FCC RF Test Report

APPLICANT	**:**	**Telink Semiconductor Co.,Limited**
EQUIPMENT	**:**	**2.4G Wireless Optical Mouse**
BRAND NAME	**:**	**Telink**
MODEL NAME	**:**	**TLM-28001**
FCC ID	**:**	**OEO28M001**
STANDARD	**:**	**FCC Part 15 Subpart C §15.247**
CLASSIFICATION	**:**	**(DTS) Digital Transmission System**

The product was received on Aug. 24, 2012 and completely tested on Sep. 17, 2012. We, SPORTON INTERNATIONAL (KUNSHAN) INC., would like to declare that the tested sample has been evaluated in accordance with the procedures and shown the compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL (KUNSHAN) INC., the test report shall not be reproduced except in full.

Reviewed by:

Jones Tsai

Jones Tsai / Manager

SPORTON INTERNATIONAL (KUNSHAN) INC.
No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C.

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR282406	Rev. 01	Initial issue of report	Sep. 18, 2012

SUMMARY OF TEST RESULT

Report Section	FCC Rule	IC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	A8.2(a)	6dB Bandwidth	≥ 0.5MHz	Pass	-
3.2	15.247(b)(1)	A8.1(b)	Peak Output Power	≤ 30dBm	Pass	-
3.5	15.247(e)	A8.2(b)	Power Spectral Density	≤ 8dBm	Pass	-
3.4	15.247(d)	A8.5	Conducted Band Edges and Spurious Emission	≤ 20dBc	Pass	-
3.5	15.247(d)	A8.5	Radiated Band Edges and Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 5.62 dB at 903.309 MHz
3.6	15.203 & 15.247(b)	A8.4	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

Telink Semiconductor Co.,Limited
floor 3,Building 21,No 88,Daerwen Road,Zhangjiang Hi-Tech park,Shanghai,China

1.2 Manufacturer

Telink Semiconductor Co.,Limited
floor 3,Building 21,No 88,Daerwen Road,Zhangjiang Hi-Tech park,Shanghai,China

1.3 Feature of Equipment Under Test

Product Feature	
Equipment	2.4G Wireless Optical Mouse
Brand Name	Telink
Model Name	TLM-28001
FCC ID	OEO28M001
EUT supports Radios application	2.4G Wireless
EUT Stage	Production Unit

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

Product Specification subjective to this standard	
Tx/Rx Frequency Range	2406 MHz ~ 2466 MHz
Number of Channels	16
Carrier Frequency of Each Channel	4MHz
Maximum Output Power to Antenna	3.35 dBm (0.002 W)
Antenna Type	PCB Antenna with gain 1.2 dBi
Type of Modulation	OQPSK/MSK

1.4 Testing Site

Test Site	SPORTON INTERNATIONAL (KUNSHAN) INC.		
Test Site Location	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C. TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958		
Test Site No.	Sporton Site No.		FCC/IC Registration No.
	TH01-KS	03CH01-KS	149928/4086E-1

1.5 Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC Part 15 Subpart C §15.247
- FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v01
- FCC TCB Workshop 2012, April
- ANSI C63.4-2003
- IC RSS-210 Issue 8
- IC RSS-Gen Issue 3

Remark:

All test items were verified and recorded according to the standards and without any deviation during the test.

1.6 Ancillary Equipment List

N/A

2 Test Configuration of Equipment Under Test

2.1 RF Output Power

The RF output power was recorded in the following table:

Channel	Frequency	Output Power
		Data Rate / Modulation
		OQPSK/MSK
Ch01	2406MHz	3.13 dBm
Ch09	2438MHz	**3.35** dBm
Ch16	2466MHz	3.12 dBm

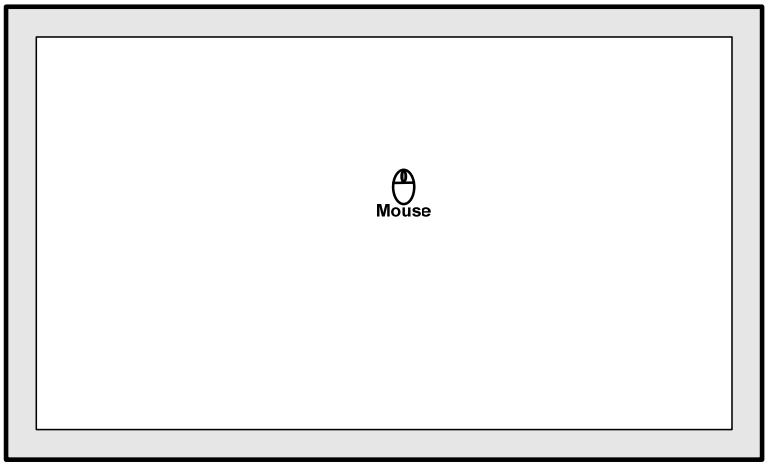
2.2 Test Mode

The EUT has been associated with peripherals pursuant to ANSI C63.4-2003 and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction (150 kHz to 30 MHz), radiation (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

The following tables are showing the test modes as the worst cases and recorded in this report.

Test Cases	
Test Item	Data Rate / Modulation
	OQPSK/MSK
Conducted TCs	Mode 1: 2.4G Wireless Tx CH01_2406 MHz Mode 2: 2.4G Wireless Tx CH09_2438 MHz Mode 3: 2.4G Wireless Tx CH16_2466 MHz
Radiated TCs	Mode 1: 2.4G Wireless Tx CH01_2406 MHz Mode 2: 2.4G Wireless Tx CH09_2438 MHz Mode 3: 2.4G Wireless Tx CH16_2466 MHz

2.3 Connection Diagram of Test System



2.4 RF Utility

i) keep middle + right key for 1s when system power on to enter test mode

ii) click left/right key to switch RF channels: left button - channel decrease to the next lower channel; right button - channel increases to the next upper channel

iii) click middle key to switch between the three test modes: single tone, continuous modulation, and receive.

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3 Test Result

3.1 6dB Bandwidth Measurement

3.1.1 Limit of 6dB Bandwidth

The minimum 6 dB bandwidth shall be at least 500 KHz.

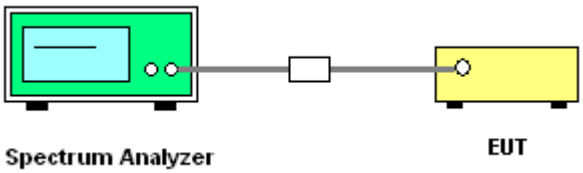
3.1.2 Measuring Instruments

See list of measuring instruments of this test report.

3.1.3 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v01.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 KHz.

3.1.4 Test Setup

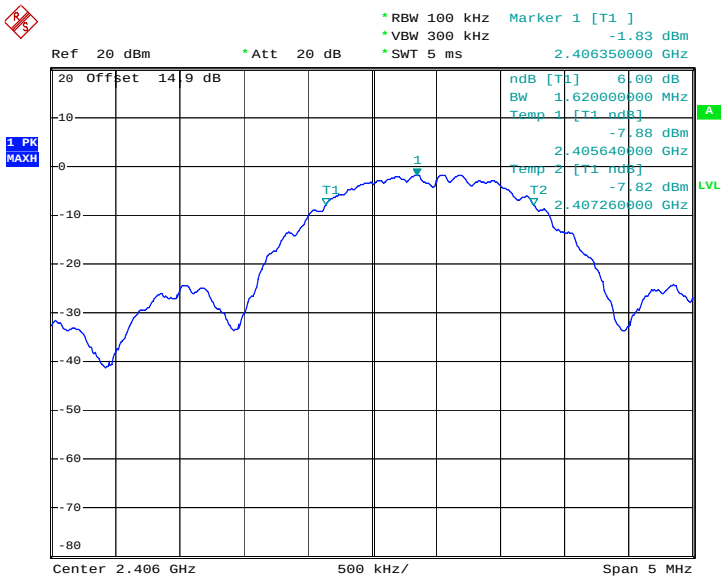


3.1.5 Test Result of 6dB Bandwidth

Test Mode :	2.4G Wireless Tx	Temperature :	21~22℃
Test Engineer :	FeiXu	Relative Humidity :	41~42%

Channel	Frequency (MHz)	6dB Bandwidth (MHz)
01	2406	1.62 MHz
09	2438	1.63 MHz
16	2466	1.65 MHz

6 dB Bandwidth Plot on Channel 01



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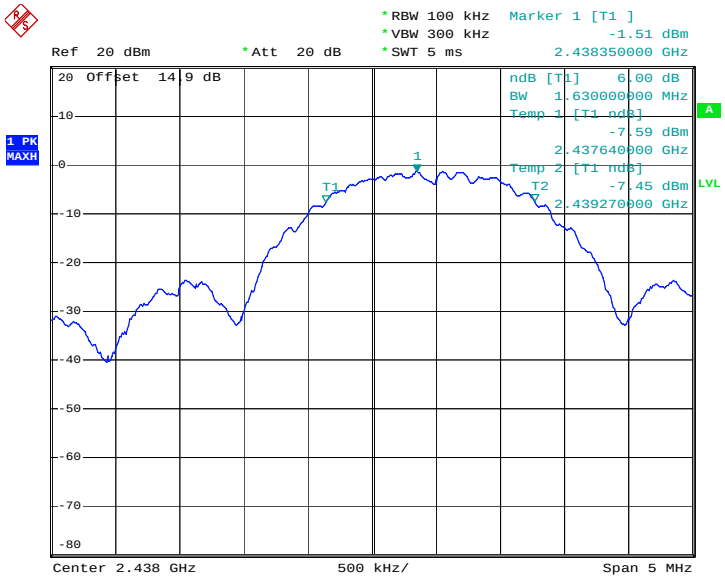
6 dB Bandwidth Plot on Channel 09



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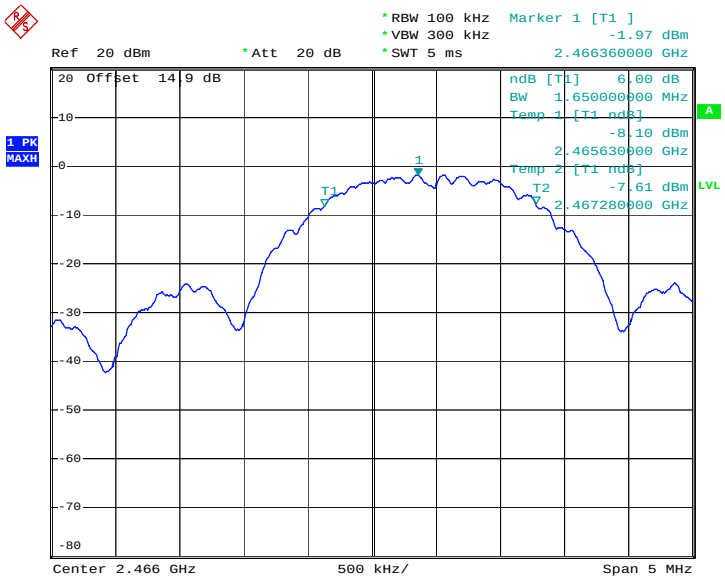
6 dB Bandwidth Plot on Channel 16



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3.2 Peak Output Power Measurement

3.2.1 Limit of Peak Output Power

For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm. If transmitting antenna of directional gain greater than 6dBi are used the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

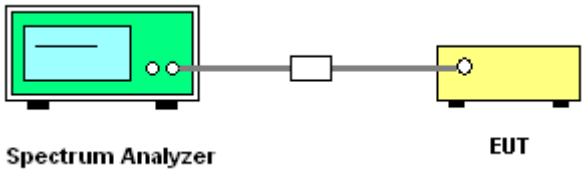
3.2.2 Measuring Instruments

See list of measuring instruments of this test report.

3.2.3 Test Procedures

1. The testing follows the Measurement Procedure of FCC KDB No. 558074 DTS D01 Meas. Guidance and TCB Workshop 2012, April.
2. The RF output of EUT was connected to the power meter by a low loss cable
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.

3.2.4 Test Setup

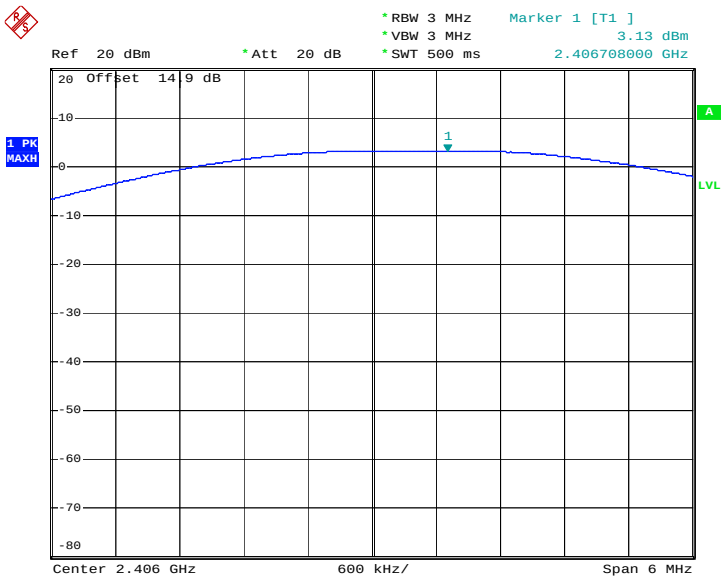


3.2.5 Test Result of Peak Output Power

Test Mode :	2.4G Wireless Tx	Temperature :	21~22℃
Test Engineer :	FeiXu	Relative Humidity :	41~42%

Channel	Frequency (MHz)	RF Power (dBm)		
		OQPSK/MSK	Max. Limits (dBm)	Pass/Fail
01	2406	3.13	30.00	Pass
09	2438	3.35	30.00	Pass
16	2466	3.12	30.00	Pass

Peak Output Power Plot on Channel 01



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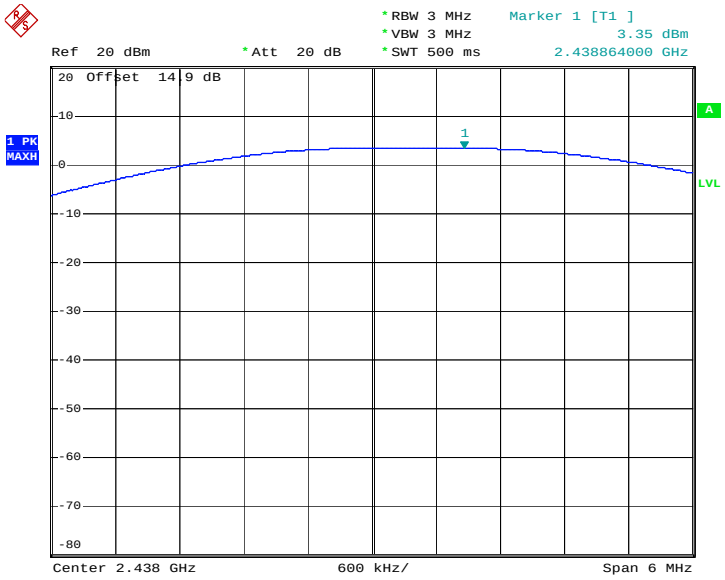
Peak Output Power Plot on Channel 09



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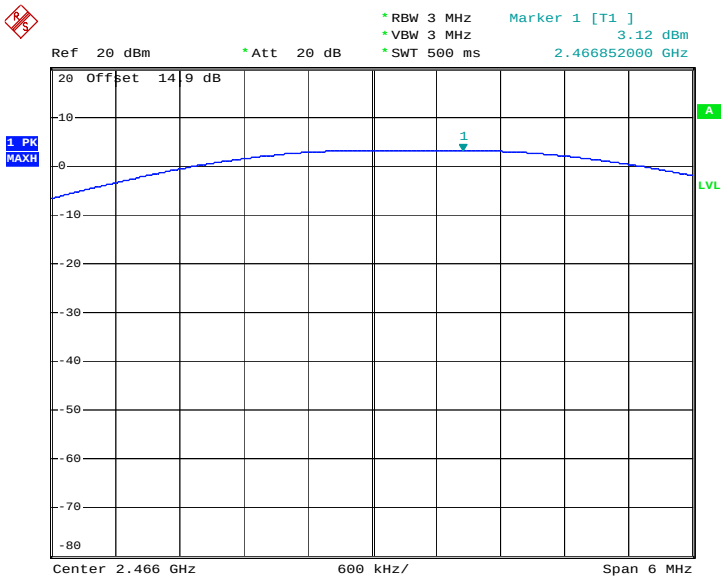
Peak Output Power Plot on Channel 16



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3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

The peak power spectral density shall not be greater than 8dBm in any 3KHz band at any time interval of continuous transmission.

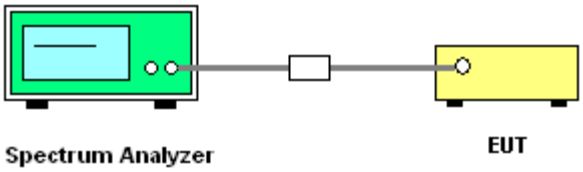
3.3.2 Measuring Instruments

See list of measuring instruments of this test report.

3.3.3 Test Procedures

1. The testing follows Measurement Procedure PKPSD of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v01.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 KHz. Video bandwidth (VBW) >= 300 KHz In order to make an accurate measurement, set the span to 5-30% greater than Emission Bandwidth (EBW)
5. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.
6. Record the measurement data derived from spectrum analyzer.
7. Scale the observed power level to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where BWCF = 10log (3 kHz/100 kHz = -15.2 dB).

3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

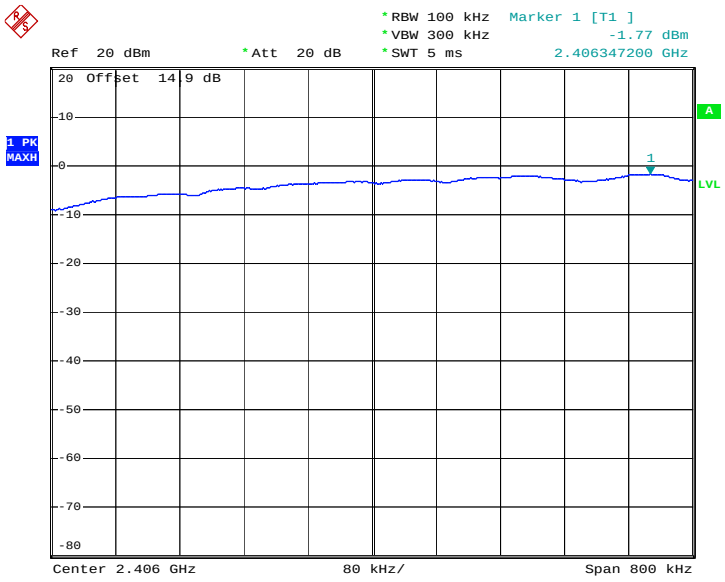
Test Mode :	2.4G Wireless Tx	Temperature :	21~22℃
Test Engineer :	FeiXu	Relative Humidity :	41~42%

Channel	Frequency (MHz)	Power Density		Max. Limits (dBm)	Pass/Fail
		Measured PSD/100KHz (dBm)	PSD/3KHz (dBm)		
01	2406	-1.77	-16.97	8	Pass
09	2438	-1.55	-16.75	8	Pass
16	2466	-1.99	-17.19	8	Pass

Note:

1. *Measured power density (dBm) has offset with cable loss.*
2. *BWCF (dB) = 10 log (3k/100k) = -15.2 dB*
3. *Power Density/ 3kHz (dBm)= Measured power density/ 100KHz (dBm) + BWCF (dB)*

PSD Plot on Channel 01



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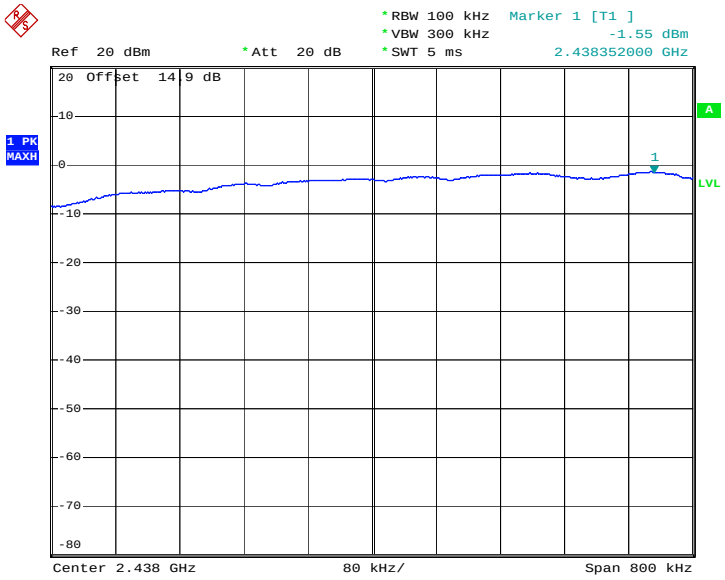
PSD Plot on Channel 09



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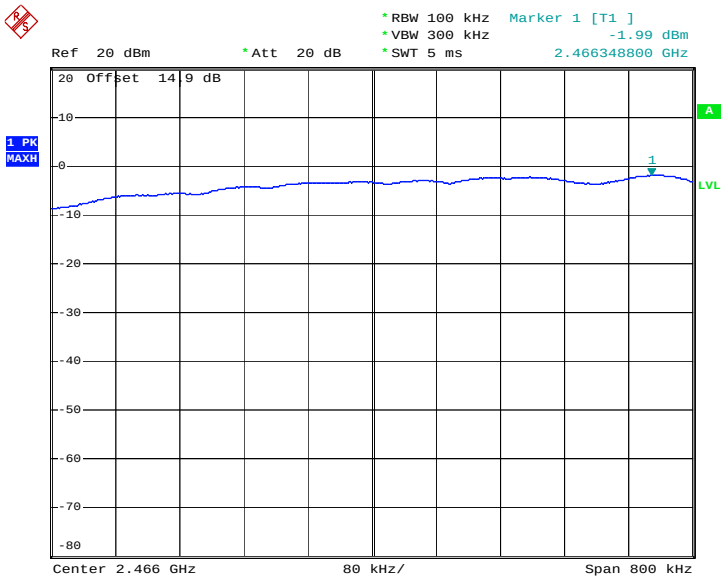
PSD Plot on Channel 16



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3.4 Conducted Band Edges and Spurious Emission Measurement

3.4.1 Limit of Conducted Band Edges and Spurious Emission

All harmonics/spurious must be at least 20 dB down from the highest emission level within the authorized band.

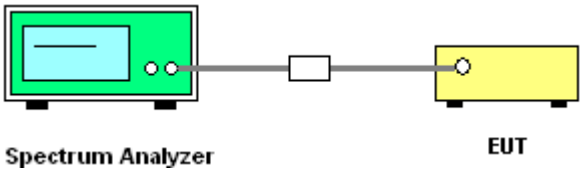
3.4.2 Measuring Instruments

See list of measuring instruments of this test report.

3.4.3 Test Procedure

1. The testing follows the guidelines in ANSI C63.4-2003 and the Measurement Procedure of FCC KDB Publication No. 558074 D01 DTS Meas. Guidance v01.
2. The transmitter output was connected to the spectrum analyzer via a low lose cable.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Set RBW = 100 KHz, Video bandwidth (VBW) ≥ RBW. Out of the authorized frequency band emissions must be at least 20 dB lower than the highest emission level within the authorized band as measured with a 100 KHz RBW. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB per 15.247(d).

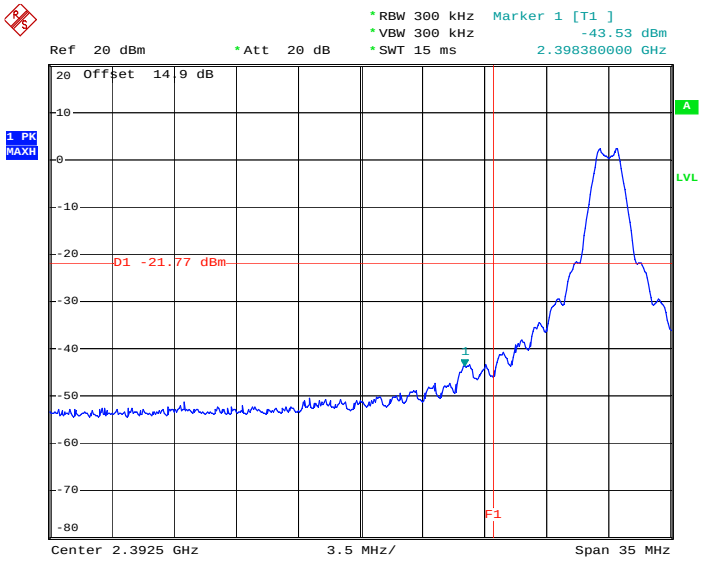
3.4.4 Test Setup



3.4.5 Test Result of Conducted Band Edges

Test Mode :	2.4G Wireless Tx	Temperature :	21~22℃
Test Channel :	01 and 16	Relative Humidity :	41~42%
		Test Engineer :	FeiXu

Low Band Edge Plot on Channel 01



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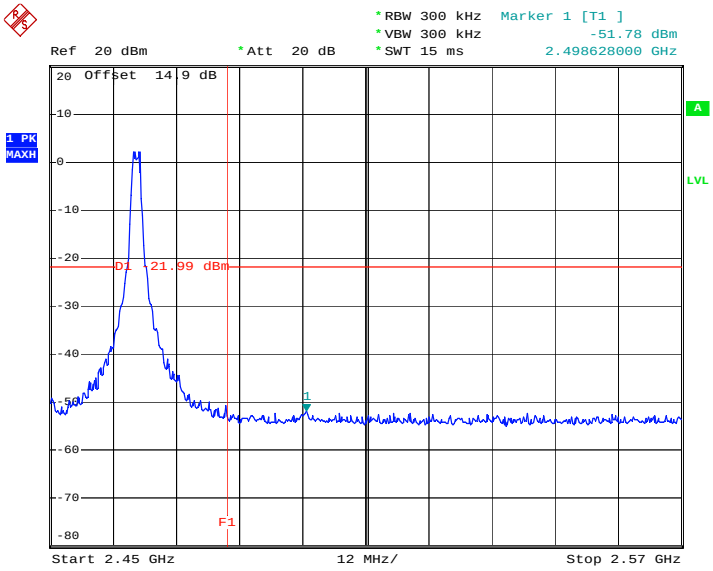
High Band Edge Plot on Channel 16



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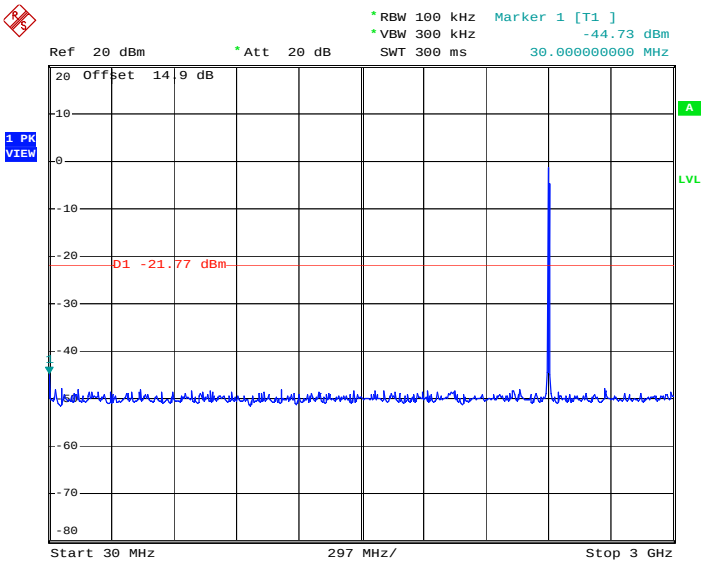
3.4.6 Test Result of Conducted Spurious Emission

Test Mode :	2.4G Wireless Tx	Temperature :	21~22℃
Test Channel :	01	Relative Humidity :	41~42%
		Test Engineer :	FeiXu

Conducted Spurious Emission Plot on OQPSK/MSK Channel 01



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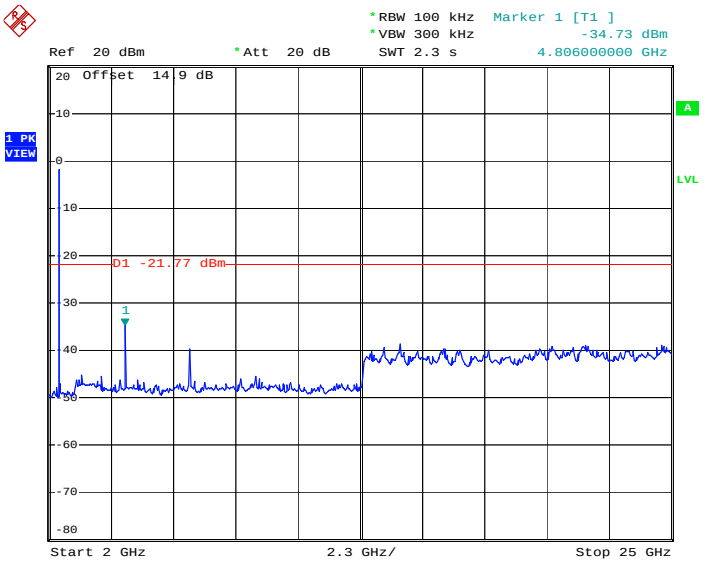
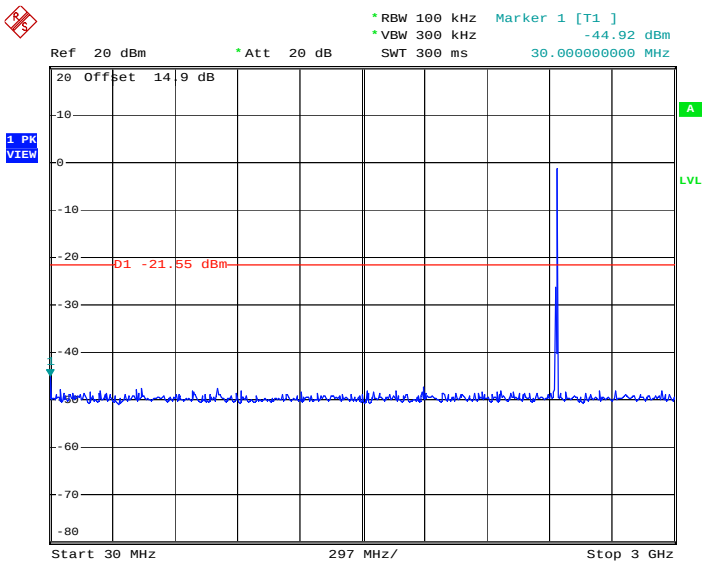
Conducted Spurious Emission Plot on OQPSK/MSK Channel 01



Date: 17.SEP.2012 14:49:33

Test Mode :	2.4G Wireless Tx	Temperature :	21~22℃
Test Channel :	09	Relative Humidity :	41~42%
		Test Engineer :	FeiXu

Conducted Spurious Emission Plot on OQPSK/MSK Channel 09



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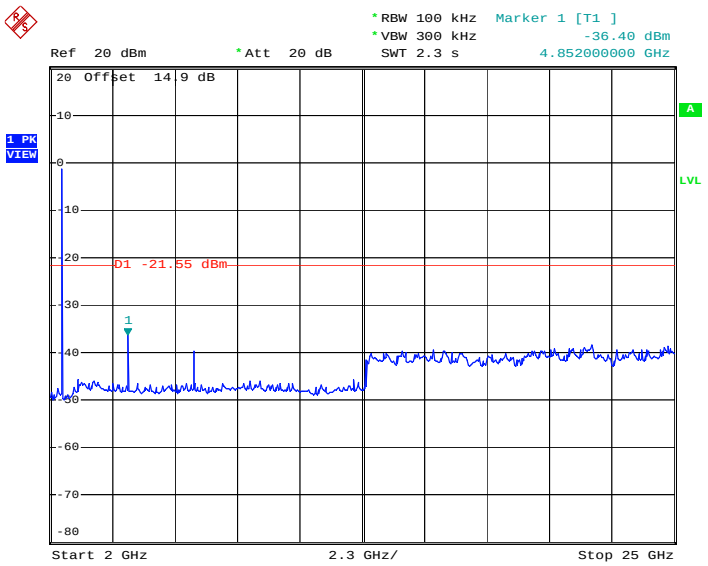
Conducted Spurious Emission Plot on OQPSK/MSK Channel 09



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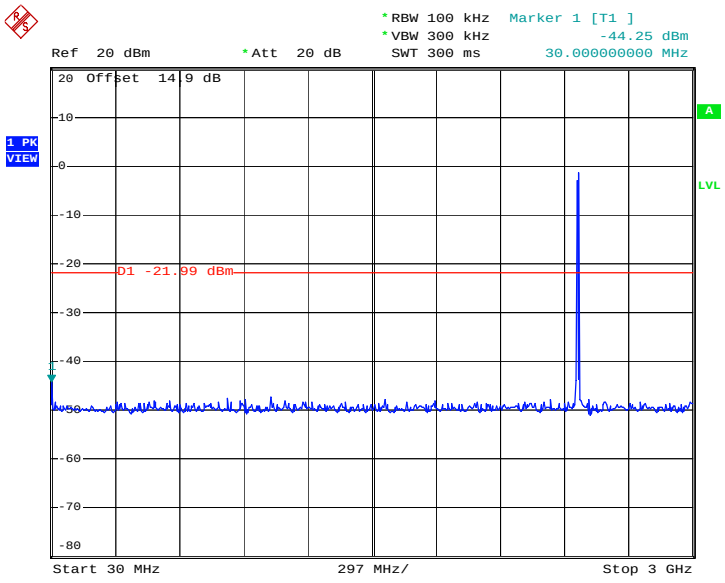
Test Mode :	2.4G Wireless Tx	Temperature :	21~22℃
Test Channel :	16	Relative Humidity :	41~42%
		Test Engineer :	FeiXu

Conducted Spurious Emission Plot on OQPSK/MSK Channel 16



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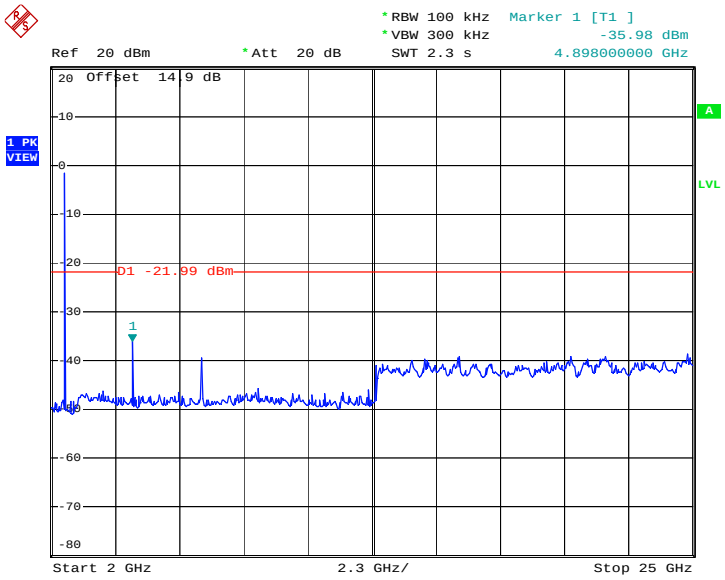
Conducted Spurious Emission Plot on OQPSK/MSK Channel 16



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3.5 Radiated Band Edges and Spurious Emission Measurement

3.5.1 Limit of Radiated Band Edges and Spurious Emission

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. In addition, radiated emissions which fall in the restricted bands must also comply with the FCC section 15.209 limits as below.

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

3.5.2 Measuring Instruments

See list of measuring instruments of this test report.

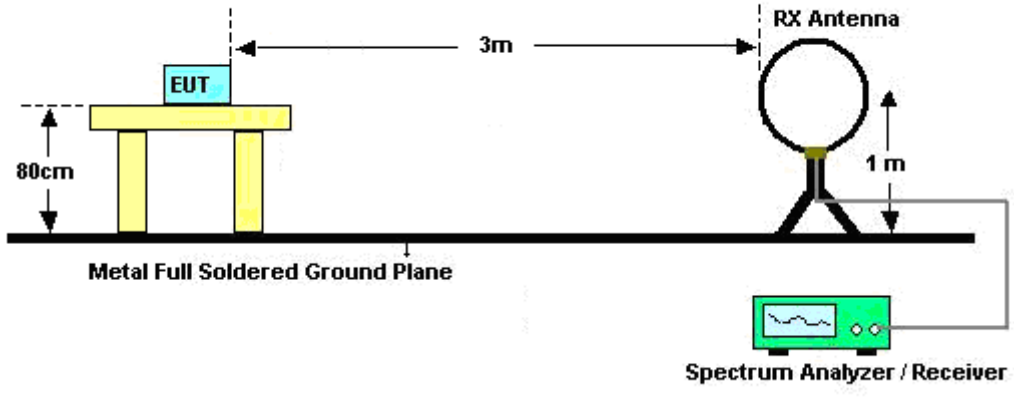
3.5.3 Test Procedures

1. The testing follows TCB Workshop 2012, April and fulfills ANSI C63.4-2003 and the guidelines in ANSI C63.10-2009 test site requirement. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
2. The EUT was placed on a turntable with 0.8 meter above ground.
3. The EUT was set 3 meters from the interference receiving Antenna, which was mounted on the top of a variable height Antenna tower.
4. Set to the maximum power setting and enable the EUT transmit continuously.
5. Use the following spectrum analyzer settings:
   (1) Span shall wide enough to fully capture the emission being measured;
   (2) Set RBW=100 KHz for f < 1 GHz, RBW=1MHz for f>1GHz ; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold for peak; Set RBW=1MHz, VBW = 10 Hz for average measurement.

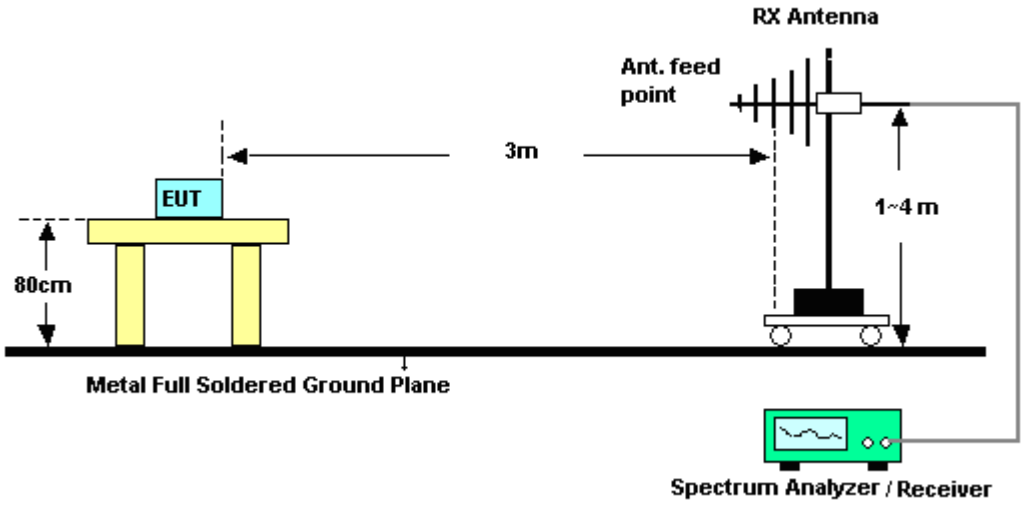
Band	Duty Cycle(%)	VBW Setting
2.4G Wireless	100	10Hz

3.5.4 Test Setup

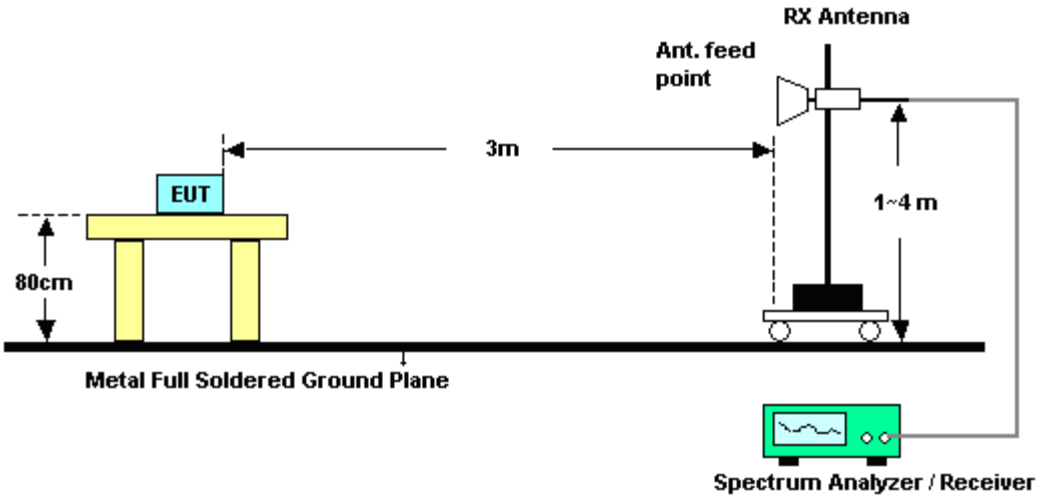
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.5.5 Test Results of Radiated Emissions (9 kHz ~ 30 MHz)

The low frequency, which started from 9 KHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

3.5.6 Test Result of Radiated Band Edges

Test Mode :	Mode 1	Temperature :	21~22°C
Test Channel :	01	Relative Humidity :	41~42%
		Test Engineer :	Jacky Li

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2332.23	53.37	-20.63	74	45.59	32.76	4.2	29.18	114	238	Peak
2332.23	46.88	-7.12	54	39.1	32.76	4.2	29.18	114	238	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2316.08	53.08	-20.92	74	45.37	32.73	4.19	29.21	188	87	Peak
2316.08	46.99	-7.01	54	39.28	32.73	4.19	29.21	188	87	Average

Test Mode :	Mode 3	Temperature :	21~22°C
Test Channel :	16	Relative Humidity :	41~42%
		Test Engineer :	Jacky Li

ANTENNA POLARITY : HORIZONTAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2485.18	52.37	-21.63	74	44.07	33.01	4.29	29	113	120	Peak
2485.18	46.25	-7.75	54	37.95	33.01	4.29	29	113	120	Average

ANTENNA POLARITY : VERTICAL										
Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
2483.66	52.58	-21.42	74	44.28	33.01	4.29	29	200	74	Peak
2483.66	46.83	-7.17	54	38.53	33.01	4.29	29	200	74	Average

3.5.7 Test Result of Radiated Emission (30 MHz ~ 10th Harmonic)

Test Mode :	Mode 1	Temperature :	21~22°C
Test Channel :	01	Relative Humidity :	41~42%
Test Engineer :	Jacky Li	Polarization :	Horizontal
Remark :	2406 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
33.211	23.08	-16.92	40	36.89	16.04	0.24	30.09			Peak
42.007	24.11	-15.89	40	42.98	10.95	0.26	30.08	200	0	Peak
104.903	21.12	-22.38	43.5	39.51	11.15	0.42	29.96			Peak
383.932	30.07	-15.93	46	43.51	15.59	0.83	29.86			Peak
760.704	25.67	-20.33	46	34.14	19.89	1.19	29.55			Peak
962.162	33.2	-20.8	54	40.59	20.8	1.35	29.54			Peak
2332.23	53.37	-20.63	74	45.59	32.76	4.2	29.18	114	238	Peak
2332.23	46.88	-7.12	54	39.1	32.76	4.2	29.18	114	238	Average
2406	103.59	-	-	95.53	32.89	4.23	29.06	149	233	Peak
2406	101.25	-	-	93.19	32.89	4.23	29.06	149	233	Average
2492.4	52.2	-21.8	74	43.84	33.05	4.3	28.99	200	28	Peak
2492.4	46.23	-7.77	54	37.87	33.05	4.3	28.99	200	28	Average

Test Mode :	Mode 1	Temperature :	21~22°C
Test Channel :	01	Relative Humidity :	41~42%
Test Engineer :	Jacky Li	Polarization :	Vertical
Remark :	2406 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
52.945	29.72	-10.28	40	52.76	6.8	0.29	30.13			Peak
63.092	30.67	-9.33	40	55.22	5.25	0.32	30.12			Peak
66.499	32.77	-7.23	40	57.29	5.25	0.33	30.1	110	12	Peak
93.44	28.83	-14.67	43.5	48.9	9.51	0.4	29.98			Peak
875.247	28.5	-17.5	46	36.3	20.48	1.29	29.57			Peak
948.761	33.69	-12.31	46	41.17	20.73	1.33	29.54			Peak
2316.08	53.08	-20.92	74	45.37	32.73	4.19	29.21	188	87	Peak
2316.08	46.99	-7.01	54	39.28	32.73	4.19	29.21	188	87	Average
2406	95.94	-	-	87.88	32.89	4.23	29.06	155	4	Peak
2406	93.57	-	-	85.51	32.89	4.23	29.06	155	4	Average
2485.37	52.71	-21.29	74	44.41	33.01	4.29	29	200	176	Peak
2485.37	46.8	-7.2	54	38.5	33.01	4.29	29	200	176	Average

Test Mode :	Mode 2	Temperature :	21~22°C
Test Channel :	09	Relative Humidity :	41~42%
Test Engineer :	Jacky Li	Polarization :	Horizontal
Remark :	2438 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30.531	22.99	-17.01	40	35.53	17.29	0.25	30.08			Peak
37.548	21.31	-18.69	40	37.43	13.7	0.24	30.06			Peak
89.276	22.84	-20.66	43.5	43.83	8.61	0.39	29.99			Peak
385.281	29.55	-16.45	46	42.96	15.62	0.83	29.86			Peak
903.309	40.38	-5.62	46	48.1	20.46	1.3	29.48	112	347	Peak
948.761	34.4	-11.6	46	41.88	20.73	1.33	29.54			Peak
2347.05	52.94	-21.06	74	45.1	32.78	4.21	29.15	178	235	Peak
2347.05	46.85	-7.15	54	39.01	32.78	4.21	29.15	178	235	Average
2438	104.32	-	-	96.15	32.95	4.25	29.03	140	225	Peak
2438	101.54	-	-	93.37	32.95	4.25	29.03	140	225	Average
2486.7	52.4	-21.6	74	44.1	33.01	4.29	29	112	27	Peak
2486.7	46.95	-7.05	54	38.65	33.01	4.29	29	112	27	Average

Test Mode :	Mode 2	Temperature :	21~22°C
Test Channel :	09	Relative Humidity :	41~42%
Test Engineer :	Jacky Li	Polarization :	Vertical
Remark :	2438 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30.745	20.54	-19.46	40	33.08	17.29	0.25	30.08			Peak
44.901	25.31	-14.69	40	45.57	9.6	0.27	30.13			Peak
56.395	24.49	-15.51	40	48.35	5.98	0.3	30.14			Peak
750.108	25.07	-20.93	46	33.53	19.9	1.18	29.54			Peak
903.309	37.02	-8.98	46	44.74	20.46	1.3	29.48	100	221	Peak
942.131	33.21	-12.79	46	40.71	20.7	1.33	29.53			Peak
2323.68	52.59	-21.41	74	44.82	32.76	4.2	29.19	200	225	Peak
2323.68	47.24	-6.76	54	39.47	32.76	4.2	29.19	200	225	Average
2438	96.41	-	-	88.24	32.95	4.25	29.03	179	129	Peak
2438	94.19	-	-	86.02	32.95	4.25	29.03	179	129	Average
2497.53	52.57	-21.43	74	44.21	33.05	4.3	28.99	107	56	Peak
2497.53	47.12	-6.88	54	38.76	33.05	4.3	28.99	107	56	Average

Test Mode :	Mode 3	Temperature :	21~22°C
Test Channel :	16	Relative Humidity :	41~42%
Test Engineer :	Jacky Li	Polarization :	Horizontal
Remark :	2466 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30.211	19.41	-20.59	40	31.23	18	0.26	30.08			Peak
68.391	21.63	-18.37	40	46.1	5.28	0.34	30.09			Peak
81.212	29.79	-10.21	40	52.61	6.87	0.35	30.04			Peak
377.259	30.69	-15.31	46	44.4	15.34	0.83	29.88			Peak
903.309	38.56	-7.44	46	46.28	20.46	1.3	29.48	100	10	Peak
948.761	33.73	-12.27	46	41.21	20.73	1.33	29.54			Peak
2365.48	53.14	-20.86	74	45.22	32.81	4.22	29.11	200	251	Peak
2365.48	46.96	-7.04	54	39.04	32.81	4.22	29.11	200	251	Average
2466	105.43	-	-	97.19	32.98	4.27	29.01	175	225	Peak
2466	103.24	-	-	95	32.98	4.27	29.01	175	225	Average
2485.18	52.37	-21.63	74	44.07	33.01	4.29	29	113	120	Peak
2485.18	46.25	-7.75	54	37.95	33.01	4.29	29	113	120	Average

Test Mode :	Mode 3	Temperature :	21~22°C
Test Channel :	16	Relative Humidity :	41~42%
Test Engineer :	Jacky Li	Polarization :	Vertical
Remark :	2466 MHz is fundamental signal which can be ignored.		

Frequency (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Remark
30.962	19.41	-20.59	40	31.95	17.29	0.25	30.08			Peak
228.49	23.31	-22.69	46	41.75	10.83	0.64	29.91			Peak
552.883	26.61	-19.39	46	36.79	18.5	1	29.68			Peak
647.386	25.45	-20.55	46	35.12	18.89	1.09	29.65			Peak
903.309	35.55	-10.45	46	43.27	20.46	1.3	29.48	152	207	Peak
948.761	32.44	-13.56	46	39.92	20.73	1.33	29.54			Peak
2378.97	52.7	-21.3	74	44.74	32.83	4.22	29.09	175	223	Peak
2378.97	47.11	-6.89	54	39.15	32.83	4.22	29.09	175	223	Average
2466	97.71	-	-	89.47	32.98	4.27	29.01	121	351	Peak
2466	95.45	-	-	87.21	32.98	4.27	29.01	121	351	Average
2483.66	52.58	-21.42	74	44.28	33.01	4.29	29	200	74	Peak
2483.66	46.83	-7.17	54	38.53	33.01	4.29	29	200	74	Average

3.6 Antenna Requirements

3.6.1 Standard Applicable

If directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the FCC rule.

3.6.2 Antenna Connected Construction

Non-standard connector used.

3.6.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSP40	100319	9kHz~40GHz	Dec. 30, 2011	Sep. 17, 2012	Dec. 29, 2012	Conducted (TH01-KS)
Power Meter	Agilent	E4416A	MY45101555	N/A	Aug. 22, 2012	Sep. 17, 2012	Aug. 21, 2013	Conducted (TH01-KS)
Power Sensor	Agilent	E9327A	MY44421198	N/A	Aug. 22, 2012	Sep. 17, 2012	Aug. 21, 2013	Conducted (TH01-KS)
DC Power Supply	GWINSTEK	GPS-3030D	E1884515	N/A	Aug. 22, 2012	Sep. 17, 2012	Aug. 21, 2013	Conducted (TH01-KS)
Thermal Chamber	Ten Billion	TTC-B3S	TBN-960502	N/A	Dec. 30, 2011	Sep. 17, 2012	Dec. 29, 2012	Conducted (TH01-KS)
EMI Test Receiver	R&S	ESCI	100534	9kHz~3GHz	Nov. 09, 2011	Sep. 17, 2012	Nov. 08, 2012	Radiation (03CH01-KS)
Spectrum Analyzer	R&S	FSP40	100319	9kHz~40GHz	Dec. 30, 2011	Sep. 17, 2012	Dec. 29, 2012	Radiation (03CH01-KS)
Bilog Antenna	SCHAFFNER	CBL6112D	23182	25MHz~2GHz	Dec. 08, 2011	Sep. 17, 2012	Dec. 07, 2012	Radiation (03CH01-KS)
Loop Antenna	R&S	HFH2-Z2	860004/00	9 kHz~30 MHz	Jul. 28, 2012	Sep. 17, 2012	Jul. 27, 2013	Radiation (03CH01-KS)
Double Ridge Horn Antenna	EMCO	3117	00075959	1GHz~18GHz	Jan. 06, 2012	Sep. 17, 2012	Jan. 05, 2013	Radiation (03CH01-KS)
Amplifier	Wireless	FPA-6592G	060004	30MHz~2GHz	Dec. 30, 2011	Sep. 17, 2012	Dec. 29, 2012	Radiation (03CH01-KS)
Amplifier	Agilent	8449B	3008A02370	1GHz~26.5GHz	Dec. 30, 2011	Sep. 17, 2012	Dec. 29, 2012	Radiation (03CH01-KS)
Active Horn Antenna	com-power	AHA-118	701023	1GHz~18GHz	Nov. 07, 2011	Sep. 17, 2012	Nov. 06, 2012	Radiation (03CH01-KS)
SHF-EHF Horn	Schwarzbeck	BBHA 9170	BBHA170249	15GHz~40GHz	Oct. 11, 2011	Sep. 17, 2012	Oct.10, 2012	Radiation (03CH01-KS)

5 Uncertainty of Evaluation

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**2.54**

Uncertainty of Radiated Emission Measurement (1 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**4.72**

Appendix A. Photographs of EUT

Please refer to Sporton report number EP282406 as below.