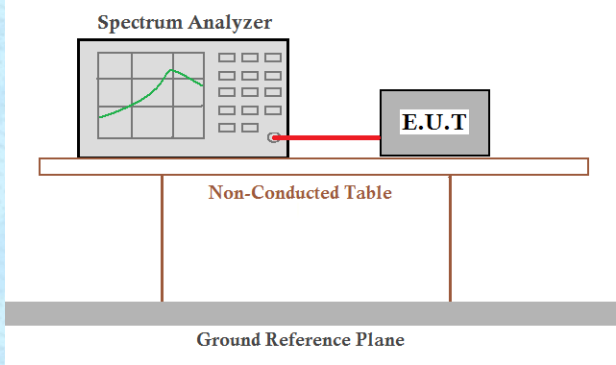


7.8 Band Edge & Spurious Emission

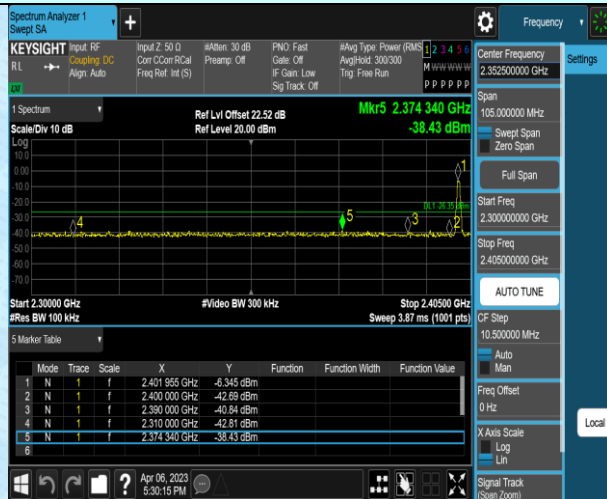
7.8.1 Conducted Method

Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	ANSI C63.10:2013
Receiver setup:	RBW=100kHz, VBW=300kHz, Detector=Peak
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Test setup:	 The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both the Spectrum Analyzer and the E.U.T. are placed on a Non-Conducted Table. The table is supported by a Ground Reference Plane.
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

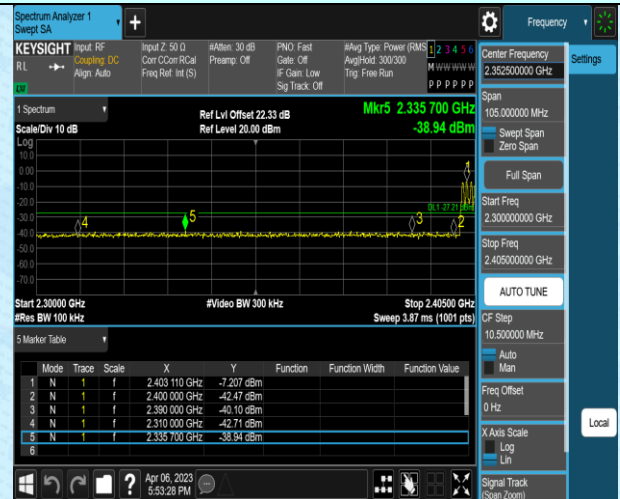
Test plot as follows:

GFSK Mode:

Test channel:	Lowest channel
---------------	----------------

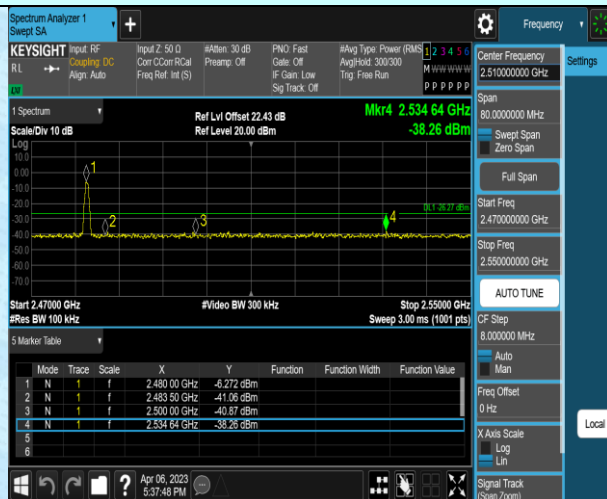


No-hopping mode

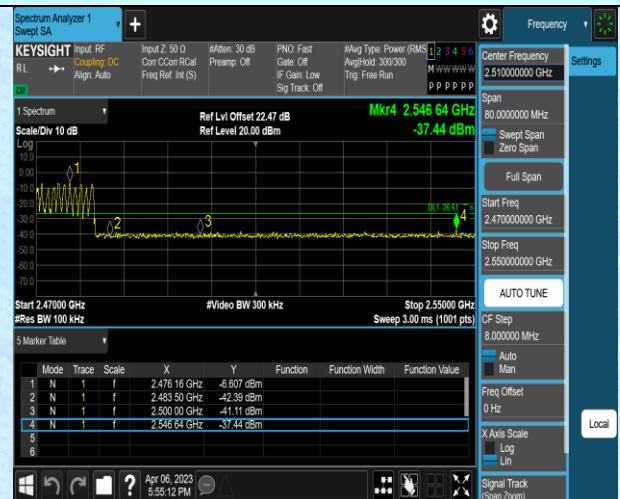


Hopping mode

Test channel:	Highest channel
---------------	-----------------



No-hopping mode



Hopping mode

Test channel:

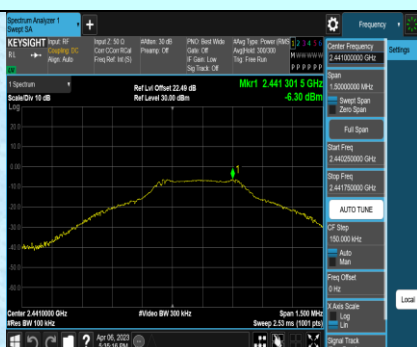
Lowest channel



30MHz~26.5GHz

Test channel:

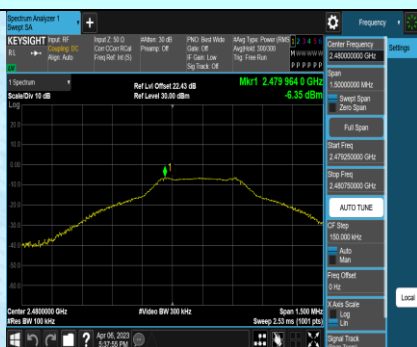
Middle channel



30MHz~26.5GHz

Test channel:

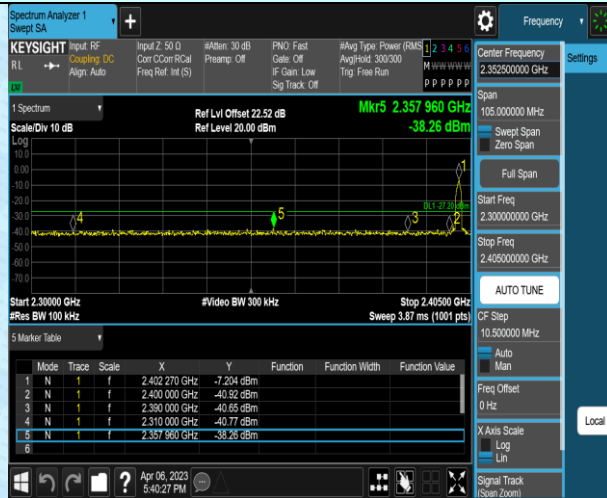
Highest channel



30MHz~26.5GHz

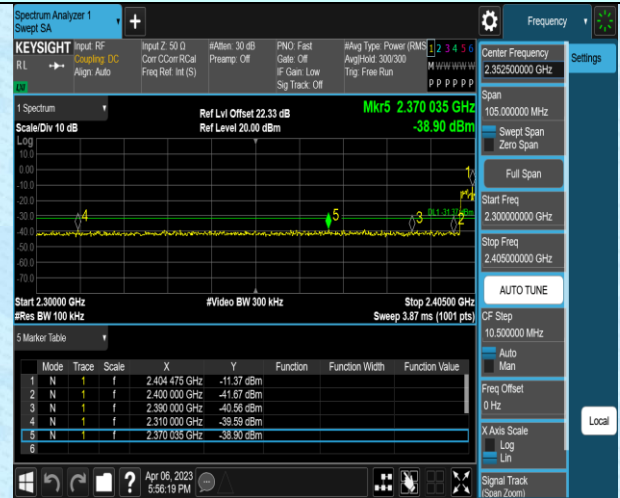
$\pi/4$ -DQPSK Mode:

Test channel:



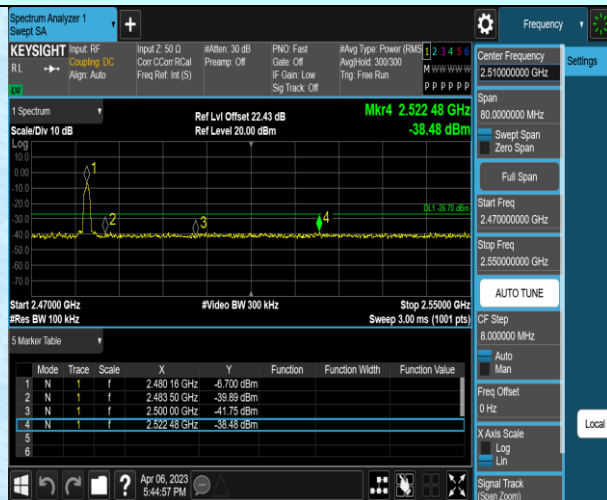
No-hopping mode

Lowest channel



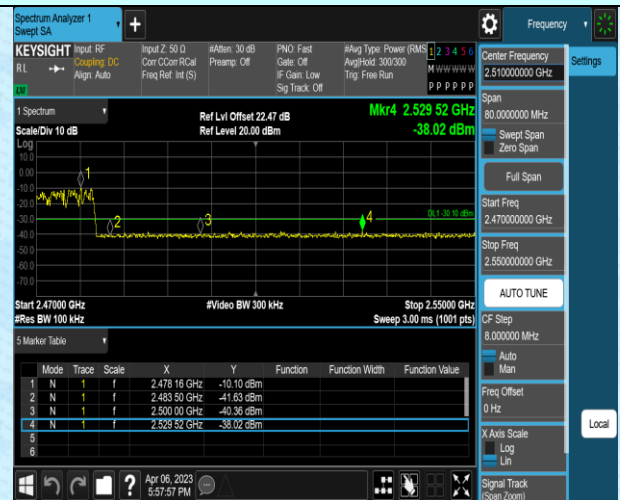
Hopping mode

Test channel:



No-hopping mode

Highest channel



Hopping mode

Test channel:



Lowest channel



30MHz-26.5GHz

Test channel:



Middle channel



30MHz-26.5GHz

Test channel:



Highest channel



30MHz-26.5GHz

8-DPSK Mode:



Lowest channel



30MHz~26.5GHz

Middle channel



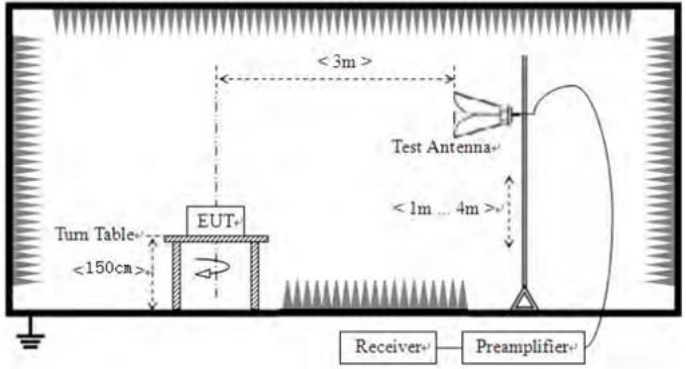
30MHz~26.5GHz

Highest channel



30MHz~26.5GHz

7.8.2 Radiated Method

Test Requirement:	FCC Part15 C Section 15.209 and 15.205				
Test Method:	ANSI C63.10:2013				
Test Frequency Range:	All of the restrict bands were tested, only the worst band's (2310MHz to 2500MHz) data was showed.				
Test site:	Measurement Distance: 3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Remark
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
		Peak	1MHz	10Hz	Average Value
Limit:	Frequency		Limit (dBuV/m @3m)		Remark
	Above 1GHz		54.00		Average Value
			74.00		Peak Value
Test setup:					
Test Procedure:	1. The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. 4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.				
Test Instruments:	Refer to section 6.0 for details				
Test mode:	Refer to section 5.2 for details				
Test results:	Pass				

Measurement data:

Remarks:

1. *During the test, pre-scan the GFSK, $\pi/4$ -DQPSK, 8-DPSK modulation, and found the GFSK modulation which it is worse case.*
2. *Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis which it is worse case.*

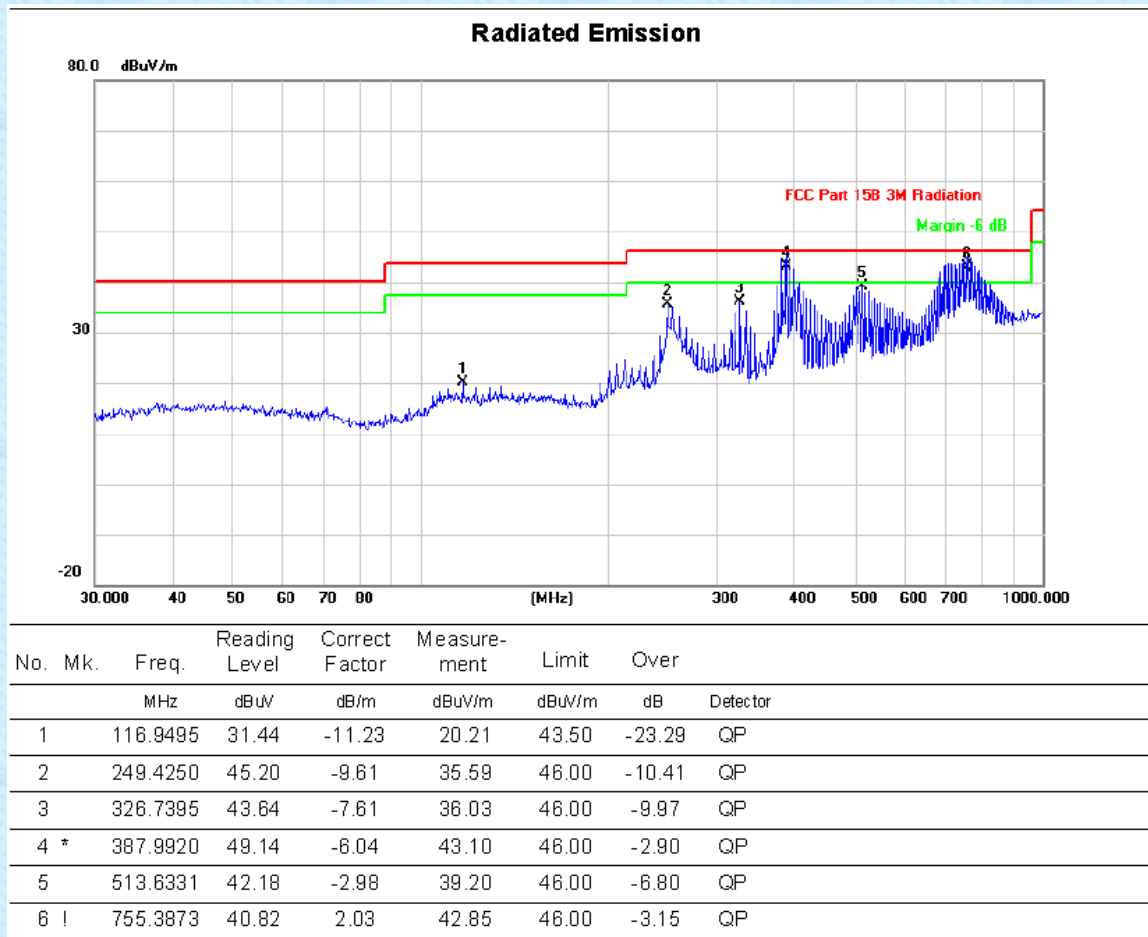
■ **9kHz~30MHz**

The low frequency, which started from 9 kHz to 30 MHz, was pre-scanned and the result which was 20 dB lower than the limit line per 15.31(o) was not reported.

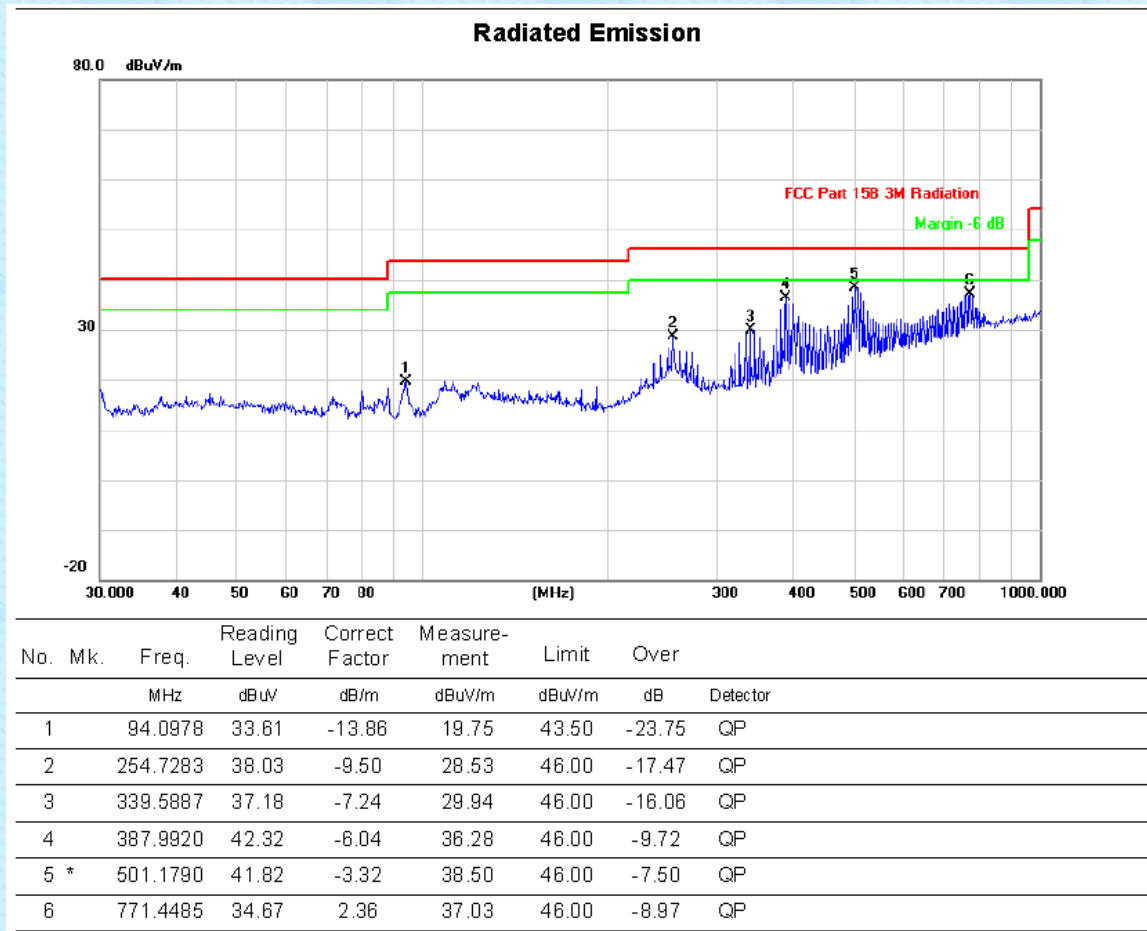
■ Below 1GHz

Pre-scan all test modes, found worst case at GFSK 2402MHz, and so only show the test result of GFSK 2402MHz

Horizontal



Vertical



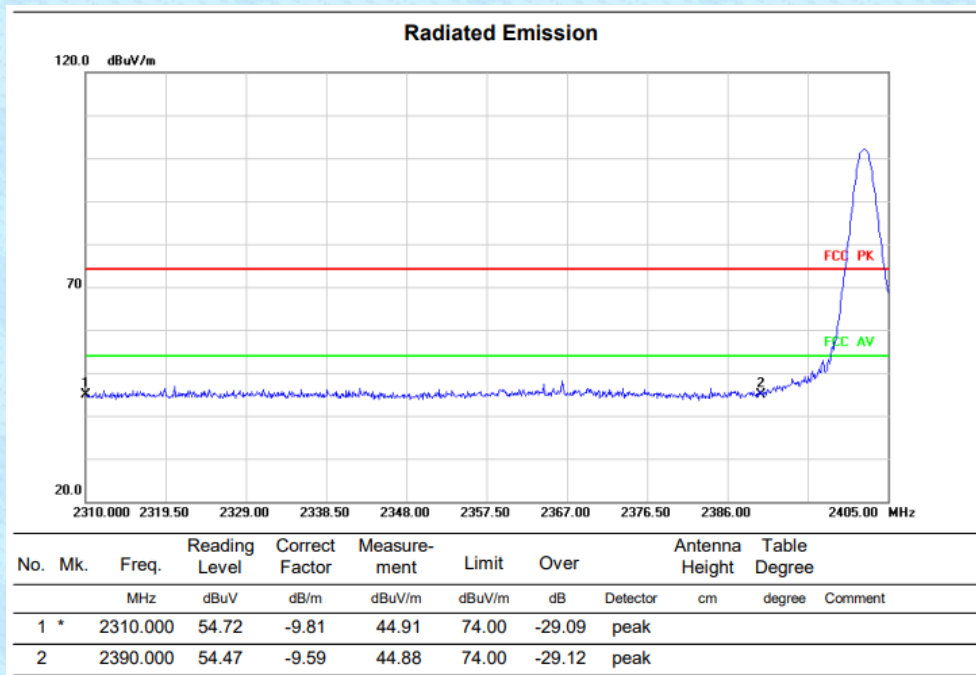
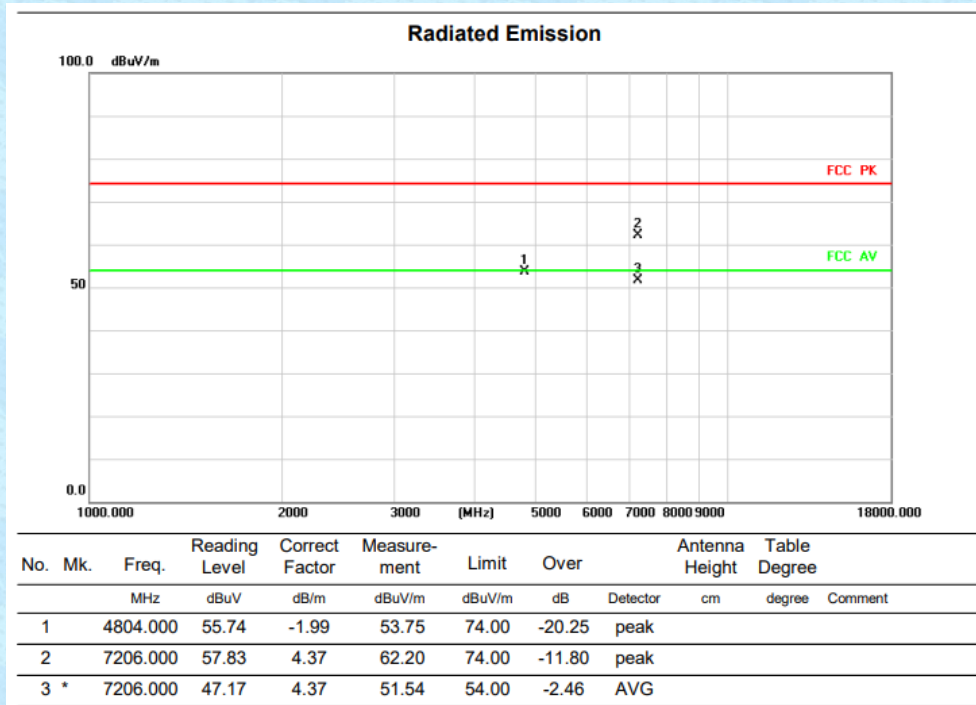
Remarks:

1. Measurement Value = Reading Level + Correct Factor.
2. Margin Level = Measurement Value - Limit Value.
3. The pre-test were performed on lowest, middle and highest frequencies, only the worst case's (lowest and highest frequencies) data was showed.
4. During the test, pre-scan the GFSK, $\pi/4$ -DQPSK, 8-DPSK modulation, and found the GFSK modulation which it is worse case.

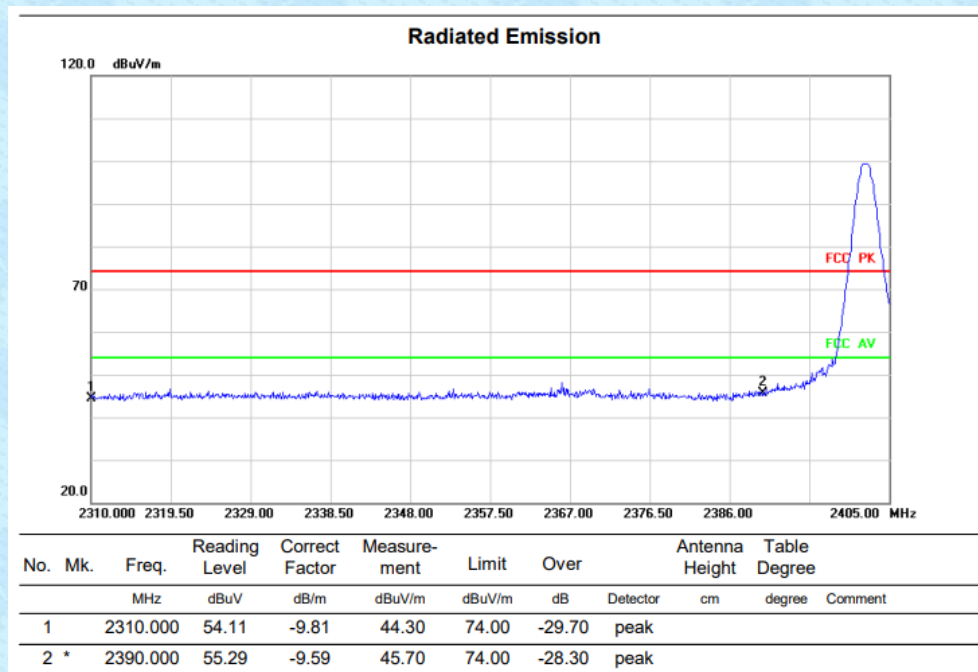
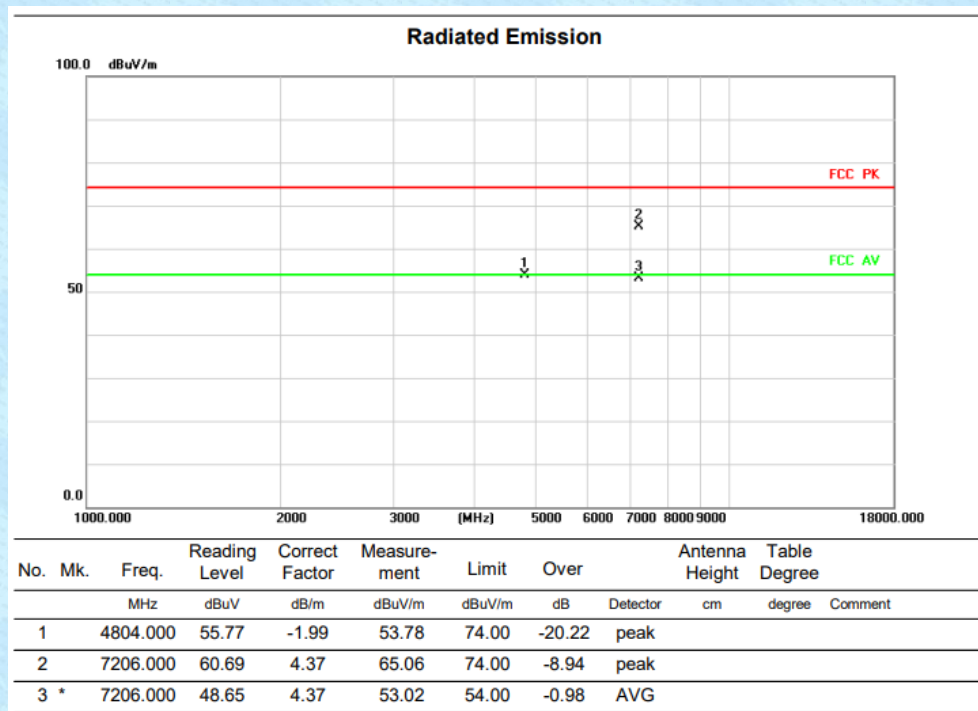
■ Above 1GHz

GFSK: 2402MHz

Horizontal

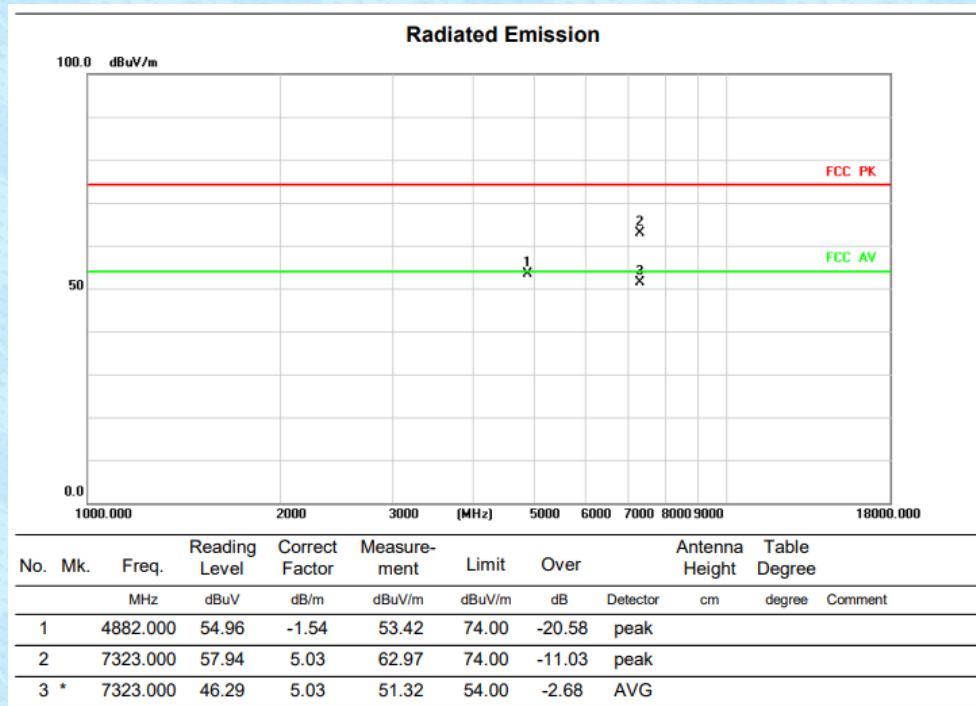


Vertical

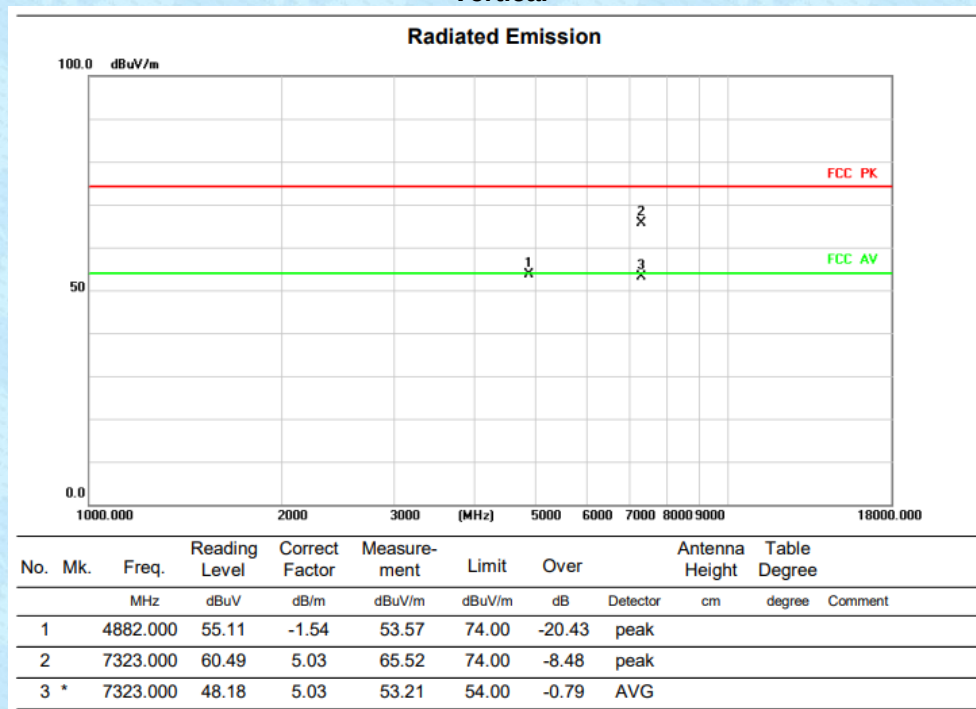


2441MHz

Horizontal

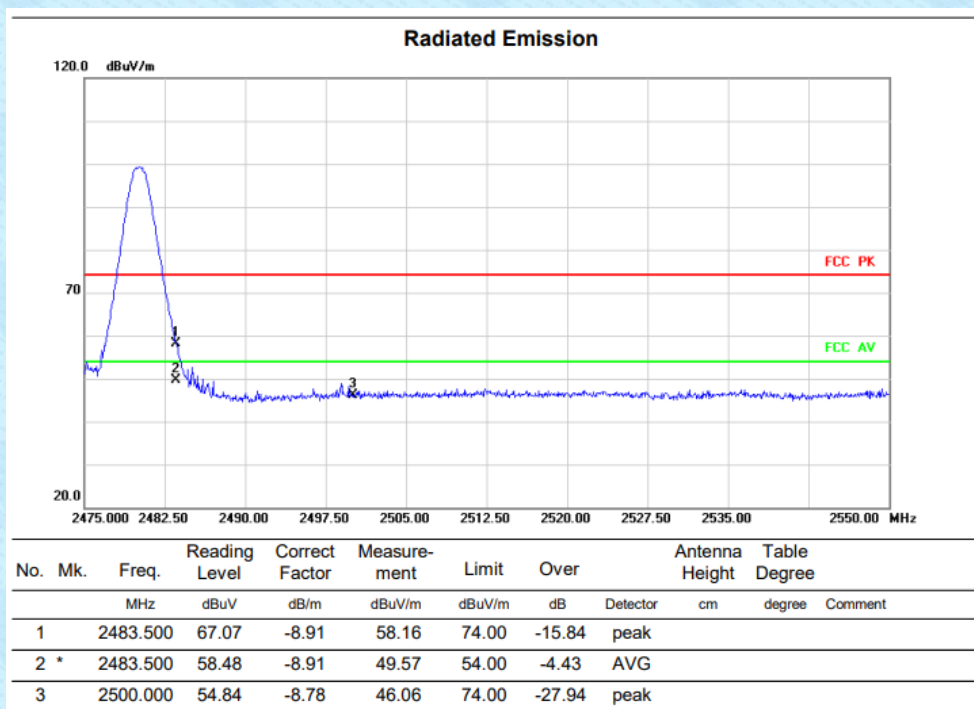
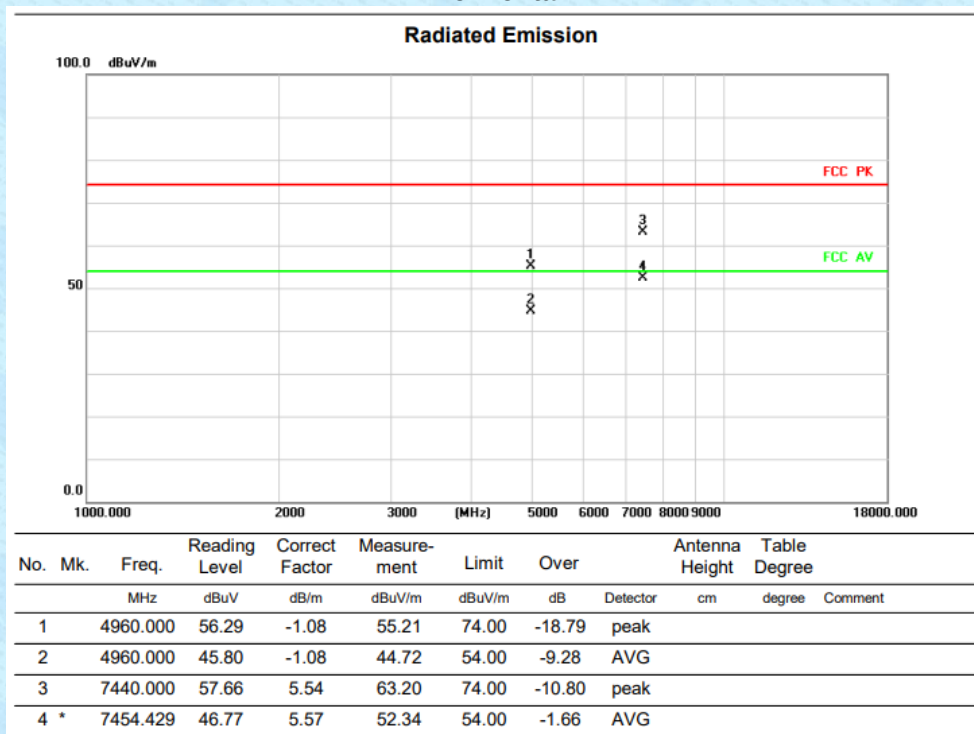


Vertical

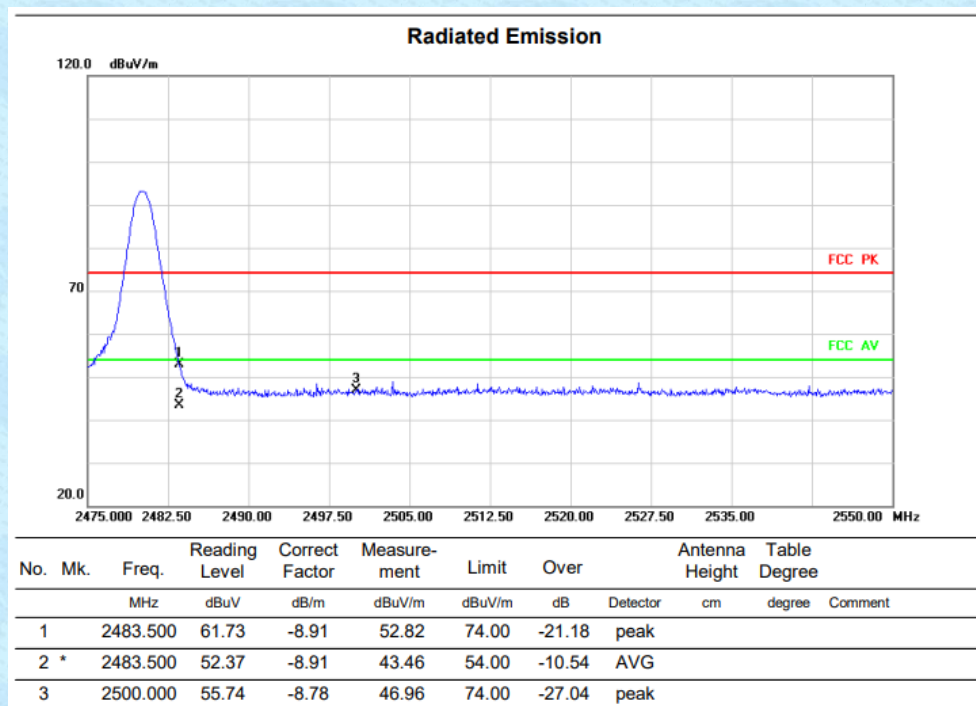
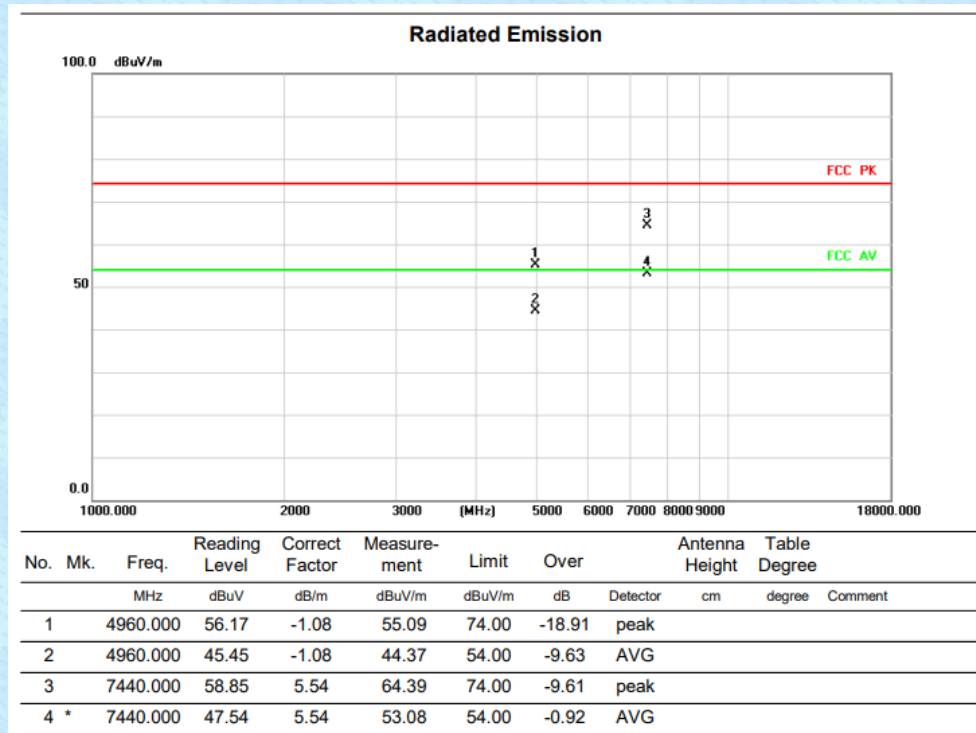


2480MHz

Horizontal

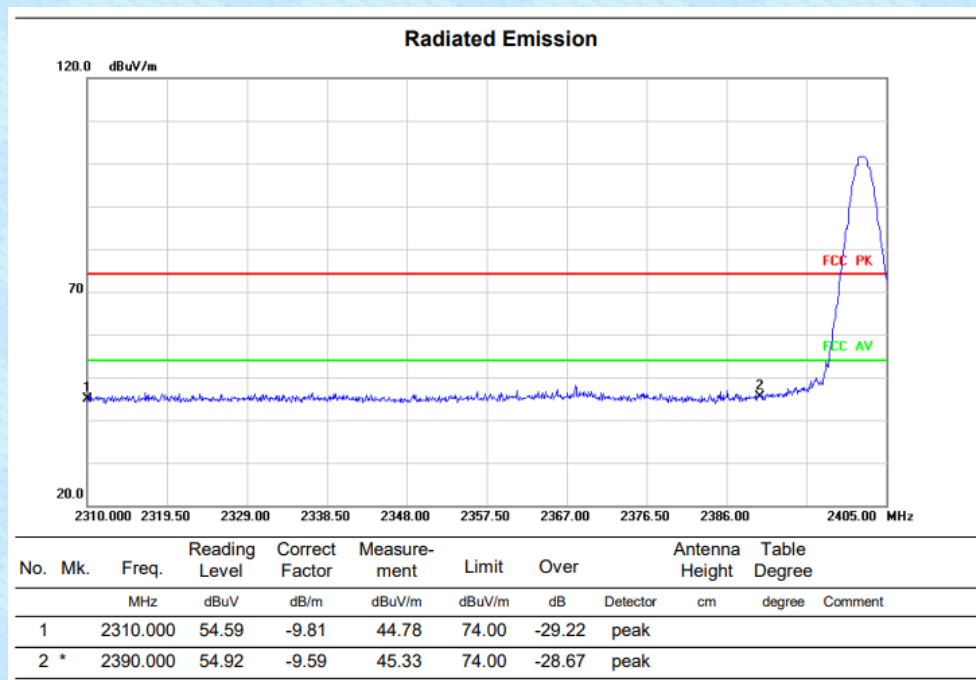
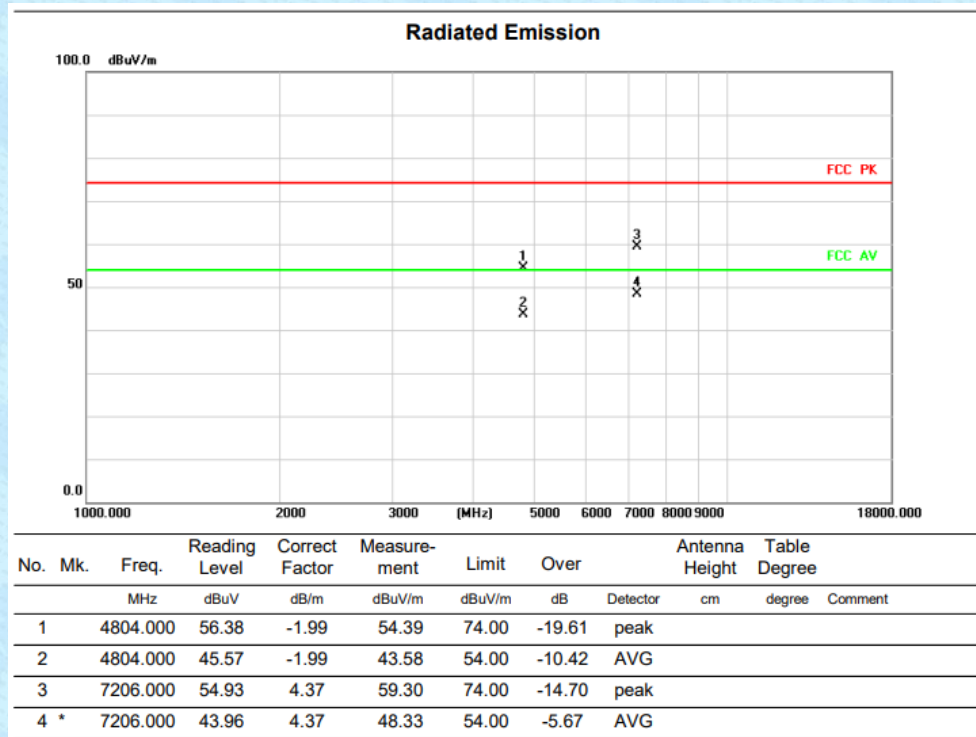


Vertical

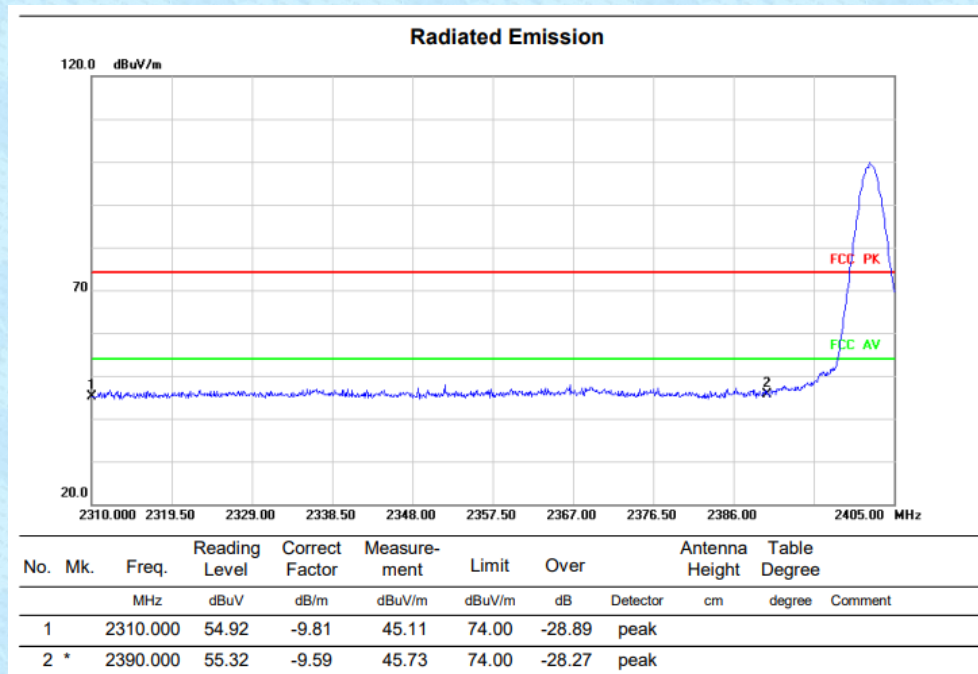
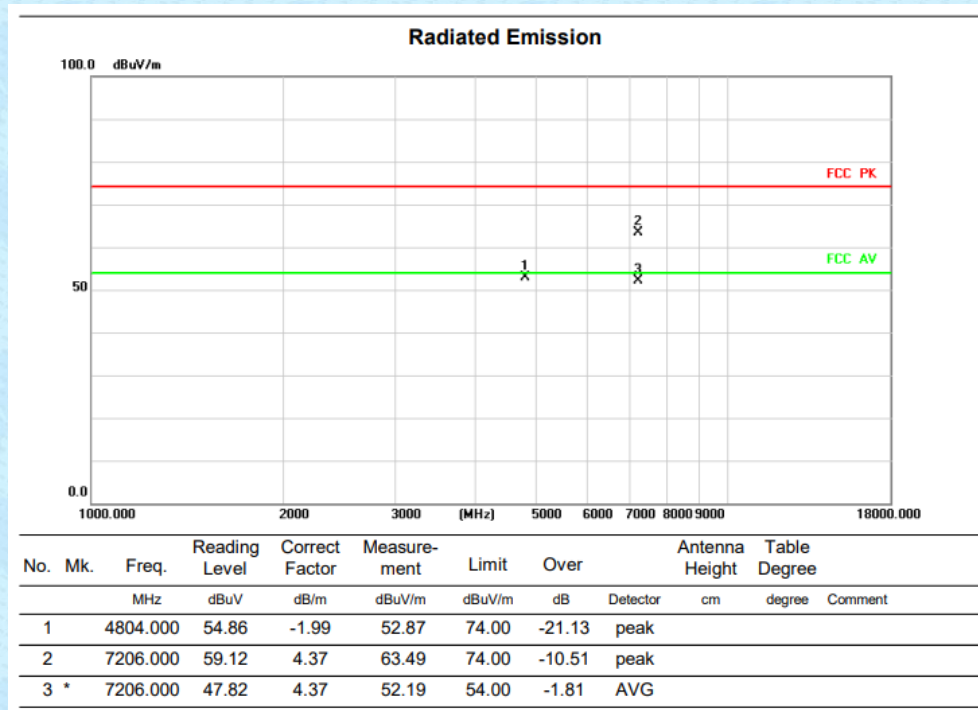


$\pi/4$ -DQPSK: 2402 MHz

Horizontal

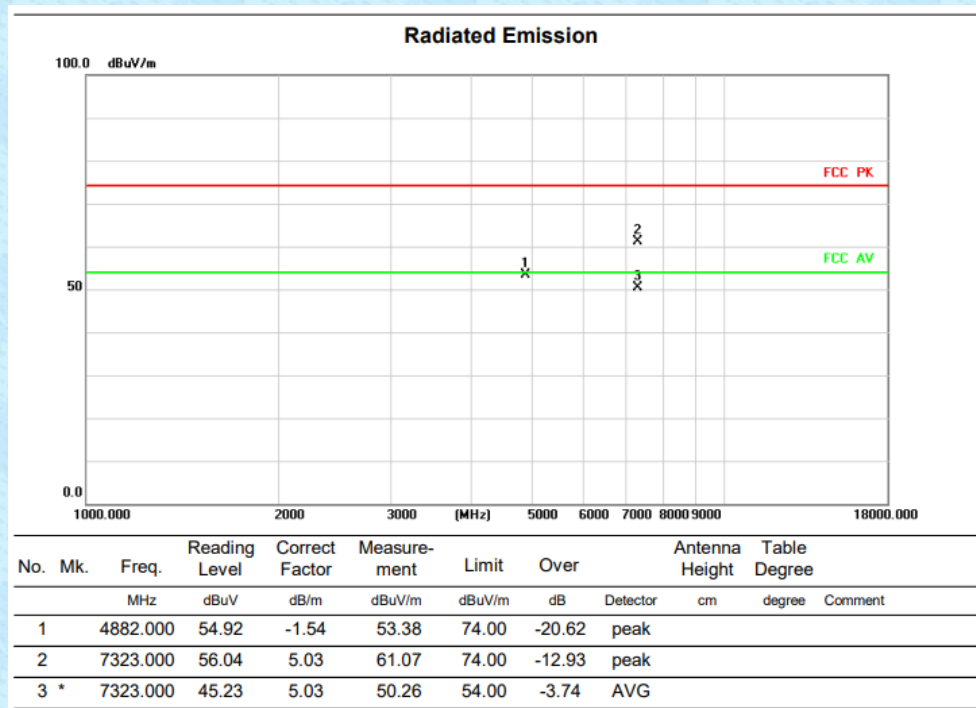


Vertical

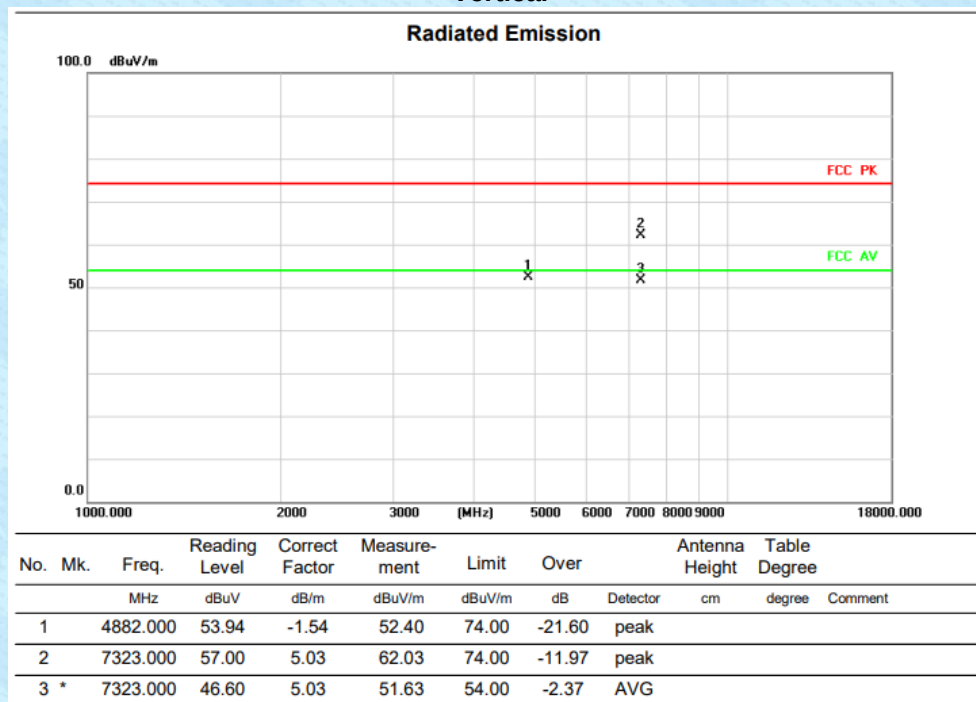


2441MHz

Horizontal

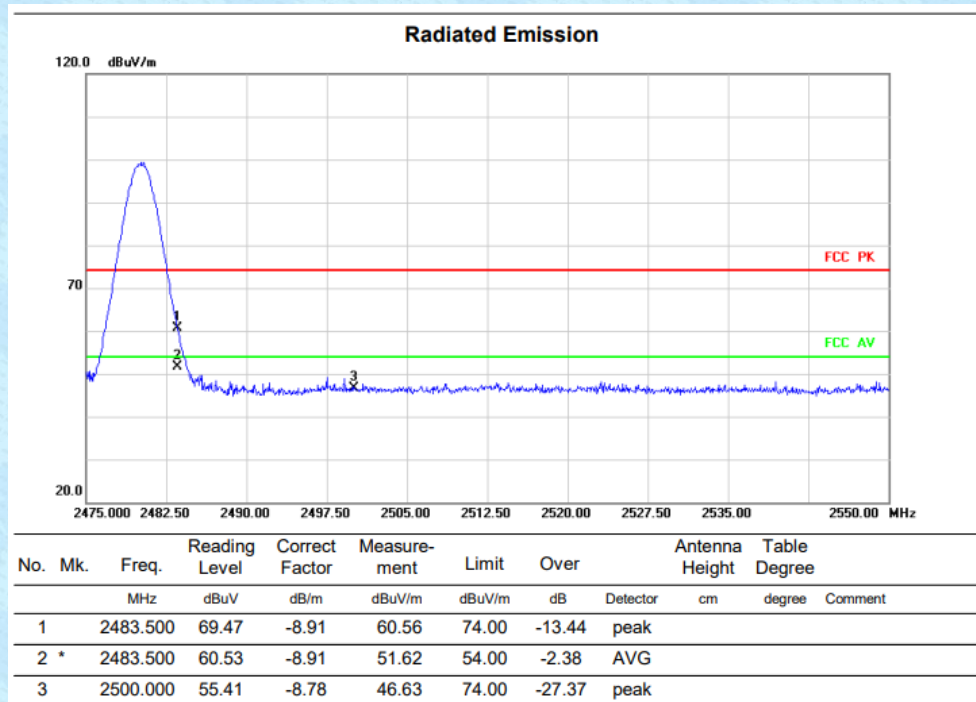
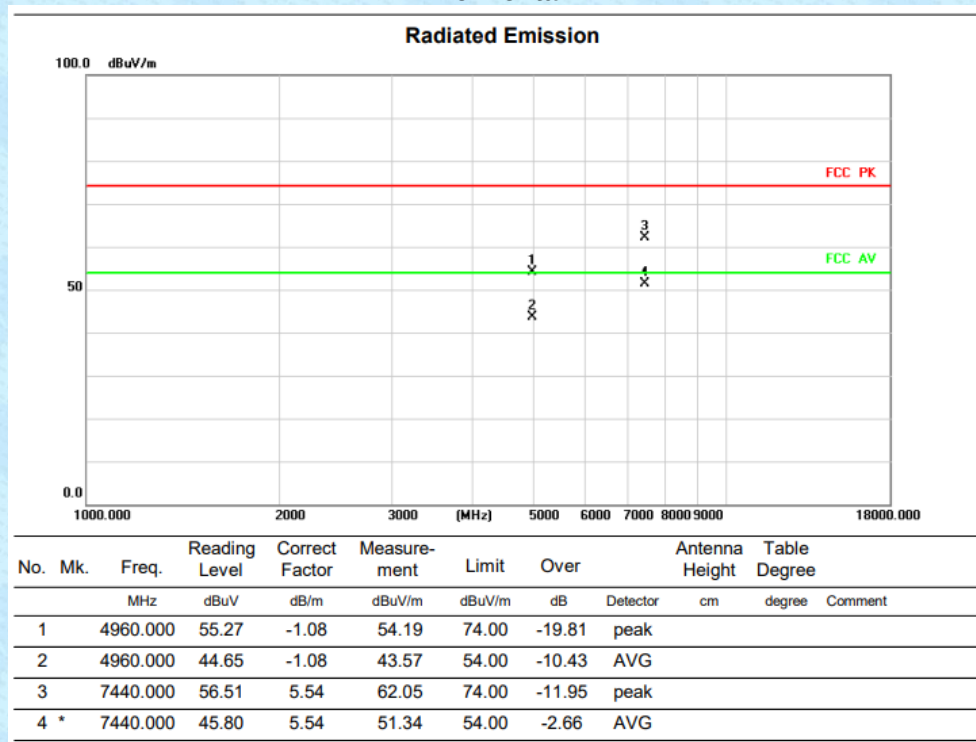


Vertical

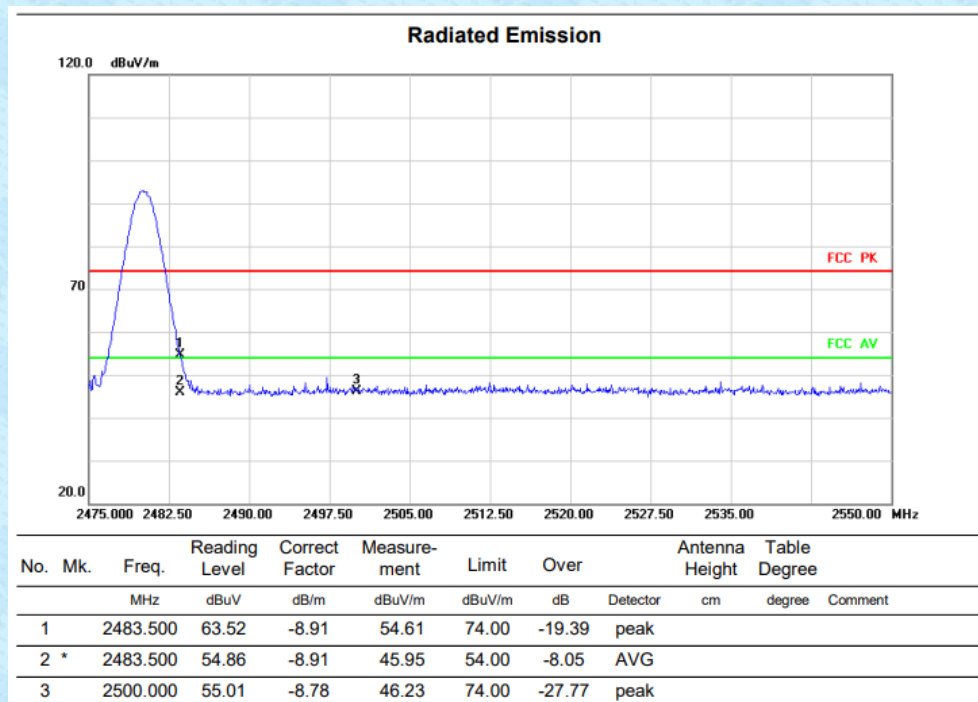
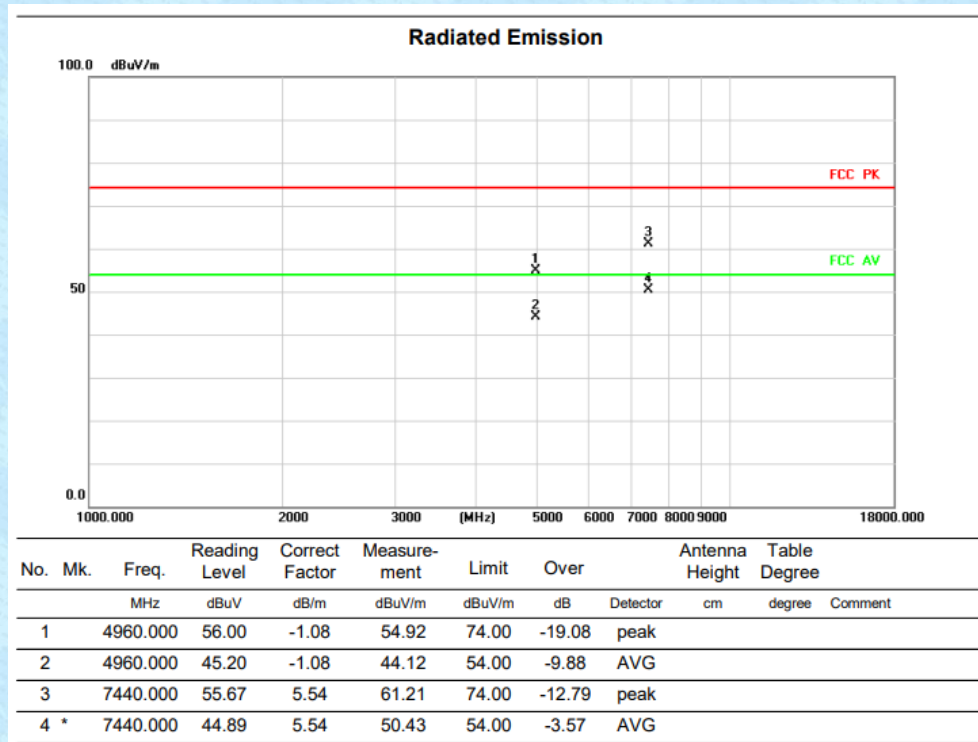


2480MHz

Horizontal

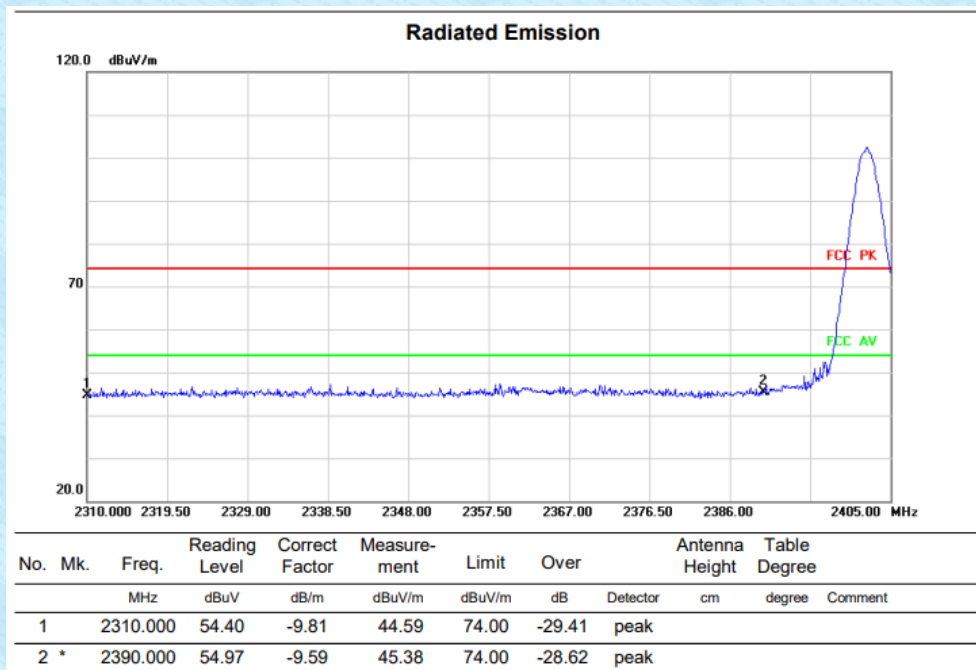
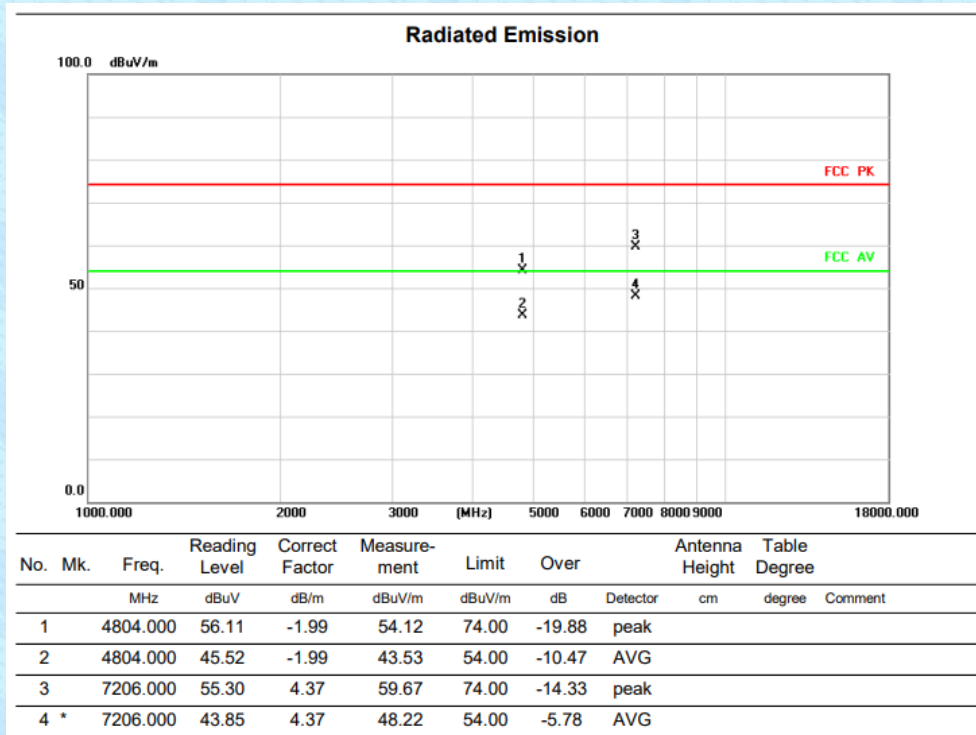


Vertical

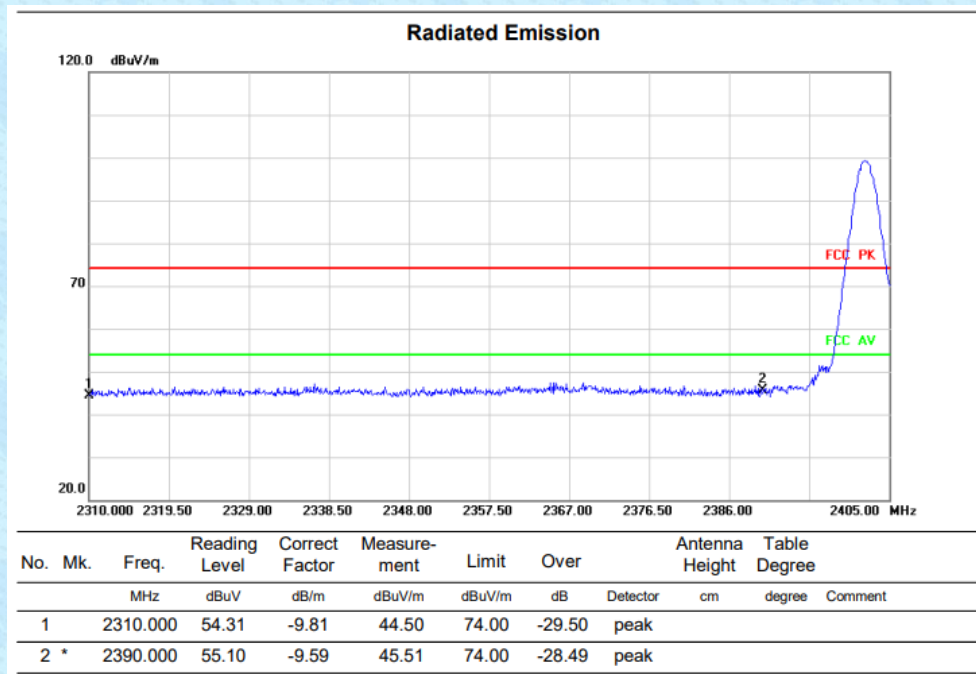
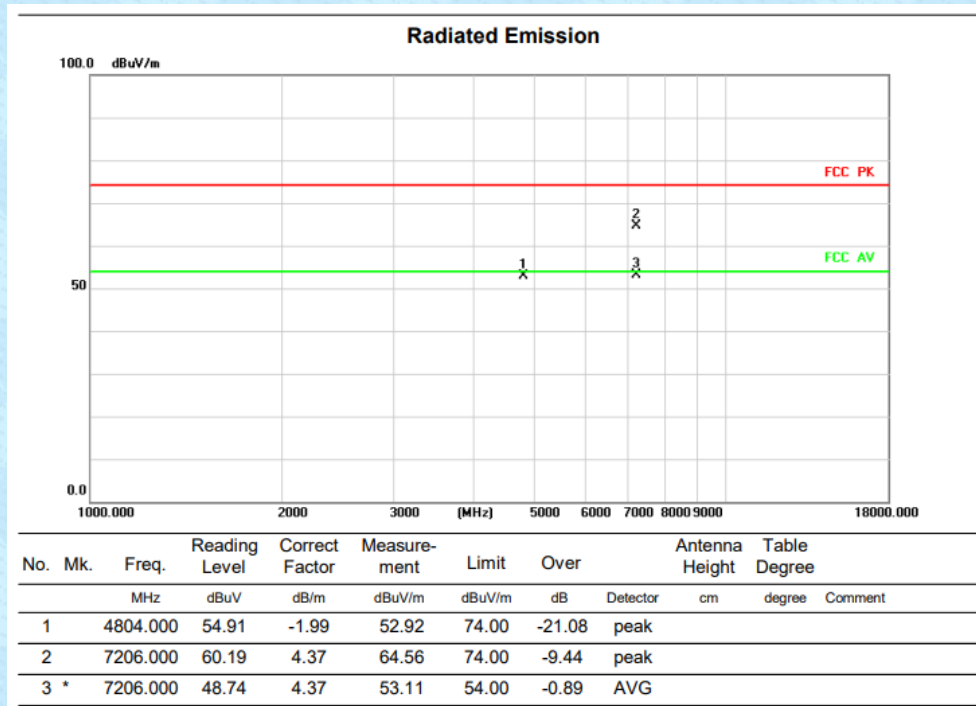


8-DPSK: 2402 MHz

Horizontal

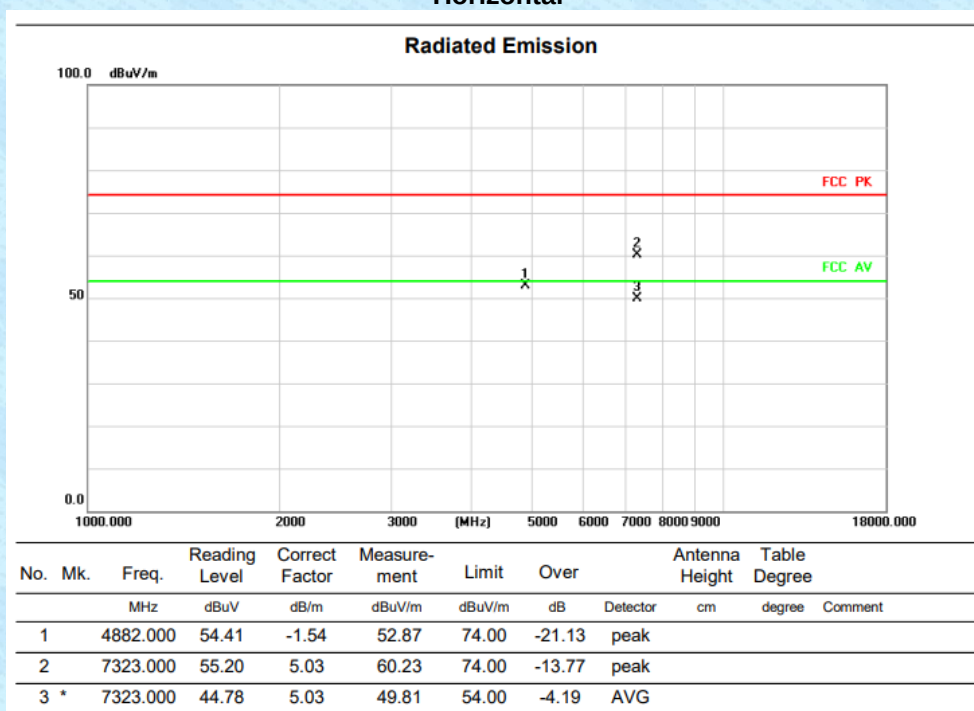


Vertical

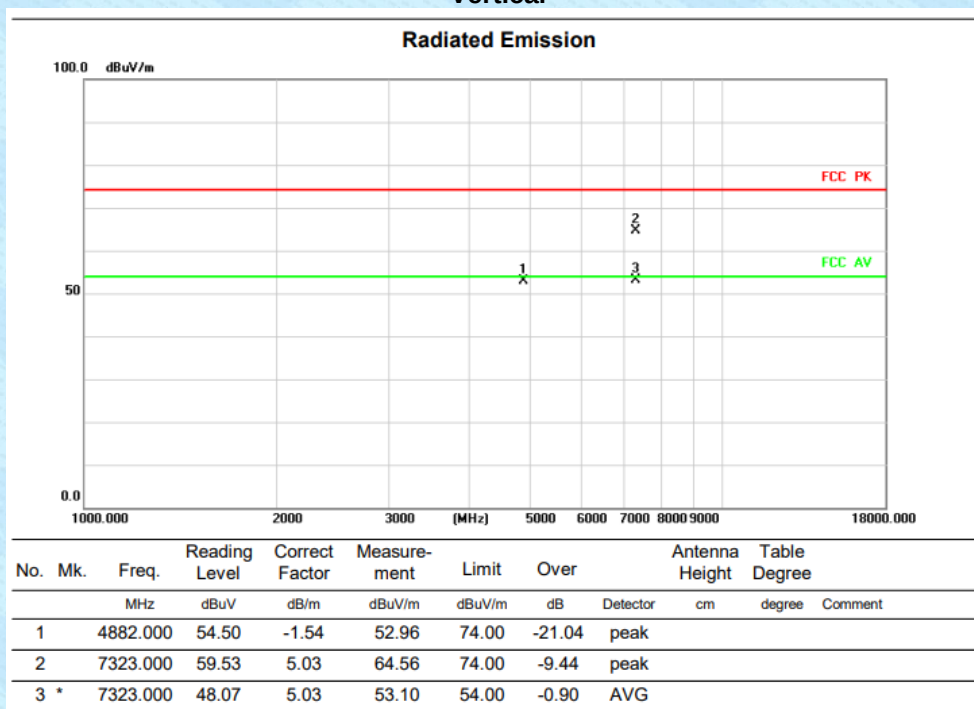


2441MHz

Horizontal

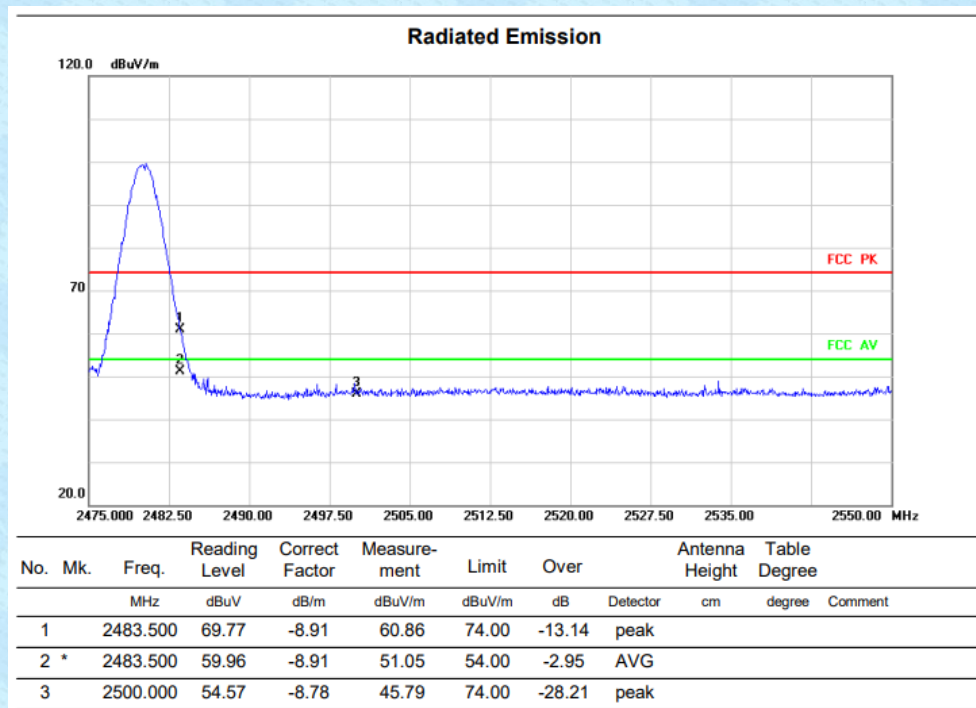
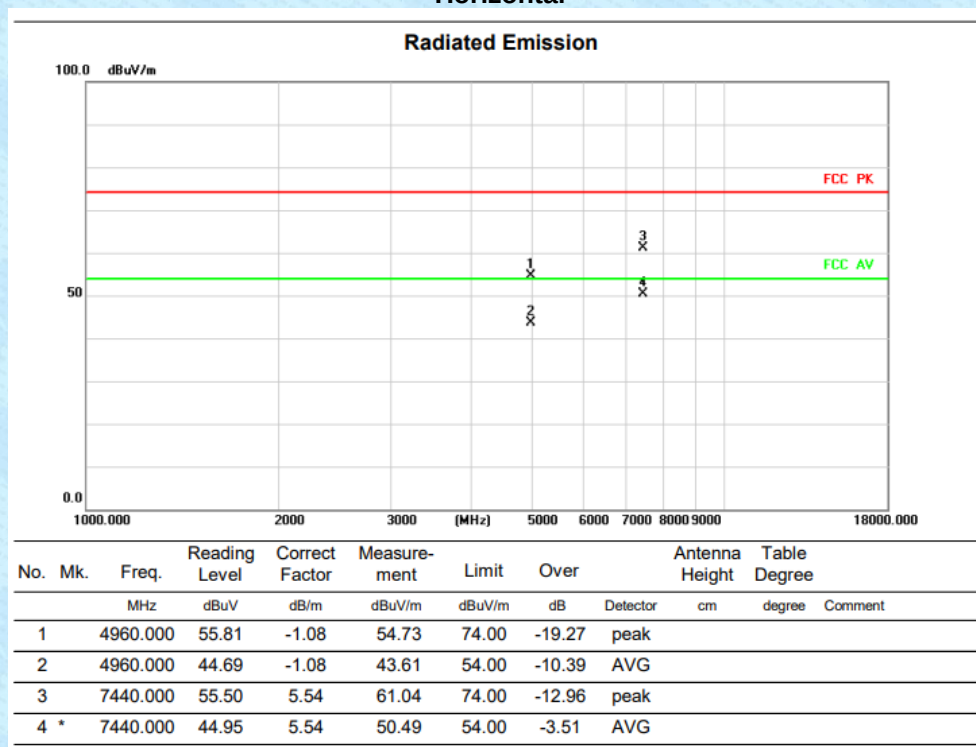


Vertical

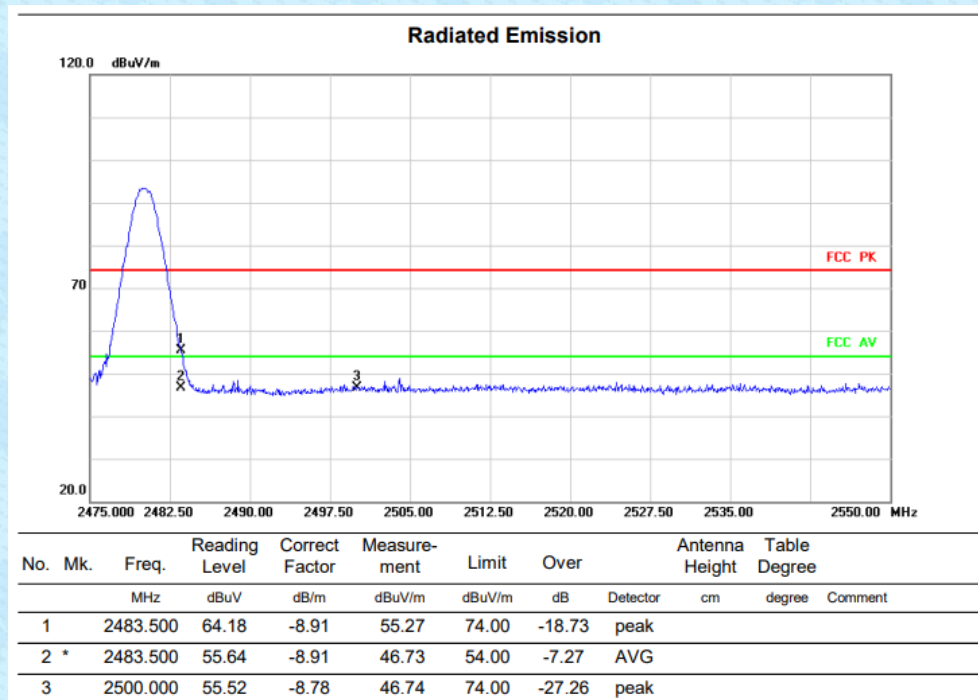
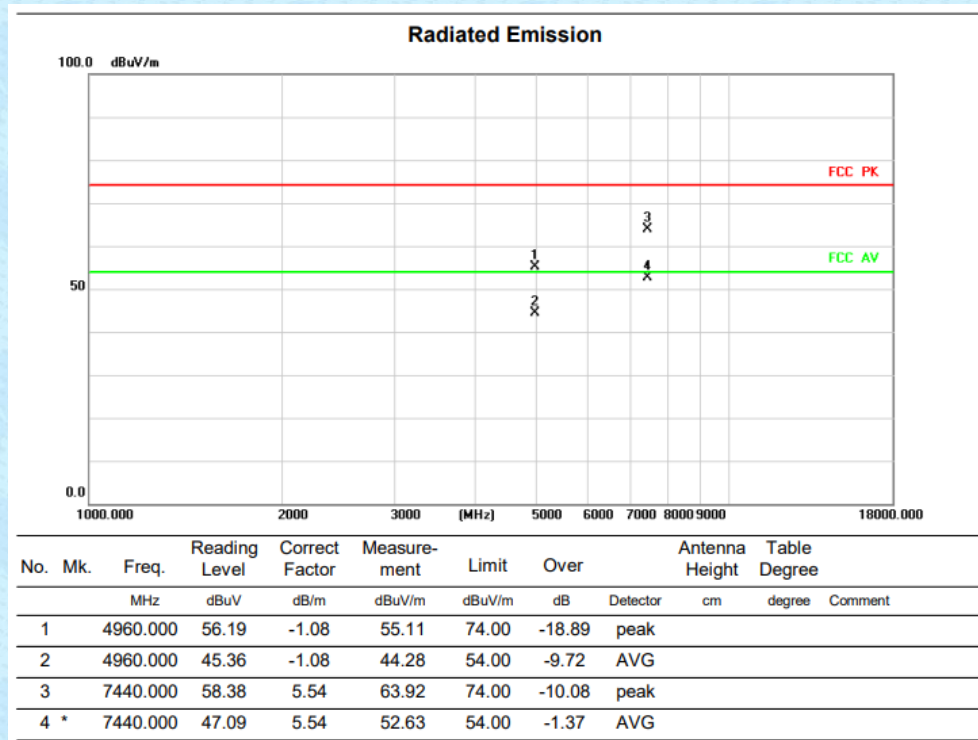


2480MHz

Horizontal



Vertical



Remarks:

1. Measurement Value = Reading Level + Correct Factor.
2. Margin Level = Measurement Value - Limit Value.
3. The pre-test were performed on lowest, middle and highest frequencies, all datas was showed.

8 Test Setup Photo

Reference to the **appendix I** for details.

9 EUT Constructional Details

Reference to the **appendix II** for details.

-----End-----