



3.7. TIME OF OCCUPANCY (DWELL TIME)

Limit

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.

Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. Set center frequency of spectrum analyzer=operating frequency with 1MHz RBW and 3MHz VBW, Span 0Hz.

Test Configuration



Test Results

Modulation	Packet	Pulse time (ms)	Dwell time (second)	Limit (second)	Result
GFSK	DH1	0.40	0.128	0.40	PASS
	DH3	1.68	0.269		
	DH5	2.93	0.313		
π/4DQPSK	2-DH1	0.41	0.131	0.40	PASS
	2-DH3	1.68	0.269		
	2-DH5	2.92	0.311		
8DPSK	3-DH1	0.41	0.131	0.40	PASS
	3-DH3	1.68	0.269		
	3-DH5	2.93	0.313		

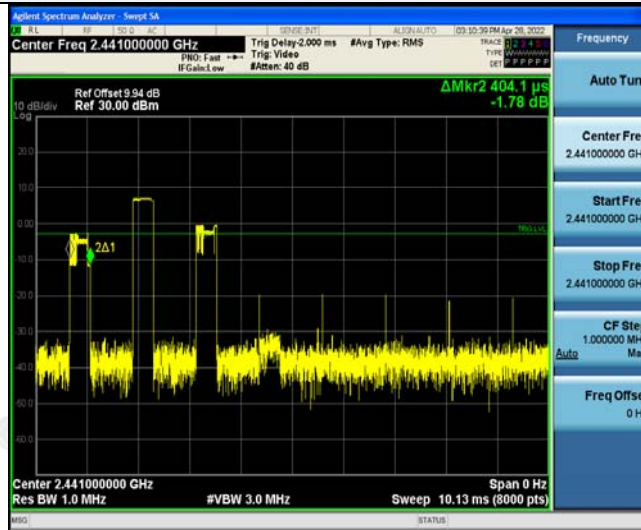
Note:

- We have tested all mode at high, middle and low channel, and recorded worst case at middle channel.
- $\text{Dwell time} = \text{Pulse time (ms)} \times (1600 \div 2 \div 79) \times 31.6$ Second for DH1, 2-DH1, 3-DH1
 $\text{Dwell time} = \text{Pulse time (ms)} \times (1600 \div 4 \div 79) \times 31.6$ Second for DH3, 2-DH3, 3-DH3
 $\text{Dwell time} = \text{Pulse time (ms)} \times (1600 \div 6 \div 79) \times 31.6$ Second for DH5, 2-DH5, 3-DH5

Test plot as follows:



GFSK Modulation



DH1

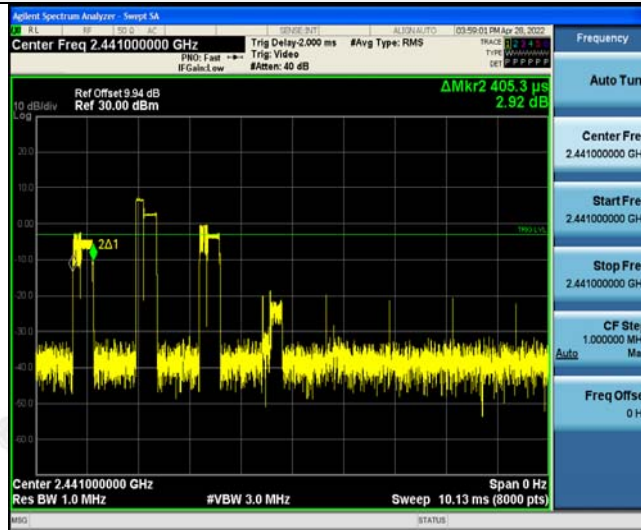


DH3



DH5

$\pi/4$ DQPSK Modulation



2-DH1



2-DH3



2-DH5

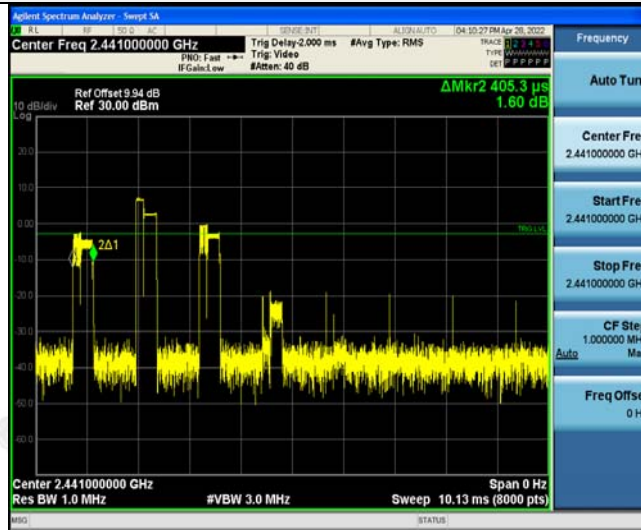
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8DPSK Modulation



3-DH1



3-DH3



3-DH5



3.8. OUT-OF-BAND EMISSIONS

Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under Section 5.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

Test Procedure

Connect the transmitter output to spectrum analyzer using a low loss RF cable, and set the spectrum analyzer to RBW=100 kHz, VBW= 300 kHz, peak detector, and max hold. Measurements utilizing these settings are made of the in-band reference level, band edge and out-of-band emissions.

Test Configuration



Test Results

Remark: The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the spurious emissions and band edge measurement data.

We measured all conditions (DH1, DH3, DH5) and recorded worst case at DH5, 2DH5 and 3DH5.

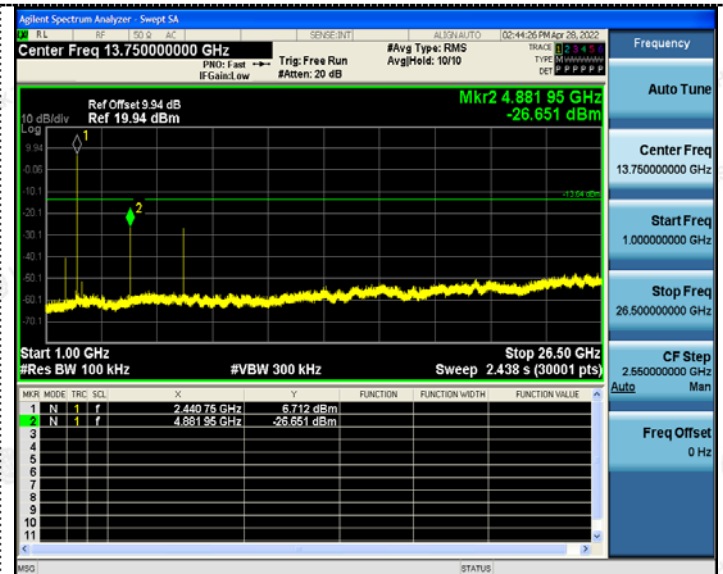
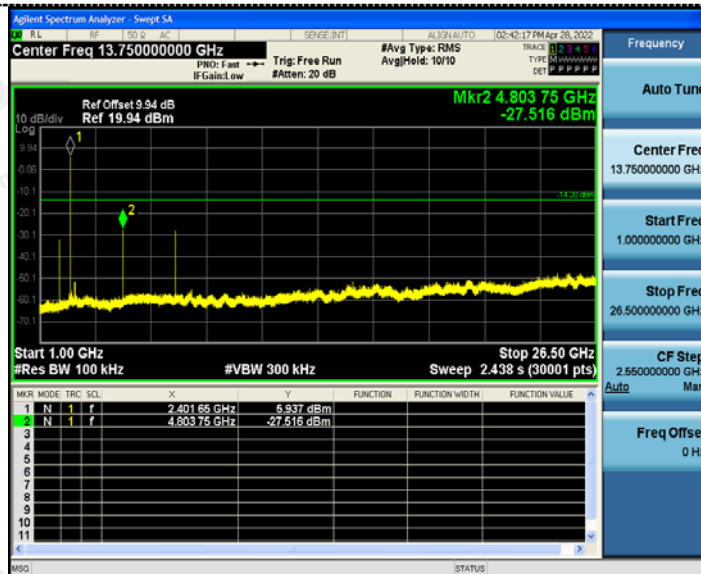
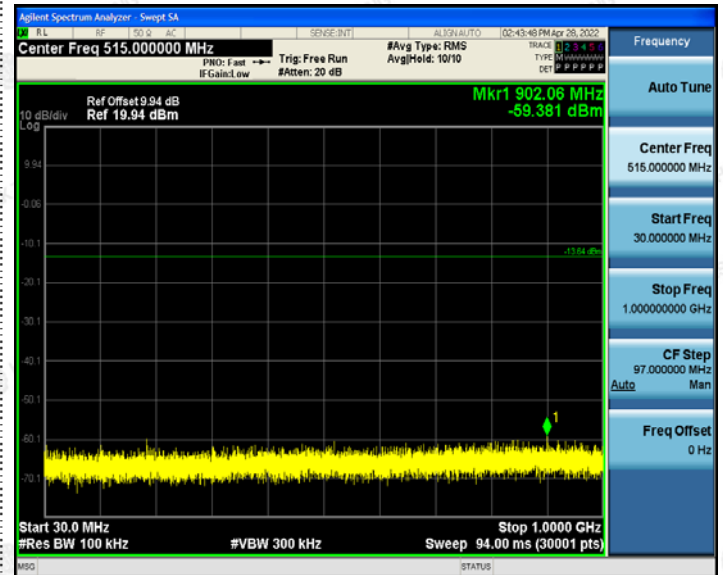
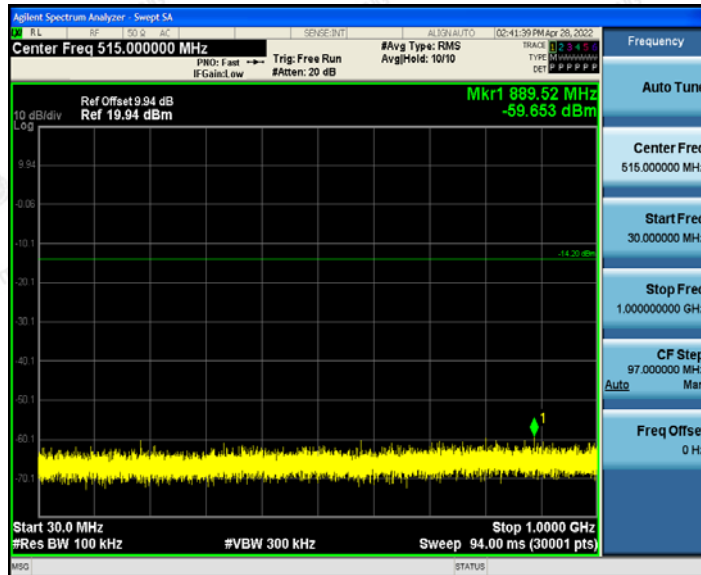
Test plot as follows:



GFSK

CH00

CH39



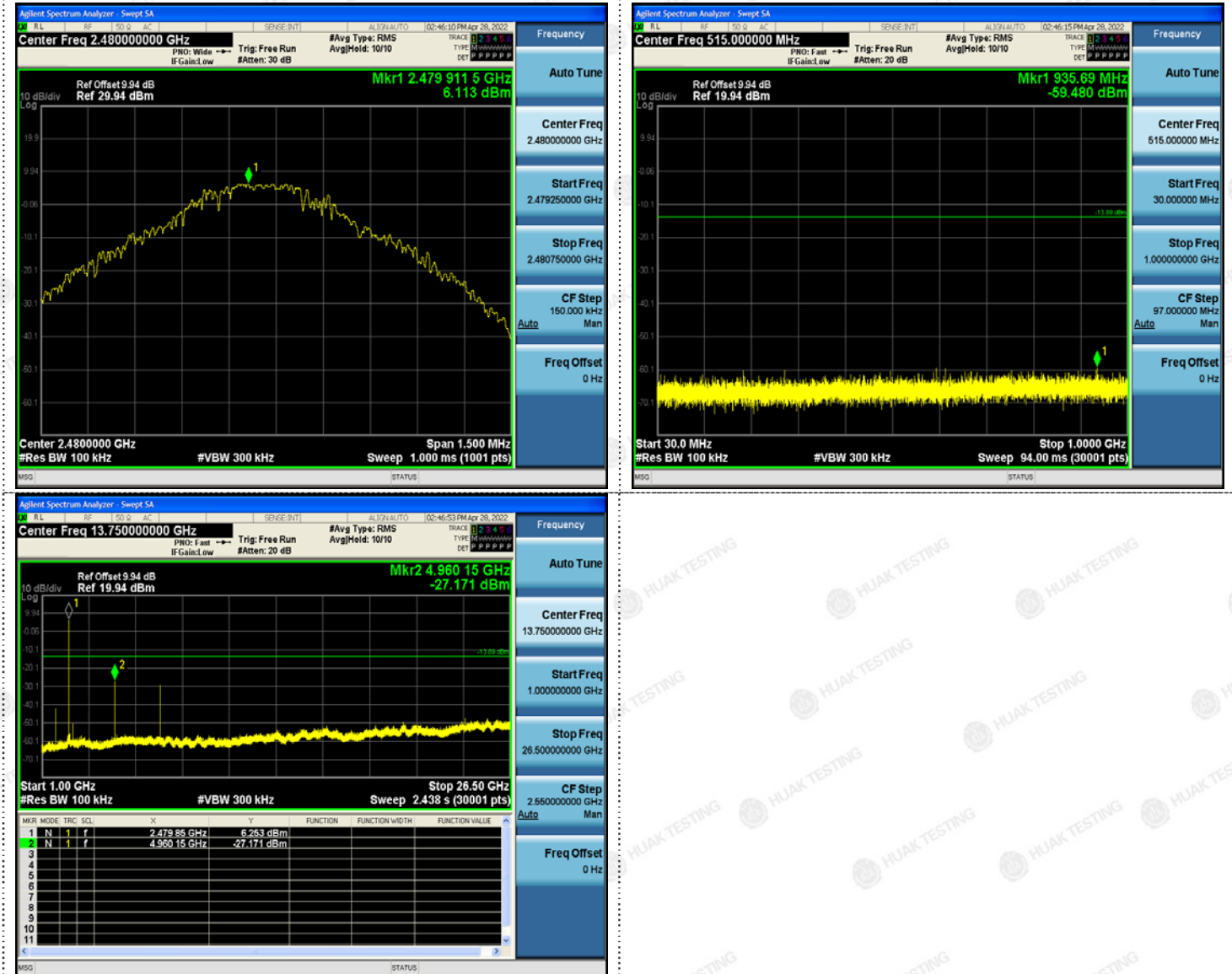
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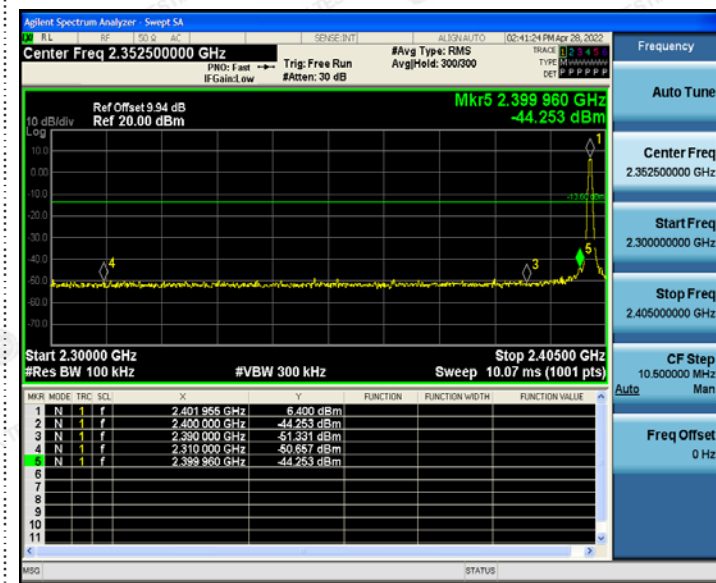
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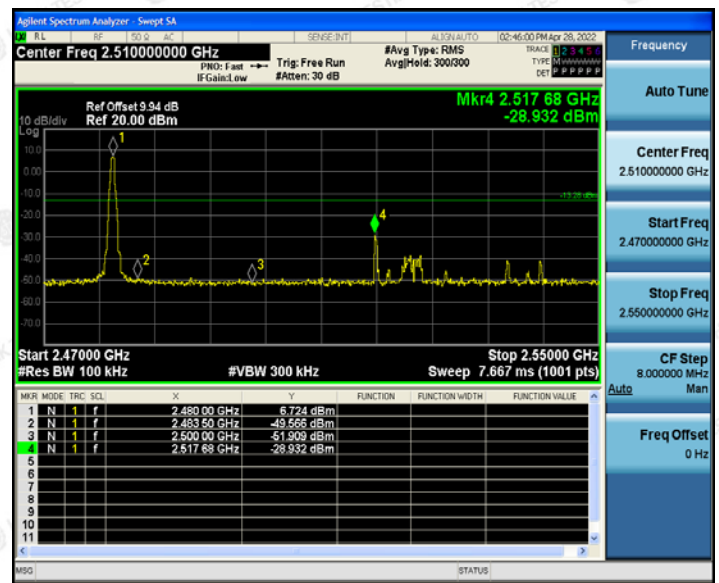


CH78

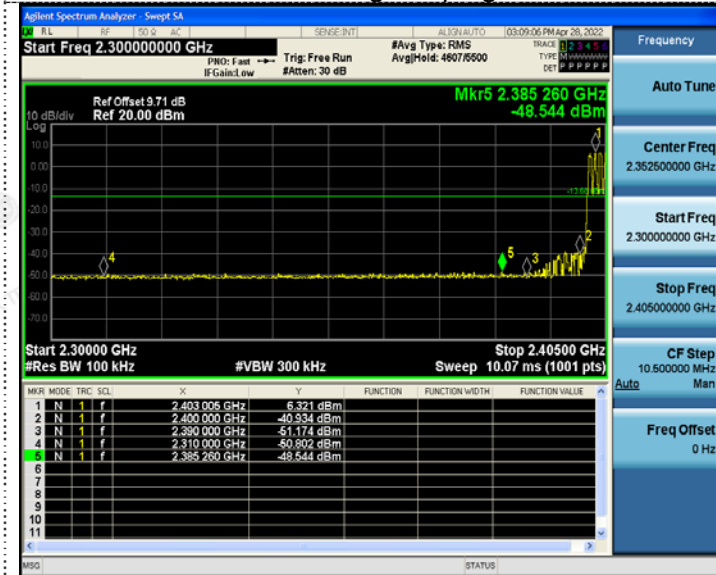




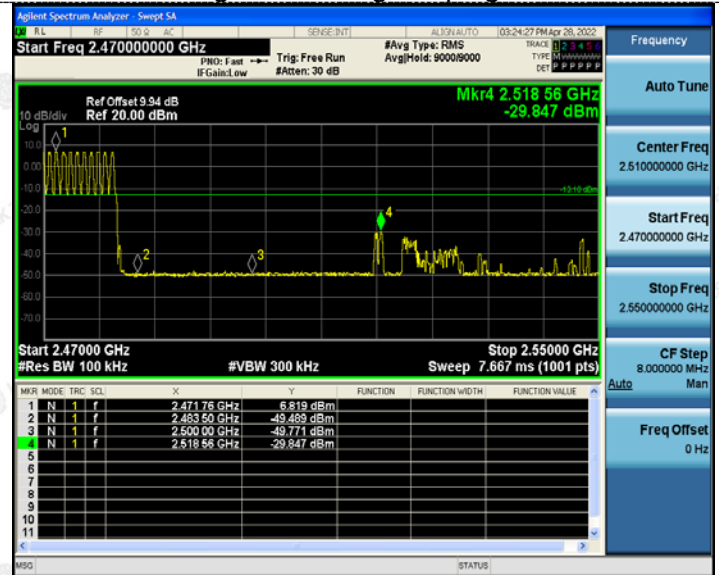
Left Band edge hopping off



Right Band edge hopping off



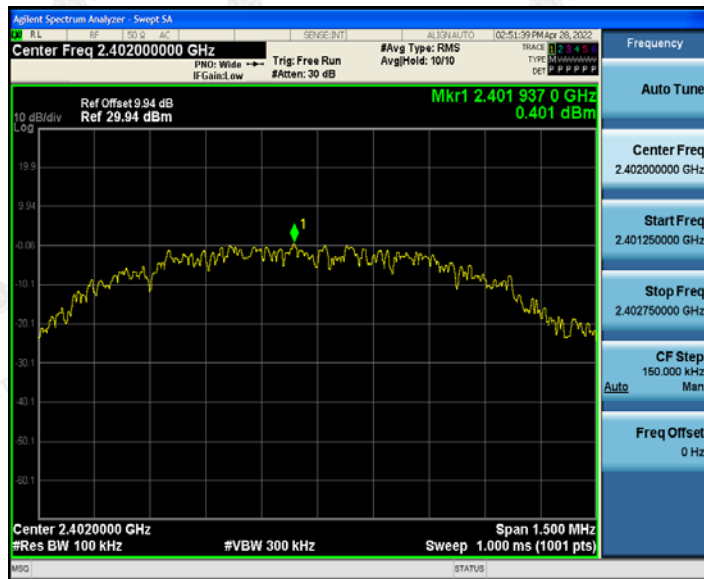
Left Band edge hopping on



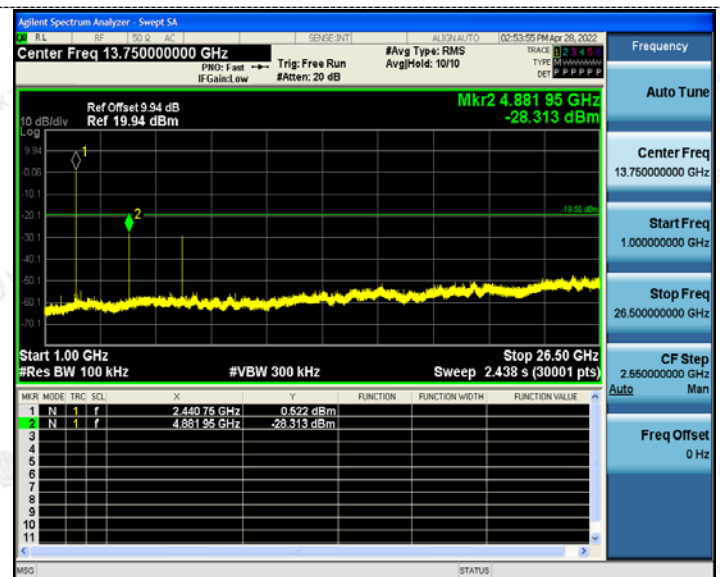
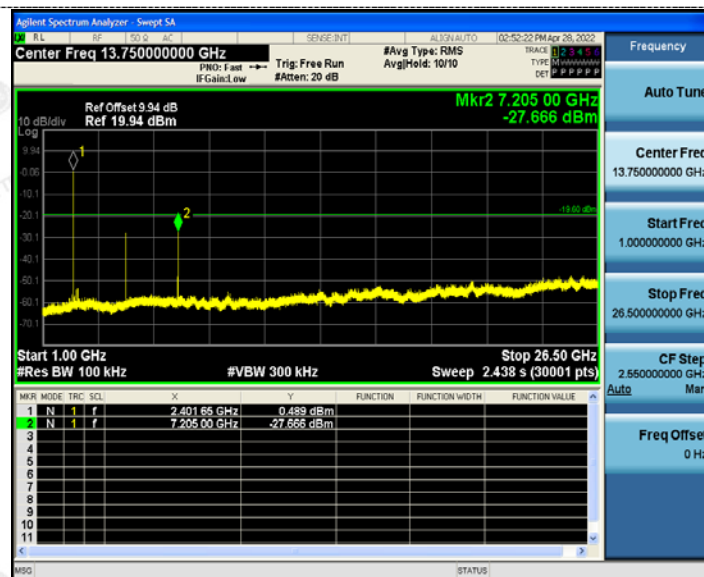
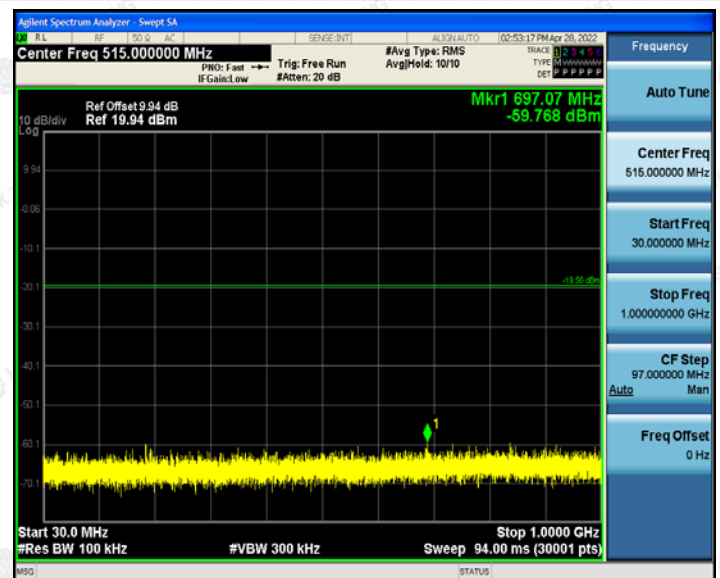
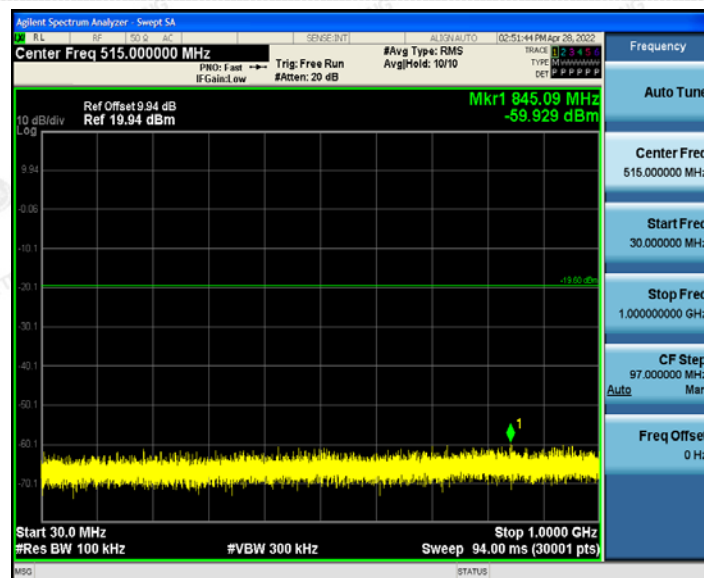
Right Band edge hopping on

 $\pi/4$ DQPSK

CH00



CH39



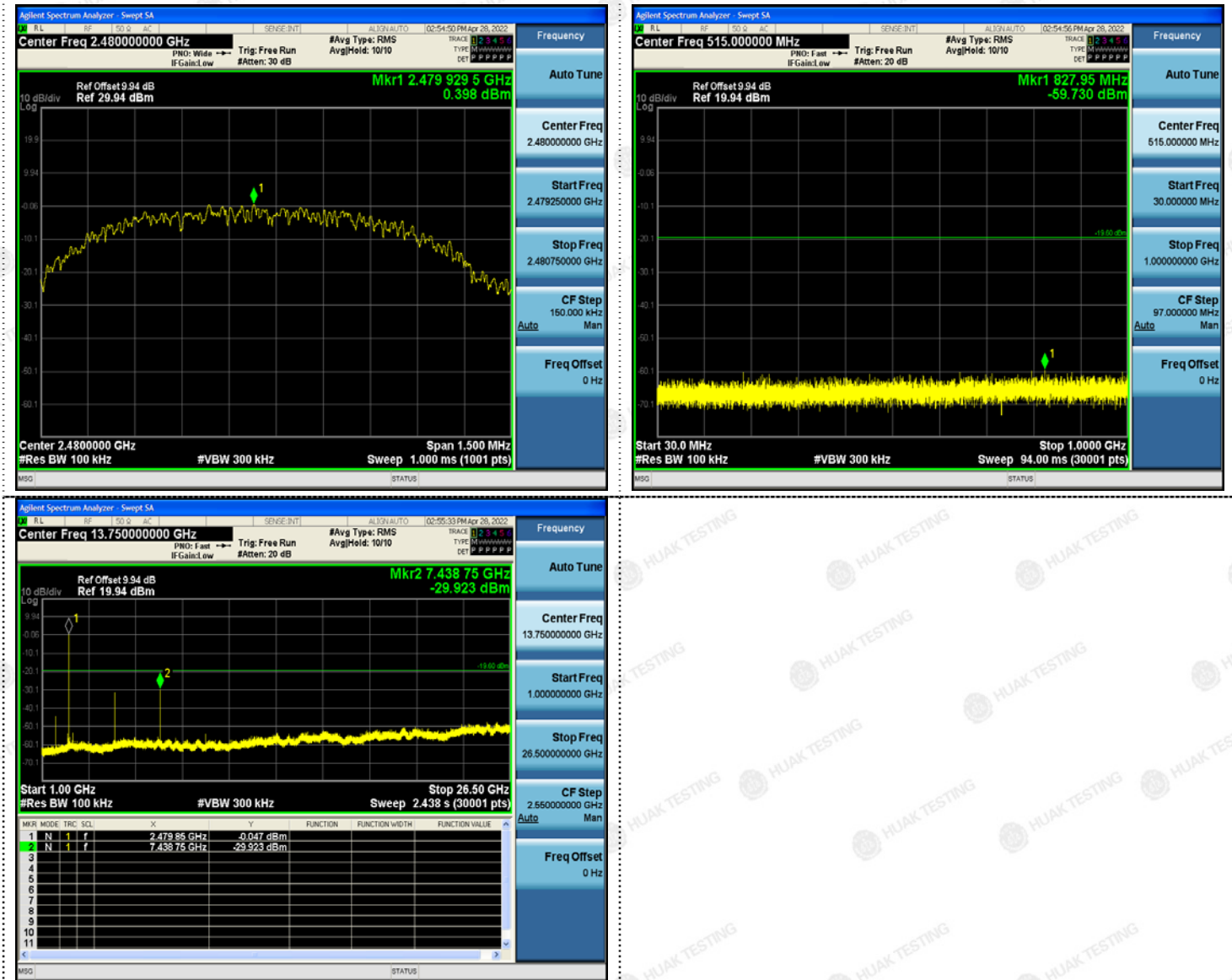
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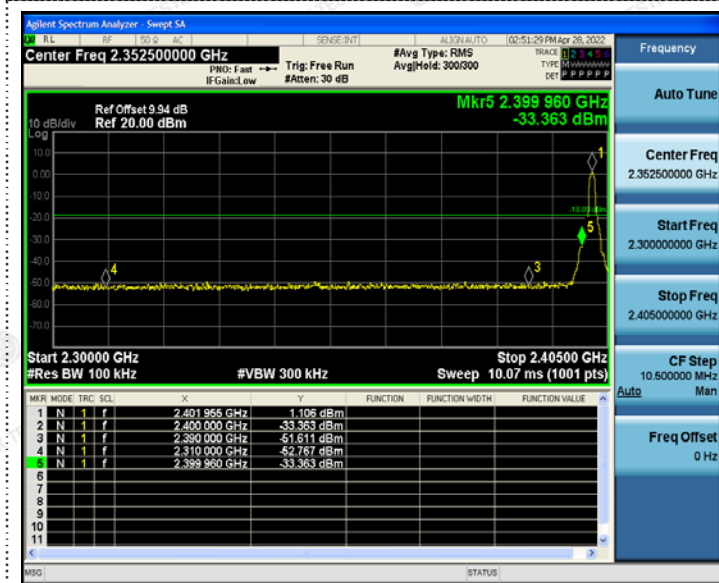
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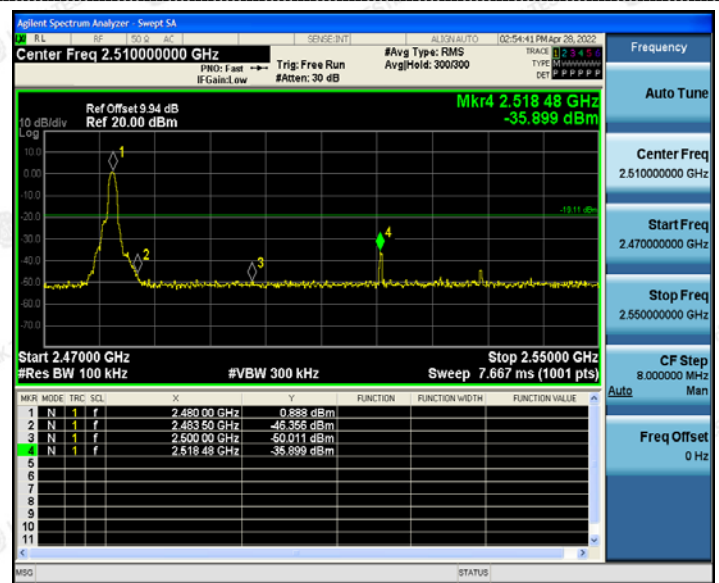


CH78

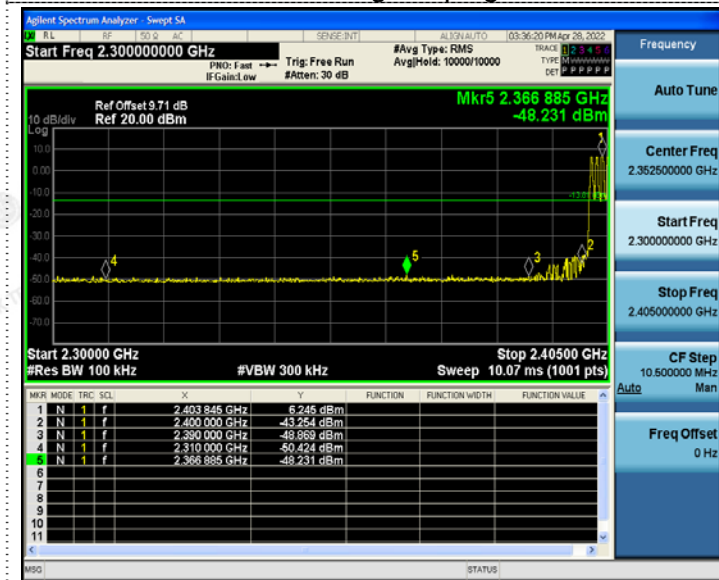




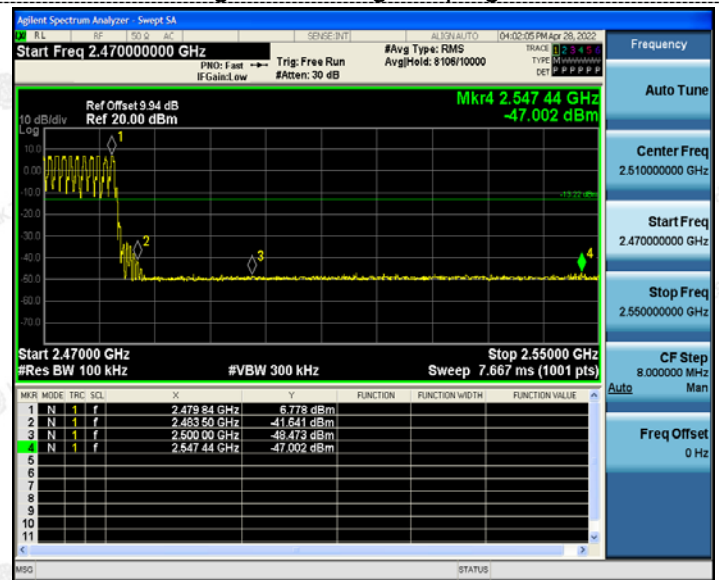
Left Band edge hopping off



Right Band edge hopping off



Left Band edge hopping on



Right Band edge hopping on

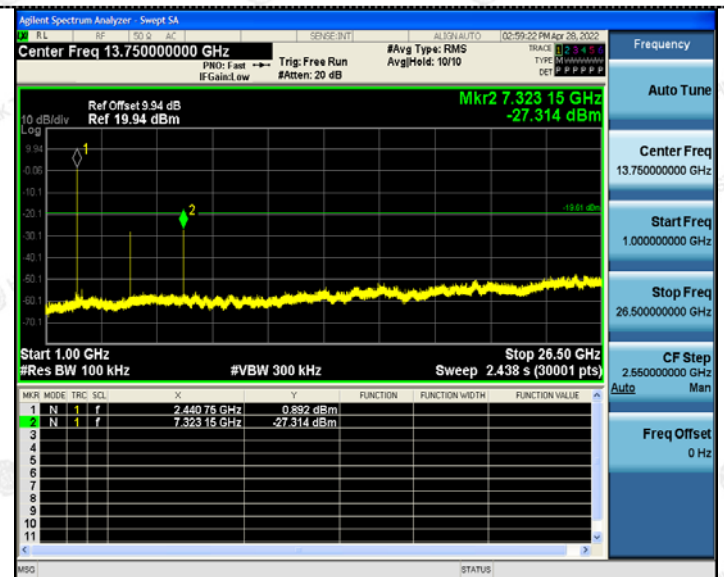
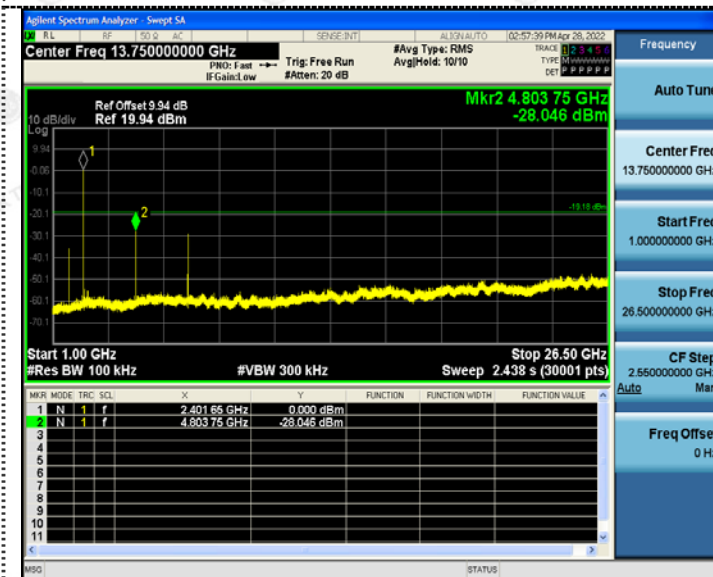
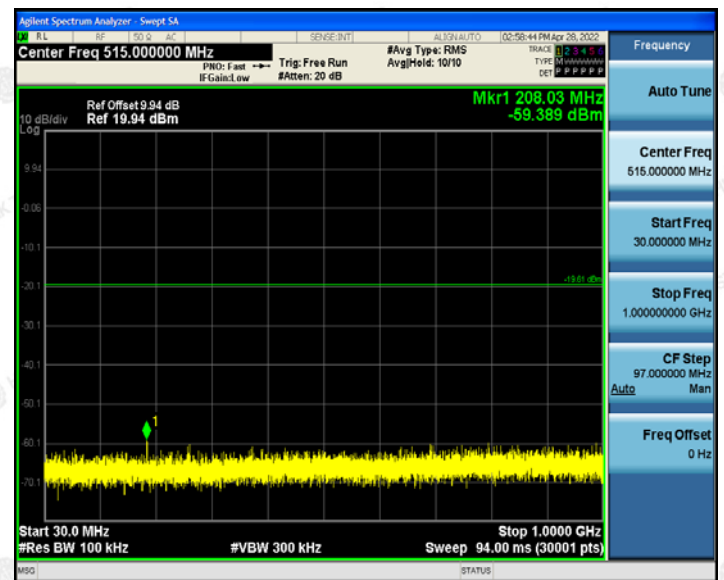
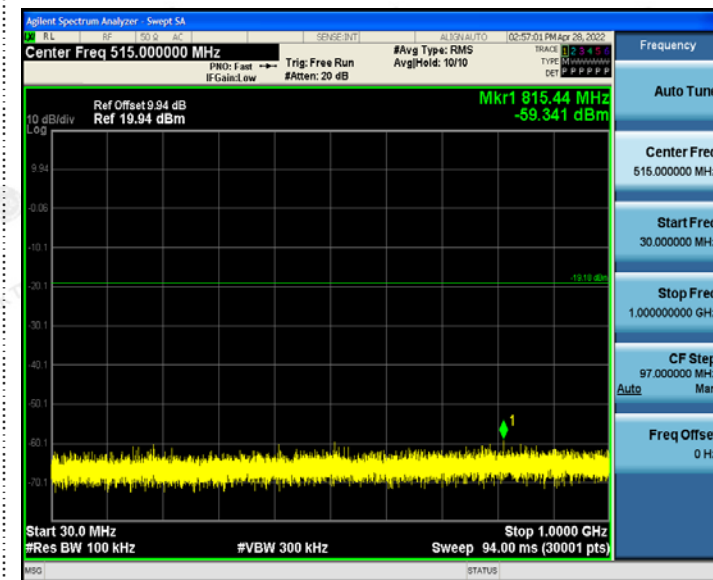
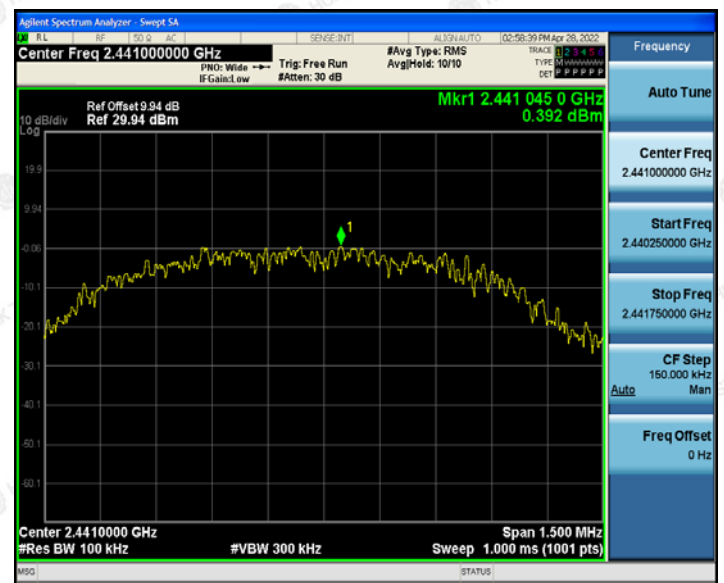


8DPSK

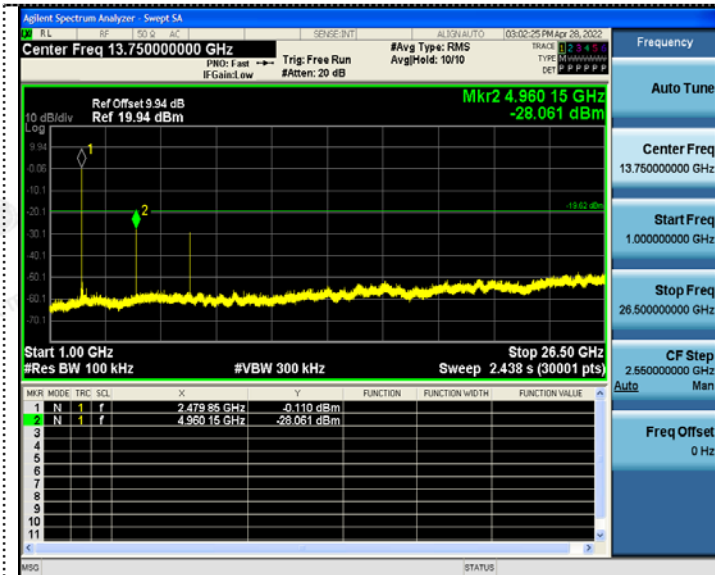
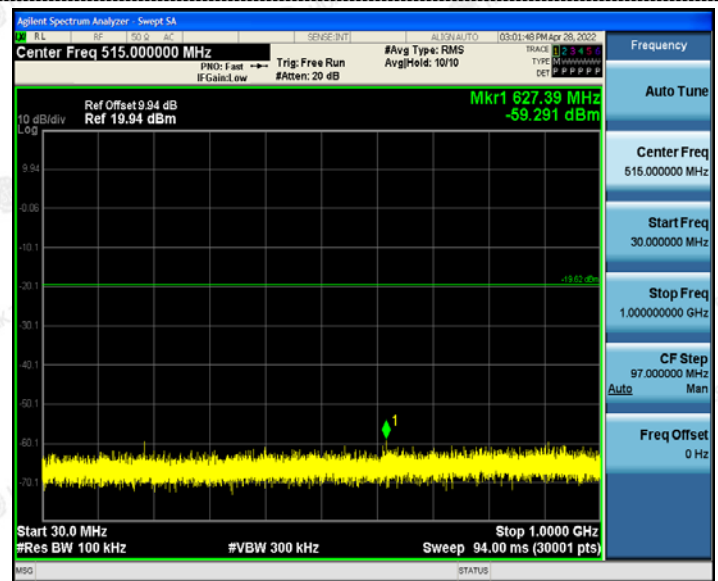
CH00



CH39



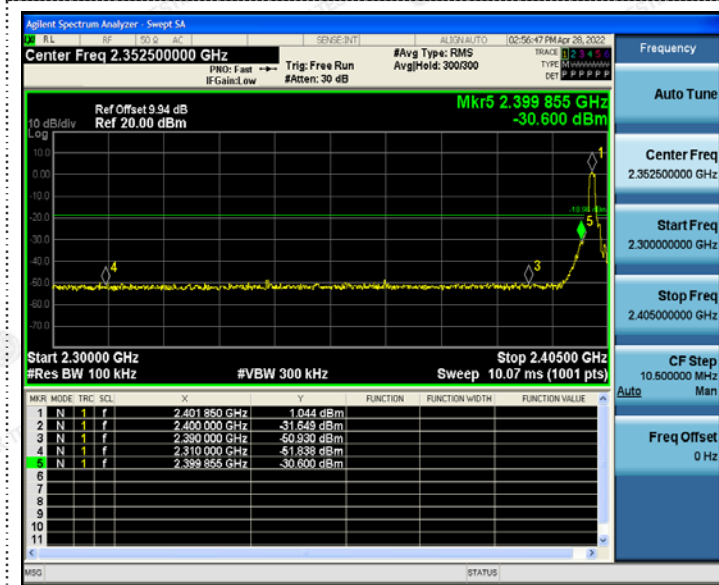
CH78



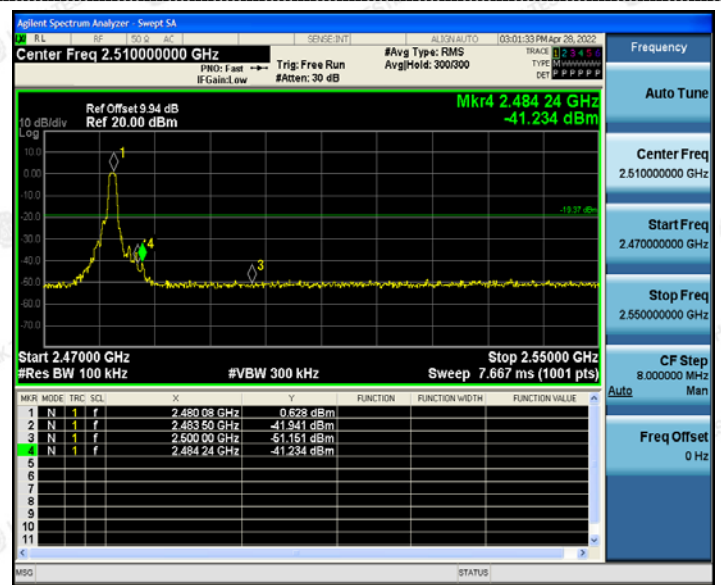
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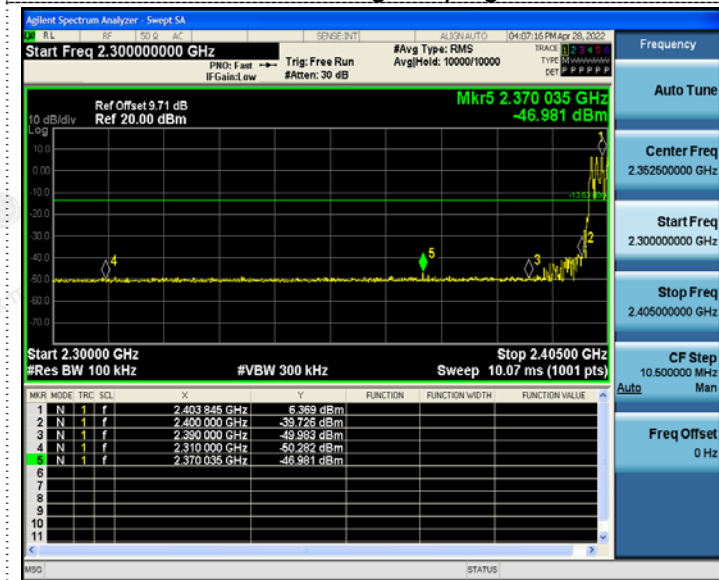
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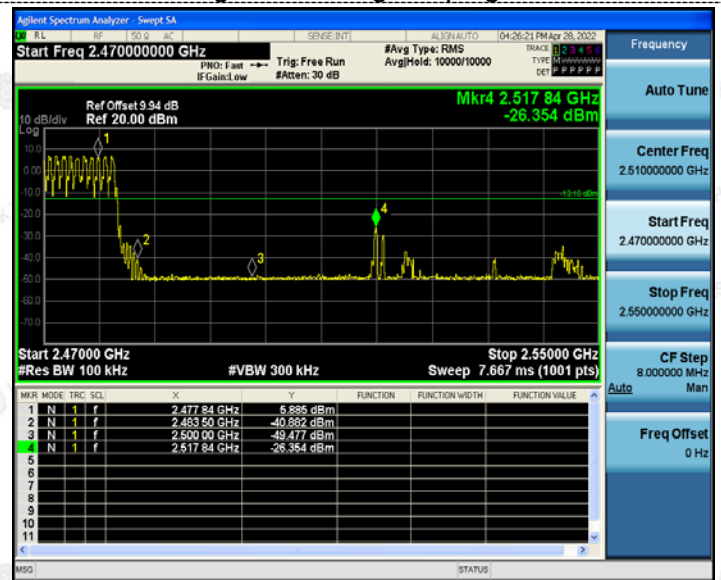
Left Band edge hopping off



Right Band edge hopping off



Left Band edge hopping on



Right Band edge hopping on



3.10. ANTENNA REQUIREMENT

Standard Applicable

For intentional device, according to FCC 47 CFR Section 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. And according to FCC 47 CFR Section 15.247, if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

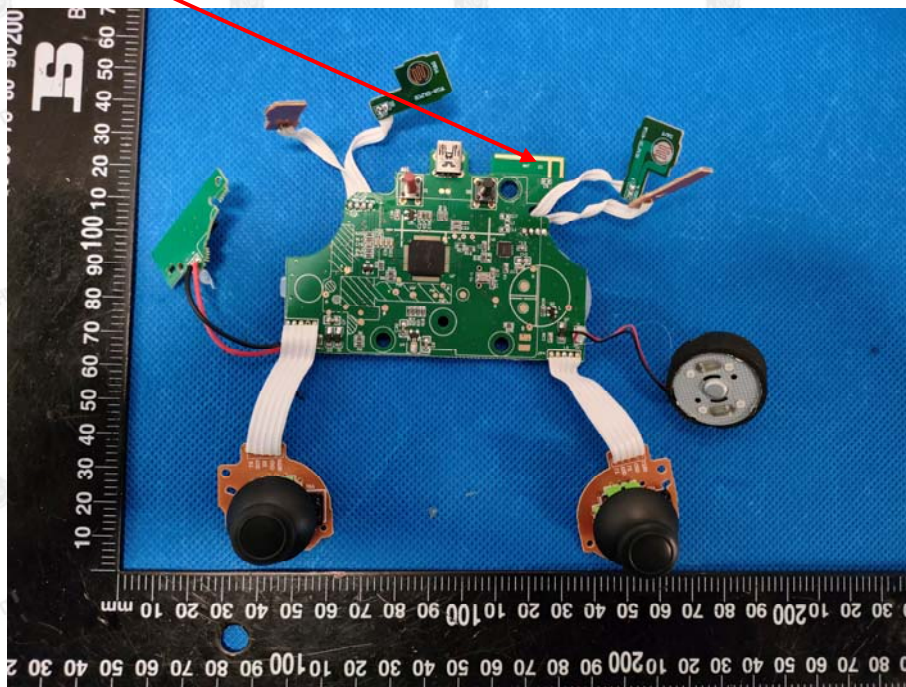
Refer to statement below for compliance.

The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

Antenna Connected Construction

The antenna used in this product is a PCB Antenna, which permanently attached. It conforms to the standard requirements. The directional gains of antenna used for transmitting is 2.64dBi.

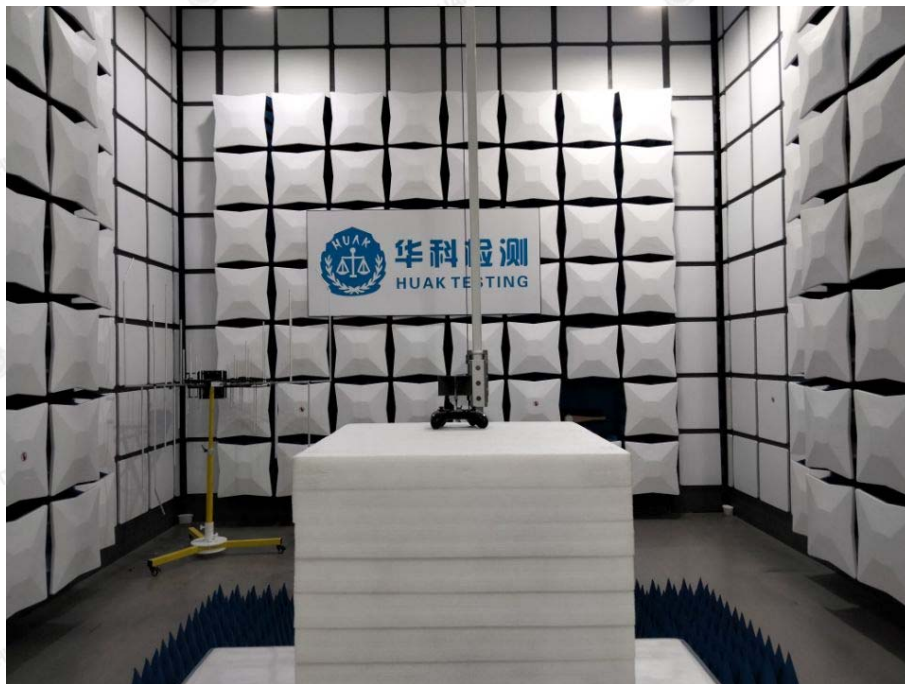
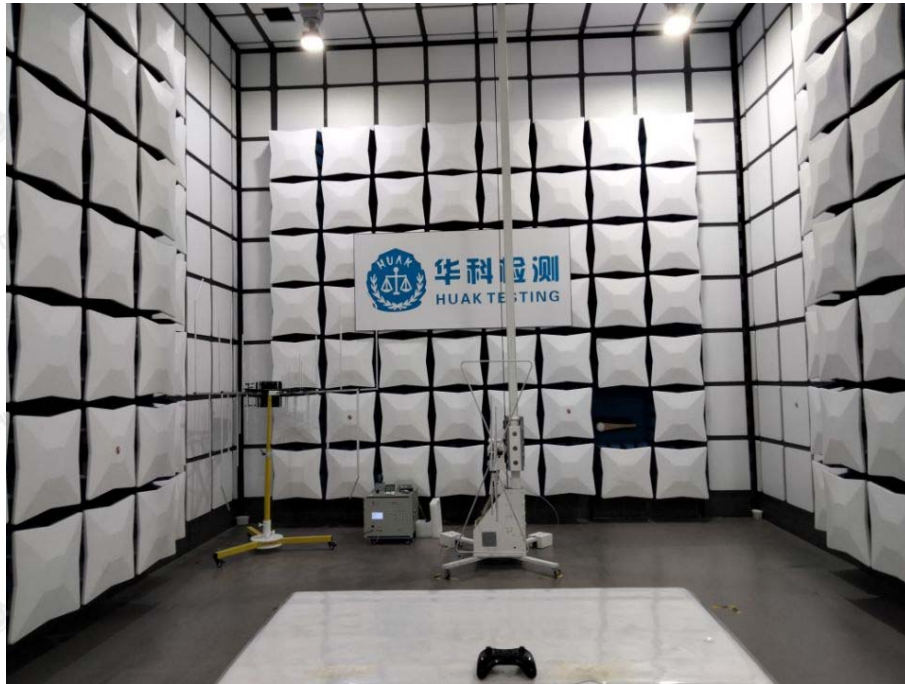
ANTENNA





4. TEST SETUP PHOTOS OF THE EUT

Radiated Emissions





Conducted Emission





5. PHOTOS OF THE EUT

Reference to the report: ANNEX A of external photos and ANNEX B of internal photos.

-----End of test report-----