

TEST REPORT

Report No.:	BCTC2204827591-1E
Applicant:	shenzhen Intellirocks Tech . Co., Ltd.
Product Name:	Govee RGBIC LED Strip Light
Model/Type Ref.:	H618F
Tested Date:	2022-04-08 to 2022-04-28
Issued Date:	2022-10-21





No.: BCTC/RF-EMC-005



FCC ID:2AQA6-H618F

Product Name:	Govee RGBIC LED Strip Light
Trademark:	Govee
Model/Type Ref.:	H618F
Prepared For:	shenzhen Intellirocks Tech . Co., Ltd.
Address:	No. 2901-2904, 3002, Block C, Section 1, Chuangzhi Yuncheng Building, Liuxian Avenue,Xili Community, Xili Street, Nanshan District, Shenzhen Guangdong, China.
Manufacturer:	shenzhen Intellirocks Tech . Co., Ltd.
Address:	No. 2901-2904, 3002, Block C, Section 1, Chuangzhi Yuncheng Building, Liuxian Avenue,Xili Community, Xili Street, Nanshan District, Shenzhen Guangdong, China.
Prepared By:	Shenzhen BCTC Testing Co., Ltd.
Address:	1-2/F., Building B, Pengzhou Industrial Park, No.158, Fuyuan 1st Road, Tangwei, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China
Sample Received Date:	2022-04-08
Sample tested Date:	2022-04-08 to 2022-04-28
Issue Date:	2022-10-21
Report No.:	BCTC2204827591-1E
Test Standards:	FCC Part15.247 ANSI C63.10-2013
Test Results:	PASS
Remark:	This is Bluetooth BLE radio test report.

Tested by:

Jeff.Fu/Project Handler

Approved by:

×

Zero Zhou/Reviewer

The test report is effective only with both signature and specialized stamp. This result(s) shown in this report refer only to the sample(s) tested. Without written approval of Shenzhen BCTC Testing Co., Ltd, this report can't be reproduced except in full. The tested sample(s) and the sample information are provided by the client.



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(Note: N/A Means Not Applicable)



1. Version

Report No.	Issue Date	Description	Approved
BCTC2204827591-1E	2022-10-21	Original	Valid



2. Test Summary

The Product has been tested according to the following specifications:

No.	Test Parameter	Clause No	Results
1	Conducted Emission	15.207	PASS
2	6dB Bandwidth	15.247 (a)(2)	PASS
3	Peak Output Power	15.247 (b)	PASS
4	Radiated Spurious Emission	15.247 (d), 15.205	PASS
5	Power Spectral Density	15.247 (e)	PASS
6	Restricted Band of Operation	15.205	PASS
7	Band Edge (Out of Band Emissions)	15.247(d)	PASS
8	Antenna Requirement	15.203	PASS



3. Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

No.	Item	Uncertainty
1	3m chamber Radiated spurious emission(9kHz-30MHz)	U=3.7dB
2	3m chamber Radiated spurious emission(30MHz-1GHz)	U=4.3dB
3	3m chamber Radiated spurious emission(1GHz-18GHz)	U=4.5dB
4	3m chamber Radiated spurious emission(18GHz-40GHz)	U=3.34dB
5	Conducted Emission(150kHz-30MHz)	U=3.20dB
6	Conducted Adjacent channel power	U=1.38dB
7	Conducted output power uncertainty Above 1G	U=1.576dB
8	Conducted output power uncertainty below 1G	U=1.28dB
9	humidity uncertainty	U=5.3%
10	Temperature uncertainty	U=0.59°C



4. Product Information And Test Setup

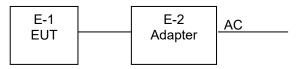
4.1 Product Information

Model/Type Ref.:	H618F
Model differences:	N/A
Bluetooth Version:	5.0
Hardware Version:	N/A
Software Version:	N/A
Operation Frequency:	2402-2480MHz
Type of Modulation:	GFSK
Number Of Channel	40CH
Antenna installation:	PCB antenna
Antenna Gain:	4.51 dBi
Ratings:	DC 24V From Adapter
Adapter Information:	Manufacture: Shenzhen Cenwell Technology Co., Ltd Model No.:CW2402000US Input:100-240~ 50/60Hz 1.2A MAX Output: DC 24V 2000mA

4.2 Test Setup Configuration

See test photographs attached in *EUT TEST SETUP PHOTOGRAPHS* for the actual connections between Product and support equipment.

Conducted Emission:



Radiated Spurious Emission



4.3 Support Equipment

No.	Device Type	Brand	Model	Series No.	Note
E-1	Govee RGBIC LED Strip Light	Govee	H618F	N/A	EUT
E-2	Adapter	N/A	CW2402000US	N/A	EUT

Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.

2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.



4.4 Channel List

	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

4.5 Test Mode

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 All Mode	Description	Modulation Type	
Mode 1	CH01		
Mode 2	CH20	GFSK	
Mode 3	CH40		
Mode 4	Charging (Conducted emission)		
Mode 5	Link mode (Radiated emission)		

Note:

(1) The measurements are performed at the highest, middle, lowest available channels.

(2) Fully-charged battery is used during the test

4.6 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

Test software Version	Bluesuite2.5.8		
Frequency	2402 MHz	2440 MHz	2480 MHz
Parameters	DEF	DEF	DEF



5. Test Facility And Test Instrument Used

5.1 Test Facility

All measurement facilities used to collect the measurement data are located at Shenzhen BCTC Testing Co., Ltd. Address: 1-2/F., Building B, Pengzhou Industrial Park, No.158, Fuyuan 1st Road, Tangwei, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China. The site and apparatus are constructed in conformance with the requirements of ANSI C63.4 and CISPR 16-1-1 other equivalent standards.

5.2 Test Instrument Used

Conducted emissions Test					
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.
Receiver	R&S	ESR3	102075	May 28, 2021	May 27, 2022
LISN	R&S	ENV216	101375	May 28, 2021	May 27, 2022
Software	Frad	EZ-EMC	EMC-CON 3A1	/	/
Attenuator	1	10dB DC-6GHz	1650	May 28, 2021	May 27, 2022

RF Conducted Test					
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.
Power Metter	Keysight	E4419	/	May 28, 2021	May 27, 2022
Power Sensor (AV)	Keysight	E9300A	/	May 28, 2021	May 27, 2022
Signal Analyzer20kH z-26.5GHz	Keysight	N9020A	MY49100060	May 28, 2021	May 27, 2022
Spectrum Analyzer9kHz- 40GHz	R&S	FSP40	١	May 28, 2021	May 27, 2022

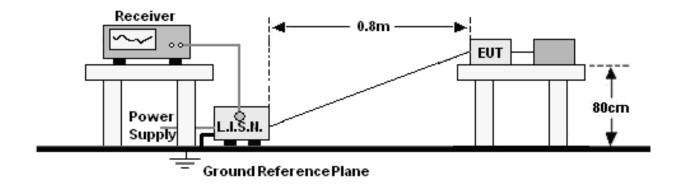


Radiated emissions Test (966 chamber)						
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.	
966 chamber	ChengYu	966 Room	966	Jun. 06. 2020	Jun. 05, 2023	
Receiver	R&S	ESR3	102075	May 28, 2021	May 27, 2022	
Receiver	R&S	ESRP	101154	May 28, 2021	May 27, 2022	
Amplifier	SKET	LAPA_01G18 G-45dB	١	May 28, 2021	May 27, 2022	
Amplifier	Schwarzbeck	BBV9744	9744-0037	May 28, 2021	May 27, 2022	
TRILOG Broadband Antenna	Schwarzbeck	VULB9163	942	Jun. 01, 2021	May 31, 2022	
Horn Antenna	Schwarzbeck	BBHA9120D	1541	Jun. 02, 2021	Jun. 01, 2022	
Horn Antenn(18GHz -40GHz)	Schwarzbeck	BBHA9170	00822	Jun. 15, 2021	Jun. 14, 2022	
Amplifier(18G Hz-40GHz)	MITEQ	TTA1840-35- HG	2034381	May 28, 2021	May 27, 2022	
Loop Antenna(9KHz -30MHz)	Schwarzbeck	FMZB1519B	00014	Jun. 02, 2021	Jun. 01, 2022	
RF cables1(9kHz- 30MHz)	Huber+Suhnar	9kHz-30MHz	B1702988-00 08	May 28, 2021	May 27, 2022	
RF cables2(30MH z-1GHz)	Huber+Suhnar	30MHz-1GH z	1486150	May 28, 2021	May 27, 2022	
RF cables3(1GHz- 40GHz)	Huber+Suhnar	1GHz-40GHz	1607106	May 28, 2021	May 27, 2022	
Power Metter	Keysight	E4419	/	May 28, 2021	May 27, 2022	
Power Sensor (AV)	Keysight	E9300A	١	May 28, 2021	May 27, 2022	
Signal Analyzer20kHz -26.5GHz	Keysight	N9020A	MY49100060	May 28, 2021	May 27, 2022	
Spectrum Analyzer9kHz- 40GHz	R&S	FSP40	١	May 28, 2021	May 27, 2022	
Software	Frad	EZ-EMC	FA-03A2 RE	\	١	



6. Conducted Emissions

Block Diagram Of Test Setup 6.1



6.2 Limit

	Limit (d	dBuV)
FREQUENCY (MHz)	Quas-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

2. The lower limit shall apply at the transition frequencies.

6.3 Test Procedure

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

a. The Product was placed on a nonconductive table 0.8 m above the horizontal ground reference plane, and 0.4 m from the vertical ground reference plane, and connected to the main through Line Impedance Stability Network (L.I.S.N).

b. The RBW of the receiver was set at 9 kHz in 150 kHz ~ 30MHz with Peak and AVG detector in Max Hold mode. Run the receiver's pre-scan to record the maximum disturbance generated from Product in all power lines in the full band.

c. For each frequency whose maximum record was higher or close to limit, measure its QP and AVG values and record.



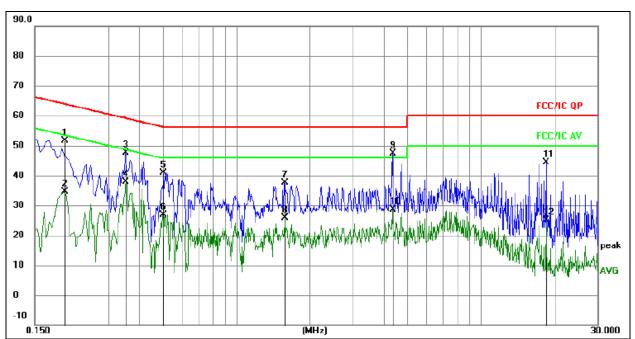
6.4 EUT Operating Conditions

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.



6.5 Test Result

Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101kPa	Phase :	Line
Test Voltage :	AC120V/60Hz	Test Mode:	Mode 4



Remark:

All readings are Quasi-Peak and Average values.
 Factor = Insertion Loss + Cable Loss.

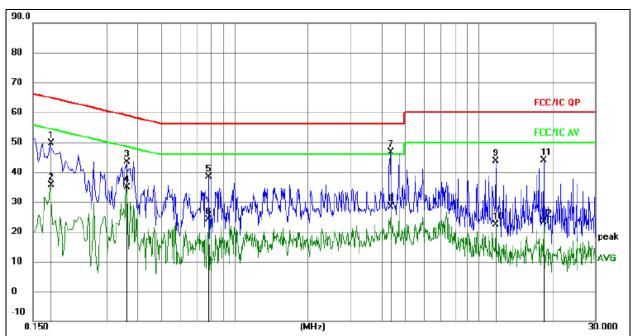
3. Measurement=Reading Level+ Correct Factor 4. Over= Measurement-Limit

No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
	MHz		dB	dBuV	dBuV	dB	Detector
1	0.1995	31.81	19.80	51.61	63.63	-12.02	QP
2	0.1995	14.79	19.80	34.59	53.63	-19.04	AVG
3	0.3525	27.87	19.76	47.63	58.90	-11.27	QP
4	0.3525	18.21	19.76	37.97	48.90	-10.93	AVG
5	0.5010	21.19	19.72	40.91	56.00	-15.09	QP
6	0.5010	7.21	19.72	26.93	46.00	-19.07	AVG
7	1.5765	17.69	19.83	37.52	56.00	-18.48	QP
8	1.5765	6.05	19.83	25.88	46.00	-20.12	AVG
9 *	4.3439	27.22	20.11	47.33	56.00	-8.67	QP
10	4.3439	8.64	20.11	28.75	46.00	-17.25	AVG
11	18.5145	24.03	20.44	44.47	60.00	-15.53	QP
12	18.5145	4.75	20.44	25.19	50.00	-24.81	AVG

No.: BCTC/RF-EMC-005



Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101kPa	Phase :	Neutral
Test Voltage :	AC120V/60Hz	Test Mode:	Mode 4



Remark:

1. All readings are Quasi-Peak and Average values.

2. Factor = Insertion Loss + Cable Loss.

3. Measurement=Reading Level+ Correct Factor 4. Over= Measurement-Limit

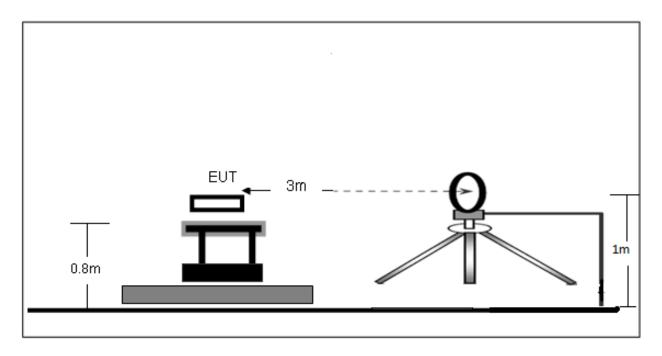
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz		dB	dBuV	dBuV	dB	Detector
1		0.1768	29.91	19.74	49.65	64.63	-14.98	QP
2		0.1768	15.78	19.74	35.52	54.63	-19.11	AVG
3		0.3615	23.73	19.76	43.49	58.69	-15.20	QP
4		0.3615	15.13	19.76	34.89	48.69	-13.80	AVG
5		0.7876	18.54	19.75	38.29	56.00	-17.71	QP
6		0.7876	4.42	19.75	24.17	46.00	-21.83	AVG
7	*	4.3376	26.58	20.11	46.69	56.00	-9.31	QP
8		4.3376	8.39	20.11	28.50	46.00	-17.50	AVG
9		11.7446	23.33	20.28	43.61	60.00	-16.39	QP
10		11.7446	2.04	20.28	22.32	50.00	-27.68	AVG
11		18.4258	23.40	20.44	43.84	60.00	-16.16	QP
12		18.4258	2.88	20.44	23.32	50.00	-26.68	AVG



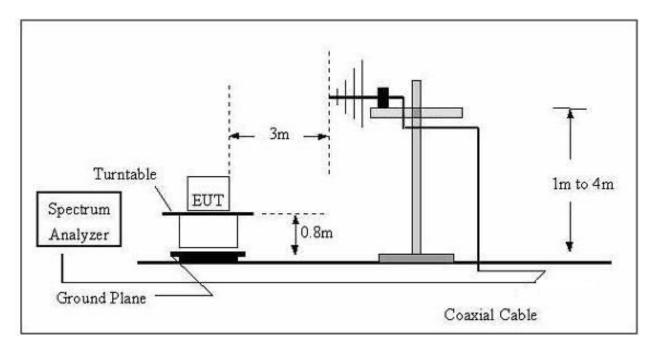
7. Radiated Emissions

7.1 Block Diagram Of Test Setup

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

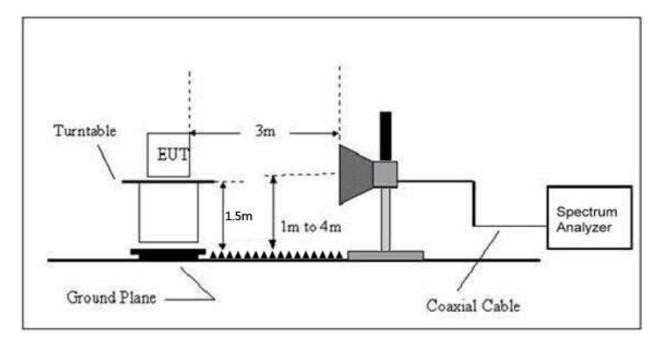


(B) Radiated Emission Test-Up Frequency 30MHz~1GHz





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



7.2 Limit

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.

Frequency	Field Strength	Distance	Field Strength Limit at 3m Distance		
(MHz)	uV/m	(m)	uV/m	dBuV/m	
0.009 ~ 0.490	2400/F(kHz)	300	10000 * 2400/F(kHz)	20log ^{(2400/F(kHz))} + 80	
0.490 ~ 1.705	24000/F(kHz)	30	100 * 24000/F(kHz)	20log ^{(24000/F(kHz))} + 40	
1.705 ~ 30	30	30	100 * 30	20log ⁽³⁰⁾ + 40	
30 ~ 88	100	3	100	20log ⁽¹⁰⁰⁾	
88 ~ 216	150	3	150	20log ⁽¹⁵⁰⁾	
216 ~ 960	200	3	200	20log ⁽²⁰⁰⁾	
Above 960	500	3	500	20log ⁽⁵⁰⁰⁾	



LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY	Limit (dBuV/m) (at 3M)		
(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 th harmonic of the highest frequency or 40 GHz, whichever is lower

7.3 Test Procedure

Receiver Parameter	Setting
Attenuation	Auto
9kHz~150kHz	RBW 200Hz for QP
150kHz~30MHz	RBW 9kHz for QP
30MHz~1000MHz	RBW 120kHz for QP

Spectrum Parameter	Setting
1-25GHz	RBW 1 MHz /VBW 1 MHz for Peak, RBW 1 MHz / VBW 10Hz for Average

Below 1GHz test procedure as below:

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.



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

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

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

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

Above 1GHz test procedure as below:

g. Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 metre to 1.5 metre(Above 18GHz the distance is 1 meter and table is 1.5 metre).

h. Test the EUT in the lowest channel ,the middle channel ,the Highest channel.

Note:

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

Above 1GHz test procedure as below:

a. The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

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

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

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

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

g. Test the EUT in the lowest channel, the Highest channel.

Note:

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

7.4 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.



7.5 Test Result

Below 30MHz

Temperature:	26 ℃	Relative Humidity:	24%
Pressure:	101 kPa	Test Voltage :	AC 120V/60Hz
Test Mode :	Mode 5	Polarization :	

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

Note:

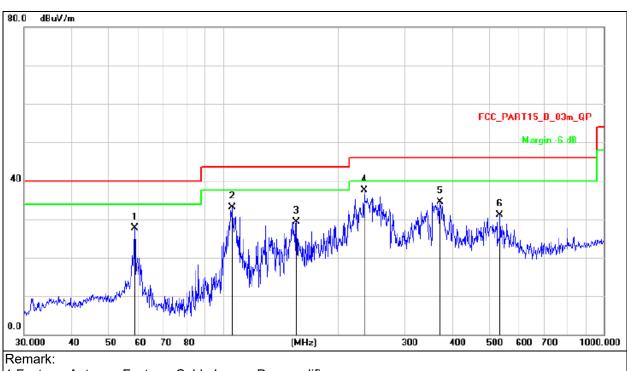
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor =40 log (specific distance/test distance)(dB); Limit line = specific limits(dBuv) + distance extrapolation factor.



Between 30MHz - 1GHz

Temperature:	26° ℃	Relative Humidity:	54%
Pressure:	101 kPa	Test Voltage :	AC 120V/60Hz
Test Mode:	Mode 5	Polarization :	Horizontal

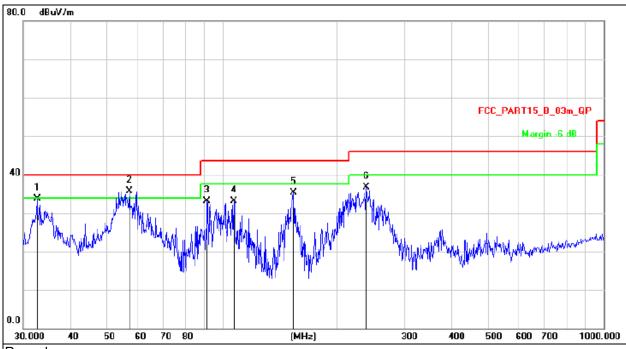


Factor = Antenna Factor + Cable Loss – Pre-amplifier.
 Measurement=Reading Level+ Correct Factor
 Over= Measurement-Limit

No.	Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		58.6126	44.11	-16.50	27.61	40.00	-12.39	QP
2		105.6415	50.25	-17.08	33.17	43.50	-10.33	QP
3		155.9101	48.78	-19.40	29.38	43.50	-14.12	QP
4	*	234.9909	52.25	-14.72	37.53	46.00	-8.47	QP
5		372.0045	44.99	-10.56	34.43	46.00	-11.57	QP
6		533.8321	38.16	-7.15	31.01	46.00	-14.99	QP



Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101 kpa	Test Voltage :	AC 120V/60Hz
Test Mode:	Mode 5	Polarization :	Vertical



Remark:

1.Factor = Antenna Factor + Cable Loss – Pre-amplifier.2. Measurement=Reading Level+ Correct Factor

3. Over= Measurement-Limit

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		32.6340	51.46	-17.66	33.80	40.00	-6.20	QP
2	*	56.9912	51.88	-16.22	35.66	40.00	-4.34	QP
3		91.1746	51.16	-18.15	33.01	43.50	-10.49	QP
4		107.1337	50.36	-17.18	33.18	43.50	-10.32	QP
5		153.7385	54.86	-19.57	35.29	43.50	-8.21	QP
6		238.3102	51.40	-14.60	36.80	46.00	-9.20	QP



Between 10	GHz – 25GHz
------------	-------------

GFSK								
Polar	Frequency	Reading Level	Correct Factor	Measure- ment	Limits	Over	Detector	
(H/V)	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/ m)	(dB)	Туре	
Low channel								
V	4804.00	53.27	-0.43	52.84	74.00	-21.16	PK	
V	4804.00	44.48	-0.43	44.05	54.00	-9.95	AV	
V	7206.00	45.90	8.31	54.21	74.00	-19.79	PK	
V	7206.00	36.56	8.31	44.87	54.00	-9.13	AV	
Н	4804.00	48.58	-0.43	48.15	74.00	-25.85	PK	
Н	4804.00	39.45	-0.43	39.02	54.00	-14.98	AV	
Н	7206.00	43.29	8.31	51.60	74.00	-22.40	PK	
Н	7206.00	35.83	8.31	44.14	54.00	-9.86	AV	
	Middle channel							
V	4880.00	51.64	-0.38	51.26	74.00	-22.74	PK	
V	4880.00	42.65	-0.38	42.27	54.00	-11.73	AV	
V	7320.00	43.33	8.83	52.16	74.00	-21.84	PK	
V	7320.00	34.11	8.83	42.94	54.00	-11.06	AV	
Н	4880.00	48.57	-0.38	48.19	74.00	-25.81	PK	
Н	4880.00	37.69	-0.38	37.31	54.00	-16.69	AV	
Н	7320.00	40.47	8.83	49.30	74.00	-24.70	PK	
Н	7320.00	32.79	8.83	41.62	54.00	-12.38	AV	
	•	•	High chan	nel	-		•	
V	4960.00	53.32	-0.32	53.00	74.00	-21.00	PK	
V	4960.00	42.37	-0.32	42.05	54.00	-11.95	AV	
V	7440.00	46.62	9.35	55.97	74.00	-18.03	PK	
V	7440.00	35.64	9.35	44.99	54.00	-9.01	AV	
Н	4960.00	51.60	-0.32	51.28	74.00	-22.72	PK	
Н	4960.00	42.08	-0.32	41.76	54.00	-12.24	AV	
Н	7440.00	43.90	9.35	53.25	74.00	-20.75	PK	
Н	7440.00	36.52	9.35	45.87	54.00	-8.13	AV	

Remark:

1.Emission Level = Meter Reading + Factor,

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

Over= Emission Level - Limit

2.If peak below the average limit, the average emission was no test.

3. In restricted bands of operation, The spurious emissions below the permissible value more than 20dB4. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible

value has no need to be reported.

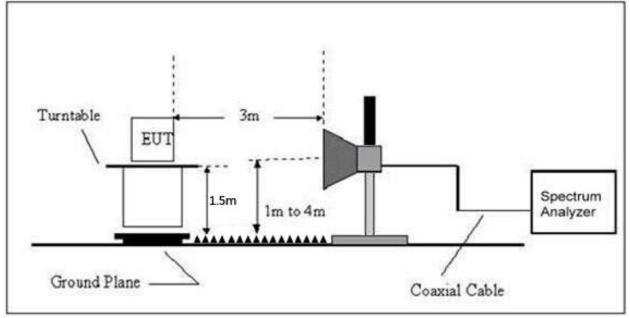
5. This report only shows the worst case test data.



8. Radiated Band Emission Measurement And Restricted Bands Of Operation

8.1 Block Diagram Of Test Setup

Radiated Emission Test-Up Frequency Above 1GHz



8.2 Limit

FCC Part15 C Section 15.209 and 15.205

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

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
¹ 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(2)
13.36-13.41			



LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Limit (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).

8.3 Test Procedure

Receiver Parameter	Setting
Attenuation	Auto
Start Frequency	2300MHz
Stop Frequency	2520
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

Above 1GHz test procedure as below:

a. The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

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

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

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

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

g. Test the EUT in the lowest channel, the Highest channel. Note:

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

8.4 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.



8.5 Test Result

	Polar (H/V)	Frequency (MHz)	Reading Level	Correct Factor	Measure- ment (dBuV/m)		Limits (dBuV/m)		Result
	(17, •)	(11112)	(dBuV/m)	(dB)	РК	□PK	AV		
	Low Channel 2402MHz								
	Н	2390.00	54.15	-6.70	47.45	74.00	54.00	PASS	
	Н	2400.00	57.30	-6.71	50.59	74.00	54.00	PASS	
	V	2390.00	53.70	-6.70	47.00	74.00	54.00	PASS	
GFSK	V	2400.00	56.92	-6.71	50.21	74.00	54.00	PASS	
GFSK			Hig	h Channel 24	480MHz				
	Н	2483.50	56.29	-6.79	49.50	74.00	54.00	PASS	
	Н	2500.00	52.50	-6.81	45.69	74.00	54.00	PASS	
	V	2483.50	56.16	-6.79	49.37	74.00	54.00	PASS	
	V	2500.00	51.89	-6.81	45.08	74.00	54.00	PASS	

Remark:

1. Emission Level = Meter Reading + Factor,

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

Over= Emission Level - Limit

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

3 In restricted bands of operation, The spurious emissions below the permissible value more than 20dB 4. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

5. This report only shows the worst case test data.



9. Power Spectral Density Test

9.1 Block Diagram Of Test Setup



9.2 Limit

FCC Part15 (15.247) , Subpart C							
Section	Test Item	Limit	Frequency Range (MHz)	Result			
15.247	Power Spectral Density	8 dBm (in any 3KHz)	2400-2483.5	PASS			

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

9.3 Test Procedure

- 1. Set analyzer center frequency to DTS channel center frequency.
- 2. Set the span to 1.5 times the DTS bandwidth.
- 3. Set the RBW to: 3 kHz
- 4. Set the VBW \geq 3 x RBW.
- 5. Detector = peak.
- 6. Sweep time = auto couple.
- 7. Trace mode = max hold.
- 8. Allow trace to fully stabilize.
- 9. Use the peak marker function to determine the maximum amplitude level within the RBW.
- 10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

9.4 EUT Operating Conditions

The EUT tested system was configured as the statements of 4.6 Unless otherwise a special operating condition is specified in the follows during the testing. Note: Power Spectral Density(dBm)=Reading+Cable Loss



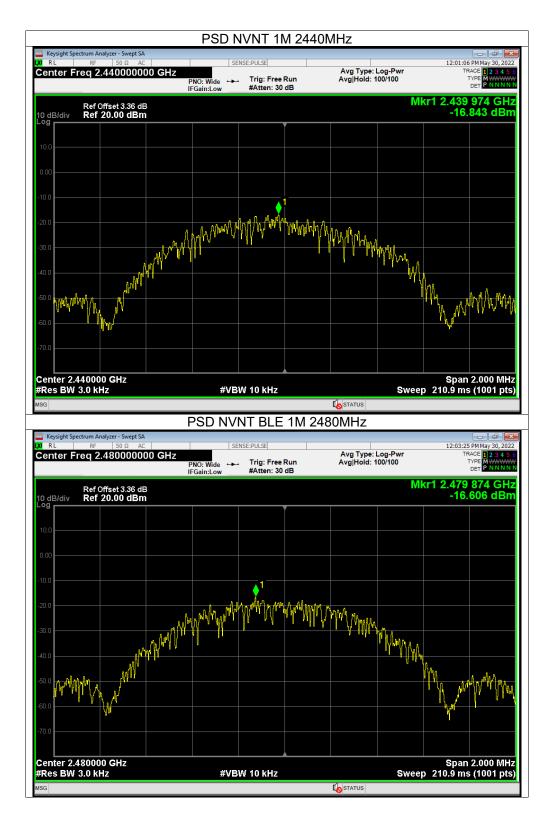
9.5 Test Result

Temperature :	26 ℃	Relative Humidity :	54%
Test Mode :	GFSK	Test Voltage :	DC 24V

Condition	Mode	Frequency (MHz)	Conducted PSD (dBm)	Limit (dBm)	Verdict
NVNT	BLE 1M	2402	-17.26	8	Pass
NVNT	BLE 1M	2440	-16.84	8	Pass
NVNT	BLE 1M	2480	-16.61	8	Pass









10. Bandwidth Test

10.1 Block Diagram Of Test Setup



10.2 Limit

FCC Part15 (15.247) , Subpart C						
Section	Test Item	Limit	Frequency Range (MHz)	Result		
15.247(a)(2)	Bandwidth	>= 500KHz (6dB bandwidth)	2400-2483.5	PASS		

10.3 Test Procedure

- 1. Set RBW = 100 kHz.
- 2. Set the video bandwidth (VBW) \ge 3 x RBW.
- 3. Detector = Peak.
- 4. Trace mode = max hold.
- 5. Sweep = auto couple.
- 6. Allow the trace to stabilize.

7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

10.4 EUT Operating Conditions

The EUT tested system was configured as the statements of 4.6 Unless otherwise a special operating condition is specified in the follows during the testing. Note: Power Spectral Density(dBm)=Reading+Cable Loss



10.5 Test Result

Temperature :		26° ℃			Relative Humidity	<i>'</i> :	54%	
Test Mode :		GFSK		Test Voltage :		DC 24V		
		_	Frequency	-6	dB Bandwidth		Limit -6 dB	Verdict
Condition	ion Mode		(MHz)		(MHz)		Bandwidth (MHz)	
NVNT	BLE	1M	2402		0.653		0.5	Pass
NVNT	BLE	1M	2440		0.654		0.5	Pass
NVNT	BLE	1M	2480		0.642		0.5	Pass





Keysight Spectrum Analyzer - Occupied BW RL RF 50 Ω AC		ENSE:PULSE		11:59:52 AM May 30, 2
enter Freq 2.440000000	GHz	Center Freq: 2.440000 Trig: Free Run #Atten: 30 dB	000 GHz Avg Hold: 100/100	Radio Std: None
	#IFGain:Low	#Atten: 30 dB		Mkr3 2.440302 G
Ref Offset 3.36 dB dB/div Ref 23.36 dBm				-7.6411 dB
og 3.4				
.36			3	
5.6	www.www.www.www.		and a real of the second s	
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5.6 ********** *****				
5.6				
5.6				
enter 2.44 GHz Res BW 100 kHz		#VBW 300 k		Span 2 M Sweep 1 333
		#VBW 300K	112	Sweep 1.333
Occupied Bandwidt	^h 0432 MHz			
		% of OBW Pow	er 99.00 %	
Transmit Freq Error x dB Bandwidth	-24.690 kHz 654.3 kHz	% of OBW Pow	-6.00 dB	
	034.3 KHZ	хuв	-0.00 dB	
G				
	6dB Bandwid	th NVNT BLE		
Keysight Spectrum Analyzer - Occupied BW	1			
RL RF 50 Ω AC enter Freq 2.480000000		ENSE:PULSE Center Freq: 2.480000		12:02:04 PM May 30, 2 Radio Std: None
	#IFGain:Low	→ Trig: Free Run #Atten: 30 dB	Avg Hold: 100/100	Radio Device: BTS
Ref Offset 3.36 df dB/div Ref 23.36 dBn	3			Mkr3 2.480299 GI -8.1726 dB
>g 3.4				
.36	2 ² 2200.00		3	
64			why www.	
5.6				man and a second
5.6 ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~				Martin and a second
5.6				
5.6				Spap 2 M
enter 2.48 GHz		#VBW 300 k	Hz	Span 2 M Sweep 1.333 i
enter 2.48 GHz Res BW 100 kHz Occupied Bandwidt	h	#VBW 300 k	Hz	
enter 2.48 GHz Res BW 100 kHz Occupied Bandwidt	h 0422 MHz	#VBW 300 k	Hz	
enter 2.48 GHz Res BW 100 kHz Occupied Bandwidt		#VBW 300 k % of OBW Pow		
enter 2.48 GHz Res BW 100 kHz Occupied Bandwidt 1.	0422 MHz			
enter 2.48 GHz Res BW 100 kHz Occupied Bandwidt 1. Transmit Freq Error	0422 MHz -21.568 kHz	% of OBW Pow	er 99.00 %	
enter 2.48 GHz Res BW 100 kHz Occupied Bandwidt 1. Transmit Freq Error	0422 MHz -21.568 kHz	% of OBW Pow	er 99.00 %	



11. Peak Output Power Test

11.1 Block Diagram Of Test Setup



11.2 Limit

FCC Part15 (15.247) , Subpart C						
Section	Test Item	Limit	Frequency Range (MHz)	Result		
15.247(b)(3)	Peak Output Power	1 watt or 30dBm	2400-2483.5	PASS		

11.3 Test Procedure

a. The EUT was directly connected to the Power meter

11.4 EUT Operating Conditions

The EUT tested system was configured as the statements of 4.6 Unless otherwise a special operating condition is specified in the follows during the testing. Note: Power Spectral Density(dBm)=Reading+Cable Loss



11.5 Test Result

Temperature :	26 ℃	Relative Humidity :	54%
Test Mode :	GFSK	Test Voltage :	DC 24V

Condition	Mode	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	BLE 1M	2402	-0.47	30	Pass
NVNT	BLE 1M	2440	-1.34	30	Pass
NVNT	BLE 1M	2480	-1.07	30	Pass



12. 100 KHz Bandwidth Of Frequency Band Edge

12.1 Block Diagram Of Test Setup



12.2 Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

12.3 Test Procedure

Using the following spectrum analyzer setting:

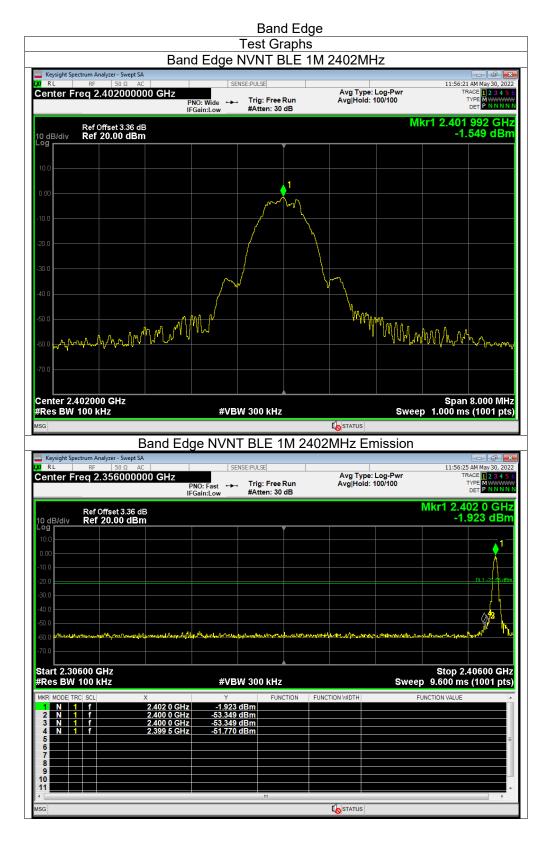
- a) Set the RBW = 100KHz.
- b) Set the VBW = 300KHz.
- c) Sweep time = auto couple.
- d) Detector function = peak.
- e) Trace mode = max hold.
- f) Allow trace to fully stabilize..

12.4 EUT Operating Conditions

The EUT tested system was configured as the statements of 4.6 Unless otherwise a special operating condition is specified in the follows during the testing. Note: Power Spectral Density(dBm)=Reading+Cable Loss



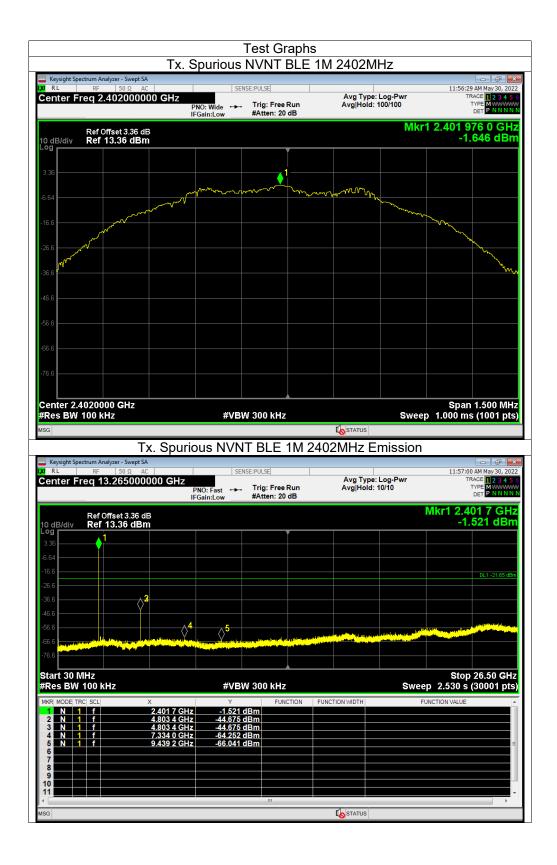
12.5 Test Result





		i Eage NVN I	BLE 1M	2480MHz		
Keysight Spectrum Analyzer - Swep RL RF 50 Ω	AC	SENSE:PULSE				2:02:08 PM May 30, 20
Center Freq 2.48000	PN	O:Wide ↔→ Trig:Fr Sain:Low #Atten:		Avg Type: Log Avg Hold: 100/1		TRACE 1234 TYPE MWWW DET PNNN
Ref Offset 3.36 0 dB/div Ref 20.00 d					Mkr1 2.	479 984 GH -1.390 dBi
10.0						
			1			
0.00		<u>^</u>	m			
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30.0						
40.0		pmp/	h	\sim		
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70.0	4U4 947 1				υ υ - · · · · ·	- Ari β N Abria
enter 2.480000 GHz Res BW 100 kHz		#VBW 300 k	Hz			pan 8.000 Mi 0 ms (1001 pi
SG				STATUS		
Keysight Spectrum Analyzer - Swep		e NVNT BLE	1M 2480	MHZ EMIS	sion	
RL RF 50 Ω Center Freq 2.52600	AC	SENSE:PULSE		Aver Turney Loop		2:02:11 PM May 30, 20 TRACE 1 2 3 4
	PN	IO: Fast Trig: Fr		Avg Type: Log- Avg Hold: 100/1	00	
Ref Offset 3.30	PN IFG 6 dB	IO: Fast ↔ Trig: Fr Gain:Low #Atten:		Avg Hold: 100/1	00	
Ref Offset 3.3 0 dB/div Ref 20.00 d	PN IFG 6 dB			Avg Hold: 100/1	00	
Ref Offset 3.3 0 dB/div Ref 20.00 d	PN IFG 6 dB			Avg Hold: 100/1	00	
Ref Offset 3.3 0 dB/div 10 0.00 10.00 20.00 1	PN IFG 6 dB			Avg/Hold: 100/1	00	2.480 0 GH -1.706 dB
Ref Offset 3.3 0 dB/div 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	PN IFG 6 dB			Avg/Hold: 100/1	00	2.480 0 GH -1.706 dBi
Ref Offset 3.3 0 dB/div 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	PN IFG 6 dB		30 dB	Avg Hold: 100/1	00	2.480 0 GH -1.706 dB
Ref Offset 3.3 0 dB/div Ref 20.00 d 10.0 1 0.00 1 0.00 10.0 <td< td=""><td>PN IFG 6 dB</td><td></td><td>30 dB</td><td>Avg Hold: 100/1</td><td>00 Mkr1</td><td></td></td<>	PN IFG 6 dB		30 dB	Avg Hold: 100/1	00 Mkr1	
Ref Offset 3.3 Ref 20.00 d 0.00 0.00 0.00 0.00 0.00 0.00 0.0	6 dB Bm	ain:Low #Atten: #VBW 300 k	30 dB	Avg Hold: 100/1	00 Mkr1	2.480 0 GH -1.706 dB 0 1.21 384
Ref Offset 3.3 Ref 20.00 d 0 d 0 d 0 d 0 d 0 d 0 d 0 d	2.480 0 GHz	#VBW 300 k	30 dB	Avg Hold: 100/1	00 Mkr1	2.480 0 GH -1.706 dBi
Ref Offset 3.3 Ref 20.00 d 0 0 0 0 0 0 0 0 0 0 0 0 0	× 2.480 0 GHz 2.500 0 GHz	#VBW 300 k +1.706 dBm -56.838 dBm -56.836 dBm	30 dB	Avg Hold: 100/1	00 Mkr1	2.480 0 GH -1.706 dBi
Ref Offset 3.3 Ref 20.00 d Ref 20.00 d Ref 20.00 d 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2.480 0 GHz 2.483 5 GHz	#VBW 300 k	30 dB	Avg Hold: 100/1	00 Mkr1	2.480 0 GH -1.706 dBi
Ref Offset 3.3 0 dB/div 9 Ref 20.00 d 9 Ref 20.0	× 2.480 0 GHz 2.500 0 GHz	#VBW 300 k +1.706 dBm -56.838 dBm -56.836 dBm	30 dB	Avg Hold: 100/1	00 Mkr1	2.480 0 GH -1.706 dBi
Ref Offset 3.3 Ref 20.00 d 9 10.0 0.00 10.0	× 2.480 0 GHz 2.500 0 GHz	#VBW 300 k +1.706 dBm -56.838 dBm -56.836 dBm	30 dB	Avg Hold: 100/1	00 Mkr1	2.480 0 GH -1.706 dB 0 1.21 384
Ref Offset 3.3 Ref 20.00 d 9 9 9 9 9 9 9 9 9 9 9 9 9	× 2.480 0 GHz 2.500 0 GHz	#VBW 300 k +1.706 dBm -56.838 dBm -56.836 dBm	30 dB	Avg Hold: 100/1	00 Mkr1	2.480 0 GH -1.706 dB 0 1.21 384







		purious NVN	TT BLE 1M 2	440MHz	
Keysight Spectrum Analyzer - S	Swept SA Ω AC	SENSE:PULSE			11:59:57 AM May 30, 20
Center Freq 2.4400				Avg Type: Log-Pwr	TRACE TO A MAIN
	PN	NO:Wide ↔ Trig:I Gain:Low #Atter	Free Run / n: 20 dB	Avg Hold: 100/100	DET P NNN
Ref Offset 3 0 dB/div Ref 13.36				Mkr	1 2.439 977 5 GF -1.625 dB
3.36			1		
	~ ~ ~	man from the second		~ ^m u ^m umm	
6.64	man			March Mar	
16.6					Mar
26.6					- Andrew -
36.6					ب ىر
46.6					
56.6					
66.6					
76.6					
Center 2.4400000 GH	Hz				Span 1.500 MH
Res BW 100 kHz		#VBW 3001	kHz	Swee	p 1.000 ms (1001 pt
SG			4	STATUS	
	Tx, Spurio	us NVNT BI	E 1M 2440N	/IHz Emission	
Keysight Spectrum Analyzer - S					- F
RL RF 50 Center Freq 13.265	5000000 GHz	110. Tube -	Free Run .	Avg Type: Log-Pwr Avg Hold: 10/10	12:00:29 PM May 30, 20 TRACE 1 2 3 4 TYPE MWMM DET P N N N
	IFO	Gain:Low #Atter	n: 20 dB		
Ref Offset 3	3.36 dB				Mkr1 2.439 7 GH
0 dB/div Ref 13.36	3.36 dB dBm				Mkr1 2.439 7 GH -3.334 dBi
0 dB/div Ref 13.36	3.36 dB dBm				Mkr1 2.439 7 GH -3.334 dBi
0 dB/div Ref 13.36 • 9 3.36 6.64 16.6	3.36 dB 6 dBm				-3.334 dB
0 dB/div Ref 13.36	3.36 dB 6 dBm				-3.334 dBi
0 dB/div Ref 13.36 0 d / 1 / 1 / 1 / 1 / 1 / 1 / 1 / 1 / 1 /	i dBm	5			-3.334 dBi
O dB/div Ref 13.36 .9 1 .6 4 .6 4	i dBm	\$ 			-3.334 dBi
0 dB/div Ref 13.36 0 d 0 dB/div Ref 13.36 0 d 1 d 0 d 0 dB/div Ref 13.36 1 d 0 d 0 d 0 d 0 d 0 d 0 d 0 d 0	i dBm	↓ ⁵ #VBW 300		stati Swee	-3.334 dBi
0 dB/div Ref 13.36 0 dB/div Ref 13.36 0 d 0 dB/div Ref 13.36 0 d 0 dB/div Ref 13.36 0 dB/div Ref 13.36 0 dB/div Ref 13.36 1 d0 dV 1 d0 dV	à dBm	#VBW 300	KHZ FUNCTION FUNCTION		-3.334 dBi
IO Bl/div Ref 13.36 Og 1 1 3 1 1 4 1 1 5 1 1 6 1 1 6 1 1 6 1 1 7 6 1 7 1 1 1 1 1 1 1 1 2 1 1	2.439 7 GHz 4.880 2 GHz	#VBW 300 -3.334 dBm -46.718 dBm			Mkr1 2.439 7 GH -3.334 dB 001-21 65 6 001-21 65 6 Stop 26.50 GH p 2.530 s (30001 pt UNCTION VALUE
IO dB/div Ref 13.36 • 93 - 1 • 6.64 - 1 • 6.64 - - • 16.6 - - • 26.6 - - • 46.6 - - • 46.6 - - • 46.6 - - • 46.6 - - • 46.6 - - • 46.6 - - • 46.6 - - • 46.6 - - • 46.6 - - • 46.6 - - • 46.6 - - • 46.6 - - • 46.6 - - • 46.6 - - • 47.6 - - • 58.6 - - • 78.6 - - • 78.6 - - • 78.7 1 1	× 4 2.439 7 GHz 4.880 2 GHz 4.880 2 GHz	#VBW 300 -3.334 dBm -46.718 dBm -46.718 dBm			-3.334 dBi
10 dB/div Ref 13.36 9 g 1 6 G4 1 16 G 1 26 G 1 36 G 1 46 G 1 56 G 1 57 N 1 5< N	2.439 7 GHz 4.880 2 GHz	#VBW 300 -3.334 dBm -46.718 dBm			-3.334 dBi
O dB/div Ref 13.36 O g 1 O g 1 O g 1 O g 1 O g 1 O g 1 O g 1 O g 1 O g 1 O g 1 O g 1 O g 1 O g 1 O g 1 O g 1 O g 1 O g 1 O g 1	2.439 7 GHz 4.880 2 GHz 4.880 2 GHz 7.310 1 GHz	#VBW 300 -3.334 dBm -46.718 dBm -64.225 dBm			-3.334 dBi
0 dB/div Ref 13.36 9 g 1 6 64 1 16 64 1 6 64 1 6 64 1 6 64 1 6 64 1 6 64 1 6 64 1 3 6 64 1 6 64 1 3 6 64 1 6 64 1 3 6 64 1 6 66 6 1 66 6 1 5 10 1 1 1 2 1 1 1 2 1 3 1 6 1 7 1 8 1 9 1	2.439 7 GHz 4.880 2 GHz 4.880 2 GHz 7.310 1 GHz	#VBW 300 -3.334 dBm -46.718 dBm -64.225 dBm			-3.334 dBi
0 dB/div Ref 13.36 3.36 5.64 1.65 5.64 1.65 5.66 5.66 5.66 5.66 5.66 5.67 5.64 1.65 5.64 1.65 5.66 5.66 5.66 5.66 5.66 5.67 5.64 1.65 5.64 1.65 5.64 1.65 5.64 1.65 5.64 1.65 5.64 1.65 5.64 1.65 5.64 1.65 5.64 1.65 5.64 1.65 5.75 5.75	2.439 7 GHz 4.880 2 GHz 4.880 2 GHz 7.310 1 GHz	#VBW 300 -3.334 dBm -46.718 dBm -64.225 dBm	FUNCTION FUNCTION		-3.334 dBi



Keysight Spectrum Anal	yzer - Swept SA 50 Ω AC						12-02-1/	
	180000000 GHz		SENSE:PULSE		Avg Type: Avg Hold: 1	Log-Pwr	TF	PM May 30, 20
		PNO: Wide ↔ IFGain:Low	Trig: Free R #Atten: 20 o		Avginoid: 1			
Ref Off	fset 3.36 dB					Mkr	1 2.479 9 -1	74 5 GH 350 dBi
0 dB/div Ref 1:	3.36 dBm							
3.36			1					
		Man	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	- Junior and a second	mm			
5.64	- A Walk	4			<u>···</u> Υγ	m		
16.6	af and a second s						have	
26.6								m
NO.0								ليمرحر
36.6								w/
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enter 2.480000								1.500 MH
Res BW 100 kH								
	2	#VE	300 kHz		1	Swee	p 1.000 ms	s (1001 pt
					STATUS		p 1.000 ms	s (1001 pt
SG	Τχ. Spι	#vi urious NVI			<u> </u>		p 1.000 ms	
SG Keysight Spectrum Anal RL RF	Тх. Spι у zer - Swept SA 50 Ω АС	urious NVI			MHz Er	mission	12:02:48	- @ . 3 PM May 30, 20
SG Keysight Spectrum Anal RL RF	Tx. Spu yzer - Swept SA	urious NVI z PN0: Fast ↔	NT BLE 1	1M 24801 Run	<u> </u>	mission ₋₀g-Pwr	12:02:48 TF	B PM May 30, 20
SG Keysight Spectrum Anal RL RF Center Freq 13.	Tx. Spu yzer - Swept SA 50 Ω AC 2650000000 GH	urious NVI		1M 24801 Run	MHz Ei	nission _og-Pwr 0/10	12:02:48 TF 	DPMMay 30, 20 ACCE 12 3 4 TYPE MWWW DET PNNN 80 2 GH
sg Reysight Spectrum Anal RL RF center Freq 13. Ref Of	Тх. Spι у zer - Swept SA 50 Ω АС	urious NVI z PN0: Fast ↔		1M 24801 Run	MHz Ei	nission _og-Pwr 0/10	12:02:48 TF 	DPMMay 30, 20 ACCE 12 3 4 TYPE MWWW DET PNNN 80 2 GH
RL RF RL RF Center Freq 13.	Tx. Spt yzer - Swept SA 50 Ω AC .2650000000 GH fsett 3.36 dB	urious NVI z PN0: Fast ↔		1M 24801 Run	MHz Ei	nission _og-Pwr 0/10	12:02:48 TF 	DPMMay 30, 20 ACCE 12 3 4 TYPE MWWW DET PNNN 80 2 GH
RL RF Renter Freq 13.	Tx. Spt yzer - Swept SA 50 Ω AC .2650000000 GH fsett 3.36 dB	urious NVI z PN0: Fast ↔		1M 24801 Run	MHz Ei	nission _og-Pwr 0/10	12:02:48 TF 	BPMMay 30, 20 Acce 1 2 3 4 TYPE WWWW Det PNNN 80 2 GH 371 dB
RL RF Renter Freq 13. 0 dB/div Ref 1 0 dB/div Ref 1	Tx. Spt yzer - Swept SA 50 Ω AC .2650000000 GH fsett 3.36 dB	urious NVI z PN0: Fast ↔		1M 24801 Run	MHz Ei	nission _og-Pwr 0/10	12:02:48 TF 	BPMMay 30, 20 Acc 1 2 3 4 TYPE WWWW Det PNNN 80 2 GH 371 dB
RL RF Ref Of 0 dB/div Ref 1 3.36 6.64 16.66	Тх. Spu yzer - Swept SA 50 Ω AC .26550000000 GH fset 3.36 dB 3.36 dBm	urious NVI z PN0: Fast ↔		1M 24801 Run	MHz Ei	nission _og-Pwr 0/10	12:02:48 TF 	BPMMay 30, 20 Acce 1 2 3 4 TYPE WWWW Det PNNN 80 2 GH 371 dB
RL RF Center Freq 13. Based Ref of 0 dB/div Ref 1 0 g 1 0 g 1 1 6 64 6 64 6 64 6 66	Tx. Spt yzer - Swept SA 50 Ω AC .2650000000 GH fsett 3.36 dB	urious NVI z PN0: Fast ↔		1M 24801 Run	MHz Ei	nission _og-Pwr 0/10	12:02:48 TF 	BPMMay 30, 20 Acce 1 2 3 4 TYPE WWWW Det PNNN 80 2 GH 371 dB
SG Reysight Spectrum Anal RL RF Center Freq 13. Ref Of 0 dB/div Ref 1 0 g 1 0 64 1 6 64 1 6 64 1 6 64 1 6 64 1 6 64 1	Тх. Spu yzer - Swept SA 50 Ω AC .26550000000 GH fset 3.36 dB 3.36 dBm	urious NVI z PN0: Fast ↔		1M 24801 Run	MHz Ei	nission _og-Pwr 0/10	12:02:48 TF 	BPMMay 30, 20 Acce 1 2 3 4 TYPE WWWW Det PNNN 80 2 GH 371 dB
RL RF RL RF Center Freq 13.	Тх. Spu yzer - Swept SA 50 Ω AC .26550000000 GH fset 3.36 dB 3.36 dBm	Z PNO: Fast IFGain:Low		1M 24801 Run	MHz Ei	nission _og-Pwr 0/10	12:02:48 TF 	PM May 30, 20 ACE 1 2 3 4 TYPE MWWW DET PNNN
Rc Ref 0 RL RF Center Freq 13. Ref of 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Тх. Spu yzer - Swept SA 50 Ω AC .26550000000 GH fset 3.36 dB 3.36 dBm	Z PNO: Fast IFGain:Low		1M 24801 Run	MHz Ei	nission .og-Pwr 0/10	12:02:48 TF Mkr1 2.44 -3.	26.50 GH
SG RL RF Center Freq 13. RL RF Center Freq 13. RE RF Center Freq 13. RE 1 RF Center Freq 13. Ref 0f Ref 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0	Tx. Spu	UTIOUS NVI Z PNO: Fast IFGain:Low	NT BLE 1	IM 2480	Avg Type: Avg Hold: 1	nission .og-Pwr 0/10 Swee	12:02:48 TF Mkr1 2.44 -3. -3. -3. -3. -3. -3. -3. -3. -3. -3.	26.50 GH
SG Ref of RL RF Center Freq 13. Ref of 0 dB/div Ref of	Tx. Spu yzer - Swept SA 50 Q AC 26650000000 GH fset 3.36 dB 3.36 dBm 2 2 2 2 2 2 2 2 2 2 2 2 2	Z PNO: Fast IFGain:Low 4 4 #VI #VI SHz -3.37	NT BLE 1	IM 2480	MHz Ei	nission .og-Pwr 0/10 Swee	12:02:48 TF Mkr1 2.44 -3.	26.50 GH
SG Reysight Spectrum Analy RL RF Center Freq 13. 0 B/div 80 Ref 0f 0 B/div 81 Ref 0f 0 GB/div 83 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 1 1	Tx. Spu yzer - Swept SA 50 Ω AC -26550000000 GH fset 3.36 dB 3.36 dBm √3 √3 √3 √3 √3 √3 √3 √3 √3 √3	UTIOUS NVI Z PNO: Fast IFGain:Low ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	NT BLE 1	IM 2480	Avg Type: Avg Hold: 1	nission .og-Pwr 0/10 Swee	12:02:48 TF Mkr1 2.44 -3. -3. -3. -3. -3. -3. -3. -3. -3. -3.	26.50 GH
SG Reysight Spectrum Anal RL RF Center Freq 13. 0 dB/div Ref 0f 1 db/div Ref 0f	Tx. Spu yzer - Swept SA 50 0 AC -265000000 GH fset 3.36 dB 3.36 dBm 	Urious NVI Z PNO: Fast IFGain:Low ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	NT BLE 1	IM 2480	Avg Type: Avg Hold: 1	nission .og-Pwr 0/10 Swee	12:02:48 TF Mkr1 2.44 -3. -3. -3. -3. -3. -3. -3. -3. -3. -3.	26.50 GH
SG Repsight Spectrum Anal RL RF Center Freq 13. 0 dB/div Ref Of 1 d f 1 d f 1 d f 1 d f 1 d f 1 d f 1 d f	Tx. Spu yzer - Swept SA 50 Ω AC .265000000 GH fset 3.36 dB 3.36 dBm 2 2 2 2 2	Urious NVI Z PNO: Fast IFGain:Low ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	NT BLE 1	IM 2480	Avg Type: Avg Hold: 1	nission .og-Pwr 0/10 Swee	12:02:48 TF Mkr1 2.44 -3. -3. -3. -3. -3. -3. -3. -3. -3. -3.	26.50 GH
SG Keysight Spectrum Anal, RL RF Renter Freq 13. Ref Of 0 dB/div Ref 1 3.36 1 6.4 1 6.5 1 6.64 1 6.64 1 6.64 1 6.64 1 6.64 1 6.64 1 6.64 1 6.64 1 6.64 1 6.64 1 6.64 1 6.64 1 6.64 1 6.64 1 6.64 1 6.64 1 6.64 1 7.7 1 7.7 1 7.7 1 7.7 1 7.7 1 7.7 1 7.7 1 7.7 1 7.7 1 7.7 1 7	Tx. Spu yzer - Swept SA 50 Ω AC .265000000 GH fset 3.36 dB 3.36 dBm 2 2 2 2 2	Urious NVI Z PNO: Fast IFGain:Low ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	NT BLE 1	IM 2480	Avg Type: Avg Hold: 1	nission .og-Pwr 0/10 Swee	12:02:48 TF Mkr1 2.44 -3. -3. -3. -3. -3. -3. -3. -3. -3. -3.	26.50 GH



13. Antenna Requirement

13.1 Limit

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.

13.2 Test Result

The EUT antenna is PCB antenna, Antenna Gain is 4.51dBi, fulfill the requirement of this section.



14. EUT Photographs

EUT Photo 1



EUT Photo 2



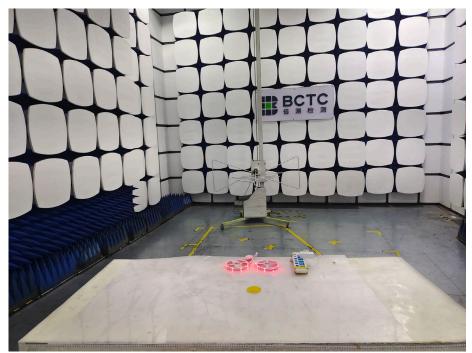


15. EUT Test Setup Photographs

Conducted Measurement Photo



Radiated Measurement Photos









STATEMENT

1. The equipment lists are traceable to the national reference standards.

2. The test report can not be partially copied unless prior written approval is issued from our lab.

3. The test report is invalid without stamp of laboratory.

4. The test report is invalid without signature of person(s) testing and authorizing.

5. The test process and test result is only related to the Unit Under Test.

6.The quality system of our laboratory is in accordance with ISO/IEC17025.

7.If there is any objection to report, the client should inform issuing laboratory within 15 days from the date of receiving test report.

Address:

1-2/F., Building B, Pengzhou Industrial Park, No.158, Fuyuan 1st Road, Tangwei, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China

TEL: 400-788-9558

P.C.: 518103

FAX: 0755-33229357

Website: http://www.chnbctc.com

E-Mail: bctc@bctc-lab.com.cn

***** END *****

No.: BCTC/RF-EMC-005