# **Radio Test Report**

Report No.:STS2311021W02

Issued for

Orbit Irrigation Product Inc.

845N. Overland Road, North Salt Lake, Utah 84054 USA

Product Name:	Hose Faucet Timer		
Brand Name:	B-hyve/Orbit		
Model Name:	HT25ASR		
Series Model(s):	N/A		
FCC ID:	ML6HT25ASR		
Test Standards:	FCC Part15.247		

The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the ShenZhen STS Test Services Co., Ltd.



#### **TEST REPORT**

Applicant's Name:	Orbit Irrigation Product Inc.
Address	845N. Overland Road, North Salt Lake, Utah 84054 USA
Manufacturer's Name	GARDENA Inc.
Address	845 N Overland Road., North Salt Lake, Utah 84054 USA
Product Description	
Product Name:	Hose Faucet Timer
Brand Name:	B-hyve/Orbit
Model Name:	HT25ASR
Series Model(s)	N/A
Test Standards	FCC Part15.247
Test Procedure:	ANSI C63.10-2013
This device described above ha	s been tested by STS, the test results show that the equipment unde

This device described above has been tested by STS, 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.

The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the ShenZhen STS Test Services Co., Ltd.

Date of Test	
Date of receipt of test item:	30 Oct. 2023
Date (s) of performance of tests:	30 Oct. 2023 ~ 27 Nov. 2023
Date of Issue	27 Nov. 2023
Test Result	Pass

Testing Engineer

Aann 13u

(Aaron Bu)

Technical Manager

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(Chris Chen)

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Authorized Signatory :

(Bovey Yang)

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# **Revision History**

Rev.	Issue Date	Report No.	Effect Page	Contents
00	27 Nov. 2023	STS2311021W02	ALL	Initial Issue
1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1			9	9





## **1. SUMMARY OF TEST RESULTS**

Test procedures according to the technical standards: KDB 558074 D01 15.247 Meas Guidance v05r02.

FCC Part 15.247,Subpart C						
Standard Section	Judgment	Remark				
15.207	Conducted Emission	N/A				
15.247 (a)(2)	6dB Bandwidth	PASS				
15.247 (b)(3)	Output Power	PASS				
15.209	15.209 Radiated Spurious Emission					
15.247 (d)	Conducted Spurious & Band Edge Emission		-			
15.247 (e)	Power Spectral Density	PASS				
15.205 Restricted bands of operation		PASS				
Part 15.247(d)/ Part 15.209(a) Band Edge Emission		PASS				
15.203	PASS					

#### NOTE:

- (1) 'N/A' denotes test is not applicable in this Test Report.
- (2) All tests are according to ANSI C63.10-2013.



#### 1.1 TEST FACTORY

SHENZHEN STS TEST SERVICES CO., LTD Add. : 101, Building B, Zhuoke Science Park, No.190 Chongqing Road, ZhanChengShequ, Fuhai Sub-District, Bao'an District, Shenzhen, Guang Dong, China FCC test Firm Registration Number: 625569

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IC test Firm Registration Number: 12108A

A2LA Certificate No.: 4338.01

#### **1.2 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	RF output power, conducted	±1.197dB
2	Unwanted Emissions, conducted	±2.896dB
3	All emissions, radiated 9K-30MHz	±3.84dB
4	All emissions, radiated 30M-1GHz	±3.94dB
5	All emissions, radiated 1G-6GHz	±4.59dB
6	All emissions, radiated>6G	±5.22dB
7	Conducted Emission (9KHz-150KHz)	±2.14dB
8	Conducted Emission (150KHz-30MHz)	±2.54dB
9	Occupied Channel Bandwidth	±3.5%
10	Dwell time	±3.2%
11	Power Spectral Density, conducted	±1.245dB



## 2. GENERAL INFORMATION

## 2.1 GENERAL DESCRIPTION OF THE EUT

Hose Faucet Timer	13 13	
B-hyve/Orbit	1°	
HT25ASR		
N/A		
N/A		
The EUT is a Hose	Faucet Timer	
Operation Frequency:	2402~2480 MHz	
Modulation Type:	GFSK	
Radio Technology:	BLE	
Bluetooth	LE(Support 1M PHY)	
Configuration:		
Number Of Channel:	40	
Antenna Type:	PCB antenna	
Antenna Gain (dBi) 0.95dBi		
Please refer to the Note 3.		
Input :DC 3V		
2x AA, Not Included		
Please refer to the I	Note 1.	
	B-hyve/Orbit HT25ASR N/A N/A The EUT is a Hose Operation Frequency: Modulation Type: Radio Technology: Bluetooth Configuration: Number Of Channel: Antenna Type: Antenna Gain (dBi) Please refer to the N Input :DC 3V	

Note:

- 1. For a more detailed features description, please refer to the manufacturer's specifications or the User Manual.
- 2. The antenna information refer the manufacturer provide report, applicable only to the tested sample identified in the report. Due to the incorrect antenna information, a series of problems such as the accuracy of the test results will be borne by the customer.



Channel List								
	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequenc y (MHz)
	00	2402	10	2422	20	2442	30	2462
	01	2404	11	2424	21	2444	31	2464
	02	2406	12	2426	22	2446	32	2466
	03	2408	13	2428	23	2448	33	2468
	04	2410	14	2430	24	2450	34	2470
	05	2412	15	2432	25	2452	35	2472
	06	2414	16	2434	26	2454	36	2474
	07	2416	17	2436	27	2456	37	2476
	08	2418	18	2438	28	2458	38	2478
	09	2420	19	2440	29	2460	39	2480
					4			1 The



#### 2.2 DESCRIPTION OF THE TEST MODES

For conducted test items and radiated spurious emissions

Each of these EUT operation mode(s) or test configuration mode(s) mentioned below was evaluated respectively.

Worst Mode	Description	Data/Modulation
Mode 1	TX CH00(2402MHz)	1 Mbps/GFSK
Mode 2	TX CH19(2440MHz)	1 Mbps/GFSK
Mode 3 TX CH39(2480MHz)		1 Mbps/GFSK

Note:

We tested for available U.S. voltage (For battery- 2x AA DC 3V) for which the device is capable of operation, and the worst case of battery- 2x AA DC 3V is shown in the report.
 The battery is new during the radiated and RF conducted test.

#### 2.3 TEST SOFTWARE AND POWER LEVEL

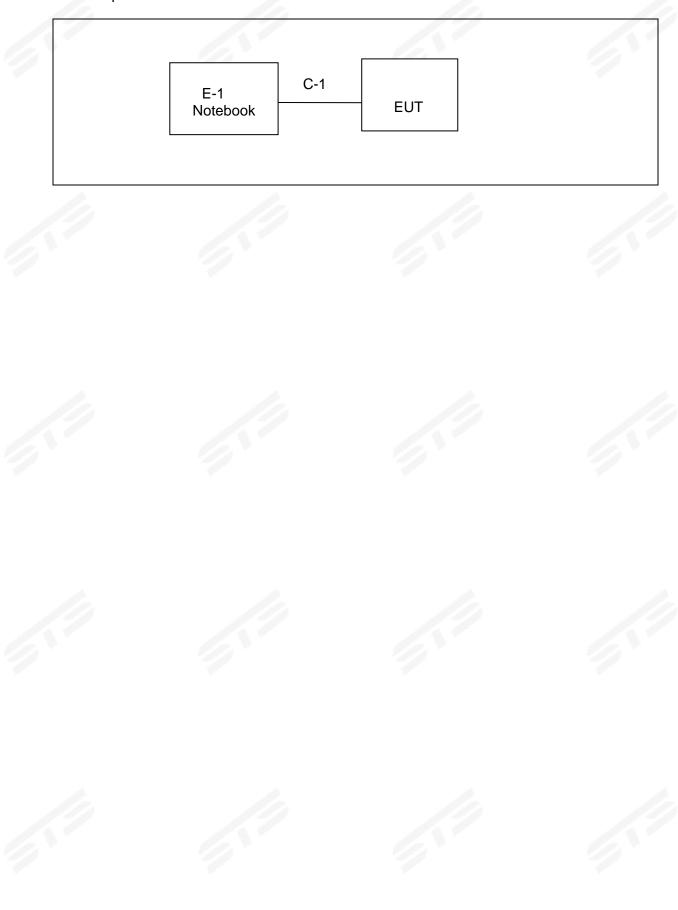
During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level.

RF Function	Туре	Mode Or Modulation type	ANT Gain(dBi)	Power Class	Software For Testing
BLE	BLE	GFSK	0.95	8	DOGO_VP2.4.2



# 2.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

# Radiated Spurious Emission Test





#### 2.5 DESCRIPTION OF NECESSARY ACCESSORIES AND SUPPORT UNITS

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.

Necessary accessories					
Item Equipment Mfr/Brand		Model/Type No.	Length	Note	
	N/A	N/A	N/A	N/A	N/A

Item	Equipment	Mfr/Brand	Model/Type No.	Length	Note
	Notebook	LENOVO	Think Pad E470	N/A	N/A
	USB Cable	N/A	N/A	150cm	NO

Note:

- (1) For detachable type I/O cable should be specified the length in cm in <sup>r</sup>Length <sub>a</sub> column.
- (2) "YES" is means "with core"; "NO" is means "without core".



# 2.6 EQUIPMENTS LIST

	RF Radia	tion Test Equipme	nt		
Kind of Equipment	Manufacturer	Туре No.	Serial No.	Last Calibration	Calibrated Until
Temperature & Humidity	SW-108	SuWei	N/A	2023.03.03	2024.03.02
Pre-Amplifier(0.1M-3GHz)	EM	EM330	060665	2023.02.28	2024.02.27
Pre-Amplifier(1G-18GHz)	SKET	LNPA-01018G-45	SK2018080901	2023.09.26	2024.09.25
Pre-Amplifier(18G-40GHz)	SKET	LNPA_1840-50	SK2018101801	2023.03.06	2024.03.05
Active loop Antenna	ZHINAN	ZN30900C	16035	2023.02.28	2024.02.27
Bilog Antenna	TESEQ	CBL6111D	34678	2022.09.30	2024.09.29
Horn Antenna	SCHWARZBECK	BBHA 9120D	02014	2023.09.24	2025.09.23
Horn Antenna	A-INFOMW	LB-180400-KF	J211020657	2023.10.10	2025.10.09
Positioning Controller	MF	MF-7802	MF-780208587	N/A	N/A
Signal Analyzer	R&S	FSV 40-N	101823	2023.09.26	2024.09.25
Switch Control Box	N/A	N/A	N/A	N/A	N/A
Filter Box	BALUN Technology	SU319E	BL-SZ1530051	N/A	N/A
Antenna Mast	MF	MFA-440H	N/A	N/A	N/A
Turn Table	MF	SC100_1	60531	N/A	N/A
AC Power Source	APC	KDF-11010G	F214050035	N/A	N/A
DC power supply	HONGSHENGFENG	DPS-305AF	17064939	2023.09.26	2024.09.25
Test SW	EZ-EMC		Ver.STSLAB-03	A1 RE	1
	Conduct	ion Test equipme	nt	- 10	
Kind of Equipment	Manufacturer	Туре No.	Serial No.	Last calibration	Calibrated until
Test Receiver	R&S	ESCI	101427	2023.09.25	2024.09.24
LISN	R&S	ENV216	101242	2023.09.25	2024.09.24
LISN	EMCO	3810/2NM	23625	2023.09.25	2024.09.24
Temperature & Humidity	SW-108	SuWei	N/A	2023.03.03	2024.03.02
Test SW	EZ-EMC		Ver.STSLAB-03	A1 CE	
	RFC	Connected Test		1	1
Kind of Equipment	Manufacturer	Туре No.	Serial No.	Last calibration	Calibrated until
Signal Analyzer	Agilent	N9020A	MY51510623	2023.03.01	2024.02.28
Power Sensor	Keysight	U2021XA	MY55520005	2023.09.26	2024.09.25
Temperature & Humidity	SW-108	SuWei	N/A	2023.03.03	2024.03.02
Test SW	MW		MTS 8310_2.0	0.0.0	



#### 3. EMC EMISSION TEST

# 3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION LIMITS

The radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table.

	Conducted Emission limit (dBuV)		
FREQUENCY (MHz)	Quasi-peak	Average	
0.15 -0.5	66 - 56 *	56 - 46 *	
0.50 -5.0	56.00	46.00	
5.0 -30.0	60.00	50.00	

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of " \* " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

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

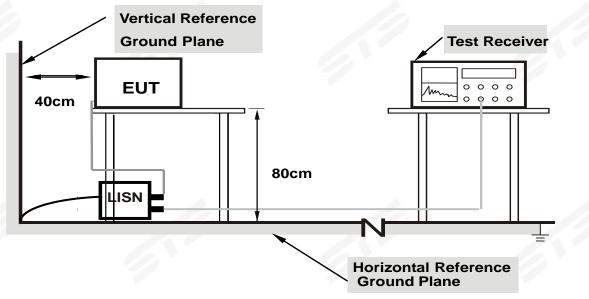
Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz



#### 3.2 TEST PROCEDURE

- a. The EUT is 0.8 m from the horizontal ground plane and 0.4 m from the vertical ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments are powered from additional LISN(s). The LISN provides 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN is at least 80 cm from the nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item -EUT Test Photos.

#### 3.3 TEST SETUP



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

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

#### 3.4 EUT OPERATING CONDITIONS

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

Note: product is battery operated and conducted emission test is not applicable.



#### 4. RADIATED EMISSION MEASUREMENT

#### **4.1 RADIATED EMISSION LIMITS**

In any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the Restricted band specified on Part15.205(a)&209(a) limit in the table and according to ANSI C63.10-2013 below has to be followed.

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

Frequencies	Field Strength	Measurement Distance
(MHz)	(micorvolts/meter)	(meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

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

	(dBuV/m) (at 3M)		
FREQUENCY (MHz)	PEAK	AVERAGE	
Above 1000	74	54	
Notes:		/ /	1
(1) The limit for radiated te	est was performed according	to FCC PART 15C.	
(2) The tighter limit applies	s at the band edges		

- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

#### LIMITS OF RESTRICTED FREQUENCY BANDS

FREQUENCY (MHz)	FREQUENCY (MHz)	FREQUENCY (MHz)	FREQUENCY (GHz)
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
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	Above 38.6
13.36-13.41			



For Radiated Emission

Spectrum Parameter	Setting	
Attenuation	Auto	
Detector	Peak/QP/AV	
Start Frequency	9 KHz/150KHz(Peak/QP/AV)	
Stop Frequency	150KHz/30MHz(Peak/QP/AV)	
	200Hz (From 9kHz to 0.15MHz)/	
RB / VB (emission in restricted	9KHz (From 0.15MHz to 30MHz);	
band)	200Hz (From 9kHz to 0.15MHz)/	
	9KHz (From 0.15MHz to 30MHz)	

Spectrum Parameter	Setting	
Attenuation	Auto	
Detector	Peak/QP	
Start Frequency	30 MHz(Peak/QP)	
Stop Frequency	1000 MHz (Peak/QP)	
RB / VB (emission in restricted	120 KHz / 200 KHz	
band)	120 KHz / 300 KHz	

Spectrum Parameter	Setting
Attenuation	Auto
Detector	Peak/AV
Start Frequency	1000 MHz(Peak/AV)
Stop Frequency	10th carrier hamonic(Peak/AV)
RB / VB (emission in restricted	1 MHz / 3 MHz(Peak)
band)	1 MHz/1/T MHz(AVG)
r Restricted band	
	Attenuation Detector Start Frequency Stop Frequency RB / VB (emission in restricted band)

Spectrum ParameterSettingDetectorPeak/AVStart/Stop FrequencyLower Band Edge: 2310 to 2410 MHzUpper Band Edge: 2475 to 2500 MHz1 MHz / 3 MHz(Peak)RB / VB1 MHz / 3 MHz(Peak)1 MHz/1/T MHz(AVG)



Receiver Parameter	Setting
Start ~ Stop Frequency	9kHz~90kHz / RB 200Hz for PK & AV
Start ~ Stop Frequency	90kHz~110kHz / RB 200Hz for QP
Start ~ Stop Frequency	110kHz~490kHz / RB 200Hz for PK & AV
Start ~ Stop Frequency	490kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

#### 4.2 TEST PROCEDURE

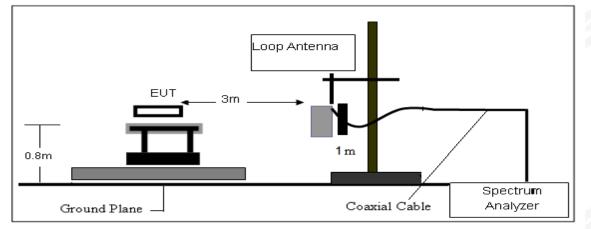
- a. The measuring distance at 3 m shall be used for measurements at frequency 0.009MHz up to 1GHz, and above 1GHz.
- b. The EUT was placed on the top of a rotating table 0.8 m (above 1GHz is 1.5 m) above the ground at a 3 m anechoic chamber test site. The table was rotated 360 degree to determine the position of the highest radiation.
- c. The height of the equipment shall be 0.8 m (above 1GHz is 1.5 m); the height of the test antenna shall vary between 1 m to 4 m. Horizontal and vertical polarization of the antenna are set to make the measurement.
- d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and QuasiPeak detector mode will be re-measured.
- e. If the Peak Mode measured value is compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and no additional QP Mode measurement was performed.
- f. 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.

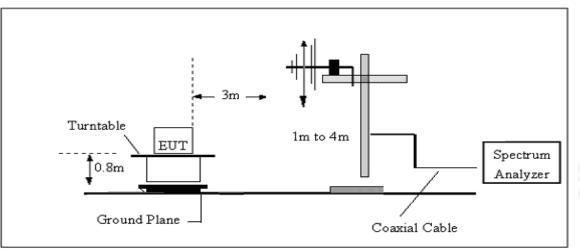


# 4.3 TEST SETUP

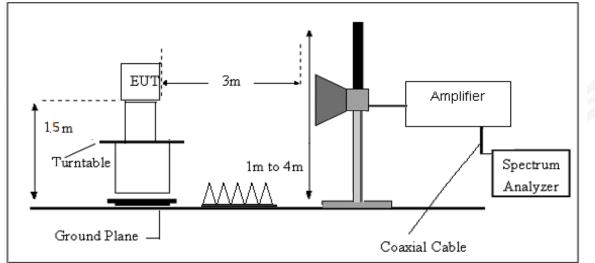
(A) Radiated Emission Test-Up Frequency Below 30MHz



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



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



<sup>4.4</sup> EUT OPERATING CONDITIONS

Please refer to section 3.4 of this report.

4.5 FIELD STRENGTH CALCULATION



The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL - AGWhere FS = Field Strength CL = Cable Attenuation Factor (Cable Loss) RA = Reading Amplitude

AG = Amplifier Gain

AF = Antenna Factor

For example

Frequency	FS	RA	AF	CL	AG	Factor
(MHz)	(dBµV/m)	(dBµV/m)	(dB)	(dB)	(dB)	(dB)
300	40	58.1	12.2	1.6	31.9	-18.1

Factor=AF+CL-AG











#### 4.6 TEST RESULTS

(Between 9KHz – 30 MHz)

Temperature:	23.1(C)	Relative Humidtity:	60%RH
Test Voltage:	DC 3V	Polarization:	
Test Mode:	TX Mode	1	

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

#### Note:

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

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

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



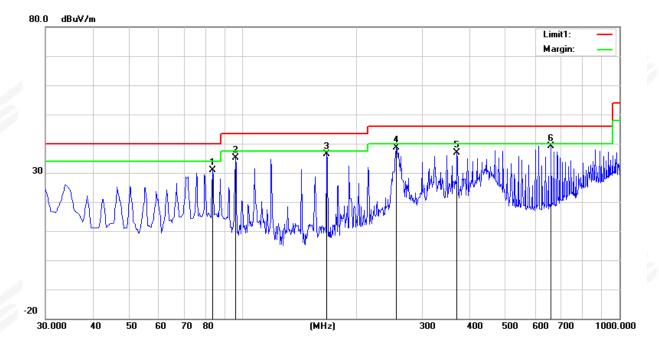
(30MHz -1000MHz)

Temperature:	23.1(C)	Relative Humidity:	60%RH				
Test Voltage:	DC 3V	Phase:	Horizontal				
Test Mode:	Mode 1/2/3 (Mode 2 worst mode)						

No.	Frequenc y	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/ m)	(dBuV/m)	(dBuV/m)	(dB)	
1	83.3500	53.45	-22.52	30.93	40.00	-9.07	peak
2	95.9600	55.92	-20.67	35.25	43.50	-8.25	peak
3	167.7400	55.98	-19.58	36.40	43.50	-7.10	peak
4	256.0100	53.91	-15.24	38.67	46.00	-7.33	peak
5	371.4400	49.40	-12.46	36.94	46.00	-9.06	peak
6	660.5000	43.98	-4.80	39.18	46.00	-6.82	peak

#### Remark:

- Margin = Result (Result = Reading + Factor )–Limit
   Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain 2.





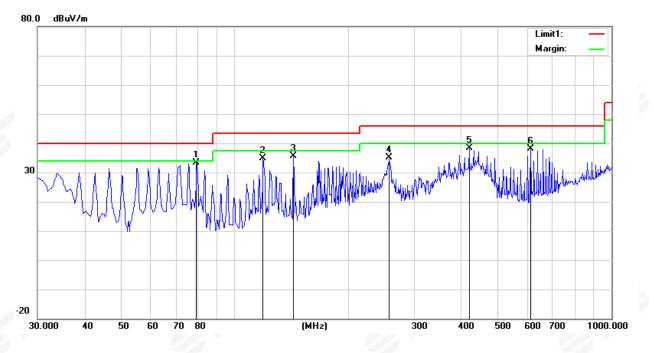
Report No.: STS2311021W02

Temperature:	23.1(C)	Relative Humidity:	60%RH				
Test Voltage:	DC 3V	Phase:	Vertical				
Test Mode: Mode 1/2/3 (Mode 2 worst mode)							
	11.	100	6.1				

No.	Frequenc y	Reading	Reading Correct		Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/ m)	(dBuV/m)	(dBuV/m)	(dB)	
1	79.4700	56.52	-23.11	33.41	40.00	-6.59	peak
2	119.2400	53.25	-18.38	34.87	43.50	-8.63	peak
3	143.4900	53.78	-18.23	35.55	43.50	-7.95	peak
4	257.9500	50.16	-15.02	35.14	46.00	-10.86	peak
5	419.9400	48.44	-10.09	38.35	46.00	-7.65	peak
6	612.0000	43.63	-5.50	38.13	46.00	-7.87	peak

#### Remark:

- Margin = Result (Result =Reading + Factor )–Limit
   Factor= Antenna factor+Cable attenuation factor(cable loss)-Amplifier gain 2.





# (1GHz-25GHz) Spurious emission Requirements

GFSK

			-			•				
Comment	Detector	Margin	Limits	Emission Level	Corrected Factor	Antenna Factor	Loss	Amplifier	Meter Reading	Frequency
	Туре	(dB)	(dBµV/m)	(dBµV/m)	(dB)	(dB/m)	(dB)	(dB)	(dBµV)	(MHz)
1 m			÷	2402 MHz)	nannel (GFSK/2	Low Ch	1. 3			1. 8
Vertical	PK	-22.51	74.00	51.49	-9.80	28.20	6.70	44.70	61.29	3264.66
Vertical	AV	-12.78	54.00	41.22	-9.80	28.20	6.70	44.70	51.02	3264.66
Horizontal	PK	-22.03	74.00	51.97	-9.80	28.20	6.70	44.70	61.77	3264.76
Horizontal	AV	-12.65	54.00	41.35	-9.80	28.20	6.70	44.70	51.15	3264.76
Vertical	PK	-18.86	74.00	55.14	-3.56	31.60	9.04	44.20	58.70	4804.33
Vertical	AV	-7.98	54.00	46.02	-3.56	31.60	9.04	44.20	49.58	4804.33
Horizontal	PK	-17.94	74.00	56.06	-3.56	31.60	9.04	44.20	59.62	4804.50
Horizontal	AV	-7.90	54.00	46.10	-3.56	31.60	9.04	44.20	49.66	4804.50
Vertical	PK	-28.39	74.00	45.61	-2.34	32.00	9.86	44.20	47.95	5359.62
Vertical	AV	-16.95	54.00	37.05	-2.34	32.00	9.86	44.20	39.39	5359.62
Horizontal	PK	-27.93	74.00	46.07	-2.34	32.00	9.86	44.20	48.41	5359.69
Horizontal	AV	-18.04	54.00	35.96	-2.34	32.00	9.86	44.20	38.30	5359.69
Vertical	PK	-15.67	74.00	58.33	3.40	35.50	11.40	43.50	54.93	7205.72
Vertical	AV	-6.65	54.00	47.35	3.40	35.50	11.40	43.50	43.95	7205.72
Horizontal	PK	-16.91	74.00	57.09	3.40	35.50	11.40	43.50	53.69	7205.68
Horizontal	AV	-6.45	54.00	47.55	3.40	35.50	11.40	43.50	44.15	7205.68
				/2440 MHz)	hannel (GFSK	Middle C				
Vertical	PK	-21.89	74.00	52.11	-9.80	28.20	6.70	44.70	61.91	3263.15
Vertical	AV	-12.64	54.00	41.36	-9.80	28.20	6.70	44.70	51.16	3263.15
Horizontal	PK	-22.41	74.00	51.59	-9.80	28.20	6.70	44.70	61.39	3262.95
Horizontal	AV	-13.69	54.00	40.31	-9.80	28.20	6.70	44.70	50.11	3262.95
Vertical	PK	-18.56	74.00	55.44	-3.56	31.60	9.04	44.20	59.00	4879.91
Vertical	AV	-7.74	54.00	46.26	-3.56	31.60	9.04	44.20	49.82	4879.91
Horizontal	PK	-18.86	74.00	55.14	-3.56	31.60	9.04	44.20	58.70	4879.98
Horizontal	AV	-7.65	54.00	46.35	-3.56	31.60	9.04	44.20	49.91	4879.98
Vertical	PK	-26.97	74.00	47.03	-2.34	32.00	9.86	44.20	49.37	5357.09
Vertical	AV	-16.04	54.00	37.96	-2.34	32.00	9.86	44.20	40.30	5357.09
Horizontal	PK	-27.91	74.00	46.09	-2.34	32.00	9.86	44.20	48.43	5357.39
Horizontal	AV	-18.27	54.00	35.73	-2.34	32.00	9.86	44.20	38.07	5356.94
Vertical	PK	-16.88	74.00	57.12	3.40	35.50	11.40	43.50	53.72	7320.85
Vertical	AV	-6.45	54.00	47.55	3.40	35.50	11.40	43.50	44.15	7320.85
Horizontal	PK	-16.44	74.00	57.56	3.40	35.50	11.40	43.50	54.16	7320.42
Horizontal	AV	-6.60	54.00	47.40	3.40	35.50	11.40	43.50	44.00	7320.42



#### Report No.: STS2311021W02

				High Char	nnel (GFSK/	2480 MHz)				
3264.67	61.54	44.70	6.70	28.20	-9.80	51.74	74.00	-22.26	PK	Vertical
3264.67	51.39	44.70	6.70	28.20	-9.80	41.59	54.00	-12.41	AV	Vertical
3264.58	61.35	44.70	6.70	28.20	-9.80	51.55	74.00	-22.45	PK	Horizontal
3264.58	50.85	44.70	6.70	28.20	-9.80	41.05	54.00	-12.95	AV	Horizontal
4960.50	58.15	44.20	9.04	31.60	-3.56	54.59	74.00	-19.41	PK	Vertical
4960.50	49.35	44.20	9.04	31.60	-3.56	45.79	54.00	-8.21	AV	Vertical
4960.40	59.07	44.20	9.04	31.60	-3.56	55.51	74.00	-18.49	PK	Horizontal
4960.40	50.36	44.20	9.04	31.60	-3.56	46.80	54.00	-7.20	AV	Horizontal
5359.73	48.27	44.20	9.86	32.00	-2.34	45.93	74.00	-28.07	PK	Vertical
5359.73	39.39	44.20	9.86	32.00	-2.34	37.05	54.00	-16.95	AV	Vertical
5359.77	47.67	44.20	9.86	32.00	-2.34	45.33	74.00	-28.67	PK	Horizontal
5359.77	38.34	44.20	9.86	32.00	-2.34	36.00	54.00	-18.00	AV	Horizontal
7439.75	53.95	43.50	11.40	35.50	3.40	57.35	74.00	-16.65	PK	Vertical
7439.75	44.75	43.50	11.40	35.50	3.40	48.15	54.00	-5.85	AV	Vertical
7439.80	54.57	43.50	11.40	35.50	3.40	57.97	74.00	-16.03	PK	Horizontal
7439.80	44.10	43.50	11.40	35.50	3.40	47.50	54.00	-6.50	AV	Horizontal

#### Note:

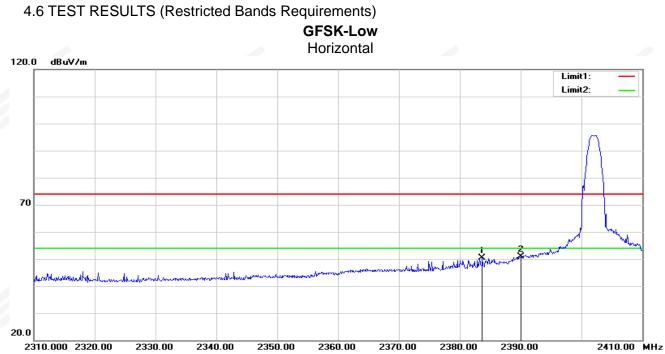
1) Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Emission Level = Reading + Factor

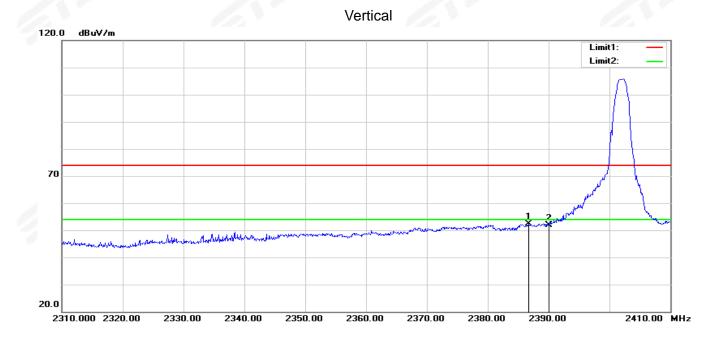
2) The frequency emission of peak points that did not show above the forms are at least 20dB below the limit, the frequency emission is mainly from the environment noise.







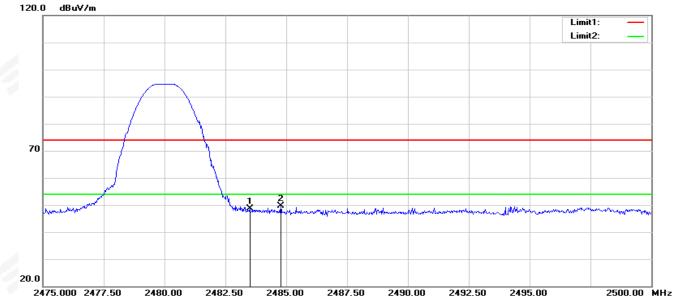
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2383.700	46.19	4.24	50.43	74.00	-23.57	peak
2	2390.000	46.50	4.34	50.84	74.00	-23.16	peak



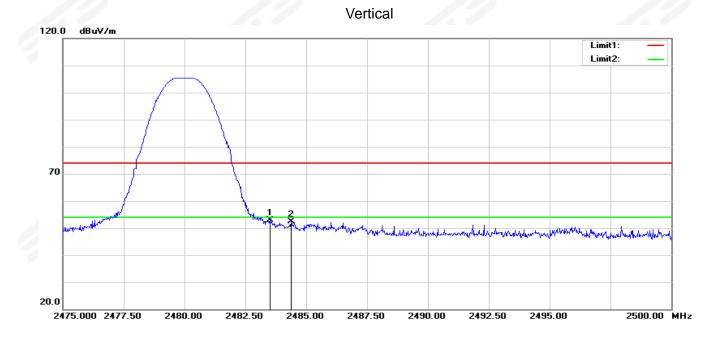
	No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
		(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
5	1	2386.700	48.04	4.29	52.33	74.00	-21.67	peak
	2	2390.000	47.61	4.34	51.95	74.00	-22.05	peak



# **GFSK-High** Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2483.500	44.05	4.60	48.65	74.00	-25.35	peak
2	2484.775	45.03	4.61	49.64	74.00	-24.36	peak



No.	Frequency	ency Reading Correct		Result Limit		Margin	Remark
	(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2483.500	48.39	4.60	52.99	74.00	-21.01	peak
2	2484.375	47.70	4.61	52.31	74.00	-21.69	peak

# 5. CONDUCTED SPURIOUS & BAND EDGE EMISSION

#### 5.1 LIMIT

According to FCC section 15.247(d), in any 100kHz 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 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

### 5.2 TEST PROCEDURE

Spectrum Parameter	Setting		
Detector	Peak		
Start/Stop Frequency	30 MHz to 10th carrier harmonic		
RB / VB (emission in restricted band)	100 KHz/300 KHz		
Trace-Mode:	Max hold		

#### For Band edge

Spectrum Parameter	Setting		
Detector	Peak		
Start/Stan Fragmanay	Lower Band Edge: 2300 – 2407 MHz		
Start/Stop Frequency	Upper Band Edge: 2475 – 2500 MHz		
RB / VB (emission in restricted band)	100 KHz/300 KHz		
Trace-Mode:	Max hold		

5.3 TEST SETUP



The EUT is connected to the Spectrum Analyzer; the RF load attached to the EUT antenna termina is 50 Ohm; the path loss as the factor is calibrated to correct the reading. Make the measurement with the spectrum analyzer's resolution bandwidth(RBW) = 100 kHz. In order to make an accurate measurement, set the span greater than RBW.

5.4 EUT OPERATION CONDITIONS Please refer to section 3.4 of this report.

#### 5.5 TEST RESULTS



## 6. POWER SPECTRAL DENSITY TEST

#### 6.1 LIMIT

FCC Part 15.247,Subpart C						
Section	Section Test Item		Frequency Range (MHz)	Result		
15.247(e)	Power Spectral Density	≤8 dBm (RBW≥3KHz)	2400-2483.5	PASS		

#### 6.2 TEST PROCEDURE

- 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: 100 kHz  $\ge$  RBW  $\ge$  3 kHz.
- 4. Set the VBW  $\geq$  3 x RBW.
- 5. Detector = peak.
- 6. Sweep time = auto couple.
- 7. Trace mode = max hold.
- 8. Allow trace to fully stabilize.
- 9. Use the peak marker function to determine the maximum amplitude level.
- 10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

## 6.3 TEST SETUP



6.4 EUT OPERATION CONDITIONS Please refer to section 3.4 of this report.

#### 6.5 TEST RESULTS



7.1 LIMIT

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

# 7.2 TEST PROCEDURE

The automatic bandwidth measurement capability of an instrument may be employed using the X dB bandwidth mode with X set to 6 dB, if the functionality described above (i.e., RBW = 100 kHz, VBW≥3RBW, peak detector with maximum hold) is implemented by the instrumentation function. When using this capability, care shall be taken so that the bandwidth measurement is not influenced by any intermediate power nulls in the fundamental emission that might be≥6 dB.

7.3 TEST SETUP



7.4 EUT OPERATION CONDITIONS Please refer to section 3.4 of this report.

# 7.5 TEST RESULTS



#### 8. PEAK OUTPUT POWER TEST

8.1 LIMIT

-			Sec		
		rt C			
	Section	Test Item	Limit	Frequency Range (MHz)	Result
	15.247(b)(3)	Output Power	1 watt or 30dBm	2400-2483.5	PASS

#### 8.2 TEST PROCEDURE

One of the following procedures may be used to determine the maximum peak conducted output power of a DTS EUT.

 $RBW \ge DTS$  bandwidth

The following procedure shall be used when an instrument with a resolution bandwidth that is greater than the DTS bandwidth is available to perform the measurement:

a) Set the RBW  $\geq$  DTS bandwidth.

b) Set VBW  $\geq$  [3 × RBW].

c) Set span  $\geq$  [3 × RBW].

d) Sweep time = auto couple.

e) Detector = peak.

f) Trace mode = max hold.

g) Allow trace to fully stabilize.

h) Use peak marker function to determine the peak amplitude level.

Integrated band power method:

The following procedure can be used when the maximum available RBW of the instrument is less than the

DTS bandwidth:

a) Set the RBW = 1 MHz.

b) Set the VBW  $\geq$  [3 × RBW].

c) Set the span  $\geq$  [1.5  $\times$  DTS bandwidth].

d) Detector = peak.

e) Sweep time = auto couple.

f) Trace mode = max hold.

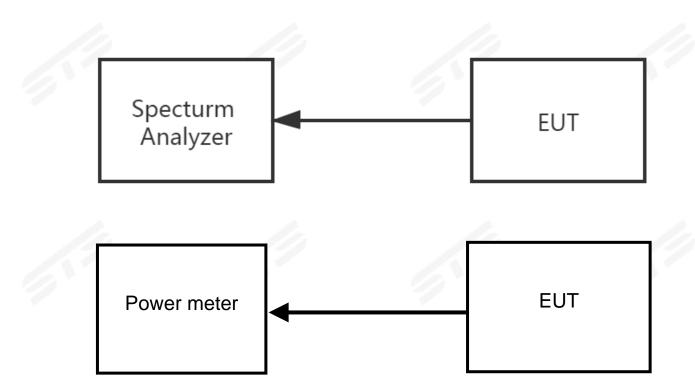
g) Allow trace to fully stabilize.

h) Use the instrument's band/channel power measurement function with the band limits set equal to the DTS bandwidth edges (for some instruments, this may require a manual override to select the peak detector). If the instrument does not have a band power function, then sum the spectrum levels (in linear power units) at intervals equal to the RBW extending across the DTS channel bandwidth.

PKPM1 Peak power meter method:

The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall use a fast-responding diode detector.





8.4 EUT OPERATION CONDITIONS Please refer to section 3.4 of this report.

# 8.5 TEST RESULTS



#### 9. ANTENNA REQUIREMENT

#### 9.1 STANDARD REQUIREMENT

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

#### 9.2 EUT ANTENNA

The EUT antenna is PCB antenna Antenna. It comply with the standard requirement.



# 1. Duty Cycle

Condition	Mode	Frequency (MHz)	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	BLE 1M	2402	97.6	0.11	0.06
NVNT	BLE 1M	2440	97.54	0.11	0.06
NVNT	BLE 1M	2480	97.6	0.11	0.06



#### **Test Graphs** Duty Cycle NVNT BLE 1M 2402MHz 01:56:44 DM Nov 23 Center Freq 2.402000000 GHz Avg Type: Log-Pwr TRACE Trig: Free Run #Atten: 30 dB TYPE WAAAAAAA DET P N N N N PNO: Fast IFGain:Low Mkr1 17.21 ms 8.28 dBm Ref Offset 0.4 dB Ref 20.00 dBm I0 dB/div $\langle \rangle$ 0.00 30.0 40.0 -50.0 Center 2.402000000 GHz Res BW 1.0 MHz Span 0 Hz Sweep 100.0 ms (10001 pts) #VBW 3.0 MHz MKR MODE TRC SCL FUNCTION VALUE UNCTION EUNCTION WIDTH 8.28 dBm 3.28 dBm 8.27 dBm 17.21 ms 17.63 ms 34.71 ms N N N t 2 3 4 5 6 7 8 9 10 11 > STATUS SG Duty Cycle NVNT BLE 1M 2440MHz ectrum Analyzer - Swept SA RL 59 PM Nov 23, 2023 Center Freq 2.440000000 GHz Avg Type: Log-Pwr TRACE PNO: Fast + Trig: Free Run #Atten: 30 dB TYPE WWWWWWWW DET P N N N N Mkr1 12.01 ms 8.56 dBm Ref Offset 0.4 dB Ref 20.00 dBm 0 dB(dis 0.00 10.0 20.0 -30.0 40.C 70. Center 2.440000000 GHz Res BW 1.0 MHz Span 0 Hz Sweep 100.0 ms (10001 pts) #VBW 3.0 MHz MKR MODE TRC SCL FUNCTION VALUE FUNCTION FUNCTION WIDTH 8.56 dBm 8.07 dBm 8.57 dBm 12.01 ms 12.44 ms 29.51 ms N N N 2 3 4 5 6 7 8 9 10 t t STATUS



#### Duty Cycle NVNT BLE 1M 2480MHz















# 2. Maximum Average Conducted Output Power

Condition	Mode	Frequency (MHz)	Conducted Power (dBm)	Duty Factor (dB)	Total Power (dBm)	Limit (dBm)	Verdict
NVNT	BLE 1M	2402	8.22	0.11	8.33	<=30	Pass
NVNT	BLE 1M	2440	8.42	0.11	8.53	<=30	Pass
NVNT	BLE 1M	2480	8.38	0.11	8.49	<=30	Pass











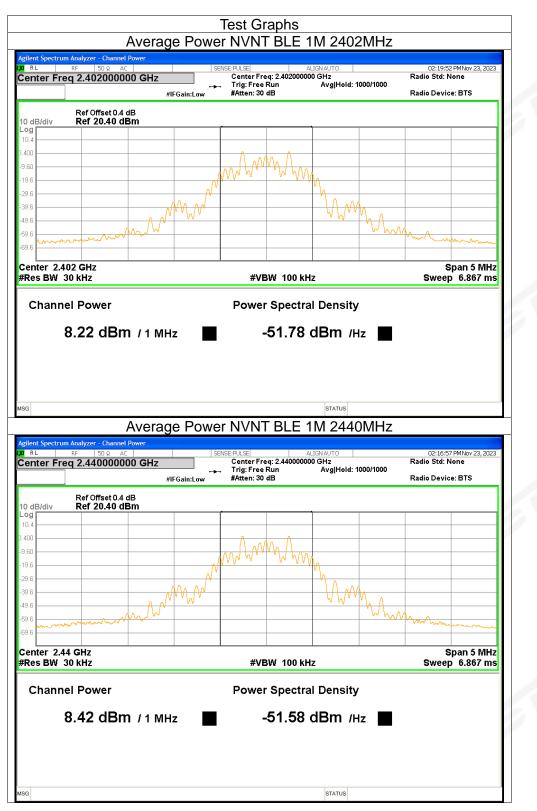






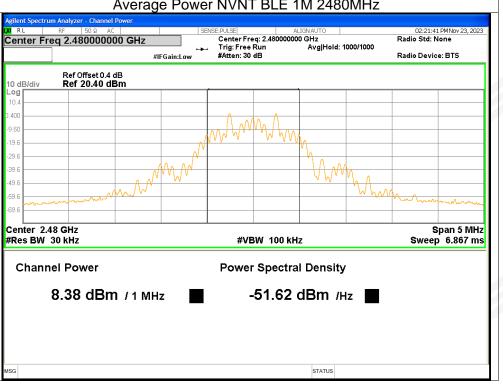






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#### Average Power NVNT BLE 1M 2480MHz









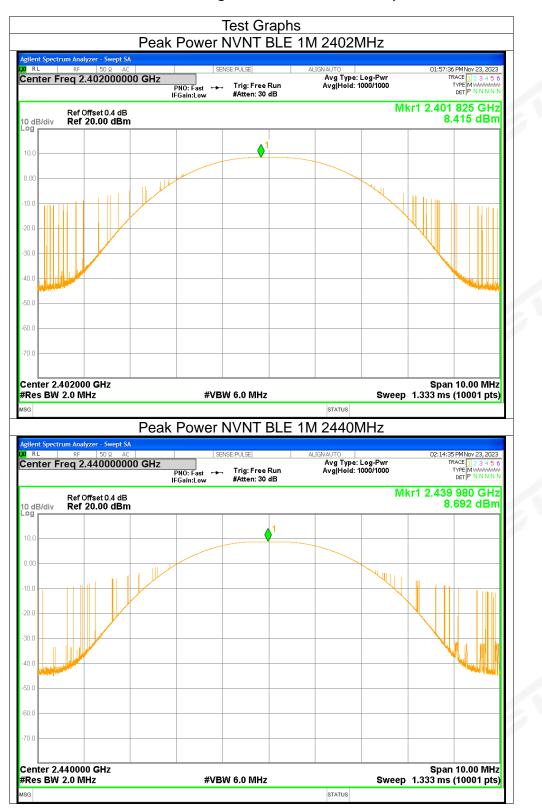


## 3. Maximum Peak Conducted Output Power

Condition	Mode	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	BLE 1M	2402	8.41	<=30	Pass
NVNT	BLE 1M	2440	8.69	<=30	Pass
NVNT	BLE 1M	2480	8.58	<=30	Pass

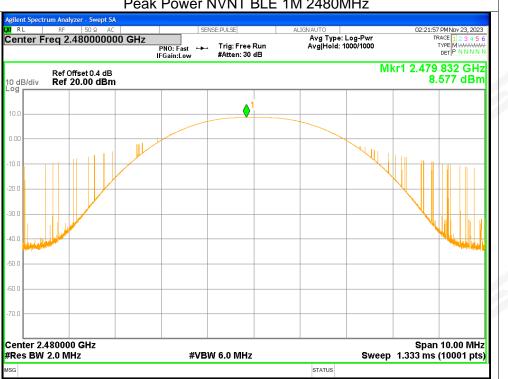








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#### Peak Power NVNT BLE 1M 2480MHz



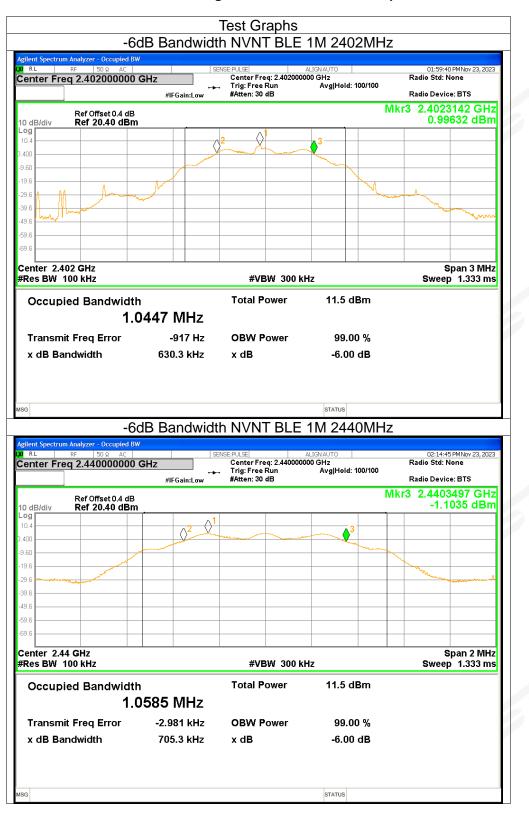
## 4. -6dB Bandwidth

Condition	Mode	Frequency (MHz)	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	BLE 1M	2402	0.6303	>=0.5	Pass
NVNT	BLE 1M	2440	0.7053	>=0.5	Pass
NVNT	BLE 1M	2480	0.6901	>=0.5	Pass



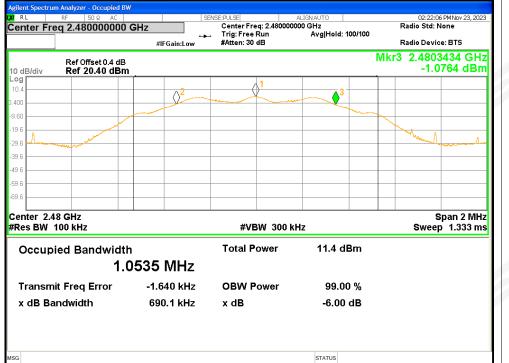








#### -6dB Bandwidth NVNT BLE 1M 2480MHz

















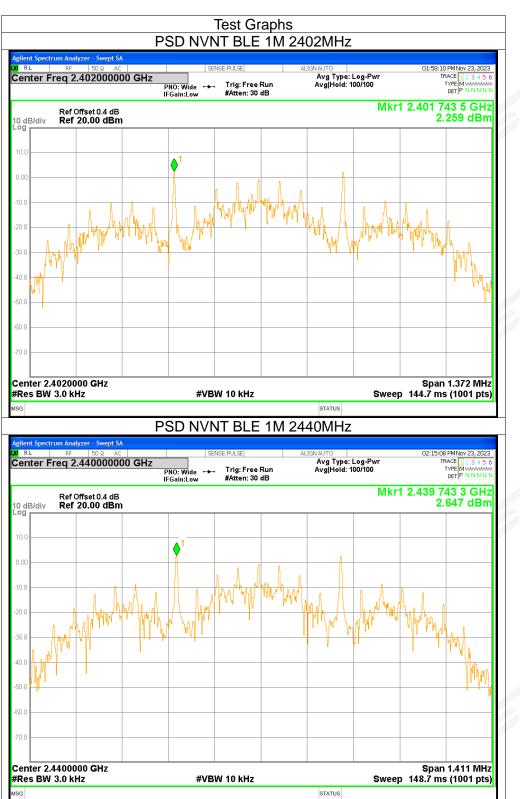


# 6. Maximum Power Spectral Density Level

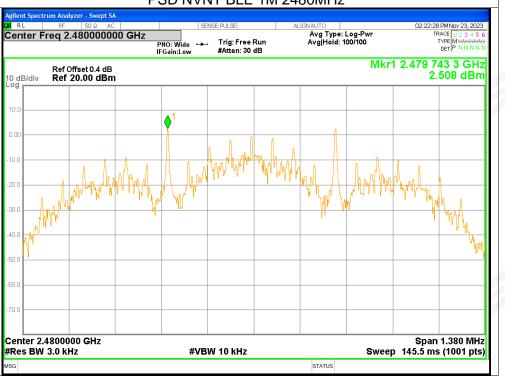
	Condition	Mode	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
	NVNT	BLE 1M	2402	2.26	<=8	Pass
¢.	NVNT	BLE 1M	2440	2.65	<=8	Pass
	NVNT	BLE 1M	2480	2.51	<=8	Pass











#### PSD NVNT BLE 1M 2480MHz









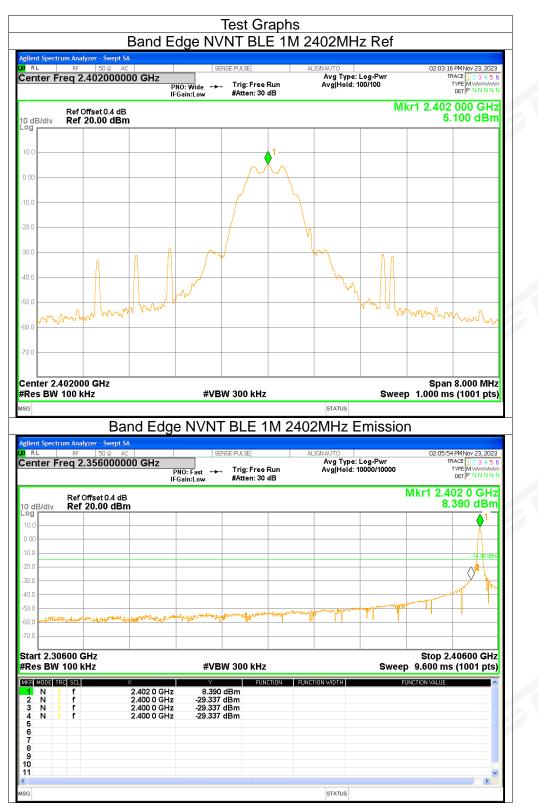


# 7. Band Edge

Condition	Mode	Frequency (MHz)	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE 1M	2402	-34.43	<=-20	Pass
NVNT	BLE 1M	2480	-40.26	<=-20	Pass







/1

1



#### 84 PM Nov 23, 202 TRACE 1 2 3 4 5 TYPE MWWWW DET P N N N N B L Center Freq 2.480000000 GHz Avg Type: Log-Pwr Avg|Hold: 100/100 Trig: Free Run #Atten: 30 dB PNO: Wide ↔ IFGain:Low Mkr1 2.480 000 GHz Ref Offset 0.4 dB Ref 20.00 dBm 5.258 dBm 10 dB/div 0.0 20.0 30. 4N ( 50.0 MM $w_{m}$ Center 2.480000 GHz Span 8.000 MHz #VBW 300 kHz Sweep 1.000 ms (1001 pts) #Res BW 100 kHz STATUS ISG Band Edge NVNT BLE 1M 2480MHz Emission ilent Spectrum Analyzer - Swept SA D2:25:12 PM Nov 23, 2023 TRACE 1 2 3 4 5 6 TYPE M DET P N N N N R L Center Freq 2.526000000 GHz Avg Type: Log-Pwr Avg|Hold: 10000/10000 PNO: Fast +++ Trig: Free Run IFGain:Low #Atten: 30 dB Mkr1 2.480 0 GHz Ref Offset 0.4 dB Ref 20.00 dBm 8.578 dBm 10 dB/div 0.0 10.0 -14.74 d י חכ $\triangle^{2}$ 30.0 40.0 $\langle \rangle$ 50.0 Stop 2.57600 GHz Start 2.47600 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 9.600 ms (1001 pts) MKR MODE TRC SCL FUNCTION FUNCTION WIDTH FUNCTION VALUE 2.480 0 GHz 2.483 5 GHz 2.500 0 GHz 2.483 5 GHz 8.578 dBm -35.009 dBm -51.370 dBm -35.009 dBm N N N 2 3 4 5 6 7 8 9 10 11 STATUS SG

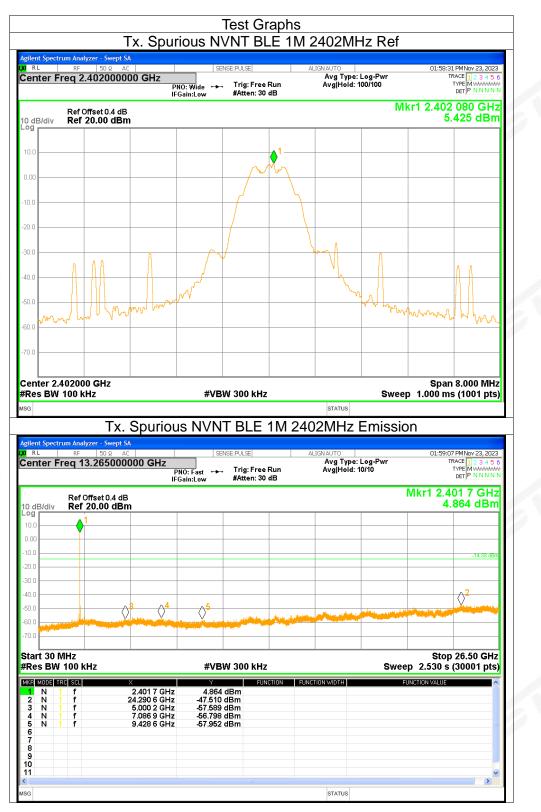
#### Band Edge NVNT BLE 1M 2480MHz Ref



# 8. Conducted RF Spurious Emission

Condition	Mode	Frequency (MHz)	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE 1M	2402	-52.93	<=-20	Pass
NVNT	BLE 1M	2440	-56.34	<=-20	Pass
NVNT	BLE 1M	2480	-56.07	<=-20	Pass







ilent Spectrum Analyzer - Sw RL RF 50 Ω	AC	SENSE	E:PULSE	ALIGNAUTO	_	02:15:16	PM Nov 23, 202
enter Freq 2.44000	PN		Trig: Free Run #Atten: 30 dB	Avg Type: L Avg Hold: 10	0/100	I	ACE 12345 TYPE MWWWWM DET PNNNN
Ref Offset 0.4 dB/div Ref 20.00 (					Mk	r1 2.440 8.1	000 GH 664 dBn
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		#VBW	300 kHz		Sweep		8.000 MH (1001 pts
enter 2.440000 GHz Res BW 100 kHz G			300 kHz	STATUS	•	1.000 ms	
Res BW 100 kHz G Ilent Spectrum Analyzer - Sw	ept SA	s NVNT	BLE 1M 2	2440MHz E	•	1.000 ms	: (1001 pts
Res BW 100 kHz G Hent Spectrum Analyzer - Sw RL RF 50 Ω	AC 00000 GHz	IS NVNT	BLE 1M 2	2440MHz E Alignauto Avg Type: L	Emissioi	1.000 ms n 02:15:52 TR 1	PMNov 23, 202 ACE 1 2 3 4 5 TYPE M WWWWW
Res BW 100 kHz G Hent Spectrum Analyzer - Sw RL RF 50 Ω	ept SA AC     1000000 GHz Pt		BLE 1M 2	2440MHz E	Emissioi og Pwr 110	1.000 ms	PMNov 23, 202 ACE 1 2 3 4 5 TYPE M MMMM DET P N N N
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Res BW 100 kHz	AC DOODOO GHZ PI IFC 4 dB	IS NVNT	BLE 1M 2	2440MHz E Alignauto Avg Type: L	Emissioi og Pwr 110	1.000 ms n 02:15:52 TR 1 1 1 1	PMNov 23, 202 ACE 1 2 3 4 5 TYPE MWWWW BETP NN NN 39 7 GH; 109 dBn
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Res BW 100 kHz           g           filent Spectrum Analyzer _ Sw           RL         RF           senter Freq 13.2650           OdB/div         Ref Offset 0.0           OdB/div         Ref 20.00           Ref 20.00         Ref 20.00           Ref 20.00         Ref 20.00           Ref 20.00         Ref 20.00           Ref 20.00         Ref 20.00 </td <td>AC DOODOO GHZ PI IFC 4 dB</td> <td>IS NVNT</td> <td>BLE 1M 2</td> <td>ALIGNAUTO Avg Type: L Avg Hold: 10</td> <td>og-Pwr /10</td> <td>1.000 ms</td> <td>PMNov 23, 202 ACE [1:23 4:5 VPM PM AND ACE [1:23 4:5 PM PM AND ACE [1:23 4:5 PM PM AND ACE [1:23 4:5 PM PM AND ACE [1:24 4:5 PM AND ACE [1:24 4:</td>	AC DOODOO GHZ PI IFC 4 dB	IS NVNT	BLE 1M 2	ALIGNAUTO Avg Type: L Avg Hold: 10	og-Pwr /10	1.000 ms	PMNov 23, 202 ACE [1:23 4:5 VPM PM AND ACE [1:23 4:5 PM PM AND ACE [1:23 4:5 PM PM AND ACE [1:23 4:5 PM PM AND ACE [1:24 4:5 PM AND ACE [1:24 4:
Res BW 100 kHz         s         T         ifent Spectrum Analyzer _ Sw         RL       RF         Senter Freq 13.2650         Ref Offset 0         Ref Offset 0         Cold B/div         Ref Offset 0         Cold B/div         Ref Offset 0         Cold B/div         Ref 0 ffset 0         Cold B/div         Cold B/div         Cold B/div         Ref 0 ffset 0         Cold B/div	AC PI	S NVNT	BLE 1M 2	ALIGNAUTO Avg Type: L Avg Hold: 10	og-Pwr /10	1.000 ms	PMNov 23, 202 ACE [1:23 4:5 VPM PM AND ACE [1:23 4:5 PM PM AND ACE [1:23 4:5 PM PM AND ACE [1:23 4:5 PM PM AND ACE [1:24 4:5 PM AND ACE [1:24 4:
Res BW 100 kHz         g         filent Spectrum Analyzer _ Sw         RL       RF         g         enter Freq 13.2650         O dB/div         Ref Offset 0         O dB/div         Ref Offset 0         0 dB/div         Ref 0ffset 0         0 dB/div         Ref 0ffset 0         0 dB/div         0 dB/div         Ref 0ffset 0         0 dB/div         1         0 dB/div         Ref 0ffset 0         0 dB/div         1         0 dB/div         Ref 0ffset 0         0 dB/div	AC PI PO00000 GHz PI IFC 4 dB 1Bm 3 4 dB 2.439 7 GHz 2.439 7 GHz 2.439 7 GHz	IS NVNT	BLE 1M 2	2440MHz E	og-Pwr /10	1.000 ms	PMNov 23, 202 ACE [1:23 4:5 VPM PM AND ACE [1:23 4:5 PM PM AND ACE [1:23 4:5 PM PM AND ACE [1:23 4:5 PM PM AND ACE [1:24 4:5 PM AND ACE [1:24 4:
Res         BW         100 kHz           G         T           Ident Spectrum Analyzer SW         RE           RL         RF         50 R           enter         Freq         13.2650           0         B         Ref         0ffset           0         B         Ref         20.00 ff           0         D         D         1           0         D         D         1           0         D         D         1           0         D         D         1         1           0         D         D         D         D         D           0         D         <	x         x           AC         PI           000000 GHz         PI           IFC         PI           4 dB         JBm           24 30 7 GHz         PI           24.39 7 GHz         24.705 3 GHz           5.029 3 GHz         5.029 3 GHz           7.476 9 GHz         7.476 9 GHz	S NVNT SENSE Sain:Low	BLE 1M 2 PULSE Trig: Free Run #Atten: 30 dB	2440MHz E	og-Pwr /10	1.000 ms	PMNov 23, 202 ACE [1:23 4:5 VPM PM AND ACE [1:23 4:5 PM PM AND ACE [1:23 4:5 PM PM AND ACE [1:23 4:5 PM PM AND ACE [1:24 4:5 PM AND ACE [1:24 4:
Res BW 100 kHz           g           ilent Spectrum Analyzer _ Sw           RL         RF         50 Q           enter Freq 13.2650           0 dB/div         Ref Offset 0.           0 dB/div         Ref 20.00 0           0 dB/div         Re	AC AC PO00000 GHz PI IFC 4 dB JBm AB AB AB AB AB AB AB AB AB AB	S NVNT SENSE NO: Fast →→ Sain:Low	BLE 1M 2 PULSE Trig: Free Run #Atten: 30 dB	2440MHz E	og-Pwr /10	1.000 ms	PMNov 23, 202 ACE [1:23 4:5 VPM PM AND ACE [1:23 4:5 PM PM AND ACE [1:23 4:5 PM PM AND ACE [1:23 4:5 PM PM AND ACE [1:24 4:5 PM AND ACE [1:24 4:
Res BW 100 kHz           g           Ilent Spectrum Analyzer SW           RE           enter Freq 13.2650           0 dB/div           Ref Offset 0.0           0 dB/div           Ref Offset 0.0           0 dB/div           Ref Offset 0.0           0 dB/div           0 dB/div           1           0 dB/div           10 dB/div           11 dB/div           12 dV           12 dV           13 n           1           2           1	x         x           AC         PI           000000 GHz         PI           IFC         PI           4 dB         JBm           24 30 7 GHz         PI           24.39 7 GHz         24.705 3 GHz           5.029 3 GHz         5.029 3 GHz           7.476 9 GHz         7.476 9 GHz	S NVNT SENSE Sain:Low	BLE 1M 2 PULSE Trig: Free Run #Atten: 30 dB	2440MHz E	og-Pwr /10	1.000 ms	PMNov 23, 202 ACE [1:23 4:5 VPM PM AND ACE [1:23 4:5 PM PM AND ACE [1:23 4:5 PM PM AND ACE [1:23 4:5 PM PM AND ACE [1:24 4:5 PM AND ACE [1:24 4:

## Ty Spurious NVNT BLE 1M 2440MHz Pot



ilent Spectrum Analyzer - Swept SA				
RL RF 50 Ω AC enter Freq 2.480000000	GH7	SENSE:PULSE	ALIGNAUTO Avg Type: Log-Pwr	02:27:31 PM Nov 23, 202 TRACE 1 2 3 4 5
cinci 1100 2.40000000	PNO: Wide + IFGain:Low	➡ Trig: Free Run #Atten: 30 dB	Avg Hold: 100/100	DET P N N N
Ref Offset 0.4 dB			Ν	/kr1 2.480 000 GH
odB/div Ref 20.00 dBm				8.558 dBr
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enter 2.480000 GHz Res BW 100 kHz		/BW 300 kHz NT BLE 1M 2	swe status 2480MHz Emiss	ep 1.000 ms (1001 pts
Res BW 100 kHz IG IG IG IG IG IG IG IG IG IG	purious NVI	NT BLE 1M 2	STATUS	ep 1.000 ms (1001 pts iON 02:28:07 PMNov 23, 202 TRACE 12 3 4 5 TYPE IN 44 4 5
Res BW 100 kHz IG TX. S Silent Spectrum Analyzer - Swept SA RL RF SO Q AC enter Freq 13.265000000	purious NVI	NT BLE 1M 2	STATUS 2480MHz Emiss ALIGNAUTO Avg Type: Log-Pwr	ep 1.000 ms (1001 pts iON 02:28:07 PMNov 23, 202 TRACE [1] 2 3 4 5
Res BW 100 kHz G Tx. S glent Spectrum Analyzer - Swept SA RL PF 50 Ω AC enter Freq 13.26500000 Ref Offset 0.4 dB 0 dB/div Ref 20.00 dBm	purious NVI	NT BLE 1M 2	STATUS 2480MHz Emiss ALIGNAUTO Avg Type: Log-Pwr	ep 1.000 ms (1001 pts OON 02:28:07 PMNov 23, 202 TRACE 12 3 4 5 TYPE MINNOW DET P NN NN
Res BW 100 kHz           sg           Tx. S           glient Spectrum Analyzer - Swept SA           RL         RF           renter Freq 13.26500000           0 dB/div         Ref Offset 0.4 dB           0 dB/div         Ref 20.00 dBm	purious NVI	NT BLE 1M 2	STATUS 2480MHz Emiss ALIGNAUTO Avg Type: Log-Pwr	ep 1.000 ms (1001 pts iON 02:28:07 PMNov 23,202 TRACE [1:2:3:4:5 TYPE [MWNN DET P.NNNN Mkr1 2.480 2 GH:
Res BW 100 kHz           sg         Tx. S           glient Spectrum Analyzer - Swept SA           RL         RF         50 Ω         AC           enter Freq 13.26500000           0 dB/div         Ref Offset 0.4 dB           0 dB/div         Ref 20.00 dBm           0 0 dB/div         1	purious NVI	NT BLE 1M 2	STATUS 2480MHz Emiss ALIGNAUTO Avg Type: Log-Pwr	ep 1.000 ms (1001 pts ion 02:28:07 PMNov 23,202 TRACE 12 3 4 5 TYPE MWWWW 0ET P NNNN Mkr1 2.480 2 GH: 4.997 dBn
Res BW 100 kHz sg Tx. S glient Spectrum Analyzer - Swept SA RL RF S0Ω AC enter Freq 13.26500000 Ref Offset 0.4 dB Ref 20.00 dBm od 0.00 0.00	purious NVI	NT BLE 1M 2	STATUS 2480MHz Emiss ALIGNAUTO Avg Type: Log-Pwr	ep 1.000 ms (1001 pts iON 02:28:07 PMNov 23,202 TRACE [1:2:3:4:5 TYPE [MWNN DET P.NNNN Mkr1 2.480 2 GH:
Res BW 100 kHz sg Tx. S glient Spectrum Analyzer - Swept SA RL RF S0 Ω AC enter Freq 13.26500000 Ref Offset 0.4 dB Ref 20.00 dBm 9 10.0 0.0	purious NVI	NT BLE 1M 2	STATUS 2480MHz Emiss ALIGNAUTO Avg Type: Log-Pwr	ep 1.000 ms (1001 pts ion 02:28:07 PMNov 23,202 TRACE 12 3 4 5 TYPE MWWWW 0ET P NNNN Mkr1 2.480 2 GH: 4.997 dBn
Res BW 100 kHz           BG         Tx. S           glient Spectrum Analyzer - Swept SA           RL         RF         S0 Ω         AC           enter Freq 13.26500000           0 dB/div         Ref Offset 0.4 dB           0 dB/div         Ref 20.00 dBm           0 0 00         1         1           0 00         1         1           0 00         0         0         0	purious NVI	NT BLE 1M 2	STATUS 2480MHz Emiss ALIGNAUTO Avg Type: Log-Pwr	ep 1.000 ms (1001 pts ion 02:28:07 PMNov 23,202 TRACE 12 3 4 5 TYPE MWWWW 0ET P NNNN Mkr1 2.480 2 GH: 4.997 dBn
Res BW 100 kHz           BG           Tx. S           glent Spectrum Analyzer - Swept SA           RL         RF           SO Q           enter Freq 13.26500000           Ref Offset 0.4 dB           OdB/div         Ref Offset 0.4 dB           OdB/div         Ref 20.00 dBm           Q         1           Q         1           Q         1           Q         3	purious NVI	NT BLE 1M 2 SENSE:PULSE     → Trig: Free Run #Atten: 30 dB	STATUS 2480MHz Emiss ALIGNAUTO Avg Type: Log-Pwr	ep 1.000 ms (1001 pts ion 02:28:07 PMNov 23,202 TRACE 12 3 4 5 TYPE [MVNN DET]P NNNN Mkr1 2.480 2 GH: 4.997 dBn
Res BW 100 kHz sg Tx. S glent Spectrum Analyzer - Swept SA RL RF S0 Ω AC enter Freq 13.26500000 Ref Offset 0.4 dB Ref 20.00 dBm glob g	purious NVI	NT BLE 1M 2 SENSE:PULSE     → Trig: Free Run #Atten: 30 dB	STATUS 2480MHz Emiss ALIGNAUTO Avg Type: Log-Pwr Avg Hold: 10/10	ep 1.000 ms (1001 pts ion 02:28:07 PMNov 23,202 TRACE 12 3 4 5 TYPE [MVNN DET]P NNNN Mkr1 2.480 2 GH: 4.997 dBn
Res BW 100 kHz           sg           Tx. S           glent Spectrum Analyzer - Swept SA           RL         RF           so gamma           enter Freq 13.26500000           0         AC           0         B           0         AC           0         1           0         1           0         1           0         1           0         1           0         1           0         1           0         3           0         3           0         3	purious NVI	NT BLE 1M 2 SENSE:PULSE     → Trig: Free Run #Atten: 30 dB	STATUS 2480MHz Emiss ALIGNAUTO Avg Type: Log-Pwr Avg Hold: 10/10	ep 1.000 ms (1001 pts iON 02:28:07 PMNov 23,202 TRACE 12:345 TYPE [ MKr1 2:480 2 GH: 4.997 dBn
Res BW 100 kHz           BG         Tx. S           glent Spectrum Analyzer - Swept SA         RF           RL         RF         SO Q         AC           enter Freq 13.26500000         Ref Offset 0.4 dB         Ref 20.00 dBm           9         1         1         1           0.0         1         1         1         1           0.0         1         1         1         1           0.0         1         1         1         1           0.0         1         1         1         1         1           0.0         1         1         1         1         1         1           0.0         1 <td>D GHZ PNO: Fast - IFGain:Low</td> <td>NT BLE 1M 2 SENSE:PULSE     → Trig: Free Run #Atten: 30 dB</td> <td>STATUS 2480MHz Emiss ALIGNAUTO Avg Type: Log-Pwr Avg Hold: 10/10</td> <td>ep 1.000 ms (1001 pts ion 02:28:07 PMNov 23,202 TRACE 12 3 4 5 TYPE [MVNN DET]P NNNN Mkr1 2.480 2 GH: 4.997 dBn</td>	D GHZ PNO: Fast - IFGain:Low	NT BLE 1M 2 SENSE:PULSE     → Trig: Free Run #Atten: 30 dB	STATUS 2480MHz Emiss ALIGNAUTO Avg Type: Log-Pwr Avg Hold: 10/10	ep 1.000 ms (1001 pts ion 02:28:07 PMNov 23,202 TRACE 12 3 4 5 TYPE [MVNN DET]P NNNN Mkr1 2.480 2 GH: 4.997 dBn
Res BW 100 kHz           Image: State Sta	Bourious NVI	NT BLE 1M 2 SENSE:PULSE     → Trig: Free Run #Atten: 30 dB   	STATUS 2480MHz Emiss ALIGNAUTO Avg Type: Log-Pwr Avg Hold: 10/10	ep 1.000 ms (1001 pts iON 02:28:07 PMNov 23,202 TRACE 12 3 4 5 TYPE [ Mkr1 2.480 2 GH: 4.997 dBn 
Res BW 100 kHz           Image: Spectrum Analyzer - Swept SA           Rel         PF         SO Q         AC           enter Freq 13.26500000           0 dB/div         Ref Offset 0.4 dB           0 dB/div         Ref 20.00 dBm           0 dB/div         1           0 dB/div         Ref Offset 0.4 dB           0 dB/div         1           0 dB/div         3           0 dB/div         4	Bourious NVI	NT BLE 1M 2 SENSE:PULSE     → Trig: Free Run #Atten: 30 dB   	STATUS	ep 1.000 ms (1001 pts iON 02:28:07 PMINOV 23,202 TRACE 12:3:4:5 TYPE [ Mkr1 2:480 2 GH: 4.997 dBn 1144 dB 1144 dB
Res BW 100 kHz           BG           T.x. S           glent Spectrum Analyzer - Swept SA           RL         RF         500 AC           enter Freq 13.26500000           O dB/div         Ref Offset 0.4 dB           0 dB/div         Ref 20.00 dBm         1           0 dB/div         Ref 20.00 dBm         2           0 dB/div         Ref 20.00 dBm         3           1 m         1 m         1           2 N         1 m         2           1 N         1 m         2           2 N         1 m         7	D GHz PNO: Fast IFGain:Low 4 4 4 4 4 4 4 2 2 7 1 2 6 7 7 7 2 6 7 7 7 7 2 6 7 7 7 7 7 7 7 7 7 7 7 7 7	NT BLE 1M 2 SENSE:PULSE     → Trig: Free Run #Atten: 30 dB   	STATUS	ep 1.000 ms (1001 pts iON 02:28:07 PMINOV 23,202 TRACE 12:3:4:5 TYPE [ Mkr1 2:480 2 GH: 4.997 dBn 1144 dB 1144 dB
Res BW 100 kHz           BG         T.X. S           glent Spectrum Analyzer - Swept SA         RF           RL         RF         SO Q         AC           enter Freq 13.26500000         AC         B         C           0 dB/dlv         Ref Offset 0.4 dB         Ref 20.00 dBm         C           0 dB/dlv         Ref 20.00 dBm         C         C         C           0 dB/dlv         Ref 20.00 dBm         C         C         C         C           1 dB/dlv         Ref 20.00 dBm         C         C         C         C         C           2 dB/dlv         Ref 20.00 dBm         C         C         C	D GHz PNO: Fast IFGain:Low 4 4 4 4 4 4 4 2 2 7 1 2 6 7 7 7 2 6 7 7 7 7 2 6 7 7 7 7 7 7 7 7 7 7 7 7 7	NT BLE 1M 2 SENSE:PULSE     → Trig: Free Run #Atten: 30 dB   / / / / / / / / / / / / /	STATUS	ep 1.000 ms (1001 pts iON 02:28:07 PMINOV 23,202 TRACE 12:3:4:5 TYPE [ Mkr1 2:480 2 GH: 4.997 dBn 1144 dB 1144 dB
Res BW 100 kHz rs (Int Spectrum Analyzer - Swept SA Rt RF 50 Ω AC enter Freq 13.26500000 Ref Offset 0.4 dB 0 dB/div Ref 20.00 dBm 9 10.0 0 dB/div Ref 20.00 dBm 9 10.0	D GHz PNO: Fast IFGain:Low 4 4 4 4 4 4 4 2 2 7 1 2 6 7 7 7 2 6 7 7 7 7 2 6 7 7 7 7 7 7 7 7 7 7 7 7 7	NT BLE 1M 2 SENSE:PULSE     → Trig: Free Run #Atten: 30 dB   	STATUS	ep 1.000 ms (1001 pts iON 02:28:07 PMNov 23,202 TRACE 12 3 4 5 TYPE [MNNN Mkr1 2.480 2 GH: 4.997 dBn 1144 dB

## Tx Spurious NI/NT BLE 1M 2480MHz Ref



### APPENDIX 2- EUT TEST PHOTO

Note: See test photos in setup photo document for the actual connections between Product and support equipment.

\*\* \*\* \*\* END OF THE REPORT \*\* \*\* \*\*