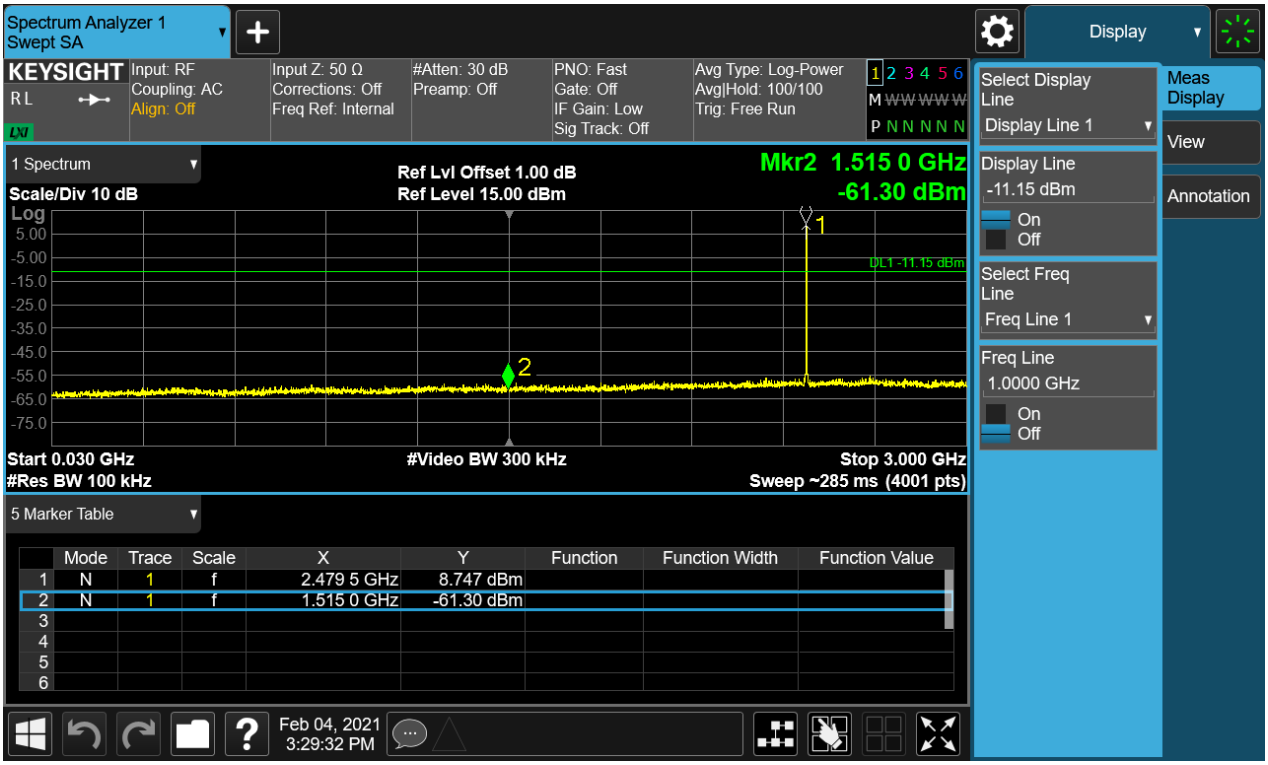
Conducted spurious emissions 30MHz-25GHz



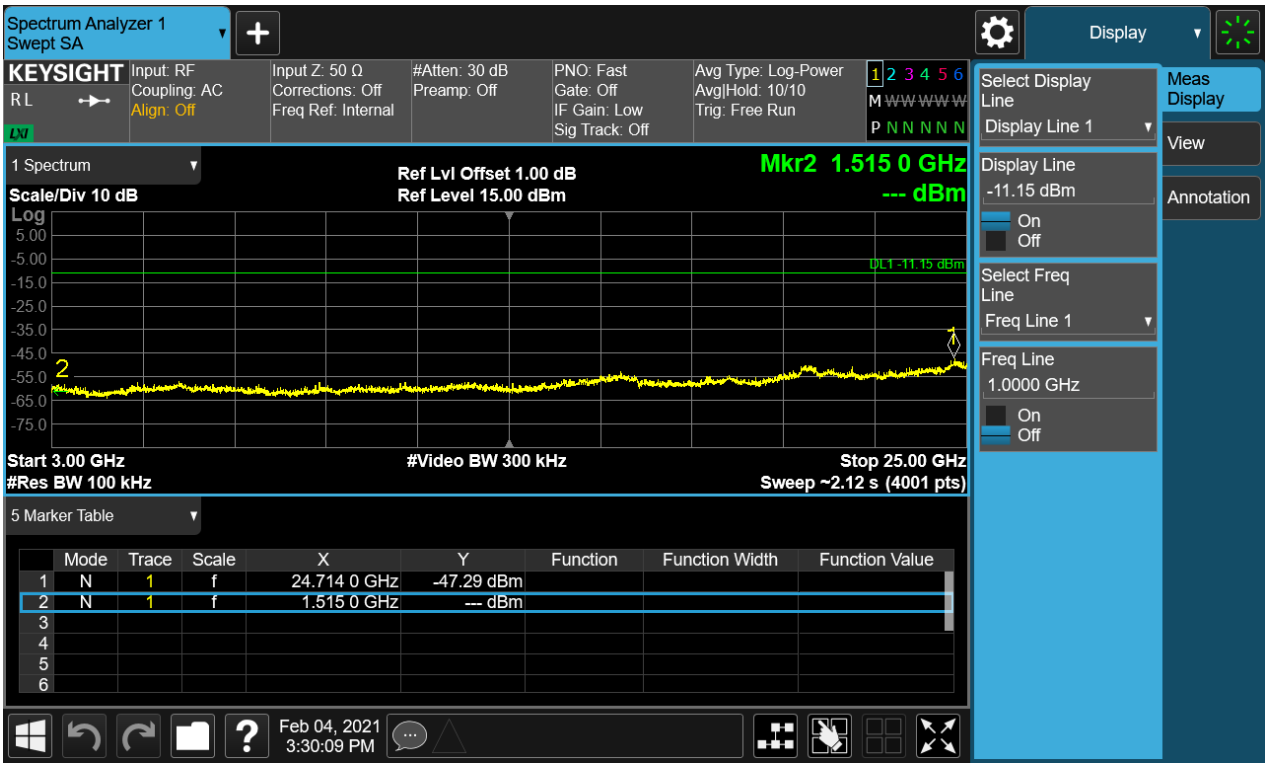
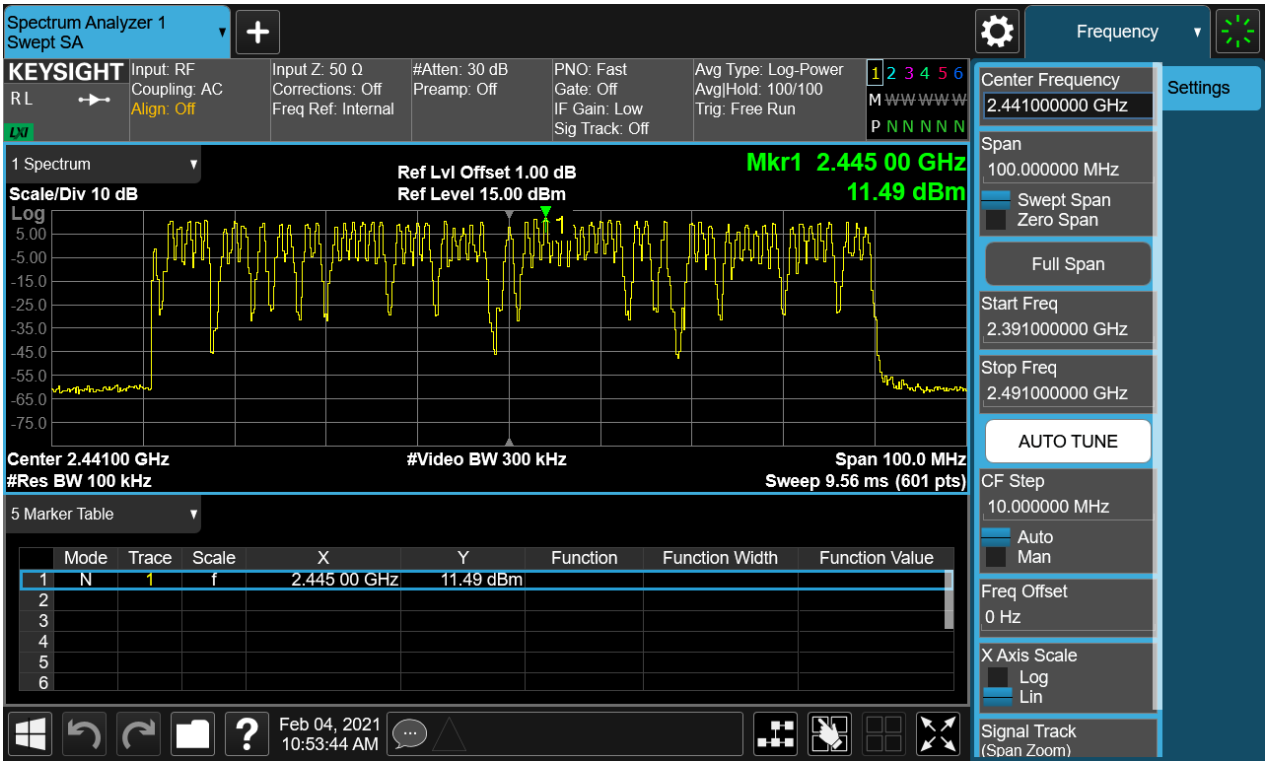


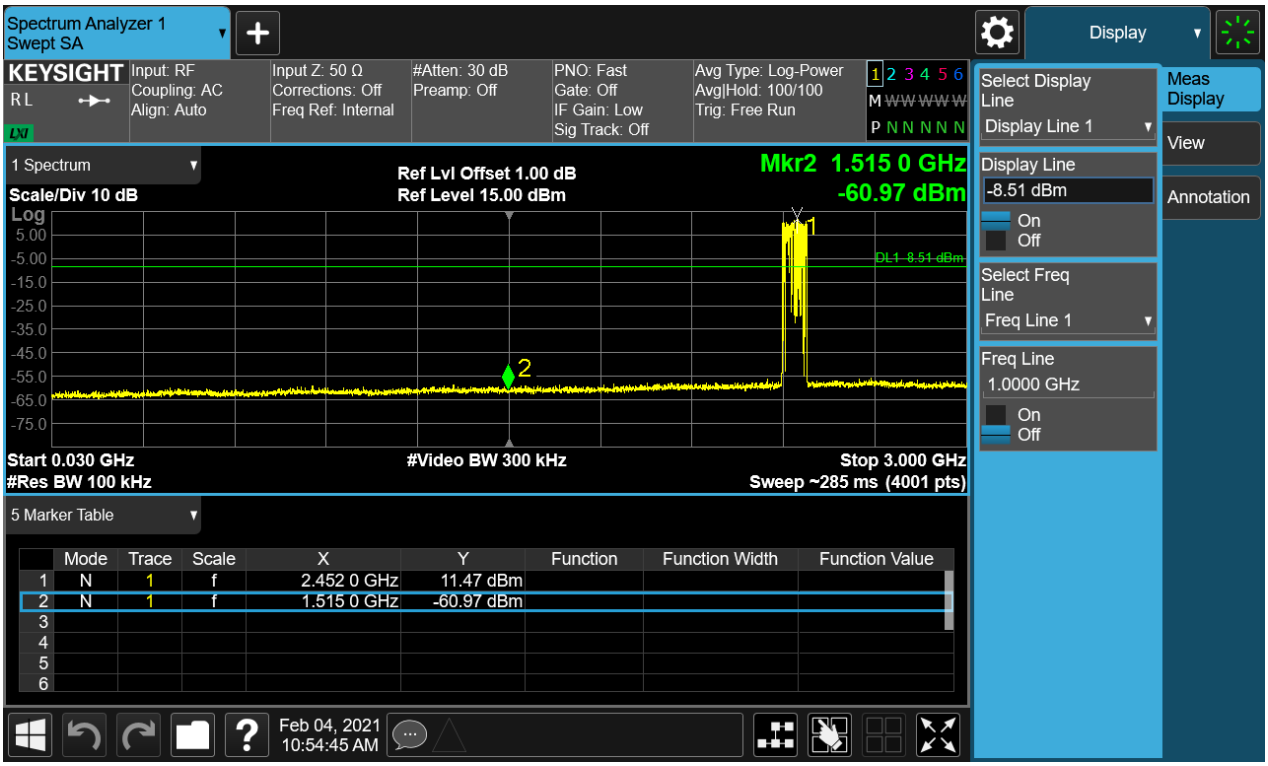
Figure 22: Conducted Spurious Emission & Authorized-band band-edge, Hopping Mode, GFSK Carrier Level



Band Edge(Low)

Band Edge(High)

Conducted spurious emissions 30MHz-25GHz



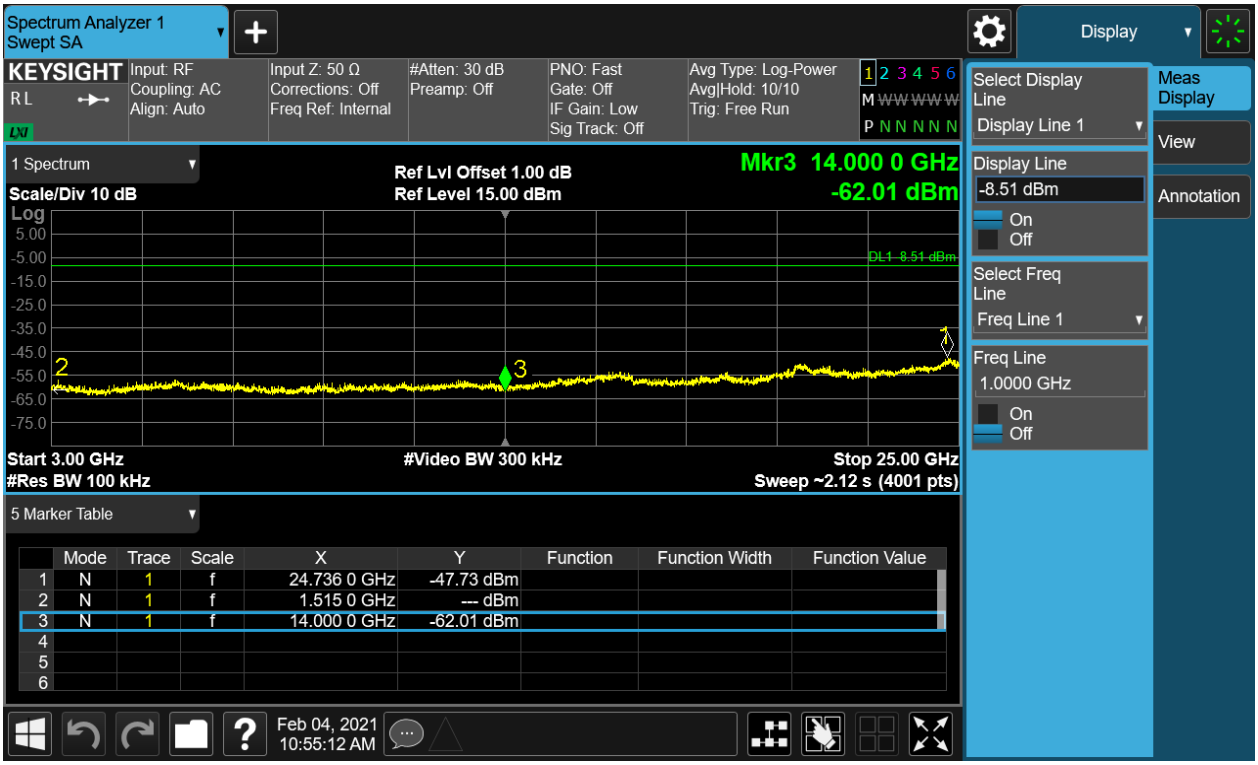
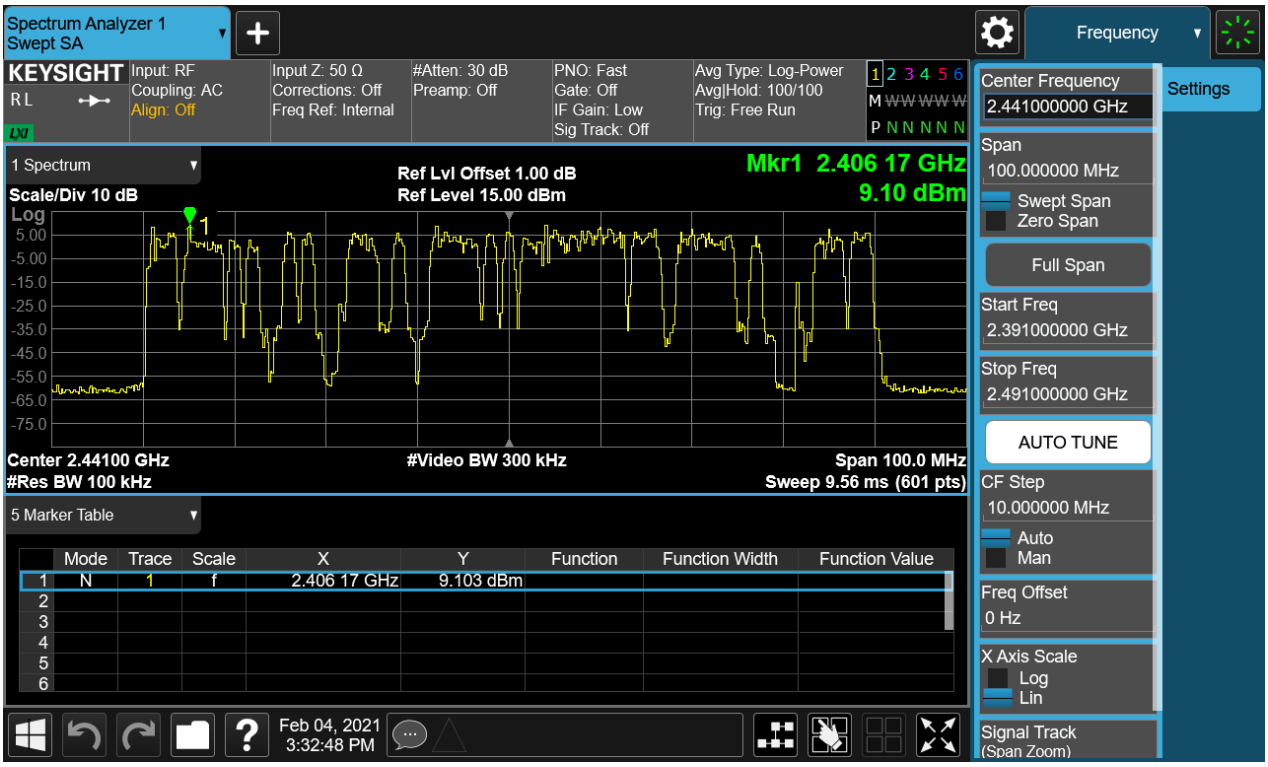
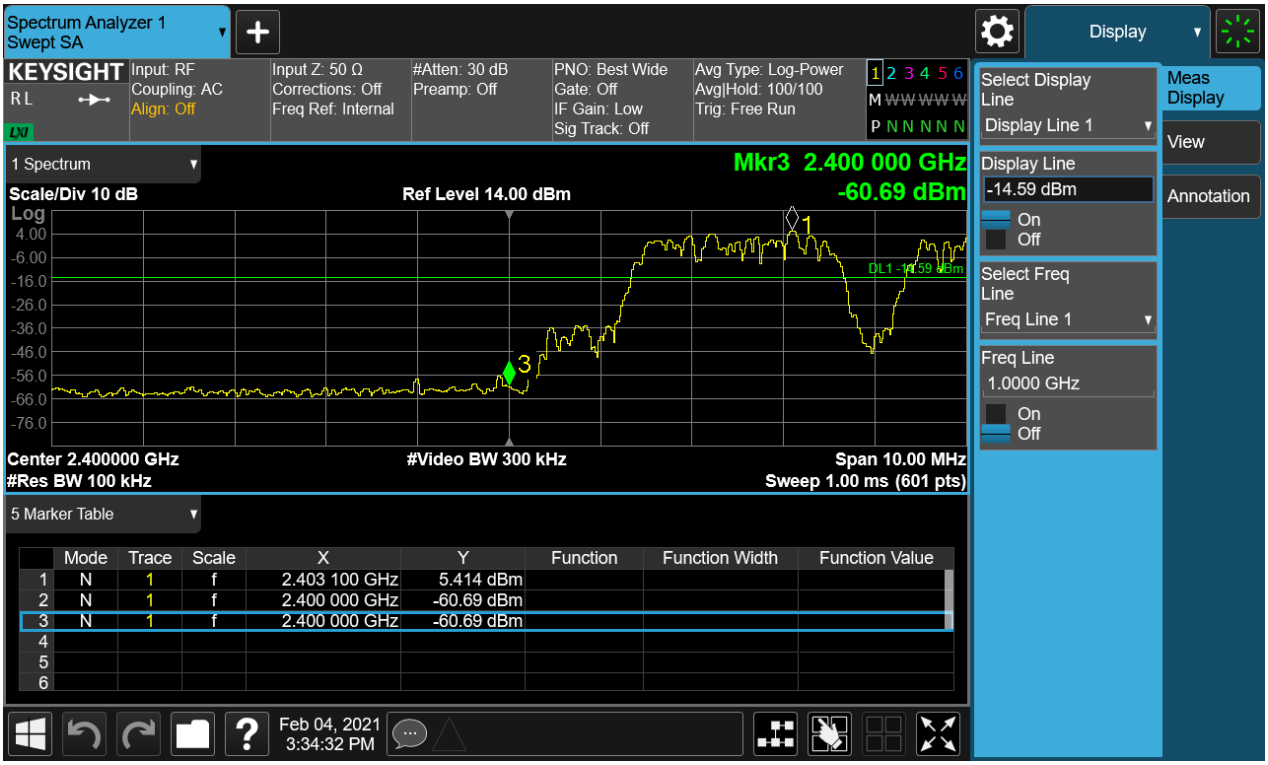


Figure 23: Conducted Spurious Emission & Authorized-band band-edge, Hopping Mode, 8-DPSK Carrier Level

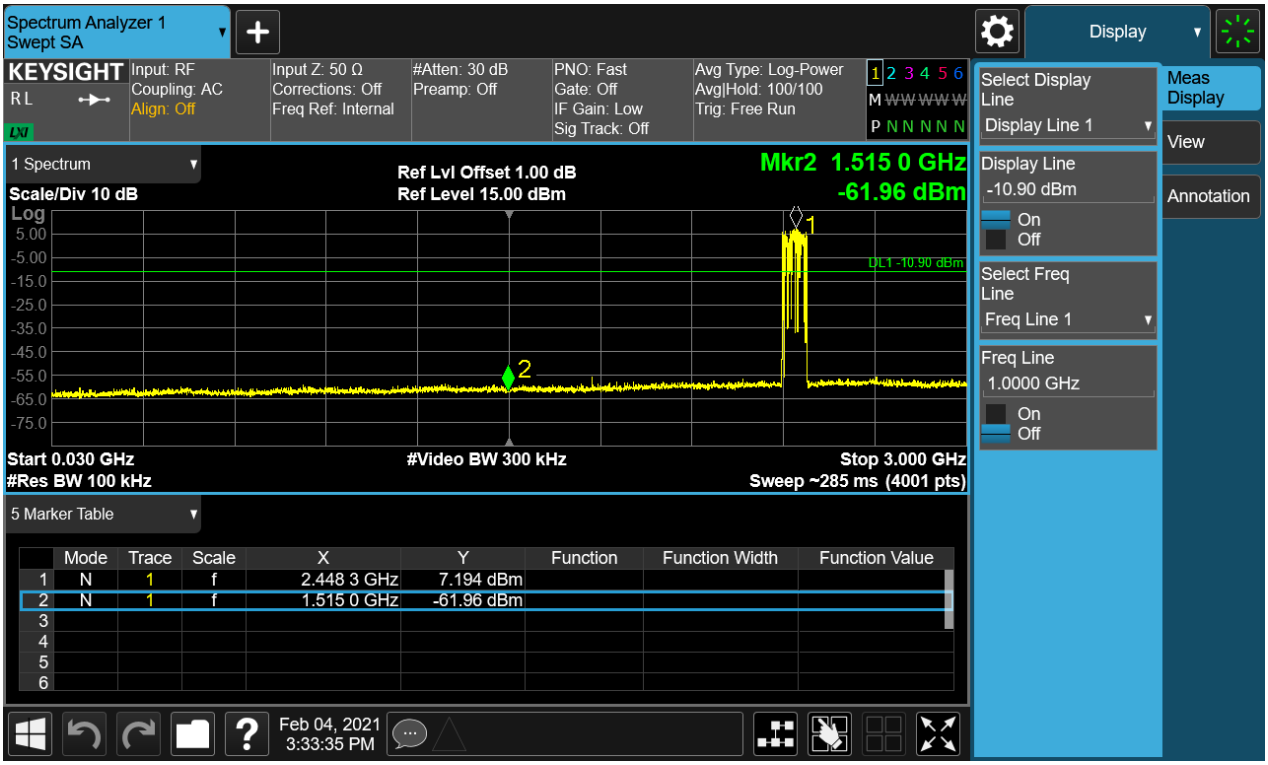


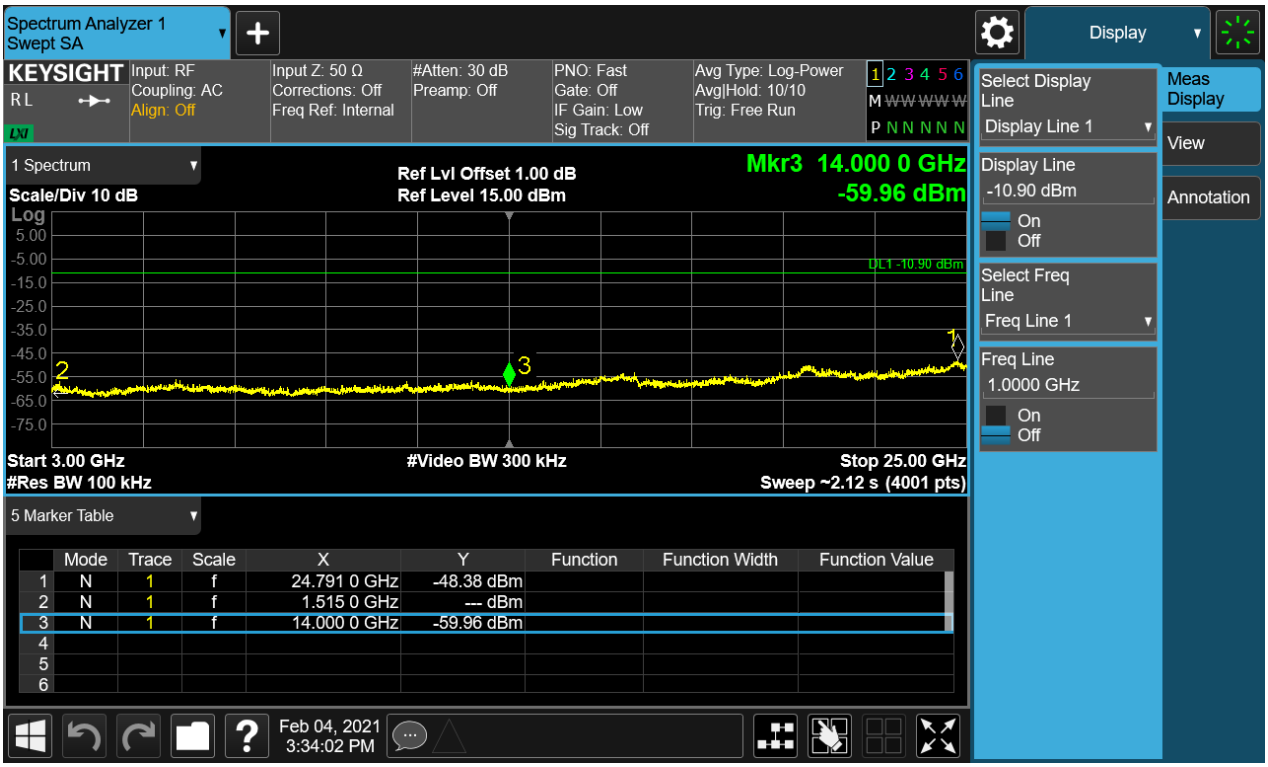
Band Edge(Low)



Band Edge(High)

Conducted spurious emissions 30MHz-25GHz





4.1.5 Spurious Emission

RESULT: **PASS**

Test standard	:	FCC Part 15.247(d), 15.205, 15.209 RSS-247 5.5
Requirement	:	ANSI C63.10-2013
Kind of test site	:	3m Semi-Anechoic Chamber

Test setup

Test Channel	:	Low/Middle/High
Operation Mode	:	A
Ambient temperature	:	23°C
Relative humidity	:	52%

Notes

Test plots please refer to the annex document "SHE20100017-02HE 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. The EUT is working in the Normal link mode below 1 GHz.

4.1.6 Band Edge (Restricted-band band-edge)

RESULT: **PASS**

Test standard	:	FCC Part 15.247(d), 15.205, 15.209 RSS-247 5.5
Requirement	:	ANSI C63.10-2013
Kind of test site	:	3m Semi-Anechoic Chamber

Test setup

Test Channel	:	Low/Middle/High
Operation Mode	:	A.1
Ambient temperature	:	23°C
Relative humidity	:	52%

Notes

Test plots please refer to the annex document “SHE20100017-02HE DATA BDEDR-TX EXHIBIT A”.

4.1.7 Hopping Frequency Separation

RESULT: **PASS**

Test standard	:	FCC Part 15.247(a)(1) RSS-247 5.1(2)
Requirement	:	ANSI C63.10-2013
Kind of test site	:	Shielded room

Test setup

Test Channel	:	Hopping
Operation Mode	:	A.1.a.iv
Ambient temperature	:	23°C
Relative humidity	:	52%

Table 4: Hopping Frequency Separation

Mode	Frequency (MHz)	Channel Separation (MHz)	Limit (MHz)
GFSK	2441	1.020	≥ 25kHz or two-thirds of 20dB bandwidth
8-DPSK	2441	0.855	

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

Figure 24: Hopping Frequency Separation, Hopping Mode, GFSK

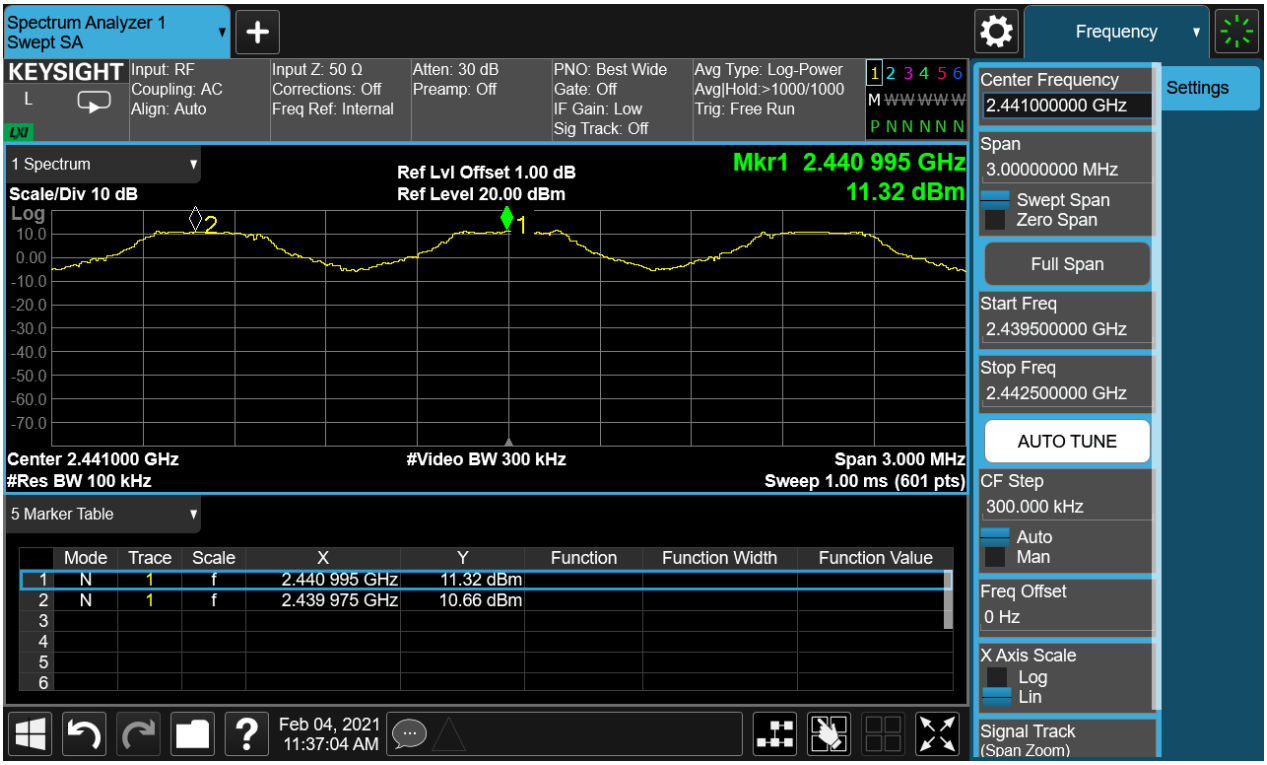
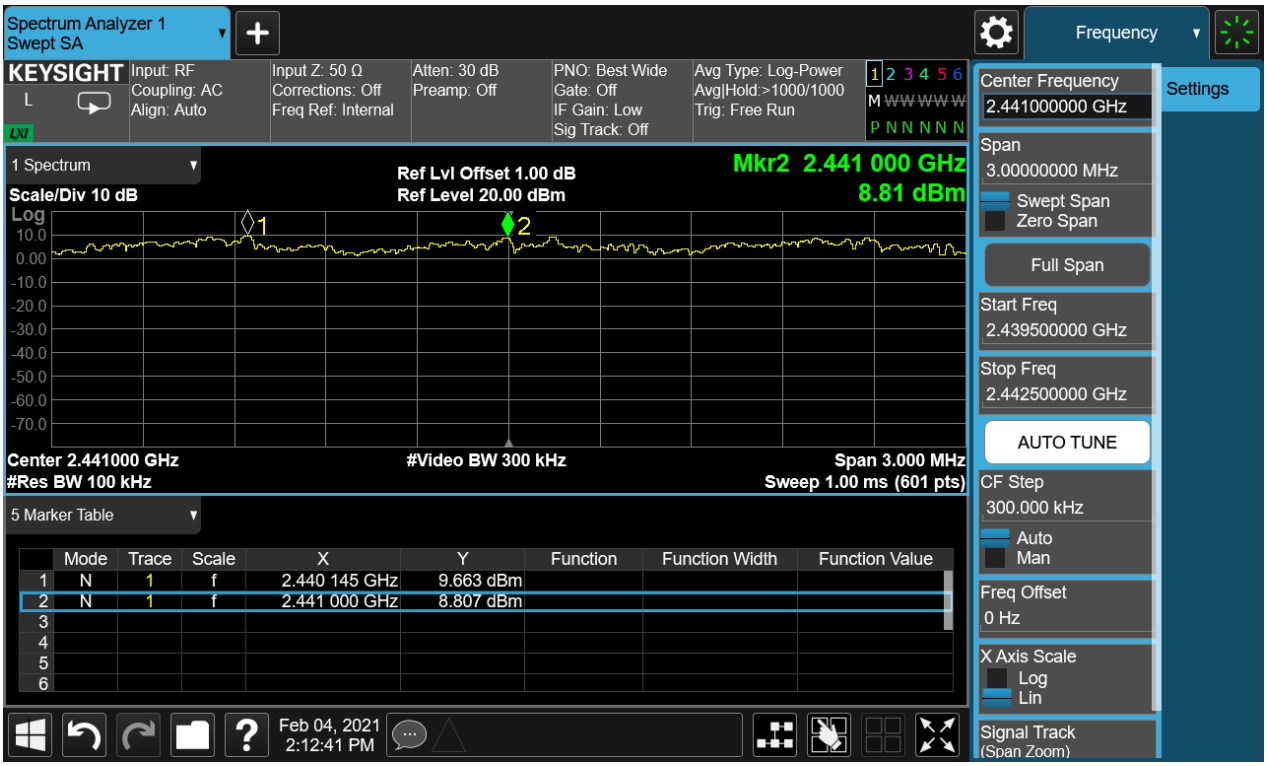


Figure 25: Hopping Frequency Separation, Hopping Mode, 8DPSK



4.1.8 Number of Hopping Frequency

RESULT: **PASS**

Test standard	:	FCC Part 15.247(a)(1)(iii) RSS-247 5.1(4)
Requirement	:	ANSI C63.10-2013
Kind of test site	:	Shielded room

Test setup

Test Channel	:	Hopping
Operation Mode	:	A.1.a.iv
Ambient temperature	:	23°C
Relative humidity	:	52%

Table 5: Number of Hopping Frequency

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

Figure 26: Number of Hopping Frequency, Hopping Mode, GFSK

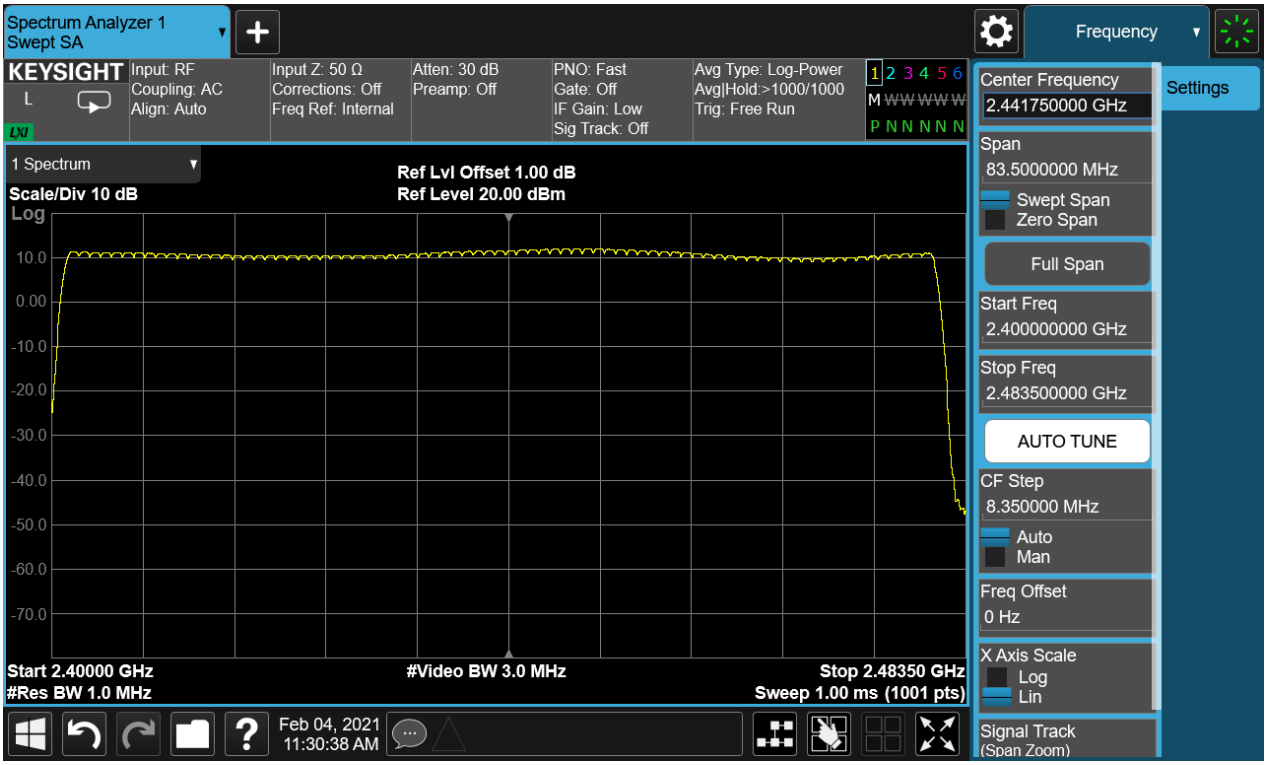
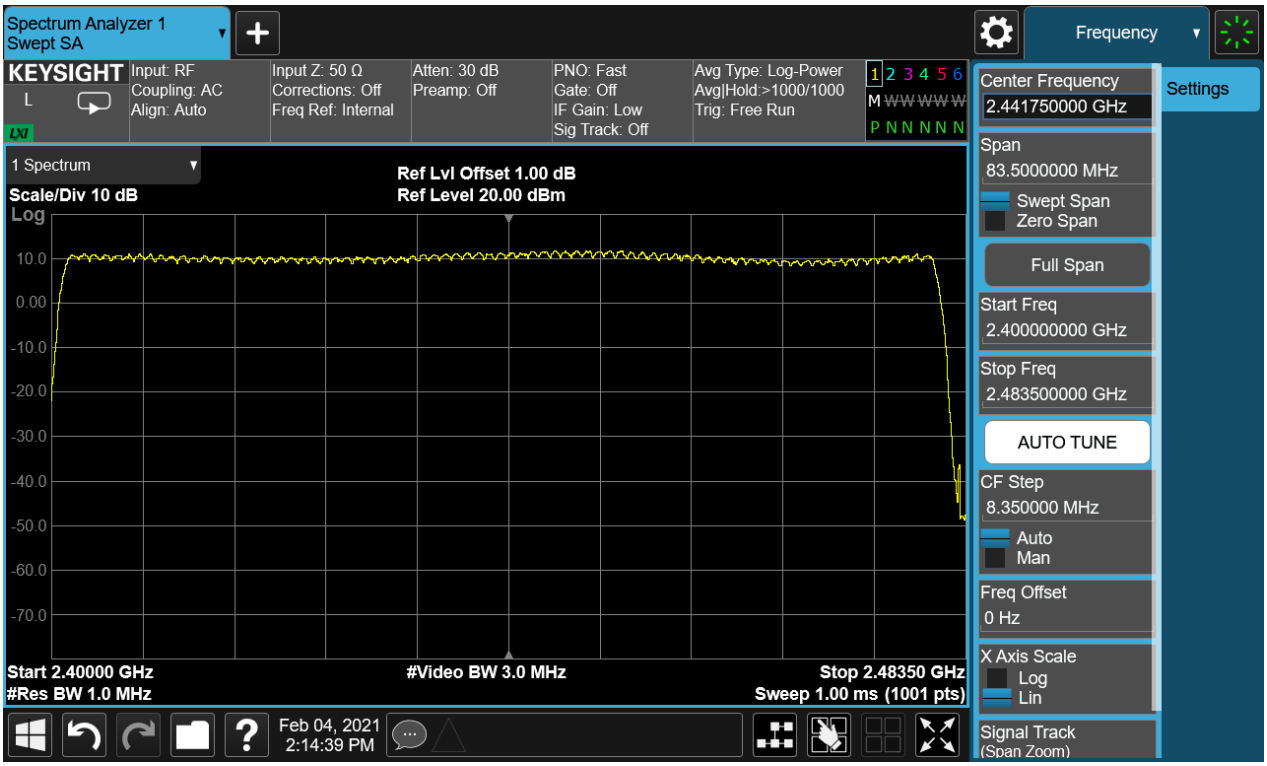


Figure 27: Number of Hopping Frequency, Hopping Mode, 8-DPSK



4.1.9 Time of Occupancy

RESULT: **PASS**

Test standard	:	FCC Part 15.247(a)(1)(iii) RSS-247 5.1(4)
Requirement	:	ANSI C63.10-2013
Kind of test site	:	Shielded room

Test setup

Test Channel	:	Middle
Operation Mode	:	A.1.a
Ambient temperature	:	23°C
Relative humidity	:	52%

Table 6: Time of Occupancy

Mode	Packet Type	Pulse Time (ms)	Total of Dwell (ms)	Limit (s)
GFSK	DH1	0.4033	129.056	0.4
	DH3	1.6650	266.400	0.4
	DH5	2.9200	311.467	0.4
8-DPSK	DH1	0.4083	130.656	0.4
	DH3	1.6650	266.400	0.4
	DH5	2.9200	311.467	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

Figure 28: Time of Occupancy, 2441MHz, GFSK DH1

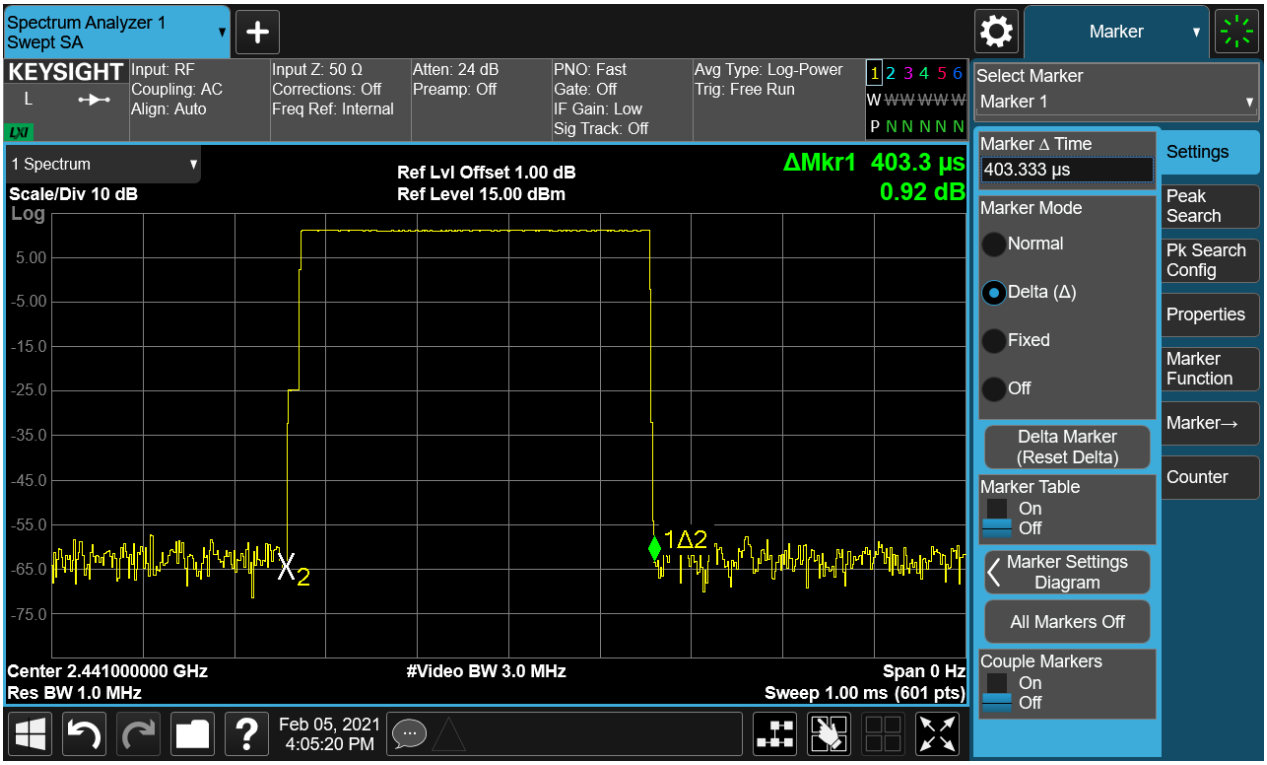


Figure 26: Time of Occupancy, 2441MHz, GFSK DH3

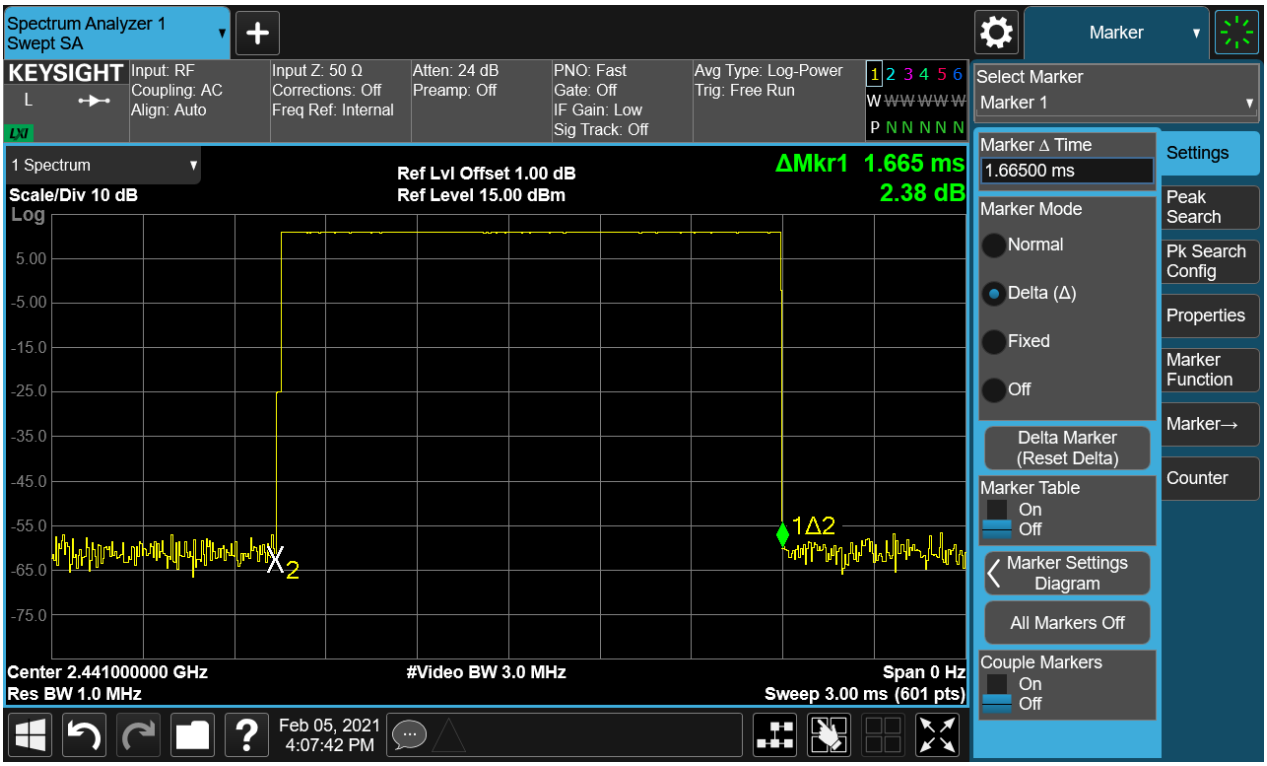


Figure 30: Time of Occupancy, 2441MHz, GFSK DH5

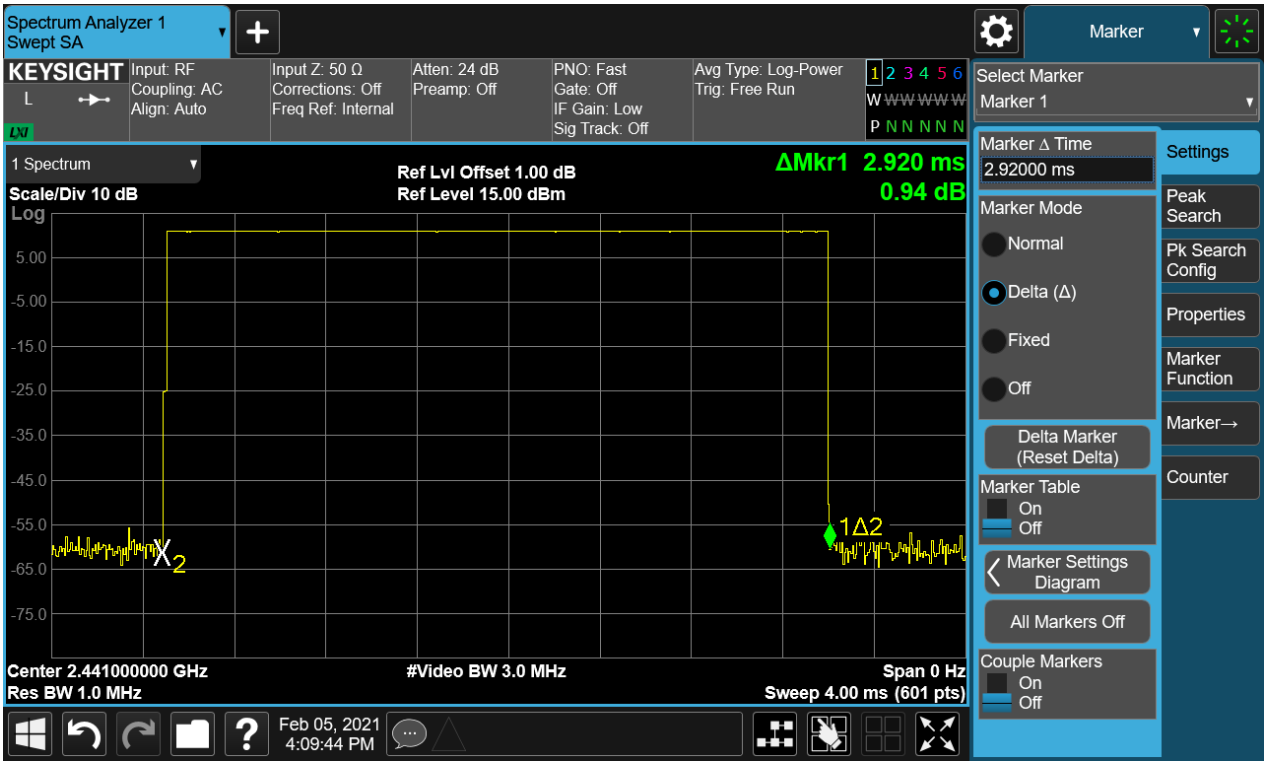


Figure 31: Time of Occupancy, 2441MHz, 8-DPSK DH1

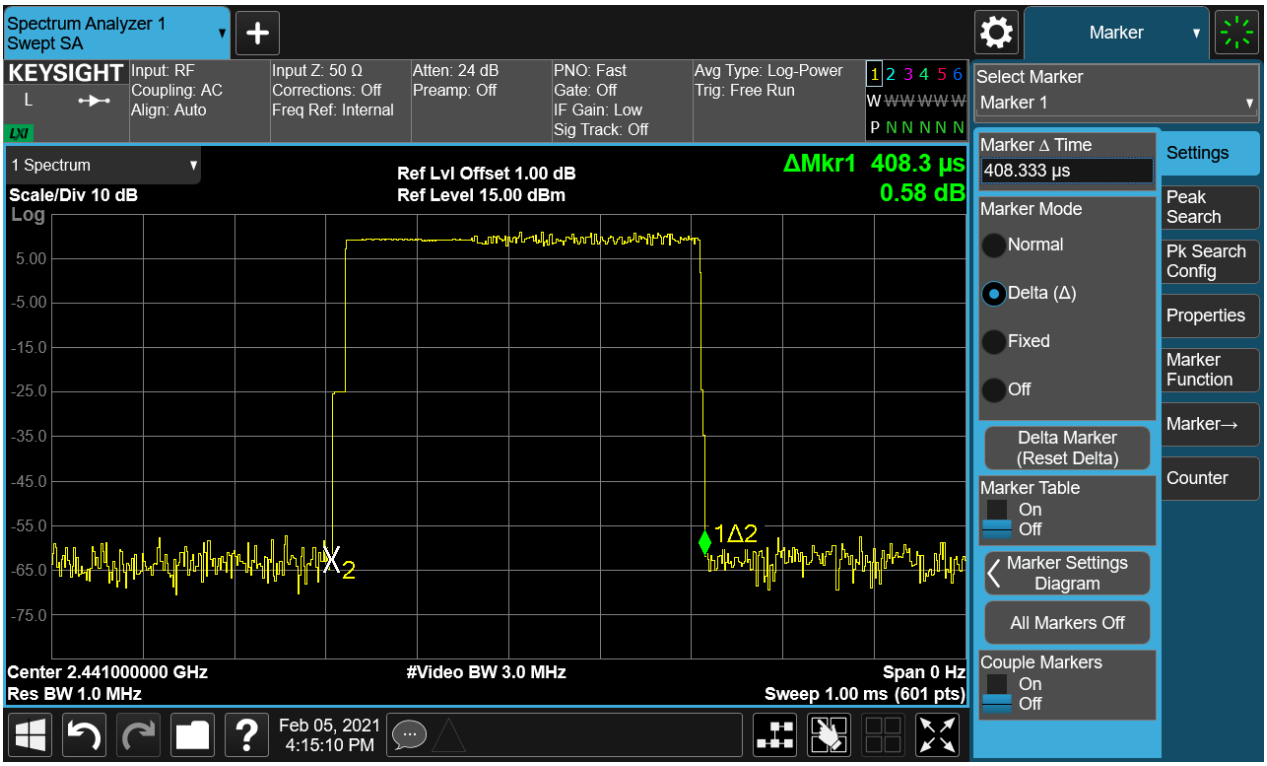


Figure 32: Time of Occupancy, 2441MHz, 8-DPSK DH3

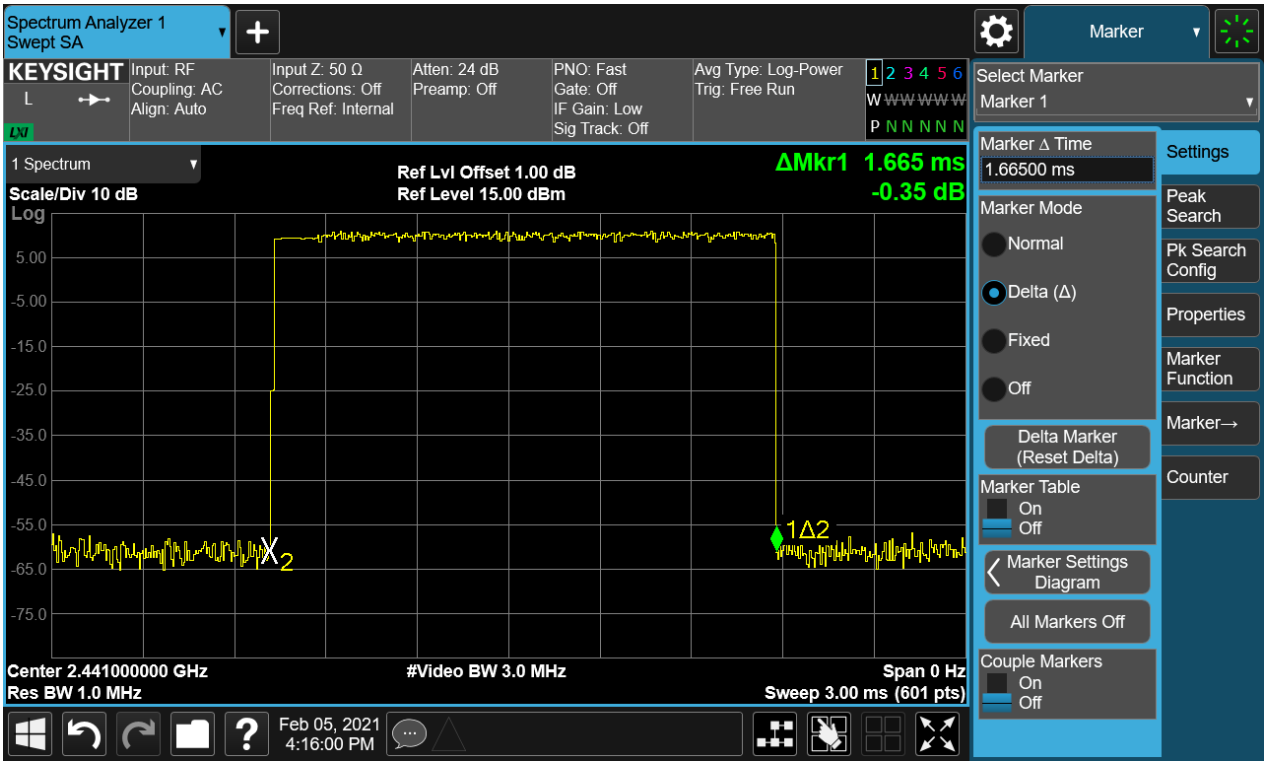
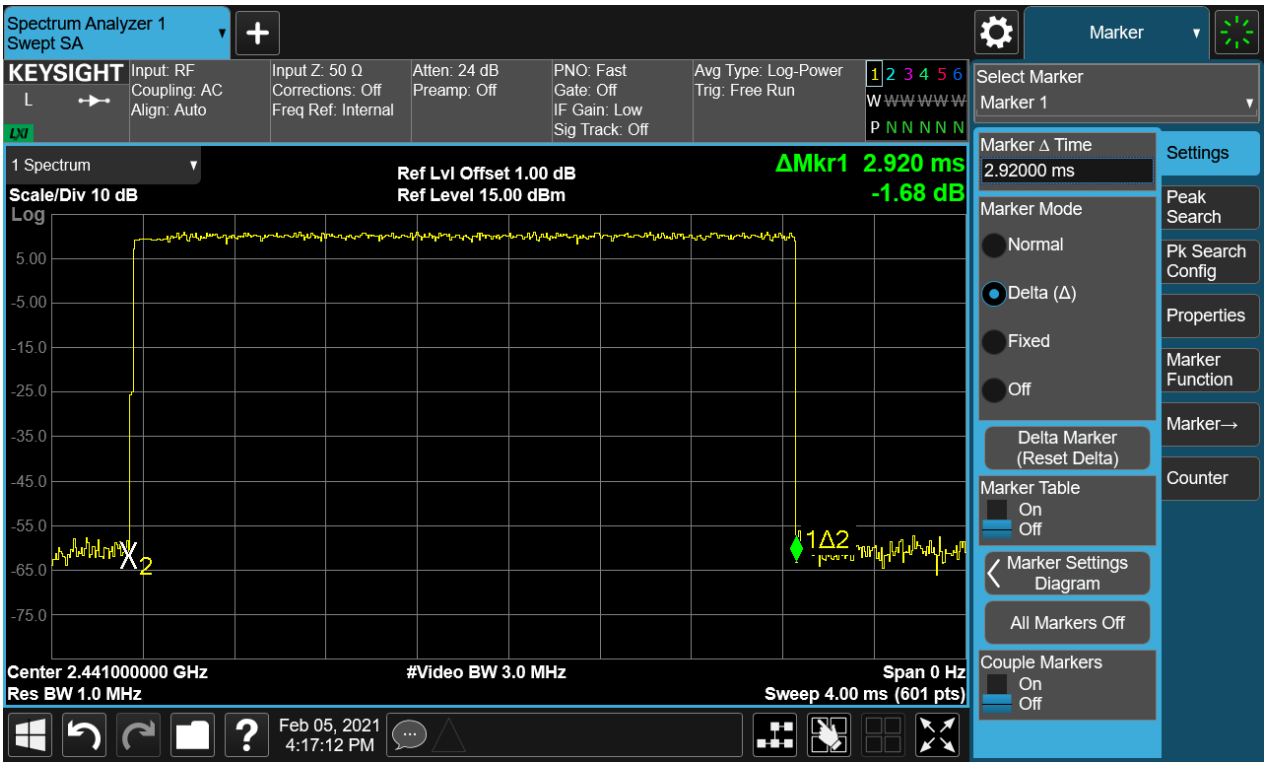


Figure 33: Time of Occupancy, 2441MHz, 8-DPSK DH5



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
Kind of test site	:	Shielded room

Test setup

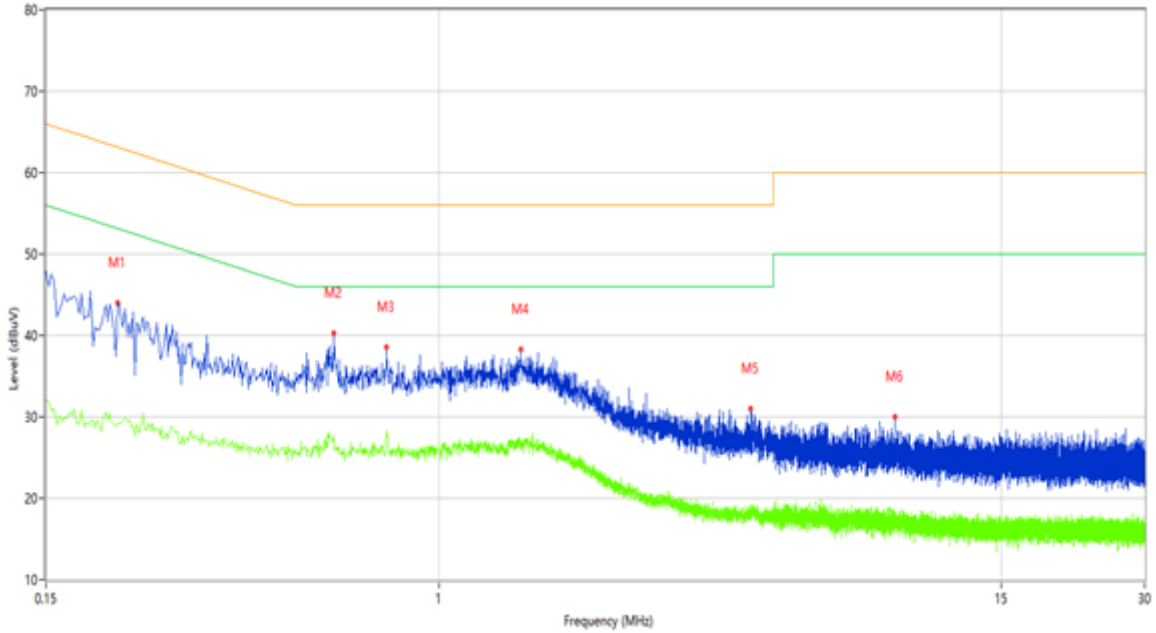
Input Voltage	:	AC 120V, 60Hz; AC 240V, 50Hz
Operation Mode	:	A.1.a
Earthing	:	Not Connected
Ambient temperature	:	23°C
Relative humidity	:	52%

For details refer to following test plot.

Note：

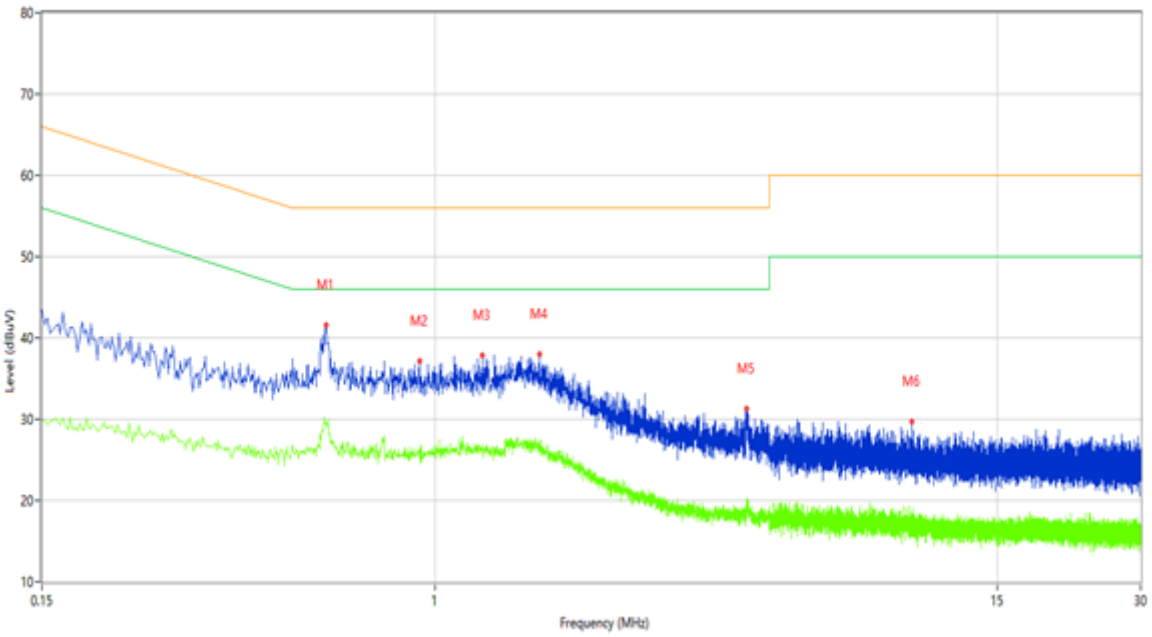
The all configurations were tested respectively, but only the worst configuration shown here.

Figure 34: Conducted Emission on AC Mains, L Phase



No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Over Limit (dB)	Detector	Line	Verdict
1	0.212	40.02	9.67	63.13	-23.11	Peak	L	Pass
1*	0.212	34.28	9.67	63.13	-28.85	QP	L	Pass
1**	0.212	29.13	9.67	53.13	-24.00	AV	L	Pass
2	0.600	36.97	9.76	56.00	-19.03	Peak	L	Pass
2*	0.600	30.06	9.76	56.00	-25.94	QP	L	Pass
2**	0.600	27.64	9.76	46.00	-18.36	AV	L	Pass
3	0.776	33.97	9.75	56.00	-22.03	Peak	L	Pass
3*	0.776	26.09	9.75	56.00	-29.91	QP	L	Pass
3**	0.776	28.31	9.75	46.00	-17.69	AV	L	Pass
4	1.484	32.77	9.67	56.00	-23.23	Peak	L	Pass
4*	1.484	23.54	9.67	56.00	-32.46	QP	L	Pass
4**	1.484	27.03	9.67	46.00	-18.97	AV	L	Pass
5	4.484	25.14	9.69	56.00	-30.86	Peak	L	Pass
5*	4.484	18.32	9.69	56.00	-37.68	QP	L	Pass
5**	4.484	18.59	9.69	46.00	-27.41	AV	L	Pass
6	9.008	21.29	9.67	60.00	-38.71	Peak	L	Pass
6*	9.008	15.10	9.67	60.00	-44.90	QP	L	Pass
6**	9.008	17.01	9.67	50.00	-32.99	AV	L	Pass

Figure 35: Conducted Emission on AC Mains, N Phase



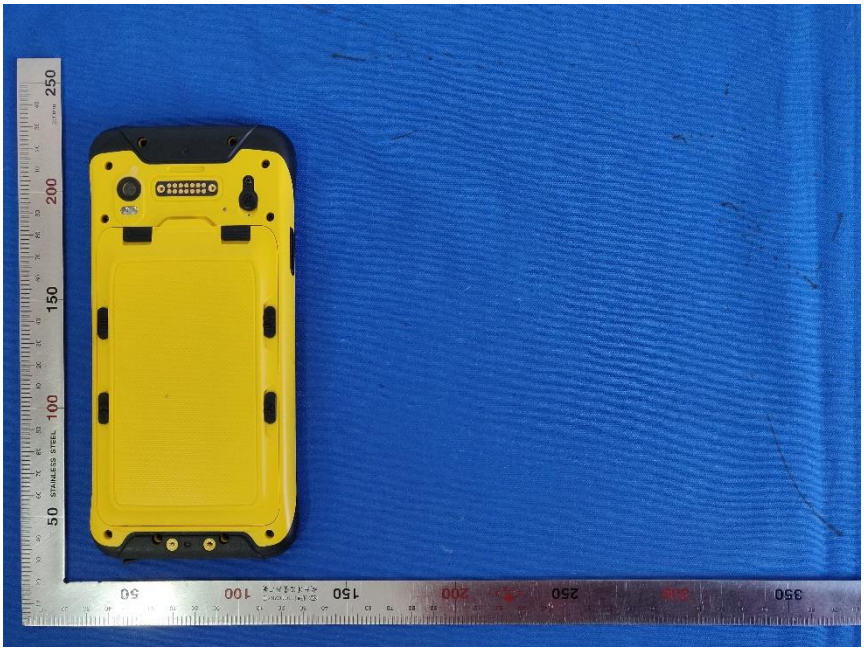
No.	Frequency (MHz)	Results (dBuV)	Factor (dB)	Limit (dBuV)	Over Limit (dB)	Detector	Line	Verdict
1	0.590	41.70	9.76	56.00	-14.30	Peak	N	Pass
1*	0.590	36.72	9.76	56.00	-19.28	QP	N	Pass
1**	0.590	29.55	9.76	46.00	-16.45	AV	N	Pass
2	0.926	29.79	9.76	56.00	-26.21	Peak	N	Pass
2*	0.926	21.89	9.76	56.00	-34.11	QP	N	Pass
2**	0.926	26.27	9.76	46.00	-19.73	AV	N	Pass
3	1.252	31.51	9.67	56.00	-24.49	Peak	N	Pass
3*	1.252	24.59	9.67	56.00	-31.41	QP	N	Pass
3**	1.252	26.59	9.67	46.00	-19.41	AV	N	Pass
4	1.652	34.49	9.67	56.00	-21.51	Peak	N	Pass
4*	1.652	23.63	9.67	56.00	-32.37	QP	N	Pass
4**	1.652	27.46	9.67	46.00	-18.54	AV	N	Pass
5	4.492	25.78	9.69	56.00	-30.22	Peak	N	Pass
5*	4.492	17.21	9.69	56.00	-38.79	QP	N	Pass
5**	4.492	19.23	9.69	46.00	-26.77	AV	N	Pass
6	9.964	21.32	9.65	60.00	-38.68	Peak	N	Pass
6*	9.964	13.95	9.65	60.00	-46.05	QP	N	Pass
6**	9.964	18.03	9.65	50.00	-31.97	AV	N	Pass

5 Appendixes

5.1 Photographs of the Sample

TDC600_2 Model

Front of the sample



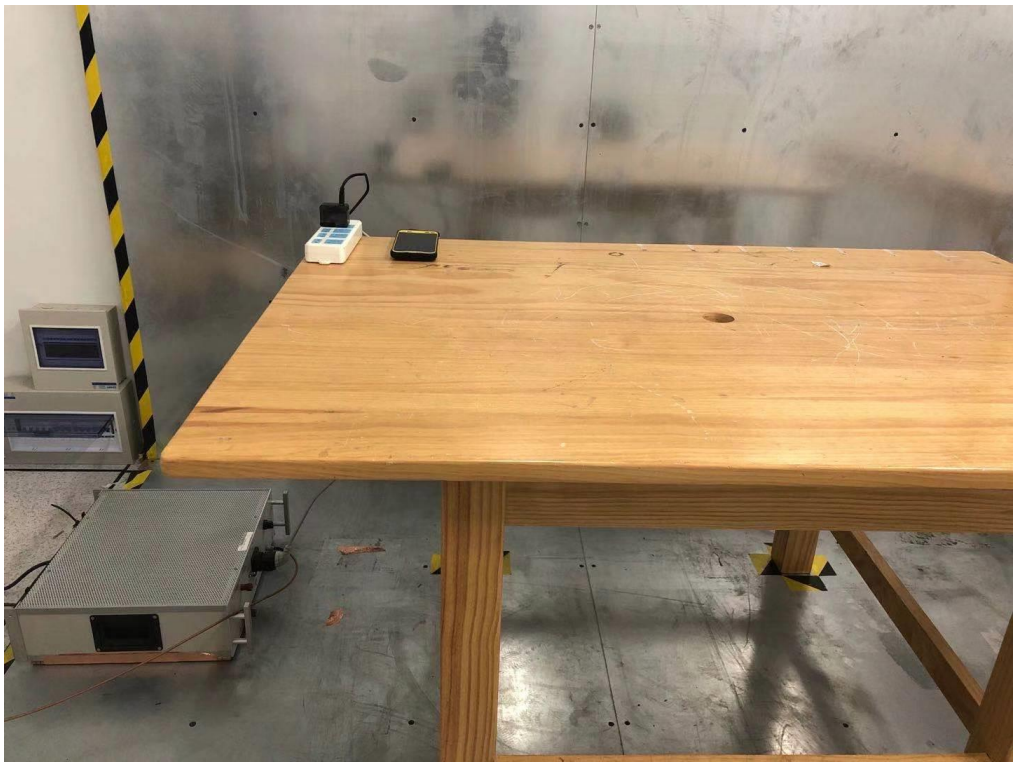
Rear of the sample

MobileMapper60_2 Model

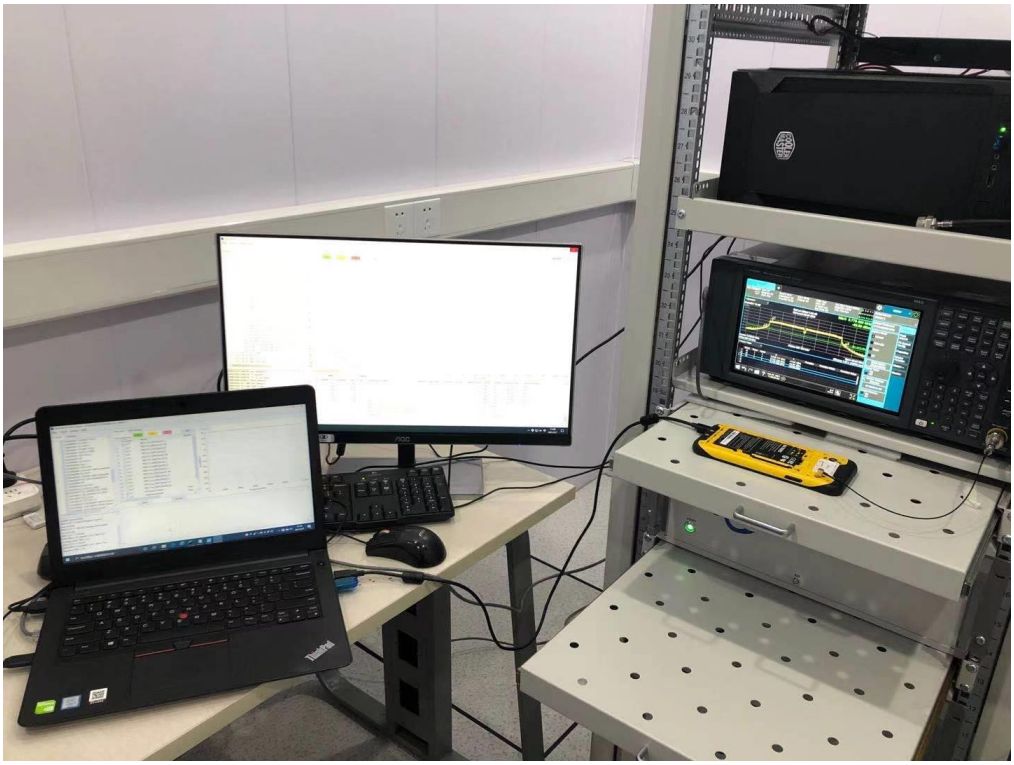
Front of the sample

Rear of the sample

5.2 Set-up for Conducted Emissions

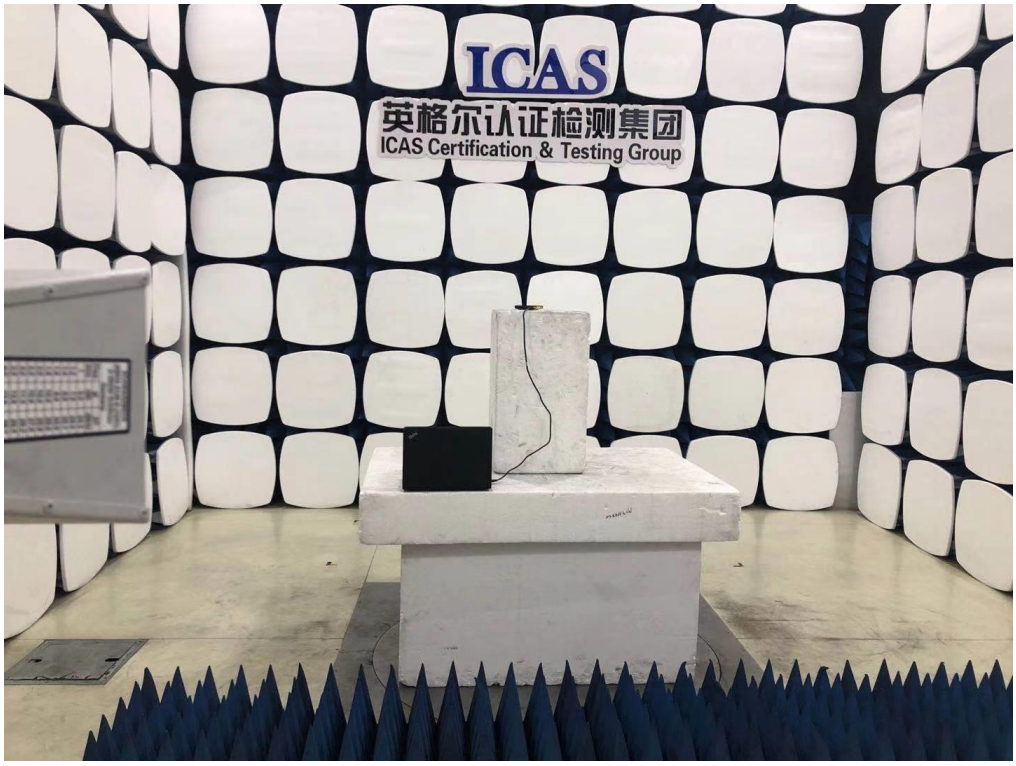


5.3 Set-up for Conducted RF test at Antenna Port



5.4 Set-up for Spurious Emissions below 1GHz

5.5 Set-up for Spurious Emissions above 1GHz



End of the report