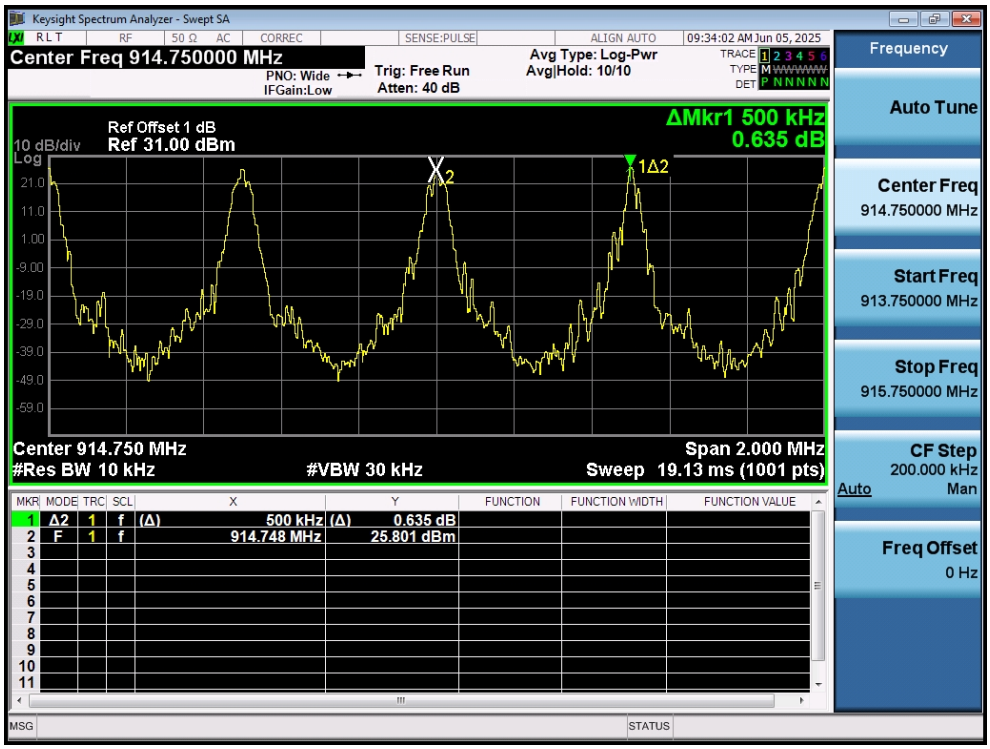

Keysight Spectrum Analyzer - Swept SA
Center Freq 914.750000 MHz
PNO: Wide
IFGain:Low
Trig: Free Run
Atten: 40 dB
Avg Type: Log-Pwr
Avg|Hold: 10/10
09:34:02 AM Jun 05, 2025
Ref Offset 1 dB
10 dB/div
Ref 31.00 dBm
ΔMkr1 500 kHz
0.635 dB
Center 914.750 MHz
#Res BW 10 kHz
#VBW 30 kHz
Span 2.000 MHz
Sweep 19.13 ms (1001 pts)
1 Δ2 1 f (Δ) 500 kHz (Δ) 0.635 dB
2 F 1 f 914.748 MHz 25.801 dBm
Frequency
Auto Tune
Center Freq
914.750000 MHz
Start Freq
913.750000 MHz
Stop Freq
915.750000 MHz
CF Step
200.000 kHz
Auto
Man
Freq Offset
0 Hz

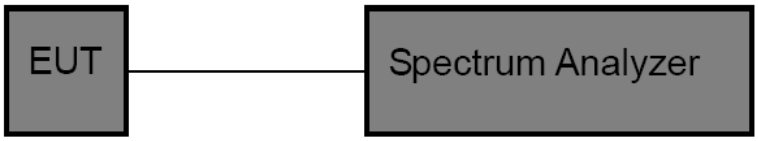
Hopping

8. Number of Hopping Channel Test

8.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.247(a)(1)(i)
Test Limit	≥ 50 channels for 20 dB bandwidth less than 250KHz ≥ 25 channels for 20 dB bandwidth greater than 250KHz

8.2. Test Setup



8.3. Test Procedure

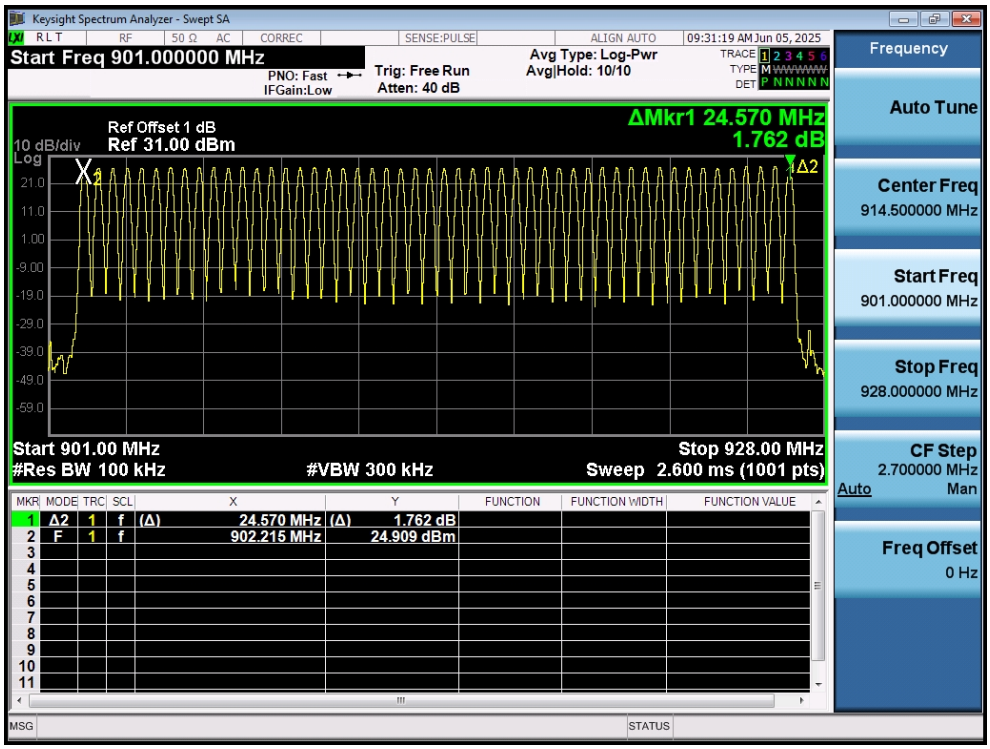
The EUT must have its hopping function enabled. Using the following spectrum analyzer setting:

1. Span= the frequency band of operation
2. Set the RBW = less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller.
3. Set the VBW ≥ RBW.
4. Sweep time = auto couple.
5. Detector function = peak.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.

8.4. Test Data

Temperature:	25.3 °C	Humidity:	48 %	Atmospheric Pressure:	101 kPa

Hopping Channel Frequency Range	Quantity of Hopping Channel	Quantity of Hopping Channel
902-928MHz	50	≥ 50


Keysight Spectrum Analyzer - Swept SA
Start Freq 901.000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 40 dB
Avg Type: Log-Pwr
Avg|Hold: 10/10
09:31:19 AM Jun 05, 2025
Ref Offset 1 dB
Ref 31.00 dBm
10 dB/div
Log
ΔMkr1 24.570 MHz
1.762 dB
Start 901.00 MHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 928.00 MHz
Sweep 2.600 ms (1001 pts)
Frequency
Auto Tune
Center Freq
914.500000 MHz
Start Freq
901.000000 MHz
Stop Freq
928.000000 MHz
CF Step
2.700000 MHz
Auto
Man
Freq Offset
0 Hz
1 Δ2 1 f (Δ) 24.570 MHz (Δ) 1.762 dB
2 F 1 f 902.215 MHz 24.909 dBm

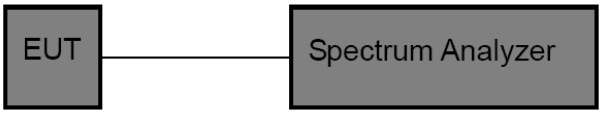
Hopping

9. Dwell Time Test

9.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.247(a)(1)(i)
Test Limit	15.247(a)(1)(i): if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period.

9.2. Test Setup



9.3. Test Procedure

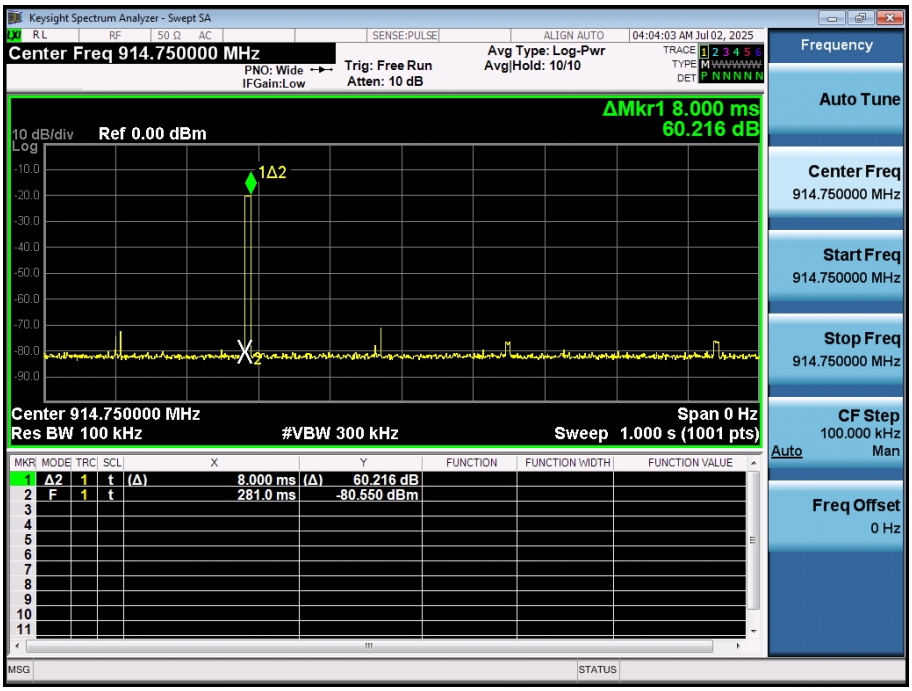
The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

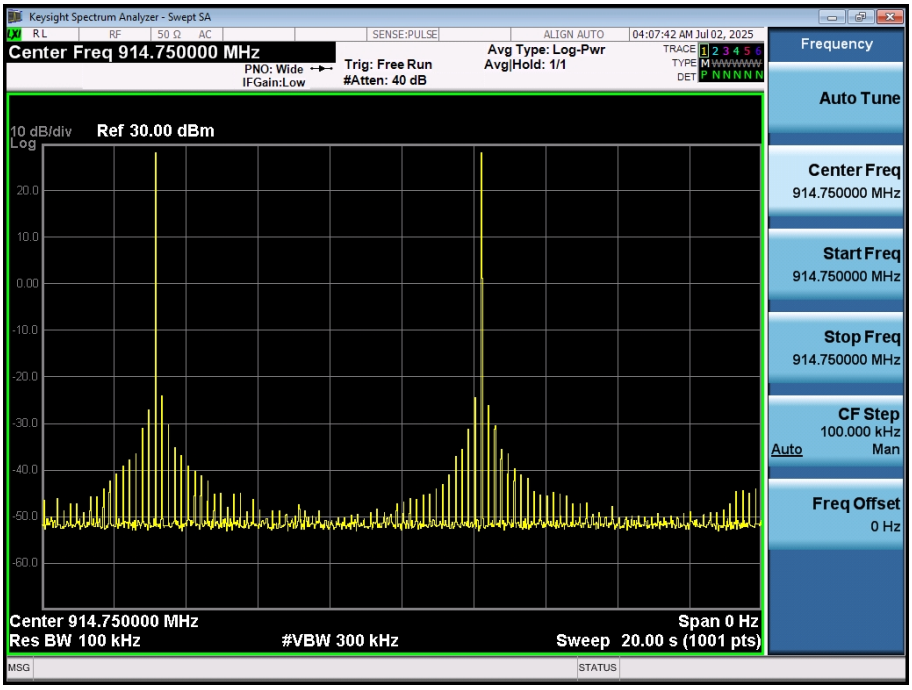
1. Span= zero span, centered on a hopping channel
2. Set the RBW = 100 KHz.
3. Set the VBW = 300 KHz.
4. Sweep time = as necessary to capture the entire dwell time per hopping channel.
5. Detector function = peak.
6. Trace mode = clear write.

9.4. Test Data

Temperature:	25.3 °C	Humidity:	48 %	Atmospheric Pressure:	101 kPa

Requirement	Pulse width (ms)	Observe Period(s)	TotalHops [Num]	Dwell time (ms)	Limit (s)	Result
15.247(a)(1)(i)	8	20.00	2	16	0.40	PASS





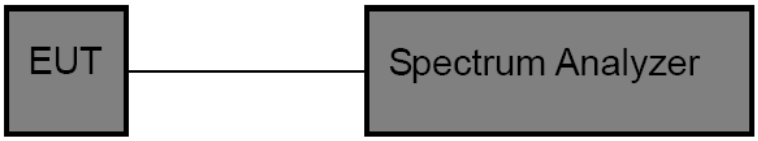
Hopping

10. 100kHz Bandwidth of Frequency Band Edge Requirement

10.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.247 (d)
Test Limit	in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, 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 15.209(a).

10.2. Test Setup



10.3. Test Procedure

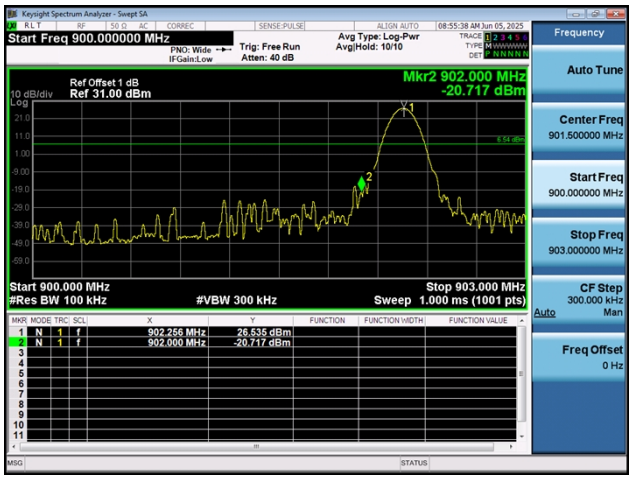
The EUT must have its hopping/Non-hopping function enabled. Using the following spectrum analyzer setting:

1. Set the RBW = 100kHz.
2. Set the VBW = 300kHz.
3. Sweep time = auto couple.
4. Detector function = peak.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.

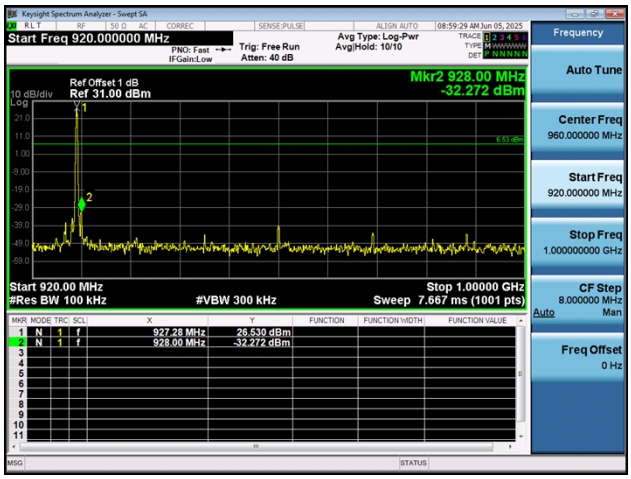
10.4. Test Data

Temperature:	25.3 °C	Humidity:	48 %	Atmospheric Pressure:	101 kPa

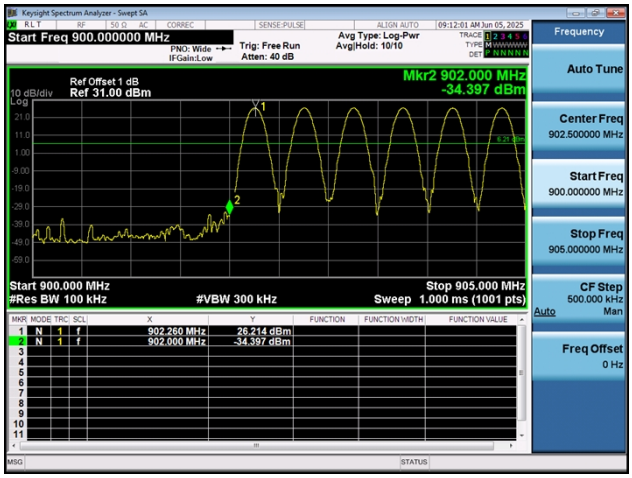
Band edge measurements



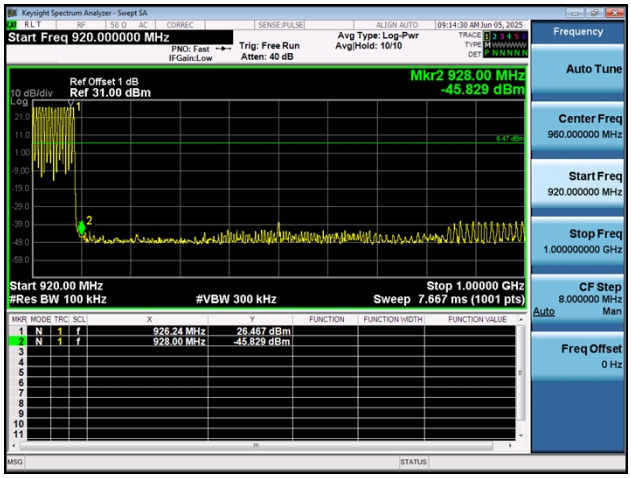
For Low channel Non-Hopping Mode



For High channel Non-Hopping Mode



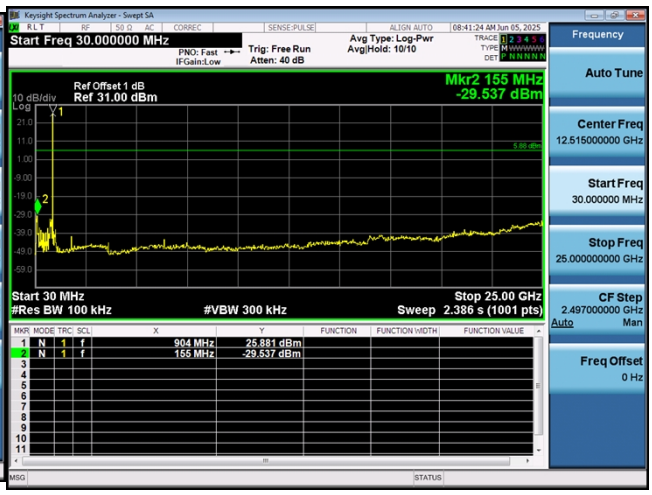
For Low channel Hopping Mode



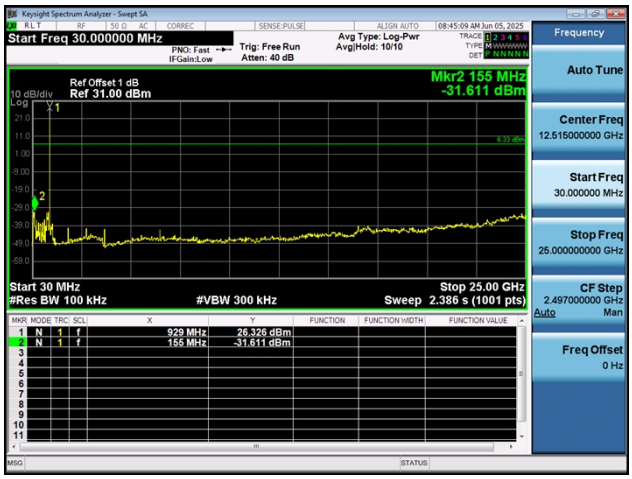
For High channel Hopping Mode

Conducted Emission Method

Low Channel



Mid Channel



High Channel

11. Antenna Requirement

11.1. Test Standard and Requirement

Test Standard	FCC Part15 Section 15.203 /247(c)
Requirement	1) 15.203 requirement: 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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. 2) 15.247(c) (1)(i) requirement: Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

11.2. Antenna Connected Construction

The antenna is External Antenna which permanently attached, and the best case gain of the antenna is 2dBi. It complies with the standard requirement.

APPENDIX I -- TEST SETUP PHOTOGRAPH

Please refer to separated files Appendix I -- Test Setup Photograph_RF

APPENDIX II -- EXTERNAL PHOTOGRAPH

Please refer to separated files Appendix II -- External Photograph

APPENDIX III -- INTERNAL PHOTOGRAPH

Please refer to separated files Appendix III -- Internal Photograph

---------- End of Report ----------