

# **FCC Part 15C Test Report**

Report No.: BCTC-160404888E

# **FCC ID:2AIFBLUNECASE**

Product Name:	Lunecase	
Trademark:	Lunecase	
Model Name :	ICON Oculto, Eclipse, Cult, MAGNA, ION.	
Prepared For :	Nolo Inc.	
Address :	2360 Corporate Cir Ste 400, Henderson, NV 89074-7739, USA	
Prepared By :	Shenzhen BCTC Technology Co., Ltd.	
Address :	No.101, Yousong Road, Longhua New District, Shenzhen, China	
Test Date:	May 04 - May 11, 2016	
Date of Report :	May 11, 2016	
Report No.:	BCTC-160404888E	



## **VERIFICATION OF COMPLIANCE**

Report No.: BCTC-160404888E

Applicant's name:	Nolo Inc.
Address:	2360 Corporate Cir Ste 400, Henderson, NV 89074-7739, USA
Manufacture's Name:	Minewing (Shenzhen) Electronics Integrated Co., Ltd.
Address:	Floor #2, Building H2, Hongfa-Tech Park, No 32 TonG Tau Road, ShiYan Town, Bao'An District, Shenzhen, China, 518108
Product description	
Product name:	Lunecase
Trademark:	Lunecase
Model Name:	ICON
Test Standards:	ANSI C63.10-2013 FCC Part15.249
	s been tested by BCTC, and the test results show that the compliance with the FCC requirements. And it is applicable only to be report.
	ced except in full, without the written approval of BCTC, this ised by BCTC, personal only, and shall be noted in the revision of
Test Result	
Testing Engineer	Eric Yang)
Technical Manager :	Jade Yang)
Authorized Signatory:	APPROVED S



Table of Contents	rage
1 . SUMMARY OF TEST RESULTS	5
1.1 TEST FACILITY	5
1.2 MEASUREMENT UNCERTAINTY	5
2. GENERAL INFORMATION	6
2.1 GENERAL DESCRIPTION OF EUT	6
2.2 DESCRIPTION OF TEST MODES	7
2.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING	7
2.4 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TE	STED 7
2.5 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)	8
2.6 EQUIPMENTS LIST FOR ALL TEST ITEMS	9
3 . EMC EMISSION TEST	10
3.1 CONDUCTED EMISSION MEASUREMENT	10
3.1.1 POWER LINE CONDUCTED EMISSION LIMITS	10
3.1.2 TEST PROCEDURE 3.1.3 DEVIATION FROM TEST STANDARD	11 11
3.1.4 TEST SETUP	11
3.1.5 EUT OPERATING CONDITIONS	11
3.2 RADIATED EMISSION MEASUREMENT	12
3.2.1 RADIATED EMISSION LIMITS 3.2.2 TEST PROCEDURE	12 13
3.2.3 DEVIATION FROM TEST STANDARD	13
3.2.4 TEST SETUP	14
3.2.5 EUT OPERATING CONDITIONS 3.2.6 TEST RESULTS	15 16
4 . BANDWIDTH TEST	21
4.1 APPLIED PROCEDURES / LIMIT 4.1.1 TEST PROCEDURE	21 21
4.1.2 DEVIATION FROM STANDARD	21
4.1.3 TEST SETUP	21
4.1.4 EUT OPERATION CONDITIONS 4.1.5 TEST RESULTS	21 22
	24
5 . BAND EDGE EMISSION 5.1 DEVIATION FROM STANDARD	24 24
5.2 EUT OPERATION CONDITIONS	24
5.3 TEST RESULTS	25



	Snenznen BCTC Technology Co., Ltd.	Report No.: BCTC-160404888E
Table of Contents		Page
6 . ANTENNA R	EQUIREMENT	26
6.1 STANDAR	RD REQUIREMENT	26
6.2 EUT ANTE	ENNA	26
7 . EUT TEST P	НОТО	27
8 . PHOTOS OF	THE EUT	28

Report No.: BCTC-160404888E



### 1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.249) , Subpart C				
Standard Section	Test Item	Judgment	Remark	
15.207	Conducted Emission	N/A		
15.249	Fundamental &Radiated Spurious Emission Measurement	PASS		
15.249	Bandwidth	PASS		
15.205	Band Edge Emission	PASS		
15.203	Antenna Requirement	PASS		

### NOTE:

(1)" N/A" denotes test is not applicable in this Test Report

### 1.1 TEST FACILITY

Shenzhen BCTC Technology Co., Ltd.

Add.:No.101, Yousong Road, Longhua New District, Shenzhen, China

FCC Registration No.:187086

### 1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement  $\mathbf{y} \pm \mathbf{U}$ , where expended uncertainty  $\mathbf{U}$  is based on a standard uncertainty multiplied by a coverage factor of  $\mathbf{k=2}$ , providing a level of confidence of approximately  $\mathbf{95}$  %  $^{\circ}$ 

No.	Item	Uncertainty
1	Conducted Emission Test	±1.38dB
2	RF power,conducted	±0.16dB
3	Spurious emissions,conducted	±0.21dB
4	All emissions,radiated(<1G)	±4.68dB
5	All emissions,radiated(>1G)	±4.89dB
6	Temperature	±0.5°C
7	Humidity	±2%



### 2. GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

Equipment	Lunecase		
Trade Name	Lunecase		
Model Name	ICON		
Serial Model	Oculto, Eclipse, Cult, MA	GNA, ION.	
Model Difference	All the same, Only mode	I name is different.	
	Operation Frequency:	2402~2480 MHz	
	Modulation Type:	GFSK	
	Bit Rate of Transmitter	2M	
	Number Of Channel	40 CH	
Product Description	Antenna Designation:	Please see Note 3.	
	Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.		
Channel List	Please refer to the Note 2		
Battery	DC 3.0V From Battery		
Connecting I/O Port(s)	Please refer to the User's	Manual	
hardware version			
Software version			
Serial number			

### Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

2

	Channel List					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	
01	2402	11	2422	21	2442	
02	2404	12	2424	22	2444	
03	2406	13	2426	23	2446	
~	~	~	~	~	~	
09	2418	19	2438	39	2478	
10	2420	20	2440	40	2480	

### 3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Gain (dBi)	NOTE
1	N/A	N/A	PCB Antenna	0	



### 2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

For Conducted & Radiated Emission			
Final Test Mode	Description		
Mode 1	CH01		
Mode 2	CH20		
Mode 3	CH40		
Mode 4	Link Mode		

#### Note:

- (1) The measurements are performed at the highest, middle, lowest available channels.
- (2) Fully-charged battery is used during the test

#### 2.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of FHSS

Frequency	2402 MHz	2440 MHz	2480 MHz
Channel	Low	Middle	High

### 2.4 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Radiated Spurious Emission Test

E-1 EUT



### 2.5 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
E-1	Lunecase	Lunecase	ICON	N/A	EUT

Item	Shielded Type	Ferrite Core	Length	Note

#### Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in <code>"Length\_"</code> column.
- (3) "YES" is means "shielded" "with core"; "NO" is means "unshielded" "without core".



### 2.6 EQUIPMENTS LIST FOR ALL TEST ITEMS

Conduction Test equipment

Item	Kind of Equipment	Manufactu rer	Type No.	Serial No.	Last calibration	Calibrated until	Calibratio n period
1	Test Receiver	R&S	ESCI	1166.5950K 03-101165- ha	2015.06.05	2016.06.05	1 year
2	LISN	R&S	NSLK81 26	812646 6	2015.08.24	2016.08.23	1 year
3	LISN	R&S	NSLK81 26	812648 7	2015.08.24	2016.08.23	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	620026441 7	2015.06.05	2016.06.05	1 year
5	RF cables	R&S	R204	R20X	2015.06.05	2016.06.05	1 year

Radiation test, Band-edge test and 20db bandwith test quipment

Tradiation test, band-edge test and zodb bandwith test quipment							
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibratio n period
1	Spectrum Analyzer	Agilent	E4407B	MY4510804 0	2015.06.05	2016.06.05	1 year
2	Test Receiver	R&S	ESPI	101318	2015.06.05	2016.06.05	1 year
3	Bilog Antenna	R&S	VULB 9168	VULB91 68-438	2015.06.05	2016.06.05	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	620026441 6	2015.06.05	2016.06.05	1 year
5	Spectrum Analyzer	ADVANTEST	R3132	150900201	2015.06.05	2016.06.05	1 year
6	Horn Antenna	R&S	HF906	10027	2015.06.05	2016.06.05	1 year
7	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2015.06.05	2016.06.05	1 year
8	Amplifier	R&S	BBV9743	9743-01 9	2015.08.24	2016.08.23	1 year
9	Loop Antenna	ARA	PLA-1030/B	1029	2015.06.05	2016.06.05	1 year
10	RF cables	R&S	R203	R20X	2015.06.05	2016.06.05	1 year
11	Antenna connector	Florida RFLa bs	Lab-Fle	RF 01#	2015.06.05	2016.06.05	1 year



### 3. EMC EMISSION TEST

### 3.1 CONDUCTED EMISSION MEASUREMENT

### 3.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)		Standard
FREQUENCY (MINZ)	Quasi-peak	Average	Quas -peak	Average	Statiuatu
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	CISPR
0.50 -5.0	73.00	60.00	56.00	46.00	CISPR
5.0 -30.0	73.00	60.00	60.00	50.00	CISPR

0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	73.00	60.00	56.00	46.00	FCC
5.0 -30.0	73.00	60.00	60.00	50.00	FCC

### Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " \* " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

### The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz



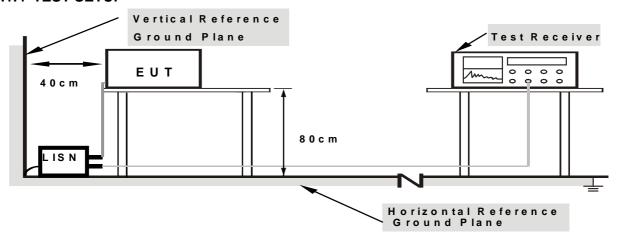
#### 3.1.2 TEST PROCEDURE

- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item -EUT Test Photos.

#### 3.1.3 DEVIATION FROM TEST STANDARD

No deviation

### 3.1.4 TEST SETUP



Note: 1. Support units were connected to second LISN.

2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

### 3.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

NOTE: This EUT is powered by the Battery only, this test item is not applicable.



### 3.2 RADIATED EMISSION MEASUREMENT

### 3.2.1 RADIATED EMISSION LIMITS (Frequency Range 9kHz-1000MHz)

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies	Field Strength	Measurement Distance
(MHz)	(micorvolts/meter)	(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

### LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

	Class B (dBuV/m) (at 3M)		
FREQUENCY (MHz)	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).

### FREQUENCY RANGE OF RADIATED MEASUREMENT (For unintentional radiators)

Highest frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes (MHz)	Range (MHz)
Below 1.705	30
1.705 – 108	1000
108 – 500	2000
500 – 1000	5000
Above 1000	5 <sup>th</sup> harmonic of the highest frequency or 40 GHz, whichever is lower



Spectrum Parameter	Setting	
Attenuation	Auto	
Start Frequency	1000 MHz	
Stop Frequency	10th carrier harmonic	
RB / VB (emission in restricted	4 Mile / 4 Mile for Dools 4 Mile / 40He for Average	
band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average	

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

### 3.2.2 TEST PROCEDURE

- a. The measuring distance of at 3 m shall be used for measurements at frequency up to 25GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- b. The EUT was placed on the top of a rotating table 0.8 and 1.5 meters above the ground at a 3 meter semi-chamber test. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The height of the equipment or of the substitution antenna shall be 0.8 m; above 1GHz, the height was 1.5m, the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos.
- g. For the radiated emission test above 1GHz:

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response.

The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane. Note:

Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

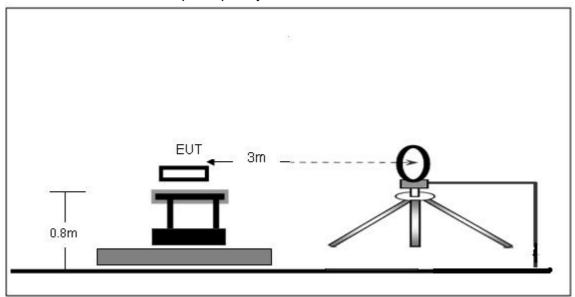
### 3.2.3 DEVIATION FROM TEST STANDARD

No deviation

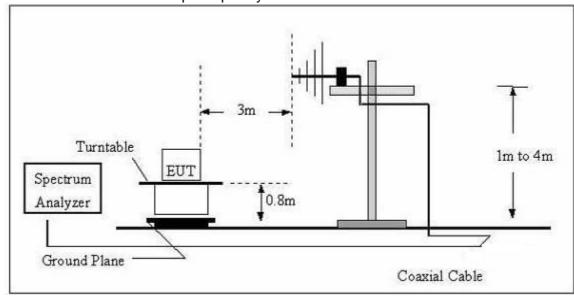


### 3.2.4 TEST SETUP

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



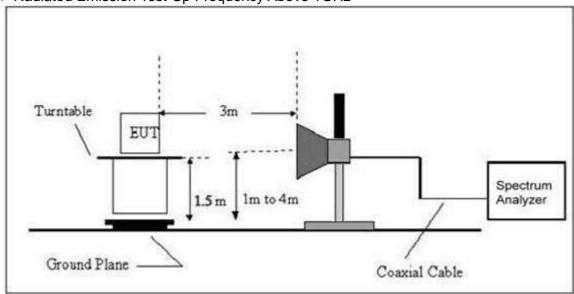
### (B) Radiated Emission Test-Up Frequency 30MHz~1GHz





Report No.: BCTC-160404888E

### (C) Radiated Emission Test-Up Frequency Above 1GHz



### 3.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.



### 3.2.6 TEST RESULTS

Radiated Spurious Emission (Below 30MHz)

Temperature:	<b>20</b> ℃	Relative Humidity:	48%		
Pressure:	1010 hPa	Polarization :			
Test Voltage :	DC 3.0V From Battery				
Test Mode :	Link Mode				

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
				PASS
				PASS

### NOTE:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor =40 log (specific distance/test distance)(dB);

Limit line = specific limits(dBuv) + distance extrapolation factor.



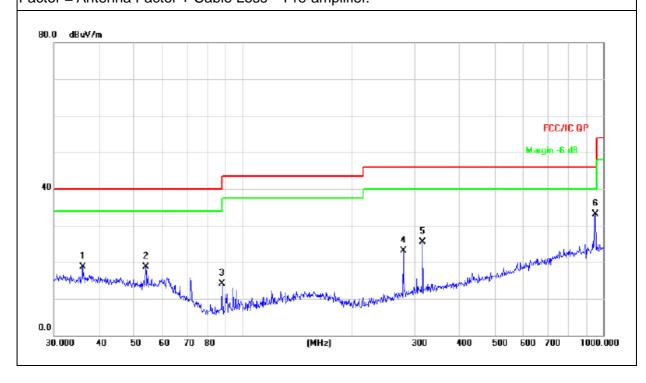
### Radiated Spurious Emission (Between 30MHz – 1GHz)

Temperature:	<b>26</b> ℃	Relative Humidity:	54%
Pressure :	1010 hPa	Polarization:	Horizontal
Test Voltage :	DC 3.0V From Battery		
Test Mode : (Worst)	Link Mode		

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Data eter Tuna
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Detector Type
36.0007	27.31	-8.59	18.72	40.00	-21.28	QP
53.8818	29.54	-10.93	18.61	40.00	-21.39	QP
87.7248	31.92	-17.79	14.13	40.00	-25.87	QP
279.0436	36.26	-13.13	23.13	46.00	-22.87	QP
315.4808	37.73	-12.18	25.55	46.00	-20.45	QP
952.0937	33.64	-0.46	33.18	46.00	-12.82	QP

#### Remark:

Factor = Antenna Factor + Cable Loss - Pre-amplifier.



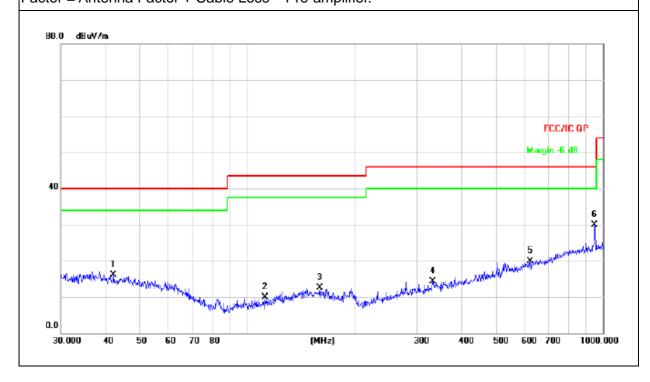


Temperature:	26 ℃	Relative Humidity:	54%
Pressure :	1010 hPa	Polarization :	Vertical
Test Voltage :	DC 3.0V From Battery		
Test Mode : (Worst)	Link Mode		

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Detector Type
42.1542	25.19	-9.12	16.07	40.00	-23.93	QP
112.5244	25.24	-15.42	9.82	43.50	-33.68	QP
160.3456	25.48	-12.89	12.59	43.50	-30.91	QP
332.5187	25.96	-11.74	14.22	46.00	-31.78	QP
625.0780	25.44	-5.52	19.92	46.00	-26.08	QP
948.7610	30.39	-0.48	29.91	46.00	-16.09	QP

### Remark:

Factor = Antenna Factor + Cable Loss - Pre-amplifier.





# Radiated Spurious Emission (1GHz to 10<sup>th</sup> harmonics)

### GFSK

	Freq.	Receiver Reading	Detector	Polar	Corrected Factor	Emission Level	Limit	Result
	(MHz)	(dBµV)	(PK/QP/Ave)	(H/V)	(dB)	(dBµV/m)	(dBµV/m)	resuit
	2402.00	90.55	PK	Н	13.85	104.40	114.00	Pass
	2402.00	70.53	Ave	Н	13.85	84.38	94.00	Pass
	4804.00	47.65	PK	Н	19.33	66.98	74.00	Pass
_	4804.00	28.47	Ave	Н	19.33	47.80	54.00	Pass
Lower Channel	12355.00	24.43	PK	Н	17.81	42.24	74.00	Pass
2402MHz	17850.00	18.54	PK	Н	25.39	43.93	74.00	Pass
	2402.00	89.43	PK	V	13.85	103.28	114.00	Pass
	2402.00	71.24	Ave	V	13.85	85.09	94.00	Pass
	4804.00	47.16	PK	V	19.33	66.49	74.00	Pass
	4804.00	27.92	Ave	V	19.33	47.25	54.00	Pass
	12355.00	25.03	PK	V	17.81	42.84	74.00	Pass
	17850.00	17.94	PK	V	25.39	43.33	74.00	Pass
	2440.00	90.22	PK	Н	13.94	104.16	114.00	Pass
	2440.00	73.12	Ave	Н	13.94	87.06	94.00	Pass
	4880.00	48.78	PK	Н	19.43	68.21	74.00	Pass
	4880.00	27.24	Ave	Н	19.43	46.67	54.00	Pass
	12355.00	25.85	PK	Н	17.81	43.66	74.00	Pass
Middle Channel	17850.00	18.71	PK	Н	25.39	44.10	74.00	Pass
2440MHz	2440.00	91.22	PK	V	13.94	105.16	114.00	Pass
	2440.00	70.37	Ave	V	13.94	84.31	94.00	Pass
	4880.00	46.52	PK	V	19.43	65.95	74.00	Pass
	4880.00	28.11	Ave	V	19.43	47.54	54.00	Pass
	12355.00	26.06	PK	V	17.81	43.87	74.00	Pass
	17850.00	19.29	PK	V	25.39	44.68	74.00	Pass
Upper	2480.00	89.85	PK	Н	14.02	103.87	114.00	Pass
Channel	2480.00	70.11	Ave	Н	14.02	84.13	94.00	Pass
2480MHz	4960.00	45.73	PK	Н	19.51	65.24	74.00	Pass



Shenzhen BCTC Technology Co., Ltd. Report No.: BCTC-160404888E

			I				
4960.00	27.66	Ave	Н	19.51	47.17	54.00	Pass
12355.00	24.94	PK	Н	17.81	42.75	74.00	Pass
17850.00	19.27	PK	Н	25.39	44.66	74.00	Pass
2480.00	90.72	PK	V	14.02	104.74	114.00	Pass
2480.00	71.38	Ave	V	14.02	85.40	94.00	Pass
4960.00	45.41	PK	V	19.51	64.92	74.00	Pass
4960.00	27.23	Ave	V	19.51	46.74	54.00	Pass
12355.00	26.14	PK	V	17.81	43.95	74.00	Pass
17850.00	19.23	PK	V	25.39	44.62	74.00	Pass

### Remark:

Factor = Antenna Factor + Cable Loss - Pre-amplifier.

Emission Level = Meter Reading + Factor

Margin = Emission Level - Limit

Other harmonics emissions are lower than 20dB below the allowable limit.



### 4. BANDWIDTH TEST

### 4.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.249) , Subpart C					
Section	Test Item	Limit	Frequency Range (MHz)	Result	
15.249	Bandwidth	(20dB bandwidth)	2400-2483.5	PASS	

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> Measurement Bandwidth or Channel Separation
RB	100KHz
VB	≥RBW
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

### 4.1.1 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting : RBW= 100KHz, VBW≥ RBW, Sweep time = Auto.

#### 4.1.2 DEVIATION FROM STANDARD

No deviation.

### 4.1.3 TEST SETUP



### 4.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

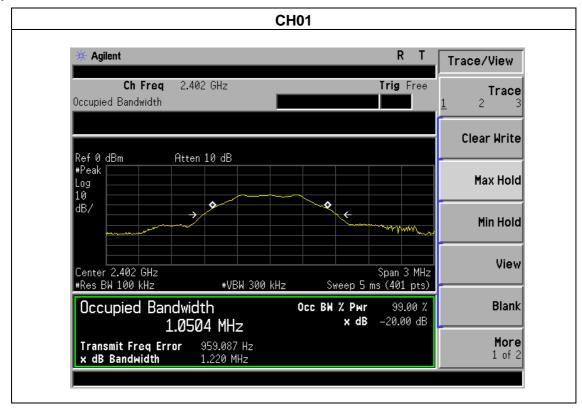


### 4.1.5 TEST RESULTS

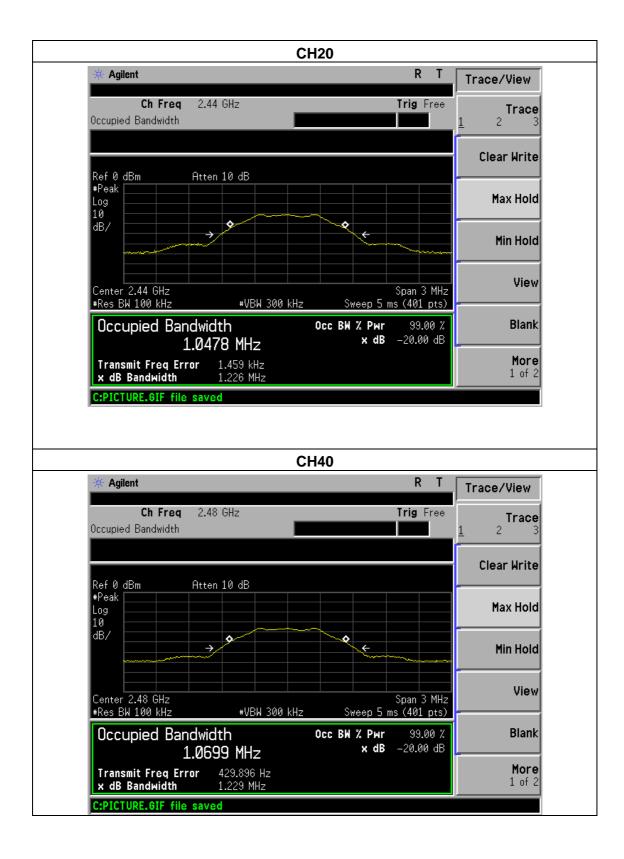
Temperature:	<b>25</b> ℃	Relative Humidity:	54%
Pressure:	1012 hPa	Test Voltage :	DC 3.0V From Battery
Test Mode :	CH01 / CH20 /CH40		

	Frequency	20dB Bandwidth (MHz)	Result
	2402 MHz	1.220	PASS
GFSK	2440 MHz	1.226	PASS
	2480 MHz	1.229	PASS

### **GFSK**







Report No.: BCTC-160404888E



#### 5. BAND EDGE EMISSION

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.

#### **TEST PROCEDURE**

- a. The measuring distance of at 3 m shall be used for measurements at frequency up to 25GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- b. The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The height of the equipment or of the substitution antenna shall be 1.5 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- e. For the actual test configuration, please refer to the related Item –EUT Test Photos.
- f. For the radiated emission test above 1GHz:
  - Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response.
  - The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
- g Spectrum Setting : RBW= 1MHz, VBW=3MHz, Sweep time = Auto for peak RBW= 1MHz, VBW=10Hz, Sweep time = Auto for average

Note:

Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

#### 5.1 DEVIATION FROM STANDARD

No deviation.

#### 5.2 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.



### **5.3 TEST RESULTS**

Temperature:	<b>25</b> ℃	Relative Humidity:	54%
Pressure:	1012 hPa	Test Voltage :	DC 3.0V From Battery
Test Mode :	CH01/CH40	Polarization:	Horizontal

	Frequency (MHz)	polarization (MHz)	Frequency (MHz)	Meter Reading (dBµV)	Factor (dB)	Emission (dBuV/m) PK	Band edge Limit (dBuV/m) PK AV		Result
			2390.00			48.31	74.00	54.00	Pass
GFSK	<2400	V	2390.00	34.32	13.83	48.15	74.00	54.00	Pass
	<2400	H	2400.00	35.23	13.85	49.08	74.00	54.00	Pass
	<2400	V	2400.00	34.31	13.85	48.16	74.00	54.00	Pass
	>2483.5	Н	2483.50	34.43	14.02	48.45	74.00	54.00	Pass
	>2483.5	V	2483.50	33.89	14.02	47.91	74.00	54.00	Pass
	>2483.5	Н	2485.50	34.24	14.04	48.28	74.00	54.00	Pass
	>2483.5	V	2485.50	34.46	14.04	48.50	74.00	54.00	Pass

If the PK measured levels comply with average limit, then the average level were deemed to comply with average limit.



### **6. ANTENNA REQUIREMENT**

### **6.1 STANDARD REQUIREMENT**

15.203 requirement: For intentional device, according to 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.

### **6.2 EUT ANTENNA**

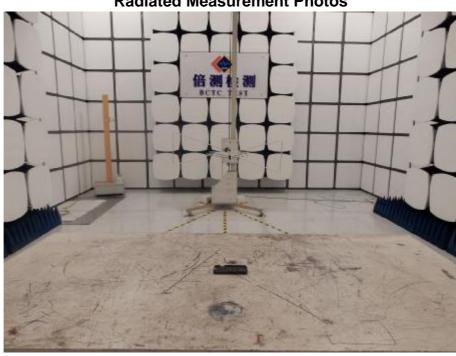
The EUT antenna is Integrated (PCB) antenna. It complies with the standard requirement.

Report No.: BCTC-160404888E



### 7. EUT TEST PHOTO









### 8. PHOTOS OF THE EUT



