

TEST REPORT

Report No.:	BCTC2404866847-1E
Applicant:	Shenzhen Mike Morgen Technology Co., Ltd.
Product Name:	NYXI Warrior Bluetooth Controller
Test Model:	SP04
Tested Date:	2024-04-15 to 2024-04-29
Issued Date:	2024-05-10
Sh	enzhen BCTC Testing Co., Ltd.
No.: BCTC/RF-EMC-00	5 Page: 1 of 85 Edition : B.2



FCC ID: 2A88F-SP04

Product Name:	NYXI Warrior Bluetooth Controller
Trademark:	N/A
Model/Type Reference:	SP04
Prepared For:	Shenzhen Mike Morgen Technology Co., Ltd.
Address:	Room 302,Building 5,Zone C,Jinxiu Huacheng Park,Bantian Street,Longgang District,Shenzhen China 518000
Manufacturer:	Shenzhen Mike Morgen Technology Co., Ltd.
Address:	Room 302,Building 5,Zone C,Jinxiu Huacheng Park,Bantian Street,Longgang District,Shenzhen China 518000
Prepared By:	Shenzhen BCTC Testing Co., Ltd
Address:	1-2/F., Building B, Pengzhou Industrial Park, No.158, Fuyuan 1st Road, Tangwei, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China
Sample Received Date:	2024-04-15
Sample Tested Date:	2024-04-15 to 2024-04-29
Report No.:	BCTC2404866847-1E
Test Standards	FCC Part15.247 ANSI C63.10-2013
Test Results	PASS
Remark:	This is Bluetooth Classic radio test report.

Tested by: Yave

Brave Zeng/ Project Handler

Approved by: Zero Zhou/Reviewer

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



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1. Version

Report No.	Issue Date	Description	Approved
BCTC2404866847-1E	2024-05-10	Original	Valid

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Test Summary 2.

The Product has been tested according to the following specifications:

No.	Test Parameter	Clause No.	Results
1	Conducted emission AC power port	§15.207	PASS
2	Conducted peak output power for FHSS	§15.247(b)(1)	PASS
3	20dB Occupied bandwidth	§15.247(a)(1)	PASS
4	Number of hopping frequencies	§15.247(a)(1)(iii)	PASS
5	Dwell Time	§15.247(a)(1)(iii)	PASS
6	Spurious RF conducted emissions	§15.247(d)	PASS
7	Band edge	§15.247(d)	PASS
8	Spurious radiated emissions for transmitter	§15.247(d) & §15.209 & §15.205	PASS
9	Antenna Requirement	15.203	PASS
NOTE4.			

NOTE1: N/A (Not Applicable) NOTE2: According to FCC OET KDB 558074, the report use radiated measurements in the restricted frequency bands. In addition, the radiated test is also performed to ensure the emissions emanating from the device cabinet also comply with the applicable limits.

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3. Measurement Uncertainty

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

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

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4. Product Information and Test Setup

4.1 Product Information

Model/Type reference:	SP04
Model differences:	N/A
Hardware Version:	N/A
Software Version:	N/A
Operation Frequency:	Bluetooth: 2402-2480MHz
Type of Modulation:	Bluetooth: GFSK, π/ 4 DQPSK,8DPSK
Number Of Channel	79CH
Antenna installation:	Internal antenna
Antenna Gain:	-2.30dBi
Remark:	The antenna gain of the product comes from the antenna report provided by the customer, and the test data is affected by the customer information.
power supply:	DC 5V,0.39A
Battery:	DC 3.7V,900mAh

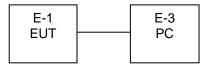
4.2 Test Setup Configuration

See test photographs attached in eut test setup photographs for the actual connections between product and support equipment.

Conducted Emission:

E-1 EUT	E-2 Adapter

Radiated Spurious Emission



No.: BCTC/RF-EMC-005

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4.3 Support Equipment

No.	Device Type	Brand	Model	Series No.	Note
E-1	NYXI Warrior Bluetooth Controller	N/A	SP04	N/A	EUT
E-2	Adapter	N/A	N/A	N/A	Auxiliary
E-3	PC	N/A	N/A	N/A	Auxiliary

Item	Shielded Type	Ferrite Core	Length	Note
C-1	N/A	N/A	N/A	N/A

Notes:

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

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

4.4 Channel List

СН	Frequency (MHz)	СН	Frequency (MHz)	СН	Frequency (MHz)	СН	Frequency (MHz)
0	2402	1	2403	2	2404	3	2405
4	2406	5	2407	6	2408	7	2409
8	2410	9	2411	10	2412	11	2413
12	2414	13	2415	14	2416	15	2417
16	2418	17	2419	18	2420	19	2421
20	2422	21	2423	22	2424	23	2425
24	2426	25	2427	26	2428	27	2429
28	2430	29	2431	30	2432	31	2433
32	2434	33	2435	34	2436	35	2437
36	2438	37	2439	38	2440	39	2441
40	2442	41	2443	42	2444	43	2445
44	2446	45	2447	46	2448	47	2449
48	2450	49	2451	50	2452	51	2453
52	2454	53	2455	54	2456	55	2457
56	2458	57	2459	58	2460	59	2461
60	2462	61	2463	62	2464	63	2465
64	2466	65	2467	66	2468	67	2469
68	2470	69	2471	70	2472	71	2473
72	2474	73	2475	74	2476	75	2477
76	2478	77	2479	78	2480	79	8 / 18



4.5 Test Mode

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

Test Mode	Test mode	Low channel	Middle channel	High channel				
1	Transmitting(GFSK)	2402MHz	2441MHz	2480MHz				
2	Transmitting(π/ 4 DQPSK)	2402MHz	2441MHz	2480MHz				
3	Transmitting(8DPSK)	2402MHz	2441MHz	2480MHz				
4	Transmitting (Co	Transmitting (Conducted emission & Radiated emission)						

Note:

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

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

4.6 Table Of Parameters Of Text Software Setting

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

Test software Version	FCC_assist 1.0.1.2					
Frequency	2402 MHz	2441 MHz	2480 MHz			
Parameters	DEF	DEF	DEF			

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5. Test Facility And Test Instrument Used

5.1 Test Facility

All measurement facilities used to collect the measurement data are located at Shenzhen BCTC Testing Co., Ltd. Address: 1-2/F., Building B, Pengzhou Industrial Park, No.158, Fuyuan 1st Road, Tangwei, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China. The site and apparatus are constructed in conformance with the requirements of ANSI C63.4 and CISPR 16-1-1 other equivalent standards. FCC Test Firm Registration Number: 712850 IC Registered No.: 23583

5.2 Test Instrument Used

Conducted Emissions Test									
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.				
Receiver	R&S	ESR3	102075	May 15, 2023	May 14, 2024				
LISN	R&S	ENV216	101375	May 15, 2023	May 14, 2024				
Software	Frad	EZ-EMC	EMC-CON 3A1	/	/				
Attenuator	\	10dB DC-6GHz	1650	May 15, 2023	May 14, 2024				

RF Conducted Test									
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.				
Power Metter	Keysight	E4419	\	May 15, 2023	May 14, 2024				
Power Sensor (AV)	Keysight	E9300A	\	May 15, 2023	May 14, 2024				
Signal Analyzer20kH z-26.5GHz	Keysight	N9020A	MY49100060	May 15, 2023	May 14, 2024				
Spectrum Analyzer9kHz- 40GHz	R&S	FSP40	·*************************************	May 15, 2023	May 14, 2024				

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Radiated Emissions Test (966 Chamber)								
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.			
966 chamber	ChengYu	966 Room	966	May 15, 2023	May 14, 2026			
Receiver	R&S	ESR3	102075	May 15, 2023	May 14, 2024			
Receiver	R&S	ESRP	101154	May 15, 2023	May 14, 2024			
Amplifier	SKET	LAPA_01G18 G-45dB	١	May 15, 2023	May 14, 2024			
Amplifier	Schwarzbeck	BBV9744	9744-0037	May 15, 2023	May 14, 2024			
TRILOG Broadband Antenna	Schwarzbeck	VULB9163	942	May 15, 2023	May 14, 2024			
Horn Antenna	Schwarzbeck	BBHA9120D	1541	May 15, 2023	May 14, 2024			
Horn Antenn(18GH z-40GHz)	Schwarzbeck	BBHA9170	00822	May 15, 2023	May 14, 2024			
Amplifier(18G Hz-40GHz)	MITEQ	TTA1840-35- HG	2034381	May 15, 2023	May 14, 2024			
Loop Antenna(9KHz -30MHz)	Schwarzbeck	FMZB1519B	00014	May 15, 2023	May 14, 2024			
RF cables1(9kHz- 30MHz)	Huber+Suhnar	9kHz-30MHz	B1702988-000 8	May 15, 2023	May 14, 2024			
RF cables2(30MH z-1GHz)	Huber+Suhnar	30MHz-1GHz	1486150	May 15, 2023	May 14, 2024			
RF cables3(1GHz -40GHz)	Huber+Suhnar	1GHz-40GHz	1607106	May 15, 2023	May 14, 2024			
Power Metter	Keysight	E4419	/	May 15, 2023	May 14, 2024			
Power Sensor (AV)	Keysight	E9300A	\	May 15, 2023	May 14, 2024			
Signal Analyzer20kH z-26.5GHz	Keysight	N9020A	MY49100060	May 15, 2023	May 14, 2024			
Spectrum Analyzer9kHz- 40GHz	R&S	FSP40	······································	May 15, 2023	May 14, 2024			
Software	Frad	EZ-EMC	FA-03A2 RE	· · · · · · · · · · · · · · · · · · ·				

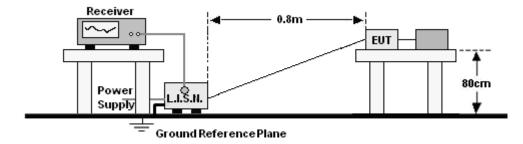
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XXXXII*I/////*/



6. Conducted Emissions

6.1 Block Diagram Of Test Setup



6.2 Limit

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

Notes:

1. *Decreasing linearly with logarithm of frequency.

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

6.3 Test procedure

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

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

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

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

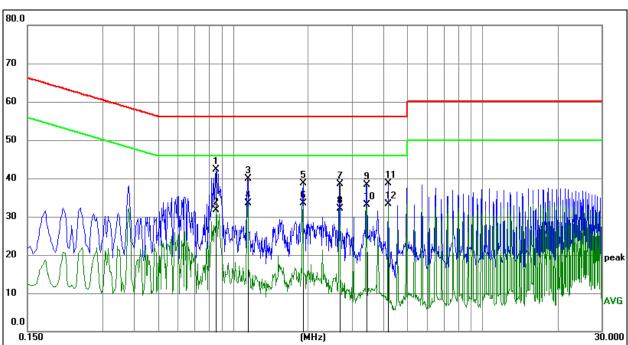
6.4 EUT operating Conditions

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



6.5 Test Result

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



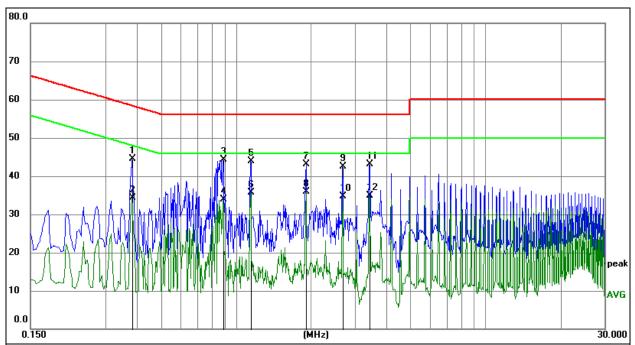
Remark:

- All readings are Quasi-Peak and Average values.
 Factor = Insertion Loss + Cable Loss.
 Measurement = Reading Level + Correct Factor
 Over = Measurement Limit

No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over			
	MHz		dB	dBuV	dBuV	dB	Detector	Comment	
1	0.8565	32.13	10.21	42.34	56.00	-13.66	QP		
2	0.8565	21.45	10.21	31.66	46.00	-14.34	AVG		
3	1.1445	29.71	10.19	39.90	56.00	-16.10	QP		
4 *	1.1445	23.39	10.19	33.58	46.00	-12.42	AVG		
5	1.9095	28.60	10.10	38.70	56.00	-17.30	QP		
6	1.9095	23.48	10.10	33.58	46.00	-12.42	AVG		
7	2.6700	28.31	10.14	38.45	56.00	-17.55	QP		
8	2.6700	21.95	10.14	32.09	46.00	-13.91	AVG		
9	3.4350	28.02	10.20	38.22	56.00	-17.78	QP		
10	3.4350	22.81	10.20	33.01	46.00	-12.99	AVG		
11	4.2000	28.44	10.26	38.70	56.00	-17.30	QP		
12	4.2000	23.07	10.26	33.33	46.00	-12.67	AVG		



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



Remark:

- All readings are Quasi-Peak and Average values.
 Factor = Insertion Loss + Cable Loss.
 Measurement = Reading Level + Correct Factor
 Over = Measurement Limit

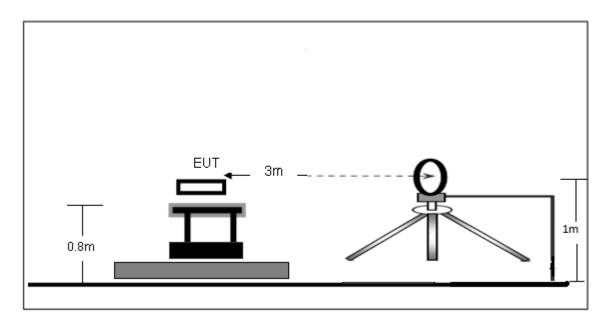
No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over			
	MHz		dB	dBuV	dBuV	dB	Detector	Comment	
1	0.3840	34.26	10.18	44.44	58.19	-13.75	QP		
2	0.3840	24.16	10.18	34.34	48.19	-13.85	AVG		
3	0.8880	34.13	10.21	44.34	56.00	-11.66	QP		
4	0.8880	23.67	10.21	33.88	46.00	-12.12	AVG		
5	1.1445	33.80	10.19	43.99	56.00	-12.01	QP		
6	1.1445	25.44	10.19	35.63	46.00	-10.37	AVG		
7	1.9095	33.03	10.10	43.13	56.00	-12.87	QP		
8 *	1.9095	25.72	10.10	35.82	46.00	-10.18	AVG		
9	2.6745	32.34	10.14	42.48	56.00	-13.52	QP		
10	2.6745	24.49	10.14	34.63	46.00	-11.37	AVG		
11	3.4350	32.92	10.20	43.12	56.00	-12.88	QP		
12	3.4350	24.65	10.20	34.85	46.00	-11.15	AVG		



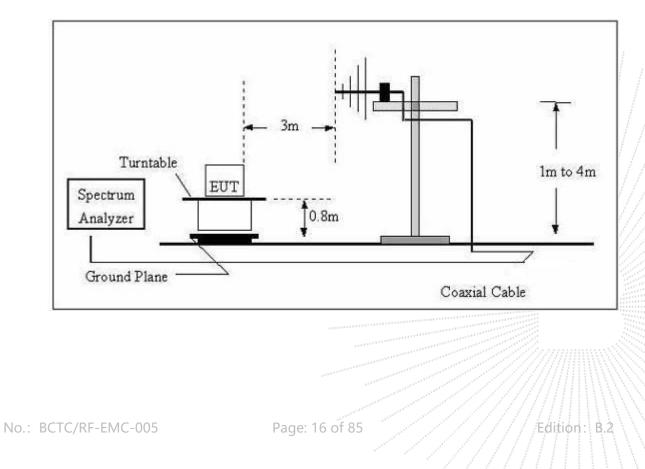
7. Radiated emissions

7.1 Block Diagram Of Test Setup

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

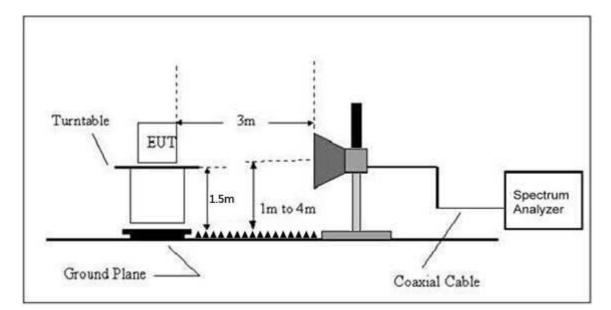


(B) Radiated Emission Test-Up Frequency 30MHz~1GHz





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



7.2 Limit

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

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

Limits Of Radiated Emission Measurement (Above 1000MHz)

	Limit (dBuV/m) (at 3M) Peak Average		
Frequency (MHz)			
Above 1000	74 54		

Notes:

(1)The limit for radiated test was performed according to FCC PART 15C.

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

(3) Emission level (dBuV/m)=20log Emission level (uV/m).



Frequency Range Of Radiated Measurement

(a) For an intentional radiator the spectrum shall be investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to at least the frequency shown in this paragraph:

(1) If the intentional radiator operates below 10 GHz: to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

(2) If the intentional radiator operates at or above 10 GHz and below 30 GHz: to the fifth harmonic of the highest fundamental frequency or to 100 GHz, whichever is lower.

(3) If the intentional radiator operates at or above 30 GHz: to the fifth harmonic of the highest fundamental frequency or to 200 GHz, whichever is lower, unless specified otherwise elsewhere in the rules.

(4) If the intentional radiator operates at or above 95 GHz: To the third harmonic of the highest fundamental frequency or to 750 GHz, whichever is lower, unless specified otherwise elsewhere in the rules.

(5) If the intentional radiator contains a digital device, regardless of whether this digital device controls the functions of the intentional radiator or the digital device is used for additional control or function purposes other than to enable the operation of the intentional radiator, the frequency range shall be investigated up to the range specified in paragraphs (a) (1)through (4) of this section or the range applicable to the digital device, as shown in paragraph (b)(1) of this section, whichever is the higher frequency range of investigation.

7.3 Test procedure

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

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

Below 1GHz test procedure as below:

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

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

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



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

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

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

Above 1GHz test procedure as below:

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

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

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

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

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

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

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

Note:

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

7.4 EUT operating Conditions

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

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7.5 Test Result

Below 30MHz

Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101KPa		DC 3.7V
Test Mode:	Mode 4	Test Voltage :	DC 3.7 V

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

Note:

The amplitude of spurious emissions which are attenuated by more than 20dB below the

permissible value has no need to be reported.

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

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

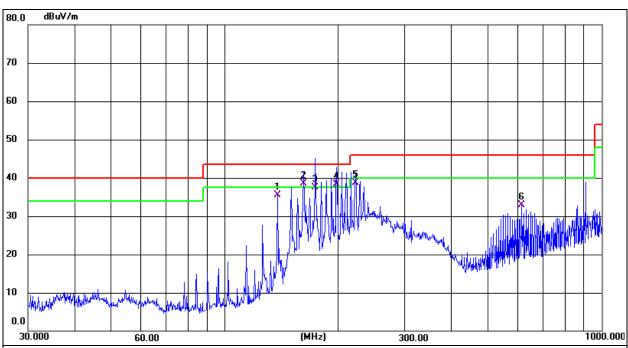
No.: BCTC/RF-EMC-005

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Between 30MHz - 1GHz

Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101KPa	Phase :	Horizontal
Test Mode:	Mode 4	Test Voltage :	DC 3.7V



Remark:

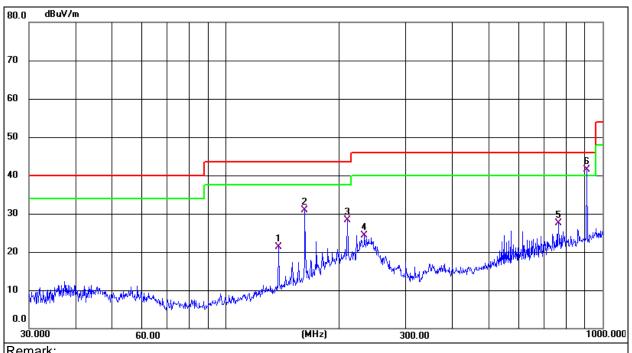
1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

- Measurement = Reading Level + Correct Factor
 Over = Measurement Limit

					1 1 1		1 1 1 1
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)		Margin (dB)	Detector
1	137.9028	50.99	-15.41	35.58	43.50	-7.92	QP
2 *	162.0414	53.74	-15.14	38.60	43.50	-4.90	QP
3	173.8135	53.38	-15.88	37.50	43.50	-6.00	QP
4 !	197.8928	55.80	-17.40	38.40	43.50	-5.10	QP
5	222.1698	55.51	-16.71	38.80	46.00	-7.20	QP
6	614.2142	37.46	-4.61	32.85	46.00	-13.15	QP
							· I



Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101KPa	Phase :	Vertical
Test Mode:	Mode 4	Test Voltage :	DC 3.7V



Remark:

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

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detecto
1	137.9028	36.71	-15.41	21.30	43.50	-22.20	QP
2	162.0414	46.03	-15.14	30.89	43.50	-12.61	QP
3	210.0482	45.39	-17.17	28.22	43.50	-15.28	QP
4	233.3487	40.63	-16.29	24.34	46.00	-21.66	QP
5	763.3757	28.74	-1.22	27.52	46.00	-18.48	QP
6 *	909.6666	40.48	1.05	41.53	46.00	-4.47	QP



Reading Correct Measure-Limits Frequency Over Polar Level Factor ment Detector (H/V) Type (dBuV/ (dBuV/m) (MHz) (dBuV/m) (dB) (dB) m) **GFSK Low channel** 4804.00 70.42 -19.99 74.00 -23.57 ΡK V 50.43 V 4804.00 59.73 -19.99 39.74 54.00 -14.26 AV V 7206.00 62.58 -14.22 48.36 74.00 -25.64 ΡK V 7206.00 -14.22 37.88 54.00 -16.12 52.10 AV Н 4804.00 67.87 -19.99 47.88 74.00 -26.12 ΡK Н 4804.00 58.04 -19.99 38.05 54.00 -15.95 AV ΡK Н 7206.00 61.17 -14.22 46.95 74.00 -27.05 Н 7206.00 53.15 -14.22 38.93 54.00 -15.07 AV **GFSK Middle channel** ΡK V 4882.00 66.99 -19.84 47.15 74.00 -26.85 -15.22 V 4882.00 38.78 54.00 AV 58.62 -19.84 V 7323.00 59.82 -13.90 45.92 74.00 -28.08 PΚ V 7323.00 50.77 -13.90 36.87 54.00 -17.13 AV 4882.00 42.99 ΡK Н 62.83 -19.84 74.00 -31.01 Н 4882.00 52.85 -19.84 33.01 54.00 -20.99 AV Н ΡK 7323.00 58.04 -13.90 44.14 74.00 -29.86 36.76 Н 7323.00 50.66 -13.90 54.00 -17.24 AV **GFSK High channel** ΡK V 4960.00 -19.68 74.00 -24.37 69.31 49.63 V 4960.00 60.02 -19.68 40.34 54.00 -13.66 AV ΡK V 7440.00 63.24 -13.57 49.67 74.00 -24.33 V 7440.00 53.01 -13.57 39.44 54.00 -14.56 AV Н 4960.00 47.28 74.00 -26.72 ΡK 66.96 -19.68 Н 4960.00 57.06 -19.68 37.38 54.00 -16.62 AV ΡK Н 7440.00 -13.57 47.87 74.00 -26.13 61.44 Н 7440.00 53.19 -13.57 39.62 54.00 -14.38 AV

Between 1GHz – 25GHz

Remark:

1.Emission Level = Meter Reading + Factor, Factor = Antenna Factor + Cable Loss – Pre-amplifier. Over= Emission Level - Limit

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

3. In restricted bands of operation, The spurious emissions below the permissible value more than 20dB

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

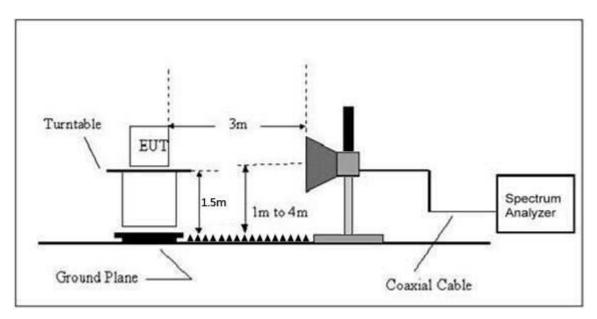
5.All the Modulation are test, the worst mode is GFSK, the data recording in the report.



8. Radiated Band Emission Measurement and Restricted Bands of Operation

8.1 Block Diagram Of Test Setup

Radiated Emission Test-Up Frequency Above 1GHz



8.2 Limit

FCC Part15 C Section 15.209 and 15.205

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

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



Limits Of Radiated Emission Measurement (Above 1000MHz)

Frequency (MHz)	Limit (d	BuV/m) (at 3M)		
Frequency (MIRZ)	Peak Average			
Above 1000	74	54		

Notes:

(1)The limit for radiated test was performed according to FCC PART 15C.

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

(3)Emission level (dBuV/m)=20log Emission level (uV/m).

8.3 Test procedure

Receiver Parameter	Setting
Attenuation	Auto
Start Frequency	2300MHz
Stop Frequency	2520
RB / VB (Emission In Restricted Band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

Above 1GHz test procedure as below:

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

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

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

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

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

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

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

Note:

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

8.4 EUT operating Conditions

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



8.5 Test Result

Test mode	Polar (H/V)	Frequency (MHz)	Reading Level (dBuV/m)	Correct Factor (dB)	Measure- ment (dBuV/m)	Limits (dBuV/m)		Result
					PK	PK	AV	
	Low Channel 2402MHz							
GFSK	Н	2390.00	72.98	-25.43	47.55	74.00	54.00	PASS
	Н	2400.00	74.76	-25.40	49.36	74.00	54.00	PASS
	V	2390.00	73.95	-25.43	48.52	74.00	54.00	PASS
	V	2400.00	75.17	-25.40	49.77	74.00	54.00	PASS
	High Channel 2480MHz							
	Н	2483.50	71.37	-25.15	46.22	74.00	54.00	PASS
	Н	2500.00	69.62	-25.10	44.52	74.00	54.00	PASS
	V	2483.50	73.82	-25.15	48.67	74.00	54.00	PASS
	V	2500.00	69.51	-25.10	44.41	74.00	54.00	PASS
π/4DQPSK	Low Channel 2402MHz							
	H	2390.00	73.89	-25.43	48.46	74.00	54.00	PASS
	Н	2400.00	76.14	-25.40	50.74	74.00	54.00	PASS
	V	2390.00	74.68	-25.43	49.25	74.00	54.00	PASS
	V	2400.00	76.13	-25.40	50.73	74.00	54.00	PASS
	High Channel 2480MHz							
	H	2483.50	72.83	-25.15	47.68	74.00	54.00	PASS
	Н	2500.00	69.96	-25.10	44.86	74.00	54.00	PASS
	V	2483.50	74.29	-25.15	49.14	74.00	54.00	PASS
	V	2500.00	70.39	-25.10	45.29	74.00	54.00	PASS
8DPSK	Low Channel 2402MHz							
	H	2390.00	72.01	-25.43	46.58	74.00	54.00	PASS
	Н	2400.00	73.11	-25.40	47.71	74.00	54.00	PASS
	V	2390.00	71.57	-25.43	46.14	74.00	54.00	PASS
	V	2400.00	72.11	-25.40	46.71	74.00	54.00	PASS
	High Channel 2480MHz							
	Н	2483.50	70.19	-25.15	45.04	74.00	54.00	PASS
	Н	2500.00	68.06	-25.10	42.96	74.00	54.00	PASS
	V	2483.50	69.68	-25.15	44.53	74.00	54.00	PASS
	V	2500.00	65.30	-25.10	40.20	74.00	54.00	PASS

Remark:

1. Emission Level = Meter Reading + Factor, Factor = Antenna Factor + Cable Loss – Pre-amplifier. Over= Emission Level - Limit

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

3 In restricted bands of operation, The spurious emissions below the permissible value more than 20dB

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



9. Spurious RF Conducted Emissions

9.1 Block Diagram Of Test Setup



9.2 Limit

Regulation 15.247 (d),In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.205(c))

9.3 Test procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;

2. Set the spectrum analyzer: Below 30MHz: RBW = 100kHz, VBW = 300kHz, Sweep = auto Detector function = peak, Trace = max hold Above 30MHz: RBW = 100KHz, VBW = 300KHz, Sweep = auto Detector function = peak, Trace = max hold

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9.4 Test Result



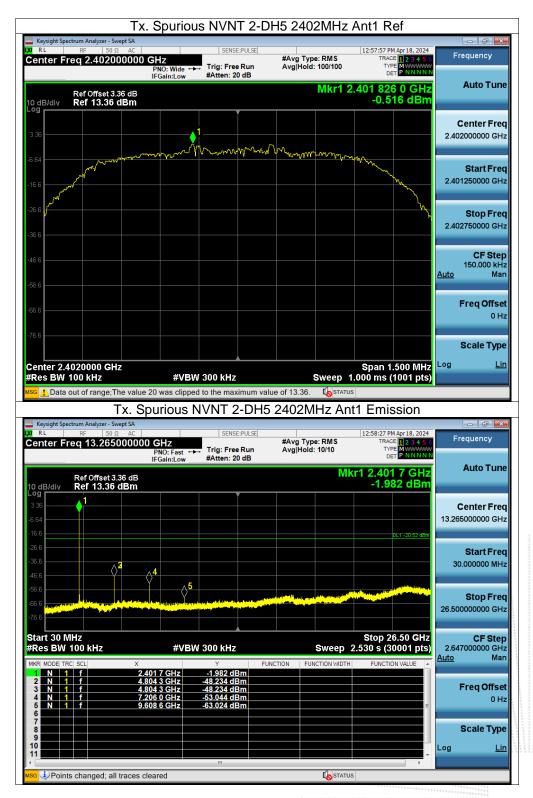




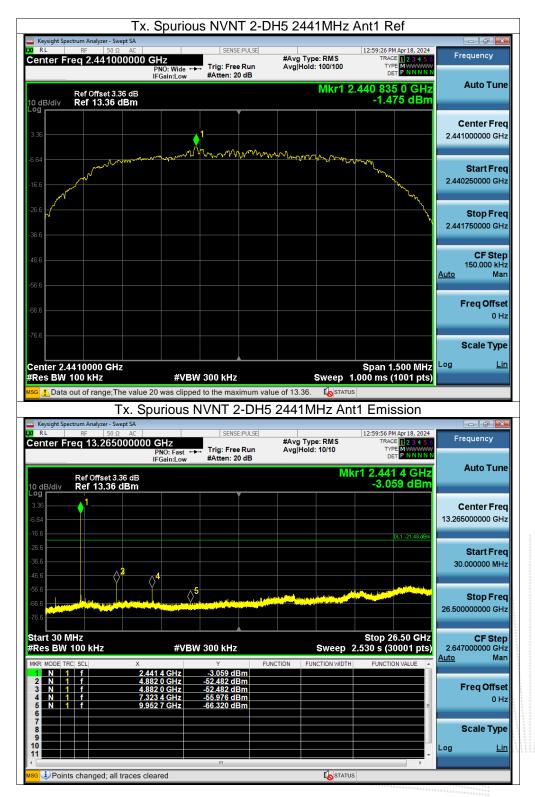




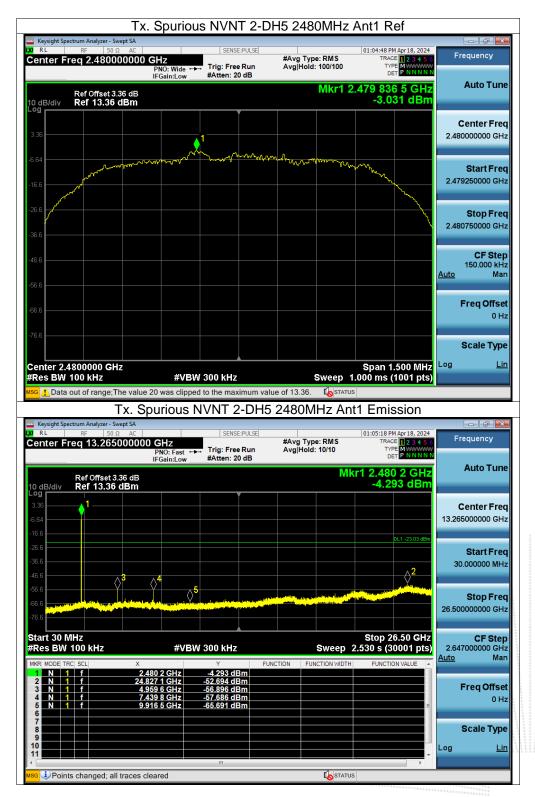








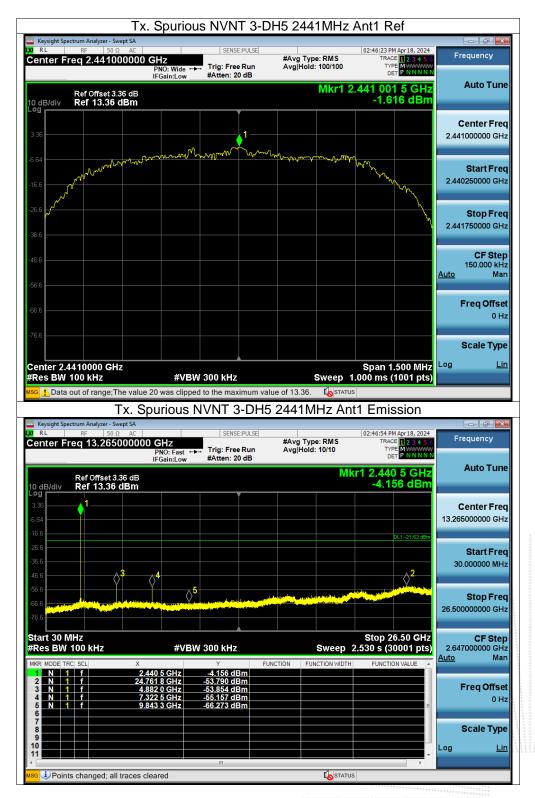




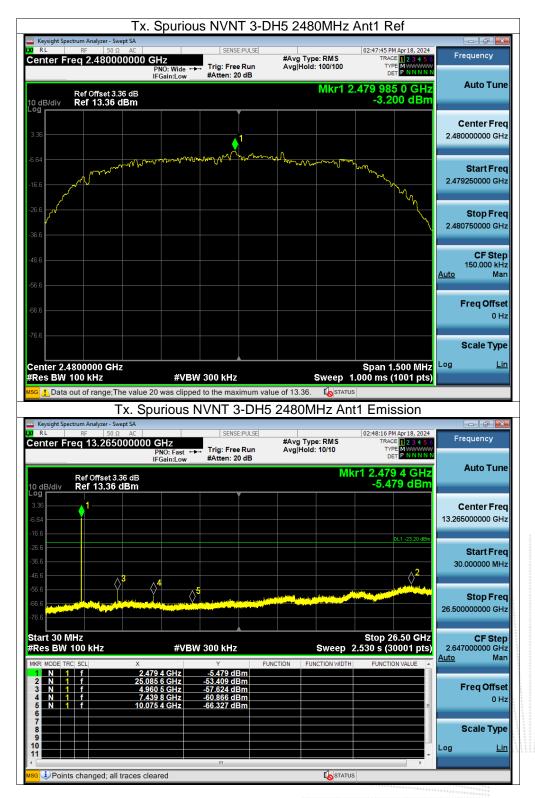




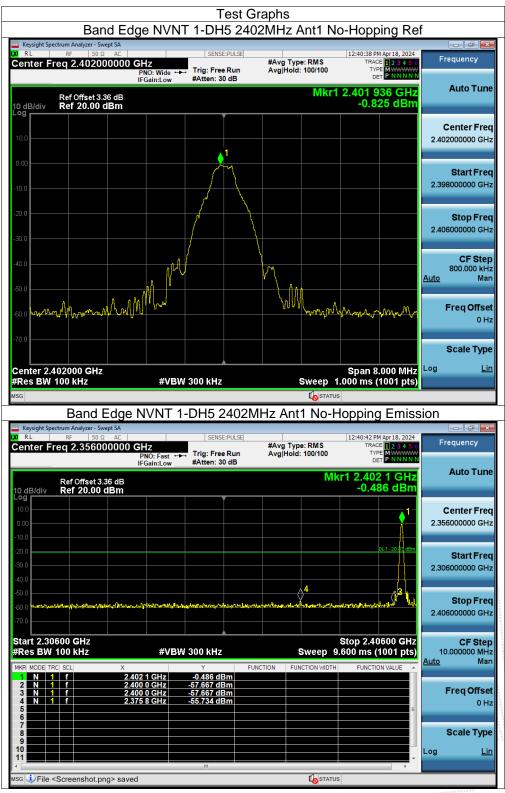




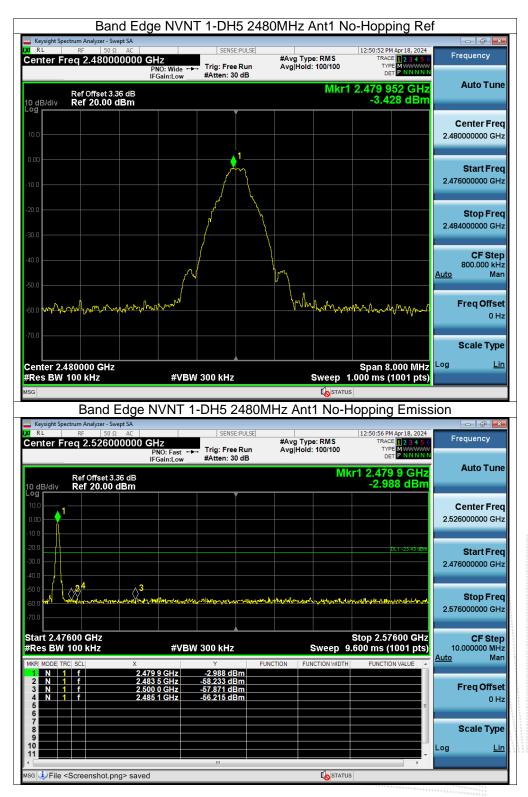




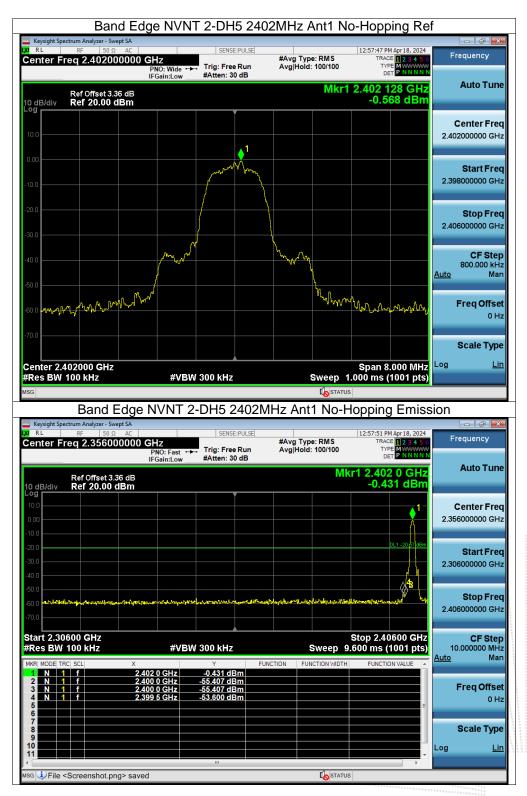




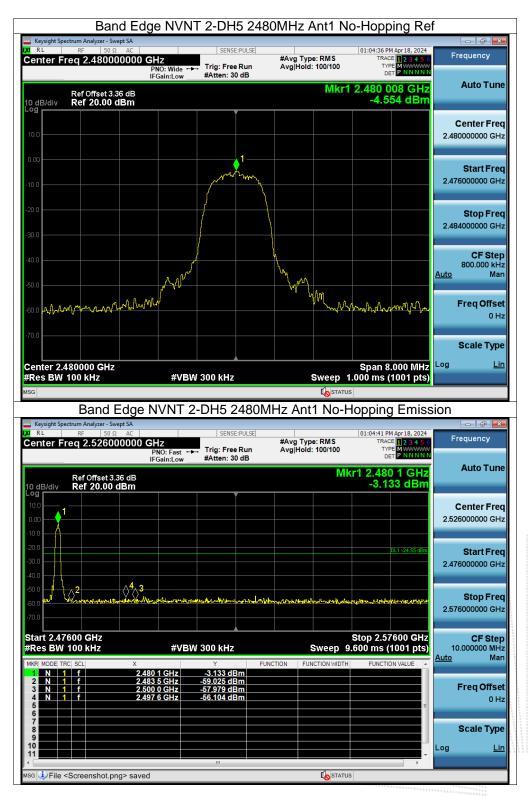




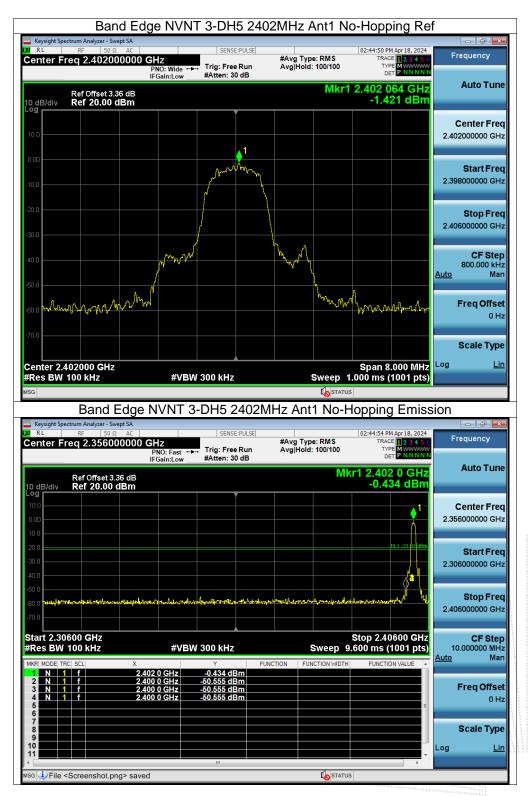




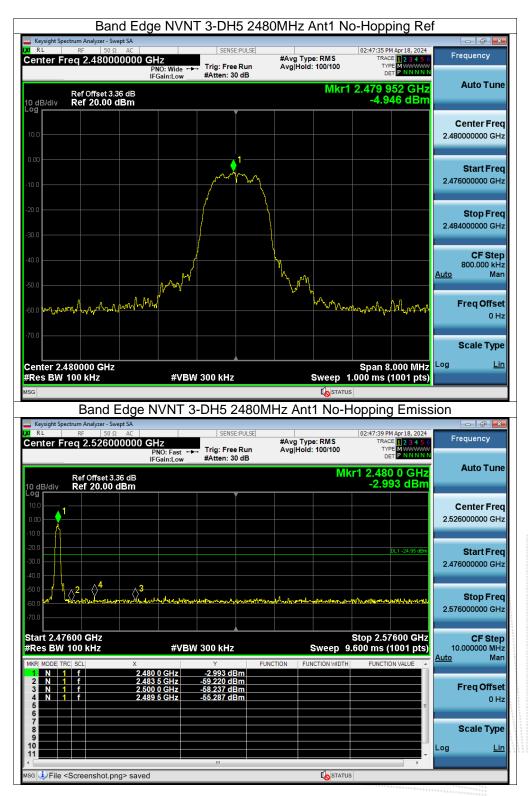














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		g) NVNT 1-D	H5 2402MHz /	Ant1 Hopping	
Keysight Spectrum Analyzer - Swe R L RF 50 Ω		SENSE:PULSE		12:53:45 PM Apr 18, 2024	£
Center Freq 2.40200	0000 GHz	Talas Free Days	#Avg Type: RMS Avg Hold: 2000/2000	TRACE 1 2 3 4 5 6	Frequency
	PNO: Wide ← IFGain:Low	#Atten: 30 dB	Arginola. 2000/2000	TYPE MWWWWW DET PNNNN	
Ref Offset 3.3 0 dB/div Ref 20.00 d	6 dB Bm		Mkr1	2.406 000 GHz -0.686 dBm	Auto Tun
^{og}		Ţ			
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			M M	N M	Start Fre
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Center 2.402000 GHz Res BW 100 kHz	#\/B)	N 300 kHz		Span 8.000 MHz	
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Band Edge	e(Hopping) I	NVNT 1-DH5	I ostatus	.000 ms (1001 pts) 1 Hopping En	
Band Edge Keysight Spectrum Analyzer - Swe RL RF 50 Ω	e(Hopping) I	NVNT 1-DH5	2402MHz Ant	.000 ms (1001 pts) 1 Hopping En 12:54:03 PM Apr 18, 2024 TRACE 2 3 4 5 6	
Band Edge	e(Hopping) I AC 0000 GHz PN0: Fast ←	NVNT 1-DH5	5 2402MHz Ant	.000 ms (1001 pts) 1 Hopping En	
Band Edge keysight Spectrum Analyzer - Swe R RL RF 50 Q Center Freq 2.35600	e(Hopping) I ^{t SA} AC 0000 GHz PNO: Fast ← IFGain:Low	NVNT 1-DH5	STATUS 2402MHz Ant #Avg Type: RMS Avg Hold: 1000/1000	.000 ms (1001 pts) 1 Hopping En 12:54:03 PM Apr 18, 2024 TRACE 2 2 3 4 5 0 TRACE PL 2 3 4 5 0 TRACE PL 2 3 4 5 0	Frequency
Band Edge keysight Spectrum Analyzer - Sug RL RF 500 Center Freq 2.356000 Ref Offset 3.3 10 dB/div Ref 20.00 d	e(Hopping) I pt SA AC 0000 GHz PNO: Fast - IFGain:Low 6 dB	NVNT 1-DH5	STATUS 2402MHz Ant #Avg Type: RMS Avg Hold: 1000/1000	.000 ms (1001 pts) 1 Hopping En 12:54:03 PM Apr 18, 2024 TRACE 2 3 4 5 6	Frequency
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Band Edge keysight Spectrum Analyzer - Sug Resolution of the state	e(Hopping) I pt SA AC 0000 GHz PNO: Fast - IFGain:Low 6 dB	NVNT 1-DH5	STATUS 2402MHz Ant #Avg Type: RMS Avg Hold: 1000/1000	.000 ms (1001 pts) 1 Hopping En 12:54:03 PM Apr18, 2024 TRACE 12 23 45 6 TYPE 12 34 5 6 TYPE 12 34 5 6 TYPE 12 44 5 6 TYPE 12 45	Frequency Auto Tun Center Fre 2.356000000 GH Start Fre
Band Edge keysight Spectrum Analyzer - Sug Center Freq 2.356000 Ref Offset 3.3 Ref Offset 3.3 10 dB/div Ref 20.00 d 00 00 00 00 00 00 00 00 00 0	e(Hopping) I pt SA AC 0000 GHz PNO: Fast - IFGain:Low 6 dB	NVNT 1-DH5	5 2402MHz Ant #Avg Type: RMS Avg Hold: 1000/1000	.000 ms (1001 pts) 1 Hopping En 12:54:03 PM Apr18, 2024 TRACE 12:34:56 TRACE 12:35 TRACE	Frequency Auto Tun Center Fre 2.356000000 GH Start Fre
Band Edge keysight Spectrum Analyzer - Sug Ref Offset 3.3 G dB/div Ref 20.00 d 0 0 0 0 0 0 0 0 0 0 0 0 0	e(Hopping) I pt SA AC 0000 GHz PNO: Fast - IFGain:Low 6 dB	NVNT 1-DH5	5 2402MHz Ant #Avg Type: RMS Avg Hold: 1000/1000	.000 ms (1001 pts) 1 Hopping En 12:54:03 PM April8, 2024 TRACE 2:34:5 0 TRACE 3:500 TRACE	Frequency Auto Tun Center Fre 2.356000000 GH Start Fre 2.306000000 GH
Band Edge Keysight Spectrum Analyzer - Sug R RF Senter Freq 2.356000 Ref Offset 3.3 Ref 20.00 d 0 dB/div Ref 20.00 d 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	e(Hopping) I pt SA AC 0000 GHz PNO: Fast - IFGain:Low 6 dB	VVNT 1-DH5 [SENSE:PULSE] → Trig: Free Run #Atten: 30 dB	STATUS 2402MHz Ant #Avg Type: RMS Avg Hold: 1000/1000	.000 ms (1001 pts) 1 Hopping En 12:54:03 PM Apr18, 2024 TRACE 12:34:56 TRACE 12:35 TRACE	Frequency Auto Tun Center Fre 2.356000000 GH Start Fre 2.306000000 GH
Band Edge Keysight Spectrum Analyzer - Swee RL RF 50 Q Center Freq 2.356000 Ref Offset 3.3 10 dE/div Ref Offset 3.3 10 dE/div Ref 20.00 d 9	e(Hopping) I pt SA AC 0000 GHz PNO: Fast - IFGain:Low 6 dB	VVNT 1-DH5 [SENSE:PULSE] → Trig: Free Run #Atten: 30 dB	STATUS 2402MHz Ant #Avg Type: RMS Avg Hold: 1000/1000	.000 ms (1001 pts) 1 Hopping En 12:54:03 PM Apr18, 2024 TRACE 12:34:56 TYPE 1	Frequency Auto Tun Center Fre 2.356000000 GH Start Fre 2.306000000 GH Stop Fre 2.406000000 GH
Band Edge Keysight Spectrum Analyzer Swe Reysight Spectrum Analyzer Son Center Freq 2.356000 Band B/div Ref 20.00 d Pg 10.0 0.00	e(Hopping) I AC OOOO GHz PNO: Fast ~ IFGain:Low 6 dB BM	VVNT 1-DH5 SENSE:PULSE Trig: Free Run #Atten: 30 dB	E 2402MHz Ant #Avg Type: RMS Avg Hold: 1000/1000	.000 ms (1001 pts) 1 Hopping En 12:54:03 PM Apr18, 2024 TRACE 12:34:56 TRACE 12:34:56 TRACE 02:34:56 TRACE 12:34:56 TRACE 12:34:56 TRA	Center Free 2.35600000 GH Start Free 2.30600000 GH Stop Free 2.406000000 GH
Band Edge Keysight Spectrum Analyzer - Swe RL RF 50 Ω Center Freq 2.356000 Ref Offset 3.3 Ref Offset 3.3 Ref 0ffset 3.3 0 dB/div Ref 20.00 d 0 0 0 0 0 0 0 0 0 0 0 0 0 0	e(Hopping) I AC AC PNO: Fast IFGain:Low 6 dB Bm 4	NVNT 1-DH5	5 2402MHz Ant #Avg Type: RMS Avg Hold: 1000/1000	.000 ms (1001 pts) 1 Hopping En 12:54:03 PM Apr18, 2024 TRACE 12:34:56 TRACE 12:35 TRACE 12:35 TR	Frequency Auto Tun Center Fre 2.356000000 GH Start Fre 2.306000000 GH Stop Fre 2.40600000 GH CF Step 10.000000 MH
Band Edge keysight Spectrum Analyzer Swe (RL RF 50 Q Center Freq 2.356000 Ref Offset 3.3 Ref Offset 3.3 10 dB/div Ref 20.00 d 0 00 0 00	e (Hopping) I pt SA AC PNO: Fast → IFGain:Low 6 dB Bm 4.0000 GHz 4.000 GHZ 4.000 GHZ #VBN × 2.403 0 GHZ	VVNT 1-DH5 Sense:PULSE Trig: Free Run #Atten: 30 dB	E 2402MHz Ant #Avg Type: RMS Avg Hold: 1000/1000	.000 ms (1001 pts) 1 Hopping En 12:54:03 PM Apr18, 2024 TRACE 12:34:56 TRACE 12:34:56 TRACE 02:34:56 TRACE 12:34:56 TRACE 12:34:56 TRA	Frequency Auto Tun Center Fre 2.356000000 GH Start Fre 2.306000000 GH Stop Fre 2.406000000 GH CF Step 10.000000 MH
Band Edge Keysight Spectrum Analyzer Swe Ref Offset 3.3 Center Freq 2.356000 Ref 20.00 d 0 0 0 0 0 0 0 0 0 0 0 0 0 0	e(Hopping) I AC AC PNO: Fast IFGain:Low 6 dB BM 6 dB BM 4 4 4 4 4 4 4 4 4 4 4 4 4	VVNT 1-DH5 SENSE:PULSE Trig: Free Run #Atten: 30 dB	5 2402MHz Ant #Avg Type: RMS Avg Hold: 1000/1000	.000 ms (1001 pts) 1 Hopping En 12:54:03 PM Apr18, 2024 TRACE 12:34:56 TRACE 12:35 TRACE 12:35 TR	Frequency Auto Tun Center Fre 2.356000000 GH Start Fre 2.306000000 GH Stop Fre 2.406000000 GH CF Step 10.000000 MH
Band Edge Keysight Spectrum Analyzer - Sweg RL RF 50 Q Center Freq 2.356000 10 Ref Offset 3.3 10 Ref 0 00 Ref 0 010 Ref 0 020 Ref 0 040 Ref 0 050 Ref 0 060 Ref 0 070 Ref 0 080 Ref 0 090 Ref 0 100 Ref 1 100 Ref 1 100 Ref 1 100 R	e (Hopping) I pt SA AC PNO: Fast → IFGain:Low 6 dB Bm 4.0000 GHz 4.000 GHZ 4.000 GHZ #VBN × 2.403 0 GHZ	VVNT 1-DH5 Sense:PULSE Trig: Free Run #Atten: 30 dB	5 2402MHz Ant #Avg Type: RMS Avg Hold: 1000/1000	.000 ms (1001 pts) 1 Hopping En 12:54:03 PM Apr18, 2024 TRACE 12:34:56 TRACE 12:35 TRACE 12:35 TR	Frequency Auto Tun Center Free 2.355000000 GH Start Free 2.306000000 GH Stop Free 2.406000000 GH CF Step 10.000000 MH Auto Auto Tun
Band Edge keysight Spectrum Analyzer - Swe Ref Offset 3.3 Center Freq 2.356000 Ref 20.00 df 200 10.0 20.0	e (Hopping) I pt SA AC PNO: Fast → IFGain:Low 6 dB Bm 4 4 4 4 4 4 4 4 4 4 4 4 4	VVNT 1-DH5 SENSE:PULSE Trig: Free Run #Atten: 30 dB Atten: 30 dB Atten: 40 dB A	5 2402MHz Ant #Avg Type: RMS Avg Hold: 1000/1000	.000 ms (1001 pts) 1 Hopping En 12:54:03 PM Apr18, 2024 TRACE 12:34:56 TRACE 12:35 TRACE 12:35 TR	Frequency Auto Tun Center Fre 2.356000000 GH Start Fre 2.306000000 GH Stop Fre 2.406000000 GH CF Step 10.000000 MH Auto Auto Freq Offsee
Band Edge keysight Spectrum Analyzer - Sug Ref Offset 3.3 Center Freq 2.356000 Ref 20.00 d 0 d 0 d 0 d 0 d 0 d 0 d 0 d	e (Hopping) I pt SA AC PNO: Fast → IFGain:Low 6 dB Bm 4 4 4 4 4 4 4 4 4 4 4 4 4	VVNT 1-DH5 SENSE:PULSE Trig: Free Run #Atten: 30 dB Atten: 30 dB Atten: 40 dB A	5 2402MHz Ant #Avg Type: RMS Avg Hold: 1000/1000	.000 ms (1001 pts) 1 Hopping En 12:54:03 PM Apr18, 2024 TRACE 12:34:56 TRACE 12:35 TRACE 12:35 TR	Frequency Auto Tun Center Fre 2.356000000 GH Start Fre 2.306000000 GH Stop Fre 2.406000000 GH CF Step 10.000000 MH Auto Auto Freq Offsee
Band Edge Keysight Spectrum Analyzer Swe Ref Offset 3.3 Center Freq 2.356000 10 0 </td <td>e (Hopping) I pt SA AC PNO: Fast → IFGain:Low 6 dB Bm 4 4 4 4 4 4 4 4 4 4 4 4 4</td> <td>VVNT 1-DH5 SENSE:PULSE Trig: Free Run #Atten: 30 dB Atten: 30 dB Atten: 40 dB A</td> <td>5 2402MHz Ant #Avg Type: RMS Avg Hold: 1000/1000</td> <td>.000 ms (1001 pts) 1 Hopping En 12:54:03 PM Apr18, 2024 TRACE 12:34:56 TRACE 12:35 TRACE 12:35 TR</td> <td>Start Fre 2.356000000 GH Start Fre 2.306000000 GH Stop Fre 2.406000000 GH CF Step 10.000000 MH Auto Math Freq Offse 0 H Scale Typ</td>	e (Hopping) I pt SA AC PNO: Fast → IFGain:Low 6 dB Bm 4 4 4 4 4 4 4 4 4 4 4 4 4	VVNT 1-DH5 SENSE:PULSE Trig: Free Run #Atten: 30 dB Atten: 30 dB Atten: 40 dB A	5 2402MHz Ant #Avg Type: RMS Avg Hold: 1000/1000	.000 ms (1001 pts) 1 Hopping En 12:54:03 PM Apr18, 2024 TRACE 12:34:56 TRACE 12:35 TRACE 12:35 TR	Start Fre 2.356000000 GH Start Fre 2.306000000 GH Stop Fre 2.406000000 GH CF Step 10.000000 MH Auto Math Freq Offse 0 H Scale Typ
Band Edge Keysight Spectrum Analyzer - Swee Ref Offset 3.3 Center Freq 2.356000 Ref Offset 3.3 Ref Offset 3.3 10 dB/div Ref Offset 3.3 10 dB/div Ref 20.00 d 0 0	e (Hopping) I pt SA AC PNO: Fast → IFGain:Low 6 dB Bm 4 4 4 4 4 4 4 4 4 4 4 4 4	VVNT 1-DH5 Sense:PULSE Trig: Free Run #Atten: 30 dB Atten: 30 dB Atten: 40 dB A	5 2402MHz Ant #Avg Type: RMS Avg Hold: 1000/1000	.000 ms (1001 pts) 1 Hopping En 12:54:03 PM Apr18, 2024 TRACE 12:34:56 TRACE 12:35 TRACE	Start Fre 2.35600000 GH Start Fre 2.30600000 GH Stop Fre 2.40600000 GH CF Step 10.00000 MH Auto Main Freq Offsee 0 H

No.: BCTC/RF-EMC-005























10. 20 dB Bandwidth

10.1 Block Diagram Of Test Setup



10.2 Limit

N/A

10.3 Test procedure

- 1. Set RBW = 30kHz.
- 2. Set the video bandwidth (VBW) \ge 3 x RBW.
- 3. Detector = Peak.
- 4. Trace mode = max hold.
- 5. Sweep = auto couple.
- 6. Allow the trace to stabilize.

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

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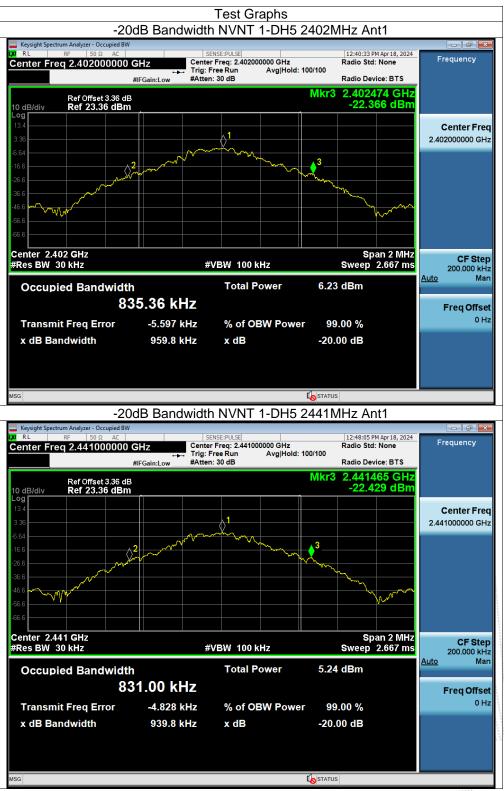


10.4 Test Result

Condition	Mode	Frequency (MHz)	-20 dB Bandwidth (MHz)	Verdict
NVNT	1-DH5	2402	0.96	Pass
NVNT	1-DH5	2441	0.94	Pass
NVNT	1-DH5	2480	0.943	Pass
NVNT	2-DH5	2402	1.289	Pass
NVNT	2-DH5	2441	1.317	Pass
NVNT	2-DH5	2480	1.321	Pass
NVNT	3-DH5	2402	1.295	Pass
NVNT	3-DH5	2441	1.304	Pass
NVNT	3-DH5	2480	1.302	Pass

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11. Maximum Peak Output Power

11.1 Block Diagram Of Test Setup



11.2 Limit

FCC Part15 (15.247) , Subpart C					
Section	Test Item	Limit	Frequency Range (MHz)	Result	
15.247(b)(1)	Peak Output Power	0.125 watt or 21dBm	2400-2483.5	PASS	

11.3 Test procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.

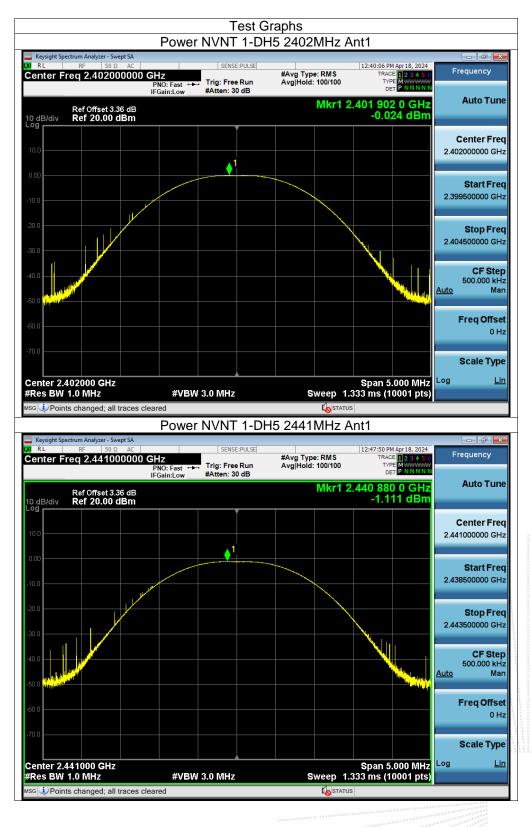
2. Set the spectrum analyzer: RBW = 2MHz. VBW = 6MHz. Sweep = auto; Detector Function = Peak.

3. Keep the EUT in transmitting at lowest, medium and highest channel individually. Record the max value.

11.4 Test Result

Condition	Mode	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	1-DH5	2402	-0.02	21	Pass
NVNT	1-DH5	2441	-1.11	21	Pass
NVNT	1-DH5	2480	-2.64	21	Pass
NVNT	2-DH5	2402	2.23	21	Pass
NVNT	2-DH5	2441	0.97	21	Pass
NVNT	2-DH5	2480	-0.65	21	Pass
NVNT	3-DH5	2402	2.57	21	Pass
NVNT	3-DH5	2441	1.27	21	Pass
NVNT	3-DH5	2480	-0.33	21	Pass



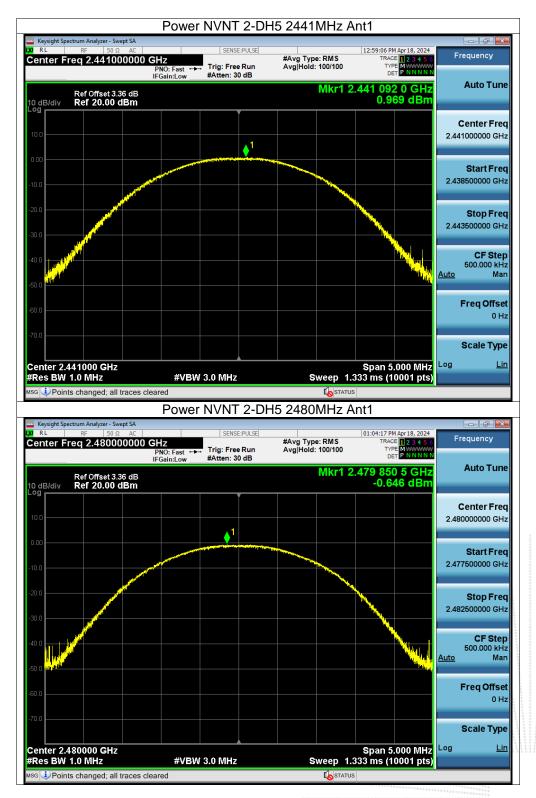


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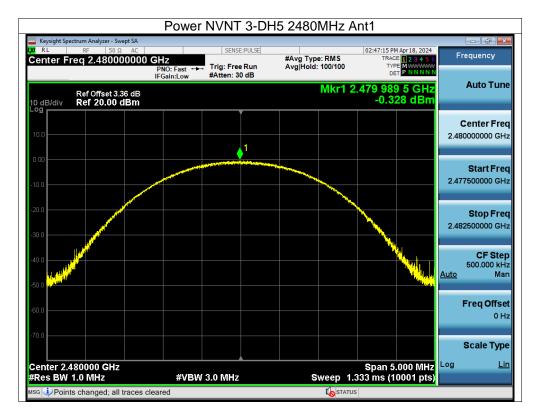
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12. Hopping Channel Separation

12.1 Block Diagram Of Test Setup



12.2 Limit

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 0.125W.

12.3 Test procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.

2. Set the spectrum analyzer: RBW = 30kHz. VBW = 100kHz , Span = 2.0MHz. Sweep = auto; Detector Function = Peak. Trace = Max hold.

3. Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section Submit this plot.

						1 1 1 1
Condition	Mode	Hopping Freq1 (MHz)	Hopping Freq2 (MHz)	HFS (MHz)	Limit (MHz)	Verdict
NVNT	1-DH5	2402.01	2402.984	0.974	0.64	Pass
NVNT	1-DH5	2441.008	2442.016	1.008	0.627	Pass
NVNT	1-DH5	2479.012	2479.97	0.958	0.629	Pass
NVNT	2-DH5	2402.036	2402.982	0.946	0.859	Pass
NVNT	2-DH5	2441.122	2442.022	0.9	0.878	Pass
NVNT	2-DH5	2479.022	2480.022	····· 1	0.881	Pass
NVNT	3-DH5	2402.012	2403.008	0.996	0.863	Pass
NVNT	3-DH5	2440.94	2442.01	1.07	0.869	Pass
NVNT	3-DH5	2478.992	2480.006	1.014	0.868	Pass

12.4 Test Result

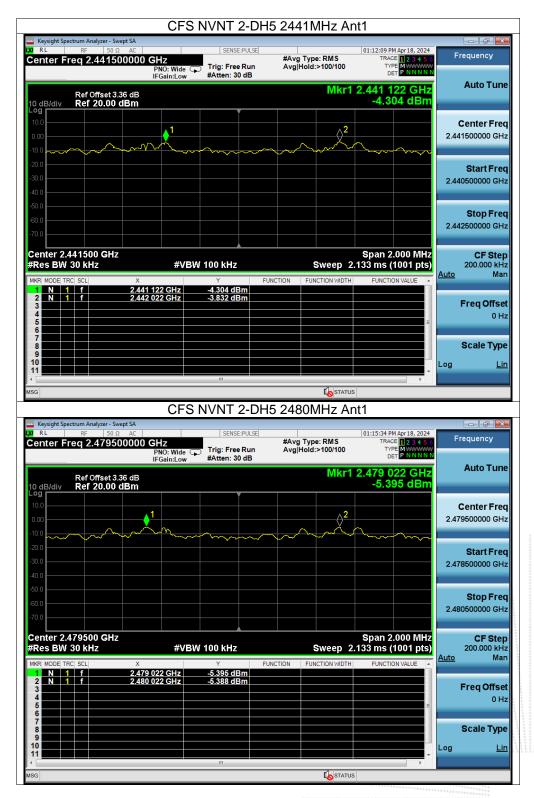


	050		Braphs 5 2402MHz Ar	14	
Keysight Spectrum Analyze		INVINT 1-DH	5 Z4UZIVIHZ Ar	111	
	50 Ω AC	SENSE:PULSE ☐ Trig: Free Run #Atten: 30 dB	#Avg Type: RMS Avg Hold:>100/100	12:54:14 PM Apr 18, 2024 TRACE 1 2 3 4 5 6 TYPE MWWWW DET P N N N N	Frequency
	et 3.36 dB .00 dBm		Mkr1	2.402 010 GHz -3.437 dBm	Auto Tune
10.0			2 mm 2	~~~~~	Center Fred 2.402500000 GH;
-10.0 -20.0 -30.0 -40.0		how		~ V WW	Start Fred 2.401500000 GH;
-50.0 -60.0 -70.0					Stop Fred 2.403500000 GH:
Center 2.402500 C #Res BW 30 kHz		√ 100 kHz Y FL	Sweep 2	Span 2.000 MHz 133 ms (1001 pts) FUNCTION VALUE	CF Step 200.000 kH <u>Auto</u> Mar
1 N 1 f 2 N 1 f 3 4 5 6	2.402 010 GHz 2.402 984 GHz	-3.437 dBm -3.149 dBm		E	Freq Offse 0 H:
7 8 9 10					Scale Type
11 MSG					Log <u>Lir</u>
			K STATUS		
	CFS	NVNT 1-DH	5 2441MHz Ar		
14	er - Swept SA 50 Ω AC 1500000 GHz PNO: Wide ⊂	SENSE:PULSE	S	12:55:09 PM Apr 18, 2024 TRACE 1 2 3 4 5 6 TYPE MWWWWW	Frequency
Center Freq 2.44	er - Swept SA 50 Ω AC 15000000 GHz	SENSE:PULSE	5 2441MHz Ar #Avg Type: RMS Avg Hold:>100/100	12:55:09 PM Apr 18, 2024 TRACE 12 3 4 5 6	Frequency
X RL RF Center Freq 2.44 Ref Offs 10 dB/div Ref Offs 10.0 0.00 -10.0 0.00	er - Swept SA 50 0 AC L1500000 GHz PNO: Wide IFGain:Low et 3.36 dB .00 dBm	SENSE:PULSE	5 2441MHz Ar #Avg Type: RMS Avg Hold:>100/100 Mkr1	12:55:09 PM Apr 18, 2024 TRACE 12 3 4 5 6 TYPE WWWWW DET WINNINN 2.441 008 GHz -5.153 dBm	Frequency Auto Tune Center Free
XX RL RF Center Freq 2.44 Ref Offs 10 dB/div Ref 20. 10.0	er - Swept SA 50 0 AC L1500000 GHz PNO: Wide IFGain:Low et 3.36 dB .00 dBm	SENSE:PULSE	5 2441MHz Ar #Avg Type: RMS Avg Hold:>100/100	12:55:09 PM Apr 18, 2024 TRACE 3 2 3 4 5 6 TYPE MWWWW DET P NNNN N 2.441 008 GHz	
XX RL RF Center Freq 2.44 Ref Offs 10 dB/div Ref 20. 10 0	er - Swept SA 50 0 AC L1500000 GHz PNO: Wide IFGain:Low et 3.36 dB .00 dBm	SENSE:PULSE	5 2441MHz Ar #Avg Type: RMS Avg Hold:>100/100 Mkr1	12:55:09 PM Apr 18, 2024 TRACE 12 3 4 5 6 TYPE WWWWW DET WINNINN 2.441 008 GHz -5.153 dBm	Frequency Auto Tune Center Frec 2.441500000 GH Start Frec
XY RL RF Center Freq 2.44 Center Freq 2.44 10 dB/div Ref Offs 10 dB/div Ref 20. 10 0	er - Swept SA S0 Ω AC I1500000 GHz PNO: Wide G IFGain:Low et 3.36 dB 00 dBm 1 1 GHz #VEM	SENSE:PULSE Trig: Free Run #Atten: 30 dB	5 2441MHz Ar #Avg Type: RMS Avg Hold:>100/100 Mkr1	12:55:09 PM Apr 18, 2024 TRACE 12 3 4 5 6 TYPE WWWWW DET WINNINN 2.441 008 GHz -5.153 dBm	Frequency Auto Tune Center Free 2.441500000 GH Start Free 2.440500000 GH Stop Free
X RL RF Center Freq 2.44 Ref Offs 10 dB/div Ref 20, 0 g	er - Swept SA S0 Q AC L1500000 GHz PNO: Wide IFGain:Low et 3.36 dB .00 dBm .00 dBm	SENSE:PULSE	5 2441MHz Ar #Avg Type: RMS Avg Hold:>100/100 Mkr1	2.441 008 GHz -5.153 dBm	Frequency Auto Tune Center Free 2.441500000 GH: Start Free 2.440500000 GH: Stop Free 2.442500000 GH: CF Step 200.000 kH: Auto Mar
XX RL RF Center Freq 2.44 Ref Offs 10 dB/div Ref 20. 10 0 0 10 0 0 10 0 0 10 0 0 10 0 0 10 0 0 20 0 0 30 0 0 40 0 0 550 0 0 60 0 0 770 0 0 Center 2.441500 C 0 #Res BW 30 kHz 0 MKR MODE TRC SCL 1 1 N 1 2 N 1 3 0 0	er - Swept SA S0 0 AC L1500000 GHz PN0: Wide GHZ	SENSE:PULSE Trig: Free Run #Atten: 30 dB	5 2441MHz Ar #Avg Type: RMS Avg Hold:>100/100 Mkr1	11 12:55:09 PM Apr 18, 2024 TRACE 12:34 5: 6 TYPE 2:441 008 GHz -5.153 dBm 5:153 d	Start Frequency Auto Tune Center Frequency 2.441500000 GH: Start Frequency 2.440500000 GH: Stop Frequency 2.442500000 GH: CF Step 200.000 kH:











	CFS	NVNT 3-DH	<u>5 2402MHz An</u>	t1	
Keysight Spectrum Analyzer -	- Swept SA	SENSE:PULSE		02:50:11 PM Apr 18, 2024	
Center Freq 2.402		Talas Free Days	#Avg Type: RMS Avg Hold:>100/100	TRACE 1 2 3 4 5 6 TYPE M WWWW DET P N N N N	Frequency
Ref Offset 10 dB/div Ref 20.0	: 3.36 dB 0 dBm		Mkr1 :	2.402 012 GHz -4.168 dBm	Auto Tune
10.0	1				Center Fred 2.402500000 GHz
-10.0	when the second second			Mart and	Start Fred
-30.0					2.401500000 GHz
-50.0					Stop Fred 2.403500000 GH:
Center 2.402500 Gł #Res BW 30 kHz		W 100 kHz	Sweep 2.7	Span 2.000 MHz 133 ms (1001 pts)	CF Step 200.000 kH Auto Mar
MKR MODE TRC SCL	× 2.402 012 GHz	Y FU -4.168 dBm	NCTION FUNCTION WIDTH	FUNCTION VALUE	
2 N 1 f 3 4 5 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	2.403 008 GHz	-3.839 dBm		= =	Freq Offset 0 Hz
6 7 8 9 10					Scale Type
11					Log <u>Lir</u>
MSG				, , , , , , , , , , , , , , , , , , ,	
	CES			+1	
Keysight Spectrum Analyzer -		NVNT 3-DH	5 2441MHz An	t1	- 6 -
XIRL RF 5	Swept SA 0 Ω AC 500000 GHz PNO: Wide	SENSE:PULSE		02:56:16 PM Apr 18, 2024 TRACE 12 3 4 5 6 TYPE MUMANIN N	Frequency
X RL RF 5 Center Freq 2.441 Ref Offset 10 dB/div Ref 20.0	Swept SA 0 Ω AC 500000 GHz PNO: Wide C IFGain:Low 3.36 dB	SENSE:PULSE	5 2441MHz An #Avg Type: RMS Avg Hold:>100/100	02:56:16 PM Apr 18, 2024	Frequency
RL RF 5 Center Freq 2.441 Ref Offset	Swept SA 0 Ω AC 500000 GHz PNO: Wide C IFGain:Low 3.36 dB	SENSE:PULSE	5 2441MHz An #Avg Type: RMS Avg Hold:>100/100	02:56:16 PM Apr 18, 2024 TRACE 2 3 4 5 6 TYPE MUNICIPAL DET P NNNN 2.440 940 GHz	Frequency Auto Tun Center Free
Ref Offset 10 dB/div Ref 20.0 10.0	Swept SA 0 Ω AC 500000 GHz PNO: Wide C IFGain:Low 3.36 dB	SENSE:PULSE Trig: Free Run #Atten: 30 dB	5 2441MHz An #Avg Type: RMS Avg Hold:>100/100 Mkr1 :	02:56:16 PM Apr 18, 2024 TRACE 2 3 4 5 6 TYPE MUNICIPAL DET P NNNN 2.440 940 GHz	Frequency Auto Tun Center Fre 2.441500000 GH
X RF 5 Center Freq 2.441 Ref Offset 10 dB/div Ref Offset 10 0	Swept SA 0.0 AC 500000 GHz PNO: Wide C IFGein:Low 3.36 dB 0 dBm	SENSE:PULSE Trig: Free Run #Atten: 30 dB	5 2441MHz An #Avg Type: RMS Avg Hold:>100/100 Mkr1 :	02:56:16 PM Apr 18, 2024 TRACE 23 4 5 6 TYPE NNNNN DET PNNNNN 2.440 940 GHz -7.449 dBm	Frequency Auto Tun Center Fre 2.441500000 GH Start Fre
X RE RF IS Center Freq 2.441 Ref Offset 10	Swept SA 0.0 AC 500000 GHz PNO: Wide C IFGein:Low 3.36 dB 0 dBm	SENSE:PULSE Trig: Free Run #Atten: 30 dB	5 2441MHz An #Avg Type: RMS Avg Hold:>100/100 Mkr1 :	02:56:16 PM Apr 18, 2024 TRACE 23 4 5 6 TYPE NNNNN DET PNNNNN 2.440 940 GHz -7.449 dBm	Frequency Auto Tun Center Free 2.441500000 GH Start Free 2.440500000 GH
Ref Offset 10 dB/div Ref Offset 10 dB/div Ref 20.0 100	Swept SA 0.2 AC 500000 GHz PNO: Wide C IFGain:Low 3.36 dB 0 dBm 1 1 1 1 2	SENSE:PULSE	5 2441MHz An #Avg Type: RMS Avg Hold:>100/100 Mkr1 2	02:56:16 PM Apr 18, 2024	Frequency Auto Tun Center Free 2.441500000 GH Start Free 2.440500000 GH Stop Free 2.442500000 GH
K Rc Rc S Center Freq 2.441 Ref Offset Ref 20.0 10 Ref 20.0 Ref 20.0 100 Ref 20.0 Ref 20.0 .200	Swept SA 20 AC 500000 GHz PNO: Wide C IFGain:Low 3.36 dB 0 dBm 1 12 #VB	SENSE:PULSE Trig: Free Run #Atten: 30 dB	5 2441MHz An #Avg Type: RMS Avg Hold:>100/100 Mkr1 2 Avg	02:56:16 PM Apr 18, 2024	Frequency Auto Tun Center Fre 2.441500000 GH Start Fre 2.440500000 GH Stop Fre 2.442500000 GH CF Stej 200.000 kH
X RL RF S Center Freq 2.441 Ref Offset 10 dB/div Ref 20.0 Log 10.0 0000 000 000 000<	Swept SA 0.2 AC 500000 GHz PNO: Wide C IFGain:Low 3.36 dB 0 dBm 1 1 1 1 2	SENSE:PULSE Trig: Free Run #Atten: 30 dB	5 2441MHz An #Avg Type: RMS Avg Hold:>100/100 Mkr1 2	02:56:16 PM Apr 18, 2024	Frequency Auto Tum Center Freq 2.441500000 GH Start Freq 2.440500000 GH Stop Freq 2.442500000 GH CF Step 200.000 kH Auto Auto Freq Offsee
X RL RF IS Center Freq 2.441 Ref Offset Ref Offset 10 Genter Freq 2.441 Ref Offset 10 Genter Freq 2.441 Ref Offset 0 Genter Freq 2.441 Ref Offset 10 Genter Freq 2.441 Genter Freq 2.441 0 Genter Freq 2.441 Genter Freq 2.441 40.0 Genter Freq 2.441 Genter Freq 2.441 60.0 Genter Freq 2.441 Genter Freq 2.441 6 Genter Freq 2.441 Genter Freq 2.441 70.0 Genter Freq 2.441 Genter Freq 2.441 70.0 Genter Freq 2.441 Genter Freq 2.441 1 N 1 f 2 N 1 f 3 4 Genter Freq 2.441 Genter Freq 2.441 Genter Freq 2.441	Swept SA 0.0 AC 500000 GHz IFGain:Low 3.36 dB 0 dBm 1 12 #VB1 X	SENSE:PULSE Trig: Free Run #Atten: 30 dB	5 2441MHz An #Avg Type: RMS Avg Hold:>100/100 Mkr1 2 Avg	02:56:16 PM Apr 18, 2024	Frequency Auto Tune Center Freq 2.441500000 GH Start Freq 2.440500000 GH Stop Freq 2.442500000 GH CF Step 200.000 kH Auto Freq Offse 0 H
X Rt Ref IS Center Freq 2.441 Ref Offset Ref 20.0 10 dB/div Ref 20.0 100	Swept SA 0.0 AC 500000 GHz IFGain:Low 3.36 dB 0 dBm 1 12 #VB1 X	SENSE:PULSE Trig: Free Run #Atten: 30 dB	5 2441MHz An #Avg Type: RMS Avg Hold:>100/100 Mkr1 2 Avg	02:56:16 PM Apr 18, 2024	Frequency Auto Tum Center Freq 2.441500000 GH Start Freq 2.440500000 GH Stop Freq 2.442500000 GH CF Step 200.000 kH Auto Auto Freq Offsee



C	FS NVNT 3-DH	5 2480MHz Ai	nt1	
Keysight Spectrum Analyzer - Swept SA				- đ 💌
RL RF 50 Ω AC Center Freq 2.479500000 GHz	SENSE:PULSE	#Avg Type: RMS	02:54:06 PM Apr 18, 2024 TRACE 1 2 3 4 5 6	Frequency
	ide Trig: Free Run w #Atten: 30 dB	Avg Hold:>100/100	DET P N N N N	
Ref Offset 3.36 dB 10 dB/div Ref 20.00 dBm		Mkr1	2.478 992 GHz -5.646 dBm	Auto Tune
Log 10.0				Center Freg
0.00				2.479500000 GHz
-10.0	man			
-20.0				Start Freq
-30.0				2.478500000 GHz
-40.0				
-50.0				Stop Freq
-60.0				2.480500000 GHz
-70.0				
Center 2.479500 GHz #Res BW 30 kHz	#VBW 100 kHz	Sweep 2	Span 2.000 MHz 133 ms (1001 pts).	CF Step 200.000 kHz Auto Man
MKR MODE TRC SCL X		NCTION FUNCTION WIDTH	FUNCTION VALUE	Auto Mari
2 N 1 f 2.480 006 GH				Freq Offset
3 4 4				0 Hz
5 6 				
7 8				Scale Type
9				Log <u>Lin</u>
			Ψ 4	
MSG		to statu:	s	

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13. Number of Hopping Frequency

13.1 Block Diagram Of Test Setup



13.2 Limit

Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

13.3 Test procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.

2. Set the spectrum analyzer: RBW = 100kHz. VBW = 300kHz. Sweep = auto; Detector Function = Peak. Trace = Max hold.

3. Allow the trace to stabilize. It may prove necessary to break the span up to sections. in order to clearly show all of the hopping frequencies. The limit is specified in one of the subparagraphs of this Section.

4. Set the spectrum analyzer: Start Frequency = 2.4GHz, Stop Frequency = 2.4835GHz. Sweep=auto;

13.4 Test Result

Condition	Mode	Hopping Number	Limit	Verdict
NVNT	1-DH5	79	15	Pass
NVNT	2-DH5	79	15	Pass
NVNT	3-DH5	79	15	Pass



	Llannina		Braphs	- 1 - 11	
Keysight Spectrum Analyze		INO. INVINT 1	-DH5 2402MH		
	50 Ω AC	SENSE:PULSE Trig: Free Run #Atten: 30 dB	#Avg Type: RMS Avg Hold:>100/100	12:53:31 PM Apr 18, 2024 TRACE 1 2 3 4 5 6 TYPE MWWWW DET P N N N N N	Frequency
Ref Offs 10 dB/div Ref 20.	et 3.36 dB .00 dBm		Mkr1 2.	401 837 0 GHz -0.386 dBm	Auto Tune
10.0 0.00 -10.0		AADAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA			Center Fred 2.441750000 GH;
-20.0					Start Free 2.400000000 GH;
-60.0				Uun	Stop Fred 2.483500000 GH:
Start 2.40000 GHz #Res BW 100 kHz MKR MODE TRC SCL		W 300 kHz		Stop 2.48350 GHz 000 ms (1001 pts)	CF Step 8.350000 MH; <u>Auto</u> Mar
1 N 1 f 2 N 1 f 3 4 5 6 6	2.401 837 0 GHz 2.480 076 5 GHz	-0.386 dBm -3.327 dBm		E	Freq Offse 0 Hi
7 8 9 10					Scale Type
11			In STATUS	•	Log <u>Lir</u>
	Hopping	No. NVNT 2	2-DH5 2402MH	z Ant1	
Keysight Spectrum Analyze	er - Swept SA 50 Ω AC	SENSE:PULSE	#Avg Type: RMS	01:07:16 PM Apr18, 2024 TRACE 12 3 4 5 6	Frequency
	DNO: East (Trid: Free Run		TYPE M WWWWW	requeries
10 dB/div Ref 20.	PNO: Fast IFGain:Low et 3.36 dB .00 dBm	Trig: Free Run #Atten: 30 dB	Avg Hold:>100/100	402 004 0 GHz -2.185 dBm	
10 dB/div Ref 20.	IFGain:Low et 3.36 dB .00 dBm	#Atten: 30 dB	Avg Hold:>100/100	402 004 0 GHz -2.185 dBm	Auto Tuno Center Fred
10 dB/div Ref 20.	IFGain:Low et 3.36 dB .00 dBm	#Atten: 30 dB	Avg Hold:>100/100	402 004 0 GHz -2.185 dBm	Auto Tune Center Fred 2.441750000 GH: Start Fred
10 dB/div Ref 20.	IFGain:Low et 3.36 dB .00 dBm	#Atten: 30 dB	Avg Hold:>100/100	402 004 0 GHz -2.185 dBm	Auto Tune Center Free 2.441750000 GH: Start Free 2.400000000 GH: Stop Free 2.483500000 GH:
10 dB/div Ref 20. 10 d / 1 10 d /	EFGain:Low et 3.36 dB 00 dBm	#Atten: 30 dB	Avg Hold:>100/100	402 004 0 GHz -2.185 dBm	Auto Tune Center Free 2.441750000 GH: Start Free 2.400000000 GH: Stop Free
10 dB/div Ref 20. 0 g 1 0.0 1 0.0 1 0.0 1 0.0 1 0.0 1 0.0 1 0.0 1 0.0 1 0.0 1 -0.0 -	IFGain:Low et 3.36 dB 00 dBm ////////////////////////////////////	#Atten: 30 dB	Avg Hold:>100/100 Mkr1 2. Why Way Angel Ange	402 004 0 GHz -2.185 dBm	Start Free 2.441750000 GH: Start Free 2.400000000 GH: Stop Free 2.4835500000 GH: CF Step 8.3550000 MH: Auto Mar Freq Offse
10 dB/div Ref 20.	#VB	#Atten: 30 dB	Avg Hold:>100/100	402 004 0 GHz -2.185 dBm	Auto Tune Center Free 2.441750000 GH: Start Free 2.400000000 GH: Stop Free 2.483500000 GH: CF Step 8.350000 MH:

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Hoppin	g No. NVNT 3-	DH5 2402MH	z Ant1	
Keysight Spectrum Analyzer - Swept SA	-			
XX RL RF 50 Ω AC Center Freq 2.441750000 GHz	SENSE:PULSE	#Avg Type: RMS	02:49:08 PM Apr 18, 2024 TRACE 1 2 3 4 5 6	Frequency
PNO: Fast IFGain:Lov		Avg Hold:>100/100	DET PNNNN	
Ref Offset 3.36 dB		Mkr1 2	.401 753 5 GHz	Auto Tune
10 dB/div Ref 20.00 dBm			-2.893 dBm	
				Center Freq
			2_	2.441750000 GHz
0.00 - 200	wallowbywywywywywywanyw	ᠬᢉᢦᢦᡩ᠇ᢦᡗ᠊ᢦᠰᡳᡊ᠕ᡧᢋᠰᡎᡇᠬ	manyshaway	
-20.0				Start Freq
-30.0				2.400000000 GHz
-40.0 🖌				
-50.0			<u>├────</u> \	Stop Freq
-60.0				2.483500000 GHz
-70.0				
Start 2.40000 GHz			Stop 2.48350 GHz	CF Step
#Res BW 100 kHz #V	BW 300 kHz	Sweep 8	.000 ms (1001 pts)	8.350000 MHz Auto Man
MKR MODE TRC SCL X 1 N 1 f 2.401 753 5 GHz	Y FUN -2.893 dBm	CTION FUNCTION WIDTH	FUNCTION VALUE	Auto Man
2 N 1 f 2.480 410 5 GHz	-7.621 dBm			Freq Offset
3				0 Hz
5 6 			=	
7				Scale Type
9				
11			•	Log <u>Lin</u>
MSG		STATU	3	

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14. Dwell Time

14.1 Block Diagram Of Test Setup

EUT	SPECTRUM
	ANALYZER

14.2 Limit

Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

14.3 Test procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.

2. Set spectrum analyzer span = 0. Centred on a hopping channel;

3. Set RBW = 1MHz and VBW = 3MHz.Sweep = as necessary to capture the entire dwell time per hopping channel. Set the EUT for DH5, DH3 and DH1 packet transmitting.

4. Use the marker-delta function to determine the dwell time. If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation. The limit is specified in one of the subparagraphs of this Section. Submit this plot(s).

14.4 Test Result

DH5 Packet permit maximum 1600 / 79 / 6 hops per second in each channel (5 time slots RX, 1 time slot TX).

DH3 Packet permit maximum 1600 / 79 / 4 hops per second in each channel (3 time slots RX, 1 time slot TX).

DH1 Packet permit maximum 1600 / 79 /2 hops per second in each channel (1 time slot RX, 1 time slot TX). So, the Dwell Time can be calculated as follows:

DH5:1600/79/6*0.4*79*(MkrDelta)/1000 DH3:1600/79/4*0.4*79*(MkrDelta)/1000 DH1:1600/79/2*0.4*79*(MkrDelta)/1000 Remark: Mkr Delta is once pulse time.

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Condition	Mode	Frequency (MHz)	Pulse Time (ms)	Total Dwell Time (ms)	Limit (ms)	Verdict
NVNT	1-DH1	2441	0.388	124.160	400	Pass
NVNT	1-DH3	2441	1.646	263.360	400	Pass
NVNT	1-DH5	2441	2.894	308.693	400	Pass
NVNT	2-DH1	2441	0.395	126.400	400	Pass
NVNT	2-DH3	2441	1.651	264.160	400	Pass
NVNT	2-DH5	2441	2.900	309.333	400	Pass
NVNT	3-DH1	2441	0.400	128.000	400	Pass
NVNT	3-DH3	2441	1.647	263.520	400	Pass
NVNT	3-DH5	2441	2.897	309.013	400	Pass

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	Dwell NVN	Test G T 1-DH1 244	raphs 11MHz Ant1 (One Burst	
Keysight Spectrum Analyzer - Sw	ept SA				
RL RF 50 Ω enter Freq 2.44100		SENSE:PULSE Trig Delay-500.0 µs Trig: Video #Atten: 30 dB	#Avg Type: RMS	02:56:43 PM Apr 18, 2024 TRACE 1 2 3 4 5 6 TYPE WWWWWW DET P N N N N	Frequency
Ref Offset 3.3 dB/div Ref 20.00	36 dB			ΔMkr1 388.0 μs 4.46 dB	Auto Tur
9 g -					Center Fre
.00 ο				TRIG LVL	2.441000000 GH
0.0 <mark>X2"</mark> 0.0					Start Fre 2.441000000 GH
0.0 (http://www.internationality.com	a A graef keld je fig vilder (biller every die steroge de A graef keld je fig vilder (biller every die steroge die steroge die steroge die steroge die steroge die stero	ala Hang Pang Aslam (1996) and 1997 (1997) Ala Managara ang Pang Pang Pang Pang Pang Pang Pang		la la particulari da principal da la plata e por primero La dina da constante da la plata e por primero da la constante da la dina da la dina da la dina da la dina da la	Stop Fre
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enter 2.441000000 C es BW 1.0 MHz		V 3.0 MHz	Sweep 1	Span 0 Hz 0.00 ms (10001 pts)	CF Ste 1.000000 MH
KR MODE TRC SCL 1 Δ2 1 t (Δ)	× 388.0 μs (Δ)	4.46 dB	NCTION FUNCTION WIDT	H FUNCTION VALUE	Auto Ma
2 F 1 t 3	493.0 µs	-19.63 dBm			Freq Offs 0 F
6 7 8					Scale Tyr
9					Log <u>L</u>
G Doints changed; all	traces cleared		To STAT	US	
		1-DH1 2441	MHz Ant1 Ac		
Keysight Spectrum Analyzer - Sev RL RF 50 Ω	ept SA	SENSE PULSE		02:57:18 PM Apr 18, 2024	
enter Freq 2.44100	00000 GHz PN0: Fast ++	Trig: Free Run #Atten: 30 dB	#Avg Type: RMS	TRACE 1 2 3 4 5 6 TYPE WWWWWWW OFT PINNING	Frequency
Ref Offset 3.3	IFGain:Low	anweit, au do			Auto Tur
dBídiv Ref 20.00 (18m				Center
0.0					Center Fre 2.441000000 GR
					Start Fre
					2.441000000 GH
.0					Stop Fre
10					CF Ste 1.000000 MH <u>Auto</u> Ma
					Freq Offs
					01
					Scale Typ
.0					
enter 2.441000000 G es BW 1.0 MHz		V 3.0 MHz	Sweep	Span 0 Hz 31.60 s (10001 pts)	Log <u>L</u>



Dwe	INVNT 1-DH	3 2441MHz Ant	1 One Burst	
Keysight Spectrum Analyzer - Swept SA	CENCE	חווו כב	02:57:24 DM April 0. 2024	
Center Freq 2.441000000 G	SENSE: Trig Delay Trig: Video Gain:Low #Atten: 30	-500.0 μs #Αvg Type: RM	02:57:34 PM Apr 18, 2024 S TRACE 1 2 3 4 5 6 TYPE WWWWWW DET P N N N N N	Frequency
Ref Offset 3.36 dB 10 dB/div Ref 20.00 dBm	Gameow		ΔMkr1 1.646 ms 6.24 dB	Auto Tune
10.0 Δ1Δ2				Center Freq
-10.0 X2			TRIG LVL	2.441000000 GHz
-20.0				Start Freq
-40.0				2.441000000 GHz
-50.0 <mark>hiji sentin</mark>	in the standbar terms of the	and the product of the second s	<mark>n half an getal na taile an getal na taile an </mark>	Stop Freq 2.441000000 GHz
-70.0				2.44100000 3112
Center 2.441000000 GHz Res BW 1.0 MHz	#VBW 3.0 MHz	Swee	Span 0 Hz p 10.00 ms (10001 pts)	CF Step 1.000000 MHz
MKR MODE TRC SCL X 1 Δ2 1 t (Δ) 1	646 ms (Δ) 6.24 c		WIDTH FUNCTION VALUE	<u>Auto</u> Man
3 4	98.0 µs -10.10 dB	m		Freq Offset 0 Hz
5 6 7				Scale Tyme
8 9 10				Scale Type
MSG Doints changed; all traces clea		rl-	STATUS	
		2441MHz Ant1		
Keysight Spectrum Analyzer - Swept SA				- 8 - 8
	SENSE 200: Fast +++ Gain:Low #Atten: 30	#Avg Type: RM Run	02:58:09 PM Apr 18, 2024	Frequency
Ref Offset 3.35 dB 10 dB/div Ref 20.00 dBm				Auto Tune
Log				Center Freq
10.0				2.441000000 GHz
0.00				Start Freq
-10.0				2.441000000 GHz
-20.0				Stop Freq 2.441000000 GHz
-30.0				
-0.0				CF Step 1.000000 MHz
-50.0				<u>Auto</u> Man
-60.0				Freq Offset 0 Hz
-70.0				Scale Type
Center 2.441000000 GHz			Span 0 Hz	Log <u>Lin</u>
Res BW 1.0 MHz	#VBW 3.0 MHz		eep 31.60 s (10001 pts)	
MBB JFile <screenshot.png> saved</screenshot.png>		10	STATUS	

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Dwe	ell NVNT 1-DH5 2	441MHz Ant1 O	ne Burst	
Keysight Spectrum Analyzer - Swept SA	SENSE:PULSE		12:54:21 PM Apr 18, 2024	
Center Freq 2.441000000 G	Hz PNO: Fast ↔→ FGain:Low Hz FGain:Low Hz Hz Hz Hz Hz Hz Hz Hz Hz Hz Hz Hz Hz)µs #Avg Type: RMS	TRACE 1 2 3 4 5 6 TYPE WWWWW DET P NNNNN	Frequency
Ref Offset 3.36 dB 10 dB/div Ref 20.00 dBm		Δ	Mkr1 2.894 ms 8.66 dB	Auto Tune
10.0 0.00 -10.0	1Δ2		TRIG LVL	Center Freq 2.441000000 GHz
-20.0				Start Freq 2.441000000 GHz
-50.0 model -60.0 model -70.0		staten and the state state of the		Stop Freq 2.441000000 GHz
Center 2.441000000 GHz Res BW 1.0 MHz	#VBW 3.0 MHz	Sweep 10	Span 0 Hz .00 ms (10001 pts)	CF Step 1.000000 MHz
2 F 1 t 4	¥ 894 ms (Δ) 8.66 dB 98.0 μs -10.64 dBm	FUNCTION FUNCTION WIDTH	FUNCTION VALUE	Auto Man Freq Offset 0 Hz
6 7 8 9 10				Scale Type
11 <			*	
MSG 🔱 Points changed; all traces clea		to status		
	NVNT 1-DH5 24	41MHz Ant1 Aco	cumulated	
	PNO: Fast +++ Trig: Free Run	#Avg Type: RMS	12:54:54 PM Apr 18, 2024 TRACE 1 2 3 4 5 6 TYPE P NNNN N	Frequency
Ref Offset 3.35 dB 10 dB/dlv Ref 20.00 dBm	FGain:Low #Atten: 30 dB		01	Auto Tune
10.0				Center Freq 2.441000000 GHz
.10.0				Start Freq 2.441000000 GHz
-20.0				Stop Freq 2.441000000 GHz
-40.0				CF Step 1.000000 MHz Auto Man
-60.0				Freq Offset 0 Hz
-70.0				Scale Type
Center 2.441000000 GHz Res BW 1.0 MHz	#VBW 3.0 MHz	Sweep	Span 0 Hz 31.60 s (10001 pts)	Log <u>Lin</u>

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	Dwell NVN	Г 2-DH1 24	41MHz Ar	nt1 One Bu	rst	
Keysight Spectrum Analyzer - Swept K RL RF 50 Ω	AC	SENSE:PULSE			PM Apr 18, 2024	
Center Freq 2.441000	IOOO GHZ PNO: Fast ↔→ IFGain:Low	Trig Delay-500.0 µ . Trig: Video #Atten: 30 dB	us #Avg Type:I	RMS TR. T	ACE 123456 YPE WWWWWW DET PNNNNN	Frequency
Ref Offset 3.36 10 dB/div Ref 20.00 dE	dB 3m			ΔMkr1	395.0 µs -0.97 dB	Auto Tune
10.0						Center Freq
0.00 1 42						2.441000000 GHz
-10.0					TRIGLVL	
-30.0						Start Freq 2.441000000 GHz
-40.0						
-50.0 date - anticipal protocol	en la la la planta de la planta de la composición de la planta de la planta de la composición de la planta de La composición de la composición de la composición de la planta de la planta de la planta de la planta de la pl				inderformentligter werden i steren	Stop Freq
-70.0		a state a superior da la superior d La superior da la	here the plant of the ball of the	an blatter that and	ha là ha airtea	2.441000000 GHz
Center 2.441000000 GH	İz				Span 0 Hz	CF Step
Res BW 1.0 MHz		3.0 MHz		eep 10.00 ms (1.000000 MHz <u>Auto</u> Man
MKR MODE TRC SCL 1 Δ2 1 t (Δ) 2 F 1 t	× <u>395.0 μs</u> (Δ) 364.0 μs	-0.97 dB -13.86 dBm	FUNCTION FUNCT	ION WIDTH FUNC	ION VALUE	
	004.0 µ0	-10.00 abiii				Freq Offset 0 Hz
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7 8 9						Scale Type
10					-	Log <u>Lin</u>
I < Msg ↓ Points changed; all tra	ces cleared				4	
	Dwell NVNT	2-DH1 244		-	ated	
Keysight Spectrum Analyzer - Swept		SENSE PULSE		02:58:58	PM Apr 18, 2024	- 2 -
Center Freq 2.441000	000 GHz PN0: Fast	Trig: Free Run #Atten: 30 dB	#Avg Type: I	RMS TRU		Frequency
Ref Offset 3.35	IFGain:Low	BAtten: 30 GB				Auto Tune
10 dB/div Ref 20.00 dB	əm					
10.0						Center Freq 2.441000000 GHz
						2.44100000 GH2
0.00						Start Freq
0.00 -10.0						
						Start Freq 2.441000000 GHz
-100						Start Freq
-100 -200 -300						Start Freq 2.441000000 GHz Stop Freq 2.441000000 GHz
-100						Start Freq 2.441000000 GHz Stop Freq 2.441000000 GHz CF Step 1.000000 MHz
-100 -200 -300						Start Freq 2.441000000 GHz Stop Freq 2.441000000 GHz CF Step
-100 -200 -300 -400						Start Freq 2.441000000 GHz Stop Freq 2.441000000 GHz CF Step 1.000000 MHz Auto Man
-100 -200 -300 -400 -500						Start Freq 2.441000000 GHz Stop Freq 2.441000000 GHz CF Step 1.000000 MHz Auto Man
-100 -200 -300 -400						Start Freq 2.441000000 GHz Stop Freq 2.441000000 GHz CF Step 1.000000 MHz Auto Man
-100 -200 -300 -400 -500	z				Span 0 Hz	Start Freq 2.441000000 GHz Stop Freq 2.441000000 GHz CF Step 1.000000 MHz Auto Man Freq Offset 0 Hz
-100 -200 -300 -400 -600 -700	#VBW	3.0 MHz		weep 31.60 s (Start Freq 2.441000000 GHz Stop Freq 2.441000000 GHz 1.000000 GHz Auto Freq Offset 0 Hz Scale Type



	Dwell NVN	2-DH3 244	1MHz Ant1 O	ne Burst	
Keysight Spectrum Analyzer - Sw	ept SA		_		
[X] RL RF 50 Ω Center Freq 2.44100		SENSE:PULSE Trig Delay-500.0 µs Trig: Video #Atten: 30 dB	#Avg Type: RMS	02:59:15 PM Apr 18, 2024 TRACE 1 2 3 4 5 6 TYPE WWWWW DET P N N N N N	Frequency
Ref Offset 3.3 10 dB/div Ref 20.00 d	36 dB	WAREEN. OU UB	L	Mkr1 1.651 ms 5.27 dB	Auto Tune
	1Δ2				Center Freq 2.44100000 GHz
-10.0 X2				TRIG LVL	
-30.0					Start Freq 2.441000000 GHz
-50.0 <mark>plated</mark> -60.0 mitju r			<mark>ender ^{bei}nstellten beiden br/>Generalische Beiden b</mark>	al Fryslenia Mary Color and Friday and Star A star Alfan (1996) and Angel Angel (1997) and Angel (1997)	Stop Freq
-70.0		a addition of the A			2.441000000 GHz
Res BW 1.0 MHz		3.0 MHz	Sweep 10	Span 0 Hz 0.00 ms (10001 pts)	CF Step 1.000000 MHz <u>Auto</u> Man
1 <u>A2</u> 1 t (A) 2 F 1 t 3 4 5	1.651 ms (Δ) 498.0 μs	5.27 dB -8.60 dBm			Freq Offset 0 Hz
6 7 8 9					Scale Type
10 11 •					Log <u>Lin</u>
MSG iPoints changed; all	traces cleared			S	
_	Dwell NVNT	2-DH3 2441	MHz Ant1 Ac	cumulated	
Keynight Spectrum Analyzer - Swy RL RF 50 12 Center Freq 2.44100	AC	SENSE PULSE	#Avg Type: RMS	02:59:49 PM Apr 18, 2024 TRACE 1 2 3 4 5 6 TVPE 0 N N N N N	Frequency
Ref Offset 3.3 10 dB/dlv Ref 20.00 0	IFGain:Low	#Atten: 30 dB		DET PINNNN	Auto Tune
					Center Freq 2.441000000 GHz
0.00					Start Freq 2.441000000 GHz
-20.0					Stop Freq 2.441000000 GHz
-0.0					CF Step 1.000000 MHz
-50.0		a selection of the sele		e leve te distincte di	Auto Man
-80.0					Freq Offset 0 Hz
-70.0					Scale Type
Center 2.441000000 G Res BW 1.0 MHz	#VBW	3.0 MHz		Span 0 Hz 31.60 s (10001 pts)	Log <u>Lin</u>
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	Dwell NVNT	2-DH5 24	41MHz Ant1 C	One Burst	
Keysight Spectrum Analyzer - Swe					- F ×
ເ₩ RL RF 50Ω Center Freq 2.44100		SENSE:PULSE Trig Delay-500.0 µ Trig: Video #Atten: 30 dB	s #Avg Type: RMS	01:08:09 PM Apr 18, 2024 TRACE 1 2 3 4 5 6 TYPE WWWWW DET P N N N N N	Frequency
Ref Offset 3.3 10 dB/div Ref 20.00 d	6 dB			ΔMkr1 2.900 ms 7.09 dB	Auto Tune
10.0	<u>1</u> Δ2				Center Freq
-10.0 X 2				TRIG LVL	2.441000000 GHz
-20.0					Start Freq 2.441000000 GHz
-40.0					2.44100000 GH2
-50.0 1.44 -60.0 144			er di hate eta di se br>Na da fili di se di s		Stop Freq 2.441000000 GHz
-70.0					
Center 2.441000000 G Res BW 1.0 MHz	Hz #VBW (3.0 MHz	Sweep 1	Span 0 Hz 5.33 ms (10001 pts)	CF Step 1.000000 MHz Auto Man
MKR MODE TRC SCL 1 Δ2 1 t (Δ) 2 F 1 t	X 2.900 ms (Δ) 496.8 μs	Y FU 7.09 dB -9.02 dBm	INCTION FUNCTION WIDT	H FUNCTION VALUE	Auto Marr
	450.0 μS	-9.02 UBIII			Freq Offset 0 Hz
6 7					Scale Type
8 9 10					Log <u>Lin</u>
MSG Doints changed; all to	races cleared	m	to stat	•	
	Dwell NVNT 2				
🔤 Keysight Spectrum Analyzer - Seve		-DH0 244		cumulated	- 2 -
Center Freq 2.44100	0000 GHz PN0: Fast	SENSE:PULSE Trig: Free Run #Atten: 30 dB	#Avg Type: RMS	01:08:44 PM Apr 18, 2024 TRACE 1 2 3 4 5 6 TYPE W	Frequency
Ref Offset 3.3 10 dB/div Ref 20.00 d		antien: 30 db			Auto Tune
Log					Center Freq
10.0					2.441000000 GHz
0.00					Start Freq
-10.0					2.441000000 GHz
-20.0					Stop Freq
-30.0					2.441000000 GHz
-40.0					CF Step 1.000000 MHz
	a lea di constitución de cale	Register calendary	and America District		<u>Auto</u> Man
-20.0					
-50.0					Freq Offset
					0 Hz
-00.0					0 Hz Scale Type
-60.0	#VBW 3	3.0 MHz	Sweep	Span 0 Hz 31.60 s (10001 pts)	0 Hz

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	eli invini 3-	DH1 244	1MHz Ant1	One Burst	
Keysight Spectrum Analyzer - Swept SA		SENSE:PULSE		03:00:21 PM Apr 18, 2024	
Center Freq 2.441000000	Hz Trig	Delay-500.0 µs : Video en: 30 dB	#Avg Type: RMS	TRACE 1 2 3 4 5 6 TYPE WWWWWW DET P N N N N	Frequency
Ref Offset 3.36 dB 10 dB/div Ref 20.00 dBm				ΔMkr1 400.0 μs 3.64 dB	Auto Tune
10.0					Center Freq
-10.0 2				TRIG LVL	2.441000000 GHz
-20.0					Start Freq 2.441000000 GHz
-40.0	iki kata setempek ng kata dalam ng sata ng s	a that the star of the start	ali i ali sela essa i a piri a ^b an di si pirange	saperary in terms to a the strategy of a	
	the second s		il militado de la composición de la com		Stop Freq 2.441000000 GHz
Center 2.441000000 GHz	#\/B\\/ 2.0 I	<u>лн</u> -	Swoon	Span 0 Hz	CF Step 1.000000 MHz
Res BW 1.0 MHz MKR MODE TRC SCL X 1 Δ2 1 t (Δ)	#VBW 3.0 Μ 400.0 μs (Δ)			10.00 ms (10001 pts)	Auto Man
2 F 1 t		26 dBm			Freq Offset 0 Hz
5 6 7					Scale Type
8 9 10 11					Log <u>Lin</u>
MSG Doints changed; all traces cle	"	1	In sta		
	II NVNT 3-D	H1 2441			
Køysight Spectrum Anølyzer - Sovept SA		111 2441		ccumulateu	- # E
Center Freq 2.441000000 C	SHz	SENSE:PULSE	#Avg Type: RMS	03:00:56 PM Apr 18, 2024 TRACE 12 3 4 5 6	Frequency
		en: 30 dB		DET P N N N N N	
Ref Offset 3,35 dB		en: 30 dB		DET PRINKIN	Auto Tune
Ref Offset 3.36 dB 10 dB/div Ref 20.00 dBm		en: 30 dB		TYPE WARNANG	Auto Tune Center Freq
Ref Offset 3.36 dB 10 dB/dlv Ref 20.00 dBm		en: 30 dB			Auto Tune
Ref Offset 3.36 dB 10 dB/dlv Ref 20.00 dBm Log		en: 30 dB			Auto Tune Center Freq
Ref Offset 3.36 dB 10 dB/dlv Ref 20.00 dBm 10 a		en: 30 dB			Auto Tune Center Freq 2.44100000 GHz Start Freq 2.441000000 GHz
Ref Offset 3.36 dB 10 dB/dlv Ref 20.00 dBm 10 a		en: 30 dB			Auto Tune Center Freq 2.441000000 GHz Start Freq
Ref Offset 3.35 dB 10 dB/div Ref 20.00 dBm 20 dB/div Ref 20.00 dBm		en: 30 dB			Auto Tune Center Freq 2.441000000 GHz Start Freq 2.441000000 GHz Stop Freq 2.441000000 GHz CF Step 1.000000 MHz
Ref Offset 3.35 dB 10 dB/dlv Ref 20.00 dBm 10 0 0.00 Handle Ha		en: 30 dB			Auto Tune Center Freq 2.441000000 GHz Start Freq 2.441000000 GHz Stop Freq 2.441000000 GHz
Ref Offset 3.36 dB 10 dB/div Ref 20.00 dBm 10 0 0.00 10 0 10		en: 30 dB			Auto Tune Center Freq 2.441000000 GHz Start Freq 2.441000000 GHz Stop Freq 2.441000000 GHz CF Step 1.000000 MHz
Ref Offset 3.36 dB 10 dB/dlv Ref 20.00 dBm 10 0 0.00 10 0 10		en: 30 dB			Auto Tune Center Freq 2.441000000 GHz Start Freq 2.441000000 GHz 2.441000000 GHz 1.000000 GHz 1.000000 MHz Auto Man
Ref Offset 3.35 dB 10 dB/dlv Ref 20.00 dBm 10 0				Span 0 Hz	Auto Tune Center Freq 2.441000000 GHz Start Freq 2.441000000 GHz Stop Freq 2.441000000 GHz CF Step 1.000000 MHz Auto Man Freq Offset 0 Hz Scale Type



Dwell	NVNT 3-DH3 244	1MHz Ant1 On	e Burst	
Keysight Spectrum Analyzer - Swept SA	SENSE:PULSE		03:01:21 PM Apr 18, 2024	- đ ×
Center Freq 2.441000000 GHz	Trig Delay-500.0 µs Fast ↔ Trig: Video	#Avg Type: RMS	TRACE 1 2 3 4 5 6 TYPE WWWWWW DET P NNNN	Frequency
Ref Offset 3.36 dB 10 dB/div Ref 20.00 dBm		Δι	Mkr1 1.647 ms 3.39 dB	Auto Tune
				Center Freq 2.441000000 GHz
-10.0 -20.0			TRIG LVL	Start Freq
-30.0				2.441000000 GHz
-60.0 <mark>// //</mark>	alihing an analah persekeri ting dan penengan taning a 1944 ng terlepi palan (1947) persekeri dan penengan penengan pengan pengan pengan pengan pengan pengan pengan p	n farandar manan faran ary sala dar daran ba		Stop Freq 2.441000000 GHz
Center 2.441000000 GHz Res BW 1.0 MHz	#VBW 3.0 MHz	Sweep 10.0	Span 0 Hz)0 ms (10001 pts)	CF Step 1.000000 MHz <u>Auto</u> Man
MKR MODE TRC SCL X 1 Δ2 1 t (Δ) 1.647 2 F 1 t 363.0 3 4 5 6	ms (Δ) 3.39 dB	NCTION FUNCTION WIDTH	FUNCTION VALUE	Freq Offset 0 Hz
7 8 9 9				Scale Type
				Log <u>Lin</u>
MSG iPoints changed; all traces cleared				
Dwell N	VNT 3-DH3 2441	MHz Ant1 Accu	umulated	
Keysight Spectrum Analyzer - Sovept SA RL RF 50 R AC Center Freq 2.441000000 GHz FN0: FN0:	SENSE PULSE	#Avg Type: RMS	03:01:56 PM Apr 18, 2024 TRACE 1 2 3 4 5 6 TYPE WWWWWW	Frequency
IFGain Ref Offset 3,36 dB 10 dB/dly Ref 20,00 dBm	:Low #Atten: 30 dB		DET PINNNN	Auto Tune
Log				
10.0				Center Freq 2.441000000 GHz
10.0 0.00 + 111 - 111 - 111 - 111 - 111 - 111 - 111 .10.0				
0.00				2.441000000 GHz Start Freq
0.00				2.441000000 GHz Start Freq 2.441000000 GHz Stop Freq
				2.441000000 GHz Start Freq 2.441000000 GHz Stop Freq 2.441000000 GHz CF Step 1.000000 MHz
0.00				2.441000000 GHz Start Freq 2.441000000 GHz Stop Freq 2.441000000 GHz CF Step 1.000000 MHz Auto Man



	Dwell NVN	3-DH5 244	41MHz Ant1 C	Dne Burst	
Keysight Spectrum Analyzer - Swe		CENCE DUI CE		00-51-01 PM 410-2024	
Center Freq 2.44100		SENSE:PULSE Trig Delay-500.0 µ Trig: Video #Atten: 30 dB	s #Avg Type: RMS	02:51:31 PM Apr 18, 2024 TRACE 1 2 3 4 5 6 TYPE DET P N N N N	Frequency
Ref Offset 3.3 10 dB/div Ref 20.00 d	6 dB			ΔMkr1 2.897 ms 2.55 dB	Auto Tune
Log					Center Freq 2.441000000 GHz
				TRIG LVL	
-30.0					Start Freq 2.441000000 GHz
-50.0 /////	and Pather Alfala, diff		and his tertan bat is the constitution of this term	an berligten bezur bereinten er bei engefördet ant. Fra hannen setter af anskan dagarte beiget geter	Stop Freq
-70.0 Center 2.441000000 G		· 1]. [] - 141		Span 0 Hz	2.441000000 GHz
Res BW 1.0 MHz		3.0 MHz	Sweep 1	0.00 ms (10001 pts)	CF Step 1.000000 MHz <u>Auto</u> Man
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	2.897 ms (Δ) 364.0 μs	2.55 dB -14.21 dBm		E E	Freq Offset 0 Hz
7 8 9 10					Scale Type
11		m	2		Log <u>Lin</u>
MSG Points changed; all t					
Keysight Spectrum Analyzer - Seve		3-DH5 2441	MHz Ant1 Ac	cumulated	
Center Freq 2.44100	AC 0000 GHz PN0: Fast	SENSE PULSE	#Avg Type: RMS	02:52:06 PM Apr 18, 2024 TRACE 12, 34, 5, 6 TYPE OFT P N N N N	Frequency
Ref Offset 3.3 10 dB/div Ref 20.00 d		#Atten: 30 dB		0.	Auto Tune
10.0					Center Freq 2.441000000 GHz
0.00					Start Freq 2.441000000 GHz
-20.0					Stop Freq 2.441000000 GHz
40.0				المراد و المطالح	CF Step 1.000000 MHz <u>Auto</u> Man
-60.0					Freq Offset 0 Hz
-70.0					Scale Type
Center 2.441000000 G Res BW 1.0 MHz		3.0 MHz		Span 0 Hz 31.60 s (10001 pts)	Log <u>Lin</u>
MBB 🜙 File <screenshot.pn< td=""><td>q> saved</td><td></td><td>(ASTAT)</td><td>18</td><td></td></screenshot.pn<>	q> saved		(ASTAT)	18	



15. Antenna Requirement

15.1 Limit

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

15.2 Test Result

The EUT antenna is internal antenna, fulfill the requirement of this section.

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16. EUT Test Setup Photographs

Conducted Emission Measurement Photos

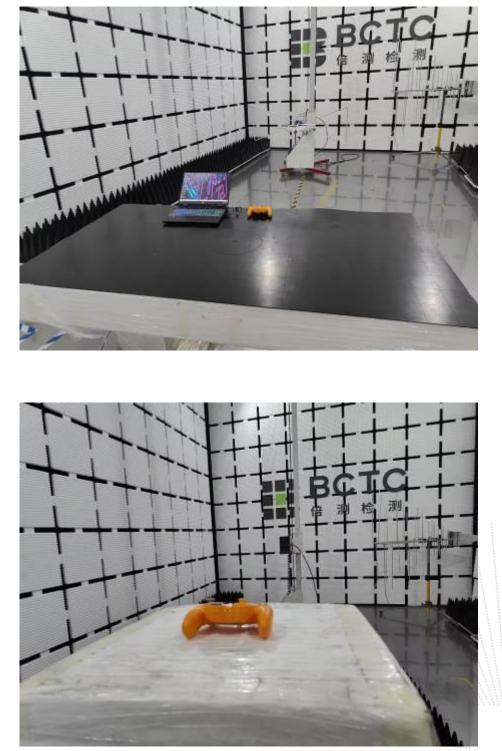


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Radiated Measurement Photos



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STATEMENT

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

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

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

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

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

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

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

Address:

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

TEL: 400-788-9558

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Website: http://www.chnbctc.com

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Complaint/Advice E-mail: advice@bctc-lab.com.cn

***** END *****

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