

(Band edge, Channel 78, $\pi/4$ -DQPSK)



(Band edge with hopping on, Channel 78, $\pi/4$ -DQPSK)

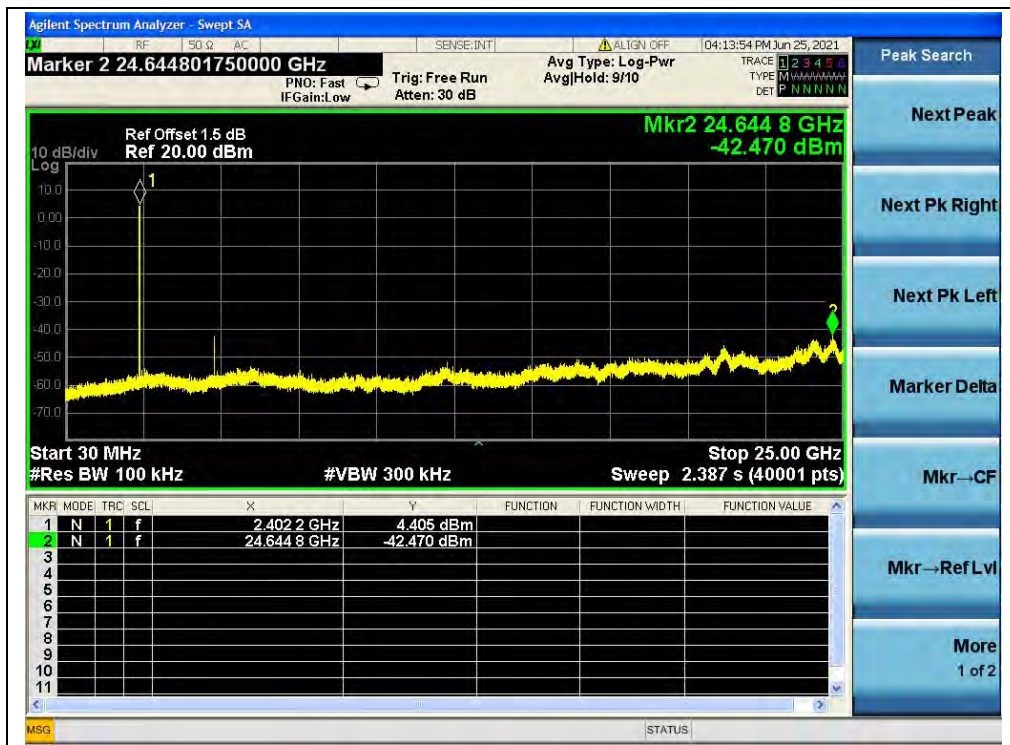


8-DPSK Mode

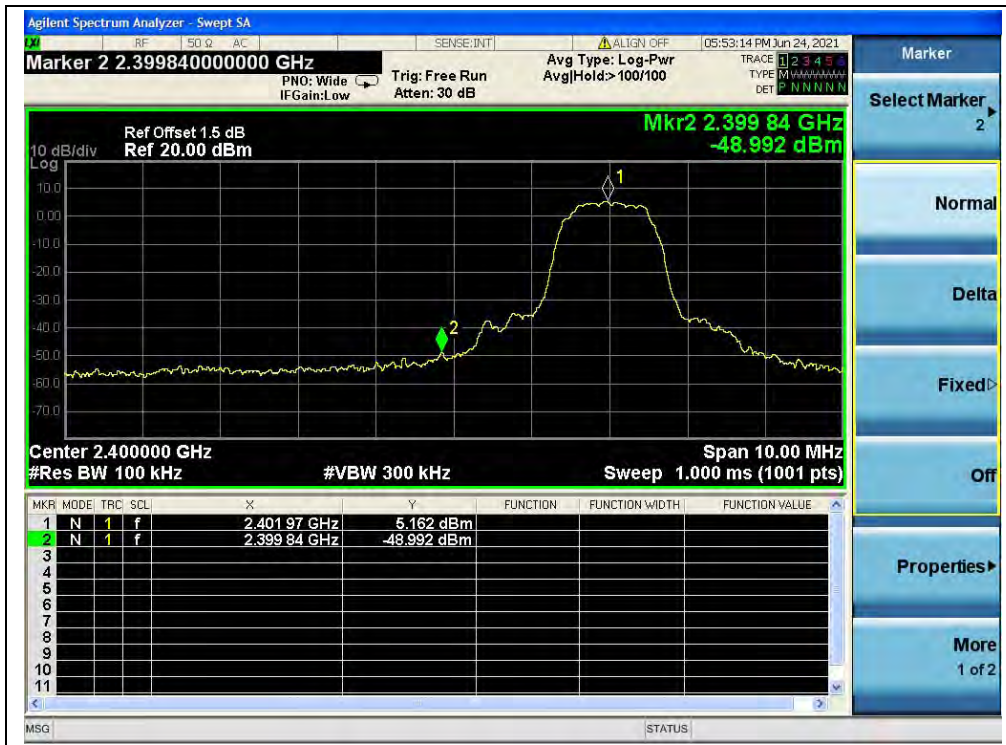
A. Test Verdict:

Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated -20dBc Limit	
0	2402	-42.47	4.41	-15.59	PASS
39	2441	-43.68	4.92	-15.08	PASS
78	2480	-42.75	3.54	-16.46	PASS

B. Test Plot:



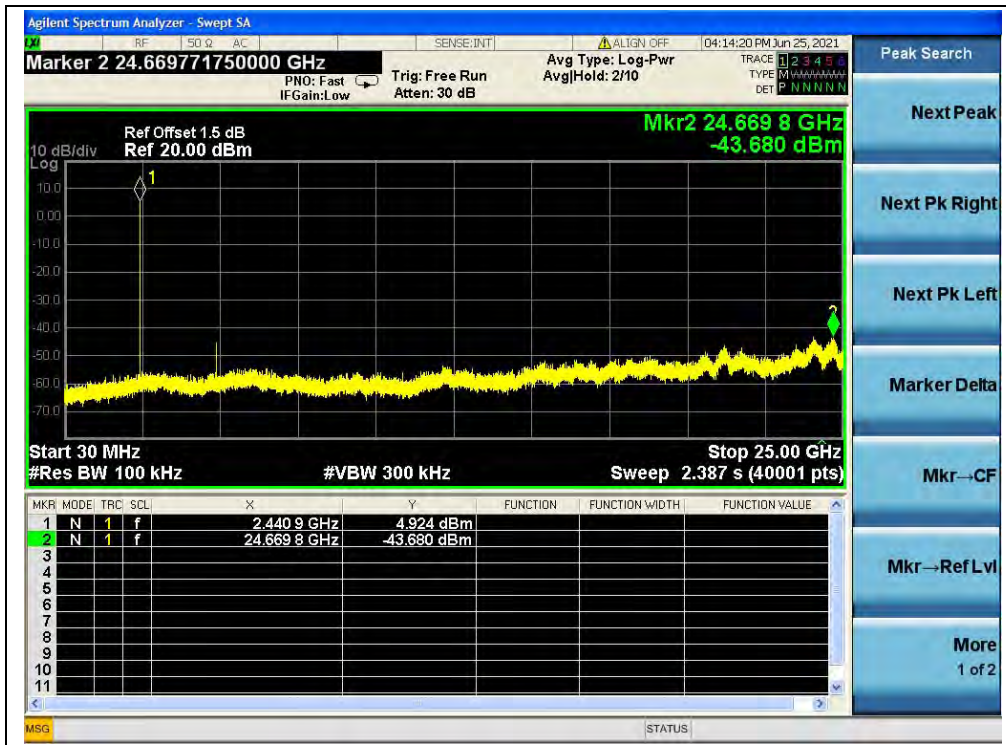
(30MHz to 25GHz, Channel 0, 8-DPSK)



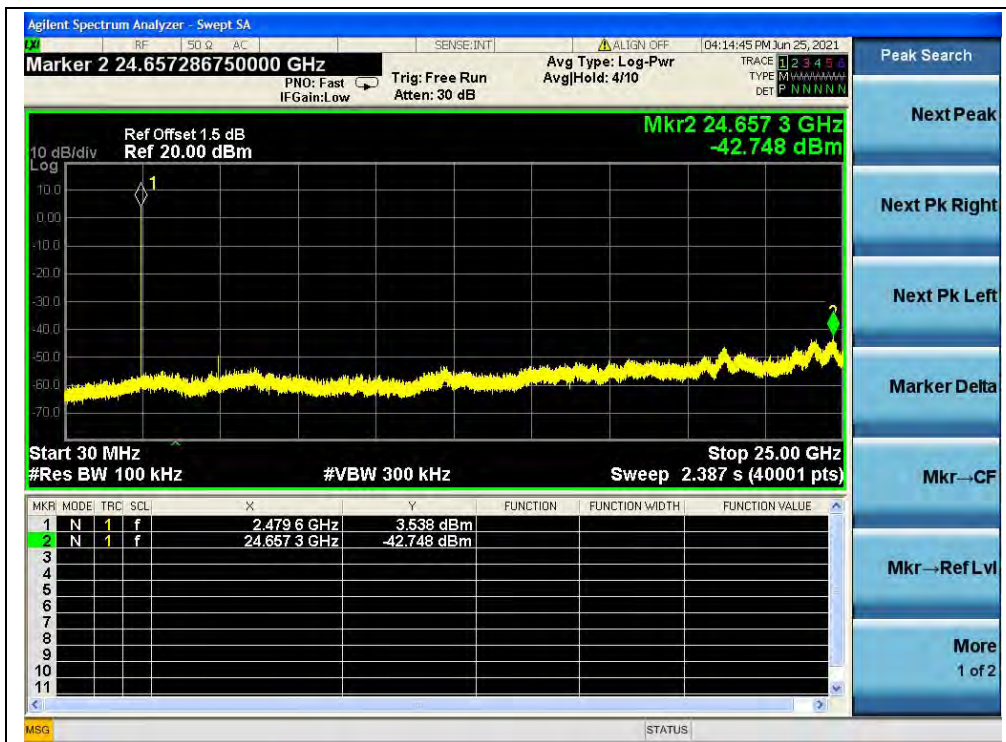
(Band edge, Channel 0, 8-DPSK)



(Band edge with hopping on, Channel 0, 8-DPSK)



(30MHz to 25GHz, Channel 39, 8-DPSK)



(30MHz to 25GHz, Channel 78, 8-DPSK)



(Band edge, Channel 78, 8-DPSK)



(Band edge with hopping on, Channel 78, 8-DPSK)

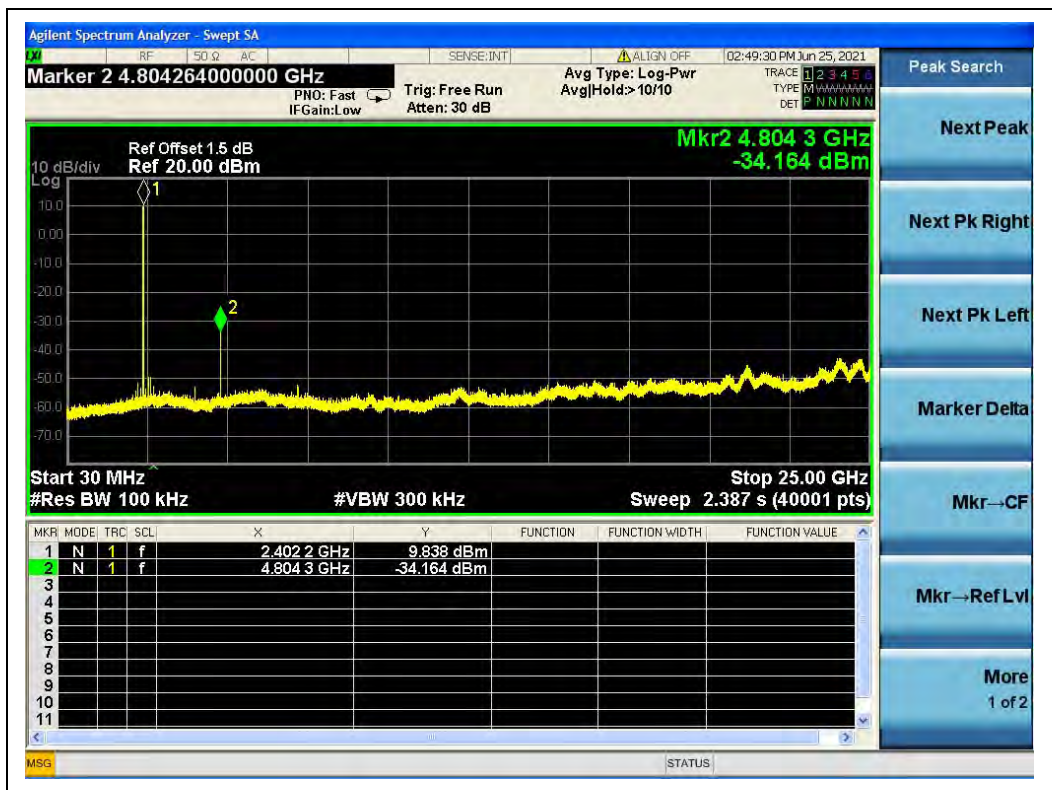


Right:
GFSK Mode

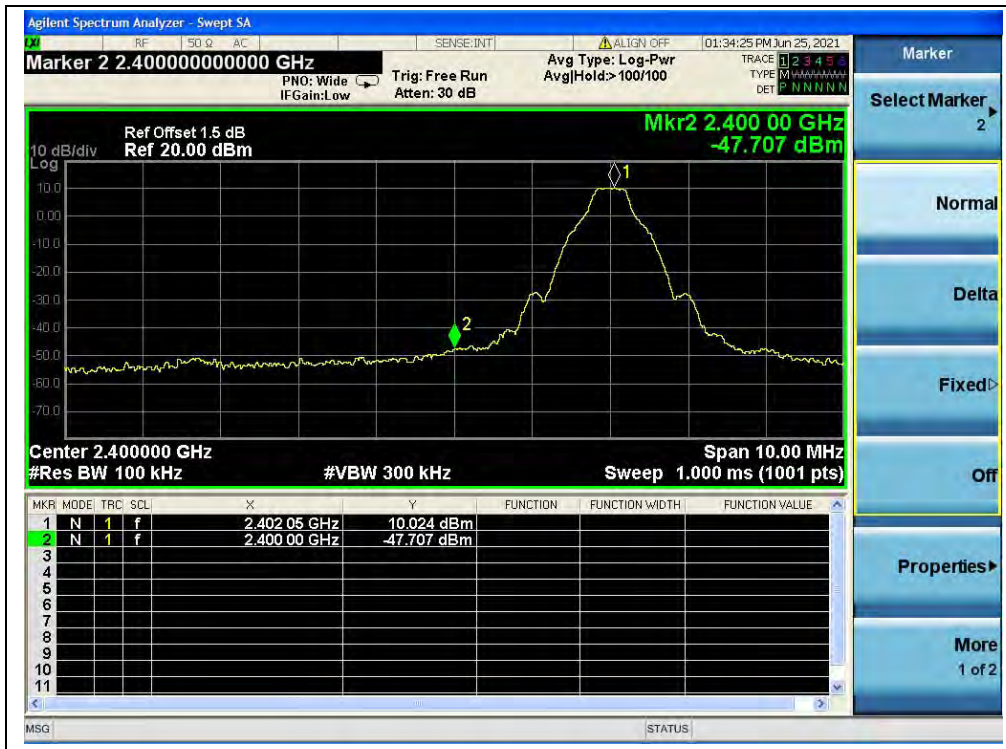
A. Test Verdict:

Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated -20dBc Limit	
0	2402	-34.16	9.84	-10.16	PASS
39	2441	-35.71	9.27	-10.73	PASS
78	2480	-40.97	9.41	-10.59	PASS

B. Test Plot:



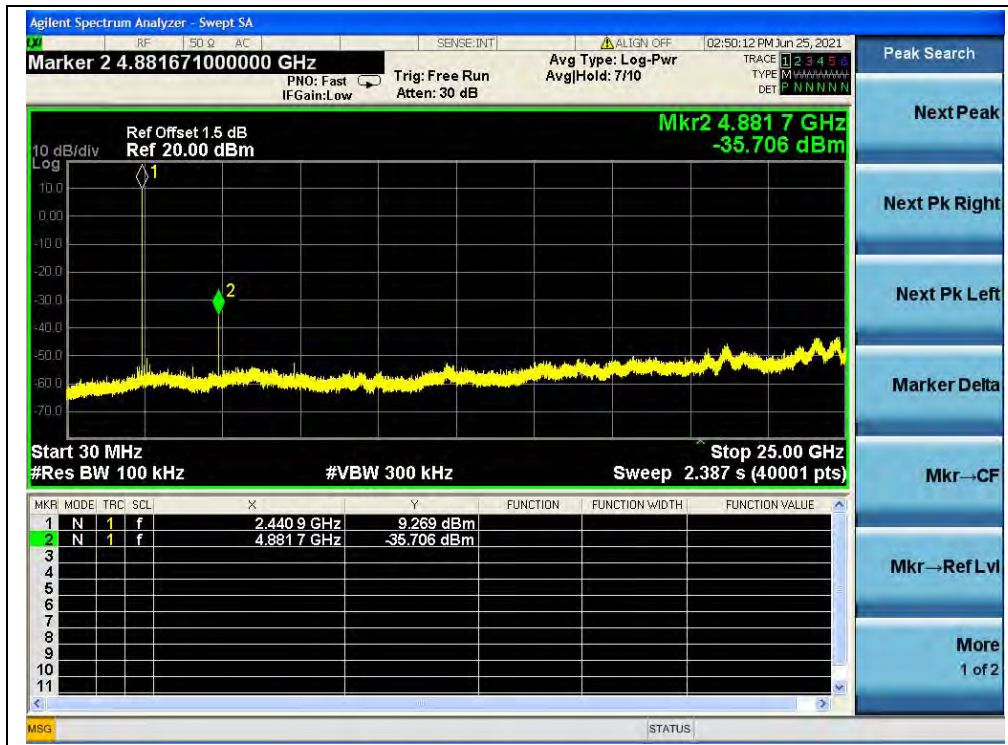
(30MHz to 25GHz, Channel 0, GFSK)



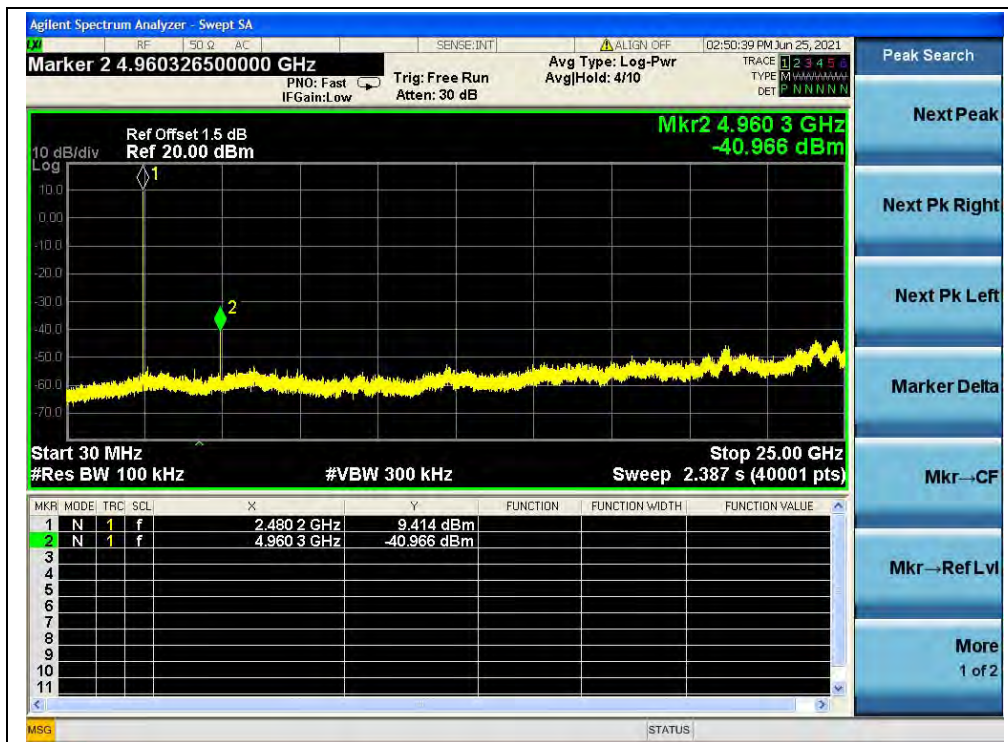
(Band edge, Channel 0, GFSK)



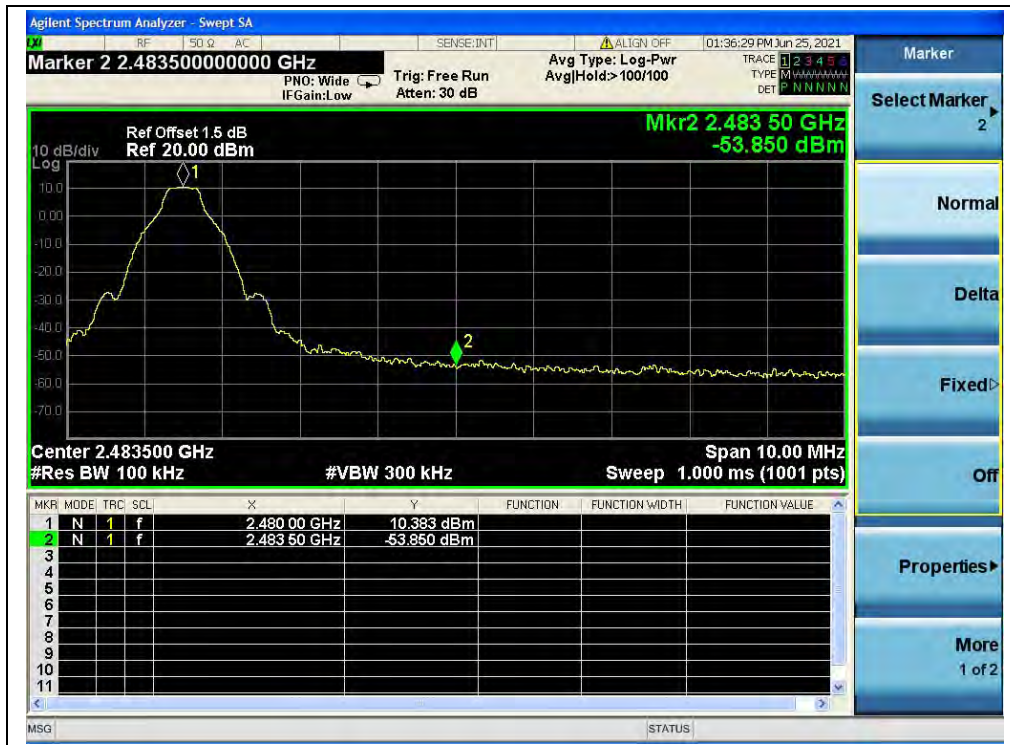
(Band edge with hopping on, Channel 0, GFSK)



(30MHz to 25GHz, Channel 39, GFSK)



(30MHz to 25GHz, Channel 78, GFSK)



(Band edge, Channel 78, GFSK)



(Band edge with hopping on, Channel 78, GFSK)

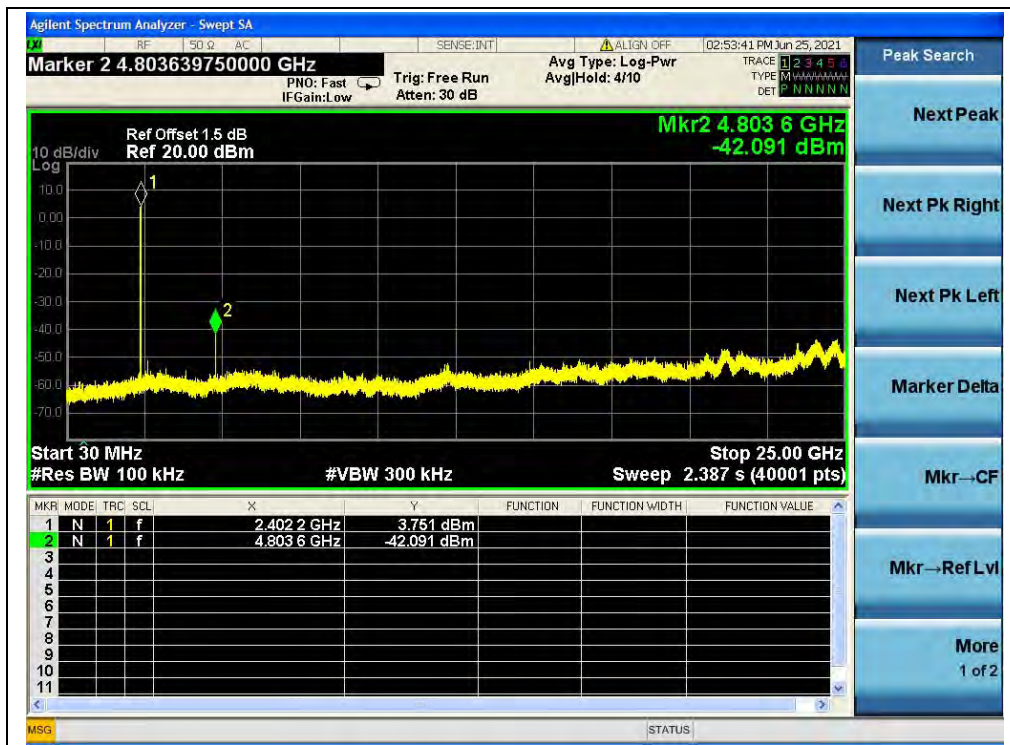


$\pi/4$ -DQPSK Mode

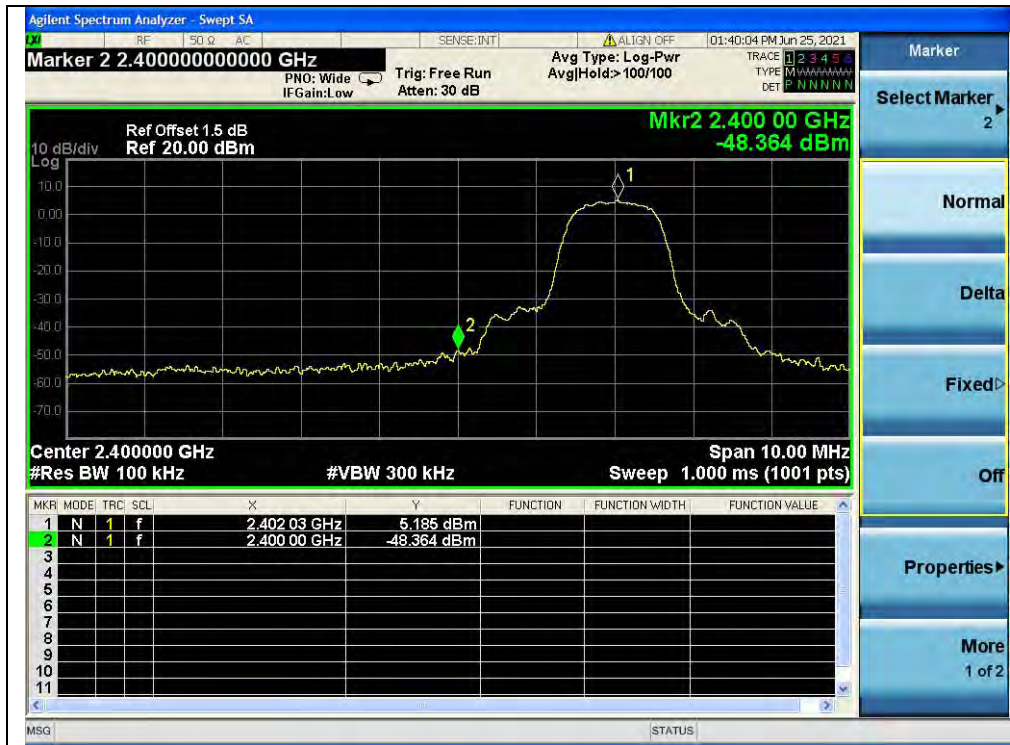
A. Test Verdict:

Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated -20dBc Limit	
0	2402	-42.09	3.75	-16.25	PASS
39	2441	-41.40	5.05	-14.95	PASS
78	2480	-43.56	4.15	-15.85	PASS

B. Test Plot:



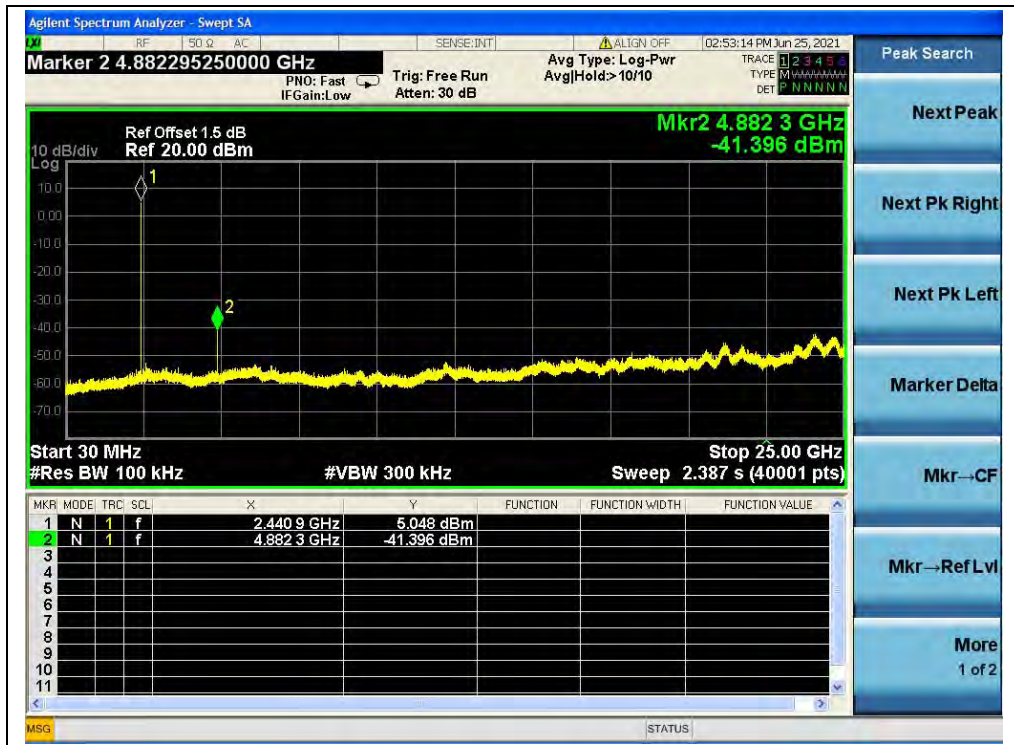
(30MHz to 25GHz, Channel 0, $\pi/4$ -DQPSK)



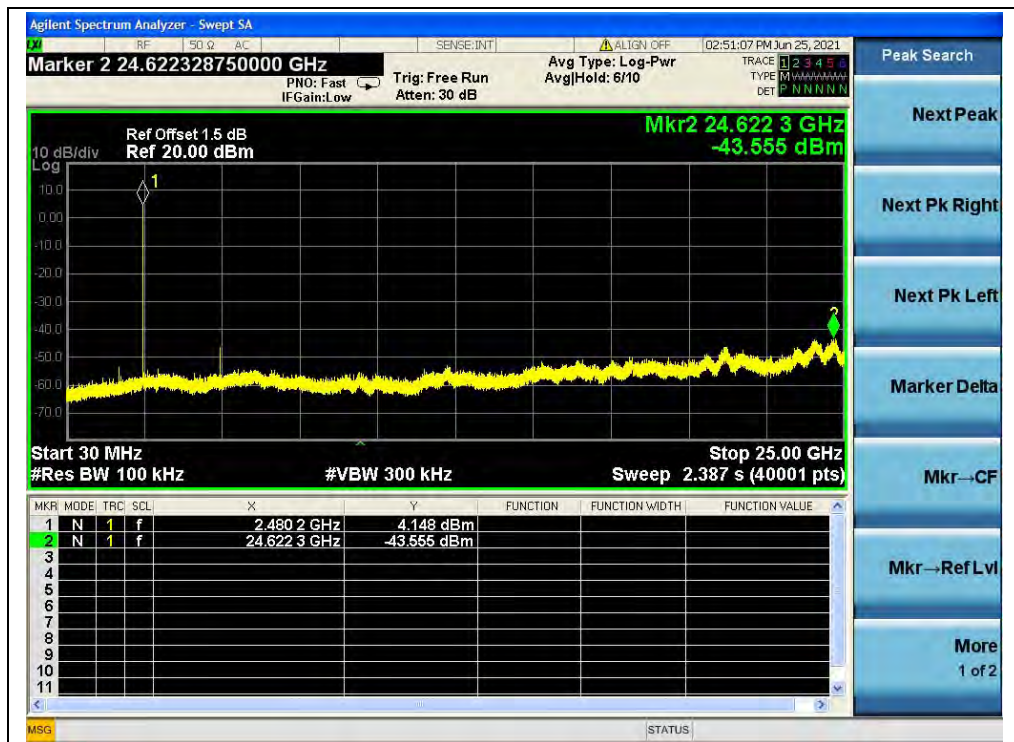
(Band edge, Channel 0, $\pi/4$ -DQPSK)



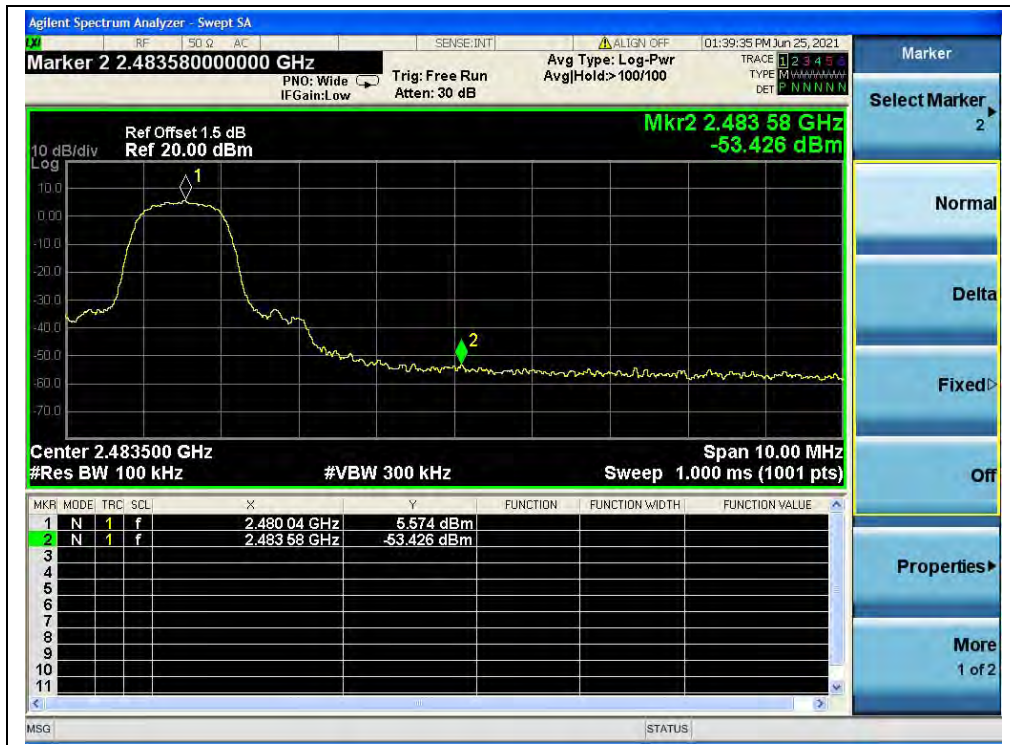
(Band edge with hopping on, Channel 0, $\pi/4$ -DQPSK)



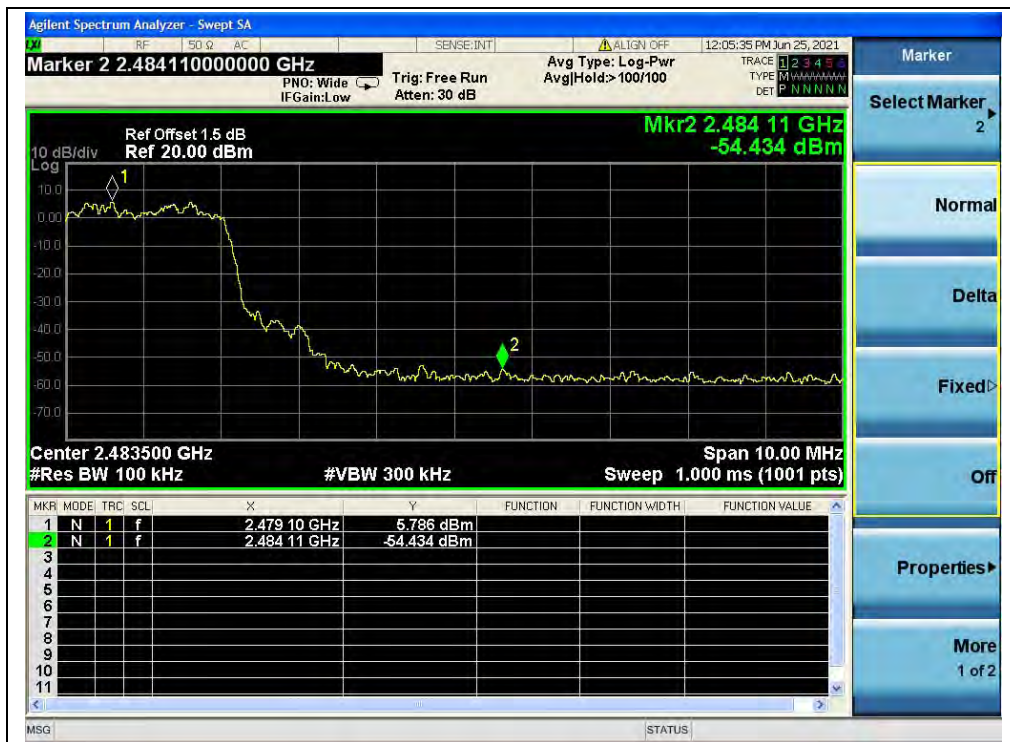
(30MHz to 25GHz, Channel 39, $\pi/4$ -DQPSK)



(30MHz to 25GHz, Channel 78, $\pi/4$ -DQPSK)



(Band edge, Channel 78, $\pi/4$ -DQPSK)



(Band edge with hopping on, Channel 78, $\pi/4$ -DQPSK)

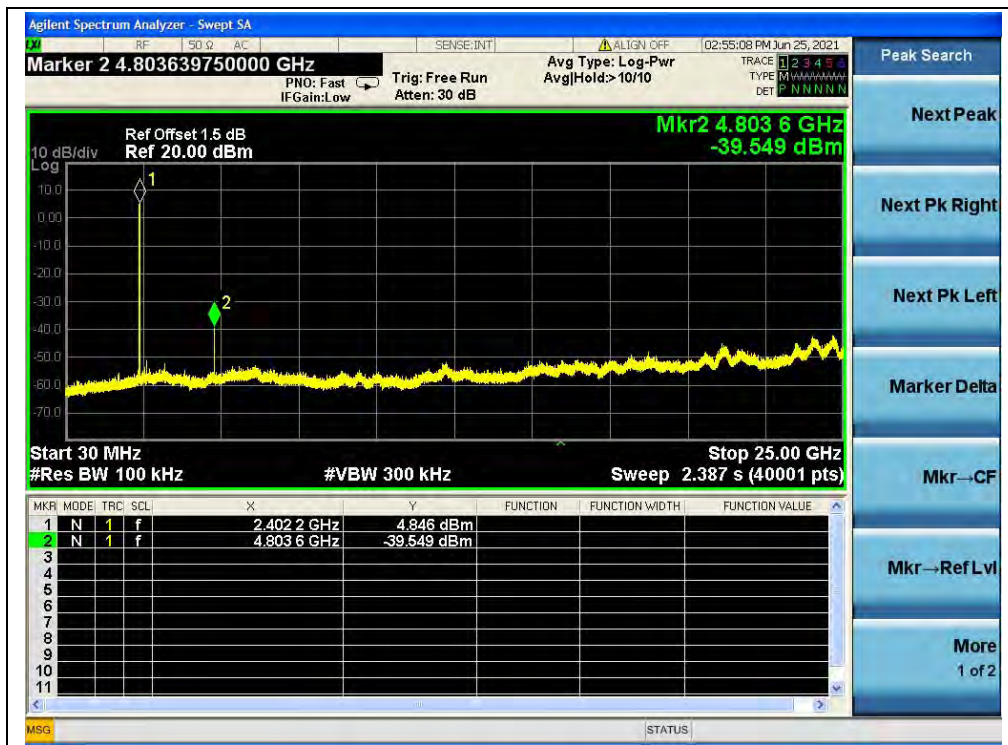


8-DPSK Mode

A. Test Verdict:

Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated -20dBc Limit	
0	2402	-39.55	4.85	-15.15	PASS
39	2441	-42.63	4.47	-15.53	PASS
78	2480	-42.25	5.18	-14.82	PASS

B. Test Plot:



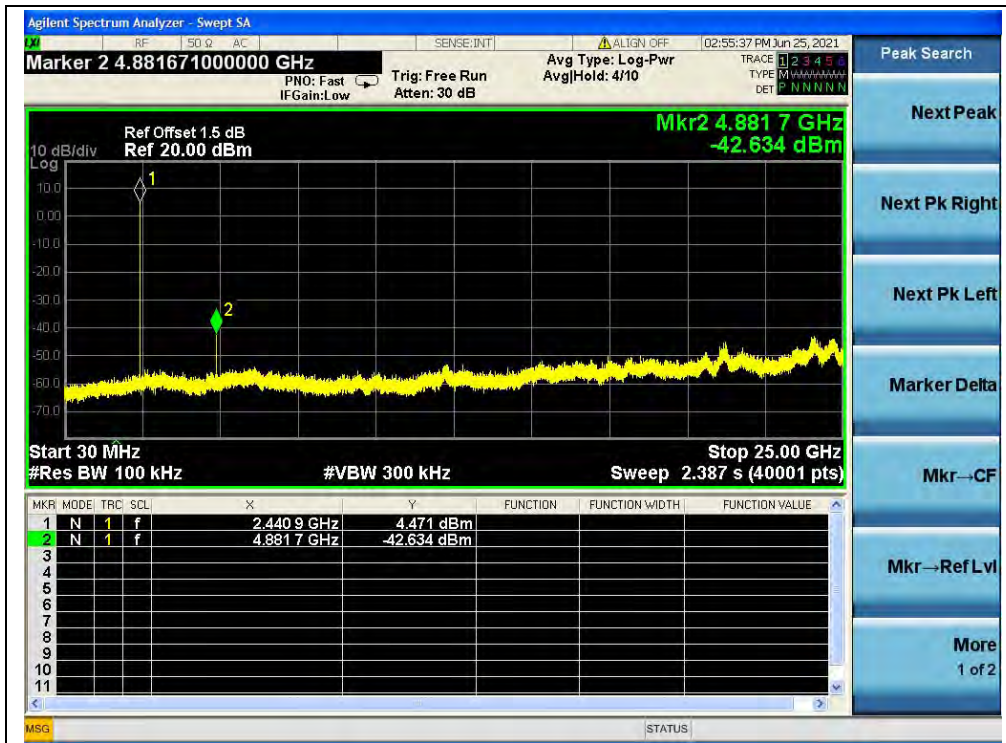
(30MHz to 25GHz, Channel 0, 8-DPSK)



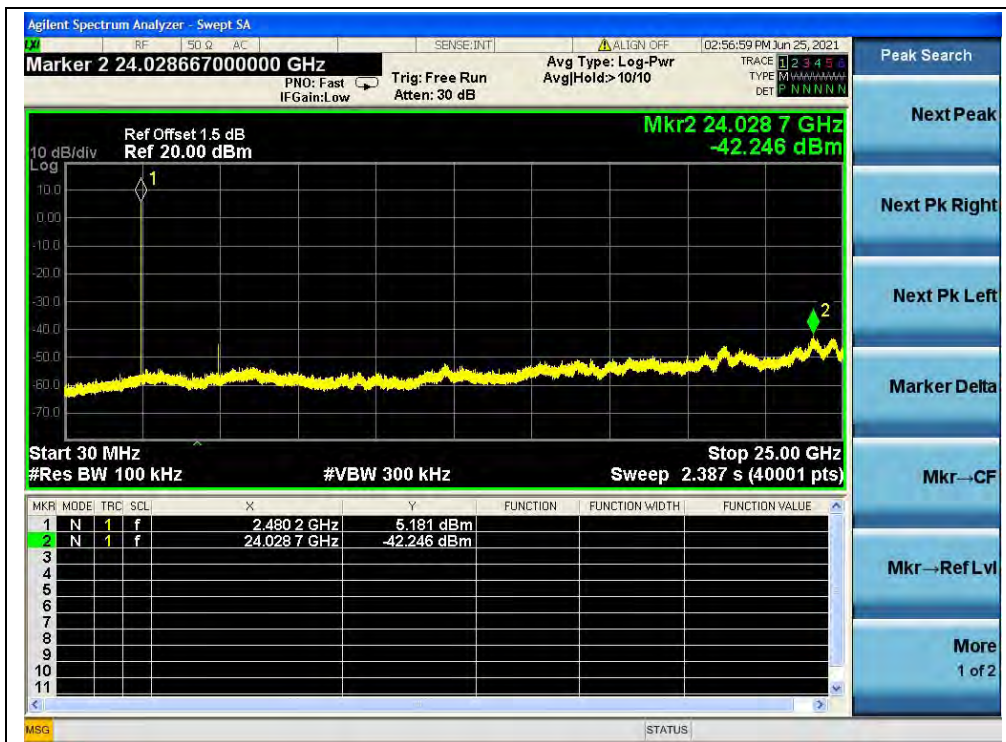
(Band edge, Channel 0, 8-DPSK)



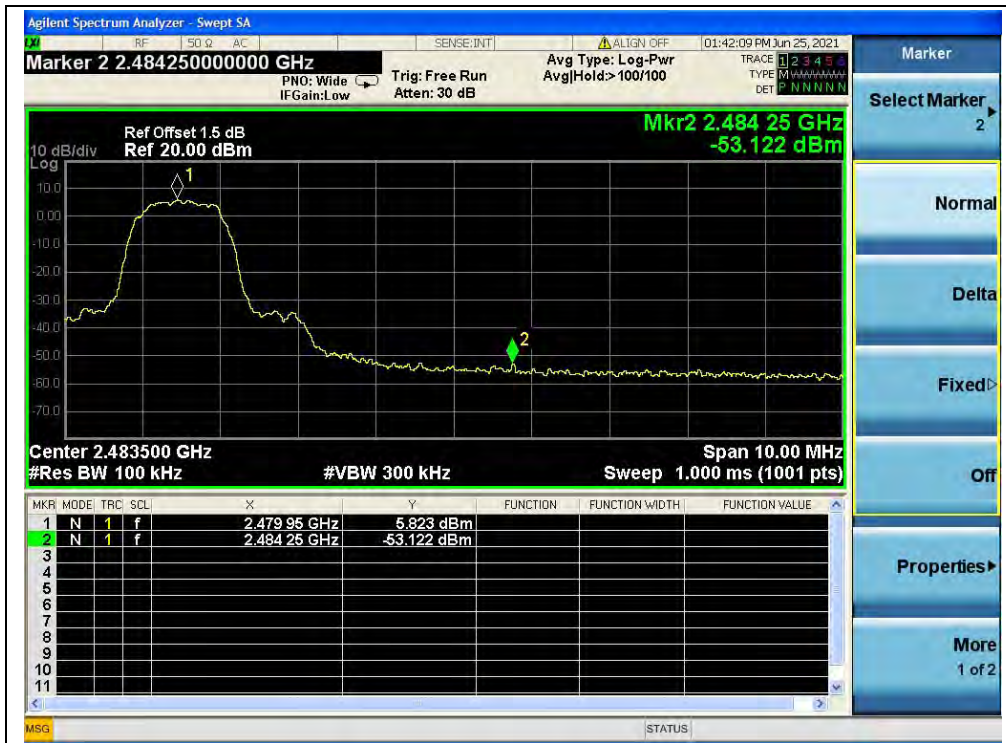
(Band edge with hopping on, Channel 0, 8-DPSK)



(30MHz to 25GHz, Channel 39, 8-DPSK)



(30MHz to 25GHz, Channel 78, 8-DPSK)



(Band edge, Channel 78, 8-DPSK)



(Band edge with hopping on, Channel 78, 8-DPSK)

2.11. Conducted Emission

2.11.1. Requirement

According to FCC section 15.207, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150kHz to 30MHz shall not exceed the limits in the following table, as measured using a 50μH/50Ω line impedance stabilization network (LISN).

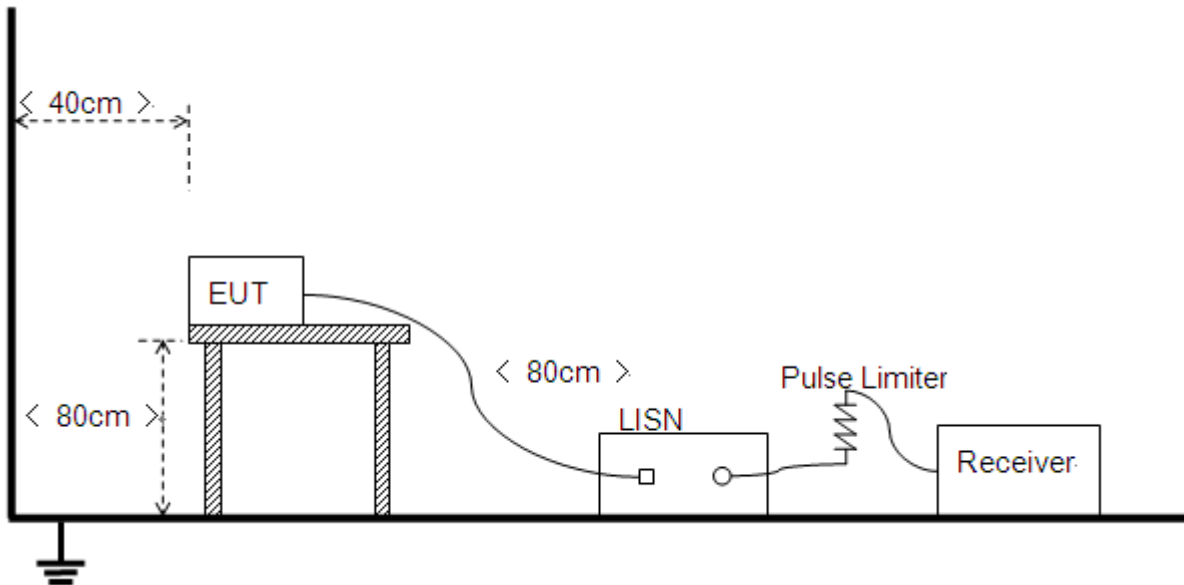
Frequency Range (MHz)	Conducted Limit (dBμV)	
	Quai-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
5- 30	60	50

Note:

- (a) The lower limit shall apply at the band edges.
- (b) The limit decreases linearly with the logarithm of the frequency in the range 0.15 - 0.50MHz.

2.11.2. Test Description

Test Setup:



The Table-top EUT was placed upon a non-metallic table 0.8m above the horizontal metal reference ground plane. EUT was connected to LISN and LISN was connected to reference Ground Plane. EUT was 80cm from LISN. The set-up and test methods were according to ANSI C63.10: 2013.



REPORT No.: SZ21060185W01

2.11.3. Test Result

Note: This test case does not apply this kind of EUT.

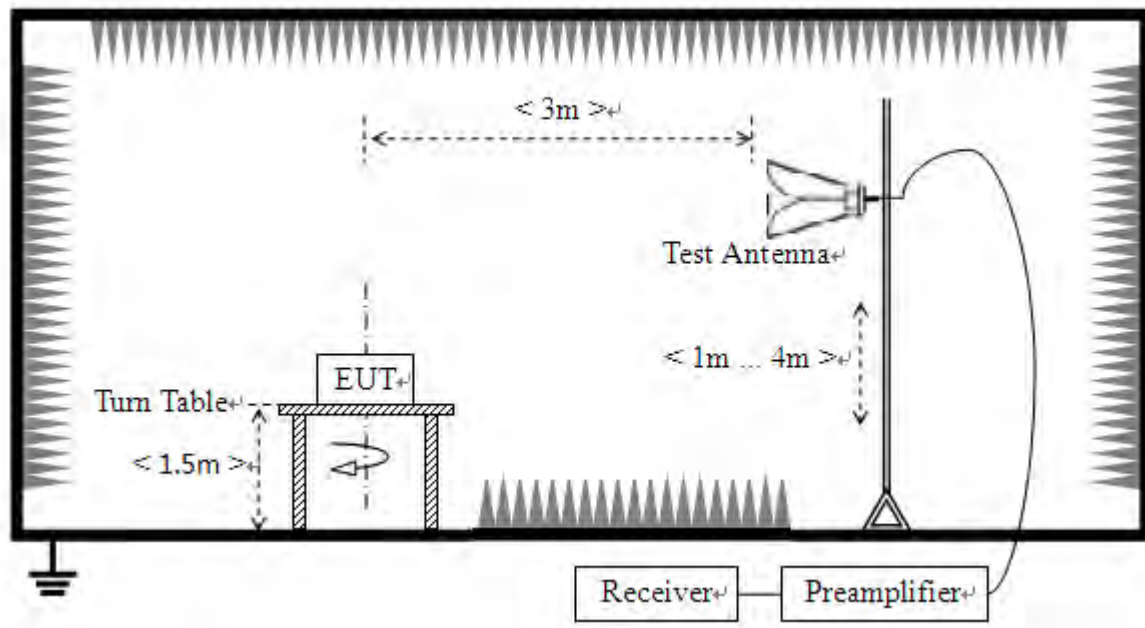
2.12. Restricted Frequency Bands

2.12.1. Requirement

According to FCC section 15.247(d), in any 100kHz 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 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, In addition, radiated emissions which fall in the restricted bands, as defined in 15.205(a), must also comply with the radiated emission limits specified in 15.209(a).

2.12.2. Test Description

Test Setup:



The EUT is located in a 3m Semi-Anechoic Chamber; the antenna factors, cable loss and so on of the site as factors are calculated to correct the reading.

For the Test Antenna:

Horn Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength.



2.12.3. Test Procedure

Span = wide enough to fully capture the emission being measured

RBW = 1 MHz for $f \geq 1\text{GHz}$, 100 kHz for $f < 1\text{GHz}$

VBW = 3 MHz

Sweep = auto

Detector function = peak/average

Trace = max hold

Allow the trace to stabilize

2.12.4. Test Result

The lowest and highest channels are tested to verify Restricted Frequency Bands.

The measurement results are obtained as below:

$$E \text{ [dB}\mu\text{V/m]} = U_R + A_T + A_{\text{Factor}} \text{ [dB]}; A_T = L_{\text{Cable loss}} \text{ [dB]} - G_{\text{preamp}} \text{ [dB]}$$

AT: Total correction Factor except Antenna

UR: Receiver Reading

G_{preamp}: Preamplifier Gain

A_{Factor}: Antenna Factor at 3m

Note: Restricted Frequency Bands were performed when antenna was at vertical and horizontal polarity, and only the worse test condition (vertical) was recorded in this test report.

Left:

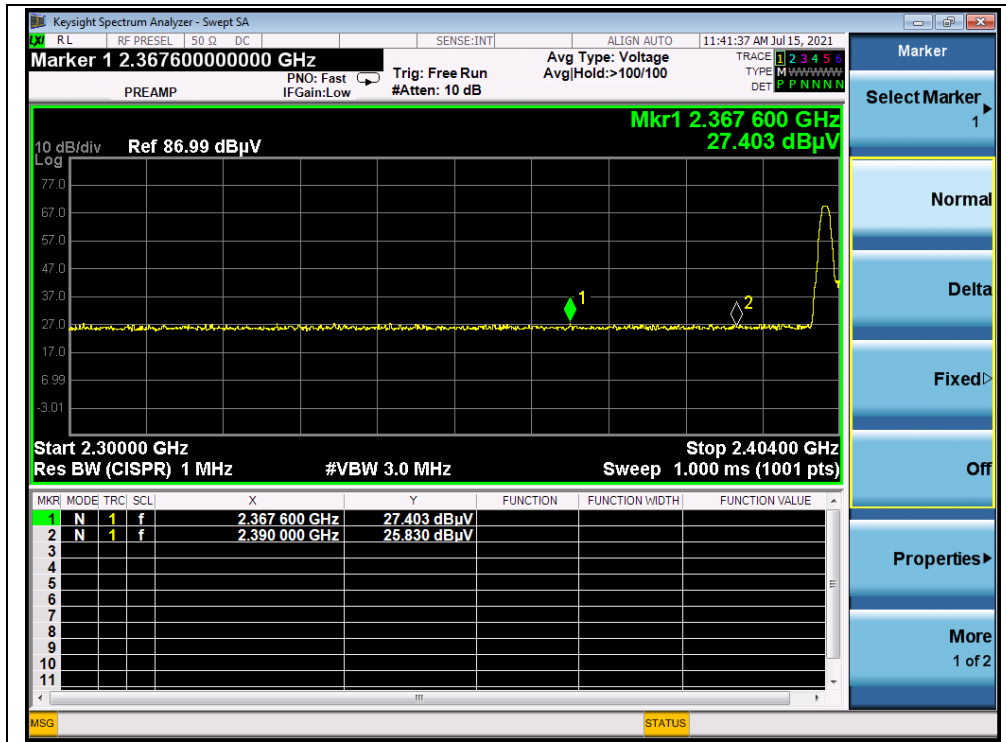
GFSK Mode

A. Test Verdict:

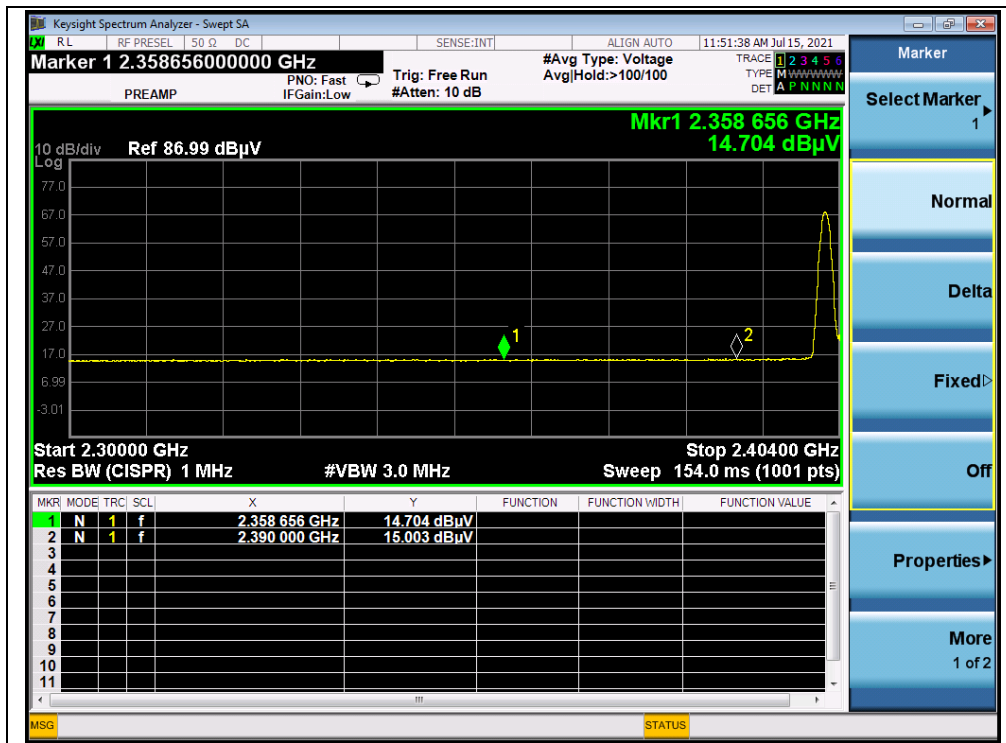
Channel	Frequency (MHz)	Detector	Receiver Reading U _R (dBμV)	A _T (dB)	A _{Factor} (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
		PK/ AV						
0	2367.60	PK	27.40	6.74	27.20	61.34	74	PASS
0	2390.00	AV	15.00	6.74	27.20	48.94	54	PASS
78	2487.66	PK	26.94	6.74	27.20	60.88	74	PASS
78	2485.68	AV	16.37	6.74	27.20	50.31	54	PASS



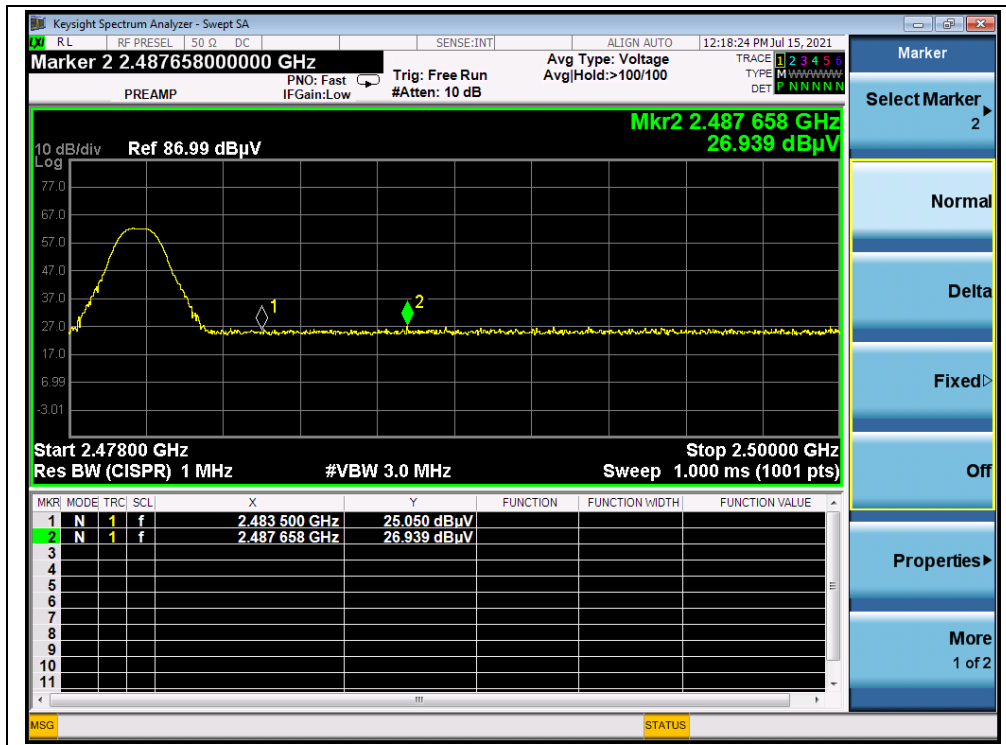
B. Test Plot:



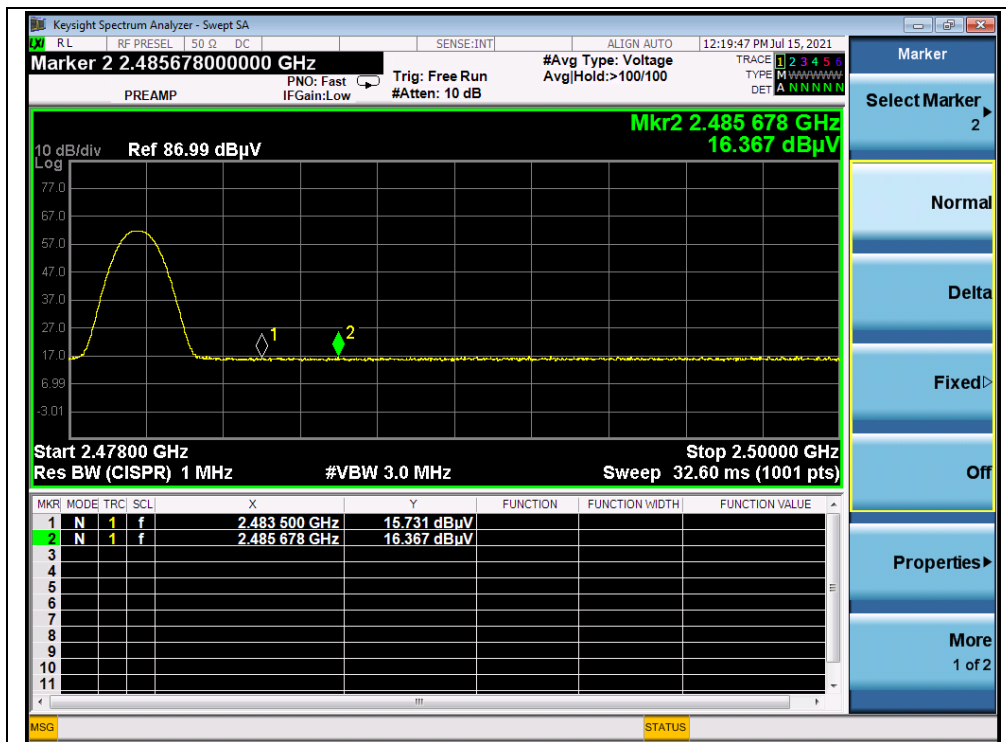
(PEAK, Channel 0, GFSK)



(AVERAGE, Channel 0, GFSK)



(PEAK, Channel 78, GFSK)



(AVERAGE, Channel 78, GFSK)

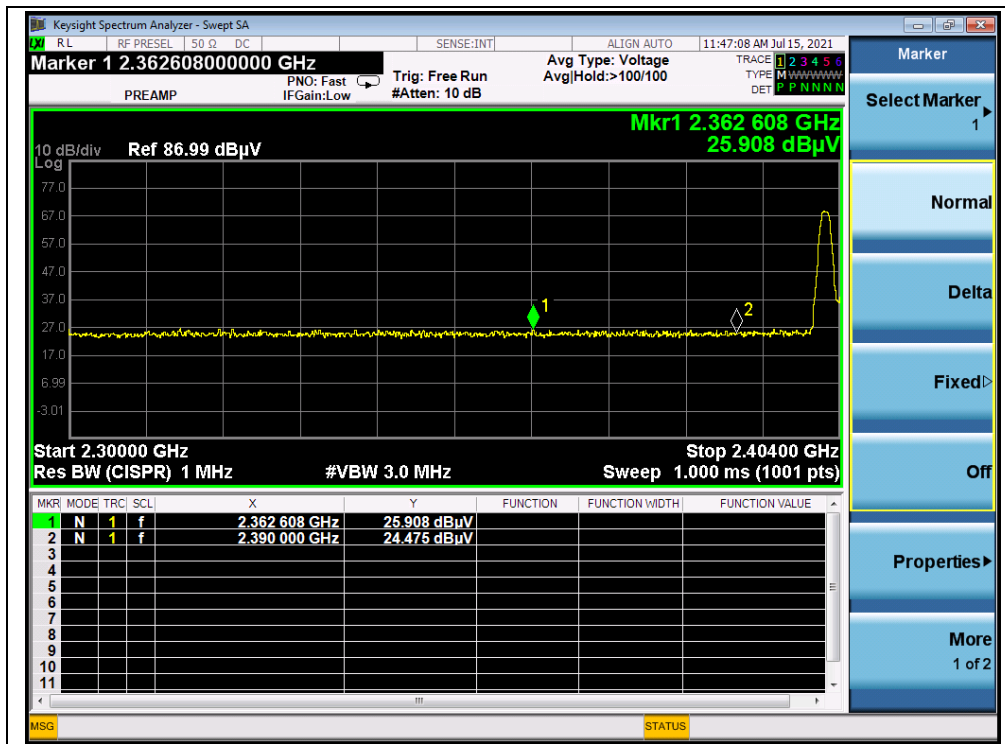


$\pi/4$ -DQPSK Mode

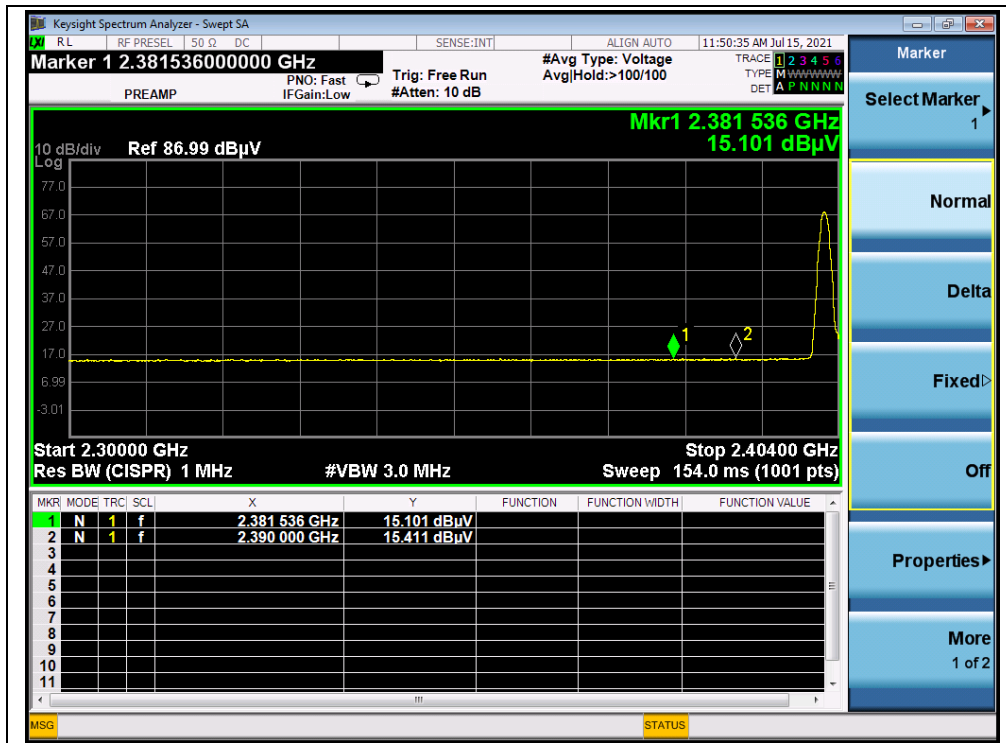
A. Test Verdict:

Channel	Frequency (MHz)	Detector	Receiver Reading	A _T (dB)	A _{Factor} (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
		PK/ AV	U _R (dBμV)					
0	2362.61	PK	25.91	6.74	27.20	59.85	74	PASS
0	2390.00	AV	15.41	6.74	27.20	49.35	54	PASS
78	2488.67	PK	26.09	6.74	27.20	60.03	74	PASS
78	2486.49	AV	16.35	6.74	27.20	50.29	54	PASS

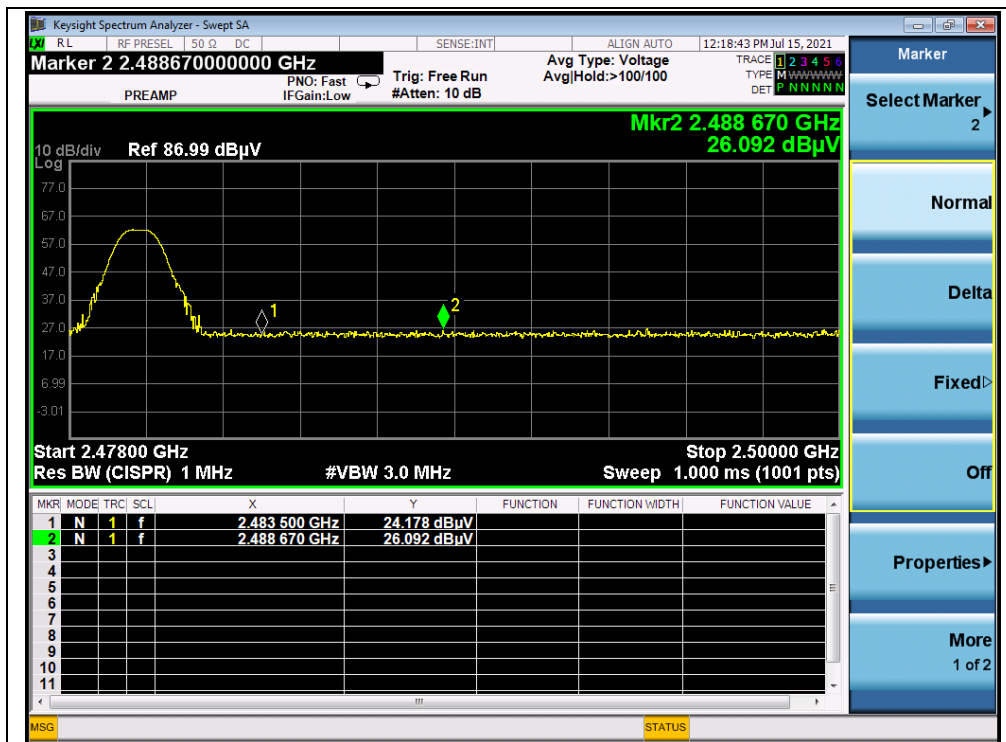
B. Test Plot:



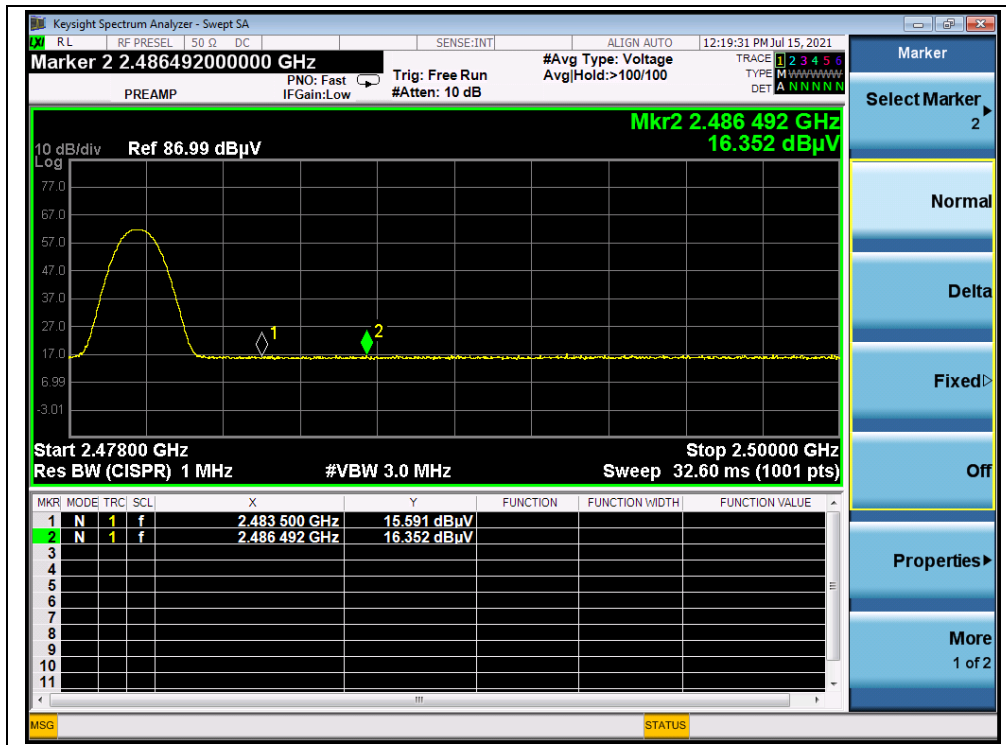
(PEAK, Channel 0, $\pi/4$ -DQPSK)



(AVERAGE, Channel 0, $\pi/4$ -DQPSK)



(PEAK, Channel 78, $\pi/4$ -DQPSK)



(AVERAGE, Channel 78, π/4-DQPSK)

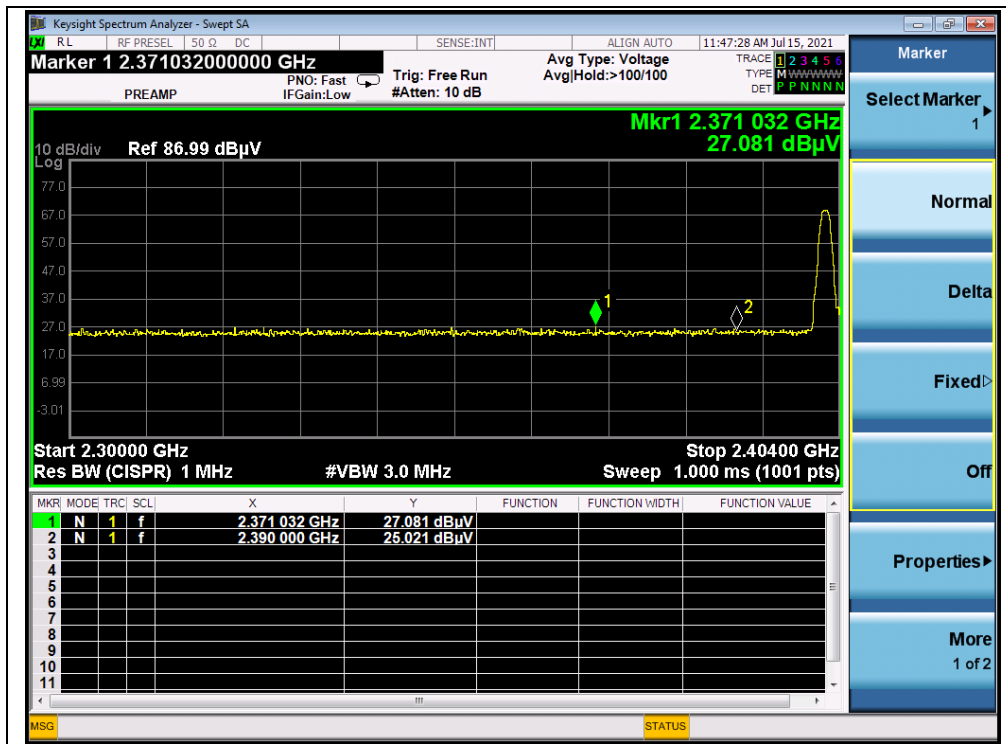


8-DPSK Mode

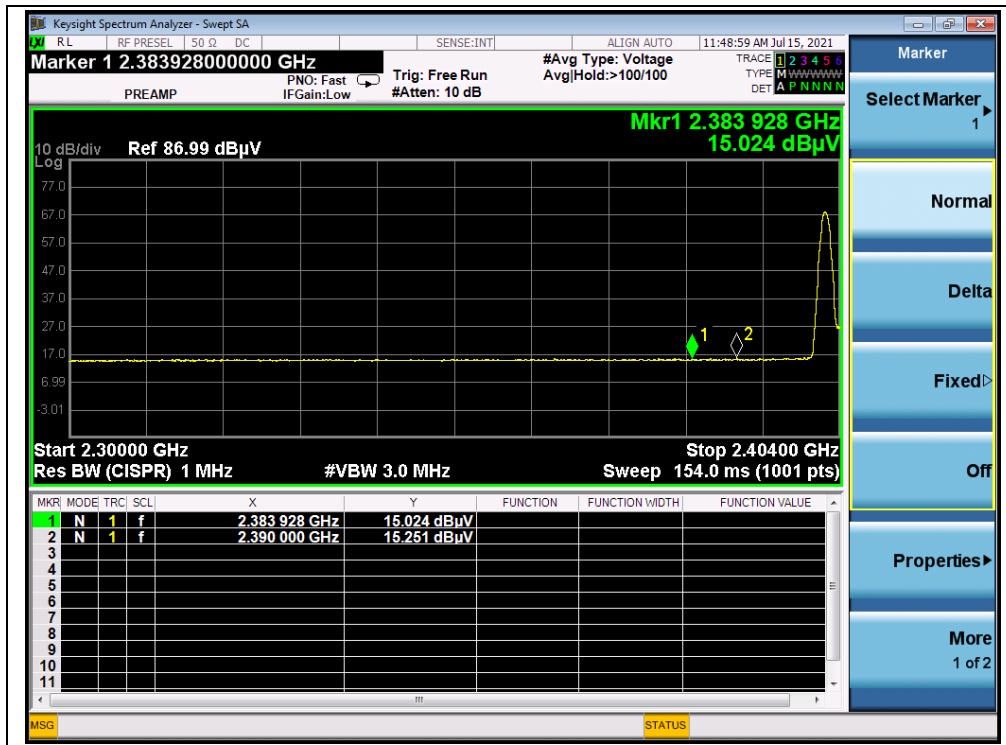
A. Test Verdict:

Channel	Frequency (MHz)	Detector	Receiver Reading	A _T (dB)	A _{Factor} (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
		PK/ AV	U _R (dBμV)					
0	2371.03	PK	27.08	6.74	27.20	61.02	74	PASS
0	2390.00	AV	15.25	6.74	27.20	49.19	54	PASS
78	2484.12	PK	25.84	6.74	27.20	59.78	74	PASS
78	2487.68	AV	17.45	6.74	27.20	51.39	54	PASS

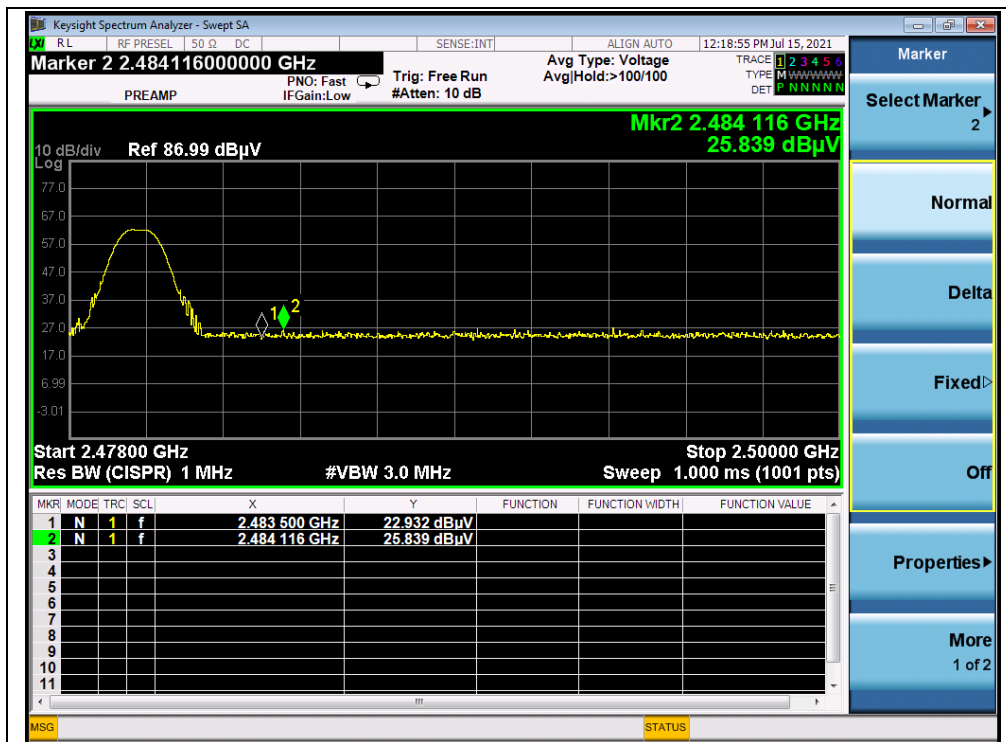
B. Test Plot:



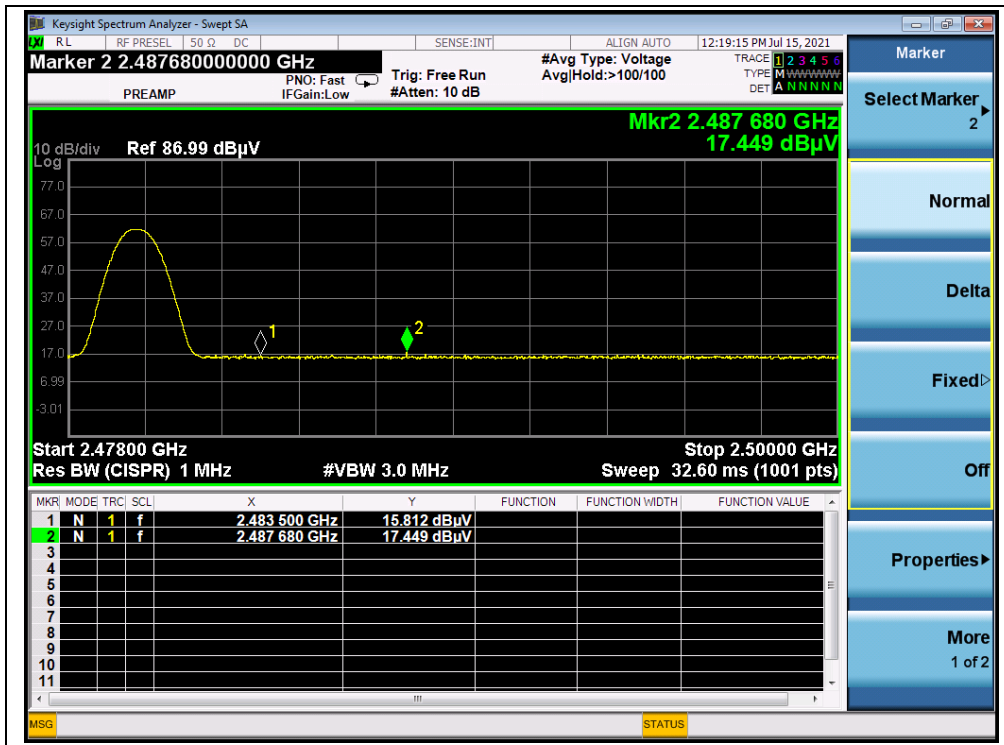
(PEAK, Channel 0, 8-DPSK)



(AVERAGE, Channel 0, 8-DPSK)



(PEAK, Channel 78, 8-DPSK)



(AVERAGE, Channel 78, 8-DPSK)



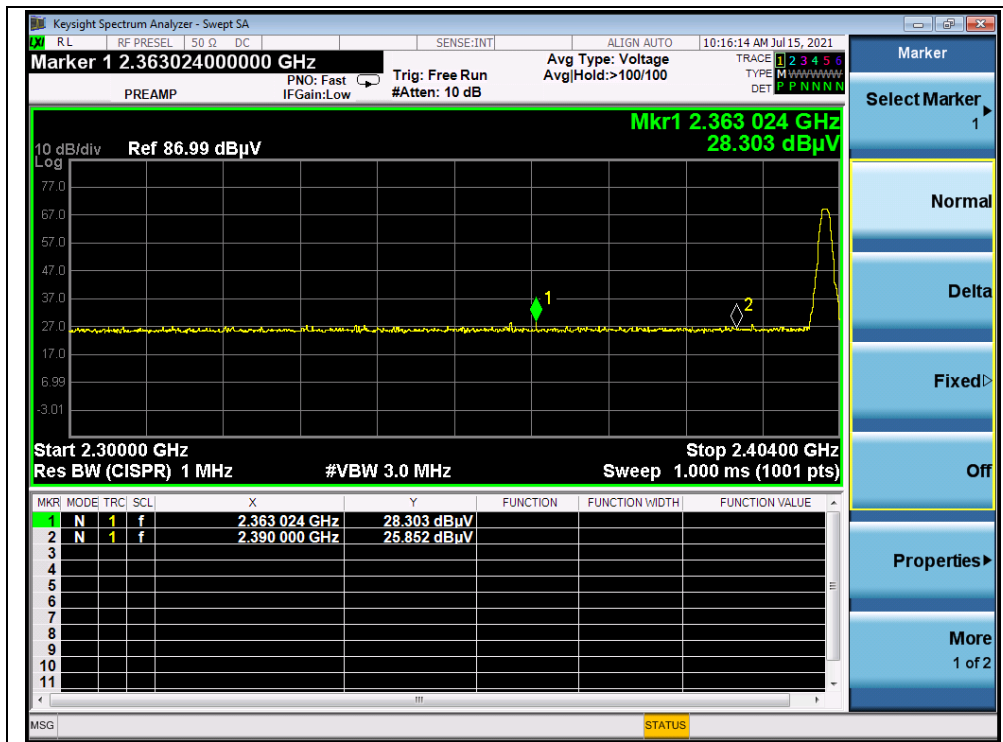
Right:

GFSK Mode

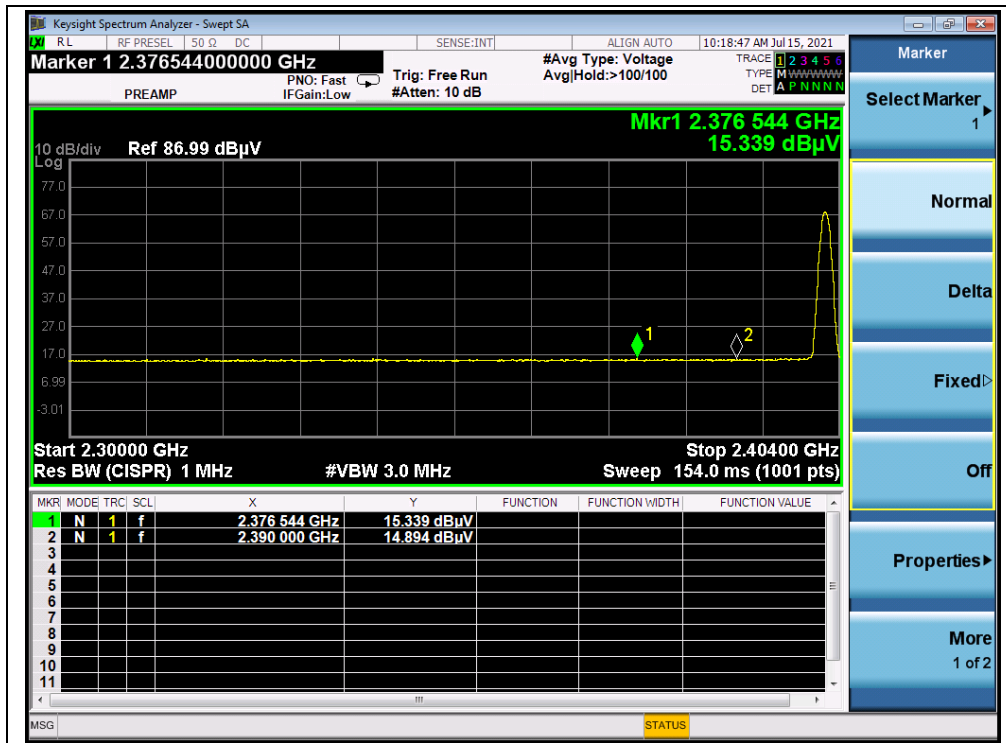
A. Test Verdict:

Channel	Frequency (MHz)	Detector	Receiver Reading U_R (dB μ V)	A_T (dB)	A_{Factor} (dB@3m)	Max. Emission E (dB μ V/m)	Limit (dB μ V/m)	Verdict
		PK/ AV						
0	2363.02	PK	28.30	6.74	27.20	62.24	74	PASS
0	2376.54	AV	15.34	6.74	27.20	49.28	54	PASS
78	2488.34	PK	26.90	6.74	27.20	60.84	74	PASS
78	2485.79	AV	16.57	6.74	27.20	50.51	54	PASS

B. Test Plot:



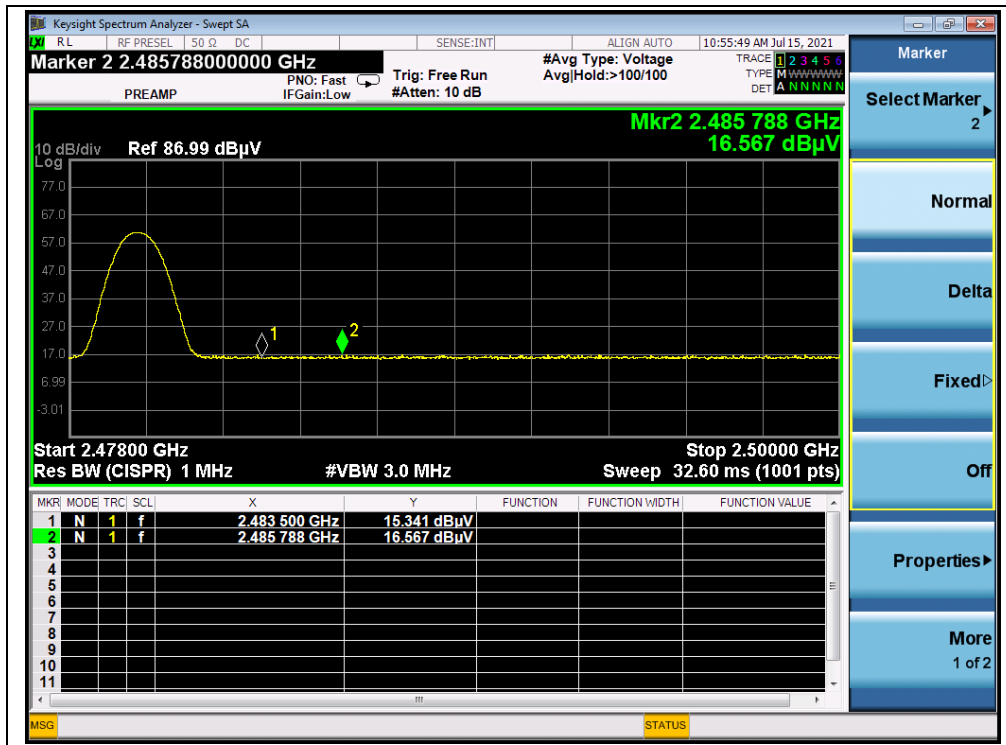
(PEAK, Channel 0, GFSK)



(AVERAGE, Channel 0, GFSK)



(PEAK, Channel 78, GFSK)



(AVERAGE, Channel 78, GFSK)

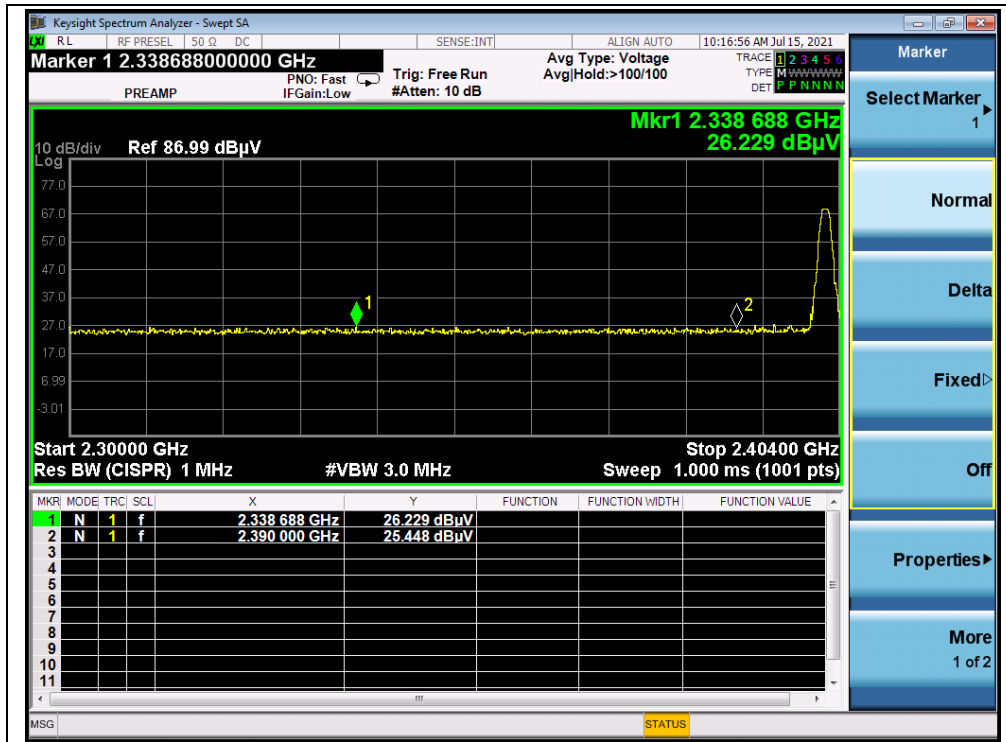


$\pi/4$ -DQPSK Mode

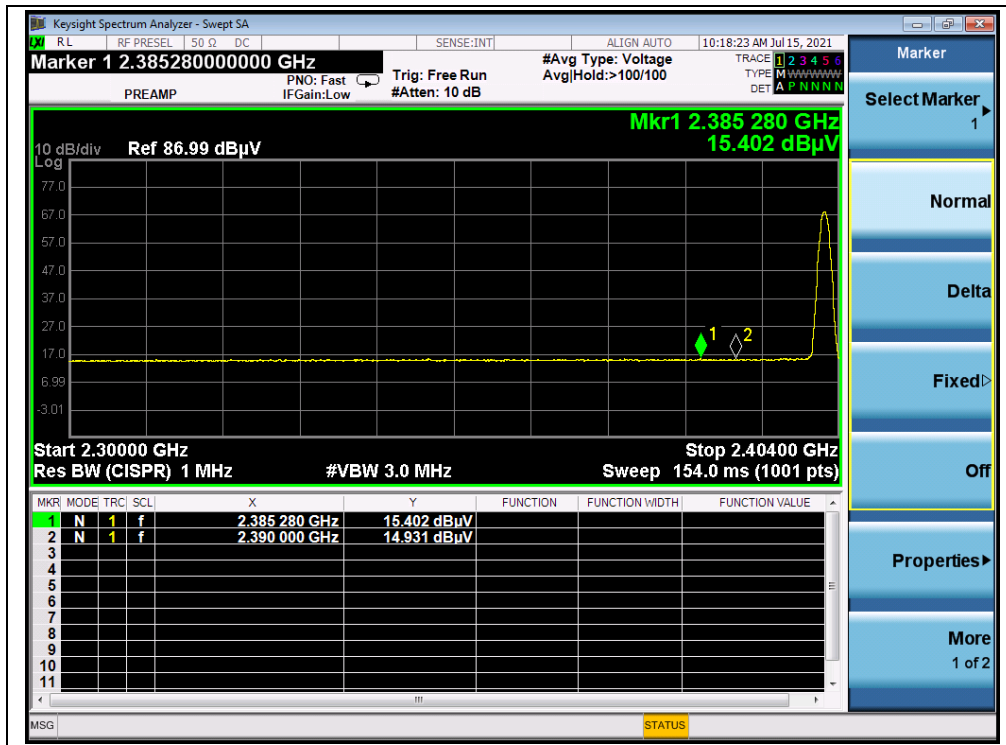
A. Test Verdict:

Channel	Frequency (MHz)	Detector	Receiver Reading	A _T (dB)	A _{Factor} (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
		PK/ AV	U _R (dBμV)					
0	2370.00	PK	27.12	6.74	27.20	61.06	74	PASS
0	2379.87	AV	15.35	6.74	27.20	49.29	54	PASS
78	2489.33	PK	26.19	6.74	27.20	60.13	74	PASS
78	2483.87	AV	16.42	6.74	27.20	50.36	54	PASS

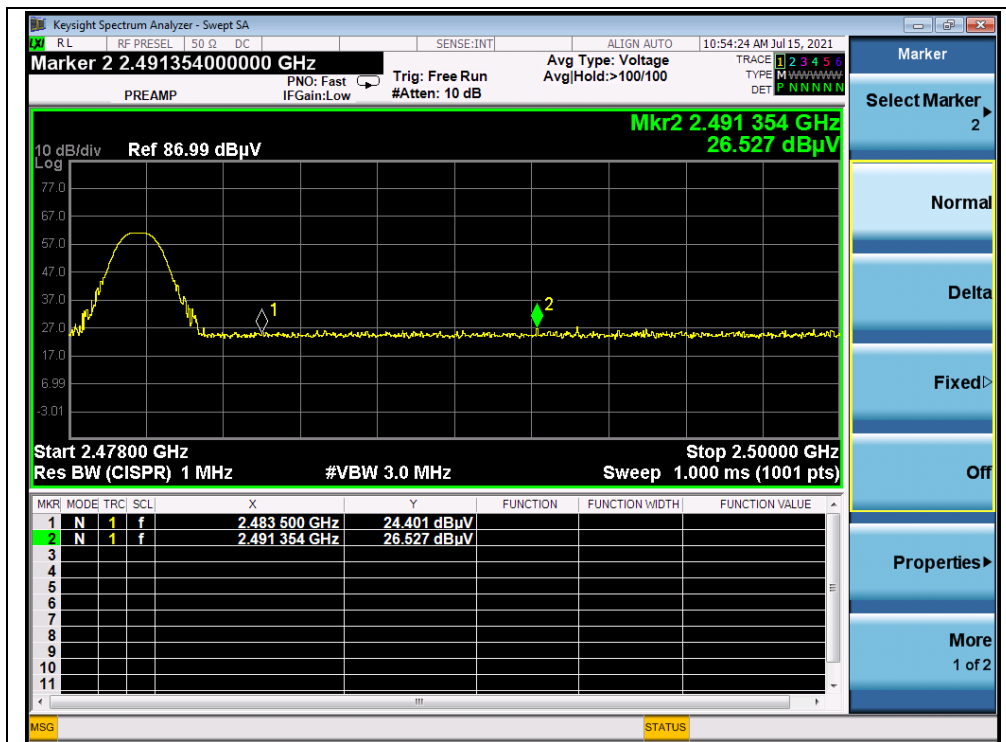
B. Test Plot:



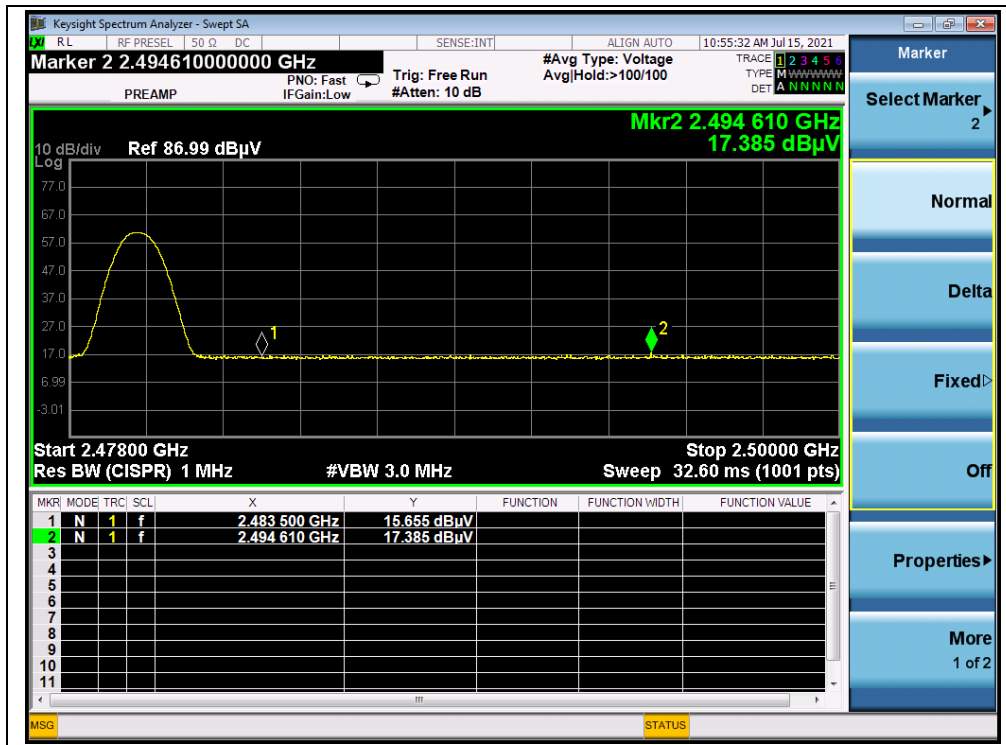
(PEAK, Channel 0, $\pi/4$ -DQPSK)



(AVERAGE, Channel 0, $\pi/4$ -DQPSK)



(PEAK, Channel 78, $\pi/4$ -DQPSK)



(AVERAGE, Channel 78, π/4-DQPSK)

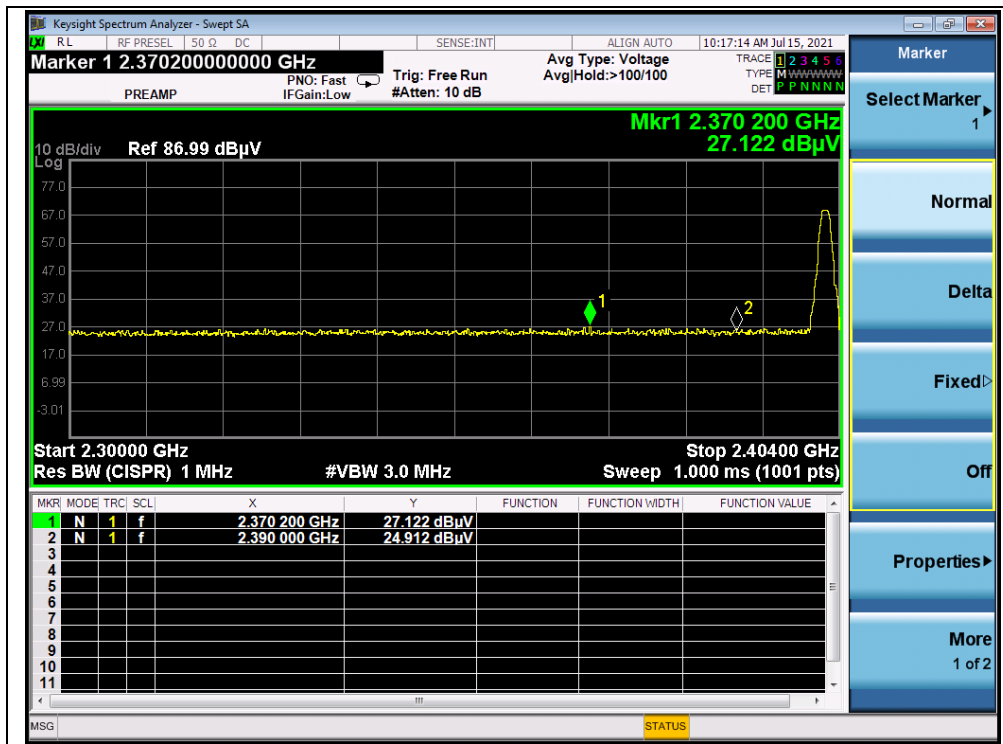


8-DPSK Mode

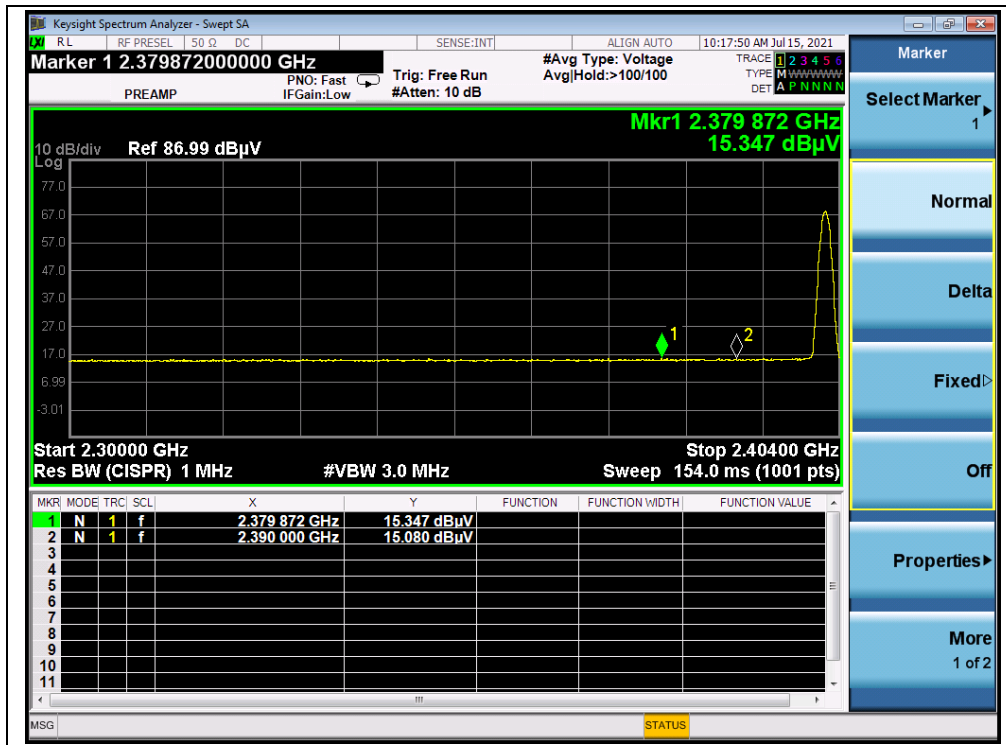
A. Test Verdict:

Channel	Frequency (MHz)	Detector	Receiver Reading	A _T (dB)	A _{Factor} (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
		PK/ AV	U _R (dBμV)					
0	2370.20	PK	27.12	6.74	27.20	61.06	74	PASS
0	2379.87	AV	15.35	6.74	27.20	49.29	54	PASS
78	2489.33	PK	26.19	6.74	27.20	60.13	74	PASS
78	2483.87	AV	16.42	6.74	27.20	50.36	54	PASS

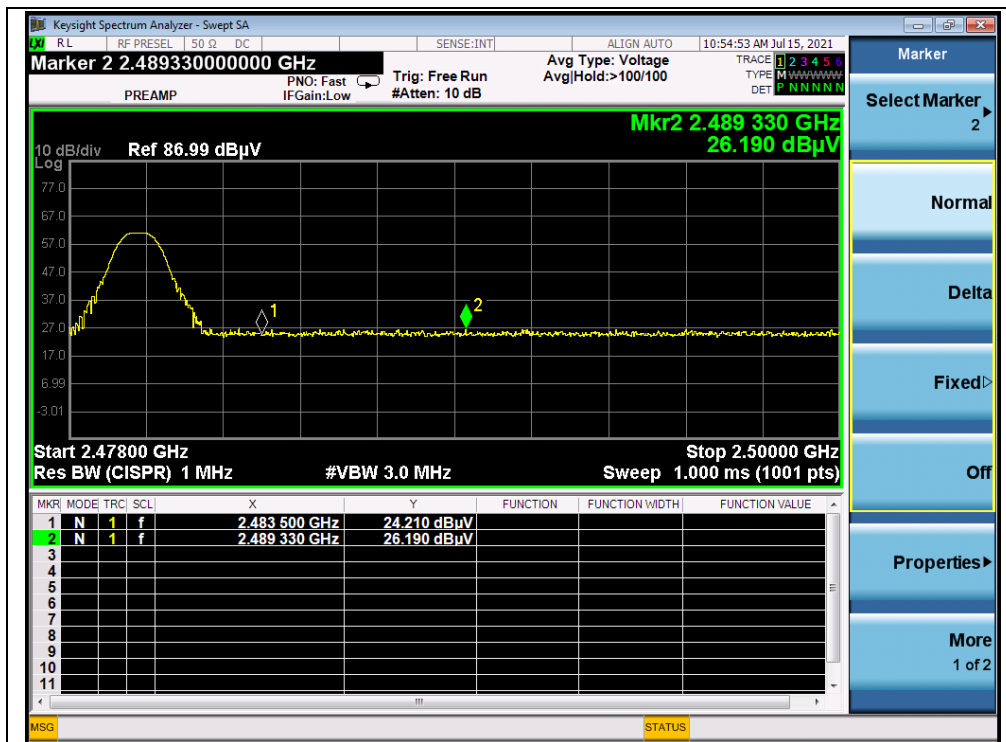
B. Test Plot:



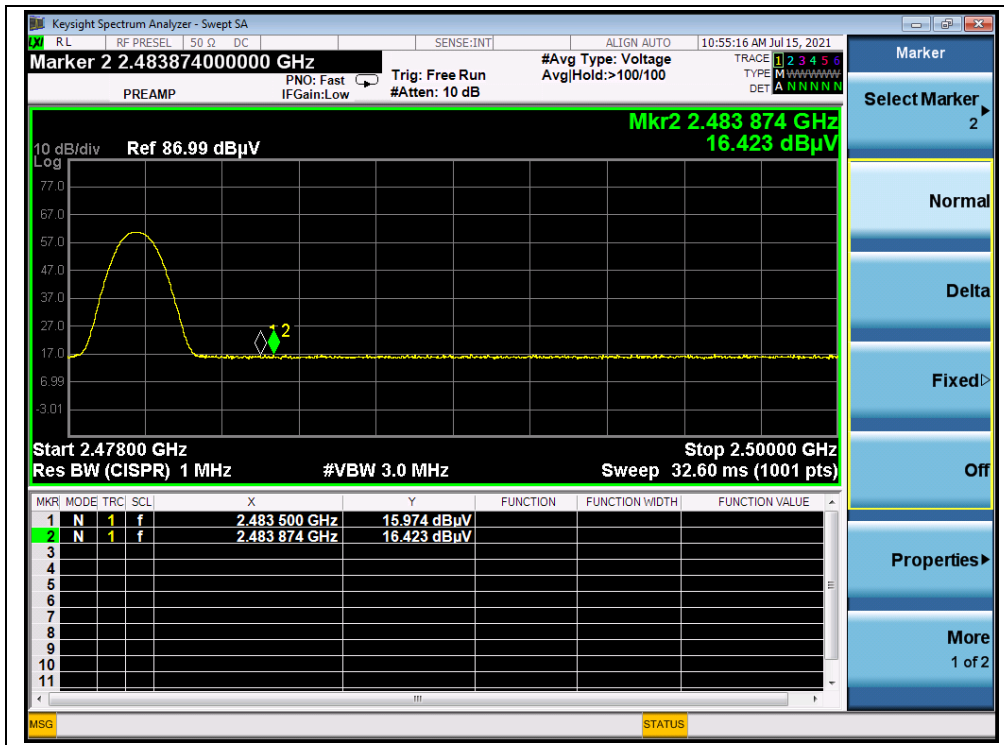
(PEAK, Channel 0, 8-DPSK)



(AVERAGE, Channel 0, 8-DPSK)



(PEAK, Channel 78, 8-DPSK)



(AVERAGE, Channel 78, 8-DPSK)



2.13. Radiated Emission

2.13.1. Requirement

According to FCC section 15.247(d), radiated emission outside the frequency band attenuation below the general limits specified in FCC section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in FCC section 15.205(a), must also comply with the radiated emission limits specified in FCC section 15.209(a).

According to FCC section 15.209 (a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength ($\mu\text{V}/\text{m}$)	Measurement Distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

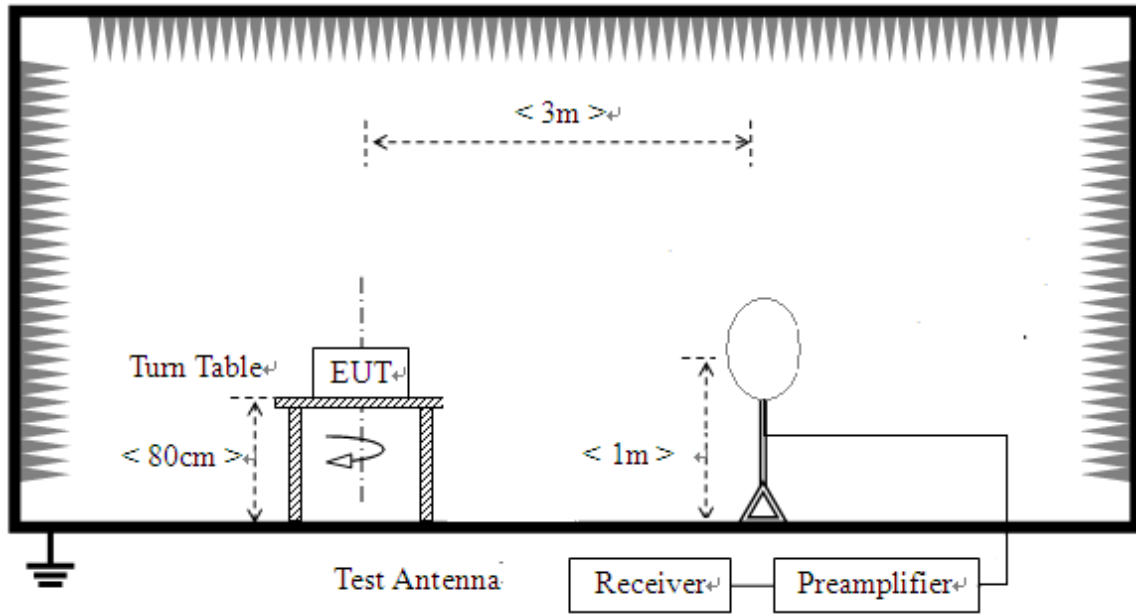
Note1: For above 1000MHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit.

Note2: For above 1000MHz, limit field strength of harmonics: 54dBuV/m@3m (AV) and 74dBuV/m@3m (PK). In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), also should comply with the radiated emission limits specified in Section 15.209(a)(above table).

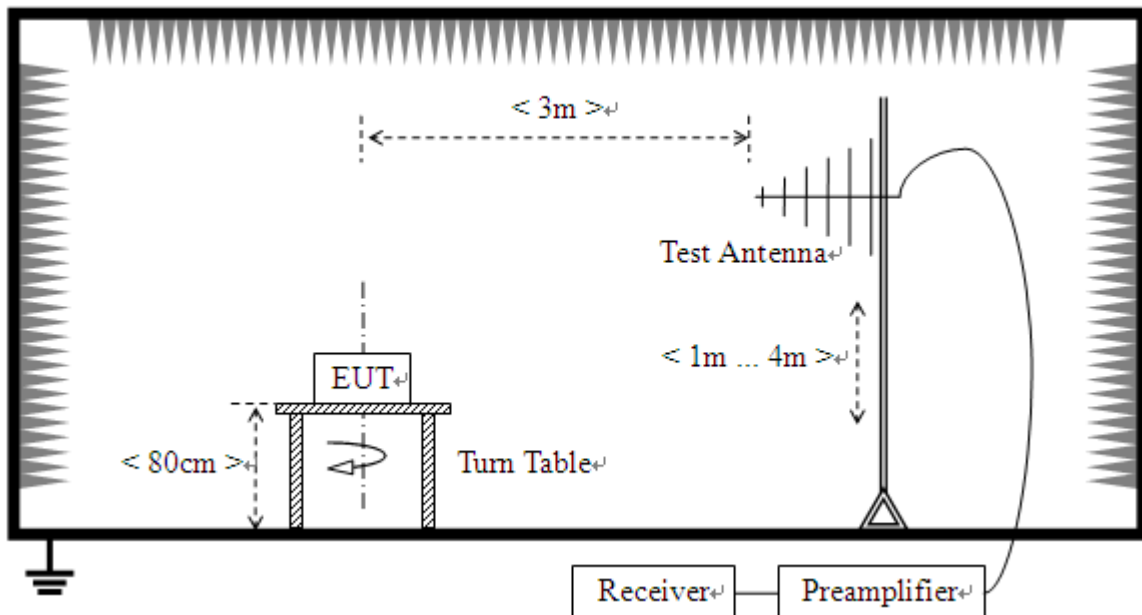
2.13.2. Test Description

Test Setup:

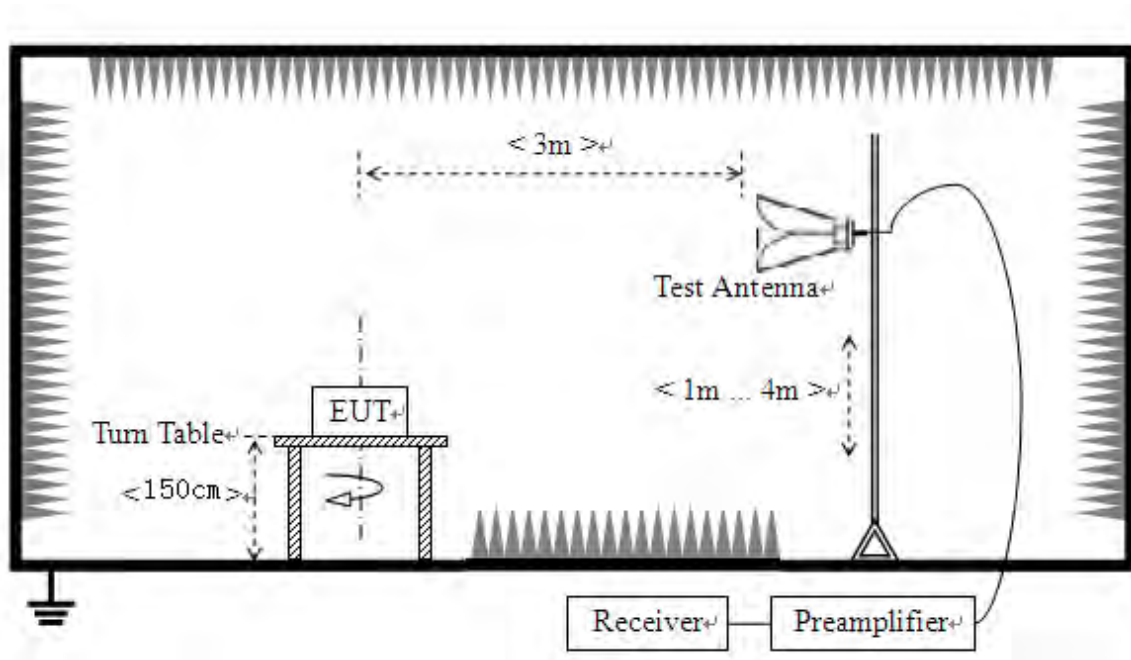
- 1) For radiated emissions from 9kHz to 30MHz



- 2) For radiated emissions from 30MHz to 1GHz



3) For radiated emissions above 1GHz



The EUT is placed on a non-conducting table 80 cm above the ground plane for measurement below 1GHz; 1.5 m above the ground plane for measurement above 1GHz. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

For measurements below 30MHz, the emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9kHz-90 kHz, 110kHz-490 kHz. Radiated emission limits in these two bands are based on measurements employing an average detector.

For measurements below 1GHz the resolution bandwidth is set to 100kHz for peak detection measurements or 120kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1GHz the resolution bandwidth is set to 1MHz, the video band width is set to 3MHz for peak measurements and as applicable for average measurements.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.



2.13.3. Test Result

According to ANSI C63.10, because of peak detection will yield amplitudes equal to or greater than amplitudes measured with the quasi-peak (or average) detector, the measurement data from a spectrum analyzer peak detector will represent the worst-case results, if the peak measured value complies with the quasi-peak (or average) limit, it is unnecessary to perform an quasi-peak measurement (or average).

The measurement results are obtained as below:

$$E \text{ [dB}\mu\text{V/m]} = U_R + A_T + A_{\text{Factor}} \text{ [dB]}; A_T = L_{\text{Cable loss}} \text{ [dB]} - G_{\text{preamp}} \text{ [dB]}$$

A_T : Total correction Factor except Antenna

U_R : Receiver Reading

G_{preamp} : Preamplifier Gain

A_{Factor} : Antenna Factor at 3m

During the test, the total correction Factor A_T and A_{Factor} were built in test software.

Note 1: All radiated emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

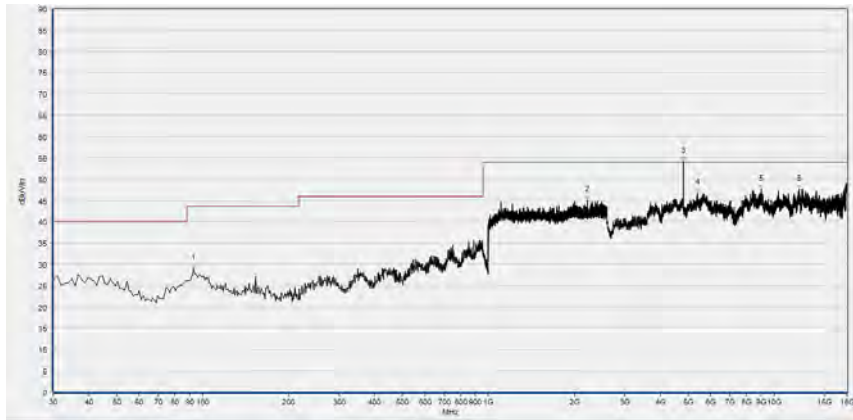
Note 2: For the frequency, which started from 9kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit was not recorded.

Note 3: For the frequency, which started from 18GHz to 40GHz, was pre-scanned and the result which was 20dB lower than the limit was not recorded.



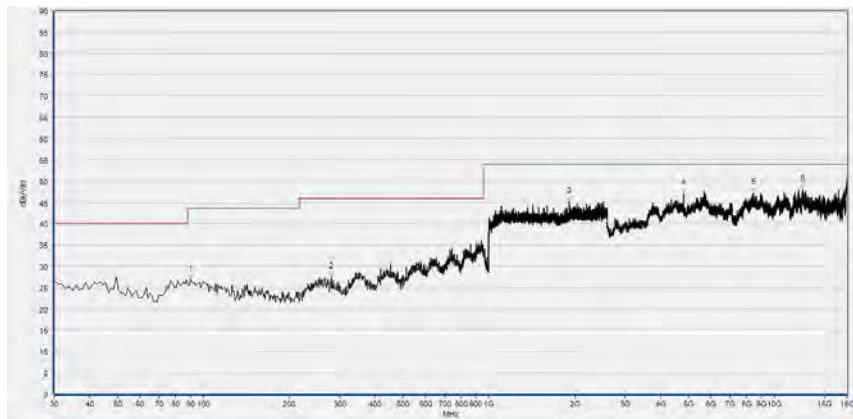
Left, GFSK Mode

Plots for Channel 0



Fre. (MHz)	PK (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
93.050	28.96	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
2226.133	45.07	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4803.700	53.57	N/A	45.75	74.00	N/A	54.00	Horizontal	PASS
5387.400	46.73	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8994.080	47.64	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12212.680	47.66	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

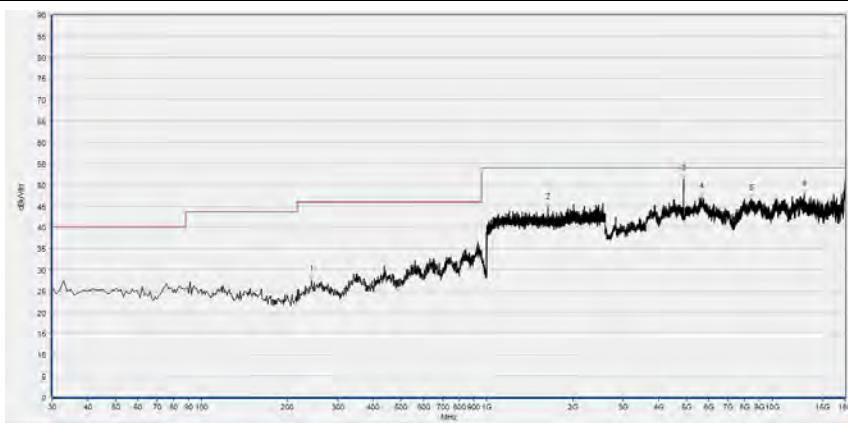
(Antenna Horizontal, 30MHz to 18GHz)



Fre. (MHz)	PK (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
90.140	26.95	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
281.230	27.43	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1910.400	45.22	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4805.280	47.12	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8439.680	47.26	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12576.120	48.14	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

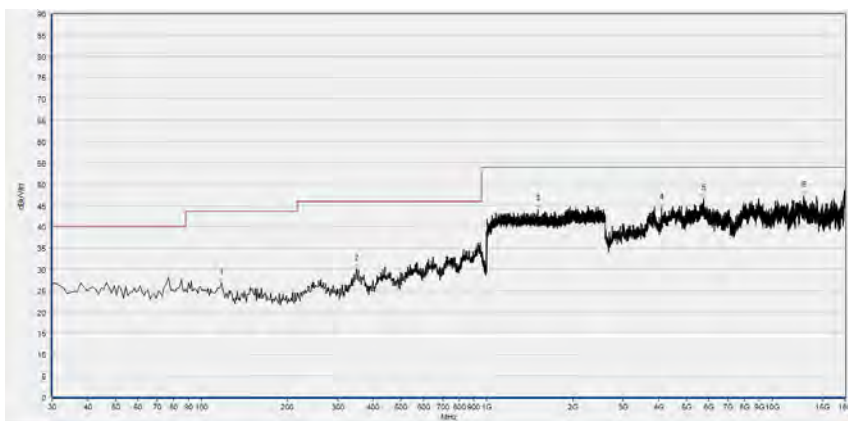
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 39



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
243.400	27.59	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1635.200	44.60	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4882.300	53.11	N/A	44.99	74.00	N/A	54.00	Horizontal	PASS
5643.040	47.13	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8467.400	46.73	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12924.160	47.75	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

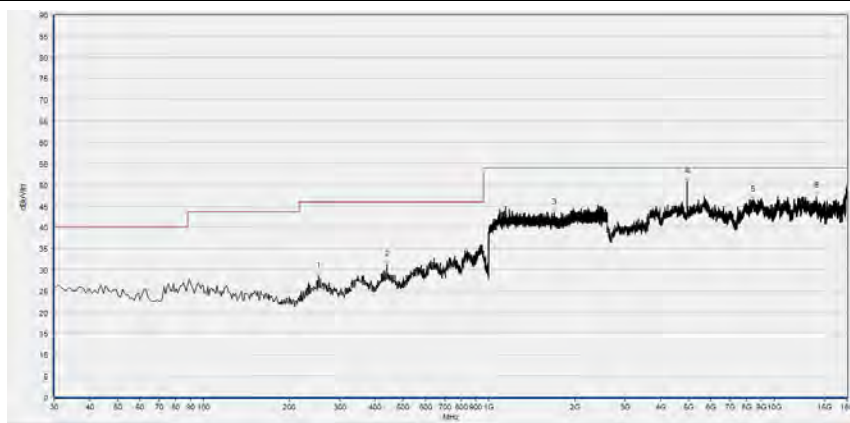
(Antenna Horizontal, 30MHz to 18GHz)



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
117.300	26.82	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
350.100	29.99	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1510.933	44.01	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4103.040	44.41	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5738.520	46.57	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12887.200	47.22	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

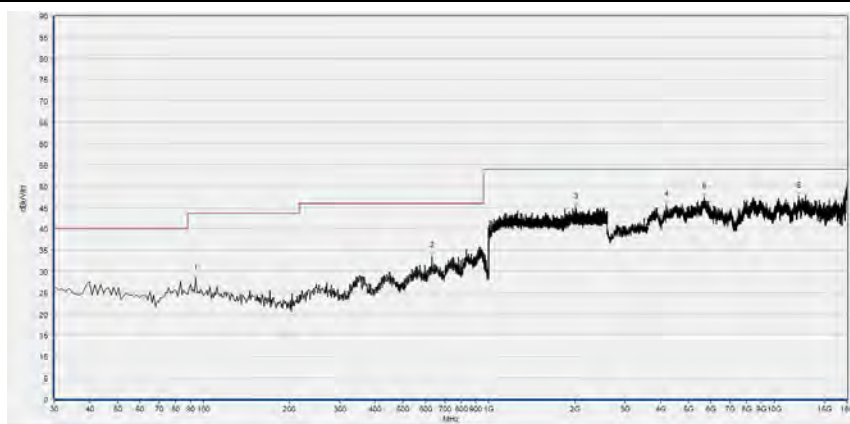
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 78



Fre. (MHz)	PK (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
253.100	28.51	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
439.340	31.14	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1691.200	43.43	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4959.280	50.61	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8427.360	46.42	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
14029.880	47.22	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 18GHz)

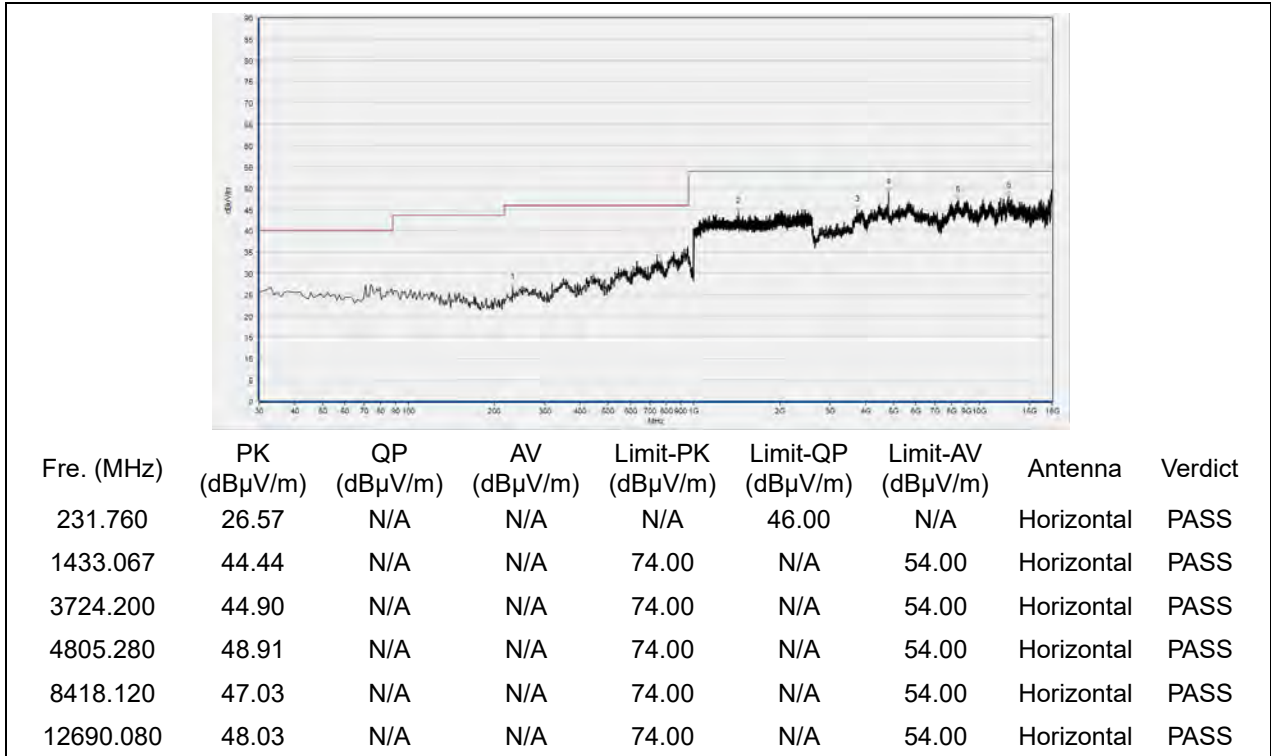


Fre. (MHz)	PK (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
94.020	28.31	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
631.400	33.57	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
2019.200	45.01	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4183.120	45.65	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5686.160	47.35	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12188.040	47.65	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

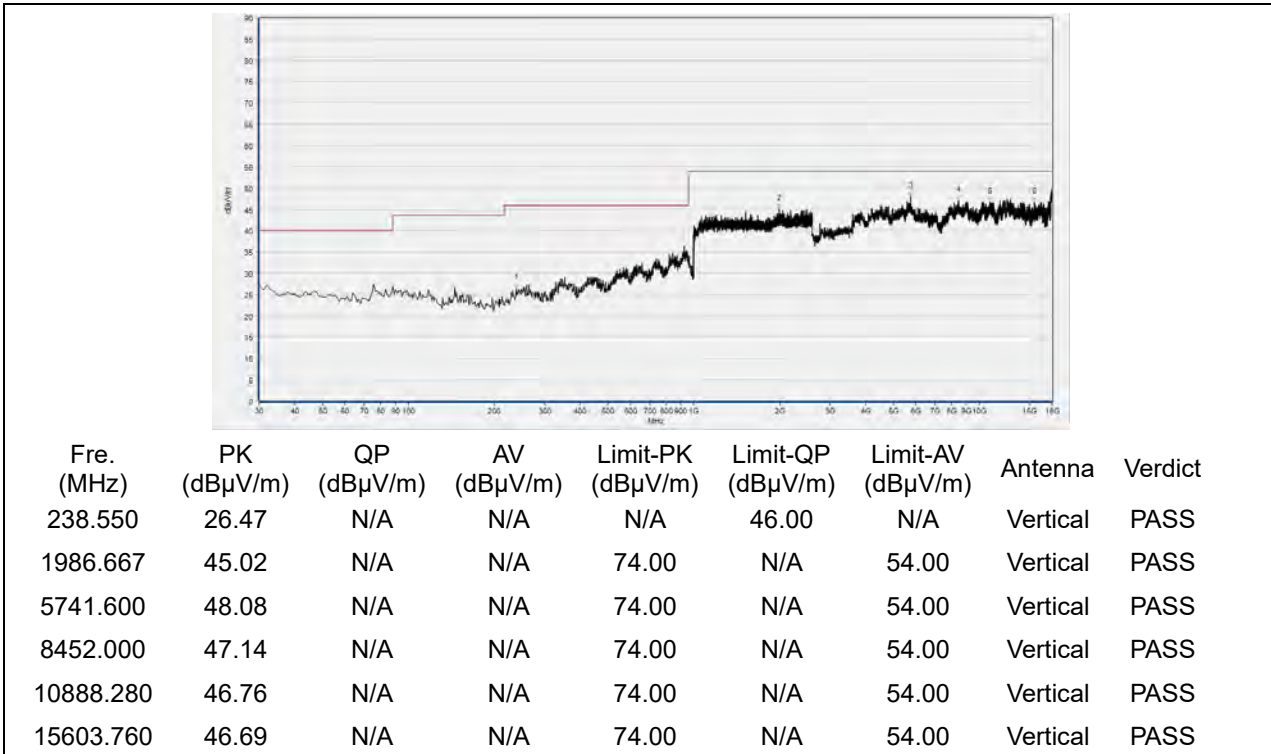
(Antenna Vertical, 30MHz to 18GHz)

$\pi/4$ -DQPSK Mode

Plots for Channel 0

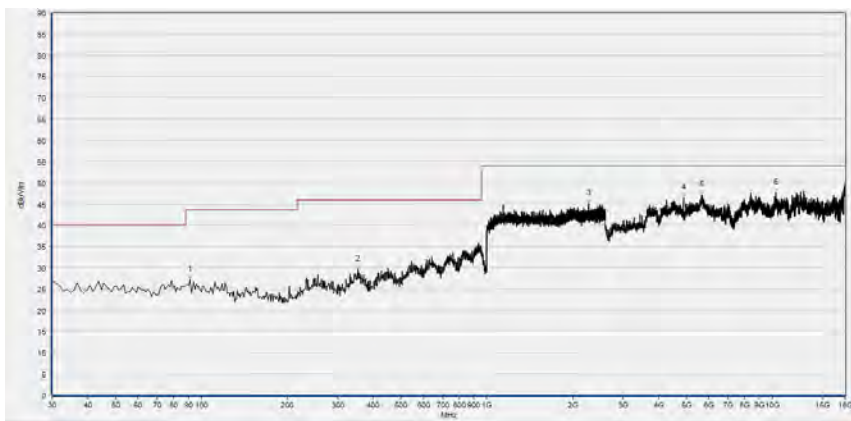


(Antenna Horizontal, 30MHz to 18GHz)



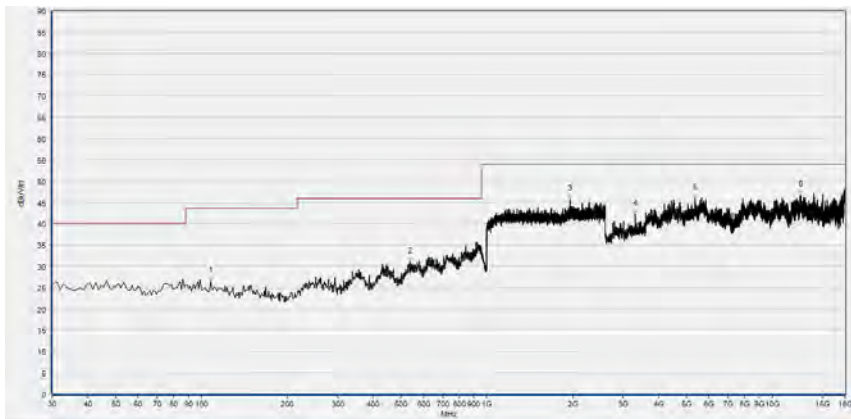
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 39



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
91.110	27.07	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
353.010	29.44	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
2271.467	45.00	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4882.280	46.38	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5649.200	47.03	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
10309.240	47.61	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

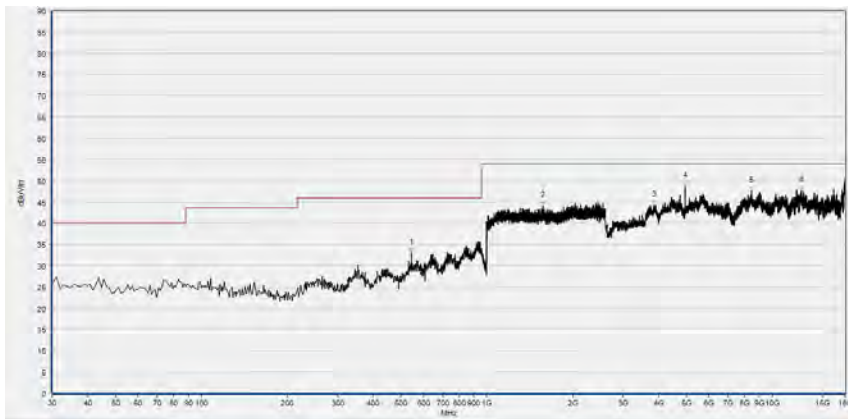
(Antenna Horizontal, 30MHz to 18GHz)



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
107.600	26.43	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
537.310	31.06	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1953.600	45.72	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
3314.560	42.26	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5378.160	46.00	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12557.640	46.70	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

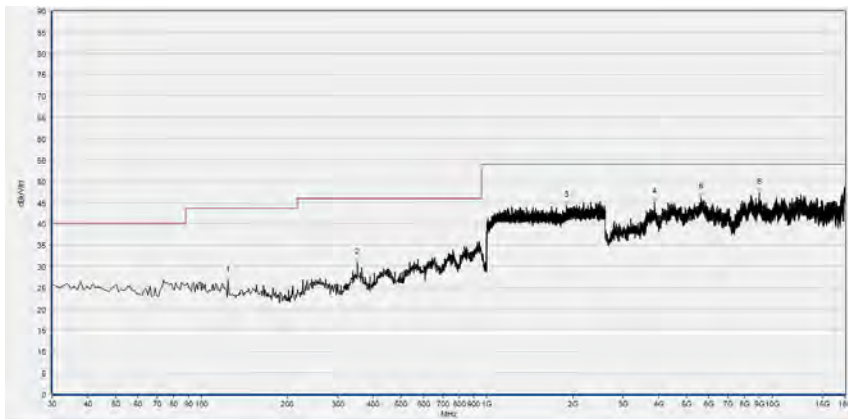
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 78



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
545.070	33.05	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1572.800	44.00	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
3856.640	44.23	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4959.280	48.72	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8436.600	47.60	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12628.480	47.70	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 18GHz)

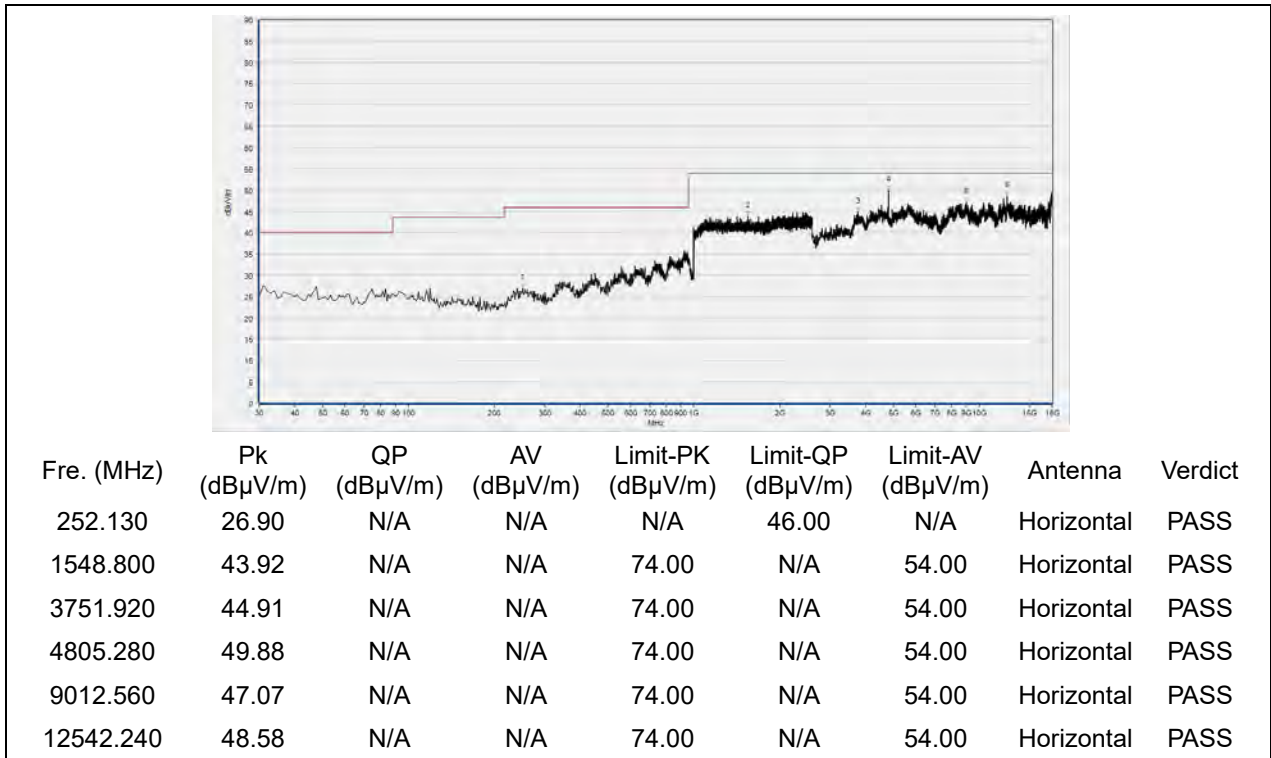


Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
124.090	26.69	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
352.040	30.85	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1901.333	44.18	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
3872.040	45.06	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5633.800	46.22	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8991.000	47.21	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

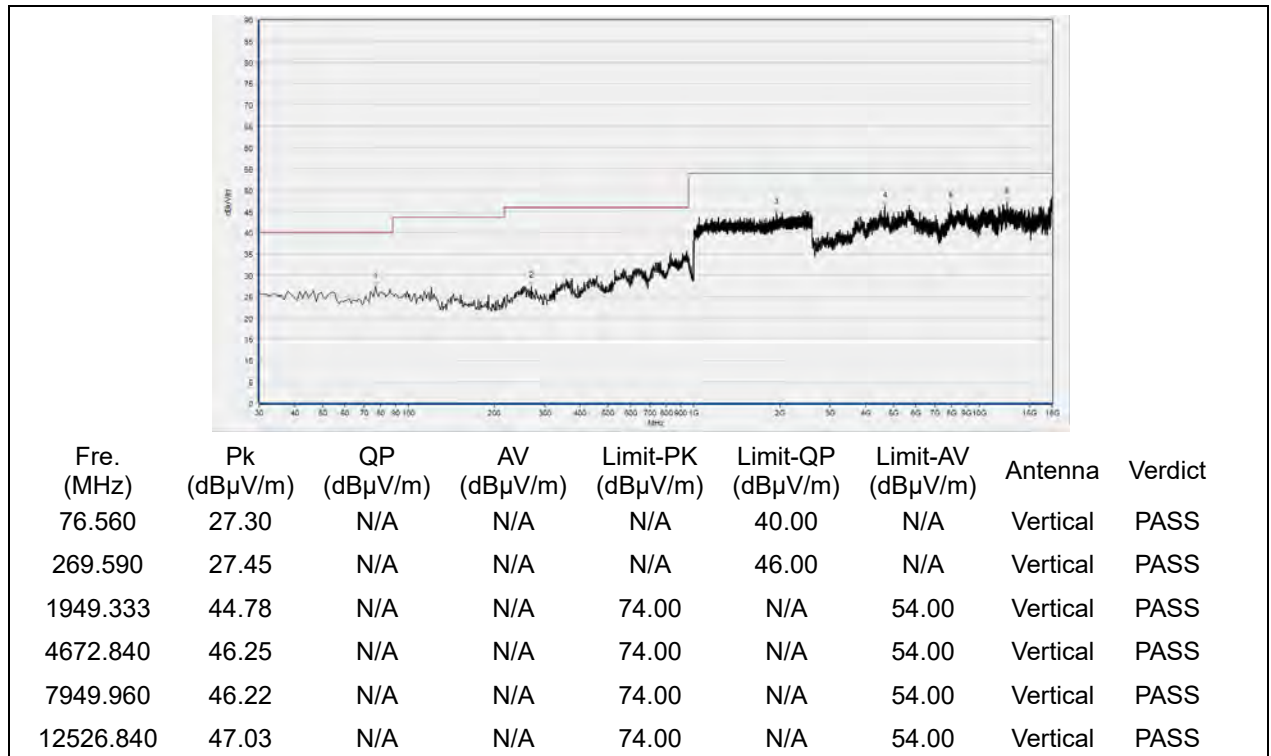
(Antenna Vertical, 30MHz to 18GHz)

8-DPSK Mode

Plots for Channel 0

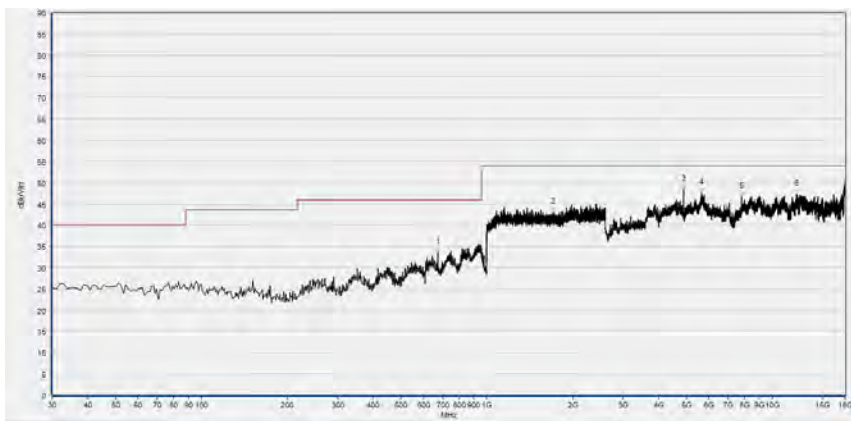


(Antenna Horizontal, 30MHz to 18GHz)



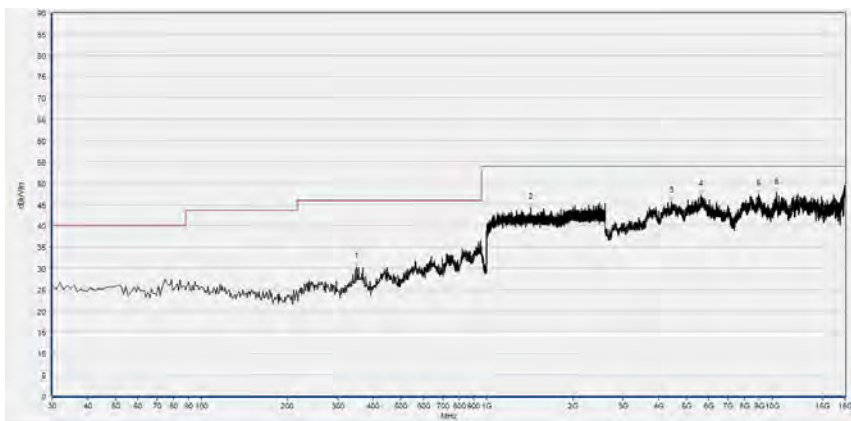
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 39



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
672.140	33.58	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1702.933	43.11	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4882.280	48.37	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5655.360	47.60	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
7817.520	46.82	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12151.080	47.18	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

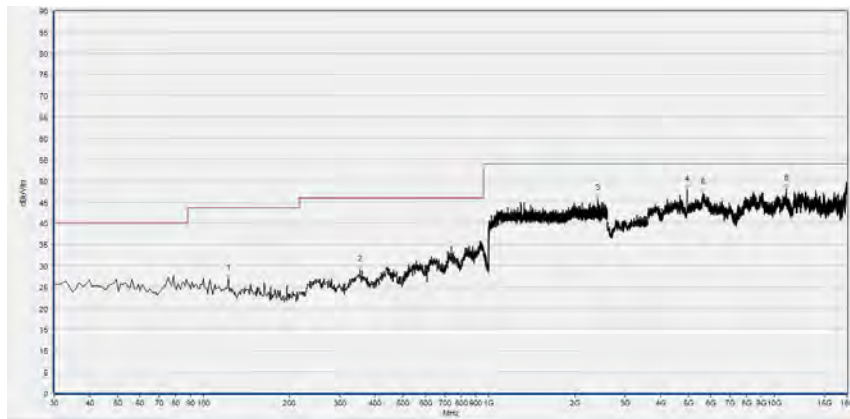
(Antenna Horizontal, 30MHz to 18GHz)



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
350.100	30.38	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1424.533	44.28	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4435.680	45.73	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5606.080	47.24	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8981.760	47.39	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
10358.520	47.68	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

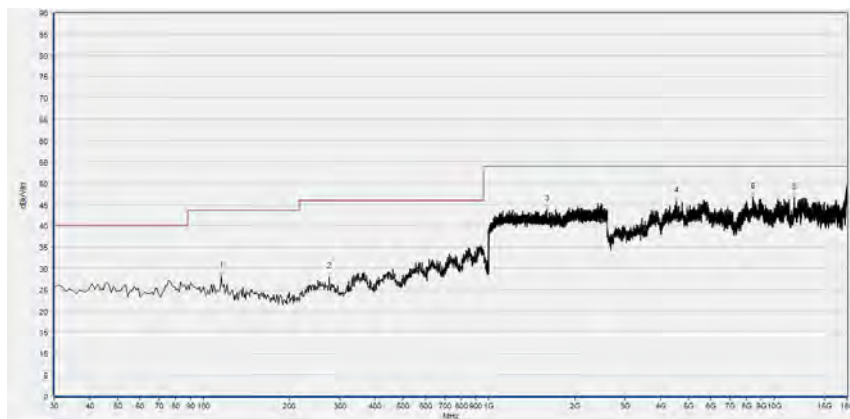
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 78



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
122.150	26.99	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
353.010	29.02	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
2409.067	45.84	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4959.280	47.92	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5621.480	47.02	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
11005.320	48.18	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 18GHz)



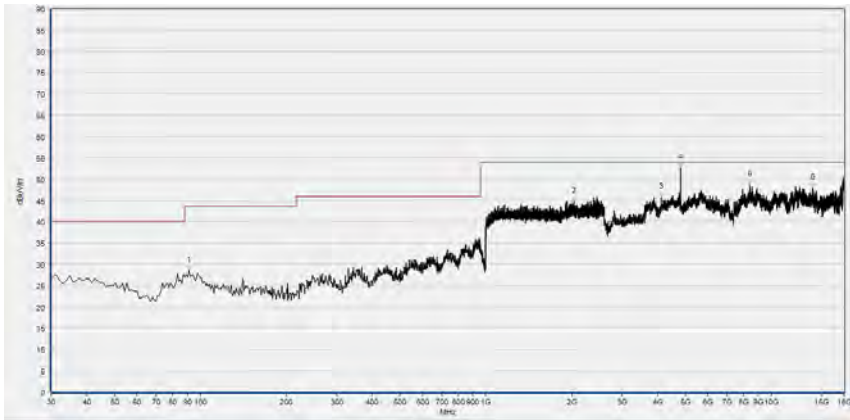
Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
115.360	28.10	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
276.380	28.01	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1597.333	43.90	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4546.560	45.77	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8430.440	46.79	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
11732.200	46.60	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 18GHz)



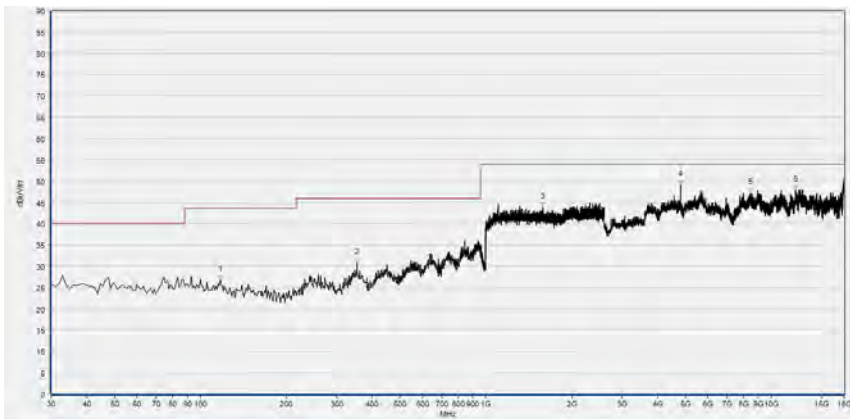
Right, GFSK Mode

Plots for Channel 0



Fre. (MHz)	PK (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
91.110	28.55	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
2040.000	44.67	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4124.600	45.81	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4803.600	52.90	N/A	42.08	74.00	N/A	54.00	Horizontal	PASS
8424.280	48.58	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
13983.680	47.90	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

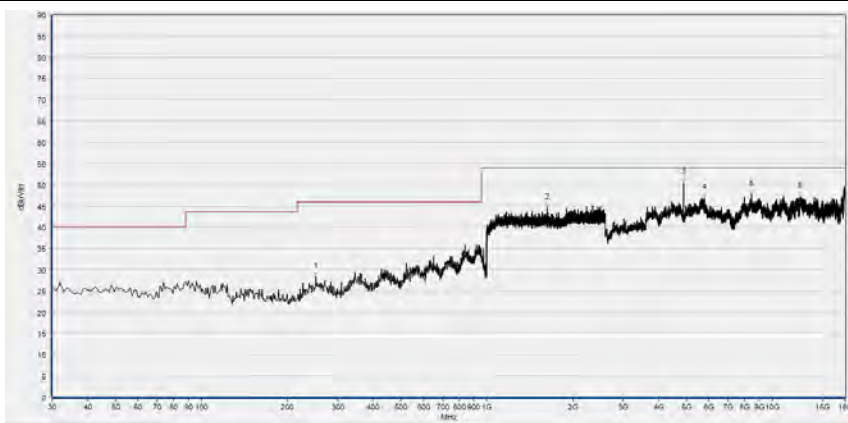
(Antenna Horizontal, 30MHz to 18GHz)



Fre. (MHz)	PK (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
117.300	26.89	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
353.980	30.83	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1585.600	43.92	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4805.280	49.05	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8445.840	47.34	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12141.840	47.86	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

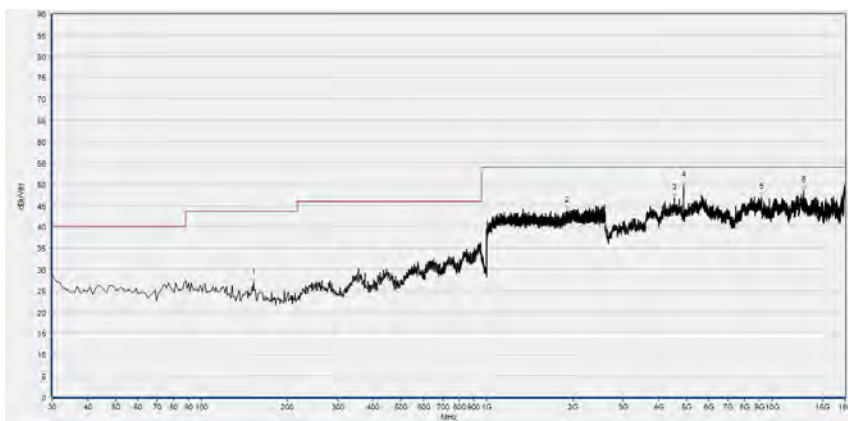
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 39



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
252.130	28.32	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1630.400	44.61	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4882.280	50.44	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5800.120	47.00	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8448.920	47.81	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12517.600	47.17	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

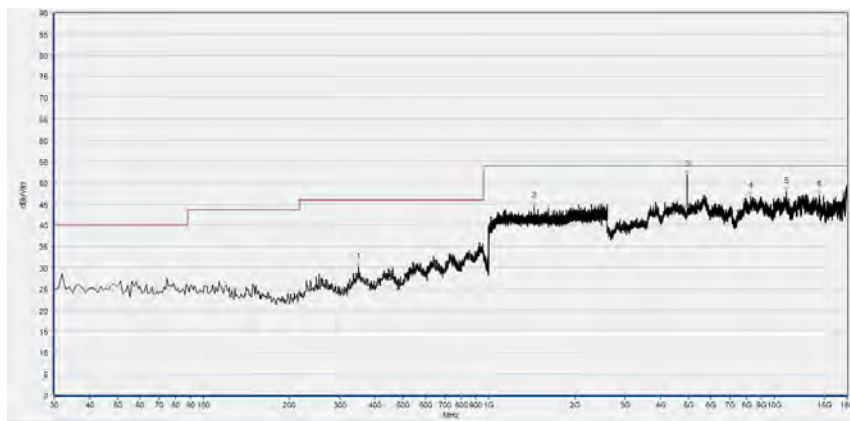
(Antenna Horizontal, 30MHz to 18GHz)



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
152.220	26.87	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
1908.267	43.81	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4549.640	46.83	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4882.280	49.60	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
9148.080	46.94	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12887.200	48.37	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

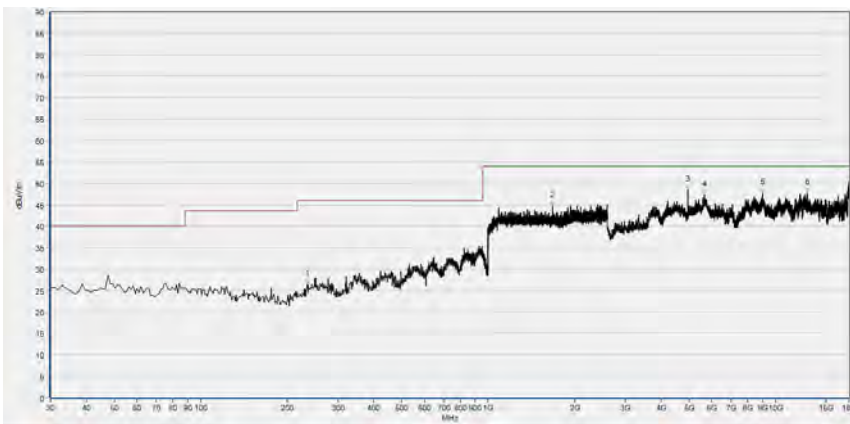
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 78



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
350.100	30.13	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1441.600	44.39	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4960.300	52.75	N/A	44.27	74.00	N/A	54.00	Horizontal	PASS
8285.680	46.68	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
11036.120	47.96	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
14417.960	47.02	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 18GHz)

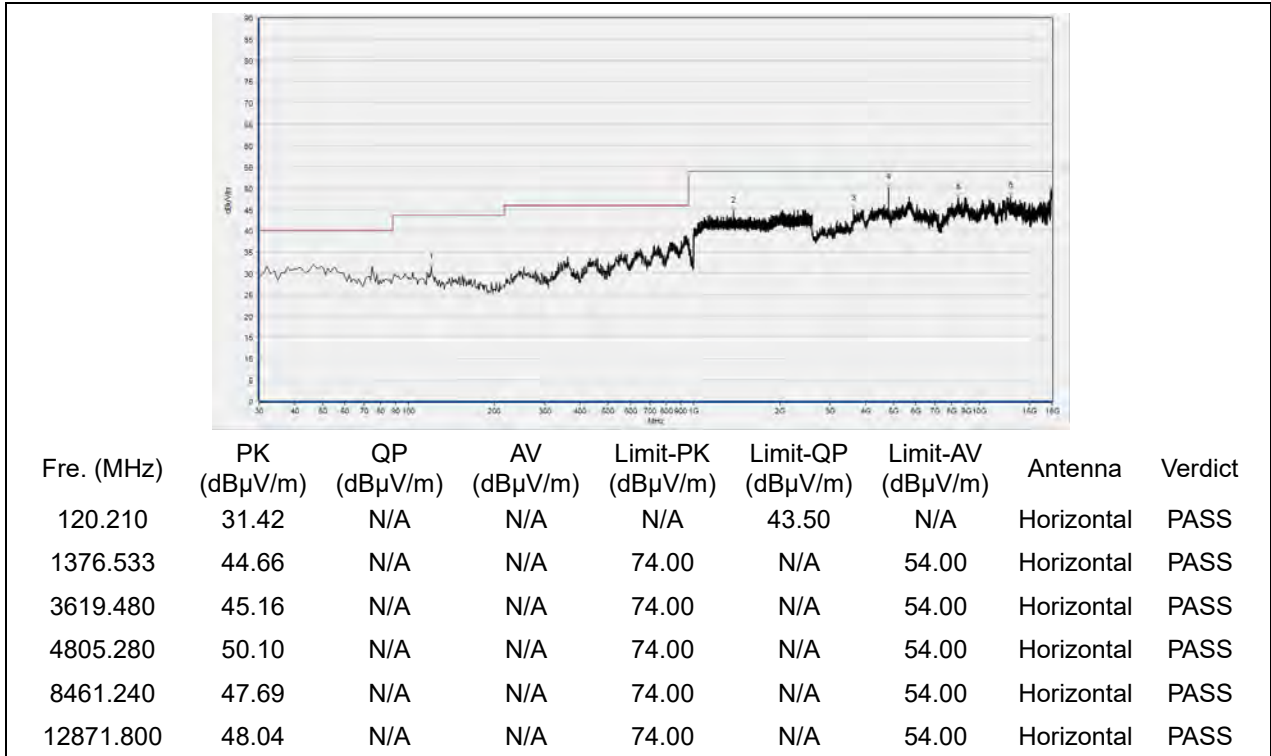


Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
234.670	26.53	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1672.000	44.68	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4959.280	48.45	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5658.440	47.32	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8991.000	47.80	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12896.440	47.74	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

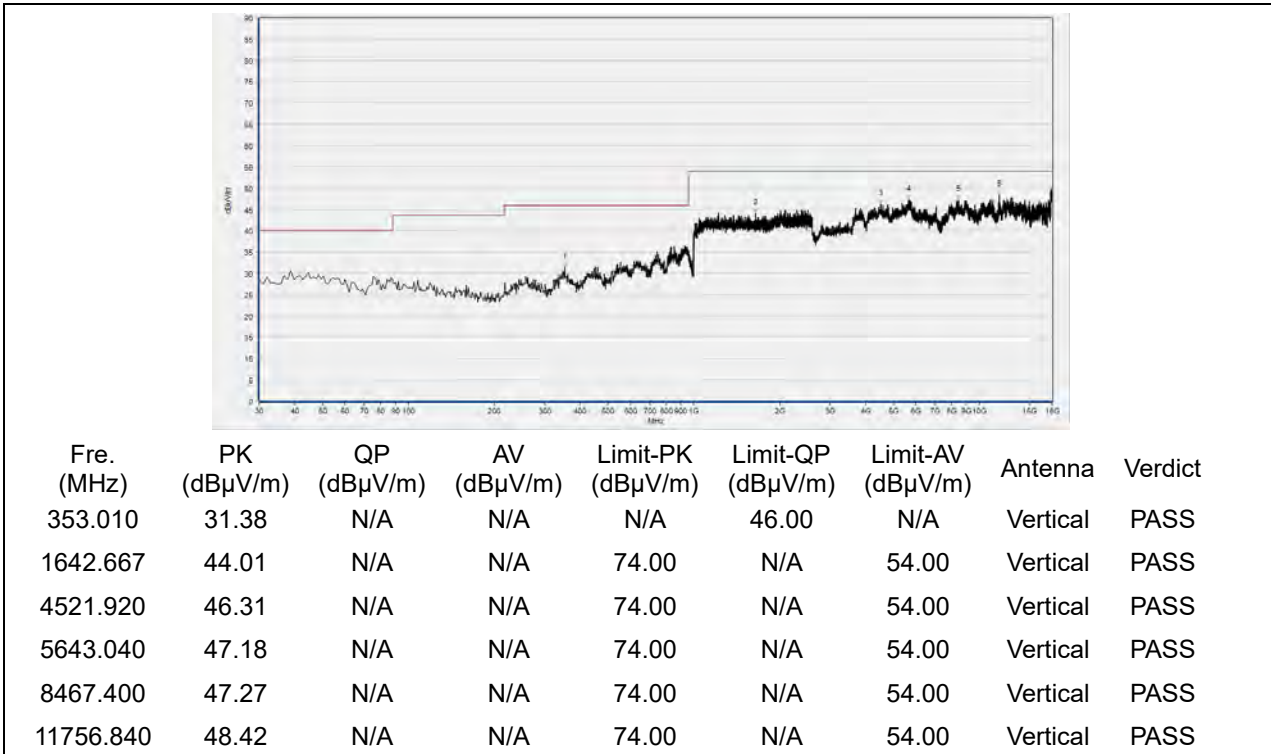
(Antenna Vertical, 30MHz to 18GHz)

$\pi/4$ -DQPSK Mode

Plots for Channel 0

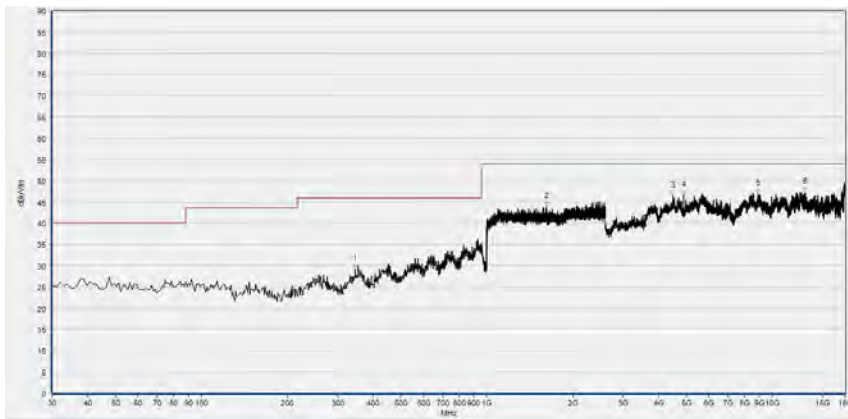


(Antenna Horizontal, 30MHz to 18GHz)



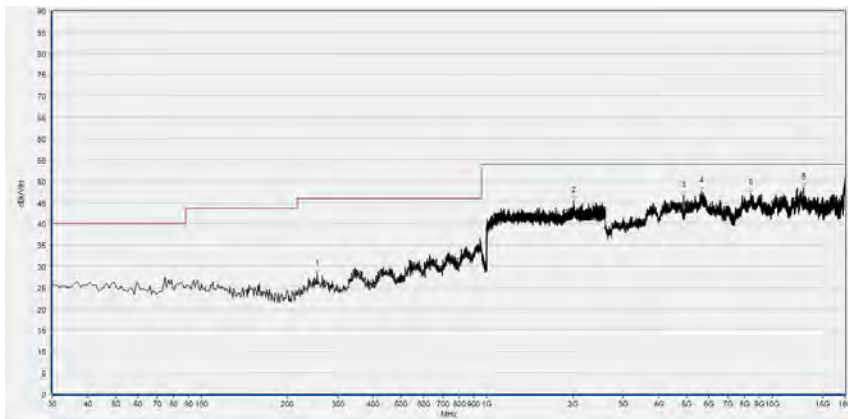
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 39



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
346.220	29.18	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1619.733	43.87	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4491.120	46.46	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4882.280	46.53	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8929.400	46.95	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
13044.280	47.28	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

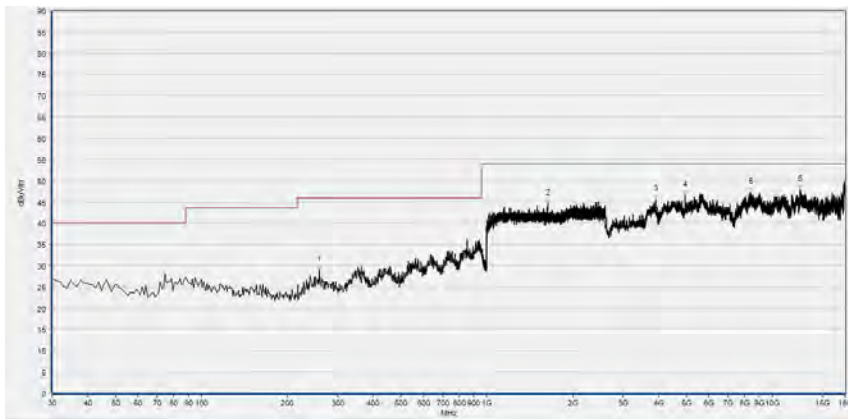
(Antenna Horizontal, 30MHz to 18GHz)



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
255.040	28.14	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
2016.000	45.47	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4882.280	46.53	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5655.360	47.54	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8411.960	47.09	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12896.440	48.49	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

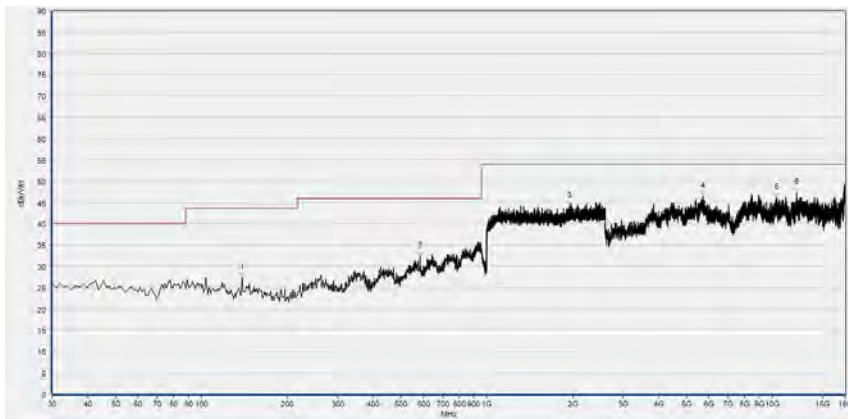
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 78



Fre. (MHz)	Pk (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
258.920	29.07	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1632.533	44.65	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
3902.840	45.58	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4959.280	46.55	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8405.800	47.30	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12523.760	47.94	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 18GHz)



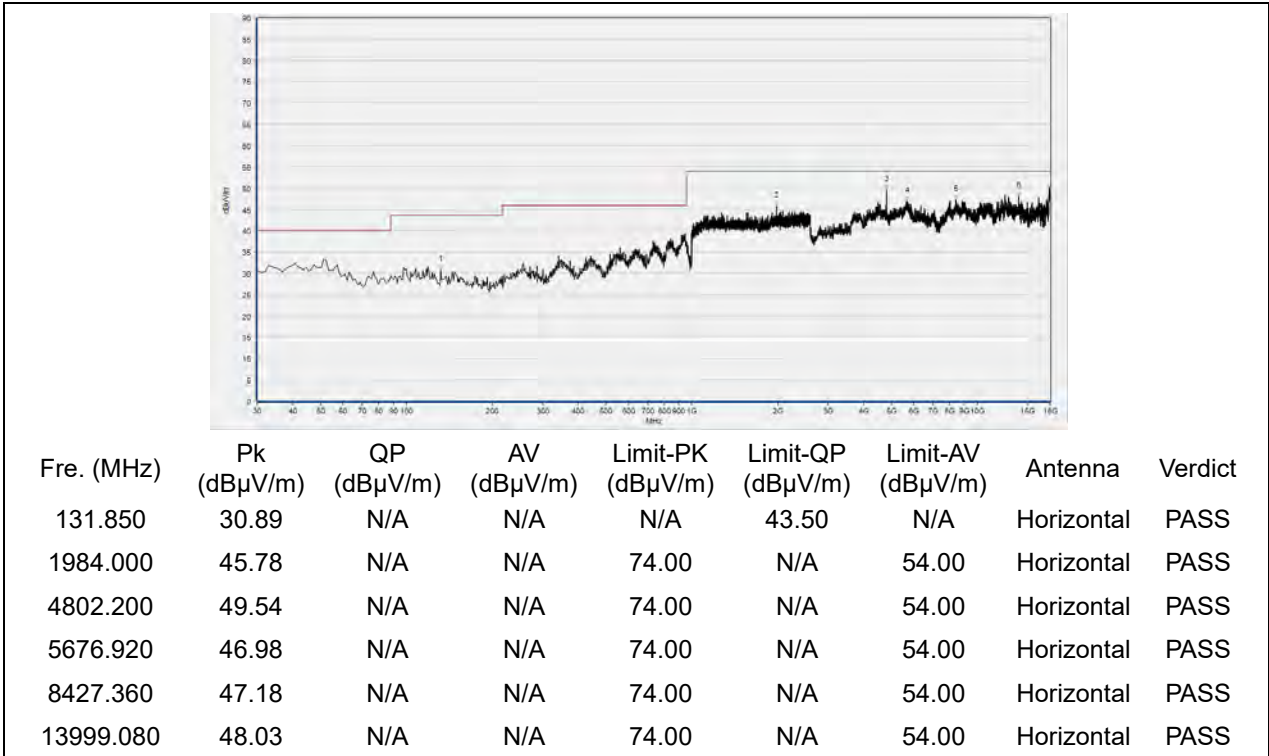
Fre. (MHz)	Pk (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
138.640	27.39	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
581.930	32.32	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1949.333	44.12	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5716.960	46.41	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
10333.880	46.01	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12197.280	47.21	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 18GHz)

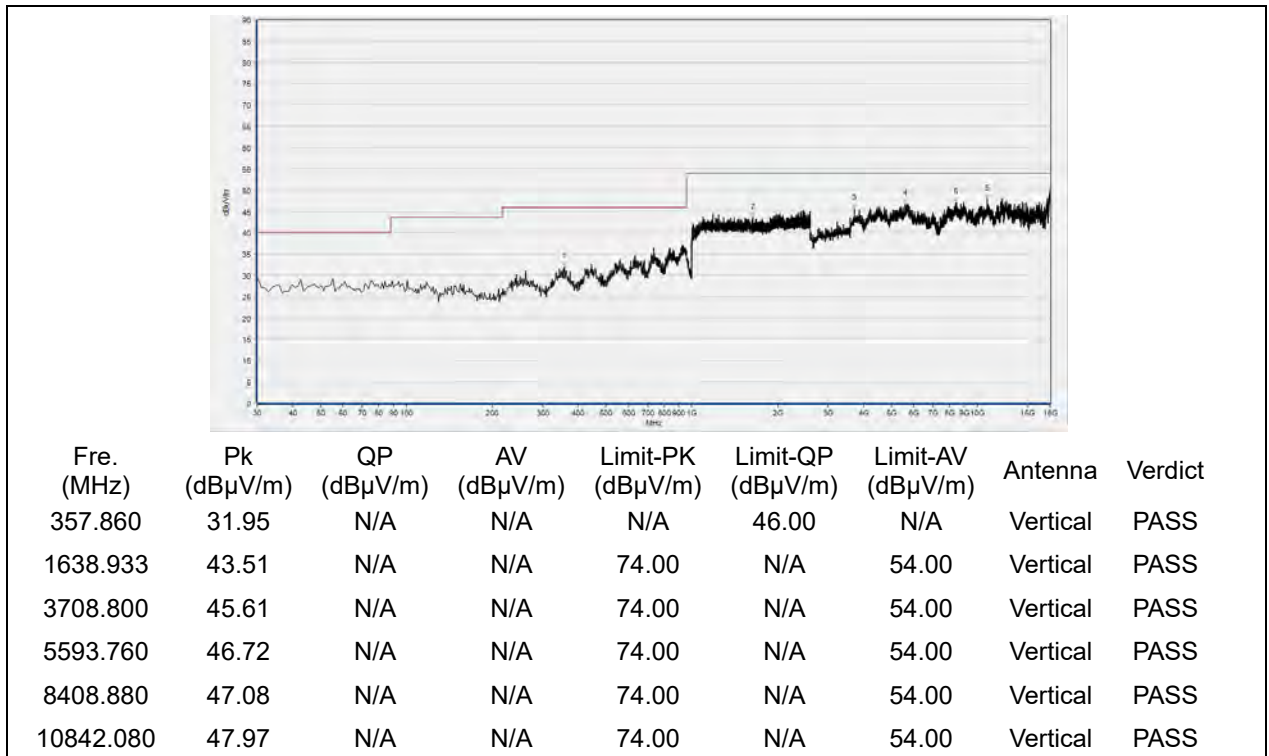


8-DPSK Mode

Plots for Channel 0

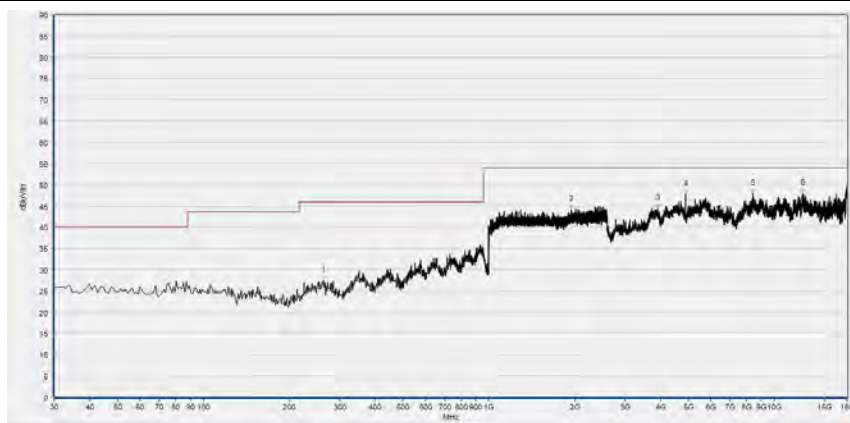


(Antenna Horizontal, 30MHz to 18GHz)



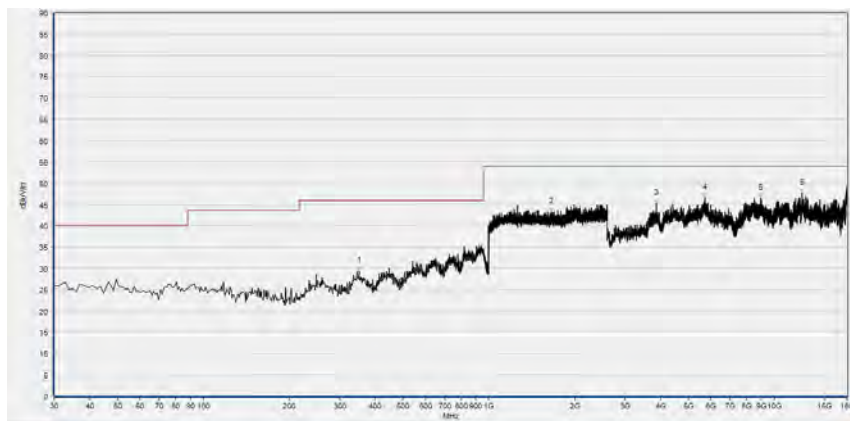
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 39



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
262.800	27.42	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1944.000	44.06	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
3899.760	44.49	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4882.280	47.79	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8427.360	47.97	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12588.440	47.93	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

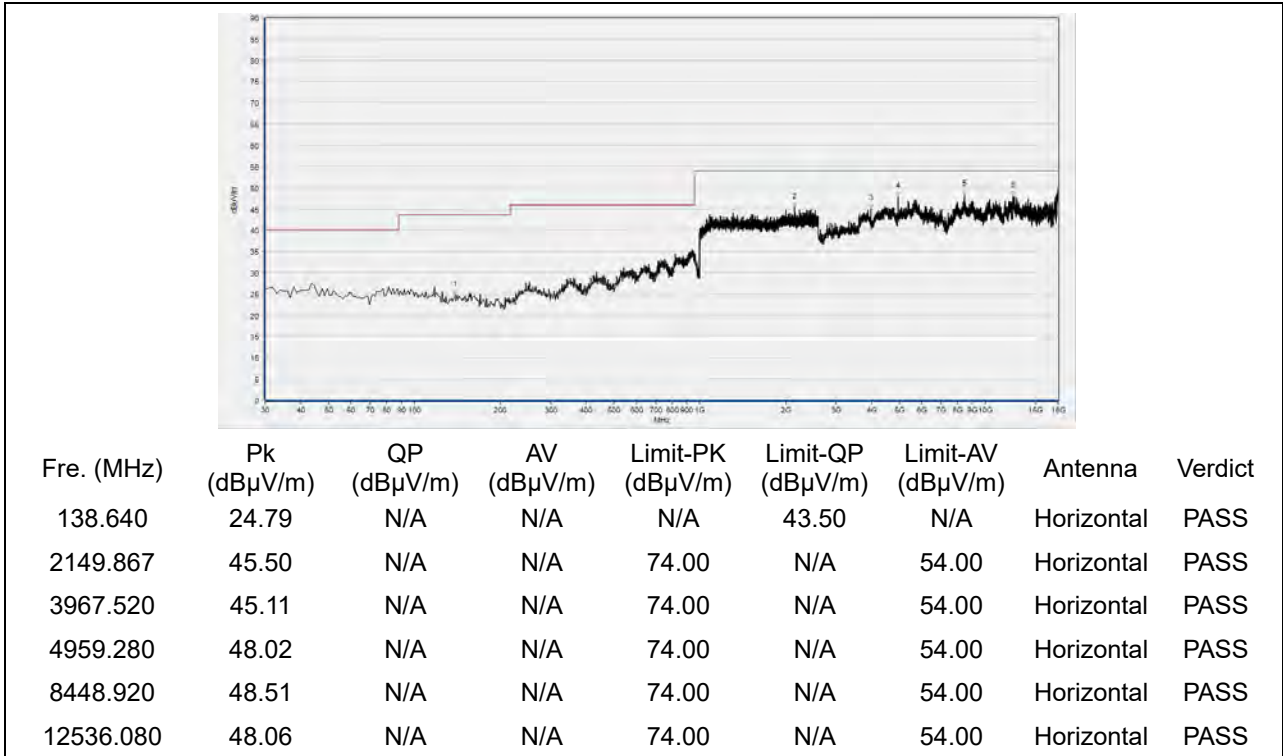
(Antenna Horizontal, 30MHz to 18GHz)



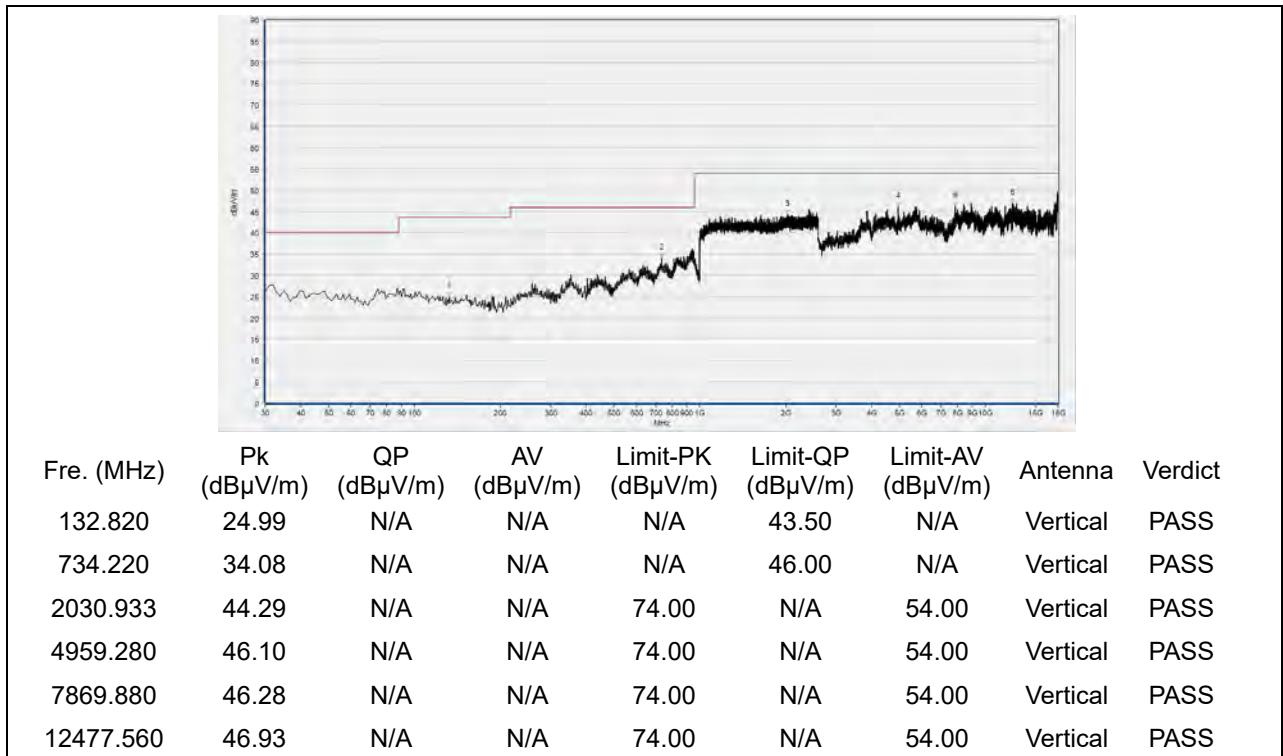
Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
351.070	29.34	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1655.467	43.22	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
3868.960	45.24	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5729.280	46.52	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8963.280	46.43	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12511.440	47.62	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 78



(Antenna Horizontal, 30MHz to 18GHz)



(Antenna Vertical, 30MHz to 18GHz)



Annex A Test Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for test performed on the EUT as specified in CISPR 16-1-2:

Test Items	Uncertainty
Number of Hopping Frequency	±5%
Peak Output Power	±2.22dB
Bandwidth	±5%
Carrier Frequency Separation	±5%
Time of Occupancy (Dwell time)	±5%
Conducted Spurious Emission	±2.77dB
Restricted Frequency Bands	±5%
Radiated Emission	±2.95dB
Conducted Emission	±2.44dB

This uncertainty represent an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.



Annex B Testing Laboratory Information

1. Identification of the Responsible Testing Laboratory

Laboratory Name:	Shenzhen Morlab Communications Technology Co., Ltd.
Laboratory Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China
Telephone:	+86 755 36698555
Facsimile:	+86 755 36698525

2. Identification of the Responsible Testing Location

Name:	Shenzhen Morlab Communications Technology Co., Ltd.
Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China

3. Facilities and Accreditations

All measurement facilities used to collect the measurement data are located at FL.3, Building A, FeiYang Science Park, Block 67, BaoAn District, Shenzhen, 518101 P. R. China. The test site is constructed in conformance with the requirements of ANSI C63.10-2013 and CISPR Publication 22; the FCC designation number is CN1192, the test firm registration number is 226174.



4. Test Equipments Utilized

4.1 Conducted Test Equipments

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Due Date
Bluetooth Base Station	6K00006210	MT8852B	Anritsu	2021.03.25	2022.03.24
Directional Coupler	17041703	DTO-5-30	ShangHaiHuaxiang	N/A	N/A
EXA Signal Analyzer	MY53470836	N9010A	Agilent	2021.03.25	2022.03.24
RF Cable (30MHz-26GHz)	CB01	RF01	Morlab	N/A	N/A
Coaxial Cable	CB02	RF02	Morlab	N/A	N/A
SMA Connector	CN01	RF03	HUBER-SUHNER	N/A	N/A

4.2 Conducted Emission Test Equipments

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Due Date
Receiver	MY56400093	N9038A	KEYSIGHT	2021.03.09	2022.03.08
LISN	812744	NSLK 8127	Schwarzbeck	2021.03.09	2022.03.08
Pulse Limiter (10dB)	VTSD 9561 F-B #206	VTSD 9561-F	Schwarzbeck	2020.07.24	2021.07.23
Coaxial Cable(BNC) (30MHz-26GHz)	CB01	EMC01	Morlab	N/A	N/A

4.3 List of Software Used

Description	Manufacturer	Software Version
Test System	Tonscend	V2.5.77.0418
Morlab EMCR V1.2	Morlab	V1.0
TS+ -[JS32-CE]	Tonscend	V2.5.0.0

**4.4 Radiated Test Equipments**

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Due Date
Receiver	MY54130016	N9038A	Agilent	2020.07.21	2021.07.20
Test Antenna - Bi-Log	9163-519	VULB 9163	Schwarzbeck	2019.05.24	2022.05.23
Test Antenna - Loop	1519-022	FMZB1519	Schwarzbeck	2019.02.14	2022.02.13
Test Antenna – Horn	01774	BBHA 9120D	Schwarzbeck	2019.07.26	2022.07.25
Test Antenna – Horn	BBHA9170 #774	BBHA9170	Schwarzbeck	2019.07.26	2022.07.25
Coaxial Cable (N male) (9KHz-30MHz)	CB04	EMC04	Morlab	N/A	N/A
Coaxial Cable (N male) (30MHz-26GHz)	CB02	EMC02	Morlab	N/A	N/A
Coaxial Cable (N male) (30MHz-26GHz)	CB03	EMC03	Morlab	N/A	N/A
Coaxial Cable (N male) (30MHz-40GHz)	CB05	EMC05	Morlab	N/A	N/A
1-18GHz pre-Amplifier	61171/61172	S020180L32 03	Tonscend	2020.07.21	2021.07.20
18-26.5GHz pre-Amplifier	46732	S10M100L38 02	Tonscend	2020.07.21	2021.07.20
26-40GHz pre-Amplifier	56774	S40M400L40 02	Tonscend	2020.07.21	2021.07.20
Notch Filter	N/A	WRCG-2400-2483.5-60SS	Wainwright	2020.07.21	2021.07.20
Anechoic Chamber	N/A	9m*6m*6m	CRT	2020.01.06	2023.01.05

————— END OF REPORT —————