

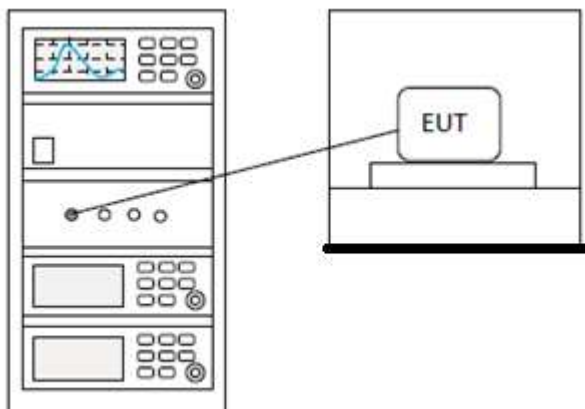
## 14 CONDUCTED PEAK OUTPUT POWER

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 7.8.5
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Eason
Temperature	25°C
Humidity	52%

### 14.1 LIMITS

Frequency range(MHz)	Output power of the intentional radiator(watt)
902-928	1 for $\geq 50$ hopping channels
	0.25 for $25 \leq \text{hopping channels} < 50$
	1 for digital modulation
2400-2483.5	1 for $\geq 75$ non-overlapping hopping channels
	0.125 for all other frequency hopping systems
	1 for digital modulation
5725-5850	1 for frequency hopping systems and digital modulation

### 14.2 BLOCK DIAGRAM OF TEST SETUP



**14.3 TEST DATA**

<b>Pass: Please Refer To Appendix: For Details</b>
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BlueAsia

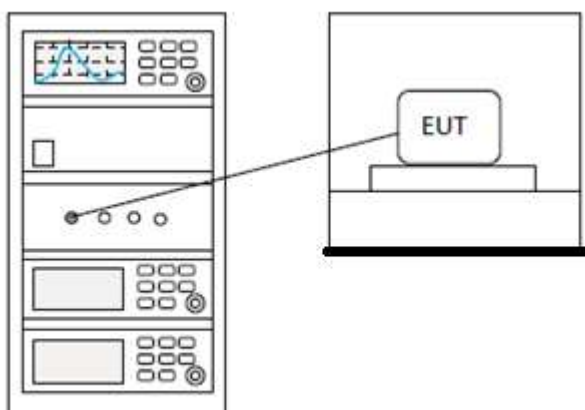
## 15 DWELL TIME

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 7.8.4
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Eason
Temperature	25℃
Humidity	52%

### 15.1 LIMITS

Frequency(MHz)	Limit
902-928	0.4S within a 20S period(20dB bandwidth<250kHz)
	0.4S within a 10S period(20dB bandwidth≥250kHz)
2400-2483.5	0.4S within a period of 0.4S multiplied by the number of hopping channels
5725-5850	0.4S within a 30S period

### 15.2 BLOCK DIAGRAM OF TEST SETUP



**15.3 TEST DATA**

<b>Pass: Please Refer To Appendix: For Details</b>
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BlueAsia

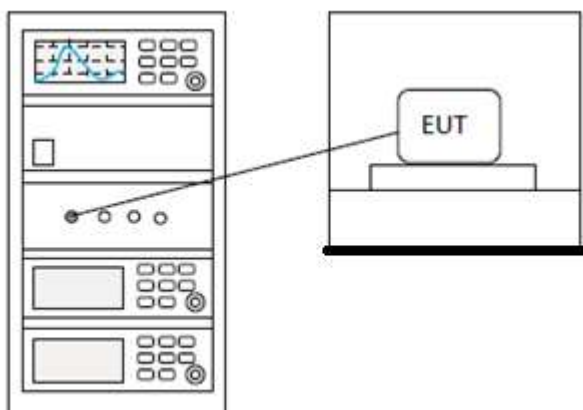
## 16 HOPPING CHANNEL NUMBER

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 7.8.3
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Eason
Temperature	25℃
Humidity	52%

### 16.1 LIMITS

Frequency range(MHz)	Number of hopping channels (minimum)
902-928	50 for 20dB bandwidth <250kHz
	25 for 20dB bandwidth ≥250kHz
2400-2483.5	15
5725-5850	75

### 16.2 BLOCK DIAGRAM OF TEST SETUP



### 16.3 TEST DATA

**Pass: Please Refer To Appendix: For Details**

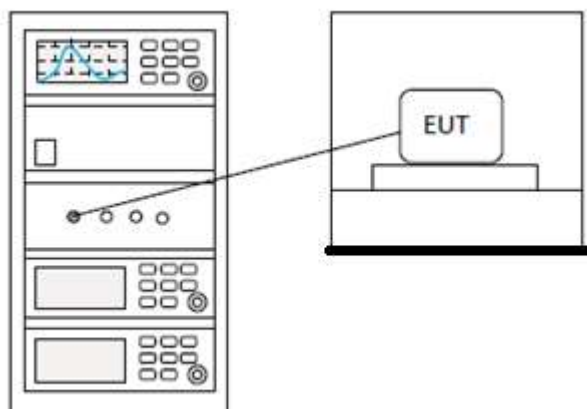
## 17 CARRIER FREQUENCIES SEPARATION

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 7.8.2
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Eason
Temperature	25°C
Humidity	52%

### 17.1 LIMITS

<b>Limit:</b>	2/3 of the 20dB bandwidth base on the transmission power is less than 0.125W
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### 17.2 BLOCK DIAGRAM OF TEST SETUP



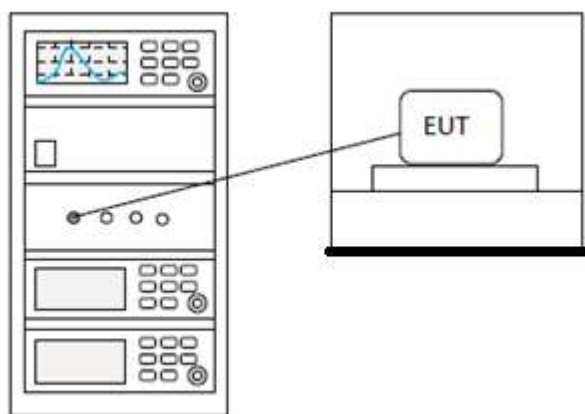
### 17.3 TEST DATA

**Pass: Please Refer To Appendix: For Details**

## 18 20DB BANDWIDTH

Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 7.8.7
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Eason
Temperature	25℃
Humidity	52%

### 18.1 BLOCK DIAGRAM OF TEST SETUP



### 18.2 TEST DATA

**Pass: Please Refer To Appendix: For Details**

## 19 CONDUCTED EMISSIONS AT AC POWER LINE (150KHZ-30MHZ)

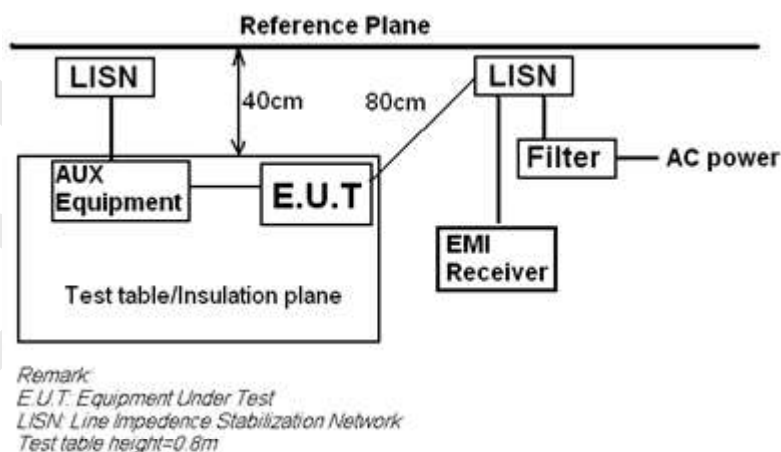
Test Standard	47 CFR Part 15, Subpart C 15.247
Test Method	ANSI C63.10 (2013) Section 6.2
Test Mode (Pre-Scan)	TX
Test Mode (Final Test)	TX
Tester	Eason
Temperature	25℃
Humidity	52%

### 19.1 LIMITS

Frequency of emission(MHz)	Conducted limit(dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

\*Decreases with the logarithm of the frequency.

### 19.2 BLOCK DIAGRAM OF TEST SETUP



### 19.3 PROCEDURE

- 1) The mains terminal disturbance voltage test was conducted in a shielded room.
- 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50ohm/50H + 5ohm linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.

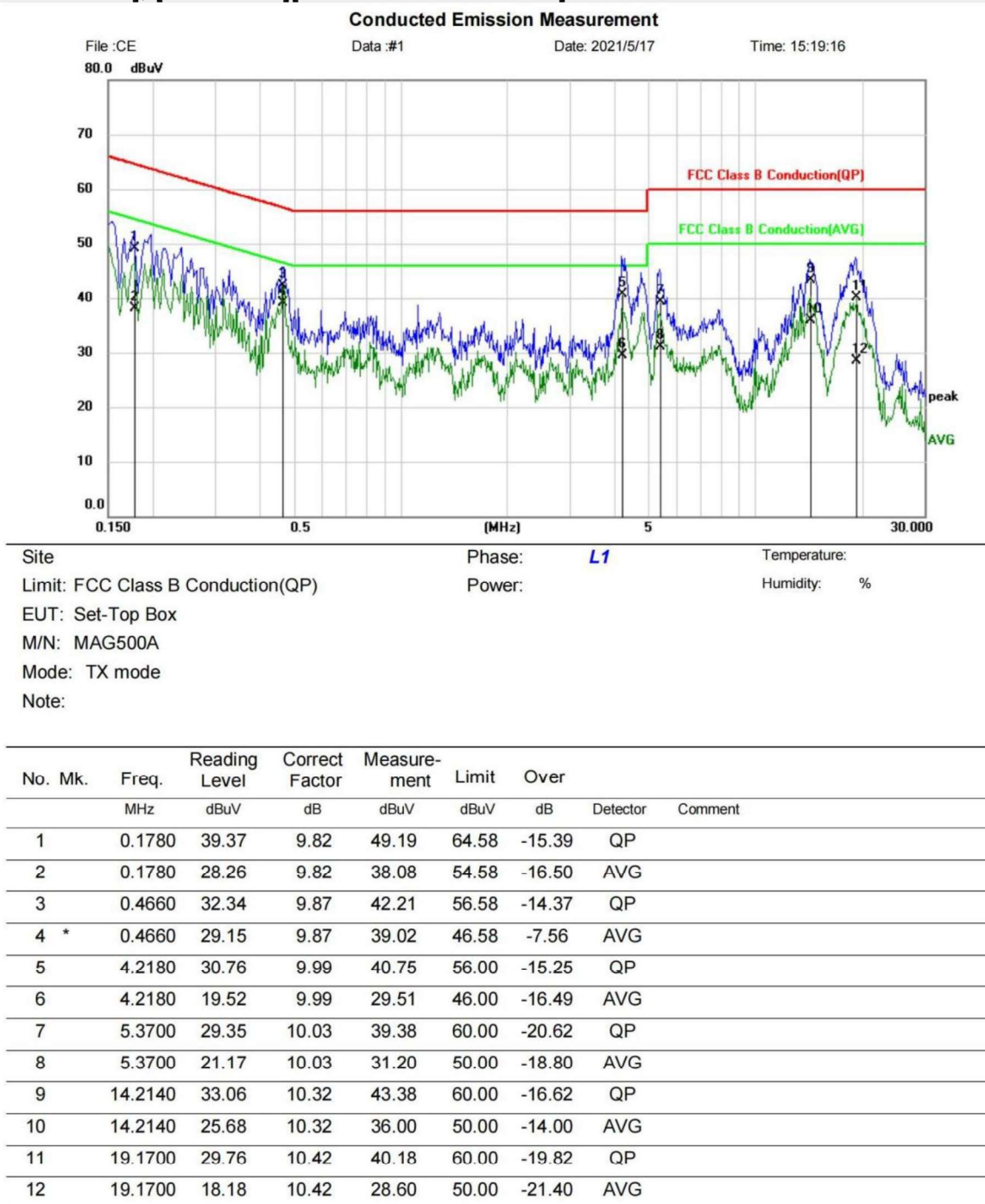


- 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,
- 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
- 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.

Remark:  $\text{LISN} = \text{Read Level} + \text{Cable Loss} + \text{LISN Factor}$

## 19.4 TEST DATA

[TestMode: TX]; [Line: Line][Power:AC120V/60Hz]



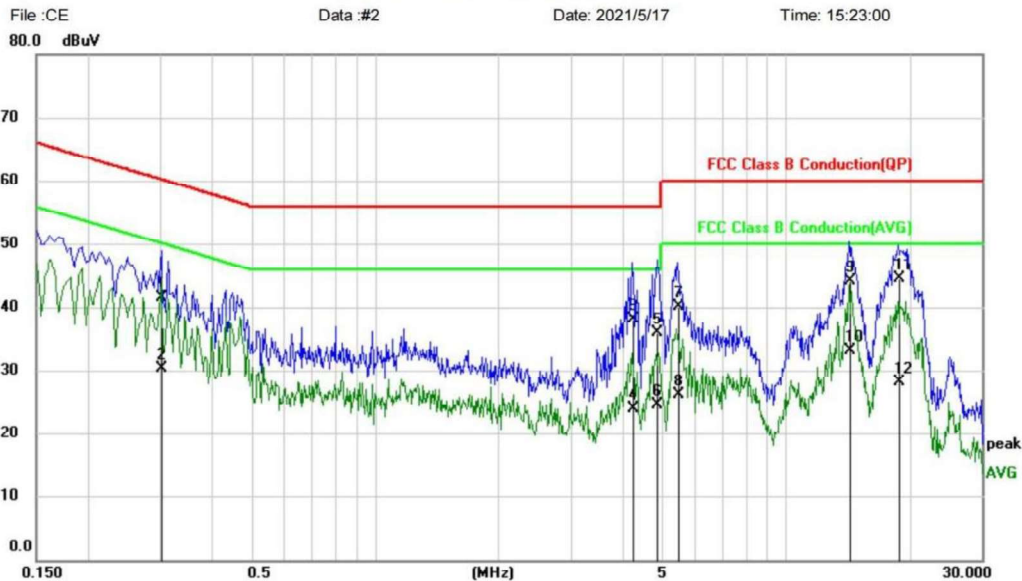
\*:Maximum data    x:Over limit    !:over margin

Reference Only

## Test Result: Pass

[TestMode: TX]; [Line: Nutral] [Power:AC120V/60Hz]

### Conducted Emission Measurement



Site: Phase: **N** Temperature:   
Limit: FCC Class B Conduction(QP) Power: Humidity: %   
EUT: Set-Top Box   
M/N: MAG500A   
Mode: TX mode   
Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.3020	31.80	9.77	41.57	60.19	-18.62	QP	
2		0.3020	20.57	9.77	30.34	50.19	-19.85	AVG	
3		4.2420	28.14	9.92	38.06	56.00	-17.94	QP	
4		4.2420	14.03	9.92	23.95	46.00	-22.05	AVG	
5		4.8540	26.00	9.95	35.95	56.00	-20.05	QP	
6		4.8540	14.53	9.95	24.48	46.00	-21.52	AVG	
7		5.4699	30.22	9.96	40.18	60.00	-19.82	QP	
8		5.4699	16.22	9.96	26.18	50.00	-23.82	AVG	
9		14.2140	33.85	10.28	44.13	60.00	-15.87	QP	
10		14.2140	22.75	10.28	33.03	50.00	-16.97	AVG	
11	*	18.7939	34.20	10.40	44.60	60.00	-15.40	QP	
12		18.7939	17.73	10.40	28.13	50.00	-21.87	AVG	

\*:Maximum data x:Over limit !:over margin

(Reference Only)

**Test Result: Pass**

## 20 RADIATED SPURIOUS EMISSIONS

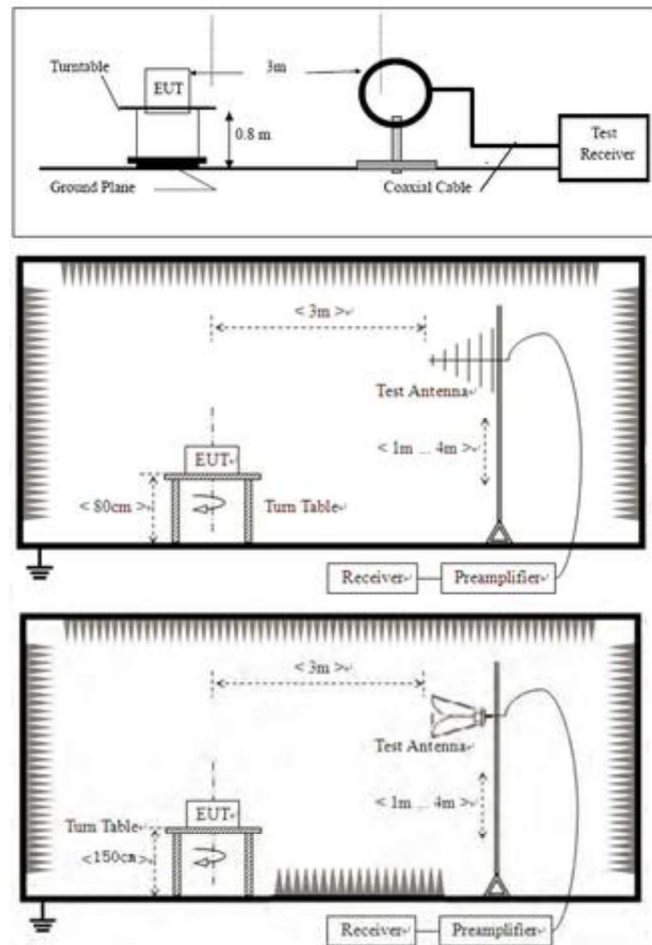
<b>Test Standard</b>	47 CFR Part 15, Subpart C 15.247
<b>Test Method</b>	ANSI C63.10 (2013) Section 6.4,6.5,6.6
<b>Test Mode (Pre-Scan)</b>	TX middle channel;TX Low channel;TX high channel
<b>Test Mode (Final Test)</b>	TX middle channel;TX Low channel;TX high channel
<b>Tester</b>	Eason
<b>Temperature</b>	25℃
<b>Humidity</b>	52%

### 20.1 LIMITS

<b>Frequency(MHz)</b>	<b>Field strength(microvolts/meter)</b>	<b>Measurement distance(meters)</b>
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

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

## 20.2 BLOCK DIAGRAM OF TEST SETUP



## 20.3 PROCEDURE

- For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- 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.
- 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 (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- 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.

- h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j. Repeat above procedures until all frequencies measured was complete.

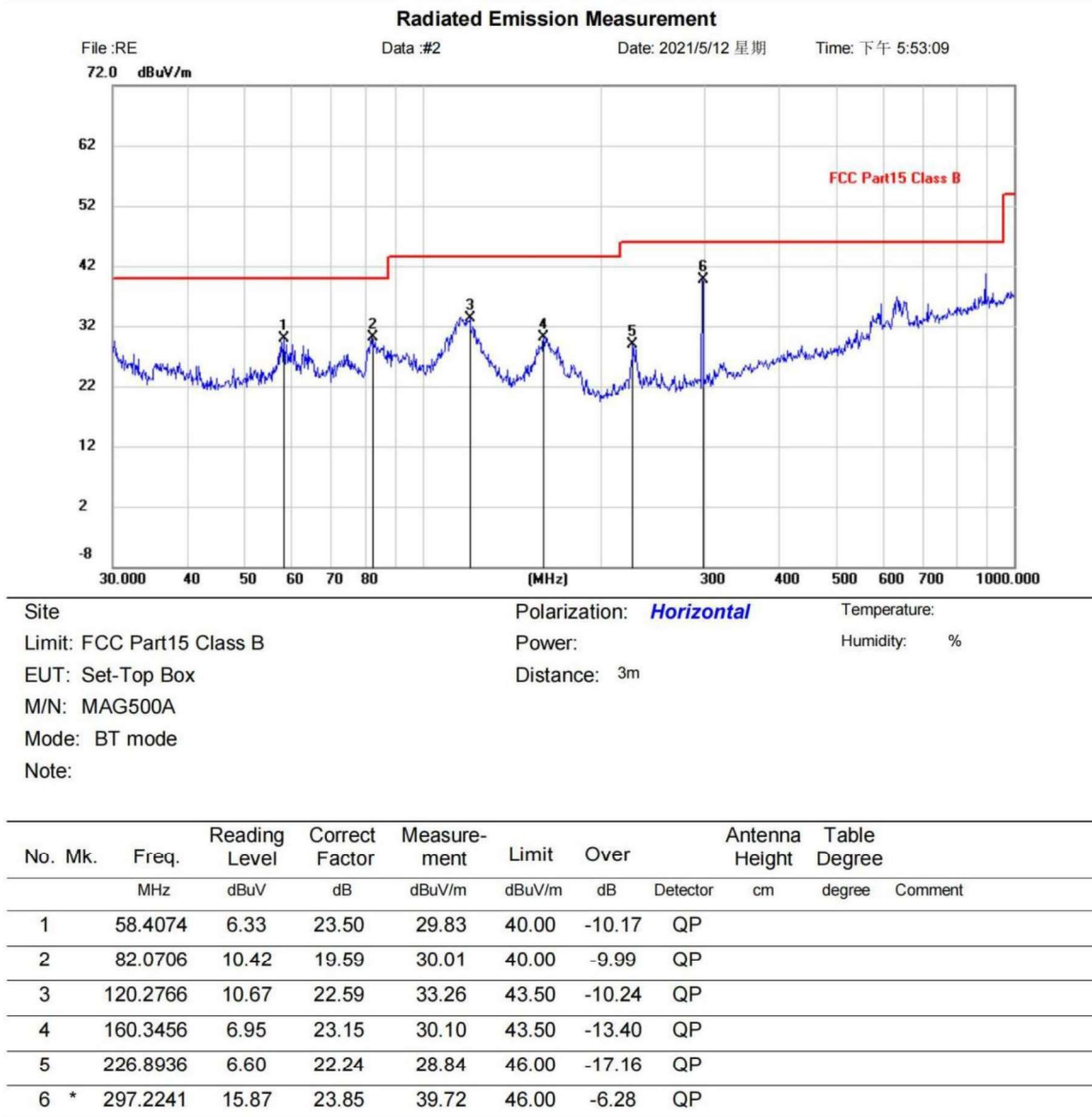
Remark:

- 1) For emission below 1GHz, through pre-scan found the worst case is the lowest channel. Only the worst case is recorded in the report.
- 2) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:  
Final Test Level = Receiver Reading + Antenna Factor + Cable Factor - Preamplifier Factor
- 3) Scan from 9kHz to 25GHz, the disturbance above 12.75GHz and below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported. Fundamental frequency is blocked by filter, and only spurious emission is shown.
- 4) For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.



## 20.4 TEST DATA

[TestMode: TX]; [Polarity: Horizontal]

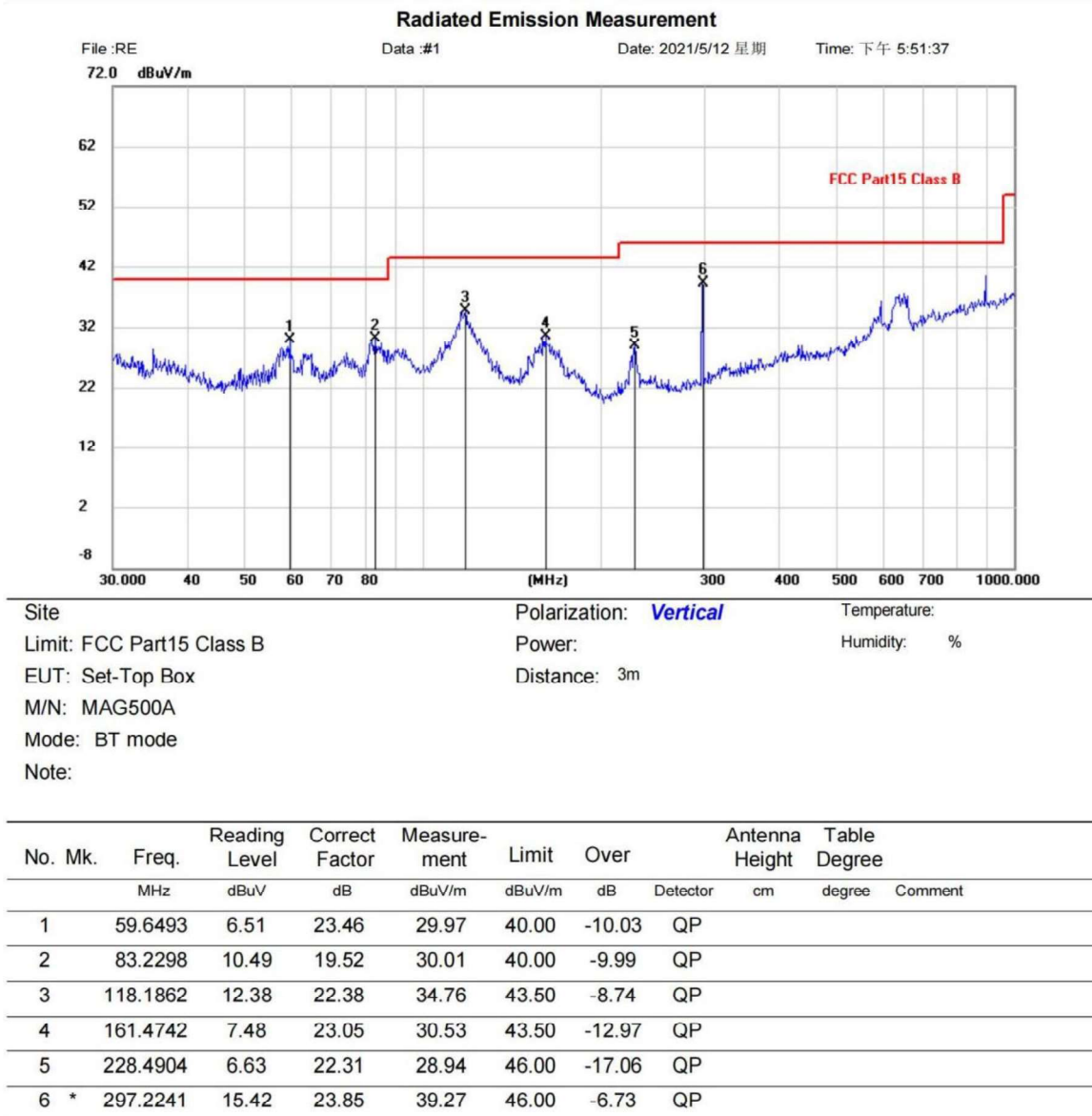


\*:Maximum data    x:Over limit    !:over margin

⟨Reference Only

**Test Result: Pass**

[TestMode: TX]; [Polarity: Vertical]



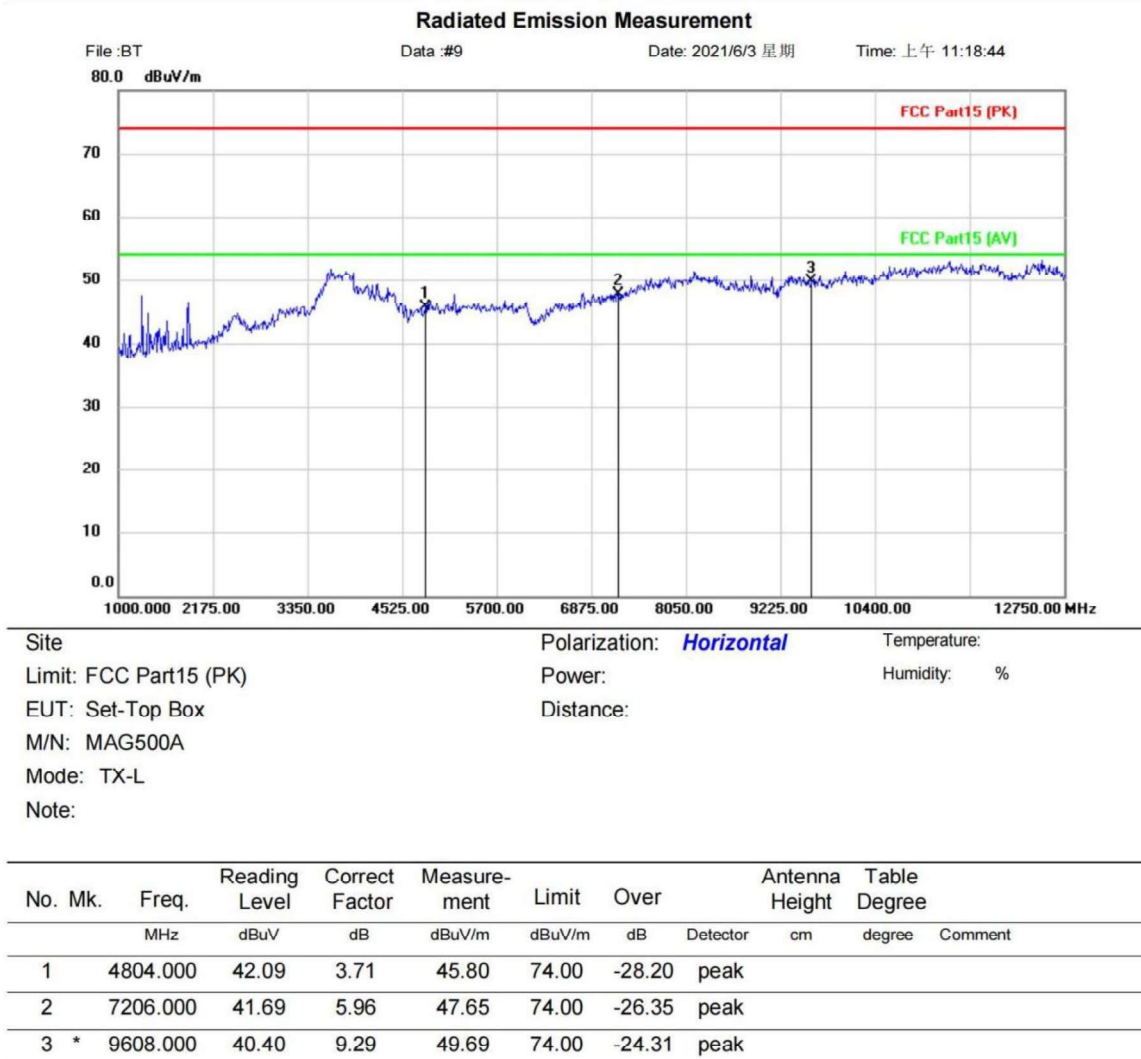
\*:Maximum data    x:Over limit    !:over margin

⟨Reference Only

**Test Result: Pass**



[TestMode: TX Low channel]; [Polarity: Horizontal]

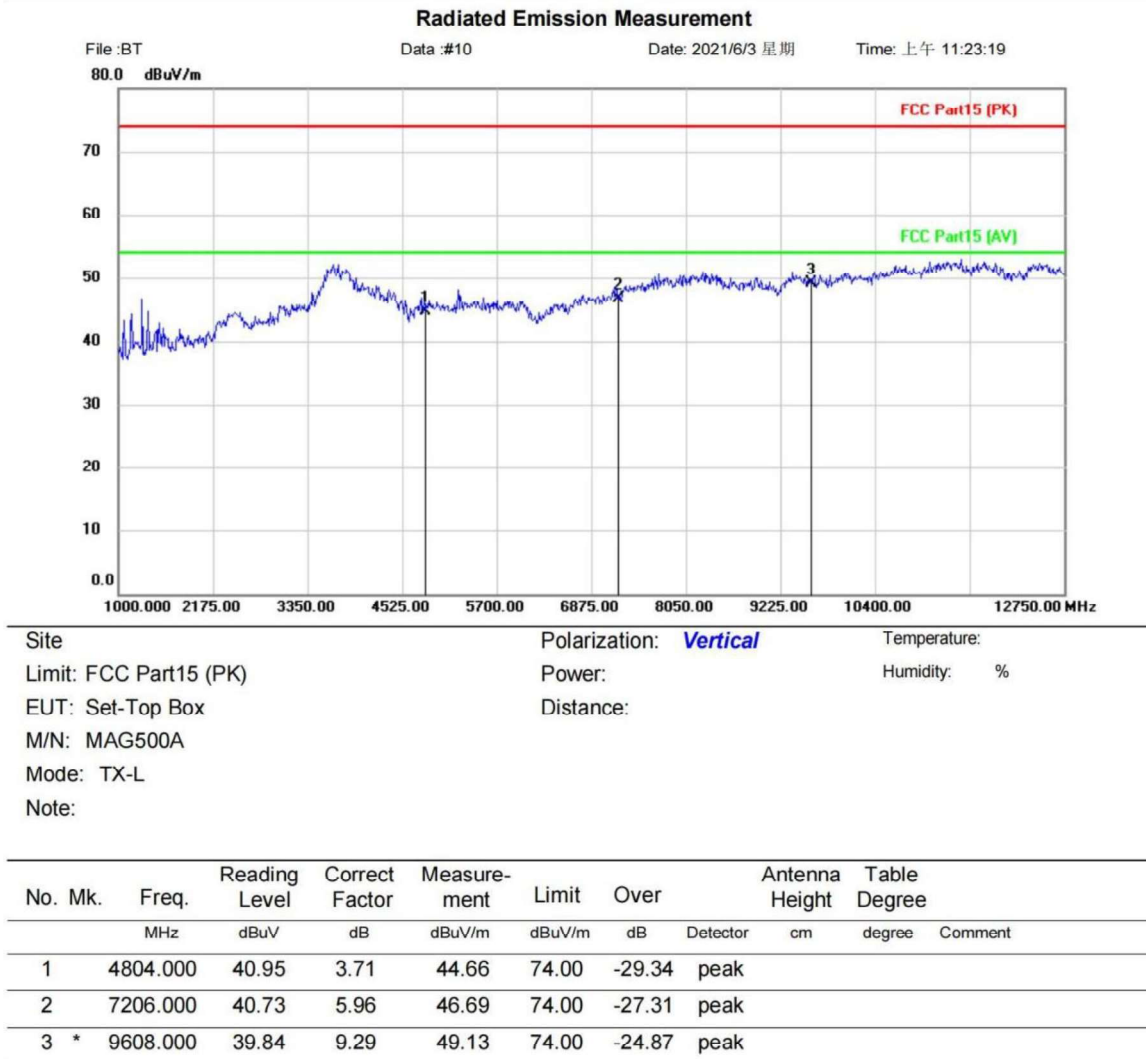


\*:Maximum data    x:Over limit    !:over margin

⟨Reference Only

**Test Result: Pass**

[TestMode: TX Low channel]; [Polarity: Vertical]

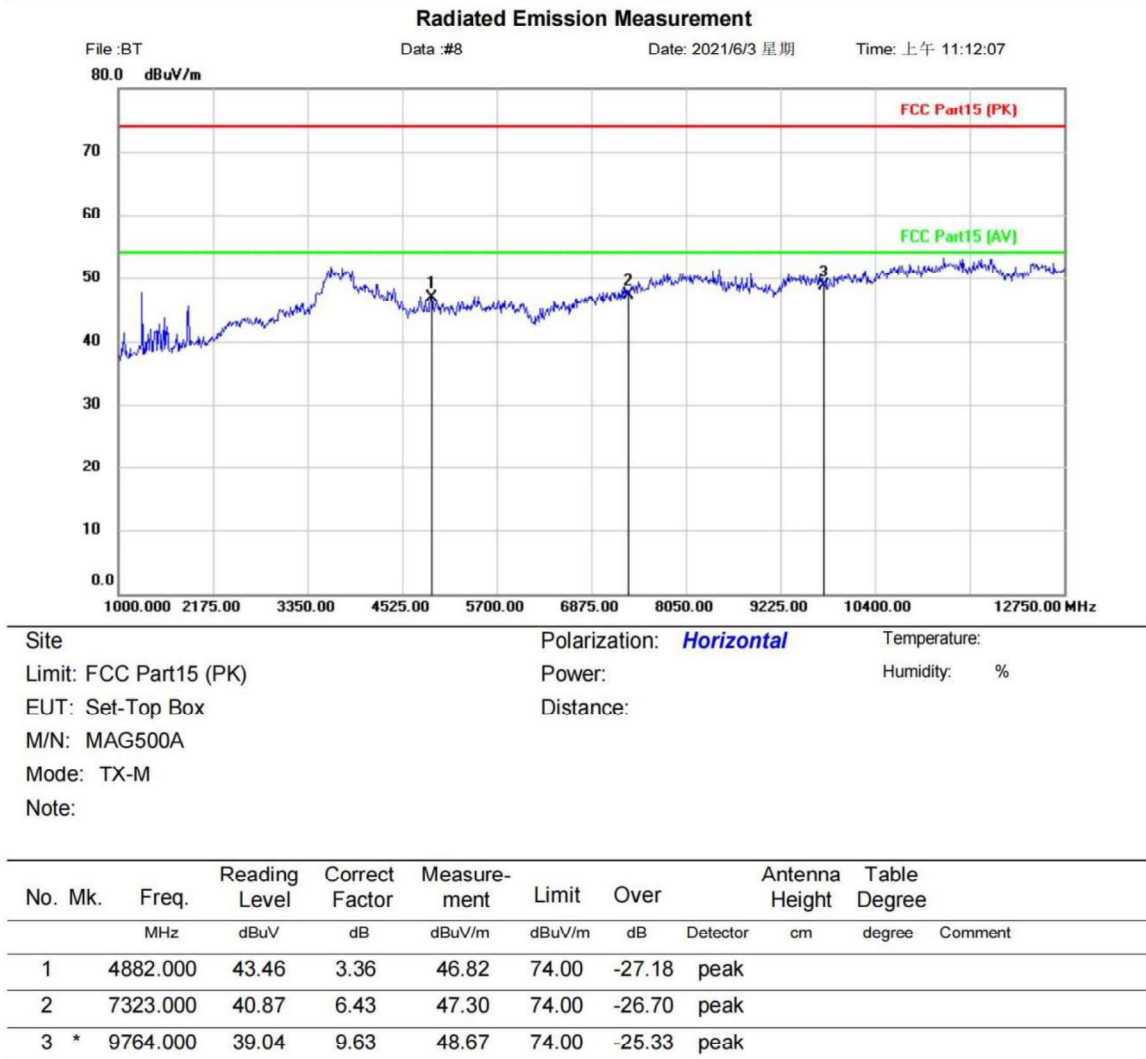


\*:Maximum data    x:Over limit    !:over margin

⟨Reference Only

**Test Result: Pass**

[TestMode: TX middle channel]; [Polarity: Horizontal]

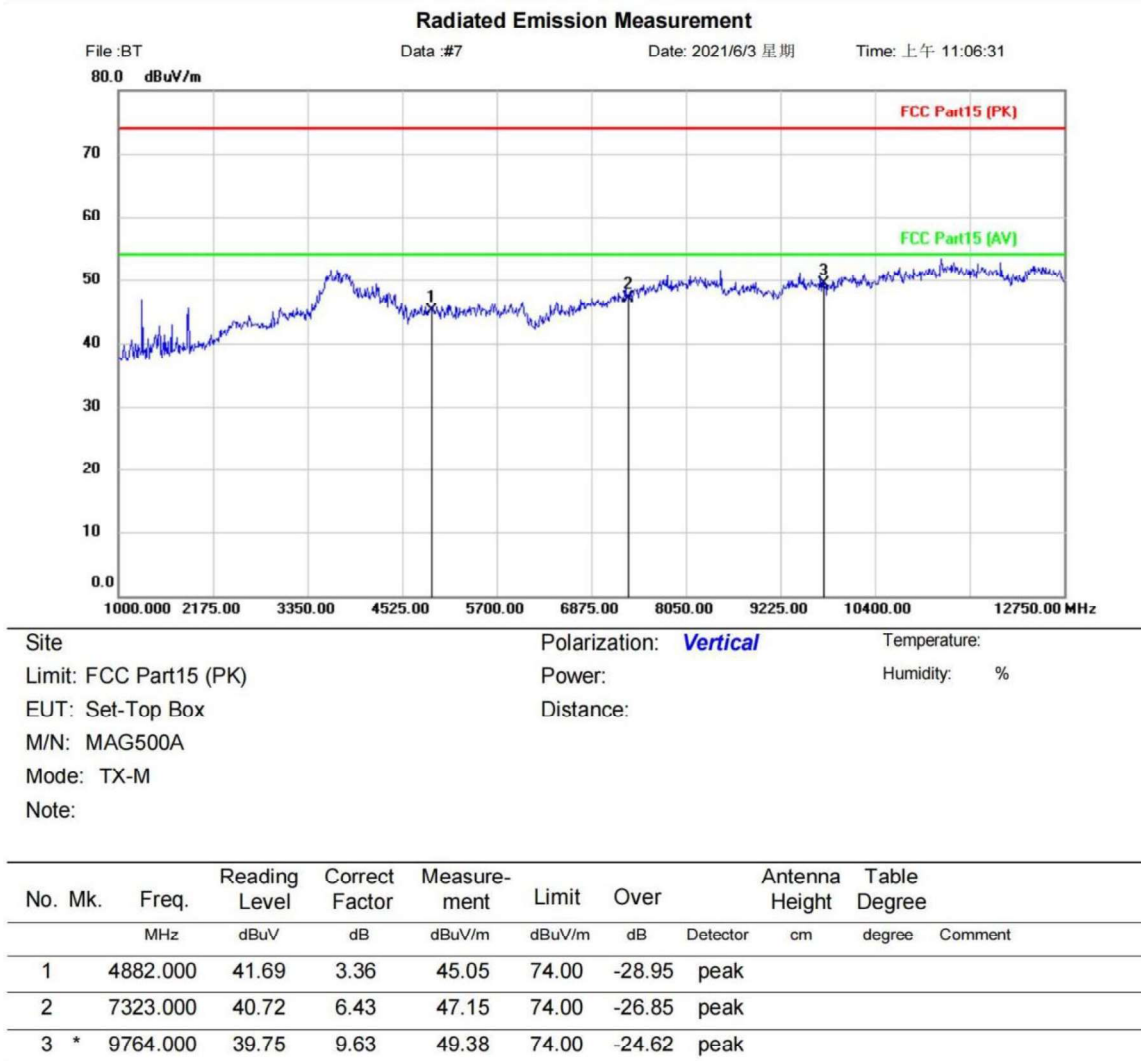


\*:Maximum data    x:Over limit    !:over margin

⟨Reference Only

**Test Result: Pass**

[TestMode: TX middle channel]; [Polarity: Vertical]

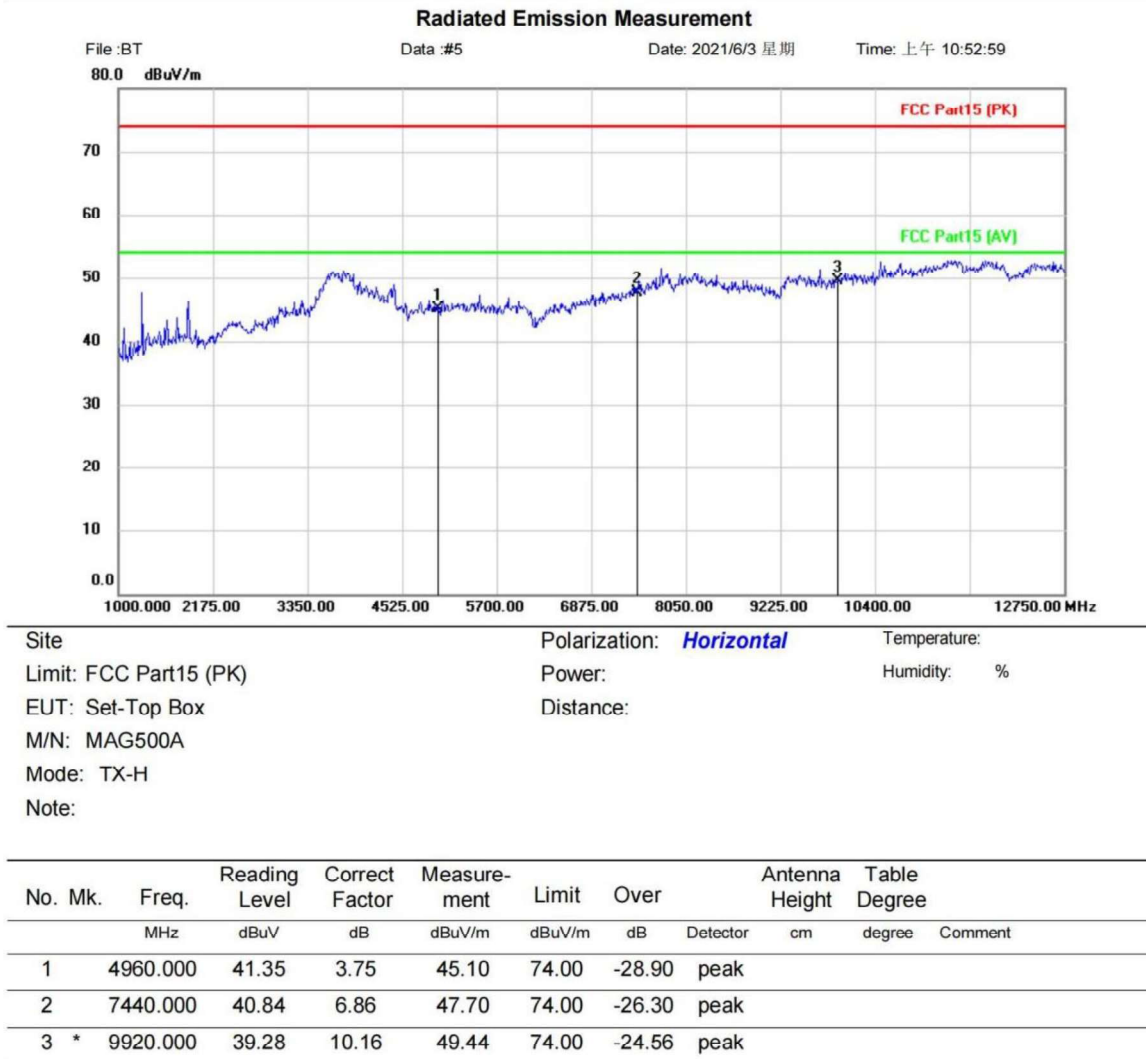


\*:Maximum data    x:Over limit    !:over margin

⟨Reference Only

**Test Result: Pass**

[TestMode: TX high channel]; [Polarity: Horizontal]



\*:Maximum data    x:Over limit    !:over margin

⟨Reference Only

**Test Result: Pass**

[TestMode: TX high channel]; [Polarity: Vertical]



\*:Maximum data    x:Over limit    !:over margin

⟨Reference Only

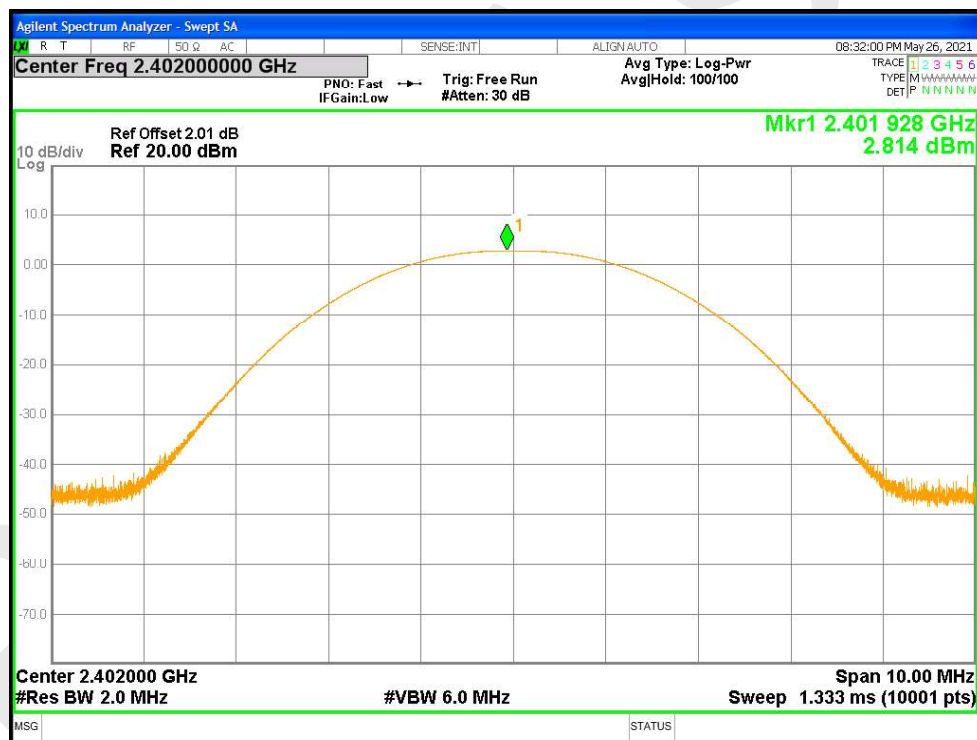
**Test Result: Pass**

## 21 APPENDIX

### 21.1 MAXIMUM CONDUCTED OUTPUT POWER

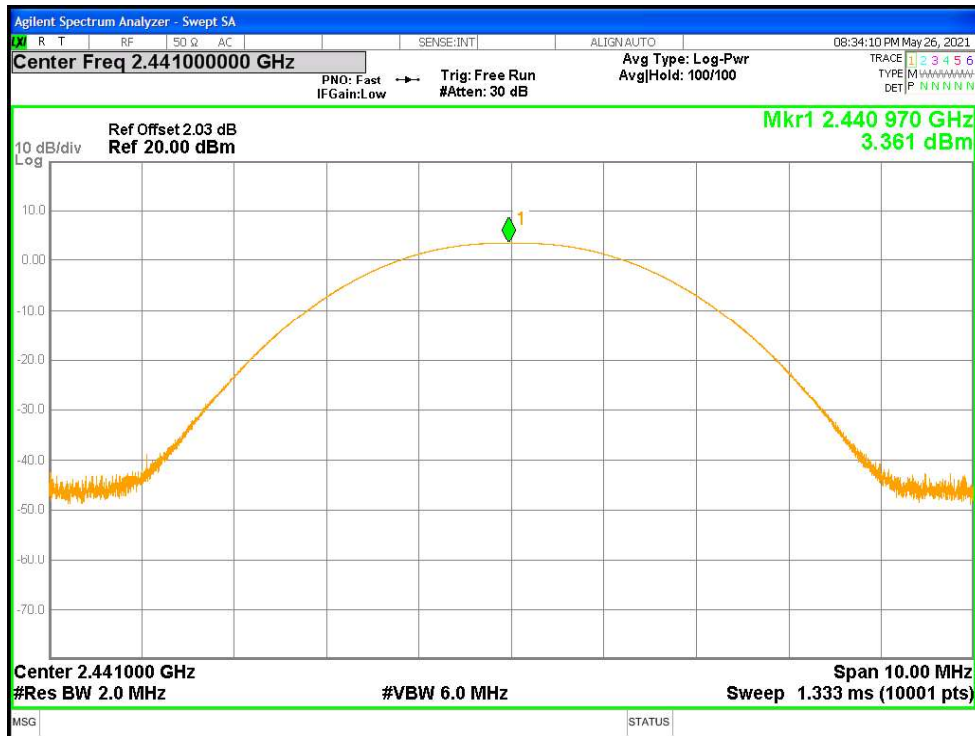
Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Total Power (dBm)	Limit (dBm)	Verdict
NVNT	1-DH1	2402	Ant1	2.814	2.814	21	Pass
NVNT	1-DH1	2441	Ant1	3.361	3.361	21	Pass
NVNT	1-DH1	2480	Ant1	2.7	2.7	21	Pass
NVNT	2-DH1	2402	Ant1	4.796	4.796	21	Pass
NVNT	2-DH1	2441	Ant1	4.818	4.818	21	Pass
NVNT	2-DH1	2480	Ant1	4.953	4.953	21	Pass
NVNT	3-DH1	2402	Ant1	4.924	4.924	21	Pass
NVNT	3-DH1	2441	Ant1	5.899	5.899	21	Pass
NVNT	3-DH1	2480	Ant1	5.65	5.65	21	Pass

Power NVNT 1-DH1 2402MHz Ant1

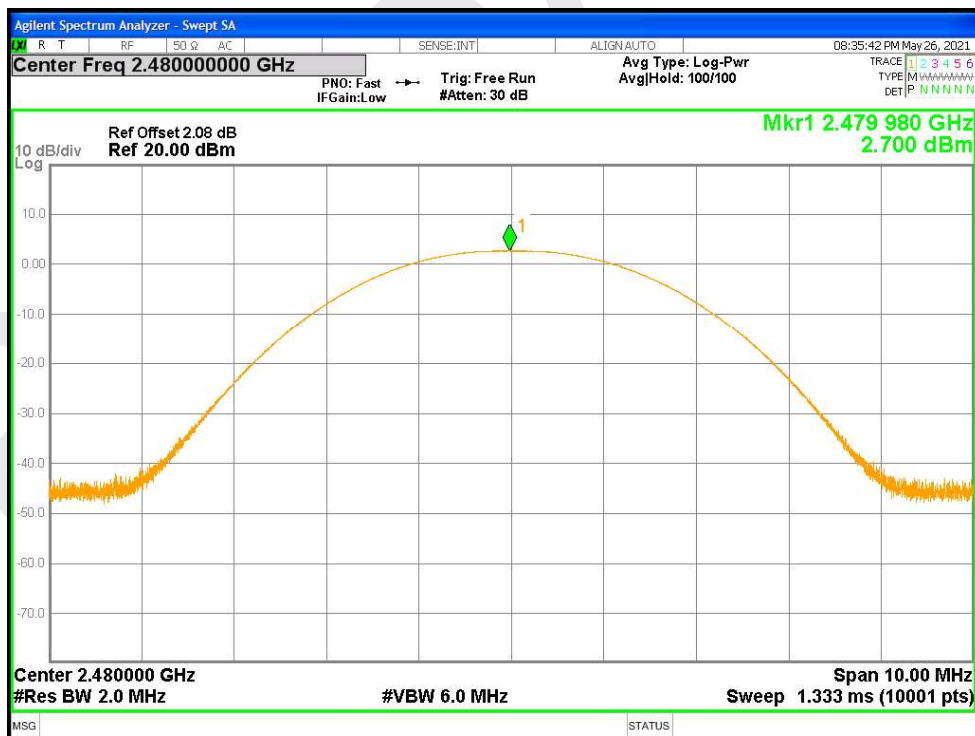




### Power NVNT 1-DH1 2441MHz Ant1

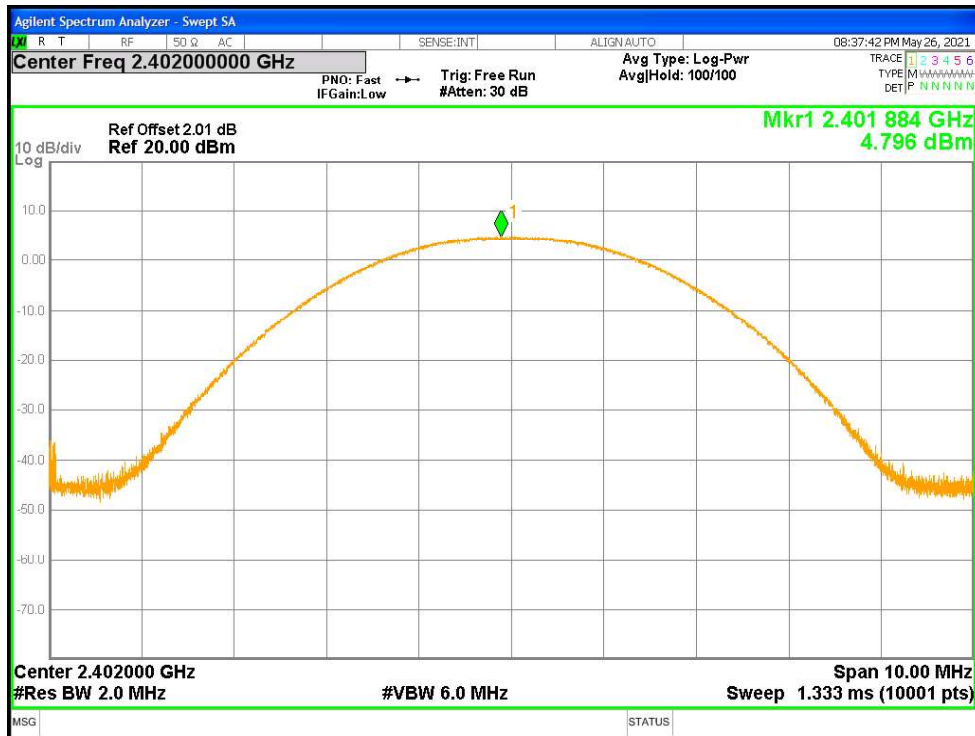


### Power NVNT 1-DH1 2480MHz Ant1





### Power NVNT 2-DH1 2402MHz Ant1



### Power NVNT 2-DH1 2441MHz Ant1

