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LAB LOCATION: DONG GUAN, CHINA REPORT NUMBER: 65316-050230-1 DATE IN: May 13, 2015 DATE OUT: May 25, 2015

Product Description: Peach, Pear, Cowboy

Style No. : C88-HM31, C88-HM32, C88-HM33

P.O/Order No. : /

FCC ID : 2AILYC88

Applicant's name : JM Sunflower Limited.

Address : Unit 301, 3/F., Fabrico Factory Building, 78-84 Kwai

Cheong Road, Kwai Chung, N.T. Hong Kong

Manufacturer : JM Sunflower Limited.

Address : Unit 301, 3/F., Fabrico Factory Building, 78-84 Kwai

Cheong Road, Kwai Chung, N.T. Hong Kong

Laboratory Name

Address

: Modern Testing Services (Dongguan) Limited

No.76, Liang Ping Road, Xin Jiu Wei Village, Liaobu, Town Dongguan City, Guangdong Province, China

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Report No. : 65316-050230-1



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## **TEST RESULT CERTIFICATION**

Applicant's name:	JM Sunflower Limited. Unit 301, 3/F., Fabrico Factory Building, 78-84 Kwai
Address:	Cheong Road, Kwai Chung, N.T. Hong Kong
Maria Carda and Maria	
Manufacture's Name:	Unit 301, 3/F., Fabrico Factory Building, 78-84 Kwai
Address:	Cheong Road, Kwai Chung, N.T. Hong Kong
Draduct decoration	Oncong Reda, Ruar Ghang, Run Hong Rong
Product description	
Trade Mark:	
Product name:	•
•	C88-HM31, C88-HM32, C88-HM33
Standards:	FCC Rules and Regulations Part 15 Subpart C Section 15.249 ANSI C63.10: 2013
the Modern Testing Services (D of the material. Modern Testing	
Date (s) of performance of tests.	: May 13, 2016 ~ May 25, 2016
Date of Issue	: Nov. 18, 2015
Test Result	Pass
Prepared by:	John
Reviewed by:	JANG Ping, Loken Project Engineer
·	WANG Yang, Oscar
	Project Supervisor
Approved by:	en Chen
	CHEN Chu Peng, Ken
	EMC Manager



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#### 1. TEST SUMMARY

1.1 Description of Test

Description of Test	Result
CONDUCTED EMISSIONS TEST	Compliant
RADIATED EMISSION TEST	Compliant
BAND EDGE	Compliant
OCCUPIED BANDWIDTH MEASUREMENT	Compliant
ANTENNA REQUIREMENT	Compliant

#### 1.2 Test Location

Test Firm : Dongguan Dongdian Testing Service Co., Ltd

Address : No.17 Zongbu road 2, Songshan Lake Sci&Tech, DongGuan

City, Guangdong province,523808 China

FCC Registration Number: 270092

### 1.3 Measurement Uncertainty

Measurement Uncertainty

Conducted Emission Expanded Uncertainty = 2.23dB, k=2
Radiated emission expanded uncertainty(9kHz-30MHz) = 3.08dB, k=2
Radiated emission expanded uncertainty(30MHz-1000MHz) = 4.42dB, k=2
Radiated emission expanded uncertainty(Above 1GHz) = 4.06dB, k=2



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#### 2. GENERAL INFORMATION

## 2.1 General Description of EUT

Equipment : Peach, Pear, Cowboy

Style No. : C88-HM31, C88-HM32, C88-HM33

P.O/Order No. : /

FCC ID : 2AILYC88

Model Difference

Modulation Type : ACK

Antenna Type : PCB Antenna

Antenna Gain : 0 dBi

Operation frequency : 2478MHz

Number of Channels : 1CH

Data Rate : 2Mdbs

Power Source : DC 3V

Adapter Model : /



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Carrier Frequency of Channels

|--|

2.2 Operation of EUT during testing
Operating Mode

The mode is used: Transmitting mode

Channel: 2478MHz

2.3 Description of Test Setup

Operation of EUT during testing

EUT



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## 2.4 Measurement Instruments List

	Wicasarchicht mistra		1			
Item	Equipment Manufacturer		Model No.	Serial No.	Last Cal.	Cal. Interval
1.	EMI Receiver	Rohde & Schwarz	ESCI	100627	Feb. 19, 2016	1 Year
2.	LISN	SchwarzBeck	NSLK 8126	8126377	Feb. 19, 2016	1 Year
3.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Feb. 19, 2016	1 Year
4.	EMI Test Software ES-K1	Rohde & Schwarz	N/A	N/A	N/A	N/A
5.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Feb. 19, 2016	1 Year
6.	Trilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Feb. 19, 2016	1 Year
7.	Pre-amplifier	Compliance Direction	PAP-0203	22008	Feb. 19, 2016	1 Year
8.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A
9.	EMI Receiver	Rohde & Schwarz	ESCI	100627	Feb. 19, 2016	1 Year
10.	LISN	SchwarzBeck	NSLK 8126	8126377	Feb. 19, 2016	1 Year
11.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Feb. 19, 2016	1 Year
12.	EMI Test Software ES-K1	Rohde & Schwarz	N/A	N/A	N/A	N/A
13.	EMI Receiver	Rohde & Schwarz	ESCI	100627	Feb. 19, 2016	1 Year
14.	EMI Receiver	Rohde & Schwarz	ESCI	100627	Feb. 19, 2016	1 Year
15.	LISN	SchwarzBeck	NSLK 8126	8126377	Feb. 19, 2016	1 Year
16.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Feb. 19, 2016	1 Year
17.	EMI Test Software ES-K1	Rohde & Schwarz	N/A	N/A	N/A	N/A
18.	Programmable AC Power source	SOPH POWER	PAG-1050	630250	Feb. 19, 2016	1 Year
19.	Harmonic and Flicker Analyzer	LAPLACE	AC2000A	272629	Feb. 19, 2016	1 Year
20.	Harmonic and Flicker Test Software AC 2000A	LAPLACE	N/A	N/A	N/A	N/A
21.	ESD Simulators	KIKUSUI	KES4021	LJ003477	Feb. 19, 2016	1 Year
22.	EFT Generator	EMPEK	EFT-4040B	0430928N	Feb. 19, 2016	1 Year
23.	Shielding Room	ChangZhou ZhongYu	JB88	SEL0166	Feb. 19, 2016	1 Year
24.	Signal Generator 9KHz~2.2GHz	R&S	SML02	SEL0143	Feb. 19, 2016	1 Year
25.	Signal Generator 9KHz~1.1GHz	R&S	SML01	SEL0135	Feb. 19, 2016	1 Year
26.	Power Meter	R&S	NRVS	SEL0144	Feb. 19, 2016	1 Year
27.	RF Level Meter		URV35	SEL0137	Feb. 19, 2016	1 Year
28.	Audio Analyzer	R&S	UPL	SEL0136	Feb. 19, 2016	1 Year
29.	RF-Amplifier 150KHz~150MHz	BONN Elektronik	BSA1515-25	SEL0157	Feb. 19, 2016	1 Year
30.	Stripline Test Cell	Erika Fiedler	VDE0872	SEL0167	N/A	N/A
31.	TV Test Transmitter	R&S	SFM	SEL0159	Feb. 19, 2016	1 Year
32.	TV Generator PAL	R&S	SGPF	SEL0138	Feb. 19, 2016	1 Year
33.	TV Generator Ntsc	R&S	SGMF	SEL0140	Feb. 19, 2016	1 Year
34.	TV Generator Secam	R&S	SGSF	SEL0139	Feb. 19, 2016	1 Year
<u> </u>			I	L		L



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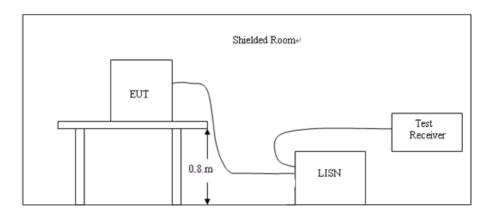
35.	TV Test Transmitter 0.3MHz~3300MHz	R&S	SFQ	SEL0142	Feb. 19, 2016	1 Year
36.	MPEG2 Measurement Generator	R&S	DVG	SEL0141	Feb. 19, 2016	1 Year
37.	Spectrum Analyzer	R&S	FSP	SEL0177	Feb. 19, 2016	1 Year
38.	Matching	R&S	RAM	SEL0146	N/A	N/A
39.	Matching	R&S	RAM	SEL0148	N/A	N/A
40.	Absorbing Clamp	R&S	MDS21	SEL0158	Feb. 19, 2016	1 Year
41.	Coupling Set	Erika Fiedler	Rco, Rci, MC, AC, LC	SEL0149	N/A	N/A
42.	Filters	Erika Fiedler	Sr, LBS	SEL0150	N/A	N/A
43.	Matching Network	Erika Fiedler	MN, T1	SEL0151	N/A	N/A
44.	Fully Anechoic Room	ChangZhou ZhongYu	854	SEL0169	Oct. 24, 2015	1 Year
45.	Signal Generator	Signal Generator R&S SML03		SEL0068	Oct. 24, 2015	1 Year
46.	RF-Amplifier 30M~1GHz	Amplifier Reasearch 250W1000A SEL0066		Oct. 24, 2015	1 Year	
47.	RF-Amplifier 0.8~3.0GHz	Amplifier Reasearch	60S1G3	SEL0065	Oct. 24, 2015	1 Year
48.	Power Meter	R&S	NRVD	SEL0069	Oct. 24, 2015	1 Year
49.	Power Sensor	R&S	URV5-Z2	SEL0071	Oct. 24, 2015	1 Year
50.	Power Sensor	R&S	URV5-Z2	SEL0072	Oct. 24, 2015	1 Year
51.	Software EMC32	R&S	EMC32-S	SEL0082	N/A	N/A
52.	Log-periodic Antenna	Amplifier Reasearch	AT1080	SEL0073	N/A	N/A
53.	Antenna Tripod	Amplifier Reasearch	TP1000A	SEL0074	N/A	N/A
54.	High Gain Horn Antenna(0.8-5GHz)	Amplifier Reasearch	AT4002A	SEL0075	N/A	N/A
55.	Double-Ridged				Oct. 24, 2015	
	Waveguide Horn Antenna (0.8-18GHz)	ROHDE& SCHWARZ	HF907	100013		1 Year
56.	Log-periodic Antenna				Oct. 24, 2015	
50.	(850MHz-26.5GHz)	KONDEA		100496		1 Year



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#### 3. CONDUCTED EMISSION TEST

### 3.1 Block Diagram of Test Setup



#### 3.2 Conducted Power Line Emission Limit

For unintentional device, according to § 15.107(a) Line Conducted Emission Limits is as following

F	Maximum RF Line Voltage (dBμV)							
Frequency (MHz)	CLAS	SS A	CLASS B					
(11112)	Q.P.	Ave.	Q.P.	Ave.				
0.15 - 0.50	79	66	66-56*	56-46*				
0.50 - 5.00	73	60	56	46				
5.00 - 30.0	73	60	60	50				

<sup>\*</sup> Decreasing linearly with the logarithm of the frequency

For intentional device, according to §15.207(a) Line Conducted Emission Limit is same as above table.

#### 3.3 Test Procedure

- 1, The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4.
- 2, Support equipment, if needed, was placed as per ANSI C63.4.
- 3, All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
- 4, If a EUT received DC power from the USB Port of Notebook PC, the PC's adapter received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
- 5, All support equipments received AC power from a second LISN, if any.
- 6, The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 7, Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes

#### 3.4 Test Result

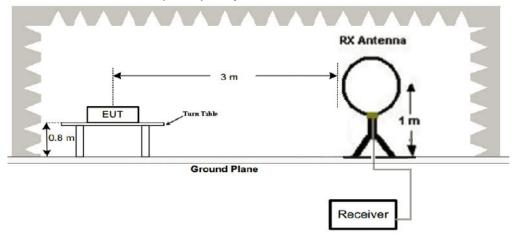
N/A (Because the sample have not AC power source, so the test item result is NA)



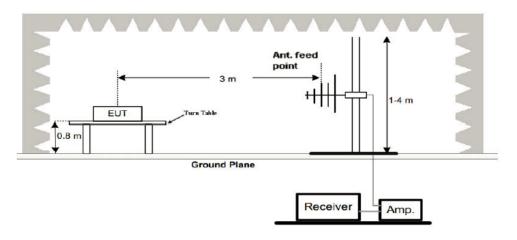
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## 4. RADIATED EMISSION TEST

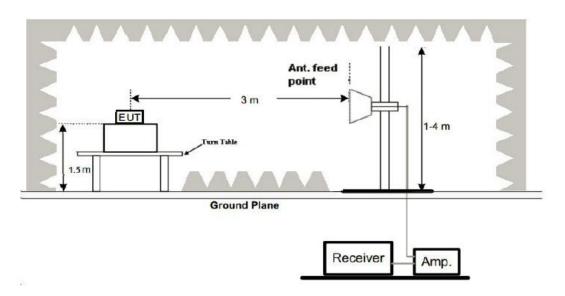
- 4.1 Block Diagram of Test Setup
  - (1) Radiated Emission Test-Up Frequency Below 30MHz



(2) Radiated Emission Test-Up Frequency 30MHz~1GHz



(3) Radiated Emission Test-Up Frequency Above 1GHz



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#### 4.2 Limits

For unintentional device, according to § 15.109(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency range	Distance Meters	Field Strengths	Limit (15.209)		
MHz		μV	/m		
0.009 ~ 0.490	300	2400/F	(kHz)		
0.490 ~ 1.705	30	24000/	F(kHz)		
1.705 ~ 30	30	30	)		
30 ~ 88	3	10	0		
88 ~ 216	3	150			
216 ~ 960	3	200			
Above 960	3	500			
Frequency range	Distance Meters	Field Strengths Limit (15.249)			
MHz		μV/m	μV/m		
		(Field strength of	(Field strength of		
		fundamental)	Harmonics)		
902 ~ 928	3	50	500		
2400 ~ 2483.5	3	50	500		
5725 ~ 5875	3	50	500		
24000 ~ 2425000	3	250	2500		

For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the above table.

#### 4.3 Test Procedure

- 1. Below 1GHz measurement the EUT is placed on turntable which is 0.8m above ground plane. And above 1GHz measurement EUT was placed on low permittivity and low tangent turn table which is 1.5m above ground plane.
- 2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
- 3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
- 4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 6. Repeat above procedures until the measurements for all frequencies are complete.

#### Note:

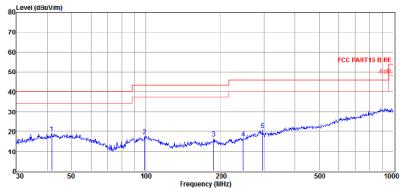
For battery operated equipment, the equipment tests shall be performed using a new battery.

4.4 Test Result PASS



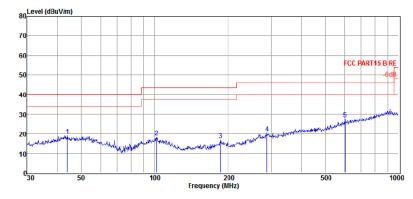
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#### Below 1GHz Test Results:



Item (Mark)	Freq (MHz)	Read Level (dBµV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBµV/m)	Limit Line (dBµV/m)	Over Limit (dB)	Detector	Polarization
1	41.57	3.87	14.00	1.01	18.88	40.00	-21.12	Peak	VERTICAL
2	98.83	3.99	12.25	1.49	17.73	43.50	-25.77	Peak	VERTICAL
3	187.75	3.69	10.57	2.11	16.37	43.50	-27.13	Peak	VERTICAL
4	246.82	2.60	11.50	2.38	16.48	46.00	-29.52	Peak	VERTICAL
5	296.18	4.19	13.83	2.69	20.71	46.00	-25.29	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.
2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.
3. Test setup: RBW: 100 kHz, VBW: 300 kHz, Sweep time: auto.



Item (Mark)	Freq (MHz)	Read Level (dBµV)	Antenna Factor (dB/m)	Cable Loss dB	Result Level (dBµV/m)	Limit Line (dBµV/m)	Over Limit (dB)	Detector	Polarization
1	43.81	3.07	14.90	1.03	19.00	40.00	-21.00	Peak	HORIZONTAL
2	101.64	4.16	12.50	1.50	18.16	43.50	-25.34	Peak	HORIZONTAL
3	185.79	3.99	10.57	2.10	16.66	43.50	-26.84	Peak	HORIZONTAL
4	289.00	3.40	14.25	2.67	20.32	46.00	-25.68	Peak	HORIZONTAL
5	603.54	5.39	18.21	3.98	27.58	46.00	-18.42	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss.
2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.
3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

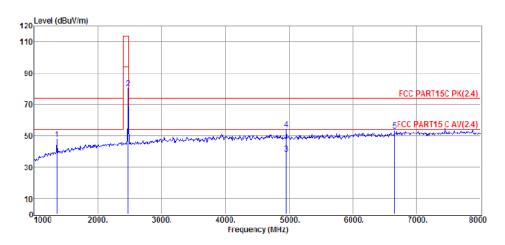
#### Remark:

- (1) Measuring frequencies from 9 KHz to the 1 GHz, Radiated emission test from 9KHz to 30MHz was verified, and no any emission was found except system noise floor.
- (2) \* denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
- (3) The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120KHz, 1 MHz for measuring above 1 GHz, below 30MHz was 10KHz.



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## Above 1 GHz Test Results: Horizontal

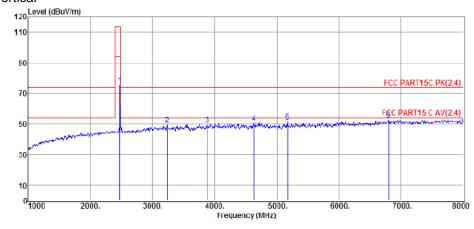


Item (Mark)	Freq (MHz)	Read Level (dBµV)	Antenna Factor (dB/m)	PRM Factor dB	Cable Loss dB	Result Level (dBµV/m)	Limit Line (dBμV/m)	Over Limit (dB)	Detector	Polarization
1	1357.00	47.56	24.88	29.34	4.57	47.67	74.00	-26.33	Peak	HORIZONTAL
2	2477.00	73.93	30.11	29.69	6.13	80.48	114.00	-33.52	Peak	HORIZONTAL
3	4955.00	25.36	33.71	29.34	8.63	38.36	54.00	-15.64	Average	HORIZONTAL
4	4955.00	41.07	33.71	29.34	8.63	54.07	74.00	-19.93	Peak	HORIZONTAL
5	6656.00	37.09	35.93	30.10	10.10	53.02	74.00	-20.98	Peak	HORIZONTAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

#### Note: Above 8G test data, margin is more than 20dB did not show it. Vertical



Item	Freq	Read	Antenna	PRM	Cable	Result	Limit	Over	Detector	Polarization
(Mark)	(MHz)	Level (dBµV)	Factor (dB/m)	Factor dB	Loss dB	Level (dBµV/m)	Line (dBµV/m)	Limit (dB)		
1	2477.00	68.89	30.11	29.69	6.13	75.44	114.00	-38.56	Peak	VERTICAL
2	3240.00	40.77	31.80	30.01	7.03	49.59	74.00	-24.41	Peak	VERTICAL
3	3884.00	38.18	33.07	29.11	7.53	49.67	74.00	-24.33	Peak	VERTICAL
4	4633.00	38.01	33.77	29.27	8.29	50.80	74.00	-23.20	Peak	VERTICAL
5	5172.00	37.97	34.05	29.33	8.85	51.54	74.00	-22.46	Peak	VERTICAL
6	6803.00	36.54	36.05	30.24	10.24	52.59	74.00	-21.41	Peak	VERTICAL

Note: 1. Result Level = Read Level + Antenna Factor + Cable loss - PRM Factor.

- 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

Note: Above 8G test data, margin is more than 20dB did not show it.

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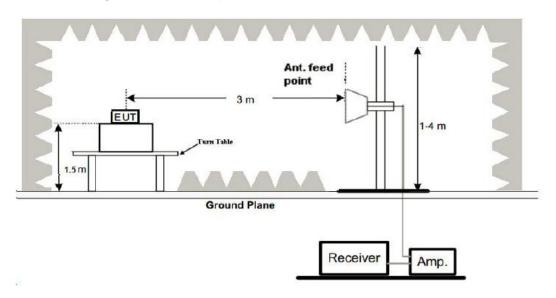
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#### 5. BAND EDGE

#### 5.1 Block Diagram of Test Setup



#### 5.2 Limits

FCC PART 15.249(d) 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 to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

#### 5.3 Test Procedure

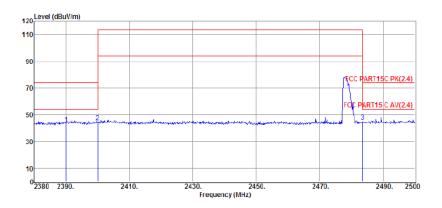
The band edge compliance of RF radiated emission should be measured by following the guidance in ANSI C63.4 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization etc. Set RBW to 1MHz and VBW to 1MHz to measure the peak field strength and set RBW to 1MHz and VBW to 1MHz to measure the average radiated field strength. The conducted RF band edge was measured by using a spectrum analyzer. Set span wide enough to capture the highest in-band emission and the emission at the band edge. Set RBW to 1MHz and VBW to 1MHz, to measure the conducted peak band edge.

# 5.4 Test Result PASS



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### Antenna polarization: V

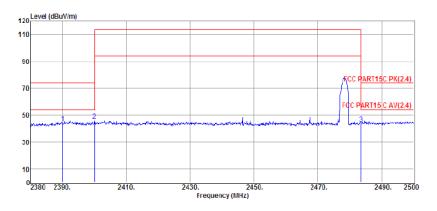


Item	Freq	Read Level	Antenna Factor	PRM Factor	Cable Loss	Result Level	Limit Line	Over Limit	Detector	Polarization
(Mark)	(MHz)	(dBµV)	(dB/m)	dB	dB	(dBµV/m)	(dBµV/m)	(dB)		
1	2390.00	37.11	29.78	29.41	6.01	43.49	74.00	-30.51	Peak	VERTICAL
2	2400.00	37.98	29.82	29.44	6.03	44.39	74.00	-29.61	Peak	VERTICAL
3	2483.50	38.27	30.14	29.71	6.15	44.85	74.00	-29.15	Peak	VERTICAL

- Note: 1. Result Level = Read Level + Antenna Factor + Cable loss PRM Factor.

  2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
  - 3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.

## Antenna polarization: H



Item	Freq	Read Level	Antenna Factor	PRM Factor	Cable Loss	Result Level	Limit Line	Over Limit	Detector	Polarization
(Mark)	(MHz)	(dBµV)	(dB/m)	dB	dΒ	$(dB\mu V/m)$	$(dB\mu V/m)$	(dB)		
1	2390.00	37.55	29.78	29.41	6.01	43.93	74.00	-30.07	Peak	HORIZONTAL
2	2400.00	39.44	29.82	29.44	6.03	45.85	74.00	-28.15	Peak	HORIZONTAL
3	2483.50	37.15	30.14	29.71	6.15	43.73	74.00	-30.27	Peak	HORIZONTAL

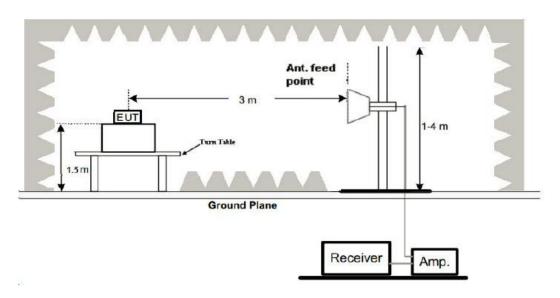
- Note: 1. Result Level = Read Level + Antenna Factor + Cable loss PRM Factor.
  - 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
  - 3. Test setup: RBW: 1 MHz, VBW: 3 MHz, Sweep time: auto.



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### 6. OCCUPIED BANDWIDTH MEASUREMENT

### 6.1 Block Diagram of Test Setup



#### 6.2 Test Procedure

- 1. The EUT was placed on a turn table which is 1.5m above ground plane.
- 2. Set EUT as operation in fixed frequency emission.
- 3. Based on FCC Part15 C Section 15.249(a): RBW= 30KHz. VBW= 100 KHz, Span=3MHz.
- 4. The useful radiated emission from the EUT was detected by the spectrum analyser with peak detector.

## 6.3 Test Result

**PASS** 

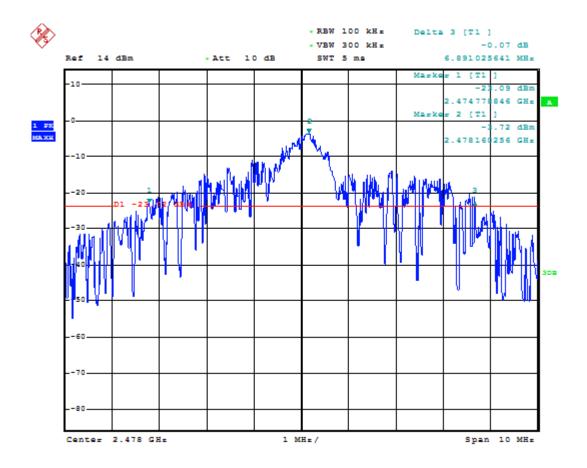
Channel Frequency	20DB Bandwidth	Result
(MHz)	(MHz)	
2478	6.89	Pass

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CH: 2478MHz



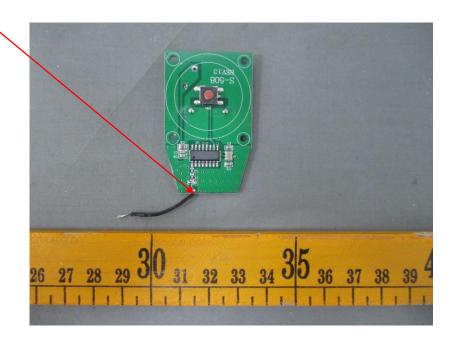


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### 7. ANTENNA REQUIREMENT

According to 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. Antenna is fixed by enclosure, can not be changed except take apart the product.

### **Antenna**

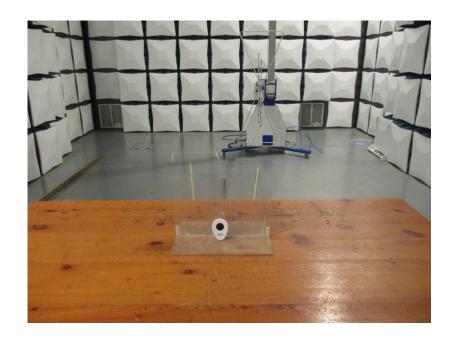


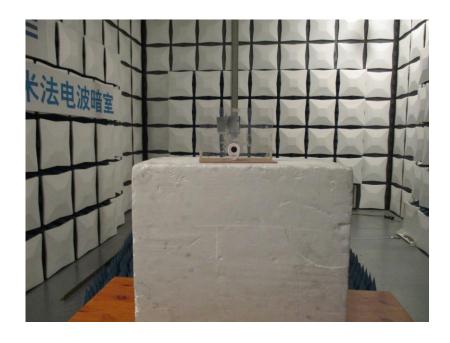


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## 8. PHOTOGRAPH OF TEST

**Radiated Emission** 







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### NOTE:

If there is question or concern regarding the above results, please contact the appropriate lab person below:

General question & concern: Elvis Chan

Costumer Service Coordinator

(852) 3604 1352

elvischan@mts-global.com

Technical question & concern: CHEN Chu Peng, Kait

**EMC Manager** 

(86) 769 8112 0818 Ext. 838 Kchen@mts-china.com

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