



Edition: B.2

No.: BCTC/RF-EMC-005









No.: BCTC/RF-EMC-005











### 10. 20 dB Bandwidth

### 10.1 Block Diagram Of Test Setup



### 10.2 Limit

N/A

### 10.3 Test procedure

1. Set RBW = 30kHz.

2. Set the video bandwidth (VBW)  $\ge$  3 x RBW.

3. Detector = Peak.

4. Trace mode = max hold.

5. Sweep = auto couple.

10.4 Test Result

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.

-20 dB

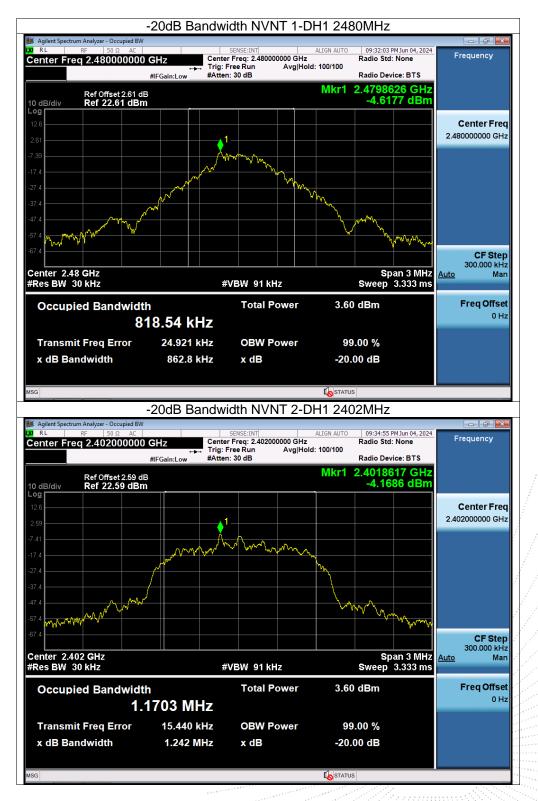
# Condition Mode Frequency (MHz)

Condition	Mode	Frequency (MHz)	Bandwidth (MHz)	Verdict
NVNT	1-DH1	2402	0.833	Pass
NVNT	1-DH1	2441	0.874	Pass
NVNT	1-DH1	2480	0.863	Pass
NVNT	2-DH1	2402	1.242	Pass
NVNT	2-DH1	2441	1.276	Pass
NVNT	2-DH1	2480	1.288	Pass
NVNT	3-DH1	2402	1.201	Pass
NVNT	3-DH1	2441	1.244	Pass
NVNT	3-DH1-	2480	1.223	Pass
	·	and the second	2277M	









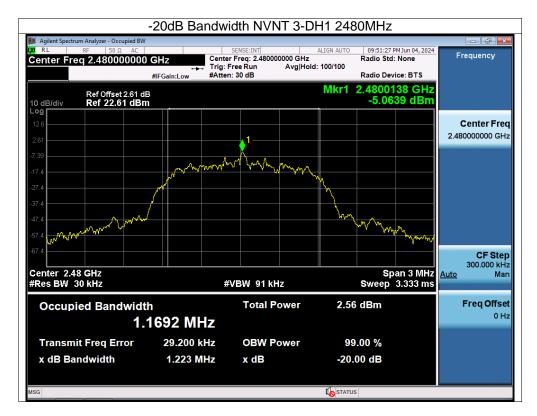












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### 11. Maximum Peak Output Power

### 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.

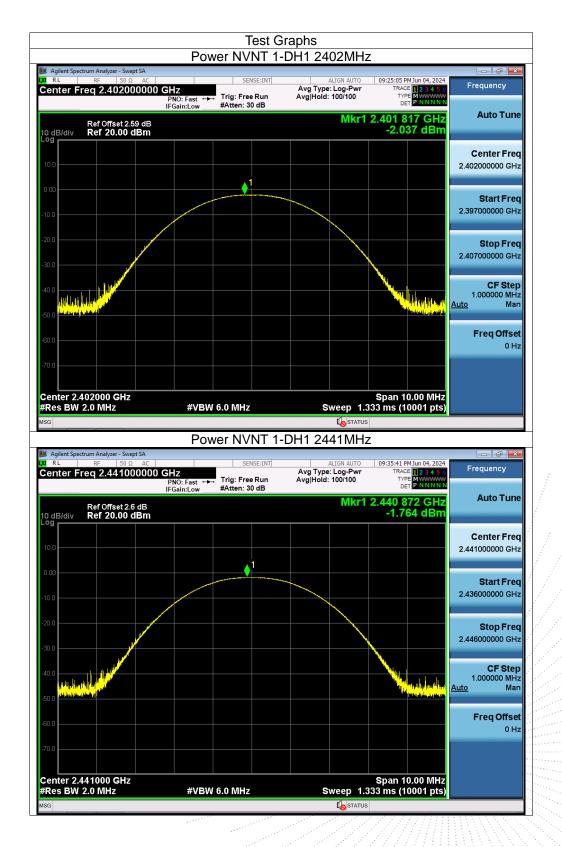
2. Set the spectrum analyzer: RBW = 2MHz. VBW = 6MHz. Sweep = auto; Detector Function = Peak.

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

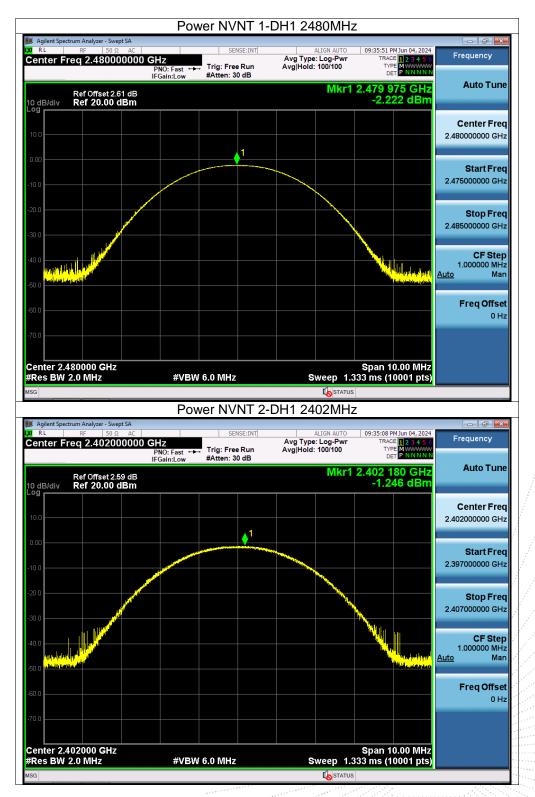
### 11.4 Test Result

Condition	Mode	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	1-DH1	2402	-2.04	21	Pass
NVNT	1-DH1	2441	-1.76	21	Pass
NVNT	1-DH1	2480	-2.22	21	Pass
NVNT	2-DH1	2402	-1.25	21	Pass
NVNT	2-DH1	2441	-1.04	21	Pass
NVNT	2-DH1	2480	-1.52	21	Pass
NVNT	3-DH1	2402	-0.81	21	Pass
NVNT	3-DH1	2441	-0.62	21	Pass
NVNT	3-DH1	2480	-1.05	21	Pass





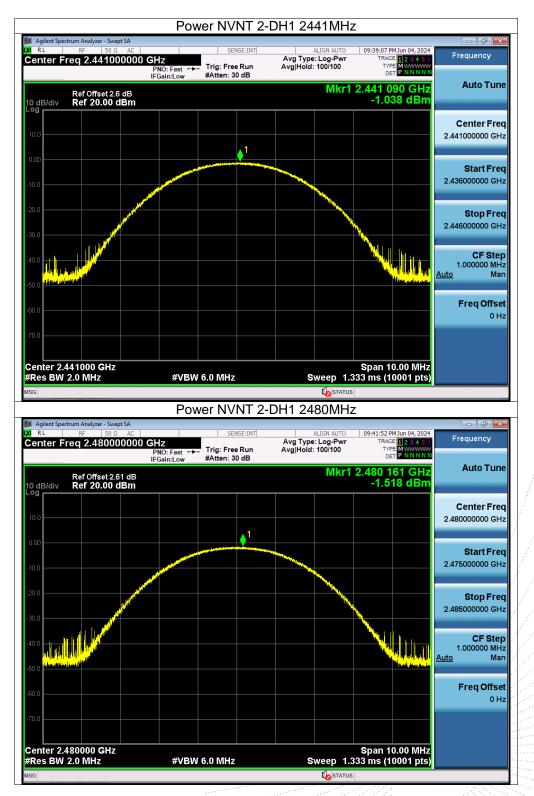




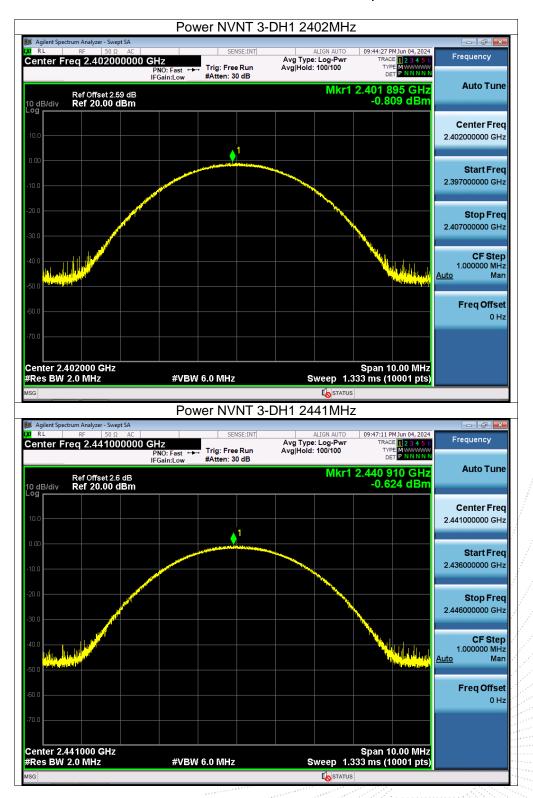
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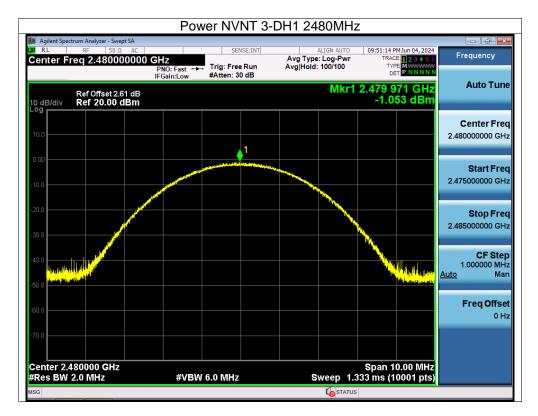






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### 12. Hopping Channel Separation

### 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.

odulation	Test Channel	Separation (MHz)	Limit(MHz)	Result
GFSK	Low Manager	1.002	0.555	PASS
GFSK	Middle	1.000	0.583	PASS
GFSK	High	1.000	0.575	PASS
π/4 DQPSK	Low	1.000	0.828	PASS
π/4 DQPSK	Middle	1:000	0.851	PASS
π/4 DQPSK	High	1.000	0.859	PASS
8DPSK	Low	1.002	0.801	PASS
8DPSK	Middle	1.000	0.829	PASS
8DPSK	High	0.998	0.815	PASS

### 12.4 Test Result











RL RF 50 9	ept SA				
enter Freq 2.4415	Ω AC 00000 GHz PNO: Wide C	SENSE:INT	ALIGN AUTO Avg Type: Log-Pwr Avg Hold:>100/100	09:18:05 PM Jun 05, 2024 TRACE 1 2 3 4 5 6 TYPE MWWWW DET P NNNNN	Frequency
Ref Offset 2	IFGain:Low	#Atten: 30 dB	Mkr1 2	2.440 860 GHz	Auto Tun
10 dB/div Ref 20.00	dBm			-3.439 dBm	
10.0					Center Fre 2.441500000 G⊢
20.0					<b>Start Fre</b> 2.440500000 G⊢
-40.0 -50.0 -60.0					<b>Stop Fre</b> 2.44250000 G⊢
70.0				Span 2.000 MHz	CF Ste
*Res BW 30 kHz	#VB\	N 100 kHz	Sweep 2.1	133 ms (1001 pts)	200.000 k⊢ <u>Auto</u> Ma
1 N 1 f 2 N 1 f 3 4	2.440 860 GHz 2.441 860 GHz	-3.439 dBm -3.524 dBm			Freq Offse 0 ⊢
5 6 7 8 9				E	
10 11				•	
sg		III		•	
	C	ES NVNT 2-I	DH1 2480MHz		
Agilent Spectrum Analyzer - Sw	ept SA			00-10-11 DV2 05 055	
Center Freq 2.4795		Trig: Free Run #Atten: 30 dB	ALIGN AUTO Avg Type: Log-Pwr Avg Hold:>100/100	09:19:11 PM Jun 05, 2024 TRACE 1 2 3 4 5 6 TYPE MWWWW DET PNNNNN	Frequency
Ref Offset 2 I0 dB/div Ref 20.00	.61 dB		Mkr1 2	2.478 858 GHz -3.845 dBm	Auto Tur
-og	1		<sup>2</sup>		Center Fre 2.479500000 GH
0.00					2.4100000000
0.00				~~~~ <u>~</u>	
0.00				~~~~~	Start Fre
0.00 10.0 20.0 40.0 40.0 60.0				~~~~~	Start Fre 2.478500000 GH Stop Fre 2.480500000 GH
0.00 10.0 20.0 30.0 40.0 50.0		N 100 kHz		Span 2.000 MHz 33 ms (1001 pts)	Start Fre 2.47850000 GH Stop Fre 2.48050000 GH CF Ste
0.00 10.0 20.0 30.0 40.0 50.0	#VB × 2.478 858 GHz	-3.845 dBm		133 ms (1001 pts)	Start Fre 2.47850000 GF Stop Fre 2.48050000 GF CF Ste 200.000 kF
0.00 10.0 20.0 30.0 40.0 50.0	#VB	Y FI	Sweep 2.1	133 ms (1001 pts)	Start Fre           2.478500000 GH           Stop Fre           2.480500000 GH           2.480500000 GH           2.480500000 GH           200.000 KH           Auto           Mathematical           Freq Offset
0 00 10 0 20 0 30 0 40 0 50 0	#VB × 2.478 858 GHz	Y FU -3.845 dBm	Sweep 2.1	133 ms (1001 pts)	Start Fre 2.47850000 GF Stop Fre 2.48050000 GF CF Ste 200.000 kF

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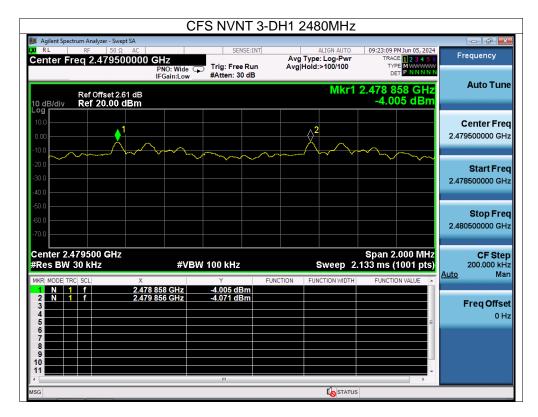


Agilent Spectrum Analyzer - Swept SA RL RF 50 Ω AC	SENSE:INT	ALIGN AUTO	09:20:29 PM Jun 05, 2024	Frequency
enter Freq 2.402500000 C	PNO: Wide IFGain:Low #Atten: 30 dB	Avg Type: Log-Pwr Avg Hold:>100/100	TRACE 1 2 3 4 5 6 TYPE MWWWW DET PNNNN	Trequency
Ref Offset 2.59 dB 0 dB/div Ref 20.00 dBm		Mkr1	2.401 858 GHz -3.736 dBm	Auto Tur
- <b>0</b> g 10.0				Center Fre
				2.402500000 GH
20.0				Start Fre
40.0				2.401500000 G
50.0				Stop Fre
60.0				2.403500000 Gi
Center 2.402500 GHz			Span 2.000 MHz	CF Ste
	#VBW 100 kHz	Sweep 2.	133 ms (1001 pts)	200.000 kł <u>Auto</u> Ma
1 N 1 f 2.401	Y         Fi           358 GHz         -3.736 dBm           360 GHz         -3.822 dBm	SNETION FUNCTION WIDTH	FUNCTION VALUE	
3 4				Freq Offs 01
5 6 7			E	
8 9				
SG		<b>I</b> STATUS		
	CFS NVNT 3-	DH1 2441MHz		
I Agilent Spectrum Analyzer - Swept SA RL RF 50 Ω AC	SENSE:INT	ALIGN AUTO	09:21:49 PM Jun 05, 2024	Frequency
enter Freq 2.441500000 C	PNO: Wide Trig: Free Run IFGain:Low #Atten: 30 dB	Avg Type: Log-Pwr Avg Hold:>100/100	TRACE 1 2 3 4 5 6 TYPE MWWWWW DET P N N N N N	rrequency
Ref Offset 2.6 dB	IFGam:Low	Mkr1	2.440 858 GHz	Auto Tur
0 dB/div Ref 20.00 dBm			-3.566 dBm	
10.0		<mark>2</mark>		Center Fre 2.441500000 GF
10.0			~~~~	2.441500000 Gr
20.0				Start Fre
40.0				2.440500000 GH
50.0				Oton Er
60.0				<b>Stop Fre</b> 2.442500000 GH
70.0				
Center 2.441500 GHz /Res BW 30 kHz	#VBW 100 kHz	Sweep 2.	Span 2.000 MHz 133 ms (1001 pts)	CF Ste 200.000 ki
MKR MODE TRC SCL X		UNCTION FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Ma
	858 GHz -3.566 dBm 858 GHz -3.633 dBm			Freq Offs
4 5			E	. 01
6 7				
6 7 7 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9				

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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



	Iest G Hopping No. NVN	raphs T 1-DH1 2441MF	17	
🕻 Agilent Spectrum Analyzer - Swe	11 0		12	- 6 -
RL RF 50 S Center Freg 2.4417		Avg Type: Log-Pwr		equency
	PNO: Fast Trig: Free Run IFGain:Low #Atten: 30 dB	Avg Hold:>100/100		
Ref Offset 2	.6 dB	Mkr1 2.4	01 837 0 GHz	Auto Tun
0 dB/div Ref 20.00			-2.175 dBm	
10.0				enter Fre
0.00	ากการคลสุดที่สุดการคลายการคลายการคลายการคลายการคลายการคลายการคลายการคลายการคลายการคลายการคลายการคลายการคลายการค	ເປັນການປັດເປັນການເປັນເປັນເປັນເປັນເປັນເປັນເປັນເປັນເປັນເປັ	000000000000000000000000000000000000000	1750000 GH
10.0	<u>TAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA</u>	<u>AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA</u>	AAAAAAAAAAAA	
30.0			2.400	Start Fre 0000000 GH
40.0				
50.0			tur la	Stop Free
70.0			2.483	3500000 GH
Start 2.40000 GHz Res BW 100 kHz	#VBW 300 kHz			CF Stej 350000 MH.
MKR MODE TRC SCL		JNCTION FUNCTION WIDTH	FUNCTION VALUE	Ma
1 N 1 f 2 N 1 f 3	2.401 837 0 GHz -2.175 dBm 2.480 160 0 GHz -2.314 dBm			=req Offse
4 5				0 H
6 7				
8				
10 11				
sg	m		•	
56		CTATUS		
			47	
🖡 Agilent Spectrum Analyzer - Swi	Hopping No. NVN	<b>-</b>	lz	
RL RF 50 S	ept SA 2 AC SENSE:INT 50000 GHz	T 2-DH1 2441MH ALIGN AUTO Avg Type: Log-Pwr	09:30:40 PM Jun 05, 2024	equency
RL RF 50 S	ept SA 2 AC SENSE:INT	T 2-DH1 2441MH	09:30:40 PM Jun 05, 2024	equency
enter Freq 2.4417	ept SA 2 AC SENSE:INT 50000 GHz PNO: Fast IFGain:Low #Atten: 30 dB	ALIGN AUTO Avg Type: Log.Pwr Avg Hold:>100/100	09:30:40 PM Jun 05, 2024 TRACE 22 3 4 5 6 TYPE NNNNN DET PNNNNN 01 586 5 GHz	equency
RL RF 50 S	ept SA 2 AC 50000 GHZ PN0: Fast IFGain:Low 6 dB	ALIGN AUTO Avg Type: Log.Pwr Avg Hold:>100/100	09:30:40 PMJun 05, 2024 TRACE 1 2 3 4 5 6 TYPE MWWWW DET P NNNN	equency
RL RF 50 5 Center Freq 2.4417 Ref Offset 2 0 dB/div Ref 20.00	ept SA 2 AC 50000 GHZ PN0: Fast IFGain:Low 6 dB	ALIGN AUTO Avg Type: Log.Pwr Avg Hold:>100/100	09:30:40 PM Jun 05, 2024 TRACE 12 3 4 5 6 TYPE MINIMAN DET PININNN 11 586 5 GHz -8.120 dBm	equency Auto Tun Center Free
RL         RF         50.5           Center Freq 2.4417         Ref Offset 2           0 dB/div         Ref Offset 2	ept SA 2 AC 50000 GHZ PN0: Fast IFGain:Low 6 dB	T 2-DH1 2441MF ALIGN AUTO Avg Type: Log-Pwr Avg Hoid:>100/100 Mkr1 2.40	09:30:40 PM Jun 05, 2024 TRACE 1 2 3 4 5 6 TYPE MININ N DET PININN N 1 586 5 GHz -8.120 dBm	equency Auto Tun Center Free
RL RF 50.5 Center Freq 2.4417 0 dB/div Ref 20.00	ept SA 2 AC SENSE:INT 50000 GHz PNO: Fast IFGain:Low 6 dB dBm	T 2-DH1 2441MF ALIGN AUTO Avg Type: Log-Pwr Avg Hoid:>100/100 Mkr1 2.40	09:30:40 PM Jun 05, 2024 TRACE 1 2 3 4 5 6 TYPE MININ N DET PININN N 1 586 5 GHz -8.120 dBm	equency Auto Tun Center Free 1750000 GH
RL RF 50.5 Center Freq 2.4417 0 dB/div Ref 20.00	ept SA 2 AC SENSE:INT 50000 GHz PNO: Fast IFGain:Low 6 dB dBm	T 2-DH1 2441MF ALIGN AUTO Avg Type: Log-Pwr Avg Hoid:>100/100 Mkr1 2.40	09:30:40 PM Jun 05,2024 TRACE 1 2 3 4 5 6 TYPE 0 NNNN N 01 586 5 GHz -8.120 dBm 2.44*	equency Auto Tun Center Fre 1750000 GH Start Fre
RL RF 50 5 Center Freq 2.4417 0 dB/div Ref 20.00 10.0 0.00 10.0 0.00 0.	ept SA 2 AC SENSE:INT 50000 GHz PNO: Fast IFGain:Low 6 dB dBm	T 2-DH1 2441MF ALIGN AUTO Avg Type: Log-Pwr Avg Hoid:>100/100 Mkr1 2.40	09:30:40 PM Jun 05,2024 TRACE 1 2 3 4 5 6 TYPE 0 NNNN N 01 586 5 GHz -8.120 dBm 2.44*	equency Auto Tun Center Fre 1750000 GH Start Fre
RL RF 50 5 Center Freq 2.4417 0 dB/div Ref 20.00 0.00 10.0 0.00 0.	ept SA 2 AC SENSE:INT 50000 GHz PNO: Fast IFGain:Low 6 dB dBm	T 2-DH1 2441MF ALIGN AUTO Avg Type: Log-Pwr Avg Hoid:>100/100 Mkr1 2.40	09:30:40 PM Jun 05,2024 TRACE 1 2 3 4 5 6 TYPE 0 NNNN N 01 586 5 GHz -8.120 dBm 2.44*	equency Auto Tun Center Fre 1750000 GH Start Fre 20000000 GH
RL RF 50 G Center Freq 2.4417 0 dB/div Ref 20.00 0 00 10.000	ept SA 2 AC SENSE:INT 50000 GHz PNO: Fast IFGain:Low 6 dB dBm	T 2-DH1 2441MF ALIGN AUTO Avg Type: Log-Pwr Avg Hoid:>100/100 Mkr1 2.40	09:30:40 PM Jun 05, 2024 TRACE    2 3 4 5 6 TYPE    1 2 3 4 5 6 TYPE    1 2 9 4 5 6 TYPE	equency Auto Tun Eenter Fre 1750000 GH Start Fre 20000000 GH Stop Fre
RL RF 50.6 Center Freq 2.4417 Ref Offset 2 0 dB/div Ref 20.00 0 00 10 0 10 0 20 0 30 0 50 0	ept SA 2 AC SENSE:INT 50000 GHz PNO: Fast IFGain:Low 6 dB dBm	T 2-DH1 2441MF	09:30:40 PM Jun 05, 2024 TRACE    2 3 4 5 6 TYPE    2 3 4 5 6 TYPE	equency Auto Tun Center Fre 1750000 GH Start Fre 3000000 GH Stop Fre 3500000 GH
RL RF 50 G Center Freq 2.4417 0 dB/div Ref 20.00 0.00 10.0 0.00 10.0 0.00 10.0 0.00 10.0 0.00 10.0 0.00 10.0 0.00 10.0 0.00 10.0 0.00 10.0 0.00 10.0 0 0.00 10.0 0 0 0	ept SA 2 AC SENSE:INT 50000 GHz PNO: Fast IFGain:Low 6 dB dBm	T 2-DH1 2441MF	09:30:40 PM Jun 05, 2024 TRACE 2 2 4 5 6 DET PINNING DET PINNING 2 2 4 5 2 2 4 5 2 2 4 5 2 2 4 5 2 2 4 7 2 2 4 4 2 2 4 0 2 4 8 2 4 8 2 4 8 2 4 8 2 4 8 2 4 8 2 9 2 9 2 4 8 2 9 2 9 2 9 2 9 2 9 2 9 2 9 2 9	equency Auto Tun Center Fre 1750000 GH Start Fre 2000000 GH Stop Fre 3500000 GH CF Ste .350000 MH
RL RF 50 G Center Freq 2.4417 Ref Offset 2 0 dB/div Ref 20.00 0 00 10.0 0 00 10.0 0 00 10.0 0 00 10.0 0 00 10.0 0 00 10.0 0 00 10.0 0 00 10.0 0 00 10.0 0 0 00 10.0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	eptSA 2 AC SENSE:INT 50000 GHz PN0: Fast IFGain:Low 5 dB dB dB 4 4 4 4 4 4 4 4 4 4 4 4 4	T 2-DH1 2441MF	09:30:40 PM Jun 05, 2024 TRACE    2 3 4 5 6 TYPE    1 2 4 5 6 TYPE    1 2 5 4 5 6 TYPE    1 2 5 4 5 6 TYPE    1 2 5 4 5 6 TYPE    2 5 6	equency Auto Tun Center Fre 1750000 GH Start Fre 2000000 GH Stop Fre 3500000 GH CF Stej .350000 MH
RL         RF         S0.6           Center Freq 2.4417         Ref Offset 2           0 dB/div         Ref 20.00           0 g         1           0 dB/div         Ref 20.00           0 g         1           0 dB/div         Ref 20.00           0 g         1           0 d0         1	ept SA 2 AC SENSE:INT 50000 GHZ PN0: Fast IFGain:Low Trig: Free Run #Atten: 30 dB 6 dB dBm AM//MAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	T 2-DH1 2441MF	09:30:40 PM Jun 05, 2024 TRACE    2 3 4 5 6 TYPE    1 2 4 5 6 TYPE    1 2 1 4 5 6 TYPE    1 2 1 4 5 6 TYPE    2 1 4 5 6 T	equency Auto Tun Eenter Fre 1750000 GH Start Fre 10000000 GH Stop Fre 1350000 GH CF Stej 1350000 MH Ma
RL         RF         50.9           Center Freq 2.4417         Ref Offset 2           0 dB/div         Ref 20.00           0 dB/div         Ref 20.00 <t< td=""><td>eptSA 2 AC SENSE:INT 50000 GHz PN0: Fast IFGain:Low 5 dB dB dB 4 4 4 4 4 4 4 4 4 4 4 4 4</td><td>T 2-DH1 2441MF</td><td>09:30:40 PM Jun 05, 2024 TRACE    2 3 4 5 6 TYPE    1 2 4 5 6 TYPE    1 2 1 4 5 6 TYPE    1 2 1 4 5 6 TYPE    2 1 4 5 6 T</td><td>equency Auto Tun Center Fre 1750000 GH Start Fre 2000000 GH Stop Fre 3500000 GH CF Step .350000 MH Ma</td></t<>	eptSA 2 AC SENSE:INT 50000 GHz PN0: Fast IFGain:Low 5 dB dB dB 4 4 4 4 4 4 4 4 4 4 4 4 4	T 2-DH1 2441MF	09:30:40 PM Jun 05, 2024 TRACE    2 3 4 5 6 TYPE    1 2 4 5 6 TYPE    1 2 1 4 5 6 TYPE    1 2 1 4 5 6 TYPE    2 1 4 5 6 T	equency Auto Tun Center Fre 1750000 GH Start Fre 2000000 GH Stop Fre 3500000 GH CF Step .350000 MH Ma
RL         RF         S0 G           Center Freq 2.4417         Ref Offset2         0           0 dB/div         Ref 20.00         0           0 dD         0         0         0           0 dD         <	eptSA 2 AC SENSE:INT 50000 GHz PN0: Fast IFGain:Low 5 dB dB dB 4 4 4 4 4 4 4 4 4 4 4 4 4	T 2-DH1 2441MF	09:30:40 PM Jun 05, 2024 TRACE   2 3 4 5 6 TYPE   2 3 4 5 6 PULLINING 2 4 5 2 4 4 2 4 5 2 4 2 4 5 2 4 2 4 2 4 2 4 2 4 2 4 2 4 2 4	
RL         RF         S0.6           Center Freq 2.4417         Ref Offset 2           0 dB/div         Ref 20.00           0 g	eptSA 2 AC SENSE:INT 50000 GHz PN0: Fast IFGain:Low 5 dB dB dB 4 4 4 4 4 4 4 4 4 4 4 4 4	T 2-DH1 2441MF	09:30:40 PM Jun 05, 2024 TRACE   2 3 4 5 6 TYPE   2 3 4 5 6 PULLINING 2 4 5 2 4 4 2 4 5 2 4 2 4 5 2 4 2 4 2 4 2 4 2 4 2 4 2 4 2 4	equency Auto Tun Center Fre 1750000 GH Start Fre 2000000 GH Stop Fre 3500000 GH CF Step .350000 MH Ma
RL         RF         S0.4           Center Freq 2.4417         Ref Offset 2           0 dB/div         Ref 20.00           10.0	eptSA 2 AC SENSE:INT 50000 GHz PN0: Fast IFGain:Low 5 dB dB dB 4 4 4 4 4 4 4 4 4 4 4 4 4	T 2-DH1 2441MF	09:30:40 PM Jun 05, 2024 TRACE   2 3 4 5 6 TYPE   2 3 4 5 6 PULLINING 2 4 5 2 4 4 2 4 5 2 4 2 4 5 2 4 5 2 4 2 4 5 2 4 2 4 2 4 2 4 2 4 2 4 2 4 2 4	equency Auto Tun Center Fre 1750000 GH Start Fre 2000000 GH Stop Fre 3500000 GH CF Step .350000 MH Ma



	Hopping No. NVN	T 3-DH1 2441N	1Hz	
J Agilent Spectrum Analyzer - Swept SA				
RE RF 50 Ω AC     Center Freq 2.441750000	GHz SENSE:INT	ALIGN AUTO Avg Type: Log-Pwr	09:35:05 PM Jun 05, 2024 TRACE 1 2 3 4 5 6	Frequency
	PNO: Fast Trig: Free Run IFGain: I ow #Atten: 30 dB	Avg Hold:>100/100	DET P NNNN	
Ref Offset 2.6 dB 10 dB/div Ref 20.00 dBm		Mkr1 2.	401 503 0 GHz -7.910 dBm	Auto Tune
Log 10.0 0.00 -10.0	www.www.www.			Center Freq 2.441750000 GHz
-20.0				Start Free 2.400000000 GHz
-50.0			Vint	<b>Stop Fred</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 Auto Mar
MKR MODE TRC SCL X	503 0 GHz -7.910 dBm	UNCTION FUNCTION WIDTH	FUNCTION VALUE	Auto Man
2 N 1 f 2.480 3 4 5	160 0 GHz -3.430 dBm			Freq Offset 0 Hz
6 7 8 9				
MSG		<b>I</b> STATUS		

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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.

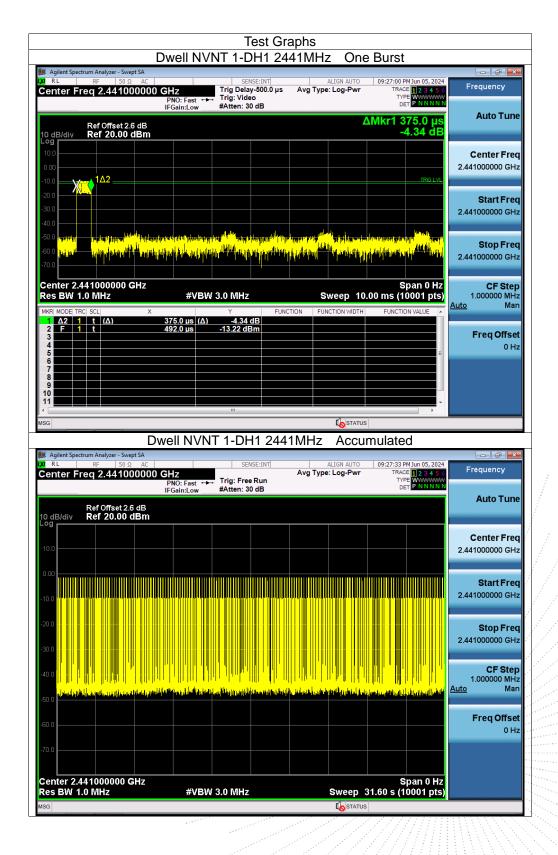
4. Use the marker-delta function to determine the dwell time. If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation. The limit is specified in one of the subparagraphs of this Section. Submit this plot(s).

Mode	Frequency (MHz)	Pulse Time (ms)	Total Dwell Time (ms)	Burst Count	Period Time (ms)	Limit (ms)	Verdict
1-DH1	2441	0.375	119.625	319	31600	400	Pass
1-DH3	2441	1.631	270.746	166	31600	400	Pass
1-DH5	2441	2.88	313.92	109	31600	400	Pass
2-DH1	2441	0.386	122.362	317	31600	400	Pass
2-DH3	2441	1.638	268.632	164	31600	400	Pass
2-DH5	2441	2.879	293.658	102	31600	400	Pass
3-DH1	2441	0.386	122.362	317	31600	400	Pass
3-DH3	2441	1.637	260.283	159	31600	400	Pass
3-DH5	2441	2.887	320.457	111	31600	400	Pass

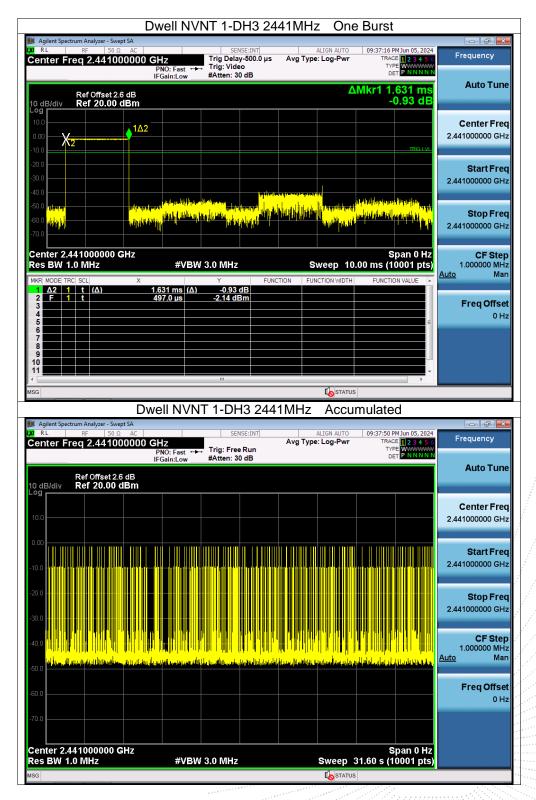
### 14.4 Test Result

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

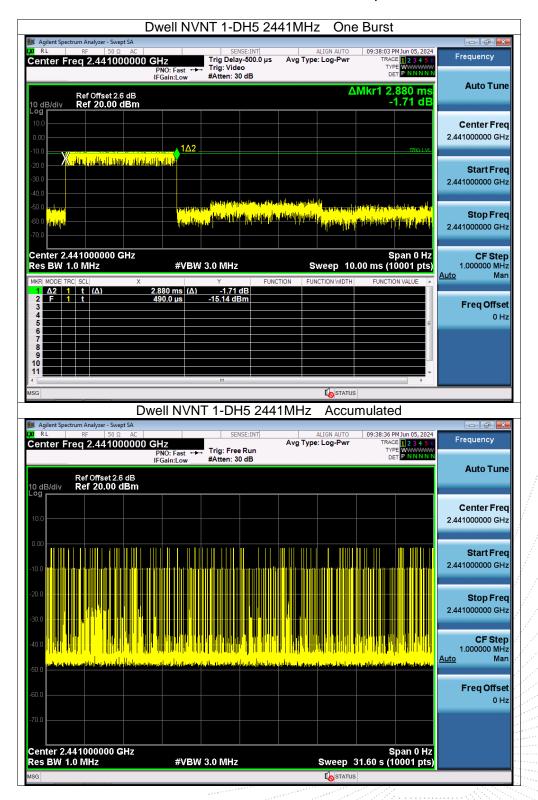












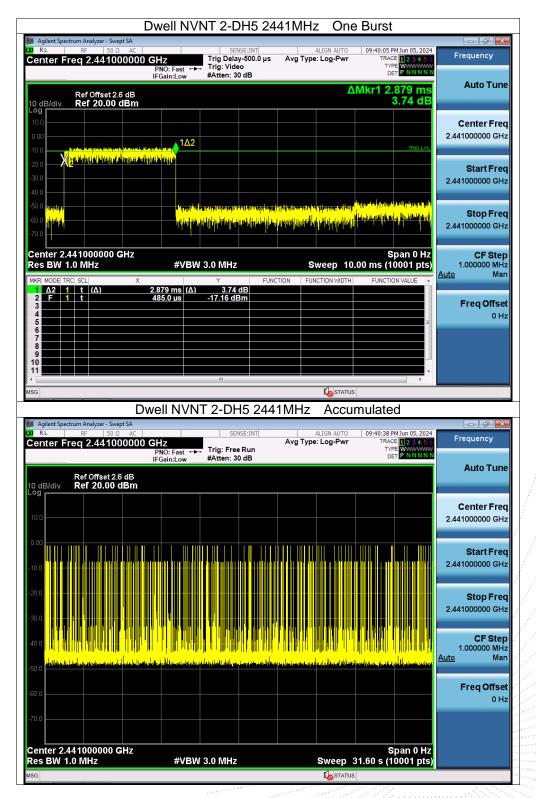


Dwell NVNT 2-DH1 2	441MHz One Burst	
Image: Mail And Section Analyzer - Swept SA           Image: Mail Analyzer - Swept SA	ALIGN AUTO 09:30:45 PM Jun 05, 2024	
Center Freq 2.441000000 GHz PNO: Fast	S Avg Type: Log-Pwr TRACE 123456 TYPE WWWWWW DET PNNNN	Frequency
Ref Offset 2.6 dB	ΔMkr1 386.0 μs -3.38 dB	Auto Tune
10 dB/div Ref 20.00 dBm	-5.56 UB	
10.0 0.00 <u>1Δ2</u>		Center Freq 2.441000000 GHz
-10.0	TRIG LVL	
-20.0		Start Freq
-40.0		2.441000000 GHz
-50.0 epidet	ter Aller er bereckte get der Aller angezeigter eine der beste aller ander ander andere andere andere andere andere Aller eine der andere andere andere angezeigter eine angezeigter eine angezeigter angezeigter eine angezeigter	Stop Freq
	and a state of the second s	2.441000000 GHz
Center 2.441000000 GHz	Span 0 Hz	CF Step
Res BW 1.0 MHz #VBW 3.0 MHz	Sweep 10.00 ms (10001 pts)	1.000000 MHz <u>Auto</u> Man
MKR MODE         TRC         SCI         X         Y         FL           1         Δ2         1         t         (Δ)         386.0 μs         (Δ)         -3.38 dB           2         F         1         t         497.0 μs         -5.09 dBm	JNCTION FUNCTION WIDTH FUNCTION VALUE	
		Freq Offset 0 Hz
5. 6	EE	
8		
10	· · · · · · · · · · · · · · · · · · ·	
MSG III	STATUS	
Dwell NVNT 2-DH1 24	41MHz Accumulated	
Agilent Spectrum Analyzer - Swept SA           R L         RF         50 Ω         AC         SENSE:INT	ALIGN AUTO 09:31:18 PM Jun 05, 2024	
Center Freq 2.441000000 GHz PNO: Fast +++ IFGain:Low #Atten: 30 dB	Avg Type: Log-Pwr TRACE 123456 TYPE WWWWW DET PNNNNN	Frequency
Ref Offset 2.6 dB		Auto Tune
10 dB/div Ref 20.00 dBm		
10.0		Center Fred 2.441000000 GH;
		Start Free
-10.0		2.441000000 GH:
-20.0		Stop Fred
		2.441000000 GH
.300		
		CF Ster
		1.000000 MH
	n ang ang ang ang ang ang ang ang ang an	1.000000 MHz
	in a standard	1.000000 MH <del>i</del> <u>Auto</u> Mar <b>Freq Offse</b>
-40.0 1 -50.0 4 -60.0	n an	CF Step 1.000000 MHz <u>Auto</u> Mar Freq Offset 0 Hz
-40.0		1.000000 MHz <u>Auto</u> Man Freq Offset
	Span 0 Hz Sweep 31.60 s (10001 pts)	1.000000 MH <del>i</del> <u>Auto</u> Mar <b>Freq Offse</b>



	Dwell NVNT 2	2-DH3 2441	MHz One	Burst	
Jacob Agilent Spectrum Analyzer - Swept SA		SENSE:INT	ALIGN AUTO	09:39:05 PM Jun 05, 2024	
Center Freq 2.4410000	PNO: Fast Trig	Delay-500.0 µs Av Video	g Type: Log-Pwr	TRACE 1 2 3 4 5 6 TYPE WWWWWW	Frequency
	IFGain:Low #Atte	en: 30 dB	A.1		Auto Tune
Ref Offset 2.6 dl 10 dB/div Ref 20.00 dB			Δι	/kr1 1.638 ms -1.52 dB	
10.0					Center Freq
0.00					2.441000000 GHz
	1Δ2			TRIG LVL	
-20.0					Start Freq
-30.0					2.441000000 GHz
	part sing in a contract singly and set of the		a turka a shi ya shi	to a state to the providence of the state of t	
				<mark>يار ب</mark> ور الاعتراد بواغر متاريخ	<b>Stop Freq</b> 2.441000000 GHz
-70.0	· · · · · · · · · · · · · · · · · · ·		···	<u> </u>	2.44 1000000 GHZ
Center 2.441000000 GH:				Span 0 Hz	CF Step
Res BW 1.0 MHz	#VBW 3.0 N			00 ms (10001 pts)	1.000000 MHz <u>Auto</u> Man
MKR MODE TRC SCL 1 Δ2 1 t (Δ)		FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	
2 F 1 t	491.0 µs -15.4	11 dBm			Freq Offset
4 5				E	0 Hz
6 7 8					
9					
				-	
MSG			<b>I</b> STATUS		
	Dwell NVNT 2-	DH3 2441M	Hz Accun	nulated	
Magilent Spectrum Analyzer - Swept SA		SENSE:INT	ALIGN AUTO	09:39:38 PM Jun 05, 2024	
Center Freq 2.4410000	000 GHz PNO: Fast ↔ Trig		g Type: Log-Pwr	TRACE 1 2 3 4 5 6	Frequency
		en: 30 dB		DET PNNNN	Auto Tune
Ref Offset 2.6 dE 10 dB/div Ref 20.00 dB					Auto Fune
10.0					Center Freq 2.441000000 GHz
		0, 10 00 1 <b>0</b> 00 1 0			Start Freq
-10.0		der del nime proton interner			2.441000000 GHz
-20.0					Stop Freq
-30.0					2.441000000 GHz
					CF Step
-40.0				ar a caller i ja	1.000000 MHz
-50.0	hannah de de a la hair di din han da da an hair da di sebaha	and she per to the establish of the solution of	As has the work of the south of the state	All And And Annal and a straight states and a ball of the	<u>Auto</u> Man
co. 0					Freq Offset
-60.0					0 Hz
-70.0					
Center 2.441000000 GHz Res BW 1.0 MHz		147	Swoon - 2	Span 0 Hz	
Res BW 1.0 MHZ	#VBW 3.0 N	1112	Sweep 3	1.60 s (10001 pts)	
			-000		





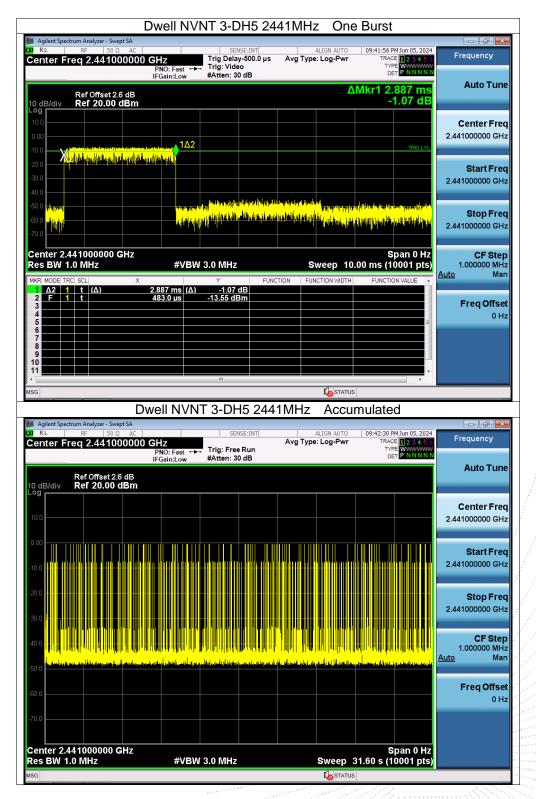


	Dwell NVNT 3-DH1	2441MHz One	Burst	
Jeff Agilent Spectrum Analyzer - Swept SA			09:35:10 PM Jun 05, 2024	
Center Freq 2.4410000	PNO: Fast Here Trig: Video	0 µs Avg Type: Log-Pwr	TRACE 1 2 3 4 5 6 TYPE WWWWWW	Frequency
	IFGain:Low #Atten: 30 dB			Auto Tune
Ref Offset 2.6 dB 10 dB/div Ref 20.00 dBm	n	Ľ	Mkr1 386.0 µs -2.06 dB	
0.00				Center Freq 2.441000000 GHz
-10.0 <b>1</b> <u>Δ</u> 2			TRIG LVL	2.441000000 0112
-20.0				Start Freq
-30.0				2.441000000 GHz
-40.0			silvana	
	sun han bir ferinde statik en syne <mark>stat bir han slander statik kan bir dan sense</mark> tik.		na reizette anne teilie sons Reisette	Stop Freq
-60.0	and The share of a product of the second state			2.441000000 GHz
Center 2.441000000 GHz Res BW 1.0 MHz	#VBW 3.0 MHz	Sweep 10.	Span 0 Hz (10001 pts)	CF Step 1.000000 MHz
	X Y	FUNCTION FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Man
1 Δ2 1 t (Δ) 2 F 1 t	386.0 μs (Δ) -2.06 dB 492.0 μs -13.19 dBm			-
3 4				Freq Offset 0 Hz
5			=	0112
7				
9				
11				
MSG		<b>K</b> STATUS		
	Dwell NVNT 3-DH1 2	2441MHz Accui	mulated	
Magilent Spectrum Analyzer - Swept SA	CENCE INT		00/25/42 DM Jup 05, 2024	
Center Freq 2.44100000		ALIGN AUTO Avg Type: Log-Pwr	09:35:43 PM Jun 05, 2024 TRACE 1 2 3 4 5 6 TYPE WWWWW	Frequency
	PNO: Fast Trig: Free Run IFGain:Low #Atten: 30 dB		DET PNNNNN	
Ref Offset 2.6 dB				Auto Tune
10 dB/div Ref 20.00 dBm				
				Center Freq
10.0				2.441000000 GHz
0.00				
				Start Freq 2.441000000 GHz
-10.0				2.44100000 3H2
-20.0				Stop Fred
-20.0				
-20.0				
				2.441000000 GHz
-30.0				2.441000000 GHz
-30.0	La pré la stratige diné i desta de la stratégica de la strategica de la strategica de la strategica de la strat		en langet - som bekanne	2.441000000 GHz CF Step 1.000000 MHz
-30.0 -40.0 -50.0	ita ya kashiri kata kashiri kata kashiri kashiri kashiri kashiri kashiri kashiri kashiri kashiri kashiri kashir		Halles (fl., orgen tele open)	2.44100000 GHz CF Step 1.00000 MHz <u>Auto</u> Man Freq Offset
-30.0	i ta 16 da la cinta da la c		ana ila siddi e seu tabas su	2.441000000 GHz CF Step 1.000000 MHz <u>Auto</u> Man
-30.0 -40.0 -60.0			and the second sec	1.000000 MHz <u>Auto</u> Man Freq Offset
-30.0 -40.0 -60.0 -70.0				2.44100000 GHz CF Step 1.00000 MHz <u>Auto</u> Man Freq Offset
-30.0 -40.0 -50.0 -50.0 -70.0 Center 2.441000000 GHz			Span 0 Hz	2.44100000 GHz CF Step 1.00000 MHz <u>Auto</u> Man Freq Offset
-30.0	المراجع المراجع المراجع المراجع المراجع #VBW 3.0 MHz	Sweep 3	Span 0 Hz 11.60 s (10001 pts)	2.44100000 GHz CF Step 1.00000 MHz <u>Auto</u> Man Freq Offset



	Dwell	NVNT 3-DF	<u>13 2441MH</u>	z One B	urst	
Milent Spectrum Analyzer - Swe	ept SA Ω AC	SENSE	INT	ALIGN AUTO 09	9:40:53 PM Jun 05, 2024	e é 💌
Center Freq 2.4410		Trig Delay-5 st ↔ Trig: Video	500.0 μs Avg Type	e: Log-Pwr	TRACE 1 2 3 4 5 6 TYPE WWWWWW DET P N N N N N	Frequency
Ref Offset 2. 10 dB/div Ref 20.00	.6 dB			ΔMk	r1 1.637 ms -6.04 dB	Auto Tune
10.0						Center Freq
	1Δ2					2.441000000 GHz
-10.0 X2					TRIG LVL	
-20.0						Start Freq
-40.0						2.441000000 GHz
-50.0 <mark>11/17/197</mark>	terreter (alterreter) Networkspation	in the Albert of the second	rent alternation of a state of a s		h in heddlaed ar warpenske	Stop Freq
-60.0 <mark>Juli<sup>4</sup>M</mark>	all and built and a	<mark>eludia, plea dol.</mark> (ainsto)	a di sa		in a solo i la solo a la catal	2.441000000 GHz
-70.0						
Center 2.441000000 ( Res BW 1.0 MHz		VBW 3.0 MHz	S	weep 10.00 i	Span 0 Hz ms (10001 pts)	CF Step 1.000000 MHz
MKR MODE TRC SCL	Х	Y	FUNCTION FUN	· ·	FUNCTION VALUE	<u>Auto</u> Man
1 Δ2 1 t (Δ) 2 F 1 t	<u>1.637 ms</u> 497.0 µs	s (Δ) -6.04 dB s -4.09 dBm				Freq Offset
3						0 Hz
6 7					F	
8						
10						
MSG					•	
		VNT 3-DH3	2//1MHz	Accumu	lated	
🎉 Agilent Spectrum Analyzer - Swe	ept SA		, <u>2</u>	710001110	latea	- ¢ ×
Center Freq 2.4410	2 AC 00000 GHz	SENSE	Avg Type	ALIGN AUTO 09 e: Log-Pwr	TRACE 1 2 3 4 5 6	Frequency
	PNO: Fas IFGain:Lo				DET PNNNN	
						Auto Tune
Ref Offset 2.						
Ref Offset 2. 10 dB/div Ref 20.00						
10 dB/div Ref 20.00						Center Freq
10 dB/div Ref 20.00						Center Freq 2.441000000 GHz
10 dB/div Ref 20.00						2.441000000 GHz
10 dB/div Ref 20.00 d Log						
10 dB/div Ref 20.00 d 10 0 0.00 -10 0						2.441000000 GHz Start Freq
10 dB/div Ref 20.00 d 10 0						2.44100000 GHz Start Freq 2.441000000 GHz Stop Freq
10 dB/div Ref 20.00 d 10 0 0.00 -10 0						2.441000000 GHz Start Freq 2.441000000 GHz
10 dB/div Ref 20.00 d 10 0 -10 0 -20 0 -30 0						2.44100000 GHz Start Freq 2.441000000 GHz Stop Freq 2.441000000 GHz CF Step
10 dB/div Ref 20.00 d 10 0 0.00 -10 0 -20 0						2.44100000 GHz Start Freq 2.441000000 GHz Stop Freq 2.441000000 GHz
10 dB/div Ref 20.00 d 10 0 0 00 -10 0 -20 0 -30 0						2.441000000 GHz Start Freq 2.441000000 GHz Stop Freq 2.441000000 GHz CF Step 1.000000 MHz
10 dB/div Ref 20.00 d 10 0 10 0 -10 0 -20 0 -30 0 -40 0 -4						2.441000000 GHz Start Freq 2.441000000 GHz Stop Freq 2.441000000 GHz CF Step 1.000000 MHz <u>Auto</u> Man Freq Offset
10 dB/div         Ref 20.00 r           10 0						2.441000000 GHz Start Freq 2.441000000 GHz Stop Freq 2.441000000 GHz CF Step 1.000000 MHz Auto Man
10 dB/div         Ref 20.00 f           10 0						2.441000000 GHz Start Freq 2.441000000 GHz Stop Freq 2.441000000 GHz CF Step 1.000000 MHz <u>Auto</u> Man Freq Offset
10 dB/div         Ref 20.00 d           10 0						2.441000000 GHz Start Freq 2.441000000 GHz Stop Freq 2.441000000 GHz CF Step 1.000000 MHz <u>Auto</u> Man Freq Offset
10.0         End         Ref         20.00 (Constraint)           10.0	dBm				Span 0 Hz 0 s (10001 pts)	2.441000000 GHz Start Freq 2.441000000 GHz Stop Freq 2.441000000 GHz CF Step 1.000000 MHz <u>Auto</u> Man Freq Offset







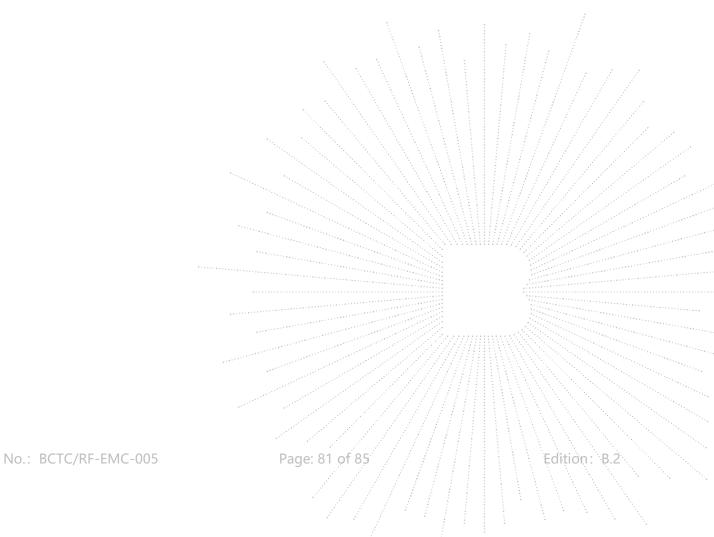
### 15. Antenna Requirement

### 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



NOTE: Appendix-Photographs Of EUT Constructional Details

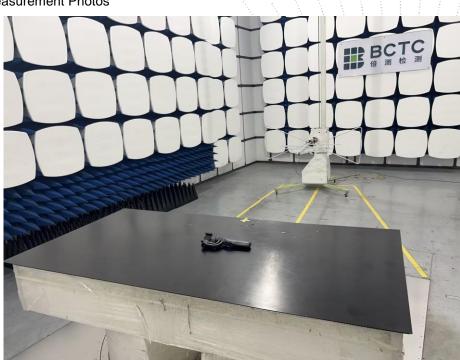


# 17. EUT Test Setup Photographs

### Conducted emissions



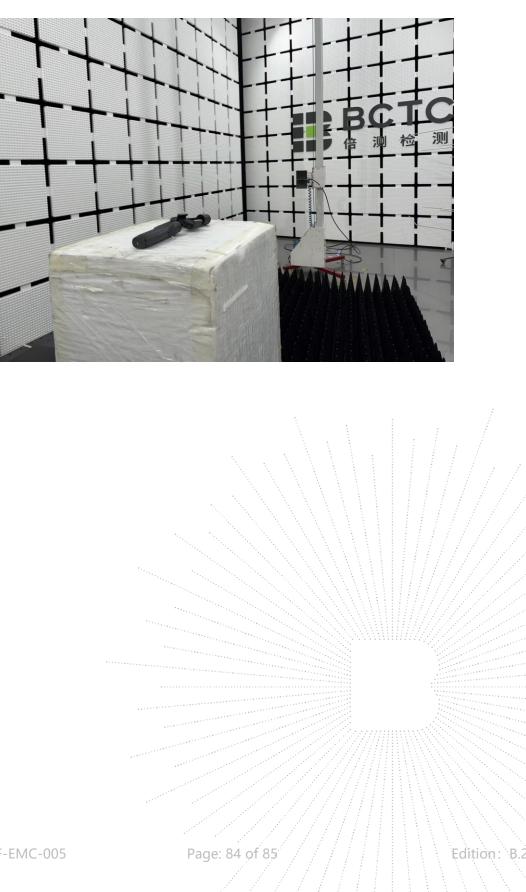
## Radiated Measurement Photos



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No.: BCTC/RF-EMC-005



# 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

Consultation E-mail: bctc@bctc-lab.com.cn

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

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

No.: BCTC/RF-EMC-005

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