

TEST REPORT

Report No.:	No.: BCTC2304548311-1E				
Applicant:	OAXIS ASIA PTE LTD				
Product Name:	myFirst Fone S3				
Model/Type reference:	KW1401				
Tested Date:	2023-04-24 to 2023-05-15				
Issued Date:	2023-05-15				
She	nzhen BCTC Testing Co., Ltd.				
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FCC ID: 2ALET-KW1401

Product Name:	myFirst Fone S3
Trademark:	myFirst Fone
Model/Type Reference:	KW1401 KW1402
Prepared For:	OAXIS ASIA PTE LTD
Address:	31 Woodlands Close #01-22 Singapore
Manufacturer:	OAXIS ASIA PTE LTD
Address:	31 Woodlands Close #01-22 Singapore
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:	2023-04-24
Sample tested Date:	2023-04-24 to 2023-05-15
Issue Date:	2023-05-15
Report No.:	BCTC2304548311-1E
Test Standards	FCC Part15.247 ANSI C63.10-2013
Test Results	PASS
Remark:	This is Bluetooth Classic radio test report.

Tested by:

VONE 1

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)

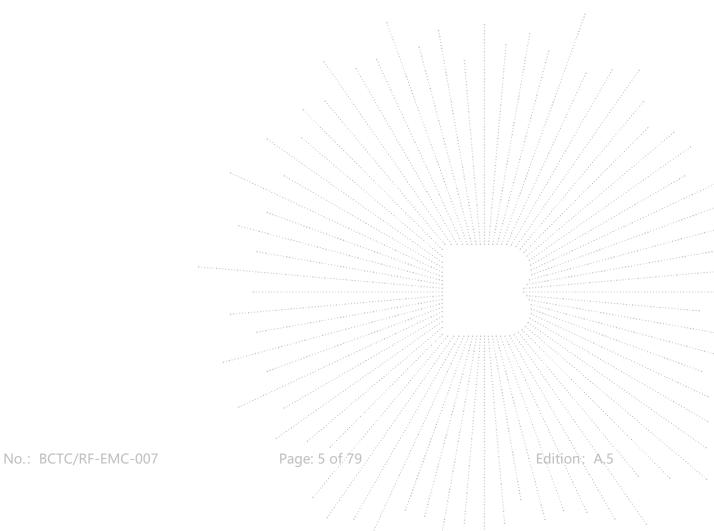
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1. Version

Report No.	Issue Date	Description	Approved
BCTC2304548311-1E	2023-05-15	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



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℃



Product Information And Test Setup 4.

4.1 Product Information

Model/Type reference:	KW1401 KW1402
Model differences:	All the model are the same circuit and RF module, except model names.
Bluetooth Version:	5.0
Hardware Version:	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:	-2.74 dBi
Ratings:	DC 5V from adapter/DC 3.7V from battery

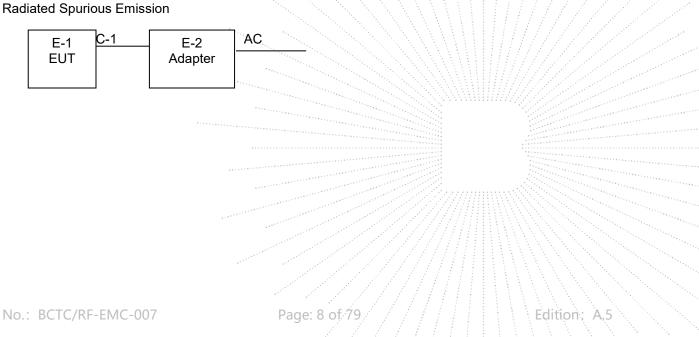
4.2 Test Setup Configuration

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	myFirst Fone S3	myFirst Fone	KW1401	N/A	EUT
E-2	Adapter	N/A	BCTC001	N/A	Auxiliary

ltem	Shielded Type	Ferrite Core	Length	Note
C-1	N/A	N/A	1M	DC cable unshielded

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	1



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 (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



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 24, 2022	May 23, 2023		
LISN	R&S	ENV216	101375	May 24, 2022	May 23, 2023		
Software	Frad	EZ-EMC	EMC-CON 3A1	١	١		
Attenuator	/	10dB DC-6GHz	1650	May 24, 2022	May 23, 2023		

	RF Conducted Test						
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.		
Power Metter	Keysight	E4419		May 24, 2022	May 23, 2023		
Power Sensor (AV)	Keysight	E9300A		May 24, 2022	May 23, 2023		
Signal Analyzer20kH z-26.5GHz	Keysight	N9020A	MY49100060	May 24, 2022	May 23, 2023		
Spectrum Analyzer9kHz- 40GHz	R&S	FSP40	100363	May 24, 2022	May 23, 2023		
Radio frequency control box	MAIWEI	MW100-RFC B	I_{\dots}	١			
Software	MAIWEI	MTS 8310		l l	\mathbf{F}		



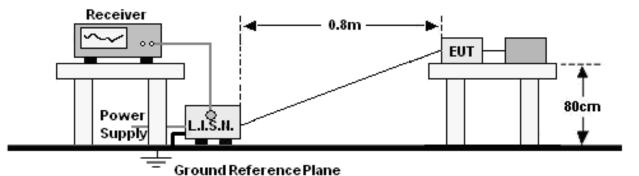
Radiated Emissions Test (966 Chamber01)							
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.		
966 chamber	ChengYu	966 Room	966	Jun. 06. 2020	Jun. 05, 2023		
Receiver	R&S	ESR3	102075	May 24, 2022	May 23, 2023		
Receiver	R&S	ESRP	101154	May 24, 2022	May 23, 2023		
Amplifier	Schwarzbeck	BBV9744	9744-0037	May 24, 2022	May 23, 2023		
TRILOG Broadband Antenna	Schwarzbeck	VULB9163	942	May 26, 2022	May 25, 2023		
Loop Antenna(9KHz -30MHz)	Schwarzbeck	FMZB1519B	00014	May 26, 2022	May 25, 2023		
Amplifier	SKET	LAPA_01G18 G-45dB	١	May 24, 2022	May 23, 2023		
Horn Antenna	Schwarzbeck	BBHA9120D	1541	Jun. 06, 2022	Jun. 05, 2023		
Amplifier(18G Hz-40GHz)	MITEQ	TTA1840-35- HG	2034381	May 26, 2022	May 25, 2023		
Horn Antenna(18G Hz-40GHz)	Schwarzbeck	BBHA9170	00822	Jun. 06, 2022	Jun. 05, 2023		
Spectrum Analyzer9kHz- 40GHz	R&S	FSP40	100363	May 24, 2022	May 23, 2023		
Software	Frad	EZ-EMC	FA-03A2 RE		λ_{j}		

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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	

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.

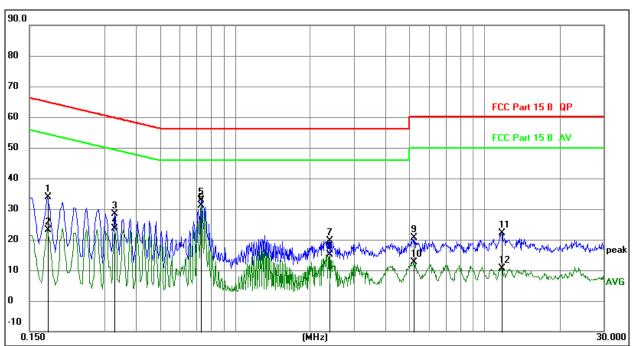
6.4 EUT operating Conditions

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 1	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
1	0.1768	14.03	19.74	33.77	64.63	-30.86	QP
2	0.1768	3.30	19.74	23.04	54.63	-31.59	AVG
3	0.3286	8.73	19.77	28.50	59.49	-30.99	QP
4	0.3286	3.95	19.77	23.72	49.49	-25.77	AVG
5	0.7313	13.14	19.74	32.88	56.00	-23.12	QP
6 *	0.7313	11.33	19.74	31.07	46.00	-14.93	AVG
7	2.3836	-0.36	19.92	19.56	56.00	-36.44	QP
8	2.3836	-4.86	19.92	15.06	46.00	-30.94	AVG
9	5.2213	0.41	20.13	20.54	60.00	-39.46	QP
10	5.2213	-7.54	20.13	12.59	50.00	-37.41	AVG
11	11.6826	1.76	20.28	22.04	60.00	-37.96	QP
12	11.6826	-9.60	20.28	10.68	50.00	-39.32	AVG

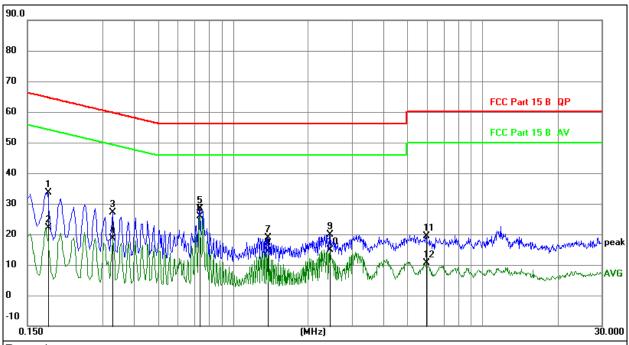
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Edition:



Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101KPa	Phase :	Ν
Test Mode:	Mode 1	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
1		0.1815	13.81	19.75	33.56	64.42	-30.86	QP
2		0.1815	2.28	19.75	22.03	54.42	-32.39	AVG
3		0.3300	7.32	19.77	27.09	59.45	-32.36	QP
4		0.3300	-1.04	19.77	18.73	49.45	-30.72	AVG
5		0.7350	8.76	19.74	28.50	56.00	-27.50	QP
6	*	0.7350	6.12	19.74	25.86	46.00	-20.14	AVG
7		1.3740	-0.92	19.80	18.88	56.00	-37.12	QP
8		1.3740	-5.52	19.80	14.28	46.00	-31.72	AVG
9		2.4360	0.00	19.93	19.93	56.00	-36.07	QP
10		2.4360	-5.04	19.93	14.89	46.00	-31.11	AVG
11		5.9370	-0.65	20.15	19.50	60.00	-40.50	QP
12		5.9370	-9.64	20.15	10.51	50.00	-39.49	AVG

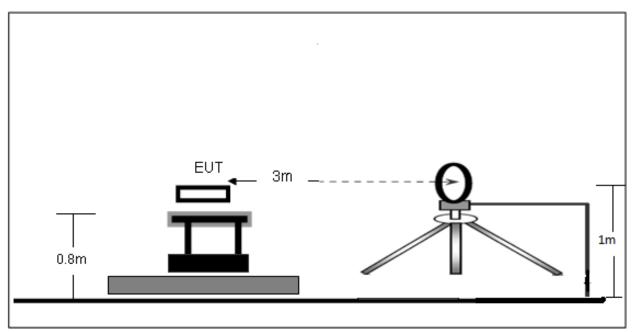
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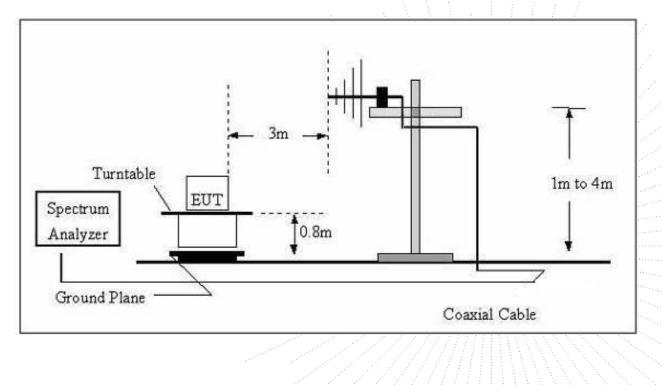
7. Radiated emissions

7.1 Block Diagram Of Test Setup

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

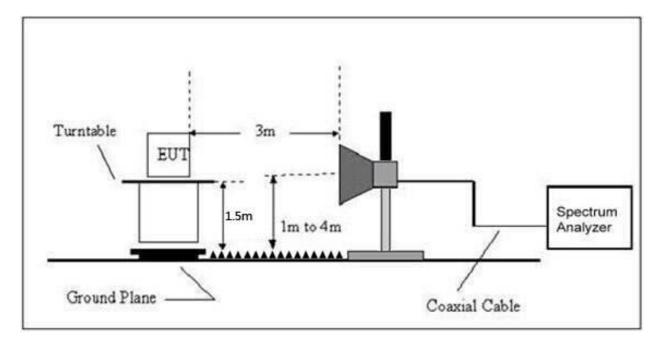


(B) Radiated Emission Test-Up Frequency 30MHz~1GHz





(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.

Field Strength	Distance	Field Strength Limit at 3m Distance		
uV/m	(m)	uV/m	dBuV/m	
2400/F(kHz)	300	10000 * 2400/F(kHz)	20log ^{(2400/F(kHz))} + 80	
24000/F(kHz)	30	100 * 24000/F(kHz)	20log ^{(24000/F(kHz))} + 40	
30	30	100 * 30	20log ⁽³⁰⁾ + 40	
100	3	100	20log ⁽¹⁰⁰⁾	
150	3	150	20log ⁽¹⁵⁰⁾	
200	3	200	20log ⁽²⁰⁰⁾	
500	3	500	20log ⁽⁵⁰⁰⁾	
	uV/m 2400/F(kHz) 24000/F(kHz) 30 100 150 200	uV/m (m) 2400/F(kHz) 300 24000/F(kHz) 30 30 30 100 3 150 3 200 3	uV/m (m) uV/m 2400/F(kHz) 300 10000 * 2400/F(kHz) 24000/F(kHz) 30 100 * 24000/F(kHz) 30 30 100 * 30 100 3 100 150 3 150 200 3 200	

Limits Of Radiated Emission Measurement (Above 1000MHz)

	Limit (dBuV/m) (at 3M)	
Frequency (MHz)	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).



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

Temperature:	26 °C		Relative Humidity:	54%
Pressure:	101KPa	and the second	Test Voltage :	AC120V/60Hz
Test Mode:	Mode 1		Polarization :	

Below 30MHz

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.

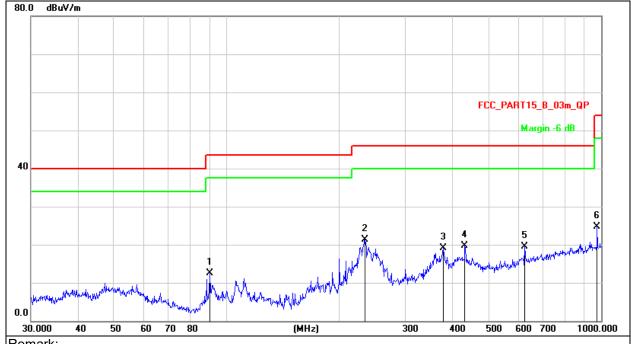
Distance extrapolation factor =40 log (specific distance/test distance)(dB);

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



Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101KPa	Phase :	Horizontal
Test Mode:	Mode 1	Test Voltage :	AC120V/60Hz





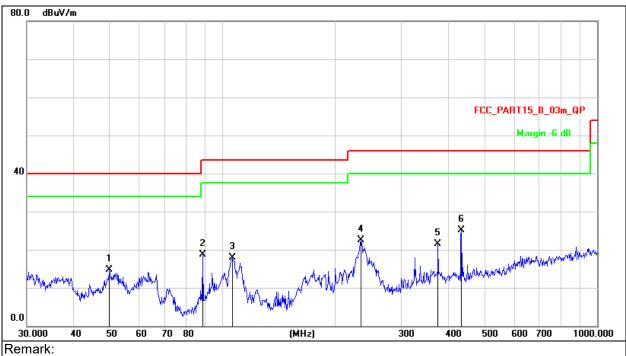
Remark:

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

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1	9	90.2205	31.79	-19.20	12.59	43.50	-30.91	QP
2	* 2	34.1684	37.60	-16.32	21.28	46.00	-24.72	QP
3	3	78.5843	31.51	-12.46	19.05	46.00	-26.95	QP
4	43	32.5457	31.51	-11.74	19.77	46.00	-26.23	QP
5	6	25.0780	27.60	-8.05	19.55	46.00	-26.45	QP
6	9	75.7529	28.57	-3.90	24.67	54.00	-29.33	QP



Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	101KPa	Phase :	Vertical
Test Mode:	Mode 1	Test Voltage :	AC120V/60Hz



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

2. Measurement = Reading Level + Correct Factor

3. Over = Measurement - Limit

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		49.8814	30.29	-15.60	14.69	40.00	-25.31	QP
2		88.3421	38.38	-19.62	18.76	43.50	-24.74	QP
3	,	106.0126	35.97	-18.16	17.81	43.50	-25.69	QP
4	:	234.1684	38.75	-16.32	22.43	46.00	-23.57	QP
5	;	375.9385	34.01	-12.49	21.52	46.00	-24.48	QP
6	*	434.0651	36.80	-11.72	25.08	46.00	-20.92	QP



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	54.04	-0.43	53.61	74.00	-20.39	PK	
V	4804.00	44.95	-0.43	44.52	54.00	-9.48	AV	
V	7206.00	43.46	8.31	51.77	74.00	-22.23	PK	
V	7206.00	33.57	8.31	41.88	54.00	-12.12	AV	
Н	4804.00	50.91	-0.43	50.48	74.00	-23.52	PK	
Н	4804.00	40.73	-0.43	40.30	54.00	-13.70	AV	
Н	7206.00	41.76	8.31	50.07	74.00	-23.93	PK	
Н	7206.00	33.69	8.31	42.00	54.00	-12.00	AV	
		G	FSK Middle c	hannel				
V	4882.00	52.80	-0.38	52.42	74.00	-21.58	PK	
V	4882.00	46.16	-0.38	45.78	54.00	-8.22	AV	
V	7323.00	45.19	8.83	54.02	74.00	-19.98	PK	
V	7323.00	37.11	8.83	45.94	54.00	-8.06	AV	
Н	4882.00	51.00	-0.38	50.62	74.00	-23.38	PK	
Н	4882.00	40.85	-0.38	40.47	54.00	-13.53	AV	
Н	7323.00	43.19	8.83	52.02	74.00	-21.98	PK	
Н	7323.00	35.62	8.83	44.45	54.00	-9.55	AV	
			GFSK High ch	annel				
V	4960.00	54.91	-0.32	54.59	74.00	-19.41	PK	
V	4960.00	44.80	-0.32	44.48	54.00	-9.52	AV	
V	7440.00	48.35	9.35	57.70	74.00	-16.30	PK	
V	7440.00	38.65	9.35	48.00	54.00	-6.00	AV	
Н	4960.00	52.35	-0.32	52.03	74.00	-21.97	PK	
Н	4960.00	42.05	-0.32	41.73	54.00	-12.27	AV	
Н	7440.00	46.38	9.35	55.73	74.00	-18.27	PK	
Н	7440.00	38.50	9.35	47.85	54.00	-6.15	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.

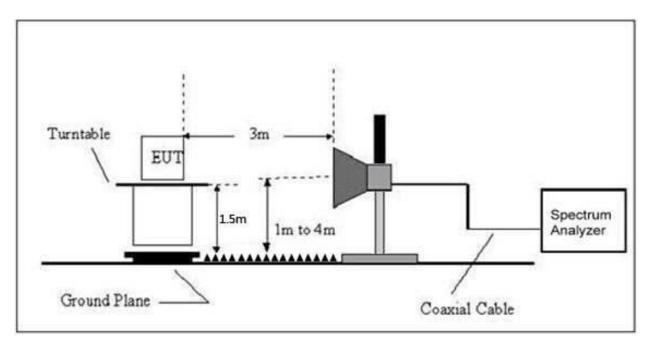
5.All the Modulation are test, the worst mode is GFSK, the data recording in the report.



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)

	Limit (d	BuV/m) (at 3M)
Frequency (MHz)	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					
	(⊓/♥)				РК	PK	AV						
			Low	Channel 24	402MHz	•	•						
	Н	2390.00	53.02	-6.70	46.32	74.00	54.00	PASS					
	Н	2400.00	56.10	-6.71	49.39	74.00	54.00	PASS					
	V	2390.00	53.84	-6.70	47.14	74.00	54.00	PASS					
GFSK	V	2400.00	57.40	-6.71	50.69	74.00	54.00	PASS					
		High Channel 2480MHz											
	Н	2483.50	55.68	-6.79	48.89	74.00	54.00	PASS					
	Н	2500.00	50.21	-6.81	43.40	74.00	54.00	PASS					
	V	2483.50	55.84	-6.79	49.05	74.00	54.00	PASS					
	V	2500.00	51.81	-6.81	45.00	74.00	54.00	PASS					
			Low	Channel 24	402MHz								
	Н	2390.00	54.23	-6.70	47.53	74.00	54.00	PASS					
	Н	2400.00	57.81	-6.71	51.10	74.00	54.00	PASS					
	V	2390.00	53.42	-6.70	46.72	74.00	54.00	PASS					
	V	2400.00	57.19	-6.71	50.48	74.00	54.00	PASS					
π/4DQPSK	High Channel 2480MHz												
	Н	2483.50	57.19	-6.79	50.40	74.00	54.00	PASS					
	Н	2500.00	51.73	-6.81	44.92	74.00	54.00	PASS					
	V	2483.50	55.84	-6.79	49.05	74.00	54.00	PASS					
	V	2500.00	52.45	-6.81	45.64	74.00	54.00	PASS					
			Low	Channel 24	402MHz								
	Н	2390.00	54.39	-6.70	47.69	74.00	54.00	PASS					
	Н	2400.00	57.63	-6.71	50.92	74.00	54.00	PASS					
	V	2390.00	53.49	-6.70	46.79	74.00	54.00	PASS					
	V	2400.00	58.35	-6.71	51.64	74.00	54.00	PASS					
8DPSK		**,	High	Channel 2	480MHz								
	Н	2483.50	57.22	-6.79	50.43	74.00	54.00	PASS					
	Н	2500.00	51.65	-6.81	44.84	74.00	54.00	PASS					
	V	2483.50	57.66	-6.79	50.87	74.00	54.00	PASS					
	V	2500.00	53.52	-6.81	46.71	74.00	54.00	PASS					

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



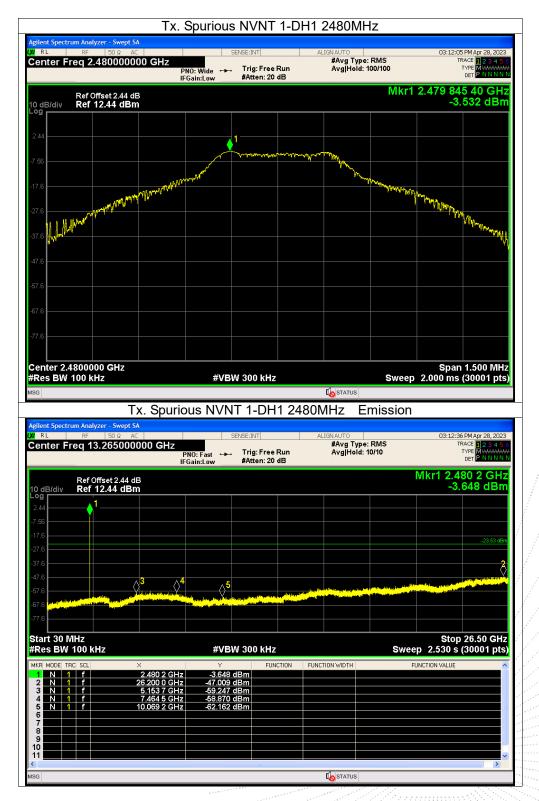
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gilent Spectrum Analyzer - Swep		Spurious N\	/111 2-0	H1 2402M	HZ		
RL RF 50Ω enter Freq 2.402000	AC 0000 GHz P		g: Free Run	ALIGNAUTO #Avg Typ Avg Hold	e: RMS : 100/100	03:14:12 PM/ TRACE TYPE	Apr 28, 202 1 2 3 4 5 M M M M P N N N
Ref Offset 2.37		Gain:Low #At	ten: 20 dB		Mkr1	2.401 853 5	55 GH
dB/div Ref 12.37 dl	Bm					-1.31	0 dBr
2.37		1					
.63	will and a second se	and the way was a second	WWW WWWW	www.man.	hermon	and the second	
7.6						K. allulut	N.,
7.6 M							MAN NAVER
7.6 							
7.6							
7.6							
7.6							
7.6							
enter 2.4020000 GHz						Span 1.	500 MH
Res BW 100 kHz		#VBW 30	UKHZ	I STATUS	sweep	2.000 ms (30	oon pt
	Tx. Spuric	ous NVNT 2	-DH1 24	02MHz E	Emission		
<mark>ilent Spectrum Analyzer - Swep</mark> RL RF 50 Ω	pt SA AC	DUS NVNT 2		ALIGN AUTO		03:14:43 PM	
<mark>ilent Spectrum Analyzer - Swep</mark> RL RF 50 Ω	pt SA AC 000000 GHz	SENSE:II			e: RMS	TRACE	12345
ilent Spectrum Analyzer - Swep RL RF 50 Ω enter Freq 13.26500 Ref Offset 2.37	pt SA AC 000000 GHz IF 7 dB	SENSE:II	ut g: Free Run	ALIGN AUTO #Avg Typ	e: RMS : 10/10	TRACE TYPE DET	1234 MWWW PNNNN 6 GH
RL RF 50 Ω enter Freq 13.26500 Ref Offset 2.37 O dB/div Ref 12.37	pt SA AC 000000 GHz IF 7 dB	SENSE:II	ut g: Free Run	ALIGN AUTO #Avg Typ	e: RMS : 10/10	TRACE TYPE DET	1234 MWWW PNNNN 6 GH
Ilent Spectrum Analyzer - Swep RL RF SO Ω enter Freq 13.26500 Ref Offset 2.37 O dB/div Ref 12.37 Og 37 63	pt SA AC 000000 GHz IF 7 dB	SENSE:II	ut g: Free Run	ALIGN AUTO #Avg Typ	e: RMS : 10/10	TRACE TYPE DET	1234 MWWW PNNNN 6 GH
RL RF 50 Ω enter Freq 13.2650(Ref Offset 2.37 0 0 dB/div Ref 12.37 d 0 2.37 1 1 7.6 1 1 7.7 1 1	pt SA AC 000000 GHz IF 7 dB	SENSE:II	ut g: Free Run	ALIGN AUTO #Avg Typ	e: RMS : 10/10	TRACE TYPE DET	1234 MWWW PNNNN 6 GH
Rt RF 50 Ω enter Freq 13.2650(Ref Offset 2.37 0 D dB/div Ref 12.37 d 0 237 1 1 63 7 6 1 7 6 1 1 1	pt SA AC 000000 GHz IF 7 dB	SENSE:IT PNO: Fast Trig Gain:Low #At	ut g: Free Run	ALIGN AUTO #Avg Typ	e: RMS : 10/10	TRACE TYPE DET	1234 MWWW PNNNN 6 GH
Rt RF 50 Ω enter Freq 13.2650(Ref Offset 2.37 0 D dB/div Ref 12.37 d 0 237 1 .63 7.6 7.6	pt SA AC 000000 GHz IF 7 dB	SENSE:II	ut g: Free Run	ALIGN AUTO #Avg Typ	e: RMS : 10/10	TRACE TYPE DET	1234 MWWW PNNNN 6 GH
Rel Ref 50 g enter Freq 13.26500 864 000 867 000 0 dB/div Ref 0000 861 12.37 d 237 1 1 7.6 1 1 7.6 1 1 7.6 1 1 7.7.6 1 1 7.7.6 1 1 7.7.6 1 1 7.7.6 1 1 7.7.6 1 1 7.7.6 1 1 7.7.6 1 1 7.7.6 1 1 7.7.6 1 1 7.7.6 1 1 7.7.6 1 1 7.7.6 1 1 7.7.6 1 1 7.7.7 1 1 7.7.6 1 1 7.7.7 1 1 7.7.7 1 1 7.7.7 1 1	pt SA AC 000000 GHz IF 7 dB	SENSE:IT PNO: Fast Trig Gain:Low #At	ut g: Free Run	ALIGN AUTO #Avg Typ	e: RMS : 10/10	TRACE TYPE DET	1234 MWWW PNNNN 6 GH
Ref Offset 2.37 0 dB/div Ref 7.6 1 7.6 1 7.6 1 7.6 1 7.6 1 7.6 1 7.6 1 7.6 1 7.6 1 7.6 1 7.6 1 7.6 1 7.7 1 7.6 1 7.7 1 7.6 1 7.7 1 7.6 1 7.7 1 7.6 1 7.7 1 7.8 1 7.9 1 7.1 1 7.2 1 7.3 1 7.4 1 7.5 1 7.6 1 7.7 1 7.7 1 7.7 1	pt SA AC 000000 GHz IF 7 dB	SENSE:IT PNO: Fast Trig Gain:Low #At	yr Free Run ten: 20 dB	ALIGN AUTO #Avg Typ	e: RMS : 10/10	TRACE TYPE DET	6 GH 9 NNNN 5 dBr
Itent Spectrum Analyzer - Swer RL RF 50 0 enter Freq 13.26500 Sef Offset 2.37 Sef Offset 2.37 0 dB/div Ref 0ffset 2.37 Sef 0 12.37 0 dB/div Ref 12.37 Sef 0 12.37 7.6 Sef 0 12.37	×	SENSE II PNO: Fast Gain:Low #Att	yr Free Run ten: 20 dB	ALIGN AUTO #Avg Typ	e: RMS : 10/10	TRACE Der Mkr1 2.402 -5.87	6 GH 9 NNN 9 NNN -2131 0 -2131 0
Silent Spectrum Analyzer - Swep RL RF 50 0 Rt RF 50 0 enter Freq 13.26500 Ref Offset 2.37 Colspan="2">Ref Offset 2.37 Colspan="2">O dB/div Ref Offset 2.37 Colspan="2">O dB/div Colspan="2">O dB/div Ref Offset 2.37 Colspan="2">O dB/div Ref O dB/div Ref O dB/div Ref O dB/div Colspan="2">O dB/div Ref O dB/div Colspan="2">O dB/div Colspan="2">O dB/div Ref O dB/div Colspan="2">O dB/div Colspan="2">O dB/div Colspan="2">O dB/div Ref O dB/div Colspan="2">O dB/d	AC 00000 GHz FF 7 dB Bm 3 underlaw 4 2.402 6 GHz 4.777 0 GHz	SENSE IT Gain:Low #At 5 #VBW 30 * *VBW 30 * * 46.394 dBm -60.592 dBm	g: Free Run ten: 20 dB	ALIGNAUTO #Avg Typ Avg Hold	e: RMS : 10/10	TRACE Der Mkr1 2.402 -5.87	6 GH 9 NNNN 5 dBr
Steetrum Analyzer - Swer RL RF 50.0 Ref Offset 2.37 Soc Soc 0 dB/div Ref 12.37 dl 37 1.37 1 1 7.6 1 1 7.6 1 1 7.6 1 1 7.6 1 1 7.7.6 1 1 7.7.6 1 1 7.7.6 1 1 7.7.6 1 1 7.7.6 1 1 7.7.6 1 1 7.7.6 1 1 7.7.6 1 1 7.7.6 1 1 7.7.6 1 1 7.7.6 1 1 7.7.6 1 1 7.7.6 1 1 7.7.6 1 1 7.7.6 1 1 7.7.6 1 1 7.7.6 <td>Pt SA AC AC AC AC AC AC AC AC AC A</td> <td>SENSE:// Gain:Low #Att 5 #VBW 30 #VBW 30</td> <td>g: Free Run ten: 20 dB</td> <td>ALIGNAUTO #Avg Typ Avg Hold</td> <td>e: RMS : 10/10</td> <td>TRACE Der Mkr1 2.402 -5.87</td> <td>6 GH 9 NNNN 5 dBr</td>	Pt SA AC AC AC AC AC AC AC AC AC A	SENSE:// Gain:Low #Att 5 #VBW 30 #VBW 30	g: Free Run ten: 20 dB	ALIGNAUTO #Avg Typ Avg Hold	e: RMS : 10/10	TRACE Der Mkr1 2.402 -5.87	6 GH 9 NNNN 5 dBr
Ident Spectrum Analyzer - Swep RL RF 50.0 enter Freq 13.26500 Ref Offset 2.37 G 0 dB/div Ref 12.37 dl G 237 6 1 6 376 9 1 7 6 776 9 9 1 7 6 776 9 9 9 9 9 9	AC 00000 GHz F F 7 dB Bm 3 44 44 44 44 44 44 44 44 44 44 44 44 44	SENSE:// Gain:Low → Trig Gain:Low → #At 55 #VEW 300 ¥VEW 300 ¥CBW 300 55.575 dBm -46.394 dBm -50.592 dBm -50.592 dBm	g: Free Run ten: 20 dB	ALIGNAUTO #Avg Typ Avg Hold	e: RMS : 10/10	TRACE Der Mkr1 2.402 -5.87	6 GH 9 NNNN 5 dBr
Illent Spectrum Analyzer - Swep RL RF 50.0 Rt RF 50.0 enter Freq 13.26500 Ref Offset 2.37 o dE/div Ref 12.37 di o dE/div Ref 12.37 di 0 1 1 1 7.6 7.6 7.6 7.6 Colspan="2">Colspan="2">Colspan="2">Colspan="2">Colspan="2">Colspan="2">Colspan="2">Colspan="2">Colspan="2">Colspan="2">Colspan="2">Colspan="2">Colspan="2">Colspan="2">Colspan="2">Colspan="2">Colspan="2"Colspan=	AC 00000 GHz F F 7 dB Bm 3 44 44 44 44 44 44 44 44 44 44 44 44 44	SENSE:// Gain:Low → Trig Gain:Low → #At 55 #VEW 300 ¥VEW 300 ¥CBW 300 55.575 dBm -46.394 dBm -50.592 dBm -50.592 dBm	g: Free Run ten: 20 dB	ALIGNAUTO #Avg Typ Avg Hold	e: RMS : 10/10	TRACE Der Mkr1 2.402 -5.87	6 GH 9 NNNN 5 dBr





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wept SA			<u>.</u>
Ω AC	SENSE:INT	ALIGNAUTO #Avg Type: R	03:17:41 PM Apr 28, 202 MS TRACE 1 2 3 4 5
PNO		n Avg Hold: 100	100 TYPE MWWWW DET PNNN
.44 dB			Mkr1 2.479 858 85 GH -5.382 dBi
	1		
	ALL BONOM A PROVINGE	WWWWWWWWWWWWWWWWW	W/W/Maam w.
hund high and have been and and and and	AMAAA	The second se	Martin and Martin and Martin and a
			and the second s
			" Www
IZ	#VBW 300 kHz		Span 1.500 MF Sweep 2.000 ms (30001 pt
		I STATUS	
Tx. Spuriou	IS NVNT 2-DH1	2480MHz Em	ission
wept SA			03:18:12 PM Apr 28, 202
5000000 GHz): Fast 🛶 Trig: Free Ru	#Avg Type: R n Avg Hold: 10/	MS TRACE 1234
2.44 dB			Mkr1 2.480 2 GH
dBm			-6.663 dBr
			-25.38 dB
			<i>i</i>
	5		
	5 		
A 4			
,3 ,4 	5 		
	#VBW 300 kHz	DN FUNCTION WIDTH	
2.480 2 GHz 26.121 5 GHz	#VBW 300 kHz -6.663 dBm -7.066 dBm	DN FUNCTION WIDTH	Sweep 2.530 s (30001 pt
2.480 2 GHz	#VBW 300 kHz	DN FUNCTION WIDTH	Stop 26.50 GH Sweep 2.530 s (30001 pt: FUNCTION VALUE
2.480 2 GHz 26.121 5 GHz 5.148 4 GHz 7.326 9 GHz	#VBW 300 kHz #VBW 300 kHz \$ FUNCTIL -5.663 dBm -47.066 dBm -59.903 dBm -59.903 dBm	DN FUNCTION WIDTH	Sweep 2.530 s (30001 pt
2.480 2 GHz 26.121 5 GHz 5.148 4 GHz 7.326 9 GHz	#VBW 300 kHz #VBW 300 kHz \$ FUNCTIL -5.663 dBm -47.066 dBm -59.903 dBm -59.903 dBm	DN FUNCTION WIDTH	Sweep 2.530 s (30001 pt
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ilent Spectrum Analyzer - Swep	ot SA			402MHz E	mission	02:10:55 PM (mr 20	2,202
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<mark>ilent Spectrum Analyzer - Swep</mark> RL RF 50 Ω	AC AC 00000 GHz	SENSE:II	IT	402MHz E Alignauto #Avg Type	e: RMS 10/10	TRACE 12 TYPE MWA DET P N	345 /////
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rilent Spectrum Analyzer - Swep RL RF 50 0. enter Freq 13.26500 Second Ref Offset 2.37 Galaxy 0 dB/div Ref 12.37 dI 2.37 - 7.63 - 7.64 - 7.75 - 7.76 - 7.76 - 7.76 - 7.76 - 7.76 - 7.76 - 7.76 - 7.76 - 7.76 - 7.76 - 7.76 - 7.76 - 7.76 - 7.76 - 8 W 100 kHz Res BW 100 kHz 1 N 2 N 1 N	AC 00000 GHz F F 7 dB Bm 2.401 7 GHz 2.401 7 GHz 4.923 4 GHz	SENSE:// Gain:Low → Trig Gain:Low → #Att 5 #VBW 30 #VBW 30 -6.951 dBm -6.306 dBm -6.370 dBm	IT g: Free Run sen: 20 dB	402MHz E	e: RMS 10/10	TRACE 12 TYPE MU DET P N Mkr1 2.401 7 C -6.951 d -21 -21 -21 -21 -21 -21 -21 -21 -21 -21	
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Selectrum Analyzer - Swep RL RF 50.0 enter Freq 13.26500 Ref Offset 2.37 0 dB/div Ref 12.37 dI 237 1 7 1 7 1 7 1 7 1 7 1 7 1 7 1 7 1 7 1 7 1 7 1 7 1 7 1 7 1 7 1 7 1 8 1 9 1 1 1 8 1 8 1 8 1 9 1 1 1	× 2401 7 GHz 2401 7 GHz 2401 7 GHz 26,204 4 GHz 4,923 4 GHz 4,923 4 GHz	SENSE:// Gain:Low #At 5 5 #VBW 30 ¥VBW 30 ¥ 46.306 dBm -61.297 dBm -51.277 dBm	IT g: Free Run sen: 20 dB	402MHz E	e: RMS 10/10	TRACE 12 TYPE MU DET P N Mkr1 2.401 7 C -6.951 d -21 -21 -21 -21 -21 -21 -21 -21 -21 -21	
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RL RF 50 G enter Freq 2.4410	Ω AC 000000 GHz	SENSE:IN NO:Wide ↔ Trig:	T : Free Run	ALIGNAUTO #Avg Typ Avg Hold	e: RMS I: 100/100	03:21:	38 PM Apr 28, 202 TRACE 1 2 3 4 5 TYPE MWWW DET P N N N
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jilent Spectrum Analyzer - Sv	wept SA	us NVNT 3-	DH1 24	41MHz I	swee Emission)	s (30001 pt
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j <mark>ilent Spectrum Analyzer - Sv</mark> R L RF 50 S	wept SA Ω AC OOOOOO GHz P	US NVNT 3- SENSE:IN NO: Fast Trig	DH1 24	41MHz I		03:22:	10 PM Apr 28, 202 TRACE 1 2 3 4 5 TYPE M WWWW DET P N N N
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	wept SA 2 AC 0000000 GHz P IF 	NO: Fast + Trig	DH1 24			03:22: Mkr1 2.4	10 PM Apr 28, 202
RL RF 13.265 RL RF 1500 enter Freq 13.265 0 dB/div Ref 0ffset 2 0 dB/div Ref 12.39	wept SA 2 AC 0000000 GHz P IF 	NO: Fast + Trig	DH1 24			03:22: Mkr1 2.4	10 PM Apr 28, 202 TRACE 1 2 3 4 E TYPE MWWWW DET P N N N N 141 4 GH
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glent Spectrum Analyzer - Sv RL RF S0's enter Freq 13.265 Set of the set	wept SA 2 AC 0000000 GHz P IF 	NO: Fast Trig Gain:Low	DH1 24			03:22: Mkr1 2.4 -4	10 PM Apr 28, 202 TRACE 1 2 3 4 5 TYPE 1 2 3 4 5 DET P N NN 441 4 GH .970 dBr
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2 AC 00000 GHz	SENSE:INT			
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	#VBW 300 kHz		Sweep 2.000 ms (300	001 pt
	SNVNT 3-DH1	2480MHz Emi	ssion	
2 AC	SENSE:INT		S TRACE	2345
PNO:	ruat -		DET	- N N N P
.44 dB dBm			Mkr1 2.480 : -5.587	2 GH ' dBr
				-25.08 dB
34				-25.08 dB
	5 5			-25.08 dE
34				-25.08 dE
3 4	5 5 #VBW 300 kHz		Stop 26. Sweep 2.530 s (300	50 GH
X	#VBW 300 kHz			50 GH
X	#VBW 300 kHz 5.587 dBm -46.657 dBm -60.317 dBm	No Function width	Sweep 2.530 s (300	50 GH
	#VBW 300 kHz 5.587 dBm 46.657 dBm	DN FUNCTION WIDTH	Sweep 2.530 s (300	50 GH
× 2450 2 GHz 26.477 1 GHz 5.150 2 GHz 7.424 0 GHz	Y FUNCTIO 5.557 dBm	NOTION WIDTH	Sweep 2.530 s (300	50 GH
× 2450 2 GHz 26.477 1 GHz 5.150 2 GHz 7.424 0 GHz	Y FUNCTIO 5.557 dBm	PUNCTION WIDTH	Sweep 2.530 s (300	50 GH
	AC DOUDOU GHZ PRO: PR	AC SENSE:INT 000000 GHZ PN0: Wide IFGain:Low → Trig: Free Ru Atten: 20 dB 44 dB dBm 44 dB 44 dB 44 dB 2 44 dB 44 dB	AC SENSE:INT ALLONAUTO PRO: Wide → Trig: Free Run #Atten: 20 dB 44 dB dBm 44 dB 44 dB 44 dB 44 dB Trig: Free Run #Atten: 20 dB 44 dB ALGNAUTO TRICE	A Constrained and a service of the s

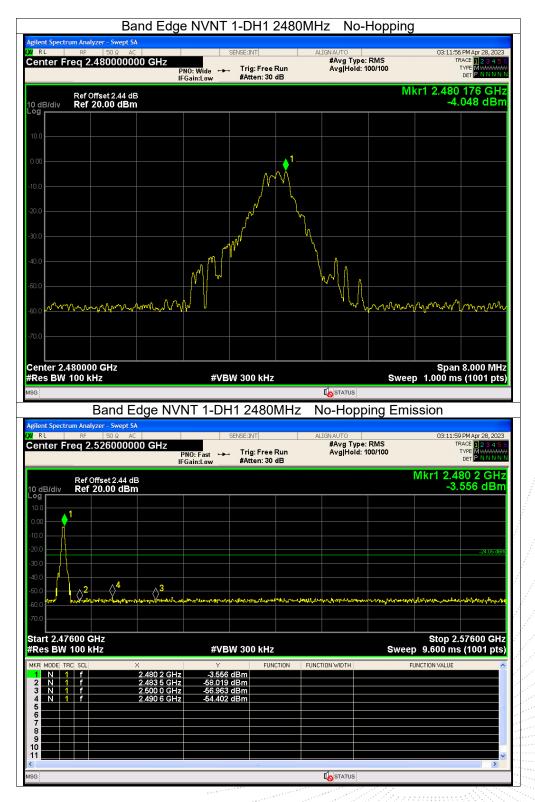




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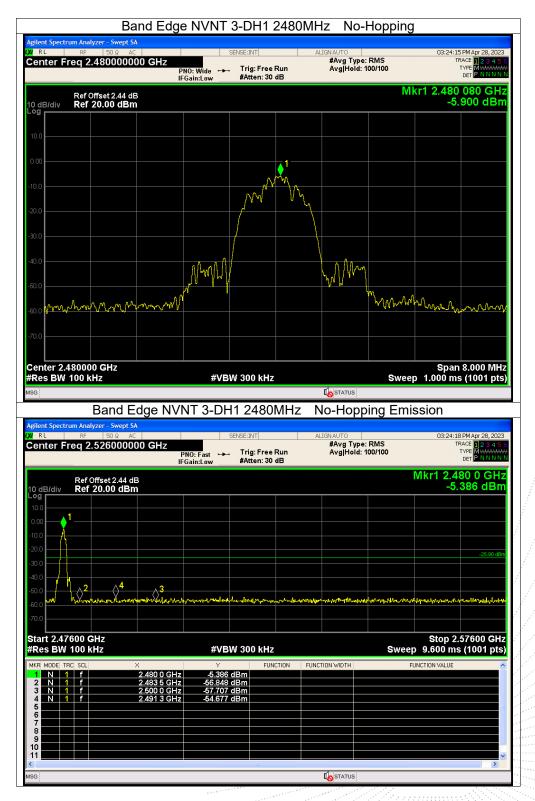
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10. 20 dB Bandwidth

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	NVNT 1-DH1		0.869	Pass	
NVNT	1-DH1	2441	0.854	Pass	
NVNT	1-DH1	2480	0.826	Pass	
NVNT	2-DH1	2402	1.268	Pass	
NVNT	2-DH1	2441	1.27	Pass	
NVNT	2-DH1	2480	1.264	Pass	
NVNT	3-DH1	2402	1.218	Pass	
NVNT	3-DH1	2441	1.226	Pass	
NVNT	3-DH1	2480	1.216	Pass	











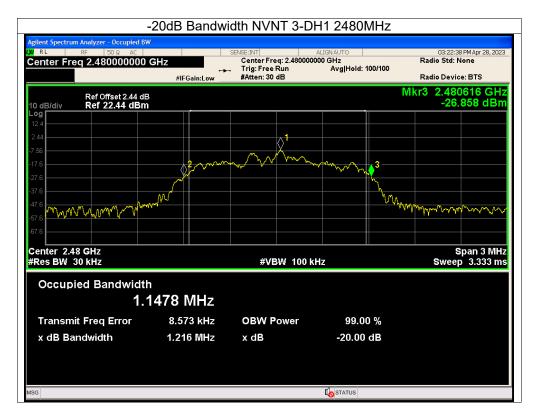






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11. Maximum Peak Output Power

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.

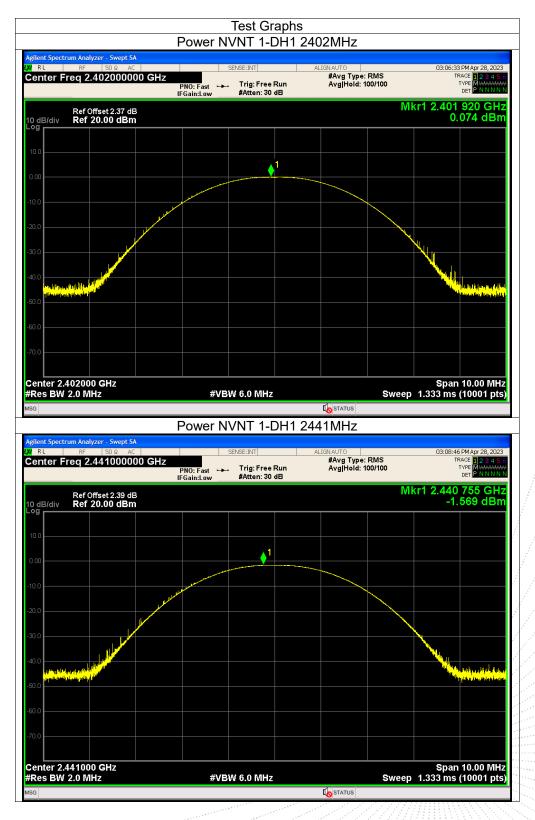
2. Set the spectrum analyzer: RBW = 2MHz. VBW = 6MHz. Sweep = auto; Detector Function = Peak.

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

11.4 Test Result

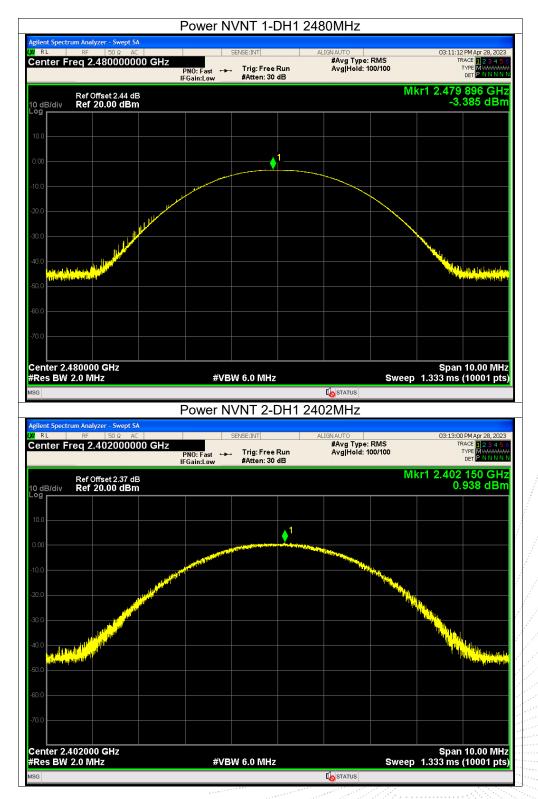
Condition	Mode	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	1-DH1	2402	0.07	21	Pass
NVNT	1-DH1	2441	-1.57	21	Pass
NVNT	1-DH1	2480	-3.39	21	Pass
NVNT	2-DH1	2402	0.94	21	Pass
NVNT	2-DH1	2441	-1.1	21	Pass
NVNT	2-DH1	2480	-2.9	21	Pass
NVNT	3-DH1	2402	1.13	21	Pass
NVNT	3-DH1	2441	-0.63	21	Pass
NVNT	3-DH1	2480	-2.71	21	Pass



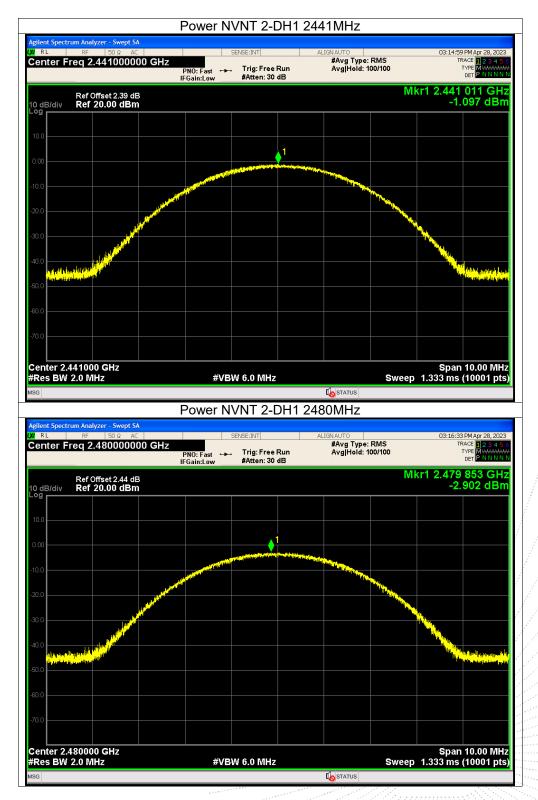


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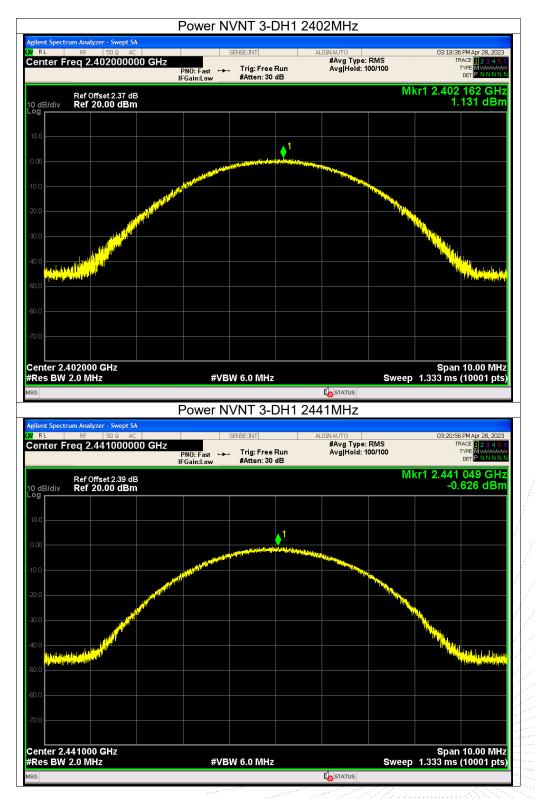




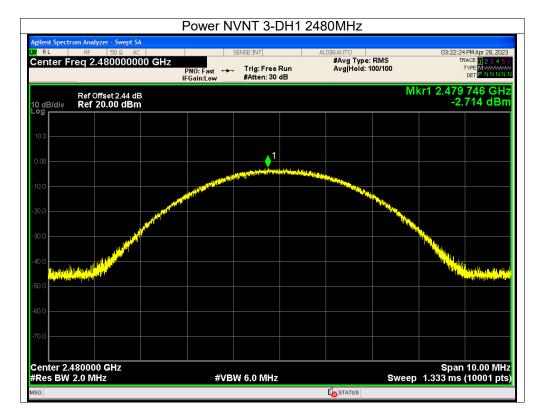












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12. Hopping Channel Separation

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.

Condition	Mode	Hopping Freq1 (MHz)	Hopping Freq2 (MHz)	HFS (MHz)	Limit (MHz)	Verdict
NVNT	1-DH1	2401.844	2402.846	1.002	0.579	Pass
NVNT	1-DH1	2440.846	2441.846	1	0.569	Pass
NVNT	1-DH1	2478.846	2479.846	1	0.551	Pass
NVNT	2-DH1	2402.026	2403.03	1.004	0.845	Pass
NVNT	2-DH1	2441.028	2442.028	1	0.847	Pass
NVNT	2-DH1	2479.026	2480.028	1.002	0.843	Pass
NVNT	3-DH1	2402.028	2403.026	0.998	0.812	Pass
NVNT	3-DH1	2441.03	2442.026	0.996	0.817	Pass
NVNT	3-DH1	2479.03	2480.028	0.998	0.811	Pass

12.4 Test Result

Page: 60 of 7



	C	Test (FS NVNT 1-		02MHz			
ilent Spectrum Analyzer - So RL RF 50 9 enter Freq 2.4025	Ω AC 000000 GHz PN0	: Wide Trig: Fi in:Low #Atten:	ree Run : 30 dB	ALIGNAUTO #Avg Type: F Avg Hold:>10	RMS 00/100	03:07:11 PM Apr 28, 2023 TRACE 12345 (TYPE MWWWW DET PNNNN	
Ref Offset 2 dB/div Ref 20.00	.37 dB dBm				Mkr1	2.401 844 GHz -0.744 dBm	
o.0	_1						
.00	<u> </u>	\sim			~~~~~		
			~~~~~	~~~~~			
0.0							
0.0							
0.0							
enter 2.402500 GHz Res BW 30 kHz	2	#VBW 100 k	Hz		Sweep 2.	Span 2.000 MHz 133 ms (1001 pts)	
KR MODE TRC SCL	× 2.401 844 GHz	-0.744 dBm	FUNCTION F	UNCTION WIDTH	FUNCTIO	N VALUE	
2 N 1 f 3	2.402 846 GHz	-0.636 dBm					
5 <b>6</b>						-	
7 8 9							
0							
G						>	
3				STATUS			
	C	FS NVNT 1	-DH1 24				
' ilent Spectrum Analyzer - Sv	wept SA		-DH1 24	41MHz			
ilent Spectrum Analyzer - Sv RL RF 50 enter Freq 2.4415	wept SA Ω AC 0 00000 GHz PN0	SENSE:INT	ree Run		RMS 00/100	03:09:36 PM Apr 28, 2023 TRACE 1 2 3 4 5 Type M MAMM	
ilent Spectrum Analyzer - Sv RL RF 503 enter Freq 2.4415 Ref Offset 2	wept SA Q AC O00000 GHz PNO IFGa 	SENSE:INT	ree Run	ALIGNAUTO #Avg Type: F	00/100	03:09:36 PMApr 28, 2023 TRACE 12 23 4 5 TYPE MWMMM DET PNINNI 2,440 846 GHz	
RL Spectrum Analyzer - So RL RF 500 enter Freq 2.4415 Ref Offset 2 dB/div Ref 20.00	wept SA Q AC O00000 GHz PNO IFGa 	SENSE:INT	ree Run	ALIGNAUTO #Avg Type: F	00/100	03:09:36 PMApr 28, 2023 TRACE 12 23 4 5 TYPE MWMMM DET PNINNI 2,440 846 GHz	
Ilent Spectrum Analyzer - So RL RF So enter Freq 2.4415 Ref Offset 2 dB/div Ref 20.00	wept SA Q AC O00000 GHz PNO IFGa 	SENSE:INT	ree Run	ALIGNAUTO #Avg Type: F	00/100	03:09:36 PMApr 28, 2023 TRACE 12 23 4 5 TYPE MWMMM DET PNINNI 2,440 846 GHz	
RL RF 500 RL RF 500 enter Freq 2.4415 dB/div Ref Offset 2 00 00	wept SA Q AC O00000 GHz PNO IFGa 	SENSE:INT	ree Run	ALIGNAUTO #Avg Type: F Avg Hold>1	00/100	03:09:36 PMApr 28, 2023 TRACE 12 23 4 5 TYPE MWMMM DET PNINNI 2,440 846 GHz	
RL RF 500 RL RF 500 enter Freq 2.4415 Ref Offset 2 dB/div Ref 20.00	wept SA Q AC O00000 GHz PNO IFGa 	SENSE:INT	ree Run	ALIGNAUTO #Avg Type: F Avg Hold>1	00/100	03:09:36 PMApr 28, 2023 TRACE 12 23 4 5 TYPE MINIMU DET PNINNIN 2, 440 846 GHz	
RL RF 500 enter Freq 2.4415 dB/div Ref 20.00	wept SA Q AC O00000 GHz PNO IFGa 	SENSE:INT	ree Run	ALIGNAUTO #Avg Type: F Avg Hold>1	00/100	03:09:36 PMApr 28, 2023 TRACE 12 23 4 5 TYPE MINIMU DET PNINNIN 2, 440 846 GHz	
RL         RF         50 t           enter Freq 2.4415         Ref Offset 2         00           rdB/div         Ref Offset 20.00         00           00         00         00           00         00         00           00         00         00           00         00         00	wept SA Q AC O00000 GHz PNO IFGa 	SENSE:INT	ree Run	ALIGNAUTO #Avg Type: F Avg Hold>1	00/100	03:09:36 PMApr 28, 2023 TRACE 12 2 3 4 5 TYPE MINIMU DET PNINNIN 2, 440 846 GHz	
RL RE 500 RL RE 500 enter Freq 2.4415 rdB/div Ref 0ffset 2 rdB/div Ref 20.00	wept SA Q AC O00000 GHz PNO IFGa 	SENSE:INT	ree Run	ALIGNAUTO #Avg Type: F Avg Hold>1	00/100	03:09:36 PMApr 28, 2023 TRACE 12 23 4 5 TYPE MWMMM DET PNINNI 2,440 846 GHz	
RL         RE         ISO           enter Freq 2.4415         Ref Offset 2         GB/div           Ref Offset 2         Ref Offset 2         GB/div           00         00         00         00           00         00         00         00           00         00         00         00           00         00         00         00           00         00         00         00           00         00         00         00           00         00         00         00	wept SA 2 AC 00000 GHz PNO IFGa 39 dB dBm	SENSE:INT	ree Run	ALIGNAUTO #Avg Type: F Avg Hold>1	Mkr1	03:09:36 PMApr 28, 2023 TRACE 12 23 4 5 TYPE MYWWW 2.440 846 GHz -2.403 dBm	
Ref Offset 2 additional set of the set of t	vept SA 2 AC 00000 GHz PNO IFGa .39 dB dBm 1 1 2	SENSE:INT	ree Run : 30 dB	ALIGNAUTO #AvgType: F AvgHold>1	Mkr1	03:09:36 PMApr 28, 2023 TRACE 12 3 4 5 TYPE 12 4 5 000 MHz Span 2.000 MHz 133 ms (1001 pts)	
RL         RF         S0:           RL         RF         S0:           enter Freq 2.4415         Ref Offset 2         GB/div           dB/div         Ref 20.00         GB/div           00         Ref 20.00         GB/div           00         Ref 0ffset 2         GB/div           01         Ref 0ffset 2         GB/div           02         Ref 0ffset 2         GB/div           03         Ref 0ffset 2         GB/div           04         Ref 0ffset 2         GB/div           05         Ref 0ffset 2         GB/div           06         Ref 0ffset 2         GB/div           07         Ref 0ffset 2         GB/div           08         Ref 0ffset 2         GB/div           09         Ref 0ffset 2         GB/div           00         Ref 0ffset 2         GB/div           00         Ref 0ffset 2         GB/div           00         Ref 0ffset 2         GB/div           01         Ref 0ffset 2         GB/div           02         Ref 0ffset 2         GB/div           03         Ref 0ffset 2         GB/div           04         R         GB/div           0	xept SA 2 AC 00000 GHz PNO IFG2 39 dB dBm 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	SENSE:INT	ree Run : 30 dB	ALIGNAUTO #Avg Type: F Avg Hold>1	Mkr1	03:09:36 PMApr 28, 2023 TRACE 12 3 4 5 TYPE 12 4 5 000 MHz Span 2.000 MHz 133 ms (1001 pts)	
Ref Offset 2           Ref Offset 2           dB/div         Ref 20.00         dB/div           dB/div         R         dB/div           dB/div         R         dB/div           dB/div         S <td co<="" td=""><td>vept SA R AC 00000 GHz PRO IFGa :39 dB dBm 1 1 2 z</td><td>SENSE:INT</td><td>ree Run : 30 dB</td><td>ALIGNAUTO #AvgType: F AvgHold&gt;1</td><td>Mkr1</td><td>03:09:36 PMApr 28, 2023 TRACE 0 2 3 4 5 TYPE 0 2 5 TYPE</td></td>	<td>vept SA R AC 00000 GHz PRO IFGa :39 dB dBm 1 1 2 z</td> <td>SENSE:INT</td> <td>ree Run : 30 dB</td> <td>ALIGNAUTO #AvgType: F AvgHold&gt;1</td> <td>Mkr1</td> <td>03:09:36 PMApr 28, 2023 TRACE 0 2 3 4 5 TYPE 0 2 5 TYPE</td>	vept SA R AC 00000 GHz PRO IFGa :39 dB dBm 1 1 2 z	SENSE:INT	ree Run : 30 dB	ALIGNAUTO #AvgType: F AvgHold>1	Mkr1	03:09:36 PMApr 28, 2023 TRACE 0 2 3 4 5 TYPE 0 2 5 TYPE
Ient Spectrum Analyzer - So:         RL       RF       50:         enter Freq 2.4415         Ref Offset 2         dB/div       Ref 20.00         0	xept SA 2 AC 00000 GHz PNO IFG2 39 dB dBm 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	SENSE:INT	ree Run : 30 dB	ALIGNAUTO #AvgType: F AvgHold>1	Mkr1	03:09:36 PMApr 28, 2023 TRACE 12 3 4 5 TYPE 12 4 5 000 MHz Span 2.000 MHz 133 ms (1001 pts)	
RL         RE         SO           RL         RF         SO           enter Freq 2.4415         Ref Offset 2           dB/div         Ref 20.00           00         Ref 20.00	xept SA 2 AC 00000 GHz PNO IFG2 39 dB dBm 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	SENSE:INT	ree Run : 30 dB	ALIGNAUTO #AvgType: F AvgHold>1	Mkr1	03:09:36 PMApr 28, 2023 TRACE 12 3 4 5 TYPE 12 4 5 000 MHz Span 2.000 MHz 133 ms (1001 pts)	
Ient Spectrum Analyzer - 50:           RL         RF         50:           enter Freq 2.4415         Ref Offset 2         GB/div         Ref Offset 2           dB/div         Ref Offset 3         GB/div         Ref Offset 2         GB/div         Ref Offset 3           dB/div         Ref Offset 3         GB/div         Ref Offset 4         GB/div	xept SA 2 AC 00000 GHz PNO IFG2 39 dB dBm 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	SENSE:INT	ree Run : 30 dB	ALIGNAUTO #AvgType: F AvgHold>1	Mkr1	03:09:36 PMApr 28, 2023 TRACE 12 3 4 5 TYPE 12 4 5 000 MHz Span 2.000 MHz 133 ms (1001 pts)	

Edition: A.5



RL RF P	9500000 GHz		Free Run	ALIGNAUTO #Avg Type: RM Avg Hold:>100	IS	:51 PM Apr 28, 2023 TRACE <b>1</b> 2 3 4 5 TYPE MWWWW
	PNC IFG	): Wide 😱 Trig: ain:Low #Atte	n: 30 dB	Avg Hold.> loo		DET P N N N N
Ref Offse dB/div Ref 20.0					Mkr1 2.47 ∽	8 846 GH: 1.037 dBn
0.0						
.00		~		2	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	
0.0		han hand				
0.0			~~			
0.0						
0.0						
enter 2.479500 G Res BW 30 kHz	Hz	#VBW 100	kHz		Spa Sweep 2.133 n	in 2.000 MH: ns (1001 pts
KR MODE TRC SCL	× 2.478 846 GHz	۲ -4.037 dBm	FUNCTION F	UNCTION WIDTH	FUNCTION VALUE	2
2 N 1 f	2.479 846 GHz	-4.208 dBm				
4 6						
8						
9						
1				1		
3						
ilent Spectrum Analyzer		FS NVNT 2				
RL RF Pred 2.402		SENSE:INT	· · · · · ·	ALIGN AUTO #Avg Type: RN	IS	:57 PM Apr 28, 2023 TRACE 12 3 4 5
			Free Run n: 30 dB	Avg Hold:>100		TRACE 12345 TYPE MWWW DET PNNNN
Ref Offse dB/div Ref 20.0	t 2.37 dB				Mkr1 2.40	2 026 GH: 2.704 dBn
	1				2 ²	
.00		$\sim$	~~~~~	$\sim$		
.00						
	Hz					
00 00 00 00 00 00 00 00 00 00 00 00 00		#VBW 100			Sweep 2.133 n	ns (1001 pts
00 00 00 00 00 00 00 00 00 00	× 2.402 026 GHz	۲ -2.704 dBm				ns (1001 pts
00 00 00 00 00 00 00 00 00 00	×	Y			Sweep 2.133 n	ns (1001 pts
00 00 00 00 00 00 00 00 00 00	× 2.402 026 GHz	۲ -2.704 dBm			Sweep 2.133 n	ns (1001 pts
0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	× 2.402 026 GHz	۲ -2.704 dBm			Sweep 2.133 n	· ·



enter Freq 2.4415	PNC		⊤ : Free Run en: 30 dB	ALIGNAUTO #Avg Type: Avg Hold:>		03:15:40 PM Apr 28, 202 TRACE 1 2 3 4 5 TYPE MWWWW DET P N N N
Ref Offset 2.	39 dB	ain:Low #Att	en. 50 dB		Mkr1	2.441 028 GH -4.990 dBr
0 dB/div Ref 20.00						4.000 0.01
.00		<u> </u>			2	
0.0			~~~			m
0.0						
0.0						
0.0						
enter 2.441500 GHz	<u>     </u>					Span 2.000 MH
Res BW 30 kHz	X	#VBW 100	FUNCTION	FUNCTION WIDTH		.133 ms (1001 pt
1 N 1 f 2 N 1 f 3	2.441 028 GHz 2.442 028 GHz	-4.990 dBm -4.609 dBm				
4						
6 7 8 <b>1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1</b>						
9						
a l			Ш	<b>I</b> STATUS		
	C	FS NVNT	2-DH1 :			
<mark>ilent Spectrum Analyzer - Sw</mark> RL RF 50 Ω	2 AC	SENSE:IN	т			
				ALIGN AUTO		03:17:27 PM Apr 28, 202
enter Freq 2.4795	PNC	): Wide 😱 Trig ain:Low #Att	: Free Run en: 30 dB	ALIGN AUTO #Avg Type: Avg Hold:>	RMS 100/100	03:17:27 PM Apr 28, 202 TRACE 12345 TYPE MWWWW DET PNNN
Ref Offset 2.	PNC IFG: .44 dB		: Free Run	#Avg Type:	100/100	TRACE 1234 TYPE MWWW DET PNNN 2.479 026 GH
Ref Offset 2. 0 dB/div Ref 20.00	PNC IFG: .44 dB		: Free Run	#Avg Type:	100/100	TRACE 1234 TYPE MWWW DET PNNN
Ref Offset 2. 0 dB/div Ref 20.00	PNC IFG: .44 dB		: Free Run	#Avg Type:	100/100	TRACE 1234 TYPE MWWW DET PNNN 2.479 026 GH
Ref Offset 2. d B/div Ref 20.00	44 dB dBm		: Free Run	#Avg Type:	100/100 Mkr1	TRACE 1234 TYPE MWWW DET PNNN 2.479 026 GH
Ref Offset 2. d B/div Ref 20.00 9 0 0 0 0 0 0 0 0 0 0 0 0 0	44 dB dBm		: Free Run	#Avg Type:	100/100 Mkr1	TRACE 1234 TYPE MWWW DET PNNN 2.479 026 GH
Ref Offset 2. gB/div Ref 20.00 9 0 0 0 0 0 0 0 0 0 0 0 0 0	44 dB dBm		: Free Run	#Avg Type:	100/100 Mkr1	TRACE 1234 TYPE MWWW DET PNNN 2.479 026 GH
Ref Offset 2. Ref 20.00 Ref 20.	44 dB dBm		: Free Run	#Avg Type:	100/100 Mkr1	TRACE 1234 TYPE MWWW DET PNNN 2.479 026 GH
Ref Offset 2. dB/div Ref 20.00 9 0 0 0 0 0 0 0 0 0 0 0 0 0	44 dB dBm		: Free Run	#Avg Type:	100/100 Mkr1	1746C 1729 4 1779 026 GH -6.679 dBt
Ref Offset 2. dB/div Ref 20.00 00 00 00 00 00 00 00 00 00	44 dB dBm	#VBW 100	: Free Run en: 30 dB	#Avg Type: Avg Hold>	100/100 Mkr1	2.479 026 GH -6.679 dBt
Ref Offset 2. d B/div Ref 20.00 0 0 0 0 0 0 0 0 0 0 0 0	44 dB dBm	Att	: Free Run en: 30 dB	#Avg Type:	100/100 Mkr1	2.479 026 GH -6.679 dBr
Ref Offset 2.           dB/div         Ref 20.00           0	44 dB dBm	#VBW 100	: Free Run en: 30 dB	#Avg Type: Avg Hold>	100/100 Mkr1	2.479 026 GH -6.679 dBt
dB/div         Ref 20.00           GB/div         Ref 20.00	44 dB dBm	#VBW 100	: Free Run en: 30 dB	#Avg Type: Avg Hold>	100/100 Mkr1	2.479 026 GH -6.679 dBt



ilent Spectrum Analyzer - S RL RF 50		SENSE:INT	ALIGNAUTO	03:19:11 PM Apr 28, 202
enter Freq 2.4025	500000 GHz PNO: 1 IFGair	Wide 🖵 Trig: Free Run	#Avg Type: RMS Avg Hold:>100/100	TRACE 1 2 3 4 5 TYPE MWWWW DET P N N N
Ref Offset 2 dB/div Ref 20.00	2.37 dB		M	kr1 2.402 028 GH: -2.789 dBn
o.0	1			
0.0				
0.0				
0.0				
0.0				
enter 2.402500 GH Res BW 30 kHz	Z	#VBW 100 kHz	Swee	Span 2.000 MH ep 2.133 ms (1001 pts
KR MODE TRC SCL 1 N 1 f 2 N 1 f	× 2.402 028 GHz	Y FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
2 N 1 f 3	2.403 026 GHz	-2.646 dBm		
5 6				
8 9 0				
1				
3			STATUS	
	wept SA	S NVNT 3-DH1 2	2441MHz	
RL RF 50	wept SA Ω AC 500000 GHz	SENSE:INT	ALIGNAUTO #Avg Type: RMS	03:21:32 PM Apr 28, 202 TRACE 1234 5 TYPE M
RL RF 50 enter Freq 2.4415	wept SA Ω AC       500000 GHz PNO: IFGair	SENSE:INT	ALIGNAUTO #Avg Type: RMS Avg Hold>100/100	TRACE 12345 TYPE MWWWW DET PNNNN
RL RF 50 enter Freq 2.4415 Ref Offset2 0 dB/div Ref 20.00	wept SA Ω AC 5000000 GHz IFGair 2.39 dB	SENSE:INT	ALIGNAUTO #Avg Type: RMS Avg Hold>100/100	TRACE 1 2 3 4 5 TYPE MWWWW DET P NNNN
RL RF 50 enter Freq 2.4415 Ref Offset 2 d dB/div Ref 20.00	wept SA Ω AC 5000000 GHz IFGair 2.39 dB	SENSE:INT	ALIGNAUTO #Avg Type: RMS Avg Hold>100/100	TRACE 1 2 3 4 5 TYPE MWWWW DET P NNNN
RL         RF         50           enter Freq 2.4415         Ref Offset 2           Ref Offset 20         Ref 20.00           0         Ref 20.00           0         0	wept SA Q AC PRO: PNO: PNO: IFGair 2.39 dB dBm	SENSE:INT	ALIGNAUTO #Avg Type: RMS Avg Hold>100/100	TRACE 1 2 3 4 5 TYPE MWWWW DET P NNNN
RL         RF         50           enter Freq 2.4415         Ref Offset2         Ref Offset2           0 dB/div         Ref 20.00         Ref 20.00           0	wept SA Q AC PRO: PNO: PNO: IFGair 2.39 dB dBm	SENSE:INT	ALIGNAUTO #Avg Type: RMS Avg Hold>100/100	TRACE 2 3 4 5 TYPE MWWWW DET P NNNN
RL         RF         50           enter Freq 2.4415         Ref Offset 2         Ref Offset 2           dB/div         Ref 20.00         Ref 20.00           0	wept SA Q AC PRO: PNO: PNO: IFGair 2.39 dB dBm	SENSE:INT	ALIGNAUTO #Avg Type: RMS Avg Hold>100/100	TRACE 2 3 4 5 TYPE MWWWW DET P NNNN
RL         RF         50           enter Freq 2.4415         Ref Offset 2         Ref Offset 2           0 dB/div         Ref 20.00         Ref 20.00           0 0	wept SA Q AC PRO: PNO: PNO: IFGair 2.39 dB dBm	SENSE:INT	ALIGNAUTO #Avg Type: RMS Avg Hold>100/100	TRACE 2345 TYPE MWWWW DET PNNNN
RL         RF         S0           enter Freq 2.4415         Ref Offset2         Ref Offset2           dB/div         Ref 20.00         Ref 20.00           00	wept SA R AC F S00000 GHz PN0: IFGain 2.39 dB 0 dBm	SENSE:INT	ALIGNAUTO #Avg Type: RMS Avg Hold>100/100	IRACE [] 23 45 TYPE [] NNNN kr1 2.441 030 GH: -4.933 dBn
RL         RF         S0           enter Freq 2.4415         Ref Offset 2           dB/div         Ref 20.00           0	wept SA R AC F S00000 GHz PN0: IFGain 2.39 dB 0 dBm	SENSE:INT	ALIGN AUTO #Avg Type: RMS Avg Hold>100/100	Kr1 2.441 030 GH: -4.933 dBn
RL RF 50 enter Freq 2.4415 dB/div Ref 20.00 00 00 00 00 00 00 00 00 00 00 00 00	x AC SOLUCION CONTRACTOR CONTRACT	SENSE:INT Wide Trig: Free Run #Atten: 30 dB #Ubw #VBW 100 kHz #VBW 100 kHz FUNCTION	ALIGNAUTO #Avg Type: RMS Avg]Hold>100/100	03:21:32 PMApr 28, 202 TRACE 12 3 4 5 TYPE MUMININ Ikr1 2.441 030 GH: -4.933 dBn -4.933 dBn -4.934 dBn -4.9
RL         RF         S0           enter Freq 2.4415         Ref Offset2         Ref Offset2           dB/div         Ref 20.00         Ref 20.00           00	x AC R AC S00000 GHz IFGain 2.39 dB 0 dBm 1 1 1 2.39 dB 1 2.39 dB 1 2.39 dB 1 2.39 dB 1 2.39 dB 1 2.39 dB 1 2.39 dB 1 2.39 dB 1 2.39 dB 1 2.39 dB 1 2 2 2 2 2 2 2 2 2 2 2 2 2	SENSE:INT Mide Trig: Free Run #Atten: 30 dB #VEW 100 kHz Y FUNCTION	ALIGNAUTO #Avg Type: RMS Avg]Hold>100/100	Span 2.000 MH pp 2.133 ms (1001 pts
RL         RF         S0           enter Freq 2.4415         Ref Offset2         Ref 20.00           dB/div         Ref 20.00         Ref 20.00           00	x AC SOLUCION CONTRACTOR CONTRACT	SENSE:INT Wide Trig: Free Run #Atten: 30 dB #Ubw #VBW 100 kHz #VBW 100 kHz FUNCTION	ALIGNAUTO #Avg Type: RMS Avg]Hold>100/100	Span 2.000 MH pp 2.133 ms (1001 pts
Ref Offset 2 D dB/div Ref 20.00 D dB/di Ref 20.00 D dB/di Ref 20.00 D dB/div Ref 20.00 D dB/div Ref 2	x AC SOLUCION CONTRACTOR CONTRACT	SENSE:INT Wide Trig: Free Run #Atten: 30 dB #Ubw #VBW 100 kHz #VBW 100 kHz FUNCTION	ALIGNAUTO #Avg Type: RMS Avg]Hold>100/100	TRACE         Image: Type Image: T



	CFS NVN	IT 3-DH1 24	80MHz	
Agilent Spectrum Analyzer - Swep	ot SA			
XIRL RF 50Ω	AC SEN	SE:INT	ALIGN AUTO	03:24:10 PM Apr 28, 2023
Center Freq 2.479500	DOOD GHZ PNO: Wide	Trig: Free Run	#Avg Type: RMS Avg[Hold:>100/100	TRACE 12345 TYPE MWWWW
		#Atten: 30 dB		DET PNNN
Ref Offset 2.44			Ν	/lkr1 2.479 030 GHz -6.614 dBr
10 dB/div Ref 20.00 dl	Bm			-0.014 0011
10.0				
0.00	¹			
-10.0				
-20.0		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		
-30.0				
-40.0				
-50.0				
-60.0				
-70.0				
Center 2.479500 GHz				On on 2 000 MU
#Res BW 30 kHz	#VBW	100 kHz	Swe	Span 2.000 MH: ep 2.133 ms (1001 pts
MKR MODE TRC SCL	X Y		UNCTION WIDTH	FUNCTION VALUE
1 N 1 f 2 N 1 f	2.479 030 GHz -6.614 dB 2.480 028 GHz -6.778 dB	im in the second se		
3	2.400 020 GHZ -0.770 dE			
5				
6				
8				
9				
11				>
ISG			STATUS	

No.: BCTC/RF-EMC-007

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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-DH1	79 15	Pass
NVNT	2-DH1	79 15	Pass
NVNT	3-DH1	79 15	Pass



<mark>ilent Spectrum Analyzer - Swept SA</mark> RL RF 50 Ω AC	Hopping No. NVNT 1	ALIGNAUTO	03:35:36 PM Apr 28, 2023
enter Freq 2.441750000 GH		#Avg Type: RMS	TRACE 12345 TYPE MWWWW DET PNNNN
Ref Offset 2.39 dB dB/div Ref 20.00 dBm		Mkr1 2	.401 837 0 GHz -0.116 dBm
	MMMMMMMMMMMM		
tart 2.40000 GHz Res BW 100 kHz	#VBW 300 kHz	· · · · ·	Stop 2.48350 GHz .000 ms (1001 pts)
1         N         1         f         2.401837           2         N         1         f         2.480160           3         -         -         -           4         -         -         -           5         -         -         -           6         -         -         -           9         -         -         -           1         -         -         -           6         -         -         -	0 GHz -0.116 dBm 0 GHz -3.668 dBm		
ilent Spectrum Analyzer - Swept SA	Hopping No. NVNT 2	-DH1 2441MHz	
RL   RF  50Ω AC   enter Freq 2.441750000 GH	PNO: Fast 🖵 Trig: Free Rur	ALIGN AUTO #Avg Type: RMS n Avg Hold:>100/100	03:44:01 PM Apr 28, 2023 TRACE 1 2 3 4 5 0 TYPE MVAAAAAA DET P N N N N
Ref Offset 2.39 dB	IFGain:Low #Atten: 30 dB	Mkr1 2	.401 670 0 GHz -5.959 dBm
	www.www.www.www.		A 2
tart 2.40000 GHz Res BW 100 kHz	#VBW 300 kHz	Sweep 8	Stop 2.48350 GHz .000 ms (1001 pts)
KR MODE TRC SCL X 1 N 1 f 2.401 670	Y FUNCTIO 0 GHz -5.959 dBm 5 GHz -5.715 dBm	N FUNCTION WIDTH FUNCT	ION VALUE



	Норр	oing No. N	VNT 3-DI	H1 2441M	Hz	
Agilent Spectrum Analyzer - Sw W RL RF 50 ຜ Center Freq 2.44175	AC 50000 GHz	SENSE:	(NT)	ALIGNAUTO #Avg Typ		03:52:07 PM Apr 28, 20 TRACE 1 2 3 4 TYPE MWWW
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MKR MODE TRC SCL	X	Y	FUNCTION	FUNCTION WIDTH		NCTION VALUE
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7 8 9						
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MSG				<b>I</b> STATUS		

No.: BCTC/RF-EMC-007

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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).

### 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).

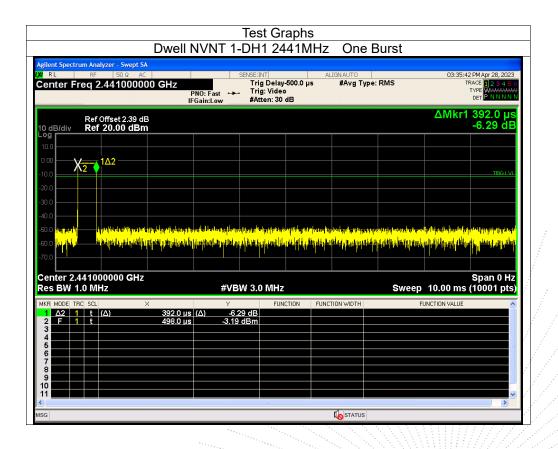
DH3 Packet permit maximum 1600 / 79 / 4 hops per second in each channel (3 time slots RX, 1 time slot TX).

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:

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Condition	Mode	Frequency (MHz)	Pulse Time (ms)	Total Dwell Time (s)	Limit (s)	Verdict
NVNT	1-DH1	2441	0.392	0.125	0.4	Pass
NVNT	1-DH3	2441	1.648	0.264	0.4	Pass
NVNT	1-DH5	2441	2.896	0.309	0.4	Pass
NVNT	2-DH1	2441	0.384	0.123	0.4	Pass
NVNT	2-DH3	2441	1.636	0.262	0.4	Pass
NVNT	2-DH5	2441	2.884	0.308	0.4	Pass
NVNT	3-DH1	2441	0.382	0.122	0.4	Pass
NVNT	3-DH3	2441	1.633	0.261	0.4	Pass
NVNT	3-DH5	2441	2.827	0.302	0.4	Pass



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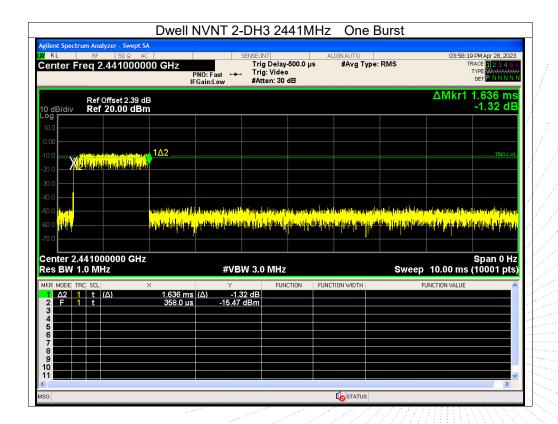


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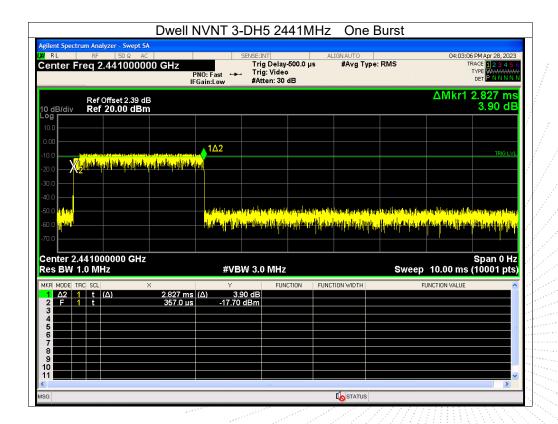


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	Dwell N	NVNT 3-DI	H3 2441Ⅳ	1Hz One	Burst		
gilent Spectrum Analyzer - Swept SA RL RF 50 Ω AC enter Freq 2.44100000	00 GHz	PNO:East →→ T	E:INT rig Delay-500.0 μ rig: Video Atten: 30 dB	ALIGN AUTO Is #Avg Ty	pe: RMS	Tf	5 PM Apr 28, 202 RACE 1 2 3 4 5 TYPE WWWWW DET P N N N
Ref Offset 2.39 dB 0 dB/div Ref 20.00 dBm						∆Mkr1	1.633 m -2.20 dl
10.0							
10.0 X2	1Δ2						TRIG LV
20.0							
50.0 <mark>на војна во</mark> 50.0 <mark>на војна на</mark>	ethinitury sold didig theory of a	alleralaliterianen redenstra gehjeden anden ander and	ally no an air da air da air da Island air	ly no detain the formation of the second state	l <mark>et en </mark>	alayan sa dina kabula Lan hing Mariya kupi	<mark>an an a</mark>
20.0 Hard	a de up signa y a segur Alalia y fi faces de la	ulodi Wainen Yelan di Affili pina Amin' sa Affili pina Amin' sa WBW 3		ly a second of the second state on a filmen of the second state for	<mark>id all on Apple plak, and t</mark> od.	10.00 ms	Span 0 H
Conter 2.441000000 GHz Center 2.441000000 GHz Les BW 1.0 MHz KRI MODE TRC SCL >	Intellän järavana ja konstruktion ja konstrukt	**************************************	.0 MHz	<mark>และสมุขา (ใน</mark> และไปไป) _เ น สุขณะ (ปัน 2011) FUNCTION WIDTH	Sweep	<mark>k_an bin ji ka ka ka</mark> ilu	Span 0 H (10001 pt
Image: Non-Ample Ample Am	ildä <mark>r i frass</mark> torfo	<b>μμη μαλιώλη μη</b> #VBW 3 (Δ) -2.20 dl	.0 MHz	at an an in the angle of the second	Sweep	10.00 ms	Span 0 H (10001 pt
and and a second seco	1.633 ms	<b>μμη μαλιώλη μη</b> #VBW 3 (Δ) -2.20 dl	.0 MHz	at an an in the angle of the second	Sweep	10.00 ms	Span 0 H



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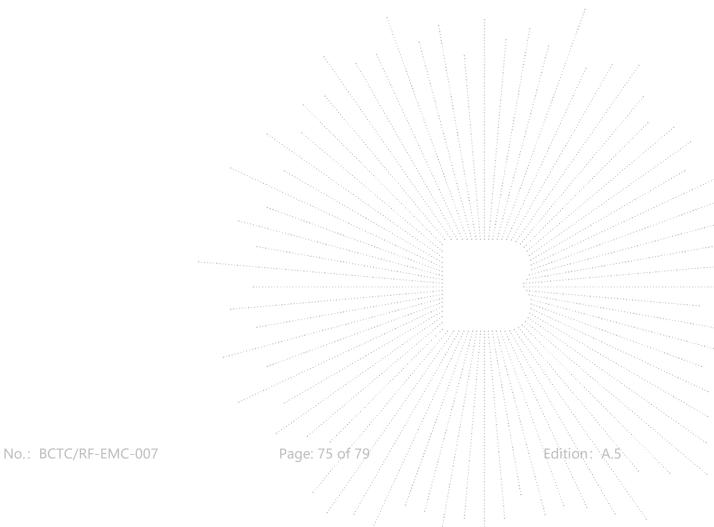
## 15. Antenna Requirement

### 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

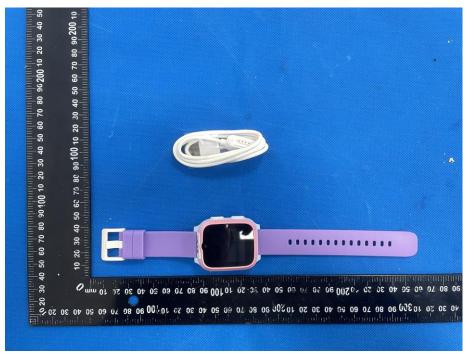
The EUT antenna is Internal antenna, fulfill the requirement of this section.





## 16. EUT Photographs

### EUT Photo 1



### EUT Photo 2



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# 17. EUT Test Setup Photographs

#### **Conducted Emissions Photo**



**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 test report without CMA mark is only used for scientific research, teaching, enterprise product development and internal quality control purposes.

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

9. 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.

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***** END *****

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