


<p>TEST REPORT</p> <p>EN IEC 62368-3</p> <p>Audio/video, information and communication technology equipment</p> <p>Part 3: Safety aspects for DC power transfer through communication cables and ports</p>	
Report reference No	XMDN220516-20736E-SF
Compiled by (+ signature)	Engineer: Jane Tao
Approved by (+ signature)	Team Leader: Eric Ding
Date of issue	2022-06-21
Testing laboratory	Bay Area Compliance Laboratories Corp. (Dongguan)
Address	No.12, Pulong East 1 st Road, Tangxia Town, Dongguan, Guangdong, China
Testing location	See above
Applicant's name	Xiamen Milesight Technology Co., Ltd.
Address.....	Building C09, Software Park Phase III, Xiamen 361024, Fujian, China
Manufacturer's name.....	Xiamen Milesight Technology Co., Ltd.
Address.....	Building C09, Software Park Phase III, Xiamen 361024, Fujian, China
Factory s name.....	N/A
Address.....	N/A
Standard	EN IEC 62368-3:2020 for use in conjunction with EN IEC 62368-1:2020+A11:2020
Test sample(s) received	2022-05-16
Test in period.....	2022-05-16 to 2022-05-20
Procedure deviation	N/A
Non-standard test method	N/A

Type of test object : LoRaWAN Gateway

Trademark : *Milesight*

Model/type reference : UG67-L04EU-868M, 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

Manufacturer..... : Xiamen Milesight IoT Co., Ltd.

Rating..... : EUT input: 56V  by PoE adapter

Copy of marking plate:

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.

Milesight
LoRaWAN Gateway
Model:UG67-L04EU-868M
Power Input:PoE 802.3 af
IP Address: 192.168.23.150
Username: admin
Password: password
FCC ID: 2AYHY-UG67
Contains FCC ID: XMR201909EC25AFX
IMEI: 861234567891234



Others models' label are the same as above, except the model name.

- The CE marking and WEEE symbol (if any) should be at least 5.0mm and 7.0mm respectively in height.
- Manufacturers shall ensure that the equipment bears a type, batch or serial number or other element allowing its identification.
- Manufacturers shall indicate on the electrical equipment their name, registered trade name or registered trade mark and the postal address at which they can be contacted.
- Importers shall indicate on the electrical equipment their name, registered trade name or registered trade mark and the postal address at which they can be contacted.

Test item particulars:	See referred EN IEC 62368-1 test report.
Supply Connection.....:	<input type="checkbox"/> AC Mains <input type="checkbox"/> DC Mains <input type="checkbox"/> Battery <input checked="" type="checkbox"/> External Circuit - not directly connected to the mains <input checked="" type="checkbox"/> ES1 <input type="checkbox"/> ES2 <input type="checkbox"/> ES3
Class of equipment.....:	<input type="checkbox"/> Class I <input type="checkbox"/> Class II <input checked="" type="checkbox"/> Class III
Equipment type.....:	<input type="checkbox"/> PSE power sourcing equipment <input checked="" type="checkbox"/> PD powered device <input type="checkbox"/> connected to ICT network <input type="checkbox"/> RFT circuit (remote feeding telecom circuit)
Possible test case verdicts:	
- test case does not apply to the test object.....:	N(N/A)
- test object does meet the requirement.....:	P(ass)
- test object does not meet the requirement.....:	F(ail)
General remarks:	
<p>”(see remark #)” refers to a remark appended to the report. (see appended table)” refers to a table appended to the report. The test results presented in this report relate only to the object tested. This report shall not be reproduced except in full without the written approval of the testing laboratory. Throughout this report a <input type="checkbox"/>comma/ <input checked="" type="checkbox"/>point is used as the decimal separator.</p>	

<p>Summary of testing: All tests were performed at the worst case and all test results complied with the standard on the cover page.</p>
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General product information:

1. The EUT is LoRaWAN Gateway, supplied by 56Vdc by PoE adapter.
2. All the circuits of EUT are considered as ES1 circuits.
3. All 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)	√	

All tests were performed on the model UG67-L04EU-868M, if no specified and the test results valid for others model.

4. The product was submitted and tested for use at the manufacturer's recommended ambient temperature (Tma) of 50°C.
5. Instructions and equipment marking related to safety is applied in the language that is acceptable in the country in which the equipment is to be sold.

ENERGY SOURCE IDENTIFICATION AND CLASSIFICATION TABLE:

See referred EN IEC 62368-1 test report.
The EN IEC 62368-1:2020+A11:2020 report No.: XMDN220516-20735E-SF-A1 issued by Bay Area Compliance Laboratories Corp. (Dongguan)

ENERGY SOURCE DIAGRAM

Indicate which energy sources are included in the energy source diagram. Insert diagram below

See referred EN IEC 62368-1 test report.
The EN IEC 62368-1:2020+A11:2020 report No.: XMDN220516-20735E-SF-A1 issued by Bay Area Compliance Laboratories Corp. (Dongguan)

OVERVIEW OF EMPLOYED SAFEGUARDS

See referred EN IEC 62368-1 test report.
The EN IEC 62368-1:2020+A11:2020 report No.: XMDN220516-20735E-SF-A1 issued by Bay Area Compliance Laboratories Corp. (Dongguan)

EN IEC 62368-3			
Clause	Requirement + Test	Result - Remark	Verdict
4	GENERAL REQUIREMENTS		P
	Equipment serving as a PD or a PSE using voltages at ES1 or ES2,	POE input port comply with ES1	P
	Equipment used as PSE or PD with proprietary connectors	No such proprietary connectors	N/A
	Equipment where a proprietary protocol is used to enable the power transfer	No such proprietary protocol	N/A
5	POWER TRANSFER USING ES1 OR ES2 VOLTAGES		P
5.1	General requirements		N/A
	Maximum rated output voltage of PSE (V)		—
	under conditions of no load (V)		—
	normal load (V)		—
	maximum rated load (V)		—
	Rated limits of intended communication systems:		N/A
	PD or PSE have the capability to both provide power and receive power		N/A
5.2	Electrical-caused injury, electrical sources and safeguards		N/A
	For a PSE classified as ES1 and ES2, the requirements of IEC 62368-1 clause 5.2 apply.		N/A
5.3	Electrical-caused fire, power sources and safeguards		N/A
5.3.1	Output power reduces the likelihood of ignition.		N/A
	Output current does not cause damage to communication cables, building wiring, and other devices including PD.		N/A
	PSE circuits comply with IEC 62368 1, Annex Q.1 requirements for limited power source (LPS).		N/A
	Interconnection of PSE circuits to other devices for DC power transfer via building wiring		N/A
	PSE maximum continuous current (A)		—
	Minimum wire gauge specified in the equipment installation instruction (mm ² or AWG)		—
	Current limits of minimum wire gauge (A)		—
	PD receives multiple PSE power inputs. PD implements power limiting in accordance with PS2 or IEC 62368-1, Annex Q		N/A
	PSE connected to external paired conductor cable having a minimum wire diameter of 0.4 mm (IEC 62368-1:2014, Table 14, ID 1 and 2 IEC 62368-1:2018, Table 13, ID 1 and 2)		N/A

EN IEC 62368-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Current limited to not more than 1.3 A.....:		—
5.3.2	DC power transfer interconnection to other equipment, where it is unknown that attached devices are likely to comply with IEC 62368-1, PSE circuit shall comply with requirements of IEC 62368-1 for PS2 or Clause Q.1		N/A
	Available output current under abnormal operating conditions and single fault conditions in the PSE does not exceed the specified fault current rating in power delivery specification.		N/A
	Fault current rating in power delivery specification (A).....:		—
	Available output current under abnormal operating conditions and single fault conditions in the PSE (A)..... :		—
	No prescribed maximum fault current specified for standardized interface. Available current not exceeding:		N/A
	8.0 A under any circumstances		N/A
	Circuits > 2 A, 130% for more than 5 s.....:		N/A
	Circuits ≤ 2 A, 150% for more than 5 s:.....:		N/A
5.4	Safeguards to protect against a single fault condition in the PSE		P
5.4.1	Requirement for the PSE		N/A
	PSE with a single output voltage		N/A
	Nominal rated output voltage (V)		—
	Single fault conditions output voltage (V).....:		—
	ES2 limit (DC 120V, 50V RMS, 70.7 V peak)		N/A
	PSE delivering a range of output voltages via negotiation with the PD		N/A
	Single fault conditions output voltage (V).....:		—
	Negotiated > 5 V, output 130% (min. 7.5 V)		N/A
	Negotiated ≤ 5 V, output 150%		N/A
5.4.2	Requirement for the PD		P
	Nominal rated input voltage (V).....:	56Vdc	—
	Nominal > 5 V, supplied with 130% (min. 7.5 V) :	72.8Vdc	P
	Nominal ≤ 5 V supplied with 150%.....:		N/A
	Any consequential failure of components in the PD	After test, no hazards.	P
6	Power transfer using RFT		N/A

EN IEC 62368-3			
Clause	Requirement + Test	Result - Remark	Verdict
6.1	General requirements		N/A
	Access to RFT circuit conductors is restricted to a skilled person		N/A
	Access by an instructed person is restricted in accordance with IEC 62368-1, clause 5.3.2.1 and 5.3.2.2		N/A
6.2	Connection to ICT networks		N/A
	RFT circuit directly connected to an ICT network:		N/A
6.3	Electrically caused injury		N/A
6.3.1.1.1	The current limits in 6.3.1.1.2 to 6.3.1.1.4 are inherently met.	See appended table 6.3.1.1	N/A
	The RFT-C circuit has a monitoring and control device that maintains the required current limits		N/A
6.3.1.1.2	Limits under normal operating conditions		N/A
	a) steady state current from supply equipment into ICT network under any load condition (mA)		N/A
	b) using a resistor of $2\,000\ \Omega \pm 2\%$, max. steady state current from one conductor of equipment through ICT network to earth (mA)		N/A
	c) RFT-C circuit is limited to voltage rating of ICT network wiring, if this voltage is known (V)		N/A
	d) RFT-C circuit voltage rating of insulation between conductors and from any conductor to earth is coordinated with max. RFT-C circuit supply equipment voltage (V)		N/A
6.3.1.1.3	Current measured under single fault conditions did not exceed the line-to-earth and line-to-line limits in Figure 1	See appended table 6.3.1.1	N/A
6.3.1.1.4	Current limits with one RFT-C conductor accidentally earthed, between the other conductor and earth measured through a $2\,000\ \Omega \pm 2\%$ resistor, under any external load condition		N/A
	Current not exceeding line-to-earth limits in Figure 1 with a limit of 25 mA after 10 s		N/A
	Open circuit voltage between other conductor and earth not exceeding maximum RFT-C circuit voltage determined in 6.3.1.1.2 c) and 6.3.1.1.2 d), after 2 s		N/A
6.3.1.2	RFT-V circuit limits	See appended table 6.3.1.2	N/A
6.3.1.2.1	Limits under normal operating conditions		N/A

EN IEC 62368-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Steady state open circuit voltage between earth and each RFT-V circuit conductor that normally connects to an ICT network, not exceeding (V) - 140 V DC: - 200 V DC with monitoring and control device in accordance with 6.3.1.2.3		N/A
	Voltage rating of insulation of RFT-V circuit receiving power via ICT network is suitable for - 400 V between conductors and - 200 V from any conductor to earth		N/A
6.3.1.2.2	Voltage limits within RFT-V circuit supply equipment under single fault conditions (see IEC 62368-1, clause B.4)		N/A
	with any conductor of RFT-V circuit that normally connects to ICT network being earthed (V).....:		—
	without any conductor of RFT-V circuit that normally connects to ICT network being earthed (V)		—
	Not exceeding Figure 2 limits during first 200 ms, measured across a 5 000 $\Omega \pm 2\%$ resistor with all load circuits disconnected		N/A
	Not exceeding 6.3.1.2.1 limits after first 200 ms		N/A
6.3.1.2.3	Voltage limits with one RFT-V conductor earthed, between the other conductor and earth:		N/A
	Not exceeding maximum RFT-V circuit supply voltage after 200 ms (V)		N/A
	For RFT-V circuits with normal open circuit voltage exceeding 140 V DC, current between the other conductor and earth not exceeding Figure 1 line-to-earth limits, measured through a 2 000 $\Omega \pm 2\%$ resistor, under any external load condition.....:		N/A
	This current not exceeding 10 mA DC after 10 s ...:		N/A
6.3.2	Accessibility to electrical energy sources and safeguards (See also IEC 62368-1, 5.3.2)		N/A
6.3.2.1	Accessibility for an ordinary person		N/A
	Adequate protection against contact with RFT circuits bare parts for all positions of the equipment wired and operated as in normal use.		N/A
	Not accessible: bare parts at ES3; and an ES3 basic safeguard		N/A
	Not accessible: bare parts at ES2, except for pins of connectors. However, such pins are not accessible under normal operating conditions by IEC 62368-1, Figure V.3 blunt probe		N/A

EN IEC 62368-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Protection achieved by insulation, guarding (electrical enclosure), interlocks	See appended table 4.1.2	N/A
6.3.2.2	Accessibility for an instructed person (See also IEC 62368-1, clause 4.3.3)		N/A
	Contact is possible with RFT circuit bare parts by the IEC 62368-1, Figure V.3 blunt probe		N/A
	RFT circuit bare parts so located or guarded that unintentional contact is unlikely.		N/A
6.3.2.3	Accessibility for a skilled person (See also IEC 62368-1, clause 4.3.4 and 5.3)		N/A
	RFT circuits bare parts located or guarded so that accidental shorting to ES1 or ES2 parts is unlikely		N/A
	Required guards easily removable and replaceable if necessary for servicing.		N/A
6.3.3	Safeguards		N/A
6.3.3.1	RFT circuits separated from other circuits and parts		N/A
	from other RFT circuits by functional insulation. If shorted, neither circuit exceeds 6.3.1.1 and 6.3.1.2 limits		N/A
	from other RFT circuits separated as if one was at ES3		N/A
	from earthed accessible parts, earthed ES1 circuits and earthed ES2 circuits by basic insulation		N/A
	from unearthed accessible parts, ES1, ES2 and ES3 circuits by one or both: • double insulation or reinforced insulation; • basic insulation, together with a conductive screen as protective bonding conductor.		N/A
6.3.3.2	Interconnection of equipment		N/A
6.3.3.2.1	General requirements.....		N/A
	Interconnecting cable containing more than one type of circuit.....		N/A
6.3.3.2.2	Interconnection between RFT circuits		N/A
	RFT-C circuits in supply equipment are connected to RFT-C circuits in other equipment		N/A
	RFT-V circuits in supply equipment are connected to RFT-V circuits in other equipment		N/A
6.3.4	Installation instructions for equipment using an RFT circuit do specify:		N/A
6.3.4 a)	RFT circuit voltage (V).....		N/A

EN IEC 62368-3			
Clause	Requirement + Test	Result - Remark	Verdict
6.3.4 b)	EUT effective capacitance between connection points		N/A
	1) for the ICT network conductors (nF).....:		—
	2) for ICT network one conductor and earth (nF):		—
6.3.4 c)	A system assessment shall be carried out at the time of installation, to ensure:		N/A
	Effective capacitance of the total system, including the capacitance of the EUT, does not exceed the values specified in Figure 3		N/A
6.3.4 d)	Checking is done that the voltage rating of ICT network wiring is adequate for normal RFT circuit voltage, together with superimposed transients ..:		N/A
6.3.4 e)	Checking is done that circuits to be connected together are either all RFT-C circuits or all RFT-V circuits		N/A
6.3.4 f)	Where an RFT circuit is directly connected to an ICT network, that the building cabling termination records are updated to indicate which terminals are used for an RFT circuit		N/A
6.4	Electrically caused fire		N/A
6.4.1	Classification of RFT power sources		N/A
6.4.1.1	RFT-C power source is a PS2 circuit (See IEC 62368-1, clause 6.2.2.5 or 6.2.2.6).....:		N/A
	RFT-C circuit limited by maximum current (60 mA) and maximum voltage (usually < 800 V).		N/A
	RFT-C circuits comply with requirements of 6.4.2.		N/A
6.4.1.2	RFT-V power source is a PS2 circuit (See IEC 62368-1, clause 6.2.2.5)		N/A
	RFT-V circuits comply with requirements of 6.4.2.		N/A
6.4.2	Fire protection requirements		N/A
	RFT circuit power in accordance with Table 1		N/A
	Output voltage (V)		—
	Maximum current (A)		—
	Maximum Power (W)		—
	Steady state current that can be supplied to ICT network complies with IEC 62368-1:2014, 6.5.3 IEC 62368-1:2018, 6.5.2		N/A

EN IEC 62368-3			
Clause	Requirement + Test	Result - Remark	Verdict

5.1	Table: Power transfer using ES1 or ES2 voltages. General requirements				N/A
Output Connector	Components	Output voltage V dc)			
		No load	Normal load	Max. rated road	Limits
--	--	--	--	--	--
--	--	--	--	--	--

Supplementary Information:

5.3.2	TABLE: DC power transfer interconnection to other equipment				N/A	
Note: Measured each port with maximum attainable current:						
Output Circuit	Components	Fault current rating (A)	Any circumstance (A)		More than 5 s (A)	
			Meas.	Limit	Meas.	Limit
--	--	--	--	--	--	--

Supplementary Information: Fault current rating: > 2 A, limit 130%, ≤ 2 A, limit 150%
Fault conditions tested: SC=Short circuit, OC=Open circuit

5.4.1	TABLE: Requirement for the PSE				N/A
Note: Measured U fault (V) with all load circuits disconnected:					
Output Circuit	Components	U nominal rated (V)	U fault (V)		Fault conditions tested
			Meas.	Limit	
--	--	--	--	--	--
--	--	--	--	--	--

Supplementary Information:
Fault conditions tested: SC=Short circuit, OC=Open circuit

5.4.2	TABLE: Requirement for the PD				P	
Note: Measured U input at PSE with all other load circuits disconnected:						
Input Circuit	Components	U nominal rated (V)	U input (V)		Observation	
			Meas.	Limit	Component	Hazard
56V POE	--	56Vdc	72.8	120	--	After test, no hazards.

Supplementary Information: Conditions tested: PD supplied with voltage above nominal rated input voltage.
Nominal > 5 V, supplied with 130% (min. 7.5 V)
Nominal ≤ 5 V supplied with 150%

EN IEC 62368-3			
Clause	Requirement + Test	Result - Remark	Verdict

6.3.1.1		TABLE: RFT-C circuit limits					N/A
No.	Supply Voltage	Location (e.g. circuit designation)	Test conditions	Parameters			
				U (V DC)	I (mA DC)	limit	
1	--	--	Normal load	--	--	60 mA	--
			Abnormal load	--	--	60 mA	
			To earth	--	--	2 mA	
			Single fault	--	--	60 mA	
			Single fault – to earth	--	--	25 mA	
2	--	--	Normal load	--	--	60 mA	--
			Abnormal load	--	--	60 mA	
			To earth	--	--	2 mA	
			Single fault –	--	--	60 mA	
			Single fault – to earth	--	--	25 mA	

Supplementary information:
 1) Current flow from the RFT-C CIRCUIT supply equipment into the TELECOMMUNICATION NETWORK
 2) Current flow from one conductor of the RFT-C CIRCUIT supply equipment through the TELECOMMUNICATION NETWORK to earth. Use of a resistor of 2000 $\Omega \pm 2\%$

6.3.1.2		TABLE: RFT-V circuit limits					N/A
No.	Supply Voltage	Location (e.g. circuit designation)	Test conditions	Parameters			
				U (V DC)	I (mA DC)	limit	
1	--	--	Open circuit	--	--	140 V	--
			Open circuit, monitored	--	--	200 V	
			Single fault – < 200 ms	--	--	Figure 2	
			Single fault – > 200 ms	--	--	140 V	
			Single fault – > 200 ms, monitored	--	--	200 V	
			Conductor earthed > 200 ms	--	--	Figure 1	
			Conductor earthed > 10 s	--	--	10 mA	
2	--	--	Open circuit	--	--	140 V	--
			Open circuit, monitored	--	--	200 V	

EN IEC 62368-3			
Clause	Requirement + Test	Result - Remark	Verdict

		Single fault – < 200 ms	--	--	Figure 2
		Single fault – > 200 ms	--	--	140 V
		Single fault – > 200 ms, monitored	--	--	200 V
		Conductor earthed > 200 ms	--	--	Figure 1
		Conductor earthed > 10 s	--	--	10 mA

Test Conditions:

Normal –

Abnormal -

Supplementary information: SC=Short Circuit, OC=Open Circuit

4.1.2	TABLE: List of critical components *					P
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity ¹	
--	--	--	--	--	--	
--	--	--	--	--	--	

Supplementary information: *See referred EN IEC 62368-1 test report.

The EN IEC 62368-1:2020+A11:2020 report No.: XMDN220516-20735E-SF-A1 issued by Bay Area Compliance Laboratories Corp. (Dongguan)

¹) Provided evidence ensures the agreed level of compliance. See OD-2039.

²) Description line content is optional. Main line description needs to clearly detail the component used for testing

EUT- Whole view



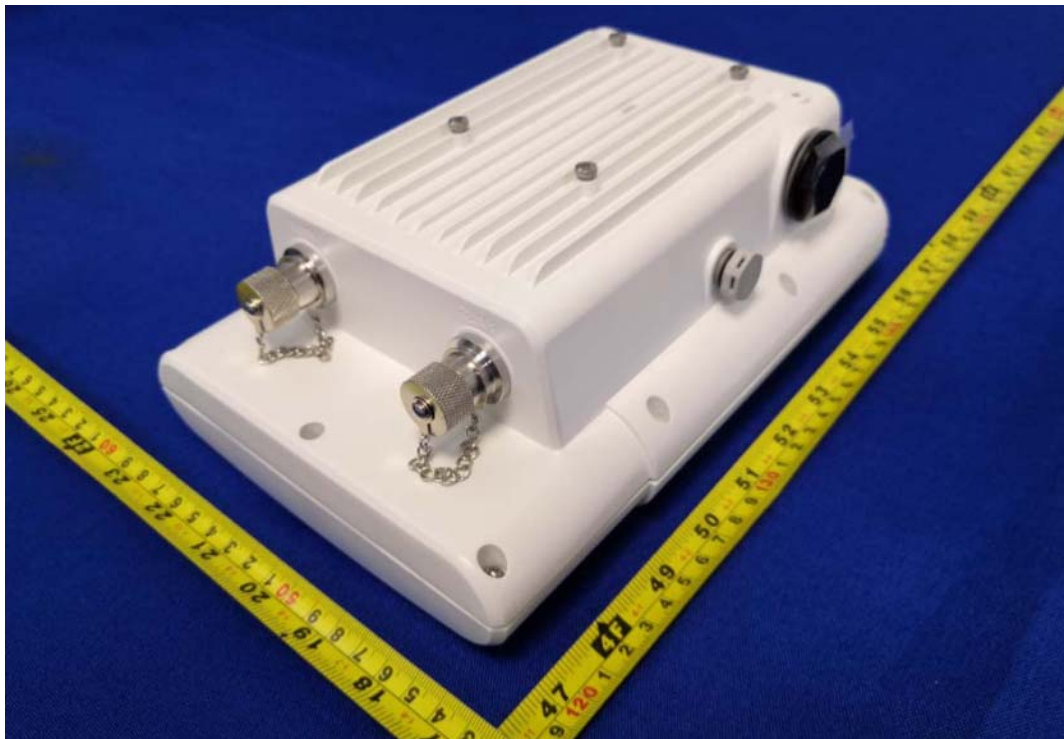
EUT- Top view



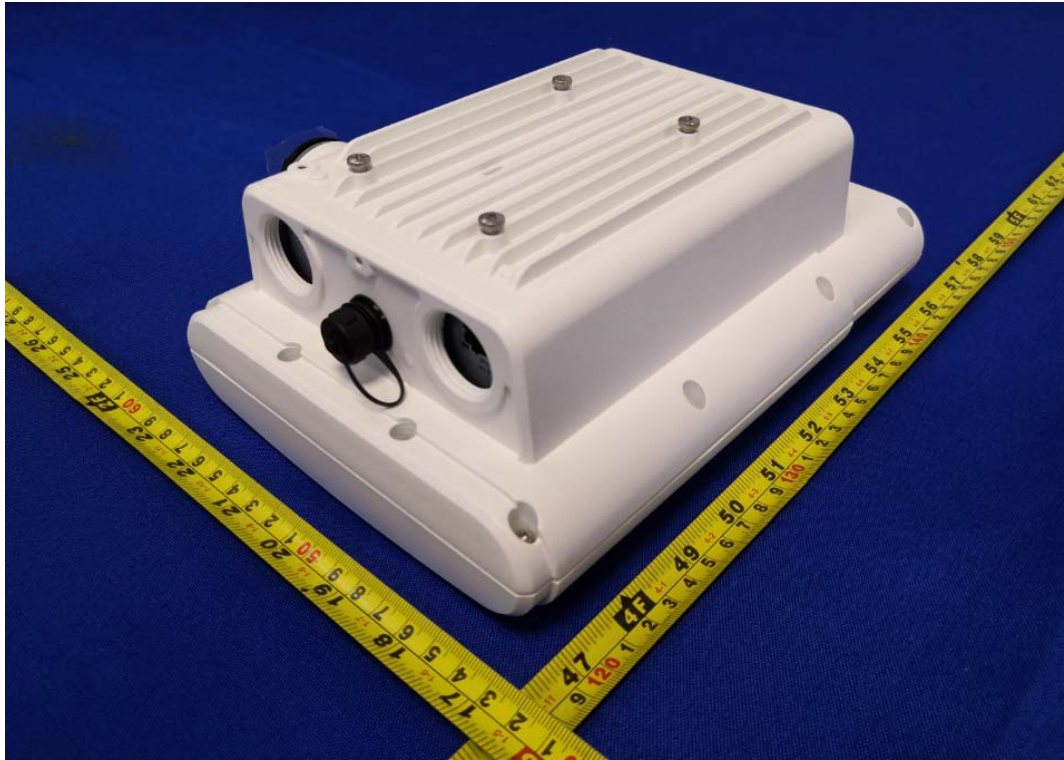
EUT- Bottom view



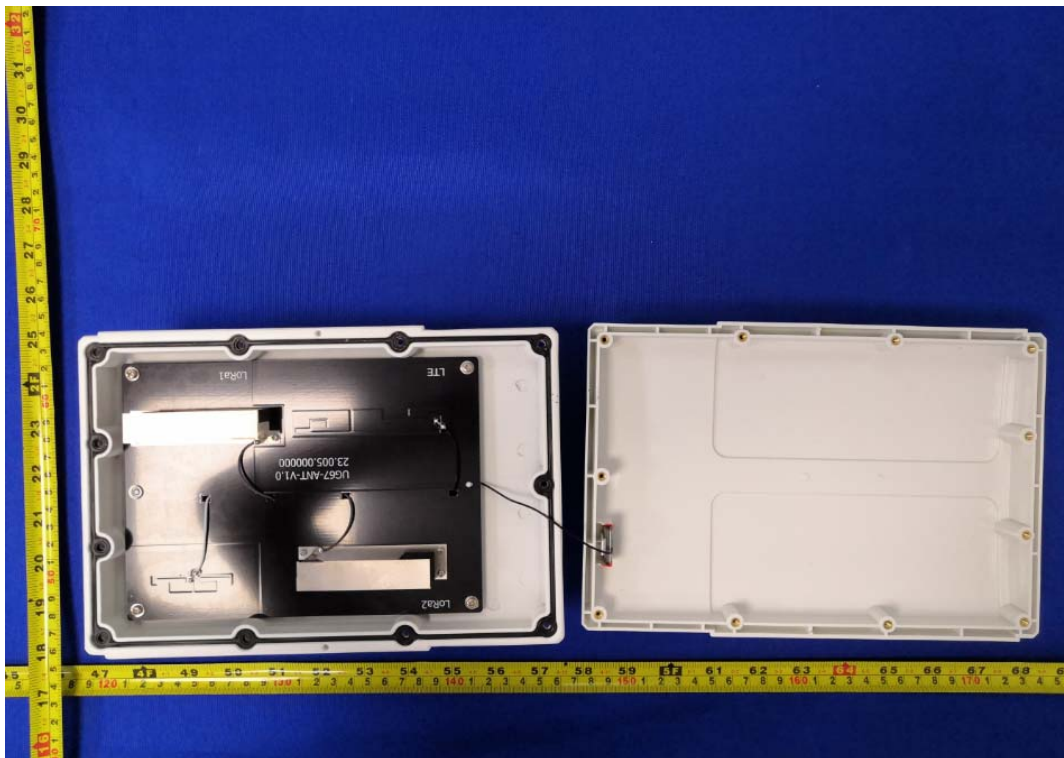
EUT- Side view



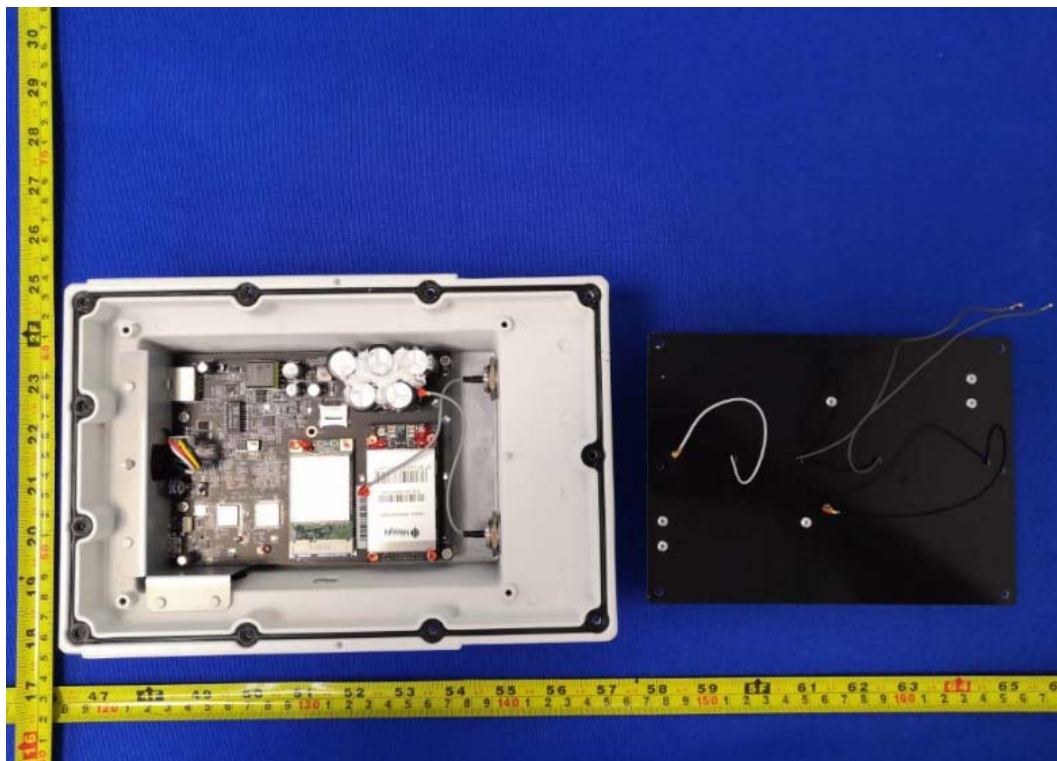
EUT- Side view



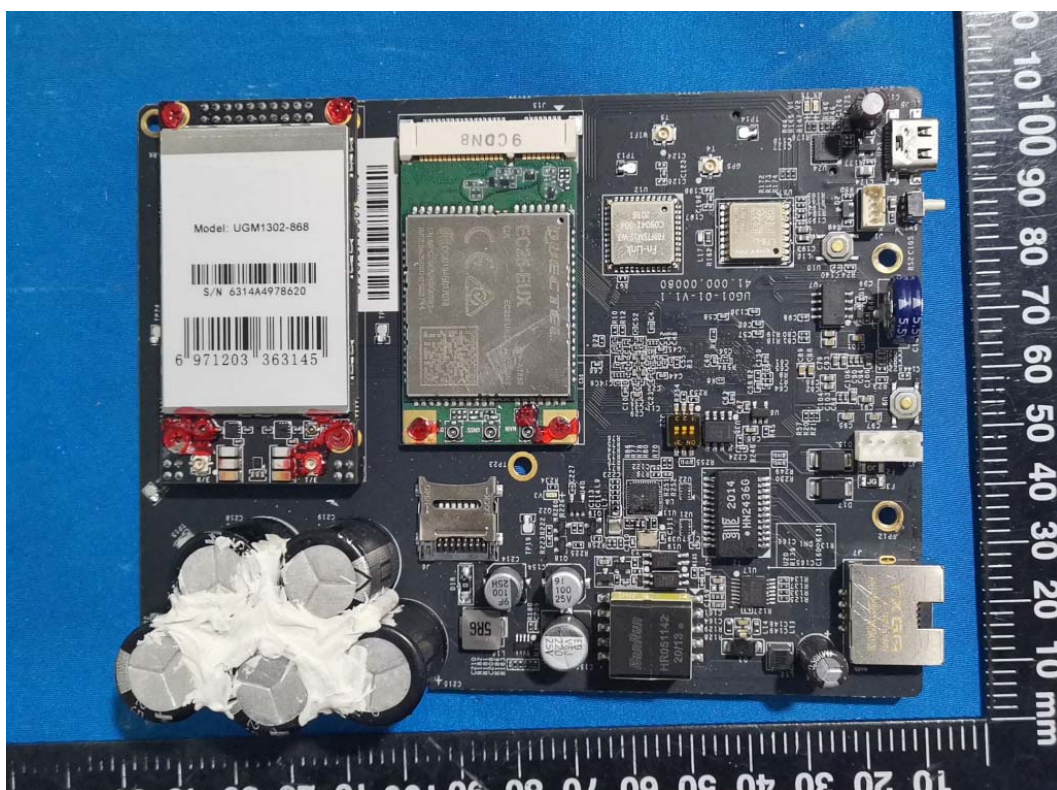
EUT- Uncover view



EUT- Internal view



EUT- PCB top view



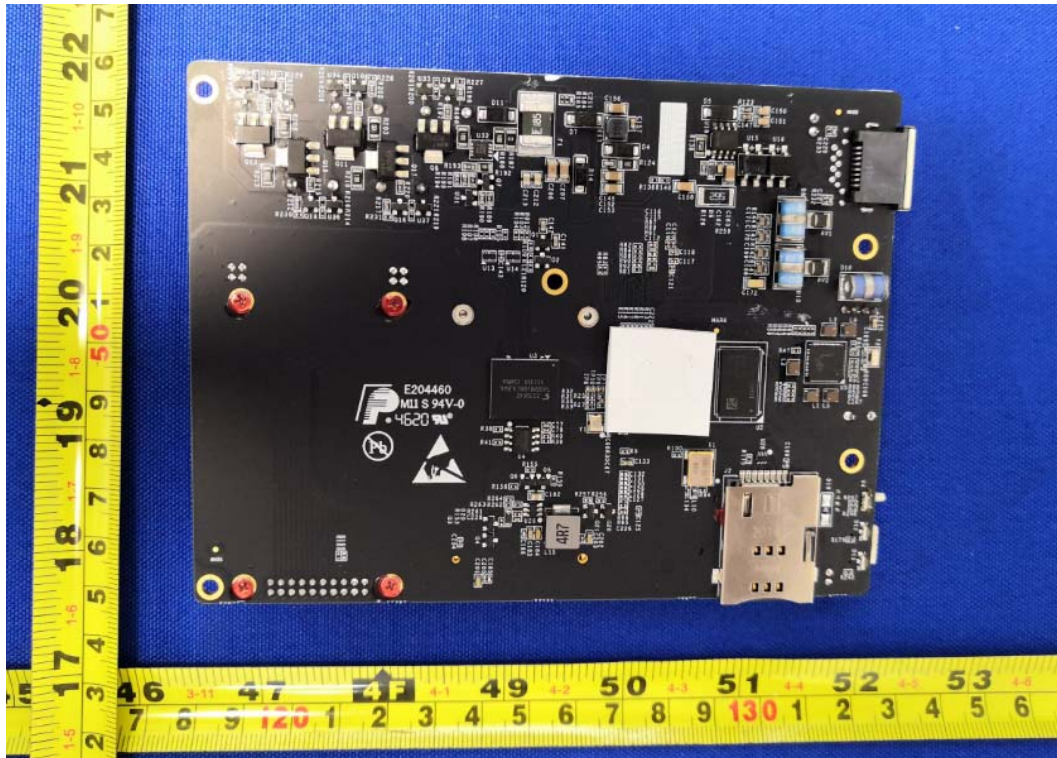
EUT- PCB top uncover view



EUT- UGM1302-868 view



EUT- PCB bottom view



EUT- PoE adapter view



EUT- PoE adapter label view



Directions

1. The information marked # is provided by the applicant, the laboratory is not responsible for its authenticity and this information can affect the validity of the result in the test report.
2. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.
3. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.
4. 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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*****End of Report*****