ETSI EN 301 489-1 V2.2.3 (2019-11)
ETSI EN 301 489-3 V2.2.0 (2021-11)
ETSI EN 301 489-17 V3.2.4 (2020-09)
ETSI EN 301 489-19 V2.2.0 (2020-09)
ETSI EN 301 489-52 V1.2.1 (2021-11)

TEST REPORT

For

Xiamen Milesight IoT Co., Ltd.

Building C09, Software Park Phase III, Xiamen 361024, Fujian, China

Tested Model: UG67-L04EU-868M
Multiple Models: UG67-L00E-868M, UG67-868M,UG67-L04EU-868M-H32, UG67-L00E-868M-H32, UG67-868M-H32, UG67-868M-H512,UG67-L04EU-868M-H512, UG67-L00E-868M-H512,UG67-868M-H8, UG67-L04EU-868M-H8,UG67-L00E-868M-H8

Report Type:	**Product Type:**
Amended Report	LoRaWAN Gateway

Report Number:	XMDN220516-20735E-02A1
Report Date:	2022-06-10
Reviewed By:	Rocky Xiao RF Engineer
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Dongguan) No.12, Pulong East 1st Road, Tangxia Town, Dongguan, Guangdong, China Tel: +86-769-86858888 Fax: +86-769-86858891 www.baclcorp.com.cn

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	RXM210219050-02	Original Report	2021-09-17
1	XMDN220516-20735E-02A1	Amended Report	2022-06-10

Note: This is the first amended report application which was based on the original report. The differences between them as following:

1. Changed the applicant's address to **Building C09, Software Park Phase III, Xiamen 361024, Fujian, China;**

2. Added EUT models: **UG67-868M-H512, UG67-L04EU-868M-H512, UG67-L00E-868M-H512, UG67-868M-H8, UG67-L04EU-868M-H8, UG67-L00E-868M-H8;**

3. Changed the trade name to Milesight;

4. Change the **silk screen** on the EUT appearance;

5. Upgraded the standard to **ETSI EN 301 489-3 V2.2.0 (2021-11), ETSI EN 301 489-52 V1.2.1 (2021-11).**

The change between the previous equipment and the current equipment is stated and guaranteed by the applicant. The difference between them will not affect the test results, we will keep the test results, test photos, but updated the related EUT photos.

Declarations

BACL is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with a triangle symbol "△". Customer model name, addresses, names, trademarks etc. are not considered data.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

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EXHIBITA – EUT PHOTOGRAPHS

DECLARATION LETTER

Xiamen Milesight IoT Co., Ltd.
Add:Building C09, Software Park Phase III, Xiamen 361024, Fujian, China
Tel: 0592-5023060
Fax: 0592-5023065
Emal: tongzl@ursalink.com

DECLARATION OF SIMILARITY

Date: 2022-5-9

To whom it may concern

We, Xiamen Milesight IoT Co., Ltd., hereby declare that the product: LoRaWAN Gateway, model:UG67-L00E-868M,UG67-868M ,UG67-L04EU-868M-H32,UG67-L00E-868M-H32, UG67-868M-H32,UG67-868M-H512,UG67-L04EU-868M-H512,UG67-L00E-868M-H512, UG67-868M-H8,UG67-L04EU-868M-H8,UG67-L00E-868M-H8 is electrically identical with the model: UG67-L04EU-868M which was tested by BACL with the same electromagnetic emissions and electromagnetic compatibility characteristics.
A description of the differences between the tested model and those that are declared similar are as follows:
The models have same software.
All the above models share one PCB board. The only difference between models is that some function devices paste or not paste. The below table show differences:
√: paste --: not paste

	LTE module	WiFi	GPS	POE	LoRa	External antenna	Other differences
UG67-L04EU-868M	√ (EC25-EUX)	√	√	√	√ (868)	√	model names
UG67-L00E-868M	√ (EC25-EUX)	√	√	√	√ (868)	√	
UG67-868M	--	√	√	√	√ (868)	√	
UG67-L04EU-868M-H32	√ (EC25-EUX)	√	--	√	√ (868)	√	model names
UG67-L00E-868M-H32	√ (EC25-EUX)	√	--	√	√ (868)	√	
UG67-868M-H32	--	√	--	√	√ (868)	√	
UG67-868M-H512	--	√	--	√	√ (868)	√	
UG67-L04EU-868M-H512	√ (EC25-EUX)	√	--	√	√ (868)	√	model names
UG67-L00E-868M-H512	√ (EC25-EUX)	√	--	√	√ (868)	√	
UG67-868M-H8	--	√	--	√	√ (868)	√	
UG67-L04EU-868M-H8	√ (EC25-EUX)	√	--	√	√ (868)	√	model names

UG67-L00E-868M-H8	√ (EC25-EUX)	√	--	√	√ (868)	√	

Please contact me should there be need for any additional clarification or information.
Best Regards,
Signature: zhenlong Tong

Printed Name: Zhenlong Tong
Title: Manager

BELOW IS THE ORIGINAL REPORT

ETSI EN 301 489-1 V2.2.3 (2019-11)
ETSI EN 301 489-3 V2.1.2 (2021-03)
ETSI EN 301 489-17 V3.2.4 (2020-09)
ETSI EN 301 489-19 V2.2.0 (2020-09)
ETSI EN 301 489-52 V1.1.2 (2020-12)

TEST REPORT

For

Xiamen Milesight IoT Co., Ltd.

4/F,NO. 63-2 Wanghai Road, 2nd Software Park,Xiamen ,China

Tested Model: UG67-L04EU-868M
Multiple Models: UG67-L00E-868M, UG67-868M, UG67-L04EU-868M-H32, UG67-L00E-868M-H32, UG67-868M-H32

Report Type:	**Product Type:**
Original Report	LoRaWAN Gateway

Report Number:	RXM210219050-02
Report Date:	2021-09-17
Reviewed By:	Rocky Xiao RF Engineer
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Dongguan) No.12, Pulong East 1st Road, Tangxia Town, Dongguan, Guangdong, China Tel: +86-769-86858888 Fax: +86-769-86858891 www.baclcorp.com.cn

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

EUT Name:	LoRaWAN Gateway
Test Model:	UG67-L04EU-868M
Multiple Models:	UG67-L00E-868M, UG67-868M, UG67-L04EU-868M-H32,UG67-L00E-868M-H32, UG67-868M-H32
Model Difference:	Refer to Dos
Rated Input Voltage:	DC 56V from POE
Serial Number:	RXM210219050-RF-S1
EUT Received Date:	2021.02.20
EUT Received Status:	Good

Objective

This report is prepared on behalf of ***Xiamen Milesight IoT Co., Ltd.*** in accordance with

ETSI EN 301 489-1 V2.2.3 (2019-11)ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard for ElectroMagnetic Compatibility;

ETSI EN 301 489-3 V2.1.2 (2021-03) ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 3: Specific conditions for Short Range Devices (SRD) operating on frequencies between 9 kHz and 246 GHz; Harmonised Standard for ElectroMagnetic Compatibility

ETSI EN 301 489-17 V3.2.4 (2020-09) ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 17: Specific conditions for Broadband Data Transmission Systems

ETSI EN 301 489-19 V2.2.0 (2020-09)ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 19: Specific conditions for Receive Only Mobile Earth Stations (ROMES) operating in the 1,5 GHz band providing data communications and GNSS receivers operating in the RNSS band providing positioning, navigation, and timing data; Harmonised Standard for ElectroMagnetic Compatibility;

ETSI EN 301 489-52 V1.1.2 (2020-12) ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 52: Specific conditions for Cellular Communication Mobile and portable (UE) radio and ancillary equipment.

The objective is to determine the compliance of EUT with: ETSI EN 301 489-1 V2.2.3 (2019-11), ETSI EN 301 489-3 V2.1.2 (2021-03), ETSI EN 301 489-17 V3.2.4 (2020-09), ETSI EN 301 489-19 V2.2.0 (2020-09), ETSI EN 301 489-52 V1.1.2 (2020-12).

Test Methodology

All measurements contained in this report were conducted with ETSI EN 301 489-1 V2.2.3 (2019-11)ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard for ElectroMagnetic Compatibility.

Declarations

BACL is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with a triangle symbol "▲". Customer model name, addresses, names, trademarks etc. are not considered data.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

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Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

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This report may contain data that are not covered by the accreditation scope and shall be marked with an asterisk "★".

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in a typical fashion (as normally used by a typical user).
Test Mode 1: GPRS/EGPRS communication (working and monitoring with CMU200)
Test Mode 2: WCDMA/ HSPA communication (working and monitoring with CMU200)
Test Mode 3: LTE communication (working and monitoring with CMW500)
Test Mode 4: WIFI link (working and monitoring with CMW500)
Test Mode 5: Lora working (monitoring with FSU26)
Test Mode 6: GPS receiving (working with N5182B and monitoring with CCD camera and FSU26)

Equipment Modifications

No modification was made to the EUT.

EUT Exercise Software

No software was used.

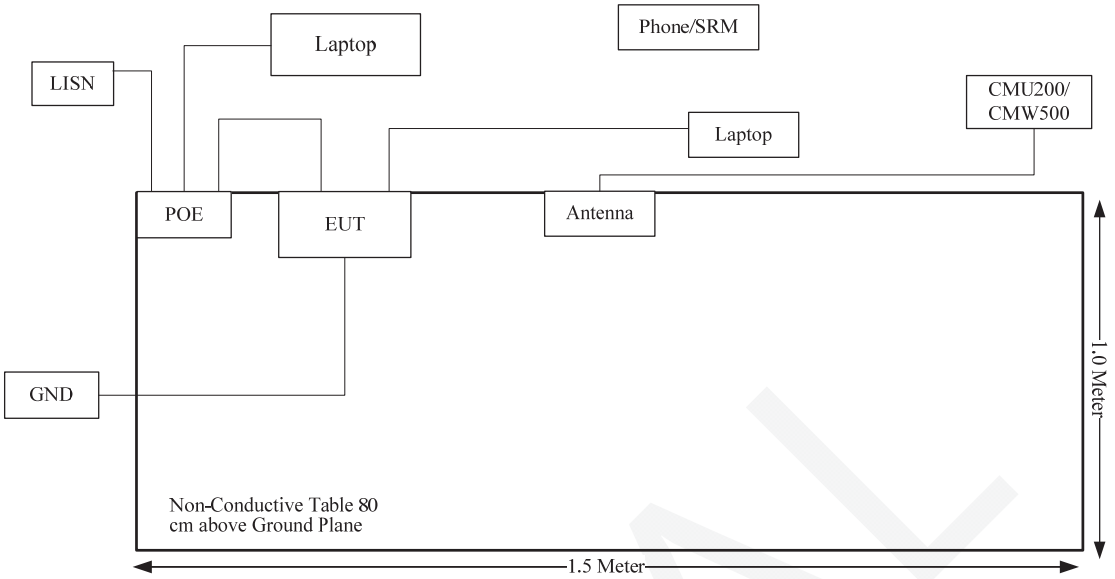
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Dell	Laptop	E6410	586N3Q1
R&S	Universal Radio Communication Tester	CMU200	110 822
R&S	Wideband Radio Communication Tester	CMW500	149216
Prestigio Plaza	Laptop	PSB141C05CGP_DG	CB04060626
Badge	Messenger(Lora)	SRM	190813006

Support Cable List and Details

Cable Description	Shielding Cable	Ferrite Core	Length (m)	From Port	To
AC Line	No	No	1.5	AC main	POE
RJ45	No	No	1.2	POE	EUT
RJ45	No	No	10	POE	Laptop
Type C Cable (and extend cable)	No	No	5	EUT	Laptop

Block Diagram of Test Setup



Test Equipment List

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted emission					
R&S	LISN	ENV 216	101614	2020-09-12	2021-09-12
TESEQ	ISN	T800	34379	2020-09-12	2021-09-12
R&S	EMI Test Receiver	ESCI	101121	2020-07-07	2021-07-07
MICRO-COAX	Coaxial Cable	C-NJNJ-50	C-0200-01	2020-09-05	2021-09-05
R&S	Test Software	EMC32	Version 9.10.00	N/A	N/A
Radiated emissions below 1GHz					
Sunol Sciences	Antenna	JB3	A060611-2	2020-08-25	2023-08-25
R&S	EMI Test Receiver	ESCI	100224	2020-09-12	2021-09-12
Unknown	Coaxial Cable	C-NJNJ-50	C-1000-01	2020-09-05	2021-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-02	2020-09-05	2021-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0530-01	2020-09-24	2021-09-24
Sonoma	Amplifier	310N	185914	2020-10-13	2021-10-13
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A
Radiated emissions above 1GHz					
ETS-Lindgren	Horn Antenna	3115	000 527 35	2018-10-12	2021-10-12
Agilent	Spectrum Analyzer	E4440A	MY44303352	2021-04-25	2022-04-24
Unknown	Coaxial Cable	C-SJSJ-50	C-0800-01	2020-09-05	2021-09-05
Mini-Circuit	Amplifier	ZVA-213-S+	54201245	2020-09-05	2021-09-05
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A
E-Microwave	Band-stop Filters	OBSF-2400-2483.5-S	OE01601525	2021-06-16	2022-06-15
EFT & Surge & Dips					
EM TEST	Ultra Compact Generator	UCS 500N5	P1406130994	2021-07-22	2022-07-21
EM TEST	Autotransformer	MV2616	P1450144859	N/A	N/A
EM TEST	CDN	CNV508 S1	311137	2021-01-26	2022-01-25
EM TEST	EFT Clamp	N/A	300886	2021-07-22	2022-07-21
Flicker & Harmonic					
ELGAR	AC Power Source	1751SX	5611	2020-09-23	2021-09-23
EM TEST	Harmonic & Flicker Analyzer	DPA 500	303278	2020-09-17	2021-09-16
ESD					
HAEFELY	Electrostatic Discharge Simulator	ONYX	180786	2020-09-16	2021-09-16
CS					
HP	Signal Generator	8648A	3246A00831	2020-09-12	2021-09-12
R&S	Power Amplifier	15A250	12934	N/A	N/A
Werlatone	Dual Directional Coupler	C5091-10	113192	2021-02-09	2022-02-08
HP	Power Meter	HP EPM-441A	GB37481494	2020-09-12	2021-09-12
Agilent	8482A Power sensor	8482A	US37296108	2020-09-12	2021-09-12
NARDA	Attenuator	769-6	2754	N/A	N/A
COM-POWER	CDN	M325E	521064	2020-09-12	2021-09-12
COM-POWER	CDN	T8E	581607	2019-05-09	2022-05-09

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
RS					
AR	Antenna	ATL80M1G	0351400	N/A	N/A
AR	Antenna	ATT700M12G	0349410	N/A	N/A
HP	Signal Generator	8665B	3438a00584	2020-09-12	2021-09-12
AR	Power Amplifier	500W1000C	0353561	N/A	N/A
AR	Power Amplifier	60S1G6	0348711	N/A	N/A
PASTERNACK	Dual Directional Coupler	PE2239-30	1711	2021-07-15	2022-07-14
Agilent	EPM Series Power Meter	E4419B	MY45103907	2020-09-12	2021-09-12
Agilent	E-Series Avg Power Sensor	E9301A	MY41497625	2020-09-12	2021-09-12
Agilent	E-Series Avg Power Sensor	E9301A	MY41497628	2020-09-12	2021-09-12

* Statement of Traceability: Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

Environmental Conditions

Test Item:	Conducted emission	Radiated emissions below 1GHz	Radiated emissions above 1GHz	EMS & Flicker
Temperature:	26.2℃	21.4℃	27.8℃	25.2~27.3 ℃
Relative Humidity:	67%	53%	40%	52~65 %
ATM Pressure:	100.1kPa	100.7kPa	100.1kPa	100.4 kPa
Tester:	Mia Huang	Burt Hu	Wade Huang	Mia Huang
Test Date:	2021.06.15	2021.07.02	2021.08.13	2021.09.09

Note: The Relative Humidity in ESD site is 52%.

SUMMARY OF TEST RESULTS

SN	Rule and Clause	Description of Test	Test Result
1	EN 301 489 Clause 8.2	Enclosure of ancillary equipment measured on a stand alone basis	Compliance
2	EN 301 489 Clause 8.3	DC power input/output ports	Not applicable
3	EN 301 489 Clause 8.4	AC mains power input/output ports	Compliance
4	EN 301 489 Clause 8.5	Harmonic current emissions (AC mains input port)	Not applicable
5	EN 301 489 Clause 8.6	Voltage fluctuations and flicker (AC mains input port)	Compliance
6	EN 301 489 Clause 8.7	Wired network ports	Compliance
7	EN 301 489 Clause 9.2	Radio frequency electromagnetic fields (80 MHz to 6 000 MHz)	Compliance
8	EN 301 489 Clause 9.3	Electrostatic discharges	Compliance
9	EN 301 489 Clause 9.4	Fast transients, common mode	Compliance
10	EN 301 489 Clause 9.5	Radio frequency, common mode	Compliance
11	EN 301 489 Clause 9.6	Transients and surges in the vehicular environment	Not applicable
12	EN 301 489 Clause 9.7	Voltage dips and short interruptions	Compliance
13	EN 301 489 Clause 9.8	Surges	Compliance

Note:
Not Applicable: Please refer to Applicability overview tables in sections 7.1 and 7.2 of EN 301 489-1 requirements for Radio and ancillary equipment.

1 – ENCLOSURE OF ANCILLARY EQUIPMENT MEASURED ON A STAND ALONE BASIS

Measurement Uncertainty

Compliance or non- compliance with a disturbance limit shall be determined in the following manner：

If U_{lab} is less than or equal to U_{cispr} of Table 1, then:
– compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
– non - compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.
If U_{lab} is greater than U_{cispr} of Table 1, then:
– compliance is deemed to occur if no measured disturbance level, increased by ($U_{lab} - U_{cispr}$), exceeds the disturbance limit;
– non - compliance is deemed to occur if any measured disturbance level, increased by ($U_{lab} - U_{cispr}$), exceeds the disturbance limit.

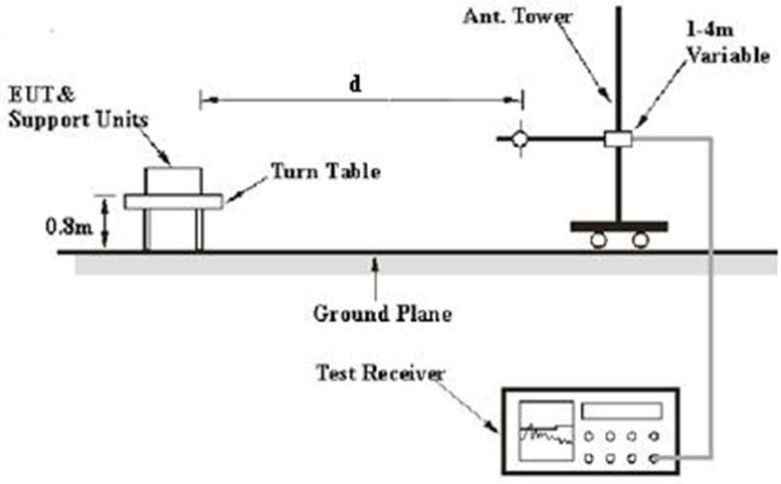
Based on CISPR 16-4-2: 2011, measurement uncertainty of radiated emission at a distance of 10m at Bay Area Compliance Laboratories Corp. (Dongguan) is:30M~200MHz: 4.55 dB for Horizontal, 4.57 dB for Vertical; 200M~1GHz: 4.66 dB for Horizontal, 4.56 dB for Vertical; measurement uncertainty of radiated emission at a distance of 3m at Bay Area Compliance Laboratories Corp. (Dongguan) is:30M~200MHz: 4.58 dB for Horizontal, 4.59 dB for Vertical; 200M~1GHz: 4.83 dB for Horizontal, 5.85 dB for Vertical; 1G~6GHz: 4.45 dB, 6G~18GHz: 5.23 dB

Table 1 – Values of U_{cispr}

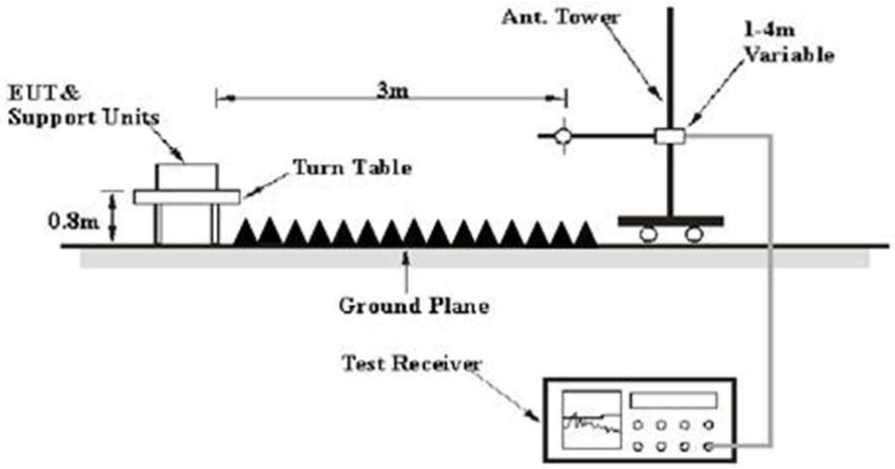
Measurement	U_{cispr}
Radiated disturbance (electric field strength at an OATS or in a SAC)(30 MHz to 1000 MHz)	6.3 dB
Radiated disturbance (electric field strength in a FAR)(1 GHz to 6 GHz)	5.2 dB
Radiated disturbance (electric field strength in a FAR)(6 GHz to 18 GHz)	5.5 dB

Test System Setup

Below 1GHz:



Above 1GHz:



The radiated emission tests below 1GHz were performed in 3 meters, above 1GHz were performed in the 3 meters. The specification used was EN 55032 Class A limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40cm long in the middle. The spacing between the peripherals was 10cm.

EMI Test Receiver Setup

The system was investigated from 30 MHz to 6 GHz.

During the radiated emission test, the EMI test receiver Setup was set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Detector
30MHz – 1000 MHz	120 kHz	300 kHz	120kHz	QP
Above 1 GHz	1MHz	3 MHz	/	Peak
	1MHz	10Hz	/	Peak

If the maximized peak measured value complies with under the QP/Average limit more than 6dB, then it is unnecessary to perform an QP/Average measurement.

Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All data was recorded in the Quasi-peak detection mode from 30MHz to 1GHz, Peak and average detection mode above 1GHz.

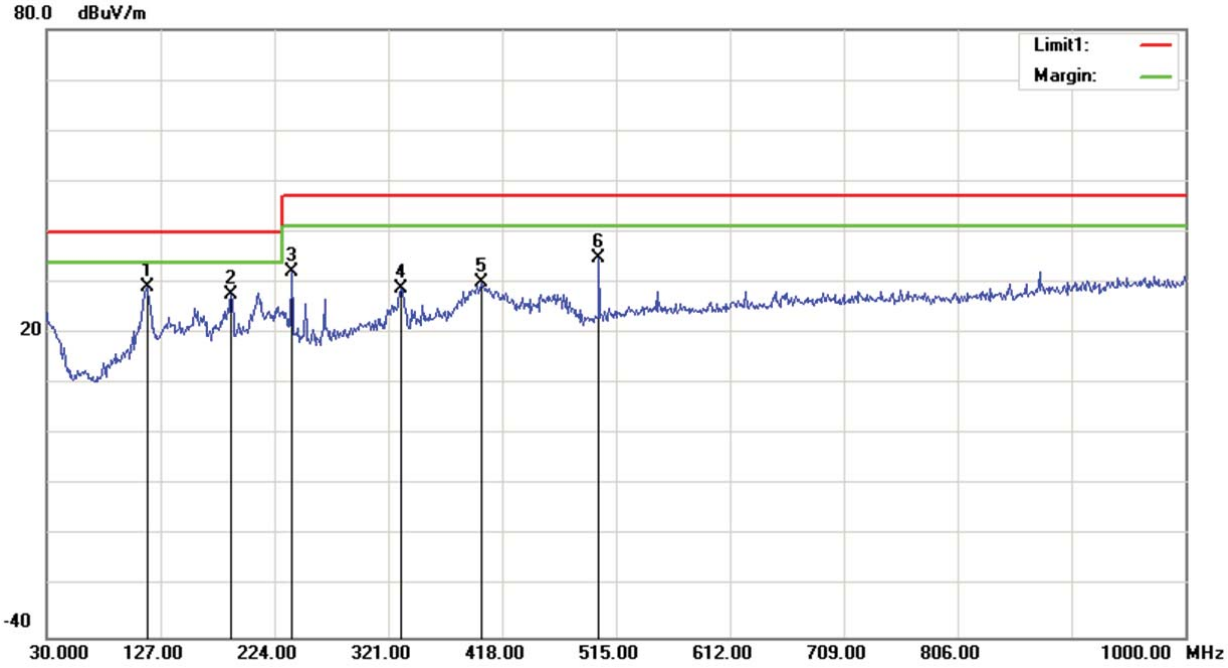
Corrected Amplitude & Margin Calculation

The basic equation is as follows: Result = Meter Reading+ Corrected
Note:
Corrected = Antenna Factor + Cable Loss - Amplifier Gain, or
Corrected = Antenna Factor + Cable Loss + Insertion loss of attenuator - Amplifier Gain
The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows: Margin = Limit–Result

Test Data

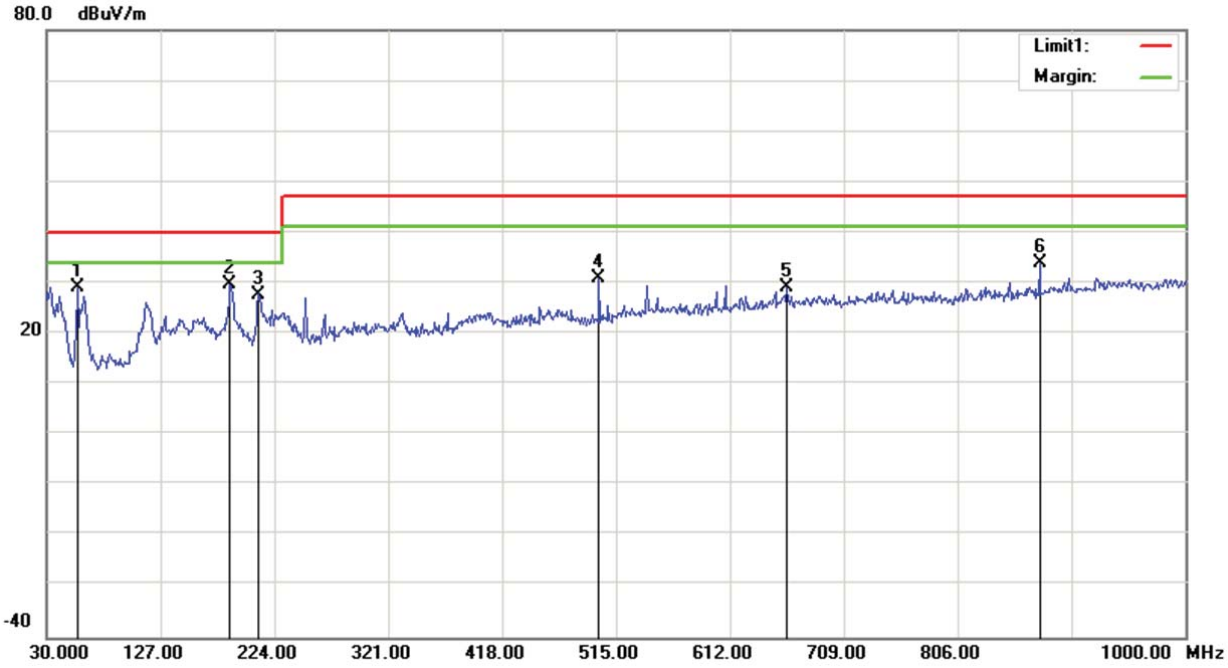
Please refer to following table and plots:

Condition:	EN 301 489 Class B 3m Radiation	**Polarization:**	Horizontal
Test Mode:	Test Mode 4_Worst case	**Distance:**	3m
Note:			



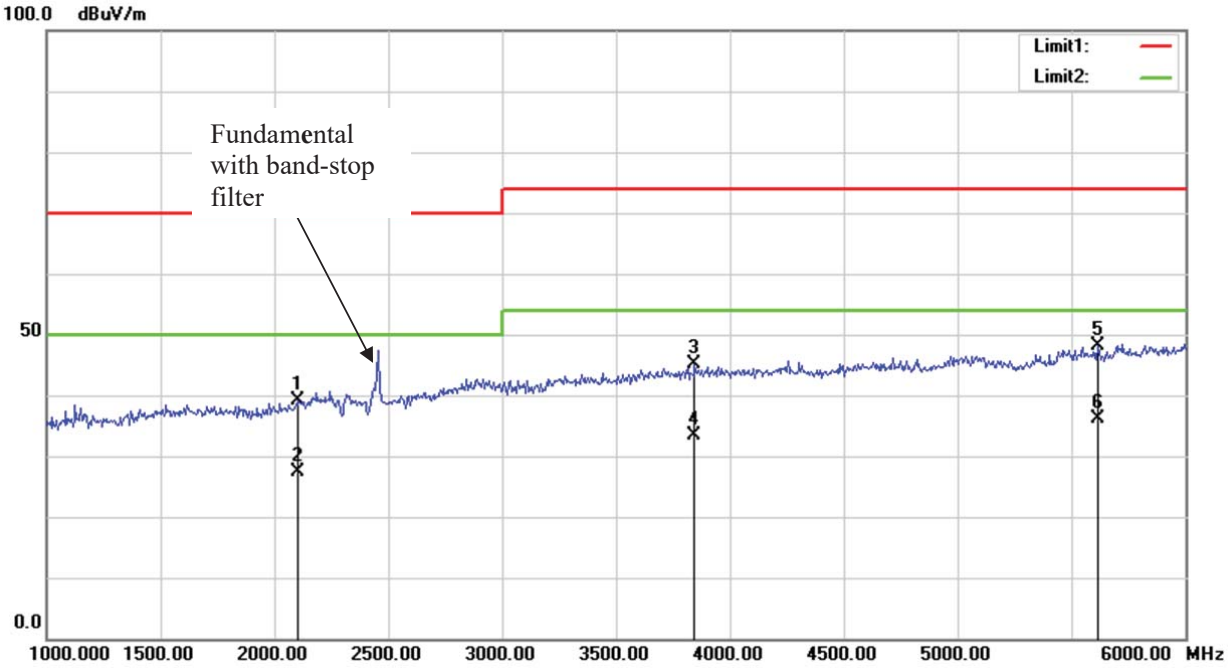
No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	115.3600	41.92	peak	-12.76	29.16	40.00	10.84
2	187.1400	37.98	peak	-10.32	27.66	40.00	12.34
3	238.5500	42.15	peak	-10.06	32.09	47.00	14.91
4	331.6700	35.88	peak	-7.00	28.88	47.00	18.12
5	400.5400	35.18	peak	-5.23	29.95	47.00	17.05
6	500.4500	38.22	peak	-3.45	34.77	47.00	12.23

Condition:	EN 301 489 Class B 3m Radiation	**Polarization:**	Vertical
Test Mode:	Test Mode 4_Worst case	**Distance:**	3m
Note:			



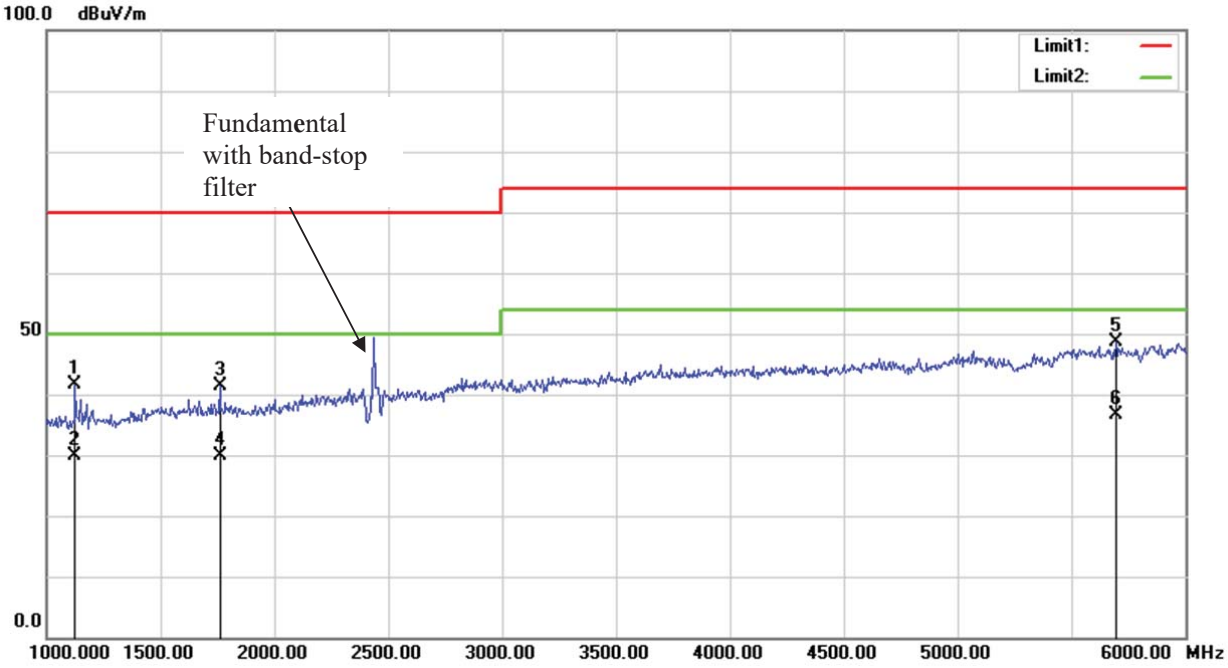
No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	56.1900	45.58	peak	-16.32	29.26	40.00	10.74
2	186.1700	39.92	peak	-10.19	29.73	40.00	10.27
3	210.4200	39.02	peak	-11.22	27.80	40.00	12.20
4	500.4500	34.32	peak	-3.45	30.87	47.00	16.13
5	660.5000	29.44	peak	-0.22	29.22	47.00	17.78
6	875.8400	31.33	peak	2.67	34.00	47.00	13.00

Condition: EN 301 489 Class B 3m Radiation **Polarization:** Horizontal
Test Mode: Test Mode 4_Worst case **Distance:** 3m
Note:



No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	2100.000	35.38	peak	3.82	39.20	70.00	30.80
2	2100.000	23.64	AVG	3.82	27.46	50.00	22.54
3	3845.000	36.25	peak	8.80	45.05	74.00	28.95
4	3845.000	24.64	AVG	8.80	33.44	54.00	20.56
5	5617.500	35.45	peak	12.63	48.08	74.00	25.92
6	5617.500	23.61	AVG	12.63	36.24	54.00	17.76

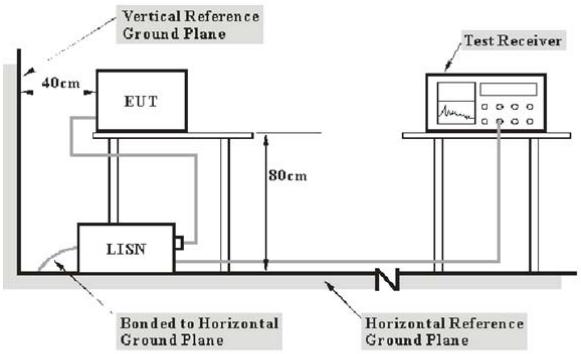
Condition:	EN 301 489 Class B 3m Radiation	**Polarization:**	Vertical
Test Mode:	Test Mode 4_Worst case	**Distance:**	3m
Note:			



No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	1125.000	42.23	peak	-0.55	41.68	70.00	28.32
2	1125.000	30.54	AVG	-0.55	29.99	50.00	20.01
3	1760.000	39.27	peak	2.14	41.41	70.00	28.59
4	1760.000	27.64	AVG	2.14	29.78	50.00	20.22
5	5697.500	35.68	peak	12.96	48.64	74.00	25.36
6	5697.500	23.56	AVG	12.96	36.52	54.00	17.48

3 - AC MAINS POWER INPUT/OUTPUT PORTS

Test System Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per EN 301 489-1 measurement procedures. The specification used was with the EN 301 489-1 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40cm long in the middle.

The spacing between the peripherals was 10cm.

The adapter was connected to AC230V/50Hz power source.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

Test Procedure

During the conducted emissions test, the adapter was connected to the main outlet of the first LISN and the other support equipments were connected to the outlet of the second LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

Corrected Amplitude & Margin Calculation

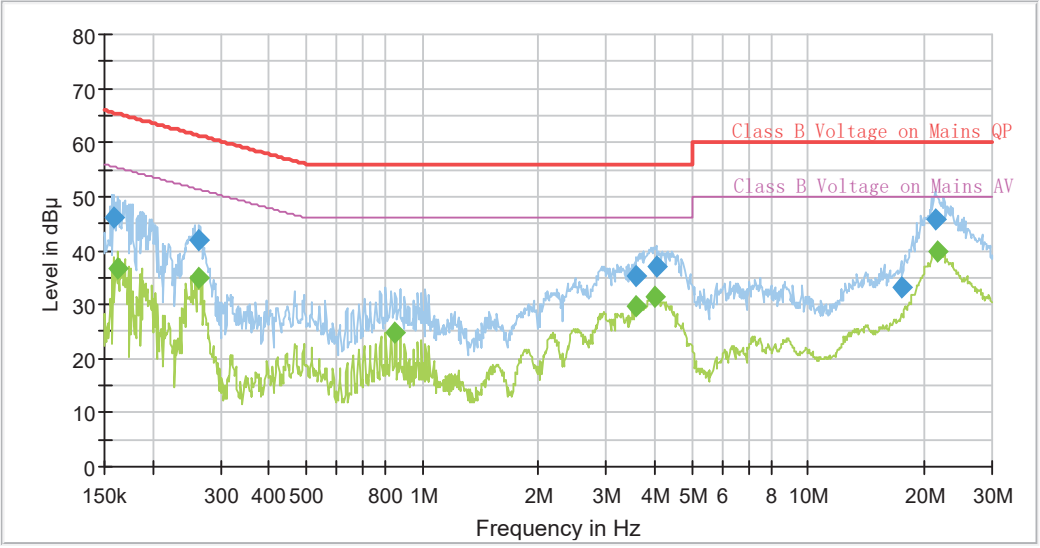
The basic equation is as follows:Result (QuasiPeak or Average) = Meter Reading + Corr.

Note:
Corr. = Cable loss + Factor of coupling device
The "**Margin**" column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows: Margin = Limit –Result

Test Data

Please refer to following table and plots:

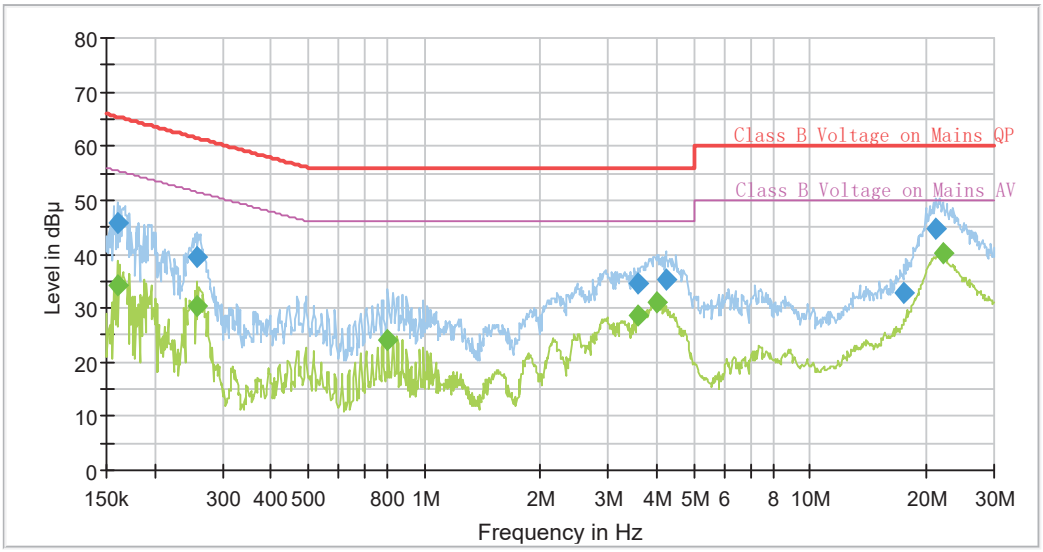
Port:	L
Test Mode:	Test Mode 1_Worst case
Power Source:	AC 230V/50Hz
Note:	



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.158459	45.96	---	65.54	19.58	9.000	L1	9.6
0.162461	---	36.72	55.34	18.62	9.000	L1	9.6
0.263546	---	34.80	51.32	16.52	9.000	L1	9.6
0.263546	42.03	---	61.32	19.29	9.000	L1	9.6
0.850904	---	24.79	46.00	21.21	9.000	L1	9.7
3.578545	---	29.67	46.00	16.33	9.000	L1	9.7
3.596438	35.29	---	56.00	20.71	9.000	L1	9.7
4.013525	---	31.48	46.00	14.52	9.000	L1	9.7
4.033592	36.93	---	56.00	19.07	9.000	L1	9.7
17.391943	33.09	---	60.00	26.91	9.000	L1	10.1
21.338144	45.64	---	60.00	14.36	9.000	L1	10.0
21.552059	---	39.86	50.00	10.14	9.000	L1	10.0

Port: N
Test Mode: Test Mode 1_Worst case
Power Source: AC 230V/50Hz
Note:

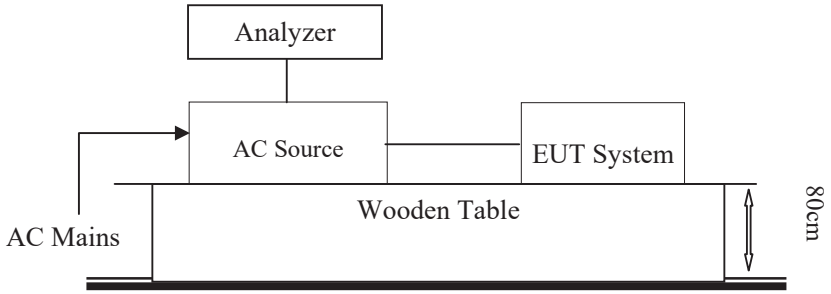


Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.160048	---	34.26	55.46	21.20	9.000	N	9.6
0.160048	45.76	---	65.46	19.70	9.000	N	9.6
0.257055	---	30.38	51.53	21.15	9.000	N	9.6
0.257055	39.65	---	61.53	21.88	9.000	N	9.6
0.805479	---	24.15	46.00	21.85	9.000	N	9.6
3.578545	---	28.68	46.00	17.32	9.000	N	9.6
3.596438	34.42	---	56.00	21.58	9.000	N	9.6
4.013525	---	31.15	46.00	14.85	9.000	N	9.6
4.218777	35.40	---	56.00	20.60	9.000	N	9.6
17.566298	32.87	---	60.00	27.13	9.000	N	9.9
21.231984	44.81	---	60.00	15.19	9.000	N	9.9
22.096276	---	40.08	50.00	9.92	9.000	N	9.9

5 - VOLTAGE FLUCTUATIONS AND FLICKER (AC MAINS INPUT PORT)

Test System Setup



Test Standard

EN 61000-3-3:2013

Flicker Test Limits:

The limits shall be applicable to voltage fluctuations and flicker at the supply terminals of the equipment under test, measured or calculated according to clause 4 under test conditions described in clause 6 and annex A. Tests made to prove compliance with the limits are considered to be type tests.
The following limits apply:
– the value of Pst shall not be greater than 1,0;
– the value of Plt shall not be greater than 0,65;
– the value of d(t) during a voltage change shall not exceed 3,3 % for more than 500 ms;
– the relative steady-state voltage change, dc, shall not exceed 3,3 %;
– the maximum relative voltage change dmax, shall not exceed
a) 4 % without additional conditions;
b) 6 % for equipment which is:
– switched manually, or
– switched automatically more frequently than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds), or manual restart, after a power supply interruption.
Note: The cycling frequency will be further limited by the Pst and Plt limit. For example: a dmax of 6 % producing are ctangular voltage change characteristic twice per hour will give a Plt of about 0,65.
c) 7 % for equipment which is
– attended whilst in use (for example: hair dryers, vacuum cleaners, kitchen equipment such as mixers, garden equipment such as lawn mowers, portable tools such as electric drills), or
– switched on automatically, or is intended to be switched on manually, no more than twice per day, and also has either a delayed restart (the delay being not less than afew tens of seconds) or manual restart, after a power supply interruption.

In the case of equipment having several separately controlled circuits in accordance with 6.6,limits b) and c) shall apply only if there is delayed or manual restart after a power supply interruption; for all equipment with automatic switching which is energized immediately onrestoration of supply after a power supply interruption, limits a) shall apply; for all equipment with manual switching, limits b) or c) shall apply depending on the rate of switching. Pst and Plt requirements shall not be applied to voltage changes caused by manual switching. The limits shall not be applied to voltage changes associated with emergency switching or emergency interruptions.

Test Data

Please refer to following tables:

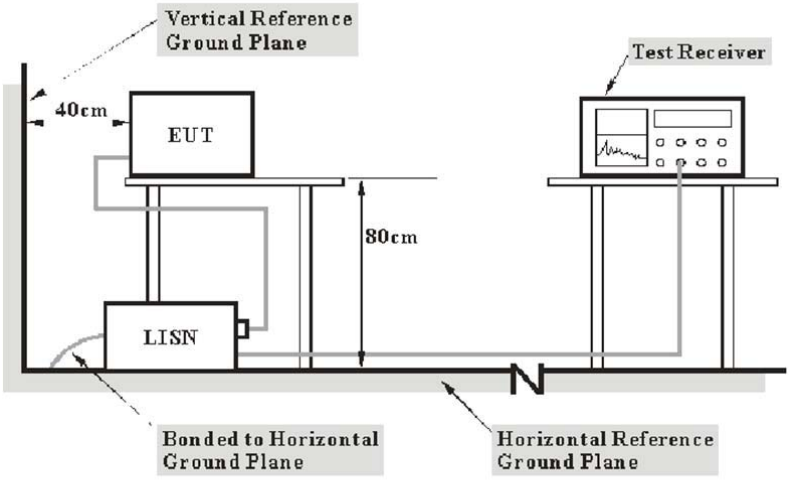
Short time (Pst):	10 min
Observation time:	120 min (12 Flicker measurement)
Test Mode:	Test Mode 1_Worst case
Power Source:	AC 230V/50Hz
Test Result	PASS

Maximum Flicker results

	EUT values	Limit	Result
Pst	0.028	1.00	PASS
Plt	0.028	0.65	PASS
dc [%]	0.008	3.30	PASS
dmax [%]	0.131	4.00	PASS
dt [s]	0.000	0.50	PASS

6 - WIRED NETWORK PORTS

EUT Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per EN 301 489-1 measurement procedures. The specification used was with the EN 301 489-1 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

If the QP/Average value complies with the limit more than 10dB, then they were not recorded.

Test Procedure

During the conducted emissions test, the EUT was connected to the main outlet of the first LISN and the other support equipments were connected to the outlet of the second LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

Corrected Amplitude & Margin Calculation

The basic equation is as follows:

Result (QuasiPeak or Average) = Meter Reading + Corr.

Note:
Corr. = Cable loss + Factor of coupling device

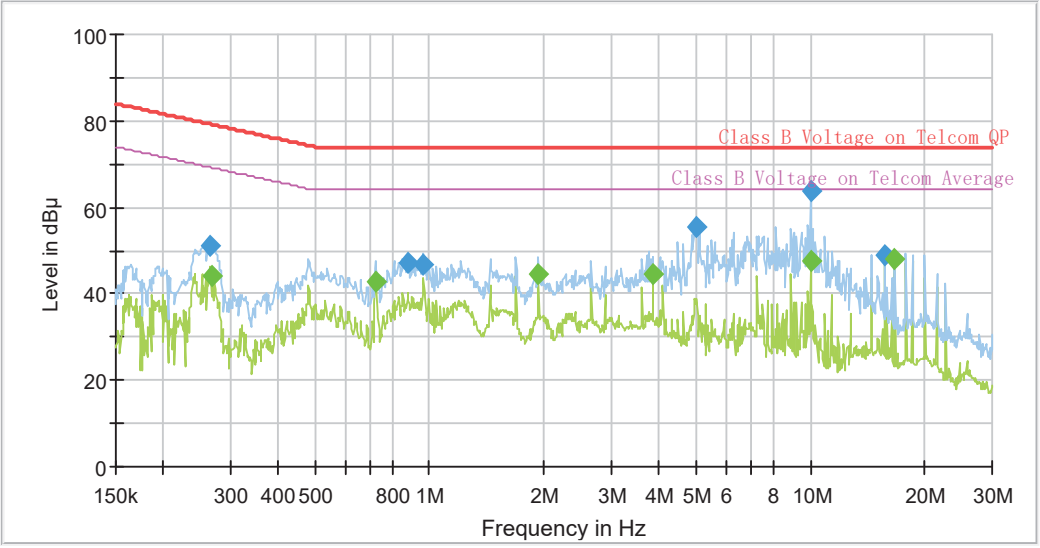
The "**Margin**" column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

Margin = Limit – Result

Test Data

Please refer to following table and plots :

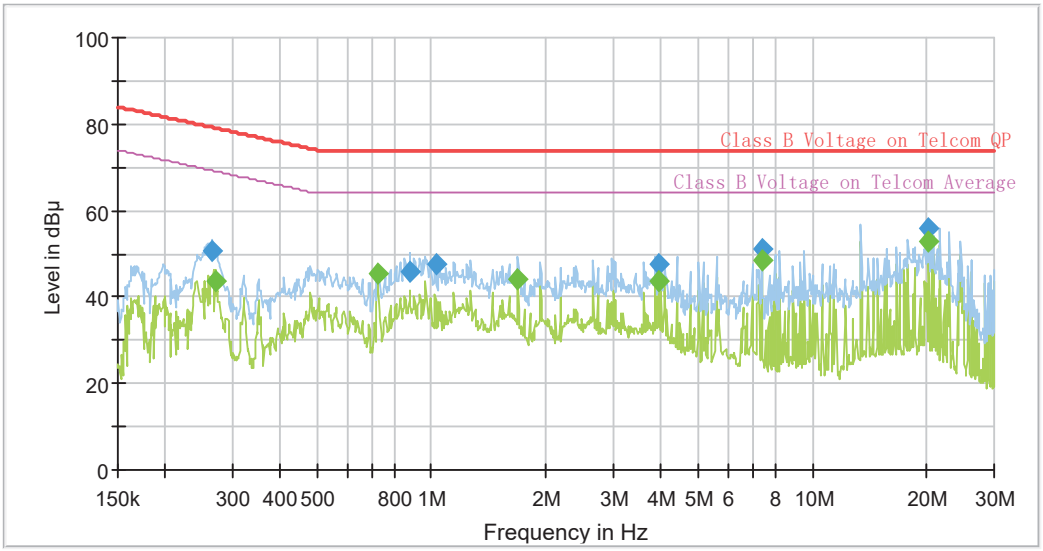
Port:	RJ45
Test Mode:	10Mbps
Power Source:	AC 230V/50Hz
Note:	



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.264864	50.99	---	79.28	28.29	9.000	Line 1	9.9
0.268856	---	43.94	69.15	25.21	9.000	Line 1	9.9
0.721773	---	42.62	64.00	21.38	9.000	Line 1	9.7
0.876753	47.18	---	74.00	26.82	9.000	Line 1	9.7
0.963901	46.54	---	74.00	27.46	9.000	Line 1	9.7
1.928035	---	44.49	64.00	19.51	9.000	Line 1	9.6
3.856537	---	44.35	64.00	19.65	9.000	Line 1	9.6
4.998419	55.51	---	74.00	18.49	9.000	Line 1	9.6
9.998049	63.54	---	74.00	10.46	9.000	Line 1	9.6
9.998049	---	47.76	64.00	16.24	9.000	Line 1	9.6
15.662490	49.03	---	74.00	24.97	9.000	Line 1	9.6
16.628518	---	48.10	64.00	15.90	9.000	Line 1	9.6

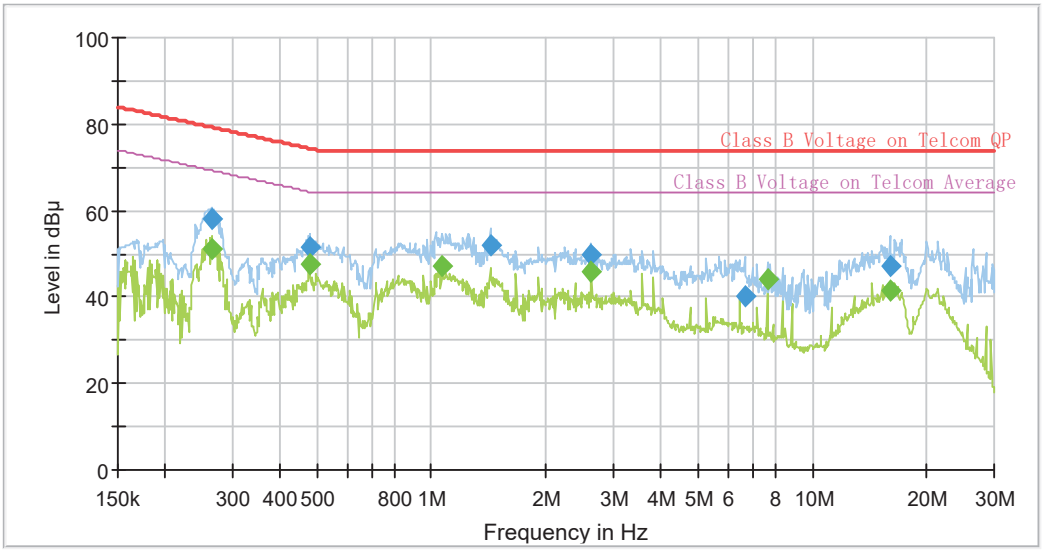
Port: RJ45
Test Mode: 100Mbps
Power Source: AC 230V/50Hz
Note:



Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.266188	50.74	---	79.24	28.50	9.000	Line 1	9.9
0.270201	---	43.81	69.11	25.30	9.000	Line 1	9.9
0.721773	---	45.60	64.00	18.40	9.000	Line 1	9.7
0.876753	45.92	---	74.00	28.08	9.000	Line 1	9.7
1.023352	47.47	---	74.00	26.53	9.000	Line 1	9.7
1.685121	---	44.26	64.00	19.74	9.000	Line 1	9.6
3.953919	47.81	---	74.00	26.19	9.000	Line 1	9.6
3.953919	---	43.73	64.00	20.27	9.000	Line 1	9.6
7.375399	51.11	---	74.00	22.89	9.000	Line 1	9.6
7.375399	---	48.26	64.00	15.74	9.000	Line 1	9.6
20.199004	---	52.79	64.00	11.21	9.000	Line 1	9.7
20.199004	56.04	---	74.00	17.96	9.000	Line 1	9.7

Port: RJ45
Test Mode: 1000Mbps
Power Source: AC 230V/50Hz
Note:

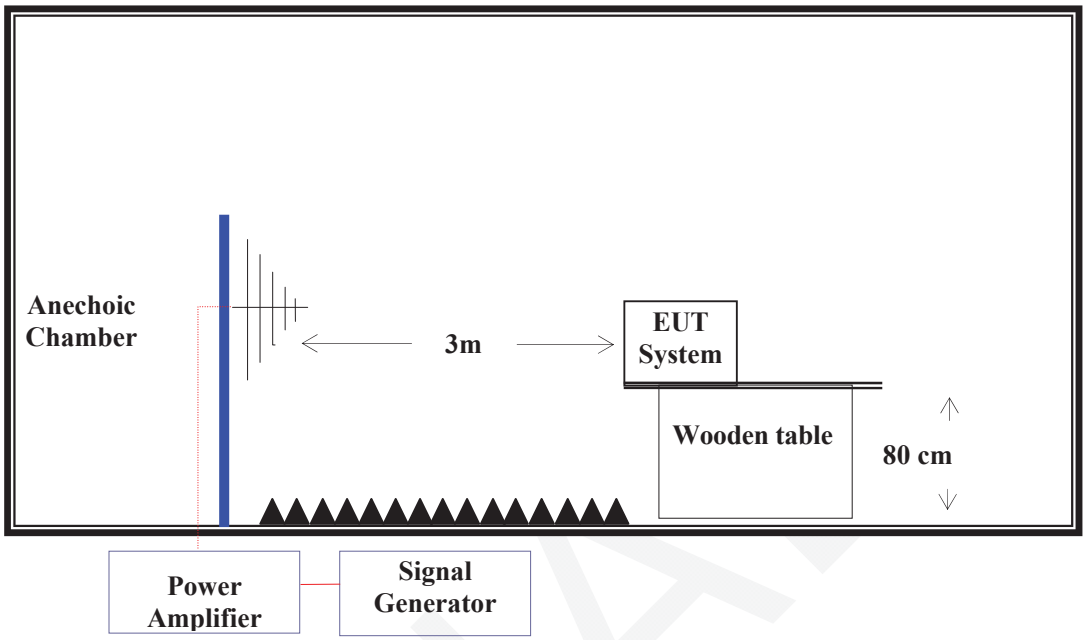


Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.264864	---	50.97	69.28	18.31	9.000	Line 1	9.9
0.264864	58.22	---	79.28	21.06	9.000	Line 1	9.9
0.477109	---	47.40	64.39	16.99	9.000	Line 1	9.8
0.479495	51.34	---	74.35	23.01	9.000	Line 1	9.8
1.070335	---	47.15	64.00	16.85	9.000	Line 1	9.7
1.429391	51.85	---	74.00	22.15	9.000	Line 1	9.6
2.626701	49.99	---	74.00	24.01	9.000	Line 1	9.6
2.626701	---	45.66	64.00	18.34	9.000	Line 1	9.6
6.641990	40.35	---	74.00	33.65	9.000	Line 1	9.6
7.637442	---	44.32	64.00	19.68	9.000	Line 1	9.6
15.978097	---	41.46	64.00	22.54	9.000	Line 1	9.6
15.978097	47.12	---	74.00	26.88	9.000	Line 1	9.6

7 - RADIO FREQUENCY ELECTROMAGNETIC FIELDS (80 MHZ TO 6 000 MHZ)

Test System Setup



Test Level

Level	Field Strength V/m
1.	1
2.	3
3.	10
X.	Special

Performance Criterion: A

General Performance Criteria:

A. The apparatus shall continue to operate as intended during and after the test. The manufacturer specifies some minimum performance level. The performance level may be specified by the manufacture as a permissible loss of performance.

B. The apparatus shall continue to operate as intended after the test. This indicates that the EUT does not need to function at normal performance levels during the test, but must recover. Again some minimal performance is defined by the manufacture. No change in operating state or loss or data is permitted.

C. Temporary loss of function is allowed. Operation of the EUT may stop as long as it is either automatically reset or can be manually restored by operation of the controls.

D. The apparatus is broken, cannot be normal operated.

Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above the ground. The EUT is set 3 meters away from the antenna which is mounted on an antenna tower. Both horizontal and vertical polarizations of the antenna are set on test. Each of the four sides of EUT must be faced this antenna and measured individually.

In order to judge the EUT performance, a CCD camera, CMU200, SRM, Phone and CMW500were used to monitor the EUT.

Test Data

Please refer to following tables:

Test Mode: Test Mode 1-6
Note:

Condition of Test	Remarks
Field Strength	10 V/m (Test Level 3)
RF Signal	1 kHz, 80% AM, sine wave
Sweep Frequency Step	1%, logarithmic
Dwell Time	1 Sec

Test Mode: GPRS/EGPRS communication

Frequency Range (MHz)	Front Side (3V/m)		Rear Side (3V/m)		Left Side (3V/m)		Right Side (3V/m)	
	VERT	HORI	VERT	HORI	VERT	HORI	VERT	HORI
80-1000	A	A	A	A	A	A	A	A
1000-6000	A	A	A	A	A	A	A	A

Note: "A" stand for, The EUT shall operate as intended with no loss of user control functions or stored data, andthe communication link shall have been maintained. The RXQUAL of the downlink is not exceeding the value of three, measured during each individual exposure in the test sequence.

Test Mode: WCDMA communication

Frequency Range (MHz)	Front Side (3V/m)		Rear Side (3V/m)		Left Side (3V/m)		Right Side (3V/m)	
	VERT	HORI	VERT	HORI	VERT	HORI	VERT	HORI
80-1000	A	A	A	A	A	A	A	A
1000-6000	A	A	A	A	A	A	A	A

Note: "A"stand for, UTRA, if the BER (as referred in ETSI TS 134 109 [4]) is used, it shall not exceed 0,001 during the test sequence; Or During and after the test, the apparatus continue to operate as intended. No degradation of performance or loss of function is allowed below a permissible performance level.

Test Mode: HSPA communication

Frequency Range (MHz)	Front Side (3V/m)		Rear Side (3V/m)		Left Side (3V/m)		Right Side (3V/m)	
	VERT	HORI	VERT	HORI	VERT	HORI	VERT	HORI
80-1000	A	A	A	A	A	A	A	A
1000-6000	A	A	A	A	A	A	A	A

Note: "A" stand for, the EUT shall operate as intended with no loss of user control functions or stored data, and the communication link shall have been maintained. UTRA, if the BER (as referred in ETSI TS 134 109) is used, it shall not exceed 0,001 during the test sequence; if the BLER (as referred in ETSI TS 134 109) is used, it shall not exceed 0,01 during the test sequence. The BLER calculation shall be based on evaluating the CRC on each transport block.

Test Mode: LTE communication

Frequency Range (MHz)	Front Side (3V/m)		Rear Side (3V/m)		Left Side (3V/m)		Right Side (3V/m)	
	VERT	HORI	VERT	HORI	VERT	HORI	VERT	HORI
80-1000	A	A	A	A	A	A	A	A
1000-6000	A	A	A	A	A	A	A	A

Note: "A" stand for, In the data transfer mode, the performance criteria shall be that the throughput shall be ≥ 95 % of the maximum throughput of the reference measurement channel as specified in annex C in TS 136 101 with parameters specified in tables 7.3.1-1 and 7.3.1-2 in TS 136 101 during the test sequence.

Test Mode: Lora working

Frequency Range (MHz)	Front Side (3V/m)		Rear Side (3V/m)		Left Side (3V/m)		Right Side (3V/m)	
	VERT	HORI	VERT	HORI	VERT	HORI	VERT	HORI
80-1000	A	A	A	A	A	A	A	A
1000-6000	A	A	A	A	A	A	A	A

Note: "A" stand for, during test, operate as intended No loss function, and after test, operate as intended.

Test Mode: Wi-Fi communication

Frequency Range (MHz)	Front Side (3V/m)		Rear Side (3V/m)		Left Side (3V/m)		Right Side (3V/m)	
	VERT	HORI	VERT	HORI	VERT	HORI	VERT	HORI
80-1000	A	A	A	A	A	A	A	A
1000-6000	A	A	A	A	A	A	A	A

Note: "A" stand for, during test, operate as intended no loss of function, no degradation of performance, no unintentional transmissions and after test, no degradation of performance, no loss of function, no loss of stored data or user programmable functions.

Test Mode: GNSS receiving

Frequency Range (MHz)	Front Side (3V/m)		Rear Side (3V/m)		Left Side (3V/m)		Right Side (3V/m)	
	VERT	HORI	VERT	HORI	VERT	HORI	VERT	HORI
80-1000	A	A	A	A	A	A	A	A
1000-6000	A	A	A	A	A	A	A	A

Note: "A" stand for, during test, operate as intended No loss function, and after test, operate as intended.

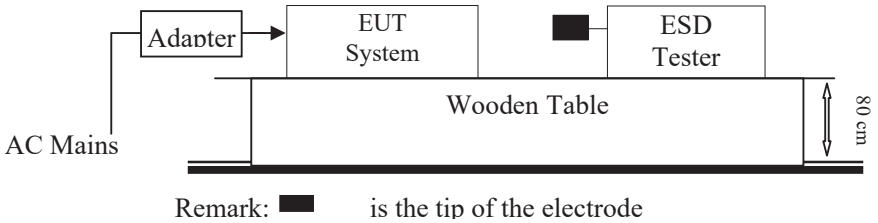
Test Mode: Idle

Frequency Range (MHz)	Front Side (3V/m)		Rear Side (3V/m)		Left Side (3V/m)		Right Side (3V/m)	
	VERT	HORI	VERT	HORI	VERT	HORI	VERT	HORI
80-1000	A	A	A	A	A	A	A	A
1000-6000	A	A	A	A	A	A	A	A

Note: "A" stand for, during test, it shall not unintentionally operate.

8 - ELECTROSTATIC DISCHARGES

Test System Setup



Remark: ■ is the tip of the electrode

EN61000-4-2 specifies that a tabletop EUT shall be placed on a non-conducting table which is 80 centimeters above a ground reference plane and that floor mounted equipment shall be placed on a insulating support approximately 10 centimeters above a ground plane. During the tests, the EUT is positioned over a ground reference plane in conformance with this requirement.

For tabletop equipment, a 1.6 by 0.8-meter metal sheet (HCP) is placed on the table and connected to the ground plane via a metal strap with two 470 k Ohms resistors in series. The EUT and attached cables are isolated from this metal sheet by *0.5-millimeter* thick insulating material. A Vertical Coupling Plane (VCP) grounded on the ground plane through the same configuration as in the HCP is used.

Test Level

Level	Test Voltage Contact Discharge (±kV)	Test Voltage Air Discharge (±kV)
1.	2	2
2.	4	4
3.	6	8
4.	8	15
X.	Special	Special

Test Level 3 for Air Discharge at ±8 kV
Test Level 3 for Direct Discharge at ±6 kV

Performance criterion: B

Test Procedure

Air Discharge:

This test is done on a non-conductive surface. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT. After each discharge, the discharge electrode shall be removed from the EUT. The generator is then re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

Contact Discharge:

All the procedure shall be same as Section 8.3.1 of EN 61000-4-2, except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

Indirect discharge for horizontal coupling plane

At least 50 single discharges shall be applied to the horizontal coupling plane, at points on each side of the EUT. The discharge electrode positions vertically at a distance of 0.1m from the EUT and with the discharge electrode touching the coupling plane.

Indirect discharge for vertical coupling plane

At least 50 single discharges shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

Test Data

Please refer to following tables:

Test Mode: Test Mode 1-6
Note:

Table 1: Electrostatic Discharge Immunity (Air Discharge)

Test Points Location	Test Level							
	-2 kV	+2 kV	-4 kV	+4 kV	-8 kV	+8 kV	-15 kV	+15 kV
Non-metallic Shell	A	A	A	A	A	A	/	/
Seam	A	A	A	A	A	A	/	/

Table 2: Electrostatic Discharge Immunity (Direct Contact)

Test Points Location	Test Level							
	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV
Metal shell	A	A	A	A	A	A	/	/
USB Port	A	A	A	A	A	A	/	/
SIM Port	A	A	A	A	A	A	/	/
RJ45 Port	A	A	A	A	A	A	/	/
Screw	A	A	A	A	A	A	/	/

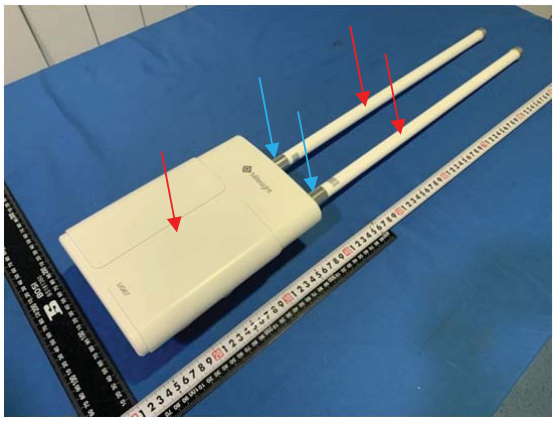
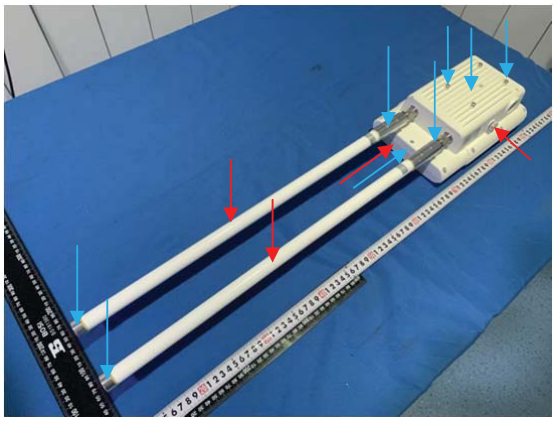
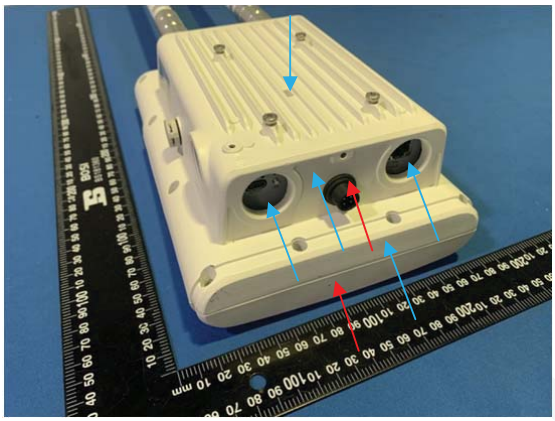
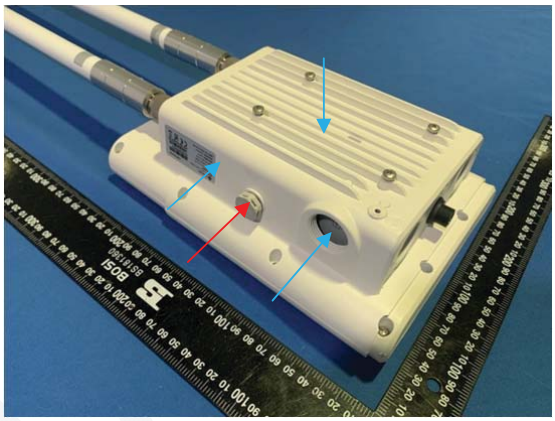
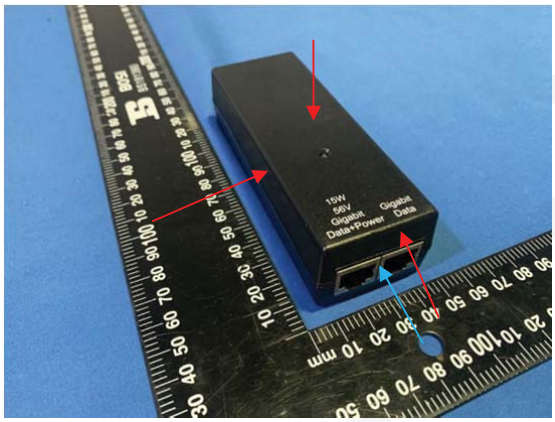
Table 3: Electrostatic Discharge Immunity (Indirect Contact HCP)

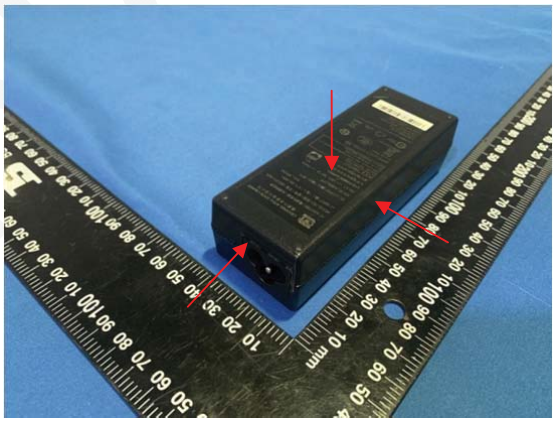
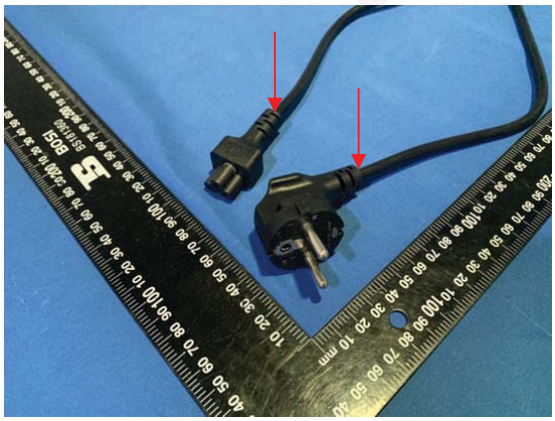
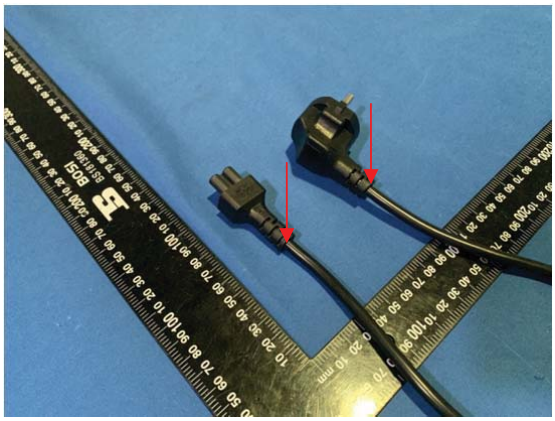
Test Points Location	Test Level							
	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV
Front Side	A	A	A	A	A	A	/	/
Back Side	A	A	A	A	A	A	/	/
Left Side	A	A	A	A	A	A	/	/
Right Side	A	A	A	A	A	A	/	/

Table 4: Electrostatic Discharge Immunity (Indirect Contact VCP)

Test Points Location	Test Level							
	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV
Front Side	A	A	A	A	A	A	/	/
Back Side	A	A	A	A	A	A	/	/
Left Side	A	A	A	A	A	A	/	/
Right Side	A	A	A	A	A	A	/	/

ESD Location Photo

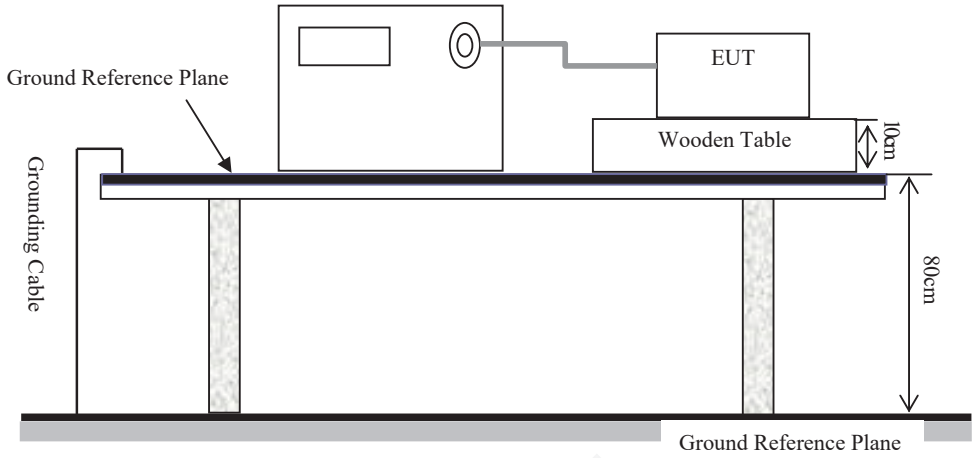






Air Discharge: → Direct Contact: →

9 - FAST TRANSIENTS, COMMON MODE

Test System Setup



Test Level

Open Circuit Output Test Voltage ±10%		
Level	**On Power Supply Lines**	**On I/O (Input/Output) Signal data and control lines**
1	0.5 kV	0.25 kV
2	1 kV	0.5 kV
3	2 kV	1 kV
4	4 kV	2 kV
X	Special	Special

Performance Criterion: B

Test Procedure

The EUT was arranged for Power Line Coupling and for I/O Line Coupling through a capacitive clamp, where applicable. (Note: The I/O coupling test using a capacitive clamp is performed on the I/O interface cables that are longer in length than 3 meters.) A metal ground plane 2.4 meter by 2.0 meter was placed between the floor and the table and is connected to the earth by a 2.0 meter ground rod. The ground rod is connected to the test facility's electrical earth.

Test Data

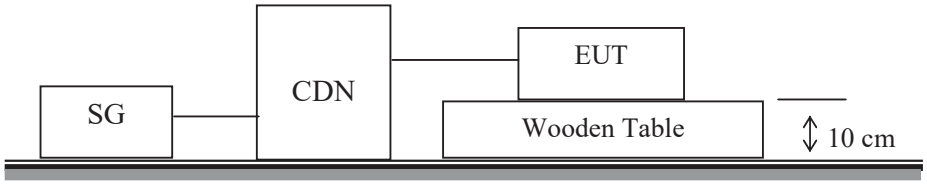
Please refer to following tables:

Test Mode: Test Mode 1-6
Note:

Test Points		Test Level (kV)							
		+0.5	-0.5	+1.0	-1.0	+2.0	-2.0	+4.0	-4.0
AC mains power input ports	L	A	A	A	A	/	/	/	/
	N	A	A	A	A	/	/	/	/
	Earth	A	A	A	A	/	/	/	/
	L+N	A	A	A	A	/	/	/	/
	L + Earth	A	A	A	A	/	/	/	/
	N + Earth	A	A	A	A	/	/	/	/
	L+N+Earth	A	A	A	A	/	/	/	/
Signal ports	RJ45	A	A	A	A	A	A	/	/

10 - RADIO FREQUENCY, COMMON MODE

Test System Setup



Test Level

Level	Voltage Level (r.m.s.) (U_0)
1	1
2	3
3	10
X	Special

Performance Criterion: A

Test Procedure

1)Let the EUT work in test mode and test it.
2)The EUT are placed on an insulating support 0.1 m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3 m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).
3)The disturbance signal described below is injected to EUT through CDN.
4)The EUT operates within its operational mode(s) under intended climatic conditions after power on.
5)The frequency range is swept from 150 kHz to 80 MHz using 10V signal level, and with the disturbance signal 80% amplitude modulated with a 1 kHz sine wave.
6) Where the frequency is swept incrementally, the step size shall not exceed 1 % of the preceding frequency value. The dwell time of the amplitude modulated carrier at each frequency shall not be less than the time necessary for the EUT to be exercised and to respond, but shall in no case be less than 0.5 s.
7) Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

***Note**: Test Level 3, 10V was applied in this case.*

Test Data

Please refer to following tables:

Test Mode: Test Mode 1-6
Note:

Table 1: AC mains power input port
Frequency range: 150 kHz to 80 MHz
■Modulated: Amplitude 80%, 1kHz sine wave □ Unmodulated □ Other:
Severity Level: 10 V Unmodulated , r.m.s

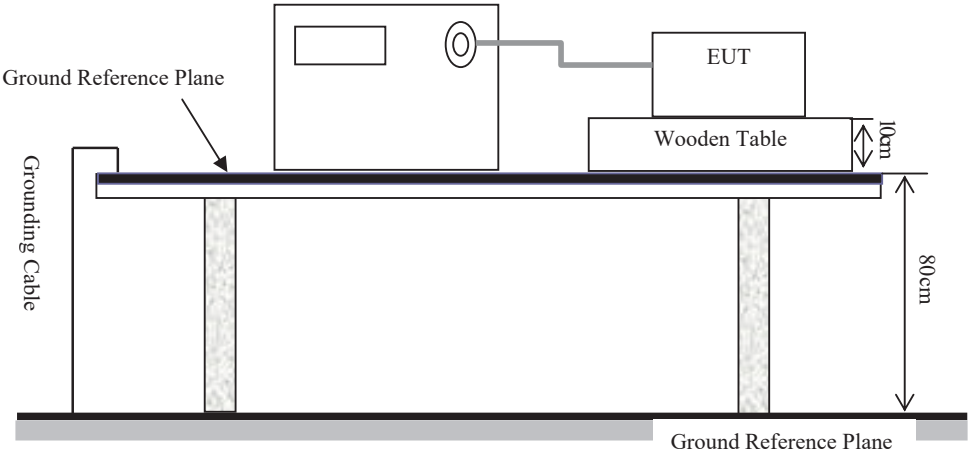
Level	Voltage Level (e.m.f.) U_0	Pass	Fail
1	1	/	/
2	3	/	/
3	10	A	/
X	Special	/	/

Table 2: Signal Port : RJ45
Frequency range: 150 kHz to 80 MHz
■Modulated: Amplitude 80%, 1kHz sine wave □Unmodulated □ Other:
Severity Level: 10 V Unmodulated , r.m.s

Level	Voltage Level (e.m.f.) U_0	Pass	Fail
1	1	/	/
2	3	/	/
3	10	A	/
X	Special	/	/

12 - VOLTAGE DIPS AND SHORT INTERRUPTIONS

Test System Setup



Test Level and Performance Criterion

Test Level	Voltage dip and short interruptions (%) Residual	Duration (in period)	Performance criterion
1	0	0.5	B
2	0	1	B
3	70	25	C
4	0	250	C

Test Procedure

1) The interruption is introduced at selected phase angles with specified duration.
2) Record any degradation of performance.

Test Data

Please refer to following tables:

Test Mode: **Test Mode 1-6**

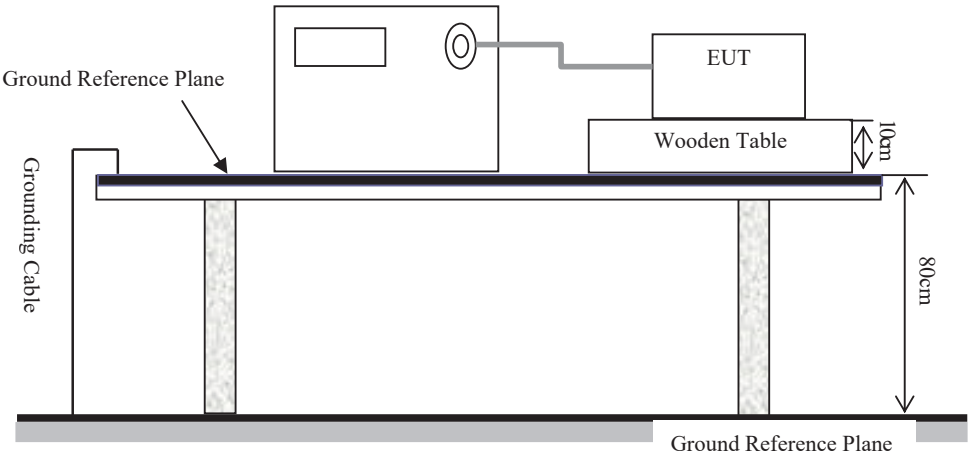
Note: B indicates that the power supply of the EUT was interrupted during the test, and the EUT was restarted. After the test, it can automatically return to normal use.

Table 1: Voltage Dips/Interruptions Test

U2 (% Reduction)	Td (Periods)	Phase Angle	N	Result
100	0.5	0/90/180/270	3	A
100	1	0/90/180/270	3	A
30	25	0/90/180/270	3	A
100	250	0/90/180/270	3	B

13 - SURGES

Test System Setup



Test Level

Level	Open Circuit Output Test Voltage ±10%
1	0.5 kV
2	1 kV
3	2 kV
4	4 kV
X	Special

Performance Criterion: B

Test Procedure

1) For line to line coupling mode, provide a 0.5 kV 1.2/50us voltage surge (at open-circuit condition).
2) At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test.
3) Different phase angles are done individually.
4) Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

Test Data

Please refer to following tables:

Test Mode: Test Mode 1-6
Note:

Table 1: AC mains power input port

Level	Voltage	Poll	Path	Pass	Fail
1	0.5kV	±	L- N , L-G , N-G	A	/
2	1kV	±	L- N , L-G , N-G	A	/
3	2kV	±	L-G , N-G	A	/
4	4kV	±	L-G , N-G	A	/

Table 2: RJ45 I/O Circuit and Lines

Level	Voltage	Poll	Path	Pass	Fail
1	0.5kV	±	Line-Ground	A	/
2	1kV	±	Line-Ground	A	/
3	2kV	±	Line-Ground	A	/
4	4kV	±	Line-Ground	A	/

EXHIBITA – EUT PHOTOGRAPHS

EUT

ANT

Port

ANT

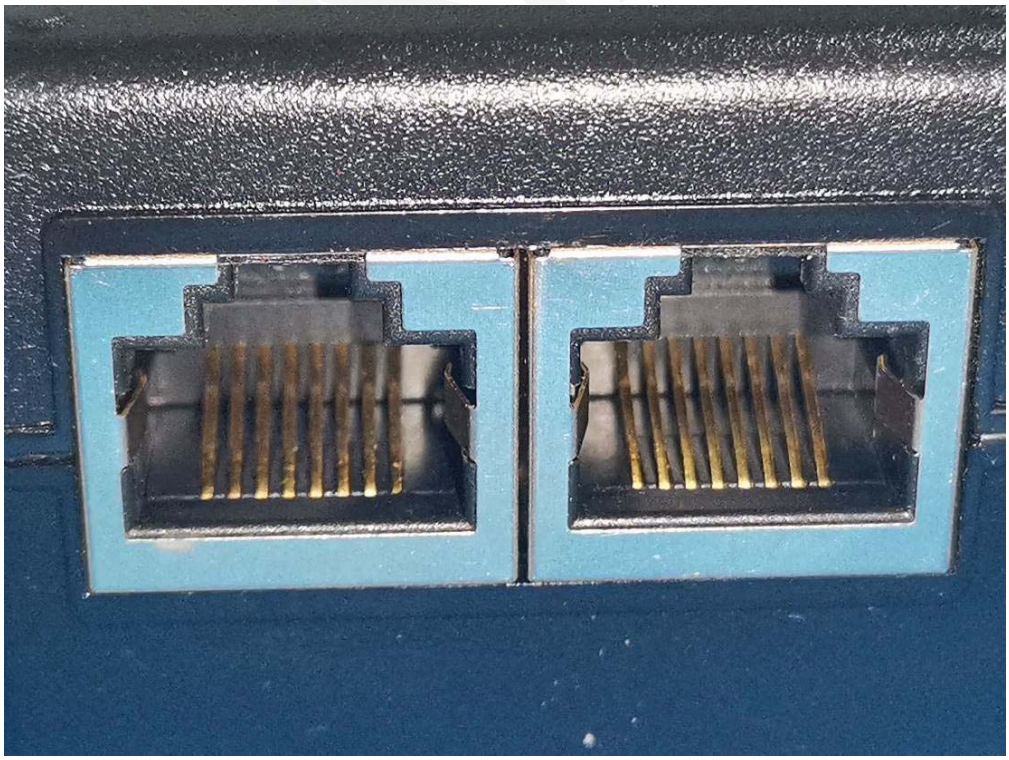

15W
56V
Gigabit
Data+Power
Gigabit
Data


15W
56V
Gigabit
Data+Power
Gigabit
Data

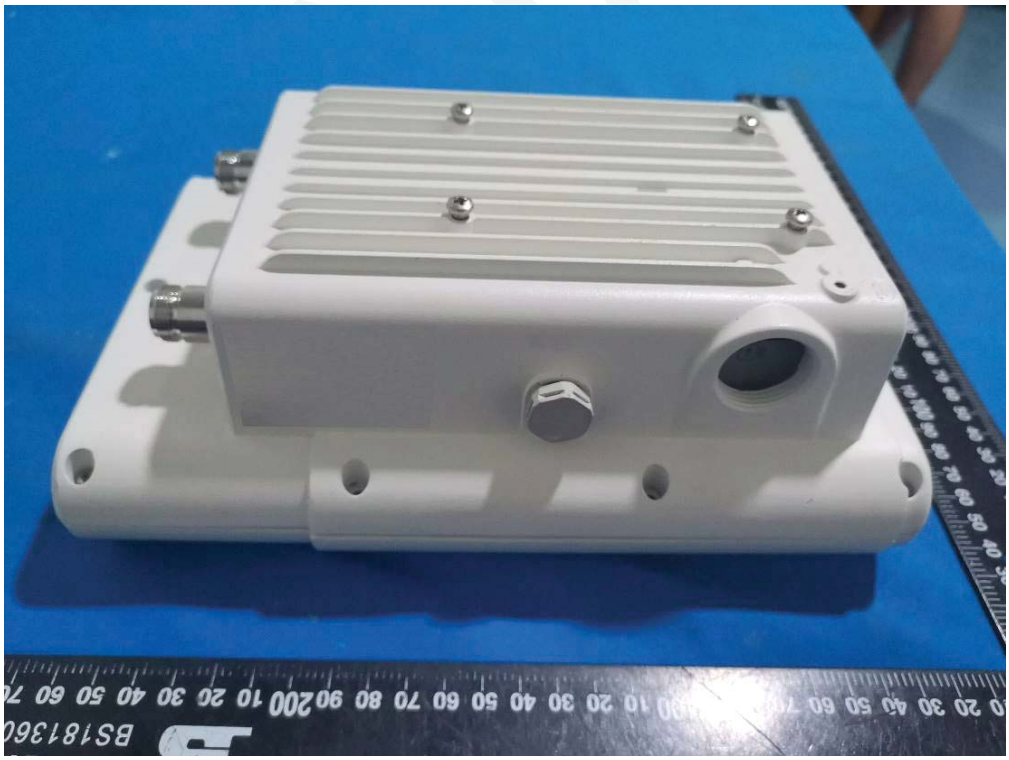

CHANNEL WELL TECHNOLOGY
AC ADAPTER
MODEL NO.
DC OUTPUT
55V DC, 0.269A,15W
PIN 4,5 ---+56V, PIN 7,8 ---Return
LTE POWER SUPPLY
EFFICIENCY LEVEL VI
LPS
CAUTION
For Indoor use only

Port

Port




Milesight
UG67



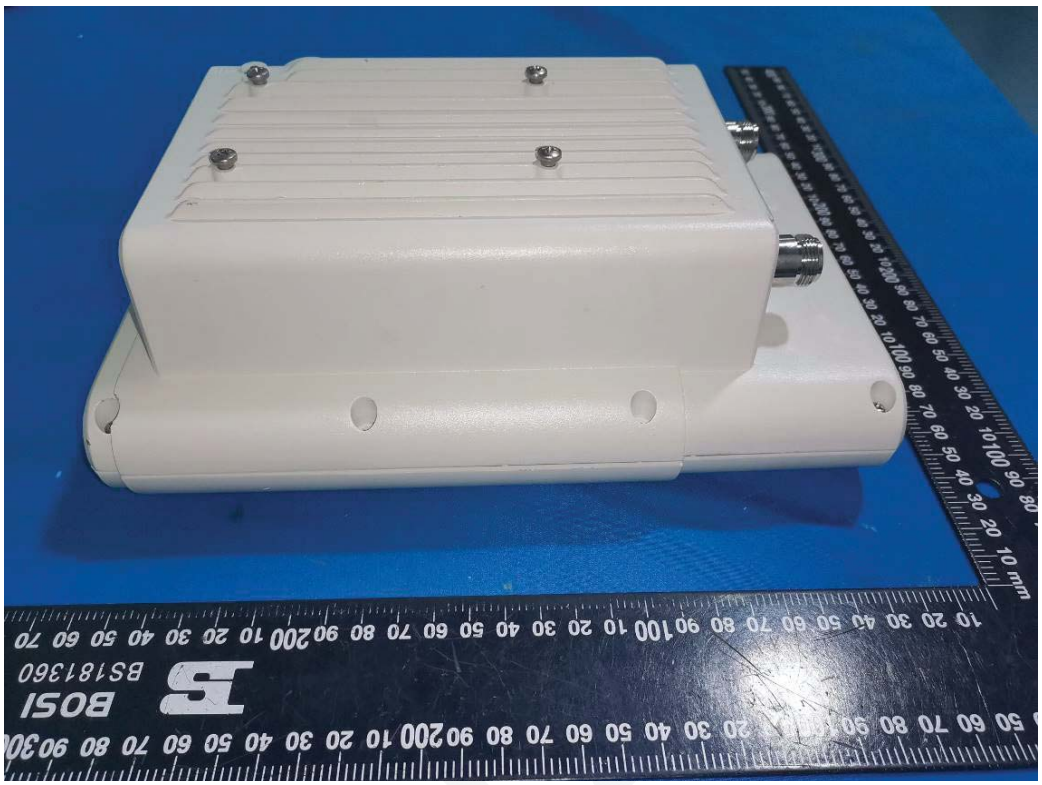
Port

Port

Port

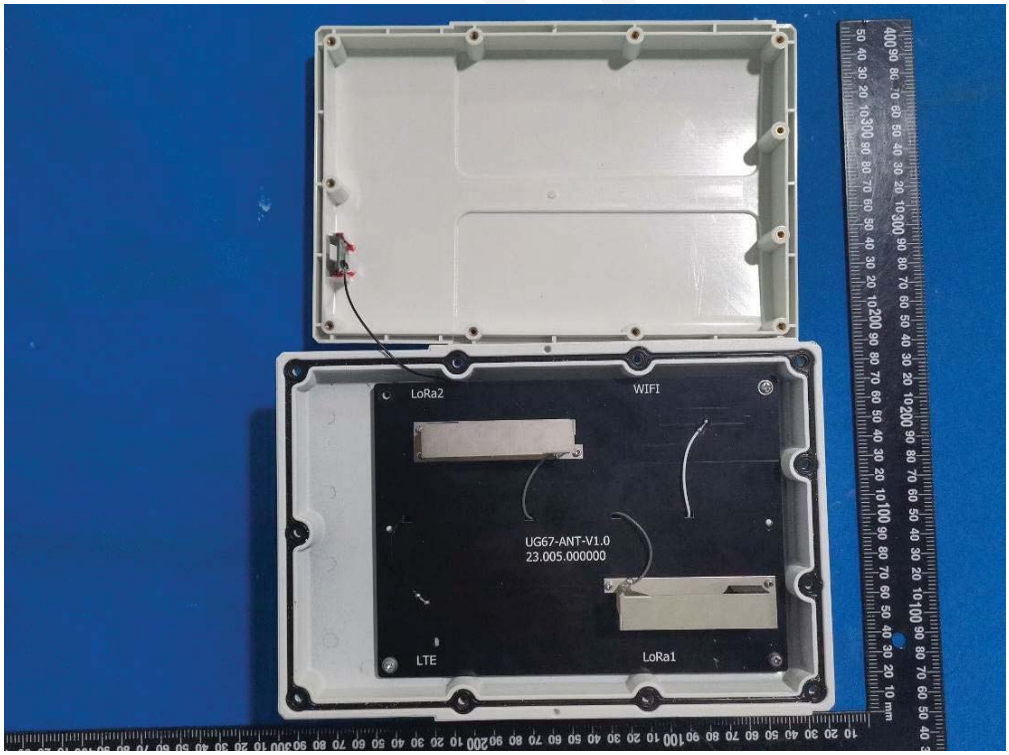
Note: This port and related circuit is reserve, function for it was not activated, which was decalared by the applicant.

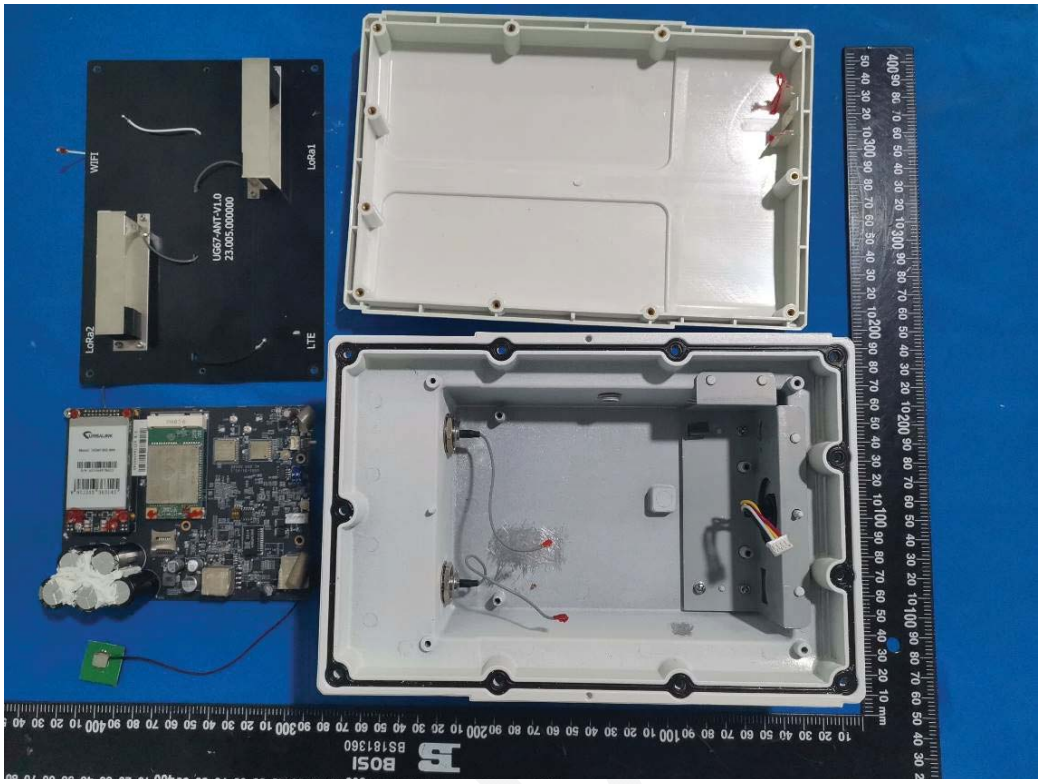
Port



Extenal ANT Port

Uncover





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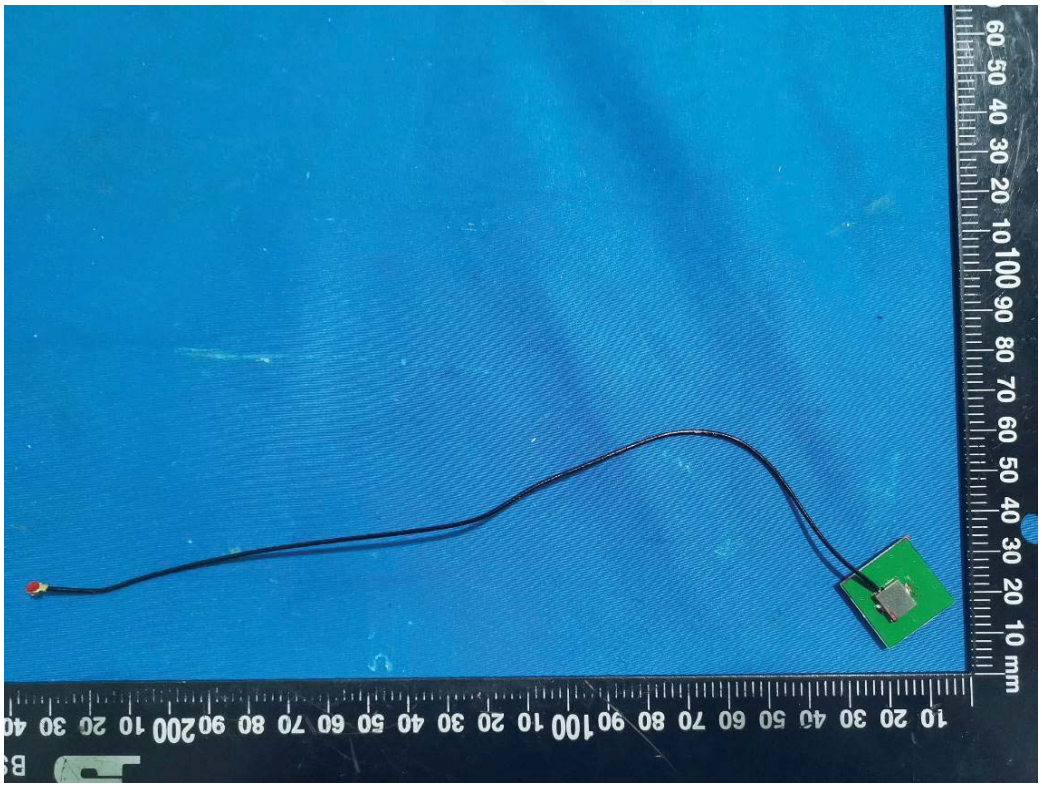

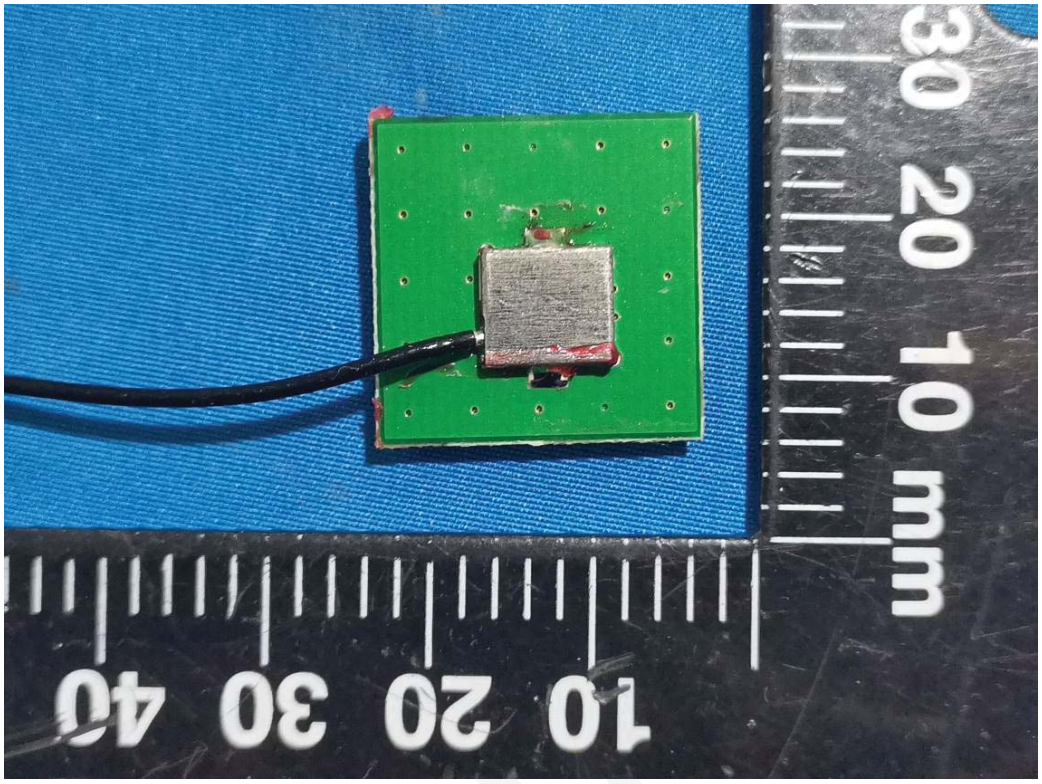
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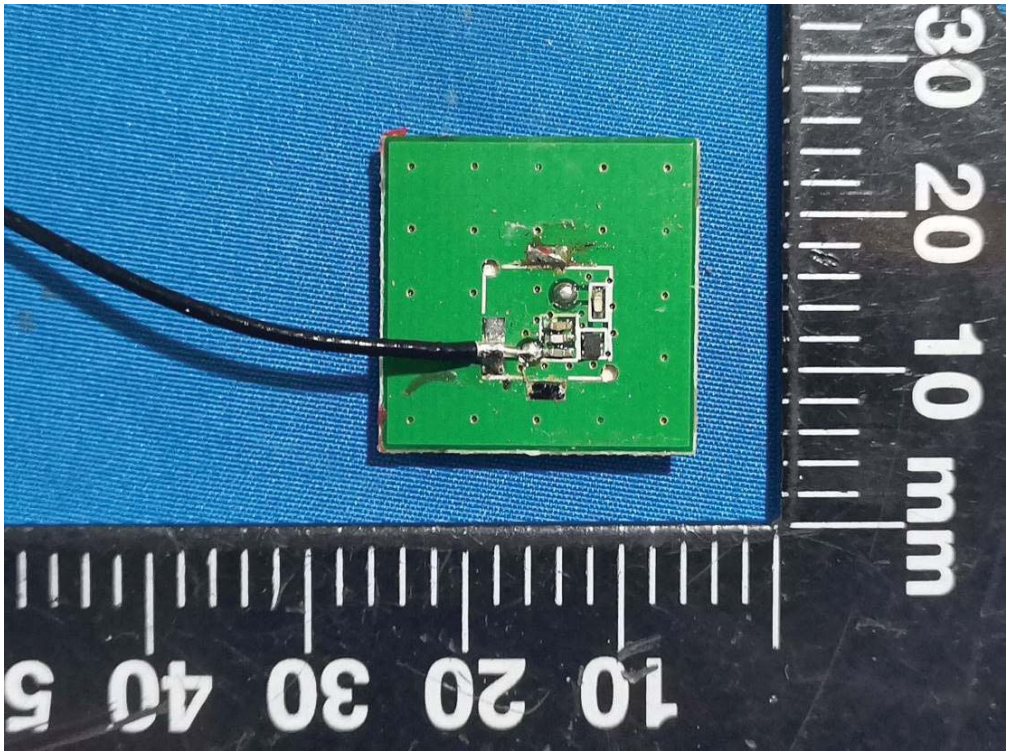
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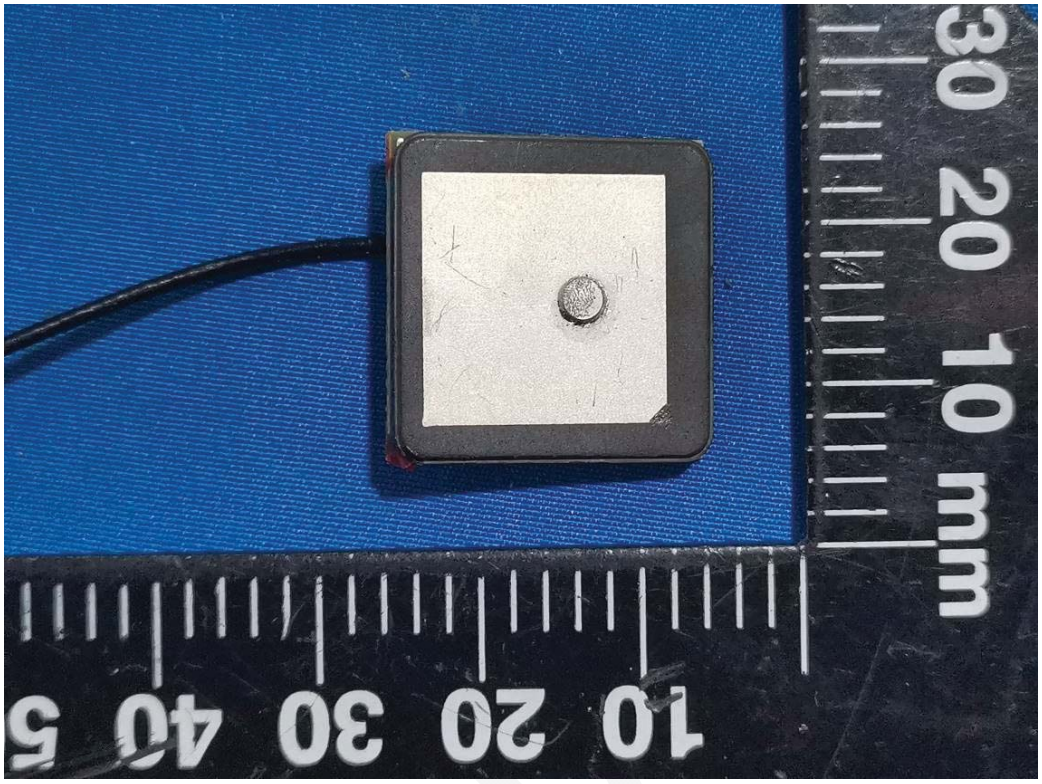
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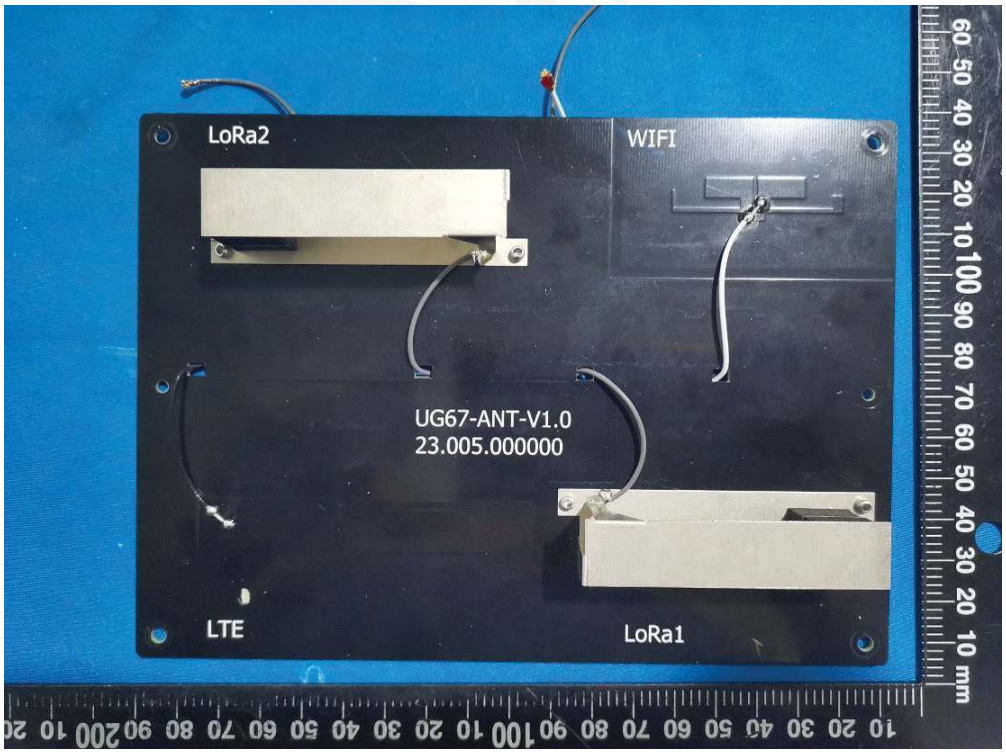
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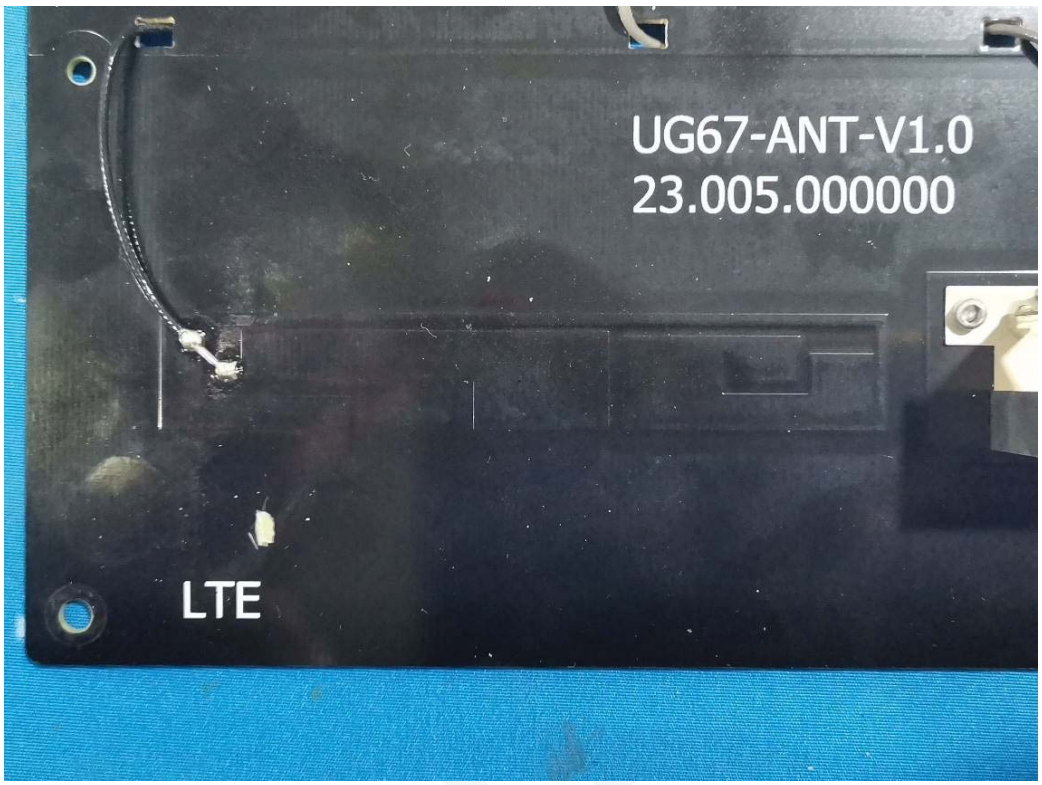
LORA TX ANT

LTE ANT



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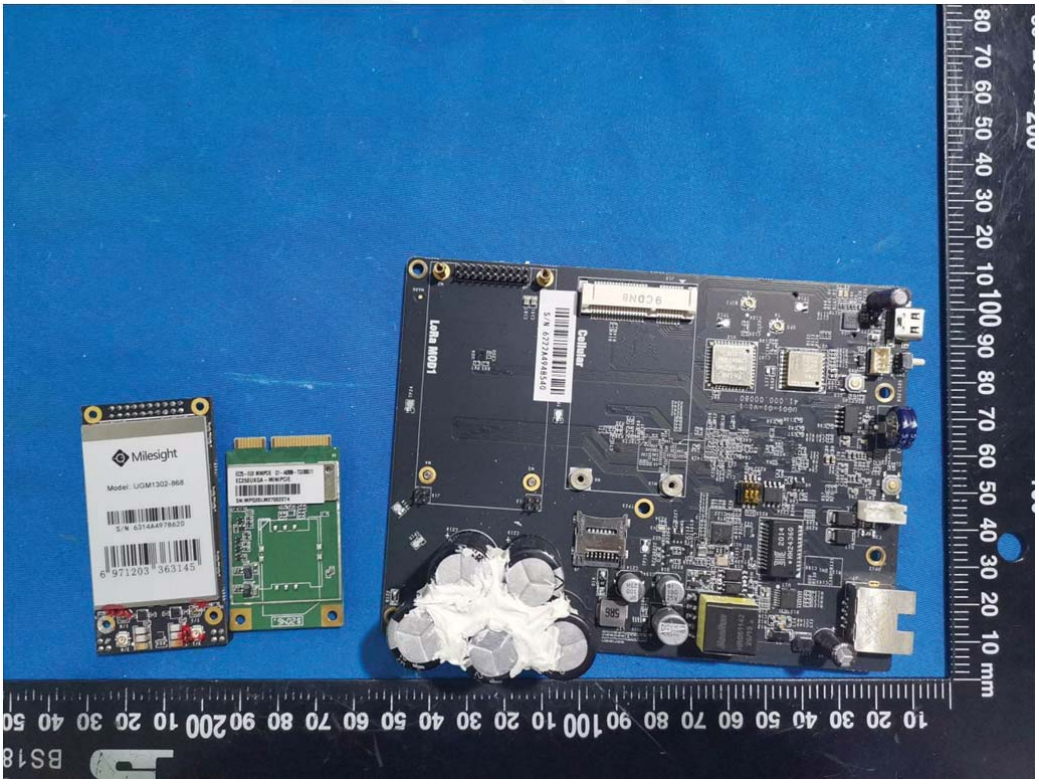

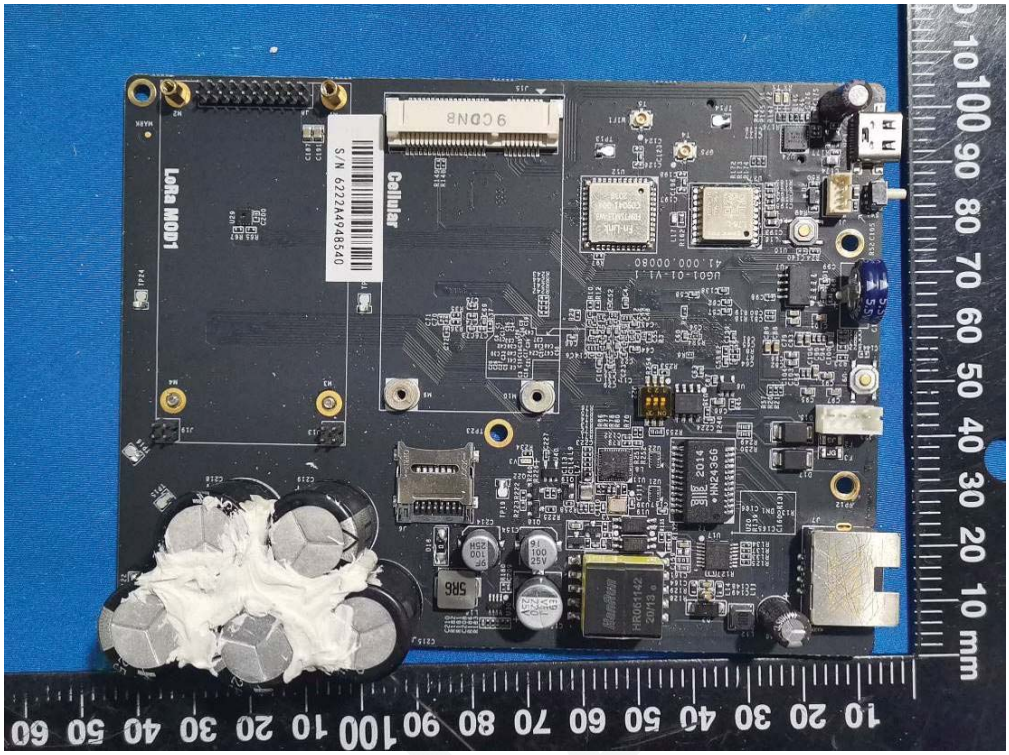
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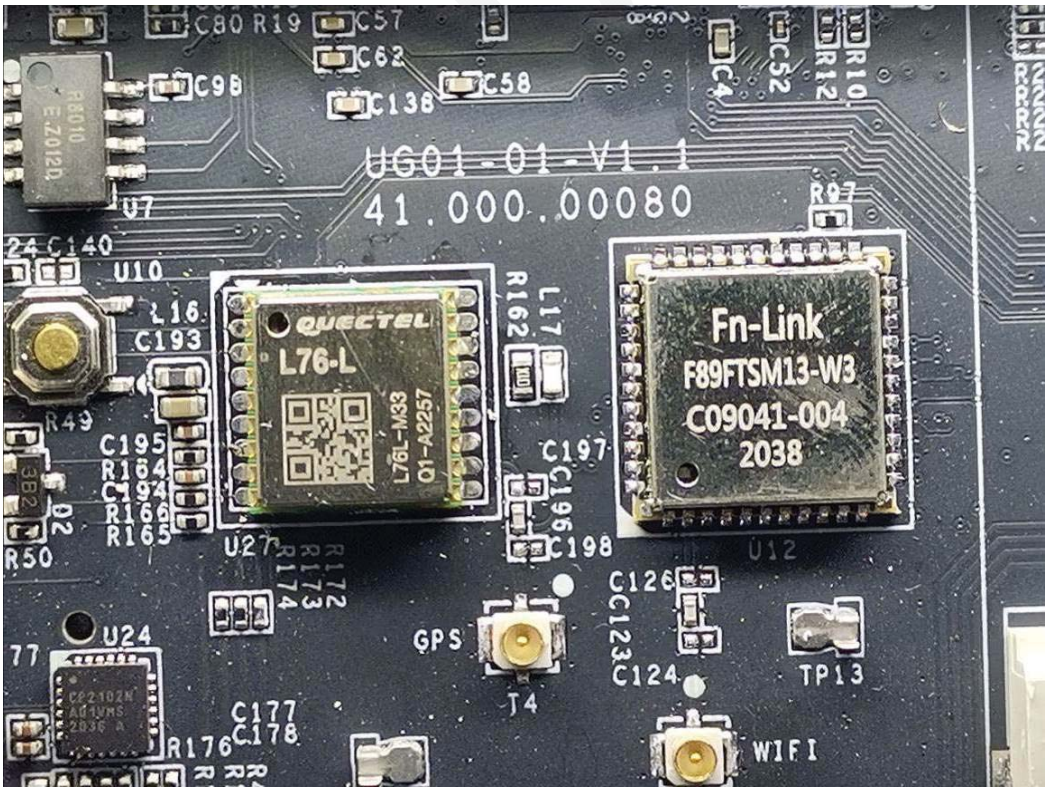
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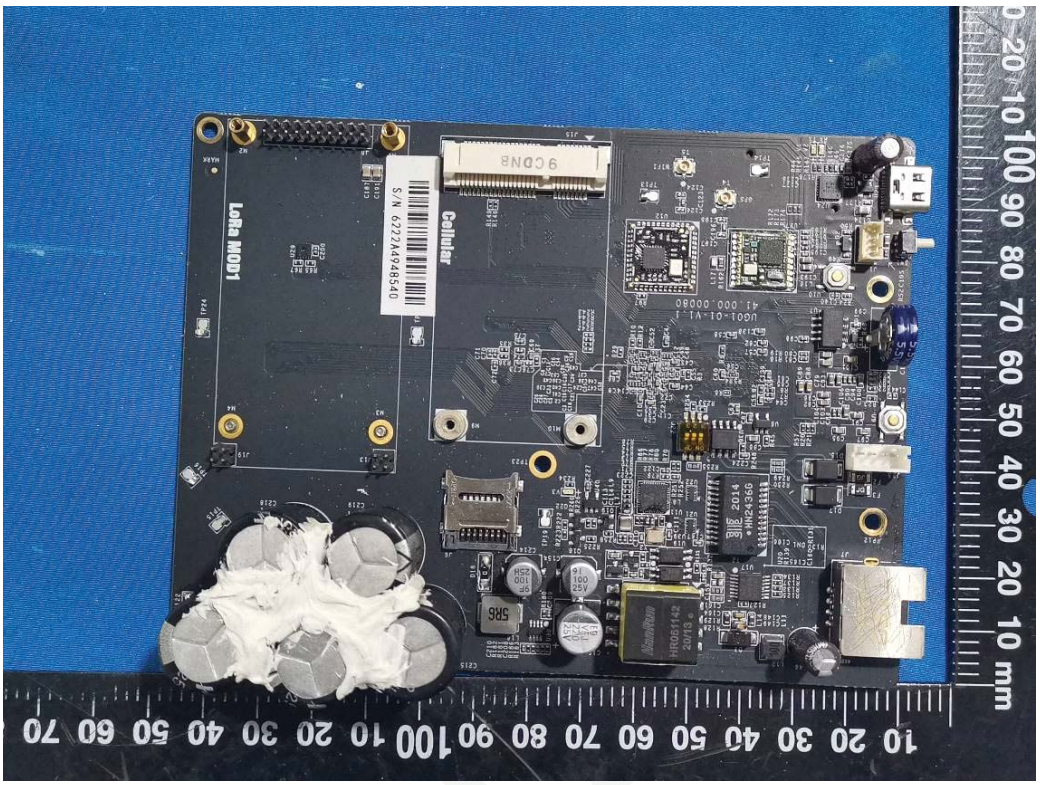
TP13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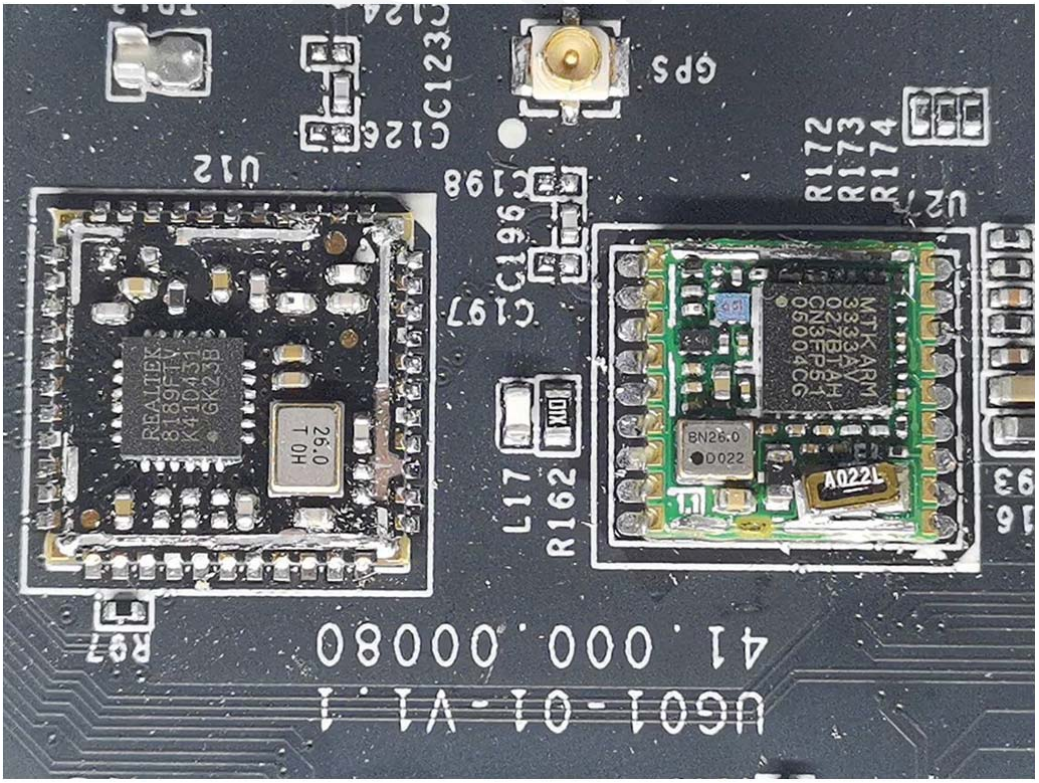
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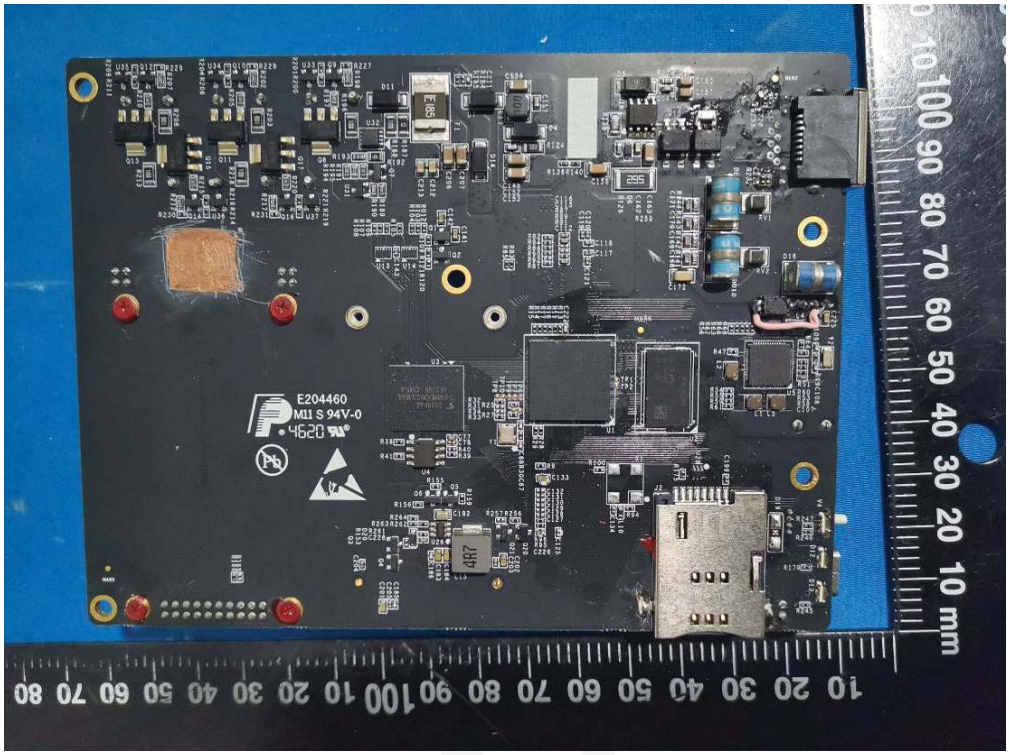
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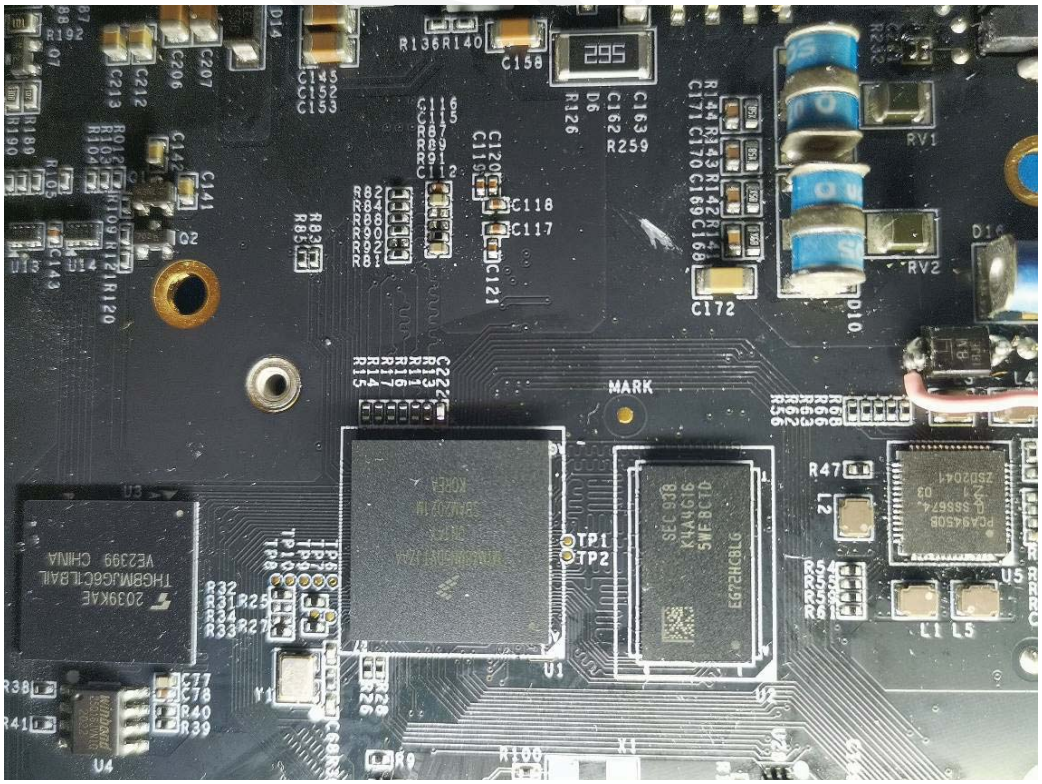
Chip 2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TP2
U1
U4
U5
RV1
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Chip 3


Milesight
Model: UGM1302-868
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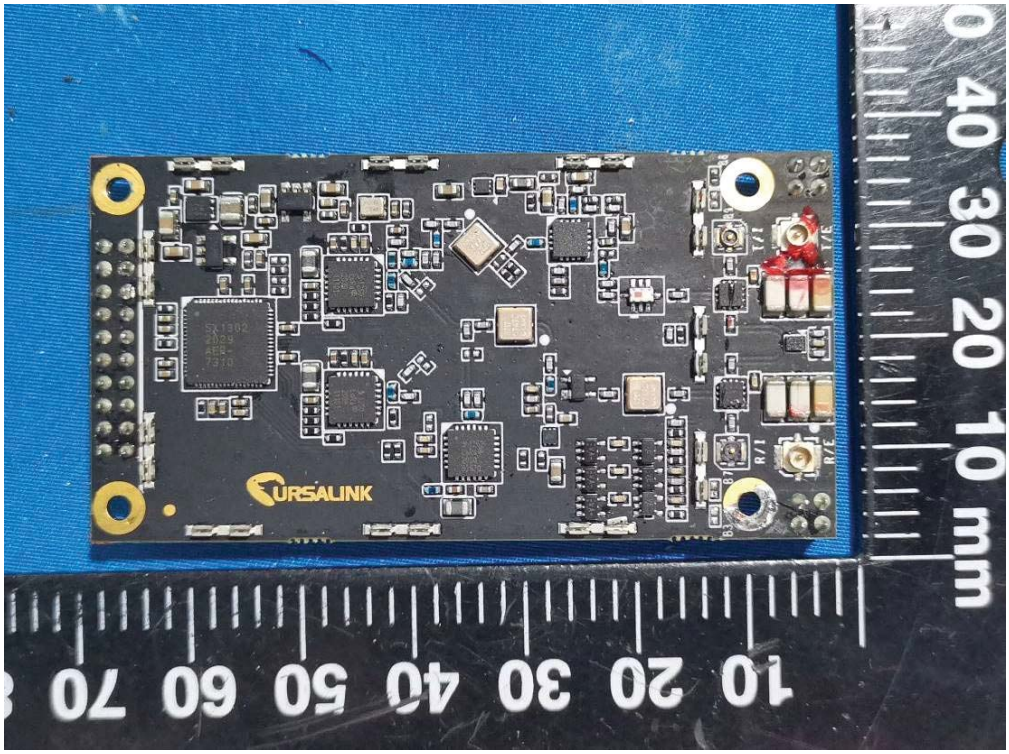
6 971203 363145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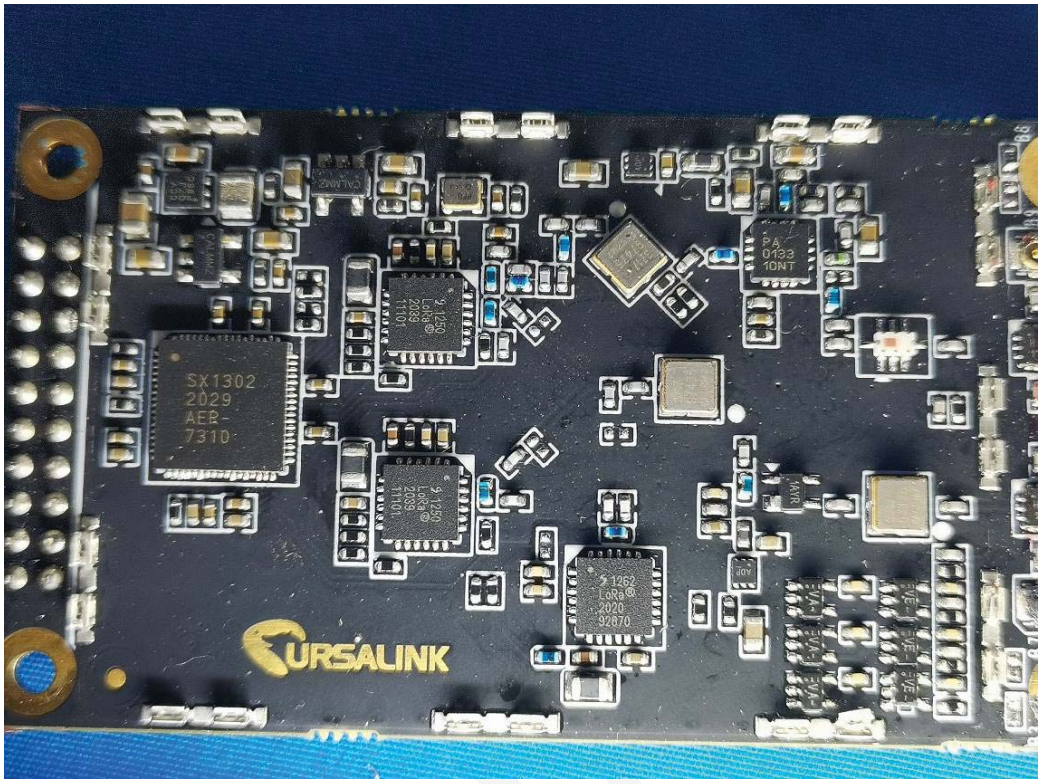
Chip 4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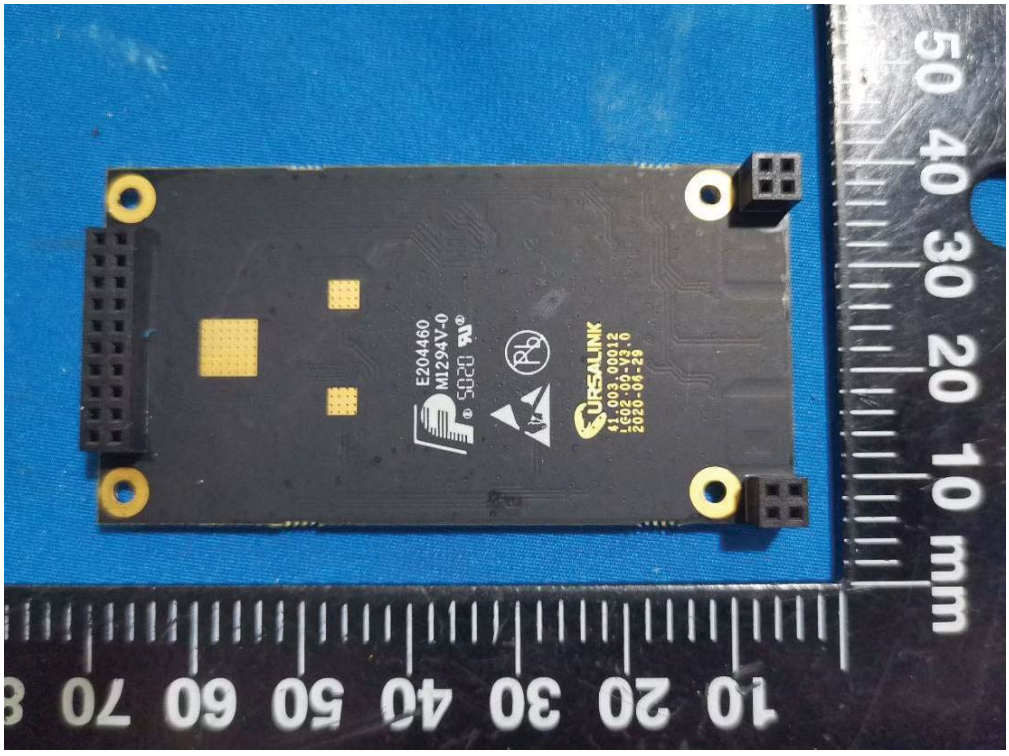
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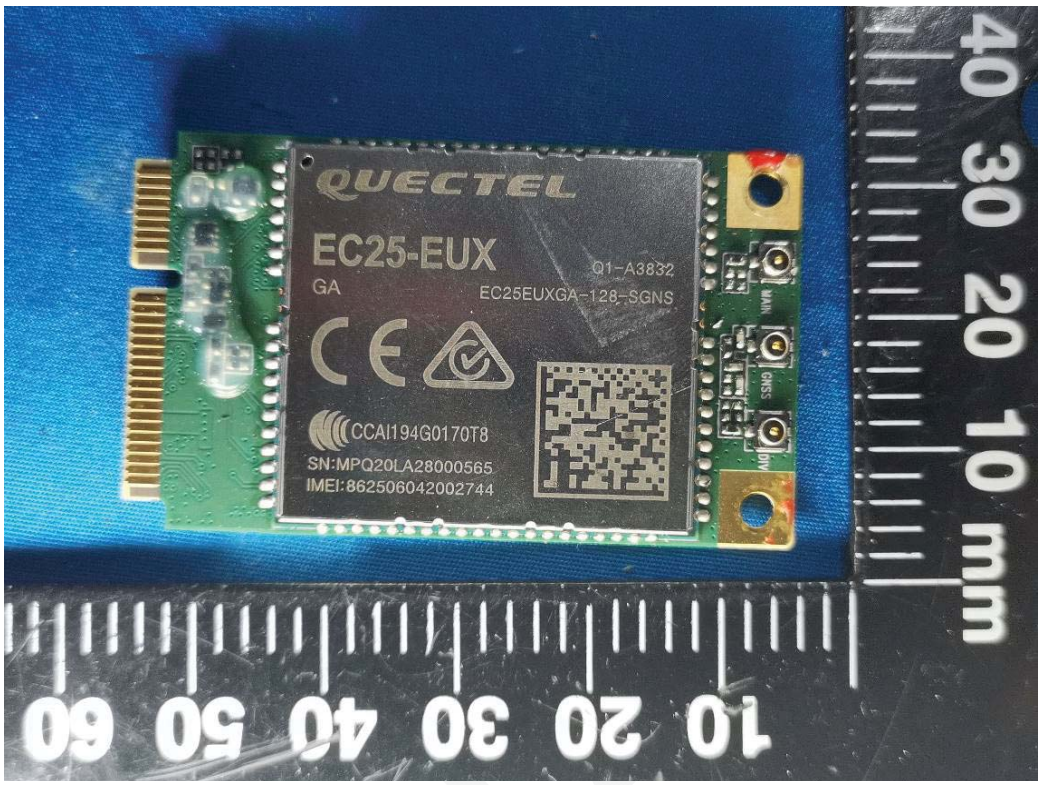
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AUX
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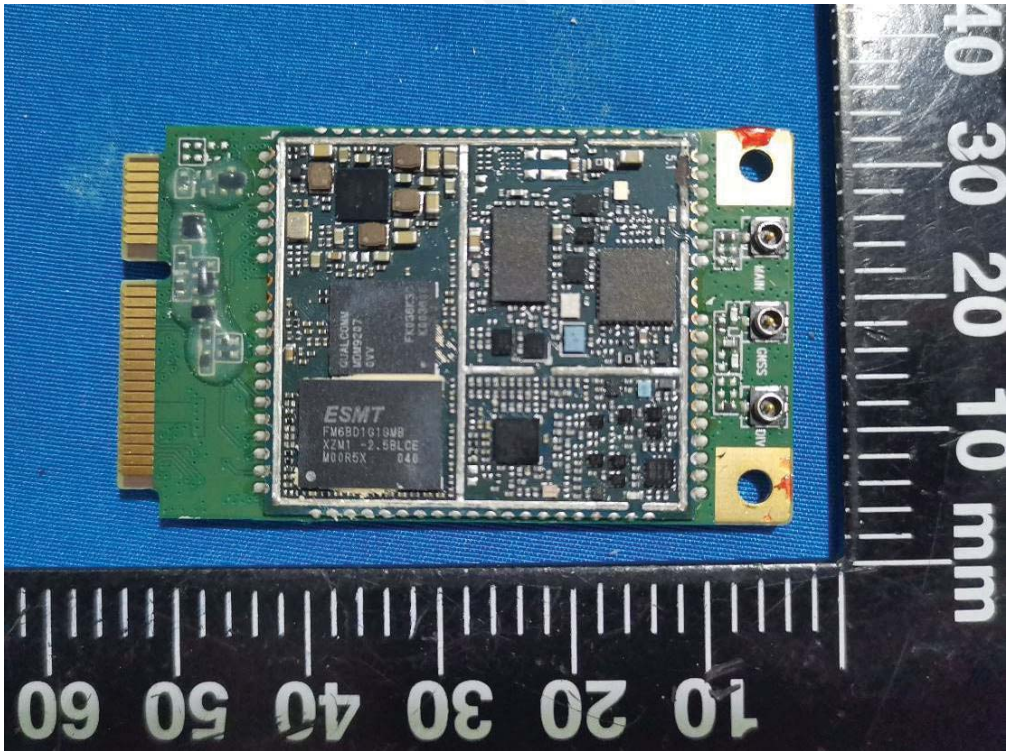
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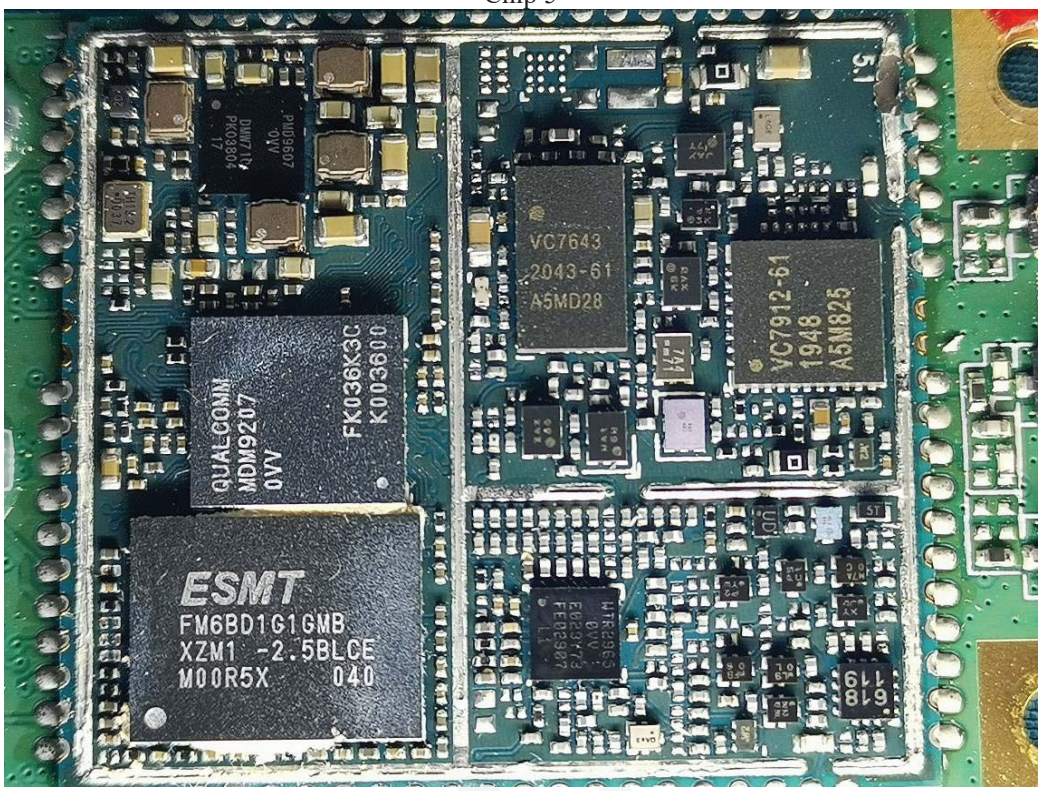
Chip 5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ESMT
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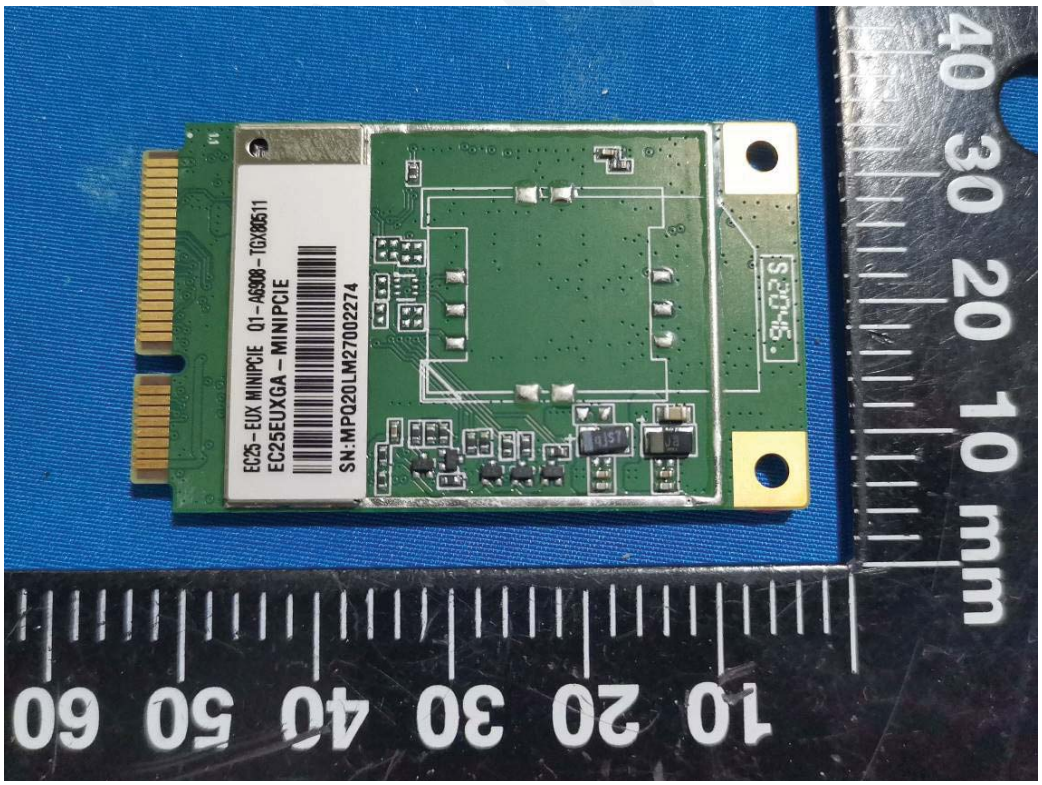
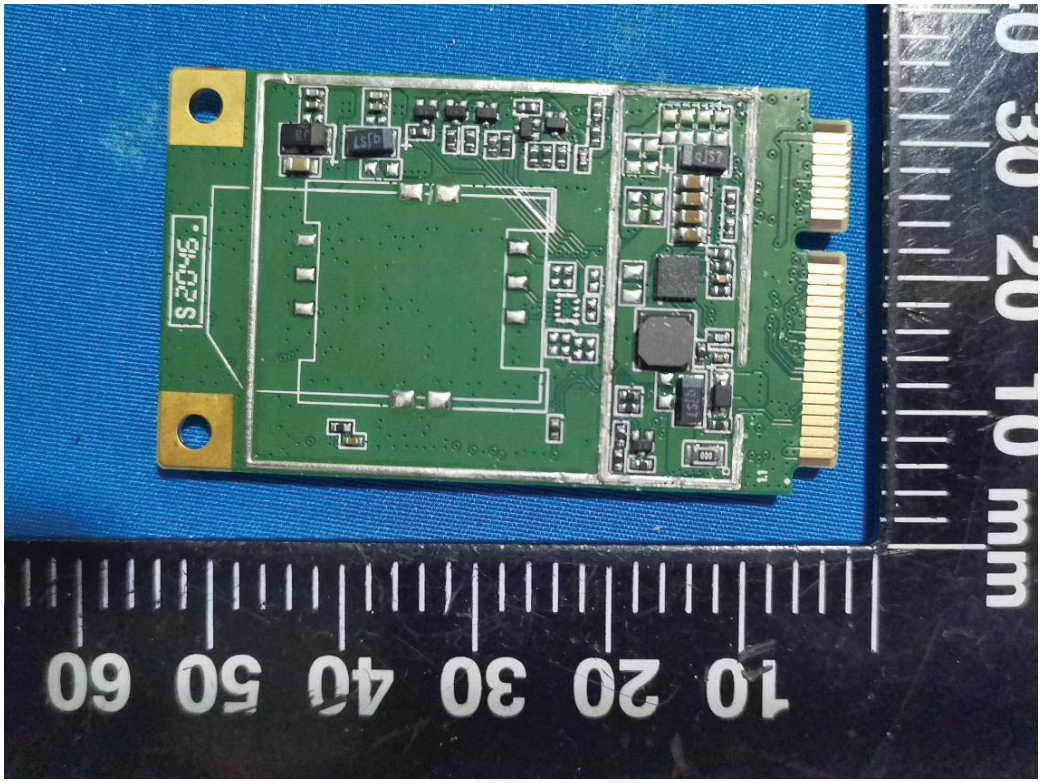
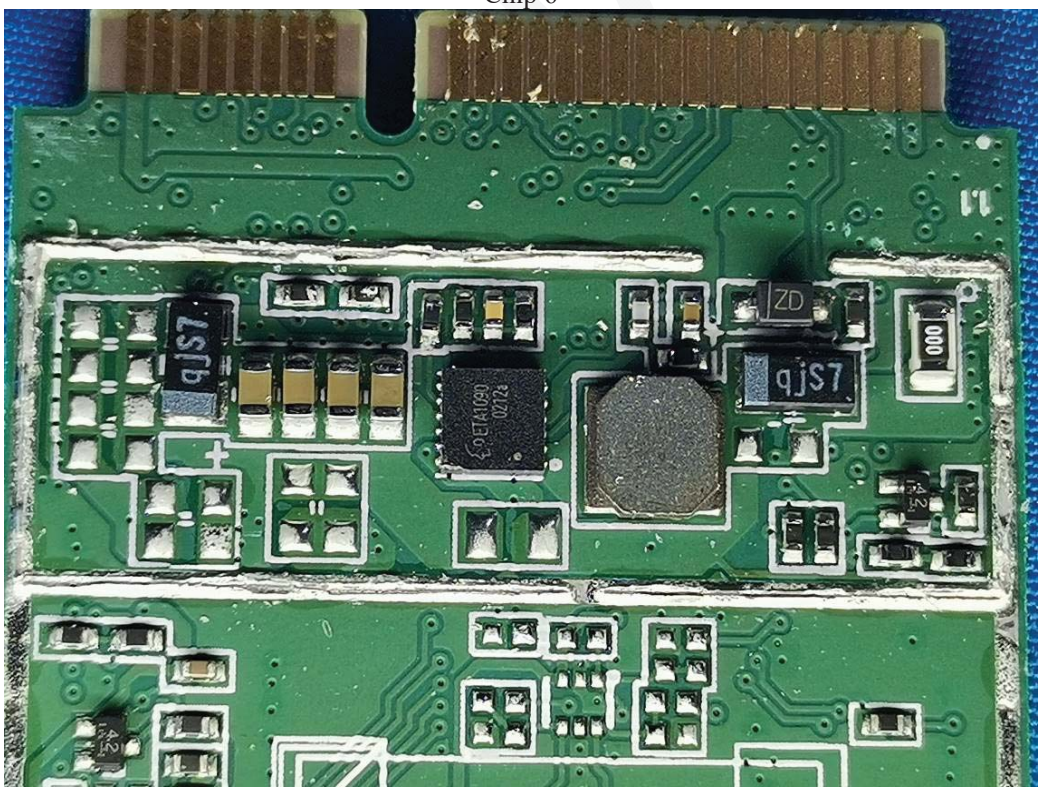
XZM1 -2.5BLCE
M00R5X 040
VC7643
2043-61
A5MD28
VC7912-61
1948
A5M825


EC25-EUX MINIPCIE 01-A6308-TGX80511
EC25EUXGA-MINIPCIE
SN:MPQ20LM27002274
40 30 20 10 mm
10 20 30 40 50 60



Chip 6

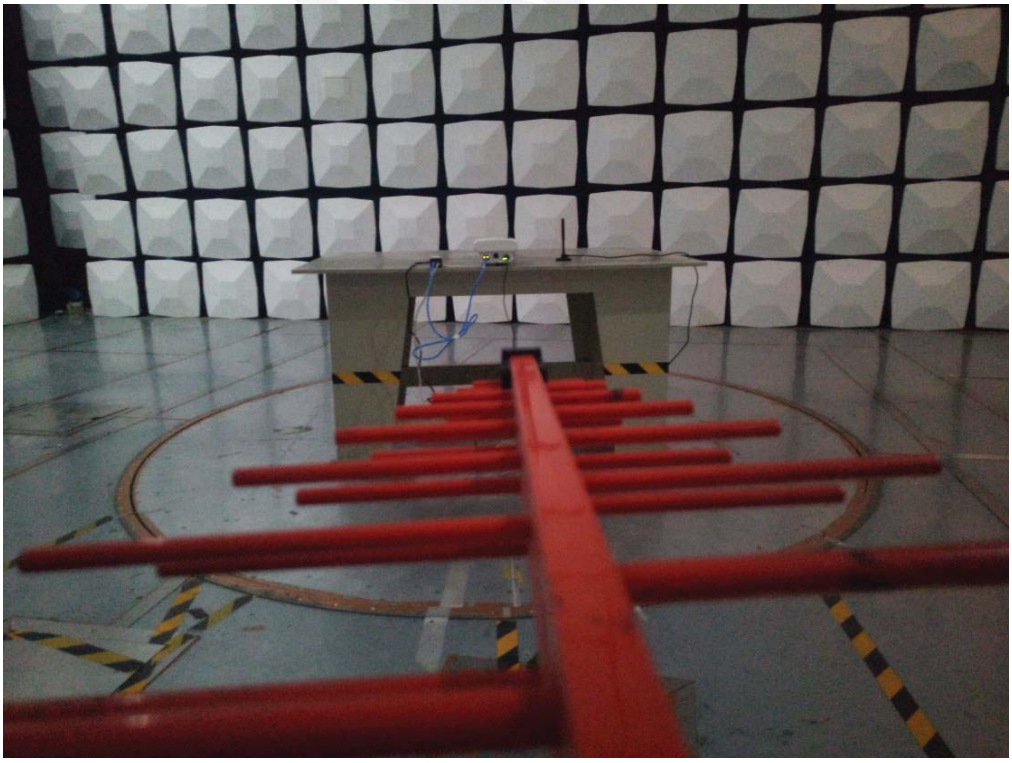


EXHIBITB – TEST SETUP PHOTOGRAPHS

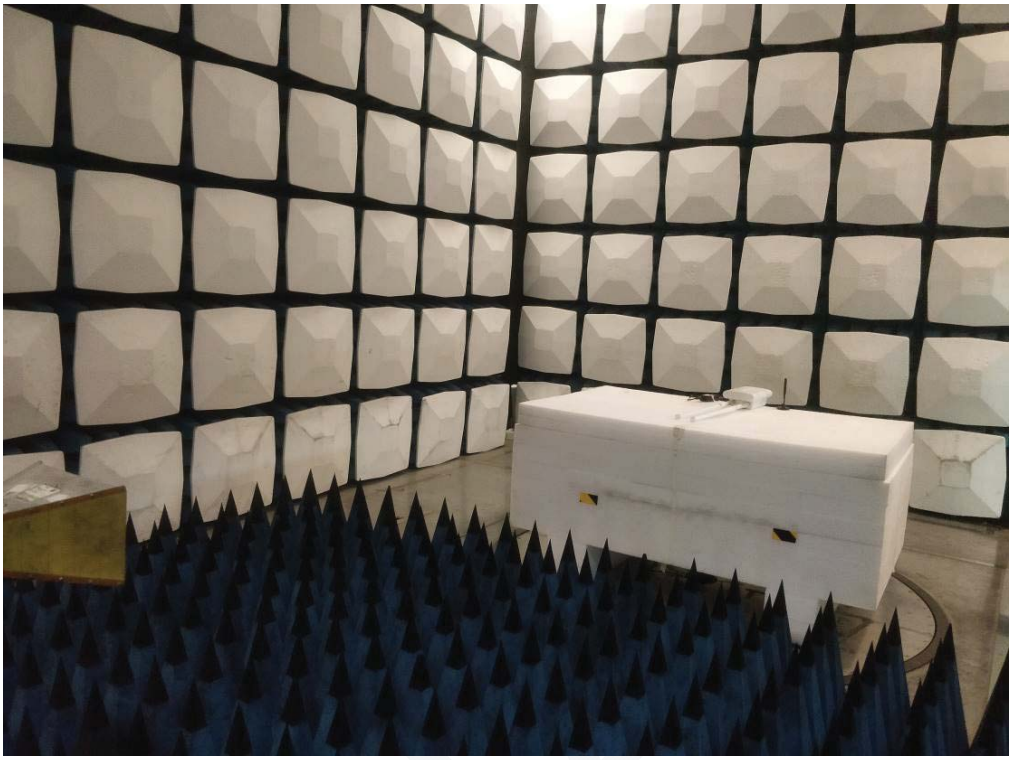
Radiated Emission

Radiated Emission Below 1GHz front View

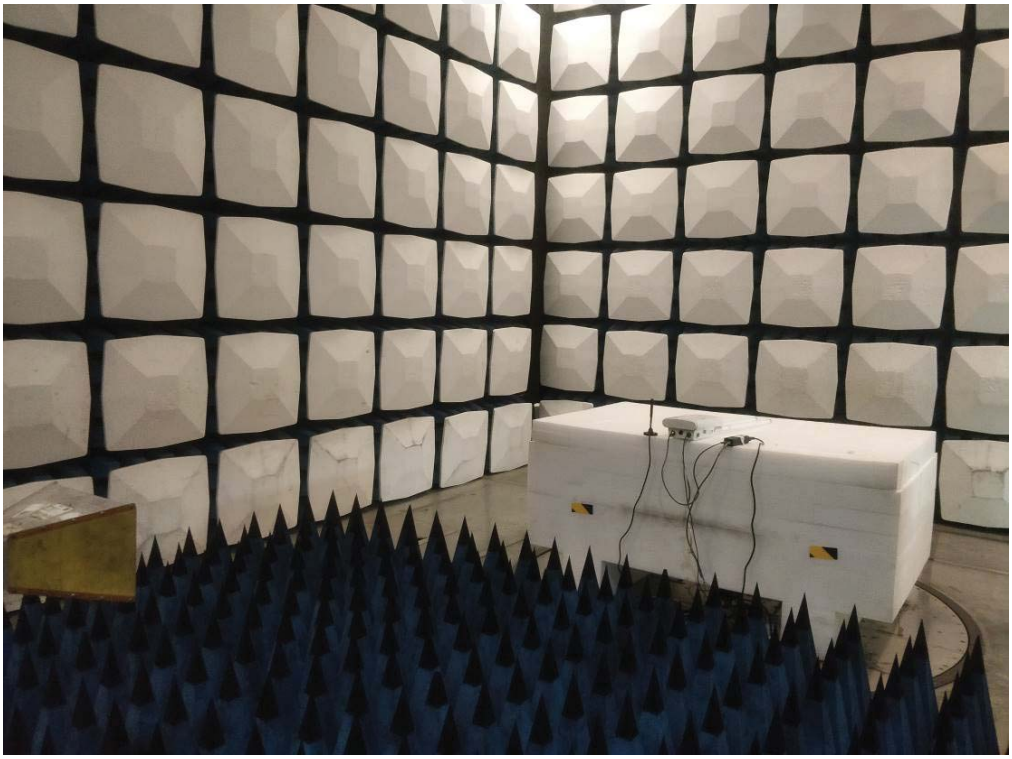
Radiated Emission Below1GHz rear View



Radiated Emission Above 1GHz front View



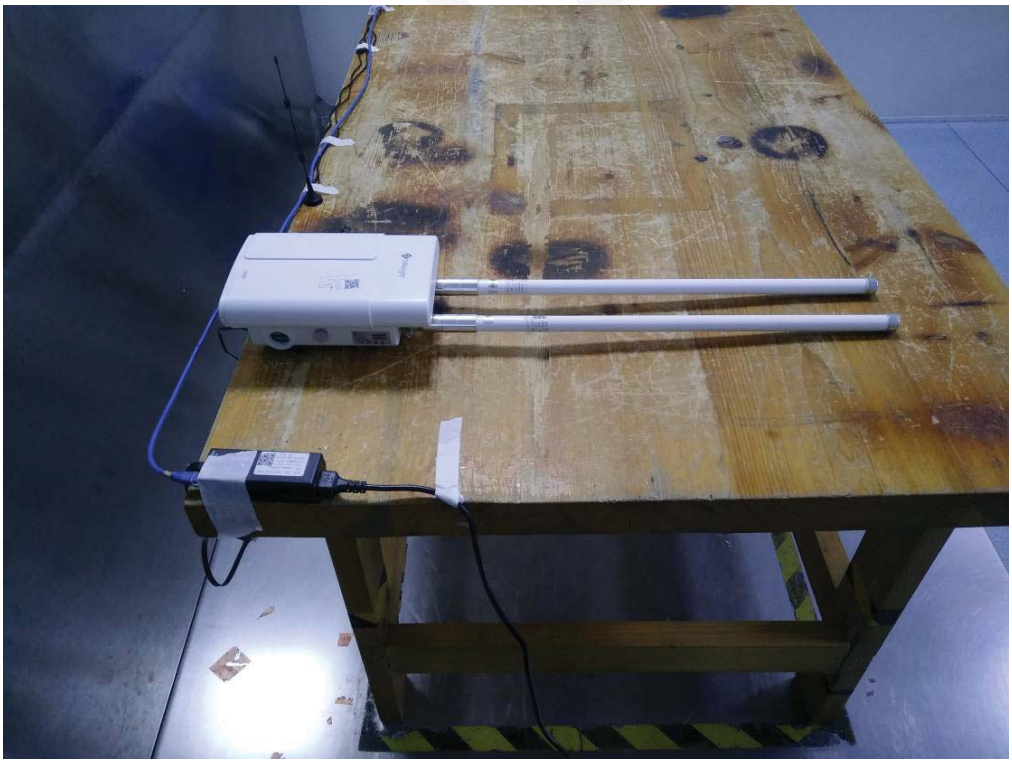
Radiated Emission Above1GHz rear View



Conducted Emissions_AC

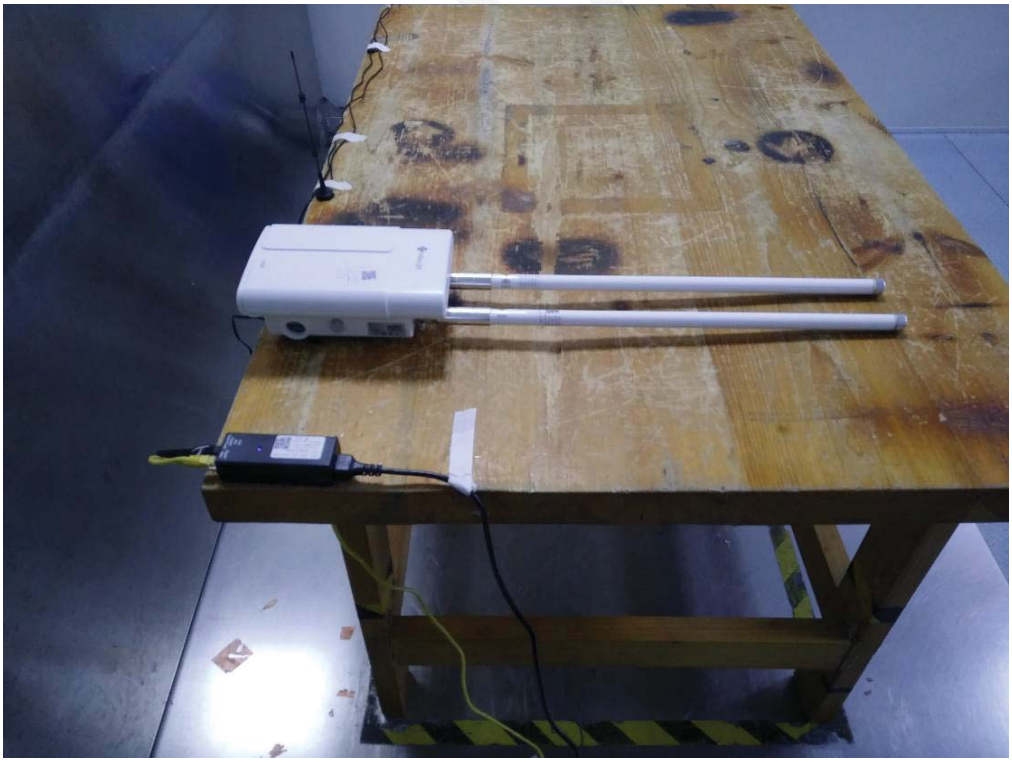
Conducted Emissions front View

Conducted Emissions side View



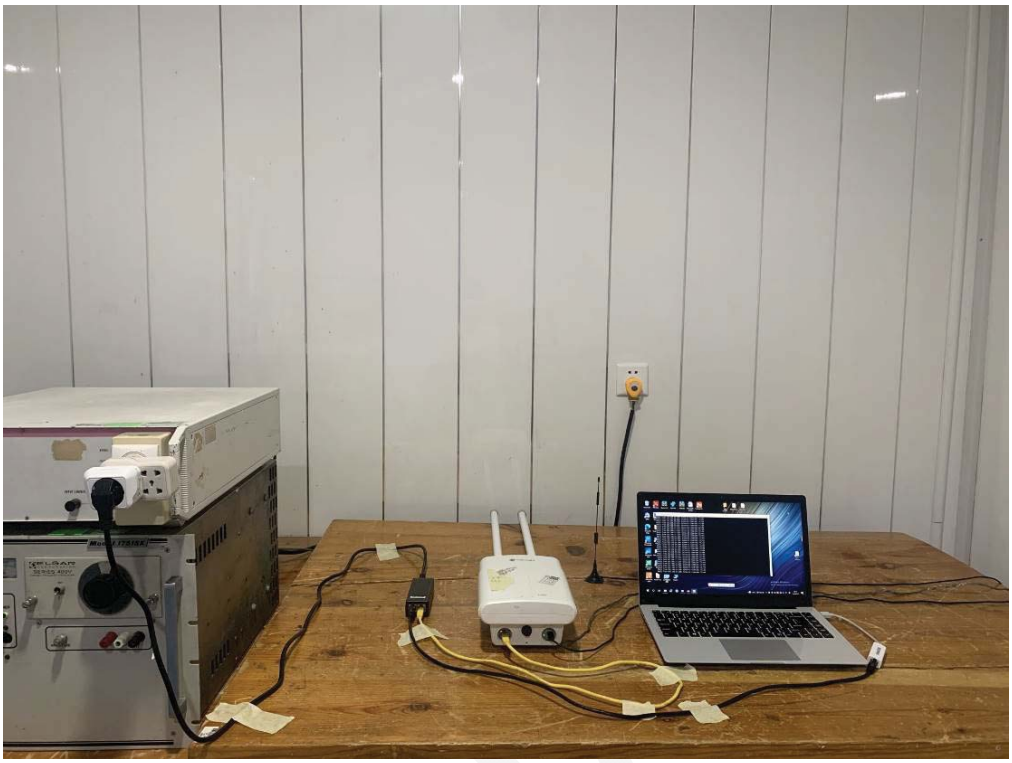
Conducted Emissions front ISN M2 View

Conducted Emissions side ISN M2 View



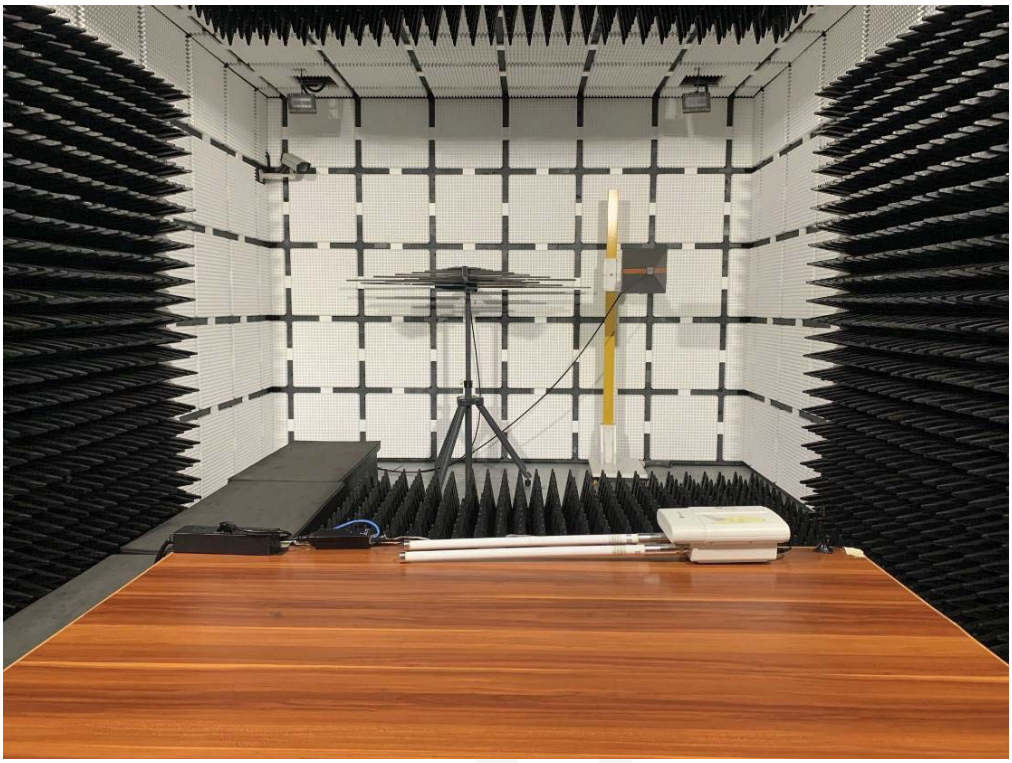
Flicker

Test Setup Photo View



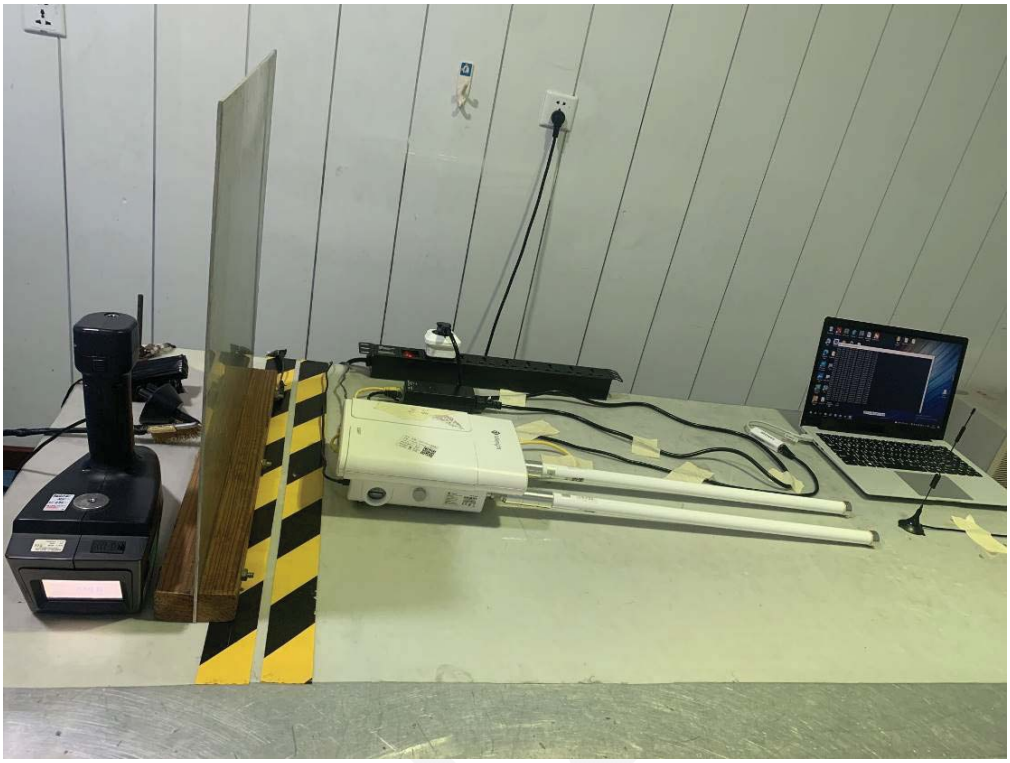
RS

Test Setup Photo View



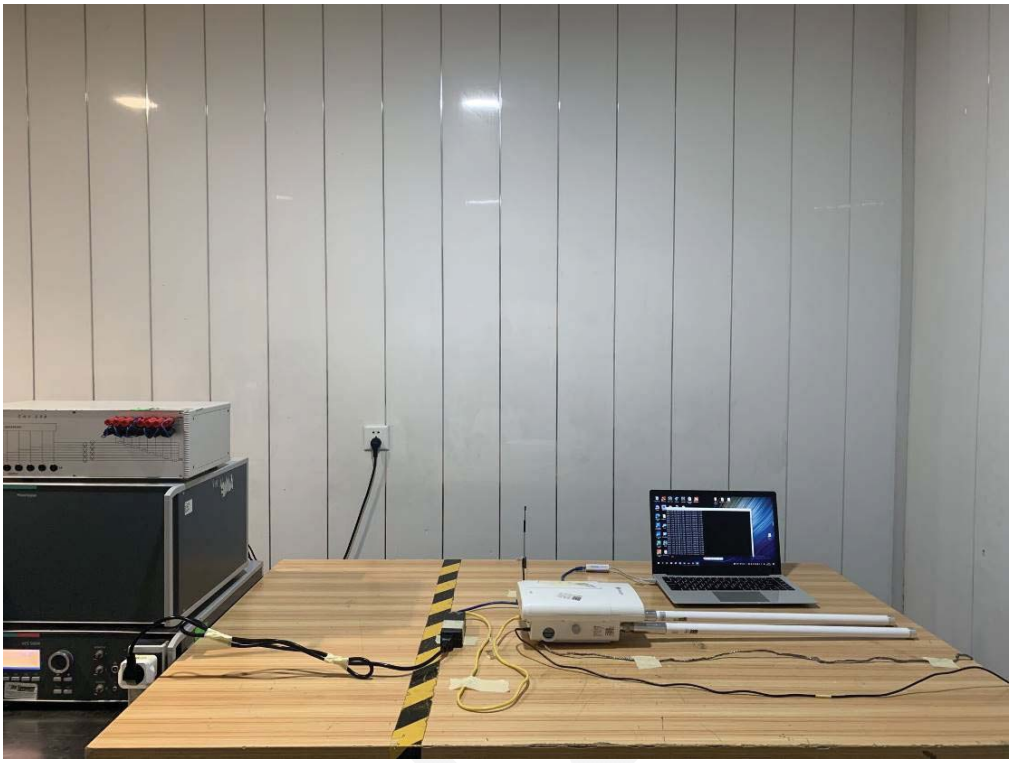
ESD

Test Setup Photo View

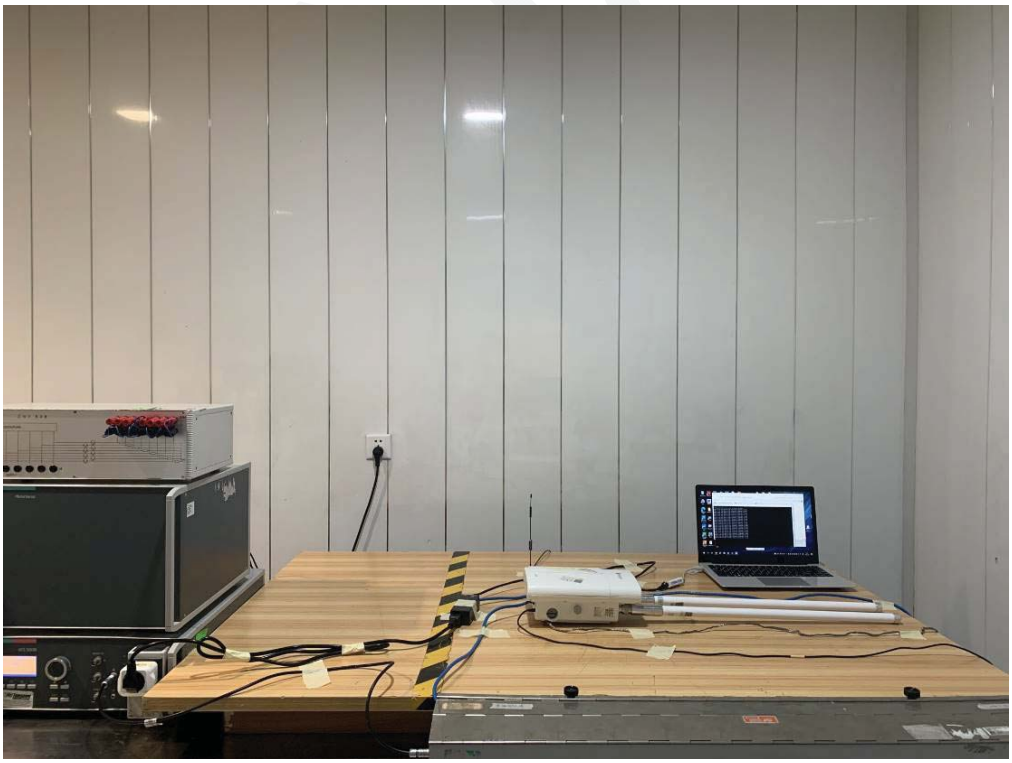


EFT

Test Setup Photo View

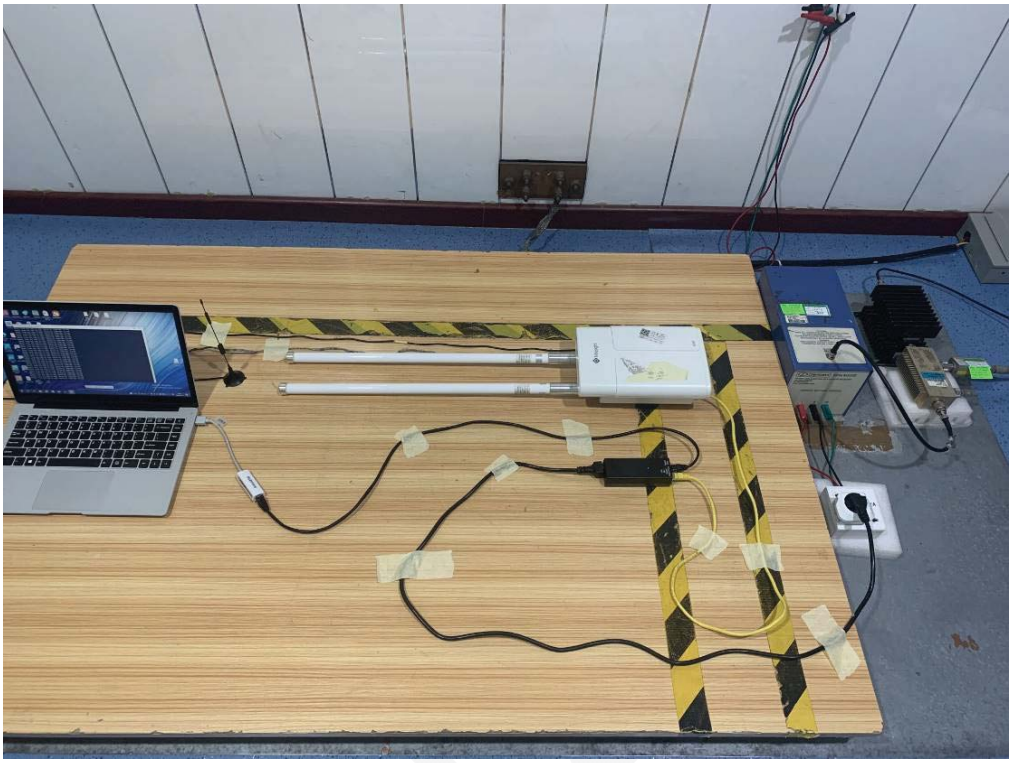


Signal Port Test Setup Photo

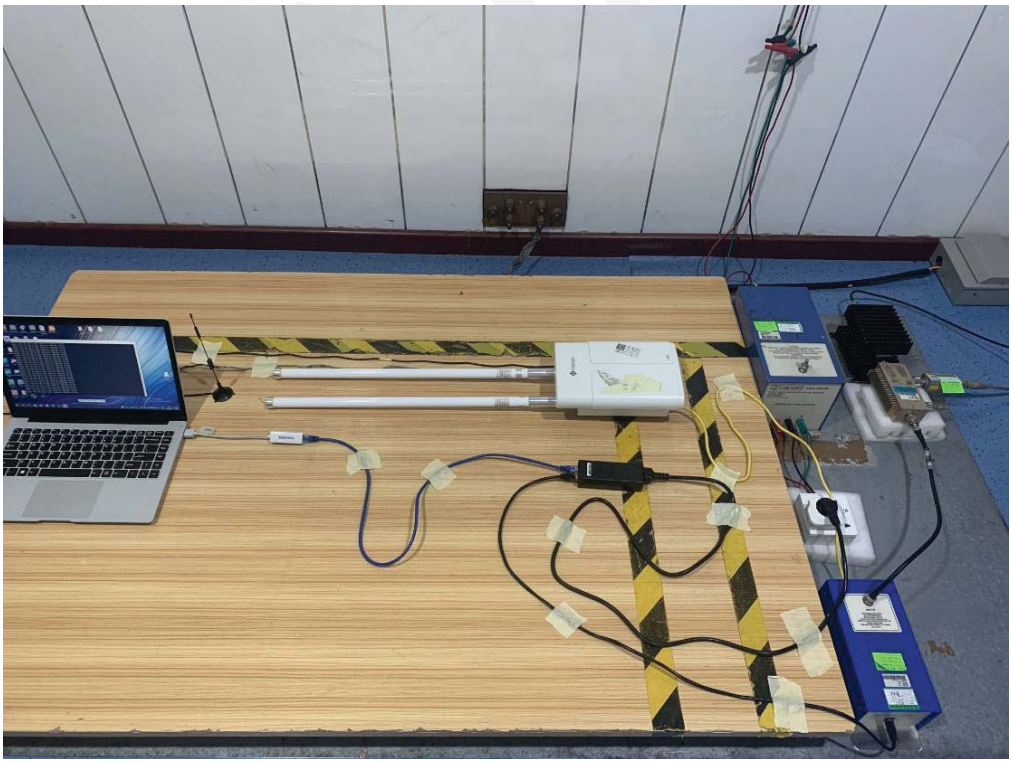


CS

Test Setup Photo View

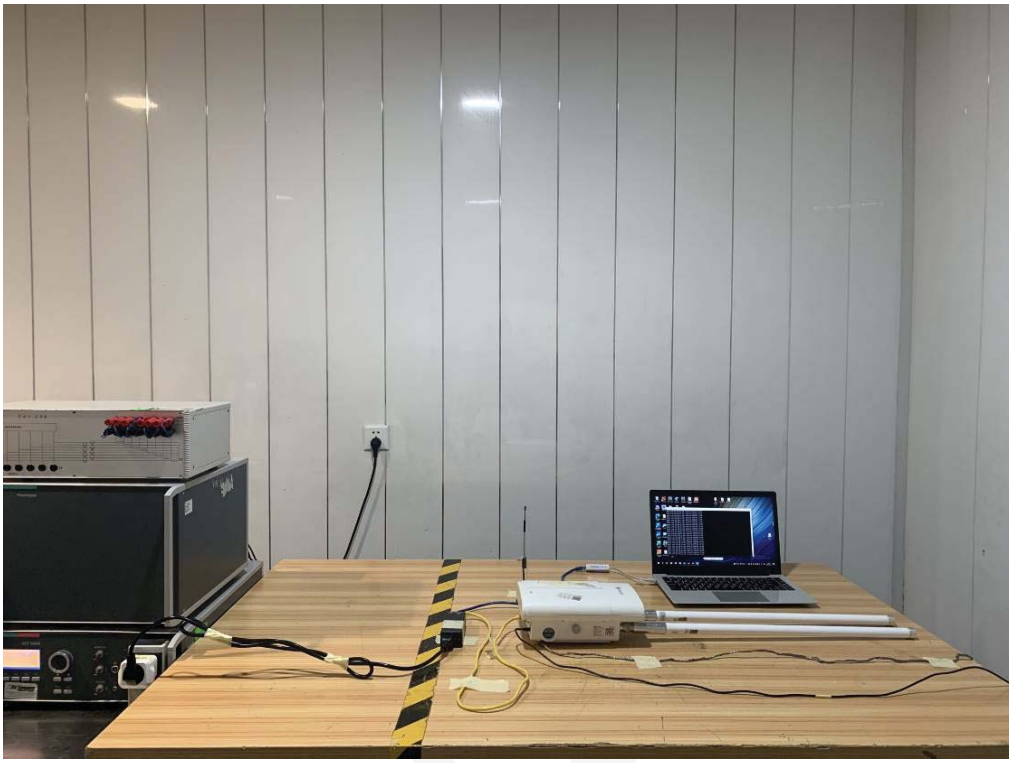


Signal Port Test Setup Photo



Dips

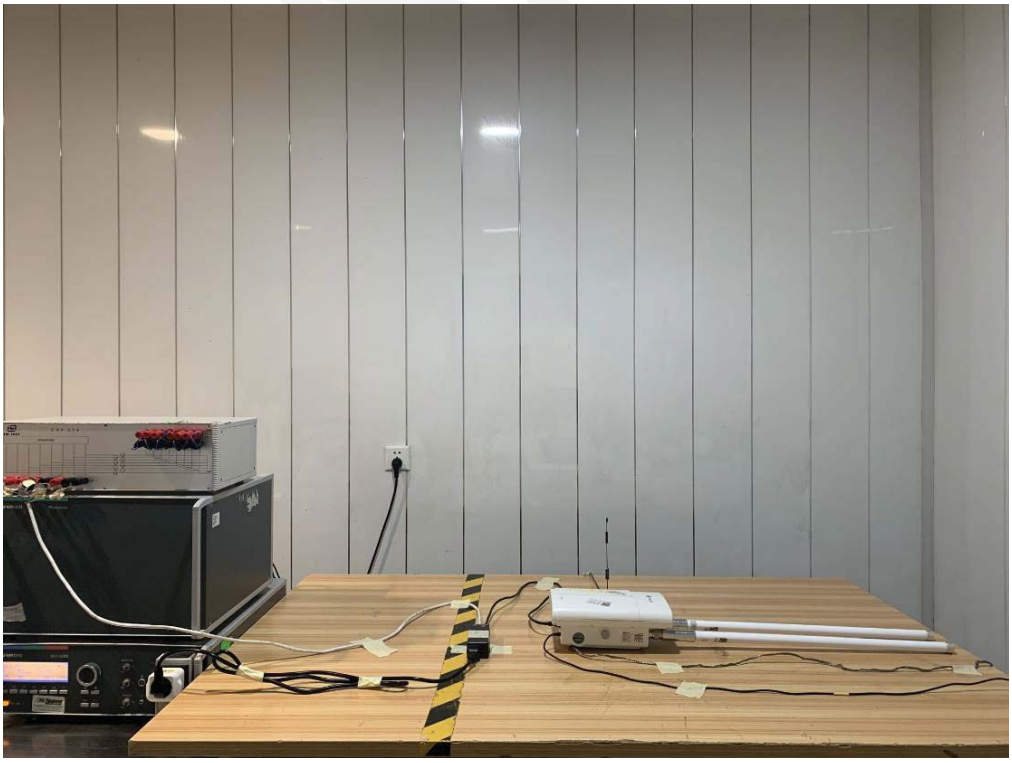
Test Setup Photo View



Surge

Test Setup Photo View

Signal Port Test Setup Photo



*******END OF REPORT*******