

3.8. Spurious Emission (Radiated)

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

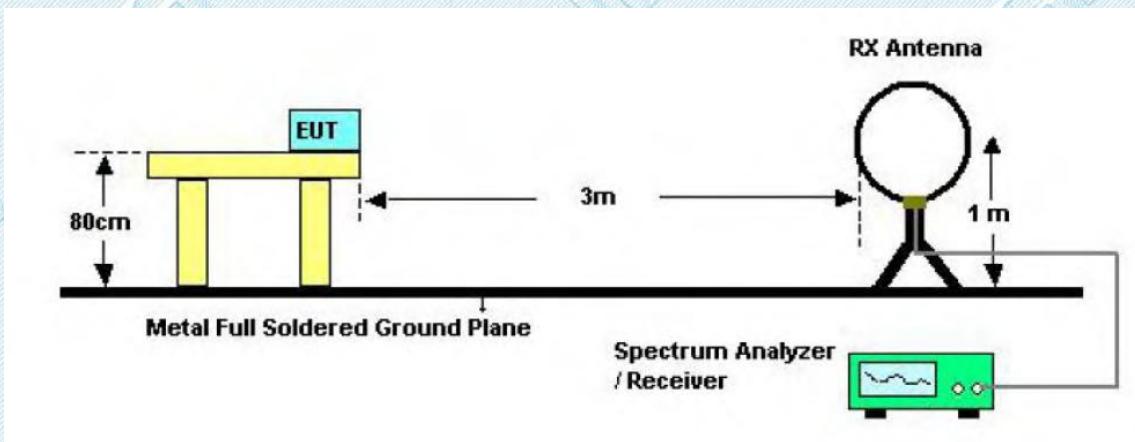
Radiated Emission Limit (Above 1000MHz)

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

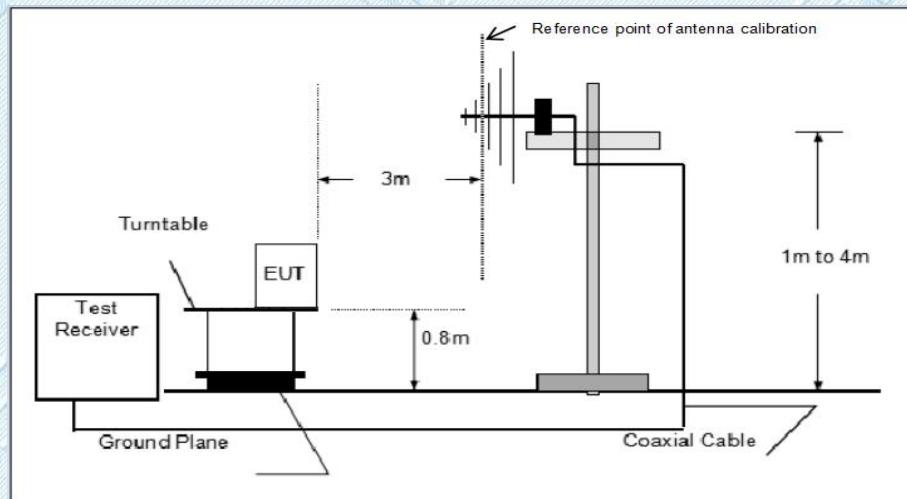
Note:

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

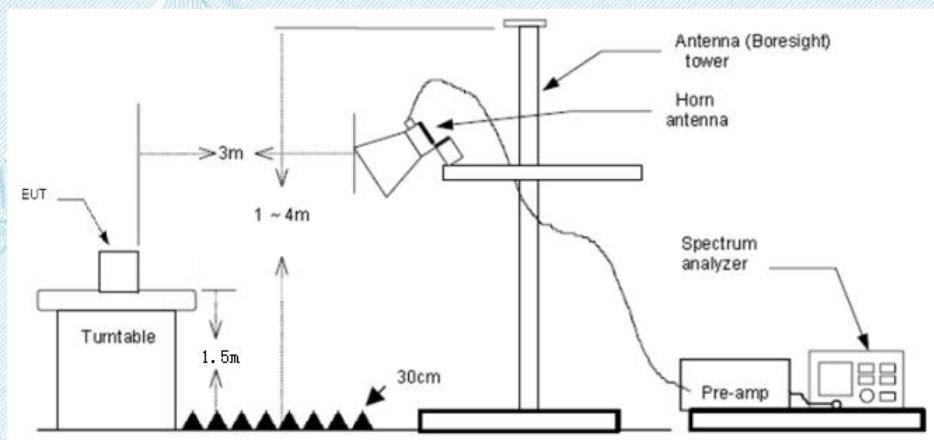
Test Configuration



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 10th harmonic:

RBW=1MHz, VBW=3MHz Peak detector for Peak value.

RBW=1MHz, VBW=10Hz Peak 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

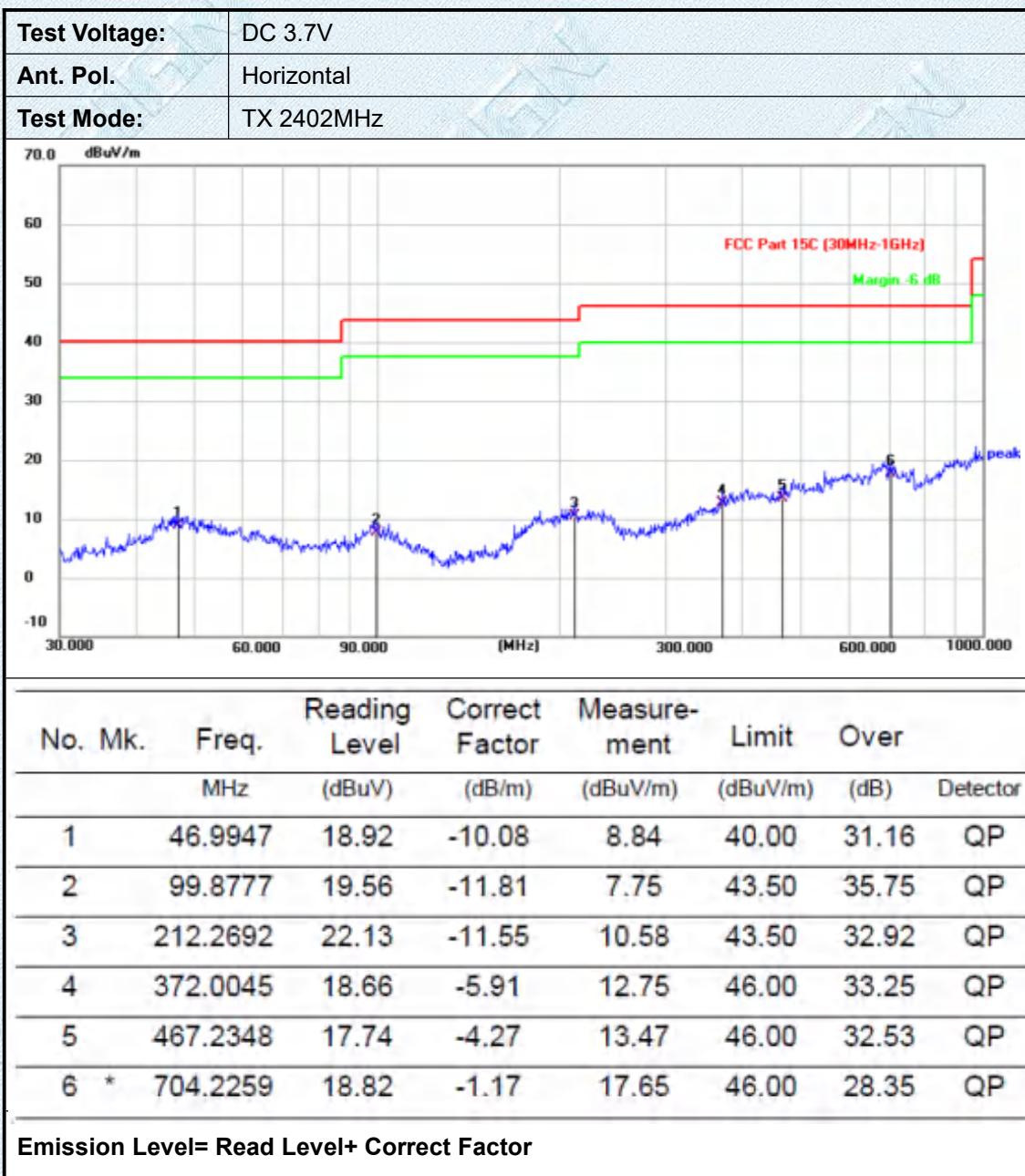
Note:

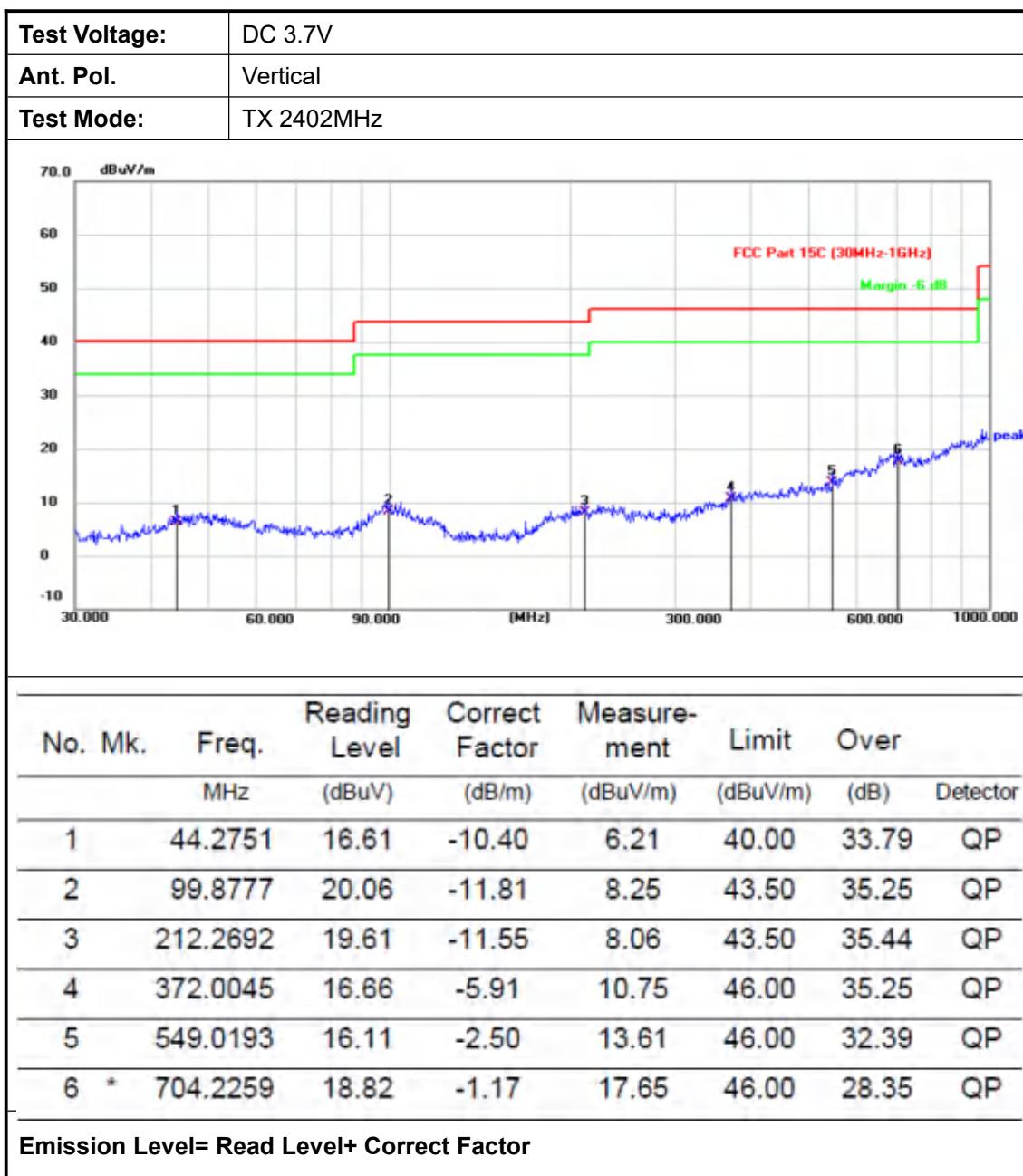
- 1) Measurement = Reading level + Correct Factor
Correct Factor=Antenna Factor + Cable Loss -Preamplifier Factor
- 2) The peak level is lower than average limit(54 dBuV/m), this data is the too weak instrument of signal is unable to test.
- 3) The emission levels of other frequencies are very lower 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 CH00, CH19 and CH39 modulation, and found the CH00 which it is worse case for 30MHz-1GHz , so only show the test data for worse case.

BELOW 30MHZ

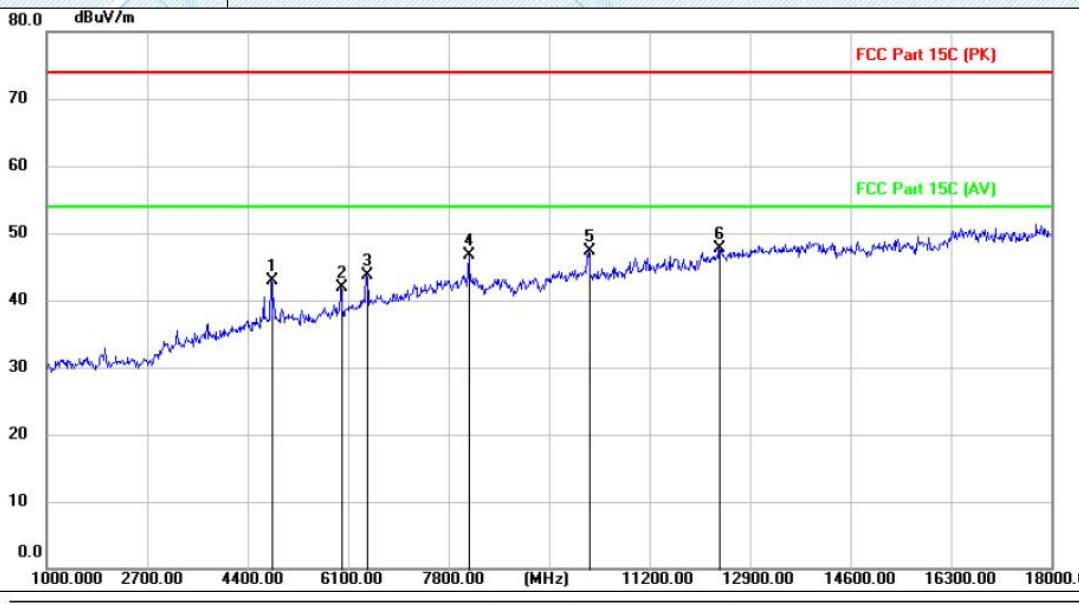
No emission found between lowest internal used/generated frequencies to 30MHz.

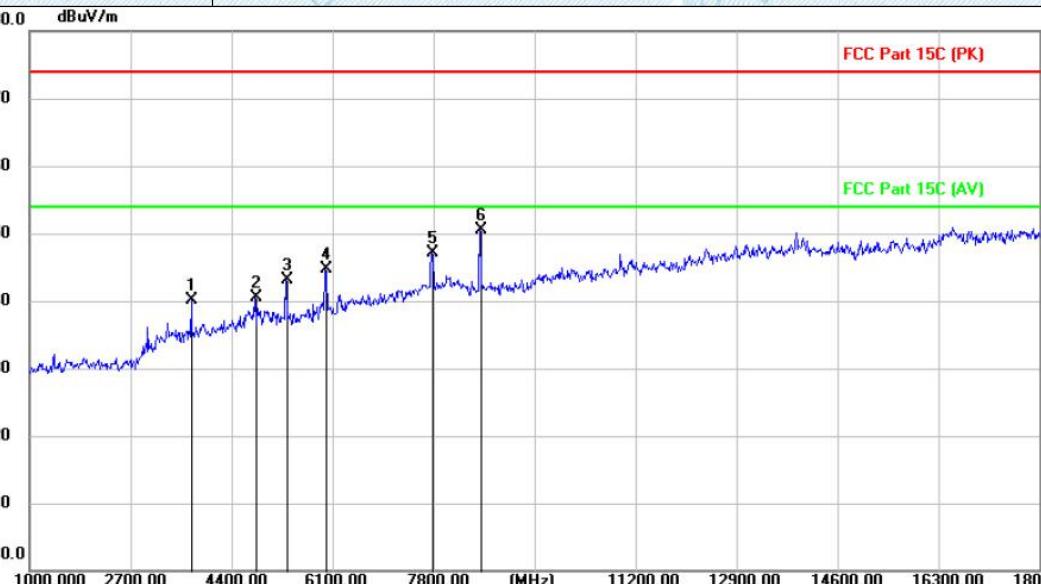
30MHz-1GHz

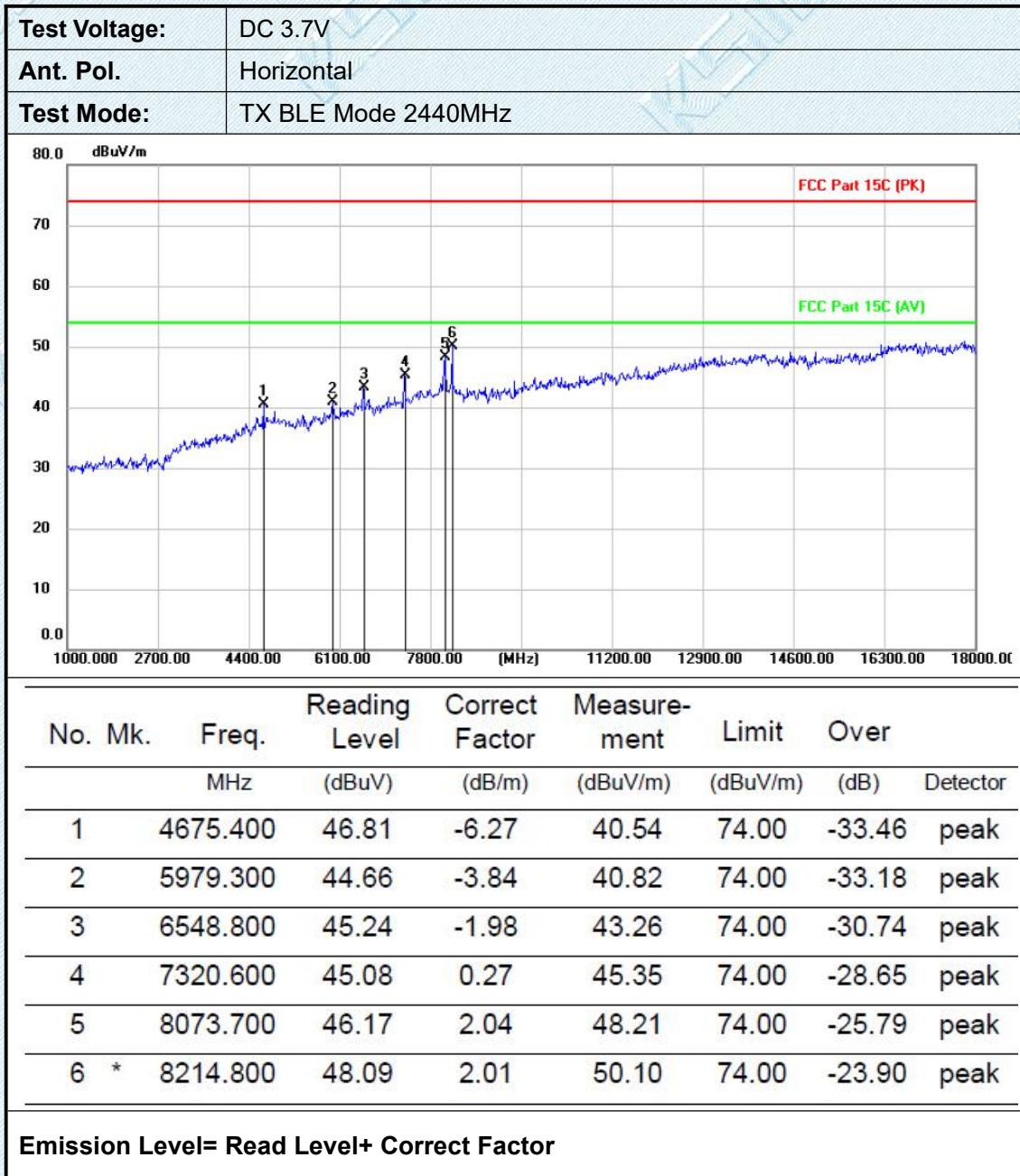


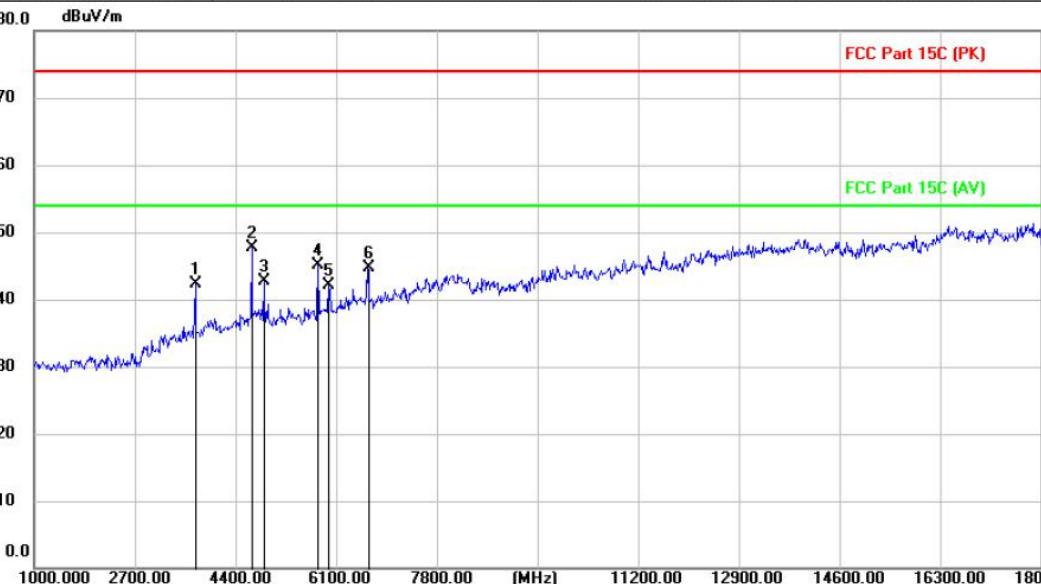


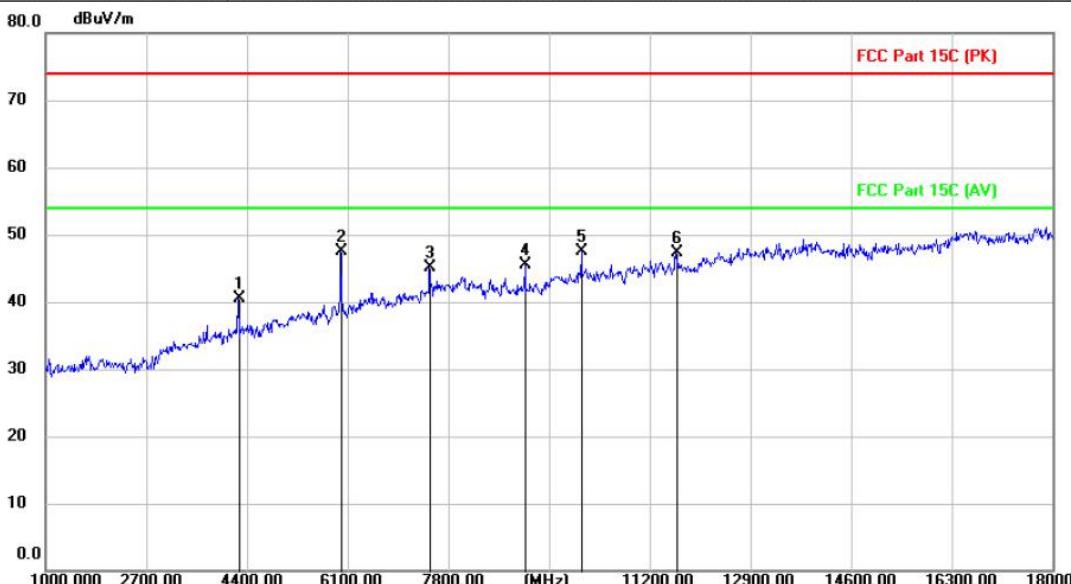
Adobe 1GHz

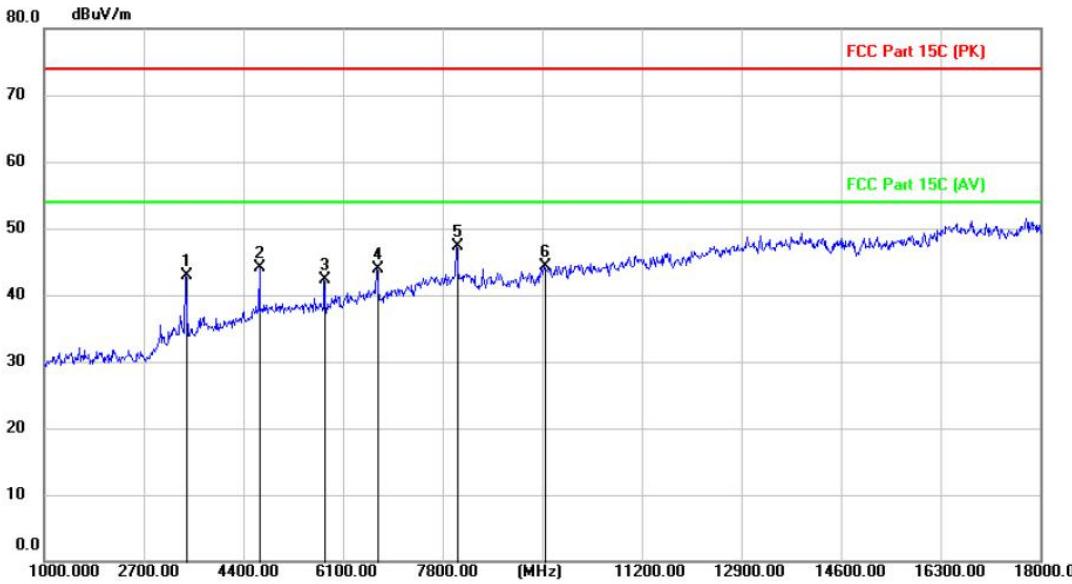
Test Voltage:	DC 3.7V																																																																
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Test Mode:	TX BLE Mode 2402MHz																																																																
																																																																	
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Test Voltage:	DC 3.7V						
Ant. Pol.	Vertical						
Test Mode:	TX BLE Mode 2402MHz						
							
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over
		MHz	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)
1		3726.800	49.19	-9.12	40.07	74.00	-33.93
2		4804.600	46.51	-5.92	40.59	74.00	-33.41
3		5326.500	48.24	-5.09	43.15	74.00	-30.85
4		5984.400	48.53	-3.84	44.69	74.00	-29.31
5		7779.600	45.66	1.52	47.18	74.00	-26.82
6	*	8593.900	48.56	1.92	50.48	74.00	-23.52
Emission Level= Read Level+ Correct Factor							



Test Voltage:	DC 3.7V						
Ant. Pol.	Vertical						
Test Mode:	TX BLE Mode 2440MHz						
							
No.	Mk.	Freq. MHz	Reading Level (dBuV)	Correct Factor (dB/m)	Measure- ment (dBuV/m)	Limit (dBuV/m) (dB)	Over Detector
1		3720.000	51.49	-9.13	42.36	74.00	-31.64 peak
2	*	4675.400	53.97	-6.27	47.70	74.00	-26.30 peak
3		4879.400	48.47	-5.72	42.75	74.00	-31.25 peak
4		5794.000	49.45	-4.27	45.18	74.00	-28.82 peak
5		5979.300	46.01	-3.84	42.17	74.00	-31.83 peak
6		6630.400	46.54	-1.74	44.80	74.00	-29.20 peak
Emission Level= Read Level+ Correct Factor							

Test Voltage:	DC 3.7V						
Ant. Pol.	Horizontal						
Test Mode:	TX BLE Mode 2480MHz						
							
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over
		MHz	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)
1		4260.600	48.04	-7.56	40.48	74.00	-33.52 peak
2	*	5991.200	51.36	-3.81	47.55	74.00	-26.45 peak
3		7482.100	44.43	0.77	45.20	74.00	-28.80 peak
4		9100.500	43.38	2.05	45.43	74.00	-28.57 peak
5		10052.500	43.39	4.16	47.55	74.00	-26.45 peak
6		11650.500	40.08	7.17	47.25	74.00	-26.75 peak
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Note: The main frequency has been screened by the filter .

4. EUT TEST PHOTOS

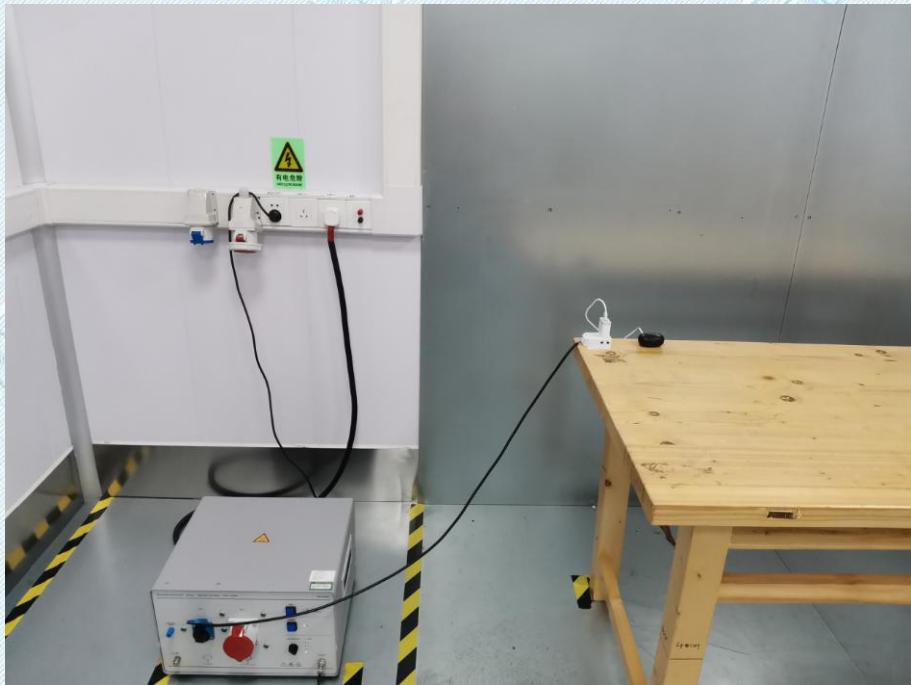
Radiated Measurement (Below 1GHz)



Radiated Measurement (Above 1GHz)



Conducted Emission



RF Conducted



5. PHOTOGRAPHS OF EUT CONSTRUCTIONAL

External Photographs







