



(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	-42.82	-1.24	-21.24	PASS
39	2441	-42.33	-1.17	-21.17	PASS
78	2480	-44.22	-0.01	-20.01	PASS

**B. Test Plot:**



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

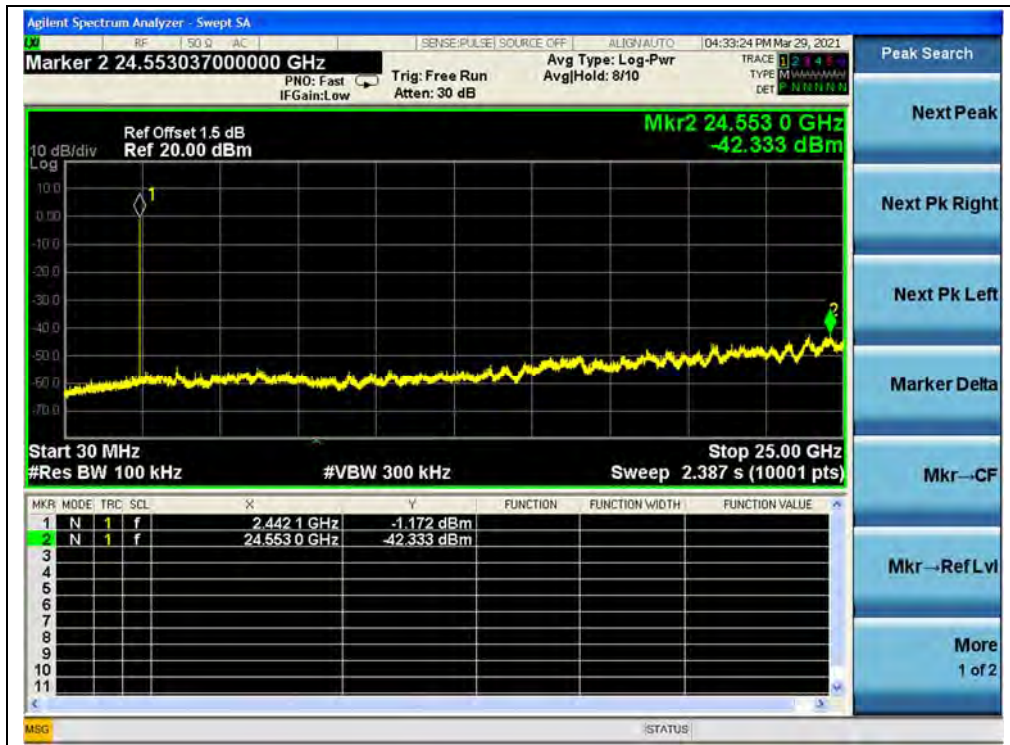


(Band edge, Channel 0, GFSK)

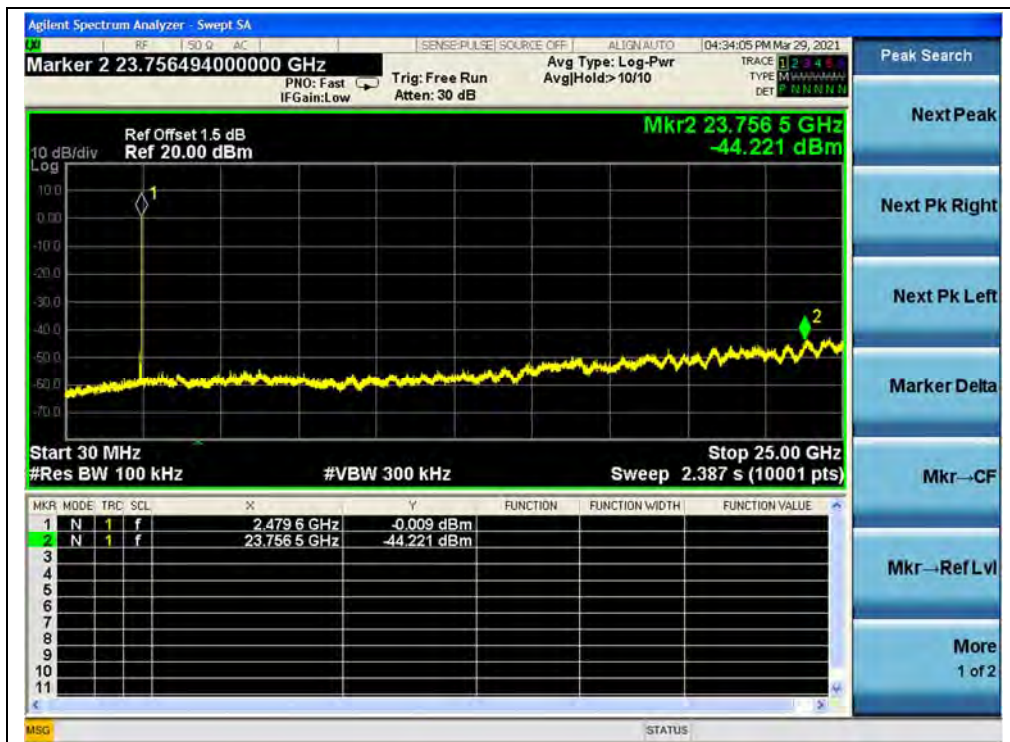


(Band edge with hopping on, Channel 0, GFSK)





(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)

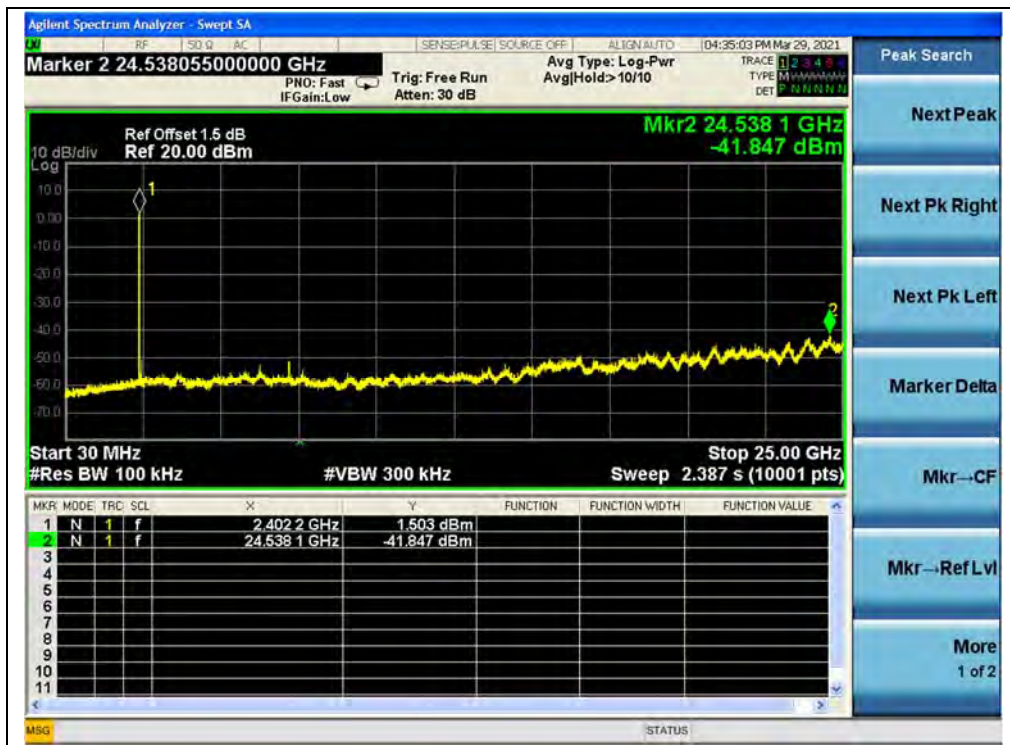


$\pi/4$ -DQPSK Mode

A. Test Verdict:

Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated -20dBc Limit	
0	2402	-41.85	1.50	-18.50	PASS
39	2441	-42.29	0.58	-19.42	PASS
78	2480	-43.44	2.60	-17.40	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)

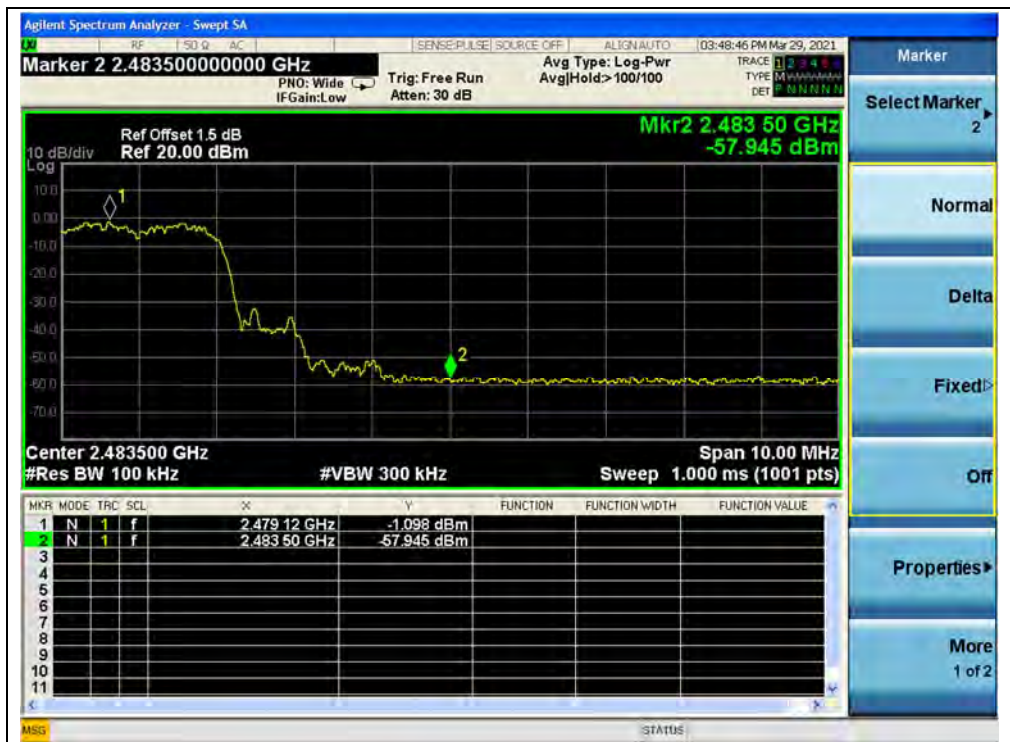


(30MHz to 25GHz, Channel 78,  $\pi/4$ -DQPSK)





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



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

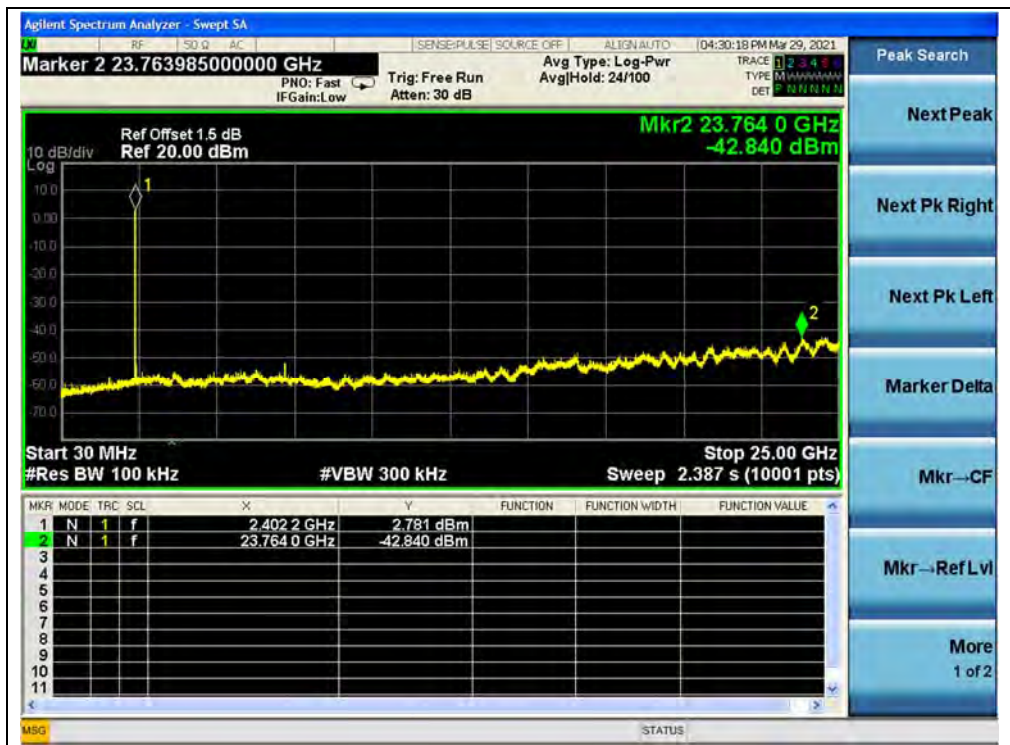


**8-DPSK Mode**

**A. Test Verdict:**

Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated -20dBc Limit	
0	2402	-42.84	2.78	-17.22	PASS
39	2441	-42.97	2.73	-17.27	PASS
78	2480	-42.88	2.28	-17.72	PASS

**B. Test Plot:**



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



(Band edge, Channel 0, 8-DPSK)

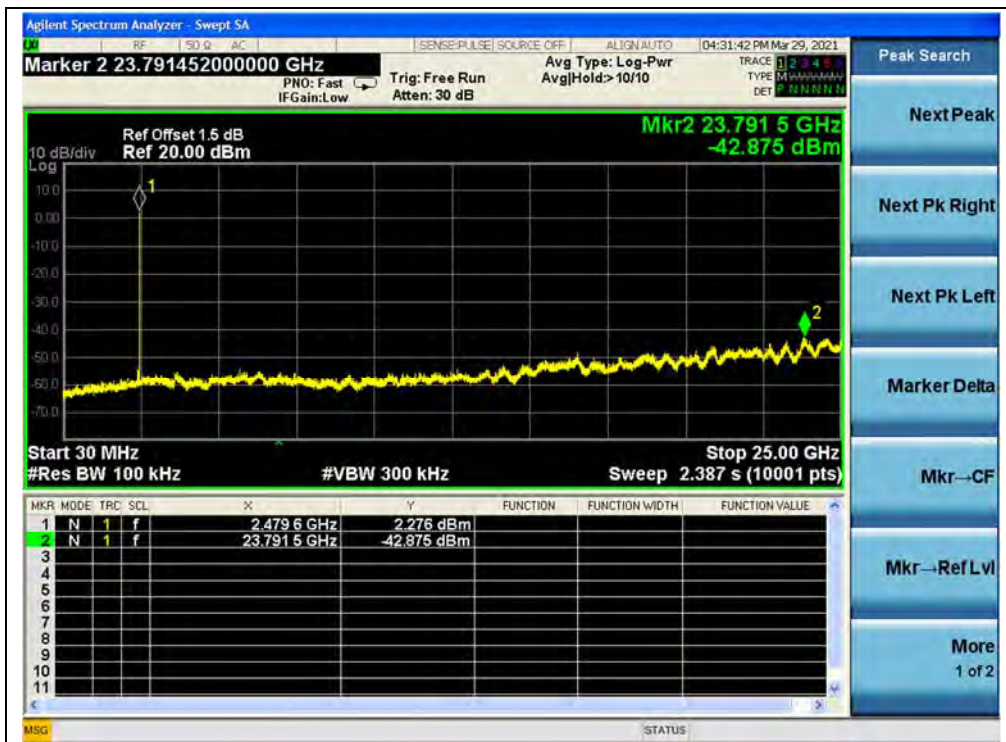


(Band edge with hopping on, Channel 0, 8-DPSK)





(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. : SZ21030255W02

### 2.11.3. Test Result

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

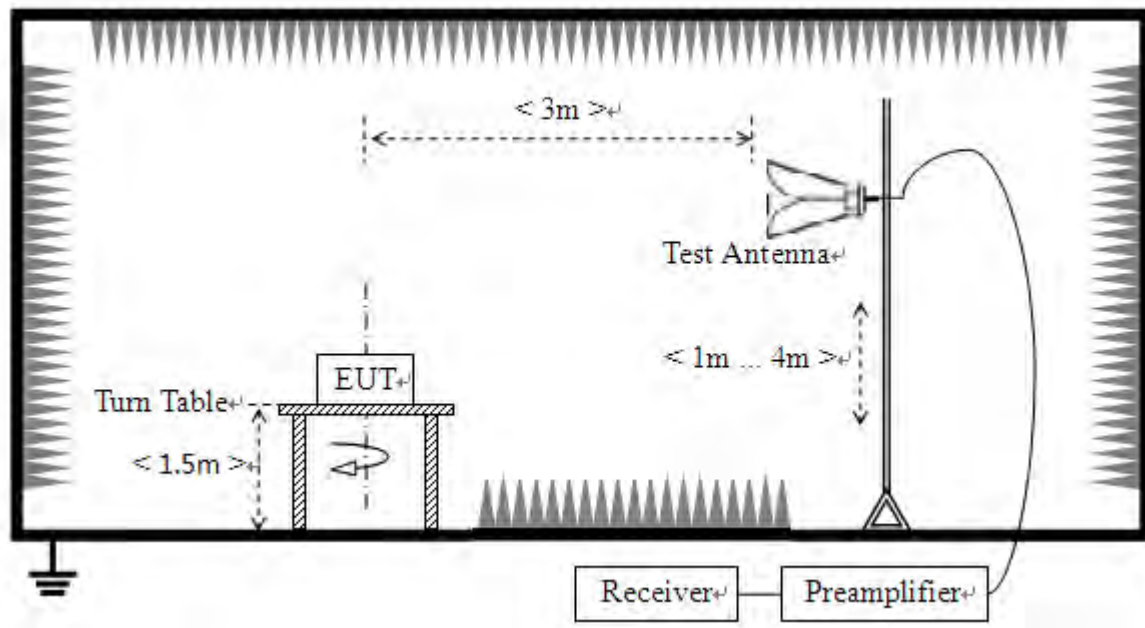
## 2.12. Restricted Frequency Bands

### 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:

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

$A_T$ : Total correction Factor except Antenna

$U_R$ : Receiver Reading

$G_{\text{preamp}}$ : Preamplifier Gain

$A_{\text{Factor}}$ : 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**

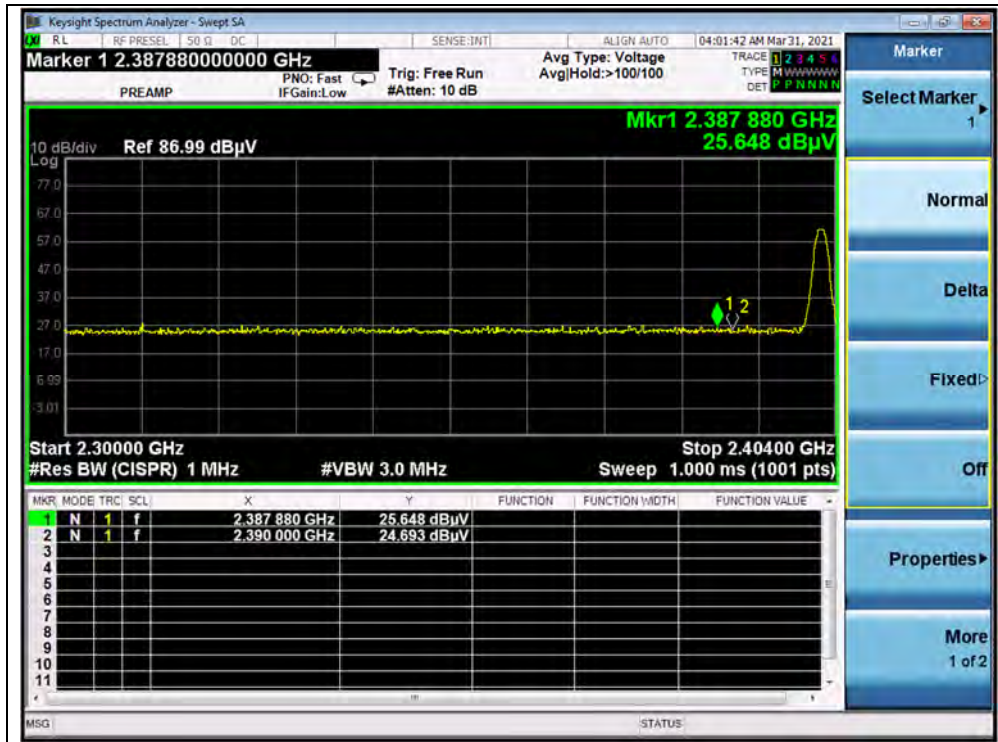
**A. Test Verdict:**

Channel	Frequency (MHz)	Detector	Receiver Reading $U_R$ (dB $\mu$ V)	$A_T$ (dB)	$A_{\text{Factor}}$ (dB@3m)	Max. Emission E (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Verdict
		PK/ AV						
0	2387.88	PK	25.65	6.74	27.20	59.59	74	PASS
0	2390.00	AV	13.93	6.74	27.20	47.87	54	PASS
78	2485.50	PK	27.23	6.74	27.20	61.17	74	PASS
78	2485.26	AV	13.71	6.74	27.20	47.65	54	PASS

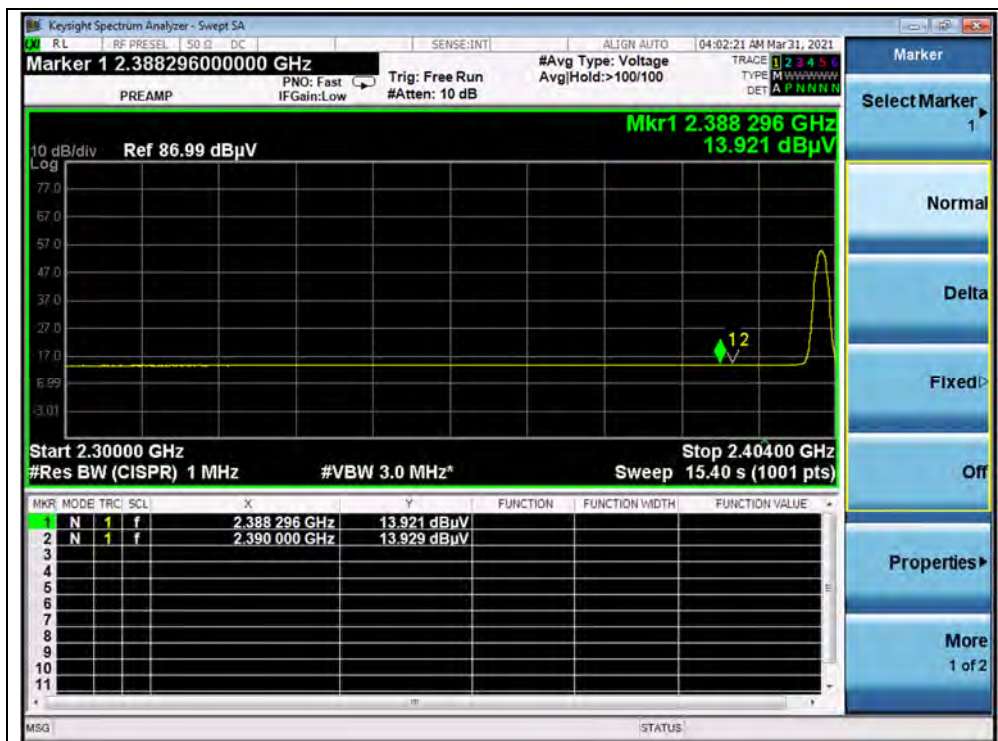




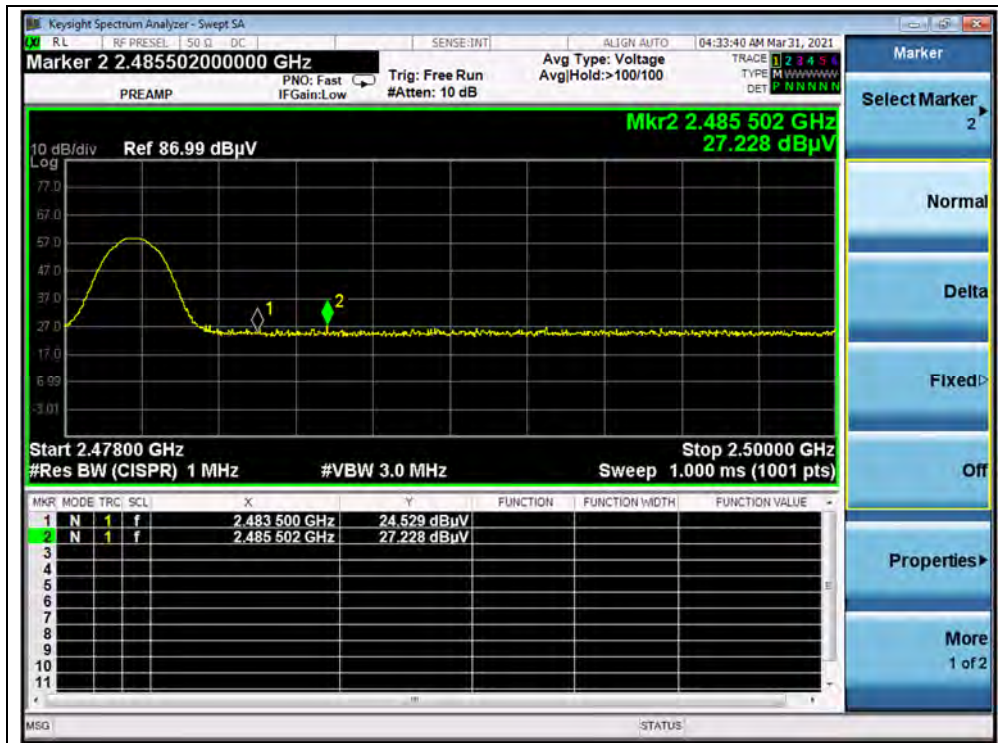
B. Test Plot:



(PEAK, Channel 0, GFSK)



(AVERAGE, Channel 0, GFSK)



(PEAK, Channel 78, GFSK)



(AVERAGE, Channel 78, GFSK)

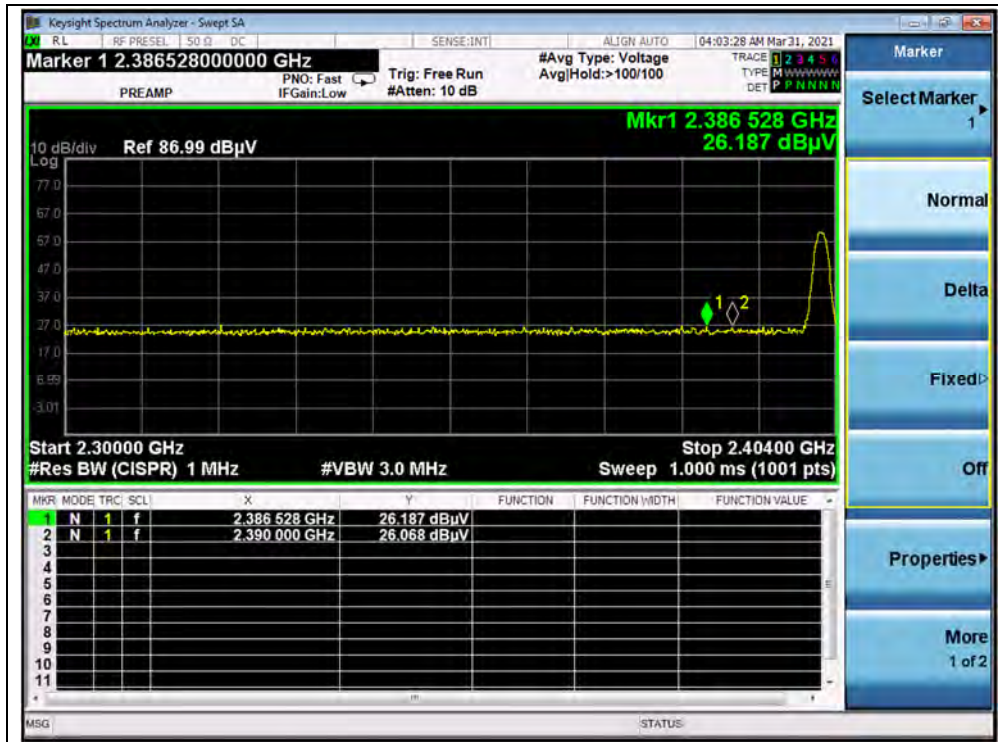


$\pi/4$ -DQPSK Mode

A. Test Verdict:

Channel	Frequency (MHz)	Detector	Receiver Reading	A <sub>T</sub> (dB)	A <sub>Factor</sub> (dB@3m)	Max. Emission	Limit (dBμV/m)	Verdict
		PK/ AV	U <sub>R</sub> (dBμV)			E (dBμV/m)		
0	2386.53	PK	26.19	6.74	27.20	60.13	74	PASS
0	2390.00	AV	13.84	6.74	27.20	47.78	54	PASS
78	2484.89	PK	25.98	6.74	27.20	59.92	74	PASS
78	2483.50	AV	13.68	6.74	27.20	47.62	54	PASS

B. Test Plot:

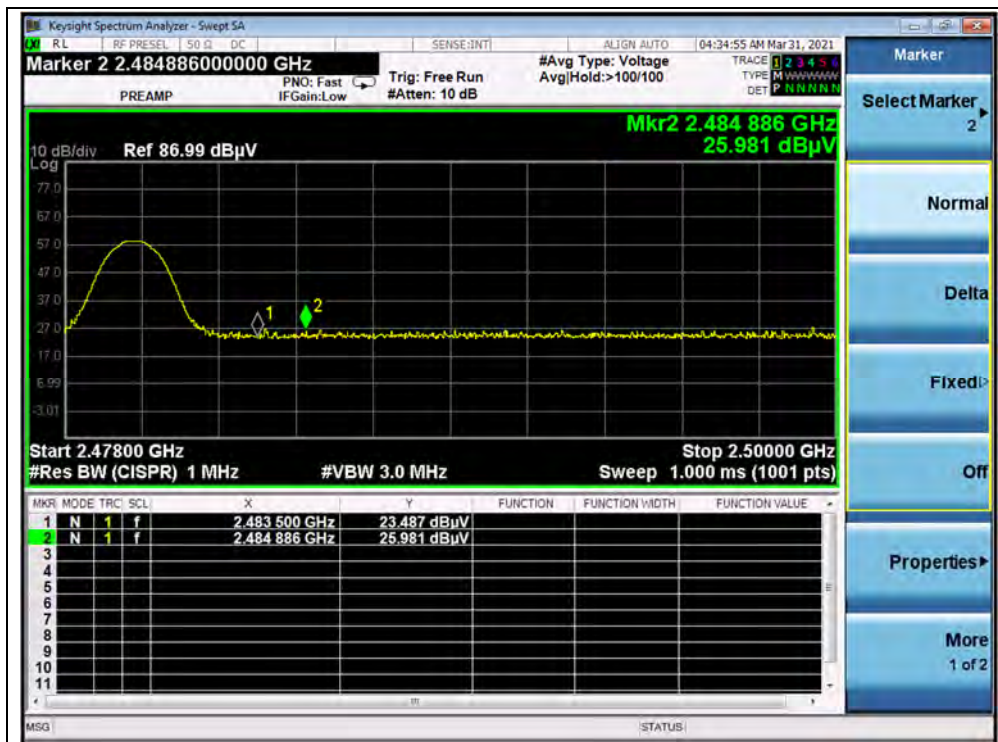


(PEAK, Channel 0,  $\pi/4$ -DQPSK)

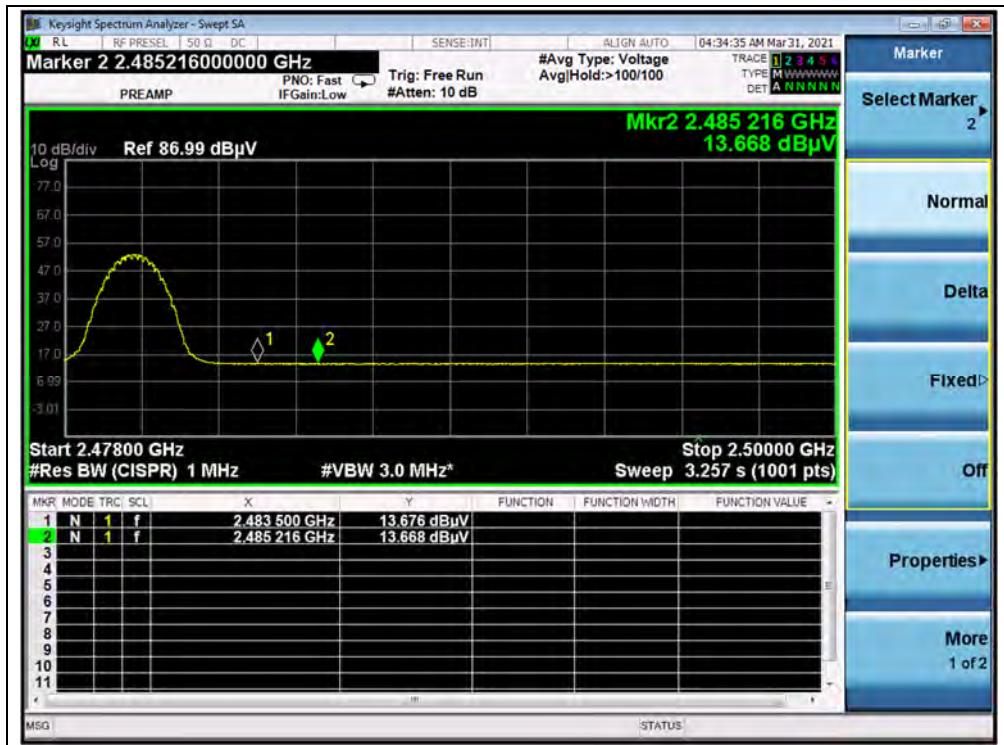




(AVERAGE, Channel 0,  $\pi/4$ -DQPSK)



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



(AVERAGE, Channel 78, π/4-DQPSK)

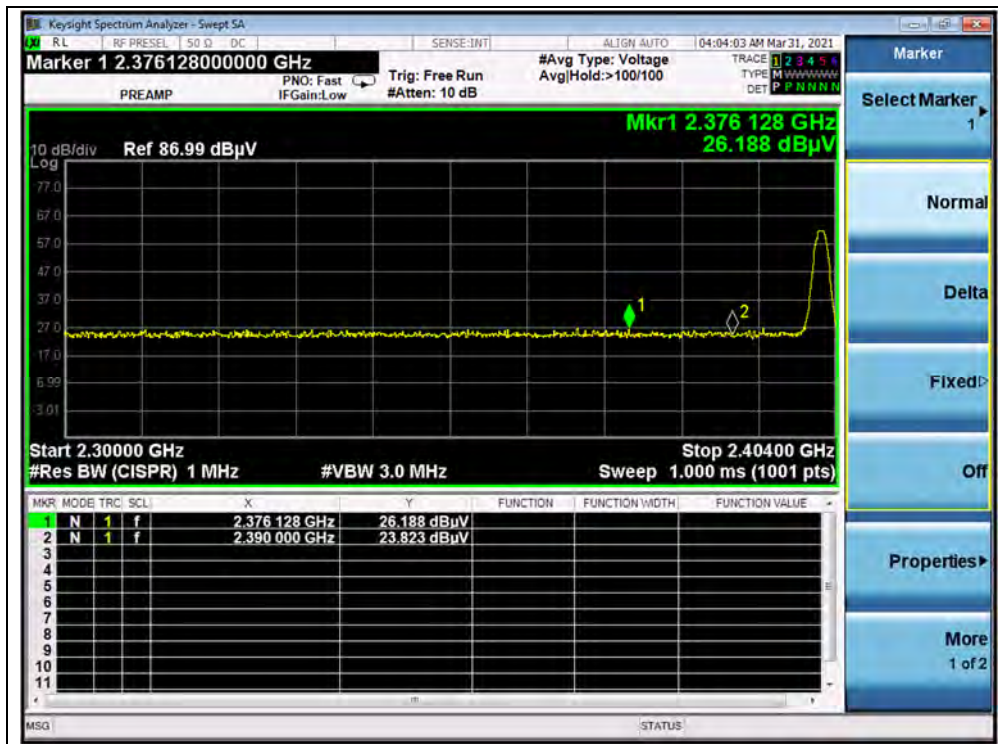


**8-DPSK Mode**

**A. Test Verdict:**

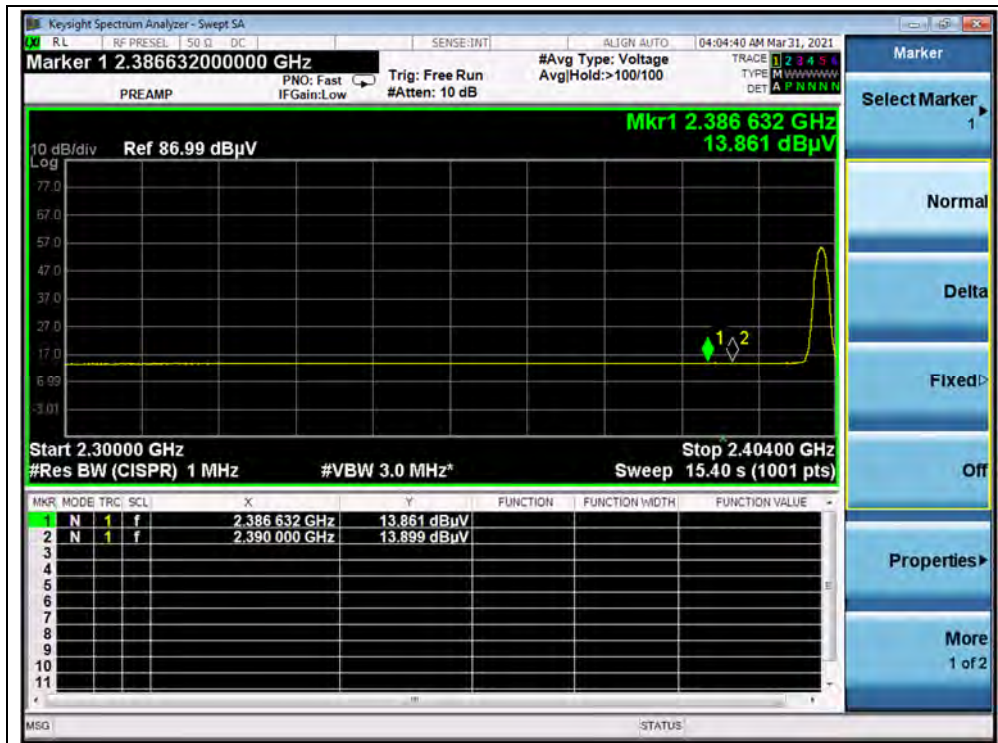
Channel	Frequency (MHz)	Detector	Receiver Reading $U_R$ (dB $\mu$ V)	$A_T$ (dB)	$A_{Factor}$ (dB@3m)	Max. Emission $E$ (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Verdict
		PK/ AV						
0	2376.13	PK	26.19	6.74	27.20	60.13	74	PASS
0	2390.00	AV	13.90	6.74	27.20	47.84	54	PASS
78	2484.09	PK	25.53	6.74	27.20	59.47	74	PASS
78	2483.50	AV	13.74	6.74	27.20	47.68	54	PASS

**B. Test Plot:**

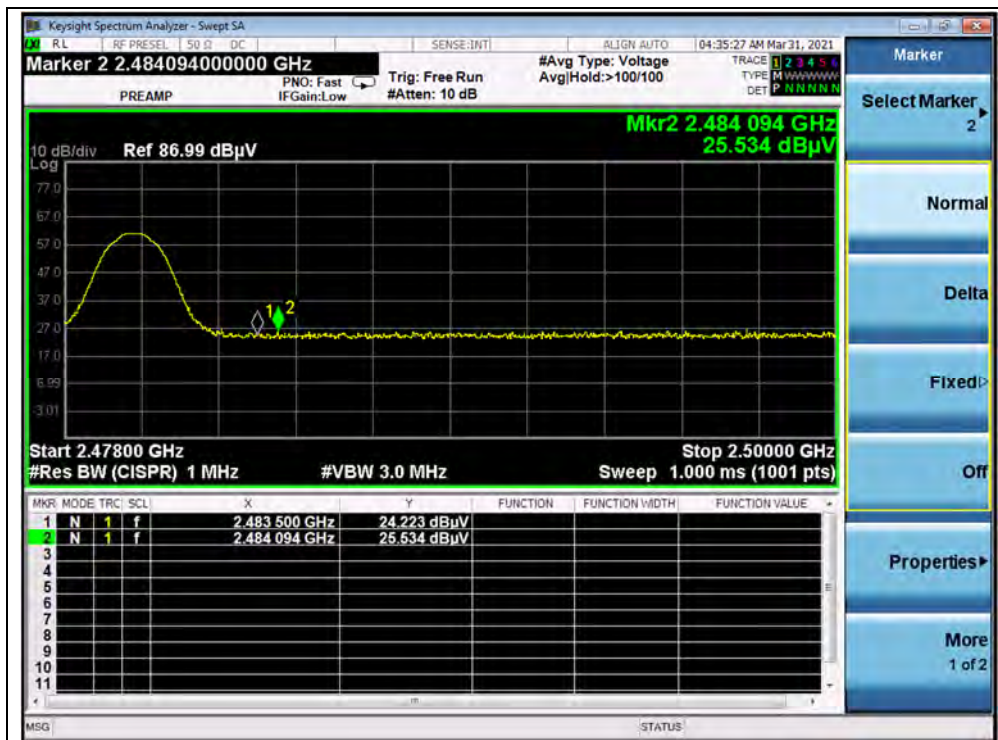


(PEAK, Channel 0, 8-DPSK)

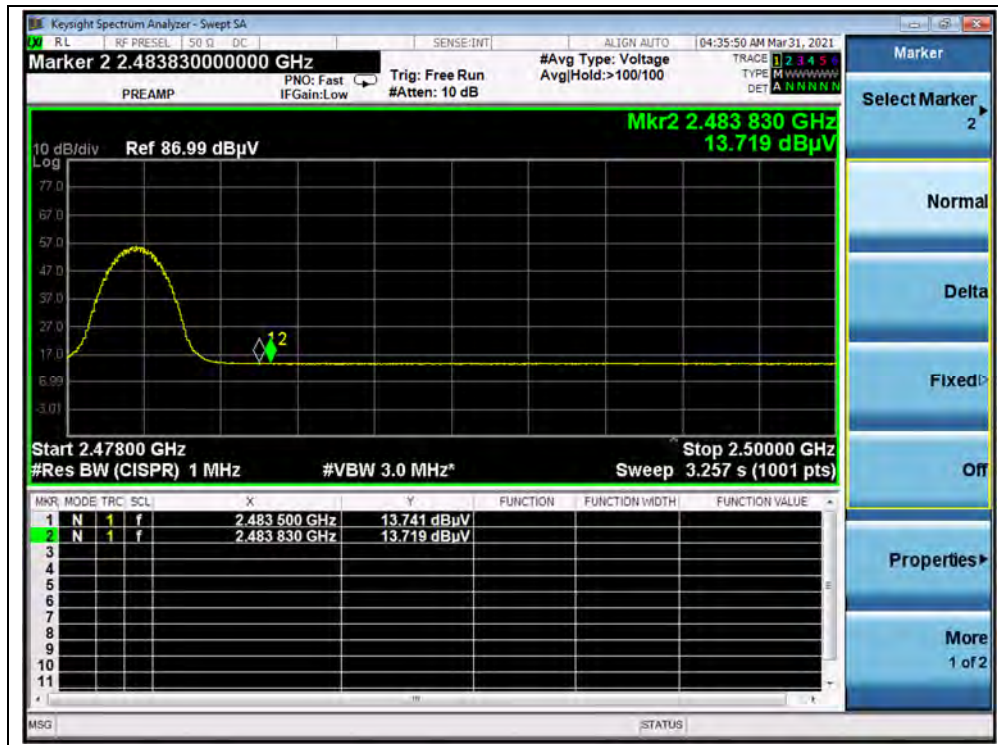




(AVERAGE, Channel 0, 8-DPSK)



(PEAK, Channel 78, 8-DPSK)



(AVERAGE, Channel 78, 8-DPSK)



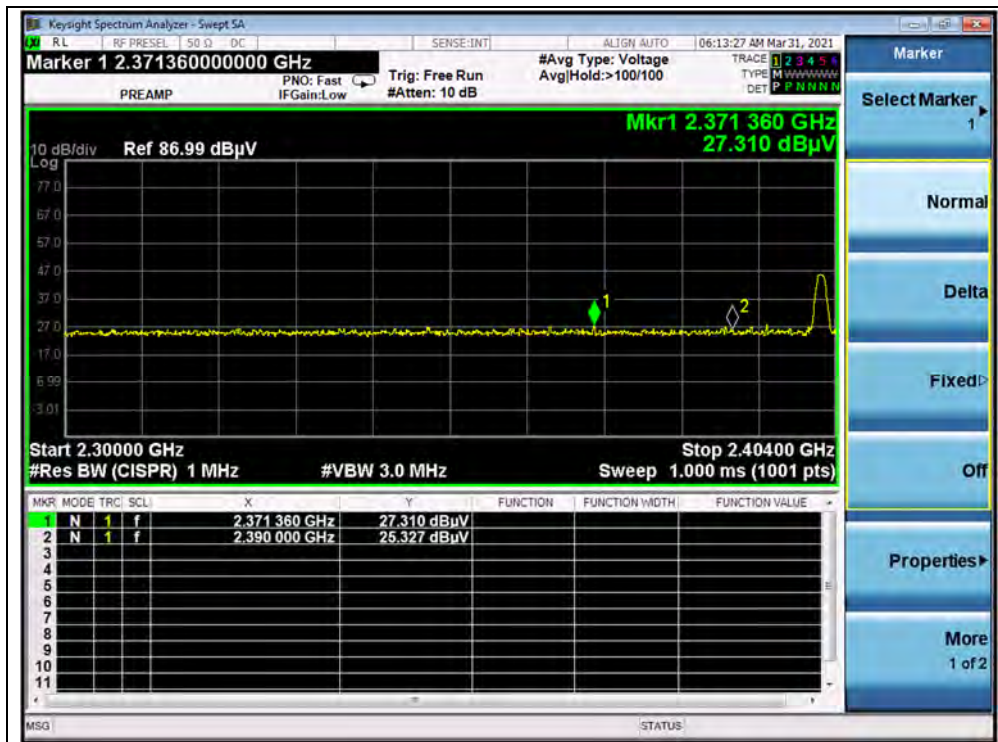
Right:

GFSK Mode

A. Test Verdict:

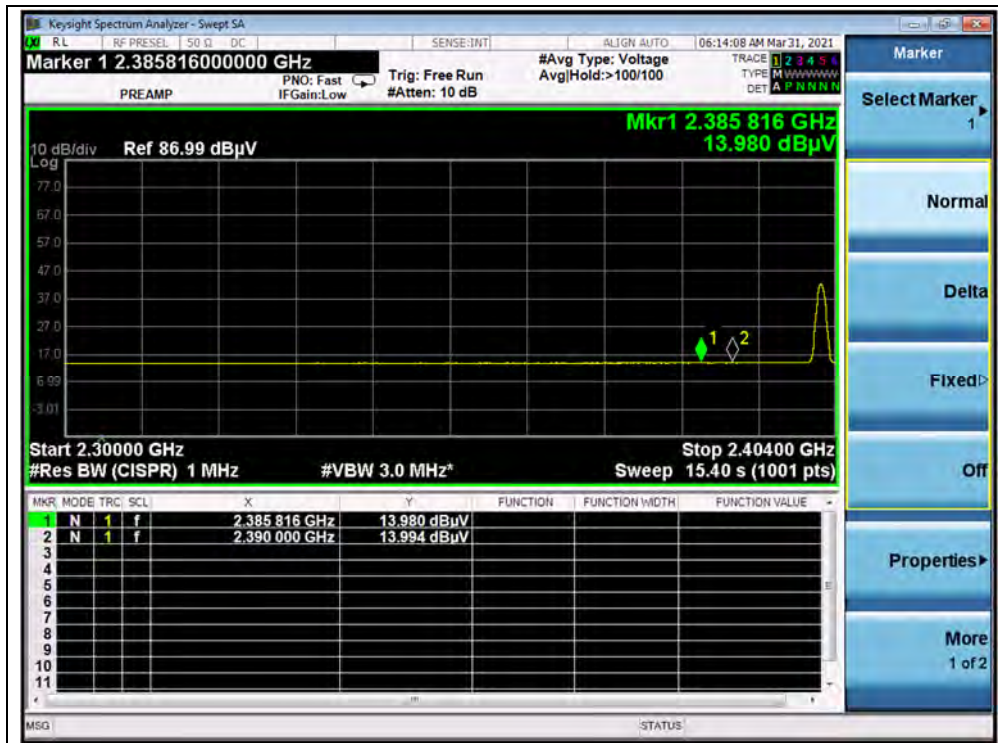
Channel	Frequency (MHz)	Detector	Receiver Reading $U_R$ (dB $\mu$ V)	$A_T$ (dB)	$A_{Factor}$ (dB@3m)	Max. Emission E (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Verdict
		PK/ AV						
0	2371.36	PK	27.31	6.74	27.20	61.25	74	PASS
0	2390.00	AV	13.99	6.74	27.20	47.93	54	PASS
78	2485.66	PK	26.16	6.74	27.20	60.10	74	PASS
78	2484.58	AV	13.81	6.74	27.20	47.75	54	PASS

B. Test Plot:

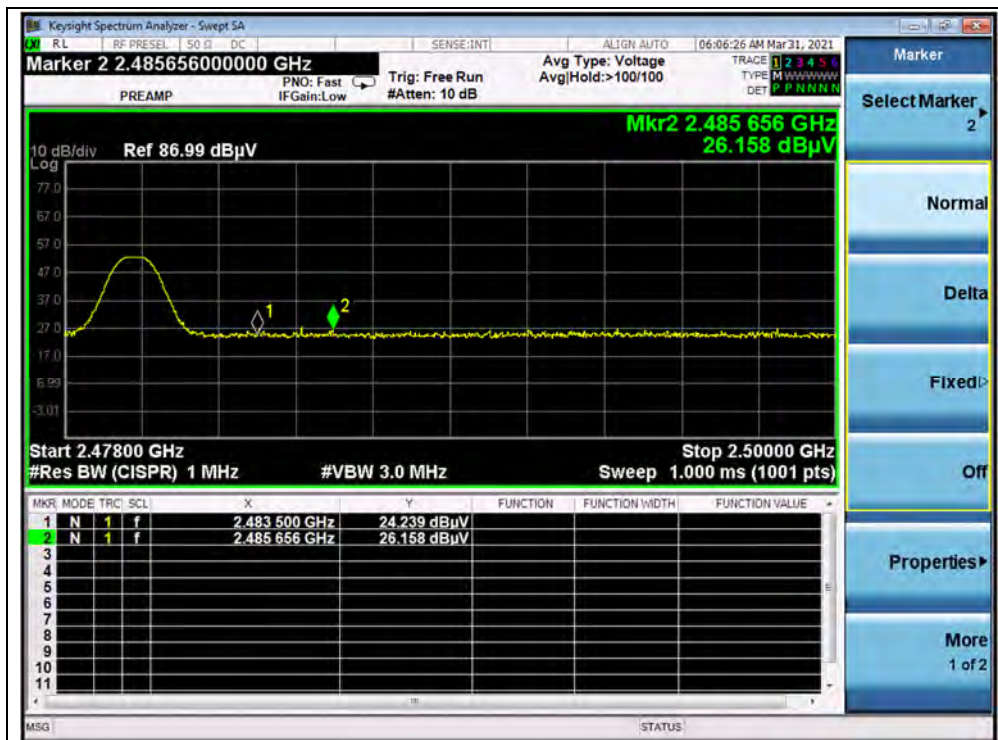


(PEAK, Channel 0, GFSK)





(AVERAGE, Channel 0, GFSK)



(PEAK, Channel 78, GFSK)



(AVERAGE, Channel 78, GFSK)

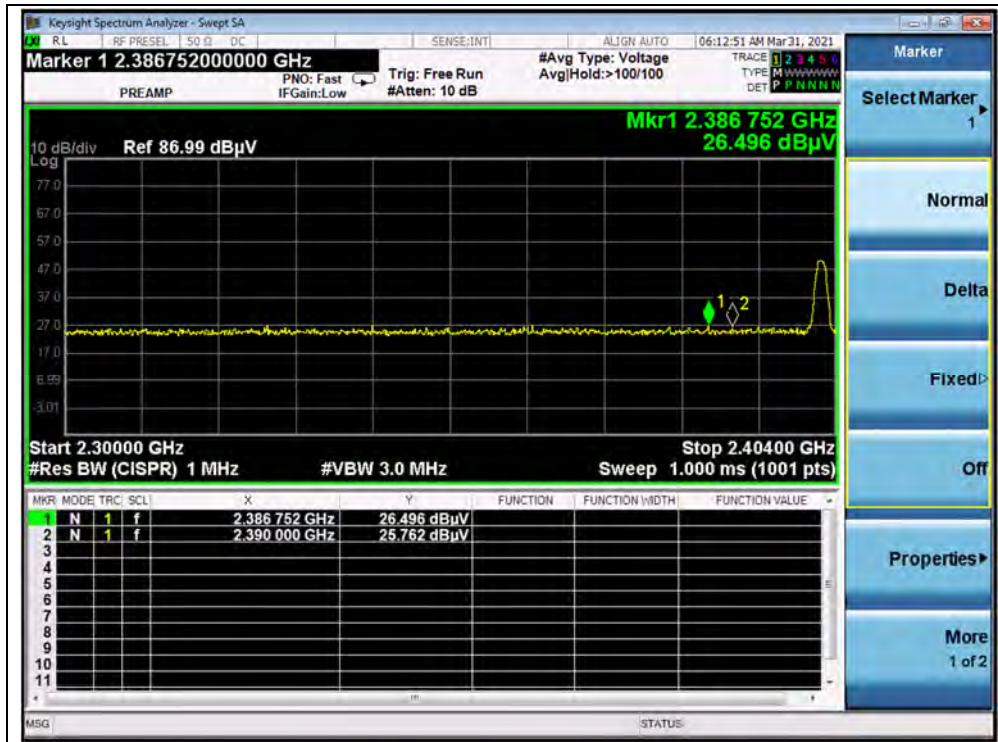


$\pi/4$ -DQPSK Mode

A. Test Verdict:

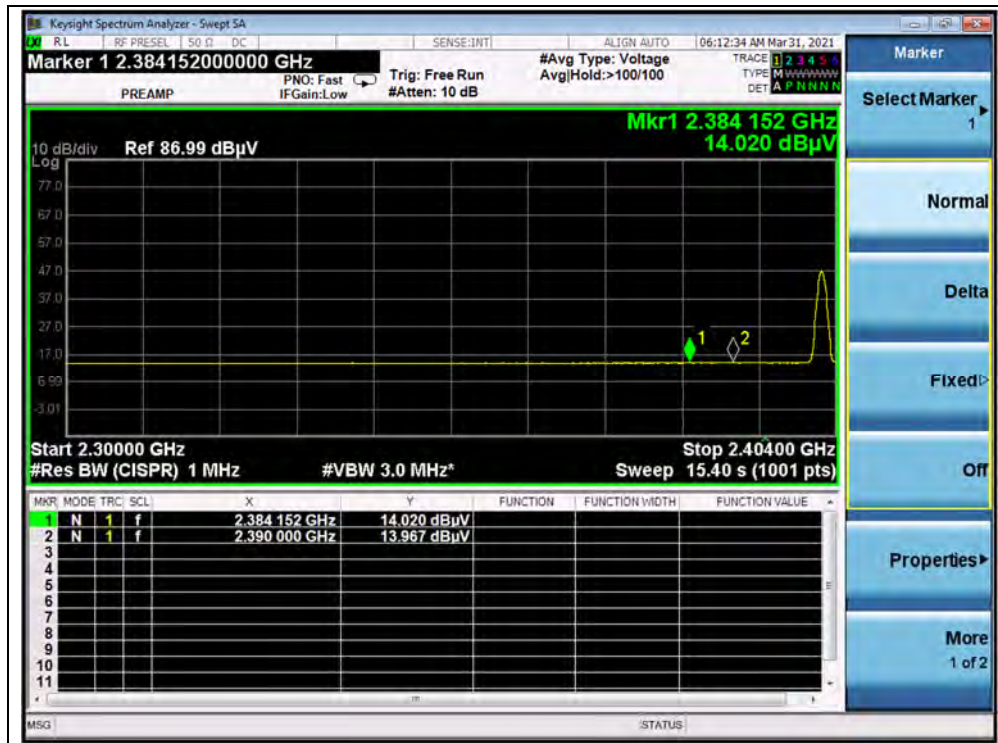
Channel	Frequency (MHz)	Detector	Receiver Reading	A <sub>T</sub> (dB)	A <sub>Factor</sub> (dB@3m)	Max. Emission	Limit (dB $\mu$ V/m)	Verdict
		PK/ AV	U <sub>R</sub> (dB $\mu$ V)			E (dB $\mu$ V/m)		
0	2386.75	PK	26.50	6.74	27.20	60.44	74	PASS
0	2384.15	AV	14.02	6.74	27.20	47.96	54	PASS
78	2483.98	PK	25.28	6.74	27.20	59.22	74	PASS
78	2484.31	AV	13.78	6.74	27.20	47.72	54	PASS

B. Test Plot:

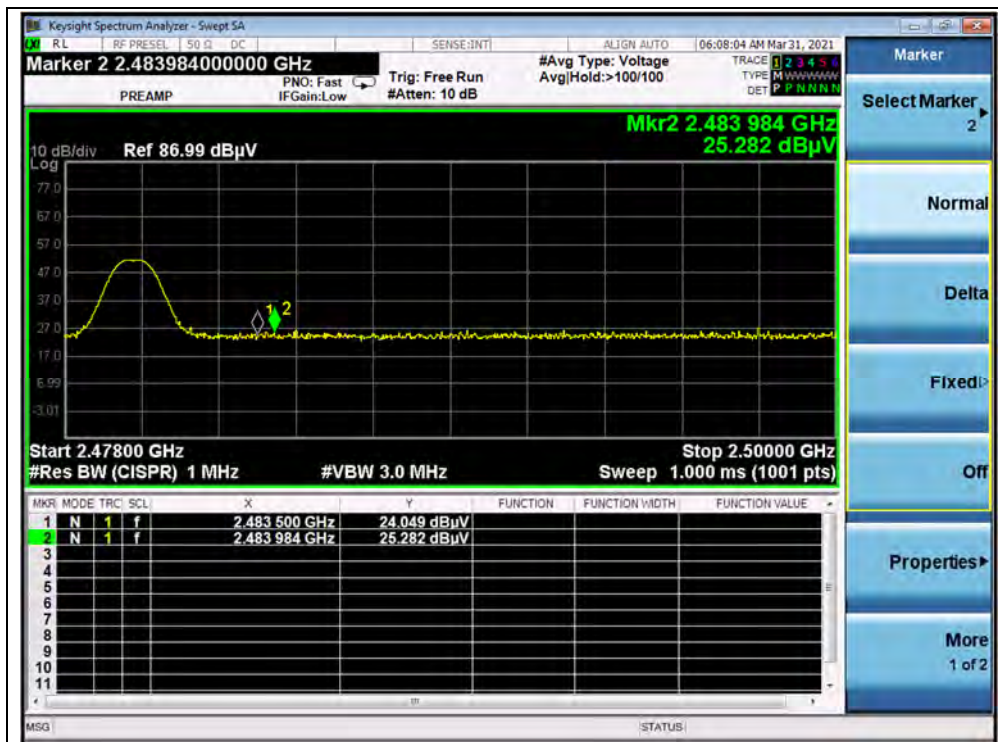


(PEAK, Channel 0,  $\pi/4$ -DQPSK)





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



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



(AVERAGE, Channel 78, π/4-DQPSK)

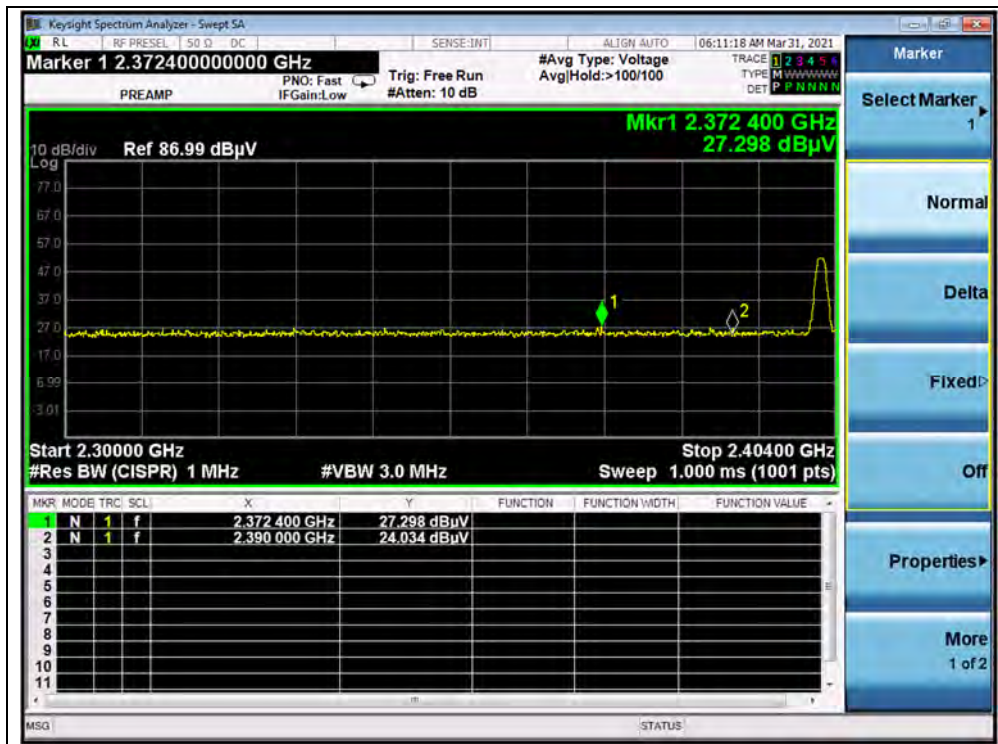


**8-DPSK Mode**

**A. Test Verdict:**

Channel	Frequency (MHz)	Detector	Receiver Reading U <sub>R</sub> (dBμV)	A <sub>T</sub> (dB)	A <sub>Factor</sub> (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
		PK/ AV						
0	2372.40	PK	27.30	6.74	27.20	61.24	74	PASS
0	2386.23	AV	13.99	6.74	27.20	47.93	54	PASS
78	2486.47	PK	26.49	6.74	27.20	60.43	74	PASS
78	2484.58	AV	13.71	6.74	27.20	47.65	54	PASS

**B. Test Plot:**

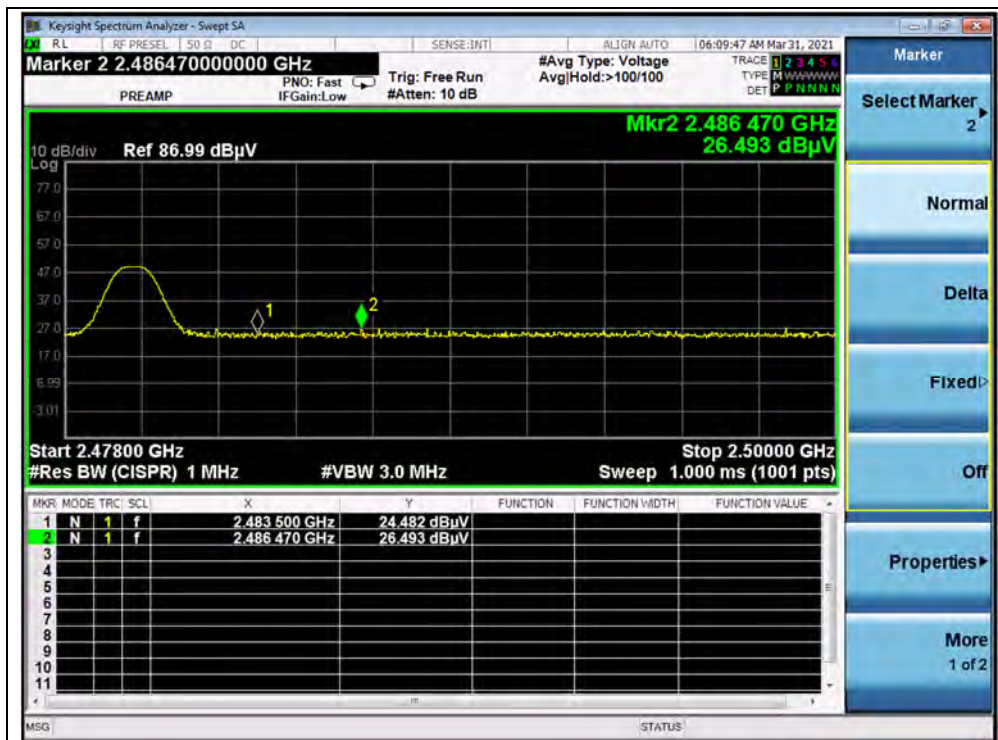


(PEAK, Channel 0, 8-DPSK)





(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.

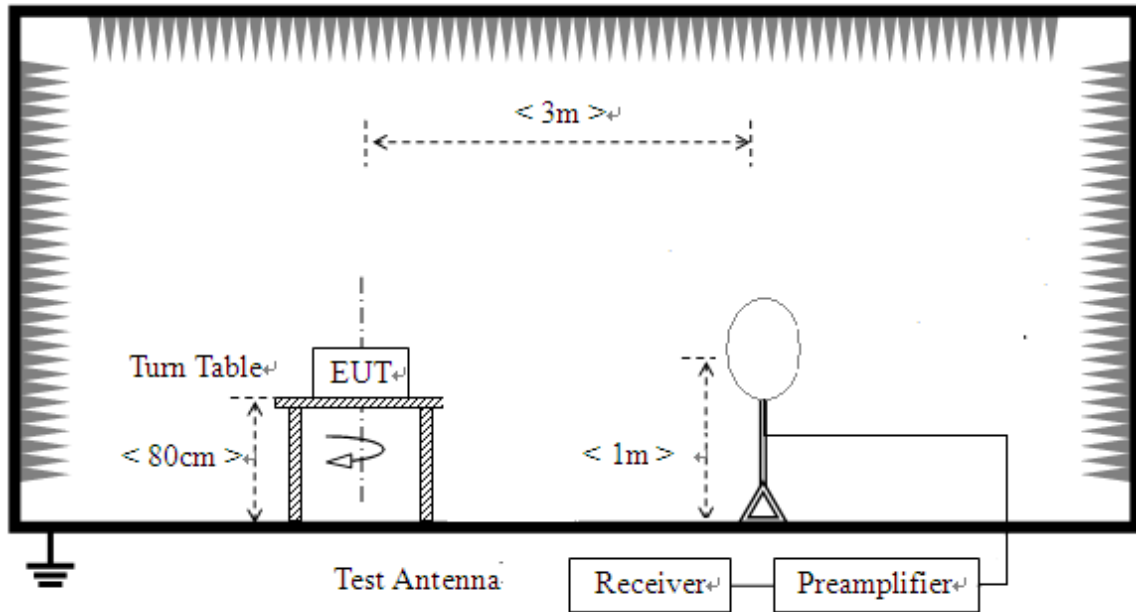
**Note2:** For above 1000MHz, limit field strength of harmonics: 54dBuV/m@3m (AV) and 74dBuV/m@3m (PK). In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), also should comply with the radiated emission limits specified in Section 15.209(a)(above table).



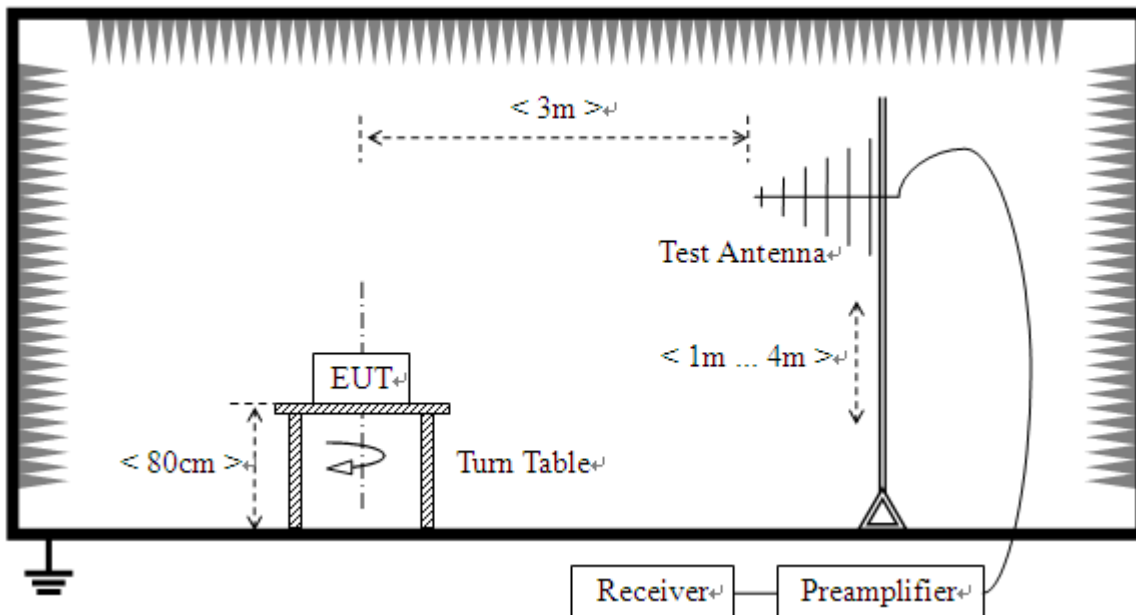
2.13.2. Test Description

Test Setup:

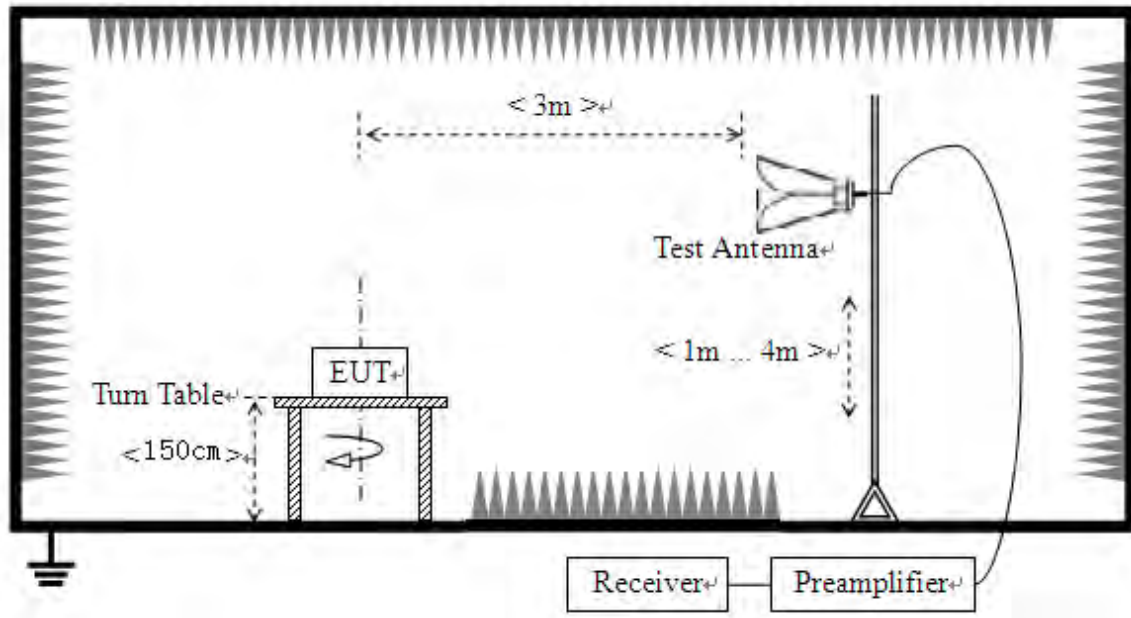
1) For radiated emissions from 9kHz to 30MHz



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:

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

$A_T$ : Total correction Factor except Antenna

$U_R$ : Receiver Reading

$G_{\text{preamp}}$ : Preamplifier Gain

$A_{\text{Factor}}$ : Antenna Factor at 3m

During the test, the total correction Factor  $A_T$  and  $A_{\text{Factor}}$  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.

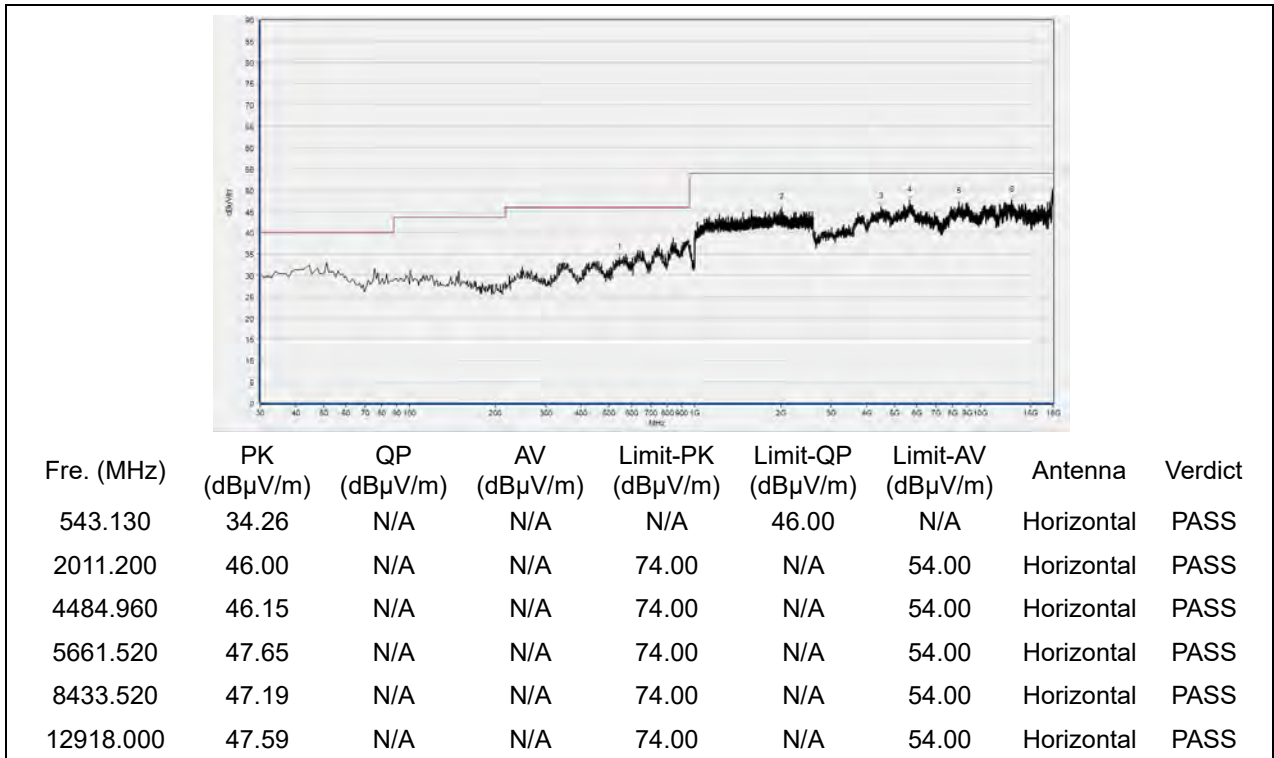
**Note 3:** For the frequency, which started from 18GHz to 40GHz, was pre-scanned and the result which was 20dB lower than the limit was not recorded.



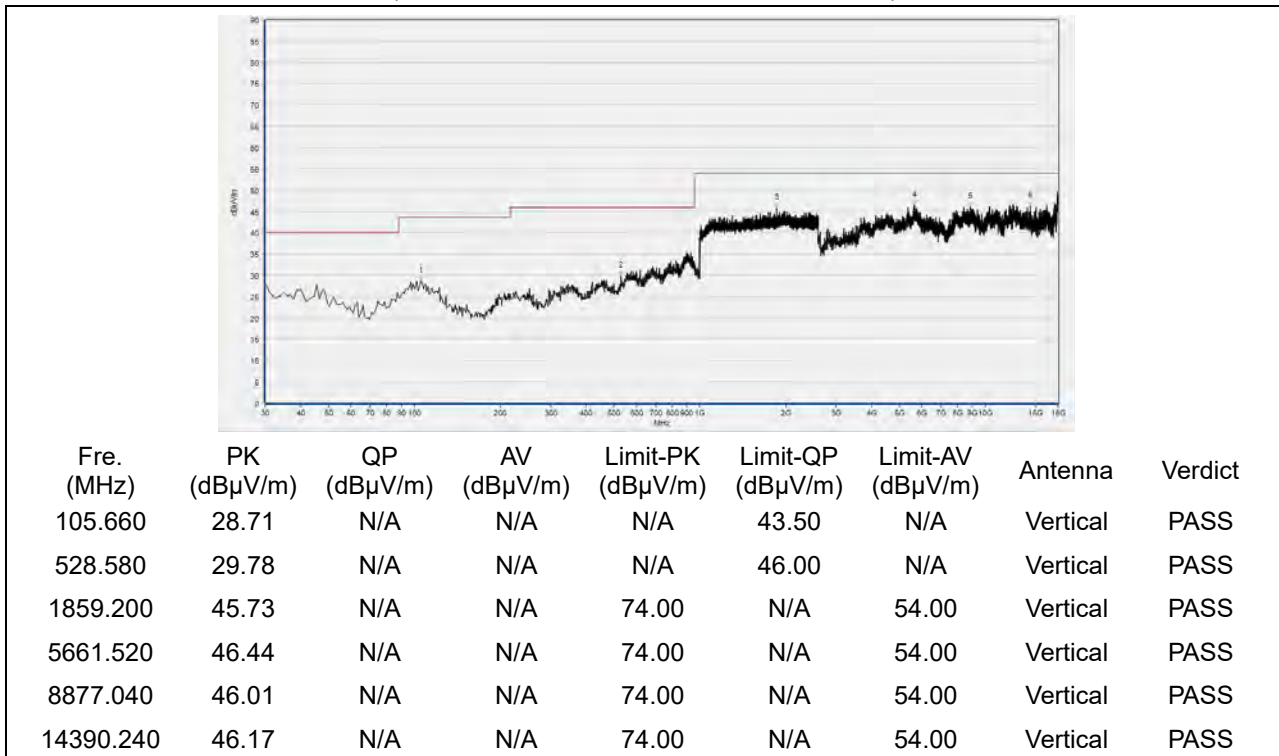


**Left, GFSK Mode**

Plots for Channel 0

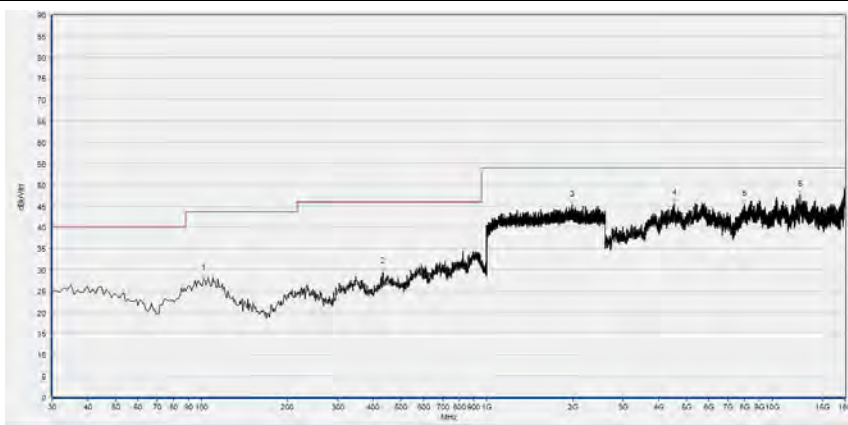


(Antenna Horizontal, 30MHz to 18GHz)



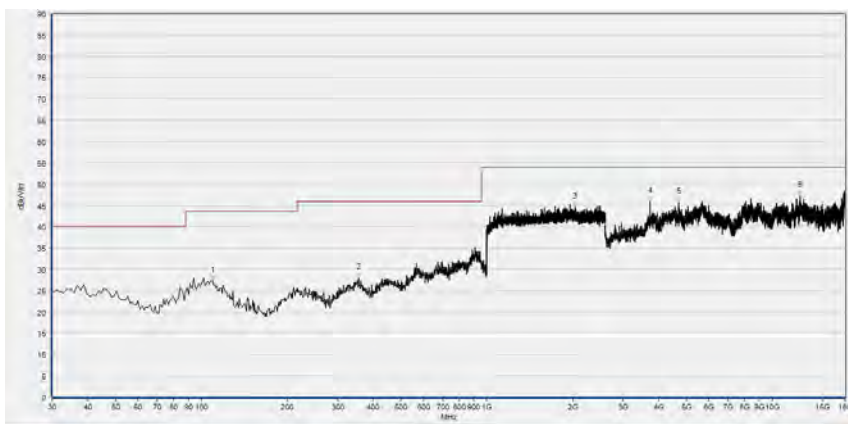
(Antenna Vertical, 30MHz to 18GHz)

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
101.780	27.84	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
431.580	29.52	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1989.867	45.24	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4537.320	45.59	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
7986.920	45.42	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12499.120	47.57	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

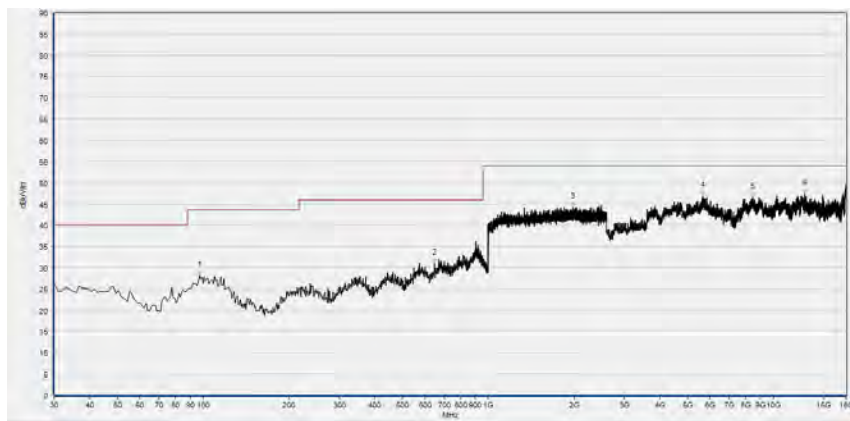
(Antenna Horizontal, 30MHz to 18GHz)



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
109.540	27.32	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
354.950	27.93	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
2038.400	44.64	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
3733.440	45.90	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4703.640	45.83	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12523.760	47.23	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

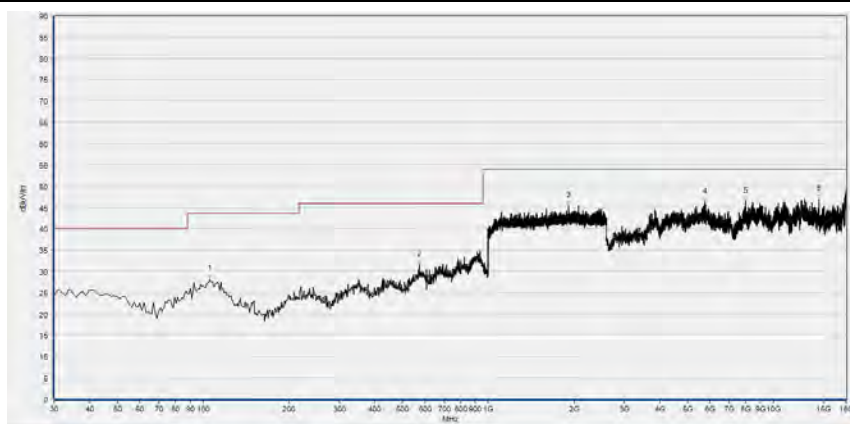
(Antenna Vertical, 30MHz to 18GHz)

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
96.930	28.21	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
647.890	31.00	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1979.733	44.26	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5658.440	46.96	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8448.920	46.62	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12902.600	47.50	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
105.660	28.15	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
573.200	31.54	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1909.867	45.44	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5735.440	46.22	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8002.320	46.47	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
14427.200	46.94	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

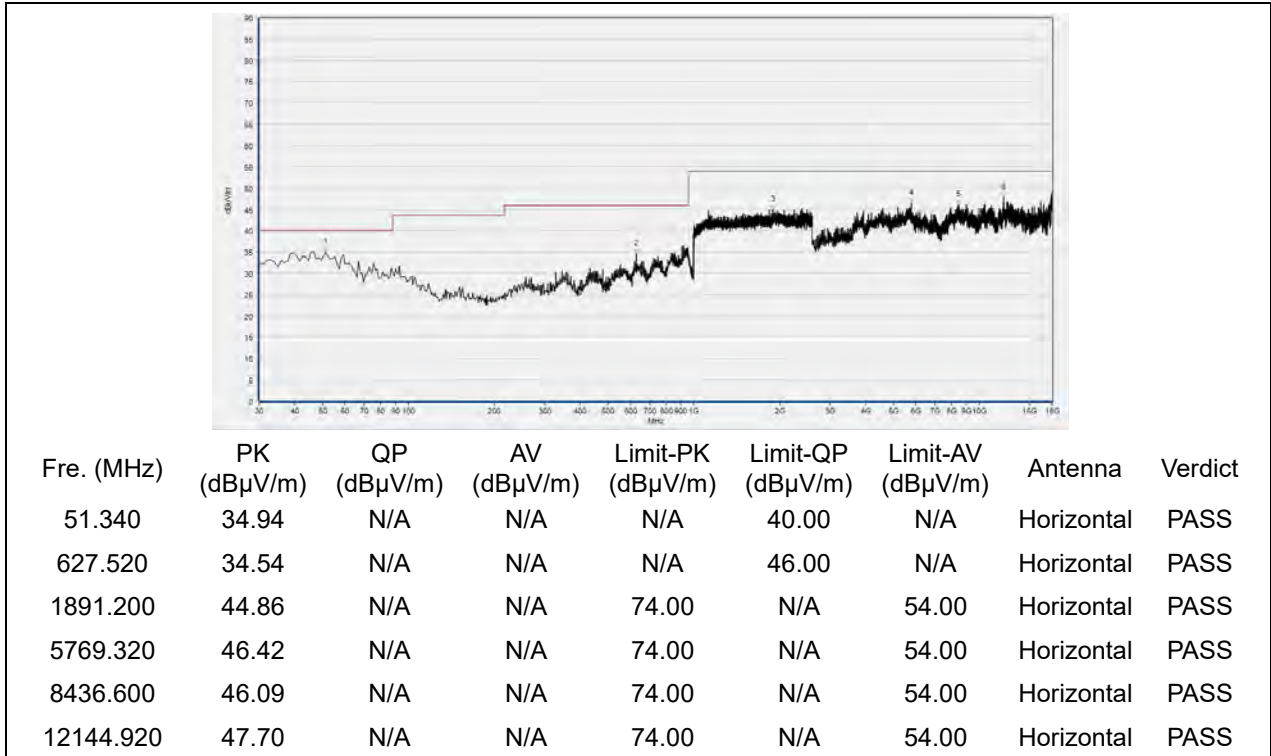
(Antenna Vertical, 30MHz to 18GHz)



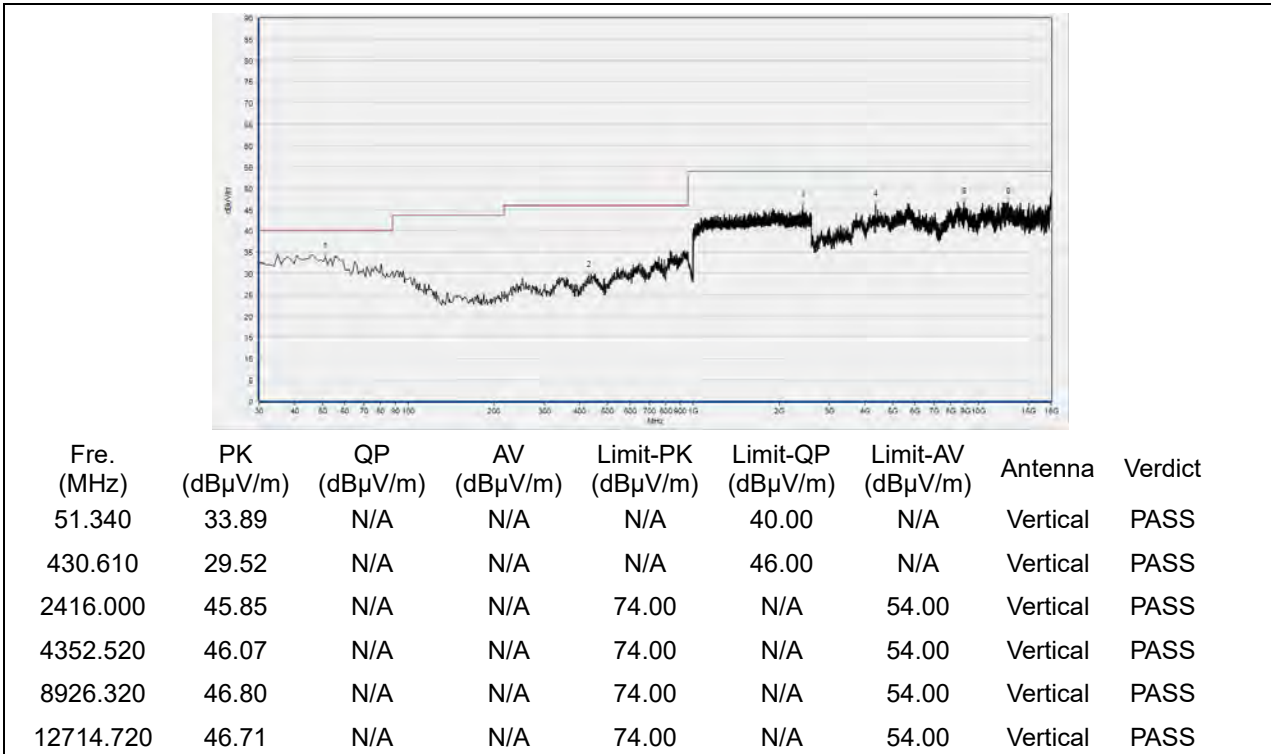


**$\pi/4$ -DQPSK Mode**

Plots for Channel 0

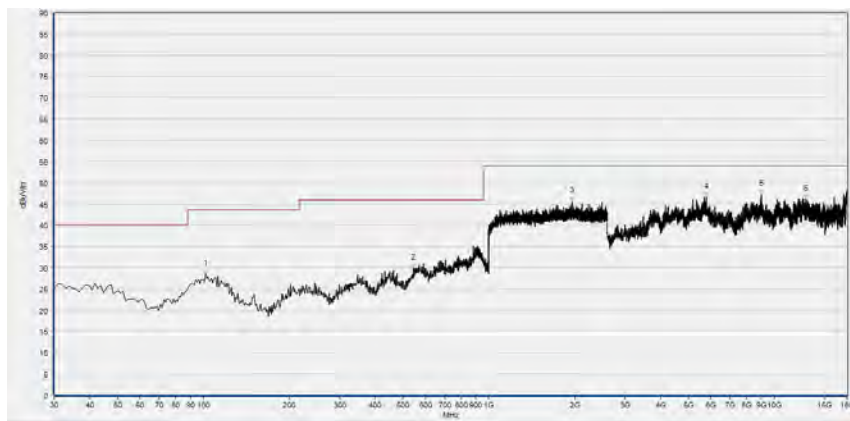


(Antenna Horizontal, 30MHz to 18GHz)



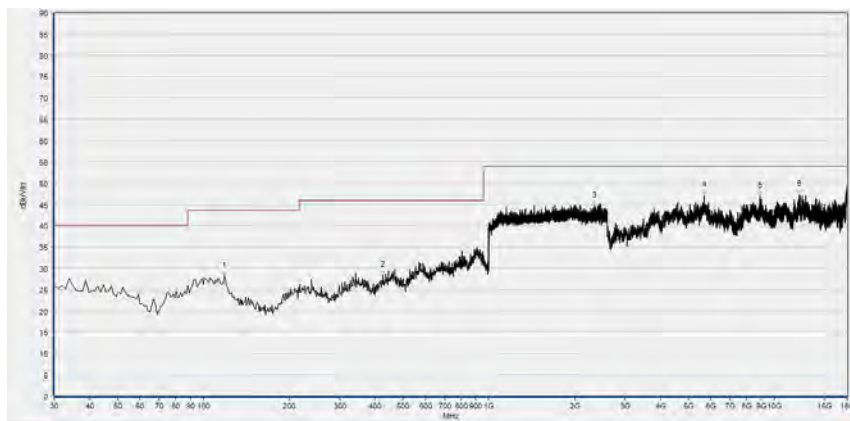
(Antenna Vertical, 30MHz to 18GHz)

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
101.780	28.45	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
543.130	29.80	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1958.400	45.59	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5781.640	46.59	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
9000.240	47.20	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12877.960	46.07	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

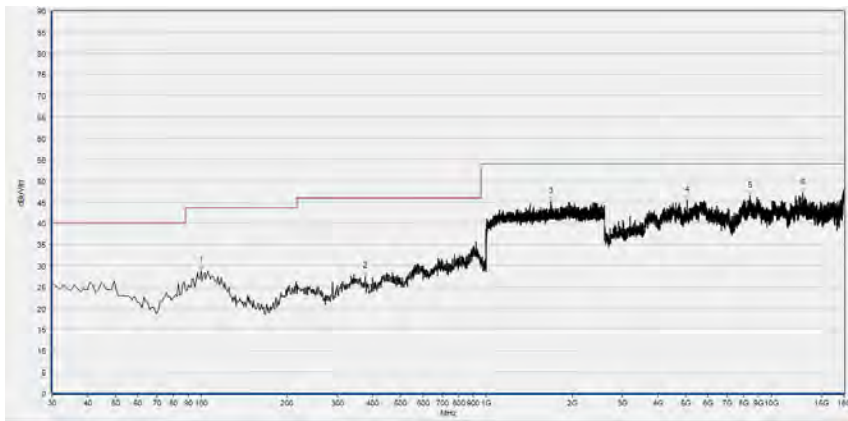
(Antenna Horizontal, 30MHz to 18GHz)



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
118.270	28.23	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
425.760	28.29	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
2339.200	44.63	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5670.760	47.16	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8917.080	46.95	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12203.440	47.22	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

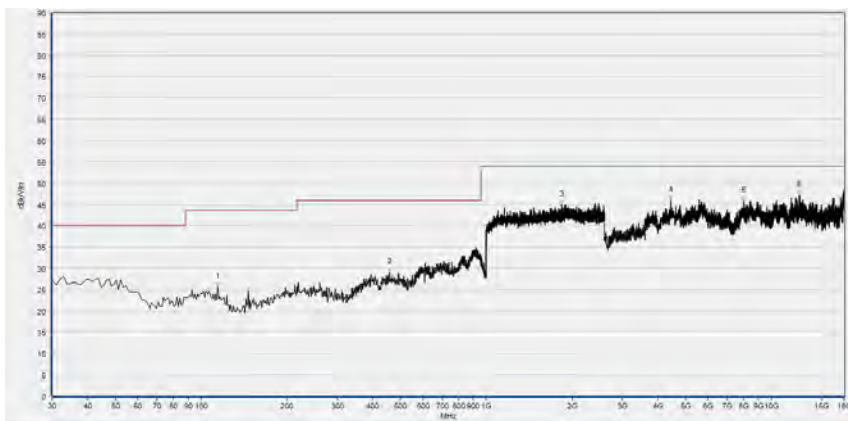
(Antenna Vertical, 30MHz to 18GHz)

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
99.840	28.86	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
376.290	27.42	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1689.600	45.03	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5054.760	45.40	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8415.040	46.37	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12899.520	47.11	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 18GHz)



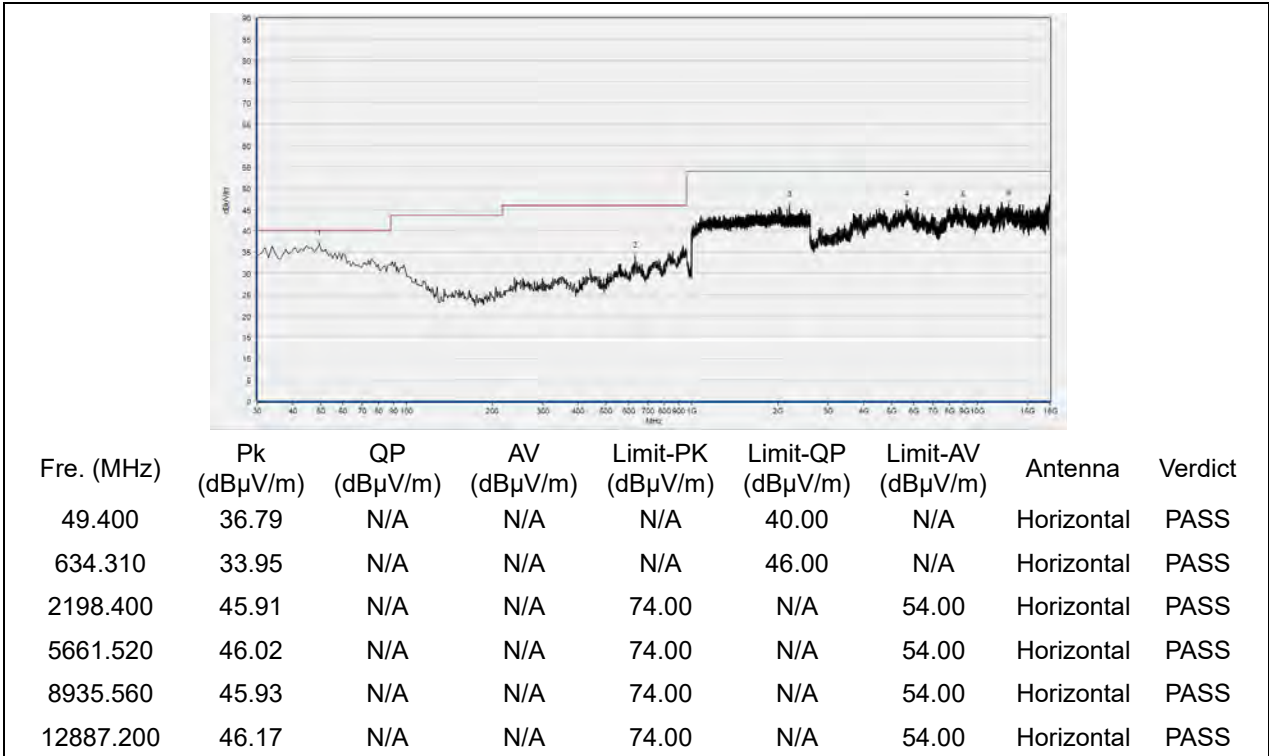
Fre. (MHz)	Pk (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
114.390	25.72	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
457.770	29.02	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1842.133	44.84	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4444.920	45.96	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8008.480	45.74	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12514.520	47.09	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 18GHz)

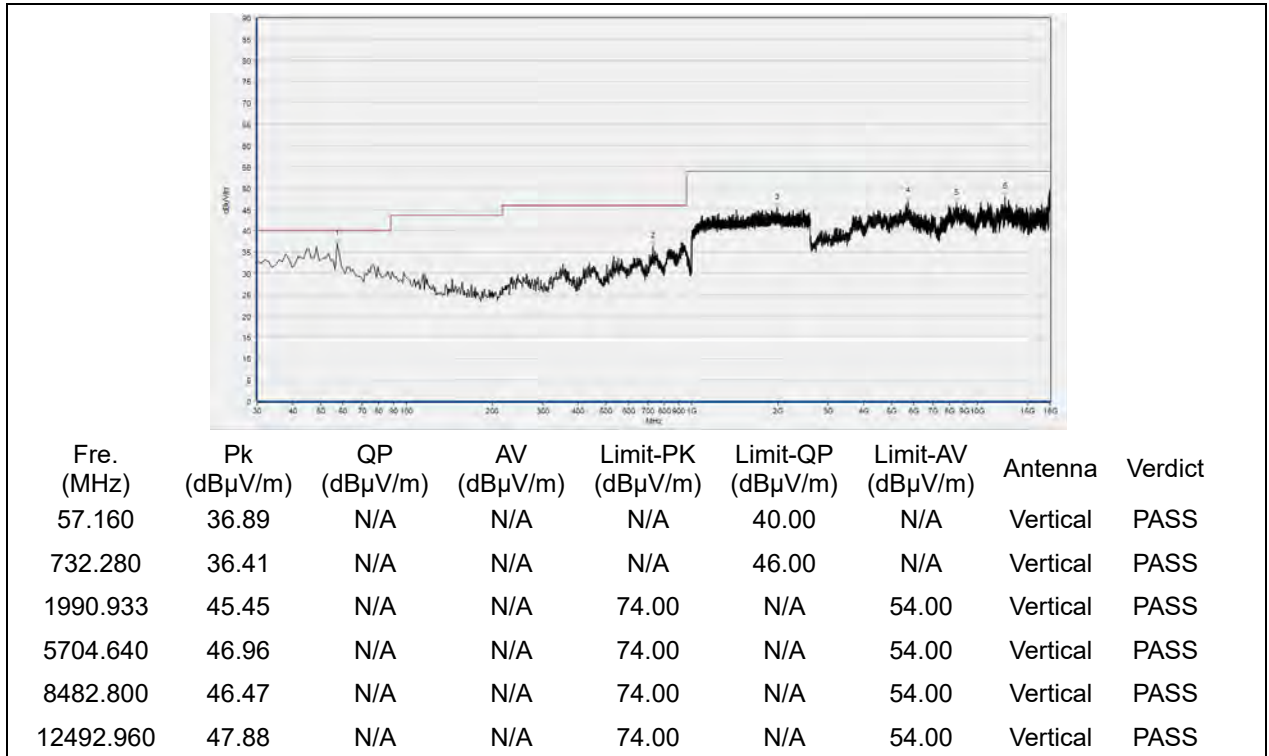


**8-DPSK Mode**

Plots for Channel 0



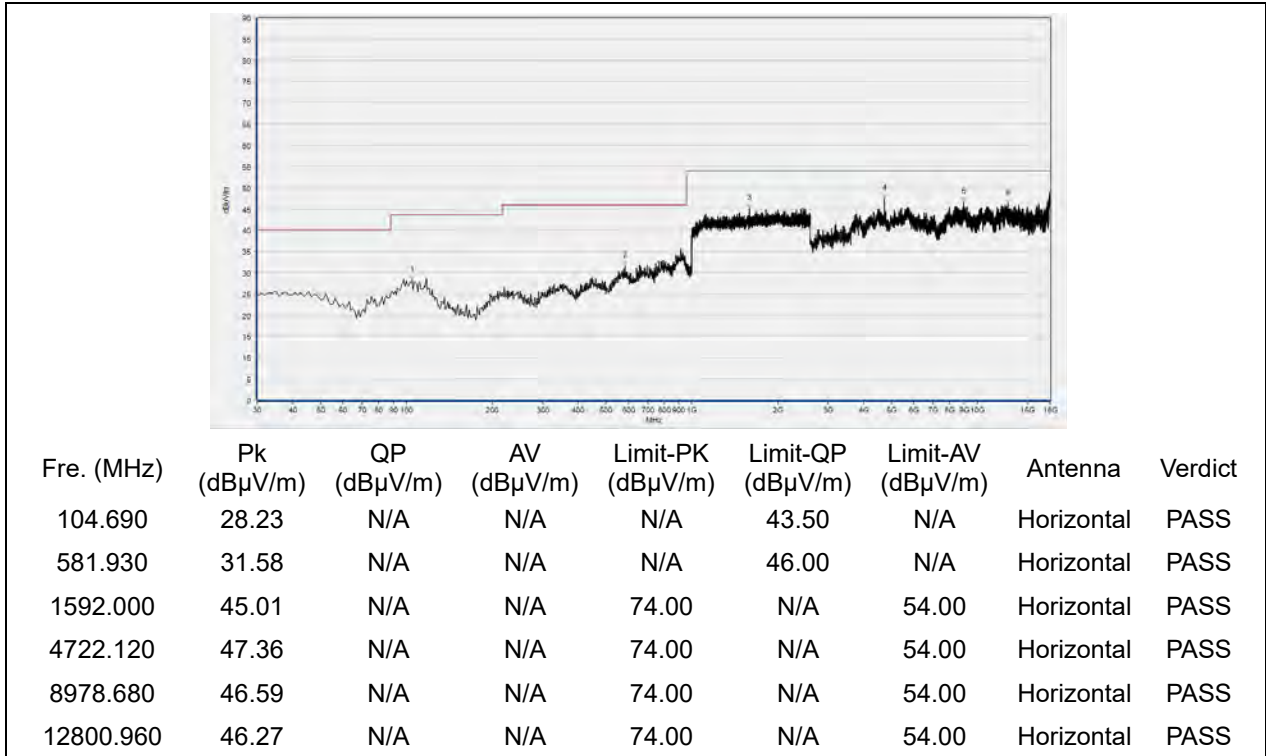
(Antenna Horizontal, 30MHz to 18GHz)



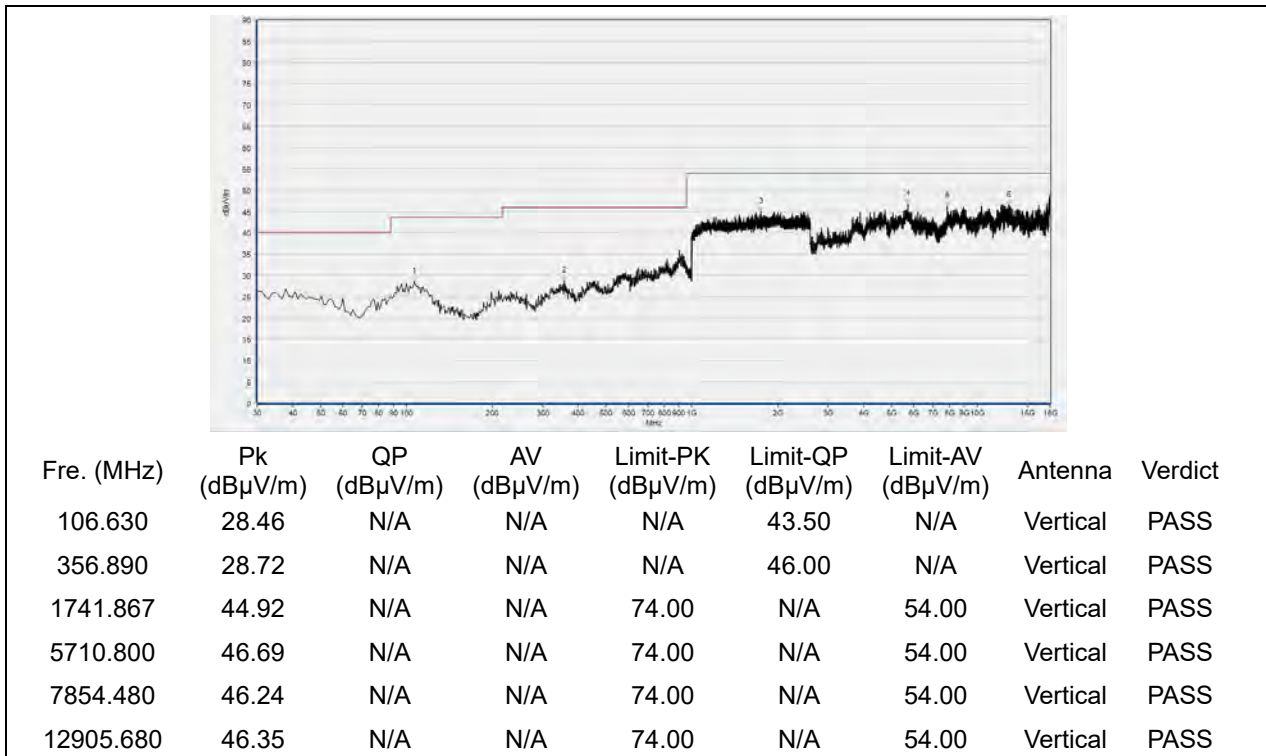
(Antenna Vertical, 30MHz to 18GHz)



Plot for Channel 39

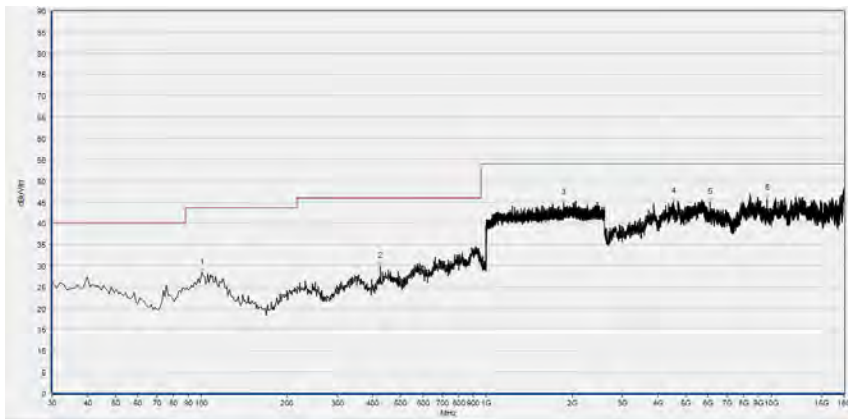


(Antenna Horizontal, 30MHz to 18GHz)



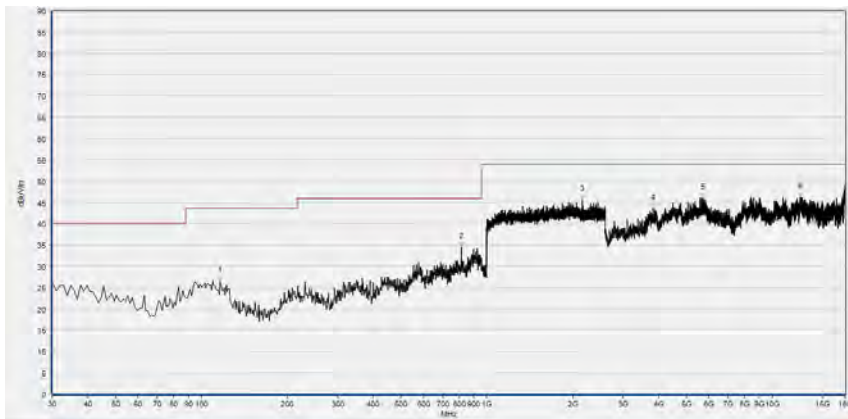
(Antenna Vertical, 30MHz to 18GHz)

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
100.810	28.33	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
424.790	29.80	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1873.067	44.72	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4534.240	45.03	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
6086.560	44.85	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
9637.800	45.72	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 18GHz)



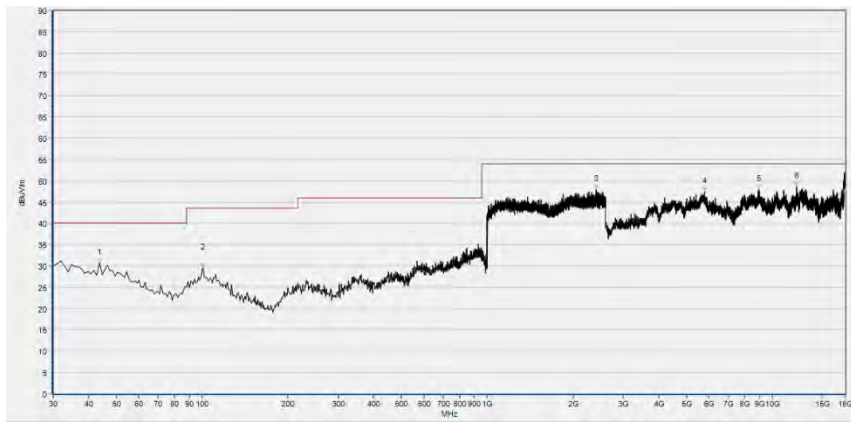
Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
116.330	26.43	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
813.760	34.46	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
2160.000	45.59	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
3819.680	43.53	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5732.360	46.14	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12511.440	46.29	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 18GHz)



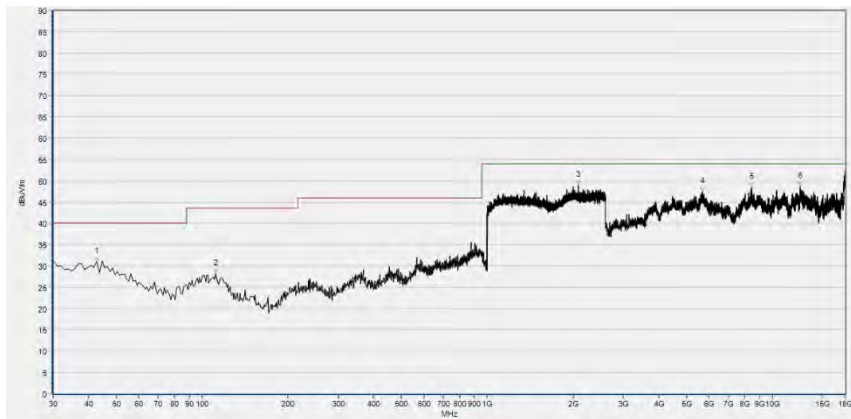
**Right, GFSK Mode**

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
43.580	30.61	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
100.810	29.49	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
2410.667	47.88	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5769.320	47.51	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8978.680	47.99	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12144.920	48.64	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

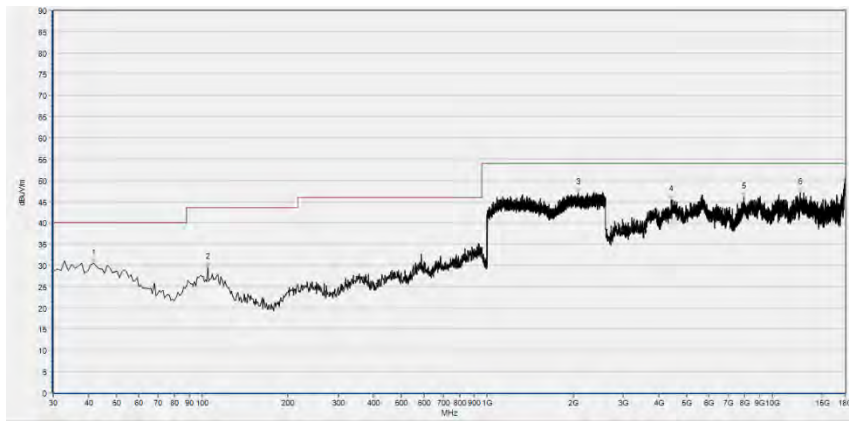
(Antenna Horizontal, 30MHz to 18GHz)



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
42.610	31.02	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
111.480	28.14	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
2083.200	48.89	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5689.240	47.40	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8436.600	48.48	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12517.600	48.69	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

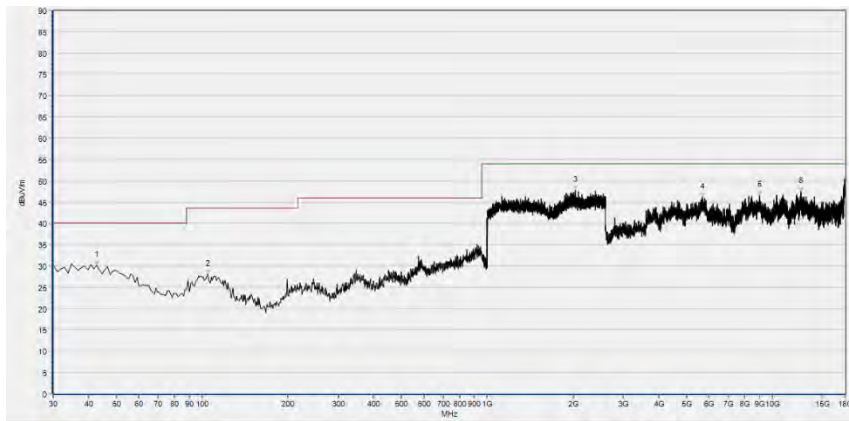
(Antenna Vertical, 30MHz to 18GHz)

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
41.640	30.52	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
104.690	29.49	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
2088.000	47.04	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4423.360	45.44	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
7943.800	46.17	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12486.800	47.07	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
42.610	30.24	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
104.690	27.93	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
2036.267	47.69	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5676.920	46.04	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
9000.240	46.59	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12569.960	47.49	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Vertical, 30MHz to 18GHz)

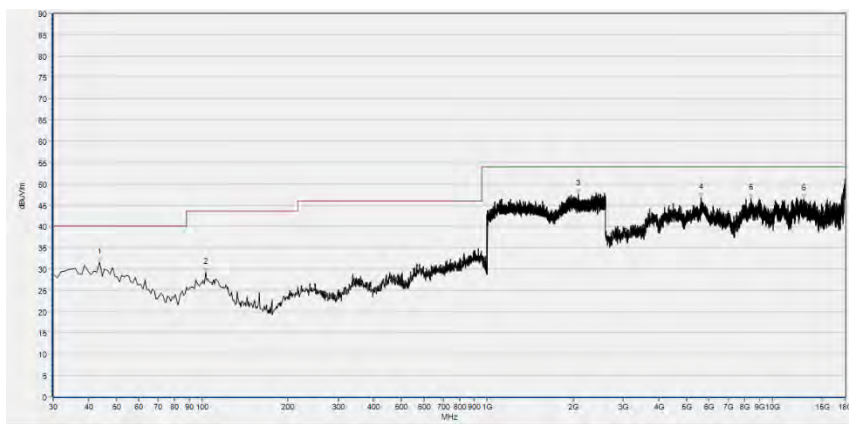


Plot for Channel 78



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
44.550	29.77	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
102.750	28.12	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
2091.733	47.89	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5830.920	46.65	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8427.360	46.72	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12597.680	47.36	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
43.580	31.48	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
102.750	29.24	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
2088.533	47.63	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5615.320	46.82	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8399.640	46.67	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12877.960	46.45	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 18GHz)



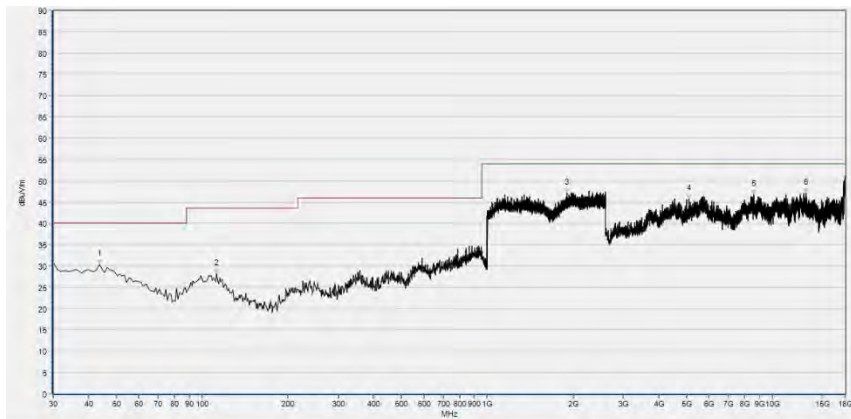
**$\pi/4$ -DQPSK Mode**

**Plots for Channel 0**



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
31.940	30.25	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
100.810	28.35	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
1575.467	45.74	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5778.560	46.53	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8418.120	46.60	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12683.920	46.89	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

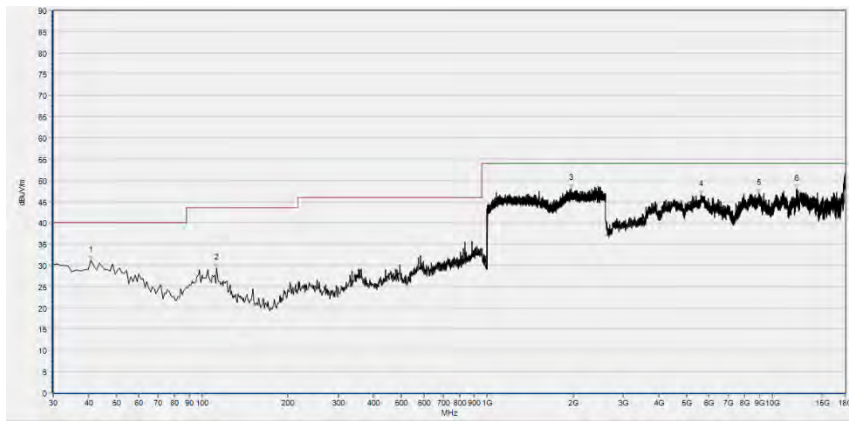
(Antenna Horizontal, 30MHz to 18GHz)



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
43.580	30.36	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
112.450	28.20	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
1897.067	47.03	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5100.960	45.77	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8621.400	46.70	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
13112.040	47.03	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

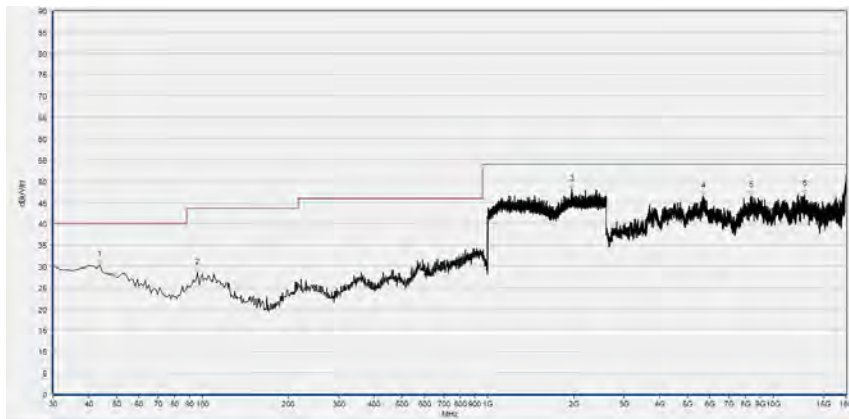
(Antenna Vertical, 30MHz to 18GHz)

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
40.670	31.12	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
112.450	29.37	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
1966.400	48.07	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5630.720	46.67	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8963.280	46.99	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12166.480	47.92	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

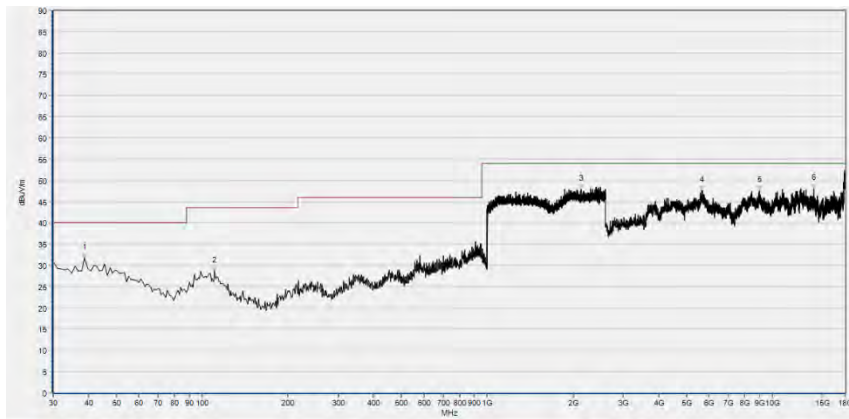
(Antenna Horizontal, 30MHz to 18GHz)



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
43.580	30.41	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
95.960	28.45	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
1963.200	48.11	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5689.240	46.40	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8365.760	46.59	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12905.680	47.01	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

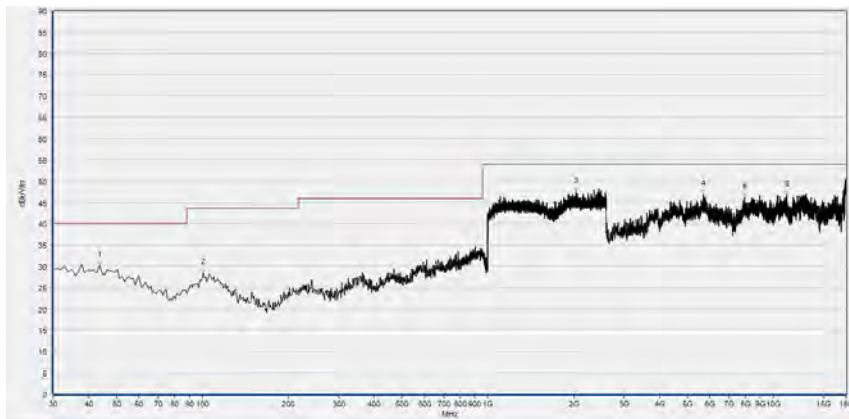
(Antenna Vertical, 30MHz to 18GHz)

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
38.730	31.65	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
110.510	28.60	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
2133.333	47.96	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5652.280	47.56	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
9015.640	47.56	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
13996.000	48.13	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
43.580	30.10	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
100.810	28.46	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
2042.667	47.35	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5686.160	46.85	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
7956.120	46.32	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
11162.400	46.72	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 18GHz)





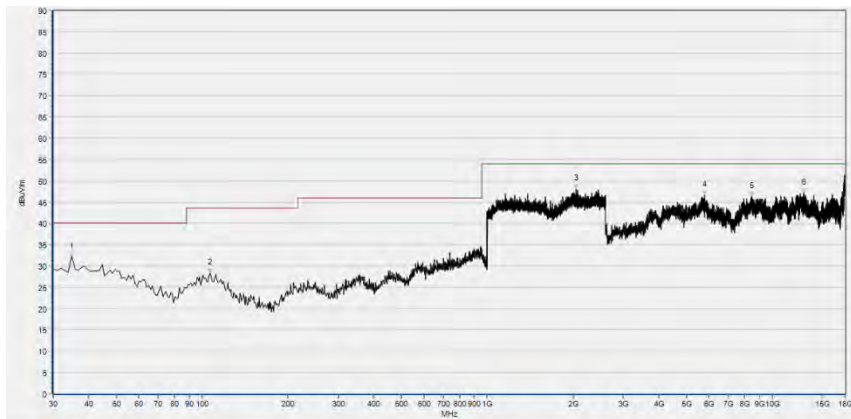
**8-DPSK Mode**

**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
36.790	30.10	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
99.840	28.57	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
2242.133	47.79	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5630.720	47.36	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8408.880	47.88	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12865.640	48.29	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

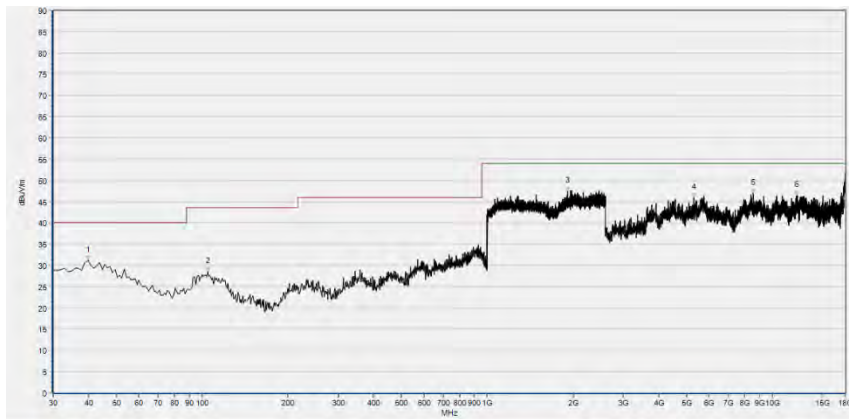
(Antenna Horizontal, 30MHz to 18GHz)



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
34.850	32.16	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
106.630	28.29	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
2045.333	48.04	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5772.400	46.51	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8436.600	46.19	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12881.040	47.07	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

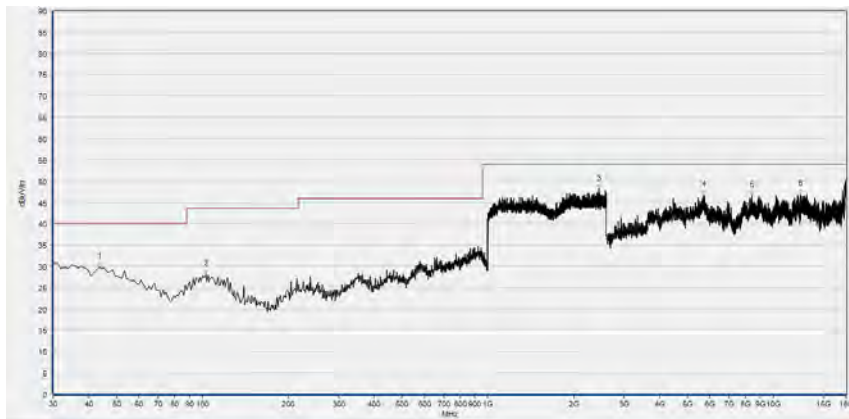
(Antenna Vertical, 30MHz to 18GHz)

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
39.700	31.10	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
104.690	28.51	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
1910.400	47.38	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5295.000	45.84	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8581.360	46.84	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12144.920	46.51	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

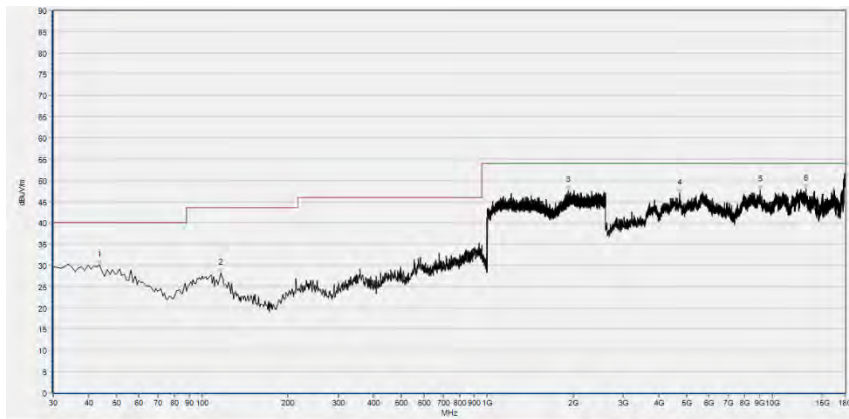
(Antenna Horizontal, 30MHz to 18GHz)



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
43.580	29.81	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
102.750	28.21	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
2445.333	48.06	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5729.280	46.68	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8411.960	46.56	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12468.320	46.97	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

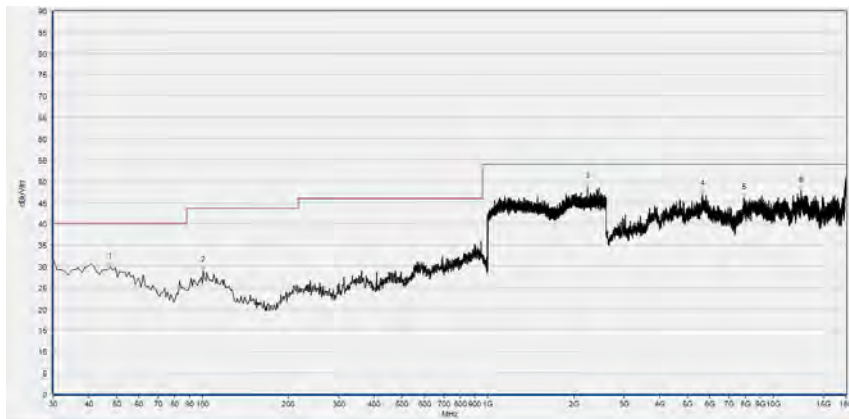
(Antenna Vertical, 30MHz to 18GHz)

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
43.580	30.04	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
116.330	28.19	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
1927.467	47.54	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4725.200	46.89	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
9068.000	47.74	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
13087.400	47.89	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
47.460	29.78	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
100.810	29.04	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
2230.933	48.52	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5652.280	46.90	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
7897.600	46.02	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12526.840	47.79	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(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

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

### 2. Identification of the Responsible Testing Location

<b>Name:</b>	Shenzhen Morlab Communications Technology Co., Ltd.
<b>Address:</b>	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 —————