

# RADIO TEST REPORT FCC ID: 2ATPO-TB05

Product: Bluetooth module Trade Mark: B&T, Ai-Thinker Model No.: TB-05 Family Model: N/A Report No.: S22112900202001 Issue Date: Dec 14. 2022

# **Prepared for**

Shenzhen Ai-Thinker Technology Co., Ltd

410, Block C, Huafeng Smart Innovation Port, Gushu 2nd Road, Gushu Community, Xixiang Street, Baoan District, Shenzhen, China

# Prepared by

Shenzhen NTEK Testing Technology Co., Ltd. 1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street Bao'an District, Shenzhen 518126 P.R. China Tel. 400-800-6106, 0755-2320 0050, 0755-2320 0090 Website: http://www.ntek.org.cn



# TABLE OF CONTENTS

1	1 TEST RESULT CERTIFICATION					
2	2 SUMMARY OF TEST RESULTS					
3	FAC	CILITIES AND ACCREDITATIONS	5			
	3.1 3.2 3.3	FACILITIES LABORATORY ACCREDITATIONS AND LISTINGS MEASUREMENT UNCERTAINTY	5 5			
4	GE	NERAL DESCRIPTION OF EUT	6			
5	DES	SCRIPTION OF TEST MODES	8			
6	SET	FUP OF EQUIPMENT UNDER TEST	9			
	6.1 6.2 6.3	BLOCK DIAGRAM CONFIGURATION OF TEST SYSTEM SUPPORT EQUIPMENT EQUIPMENTS LIST FOR ALL TEST ITEMS	10			
7	TES	ST REQUIREMENTS	13			
	7.1 7.2 7.3 7.4 7.5 7.6 7.7 7.8 7.9	CONDUCTED EMISSIONS TEST RADIATED SPURIOUS EMISSION	16 25 26 28 29 31 32 33			
8	TES	ST RESULTS	34			



# **1 TEST RESULT CERTIFICATION**

Applicant's name:	Shenzhen Ai-Thinker Technology Co., Ltd
Address:	
	Community, Xixiang Street, Baoan District, Shenzhen, China
Manufacturer's Name:	Shenzhen Ai-Thinker Technology Co., Ltd
Address 410, Block C, Huafeng Smart Innovation Port, Gushu 2nd Ro	
	Community, Xixiang Street, Baoan District, Shenzhen, China
Product description	
Product name:	Bluetooth module
Model and/or type reference:	TB-05
Family Model:	N/A
Test Sample Number:	S221129002002

Measurement Procedure Used:

#### APPLICABLE STANDARDS

APPLICABLE STANDARD/ TEST PROCEDURE	TEST RESULT	
FCC 47 CFR Part 2, Subpart J		
FCC 47 CFR Part 15, Subpart C		
ANSI C63.10-2013	Complied	
KDB 558074 D01 15.247 Meas Guidance v05r02		

This device described above has been tested by Shenzhen NTEK Testing Technology Co., Ltd., and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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

Date of Test	: Nov 29. 2022 ~ Dec 14. 2022	
Testing Engineer	:(Mary Hu)	
Authorized Signatory	:(Alex Li)	



	FCC Part15 (15.247), Subpart	С	
Standard Section	Test Item	Verdict	Remark
15.207	Conducted Emission	PASS	1
15.247 (a)(2)	6dB Bandwidth	PASS	
15.247 (b)	Peak Output Power	PASS	
15.209 (a) 15.205 (a)	Radiated Spurious Emission	PASS	
15.247 (e)	Power Spectral Density	PASS	
15.247 (d)	Band Edge Emission	PASS	
15.247 (d)	Spurious RF Conducted Emission	PASS	
15.203	Antenna Requirement	PASS	

Remark:

 "N/A" denotes test is not applicable in this Test Report.
 All test items were verified and recorded according to the standards and without any deviation during the test.



# **3 FACILITIES AND ACCREDITATIONS**

#### 3.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen 518126 P.R. China.

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10 and CISPR Publication 22.

#### 3.2 LABORATORY ACCREDITATIONS AND LISTINGS

Site Description	
CNAS-Lab. :	The Certificate Registration Number is L5516.
IC-Registration	The Certificate Registration Number is 9270A.
-	CAB identifier:CN0074
FCC- Accredited	Test Firm Registration Number: 463705.
	Designation Number: CN1184
A2LA-Lab.	The Certificate Registration Number is 4298.01
	This laboratory is accredited in accordance with the recognized
	International Standard ISO/IEC 17025:2005 General requirements for
	the competence of testing and calibration laboratories.
	This accreditation demonstrates technical competence for a defined
	scope and the operation of a laboratory quality management system
	(refer to joint ISO-ILAC-IAF Communiqué dated 8 January 2009).
Name of Firm :	Shenzhen NTEK Testing Technology Co., Ltd.
Site Location :	1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang
	Street, Bao'an District, Shenzhen 518126 P.R. China.

#### 3.3 MEASUREMENT UNCERTAINTY

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

No.	Item	Uncertainty
1	Conducted Emission Test	±2.80dB
2	RF power, conducted	±0.16dB
3	Spurious emissions, conducted	±0.21dB
4	All emissions, radiated(30MHz~1GHz)	±2.64dB
5	All emissions, radiated(1GHz~6GHz)	±2.40dB
6	All emissions, radiated(>6GHz)	±2.52dB
7	Temperature	±0.5°C
8	Humidity	±2%
9	All emissions, radiated(9KHz~30MHz)	±6dB



# 4 GENERAL DESCRIPTION OF EUT

Product Feature and Specification				
Equipment	Bluetooth module			
Trade Mark	B&T, Ai-Thinker			
FCC ID	2АТРО-ТВ05			
Model No.	TB-05			
Family Model	N/A			
Model Difference	N/A			
Operating Frequency	2402MHz~2480MHz			
Modulation	GFSK			
Number of Channels	40 Channels			
Antenna Type	PCB Antenna			
Antenna Gain	1.64dBi			
Power supply	DC 3.3V from DC Power			
Adapter	N/A			
HW Version	V1.0			
SW Version	V1.00			

Note 1: Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.

Note 2: The engineering test program was provided and the EUT was programmed to be in continuously transmitting mode.



# **Revision History** Report No. Version Description **Issued Date** Initial issue of report S22112900202001 Rev.01 Dec 14. 2022



# 5 DESCRIPTION OF TEST MODES

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

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

Test of channel included the lowest and middle and highest frequency to perform the test, then record on this report.

Those data rates (1Mbps/2Mbps for GFSK modulation) were used for all test.

The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement -X, Y, and Z-plane. The X-plane results were found as the worst case and were shown in this report.

Carrier Frequency and Channel list:

Channel	Frequency(MHz)
0	2402
1	2404
19	2440
20	2442
38	2478
39	2480

Note: fc=2402MHz+kx2MHz k=0 to 39

The following summary table is showing all test modes to demonstrate in compliance with the standard.

Test Cases				
Test Item	Data Rate/ Modulation			
AC Conducted Emission	Mode 1: normal link mode			
	Mode 1: normal link mode			
Radiated Test	Mode 2: GFSK Tx Ch00_2402MHz_1Mbps/2Mbps			
Cases	Mode 3: GFSK Tx Ch19_2440MHz_1Mbps/2Mbps			
	Mode 4: GFSK Tx Ch39_2480MHz_1Mbps/2Mbps			
Conducted Test	Mode 2: GFSK Tx Ch00_2402MHz_1Mbps/2Mbps			
Conducted Test	Mode 3: GFSK Tx Ch19_2440MHz_1Mbps/2Mbps			
Cases	Mode 4: GFSK Tx Ch39_2480MHz_1Mbps/2Mbps			

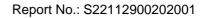
Note:

1. The engineering test program was provided and the EUT was programmed to be in continuously transmitting mode(duty cycle =100% during the test)

2. AC power line Conducted Emission was tested under maximum output power.

3. For radiated test cases, the worst mode data rate 2Mbps was reported only, because this data rate has the highest RF output power at preliminary tests, and no other significantly frequencies found in conducted spurious emission.

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6 SETUP OF EQUIPMEN	T UNDER TEST		
6.1 BLOCK DIAGRAM CONF For AC Conducted Emission Mode	GURATION OF TEST SYS	ТЕМ	
EUT	C-1 AE-1 DC Power	AC PLUG	
For Radiated Test Cases			
EUT			
For Conducted Test Cases			- -
Measurement Instrument	UT		
Note: The temporary antenna co tests and this temporary antenna	onnector is soldered on the a connector is listed in the e	PCB board in orde	r to perform conducted





#### 6.2 SUPPORT EQUIPMENT

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

Item	Equipment	Model/Type No.	Series No.	Note
AE-1	DC Power	N/A	N/A	

Item	Cable Type	Shielded Type	Ferrite Core	Length
C-1	DC Cable	YES	NO	1.0m
C-2	RF Cable	YES	NO	0.1m

#### Notes:

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



#### 6.3 EQUIPMENTS LIST FOR ALL TEST ITEMS

#### Radiation& Conducted Test equipment

aulatic	n& Conducted I	estequipment					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibrati on period
1	Spectrum Analyzer	Aglient	E4407B	MY45108040	2022.03.30	2023.03.29	1 year
2	Spectrum Analyzer	Agilent	N9020A	MY49100060	2022.06.16	2023.06.15	1 year
3	Spectrum Analyzer	R&S	FSV40	101417	2022.06.16	2023.06.15	1 year
4	Test Receiver	R&S	ESPI7	101318	2022.04.06	2023.04.05	1 year
5	Bilog Antenna	TESEQ	CBL6111D	31216	2022.03.30	2023.03.29	1 year
6	50Ω Coaxial Switch	Anritsu	MP59B	6200983705	2020.05.11	2023.05.10	3 year
7	Horn Antenna	EM	EM-AH-1018 0	2011071402	2022.03.31	2023.03.30	1 year
8	Broadband Horn Antenna	SCHWARZBE CK	BBHA 9170	803	2022.04.06	2023.04.05	1 year
9	Amplifier	EMC	EMC051835 SE	980246	2022.06.17	2023.06.16	1 year
10	Active Loop Antenna	SCHWARZBE CK	FMZB 1519 B	055	2022.11.04	2023.11.03	1 year
11	Power Meter	DARE	RPR3006W	15I00041SN 084	2022.06.16	2023.06.15	1 year
12	Test Cable (9KHz-30MHz)	N/A	R-01	N/A	2022.06.17	2025.06.16	3 year
13	Test Cable (30MHz-1GHz)	N/A	R-02	N/A	2022.06.17	2025.06.16	3 year
14	High Test Cable(1G-40G Hz)	N/A	R-03	N/A	2022.06.17	2025.06.16	3 year
15	High Test Cable(1G-40G Hz)	N/A	R-04	N/A	2022.06.17	2025.06.16	3 year
16	Filter	TRILTHIC	2400MHz	29	2022.03.30	2023.03.29	1 year
17	temporary antenna connector (Note)	NTS	R001	N/A	N/A	N/A	N/A

Note:

We will use the temporary antenna connector (soldered on the PCB board) When conducted test And this temporary antenna connector is listed within the instrument list

AC Co	AC Conduction Test equipment								
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period		
1	Test Receiver	R&S	ESCI	101160	2022.04.06	2023.04.05	1 year		
2	LISN	R&S	ENV216	101313	2022.04.06	2023.04.05	1 year		
3	LISN	SCHWARZBE CK	NNLK 8129	8129245	2022.04.06	2023.04.05	1 year		
4	50Ω Coaxial Switch	ANRITSU CORP	MP59B	6200983704	2020.05.11	2023.05.10	3 year		
5	Test Cable (9KHz-30MH z)	N/A	C01	N/A	2020.05.11	2023.05.10	3 year		
6	Test Cable (9KHz-30MH z)	N/A	C02	N/A	2020.05.11	2023.05.10	3 year		
7	Test Cable (9KHz-30MH z)	N/A	C03	N/A	2020.05.11	2023.05.10	3 year		

Note: Each piece of equipment is scheduled for calibration once a year except the Aux Equipment & Test Cable which is scheduled for calibration every 2 or 3 years.

# 7 TEST REQUIREMENTS

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#### 7.1 CONDUCTED EMISSIONS TEST

#### 7.1.1 Applicable Standard

According to FCC Part 15.207(a)

#### 7.1.2 Conformance Limit

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

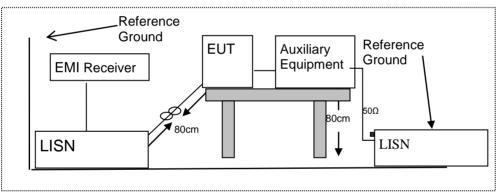
Note: 1. \*Decreases with the logarithm of the frequency

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

#### 7.1.3 Measuring Instruments

The Measuring equipment is listed in the section 6.3 of this test report.

#### 7.1.4 Test Configuration



#### 7.1.5 Test Procedure

According to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 Conducted emissions the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode.

- 1. The EUT was placed 0.4 meter from the conducting wall of the shielding room.
- 2. The EUT was placed on a table which is 0.8m above ground plane.
- Connect EUT to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- 4. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40cm long.
- 5. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- 6. LISN at least 80 cm from nearest part of EUT chassis.
- 7. The frequency range from 150KHz to 30MHz was searched.
- 8. Set the test-receiver system to Peak Detect Function and specified bandwidth(IF bandwidth=9KHz) with Maximum Hold Mode
- 9. For the actual test configuration, please refer to the related Item -EUT Test Photos.

# 7.1.6 Test Results

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EUT:		Bluetooth	module		Model Name :		TB-05	
Temperature: 22 °C				Relative Humidity:		57%		
Pressure:		1010hPa			Phase :		L	
Test Voltage :		DC 3.3V f	rom DC Powei	AC 120V/60Hz	Test Mode:		Mode 1	
Frequency	Rea	ding Level	Correct Factor	Measure-ment	Limits	Ν	largin	
(MHz)	(	(dBµV)	(dB)	(dBµV)	(dBµV)		(dB)	Remark
0.4660		6.86	9.66	16.52	56.58	-	40.06	QP
0.4660		-3.28	9.66	6.38	46.58	-	40.20	AVG
1.2059		7.37	9.68	17.05	56.00	, L	38.95	QP
1.2059		-3.54	9.68	6.14	46.00	-:	39.86	AVG
3.2300		6.32	9.73	16.05	56.00	-:	39.95	QP
3.2300		-3.92	9.73	5.81	46.00		40.19	AVG
19.2380		10.02	10.16	20.18	60.00	-:	39.82	QP
19.2380		-1.07	10.16	9.09	50.00	-	40.91	AVG
22.1980		15.37	10.22	25.59	60.00	-:	34.41	QP
22.1980		0.56	10.22	10.78	50.00	-:	39.22	AVG
24.3260		11.99	10.27	22.26	60.00	-:	37.74	QP
24.3260		-0.02	10.27	10.25	50.00	-3	39.75	AVG

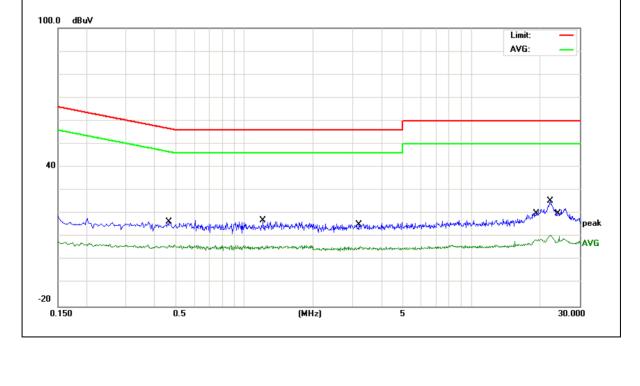
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Remark:

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

2. Factor = Insertion Loss + Cable Loss.



Version.1.3



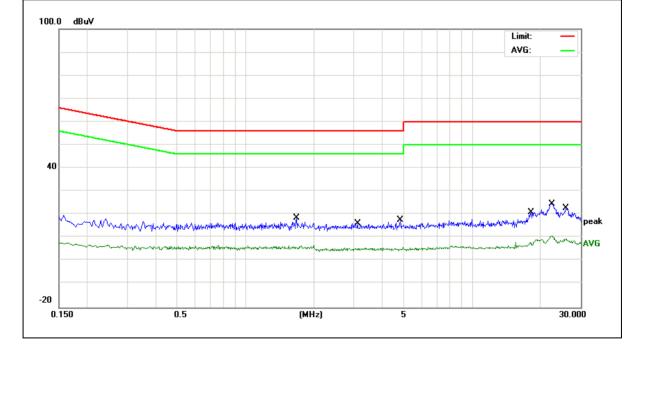
EUT:	Bluet	ooth	h module		Model Name :		TB-05		
Temperature: 22 °C					Relative Hu	Relative Humidity:		57%	
Pressure:	1010	hPa			Phase :		N		
Test Voltage	: DC 3	.3V 1	from DC Powe	er AC 120V/60Hz	Test Mode:		Mode 1		
Frequency	Reading Le	evel	Correct Factor	Measure-ment	Limits	Ма	rgin		
(MHz)	(dBµV)		(dB)	(dBµV)	(dBµV)	(d	B)	- Remark	
1.6780	8.91		9.67	18.58	56.00	-37	.42	QP	
1.6780	-3.41		9.67	6.26	46.00	-39	).74	AVG	
3.1140	6.57		9.69	16.26	56.00	-39	).74	QP	
3.1140	-4.24		9.69	5.45	46.00	-40	).55	AVG	
4.7979	7.99		9.74	17.73	56.00	-38	3.27	QP	
4.7979	-3.76		9.74	5.98	46.00	-40	).02	AVG	
18.0899	10.91		10.11	21.02	60.00	-38	8.98	QP	
18.0899	-0.96		10.11	9.15	50.00	-40	).85	AVG	
22.2979	14.49		10.18	24.67	60.00	-35	5.33	QP	
22.2979	0.64		10.18	10.82	50.00	-39	).18	AVG	
25.7540	12.46		10.22	22.68	60.00	-37	'.32	QP	
25.7540	-0.66		10.22	9.56	50.00	-40	).44	AVG	

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#### Remark:

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





Version.1.3



#### 7.2 RADIATED SPURIOUS EMISSION

#### 7.2.1 Applicable Standard

According to FCC Part 15.247(d) and 15.209 and ANSI C63.10-2013

#### 7.2.2 Conformance Limit

According to FCC Part 15.247(d): radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)). According to FCC Part15.205, Restricted bands

MHz	MHz	GHz
16.42-16.423	399.9-410	4.5-5.15
16.69475-16.69525	608-614	5.35-5.46
16.80425-16.80475	960-1240	7.25-7.75
25.5-25.67	1300-1427	8.025-8.5
37.5-38.25	1435-1626.5	9.0-9.2
73-74.6	1645.5-1646.5	9.3-9.5
74.8-75.2	1660-1710	10.6-12.7
123-138	2200-2300	14.47-14.5
149.9-150.05	2310-2390	15.35-16.2
156.52475-156.52525	2483.5-2500	17.7-21.4
156.7-156.9	2690-2900	22.01-23.12
162.0125-167.17	3260-3267	23.6-24.0
167.72-173.2	3332-3339	31.2-31.8
240-285	3345.8-3358	36.43-36.5
322-335.4	3600-4400	(2)
	MHz 16.42-16.423 16.69475-16.69525 16.80425-16.80475 25.5-25.67 37.5-38.25 73-74.6 74.8-75.2 123-138 149.9-150.05 156.52475-156.52525 156.7-156.9 162.0125-167.17 167.72-173.2 240-285	MHzMHz16.42-16.423399.9-41016.69475-16.69525608-61416.80425-16.80475960-124025.5-25.671300-142737.5-38.251435-1626.573-74.61645.5-1646.574.8-75.21660-1710123-1382200-2300149.9-150.052310-2390156.52475-156.525252483.5-2500156.7-156.92690-2900162.0125-167.173260-3267167.72-173.23332-3339240-2853345.8-3358

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.

Restricted Frequency(MHz)	Field Strength (µV/m)	Field Strength (dBµV/m)	Measurement Distance
0.009~0.490	2400/F(KHz)	20 log (uV/m)	300
0.490~1.705	24000/F(KHz)	20 log (uV/m)	30
1.705~30.0	30	29.5	30
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

#### Limits of Radiated Emission Measurement(Above 1000MHz)

Frequency(MHz)	Class B (dBuV/m) (at 3M)		
	PEAK	AVERAGE	
Above 1000	74	54	

Remark :1. Emission level in dBuV/m=20 log (uV/m)

2. Measurement was performed at an antenna to the closed point of EUT distance of meters.

3. For Frequency 9kHz~30MHz: Distance extrapolation factor =40log(Specific distance/ test distance)(dB); Limit line=Specific limits(dBuV) + distance extrapolation factor.

For Frequency above 30MHz: Distance extrapolation factor =20log(Specific distance/ test distance)(dB); Limit line=Specific limits(dBuV) + distance extrapolation factor.

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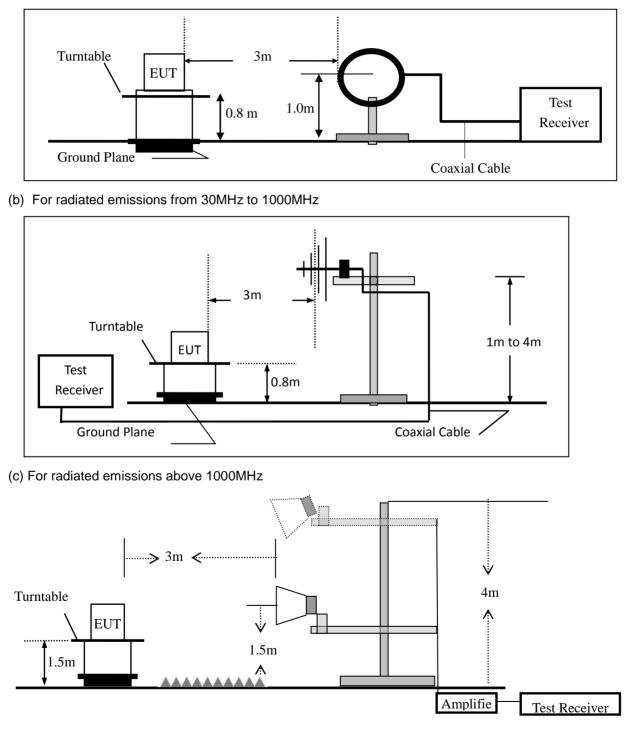
## 7.2.3 Measuring Instruments

The Measuring equipment is listed in the section 6.3 of this test report.

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## 7.2.4 Test Configuration

#### (a) For radiated emissions below 30MHz





#### 7.2.5 Test Procedure

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.10-2013. The test distance is 3m. The setup is according to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 and CAN/CSA-CEI/IEC CISPR 22.

This test is required for any spurious emission that falls in a Restricted Band, as defined in Section 15.205. It must be performed with the highest gain of each type of antenna proposed for use with the EUT. Use the following spectrum analyzer settings:

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

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

- a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- b. The EUT was placed on the top of a rotating table 0.8 m for below 1GHz and 1.5m for above 1GHz the ground at a 3 meter. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The height of the equipment or of the substitution antenna shall be 0.8 m for below 1GHz and 1.5m for above 1GHz; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For the radiated emission test above 1GHz: Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
- e. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- f. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- g. For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

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



During the radiated emission test, the Spectrum Analyzer was set with the following configurations:							
Frequency Band (MHz)	Function	Resolution bandwidth	Video Bandwidth				
30 to 1000	QP	120 kHz	300 kHz				
Ab ave 4000	Peak	1 MHz	1 MHz				
Above 1000	Average	1 MHz	1 MHz				

Note: for the frequency ranges below 30 MHz, a narrower RBW is used for these ranges but the measured value should add a RBW correction factor (RBWCF) where RBWCF [dB] =10\*lg(100 [kHz]/narrower RBW [kHz]). , the narrower RBW is 1 kHz and RBWCF is 20 dB for the frequency 9 kHz to 150 kHz, and the narrower RBW is 10 kHz and RBWCF is 10 dB for the frequency 150 kHz to 30 MHz.

#### 7.2.6 Test Results

EUT:	Bluetooth module	Model No.:	TB-05
Temperature:	<b>20</b> ℃	Relative Humidity:	48%
Test Mode:	Mode1/Mode2/Mode3/ Mode4	Test By:	Mary Hu

Freq.	Ant.Pol.	Emission L	.evel(dBuV/m)	Limit 3	m(dBuV/m)	Over(dB)		
(MHz)	H/V	PK	AV	PK	AV	PK	AV	

Note: the amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.



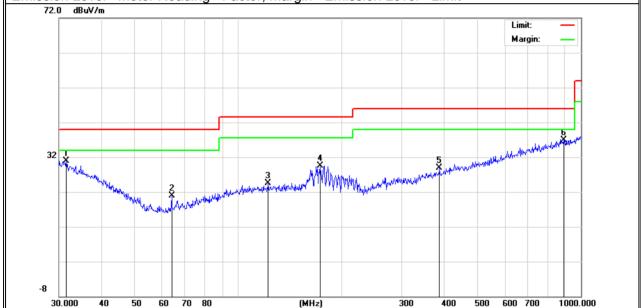
Spurious Emission below 1GHz (30MHz to 1GHz) All the modulation modes have been tested, and the worst result was report as below:

All the	All the modulation modes have been tested, and the worst result was report as below.							
EUT:		Bluetooth module	Model Name :	TB-05				
Temper	ature:	<b>25</b> ℃	Relative Humidity:	55%				
Pressur	e:	1010hPa	Test Mode:	GFSK 2M CH39				
Test Vol	Itage :	DC 3.3V						

Polar	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
(H/V)	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
V	31.5095	5.68	25.27	30.95	40.00	-9.05	QP
V	63.9828	8.38	12.52	20.90	40.00	-19.10	QP
V	122.4040	5.80	18.67	24.47	43.50	-19.03	QP
V	173.2051	12.43	17.15	29.58	43.50	-13.92	QP
V	386.6338	5.95	22.90	28.85	46.00	-17.15	QP
V	890.7278	6.55	30.38	36.93	46.00	-9.07	QP

#### Remark:

Emission Level= Meter Reading+ Factor, Margin= Emission Level - Limit





(H/V)         (MHz)         (dBuV)         (dB)         (dBuV/m)         (dBuV/m)         (dB)           H         31.5092         5.28         25.27         30.55         40.00         -9.45         112.9196         5.57         18.42         23.99         43.50         -19.51         112.9196         5.57         18.42         23.99         43.50         -19.51         112.9196         112.9196         5.57         18.42         23.99         43.50         -18.08         112.9196         112.9196         112.9196         -112.9196         112.9196         112.9196         -112.9196         112.9196         -112.9196	Remark QP QP QP QP QP QP QP
H         112.9196         5.57         18.42         23.99         43.50         -19.51           H         214.5143         8.45         16.97         25.42         43.50         -18.08           H         357.9287         7.81         22.09         29.90         46.00         -16.10           H         574.6258         6.66         26.08         32.74         46.00         -13.26           H         962.1623         7.14         31.25         38.39         54.00         -15.61           Remark:         Emission Level= Meter Reading+ Factor, Margin= Emission Level - Limit         100         100         100	QP QP QP QP
H         214.5143         8.45         16.97         25.42         43.50         -18.08           H         357.9287         7.81         22.09         29.90         46.00         -16.10           H         574.6258         6.66         26.08         32.74         46.00         -13.26           H         962.1623         7.14         31.25         38.39         54.00         -15.61           Remark:         Emission Level= Meter Reading+ Factor, Margin= Emission Level - Limit         Limit         20.00         20.00         20.00         20.00	QP QP QP
H         357.9287         7.81         22.09         29.90         46.00         -16.10           H         574.6258         6.66         26.08         32.74         46.00         -13.26           H         962.1623         7.14         31.25         38.39         54.00         -15.61           Remark:           Emission Level= Meter Reading+ Factor, Margin= Emission Level - Limit	QP QP
H         574.6258         6.66         26.08         32.74         46.00         -13.26           H         962.1623         7.14         31.25         38.39         54.00         -15.61           Remark:           Emission Level= Meter Reading+ Factor, Margin= Emission Level - Limit	QP
H         962.1623         7.14         31.25         38.39         54.00         -15.61           Remark:         Emission Level= Meter Reading+ Factor, Margin= Emission Level - Limit         -15.61         -15.61	
Remark: Emission Level= Meter Reading+ Factor, Margin= Emission Level - Limit	$\cap P$
Emission Level= Meter Reading+ Factor, Margin= Emission Level - Limit	QI
72.0 dBuV/m	-
32 32 34 34 34 34 34 34 34 34 34 34	- - -
-8	
30.000 40 50 60 70 80 (MHz) 300 400 500 600 700 1000	.000



■ Spurious	Spurious Emission Above 1GHz (1GHz to 25GHz)									
EUT:	E	Bluetooth n	nodule	ſ	Model No.:		TB-0	)5		
Temperature	э: 2	20 ℃			Relative Hun	nidity:	48%			
Test Mode:	Test Mode: Mode2/Mode3/Mode4 Test By: Mary Hu									
Frequency	Read Level	Cable loss	Antenna Factor	Preamp Factor	Emission Level	Lim	its	Margin	Remark	Comment
(MHz)	(dBµV)	) (dB)	dB/m	(dB)	(dBµV/m)	(dBµ∖		(dB)		
	Low Channel (2402 MHz)(GFSK)Above 1G									
4802.14	62.00	5.21	35.59	44.30	58.50	74.(	00	-15.50	Pk	Vertical
4802.14	43.39	5.21	35.59	44.30	39.89	54.0	00	-14.11	AV	Vertical
7206.70	62.07	6.48	36.27	44.60	60.22	74.(	00	-13.78	Pk	Vertical
7206.70	43.62	6.48	36.27	44.60	41.77	54.0	00	-12.23	AV	Vertical
4804.15	60.47	5.21	35.55	44.30	56.93	74.(	00	-17.07	Pk	Horizontal
4804.15	43.26	5.21	35.55	44.30	39.72	54.0	00	-14.28	AV	Horizontal
7206.99	64.15	6.48	36.27	44.52	62.38	74.(	00	-11.62	Pk	Horizontal
7206.99	43.60	6.48	36.27	44.52	41.83	54.0		-12.17	AV	Horizontal
	Mid Channel (2440 MHz)(GFSK)Above 1G									
4880.57	64.60	5.21	35.66	44.20	61.27	74.(	00	-12.73	Pk	Vertical
4880.57	43.91	5.21	35.66	44.20	40.58	54.0	00	-13.42	AV	Vertical
7320.05	62.25	7.10	36.50	44.43	61.42	74.(	00	-12.58	Pk	Vertical
7320.05	43.96	7.10	36.50	44.43	43.13	54.0	00	-10.87	AV	Vertical
4880.17	64.67	5.21	35.66	44.20	61.34	74.(	00	-12.66	Pk	Horizontal
4880.17	43.13	5.21	35.66	44.20	39.80	54.0	00	-14.20	AV	Horizontal
7320.92	63.18	7.10	36.50	44.43	62.35	74.(	00	-11.65	Pk	Horizontal
7320.92	43.62	7.10	36.50	44.43	42.79	54.0	00	-11.21	AV	Horizontal
		<u> </u>	High Cha	annel (248	0 MHz)(GFSK	() Abo	ove 10	3		
4960.268	60.02	5.21	35.52	44.21	56.54	74.(	00	-17.46	Pk	Vertical
4960.268	43.21	5.21	35.52	44.21	39.73	54.0	00	-14.27	AV	Vertical
7440.090	63.98	7.10	36.53	44.60	63.01	74.(	00	-10.99	Pk	Vertical
7440.090	43.30	7.10	36.53	44.60	42.33	54.0	00	-11.67	AV	Vertical
4960.559	60.82	5.21	35.52	44.21	57.34	74.(	00	-16.66	Pk	Horizontal
4960.559	43.31	5.21	35.52	44.21	39.83	54.0	00	-14.17	AV	Horizontal
7440.555	60.90	7.10	36.53	44.60	59.93	74.(	00	-14.07	Pk	Horizontal
7440.555	43.62	7.10	36.53	44.60	42.65	54.0	00	-11.35	AV	Horizontal

Note:

(1) Emission Level= Antenna Factor + Cable Loss + Read Level - Preamp Factor

(2)All other emissions more than 20dB below the limit.

(3)Only the worst data is recorded in the report, the data rates (2Mbps for GFSK modulation) test result is the worst



UT:	Bluetoo	Bluetooth module			Model No.: TB-0		TB-0	-05		
emperature:	<b>20</b> ℃	20 °C Re			ative Humidi	ty:	48%			
est Mode:	Mode2/	Mode2/ Mode4 Test By:			t By:		Mary	/ Hu		
Frequency	Meter Reading	Cable Loss	Antenna Factor	Preamp Factor	Emission Level	Lim	its	Margin	Detector	Comment
(MHz)	(dBµV)	(dB)	dB/m	(dB)	(dBµV/m)	(dBµ\	V/m)	(dB)	Туре	
2Mbps(GFSK)										
2310.00	62.23	2.97	27.80	43.80	49.20	74	4	-24.80	Pk	Horizontal
2310.00	39.83	2.97	27.80	43.80	26.80	54	4	-27.20	AV	Horizonta
2310.00	63.57	2.97	27.80	43.80	50.54	74	1	-23.46	Pk	Vertical
2310.00	43.30	2.97	27.80	43.80	30.27	54	1	-23.73	AV	Vertical
2390.00	64.76	3.14	27.21	43.80	51.31	74	1	-22.69	Pk	Vertical
2390.00	43.86	3.14	27.21	43.80	30.41	54	1	-23.59	AV	Vertical
2390.00	63.45	3.14	27.21	43.80	50.00	74	4	-24.00	Pk	Horizontal
2390.00	43.31	3.14	27.21	43.80	29.86	54	4	-24.14	AV	Horizontal
2483.50	60.38	3.58	27.70	44.00	47.66	74	4	-26.34	Pk	Vertical
2483.50	43.48	3.58	27.70	44.00	30.76	54	1	-23.24	AV	Vertical
2483.50	61.42	3.58	27.70	44.00	48.70	74	4	-25.30	Pk	Horizontal
2483.50	43.23	3.58	27.70	44.00	30.51	54	1	-23.49	AV	Horizontal

Note: (1) All other emissions more than 20dB below the limit.

(2)Only the worst data is recorded in the report, the data rates (2Mbps for GFSK modulation) test result is the worst



UT:	Bluetoo	oth mod	ule		Model No.: TB-05					
emperature:	<b>20</b> ℃			Relative Humidity: 48%						
est Mode:	Mode2	Mode2/ Mode4			Test By:	t By: Mary Hu				
Frequency	Reading Level	Cable Loss	Antenna Factor	Pream Factor		Lin	nits	Margin	Detector	Comment
(MHz)	(dBµV)	(dB)	dB/m	(dB)	(dBµV/m)	(dBµ	ıV/m)	(dB)	Туре	
3260	65.54	4.04	29.57	44.70	54.45	7	'4	-19.55	Pk	Vertical
3260	43.51	4.04	29.57	44.70	32.42	5	54	-21.58	AV	Vertical
3260	63.84	4.04	29.57	44.70	52.75	7	'4	-21.25	Pk	Horizontal
3260	43.75	4.04	29.57	44.70	32.66	5	54	-21.34	AV	Horizontal
3332	62.22	4.26	29.87	44.40	51.95	7	'4	-22.05	Pk	Vertical
3332	43.49	4.26	29.87	44.40	33.22	5	54	-20.78	AV	Vertical
3332	63.87	4.26	29.87	44.40	53.60	7	'4	-20.40	Pk	Horizontal
3332	43.22	4.26	29.87	44.40	32.95	5	54	-21.05	AV	Horizontal
17797	47.08	10.99	43.95	43.50	58.52	7	<b>'</b> 4	-15.48	Pk	Vertical
17797	34.69	10.99	43.95	43.50	46.13	5	54	-7.87	AV	Vertical
17788	49.68	11.81	43.69	44.60	60.58	7	'4	-13.42	Pk	Horizontal
17788	34.97	11.81	43.69	44.60	45.87	5	54	-8.13	AV	Horizontal

Note: (1) All other emissions more than 20dB below the limit.

(2)Only the worst data is recorded in the report, the data rates (2Mbps for GFSK modulation) test result is the worst



#### 7.3 6DB BANDWIDTH

#### 7.3.1 Applicable Standard

According to FCC Part 15.247(a)(2) and KDB 558074 D01 15.247 Meas Guidance v05r02 Section 8.2.

#### 7.3.2 Conformance Limit

The minimum permissible 6dB bandwidth is 500 kHz.

#### 7.3.3 Measuring Instruments

The Measuring equipment is listed in the section 6.3 of this test report.

#### 7.3.4 Test Setup

Please refer to Section 6.1 of this test report.

#### 7.3.5 Test Procedure

The testing follows Subclause 11.8 of ANSI C63.10

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator.

The path loss was compensated to the results for each measurement.

Set to the maximum power setting and enable the EUT transmit continuously.

The EUT was operating in controlled its channel.

Use the following spectrum analyzer settings:

- a) Set RBW = 100 kHz.
- b) Set the video bandwidth (VBW)  $\geq$  3\*RBW.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Sweep = auto couple.
- f) Allow the trace to stabilize.

g) 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.

#### 7.3.6 Test Results

EUT:	Bluetooth module	Model No.:	TB-05
Temperature:	<b>20</b> ℃	Relative Humidity:	48%
Test Mode:	Mode2/Mode3/Mode4	Test By:	Mary Hu



#### 7.4 DUTY CYCLE

#### 7.4.1 Applicable Standard

According to KDB 558074 D01 15.247 Meas Guidance v05r02s Section 6.

#### 7.4.2 Conformance Limit

No limit requirement.

#### 7.4.3 Measuring Instruments

The Measuring equipment is listed in the section 6.3 of this test report.

#### 7.4.4 Test Setup

Please refer to Section 6.1 of this test report.

#### 7.4.5 Test Procedure

The zero-span mode on a spectrum analyzer or EMI receiver if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the on and off times of the transmitted signal. Set the center frequency of the instrument to the center frequency of the transmission. Set RBW  $\geq$  OBW if possible; otherwise, set RBW to the largest available value. Set VBW  $\geq$  RBW. Set detector = peak or average. The zero-span measurement method shall not be used unless both RBW and VBW are > 50/T and the number of sweep points across duration T exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring duty cycle shall not be used if T  $\leq$  16.7 microseconds.)

The transmitter output is connected to the Spectrum Analyzer. We tested accroding to the zero-span measurement method, 6.0)b) in KDB 558074

The largest available value of RBW is 8 MHz and VBW is 50 MHz. The zero-span method of measuring duty cycle shall not be used if  $T \le 6.25$  microseconds. (50/6.25 = 8)

The zero-span method was used because all measured T data are > 6.25 microseconds and both RBW and VBW are > 50/T.

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement. Set to the maximum power setting and enable the EUT transmit continuously. The EUT was operating in controlled its channel. Use the following spectrum analyzer settings: Span = Zero Span RBW = 8MHz(the largest available value) VBW = 8MHz ( $\geq$  RBW) Number of points in Sweep >100 Detector function = peak Trace = Clear write Measure T<sub>total</sub> and T<sub>on</sub> Calculate Duty Cycle = T<sub>on</sub> / T<sub>total</sub>





# 7.4.6 Test Results

EUT:	Bluetooth module	Model No.:	TB-05
Temperature:	20 °C	Relative Humidity:	48%
Test Mode:	N/A	Test By:	N/A

Note: Not Applicable



#### 7.5 **PEAK OUTPUT POWER**

#### 7.5.1 Applicable Standard

According to FCC Part 15.247(b)(3) and KDB 558074 D01 15.247 Meas Guidance v05r02 Section 8.3.1.

#### 7.5.2 Conformance Limit

The maximum peak conducted output power of the intentional radiator for systems using digital modulation in the 2400 - 2483.5 MHz bands shall not exceed: 1 Watt (30dBm). If transmitting antenna of directional gain greater than 6dBi is used, the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

#### 7.5.3 Measuring Instruments

The Measuring equipment is listed in the section 6.3 of this test report.

#### 7.5.4 Test Setup

Please refer to Section 6.1 of this test report.

#### 7.5.5 Test Procedure

The testing follows Subclause 11.9.1.1 of ANSI C63.10 The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement. Set to the maximum power setting and enable the EUT transmit continuously. The EUT was operating in controlled its channel. Use the following spectrum analyzer settings: Set the RBW  $\geq$  DTS bandwidth. Set VBW =3\*RBW. Set the span  $\geq$  3\*RBW Set Sweep time = auto couple. Set Detector = peak. Set Trace mode = max hold. Allow trace to fully stabilize. Use peak marker function to determine the peak amplitude level.

#### 7.5.6 Test Results

EUT:	Bluetooth module	Model No.:	TB-05
Temperature:	20 °C	Relative Humidity:	48%
Test Mode:	Mode2/Mode3/Mode4	Test By:	Mary Hu



#### 7.6 **POWER SPECTRAL DENSITY**

#### 7.6.1 Applicable Standard

According to FCC Part 15.247(e) and KDB 558074 D01 15.247 Meas Guidance v05r02 Section 8.4.

#### 7.6.2 Conformance Limit

The transmitter power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

#### 7.6.3 Measuring Instruments

The Measuring equipment is listed in the section 6.3 of this test report.

#### 7.6.4 Test Setup

Please refer to Section 6.1 of this test report.

#### 7.6.5 Test Procedure

The testing follows Measurement Procedure Subclause 11.10.2 of ANSI C63.10 This procedure shall be used if maximum peak conducted output power was used to demonstrate compliance, and is optional if the maximum conducted (average) output power was used to demonstrate compliance.

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator.

The path loss was compensated to the results for each measurement.

Set to the maximum power setting and enable the EUT transmit continuously.

The EUT was operating in controlled its channel.

- a) Set analyzer center frequency to DTS channel center frequency.
- b) Set the span to 1.5\*DTS bandwidth.
- c) Set the RBW to:  $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$ .
- d) Set the VBW  $\geq$  3 RBW.
- e) Detector = peak.
- f) Sweep time = auto couple.
- g) Trace mode = max hold.
- h) Allow trace to fully stabilize.
- i) Use the peak marker function to determine the maximum amplitude level within the RBW.
- j) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.



#### 7.6.6 Test Results

EUT:	Bluetooth module	Model No.:	TB-05
Temperature:	20 °C	Relative Humidity:	48%
Test Mode:	Mode2/Mode3/Mode4	Test By:	Mary Hu



#### 7.7 CONDUCTED BAND EDGE MEASUREMENT

#### 7.7.1 Applicable Standard

According to FCC Part 15.247(d) and KDB 558074 D01 15.247 Meas Guidance v05r02 Section 8.7.

#### 7.7.2 Conformance Limit

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.

#### 7.7.3 Measuring Instruments

The Measuring equipment is listed in the section 6.3 of this test report.

#### 7.7.4 Test Setup

Please refer to Section 6.1 of this test report.

#### 7.7.5 Test Procedure

The testing follows FCC KDB 558074 D01 15.247 Meas Guidance v05r02 Section 8.7.

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator.

The path loss was compensated to the results for each measurement.

Set to the maximum power setting and enable the EUT transmit continuously.

The EUT was operating in controlled its channel.

Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.

Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.

Repeat above procedures until all measured frequencies were complete.

#### 7.7.6 Test Results

EUT:	Bluetooth module	Model No.:	TB-05
Temperature:	20 °C	Relative Humidity:	48%
Test Mode:	Mode2/Mode4	Test By:	Mary Hu



#### 7.8 SPURIOUS RF CONDUCTED EMISSIONS

#### 7.8.1 Conformance Limit

1. Below -20dB of the highest emission level in operating band.

2. Fall in the restricted bands listed in section 15.205. The maximum permitted average field strength is listed in section 15.209.

#### 7.8.2 Measuring Instruments

The Measuring equipment is listed in the section 6.3 of this test report.

#### 7.8.3 Test Setup

Please refer to Section 6.1 of this test report.

#### 7.8.4 Test Procedure

The Spurious RF conducted emissions compliance of RF radiated emission should be measured by following the guidance in ANSI C63.10-2013 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization etc. Set RBW=100kHz and VBW= 300KHz to measure the peak field strength , and measure frequency range from 30MHz to 26.5GHz.

#### 7.8.5 Test Results

Remark: The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the spurious emissions and bandege measurement data.



#### 7.9 ANTENNA APPLICATION

#### 7.9.1 Antenna Requirement

15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

#### 7.9.2 Result

The EUT antenna is permanent attached PCB antenna (Gain: 1.64 dBi). It comply with the standard requirement.

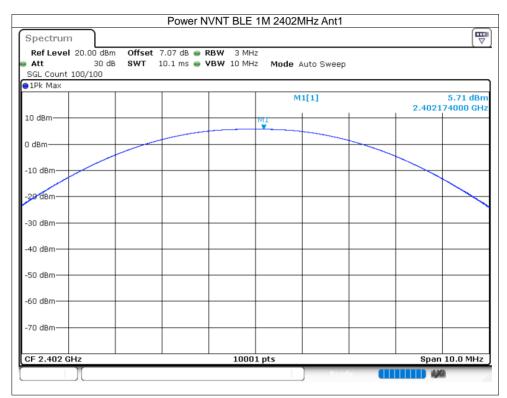


# 8 TEST RESULTS

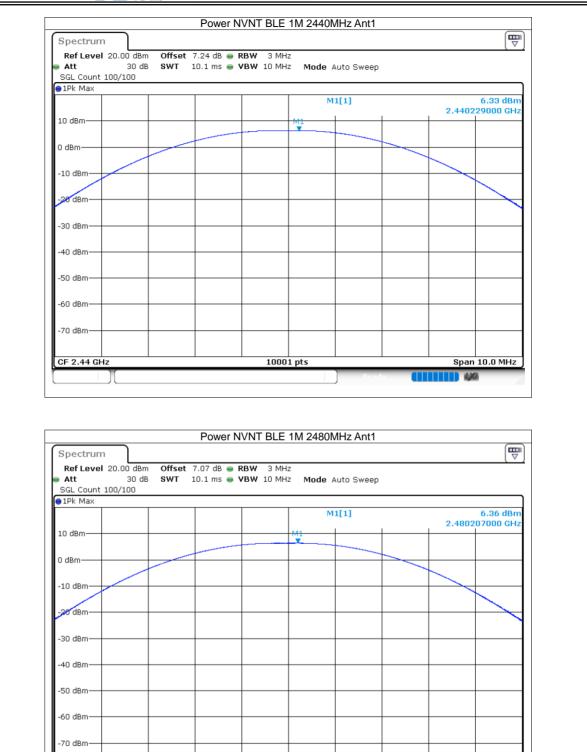
#### 1M:

#### 8.1.1 MAXIMUM CONDUCTED OUTPUT POWER

Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	BLE	2402	Ant 1	5.71	30	Pass
NVNT	BLE	2440	Ant 1	6.33	30	Pass
NVNT	BLE	2480	Ant 1	6.36	30	Pass







10001 pts

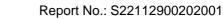
CF 2.48 GHz

Span 10.0 MHz



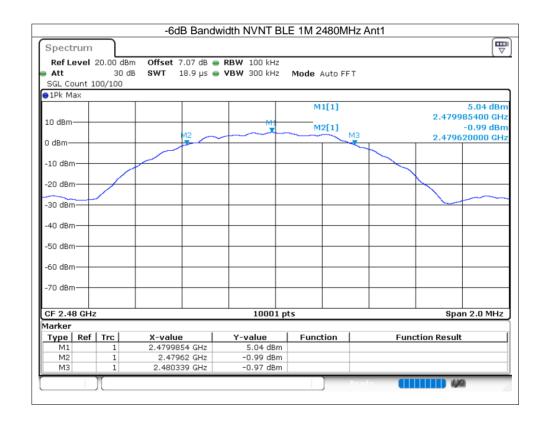
# 8.1.2 OCCUPIED CHANNEL BANDWIDTH

ondition	Mode	Frequ	ency (MHz)	Antenna	-6 dB Bandw (MHz)		Limit -6 dB ndwidth (MHz)	Verdic
IVNT	BLE		2402	Ant 1	0.656		0.5	Pass
IVNT	BLE		2440	Ant 1	0.717		0.5	Pass
IVNT	BLE		2480	Ant 1	0.718		0.5	Pass
	Spectru				T BLE 1M 2402MF	Hz Ant1		
	🖷 Att	<b>el</b> 20.00 di/ 30 nt 100/100		dB 👄 RBW 100 µs 👄 VBW 300	kHz kHz <b>Mode</b> Auto FF	т		
	IPk Max							
					M1[1]		5.47 d 2.401726630 (	
	10 dBm		M1 M2[1] M3			-0.54 dBm		
	0 dBm		M2			~	2.401644000	GHz
	-10 dBm-							
	-20 dBm-							
	-30 dBm-							_
	-40 dBm-							
	-50 dBm-							
	-60 dBm-							
	-70 dBm-							
	CF 2.402 Marker	GHZ		10	001 pts		Span 2.0 M	HZ
		Ref Trc	X-value	Y-value		Fur	iction Result	
	M1 M2	1	2.40172663 Gł 2.401644 Gł		dBm dBm			
	M3	1	2.4023 G					
						Ready 🚺		





		-6	dB Bandv	vidth NVNT BI	_E 1M 2440MHz	Ant1		
Spectrum								
Ref Level	20.00 dBm	Offset	7.24 dB 🔵	<b>RBW</b> 100 kHz				
Att 🛛	30 dB	SWT	18.9 µs 👄	<b>VBW</b> 300 kHz	Mode Auto FFT			
SGL Count 1	.00/100							
∋1Pk Max								
					M1[1]			5.27 dBm
10 10							2.439	986600 GHz
10 dBm				M1	M2[1]			-0.74 dBm
0 dBm			M2	1	M3		2.439	523000 GHz
U UBIII		~	-					
-10 dBm								
-10 ubiii								
-20 dBm								
20 0.0.11								
-30 dBm				_			· · · ·	
-40 dBm								
-50 dBm								
-60 dBm								
-70 dBm —			+					
CF 2.44 GHz	2		1	10001 μ	ots		Spa	an 2.0 MHz
Marker								
Type   Ref	Trc	X-valu	ie	Y-value	Function	Fun	ction Resul	t
M1	1	2.4399	866 GHz	5.27 dBm				
M2	1	2.439	623 GHz	-0.74 dBm				
MЗ	1	2.44	034 GHz	-0.73 dBm				
	Υ Υ				- Pos			()
								- ///

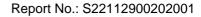




# 8.1.3 MAXIMUM POWER SPECTRAL DENSITY LEVEL

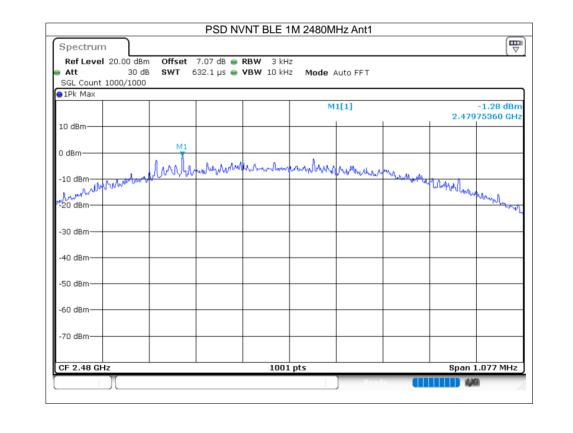
Condition	Mode	Frequency (MHz)	Antenna	Max PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
NVNT	BLE	2402	Ant 1	-3.83	8	Pass
NVNT	BLE	2440	Ant 1	-3.18	8	Pass
NVNT	BLE	2480	Ant 1	-1.28	8	Pass

Spectrum Ref Level 20.	00 dBm Offse	et 7.07 dB (	<b>RBW</b> 3	<hz< th=""><th></th><th></th><th></th><th></th></hz<>				
Att	30 dB SWT	632.2 µs (	<b>VBW</b> 10	Hz Mod	e Auto FFT			
SGL Count 1000 91Pk Max	1/1000							
					M1[1]			-3.83 dB
10 dBm						+	2.4020	10810 GF
0 dBm				11 T				
-10 dBm	and an or Marcal	an man	10 marchinghe	walkerny	when when	AMA AN	Mar at a	
-10 dBm -10 dBm -10 dBm -20 dBm							- WWW Wyh	mulme
-20 dBm				-				901
-30 dBm				_				
-40 dBm								
-50 dBm				_				
-60 dBm								
-70 dBm		_	_		_			
CF 2.402 GHz			10	01 pts			Span	984.0 kH





	PSD NV	NT BLE 1M	2440MHz Ant1			
Spectrum						
Ref Level 20.00 dBm Att 30 dB	Offset 7.24 dB ● F SWT 631.9 µs ● V		Mode Auto FFT			<u>`</u>
SGL Count 1000/1000						
1Pk Max			M1[1]			-3.18 dBm
			milil			02685 GHz
10 dBm						
0 dBm		MI				
0 dBm	and an analysis	mar a line sale	A hard hard here here			
-10 dBm	MAN WAN ANDA MAN	Sound of the sub-the same	will were would and	h May weaks the same		
1 WWWWWWWWW					W WWW WWW W	Another A
-20 dBm						- who who
-30 dBm						
-30 dBm						
-40 dBm						
-50 dBm						
-60 dBm						
-60 dBm						
-70 dBm						
CF 2.44 GHz		1001 pts	I		Span 1.	0755 MHz
			Rea	dy 🚺		1

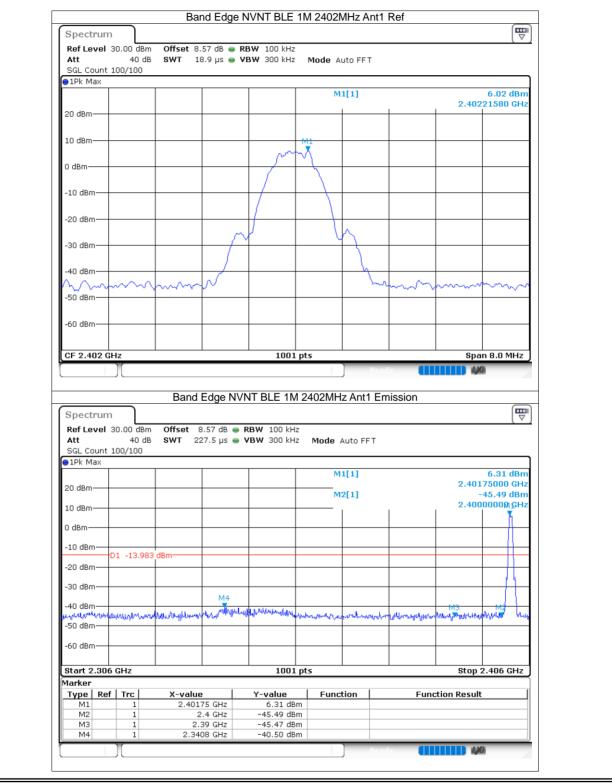


Version.1.3



### 8.1.4 BAND EDGE

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE	2402	Ant 1	-46.51	-20	Pass
NVNT	BLE	2480	Ant 1	-49.21	-20	Pass





Spectrum									
Ref Level 3 Att SGL Count 1	40 dB			RBW 100 kHz VBW 300 kHz		uto FFT			
1Pk Max	100/100								
					M	1[1]			7.45 dBm
20 dBm								2.47	972830 GHz
to abiii									
10 dBm				M1					
D dBm				ļ,	~				
-10 dBm							_		
-20 dBm									
			r	$\neg$	\	M			
-30 dBm									
-40 dBm									
-50 dBm	$\sim$	v m	$\sim$				m		
-50 aBm									
-60 dBm									
CF 2.48 GH:	7			1001	Ints			Sn	an 8.0 MHz
51 2.10 dil	<u>د</u>			1001	r pts	0.0	adv 🚺	40	
						)			- ///
		Bond			1 2480141	7 Apt1 5	mission		
		Band E	Edge N\	/NT BLE 1M	/I 2480MH	z Ant1 E	Emission		
						z Ant1 E	Emission		
Ref Level 3	30.00 dBm	Offset 8	.57 dB 👄	<b>RBW</b> 100 kH	Iz		Emission		
Ref Level 3 Att	30.00 dBm 40 dB	Offset 8	.57 dB 👄		Iz	z Ant1 E	Emission		
Ref Level 3 Att SGL Count 1	30.00 dBm 40 dB	Offset 8	.57 dB 👄	<b>RBW</b> 100 kH	iz iz Mode /	Auto FFT	Emission		
Ref Level 3 Att SGL Count 1 1Pk Max	30.00 dBm 40 dB	Offset 8	.57 dB 👄	<b>RBW</b> 100 kH	iz iz Mode /		Emission	2 48	6.83 dBm
Ref Level 3 Att SGL Count 1 1Pk Max	30.00 dBm 40 dB	Offset 8	.57 dB 👄	<b>RBW</b> 100 kH	iz iz Mode / M	Auto FFT	mission		6.83 dBm 025000 GHz -44.83 dBm
Ref Level 3 Att SGL Count 1 1Pk Max 20 dBm	30.00 dBm 40 dB	Offset 8	.57 dB 👄	<b>RBW</b> 100 kH	iz iz Mode / M	Auto FFT	mission		6.83 dBm 025000 GHz
Ref Level 3 Att SGL Count 1 1Pk Max 20 dBm 10 dBm	30.00 dBm 40 dB	Offset 8	.57 dB 👄	<b>RBW</b> 100 kH	iz iz Mode / M	Auto FFT	mission		6.83 dBm 025000 GHz -44.83 dBm
Ref Level 3 Att SGL Count 1 1Pk Max 20 dBm 10 dBm	30.00 dBm 40 dB	Offset 8	.57 dB 👄	<b>RBW</b> 100 kH	iz iz Mode / M	Auto FFT			6.83 dBm 025000 GHz -44.83 dBm
Spectrum Ref Level 3 Att SGL Count 1 1Pk Max 20 dBm 10 dBm 0 dBm -10 dBm	30.00 dBm 40 dB	Offset 8 SWT 22	.57 dB 👄	<b>RBW</b> 100 kH	iz iz Mode / M	Auto FFT			6.83 dBm 025000 GHz -44.83 dBm
Ref Level 3 Att SGL Count 1 1Pk Max 20 dBm 10 dBm	30.00 dBm 40 dB 100/100	Offset 8 SWT 22	.57 dB 👄	<b>RBW</b> 100 kH	iz iz Mode / M	Auto FFT			6.83 dBm 025000 GHz -44.83 dBm
Ref Level 3           Att           SGL Count 1           1Pk Max           20 dBm           10 dBm           0 dBm           10 dBm	30.00 dBm 40 dB 100/100	Offset 8 SWT 22	.57 dB 👄	<b>RBW</b> 100 kH	iz iz Mode / M	Auto FFT			6.83 dBm 025000 GHz -44.83 dBm
Ref Level 3           Att           SGL Count 1           1Pk Max           20 dBm           10 dBm           -10 cBm           -20 cBm           -30 dBm	30.00 dBm 40 dB 100/100	Offset 8 SWT 22	.57 dB 👄	RBW 100 kH	iz Iz Mode / M M	Auto FF T 1[1] 2[1]		2.46	6.83 dBm 025000 GHz -44.83 dBm 350000 GHz
Ref Level 3           Att           SGL Count 1           1Pk Max           20 dBm           10 dBm           -10 cBm           -20 cBm           -30 dBm	30.00 dBm 40 dB 100/100	Offset 8 SWT 22	.57 dB 👄	RBW 100 kH	iz Iz Mode / M M	Auto FF T 1[1] 2[1]		2.46	6.83 dBm 025000 GHz -44.83 dBm 350000 GHz
Ref Level 3           Att           SGL Count 1           1Pk Max           20 dBm           10 dBm           -10 cBm           -20 cBm           -30 dBm	30.00 dBm 40 dB 100/100	Offset 8 SWT 22	.57 dB ● 7.5 µs ●	RBW 100 kH	iz Iz Mode / M M	Auto FF T 1[1] 2[1]		2.46	6.83 dBm 025000 GHz -44.83 dBm
Ref Level 3           Att           SGL Count 3           1Pk Max           20 dBm           10 dBm           0 dBm           -10 dBm           -20 dBm           -30 dBm           -40 dBm	30.00 dBm 40 dB 100/100	Offset 8 SWT 22	.57 dB ● 7.5 µs ●	RBW 100 kH	iz Iz Mode / M M	Auto FF T 1[1] 2[1]		2.46	6.83 dBm 025000 GHz -44.83 dBm 350000 GHz
Ref Level 3           Att           SGL Count 3           IPk Max           20 dBm           10 dBm           10 dBm           -10 cBm           -20 cBm           -30 dBm           -50 dBm	30.00 dBm 40 dB 100/100	Offset 8 SWT 22	.57 dB ● 7.5 µs ●	RBW 100 kH	iz Iz Mode / M M	Auto FF T 1[1] 2[1]		2.46	6.83 dBm 025000 GHz -44.83 dBm 350000 GHz
Ref Level 3           Att           SGL Count 3           1Pk Max           20 dBm           10 dBm           10 dBm           -10 dBm           -20 dBm           -30 dBm           -40 dBm           -50 dBm           -60 dBm           -60 dBm	30.00 dBm 40 dB 100/100	Offset 8 SWT 22	.57 dB ● 7.5 µs ●	RBW 100 kH	IZ Mode /	Auto FF T 1[1] 2[1]		2.46	6.83 dBm 025000 GHz -44.83 dBm 350000 GHz
Ref Level 3           Att           SGL Count 3           1Pk Max           20 dBm           10 dBm           10 dBm           -10 dBm           -20 dBm           -30 dBm           -40 dBm           -50 dBm           -60 dBm           Start 2.476	30.00 dBm 40 dB 100/100 D1 -12.549	Offset 8 SWT 22	.57 dB ● 7.5 µs ●	RBW         100 kH           VBW         300 kH	IZ Mode /	Auto FFT  1[1]  2[1]		2.46	6.83 dBm 025000 GHz -44.83 dBm 350000 GHz
Ref Level 3           Att           SGL Count 3           1Pk Max           20 dBm           10 dBm           10 dBm           -10 dBm           -20 dBm           -30 dBm           -40 dBm           -50 dBm           -60 dBm           -60 dBm	30.00 dBm 40 dB 100/100 D1 -12.549	Offset 8 SWT 22	.57 dB ● 7.5 µs ●	RBW         100 kH           VBW         300 kH	IZ Mode /	Auto FFT  1[1]  2[1]		2.46	6.83 dBm 025000 GHz -44.83 dBm 350000 GHz
Ref Level 3           Att           SGL Count 3           IPk Max           20 dBm           10 dBm           10 dBm           -20 dBm           -30 dBm           -40 dBm           -50 dBm           -60 dBm           -50 dBm           -60 dBm	30.00 dBm 40 dB 100/100 01 -12.549 60-12.549 6	Offset 8 SWT 22 dBm dBm M4 M4 M2 yV M4 M4 M2 yV M4 M4 M2 yV M4 M4 M2 yV M4 M4 M2 yV M4 M4 M2 yV M4 M4 M2 yV M M4 M2 Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z	.57 dB 7.5 μs 7.5 μs 7.	RBW         100 kH           VBW         300 kH	IZ Mode /	Auto FFT  1[1]  2[1]		2.46	6.83 dBm 025000 GHz -44.83 dBm 350000 GHz
Ref Level 3           Att           SGL Count 3           1Pk Max           20 dBm           10 dBm           10 dBm           -10 dBm           -20 dBm           -30 dBm           -40 dBm           -50 dBm           -60 dBm           Start 2.476           1arker           Type           M2           M3	30.00 dBm 40 dB 100/100 01 -12.549 6Hz GHz 1 1 1	Offset 8 SWT 22	.57 dB .57 dB .57 μs .5 μs .5 GHz .5	RBW 100 kH VBW 300 kH 	IZ Mode / M M M M M M M L pts Funct M M Sm	Auto FFT  1[1]  2[1]		2.46	6.83 dBm 025000 GHz -44.83 dBm 350000 GHz
Ref Level 3           Att           SGL Count 3           IPK Max           20 dBm           10 dBm           10 dBm           20 dBm           -10 dBm           -20 dBm           -30 dBm           -50 dBm           -60 dBm	30.00 dBm 40 dB 100/100 01 -12.549 60-12.549 6	Offset 8 SWT 22	.57 dB 7.5 μs 7.5 μs 7.	RBW         100 kH           VBW         300 kH	IZ Mode / M M M M M M M L pts Funct M M Sm	Auto FFT  1[1]  2[1]		2.46	6.83 dBm 025000 GHz -44.83 dBm 350000 GHz

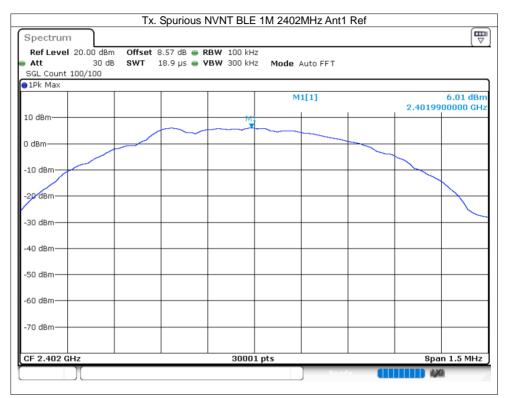


NTEK 北测

® ilac-M

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE	2402	Ant 1	-50.06	-20	Pass
NVNT	BLE	2440	Ant 1	-51.68	-20	Pass
NVNT	BLE	2480	Ant 1	-51.84	-20	Pass

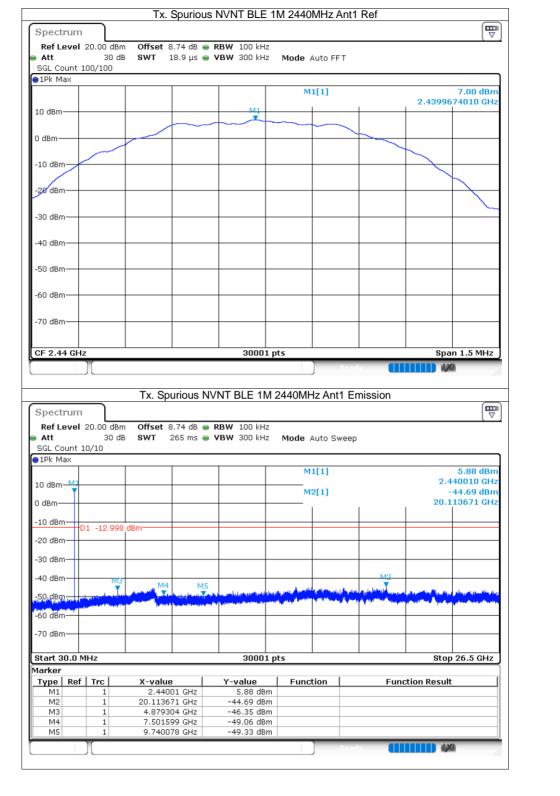
ACCREDITED Certificate #4298.01



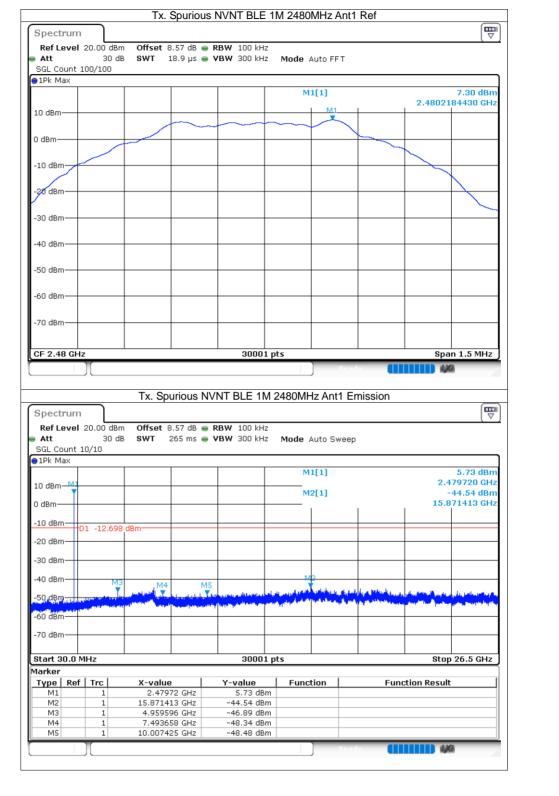


		Tx. S	purious N	VNT BLE 1M	2402MHz An	t1 Emission		
Spectrum								
Ref Level	20.00	dBm Offset	8.57 dB 🧉	• RBW 100 kHz				
Att	З	D dB SWT	265 ms 🍯	● <b>VBW</b> 300 kHz	Mode Auto S	weep		
SGL Count :	10/10					-		
∋1Pk Max								
					M1[1]			6.10 dBm
10 dBm							2.4	02070 GHz
The second secon					M2[1]			44.06 dBm
0 dBm			-				16.3	80519 GHz
10 40 -								
-10 dBm	01 -13.	992 dBm						
-20 dBm								
-30 dBm								
					M2			
-40 dBm		M3 M4	M5					
-50,dBm	ما مر در ا	Turner and the State	T.		ويتحادث والمتحدين	and the state of the state of	والقريرة أللا الأقليدان أرمار	ويتأثر وبالاستادة القرورهم
and the second se	La Sullan Ma	and the second	an langutanger	A REAL PROPERTY AND A REAL			and the second	
-60 dBm	-		+				_	
-70 dBm								
Start 30.0 M	/IHz			30001 p	ts		Stop	26.5 GHz
larker								
	Trc	X-valı		Y-value	Function	Fu	nction Result	
			207 GHz	6.10 dBm				
M1	1			-44.06 dBm				
M1 M2	1	16.380						
M1 M2 M3	1	4.803	423 GHz	-47.42 dBm				
M1 M2 M3 M4	1 1 1	4.803 7.041	423 GHz 903 GHz	-47.42 dBm -47.74 dBm				
M1 M2 M3	1	4.803 7.041	423 GHz	-47.42 dBm				











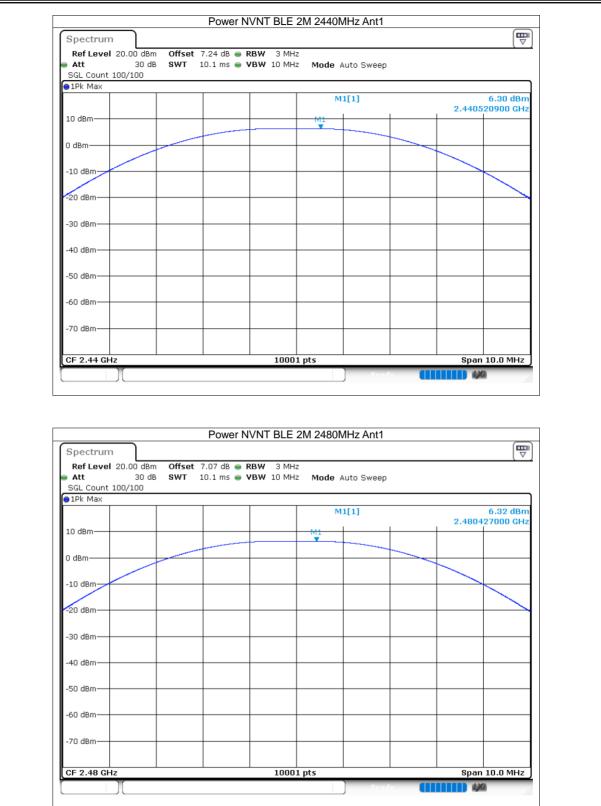
#### 2M:

### 8.1.6 MAXIMUM CONDUCTED OUTPUT POWER

Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	BLE	2402	Ant 1	5.7	30	Pass
NVNT	BLE	2440	Ant 1	6.3	30	Pass
NVNT	BLE	2480	Ant 1	6.32	30	Pass

RefLevel 20.00 Att 3	dBm Offse OdB SWT	t 7.07 dB 👄 F	RBW 3 MHz /BW 10 MHz	Banda Autor			
SGL Count 100/10		10.1 ms 🚽 י	YOW IU MIN2	Mode Auto :	Sweep		
1Pk Max				M1[1]			5.70 dB
10 dBm				MI		2.402	477000 GF
0 dBm							
-10 dBm							
20 dBm							$\rightarrow$
-30 dBm							
-40 dBm							
-50 dBm							
-60 dBm							
-70 dBm		_				_	
CF 2.402 GHz			10001				n 10.0 MH:

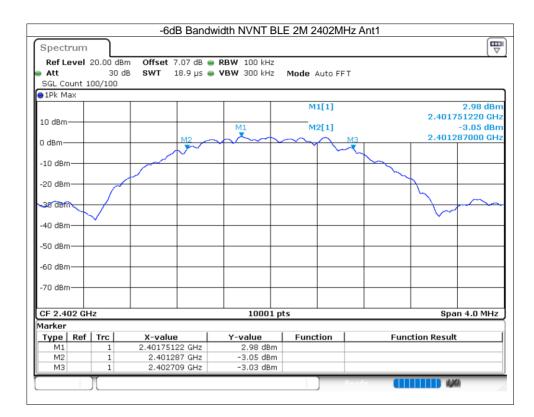






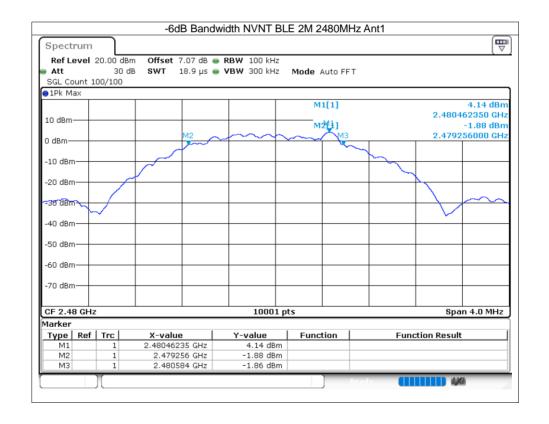
# 8.1.7 OCCUPIED CHANNEL BANDWIDTH

Condition	Mode	Frequency (MHz)	Antenna	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	BLE	2402	Ant 1	1.422	0.5	Pass
NVNT	BLE	2440	Ant 1	1.266	0.5	Pass
NVNT	BLE	2480	Ant 1	1.328	0.5	Pass





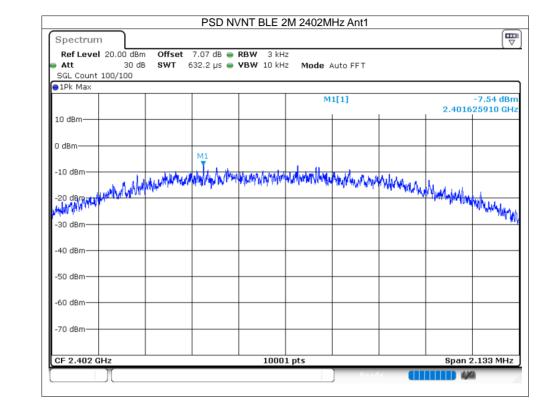
Spectrum					E
L Ref Level 20.00	dBm Offset 7.24 dB	RBW 100 kHz			( .
Att 3	0 dB <b>SWT</b> 18.9 µs	🖷 VBW 300 kHz	Mode Auto FFT		
SGL Count 100/10	0				
1Pk Max					
			M1[1]		4.32 dBm
10 dBm					2.439918410 GHz
		MI	M2[1]		-1.68 dBm
D dBm	M2 /	$\sim$	M3		2.439323000 GHz
J GDIII					
10 dBm				~~~	
10 0.0.00					
-20 dBm	A				
/					
-30 dBm					
$\sim$					
40 dBm					
-50 dBm					
60 dBm				+ +	
-70 dBm					
CF 2.44 GHz		10001 pt	s		Span 4.0 MHz
1arker					•
Type   Ref   Trc	X-value	Y-value	Function	Functi	ion Result
M1 1	2.43991841 GHz	4.32 dBm			
M2 1	2.439323 GHz	-1.68 dBm			
M3 1	2.440589 GHz	-1.68 dBm			
					444



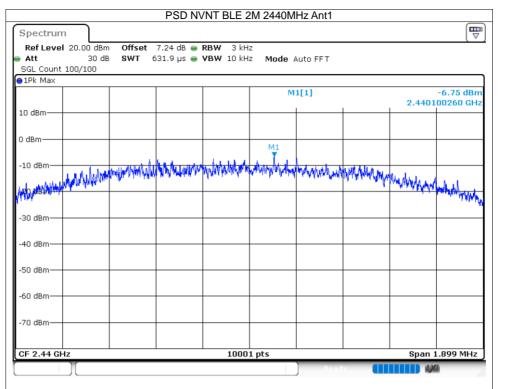


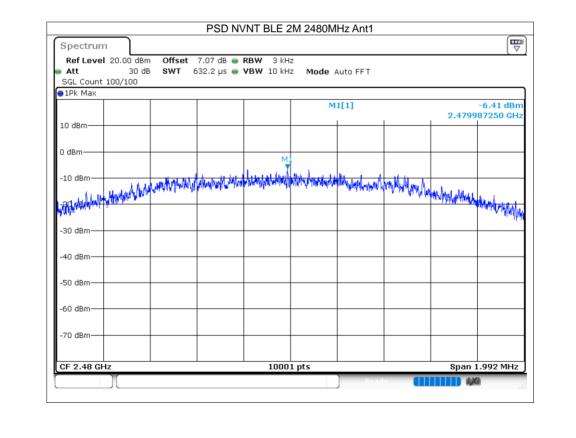
# 8.1.8 MAXIMUM POWER SPECTRAL DENSITY LEVEL

Condition	Mode	Frequency (MHz)	Antenna	Max PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
NVNT	BLE	2402	Ant 1	-7.54	8	Pass
NVNT	BLE	2440	Ant 1	-6.75	8	Pass
NVNT	BLE	2480	Ant 1	-6.41	8	Pass







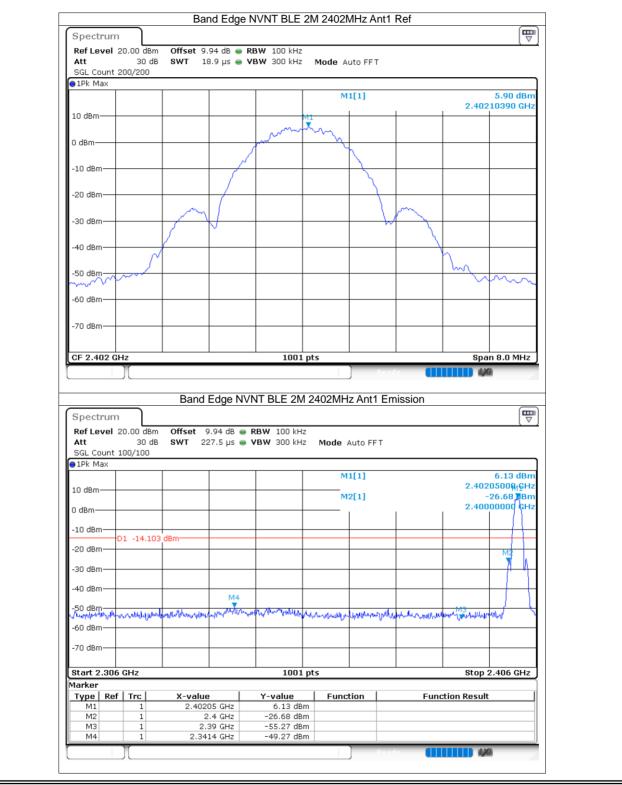


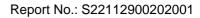
Page 51 of 57



### 8.1.9 BAND EDGE

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE	2402	Ant 1	-55.16	-20	Pass
NVNT	BLE	2480	Ant 1	-57.77	-20	Pass







	20.00 dBm			<b>RBW</b> 100 kHz					
Att SGL Count	30 dB t 200/200	SWT 1	.8.9 µs 👄	VBW 300 kHz	Mode A	uto FFT			
∎1Pk Max									
					м	1[1]		0.47	7.36 dBm
10 dBm								2.47	948050 GHz
				Mm	m				
0 dBm					- he				
			7			2			
-10 dBm—			1			7			
-20 dBm			<b>↓</b> /	_					
		m					m		
-30 dBm—		ſ	$\mathbb{W}$			- W			
10 10-		1							
-40 dBm—	~	1						h	
-50 dBm <del>/</del>	-							m	
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	ľ i								$\sim \sim 1$
-60 dBm—									
70 dp									
-70 dBm—									
CF 2.48 G				1001	pts			ара	an 8.0 MHz
Spectrur Paft qual				/NT BLE 2M		z Ant1 Em	nission		
-	20.00 dBm 30 dB	Offset	9.94 dB 👄	/NT BLE 2M RBW 100 kHz VBW 300 kHz	2		nission		
Ref Level Att	20.00 dBm 30 dB	Offset	9.94 dB 👄	<b>RBW</b> 100 kHz	2 2 Mode -	Auto FFT	nission		
Ref Level Att SGL Count 1Pk Max	20.00 dBm 30 dB	Offset	9.94 dB 👄	<b>RBW</b> 100 kHz	2 2 Mode -		nission	2.47	6.16 dBm 975000 GHz
Ref Level Att SGL Count 1Pk Max	20.00 dBm 30 dB	Offset	9.94 dB 👄	<b>RBW</b> 100 kHz	2 2 Mode . M	Auto FFT	nission		6.16 dBm 975000 GHz -52.24 dBm
Ref Level Att SGL Count 1Pk Max	20.00 dBm 30 dB	Offset	9.94 dB 👄	<b>RBW</b> 100 kHz	2 2 Mode . M	Auto FFT 1[1]	nission		6.16 dBm 975000 GHz
Ref Level Att SGL Count 1Pk Max	20.00 dBm 30 dB t 100/100	Offset SWT 2	9.94 dB 👄	<b>RBW</b> 100 kHz	2 2 Mode . M	Auto FFT 1[1]	nission		6.16 dBm 975000 GHz -52.24 dBm
Ref Level Att SGL Count 1Pk Max 10 dBm	20.00 dBm 30 dB	Offset SWT 2	9.94 dB 👄	<b>RBW</b> 100 kHz	2 2 Mode . M	Auto FFT 1[1]	nission		6.16 dBm 975000 GHz -52.24 dBm
Ref Level           Att           SGL Count           1Pk Max           10 dBm           0 dBm           -10 dBm	20.00 dBm 30 dB t 100/100	Offset SWT 2	9.94 dB 👄	<b>RBW</b> 100 kHz	2 2 Mode . M	Auto FFT 1[1]	hission		6.16 dBm 975000 GHz -52.24 dBm
Ref Level           Att           SGL Count           IPk Max           10° dBm           0 dBm           -10 dBm           -20 dBm           -30 dBm	20.00 dBm 30 dB t 100/100	Offset SWT 2	9.94 dB 👄	<b>RBW</b> 100 kHz	2 2 Mode . M	Auto FFT 1[1]	nission		6.16 dBm 975000 GHz -52.24 dBm
Ref Level           Att           SGL Count           1Pk Max           10 dBm           -10 dBm           -20 dBm           -20 dBm           -30 dBm	20.00 dBm 30 dB 100/100	Offset SWT 2	9.94 dB 👄	<b>RBW</b> 100 kHz	2 2 Mode . M	Auto FFT 1[1]			6.16 dBm 975000 GHz -52.24 dBm
Ref Level           Att           SGL Count           1Pk Max           10 dBm           -10 dBm           -20 dBm           -20 dBm           -30 dBm	20.00 dBm 30 dB 100/100	Offset SWT 2	9.94 dB • 27.5 µs •	RBW 100 kHz VBW 300 kHz	2 Mode . M M	Auto FFT  1[1] 2[1]		2.48	6.16 dBm 975000 GHz -52.24 dBm 350000 GHz
Ref Level           Att           SGL Count           1Pk Max           10 dBm           -10 dBm           -20 dBm           -20 dBm           -30 dBm	20.00 dBm 30 dB 100/100	Offset SWT 2	9.94 dB • 27.5 µs •	<b>RBW</b> 100 kHz	2 Mode . M M	Auto FFT  1[1] 2[1]		2.48	6.16 dBm 975000 GHz -52.24 dBm 350000 GHz
Ref Level           Att           SGL Count           1Pk Max           10 dBm           0 dBm           -10 dBm           -20 dBm           -30 dBm           -50 dBm           -60 dBm	20.00 dBm 30 dB 100/100	Offset SWT 2	9.94 dB • 27.5 µs •	RBW 100 kHz VBW 300 kHz	2 Mode . M M	Auto FFT  1[1] 2[1]		2.48	6.16 dBm 975000 GHz -52.24 dBm 350000 GHz
Ref Level           Att           SGL Count           1Pk Max           10 dBm           -10 dBm           -20 dBm           -30 dBm           -50 dBm           -50 dBm	20.00 dBm 30 dB 100/100	Offset SWT 2	9.94 dB • 27.5 µs •	RBW 100 kHz VBW 300 kHz	2 Mode . M M	Auto FFT  1[1] 2[1]		2.48	6.16 dBm 975000 GHz -52.24 dBm 350000 GHz
Ref Level           Att           SGL Count           1Pk Max           10 dBm           0 dBm           -10 dBm           -20 dBm           -30 dBm           -50 dBm           -60 dBm	20.00 dBm 30 dB 100/100	Offset SWT 2	9.94 dB • 27.5 µs •	RBW 100 kHz VBW 300 kHz	2 Mode . M M M M	Auto FFT  1[1] 2[1]		2.48:	6.16 dBm 975000 GHz -52.24 dBm 350000 GHz
Ref Level           Att           SGL Count           10'dbm           0 dbm           -10 dbm           -20 dbm           -30 dbm           -60 dbm           -70 dbm           -70 dbm           SG dbm           -80 dbm           -90 dbm           -10 dbm           -20 dbm           -20 dbm           -60 dbm           -70 dbm           -70 dbm	20.00 dBm 30 dB 100/100	Offset SWT 2	9.94 dB • .27.5 µs •	RBW 100 kHz VBW 300 kHz	2 Mode Mode Mode Mode Mode Mode Mode Mode	Auto FFT  1[1]  2[1]		2.48	6.16 dBm 975000 GHz -52.24 dBm 350000 GHz
Ref Level           Att           SGL Count           10'dbm           0 dbm           -10 dbm           -20 dbm           -30 dbm           -60 dbm           -70 dbm           -70 dbm           SG dbm           -80 dbm           -90 dbm           -10 dbm           -20 dbm           -20 dbm           -60 dbm           -70 dbm           -70 dbm	20.00 dBm 30 dB 100/100	Offset SWT 2 dBm dBm	9.94 dB • .27.5 µs •	RBW 100 kHz VBW 300 kHz	2 Mode . M M Jypaq_d/sbothal pts	Auto FFT  1[1]  2[1]		2.48:	6.16 dBm 975000 GHz -52.24 dBm 350000 GHz
Ref Level           Att           SGL Count           IPk Max           IO dBm           -10 dBm           -20 dBm           -20 dBm           -50 dBm           -60 dBm           -70 dBm           Start 2.47           Marker           Type         Re           M1	20.00 dBm 30 dB 100/100	Offset SWT 2 dBm dBm M4 cm M4 cm M4 cm M4 cm M4 cm M4 cm M4 cm M4 cm M4 cm M4 cm M4 cm M4 cm M4 cm M4 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 cm M5 C C Cm M5 C C C Cm M5 C C C C C C C C C C C C C C C C C C	9.94 dB  27.5 µs	RBW 100 kHz VBW 300 kHz 	2 Mode . 	Auto FFT  1[1]  2[1]		2.48	6.16 dBm 975000 GHz -52.24 dBm 350000 GHz
Ref Level           Att           SGL Count           1Pk Max           10 dBm           -10 dBm           -10 dBm           -20 dBm           -20 dBm           -30 dBm           -50 dBm           -60 dBm           -70 dBm           Start 2.47           Type           Re           M1	20.00 dBm 30 dB 100/100	Offset SWT 2 dBm dBm M4 M4 M4 M4 M4 M4 M4 M4 CA13 CA14 CA14 CA14 CA14 CA14 CA14 CA14 CA14	9.94 dB • 27.5 µs •	RBW 100 kHz VBW 300 kHz	2 Mode . Mode . M M M M M M M M M M M M M	Auto FFT  1[1]  2[1]		2.48	6.16 dBm 975000 GHz -52.24 dBm 350000 GHz
Ref Level           Att           SGL Count           SGL Count           IPk Max           10'dbm           -10 dbm           -20 dbm           -20 dbm           -30 dbm           -50 dbm           -60 dbm           -70 dbm           Stort 2.47           Marker           Type           M2           M3	20.00 dBm 30 dB 100/100	Offset SWT 2 dBm dBm M4 M4 M4 M4 M4 M4 M4 M4 CA13 CA14 CA14 CA14 CA14 CA14 CA14 CA14 CA14	9.94 dB • -27.5 µs •	RBW         100 kHz           VBW         300 kHz           Image: State St	2 Mode . Mode . M M M M M M M M M M M M M	Auto FFT  1[1]  2[1]	ς	2.48	6.16 dBm 975000 GHz -52.24 dBm 350000 GHz 

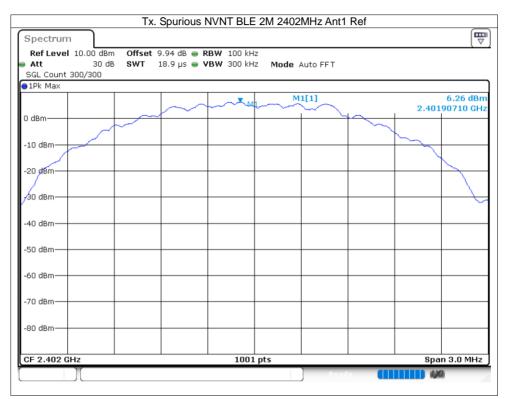


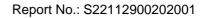
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Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE	2402	Ant 1	-49.35	-20	Pass
NVNT	BLE	2440	Ant 1	-49.54	-20	Pass
NVNT	BLE	2480	Ant 1	-50.78	-20	Pass

ACCREDITED Certificate #4298.01







	Spectrum							
SGL Count 10/10         IPk Max         0 dBm       M1         0 dBm       M1[1]         10 dBm       M2[1]         -20 dBm       M2[1]         -20 dBm       M2[1]         -30 dBm       M2         -40 dBm       M2         -30 dBm       M3         -40 dBm       M2         -30 dBm       M3         -40 dBm       M2         -30 dBm       M2         -30 dBm       M3         -40 dBm       M3         -40 dBm       M2         -40 dBm       M3         -50 dBm       M4         -30 dBm       M4         -40 dBm       M2         -40 dBm       M4         -50 dBm       M4         -60 dBm       M4         -70 dBm       M4         -70 dBm       M4         -70 dBm       M4         -70 dBm       Stop 26.5 GHz         M1       1       2.397 GHz       5.14 dBm         M1       1       2.397 GHz       5.14 dBm         M3       1       4.953 GHz       -43.09 dBm         M3       1 <td< th=""><th>Ref Level</th><th>10.00 di</th><th>m Offset</th><th>9.94 dB 🖷</th><th>RBW 100 kHz</th><th></th><th></th><th></th></td<>	Ref Level	10.00 di	m Offset	9.94 dB 🖷	RBW 100 kHz			
1Pk Max       M1       M1       S.14 dBm       2.3970 GHz         10 dBm       01 -13.738 dBm       M2[1]       -43.09 dBm         -20 dBm       01 -13.738 dBm       15.9385 GHz         -20 dBm       01 -13.738 dBm       15.9385 GHz         -30 dBm       M2       15.9385 GHz         -30 dBm       M2       M2         -40 dBm       M2       M4         -40 dBm       M2       M4         -40 dBm       M2       M4         -40 dBm       M2       M4         -70 dBm       M4       M5         -70 dBm       M4       M5         -80 dBm       M4       M4         -70 dBm       M4         -70 dBm       M1       1         -80 dBm       M4       M4         -90 dBm       M4       M4         1       7.937 GHz       5.14 dBm         M1       1       7.937 GHz       5.14 dBm         M3       1       4.9534 GHz       -46.	Att	30	dB SWT	265 ms 🖷	<b>VBW</b> 300 kHz	Mode Auto S	weep	
M1     S.14 dBm       0 dBm     M1       -10 dBm     M2[1]       -10 dBm     01 -13.738 dBm       -20 dBm     01 -13.738 dBm       -30 dBm     01 -13.738 dBm       -30 dBm     01 -13.738 dBm       -20 dBm     01 -13.738 dBm       -30 dBm     01 -13.738 dBm       -30 dBm     01 -13.738 dBm       -40 dBm     M2       -40 dBm     M2       -30 dBm     M4       -40 dBm     M2       -50 dBm     M4       -60 dBm     -10 -10 -10 -10 -10 -10 -10 -10 -10 -10	SGL Count 1	.0/10						
0 dBm       M1	1Pk Max							
0 dBm	▼.					M1[1]		5.14 dBm
10 dBm     01 -13.738 dBm     15.9385 GHz       20 dBm     01 -13.738 dBm     15.9385 GHz       -20 dBm     01 -13.738 dBm     15.9385 GHz       -30 dBm		41						2.3970 GHz
20 dbm     D1 -13.738 dbm     Image: Constraint of the second sec						M2[1]		-43.09 dBm
-20 dBm     -30 dBm	-10 dBm							15.9385 GHz
-30 dBm		01 -13.73	18 aBm					
40 dBm     M3     M4     M5     M4     M5       -50 dBm     -60 dBm     -     -     -     -       -60 dBm     -     -     -     -     -       -70 dBm     -     -     -     -     -       -80 dBm     -     -     -     -     -     -       -90 dBm     -     -     -     <	-20 dBm							
40 dBm     M3     M4     M5     M4     M5       -50 dBm     -60 dBm     -     -     -     -       -60 dBm     -     -     -     -     -       -70 dBm     -     -     -     -     -       -80 dBm     -     -     -     -     -     -       -90 dBm     -     -     -     <	-30 dBm							
M4     M5       50 dBm     -0       -60 dBm     -0       -70 dBm     -0       -70 dBm     -0       -80 dBm     -0       -80 dBm     -0       -70 dBm     -0       -80 dBm     -0       -80 dBm     -0       -70 dBm     -0       -80 dBm     -0       -90 dBm     -0       -91 dBm     -1       -92 dBm     -1       -93 dBm	oo abiii							
Start 30.0 MHz     X-value     Y-value     Function       Type     Ref     Trc     X-value     Y-value       M1     1     2.397 GHz     5.14 dBm       M2     1     15.9385 GHz     -43.09 dBm       M3     1     4.9534 GHz     -46.77 dBm       M4     1     7.0446 GHz     -47.18 dBm	-40 dBm		13 M4	NAC.		M2		
60 dBm			T. Wetnerst	M5	a real way and a stranger of the start	work have been provided and the second	more have not when a	un may make Mark month
To dBm         Image: Constraint of the second	,50vdBpq,,,,hill+	and the second s	<u>, , , , , , , , , , , , , , , , , , , </u>	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Company of the	·		
Tod Bm         Image: Constraint of the second	-60 dBm							
BO dBm         Image: start 30.0 MHz         Image: start 30.0 MHz         Image: start 30.0 MHz         Stop 26.5 GHz           Start 30.0 MHz         Stop 26.5 GHz           Marker         Image: start 30.0 MHz         Stop 26.5 GHz           Marker           Type Ref Trc X-value         Y-value         Function Result           M1         1         2.397 GHz         5.14 dBm           M2         1         15.9385 GHz	-00 00111							
Start 30.0 MHz         1001 pts         Stop 26.5 GHz           Marker         Yolue         Function         Function Result           M1         1         2.397 GHz         5.14 dBm            M2         1         15.9385 GHz         -43.09 dBm            M3         1         4.9534 GHz         -47.7 dBm            M4         1         7.0446 GHz         -47.18 dBm	-70 dBm				_			
Start 30.0 MHz         1001 pts         Stop 26.5 GHz           Aarker         Trype         Ref         Trc         X-value         Function         Function Result           M1         1         2.397 GHz         5.14 dBm              M2         1         15.9385 GHz         -43.09 dBm              M3         1         4.9534 GHz         -47.7 dBm              M4         1         7.0446 GHz         -47.18 dBm								
Marker           Type         Ref         Trc         X-value         Y-value         Function         Function Result           M1         1         2.397 GHz         5.14 dBm	-80 dBm —		+					
Marker           Type         Ref         Trc         X-value         Y-value         Function         Function Result           M1         1         2.397 GHz         5.14 dBm								
Type         Ref         Trc         X-value         Y-value         Function         Function Result           M1         1         2.397 GHz         5.14 dBm	Start 30.0 M	1Hz			1001 pt	s		Stop 26.5 GHz
M1         1         2.397 GHz         5.14 dBm           M2         1         15.9385 GHz         -43.09 dBm           M3         1         4.9534 GHz         -46.77 dBm           M4         1         7.0446 GHz         -47.18 dBm	1arker							
M2         1         15.9385 GHz        43.09 dBm           M3         1         4.9534 GHz         -46.77 dBm           M4         1         7.0446 GHz         -47.18 dBm	Type   Ref	Trc	X-valu	e	Y-value	Function	Fun	ction Result
M3         1         4.9534 GHz        46.77 dBm           M4         1         7.0446 GHz         -47.18 dBm	M1	1	2.3	397 GHz	5.14 dBm			
M4 1 7.0446 GHz -47.18 dBm		1						
M5 1 9.5857 GHz -47.85 dBm	644							
			0 50	357 GHz	-47.85 dBm			



