

Appendix A of data

A1.Maximum Peak Conducted Output Power

Test Result

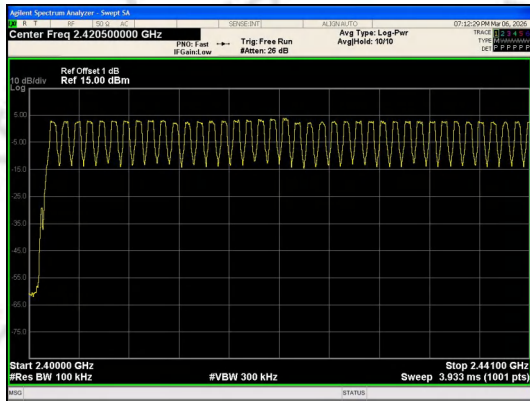
Modulation	Packet Type	Channel	Peak Output Power (dBm)	Peak Output Power (mW)	Limit (dBm)	Result
GFSK	DH5	0	3.01	2.000	≤21	PASS
		39	2.85	1.928		PASS
		78	1.24	1.330		PASS
π/4DQPSK	2-DH5	0	2.33	1.710		PASS
		39	3.47	2.223		PASS
		78	2.16	1.644		PASS
8DPSK	3-DH5	0	2.61	1.824		PASS
		39	3.71	2.350		PASS
		78	2.38	1.730		PASS

A2. Number of Hopping Frequencies

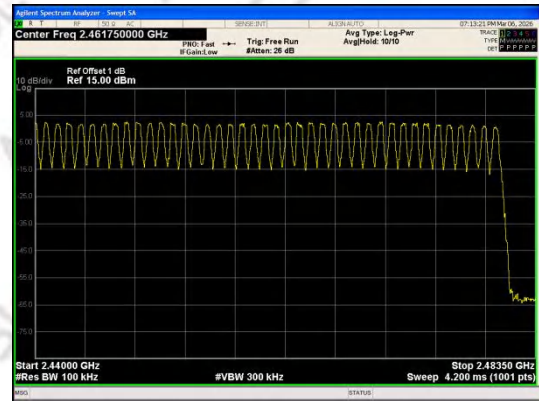
Test Result

Modulation	Packet	Number of Hopping Channel	Limit	Result
GFSK	DH5	79	15	PASS
$\pi/4$ DQPSK	2-DH5	79	15	PASS
8DPSK	3-DH5	79	15	PASS

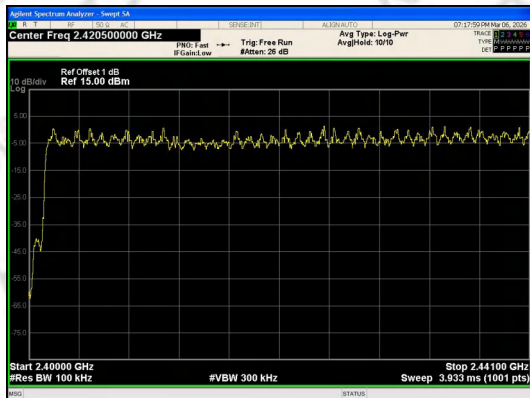
Test Graphs



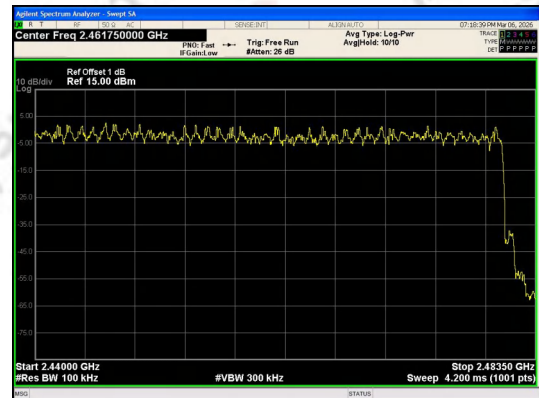
Low End Spectrum Channel Hopping Plot
GFSK



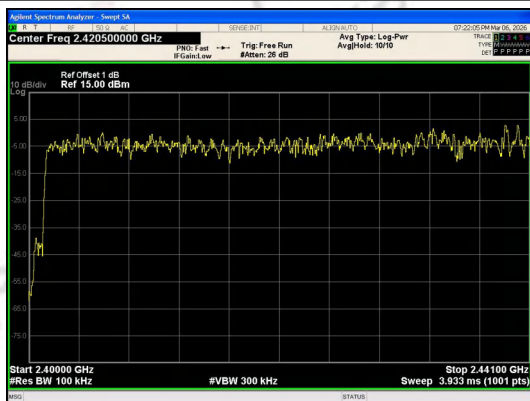
High End Spectrum Channel Hopping Plot
GFSK



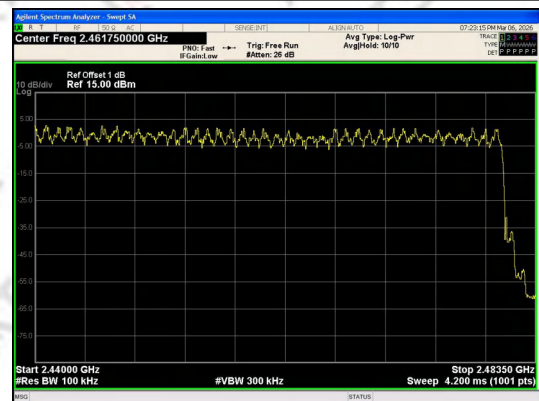
Low End Spectrum Channel Hopping Plot
 $\pi/4$ DQPSK



High End Spectrum Channel Hopping Plot
 $\pi/4$ DQPSK



Low End Spectrum Channel Hopping Plot
8DPSK



High End Spectrum Channel Hopping Plot
8DPSK

A3.Duty Cycle and Dwell Time

Duty Cycle

Test Result

Modulation	Packets	Channel	On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle (linear)	Duty Cycle Factor (dB)
GFSK	DH5	0	2.908	3.748	77.59	0.7759	1.1019
		39	2.908	3.748	77.59	0.7759	1.1019
		78	2.908	3.748	77.59	0.7759	1.1019
π /4DQPSK	2-DH5	0	2.898	3.748	77.32	0.7732	1.1171
		39	2.898	3.748	77.32	0.7732	1.1171
		78	2.898	3.748	77.32	0.7732	1.1171
8DPSK	3-DH5	0	2.896	3.748	77.27	0.7727	1.1199
		39	2.896	3.748	77.27	0.7727	1.1199
		78	2.896	3.748	77.27	0.7727	1.1199

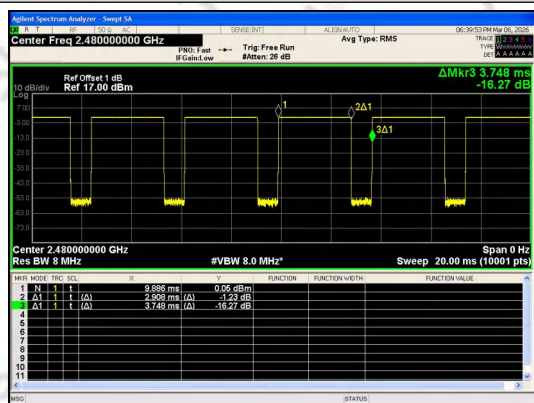
Test Graphs



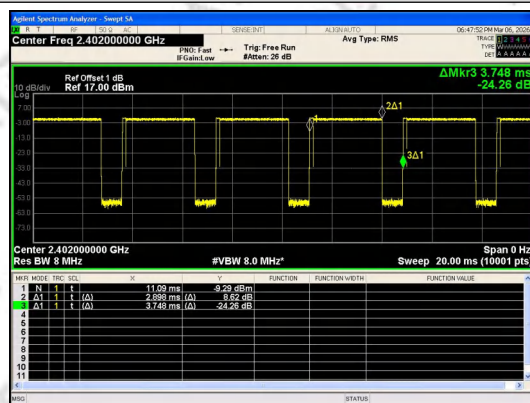
GFSK(DH5)_Channel 0

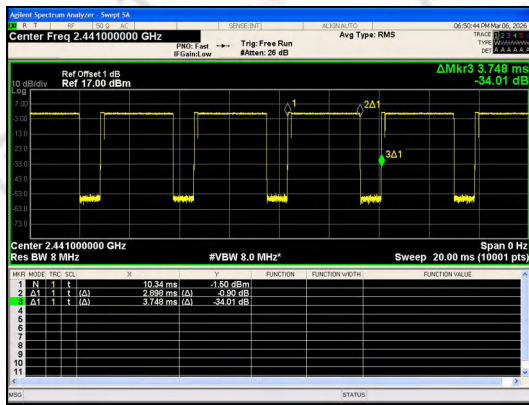


GFSK(DH5)_Channel 39

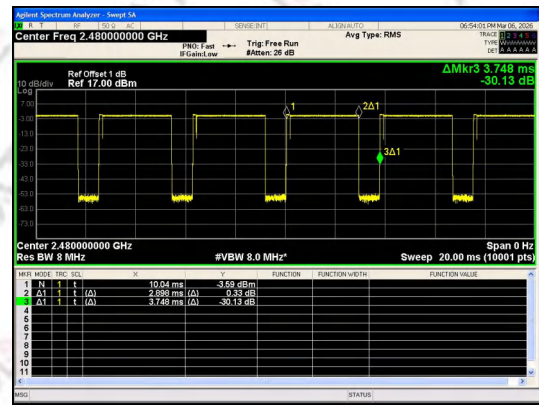


GFSK(DH5)_Channel 78

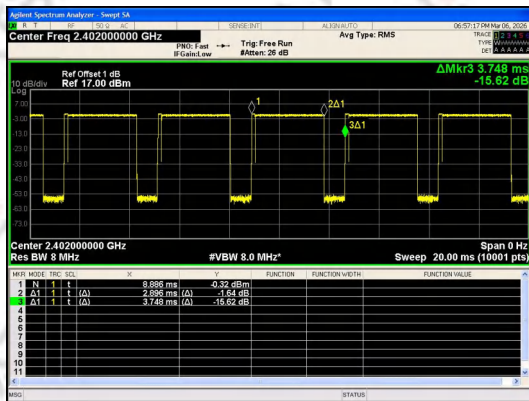

 π /4DQPSK(2-DH5)_Channel 0



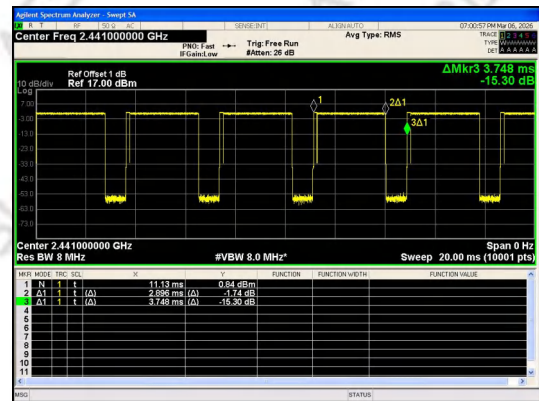
$\pi/4$ DQPSK(2-DH5)_Channel 39



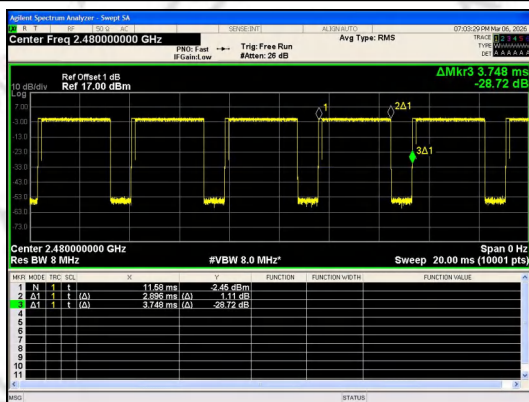
$\pi/4$ DQPSK(2-DH5)_Channel 78



8DPSK(3-DH5)_Channel 0



8DPSK(3-DH5)_Channel 39



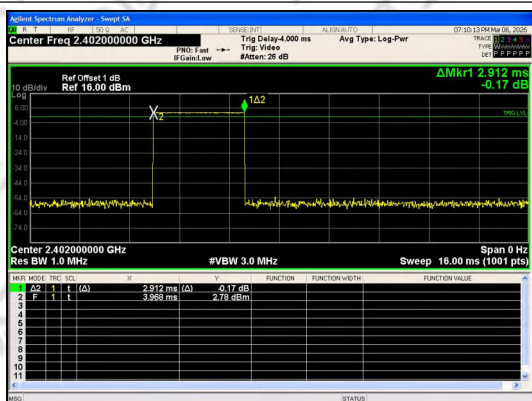
8DPSK(3-DH5)_Channel 78

Dwell Time	Test Result
10 min	100%
20 min	100%
30 min	100%
40 min	100%
50 min	100%
60 min	100%
70 min	100%
80 min	100%
90 min	100%
100 min	100%
110 min	100%
120 min	100%
130 min	100%
140 min	100%
150 min	100%
160 min	100%
170 min	100%
180 min	100%
190 min	100%
200 min	100%
210 min	100%
220 min	100%
230 min	100%
240 min	100%
250 min	100%
260 min	100%
270 min	100%
280 min	100%
290 min	100%
300 min	100%
310 min	100%
320 min	100%
330 min	100%
340 min	100%
350 min	100%
360 min	100%
370 min	100%
380 min	100%
390 min	100%
400 min	100%
410 min	100%
420 min	100%
430 min	100%
440 min	100%
450 min	100%
460 min	100%
470 min	100%
480 min	100%
490 min	100%
500 min	100%
510 min	100%
520 min	100%
530 min	100%
540 min	100%
550 min	100%
560 min	100%
570 min	100%
580 min	100%
590 min	100%
600 min	100%
610 min	100%
620 min	100%
630 min	100%
640 min	100%
650 min	100%
660 min	100%
670 min	100%
680 min	100%
690 min	100%
700 min	100%
710 min	100%
720 min	100%
730 min	100%
740 min	100%
750 min	100%
760 min	100%
770 min	100%
780 min	100%
790 min	100%
800 min	100%
810 min	100%
820 min	100%
830 min	100%
840 min	100%
850 min	100%
860 min	100%
870 min	100%
880 min	100%
890 min	100%
900 min	100%
910 min	100%
920 min	100%
930 min	100%
940 min	100%
950 min	100%
960 min	100%
970 min	100%
980 min	100%
990 min	100%
1000 min	100%

Modulation	Packet	Channel	Pulse Width (ms)	Number of Pulses in 31.6 seconds	Dwell Time (ms)	Limit (ms)	Result
GFSK	DH5	0	2.912	113	329.06	< 400	PASS
π/4DQPSK	2-DH5	0	2.896	97	280.91		PASS
8DPSK	3-DH5	0	2.896	111	321.46		PASS

Note: Dwell time=Pulse time(ms)*Number of Pulses in 31.6 seconds

Test Graphs

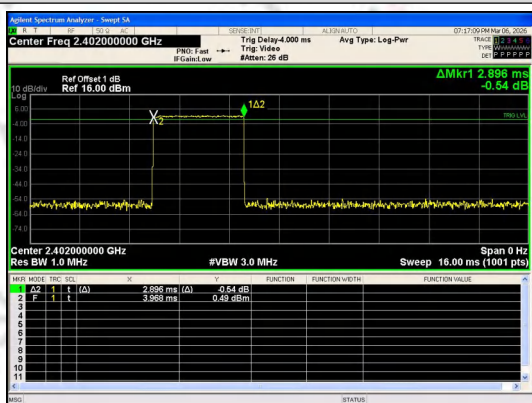


Pulse Width

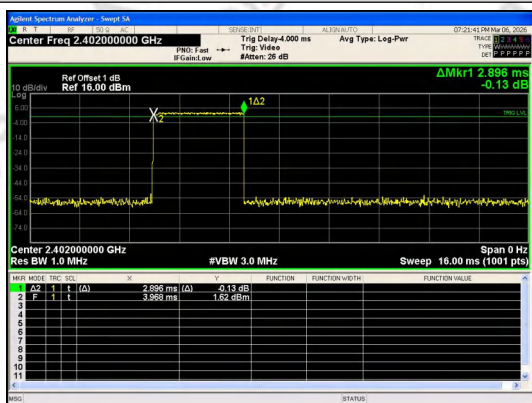
GFSK DH5



Number of Pulses in 31.6 seconds
GFSK DH5

Pulse Width
 $\pi/4$ DQPSK 2-DH5

Number of Pulses in 31.6 seconds
 $\pi/4$ DQPSK 2-DH5



Pulse Width
8DPSK_3-DH5

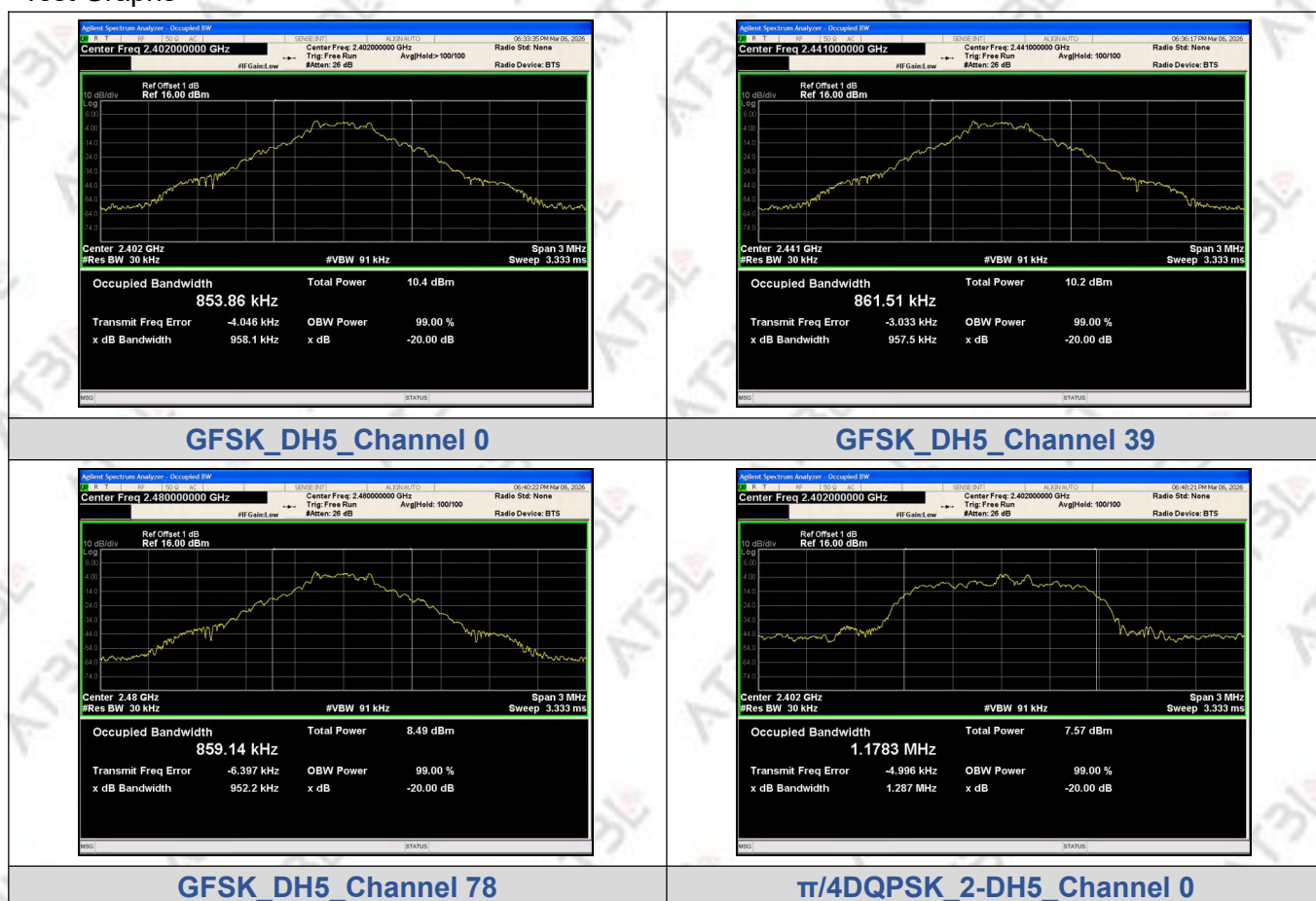
Number of Pulses in 31.6 seconds
8DPSK_3-DH5

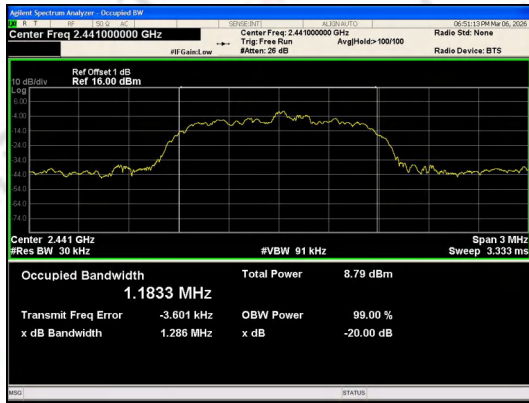
A4.20dB Bandwidth

Test Result

Modulation	Channel	Center Frequency (MHz)	20 dB Bandwidth (MHz)
GFSK	0	2402 MHz	0.9581
	39	2441 MHz	0.9575
	78	2480 MHz	0.9522
$\pi/4$ DQPSK	0	2402 MHz	1.287
	39	2441 MHz	1.286
	78	2480 MHz	1.288
8DPSK	0	2402 MHz	1.298
	39	2441 MHz	1.299
	78	2480 MHz	1.292

Test Graphs





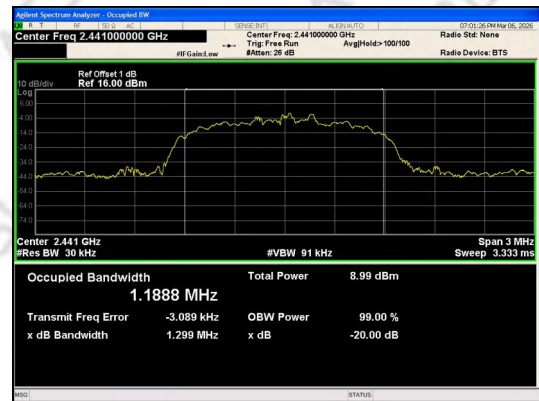
$\pi/4$ DQPSK_2-DH5_Channel 39



$\pi/4$ DQPSK_2-DH5_Channel 78



8DPSK_3-DH5_Channel 0



8DPSK_3-DH5_Channel 39



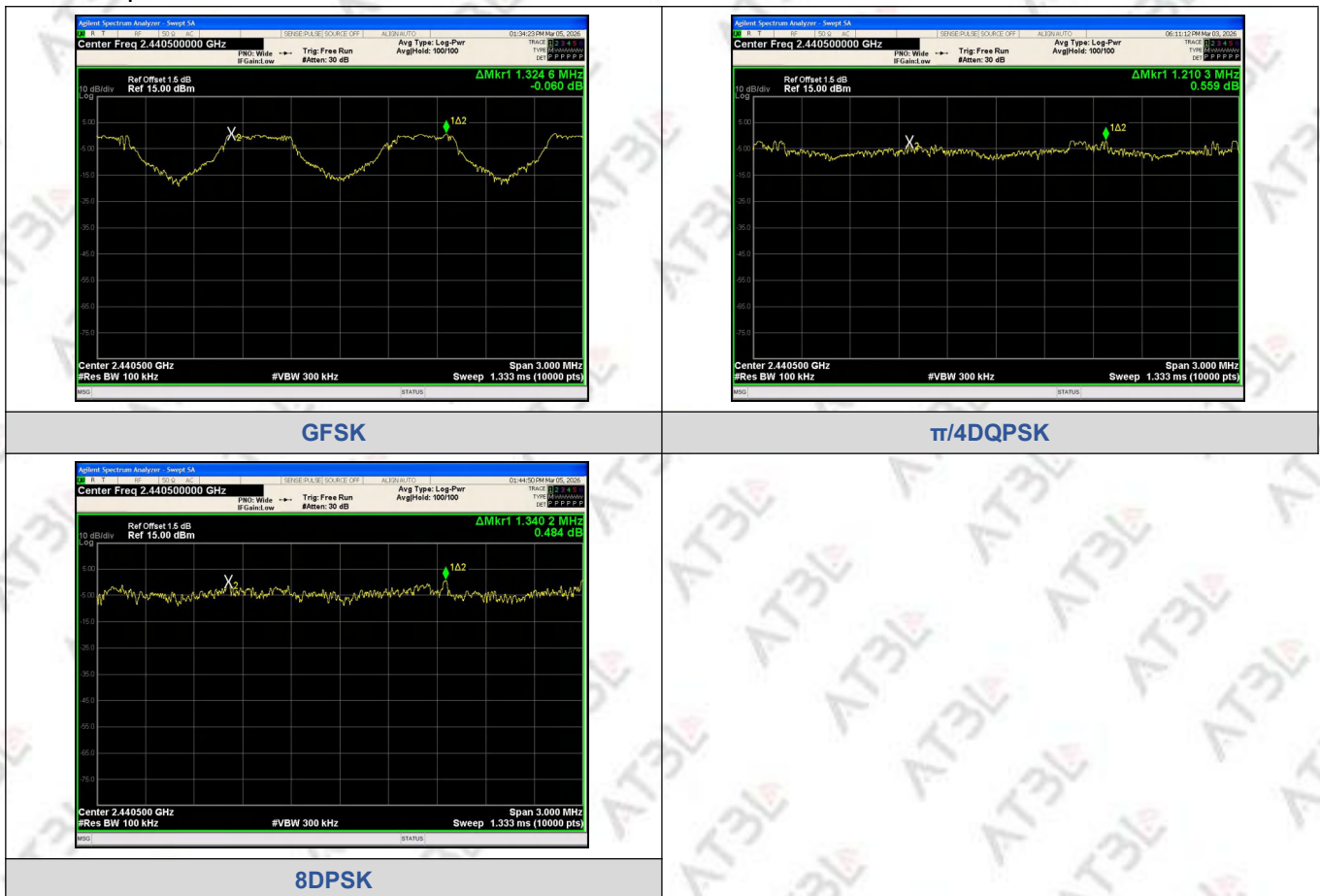
8DPSK_3-DH5_Channel 78

A5.Carrier Frequencies Separation

Test Result

Modulation	Packet	Left Center frequency (MHz)	Right Center frequency (MHz)	Hopping Frequency Separation (MHz)	Minimum Limit (MHz)	Result
GFSK	DH5	2439.8314	2441.156	1.3246	0.639	PASS
$\pi/4$ DQPSK	2-DH5	2439.9667	2441.177	1.2103	0.858	PASS
8DPSK	3-DH5	2439.8122	2441.1524	1.3402	0.868	PASS

Test Graphs



A6.Conducted Spurious & Band Edge Emission

Non-Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Cable Loss (dB)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	0	2400.00	-60.506	N/A	-17.24	-43.266	PASS
			24882.0	-49.949	1.36	-17.24	-32.709	PASS
		39	24842.7	-49.641	1.36	-17.45	-32.191	PASS
		78	2483.50	-62.614	N/A	-19.06	-43.554	PASS
			24900.1	-50.311	1.36	-19.06	-31.251	PASS
$\pi/4$ DQPSK	2-DH5	0	2400.00	-58.304	N/A	-19.83	-38.474	PASS
			24936.3	-50.329	1.36	-19.83	-30.499	PASS
		39	24915.7	-49.729	1.36	-18.47	-31.259	PASS
		78	2483.50	-62.838	N/A	-19.97	-42.868	PASS
			24863.3	-50.231	1.36	-19.97	-30.261	PASS
8DPSK	3-DH5	0	2400.00	-56.716	N/A	-19.64	-37.076	PASS
			24895.8	-50.266	1.36	-19.64	-30.626	PASS
		39	24903.9	-50.194	1.36	-18.41	-31.784	PASS
		78	2483.50	-60.924	N/A	-19.96	-40.964	PASS
			24900.7	-49.17	1.36	-19.96	-29.21	PASS

Note:

1.input compensation coefficient (dB)= Cable Loss (dB)

2.30MHz~25GHz OOB Emission Level final result cable loss was added. maximum cable Loss is 2.86 dB (When the frequency reaches 25GHz, add an additional compensation of 1.36dB for Cable Loss.)

Hopping

Modulation	Packet	Channel	OOB Emission Frequency (MHz)	OOB Emission Level (dBm)	Limit (dBm)	Over Limit (dB)	Result
GFSK	DH5	Hopping	2320.37	-60.998	-23.96	-37.038	PASS
			2400.00	-62.778	-23.96	-38.818	PASS
			2483.50	-62.353	-21.57	-40.783	PASS
π /4DQPSK	2-DH5		2400.00	-59.535	-23.96	-35.575	PASS
2483.50			-62.489	-21.38	-41.109	PASS	
8DPSK	3-DH5		2400.00	-59.803	-24.11	-35.693	PASS
			2483.50	-61.624	-21.39	-40.234	PASS

Note: input compensation coefficient (dB)= Cable Loss (dB)

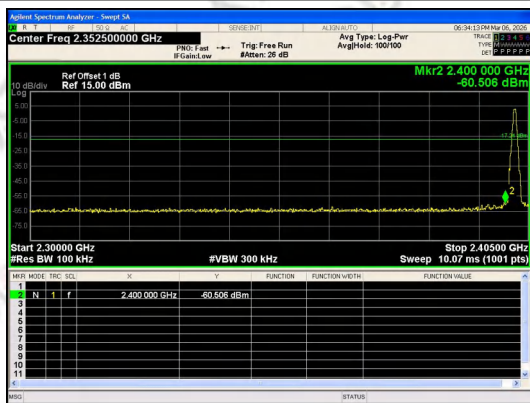
Test Graphs



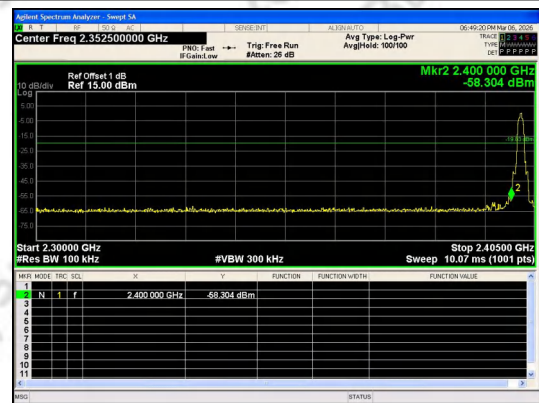
**In-Band Reference Level
GFSK_DH5_Channel 0**



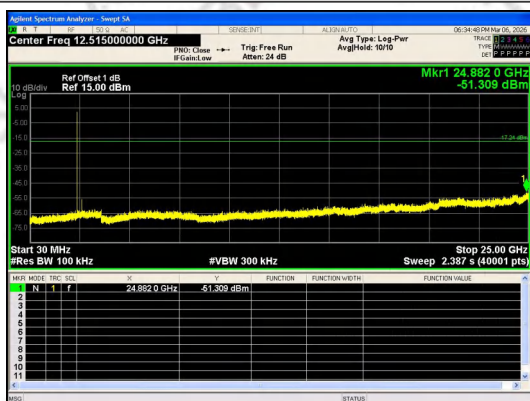
**In-Band Reference Level
 $\pi/4$ DQPSK_2-DH5_Channel 0**



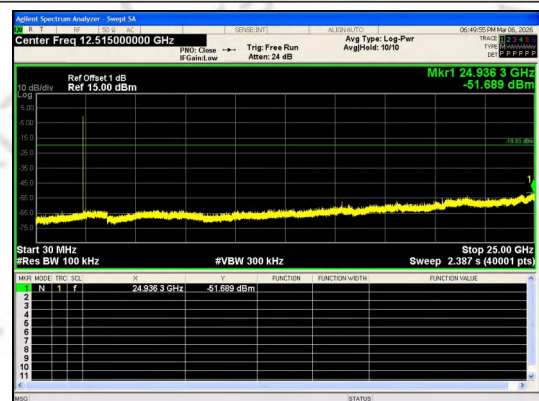
**Out Of Band Emission
GFSK_DH5_Channel 0**



**Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 0**



**30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 0**



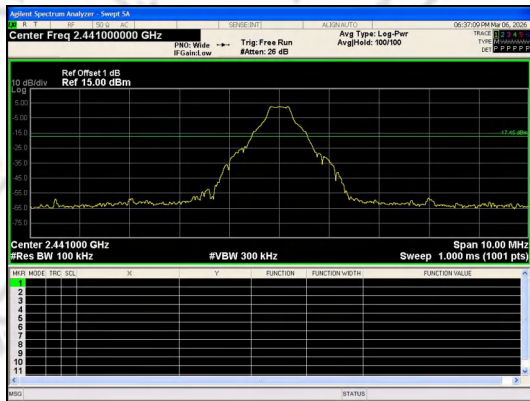
**30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 0**



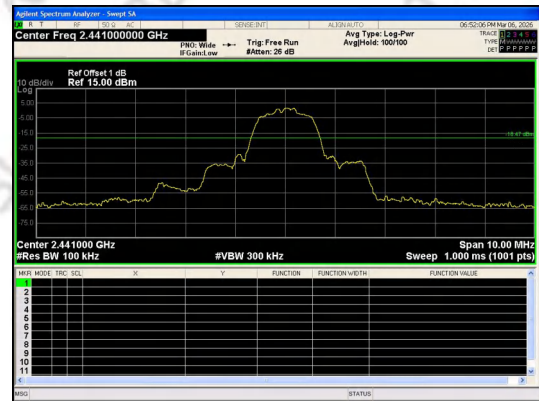
In-Band Reference Level
GFSK_DH5_Channel 39



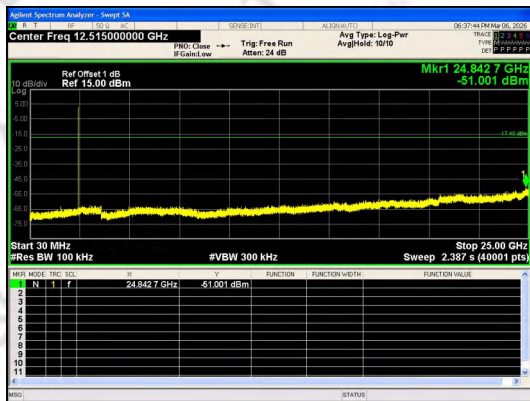
In-Band Reference Level
 $\pi/4$ DQPSK_2-DH5_Channel 39



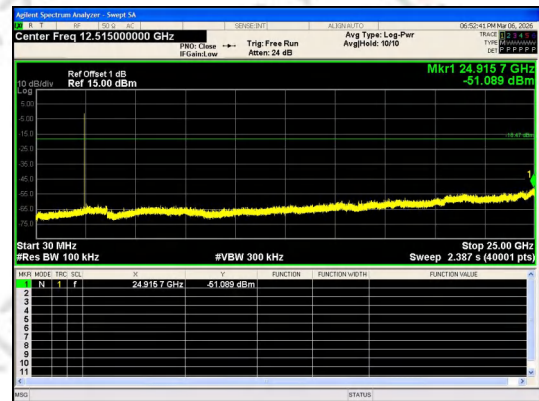
Out Of Band Emission
GFSK_DH5_Channel 39



Out Of Band Emission
 $\pi/4$ DQPSK_2-DH5_Channel 39



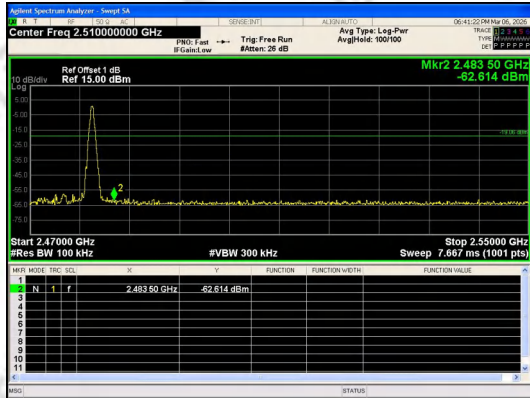
30.0 MHz - 25000.0 MHz
GFSK_DH5_Channel 39



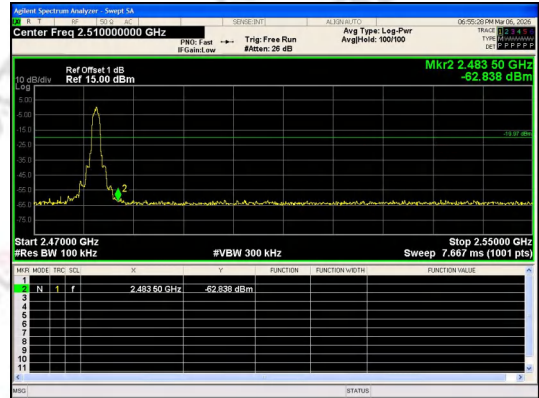
30.0 MHz - 25000.0 MHz
 $\pi/4$ DQPSK_2-DH5_Channel 39



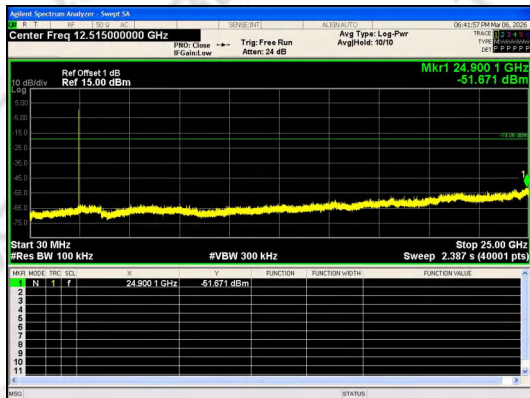
In-Band Reference Level GFSK_DH5_Channel 78



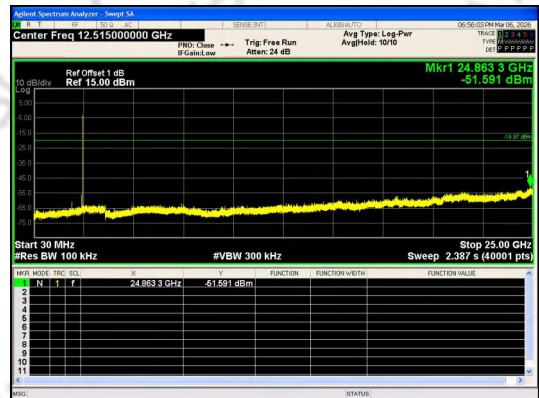
In-Band Reference Level $\pi/4$ DQPSK_2-DH5_Channel 78



Out Of Band Emission GFSK_DH5_Channel 78

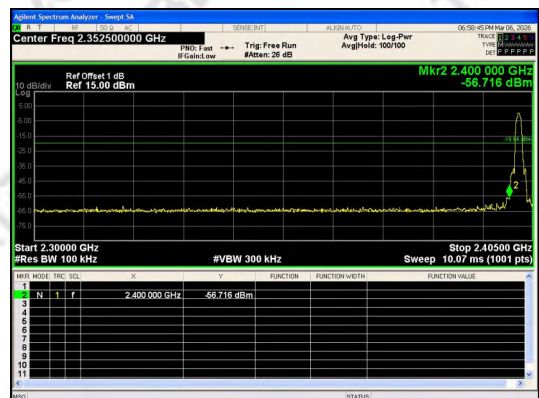


Out Of Band Emission $\pi/4$ DQPSK_2-DH5_Channel 78



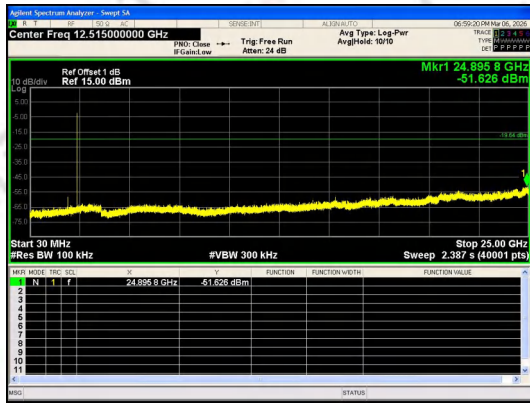
30.0 MHz - 25000.0 MHz GFSK_DH5_Channel 78

30.0 MHz - 25000.0 MHz $\pi/4$ DQPSK_2-DH5_Channel 78



In-Band Reference Level 8DPSK_3-DH5_Channel 0

Out Of Band Emission 8DPSK_3-DH5_Channel 0



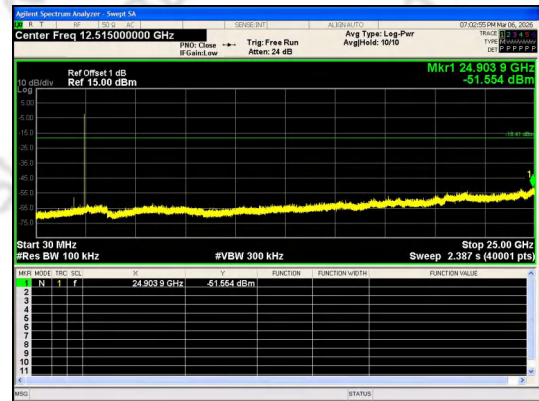
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 0



In-Band Reference Level
8DPSK_3-DH5_Channel 39



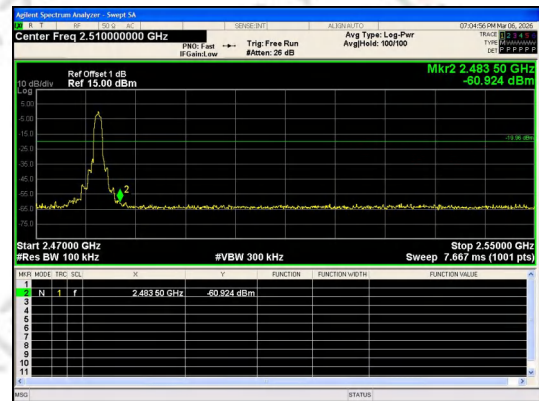
Out Of Band Emission
8DPSK_3-DH5_Channel 39



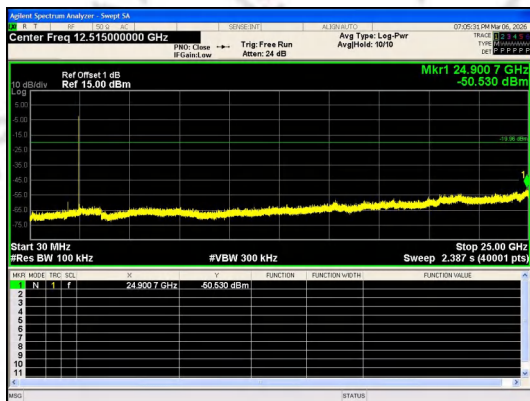
30.0 MHz - 25000.0 MHz
8DPSK_3-DH5_Channel 39



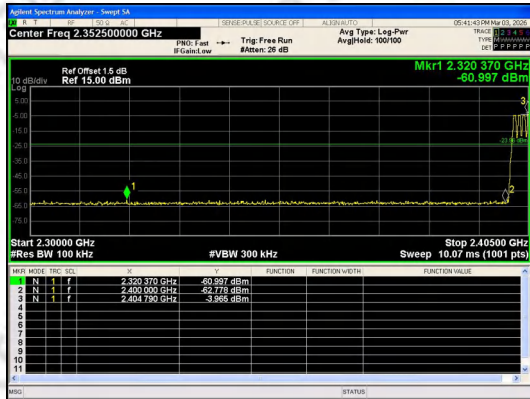
In-Band Reference Level
8DPSK_3-DH5_Channel 78



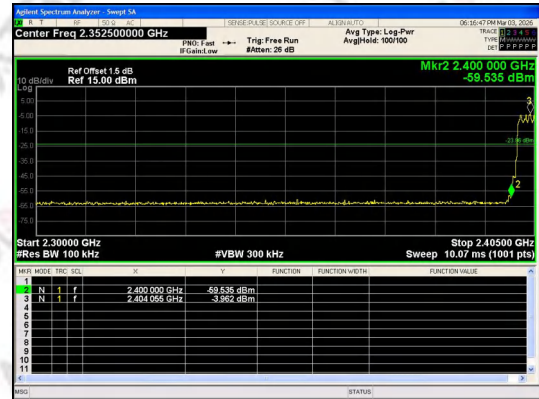
Out Of Band Emission
8DPSK_3-DH5_Channel 78



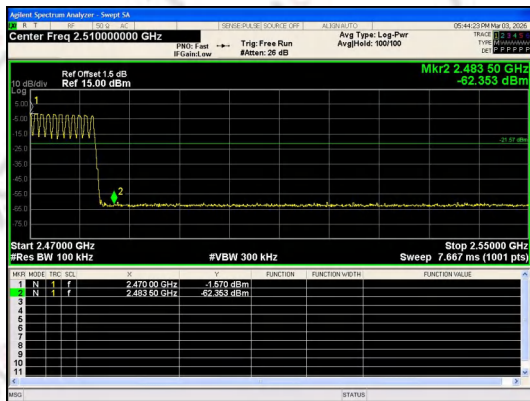
30.0 MHz - 25000.0 MHz 8DPSK_3-DH5_Channel 78



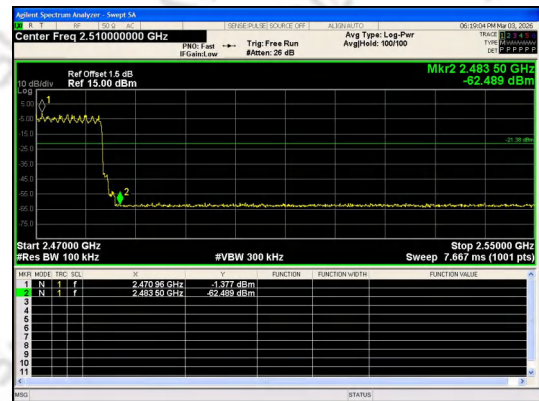
Out Of Band Emission(Left)
GFSK_DH5_Channel Hopping



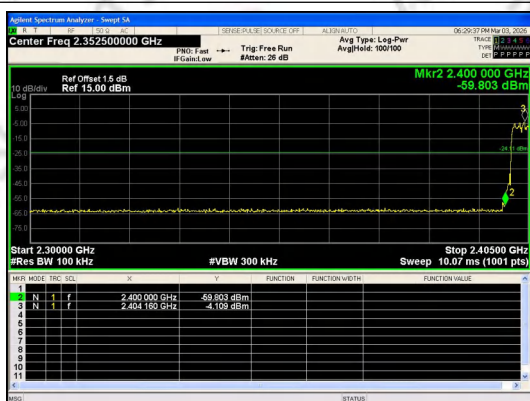
Out Of Band Emission(Left)
 $\pi/4$ DQPSK_2-DH5_Channel Hopping



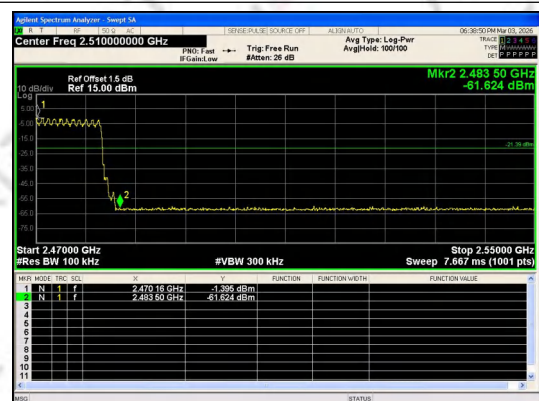
Out Of Band Emission(Right)
GFSK_DH5_Channel Hopping



Out Of Band Emission(Right)
 $\pi/4$ DQPSK_2-DH5_Channel Hopping



Out Of Band Emission(Left)
8DPSK_3-DH5_Channel Hopping



Out Of Band Emission(Right)
8DPSK_3-DH5_Channel Hopping

A6.Radiated Spurious Emission and Restricted Band

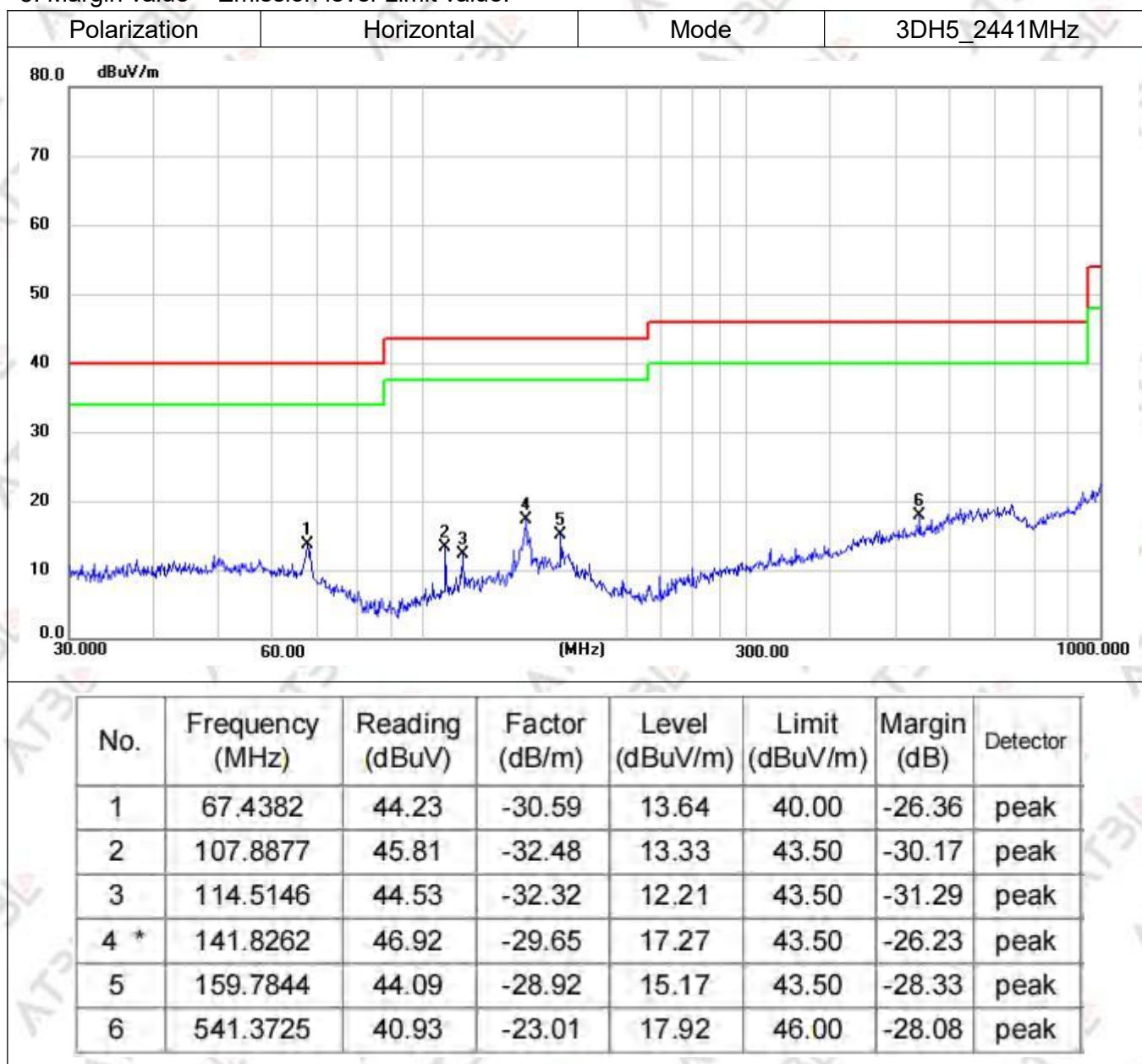
For 9 kHz ~ 30 MHz

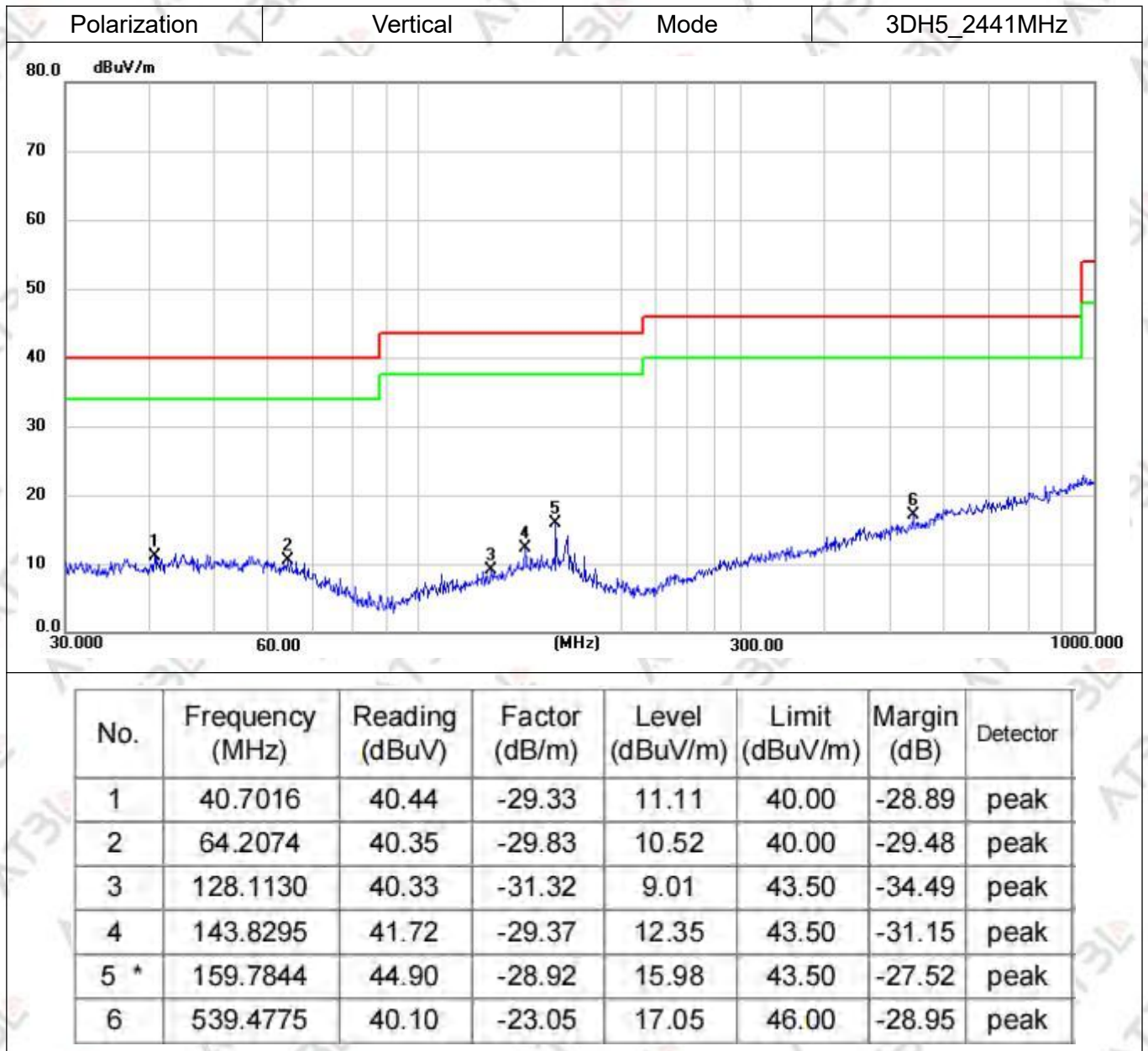
The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

For 30 MHz ~ 1 GHz:

Note:

- 1.All modes have been tested, only worst mode(3DH5_2441MHz) was recorded in the test report.
- 2.Emission Level (dBuV/m) = Reading Value (dBuV) + Correction Factor (dB/m).
3. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)-Amplifier Gain.
4. The emission levels of other frequencies were less than 20dB margin against the limit.
5. Margin value = Emission level-Limit value.

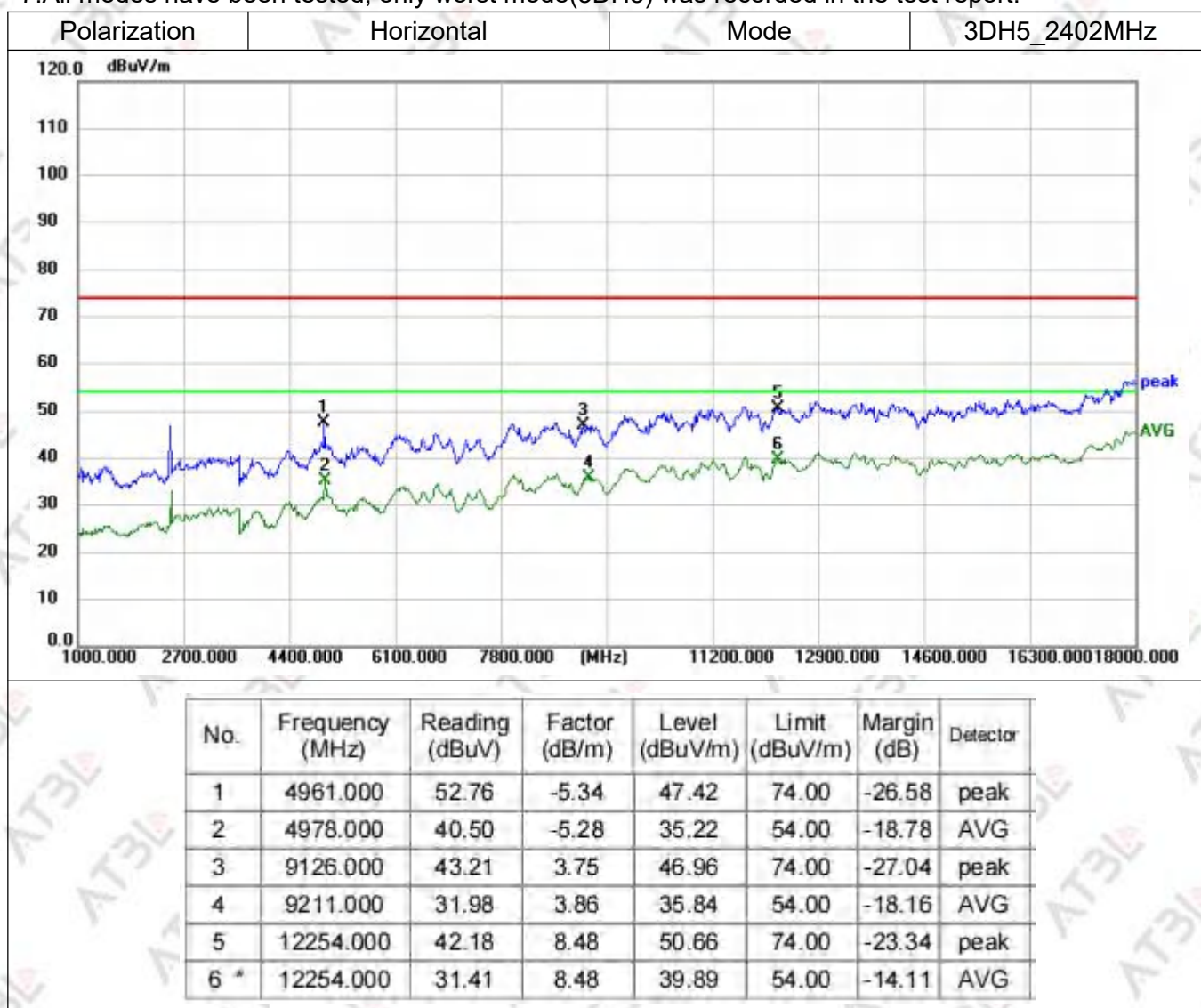


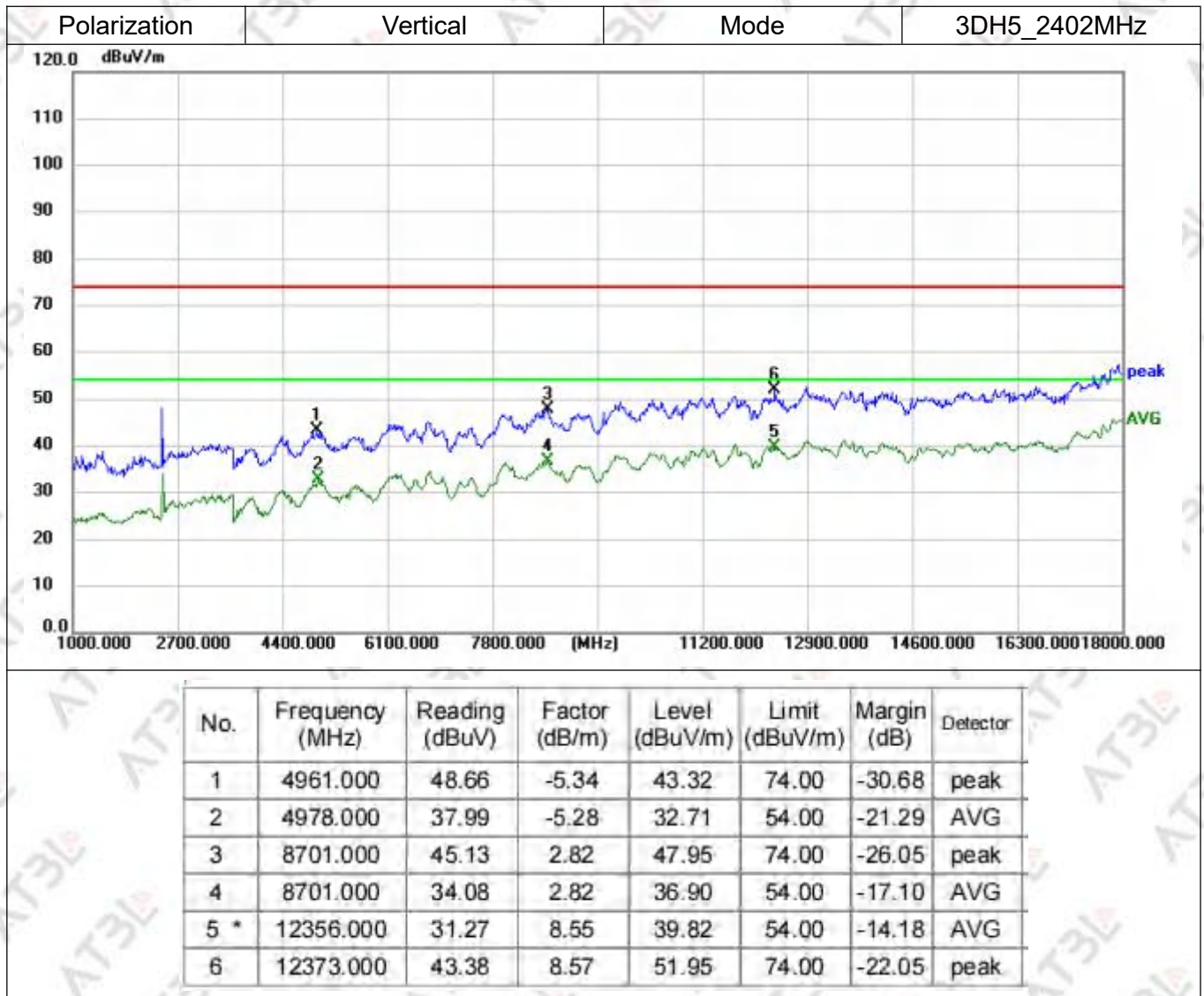


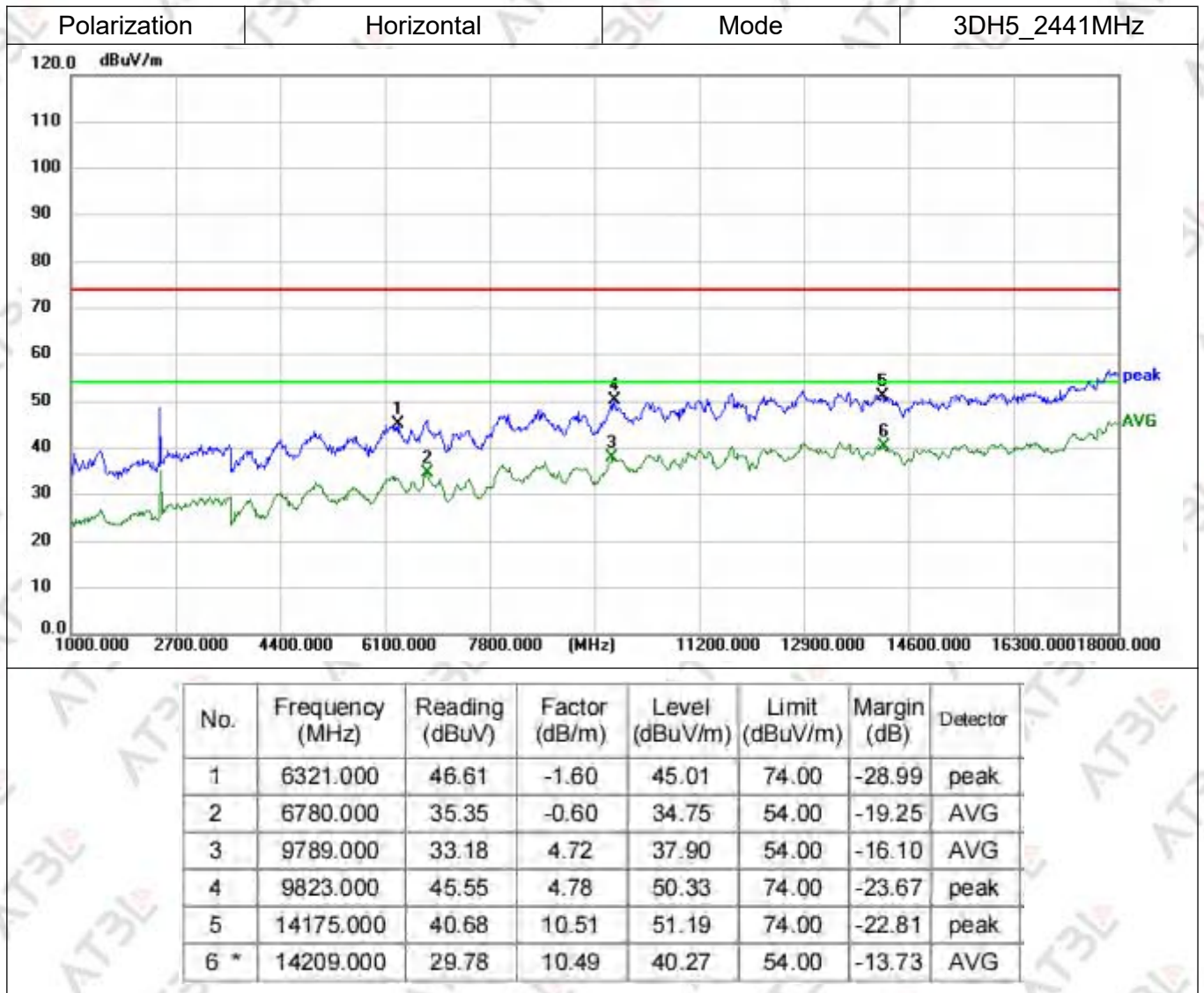
For 1 GHz ~ 18GHz:

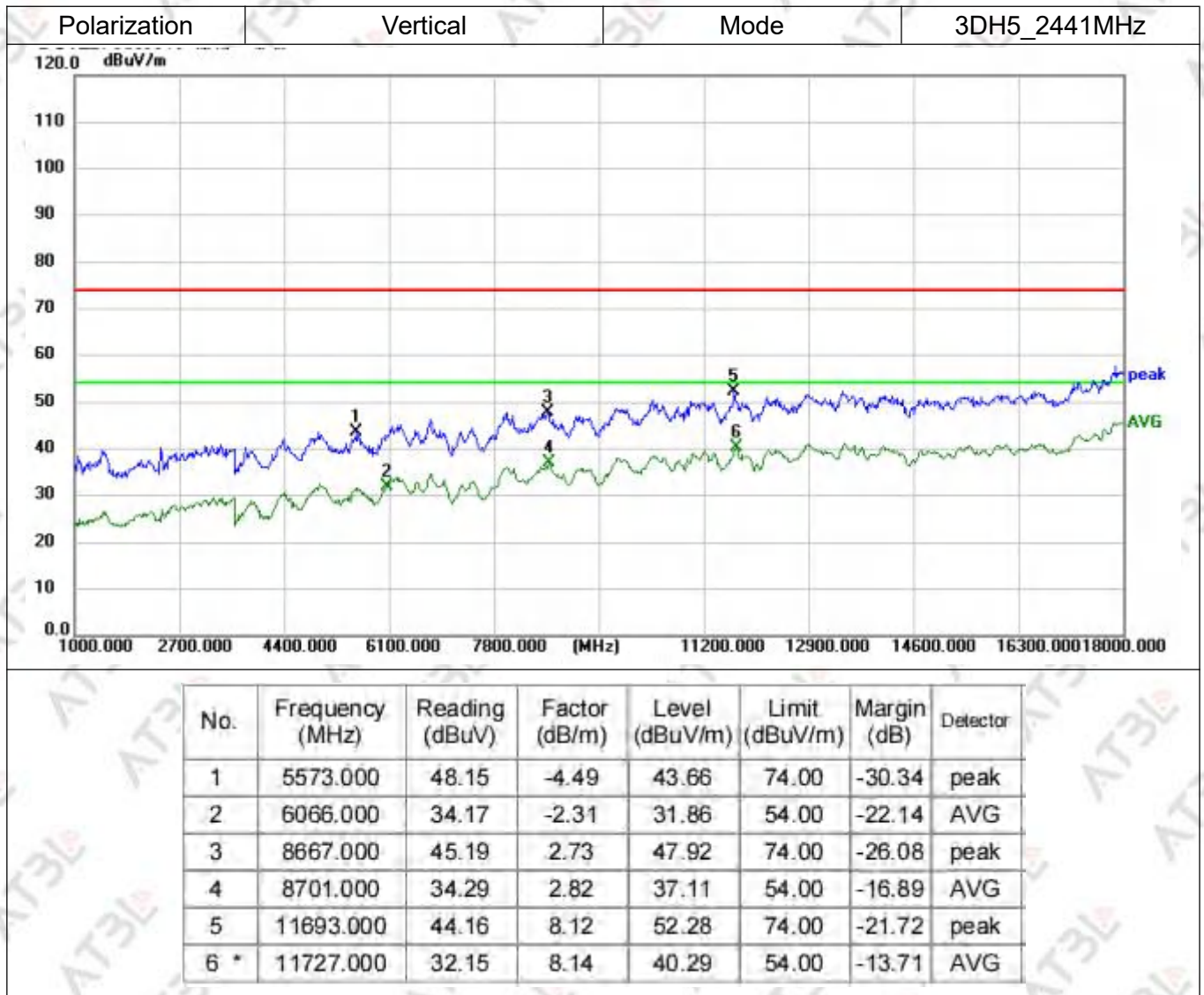
Note:

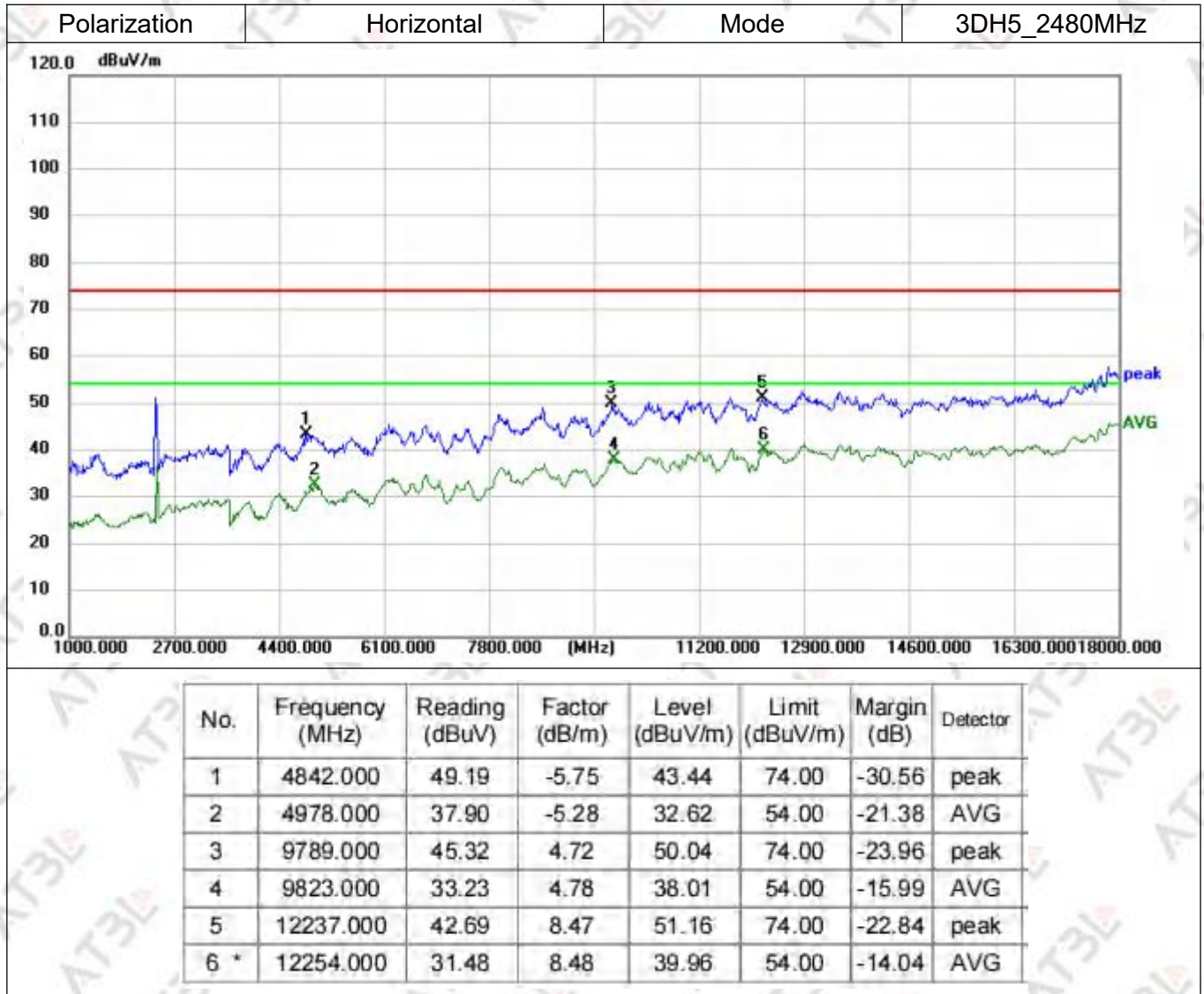
1. In frequency ranges 18 ~25GHz no any other harmonic emissions detected which are tested to compliance with the limit. No recording in the test report. No any other emissions level which are attenuated less than 20dB below the limit. No recording in the test report.
2. We used the filter to test and the main frequency was filtered out.
3. Emission Level (dBuV/m) = Reading Value (dBuV) + Correction Factor (dB/m).
4. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)-Amplifier Gain.
5. The emission levels of other frequencies were less than 20dB margin against the limit.
6. Margin value = Emission level-Limit value.
7. All modes have been tested, only worst mode(3DH5) was recorded in the test report.

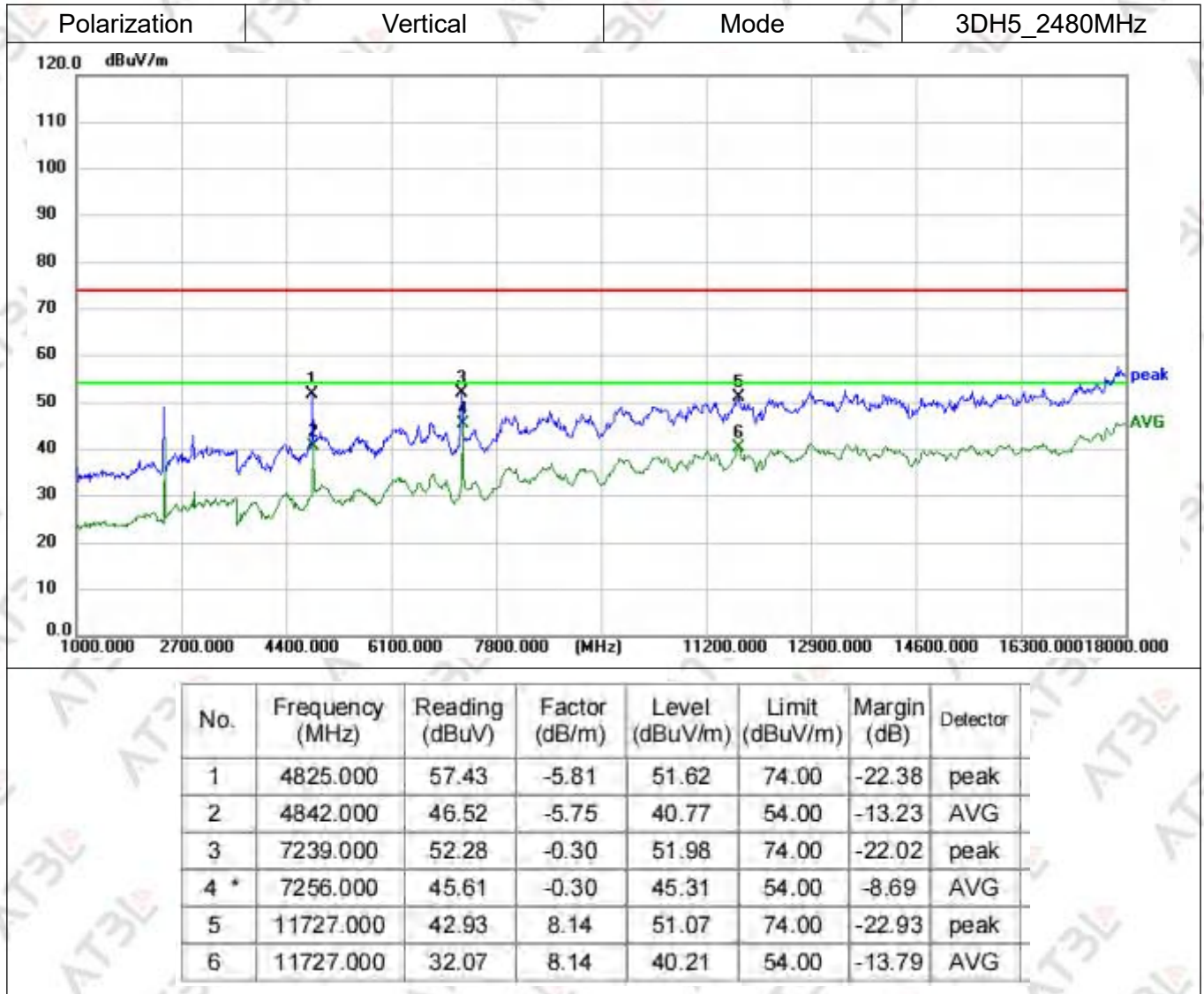








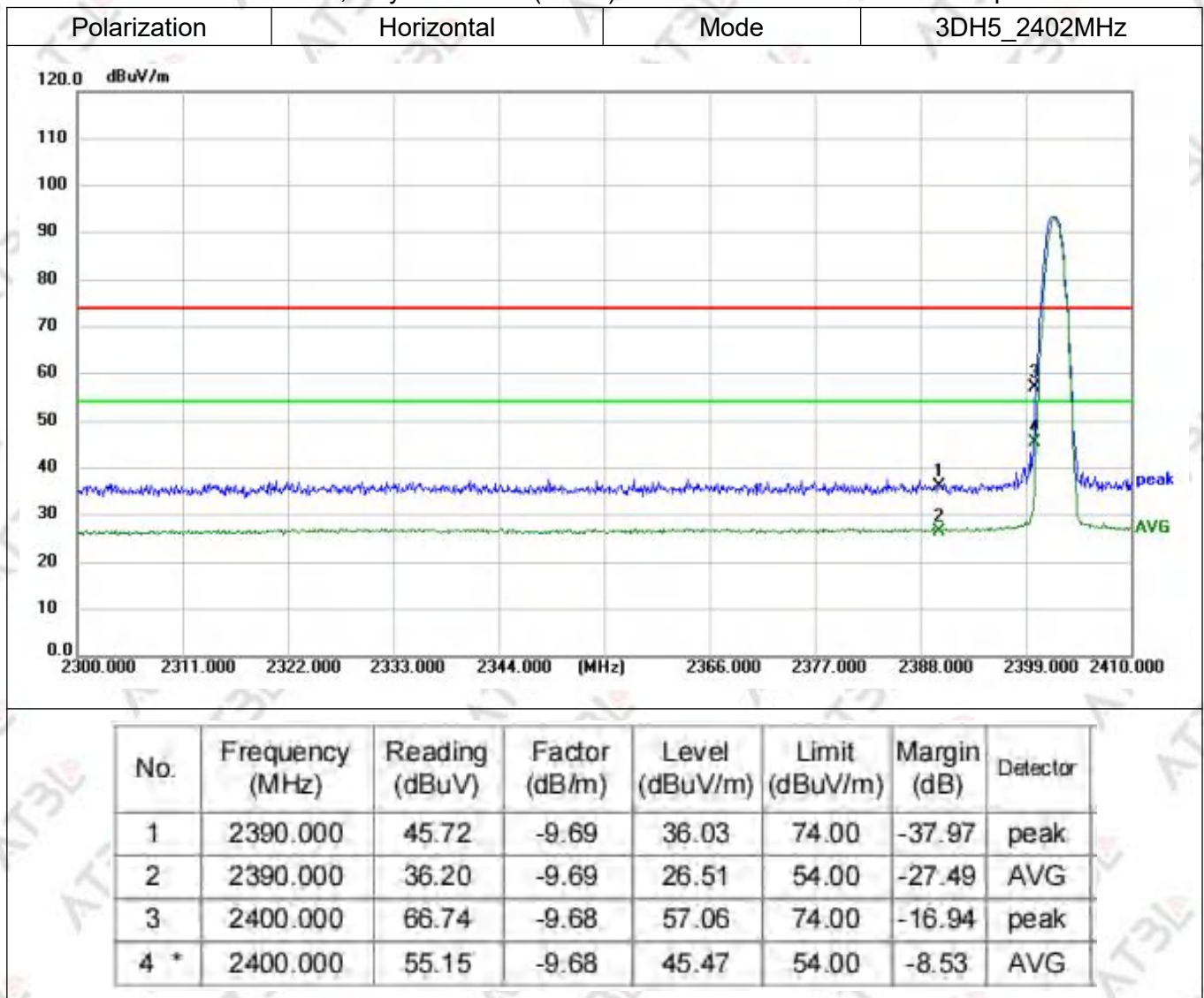


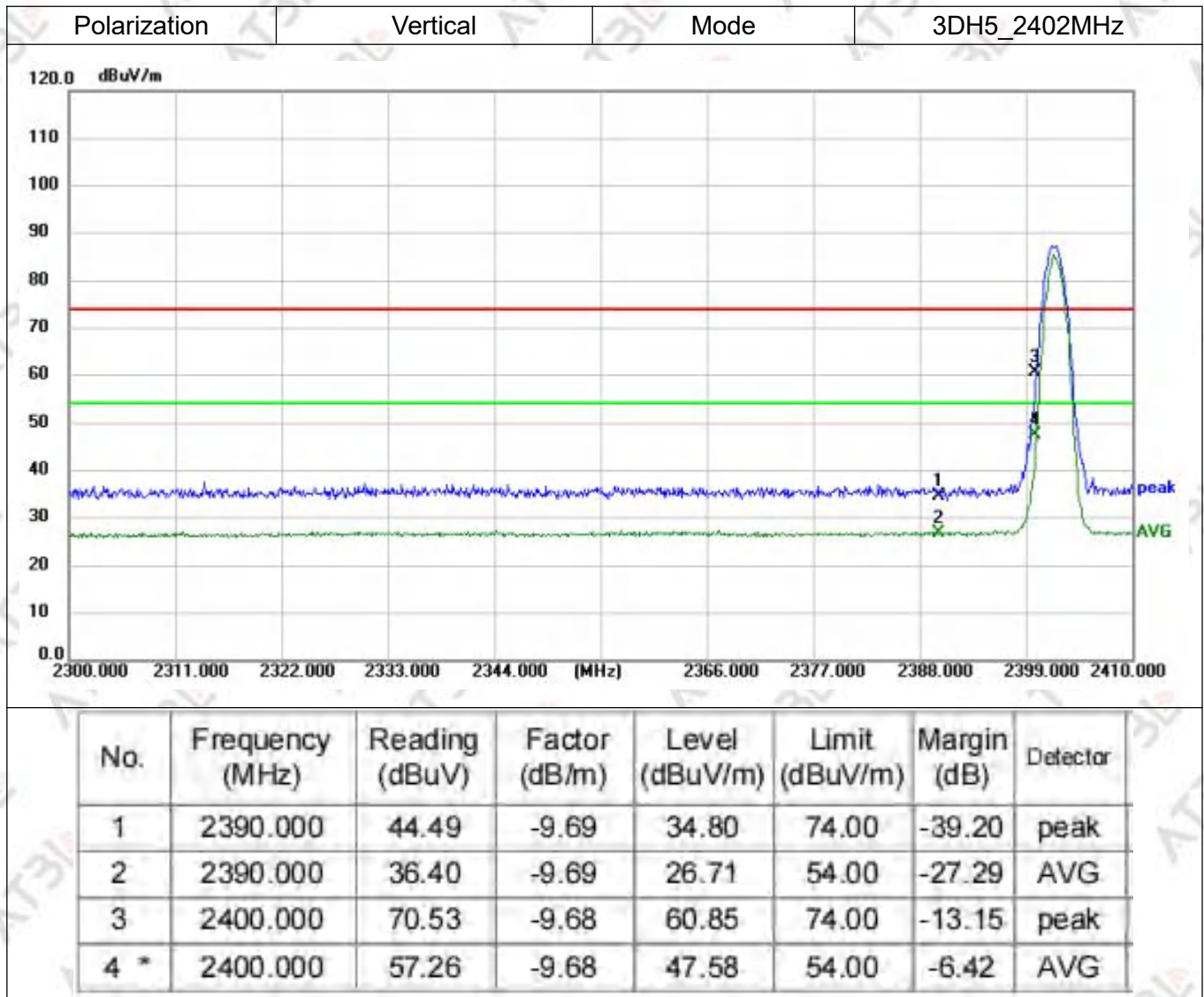


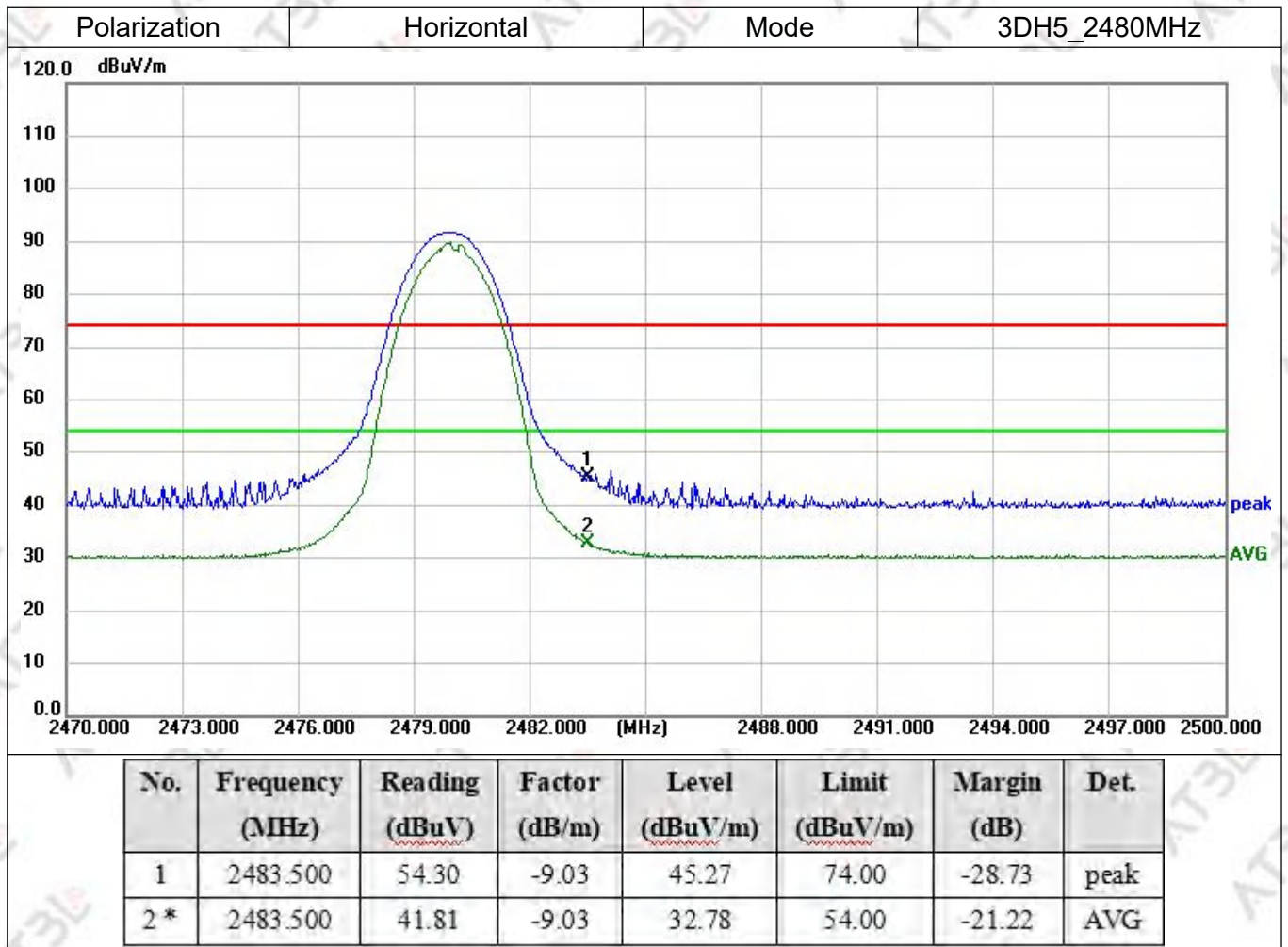
Test Result of Restricted Band

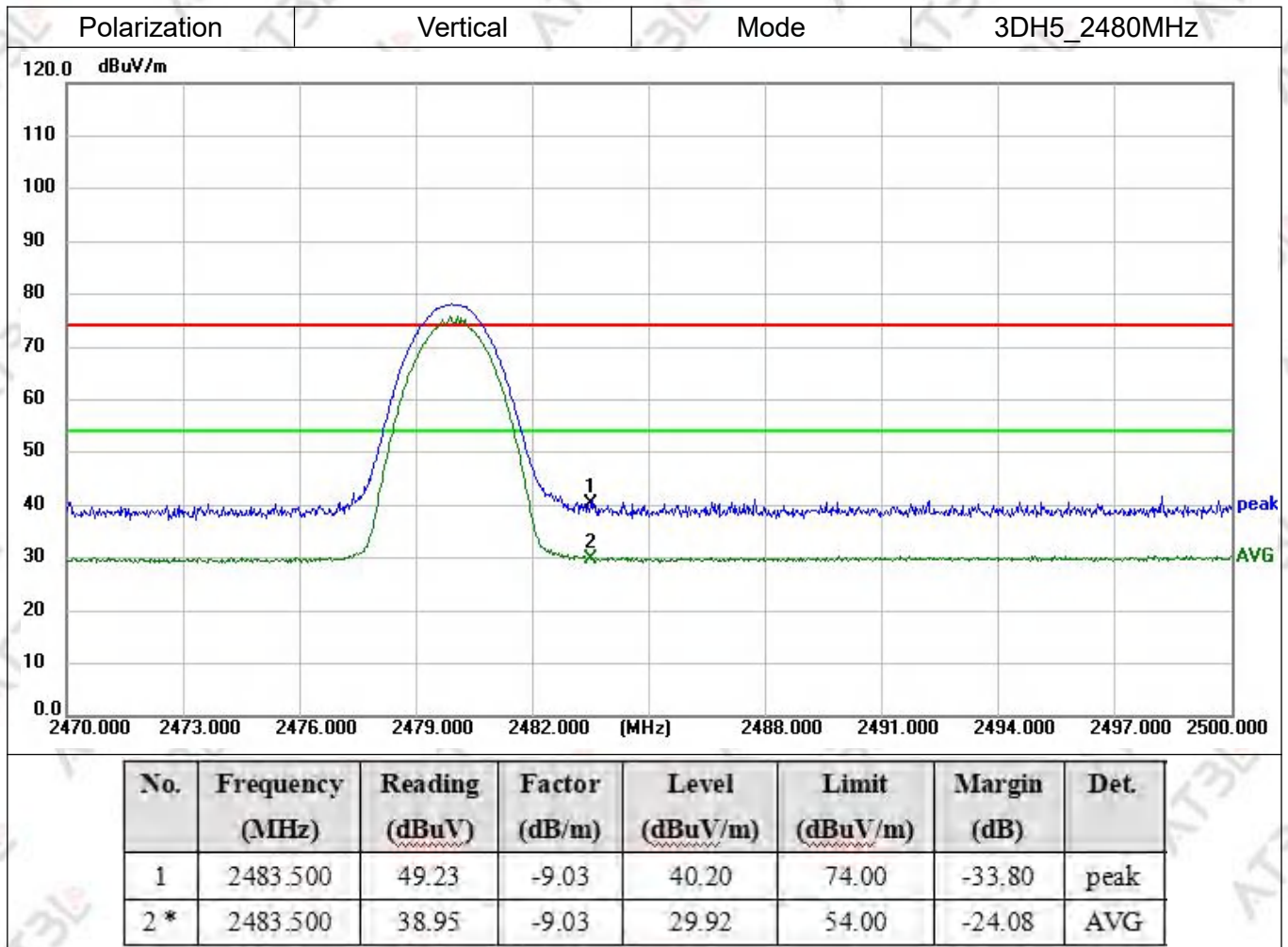
Note:

All modes have been tested, only worst case(3DH5)mode was recorded in the test report.





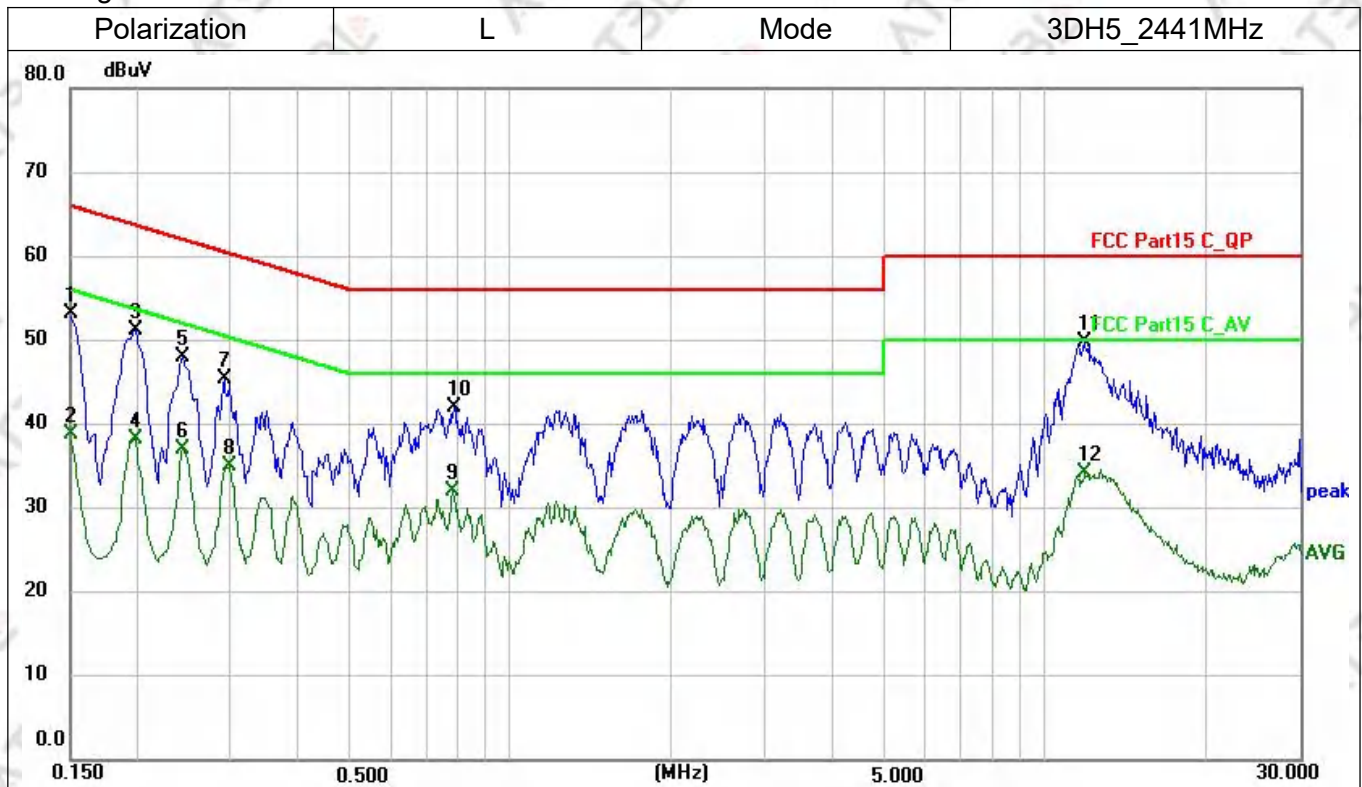




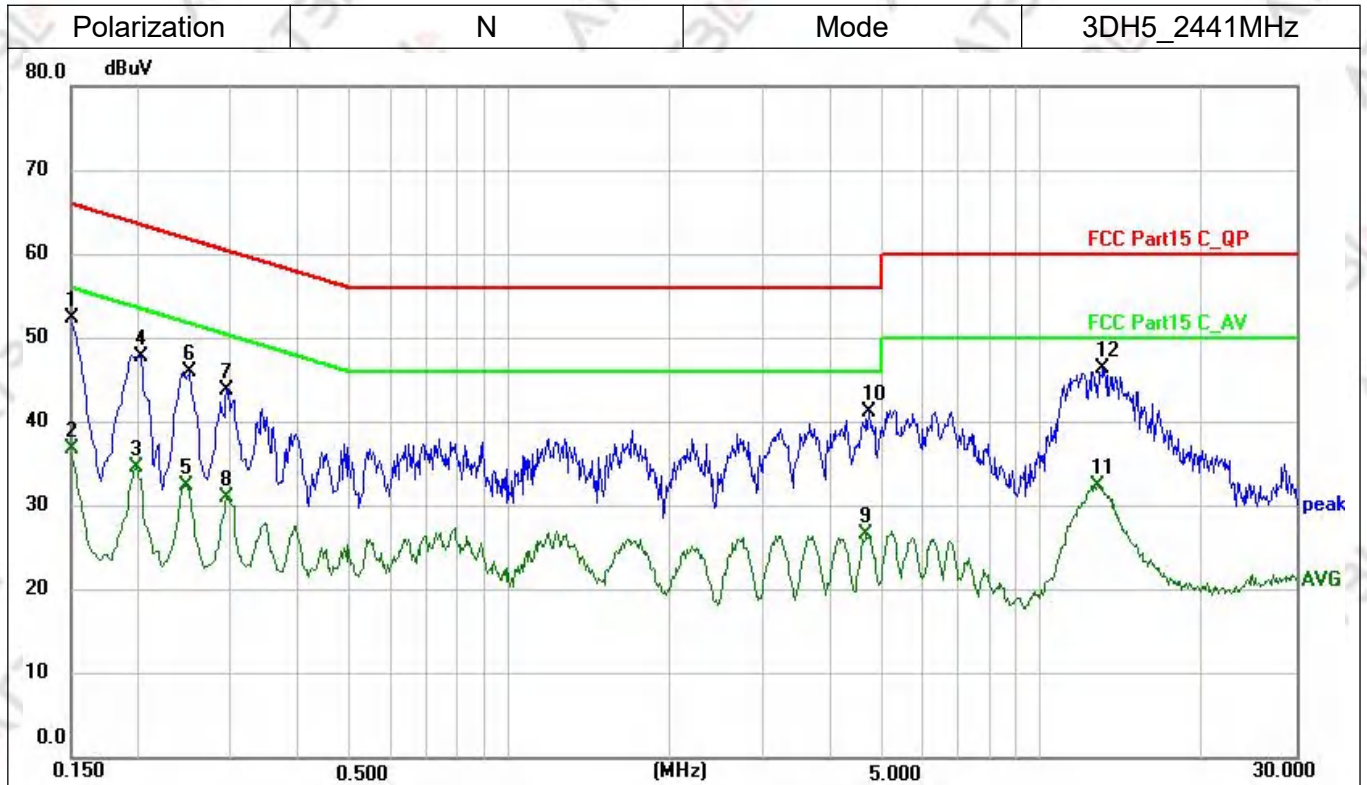
A7.AC Power-Line Conducted Emission

Note:

- 1.All modes have been tested, only worst case(3DH5_2441MHz)mode was recorded in the test report.
- 2.Emission Level= Reading Value+ Correction Factor.
- 3.Correction Factor= Insertion loss+ Cable Factor.
- 4.The emission levels of other frequencies were less than 20dB margin against the limit.
- 5.Margin value = Emission level-Limit value.



No.	Frequency (MHz)	Reading Level(dBuV)	Factor (dB)	Measure-ment(dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1500	33.39	19.75	53.14	66.00	-12.86	peak
2	0.1500	19.14	19.75	38.89	56.00	-17.11	AVG
3	0.1980	31.23	20.01	51.24	63.69	-12.45	peak
4	0.1980	18.27	20.01	38.28	53.69	-15.41	AVG
5	0.2420	28.12	19.95	48.07	62.03	-13.96	peak
6	0.2420	17.07	19.95	37.02	52.03	-15.01	AVG
7	0.2900	25.40	19.90	45.30	60.52	-15.22	peak
8	0.2980	15.03	19.90	34.93	50.30	-15.37	AVG
9	0.7820	12.21	19.75	31.96	46.00	-14.04	AVG
10	0.7860	22.32	19.75	42.07	56.00	-13.93	peak
11 *	11.8500	28.61	21.08	49.69	60.00	-10.31	peak
12	11.9180	13.06	21.09	34.15	50.00	-15.85	AVG



No.	Frequency (MHz)	Reading Level(dBuV)	Factor (dB)	Measurement(dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1500	32.60	19.75	52.35	66.00	-13.65	peak
2	0.1500	17.14	19.75	36.89	56.00	-19.11	AVG
3	0.1980	14.90	19.72	34.62	53.69	-19.07	AVG
4	0.2020	28.08	19.72	47.80	63.53	-15.73	peak
5	0.2460	12.77	19.74	32.51	51.89	-19.38	AVG
6	0.2500	26.19	19.74	45.93	61.76	-15.83	peak
7	0.2940	24.02	19.79	43.81	60.41	-16.60	peak
8	0.2940	11.33	19.79	31.12	50.41	-19.29	AVG
9	4.6860	6.27	20.36	26.63	46.00	-19.37	AVG
10	4.7380	20.84	20.36	41.20	56.00	-14.80	peak
11	12.7380	11.08	21.40	32.48	50.00	-17.52	AVG
12 *	13.0540	24.98	21.49	46.47	60.00	-13.53	peak

*****END*****