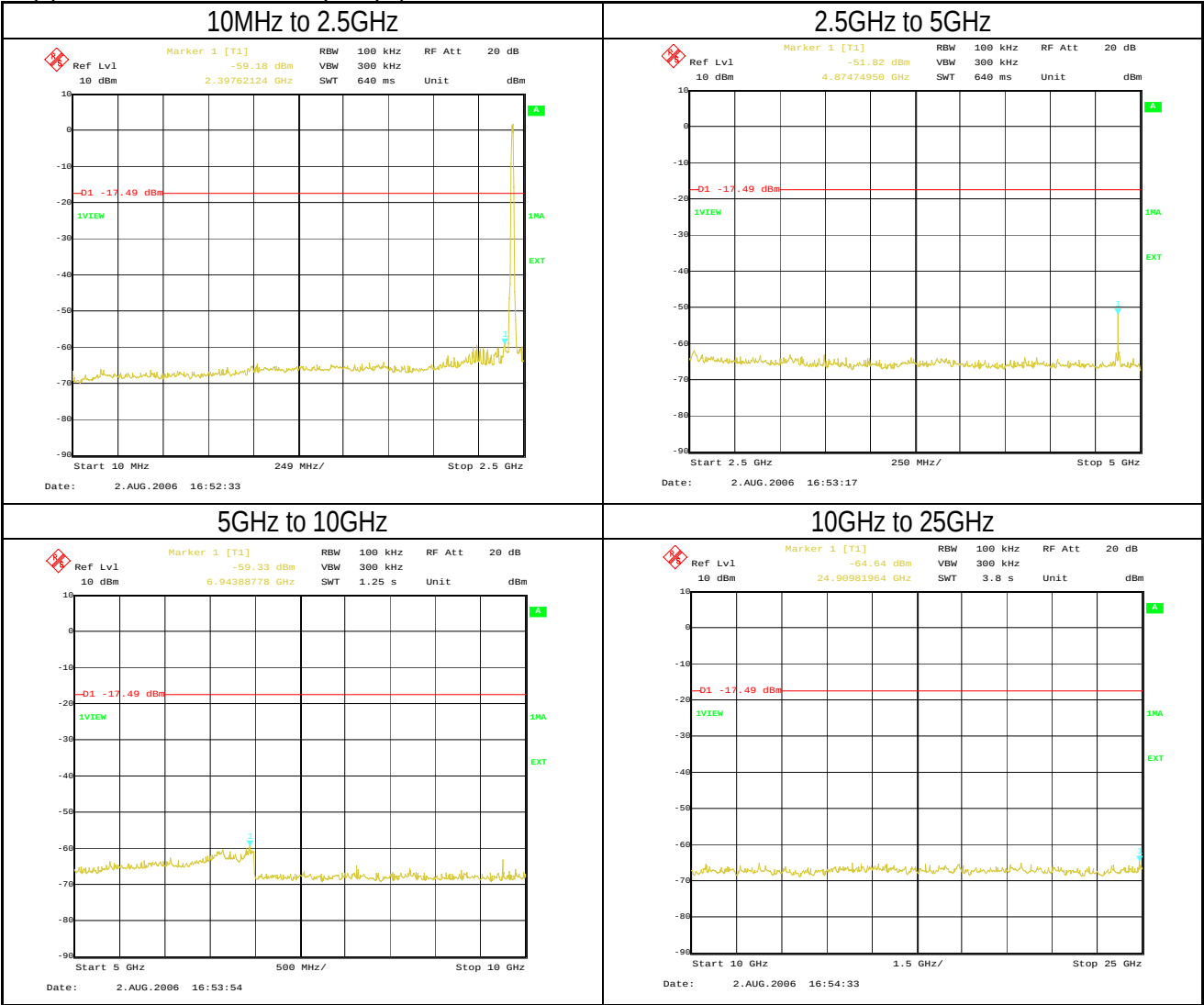
Serial No.: Keel-CS-FB-31
Power: DC5.0V via USB port.
Mode: Transmitting mode, (1CH,6CH,11CH)
DBPSK (1Mbps) for IEEE 802.11b (DSSS)
BPSK (6Mbps) for IEEE 802.11g (OFDM)
Temperature: 21.3
Humidity: 62.0 %
Regulation: FCC Part15 C §15.247 (d)

The spectrum data are attached next page. Display line indicates the 20dB offset below highest level.
It shows compliance with the requirement in part 15.247(d)

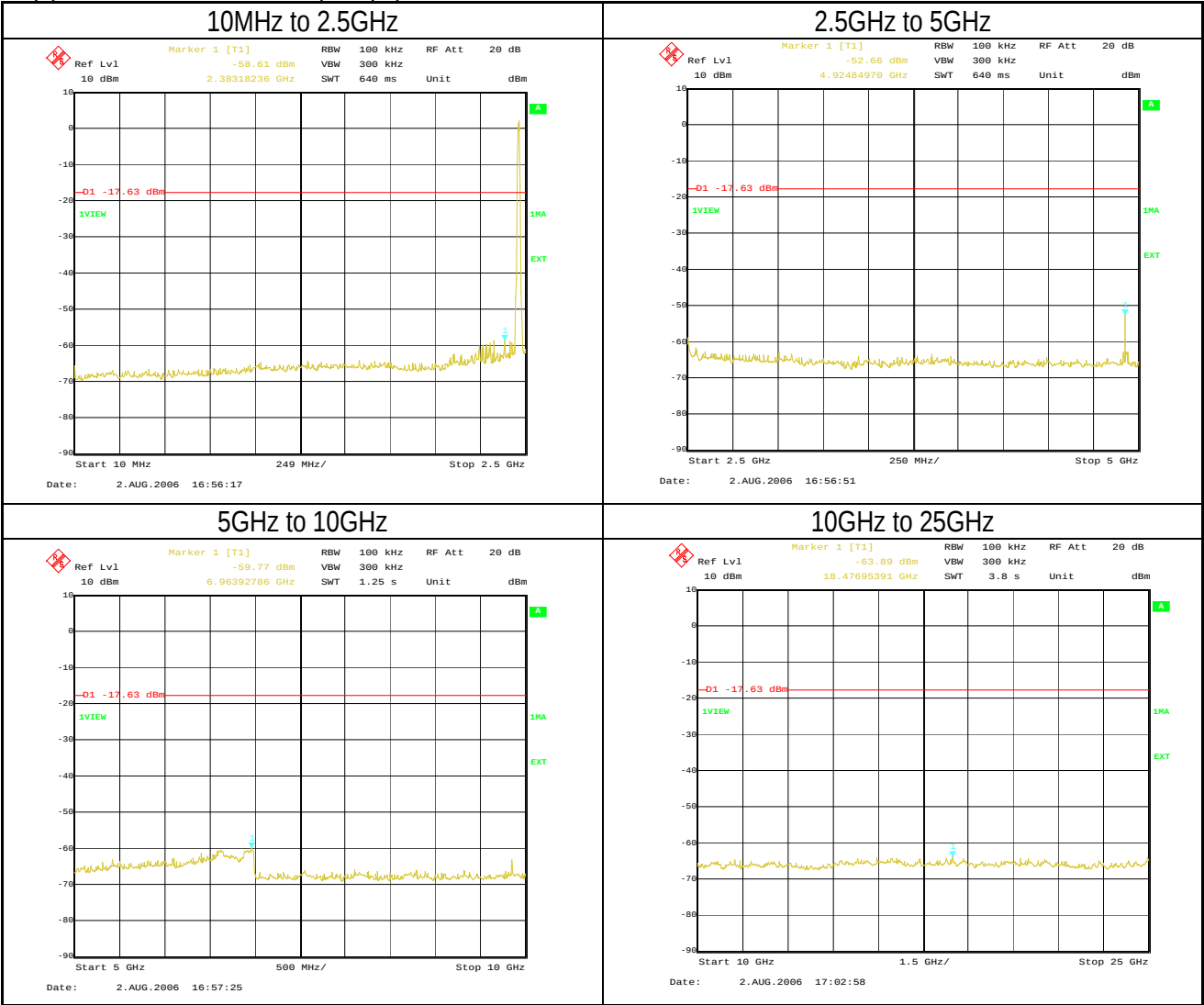
(1) 802.11b Mode DBPSK (1Mbps): 2412MHz



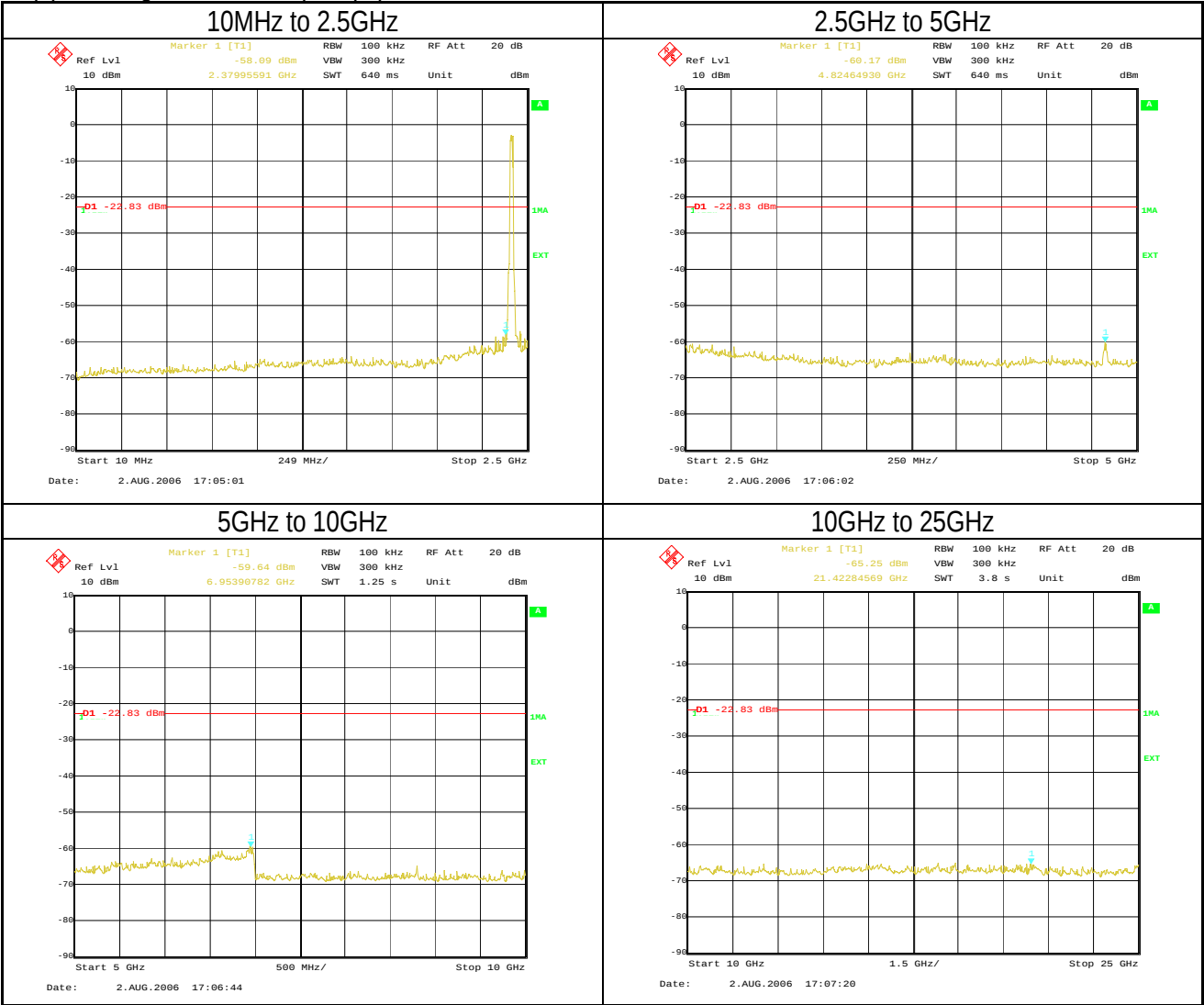
(2) 802.11b Mode DBPSK (1Mbps): 2437MHz



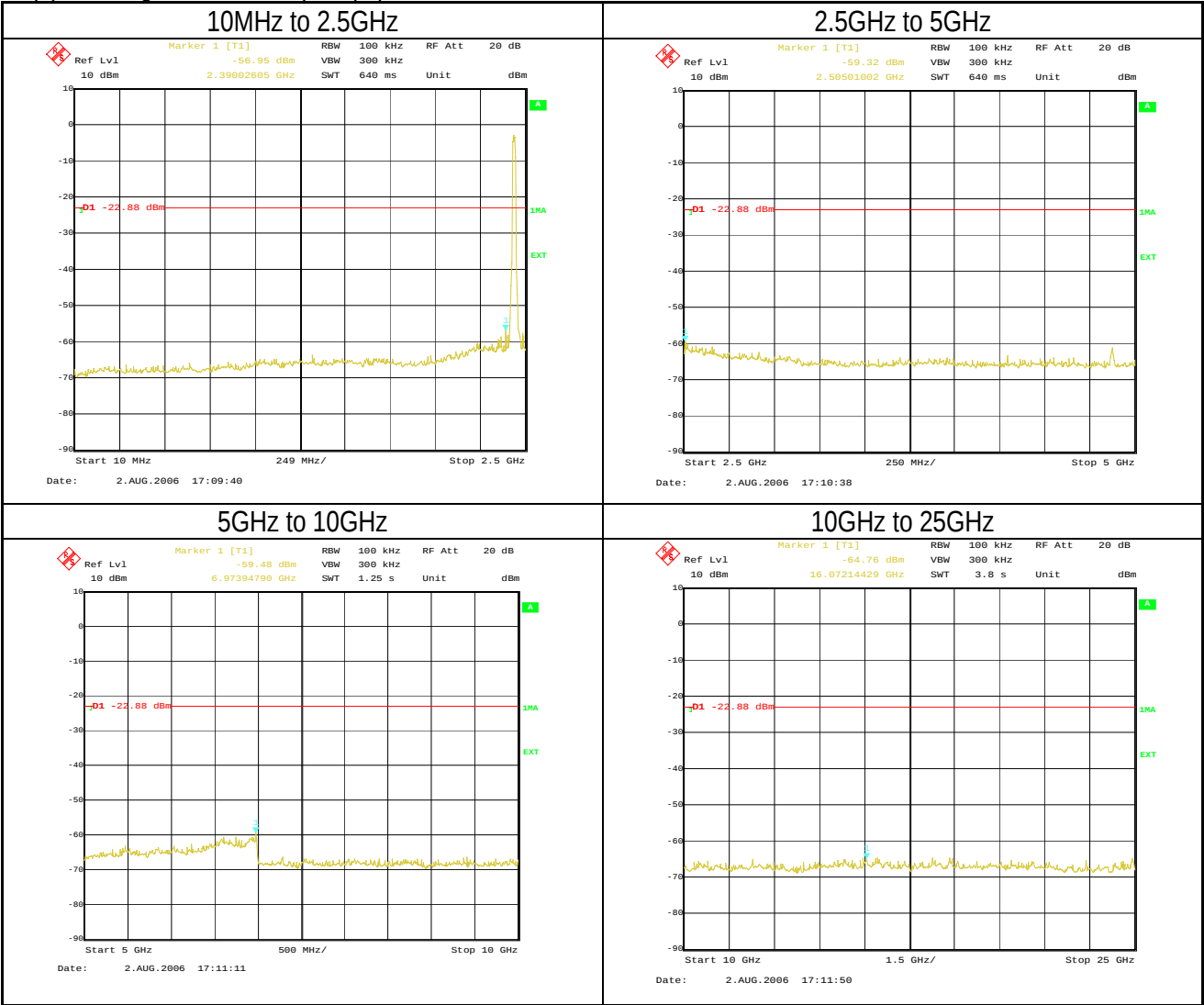
(3) 802.11b Mode DBPSK (1Mbps): 2462MHz



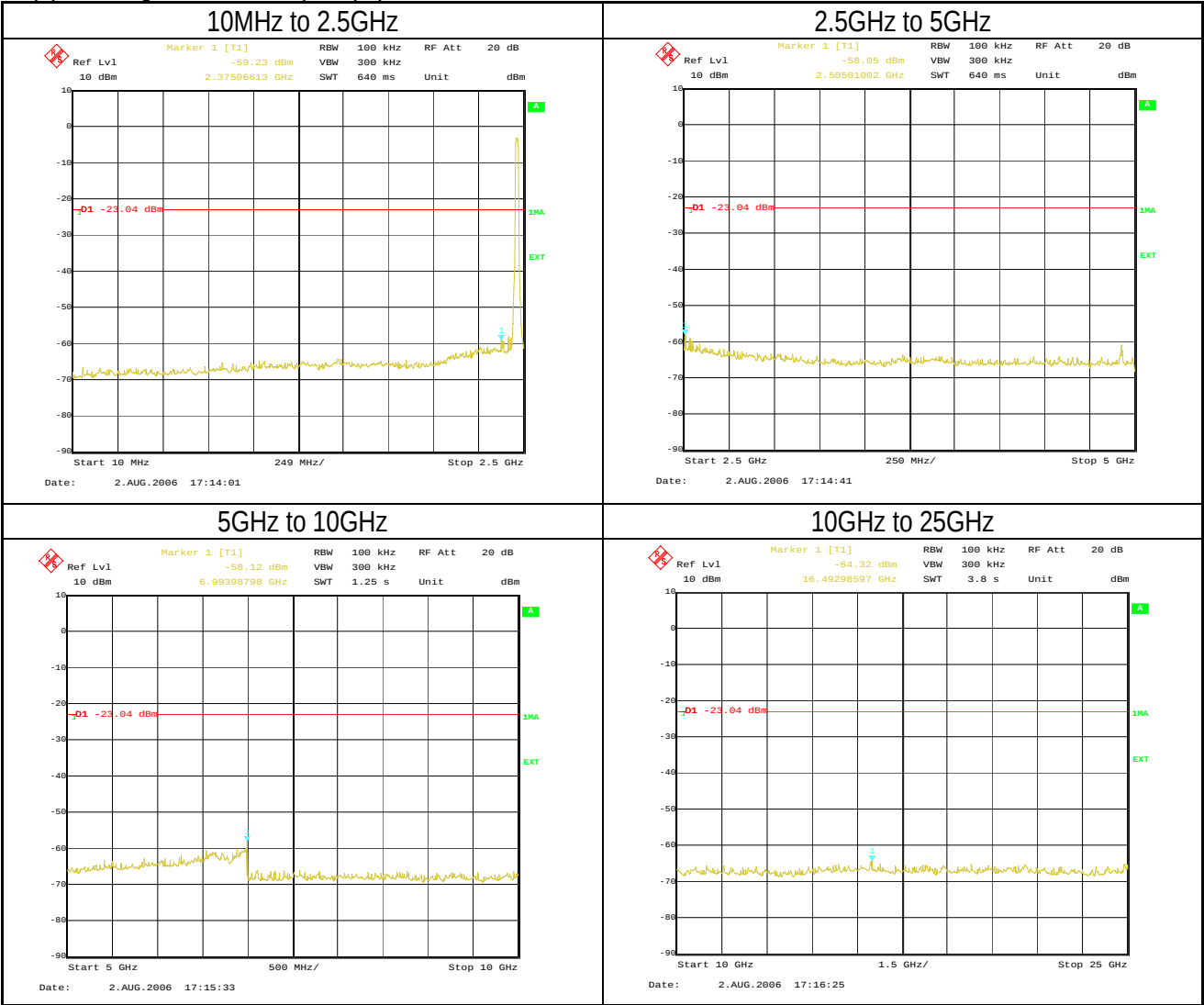
(4) 802.11g Mode BPSK (6Mbps): 2412MHz



(5) 802.11g Mode BPSK (6Mbps): 2437MHz

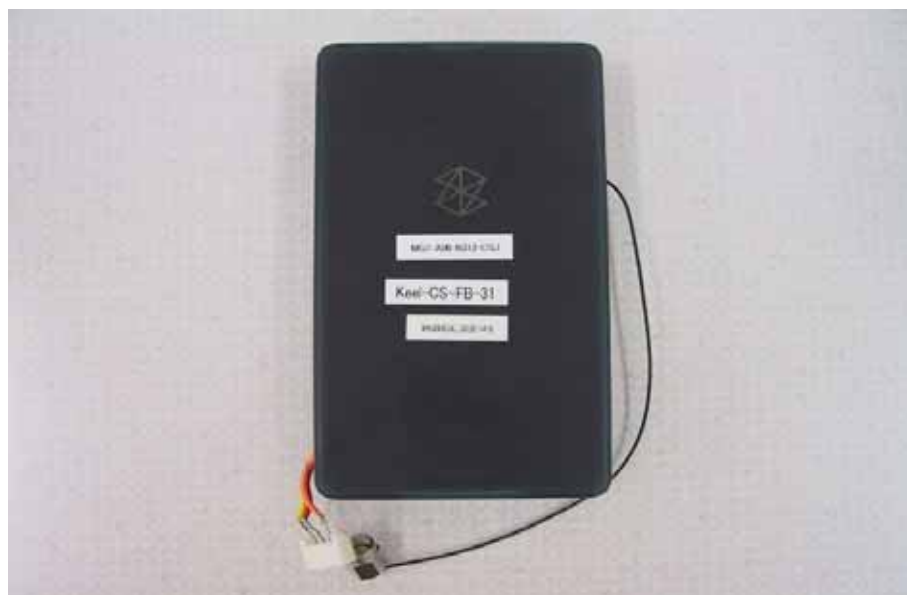


(6) 802.11g Mode BPSK (6Mbps): 2462MHz



12 PHOTOS OF TESTED EUT

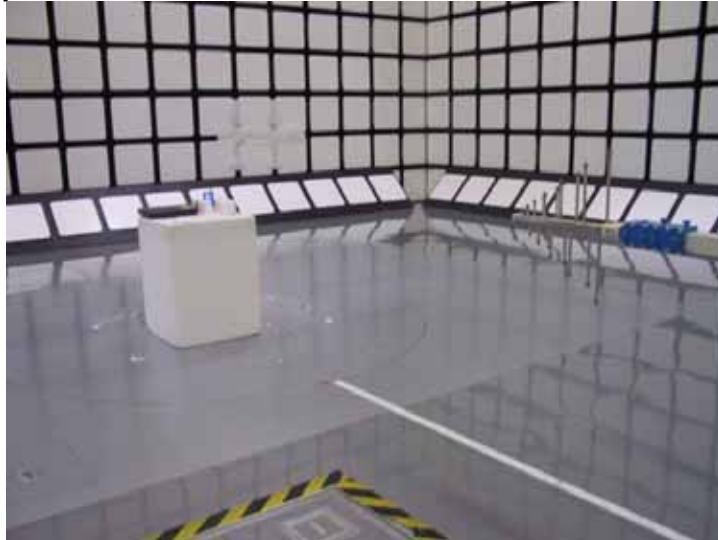
12.1 External Photos



13 PHOTOS OF TEST SETUP

13.1 Photos of Radiated Measurement

USB Power Supply



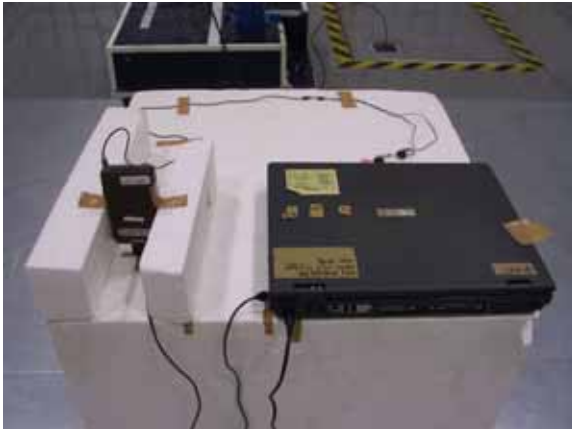
Axial Direction: XY-Plane



Axial Direction: YZ-Plane

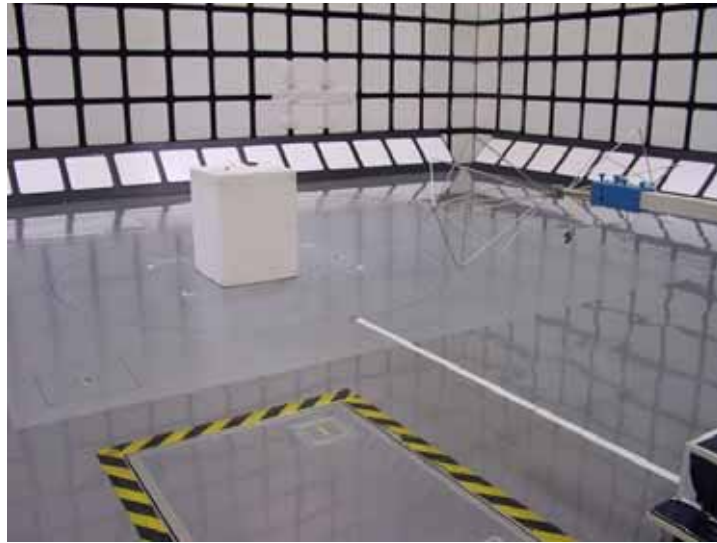


Axial Direction: ZX-Plane

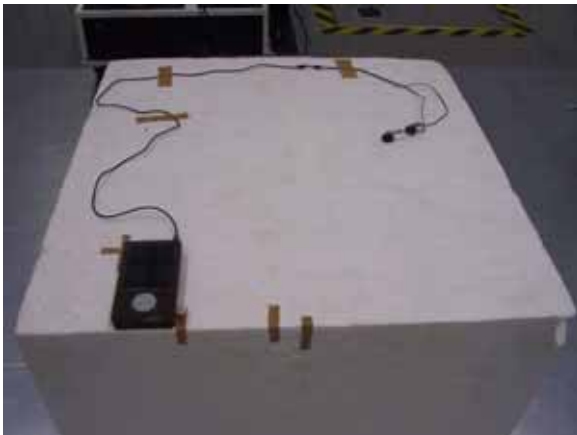


These photos show the instruments arrangement under testing, which records the maximum level of the radiation noise level.

Battery Power Supply



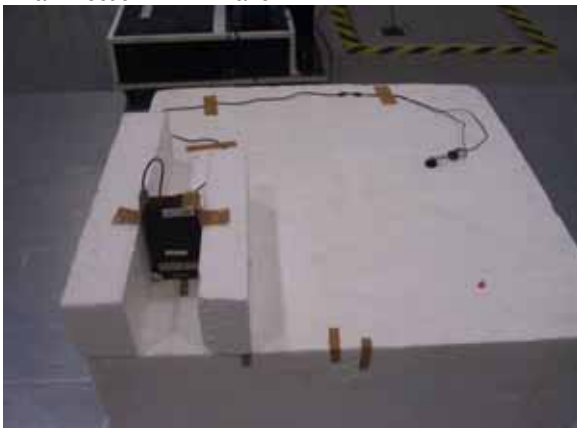
Axial Direction: XY-Plane



Axial Direction: YZ-Plane



Axial Direction: ZX-Plane



These photos show the instruments arrangement under testing, which records the maximum level of the radiation noise level.

13.2 Photos of Conducted Measurement



These photos show the instruments arrangement under testing, which records the maximum level of the radiation noise level.

APPENDIX 1

TOSHIBA

TOSHIBA CORPORATION
OME COMPLEX
DIGITAL MEDIA NETWORK COMPANY
2-9, SUEHIRO-CHO, OME, TOKYO 198-8710, JAPAN
PHONE: +81(426)34-1050
FACSIMILE: +81(426)30-7331

Declaration of Identity

We, Toshiba Corporation, hereby declare that these models described below product list are identical except color of enclosure and these color difference has no effect on electrical and RF characteristics.

Product list

Product name: HDD portable audio player

Model No.	Body color
1089	Black
1090	White
1091	Brown

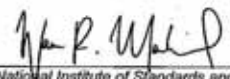
Sincerely,


K. Hoshino, Group Manager

Development & Design Group 1
Mobile & Giga Technical Development Dept.
Mobile Entertainment Products Div.
Toshiba Corporation

Date: 9th August, 2006

APPENDIX 2

United States Department of Commerce National Institute of Standards and Technology		COPY
NVLAP [®]		
Certificate of Accreditation to ISO/IEC 17025:1999		
NVLAP LAB CODE: 200607-0		
Taiyo Yuden Co., Ltd. EMC Center Gunma-gun Gunma 370-3347 JAPAN		
<i>is recognized by the National Voluntary Laboratory Accreditation Program for conformance with criteria set forth in NIST Handbook 150:2001 and all requirements of ISO/IEC Guide 17025:1999. Accreditation is granted for specific services, listed on the Scope of Accreditation, for:</i>		
ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS		
2005-10-01 through 2006-09-30 Effective dates		 For the National Institute of Standards and Technology

NVLAP-01C (REV. 2005-05-19)