FCC PART 15C TEST REPORT FOR CERTIFICATION
On Behalf of

VoltEdge, LLC

DONGLE

Model Number: TX70T01

FCC ID: 2AT7K-TX70T01

Prepared for:	VoltEdge, LLC
	1701 Quail Street, Newport Beach, California 92660, United States
Prepared By:	EST Technology Co., Ltd.
	Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong, China
Tel: 86-769-83081888-808	

Report Number:	ESTE-R1908122
Date of Test:	Aug. 01~21, 2019
Date of Report:	Aug. 24, 2019

TABLE OF CONTENTS

Description Page

TEST REPORT VERIFICATION....3
1. GENERAL INFORMATION....4
1.1. Description of Device (EUT)....4
1.2. Antenna Information....4
2. SUMMARY OF TEST....5
2.1. Summary of test result....5
2.2. Test Facilities....6
2.3. Measurement uncertainty....7
2.4. Assistant equipment used for test....7
2.5. Block Diagram....7
2.6. Test Mode....8
2.7. Power Setting of Test Software....8
2.8. Channel List....8
2.9. Test Equipment List....9
3. FIELD STRENGTH OF FUNDAMENTAL....10
3.1. Limit....10
3.2. Test Setup....10
3.3. Spectrum Analyzer Setting....10
3.4. Test Procedure....11
3.5. Test Result....12
4. RADIATED SPURIOUS EMISSIONS AND BAND EDGE....19
4.1. Limit....19
4.2. Test Setup....21
4.3. Spectrum Analyzer Setting....22
4.4. Test Procedure....23
4.5. Test Result....24
5. 20DB BANDWIDTH....32
5.1. Limit....32
5.2. Test Setup....32
5.3. Spectrum Analyzer Setting....32
5.4. Test Procedure....32
5.5. Test Condition....32
5.6. Test Result....33
6. AC POWER LINE CONDUCTED EMISSIONS....35
6.1. Limit....35
6.2. Test Setup....35
6.3. Spectrum Analyzer Setting....35
6.4. Test Procedure....35
6.5. Test Result....36
7. ANTENNA REQUIREMENTS....40
7.1. Limit....40
7.2. Test Result....40
8. TEST SETUP PHOTO....41
9. PHOTO EUT....43

EST Technology Co., Ltd.

Applicant: **Address:**	VoltEdge, LLC 1701 Quail Street, Newport Beach, California 92660, United States		
Manufacturer: **Address:**	VoltEdge, LLC 1701 Quail Street, Newport Beach, California 92660, United States		
E.U.T:	DONGLE		
Model Number:	TX70T01		
Power Supply:	DC 5V		
Trade Name:	VoltEdge	Serial No.:	------
Date of Receipt:	Aug. 01, 2019	Date of Test:	Aug. 01~21, 2019
Test Specification:	FCC Part 15 Subpart C (15.249) ANSI C63.10:2013		
Test Result:	The device described above is tested by EST Technology Co., Ltd. The measurement results were contained in this test report and EST Technology Co., Ltd. was assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliance with the FCC Rules and Regulations Part 15 Subpart C requirements. This report applies to above tested sample only and shall not be reproduced in part without written approval of EST Technology Co., Ltd. **Date:** Aug. 24, 2019		
Prepared by: Ring Ring / Assistant	Reviewed by: Tony Tony / Engineer	Approved by: Iceman Hu / Manager	
Other Aspects: None.			
Abbreviations: OK/P=passed	*fail/F=failed*	*n.a/N=not applicable*	*E.U.T=equipment under tested*
This test report is based on a single evaluation of one sample of above mentioned products ,It is not permitted to be duplicated in extracts without written approval of EST Technology Co., Ltd.			

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Product Name	:	DONGLE
Model Number	:	TX70T01
Software Version	:	A8102_V7 Aug 19 2019 PCB0.4.hex
Hardware Version	:	TX70PS4-BK v1.0
Operation frequency	:	2400MHz-2483.5MHz
Number of channel	:	35
Field Strength of Fundamental	:	95.8 dBμV/m
Modulation Type	:	FSK
Sample Type	:	Prototype production

Note:

For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

1.2. Antenna Information

Ant No.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	N/A	N/A	PCB	N/A	0

Note:

1. The EUT has two antennas, and support MIMO .
2. According to ANSI C63.10:2013 14.4.3.2.5 a):

   Directional gain=0dBi+10×log(2/1)dB=3.01dBi＜6dBi

2. SUMMARY OF TEST

2.1. Summary of test result

Report Section	Description of Test Item	FCC Standard Section	Results
3	Field Strength of Fundamental	15.249(a)	PASS
4	Radiated Spurious Emissions and Band Edge	15.205 15.209 15.249(a)(c)(d)(e) 15.35(b)	PASS
5	20dB Bandwidth	15.215	PASS
6	AC Power Line Conducted Emissions	15.207	PASS
7	Antenna Requirement	15.203	PASS

Note:

(1) “N/A” denotes test is not applicable in this test report

2.2. Test Facilities

EMC Lab	:	Certificated by CNAS, CHINA Registration No.: L5288 Date of registration: November 13, 2017 Certificated by FCC, USA Designation Number: CN1215 Test Firm Registration Number: 722932 Date of registration: November 21, 2017 Certificated by A2LA, USA Registration No.: 4366.01 Date of registration: November 07, 2017 Certificated by Industry Canada CAB identifier No.: CN0035 Date of registration: January 04, 2019 Certificated by VCCI, Japan Registration No.: R-13663; C-14103 Date of registration: July 25, 2017 This Certificate is valid until: July 24, 2020 Certificated by TUV Rheinland, Germany Registration No.: UA 50413872 0001 Date of registration: July 31, 2018 Certificated by TUV/PS, Shenzhen Registration No.: SCN1017 Date of registration: January 27, 2011 Certificated by Intertek ETL SEMKO Registration No.: 2011-RTL-L2-64 Date of registration: April 28, 2011 Certificated by Nemko, Hong Kong Registration No.: 175193 Date of registration: May 4, 2011
Name of Firm	:	EST Technology Co., Ltd.
Site Location	:	Chilingxiang, Qishantou, Santun, Houjie, Dongguan, Guangdong, China

2.3. Measurement uncertainty

Test Item	Uncertainty
Uncertainty for Conduction emission test	±3.48dB
Uncertainty for spurious emissions test (30MHz-1GHz)	±4.60 dB(Polarize: H)
	±4.68 dB(Polarize: V)
Uncertainty for spurious emissions test (1GHz to 18GHz)	±4.96dB
Uncertainty for radio frequency	7×10^{-8}
Uncertainty for conducted RF Power	0.20dB
Uncertainty for Power density test	0.26dB

Note：This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

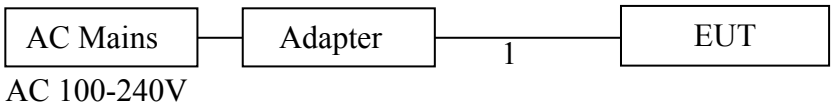
2.4. Assistant equipment used for test

Item	Equipment	Brand	Model Name/Type No.	FCC ID	Series No.
-	Adapter	-	A1443	-	-

Item	Shielded Type	Ferrite Core	Length	Note
1	NO	NO	0.8m	DC Cable

2.5. Block Diagram

For radiated emissions test: EUT was placed on a turn table, which is 0.8 (or 1.5) meter high above ground. EUT was beset into test mode by software before test.



(EUT: DONGLE)

2.6. Test Mode

The test mode was selected for the final test as listed below.

Test Item	Test Mode	Test Channel
Field Strength of Fundamental	TX	Low/Middle/High
Radiated Spurious Emissions	TX	Low/Middle/High
20dB Bandwidth&99% Occupied Bandwidth	TX	Low/Middle/High
AC Power Line Conducted Emissions	TX	Low/Middle/High

Note:

1. In radiated measurement,the EUT had been pre-scan on the positioned of each 3 axis(X,Y,Z), the worst case was found when positioned on **X-plane.**

2.7. Power Setting of Test Software

Software Name	N/A		
Frequency(MHz)	2405.89	2442.753	2477.57
Setting	N/A	N/A	N/A

2.8. Channel List

Indx	Channel	Frequency (MHz)	Indx	Channel	Frequency (MHz)	Indx	Channel	Frequency (MHz)
0	CH14	2405.889	12	CH62	2430.465	24	CH110	2455.041
1	CH18	2407.937	13	CH66	2432.513	25	CH114	2457.089
2	CH22	2409.985	14	CH70	2434.561	26	CH118	2459.137
3	CH26	2412.033	15	CH74	2436.609	27	CH122	2461.185
4	CH30	2414.081	16	CH78	2438.657	28	CH126	2463.233
5	CH34	2416.129	17	CH82	2440.705	29	CH130	2465.281
6	CH38	2418.177	18	CH86	2442.753	30	CH134	2467.329
7	CH42	2420.225	19	CH90	2444.801	31	CH138	2469.377
8	CH46	2422.273	20	CH94	2446.849	32	CH142	2471.425
9	CH50	2424.321	21	CH98	2448.897	33	CH146	2473.473
10	CH54	2426.369	22	CH102	2450.945	34	CH150	2475.521
11	CH58	2428.417	23	CH106	2452.993	35	CH154	2477.569

2.9. Test Equipment List

For conducted emission test						
Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
EMI Test Receiver	Rohde & Schwarz	ESHS30	EST-E001	LISAI	June 14,19	1 Year
Artificial Mains Network	Rohde & Schwarz	ENV216	EST-E002	LISAI	June 14,19	1 Year
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	EST-E078	LISAI	June 14,19	1 Year
Test Software	Audix	e3-6.111221a	N/A	N/A	N/A	N/A

For radiated emission test(9kHz-30MHz)						
Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
EMI Test Receiver	Rohde & Schwarz	ESR7	EST-E047	LISAI	June 14,19	1 Year
Active Loop Antenna	SCHWAREB ECK	FMZB 1519B	EST-E054	LISAI	June 14,19	1 Year
Test Software	Audix	e3-6.111221a	N/A	N/A	N/A	N/A
9kHz-30MHz Cable	N/A	EST-001	N/A	N/A	N/A	N/A

For radiated emissions test (30MHz-1000MHz)						
Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
EMI Test Receiver	Rohde & Schwarz	ESR7	EST-E047	LISAI	June 14,19	1 Year
Bilog Antenna	Teseq	CBL 6111D	EST-E034	LISAI	June 14,19	1 Year
Test Software	Audix	e3-6.111221a	N/A	N/A	N/A	N/A
30-1000MHz Cable	N/A	EST-002	N/A	N/A	N/A	N/A

For radiated emission test(Above 1000MHz)						
Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
Horn Antenna	SCHWARZB ECK	BBHA9120D	EST-E031	LISAI	June 14,19	1 Year
Signal Amplifier	SCHWARZB ECK	BBV9718	EST-E032	LISAI	June 14,19	1 Year
Spectrum Analyzer	Rohde &Schwarz	FSV	EST-E069	LISAI	June 14,19	1 Year
Test Software	Audix	e3-6.111221a	N/A	N/A	N/A	N/A
Above 1GHz Cable	N/A	EST-003	N/A	N/A	N/A	N/A

For connect EUT antenna terminal test						
Equipment	Manufacturer	Model No.	Serial No.	Calibration Body	Last Cal.	Next Cal.
Spectrum Analyzer	Agilent	E4408B	E4408B	LISAI	June 14,19	1 Year

3. FIELD STRENGTH OF FUNDAMENTAL

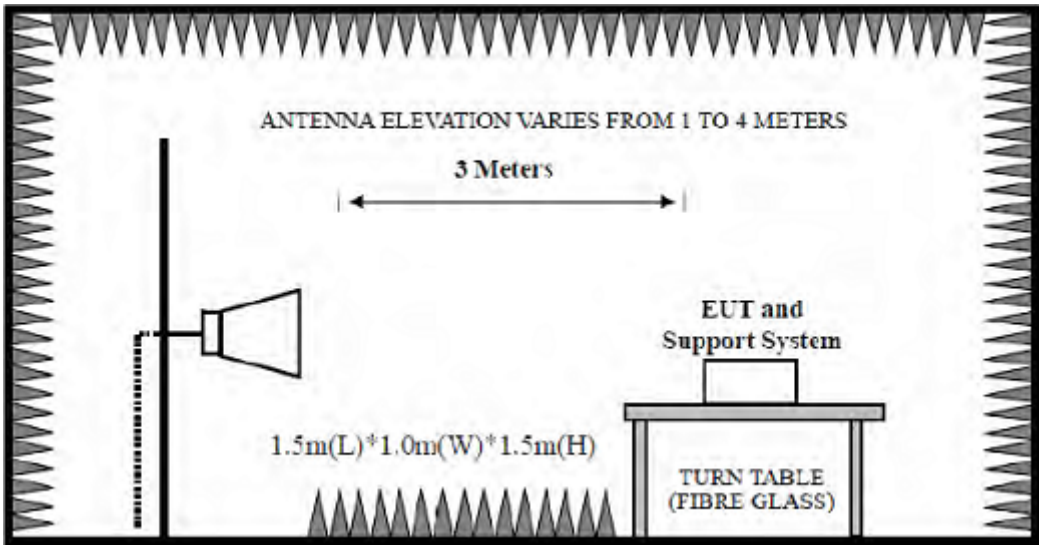
3.1. Limit

Fundamental frequency	Field strength of fundamental@3m (millivolts/meter)	Average Limit@3m dBμV/m	Peak Limit@3m dBμV/m
902-928MHz	50	94	114
2400-2483.5MHz	50	94	114
5725-5875MHz	50	94	114
24.0-24.25	250	108	128

Note:

1. Average Limit (dBμV/m)=20×log[1000×Field Strength (mV/m)].
2. Peak Limit (dBμV/m)= Average Limit (dBμV/m)+20dB

3.2. Test Setup



3.3. Spectrum Analyzer Setting

Spectrum Parameters	Setting
RBW	≥OBW
VBW	3×RBW
Start frequency	2400MHz
Stop frequency	2483.5GHz
Sweep Time	Auto
Detector	PEAK/AVG
Trace Mode	Max Hold

3.4. Test Procedure

a. EUT was placed on a turn table, which is 1.5 meter high above the ground.
b. EUT is set 3 meters away from the receiving antenna, which is mounted on a antenna tower.
c. Spectrum analyzer setting parameters in accordance with section 3.3.
d. Set the EUT transmit continuously with maximum output power.
e. The turn table can rotate 360 degrees to determine the position of the maximum emission level.
f. The antenna can be moved up and down between 1 meter and 4 meters to find out the maximum emission level. Both horizontal and vertical polarization of the antenna are set on test,record the average and peak value.
g. Repeat above procedures until all channels were measured.
h. Record the results in the test report.

3.5. Test Result

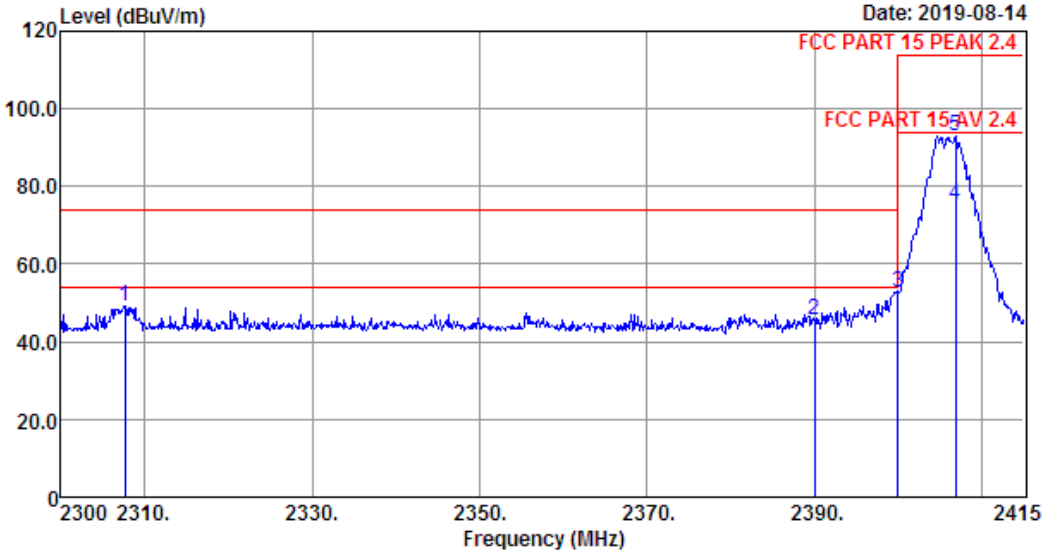
Test frequency (MHz)	Fundamental frequency (MHz)	Field strength of fundamental level (dBμV/m)		Limit (dBμV/m)		Result	Antenna Pole (H/V)
		Avg	Peak	Avg	Peak		
2405.889	2406.84	75.19	93.11	94	114	Pass	V
	2404.77	70.18	88.50	94	114	Pass	H
2442.753	2441.50	79.90	94.69	94	114	Pass	V
	2441.58	71.92	90.17	94	114	Pass	H
2477.569	2478.55	78.95	95.80	94	114	Pass	V
	2476.54	71.68	89.64	94	114	Pass	H

Low Channel(2405.889MHz)

EST Technology

Chilingxiang, Qishantou, Santun,
Houjie, Dongguan,Guangdong,China
Tel:+86-769-83081888
Fax:+86-769-83081878

Data: 55 File: \\Emc-966-1\test data\2019\RF\D\DiPin.EM6 (60)



Site no. : 1# 966 Chamber Data no. : 55
Dis. / Ant. : 3m ANT9120D 1-18G Ant. pol. : VERTICAL
Limit : FCC PART 15 PEAK 2.4
Env. / Ins. : Temp:24.4';Humi:58%;Press:101.52kPa
Engineer : Viking
EUT : DONGLE
Power : DC 5V From USB
M/N : TX70T01
Test Mode : TX 2405.889MHz

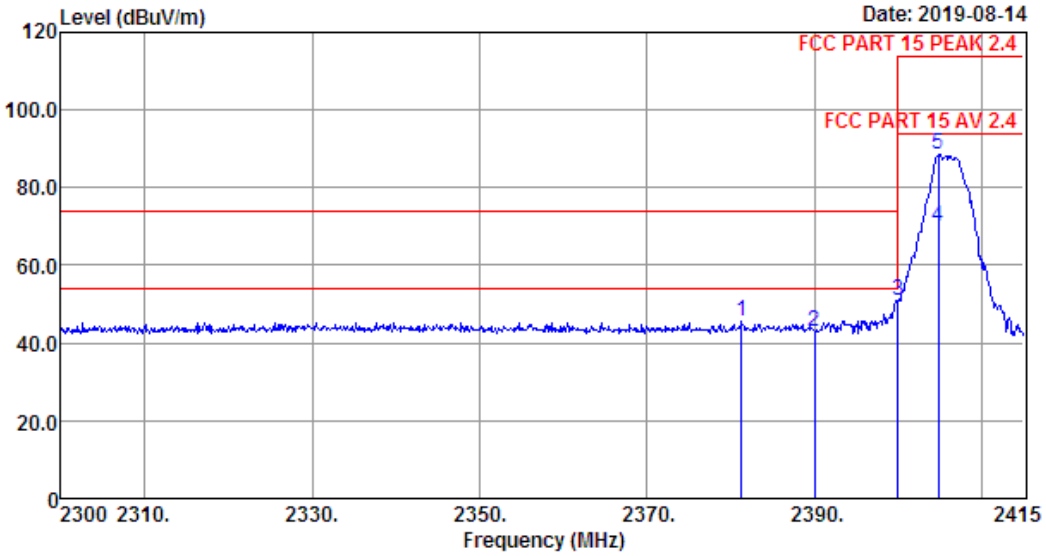
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2307.59	27.13	1.41	34.68	55.41	49.27	74.00	24.73	Peak
2	2390.00	27.26	1.45	34.64	51.73	45.80	74.00	28.20	Peak
3	2400.00	27.26	1.45	34.64	58.43	52.50	74.00	21.50	Peak
4	2406.84	27.28	1.46	34.64	81.09	75.19	94.00	18.81	Average
5	2406.84	27.28	1.46	34.64	99.01	93.11	114.00	20.89	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. Margin= Limit - Emission Level.
3. The emission levels that are 20dB below the official limit are not reported.

EST Technology

Chilingxiang, Qishantou, Santun,
Houjie, Dongguan,Guangdong,China
Tel:+86-769-83081888
Fax:+86-769-83081878

Data: 56 File: \\Emc-966-1\test data\2019\RF\D\DiPin.EM6 (60)



Site no. : 1# 966 Chamber Data no. : 56
Dis. / Ant. : 3m ANT9120D 1-18G Ant. pol. : HORIZONTAL
Limit : FCC PART 15 PEAK 2.4
Env. / Ins. : Temp:24.4';Humi:58%;Press:101.52kPa
Engineer : Viking
EUT : DONGLE
Power : DC 5V From USB
M/N : TX70T01
Test Mode : TX 2405.889MHz

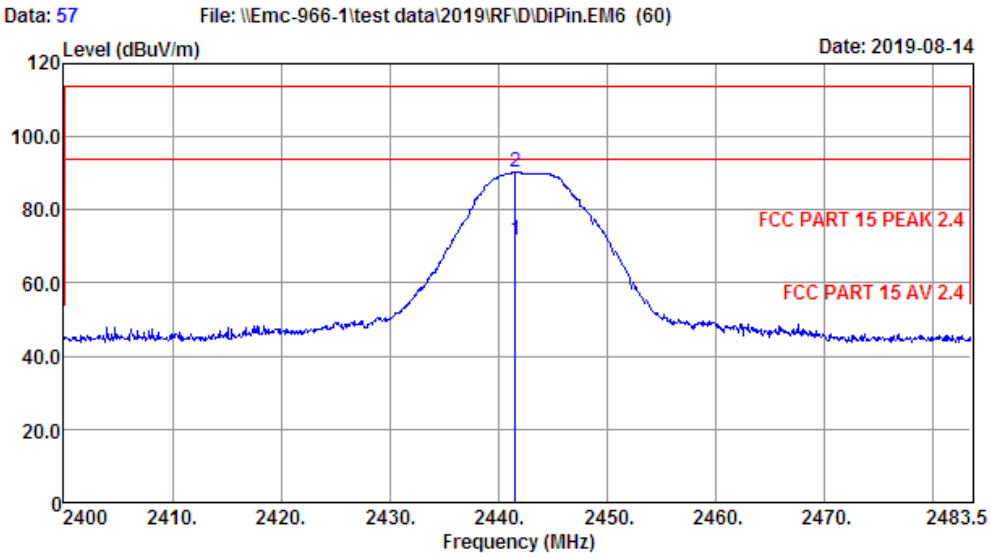
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2381.31	27.23	1.44	34.65	51.74	45.76	74.00	28.24	Peak
2	2390.00	27.26	1.45	34.64	48.99	43.06	74.00	30.94	Peak
3	2400.00	27.26	1.45	34.64	56.73	50.80	74.00	23.20	Peak
4	2404.77	27.28	1.46	34.64	76.08	70.18	94.00	23.82	Average
5	2404.77	27.28	1.46	34.64	94.40	88.50	114.00	25.50	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. Margin= Limit - Emission Level.
3. The emission levels that are 20dB below the official limit are not reported.

Middle Channel(2442.753MHz)

EST Technology

Chilingxiang, Qishantou, Santun,
Houjie, Dongguan,Guangdong,China
Tel:+86-769-83081888
Fax:+86-769-83081878



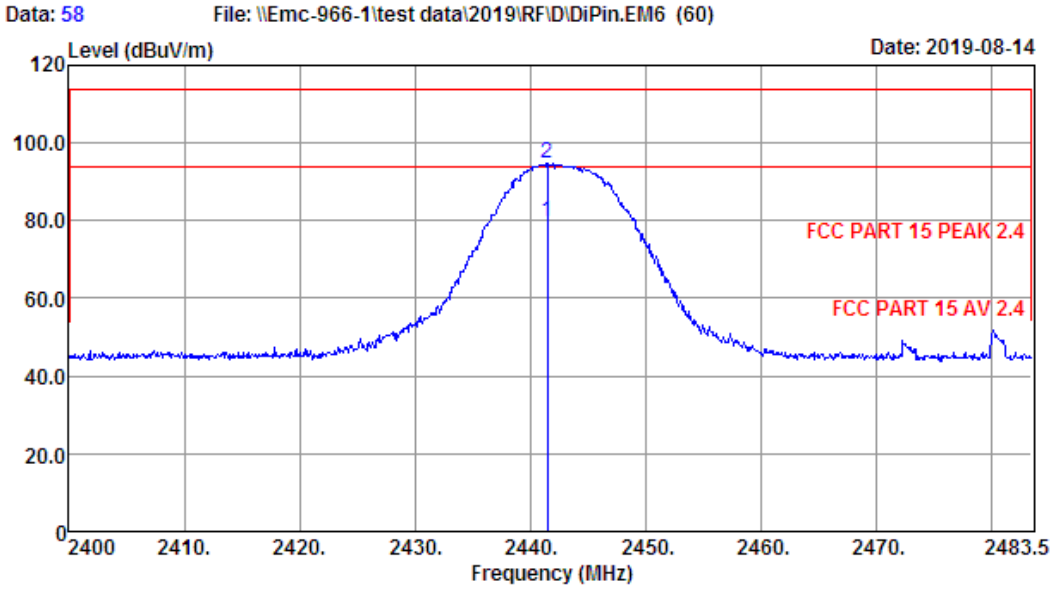

```
Site no.      : 1# 966 Chamber              Data no.  : 57
Dis. / Ant.   : 3m   ANT9120D 1-18G         Ant. pol. : HORIZONTAL
Limit         : FCC PART 15 PEAK 2.4
Env. / Ins.   : Temp:24.4';Humi:58%;Press:101.52kPa
Engineer      : Viking
EUT           : DONGLE
Power         : DC 5V From USB
M/N           : TX70T01
Test Mode     : TX 2442.753MHz
```

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2441.58	27.33	1.47	34.62	77.74	71.92	94.00	22.08	Average
2	2441.58	27.33	1.47	34.62	95.99	90.17	114.00	23.83	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. Margin= Limit - Emission Level.
3. The emission levels that are 20dB below the official limit are not reported.

EST Technology

Chilingxiang, Qishantou, Santun,
Houjie, Dongguan,Guangdong,China
Tel:+86-769-83081888
Fax:+86-769-83081878



Site no. : 1# 966 Chamber Data no. : 58
Dis. / Ant. : 3m ANT9120D 1-18G Ant. pol. : VERTICAL
Limit : FCC PART 15 PEAK 2.4
Env. / Ins. : Temp:24.4';Humi:58%;Press:101.52kPa
Engineer : Viking
EUT : DONGLE
Power : DC 5V From USB
M/N : TX70T01
Test Mode : TX 2442.753MHz

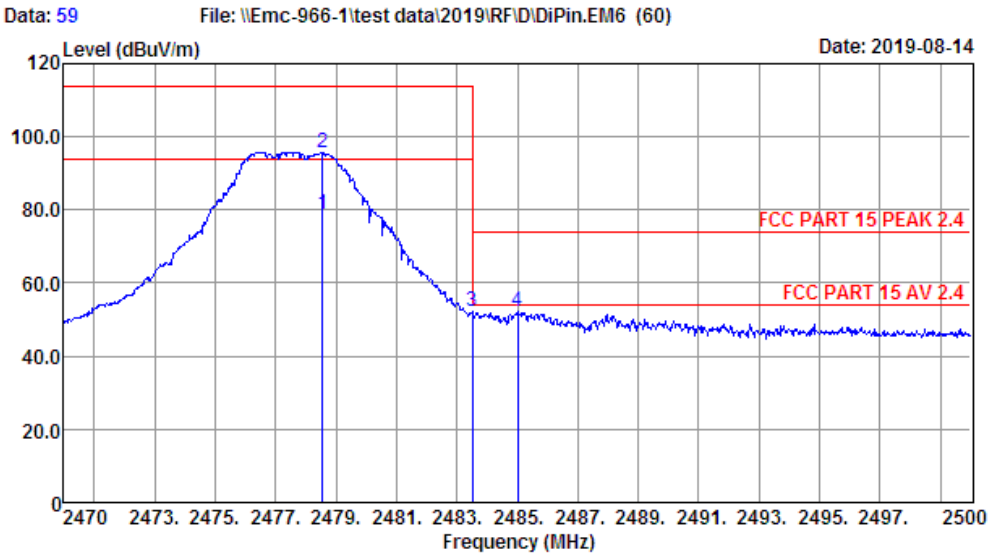
	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2441.50	27.33	1.47	34.62	85.72	79.90	94.00	14.10	Average
2	2441.50	27.33	1.47	34.62	100.51	94.69	114.00	19.31	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. Margin= Limit - Emission Level.
3. The emission levels that are 20dB below the official limit are not reported.

High Channel(2477.569MHz)

EST Technology

Chilingxiang, Qishantou, Santun,
Houjie, Dongguan,Guangdong,China
Tel:+86-769-83081888
Fax:+86-769-83081878



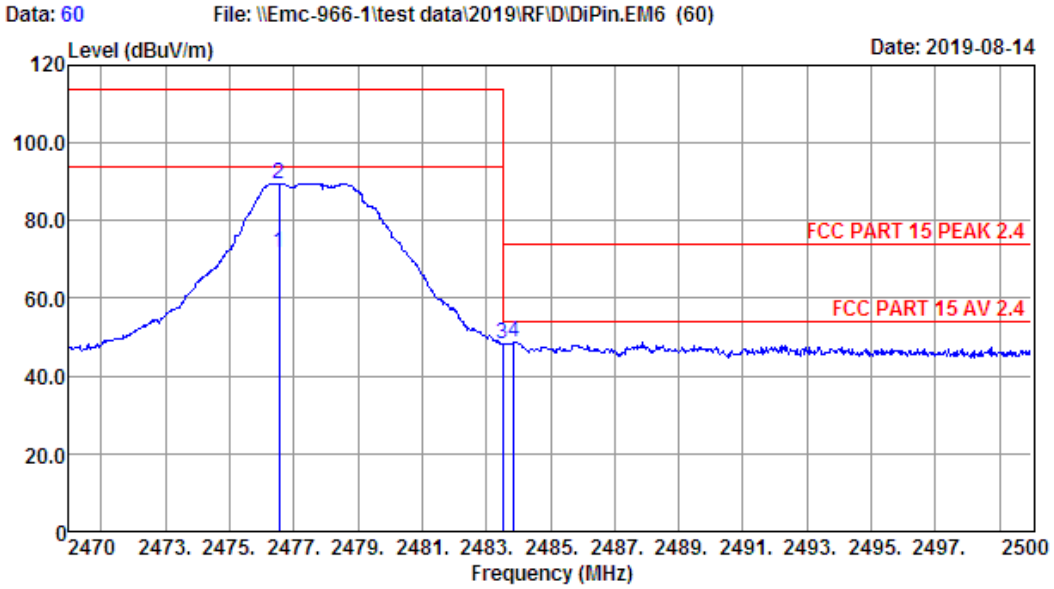
Site no. : 1# 966 Chamber Data no. : 59
Dis. / Ant. : 3m ANT9120D 1-18G Ant. pol. : VERTICAL
Limit : FCC PART 15 PEAK 2.4
Env. / Ins. : Temp:24.4';Humi:58%;Press:101.52kPa
Engineer : Viking
EUT : DONGLE
Power : DC 5V From USB
M/N : TX70T01
Test Mode : TX 2477.569MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2478.55	27.38	1.48	34.61	84.70	78.95	94.00	15.05	Average
2	2478.55	27.38	1.48	34.61	101.55	95.80	114.00	18.20	Peak
3	2483.50	27.38	1.48	34.61	57.81	52.06	74.00	21.94	Peak
4	2485.00	27.38	1.48	34.61	58.14	52.39	74.00	21.61	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. Margin= Limit - Emission Level.
3. The emission levels that are 20dB below the official limit are not reported.

EST Technology

Chilingxiang, Qishantou, Santun,
Houjie, Dongguan,Guangdong,China
Tel:+86-769-83081888
Fax:+86-769-83081878



Site no. : 1# 966 Chamber Data no. : 60
Dis. / Ant. : 3m ANT9120D 1-18G Ant. pol. : HORIZONTAL
Limit : FCC PART 15 PEAK 2.4
Env. / Ins. : Temp:24.4';Humi:58%;Press:101.52kPa
Engineer : Viking
EUT : DONGLE
Power : DC 5V From USB
M/N : TX70T01
Test Mode : TX 2477.569MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2476.54	27.38	1.48	34.61	77.43	71.68	94.00	22.32	Average
2	2476.54	27.38	1.48	34.61	95.39	89.64	114.00	24.36	Peak
3	2483.50	27.38	1.48	34.61	53.95	48.20	74.00	25.80	Peak
4	2483.86	27.38	1.48	34.61	54.68	48.93	74.00	25.07	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. Margin= Limit - Emission Level.
3. The emission levels that are 20dB below the official limit are not reported.

4. RADIATED SPURIOUS EMISSIONS AND BAND EDGE

4.1. Limit

(a) The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency	Field strength of harmonics@3m (microvolts/meter)	Average Limit@3m dBμV/m	Peak Limit@3m dBμV/m
902-928MHz	500	54	74
2400-2483.5MHz	500	54	74
5725-5875MHz	500	54	74
24.0-24.25	2500	68	88

(b) Field strength limits are specified at a distance of 3 meters.

(c) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

15.209 Radiated emission limits

Frequency (MHz)	Field Strength(μV/m)	Distance(m)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

15.205 Restricted frequency band

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	([2])

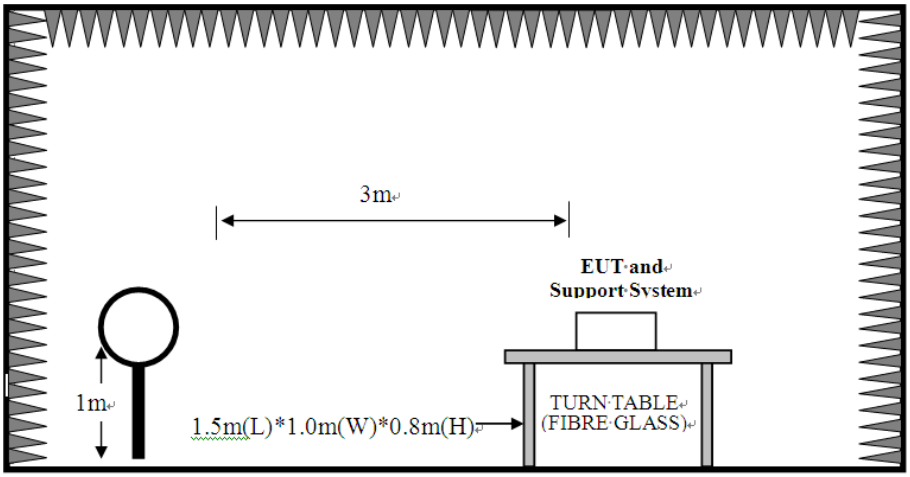
(d) As shown in §15.35(b), for frequencies above 1000 MHz, the field strength limits in paragraphs (a) of this section are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation

Note:

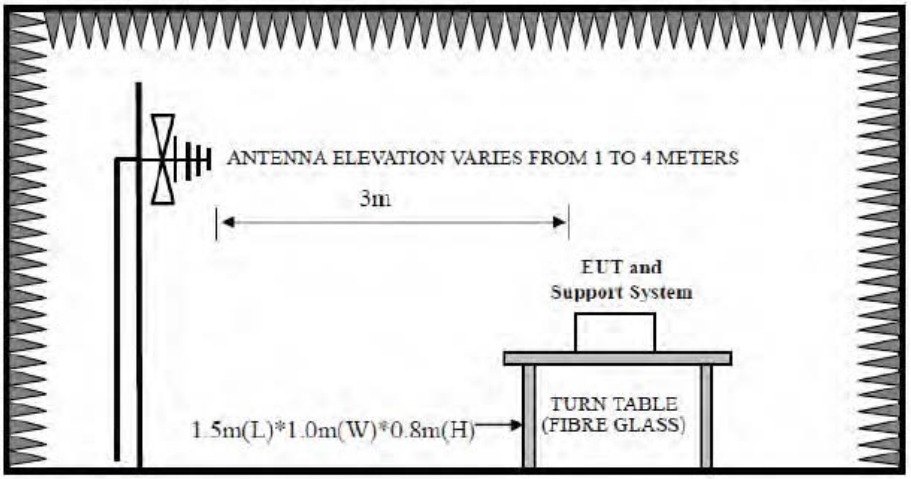
(1) Emission level dBμV = 20 log Emission level μV/m.
(2) The smaller limit shall apply at the cross point between two frequency bands.
(3) Distance is the distance in meters between the measuring instrument,antenna and the closest point of any part of the device or system.

4.2. Test Setup

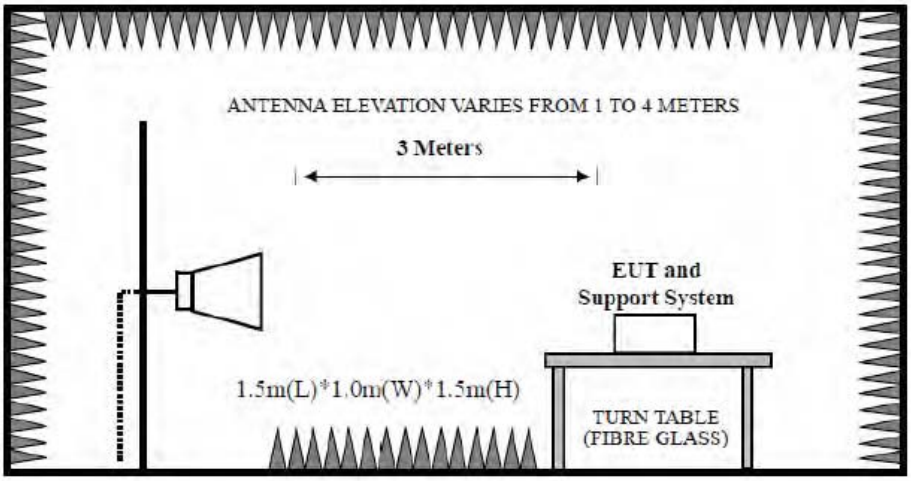
9kHz~30MHz



30~1000MHz



Above 1GHz



4.3. Spectrum Analyzer Setting

For 9KHz-150KHz

Spectrum Parameters	Setting
RBW	300Hz(for Peak&AVG)/CISPR 200Hz(for QP)
VBW	300Hz(for Peak&AVG)/CISPR 200Hz(for QP)
Start frequency	9KHz
Stop frequency	150KHz
Sweep Time	Auto
Detector	PEAK/QP/AVG
Trace Mode	Max Hold

For 150KHz-30MHz

Spectrum Parameters	Setting
RBW	9KHz
VBW	9KHz
Start frequency	150KHz
Stop frequency	30MHz
Sweep Time	Auto
Detector	QP
Trace Mode	Max Hold

For 30MHz-1000MHz

Spectrum Parameters	Setting
RBW	120KHz
VBW	300KHz
Start frequency	30MHz
Stop frequency	1000MHz
Sweep Time	Auto
Detector	QP
Trace Mode	Max Hold

For Above 1GHz

Spectrum Parameters	Setting
RBW	1MHz
VBW	3MHz
Start frequency	1GHz
Stop frequency	10 Times Carrier Frequency
Sweep Time	Auto
Detector	PEAK
Trace Mode	Max Hold

4.4. Test Procedure

a. EUT was placed on a turn table, which is 0.8 meter high above ground for below 1GHz test, and which is 1.5 meter high above ground for above 1GHz test.
b. EUT is set 3 meters away from the receiving antenna, which is mounted on a antenna tower.
c. Set the EUT transmit continuously with maximum output power.
d. The turn table can rotate 360 degrees to determine the position of the maximum emission level.
e. The antenna can be moved up and down between 1 meter and 4 meters to find out the maximum emission level. Both horizontal and vertical polarization of the antenna are set on test.
f. Spectrum analyzer setting parameters in accordance with section 4.3.
g. Repeat above procedures until all channels were measured.
h. Record the results in the test report.

Note:

1. For emissions above 1GHz, if peak level comply with average limit, then the average level is deemed to comply with average limit.
2. The frequency 2405.889MHz/2442.753MHz/2477.57MHz are fundamental frequency.

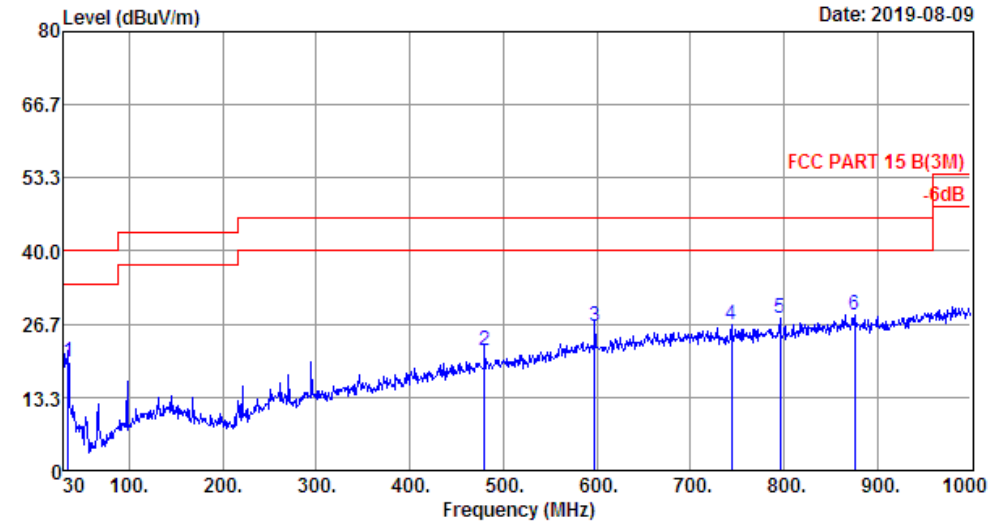
4.5. Test Result

Radiated Emissions Below 1GHz

EST Technology

Chilingxiang, Qishantou, Santun,
Houjie, Dongguan,Guangdong,China
Tel:+86-769-83081888
Fax:+86-769-83081878

Data: 5 File: \\Emc-966-1\test data\2019\RF\D\DiPin.EM6 (60)



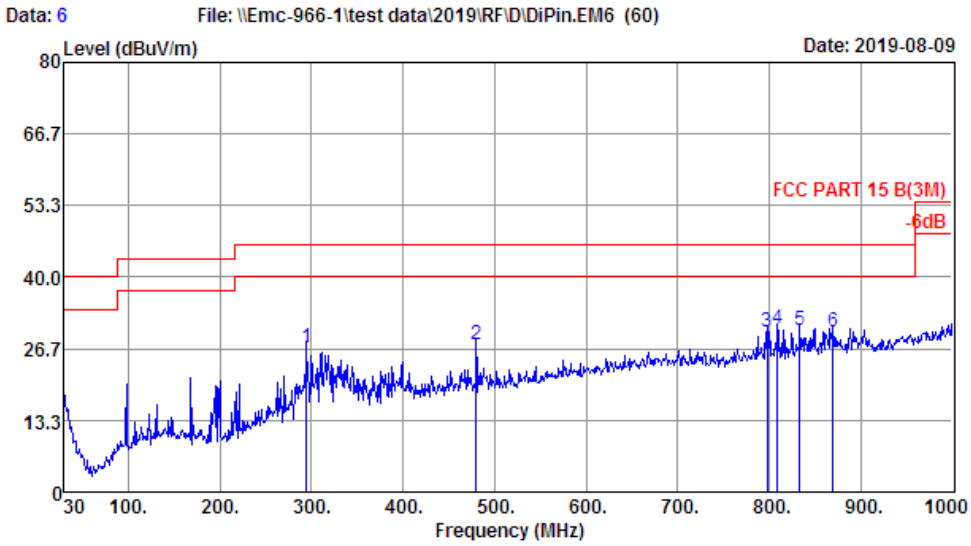
Site no. : 1# 966 Chamber Data no. : 5
Dis. / Ant. : 3m 37062 Ant. pol. : VERTICAL
Limit : FCC PART 15 B(3M)
Env. / Ins. : Temp:24.9';Humi:55%;Press:101.52kPa
Engineer : Viking
EUT : DONGLE
Power : DC 5V From USB
M/N : TX70T01
Test Mode : TX Mode

	Freq. (MHz)	ANT Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	34.85	14.95	0.19	4.73	19.87	40.00	20.13	QP
2	480.08	17.90	2.63	1.25	21.78	46.00	24.22	QP
3	597.45	20.37	2.95	2.87	26.19	46.00	19.81	QP
4	743.92	21.80	3.65	1.05	26.50	46.00	19.50	QP
5	796.30	22.82	3.58	1.22	27.62	46.00	18.38	QP
6	875.84	23.84	3.85	0.71	28.40	46.00	17.60	QP

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. Margin= Limit - Emission Level.
3. The emission levels that are 20dB below the official limit are not reported.

EST Technology

Chilingxiang, Qishantou, Santun,
Houjie, Dongguan,Guangdong,China
Tel:+86-769-83081888
Fax:+86-769-83081878




```
Site no.      : 1# 966 Chamber              Data no.  : 6
Dis. / Ant.   : 3m   37062                  Ant. pol. : HORIZONTAL
Limit         : FCC PART 15 B(3M)
Env. / Ins.   : Temp:24.9';Humi:55%;Press:101.52kPa
Engineer      : Viking
EUT           : DONGLE
Power         : DC 5V From USB
M/N           : TX70T01
Test Mode     : TX Mode
```

	Freq. (MHz)	ANT Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	294.81	13.50	1.83	11.63	26.96	46.00	19.04	QP
2	480.08	17.90	2.63	6.78	27.31	46.00	18.69	QP
3	798.24	22.86	3.59	3.33	29.78	46.00	16.22	QP
4	808.91	23.17	3.66	3.51	30.34	46.00	15.66	QP
5	833.16	23.43	3.71	2.98	30.12	46.00	15.88	QP
6	870.02	23.90	3.81	2.17	29.88	46.00	16.12	QP

Remarks: 1. Emission Level= Antenna Factor + Cable Loss + Reading.
2. Margin= Limit - Emission Level.
3. The emission levels that are 20dB below the official limit are not reported.

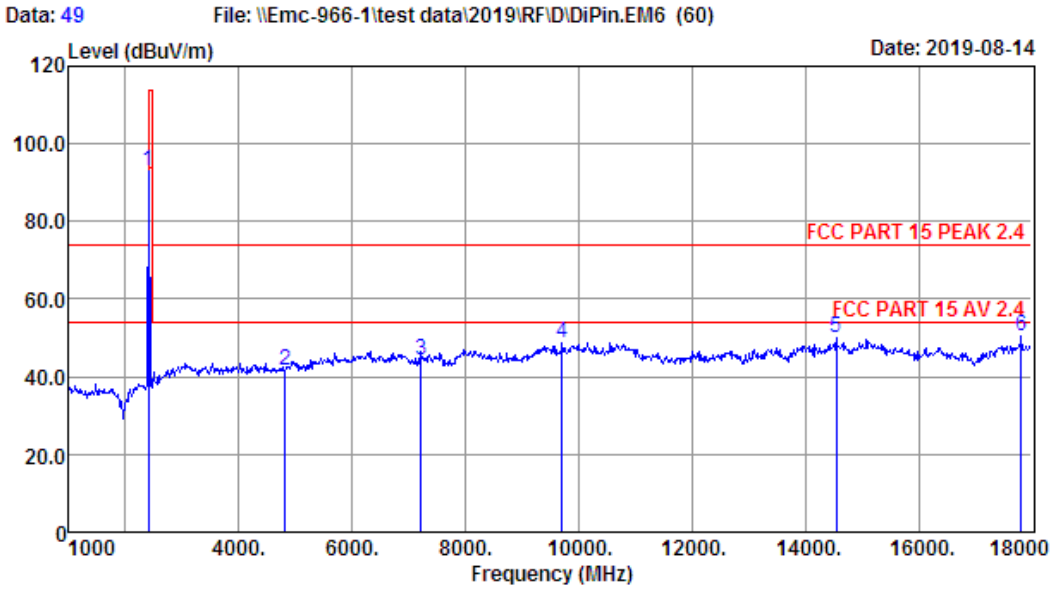
Note:

1. The amplitude of 9KHz to 30MHz spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.
2. All channels had been pre-test,only the worst case was reported.

Radiated Emissions Above 1G

EST Technology

Chilingxiang, Qishantou, Santun,
Houjie, Dongguan,Guangdong,China
Tel:+86-769-83081888
Fax:+86-769-83081878



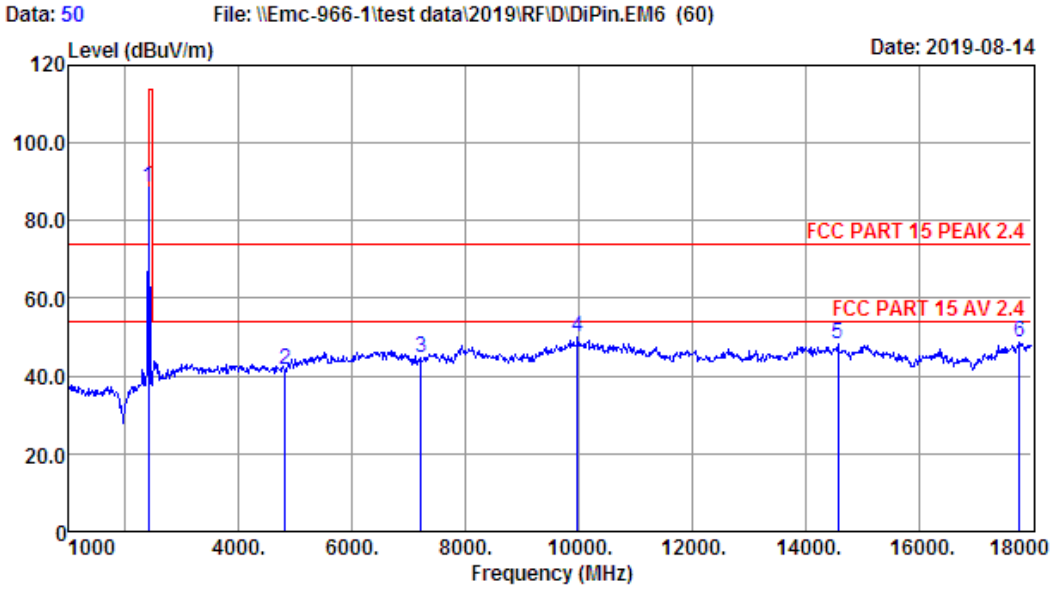

```
Site no.      : 1# 966 Chamber              Data no.  : 49
Dis. / Ant.   : 3m   ANT9120D 1-18G         Ant. pol. : VERTICAL
Limit         : FCC PART 15 PEAK 2.4
Env. / Ins.   : Temp:24.4';Humi:58%;Press:101.52kPa
Engineer      : Viking
EUT           : DONGLE
Power         : DC 5V From USB
M/N           : TX70T01
Test Mode     : TX 2405.889MHz
```

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2405.89	27.28	1.46	34.64	98.72	92.82	114.00	21.18	Peak
2	4811.78	31.12	3.25	34.66	41.99	41.70	74.00	32.30	Peak
3	7217.67	36.25	5.19	34.82	37.78	44.40	74.00	29.60	Peak
4	9704.00	38.31	5.66	34.26	39.11	48.82	74.00	25.18	Peak
5	14549.00	40.99	6.89	34.46	36.62	50.04	74.00	23.96	Peak
6	17813.00	47.41	8.12	34.32	29.43	50.64	74.00	23.36	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. Margin= Limit - Emission Level.
3. The emission levels that are 20dB below the official limit are not reported.

EST Technology

Chilingxiang, Qishantou, Santun,
Houjie, Dongguan,Guangdong,China
Tel:+86-769-83081888
Fax:+86-769-83081878



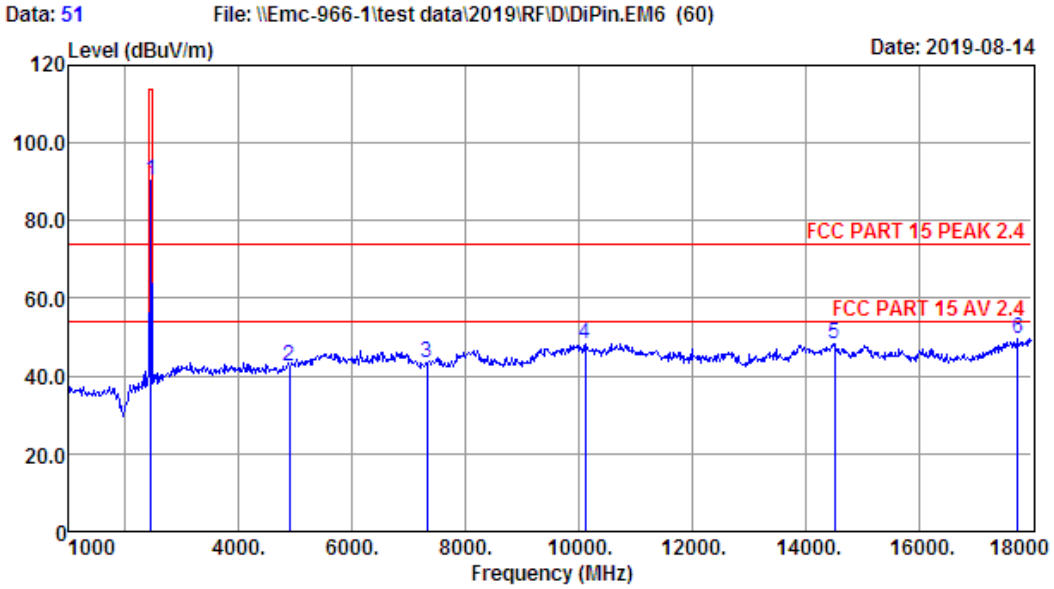
Site no. : 1# 966 Chamber Data no. : 50
Dis. / Ant. : 3m ANT9120D 1-18G Ant. pol. : HORIZONTAL
Limit : FCC PART 15 PEAK 2.4
Env. / Ins. : Temp:24.4';Humi:58%;Press:101.52kPa
Engineer : Viking
EUT : DONGLE
Power : DC 5V From USB
M/N : TX70T01
Test Mode : TX 2405.889MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2405.89	27.28	1.46	34.64	94.67	88.77	114.00	25.23	Peak
2	4811.78	31.12	3.25	34.66	42.13	41.84	74.00	32.16	Peak
3	7217.67	36.25	5.19	34.82	38.13	44.75	74.00	29.25	Peak
4	9976.00	38.87	5.88	34.20	39.44	49.99	74.00	24.01	Peak
5	14583.00	40.98	6.89	34.47	34.70	48.10	74.00	25.90	Peak
6	17779.00	47.14	8.10	34.32	27.95	48.87	74.00	25.13	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. Margin= Limit - Emission Level.
3. The emission levels that are 20dB below the official limit are not reported.

EST Technology

Chilingxiang, Qishantou, Santun,
Houjie, Dongguan,Guangdong,China
Tel:+86-769-83081888
Fax:+86-769-83081878



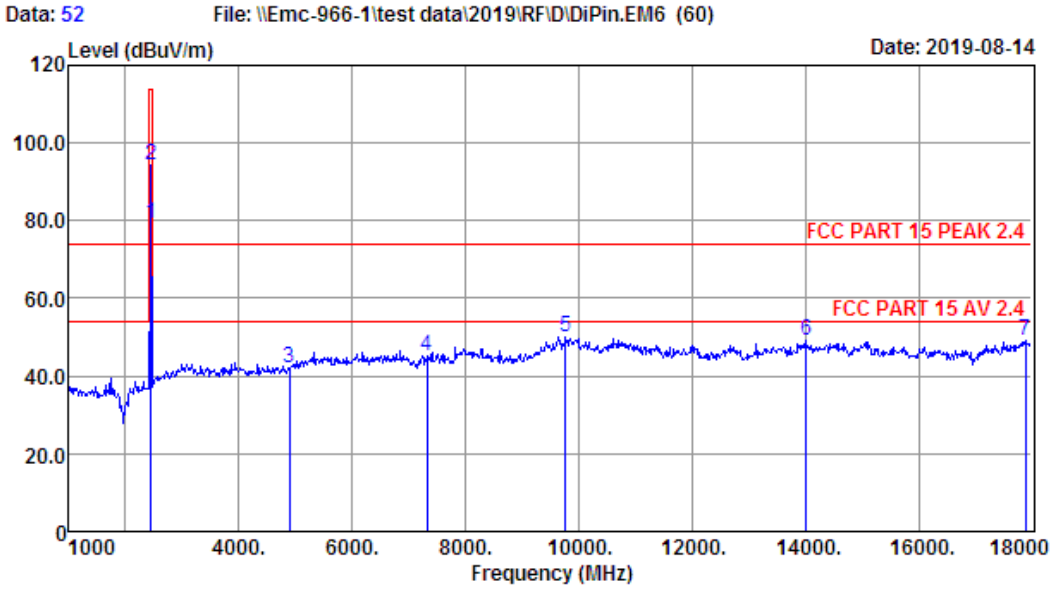
Site no. : 1# 966 Chamber Data no. : 51
Dis. / Ant. : 3m ANT9120D 1-18G Ant. pol. : HORIZONTAL
Limit : FCC PART 15 PEAK 2.4
Env. / Ins. : Temp:24.4';Humi:58%;Press:101.52kPa
Engineer : Viking
EUT : DONGLE
Power : DC 5V From USB
M/N : TX70T01
Test Mode : TX 2442.753MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2442.75	27.33	1.47	34.62	95.95	90.13	114.00	23.87	Peak
2	4885.51	31.43	3.32	34.68	42.58	42.65	74.00	31.35	Peak
3	7328.26	36.46	5.22	34.83	36.51	43.36	74.00	30.64	Peak
4	10112.00	39.02	5.92	34.24	37.64	48.34	74.00	25.66	Peak
5	14515.00	41.00	6.90	34.45	35.02	48.47	74.00	25.53	Peak
6	17745.00	46.87	8.07	34.33	29.04	49.65	74.00	24.35	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. Margin= Limit - Emission Level.
3. The emission levels that are 20dB below the official limit are not reported.

EST Technology

Chilingxiang, Qishantou, Santun,
Houjie, Dongguan,Guangdong,China
Tel:+86-769-83081888
Fax:+86-769-83081878



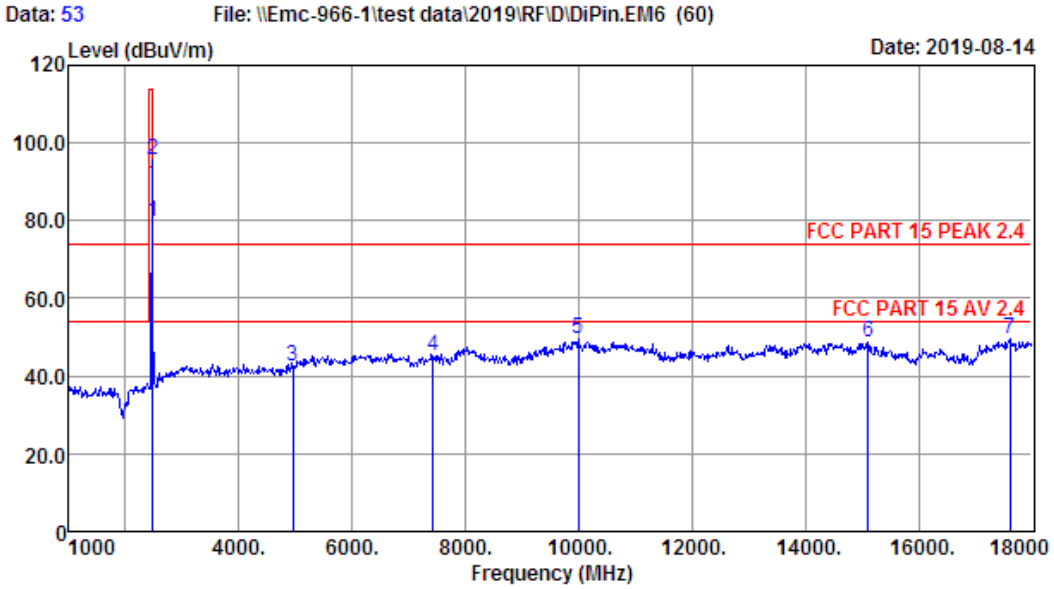
Site no. : 1# 966 Chamber Data no. : 52
Dis. / Ant. : 3m ANT9120D 1-18G Ant. pol. : VERTICAL
Limit : FCC PART 15 PEAK 2.4
Env. / Ins. : Temp:24.4';Humi:58%;Press:101.52kPa
Engineer : Viking
EUT : DONGLE
Power : DC 5V From USB
M/N : TX70T01
Test Mode : TX 2442.753MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2442.75	27.33	1.47	34.62	84.95	79.13	94.00	14.87	Average
2	2442.75	27.33	1.47	34.62	100.19	94.37	114.00	19.63	Peak
3	4885.51	31.43	3.32	34.68	42.21	42.28	74.00	31.72	Peak
4	7328.26	36.46	5.22	34.83	38.47	45.32	74.00	28.68	Peak
5	9772.00	38.45	5.72	34.24	40.23	50.16	74.00	23.84	Peak
6	14022.00	41.10	6.54	34.31	35.67	49.00	74.00	25.00	Peak
7	17881.00	47.95	8.16	34.31	27.13	48.93	74.00	25.07	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. Margin= Limit - Emission Level.
3. The emission levels that are 20dB below the official limit are not reported.

EST Technology

Chilingxiang, Qishantou, Santun,
Houjie, Dongguan,Guangdong,China
Tel:+86-769-83081888
Fax:+86-769-83081878



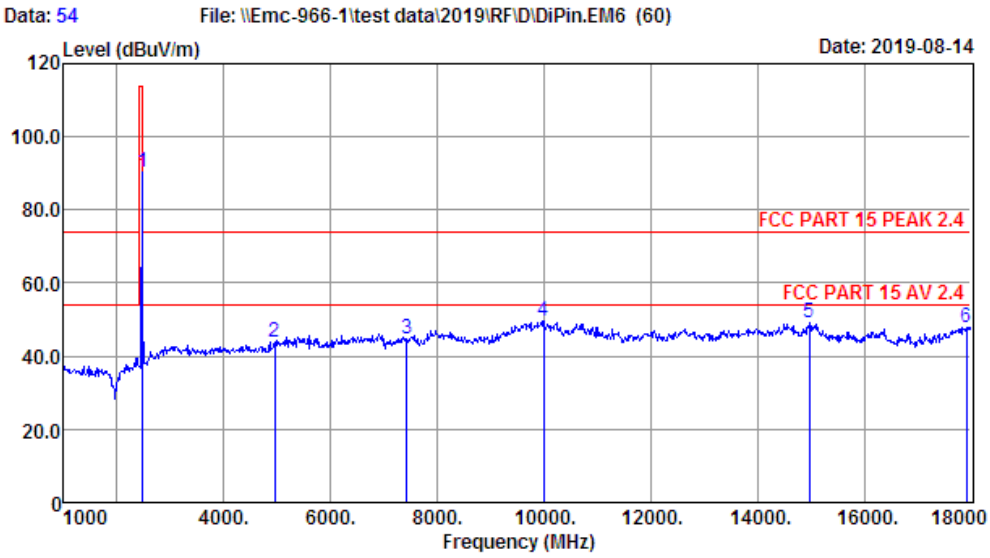
Site no. : 1# 966 Chamber Data no. : 53
Dis. / Ant. : 3m ANT9120D 1-18G Ant. pol. : VERTICAL
Limit : FCC PART 15 PEAK 2.4
Env. / Ins. : Temp:24.4';Humi:58%;Press:101.52kPa
Engineer : Viking
EUT : DONGLE
Power : DC 5V From USB
M/N : TX70T01
Test Mode : TX 2477.569MHz

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2477.57	27.38	1.48	34.61	85.32	79.57	94.00	14.43	Average
2	2477.57	27.38	1.48	34.61	101.60	95.85	114.00	18.15	Peak
3	4955.14	31.68	3.38	34.69	42.20	42.57	74.00	31.43	Peak
4	7432.71	36.66	5.25	34.84	38.18	45.25	74.00	28.75	Peak
5	9993.00	38.90	5.89	34.20	38.81	49.40	74.00	24.60	Peak
6	15110.00	40.79	6.73	34.56	35.71	48.67	74.00	25.33	Peak
7	17609.00	45.78	7.99	34.34	29.95	49.38	74.00	24.62	Peak

Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
2. Margin= Limit - Emission Level.
3. The emission levels that are 20dB below the official limit are not reported.

EST Technology

Chilingxiang, Qishantou, Santun,
Houjie, Dongguan,Guangdong,China
Tel:+86-769-83081888
Fax:+86-769-83081878




```
Site no.       : 1# 966 Chamber              Data no.  : 54
Dis. / Ant.    : 3m   ANT9120D 1-18G         Ant. pol. : HORIZONTAL
Limit          : FCC PART 15 PEAK 2.4
Env. / Ins.    : Temp:24.4';Humi:58%;Press:101.52kPa
Engineer       : Viking
EUT            : DONGLE
Power          : DC 5V From USB
M/N            : TX70T01
Test Mode      : TX 2477.569MHz
```

	Freq. (MHz)	Ant. Factor (dB/m)	Cable Loss (dB)	Amp Factor (dB)	Reading (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Remark
1	2477.57	27.38	1.48	34.61	95.86	90.11	114.00	23.89	Peak
2	4955.14	31.68	3.38	34.69	43.33	43.70	74.00	30.30	Peak
3	7432.71	36.66	5.25	34.84	37.55	44.62	74.00	29.38	Peak
4	9993.00	38.90	5.89	34.20	39.04	49.63	74.00	24.37	Peak
5	14974.00	40.91	6.82	34.59	36.21	49.35	74.00	24.65	Peak
6	17915.00	48.22	8.18	34.31	25.78	47.87	74.00	26.13	Peak

```
Remarks: 1. Emission Level= Antenna Factor + Cable Loss - Amp Factor + Reading.
         2. Margin= Limit - Emission Level.
         3. The emission levels that are 20dB below the official
            limit are not reported.
```

Note:

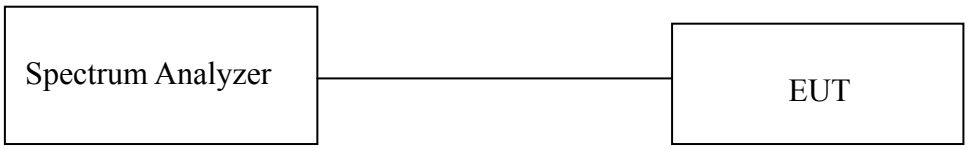
1. The amplitude of 18GHz to 25GHz spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.

5. 20DB BANDWIDTH

5.1. Limit

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§15.217 through 15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. In the case of intentional radiators operating under the provisions of subpart E, the emission bandwidth may span across multiple contiguous frequency bands identified in that subpart. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

5.2. Test Setup



5.3. Spectrum Analyzer Setting

Spectrum Parameters	Setting
RBW	1%~5% OBW
VBW	3×RBW
Span	two times and five times the OBW
Sweep Time	Auto
Detector	Peak
Trace Mode	Max Hold

5.4. Test Procedure

a. Connect EUT antenna terminal to the spectrum analyzer with RF cable.
b. Spectrum analyzer setting parameters in accordance with section 5.3.
c. Set the EUT transmit continuously with maximum output power.
d. Allow trace to stabilize, measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 20 dB relative to the maximum level measured in the fundamental emission.
e. Repeat above procedures until all modes and channels were measured.
f. Record the results in the test report.

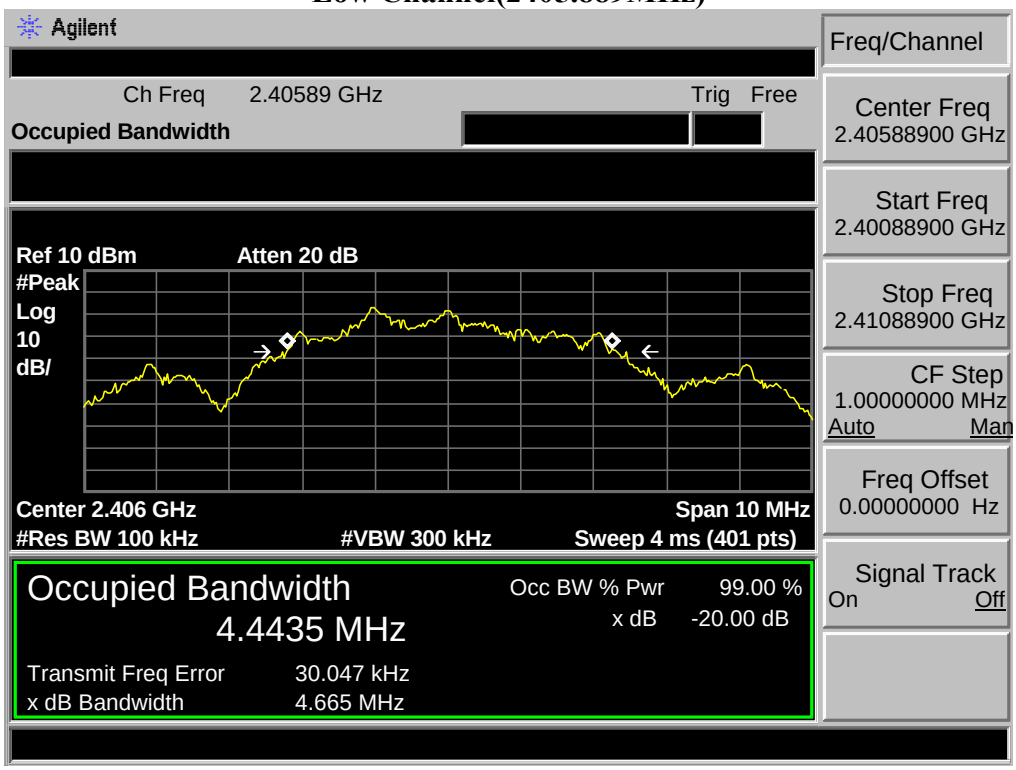
5.5. Test Condition

Temperature	25℃	Relative Humidity	55%	Test Voltage	DC 5V

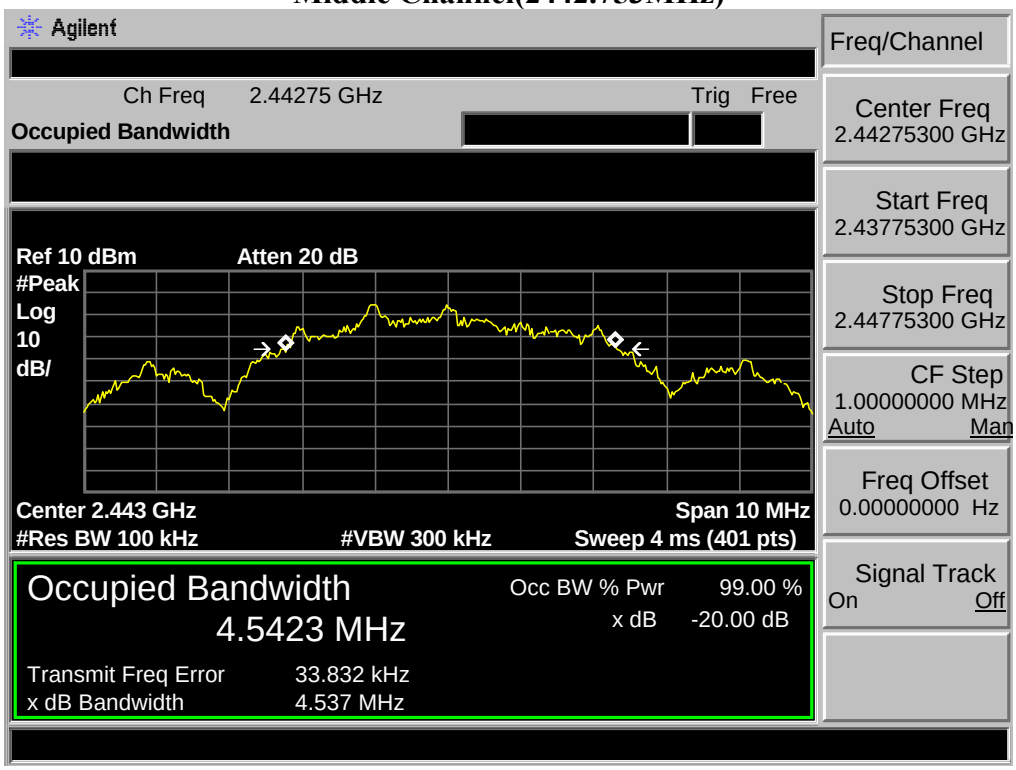
5.6. Test Result

Test Frequency (MHz)	20dB Bandwidth (MHz)	Result
2405.889	4.665	Pass
2442.753	4.537	Pass
2477.569	4.572	Pass

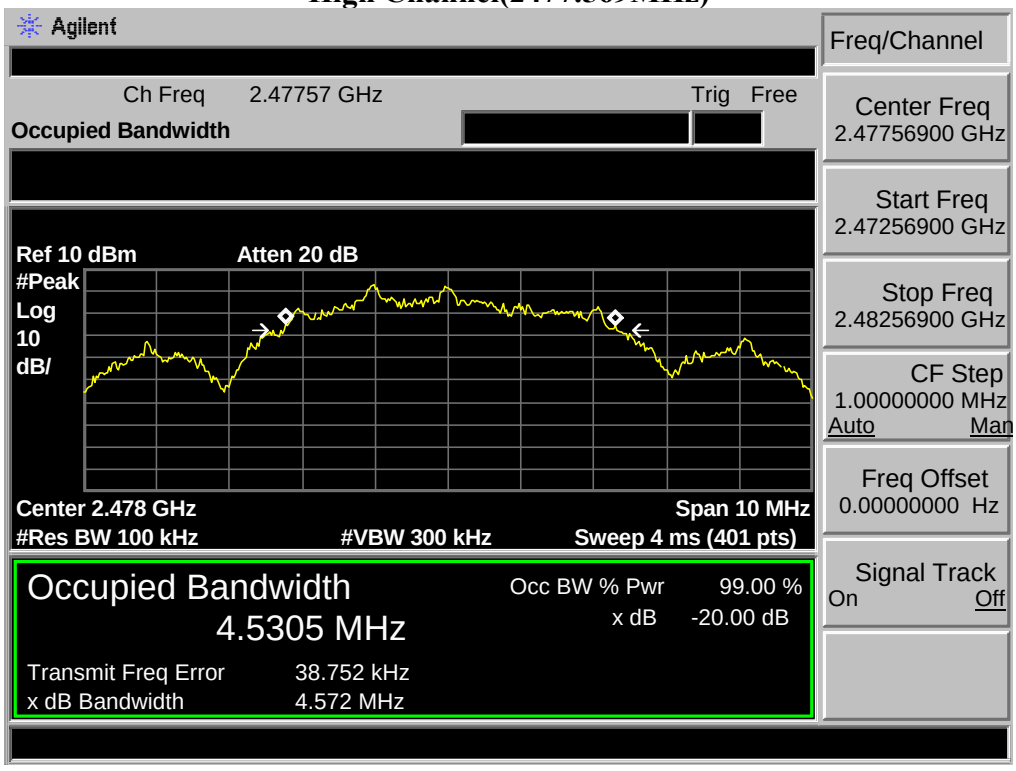
Low Channel(2405.889MHz)



Middle Channel(2442.753MHz)



High Channel(2477.569MHz)



6. AC POWER LINE CONDUCTED EMISSIONS

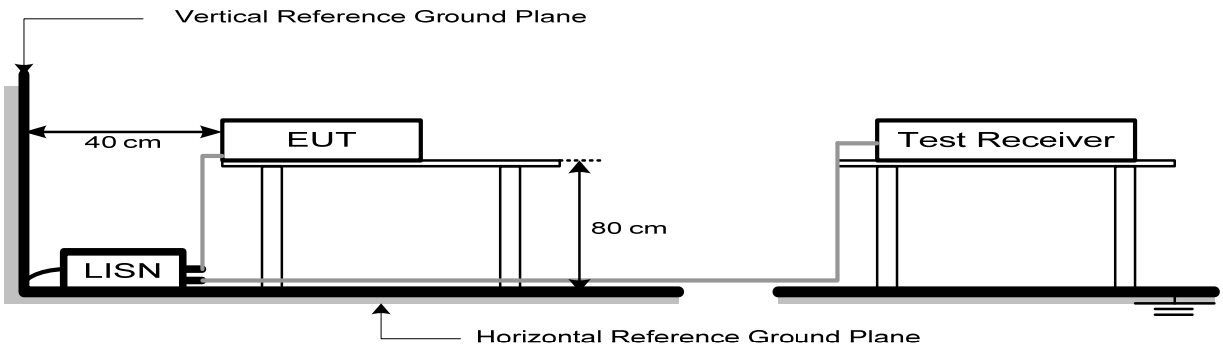
6.1. Limit

Frequency			Maximum RF Line Voltage	
			Quasi-Peak Level dB(μV)	Average Level dB(μV)
150kHz	~	500kHz	66 ~ 56*	56 ~ 46*
500kHz	~	5MHz	56	46
5MHz	~	30MHz	60	50

Note:

1. * Decreasing linearly with logarithm of frequency.
2. The lower limit shall apply at the transition frequencies.

6.2. Test Setup



6.3. Spectrum Analyzer Setting

Spectrum Parameters	Setting
RBW	9KHz
VBW	9KHz
Start frequency	150KHz
Stop frequency	30MHz
Sweep Time	Auto
Detector	QP/AVG
Trace Mode	Max Hold

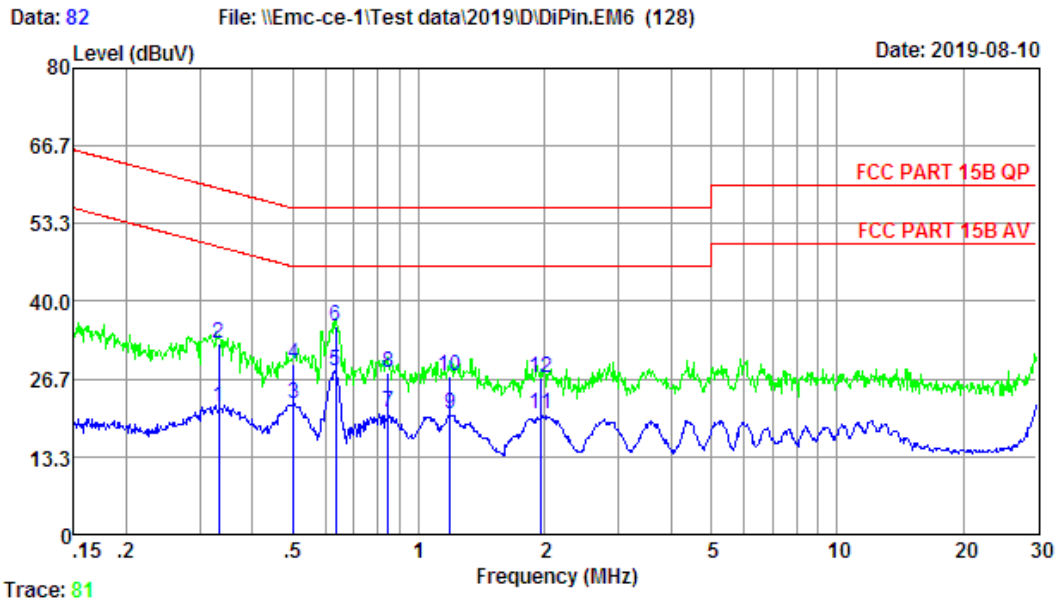
6.4. Test Procedure

a. The EUT was placed on a non-metallic table, 80cm above the ground plane.
b. The EUT Power connected to the power mains through a line impedance stabilization network.
c. Provides a 50 ohm coupling impedance for the EUT (Please refer the block diagram of the test setup and photographs).
d. Set the EUT transmit continuously with maximum output power.
e. Spectrum analyzer setting parameters in accordance with section 6.3.
f. The AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.10: 2013 on Conducted Emission Test.
g. Record the results in the test report.

6.5. Test Result

EST Technology

Chilingxiang, Qishantou, Santun,
Houjie, Dongguan,Guangdong,China
Tel:+86-769-83081888
Fax:+86-769-83081878



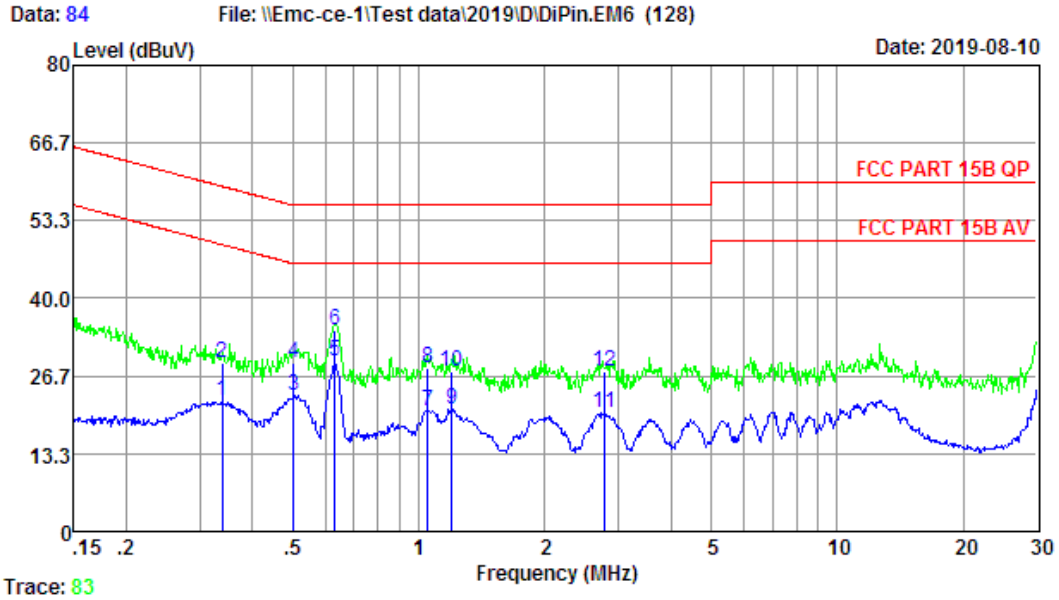

```
Site no      : 844 Shield Room                    Data no.   : 82
Env. / Ins.  : Temp:24.0'C Humi:55% Press:101.50kPa LINE Phase : NEUTRAL
Limit        : FCC PART 15B QP
Engineer     : Zero
EUT          : DONGLE
Power        : DC 5V From Adapter Input AC 240V/60Hz
M/N          : TX70T01
Test Mode    : TX Mode
```

	Freq. (MHz)	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuv)	Limits (dBuv)	Margin (dB)	Remark
1	0.33	9.74	9.92	2.26	21.92	49.40	27.48	Average
2	0.33	9.74	9.92	13.00	32.66	59.40	26.74	QP
3	0.50	9.78	9.92	2.70	22.40	46.00	23.60	Average
4	0.50	9.78	9.92	9.66	29.36	56.00	26.64	QP
5	0.63	9.76	9.92	8.47	28.15	46.00	17.85	Average
6	0.63	9.76	9.92	15.93	35.61	56.00	20.39	QP
7	0.84	9.71	9.93	1.43	21.07	46.00	24.93	Average
8	0.84	9.71	9.93	8.20	27.84	56.00	28.16	QP
9	1.19	9.67	9.94	1.02	20.63	46.00	25.37	Average
10	1.19	9.67	9.94	7.69	27.30	56.00	28.70	QP
11	1.96	9.68	9.96	0.90	20.54	46.00	25.46	Average
12	1.96	9.68	9.96	7.30	26.94	56.00	29.06	QP

Remarks: 1. Emission Level= LISN Factor + Cable Loss + Reading.
2. Margin= Limit - Emission Level.
3. If the average limit is met when useing a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

EST Technology

Chilingxiang, Qishantou, Santun,
Houjie, Dongguan,Guangdong,China
Tel:+86-769-83081888
Fax:+86-769-83081878



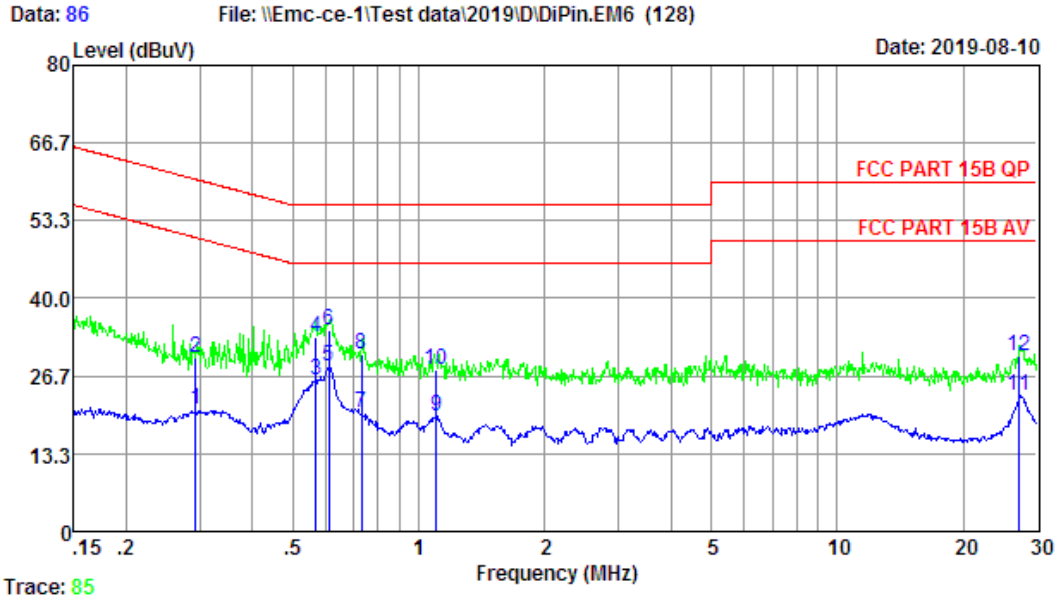
Site no : 844 Shield Room Data no. : 84
Env. / Ins. : Temp:24.0'C Humi:55% Press:101.50kPa LINE Phase : LINE
Limit : FCC PART 15B QP
Engineer : Zero
EUT : DONGLE
Power : DC 5V From Adapter Input AC 240V/60Hz
M/N : TX70T01
Test Mode : TX Mode

	Freq. (MHz)	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuv)	Limits (dBuv)	Margin (dB)	Remark
1	0.34	9.68	9.92	2.76	22.36	49.22	26.86	Average
2	0.34	9.68	9.92	9.20	28.80	59.22	30.42	QP
3	0.50	9.95	9.92	3.37	23.24	46.00	22.76	Average
4	0.50	9.95	9.92	9.07	28.94	56.00	27.06	QP
5	0.63	9.84	9.92	9.36	29.12	46.00	16.88	Average
6	0.63	9.84	9.92	14.67	34.43	56.00	21.57	QP
7	1.05	9.79	9.94	1.06	20.79	46.00	25.21	Average
8	1.05	9.79	9.94	8.34	28.07	56.00	27.93	QP
9	1.20	9.79	9.94	1.22	20.95	46.00	25.05	Average
10	1.20	9.79	9.94	7.69	27.42	56.00	28.58	QP
11	2.78	9.85	9.97	0.48	20.30	46.00	25.70	Average
12	2.78	9.85	9.97	7.70	27.52	56.00	28.48	QP

Remarks: 1. Emission Level= LISN Factor + Cable Loss + Reading.
2. Margin= Limit - Emission Level.
3. If the average limit is met when useing a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

EST Technology

Chilingxiang, Qishantou, Santun,
Houjie, Dongguan,Guangdong,China
Tel:+86-769-83081888
Fax:+86-769-83081878



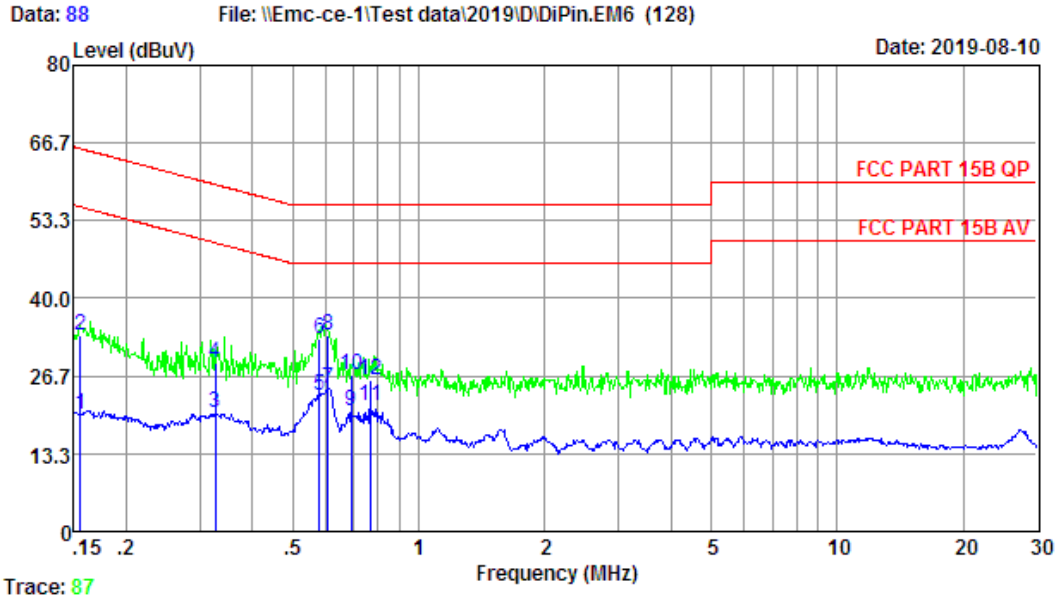
Site no : 844 Shield Room Data no. : 86
Env. / Ins. : Temp:24.0'C Humi:55% Press:101.50kPa LINE Phase : LINE
Limit : FCC PART 15B QP
Engineer : Zero
EUT : DONGLE
Power : DC 5V From Adapter Input AC 120V/60Hz
M/N : TX70T01
Test Mode : TX Mode

	Freq. (MHz)	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuv)	Limits (dBuv)	Margin (dB)	Remark
1	0.29	9.65	9.92	1.42	20.99	50.46	29.47	Average
2	0.29	9.65	9.92	10.10	29.67	60.46	30.79	QP
3	0.57	9.89	9.92	6.07	25.88	46.00	20.12	Average
4	0.57	9.89	9.92	13.47	33.28	56.00	22.72	QP
5	0.61	9.86	9.92	8.66	28.44	46.00	17.56	Average
6	0.61	9.86	9.92	14.87	34.65	56.00	21.35	QP
7	0.73	9.80	9.93	0.53	20.26	46.00	25.74	Average
8	0.73	9.80	9.93	10.56	30.29	56.00	25.71	QP
9	1.10	9.79	9.94	0.13	19.86	46.00	26.14	Average
10	1.10	9.79	9.94	8.08	27.81	56.00	28.19	QP
11	27.27	9.90	10.16	3.12	23.18	50.00	26.82	Average
12	27.27	9.90	10.16	9.99	30.05	60.00	29.95	QP

Remarks: 1. Emission Level= LISN Factor + Cable Loss + Reading.
2. Margin= Limit - Emission Level.
3. If the average limit is met when useing a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

EST Technology

Chilingxiang, Qishantou, Santun,
Houjie, Dongguan,Guangdong,China
Tel:+86-769-83081888
Fax:+86-769-83081878



Site no : 844 Shield Room Data no. : 88
Env. / Ins. : Temp:24.0'C Humi:55% Press:101.50kPa LINE Phase : NEUTRAL
Limit : FCC PART 15B QP
Engineer : Zero
EUT : DONGLE
Power : DC 5V From Adapter Input AC 120V/60Hz
M/N : TX70T01
Test Mode : TX Mode

	Freq. (MHz)	LISN Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Emission Level (dBuv)	Limits (dBuv)	Margin (dB)	Remark
1	0.16	9.62	9.69	0.68	19.99	55.69	35.70	Average
2	0.16	9.62	9.69	14.20	33.51	65.69	32.18	QP
3	0.33	9.74	9.92	0.76	20.42	49.53	29.11	Average
4	0.33	9.74	9.92	9.20	28.86	59.53	30.67	QP
5	0.58	9.77	9.92	3.61	23.30	46.00	22.70	Average
6	0.58	9.77	9.92	13.36	33.05	56.00	22.95	QP
7	0.61	9.76	9.92	4.78	24.46	46.00	21.54	Average
8	0.61	9.76	9.92	14.01	33.69	56.00	22.31	QP
9	0.69	9.75	9.93	0.91	20.59	46.00	25.41	Average
10	0.69	9.75	9.93	7.26	26.94	56.00	29.06	QP
11	0.77	9.73	9.93	1.76	21.42	46.00	24.58	Average
12	0.77	9.73	9.93	6.41	26.07	56.00	29.93	QP

Remarks: 1. Emission Level= LISN Factor + Cable Loss + Reading.
2. Margin= Limit - Emission Level.
3. If the average limit is met when useing a quasi-peak detector, the EUT shall be deemed to meet both limits and measurement with average detector is unnecessary.

7. ANTENNA REQUIREMENTS

7.1. Limit

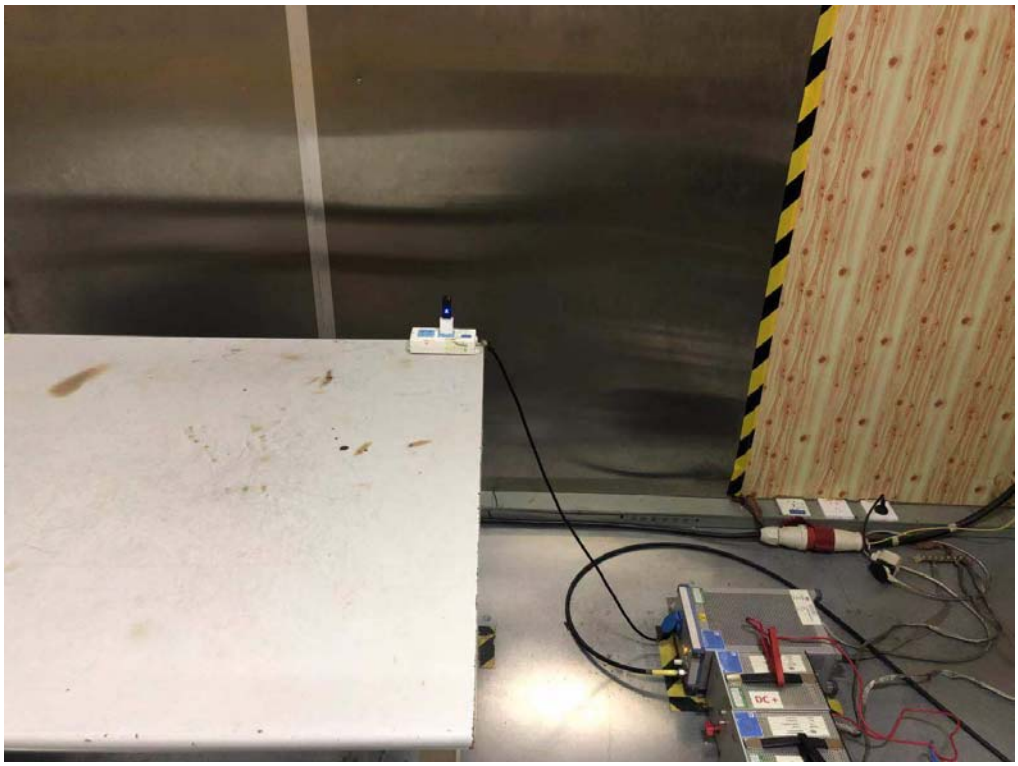
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §§15.211, 15.213, 15.217, 15.219, 15.221, or §15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

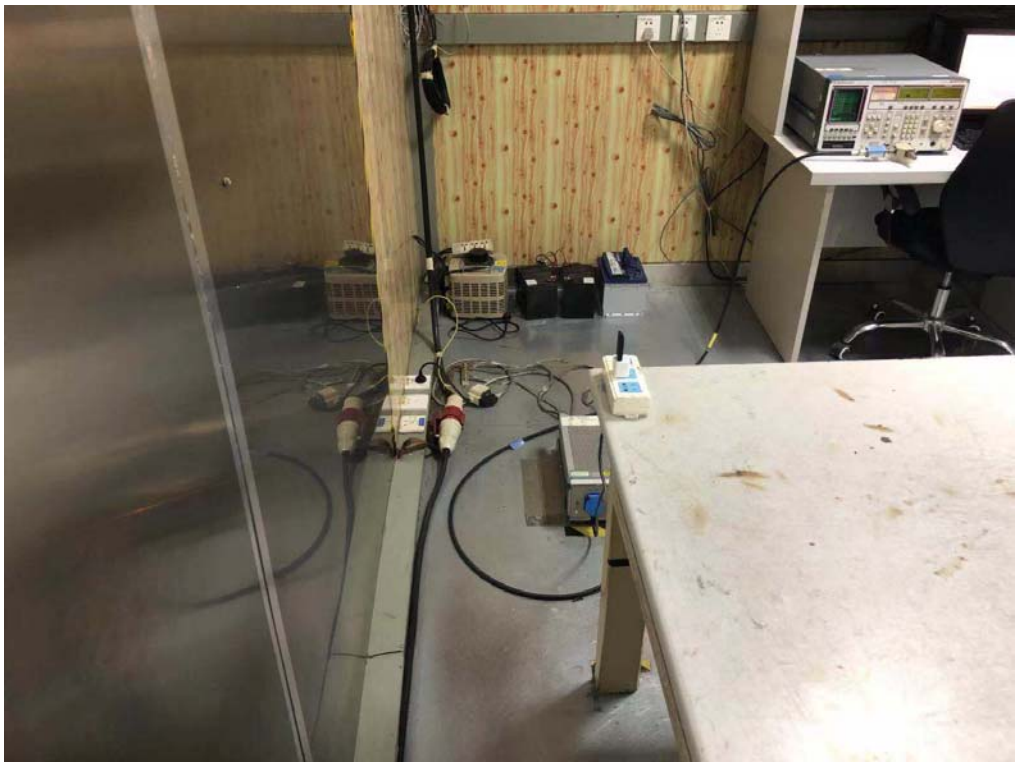
7.2. Test Result

The antennas used for this product is PCB antenna ,so compliance with antenna requirements.
(Please refer to the EUT photo for details)

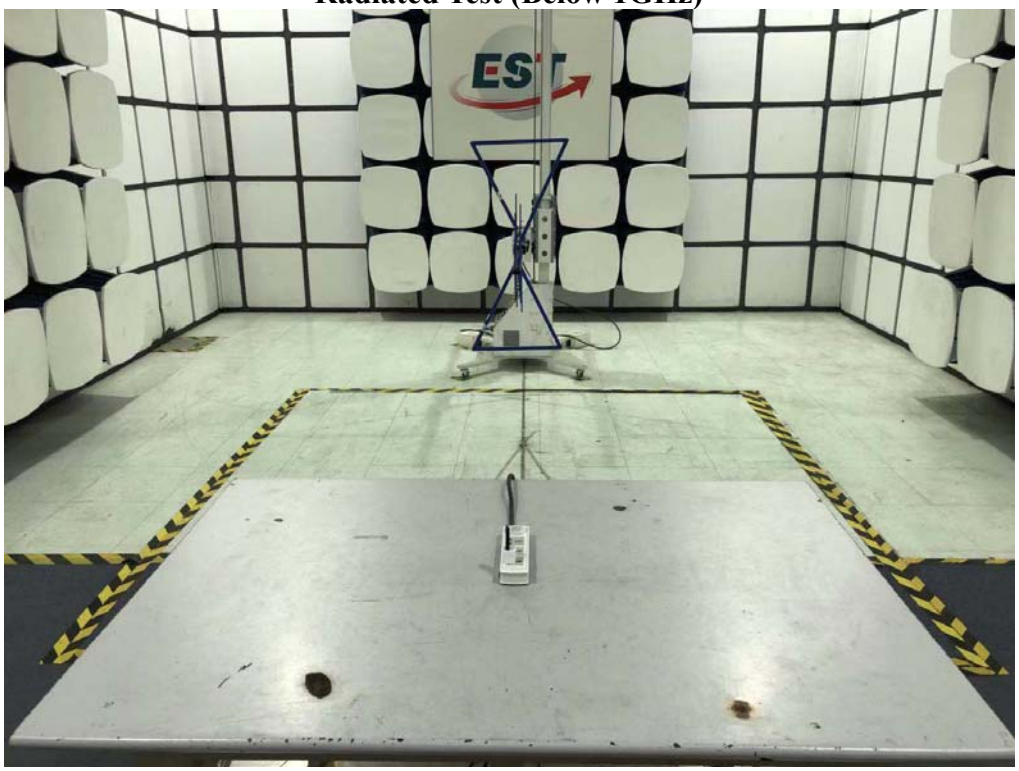
8. TEST SETUP PHOTO

Conducted Emissions Test

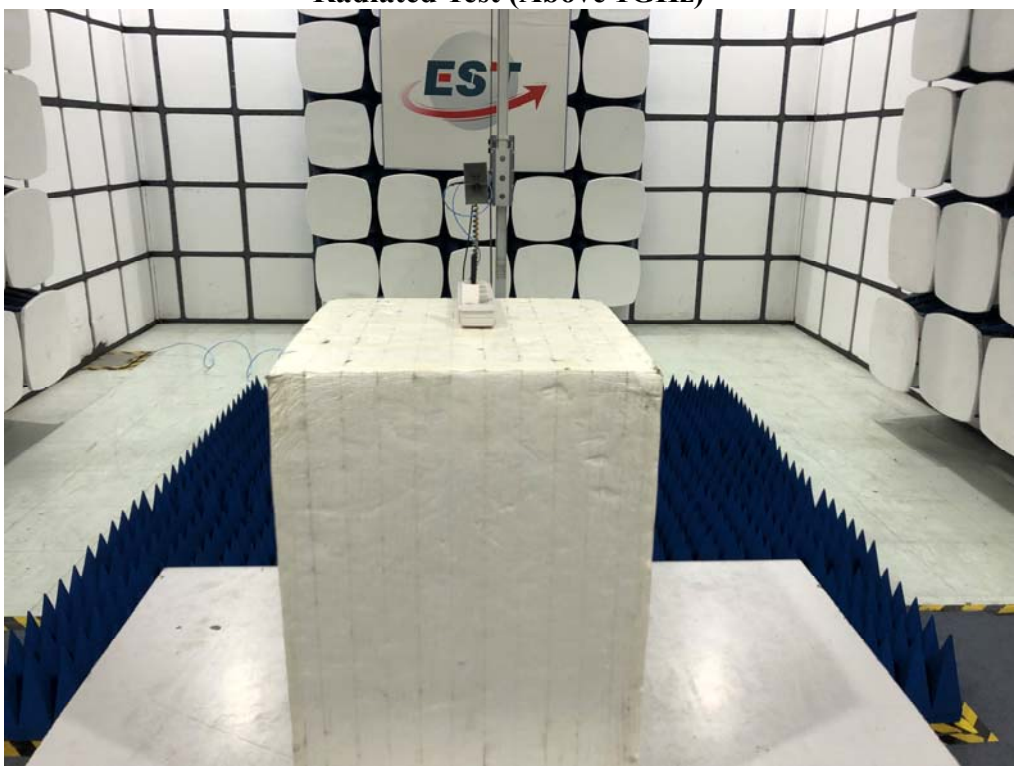




Radiated Test (Below 1GHz)



Radiated Test (Above 1GHz)



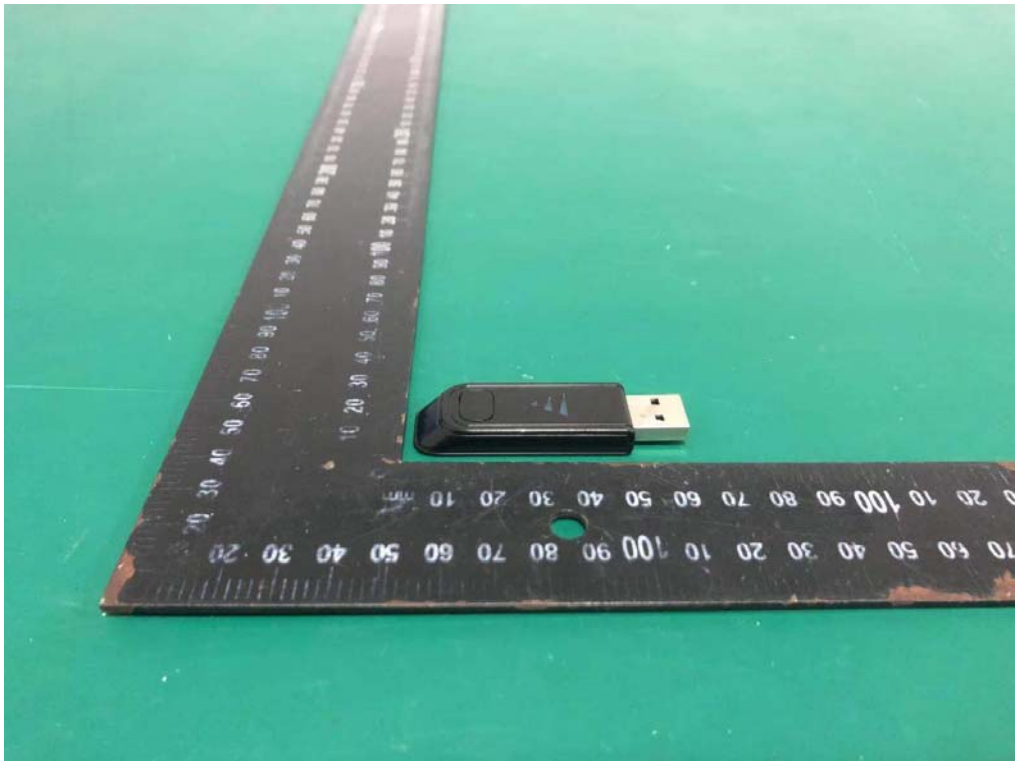
9. PHOTO EUT

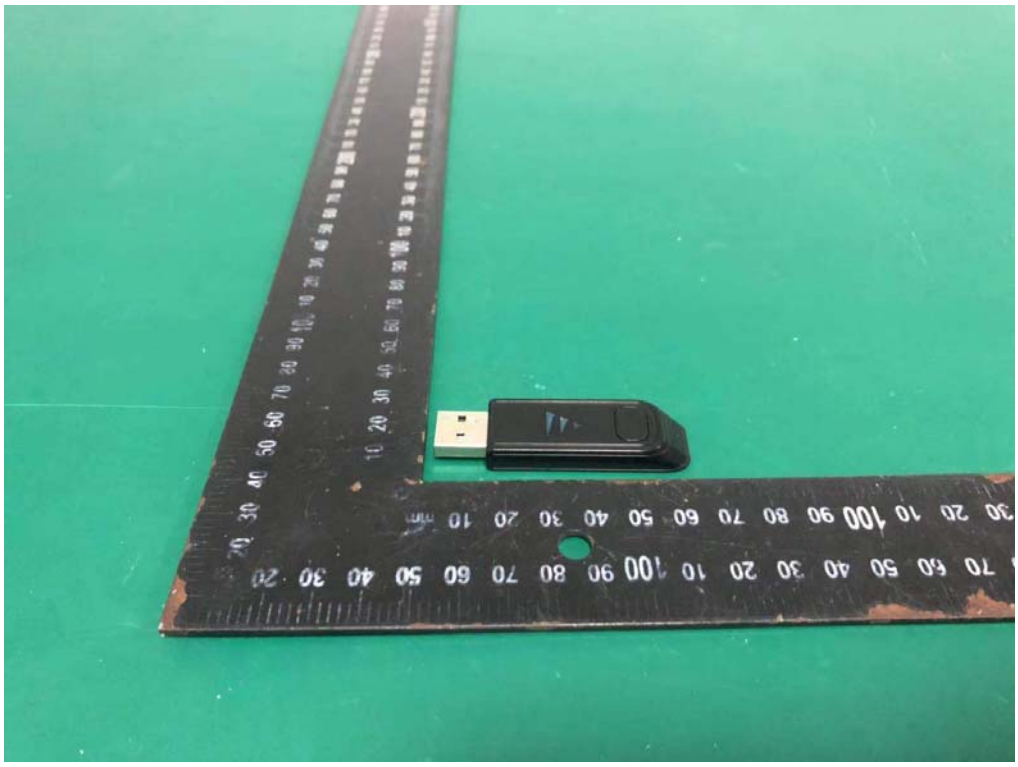
External Photos

M/N: TX70T01

External Photos

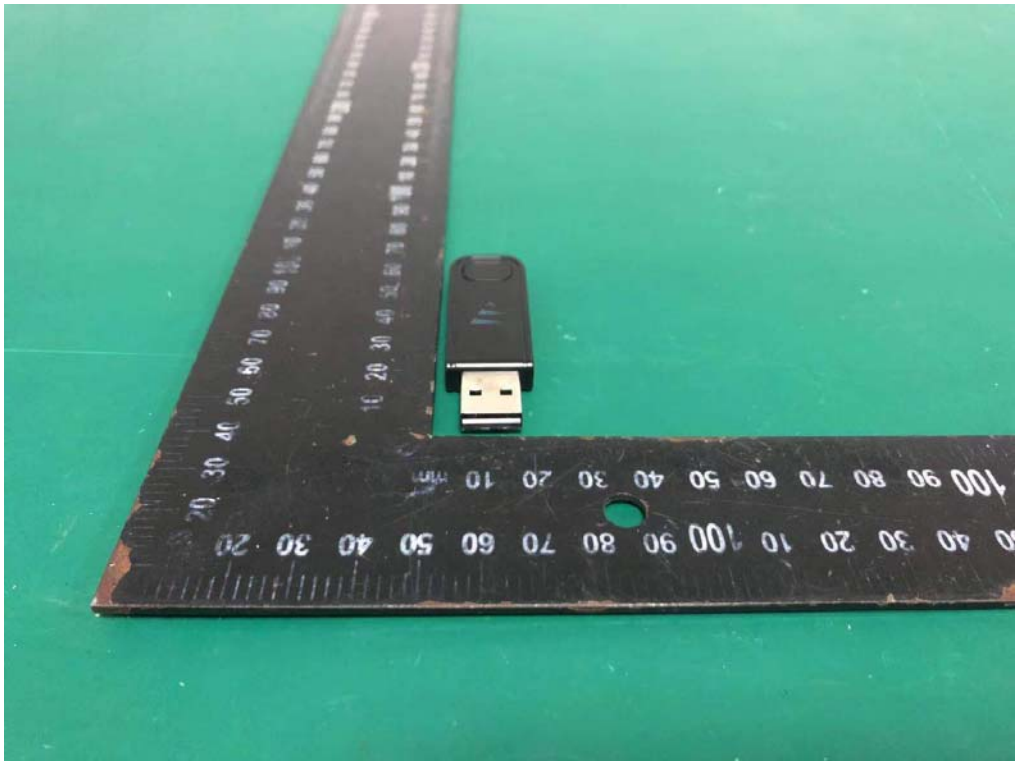
M/N: TX70T01

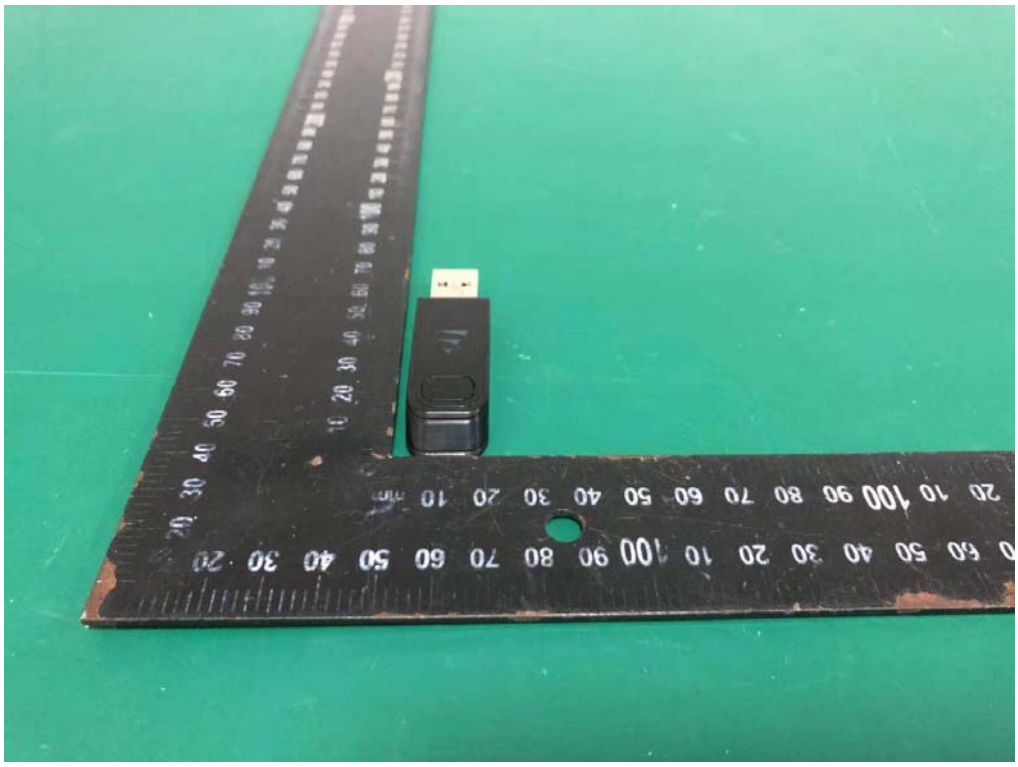




External Photos

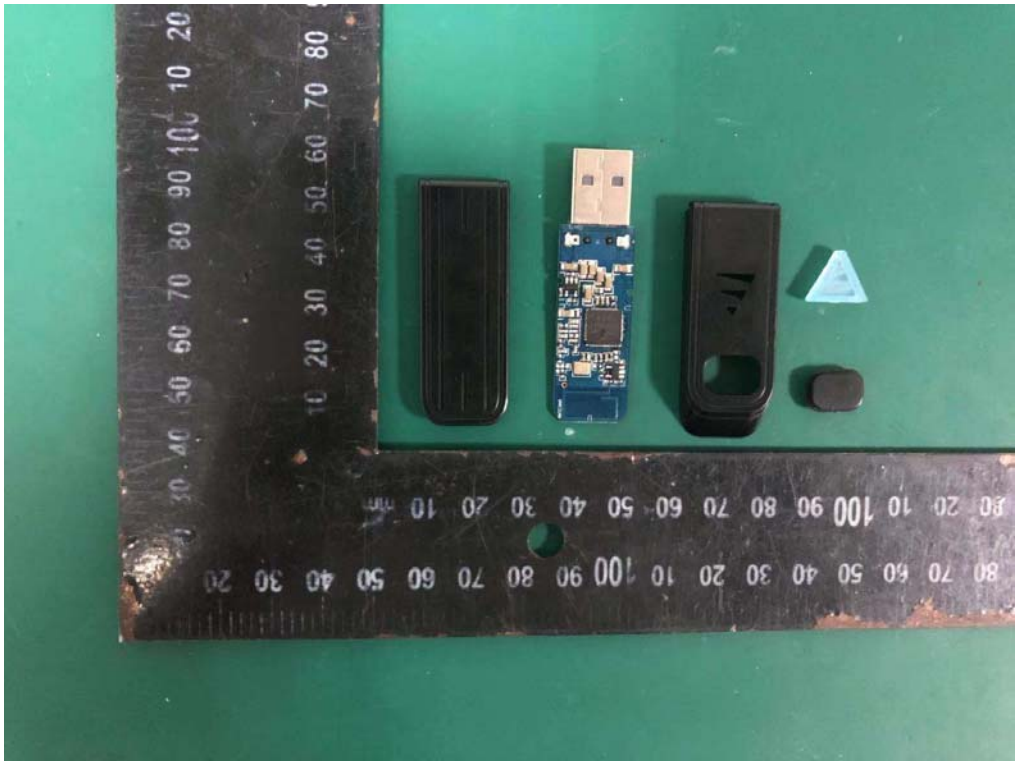
M/N: TX70T01

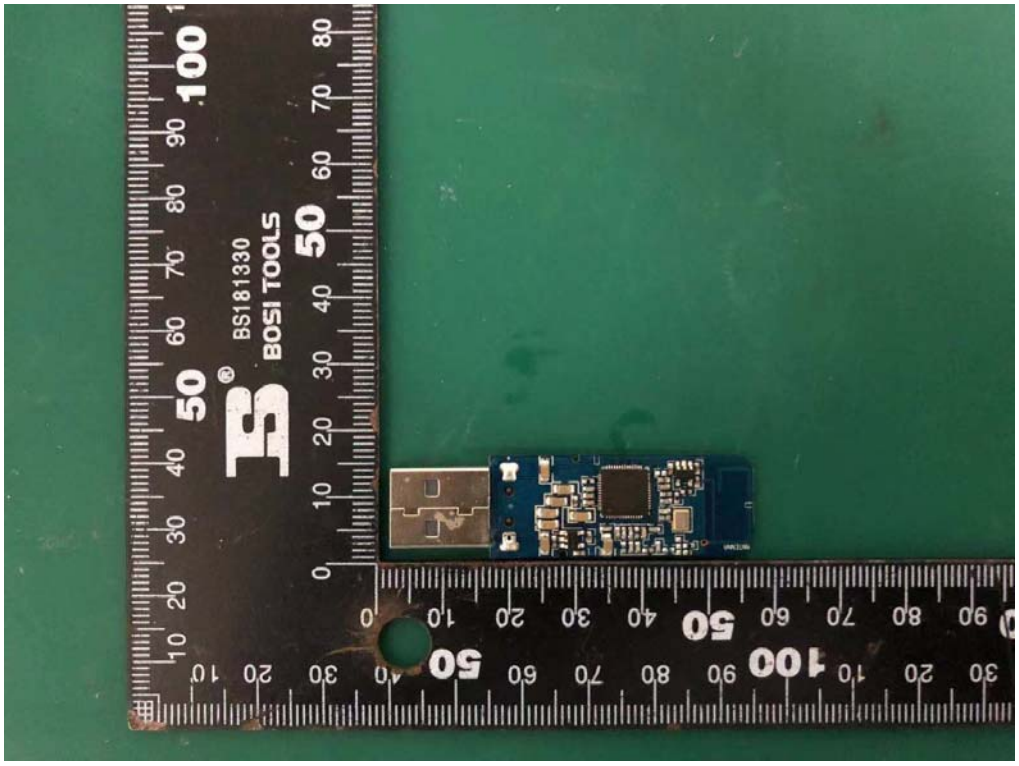




Internal Photos

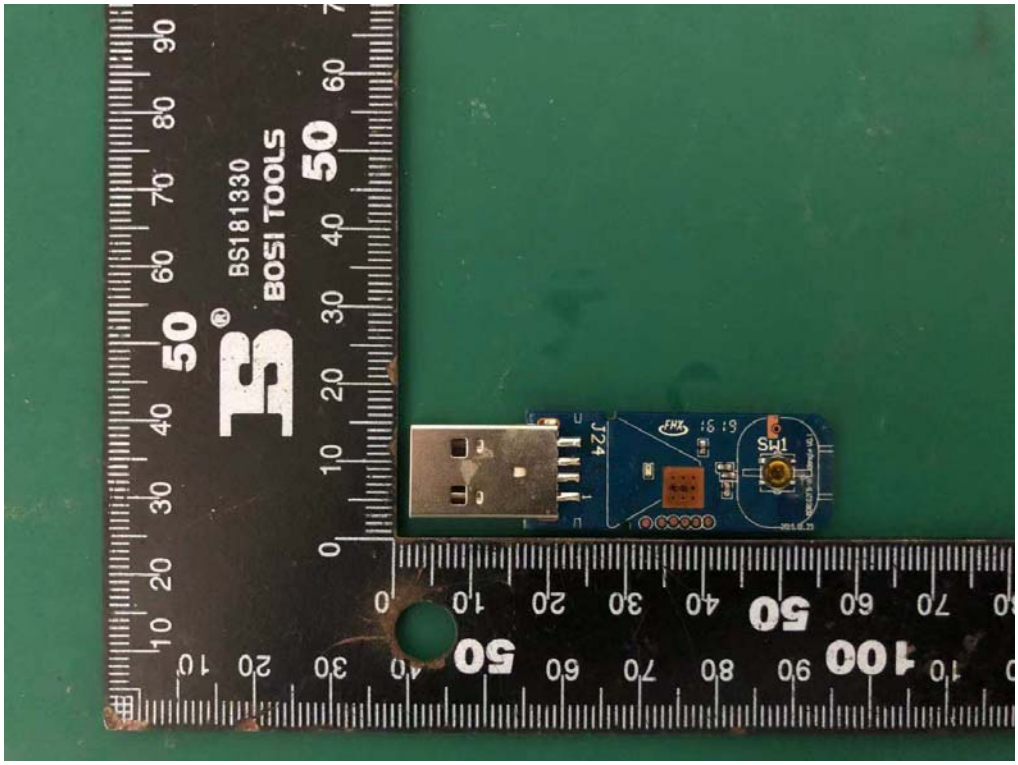
M/N: TX70T01

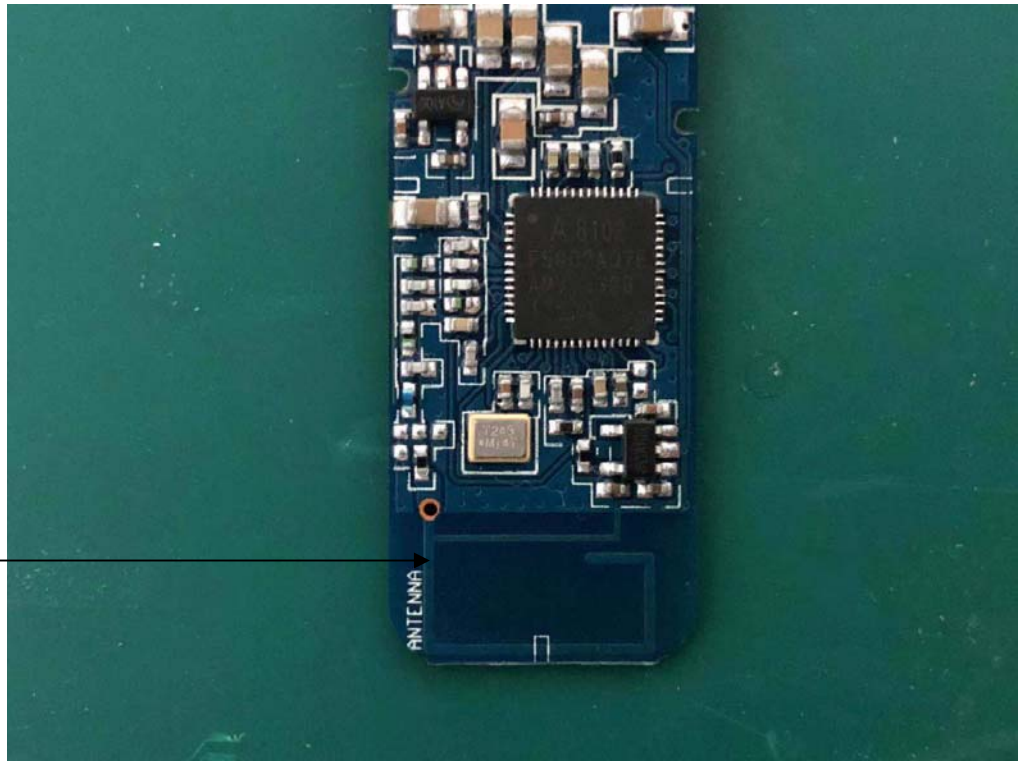




Internal Photos

M/N: TX70T01





Antenna

End of Test Report