

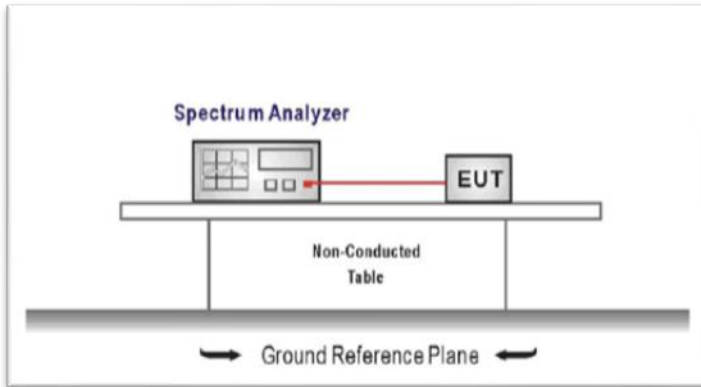
### 3.9. Band Edge and Spurious Emission (Conducted)

#### LIMIT

#### **FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d):**

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 CONFIGURATION



#### TEST PROCEDURE

1. The transmitter output was connected to the spectrum analyzer through an attenuator, the path loss was compensated to the results for each measurement.
2. Set to the maximum power setting and enable the EUT to transmit continuously.
3. Use the following spectrum analyzer settings:  
RBW = 100 KHz, VBW ≥ RBW  
Sweep = auto, Detector function = peak, Trace = max hold
4. Measure and record the results in the test report.

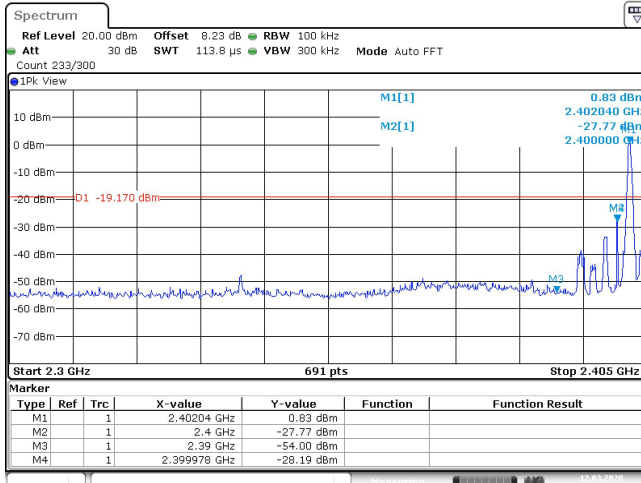
#### TEST MODE:

Please refer to clause 2.3.

#### TEST RESULTS

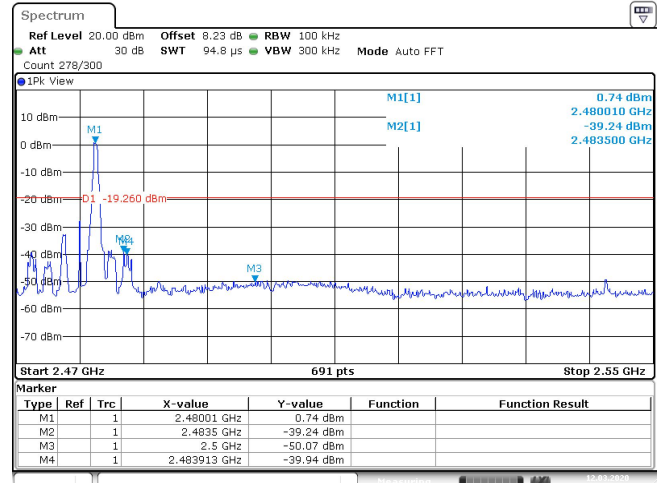
DH5

CH00-Bandedge



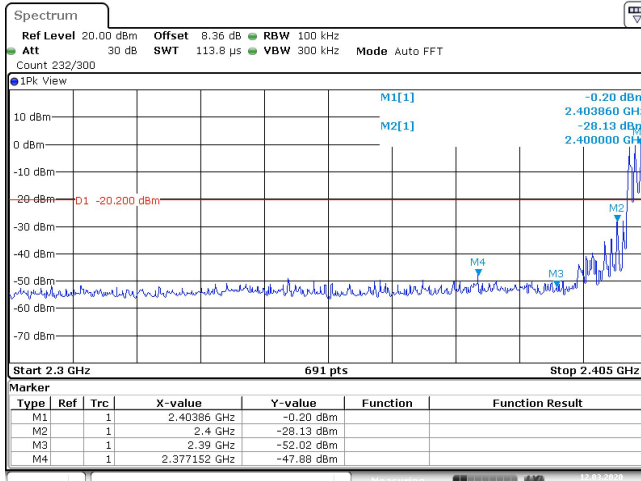
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CH78-Bandedge



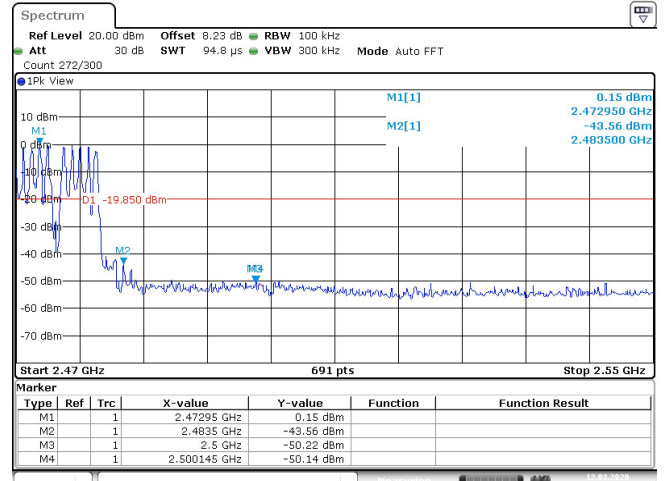
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Non-Hopping



Date: 12.MAR.2020 17:49:05

Non-Hopping



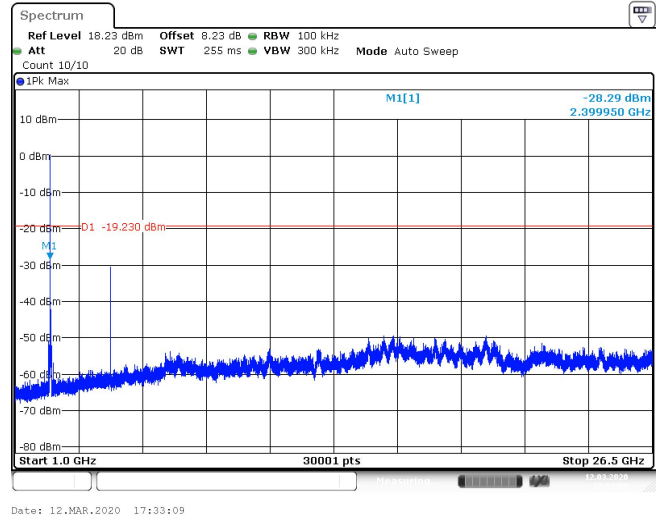
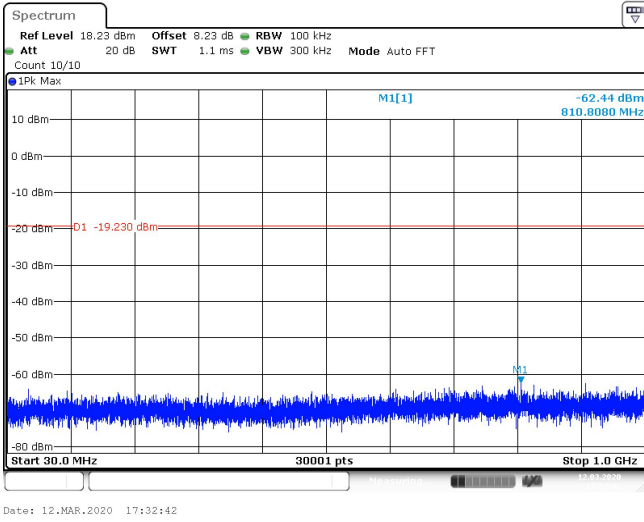
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Hopping

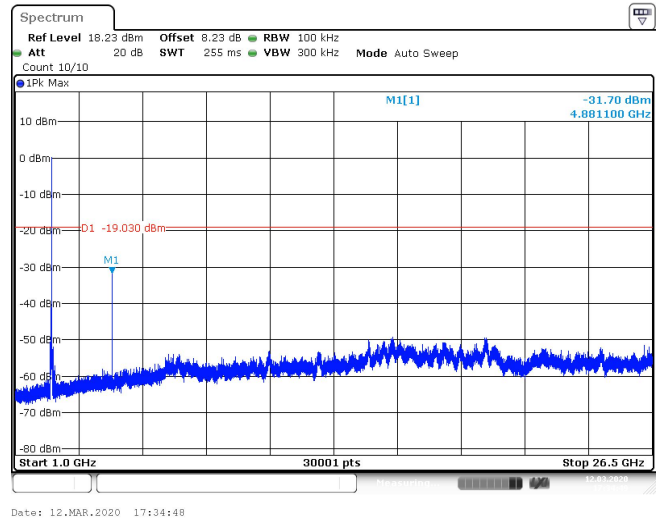
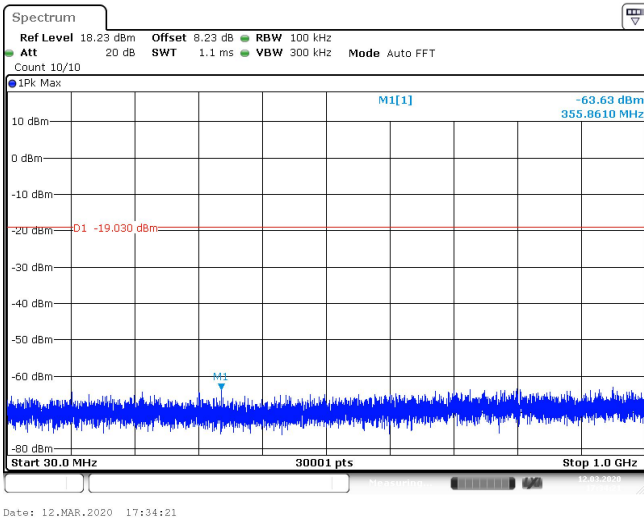
Hopping

DH5

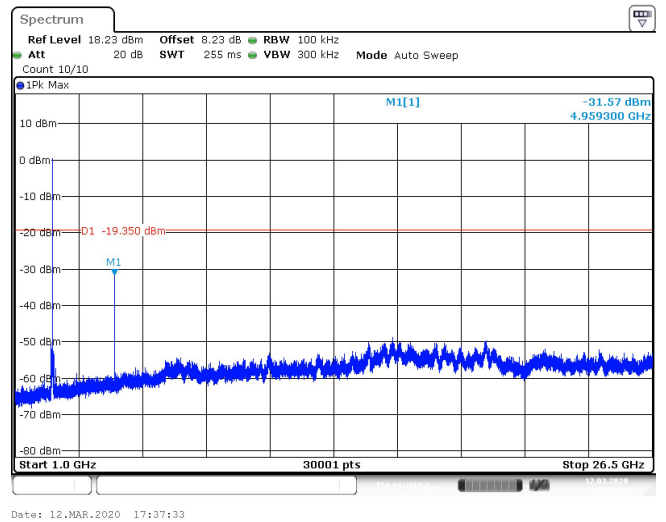
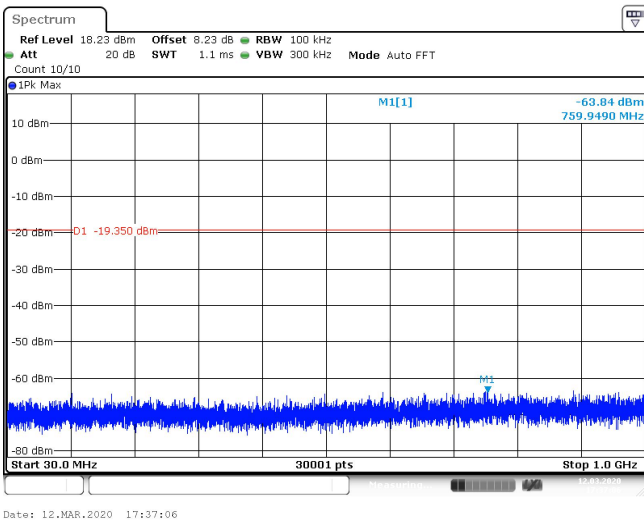
CH00-SE



CH39-SE

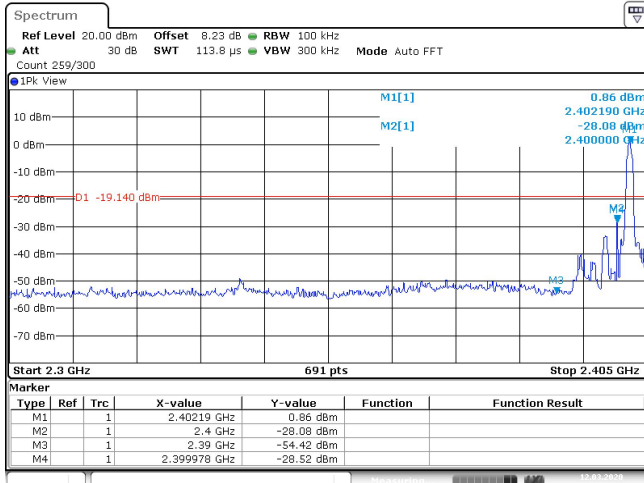


CH78-SE



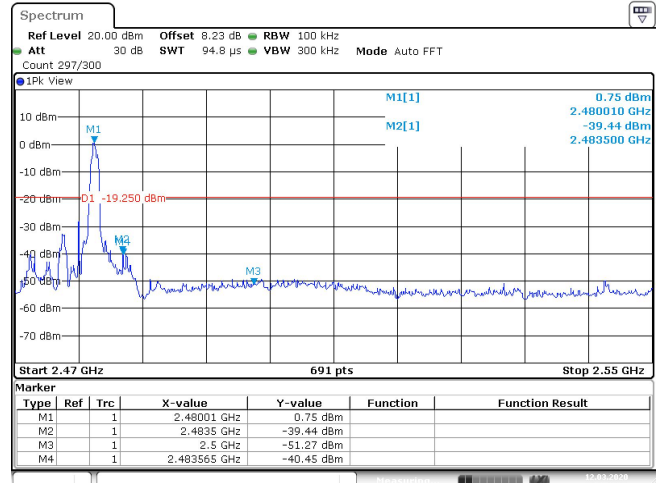
2DH5

CH00-Bandedge



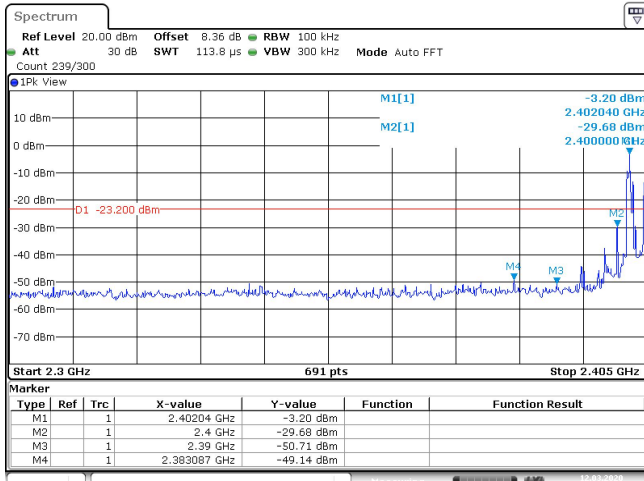
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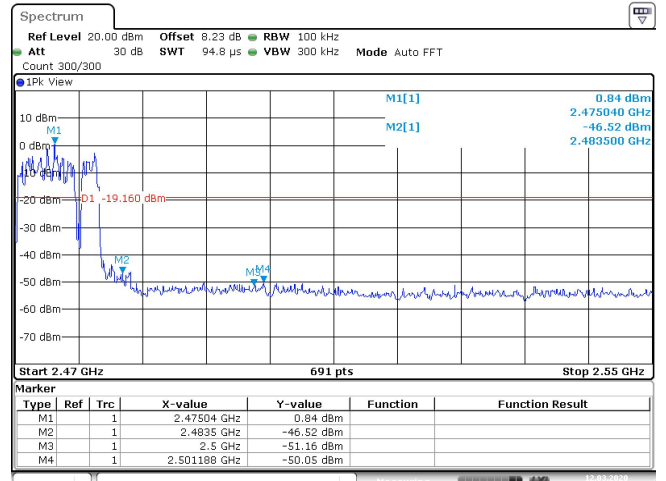
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Non-Hopping



Date: 12.MAR.2020 18:03:44

Non-Hopping



Date: 12.MAR.2020 18:12:26

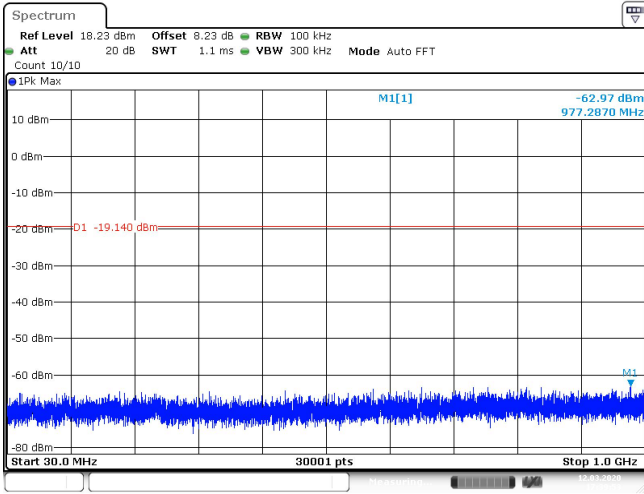
Hopping

Hopping

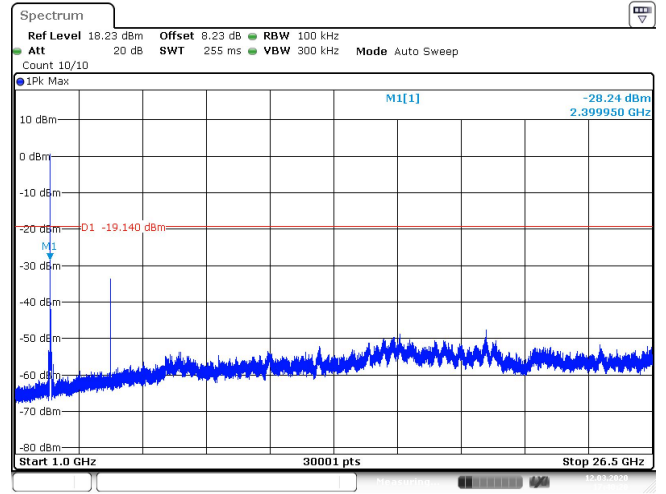


2DH5

CH00-SE

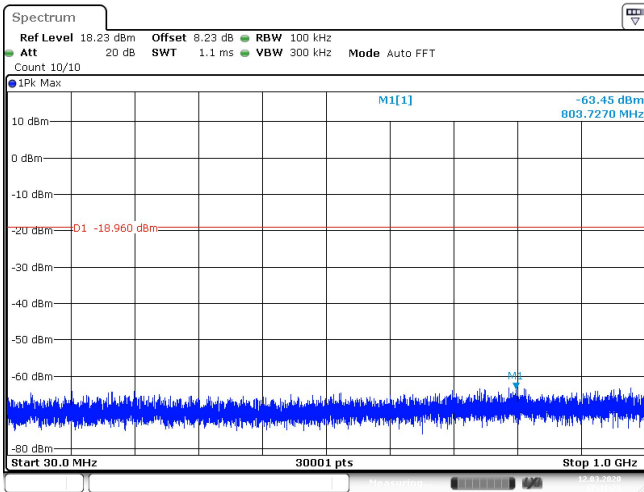


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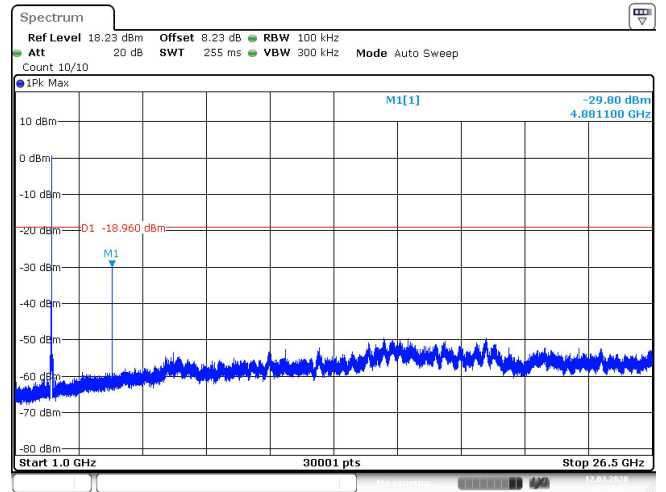


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CH39-SE

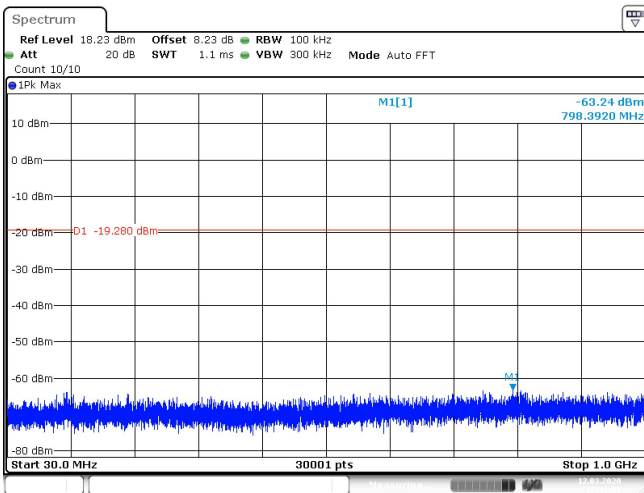


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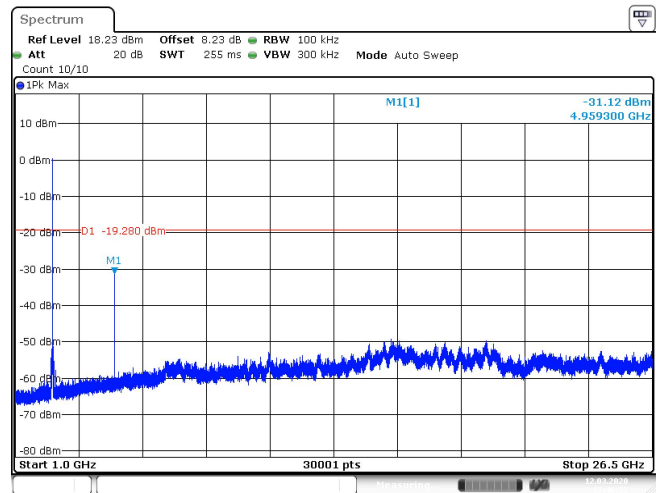


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CH78-SE



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### 3.10. Radiated Spurious Emissions

Limit

**Radiated Emission Limits (9 kHz~1000 MHz)**

Frequency (MHz)	Field Strength (microvolt/meter)	Measurement Distance (meters)
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

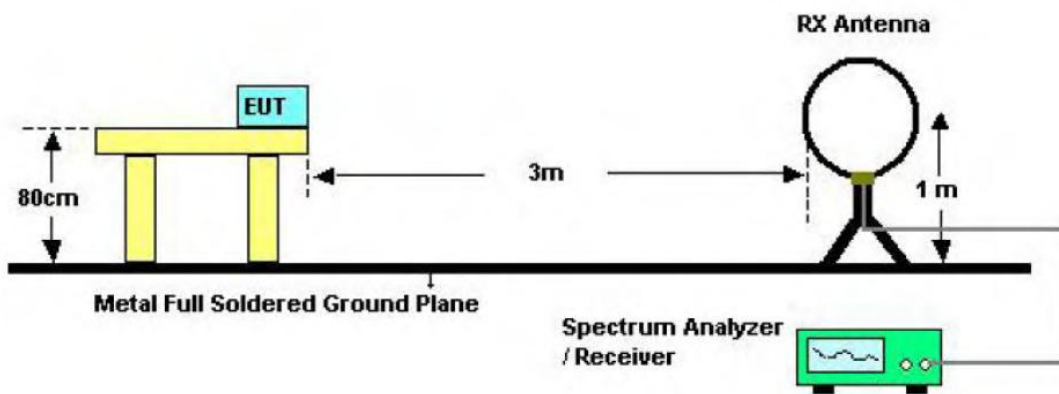
**Radiated Emission Limit (Above 1000MHz)**

Frequency (MHz)	Distance Meters(at 3m)	
	Peak	Average
Above 1000	74	54

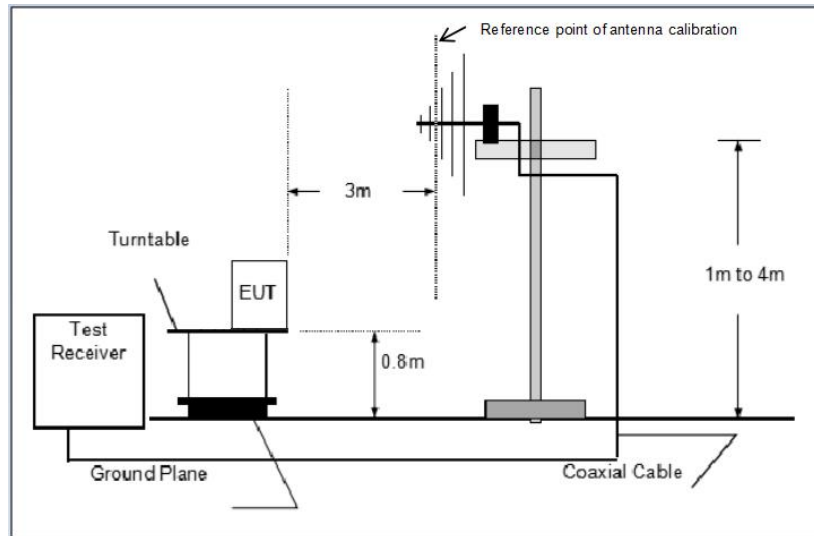
**Note:**

- (1) The tighter limit applies at the band edges.
- (2) Emission Level (dBuV/m)=20log Emission Level (uV/m).

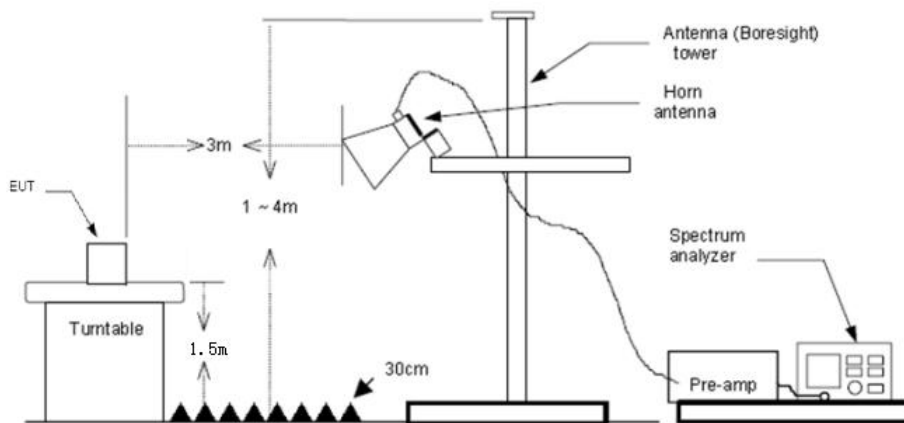
Test Configuration



Below 30MHz Test Setup



Below 1000MHz Test Setup



Above 1GHz Test Setup

**Test Procedure**

1. The EUT was setup and tested according to ANSI C63.10:2013
2. The EUT is placed on a turn table which is 0.8 meter above ground for below 1 GHz, and 1.5 m for above 1 GHz. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
3. The EUT was set 3 meters from the receiving antenna, which was mounted on the top of a variable height antenna tower.
4. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
5. Set to the maximum power setting and enable the EUT transmit continuously.
6. Use the following spectrum analyzer settings
  - (1) Span shall wide enough to fully capture the emission being measured;
  - (2) Below 1 GHz:  
 RBW=120 kHz, VBW=300 kHz, Sweep=auto, Detector function=peak, Trace=max hold;  
 If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
  - (3) From 1 GHz to 10<sup>th</sup> harmonic:  
 RBW=1MHz, VBW=3MHz Peak detector for Peak value.  
 RBW=1MHz, VBW=10Hz RMS detector for Average value.

**Test Mode**

Please refer to the clause 2.3.

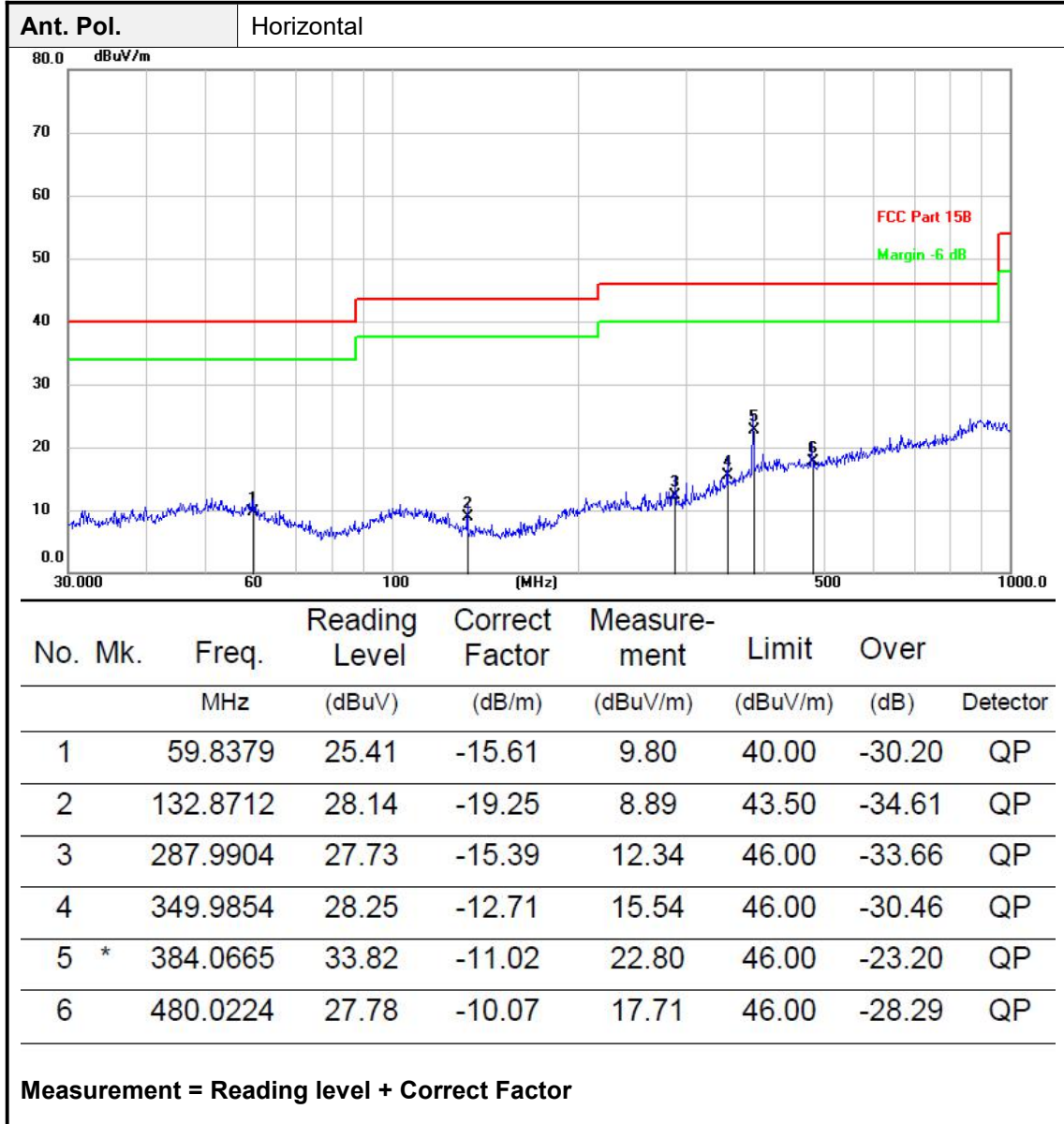
**Test Result****9 KHz~30 MHz and 18GHz~25GHz**

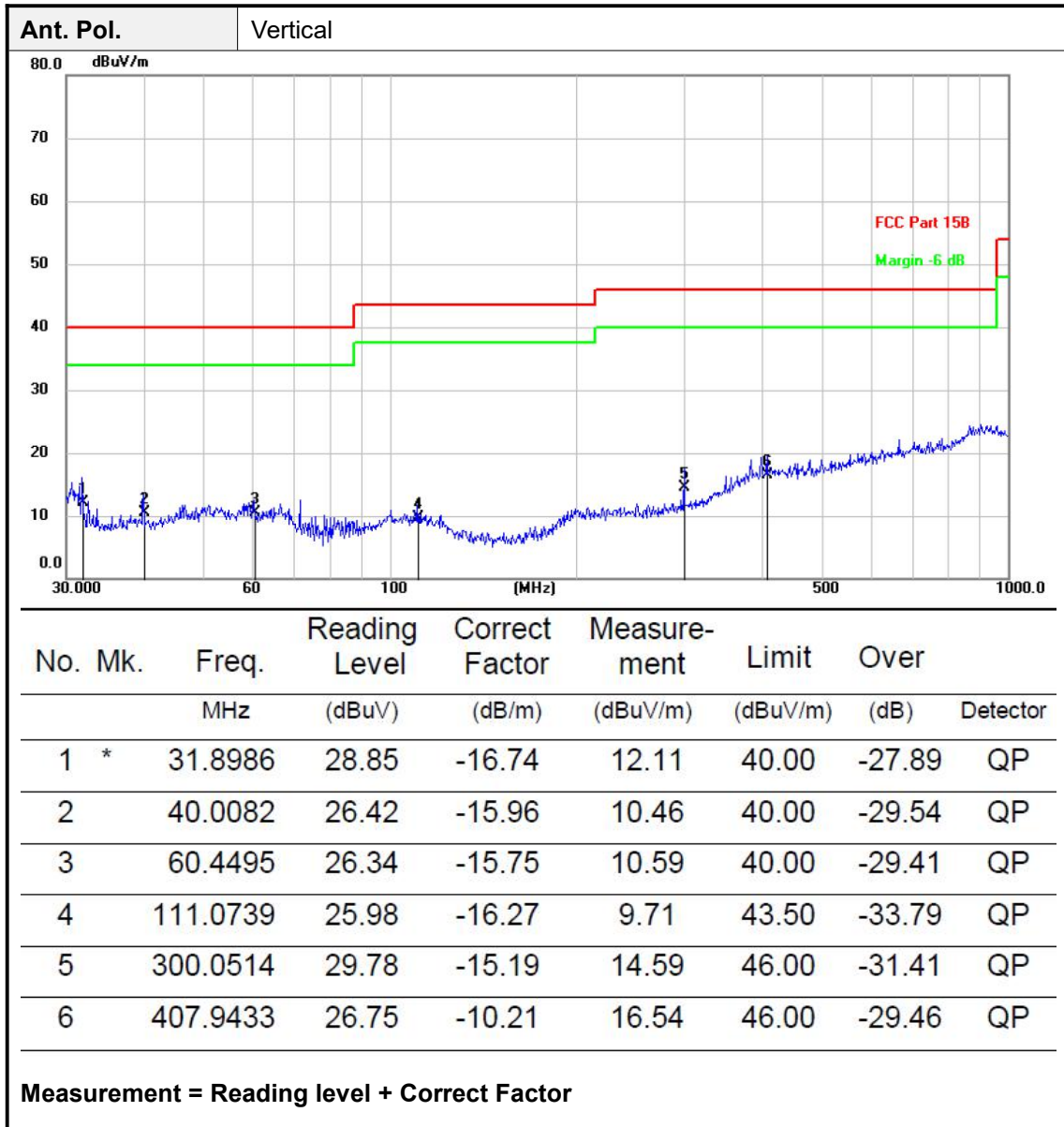
From 9 KHz~30 MHz and 18GHz~25GHz: Conclusion: PASS

Note:

- 1) Measurement = Reading level + Correct Factor  
Correct Factor=Antenna Factor + Cable Loss -Preamplifier Factor
- 2) The peak level is lower than average limit(54 dBuV/m), this data is the too weak instrument of signal is unable to test.
- 3) The emission levels of other frequencies are very lower than the limit and not show in test report.
- 4) The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
- 5) Pre-scan DH5, 2DH5 modulation, and found the 2DH5 modulation 2402MHz which it is worse case for 30MHz-1GHz , so only show the test data for worse case.
- 6) Pre-scan DH5, 2DH5 modulation, and found the 2DH5 modulation which it is worse case for above 1GHz, so only show the test data for worse case.

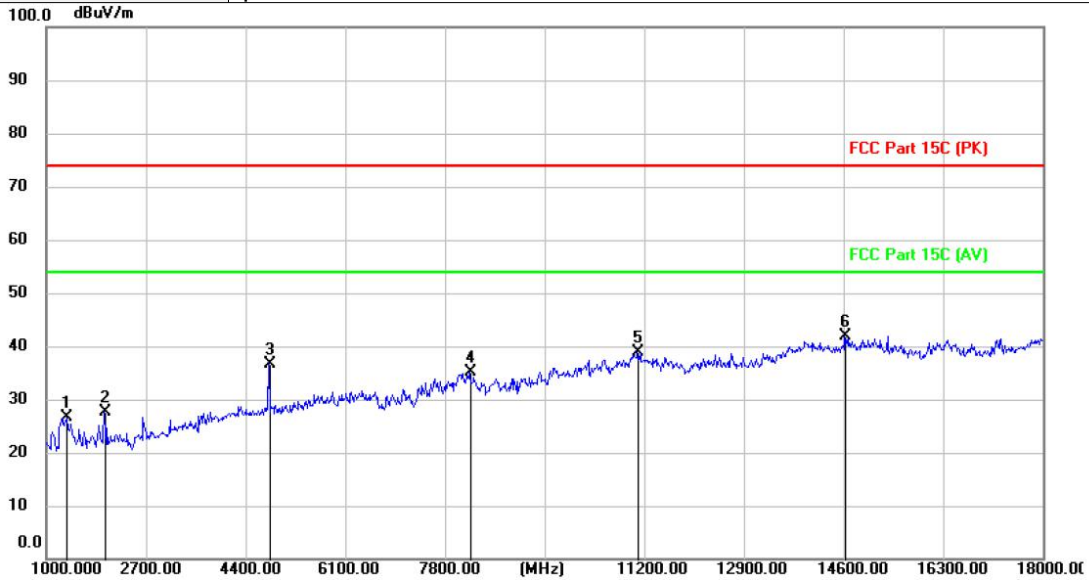
30MHz-1GHz





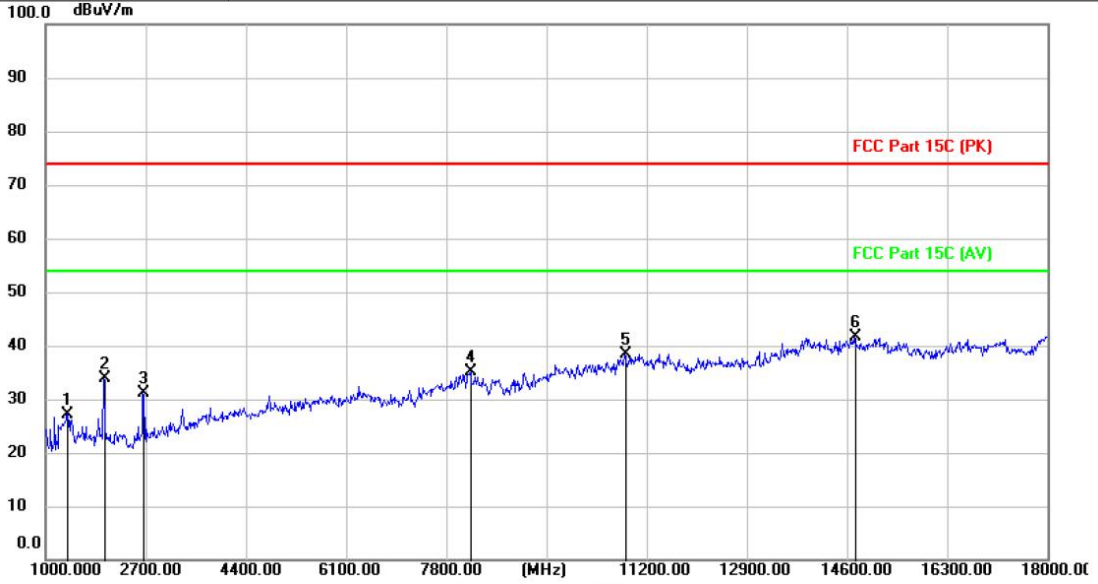
Adobe 1GHz

<b>Ant. Pol.</b>	Horizontal
<b>Test Mode:</b>	TX 2DH5 Mode 2402MHz
<b>Remark:</b>	No report for the emission which more than 10 dB below the prescribed limit.

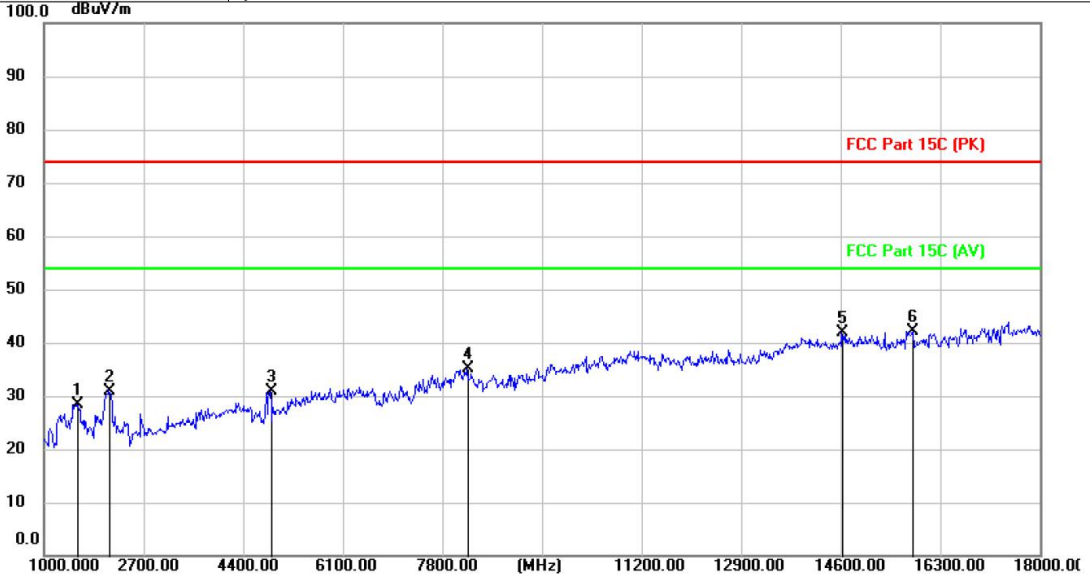


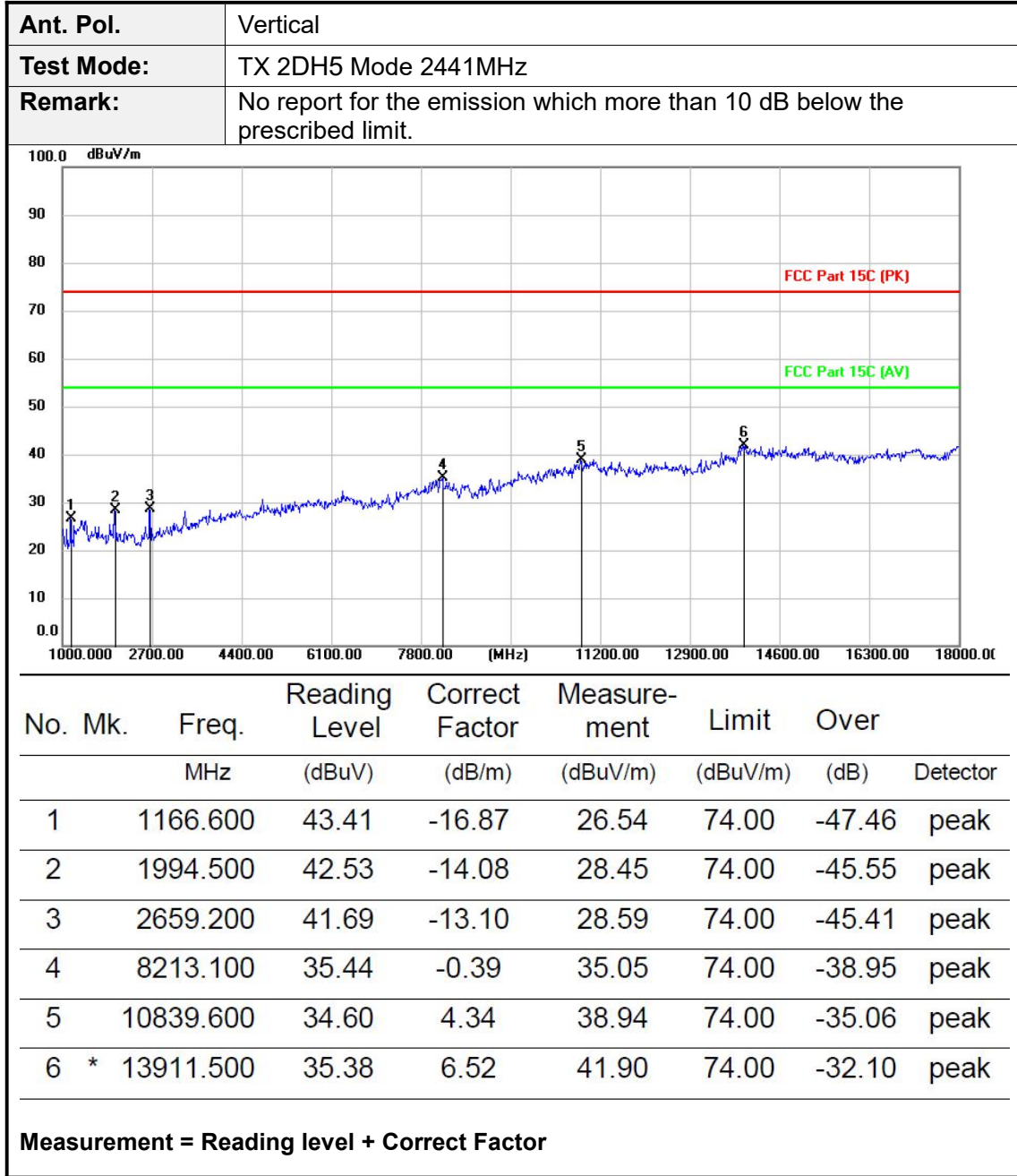
No.	Mk.	Freq. MHz	Reading Level (dBuV)	Correct Factor (dB/m)	Measure- ment (dBuV/m)	Limit (dBuV/m)	Over (dB)	Detector
1		1357.000	42.72	-16.20	26.52	74.00	-47.48	peak
2		1999.600	41.67	-14.06	27.61	74.00	-46.39	peak
3		4804.600	44.46	-7.78	36.68	74.00	-37.32	peak
4		8226.700	35.45	-0.39	35.06	74.00	-38.94	peak
5		11096.300	34.30	4.66	38.96	74.00	-35.04	peak
6	*	14628.900	35.50	6.44	41.94	74.00	-32.06	peak

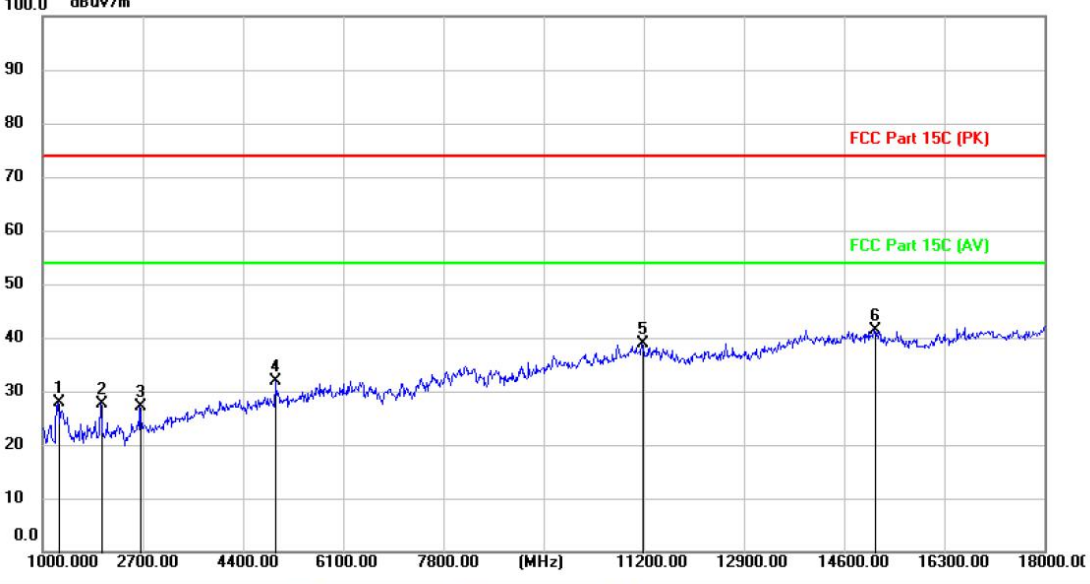
Measurement = Reading level + Correct Factor

<b>Ant. Pol.</b>	Vertical						
<b>Test Mode:</b>	TX 2DH5 Mode 2402MHz						
<b>Remark:</b>	No report for the emission which more than 10 dB below the prescribed limit.						
							
<b>No.</b>	<b>Mk.</b>	<b>Freq.</b>	<b>Reading Level</b>	<b>Correct Factor</b>	<b>Measurement</b>	<b>Limit</b>	<b>Over</b>
		MHz	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB) Detector
1		1370.600	43.35	-16.16	27.19	74.00	-46.81 peak
2		1994.500	48.03	-14.08	33.95	74.00	-40.05 peak
3		2659.200	44.19	-13.10	31.09	74.00	-42.91 peak
4		8213.100	35.44	-0.39	35.05	74.00	-38.95 peak
5		10839.600	34.10	4.34	38.44	74.00	-35.56 peak
6	*	14722.400	34.86	6.65	41.51	74.00	-32.49 peak
<b>Measurement = Reading level + Correct Factor</b>							



<b>Ant. Pol.</b>	Horizontal						
<b>Test Mode:</b>	TX 2DH5 Mode 2441MHz						
<b>Remark:</b>	No report for the emission which more than 10 dB below the prescribed limit.						
							
<b>No.</b>	<b>Mk.</b>	<b>Freq.</b>	<b>Reading Level</b>	<b>Correct Factor</b>	<b>Measure-ment</b>	<b>Limit</b>	<b>Over</b>
		MHz	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB) Detector
1		1569.500	43.94	-15.47	28.47	74.00	-45.53 peak
2		2116.900	44.89	-13.89	31.00	74.00	-43.00 peak
3		4872.600	38.43	-7.65	30.78	74.00	-43.22 peak
4		8226.700	35.45	-0.39	35.06	74.00	-38.94 peak
5		14628.900	35.50	6.44	41.94	74.00	-32.06 peak
6	*	15837.600	36.12	6.04	42.16	74.00	-31.84 peak
<b>Measurement = Reading level + Correct Factor</b>							



<b>Ant. Pol.</b>	Horizontal							
<b>Test Mode:</b>	TX 2DH5 Mode 2480MHz							
<b>Remark:</b>	No report for the emission which more than 10 dB below the prescribed limit.							
								
<b>No.</b>	<b>Mk.</b>	<b>Freq.</b>	<b>Reading Level</b>	<b>Correct Factor</b>	<b>Measurement</b>	<b>Limit</b>	<b>Over</b>	<b>Detector</b>
		MHz	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1		1256.700	44.49	-16.55	27.94	74.00	-46.06	peak
2		1997.900	41.71	-14.06	27.65	74.00	-46.35	peak
3		2660.900	40.23	-13.09	27.14	74.00	-46.86	peak
4		4959.300	39.40	-7.48	31.92	74.00	-42.08	peak
5		11176.200	34.33	4.63	38.96	74.00	-35.04	peak
6	*	15118.500	34.30	7.07	41.37	74.00	-32.63	peak
<b>Measurement = Reading level + Correct Factor</b>								