

12. BAND EDGE EMISSION

12.1. MEASUREMENT PROCEDURE

Radiated restricted band edge measurements

The radiated restricted band edge measurements are measured with an EMI test receiver connected to the receive antenna while the EUT is transmitting

12.2. TEST SET-UP

same as 11.2

Note:

1. Factor=Antenna Factor + Cable loss - Amplifier gain. Field Strength=Factor + Reading level
2. The factor had been edited in the "Input Correction" of the Spectrum Analyzer. So the Amplitude of test plots is equal to Reading level plus the Factor in dB. Use the A dB(μV) to represent the Amplitude. Use the F dB(μV/m) to represent the Field Strength. So A=F.

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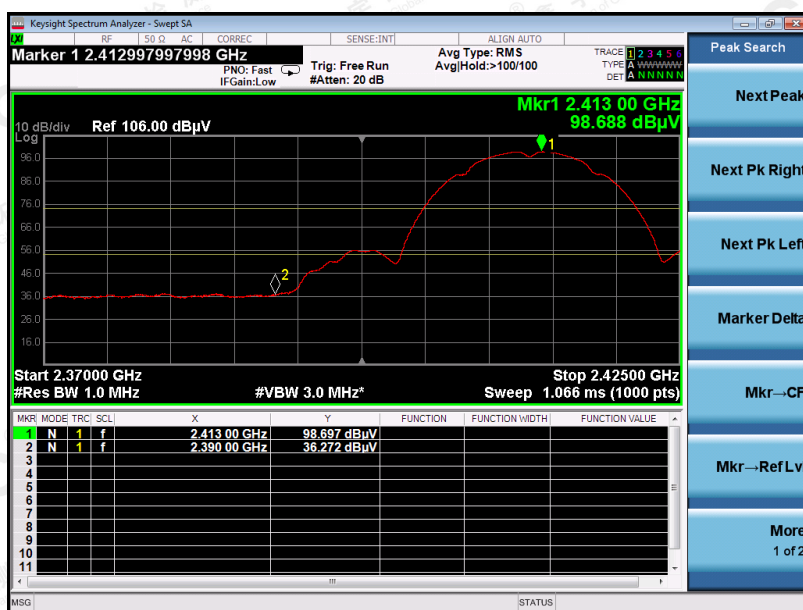
12.3. Test Result

EUT	Smart WiFi Plug Mini	Model Name	MSS110
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with data rate 1 2412MHZ	Antenna	Horizontal

PK



AV



RESULT: PASS

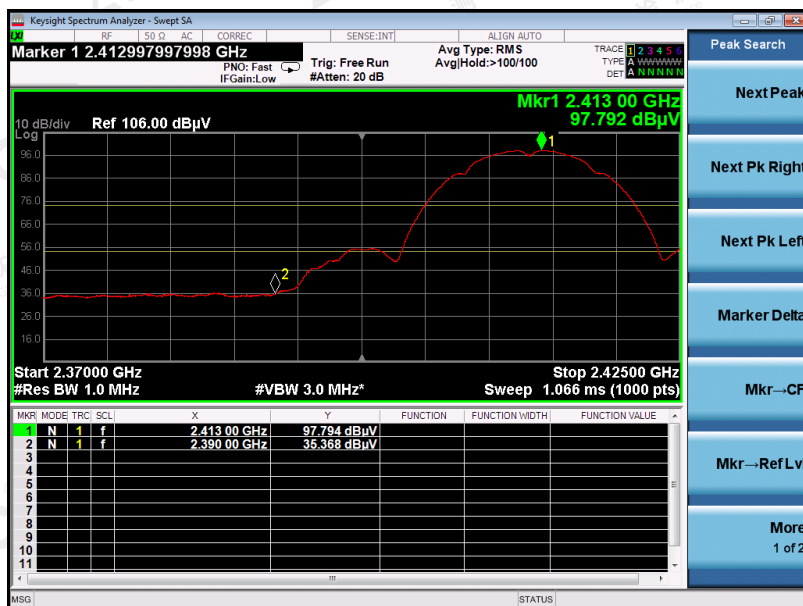
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EUT	Smart WiFi Plug Mini	Model Name	MSS110
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with data rate 1 2412MHZ	Antenna	Vertical

PK



AV



RESULT: PASS

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EUT	Smart WiFi Plug Mini	Model Name	MSS110
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with data rate 1 2462MHZ	Antenna	Horizontal

PK



AV



RESULT: PASS

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EUT	Smart WiFi Plug Mini	Model Name	MSS110
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11b with data rate 1 2462MHZ	Antenna	Vertical

PK



AV



RESULT: PASS

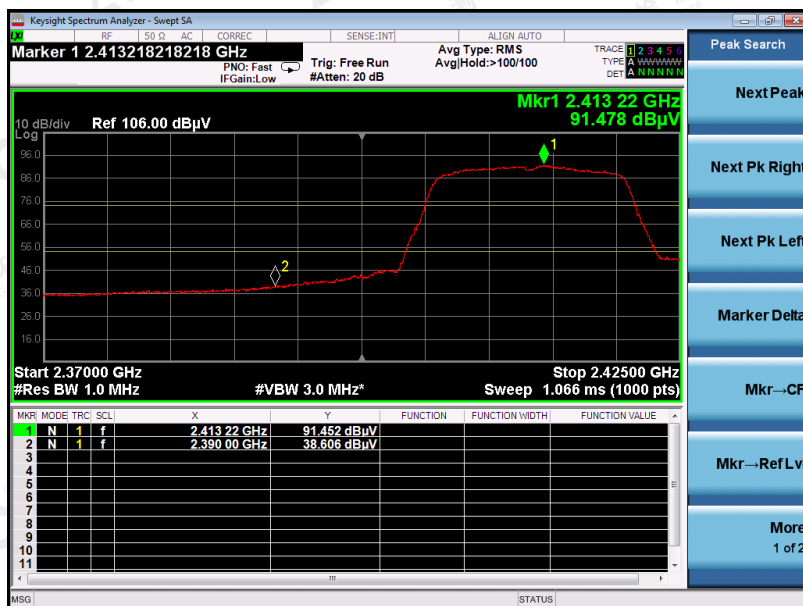
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EUT	Smart WiFi Plug Mini	Model Name	MSS110
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11g with data rate 6 2412MHZ	Antenna	Horizontal

PK



AV

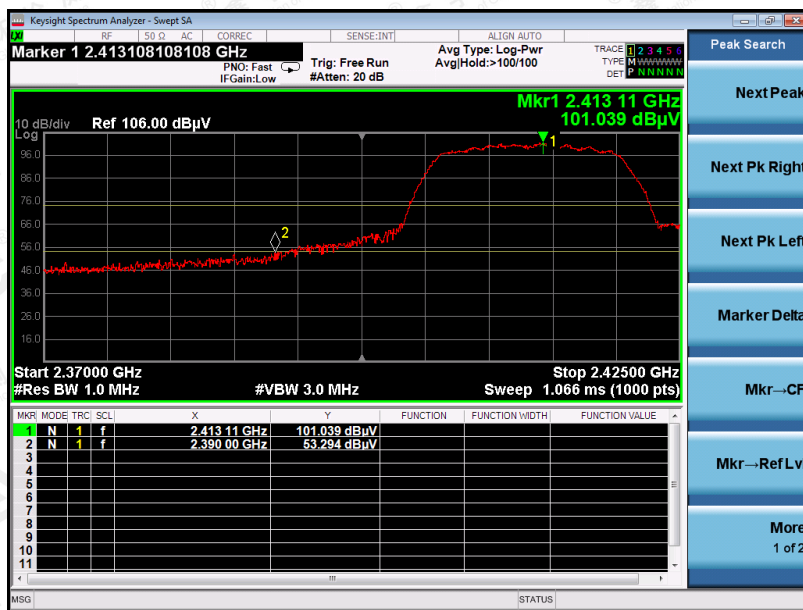


RESULT: PASS

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EUT	Smart WiFi Plug Mini	Model Name	MSS110
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11g with data rate 6 2412MHZ	Antenna	Vertical

PK



AV



RESULT: PASS

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EUT	Smart WiFi Plug Mini	Model Name	MSS110
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11g with data rate 6 2462MHZ	Antenna	Horizontal

PK



AV



RESULT: PASS

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EUT	Smart WiFi Plug Mini	Model Name	MSS110
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11g with data rate 6 2462MHZ	Antenna	Vertical

PK



AV



RESULT: PASS

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EUT	Smart WiFi Plug Mini	Model Name	MSS110
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11n 20 with data rate 6.5 2412MHZ	Antenna	Horizontal

PK



AV

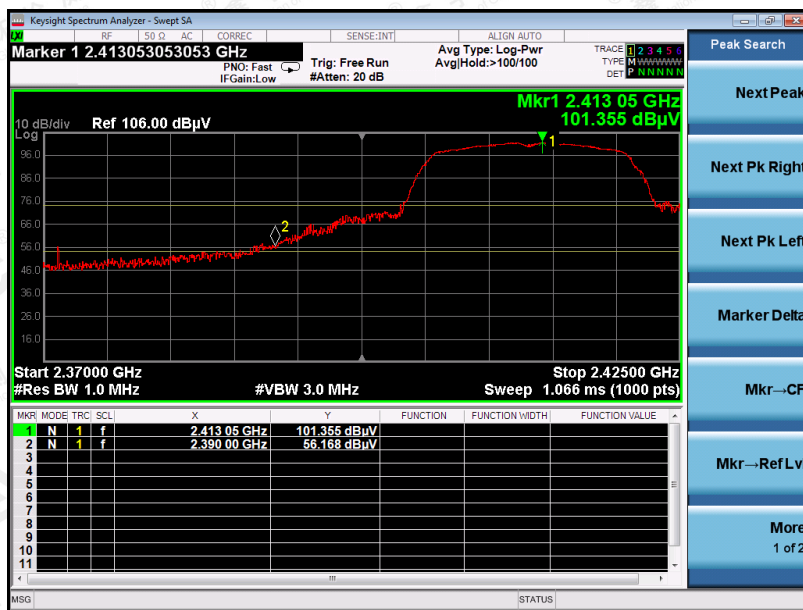


RESULT: PASS

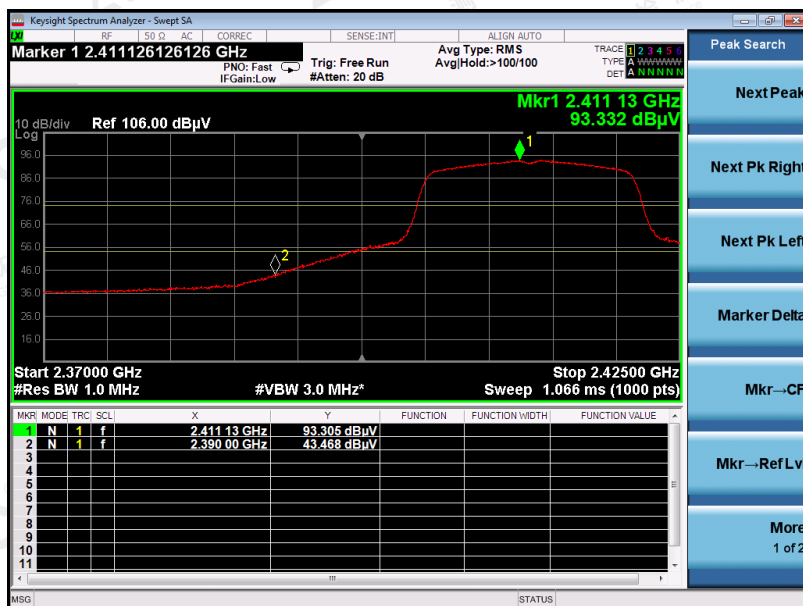
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EUT	Smart WiFi Plug Mini	Model Name	MSS110
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11n 20 with data rate 6.5 2412MHZ	Antenna	Vertical

PK



AV



RESULT: PASS

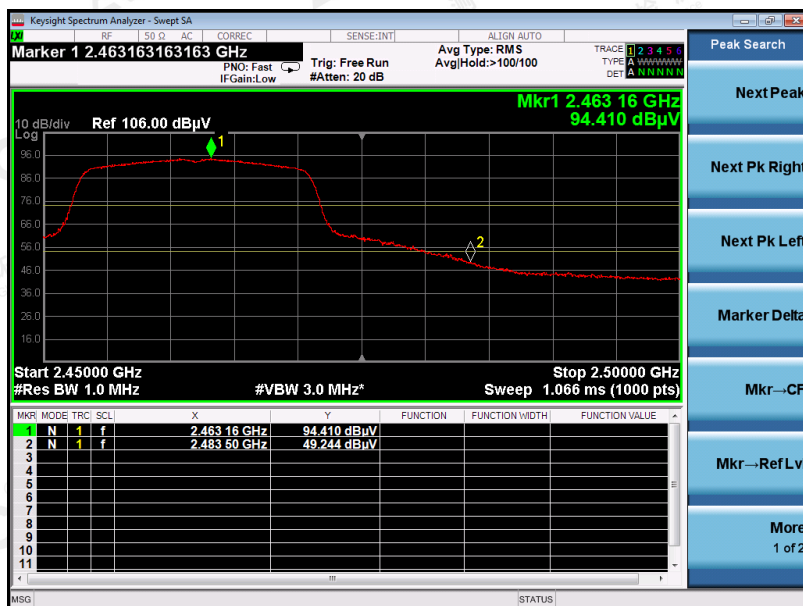
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EUT	Smart WiFi Plug Mini	Model Name	MSS110
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11n 20 with data rate 6.5 2462MHZ	Antenna	Horizontal

PK



AV



RESULT: PASS

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EUT	Smart WiFi Plug Mini	Model Name	MSS110
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11n 20 with data rate 6.5 2462MHZ	Antenna	Vertical

PK



AV



RESULT: PASS

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EUT	Smart WiFi Plug Mini	Model Name	MSS110
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11n 40 with data rate 13.5 2422MHZ	Antenna	Horizontal

PK



AV



RESULT: PASS

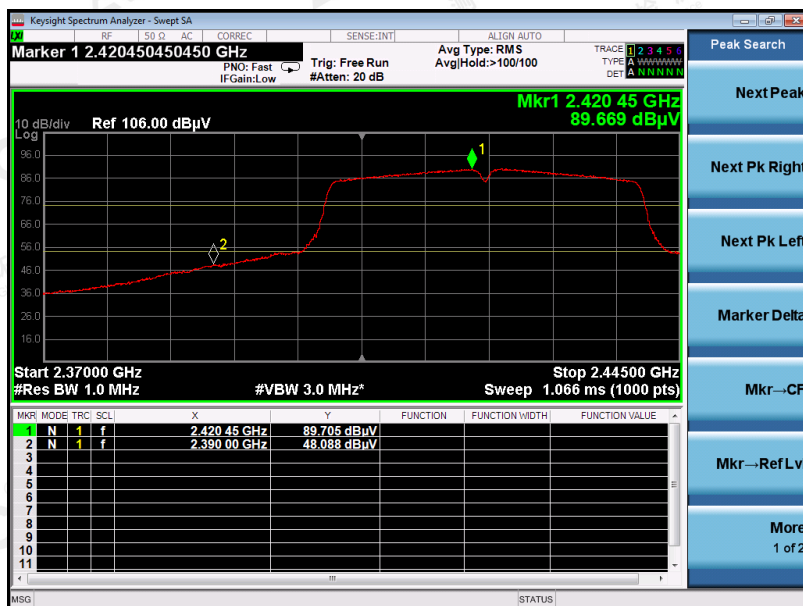
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EUT	Smart WiFi Plug Mini	Model Name	MSS110
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11n 40 with data rate 13.5 2422MHZ	Antenna	Vertical

PK



AV



RESULT: PASS

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EUT	Smart WiFi Plug Mini	Model Name	MSS110
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11n 40with data rate 13.5 2452MHZ	Antenna	Horizontal

PK



AV



RESULT: PASS

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EUT	Smart WiFi Plug Mini	Model Name	MSS110
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	802.11n 40 with data rate 13.5 2452MHZ	Antenna	Vertical

PK



AV



RESULT: PASS

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13. FCC LINE CONDUCTED EMISSION TEST

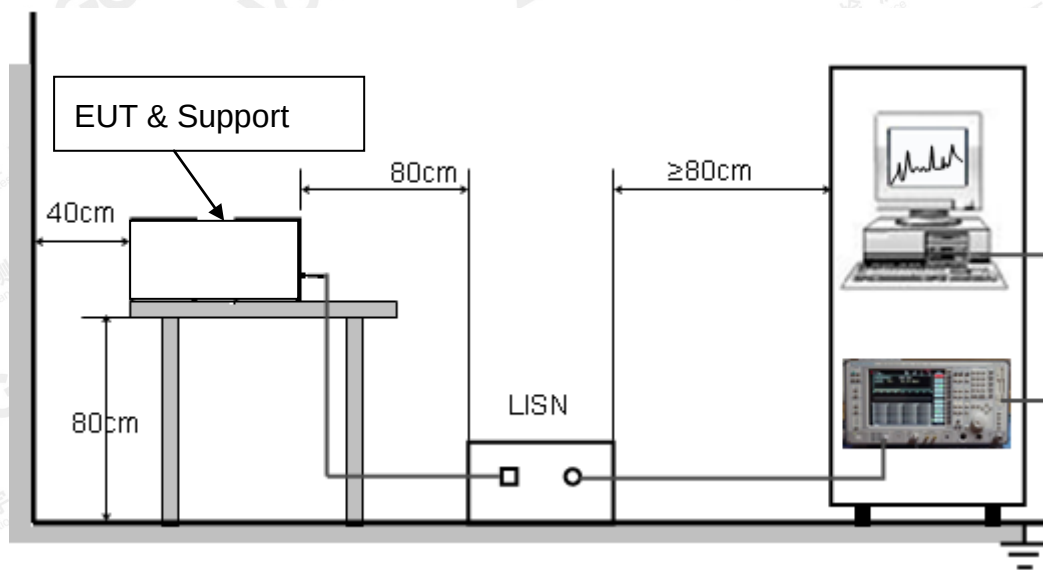
13.1. LIMITS OF LINE CONDUCTED EMISSION TEST

Frequency	Maximum RF Line Voltage	
	Q.P.(dBuV)	Average(dBuV)
150kHz~500kHz	66-56	56-46
500kHz~5MHz	56	46
5MHz~30MHz	60	50

Note:

1. The lower limit shall apply at the transition frequency.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

13.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST



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13.3. PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST

1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
2. Support equipment, if needed, was placed as per ANSI C63.10.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
4. All support equipments received AC120V/60Hz power from a LISN, if any.
5. The EUT received charging voltage by adapter which received 120V/60Hz power by a LISN..
6. The test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.
8. During the above scans, the emissions were maximized by cable manipulation.
9. The test mode(s) were scanned during the preliminary test.

Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

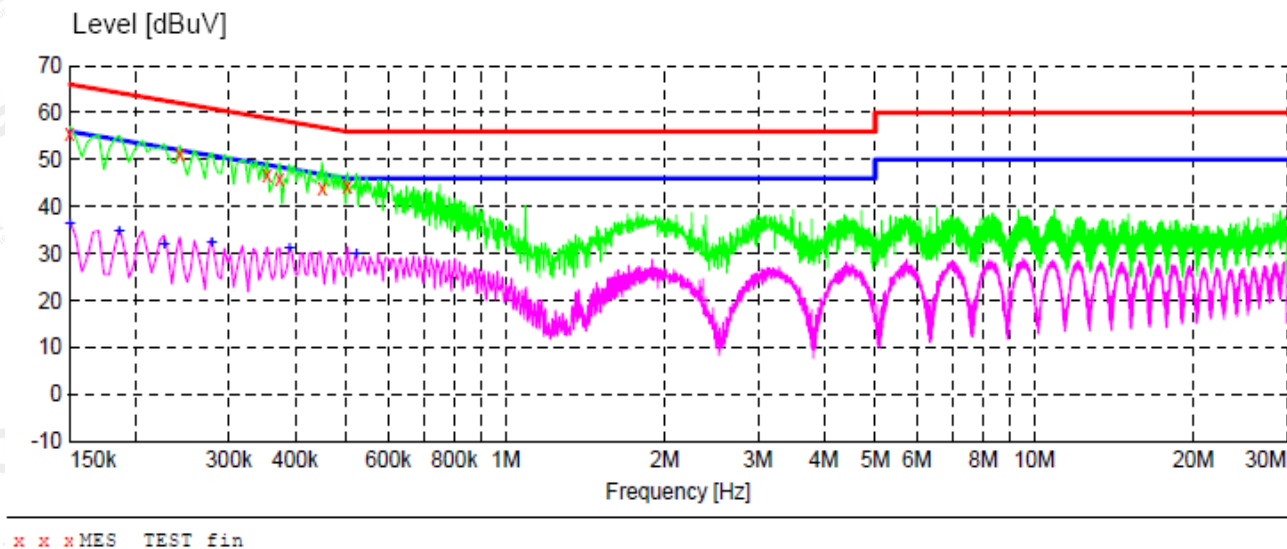
13.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST

1. EUT and support equipment was set up on the test bench as per step 2 of the preliminary test.
2. A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less -2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.
3. The test data of the worst case condition(s) was reported on the Summary Data page.

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13.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST

LINE CONDUCTED EMISSION TEST LINE 1-L



MEASUREMENT RESULT:

2018/3/26 17:44

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.150000	55.70	11.4	66	10.3	QP	L1	FLO
0.242000	51.10	11.3	62	10.9	QP	L1	FLO
0.354000	46.90	11.3	59	12.0	QP	L1	FLO
0.374000	46.00	11.3	58	12.4	QP	L1	FLO
0.450000	43.90	11.4	57	13.0	QP	L1	FLO
0.502000	44.20	11.4	56	11.8	QP	L1	FLO

MEASUREMENT RESULT:

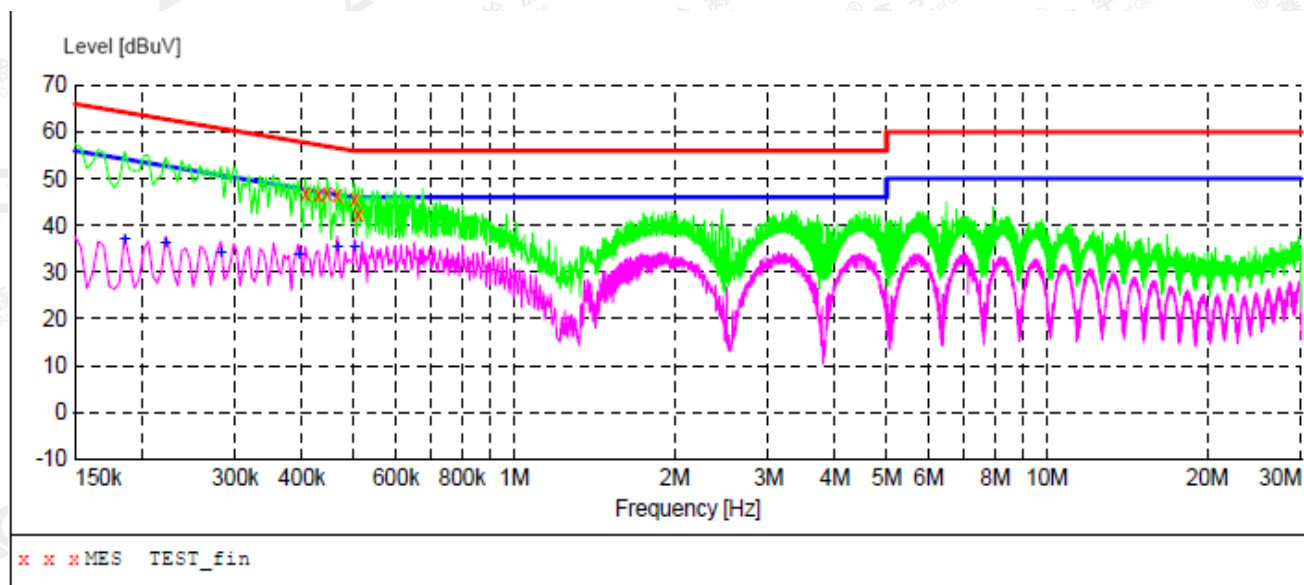
2018/3/26 17:44

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.150000	36.30	11.4	56	19.7	AV	L1	FLO
0.186000	34.80	11.4	54	19.4	AV	L1	FLO
0.226000	32.00	11.3	53	20.6	AV	L1	FLO
0.278000	32.30	11.3	51	18.6	AV	L1	FLO
0.390000	31.10	11.4	48	17.0	AV	L1	FLO
0.522000	29.80	11.4	46	16.2	AV	L1	FLO

RESULT: PASS

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Line Conducted Emission Test Line 2-N



MEASUREMENT RESULT:

2018/3/26 17:41

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.406000	46.70	11.4	58	11.0	QP	N	FLO
0.430000	46.50	11.4	57	10.8	QP	N	FLO
0.446000	46.70	11.4	57	10.2	QP	N	FLO
0.466000	46.30	11.4	57	10.3	QP	N	FLO
0.502000	45.80	11.4	56	10.2	QP	N	FLO
0.510000	42.20	11.4	56	13.8	QP	N	FLO

MEASUREMENT RESULT:

2018/3/26 17:41

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Detector	Line	PE
0.186000	36.90	11.4	54	17.3	AV	N	FLO
0.222000	36.30	11.4	53	16.4	AV	N	FLO
0.282000	34.20	11.3	51	16.6	AV	N	FLO
0.394000	33.50	11.4	48	14.5	AV	N	FLO
0.466000	35.20	11.4	47	11.4	AV	N	FLO
0.502000	35.30	11.4	46	10.7	AV	N	FLO

RESULT: PASS

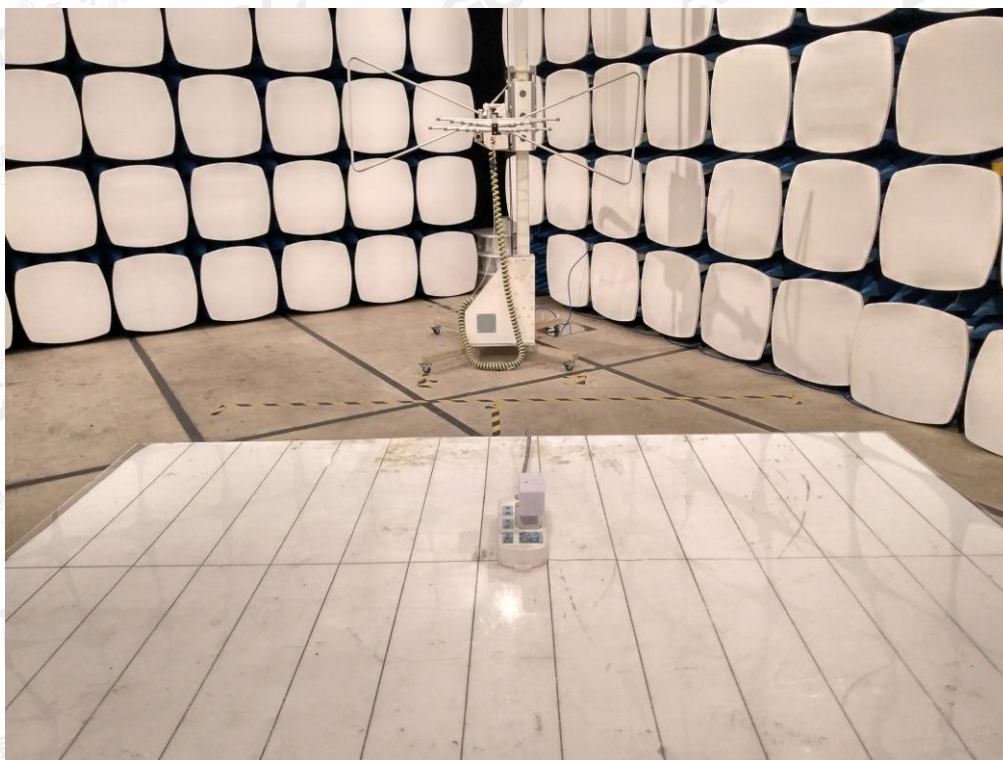
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APPENDIX A: PHOTOGRAPHS OF TEST SETUP

FCC LINE CONDUCTED EMISSION TEST SETUP

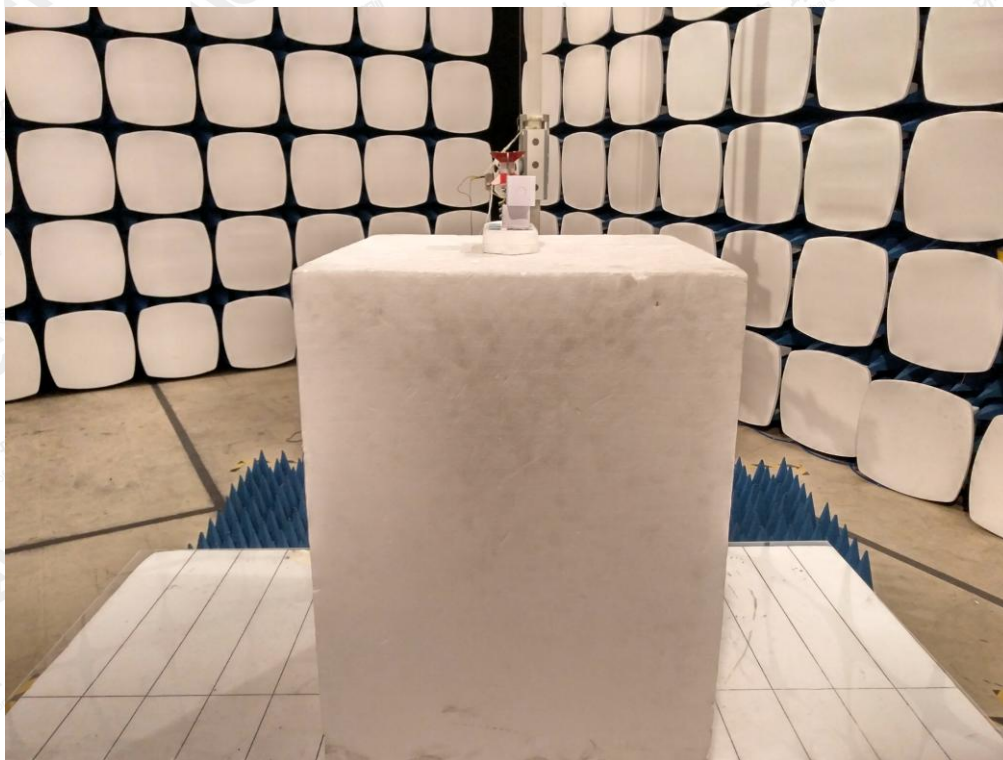


FCC RADIATED EMISSION TEST SETUP BELOW 1GHZ



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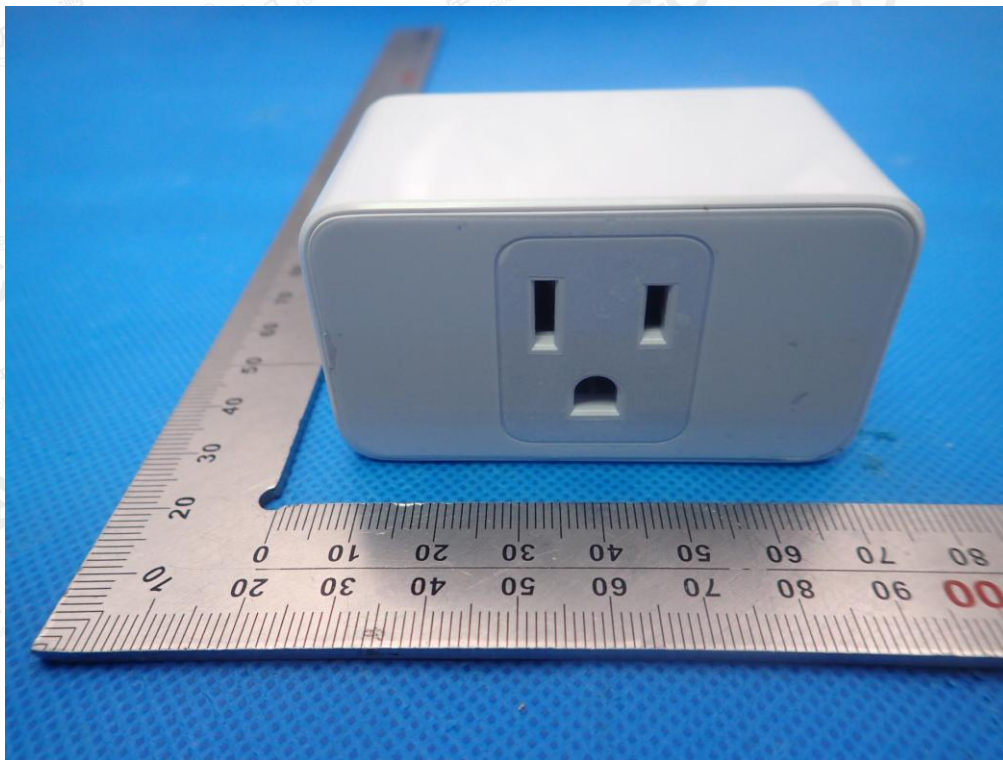
FCC RADIATED EMISSION TEST SETUP ABOVE 1GHZ



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APPENDIX B: PHOTOGRAPHS OF EUT

TOP VIEW OF EUT

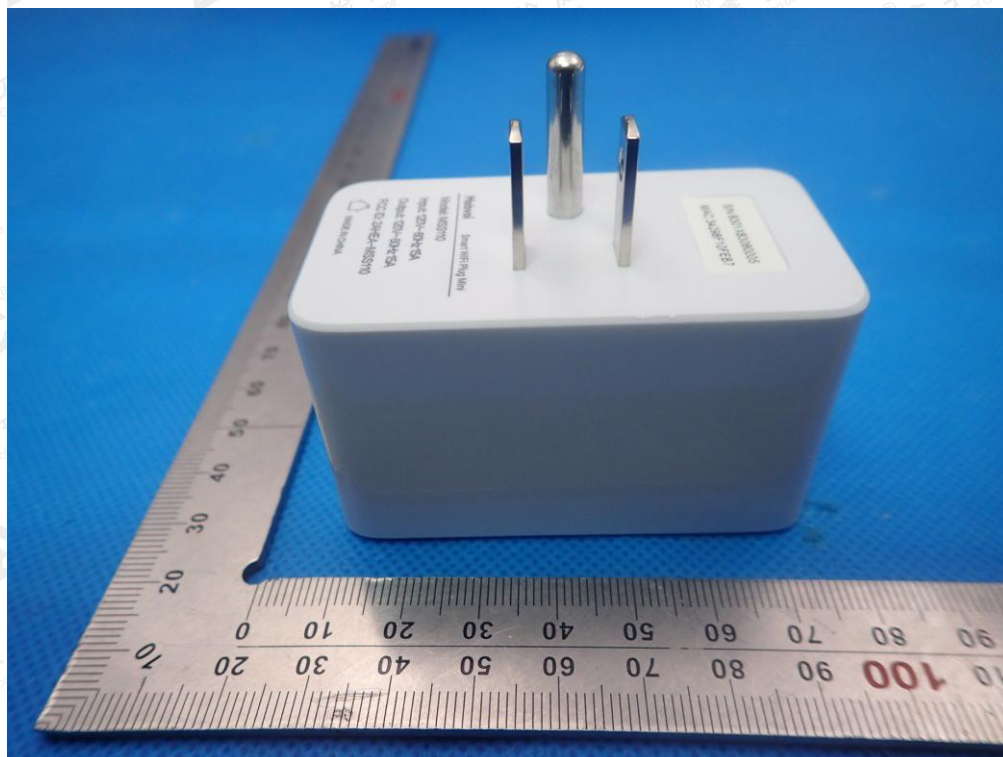


BOTTOM VIEW OF EUT

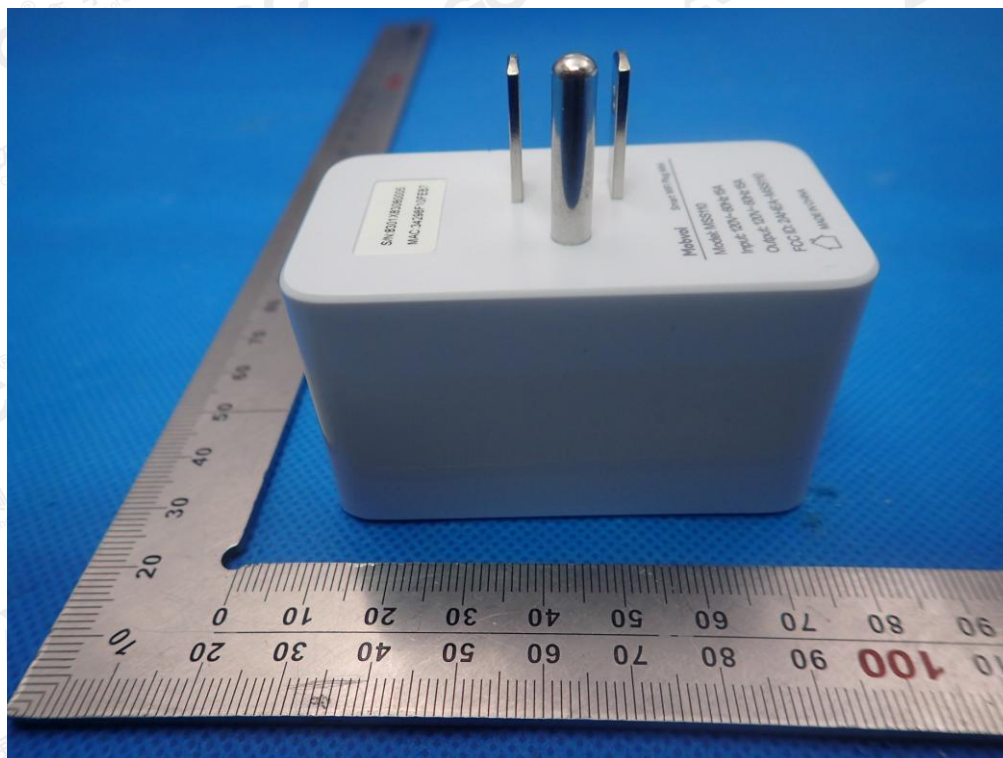


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FRONT VIEW OF EUT



BACK VIEW OF EUT

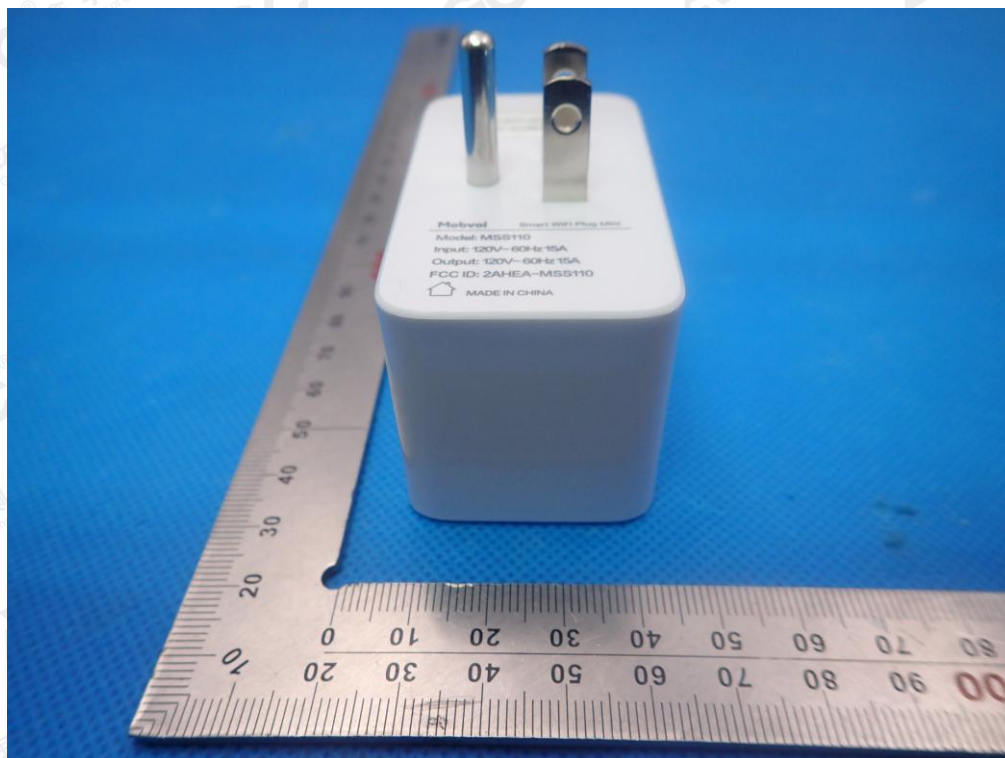


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LEFT VIEW OF EUT

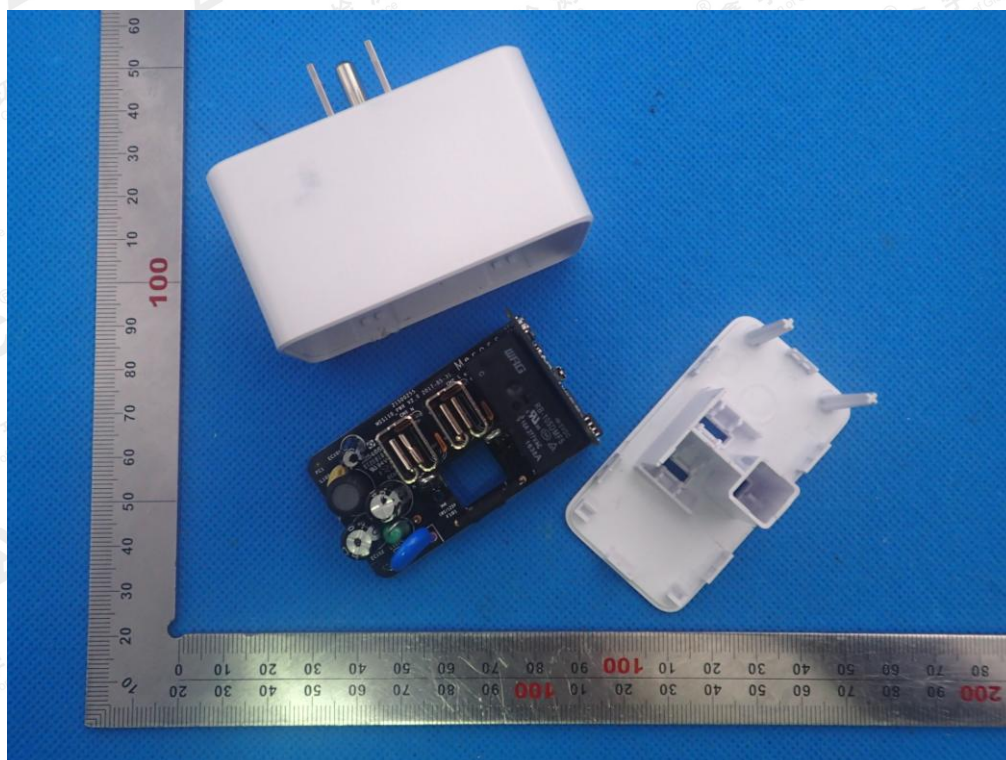


RIGHT VIEW OF EUT

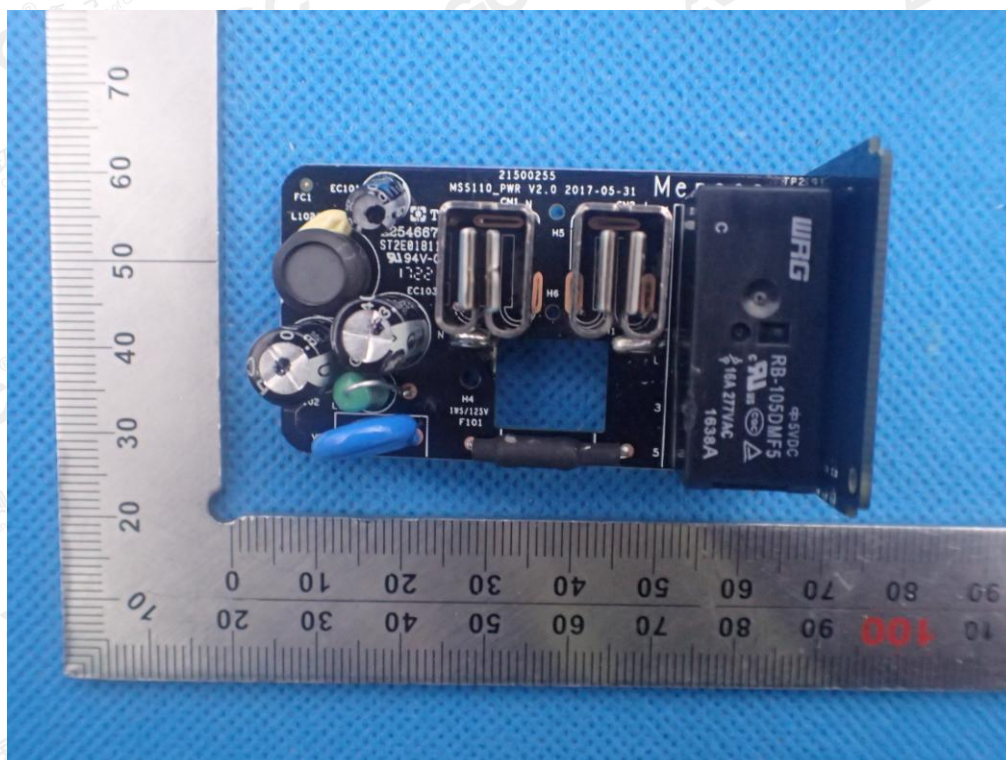


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OPEN VIEW OF EUT

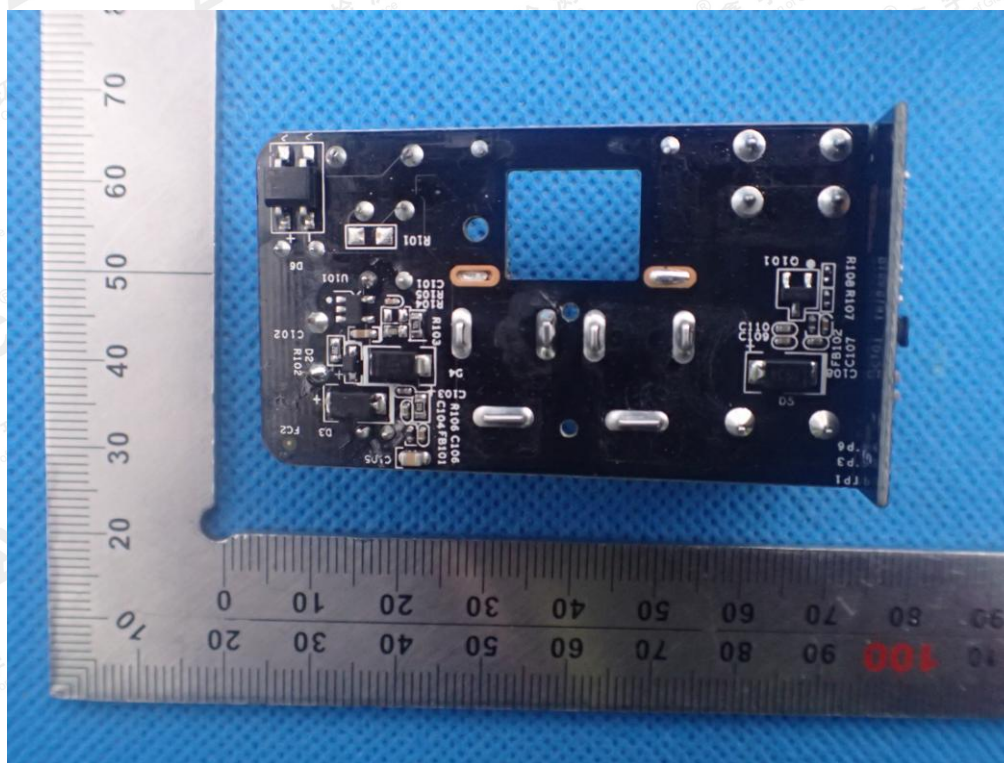


INTERNAL VIEW OF EUT-1

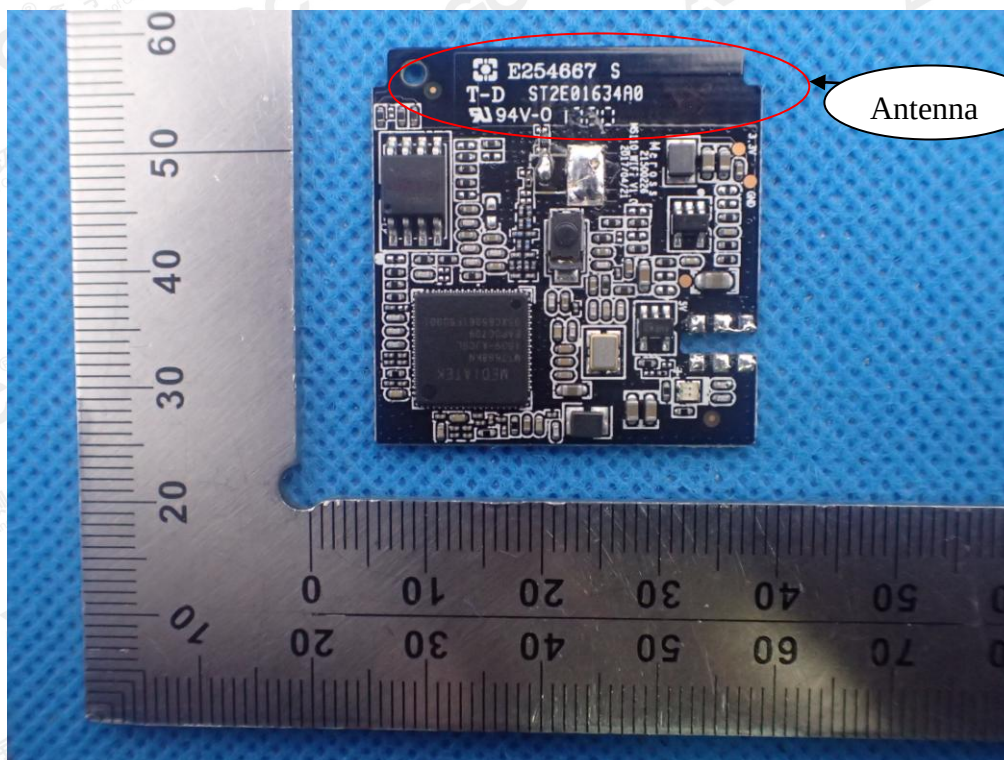


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INTERNAL VIEW OF EUT-2

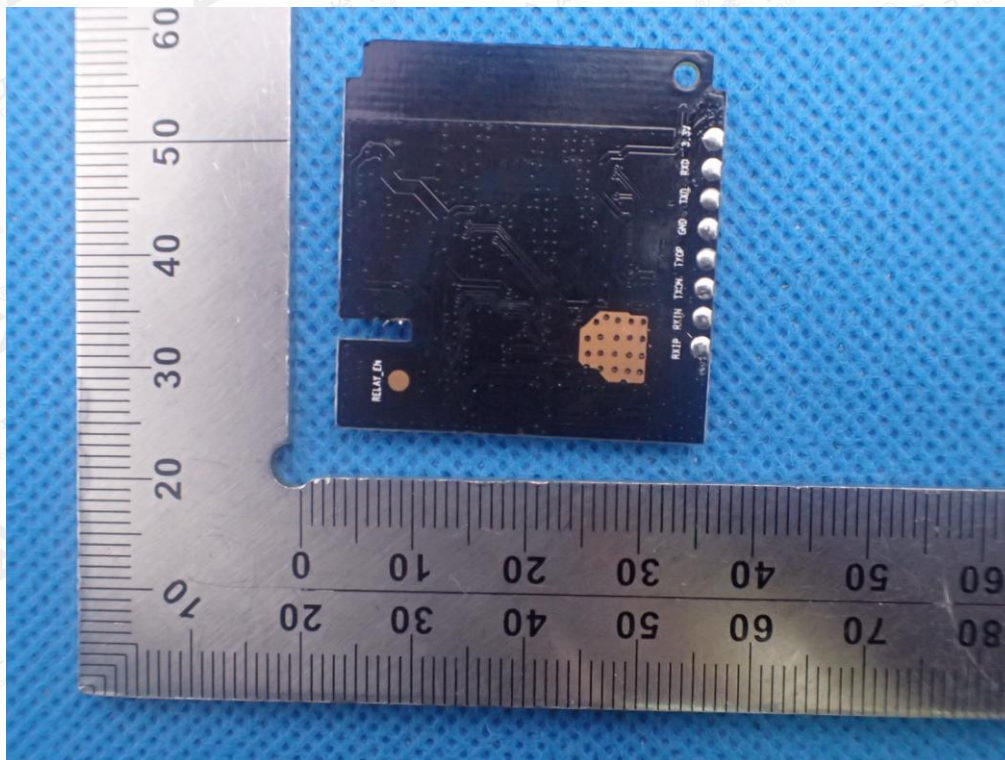


INTERNAL VIEW OF EUT-3



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INTERNAL VIEW OF EUT-4



---END OF REPORT---

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