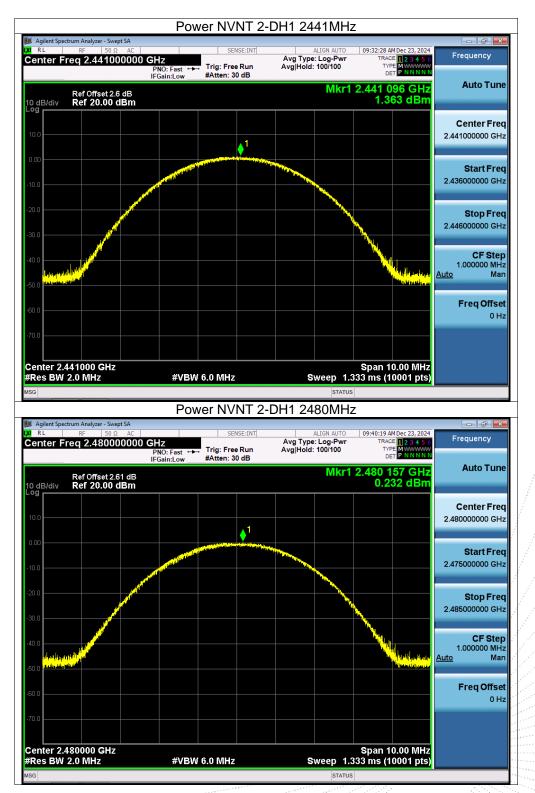


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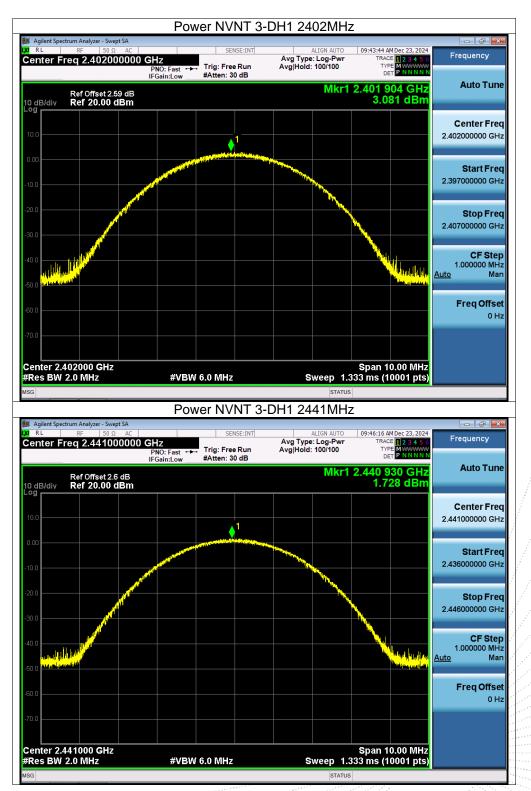




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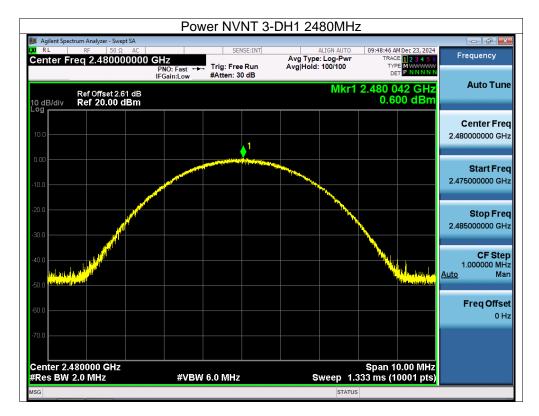




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12. Hopping Channel Separation

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	2401.842	2402.842	1	0.597	Pass
NVNT	1-DH1	2440.844	2441.842	0.998	0.581	Pass
NVNT	1-DH1	2478.84	2479.842	1.002	0.578	Pass
NVNT	2-DH1	2401.84	2402.842	1.002	0.829	Pass
NVNT	2-DH1	2440.84	2441.842	1.002	0.823	Pass
NVNT	2-DH1	2478.84	2479.84	1	0.832	Pass
NVNT	3-DH1	2401.998	2402.998	1	0.815	Pass
NVNT	3-DH1	2440.996	2441.998	1.002	0.823	Pass
NVNT	3-DH1	2478.998	2479.998	1	0.803	Pass

12.4 Test Result





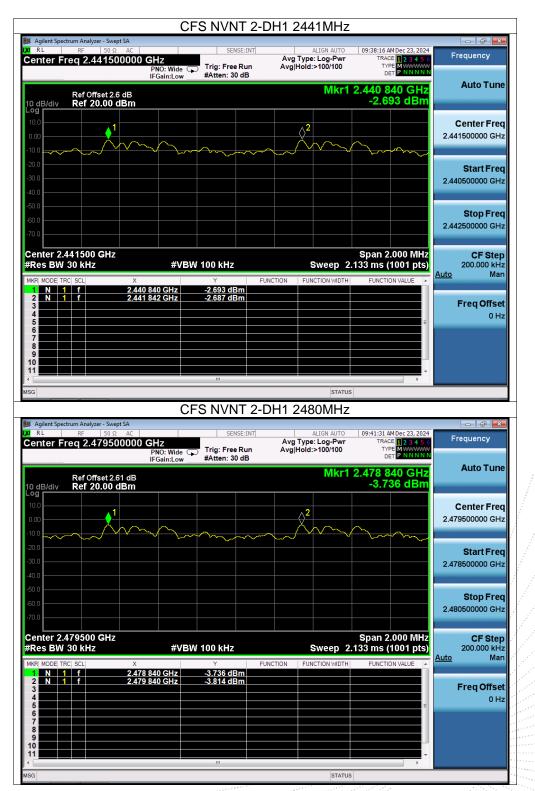
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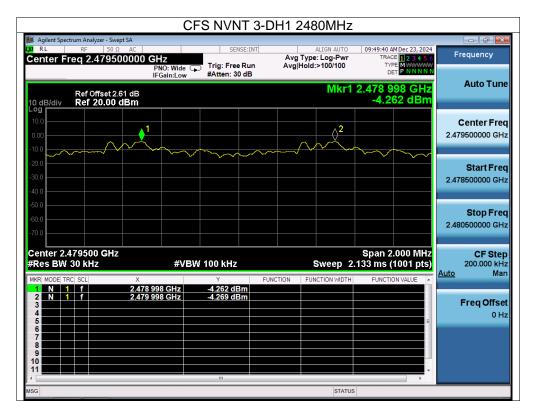




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13. Number Of Hopping Frequency

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.

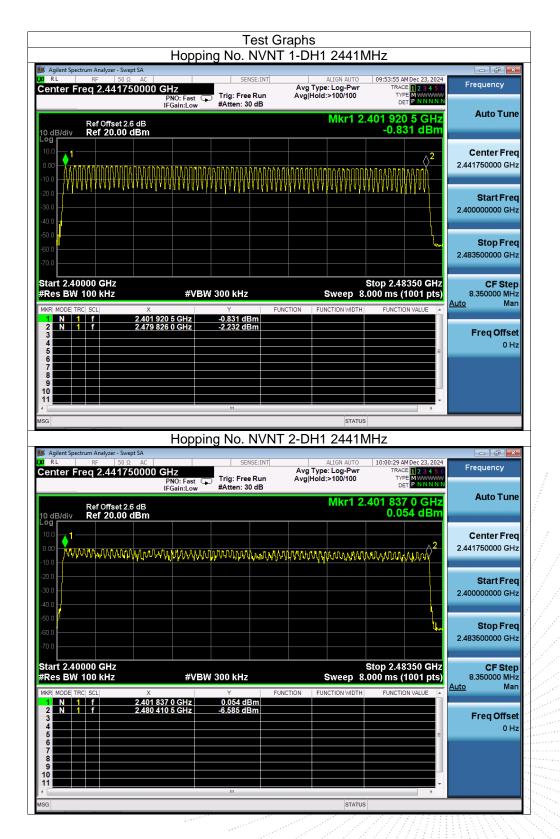
2. Set the spectrum analyzer: RBW = 100kHz. VBW = 300kHz. Sweep = auto; Detector Function = Peak. Trace = Max hold.

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





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	Hopping No. NV	NT 3-DH1 2441N	ЛНz	
Agilent Spectrum Analyzer - Swept SA RL RF 50 Ω AC Center Freq 2.441750000		ALIGN AUTO Avg Type: Log-Pwr AvgiHold:>100/100	10:04:00 AM Dec 23, 2024 TRACE 1 2 3 4 5 6 TYPE M WWWWW	Frequency
Ref Offset 2.6 dB	PNO: Fast Trig: Free Run IFGain:Low #Atten: 30 dB	5,	401 586 5 GHz -4.720 dBm	Auto Tune
10.0 B/div Ref 20.00 dBm	www.www.www.	ANNIAANNAA AMNINA		Center Freq 2.441750000 GHz
-20.0				Start Freq 2.400000000 GHz
-50.0 -60.0 -70.0				Stop Fred 2.483500000 GHz
Start 2.40000 GHz #Res BW 100 kHz	#VBW 300 kHz	Sweep 8	Stop 2.48350 GHz .000 ms (1001 pts)	CF Step 8.350000 MHz Auto Mar
	¥ i86 5 GHz -4.720 dBm i43 5 GHz -7.740 dBm	FUNCTION FUNCTION WIDTH	FUNCTION VALUE	Freq Offset
6 7 8 9 10				
MSG	m	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.

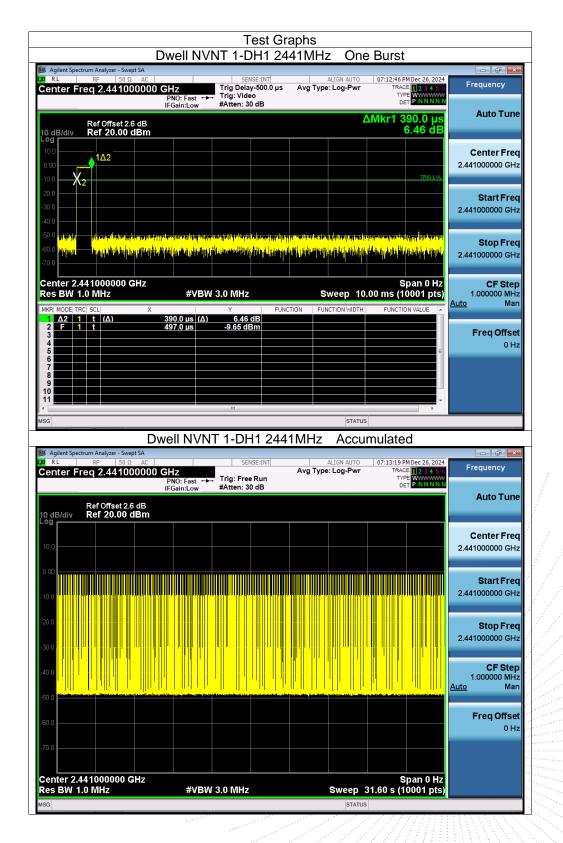
4. Use the marker-delta function to determine the dwell time. If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation. The limit is specified in one of the subparagraphs of this Section. Submit this plot(s).

Condition	Mode	Frequency (MHz)	Pulse Time (ms)	Total Dwell Time (ms)	Burst Count	Period Time (ms)	Limit (ms)	Verdict
NVNT	1-DH1	2441	0.39	124.02	318	31600	400	Pass
NVNT	1-DH3	2441	1.644	264.684	161	31600	400	Pass
NVNT	1-DH5	2441	2.895	292.395	101	31600	400	Pass
NVNT	2-DH1	2441	0.395	125.61	318	31600	400	Pass
NVNT	2-DH3	2441	1.651	257.556	156	31600	400	Pass
NVNT	2-DH5	2441	2,895	298.185	103	31600	400	Pass
NVNT	3-DH1	2441	0.4	128	320	31600	400	Pass
NVNT	3-DH3	2441	1.646	271.59	165	31600	400	Pass
NVNT	3-DH5	2441	2.897	324.464	112	31600	400	Pass

14.4 Test Result

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





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^{RL} RF nter Freg 2.44	- Swept SA 50 Ω AC 4000000 GHz	SENSE:INT	ALIGN AUTO s Avg Type: Log-Pwr	10:05:46 AM Dec 23, 2024 TRACE 1 2 3 4 5 6	Frequency
niter Frey 2.44	PNO: Fast IFGain:Lov	Trig: Video			
Ref Offs	et 2.6 dB			ΔMkr1 1.644 ms	Auto Tun
dB/div Ref 20.	00 dBm			6.57 dB	
					Center Free
	1∆2			TRIG LVL	2.441000000 GH
X₂ ^{dut} lallh	a labor, da				Start Fre
					2.441000000 GH
		ature of the tell of white the second second			
		n hin ya di kana kana di kata na kana ya kata ya kata Mwaka kata ya k		in an	Stop Fre 2.441000000 GH
		o l'ante de etc	a che a telse ter		2.44100000 GH
nter 2.4410000				Span 0 Hz	CF Ste
s BW 1.0 MHz		/BW 3.0 MHz	-	0.00 ms (10001 pts)	1.000000 MH <u>Auto</u> Ma
MODE TRC SCL Δ2 1 t (Δ)	× 1.644 ms	(Δ) 6.57 dB	UNCTION FUNCTION WIDTH	H FUNCTION VALUE	
F 1 t	492.0 µs	-18.40 dBm			Freq Offse
				E	0 H
				-	
		III	STATU	JS	
	Dwell N	VNT 1-DH3 24	41MHz Acci	umulated	
gilent Spectrum Analyzer	- Swept SA				
nter Freq 2.44	50 Ω AC 1000000 GHz	SENSE:INT	ALIGN AUTO Avg Type: Log-Pwr	10:06:20 AM Dec 23, 2024 TRACE 1 2 3 4 5 6	
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Ref Offs	et 2.6 dB				Auto Tun
IB/div Ref 20.	00 dBm				
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					Start Fre 2.441000000 GH
					2.44 1000000 GH
					Stop Fre
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					2.441000000 GH CF Stej 1.000000 MH
					2.441000000 GH CF Stej 1.000000 MH <u>Auto</u> Ma
					2.441000000 GH CF Step 1.000000 MH <u>Auto</u> Ma Freq Offse
					2.441000000 GH CF Step 1.000000 MH
					2.441000000 GH CF Step 1.000000 MH <u>Auto</u> Ma Freq Offse
		/BW 3.0 MHz		Span 0 Hz 31.60 s (10001 pts)	2.441000000 GH CF Stej 1.000000 MH <u>Auto</u> Ma Freq Offse 0 H



Agilent Spectrum Analyzer - Swept SA	Dwell NVNT 1	I-DH5 2441I	VHz One	Burst	
RL RF 50 Ω AC enter Freq 2.441000000	PNO: Fast ++++ Trig:	SENSE:INT Delay-500.0 μs Av Video en: 30 dB	ALIGN AUTO g Type: Log-Pwr	10:06:51 AM Dec 23, 2024 TRACE 1 2 3 4 5 6 TYPE WWWWW DET P N N N N	Frequency
Ref Offset 2.6 dB D dB/div Ref 20.00 dBm	IFGain:Low #Atte	an. 50 dB	Δ	Wkr1 2.895 ms 5.12 dB	Auto Tune
	162				Center Fred 2.441000000 GHz
0.0 X2				TRIG LVL	Start Free
				alannadaring yang salatala	2.441000000 GHz
0.0 <mark>m/im/</mark> 0.0 <mark>h/s/in/</mark>	dit tan in the triat			<mark>den e que per per per per per per per per per pe</mark>	Stop Free 2.441000000 GH:
enter 2.441000000 GHz es BW 1.0 MHz	#VBW 3.0 N	1Hz	Sweep 10.	Span 0 Hz 00 ms (10001 pts)	CF Step 1.000000 MH
KR MODE TRC SCL X 1 Δ2 1 t (Δ) 2 F 1 t 3		FUNCTION 5.12 dB 9 dBm	FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Mar Freq Offse
3 4 5 6 7				Ξ	0H
8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9					
G			STATUS	• •	
Agilent Spectrum Analyzer - Swept SA	well NVNT 1-	DH5 2441M	Hz Accur	nulated	
RL RF 50 Ω AC enter Freq 2.441000000	PNO: Fast - Trig:	SENSE:INT Av Free Run en: 30 dB	ALIGN AUTO g Type: Log-Pwr	10:07:25 AM Dec 23, 2024 TRACE 1 2 3 4 5 6 TYPE WWWWWW DET P N N N N	Frequency
Ref Offset 2.6 dB dB/div Ref 20.00 dBm	IPGalli:Low #Atte				Auto Tun
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enter 2.441000000 GHz				Span 0 Hz	он



		/NT 2-DH	1 2441M	Hz On	e Burst	
Agilent Spectrum Analyzer - Swep RL RF 50 Ω enter Freq 2.44100	AC 0000 GHz PNO: Fast ↔	SENSE:II Trig Delay-50 → Trig: Video #Atten: 30 dB		ALIGN AUTO	10:00:34 AM Dec 23, 202 TRACE 1 2 3 4 5 TYPE WWWWW DET P NNNN	6 Frequency
Ref Offset 2.6 0 dB/div Ref 20.00 d		#Atten: 30 dB			ΔMkr1 395.0 μs 0.52 dE	Auto Tune
0.00						Center Fred 2.441000000 GH:
						Start Free
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50.0 <mark>Лид прамиа фрам</mark> и 70.0	<mark>haralogi na</mark> la <mark>da sense a</mark> na pala da	n in an				Stop Free 2.441000000 GH
enter 2.441000000 G tes BW 1.0 MHz		V 3.0 MHz	FUNCTION	Sweep 10	Span 0 Hz 0.00 ms (10001 pts	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	395.0 μs (Δ) 362.0 μs	0.52 dB -15.34 dBm				Freq Offse
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9 0 1					•	
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Agilent Spectrum Analyzer - Swep		II 2-DH1	2441MF	Iz Accu	Imulated	- 6 -
RL RF 50 Ω enter Freq 2.44100		SENSE:II Trig: Free Run #Atten: 30 dB	Avg	ALIGN AUTO Type: Log-Pwr	10:01:08 AM Dec 23, 202 TRACE 1 2 3 4 5 TYPE WWWWW DET P NNNN	Frequency
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						CF Ste j 1.000000 MH <u>Auto</u> Ma
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		V 3.0 MHz			Span 0 Hz 31.60 s (10001 pts	

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		ell NVNT 2-D)H3 2441M	Hz One	e Burst	
	50 Ω AC		SE:INT y-500.0 μs Avg	ALIGN AUTO	10:07:52 AM Dec 23, 2024 TRACE 1 2 3 4 5 6	
Center Freq 2.44	PNO	: Fast +++ Trig: Vide in:Low #Atten: 3	0	Type. Log-r wi		
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	illing and a state	The second se				Stop Free 2.441000000 GH
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G				STATUS	•	
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		in:Low #Atten: 3			DET	Auto Tun
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og						Center Fre
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						1.000000 MH <u>Auto</u> Mar Freq Offse
) GHz	#VBW 3.0 MHz		Sweep 2	Span 0 Hz 31.60 s (10001 pts)	1.000000 MH <u>Auto</u> Mar Freq Offse





	Dwell NVNT 2-DH5 2	441MHz One B	urst	
Agilent Spectrum Analyzer - Swept SA RL RF 50 Ω AC enter Freq 2.441000000	PNO: Fast +++ Irig: Video		0:08:39 AM Dec 23, 2024 TRACE 1 2 3 4 5 6 TYPE R WWWWW	Frequency
Ref Offset 2.6 dB	IFGain:Low #Atten: 30 dB	ΔΜκ	r1 2.895 ms 0.23 dB	Auto Tune
0 dB/div Ref 20.00 dBm 9 0.0 0.0			TRIG LVL	Center Fred 2.441000000 GHz
				Start Fred 2.441000000 GH:
ιο μ ελ	ing an our off many on the second	llen hyref an ywler dy'r bergel a troe ywler a ywler a physy y dyn ywar dyn ym ar ywler hyfery a ywler yw	n ha ha a dha farfail an farfail dha an an an Ta ca dha farfail an farfail dha an an an an	Stop Fred 2.441000000 GH:
enter 2.441000000 GHz es BW 1.0 MHz	#VBW 3.0 MHz	Sweep 10.00		CF Step 1.000000 MH
R MODE TRC SCL X	Υ FU 2.895 ms (Δ) 0.23 dB 362.0 μs -15.10 dBm	NCTION FUNCTION WIDTH	FUNCTION VALUE	uuto Mar Freq Offse 0 H
	well NVNT 2-DH5 24	status 41MHz Accumu	- lated	
Agilent Spectrum Analyzer - Swept SA RL RF 50 Ω AC	SENSE:INT		0:09:12 AM Dec 23, 2024	
enter Freq 2.44100000		Avg Type: Log-Pwr	TRACE 123456 TYPE WWWWWW DET P N N N N N	Frequency
Ref Offset 2.6 dB dB/div Ref 20.00 dBm g	ingain:Low written: 00 dB			Auto Tuno
g 				Center Free 2.441000000 GH
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.0				
				2.441000000 GH CF Step 1.000000 MH
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				CF Step 1.000000 MH:

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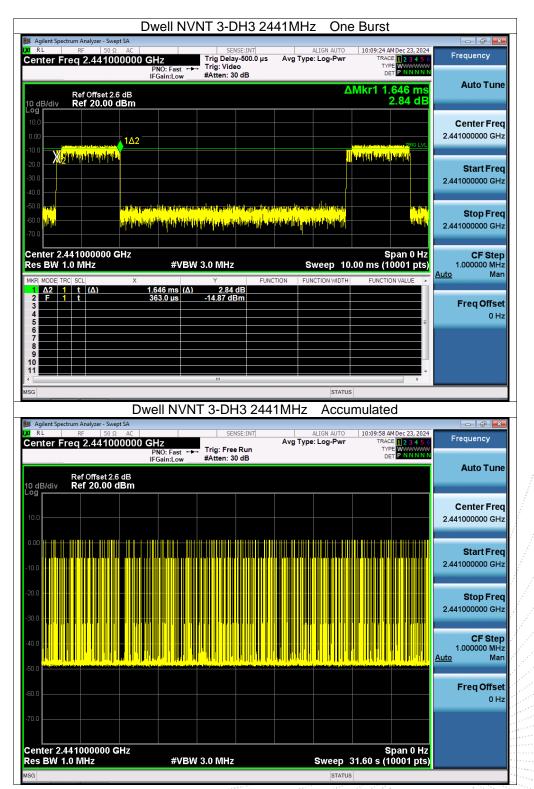


Agilent Spectrum Analyzer - Swept SA	Dwell NV	NT 3-DH1 :	2441MHz	One E	Burst	
RL RF 50 Ω AC enter Freq 2.44100000	00 GHz PNO: Fast ↔	SENSE:INT Trig Delay-500.0			10:04:06 AM Dec 23, 2024 TRACE 1 2 3 4 5 TYPE WWWWW DET P N N N N	Frequency
Ref Offset 2.6 dB	IFGain:Low	#Atten: 30 dB		ΔN	ikr1 400.0 μs 6.83 dB	Auto Tune
0 dB/div Ref 20.00 dBm						Center Freq
0.0 <mark>X2</mark>					TRIG LVL	2.441000000 GHz
						Start Freq 2.441000000 GHz
					h niith ago ar f i sa a an haile an an air an h	Stop Freq
		(handeline planation date) date	h faile an too faile a fuile			2.441000000 GHz
enter 2.441000000 GHz es BW 1.0 MHz		3.0 MHz			Span 0 Hz) ms (10001 pts)	
KR MODE TRC SCL > 1 Δ2 1 t (Δ) 2 F 1 t 3 <	400.0 μs (Δ) 497.0 μs	Y 6.83 dB -8.42 dBm	FUNCTION FUNCT	ION WIDTH	FUNCTION VALUE	Freq Offset
4 5 6					= =	0 Hz
7 8 9 0						
1		III		STATUS	•	
	Dwell NVN	T 3-DH1 24	441MHz	Accum	ulated	
Agilent Spectrum Analyzer - Swept SA RL RF 50 Ω AC enter Freq 2.44100000		SENSE:INT	ALI Avg Type: L		10:04:40 AM Dec 23, 2024 TRACE 1 2 3 4 5 0 TYPE WWWWWW	
Ref Offset 2.6 dB	PNO: Fast ↔ IFGain:Low	Trig: Free Run #Atten: 30 dB			DET P NNNN	Auto Tune
dB/div Ref 20.00 dBm						Center Freq
0.0						2.441000000 GHz
						Start Freq 2.441000000 GHz
0.0						
						Stop Freq 2.441000000 GHz
0.0						
				- 1		CF Step 1.000000 MHz <u>Auto</u> Man
				generalista de seguera		1.000000 MHz Auto Man Freq Offset
						1.000000 MHz



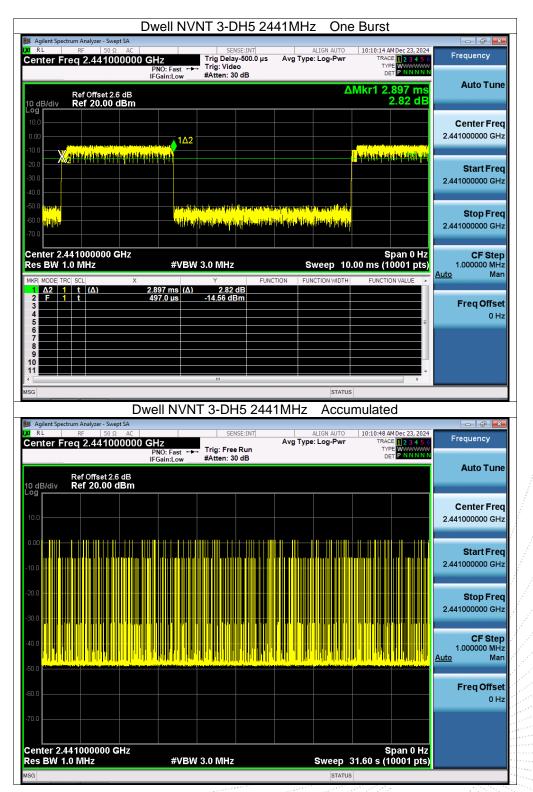






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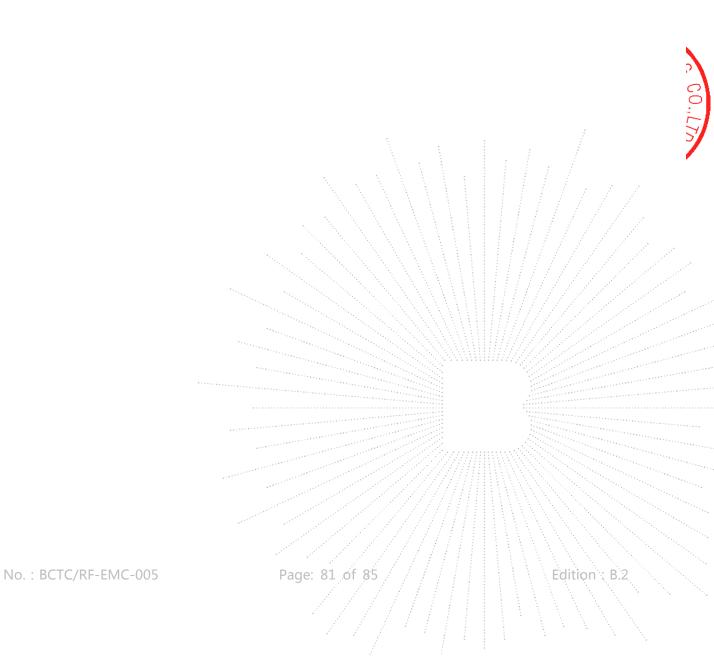
15. Antenna Requirement

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.



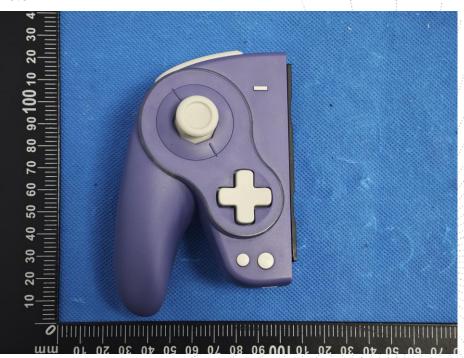


16. EUT Photographs

EUT Photo 1



EUT Photo 2



NOTE: Appendix-Photographs Of EUT Constructional Details.

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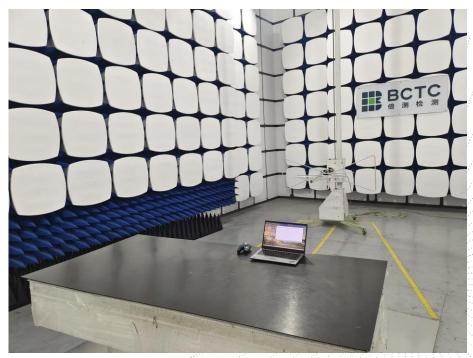


17. EUT Test Setup Photographs

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 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 *****

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