

**ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT
INTENTIONAL RADIATOR CERTIFICATION TO
FCC PART 15 SUBPART C
REQUIREMENT T**

OF

**STRIKE NX Gamepad - Wireless - for PS3, black,
STRIKE NX Gamepad - Wireless - for PC, black**

MODEL No.: SL-440401-BK, SL-650100-BK

Trademark: Speedlink

FCC ID: 2AEDNA05

REPORT NO: ES150204043E2

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Prepared for
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VERIFICATION OF COMPLIANCE

Applicant:	Winspeed Co., Ltd 14 F-1, No. 2, Jian-Ba Rd., Chung-Ho District, New Taipei City, Taiwan
Manufacturer:	Winspeed Co., Ltd 14 F-1, No. 2, Jian-Ba Rd., Chung-Ho District, New Taipei City, Taiwan
Product Description:	STRIKE NX Gamepad - Wireless - for PS3, black, STRIKE NX Gamepad - Wireless - for PC, black
Model Number:	SL-440401-BK, SL-650100-BK
Date of Test:	February 04, 2015 to May 06, 2015

We hereby certify that:

The above equipment was tested by SHENZHEN EMTEK CO., LTD. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 (2009) and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.249.

The test results of this report relate only to the tested sample identified in this report.

Date of Test :	<u>February 04, 2015 to May 06, 2015</u>
Prepared by :	<u>Yaping Shen</u> Yaping Shen/Editor
Reviewer :	<u>Joe Xia</u> Joe Xia/Supervisor
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1. GENERAL INFORMATION

1.1. Product Description

Winspeed Co., Ltd. Model: SL-440401-BK, SL-650100-BK,

The product consists of two parts **dongle** and **gamepad**, The two parts are transceiver, It is designed by way of utilizing the FSK modulation achieves the system operating.

Dongle information:	
Power supply:	DC 5V by external power
Operating Frequency Range:	2402-2480MHz
Modulation:	FSK
Number of Channels:	79 channels
Antenna Type:	PCB antenna
Antenna Gain:	0dBi
Temperature Range:	-10°C ~ +55°C

1.2. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: 2AEDNA05 filing to comply with Section 15.249 of the FCC Part 15, Subpart C Rules.

1.3. Test Methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.10 (2009). Radiated testing was performed at an antenna to EUT distance 3 meters.

1.4. Special Accessories

Not available for this EUT intended for grant.

1.5. Equipment Modifications

Not available for this EUT intended for grant.

1.6. Measurement Uncertainty

Measurement Type	Range	Confidence Level (%)	Calculated Uncertainty
AC Conducted Spurious Emissions	0.15 MHz to 30 MHz	95%	±3.00dB
Fundamental Fieldstrength	Not Applicable	95%	±2.94dB
Transmitter 20 dB Bandwidth	Not Applicable	95%	±0.92PPm
Radiated Spurious Emissions	30 MHz to 40 GHz	95%	±3.00dB

1.7. Test Facility

Site Description

EMC Lab.

- : Accredited by CNAS, 2013.10.29
The certificate is valid until 2016.10.28
The Laboratory has been assessed and proved to be in compliance with CNAS-CL01: 2006(identical to ISO/IEC17025: 2005)
The Certificate Registration Number is L2291
- : Accredited by TUV Rheinland Shenzhen, 2010.5.25
The Laboratory has been assessed according to the requirements ISO/IEC 17025.
- : Accredited by FCC, July 24, 2013
The Certificate Registration Number is 406365.
- : Accredited by FCC, April 17, 2013
The Certificate Registration Number is 709623.

Name of Firm

Site Location

2. SYSTEM TEST CONFIGURATION

2.1. EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2. EUT Exercise

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

2.3. Test Procedure

2.3.1 Conducted Emissions

The EUT is placed on a turn table which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.10-2009 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and average detector mode.

2.3.2 Radiated Emissions

The EUT is placed on a turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. Emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes according to the requirements in Section 13.1.4.1 of ANSI C63.10-2009

2.4. Description of test modes

The EUT has been tested under normal operating condition.

Pre-scanned tests, X, Y, Z in the three orthogonal panels, were conducted to determine the final configuration from all possible combinations. Let EUT transmit with highest power, and the worst result was reported with modulation FSK. The 3 channels of lower, medium and higher were chosen for test.

Pretest Mode	Description
Mode 1	Low – 2402MHz
Mode 2	Middle – 2441MHz
Mode 3	High -2480MHz

For Conducted Test	
Final Test Mode	Description
Mode 1	Wireless ON

For Radiated Test	
Mode 1	Low – 2402MHz
Mode 2	Middle – 2441MHz
Mode 3	High -2480MHz

3. SUMMARY OF TEST RESULTS

FCC Part15, Subpart C (15.249)&Canada RSS-Gen:2010		
Standard Section	Test Item	Result
FCC		
15.207	Conducted Emission	Pass
15.209	Radiated Emission	Pass
15.249	Radiated Spurious Emission	Pass
15.249	Band edge test	Pass
15.249	20dB Bandwidth	Pass

Note: (1)"N/A" denotes test is not applicable in this test report.

3.1.CONFIGURATION OF TESTED SYSTEM

Fig. 2-1 Configuration of Tested System



3.2.DESCRPTION OF SUPPORT UNITS

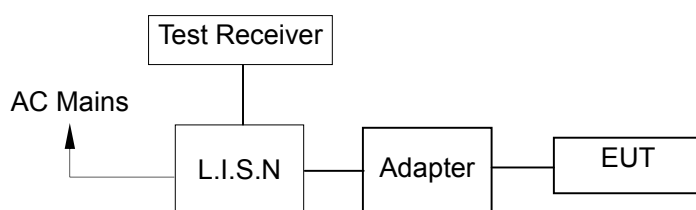
Equipment	Information
EUT(Dongle)	Model: SL-440401-BK, SL-650100-BK Band: Speedlink Serial No.: N/A
Notebook	Model: Compaq 6515b Band: HP Serial No.: SS05538914 CE, FCC

4. CONDUCTED EMISSIONS TEST

4.1. Measurement Procedure:

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured was complete.

4.2. Test SET-UP (Block Diagram of Configuration)



4.3. Measurement Equipment Used:

Conducted Emission Test Site # 1					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Test Receiver	Rohde & Schwarz	ESCS30	828985/018	May 17, 2014	May 16, 2015
L.I.S.N	Rohde & Schwarz	ESH2-Z5	834549/005	May 17, 2014	May 16, 2015
L.I.S.N	Rohde & Schwarz	ENV216	834549/005	May 17, 2014	May 16, 2015
50Ω Coaxial Switch	Anritsu	MP59B	M20531	May 17, 2014	May 16, 2015

4.4. Conducted Emission Limit

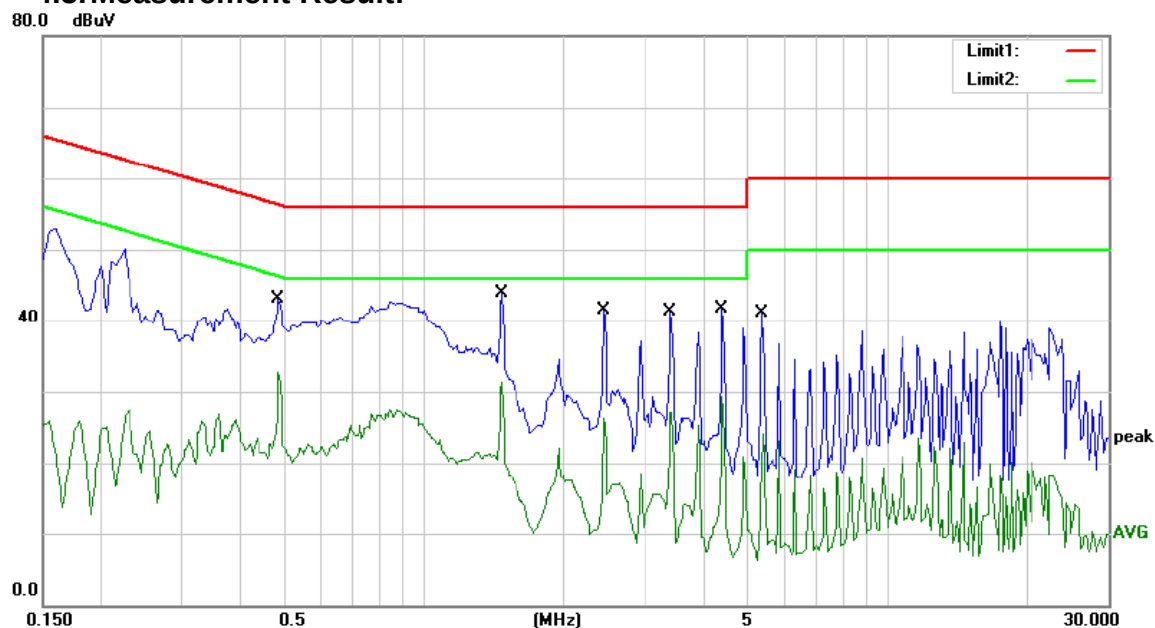
Conducted Emission

Frequency(MHz)	Quasi-peak	Average
0.15-0.5	66-56	56-46
0.5-5.0	56	46
5.0-30.0	60	50

Note:

1. The lower limit shall apply at the transition frequencies
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

4.5. Measurement Result:



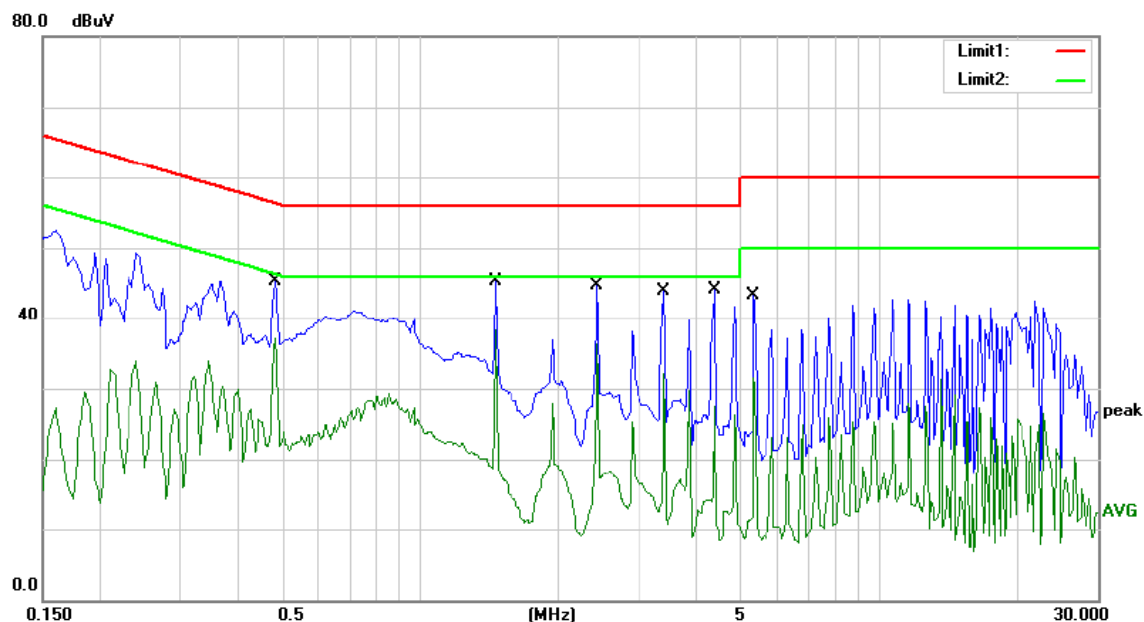
Site Conduction #1
Limit: (CE)FCC Part 15 C
Mode: Wireless ON
Note:

Phase: **L1**
Power: AC 120V/60Hz

Temperature: 26
Humidity: 60 %

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.4850	43.01	0.00	43.01	56.25	-13.24	QP	
2		0.4850	32.74	0.00	32.74	46.25	-13.51	AVG	
3	*	1.4650	43.95	0.00	43.95	56.00	-12.05	QP	
4		1.4650	31.27	0.00	31.27	46.00	-14.73	AVG	
5		2.4450	41.54	0.00	41.54	56.00	-14.46	QP	
6		2.4450	26.22	0.00	26.22	46.00	-19.78	AVG	
7		3.4150	41.33	0.00	41.33	56.00	-14.67	QP	
8		3.4150	27.08	0.00	27.08	46.00	-18.92	AVG	
9		4.4000	41.66	0.00	41.66	56.00	-14.34	QP	
10		4.4000	29.36	0.00	29.36	46.00	-16.64	AVG	
11		5.3400	41.03	0.00	41.03	60.00	-18.97	QP	
12		5.3400	24.06	0.00	24.06	50.00	-25.94	AVG	

*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: CSL



Site Conduction #1

Phase: **N**

Temperature: 26

Limit: (CE)FCC Part 15 C

Power: AC120V/60Hz

Humidity: 60 %

Mode: Wireless ON

Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.4850	45.35	0.00	45.35	56.25	-10.90	QP	
2		0.4850	37.15	0.00	37.15	46.25	-9.10	AVG	
3		1.4550	45.31	0.00	45.31	56.00	-10.69	QP	
4	*	1.4550	38.21	0.00	38.21	46.00	-7.79	AVG	
5		2.4250	44.62	0.00	44.62	56.00	-11.38	QP	
6		2.4250	36.34	0.00	36.34	46.00	-9.66	AVG	
7		3.4000	43.87	0.00	43.87	56.00	-12.13	QP	
8		3.4000	32.11	0.00	32.11	46.00	-13.89	AVG	
9		4.3800	44.08	0.00	44.08	56.00	-11.92	QP	
10		4.3800	27.54	0.00	27.54	46.00	-18.46	AVG	
11		5.3300	43.31	0.00	43.31	60.00	-16.69	QP	
12		5.3300	31.58	0.00	31.58	50.00	-18.42	AVG	

*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: CSL

5. RADIATED EMISSION TEST

5.1. Measurement Procedure

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.10. The test distance is 3m. The setup is according to the requirements in Section 13.1.4.1 of ANSI C63.10-2009

Below 30MHz:

The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna (loop antenna). The Antenna should be positioned with its plane vertical at the specified distance from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. The center of the loop shall be 1 m above the ground. For certain applications, the loop antenna plane may also need to be positioned horizontally at the specified distance from the EUT.

30GHz-1GHz:

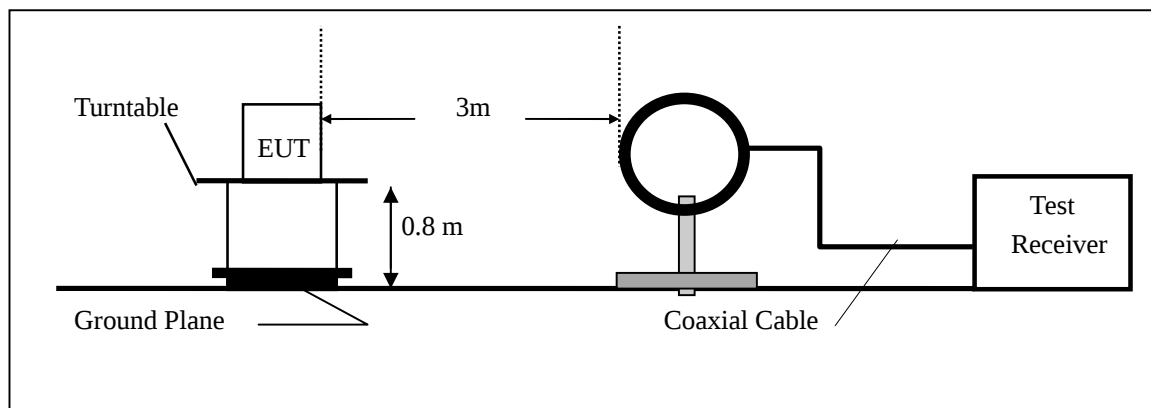
The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

Above 1GHz:

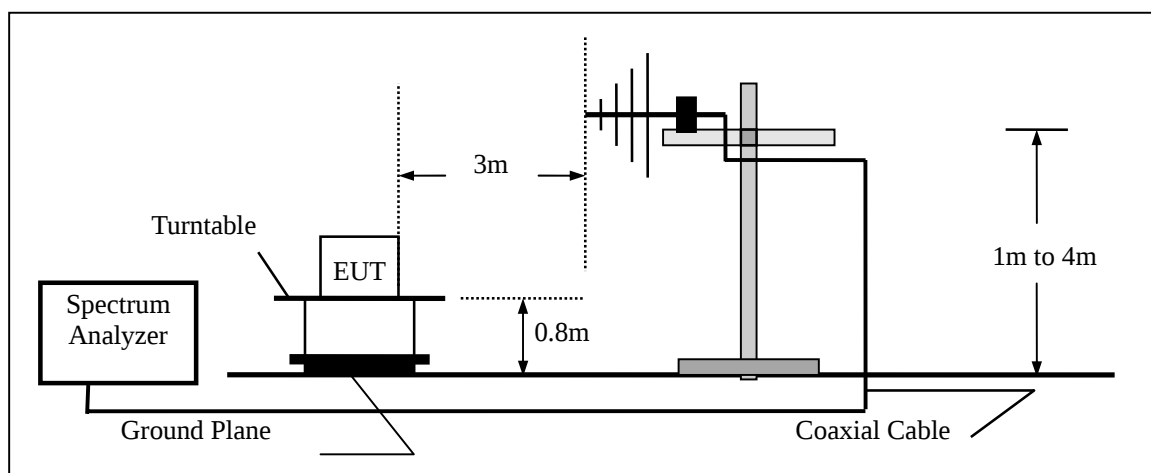
The EUT is placed on a turntable 1.5 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

5.2. Test SET-UP (Block Diagram of Configuration)

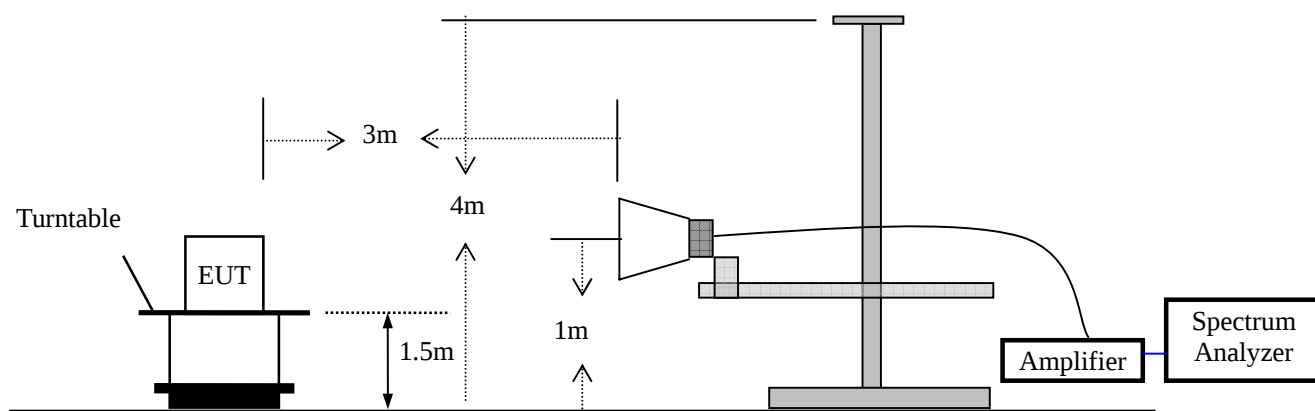
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(B) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(C) Radiated Emission Test Set-Up, Frequency above 1000MHz



5.3 Measurement Equipment Used:

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	Rohde & Schwarz	FSP7	839511/010	May 17, 2014	May 16, 2015
Spectrum Analyzer	HP	E4407B	839840481	May 17, 2014	May 16, 2015
EMI Test Receiver	Rohde & Schwarz	ESCS30	828985/018	May 17, 2014	May 16, 2015
Pre-Amplifier	HP	8447D	2944A07999	May 17, 2014	May 16, 2015
Bilog Antenna	Schwarzbeck	VULB9163	142	May 17, 2014	May 16, 2015
Loop Antenna	ARA	PLA-1030/B	1029	May 17, 2014	May 16, 2015
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170399	May 17, 2014	May 16, 2015
Horn Antenna	Schwarzbeck	BBHA 9120	D143	May 17, 2014	May 16, 2015

5.4 Radiated Emission Limit

Frequencies (MHz)	Field Strength (micorvolts/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
960~1000	500	3

Harmonic emissions limits comply with below 54 dBuV/m at 3m. Other emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or comply with the radiated emissions limits specified in section 1 5.209(a) limit in the table below has to be followed.

Note:

- (1) The tighter limit applies at the band edges.
- (2) Emission level (dBuV/m)=20log Emission level (uV/m).

Limits of radiated emission measurement (FCC 15.209)

FREQUENCY (MHz)	(dBuV/m) (at 3m)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m) = 20log Emission level (uV/m).

Limits of radiated emission measurement (FCC 15.249)

FCC Part15 (15.249) , Subpart C	
Limit	Frequency Range (MHz)
Field strength of fundamental 50000uV/m (94 dBV/m) @ 3 m	2400-2483.5
Field strength of harmonics 500uV/m (54 dBV/m) @ 3 m	Above 2483.5

5.5 Measurement Result

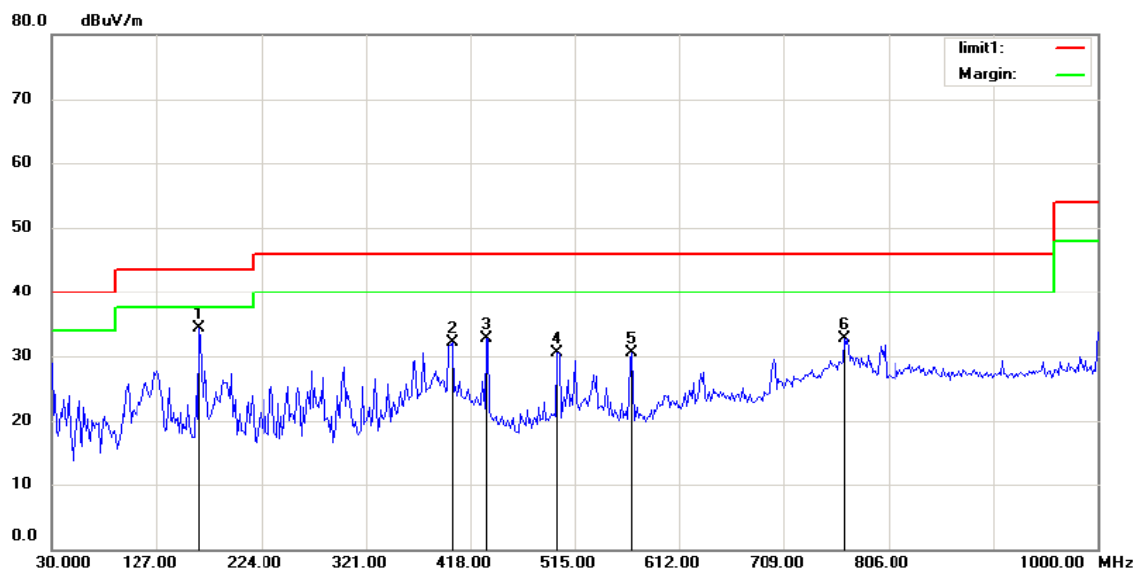
Operation Mode:	TX	Test Date :	May 04, 2015
Frequency Range:	9KHz~30MHz	Temperature :	24℃
Test Result:	PASS	Humidity :	55 %
Measured Distance:	3m	Test By:	SYP

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV/m)	Limit 3m (dBuV/m)	Over (dB)
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Note: the amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.

All the x/y/z orientation has been investigated, and only worst case is presented in this report.

Operation Mode: 2402MHz Test Date : May 04, 2015
Frequency Range: 30~1000MHz Temperature : 24°C
Test Result: PASS Humidity : 55 %
Measured Distance: 3m Test By: SYP

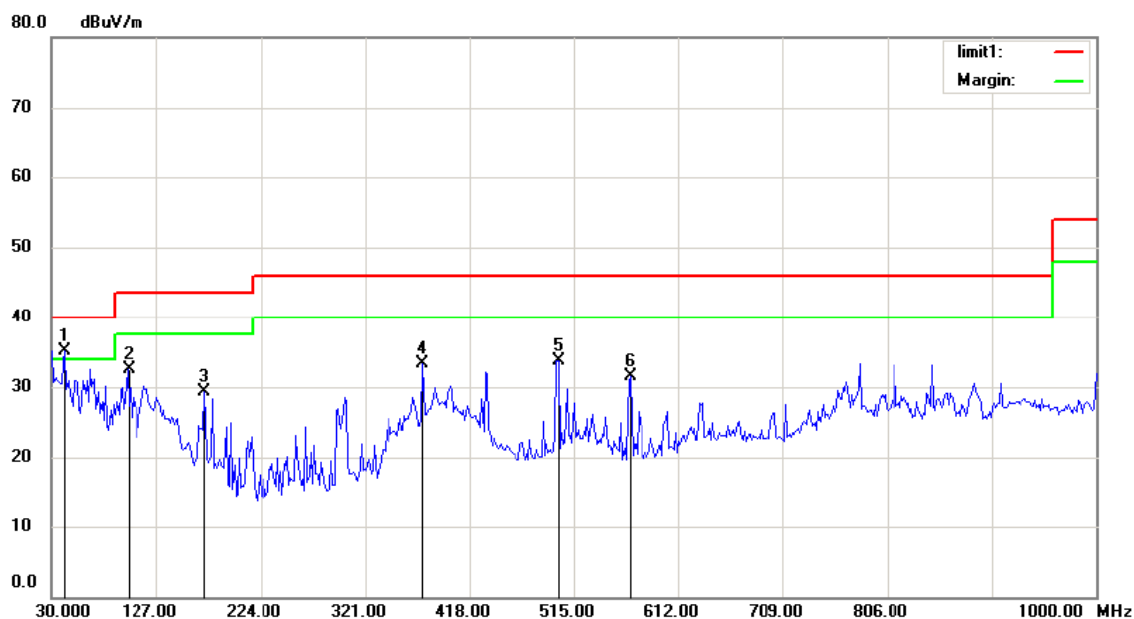


Site 3m Chamber #1 Polarization: **Horizontal** Temperature: 24
Limit: (RE)FCC PART 15 C Power: AC 120V/60Hz Humidity: 53 %
Mode:TX2402
Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree degree	Comment
1	*	166.7948	26.27	7.95	34.22	43.50	-9.28	QP		
2		401.5224	13.42	18.77	32.19	46.00	-13.81	QP		
3		432.6121	14.83	17.88	32.71	46.00	-13.29	QP		
4		499.4551	10.48	20.06	30.54	46.00	-15.46	QP		
5		567.8525	10.73	19.85	30.58	46.00	-15.42	QP		
6		765.2723	8.00	24.68	32.68	46.00	-13.32	QP		

*:Maximum data x:Over limit !:over margin

Operator: XLX



Site 3m Chamber #1

Polarization: **Vertical**

Temperature: 24

Limit: (RE)FCC PART 15 C

Power: AC 120V/60Hz

Humidity: 53 %

Mode: TX 2402

Note:

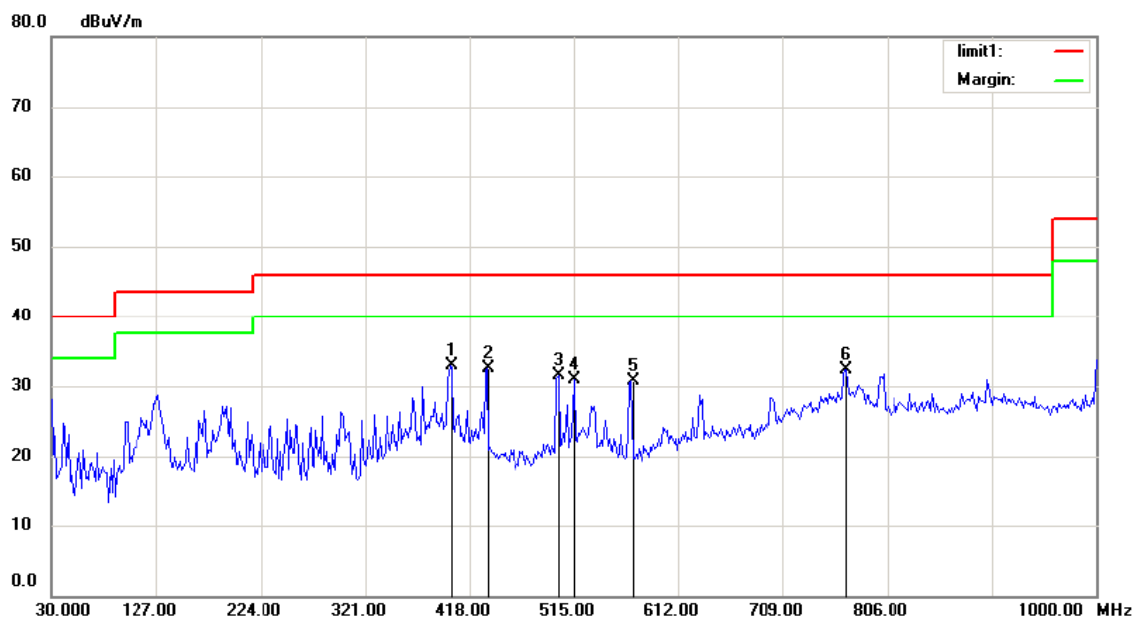
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree	Comment
1	*	42.4358	20.19	14.94	35.13	40.00	-4.87	QP		
2		99.9520	19.64	12.78	32.42	43.50	-11.08	QP		
3		171.4583	21.48	7.84	29.32	43.50	-14.18	QP		
4		375.0961	15.96	17.35	33.31	46.00	-12.69	QP		
5		501.0096	13.61	20.19	33.80	46.00	-12.20	QP		
6		567.8525	11.64	19.85	31.49	46.00	-14.51	QP		

*:Maximum data x:Over limit !:over margin

Operator: XLX

Operation Mode: 2441MHz
Frequency Range: 30~1000MHz
Test Result: PASS
Measured Distance: 3m

Test Date : May 04, 2015
Temperature : 24℃
Humidity : 55 %
Test By: SYP



Site 3m Chamber #1

Polarization: **Horizontal**

Temperature: 24

Limit: (RE)FCC PART 15 C

Power: AC 120V/60Hz

Humidity: 53 %

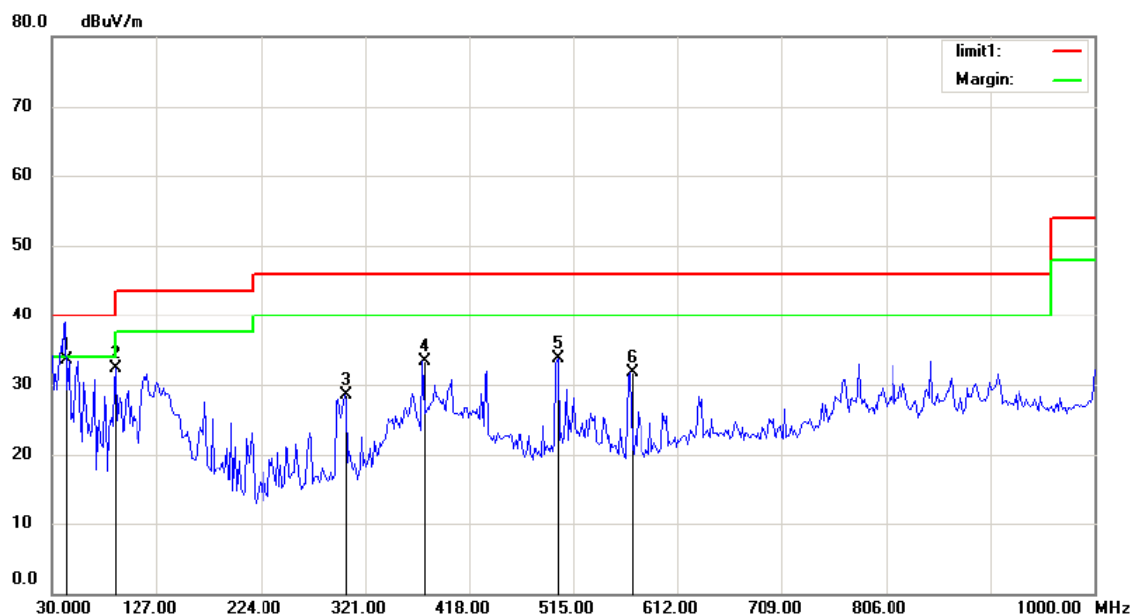
Mode: TX 2441

Note:

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table	
		MHz	Level	Factor	ment			Height	Degree	
			dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1	*	399.9680	14.18	18.74	32.92	46.00	-13.08	QP		
2		434.1667	14.69	17.75	32.44	46.00	-13.56	QP		
3		501.0096	11.25	20.19	31.44	46.00	-14.56	QP		
4		515.0000	9.63	21.27	30.90	46.00	-15.10	QP		
5		567.8526	10.80	19.85	30.65	46.00	-15.35	QP		
6		766.8270	7.54	24.75	32.29	46.00	-13.71	QP		

*:Maximum data x:Over limit !:over margin

Operator: XLX



Site 3m Chamber #1 Polarization: **Vertical** Temperature: 24
 Limit: (RE)FCC PART 15 C Power: AC 120V/60Hz Humidity: 53 %
 Mode: TX 2441
 Note:

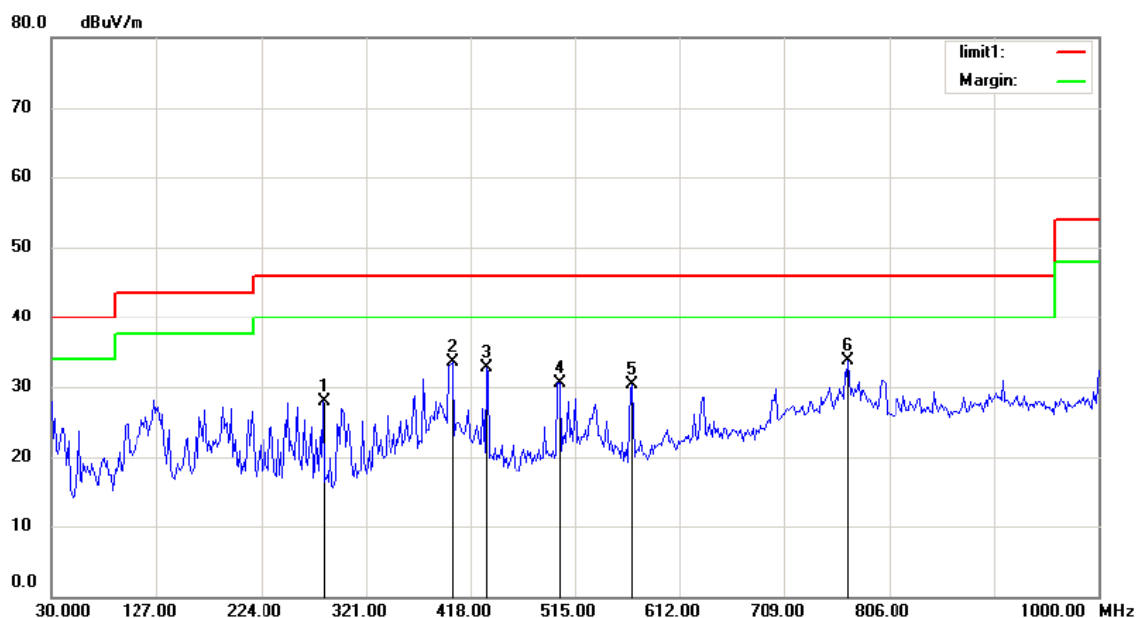
No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table	
		MHz	Level	Factor	ment			Height	Degree	Comment
			dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	
1	*	42.4360	18.50	14.94	33.44	40.00	-6.56	QP		
2		89.0705	22.36	9.99	32.35	43.50	-11.15	QP		
3		302.0353	14.39	14.02	28.41	46.00	-17.59	QP		
4		375.0962	16.04	17.35	33.39	46.00	-12.61	QP		
5		501.0096	13.49	20.19	33.68	46.00	-12.32	QP		
6		567.8526	11.83	19.85	31.68	46.00	-14.32	QP		

*:Maximum data x:Over limit !:over margin

Operator: XLX

Operation Mode: 2480MHz
Frequency Range: 30~1000MHz
Test Result: PASS
Measured Distance: 3m

Test Date : May 04, 2015
Temperature : 24°C
Humidity : 55 %
Test By: SYP



Site 3m Chamber #1

Polarization: **Horizontal**

Temperature: 24

Limit: (RE)FCC PART 15 C

Power: AC 120V/60Hz

Humidity: 53 %

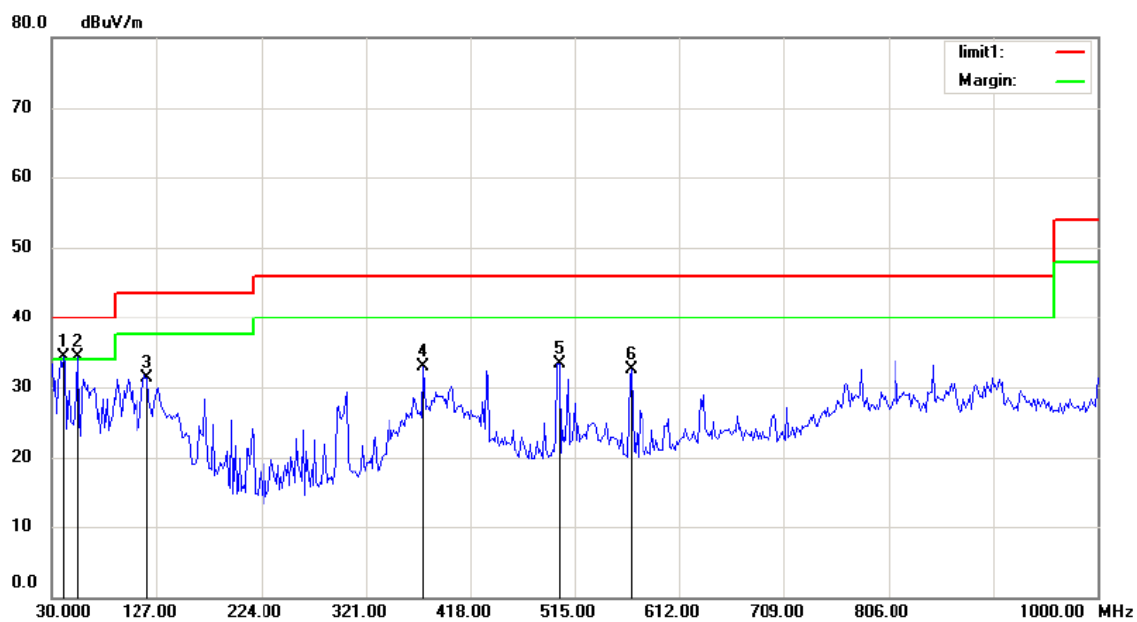
Mode: TX 2480

Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree	Comment
1		281.8270	12.95	14.95	27.90	46.00	-18.10	QP		
2		401.5224	14.82	18.77	33.59	46.00	-12.41	QP		
3		432.6121	14.74	17.88	32.62	46.00	-13.38	QP		
4		501.0096	10.36	20.19	30.55	46.00	-15.45	QP		
5		567.8525	10.50	19.85	30.35	46.00	-15.65	QP		
6	*	768.3814	8.81	24.82	33.63	46.00	-12.37	QP		

*:Maximum data x:Over limit !:over margin

Operator: XLX



Site 3m Chamber #1 Polarization: **Vertical** Temperature: 24
 Limit: (RE)FCC PART 15 C Power: AC 120V/60Hz Humidity: 53 %
 Mode:TX 2480
 Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Antenna Height cm	Table Degree degree	Comment
1	*	40.8814	20.02	14.36	34.38	40.00	-5.62	QP			
2	l	53.3173	25.82	8.40	34.22	40.00	-5.78	QP			
3		118.6057	20.74	10.62	31.36	43.50	-12.14	QP			
4		375.0961	15.60	17.35	32.95	46.00	-13.05	QP			
5		501.0096	13.03	20.19	33.22	46.00	-12.78	QP			
6		567.8525	12.60	19.85	32.45	46.00	-13.55	QP			

*:Maximum data x:Over limit l:over margin

Operator: XLX

Operation Mode:	2402MHz	Test Date :	May 04, 2015
Frequency Range:	1-25GHz	Temperature :	24 °C
Test Result:	PASS	Humidity :	55 %
Measured Distance:	3m	Test By:	SYP

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Margin(dB)	
		PK	AV	PK	AV	PK	AV
4868.88	V	53.35	42.08	74.00	54.00	-20.65	-11.92
7002.56	V	57.30	44.75	74.00	54.00	-16.70	-9.25
8419.23	V	59.67	47.28	74.00	54.00	-14.33	-6.72
4868.59	H	54.85	44.19	74.00	54.00	-19.15	-9.81
7865.39	H	58.74	49.65	74.00	54.00	-15.26	-4.35
9581.73	H	63.10	49.64	74.00	54.00	-10.90	-4.36

Note:

- (1) All Readings are Peak Value and AV.
- (2) Emission Level= Reading Level+Probe Factor +Cable Loss
- (3) Data of measurement within this frequency range shown "--" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (4) All the x/y/z orientation has been investigated, and only worst case is presented in this report.

Operation Mode:	2441MHz	Test Date :	May 04, 2015
Frequency Range:	1-25GHz	Temperature :	24 °C
Test Result:	PASS	Humidity :	55 %
Measured Distance:	3m	Test By:	SYP

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Margin(dB)	
		PK	AV	PK	AV	PK	AV
4514.42	V	53.01	42.82	74.00	54.00	-20.99	-11.18
6639.42	V	57.35	48.15	74.00	54.00	-16.65	-5.85
8491.99	V	60.65	48.56	74.00	54.00	-13.35	-5.44
3206.73	H	50.63	38.82	74.00	54.00	-23.37	-15.18
4868.59	H	55.35	44.02	74.00	54.00	-18.65	-9.98
7102.56	H	57.80	43.34	74.00	54.00	-16.20	-10.66

Note:

- (1) All Readings are Peak Value and AV.
- (2) Emission Level= Reading Level+Probe Factor +Cable Loss
- (3) Data of measurement within this frequency range shown "--" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (4) All the x/y/z orientation has been investigated, and only worst case is presented in this report.

Operation Mode:	2480MHz	Test Date :	May 04, 2015
Frequency Range:	1-25GHz	Temperature :	24 °C
Test Result:	PASS	Humidity :	55 %
Measured Distance:	3m	Test By:	SYP

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Margin(dB)	
		PK	AV	PK	AV	PK	AV
6693.91	V	56.64	46.30	74.00	54.00	-17.36	-7.70
7102.56	V	57.30	43.65	74.00	54.00	-16.70	-10.35
8519.23	V	58.67	45.54	74.00	54.00	-15.33	-8.46
7102.56	H	56.80	46.37	74.00	54.00	-17.20	-7.63
7865.39	H	59.24	49.39	74.00	54.00	-14.76	-4.61
8519.23	H	60.67	47.23	74.00	54.00	-13.33	-6.77

- Note:**
- (1) All Readings are Peak Value and AV.
 - (2) Emission Level= Reading Level+Probe Factor +Cable Loss
 - (3) Data of measurement within this frequency range shown "--" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
 - (4) All the x/y/z orientation has been investigated, and only worst case is presented in this report.

Transmitter Fundamental Field Strength

Operation Mode:	CH1: 2402MHz	Test Date :	May 04, 2015
FCC Part:	15.249(a)	Temperature :	24 °C
Test Result:	PASS	Humidity :	55 %
Measured Distance:	3m	Test By:	SYP
Test Method Used:			

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
2402	V	99.58	83.69	114	94	-14.42	-10.31
2402	H	102.9	88.47	114	94	-11.10	-5.53

Operation Mode:	CH23: 2441MHz	Test Date :	May 04, 2015
FCC Part:	15.249(a)	Temperature :	24 °C
Test Result:	PASS	Humidity :	55 %
Measured Distance:	3m	Test By:	SYP
Test Method Used:			

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
2441	V	103.41	85.62	114	94	-10.59	-8.38
2441	H	105.01	90.01	114	94	-8.99	-3.99

Operation Mode: CH45: 2480MHz
FCC Part: 15.249(a)
Test Result: PASS
Measured Distance: 3m
Test Method Used:

Test Date : May 04, 2015
Temperature : 24°C
Humidity : 55 %
Test By: SYP

Freq. (MHz)	Ant. Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
2480	V	101.65	84.61	114	94	-12.35	-9.39
2480	H	104.55	85.19	114	94	-9.45	-8.81

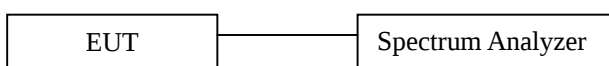
- Note:**
- (1) All Readings are Peak Value and AV.
 - (2) Emission Level= Reading Level+Probe Factor +Cable Loss
 - (3) Data of measurement within this frequency range shown "--" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
 - (4) All the x/y/z orientation has been investigated, and only worst case is presented in this report.

6. BANDWIDTH TEST

6.1. Measurement Procedure

The EUT was operating in hopping mode or could be controlled its channel. Printed out the test result from the spectrum by hard copy function.

6.2. Test SET-UP (Block Diagram of Configuration)



6.3. Measurement Equipment Used:

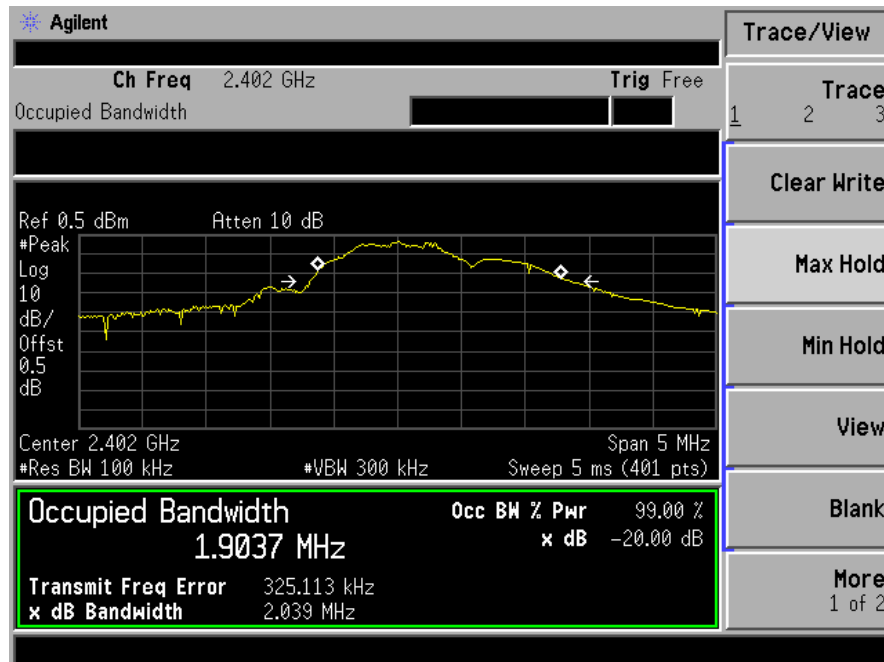
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer	Agilent	E4407B	88156318	05/17/2014	05/16/2015

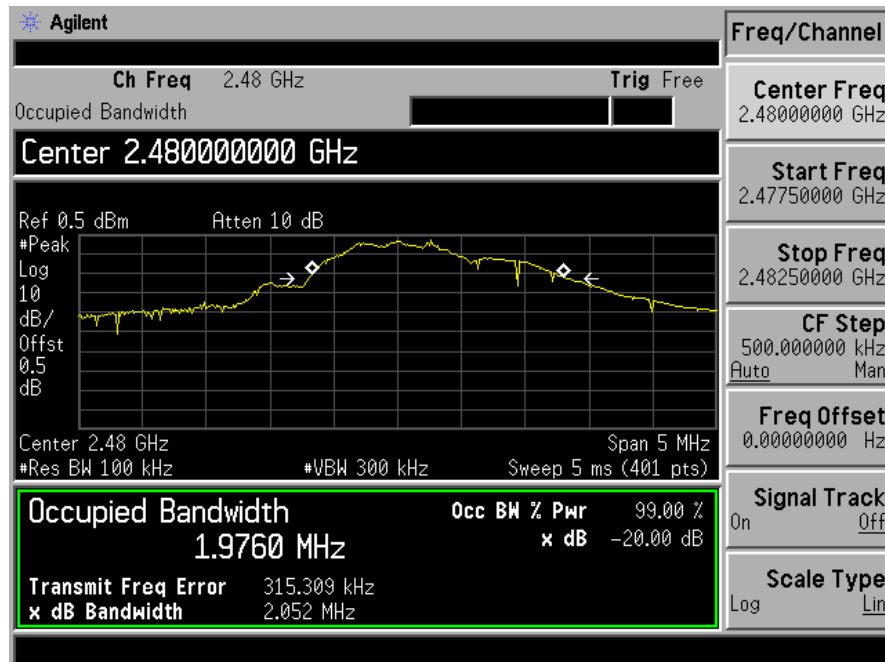
6.4. Measurement Results:

20dB Bandwidth test data Chart:
Refer to attached data chart.

Spectrum Detector:	PK	Test Date:	May 04, 2015
Test By:	SYP	Temperature:	24 °C
Test Result:	PASS	Humidity:	55 %
Modulation:	FSK		

Channel number	Channel frequency (MHz)	20dB Down BW(kHz)
CH1	2402	2.039
CH39	2441	2.067
CH78	2480	2.052





7. BAND EDGE TEST

7.1. Measurement Procedure

1. The EUT was Operating in hopping mode or could be controlled its channel. Printed out test result from the spectrum by hard copy function.
2. The EUT was placed on a turn table which is 0.8m above ground plane.
3. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
4. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
5. Repeat above procedures until all frequency measured were complete.

7.2. Test SET-UP (Block Diagram of Configuration)

As 5.2 Test set up (B) and (C)

7.3. Measurement Equipment Used:

Same as 5.3 Radiated Emission Measurement.

7.4. Measurement Results:

Spectrum Detector:	PK/AV	Test Date :	May 04, 2015
Test By:	SYP	Temperature :	24 °C
Test channel:	CH1(2402MHz)	Humidity :	55 %

Frequency (MHz)	Polarity	Level (dBuV/m)		Limited (dBuV/m)	
		PK	AV	PK	AV
2390.00	H	43.28	30.24	74	54
2390.00	V	42.15	31.54	74	54

Spectrum Detector:	PK/AV	Test Date :	May 04, 2015
Test By:	SYP	Temperature :	24 °C
Test channel:	CH3(2480MHz)	Humidity :	55 %

Frequency (MHz)	Polarity	Level (dBuV/m)		Limited (dBuV/m)	
		PK	AV	PK	AV
2483.50	H	46.88	35.01	74	54
2483.50	V	45.92	33.98	74	54

8. Antenna Application

8.1. Antenna Requirement

Standard	Requirement
FCC CRF Part 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. 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 provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

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.

8.2. Result

The EUT has a PCB antenna, the gain is 0 dBi, which in accordance to section 15.203, please refer to the internal photos.