FCC 47 CFR PART 15 SUBPART C: 2008 AND ANSI C63.4: 2003

TEST REPORT

For

Air Keyboard Chatting

Model : AK05b

Brand : cideko

Issued for

Holy Investment Co., Ltd.

1F., No.2, Lane 25, Yong-an 2nd St., Yongkang City, Tainan County 710, Taiwan

Issued by

Compliance Certification Services Inc.
Tainan Lab.
No. 8, Jiu Cheng Ling, Jiaokeng Village,Sinhua Township, Tainan Hsien 712, Taiwan R.O.C.
TEL: 886-6-580-2201
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Testing Laboratory
1109

REVISION HISTORY

Rev.		Issue Date		Revisions	Effect Page	Revised By
00		September 15, 2010		Initial Issue	ALL	Leah Peng

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1. TEST REPORT CERTIFICATION

Applicant	：Holy Investment Co., Ltd.
Address	：1F., No.2, Lane 25, Yong-an 2nd St., Yongkang City, Tainan County 710, Taiwan
Manufacture	：Jow Tong Technology CO., LTD.
Address	：46, Lane 337, Chung Cheng Rd., Yung Kang City, Tainan County 710, Taiwan, R.O.C.
Equipment Under Test	：Air Keyboard Chatting
Model Number	：AK05b
Brand Name	：cideko
Date of Test	：August 24, 2010~ September 06, 2010

APPLICABLE STANDARD	
STANDARD	**TEST RESULT**
FCC Part 15 Subpart C : 2008 AND ANSI C63.4 : 2003	No non-compliance noted

Approved by: ***Reviewed by:***

Jeter Wu
Assistant Manager

Eric Yang
Senior Engineer

2. EUT DESCRIPTION

2.1 DESCRIPTION OF EUT & POWER

Product Name	Air Keyboard Chatting
Model Number	AK05b
Brand Name	cideko
Frequency Range	TX Mode : 2402MHz～2474MHz
Transmit Power	TX Mode : 3.02dBm(2.00447mW)
Channel Spacing	TX Mode: 3MHz
Channel Number	TX Mode :25 Channels

Frequency range 2402 MHz ~ 2474 MHz

Channel	Freq.	Channel	Freq.	Channel	Freq.	Channel	Freq.	Channel	Freq.
1	2402	6	2417	11	2432	16	2447	21	2462
2	2405	7	2420	12	2435	17	2450	22	2465
3	2408	8	2423	13	2438	18	2453	23	2468
4	2411	9	2426	14	2441	19	2456	24	2471
5	2414	10	2429	15	2444	20	2459	25	2474

Transmit Data Rate	TX Mode：250kbps
Type of Modulation	TX Mode：GFSK (digital modulation)
Frequency Selection	By software / firmware
Antenna Type	**Antenna (1)TX&RX:** Manufacture: Yageo Taiwan/High Frequency Ceramic Department Model: CAN4311 712 112453K, Type: Chip Antenna, Gain: 2.84dBi
Power Source	3.7VDC
Temperature Range	0 ~ +55°C

NOTE: 1. The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.
2. This submittal(s) (test report) is intended for FCC ID: **XV3AK05B** filing to comply with Section 15.207,15.209 and 15.247 of the FCC Part 15, Subpart C Rules.
3. For more details, please refer to the User's manual of the EUT.

3. DESCRIPTION OF TEST MODES

The EUT is an WLAN Air Keyboard Chatting.

The RF chipset is manufactured by Yageo Taiwan / High Frequency BU.

The antenna peak gain 2.84dBi (highest gain) were chosen for full testing.

The EUT had been tested under operating condition.
There are three channels have been tested as following :

Channel	Frequency (MHz)
Low	2402
Middle	2438
High	2474

TX mode : 250kbps data rate were chosen for full testing.

The worst-case channel is determined as the channel with the highest output power. The highest measured output power was at **2402** MHz.

4. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4 and FCC CFR 47 2.1046, 2046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057, 15.207, 15.209 and 15.247.

5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

No. 8, Jiu Cheng Ling, Jiaokeng Village,Sinhua Township, Tainan Hsien 712, Taiwan R.O.C.

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with preselectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, “Radio Interference Measuring Apparatus and Measurement Methods.”

5.3 LABORATORY ACCREDITATIONS LISTINGS

The test facilities used to perform radiated and conducted emissions tests are accredited by Taiwan Accreditation Foundation for the specific scope of accreditation under Lab Code: 1109 to perform Electromagnetic Interference tests according to FCC PART 15 AND CISPR 22 requirements. No part of this report may be used to claim or imply product endorsement by TAF or any agency of the Government. In addition, the test facilities are listed with Federal Communications Commission (registration no: TW-1037).

5.4 TABLE OF ACCREDITATIONS AND LISTINGS

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3/10 meter Open Area Test Sites to perform FCC Part 15/18 measurements	TW-1037
Japan	VCCI	3/10 meter Open Area Test Sites and conducted test sites to perform radiated/conducted measurements	C-2882 R-2635
Taiwan	TAF	CISPR 11, FCC METHOD-47 CFR Part 18, EN 55011, EN 60601-1-2, CISPR 22, CNS 13438, EN 55022, EN 55024, AS/NZS CISPR 22 CISPR 14, EN 55014-1, EN 55014-2, CNS 13783-1, CISPR 22, CNS 13439, EN 55013, FCC Method-47 CFR Part 15 Subpart B, IC ICES-003, VCCI V-3 & V-4 FCC Method-47 CFR Part 15 Subpart C and ANSI C63.4, LP 0002 EN / IEC 61000-4-2 / -3 / -4 / -5 / -6 / -8 / -11 EN 61000-3-2, EN 61000-3-3 EN 61000-6-3, EN 61000-6-1, AS/NZS 4251.1, EN 61000-6-4, EN 61000-6-2, AS/NZS 4251.2, EN 61204-3, EN 50130-4, EN 62040-2, EN 50371, EN 50385, AS/NZS 4268, ETSI EN 300 386 ETSI EN 300 328, ETSI EN 301 489-1/-3/-9/-17 ETSI EN 301 893, ETSI EN 300 220-2/-1 ETSI EN 300 440-2/-1 ETSI EN 301 357-2/-1 RSS-310, RSS-210 Issue 7, RSS-Gen Issue 2	Testing Laboratory 1109
Taiwan	BSMI	CNS 13438, CNS 13783-1, CNS13439	SL2-IN-E-0039 SL2-R1/R2-0039 SL2-A1-E-0039
Canada	Industry Canada	RSS210, Issue 7	IC 2324H-1

* No part of this report may be used to claim or imply product endorsement by TAF or any agency of the US Government.

6. CALIBRATION AND UNCERTAINTY

6.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

6.2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

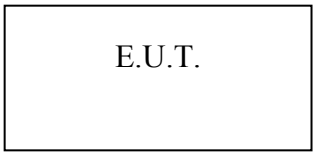
PARAMETER	UNCERTAINTY
Radiated Emission, 30 to 200 MHz Test Site : OATS-6	±3.38dB
Radiated Emission, 200 to 1000 MHz Test Site : OATS-6	±3.04dB
Radiated Emission, 1 to 26.5 GHz	± 2.38 dB
Power Line Conducted Emission	±2.01dB
Band Edge MU	0.302dBuV
Band Width	136.49kHz
Channel Separation MU	361.69Hz
Duty Cycle MU	0.064ms
Peak Output Power MU	1.904dB
Frequency Stability MU	0.223kHz

Remark: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

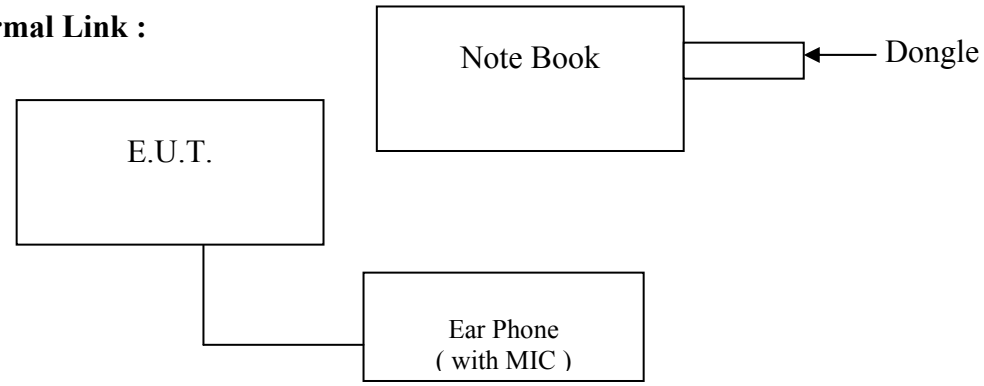
7. SETUP OF EQUIPMENT UNDER TEST

7.1 SETUP CONFIGURATION OF EUT

For RF :



For Normal Link :



7.2 SUPPORT EQUIPMENT

No.	Product	Manufacturer	Model No.	FCC ID	Signal Cable
1.	Ear Phone (with MIC)	N/A	N/A	N/A	Power cable, shd, 1.2m
2.	Notebook	MIS	MS-1452	DOC	Power cable, unshd, 1.6m
3.	Air Dongle Chatting	cideko	UD05b	XV3UD05B	-

No.	Signal cable description	
-	-	-

Remark:
1. All the above equipment/cables were placed in worse case positions to maximize emission signals during emission test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

8. APPLICABLE LIMITS AND TEST RESULTS

8.1 6DB BANDWIDTH

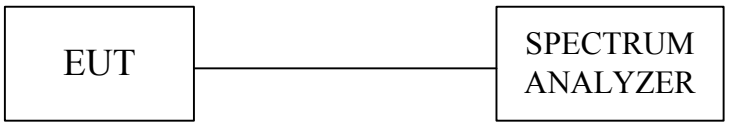
LIMIT

§ 15.247(a) (2) For direct sequence systems, the minimum 6dB bandwidth shall be at least 500kHz

TEST EQUIPMENTS

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	R&S	FSEK 30	835253/002	OCT. 14, 2010

TEST SETUP



TEST PROCEDURE

The transmitter output was connected to a spectrum analyzer. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100 KHz RBW and 100 KHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

TEST RESULTS

No non-compliance noted

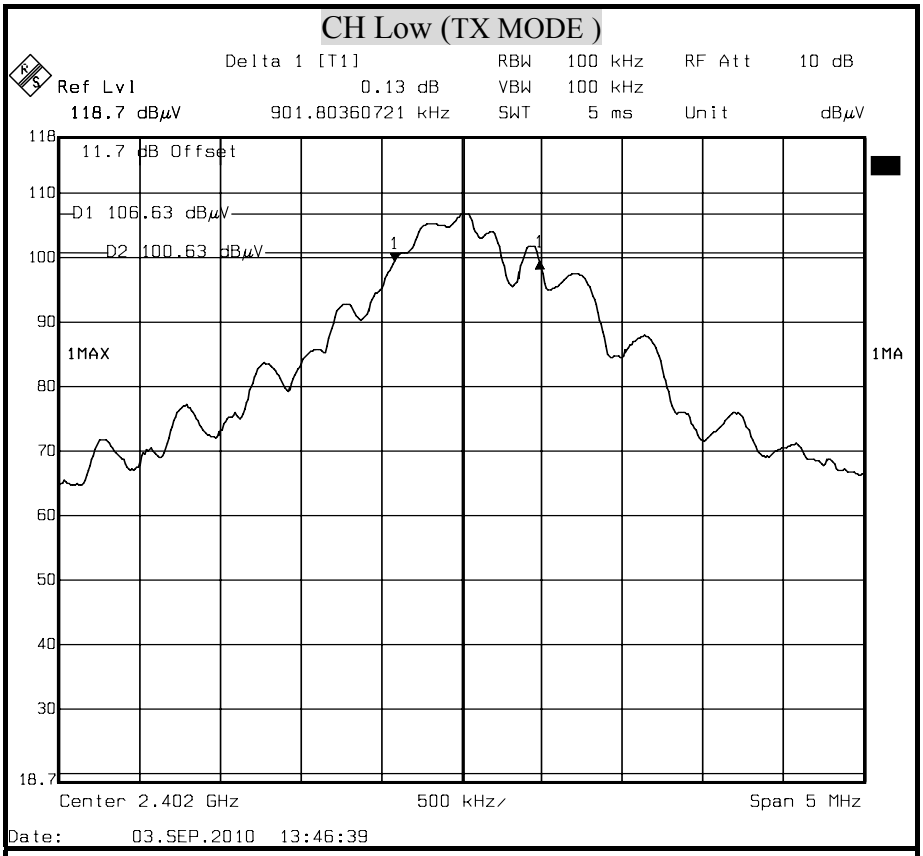
TX mode

Channel	Channel Frequency (MHz)	6dB Bandwidth (kHz)	Minimum Limit (kHz)	Pass / Fail
Low	2402	901.80	500	PASS
Middle	2438	891.78	500	PASS
High	2474	921.84	500	PASS

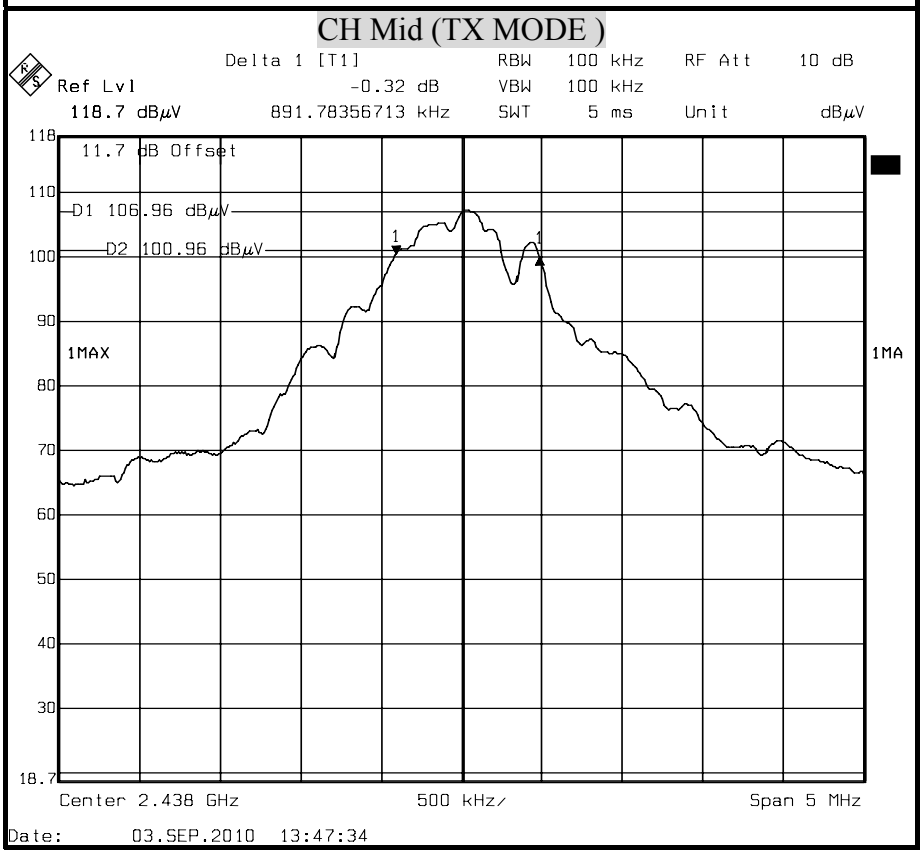
Note : 1.At finial test to get the worst-case emission at 250kbps.
2. The cable assembly insertion loss of 11.7dB (including 10 dB pad and 1.7 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

6dB BANDWIDTH (TX MODE)

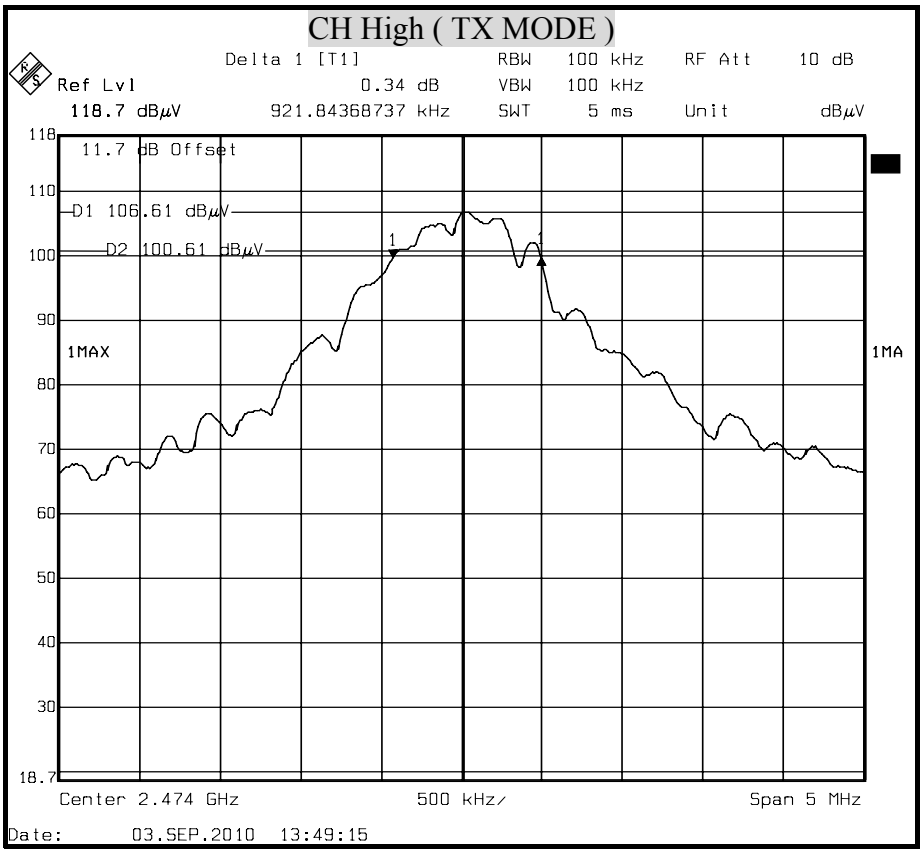
CH Low (TX MODE)



CH Mid (TX MODE)



CH High (TX MODE)



8.2 MAXIMUM PEAK OUTPUT POWER

LIMIT

§ 15.247(b) The maximum peak output power of the intentional radiator shall not exceed the following :

§ 15.247(b) (3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands : 1 watt.

§ 15.247(b) (4) Except as shown in paragraphs (c) of this section , if transmitting antennas of directional gain greater than 6 dBi are used the peak output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1) or (b)(2), and (b)(3) of this section , as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST EQUIPMENTS

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	R&S	FSEK 30	835253/002	OCT. 14, 2010

TEST SETUP

TEST PROCEDURE

1. The spectrum shall be set as follows :
   Span : 1.5 times channel integration bandwidth.
   RBW : 1MHz
   VBW : 3MHz
   Detector : Peak
   Sweep : Single trace

TEST RESULTS

No non-compliance noted

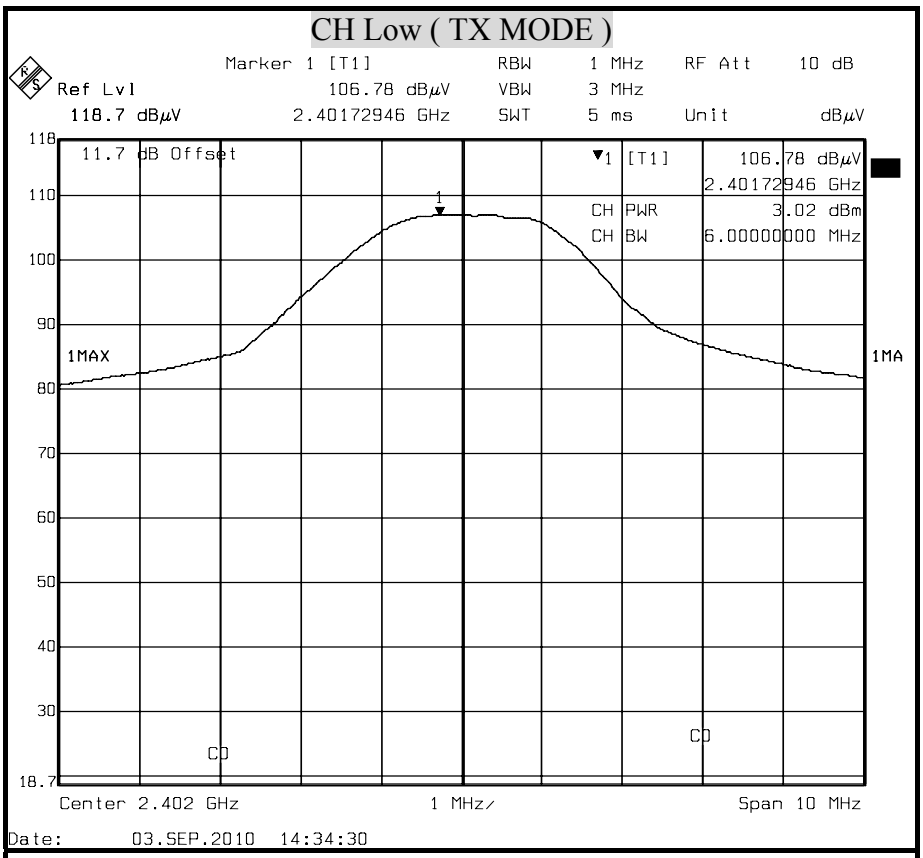
TX mode

Channel	Channel Frequency (MHz)	Peak Power (dBm)	Peak Power Limit (dBm)	Pass / Fail
Low	2402	3.02	30	PASS
Middle	2438	2.03	30	PASS
High	2474	2.39	30	PASS

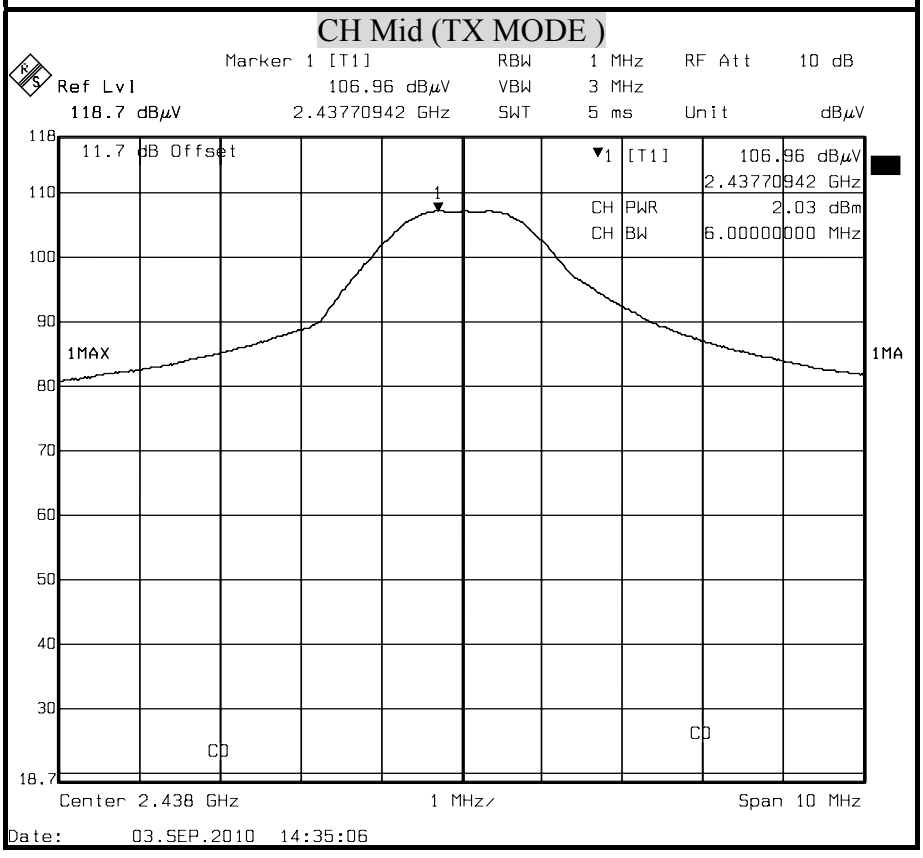
Note : 1. At finial test to get the worst-case emission at 250kbps.
2. The cable assembly insertion loss of 11.7dB (including 10 dB pad and 1.7 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

MAXIMUM PEAK OUTPUT POWER (TX MODE)

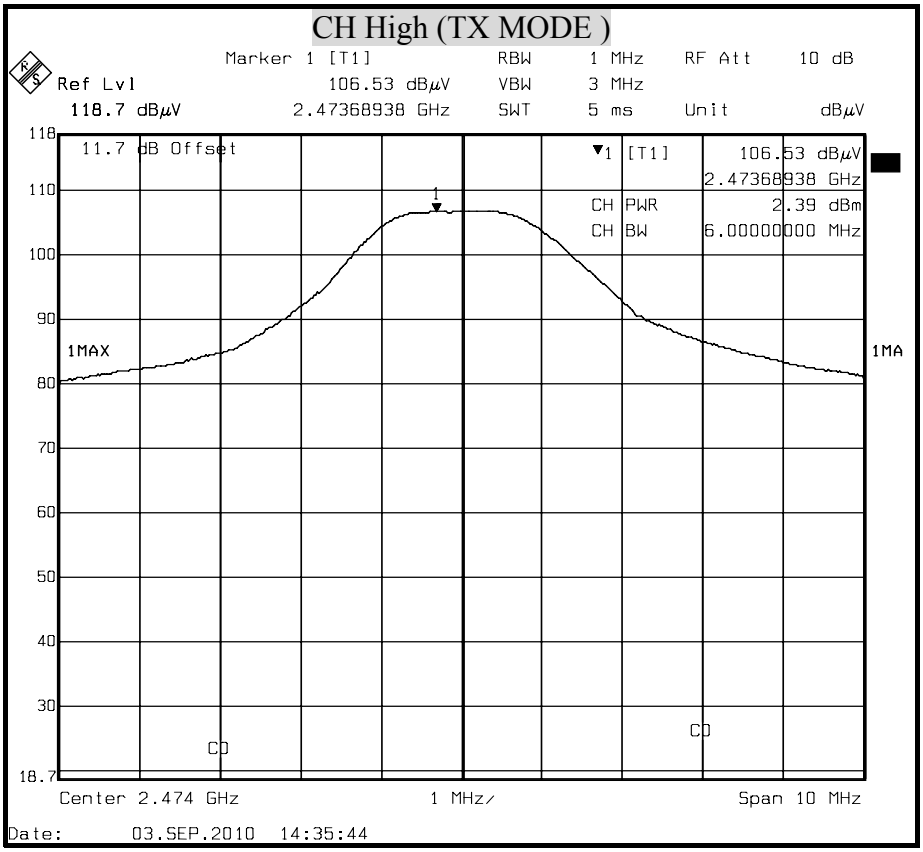
CH Low (TX MODE)



CH Mid (TX MODE)



CH High (TX MODE)



8.3 MAXIMUM PERMISSIBLE EXPOSURE

According to FCC 1.1310 : The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Average Time
(A) Limits for Occupational / Control Exposures				
300-1,500	--	--	F/300	6
1,500-100,000	--	--	5	6
(B) Limits for General Population / Uncontrol Exposures				
300-1,500	--	--	F/1500	6
1,500-100,000	--	--	1	30

CALCULATIONS

Given $E = \frac{\sqrt{30 \times P \times G}}{d}$ & $S = \frac{E^2}{3770}$

Where *E = Field strength in Volts / meter*

P = Power in Watts

G = Numeric antenna gain

d = Distance in meters

S = Power density in milliwatts / square centimeter

Combining equations and re-arranging the terms to express the distance as a function of the remaining variables yields:

$$S = \frac{30 \times P \times G}{3770 d^2}$$

Changing to units of mW and cm, using:

P (mW) = P (W) / 1000 and

d (cm) = d(m) / 100

Yields

$$S = \frac{30 \times (P/1000) \times G}{3770 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2}$$

Where *d = Distance in cm*

P = Power in mW

G = Numeric antenna gain

S = Power density in mW / cm^2

LIMIT

60/f(GHz)mW

TEST RESULTS

No non-compliance noted

And according to KDB447498 Section 1) c) Unless excluded by specific FCC test procedures, portable devices with output power > 60/f(GHz)mW shall include SAR data for equipment approval.

Details please refer to FCC Part 2 and attached KDB447498.

Please note the low power threshold is based upon average output power. If the average output power is below 60/f(GHz), then SAR evaluation is not required. In addition, since this device is a Bluetooth device, you may use source-based averaging duty cycle to adjust the average power.
After the adjustment, if the average power is greater than 60/f(GHz), then SAR is required.

60/f(GHz)mW f(the highest frequency) f=2.462GHz
60/2.462=24.37mW=((log24.37)*10)dBm=13.8686dBm

Mode	Output Power (dBm)	Limit (dBm)	Result
CH Low Mode	3.02	13.8686	Compliance
CH Mid Mode	2.03	13.8686	Compliance
CH High Mode	2.39	13.8686	Compliance

8.4 POWER SPECTRAL DENSITY

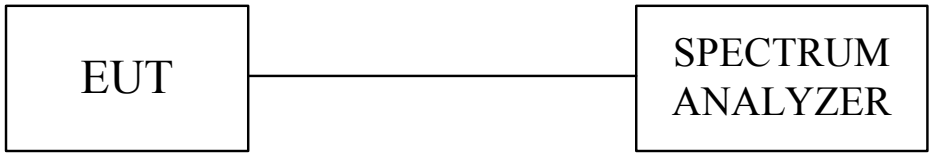
LIMIT

§ 15.247(e) For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

TEST EQUIPMENTS

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	R&S	FSEK 30	835253/002	OCT. 14, 2010

TEST SETUP



TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using RBW=3KHz and VBW≧RBW, set sweep time=span / 3KHz.
The power spectral density was measured and recorded.
The sweep time is allowed to be longer than span / 3KHz for a full response of the mixer in the spectrum analyzer.

TEST RESULTS

No non-compliance noted

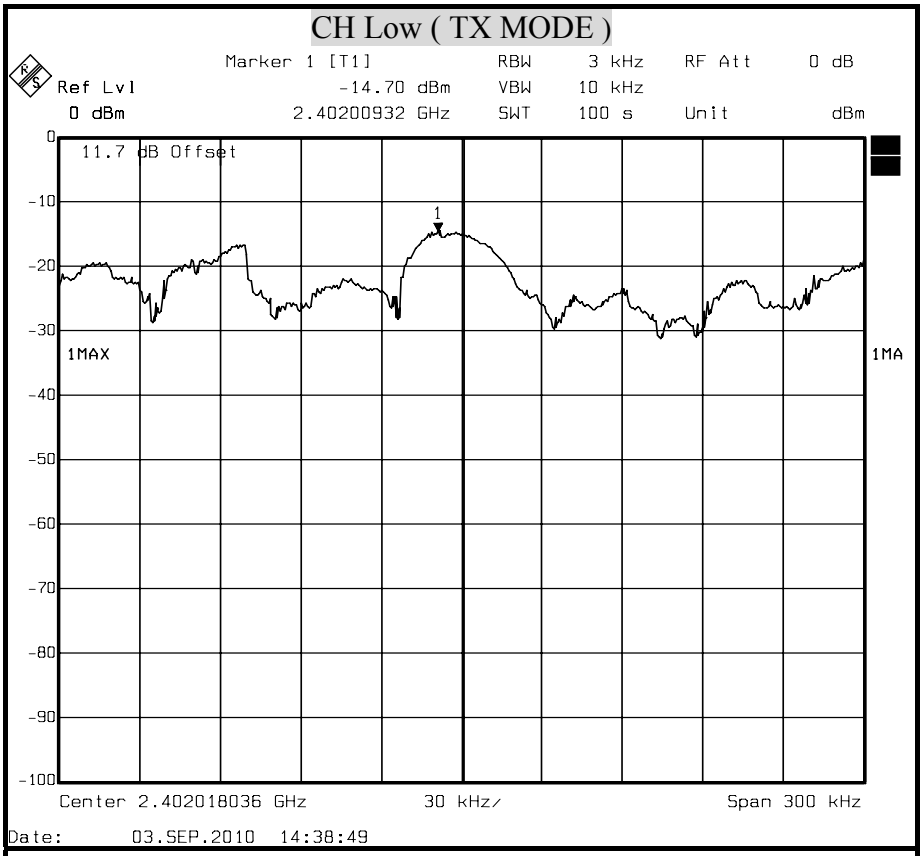
TX mode

Channel	Channel Frequency (MHz)	Final RF Power Level in 3KHz BW (dBm)	Maximum Limit (dBm)	Pass / Fail
Low	2402	-14.70	8	PASS
Middle	2438	-13.59	8	PASS
High	2474	-15.17	8	PASS

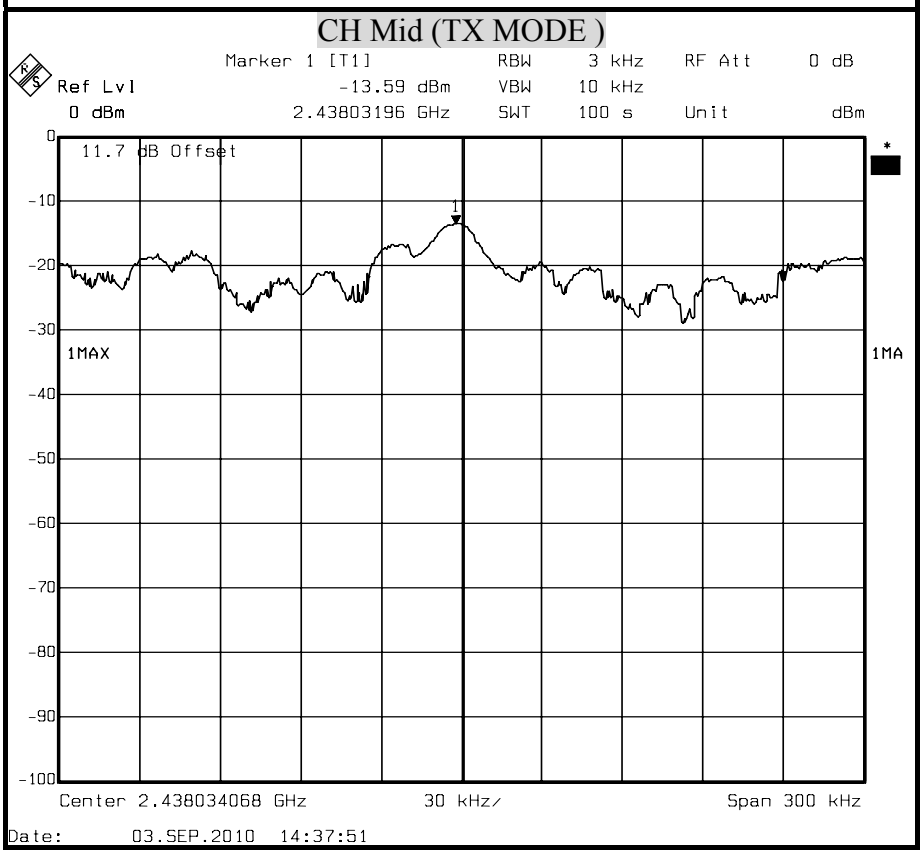
Note : 1.At finial test to get the worst-case emission at 250kbps.
2. The cable assembly insertion loss of 11.7dB (including 10 dB pad and 1.7 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

POWER SPECTRAL DENSITY (TX MODE)

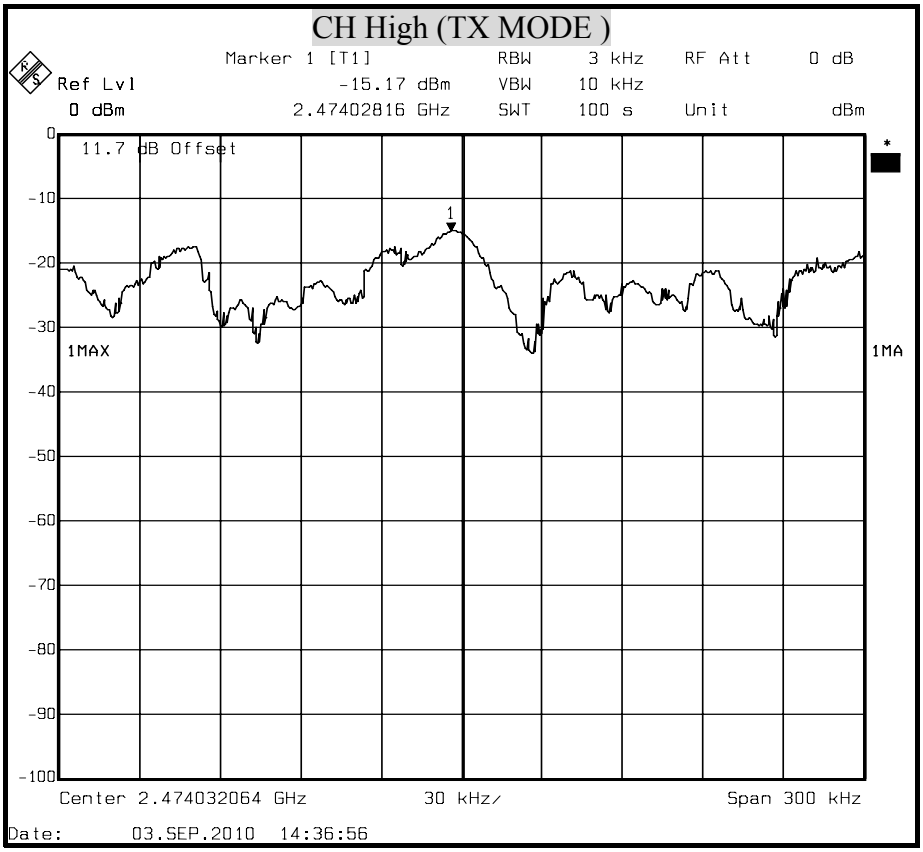
CH Low (TX MODE)



CH Mid (TX MODE)



CH High (TX MODE)



8.5 CONDUCTED SPURIOUS EMISSION

LIMITS

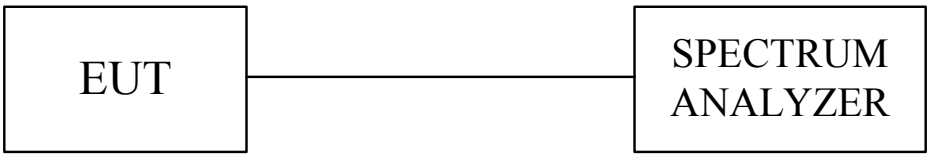
§ 15.247(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the and that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

The spectrum from 30 MHz to 26.5 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in the 2.4 GHz band.

TEST SETUP



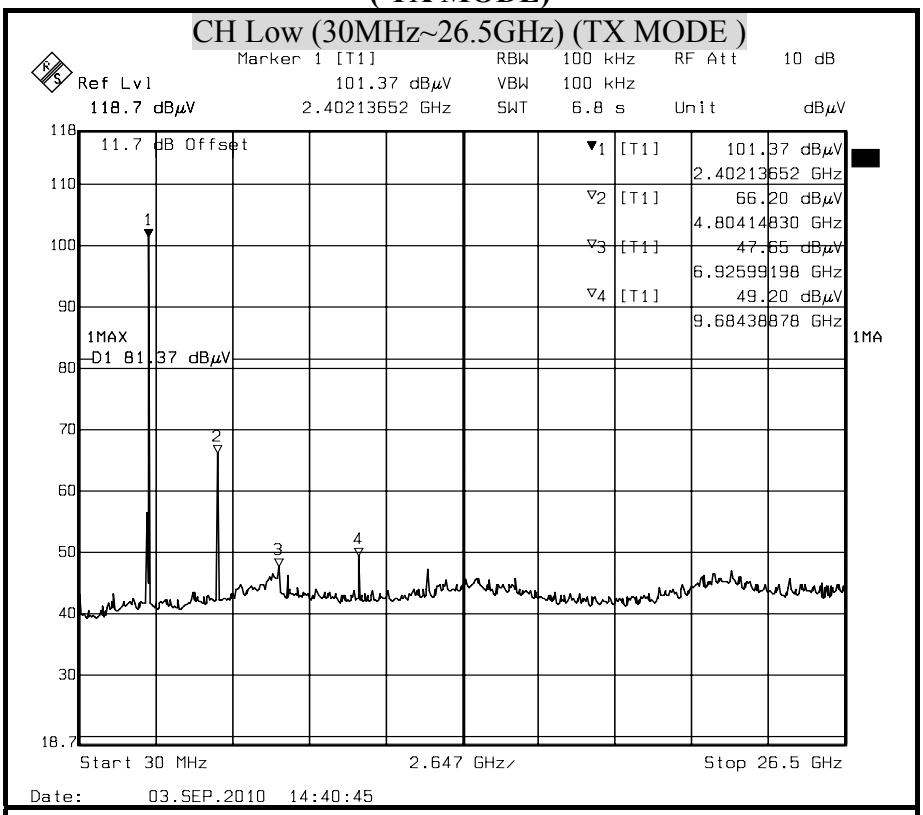
TEST RESULTS

No non-compliance noted

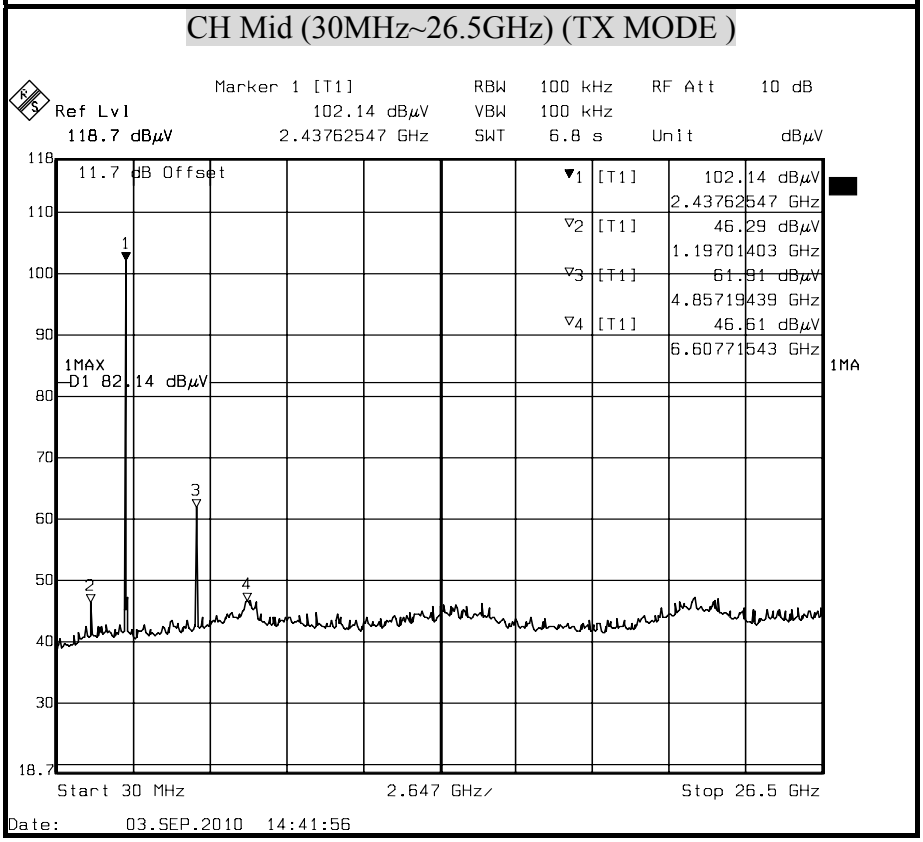
OUT-OF-BAND SPURIOUS EMISSIONS-CONDUCTED MEASUREMENT

(TX MODE)

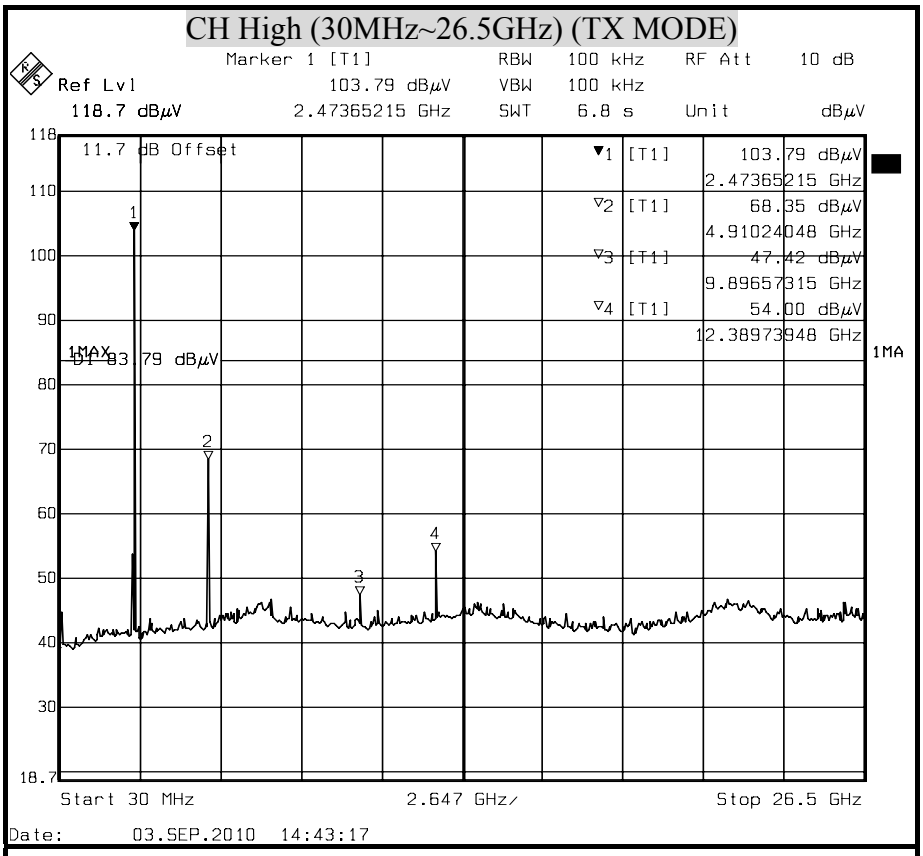
CH Low (30MHz~26.5GHz) (TX MODE)



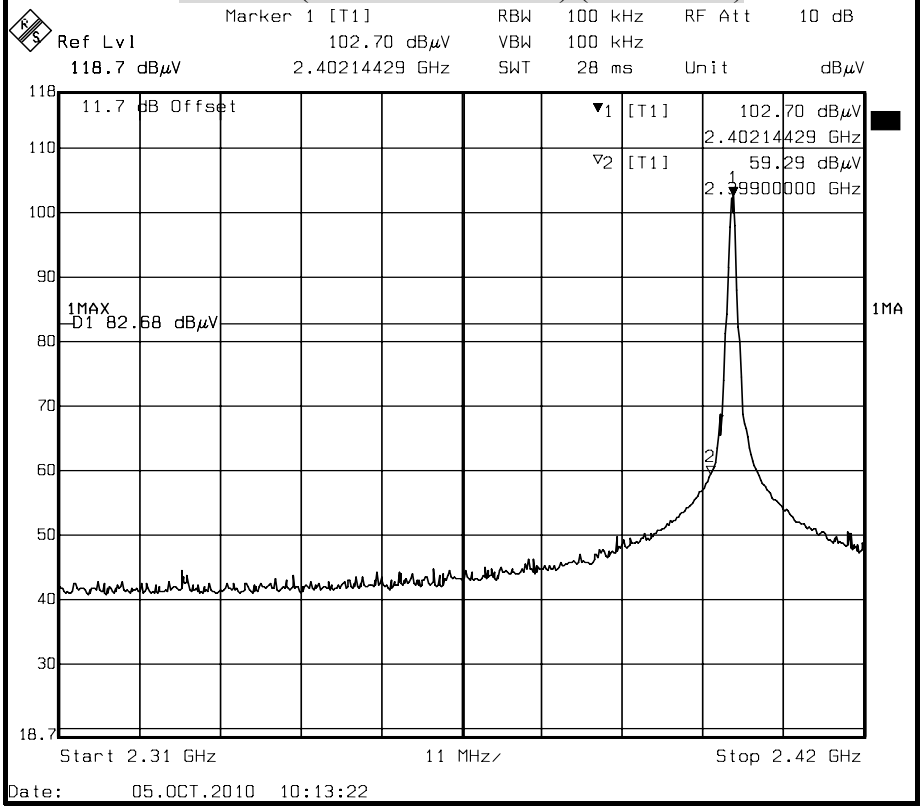
CH Mid (30MHz~26.5GHz) (TX MODE)



CH High (30MHz~26.5GHz) (TX MODE)



CH Low (2.31GHz~2.42GHz) (TX MODE)



8.6 RADIATED EMISSIONS

8.6.1 TRANSMITTER RADIATED SUPURIOUS EMSSIONS

LIMITS

§ 15.205 (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 -1710	10.6 -12.7
6.26775 - 6.26825	108 -121.94	1718.8 - 1722.2	13.25 -13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 – 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 -16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3338	36.43 - 36.5
12.57675 - 12.57725	322 -335.4	3600 - 4400	([2])
13.36 - 13.41			

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

[2] Above 38.6

§ 15.205 (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown is Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

§ 15.209 (a) Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table :

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
30 - 88	100 **	3
88 - 216	150 **	3
216 - 960	200 **	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz, However, operation within these frequency bands is permitted under other sections of this Part, e-g, Sections 15.231 and 15.241.

§ 15.209 (b) In the emission table above, the tighter limit applies at the band edges.

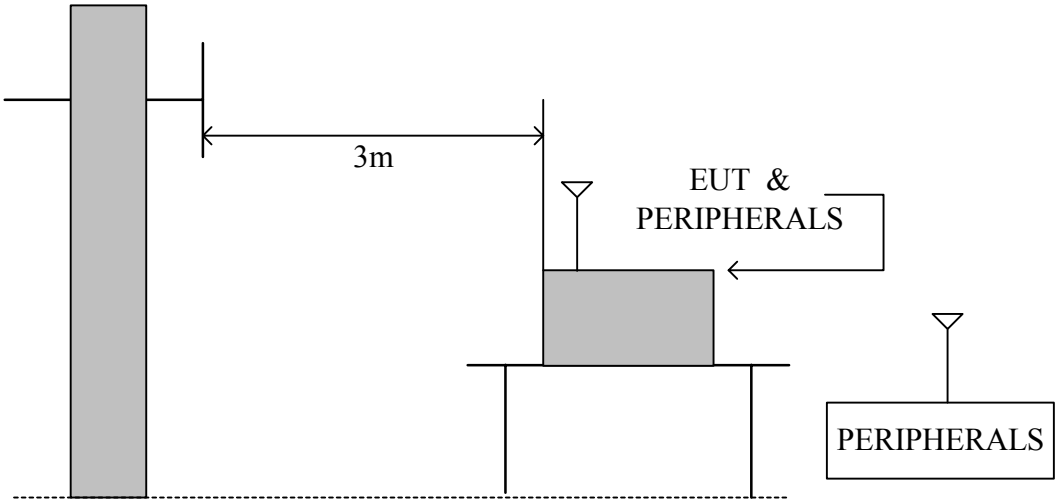
TEST EQUIPMENTS

The following test equipments are utilized in making the measurements contained in this report.

Open Area Test Site # 6				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
TYPE N COAXIAL CABLE	SUHNER	CHA9513	6	AUG. 31, 2011
BI-LOG Antenna	Sunol	JB1	A070506-2	NOV. 12, 2010
LOOP ANTENNA	EMCO	6502	8905-2356	JUN. 10, 2011
Pre-Amplifier	HP	8447F	2944A03817	AUG. 31, 2011
EMI Receiver	R&S	ESVS10	833206/012	MAY 10, 2011
RF Cable	SUHNER	SUCOFLEX104PEA	20520/4PEA	NOV. 10, 2010
Horn Antenna	Com-Power	AH-118	071032	DEC. 29, 2010
Spectrum Analyzer	R&S	FSEK 30	835253/002	JUL. 14, 2011
Pre-Amplifier	MITEQ	AFS44-00108650-42-10P-44	1205908	NOV. 10, 2010
Turn Table	Yo Chen	001	----------	N.C.R.
Antenna Tower	AR	TP1000A	309874	N.C.R.
Controller	CT	SC101	----------	N.C.R.
RF Swicth	E-INSTRUMENT TELH LTD	ERS-180A	EC1204141	N.C.R
Power Meter	Anritsu	ML2487A	6K00003888	MAY 11, 2011
Power Sensor	Anritsu	MA2491A	33265	MAY 10, 2011

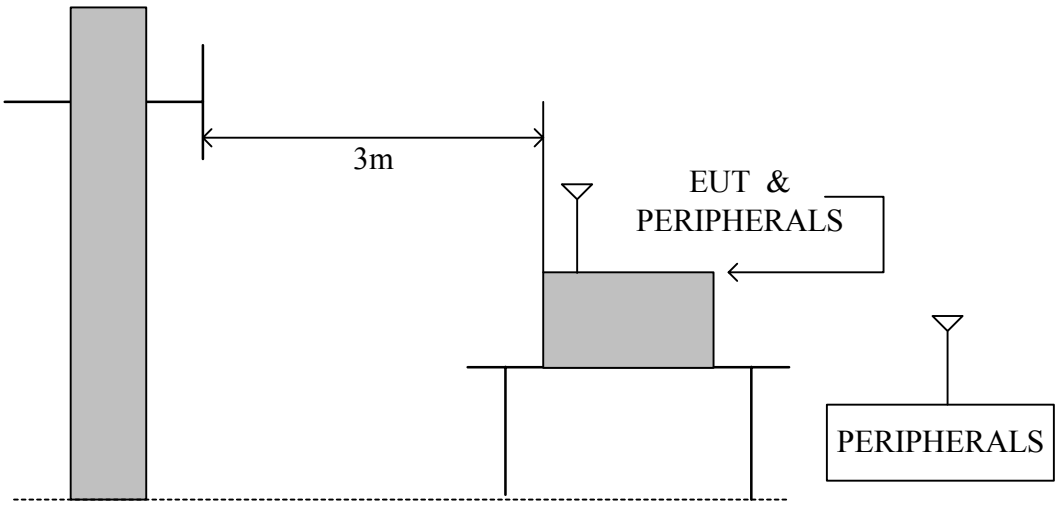
TEST SETUP

The diagram below shows the test setup that is utilized to make the measurements for emission from 30 to 1GHz.



Antenna Elevation Variable

The diagram below shows the test setup that is utilized to make the measurements for emission above 1GHz.



Antenna Elevation Variable

TEST PROCEDURE

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.

b. White measuring the radiated emission below 1GHz, the EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. White measuring the radiated emission above 1GHz, the EUT was set 3 meters away from the interference-receiving antenna

c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarization of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Note：

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 KHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.

2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection and frequency above 1GHz.

3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1GHz.

4. **No emission is found between lowest internal used/generated frequencies to 30MHz (9 kHz~30MHz).**

TEST RESULTS

No non-compliance noted

8.6.2 WORST-CASE RADIATED EMISSION BELOW 1 GHz

Product Name	Air Dongle Chatting	Test Date	2010/09/05
Model	AK05b	Test By	Eric Yang
Test Mode	Normal operating (worst case)	TEMP& Humidity	34.9℃, 57%

Horizontal

Frequency	Meter Reading	Antenna Factor	Cable Loss	Emission Level	Limits	Margin	Detector Mode
(MHz)	(dBμV)	(dB/M)	(dB)	(dBμV/M)	(dBμV/M)	(dB)	PK/QP
60.10	18.40	7.93	1.41	27.74	40.00	-12.26	QP
188.25	16.90	12.32	2.39	31.61	43.50	-11.89	QP
237.52	17.20	12.60	2.85	32.65	46.00	-13.35	QP
335.45	13.80	14.94	3.54	32.29	46.00	-13.71	QP
402.00	15.20	16.39	3.92	35.50	46.00	-10.50	QP
672.68	9.70	20.33	5.67	35.70	46.00	-10.30	QP
N/A	-----	-----	-----	-----	-----	-----	-----

Vertical

Frequency	Meter Reading	Antenna Factor	Cable Loss	Emission Level	Limits	Margin	Detector Mode
(MHz)	(dBμV)	(dB/M)	(dB)	(dBμV/M)	(dBμV/M)	(dB)	PK/QP
61.44	19.20	8.00	1.43	28.63	40.00	-11.37	QP
114.43	16.40	13.21	1.86	31.47	43.50	-12.03	QP
188.26	14.30	12.32	2.39	29.01	43.50	-14.49	QP
237.51	13.50	12.60	2.85	28.95	46.00	-17.05	QP
335.56	12.70	14.95	3.55	31.19	46.00	-14.81	QP
672.65	8.70	20.33	5.67	34.70	46.00	-11.30	QP
N/A	-----	-----	-----	-----	-----	-----	-----

Remark: Emission level (dBμV/m) =Antenna Factor (dB/m) + Cable loss (dB) + Meter Reading (dBμV).

8.6.3 TRANSMITTER RADIATED EMISSION ABOVE 1 GHz

Product Name	Air Keyboard Chatting	Test Date	2010/8/29
Model	AK05b	Test By	Eric Yang
Test Mode	TX / X mode (CH Low)	TEMP& Humidity	25.3℃, 44%

Horizontal

	TX/ X mode / CH Low				Measurement Distance at 3m Horizontal polarity					
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	4803.20	62.62	33.11	3.72	42.36	0.69	57.78	74.00	-16.22	P
*	4803.20	37.52	33.11	3.72	42.36	0.69	32.68	54.00	-21.32	A
	7205.85	55.87	38.52	4.66	41.89	1.37	58.53	74.00	-15.47	P
	7205.85	36.55	38.52	4.66	41.89	1.37	39.21	54.00	-14.79	A

Remark:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
2. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
3. The result basic equation calculation is as follow:
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. The other emission levels were 20dB below the limit
5. The test limit distance is 3M limit.

Product Name	Air Keyboard Chatting	Test Date	2010/8/29
Model	AK05b	Test By	Eric Yang
Test Mode	TX / X mode (CH Low)	TEMP& Humidity	25.3℃, 44%

Vertical

	TX / X mode / CH Low				Measurement Distance at 3m Vertical polarity					
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	4804.01	61.09	33.11	3.73	42.36	0.69	56.25	74.00	-17.75	P
*	4804.01	37.44	33.11	3.73	42.36	0.69	32.60	54.00	-21.40	A
	7205.97	61.25	38.52	4.66	41.89	1.37	63.91	74.00	-10.09	P
	7205.97	36.52	38.52	4.66	41.89	1.37	39.18	54.00z	-14.82	A

Remark:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
2. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
3. The result basic equation calculation is as follow:
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. The other emission levels were 20dB below the limit
5. The test limit distance is 3M limit.

Product Name	Air Keyboard Chatting	Test Date	2010/8/29
Model	AK05b	Test By	Eric Yang
Test Mode	TX / X mode (CH Middle)	TEMP& Humidity	25.3℃, 44%

Horizontal

	TX / X mode / CH Middle				Measurement Distance at 3m Horizontal polarity					
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	4876.32	61.22	33.33	3.75	42.44	0.71	56.57	74.00	-17.43	P
*	4876.32	36.44	33.33	3.75	42.44	0.71	31.79	54.00	-22.21	A
*	7314.05	60.25	38.84	4.71	41.72	1.60	63.68	74.00	-10.32	P
*	7314.05	36.29	38.84	4.71	41.72	1.60	39.72	54.00	-14.28	A

Remark:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
2. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
3. The result basic equation calculation is as follow:
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. The other emission levels were 20dB below the limit
5. The test limit distance is 3M limit.

Product Name	Air Keyboard Chatting	Test Date	2010/8/29
Model	AK05b	Test By	Eric Yang
Test Mode	TX / X mode (CH Middle)	TEMP& Humidity	25.3℃, 44%

Vertical

	TX / X mode / CH Middle				Measurement Distance at 3m Vertical polarity					
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	4876.29	60.52	33.33	3.75	42.44	0.71	55.87	74.00	-18.13	P
*	4876.29	36.87	33.33	3.75	42.44	0.71	32.22	54.00	-21.78	A
*	7314.08	59.87	38.84	4.71	41.72	1.60	63.31	74.00	-10.69	P
*	7314.08	37.24	38.84	4.71	41.72	1.60	40.68	54.00	-13.32	A

Remark:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
2. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
3. The result basic equation calculation is as follow:
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. The other emission levels were 20dB below the limit
5. The test limit distance is 3M limit.

Product Name	Air Keyboard Chatting	Test Date	2010/8/29
Model	AK05b	Test By	Eric Yang
Test Mode	TX / X mode (CH High)	TEMP& Humidity	25.3℃, 44%

Horizontal

	TX / X mode / CH High				Measurement Distance at 3m Horizontal polarity					
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	4948.11	59.03	33.54	3.77	42.51	0.74	54.57	74.00	-19.43	P
*	4948.11	38.11	33.54	3.77	42.51	0.74	33.65	54.00	-20.35	A
*	7421.98	57.65	39.17	4.76	41.55	1.83	61.86	74.00	-12.14	P
*	7421.98	36.85	39.17	4.76	41.55	1.83	41.06	54.00	-12.94	A

Remark:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
2. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
3. The result basic equation calculation is as follow:
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. The other emission levels were 20dB below the limit
5. The test limit distance is 3M limit.

Product Name	Air Keyboard Chatting	Test Date	2010/8/29
Model	AK05b	Test By	Eric Yang
Test Mode	TX / X mode (CH High)	TEMP& Humidity	25.3℃, 44%

Vertical

	TX / X mode / CH High				Measurement Distance at 3m Vertical polarity					
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	4948.09	58.25	33.54	3.77	42.51	0.74	53.79	74.00	-20.21	P
*	4948.09	37.15	33.54	3.77	42.51	0.74	32.69	54.00	-21.31	A
*	7422.03	55.62	39.17	4.76	41.55	1.83	59.83	74.00	-14.17	P
*	7422.03	35.95	39.17	4.76	41.55	1.83	40.16	54.00	-13.84	A

Remark:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
2. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
3. The result basic equation calculation is as follow:
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. The other emission levels were 20dB below the limit
5. The test limit distance is 3M limit.

Product Name	Air Keyboard Chatting	Test Date	2010/8/29
Model	AK05b	Test By	Eric Yang
Test Mode	TX / Y mode (CH Low)	TEMP& Humidity	25.3℃, 44%

Horizontal

	TX / Y mode / CH Low				Measurement Distance at 3m Horizontal polarity					
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	4803.28	63.52	33.11	3.72	42.36	0.69	58.68	74.00	-15.32	P
*	4803.28	38.75	33.11	3.72	42.36	0.69	33.91	54.00	-20.09	A
	7205.91	56.65	38.52	4.66	41.89	1.37	59.31	74.00	-14.69	P
	7205.91	37.44	38.52	4.66	41.89	1.37	40.10	54.00	-13.90	A

Remark:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
2. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
3. The result basic equation calculation is as follow:
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. The other emission levels were 20dB below the limit
5. The test limit distance is 3M limit.

Product Name	Air Keyboard Chatting	Test Date	2010/8/29
Model	AK05b	Test By	Eric Yang
Test Mode	TX / Y mode (CH Low)	TEMP& Humidity	25.3℃, 44%

Vertical

	TX / Y mode / CH Low				Measurement Distance at 3m Vertical polarity					
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	4804.03	62.14	33.11	3.73	42.36	0.69	57.30	74.00	-16.70	P
*	4804.03	38.52	33.11	3.73	42.36	0.69	33.68	54.00	-20.32	A
	7205.96	62.11	38.52	4.66	41.89	1.37	64.77	74.00	-9.23	P
	7205.96	37.16	38.52	4.66	41.89	1.37	39.82	54.00	-14.18	A

Remark:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
2. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
3. The result basic equation calculation is as follow:
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. The other emission levels were 20dB below the limit
5. The test limit distance is 3M limit.

Product Name	Air Keyboard Chatting	Test Date	2010/8/29
Model	AK05b	Test By	Eric Yang
Test Mode	TX / Y mode (CH Middle)	TEMP& Humidity	25.3℃, 44%

Horizontal

	TX / Y mode / CH Middle				Measurement Distance at 3m Horizontal polarity					
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	4876.34	61.42	33.33	3.75	42.44	0.71	56.77	74.00	-17.23	P
*	4876.34	36.52	33.33	3.75	42.44	0.71	31.87	54.00	-22.13	A
*	7314.06	60.87	38.84	4.71	41.72	1.60	64.30	74.00	-9.70	P
*	7314.06	36.83	38.84	4.71	41.72	1.60	40.26	54.00	-13.74	A

Remark:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
2. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
3. The result basic equation calculation is as follow:
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. The other emission levels were 20dB below the limit
5. The test limit distance is 3M limit.

Product Name	Air Keyboard Chatting	Test Date	2010/8/29
Model	AK05b	Test By	Eric Yang
Test Mode	TX / Y mode (CH Middle)	TEMP& Humidity	25.3℃, 44%

Vertical

	TX / Y mode / CH Middle				Measurement Distance at 3m Vertical polarity					
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	4876.28	60.98	33.33	3.75	42.44	0.71	56.33	74.00	-17.67	P
*	4876.28	36.54	33.33	3.75	42.44	0.71	31.89	54.00	-22.11	A
*	7314.11	60.87	38.84	4.71	41.72	1.60	64.31	74.00	-9.69	P
*	7314.11	36.55	38.84	4.71	41.72	1.60	39.99	54.00	-14.01	A

Remark:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
2. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
3. The result basic equation calculation is as follow:
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. The other emission levels were 20dB below the limit
5. The test limit distance is 3M limit.

Product Name	Air Keyboard Chatting	Test Date	2010/8/29
Model	AK05b	Test By	Eric Yang
Test Mode	TX / Y mode (CH High)	TEMP& Humidity	25.3℃, 44%

Horizontal

	TX / Y mode / CH High				Measurement Distance at 3m Horizontal polarity					
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	4948.16	62.54	33.54	3.77	42.51	0.74	58.08	74.00	-15.92	P
*	4948.16	40.51	33.54	3.77	42.51	0.74	36.05	54.00	-17.95	A
*	7421.96	58.75	39.17	4.76	41.55	1.83	62.96	74.00	-11.04	P
*	7421.96	37.55	39.17	4.76	41.55	1.83	41.76	54.00	-12.24	A

Remark:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
2. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
3. The result basic equation calculation is as follow:
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. The other emission levels were 20dB below the limit
5. The test limit distance is 3M limit.

Product Name	Air Keyboard Chatting	Test Date	2010/8/29
Model	AK05b	Test By	Eric Yang
Test Mode	TX / Y mode (CH High)	TEMP& Humidity	25.3℃, 44%

Vertical

	TX / Y mode / CH High				Measurement Distance at 3m Vertical polarity					
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	4948.11	60.52	33.54	3.77	42.51	0.74	56.06	74.00	-17.94	P
*	4948.11	39.87	33.54	3.77	42.51	0.74	35.41	54.00	-18.59	A
*	7422.06	59.87	39.17	4.76	41.55	1.83	64.08	74.00	-9.92	P
*	7422.06	37.44	39.17	4.76	41.55	1.83	41.65	54.00	-12.35	A

Remark:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
2. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
3. The result basic equation calculation is as follow:
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. The other emission levels were 20dB below the limit
5. The test limit distance is 3M limit.

Product Name	Air Keyboard Chatting	Test Date	2010/8/29
Model	AK05b	Test By	Eric Yang
Test Mode	TX / Z mode (CH Low)	TEMP& Humidity	25.3℃, 44%

Horizontal

	TX / Z mode / CH Low				Measurement Distance at 3m Horizontal polarity					
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	4803.86	57.65	33.11	3.73	42.36	0.69	52.81	74.00	-21.19	P
*	4803.86	36.87	33.11	3.73	42.36	0.69	32.03	54.00	-21.97	A
	7205.91	54.65	38.52	4.66	41.89	1.37	57.31	74.00	-16.69	P
	7205.91	36.52	38.52	4.66	41.89	1.37	39.18	54.00	-14.82	A

Remark:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
2. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
3. The result basic equation calculation is as follow:
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. The other emission levels were 20dB below the limit
5. The test limit distance is 3M limit.

Product Name	Air Keyboard Chatting	Test Date	2010/8/29
Model	AK05b	Test By	Eric Yang
Test Mode	TX / Z mode (CH Low)	TEMP& Humidity	25.3℃, 44%

Vertical

	TX / Z mode / CH Low				Measurement Distance at 3m Vertical polarity					
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	4804.01	63.54	33.11	3.73	42.36	0.69	58.70	74.00	-15.30	P
*	4804.01	39.87	33.11	3.73	42.36	0.69	35.03	54.00	-18.97	A
	7205.98	62.44	38.52	4.66	41.89	1.37	65.10	74.00	-8.90	P
	7205.98	38.54	38.52	4.66	41.89	1.37	41.20	54.00	-12.80	A

Remark:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
2. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
3. The result basic equation calculation is as follow:
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. The other emission levels were 20dB below the limit
5. The test limit distance is 3M limit.

Product Name	Air Keyboard Chatting	Test Date	2010/8/29
Model	AK05b	Test By	Eric Yang
Test Mode	TX / Z mode (CH Middle)	TEMP& Humidity	25.3℃, 44%

Horizontal

	TX / Z mode / CH Middle				Measurement Distance at 3m Horizontal polarity					
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	4876.36	58.87	33.33	3.75	42.44	0.71	54.22	74.00	-19.78	P
*	4876.36	36.54	33.33	3.75	42.44	0.71	31.89	54.00	-22.11	A
*	7314.02	61.35	38.84	4.71	41.72	1.60	64.78	74.00	-9.22	P
*	7314.02	37.55	38.84	4.71	41.72	1.60	40.98	54.00	-13.02	A

Remark:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
2. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
3. The result basic equation calculation is as follow:
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. The other emission levels were 20dB below the limit
5. The test limit distance is 3M limit.

Product Name	Air Keyboard Chatting	Test Date	2010/8/29
Model	AK05b	Test By	Eric Yang
Test Mode	TX / Z mode (CH Middle)	TEMP& Humidity	25.3℃, 44%

Vertical

	TX / Z mode / CH Middle				Measurement Distance at 3m Vertical polarity					
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	4876.31	62.85	33.33	3.75	42.44	0.71	58.20	74.00	-15.80	P
*	4876.31	38.97	33.33	3.75	42.44	0.71	34.32	54.00	-19.68	A
*	7314.05	62.85	38.84	4.71	41.72	1.60	66.28	74.00	-7.72	P
*	7314.05	39.87	38.84	4.71	41.72	1.60	43.30	54.00	-10.70	A

Remark:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
2. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
3. The result basic equation calculation is as follow:
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. The other emission levels were 20dB below the limit
5. The test limit distance is 3M limit.

Product Name	Air Keyboard Chatting	Test Date	2010/8/29
Model	AK05b	Test By	Eric Yang
Test Mode	TX / Z mode (CH High)	TEMP& Humidity	25.3℃, 44%

Horizontal

	TX / Z mode / CH High				Measurement Distance at 3m Horizontal polarity					
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	4948.13	57.87	33.54	3.77	42.51	0.74	53.41	74.00	-20.59	P
*	4948.13	36.54	33.54	3.77	42.51	0.74	32.08	54.00	-21.92	A
*	7421.96	58.98	39.17	4.76	41.55	1.83	63.19	74.00	-10.81	P
*	7421.96	37.44	39.17	4.76	41.55	1.83	41.65	54.00	-12.35	A

Remark:

1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
2. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
3. The result basic equation calculation is as follow:
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. The other emission levels were 20dB below the limit
5. The test limit distance is 3M limit.

Product Name	Air Keyboard Chatting	Test Date	2010/8/29
Model	AK05b	Test By	Eric Yang
Test Mode	TX / Z mode (CH High)	TEMP& Humidity	25.3℃, 44%

Vertical

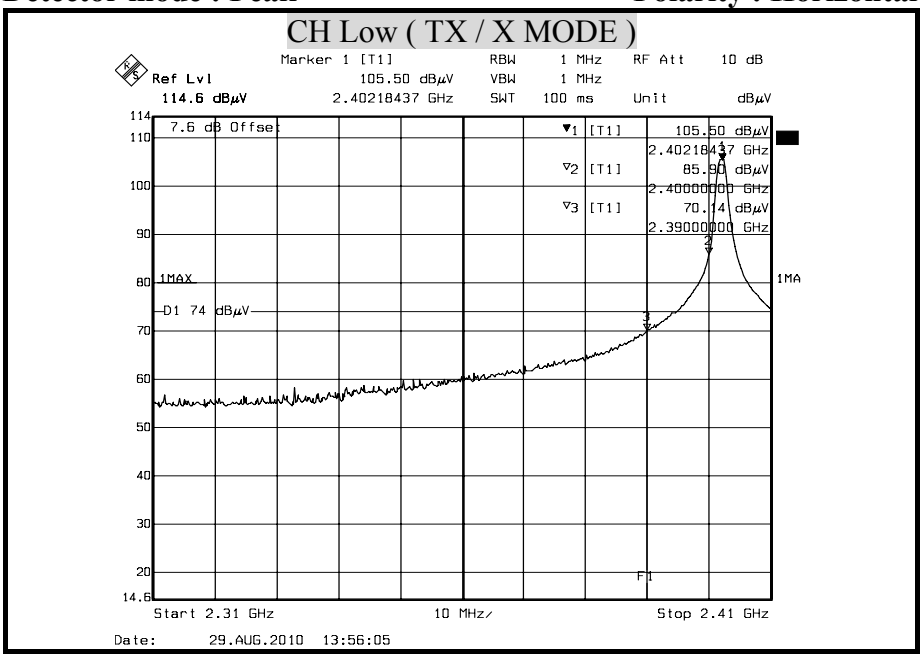
	TX / Z mode / CH High				Measurement Distance at 3m Vertical polarity					
	Freq.	Reading	AF	Cable Loss	Pre-amp	Filter	Level	Limit	Margin	Mark
	(MHz)	(dBμV)	(dB/m)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(P/Q/A)
*	4948.19	63.52	33.54	3.77	42.51	0.74	59.06	74.00	-14.94	P
*	4948.19	40.51	33.54	3.77	42.51	0.74	36.05	54.00	-17.95	A
*	7422.03	63.24	39.17	4.76	41.55	1.83	67.45	74.00	-6.55	P
*	7422.03	39.86	39.17	4.76	41.55	1.83	44.07	54.00	-9.93	A

Remark:

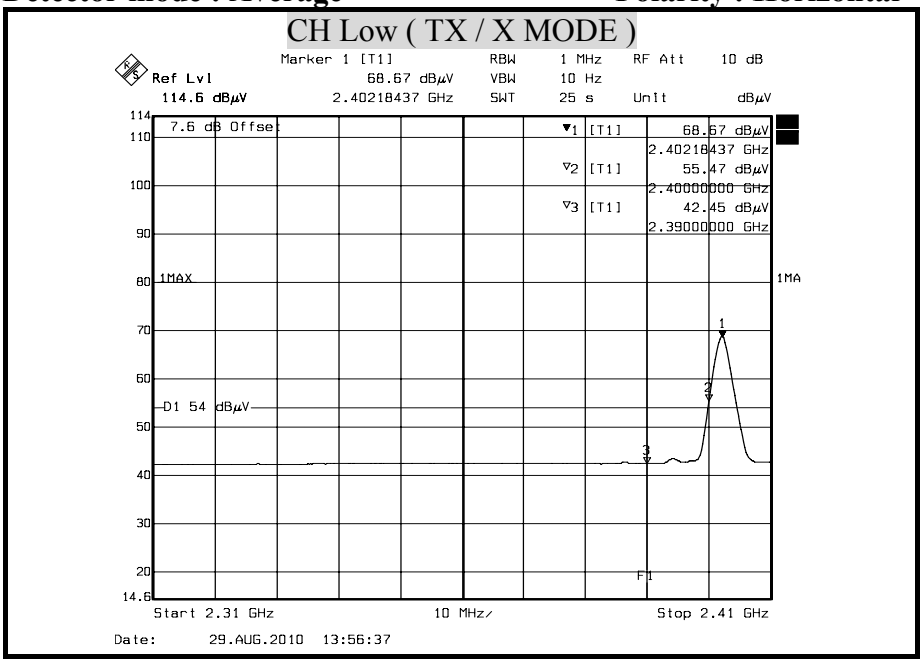
1. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
2. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
3. The result basic equation calculation is as follow:
   Level = Reading + AF + Cable – Preamp + Filter , Margin = Level-Limit
4. The other emission levels were 20dB below the limit
5. The test limit distance is 3M limit.

8.6.4 RESTRICTED BAND EDGES

Detector mode : Peak **Polarity : Horizontal**



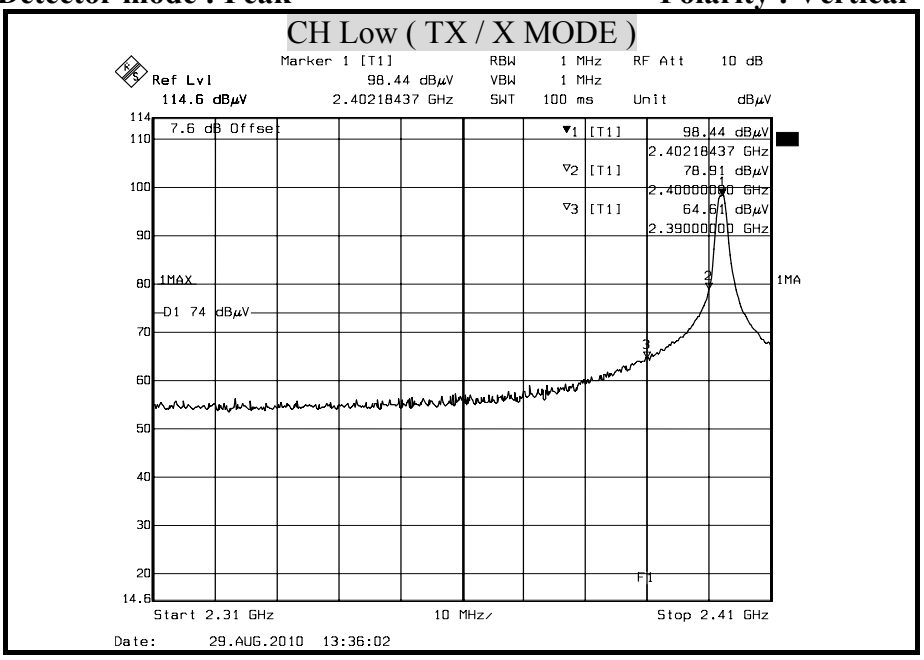
Detector mode : Average **Polarity : Horizontal**



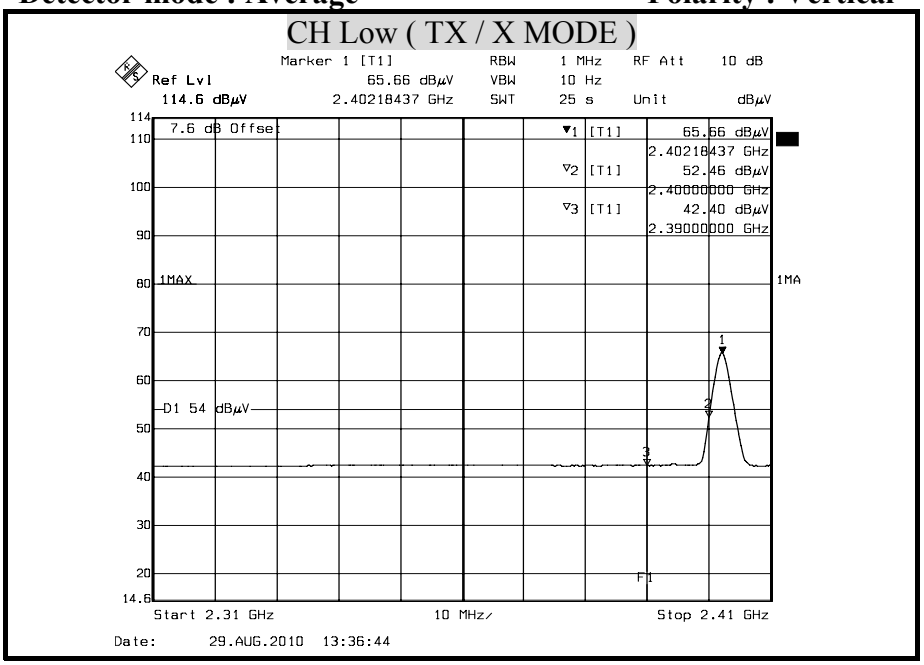
Remark:

1. Display Line = 54/74 dB μ V/m.
2. 2390MHz Offset(dB) = Antenna Factor(dB/m) + Cable Loss(dB) - Pre-Amplifier(dB) + Attenuator(dB)=7.6(dB)
3. 2483.5MHz Offset(dB) = Antenna Factor(dB/m) + Cable Loss(dB) - Pre-Amplifier(dB) + Attenuator(dB)=7.62(dB)

Detector mode : Peak **Polarity : Vertical**



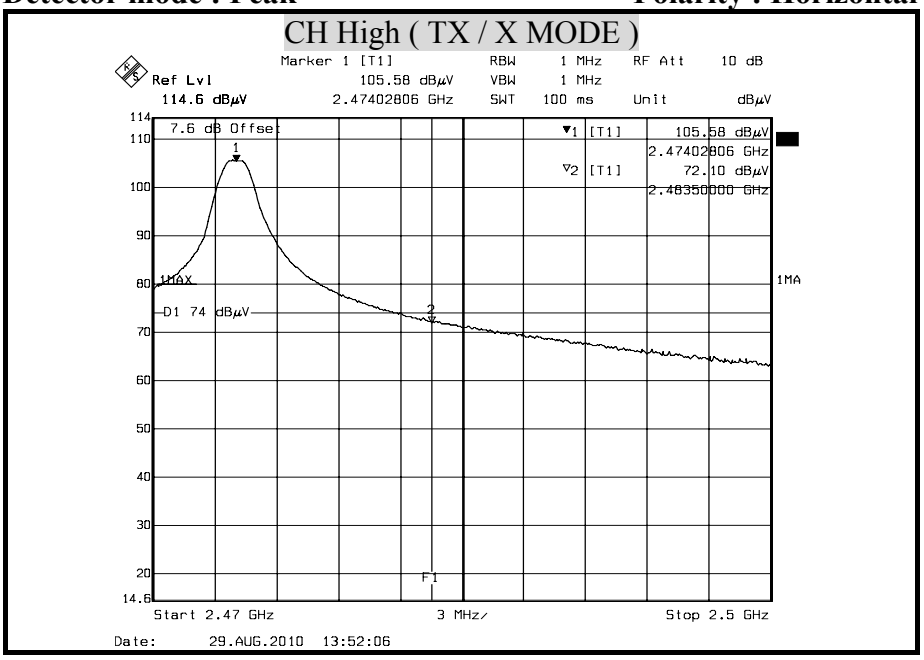
Detector mode : Average **Polarity : Vertical**



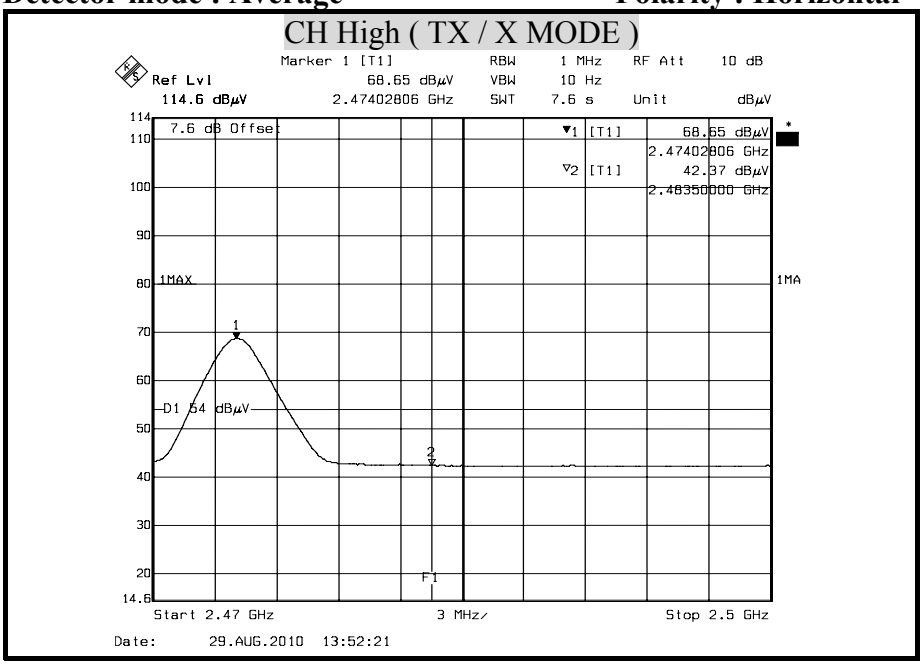
Remark:

1. Display Line = 54/74 dB μ V/m.
2. 2390MHz Offset(dB) = Antenna Factor(dB/m) + Cable Loss(dB) - Pre-Amplifier(dB) + Attenuator(dB)=7.6(dB)
3. 2483.5MHz Offset(dB) = Antenna Factor(dB/m) + Cable Loss(dB) - Pre-Amplifier(dB) + Attenuator(dB)=7.62(dB)

Detector mode : Peak **Polarity : Horizontal**



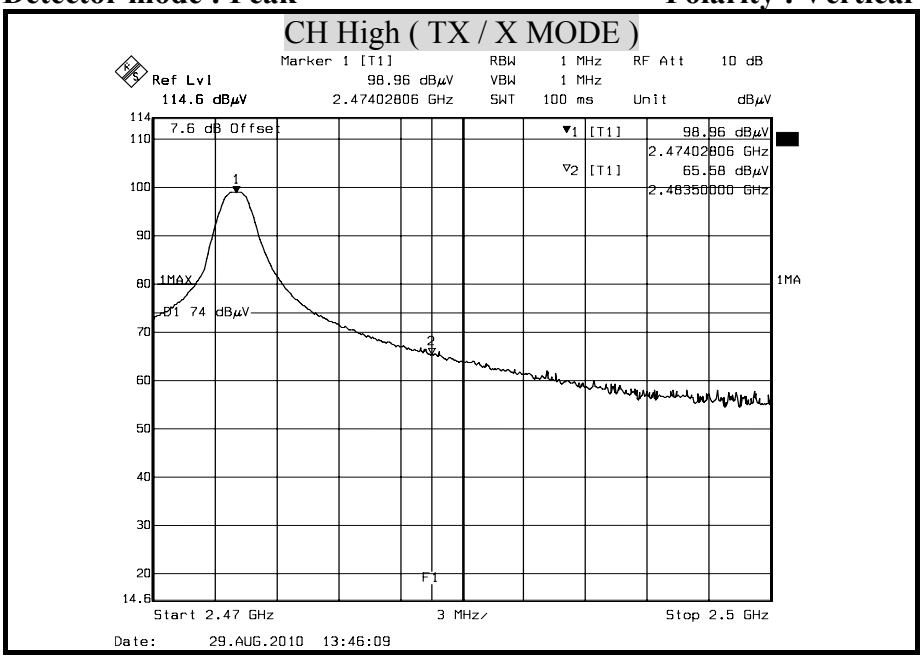
Detector mode : Average **Polarity : Horizontal**



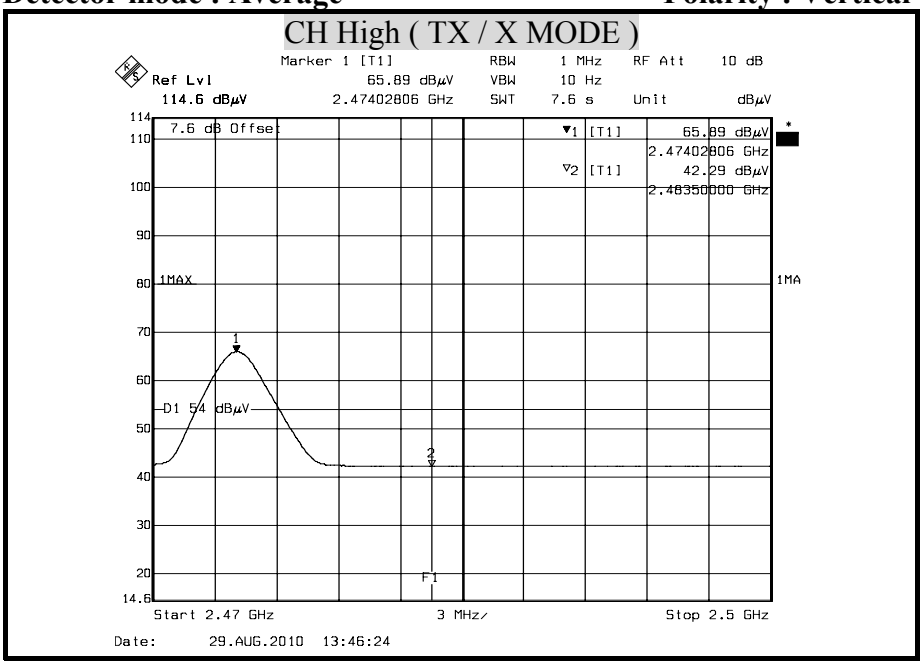
Remark:

1. Display Line = 54/74 dB μ V/m.
2. 2390MHz Offset(dB) = Antenna Factor(dB/m) + Cable Loss(dB) - Pre-Amplifier(dB) + Attenuator(dB)=7.6(dB)
3. 2483.5MHz Offset(dB) = Antenna Factor(dB/m) + Cable Loss(dB) - Pre-Amplifier(dB) + Attenuator(dB)=7.62(dB)

Detector mode : Peak **Polarity : Vertical**



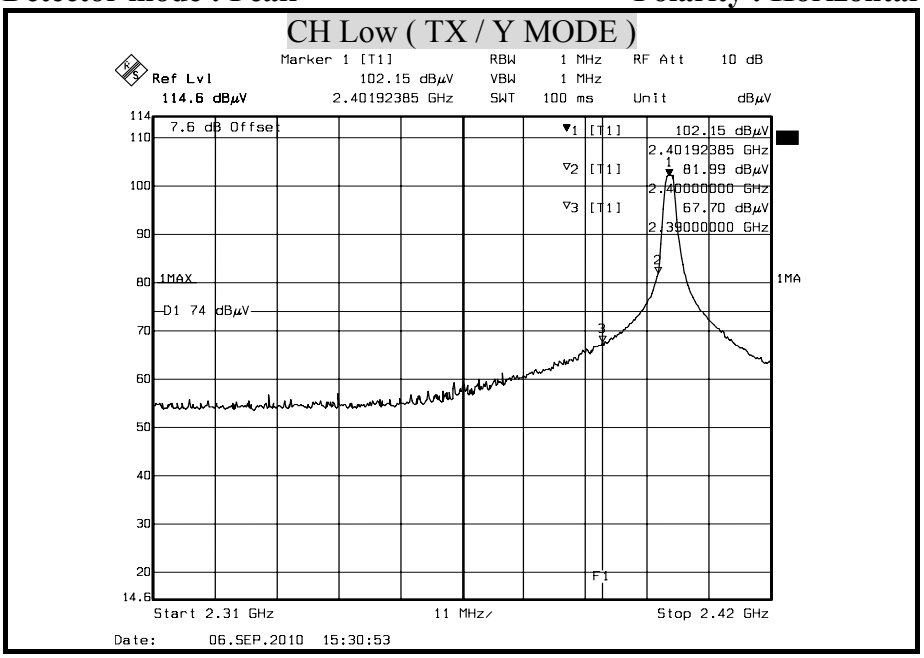
Detector mode : Average **Polarity : Vertical**



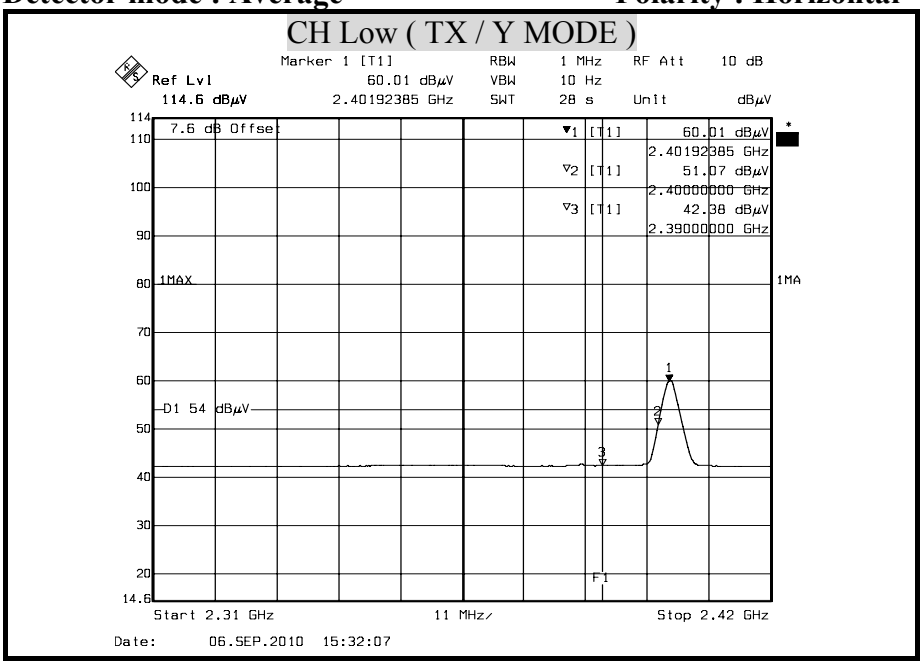
Remark:

1. Display Line = 54/74 dB μ V/m.
2. 2390MHz Offset(dB) = Antenna Factor(dB/m) + Cable Loss(dB) - Pre-Amplifier(dB) + Attenuator(dB)=7.6(dB)
3. 2483.5MHz Offset(dB) = Antenna Factor(dB/m) + Cable Loss(dB) - Pre-Amplifier(dB) + Attenuator(dB)=7.62(dB)

Detector mode : Peak **Polarity : Horizontal**



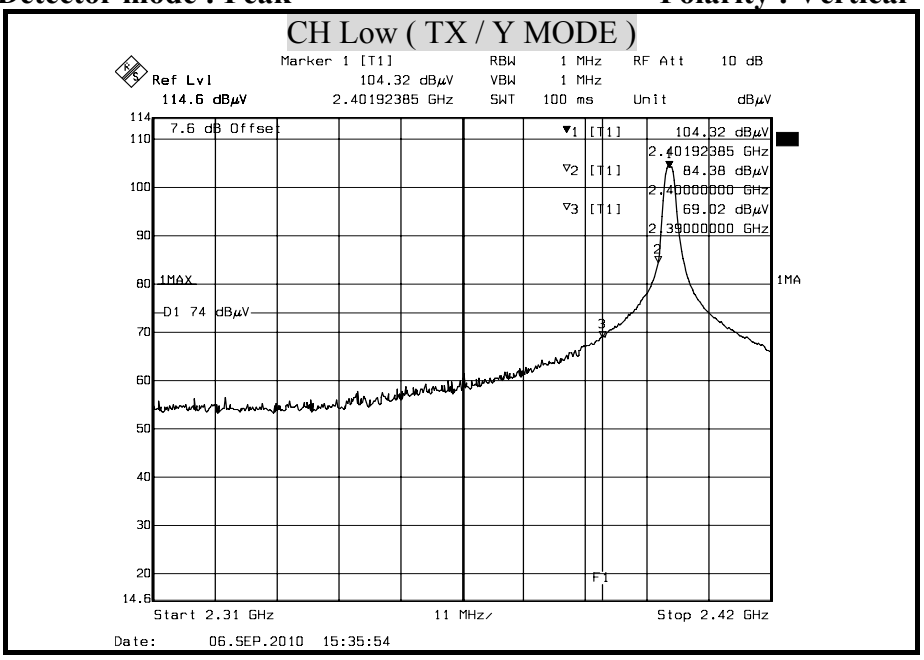
Detector mode : Average **Polarity : Horizontal**



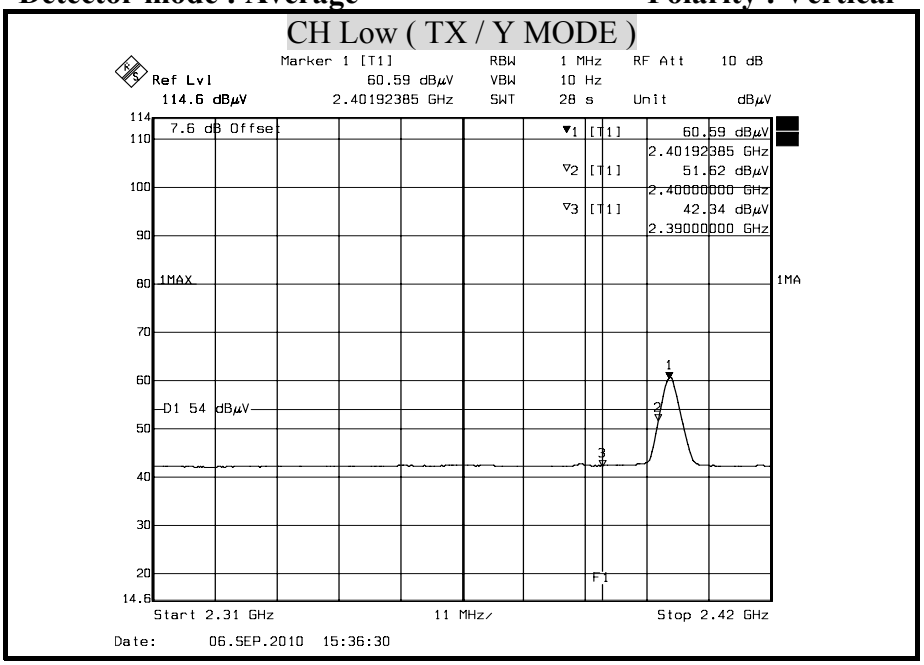
Remark:

1. Display Line = 54/74 dB μ V/m.
2. 2390MHz Offset(dB) = Antenna Factor(dB/m) + Cable Loss(dB) - Pre-Amplifier(dB) + Attenuator(dB)=7.6(dB)
3. 2483.5MHz Offset(dB) = Antenna Factor(dB/m) + Cable Loss(dB) - Pre-Amplifier(dB) + Attenuator(dB)=7.62(dB)

Detector mode : Peak **Polarity : Vertical**



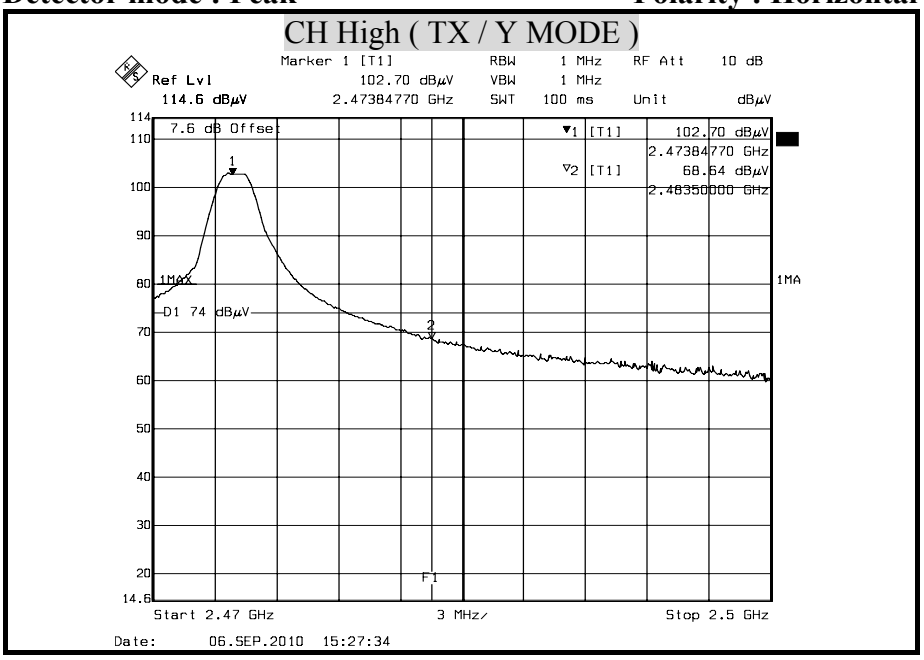
Detector mode : Average **Polarity : Vertical**



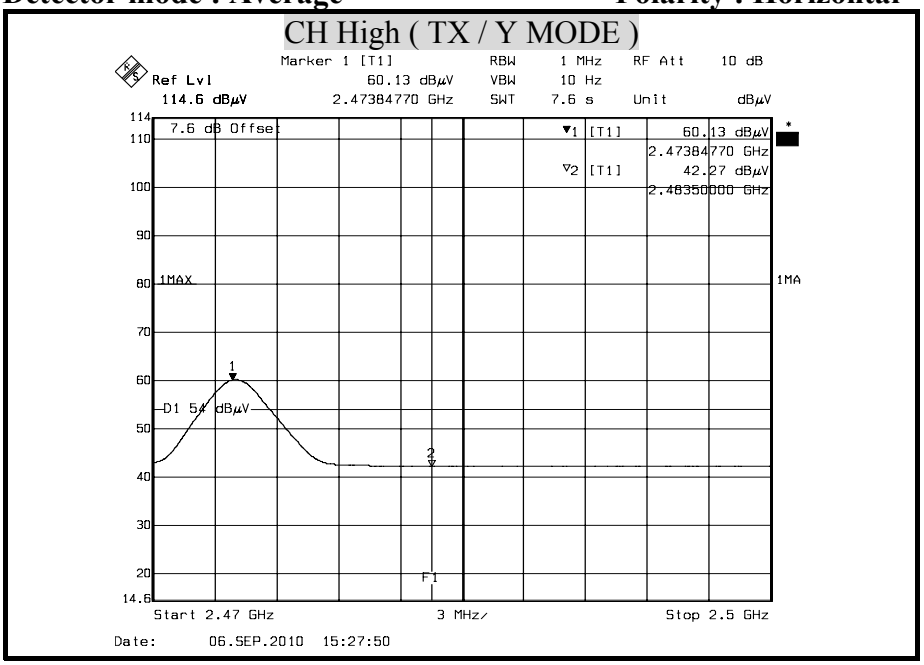
Remark:

1. Display Line = 54/74 dB μ V/m.
2. 2390MHz Offset(dB) = Antenna Factor(dB/m) + Cable Loss(dB) - Pre-Amplifier(dB) + Attenuator(dB)=7.6(dB)
3. 2483.5MHz Offset(dB) = Antenna Factor(dB/m) + Cable Loss(dB) - Pre-Amplifier(dB) + Attenuator(dB)=7.62(dB)

Detector mode : Peak **Polarity : Horizontal**



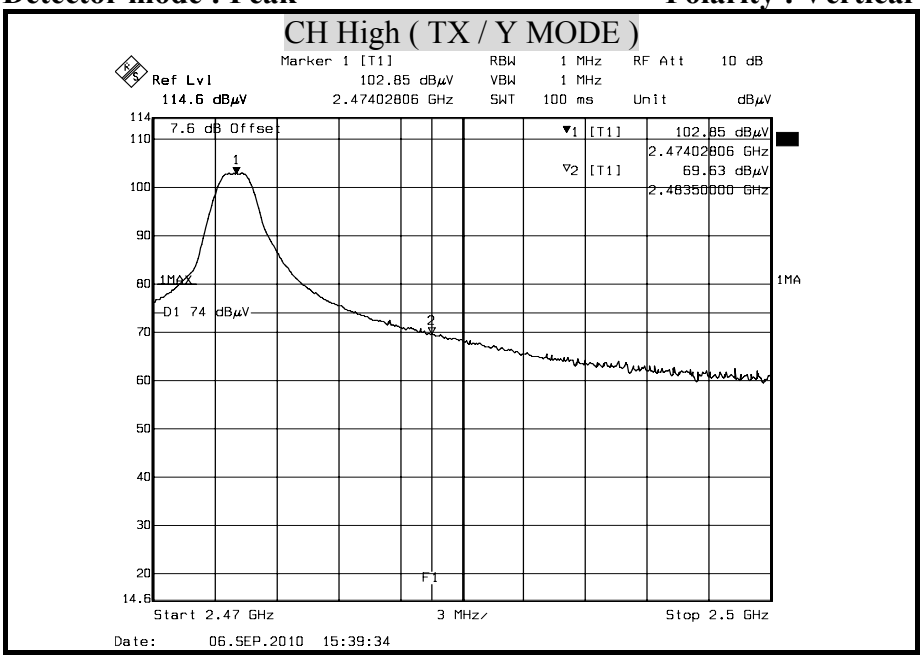
Detector mode : Average **Polarity : Horizontal**



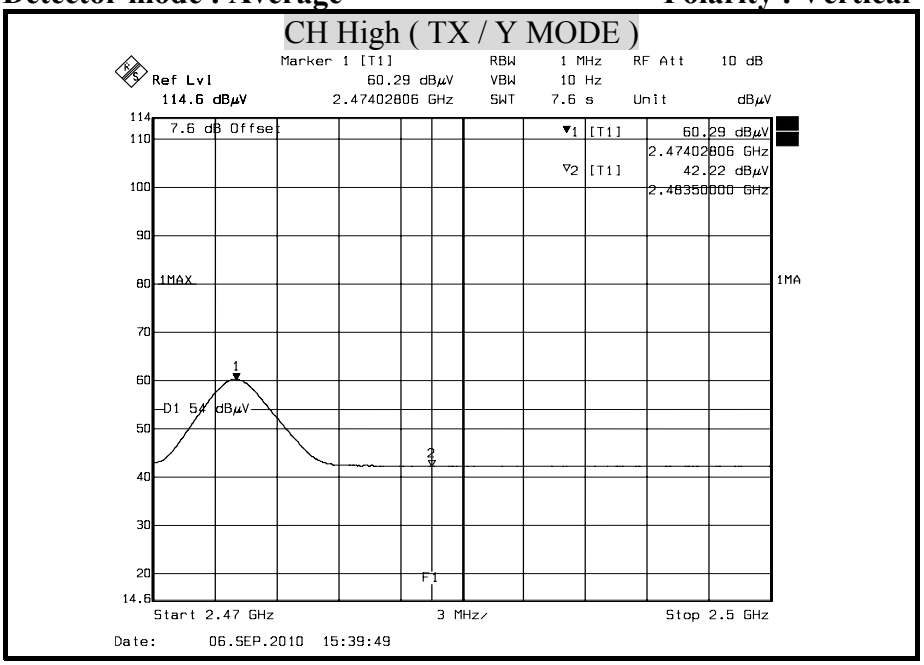
Remark:

1. Display Line = 54/74 dB μ V/m.
2. 2390MHz Offset(dB) = Antenna Factor(dB/m) + Cable Loss(dB) - Pre-Amplifier(dB) + Attenuator(dB)=7.6(dB)
3. 2483.5MHz Offset(dB) = Antenna Factor(dB/m) + Cable Loss(dB) - Pre-Amplifier(dB) + Attenuator(dB)=7.62(dB)

Detector mode : Peak **Polarity : Vertical**



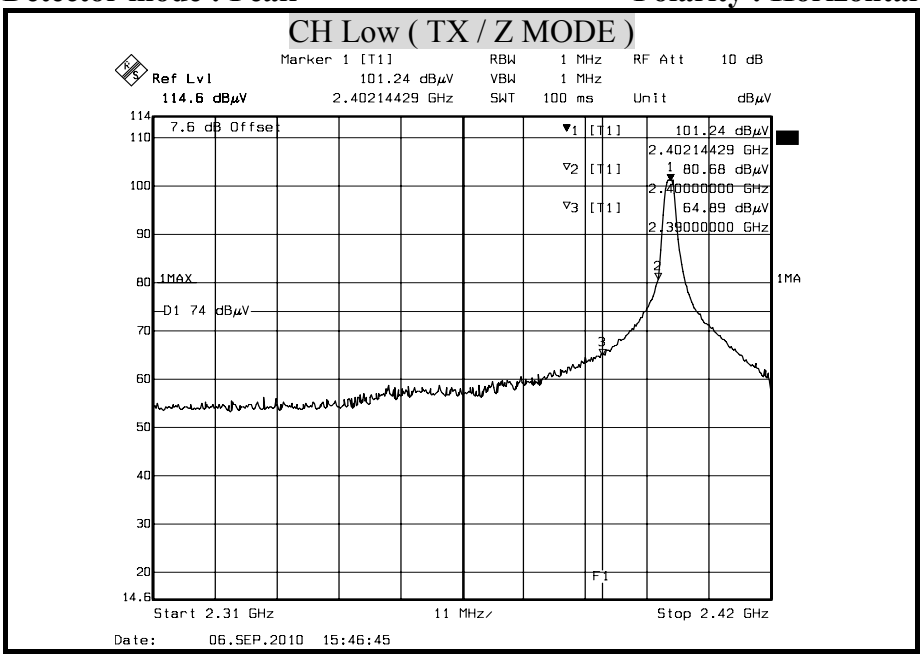
Detector mode : Average **Polarity : Vertical**



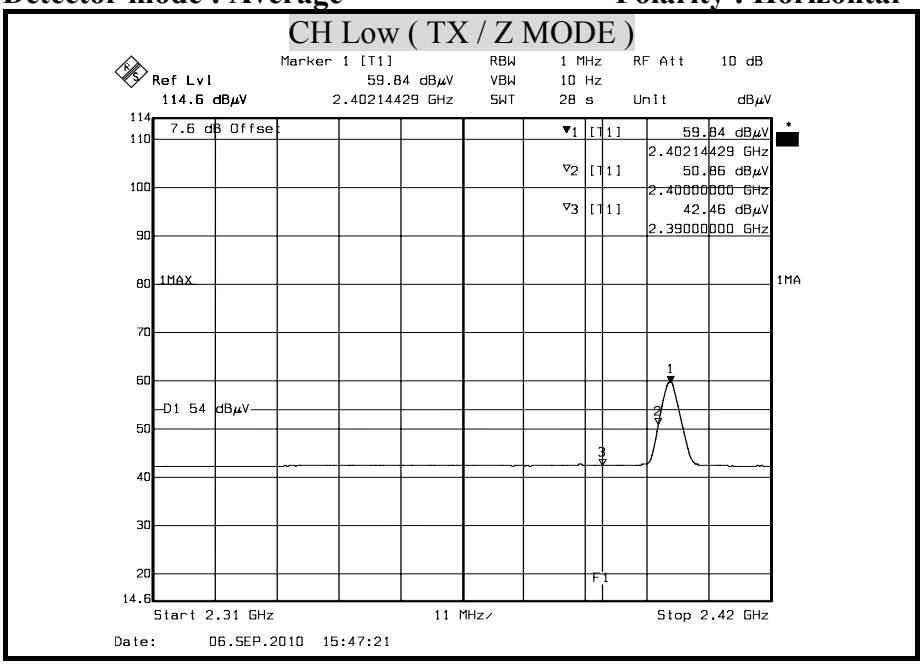
Remark:

1. Display Line = 54/74 dB μ V/m.
2. 2390MHz Offset(dB) = Antenna Factor(dB/m) + Cable Loss(dB) - Pre-Amplifier(dB) + Attenuator(dB)=7.6(dB)
3. 2483.5MHz Offset(dB) = Antenna Factor(dB/m) + Cable Loss(dB) - Pre-Amplifier(dB) + Attenuator(dB)=7.62(dB)

Detector mode : Peak **Polarity : Horizontal**



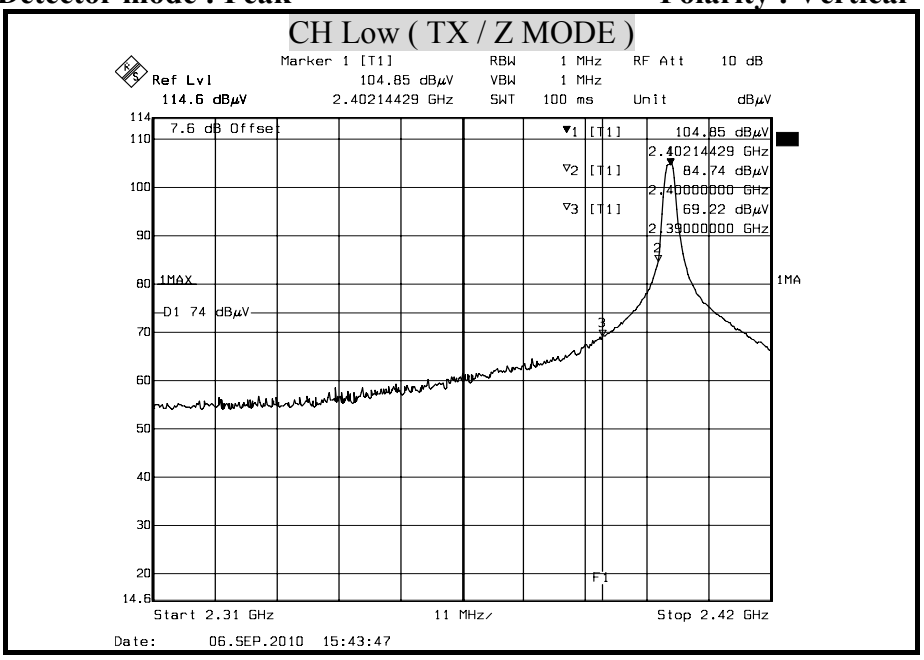
Detector mode : Average **Polarity : Horizontal**



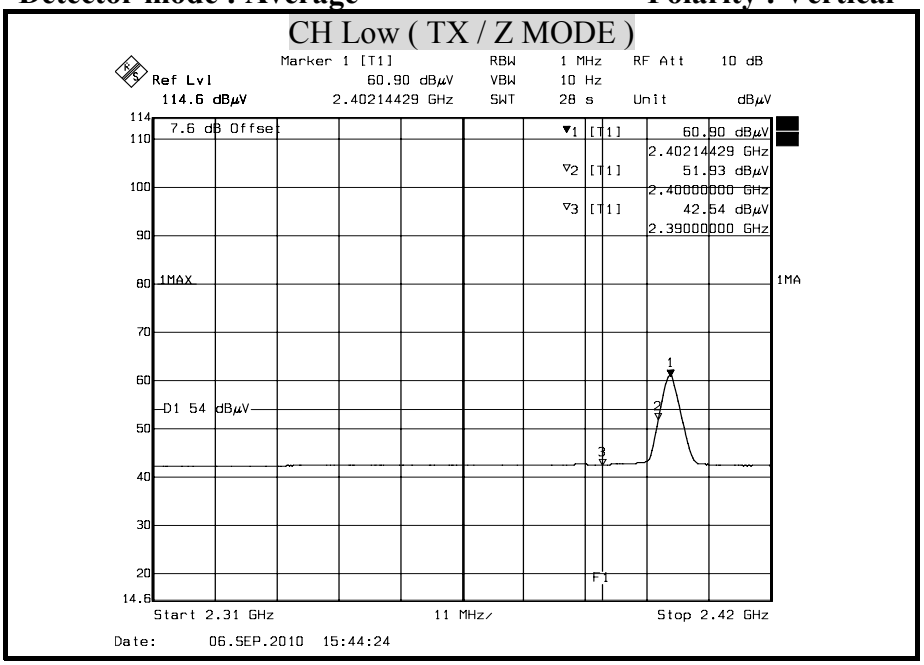
Remark:

1. Display Line = 54/74 dB μ V/m.
2. 2390MHz Offset(dB) = Antenna Factor(dB/m) + Cable Loss(dB) - Pre-Amplifier(dB) + Attenuator(dB)=7.6(dB)
3. 2483.5MHz Offset(dB) = Antenna Factor(dB/m) + Cable Loss(dB) - Pre-Amplifier(dB) + Attenuator(dB)=7.62(dB)

Detector mode : Peak **Polarity : Vertical**



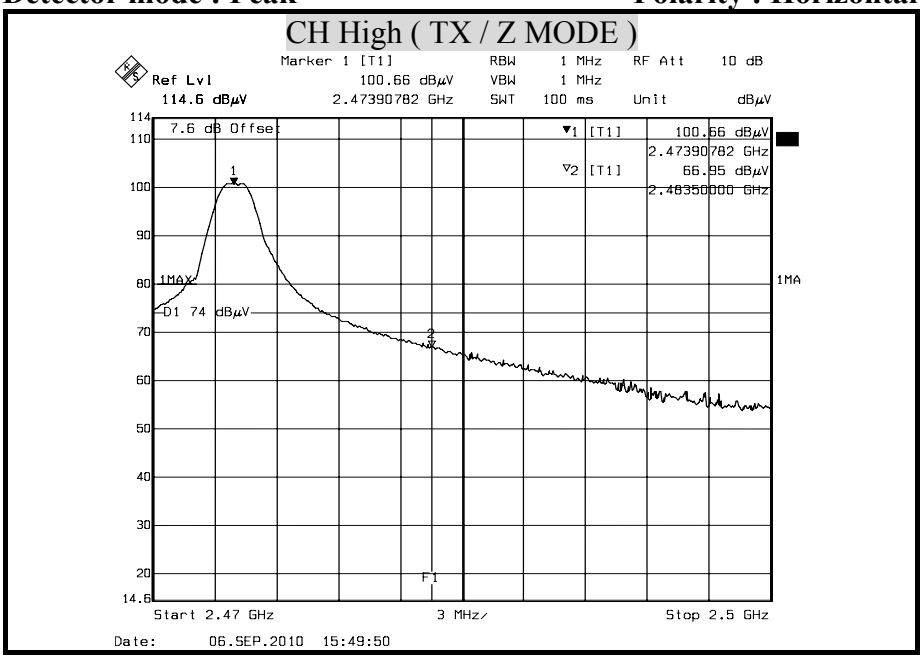
Detector mode : Average **Polarity : Vertical**



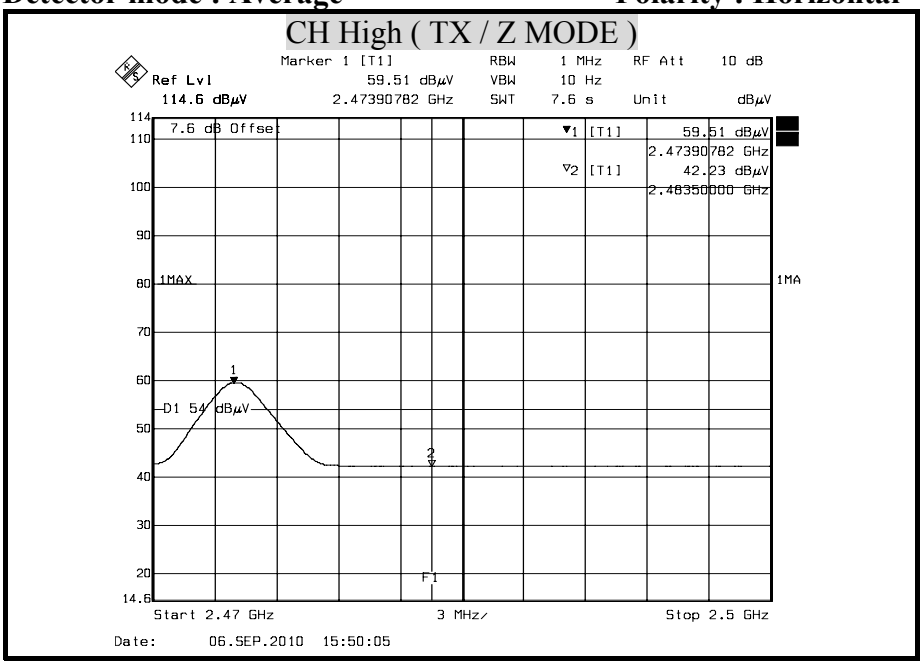
Remark:

1. Display Line = 54/74 dB μ V/m.
2. 2390MHz Offset(dB) = Antenna Factor(dB/m) + Cable Loss(dB) - Pre-Amplifier(dB) + Attenuator(dB)=7.6(dB)
3. 2483.5MHz Offset(dB) = Antenna Factor(dB/m) + Cable Loss(dB) - Pre-Amplifier(dB) + Attenuator(dB)=7.62(dB)

Detector mode : Peak **Polarity : Horizontal**



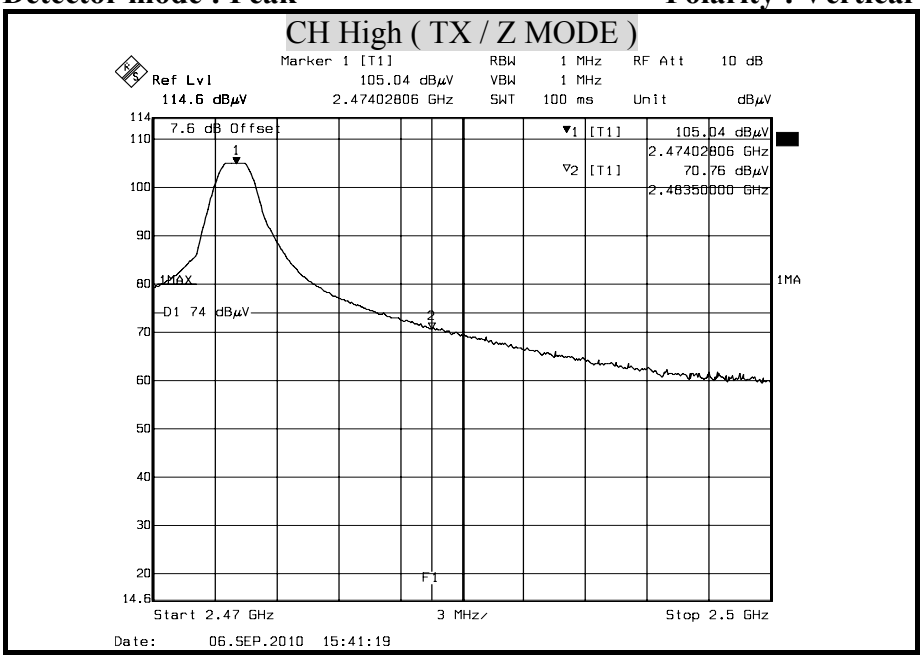
Detector mode : Average **Polarity : Horizontal**



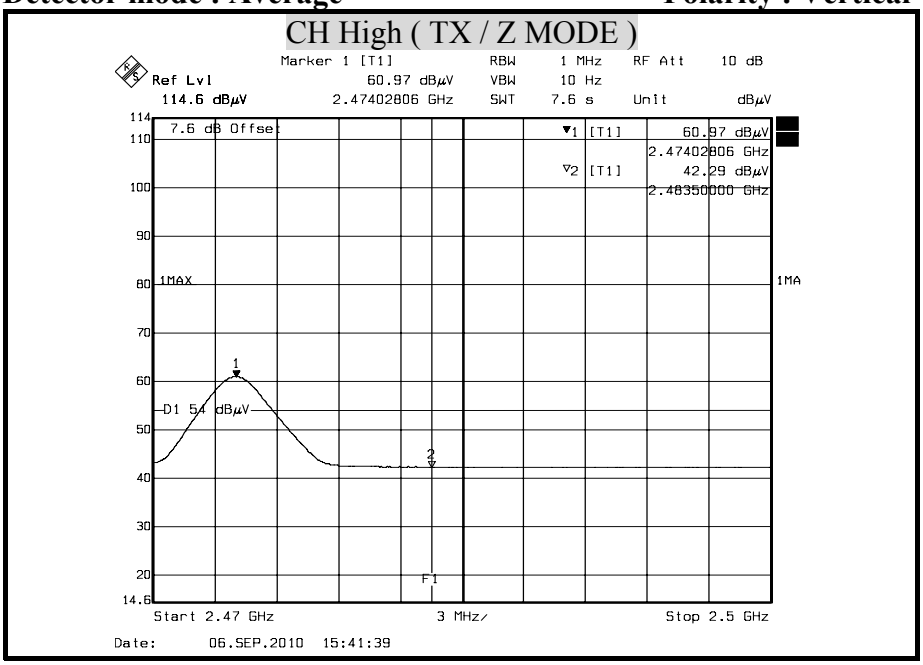
Remark:

1. Display Line = 54/74 dB μ V/m.
2. 2390MHz Offset(dB) = Antenna Factor(dB/m) + Cable Loss(dB) - Pre-Amplifier(dB) + Attenuator(dB)=7.6(dB)
3. 2483.5MHz Offset(dB) = Antenna Factor(dB/m) + Cable Loss(dB) - Pre-Amplifier(dB) + Attenuator(dB)=7.62(dB)

Detector mode : Peak **Polarity : Vertical**



Detector mode : Average **Polarity : Vertical**



Remark:

1. Display Line = 54/74 dB μ V/m.
2. 2390MHz Offset(dB) = Antenna Factor(dB/m) + Cable Loss(dB) - Pre-Amplifier(dB) + Attenuator(dB)=7.6(dB)
3. 2483.5MHz Offset(dB) = Antenna Factor(dB/m) + Cable Loss(dB) - Pre-Amplifier(dB) + Attenuator(dB)=7.62(dB)

8.7 POWERLINE CONDUCTED EMISSIONS

LIMITS

§ 15.207 (a) Except as shown in paragraph (b) and (c) this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal.

The lower limit applies at the boundary between the frequency ranges.

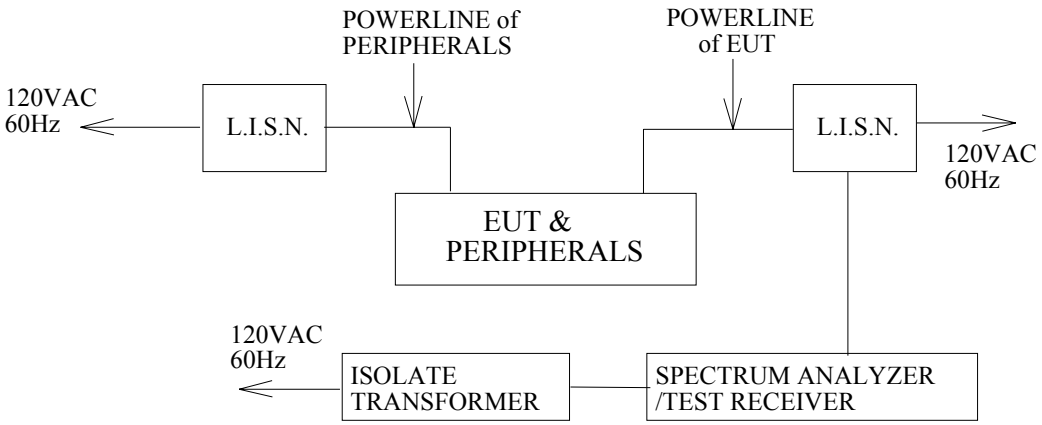
Frequency of Emission (MHz)	Conducted limit (dBμv)	
	Quasi-peak	Average
0.15 - 0.5	66 to 56	56 to 46
0.5 - 5	56	46
5 - 30	60	50

TEST EQUIPMENTS

The following test equipments are used during the conducted power line tests：

Conducted Emission room				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
L.I.S.N.	SCHWARZBECK	NNLK 8121	8121-308	MAR. 09, 2011
	Rohde & Schwarz	ESH 3-Z5	840062/021	NOV. 29, 2010
TEST RECEIVER	Rohde & Schwarz	ESCS 30	100348	JUL. 13, 2011
BNC COAXIAL CABLE	CCS	BNC50	11	AUG. 26, 2011
Test S/W	e-3 (5.04211c) R&S (2.27)			

TEST SETUP



TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80cm above the horizontal ground plane. The EUT IS CONFIGURED IN ACCORDANCE WITH ANSI C63.4.

The resolution bandwidth is set to 9 kHz for both quasi-peak detection and average detection measurements.

Line conducted data is recorded for both NEUTRAL and LINE.

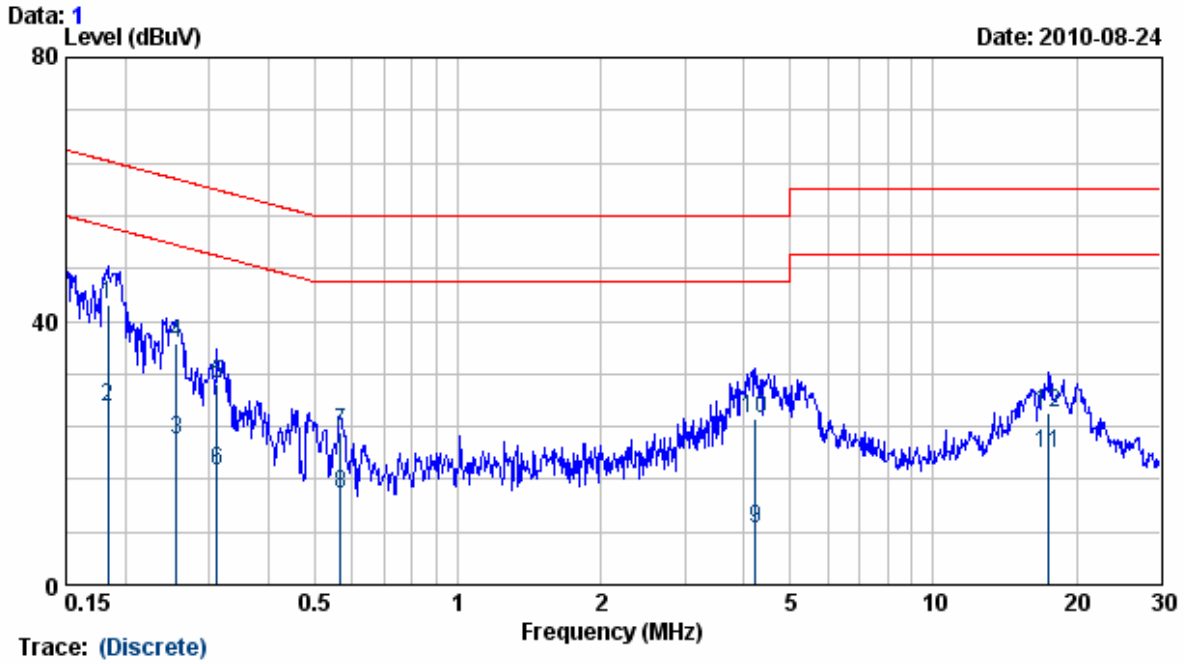
TEST RESULTS

No non-compliance noted

TEST DATA

Operation Mode:	TX + RX mode	**Test Date:**	August 24, 2010
Temperature:	24.4°C	**Humidity:**	59 RH
Tested by:	Agun Huang	**Test Mode**	Normal Link

Conducted emissions (Line)



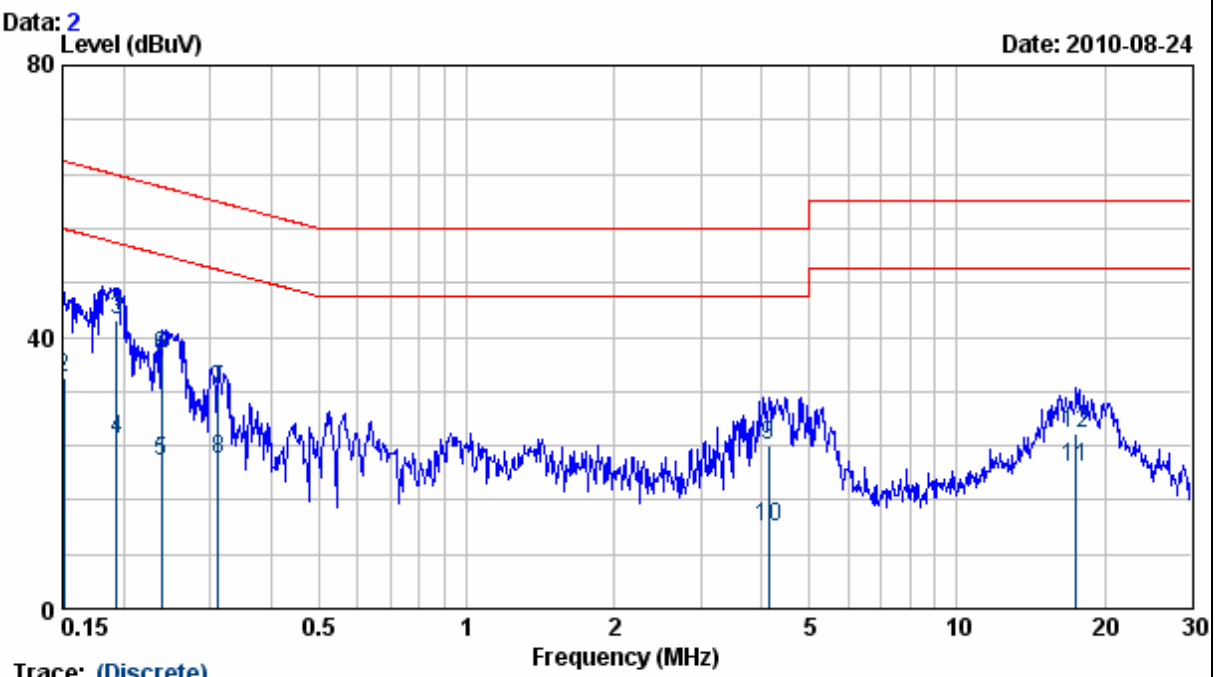
Freq. MHz	LISN Factor dB	Cable Loss dB	Meter Reading dBuV	Measured Level dBuV	Limits dBuV	Over Limits dBuV	Detector
0.183	9.77	0.02	32.78	42.57	64.33	-21.76	QP
0.183	9.77	0.02	17.30	27.09	54.33	-27.24	AVERAGE
0.256	9.80	0.02	12.07	21.89	51.56	-29.67	AVERAGE
0.256	9.80	0.02	26.94	36.76	61.56	-24.80	QP
0.312	9.81	0.02	20.62	30.45	59.93	-29.48	QP
0.312	9.81	0.02	7.51	17.34	49.93	-32.59	AVERAGE
0.567	9.81	0.02	13.24	23.07	56.00	-32.93	QP
0.567	9.81	0.02	4.01	13.84	46.00	-32.16	AVERAGE
4.224	9.89	0.07	-1.37	8.59	46.00	-37.41	AVERAGE
4.224	9.89	0.07	15.32	25.28	56.00	-30.72	QP
17.475	10.79	0.16	9.02	19.97	50.00	-30.03	AVERAGE
17.475	10.79	0.16	15.06	26.01	60.00	-33.99	QP

Remark:

1. Measuring frequencies from 0.15 MHz to 30MHz.
2. The emissions measured in frequency range from 0.15 MHz to 30MHz were made with an instrument using Quasi-peak detector and average detector.
3. The IF bandwidth of SPA between 0.15MHz to 30MHz was 10kHz; the IF bandwidth of Test Receiver between 0.15MHz to 30MHz was 9kHz;
4. a. Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB)
   b.Over Limit value (dB) = Level (dBuV) – Limit Line (dBuV)

Operation Mode:	TX + RX mode	**Test Date:**	August 24, 2010
Temperature:	24.4°C	**Humidity:**	59 RH
Tested by:	Agun Huang	**Test Mode**	Normal Link

Conducted emissions (Neutral)



Trace: (Discrete)

Freq. MHz	LISN Factor dB	Cable Loss dB	Meter Reading dBuV	Measured Level dBuV	Limits dBuV	Over Limits dBuV	Detector
0.151	9.74	0.02	-1.74	8.02	55.96	-47.94	AVERAGE
0.151	9.74	0.02	24.10	33.86	65.96	-32.10	QP
0.193	9.78	0.02	32.72	42.52	63.89	-21.37	QP
0.193	9.78	0.02	15.22	25.02	53.89	-28.87	AVERAGE
0.239	9.79	0.02	11.75	21.56	52.13	-30.56	AVERAGE
0.239	9.79	0.02	27.28	37.09	62.13	-25.03	QP
0.312	9.81	0.02	22.46	32.29	59.93	-27.64	QP
0.312	9.81	0.02	12.11	21.94	49.93	-27.99	AVERAGE
4.136	9.89	0.07	14.08	24.04	56.00	-31.96	QP
4.136	9.89	0.07	2.14	12.10	46.00	-33.90	AVERAGE
17.475	10.79	0.16	9.80	20.75	50.00	-29.25	AVERAGE
17.475	10.79	0.16	14.96	25.91	60.00	-34.09	QP

Remark:

1. Measuring frequencies from 0.15 MHz to 30MHz.
2. The emissions measured in frequency range from 0.15 MHz to 30MHz were made with an instrument using Quasi-peak detector and average detector.
3. The IF bandwidth of SPA between 0.15MHz to 30MHz was 10kHz; the IF bandwidth of Test Receiver between 0.15MHz to 30MHz was 9kHz;
4. a. Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB)
   b.Over Limit value (dB) = Level (dBuV) – Limit Line (dBuV)

9. ANTENNA REQUIREMENT

9.1 STANDARD APPLICABLE

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

9.2 ANTENNA CONNECTED CONSTRUCTION

The antenna used for this product is Chip Antenna,

Gain: 2.84dBi