

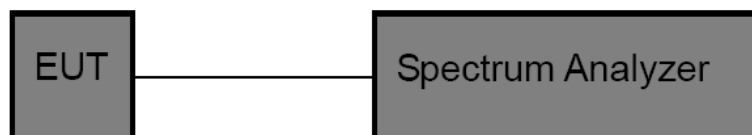


3.5. 20dB Bandwidth

Limit

N/A

Test Configuration



Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
2. OCB and 20dB Spectrum Setting:
 - (1) Set RBW = 1% ~ 5% occupied bandwidth.
 - (2) Set the video bandwidth (VBW) ≥ 3 RBW.
 - (3) Detector = Peak.
 - (4) Trace mode = Max hold.
 - (5) Sweep = Auto couple.

Note: The EUT was set to continuously transmitting in each mode and low, Middle and high channel for the test.

Test Mode

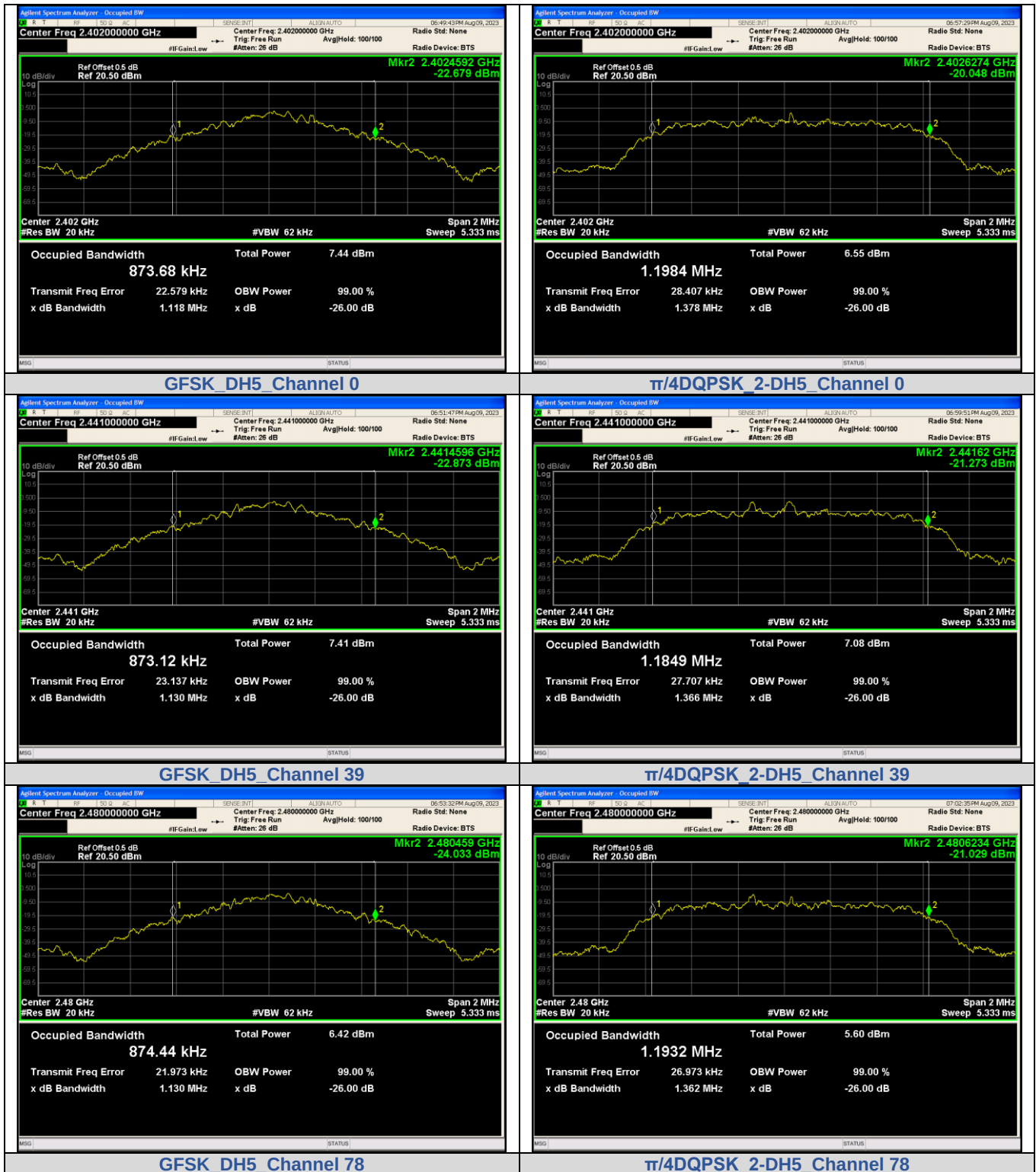
Please refer to the clause 2.4.

Test Result

Modulation	Channel	99% Bandwidth (MHz)	20 dB Bandwidth (MHz)	20dB Bandwidth *2/3 (MHz)
GFSK	0	0.87368	0.9668	0.645
	39	0.87312	0.9566	0.638
	78	0.87444	0.9578	0.639
$\pi/4$ DQPSK	0	1.1984	1.280	0.853
	39	1.1849	1.283	0.855
	78	1.1932	1.283	0.855
8DPSK	0	1.1921	1.297	0.865
	39	1.1988	1.302	0.868
	78	1.1961	1.296	0.864



99% Bandwidth:



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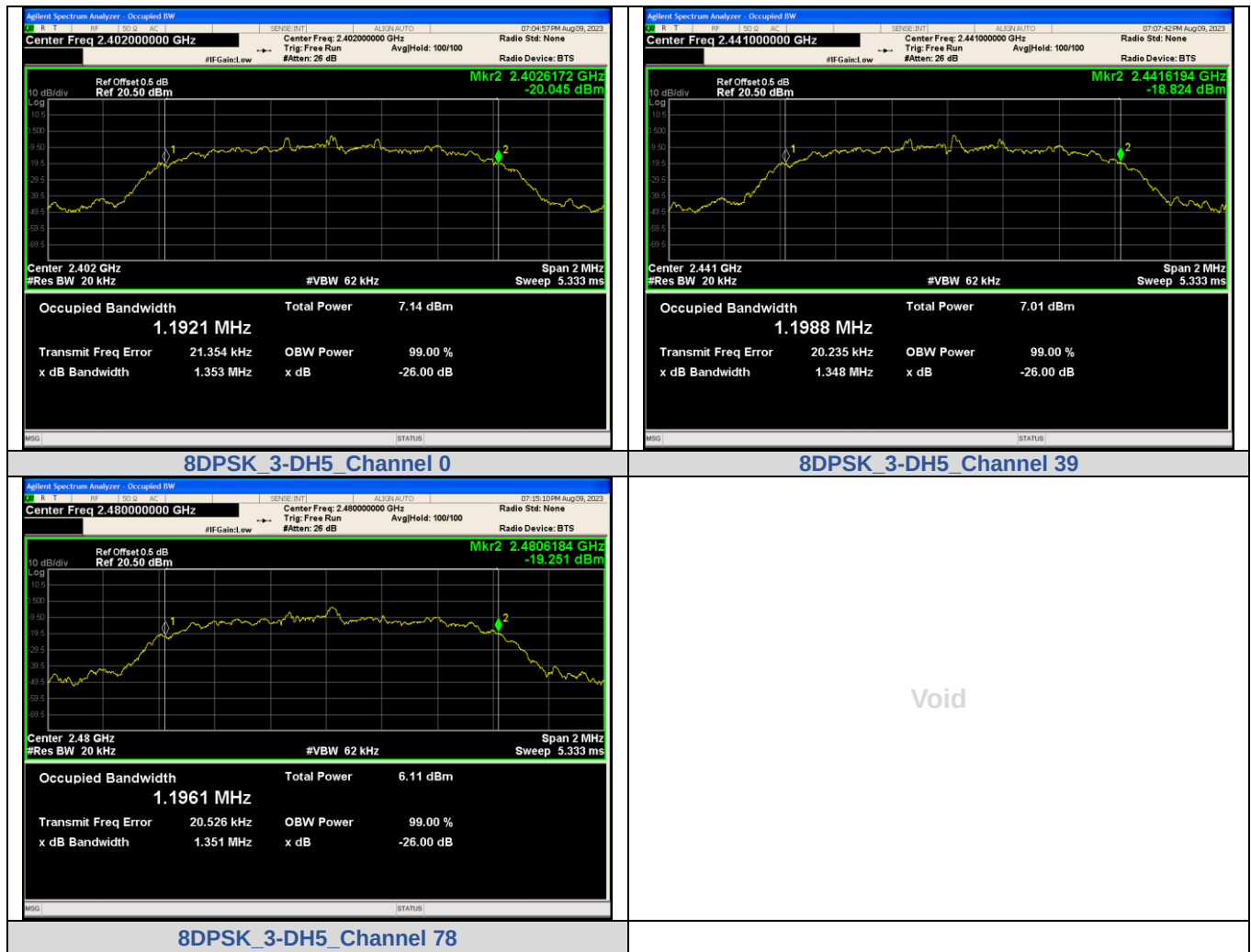
2/F., Building 1 and 1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Longhua District, Shenzhen, Guangdong, China

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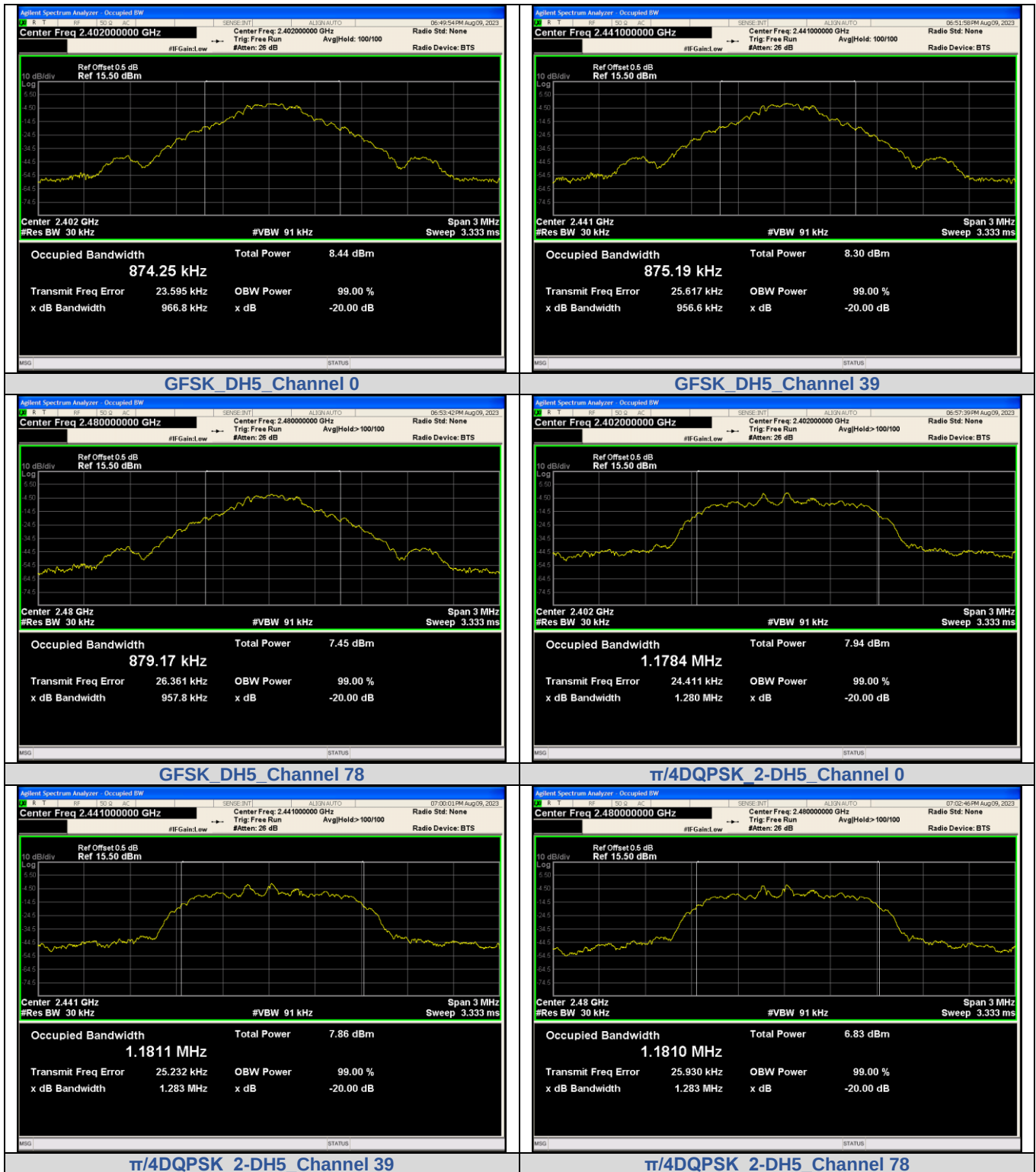
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20dB Bandwidth:



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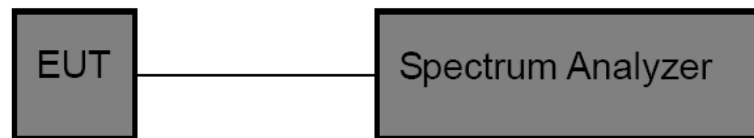
3.6. Channel Separation

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (a)(1) / RSS-247 5.1 b

Test Item	Limit	Frequency Range (MHz)
Channel Separation	>25kHz or >two-thirds of the 20 dB bandwidth Which is greater	2400~2483.5

Test Configuration



Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
2. Spectrum Setting:
 - (1) Set RBW = 100 kHz.
 - (2) Set the video bandwidth (VBW) ≥ 3 RBW.
 - (3) Detector = Peak.
 - (4) Trace mode = Max hold.
 - (5) Sweep = Auto couple.

Test Mode

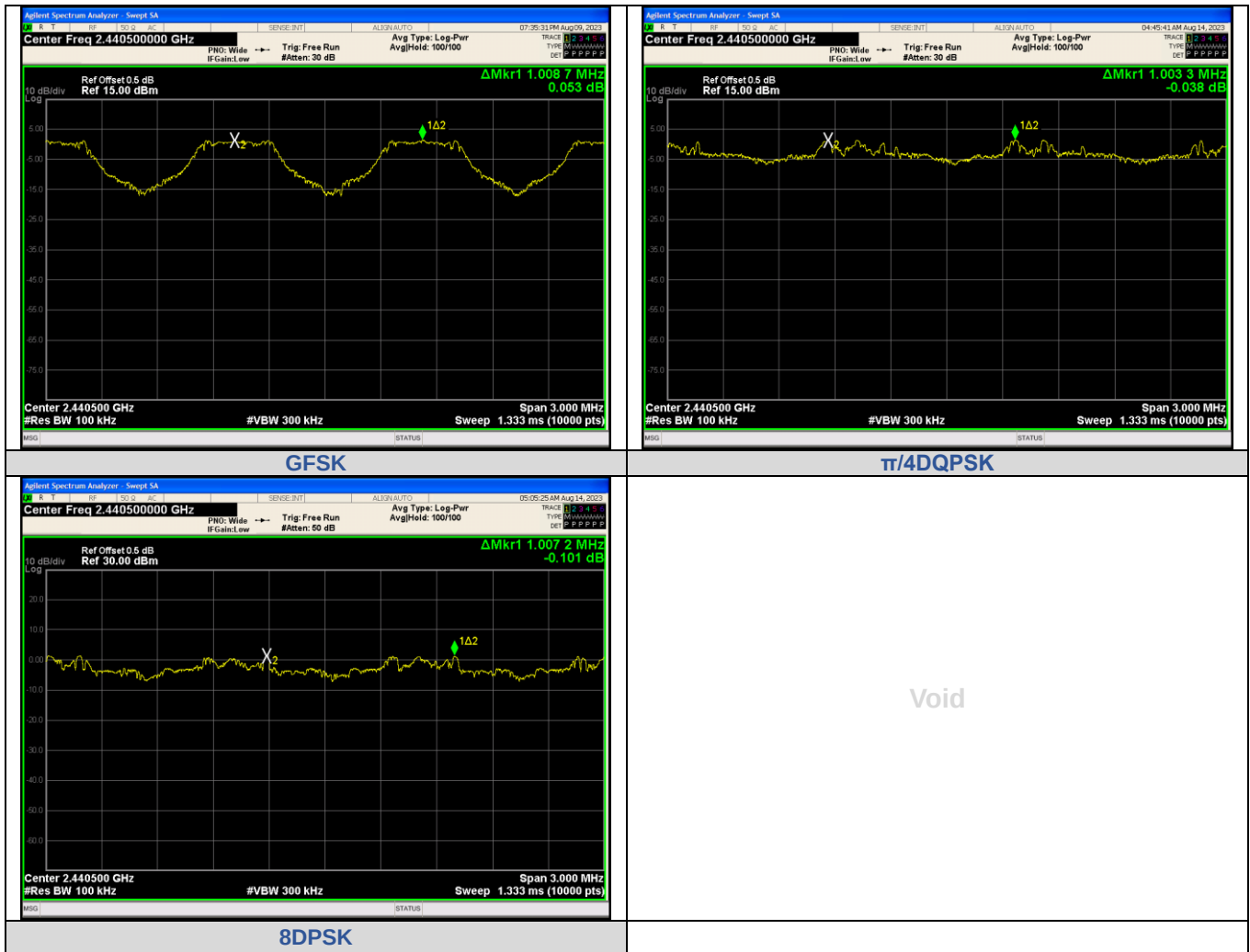
Please refer to the clause 2.4.

Test Result

Modulation	Packet	Left Center frequency (MHz)	Right Center frequency (MHz)	Hopping Frequency Separation (MHz)	Limit (MHz)	Result
GFSK	DH5	2440.0147	2441.0234	1.0087	0.638	PASS
$\pi/4$ DQPSK	2-DH5	2439.8635	2440.8668	1.0033	0.855	PASS
8DPSK	3-DH5	2440.1869	2441.1941	1.0072	0.868	PASS



Test plot as follows:



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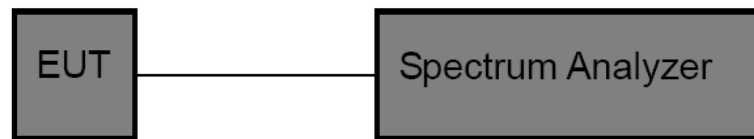
3.7. Number of Hopping Channel

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (a)(iii) / RSS-247 5.1 d

Section	Test Item	Limit
15.247 (a)(iii) RSS-247 5.1 d	Number of Hopping Channel	≥ 15

Test Configuration



Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
2. Spectrum Setting:
 - (1) Peak Detector: RBW=100 kHz, VBW $\geq$ RBW, Sweep time= Auto.

Test Mode

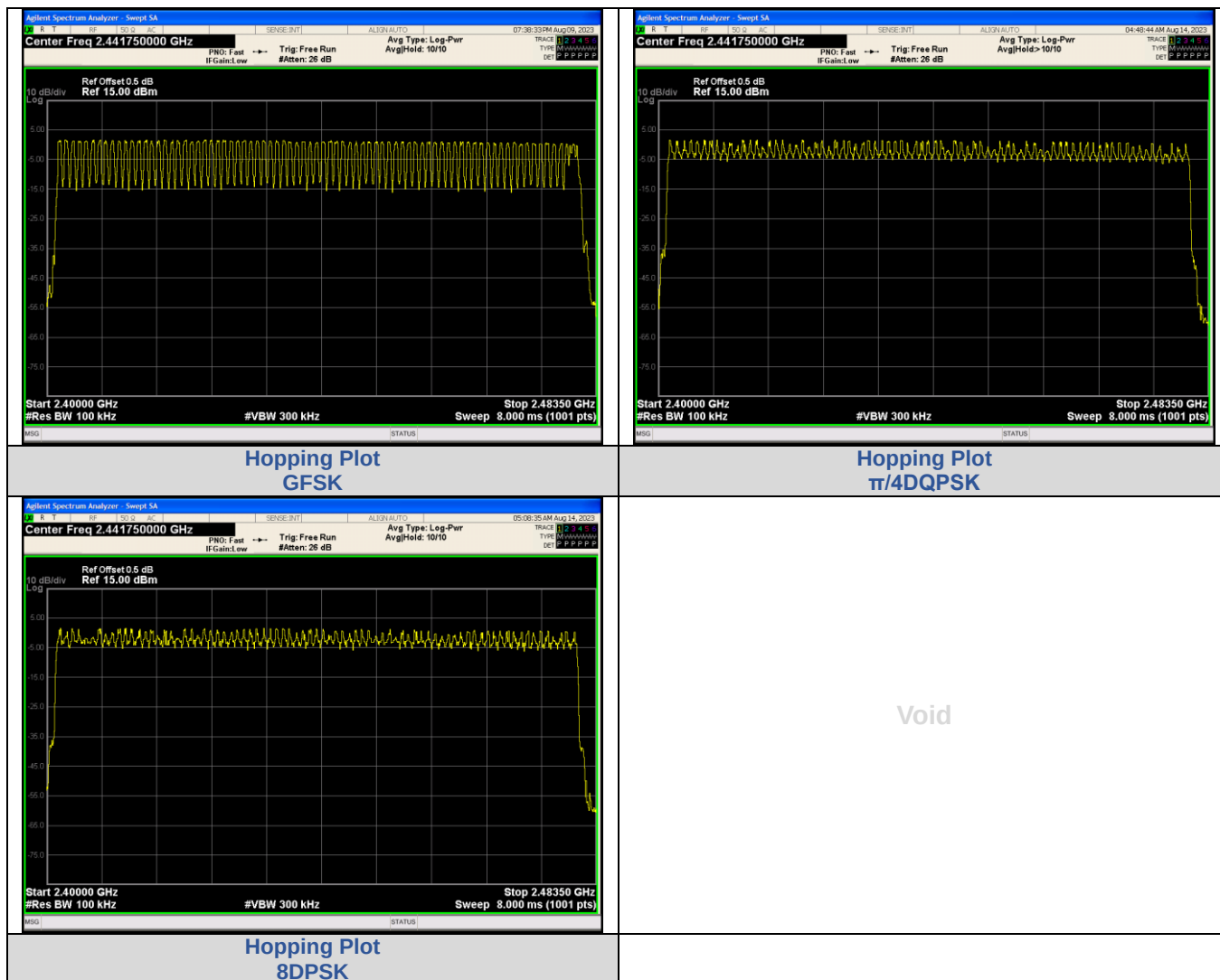
Please refer to the clause 2.4.

Test Result

Modulation	Packet	Number of Hopping Channel	Limit	Result
GFSK	DH5	79	15	PASS
$\pi/4$ DQPSK	2-DH5	79	15	PASS
8DPSK	3-DH5	79	15	PASS



Test plot as follows:





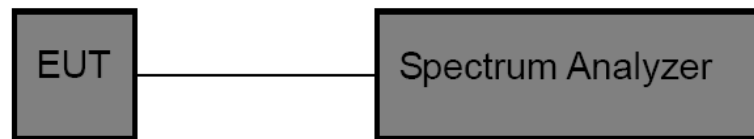
3.8. Dwell Time

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (a)(iii) / RSS-247 5.1 d

Section	Test Item	Limit
15.247 (a)(iii) RSS-247 5.1 d	Average Time of Occupancy	0.4 sec

Test Configuration



Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
2. Spectrum Setting:
 - (1) Spectrum Setting: RBW=1MHz, VBW $\geq$ RBW.
 - (2) Use video trigger with the trigger level set to enable triggering only on full pulses.
 - (3) Sweep Time is more than once pulse time.
 - (4) Set the center frequency on any frequency would be measure and set the frequency span to zero.
 - (5) Measure the maximum time duration of one single pulse.
 - (6) Set the EUT for packet transmitting.

Test Mode

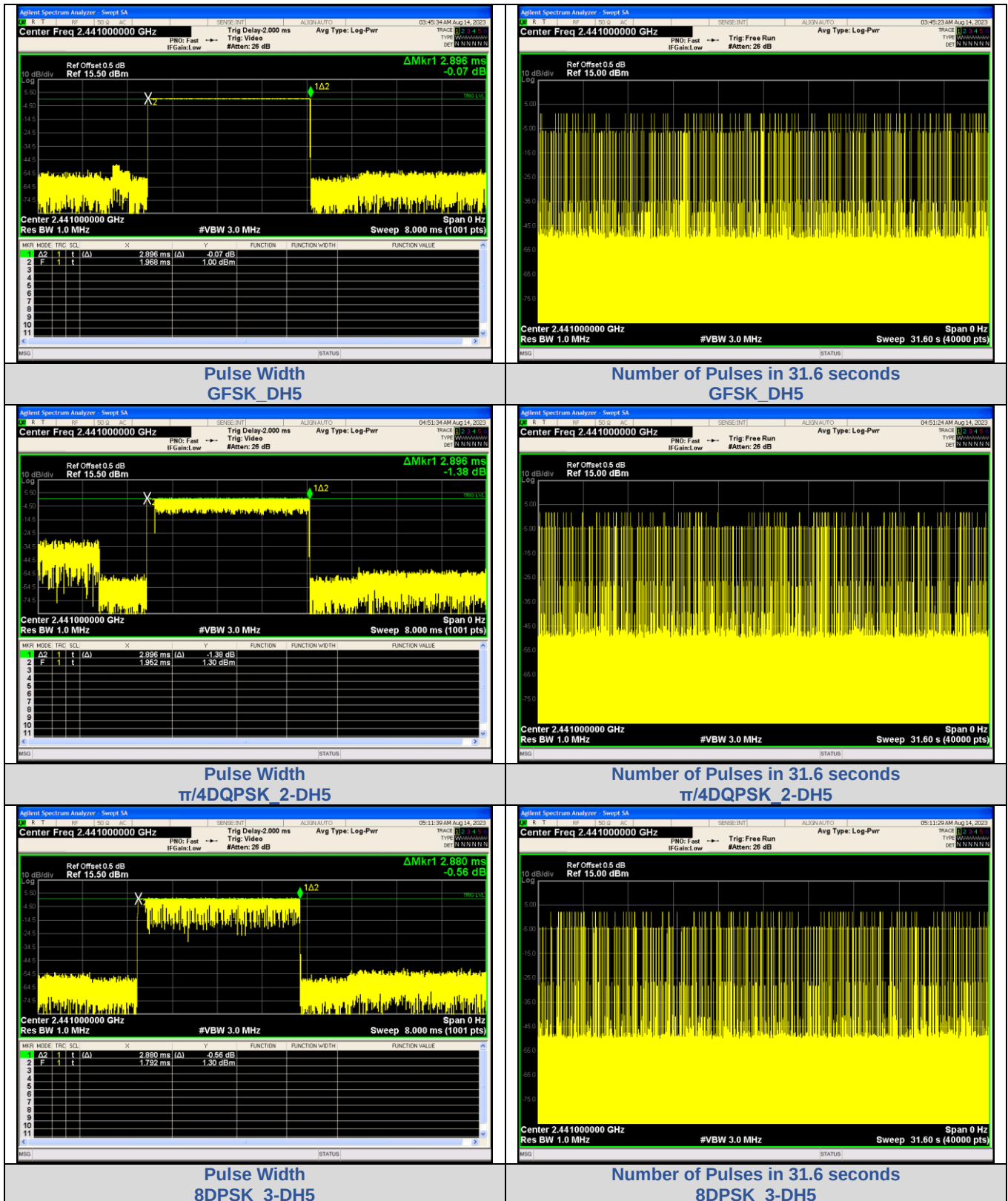
Please refer to the clause 2.4.

Test Result

Modulation	Packet	Channel	Pulse Width (ms)	Number of Pulses in 31.6 seconds	Dwell Time (ms)	Limit (ms)	Result
GFSK	DH5	CH39	2.896	110	318.56	< 400	PASS
$\pi/4$ DQPSK	2-DH5	CH39	2.896	108	312.77		PASS
8DPSK	3-DH5	CH39	2.880	114	328.32		PASS



Test plot as follows:



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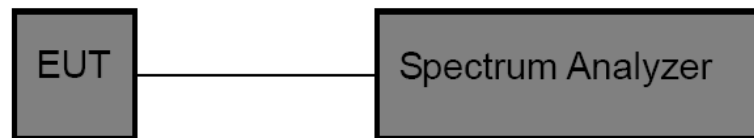
3.9. Peak Output Power

Limit

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (b)(1) / RSS-247 5.4 b

Section	Test Item	Limit	Frequency Range (MHz)
FCC CFR 47 Part 15.247 (b)(1)	Maximum Conducted Output Power	Hopping Channels ≥ 75 , Power $< 1\text{W}(30\text{dBm})$; Others $< 125\text{mW}(21\text{dBm})$	2400~2483.5
ISED RSS-247 5.4 b	EIRP	4 Watt or 36dBm	2400~2483.5

Test Configuration



Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
2. Spectrum Setting:
 - (1) Set RBW $> 20\text{dB}$ Bandwidth.
 - (2) Set VBW $\geq$ RBW.
 - (3) Detector = Peak.
 - (4) Trace mode = Max hold.
 - (5) Sweep = Auto couple.
 - (6) Span = Approximately five times the 20dB bandwidth, centered on a hopping channel.

Test Mode

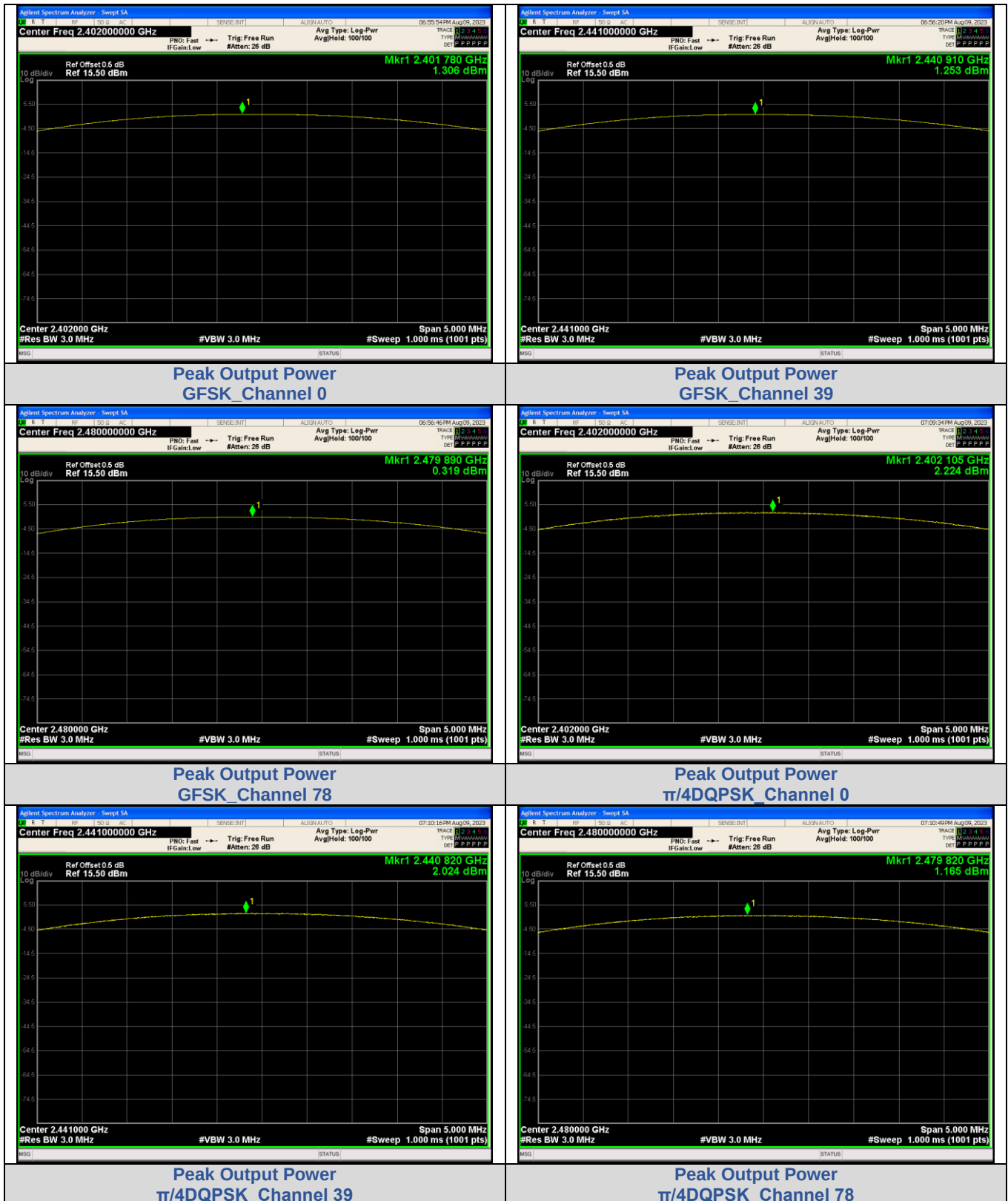
Please refer to the clause 2.4.

Test Result

Modulation	Packet Type	Channel	Peak Output Power (dBm)	Limit (dBm)	Result
GFSK	DH5	0	1.306	< 30	PASS
		39	1.253		PASS
		78	0.319		PASS
$\pi/4$ DQPSK	2-DH5	0	2.224		PASS
		39	2.024		PASS
		78	1.165		PASS
8DPSK	3-DH5	0	2.581		PASS
		39	2.397		PASS
		78	1.534		PASS



Test plot as follows:



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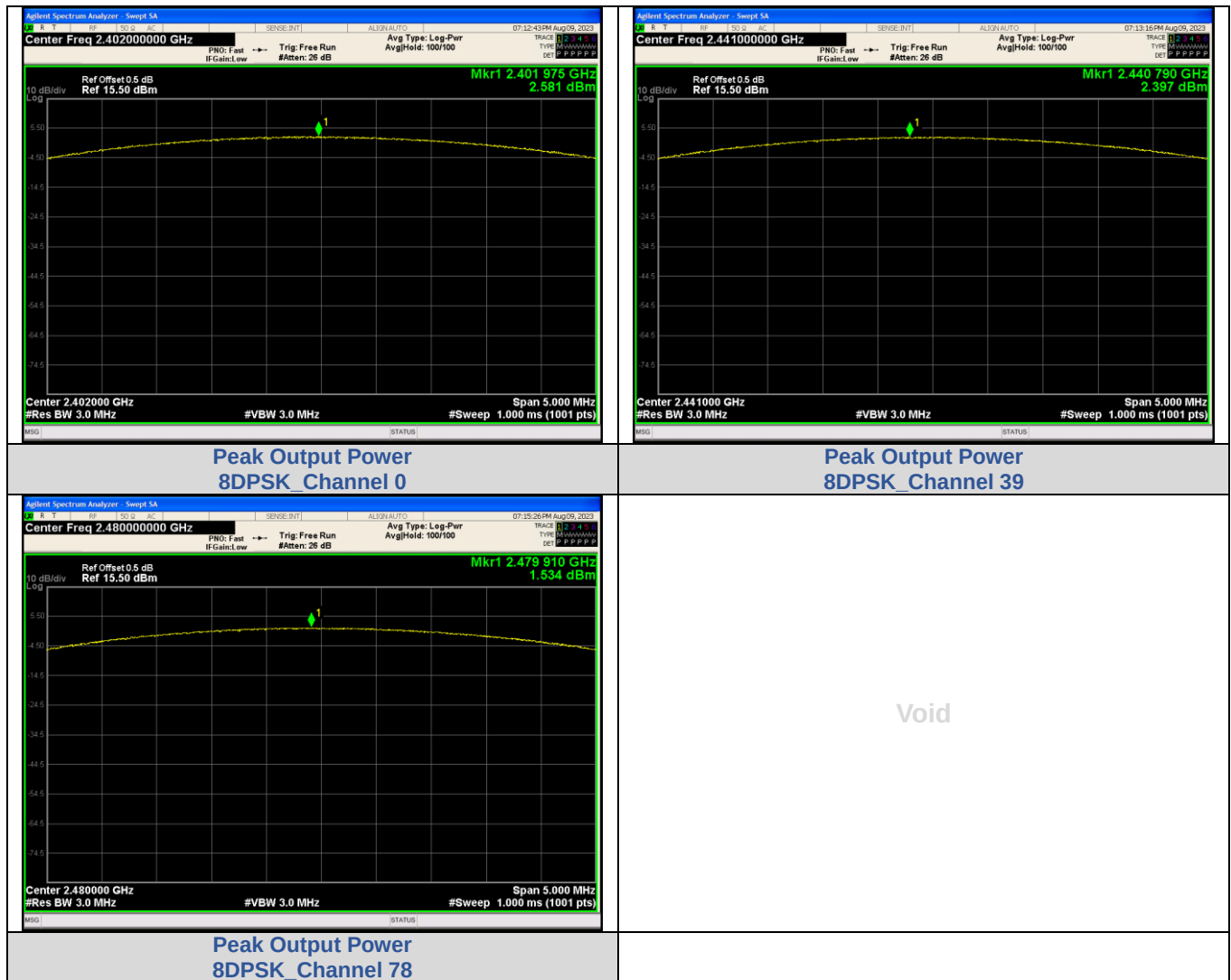
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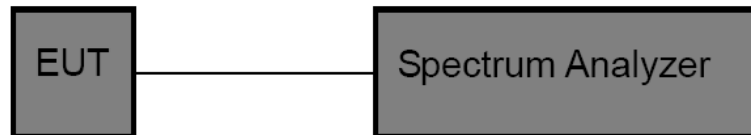


3.10. Duty Cycle

Limit

None, for report purposes only.

Test Configuration



Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
2. The EUT was directly connected to the Spectrum Analyzer and antenna output port as show in the block diagram above. The measurement according to section 10.2 of KDB 558074 D01 DTS Meas Guidance v05r02.
3. Spectrum Setting:
Set analyzer center frequency to test channel center frequency.
Set the span to 0Hz.
Set the RBW to 10MHz.
Set the VBW to 10MHz.
Detector: Peak.
Sweep time: Auto.
Allow trace to fully stabilize. Then use the peak marker function to determine the maximum amplitude level.

Test Mode

Please refer to the clause 2.4.

Test Result

Modulation	Packets	Channel	On Time (ms)	Period (ms)	Duty Cycle (%)	1/T Minimum VBW (kHz)	Final Setting for VBW (kHz)
GFSK	DH5	0	2.887	3.749	77.01	0.35	1
		39	2.885	3.747	77.00	0.35	1
		78	2.885	3.747	77.00	0.35	1
π /4DQPSK	2-DH5	0	2.880	3.720	77.42	0.35	1
		39	2.880	3.740	77.01	0.35	1
		78	2.900	3.740	77.54	0.34	1
8DPSK	3-DH5	0	2.880	3.740	77.01	0.35	1
		39	2.900	3.740	77.54	0.34	1
		78	2.900	3.740	77.54	0.34	1



Test plot as follows:



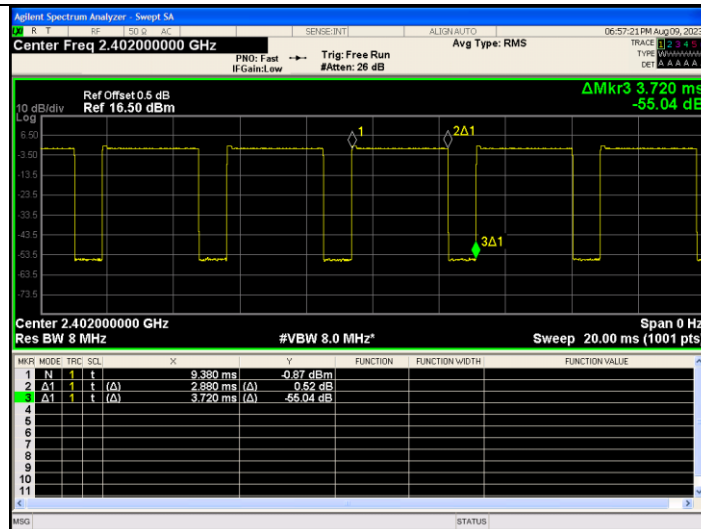
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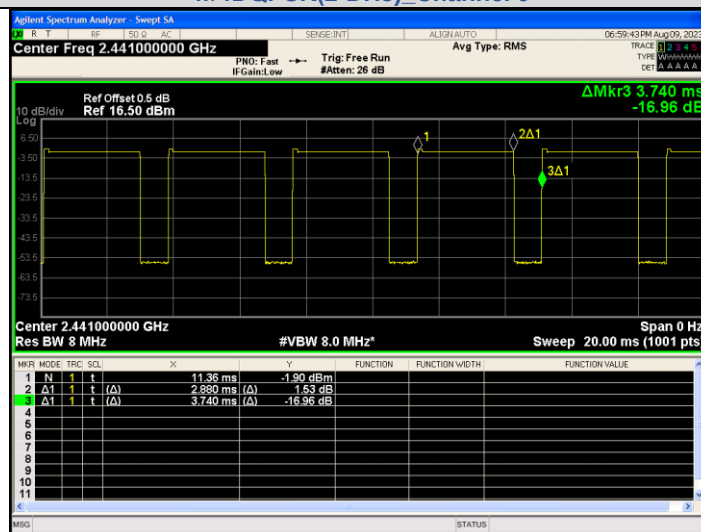
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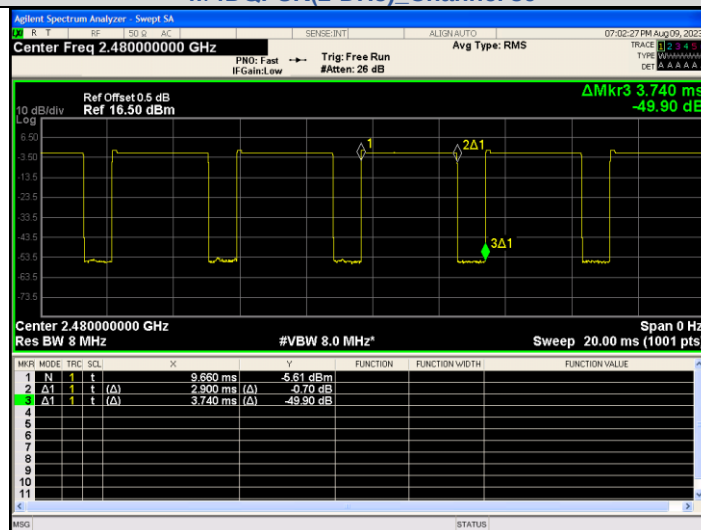
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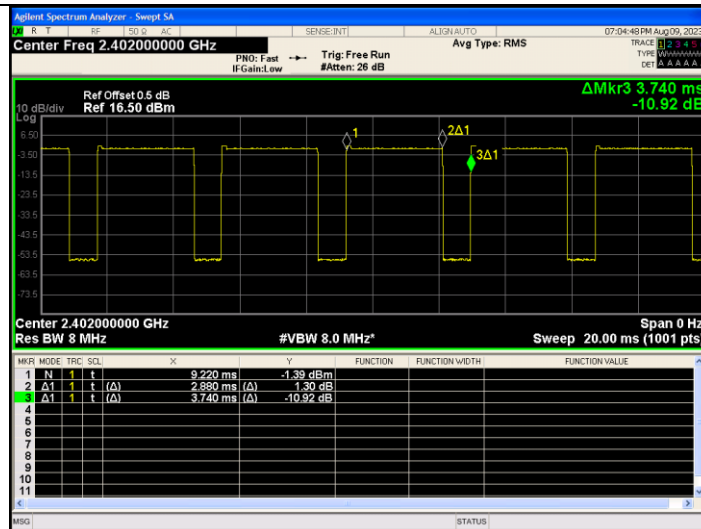
π/4DQPSK(2-DH5) Channel 0



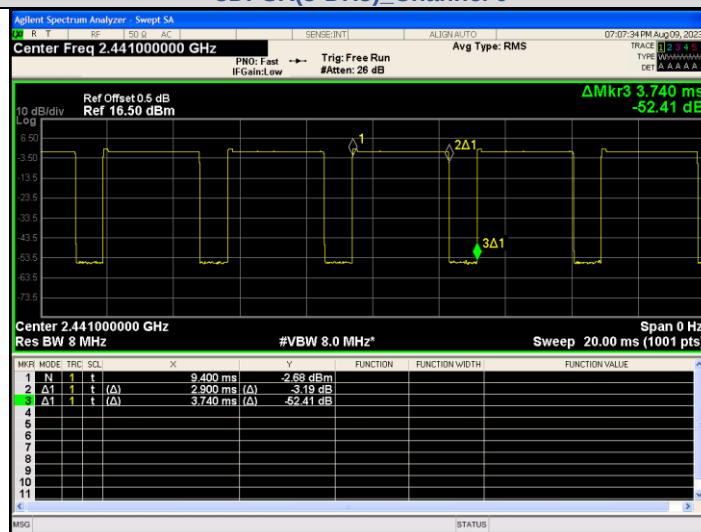
π/4DQPSK(2-DH5) Channel 39



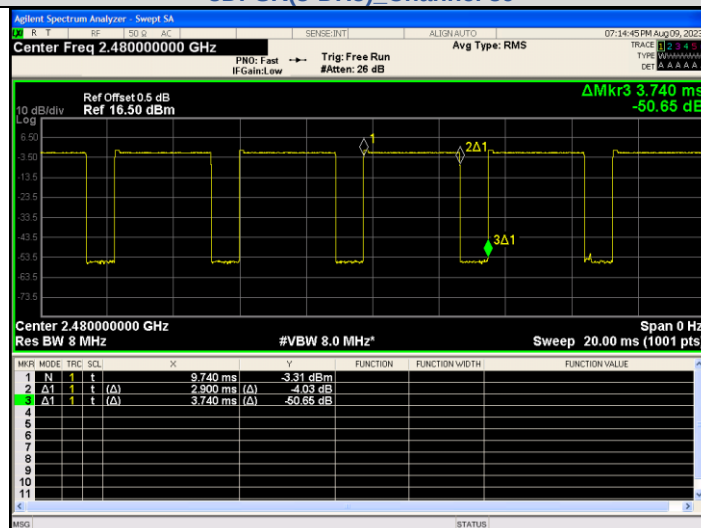
π/4DQPSK(2-DH5) Channel 78



8DPSK(3-DH5) Channel 0



8DPSK(3-DH5) Channel 39



8DPSK(3-DH5) Channel 78



3.11. Antenna Requirement

Requirement

FCC CFR Title 47 Part 15 Subpart C 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. The use of a permanently attached antenna or of 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.

FCC CFR Title 47 Part 15 Subpart C Section 15.247(c) (1)(i)

(i) 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 6dBi.

Test Result

The directional gain of the antenna is less than 6dBi, please refer to the EUT internal photographs antenna photo.

*****THE END*****