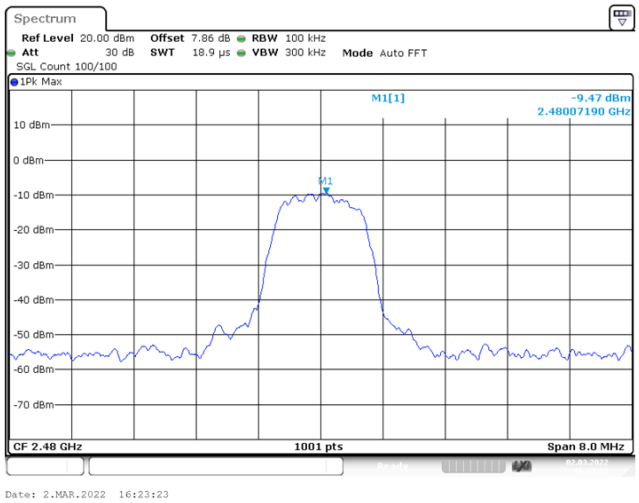
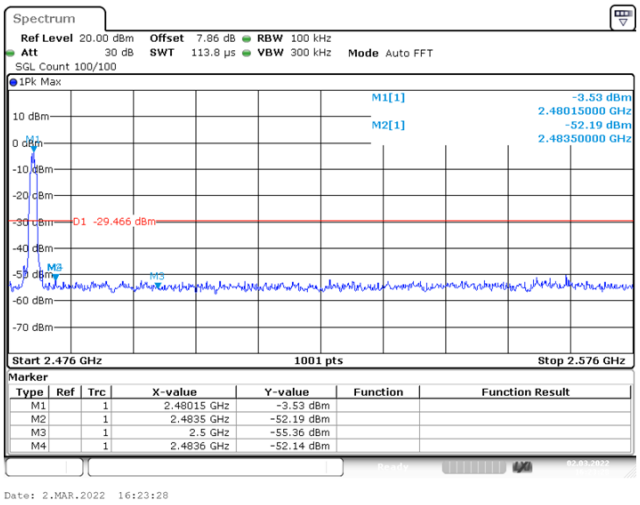
π/4-DQPSK

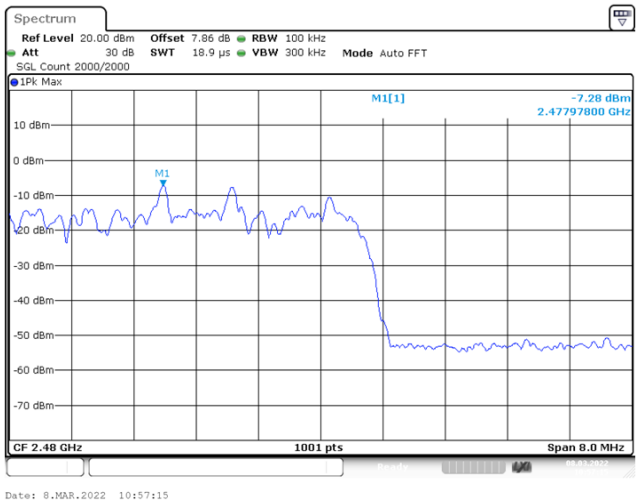
Highest Channel

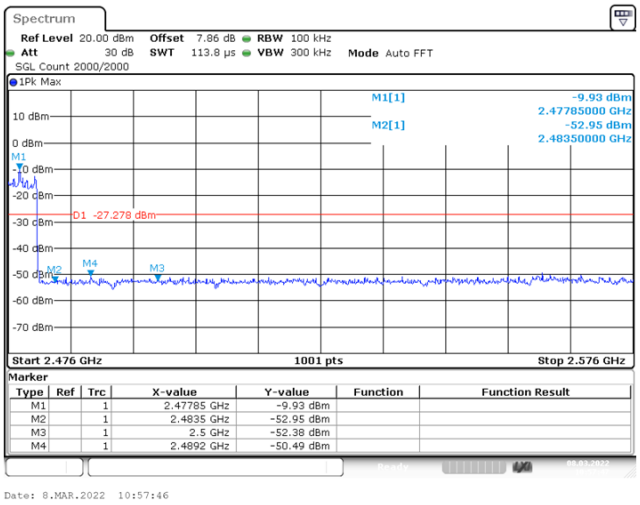




No-hopping mode

Highest Channel

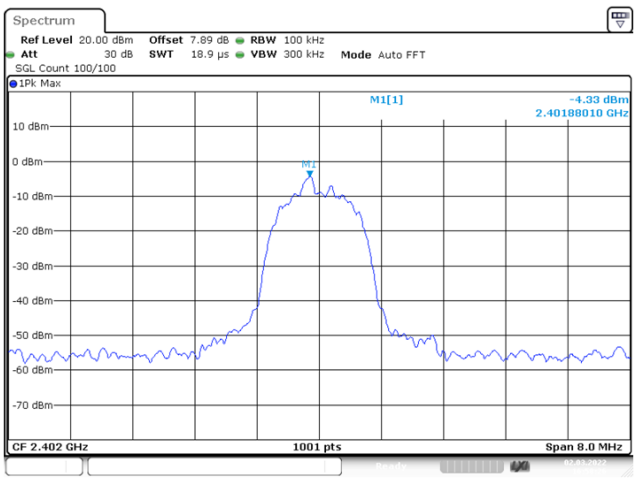


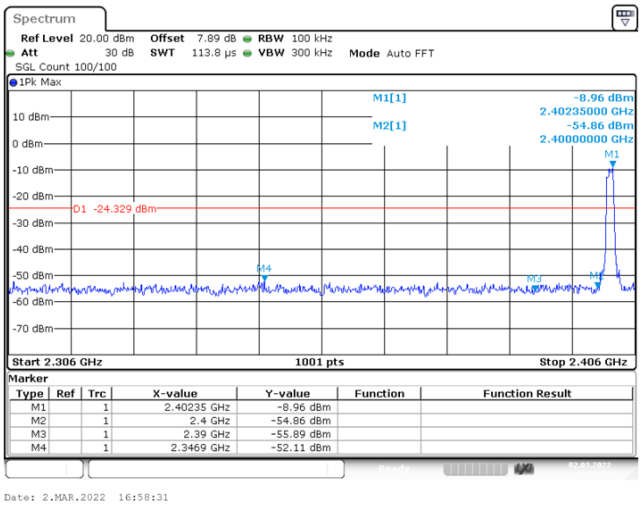


Hopping mode

8DPSK

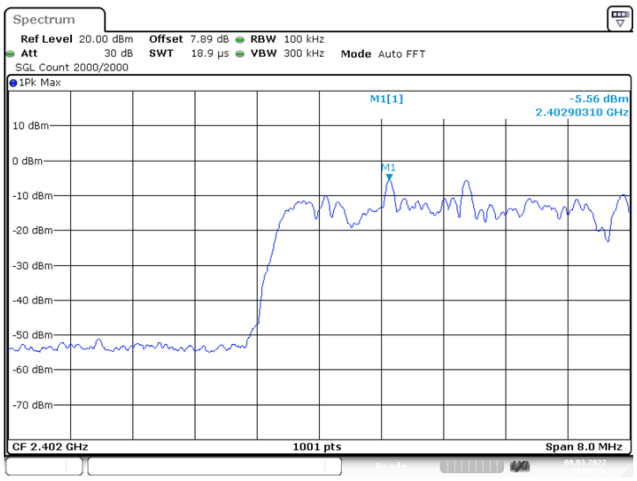
Lowest Channel

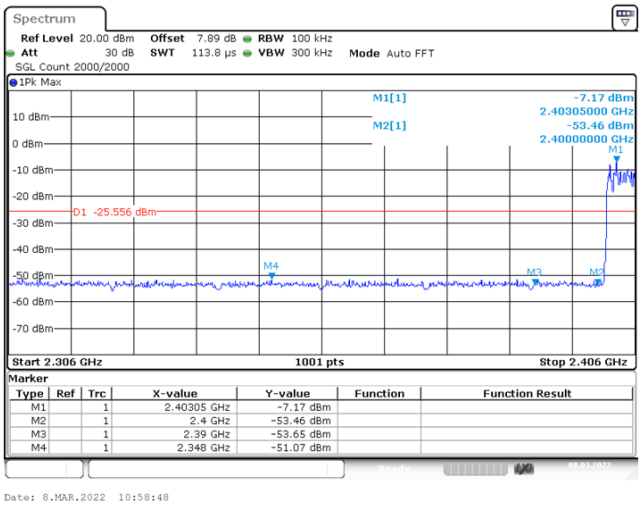




No-hopping mode

Lowest Channel

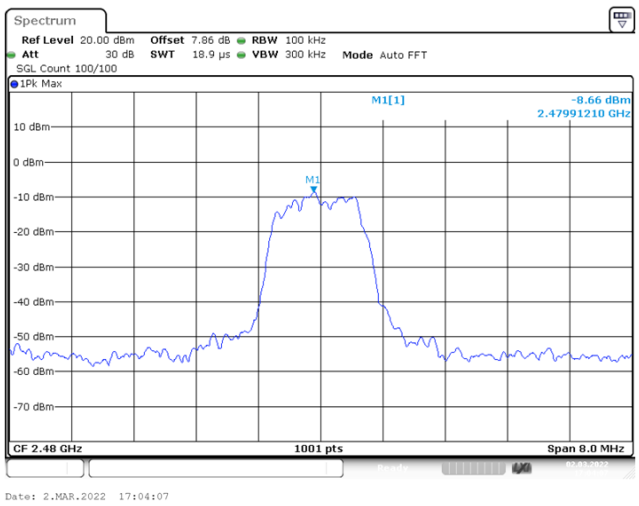


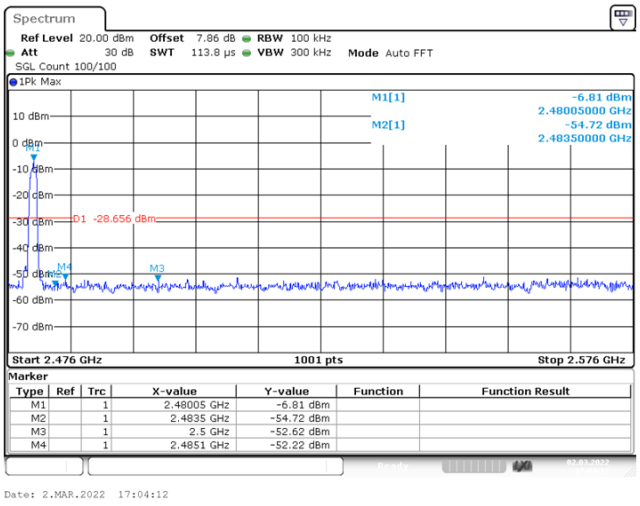


Hopping mode

8DPSK

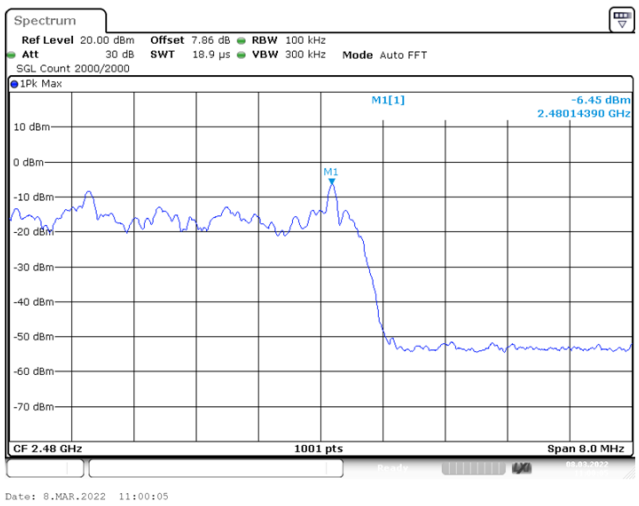
Highest Channel

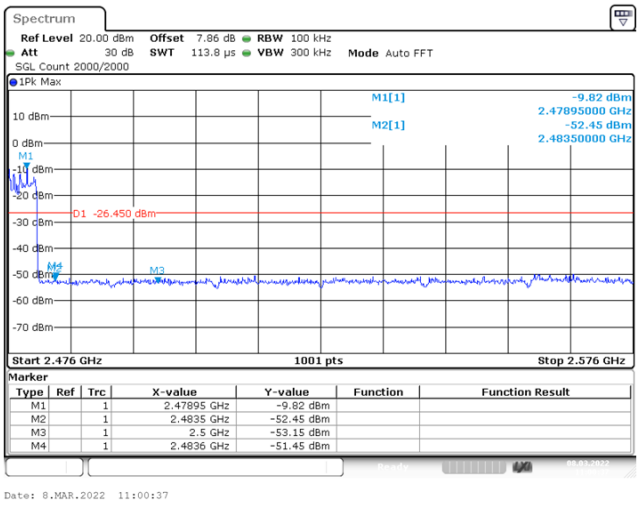




No-hopping mode

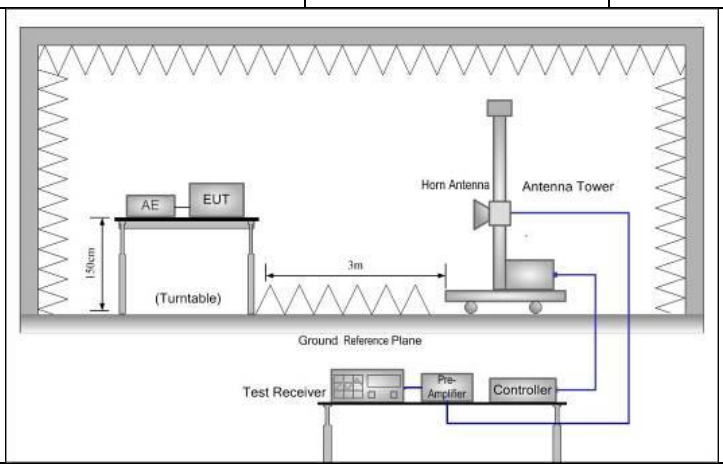
Highest Channel





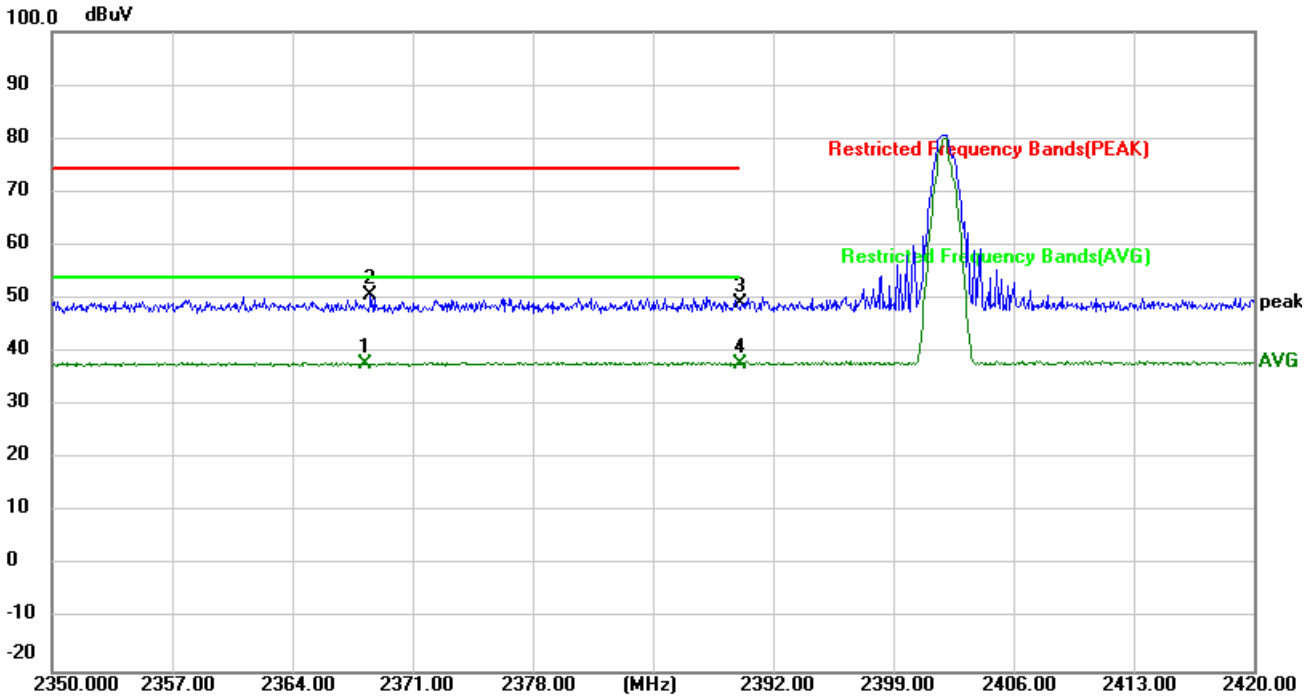
Hopping mode

5.9.2 Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.209 and 15.205				
Test Frequency Range:	2380 MHz to 2410 MHz and 2465 MHz to 2520 MHz				
TestDistance:	3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Remark
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
		RMS	1MHz	3MHz	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 1.5meters above the groundat a 3 meter camber. The table was rotated 360 degrees todetermine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, whichwas 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 thenthe antenna was tuned to heights from 1 meter to 4 meters and the rotatablewas turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and SpecifiedBandwidth 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 4.9 for details				
Test mode:	Non-hopping mode				
Test results:	Passed				

GFSK Mode:

Product Name:	Thermal Printer	Product Model:	PAPERANG-P3
Test By:	Raymon Zheng	Test mode:	DH5 Tx mode
Test Channel:	Lowest channel	Polarization:	Vertical
Test Voltage:	DC5V	Environment:	Temp:23.6℃ Humi: 48%

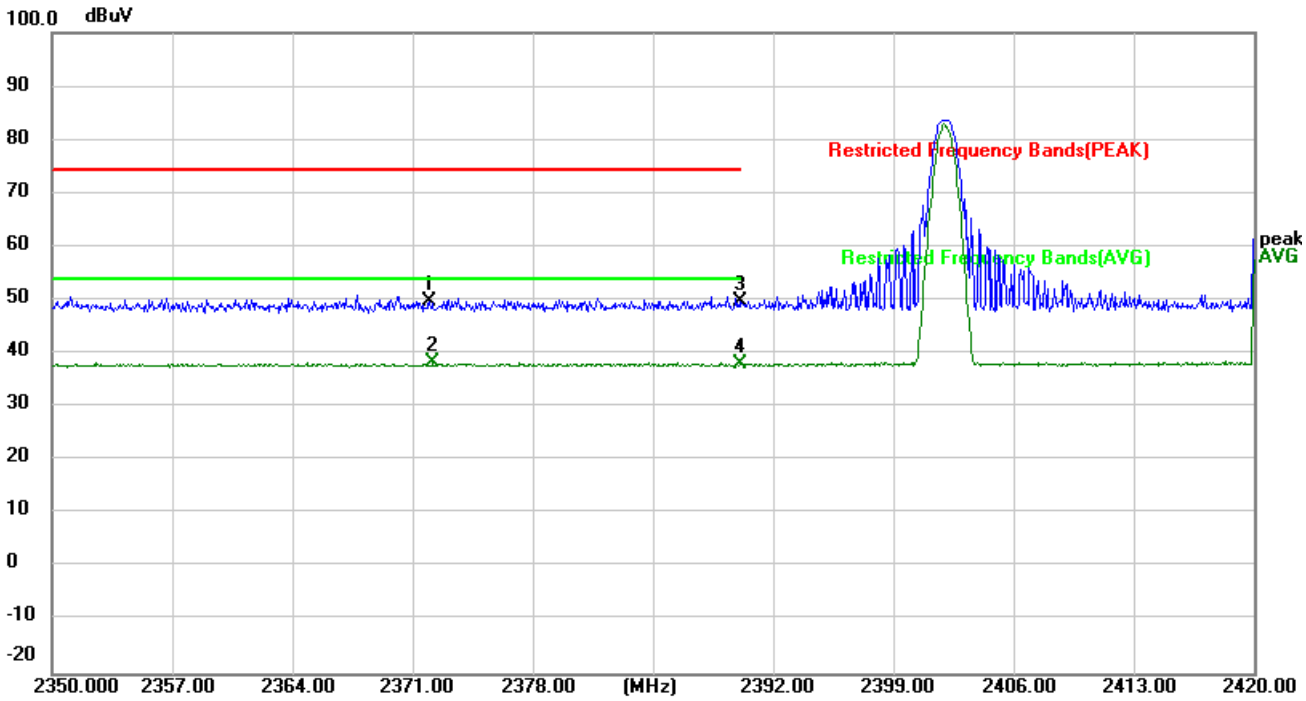


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1	*	2368.270	44.58	-6.68	37.90	54.00	16.10	AVG
2		2368.550	57.22	-6.68	50.54	74.00	23.46	peak
3		2390.000	55.80	-6.67	49.13	74.00	24.87	peak
4		2390.000	44.31	-6.67	37.64	54.00	16.36	AVG

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*

Product Name:	Thermal Printer	Product Model:	PAPERANG-P3
Test By:	Raymon Zheng	Test mode:	DH5Tx mode
Test Channel:	Lowest channel	Polarization:	Horizontal
Test Voltage:	DC5V	Environment:	Temp: 23.6℃ Humi: 48%

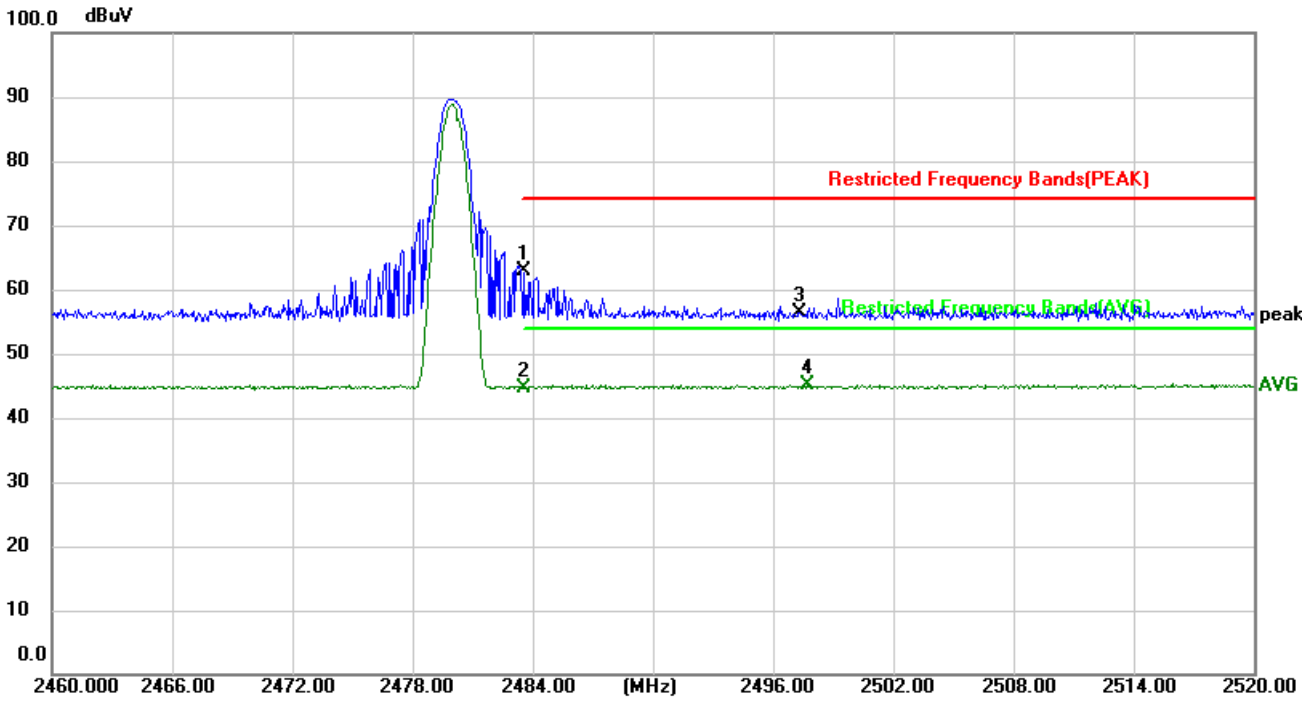


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		2371.980	56.57	-6.67	49.90	74.00	24.10	peak
2	*	2372.190	44.93	-6.67	38.26	54.00	15.74	AVG
3		2390.000	56.29	-6.67	49.62	74.00	24.38	peak
4		2390.000	44.69	-6.67	38.02	54.00	15.98	AVG

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*

Product Name:	Thermal Printer	Product Model:	PAPERANG-P3
Test By:	Raymon Zheng	Test mode:	DH5 Tx mode
Test Channel:	Highest channel	Polarization:	Vertical
Test Voltage:	DC5V	Environment:	Temp: 22.6℃ Humi: 49%

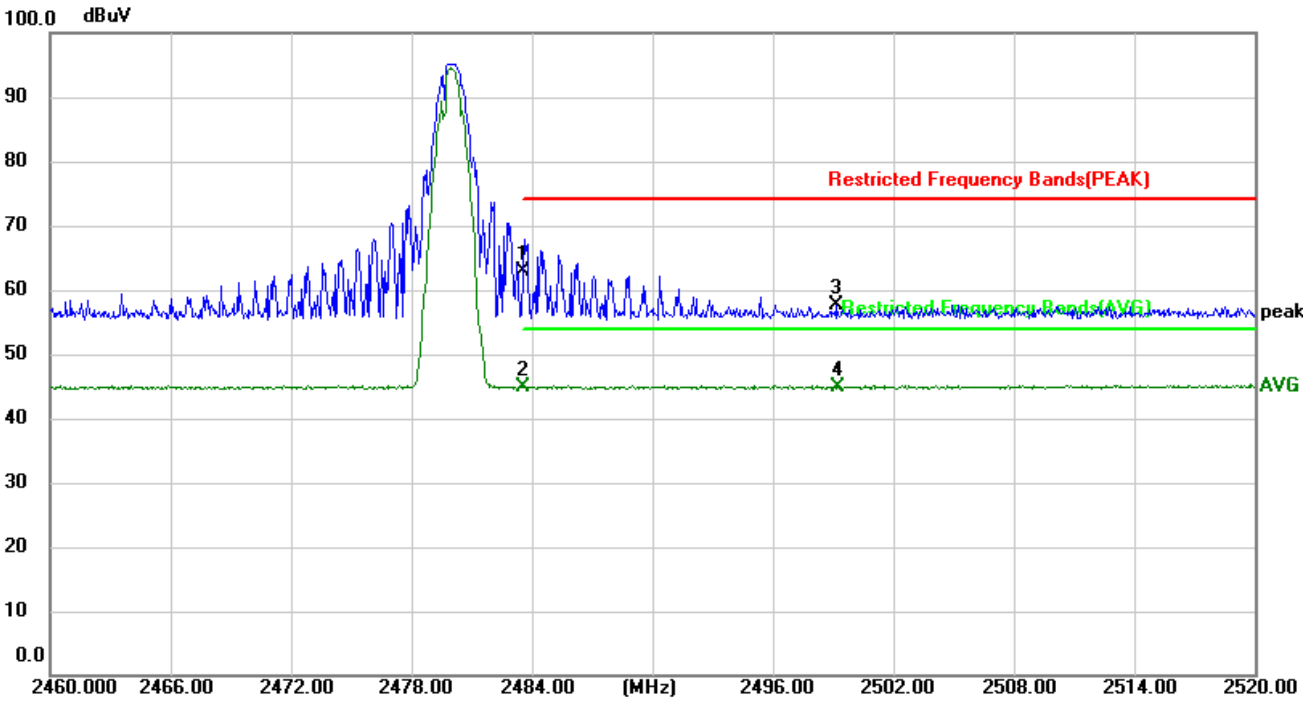


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		2483.500	63.22	-0.36	62.86	74.00	11.14	peak
2		2483.500	45.06	-0.36	44.70	54.00	9.30	AVG
3		2497.320	56.64	-0.36	56.28	74.00	17.72	peak
4	*	2497.680	45.49	-0.37	45.12	54.00	8.88	AVG

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*

Product Name:	Thermal Printer	Product Model:	PAPERANG-P3
Test By:	Raymon Zheng	Test mode:	DH5 Tx mode
Test Channel:	Highest channel	Polarization:	Horizontal
Test Voltage:	DC5V	Environment:	Temp:22.6℃ Humi: 49%



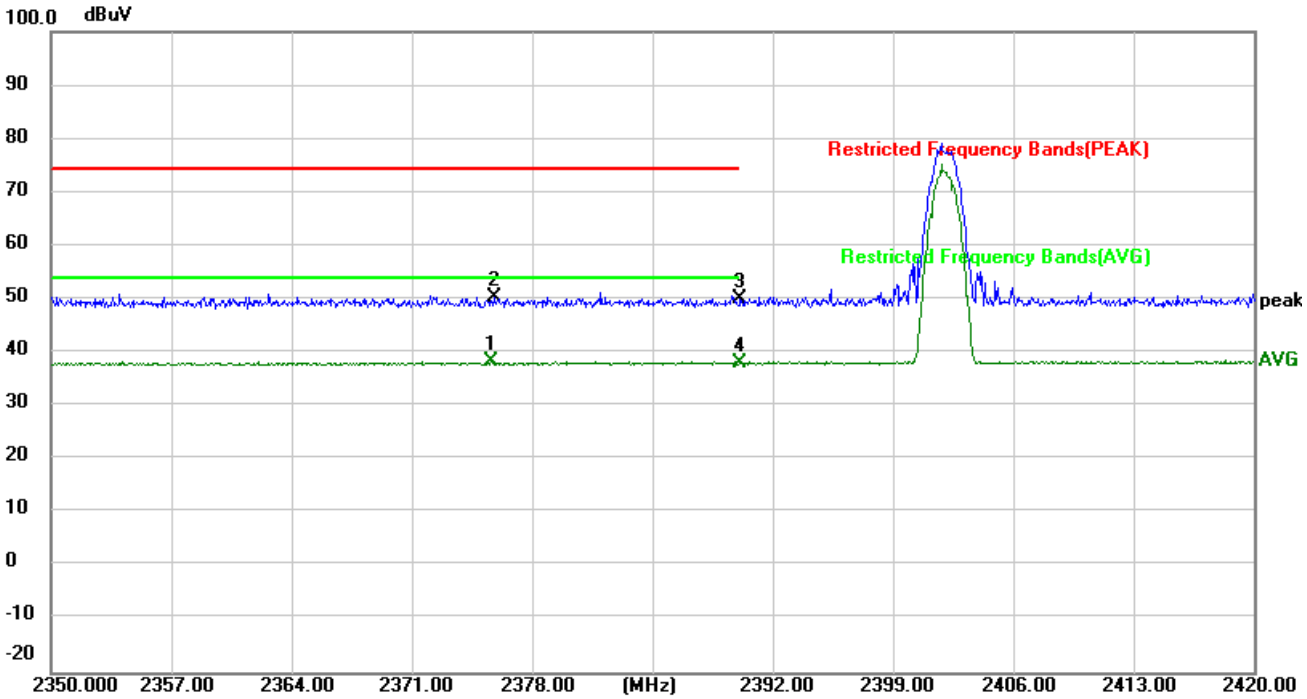
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		2483.500	63.18	-0.36	62.82	74.00	11.18	peak
2		2483.500	45.27	-0.36	44.91	54.00	9.09	AVG
3		2499.180	58.00	-0.37	57.63	74.00	16.37	peak
4	*	2499.240	45.32	-0.37	44.95	54.00	9.05	AVG

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*

π/4-DQPSK mode

Product Name:	Thermal Printer	Product Model:	PAPERANG-P3
Test By:	Raymon Zheng	Test mode:	2DH5 Tx mode
Test Channel:	Lowest channel	Polarization:	Vertical
Test Voltage:	DC5V	Environment:	Temp:23.6℃ Humi: 48%

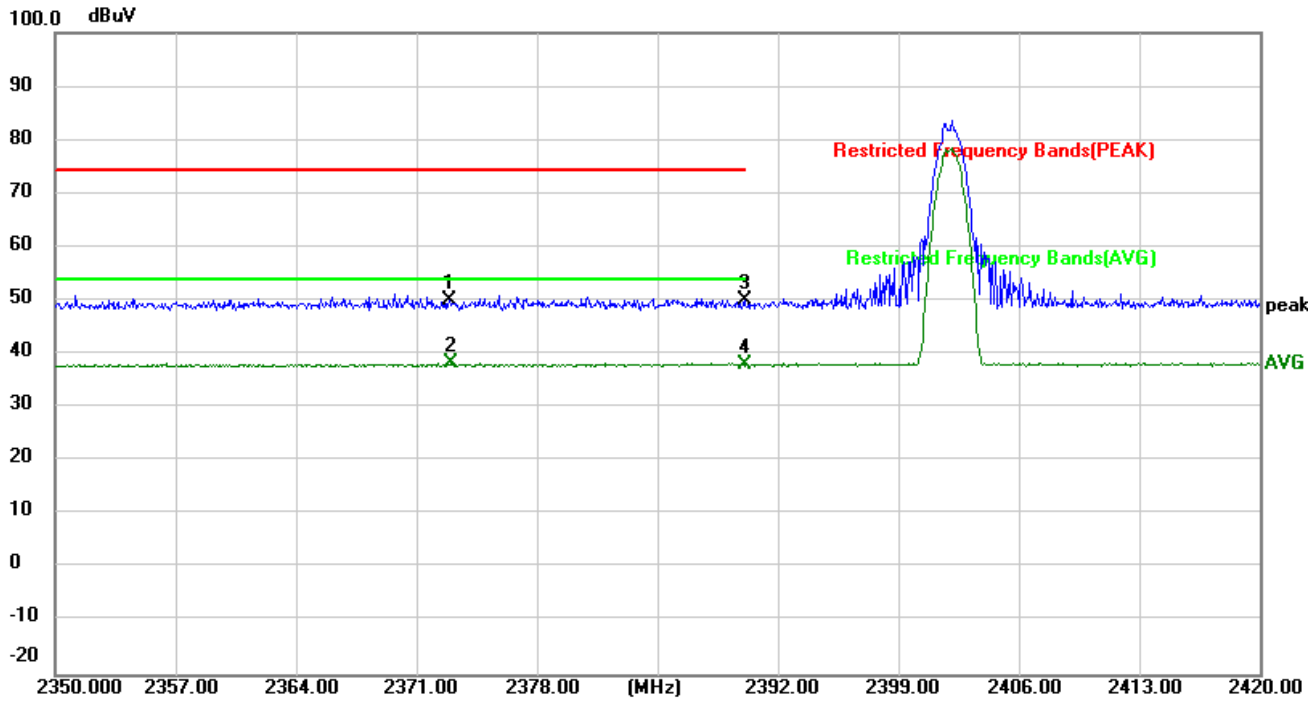


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1	*	2375.620	44.89	-6.68	38.21	54.00	15.79	AVG
2		2375.760	56.89	-6.68	50.21	74.00	23.79	peak
3		2390.000	56.64	-6.67	49.97	74.00	24.03	peak
4		2390.000	44.68	-6.67	38.01	54.00	15.99	AVG

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*

Product Name:	Thermal Printer	Product Model:	PAPERANG-P3
Test By:	Raymon Zheng	Test mode:	2DH5 Tx mode
Test Channel:	Lowest channel	Polarization:	Horizontal
Test Voltage:	DC5V	Environment:	Temp:23.6℃ Humi: 48%

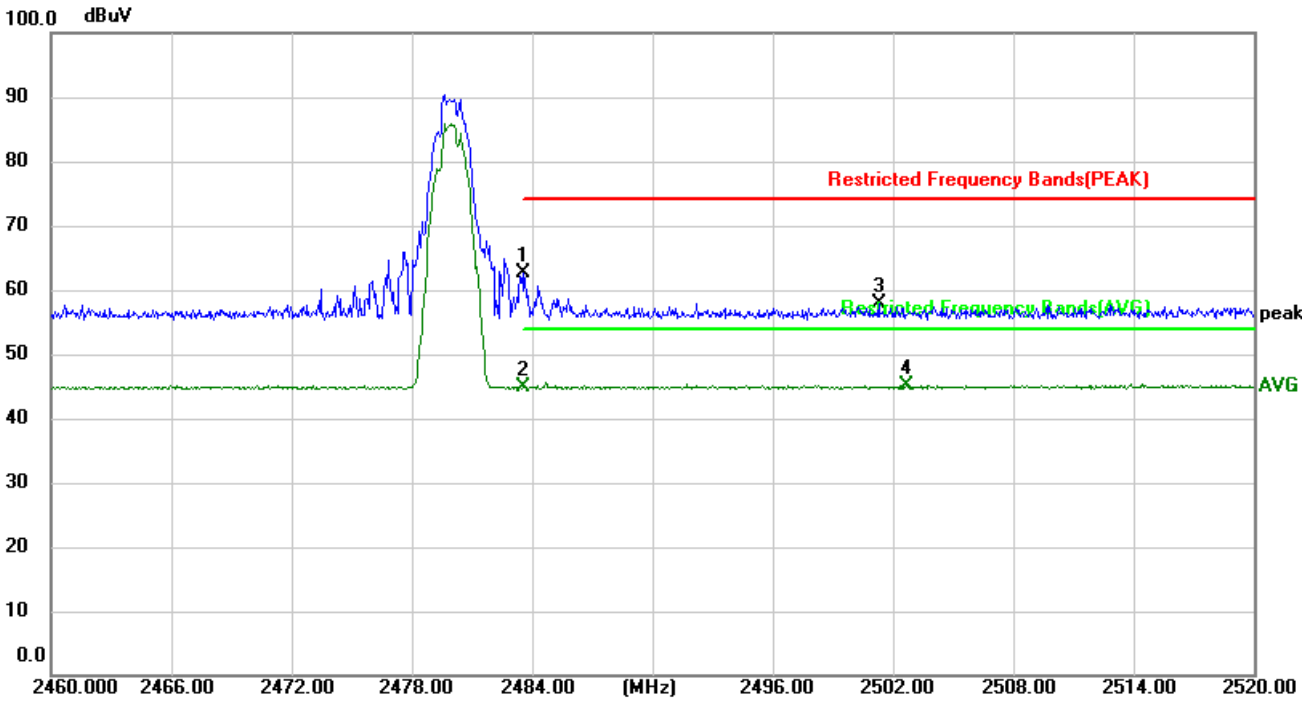


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		2372.890	56.73	-6.67	50.06	74.00	23.94	peak
2	*	2373.030	44.93	-6.67	38.26	54.00	15.74	AVG
3		2390.000	56.66	-6.67	49.99	74.00	24.01	peak
4		2390.000	44.58	-6.67	37.91	54.00	16.09	AVG

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*

Product Name:	Thermal Printer	Product Model:	PAPERANG-P3
Test By:	Raymon Zheng	Test mode:	2DH5 Tx mode
Test Channel:	Highest channel	Polarization:	Vertical
Test Voltage:	DC5V	Environment:	Temp:22.6℃ Humi: 49%

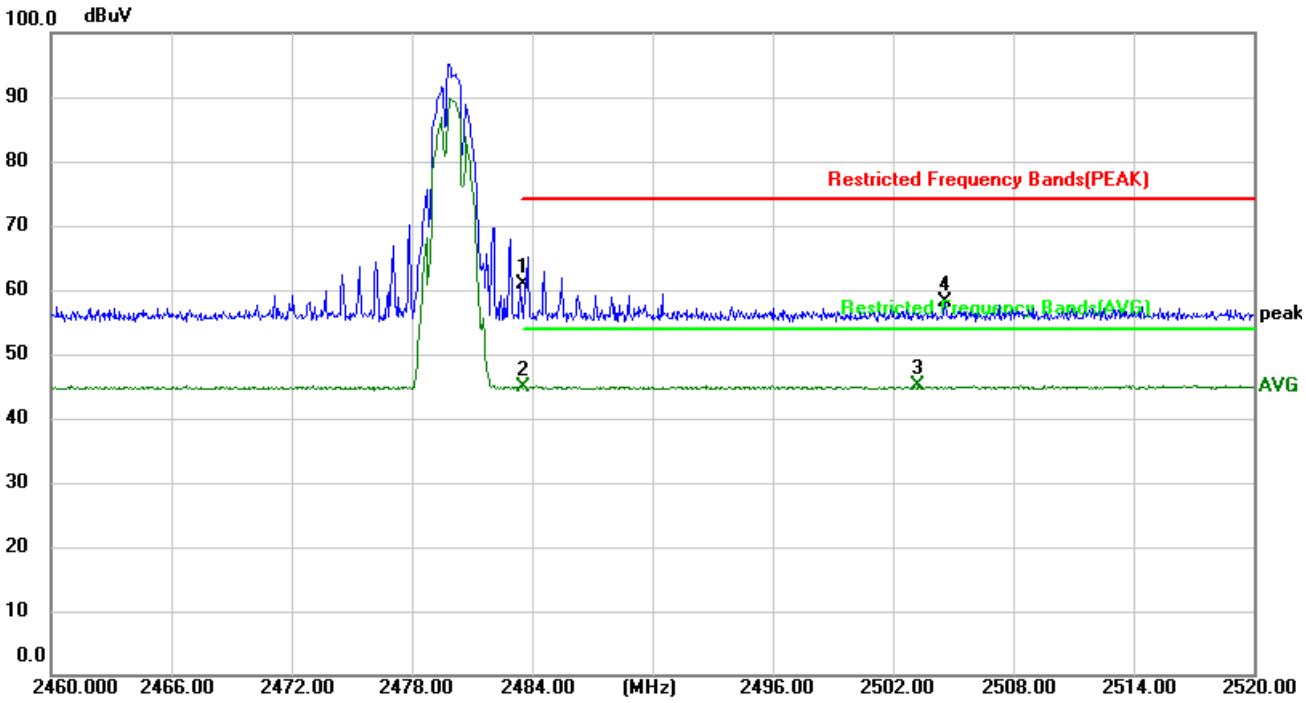


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		2483.500	62.95	-0.36	62.59	74.00	11.41	peak
2		2483.500	45.29	-0.36	44.93	54.00	9.07	AVG
3		2501.280	58.37	-0.37	58.00	74.00	16.00	peak
4	*	2502.660	45.60	-0.37	45.23	54.00	8.77	AVG

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*

Product Name:	Thermal Printer	Product Model:	PAPERANG-P3
Test By:	Raymon Zheng	Test mode:	2DH5 Tx mode
Test Channel:	Highest channel	Polarization:	Horizontal
Test Voltage:	DC5V	Environment:	Temp:22.6℃ Humi: 49%



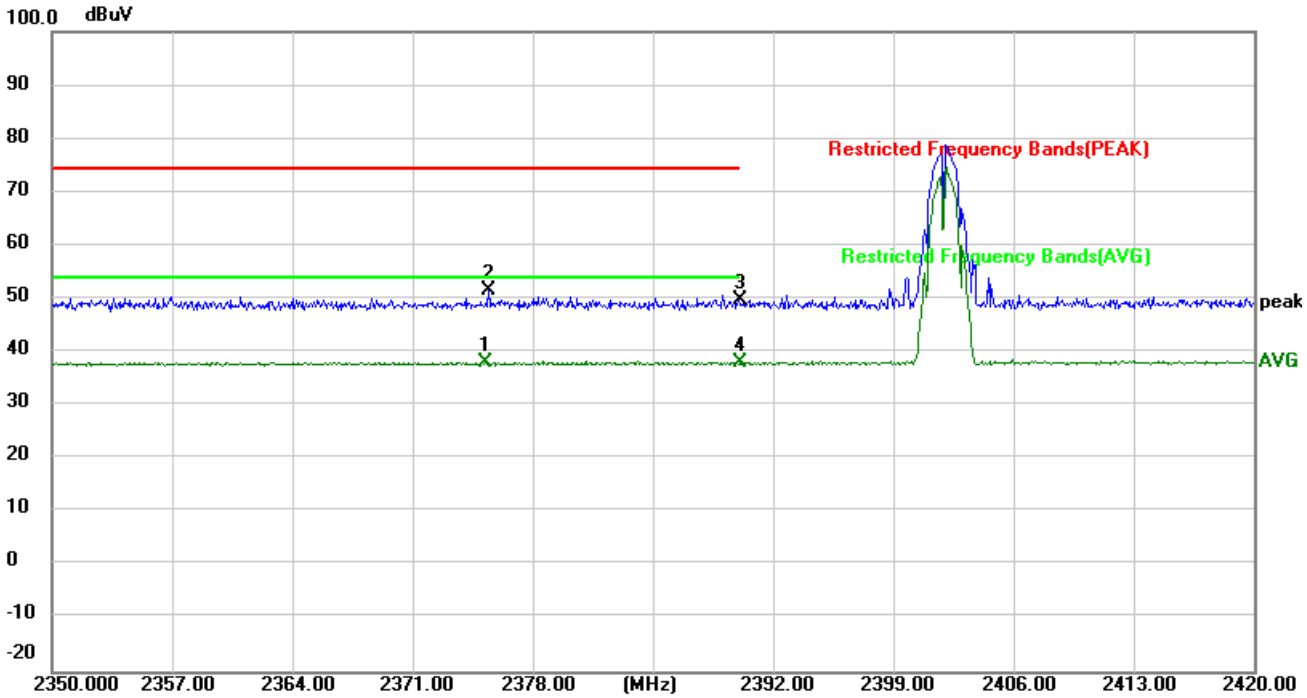
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		2483.500	61.14	-0.36	60.78	74.00	13.22	peak
2		2483.500	45.28	-0.36	44.92	54.00	9.08	AVG
3	*	2503.260	45.44	-0.37	45.07	54.00	8.93	AVG
4		2504.580	58.40	-0.36	58.04	74.00	15.96	peak

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*

8DPSK mode

Product Name:	Thermal Printer	Product Model:	PAPERANG-P3
Test By:	Raymon Zheng	Test mode:	3DH5 Tx mode
Test Channel:	Lowest channel	Polarization:	Vertical
Test Voltage:	DC5V	Environment:	Temp:23.6℃ Humi: 48%

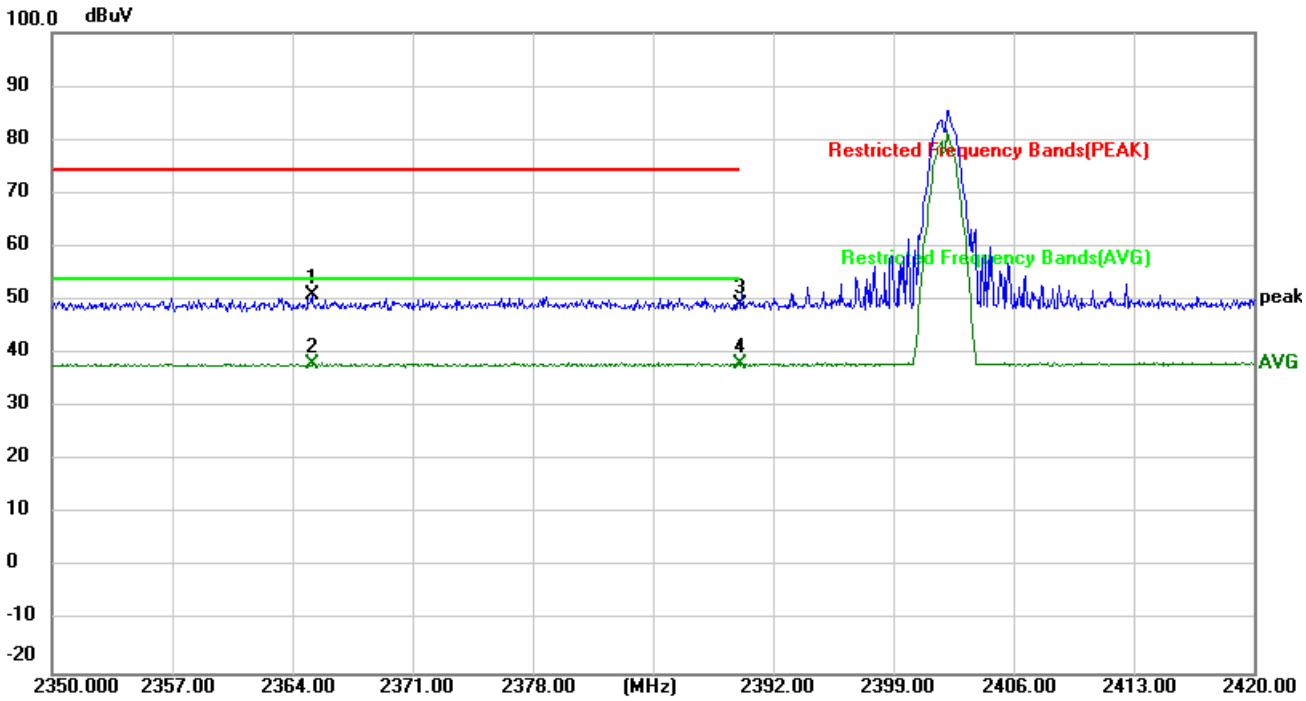


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1	*	2375.200	44.76	-6.68	38.08	54.00	15.92	AVG
2		2375.410	58.18	-6.68	51.50	74.00	22.50	peak
3		2390.000	56.55	-6.67	49.88	74.00	24.12	peak
4		2390.000	44.61	-6.67	37.94	54.00	16.06	AVG

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*

Product Name:	Thermal Printer	Product Model:	PAPERANG-P3
Test By:	Raymon Zheng	Test mode:	3DH5 Tx mode
Test Channel:	Lowest channel	Polarization:	Horizontal
Test Voltage:	DC5V	Environment:	Temp:23.6℃ Humi: 48%

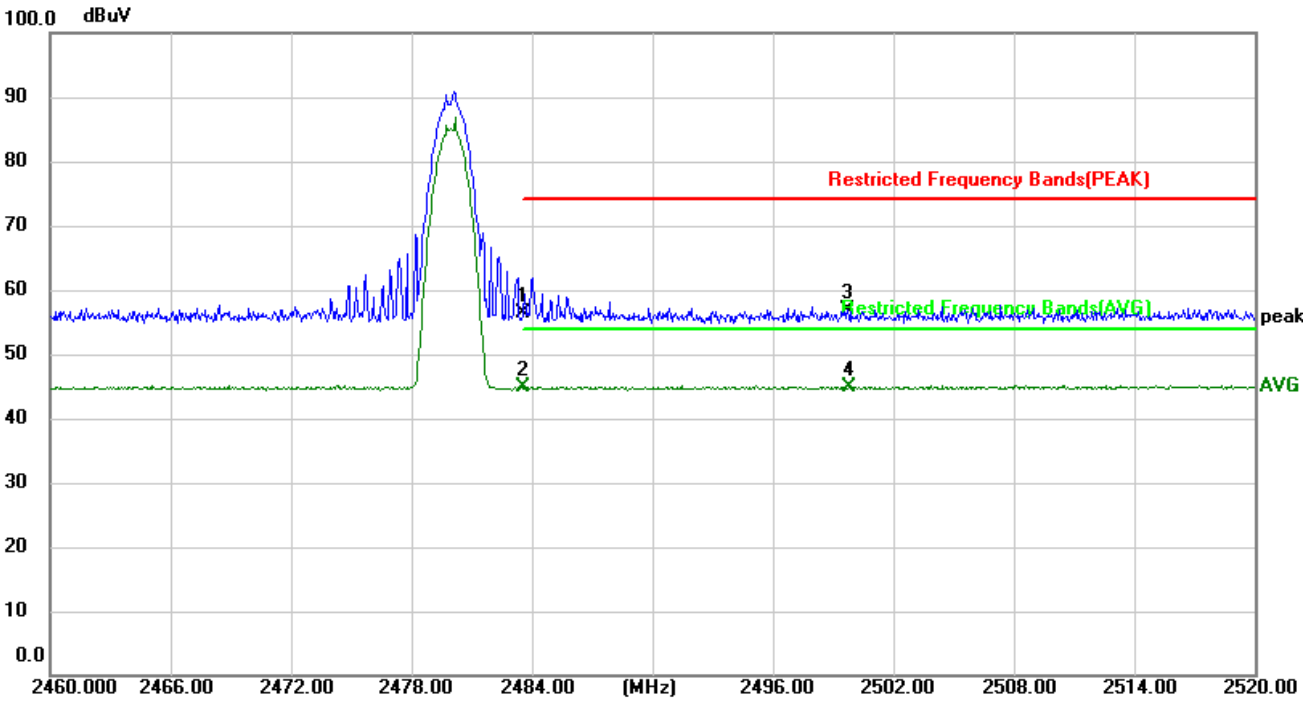


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		2365.120	57.70	-6.68	51.02	74.00	22.98	peak
2		2365.120	44.64	-6.68	37.96	54.00	16.04	AVG
3		2390.000	55.81	-6.67	49.14	74.00	24.86	peak
4	*	2390.000	44.71	-6.67	38.04	54.00	15.96	AVG

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*

Product Name:	Thermal Printer	Product Model:	PAPERANG-P3
Test By:	Raymon Zheng	Test mode:	3DH5 Tx mode
Test Channel:	Highest channel	Polarization:	Vertical
Test Voltage:	DC5V	Environment:	Temp:22.6℃ Humi: 49%

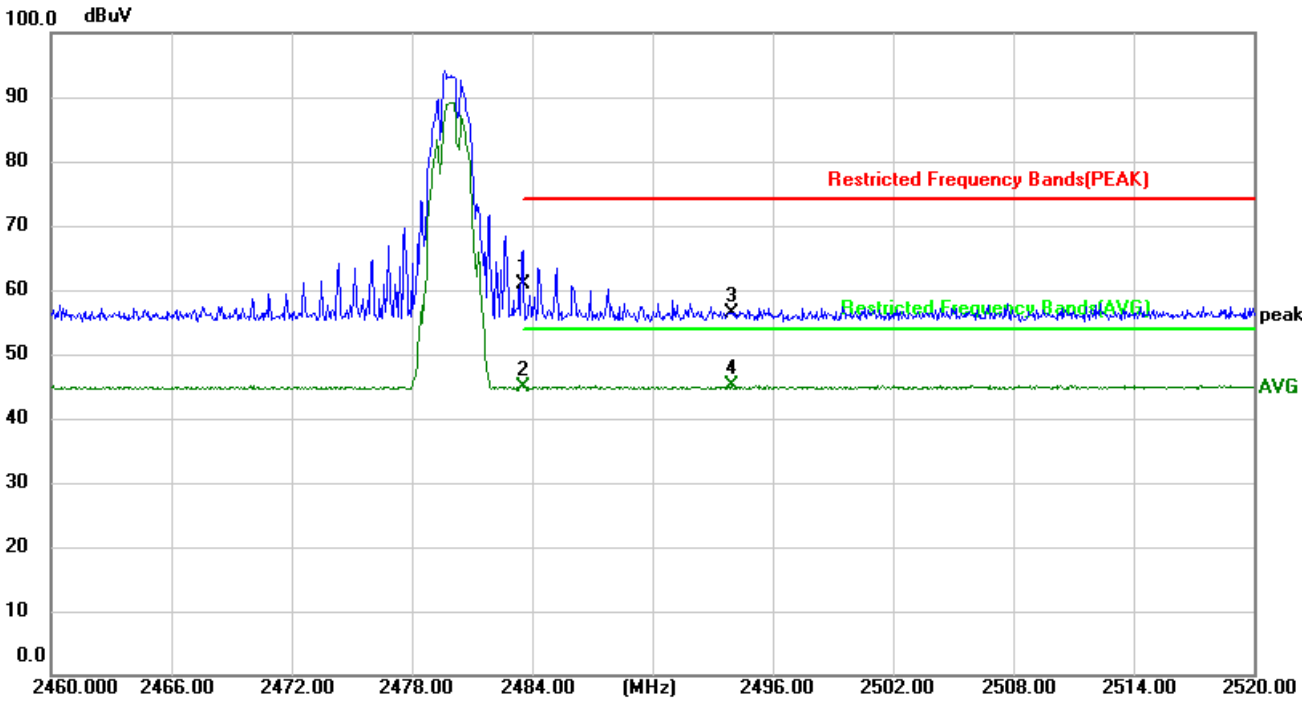


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		2483.500	56.77	-0.36	56.41	74.00	17.59	peak
2		2483.500	45.27	-0.36	44.91	54.00	9.09	AVG
3		2499.720	57.15	-0.37	56.78	74.00	17.22	peak
4	*	2499.780	45.30	-0.37	44.93	54.00	9.07	AVG

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*

Product Name:	Thermal Printer	Product Model:	PAPERANG-P3
Test By:	Raymon Zheng	Test mode:	3DH5 Tx mode
Test Channel:	Highest channel	Polarization:	Horizontal
Test Voltage:	DC5V	Environment:	Temp:22.6℃ Humi: 49%



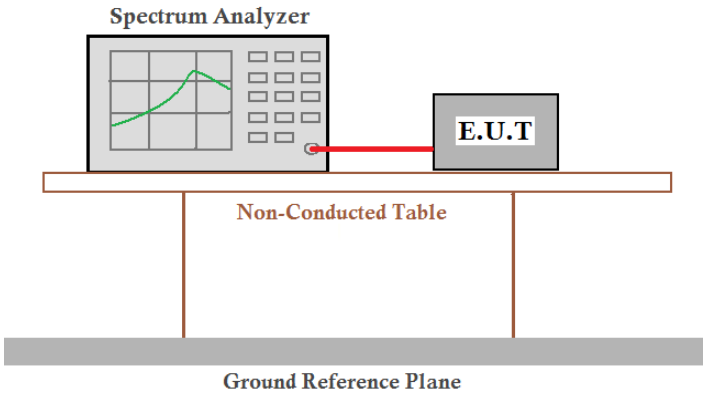
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		2483.500	61.22	-0.36	60.86	74.00	13.14	peak
2		2483.500	45.17	-0.36	44.81	54.00	9.19	AVG
3		2493.960	56.69	-0.37	56.32	74.00	17.68	peak
4	*	2493.960	45.46	-0.37	45.09	54.00	8.91	AVG

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*

5.10 Spurious Emission

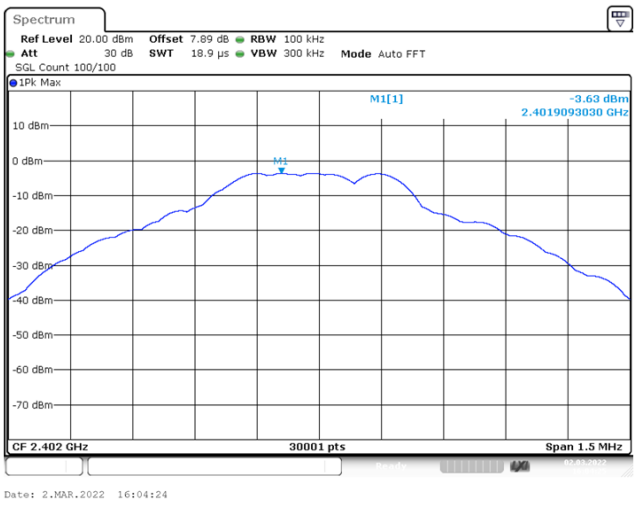
5.10.1 Conducted Emission Method

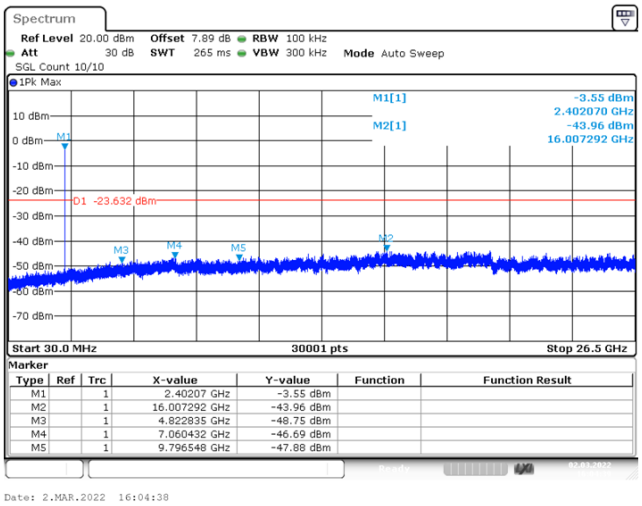
Test Requirement:	FCC Part15 C Section 15.247 (d)
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Test setup:	
Test Instruments:	Refer to section 4.9 for details
Test mode:	Non-hopping mode
Test results:	Pass

Test plot as follows:

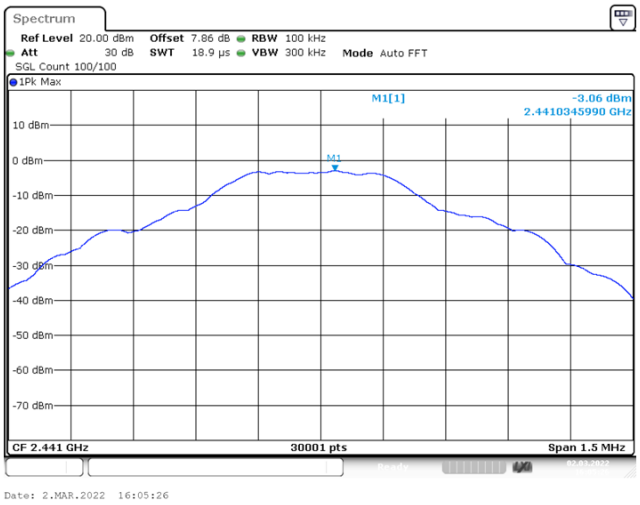
GFSK

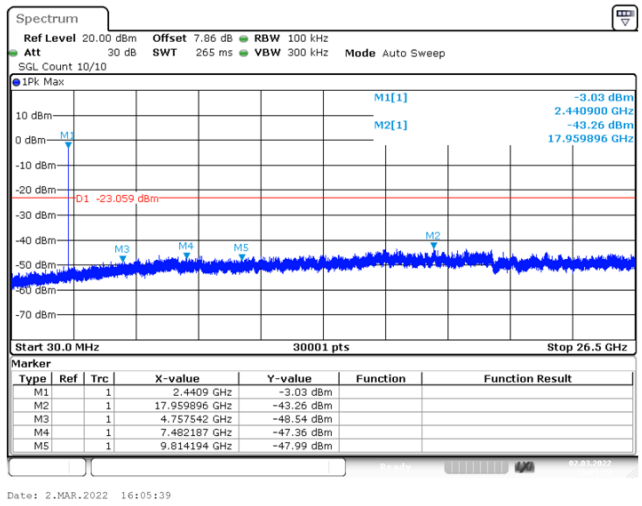
Lowest Channel



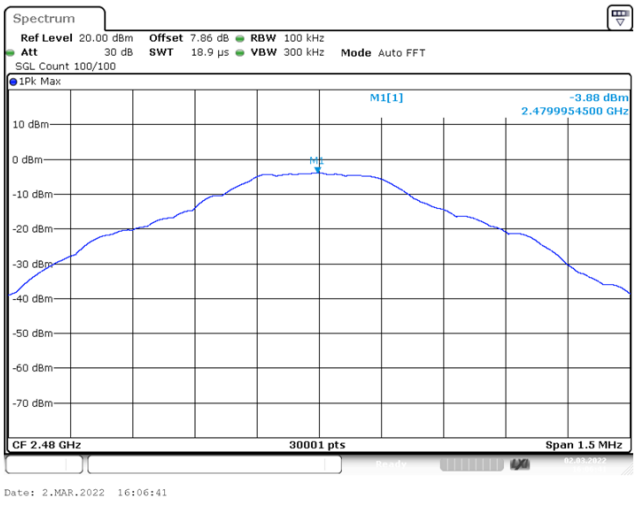


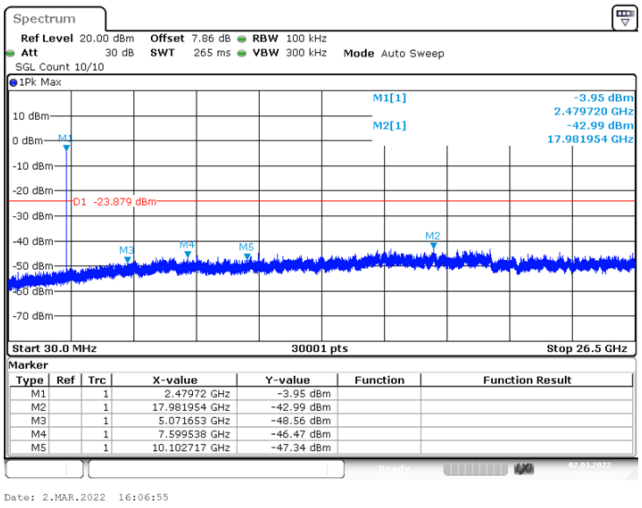
Middle channel





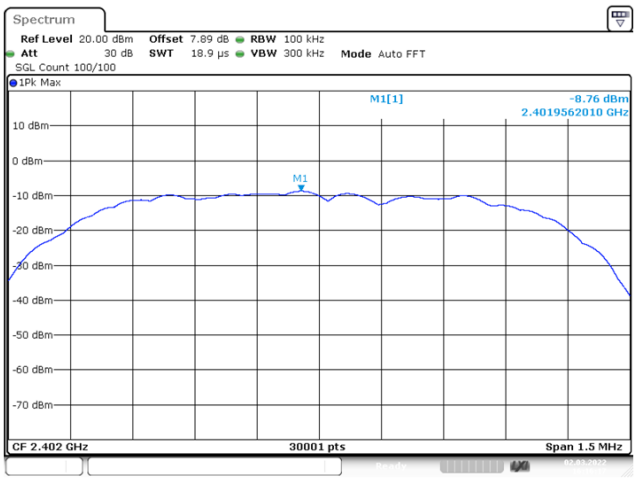
Highest Channel





π/4-DQPSK

Lowest Channel



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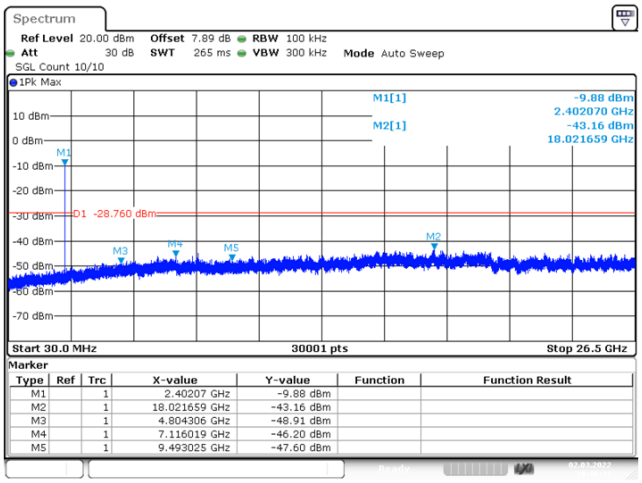

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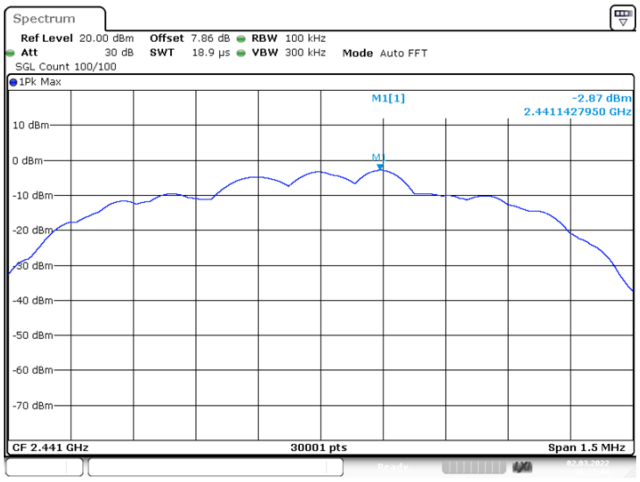
Middle channel



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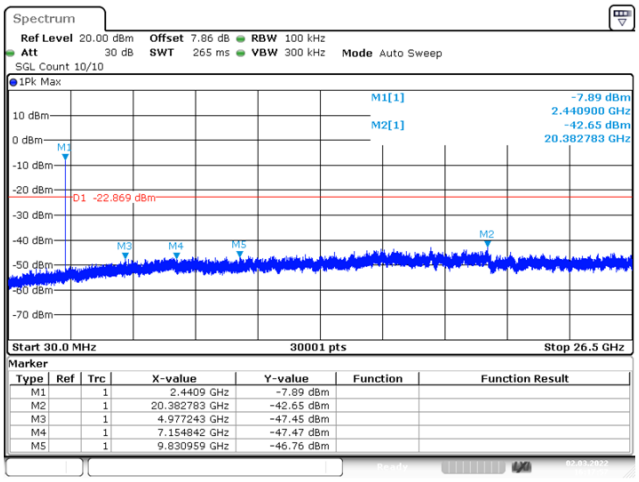

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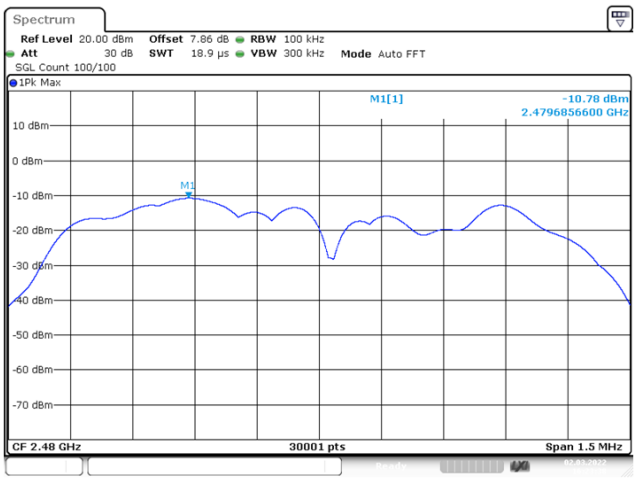
Highest Channel



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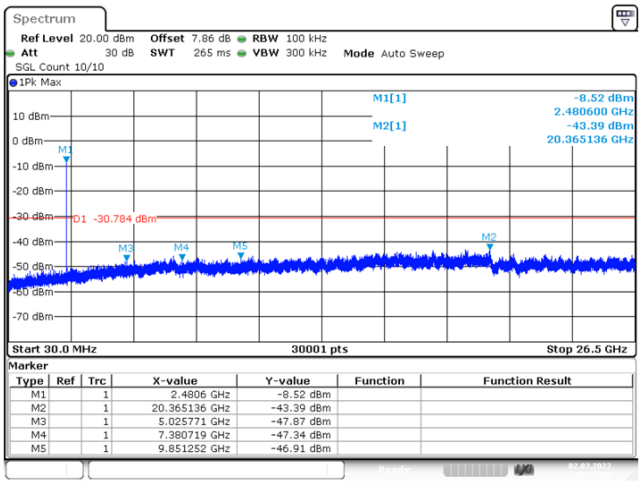

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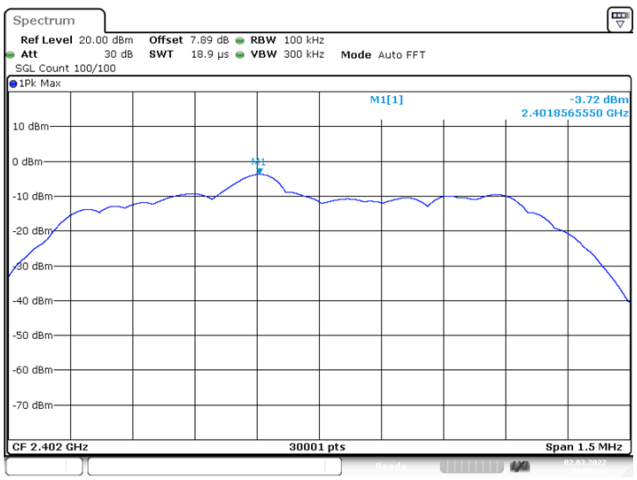
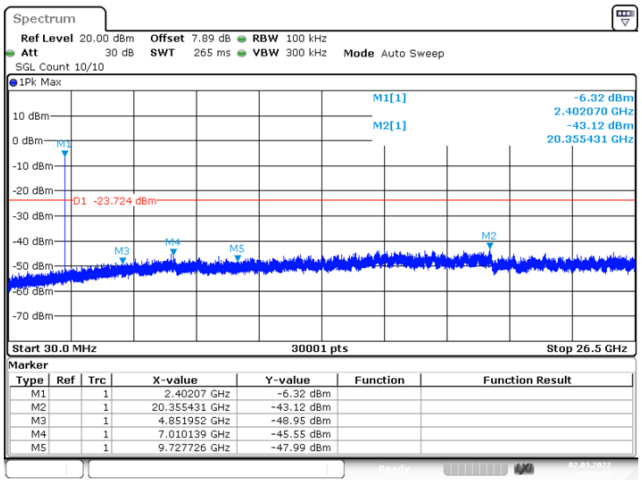
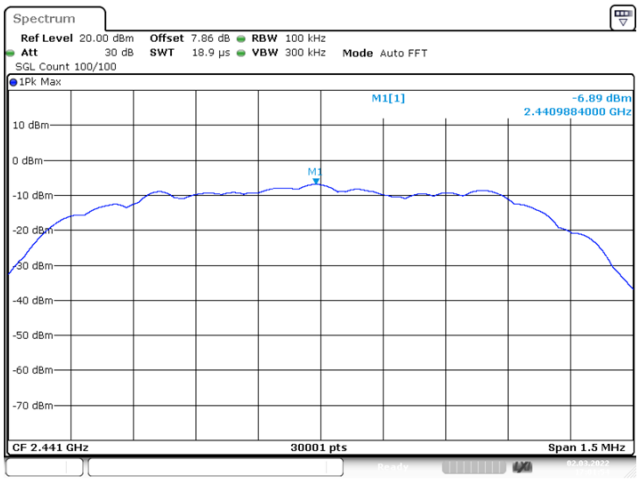
8DPSK

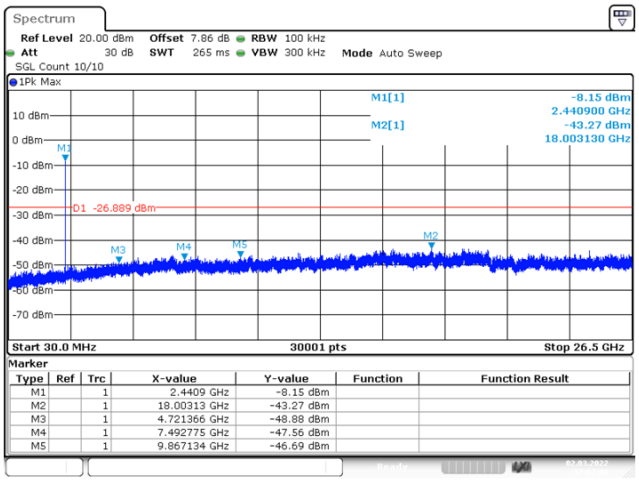
Lowest Channel



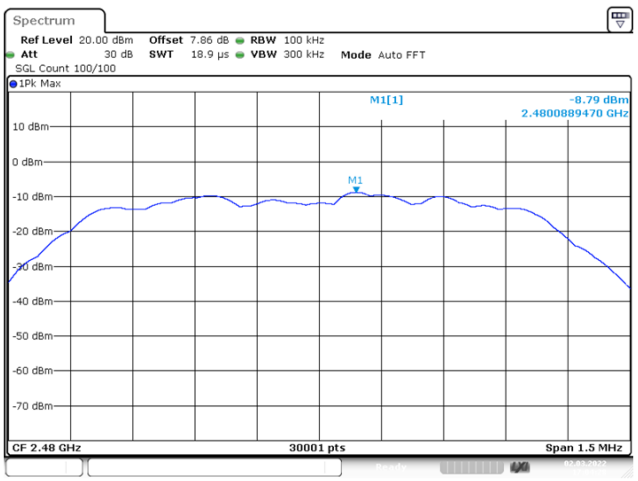


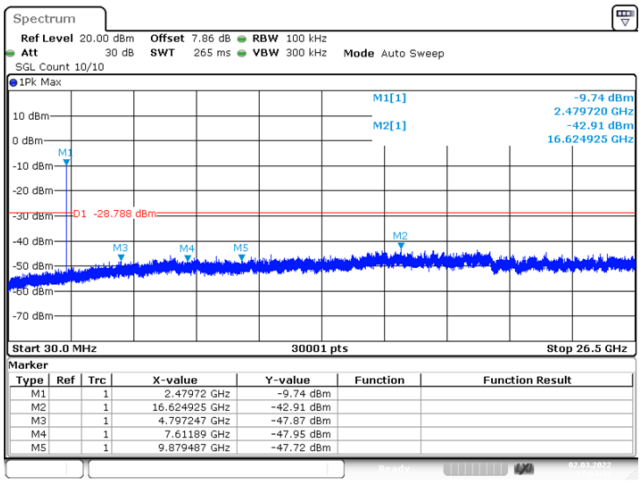
Middle channel





Highest Channel





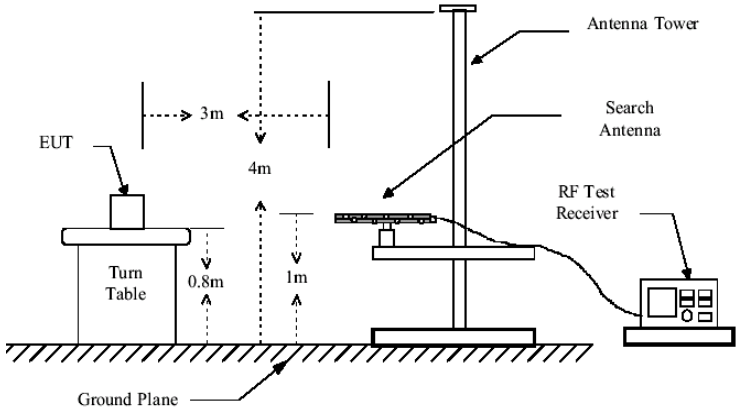
5.10.2 Radiated Emission Method

Test Requirement:	FCC Part15 C Section 15.209				
Test Frequency Range:	9kHz to 25GHz				
TestDistance:	3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Remark
	30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
		RMS	1MHz	3MHz	Average Value

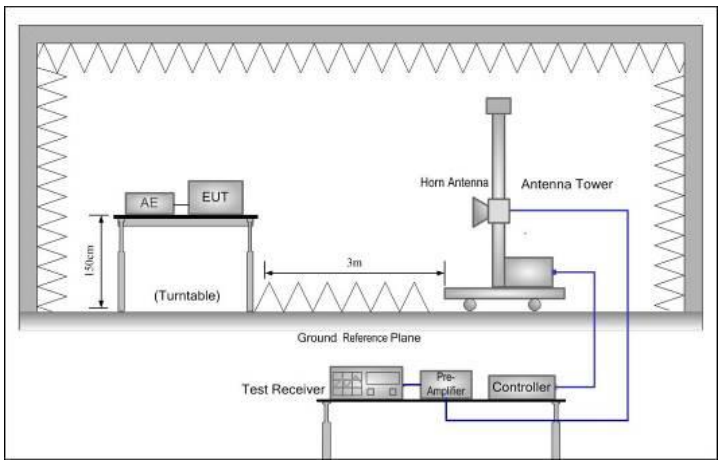
Limit:	Frequency	Limit (dBuV/m @3m)	Remark
	30MHz-88MHz	40.0	Quasi-peak Value
	88MHz-216MHz	43.5	Quasi-peak Value
	216MHz-960MHz	46.0	Quasi-peak Value
	960MHz-1GHz	54.0	Quasi-peak Value
	Above 1GHz	54.0	Average Value
		74.0	Peak Value

Test setup:

Below 1GHz



Above 1GHz



Test Procedure:

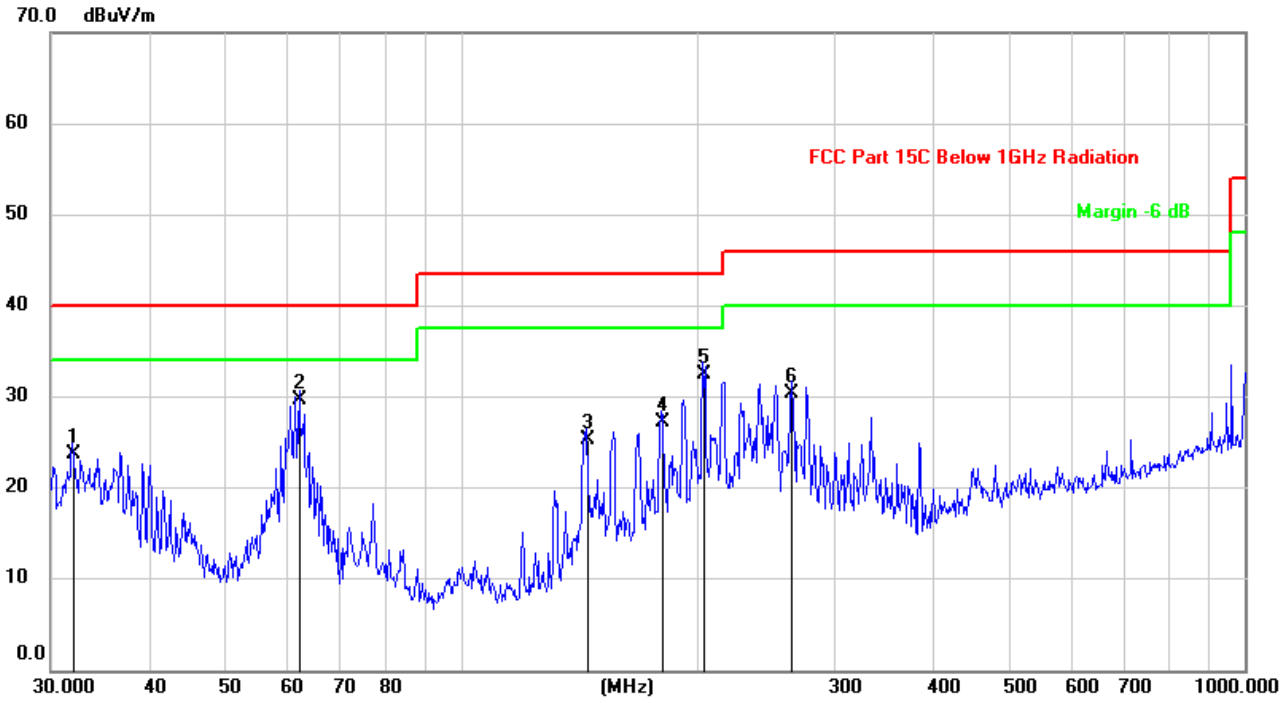
1. The EUT was placed on the top of a rotating table 0.8m(below 1GHz)/1.5m(above 1GHz) above the groundat a 3 meter chamber.The table was rotated 360 degrees todetermine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference-receiving antenna, whichwas mounted on 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 thenthe antenna was tuned to heights from 1 meter to 4 meters and the rotatablewas turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and SpecifiedBandwidth 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 4.9 for details
Test mode:	Non-hopping mode
Test results:	Pass
Remark:	1. Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis is the worst case. 2. 9 kHz to 30 MHz is noise floor, so only shows the data of above 30MHz in this report.

Measurement Data(worst case):

Below 1GHz:

Product Name:	Thermal Printer	**Product Model:**	PAPERANG-P3
Test By:	Raymon Zheng	**Test mode:**	BT Tx mode
Test Frequency:	30 MHz ~ 1 GHz	**Polarization:**	Vertical
Test Voltage:	DC5V	**Environment:**	Temp: 23.6℃ Humi: 48%

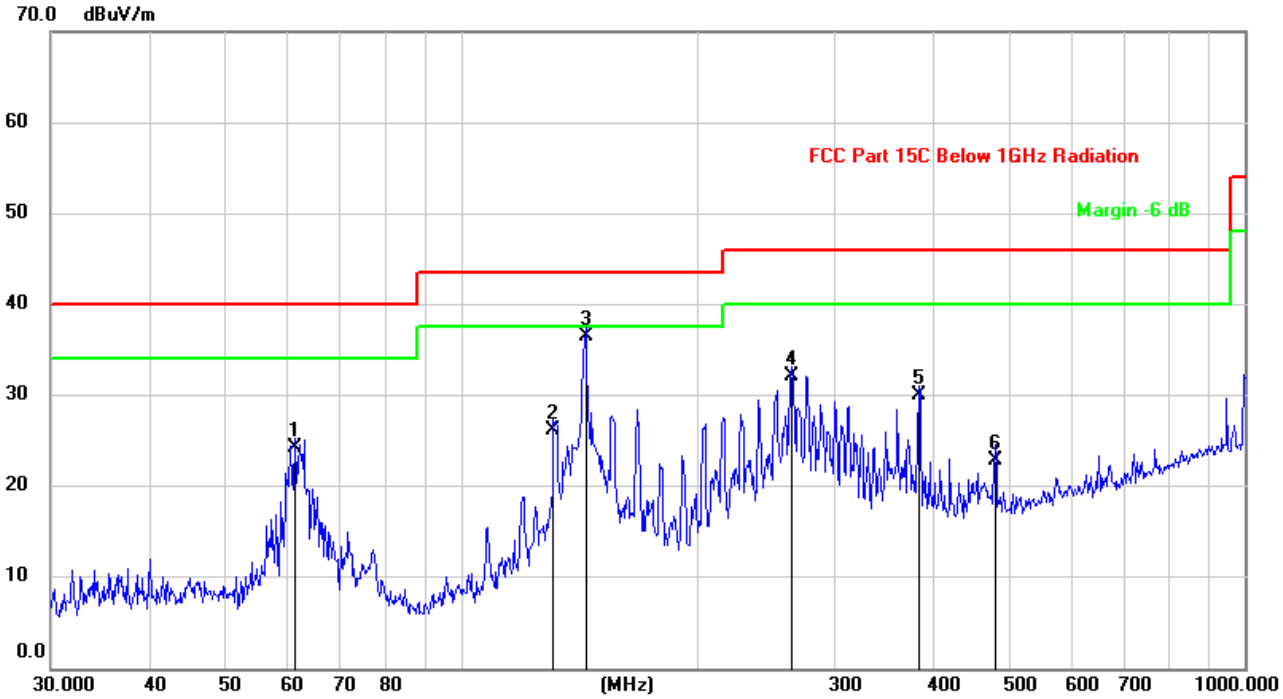


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		31.9546	40.03	-16.29	23.74	40.00	-16.26	QP
2	*	62.2128	46.11	-16.43	29.68	40.00	-10.32	QP
3		144.8418	43.07	-17.81	25.26	43.50	-18.24	QP
4		180.0165	42.88	-15.66	27.22	43.50	-16.28	QP
5		203.5228	46.67	-14.21	32.46	43.50	-11.04	QP
6		263.8190	42.53	-12.25	30.28	46.00	-15.72	QP

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*

Product Name:	Thermal Printer	Product Model:	PAPERANG-P3
Test By:	Raymon Zheng	Test mode:	BT Tx mode
Test Frequency:	30 MHz ~ 1 GHz	Polarization:	Horizontal
Test Voltage:	DC5V	Environment:	Temp: 23.6℃ Humi: 48%



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		61.3463	40.63	-16.33	24.30	40.00	-15.70	QP
2		131.2965	43.83	-17.73	26.10	43.50	-17.40	QP
3	*	144.3348	54.33	-17.83	36.50	43.50	-7.00	QP
4		263.8190	44.41	-12.25	32.16	46.00	-13.84	QP
5		383.9318	38.94	-8.94	30.00	46.00	-16.00	QP
6		480.5276	29.86	-6.96	22.90	46.00	-23.10	QP

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*

Above 1GHz:

Test channel: Lowest channel						
Detector: PeakValue						
Frequency (MHz)	Read Level (dBuV)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4804.00	37.56	7.54	45.10	74.00	-28.90	Vertical
4804.00	42.26	7.54	49.80	74.00	-24.20	Horizontal
Detector: AverageValue						
Frequency (MHz)	Read Level (dBuV)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4804.00	24.69	7.54	32.23	54.00	-21.77	Vertical
4804.00	26.97	7.54	34.51	54.00	-19.49	Horizontal
Test channel: Middle channel						
Detector: PeakValue						
Frequency (MHz)	Read Level (dBuV)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4882.00	38.22	7.79	46.01	74.00	-27.99	Vertical
4882.00	40.64	7.79	48.43	74.00	-25.57	Horizontal
Detector: AverageValue						
Frequency (MHz)	Read Level (dBuV)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4884.00	24.56	7.79	32.35	54.00	-21.65	Vertical
4884.00	25.94	7.79	33.73	54.00	-20.27	Horizontal
Test channel: Highest channel						
Detector: PeakValue						
Frequency (MHz)	Read Level (dBuV)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4960.00	37.74	8.06	45.80	74.00	-28.20	Vertical
4960.00	44.11	8.06	52.17	74.00	-21.83	Horizontal
Detector: AverageValue						
Frequency (MHz)	Read Level (dBuV)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4960.00	24.42	8.06	32.48	54.00	-21.52	Vertical
4960.00	26.98	8.06	35.04	54.00	-18.96	Horizontal
Remark: *1. Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.* *2. The emission levels of other frequencies are very lower than the limit and not show in test report.*						

------End of report------