









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

Temperature:	26 ℃	Relative Humidity:	54%RH
Pressure:	101KPa	Test Voltage :	AC 120V/60Hz

–				
Condition	Mode	Frequency (MHz)	-20dB Bandwidth (MHz)	Verdict
NVNT	1-DH1	2402	0.872	Pass
NVNT	1-DH1	2441	0.849	Pass
NVNT	1-DH1	2480	0.870	Pass
NVNT	2-DH1	2402	1.224	Pass
NVNT	2-DH1		1.238	Pass
NVNT	2-DH1	2480	1.242	Pass
NVNT	3-DH1	2402	1.213	Pass
NVNT	3-DH1	2441	1.213	Pass
NVNT	3-DH1	2480	1.213	Pass

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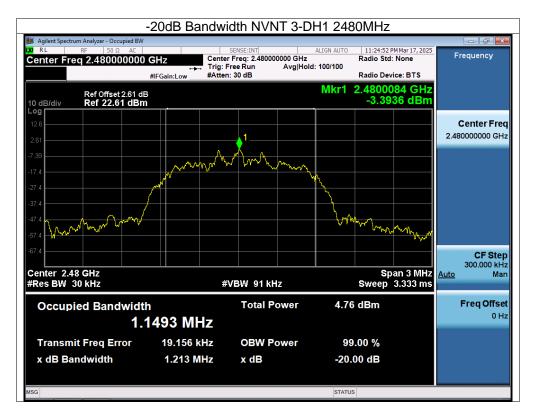
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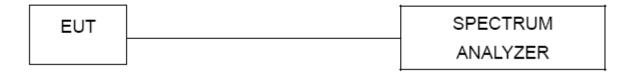
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11. Maximum Peak Output Power

11.1 Block Diagram Of Test Setup



11.2 Limit

FCC Part15 (15.247) , Subpart C						
Section	Test Item	Test Item Limit		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

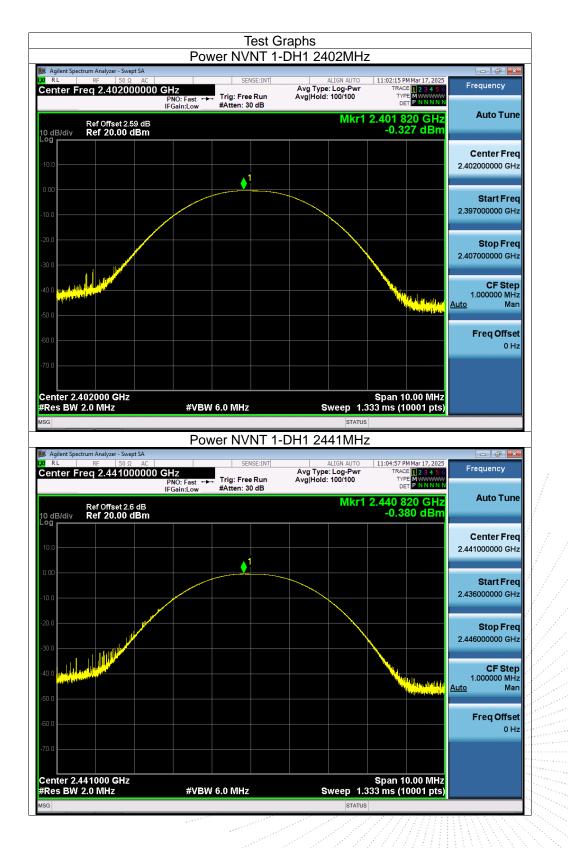
Temperature:	26 ℃	Relative Humidity:	54%RH
Pressure:	101KPa	Test Voltage :	AC 120V/60Hz

Condition	Mode	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	1-DH1	2402	-0.33	21	Pass
NVNT	1-DH1	2441	-0.38	21	Pass
NVNT	1-DH1	2480	-1.06	21	Pass
NVNT	2-DH1	2402	0.49	21	Pass
NVNT	2-DH1	2441	0.39	21	Pass
NVNT	2-DH1	2480	-0.28	21	Pass
NVNT	3-DH1	2402	1.05	21	Pass
NVNT	3-DH1	2441	0.96	21	Pass
NVNT	3-DH1	2480	0.29	21	Pass

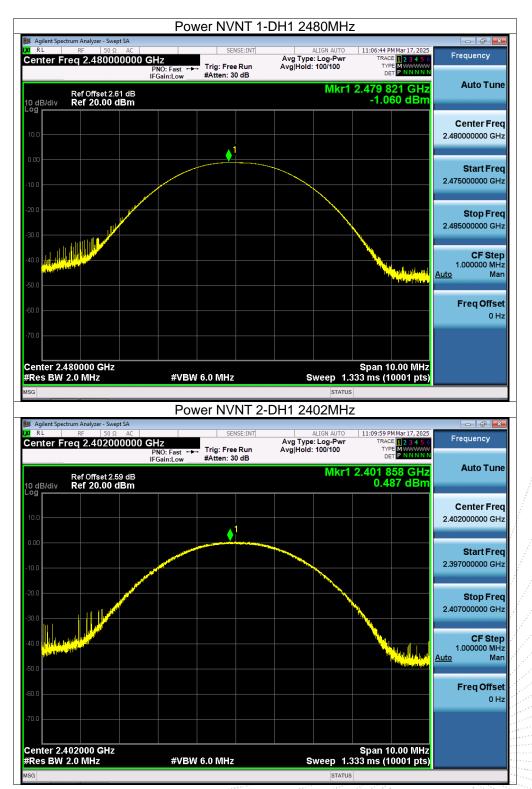
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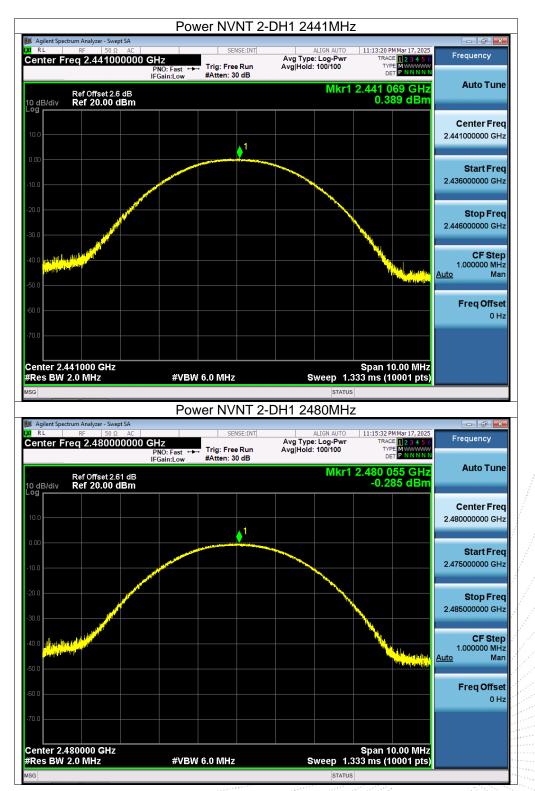




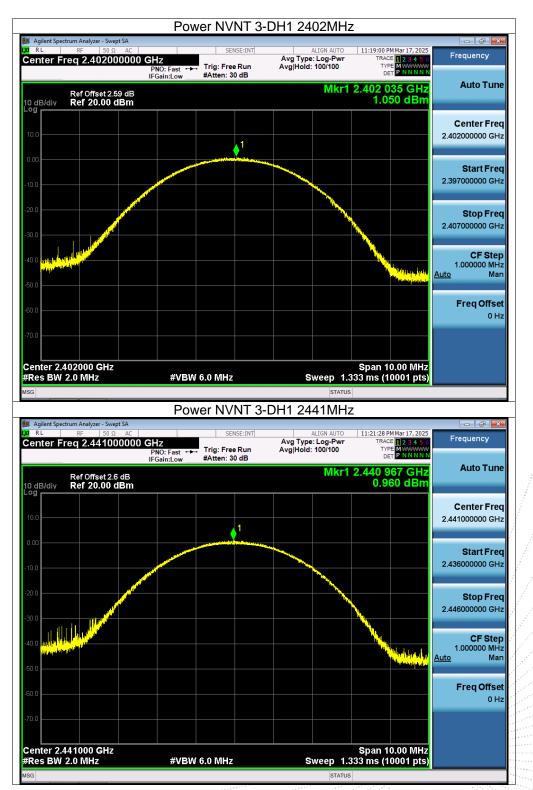




















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12. Hopping Channel Separation

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.

Mode	Test Channel	Separation (MHz)	Limit(MHz)	Result
1-DH1	Low Market	0.998	0.581	PASS
1-DH1	Middle	1.000	0.566	PASS
1-DH1	High Migh	1.000	0.580	PASS
2-DH1	Low	1.000	0.816	PASS
2-DH1	Middle	1.000	0.825	PASS
2-DH1	High	1.002	0.828	PASS
3-DH1	Low	1.006	0.809	PASS
3-DH1	Middle	1.002	0.809	PASS
3-DH1	High	1.000	0.809	PASS

12.4 Test Result

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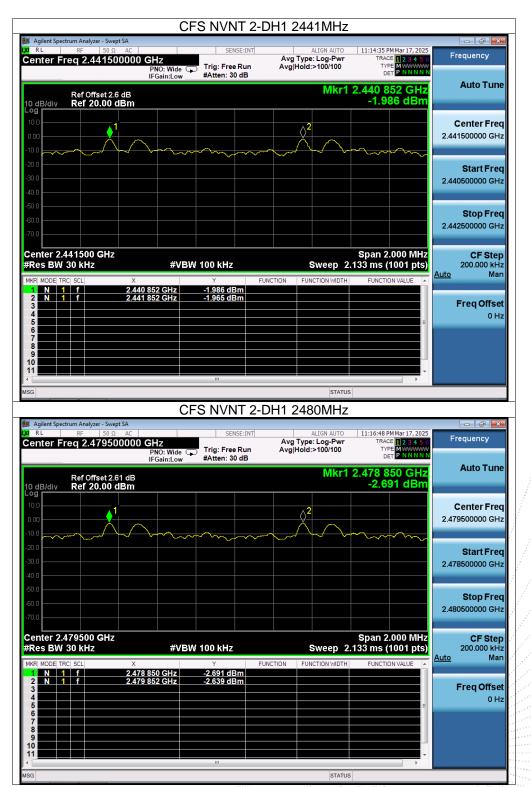










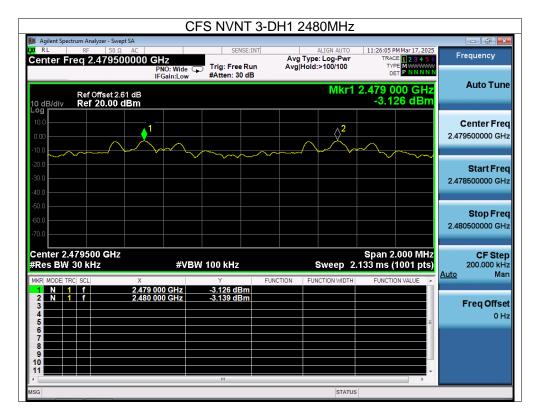






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13. Number Of Hopping Frequency

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

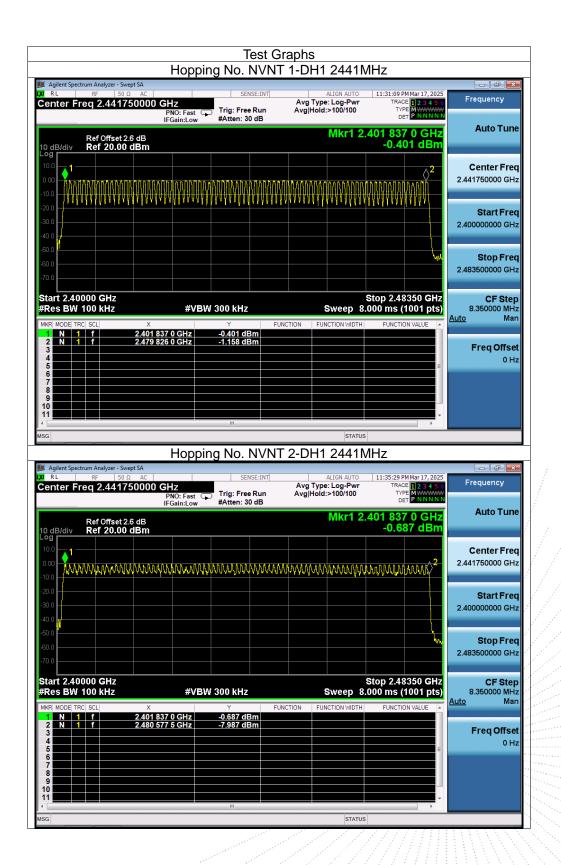
Condition	Mode	Hopping Number	Limit	Verdict
NVNT	1-DH1	79	15	Pass
NVNT	2-DH1	79	15	Pass
NVNT	3-DH1	79	15	Pass

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Нор	ping No. NVNT	3-DH1 2441N	ЛНz	
Agilent Spectrum Analyzer - Swept SA RL RF 50 Ω AC Center Freq 2.441750000 GHz PNO: Fast IFGaint to FIGAInt to		ALIGN AUTO Avg Type: Log-Pwr Avg Hold:>100/100	11:41:37 PM Mar 17, 2025 TRACE 1 2 3 4 5 6 TYPE MWWWW DET P N N N N N	Frequency
Ref Offset 2.6 dB		Mkr1 2.	401 503 0 GHz -7.015 dBm	Auto Tune
10.0	MAMAMAMAA	MMMMMMM	MMAAMMAAAA	Center Freq 2.441750000 GHz
-20.0				Start Freq 2.400000000 GHz
-50.0 1			\u	Stop Freq 2.483500000 GHz
Start 2.40000 GHz #Res BW 100 kHz #V	/BW 300 kHz		Stop 2.48350 GHz 000 ms (1001 pts)	CF Step 8.350000 MHz Auto Man
MKR MODE TRC SCI X 1 N 1 f 2.401 503 0 GHz 2 N 1 f 2.490 243 5 GHz 3 4 5 </td <td>Y FUN -7.015 dBm -4.736 dBm</td> <td>CTION FUNCTION WIDTH</td> <td>FUNCTION VALUE</td> <td>Freq Offset 0 Hz</td>	Y FUN -7.015 dBm -4.736 dBm	CTION FUNCTION WIDTH	FUNCTION VALUE	Freq Offset 0 Hz
6 7 8 9 10				
MSG	III	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.

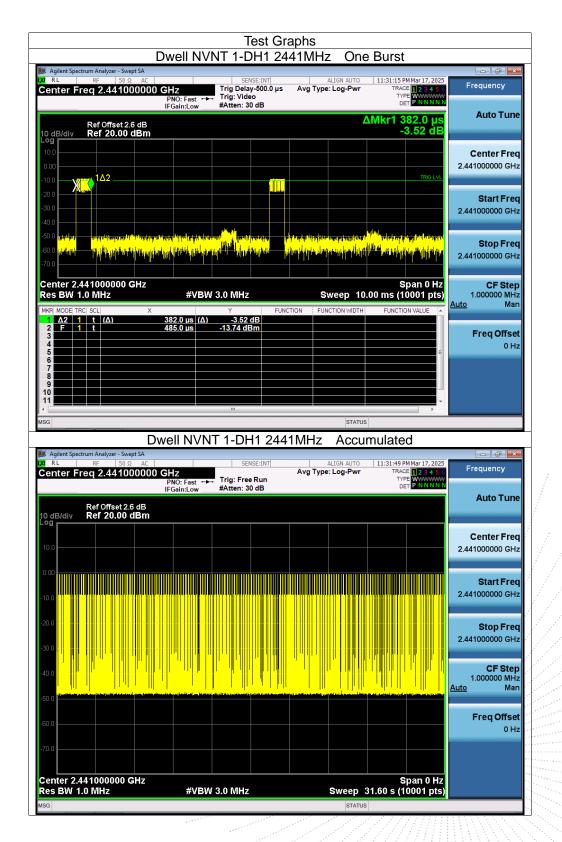
4. Use the marker-delta function to determine the dwell time. If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation. The limit is specified in one of the subparagraphs of this Section. Submit this plot(s).

Mode	Frequency (MHz)	Pulse Time (ms)	Total Dwell Time (ms)	Burst Count	Period Time (ms)	Limit (ms)	Verdict
1-DH1	2441	0.382	120.33	315	31600	400	Pass
1-DH3	2441	1.639	263.879	161	31600	400	Pass
1-DH5	2441	2.886	320.346	111	31600	400	Pass
2-DH1	2441	0.391	123.556	316	31600	400	Pass
2-DH3	2441	1.643	266.166	162	31600	400	Pass
2-DH5	2441	2.89	300.56	104	31600	400	Pass
3-DH1	2441	0.391	124.338	318	31600	400	Pass
3-DH3	2441	1.642	254.51	155	31600	400	Pass
3-DH5	2441	2.893	297.979	103	31600	400	Pass

14.4 Test Result

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

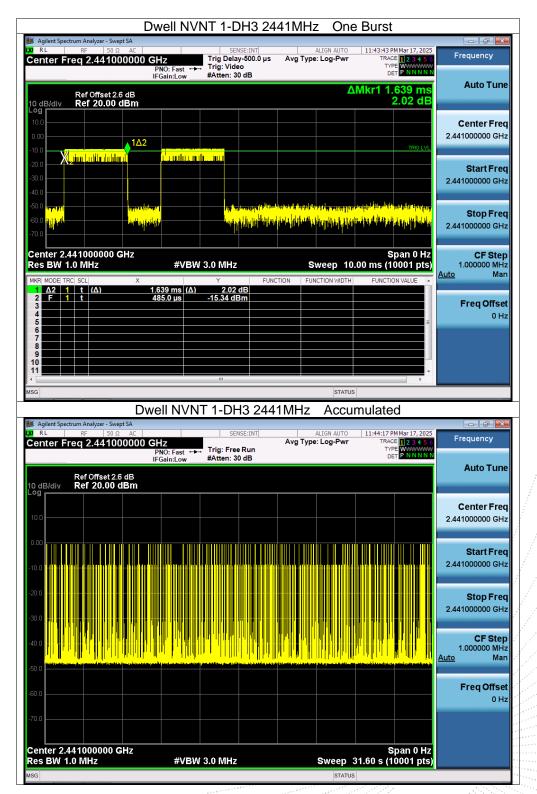




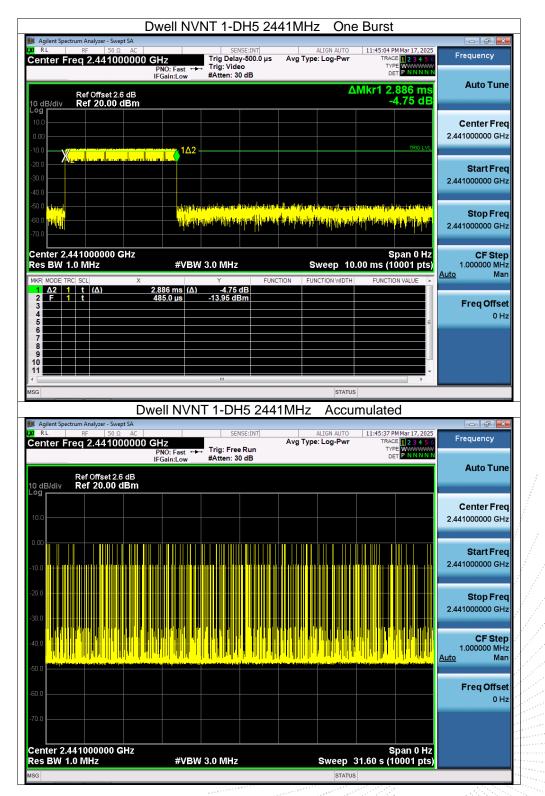


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	Dwell NVNT	2-DH1 244	1MHz One	Burst	
Agilent Spectrum Analyzer - Swep RL RF 50 Ω Center Freq 2.44100	AC 0000 GHz Trig PNO: Fast +++ Trig	SENSE:INT Delay-500.0 µs I: Video	ALIGN AUTO Avg Type: Log-Pwr	11:35:34 PM Mar 17, 2025 TRACE 1 2 3 4 5 6 TYPE WWWWW DET P NNNN	Frequency
Ref Offset 2.6 0 dB/div Ref 20.00 d	dB	ten: 30 dB	Δ	Mkr1 391.0 µs -1.67 dB	Auto Tune
		···			Center Freq 2.441000000 GHz
					Start Freq 2.441000000 GHz
0.0 <mark>oligati 0.0 <mark>oligati 0.0 oligati</mark></mark>	<mark>Anglassika padasang di kata kanjala</mark> ja. Anglassika kanjalaja na padasa na		ar an tha tha ta tha a bada baalan <mark>baan kan pilati an ta </mark>	and the second	Stop Freq 2.441000000 GHz
enter 2.441000000 G es BW 1.0 MHz	Hz #VBW 3.0 I	MHz	Sweep 10.	Span 0 Hz 00 ms (10001 pts)	CF Step 1.000000 MHz
MODE TRC SCL 1 Δ2 1 t (Δ) 2 F 1 t (Δ) 3 - - - - 5 - - - - 6 - - - - 7 - - - -		FUNCTION 1.67 dB 59 dBm	DN FUNCTION WIDTH	FUNCTION VALUE	Auto Man Freq Offset 0 Hz
8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9		11	STATUS		
	Dwell NVNT 2-	-DH1 2441	MHz Accur	nulated	
Agilent Spectrum Analyzer - Swep RL RF 50 Ω enter Freq 2.44100	AC 0000 GHz PNO: Fast ↔ Trig	SENSE:INT I: Free Run ten: 30 dB	ALIGN AUTO Avg Type: Log-Pwr	11:36:07 PM Mar 17, 2025 TRACE 1 2 3 4 5 6 TYPE WWWWW DET P NNNN	Frequency
Ref Offset 2.6 dB/div Ref 20.00 d	dB				Auto Tune
0.0					Center Freq 2.441000000 GHz
					Start Freq 2.441000000 GHz
0.0 <mark></mark>					Stop Freq 2.441000000 GHz
					CF Step 1.000000 MHz <u>Auto</u> Man
50.0 50.0					Freq Offset 0 Hz
				Span 0 Hz	



Dwell NV	'NT 2-DH3 24	41MHz O	ne Burst	
Magilent Spectrum Analyzer - Swept SA				
Center Freq 2.441000000 GHz PNO: Fast → ICC circl are	SENSE:INT Trig Delay-500.0 µs → Trig: Video #Atten: 30 dB	ALIGN AU Avg Type: Log-P		Frequency
Ref Offset 2.6 dB 10 dB/div Ref 20.00 dBm	writen. 00 dB		ΔMkr1 1.643 ms 4.49 dB	Auto Tune
10.0				Center Freq
			TRIG LVL	2.441000000 GHz
-30.0				Start Freq 2.441000000 GHz
	hillestendelsen och her et pilot de			Stop Freq
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Center 2.441000000 GHz Res BW 1.0 MHz #VBV	V 3.0 MHz	Sweep	Span 0 Hz 10.00 ms (10001 pts)	CF Step 1.000000 MHz
MKR MODE TRC SCL X 1 Δ2 1 t (Δ) 1.643 ms (Δ)		CTION FUNCTION WI	DTH FUNCTION VALUE	<u>Auto</u> Man
2 F 1 t 484.0 µs 3 4 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	-15.38 dBm			Freq Offset 0 Hz
5 6 7 8				
9 10 11				
K MSG	m	st	ATUS	
	IT 2-DH3 244		cumulated	
Magilent Spectrum Analyzer - Swept SA RL RF 50 Ω AC Center Freq 2.4410000000 GHz PN0: Fast ↔	SENSE:INT		Cumulated	Frequency
Agilent Spectrum Analyzer - Swept SA Image: RL RF 50 Ω AC Center Freq 2.441000000 GHz PN0: Fast → IFGain:Low IFGain:Low Ref Offset 2.6 dB Ref 20.00 dBm Image: Ref 20.00 dBm	SENSE:INT	1MHz Act	cumulated	
Agilent Spectrum Analyzer - Swept SA IMI RF 50 Ω AC Center Freq 2.441000000 GHz PN0: Fast - IFGain:Low Ref Offset 2.6 dB Log	SENSE:INT	1MHz Act	Cumulated	Frequency Auto Tune Center Freq
Agilent Spectrum Analyzer - Swept SA Image: RL RF 50 Ω AC Center Freq 2.441000000 GHz PN0: Fast → IFGain:Low IFGain:Low Ref Offset 2.6 dB Ref 20.00 dBm Image: Ref 20.00 dBm	SENSE:INT	1MHz Act	Cumulated	Frequency Auto Tune
Agilent Spectrum Analyzer - Swept SA IM RF 50 Ω AC Center Freq 2.441000000 GHz PN0: Fast → IFGain:Low PN0: Fast → IFGain:Low 0 dB/div Ref Offset 2.6 dB B 10 dB/div Ref 20.00 dBm Image: Comparison of the second se	SENSE:INT	1MHz Act	Cumulated	Frequency Auto Tune Center Freq
Agilent Spectrum Analyzer - Swept SA RL RF 50 Ω AC Center Freq 2.441000000 GHz PN0: Fast → IFGain:Low Ref Offset 2.6 dB Ref 20.00 dBm 0 dB/div Ref 20.00 dBm 0 00	SENSE:INT	1MHz Act	Cumulated	Frequency Auto Tune Center Freq 2.441000000 GHz Start Freq
Agilent Spectrum Analyzer - Swept SA RL RF 50 Ω AC Center Freq 2.441000000 GHz PN0: Fast → IFGain:Low Ref Offset 2.6 dB Ref 20.00 dBm 0 dB/div Ref 20.00 dBm 0 00	SENSE:INT	1MHz Act	Cumulated	Frequency Auto Tune Center Freq 2.44100000 GHz Start Freq 2.441000000 GHz Stop Freq 2.441000000 GHz CF Step 1.000000 MHz
Agilent Spectrum Analyzer - Swept SA IM RE 50 Ω AC Center Freq 2.441000000 GHz PN0: Fast → IFGain:Low Ref Offset 2.6 dB Ref 20.00 dBm IFGain:Low 10 dB/div Ref 20.00 dBm IFGain:Low 10.0	SENSE:INT	1MHz Act	Cumulated	Frequency Auto Tune Center Freq 2.441000000 GHz Start Freq 2.441000000 GHz 2.441000000 GHz 2.441000000 GHz 1.000000 MHz Auto Man
Agilent Spectrum Analyzer - Swept SA IM RE 50 Ω AC Center Freq 2.441000000 GHz PN0: Fast → IFGain:Low Ref Offset 2.6 dB Contact of the second data of the se	SENSE:INT	1MHz Act	Cumulated	Frequency Auto Tune Center Freq 2.441000000 GHz 2.441000000 GHz Stop Freq 2.441000000 GHz CF Step 1.000000 MHz
Agilent Spectrum Analyzer - Swept SA IM RE 50 Ω AC Center Freq 2.441000000 GHz PN0: Fast → IFGain:Low Ref Offset 2.6 dB Ref 20.00 dBm 10 dB/div Ref 20.00 dBm 000	SENSE:INT	1MHz Act	Cumulated	Frequency Auto Tune Center Freq 2.441000000 GHz Start Freq 2.441000000 GHz 2.441000000 GHz 2.441000000 GHz CF Step 1.000000 MHz Auto Man Freq Offset
Agilent Spectrum Analyzer - Swept SA RL RF 50 Ω AC Center Freq 2.441000000 GHz PN0: Fast → IFGain:Low PN0: Fast → IFGain:Low Ref Offset 2.6 dB Comparison Comparison Comparison 10 dB/div Ref 20.00 dBm 0 0 0 0 10.0 10.0 </td <td>SENSE:INT</td> <td>1MHz Ac</td> <td>Cumulated</td> <td>Frequency Auto Tune Center Freq 2.441000000 GHz 2.441000000 GHz 2.441000000 GHz 2.441000000 GHz 2.441000000 GHz 2.441000000 GHz Auto Man Freq Offset</td>	SENSE:INT	1MHz Ac	Cumulated	Frequency Auto Tune Center Freq 2.441000000 GHz 2.441000000 GHz 2.441000000 GHz 2.441000000 GHz 2.441000000 GHz 2.441000000 GHz Auto Man Freq Offset

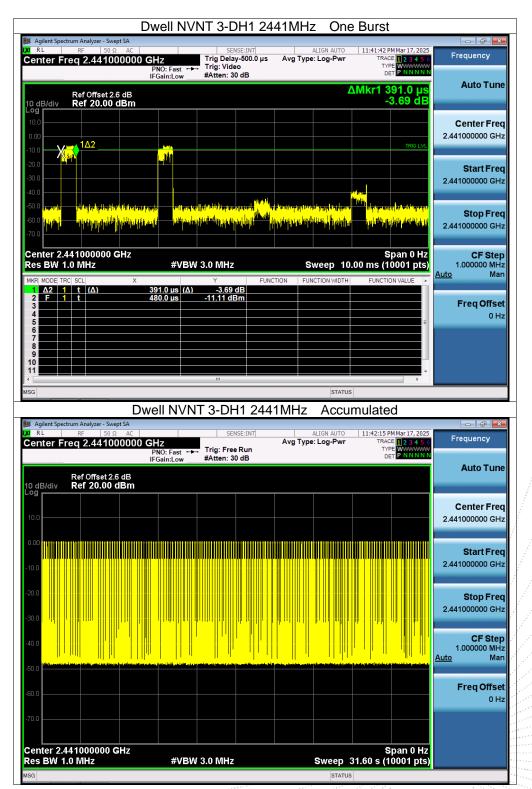
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	Dwell NVNT 2	2-DH5 2441N	IHz One	Burst	
Agilent Spectrum Analyzer - Swept SA RL RF 50 Ω AC enter Freq 2.441000000	PNO: Fast ++++ Trig:	Video	ALIGN AUTO	11:46:59 PM Mar 17, 2025 TRACE 1 2 3 4 5 6 TYPE WWWWW DET P N N N N N	Frequency
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og 10.0 0.00					Center Fred 2.441000000 GHz
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Center 2.441000000 GHz Les BW 1.0 MHz	#VBW 3.0 M	Hz FUNCTION	Sweep 10.00	Span 0 Hz 0 ms (10001 pts)	CF Step 1.000000 MH: <u>Auto</u> Mar
1 Δ2 1 t (Δ) 2 F 1 t 3 4 4 4		.96 dB 6 dBm		FUNCTION VALUE	Freq Offse
4 5 6 7				E	0 н
8 9 0 1					
G			STATUS		
Agilent Spectrum Analyzer - Swept SA RL RF 50 Ω AC	well NVNT 2-I	SENSE:INT		11:47:33 PM Mar 17, 2025	
enter Freq 2.441000000	PNO: Fast ↔ Trig:	Avg Free Run n: 30 dB	Type: Log-Pwr	TRACE 1 2 3 4 5 6 TYPE WWWWW DET PNNNNN	Frequency Auto Tun
Ref Offset 2.6 dB D dB/div Ref 20.00 dBm					Auto Tuli
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					Start Fre
0.0					2.441000000 GH
0.0					Stop Fre 2.441000000 GH
					CF Ste
0.0					1.000000 MH
Walt Contraction Contraction Fr					<u>Auto</u> Ma
					<u>Auto</u> Mar Freq Offse
					1.00000 MH <u>Auto</u> Ma Freq Offse 0 H

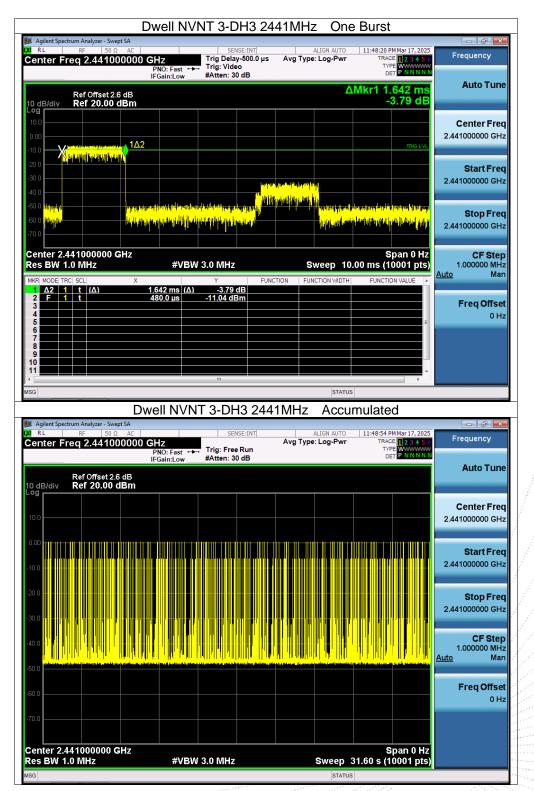
2 CO.,LTA



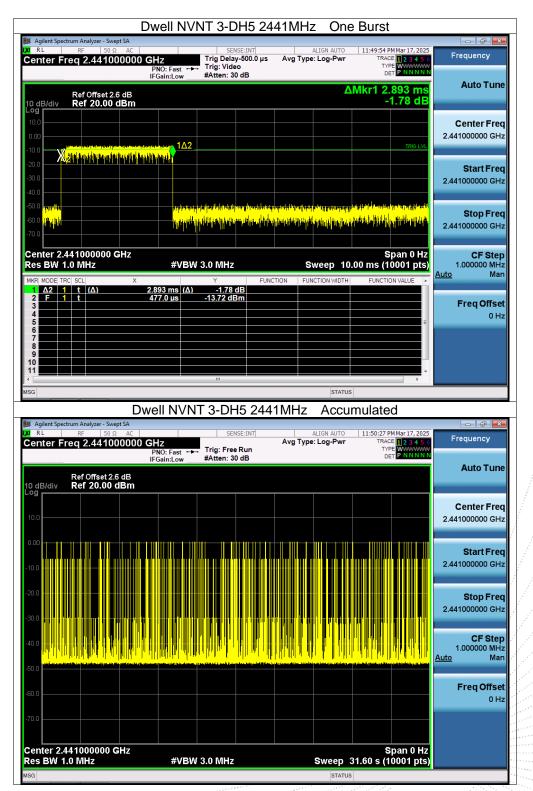














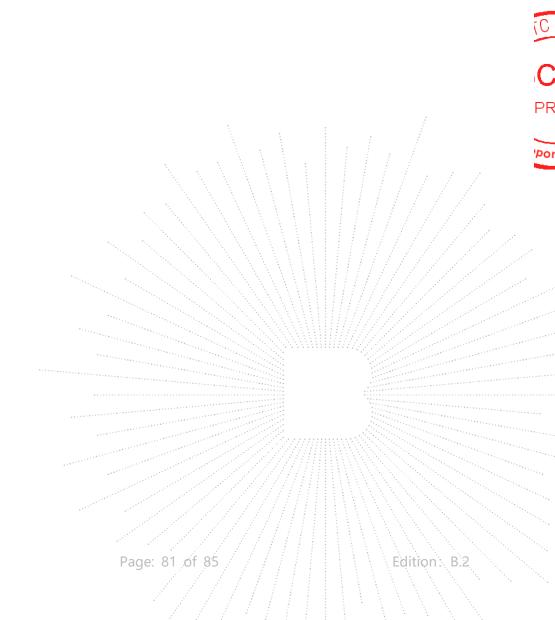
15. Antenna Requirement

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 Chip antenna, fulfill the requirement of this section.



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16. EUT Photographs

EUT Photo



NOTE: Appendix-Photographs Of EUT Constructional Details

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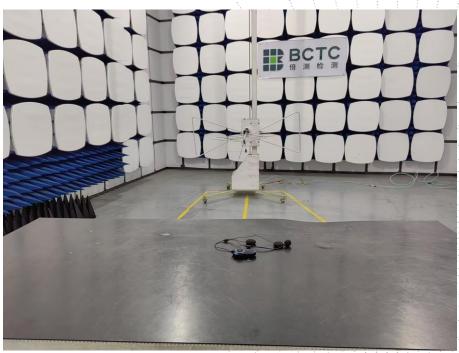


17. EUT Test Setup Photographs

Conducted emissions



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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