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Figure 53: The plots of Conducted Spurious Emission & Authorized-band band-edge, Hopping Mode, GFSK Band Edge (Low)

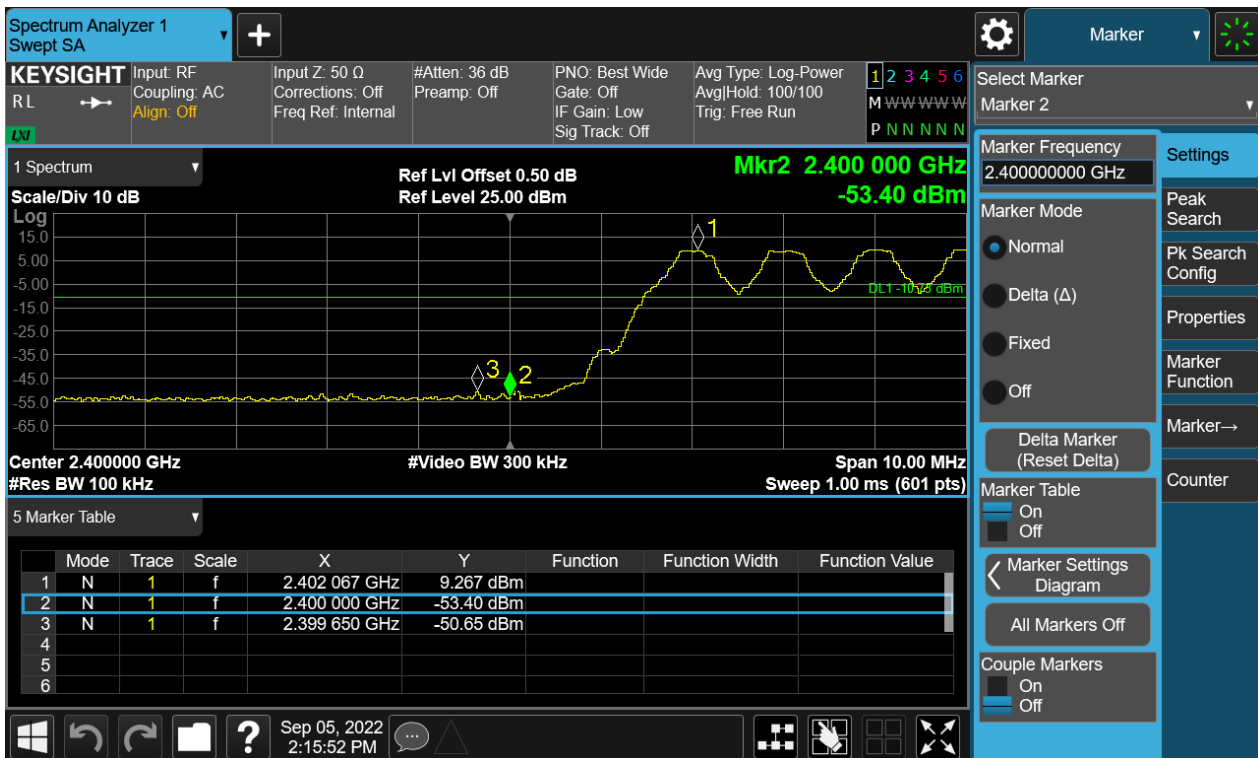
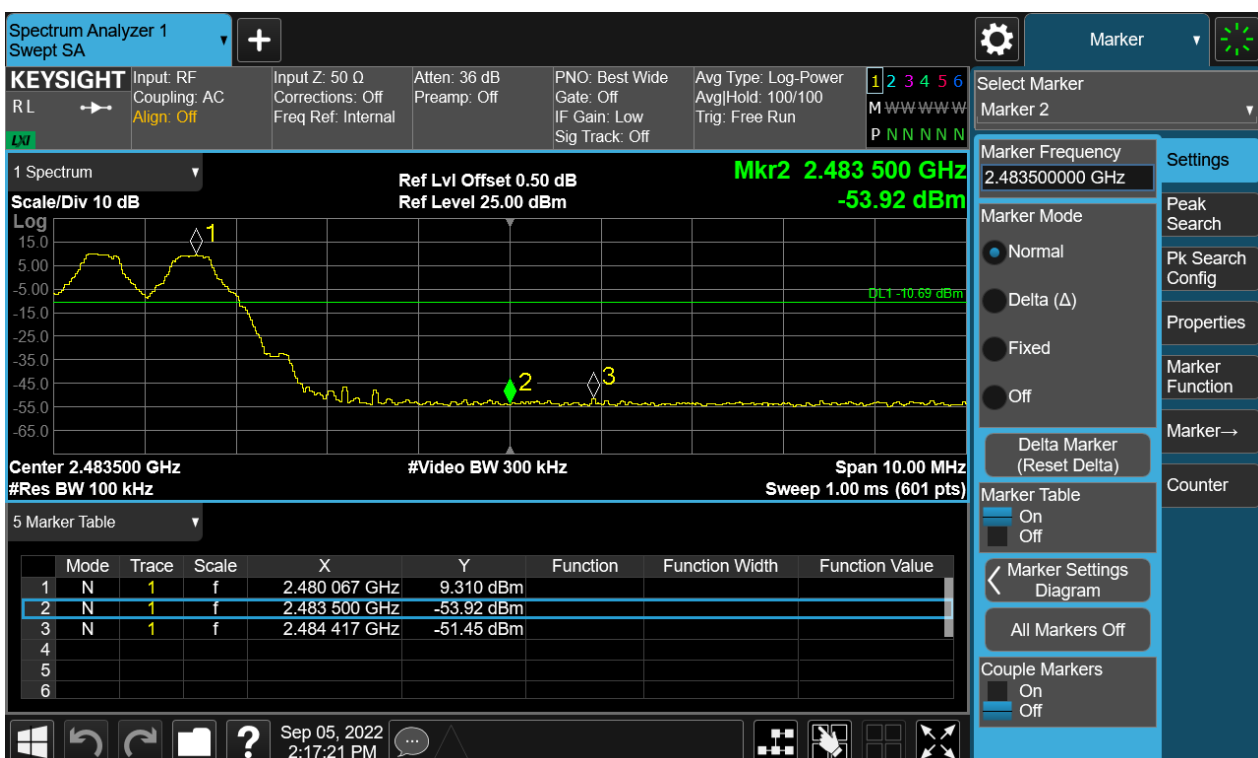


Figure 54: The plots of Conducted Spurious Emission & Authorized-band band-edge, Hopping Mode, GFSK Band Edge (High)



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Figure 55: The plots of Conducted Spurious Emission & Authorized-band band-edge, Hopping Mode, GFSK
Conducted spurious emissions 30MHz-3GHz

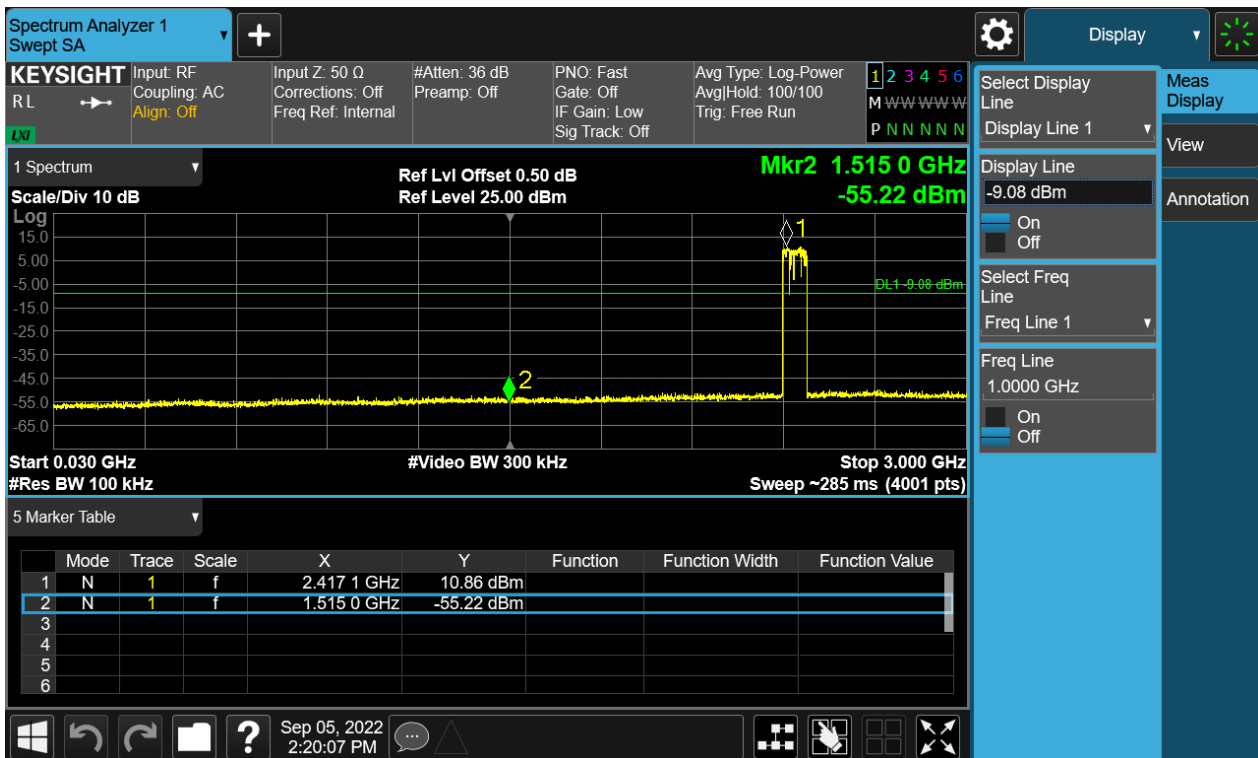
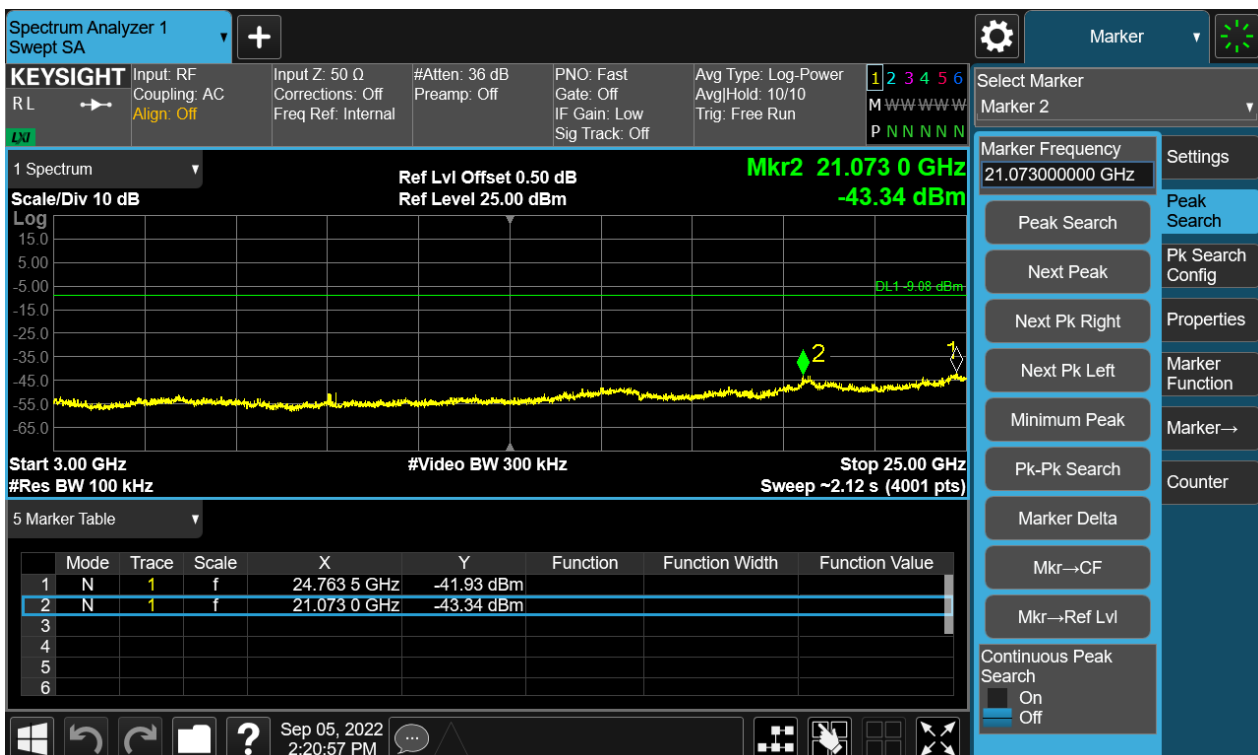


Figure 56: The plots of Conducted Spurious Emission & Authorized-band band-edge, Hopping Mode, GFSK
Conducted spurious emissions 3GHz-25GHz



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Figure 57: The plots of Conducted Spurious Emission & Authorized-band band-edge, Hopping Mode, GFSK Carrier Level

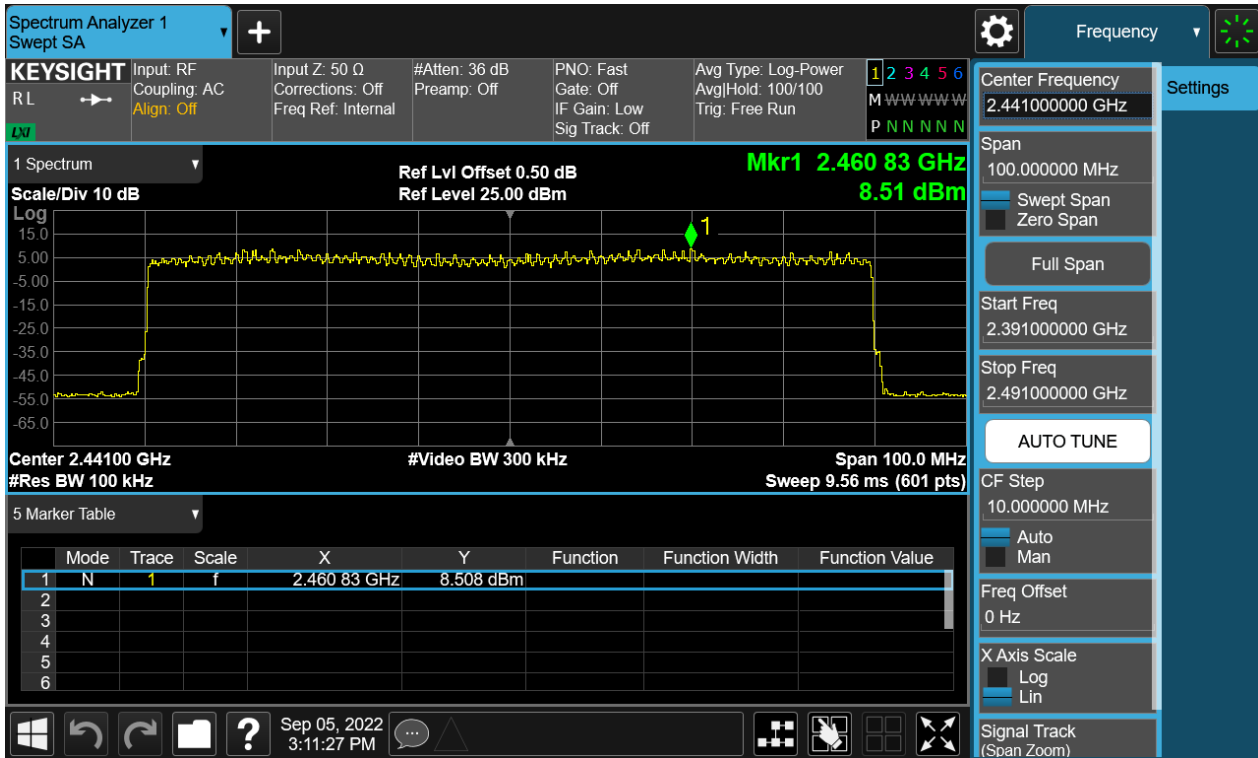
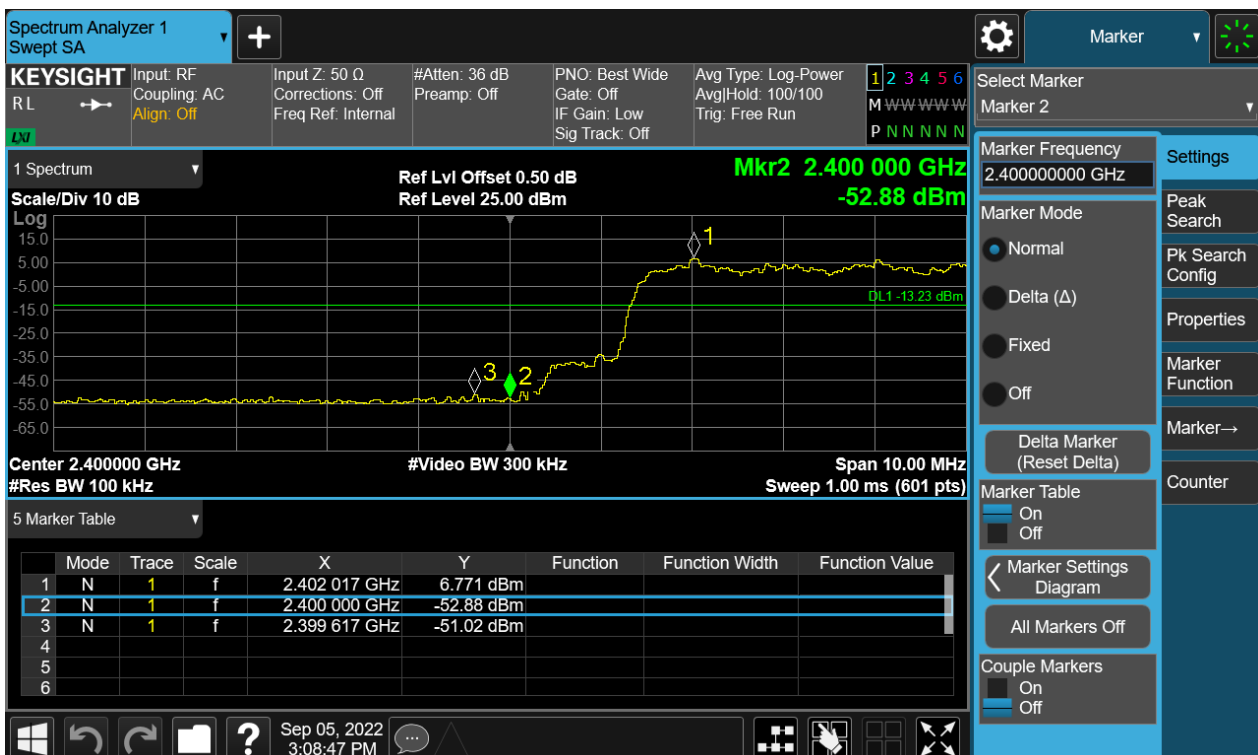


Figure 58: The plots of Conducted Spurious Emission & Authorized-band band-edge, Hopping Mode, $\pi/4$ -DQPSK, Band Edge (Low)



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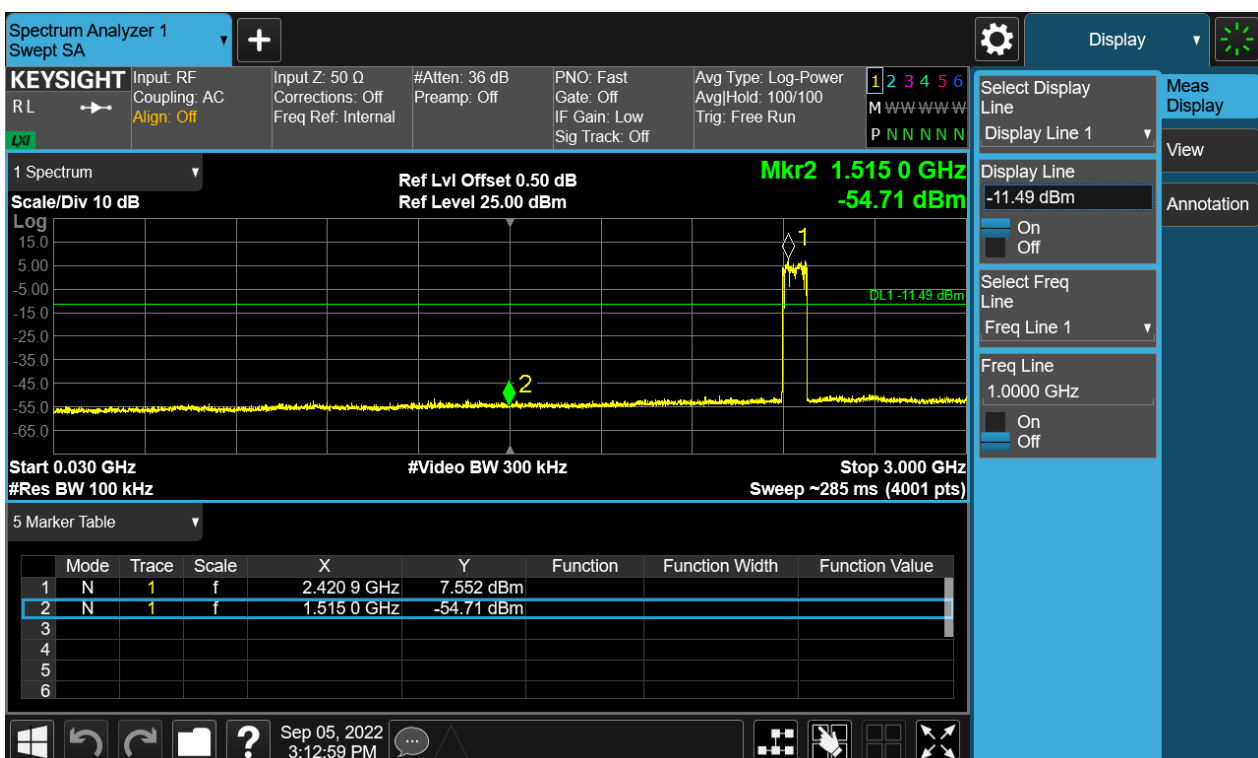
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Figure 59: The plots of Conducted Spurious Emission & Authorized-band band-edge, Hopping Mode, $\pi/4$ -DQPSK, Band Edge (High)



Figure 60: The plots of Conducted Spurious Emission & Authorized-band band-edge, Hopping Mode, $\pi/4$ -DQPSK, Conducted spurious emissions 30MHz-3GHz



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Figure 61: The plots of Conducted Spurious Emission & Authorized-band band-edge, Hopping Mode, $\pi/4$ -DQPSK, Conducted spurious emissions 3GHz-25GHz

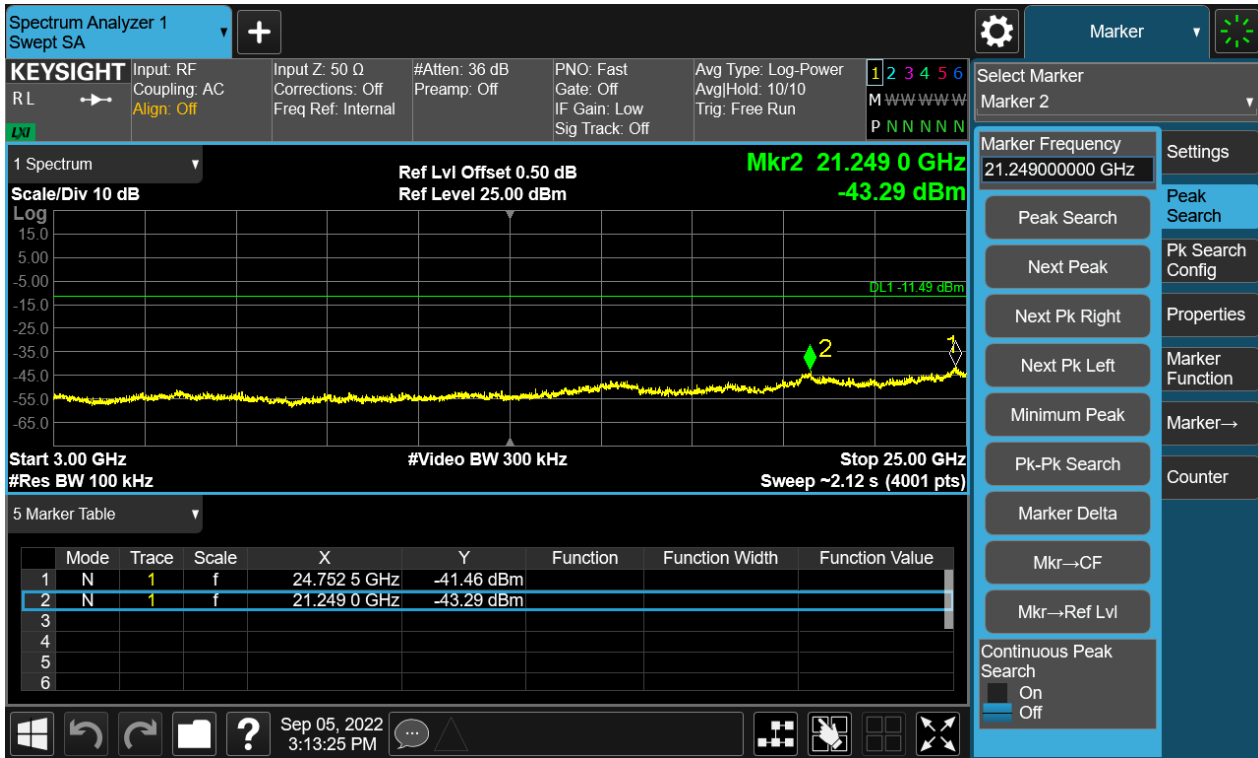
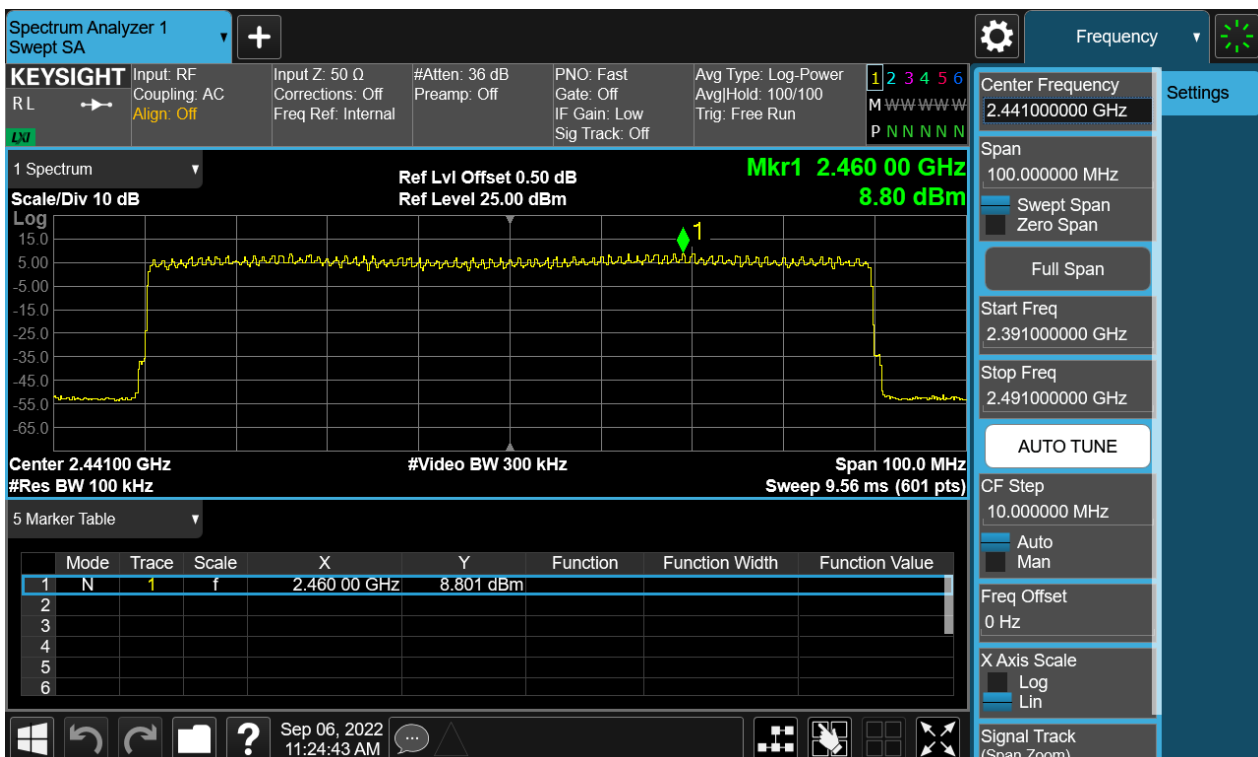


Figure 62: The plots of Conducted Spurious Emission & Authorized-band band-edge, Hopping Mode, 8-DPSK Carrier Level



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Figure 63: The plots of Conducted Spurious Emission & Authorized-band band-edge, Hopping Mode, 8-DPSK Band Edge (Low)

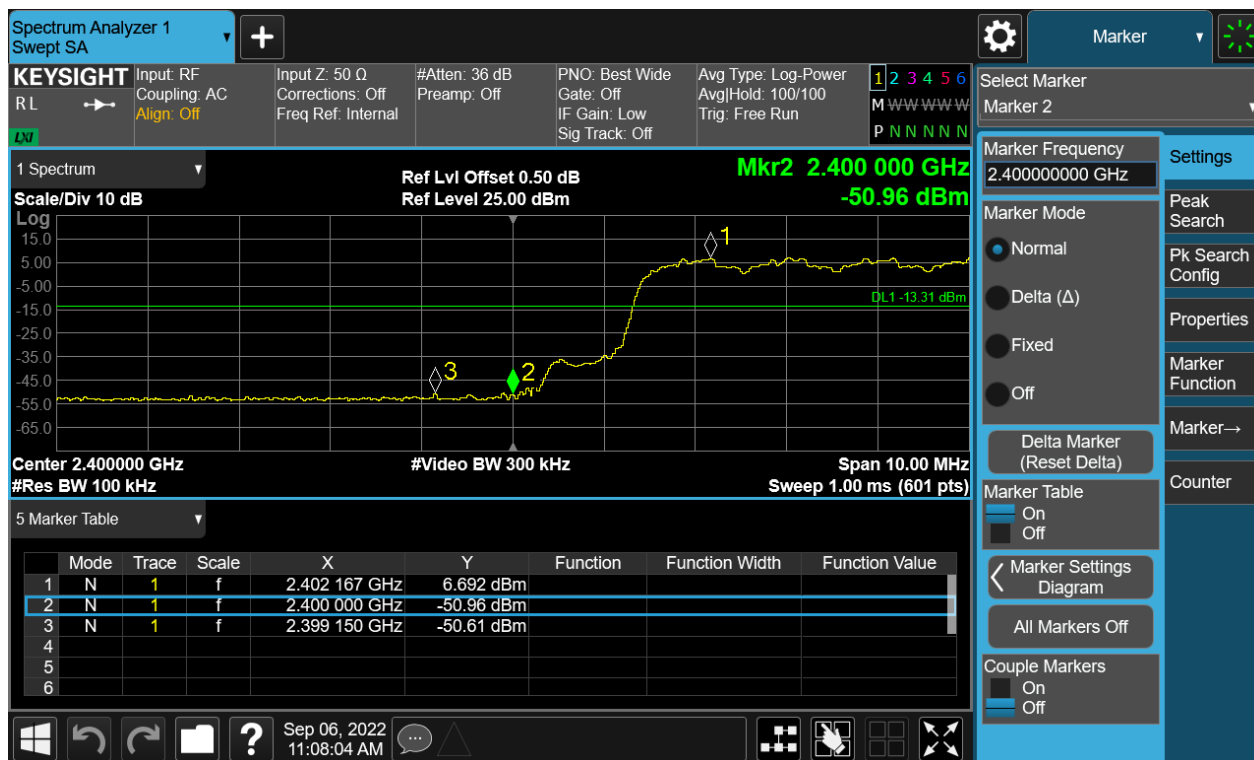


Figure 64: The plots of Conducted Spurious Emission & Authorized-band band-edge, Hopping Mode, 8-DPSK Band Edge (High)



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Figure 65: The plots of Conducted Spurious Emission & Authorized-band band-edge, Hopping Mode, 8-DPSK
Conducted spurious emissions 30MHz-3GHz

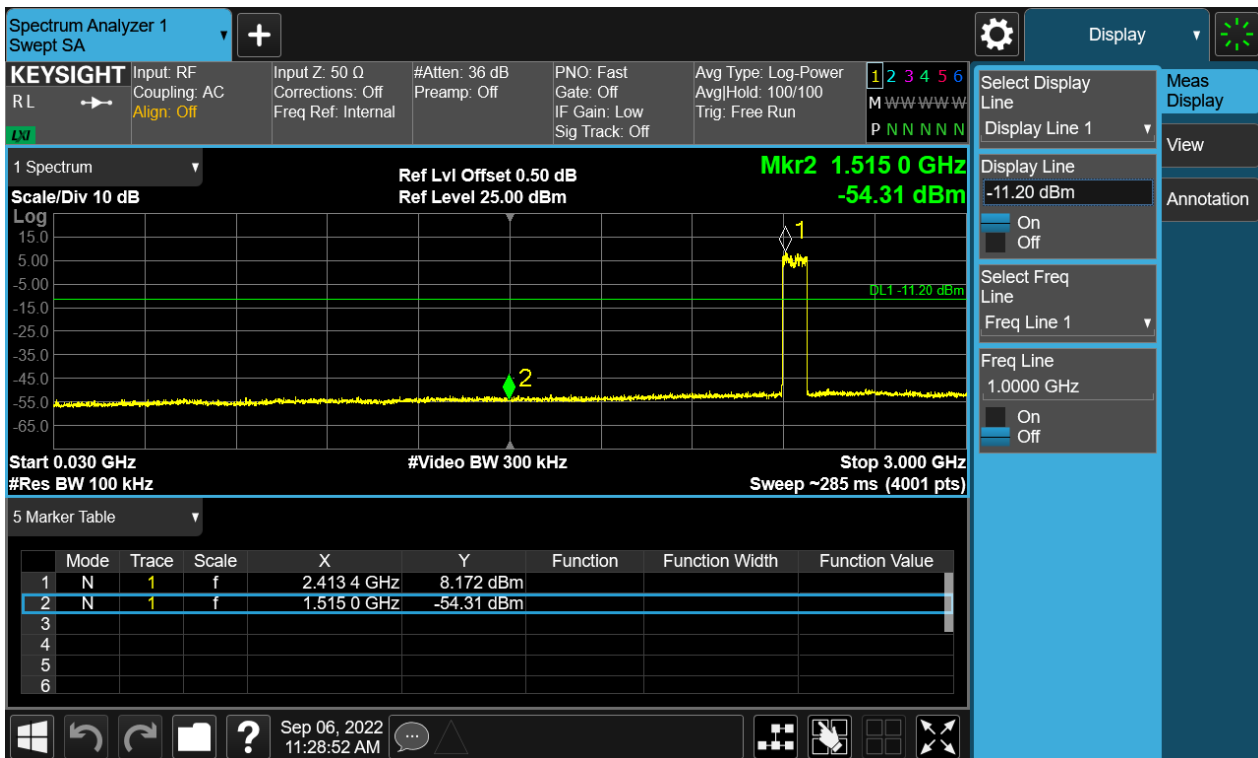
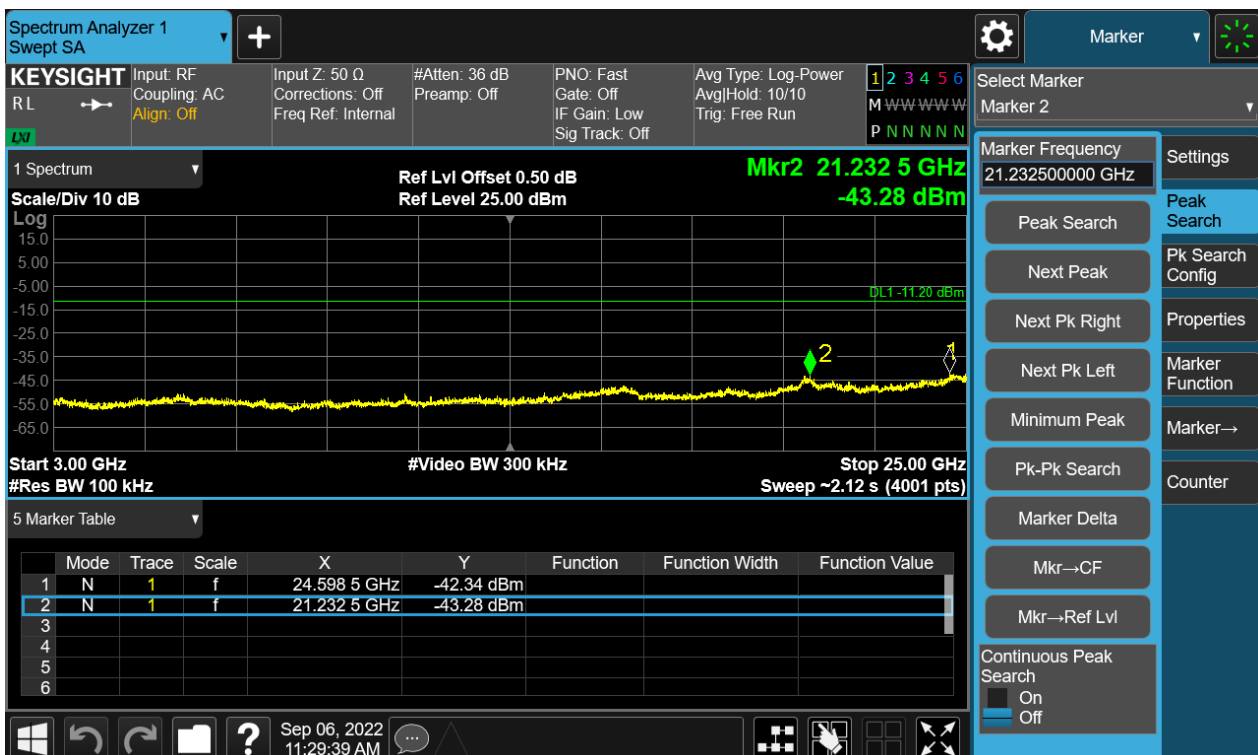


Figure 66: The plots of Conducted Spurious Emission & Authorized-band band-edge, Hopping Mode, 8-DPSK
Conducted spurious emissions 3GHz-25GHz



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4.1.5 Radiated Emission

RESULT:

PASS

Test standard	: FCC Part 15.247(d), 15.205, 15.209 RSS-GEN 8.9
Requirement	: ANSI C63.10-2013
Kind of test site	: 3m Semi-Anechoic Chamber

Test setup

Test Channel	: Low/Middle/High/Hopping
Operation Mode	: A.1.a
Ambient temperature	: 25°C
Relative humidity	: 53%

Notes

Test plots please refer to the annex document "SHE22030040-02HE DATA BDEDR-TX EXHIBIT A".

1. For 9 kHz ~ 30 MHz, the amplitude of spurious emissions that are attenuated by more than 20dB below the permissible. The value has no need to be reported.
2. The spurious above 18GHz is noise only and 20dB below the limit. The value has no need to be reported.
3. All test modes had been pre-tested, but only the GFSK-hopping mode of below 1 GHz is the worst case and recorded in the report.
4. The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement –X, Y, and Z-plane. The X-plane results were found as the worst case and were shown in this report.

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4.1.6 Band Edge (Restricted-band band-edge)

RESULT:

PASS

Test standard	: FCC Part 15.247(d), 15.205, 15.209 RSS-GEN 8.10
Requirement	: ANSI C63.10-2013
Kind of test site	: 3m Semi-Anechoic Chamber

Test setup

Test Channel	: Low/High/Hopping
Operation Mode	: A.1
Ambient temperature	: 25°C
Relative humidity	: 53%

Notes

Test plots please refer to the annex document "SHE22030040-02HE DATA BDED-R-TX EXHIBIT A".

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4.1.7 Hopping Frequency Separation

RESULT:

PASS

Test standard : FCC Part 15.247(a)(1), RSS-247 5.1(b)
Requirement : ANSI C63.10-2013 clause 7.8.2
KDB 558074 clause 2.2
Kind of test site : Shielded room

Test setup

Test Channel : Hopping
Operation Mode : A.1.a.iv
Ambient temperature : 24.9°C
Relative humidity : 57%

Table 4: Hopping Frequency Separation

Mode	Frequency (MHz)	Channel Separation (MHz)	Limit (MHz)
GFSK	2441	1.035	≥ 25kHz or two-thirds of 20dB bandwidth
$\pi/4$ -DQPSK	2441	1.190	
8-DPSK	2441	1.065	

*Note: The systems operate with an output power no greater than 125mW.

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Figure 27: The plots of Hopping Frequency Separation, Hopping Mode, GFSK

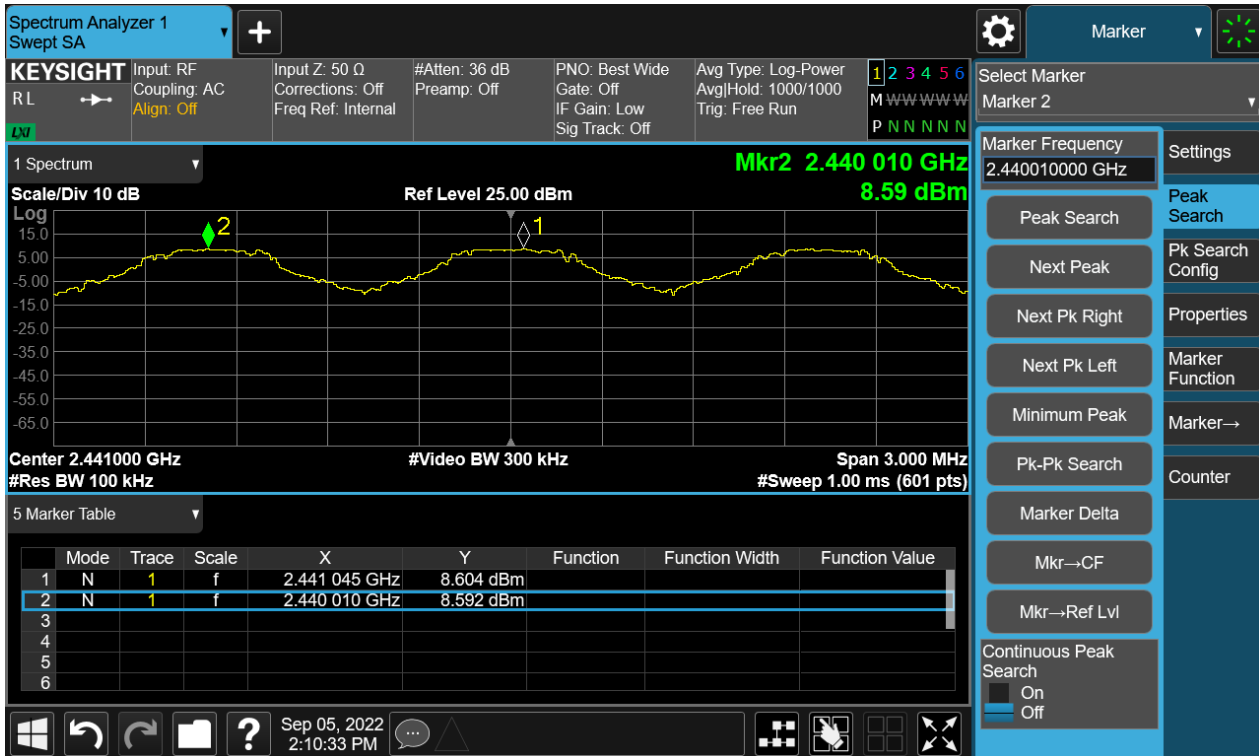
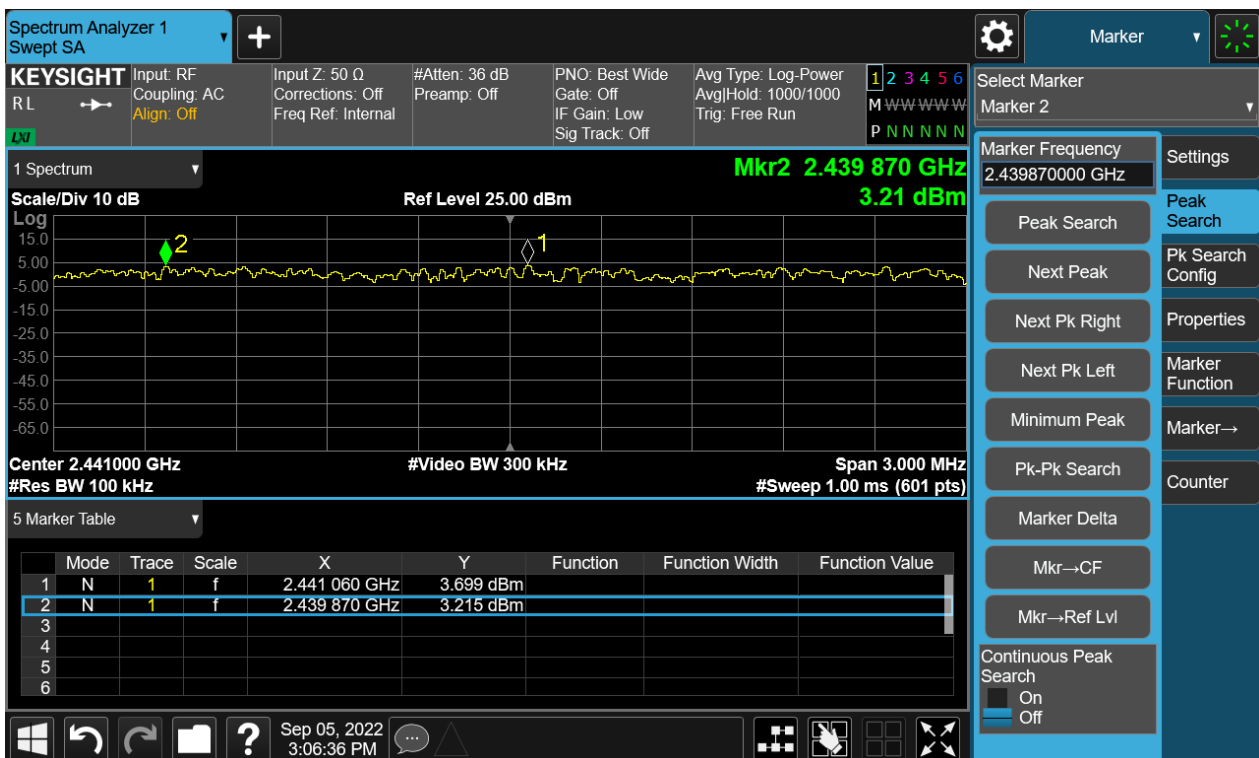


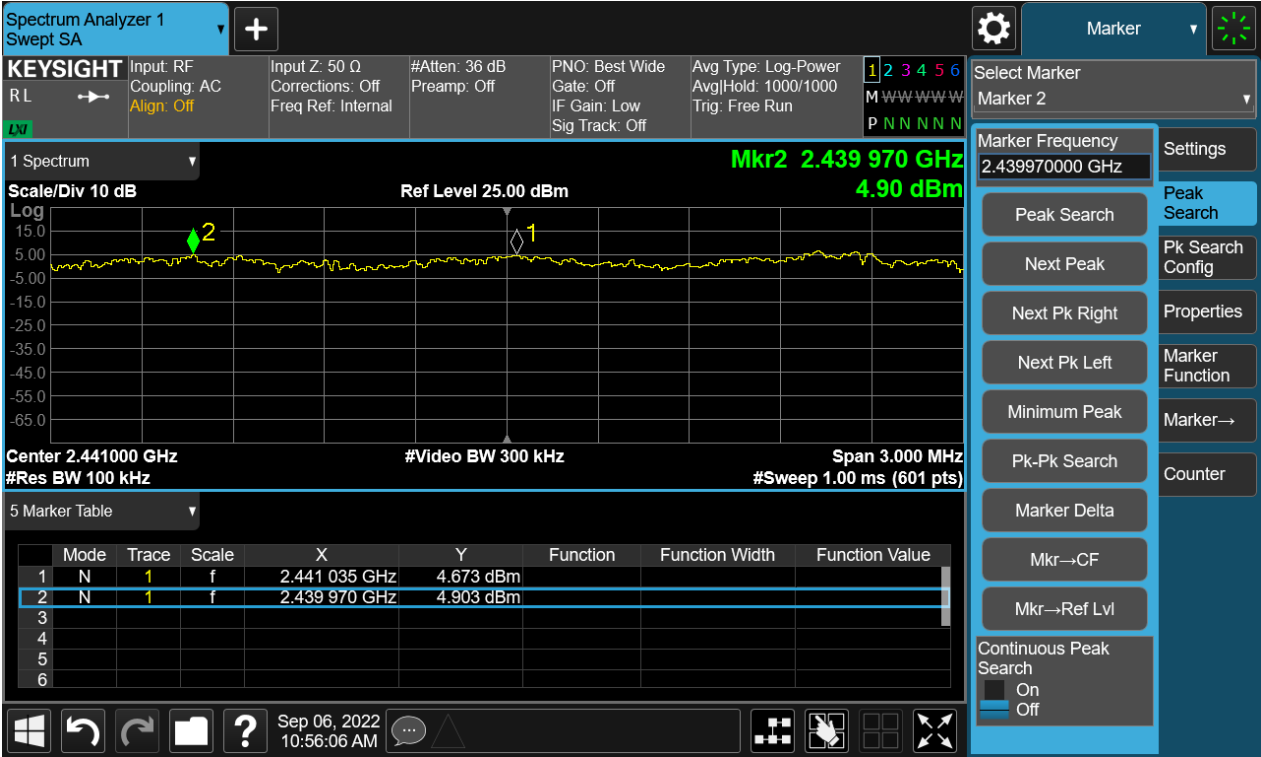
Figure 68: The plots of Hopping Frequency Separation, Hopping Mode, $\pi/4$ -DQPSK



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Figure 69: The plots of Hopping Frequency Separation, Hopping Mode, 8-DPSK



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4.1.8 Number of Hopping Frequency

RESULT:

PASS

Test standard : FCC Part 15.247(a)(1)(iii), RSS-247 5.1(d)
Requirement : ANSI C63.10-2013 clause 7.8.3
KDB 558074 clause 2.2
Kind of test site : Shielded room

Test setup

Test Channel : Hopping
Operation Mode : A.1.a.iv
Ambient temperature : 24.9°C
Relative humidity : 57%

Table 5: Number of Hopping Frequency

Mode	Frequency Range	Measured Quantity of Hopping Channel	Limit
GFSK	2400 – 2483.5	79	≥15
π/4-DQPSK	2400 – 2483.5	79	≥15
8-DPSK	2400 – 2483.5	79	≥15

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Figure 70: The plots of Number of Hopping Frequency, Hopping Mode, GFSK

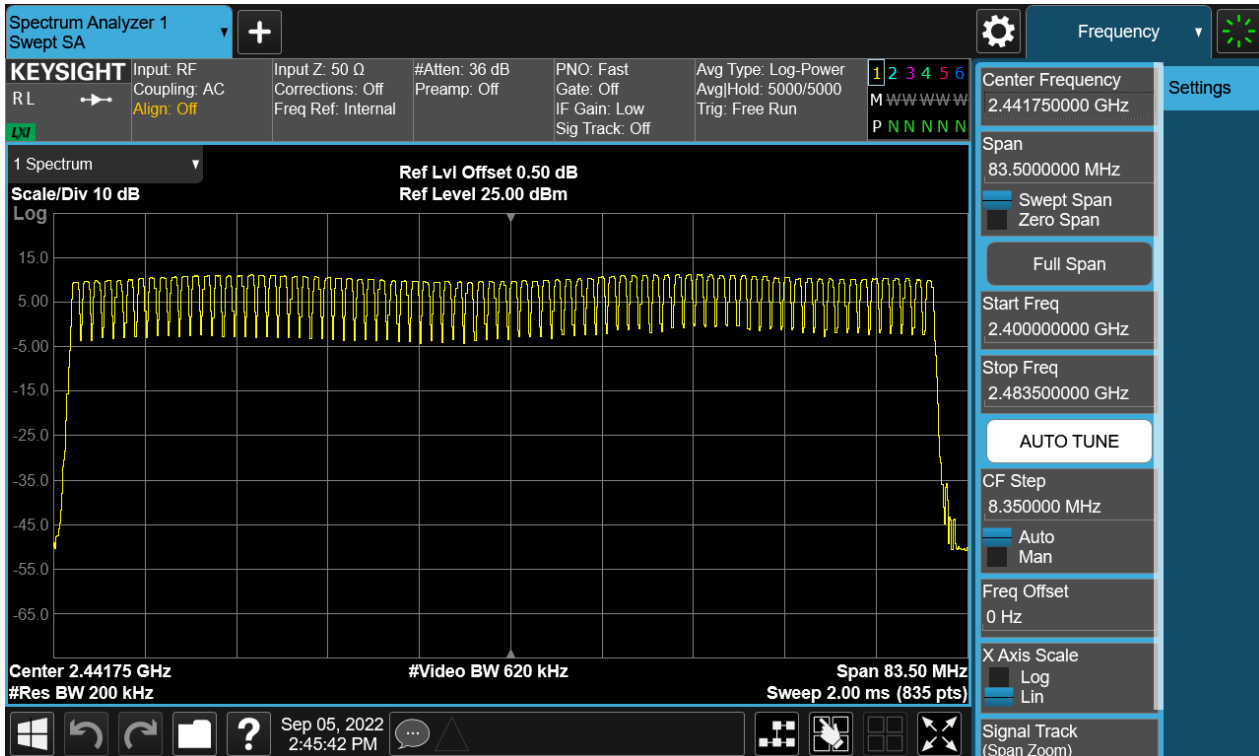
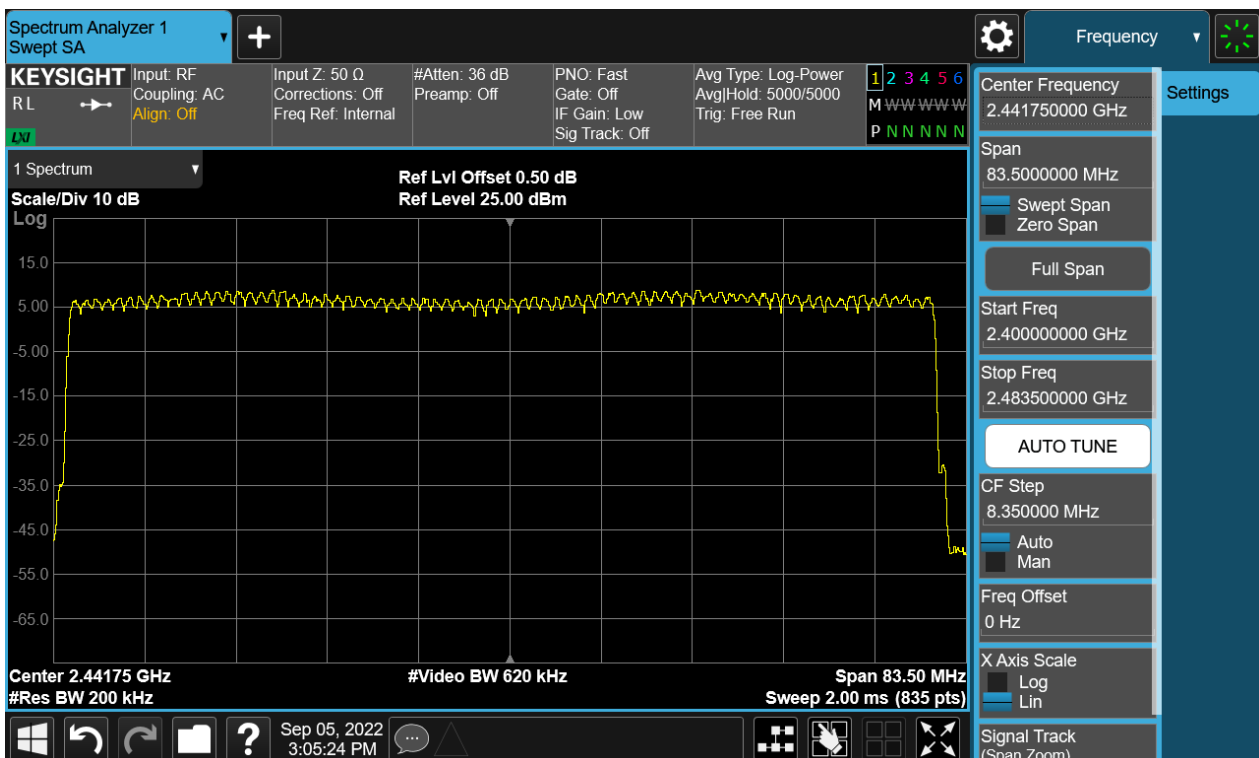


Figure 71: The plots of Number of Hopping Frequency, Hopping Mode, $\pi/4$ -DQPSK



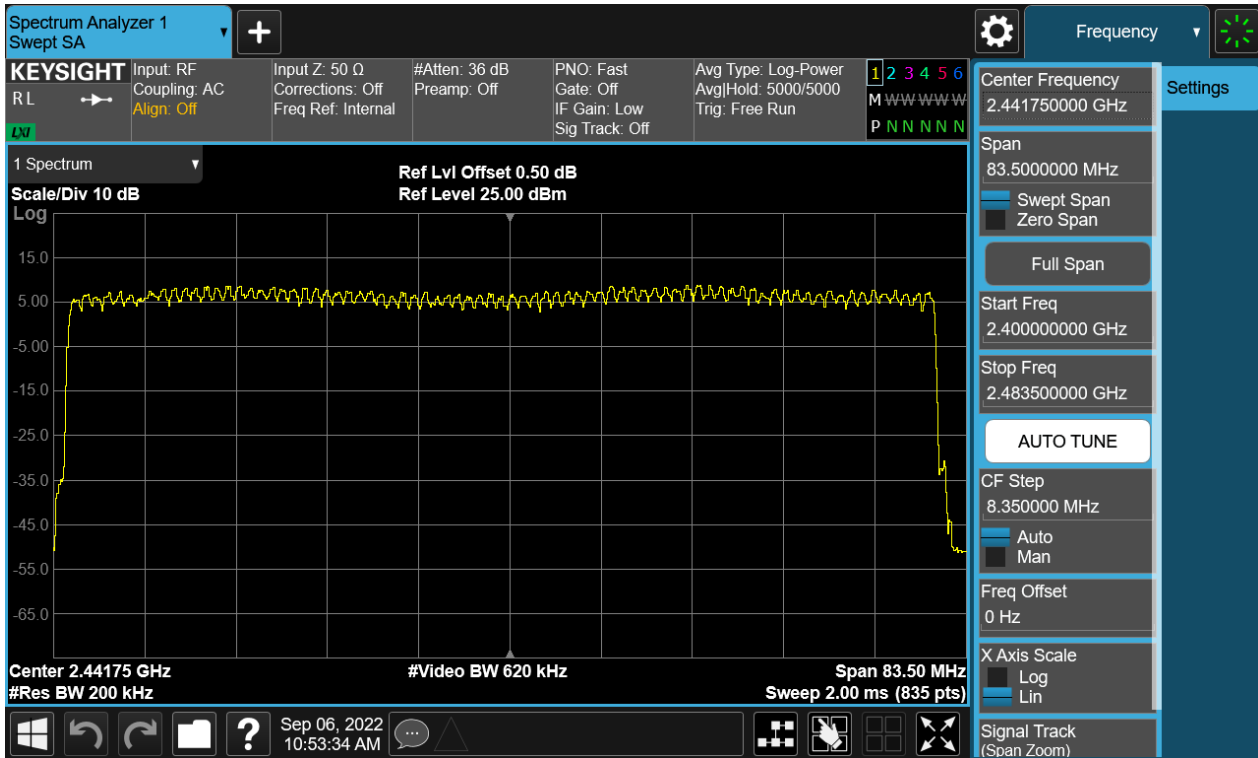
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Figure 72: The plots of Number of Hopping Frequency, Hopping Mode, 8-DPSK



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4.1.9 Time of Occupancy

RESULT:

PASS

Test standard : FCC Part 15.247(a)(1)(iii), RSS-247 5.1(d)
Requirement : ANSI C63.10-2013 clause 7.8.4,
KDB 558074 clause 2.2
Kind of test site : Shielded room

Test setup

Test Channel : Middle
Operation Mode : A.1.a
Ambient temperature : 24.9°C
Relative humidity : 57%

Table 6: Time of Occupancy

Mode	Packet Type	Pulse Time (ms)	Total of Dwell (ms)	Limit (s)
GFSK	DH1	0.4067	130.144	0.4
	DH3	1.6700	267.200	0.4
	DH5	2.9200	311.467	0.4
$\pi/4$ -DQPSK	DH1	0.4133	132.256	0.4
	DH3	1.6700	267.200	0.4
	DH5	2.9270	312.213	0.4
8-DPSK	DH1	0.4117	131.744	0.4
	DH3	1.6700	267.200	0.4
	DH5	2.9270	312.213	0.4

Note:

For DH1 package type:

Total of Dwell = Pulse Time*(1600/2)/Number of Hopping Frequency*Period

Period = 0.4* Number of Hopping Frequency

For DH3 package type:

Total of Dwell = Pulse Time*(1600/4)/Number of Hopping Frequency*Period

Period = 0.4* Number of Hopping Frequency

For DH5 package type:

Total of Dwell = Pulse Time*(1600/6)/Number of Hopping Frequency*Period

Period = 0.4* Number of Hopping Frequency

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Figure 73: The plots of Time of Occupancy, 2441MHz, GFSK DH1

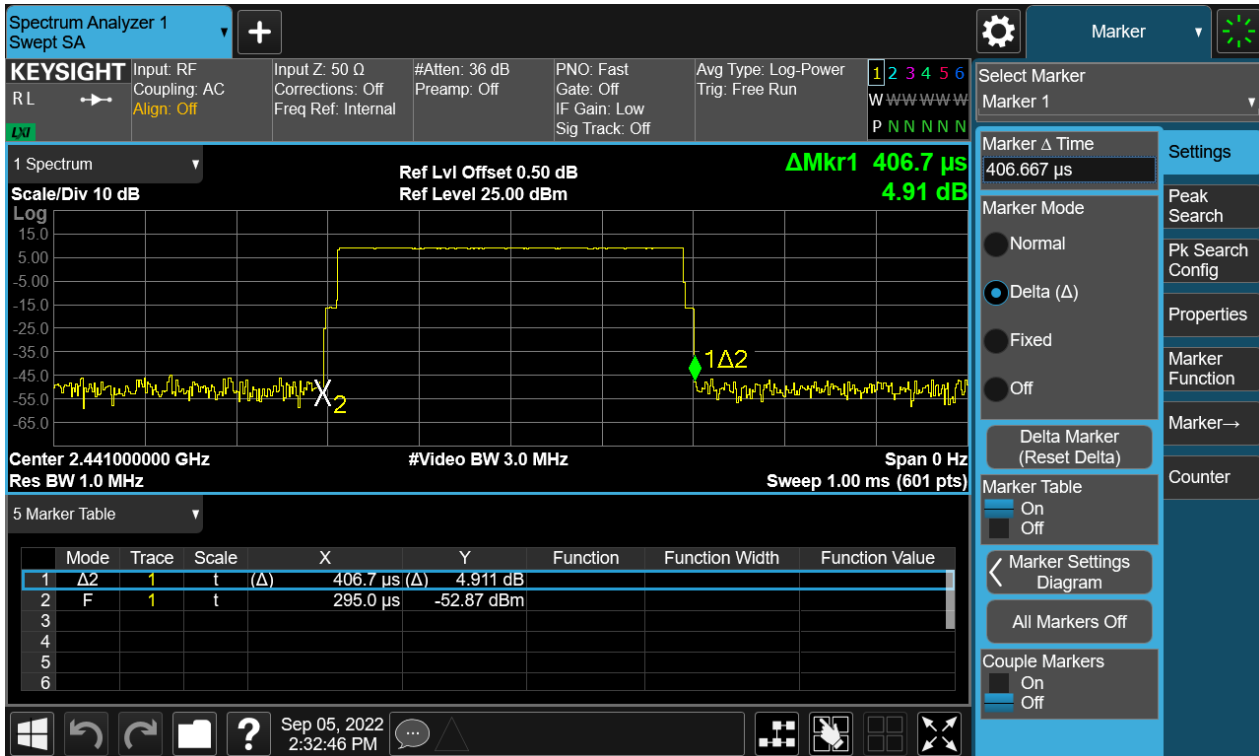
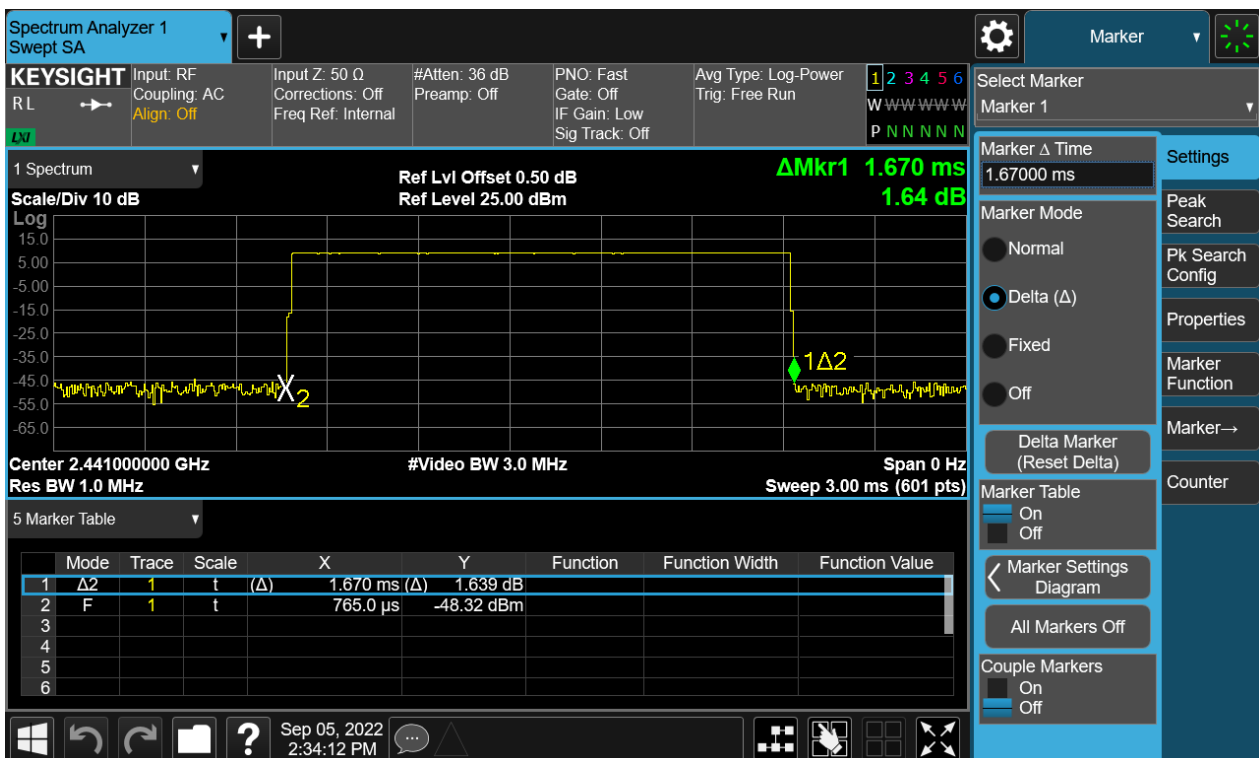


Figure 74: The plots of Time of Occupancy, 2441MHz, GFSK DH3



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Figure 75: The plots of Time of Occupancy, 2441MHz, GFSK DH5

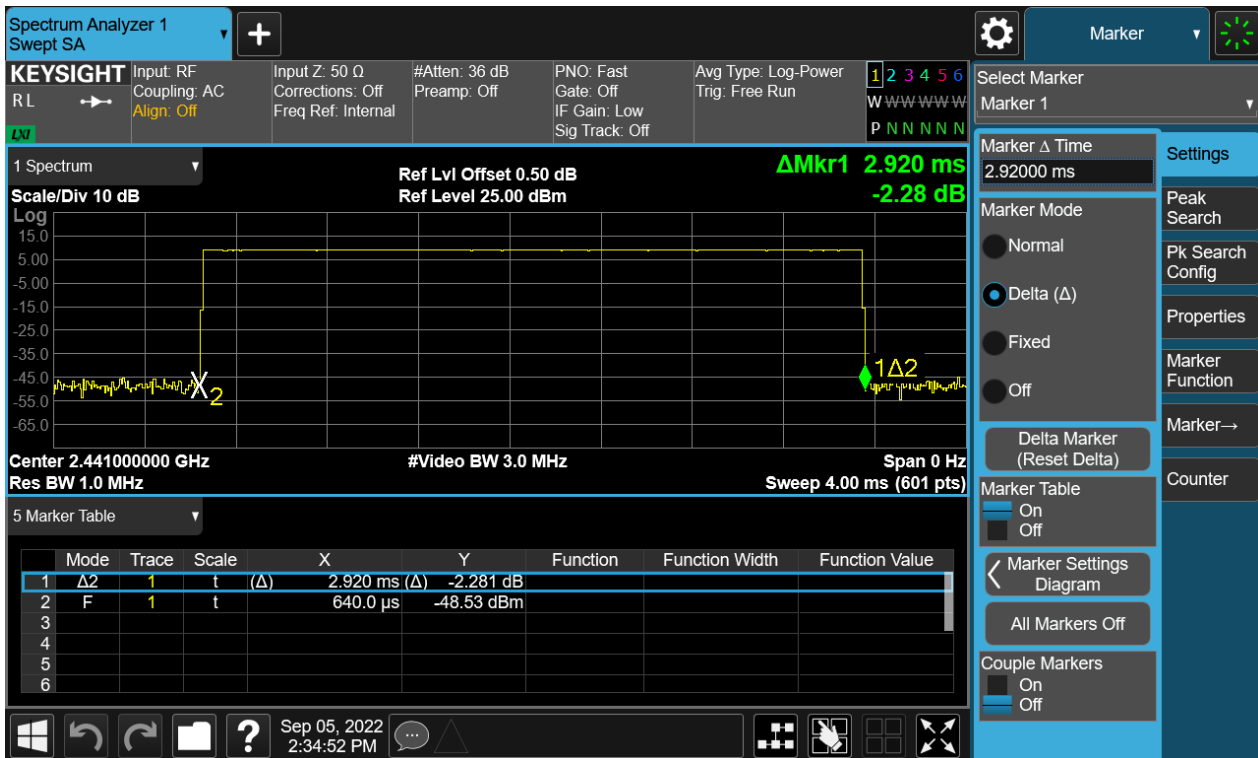
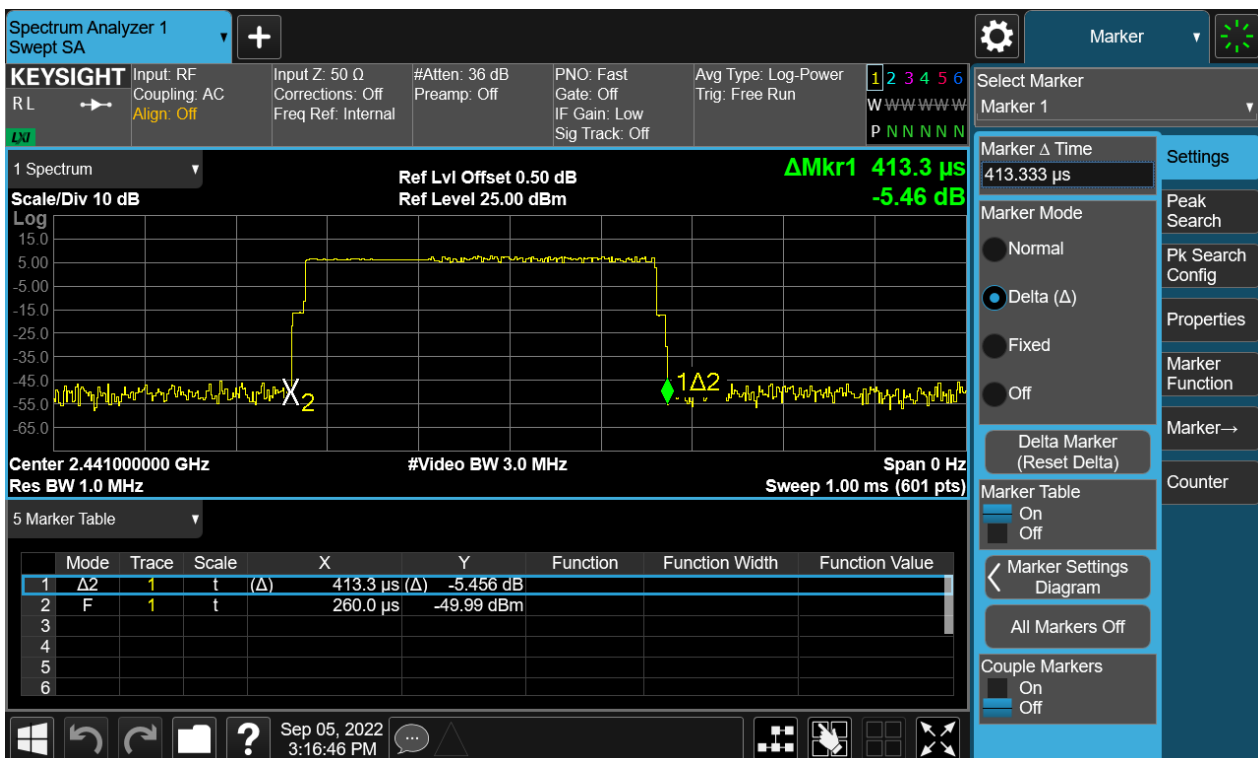


Figure 76: The plots of Time of Occupancy, 2441MHz, $\pi/4$ -DQPSK DH1



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Figure 77: The plots of Time of Occupancy, 2441MHz, $\pi/4$ -DQPSK DH3

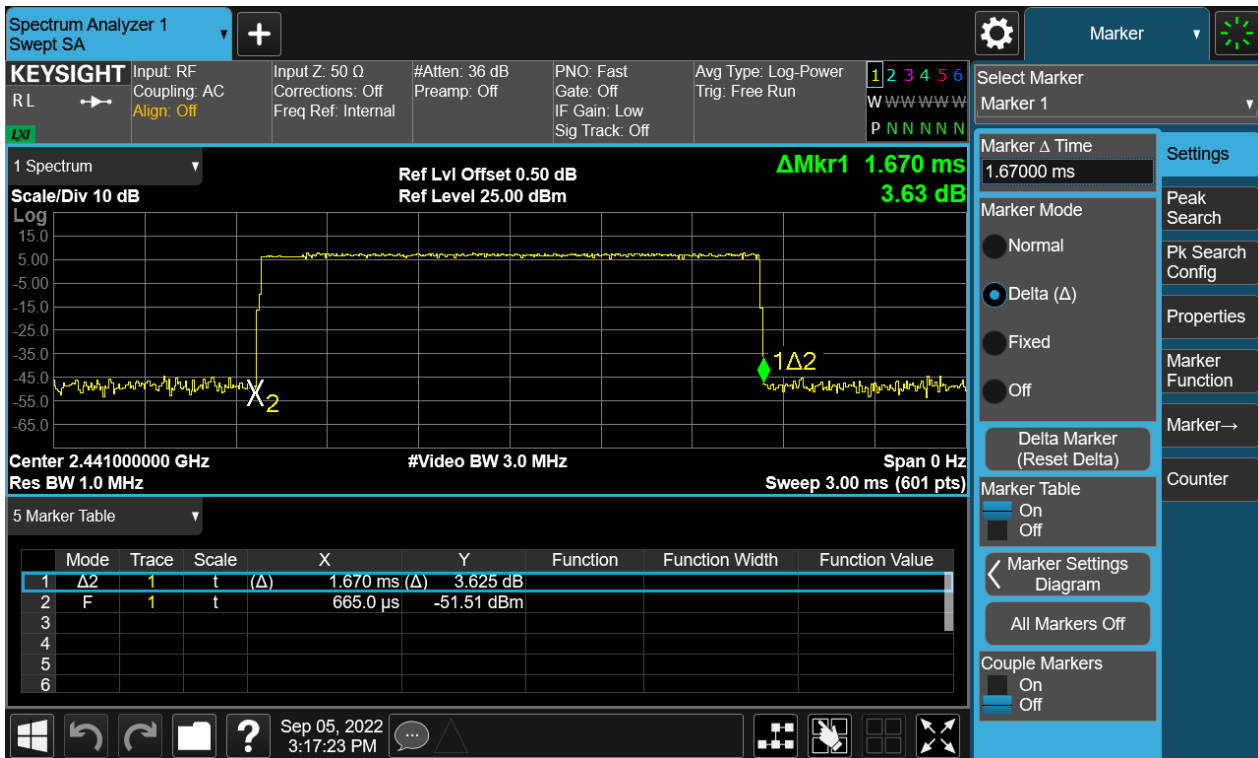
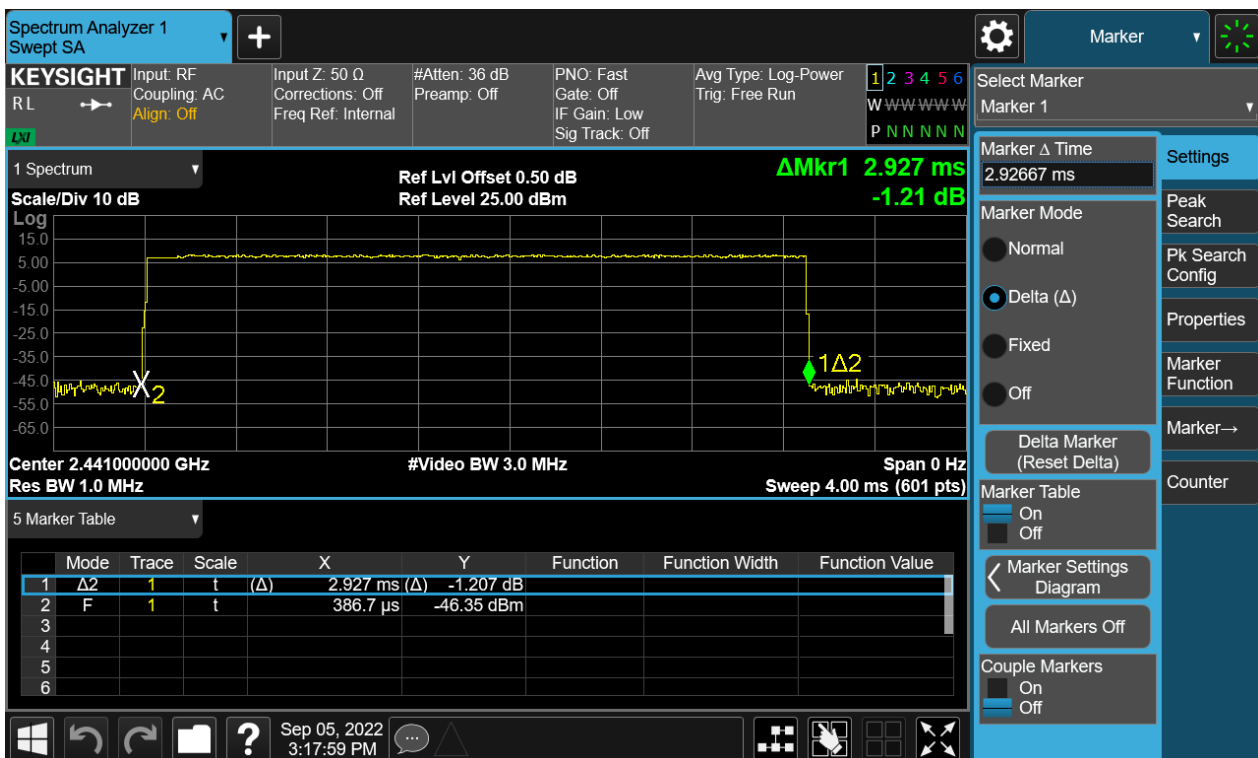


Figure 78: The plots of Time of Occupancy, 2441MHz, $\pi/4$ -DQPSK DH5



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Figure 79: The plots of Time of Occupancy, 2441MHz, 8-DPSK DH1

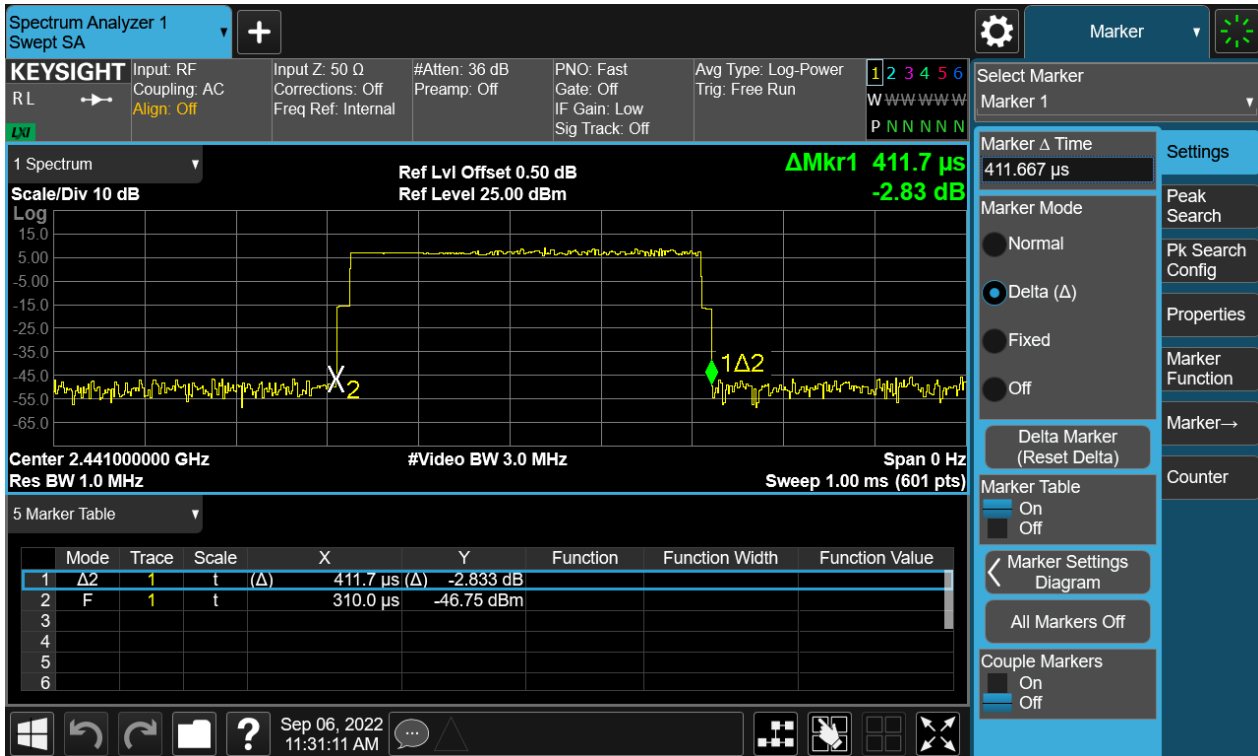
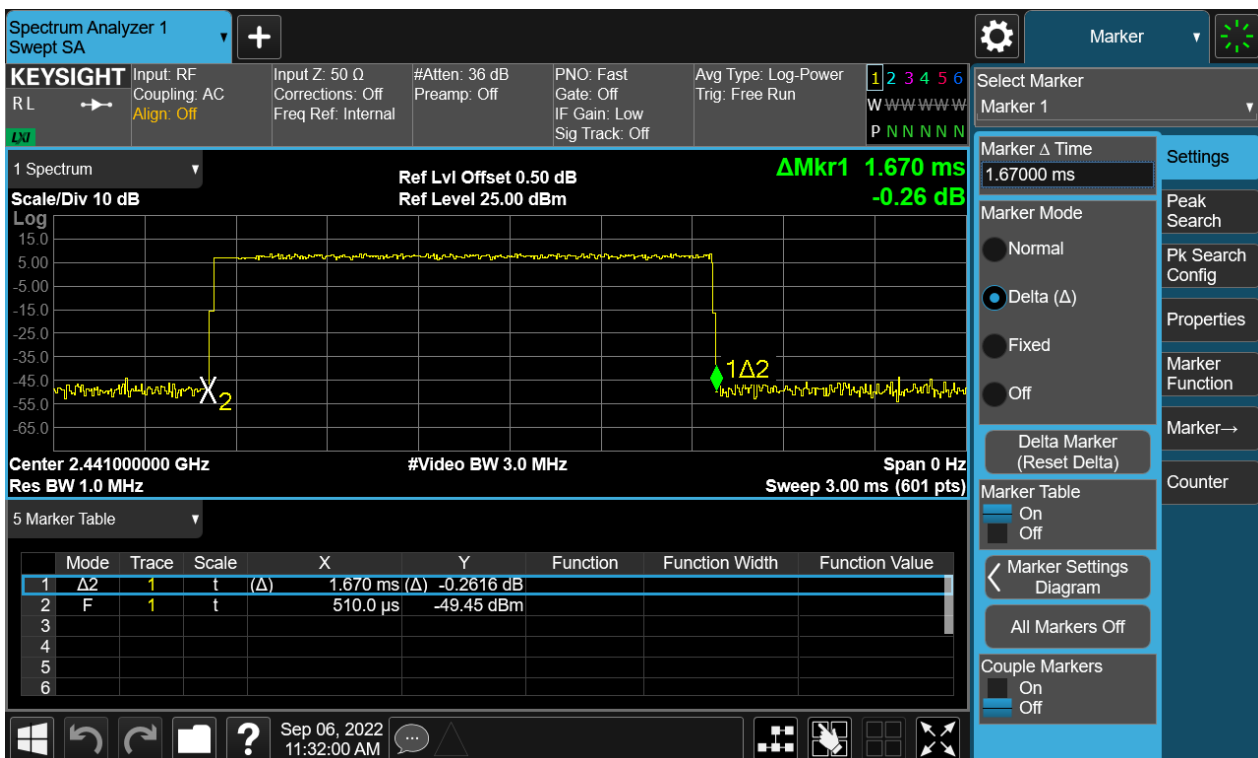


Figure 80: The plots of Time of Occupancy, 2441MHz, 8-DPSK DH3



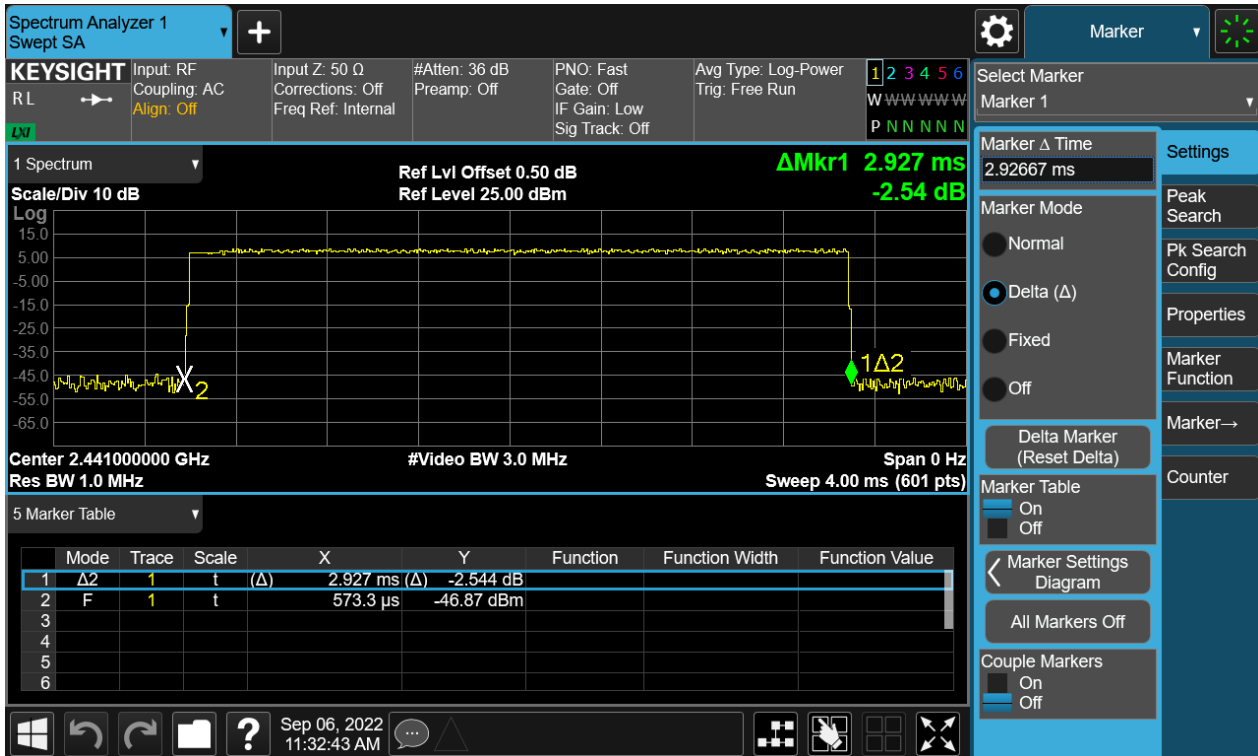
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Figure 81: The plots of Time of Occupancy, 2441MHz, 8-DPSK DH5



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4.2 Mains Emissions

4.2.1 Conducted Emission on AC Mains

RESULT:

PASS

Test standard	: FCC Part 15.207(a), RSS-Gen 8.8
Requirement	: ANSI C63.10-2013 clause 6.2
Kind of test site	: Shielded room

Test setup

Input Voltage	: AC 120V, 60Hz
Operation Mode	: A.1.a
Earthing	: Not Connected
Ambient temperature	: 23.5°C
Relative humidity	: 41%

For details refer to following test plot.

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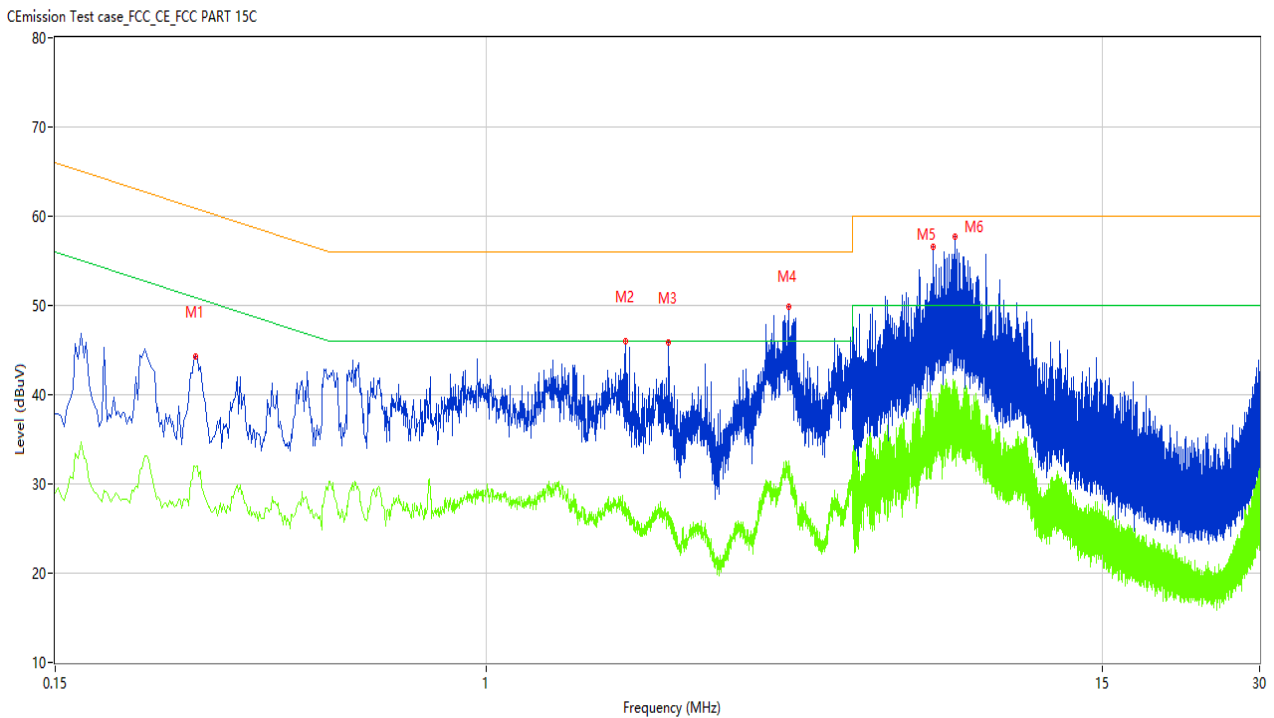
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Note:

The all configurations were tested respectively, but only the worst configuration (GFSK, hopping) shown here.

Figure 82: Conducted Emission on AC Mains, L Phase



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Over Limit (dB)	Detector	Line	Verdict
1	0.278	44.55	10.25	60.88	-16.33	Peak	L	Pass
1*	0.278	39.98	10.25	60.88	-20.90	QP	L	Pass
1**	0.278	31.80	10.25	50.88	-19.08	AV	L	Pass
2	1.848	45.89	10.19	56.00	-10.11	Peak	L	Pass
2*	1.848	35.36	10.19	56.00	-20.64	QP	L	Pass
2**	1.848	27.87	10.19	46.00	-18.13	AV	L	Pass
3	2.224	45.68	10.18	56.00	-10.32	Peak	L	Pass
3*	2.224	34.94	10.18	56.00	-21.06	QP	L	Pass
3**	2.224	26.90	10.18	46.00	-19.10	AV	L	Pass
4	3.782	52.21	10.22	56.00	-3.79	Peak	L	Pass
4*	3.782	41.46	10.22	56.00	-14.54	QP	L	Pass
4**	3.782	32.24	10.22	46.00	-13.76	AV	L	Pass
5	7.126	57.00	10.35	60.00	-3.00	Peak	L	Pass
5*	7.126	46.32	10.35	60.00	-13.68	QP	L	Pass
5**	7.126	37.53	10.35	50.00	-12.47	AV	L	Pass
6	7.846	58.76	10.36	60.00	-1.24	Peak	L	Pass
6*	7.846	47.49	10.36	60.00	-12.51	QP	L	Pass
6**	7.846	41.27	10.36	50.00	-8.73	AV	L	Pass

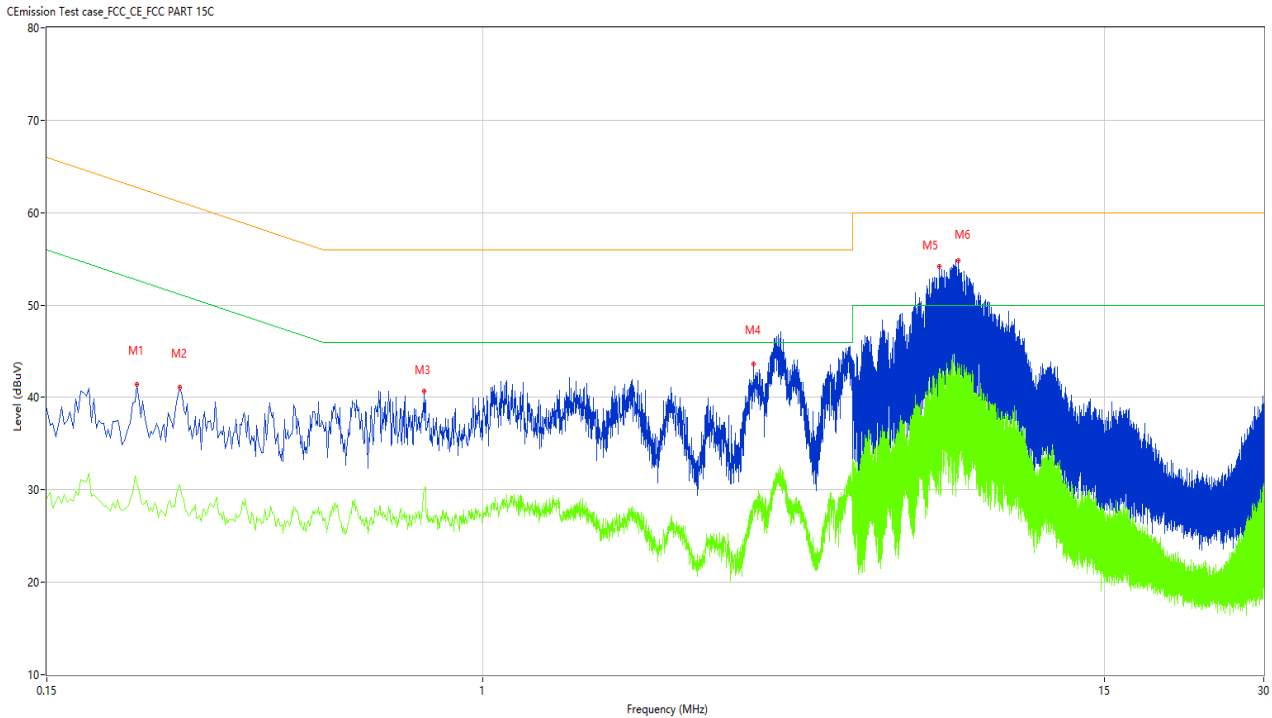
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Figure 83: Conducted Emission on AC Mains, N Phase



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Over Limit (dB)	Detector	Line	Verdict
1	0.222	42.99	10.21	62.74	-19.75	Peak	N	Pass
1*	0.222	35.13	10.21	62.74	-27.61	QP	N	Pass
1**	0.222	30.76	10.21	52.74	-21.98	AV	N	Pass
2	0.268	39.18	10.23	61.18	-22.00	Peak	N	Pass
2*	0.268	35.47	10.23	61.18	-25.71	QP	N	Pass
2**	0.268	30.58	10.23	51.18	-20.60	AV	N	Pass
3	0.776	39.44	10.19	56.00	-16.56	Peak	N	Pass
3*	0.776	32.02	10.19	56.00	-23.98	QP	N	Pass
3**	0.776	30.00	10.19	46.00	-16.00	AV	N	Pass
4	3.252	43.33	10.25	56.00	-12.67	Peak	N	Pass
4*	3.252	38.08	10.25	56.00	-17.92	QP	N	Pass
4**	3.252	28.31	10.25	46.00	-17.69	AV	N	Pass
5	7.314	55.03	10.46	60.00	-4.97	Peak	N	Pass
5*	7.314	48.17	10.46	60.00	-11.83	QP	N	Pass
5**	7.314	41.97	10.46	50.00	-8.03	AV	N	Pass
6	7.942	55.70	10.47	60.00	-4.30	Peak	N	Pass
6*	7.942	49.46	10.47	60.00	-10.54	QP	N	Pass
6**	7.942	42.77	10.47	50.00	-7.23	AV	N	Pass

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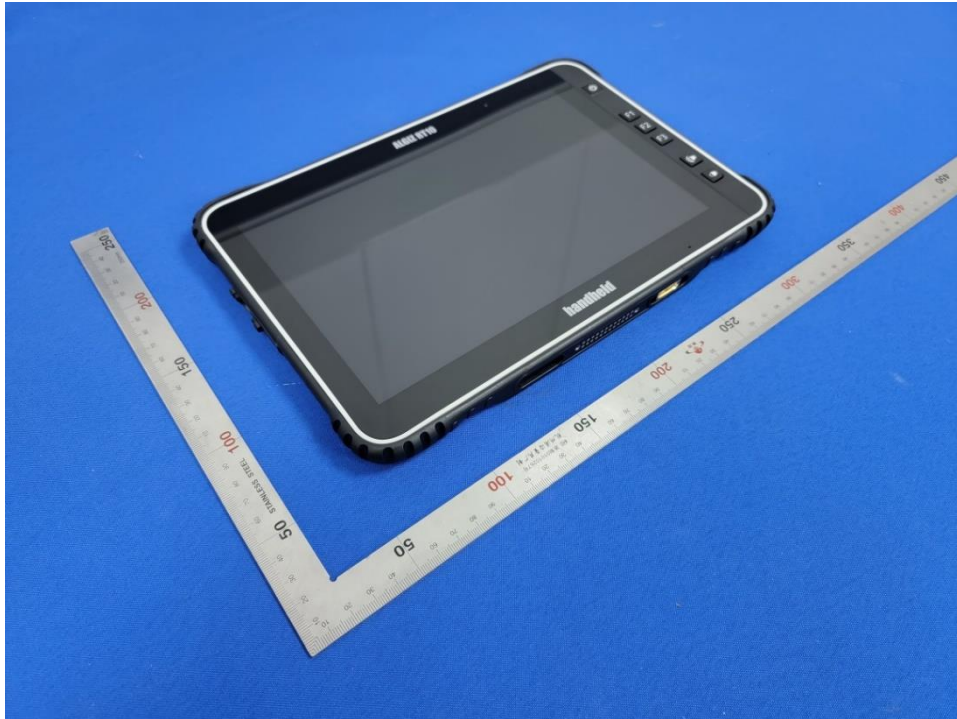
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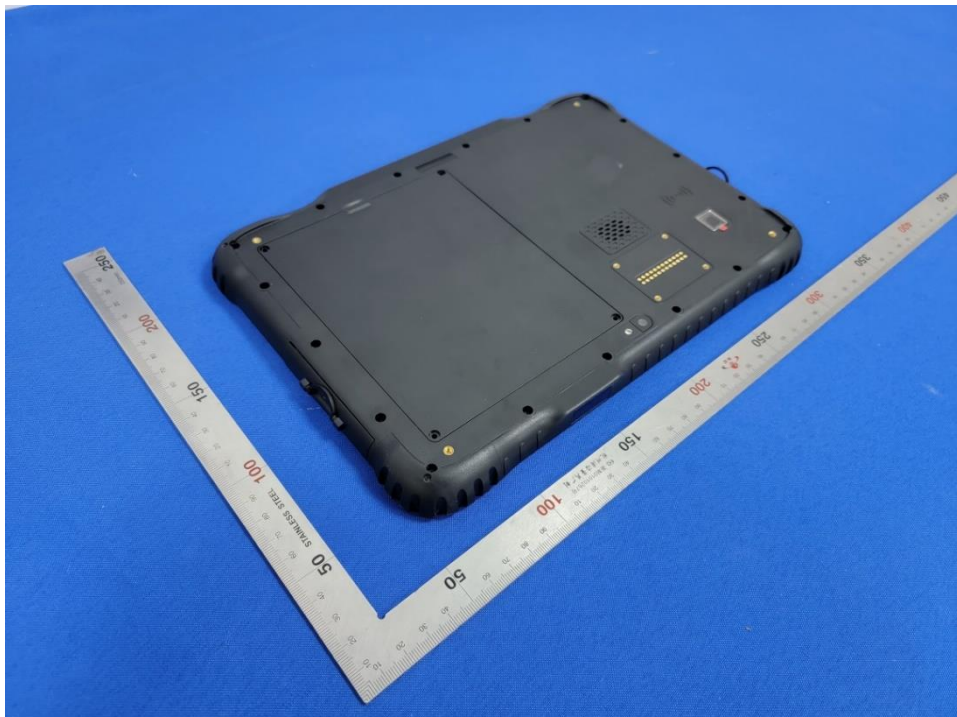
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5 Appendixes

5.1 Photographs of the Sample



Front of the sample



Rear of the sample

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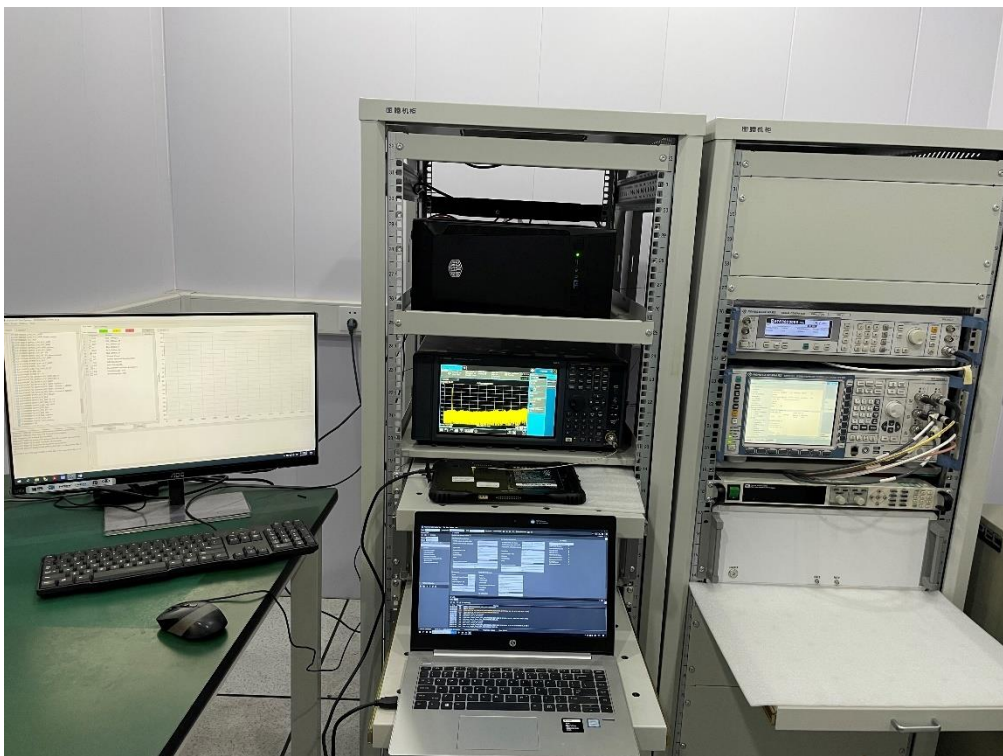
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5.2 Set-up for Conducted Emissions



5.3 Set-up for Conducted RF test at Antenna Port



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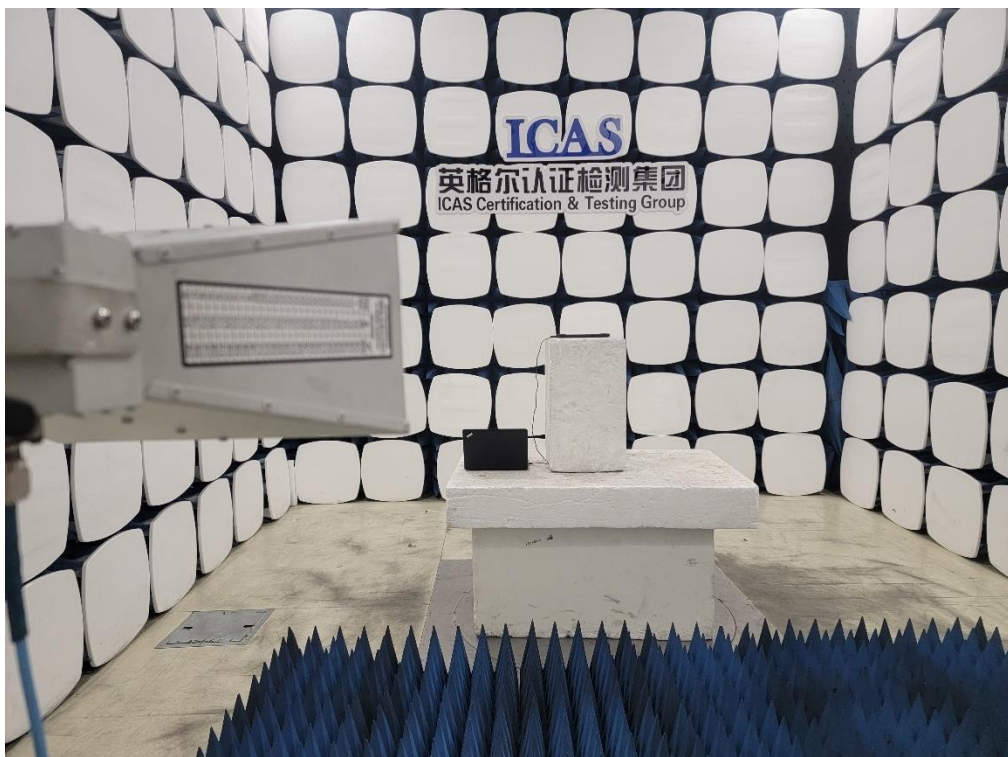
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5.4 Set-up for Spurious Emissions below 1GHz



5.5 Set-up for Spurious Emissions above 1GHz



End of the report