

# **TEST REPORT**

Report No.:	BCTC2403789071E					
Applicant:	DongGuan NIA Acoustic Technology Co., Ltd					
Product Name:	Wireless Bluetooth earphones					
Test Model:	NX200					
Tested Date:	2024-03-06 to 2024-03-13					
Issued Date:	2024-04-07					
She	enzhen BCTC Testing Co., Ltd.					
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## FCC ID: 2BFF6-NX200

Product Name:	Wireless Bluetooth earphones
Trademark:	NIA
Model/Type Reference:	NX200, Q9, Q9M ,Q10,NX200, NX300, NX400, NX500 ,NX500M, NX600SP, WH990SP,NX700, NX800, NX900, WH280, Q118
Prepared For:	DongGuan NIA Acoustic Technology Co., Ltd
Address:	NO.3 Xinghugongye2jie qiaolonglu qiaotou town dongguan city China
Manufacturer:	DongGuan NIA Acoustic Technology Co., Ltd
Address:	NO.3 Xinghugongye2jie qiaolonglu qiaotou town dongguan city China
Prepared By:	Shenzhen BCTC Testing Co., Ltd.
Address:	1-2/F., Building B, Pengzhou Industrial Park, No.158, Fuyuan 1st Road, Zhancheng, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China.
Sample Received Date:	2024-03-06
Sample Tested Date:	2024-03-06 to 2024-03-13
Report No.:	BCTC2403789071E
Test Standards:	FCC Part15.247 ANSI C63.10-2013
Test Results:	PASS
Remark:	This is Bluetooth Classic radio test report.

Tested by:

lave

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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(Note: N/A Means Not Applicable)

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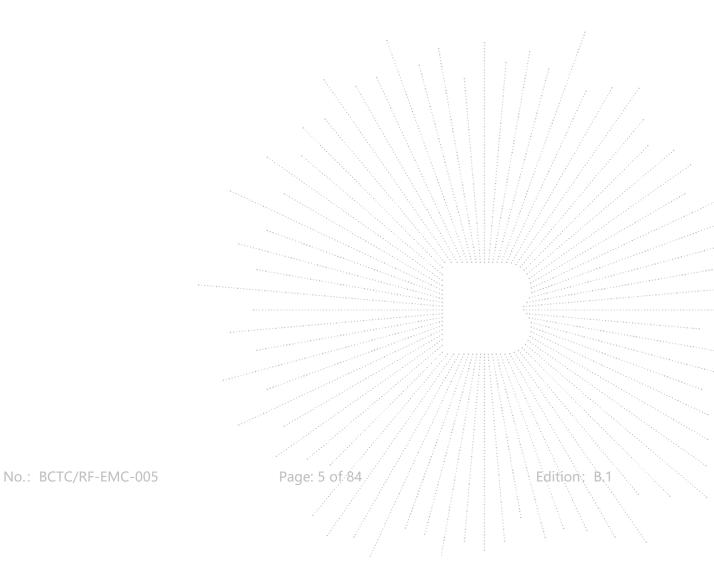
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### 1. Version

Report No.	Issue Date	Description	Approved
BCTC2403789071E	2024-04-07	Original	Valid





### 2. Test Summary

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	Hopping channel separation	§15.247(a)(1)	PASS
5	Number of hopping frequencies	§15.247(a)(1)(iii)	PASS
6	Dwell Time	§15.247(a)(1)(iii)	PASS
7	Spurious RF conducted emissions	§15.247(d)	PASS
8	Band edge	§15.247(d)	PASS
9	Spurious radiated emissions for transmitter	§15.247(d) & §15.209 & §15.205	PASS
10	Antenna Requirement	15.203	PASS

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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



### 4. Product Information And Test Setup

### 4.1 Product Information

Model/Type Reference: Model Differences: Hardware Version:	NX200, Q9, Q9M ,Q10,NX200, NX300, NX400, NX500 ,NX500M, NX600SP, WH990SP,NX700, NX800, NX900, WH280, Q118 All the model are the same circuit and RF module, except model names and appearance of the color. N/A
Software Version:	N/A
Operation Frequency:	2402-2480MHz
Type of Modulation:	GFSK, π/ 4 DQPSK, 8DPSK
Number Of Channel:	79CH
Antenna installation:	Internal antenna
Antenna Gain:	1.68 dBi
Ratings:	DC 3.7V,400mAh
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.

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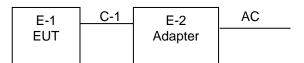
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### 4.2 Test Setup Configuration

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



Radiated Spurious Emission:



### 4.3 Support Equipment

No.	Device Type	Brand	Model	Series No.	Note
E-1	Wireless Bluetooth earphones	N/A	NX200	N/A	EUT
E-2	Adapter	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.

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### 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	/

### 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 (Conduc	Transmitting (Conducted emission & Radiated emission)				

Note:

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

### 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	SecureCRT
Frequency	2402 MHz 2441 MHz 2480 MHz
Parameters	DEF



### 5. Test Facility And Test Instrument Used

### 5.1 Test Facility

All measurement facilities used to collect the measurement data are located at Shenzhen BCTC Testing Co., Ltd. Address:1-2/F., Building B, Pengzhou Industrial Park, No.158, Fuyuan 1st Road, Zhancheng, 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

A2LA certificate registration number is: CN1212

ISED Registered No.: 23583

ISED CAB identifier: CN0017

### 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	/	\	
Pulse limiter	Schwarzbeck	VTSD9561-F	01323	Sept. 22, 2023	Sept. 21, 2024	

		RF Cond	ucted Test		I = I
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	100363	May 15, 2023	May 14, 2024
Radio frequency control box	MAIWEI	MW100-RFC B		\ \	I
Software	MAIWEI	MTS 8310	· · · · · · · · · · · · · · · · · · ·		1



Radiated Emissions Test (966 Chamber01)					
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	Schwarzbeck	BBV9744	9744-0037	May 15, 2023	May 14, 2024
TRILOG Broadband Antenna	Schwarzbeck	VULB9163	942	May 29, 2023	May 28, 2024
Loop Antenna(9KHz -30MHz)	Schwarzbeck	FMZB1519B	00014	May 31, 2023	May 30, 2024
Amplifier	SKET	LAPA_01G18 G-45dB	SK2021040901	May 15, 2023	May 14, 2024
Horn Antenna	Schwarzbeck	BBHA9120D	1541	May 31, 2023	May 30, 2024
Amplifier(18G Hz-40GHz)	MITEQ	TTA1840-35- HG	2034381	May 15, 2023	May 14, 2024
Horn Antenn(18GH z-40GHz)	Schwarzbeck	BBHA9170	00822	May 31, 2023	May 30, 2024
Spectrum Analyzer9kHz- 40GHz	R&S	FSP40	100363	May 15, 2023	May 14, 2024
Software	Frad	EZ-EMC	FA-03A2 RE	\	$\Lambda_{j}$

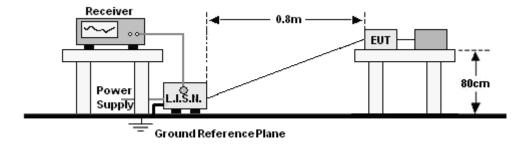
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### 6. Conducted Emissions

### 6.1 Block Diagram Of Test Setup



### 6.2 Limit

Limit (d	dBuV)	
Quas-peak	Average	
66 - 56 *	56 - 46 *	
56.00	46.00	
60.00	50.00	
	Quas-peak 66 - 56 * 56.00	

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.

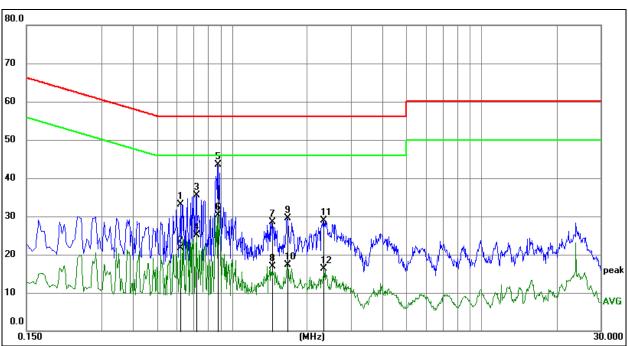
### 6.4 EUT operating Conditions

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:	<b>26</b> ℃	Relative Humidity:	54%
Pressure:	101KPa	Test Voltage:	AC 120V/60Hz
Test Mode:	Mode 4	Polarization:	L



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	0.6205	22.90	10.19	33.09	56.00	-22.91	QP		
2	0.6205	11.60	10.19	21.79	46.00	-24.21	AVG		
3	0.7198	25.23	10.19	35.42	56.00	-20.58	QP		
4	0.7198	14.99	10.19	25.18	46.00	-20.82	AVG		
5 *	0.8757	33.24	10.21	43.45	56.00	-12.55	QP		
6	0.8757	20.04	10.21	30.25	46.00	-15.75	AVG		
7	1.4409	18.41	10.16	28.57	56.00	-27.43	QP		
8	1.4409	6.76	10.16	16.92	46.00	-29.08	AVG		
9	1.6625	19.37	10.13	29.50	56.00	-26.50	QP		-
10	1.6625	7.27	10.13	17.40	46.00	-28.60	AVG		,
11	2.3213	18.82	10.11	28.93	56.00	-27.07	QP		
12	2.3213	6.14	10.11	16.25	46.00	-29.75	AVG		

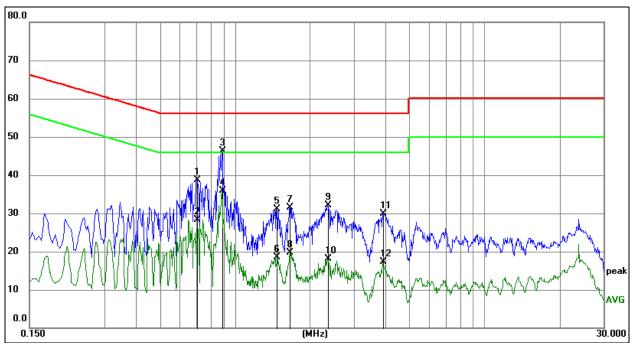
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Temperature:	<b>26</b> ℃	Relative Humidity:	54%
Pressure:	101KPa	Test Voltage:	AC 120V/60Hz
Test Mode:	Mode 4	Polarization:	Ν



Remark:

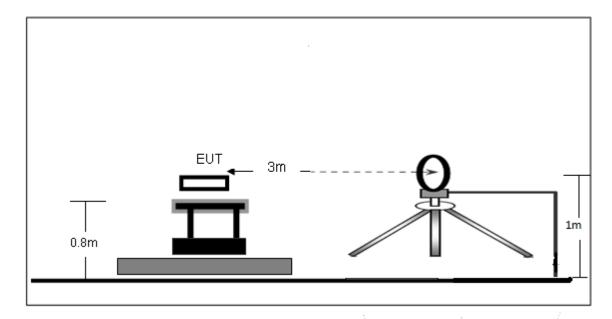
- All readings are Quasi-Peak and Average values.
   Factor = Insertion Loss + Cable Loss.
   Measurement = Reading Level + Correct Factor
   Over = Measurement Limit

No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over			
	MHz		dB	dBuV	dBuV	dB	Detector	Comment	
1	0.7080	28.60	10.19	38.79	56.00	-17.21	QP		
2	0.7080	18.09	10.19	28.28	46.00	-17.72	AVG		
3 *	0.8880	36.07	10.21	46.28	56.00	-9.72	QP		
4	0.8880	25.62	10.21	35.83	46.00	-10.17	AVG		
5	1.4640	21.02	10.15	31.17	56.00	-24.83	QP		
6	1.4640	8.29	10.15	18.44	46.00	-27.56	AVG		
7	1.6620	21.36	10.13	31.49	56.00	-24.51	QP		
8	1.6620	9.59	10.13	19.72	46.00	-26.28	AVG		
9	2.3505	21.95	10.12	32.07	56.00	-23.93	QP		
10	2.3505	7.99	10.12	18.11	46.00	-27.89	AVG		
11	3.9165	19.76	10.24	30.00	56.00	-26.00	QP		
12	3.9165	7.02	10.24	17.26	46.00	-28.74	AVG		

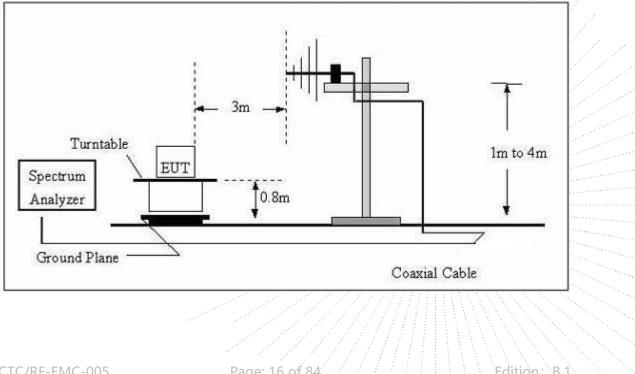


#### 7. **Radiated emissions**

- Block Diagram Of Test Setup 7.1
  - (A) Radiated Emission Test-Up Frequency Below 30MHz

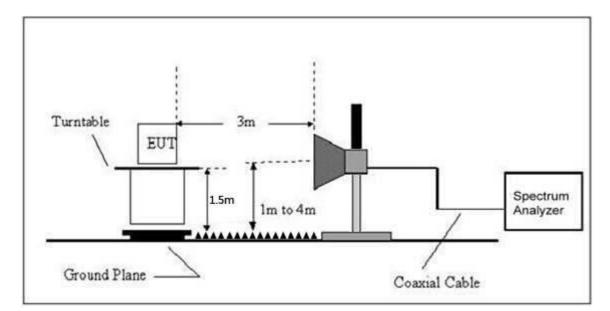


(B) Radiated Emission Test-Up Frequency 30MHz~1GHz





(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 Li	mit at 3m Distance
(MHz)	uV/m	(m)	uV/m	dBuV/m
0.009 ~ 0.490	2400/F(kHz)	300	10000 * 2400/F(kHz)	20log <sup>(2400/F(kHz))</sup> + 80
0.490 ~ 1.705	24000/F(kHz)	30	100 * 24000/F(kHz)	20log <sup>(24000/F(kHz))</sup> + 40
1.705 ~ 30	30	30	100 * 30	20log <sup>(30)</sup> + 40
30 ~ 88	100	3	100	20log <sup>(100)</sup>
88 ~ 216	150	3	150	20log <sup>(150)</sup>
216 ~ 960	200	3	200	20log <sup>(200)</sup>
Above 960	500	3	500	20log <sup>(500)</sup>

Limits Of Radiated Emission Measurement (Above 1000MHz)

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

### 7.5 Test Result

### Below 30MHz

Temperature:	<b>26</b> ℃	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:

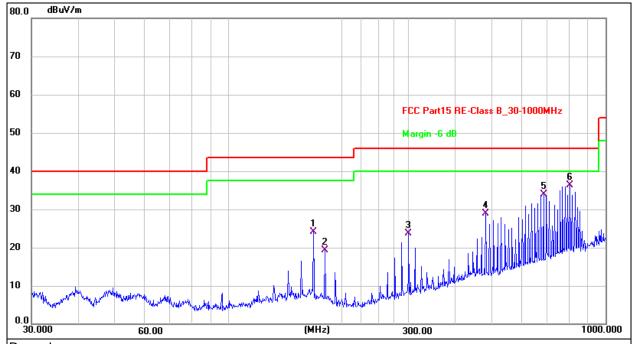
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

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



Temperature:	<b>26</b> ℃	Relative Humidity:	54%				
Pressure:	101KPa	Test Voltage:	DC 3.7V				
Test Mode:	Mode 4	Polarization:	Horizontal				

#### Botwoon 30MHz 1647



### Remark:

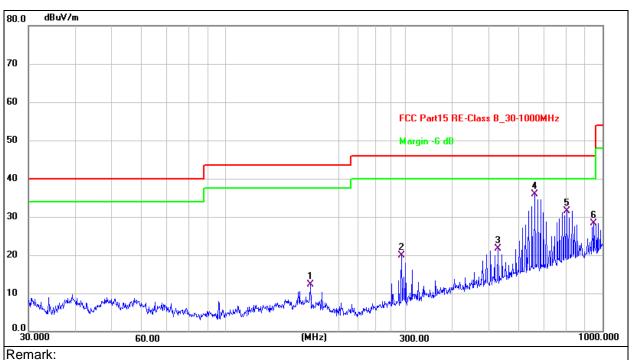
### 1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

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

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	167.8243	41.47	-17.35	24.12	43.50	-19.38	QP
2	180.0165	37.59	-18.31	19.28	43.50	-24.22	QP
3	300.3672	40.63	-16.90	23.73	46.00	-22.27	QP
4	480.5276	40.71	-11.89	28.82	46.00	-17.18	QP
5	684.7454	41.12	-7.13	33.99	46.00	-12.01	QP
6 *	804.6028	41.03	-4.76	36.27	46.00	-9.73	QP



Temperature:	<b>26</b> ℃	Relative Humidity:	54%
Pressure:	101KPa	Test Voltage:	DC 3.7V
Test Mode:	Mode 4	Polarization:	Vertical



# 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)	Detector
1	167.8243	29.74	-17.35	12.39	43.50	-31.11	QP
2	293.0842	37.11	-17.14	19.97	46.00	-26.03	QP
3	528.2458	32.59	-10.85	21.74	46.00	-24.26	QP
4 *	661.1505	43.38	-7.51	35.87	46.00	-10.13	QP
5	804.6028	36.36	-4.76	31.60	46.00	-14.40	QP
6	948.7610	30.74	-2.43	28.31	46.00	-17.69	QP



### Between 1GHz – 25GHz

Polar	Frequency	Reading Level	Correct Factor	Measure- ment	Limits	Over	Detector		
(H/V)	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/ m)	(dB)	Туре		
	GFSK Low channel								
V	4804.00	72.16	-19.99	52.17	74.00	-21.83	PK		
V	4804.00	62.10	-19.99	42.11	54.00	-11.89	AV		
V	7206.00	63.52	-14.22	49.30	74.00	-24.70	PK		
V	7206.00	54.37	-14.22	40.15	54.00	-13.85	AV		
Н	4804.00	70.70	-19.99	50.71	74.00	-23.29	PK		
Н	4804.00	59.93	-19.99	39.94	54.00	-14.06	AV		
Н	7206.00	61.05	-14.22	46.83	74.00	-27.17	PK		
Н	7206.00	53.60	-14.22	39.38	54.00	-14.62	AV		
		G	FSK Middle c	hannel					
V	4882.00	68.37	-19.84	48.53	74.00	-25.47	PK		
V	4882.00	60.35	-19.84	40.51	54.00	-13.49	AV		
V	7323.00	58.60	-13.90	44.70	74.00	-29.30	PK		
V	7323.00	49.47	-13.90	35.57	54.00	-18.43	AV		
Н	4882.00	66.41	-19.84	46.57	74.00	-27.43	PK		
Н	4882.00	56.64	-19.84	36.80	54.00	-17.20	AV		
Н	7323.00	57.23	-13.90	43.33	74.00	-30.67	PK		
Н	7323.00	49.52	-13.90	35.62	54.00	-18.38	AV		
			GFSK High ch	annel					
V	4960.00	71.05	-19.68	51.37	74.00	-22.63	PK		
V	4960.00	61.65	-19.68	41.97	54.00	-12.03	AV		
V	7440.00	63.98	-13.57	50.41	74.00	-23.59	PK		
V	7440.00	54.35	-13.57	40.78	54.00	-13.22	AV		
Н	4960.00	68.36	-19.68	48.68	74.00	-25.32	PK		
Н	4960.00	58.89	-19.68	39.21	54.00	-14.79	AV		
Н	7440.00	61.08	-13.57	47.51	74.00	-26.49	PK		
Н	7440.00	52.79	-13.57	39.22	54.00	-14.78	AV		
Remark <sup>.</sup>			14 A A A A A A A A A A A A A A A A A A A						

### Remark:

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



Frequency	Reading Level	Correct Factor	Measure- ment	Limits	Over	Detector
(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/ m)	(dB)	Туре
	π/4	DQPSK Low	channel			
4804.00	72.34	-19.99	52.35	74.00	-21.65	PK
4804.00	63.36	-19.99	43.37	54.00	-10.63	AV
7206.00	62.58	-14.22	48.36	74.00	-25.64	PK
7206.00	53.21	-14.22	38.99	54.00	-15.01	AV
4804.00	70.69	-19.99	50.70	74.00	-23.30	PK
4804.00	60.46	-19.99	40.47	54.00	-13.53	AV
7206.00	61.55	-14.22	47.33	74.00	-26.67	PK
7206.00	53.91	-14.22	39.69	54.00	-14.31	AV
	π/4	DQPSK Middl	e channel			
4882.00	69.75	-19.84	49.91	74.00	-24.09	PK
4882.00	61.48	-19.84	41.64	54.00	-12.36	AV
7323.00	60.50	-13.90	46.60	74.00	-27.40	PK
7323.00	51.05	-13.90	37.15	54.00	-16.85	AV
4882.00	65.33	-19.84	45.49	74.00	-28.51	PK
4882.00	55.33	-19.84	35.49	54.00	-18.51	AV
7323.00	57.90	-13.90	44.00	74.00	-30.00	PK
7323.00	50.01	-13.90	36.11	54.00	-17.89	AV
	π/4	DQPSK High	channel			
4960.00	71.03	-19.68	51.35	74.00	-22.65	PK
4960.00	61.85	-19.68	42,17	54.00	-11.83	AV
7440.00	64.64	-13.57	51.07	74.00	-22.93	PK
7440.00	55.41	-13.57	41.84	54.00	-12.16	AV
4960.00	68.96	-19.68	49.28	74.00	-24.72	PK
4960.00	59.81	-19.68	40.13	54.00	-13.87	AV
7440.00	61.80	-13.57	48.23	74.00	-25.77	PK
7440.00	54.65	-13.57	41.08	54.00	-12.92	AV
	(MHz) 4804.00 4804.00 7206.00 7206.00 7206.00 7206.00 7206.00 7206.00 7206.00 7206.00 7206.00 7206.00 7323.00 7440.00 7440.00 7440.00 7440.00 7440.00 7440.00	FrequencyLevel(MHz)(dBuV/m) $\pi/4$ 4804.0072.344804.0063.367206.0062.587206.0053.214804.0070.694804.0060.467206.0061.557206.0061.557206.0061.557206.0061.557206.0063.31 $\pi/4$ 4882.004882.0069.754882.0061.487323.0051.054882.0055.337323.0057.907323.0050.01 $\pi/4$ 4960.004960.0061.857440.0064.647440.0068.964960.0059.817440.0061.80	FrequencyLevelFactor(MHz)(dBuV/m)(dB)π/4 DQPSK Low4804.0072.34-19.994804.0063.36-19.997206.0062.58-14.227206.0053.21-14.224804.0070.69-19.994804.0060.46-19.997206.0061.55-14.227206.0053.91-14.227206.0053.91-14.227206.0053.91-14.227206.0053.91-14.227206.0053.91-14.227206.0053.91-14.227206.0053.91-14.227206.0053.91-14.227206.0053.91-14.227206.0053.91-14.227206.0053.91-14.227206.0053.91-14.227206.0053.91-14.227206.0053.91-13.904882.0069.75-19.844882.0065.33-19.844882.0055.33-19.844882.0055.33-19.844882.0055.33-19.847323.0057.90-13.907323.0057.90-13.907323.0057.90-13.907440.0061.85-19.687440.0064.64-13.574960.0068.96-19.684960.0059.81-19.687440.0061.80-13.57	FrequencyLevelFactorment(MHz)(dBuV/m)(dB)(dBuV/m)π/4 DQPSK Low channel4804.0072.34-19.9952.354804.0063.36-19.9943.377206.0062.58-14.2248.367206.0053.21-14.2238.994804.0070.69-19.9950.704804.0060.46-19.9940.477206.0061.55-14.2247.337206.0053.91-14.2239.69π/4 DQPSK Middle channel4882.0069.754882.0069.75-19.8449.914882.0061.48-19.8441.647323.0051.05-13.9037.154882.0065.33-19.8445.494882.0065.33-19.8445.494882.0055.33-19.8445.494882.0065.33-19.8445.494882.0065.33-19.8445.494882.0055.33-19.8445.494882.0055.33-19.8435.497323.0050.01-13.9036.11π/4 DQPSK High channel4960.0071.03-19.684960.0061.85-19.6842.177440.0064.64-13.5751.077440.0068.96-19.6849.284960.0059.81-19.6840.137440.0061.80-13.5748.23	Frequency         Level         Factor         ment         Limits           (MHz)         (dBuV/m)         (dB)         (dBuV/m)         (dBuV/m)         (dBuV/m)           π/4 DQPSK Low channel         π/4 DQPSK Low channel         19.99         52.35         74.00           4804.00         63.36         -19.99         43.37         54.00           7206.00         62.58         -14.22         48.36         74.00           7206.00         53.21         -14.22         38.99         54.00           4804.00         70.69         -19.99         50.70         74.00           4804.00         60.46         -19.99         40.47         54.00           7206.00         61.55         -14.22         47.33         74.00           4882.00         61.55         -14.22         39.69         54.00           7323.00         60.50         -13.90         46.60         74.00           4882.00         65.33         -19.84         49.91         74.00           4882.00         65.33         -19.84         45.49         74.00           7323.00         51.05         -13.90         37.15         54.00           7323.00         51.05	Frequency         Level         Factor         ment         Limits         Over           (MHz)         (dBuV/m)         (dB)         (dBuV/m)         (dBuV/m)         (dB)         (dBuV/m)         (dB)           mmath         (dBuV/m)         (dBuV/m)         (dBuV/m)         (dB)         (dB)         (dB)         (dB)           mmath         Lunits         mmath         Lunits         (dB)         (dB)<

1. Measurement = Reading Level + Correct Factor, Correct Factor = Antenna Factor + Cable Loss -Pre-amplifier. Over= Measurement - 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.



Polar	Frequency	Reading Level	Correct Factor	Measure- ment	Limits	Over	Detector
(H/V)	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/ m)	(dB)	Туре
		8	BDPSK Low cl	nannel			
V	4804.00	71.01	-19.99	51.02	74.00	-22.98	PK
V	4804.00	60.39	-19.99	40.40	54.00	-13.60	AV
V	7206.00	60.93	-14.22	46.71	74.00	-27.29	PK
V	7206.00	50.64	-14.22	36.42	54.00	-17.58	AV
Н	4804.00	68.13	-19.99	48.14	74.00	-25.86	PK
Н	4804.00	57.94	-19.99	37.95	54.00	-16.05	AV
Н	7206.00	59.28	-14.22	45.06	74.00	-28.94	PK
Н	7206.00	51.96	-14.22	37.74	54.00	-16.26	AV
		80	<b>OPSK Middle</b>	channel	•	•	•
V	4882.00	68.45	-19.84	48.61	74.00	-25.39	PK
V	4882.00	61.02	-19.84	41.18	54.00	-12.82	AV
V	7323.00	58.35	-13.90	44.45	74.00	-29.55	PK
V	7323.00	49.13	-13.90	35.23	54.00	-18.77	AV
Н	4882.00	66.18	-19.84	46.34	74.00	-27.66	PK
Н	4882.00	55.47	-19.84	35.63	54.00	-18.37	AV
Н	7323.00	57.10	-13.90	43.20	74.00	-30.80	PK
Н	7323.00	49.91	-13.90	36.01	54.00	-17.99	AV
		8	DPSK High c	hannel			
V	4960.00	71.10	-19.68	51.42	74.00	-22.58	PK
V	4960.00	60.91	-19.68	41.23	54.00	-12.77	AV
V	7440.00	63.77	-13.57	50.20	74.00	-23.80	PK
V	7440.00	53.30	-13.57	39.73	54.00	-14.27	AV
Н	4960.00	68.93	-19.68	49.25	74.00	-24.75	PK
Н	4960.00	58.86	-19.68	39.18	54.00	-14.82	AV
Н	7440.00	61.75	-13.57	48.18	74.00	-25.82	PK
Н	7440.00	53.01	-13.57	39.44	54.00	-14.56	AV

Remark:

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

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

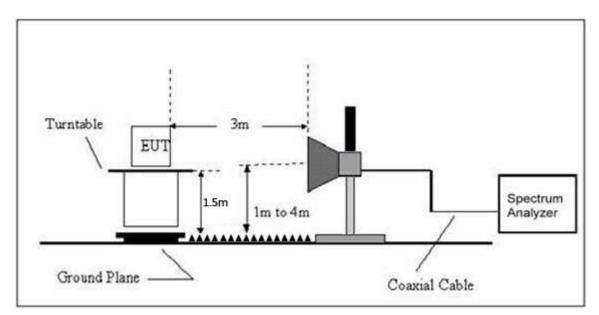
3. In restricted bands of operation, The spurious emissions below the permissible value more than 20dB4. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.



### 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
<sup>1</sup> 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	( <sup>2</sup> )
13.36-13.41			



Limits Of Radiated Emission Measurement (Above 1000MHz)

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

Notes:

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

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

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

### 8.3 Test procedure

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

Above 1GHz test procedure as below:

a. The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter 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 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)	(dBu	nits IV/m)	Over	Result		
			(abat/iii)	、 <i>,</i>	PK	PK	AV	PK			
		Low Channel 2402MHz									
GFSK	Н	2390.00	73.33	-25.43	47.90	74.00	54.00	-26.10	PASS		
	Н	2400.00	75.52	-25.40	50.12	74.00	54.00	-23.88	PASS		
	V	2390.00	73.07	-25.43	47.64	74.00	54.00	-26.36	PASS		
	V	2400.00	74.70	-25.40	49.30	74.00	54.00	-24.70	PASS		
	High Channel 2480MHz										
	Н	2483.50	72.06	-25.15	46.91	74.00	54.00	-27.09	PASS		
	Н	2500.00	68.76	-25.10	43.66	74.00	54.00	-30.34	PASS		
	V	2483.50	73.34	-25.15	48.19	74.00	54.00	-25.81	PASS		
	V	2500.00	69.86	-25.10	44.76	74.00	54.00	-29.24	PASS		
		Low Channel 2402MHz									
π/4DQPSK	Н	2390.00	72.85	-25.43	47.42	74.00	54.00	-26.58	PASS		
	Н	2400.00	74.12	-25.40	48.72	74.00	54.00	-25.28	PASS		
	V	2390.00	73.23	-25.43	47.80	74.00	54.00	-26.20	PASS		
	V	2400.00	74.44	-25.40	49.04	74.00	54.00	-24.96	PASS		
	High Channel 2480MHz										
	Н	2483.50	73.31	-25.15	48.16	74.00	54.00	-25.84	PASS		
	Н	2500.00	69.77	-25.10	44.67	74.00	54.00	-29.33	PASS		
	V	2483.50	73.63	-25.15	48.48	74.00	54.00	-25.52	PASS		
	V	2500.00	70.61	-25.10	45.51	74.00	54.00	-28.49	PASS		
		Low Channel 2402MHz									
8DPSK	Н	2390.00	73.44	-25.43	48.01	74.00	54.00	-25.99	PASS		
	Н	2400.00	76.29	-25.40	50.89	74.00	54.00	-23.11	PASS		
	V	2390.00	73.24	-25.43	47.81	74.00	54.00	-26.19	PASS		
	V	2400.00	73.03	-25.40	47.63	74.00	54.00	-26.37	PASS		
		High Channel 2480MHz									
	Н	2483.50	73.91	-25.15	48.76	74.00	54.00	-25.24	PASS		
	Н	2500.00	68.96	-25.10	43.86	74.00	54.00	-30.14	PASS		
	V	2483.50	71.98	-25.15	46.83	74.00	54.00	-27.17	PASS		
	V	2500.00	68.00	-25.10	42.90	74.00	54.00	-31.10	PASS		

### Remark:

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

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:

RBW = 100kHz, VBW = 300kHz, Sweep = auto

Detector function = peak, Trace = max hold

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### 9.4 Test Result







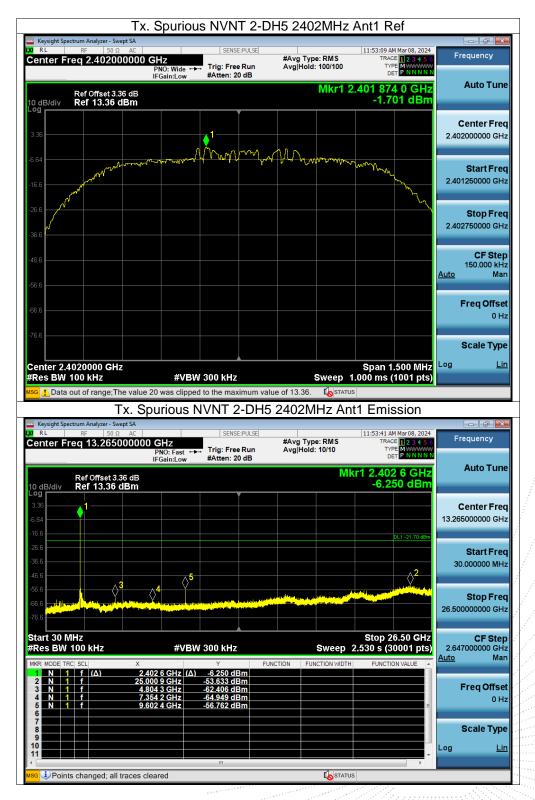
Edition: B.1



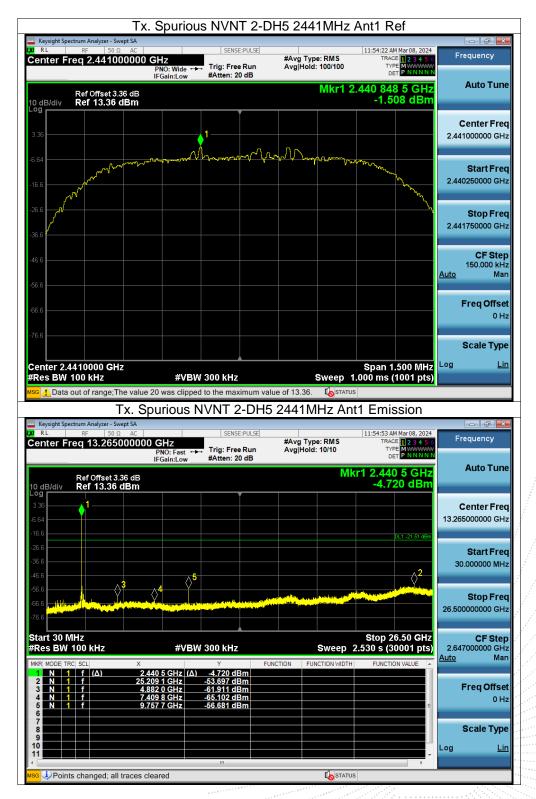


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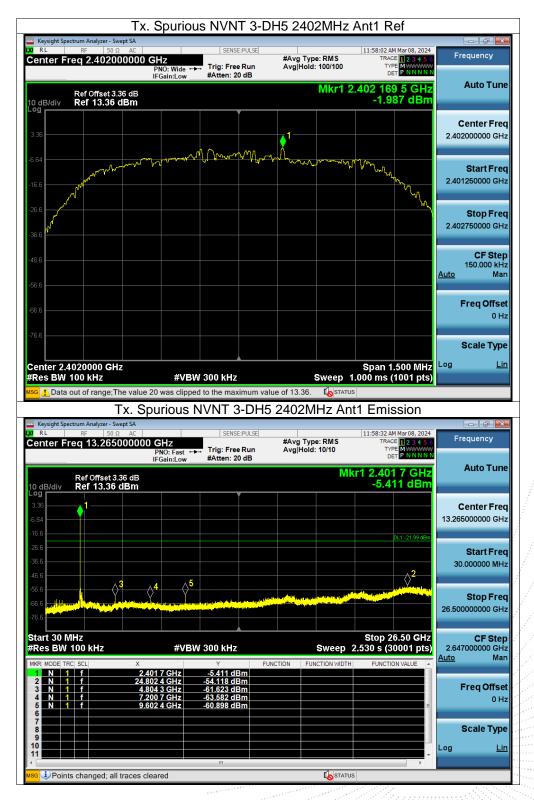
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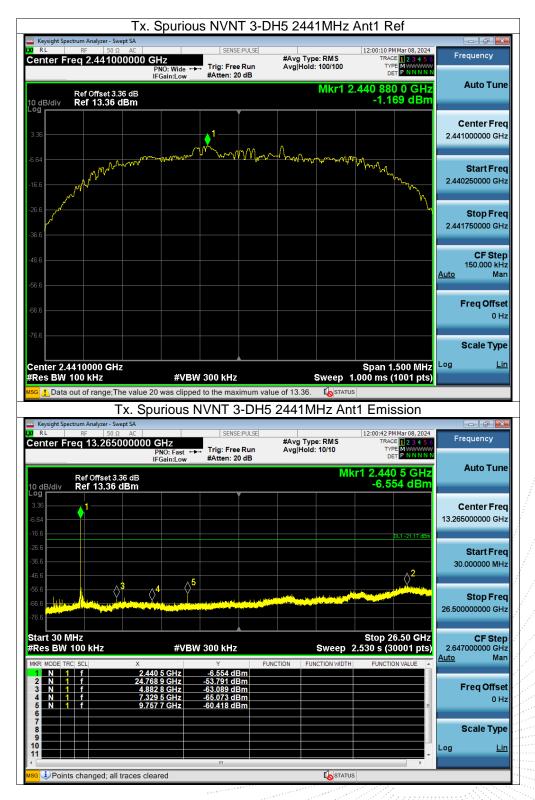
Edition: B.1





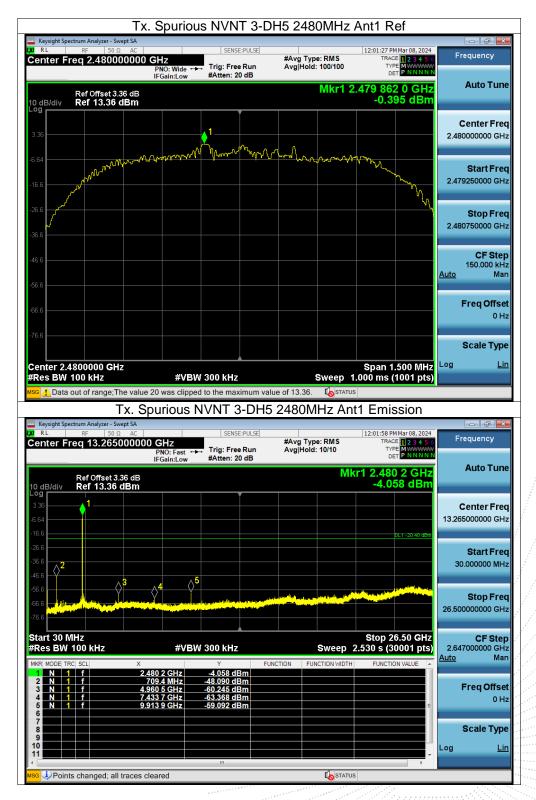
Edition: B.1



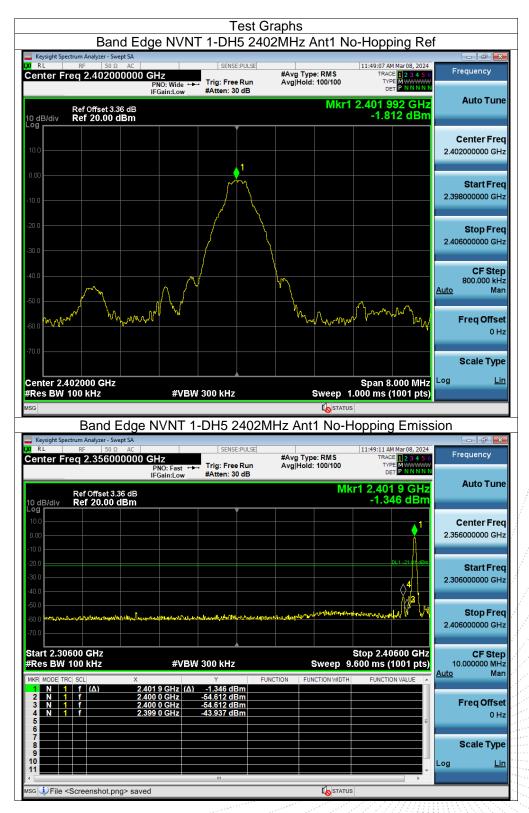


Edition: B.1













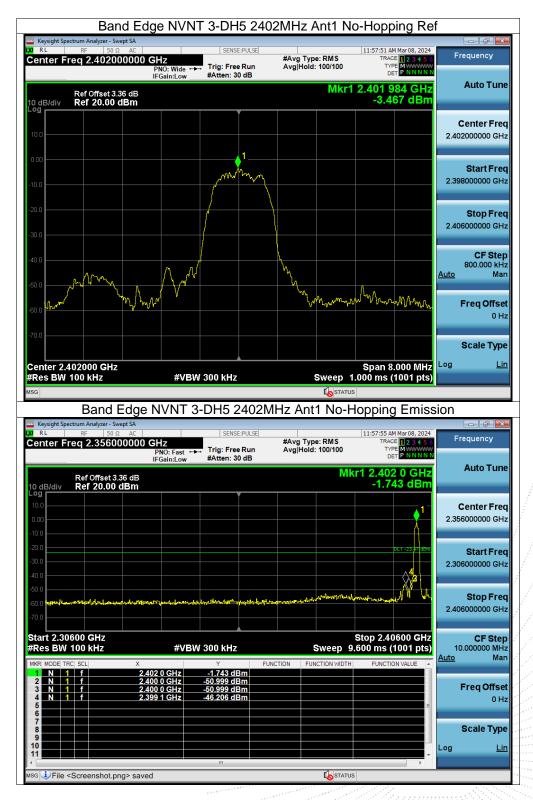








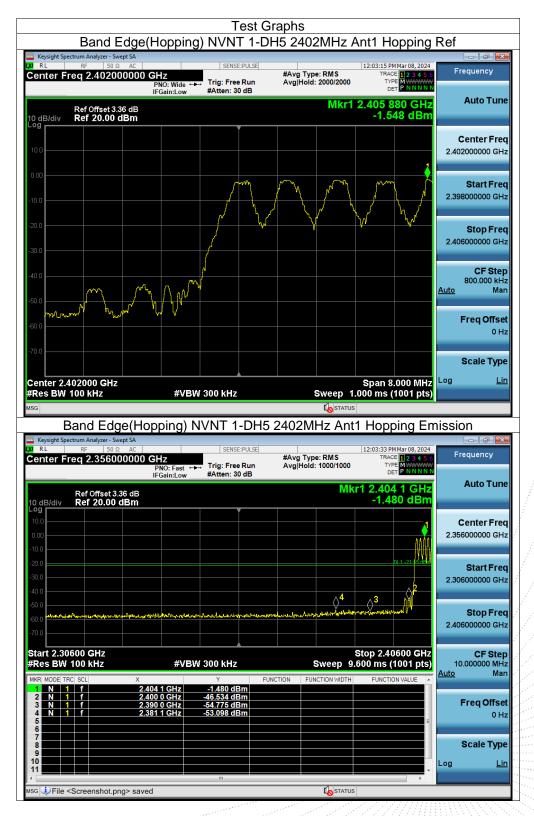












Edition: B.1









Edition: B.1





Edition: B.1











# 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.

10.4	Test Result	

Condition	Mode	Frequency (MHz)	-20 dB Bandwidth (MHz)	Verdict
NVNT	1-DH5	2402	0.946	Pass
NVNT	1-DH5	2441	0.948	Pass
NVNT	1-DH5	2480	0.95	Pass
NVNT	2-DH5	2402	1.28	Pass
NVNT	2-DH5	2441	1.271	Pass
NVNT	2-DH5	2480	1.277	Pass
NVNT	3-DH5	2402	1.284	Pass
NVNT	3-DH5		1.298	Pass
NVNT	3-DH5	2480	1.297	Pass









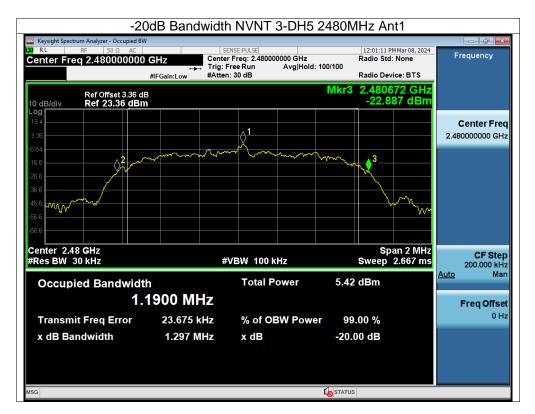












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# 11. Maximum Peak Output Power

### 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.

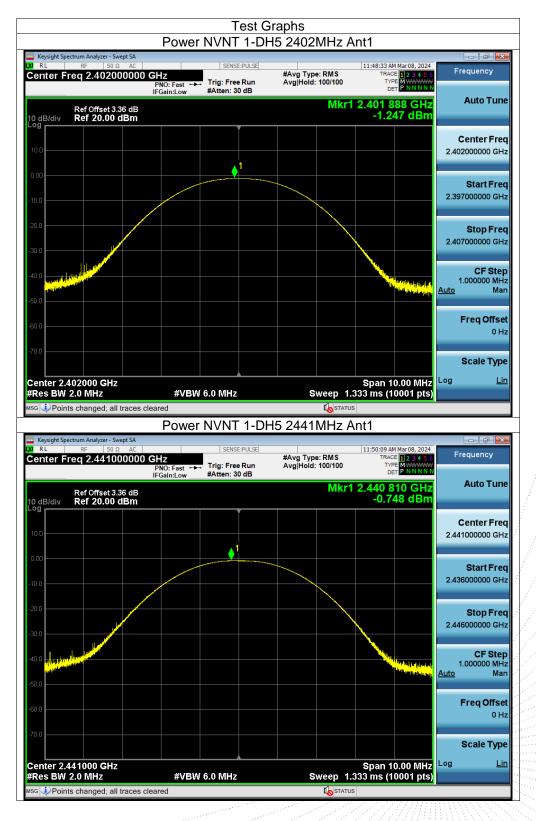
2. Set the spectrum analyzer: RBW = 2MHz. VBW = 6MHz. Sweep = auto; Detector Function = Peak.

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

### 11.4 Test Result

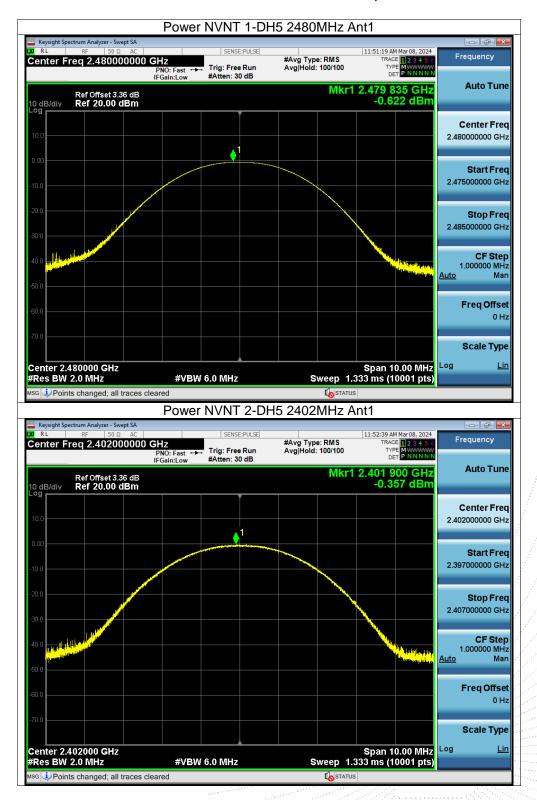
Condition	Mode	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	1-DH5	2402	-1.25	21	Pass
NVNT	1-DH5	2441	-0.75	21	Pass
NVNT	1-DH5	2480	-0.62	21	Pass
NVNT	2-DH5	2402	-0.36	21	Pass
NVNT	2-DH5	2441	0.11	21	Pass
NVNT	2-DH5	2480	0.39	21	Pass
NVNT	3-DH5	2402	0.02	21	Pass
NVNT	3-DH5	2441	0.72	21	Pass
NVNT	3-DH5	2480	1.10	21	Pass



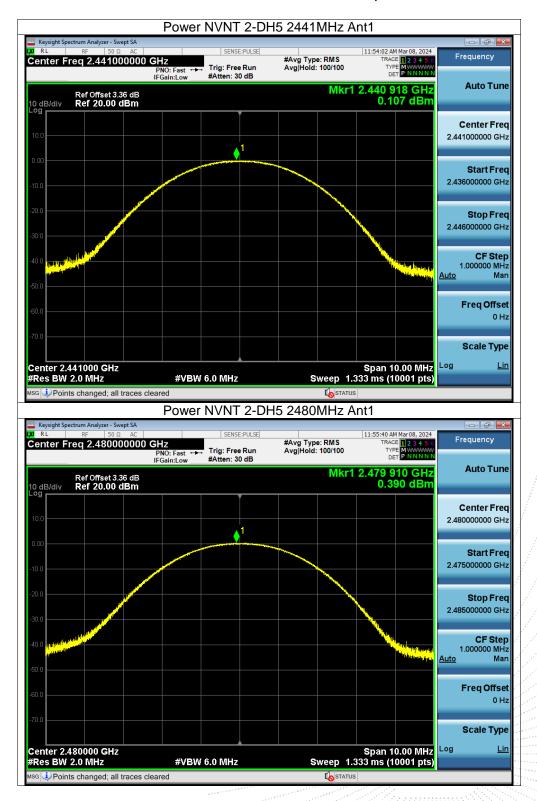


No.: BCTC/RF-EMC-005

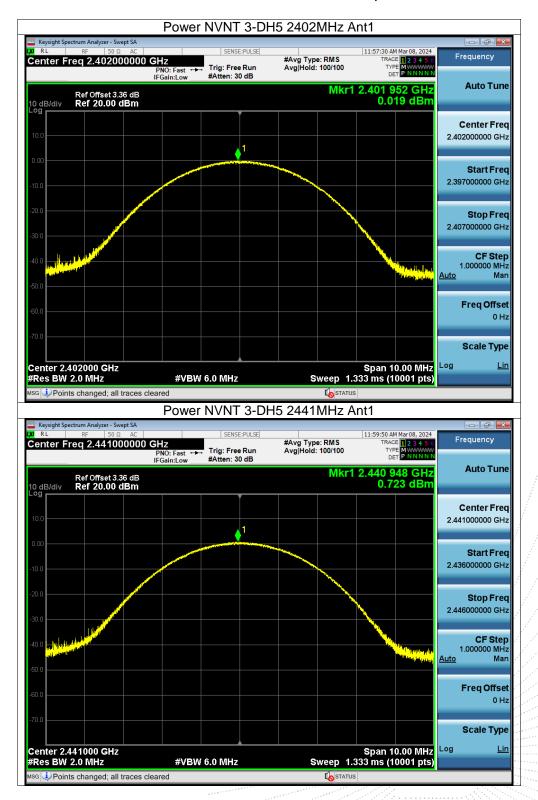






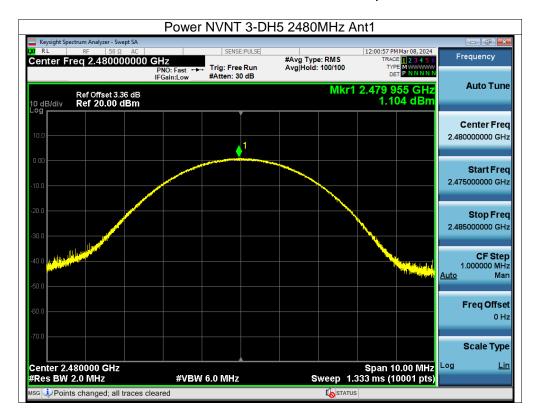






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# 12. Hopping Channel Separation

# 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.

odulation	Test Channel	Separation (MHz)	Limit(MHz)	Result
GFSK	Low Market	0.974	0.631	PASS
GFSK	Middle	1.176	0.632	PASS
GFSK	High ••••	0.952	0.633	PASS
π/4 DQPSK	Low	1.370	0.853	PASS
π/4 DQPSK	Middle	0.994	0.847	PASS
π/4 DQPSK	High	0.870	0.851	PASS
8DPSK	Low	0.994	0.856	PASS
8DPSK	Middle	0.998	0.865	PASS
8DPSK	High	1.148	0.865	PASS

#### 12.4 Test Result



	CFS		Graphs 15 2402MHz Ar	nt1	
Keysight Spectrum Analyzer	- Swept SA				
RL RF 5 enter Freq 2.402		SENSE:PULSE	#Avg Type: RMS	12:03:54 PM Mar 08, 2024 TRACE 1 2 3 4 5 6	Frequency
	PNO: Wide IFGain:Low	Trig: Free Run #Atten: 30 dB	Avg Hold:>100/100		
Ref Offset	t 3.36 dB		Mkr1	2.402 016 GHz -4.044 dBm	Auto Tur
dB/div Ref 20.0	lu abm	Ţ			
).0 <b></b>	1				Center Fre
00	man		min	× 100	2.402500000 GH
	~	Mar and	James Mar	a grand	Start Fre
0.0		with the second second			2.401500000 GH
.0					
).0 ).0					Stop Fre
).0 					2.403500000 GH
enter 2.402500 Gl	Hz			Span 2.000 MHz	CF Ste
Res BW 30 kHz		3W 100 kHz	Sweep 2	.133 ms (1001 pts)	200.000 kH
R MODE TRC SCL	× 2.402 016 GHz	۲ - <b>4.044 dBm</b>	FUNCTION FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Ma
N 1 F 2 N 1 F	2.402 016 GHz 2.402 990 GHz	-4.097 dBm			Freq Offs
				=	01
					Scale Typ
					Log <u>L</u>
		III			
			<b>1</b>	•	
		S NVNT 1-DF	<mark>Ко</mark> втатия 15 2441MHz Ar		
Keysight Spectrum Analyzer - RL RF 5	- Swept SA i0 Ω AC	S NVNT 1-DF	15 2441MHz Ar	12:04:50 PM Mar 08, 2024	Frequency
Keysight Spectrum Analyzer - R L RF 5	- Swept SA i0 Ω AC 500000 GHz PNO: Wide	SENSE:PULSE	<b>_</b>	nt1	
Keysight Spectrum Analyzer RL RF 5 Enter Freq 2.441	- Swept SA 10 Ω AC    5000000 GHz PNO: Wide IFGain:Low	SENSE:PULSE	15 2441MHz Ar #Avg Type: RMS Avg Hold:>100/100	12:04:50 PM Mar 08, 2024 TRACE 12:34 5 6 TRACE 12:34 5 6 TVPE 12:04:00 DET NNNNN 2:440 862 GH2	Frequency
Keysight Spectrum Analyzer RL RF 5 enter Freq 2.441 Ref Offset dB/div Ref 20.0	- Swept SA i0 Ω AC ISO00000 GHZ PNO: Wide IFGain:Low t3.36 dB	SENSE:PULSE	15 2441MHz Ar #Avg Type: RMS Avg Hold:>100/100	12:04:50 PM Mar 08, 2024 TRACE 2 34 5 6 TYPE MARCON DET P.N.N.N.N.	Frequency
Keysight Spectrum Analyzer RL RF 5 enter Freq 2.441 Ref Offset dB/div Ref 20.0 9	- Swept SA i0 Ω AC ISO00000 GHZ PNO: Wide IFGain:Low t3.36 dB	SENSE:PULSE	15 2441MHz Ar #Avg Type: RMS Avg Hold:>100/100 Mkr1	12:04:50 PM Mar 08, 2024 TRACE 12:34 5 6 TRACE 12:34 5 6 TVPE 12:04:00 DET NNNNN 2:440 862 GH2	Frequency Auto Tur
Keysight Spectrum Analyzer RL RF 5 enter Freq 2.441 Ref Offset dB/div Ref 20.0	- Swept SA i0 Ω AC ISO00000 GHZ PNO: Wide IFGain:Low t3.36 dB	SENSE:PULSE	15 2441MHz Ar #Avg Type: RMS Avg Hold:>100/100 Mkr1	12:04:50 PM Mar 08, 2024 TRACE 12:34 5 6 TRACE 12:34 5 6 TVPE 12:04:00 DET NNNNN 2:440 862 GH2	Frequency Auto Tur Center Fre 2.441500000 GH
Keysight Spectrum Analyzer RL RF S Senter Freq 2.441 Ref Offset dB/div Ref 20.0	- Swept SA i0 Ω AC ISO00000 GHZ PNO: Wide IFGain:Low t3.36 dB	SENSE:PULSE	15 2441MHz Ar #Avg Type: RMS Avg Hold:>100/100 Mkr1	12:04:50 PM Mar 08, 2024 TRACE 12:34 5 6 TRACE 12:34 5 6 TVPE 12:04:00 DET NNNNN 2:440 862 GH2	Frequency Auto Tur Center Fre 2.441500000 GH
Keysight Spectrum Analyzer RL RF 5 enter Freq 2.441 dB/div Ref 20.0	- Swept SA i0 Ω AC ISO00000 GHZ PNO: Wide IFGain:Low t3.36 dB	SENSE:PULSE	15 2441MHz Ar #Avg Type: RMS Avg Hold:>100/100 Mkr1	12:04:50 PM Mar 08, 2024 TRACE 12:34 5 6 TRACE 12:34 5 6 TVPE 12:04:00 DET NNNNN 2:440 862 GH2	Frequency Auto Tur Center Fre 2.441500000 GH Start Fre
Keysight Spectrum Analyzer RL RF 5 enter Freq 2.441 Ref Offset dB/div Ref 20.0	- Swept SA i0 Ω AC     15000000 GHz PN0: Wide IFGain:Low t3.36 dB	SENSE:PULSE	15 2441MHz Ar #Avg Type: RMS Avg Hold:>100/100 Mkr1	12:04:50 PM Mar 08, 2024 TRACE 12:34 5 6 TRACE 12:34 5 6 TVPE 12:04:00 DET NNNNN 2:440 862 GH2	Frequency Auto Tur Center Fre 2.441500000 GH
Keysight Spectrum Analyzer RL RF 5 Enter Freq 2.441 Ref Offset dB/div Ref 20.0 9 0 0 0 0 0 0 0 0 0 0 0 0 0	- Swept SA i0 Ω AC     15000000 GHz PN0: Wide IFGain:Low t3.36 dB	SENSE:PULSE	15 2441MHz Ar #Avg Type: RMS Avg Hold:>100/100 Mkr1	12:04:50 PM Mar 08, 2024 TRACE 12:34 5 6 TRACE 12:34 5 6 TVPE 12:04:00 DET NNNNN 2:440 862 GH2	Frequency Auto Tur Center Fre 2.441500000 GH Start Fre 2.440500000 GH
Keysight Spectrum Analyzer s RL RF 5 Senter Freq 2.441 Ref Offset dB/div Ref 20.0 0 0 0 0 0 0 0 0 0 0 0 0 0	- Swept SA i0 Ω AC     15000000 GHz PN0: Wide IFGain:Low t3.36 dB	SENSE:PULSE	15 2441MHz Ar #Avg Type: RMS Avg Hold:>100/100 Mkr1	12:04:50 PM Mar 08, 2024 TRACE 12:34 5 6 TRACE 12:34 5 6 TVPE 12:04:00 DET NNNNN 2:440 862 GH2	Frequency Auto Tur Center Fre 2.441500000 GH Start Fre 2.440500000 GH
Keysight Spectrum Analyzer RL RF S enter Freq 2.441 Ref Offset dB/div Ref 20.0 0 0 0 0 0 0 0 0 0 0 0 0 0	- Swept SA 10 Q. AC 1500000 GHz PNO: Wide IFGain:Low t3.36 dB 10 dBm 1 1 1 1 1 1 1 1 1 1 1 1 1	SENSE:PULSE	15 2441MHz Ar #Avg Type: RMS Avg Hold:>100/100 Mkr1	12:04:50 PM Mar 08, 2024 TRACE 12:24 5 G TYPE WWWW OFT 9ET WINNIN 2.440 862 GHz -3.172 dBm	Frequency Auto Tur Center Fre 2.441500000 GH Start Fre
Keysight Spectrum Analyzer RL RF S enter Freq 2.441 Ref Offset dB/div Ref 20.0 0 0 0 0 0 0 0 0 0 0 0 0 0	- Swept SA 10 Q AC     1500000 GHz PNO: Wide IFGain:Low 13.36 dB 10 dBm 1 1 1 1 1 1 1 1 1 1 1 1 1	SENSE:PULSE	H5 2441MHz Ar #Avg Type: RMS Avg Hold:>100/100 Mkr1	12:04:50 PM Mar 08, 2024 TRACE 0.23 4 5 G TYPE 0.23 4 5 G TYPE 0.000 MHz Span 2.000 MHz	Frequency           Auto Tur           Center Fre           2.441500000 GH           Start Fre           2.440500000 GH           Stop Fre           2.442500000 GH
enter 7.441500 GI Res BW 30 KHz	- Swept SA 10 Q AC     1500000 GHz PNO: Wide IFGain:Low 13.36 dB 10 dBm 1 1 1 1 1 1 1 1 1 1 1 1 1	SENSE:PULSE	H5 2441MHz Ar #Avg Type: RMS Avg Hold:>100/100 Mkr1	12:04:50 PM Mar 08, 2024 TRACE 12:24 5 G TYPE WWWW OFT 9ET WINNIN 2.440 862 GHz -3.172 dBm	Frequency           Auto Tur           Center Fre           2.441500000 GF           Start Fre           2.440500000 GF           Stop Fre           2.442500000 GF
Reysight Spectrum Analyzer RL RF 5 enter Freq 2.441 dB/div Ref 20.0 00 00 00 00 00 00 00 00 00 00 00 00	- Swept SA 10 Q. AC 1500000 GHz PNO: Wide IFGain:Low t 3.36 dB 10 dBm 10 dBm 1	SENSE:PULSE	15 2441MHz Ar #Avg Type: RMS Avg Hold:>100/100 Mkr1	12:04:50 PM Mar 08, 2024 TRACE 12:34 5: 6 TYPE 12:04:50 PM Mar 08, 2024 TRACE 12:34 5: 6 TYPE 12:04:00 PM Mar 08, 2024 2:440 862 GHz -3:172 dBm 5pan 2:000 MHz 1:33 ms (1001 pts)	Start Fre           2.441500000 GH           Start Fre           2.440500000 GH           Stop Fre           2.442500000 GH           CF Ste           200.000 kH           Auto           Mate
Revaight Spectrum Analyzer RL RF 5 enter Freq 2.441 Ref Offset 0 GE/div Ref 20.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	- Swept SA 10 Q AC 1500000 GHz PNO: Wide IFGein:Low 13.36 dB 10 dBm 1 1 1 1 1 1 1 1 1 1 1 1 1	SENSE:PULSE	15 2441MHz Ar #Avg Type: RMS Avg Hold:>100/100 Mkr1	12:04:50 PM Mar 08, 2024 TRACE 12:34 5: 6 TYPE 12:04:50 PM Mar 08, 2024 TRACE 12:34 5: 6 TYPE 12:04:00 PM Mar 08, 2024 2:440 862 GHz -3:172 dBm 5pan 2:000 MHz 1:33 ms (1001 pts)	Frequency Auto Tur Center Fre 2.441500000 GH Start Fre 2.440500000 GH Stop Fre 2.442500000 GH CF Ste 200.000 kH Auto Ma
Reysight Spectrum Analyzer           Ref Offset           Ref Offset           off	- Swept SA 10 Q. AC 1500000 GHz PNO: Wide IFGain:Low t 3.36 dB 10 dBm 10 dBm 1	SENSE:PULSE	15 2441MHz Ar #Avg Type: RMS Avg Hold:>100/100 Mkr1	12:04:50 PM Mar 08, 2024 TRACE 12:34 5: 6 TYPE 12:04:50 PM Mar 08, 2024 TRACE 12:34 5: 6 TYPE 12:04:00 PM Mar 08, 2024 2:440 862 GHz -3:172 dBm 5pan 2:000 MHz 1:33 ms (1001 pts)	Frequency Auto Tur Center Fre 2.441500000 GH Start Fre 2.440500000 GH Stop Fre 2.442500000 GH CF Ste 200.000 kH Auto Ma
Keysight Spectrum Analyzer           Ref Offset           Ref Offset           GB/div         Ref Offset           GB/div         Ref Offset           Offset	- Swept SA 10 Q. AC 1500000 GHz PNO: Wide IFGain:Low t 3.36 dB 10 dBm 10 dBm 1	SENSE:PULSE	15 2441MHz Ar #Avg Type: RMS Avg Hold:>100/100 Mkr1	12:04:50 PMMar 08, 2024 TRACE 12:24:50 PM Mar 08, 2024 TRACE 12:24:50 PM Mar 08, 2024 TRACE 12:24:50 PM Mar 08, 2024 TRACE 12:04:50 PM Mar 08, 2024 TRACE	Start Frequency           Auto Tur           Center Fre           2.441500000 GH           Start Fre           2.440500000 GH           Stop Fre           2.442500000 GH           CF Ste           200.000 kH           Auto           Freq Offs           0 H
Keysight Spectrum Analyzer RL RF S Enter Freq 2.441 Ref Offset dB/div Ref 20.0 0 0 0 0 0 0 0 0 0 0 0 0 0	- Swept SA 10 Q. AC 1500000 GHz PNO: Wide IFGain:Low t 3.36 dB 10 dBm 10 dBm 1	SENSE:PULSE	15 2441MHz Ar #Avg Type: RMS Avg Hold:>100/100 Mkr1	12:04:50 PMMar 08, 2024 TRACE 12:24:50 PM Mar 08, 2024 TRACE 12:24:50 PM Mar 08, 2024 TRACE 12:24:50 PM Mar 08, 2024 TRACE 12:04:50 PM Mar 08, 2024 TRACE	Frequency Auto Tur Center Fre 2.441500000 Gi Start Fre 2.440500000 Gi Stop Fre 2.442500000 Gi CF Ste 200.000 ki Auto Freq Offs 0 i Scale Typ
Keysight Spectrum Analyzer         RL       RF       S         Ref Offset         dB/div       Ref 20.0         00	- Swept SA 10 Q. AC 1500000 GHz PNO: Wide IFGain:Low t 3.36 dB 10 dBm 10 dBm 1	SENSE:PULSE	15 2441MHz Ar #Avg Type: RMS Avg Hold:>100/100 Mkr1	12:04:50 PMMar 08, 2024 TRACE 12:24:50 PM Mar 08, 2024 TRACE 12:24:50 PM Mar 08, 2024 TRACE 12:24:50 PM Mar 08, 2024 TRACE 12:04:50 PM Mar 08, 2024 TRACE	Start Frequency           Auto Tur           Center Fre           2.441500000 Gl           Start Fre           2.440500000 Gl           Stop Fre           2.442500000 Gl           CF Ste           200.000 kl           Auto           Auto           Freq Offs           0 l

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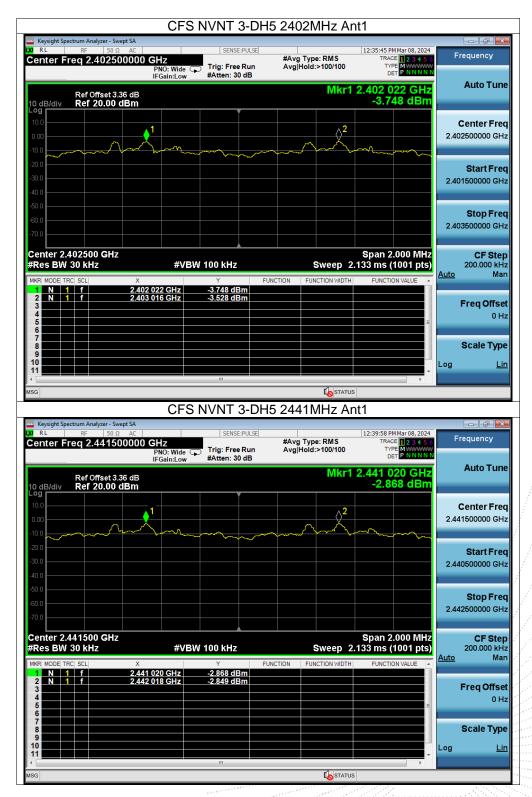
Edition: B.1



Keysight Spectrum Analyzer - Swept S		NVNT 2-DH	0 2 1 1 1 1 1 2 7 4		
RL RF 50 Ω A Center Freq 2.4415000	PNO: Wide 😱	Trig: Free Run	#Avg Type: RMS Avg Hold:>100/100	12:14:40 PM Mar 08, 2024 TRACE 1 2 3 4 5 6 TYPE MWWWWW DET P N N N N N	Frequency
Ref Offset 3.36		#Atten: 30 dB	Mkr1	2.441 182 GHz -2.799 dBm	Auto Tun
10 dB/div Ref 20.00 dB	<u>m</u>	Ĭ		-2.199 ubiii	
0.00				2 <sup>2</sup>	Center Fre 2.441500000 GH
-10.0				~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	
-20.0					Start Fre 2.440500000 G⊦
-40.0					2.440500000 GP
-60.0					Stop Fre
-70.0					2.442500000 GH
Center 2.441500 GHz #Res BW 30 kHz	#VBM	100 kHz	Sweep 2	Span 2.000 MHz 133 ms (1001 pts)	CF Ste 200.000 k⊦
MKR MODE TRC SCL	X	Y FU	UNCTION FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Ma
1 N 1 f 2 N 1 f	2.441 182 GHz 2.442 176 GHz	-2.799 dBm -2.888 dBm			FreqOffs
4 5				=	0H
6 7 8					Scale Typ
9 10					Log Li
11 (		m			
ISG	050				
Keysight Spectrum Analyzer - Swept S		INVINT 2-DH	5 2480MHz Ar	IT I	
RL RF 50 Ω A Center Freq 2.4795000	000 GHz	SENSE:PULSE	#Avg Type: RMS	01:42:11 PM Mar 08, 2024 TRACE 1 2 3 4 5 6	Frequency
	PNO: Wide G	Trig: Free Run #Atten: 30 dB	Avg Hold:>100/100	TYPE MWWWWW DET PNNNNN	Auto Tun
Ref Offset 3.36 o 10 dB/div Ref 20.00 dB			Mkr1	2.479 032 GHz -4.586 dBm	Autorun
					Center Fre
0.00			<mark>2</mark>		2.479500000 GH
-10.0	myn	munn	- Martin Martin	www.	Ctore F
-30.0					Start Fre 2.478500000 G⊢
00.0					
-40.0					
-40.0					Stop Fre 2.480500000 G⊢
-40.0 -60.0 -70.0 Center 2.479500 GHz	#VBM	/ 100 kHz	Sween 2	Span 2.000 MHz 133 ms (1001 pts)	2.480500000 G⊢ CF Ste
-40.0 -60.0 -60.0 -70.0 Center 2.479500 GHz #Res BW 30 kHz MKR MODE TRC SCL	х		Sweep 2.	Span 2.000 MHz 133 ms (1001 pts) FUNCTION VALUE	
40.0 50.0 60.0 Center 2.479500 GHz #Res BW 30 kHz MKR MODE TRC SCL 1 N 1 f 2 N 1 f				.133 ms (1001 pts)	2.480500000 G⊢ CF Ste 200.000 k⊢
40.0	× 2.479 032 GHz	Y FU		.133 ms (1001 pts)	2.480500000 GH CF Ste 200.000 kH <u>Auto</u> Ma Freq Offse
40.0 40.0	× 2.479 032 GHz	Y FU		.133 ms (1001 pts)	2.480500000 GH CF Ste 200.000 kH <u>Auto</u> Ma Freq Offse 0 H
A0.0 50.0 50.0 Center 2.479500 GHz #Res BW 30 kHz MKR MODE TRC SCL 1 N 1 f 3 I f 3 I f 6 I I I F	× 2.479 032 GHz	Y FU		.133 ms (1001 pts)	2.480500000 GH CF Ste 200.000 kH <u>Auto</u> Ma

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	CFS NVNT 3-D	H5 2480MHz A	nt1	
Keysight Spectrum Analyzer - Swept SA				
x RL RF 50Ω AC Center Freq 2.479500000	SENSE:PULSE PNO: Wide IFGain:Low #Atten: 30 dB	#Avg Type: RMS Avg Hold:>100/100	01:40:53 PM Mar 08, 2024 TRACE 1 2 3 4 5 6 TYPE MWWWW DET P N N N N	Frequency
Ref Offset 3.36 dB 10 dB/div Ref 20.00 dBm		Mkr1	2.478 858 GHz -2.903 dBm	Auto Tun
Log 10.0 0.00 -10.0	man and a second	promonia de la companya de la compan	marrin Arring	Center Fre 2.479500000 GH
20.0				<b>Start Fre</b> 2.478500000 G⊦
60.0 60.0 				<b>Stop Fre</b> 2.480500000 G⊦
Center 2.479500 GHz #Res BW 30 kHz	#VBW 100 kHz	Sweep 2	Span 2.000 MHz 2.133 ms (1001 pts)	CF Ste 200.000 k⊢
MKR MODE TRC SCL X	¥ 858 GHz -2.903 dBm	FUNCTION FUNCTION WIDTH	FUNCTION VALUE	Auto Ma
	0 006 GHz -4.777 dBm		E	Freq Offse 0 ⊢
7 8 9 10				Scale Typ
11				Log <u>Li</u>
ISG		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



	Hopping No	Test Gr I-I NVNT 1-I	DH5 2402MHz	Ant1	
Keysight Spectrum Analyzer - S	· · · ·	SENSE:PULSE		12:03:01 PM Mar 08, 2024	- ¢
enter Freq 2.441	750000 GHz	rig: Free Run	#Avg Type: RMS Avg Hold:>100/100	TRACE 1 2 3 4 5 6 TYPE MWWWW DET P NNNN	Frequency
	IFGain:Low #/	Atten: 30 dB			Auto Tun
Ref Offset			WIKET 2.4	02 087 5 GHz -2.213 dBm	
o.o					Center Fre
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	<u>HAAAAAAAAAAAAAAAAAAAAA</u>		<u>KAANAAAAAAAAAAAAAAAAA</u>	<u> MAAAAAAAA</u>	
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tart 2.40000 GHz			S	top 2.48350 GHz	CF Ste
Res BW 100 kHz	#VBW 30	0 kHz	Sweep 8.0	00 ms (1001 pts)	8.350000 MH Auto Ma
KR MODE TRC SCL	× 2.402 087 5 GHz -2	2.213 dBm	CTION FUNCTION WIDTH	FUNCTION VALUE	
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G Keysight Spectrum Analyzer - :			Costatus DH5 2402MHz		
Keysight Spectrum Analyzer - : RL RF 50		D. NVNT 2-1	DH5 2402MHz #Avg Type: RMS	Ant1 12:09:46 PM Mar 08, 2024	<mark>⊢ ∂</mark>
Keysight Spectrum Analyzer - : R L RF 50	Swept SA Q AC 750000 GHz PNO: Fast C	). NVNT 2-I	DH5 2402MHz	Ant1 12:09:46 PM Mar 08, 2024	Frequency
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Keysight Spectrum Analyzer - 50           RL         RF         50           enter Freq 2.441         Ref Offset 3         Ref Offset 3           0 dB/div         Ref 20.00         Ref 20.00	Swept SA 12 AC 750000 GHz PN0: Fast IFGain:Low 3.36 dB	). NVNT 2-1   SENSE:PULSE  rig: Free Run	DH5 2402MHz #Avg Type: RMS Avg Hold:>100/100	Ant1 12:09:46 PM Mar 08, 2024 TRACE 2 3 4 5 6 TYPE MUNICIPAL DET PINININI	Auto Tun
Keysight Spectrum Analyzer - 1 RL RE 50 enter Freq 2.4417 Ref Offset: dB/div Ref 20.00 9	Swept SA Q AC PNO: Fast IFGain:Low 3.36 dB 0 dBm	D. NVNT 2-I SENSE:PULSE rig: Free Run Atten: 30 dB	H5 2402MHz #Avg Type: RMS Avg Hold:>100/100 Mkr1 2.4	Ant1 12:09:46 PM Mar 08, 2024 TRACE 1 2 3 4 5 6 TYPE NUMBER 01 837 0 GHz -1.337 dBm	Frequency
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Keysight Spectrum Analyzer - 1           RL         RE         S0           enter Freq 2.4417           Ref Offset:           dB/div         Ref Offset:           0         M         M         M           00         1         -         -         -           00         1         -	Swept SA Q AC PNO: Fast IFGain:Low 3.36 dB 0 dBm	D. NVNT 2-I SENSE:PULSE rig: Free Run Atten: 30 dB	H5 2402MHz #Avg Type: RMS Avg Hold:>100/100 Mkr1 2.4	Ant1 12:09:46 PMMar 08, 2024 TRACE 2 3 4 5 0 TYPE M WINNE 01 837 0 GHz -1.337 dBm	Frequency Auto Tun Center Fre 2.441750000 GF Start Fre
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Recurrent Analyzer - 1           Ref 0ffset:           center Freq 2.4417           Ref 0ffset:           dB/div         Ref 0ffset:           dB/div         Ref 0ffset:           dB/div         Ref 20.00           Offset:           Offset: <td>Swept SA 20 AC PNO: Fast IFGain:Low 3.36 dB 0 dBm M/W/W/W/W/W/W/W/W/W/W/W/W/W/W/W/W/W/W/W</td> <td>D. NVNT 2-I</td> <td>DH5 2402MHz #Avg Type: RMS Avg Hold:&gt;100/100 Mkr1 2.4</td> <td>Ant1 12:09:46 PM Mar 08, 2024 TRACE 2:3:4:5:6 TYPE 0:1:2:3:4:5:6 OI 837 0 GHz -1.337 dBm 2:2:00 0:00 0:00 0:00 0:00 0:00 0:00 0:00</td> <td>Frequency Auto Tun Center Fre 2.441750000 GH Start Fre 2.400000000 GH</td>	Swept SA 20 AC PNO: Fast IFGain:Low 3.36 dB 0 dBm M/W/W/W/W/W/W/W/W/W/W/W/W/W/W/W/W/W/W/W	D. NVNT 2-I	DH5 2402MHz #Avg Type: RMS Avg Hold:>100/100 Mkr1 2.4	Ant1 12:09:46 PM Mar 08, 2024 TRACE 2:3:4:5:6 TYPE 0:1:2:3:4:5:6 OI 837 0 GHz -1.337 dBm 2:2:00 0:00 0:00 0:00 0:00 0:00 0:00 0:00	Frequency Auto Tun Center Fre 2.441750000 GH Start Fre 2.400000000 GH
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Keysight Spectrum Analyzer - 50           Ref Offset: 50           enter Freq 2.4417           Ref Offset: 50           o dB/div         Ref Offset: 50           O div         O div           O div         O div           O div         Colspan="2">O div           O div         O div	Swept SA 2 AC 750000 GHz PN0: Fast IFGain:Low 3.36 dB 0 dBm 4 4 4 4 4 4 4 4 4 4 4 4 4	D. NVNT 2-I	DH5 2402MHz #Avg Type: RMS Avg Hold:>100/100 Mkr1 2.4	Ant1 12:09:46 PM Mar 08, 2024 TRACE 2 3 4 5 0 TYPE 3 4 5 0 DET PNNNN 01 837 0 GHz -1.337 dBm 2 2 2 2 2 2 2 2 2 2 2 2 2	Frequency Auto Tun Center Fre 2.441750000 GF 2.400000000 GF 2.403500000 GF 2.48350000 GF CF Ste 8.350000 MF Auto Ma



Но	pping No. NVNT 3-	DH5 2402MH	z Ant1	
Keysight Spectrum Analyzer - Swept SA	SENSE:PULSE		12:32:19 PM Mar 08, 2024	- ¢ ×
	NO: Fast Trig: Free Run Gain:Low #Atten: 30 dB	#Avg Type: RMS Avg Hold:>100/100	TRACE 1 2 3 4 5 6 TYPE M WWWWW DET P N N N N N	Frequency
Ref Offset 3.36 dB		Mkr1 2.	401 837 0 GHz -1.310 dBm	Auto Tune
Log 10.0 0.00 -10.0	www.www.www	hvmvyjhvyddi	www.www.	Center Freq 2.441750000 GHz
-20.0 -30.0 -40.0				Start Freq 2.400000000 GHz
-50.0 <b></b>			\\\ 	<b>Stop Freq</b> 2.483500000 GHz
Start 2.40000 GHz #Res BW 100 kHz	#VBW 300 kHz		Stop 2.48350 GHz 000 ms (1001 pts)	CF Step 8.350000 MHz
MKR         MODE         TRC         SCL         X           1         N         1         f         2.401 837           2         N         1         f         2.480 410           3         4         5         6         6	0 GHz -1.310 dBm	ICTION FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Man Freq Offset 0 Hz
7 8 9 10 11			•	Scale Type
MSG		<b>I</b> STATUS		

No.: BCTC/RF-EMC-005

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# 14. Dwell Time

### 14.1 Block Diagram Of Test Setup



#### 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).

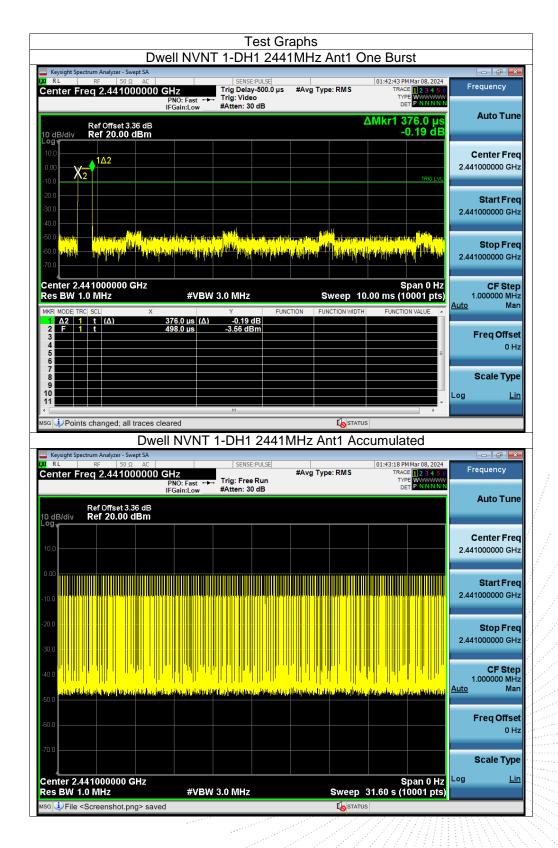
Mode	Frequency (MHz)	Pulse Time (ms)	Total Dwell Time (ms)	Burst Count	Period Time (ms)	Limit (ms)	Verdict
1-DH1	2441	0.376	120.320	314	31600	400	Pass
1-DH3	2441	1.632	261.120	156	31600	400	Pass
1-DH5	2441	2.88	307.200	94	31600	400	Pass
2-DH1	2441	0.385	123.200	317	31600	400	Pass
2-DH3	2441	1.638	262.080	159	31600	400	Pass
2-DH5	2441	2.886	307.840	129	31600	400	Pass
3-DH1	2441	0.386	123.520	318	31600	400	Pass
3-DH3	2441	1.637	261.920	162	31600	400	Pass
3-DH5	2441	2.888	308.053	101	31600	400	Pass

#### 14.4 Test Result

Note: Total Dwell Time (ms) = Pulse Time (ms)\*Burst Count









Dwe	II NVNT 1-DH3 24	41MHz Ant1 O	ne Burst	
Keysight Spectrum Analyzer - Swept SA     K     RL     RF     50 Ω AC	SENSE:PULSE		01:44:49 PM Mar 08, 2024	
Center Freq 2.441000000 G		ıs #Avg Type: RMS	TRACE 1 2 3 4 5 6 TYPE WWWWW DET P NNNN	Frequency
Ref Offset 3.36 dB 10 dB/div Ref 20.00 dBm	Guineon	Δ	Mkr1 1.632 ms 6.56 dB	Auto Tune
10.0				Center Freq
0.00 <b>1∆2</b>			TRIG LVL	2.441000000 GHz
				Start Freq
-30.0				2.441000000 GHz
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-70.0		i att bit		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
	Υ 632 ms (Δ) 6.56 dB	UNCTION FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Man
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8 9 10				Scale Type
				Log <u>Lin</u>
MSG Doints changed; all traces clea				
	NVNT 1-DH3 244	1MHz Ant1 Acc	cumulated	
Keysight Spectrum Analyzer - Swept SA           RL         RF         50 Ω         AC           Center Freq 2.441000000 G		#Avg Type: RMS	01:45:24 PM Mar 08, 2024 TRACE 1 2 3 4 5 6 TYPE WWWWWW	Frequency
	PNO: Fast ++- Trig: Free Run Gain:Low #Atten: 30 dB		TYPE WWWWW DET PNNNNN	Auto Tune
Ref Offset 3.36 dB 10 dB/div Ref 20.00 dBm Log				
10.0				Center Fred 2.441000000 GHz
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-20.0				Stop Fred 2.441000000 GH:
-30.0				CF Step
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-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	Sweep 3	31.60 s (10001 pts)	
- I no concentionering, saveu		NO CHAIDO		



	Dwell NVNT 1-D	DH5 2441MI	Hz Ant1 Or	ne Burst	
Keysight Spectrum Analyzer - Swep		ENSE:PULSE		12:04:01 PM Mar 08, 2024	e ē 🗾
Center Freq 2.441000	DOOD GHZ Trig D	Delay-500.0 µs #Av	g Type: RMS	TRACE 1 2 3 4 5 6 TYPE DET P NNNN	Frequency
Ref Offset 3.36 10 dB/div Ref 20.00 d	dB		Δι	Mkr1 2.880 ms -4.26 dB	Auto Tune
0g					Center Fre
0.00					2.441000000 GH
	1Δ2			TRIG LVL	
20.0					Start Fre
30.0					2.441000000 GH
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70.0	a dal Marth ada a				2.441000000 GH
enter 2.441000000 GI	7			Span 0 Hz	CF Ste
es BW 1.0 MHz	#VBW 3.0 M	Hz	Sweep 10.0	00 ms (10001 pts)	1.000000 MH
KR MODE TRC SCL	X Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Ma
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G Points changed; all tra			<b>K</b> STATUS		
	Dwell NVNT 1-DH	15 2441MH	z Ant1 Acc	umulated	
Keysight Spectrum Analyzer - Swep R L RF 50 Ω	AC S	ENSE:PULSE		12:04:36 PM Mar 08, 2024	Frequency
enter Freq 2.441000	PNO: Fast ++++ Irig: I	Free Run	g Type: RMS	TRACE 1 2 3 4 5 6 TYPE WWWWWW DET P NNNNN	requeries
		n: 30 dB			Auto Tun
Ref Offset 3.36 dB/div Ref 20.00 dB	dB Sm				
°g					Center Fre
0.0					2.441000000 GH
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es BW 1.0 MHz	#VBW 3.0 M	Hz		1.60 s (10001 pts)	
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	Dwell NVNT	2-DH1 244	11MHz Ant1	One Burst	
Keysight Spectrum Analyzer - Swept SA		SENSE:PULSE		01:45:37 PM Mar 08, 2024	
Center Freq 2.4410000		Trig Delay-500.0 µs Trig: Video #Atten: 30 dB	#Avg Type: RMS		Frequency
Ref Offset 3.36 d 10 dB/div Ref 20.00 dBr Log v	В			ΔMkr1 385.0 μs -3.57 dB	Auto Tune
10.0					Center Freq
0.00					2.441000000 GHz
-10.0 <b>1Δ2</b>				TRIG LVL	
-20.0					Start Freq 2.441000000 GHz
-40.0					
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-70.0		and protection of a called a	ten and the state of the state		2.441000000 GHz
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Res BW 1.0 MHz	#VBW :			10.00 ms (10001 pts)	1.000000 MHz <u>Auto</u> Man
MKR MODE TRC SCL 1 Δ2 1 t (Δ) 2 F 1 t	× 385.0 μs (Δ) 493.0 μs	Y FU -3.57 dB -12.95 dBm	NCTION FUNCTION W	IDTH FUNCTION VALUE	
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	A C OO GHz PNO: Fast ↔	SENSE:PULSE Trig: Free Run #Atten: 30 dB	#Avg Type: RMS	01:46:11 PM Mar 08, 2024	Frequency
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Reysight Spectrum Analyzer - Swept SA RL RF 50 Q Ad Center Freq 2.4410000 Ref Offset 3.36 dl	A 00 GHz PNO: Fast ↔→→ IFGain:Low	SENSE:PULSE		01:46:11 PM Mar 08, 2024 TRACE 1 2 3 4 5 6	Frequency Auto Tune
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Resight Spectrum Analyzer - Swept S/           RL         RF         50 Ω         A(           Center Freq 2.4410000         Ref Offset 3.36 dl         A(           10 dE/div         Ref 20.00 dBn         Od Bn	A 00 GHz PNO: Fast ↔→→ IFGain:Low	SENSE:PULSE		01:46:11 PM Mar 08, 2024 TRACE 1 2 3 4 5 6	Frequency Auto Tune Center Freq 2.441000000 GHz
Reysight Spectrum Analyzer - Swept S/           RE         S0 0.2 At           Center Freq 2.4410000           Ref Offset 3.36 dl           10 dEJ/div         Ref 20.00 dBn           0 00         Image: Spectrum Analyzer - Swept S/	A 00 GHz PNO: Fast ↔→→ IFGain:Low	SENSE:PULSE		01:46:11 PM Mar 08, 2024 TRACE 1 2 3 4 5 6	Frequency Auto Tune Center Freq 2.441000000 GHz Start Freq
Reysight Spectrum Analyzer - Swept S/ K RL RF 50 & At Center Freq 2.4410000 Ref Offset 3.36 dl 10 dB/div Ref 20.00 dBn 10.0	A 00 GHz PNO: Fast ↔→→ IFGain:Low	SENSE:PULSE		01:46:11 PM Mar 08, 2024 TRACE 1 2 3 4 5 6	Frequency Auto Tune Center Freq 2.441000000 GHz Start Freq
Reysight Spectrum Analyzer - Swept S/           RL         RF         50 Ω         At           Center Freq 2.4410000         Ref Offset 3.36 dl         At         At         Ref Offset 3.36 dl         At           10 dB/div         Ref 20.00 dBn         0.00	A 00 GHz PNO: Fast ↔→→ IFGain:Low	SENSE:PULSE		01:46:11 PM Mar 08, 2024 TRACE 1 2 3 4 5 6	Frequency Auto Tune Center Freq 2.441000000 GHz Start Freq 2.441000000 GHz
Reysight Spectrum Analyzer - Swept S/           RL         RF         50 Q. At           Center Freq 2.4410000         Ref Offset 3.36 di         Ref Offset 3.36 di           10 dB/div         Ref 20.00 dBn         Ref 20.00 dBn	A 00 GHz PNO: Fast ↔→→ IFGain:Low	SENSE:PULSE		01:46:11 PM Mar 08, 2024 TRACE 1 2 3 4 5 6	Frequency Auto Tune Center Freq 2.441000000 GHz Start Freq 2.441000000 GHz
Reysight Spectrum Analyzer - Swept 5/ XX RL RF 50 Q. Ad Center Freq 2.4410000 Ref Offset 3.36 dl 10 dB/div Ref 20.00 dBn 10 0 10 0 -20.0	A 00 GHz PNO: Fast ↔→→ IFGain:Low	SENSE:PULSE		01:46:11 PM Mar 08, 2024 TRACE 1 2 3 4 5 6	Frequency           Auto Tune           Center Freq           2.441000000 GHz           Start Freq           2.441000000 GHz           Stop Freq           2.441000000 GHz           CF Step           1.000000 MHz
Keysight Spectrum Analyzer - Swept S/           Keysight Spectrum Analyzer - Swept S/           R         RF         50 Ω         At           Center Freq 2.4410000         Ref Offset 3.36 dl         O         O         O           0 dB/div         Ref Offset 3.36 dl         Ref Offset 3.36 dl         O <td>A C DO GHZ PNO: Fast ↔→ IFGain:Low B m</td> <td>SENSE:PULSE</td> <td>#Avg Type: RMS</td> <td>01:46:11 PM Mar 08, 2024 TRACE 1 2:34 5 G TYPE WWWWW DET PNNNN N</td> <td></td>	A C DO GHZ PNO: Fast ↔→ IFGain:Low B m	SENSE:PULSE	#Avg Type: RMS	01:46:11 PM Mar 08, 2024 TRACE 1 2:34 5 G TYPE WWWWW DET PNNNN N	
Keysight Spectrum Analyzer - Swept 5/2           Keysight Spectrum Analyzer - Swept 5/2           Keysight Spectrum Analyzer - Swept 5/2           Center Freq 2.4410000           Ref Offset 3.36 dl           10 dB/div         Ref 20.00 dBn           10 0         Ref 20.00 dBn           10 0         Ref 20.00 dBn           -10 0         Ref 20.00 dBn           -20 0         Ref 20.00 dBn           -30 0         Ref 20.00 dBn           -40 0         Ref 20.00 dBn	A C DO GHZ PNO: Fast ↔→ IFGain:Low B m	SENSE:PULSE	#Avg Type: RMS	01:46:11 PM Mar 08, 2024 TRACE 1 2:34 5 G TYPE WWWWW DET PNNNN N	Frequency Auto Tune Center Freq 2.441000000 GHz Start Freq 2.441000000 GHz Stop Freq 2.441000000 GHz CF Step 1.000000 MHz Auto Man
Keysight Spectrum Analyzer - Swept 5/2           Keysight Spectrum Analyzer - Swept 5/2           Keysight Spectrum Analyzer - Swept 5/2           Center Freq 2.4410000           Ref Offset 3.36 dl           10 dB/div         Ref 20.00 dBn           10 0         Ref 20.00 dBn           200         Ref 20.00 dBn           10 0         Ref 20.00 dBn           200         Ref 20.00 dBn	A C DO GHZ PNO: Fast ↔→ IFGain:Low B m	SENSE:PULSE	#Avg Type: RMS	01:46:11 PM Mar 08, 2024 TRACE 1 2:34 5 G TYPE WWWWW DET PNNNN N	Frequency Auto Tune Center Freq 2.441000000 GHz Start Freq 2.441000000 GHz Stop Freq 2.441000000 GHz CF Step 1.000000 MHz Auto Man
Keysight Spectrum Analyzer - Swept 5/2           Keysight Spectrum Analyzer - Swept 5/2           Keysight Spectrum Analyzer - Swept 5/2           Center Freq 2.4410000           Ref Offset 3.36 dl           10 dB/div         Ref 20.00 dBn           10 0         Ref 20.00 dBn           10 0         Ref 20.00 dBn           -10 0         Ref 20.00 dBn           -20 0         Ref 20.00 dBn           -30 0         Ref 20.00 dBn           -40 0         Ref 20.00 dBn	A C DO GHZ PNO: Fast ↔→ IFGain:Low B m	SENSE:PULSE	#Avg Type: RMS	01:46:11 PM Mar 08, 2024 TRACE 1 2:34 5 G TYPE WWWWW DET PNNNN N	Frequency Auto Tune Center Freq 2.441000000 GHz Start Freq 2.441000000 GHz 2.441000000 GHz 2.441000000 GHz 1.000000 MHz Auto Man Freq Offset 0 Hz
Keysight Spectrum Analyzer - Swept S/           RL         RF         50 R. At           Center Freq 2.4410000         Ref Offset 3.36 dl         At           Ref Offset 3.36 dl         Ref 20.00 dBn         At           10 dB/div         Ref 20.00 dBn         At           -000	A C DO GHz PNO: Fast IFGain:Low B n IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	SENSE:PULSE	#Avg Type: RMS		Frequency Auto Tune Center Freq 2.441000000 GHz Start Freq 2.441000000 GHz Stop Freq 2.441000000 GHz CF Step 1.000000 MHz Auto Man
Keysight Spectrum Analyzer - Swept S/           RL         RF         50 Q. At           Center Freq 2.4410000         Ref Offset 3.36 dl         Ref Offset 3.36 dl           10 dB/div         Ref 20.00 dBn         Ref 20.00 dBn           -0.00         -0.00         -0.00         -0.00           -10.0         -0.00         -0.00         -0.00         -0.00           -20.0         -2.00         -0.00         -0.00         -0.00         -0.00         -0.00           -20.0         -2.00         -0.00	A C DO GHZ PNO: Fast IFGain:Low B n A B n A B n A B n A B n A B N B A B	SENSE:PULSE	#Avg Type: RMS	01-46:11 PM Mar 08, 2024 TRACE    2:3 4:5 6 TYPE WWWWWW DET PM MIN N 0 1 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Frequency Auto Tune Center Freq 2.441000000 GHz Start Freq 2.441000000 GHz 2.441000000 GHz 2.441000000 GHz 2.441000000 GHz CF Step 1.000000 MHz Auto Man Freq Offset 0 Hz Scale Type

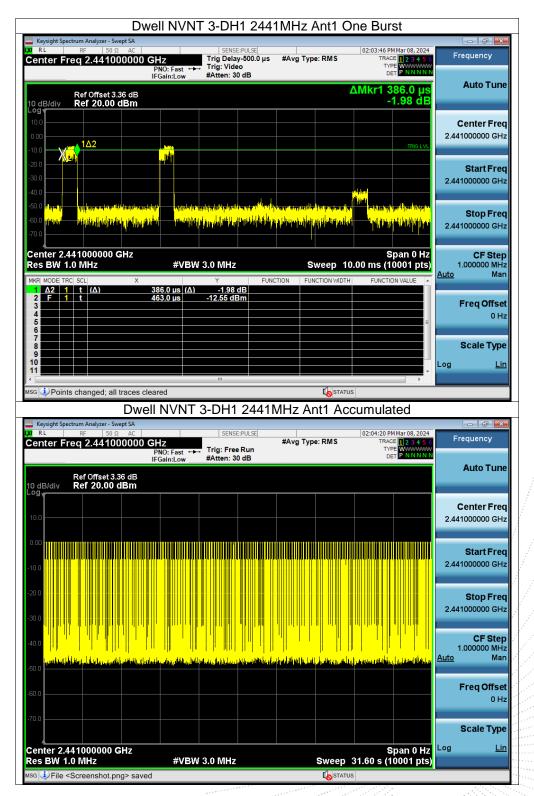


Dwe	ell NVNT 2-DH3	2441MHz Ant1 O	ne Burst	
Keysight Spectrum Analyzer - Swept SA				
	Hz PNO: Fast ↔ FGain:Low SENSE:PUI Trig Delay-50 Trig: Video #Atten: 30 dE	00.0 μs #Avg Type: RMS	02:02:52 PM Mar 08, 2024 TRACE 1 2 3 4 5 6 TYPE WWWWW DET P N N N N N	Frequency
Ref Offset 3.36 dB 10 dB/div Ref 20.00 dBm	roun.cow		Mkr1 1.638 ms 0.37 dB	Auto Tune
10.0				Center Freq
-10.0 X2			TRIG LVL	2.441000000 GHz
-20.0				<b>Start Freq</b> 2.441000000 GHz
-40.0 -50.0 <mark>สุขฐกุญ</mark>	na sina bi dan ka sika ki da ki ang ka si	the state of the length of the state of the		Stop Frog
-60.0 <mark>digitiji</mark>	i ya a kaj su kati kati kati angin su kati ni pila ngi p Ngi pila ngi	A read of the production of the free of th		<b>Stop Freq</b> 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)	<b>CF Step</b> 1.000000 MHz
	.638 ms (Δ) 0.37 dB	FUNCTION FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Man
2 F 1 t	498.0 µs -4.69 dBm			<b>Freq Offset</b> 0 Hz
6 7 8				Scale Type
9 10 11				Log <u>Lin</u>
Msg Doints changed; all traces cle	m		►	
		<b>_</b>		
DWEI	INVNI 2-DH3 2	441MHz Ant1 Acc	cumulated	
M RL RF 50 Ω AC Center Freq 2.441000000 G	PNO: Fast ++++ Trig: Free Ru	#Avg Type: RMS	02:03:26 PM Mar 08, 2024 TRACE 1 2 3 4 5 6 TYPE WWWWWWW DET P NNNNN	Frequency
Ref Offset 3.36 dB 10 dB/div Ref 20.00 dBm	IFGain:Low #Atten: 30 dE			Auto Tune
10.0				Center Freq
				2.441000000 GHz
-10.0				
-10 0 -20 0				2.441000000 GHz Stop Freq
-20.0				2.441000000 GHz Stop Freq 2.441000000 GHz CF Step 1.000000 MHz
-20 0 -30 0 -40 0 -50 0				2.441000000 GHz Stop Freq 2.441000000 GHz CF Step 1.000000 MHz <u>Auto</u> Man
-20.0 -30.0 -40.0 -40.0 -50.0 -60.0				<b>Stop Freq</b> 2.44100000 GHz <b>CF Step</b> 1.000000 MHz <u>Auto</u> Man
-20.0 -30.0 -40.0 -50.0 -20.0				2.441000000 GHz Stop Freq 2.441000000 GHz <u>CF Step</u> 1.000000 MHz <u>Auto</u> Man Freq Offset 0 Hz Scale Type
-20 0 -30 0 -40 0 -50 0 -60 0	and ministration of the second s	Sweep :	Span 0 Hz 31.60 s (10001 pts)	2.441000000 GHz Stop Freq 2.441000000 GHz 1.000000 MHz <u>Auto</u> Man Freq Offset 0 Hz

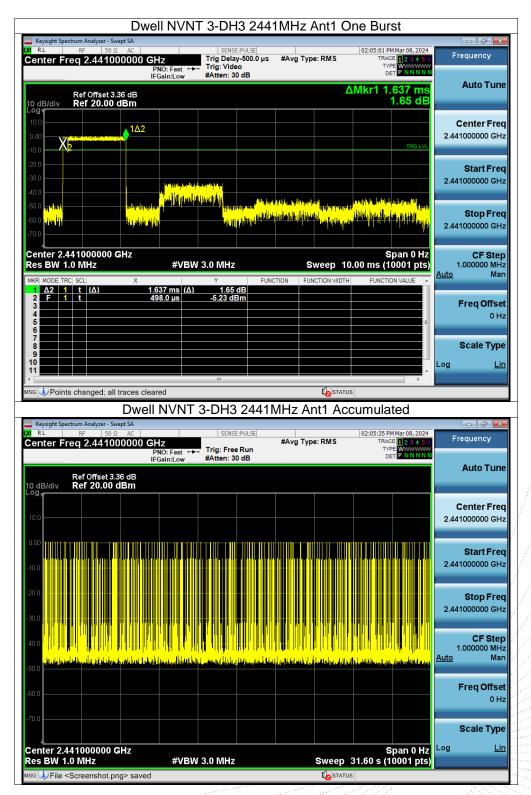


Dwell NVN	T 2-DH5 2441	MHz Ant1 One	e Burst	
Keysight Spectrum Analyzer - Swept SA				
CM RL RF 50Ω AC Center Freq 2.441000000 GHz PNO: Fast ↔ IFGain:Low	SENSE:PULSE Trig Delay-500.0 μs Trig: Video #Atten: 30 dB	#Avg Type: RMS	12:10:41 PM Mar 08, 2024 TRACE 1 2 3 4 5 6 TYPE WWWWW DET P N N N N N	Frequency
Ref Offset 3.36 dB 10 dB/div Ref 20.00 dBm	WAREN. OU UB	ΔΜ	kr1 2.886 ms 3.37 dB	Auto Tune
				Center Freq 2.441000000 GHz
-10.0 2.2.0			TRIG LVL	Start Freq
-30.0 -40.0 -50.0 tota		ية المركز الألباني. من المركز الم	dination of the spectrum to set	2.441000000 GHz
-60.0 1445	a state for the state of the st	Willing of all and support in the support of		<b>Stop Freq</b> 2.441000000 GHz
	3.0 MHz		Span 0 Hz 3 ms (10001 pts)	<b>CF Step</b> 1.000000 MHz <u>Auto</u> Man
MKR         MODE         TRC         SCL         X           1         Δ2         1         t         (Δ)         2.886 ms (Δ)           2         F         1         t         496.8 μs         3           3         4         4         4         496.8 μs	Y FUNCT 3.37 dB -5.84 dBm	ION FUNCTION WIDTH	FUNCTION VALUE	Freq Offset
5 6 7 8 9 9				Scale Type
				Log <u>Lin</u>
MSG Points changed; all traces cleared		STATUS		
	2-DH5 2441N	1Hz Ant1 Accu	mulated	
Keysight Spectrum Analyzer -Swept SA     N     RL     RF     S0 Ω AC     Center Freq 2.441000000 GHz     PN0: Fast     FGain:Low	SENSE:PULSE Trig: Free Run #Atten: 30 dB	#Avg Type: RMS	12:11:15 PM Mar 08, 2024 TRACE 1 2 3 4 5 6 TYPE WWWWW DET PNNNN	Frequency
Ref Offset 3.36 dB 10 dB/div Ref 20.00 dBm				Auto Tune
10.0				Center Freq 2.441000000 GHz
0.00 				<b>Start Freq</b> 2.441000000 GHz
-20.0				<b>Stop Freq</b> 2.441000000 GHz
			an a	<b>CF Step</b> 1.000000 MHz <u>Auto</u> Man
-50.0 <b>15 (15 (15 (15 (15 (15 (15 (15 (15 (15 (</b>				Freq Offset 0 Hz
-70.0				Scale Type
Center 2.441000000 GHz Res BW 1.0 MHz #VBW	3.0 MHz	Sweep 31	Span 0 Hz .60 s (10001 pts)	Log <u>Lin</u>
MSG JFile <screenshot.png> saved</screenshot.png>				











	NVNT 3-DH5 244	1MHz Ant1 On	e Burst	
Keysight Spectrum Analyzer - Swept SA μ RL RF 50 Ω AC	SENSE:PULSE		12:40:05 PM Mar 08, 2024	Frequency
	): Fast 🛶 Trig: Video	#Avg Type: RMS	TRACE 123456 TYPE WWWWWW DET P N N N N N	Frequency
	in:Low#Atten: 30 dB	<u> </u>	kr1 2.888 ms	Auto Tune
Ref Offset 3.36 dB 10 dB/div Ref 20.00 dBm Log			-1.89 dB	
10.0				Center Freg
0.00				2.441000000 GHz
	1Δ2		TRIG LVL	
-20.0				Start Freq
-30.0				2.441000000 GHz
-50.0	the state of the s	and a full condition of the state of the sta	ellane beellagen televantelen oppfichels te	Stop Frog
-60.0 <mark>Wint</mark>	u na sana katang kat	<mark>i na na mini di ni na kanan ing majarin</mark> a kaninda		<b>Stop Freq</b> 2.441000000 GHz
-70.0				
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
			FUNCTION VALUE	<u>Auto</u> Man
1         Δ2         1         t         (Δ)         2.88           2         F         1         t         484	8 ms (Δ) -1.89 dB .0 μs -13.82 dBm			
3 4				Freq Offset 0 Hz
5			E	
7 8 9				Scale Type
10 11				Log <u>Lin</u>
			•	
MSG Points changed; all traces cleared			and the stand	
Lowell P     Keysight Spectrum Analyzer - Swept SA	IVNT 3-DH5 2441	MHZ ANTI ACCU	mulated	
Center Freq 2.441000000 GHz	SENSE:PULSE			
			12:40:40 PM Mar 08, 2024 TRACE 1 2 3 4 5 6	Frequency
PNC	): Fast ++++ Irig: Free Run	#Avg Type: RMS	TRACE 1 2 3 4 5 6 TYPE WWWWWW DET P NNNN	Frequency
PNC IFGa	): Fast $\leftrightarrow$ Irig: Free Run		TRACE 1 2 3 4 5 6	Frequency Auto Tune
PNC IFGa Ref Offset 3.36 dB	): Fast ++++ Irig: Free Run		TRACE 1 2 3 4 5 6	
PAG IFGa 10 dB/div Ref Offset 3.36 dB Log	): Fast ++++ Irig: Free Run		TRACE 1 2 3 4 5 6	
PNC IFGa Ref Offset 3.36 dB	): Fast ++++ Irig: Free Run		TRACE 1 2 3 4 5 6	Auto Tune Center Freq
PAG IFGa Ref Offset 3.36 dB 10 dB/div Ref 20.00 dBm	): Fast ++++ Irig: Free Run		TRACE 1 2 3 4 5 6	Auto Tune Center Freq 2.441000000 GHz
PNC IFGa 10 dB/div Ref Offset 3.36 dB 10 dB/div Ref 20.00 dBm	): Fast ++++ Irig: Free Run		TRACE 1 2 3 4 5 6	Auto Tune Center Freq
10 dB/div Ref 0ffset 3.36 dB Ref 20.00 dBm	): Fast ++++ Irig: Free Run		TRACE 1 2 3 4 5 6	Auto Tune Center Freq 2.441000000 GHz Start Freq
PNC IFGa 10 dB/div Ref Offset 3.36 dB 20 dB/div Ref 20.00 dBm	): Fast ++++ Irig: Free Run		TRACE 1 2 3 4 5 6	Auto Tune Center Freq 2.441000000 GHz Start Freq
PNC IFGa Ref Offset 3.36 dB Ref 20.00 dBm 10.0 .000	): Fast ++++ Irig: Free Run		TRACE 1 2 3 4 5 6	Auto Tune Center Freq 2.44100000 GHz Start Freq 2.441000000 GHz
PAG IFGa Ref Offset 3.36 dB 10 dB/div Ref 20.00 dBm 10 0 	): Fast ++++ Irig: Free Run		TRACE 1 2 3 4 5 6	Auto Tune Center Freq 2.44100000 GHz 2.441000000 GHz Stop Freq 2.441000000 GHz
PNC IFGa Ref Offset 3.36 dB 10 dB/div Ref 20.00 dBm 10 0 .000 .10 0 .000 .000 .000 .000	): Fast ++++ Irig: Free Run		TRACE 1 2 3 4 5 6	Auto Tune Center Freq 2.441000000 GHz Start Freq 2.441000000 GHz Stop Freq 2.441000000 GHz CF Step 1.000000 MHz
PNC IFGa Ref Offset 3.36 dB 10 dB/div Ref 20.00 dBm 10 0 -0.00 -10 0 -10 0 -20 0 -30 0 -10 0 	): Fast ++++ Irig: Free Run		TRACE 1 2 3 4 5 6	Auto Tune Center Freq 2.441000000 GHz Start Freq 2.441000000 GHz Stop Freq 2.441000000 GHz
PNC IFGa 10 dB/div Ref Offset 3.36 dB 10 dB/div Ref 20.00 dBm 10 0 0.00 	): Fast ++++ Irig: Free Run		TRACE 1 2 3 4 5 6	Auto Tune Center Freq 2.441000000 GHz Start Freq 2.441000000 GHz Stop Freq 2.441000000 GHz CF Step 1.000000 MHz
PNC IFGa 10 dB/div Ref Offset 3.36 dB 10 dB/div Ref 20.00 dBm 10 0 .000 .10 0 .20 0 .30 0 .40 0 .4	): Fast ++++ Irig: Free Run		TRACE 1 2 3 4 5 6	Start Freq           2.441000000 GHz           Start Freq           2.441000000 GHz           Stop Freq           2.441000000 GHz           CF Step           1.000000 MHz           Auto
PNC IFGa 10 dB/div Ref Offset 3.36 dB 10 dB/div Ref 20.00 dBm 10 0 -0.00 -10 0 -10 0	): Fast ++++ Irig: Free Run		TRACE 1 2 3 4 5 6	Auto Tune Center Freq 2.441000000 GHz Start Freq 2.441000000 GHz 2.441000000 GHz 1.000000 MHz Auto Man Freq Offset 0 Hz
PNC IFGa 10 dB/div Ref Offset 3.36 dB 10 dB/div Ref 20.00 dBm 10 0 -0 00 -10 0 -10 0 -0 0	): Fast 🛶 Trig: Free Run		TRACE 2 3 4 5 G TYPE DET DINNIN	Auto Tune Center Freq 2.441000000 GHz 2.441000000 GHz 2.441000000 GHz 2.441000000 GHz 2.441000000 MHz Auto TFreq Offset 0 Hz Scale Type
Ref Offset 3.36 dB           10 dB/div         Ref 20.00 dBm           10.0	): Fast 🛶 Trig: Free Run	#Avg Type: RMS	TRACE 1 2 3 4 5 6	Auto Tune Center Freq 2.441000000 GHz Start Freq 2.441000000 GHz 2.441000000 GHz 1.000000 MHz Auto Man Freq Offset 0 Hz



### 15. Antenna Requirement

#### 15.1 Limit

#### 15.203 requirements:

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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217,§15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

### 15.2 Test Result

The EUT antenna is Internal antenna, not using a standard antenna jack or electrical connector for antenna replacement, fulfill the requirement of this section.

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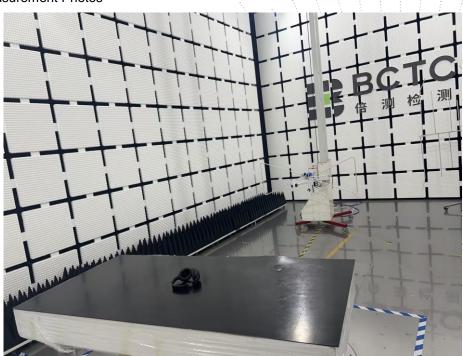


# 16. EUT Test Setup Photographs

Conducted Measurement Photos



#### 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 the "special seal for inspection and testing".
- 4. The test report is invalid without the signature of the approver.
- 5. The test process and test result is only related to the Unit Under Test.

6. Sample information is provided by the client and the laboratory is not responsible for its authenticity.

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

8. If there is any objection to this test 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, Zhancheng, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China

TEL: 400-788-9558

P.C.: 518103

FAX: 0755-33229357

Website: http://www.chnbctc.com

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

No.: BCTC/RF-EMC-005

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\*\*\*\*\* END \*\*\*\*\*