



## Shenzhen Huaxia Testing Technology Co., Ltd

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Report Template Version: V04  
Report Template Revision Date: 2018-07-06

# Test Report

**Report No.:** CQASZ20200800934E-01

**Applicant:** Huizhou Zhihang Technology Co.,Ltd.

**Address of Applicant:** 3/F,building a, Dabang Science Park, Yuechang village, Xinxu Town, Huiyang District, Huizhou City

**Equipment Under Test (EUT):**

**EUT Name:** dongle

**Model No.:** TL-180

**Brand Name:** N/A

**FCC ID:** 2AXET-TL181

**Standards:** 47 CFR Part 15, Subpart C

**Date of Receipt:** 2020-08-27

**Date of Test:** 2020-08-27 to 2020-09-09

**Date of Issue:** 2020-09-09

**Test Result:** PASS\*

\*In the configuration tested, the EUT complied with the standards specified above

**Tested By:**

Tiny You

( Tiny You )

**Reviewed By:**

Sheek, Luo

(Sheek Luo)

**Approved By:**

Jack Ai



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## 1 Version

### Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20200800934E-01	Rev.01	Initial report	2020-09-09

## 2 Test Summary

Test Item	Test Requirement	Test method	Result
<b>Antenna Requirement</b>	47 CFR Part 15, Subpart C Section 15.203	ANSI C63.10 (2013)	PASS
<b>AC Power Line Conducted Emission</b>	47 CFR Part 15, Subpart C Section 15.207	ANSI C63.10 (2013)	PASS
<b>Field Strength of the Fundamental Signal</b>	47 CFR Part 15, Subpart C Section 15.249 (a)	ANSI C63.10 (2013)	PASS
<b>Spurious Emissions</b>	47 CFR Part 15, Subpart C Section 15.249 (a)/15.209	ANSI C63.10 (2013)	PASS
<b>Restricted bands around fundamental frequency (Radiated Emission)</b>	47 CFR Part 15, Subpart C Section 15.249(a)/15.205	ANSI C63.10 (2013)	PASS
<b>20dB Occupied Bandwidth</b>	47 CFR Part 15, Subpart C Section 15.215 (c)	ANSI C63.10 (2013)	PASS

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## 4 General Information

### 4.1 Client Information

Applicant:	Huizhou Zhihang Technology Co.,Ltd.
Address of Applicant:	3/F,building a, Dabang Science Park, Yuechang village, Xinxu Town, Huiyang District, Huizhou City
Manufacturer:	Huizhou Zhihang Technology Co.,Ltd.
Address of Manufacturer:	3/F,building a, Dabang Science Park, Yuechang village, Xinxu Town, Huiyang District, Huizhou City
Factory:	Huizhou Zhihang Technology Co.,Ltd.
Address of Factory:	3/F,building a, Dabang Science Park, Yuechang village, Xinxu Town, Huiyang District, Huizhou City

### 4.2 General Description of EUT

Product Name:	dongle
Model No.:	TL-180
Trade Mark:	N/A
Hardware Version:	V7.0
Software Version:	V69
Frequency Range:	2402MHz ~ 2480MHz
Modulation Type:	GFSK
Number of Channels:	40 (declared by the client)
Sample Type:	<input type="checkbox"/> Mobile <input checked="" type="checkbox"/> Portable <input type="checkbox"/> Fix Location
Test Software of EUT:	RF test (manufacturer declare)
Antenna Type:	PCB antenna
Antenna Gain:	-2.36dBi
Power Supply:	DC 5V

Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2402MHz	11	2422MHz	21	2442MHz	31	2462MHz
2	2404MHz	12	2424MHz	22	2444MHz	32	2464MHz
3	2406MHz	13	2426MHz	23	2446MHz	33	2466MHz
4	2408MHz	14	2428MHz	24	2448MHz	34	2468MHz
5	2410MHz	15	2430MHz	25	2450MHz	35	2470MHz
6	2412MHz	16	2432MHz	26	2452MHz	36	2472MHz
7	2414MHz	17	2434MHz	27	2454MHz	37	2474MHz
8	2416MHz	18	2436MHz	28	2456MHz	38	2476MHz
9	2418MHz	19	2438MHz	29	2458MHz	39	2478MHz
10	2420MHz	20	2440MHz	30	2460MHz	40	2480MHz

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Channel	Frequency
The lowest channel (CH1)	2402MHz
The middle channel (CH20)	2440MHz
The highest channel (CH40)	2480MHz

### 4.3 Test Environment and Mode

<b>Operating Environment:</b>	
<b>Radiated Emissions:</b>	
Temperature:	25.6 °C
Humidity:	55 % RH
Atmospheric Pressure:	1009mbar
<b>Conduction emission:</b>	
Temperature:	25.3 °C
Humidity:	52 % RH
Atmospheric Pressure:	1009mbar
<b>Radio conducted item test (RF Conducted test room):</b>	
Temperature:	25.2 °C
Humidity:	55 % RH
Atmospheric Pressure:	1009mbar
<b>Test mode:</b>	
Transmitting mode:	Use test software (RF test) to set the lowest frequency, the middle frequency and the highest frequency keep transmitting of the EUT.

### 4.4 Description of Support Units

The EUT has been tested with associated equipment below.

1) Support equipment

Description	Manufacturer	Model No.	Certification	Supplied by
PC	Lenovo	ThinkPad E450c	FCC	CQA

2) Cable

Cable No.	Description	Manufacturer	Cable Type/Length	Supplied by
/	/	/	/	/

## 4.5 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate.

The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities.

The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the **Shenzhen Huaxia Testing Technology Co., Ltd** quality system acc. to DIN EN ISO/IEC 17025.

Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for **CQA** laboratory is reported:

Test	Range	Uncertainty	Notes
Radiated Emission	Below 1GHz	5.12dB	(1)
Radiated Emission	Above 1GHz	4.60dB	(1)
Conducted Disturbance	0.15~30MHz	3.34dB	(1)

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

## **4.6 Test Location**

All tests were performed at:

Shenzhen Huaxia Testing Technology Co., Ltd.,

1F., Block A of Tongsheng Technology Building, Huahui Road, Dalang Street, Longhua District, Shenzhen, China

## **4.7 Test Facility**

- A2LA (Certificate No. 4742.01)**

Shenzhen Huaxia Testing Technology Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 4742.01.

- FCC Registration No.: 522263**

Shenzhen Huaxia Testing Technology Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No.:522263

## **4.8 Deviation from Standards**

None.

## **4.9 Abnormalities from Standard Conditions**

None.

## **4.10 Other Information Requested by the Customer**

None.

## 4.11 Equipment List

Test Equipment	Manufacturer	Model No.	Instrument No.	Calibration Date	Calibration Due Date
EMI Test Receiver	R&S	ESR7	CQA-005	2019/10/25	2020/10/24
Spectrum analyzer	R&S	FSU26	CQA-038	2019/10/25	2020/10/24
Preamplifier	MITEQ	AMF-6D-02001800-29-20P	CQA-036	2019/10/25	2020/10/24
Loop antenna	Schwarzbeck	FMZB1516	CQA-060	2019/10/21	2020/10/20
Bilog Antenna	R&S	HL562	CQA-011	2019/9/26	2020/9/25
Horn Antenna	R&S	HF906	CQA-012	2019/9/26	2020/9/25
Horn Antenna	Schwarzbeck	BBHA 9170	CQA-088	2019/9/25	2020/9/24
Coaxial Cable (Above 1GHz)	CQA	N/A	C007	2019/9/26	2020/9/25
Coaxial Cable (Below 1GHz)	CQA	N/A	C013	2019/9/26	2020/9/25
Antenna Connector	CQA	RFC-01	CQA-080	2019/9/26	2020/9/25
RF cable(9KHz~40GHz)	CQA	RF-01	CQA-079	2019/9/26	2020/9/25
Power divider	MIDWEST	PWD-2533-02-SMA-79	CQA-067	2019/9/26	2020/9/25
EMI Test Receiver	R&S	ESR7	CQA-005	2019/10/25	2020/10/24
LISN	R&S	ENV216	CQA-003	2019/10/23	2020/10/22
Coaxial cable	CQA	N/A	CQA-C009	2019/9/26	2020/9/25
DC power	KEYSIGHT	E3631A	CQA-028	2019/9/26	2020/9/25

Note:

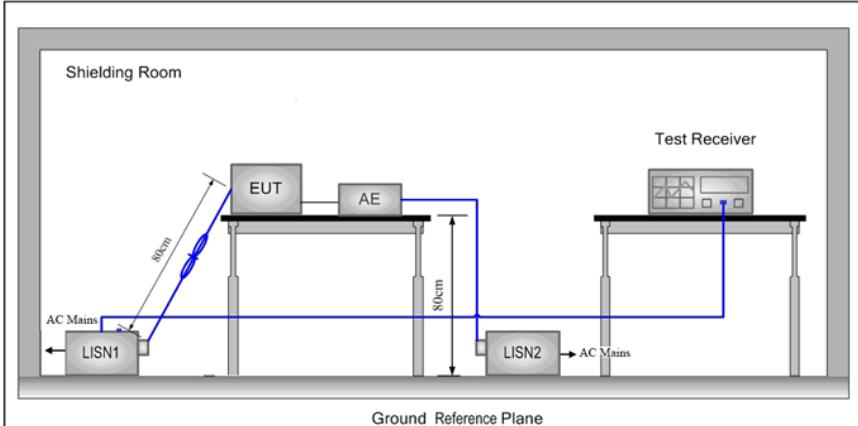
The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

## 5 Test results and Measurement Data

### 5.1 Antenna Requirement

<b>Standard requirement:</b>	47 CFR Part 15C Section 15.203
<p>15.203 requirement:</p> <p>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, 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.</p>	
<p><b>EUT Antenna:</b></p> 	
<b>EUT Antenna:</b>	The antenna is PCB antenna. The best case gain of the antenna is -2.36dBi.

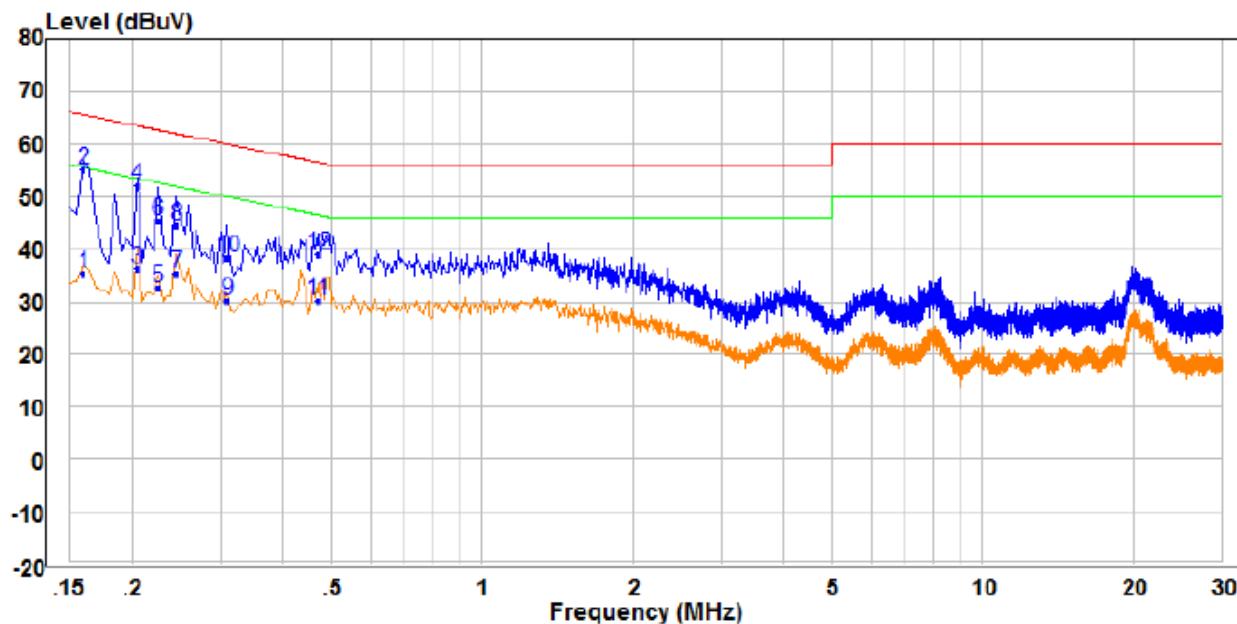
## 5.2 Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.207		
Test Method:	ANSI C63.10: 2013		
Test Frequency Range:	150kHz to 30MHz		
Limit:	Frequency range (MHz)		Limit (dBuV)
			Quasi-peak
	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.			
Test Procedure:	<ol style="list-style-type: none"> <li>1) The mains terminal disturbance voltage test was conducted in a shielded room.</li> <li>2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a <math>50\Omega/50\mu\text{H} + 5\Omega</math> 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.</li> <li>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.</li> <li>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.</li> <li>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: 2013 on conducted measurement.</li> </ol>		
Test Setup:			

Test Mode:	Transmitting with GFSK modulation. Charge +Transmitting mode.
Final Test Mode:	below 1GHz part, through pre-scan, the worst case is the lowest channel. Only the worst case is recorded in the report.
Test Results:	Pass

**Measurement Data**

Live line:

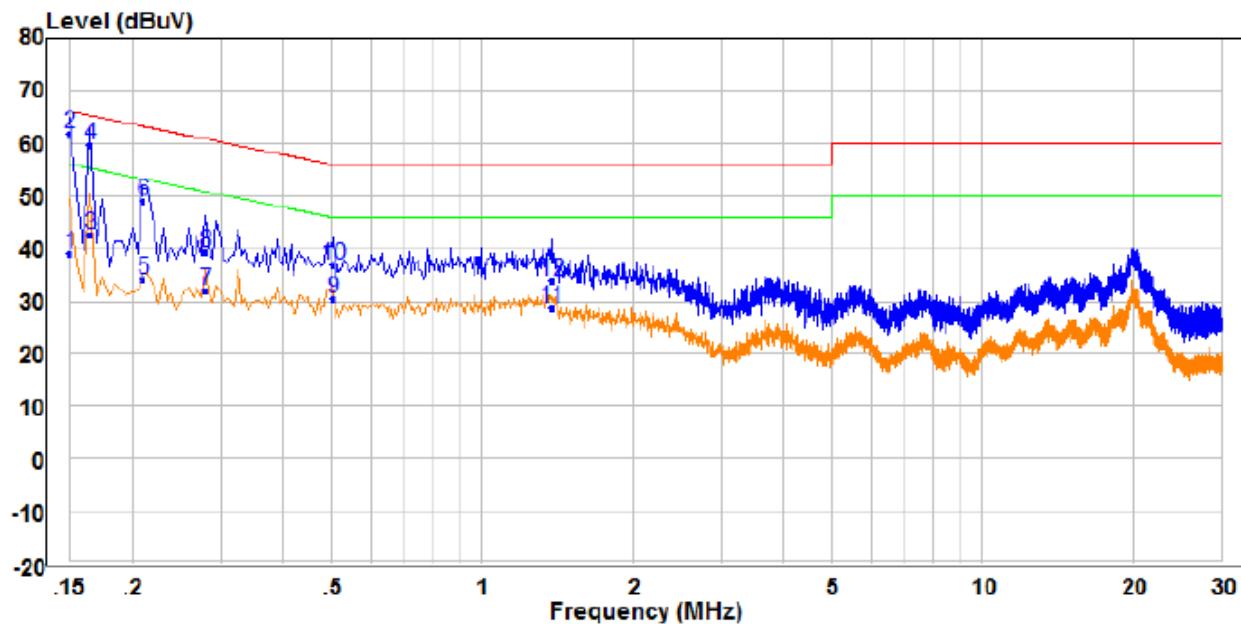


Freq	Read		Level	Limit	Over	Remark	Pol/Phase	
	MHz	dBuV	dB	dBuV	dBuV	dB		
1	0.160	25.93	9.49	35.42	55.46	-20.04	Average	Line
2 PP	0.160	45.53	9.49	55.02	65.46	-10.44	QP	Line
3	0.205	26.77	9.49	36.26	53.41	-17.15	Average	Line
4	0.205	42.47	9.49	51.96	63.41	-11.45	QP	Line
5	0.225	23.07	9.49	32.56	52.63	-20.07	Average	Line
6	0.225	35.75	9.49	45.24	62.63	-17.39	QP	Line
7	0.245	25.73	9.49	35.22	51.92	-16.70	Average	Line
8	0.245	34.93	9.49	44.42	61.92	-17.50	QP	Line
9	0.310	20.63	9.49	30.12	49.97	-19.85	Average	Line
10	0.310	28.98	9.49	38.47	59.97	-21.50	QP	Line
11 AV	0.470	20.70	9.52	30.22	46.51	-16.29	Average	Line
12	0.470	29.44	9.52	38.96	56.51	-17.55	QP	Line

**Remark:**

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.
3. If the Peak value under Average limit, the Average value is not recorded in the report.

Neutral line:



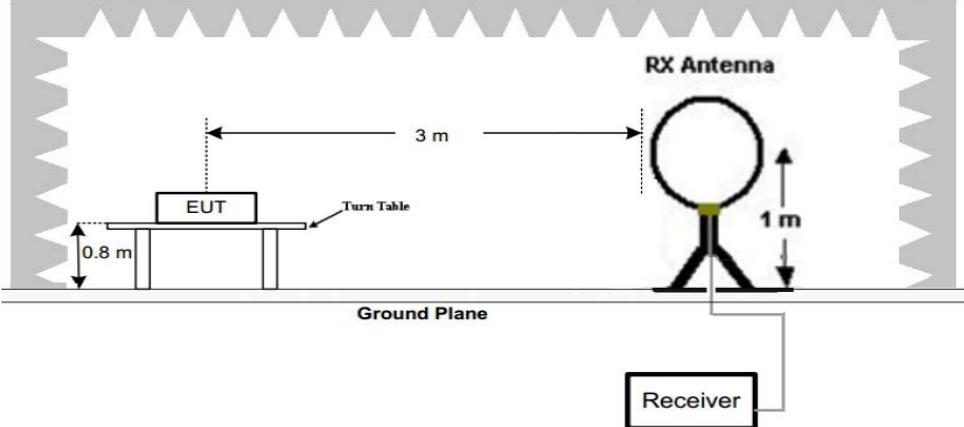
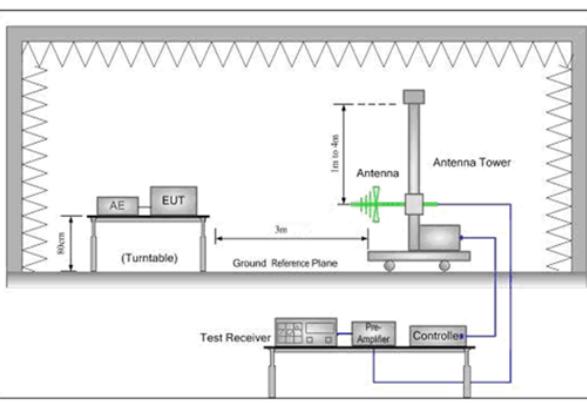
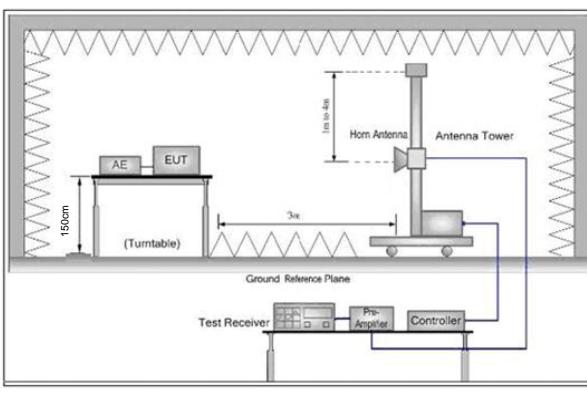
Freq	Read	Factor	Level	Limit	over	Remark	Pol/Phase
	MHz			dB	dBuV	dB	
1	0.150	29.45	9.48	38.93	56.00	-17.07	Average
2 PP	0.150	52.32	9.48	61.80	66.00	-4.20	QP
3 AV	0.165	33.25	9.48	42.73	55.21	-12.48	Average
4	0.165	50.08	9.48	59.56	65.21	-5.65	QP
5	0.210	24.74	9.48	34.22	53.21	-18.99	Average
6	0.210	39.63	9.48	49.11	63.21	-14.10	QP
7	0.280	22.37	9.48	31.85	50.82	-18.97	Average
8	0.280	29.91	9.48	39.39	60.82	-21.43	QP
9	0.505	20.88	9.60	30.48	46.00	-15.52	Average
10	0.505	27.37	9.60	36.97	56.00	-19.03	QP
11	1.375	18.92	9.72	28.64	46.00	-17.36	Average
12	1.375	24.14	9.72	33.86	56.00	-22.14	QP

Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.
3. If the Peak value under Average limit, the Average value is not recorded in the report.

### 5.3 Radiated Emission

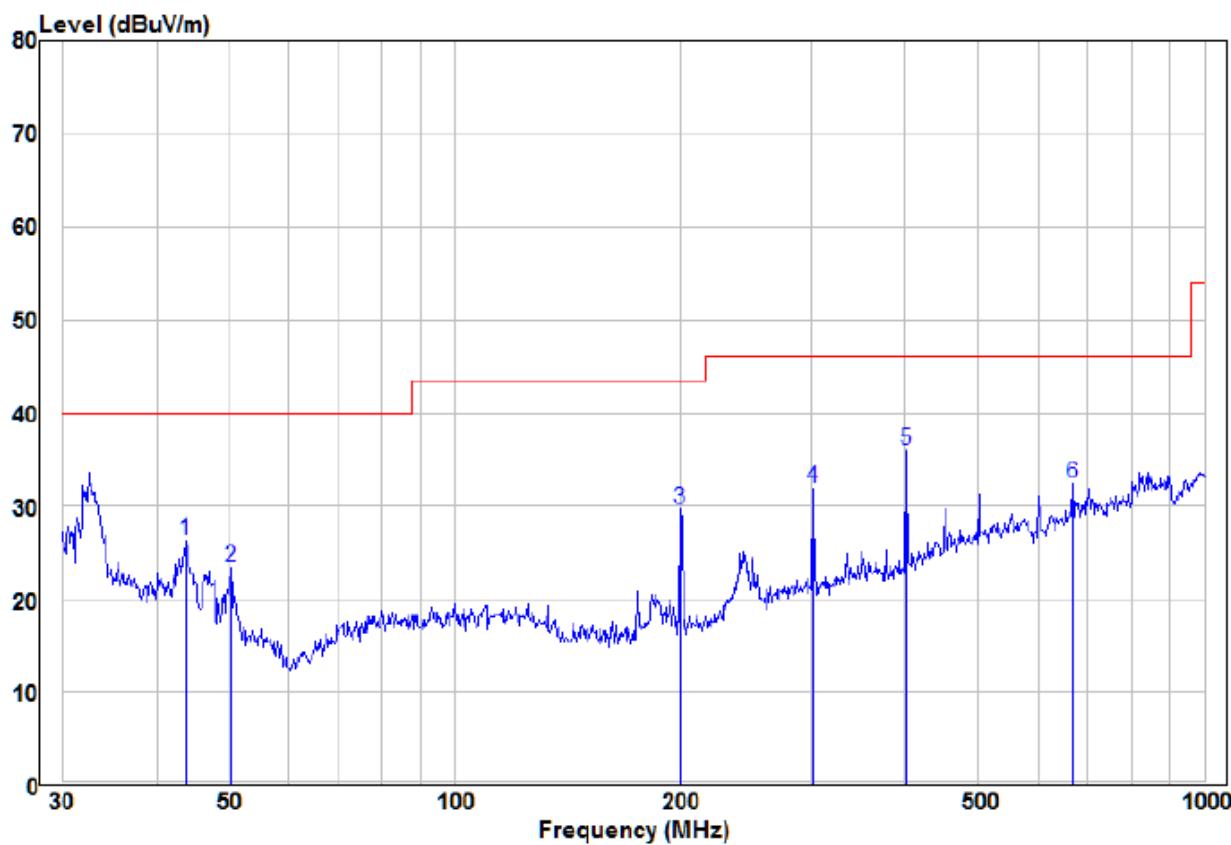
Test Requirement:	47 CFR Part 15C Section 15.249 and 15.209 and 15.205				
Test Method:	ANSI C63.10: 2013				
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)				
Receiver Setup:	Frequency	Detector	RBW	VBW	Remark
	0.009MHz-0.090MHz	Peak	10kHz	30KHz	Peak
	0.009MHz-0.090MHz	Average	10kHz	30KHz	Average
	0.090MHz-0.110MHz	Quasi-peak	10kHz	30KHz	Quasi-peak
	0.110MHz-0.490MHz	Peak	10kHz	30KHz	Peak
	0.110MHz-0.490MHz	Average	10kHz	30KHz	Average
	0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	30MHz-1GHz	Quasi-peak	100 kHz	300KHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
		Peak	1MHz	10Hz	Average
Note: For fundamental frequency, RBW=5MHz, VBW=5MHz, Peak detector is for PK value, RMS detector is for Average value.					
Limit: (Spurious Emissions and band edge)	Frequency	Field strength (microvolt/meter)	Limit (dBuV/m )	Remark	Measurement distance (m)
	0.009MHz-0.490MHz	2400/F(kHz)	-	-	300
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
	1.705MHz-30MHz	30	-	-	30
	30MHz-88MHz	100	40.0	Quasi-peak	3
	88MHz-216MHz	150	43.5	Quasi-peak	3
	216MHz-960MHz	200	46.0	Quasi-peak	3
	960MHz-1GHz	500	54.0	Quasi-peak	3
	Above 1GHz	500	54.0	Average	3
Note: 1) 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.					
2) 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 Section 15.209, whichever is the lesser attenuation.					
Limit: (Field strength of the fundamental signal)	Frequency	Limit (dBuV/m @3m)		Remark	
	2400MHz-2483.5MHz	94.0		Average Value	
		114.0		Peak Value	

Test Setup:	
	<p>Figure 1. Below 30MHz</p>  
Test Procedure:	<p>a. 1) Below 1G: The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.  2) Above 1G: The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.</p> <p>Note: For the radiated emission test above 1GHz:  Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 meters above the ground or reference ground plane.</p> <p>b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.</p> <p>c. 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.</p> <p>d. 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</p>

	<p>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.</p> <ul style="list-style-type: none"><li>e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.</li><li>f. 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.</li><li>g. Test the EUT in the lowest channel, the middle channel, the Highest channel</li><li>h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, And found the X axis positioning which it is worse case.</li><li>i. Repeat above procedures until all frequencies measured was complete.</li></ul>
Exploratory Test Mode:	Transmitting mode, Charge + Transmitting mode.
Final Test Mode:	Pretest the EUT at Transmitting mode and Charge + Transmitting mode, found the Charge + Transmitting mode which it is worse case. For below 1GHz part, through pre-scan, the worst case is the lowest channel. Only the worst case is recorded in the report.
Test Results:	Pass

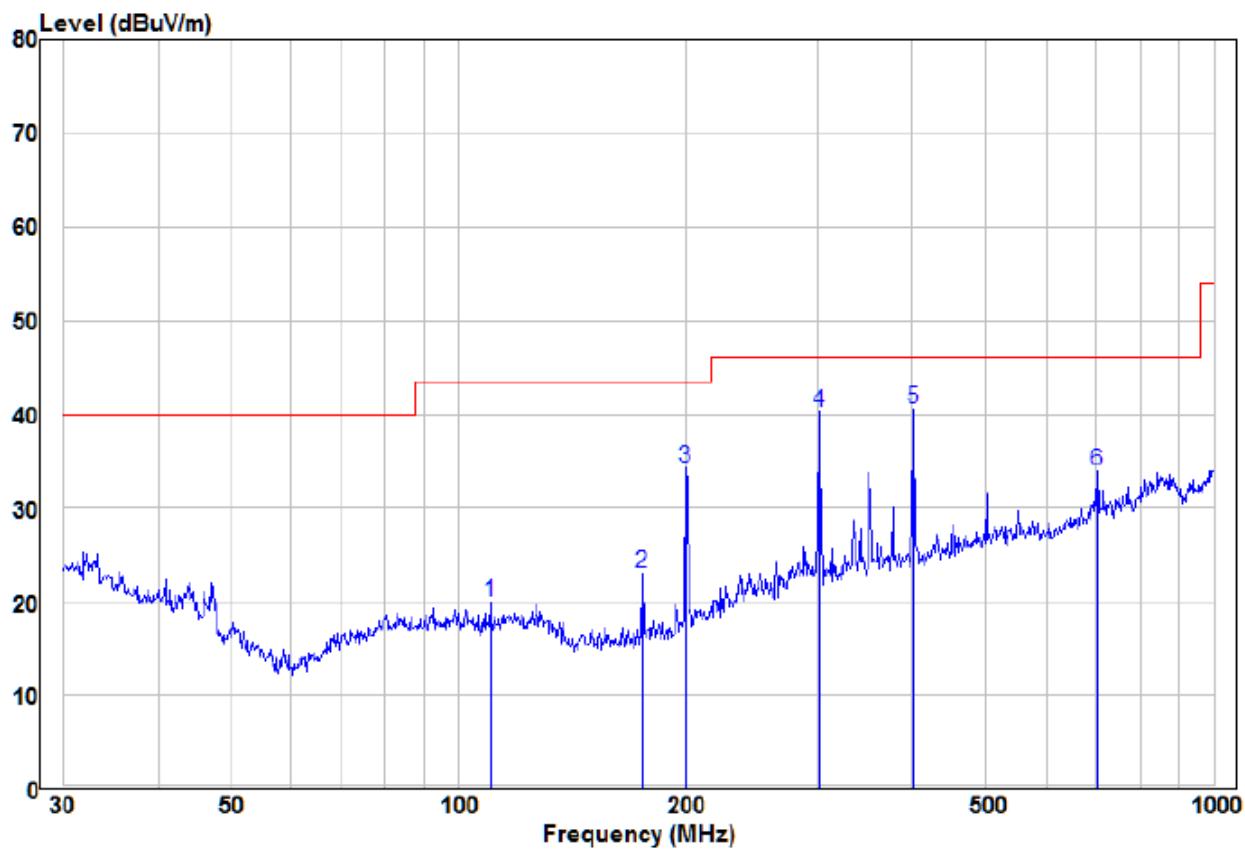
**Measurement Data**
**30MHz~1GHz**

Test mode:	Charging+Transmitting	Vertical
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Freq	Read			Limit Level	Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV	dB/m	dBuV/m				
1	43.81	15.18	11.01	26.19	40.00	-13.81	Peak	VERTICAL
2	50.41	15.45	8.00	23.45	40.00	-16.55	Peak	VERTICAL
3	199.99	21.21	8.49	29.70	43.50	-13.80	Peak	VERTICAL
4	300.37	18.16	13.74	31.90	46.00	-14.10	Peak	VERTICAL
5 pp	400.43	20.79	15.16	35.95	46.00	-10.05	Peak	VERTICAL
6	668.14	12.34	20.01	32.35	46.00	-13.65	Peak	VERTICAL

Test mode:	Charging+Transmitting	Horizontal
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Freq	Read		Limit	Over	Pol/Phase		
	Level	Factor					
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1	110.18	9.85	10.18	20.03	43.50	-23.47	Peak HORIZONTAL
2	175.65	15.03	8.03	23.06	43.50	-20.44	Peak HORIZONTAL
3	199.99	25.74	8.49	34.23	43.50	-9.27	Peak HORIZONTAL
4	300.37	26.45	13.74	40.19	46.00	-5.81	Peak HORIZONTAL
5 pp	400.43	25.38	15.16	40.54	46.00	-5.46	Peak HORIZONTAL
6	701.76	12.84	21.10	33.94	46.00	-12.06	Peak HORIZONTAL

<b>Above 1GHz</b>							
Test mode:		Transmitting		Test channel:		Lowest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dB $\mu$ V)	(dB)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB)		H/V
2390	58.95	-9.2	49.75	74	-24.25	Peak	H
2390	44.34	-9.2	35.14	54	-18.86	AVG	H
2400	59.26	-9.39	49.87	74	-24.13	Peak	H
2400	46.54	-9.39	37.15	54	-16.85	AVG	H
2402	96.37	-9.34	87.03	114	-26.97	peak	H
2402	93.16	-9.34	83.82	94	-10.18	AVG	H
4804	53.87	-4.33	49.54	74	-24.46	peak	H
4804	36.51	-4.33	32.18	54	-21.82	AVG	H
7206	51.83	1.01	52.84	74	-21.16	peak	H
7206	38.57	1.01	39.58	54	-14.42	AVG	H
2390	58.96	-9.2	49.76	74	-24.24	peak	V
2390	44.53	-9.2	35.33	54	-18.67	AVG	V
2400	59.80	-9.39	50.41	74	-23.59	peak	V
2400	46.85	-9.39	37.46	54	-16.54	AVG	V
2402	94.23	-9.34	84.89	114	-29.11	peak	V
2402	89.97	-9.34	80.63	94	-13.37	AVG	V
4804	55.51	-4.33	51.18	74	-22.82	peak	V
4804	39.56	-4.33	35.23	54	-18.77	AVG	V
7206	51.30	1.01	52.31	74	-21.69	peak	V
7206	36.96	1.01	37.97	54	-16.03	AVG	V

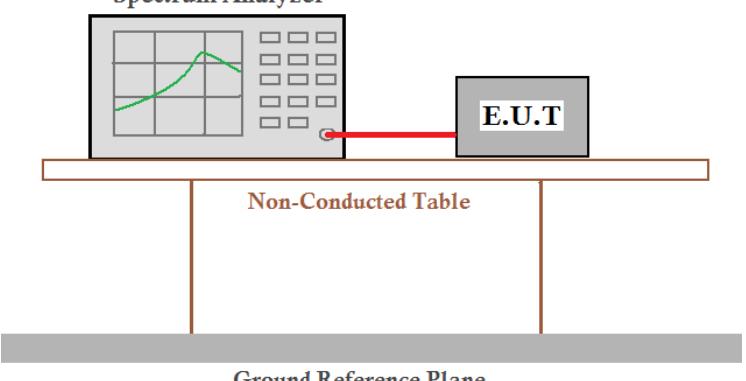
Test mode:		Transmitting		Test channel:		Middle	
Frequency (MHz)	Meter Reading (dB $\mu$ V)	Factor (dB)	Emission Level (dB $\mu$ V/m)	Limits (dB $\mu$ V/m)	Over (dB)	Detector Type	Ant. Pol. H/V
2440	95.16	-9.45	85.71	114	-28.29	peak	H
2440	92.34	-9.45	82.89	94	-11.11	AVG	H
4880	51.89	-4.11	47.78	74	-26.22	peak	H
4880	36.90	-4.11	32.79	54	-21.21	AVG	H
7320	48.56	1.51	50.07	74	-23.93	peak	H
7320	35.25	1.51	36.76	54	-17.24	AVG	H
2440	93.22	-9.45	83.77	114	-30.23	peak	V
2440	88.89	-9.45	79.44	94	-14.56	AVG	V
4880	53.37	-4.12	49.25	74	-24.75	peak	V
4880	37.59	-4.12	33.47	54	-20.53	AVG	V
7320	49.73	1.46	51.19	74	-22.81	peak	V
7320	36.75	1.46	38.21	54	-15.79	AVG	V

Test mode:		Transmitting		Test channel:		Highest	
Frequency	Meter Reading	Factor	Emission Level	Limits	Over	Detector Type	Ant. Pol.
(MHz)	(dB $\mu$ V)	(dB)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB)		H/V
2480	94.16	-9.21	84.95	114	-29.05	peak	H
2480	87.61	-9.21	78.4	94	-15.6	AVG	H
2483.5	57.63	-9.29	48.34	74	-25.66	Peak	H
2483.5	43.73	-9.29	34.44	54	-19.56	AVG	H
4960	52.17	-4.04	48.13	74	-25.87	peak	H
4960	52.83	-4.04	48.79	54	-5.21	AVG	H
7440	49.26	1.57	50.83	74	-23.17	peak	H
7440	48.31	1.57	49.88	54	-4.12	AVG	H
2480	92.39	-9.21	83.18	114	-30.82	peak	V
2480	86.76	-9.21	77.55	94	-16.45	AVG	V
2483.5	58.28	-9.29	48.99	74	-25.01	peak	V
2483.5	46.13	-9.29	36.84	54	-17.16	AVG	V
4960	50.57	-4.04	46.53	74	-27.47	peak	V
4960	51.41	-4.04	47.37	54	-6.63	AVG	V
7440	50.26	1.57	51.83	74	-22.17	peak	V
7440	49.99	1.57	51.56	54	-2.44	AVG	V

**Remark:**

- 1) 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**
- 2) Scan from 9kHz to 25GHz, The disturbance above 10GHz and below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported .

## 5.4 20dB Bandwidth

Test Requirement:	47 CFR Part 15C Section 15.215
Test Method:	ANSI C63.10:2013
Test Setup:	<p style="text-align: center;"><b>Spectrum Analyzer</b></p>  <p style="text-align: center;">Non-Conducted Table</p> <p style="text-align: center;">Ground Reference Plane</p>
Test Mode:	Transmitting with GFSK modulation.
Limit:	N/A
Test Results:	Pass

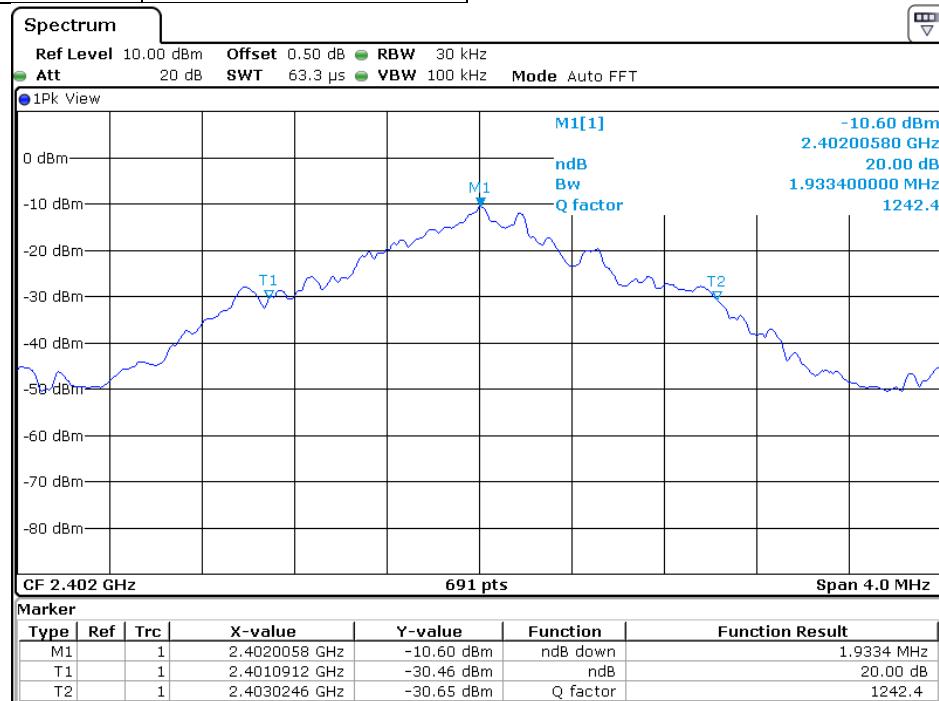
### Measurement Data

Test channel	20dB bandwidth (MHz)	Results
Lowest	1.933	Pass
Middle	1.916	Pass
Highest	1.922	Pass

**Test plot as follows:**

Test channel:

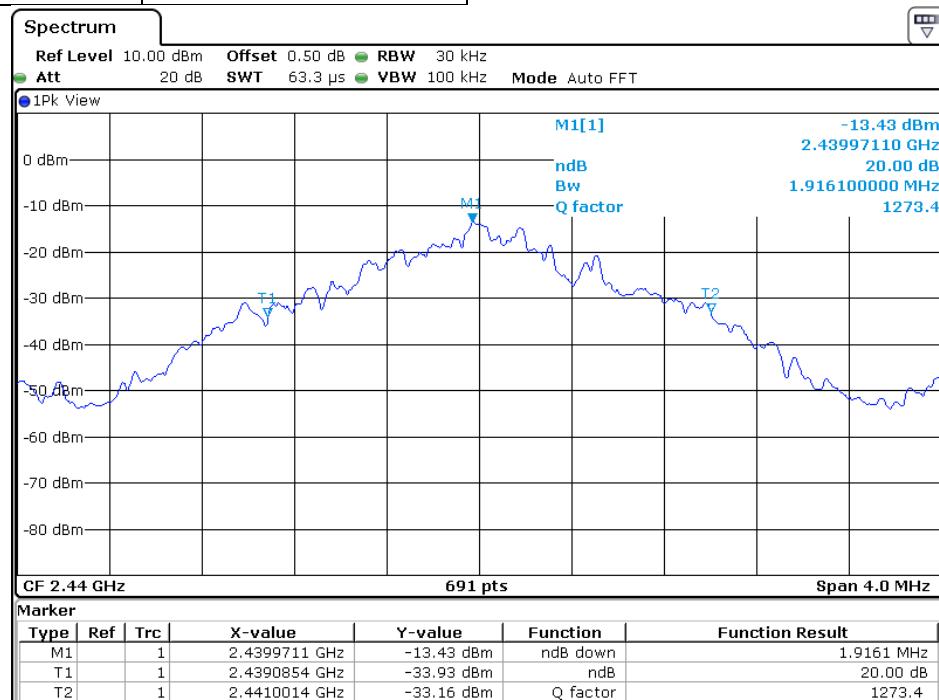
Lowest



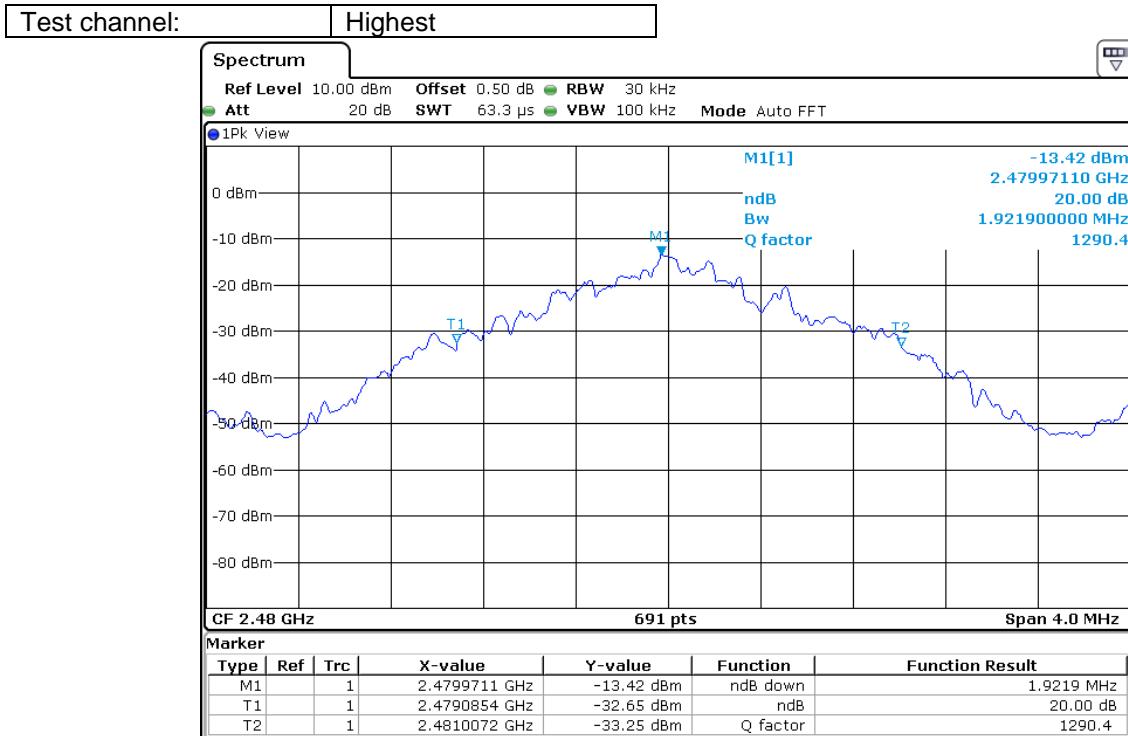
Date: 9 SEP 2020 04:54:26

Test channel:

Middle



Date: 9 SEP 2020 04:44:25



Date: 9 SEP 2020 04:32:54

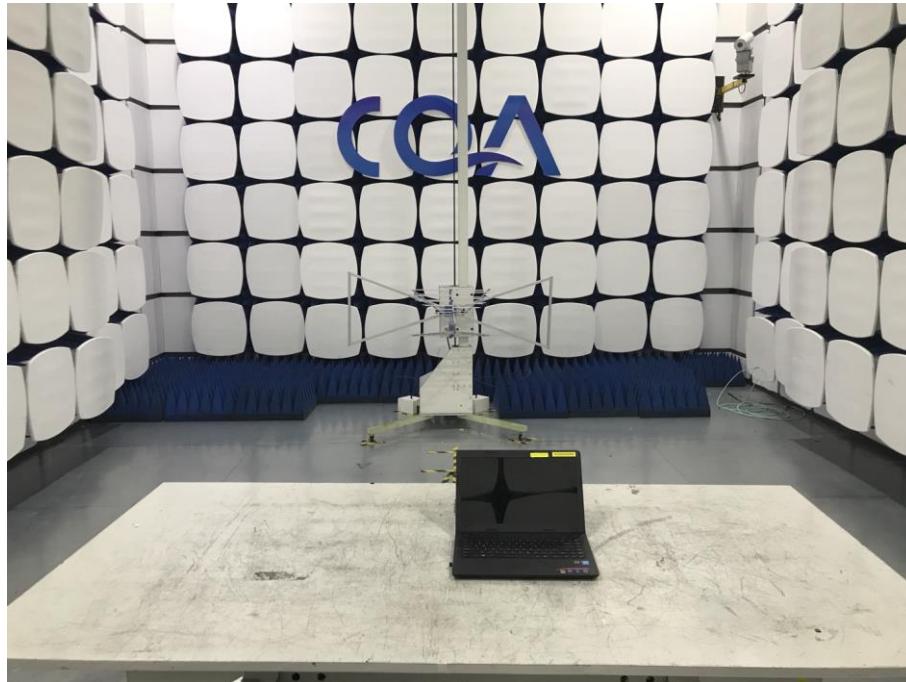
## 6 Photographs

### 6.1 Radiated Emission Test Setup

9kHz~30MHz



30MHz~1GHz:



Above 1GHz:

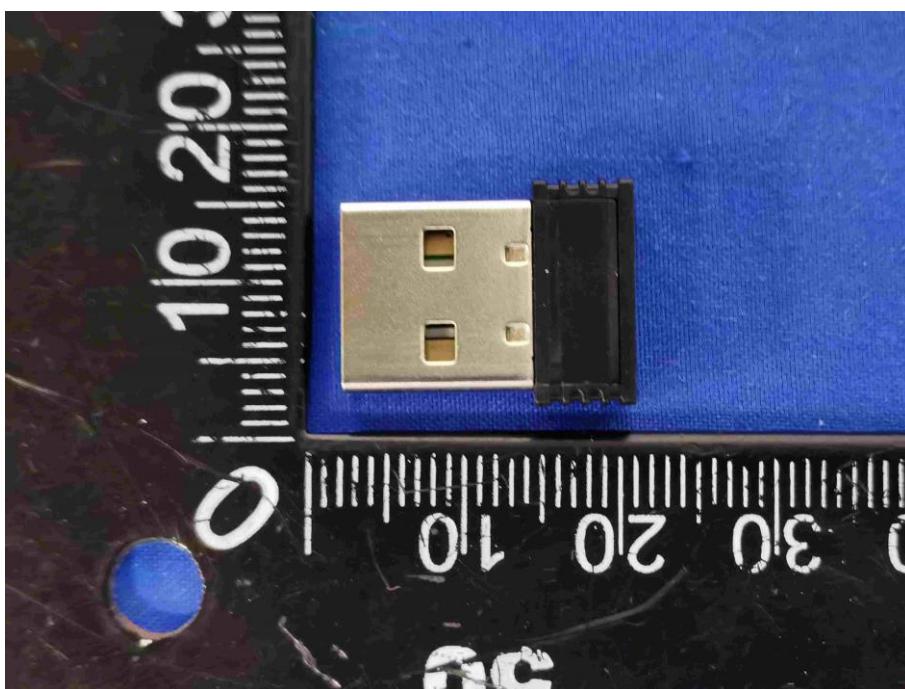
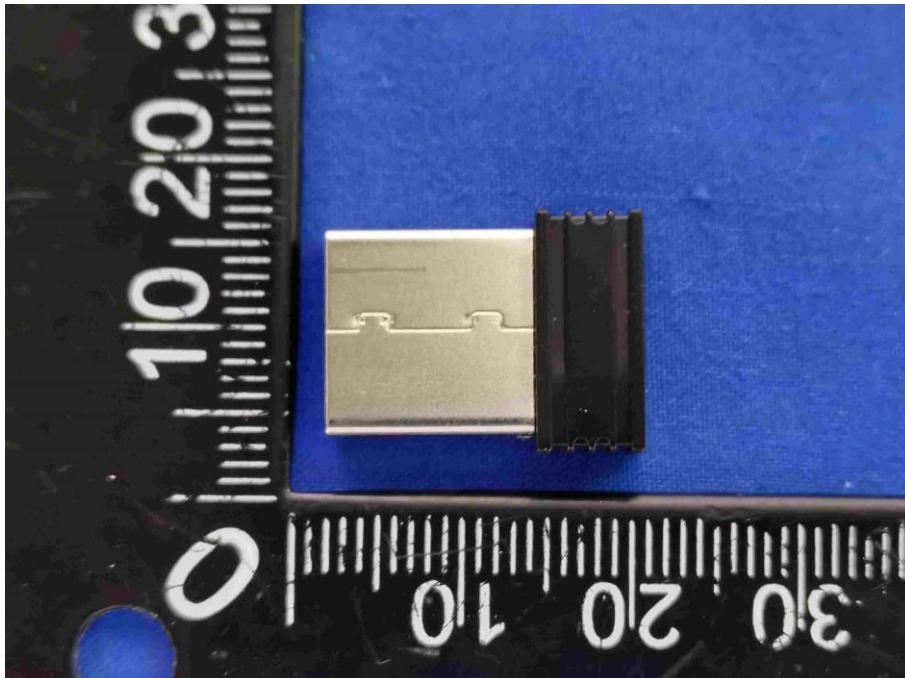


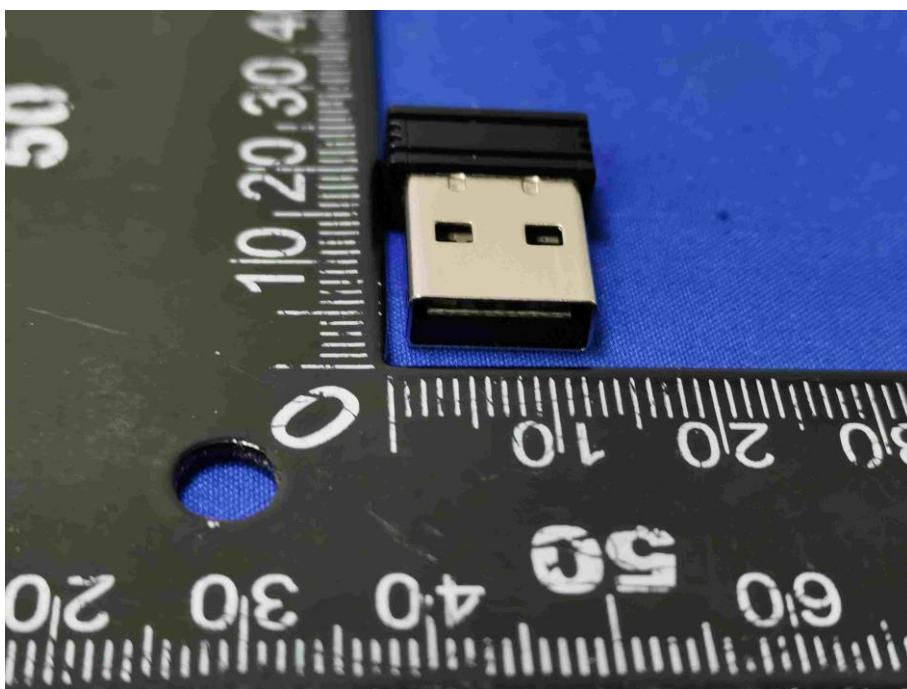
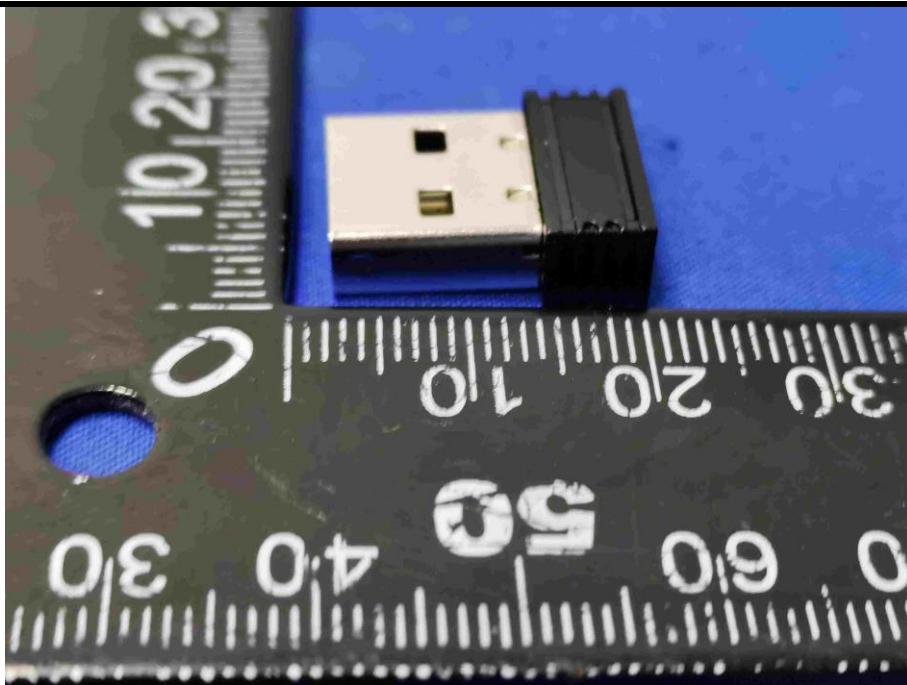
## 6.2 Conducted Emission Test Setup

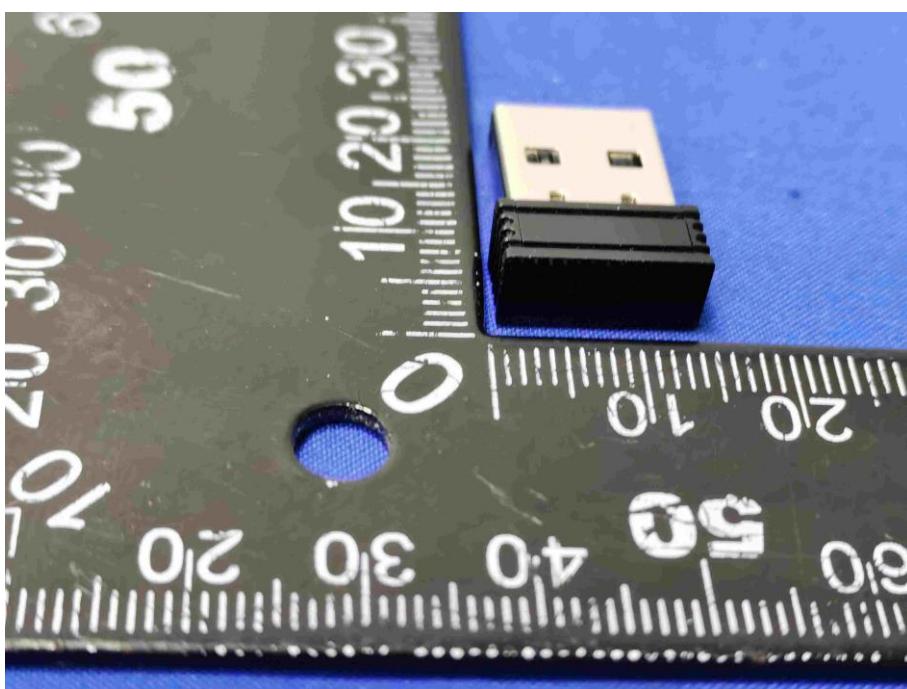
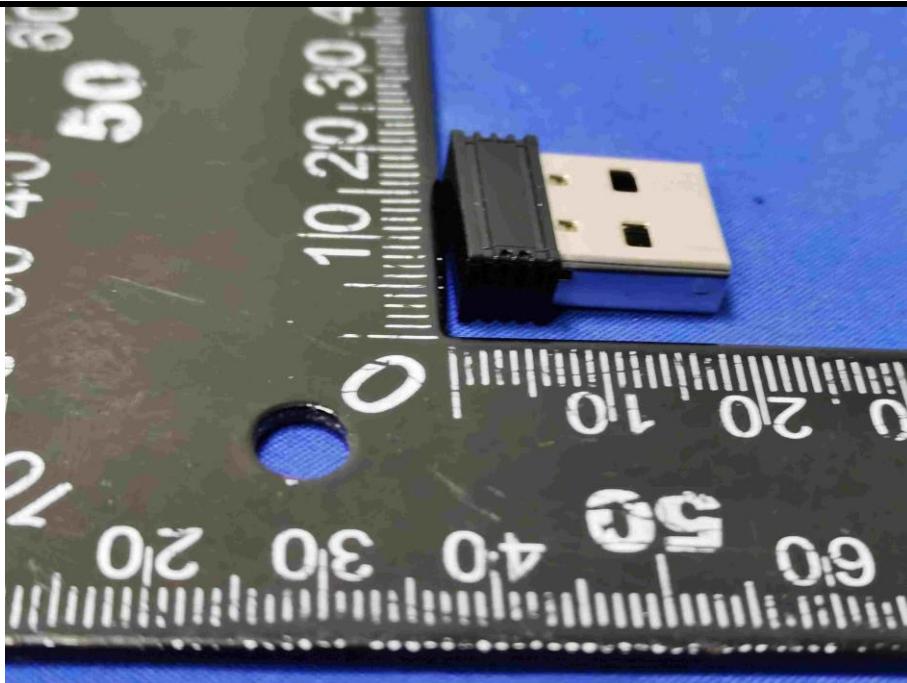


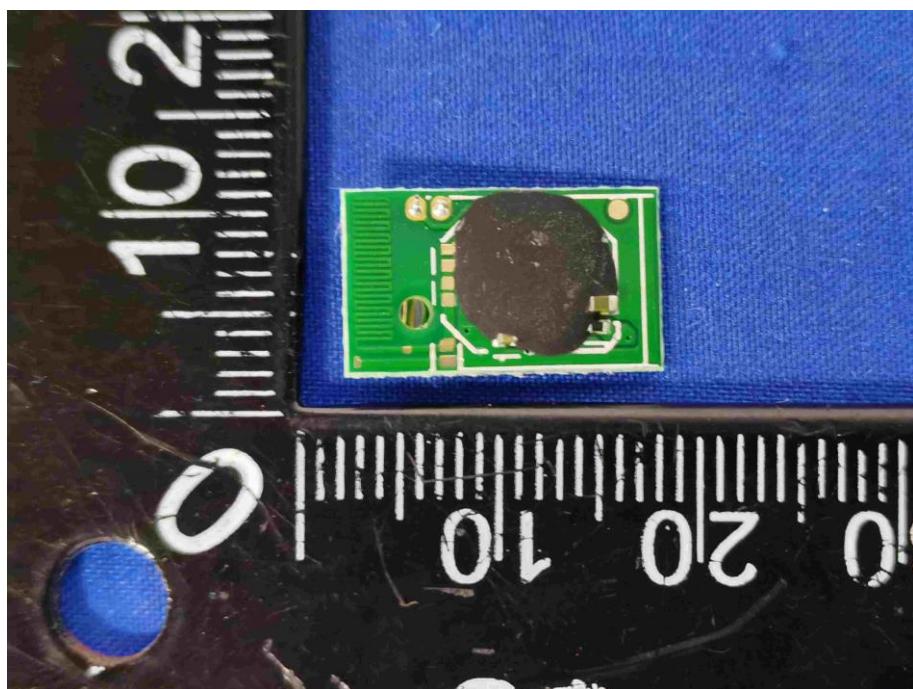
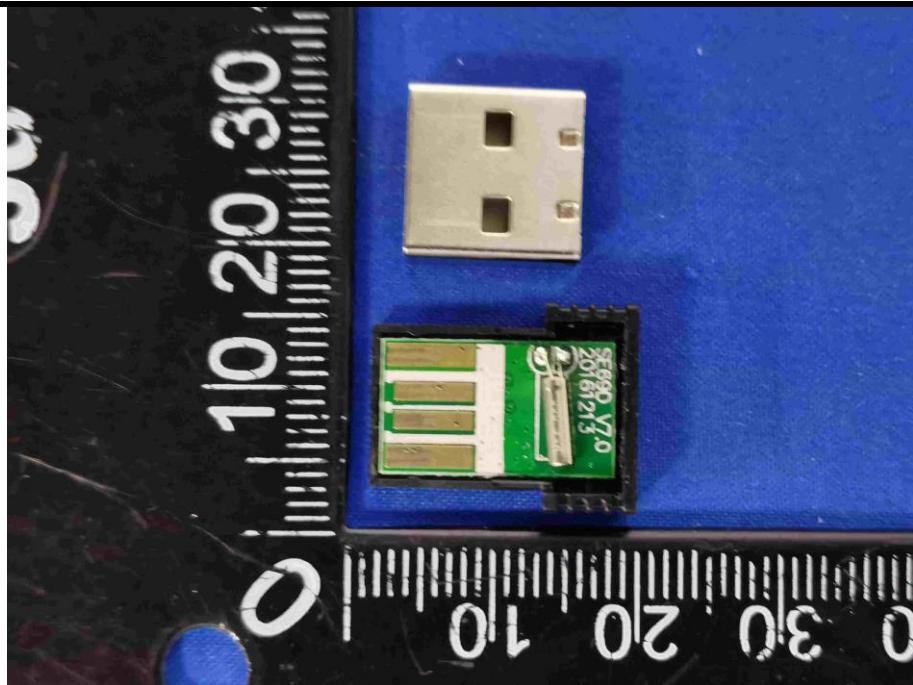
### 6.3 EUT Constructional Details

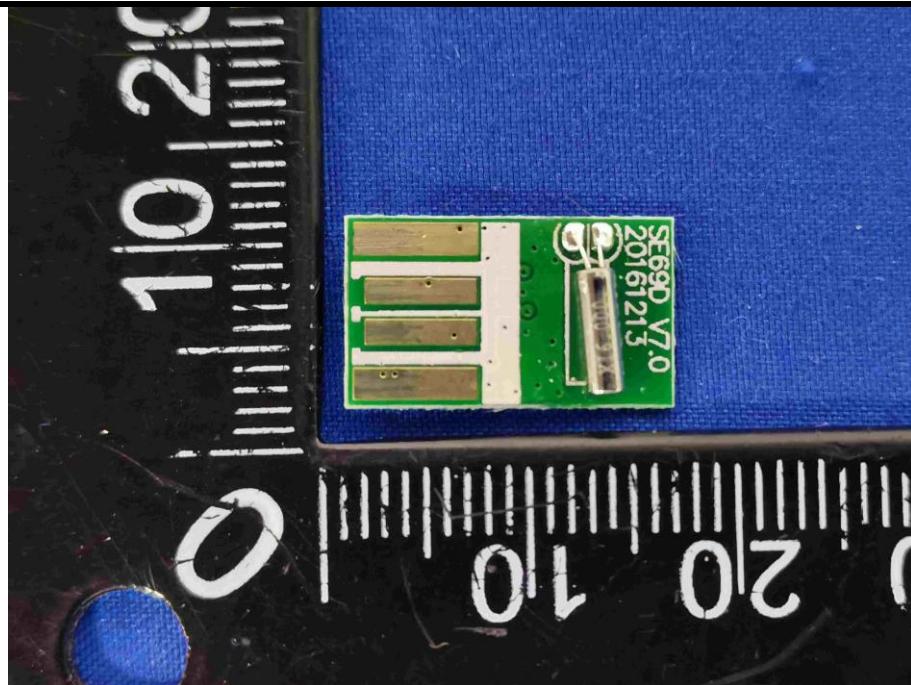
Test Model No.: TL-180











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The End