APPLICATION CERTIFICATION FCC Part 15C
On Behalf of
I-SYST Inc.

BLE Module
Model No.: IMM-NRF52832-NANO

FCC ID: 2ALTY-52832NANO

Prepared for	:	I-SYST Inc.
Address	:	212-6415 Corbiere, Brossard, QC., Canada J4Z OH7
Prepared by	:	Shenzhen Accurate Technology Co., Ltd.
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Report No.	:	ATE20180553
Date of Test	:	April 17, 2018
Date of Report	:	April 19, 2018

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Test Report Certification

Applicant	:	I-SYST Inc.
Manufacturer	:	I-SYST Inc.
EUT Description	:	BLE Module
Model No.	:	IMM-NRF52832-NANO
Trade Name	:	I-SYST

Measurement Procedure Used:

FCC Rules and Regulations Part 15 Subpart C Section 15.247
ANSI C63.10: 2013

The EUT was tested according to DTS test procedure of Apr 05, 2017 KDB558074 D01 DTS Meas Guidance v04 for compliance to FCC 47CFR 15.247 requirements

The device described above is tested by Shenzhen Accurate Technology Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C Section 15.247 limits. The measurement results are contained in this test report and Shenzhen Accurate Technology Co., Ltd. is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC requirements.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Shenzhen Accurate Technology Co., Ltd.

Date of Test :	April 17, 2018
Date of Report :	April 19, 2018

Prepared by : _____
(Steve Yang, Engineer)

Approved & Authorized Signer : _____
(Sean Liu, Manager)

1. GENERAL INFORMATION

1.1.Description of Device (EUT)

EUT	:	BLE Module
Model Number	:	IMM-NRF52832-NANO
Bluetooth version	:	V5.0 BLE
Frequency Range	:	2402MHz-2480MHz
Number of Channels	:	40
Antenna Gain	:	1dBi
Antenna type	:	ceramic antenna
Power Supply	:	DC 3.3V
Modulation mode	:	GFSK
Hardware version	:	1.0
Software version	:	1.0
Applicant	:	I-SYST Inc.
Address	:	212-6415 Corbiere, Brossard, QC., Canada J4Z OH7
Manufacturer	:	I-SYST Inc.
Address	:	212-6415 Corbiere, Brossard, QC., Canada J4Z OH7

1.2.Carrier Frequency of Channels

Channel	Frequceny (MHz)	Channel	Frequceny (MHz)	Channel	Frequceny (MHz)	Channe l	Frequceny (MHz)
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480

1.3.Special Accessory and Auxiliary Equipment

USB to A serial port plate (provided by Manufacturer)

Notebook PC (provided by laboratory)	:	Manufacturer: LENOVO
		M/N: 4290-RT8
		S/N: R9-FW93G 11/08

1.4.Description of Test Facility

EMC Lab : Recognition of accreditation by Federal Communications Commission (FCC)
The Designation Number is CN1189
The Registration Number is 708358

Listed by Innovation, Science and Economic Development Canada (ISEDC)
The Registration Number is 5077A-2

Accredited by China National Accreditation Service for Conformity Assessment (CNAS)
The Registration Number is CNAS L3193

Accredited by American Association for Laboratory Accreditation (A2LA)
The Certificate Number is 4297.01

Name of Firm : Shenzhen Accurate Technology Co., Ltd.

Site Location : 1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. China

1.5.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

2. MEASURING DEVICE AND TEST EQUIPMENT

Table 1: List of Test and Measurement Equipment

Kind of equipment	Manufacturer	Type	S/N	Calibrated dates	Calibrated until
EMI Test Receiver	Rohde&Schwarz	ESCS30	100307	Jan. 06, 2018	1 Year
EMI Test Receiver	Rohde&Schwarz	ESPI3	101526/003	Jan. 06, 2018	1 Year
Spectrum Analyzer	Agilent	E7405A	MY45115511	Jan. 06, 2018	1 Year
Pre-Amplifier	Rohde&Schwarz	CBLU1183540-01	3791	Jan. 06, 2018	1 Year
Loop Antenna	Schwarzbeck	FMZB1516	1516131	Jan. 06, 2018	1 Year
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Jan. 06, 2018	1 Year
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Jan. 06, 2018	1 Year
Horn Antenna	Schwarzbeck	BBHA9170	9170-359	Jan. 06, 2018	1 Year
LISN	Rohde&Schwarz	ESH3-Z5	100305	Jan. 06, 2018	1 Year
LISN	Schwarzbeck	NSLK8126	8126431	Jan. 06, 2018	1 Year
Highpass Filter	Wainwright Instruments	WHKX3.6/18G-10SS	N/A	Jan. 06, 2018	1 Year
Band Reject Filter	Wainwright Instruments	WRCG2400/2485-2375/2510-60/11SS	N/A	Jan. 06, 2018	1 Year
RF COAXIAL CABLE	SUHNER	N-5m(Frequency range:9KHz-26.5GHz)	NO.3	Jan. 06, 2018	1 Year
RF COAXIAL CABLE	SUHNER	N-5m(Frequency range:9KHz-26.5GHz)	NO.4	Jan. 06, 2018	1 Year
RF COAXIAL CABLE	SUHNER	N-1m(Frequency range:9KHz-26.5GHz)	NO.5	Jan. 06, 2018	1 Year
RF COAXIAL CABLE	SUHNER	N-1m(Frequency range:9KHz-26.5GHz)	NO.6	Jan. 06, 2018	1 Year
Temporary antenna connector	NTGS	14AE	N/A	Apr. 17, 2018	N/A

Note: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

3. OPERATION OF EUT DURING TESTING

3.1.Operating Mode

The mode is used: **BLE Transmitting mode**

Low Channel: 2402MHz
Middle Channel: 2440MHz
High Channel: 2480MHz

Note: The Bluetooth has been tested under continuous transmission mode.
Its duty cycle setting is greater than 98%.

EUT is connected to a computer through the usb-serial controller tool and Use test software to set the test mode.
Test software is (nrfgostudio_win-32_1.21.2_installer)

3.2.Configuration and peripherals

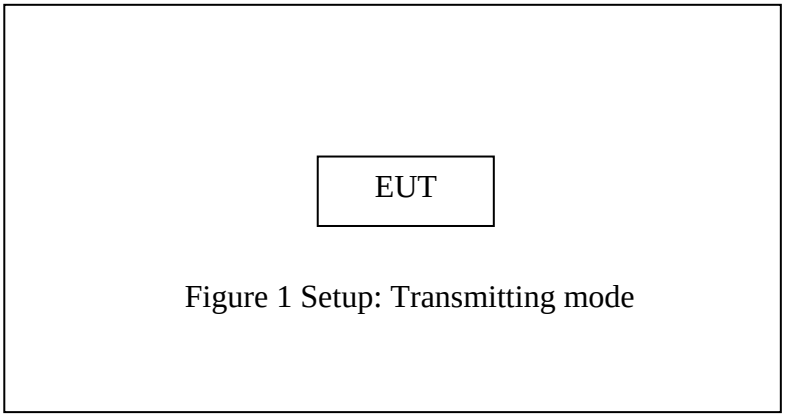


Figure 1 Setup: Transmitting mode

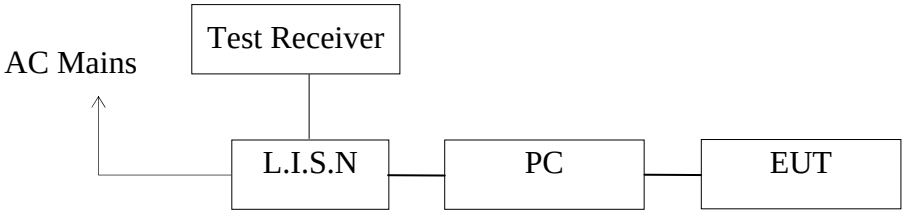
4. TEST PROCEDURES AND RESULTS

FCC Rules	Description of Test	Result
Section 15.207	AC Power Line Conducted Emission Test	Compliant
Section 15.247(a)(2)	6dB Bandwidth Test	Compliant
Section 15.247(b)(3)	Maximum Peak Output Power Test	Compliant
Section 15.247(e)	Power Spectral Density Test	Compliant
Section 15.247(d)	Band Edge Compliance Test	Compliant
Section 15.247(d) Section 15.209	Radiated Spurious Emission Test	Compliant
Section 15.203	Antenna Requirement	Compliant

5. POWER LINE CONDUCTED MEASUREMENT

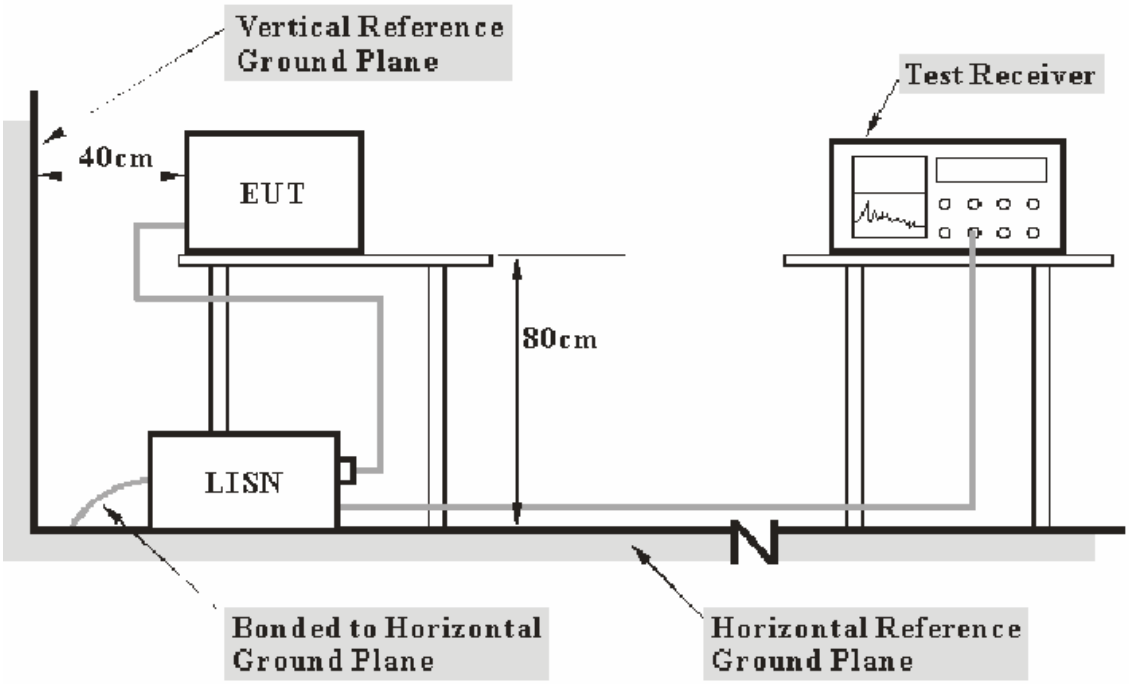
5.1.Block Diagram of Test Setup

5.1.1.Block diagram of connection between the EUT and simulators



(EUT: BLE Module)

5.1.2. Test System Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

5.2.Power Line Conducted Emission Measurement Limits

Frequency (MHz)	Limit dB(μV)	
	Quasi-peak Level	Average Level
0.15 - 0.50	66.0 – 56.0 *	56.0 – 46.0 *
0.50 - 5.00	56.0	46.0
5.00 - 30.00	60.0	50.0
NOTE1: The lower limit shall apply at the transition frequencies. NOTE2: The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.		

5.3.Configuration of EUT on Measurement

The equipments are installed on Power Line Conducted Emission Measurement to meet the commission requirement and operating regulations in a manner, which tends to maximize its emission characteristics in a normal application.

5.4.Operating Condition of EUT

5.4.1. Setup the EUT and simulator as shown as Section 5.1.

5.4.2. Turn on the power of all equipment.

5.4.3. Let the EUT work in test mode and measure it.

5.5.Test Procedure

The EUT is put on the plane 0.8 m high above the ground by insulating support and is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC lines are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.10: 2013 on Conducted Emission Measurement.
The bandwidth of test receiver (R & S ESCS30) is set at 9kHz.

The frequency range from 150kHz to 30MHz is checked.

5.6.Data Sample

Frequency (MHz)	Transducer value (dB)	QuasiPeak Level (dBμV)	Average Level (dBμV)	QuasiPeak Limit (dBμV)	Average Limit (dBμV)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark (Pass/Fail)
X.XX	11.1	41.8	32.0	56.0	46.0	14.2	14.0	Pass

Frequency(MHz) = Emission frequency in MHz
Transducer value(dB) = Insertion loss of LISN + Cable Loss
Level(dBμV) = Quasi-peak Reading/Average Reading + Transducer value
Limit (dBμV) = Limit stated in standard
Margin = Limit (dBμV) - Level (dBμV)

Calculation Formula:
Margin = Limit (dBμV) - Level (dBμV)

5.7.Power Line Conducted Emission Measurement Results

Pass.

Test Lab: Shielding room
Test Engineer: Star

The frequency range from 150kHz to 30MHz is checked.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.
Emissions attenuated more than 20 dB below the permissible value are not reported.

All data was recorded in the Quasi-peak and average detection mode.

The spectral diagrams are attached as below.

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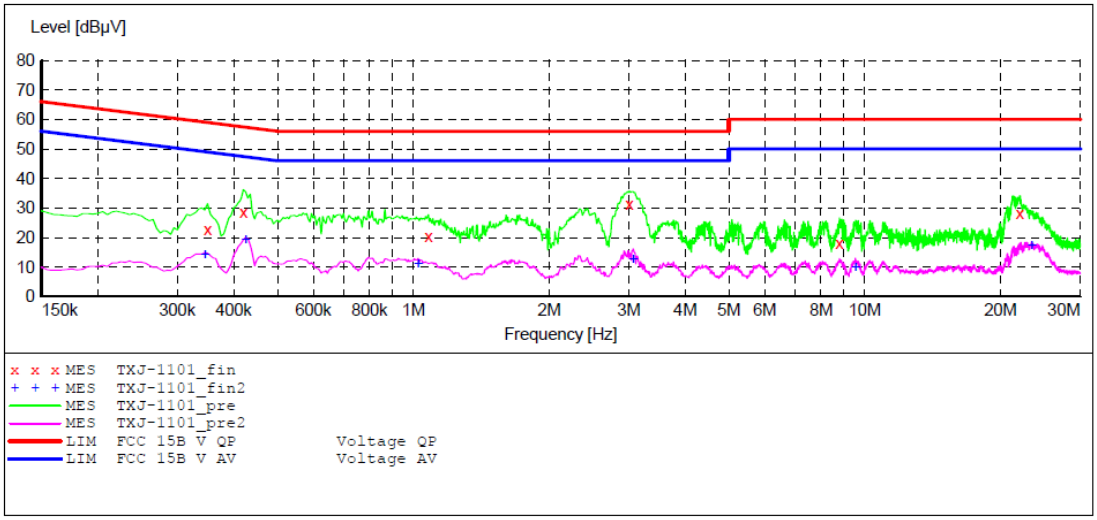
CONDUCTED EMISSION STANDARD FCC PART 15C

```
EUT:                  BLE Module    M/N:IMM-NRF52832-NANO
Manufacturer:         I-SYST Inc.
Operating Condition:  BT Communication
Test Site:            1#Shielding Room
Operator:             Star
Test Specification:   N 240V/60Hz
Comment:              Report NO.:ATE20180533
Start of Test:        17/4/2018 / 5:04:56PM
```

SCAN TABLE: "V 9K-30MHz fin"

Short Description: _SUB_STD_VTERM2 1.70

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak Average	1.0 s	200 Hz	NSLK8126 2008
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak Average	1.0 s	9 kHz	NSLK8126 2008



MEASUREMENT RESULT: "TXJ-1101_fin"

17/4/2018 5:08PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.350000	22.50	10.6	59	36.5	QP	N	GND
0.420000	28.60	10.7	57	28.8	QP	N	GND
1.080000	20.30	10.9	56	35.7	QP	N	GND
3.010000	31.10	11.1	56	24.9	QP	N	GND
8.790000	18.00	11.3	60	42.0	QP	N	GND
22.030000	28.20	11.4	60	31.8	QP	N	GND

MEASUREMENT RESULT: "TXJ-1101_fin2"

17/4/2018 5:08PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.345000	14.00	10.6	49	35.1	AV	N	GND
0.425000	19.10	10.7	47	28.2	AV	N	GND
1.025000	11.20	10.8	46	34.8	AV	N	GND
3.070000	12.50	11.1	46	33.5	AV	N	GND
9.540000	10.00	11.3	50	40.0	AV	N	GND
23.440000	17.10	11.5	50	32.9	AV	N	GND

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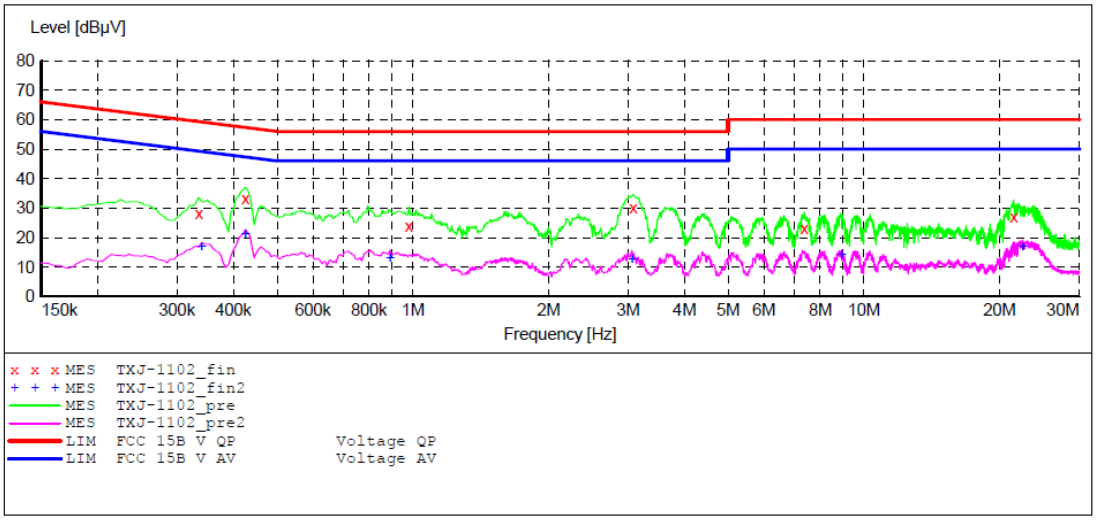
CONDUCTED EMISSION STANDARD FCC PART 15C

```
EUT:                  BLE Module    M/N:IMM-NRF52832-NANO
Manufacturer:         I-SYST Inc.
Operating Condition:  BT Communication
Test Site:            1#Shielding Room
Operator:             Star
Test Specification:   L 240V/60Hz
Comment:              Report NO.:ATE20180533
Start of Test:        17/4/2018 / 5:09:44PM
```

SCAN TABLE: "V 9K-30MHz fin"

Short Description: _SUB_STD_VTERM2 1.70

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak Average	1.0 s	200 Hz	NSLK8126 2008
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak Average	1.0 s	9 kHz	NSLK8126 2008



MEASUREMENT RESULT: "TXJ-1102_fin"

17/4/2018 5:14PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.335000	28.10	10.6	59	31.2	QP	L1	GND
0.425000	33.20	10.7	57	24.1	QP	L1	GND
0.980000	24.00	10.8	56	32.0	QP	L1	GND
3.080000	29.90	11.1	56	26.1	QP	L1	GND
7.380000	22.90	11.2	60	37.1	QP	L1	GND
21.490000	26.90	11.4	60	33.1	QP	L1	GND

MEASUREMENT RESULT: "TXJ-1102_fin2"

17/4/2018 5:14PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.340000	16.90	10.6	49	32.3	AV	L1	GND
0.425000	21.20	10.7	47	26.1	AV	L1	GND
0.890000	13.10	10.8	46	32.9	AV	L1	GND
3.060000	12.50	11.1	46	33.5	AV	L1	GND
8.920000	14.00	11.3	50	36.0	AV	L1	GND
22.495000	16.70	11.4	50	33.3	AV	L1	GND

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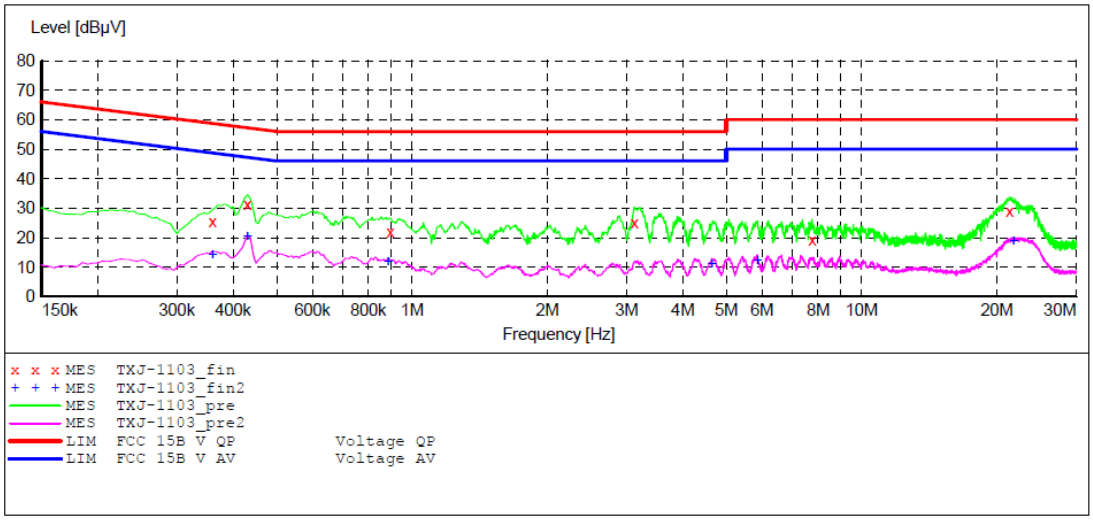
CONDUCTED EMISSION STANDARD FCC PART 15C

```
EUT:                  BLE Module    M/N:IMM-NRF52832-NANO
Manufacturer:         I-SYST Inc.
Operating Condition:  BT Communication
Test Site:            1#Shielding Room
Operator:             Star
Test Specification:   L 120V/60Hz
Comment:              Report NO.:ATE20180533
Start of Test:        17/4/2018 / 5:15:15PM
```

SCAN TABLE: "V 9K-30MHz fin"

Short Description: _SUB_STD_VTERM2 1.70

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak Average	1.0 s	200 Hz	NSLK8126 2008
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak Average	1.0 s	9 kHz	NSLK8126 2008



MEASUREMENT RESULT: "TXJ-1103_fin"

17/4/2018 5:18PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.360000	25.50	10.6	59	33.2	QP	L1	GND
0.430000	31.30	10.7	57	26.0	QP	L1	GND
0.895000	22.10	10.8	56	33.9	QP	L1	GND
3.120000	25.00	11.1	56	31.0	QP	L1	GND
7.760000	19.30	11.2	60	40.7	QP	L1	GND
21.325000	29.10	11.4	60	30.9	QP	L1	GND

MEASUREMENT RESULT: "TXJ-1103_fin2"

17/4/2018 5:18PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.360000	14.30	10.6	49	34.4	AV	L1	GND
0.430000	20.20	10.7	47	27.1	AV	L1	GND
0.885000	11.70	10.8	46	34.3	AV	L1	GND
4.640000	11.10	11.1	46	34.9	AV	L1	GND
5.860000	12.10	11.2	50	37.9	AV	L1	GND
21.760000	19.00	11.4	50	31.0	AV	L1	GND

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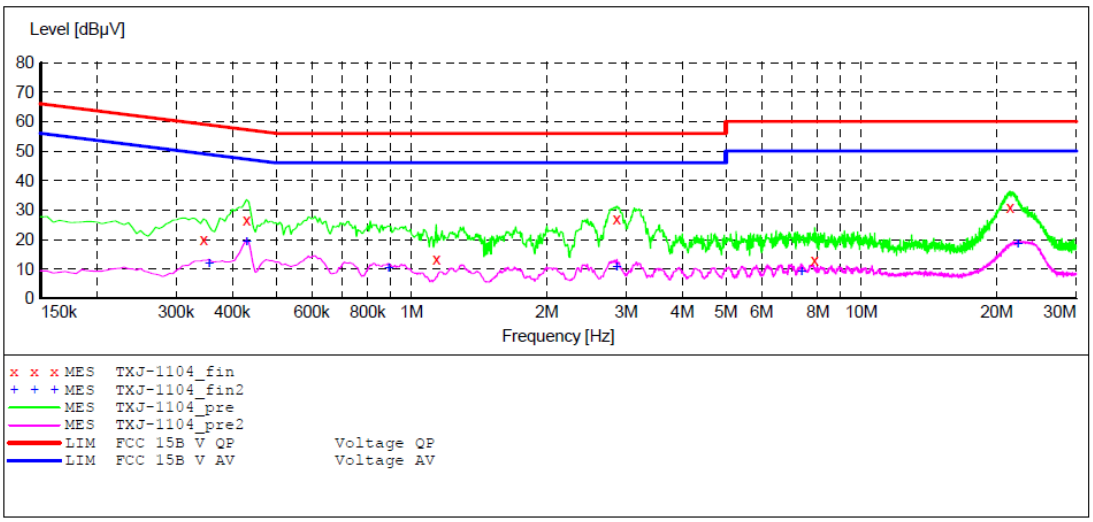
CONDUCTED EMISSION STANDARD FCC PART 15C

```
EUT:                  BLE Module   M/N:IMM-NRF52832-NANO
Manufacturer:         I-SYST Inc.
Operating Condition:  BT Communication
Test Site:            1#Shielding Room
Operator:             Star
Test Specification:   N 120V/60Hz
Comment:              Report NO.:ATE20180533
Start of Test:        17/4/2018 / 5:23:26PM
```

SCAN TABLE: "V 9K-30MHz fin"

Short Description: _SUB_STD_VTERM2 1.70

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
9.0 kHz	150.0 kHz	100.0 Hz	QuasiPeak Average	1.0 s	200 Hz	NSLK8126 2008
150.0 kHz	30.0 MHz	5.0 kHz	QuasiPeak Average	1.0 s	9 kHz	NSLK8126 2008



MEASUREMENT RESULT: "TXJ-1104_fin"

17/4/2018 5:24PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.345000	19.90	10.6	59	39.2	QP	N	GND
0.430000	26.60	10.7	57	30.7	QP	N	GND
1.135000	13.20	10.9	56	42.8	QP	N	GND
2.860000	26.80	11.0	56	29.2	QP	N	GND
7.880000	13.00	11.2	60	47.0	QP	N	GND
21.400000	31.00	11.4	60	29.0	QP	N	GND

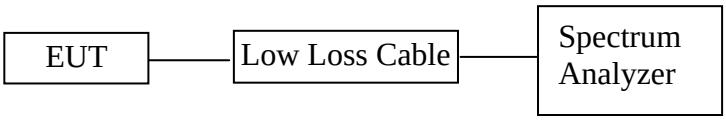
MEASUREMENT RESULT: "TXJ-1104_fin2"

17/4/2018 5:24PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.355000	11.90	10.6	49	36.9	AV	N	GND
0.430000	19.10	10.7	47	28.2	AV	N	GND
0.890000	10.10	10.8	46	35.9	AV	N	GND
2.860000	10.70	11.0	46	35.3	AV	N	GND
7.360000	9.00	11.2	50	41.0	AV	N	GND
22.255000	18.40	11.4	50	31.6	AV	N	GND

6. 6DB BANDWIDTH MEASUREMENT

6.1.Block Diagram of Test Setup



(EUT: BLE Module)

6.2.The Requirement For Section 15.247(a)(2)

Section 15.247(a)(2): Systems using digital modulation techniques may operate in the 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

6.3.EUT Configuration on Measurement

The equipment is installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

6.4.Operating Condition of EUT

6.4.1.Setup the EUT and simulator as shown as Section 6.1.

6.4.2.Turn on the power of all equipment.

6.4.3.Let the EUT work in TX modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2440MHz, and 2480MHz TX frequency to transmit.

6.5.Test Procedure

6.5.1.The transmitter output was connected to the spectrum analyzer through a low loss cable.

6.5.2.Set RBW of spectrum analyzer to 100 kHz and VBW to 300 kHz.

6.5.3.The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

6.6.Test Result

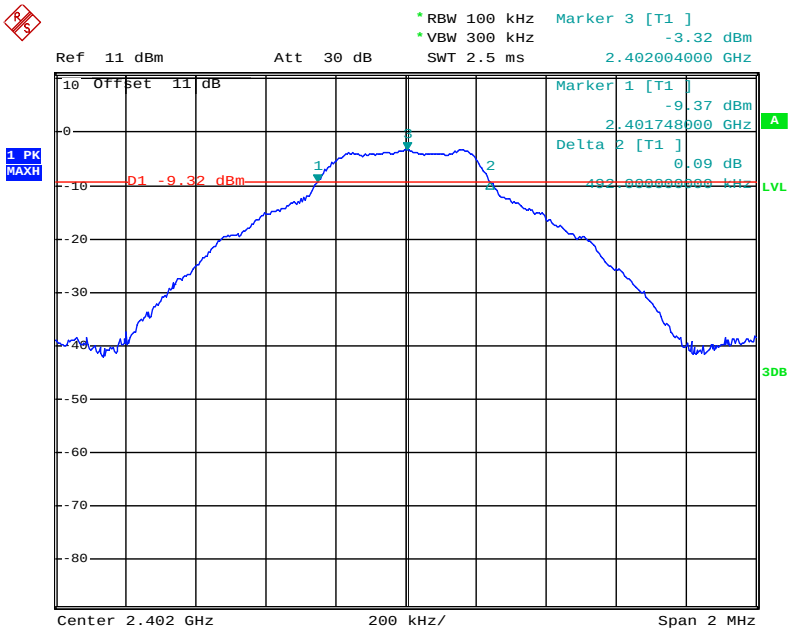
Test Lab: Shielding room
Test Engineer: Star
Note: We tested the rates of all the mode and recorded the worst case data

Channel	Frequency (MHz)	6 dB Bandwith (MHz)		Minimum Limit(MHz)	Results
		1M Rate	2M Rate		
0	2402	0.492	0.680	0.5	PASS
19	2440	0.496	0.696	0.5	PASS
39	2480	0.488	0.676	0.5	PASS

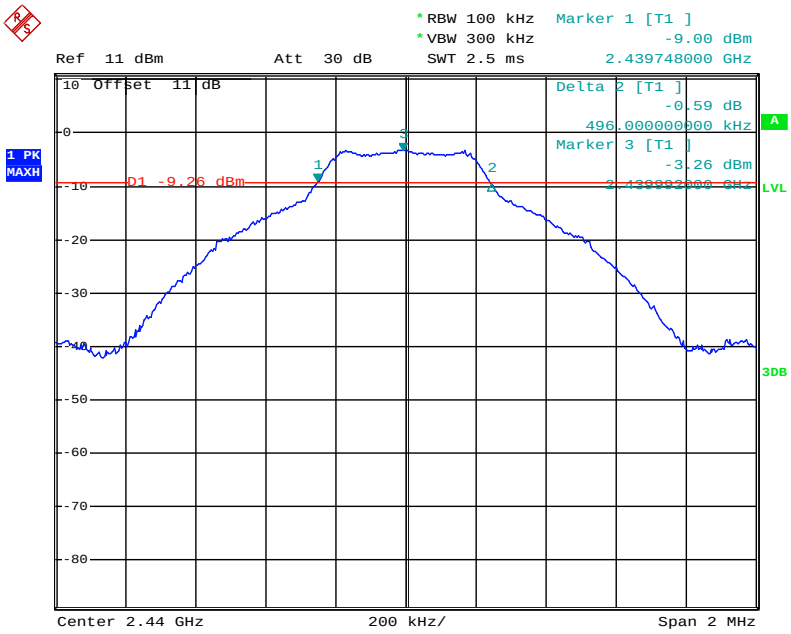
The spectrum analyzer plots are attached as below.

1M Rate:

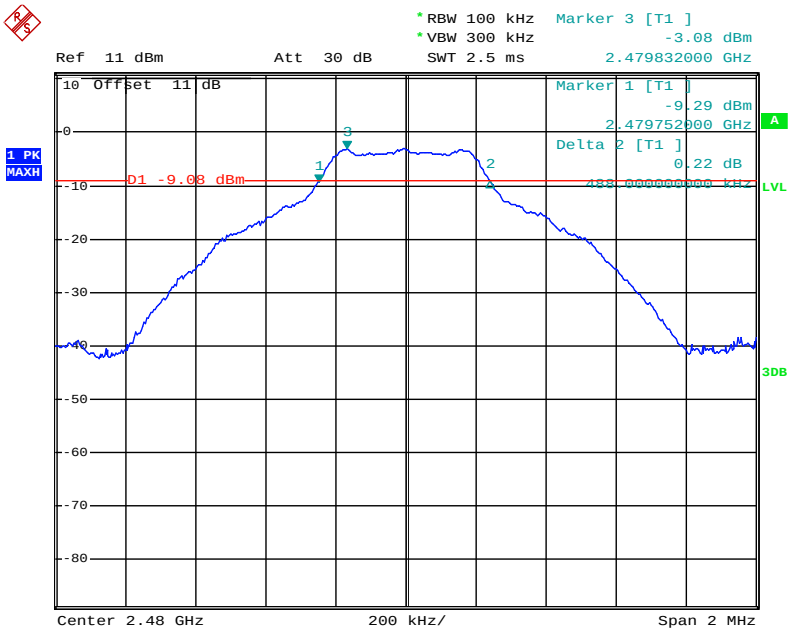
channel 0



channel 19

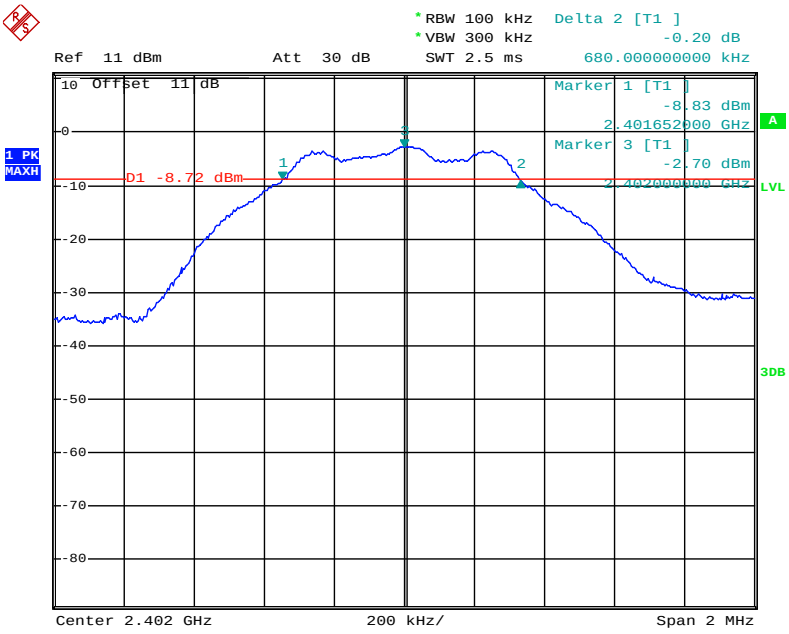


channel 39

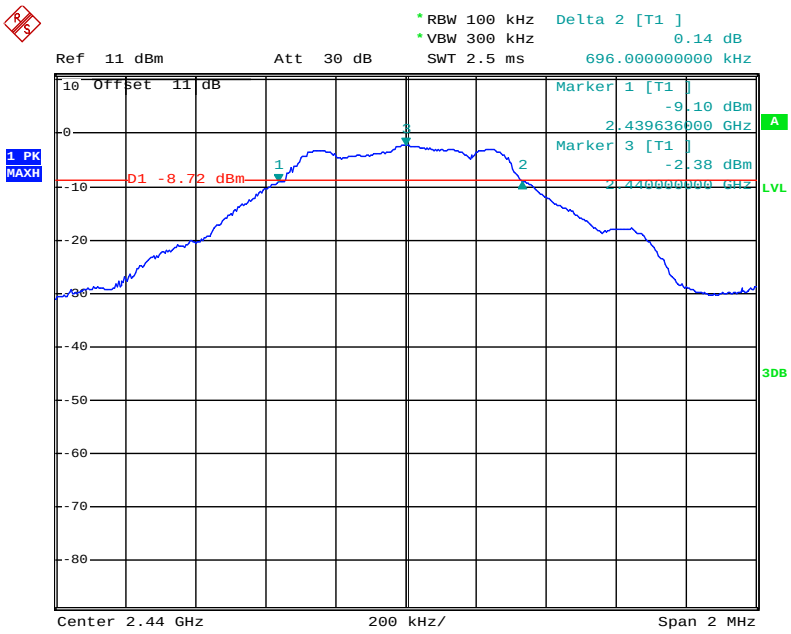


2M Rate:

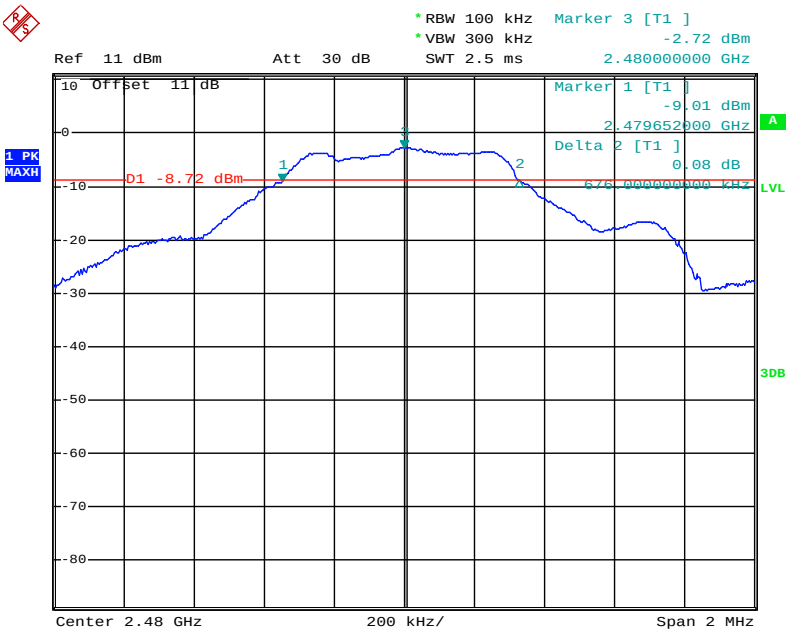
channel 0



channel 19

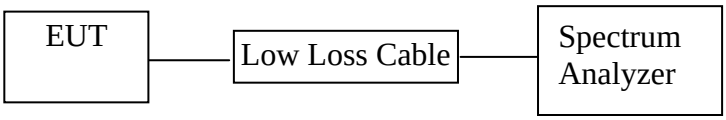


channel 39


RBW 100 kHz
VBW 300 kHz
SWT 2.5 ms
Marker 3 [T1]
-2.72 dBm
2.480000000 GHz
Ref 11 dBm
Att 30 dB
10 Offset 11 dB
Marker 1 [T1]
-9.01 dBm
2.479652000 GHz
Delta 2 [T1]
0.08 dB
676.000000000 kHz
1 PK
MAXH
D1 -8.72 dBm
A
LVL
3DB
0
-10
-20
-30
-40
-50
-60
-70
-80
Center 2.48 GHz
200 kHz/
Span 2 MHz

7. MAXIMUM PEAK OUTPUT POWER

7.1.Block Diagram of Test Setup



(EUT: BLE Module)

7.2.The Requirement For Section 15.247(b)(3)

Section 15.247(b)(3): For systems using digital modulation in the 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz bands: 1 Watt.

7.3.EUT Configuration on Measurement

The equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

7.4.Operating Condition of EUT

7.4.1.Setup the EUT and simulator as shown as Section 7.1.

7.4.2.Turn on the power of all equipment.

7.4.3.Let the EUT work in TX modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2440MHz, and 2480MHz TX frequency to transmit.

7.5.Test Procedure

7.5.1.The transmitter output was connected to the spectrum analyzer through a low loss cable.

7.5.2.Set RBW of spectrum analyzer to 1 MHz and VBW to 3MHz.

7.5.3.Measurement the maximum peak output power.

7.6.Test Result

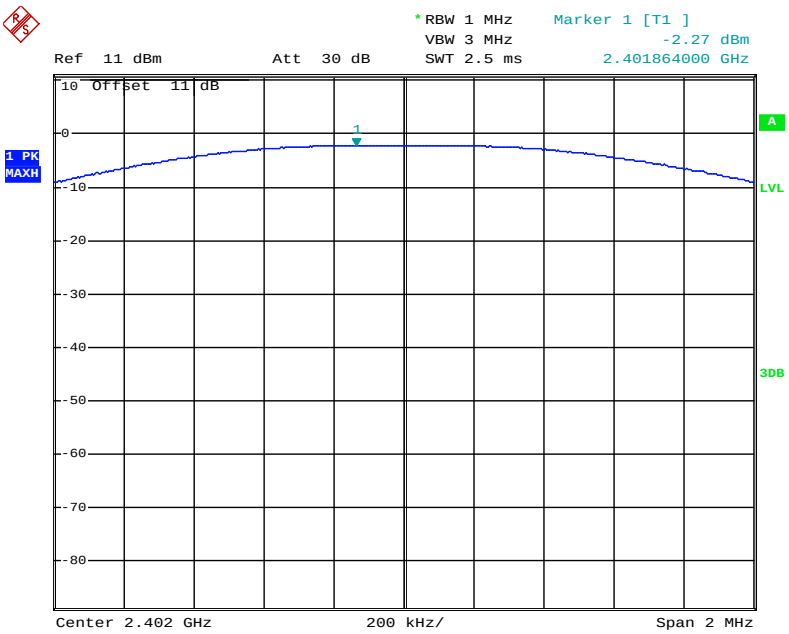
Test Lab: Shielding room
Test Engineer: Star
Note: We tested the rates of all the mode and recorded the worst case data

Channel	Frequency (MHz)	Peak Power Output (dBm)		Peak Power Limit (dBm)	Results
		1M Rate	2M Rate		
0	2402	-2.27	-2.08	30	PASS
19	2440	-2.38	-1.94	30	PASS
39	2480	-2.71	-2.71	30	PASS

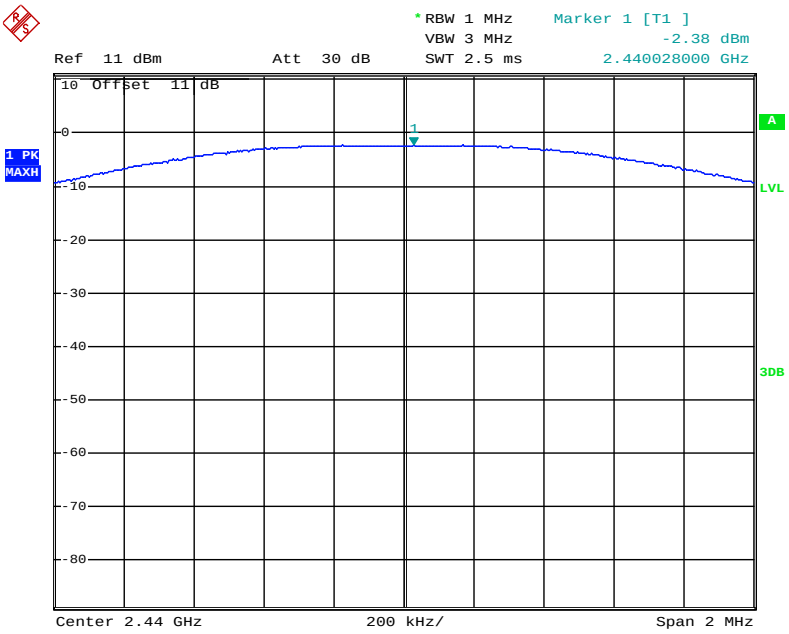
The spectrum analyzer plots are attached as below.

1M Rate:

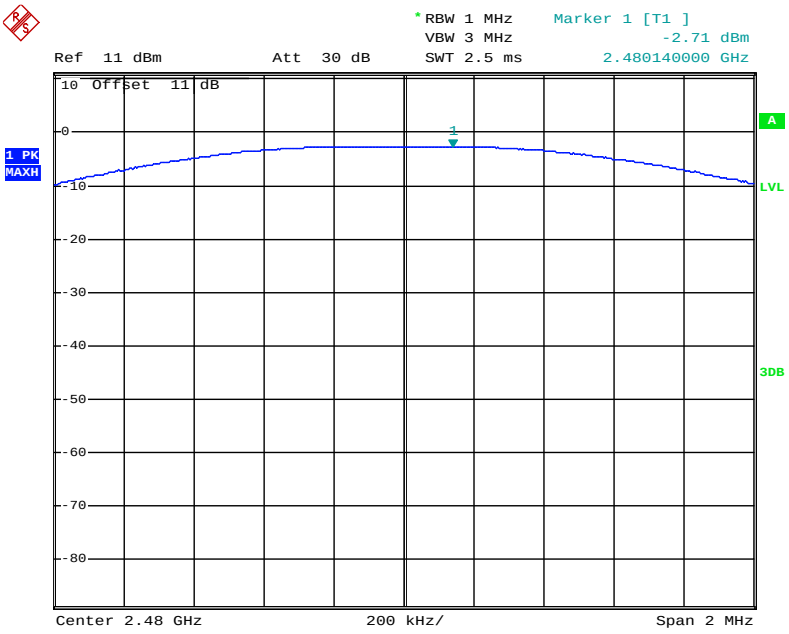
channel 0



channel 19

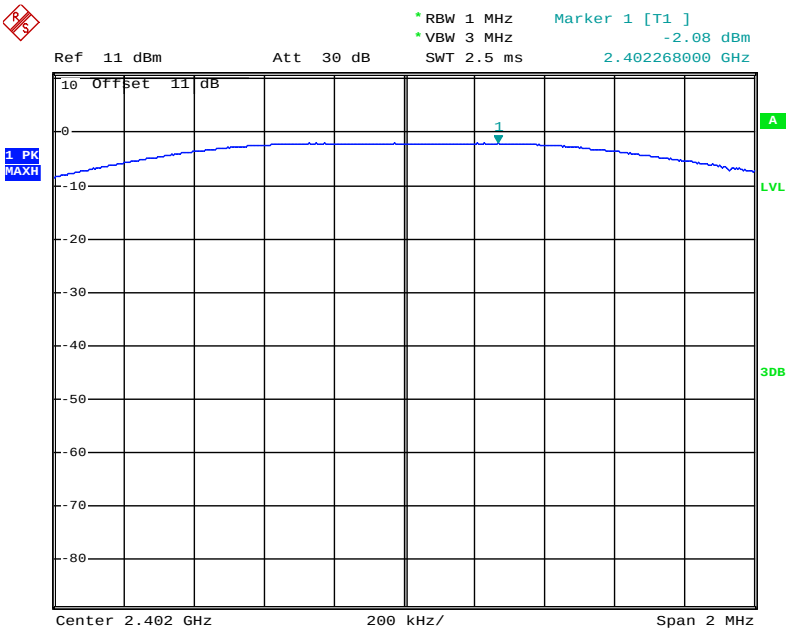


channel 39

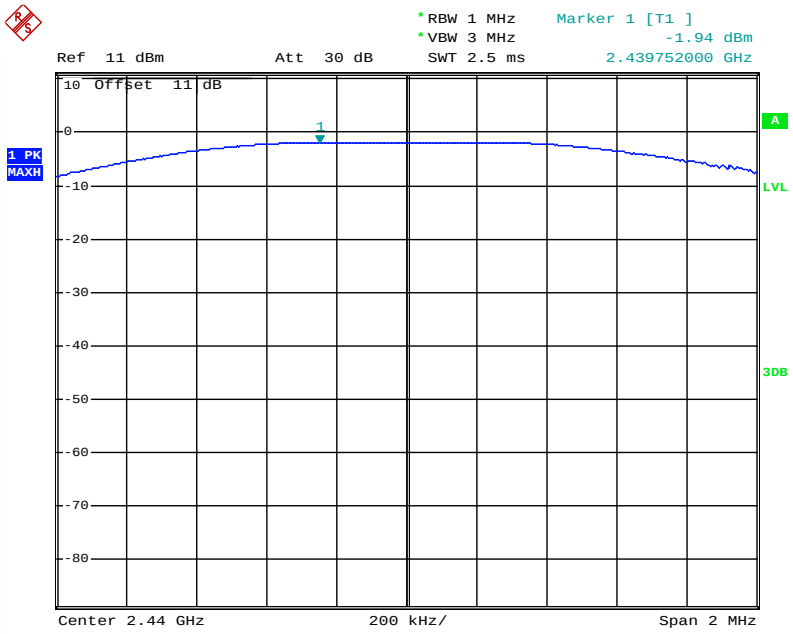


2M Rate:

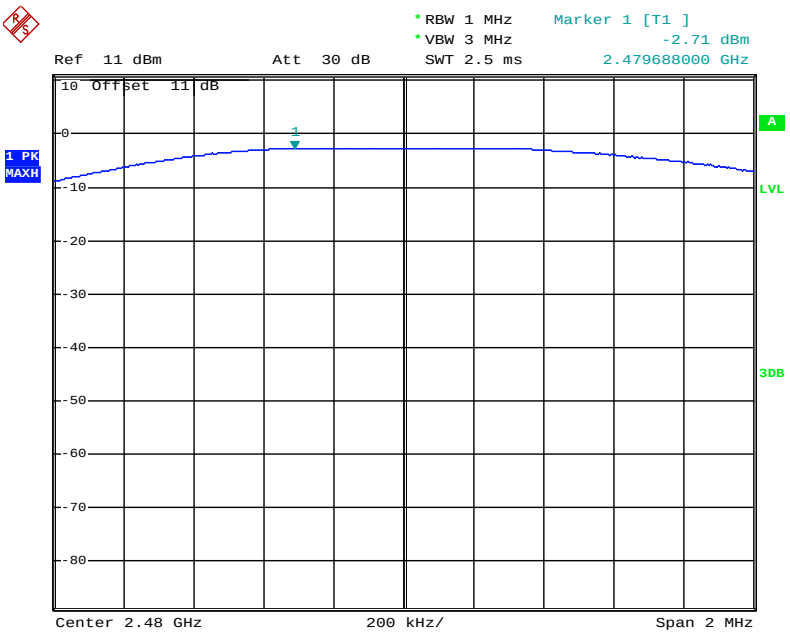
channel 0



channel 19

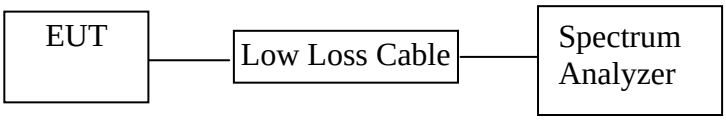


channel 39


RBW 1 MHz
VBW 3 MHz
SWT 2.5 ms
Marker 1 [T1]
-2.71 dBm
2.479688000 GHz
Ref 11 dBm
Att 30 dB
Offset 11 dB
1 PK
MAXH
A
LVL
3DB
10
0
-10
-20
-30
-40
-50
-60
-70
-80
Center 2.48 GHz
200 kHz/
Span 2 MHz

8. POWER SPECTRAL DENSITY MEASUREMENT

8.1.Block Diagram of Test Setup



(EUT: BLE Module)

8.2.The Requirement For Section 15.247(e)

Section 15.247(e): For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

8.3.EUT Configuration on Measurement

The equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

8.4.Operating Condition of EUT

8.4.1.Setup the EUT and simulator as shown as Section 8.1.

8.4.2.Turn on the power of all equipment.

8.4.3.Let the EUT work in TX modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2440MHz, and 2480MHz TX frequency to transmit.

8.5.Test Procedure

8.5.1.The transmitter output was connected to the spectrum analyzer through a low loss cable.

8.5.2.Measurement Procedure PKPSD:

8.5.3.This procedure must be used if maximum peak conducted output power was used to demonstrate compliance to the fundamental output power limit, and is optional if the maximum (average) conducted output power was used to demonstrate compliance.

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS channel bandwidth.
3. Set the RBW to: 3 kHz ≤ RBW ≤ 100 kHz.
4. Set the VBW ≥ 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.
10. If measured value exceeds limit, reduce RBW (no less than 3kHz) and repeat.

8.5.4.Measurement the maximum power spectral density.

8.6.Test Result

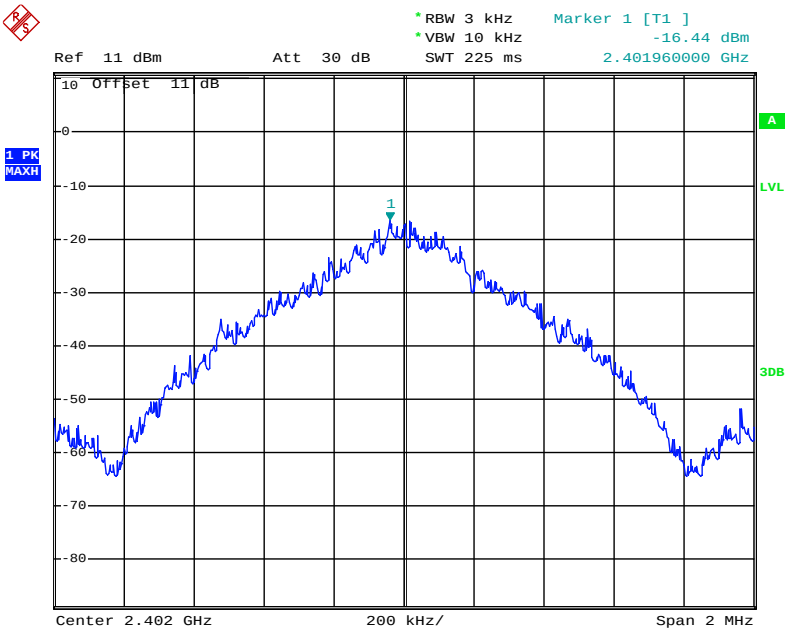
Test Lab: Shielding room
Test Engineer: Star
Note: We tested the rates of all the mode and recorded the worst case data

CHANNEL NUMBER	FREQUENCY (MHz)	PSD (dBm/3KHz)		LIMIT (dBm/3KHz)	Results
		1M Rate	2M Rate		
0	2402	-16.44	-15.88	8	PASS
19	2440	-15.51	-16.56	8	PASS
39	2480	-16.17	-16.84	8	PASS

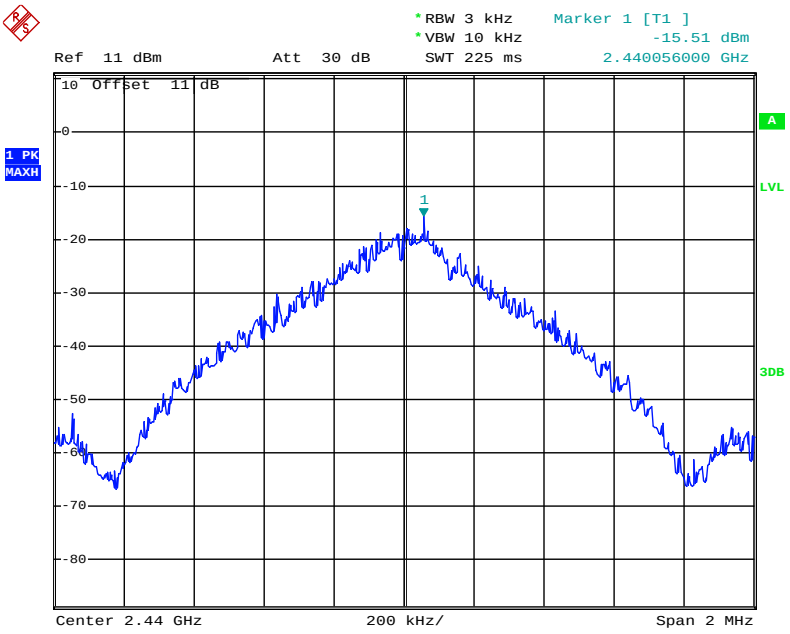
The spectrum analyzer plots are attached as below.

1M Rate:

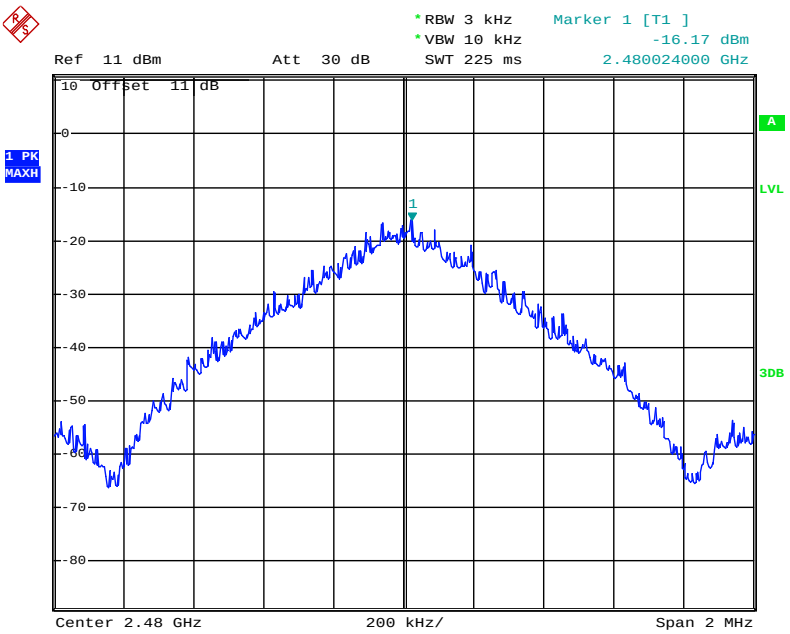
channel 0



channel 19

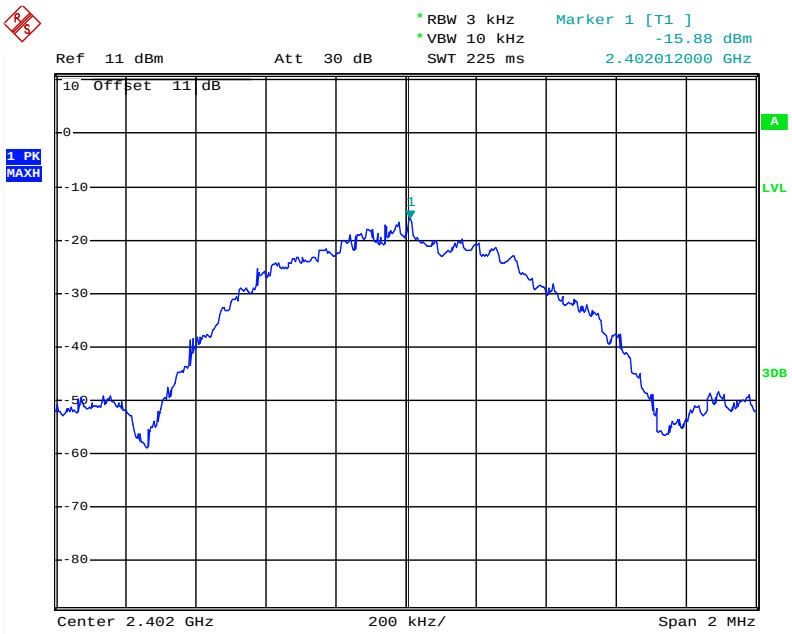


channel 39

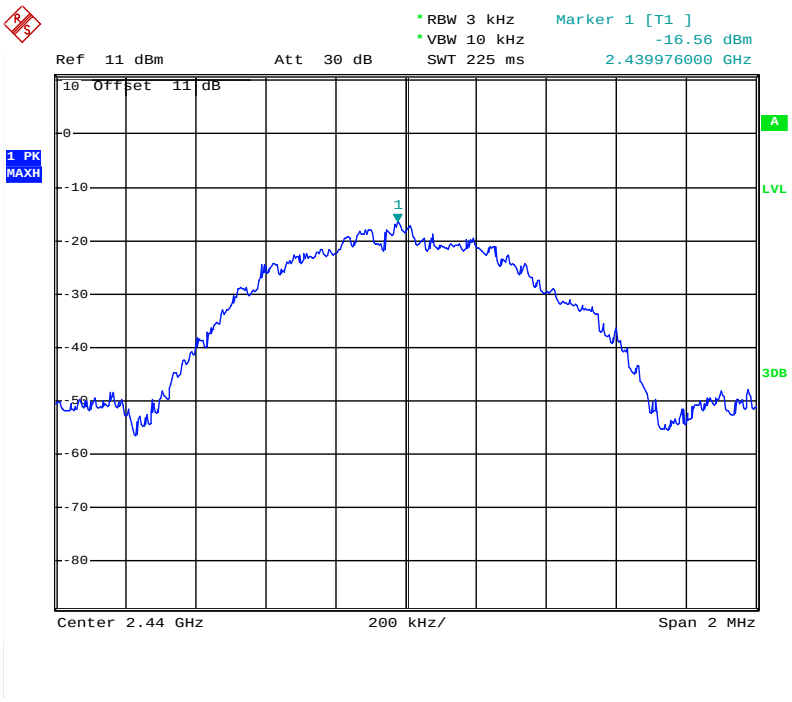


2M Rate:

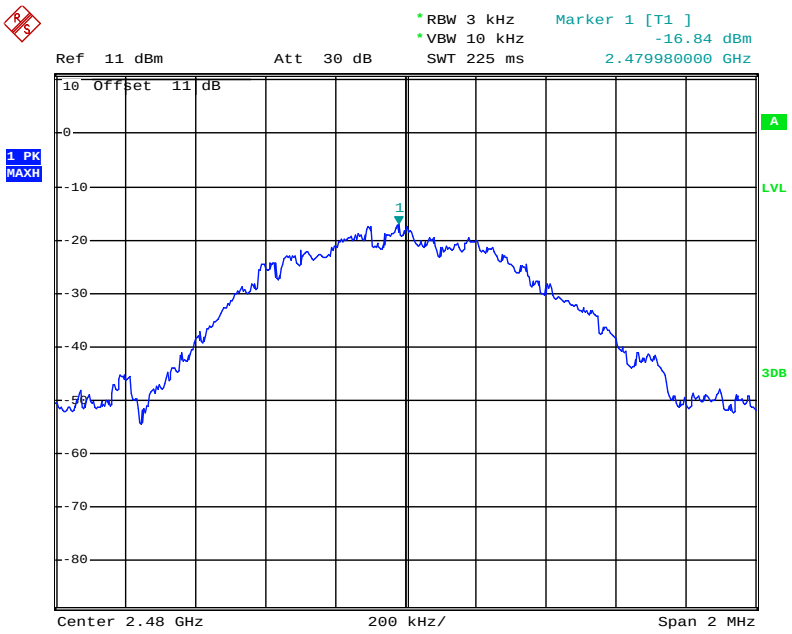
channel 0



channel 19

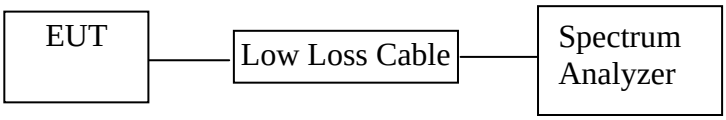


channel 39



9. BAND EDGE COMPLIANCE TEST

9.1.Block Diagram of Test Setup



(EUT: BLE Module)

9.2.The Requirement For Section 15.247(d)

Section 15.247(d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

9.3.EUT Configuration on Measurement

The equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

9.4.Operating Condition of EUT

9.4.1.Setup the EUT and simulator as shown as Section 9.1.

9.4.2.Turn on the power of all equipment.

9.4.3.Let the EUT work in TX modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2480MHz TX frequency to transmit.

9.5.Test Procedure

Conducted Band Edge:

9.5.1.The transmitter output was connected to the spectrum analyzer via a low loss cable.

9.5.2.Set RBW of spectrum analyzer to 100 kHz and VBW to 300 kHz.

9.5.3. Radiate Band Edge:

9.5.4.The EUT is placed on a turntable, which is 1.5m above the ground plane and worked at highest radiated power.

9.5.5.The turntable was rotated for 360 degrees to determine the position of maximum emission level.

9.5.6.EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.

9.5.7.Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:

9.5.8.RBW=1MHz, VBW=1MHz

9.5.9.The band edges was measured and recorded.

9.6.Test Result

Pass.

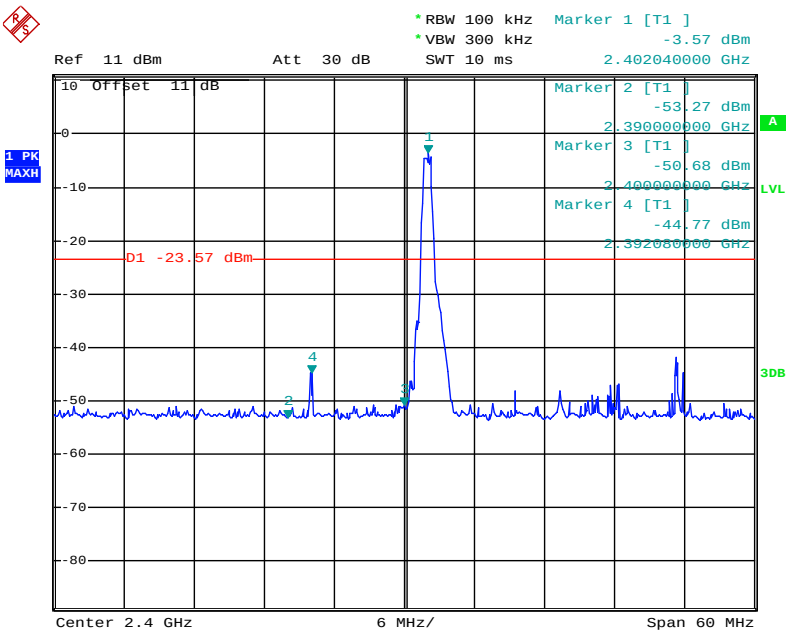
Test Lab: Shielding room
Test Engineer: Star
Note: We tested the rates of all the mode and recorded the worst case(2M rates) data

Conducted Band Edge Result

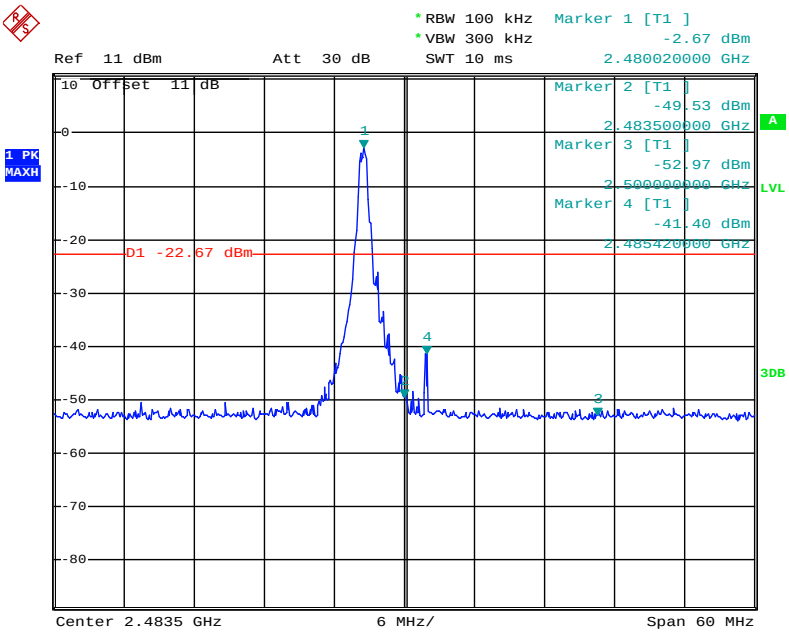
2M rates:

Channel	Frequency	Delta peak to band emission	Limit(dBc)
0	2.402GHz	47.11	20
39	2.480GHz	46.86	20

channel 0



channel 39

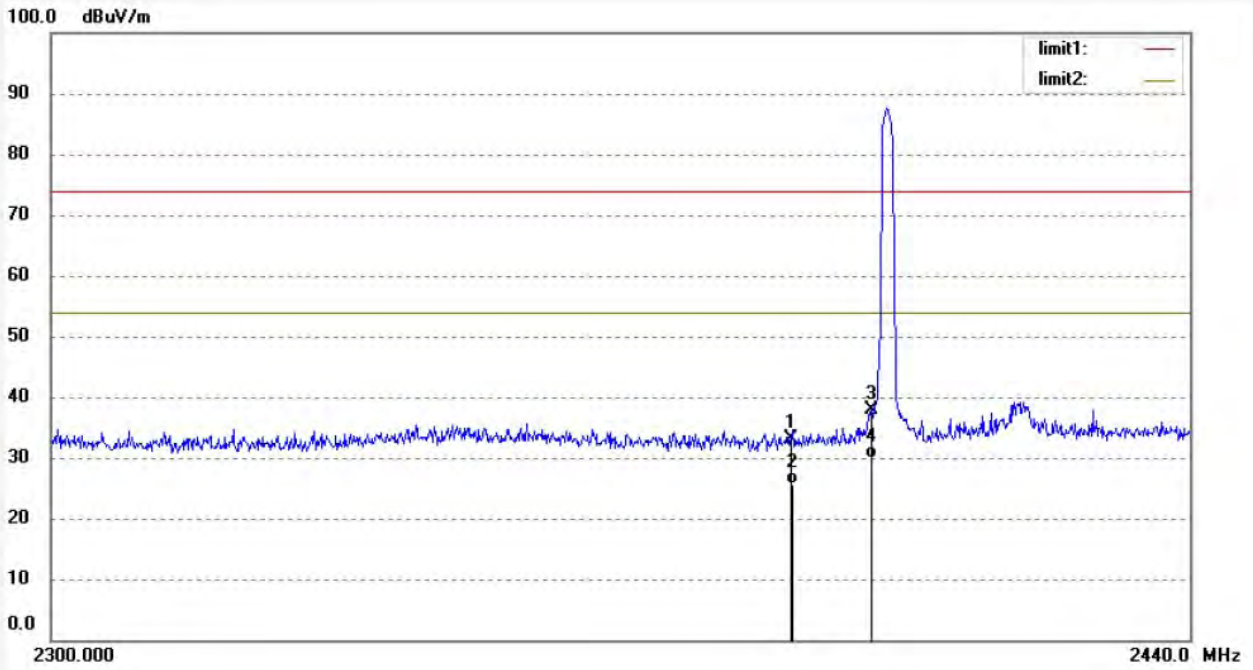


Radiated Band Edge Result: 2M Rates

ACCURATE TECHNOLOGY CO., LTD.
F1,Bldg,A,Changyuan New Material Port Keyuan Rd,
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: star2017 #1136	Polarization: Horizontal
Standard: FCC Class C 3M Radiated	Power Source: DC 3.3V
Test item: Radiation Test	Date: 18/04/17/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 9/48/58
EUT: BLE Module	Engineer Signature: star
Mode: TX 2402MHz	Distance: 3m
Model: IMM-NRF52832-NANO	
Manufacturer: I-SYST Inc.	

Note: Report No.:ATE20180553



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	39.40	-6.32	33.08	74.00	-40.92	peak	150	106	
2	2390.000	31.87	-6.32	25.55	54.00	-28.45	AVG	150	124	
3	2400.000	44.11	-6.27	37.84	74.00	-36.16	peak	150	263	
4	2400.000	36.11	-6.27	29.84	54.00	-24.16	AVG	150	199	

ACCURATE TECHNOLOGY CO., LTD.
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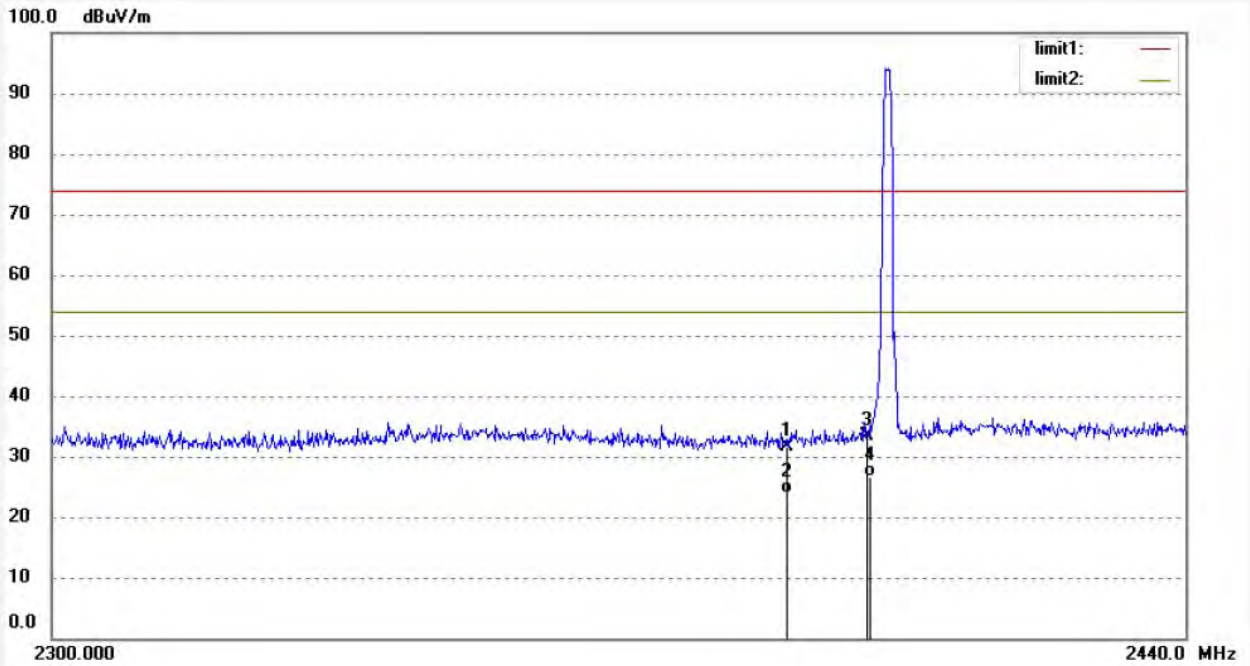
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: star2017 #1135	Polarization: Vertical
Standard: FCC Class C 3M Radiated	Power Source: DC 3.3V
Test item: Radiation Test	Date: 18/04/17/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 9/46/57
EUT: BLE Module	Engineer Signature: star
Mode: TX 2402MHz	Distance: 3m
Model: IMM-NRF52832-NANO	
Manufacturer: I-SYST Inc.	

Note: Report No.:ATE20180553



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2390.000	37.98	-6.32	31.66	74.00	-42.34	peak	150	302	
2	2390.000	30.14	-6.32	23.82	54.00	-30.18	AVG	150	275	
3	2400.000	39.54	-6.27	33.27	74.00	-40.73	peak	150	258	
4	2400.000	32.93	-6.27	26.66	54.00	-27.34	AVG	150	132	

ACCURATE TECHNOLOGY CO., LTD.
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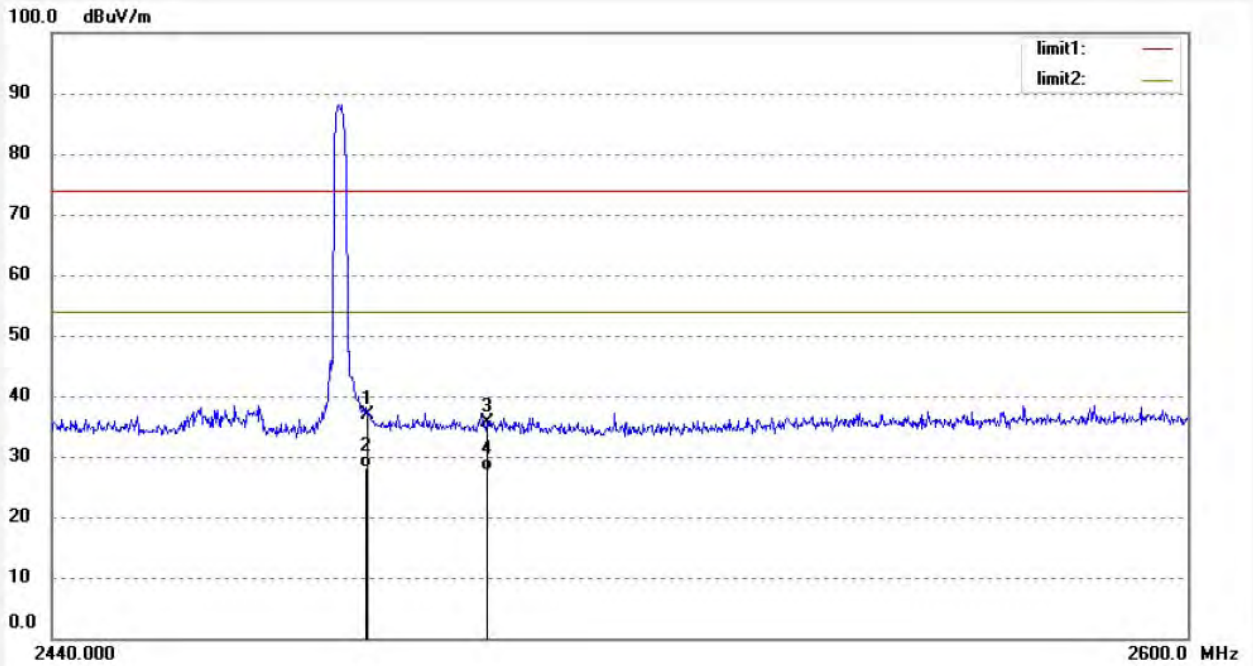
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: star2017 #1137	Polarization: Horizontal
Standard: FCC Class C 3M Radiated	Power Source: DC 3.3V
Test item: Radiation Test	Date: 18/04/17/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 9/56/06
EUT: BLE Module	Engineer Signature: star
Mode: TX 2480MHz	Distance: 3m
Model: IMM-NRF52832-NANO	
Manufacturer: I-SYST Inc.	

Note: Report No.:ATE20180553



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.500	42.73	-5.89	36.84	74.00	-37.16	peak	200	248	
2	2483.500	34.00	-5.89	28.11	54.00	-25.89	AVG	200	181	
3	2500.000	41.48	-5.81	35.67	74.00	-38.33	peak	200	111	
4	2500.000	33.48	-5.81	27.67	54.00	-26.33	AVG	200	97	

ACCURATE TECHNOLOGY CO., LTD.
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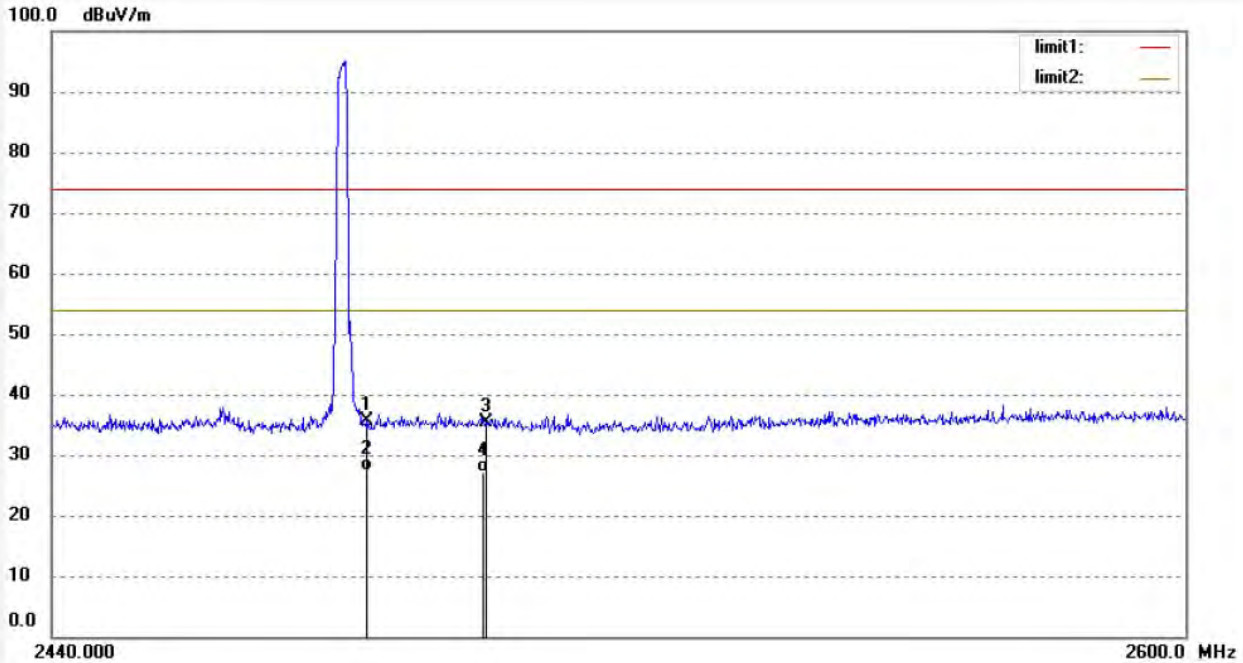
Science & Industry Park,Nanshan Shenzhen,P.R.China
Site: 1# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: star2017 #1138	Polarization: Vertical
Standard: FCC Class C 3M Radiated	Power Source: DC 3.3V
Test item: Radiation Test	Date: 18/04/17/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 9/59/03
EUT: BLE Module	Engineer Signature: star
Mode: TX 2480MHz	Distance: 3m
Model: IMM-NRF52832-NANO	
Manufacturer: I-SYST Inc.	

Note: Report No.:ATE20180553



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2483.500	41.64	-5.89	35.75	74.00	-38.25	peak	150	224	
2	2483.500	33.24	-5.89	27.35	54.00	-26.65	AVG	150	278	
3	2500.000	41.17	-5.81	35.36	74.00	-38.64	peak	150	206	
4	2500.000	32.94	-5.81	27.13	54.00	-26.87	AVG	150	199	

Note:

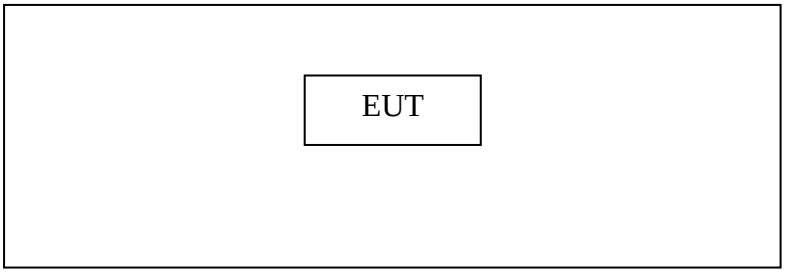
1. Emissions attenuated more than 20 dB below the permissible value are not reported.
2. The field strength is calculated by adding the antenna factor, high pass filter loss(if used) and cable loss, and subtracting the amplifier gain(if any)from the measured reading. The basic equation calculation is as follows:

   Result = Reading + Corrected Factor

10.RADIATED SPURIOUS EMISSION TEST

10.1.Block Diagram of Test Setup

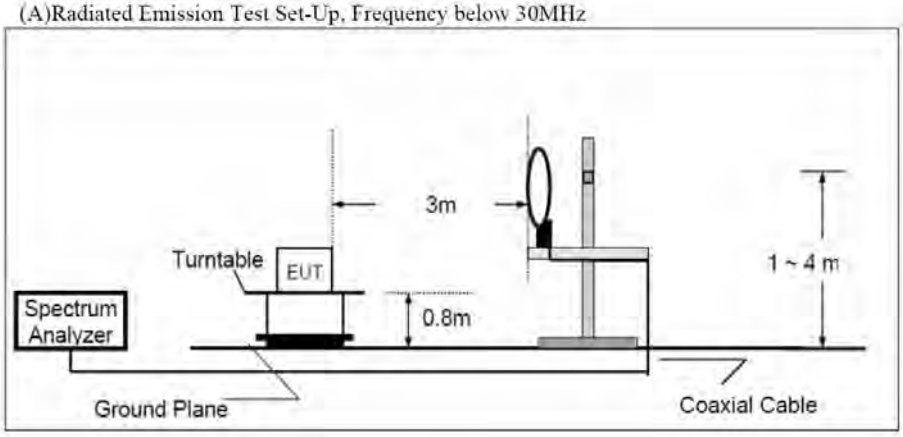
10.1.1.Block diagram of connection between the EUT and peripherals



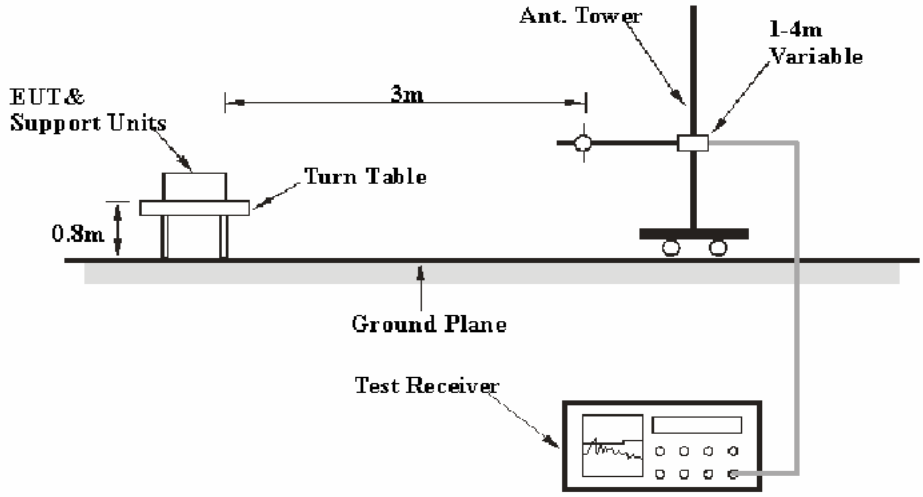
Setup: Transmitting mode

10.1.2.Semi-Anechoic Chamber Test Setup Diagram

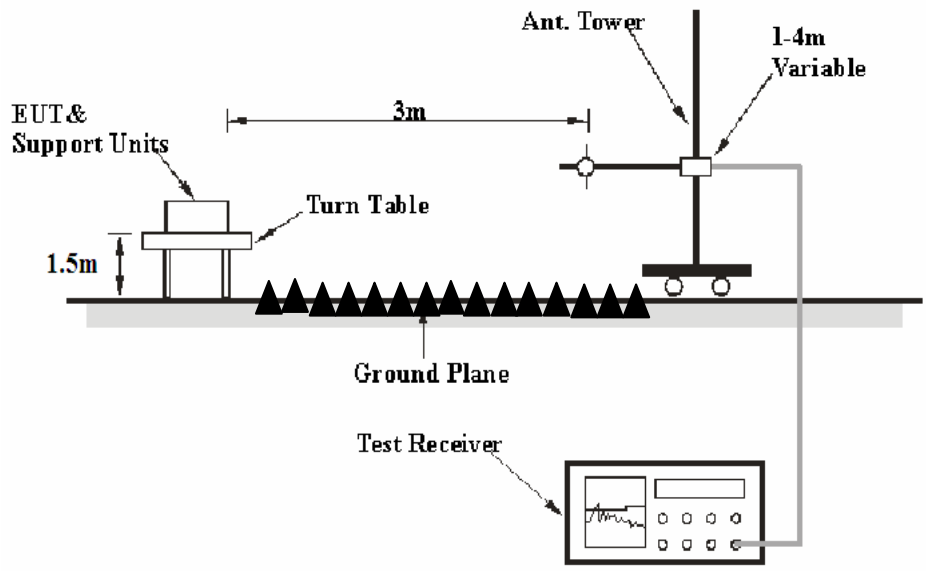
(A)Radiated Emission Test Set-Up, Frequency below 30MHz



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



(C) Radiated Emission Test Set-Up, Frequency above 1GHz



10.2.The Limit For Section 15.247(d)

Section 15.247(d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

10.3. Restricted bands of operation

10.3.1. FCC Part 15.205 Restricted bands of operation

(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			

[1]Until February 1, 1999, this restricted band shall be 0.490-0.510
[2]Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emission appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000MHz, Compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000MHz, compliance with the emission limits in Section15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

10.4. Configuration of EUT on Measurement

The equipment are installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

10.5. Operating Condition of EUT

10.5.1. Setup the EUT and simulator as shown as Section 10.1.

10.5.2. Turn on the power of all equipment.

10.5.3. Let the EUT work in TX modes measure it. The transmit frequency are 2402-2480MHz. We select 2402MHz, 2440MHz, and 2480MHz TX frequency to transmit.

10.6. Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground(Below 1GHz). The EUT and its simulators are placed on a turntable, which is 1.5 meter high above ground(Above 1GHz). The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bi-log antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the EUT location must be manipulated according to ANSI C63.10:2013 on radiated emission measurement. This EUT was tested in 3 orthogonal positions and the worst case position data was reported.

The bandwidth of test receiver is set at 9 kHz in below 30MHz. and set at 120 kHz in 30-1000MHz, and 1MHz in above 1000MHz.

The frequency range from 9 kHz to 26.5GHz is checked.

The final measurement in band 9-90 kHz, 110-490 kHz and above 1000MHz is performed with Average detector. Except those frequency bands mention above, the final measurement for frequencies below 1000MHz is performed with Quasi Peak detector.
The field strength is calculated by adding the antenna factor, and cable loss, and subtracting the amplifier gain from the measured reading.

10.7.Data Sample

Frequency (MHz)	Reading (dBμv)	Factor (dB/m)	Result (dBμv/m)	Limit (dBμv/m)	Margin (dB)	Remark
X.XX	28.66	-15.19	13.47	40.0	-26.53	QP

Frequency(MHz) = Emission frequency in MHz
Reading(dBμv) = Uncorrected Analyzer/Receiver reading
Factor (dB/m) = Antenna factor + Cable Loss – Amplifier gain
Result(dBμv/m) = Reading(dBμv) + Factor(dB/m)
Limit (dBμv/m) = Limit stated in standard
Margin (dB) = Result(dBμv/m) - Limit (dBμv/m)
QP = Quasi-peak Reading

Calculation Formula:
Margin(dB) = Result (dBμV/m)–Limit(dBμV/m)
Result(dBμV/m)= Reading(dBμV)+ Factor(dB/m)

The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the limit.

10.8.The Field Strength of Radiation Emission Measurement Results

Pass.

Test Lab: 3m Anechoic chamber
Test Engineer: Star

Note: 1. Emissions attenuated more than 20 dB below the permissible value are not reported.

2. *: Denotes restricted band of operation.

3. The radiation emissions from 9kHz-30MHz and 18-26.5GHz are not reported, because the test values lower than the limits of 20dB.

4. We tested the rates of all the mode and recorded the worst case(2M rates) data

Below 1GHz: 2M Rates

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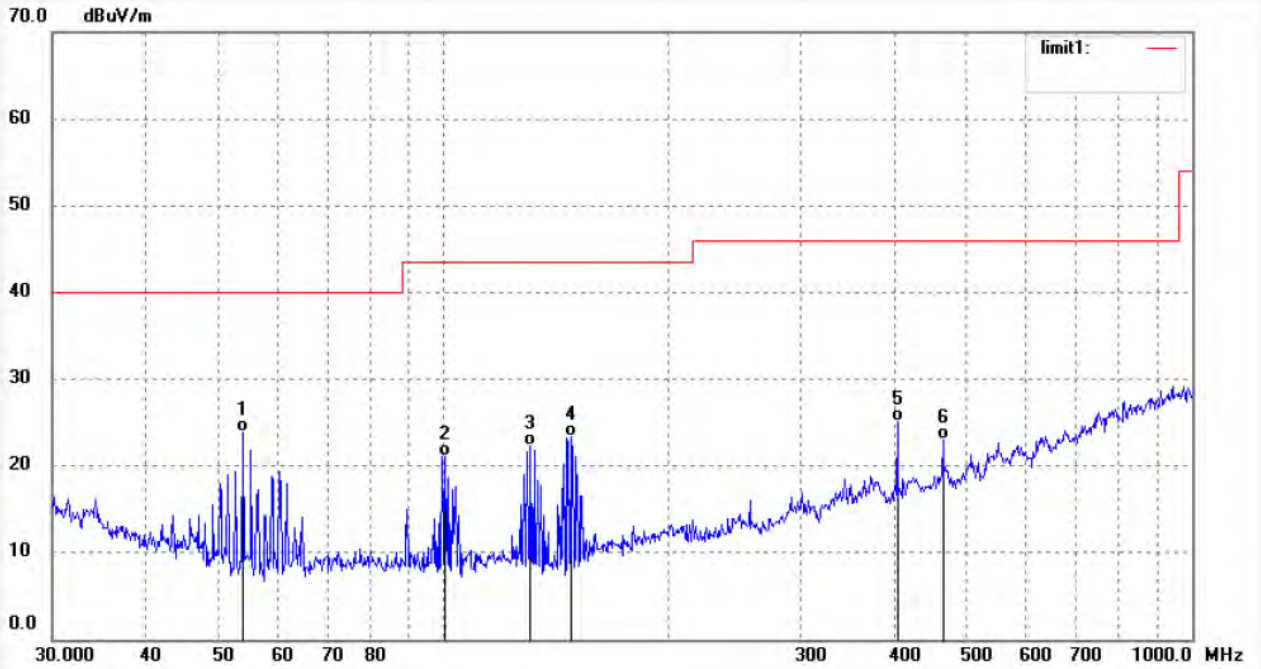
Job No.: star2017 #1123	Polarization: Horizontal
Standard: FCC Class C 3M Radiated	Power Source: DC 3.3V
Test item: Radiation Test	Date: 18/04/17/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 9/03/02
EUT: BLE Module	Engineer Signature: star
Mode: TX 2402MHz	Distance: 3m
Model: IMM-NRF52832-NANO	
Manufacturer: I-SYST Inc.	

Note: Report No.:ATE20180553



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	53.9450	50.71	-26.84	23.87	40.00	-16.13	QP	200	118	
2	100.4711	49.08	-28.05	21.03	43.50	-22.47	QP	200	134	
3	130.7632	50.13	-27.73	22.40	43.50	-21.10	QP	200	98	
4	147.8745	51.42	-28.05	23.37	43.50	-20.13	QP	200	129	
5	403.9334	43.31	-18.23	25.08	46.00	-20.92	QP	200	200	
6	464.8867	39.78	-16.83	22.95	46.00	-23.05	QP	200	207	

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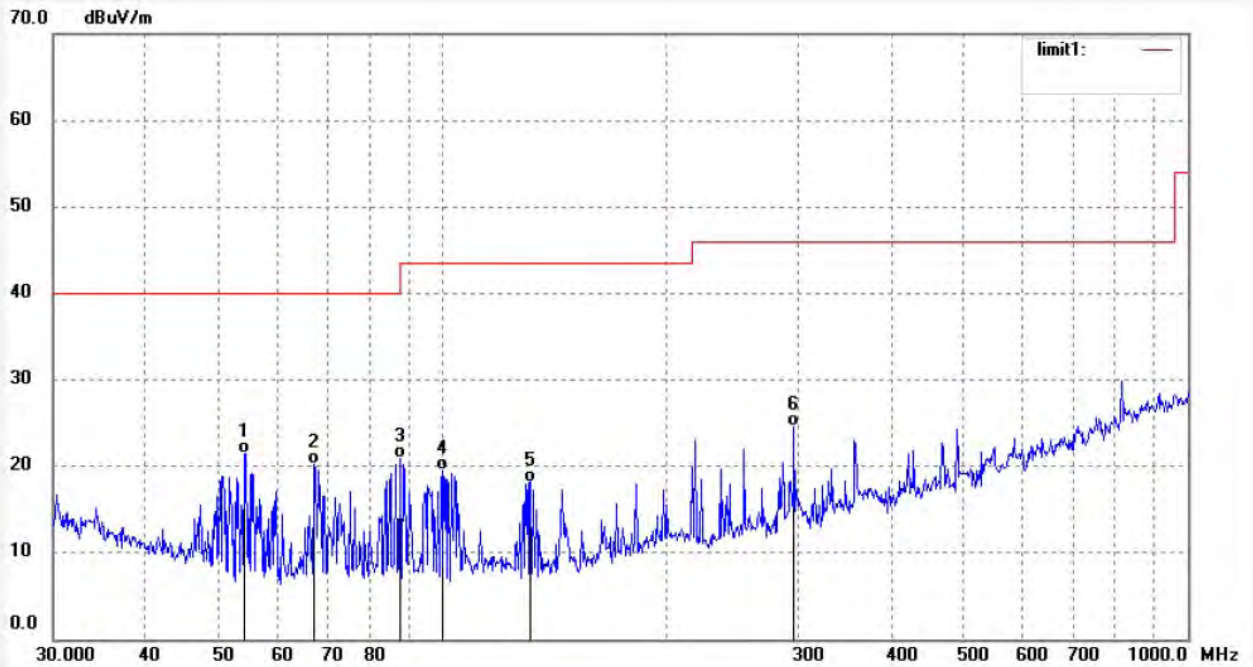
Job No.: star2017 #1124	Polarization: Vertical
Standard: FCC Class C 3M Radiated	Power Source: DC 3.3V
Test item: Radiation Test	Date: 18/04/17/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 9/03/53
EUT: BLE Module	Engineer Signature: star
Mode: TX 2402MHz	Distance: 3m
Model: IMM-NRF52832-NANO	
Manufacturer: I-SYST Inc.	

Note: Report No.:ATE20180553



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	54.1349	48.40	-26.88	21.52	40.00	-18.48	QP	100	76	
2	67.3109	47.58	-27.39	20.19	40.00	-19.81	QP	100	171	
3	87.9136	48.31	-27.43	20.88	40.00	-19.12	QP	100	326	
4	99.7676	47.51	-28.00	19.51	43.50	-23.99	QP	100	274	
5	131.2235	45.94	-27.74	18.20	43.50	-25.30	QP	100	205	
6	296.5023	45.98	-21.36	24.62	46.00	-21.38	QP	100	199	

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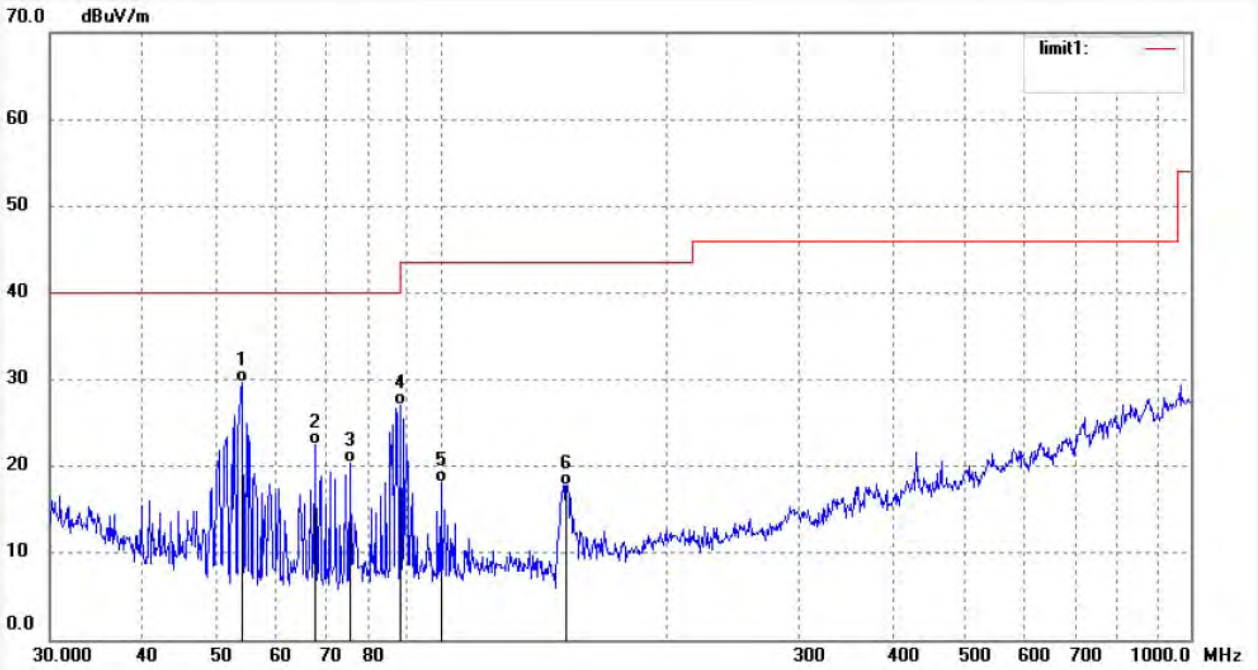
Job No.: star2017 #1126	Polarization: Horizontal
Standard: FCC Class C 3M Radiated	Power Source: DC 3.3V
Test item: Radiation Test	Date: 18/04/17/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 9/05/32
EUT: BLE Module	Engineer Signature: star
Mode: TX 2440MHz	Distance: 3m
Model: IMM-NRF52832-NANO	
Manufacturer: I-SYST Inc.	

Note: Report No.:ATE20180553



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	54.1349	56.50	-26.88	29.62	40.00	-10.38	QP	200	142	
2	67.7856	49.96	-27.40	22.56	40.00	-17.44	QP	200	155	
3	75.5858	48.08	-27.67	20.41	40.00	-19.59	QP	200	177	
4	88.2229	54.53	-27.44	27.09	43.50	-16.41	QP	200	296	
5	99.7676	46.13	-28.00	18.13	43.50	-25.37	QP	200	344	
6	146.8392	45.88	-28.06	17.82	43.50	-25.68	QP	200	302	

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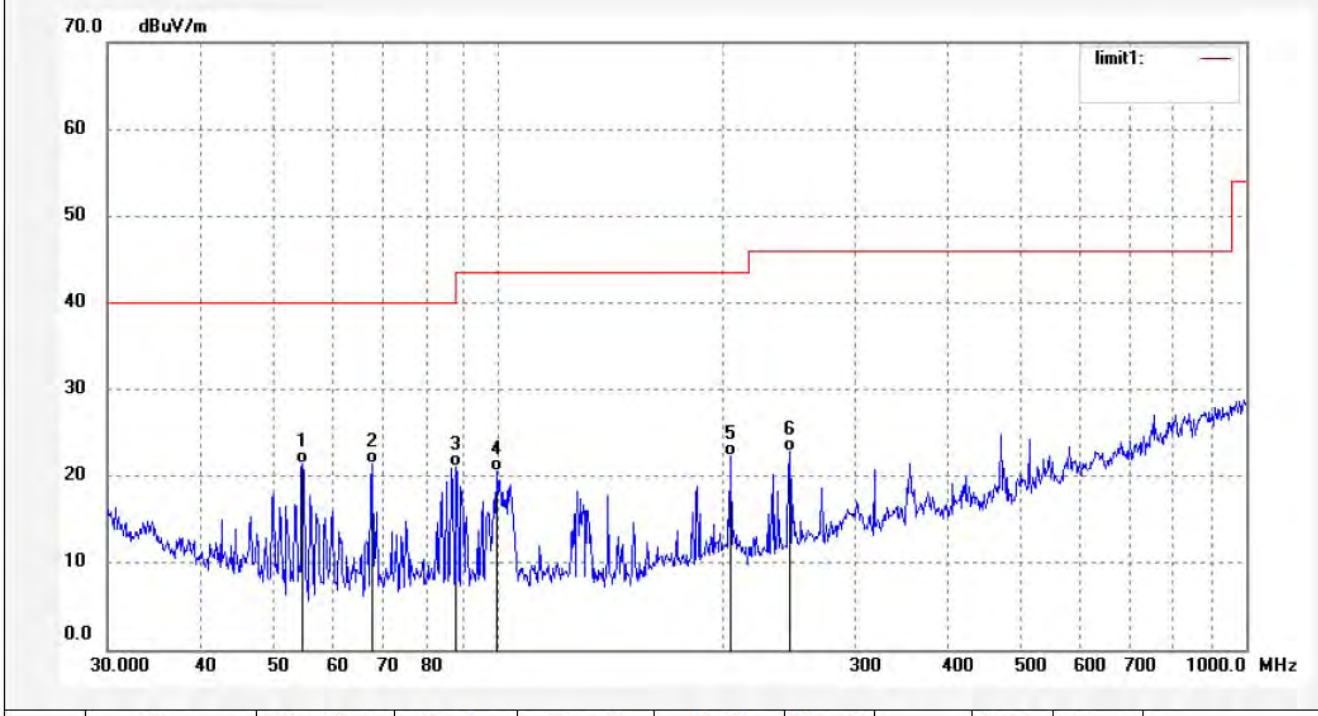
Job No.: star2017 #1125	Polarization: Vertical
Standard: FCC Class C 3M Radiated	Power Source: DC 3.3V
Test item: Radiation Test	Date: 18/04/17/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 9/04/43
EUT: BLE Module	Engineer Signature: star
Mode: TX 2440MHz	Distance: 3m
Model: IMM-NRF52832-NANO	
Manufacturer: I-SYST Inc.	

Note: Report No.:ATE20180553



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	54.7085	48.39	-26.96	21.43	40.00	-18.57	QP	100	175	
2	67.7856	48.84	-27.40	21.44	40.00	-18.56	QP	100	233	
3	87.9136	48.48	-27.43	21.05	40.00	-18.95	QP	100	208	
4	99.4176	48.47	-27.97	20.50	43.50	-23.00	QP	100	214	
5	204.3052	46.55	-24.18	22.37	43.50	-21.13	QP	100	193	
6	245.2606	46.55	-23.67	22.88	46.00	-23.12	QP	100	200	

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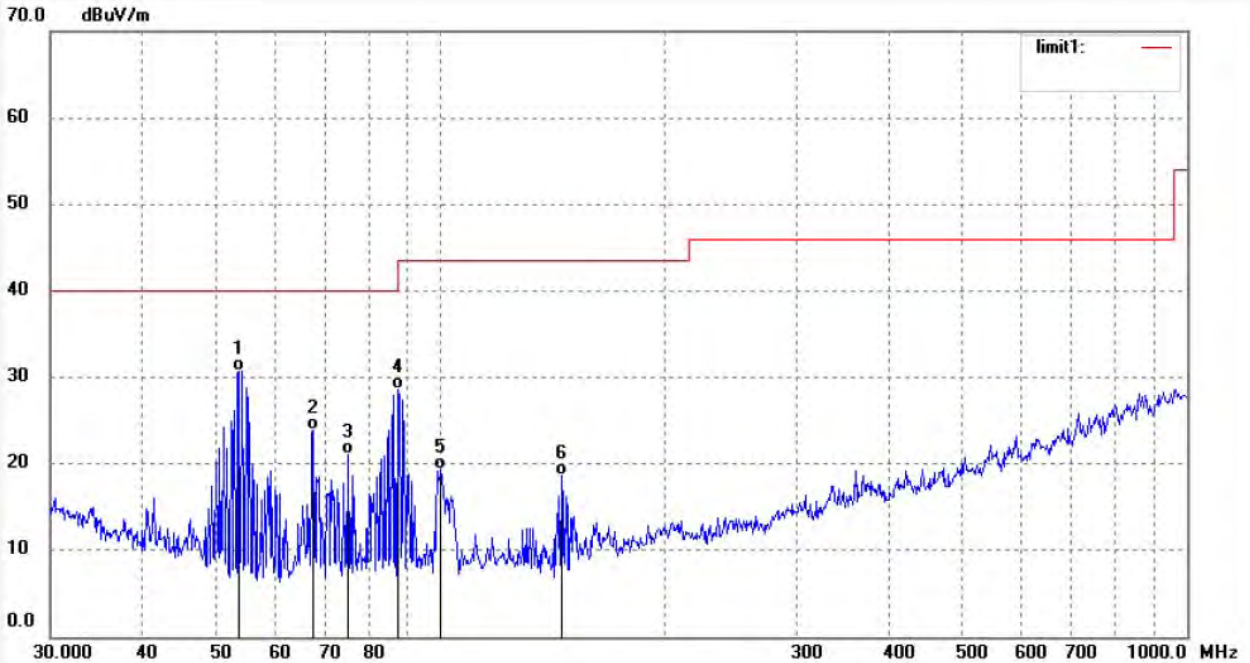
Job No.: star2017 #1127	Polarization: Horizontal
Standard: FCC Class C 3M Radiated	Power Source: DC 3.3V
Test item: Radiation Test	Date: 18/04/17/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 9/06/50
EUT: BLE Module	Engineer Signature: star
Mode: TX 2480MHz	Distance: 3m
Model: IMM-NRF52832-NANO	
Manufacturer: I-SYST Inc.	

Note: Report No.:ATE20180553



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	53.7559	57.56	-26.81	30.75	40.00	-9.25	QP	200	68	
2	67.5478	51.24	-27.39	23.85	40.00	-16.15	QP	200	112	
3	75.3208	48.85	-27.68	21.17	40.00	-18.83	QP	200	47	
4	87.9136	56.01	-27.43	28.58	40.00	-11.42	QP	200	272	
5	100.1188	47.38	-28.04	19.34	43.50	-24.16	QP	200	269	
6	145.2995	46.73	-28.04	18.69	43.50	-24.81	QP	200	300	

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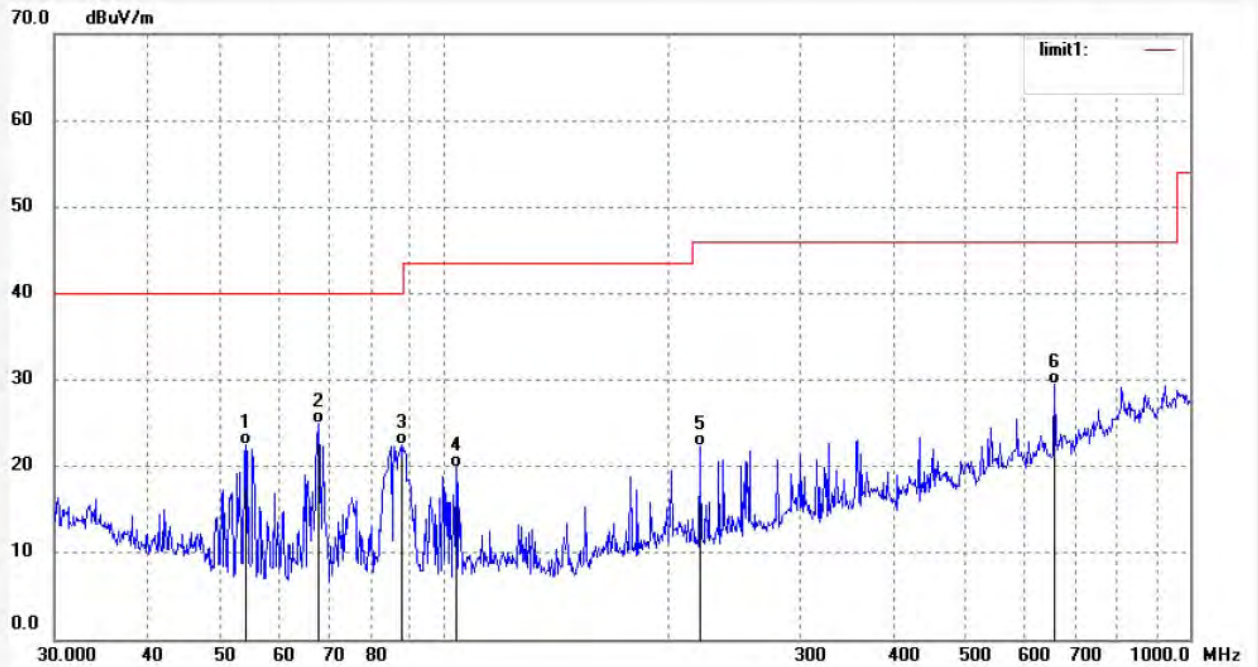
Job No.: star2017 #1128	Polarization: Vertical
Standard: FCC Class C 3M Radiated	Power Source: DC 3.3V
Test item: Radiation Test	Date: 18/04/17/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 9/08/13
EUT: BLE Module	Engineer Signature: star
Mode: TX 2480MHz	Distance: 3m
Model: IMM-NRF52832-NANO	
Manufacturer: I-SYST Inc.	

Note: Report No.:ATE20180553



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	54.1349	49.33	-26.88	22.45	40.00	-17.55	QP	100	144	
2	67.7856	52.30	-27.40	24.90	40.00	-15.10	QP	100	198	
3	87.6051	49.85	-27.44	22.41	40.00	-17.59	QP	100	201	
4	103.6989	47.89	-28.11	19.78	43.50	-23.72	QP	100	211	
5	219.9499	46.41	-24.02	22.39	46.00	-23.61	QP	100	178	
6	658.2854	41.87	-12.44	29.43	46.00	-16.57	QP	100	159	

Above 1GHz: 2M Rates

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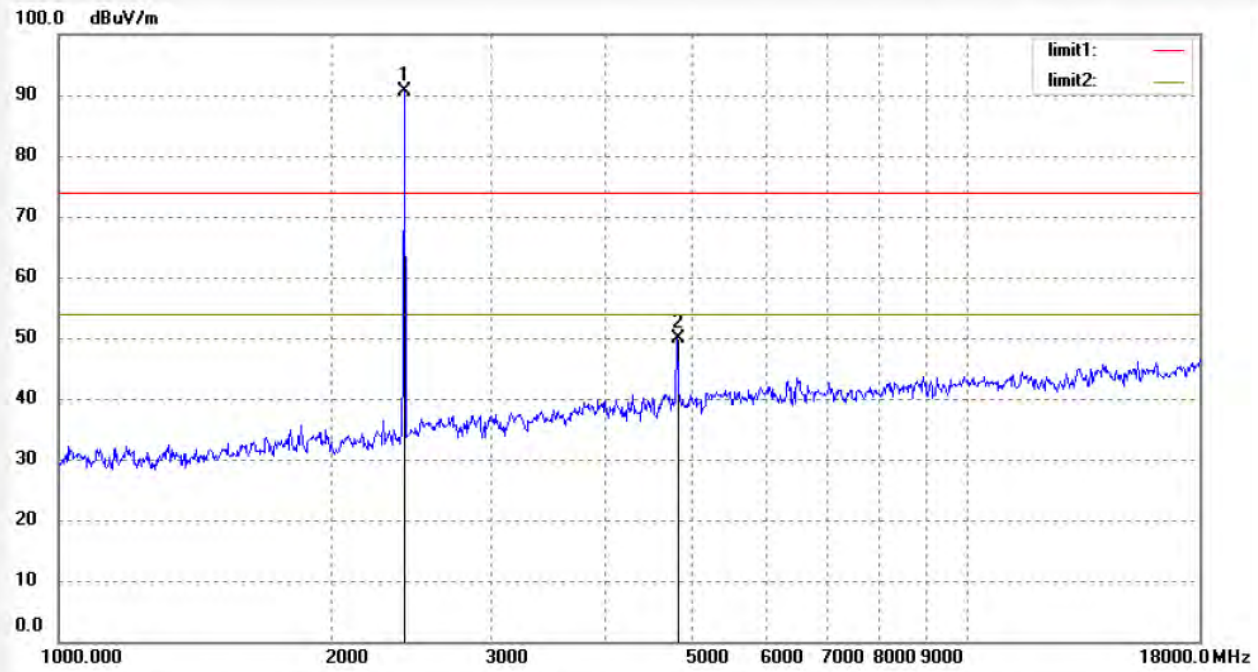
Job No.: star2017 #1130	Polarization: Horizontal
Standard: FCC Class C 3M Radiated	Power Source: DC 3.3V
Test item: Radiation Test	Date: 18/04/17/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 9/14/47
EUT: BLE Module	Engineer Signature: star
Mode: TX 2402MHz	Distance: 3m
Model: IMM-NRF52832-NANO	
Manufacturer: I-SYST Inc.	

Note: Report No.:ATE20180553



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2402.099	96.92	-6.26	90.66			peak	200	107	
2	4804.173	48.97	1.02	49.99	74.00	-24.01	peak	200	123	

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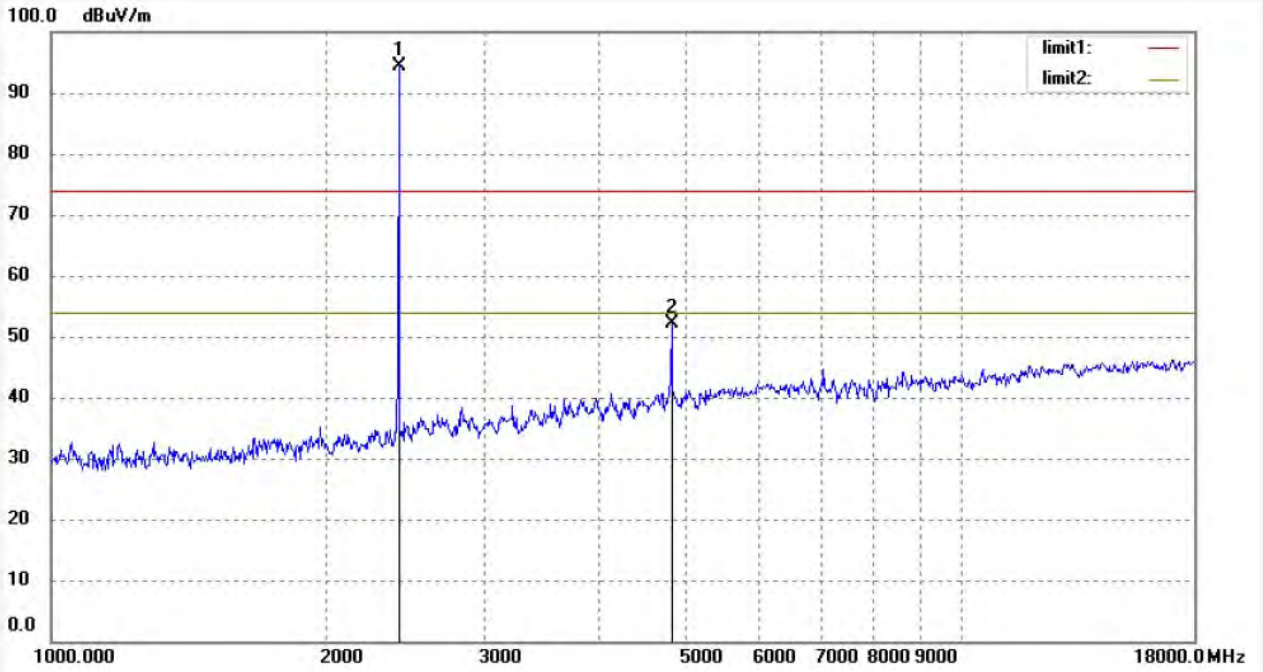
Job No.: star2017 #1129	Polarization: Vertical
Standard: FCC Class C 3M Radiated	Power Source: DC 3.3V
Test item: Radiation Test	Date: 18/04/17/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 9/13/42
EUT: BLE Module	Engineer Signature: star
Mode: TX 2402MHz	Distance: 3m
Model: IMM-NRF52832-NANO	
Manufacturer: I-SYST Inc.	

Note: Report No.:ATE20180553



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2402.010	100.55	-6.26	94.29			peak	150	88	
2	4804.328	51.08	1.02	52.10	74.00	-21.90	peak	150	120	

ACCURATE TECHNOLOGY CO., LTD.
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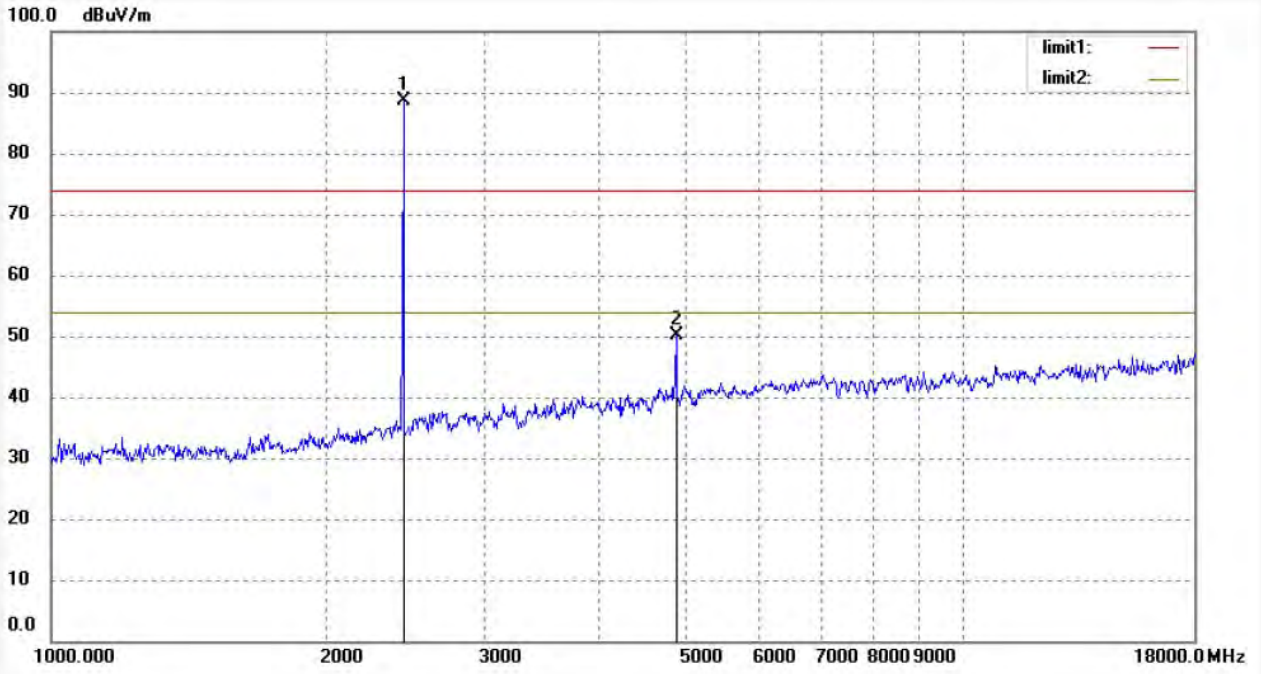
Job No.: star2017 #1131	Polarization: Horizontal
Standard: FCC Class C 3M Radiated	Power Source: DC 3.3V
Test item: Radiation Test	Date: 18/04/17/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 9/16/25
EUT: BLE Module	Engineer Signature: star
Mode: TX 2440MHz	Distance: 3m
Model: IMM-NRF52832-NANO	
Manufacturer: I-SYST Inc.	

Note: Report No.:ATE20180553



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2440.107	94.80	-6.09	88.71			peak	200	268	
2	4880.057	48.93	1.27	50.20	74.00	-23.80	peak	200	319	

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Site: 1# Chamber
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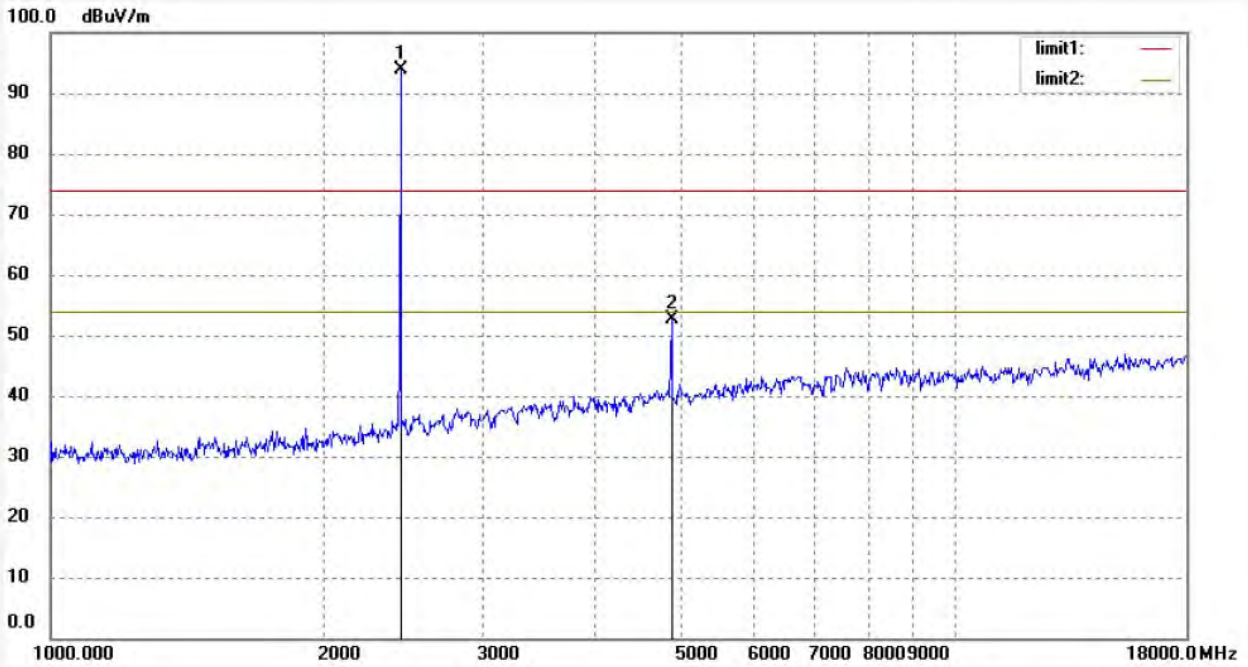
Fax:+86-0755-26503396

Job No.: star2017 #1132	Polarization: Vertical
Standard: FCC Class C 3M Radiated	Power Source: DC 3.3V
Test item: Radiation Test	Date: 18/04/17/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 9/18/41
EUT: BLE Module	Engineer Signature: star
Mode: TX 2440MHz	Distance: 3m
Model: IMM-NRF52832-NANO	
Manufacturer: I-SYST Inc.	

Note: Report No.:ATE20180553



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2440.007	100.04	-6.10	93.94			peak	150	177	
2	4880.557	51.35	1.25	52.60	74.00	-21.40	peak	150	200	

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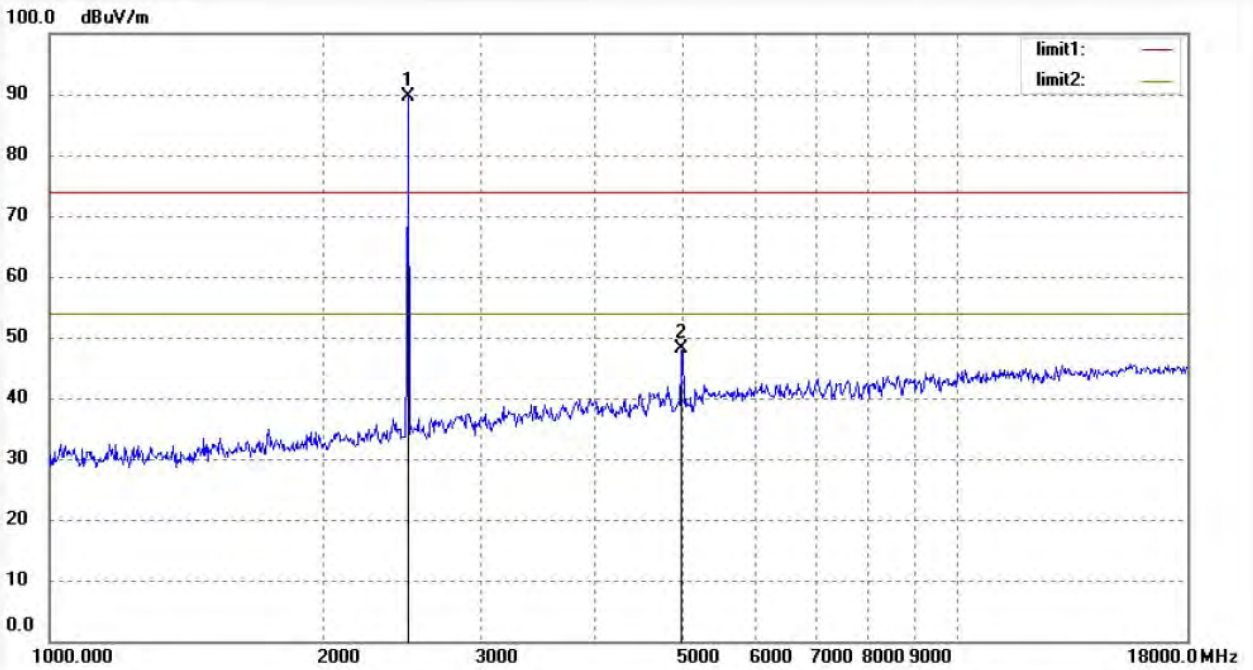
Job No.: star2017 #1134
Standard: FCC Class C 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 25 C / 55 %
EUT: BLE Module
Mode: TX 2480MHz
Model: IMM-NRF52832-NANO
Manufacturer: I-SYST Inc.

Polarization: Horizontal
Power Source: DC 3.3V
Date: 18/04/17/
Time: 9/21/18
Engineer Signature: star
Distance: 3m

Note: Report No.:ATE20180553



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2480.167	95.44	-5.90	89.54			peak	200	277	
2	4960.100	46.33	1.70	48.03	74.00	-25.97	peak	200	351	

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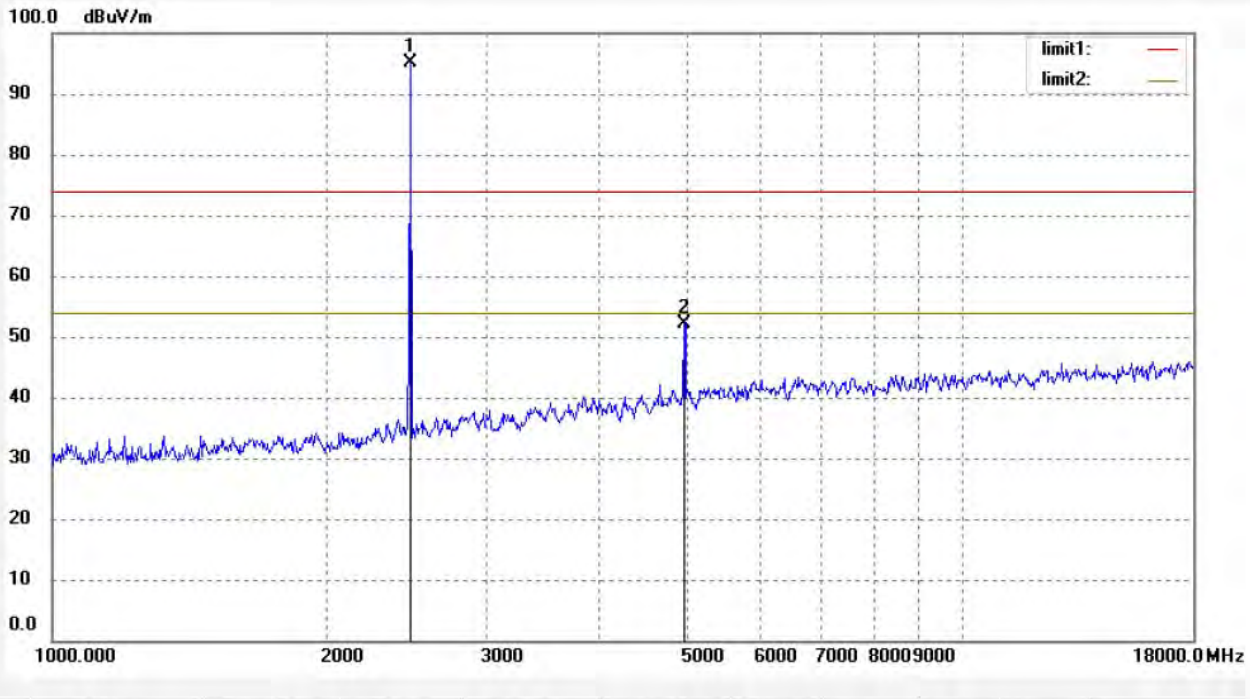
Job No.: star2017 #1133	Polarization: Vertical
Standard: FCC Class C 3M Radiated	Power Source: DC 3.3V
Test item: Radiation Test	Date: 18/04/17/
Temp.(C)/Hum.(%) 25 C / 55 %	Time: 9/20/03
EUT: BLE Module	Engineer Signature: star
Mode: TX 2480MHz	Distance: 3m
Model: IMM-NRF52832-NANO	
Manufacturer: I-SYST Inc.	

Note: Report No.:ATE20180553



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2480.038	101.04	-5.90	95.14			peak	150	198	
2	4960.146	50.52	1.70	52.22	74.00	-21.78	peak	150	336	

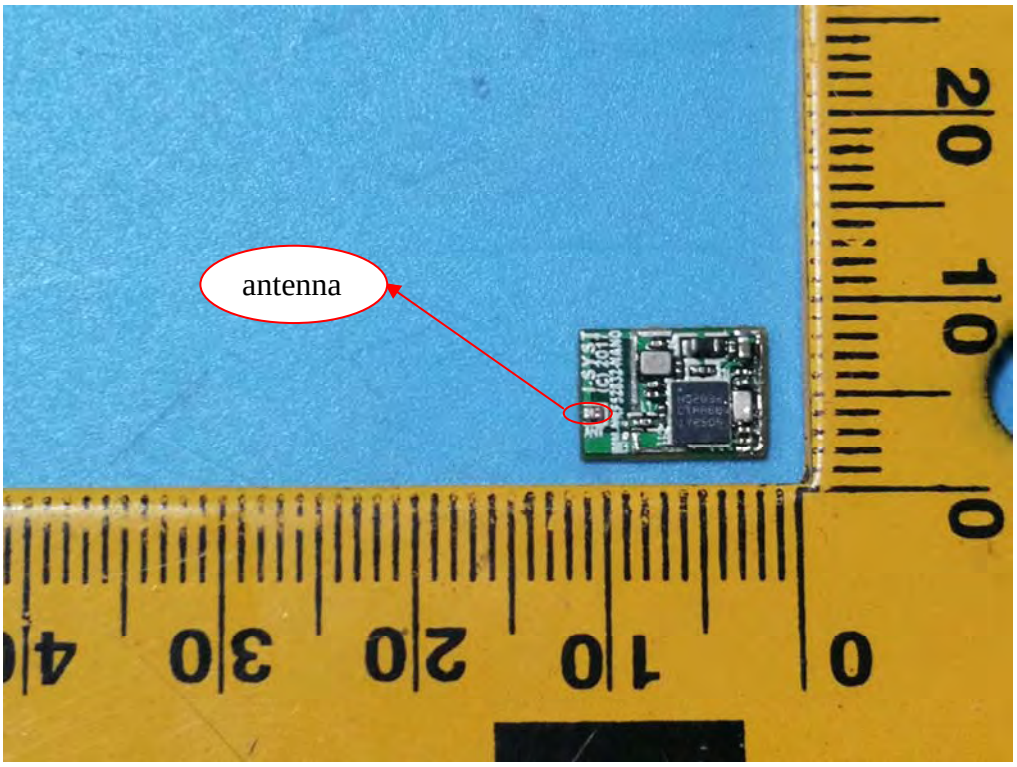
11. ANTENNA REQUIREMENT

11.1. The 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.

11.2. Antenna Construction

Device is equipped with permanent attached antenna, which isn't displaced by other antenna. The Antenna gain of EUT is 1dBi. Therefore, the equipment complies with the antenna requirement of Section 15.203.



******* End of Test Report *******