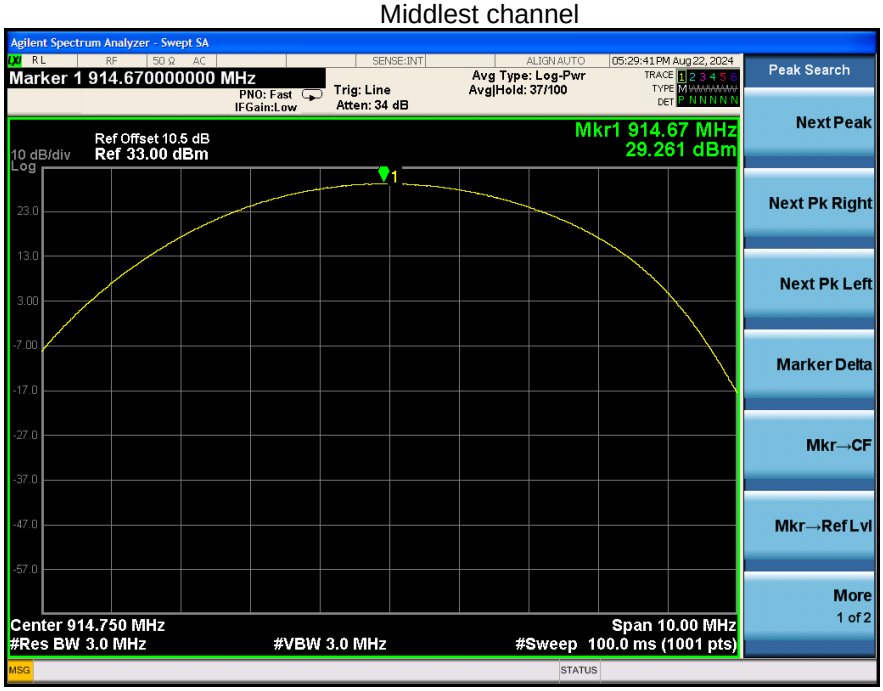
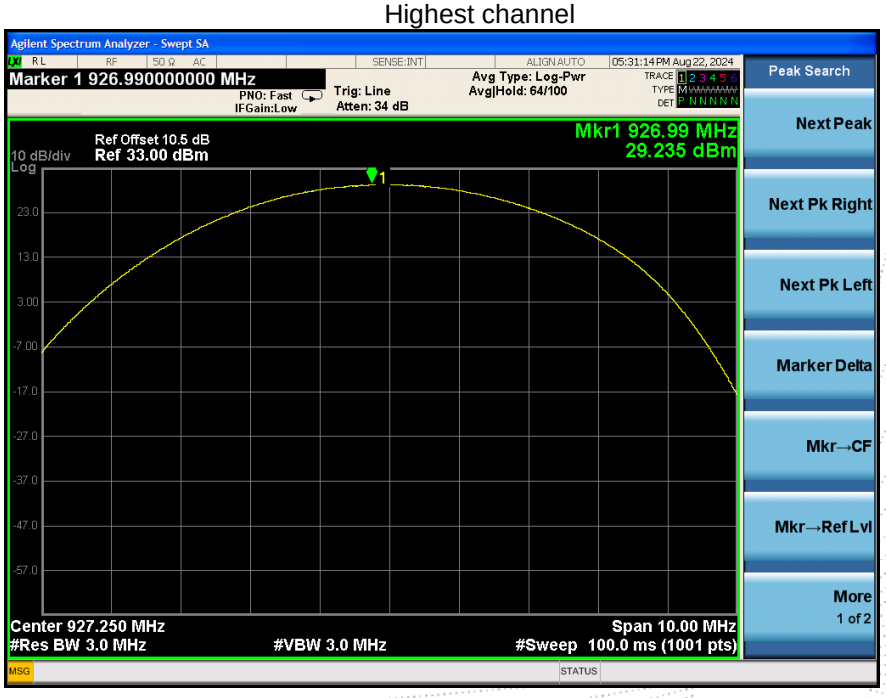
Middlest channel

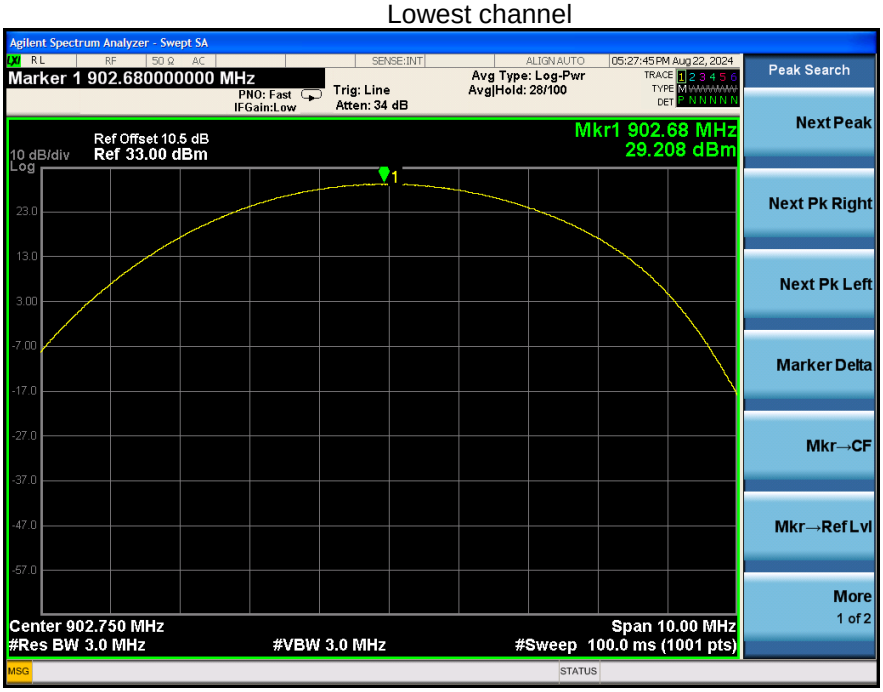


Highest channel

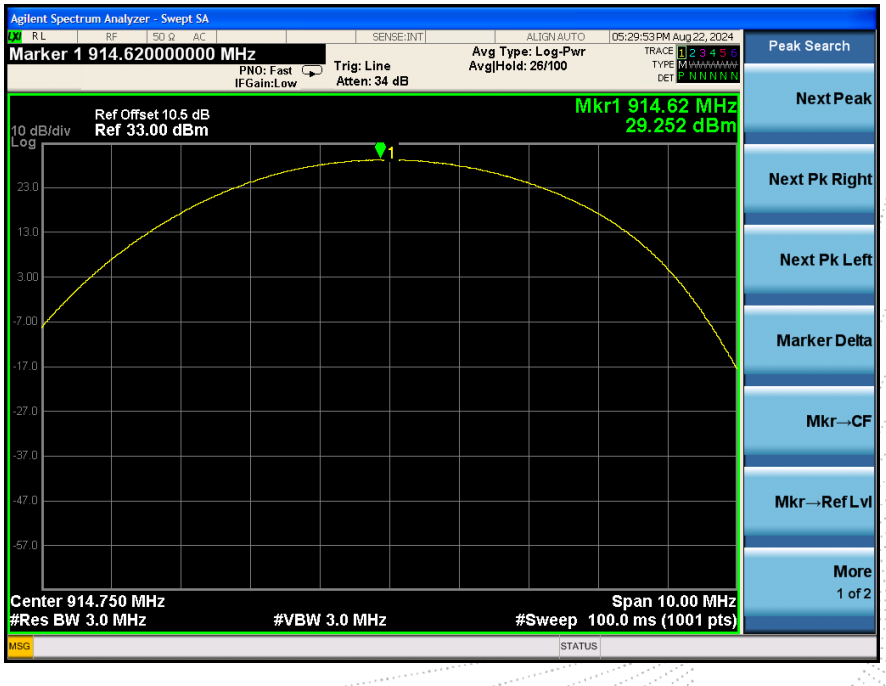


Antenna 3

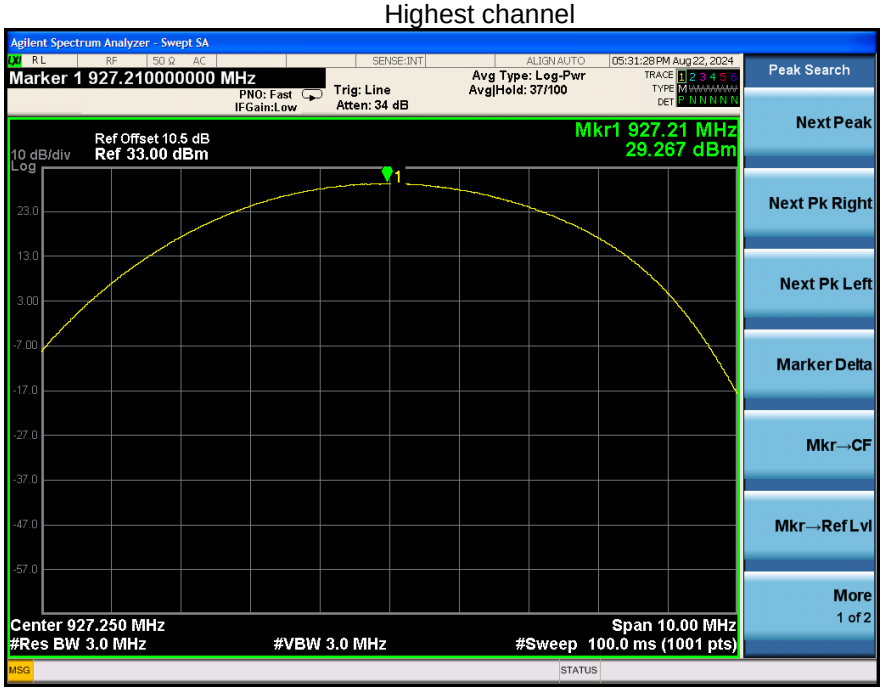
Lowest channel



Middlest channel

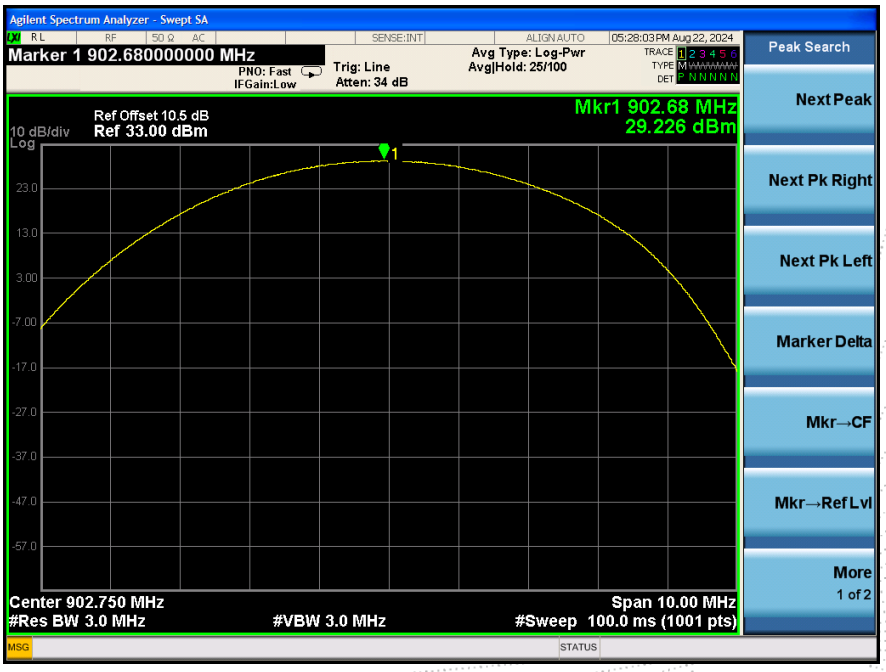


Highest channel

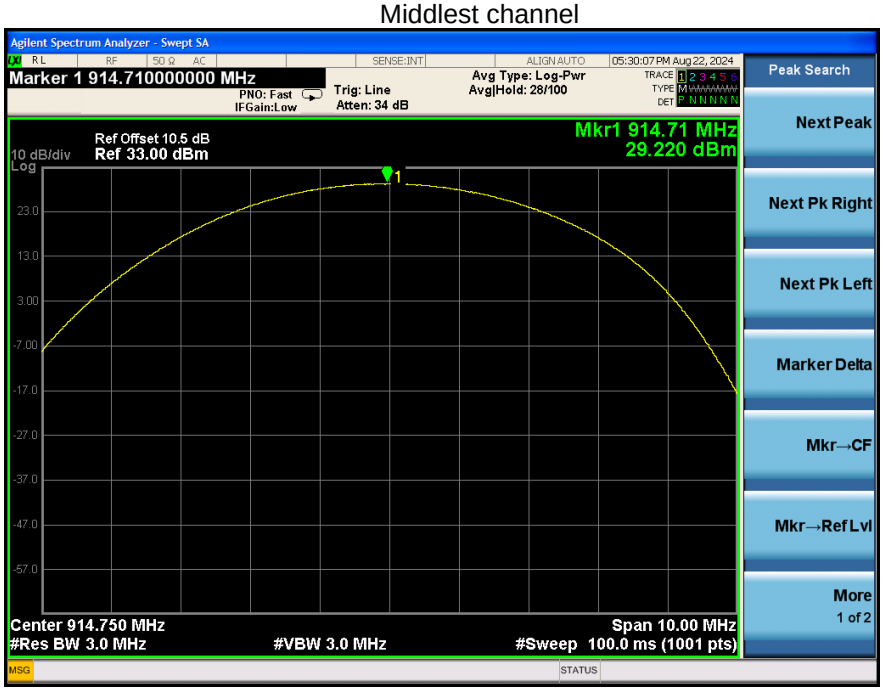


Antenna 4

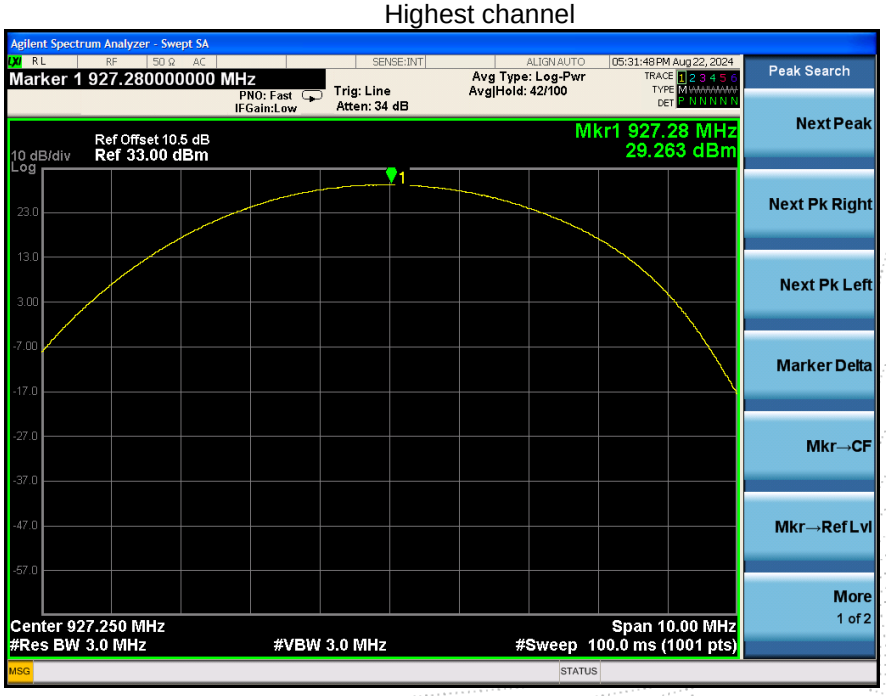
Lowest channel



Middlest channel

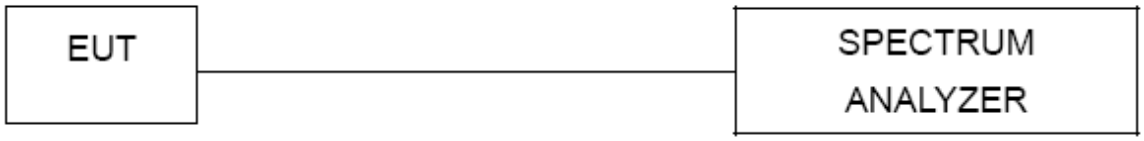


Highest channel



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.

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 = 1.0MHz. 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.

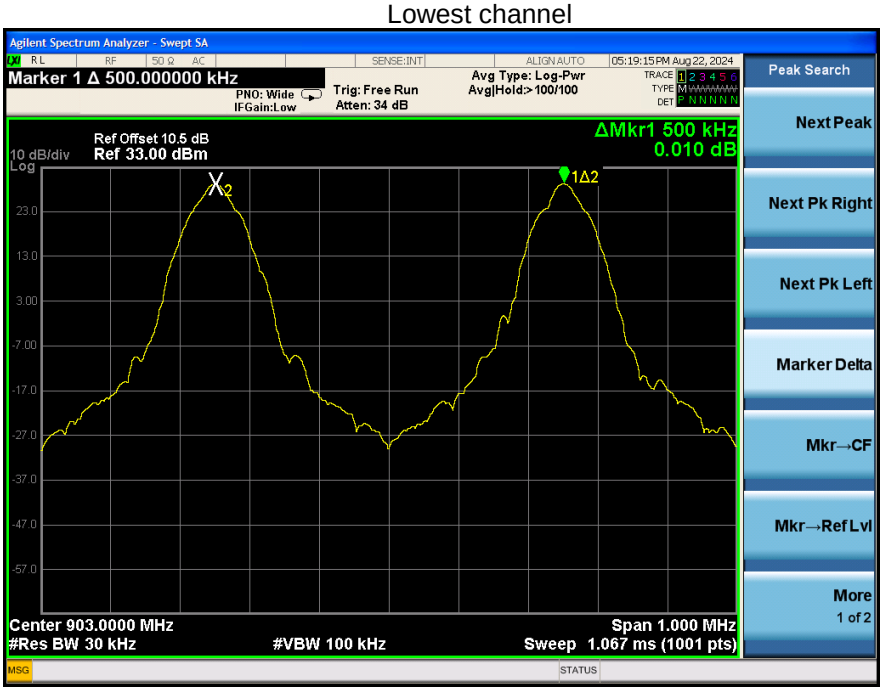
12.4 Test Result

For FHSS:

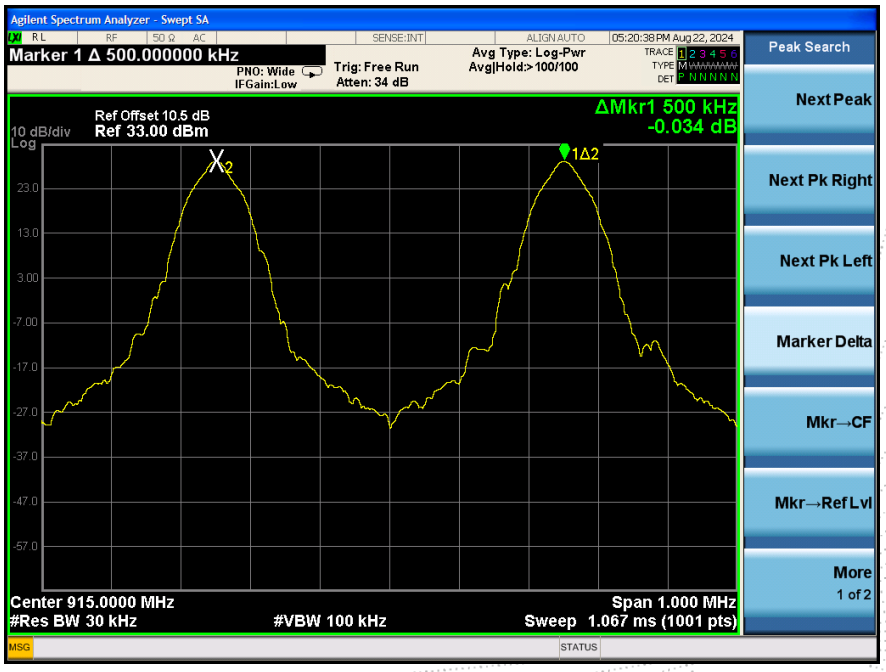
ASK				
Test channel		**Carrier Frequencies Separation (kHz)**	**Limit (kHz)**	**Result**
Lowest	Antenna 1	500	74.17	PASS
Middlest		500	72.43	PASS
Highest		500	73.59	PASS
Lowest	Antenna 2	499	72.62	PASS
Middlest		500	74.27	PASS
Highest		501	73.44	PASS
Lowest	Antenna 3	501	72.49	PASS
Middlest		500	74.7	PASS
Highest		499	74.29	PASS
Lowest	Antenna 4	500	71.32	PASS
Middlest		500	74.66	PASS
Highest		498	74.48	PASS

Antenna 1

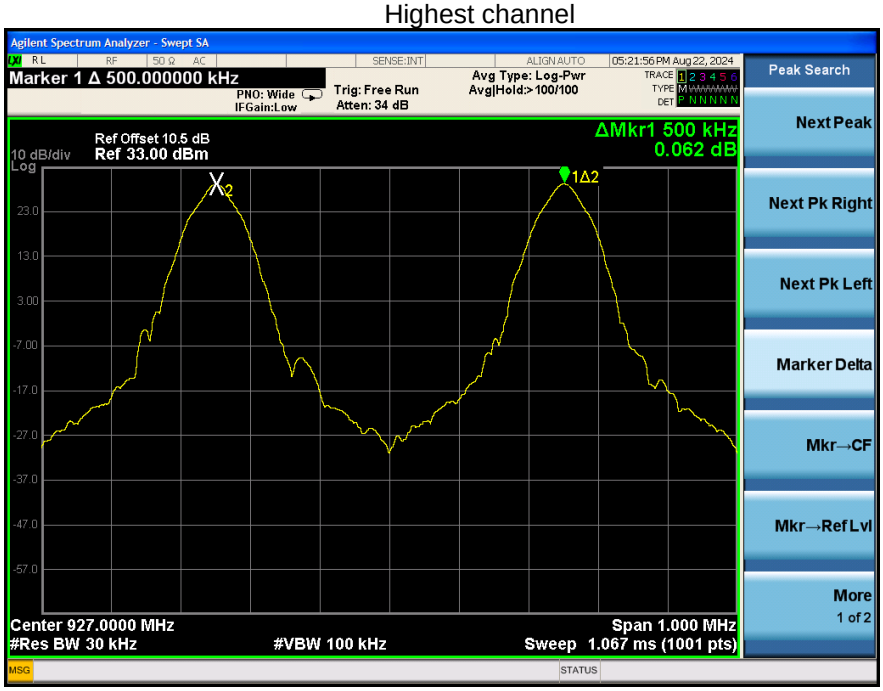
Lowest channel



Middlest channel



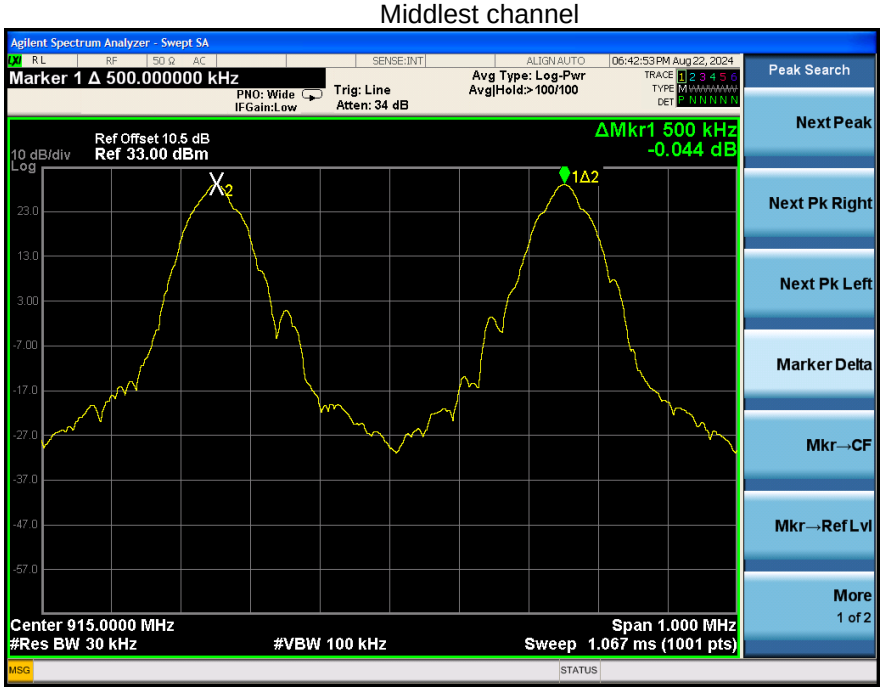
Highest channel



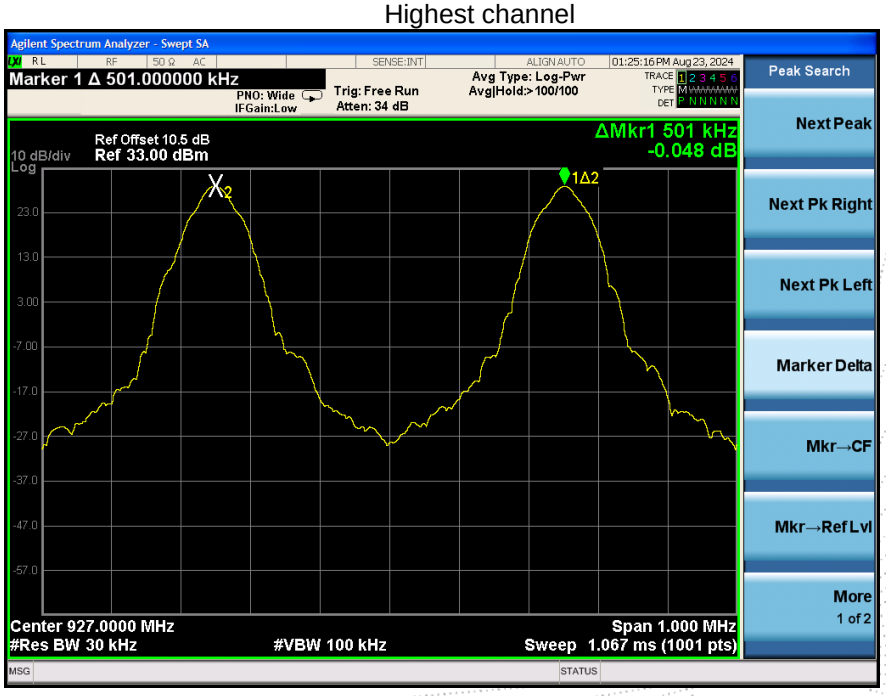
Antenna 2

Lowest channel

Middlest channel

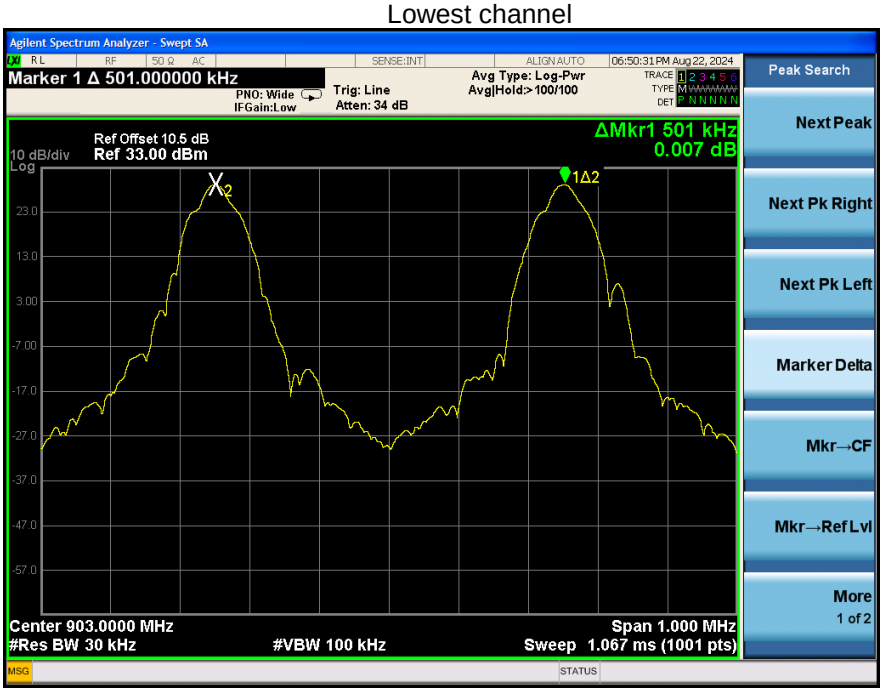


Highest channel

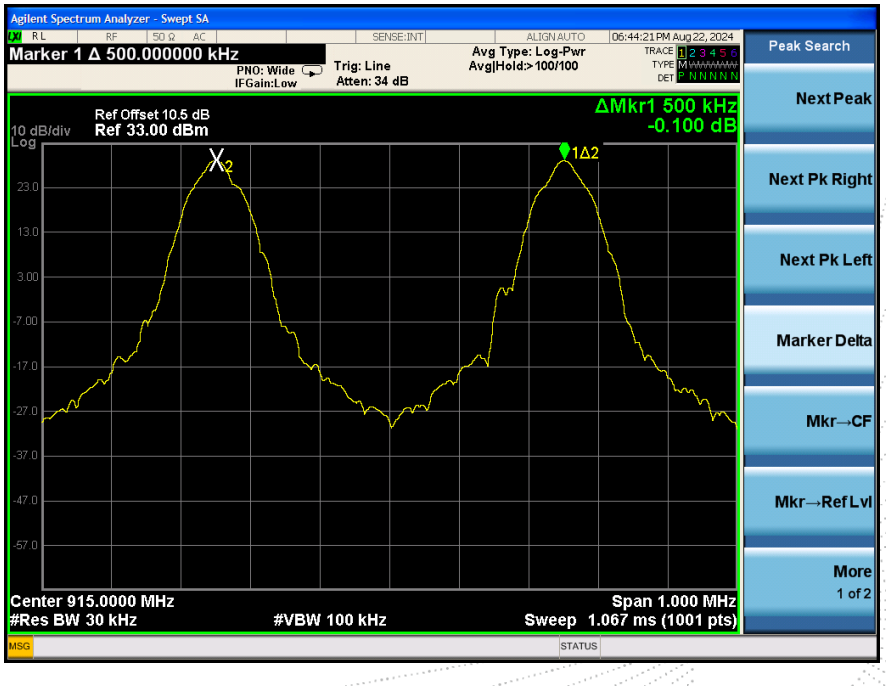


Antenna 3

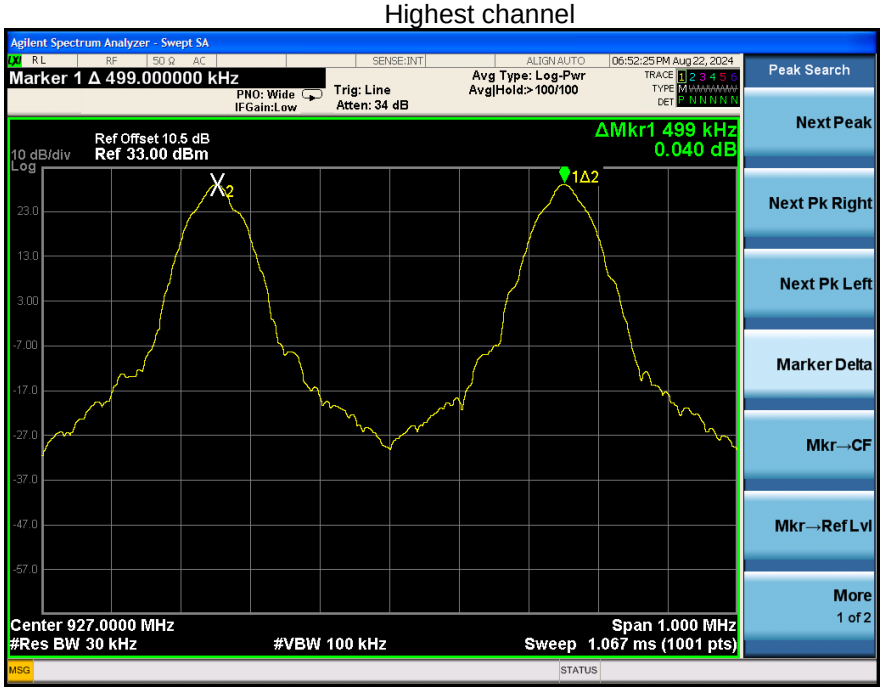
Lowest channel



Middlest channel

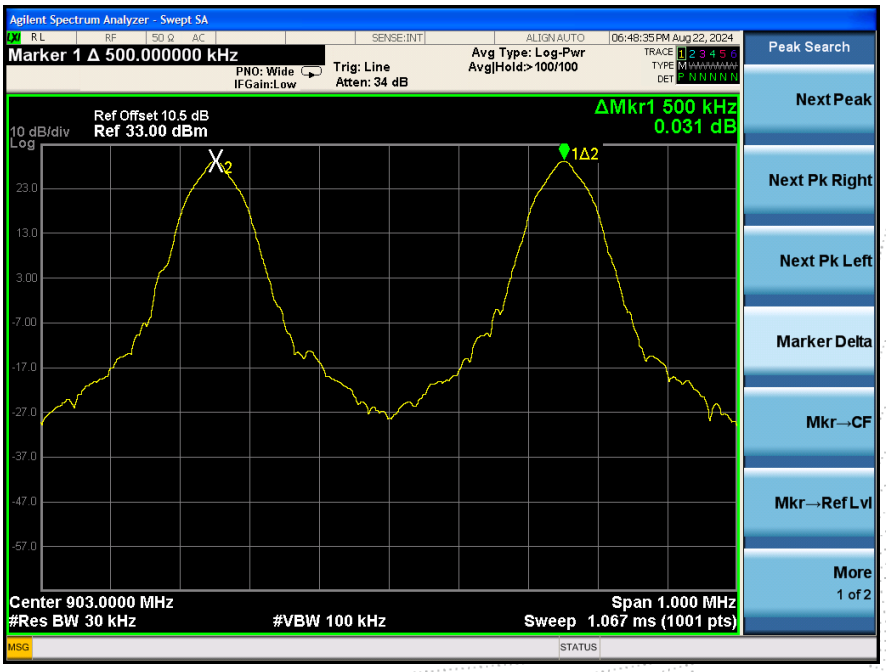


Highest channel

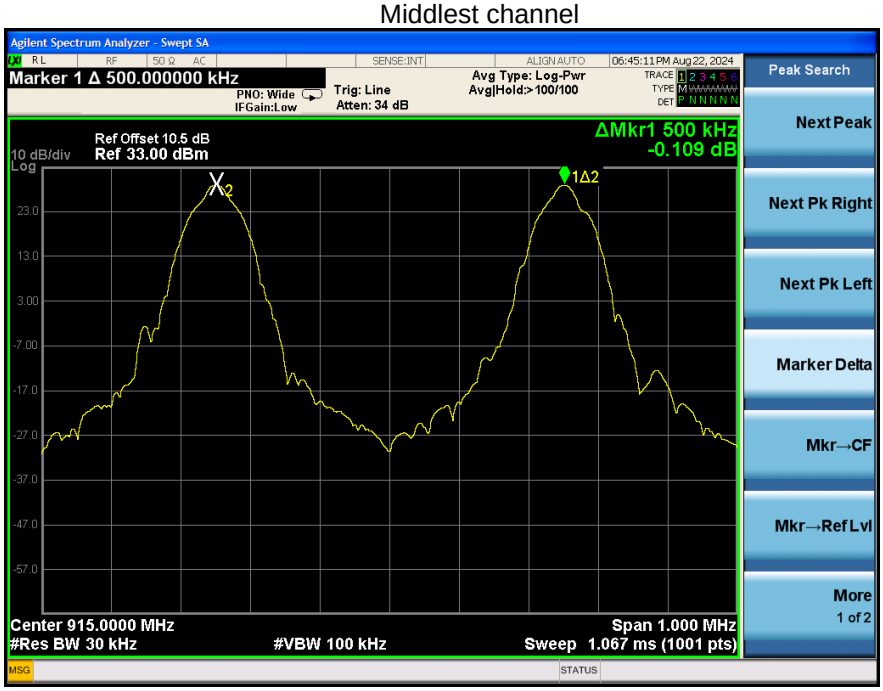


Antenna 4

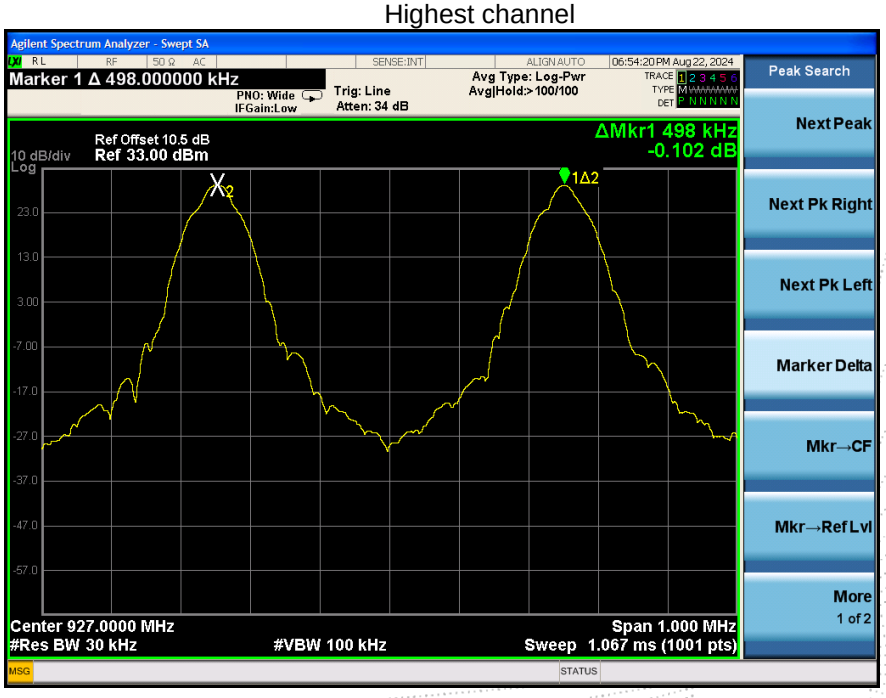
Lowest channel



Middlest channel

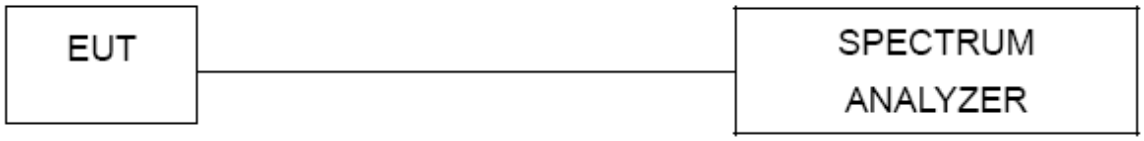


Highest channel



13. Number Of Hopping Frequency

13.1 Block Diagram Of Test Setup



13.2 Limit

For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies.

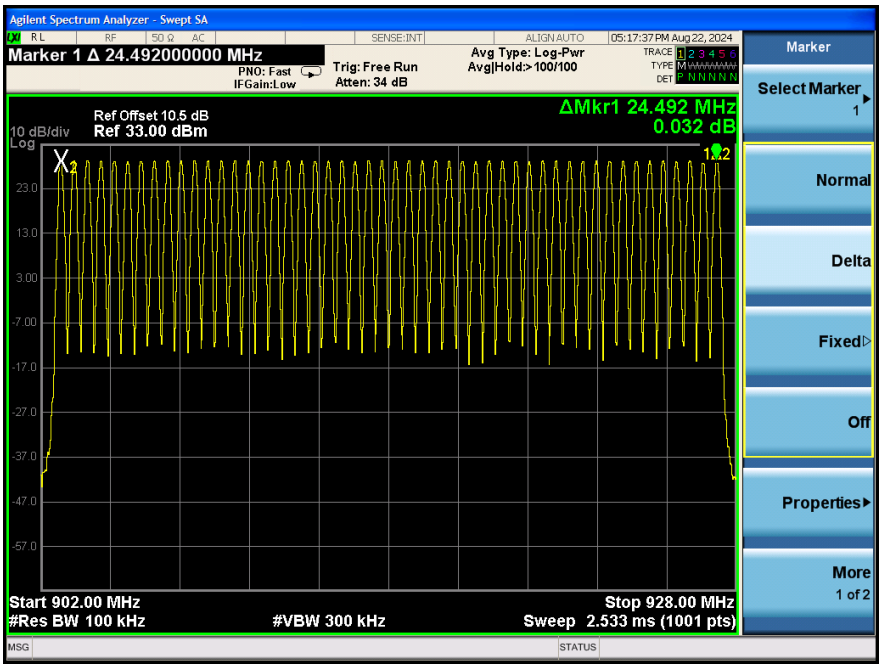
13.3 Test procedure

1. 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.
2. Set to the maximum power setting and enable the EUT transmit continuously.
3. Enable the EUT hopping function.
4. Use the following spectrum analyzer settings: Span = the frequency band of operation; set the RBW to less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller; VBW≥RBW; Sweep = auto; Detector function = peak; Trace = max hold
5. The number of hopping frequency used is defined as the number of total channel.
6. Record the measurement data in report.

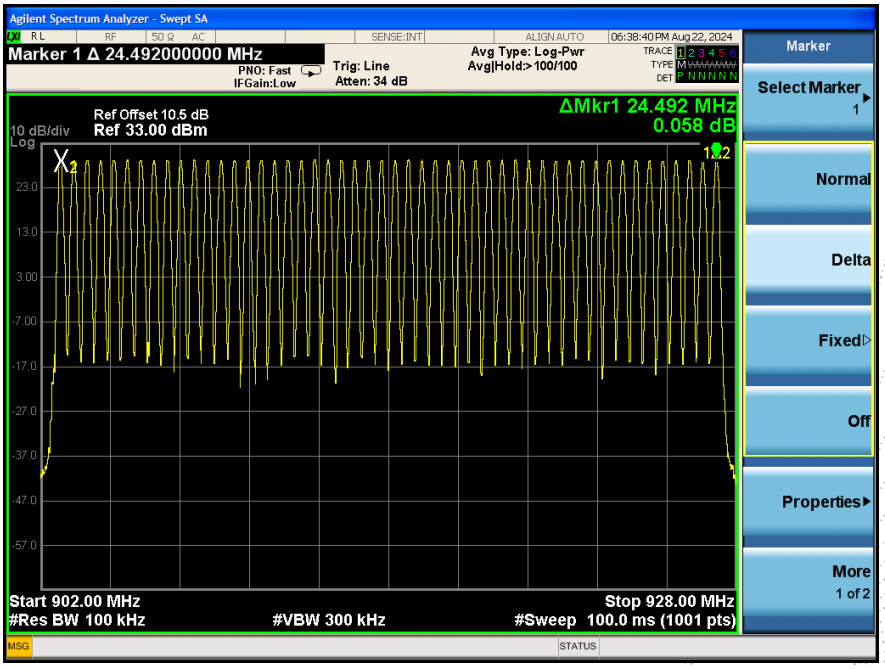
13.4 Test Result

Antenna	Hopping channel numbers	Limit	Result
Antenna 1	50	50	PASS
Antenna 2	50	50	PASS
Antenna 3	50	50	PASS
Antenna 4	50	50	PASS

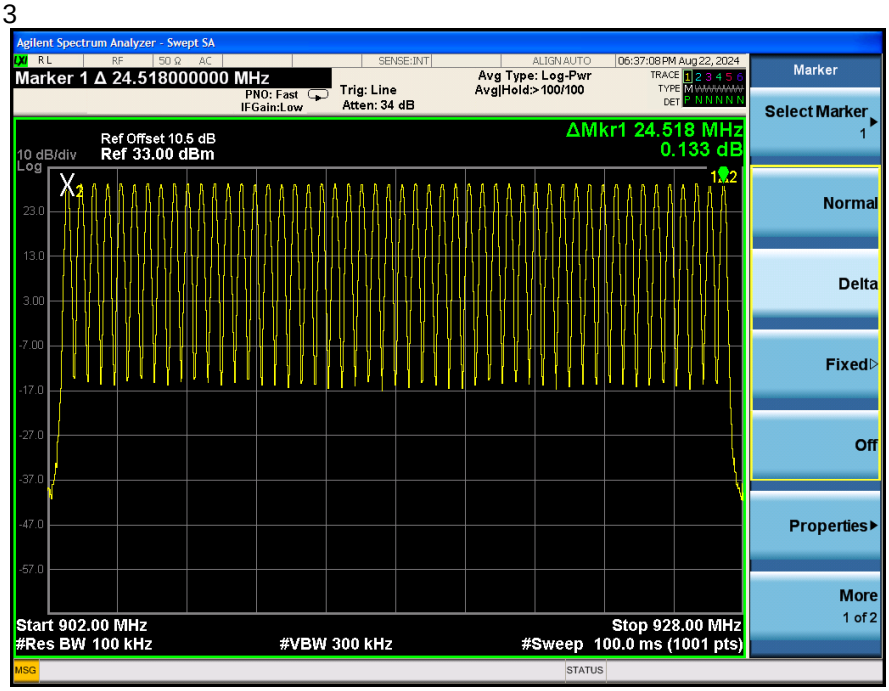
Antenna 1



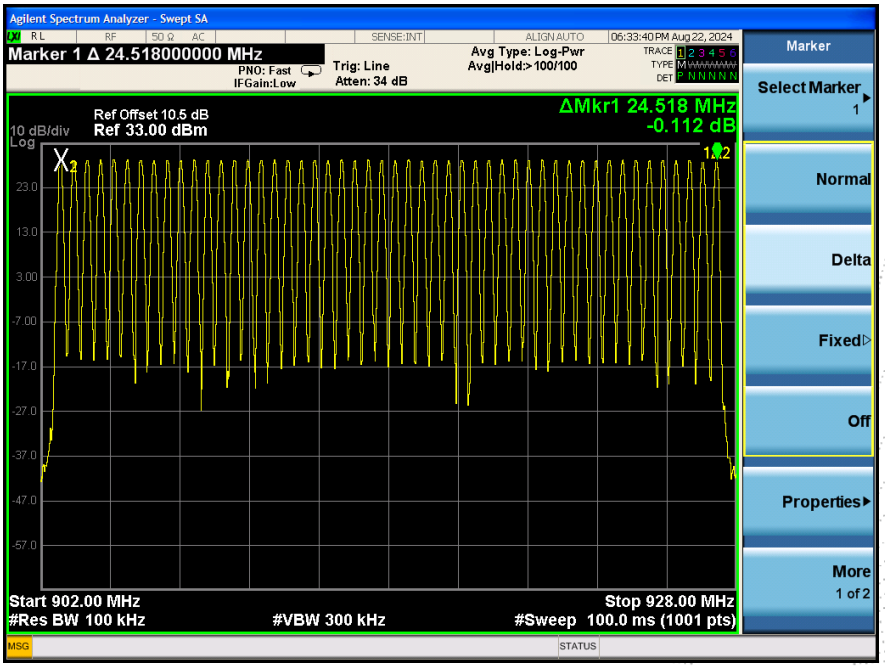
Antenna 2



Antenna 3

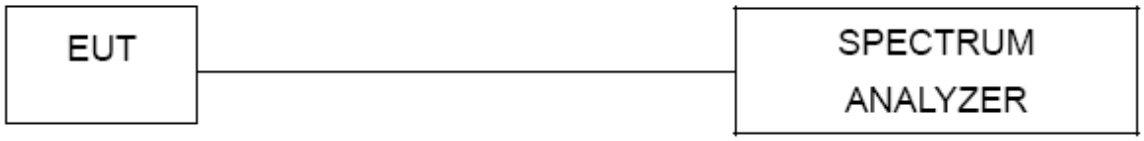


Antenna 4



14. Dwell Time

14.1 Block Diagram Of Test Setup



14.2 Limit

For frequency hopping systems operating in the 902-928 MHz band: 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. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

14.3 Test procedure

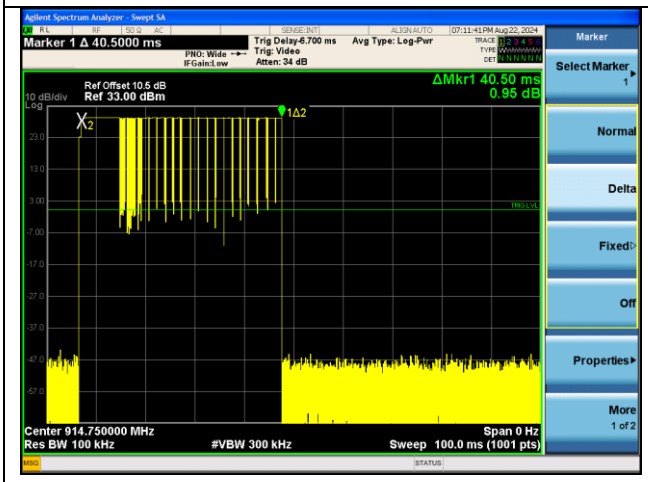
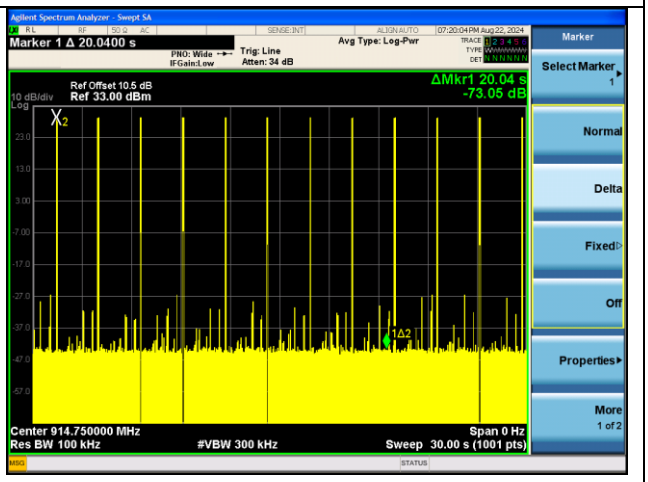
1. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
2. Set to the maximum power setting and enable the EUT transmit continuously.
3. Enable the EUT hopping function.
4. The spectrum analyzer is set to:
Center frequency = 914.75MHz, Span = zero
RBW = 100 kHz (RBW shall be ≤ channel spacing and where possible RBW should be set >> 1 / T, where T is the expected dwell time per channel),
VBW ≥ RBW Detector function = peak,
Trace = max hold
5. Measure and record the results in the test report.

14.4 Test Result

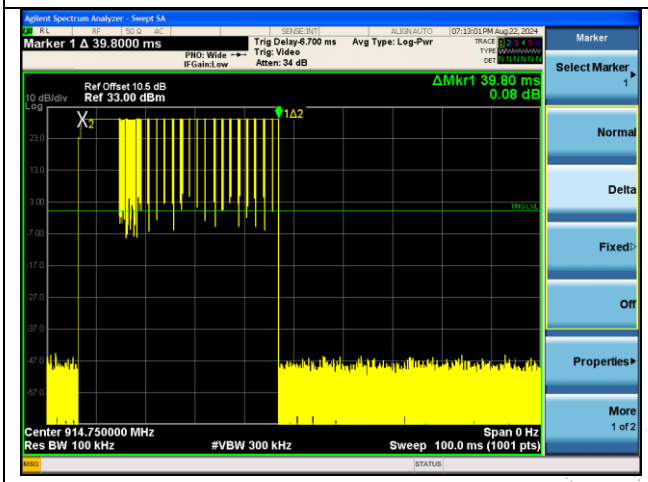
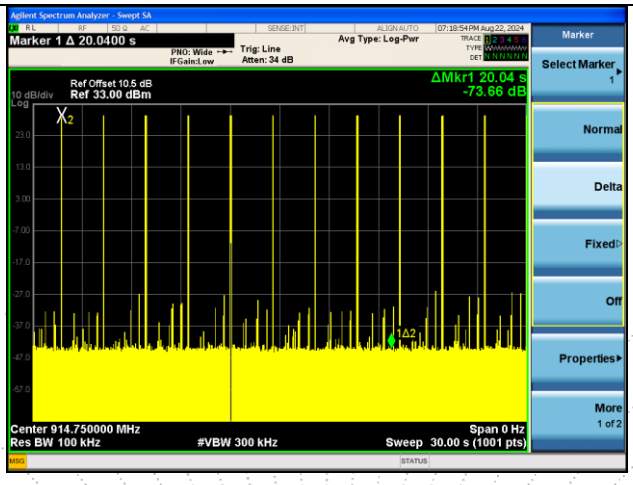
Antenna	Length (ms)	Number	Dwell time (ms)	Limit (ms)	Result
Antenna 1	40.50	8	324.00	400	PASS
Antenna 2	39.80	8	318.40	400	PASS
Antenna 3	40.10	8	320.80	400	PASS
Antenna 4	40.30	8	322.40	400	PASS

Note: Dwell time= Length* Number

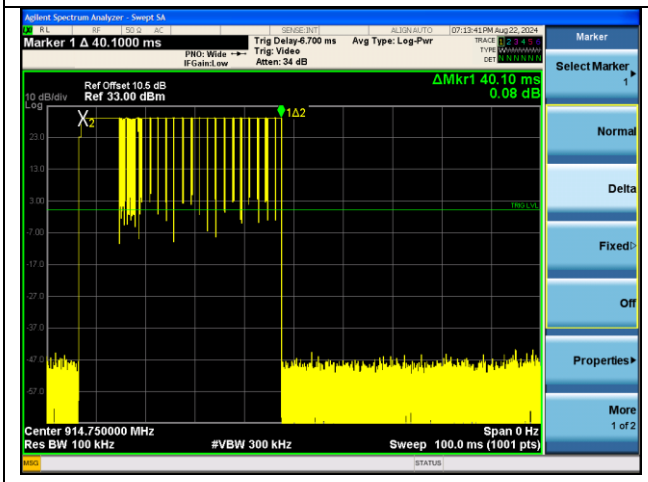
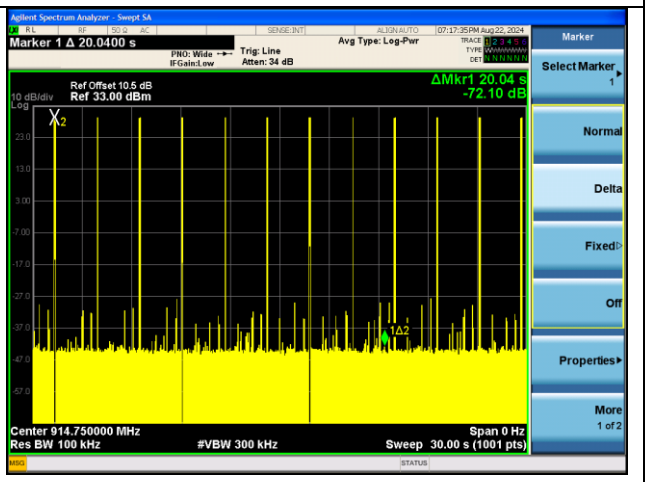
Antenna 1

Length (Hopping Mode)	Period (Hopping Mode)
	

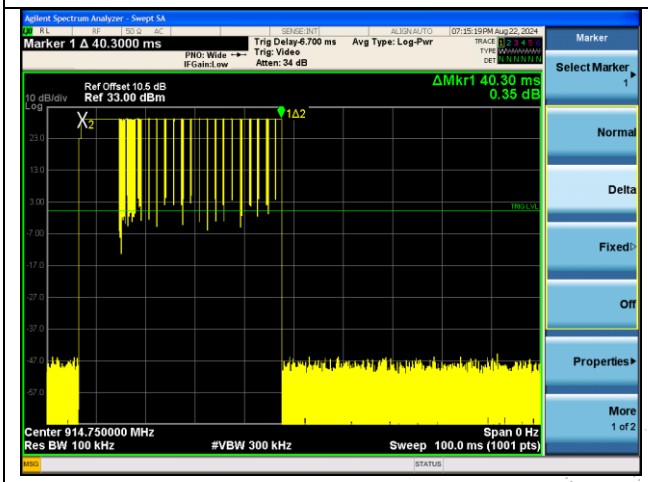
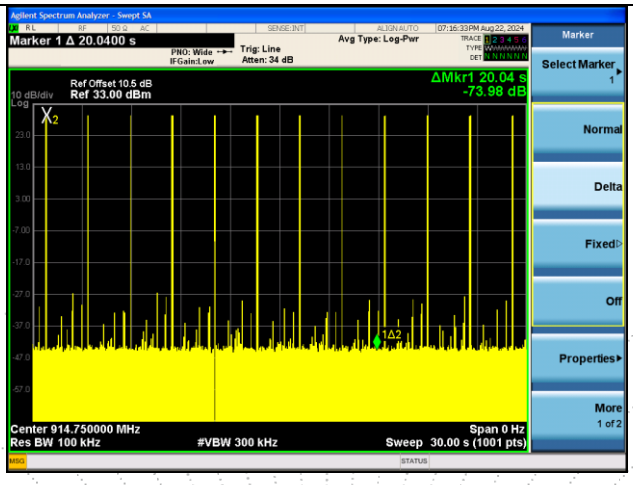
Antenna 2

Length (Hopping Mode)	Period (Hopping Mode)
	

Antenna 3

Length (Hopping Mode)	Period (Hopping Mode)
	

Antenna 4

Length (Hopping Mode)	Period (Hopping Mode)
	

15. Antenna Requirement

15.1 Limit

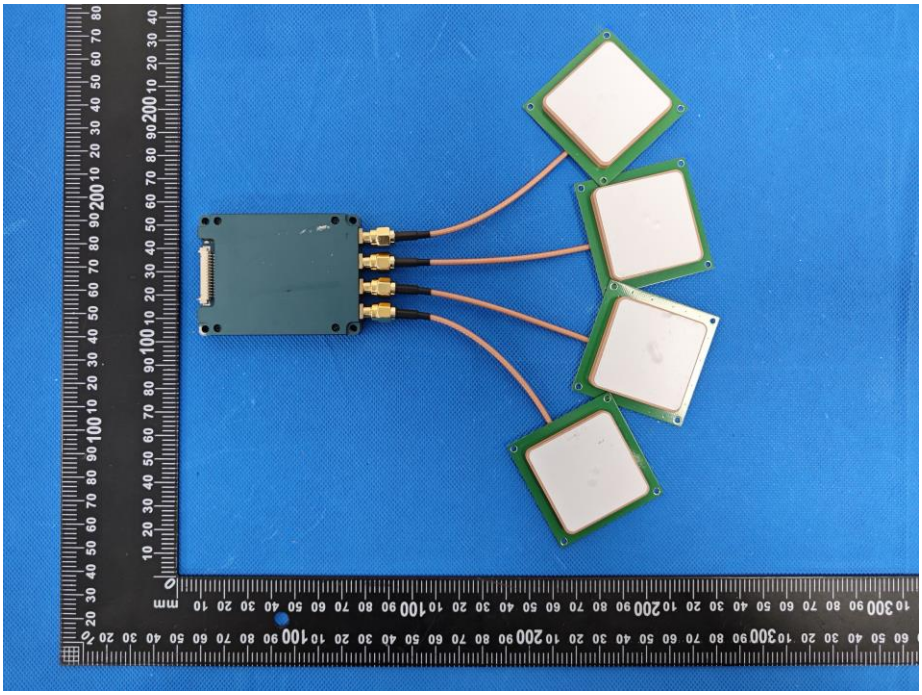
15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

15.2 Test Result

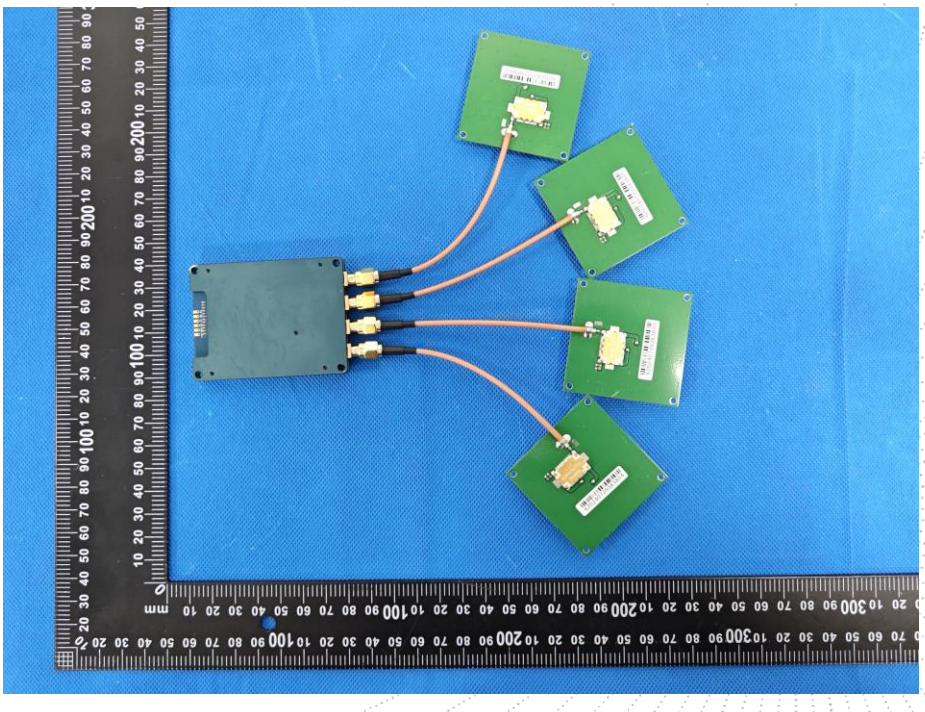
The EUT antenna is External antenna, antenna gain is 3.65dBi, antenna connector type is RP-SMA, fulfill the requirement of this section.

16. EUT Photographs

EUT Photo 1



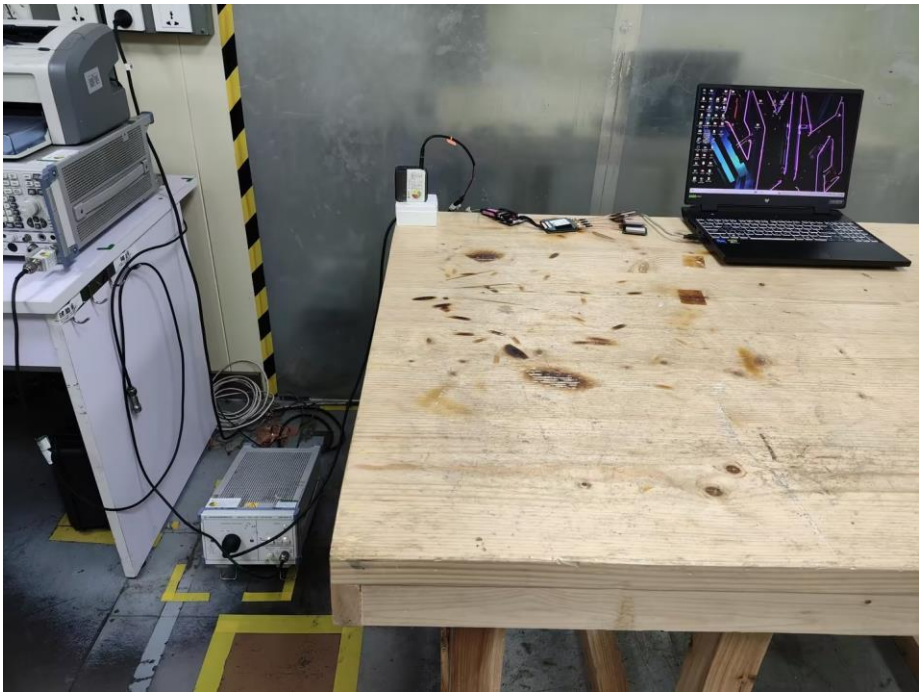
EUT Photo 2



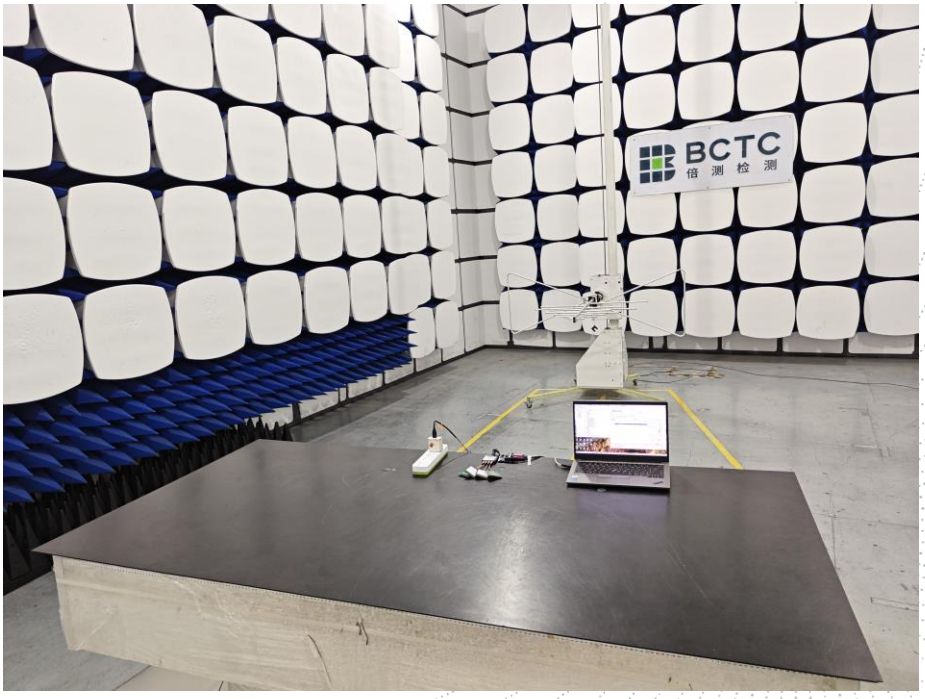
Appendix-Photographs Of EUT Constructional Details

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

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