Test Procedures

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/50 uH of coupling impedance for the measuring instrument.
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
c. The frequency range from 150 kHz to 30 MHz was searched. Emission levels under (Limit – 20 dB) was not recorded.

Note: The resolution bandwidth and video bandwidth of test receiver is 9 kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15 MHz – 30 MHz.

Test Results

Please refer to Appendix B.

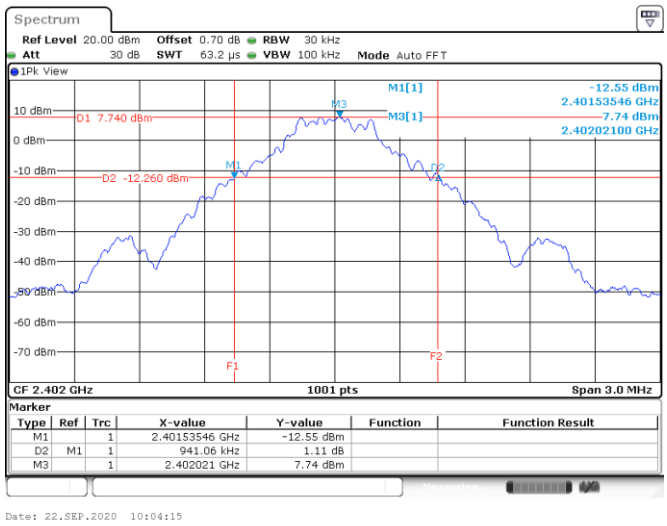
Appendix A: Test Results of Conducted Test_37130-AGJ5

Test Result of 20 dB Bandwidth

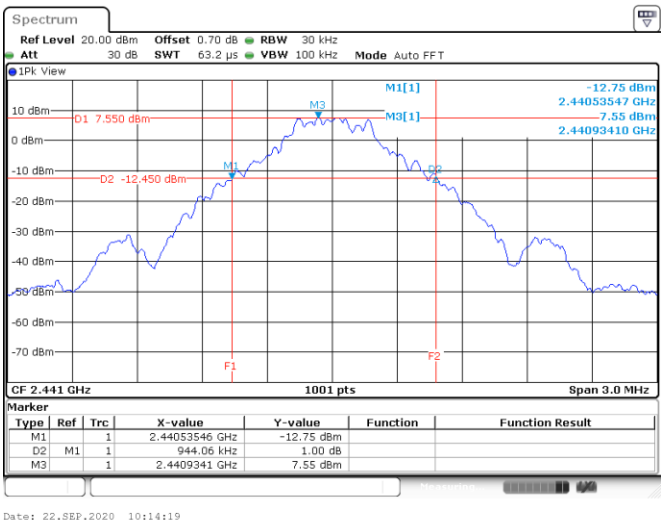
GFSK

Channel	Channel Frequency (MHz)	20 dB Bandwidth (kHz)	Result
Low Channel	2402	941.06	Pass
Middle Channel	2441	944.06	Pass
High Channel	2480	944.06	Pass

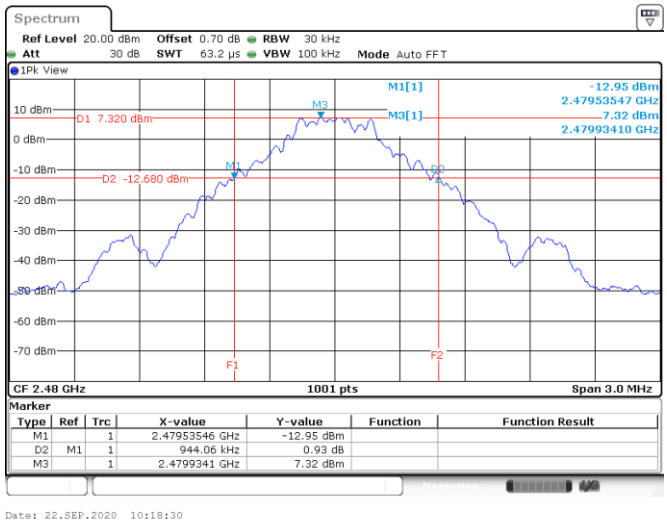
Low Channel



Middle Channel



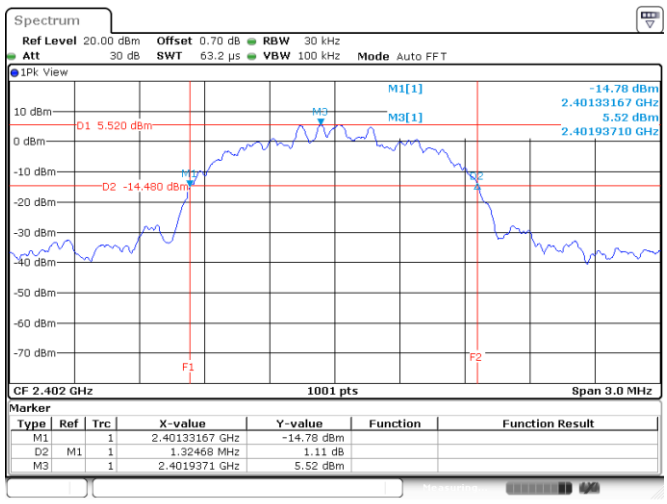
High Channel



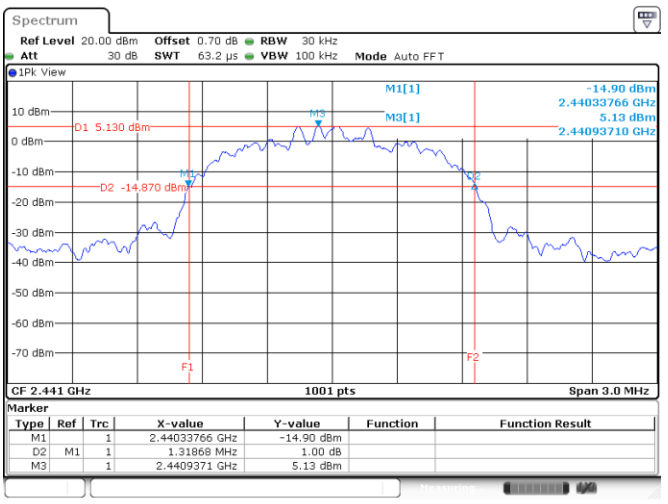
8DPSK

Channel	Channel Frequency (MHz)	20 dB Bandwidth (kHz)	Result
Low Channel	2402	1324.68	Pass
Middle Channel	2441	1318.68	Pass
High Channel	2480	1318.70	Pass

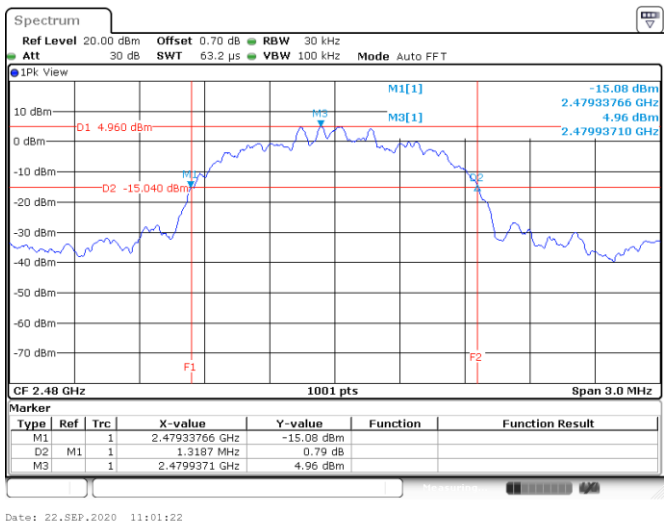
Low Channel



Middle Channel



High Channel

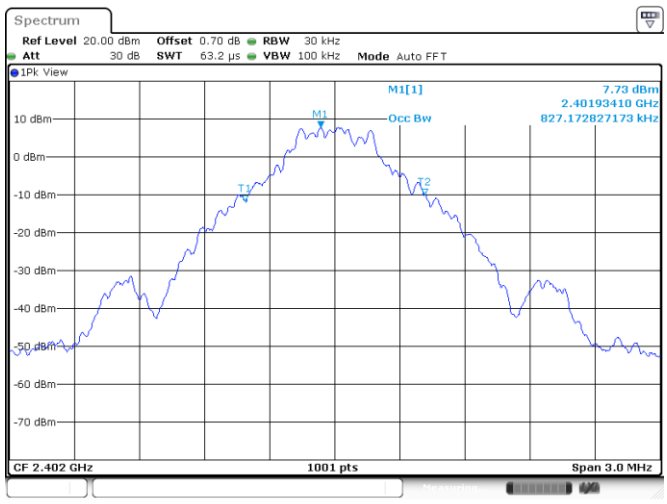


Test Result of 99% Occupied Bandwidth

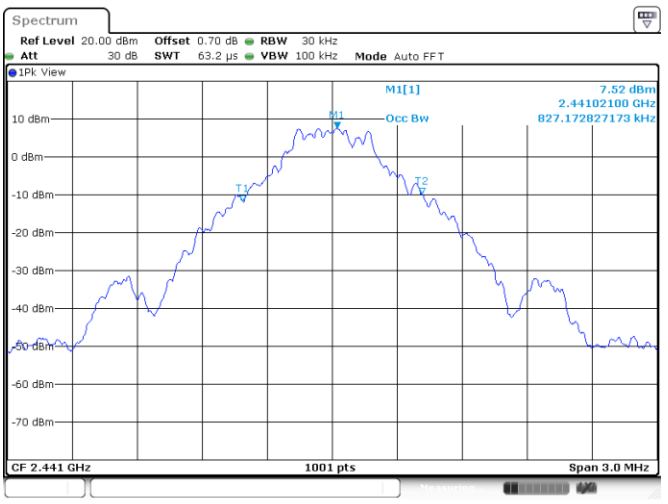
GFSK

Channel	Channel Frequency (MHz)	99% Bandwidth (kHz)
Low Channel	2402	827.17
Middle Channel	2441	827.17
High Channel	2480	839.16

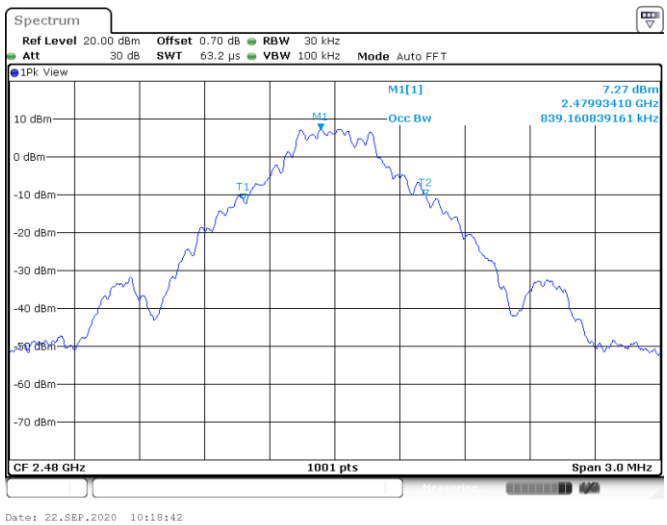
Low Channel



Middle Channel



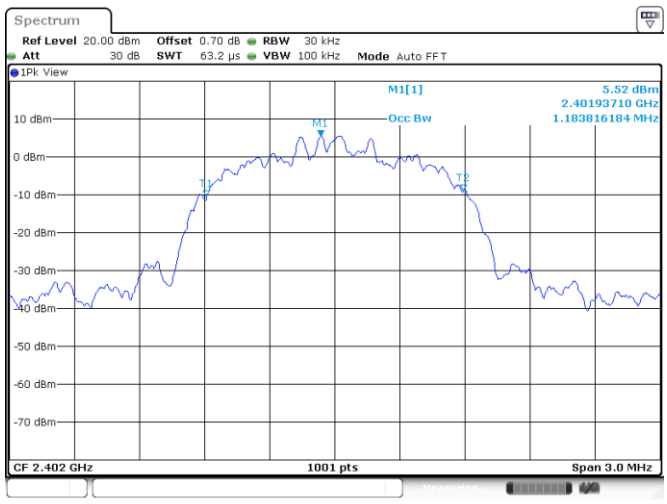
High Channel



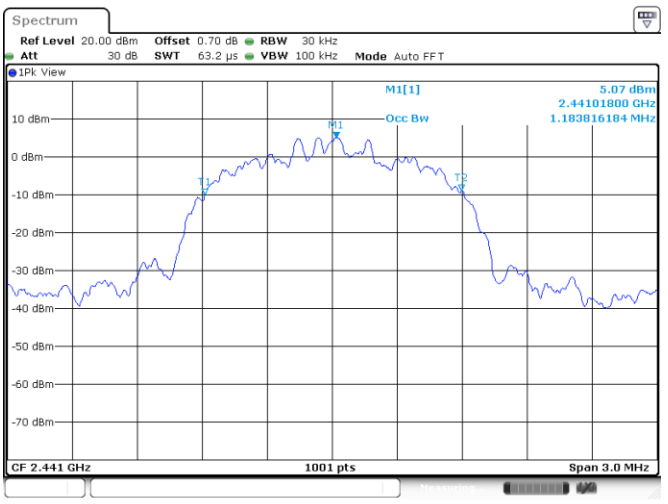
8DPSK

Channel	Channel Frequency (MHz)	99% Bandwidth (kHz)
Low Channel	2402	1183.82
Middle Channel	2441	1183.82
High Channel	2480	1183.82

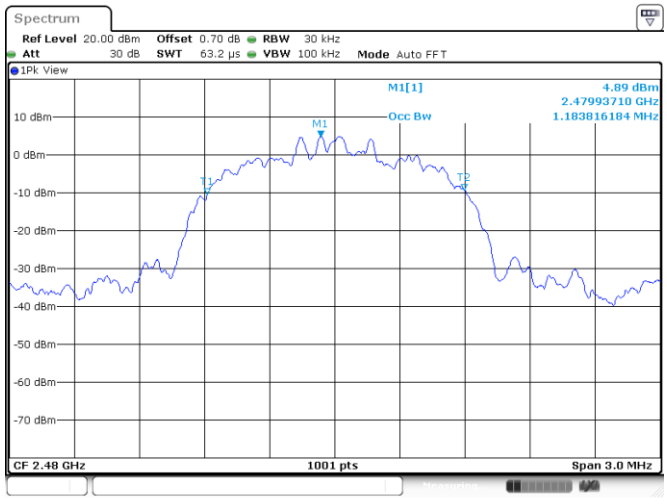
Low Channel



Middle Channel



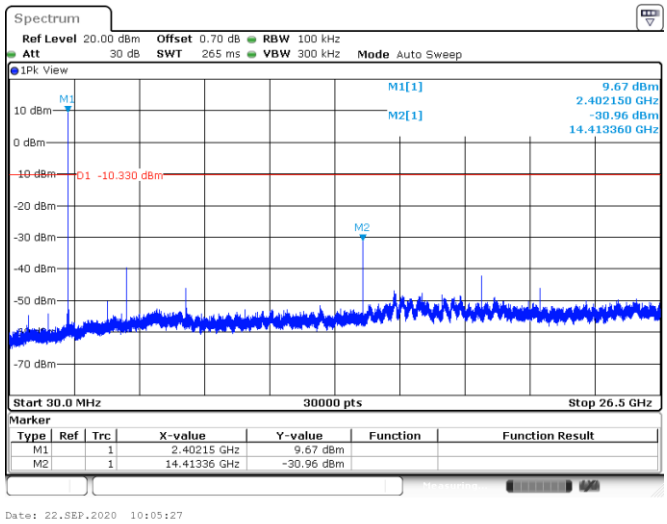
High Channel



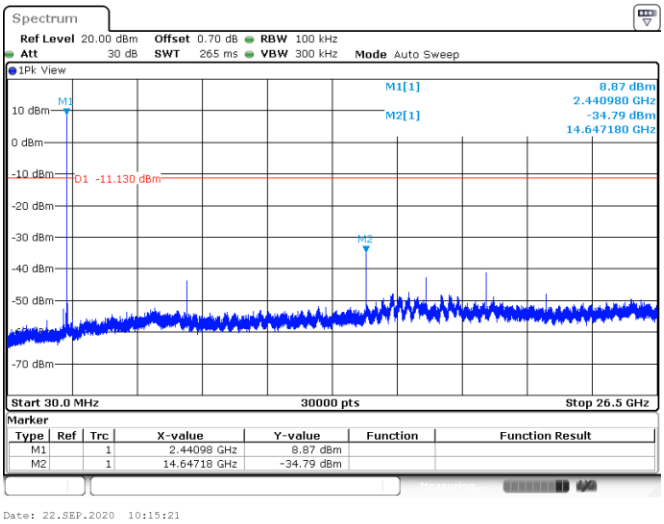
Test Result of Conducted Spurious Emissions, Tx Mode

GFSK

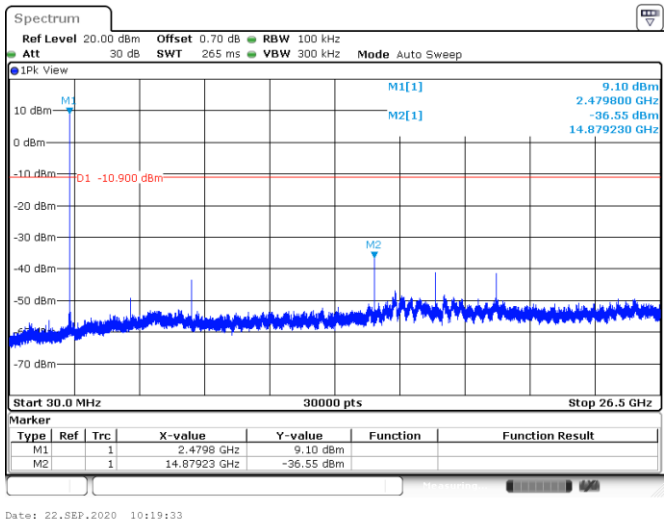
Low Channel



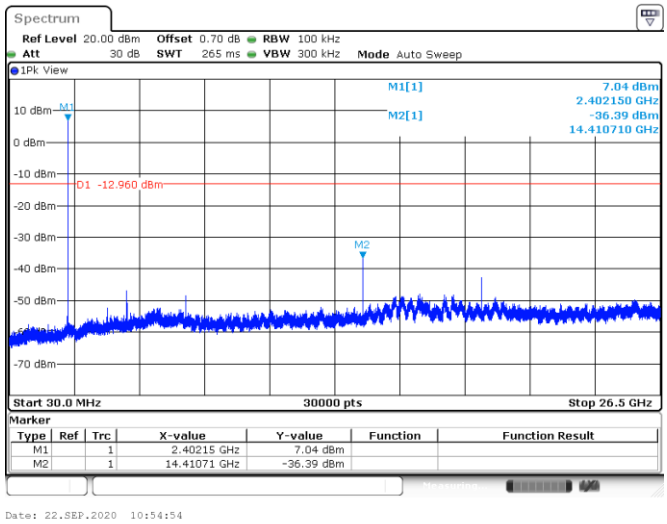
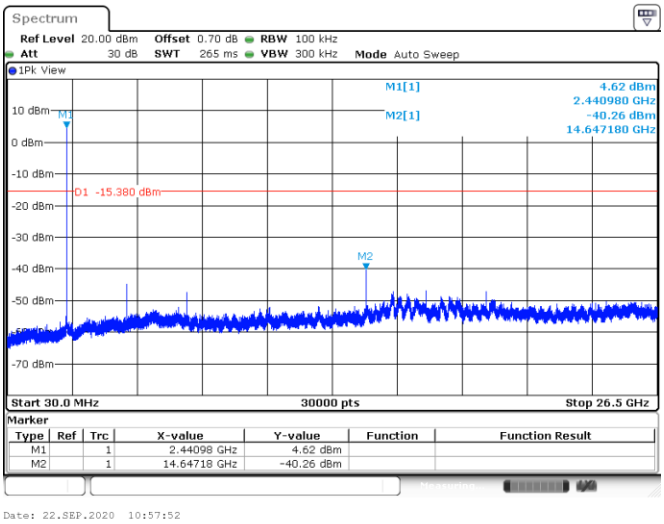
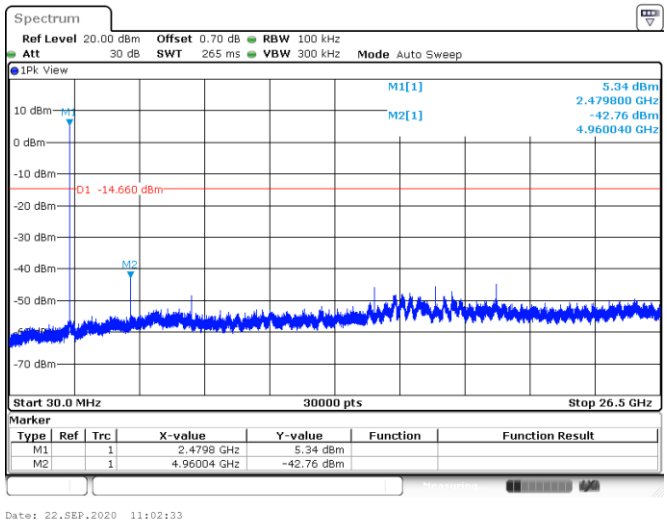
Middle Channel



High Channel

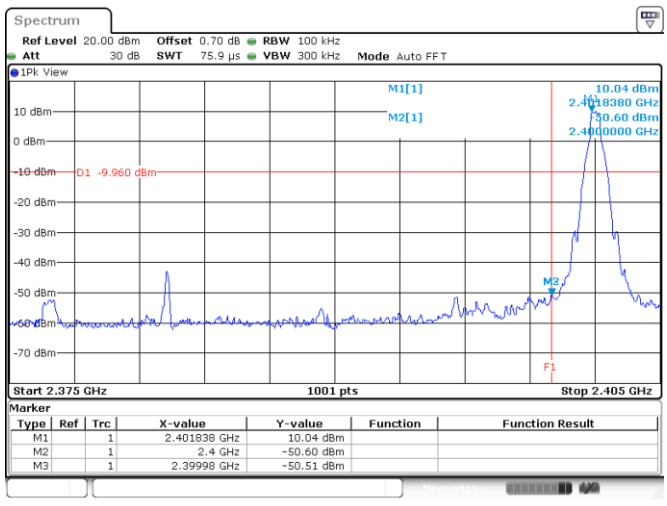
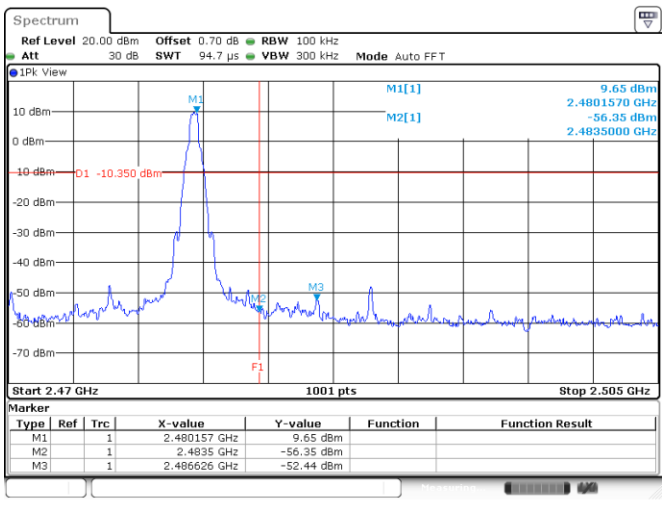


8DPSK

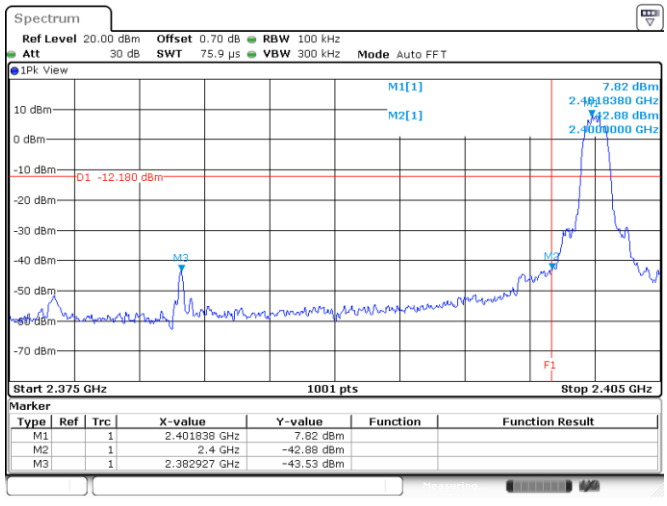
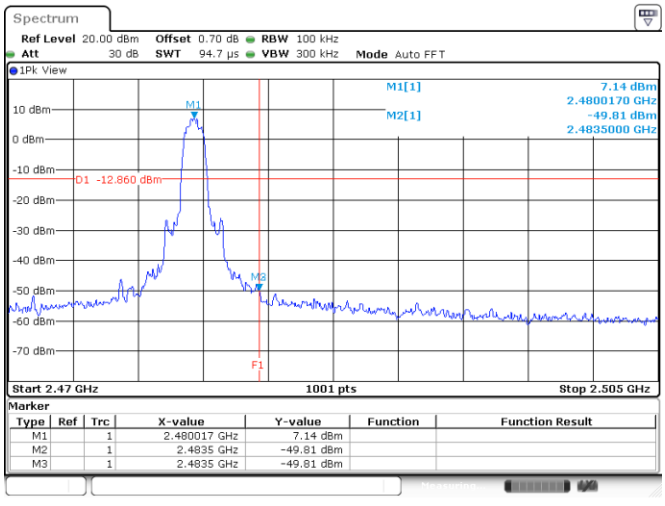
Low Channel	Middle Channel
	
High Channel	
	

Test Result of Conducted Band Edge, Tx Mode

GFSK

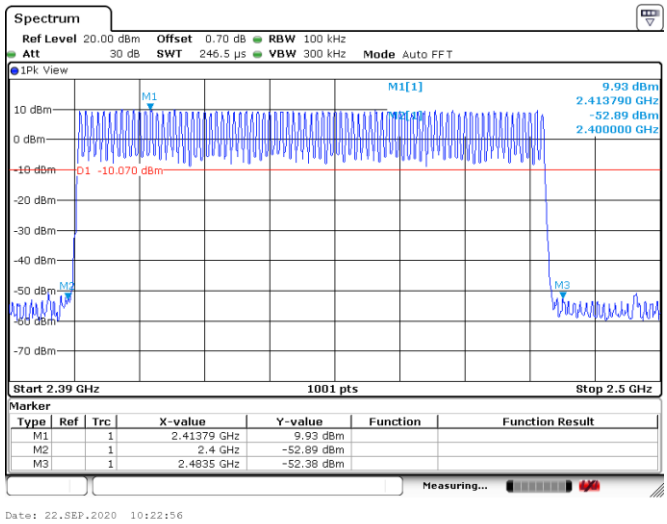
Low Channel	High Channel
	

8DPSK

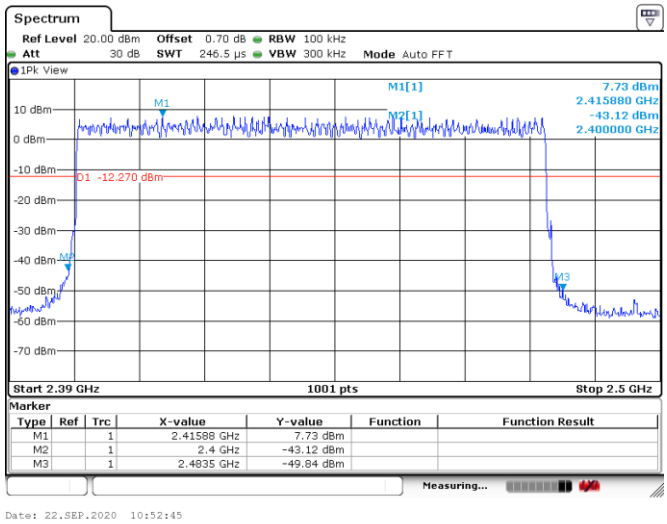
Low Channel	High Channel
	

Test Result of Hopping Band Edge

GFSK

Middle Channel	
	

8DPSK

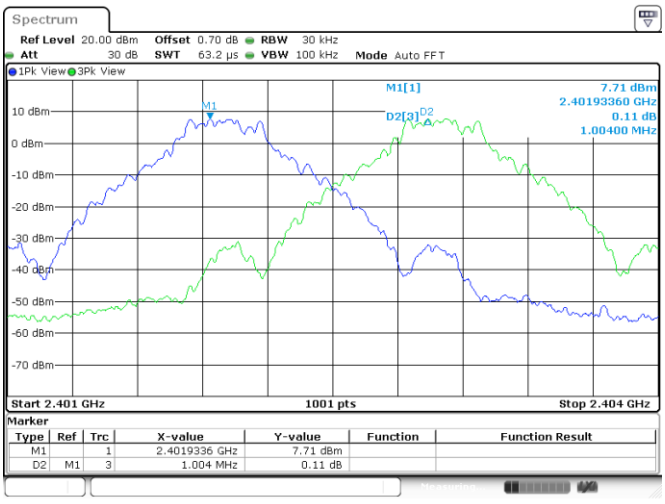
Middle Channel	
	

Test Result of Hopping Channel Separation

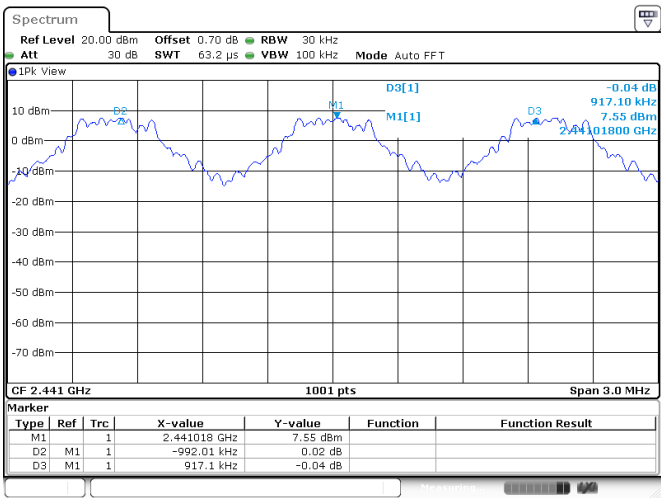
GFSK

Channel	Channel Frequency (MHz)	Adjacent Channel Separation (MHz)	20 dB Bandwidth (kHz)	Minimum Limit (MHz)	Result
0	2402	1.00	941.06	0.627	Pass
39	2441	0.92	944.06	0.629	Pass
78	2480	0.91	944.06	0.629	Pass

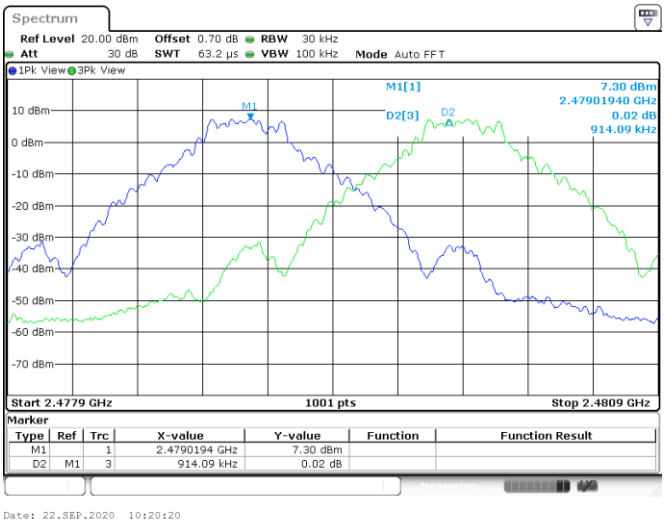
Low Channel



Middle Channel



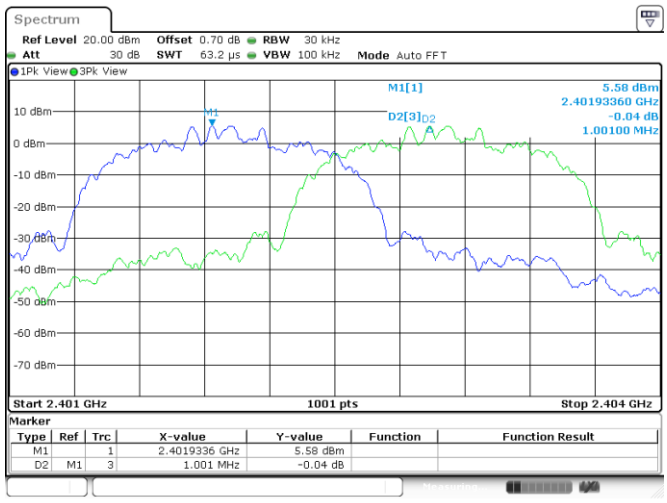
High Channel



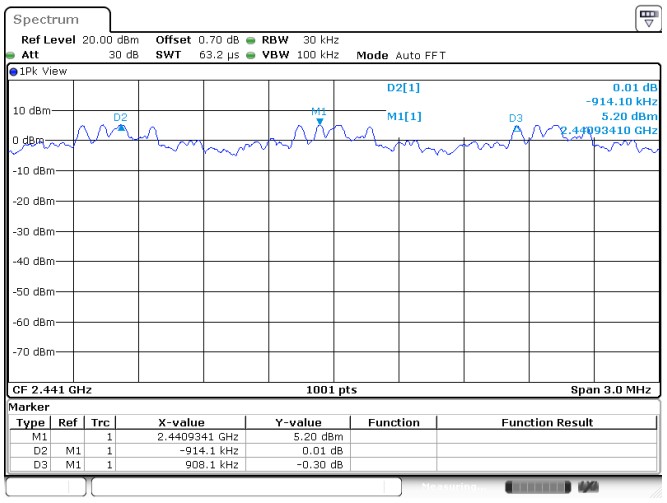
8DPSK

Channel	Channel Frequency (MHz)	Adjacent Channel Separation (MHz)	20 dB Bandwidth (kHz)	Minimum Limit (MHz)	Result
0	2402	1.00	1324.68	0.883	Pass
39	2441	0.91	1318.68	0.879	Pass
78	2480	0.91	1318.70	0.879	Pass

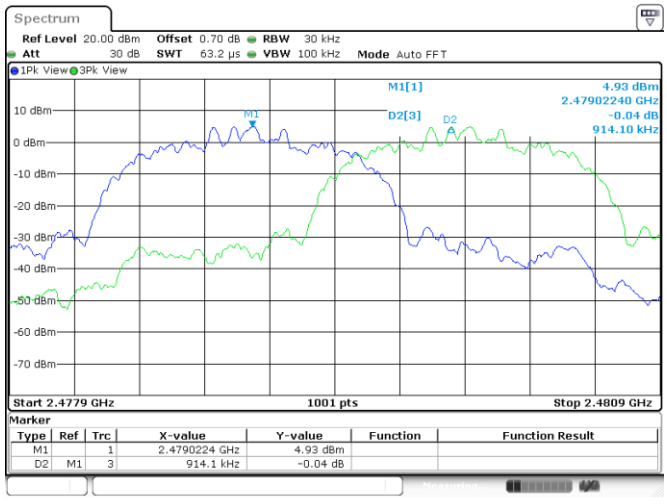
Low Channel



Middle Channel



High Channel

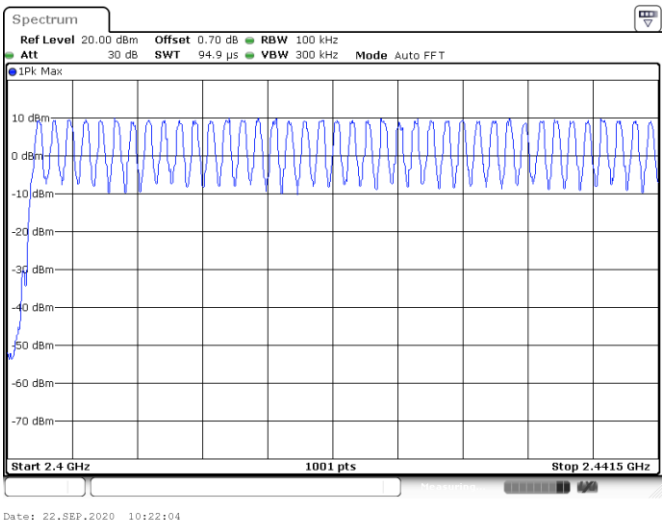


Test Result of Number of Hopping Frequency

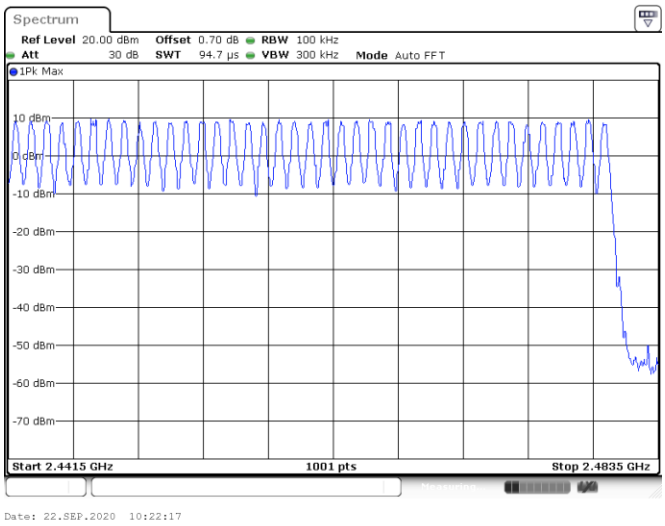
Frequency Range	Measured Quantity of Hopping Channel	Limit	Result
2400 to 2483.5 MHz	79	≥15	Pass

GFSK

2400 MHz ~ 2441.5 MHz

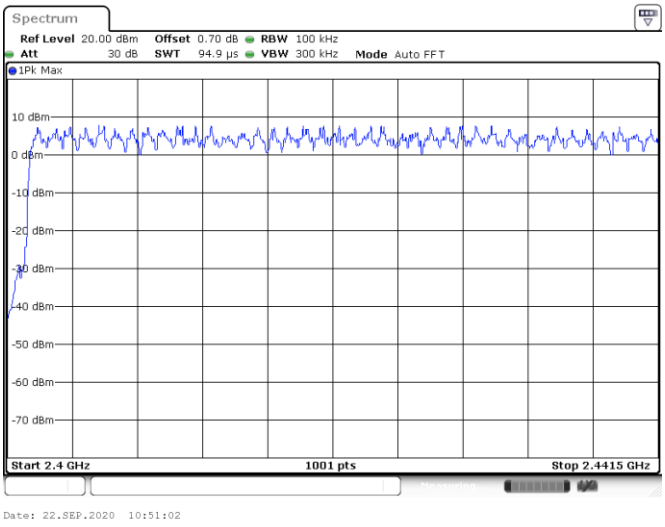


2441.5 MHz ~ 2483.5 MHz

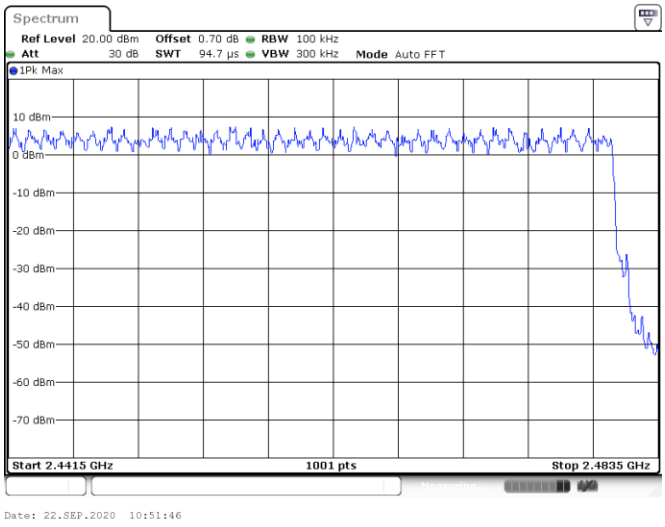


8DPSK

2400 MHz ~ 2441.5 MHz



2441.5 MHz ~ 2483.5 MHz

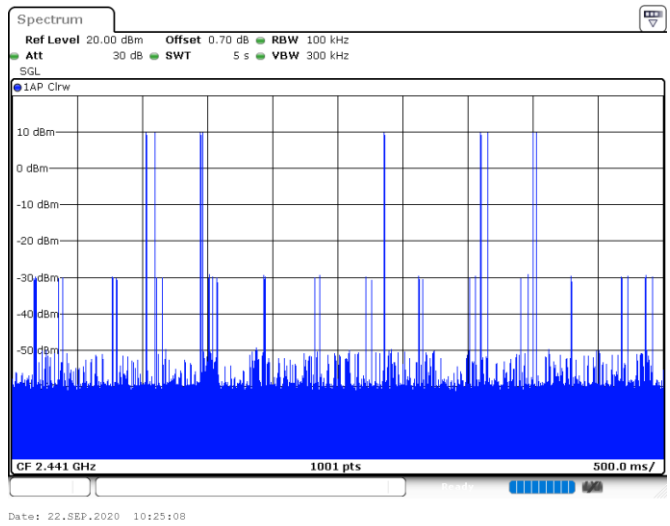


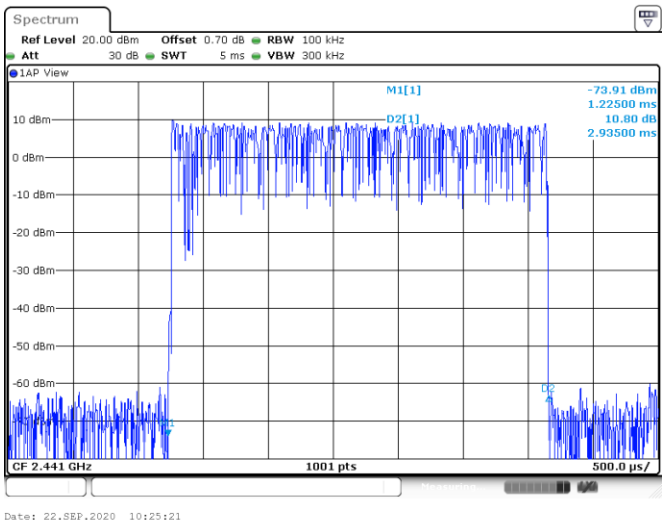
Test Result of Dwell Time

GFSK

Data Mode	Number of transfer in a 31.6 (79Hopping*0.4s)	Package transfer time (msec)	Dwell time (s)	Limit (s)	Result
1DH5	9 (times / 5 sec) * 6.32 = 56.88 times	2.935	0.167	0.4	Pass

1DH5

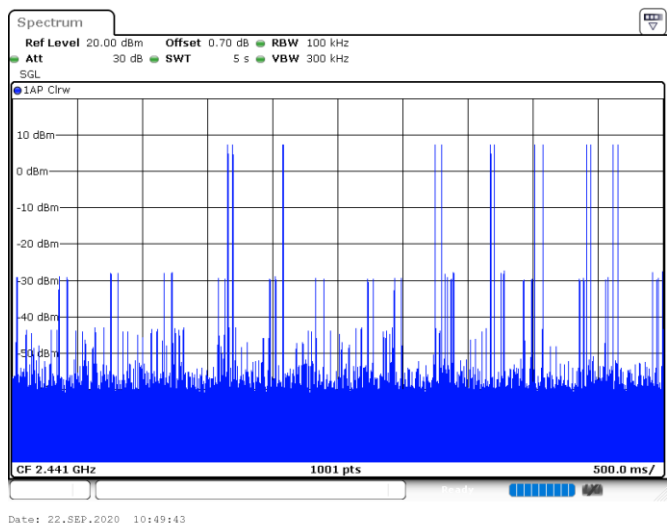


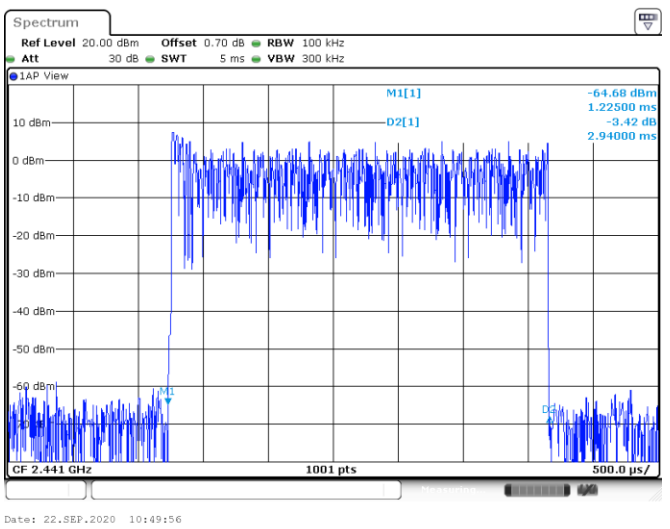


8DPSK

Data Mode	Number of transfer in a 31.6 (79Hopping*0.4s)	Package transfer time (msec)	Dwell time (s)	Limit (s)	Result
3DH5	13 (times / 5 sec) * 6.32 = 82.16 times	2.94	0.24	0.4	Pass

3DH5





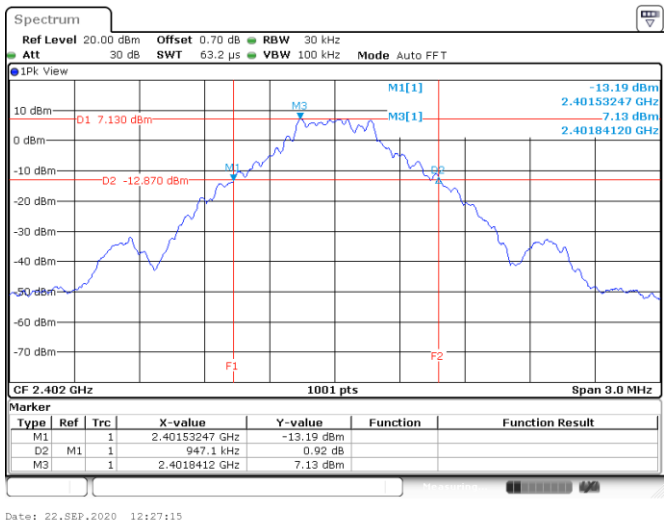
Appendix A: Test Results of Conducted Test_37130-AKD3

Test Result of 20 dB Bandwidth

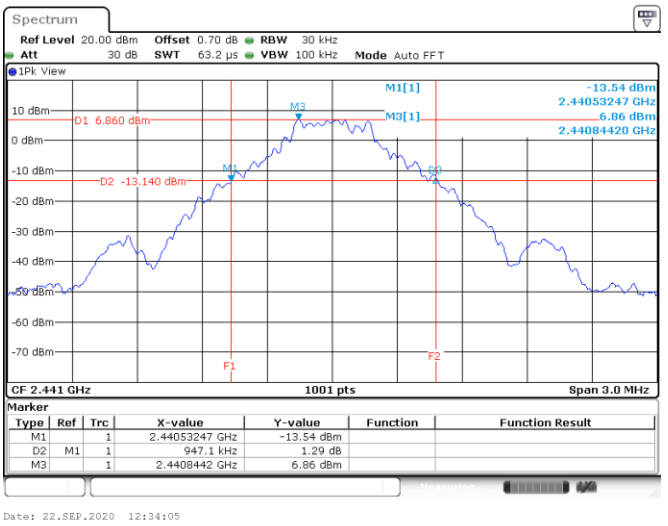
GFSK

Channel	Channel Frequency (MHz)	20 dB Bandwidth (kHz)	Result
Low Channel	2402	947.1	Pass
Middle Channel	2441	947.1	Pass
High Channel	2480	974.0	Pass

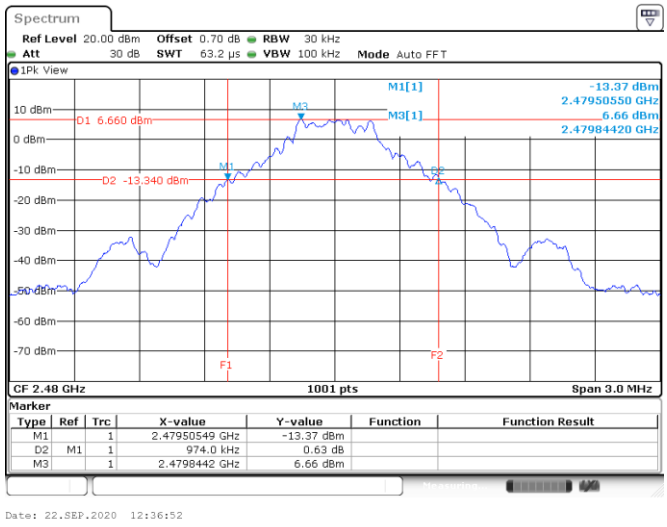
Low Channel



Middle Channel



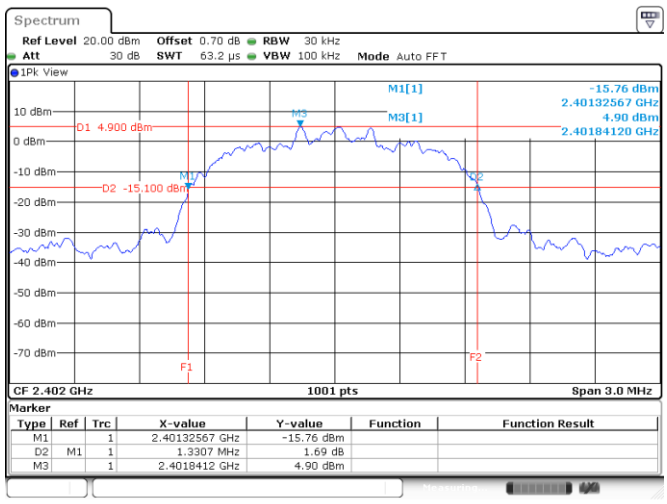
High Channel



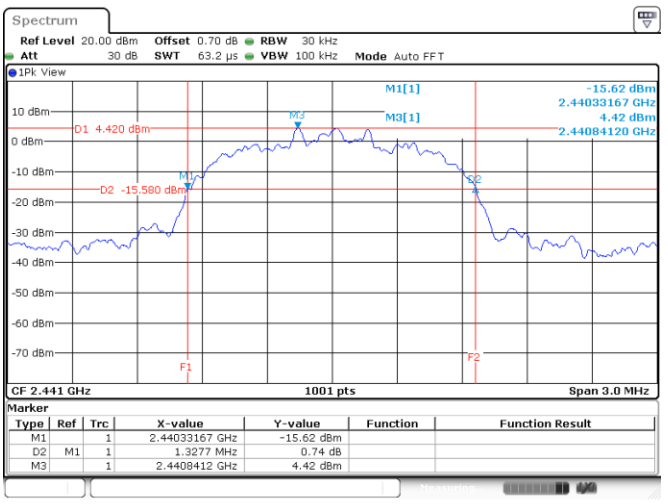
8DPSK

Channel	Channel Frequency (MHz)	20 dB Bandwidth (kHz)	Result
Low Channel	2402	1330.7	Pass
Middle Channel	2441	1327.7	Pass
High Channel	2480	1324.7	Pass

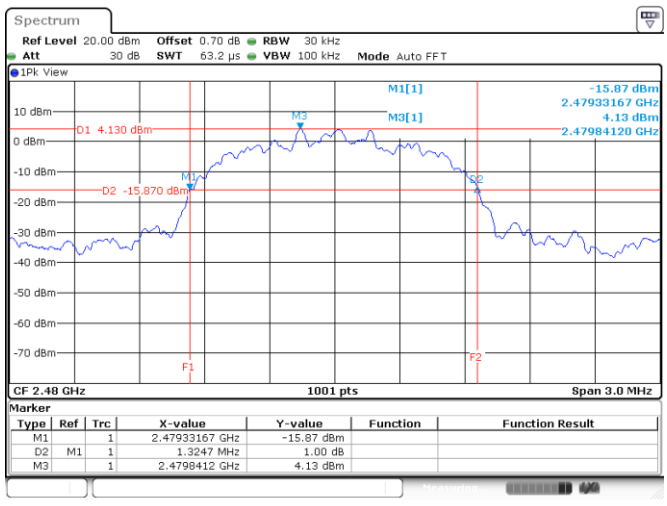
Low Channel



Middle Channel



High Channel

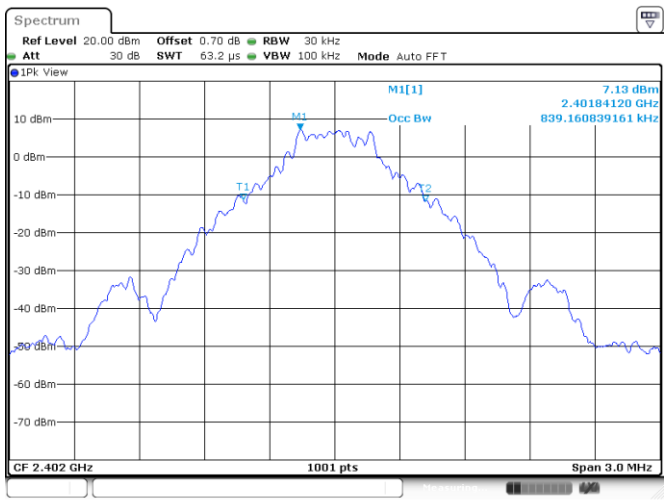


Test Result of 99% Occupied Bandwidth

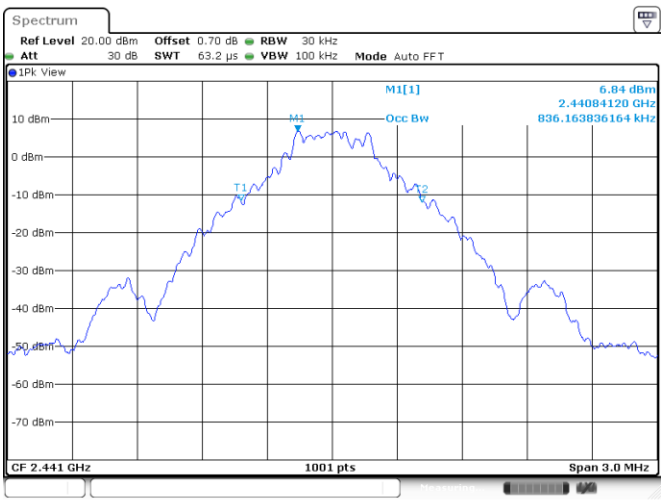
GFSK

Channel	Channel Frequency (MHz)	99% Bandwidth (kHz)
Low Channel	2402	839.16
Middle Channel	2441	836.16
High Channel	2480	851.14

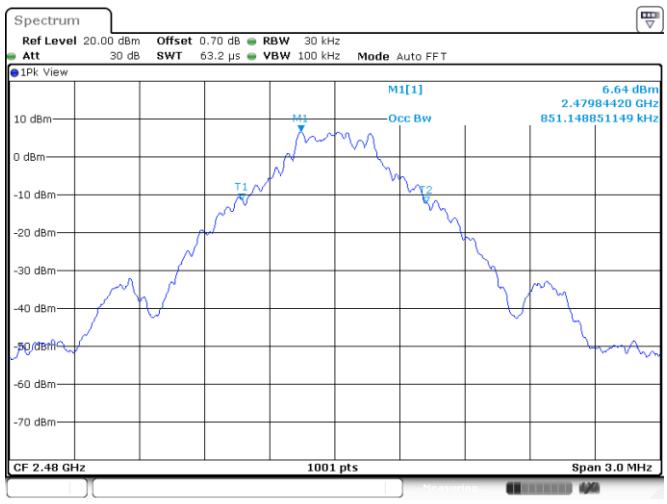
Low Channel



Middle Channel



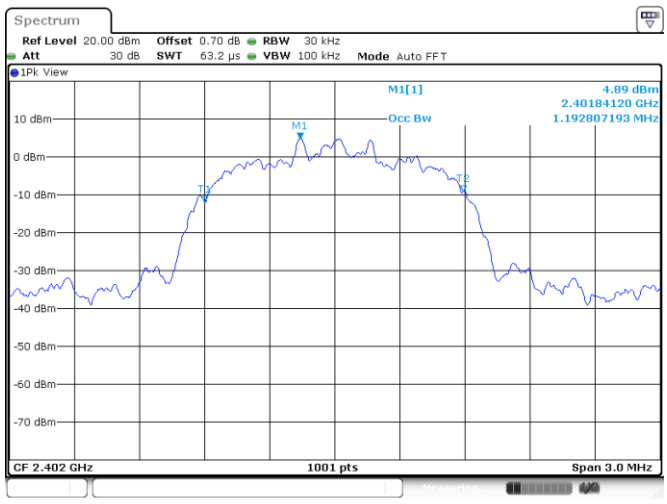
High Channel



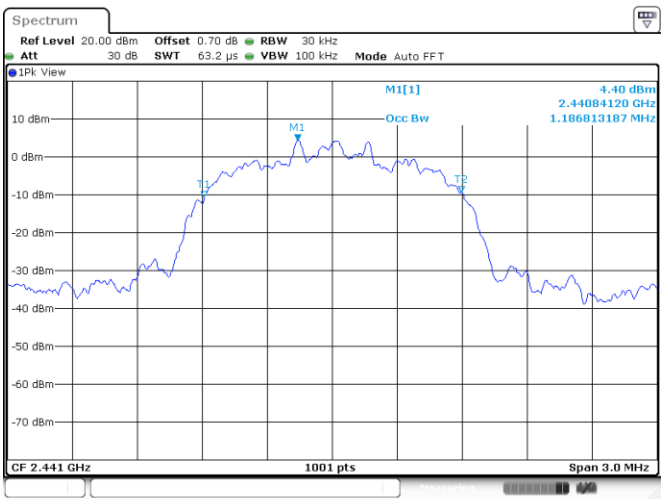
8DPSK

Channel	Channel Frequency (MHz)	99% Bandwidth (kHz)
Low Channel	2402	1192.80
Middle Channel	2441	1186.81
High Channel	2480	1189.81

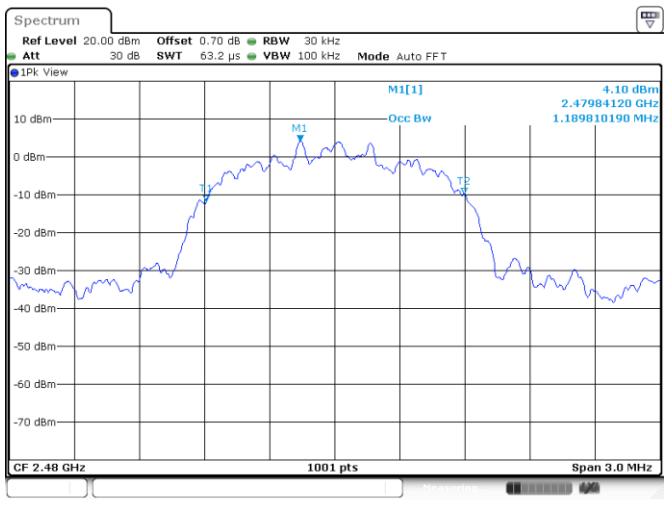
Low Channel



Middle Channel



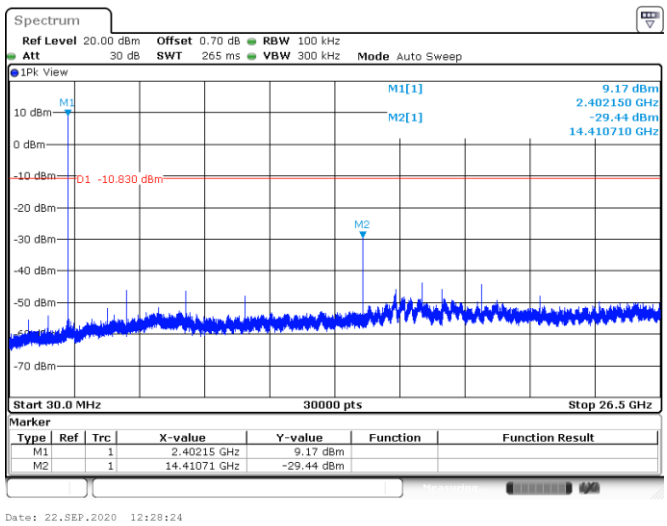
High Channel



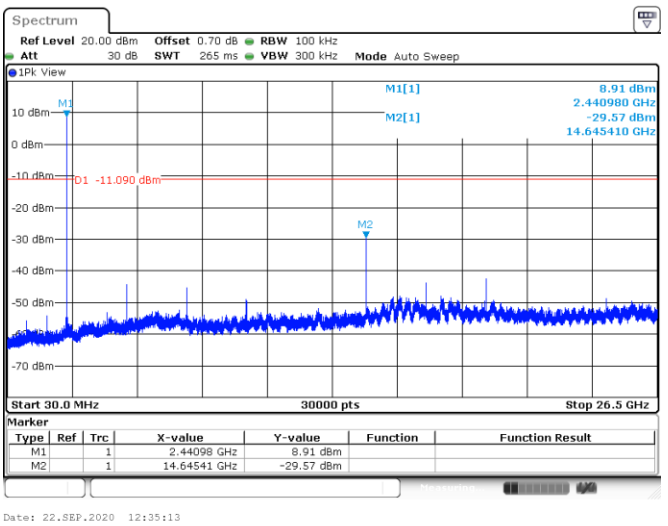
Test Result of Conducted Spurious Emissions, Tx Mode

GFSK

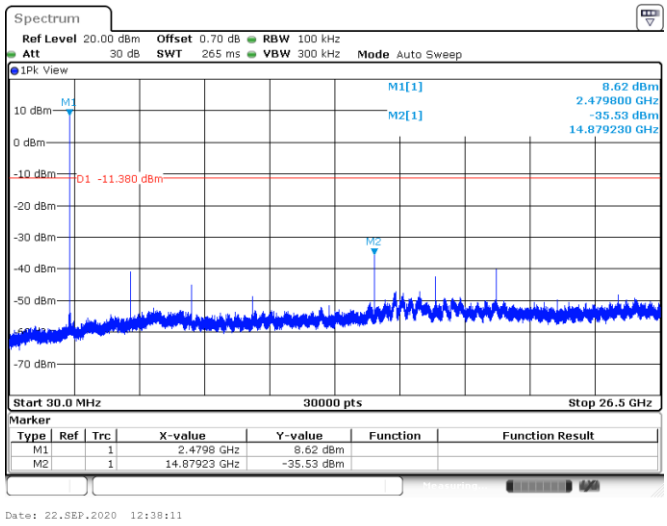
Low Channel



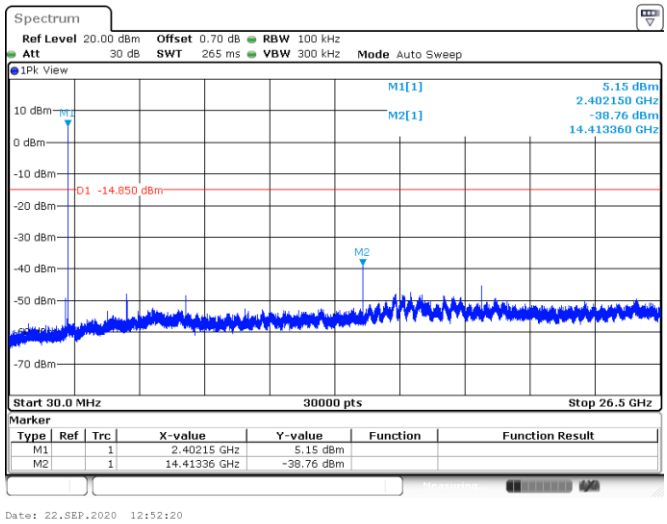
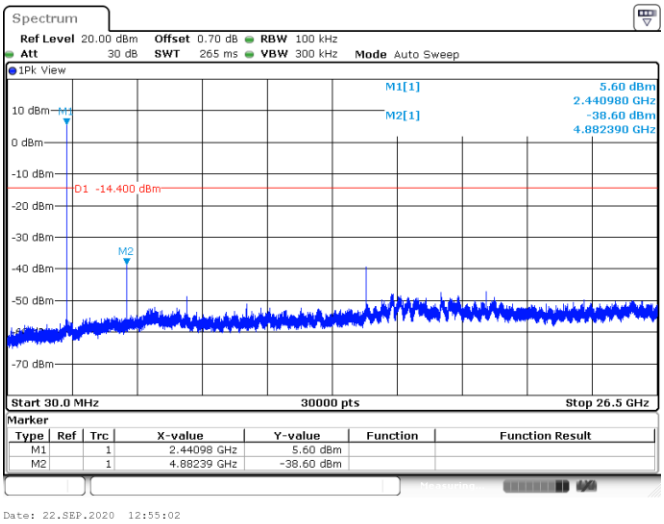
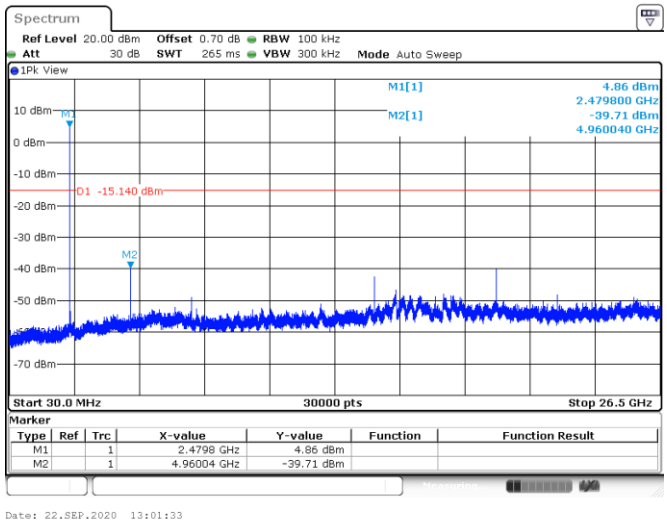
Middle Channel



High Channel

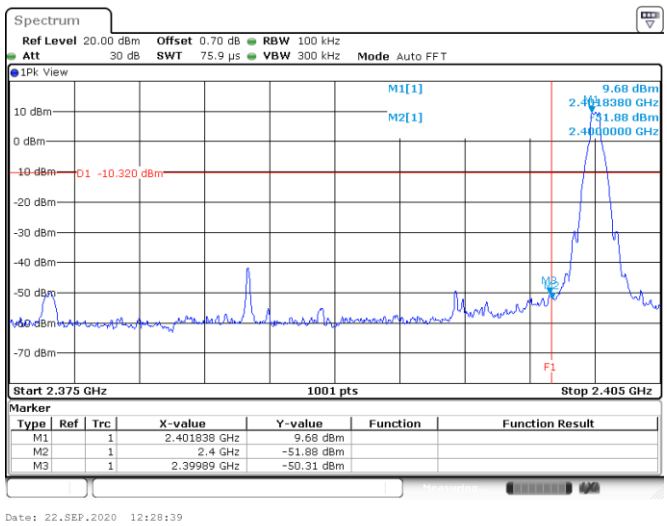
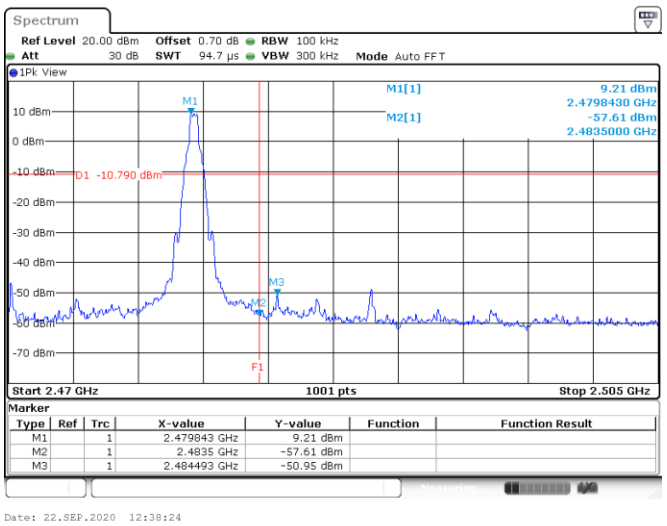


8DPSK

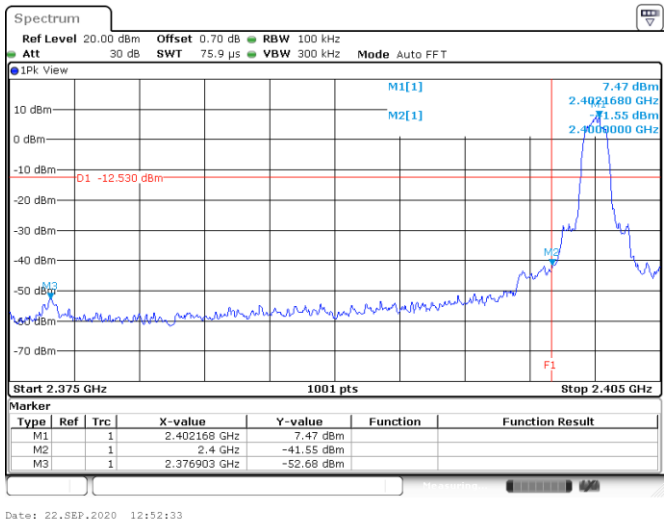
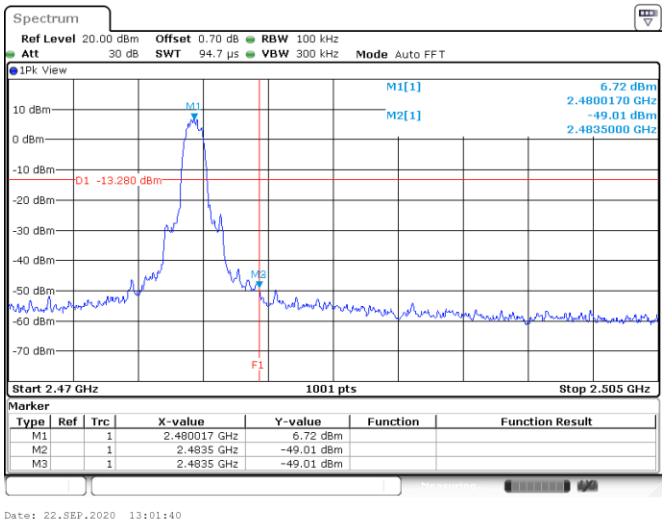
Low Channel	Middle Channel
	
High Channel	
	

Test Result of Conducted Band Edge, Tx Mode

GFSK

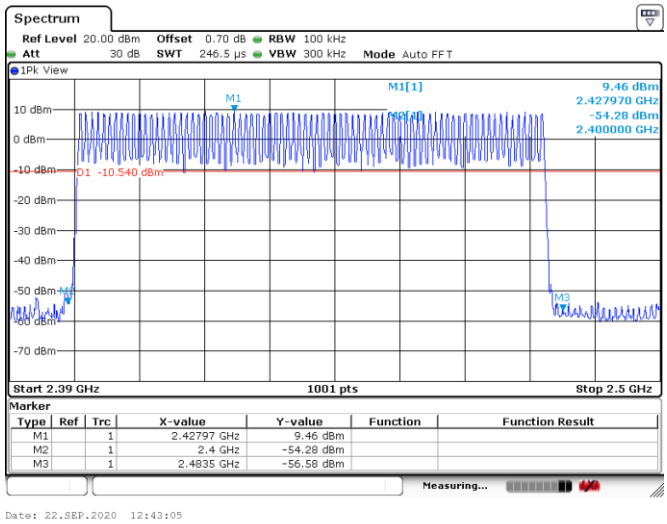
Low Channel	High Channel
	

8DPSK

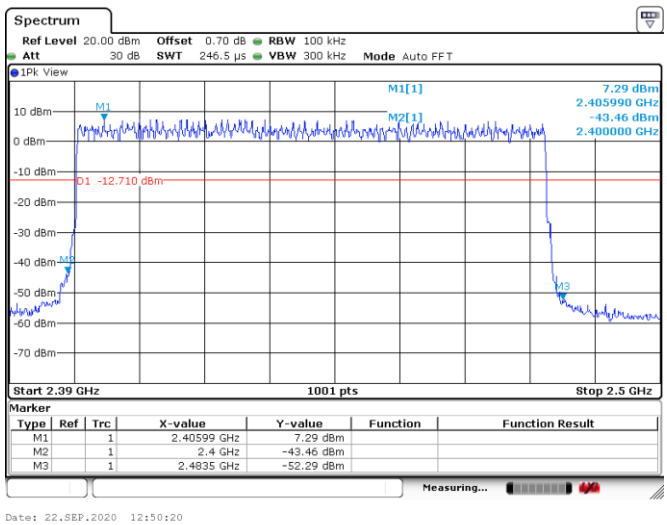
Low Channel	High Channel
	

Test Result of Hopping Band Edge

GFSK

Middle Channel	
	

8DPSK

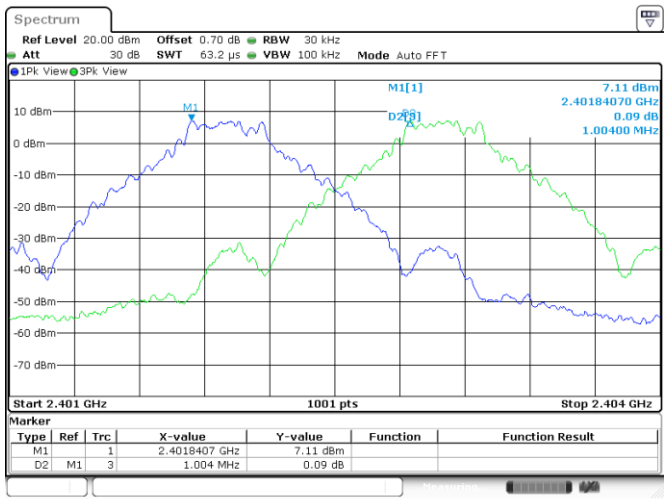
Middle Channel	
	

Test Result of Hopping Channel Separation

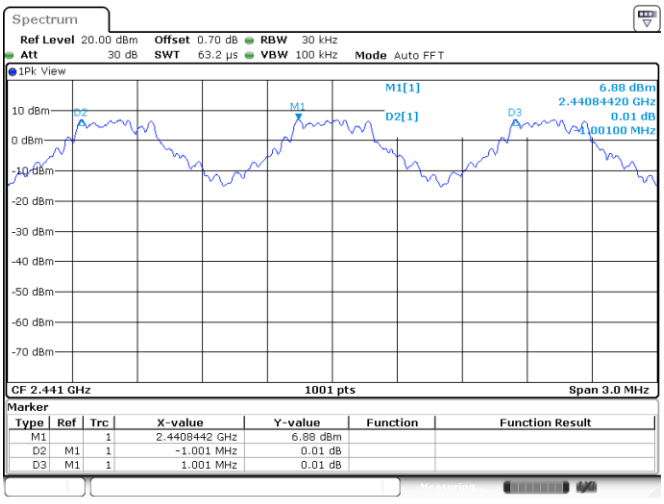
GFSK

Channel	Channel Frequency (MHz)	Adjacent Channel Separation (MHz)	20 dB Bandwidth (kHz)	Minimum Limit (MHz)	Result
0	2402	1.00	947.10	0.631	Pass
39	2441	1.00	947.10	0.631	Pass
78	2480	1.00	974.10	0.649	Pass

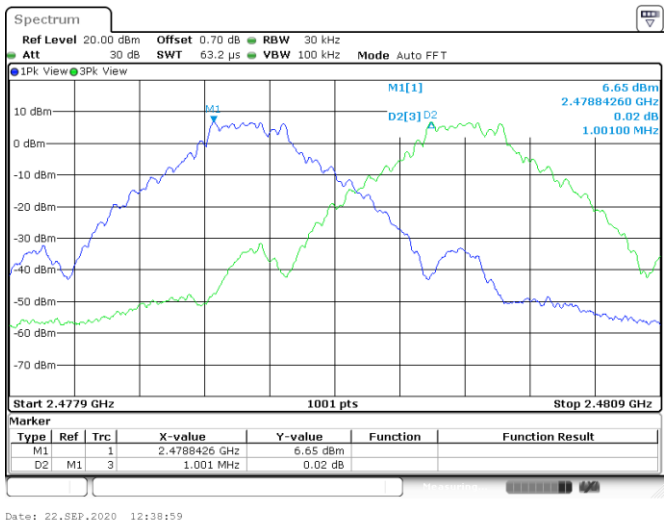
Low Channel



Middle Channel



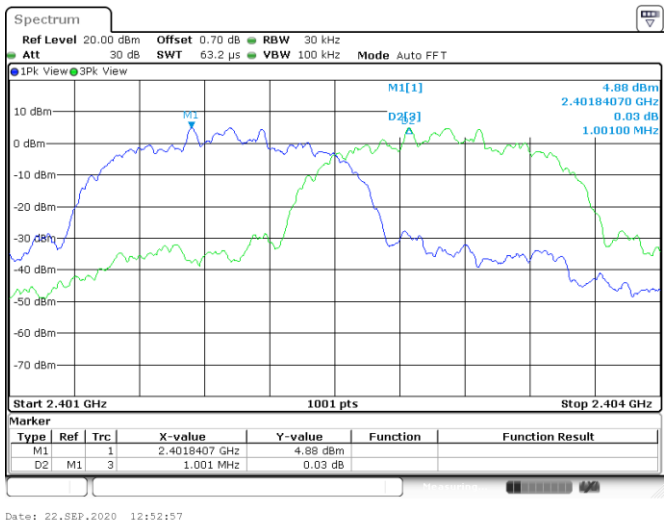
High Channel



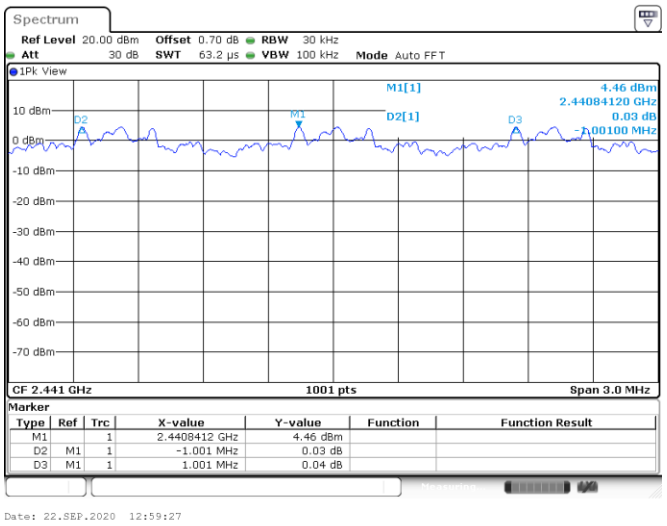
8DPSK

Channel	Channel Frequency (MHz)	Adjacent Channel Separation (MHz)	20 dB Bandwidth (kHz)	Minimum Limit (MHz)	Result
0	2402	1.00	1330.70	0.887	Pass
39	2441	1.00	1327.70	0.885	Pass
78	2480	1.00	1324.70	0.883	Pass

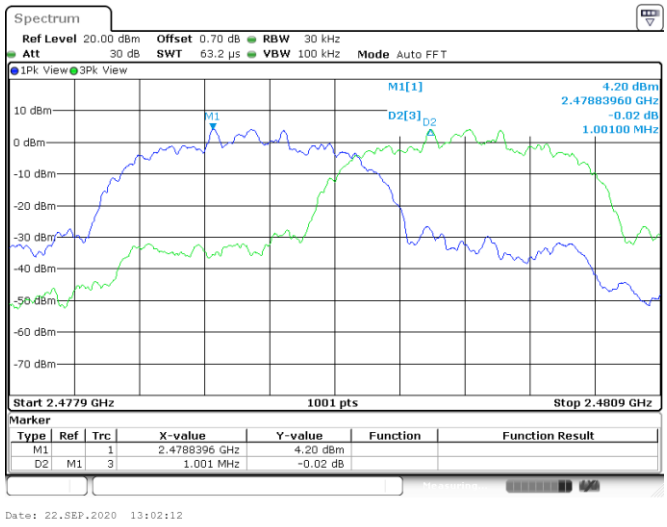
Low Channel



Middle Channel



High Channel

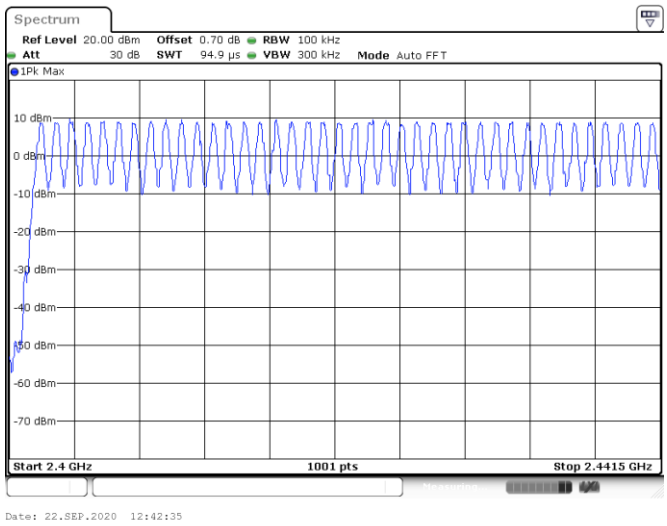


Test Result of Number of Hopping Frequency

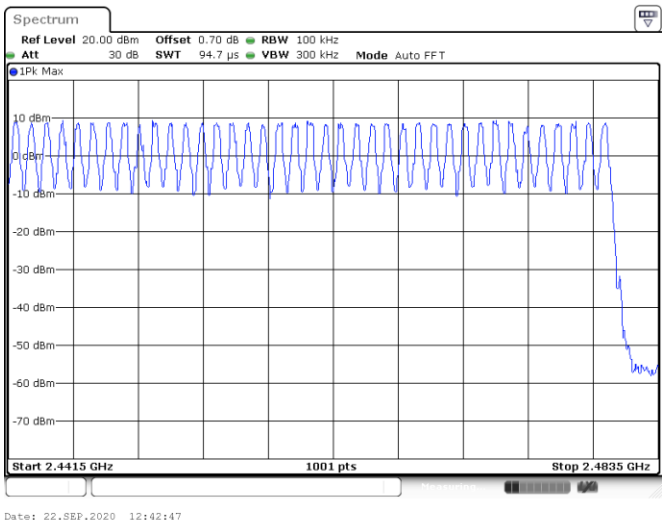
Frequency Range	Measured Quantity of Hopping Channel	Limit	Result
2400 to 2483.5 MHz	79	≥15	Pass

GFSK

2400 MHz ~ 2441.5 MHz

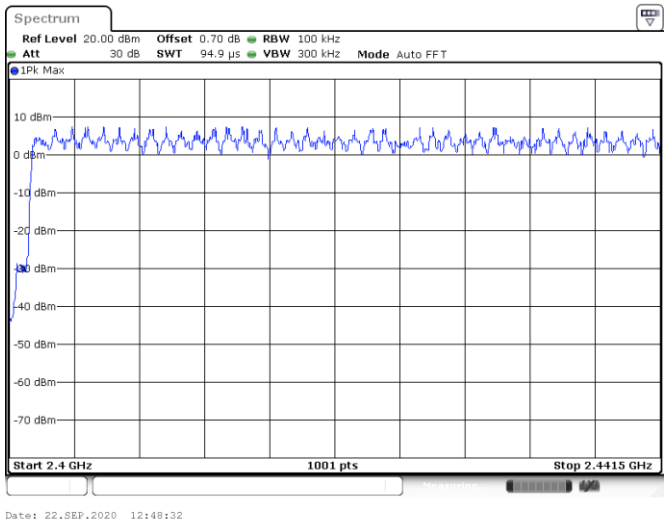


2441.5 MHz ~ 2483.5 MHz

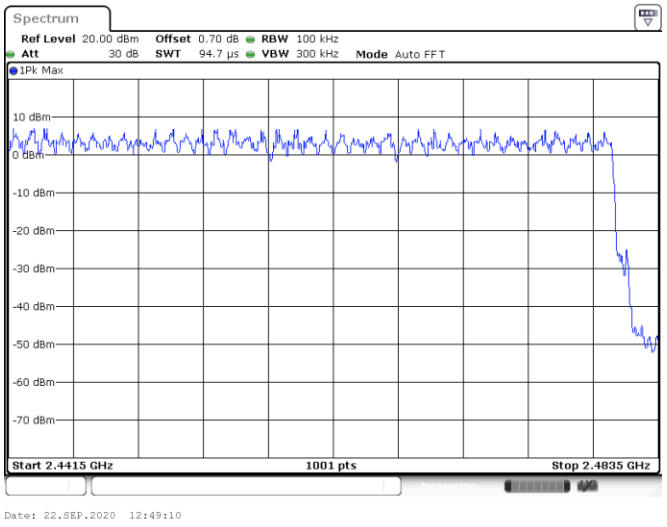


8DPSK

2400 MHz ~ 2441.5 MHz



2441.5 MHz ~ 2483.5 MHz

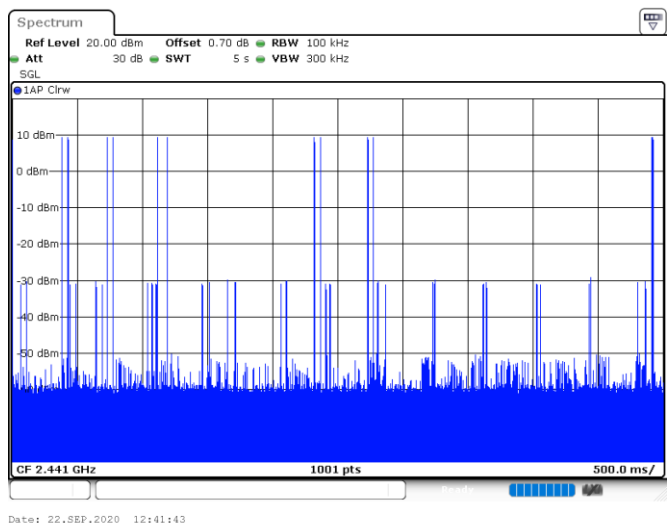


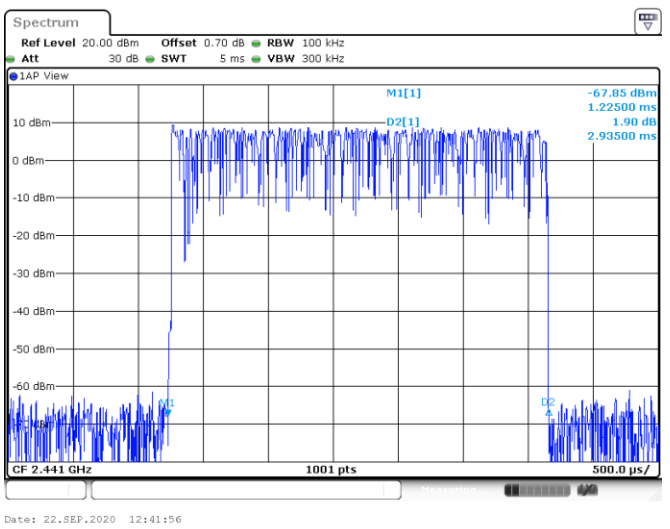
Test Result of Dwell Time

GFSK

Data Mode	Number of transfer in a 31.6 (79Hopping*0.4s)	Package transfer time (msec)	Dwell time (s)	Limit (s)	Result
1DH5	11 (times / 5 sec) * 6.32 = 69.52 times	2.935	0.204	0.4	Pass

1DH5

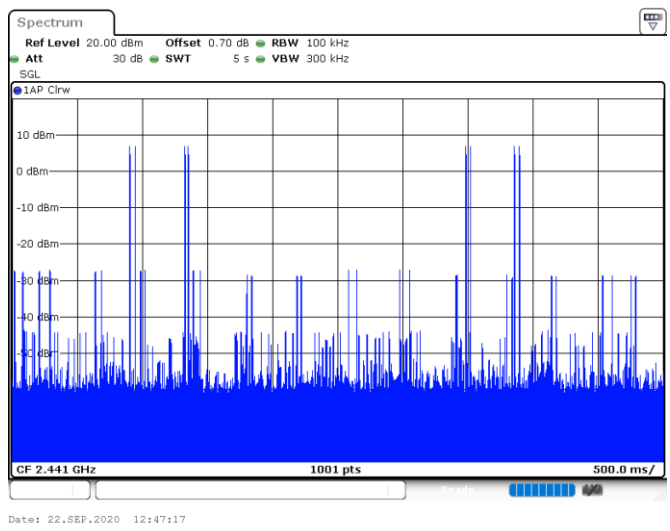


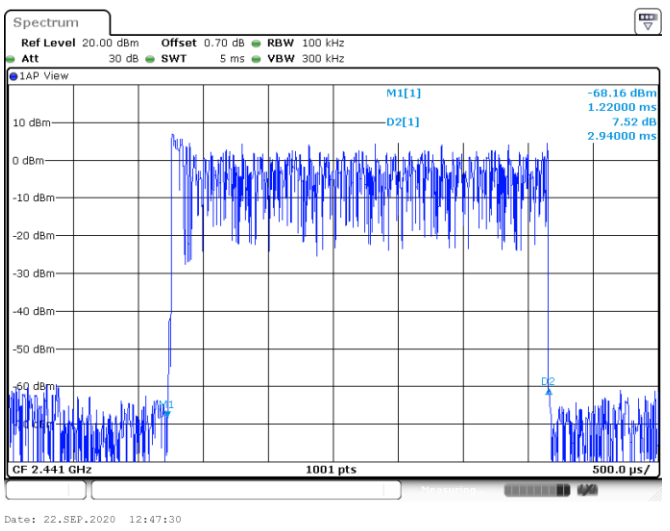


8DPSK

Data Mode	Number of transfer in a 31.6 (79Hopping*0.4s)	Package transfer time (msec)	Dwell time (s)	Limit (s)	Result
3DH5	8 (times / 5 sec) * 6.32 = 50.56 times	2.94	0.148	0.4	Pass

3DH5





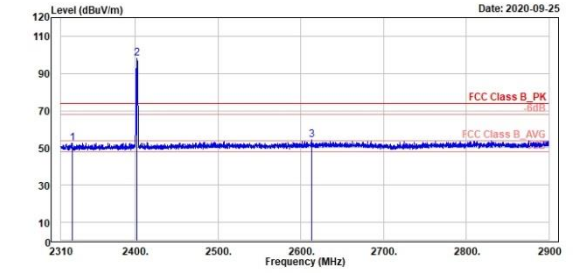
Appendix B: Test Results of Radiated Spurious Emissions & Mains Conducted Emission Test_37130-AGJ5

Band Edges, 2.31GHz ~ 2.9GHz

GFSK

Low Channel (Horizontal) Peak

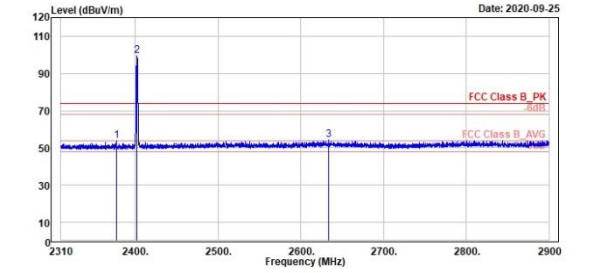
TUV Rheinland Taiwan Ltd.
No. 458-18,Sec 2,Fenliao,,Linkou Dist,,New Taipei City 244, Taiwan(R.O.C.)
Tel:+886-2172-1000 Fax:+886-2172-1322



	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	2323.43	52.55	15.42	37.13	74.00	-21.45	150	71	Peak	Horizontal	
2 *	2402.00	97.90	60.53	37.37	74.00	23.90	150	71	Peak	Horizontal	
3	2612.95	54.07	16.12	37.95	74.00	-19.93	150	71	Peak	Horizontal	

Low Channel (Vertical) Peak

TUV Rheinland Taiwan Ltd.
No. 458-18,Sec 2,Fenliao,,Linkou Dist,,New Taipei City 244, Taiwan(R.O.C.)
Tel:+886-2172-1000 Fax:+886-2172-1322



	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	2376.79	53.91	16.62	37.29	74.00	-20.09	102	239	Peak	Vertical	
2 *	2402.00	99.31	61.94	37.37	74.00	25.31	102	239	Peak	Vertical	
3	2633.45	54.08	16.18	37.90	74.00	-19.92	102	239	Peak	Vertical	

GFSK

Low Channel (Horizontal) Average

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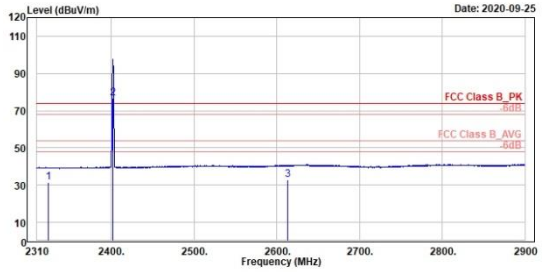
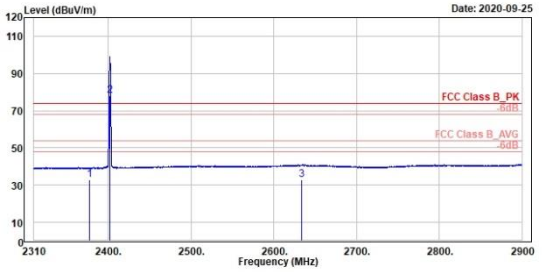


	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	2323.43	31.54	-5.59	37.13	54.00	-22.46	150	71	Average	Horizontal	DF
2 *	2402.00	76.63	39.26	37.37	54.00	22.63	150	71	Average	Horizontal	DF
3	2612.95	32.80	-5.15	37.95	54.00	-21.20	150	71	Average	Horizontal	DF

Low Channel (Vertical) Average

TUV Rheinland Taiwan Ltd.
No. 458-18, Sec 2, Fenliao, , Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
Tel:+886-2172-1000 Fax:+886-2172-1322



	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	2376.79	32.64	-4.65	37.29	54.00	-21.36	102	239	Average	Vertical	DF
2 *	2402.00	78.04	40.67	37.37	54.00	24.04	102	239	Average	Vertical	DF
3	2633.45	32.80	-5.10	37.90	54.00	-21.20	102	239	Average	Vertical	DF

GFSK

High Channel (Horizontal) Peak

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No. 458-18, Sec 2, Fenliao, , Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
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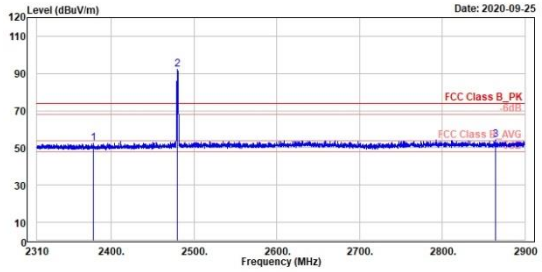

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	2378.08	52.51	15.21	37.30	74.00	-21.49	150	68	Peak	Horizontal	
2 *	2480.00	92.13	54.57	37.56	74.00	18.13	150	68	Peak	Horizontal	
3	2864.55	54.23	16.09	38.14	74.00	-19.77	150	68	Peak	Horizontal	

High Channel (Vertical) Peak

TUV Rheinland Taiwan Ltd.
No. 458-18, Sec 2, Fenliao, , Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
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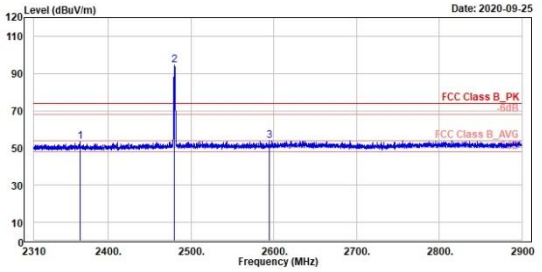
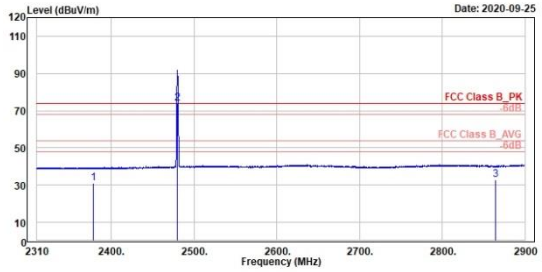


	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	2365.48	53.21	15.96	37.25	74.00	-20.79	108	240	Peak	Vertical	
2 *	2480.00	94.34	56.78	37.56	74.00	20.34	108	240	Peak	Vertical	
3	2595.05	54.02	16.05	37.97	74.00	-19.98	108	240	Peak	Vertical	

GFSK

High Channel (Horizontal) Average

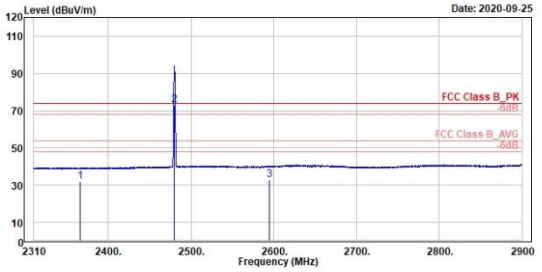
TUV Rheinland Taiwan Ltd.
No. 458-18, Sec 2, Fenliao, , Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
Tel:+886-2172-1000 Fax:+886-2172-1322



	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	2378.08	31.23	-6.07	37.30	54.00	-22.77	150	68	Average	Horizontal	CF
2 *	2480.00	73.86	36.30	37.56	54.00	19.86	150	68	Average	Horizontal	CF
3	2864.55	32.96	-5.18	38.14	54.00	-21.04	150	68	Average	Horizontal	CF

High Channel (Vertical) Average

TUV Rheinland Taiwan Ltd.
No. 458-18, Sec 2, Fenliao, , Linkou Dist., New Taipei City 244, Taiwan(R.O.C.)
Tel:+886-2172-1000 Fax:+886-2172-1322



	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Remark	Pol/Phase	Note
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg			
1	2365.48	31.94	-5.31	37.25	54.00	-22.06	108	240	Average	Vertical	DF
2 *	2480.00	73.07	35.51	37.56	54.00	19.07	108	240	Average	Vertical	DF
3	2595.05	32.75	-5.22	37.97	54.00	-21.25	108	240	Average	Vertical	DF