Report No.SH16120037E02

FCC EMC TEST REPORT

Issued to

Shanghai MXCHIP Information Technology Co., Ltd

For

Embedded WiFi & Bluetooth module

Model Name	:	EMW3239-P, EMW3239-E
Trade Name	:	MXCHIP
Brand Name	:	MXCHIP
Standard	:	47 CFR Part 15 Subpart B
FCC ID	:	P53-EMW3239
Test date	:	Jan.4,2017 to Jan.5,2017
Issue date	:	Jan.9,2017

by

Shanghai Skylabs Co., Ltd.

Tested by Fang Min ***Approved by*** Gu Yingying ***Review by*** Menglan Gu

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DIRECTORY

Change History

Issue	Date	Reason for change
1.0	Jan.9,2017	First edition

1. General Information

1.1 Applicant

Shanghai MXCHIP Information Technology Co., Ltd
9th Floor,No.5,Lane2145 JinshaJiang Road,Putuo District,ShangHai,China (200333)

1.2 Manufacturer

Shanghai MXCHIP Information Technology Co., Ltd
9th Floor,No.5,Lane2145 JinshaJiang Road,Putuo District,ShangHai,China (200333)

1.3 Description of EUT

EUT Type	:	Embedded WiFi & Bluetooth module
Brand Name	:	MXCHIP
Trade Name	:	MXCHIP
Model Name	:	EMW3239-P, EMW3239-E
Hardware Version	:	EMW3239 V1.0
Software Version	:	EMW3239_1 v3.0 921600
Modulation Type	:	Bluetooth; WiFi

For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

2. Facilities and Accreditations

2.1 Test Facility

Shanghai Skylabs Co., Ltd. is a third party testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L6644. A 9*6*6(m) fully anechoic chamber was used for the radiated spurious emissions test.

2.2 Environmental Conditions

Ambient temperature: 15~35°C
Relative humidity: 30~60%
Atmosphere pressure: 86-106kPa

2.3 Measurement Uncertainty

The uncertainty is calculated using the methods suggested in the "Guide to the Expression of Uncertainty in Measurement" (GUM) published by ISO.
Uncertainty of Conducted Emission: ±1.76dB
Uncertainty of Radiated Emission: ±3.16dB

2.4 List of Equipments Used

Description	Manufacturer	Model	Serial No.	Cal.Date	Cal.Due
Shielding Room	CHENGYU	5m×4m×3m	CR	2016.04.11	2year
EMI Test Receiver	R&S	ESCI7	100787	2016.01.27	1year
Artificial Mains Network	TESEQ	NNB 51	33285	2016.01.27	1year
3m Semi-anechoic Chamber	CHENGYU	9.2×6.25×6.15m	SAR	2016.04.11	1year
Broadband Log Antenna	Schwarzbeck	VULB 9163	9163-561	2015.07.24	2year
Broadband Horn Antenna	Schwarzbeck	BBHA 9120 D	9120D-1033	2015.07.24	2year
Laptop	ACER	Aspire 4376ZG	LXPFY0C0049352912 21601	/	/
Laptop Adapter	LITEON	PA-1650-22	9801016502	/	/

NOTE:
Equipments listed above have been calibrated and are in the period of validation.

Supporting Accessories

Description	Manufacturer	Model	Serial No.
Test Evaluation board	MX	MiCOKit-3166/3239 V1.0	(n.a.)

2.5 Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 15 Subpart B

No.	Identity	Document Title
1	47 CFR Part 15	Radio Frequency Devices

Test detailed items/section required by FCC rules and results are as below:

No.	Section	Description	Result
1	15.107（a）	Conducted Emission	PASS
2	15.109（a）	Radiated Emission	PASS
3	ANSI C63.4-2014	Radiated Emission	PASS

3. Test Conditions Setting

3.1 Test Mode

Mode 1: Traffic operating USB data transfer Mode (EMW3239-E)
In this test mode, the EUT with a TransFlash Card embedded is connected with a PC via a special USB cable supplied by applicant. During the measurement, a communication link was established between the EUT and a System Simulator (SS), simultaneity, the date is transmitting between the PC and the TransFlash Card of the EUT

Mode 2: Traffic operating USB data transfer Mode (EMW3239-P)
In this test mode, the EUT with a TransFlash Card embedded is connected with a PC via a special USB cable supplied by applicant. During the measurement, a communication link was established between the EUT and a System Simulator (SS), simultaneity, the date is transmitting between the PC and the TransFlash Card of the EUT

NOTE:
All configurations and test modes are performed, only the worst case is recorded in this report.

4. Emission Tests

4.1 Conducted Emission Measurement

4.1.1 Limits of Conducted Emission:

According to FCC section 15.107, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150kHz to 30MHz shall not exceed the limits in the following table, as measured using a 50μH/50Ω line impedance stabilization network (LISN).

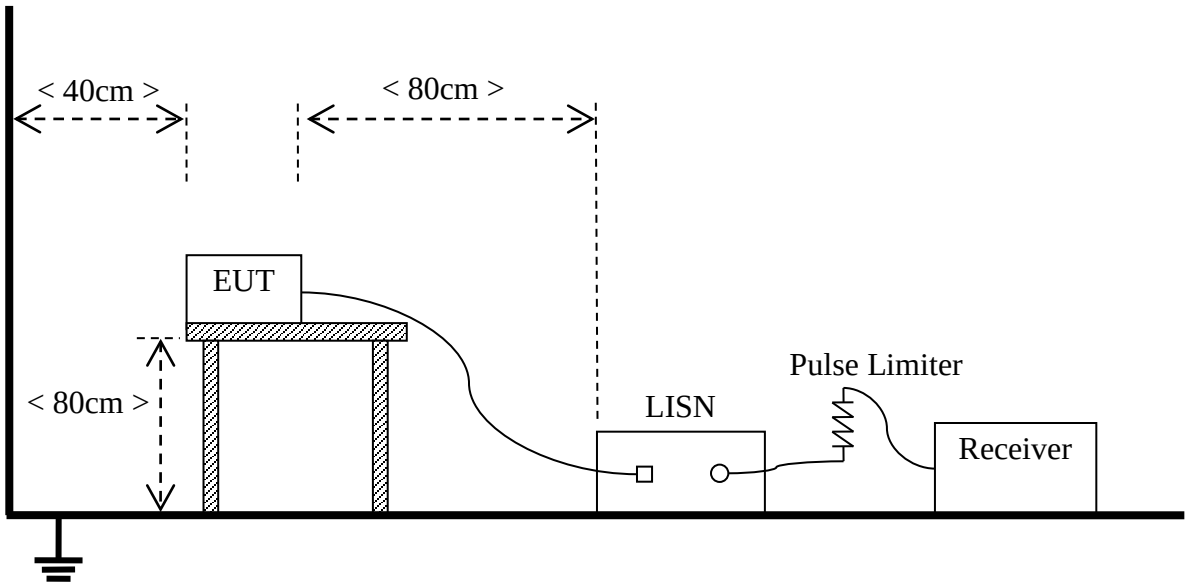
Frequency (MHz)	CLASS B (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

NOTE:
(1) The lower limit shall apply at the band edges.
(2) The limit decreases linearly with the logarithm of the frequency in the range 0.15 - 0.50MHz.

4.1.2 Test Procedure

The EUT and support equipment, if needed, were set up as per the test configuration to simulate typical 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 C63.4 (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.
All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
EUT connected to Class B Computer/Laptop via USB data cable and data exchange mode. The Computer/Laptop installed by US power 120V/60Hz, through a Line Impedance Stabilization Network (LISN), which was supplied power source and was grounded to the ground plane.
The test program of the EUT was started. Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.
The Receiver scanned from 150kHz to 30MHz for emissions in each of the test modes.
During the above scans, the emissions were maximized by cable manipulation.
The test mode(s) described in Item 3.1 were scanned during the preliminary test.
After the preliminary scan, we found the test mode described in Item 3.1 producing the highest emission level.
The worst configuration of EUT and cable of the above highest emission level were recorded for reference of the final test.

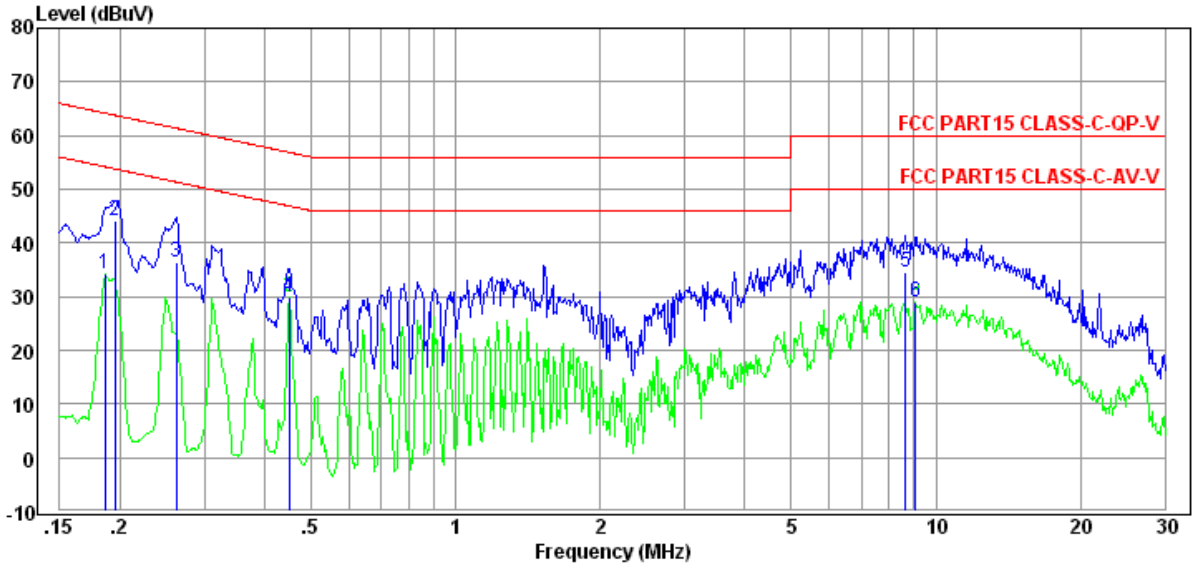
4.1.3 Test Setup



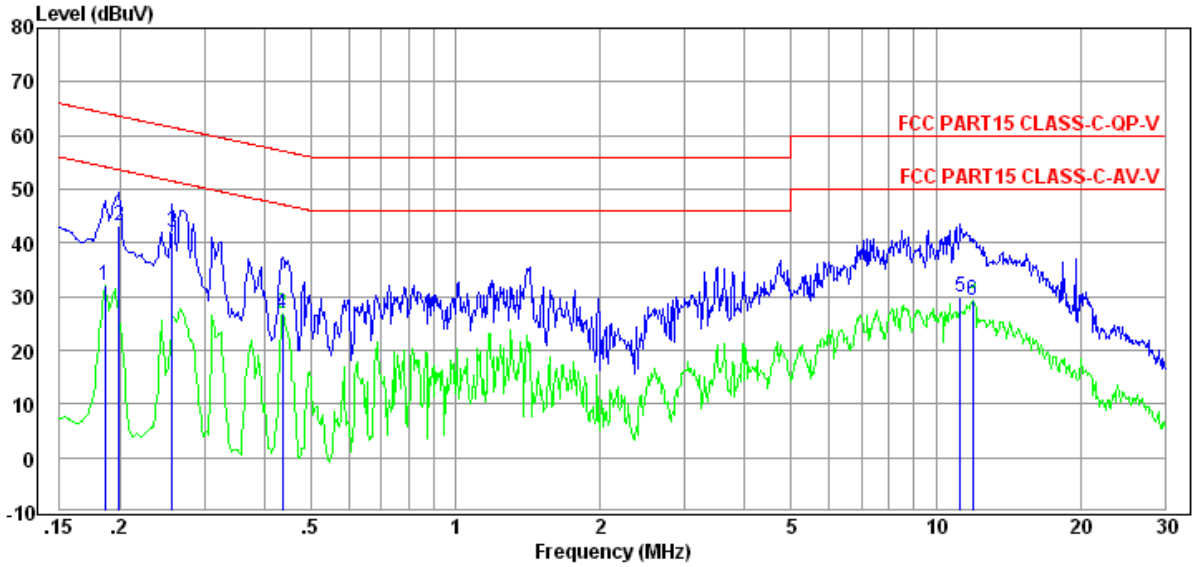
4.1.4 Test Result

Test Verdict Recorded for Suspicious Points: **Mode 1**

Frequency (MHz)	Result (dBuV)	Limit Line (dBuV)	Margin (dB)	Phase line	Detector
0.19	34.25	54.20	19.95	L	Average
0.20	44.05	63.80	19.75	L	QP
0.26	36.41	61.34	24.93	L	QP
0.45	29.76	46.85	17.09	L	Average
8.64	34.46	60.00	25.54	L	QP
9.06	29.08	50.00	20.92	L	Average
0.19	31.96	54.20	22.24	N	Average
0.20	43.18	63.62	20.44	N	QP
0.26	42.08	61.51	19.43	N	QP
0.44	26.91	47.11	20.20	N	Average
11.26	29.80	60.00	30.20	N	QP
11.93	29.16	50.00	20.84	N	Average



L Line

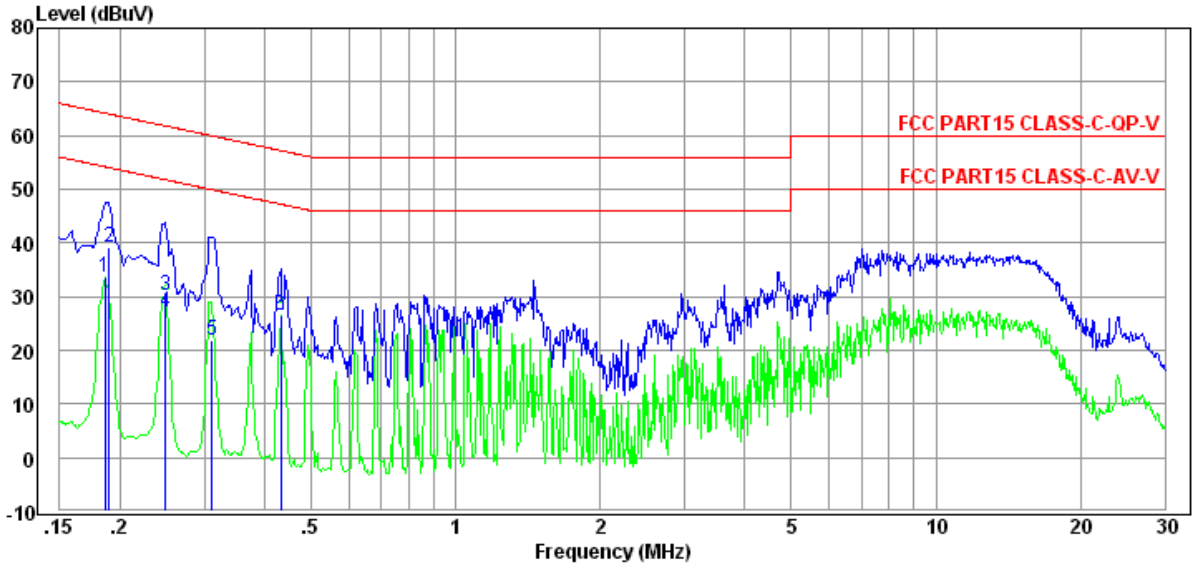


N Line

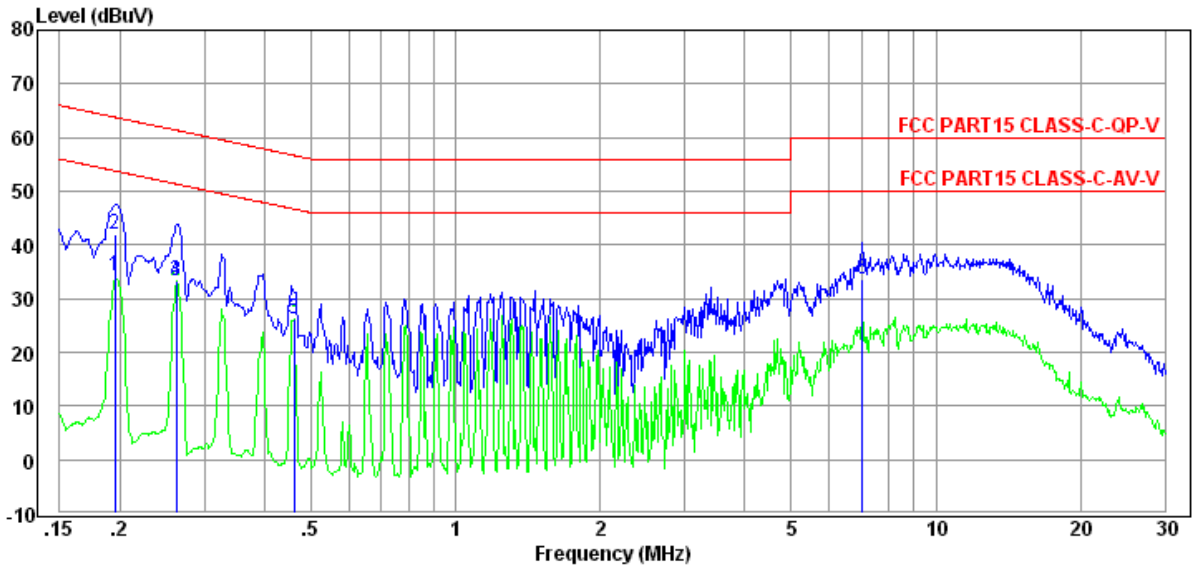
Test Verdict Recorded for Suspicious Points: **Mode 2**

Frequency (MHz)	Level (dBuV)	Limit Line (dBuV)	Margin (dB)	Phase line	Detector
0.19	33.53	54.20	20.67	L	Average
0.19	39.08	64.02	24.94	L	QP
0.25	30.15	51.78	21.63	L	Average
0.25	27.00	61.78	34.78	L	QP
0.31	21.93	59.93	38.00	L	QP
0.43	26.55	47.20	20.65	L	Average
0.20	34.11	53.80	19.69	N	Average

Frequency (MHz)	Level (dBuV)	Limit Line (dBuV)	Margin (dB)	Phase line	Detector
0.20	42.08	63.80	21.72	N	QP
0.26	33.40	51.34	17.94	N	Average
0.26	33.33	61.34	28.01	N	QP
0.46	26.17	46.67	20.50	N	Average
7.03	33.51	60.00	26.49	N	QP



L Line



N Line

4.2 Radiated Emission Measurement

4.2.1 Limits of Radiated Emission

According to FCC section 15.109, the field strength of radiated emissions from unintentional radiators at a certain distance shall not exceed the following values:

Frequency (MHz)	Field Strength CLASS B (at 3m)	
	μV/m	dBμV/m
30 - 88	100	40.0
88 - 216	150	43.5
216 - 960	200	46.0
Above 960	500	54.0

NOTE:
*(1) Field Strength (dBμV/m) = 20*log[Field Strength (μV/m)].*
(2) In the emission tables above, the tighter limit applies at the band edges.

Frequency range of radiated measurements (For unintentional radiators)

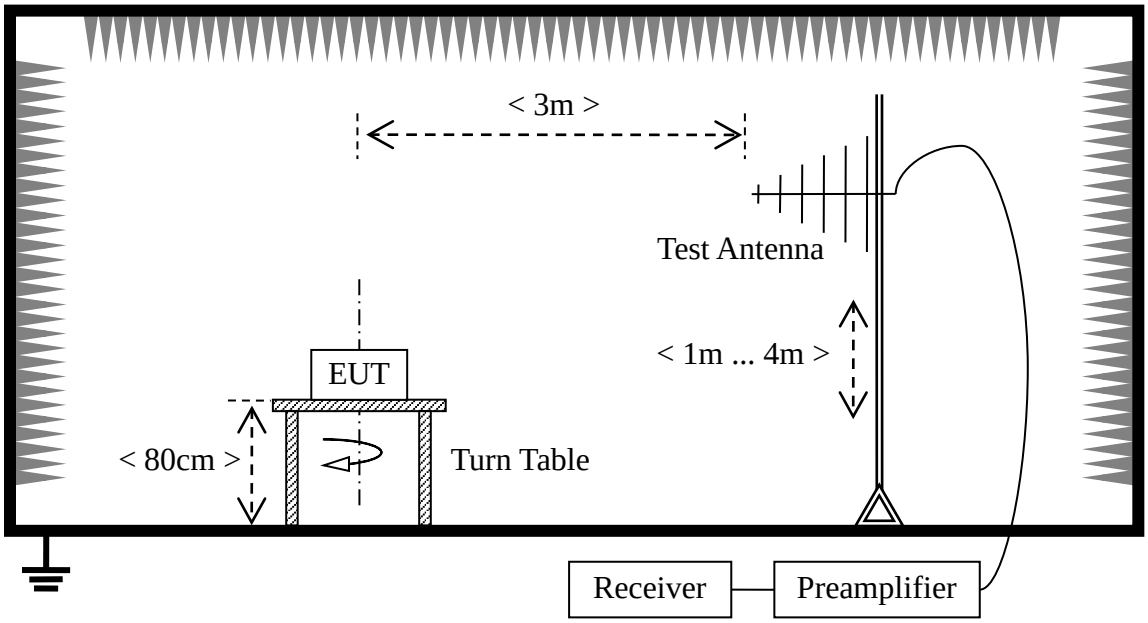
Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	**Upper frequency of measurement range (MHz)**
Below 1.705	30.
1.705-108	1000.
108-500	2000.
500-1000	5000.
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower.

Note:
The highest frequency is 2462MHz , So 5th harmonic is 12.31GHz, the frequency range is from 30MHz to 13GHz

4.2.2 Test Procedure

The equipment was set up as per the test configuration to simulate typical usage per the user's manual. When the EUT is a tabletop system, a wooden turntable with a height of 0.8 meters is used which is placed on the ground plane. 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.
Support equipment, if needed, was placed as per ANSI C63.4.
All I/O cables were positioned to simulate typical usage as per ANSI C63.4.
The EUT received AC power source from the outlet socket under the turntable. All support equipment power received from another socket under the turntable.
The antenna was placed at 3 or 10 meter away from the EUT as stated in ANSI C63.4. The antenna connected to the Spectrum Analyzer via a cable and at times a pre-amplifier would be used.
The Analyzer / Receiver quickly scanned from 30MHz to 40GHz. The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
The test mode(s) described in Item 3.1 were scanned during the preliminary test:
After the preliminary scan, we found the test mode described in Item 3.1 producing the highest emission level.
The worst configuration of EUT and cable of the above highest emission level were recorded for reference of the final test

4.2.3 Test Setup



Test Verdict Recorded for Suspicious Points: **Mode 1**

Test Verdict Recorded for Suspicious Points (30MHz~13GHz): Antenna Vertical

Frequency (MHz)	Result (dBuV)	Limit Line (dBuV)	Margin (dB)	Antenna Polarization	Result
47.83	24.89	40.00	15.11	Vertical	PASS
68.15	26.91	40.00	13.09	Vertical	PASS
95.43	23.59	43.50	19.91	Vertical	PASS
245.09	25.52	46.00	20.48	Vertical	PASS
422.06	25.90	46.00	20.10	Vertical	PASS
807.43	29.51	46.00	16.49	Vertical	PASS
1593.38	29.65	54.00	24.35	Vertical	PASS
1745.84	24.63	54.00	29.37	Vertical	PASS
2000.53	21.62	54.00	32.38	Vertical	PASS
4804.64	29.98	54.00	24.02	Vertical	PASS

Test Verdict Recorded for Suspicious Points (30MHz~13GHz): Antenna Horizontal

Frequency (MHz)	Level (dBuV)	Limit Line (dBuV)	Margin (dB)	Antenna Polarization	Result
48.84	18.91	40.00	21.09	Horizontal	PASS
102.72	24.49	43.50	19.01	Horizontal	PASS
125.01	21.68	43.50	21.82	Horizontal	PASS
245.09	30.52	46.00	15.48	Horizontal	PASS
400.43	25.33	46.00	20.67	Horizontal	PASS
709.18	28.96	46.00	17.04	Horizontal	PASS
1593.38	19.05	54.00	34.95	Horizontal	PASS
1748.97	24.50	54.00	29.50	Horizontal	PASS
2000.53	22.24	54.00	31.76	Horizontal	PASS
3193.32	21.74	54.00	32.26	Horizontal	PASS
5006.77	27.36	54.00	26.64	Horizontal	PASS

Test Verdict Recorded for Suspicious Points: **Mode 2**

Test Verdict Recorded for Suspicious Points (30MHz~13GHz): Antenna Vertical

Frequency (MHz)	Level (dBuV)	Limit Line (dBuV)	Margin (dB)	Antenna Polarization	Result
47.00	22.92	40.00	17.08	Vertical	PASS
67.44	23.77	40.00	16.23	Vertical	PASS
95.43	24.59	43.50	18.91	Vertical	PASS
245.09	23.52	46.00	22.48	Vertical	PASS
417.64	25.83	46.00	20.17	Vertical	PASS
744.87	29.74	46.00	16.26	Vertical	PASS
1273.65	17.75	54.00	36.25	Vertical	PASS
1438.68	17.86	54.00	36.14	Vertical	PASS
2308.86	20.06	54.00	33.94	Vertical	PASS
3176.20	22.05	54.00	31.95	Vertical	PASS
3895.98	23.81	54.00	30.19	Vertical	PASS

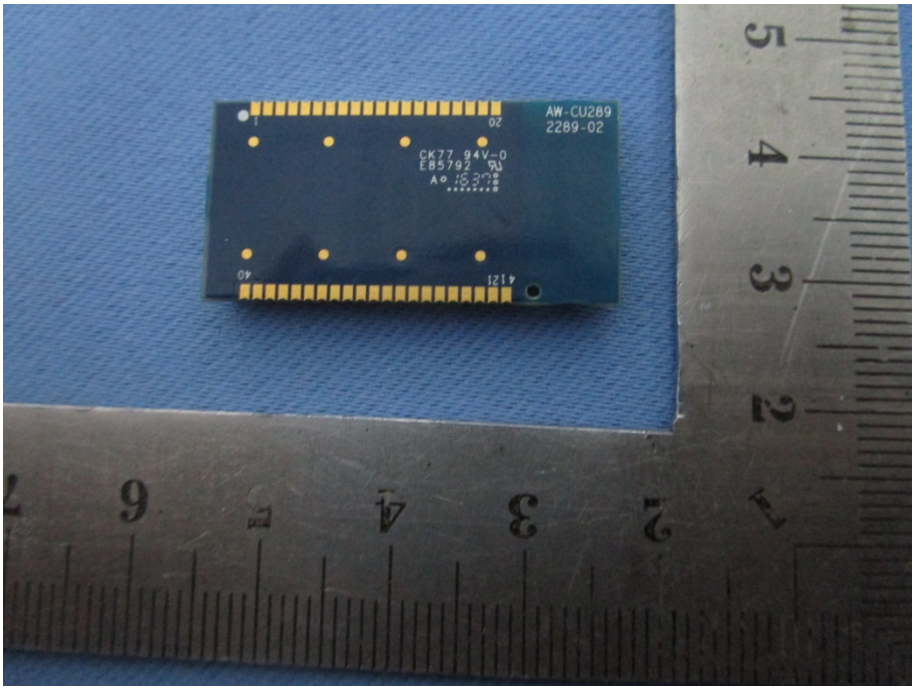
Test Verdict Recorded for Suspicious Points (30MHz~13GHz): Antenna Horizontal

Frequency (MHz)	Level (dBuV)	Limit Line (dBuV)	Margin (dB)	Antenna Polarization	Result
55.81	17.26	40.00	22.74	Horizontal	PASS
109.03	17.54	43.50	25.96	Horizontal	PASS
180.02	18.50	43.50	25.00	Horizontal	PASS
239.15	20.44	46.00	25.56	Horizontal	PASS
475.50	22.75	46.00	23.25	Horizontal	PASS
750.11	28.83	46.00	17.17	Horizontal	PASS
1198.38	19.28	50.00	30.72	Horizontal	PASS
1593.38	27.19	50.00	22.81	Horizontal	PASS
2207.71	24.61	50.00	25.39	Horizontal	PASS
2414.63	24.80	50.00	25.20	Horizontal	PASS
4392.92	24.37	54.00	29.63	Horizontal	PASS

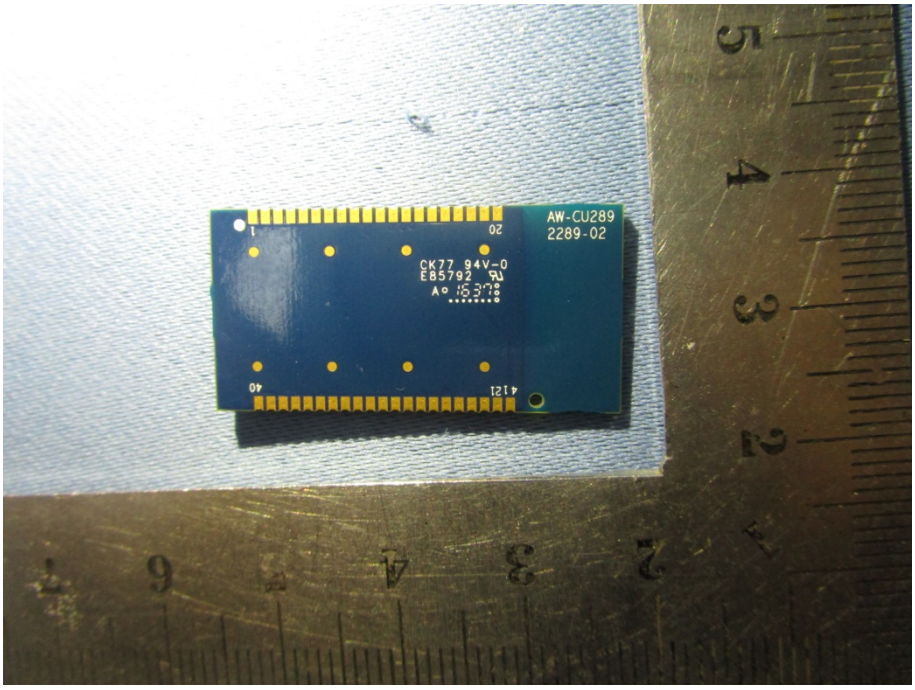
Annex A Photos of the EUT

EMW3239-E

EMW3239-P



EMW3239-E

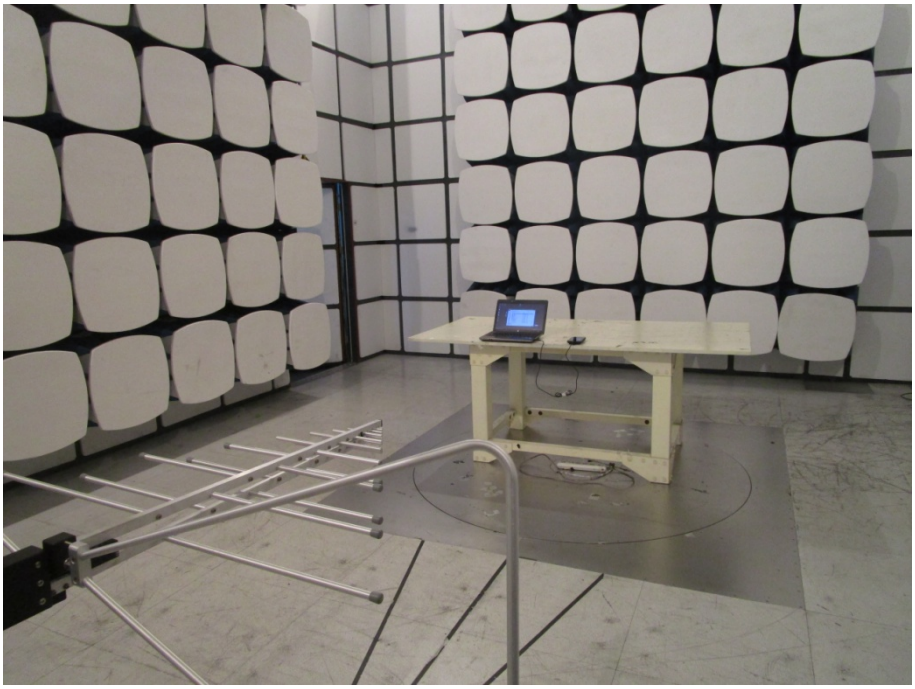


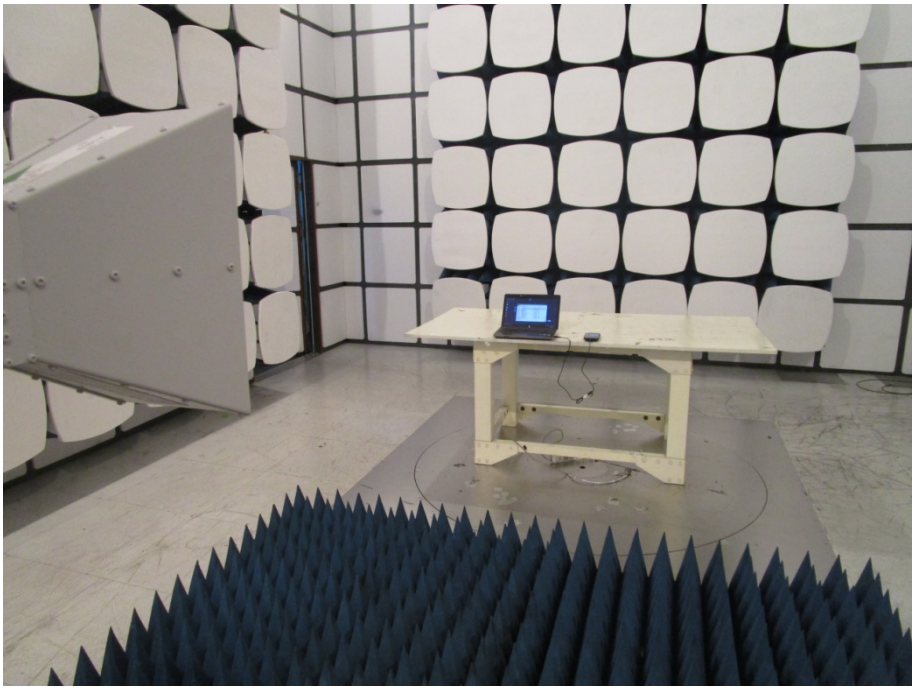
EMW3239-P

Annex B Photos of Test Setup

1. Conducted Emission

2. Radiated Emission





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