**W5**CT<sup>®</sup> W5CT° International Property of World Standardization Certification & Testing Group (Shenzhen) Co., Itd. **ac-MRA** "Infalalalata W5C1 Report No.: WSCT-ANAB-R&E250100003A-BT Dwell NVNT 1-DH5 2402MHz Ant1 One Burst Spectrum Analyzer 1 Swept SA SCPI + Input Z: 50 Ω Corr CCorr Freq Ref: Int (S) PNO: Fast Gate: Off IF Gain: Low Sig Track: Off Avg Type: Log-Power Trig: Video Trig Delay: -500.0 μs KEYSIGHT Input: RF 1 2 3 4 5 6 **w** ₩ ₩ ₩ ₩ Alian: Auto PNNNNN ΔMkr1 2.888 ms Ref LvI Offset 4.26 dB Ref Level 20.00 dBm 1.30 dE Scale/Div 10 dB





**W5**CT<sup>®</sup> WSCT" International Property of World Standardization Certification & Testing Group (Shenzhen) Co., Itd. **ac-MRA** W5C1 Report No.: WSCT-ANAB-R&E250100003A-BT Dwell NVNT 1-DH5 2480MHz Ant1 One Burst Spectrum Analyzer 1 Swept SA SCPI + Input Z: 50 Ω Corr CCorr Freq Ref: Int (S) PNO: Fast Gate: Off IF Gain: Low Sig Track: Off Avg Type: Log-Power Trig: Video Trig Delay: -500.0 μs KEYSIGHT Input: RF 1 2 3 4 5 6 **w** ₩ ₩ ₩ ₩ Alian: Auto PNNNNN ΔMkr1 2.888 ms Ref LvI Offset 4.33 dB Ref Level 20.00 dBm 6.26 dE Scale/Div 10 dB **▲**1Δ2 15 CT  $\chi_2$ والمراف والمرافع والمرافع والمحاورة والمرافع والمرافع والمرافع والمحاورة والمرافع والموارة والمرافع والم Center 2.480000000 GHz Res BW 1.0 MHz #Video BW 3.0 MHz Span 0 Hz Sweep 10.0 ms (10001 pts) Function Function Value **Function Width** 2.888 ms (Δ) 497.0 μs \*\* Dwell NVNT 1-DH5 2480MHz Ant1 Accumulated Spectrum Analyzer 1 Swept SA SCPI **v** + Input Z: 50 Ω Corr CCorr Freq Ref: Int (S) KEYSIGHT Input: RF #Atten: 30 dB Preamp: Off Avg Type: Log-Power Trig: Free Run 1 2 3 4 5 6 W + W + W + WAlign: Auto PNNNNN 1 Spectrum Ref Lvi Offset 4.33 dB Ref Level 20.00 dBm Scale/Div 10 dB

Span 0 Hz Sweep 31.6 s (10001 pts) Center 2.480000000 GHz #Video BW 3.0 MHz Res BW 1.0 MHz ? Jan 09, 2025 .... 12:38:43 PM 

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Page 48 of 75

W5 CI



World Standardization Certification & Testing Group (Shenzhen) Co., ltd.





Report No.: WSCT-ANAB-R&E250100003A-BT

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## 6.8. Pseudorandom Frequency Hopping Sequence

Test Requirement: FCC Part15 C Section 15.247 (a)(1) requirement: 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.

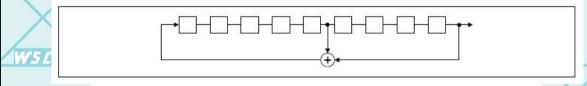
Alternatively. Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a Pseudorandom ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

### **EUT Pseudorandom Frequency Hopping Sequence**

The pseudorandom sequence may be generated in a nine-stage shift register whose 5th and 9th stage outputs are added in a modulo-two addition stage. And the result is fed back to the input of the first stage. The sequence begins with the first one of 9 consecutive ones; i.e. the shift register is initialized with nine ones.

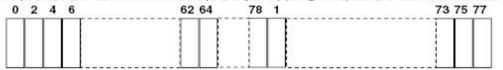
- Number of shift register stages: 9
- Length of pseudo-random sequence: 29-1 = 511 bits
- Longest sequence of zeros: 8 (non-inverted signal)

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Linear Feedback Shift Register for Generation of the PRBS sequence

An example of Pseudorandom Frequency Hopping Sequence as follow:



Each frequency used equally on the average by each transmitter.

The system receivers have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shift frequencies in synchronization with the transmitted signals.

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Page 49 of 75

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**IC-MRA** 



Report No.: WSCT-ANAB-R&E250100003A-BT

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### **Conducted Band Edge Measurement** 6.9.

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W5CT® World Standardization Certification & Testing Group (Shenzhen) Co., ltd. Report No.: WSCT-ANAB-R&E250100003A-BT **Test Data** 





15 CT

GFSK Modulation (the worst case) Test Graphs Band Edge(Hopping) NVNT 1-DH5 2402MHz Ant1 Hopping Ref SCPI + PNO: Best Wide Gate: Off IF Gain: Low Sig Track: Off Input Z: 50 Ω Corr CCorr Freq Ref: Int (S) #Atten: 30 dB Preamp: Off Avg Type: Log-Power Avg|Hold: 2000/2000 Trig: Free Run KEYSIGHT Input: RF 1 2 3 4 5 6 M W W W W PNNNN Mkr1 2.404 024 GHz 1 Spectrum Ref LvI Offset 4.26 dB Ref Level 20.00 dBm 5.05 dBm Scale/Div 10 dB #Video BW 300 kHz Center 2.402000 GHz #Res BW 100 kHz Span 8.000 MHz Sweep 1.00 ms (1001 pts) ? Jan 09, 2025 .... 12:25:24 PM # 5 6 1 Band Edge(Hopping) NVNT 1-DH5 2402MHz Ant1 Hopping Emission Spectrum Analyzer 1 Swept SA SCPI **v** + Input Z: 50 Ω Corr CCorr Freq Ref: Int (S) Avg Type: Log-Power Avg|Hold: 2000/2000 Trig: Free Run #Atten: 30 dB Preamp: Off KEYSIGHT Input: RF Gate: Off IF Gain: Low M ₩ ₩ ₩ ₩ PNNNN Sig Track: Off Mkr1 2.405 0 GHz 1 Spectrum Ref Lvi Offset 4.26 dB Ref Level 20.00 dBm 5.02 dBm Scale/Div 10 dB 50.0 maaaaaaan waxaa wax Stop 2.40600 GHz Start 2.30600 GHz #Video BW 300 kHz #Res BW 100 kHz Sweep 9.60 ms (1001 pts) Trace Scale Function Value N N 2.390 0 GHz 2.382 0 GHz -54.73 dBm -49.77 dBm

tion& Testin WS C ADD: Building A-B, Baoli'an Industrial Park, No. 58 and 60, Tangtou Avenue, Shiyan Street, Bao'an District, Shenzhen City, Guangdong Province, China

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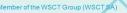
#### **Conducted Spurious Emission Measurement** 6.10.

6.10.1. Test Specificati	on	W5 L	7°	W5 CT
Test Requirement:	FCC	Part15 C Section	on 15.24	7 (d)

	Test Requirement:	FCC Part15 C Section 15.247 (d)			
	Test Method:	ANSI C63.10:2014			
	Limit:	In any 100 kHz bandwidth outside the intentional radiation frequency band, the radio frequency power shall be at least 20 dB below the highest level of the radiated power. In addition, radiated emissions which fall in the restricted bands must also comply with the radiated emission limits.	WSET		
47	Test Setup:	Spectrum Analyzer EUT WSET®			
	Test Mode:	Transmitting mode with modulation			
771	Test Procedure:	<ol> <li>The testing follows the guidelines in Spurious RF Conducted Emissions of ANSI C63.10:2014         Measurement Guidelines</li> <li>The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.</li> <li>Set to the maximum power setting and enable the EUT transmit continuously.</li> <li>Set RBW = 100 kHz, VBW = 300kHz, scan up through 10th harmonic. All harmonics / spurs must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW.</li> <li>Measure and record the results in the test report.</li> <li>The RF fundamental frequency should be excluded against the limit line in the operating frequency band.</li> </ol>	WSCT		
	Test Result:	PASS			
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Page 53 of 75

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Report No.: WSCT-ANAB-R&E250100003A-BT

# 6.11 Radiated Spurious Emission Measurement

### 6.11.1. Test Specification

	WSET WSE	WSEI	WSLT	
	Test Requirement:	FCC Part15 C Section 15.	209	
	Test Method:	ANSI C63.10:2014		
W5CT°	Frequency Range:	9 kHz to 25 GHz	VSET° W	SCT®

**Measurement Distance:** 3 m

**Antenna Polarization:** Horizontal & Vertical

	WSLT WSLT	Frequency	Detector	RBW	VBW	Remark
		9kHz- 150kHz	Quasi-peak	200Hz	1kHz	Quasi-peak Value
	X	150kHz-	Quasi-peak	9kHz	30kHz	Quasi-peak Value
	Receiver Setup:	30MHz				
	WSCT	30MHz-1GHz	Quasi-peak	100KHz	300KHz	Quasi-peak Value
_		Above 1015	Peak	1MHz	3MHz	Peak Value
		Above 1GHz	Peak	1MHz	10Hz	Average Value

	Frequency	Field Strength	Measurement
W5CT W5C1	requesto	(microvolts/meter)	Distance (meters)
	0.009-0.490	2400/F(KHz)	300
	0.490-1.705	24000/F(KHz)	30
	1.705-30	30	30
	30-88	100	3
W5 CT°	88-216	W 5 150°	V35 <i>CT</i> °
Limit:	216-960	200	3
	Above 960	500	3

WSET WSET	Frequency	5 Field Strength	Measurement Distance	Detector
	rrequericy	(microvolts/meter)	(meters)	Detector
X	A   4 O     -	500	3	Average
	Above 1GHz	5000	3	Peak

For radiated emissions below 30MHz

\ /		requesticy	(microvolts/meter)	(meters)	Dolosie
X	X	A h 2 / 2 / 2 / 1 -	500	3	Average
		Above 1GHz	5000	3	Peak
442 630		TAR CES	1446 64		A CONTRACTOR OF THE CONTRACTOR

Distance = 3m

Test setup:	EUT Turn table	
$\vee$	Ground Plane	Receiver
	30MHz to 1GHz	
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