

Test Report issued under the responsibility of:

TEST REPORT
IEC 60601-1-2
Medical Electrical Equipment
PART 1-2: General Requirements for Basic Safety
and Essential Performance
Collateral Standard: Electromagnetic Compatibility

Report Reference Number.....:	MM/2021/70013
Project Reference Number.....:	PJ217232
Approved by(+signature)	Victor Wen 
	Reviewer _____
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Name of Testing Laboratory preparing the Report.....:	SGS Taiwan Ltd. Electromagnetic Compatibility Laboratory No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan
Applicant's name	MACHAN INTERNATIONAL CO., LTD.
Address	No. 352, Dama Rd., Waipu Dist., Taichung City 438023, Taiwan
Test specification:	
Standard.....:	IEC 60601-1-2:2014 (Fourth Edition) EN 60601-1-2:2015 BS EN 60601-1-2:2015
Test procedure	Test Scheme
Non-standard test method	N/A
Test Report Form No.:	SGS_IEC 60601-1-2:2014
Test Report Form(s) Originator:	UL
Master TRF.....:	Dated 2014-12
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Test item description	Proximity Lock
Trade Mark	
Manufacturer	MACHAN INTERNATIONAL CO., LTD.
Model/Type reference	EX-series-Proximity Lock, MX-series-Proximity Lock, SC-series-Proximity Lock, LX-series-Proximity Lock, NC-series-Proximity Lock
Model/Type difference	The model(s) difference are outlook appearance, dimension, decoration. According to manufacturer provide information and EMC technical judgement, above variations could not affect EMC characteristic, no necessary to perform added model spot check test.
Ratings	DC 9 V (Batt.) DC 5 V (From PC USB)
Summary of testing:	
Tests performed (name of test and test clause):	Testing location:
Conducted Emission (IEC 60601-1-2:2014, clause 7.1.1)	SGS Taiwan Ltd. Electromagnetic Compatibility Laboratory
Radiated Emission (IEC 60601-1-2:2014, clause 7.1.1)	No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan
ESD (IEC 60601-1-2:2014, clause 8.9)	
RS_Radiated RF EM fields (IEC 60601-1-2:2014, clause 8.9)	
RS_Proximity fields from RF wireless communications equipment (IEC 60601-1-2:2014, clause 8.9)	
PFMF (IEC 60601-1-2:2014, clause 8.9)	
Summary of compliance with National Differences:	
List of countries addressed	
None	

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Test item particulars : None	
Classification of installation and use : Portable	
Supply Connection : N/A (From DC Battery 1.5 V X 6)	
Possible test case verdicts:	
- test case does not apply to the test object..... : N/A	
- test object does meet the requirement..... : P (Pass)	
- test object does not meet the requirement..... : F (Fail)	
Testing :	
Date of Sample Receipt : Jul. 30, 2021	
Date (s) of performance of tests : Dec. 07 ~ 27, 2021	
General remarks:	
"(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report.	
Throughout this report a <input type="checkbox"/> comma / <input checked="" type="checkbox"/> point is used as the decimal separator.	
Manufacturer's Declaration per sub-clause 4.2.5 of IEC60335-1:	
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> Not applicable
When differences exist; they shall be identified in the General product information section.	
Name and address of factory (ies) : MACHAN INTERNATIONAL CO., LTD. No. 352, Dama Rd., Waipu Dist., Taichung City 438023, Taiwan	

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1.1 Equipment Description

This is a mobile equipment cabinet to put or load medical equipment and physiologic monitoring systems and other related accessories. It is used for nursing ambulances and hospitals and clinics. Caregivers can scan personal ID cards to identify the users of the nursing desk.

1.1.1 Equipment 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.)

N/A

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1.1.2 Supporting Equipment Used During Test:

Use*	Product Type	Manufacturer	Model	Comments
AE	Notebook	Lenovo	LP40	N/A
AE	Battery	Panasonic	R14NT	N/A

Note: * Use one of the following:
 EUT - Equipment Under Test
 AE - Auxiliary/Associated Equipment
 SIM - Simulator (Not Subjected to Test) *Note: Use abbreviations:

1.1.3 Input/output Ports:

Port No.	Name	Type*	Cable Max. >3m	Cable Shielded	Comments (Sip/Sop lines must include description of use)
0	Enclosure	N/E	—	—	-
1	Micro USB Cable-①	SOP	1.2m	Shielding	Connect the connector to the computer
2	Micro USB Cable-②	SOP	0.3m	Shielding	Connect to the EUT I/O port

Supplementary information:
 *Note: AC = AC Power Port DC = DC Power Port N/E = Non-Electrical Batt=Battery
 Sip/Sop = Signal Input/output Port PC – Patient-Coupled Cable
 TP = Telecommunication Ports

1.1.4 EUT Internal Operating Frequencies:

Frequency (MHz)	Description	Frequency (MHz)	Description
N/A	N/A	N/A	N/A
-	-	-	-
-	-	-	-

Supplementary information:
 None

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1.1.5 Power Interface

Mode No.	Voltage (V)	Current (A)	Power (W)	Frequency (DC/AC-Hz)	Phases (No.)	Comments
Rated	DC 9	-	-	-	1	DC Battery 1.5 X 6 V
Supplementary information: None						

1.2 EUT Operation Modes

Mode #	Description
1	Operation + RFID
2	Data Link
Supplementary information: None	

1.3 EUT Configuration Modes

Mode #	Description
1	<ol style="list-style-type: none"> 1. Place the sample on the test board. 2. Load the sample into the battery. 3. Place the card in front of the sensor. 4. Confirm that the sample is sensing and operating. 5. Start test.
2	<ol style="list-style-type: none"> 1. Place the sample on the test board. 2. Load the sample into the battery. 3. Connect SGS NB with wires and samples. 4. Execute test software SerialPortMon.exe. 5. Confirm that the sample data is being transferred. 6. Start test.
Supplementary information: Test mode: Conducted Emission: Mode 1, 2 (Worst Mode: Mode 2) Radiated Emission: Mode 1, 2 (Worst Mode: Mode 2) Immunity: Mode 1, 2 (Representative mode depends on test item)	

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1.4 Basic Safety, Essential Performance and Immunity Pass/Fail Criteria as determined by the Manufacturer

Description of Basic Safety and Essential Performance
<p>This is a mobile equipment cabinet to put or load medical equipment and physiologic monitoring systems and other related accessories.</p> <p>It is used for nursing ambulances and hospitals and clinics. Caregivers can scan personal ID cards to identify the users of the nursing desk. That Non-medical professional personnel can not open the cabinet and take any medical drugs.</p>

Description how the BASIC SAFETY and ESSENTIAL PERFORMANCE were monitored during each test
<p>proximity lock system includes two type of the RIFID cards to setup the authorization levels from management to operation.</p> <p>During testing, the image status was monitored, it should work as intended setting function and image.</p>

Immunity Pass/Fail Criteria
<p>During testing, the image status was monitored, it should work as intended setting function and image.</p>

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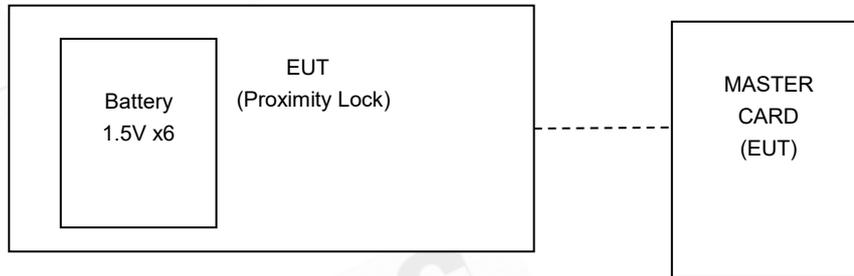
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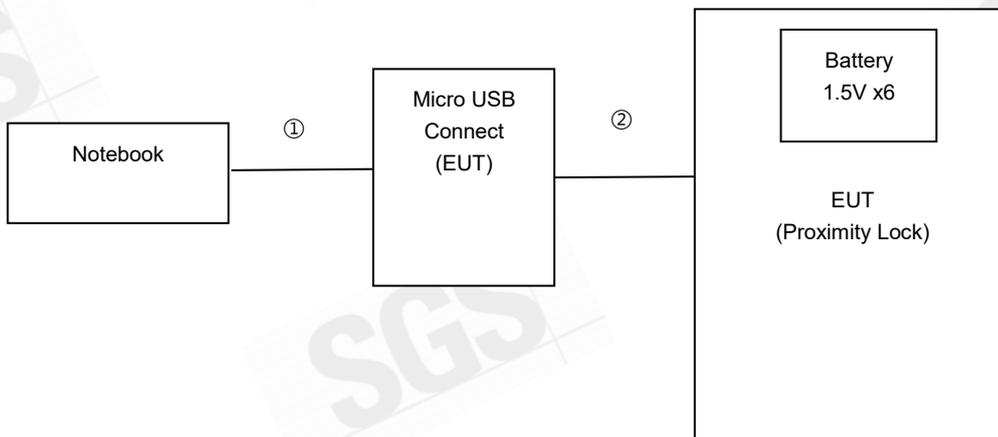
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1.5 Configuration Block Diagram

Mode 1



Mode 2



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1.6 Compliance Summary

IEC 60601-1-2			
Clause	Requirement + Test	Result - Remark	Verdict
4	GENERAL REQUIREMENTS		
4.1	Risk management process for ME equipment and ME systems.		N/E
5	IDENTIFICATION, MARKING AND DOCUMENTS		
5.1	Equipment specified for use only in shielded location has appropriate marking/warning labels	Inside the manual	P
5.2	Accompanying Documents		
5.2.1	Instructions for use		
5.2.1.1	General		
a)	A statement of the environments the ME equipment will be used. Relevant exclusions, as determined by Risk Analysis, shall also be listed.		N/E
b)	The essential performance of ME equipment and a description of what the operator can expect if the Essential Performance is lost or degraded due to EM disturbances.	Inside the manual Page 41-46	P
c)	A warning regarding stacking and location close to other equipment	Inside the manual Page 41-46	P
d)	List of cables, transducers and accessories	Inside the manual Page 25	P
e)	A warning that other cables and accessories may negatively affect EMC performance	Inside the manual Page 46	P
f)	A statement that portable RF communications equipment. Including antennas, can effect medical electrical equipment. The warning should include a use distance such as "...be used no closer than 30 cm (12 inches) to any part of the [ME EQUIPMENT or ME SYSTEM], including cables specified by the manufacturer"	Inside the manual Page 41-43	P
5.2.1.2	Required statement from standard for Class A equipment	Inside the manual Page 46	P

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t (886-2) 2299-3279

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5.2.2	Technical description		
5.2.2.1	All equipment and systems		
	Describe precautions to be taken to prevent adverse events to the Patient and Operator due to electromagnetic disturbances	Inside the manual Page 41	P
a)	Compliance information for each test	Inside the manual Page 41-43	P
b)	Statement of any deviations from standards used		N/A
c)	Statements to maintain basic safety and essential performance in regards to EMC	Inside the manual Page 46	P
5.2.2.2	ME Equipment specified for use only in shielded location		
a)	A warning that equipment should be used only in the specified type of shielded location		N/A
b)	Specifications for shielded location including: – minimum RF shielding effectiveness; – for each cable that enters or exits the shielded location, the minimum RF filter attenuation; and – the frequency range(s) over which the specifications apply		N/A
c)	Test methods for measurement of RF shielding effectiveness and RF filter attenuation		N/A
d)	Required statement(s) from standard and recommended notice for information post at entrance.		N/A
5.2.2.3	ME Equipment that intentionally receive RF energy shall include: frequency and/or band and bandwidth of receiving section		N/A
5.2.2.4	ME Equipment that include transmitters shall include frequency and/or band, modulation, and ERP		N/A
5.2.2.5	Large ME Equipment that are permanently installed		
a)	A statement that an exemption has been used and that the equipment has not been tested for radiated RF immunity over the entire frequency range 80 MHz to 6 GHz		N/A
b)	A warning that the ME equipment has been tested for radiated RF immunity only at selected frequencies		N/A
c)	A list of the frequencies and modulations tested		N/A
5.2.2.6	ME equipment that claim compatibility with HF surgical equipment shall include statement of compatibility and conditions of intended use during HR surgery		N/A

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1.7 Result Summary

1.7.1 Decision Rules of Results

Reported measurement data comply with IEC 60601-1-2:2014.

The test report shall contain a statement underlining that the measurement instrumentation uncertainty (MIU) was determined according to CISPR 16-4-2 and was also considered when determining compliance with the limits for the tested individual equipment or the number of items in the sample of series-produced equipment.

The test report may include the numerical values of the MIU which the test laboratory has determined for each test performed. If the uncertainty budgets specified in CISPR 16-4-2 are exceeded, then the test report shall include the numerical values of the MIU of the test instrumentation actually used.

According to CISPR 16-4-2: 2011+A1:2014+A2:2018 compliance assessment:

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.

NOTE For the compliance assessment procedure described in this subclause, both the measured disturbance level and the disturbance limit are expressed in logarithmic units, e.g. dB(μ V/m).

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1.7.2 Summary of Result

Requirement – Test	Result/Comments	Verdict
Clause 7 - Emissions		
Classification		—
Class A or B	Class A	—
Group 1 or 2	Group 1	—
CISPR 11, 14-1, 32 or ISO 7137	CISPR 11	—
Conducted RF Emissions		P
Radiated RF Emissions		P
Disturbance Power (if applicable)	N/A, Not applied for the test, CISPR 11 test method has applied.	N/A
Harmonic Distortion per IEC61000-3-2 (Class A, B, C, D):	N/A, EUT is battery, no necessary to perform test.	N/A
Voltage Fluctuations and Flicker per IEC61000-3-3.....	N/A, EUT is battery, no necessary to perform test.	N/A
Clause 8 - Immunity		
Electrostatic Discharges		P
Radiated RF EM Fields and Proximity Wireless fields		P
Electrical Fast Transients and bursts	N/A, EUT is battery, no necessary to perform test.	N/A
Surges.....	N/A, EUT is battery, no necessary to perform test.	N/A
Conducted Disturbances, induced by RF fields.....	N/A, EUT is battery, no necessary to perform test.	N/A
Voltage Dips and Interruptions	N/A, EUT is battery, no necessary to perform test.	N/A
Rated Power-frequency Magnetic Field		P

1.7.3 Reporting Statements of Conformity

The conformity statement in this report is based solely on the test results, measurement uncertainty is excluded.

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1.8 Test Conditions and Results – Conducted Emissions

CISPR 11	TEST: Limits of mains terminal disturbance voltage (CISPR 11: 2015+A1:2016+A2:2019)			Verdict
<p>Method: The AMN placed 0,8 m from the boundary of the unit under test and bonded to a ground reference plane. This distance was between the closest points of the AMN and the EUT. All other units of the EUT and associated equipment were at least 0,8 m from the AMN. All power was connected to the system through Artificial Mains Network (AMN). Conducted voltage measurements on mains lines were made at the output of the AMN.</p>				P
Laboratory Parameters		Required prior to the test		During the test
Ambient Temperature		10 to 40 °C		23 °C
Relative Humidity		10 to 90 %		67 %
Fully configured sample scanned over the following frequency range		Frequency range on each side of line		Measurement Point
		150kHz to 30MHz		Mains
Equipment mode		Power interface mode		DC 5 V (From PC USB)
		EUT configurations mode		
		Operation mode		Mode_2
Limits – Group 1 - Class A				
Frequency (MHz)	Limit dB (µV)			
	Quasi-Peak	Result*	Average	Result*
0.15 to 0.50	79	P	66	P
0.50 to 30	73	P	60	P
Limits - Group 2 - Class A				
Frequency (MHz)	Limit dB (µV)			
	Quasi-Peak	Result*	Average	Result*
0.15 to 0.50	100	N/A	90	N/A
0.50 to 5	86	N/A	76	N/A
5 to 30	90 to 70	N/A	80 to 60	N/A
Limits - Group 2 - Class A Mains supply currents in excess of 100 A per phase				
Frequency (MHz)	Limit dB (µV)			
	Quasi-Peak	Result*	Average	Result*
0.15 to 0.50	130	N/A	120	N/A
0.50 to 5	125	N/A	115	N/A
5 to 30	115	N/A	105	N/A

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t (886-2) 2299-3279

f (886-3) 327-7559

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Limits - Group 1 and 2 - Class B				
Frequency (MHz)	Limit dB (µV)			
	Quasi-Peak	Result*	Average	Result*
0.15 to 0.50	66 to 56	N/A	56 to 46	N/A
0.50 to 5	56	N/A	46	N/A
5 to 30	60	N/A	50	N/A

Supplementary information: * - The result in tables may be a minimum margin to the limit. EUT powered at one of the Nominal input voltages and frequencies.

SGS Conducted Emission WuKu Conducted Room EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
EMI Test Receiver	R&S	ESCI	101338	2021/3/22	2022/3/21
Coaxial Cables	N/A	WK CE Cable	N/A	2021/11/17	2022/11/16
Pulse Limiter	R&S	ESH3-Z2	357.8810.52	2021/11/17	2022/11/16
LISN	SCHWARZBECK	NSLK 8127	8127-649	2021/6/15	2022/6/14
LISN	Rolf-Heine	NNB-2/16Z	99013	2021/12/9	2022/12/8
Test Software	Farad	EZ-EMC	Ver. SGS-03A2-10	N.C.R.	N.C.R.

Testing Site : No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan
 Measurement Uncertainty of Conducted Emission
 Expanded uncertainty U_{lab} (K=2) of conducted emission is 2.34 dB.
 Expanded uncertainty U_{cispr 16-4-2 :2011+A1:2014+A2:2018} (K=2) of AC mains conducted Emission is 3.44 dB

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Photo of test setup for Mains Terminal Disturbance Voltage Measurement

**Model No.:EX-series-Proximity Lock
Mode_2_+**



Mode_2_-



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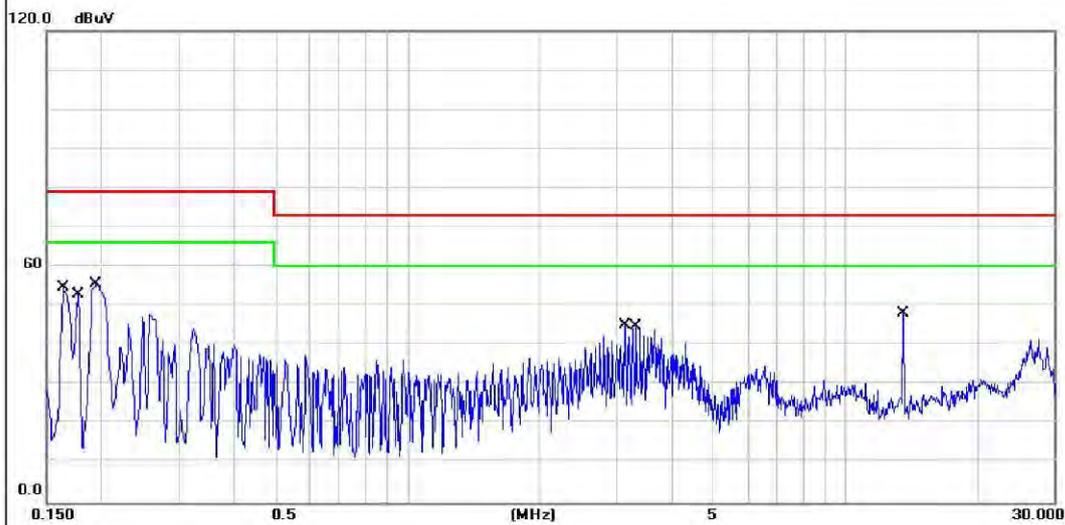
Graphical representation of Mains Terminal Disturbance Voltage Measurement

Model No.:EX-series-Proximity Lock Mode_2_L

Site: 1F Conduction Room	Date: 2021-12-16	Time: 11:19:13
Limit: CISPR11 Class A Conduction(QP)	Phase: L1	Temperature: 23 °C
Mode: Mode_2	Power: DC 5 V (From PC USB)	Humidity: 67 %RH
Report: MM-2021-70013		atm pressure: 1013 mbar
Tester: Guan Chen Wu		

Note:

SGS Taiwan Ltd. Electromagnetic Compatibility Laboratory Add.:No.134, Wu Kung Rd., New Taipei Ind. Park, Wuku Dist., New Taipei City, TW



No.	Mk	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Measurement (dBuV)	Limit (dBuV)	Over (dB)	Detector	Comment
1		0.1631	36.74	10.04	46.78	79.00	-32.22	QP	
2		0.1774	35.41	10.04	45.45	79.00	-33.55	QP	
3	*	0.1947	44.73	10.04	54.77	79.00	-24.23	QP	
4		3.1423	26.58	10.72	37.30	73.00	-35.70	QP	
5		3.3400	28.31	10.68	38.99	73.00	-34.01	QP	
6		13.5601	36.14	10.47	46.61	73.00	-26.39	QP	

*:Maximum data x:Over limit !:over margin

Page: 1

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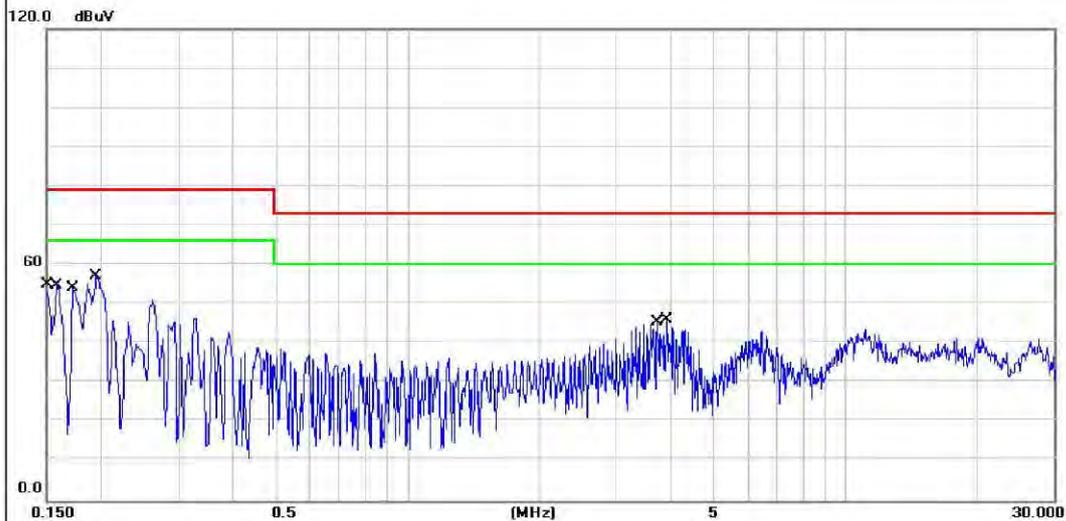
Graphical representation of Mains Terminal Disturbance Voltage Measurement

Mode_2_N

Site: 1F Conduction Room	Date: 2021-12-16	Time: 11:16:38
Limit: CISPR11 Class A Conduction(QP)	Phase: N	Temperature: 23 °C
Mode: Mode_2	Power: DC 5 V (From PC USB)	Humidity: 67 %RH
Report: MM-2021-70013		atm pressure: 1013 mbar
Tester: Guan Chen Wu		

Note:

SGS Taiwan Ltd. Electromagnetic Compatibility Laboratory Add. No.134, Wu Kung Rd., New Taipei Ind. Park, Wuku Dist., New Taipei City, TW



No.	Mk	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Measurement (dBuV)	Limit (dBuV)	Over (dB)	Detector	Comment
1		0.1505	40.40	10.05	50.45	79.00	-28.55	QP	
2		0.1598	38.72	10.05	48.77	79.00	-30.23	QP	
3		0.1720	37.38	10.05	47.43	79.00	-31.57	QP	
4	*	0.1948	46.53	10.05	56.58	79.00	-22.42	QP	
5		3.7222	27.69	10.61	38.30	73.00	-34.70	QP	
6		3.9217	29.70	10.56	40.26	73.00	-32.74	QP	

*:Maximum data x:Over limit !:over margin

Page: 1

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CISPR 32	TEST: Limits of mains terminal disturbance voltage			Verdict	
<p>Method: The AMN placed 0,8 m from the boundary of the unit under test and bonded to a ground reference plane. This distance was between the closest points of the AMN and the EUT. All other units of the EUT and associated equipment were at least 0,8 m from the AMN. All power was connected to the system through Artificial Mains Network (AMN). Conducted voltage measurements on mains lines were made at the output of the AMN.</p>				N/A	
Laboratory Parameters		Required prior to the test		During the test	
Ambient Temperature		10 to 40 °C		N/A °C	
Relative Humidity		10 to 90 %		N/A %	
Fully configured sample scanned over the following frequency range		Frequency range on each side of line		Measurement Point	
		150kHz to 30MHz		Mains	
Equipment mode		Power interface mode		N/A	
		EUT configurations mode			
		Operation mode		N/A	
Limits – Class A					
Frequency (MHz)		Limit dB (µV)			
		Quasi-Peak	Result *	Average	Result *
0.15 to 0.50		79	N/A	66	N/A
0.50 to 30		73	N/A	60	N/A
Limits - Class B					
Frequency (MHz)		Limit dB (µV)			
		Quasi-Peak	Result *	Average	Result *
0.15 to 0.50		66 to 56	N/A	56 to 46	N/A
0.50 to 5		56	N/A	46	N/A
5 to 30		60	N/A	50	N/A
<p>Supplementary information: * - The result in tables may be a minimum margin to the limit. EUT powered at one of the Nominal input voltages and frequencies. N/A: The CISPR 11 test method has applied.</p>					

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Limits – Asymmetric mode conducted emissions from Class A equipment						
Frequency (MHz)	Limit dB (μV)					
	Coupling device	Detector type / bandwidth	Class A voltage limits dB(μV)	Class A current limits dB(μA)	Result *	
0.15 to 0.50	AAN	Quasi Peak / 9 kHz	97 to 87	n/a	N/A	
0.50 to 30			87		N/A	
0.15 to 0.50	AAN	Average / 9 kHz	84 to 74		N/A	
0.50 to 30			74		N/A	
0.15 to 0.50	CVP and current probe	Quasi Peak / 9 kHz	97 to 87		53 to 43	N/A
0.50 to 30			87		43	N/A
0.15 to 0.50	CVP and current probe	Average / 9 kHz	84 to 74	40 to 30	N/A	
0.50 to 30			74	30	N/A	
0.15 to 0.50	Current probe	Quasi Peak / 9 kHz	n/a	53 to 43	N/A	
0.50 to 30				43	N/A	
0.15 to 0.50	Current probe	Average / 9 kHz		40 to 30	N/A	
0.50 to 30				30	N/A	

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Limits – Asymmetric mode conducted emissions from Class B equipment					
Frequency (MHz)	Limit dB (μV)				
	Coupling device	Detector type / bandwidth	Class B voltage limits dB(μV)	Class B current limits dB(μA)	Result *
0.15 to 0.50	AAN	Quasi Peak / 9 kHz	84 to 74	n/a	N/A
0.50 to 30			74		N/A
0.15 to 0.50	AAN	Average / 9 kHz	74 to 64		N/A
0.50 to 30			64		N/A
0.15 to 0.50	CVP and current probe	Quasi Peak / 9 kHz	84 to 74	40 to 30	N/A
0.50 to 30			74	30	N/A
0.15 to 0.50	CVP and current probe	Average / 9 kHz	74 to 64	30 to 20	N/A
0.50 to 30			64	20	N/A
0.15 to 0.50	Current probe	Quasi Peak / 9 kHz	n/a	40 to 30	N/A
0.50 to 30				30	N/A
0.15 to 0.50	Current probe	Average / 9 kHz		30 to 20	N/A
0.50 to 30				20	N/A

Supplementary information: * - The result in tables may be a minimum margin to the limit.
 EUT powered at one of the Nominal input voltages and frequencies.
 N/A, the EUT without telecommunication port exist.

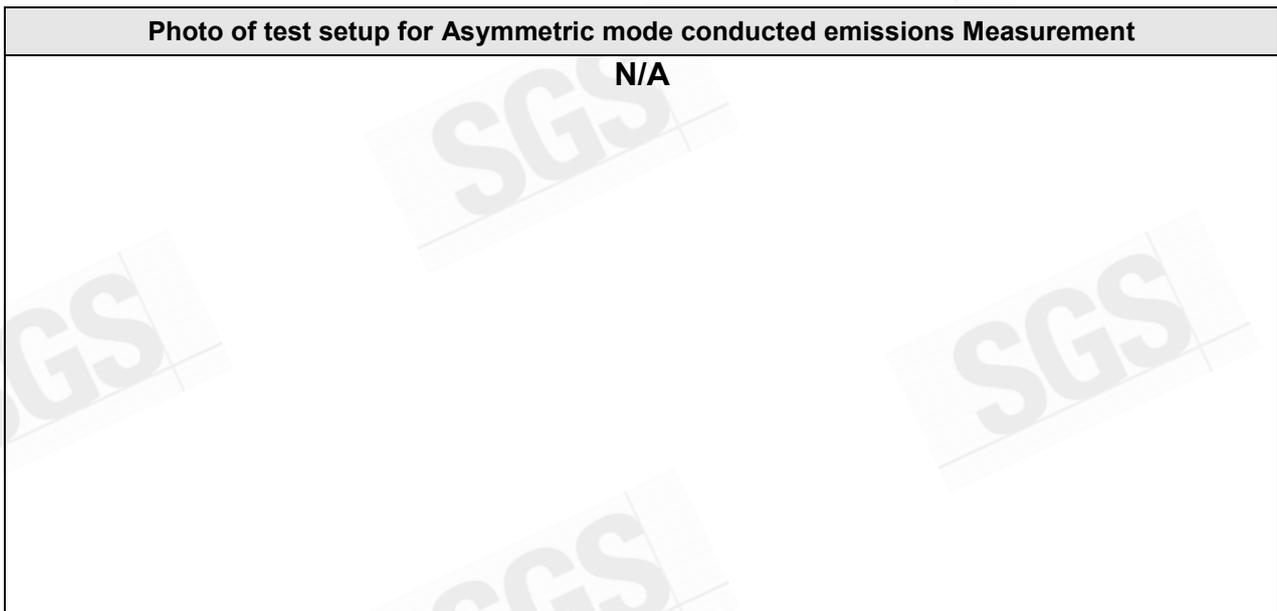
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SGS Conducted Emission WuKu Conducted Room EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

Testing Site : No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan
 Measurement Uncertainty of Conducted Emission
 Expanded uncertainty U_{lab} (K=2) of conducted emission is 2.34 dB.
 Expanded uncertainty U_{cispr 16-4-2 :2011+A1:2014+A2:2018} (K=2) of AC mains conducted Emission is 3.44 dB



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Graphical representation of Mains Terminal Disturbance Voltage Measurement

N/A

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CISPR 14-1	TEST: Limits of terminal disturbance voltage			Verdict
<p><u>Method:</u> The AMN was placed 0,8 m from the boundary of the unit under test and bonded to a ground reference plane. This distance was between the closest points of the AMN and the EUT. All other units of the EUT and associated equipment was at least 0,8 m from the AMN. All power was connected to the system through Artificial Mains Network (AMN). Conducted voltage measurements on mains lines were made at the output of the AMN.</p>				N/A
Laboratory Parameters:		Required prior to the test		During the test
Ambient Temperature		10 to 40 °C		N/A °C
Relative Humidity		10 to 90 %		N/A %
Fully configured sample scanned over the following frequency range (see note 1)		Frequency range on each side of line		Measurement Point
		148.5 kHz to 30MHz		Mains, Load Terminals, Additional Terminals
Equipment mode		Power interface mode		N/A
		EUT configurations mode		
		Operation mode		N/A
Limits – Mains Terminal				
Frequency (MHz)	Limit dB (µV)			
	Quasi-Peak	Result *	Average	Result *
0.15 to 0.50	66 to 56	N/A	59 to 46	N/A
0.50 to 5	56	N/A	46	N/A
5 to 30	60	N/A	50	N/A
Limits - Load /Additional Terminals				
Frequency (MHz)	Limit dB (µV)			
	Quasi-Peak	Result *	Average	Result *
0.15 to 0.50	80	N/A	70	N/A
0.50 to 5	74	N/A	64	N/A
5 to 30	74	N/A	64	N/A
<p>Supplementary information: * - The result in this table may be a minimum margin to the limit. EUT powered at one of the Nominal input voltages and frequencies. Note 1: the World Administrative Radio-Communications Conference (WARC) has in 1979 reduced the lower frequency limit in region 1 to 148.5 kHz; for applications falling in the scope of this standard, tests at 150 kHz are considered adequate, since 148,5 kHz falls within the receiver bandwidth. In limit tables 150 kHz used. Not applied for the test, CISPR 11 test method has applied.</p>				

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ISO 7137	TEST: Limits of mains terminal and I/O disturbance current		Verdict
Method: Measurements are made with a current probe. Tests are setup per Figure 21-6 of DO-160G. The current probe is installed five centimetres from the EUT. If the EUT connector plus back shell length exceeds five centimetres the probe shall be placed as close to the connector back shell as possible and the position noted.			N/A
Laboratory Parameters	Required prior to the test	During the test	
Ambient Temperature	10 to 40 °C	N/A	
Relative Humidity	10 to 90 %	N/A	
Fully configured sample scanned over the following frequency range	Frequency range on each side of line	Measurement Point	
	150kHz to 152MHz	Mains	
	150kHz to 152MHz	I/O	
Equipment mode	Power interface mode	N/A	
	EUT configurations mode		
	Operation mode	N/A	
Limits – Power Lines			
Frequency (MHz)	Limit dB (µA)		
	Quasi-Peak	Results *	
0.15 to 2	53 to 20	N/A	
2 to 30	2	N/A	
30 to 152	30	N/A	
Limits – I/O Line			
Frequency (MHz)	Limit dB (µA)		
	Quasi-Peak	Results *	
0.15 to 2	73 to 40	N/A	
2 to 30	40	N/A	
30 to 108	50	N/A	
30 to 152	40	N/A	
Supplementary information: * - The result in tables may be a minimum margin to the limit.			
EUT powered at one of the Nominal input voltages and frequencies.			
Not applied for this test, the device(s) not intended for use in aircraft, no necessary to perform this test.			

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Test Equipment Used					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

Graphical representation of Input/Output Terminal Disturbance Current Measurement
N/A, The device(s) not intended for use in aircraft, no necessary to perform this test.

Tabulated Results for Mains Terminal Disturbance Current								
Terminal	Test Frequency (MHz)	Meter Reading dB (μV)	Detector (Pk/QP/Av)	Gain/Loss Factor (dB)	Transducer Factor (dB)	Level dB (μA)	Limit 1 dB (μA)	Margin (dB)
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-

Supplementary information:
 Note: This table is to be used for combined correction factors (Gain/Loss and Transducer). Use column "Terminal" to identify the Line and /or Neutral that was tested. Other table formats are allowed as long as all information is included.

N/A, The device(s) not intended for use in aircraft, no necessary to perform this test.

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1.9 Test Conditions and Results – Radiated Emissions

CISPR 11	TEST: Limits for radiated disturbance 30 MHz –1 GHz (CISPR 11: 2015+A1:2016+A2:2019)		Verdict
<p><u>Method:</u> Measurements were made in a 10-meter semi-anechoic chamber or Open Area Test Site that complies to CISPR 16. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of listed below. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in horizontal and vertical polarities. Final measurements (quasi-peak) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4 m. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.</p>			P
Laboratory Parameters:	Required prior to the test	During the test	
Ambient Temperature	10 to 40 °C	23 °C	
Relative Humidity	10 to 90 %	60 %	
Fully configured sample scanned over the following frequency range	Frequency range on each side of line	Measurement Point	
	30MHz – 1GHz	3 or 10 m measurement distance***	
Equipment mode	Power interface mode	DC 5 V (From PC USB)	
	EUT configurations mode		
	Operation mode	Mode_2	
Limits – Group 1 Class A			
Frequency (MHz)	Limit dB (µV/m)		Results *
	Quasi-Peak		
30 to 230	40(10m) or 50(3m)		P
230 to 1000	47(10m) or 57(3m)		P
Limits – Group 1 Class B			
Frequency (MHz)	Limit dB (µV/m)		Results *
	Quasi-Peak		
30 to 230	30(10m) or 40(3m)		N/A
230 to 1000	37(10m) or 47(3m)		N/A
Limits – Group 2 Class A			
Frequency (MHz)	Limit dB (µV/m)		Results *
	Quasi-Peak		
30 to 1000	See standard		N/A

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Limits – Group 2 Class B			
Frequency (MHz)	Limit dB (µV/m)		
	Quasi-Peak	Average**	Results *
30 to 80,872	30	25	N/A
80,872 to 81,848	50	45	N/A
81,848 to 134,786	30	25	N/A
134,786 to 136,414	50	45	N/A
136,414 to 230	30	25	N/A
230 to 1000	37	32	N/A

Supplementary information: EUT powered at one of the Nominal input voltages and frequencies.

* - The result in this table may be a minimum margin to the limit.
 ** - The Average Limits Apply To Magnetron Driven Equipment Only.
 *** - Test distance used shall follow guidance from CISPR 11

SGS Radiated_Below_1GHz_WuKu_966-2_EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
EMI Test Receiver	R&S	ESCI	101338	2021/3/22	2022/3/21
Broadband Antenna	SCHAFFNER	CBL 6112D	23189	2021/6/30	2022/6/29
Pre Amplifier	HP	8447D	1937A02748	2021/9/30	2022/9/29
Coaxial Cable	Huber+Suhner	SUCCOFLEX 104-02	966 II	2021/9/30	2022/9/29
Antenna Master	MF	N/A	N/A	N.C.R.	N.C.R.
Turn Table	MF	N/A	N/A	N.C.R.	N.C.R.
Controller	MF	MF7802	N/A	N.C.R.	N.C.R.
Site NSA	Chamost	966II Chamber	N/A	2020/12/21	2021/12/20
Test Software	Farad	EZ-EMC	Ver. SGS-03A2-10	N.C.R.	N.C.R.

Testing Site : No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan

Measurement Uncertainty of Radiated Emission
 Expanded uncertainty U_{lab} (k=2) of radiated emission measurement is 5.71 dB. (30-1000MHz)
 Expanded uncertainty U_{Cispr 16-4-2 :2011+A1:2014+A2:2018} (K=2) of radiated emission is 6.32 dB. (30MHz - 1000MHz)

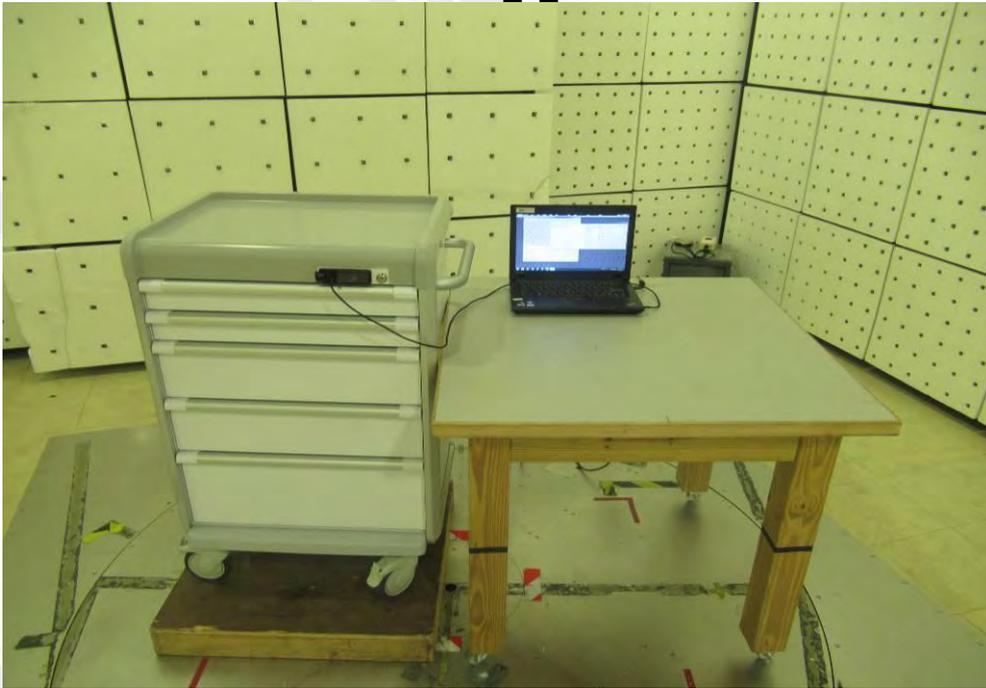
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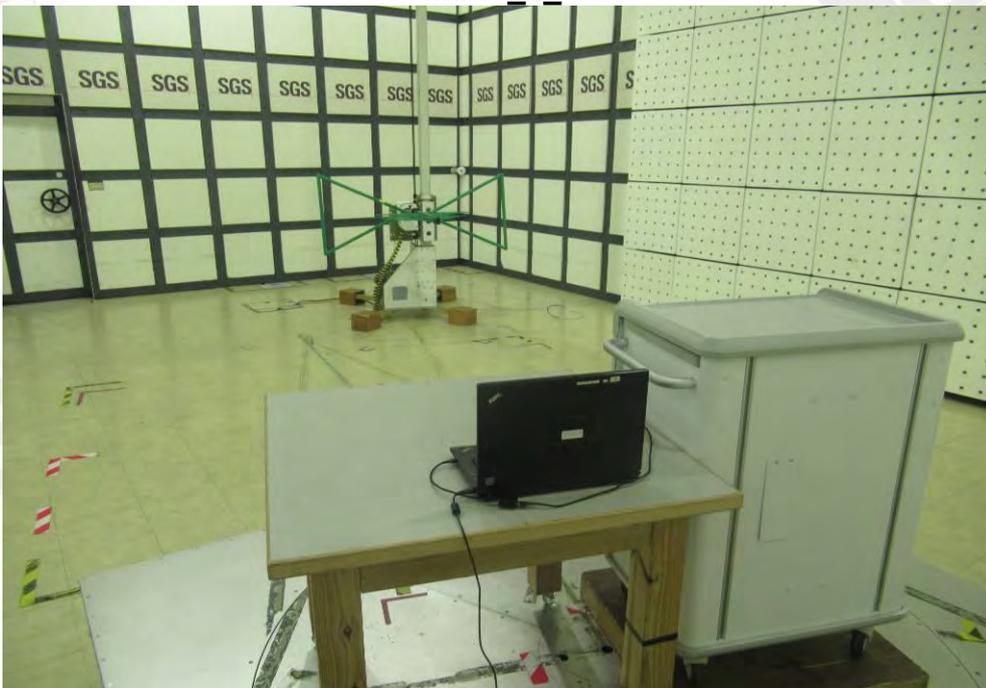
Photo of test setup for Radiated Disturbance

Model No.:EX-series-Proximity Lock

Mode_2_+



Mode_2_-



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台灣檢驗科技股份有限公司

t (886-2) 2299-3279

f (886-3) 327-7559

www.sgs.com.tw

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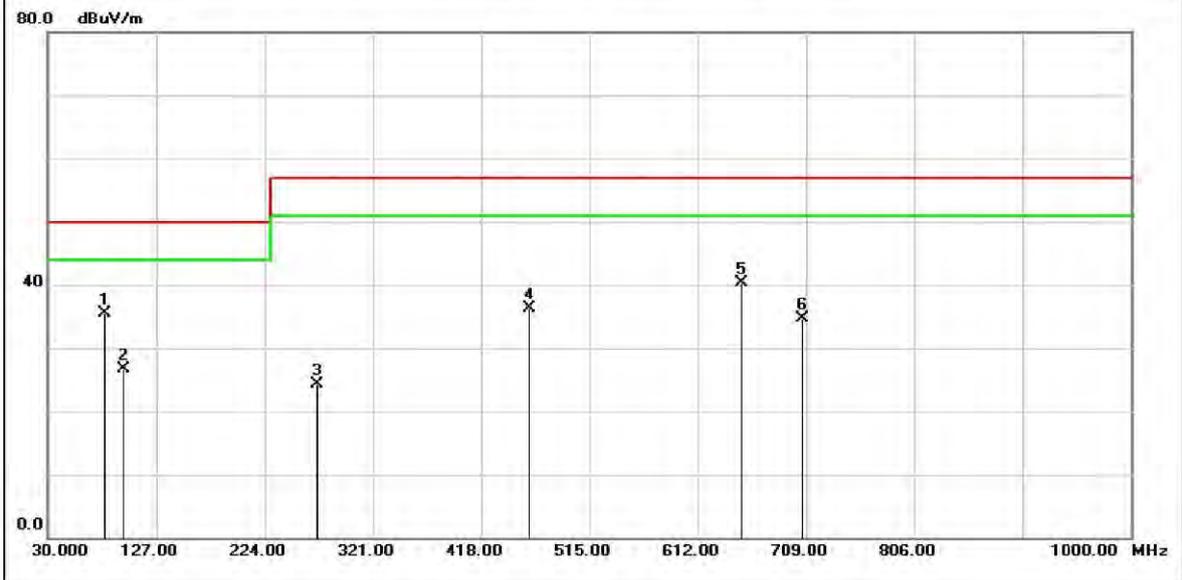
Graphical representation of Radiated Disturbance Measurement

Model No.:EX-series-Proximity Lock Mode_2_H

Site: 966-2 Chamber	Date: 2021-12-07	Time: 15:16:03
Limit: CISPR11 ClassA 3M Radiation	Polarization: Horizontal	Temperature: 23 °C
Mode: Mode_2	Power: DC 5 V (From PC USB)	Humidity: 60 %RH
Report: MM-2021-70013	Distance: 3m	atm pressure: 1015 mbar
Tester: Guan Chen Wu		

Note:

SGS Taiwan Ltd. Electromagnetic Compatibility Laboratory Add.No.134, Wu Kung Rd., New Taipei Ind. Park, Wuku Dist., New Taipei City, TW



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Height	Degree	Comment
		(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)		(cm)	(deg.)	
1	*	81.3720	48.92	-13.32	35.60	50.00	-14.40	QP	200	183	
2		97.5523	36.64	-9.84	26.80	50.00	-23.20	QP			
3		270.5600	30.58	-6.28	24.30	57.00	-32.70	QP			
4		460.6800	38.56	-2.16	36.40	57.00	-20.60	QP			
5		650.9170	40.02	0.28	40.30	57.00	-16.70	QP			
6		705.1620	34.74	0.06	34.80	57.00	-22.20	QP			

*:Maximum data x:Over limit !:over margin

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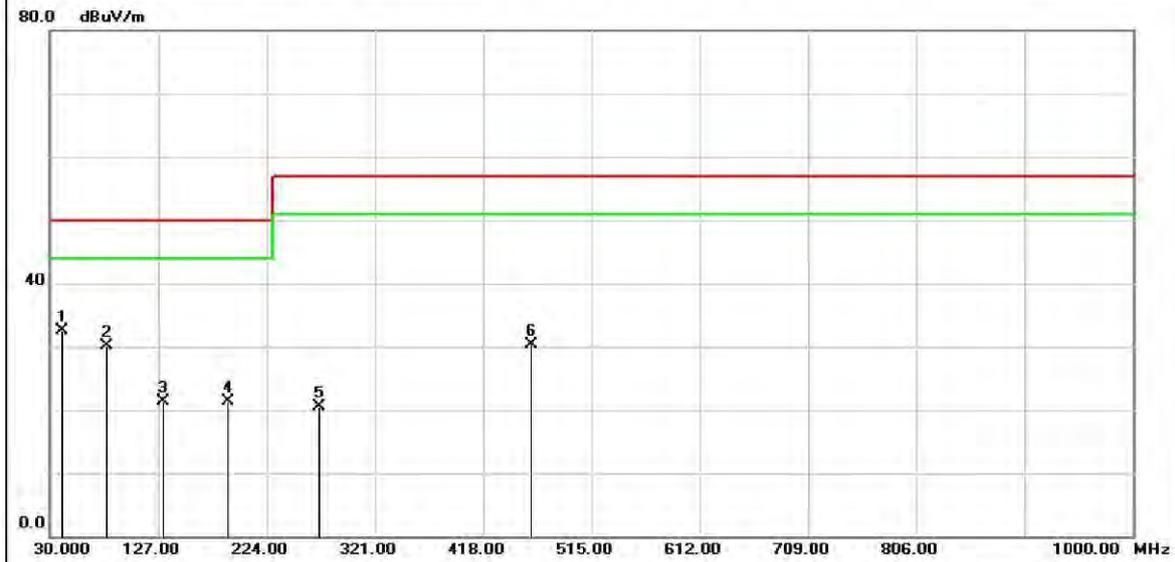
Graphical representation of Radiated Disturbance Measurement

Mode_2_V

Site: 966-2 Chamber	Date: 2021-12-07	Time: 15:12:44
Limit: CISPR11 ClassA 3M Radiation	Polarization: Vertical	Temperature: 23 °C
Mode: Mode_2	Power: DC 5 V (From PC USB)	Humidity: 60 %RH
Report: MM-2021-70013	Distance: 3m	atm pressure: 1015 mbar
Tester: Guan Chen Wu		

Note:

SGS Taiwan Ltd. Electromagnetic Compatibility Laboratory Add.No.134, Wu Kung Rd., New Taipei Ind. Park, Wuku Dist., New Taipei City,TW



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Height	Degree	Comment
		(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)		(cm)	(deg.)	
1	*	40.6610	41.07	-8.57	32.50	50.00	-17.50	QP	100	140	
2		81.3640	43.42	-13.32	30.10	50.00	-19.90	QP			
3		131.0752	29.39	-7.99	21.40	50.00	-28.60	QP			
4		189.2090	31.69	-10.39	21.30	50.00	-28.70	QP			
5		270.9696	26.86	-6.26	20.60	57.00	-36.40	QP			
6		461.0306	32.45	-2.15	30.30	57.00	-26.70	QP			

*:Maximum data x:Over limit !:over margin

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CISPR 32	TEST: Limits for radiated disturbance 30 MHz –XX GHz**		Verdict
<p>Method: Measurements were made in a 10-meter semi-anechoic chamber or Open Area Test Site that complies to CISPR 16. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 10 meter below 1GHz and 3 meter above 1GHz. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in horizontal and vertical polarities. Final measurements (quasi-peak detector below 1GHz and average detector above 1GHz) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4 m. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.</p>			N/A
Laboratory Parameters:		Required prior to the test	During the test
Ambient Temperature		10 to 40 °C	N/A °C
Relative Humidity		10 to 90 %	N/A %
Fully configured sample scanned over the following frequency range	Frequency range on each side of line		Measurement Point
	30MHz – 1GHz		10 m measurement distance
	1GHz – 6GHz		3 m measurement distance
Equipment mode	Power interface mode		N/A
	EUT configurations mode		
	Operation mode		N/A
Limits – Class A			
Frequency (MHz)	Limit dB (µV/m)		Results *
	Detector		
30 to 230	40 (10 m), 50 (3 m) Quasi-Peak		N/A
230 to 1000	47 (10 m), 57 (3 m) Quasi-Peak		N/A
1000 to 3000	56 Average, 76 Peak		N/A
3000 to 6000	76 Average, 80 Peak		N/A
Limits – Class B			
Frequency (MHz)	Limit dB (µV/m)		Results *
	Detector		
30 to 230	30 (10 m), 40 (3 m) Quasi-Peak		N/A
230 to 1000	37 (10 m), 47 (3 m) Quasi-Peak		N/A
1000 to 3000	50 Average, 70 Peak		N/A
3000 to 6000	54 Average, 74 Peak		N/A
<p>Supplementary information: EUT powered at one of the Nominal input voltages and frequencies.</p> <p>* - The result in this table may be a minimum margin to the limit.</p> <p>** - Input highest test frequency based on internal frequency used in the ME equipment</p> <p>Not applied for the test, CISPR 11 test method has applied.</p>			

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CISPR 14-1	TEST: Limits for radiated disturbance 30 MHz –1 GHz		Verdict
<p>Method: Measurements were made in a 10-meter semi-anechoic chamber or Open Area Test Site that complies to CISPR 16. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 10 meter. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in horizontal and vertical polarities. Final measurements (quasi-peak) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4 m. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.</p>			N/A
Laboratory Parameters:	Required prior to the test	During the test	
Ambient Temperature	10 to 40 °C	N/A °C	
Relative Humidity	10 to 90 %	N/A %	
Fully configured sample scanned over the following frequency range	Frequency range on each side of line	Measurement Point	
	30MHz – 1GHz	3 or 10 m measurement distance	
Equipment mode	Power interface mode	N/A	
	EUT configurations mode		
	Operation mode	N/A	
Limits – CISPR 14-1			
Frequency (MHz)	Limit dB (µV/m)		
	Quasi-Peak	Results *	
30 to 230	30 (10 m), 40 (3 m)	N/A	
230 to 1000	37 (10 m), 47 (3 m)	N/A	
Supplementary information: EUT powered at one of the Nominal input voltages and frequencies.			
* -The result in this table may be a minimum margin to the limit.			
Not applied for the test, CISPR 11 test method has applied.			

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ISO 7137	TEST: Limits for radiated disturbance 100 MHz –6 GHz		Verdict
<p>Method: Measurements were made in a shielded enclosure. RF absorber shall be placed above, behind, and on both sides of test setup boundary, from ceiling to ground plane. The absorber shall extend ≥ 50 cm in front of the ground plane. RF absorber shall be placed behind the test antenna, from ceiling to floor. The distance between the absorber and the antenna shall be ≥ 30 cm. Linearly polarized antennas are required for radiated tests. Measure radiated emissions using both vertically and horizontally polarized orientations. Other requirements in DO-160G, clause 21.5, shall be followed.</p> <p>If radiated RF emissions are conducted in a reverberation chamber, the procedures in DO-160G, clause 21.6, shall be followed.</p>			N/A
Laboratory Parameters:	Required prior to the test	During the test	
Ambient Temperature	10 to 40 °C	N/A	
Relative Humidity	10 to 90 %	N/A	
Fully configured sample scanned over the following frequency range	Frequency range on each side of line	Measurement Point	
	100MHz – 1GHz	0.9 m from the front of the test table	
	1GHz – 6GHz		
Equipment mode	Power interface mode	N/A	
	EUT configurations mode		
	Operation mode	N/A	
Limits			
Frequency (MHz)	Limit dB (μV/m)		Results *
	Detector		
100 to 108	44.6 to 45.2 (QP)		N/A
108 to 152	35 to 37.5 (QP)		N/A
152 to 960	47.5 to 60.2 (QP)		N/A
960 to 1215	50.3 to 52 (AV)		N/A
1215 to 1525	61.9 to 63.5 (AV)		N/A
1525 to 1680	53.5 to 54 (AV)		N/A
1680 to 6000	64 to 73 (AV)		N/A
Supplementary information: EUT powered at one of the Nominal input voltages and frequencies.			
* -The result in this table may be a minimum margin to the limit.			
N/A, The device(s) not intended for use in aircraft, no necessary to perform this test.			

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Test Equipment Used					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-



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SGS Taiwan Ltd. No.2, Keji 1st Rd., Guishan District, Taoyuan City, Taiwan / 桃園市龜山區科技一路2號

台灣檢驗科技股份有限公司

t (886-2) 2299-3279

f (886-3) 327-7559

www.sgs.com.tw

Member of SGS Group

Tabulated Results for Radiated Disturbance

Test Frequency (MHz)	Meter Reading dB(μV)	Detector (Pk/QP/Av)	Polarity (V/H)	Azimuth (Degrees)	Antenna Height (cm)	Gain/Loss Factor (dB)	Transducer Factor(dB)	Level dB(μV/m)	Limit dB(μV/m)	Margin (dB)
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

Supplementary information:

Note: Other table formats are allowed as long as all information is included.

Not applicable for this test, the device(s) not intended for use in aircraft, no necessary to perform this test.

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1.10 Test Conditions and Results – Disturbance Power Emissions

CISPR 14-1	TEST: Limits of disturbance power			Verdict
Method: Measurements were made on a ground plane that extends 1-meter minimum beyond all sides of the system under test. All power was connected to the system through Line Impedance Stabilization Networks (LISN). The lead to be measured on is stretched in a straight line for a distance sufficient to accommodate the absorbing clamp, and to permit the necessary measuring adjustment of position for tuning. The clamp is placed around the lead so as to measure a quantity proportional to the disturbance on the lead.				N/A
Laboratory Parameters:		Required prior to the test		During the test
Ambient Temperature		15 to 35 °C		N/A °C
Relative Humidity		30 to 60 %		N/A %
Fully configured sample scanned over the following frequency range		Frequency range		Measurement point
		30 MHz to 300 MHz		Mains
Equipment mode		Power interface mode		N/A
		EUT configurations mode		
		Operation mode		N/A
Limits disturbance power on terminals				
Frequency 30 – 300 MHz	dB(pW)			
	Quasi-Peak	Result *	Average	Result *
Household and Tools < 700 W	45 to 55	N/A	35 to 45	N/A
700 W < Tools < 1000 W	49 to 59	N/A	39 to 49	N/A
Tools >1000 W	55 to 65	N/A	45 to 55	N/A
Supplementary information: * - The result in this table may be a minimum margin to the limit. EUT powered at one of the Nominal input voltages and frequencies. N/A: Not applied for the test, CISPR 11 test method has applied.				

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Test Equipment Used					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

Photo of test setup for Disturbance Power Emissions
N/A

Tabulated Results for Disturbance Power Emissions							
Test Frequency (MHz)	Meter Reading dB(μV)	Detector (Pk/QP/Av)	Gain/Loss Factor (dB)	Transducer Factor(dB)	Level dB(μV/m)	Limit dB(μV/m)	Margin (dB)
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-

Supplementary information:
 Note: Other table formats are allowed as long as all information is included.
 Not applied for the test, CISPR 11 test method has applied.

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1.11 Test Conditions and Results – Harmonic Distortion

61000-3-2	TEST: Limits for Harmonic current emissions (IEC 61000-3-2:2018)		Verdict
Method: This test consists on the measurement of harmonics components of the input current which may be produced by equipment having an input current up to and including 16 A per phase, and intended to be connected to public low-voltage distribution systems. The equipment is tested under specified conditions of operation.			N/A
Laboratory Parameters:	Required prior to the test	During the test	
Ambient Temperature	15 to 35 °C	N/A °C	
Relative Humidity	30 to 60 %	N/A %	
Equipment mode	Power interface mode	N/A	
	EUT configurations mode		
	Operation mode	N/A	
Classification of Equipment			N/A
Supplementary information: None This device is power from DC 9V (From AAx6 Batteries), not applicable for this test.			

SGS Harmonic EN61000-3-2 WuKu EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

Testing Site : No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan

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Photo of test setup for Harmonic Current Emissions

N/A

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Tabulated Results for Harmonic Current Emissions

N/A

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1.12 Test Conditions and Results – Voltage Fluctuations and Flicker

61000-3-3	TEST: Limitation of Voltage Fluctuations And Flicker (IEC 61000-3-3: 2013+A1:2017)		Verdict
Method: The test circuit consists of a test supply voltage, reference impedance, the equipment under test and a flicker meter compliant with IEC 60868. The equipment shall be tested in the condition in which the manufacturer supplies it.			N/A
Laboratory Parameters:	Required prior to the test	During the test	
Ambient Temperature	15 to 35 °C	N/A °C	
Relative Humidity	30 to 60 %	N/A %	
Equipment mode	Power interface mode	N/A	
	EUT configurations mode		
	Operation mode	N/A	
Control Method of Equipment (see below)			
1 - without additional conditions			
2 - 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.			
3 - attended while 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 a few tens of seconds) or manual restart, after a power supply interruption.			
Supplementary information: None. This device is power from DC 9V (From AAx6 Batteries), not applicable for this test.			

SGS Flicker EN61000-3-3 WuKu EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

Testing Site : No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan

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Photo of test setup for Voltage Fluctuations And Flicker

N/A

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Tabulated Results for Voltage Fluctuations And Flicker

N/A

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1.13 Test Conditions and Results – Immunity to Electrostatic Discharges

61000-4-2	TEST: Electrostatic discharges (IEC 61000-4-2:2008)		Verdict
<p>Method: The test is intended to demonstrate the immunity of equipment subjected to static electricity discharges from operators directly and to adjacent objects. The table top equipment under test is placed on a wooden table, 0.8 m high, standing on the ground reference plane. A horizontal coupling plane (HCP), 1.6 x 0.8 m, is placed on the table. The EUT and the cables are isolated from the coupling plane by an insulating support 0.5 mm thick. The floor standing equipment is isolated from the ground reference plane by an insulating support about 0.1 m thick. The vertical coupling plane (VCP) of dimensions 0.5 m x 0.5 m is placed parallel to, and positioned at a distance of 0.1 m from, the EUT.</p>			P
Laboratory Parameters:		Required prior to the test	During the test
Ambient Temperature		15 to 35 °C	24 °C
Relative Humidity		30 to 60 %	47 %
Atmospheric Pressure		860 to 1060 mbar	1004 mbar
Equipment mode		Power interface mode	DC 9V(Batt.) DC 5 V (From PC USB)
		EUT configurations mode	
		Operation mode	Mode 1~2
Test Levels			
Discharge type	Discharge Level (kV)		Number of discharges per location (each polarity)
	Positive	Negative	
Air – Direct	2,4,8,15	2,4,8,15	10
Contact – Direct	8	8	10
Contact – Indirect	8	8	10
Discharge location	<p align="center">See photo documentation of the test set-up Red dots represent Air discharge test Point , Green dots represent Contact discharge test point All external locations accessible by hand, Horizontal plate (HCP) Vertical coupling plate (VCP)</p>		
Supplementary information: EUT powered at one of the Nominal input voltages and frequencies.			
Tested By : Guan Chen Wu			
Tested Date : 2021/12/27			

SGS ESD EN61000-4-2 WuKu No.1 EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
ESD Simulator	NoiseKen	ESS-2000/TC-815R	0189C01569	2021/7/29	2022/7/28
HCP	N/A	1.6 x 0.8 m	N/A	N.C.R.	N.C.R.
VCP	N/A	0.5 x 0.5 m	N/A	N.C.R.	N.C.R.
Testing Site : No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan					

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Photo of test setup for Immunity to Electrostatic Discharges

**Model No.:EX-series-Proximity Lock
01**



02



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Photo of test setup for Immunity to Electrostatic Discharges

03



04



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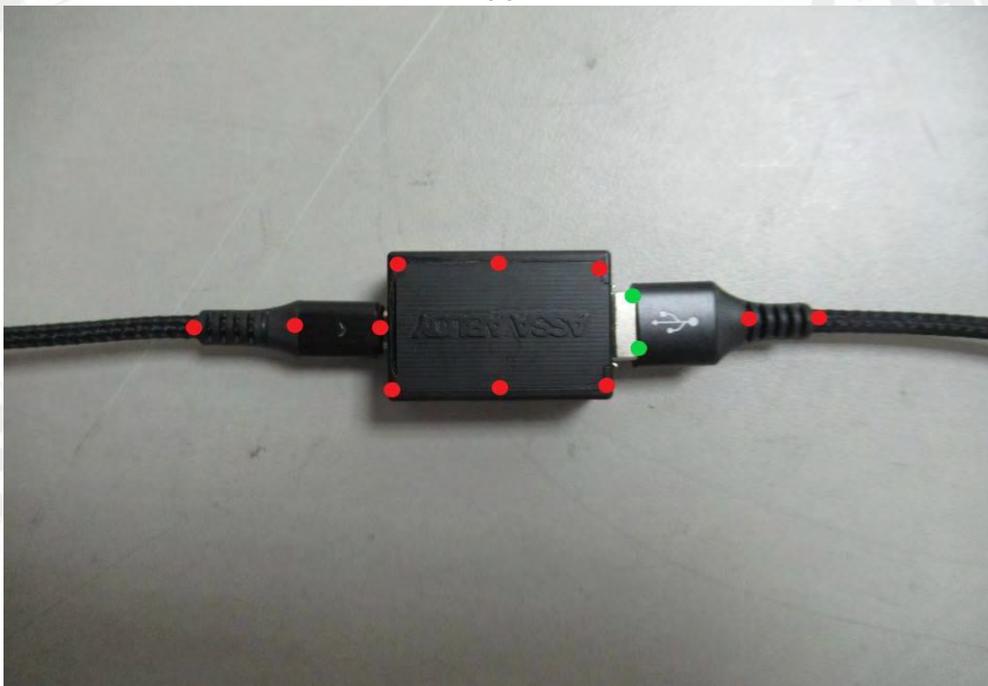
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Photo of test setup for Immunity to Electrostatic Discharges

05



06



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ESD Waveform Verification (Optional)	
None	None
Positive 6 kV Amplitude	Negative 6 kV Amplitude

Tabulated Results for Electrostatic Discharges			
Nominal Voltage (V)..... :		DC 9 V(Batt.) DC 5 V (From PC USB)	
Nominal Frequency (Hz) :		50 & 60	
Direct discharges: Air and Contact			
Discharge location (mark with red dot)	Air discharge voltage (kV)	Polarity	Result
Surface of case	2, 4, 8, 15	+ and -	1
Junction of case	2, 4, 8, 15	+ and -	1
USB Port	2, 4, 8, 15	+ and -	1
Discharge location (mark with green dot)	Contact discharge voltage (kV)	Polarity	Result
USB Port	8	+ and -	1
Surface of case	8	+ and -	1
Junction of case	8	+ and -	1
Screw	8	+ and -	1

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Indirect discharges			
Discharge location	Contact discharge voltage (kV)	Polarity	Result
HCP - Front	2, 4, 8	+ and -	1
HCP - Left	2, 4, 8	+ and -	1
HCP - Right	2, 4, 8	+ and -	1
HCP - Rear	2, 4, 8	+ and -	1
VCP - Front	2, 4, 8	+ and -	1
VCP - Left	2, 4, 8	+ and -	1
VCP - Right	2, 4, 8	+ and -	1
VCP - Rear	2, 4, 8	+ and -	1

Results Descriptions:
X - Not Performed nor required.
1 – Compliant - No perceived discharge, no observed response from EUT.
2 – Compliant – Discharge observed, no observed response from EUT.
2* – Compliant – Discharge observed, the response was observed from EUT.

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Photo of Electrostatic Discharges Test Locations

Model No.:EX-series-Proximity Lock

Mode_1



Mode_2



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1.14 Test Conditions and Results - Immunity to Radio Frequency Electromagnetic Fields

61000-4-3	TEST: RF electromagnetic fields (IEC 61000-4-3:2006+A1:2007+A2:2010)		Verdict
<p>Method: The test allows estimating of the radiated immunity of electrical and electronic equipment to electromagnetic disturbances coming from intended radio-frequency (RF) transmitters in the frequency range 80 MHz to 2700 MHz. The interference is applied on the enclosure of the equipment by using transmitting antennas.</p>			P
Laboratory Parameters:		Required prior to the test	During the test
Ambient Temperature		15 to 35 °C	22 °C
Relative Humidity		30 to 60 %	51 %
Equipment mode		Power interface mode	DC 9 V(Batt.) DC 5 V (From PC USB)
		EUT configurations mode	
		Operation mode	Mode 1~2
Test specifications			
Calibration Requirements		Uniform field area (UFA)	1.5 m x 1.5 m, 16 points with a minimum UFA size 0.5 m x 0.5 m
			75 % of calibration points within specifications if UFA is larger than 0.5 m x 0.5 m. 100 % (all 4 points) in the specifications for 0.5 x 0.5 m UFA
Frequency bandwidth		80 MHz to 2700 MHz	
Modulation		80% AM at 1kHz*	
Level	Professional Healthcare Environment	3 V/m	
	Home Healthcare Environment	10 V/m	
Frequency step		1%	
<p>Supplementary information:</p> <p>EUT powered at one of the Nominal input voltages and frequencies.</p> <p>Dwell time minimum 1 s. Actual dwell time noted in results table.</p> <p>Actual test level noted in results table.</p> <p>Note * - Testing may be performed at other modulation frequencies identified by the Risk Management Process.</p> <p>Tested By : Guan Chen Wu</p> <p>Tested Date : 2021/12/22</p>			

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SGS RS EN61000-4-3 WuKu EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
RS Test Site	Chance Most	8X4X4 Chamber	N/A	2021/8/2	2022/8/1
Signal Generator	Agilent	N5181A	MY50143807	2021/7/27	2022/7/26
Power Meter	Agilent	E4419B	GB40201546	2021/9/1	2022/8/31
Power Sensor	Agilent	E9301A	22982	2021/9/1	2022/8/31
Power Sensor	Agilent	E9301A	MY41497247	2021/9/1	2022/8/31
Power Amplifier	MILMEGA	80RF 1000-250	1067523	N.C.R.	N.C.R.
Power Amplifier	MILMEGA	AS0860B-50-50	1083416	N.C.R.	N.C.R.
Power Amplifier	MILMEGA	AS0104-100/100	1049222	N.C.R.	N.C.R.
Relay Switching Unit	FRANKONIA	RSU-3203	113A3122	N.C.R.	N.C.R.
Remote RF Switch	Audix	r2S1216	2008040801	N.C.R.	N.C.R.
Remote RF Switch	CW-01	N/A	N/A	N.C.R.	N.C.R.
Turn Table	Chance Most	N/A	N/A	N.C.R.	N.C.R.
Antenna Tower	Chance Most	N/A	N/A	N.C.R.	N.C.R.
Controller	Chance Most	886	MF7802111	N.C.R.	N.C.R.
Stacked Log. Periodic Antenna	Schwarzbeck	STLP 9129	9129-086	N.C.R.	N.C.R.
Electric Field Probes	AR	FL7006+FI7000	0433723+0433843	2021/6/12	2022/6/11
Test Software	emcware AR	N/A	Ver. 3.6.0	N.C.R.	N.C.R.

Testing Site : No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan

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Photo of test setup for Radio Frequency Electromagnetic Fields

**Model No.:EX-series-Proximity Lock
Mode_1**



Mode_2



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Tabulated Results for RF Electromagnetic Field 80 MHz to 2700 MHz				
Side of the equipment under test	Test Level (V/m)	Antenna polarization (V/H)	Dwell Time (second)	Result
Front	3	H	3	1
	3	V	3	1
Back	3	H	3	1
	3	V	3	1
Left	3	H	3	1
	3	V	3	1
Right	3	H	3	1
	3	V	3	1
Results Descriptions: X - Not performed nor required. 1 – Compliant - No observed response from EUT.				
Note: Description of the response should detail observations during testing.				

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1.15 Test Conditions and Results – Proximity fields from RF wireless communications equipment

61000-4-3	TEST: Proximity fields from RF wireless communications equipment (IEC 61000-4-3:2006+A1:2007+A2:2010)		Verdict
Method: The test allows estimating of the radiated immunity of electrical and electronic equipment to electromagnetic disturbances coming from RF communications equipment. The interference is applied on the enclosure of the equipment by using transmitting antennas.			P
Laboratory Parameters:	Required prior to the test	During the test	
Ambient Temperature	15 to 35 °C	22 °C	
Relative Humidity	30 to 60 %	51 %	
Equipment mode	Power interface mode	DC 9 V(Batt.) DC 5 V (From PC USB)	
	EUT configurations mode		
	Operation mode	Mode 1~2	
Test specifications			
Calibration Requirements	Uniform field area (UFA)	1.5 m x 1.5 m, 16 points with a minimum UFA size / 0.5 m x 0.5 m	
		75 % of calibration points within specifications if UFA is larger than 0.5 m x 0.5 m. 100 % (all 4 points) in the specifications for 0.5 x 0.5 m UFA	

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Frequency Range and Level: RF wireless communication equipment		
Test Frequency (MHz)	Modulation	Immunity Level (V/m)
385	**Pulse Modulation: 18Hz	27
450	*FM ± 5kHz deviation: 1kHz sine	28
710 745 780	**Pulse Modulation: 217Hz	9
810 870 930	**Pulse Modulation: 18Hz	28
1720 1845 1970	**Pulse Modulation: 217Hz	28
2450	**Pulse Modulation: 217Hz	28
5240 5500 5785	**Pulse Modulation: 217Hz	9

Supplementary information:

EUT powered at one of the Nominal input voltages and frequencies.

Dwell time minimum 1 s. Actual dwell time noted in results table.

Note * - As an alternative to FM modulation, 50 % pulse modulation at 18 Hz may be used because while it does not represent actual modulation, it would be worst case.

Note** - The carrier shall be modulated using a 50 % duty cycle square wave signal.

Tested By : Guan Chen Wu

Tested Date : 2021/12/22

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SGS RS EN61000-4-3 WuKu EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
RS Test Site	Chance Most	8X4X4 Chamber	N/A	2021/8/2	2022/8/1
Signal Generator	Agilent	N5181A	MY50143807	2021/7/27	2022/7/26
Power Meter	Agilent	E4419B	GB40201546	2021/9/1	2022/8/31
Power Sensor	Agilent	E9301A	22982	2021/9/1	2022/8/31
Power Sensor	Agilent	E9301A	MY41497247	2021/9/1	2022/8/31
Power Amplifier	MILMEGA	80RF 1000-250	1067523	N.C.R.	N.C.R.
Power Amplifier	MILMEGA	AS0860B-50-50	1083416	N.C.R.	N.C.R.
Power Amplifier	MILMEGA	AS0104-100/100	1049222	N.C.R.	N.C.R.
Relay Switching Unit	FRANKONIA	RSU-3203	113A3122	N.C.R.	N.C.R.
Remote RF Switch	Audix	r2S1216	2008040801	N.C.R.	N.C.R.
Remote RF Switch	CW-01	N/A	N/A	N.C.R.	N.C.R.
Turn Table	Chance Most	N/A	N/A	N.C.R.	N.C.R.
Antenna Tower	Chance Most	N/A	N/A	N.C.R.	N.C.R.
Controller	Chance Most	886	MF7802111	N.C.R.	N.C.R.
Stacked Log. Periodic Antenna	Schwarzbeck	STLP 9129	9129-086	N.C.R.	N.C.R.
Electric Field Probes	AR	FL7006+FI7000	0433723+0433843	2021/6/12	2022/6/11
Test Software	emcware AR	N/A	Ver. 3.6.0	N.C.R.	N.C.R.

Testing Site : No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan

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Photo of test setup for Proximity fields from RF wireless communications equipment

**Model No.:EX-series-Proximity Lock
Mode_1**



Mode_2



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Tabulated Results for Proximity Fields From RF Wireless Communications Equipment				
Side of the equipment under test	Frequency Band (MHz)	Antenna polarization (V/H)	Dwell Time (second)	Result
Front	380 – 390	H	3	1
	430 – 470	H	3	1
	704 – 787	H	3	1
	800 – 960	H	3	1
	1700 – 1990	H	3	1
	2400 – 2570	H	3	1
	5100 – 5800	H	3	1
Front	380 – 390	V	3	1
	430 – 470	V	3	1
	704 – 787	V	3	1
	800 – 960	V	3	1
	1700 – 1990	V	3	1
	2400 – 2570	V	3	1
	5100 – 5800	V	3	1
Back	380 – 390	H	3	1
	430 – 470	H	3	1
	704 – 787	H	3	1
	800 – 960	H	3	1
	1700 – 1990	H	3	1
	2400 – 2570	H	3	1
	5100 – 5800	H	3	1
Back	380 – 390	V	3	1
	430 – 470	V	3	1
	704 – 787	V	3	1
	800 – 960	V	3	1
	1700 – 1990	V	3	1
	2400 – 2570	V	3	1
	5100 – 5800	V	3	1
Left	380 – 390	H	3	1
	430 – 470	H	3	1

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	704 – 787	H	3	1
	800 – 960	H	3	1
	1700 – 1990	H	3	1
	2400 – 2570	H	3	1
	5100 – 5800	H	3	1
Left	380 – 390	V	3	1
	430 – 470	V	3	1
	704 – 787	V	3	1
	800 – 960	V	3	1
	1700 – 1990	V	3	1
	2400 – 2570	V	3	1
	5100 – 5800	V	3	1
Right	380 – 390	H	3	1
	430 – 470	H	3	1
	704 – 787	H	3	1
	800 – 960	H	3	1
	1700 – 1990	H	3	1
	2400 – 2570	H	3	1
	5100 – 5800	H	3	1
Right	380 – 390	V	3	1
	430 – 470	V	3	1
	704 – 787	V	3	1
	800 – 960	V	3	1
	1700 – 1990	V	3	1
	2400 – 2570	V	3	1
	5100 – 5800	V	3	1

Results Descriptions:

X - Not performed nor required.

1 – Compliant - No observed response from EUT.

Supplementary information: None

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1.16 Test Conditions and Results – Electrical Fast Transients

61000-4-4	TEST: Fast Transients – (IEC61000-4-4:2012)			Verdict
<p><u>Method:</u> Measurements were made on a ground plane that extends 1-meter minimum beyond all sides of the system under test. Mains power tests were conducted with the product connected to a Coupling/Decoupling Network (CDN). I/O lines were tested in a Capacitive Coupling Clamp. One of each unique interface was tested for a period of one (1) minute per polarity.</p>				N/A
Laboratory Parameters:		Required prior to the test		During the test
Ambient Temperature		10 to 40 °C		N/A°C
Relative Humidity		10 to 90 %		N/A%
Fully configured sample subject to the levels shown below.		Measurement Point		
		Input a.c. Power Ports		
		Input d.c. Power Ports		
		Signal Input/Output Ports		
Equipment mode		Power interface mode		N/A
		EUT configurations mode		
		Operation mode		N/A
Applied Level				
Application Point		(kV)	Coupling Method	Repetition Frequency (kHz)
Input a.c. Power Ports		±2	Direct Injection	100
Input d.c. Power Ports		±2	Direct Injection	100
Signal Input/Output Ports*		±1	Capacitive Clamp	100
Input d.c. Power ports (transportation)		See ISO 7637-2		
<p>Supplementary information: EUT powered at one of the Nominal input voltages and frequencies. Note* - SIP/SOPS whose maximum cable length is less than 3m are excluded. Tested By : N/A Tested Date : N/A</p>				

SGS EFT EN61000-4-4 WuKu EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
-	-	-	-	-	-
-	-	-	-	-	-

Testing Site : No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan

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Electrical Fast Transients Waveform Verification (Optional)	
None	None
2000V Amplitude and Rise Time	2000V Duration @ 50% amplitude
None	
	2000V Repetition Frequency

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Photo of test setup for Electrical Fast Transients
N/A

Tabulated Results for Electrical Fast Transients	
Point of application	Results
Mains	x
I/O Line 1 -	x
I/O Line 2 -	x
Results Descriptions: X - Not performed nor required. (The device(s) power from DC 9 V battery, no Signal I/O cable length > 3 m and no patient cable exist, no necessary to perform the test.) 1 – Compliant - No observed response from EUT.	
Supplementary information: None	

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1.17 Test Conditions and Results – Surge Immunity

61000-4-5	TEST: Surge Immunity Test – (IEC61000-4-5:2014+A1:2017)		Verdict
<p>Method: Mains power tests were conducted with the product connected to a Coupling/Decoupling Network (CDN). The test voltage was increased from the lowest indicated level up to the maximum level. Five (5) positive surges and five (5) negative surges were applied at each of phases of the a.c. waveform: 0°, 90°, 180° and 270°. Each surge was applied 60 seconds after the previous surge. Signal and Telecommunications ports were subject to five (5) positive and five (negative) surges applied through the appropriate Coupling/Decoupling Network (CDN).</p>			N/A
Laboratory Parameters:		Required prior to the test	During the test
Ambient Temperature		10 to 40 °C	N/A°C
Relative Humidity		10 to 90 %	N/A%
Fully configured sample subject to the levels shown below.		Measurement Point	
		Input AC and DC Power Ports	
Equipment mode		Power interface mode	N/A
		EUT configurations mode	
		Operation mode	N/A
Applied Level			
Application Point	[kV]	Required Surge Waveform	
Input Power Ports	0.5 and 1.0 (Line to Line)	Combination Wave (2µs x 50µs Voltage, 8µs x 20µs Current)	
	0.5, 1.0 and 2.0 (Line to Earth)	Combination Wave (2µs x 50µs Voltage, 8µs x 20µs Current)	
Signal input/output*	2.0 (Line to Earth)	Combination Wave (2µs x 50µs Voltage, 8µs x 20µs Current)	
ME EQUIPMENT and ME SYSTEMS that do not have a surge protection device in the primary power circuit may be tested only at 2 kV line(s) to earth and 1 kV line(s) to line(s).			
Supplementary information:			
EUT powered at one of the Nominal input voltages and frequencies.			
Note* - Applicable to output lines intended to connect directly to outdoor cables.			
Tested By : N/A			
Tested Date : N/A			

SGS Surge EN61000-4-5 WuKu EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
-	-	-	-	-	-

Testing Site : No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan

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Surge Waveform Verification (Optional)	
None	None
2000V Amplitude and Rise Time Open Circuit Voltage	2000V Duration @ 50% Amplitude Open Circuit Voltage
None	None
2000V Amplitude and Rise Time Short Circuit Current	2000V Duration @ 50% Amplitude Short Circuit Current

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Photo of test setup for Surge Immunity

N/A

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Tabulated Results for Surge - Mains			
Mode of Application	Level	Polarity	Results
Line 1 to Line 2 (Differential mode)	0.5kV	Positive	x
		Negative	x
	1.0kV	Positive	x
		Negative	x
Line 1 to Earth (Common mode)	0.5kV	Positive	x
		Negative	x
	1.0kV	Positive	x
		Negative	x
	2.0kV	Positive	x
		Negative	x
Line 2 to Earth (Common mode)	0.5kV	Positive	x
		Negative	x
	1.0kV	Positive	x
		Negative	x
	2.0kV	Positive	x
		Negative	x
Results Descriptions:			
X - Not performed nor required. (The device(s) power from DC 9 V battery, no necessary to perform the test.)			
1 – Compliant - No observed response from EUT.			
Supplementary information:			
None			

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Tabulated Results for Surge – Signal Input/output Lines Directly Connected to Outdoor Lines			
Mode of Application	Level	Polarity	Results
Line 1 to Earth (Common mode)	2kV	Positive	x
		Negative	x
Line 2 to Earth (Common mode)	2kV	Positive	x
		Negative	x
Results Descriptions: X - Not performed nor required. (The device(s) power from DC 9 V battery, without Signal Input/output cable length >3 m, no necessary to perform the test.) 1 – Compliant - No observed response from EUT.			
Supplementary information: Note: Description of the response should detail observations during testing.			

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1.18 Test Conditions and Results – Conducted Disturbances Immunity

61000-4-6		TEST: RF Continuous Conducted – (IEC61000-4-6:2013)		Verdict
<p>Method: Measurements were made on a ground plane that extends 0.5-meter minimum beyond all sides of the system under test. The EUT was located 10cm above the reference ground plane and any associated I/O cables attached to the EUT were located between 30mm and 50mm above the ground plane. The indicated field was pre-calibrated prior to placement of the system under test.</p>				N/A
Laboratory Parameters:		Required prior to the test		During the test
Ambient Temperature		10 to 40 °C		N/A°C
Relative Humidity		10 to 90 %		N/A%
Equipment mode		Power interface mode		N/A
		EUT configurations mode		
		Operation mode		N/A
Test Specifications:		Frequency range		Measurement Point
Fully configured sample scanned over the following frequency range		150kHz to 80MHz		Input a.c. Power Ports Input d.c. Power Ports Signal Input/output Ports Patient Connected Ports
Level	Home Healthcare Environment	3 V RMS outside the ISM band, 6 V RMS in the ISM and amateur radio bands		
	Professional Healthcare Environment	3 V RMS outside the ISM band, 6 V RMS in the ISM band		
Frequency step		1%		
Modulation		80% Am at 1kHz*		
<p>Supplementary information:</p> <p>EUT powered at one of the Nominal input voltages and frequencies.</p> <p>Dwell time minimum 1 s.</p> <p>Note * - Testing may be performed at other modulation frequencies identified by the Risk Management Process.</p> <p>Tested By : N/A</p> <p>Tested Date : N/A</p>				

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Photo of test setup for Conducted Disturbances
N/A

Tabulated Results for Conducted Disturbances		
Point of Application	Results	Dwell Time (second)
Mains	x	x
Sip/Sop 1 –	x	x
Sip/Sop 2 -	x	x
Sip/Sop 3 -	x	x
Patient Connected Port 1 -	x	x
Patient Connected Port 2 -	x	x
Supplementary information: Results Descriptions: X - Not performed nor required. (The device(s) power from DC 9 V battery, without Sip/Sop cable length >3 m, no patient cable exist, no necessary to perform the test.) 1 – Compliant - No observed response from EUT. Note: Description of the response should detail observations during testing. Note: Delete rows not used Note: Describe each port tested		

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1.19 Test Conditions and Results – Power- Frequency Magnetic Fields

61000-4-8	TEST: Power-frequency magnetic field – (IEC61000-4-8:2009)	Verdict
<p>Method: Measurements were made on a ground plane that extends 1-meter minimum beyond sides of the system under test. Table top EUT is located 80cm above the reference ground plane and floor-standing EUT is located 10cm above the reference ground plane. The indicated field was pre-calibrated prior to placement of the EUT under test.</p>		P
Laboratory Parameters:	Required prior to the test	During the test
Ambient Temperature	10 to 40 °C	22 °C
Relative Humidity	10 to 90 %	51 %
Equipment mode	Power interface mode	DC 9V(Batt.) DC 5 V (From PC USB)
	EUT configurations mode	
	Operation mode	Mode 1~2
Fully configured sample tested at the power line frequency (See Note 1)	Frequency	Application Point
	50 Hz and 60 Hz	Enclosure
Test Level	30 (A/m)	
<p>Supplementary information: EUT powered at one of the Nominal input voltages and frequency of either 50Hz or 60Hz. During the test, the frequency of the field and line frequency of the ME equipment shall be the same. Tested By : Guan Chen Wu Tested Date : 2021/12/27</p>		

SGS PFMF EN61000-4-8 WuKu EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
AC clamp meter	DER EE	DE-3103	K0011708	2020/12/29	2021/12/28
PMF Antenna	EMC Partner	MF-1000	MF-1000-2 -07	N.C.R.	N.C.R.
TRANSFORMER	TAI YEESH SING	ETL-0128	N/A	N.C.R.	N.C.R.

Testing Site : No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan

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Photo of test setup for Power- Frequency Magnetic Fields

**Model No.:EX-series-Proximity Lock
Mode_1**



Mode_2



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Tabulated Results for Power Frequency Magnetic Field	
Point of application	Results
X-Axis	1
Y-Axis	1
Z-Axis	1

Supplementary information:
 Results Descriptions:
 X - Not performed nor required.
 1 – Compliant - No observed response from EUT.
 Note: Description of the response should detail observations during testing.

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1.20 Test Conditions and Results – Voltage Dips, Interruptions, and Variations

61000-4-11	TEST: Voltage Dips and Interruptions – (IEC61000-4-11:2004+A1:2017)	Verdict
Method: The product was subjected to voltage dips and interruptions. Testing was performed with the product connected directly to a generator capable of simulating the voltage drops and interrupts as described.		N/A
Laboratory Parameters:	Required prior to the test	During the test
Ambient Temperature	10 to 40 °C	N/A°C
Relative Humidity	10 to 90 %	N/A%
Fully configured subjected to the levels indicated below.	Measurement Point	
	Input A.C. Power Ports	
Equipment mode	Power interface mode	N/A
	EUT configurations mode	
	Operation mode	N/A
Applied Levels		
Voltage Dips % U_T	Cycles	Sync Angle (degrees)
0	0.5*	0,45,90,135,180,225,270,315
0	1	0
70	25 (50 Hz) / 30 (60 Hz)	0
Voltage Interruption % U_T	Cycles	Sync Angle [degrees]
0	250 (50 Hz) / 300 (60 Hz)	0
Supplementary information: If the Rated voltage range <25% of the lowest rated input voltage, one rated input voltage. Otherwise, minimum and maximum rated voltage. EUT powered at one of the Nominal input frequencies. ME EQUIPMENT and ME SYSTEMS with power input voltage selection by transformer taps shall be tested at only one tap setting. Note* - Only applicable to ME equipment with single phase a.c. mains. Tested By : N/A Tested Date : N/A		

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Supply Voltage Range	Difference of Max Voltage – Min Voltage	25% of Lowest Rated input Voltage	Test at Min/Max Voltages required (Y/N)
N/A	N/A	N/A	N/A

SGS DIP EN61000-4-11 WuKu_EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
-	-	-	-	-	-
Testing Site : No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan					

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Photo of test setup for Voltage Dips, Interruptions, and Variations

N/A

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Voltage Dips and Interruption Verifications (Optional)	
30% Dip	60% Dip
None	None
>95% Interruption	
None	

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Tabulated Results for Voltage Dips and Interruptions			
Minimum Rated Voltage (V)....			N/A
Frequency (Hz).....			N/A
Point of application	Voltage Dips (% Ut)	Cycles	Results
Mains	0	0.5	x
Mains	0	1	x
Mains	70	25 (50 Hz) / 30 (60 Hz)	x
Point of application	Voltage Interruptions (% Ut)	Cycles	Results
Mains	0	250 (50 Hz) / 300 (60 Hz)	x

Supplementary information:

Results Descriptions:

X – Not performed nor required. (The device(s) power from DC 9 V battery, no necessary to perform the test.)

1 – Compliant - No observed response from EUT.

Note: Description of the response should detail observations during testing.

Tabulated Results for Voltage Dips and Interruptions			
Maximum Rated Voltage (V) ...			N/A
Frequency (Hz).....			N/A
Point of application	Voltage Dips (% Ut)	Cycles	Results
Mains	0	0.5	x
Mains	0	1	x
Mains	70	25 (50 Hz) / 30 (60 Hz)	x
Point of application	Voltage Interruptions (% Ut)	Cycles	Results
Mains	0	250 (50 Hz) / 300 (60 Hz)	x

Supplementary information:

Results Descriptions:

X – Not performed nor required. (The device(s) power from DC 9 V battery, no necessary to perform the test.)

1 – Compliant – No observed response from EUT.

Note: Description of the response should detail observations during testing.

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1.21 Test Conditions and Results – Electrical transient conduction along supply lines

ISO 7637-2	TEST: Electrical transient conduction along supply lines		Verdict
<p>Method: The DUT shall be placed on a non-conductive low relative permittivity ($\epsilon_r \leq 1.4$) support with a thickness of (50 ± 5) mm. Grounding of the DUT case to the ground plane shall reflect the vehicle installation. Preferably, the load simulator shall be placed directly on the ground plane. If the load simulator has a metallic case, this case shall be bonded to the ground plane. The peak voltage U_s shall be adjusted to be the required test level with the tolerances of +10 % and 0 %.</p>			N/A
Laboratory Parameters:			
	Required prior to the test	During the test	
Ambient Temperature	10 to 40 °C	N/A	
Relative Humidity	10 to 90 %	N/A	
Fully configured sample subject to the levels shown below.			
Equipment mode	Power interface mode	N/A	
	EUT configurations mode		
	Operation mode	N/A	
Applied Level			
Application Point	Test pulse and level	Coupling Method	
Input d.c. Power ports (transportation)	1 (-150V)	Direct Injection	
	2a (+112V)	Direct Injection	
	2b (10V for 12V system; 20V for 24V system)	Direct Injection	
	3a (-220V for 12V system; -300V for 24Vsystem)	Direct Injection	
	3b (+150V for 12V system; +300 for 24V system)	Direct Injection	
<p>Supplementary information: For ME EQUIPMENT and ME SYSTEMS intended to be installed in passenger cars and light commercial vehicles including ambulances fitted with 12 V electrical systems or commercial vehicles including ambulances fitted with 24 V electrical systems.</p> <p>Note: The device(s) not intended used for transportation environments, no necessary to perform the test.</p> <p>Tested By : N/A Tested Date : N/A</p>			

Test Equipment Used					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

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Electrical transient conduction along supply lines (Optional)	
None	None
Pulse 1	Pulse 2a
None	None
Pulse 2b	Pulse 3a
None	
Pulse 3b	

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Photo of test setup for Electrical Transient Conduction Along Supply Lines
None

Tabulated Results for Electrical Transient Conduction Along Supply Lines	
Point of application	Results
Mains Pulse 1	x
Mains Pulse 2a	x
Mains Pulse 2b	x
Mains Pulse 3a	x
Mains Pulse 3b	x
Results Descriptions: X - Not performed nor required. 1 – Compliant - No observed response from EUT.	
Note: Description of the response should detail observations during testing. Note: The device(s) not intended used for transportation environments, no necessary to perform the test.	

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1.22 Photographs of Product Exterior:

**Model No.:EX-series-Proximity Lock
O01**



O02



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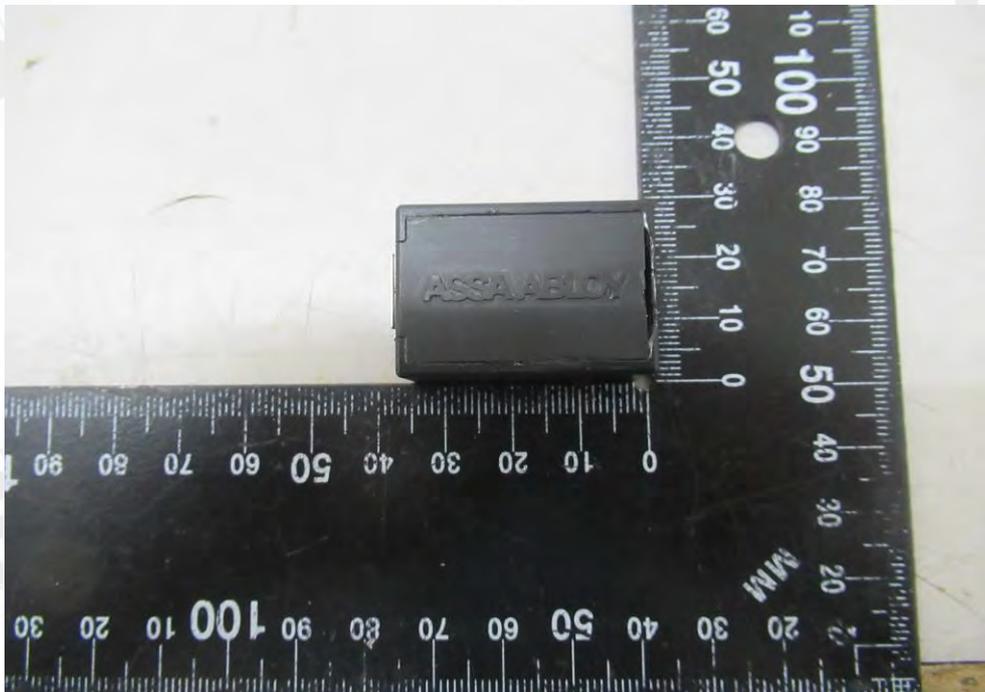
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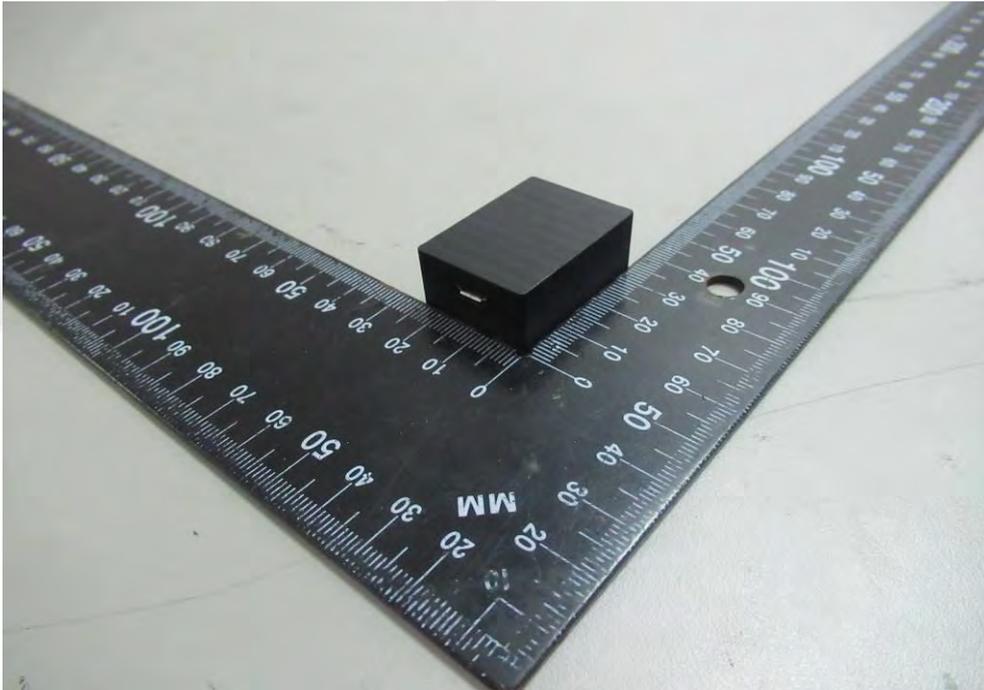
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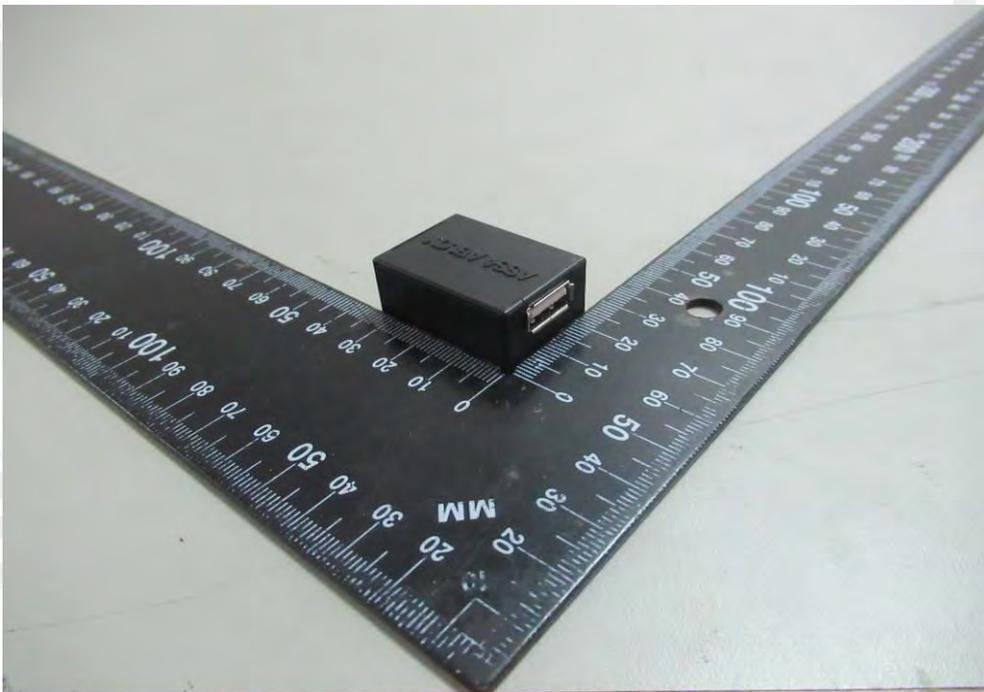
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O05



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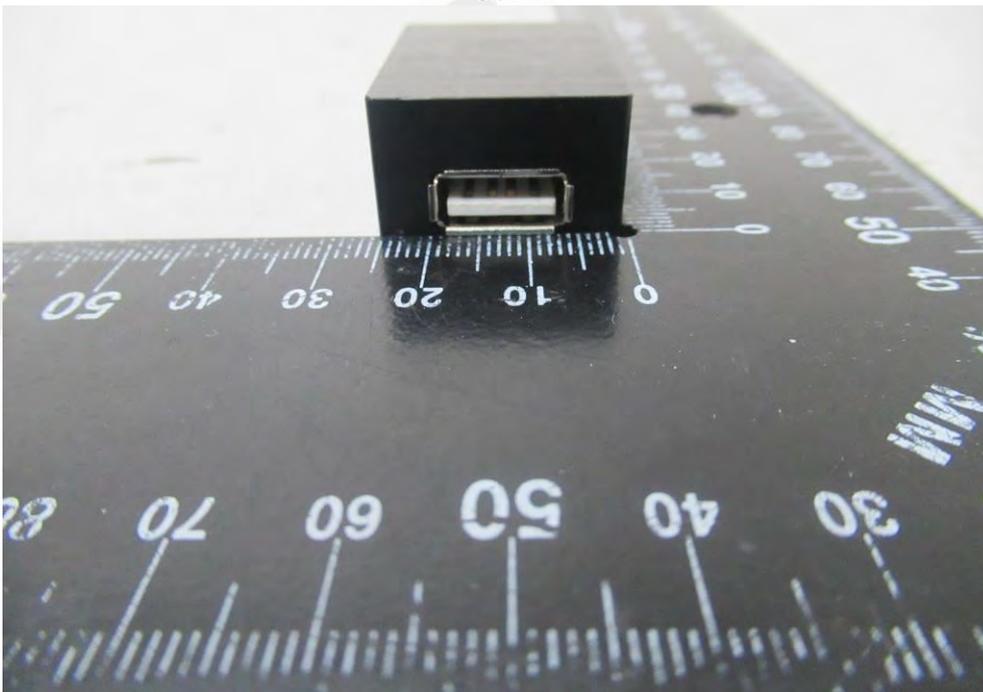


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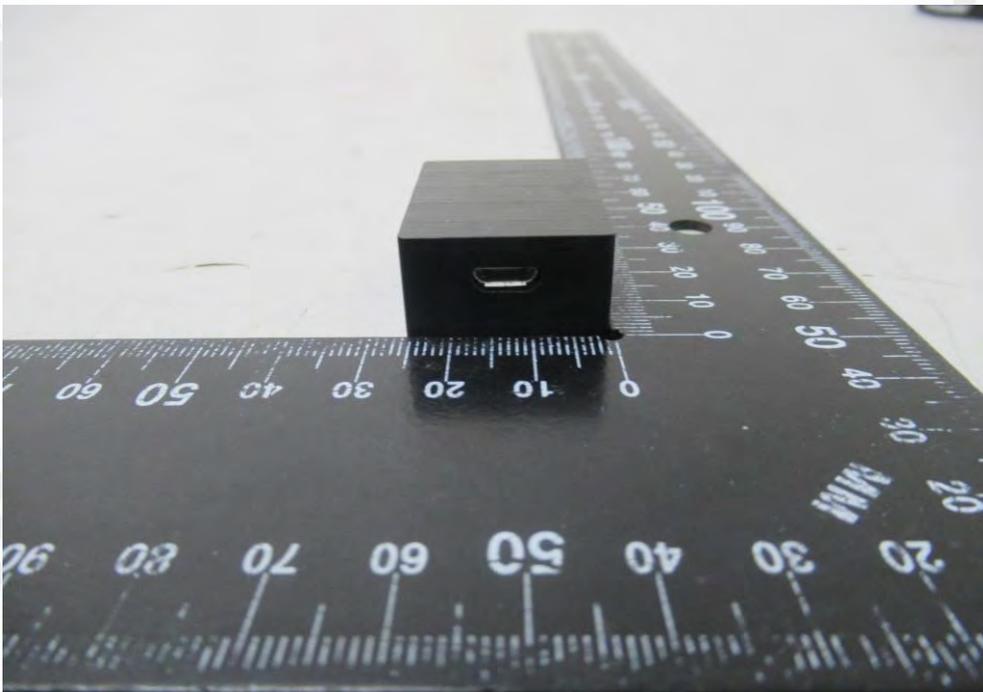
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I02

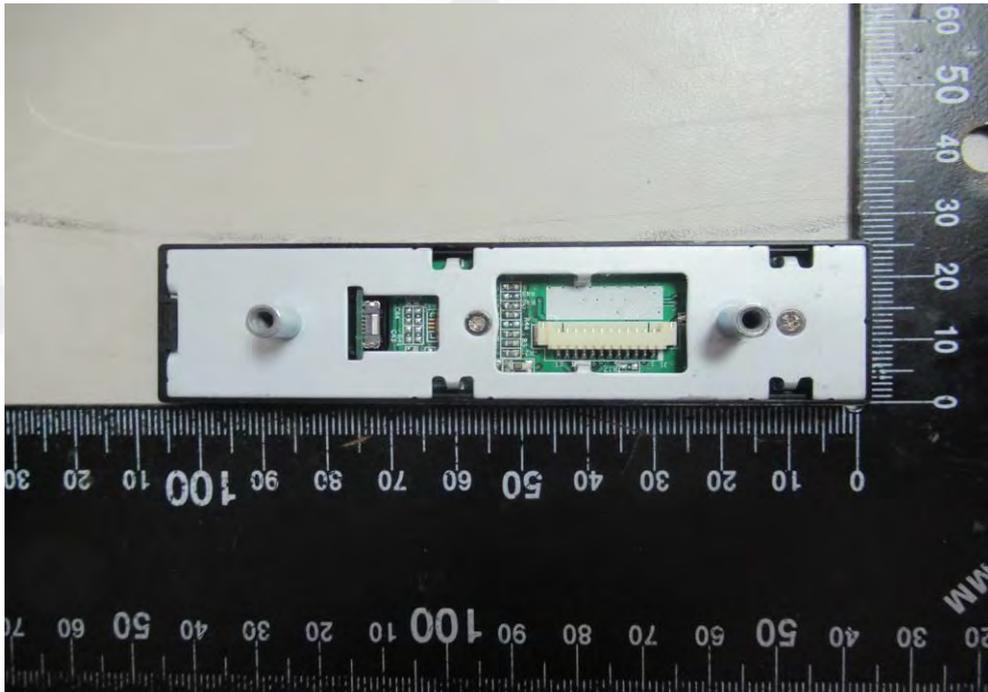


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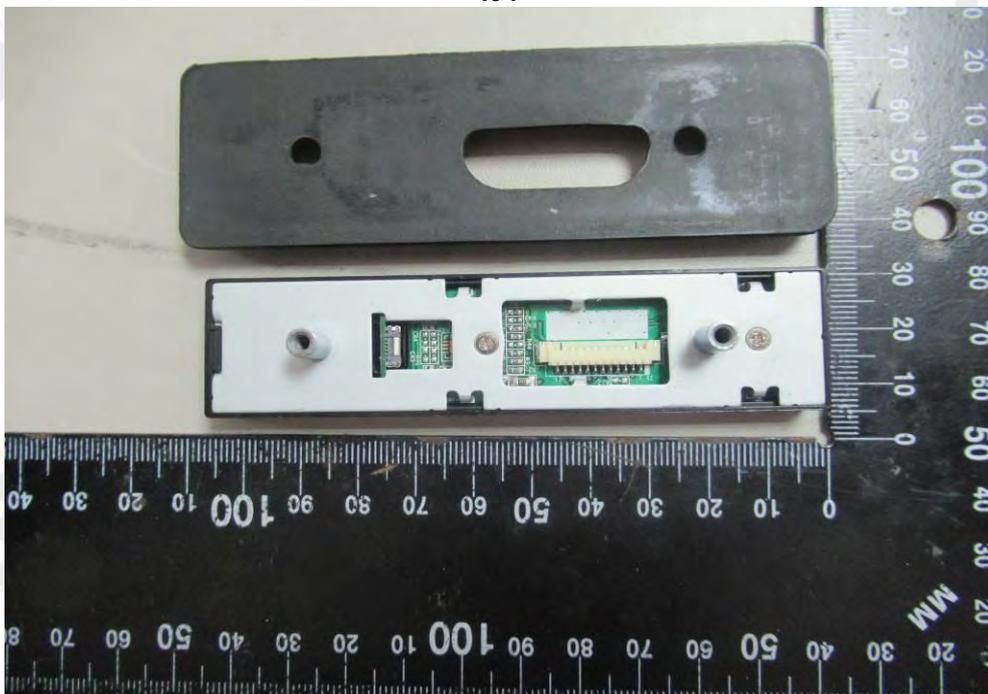
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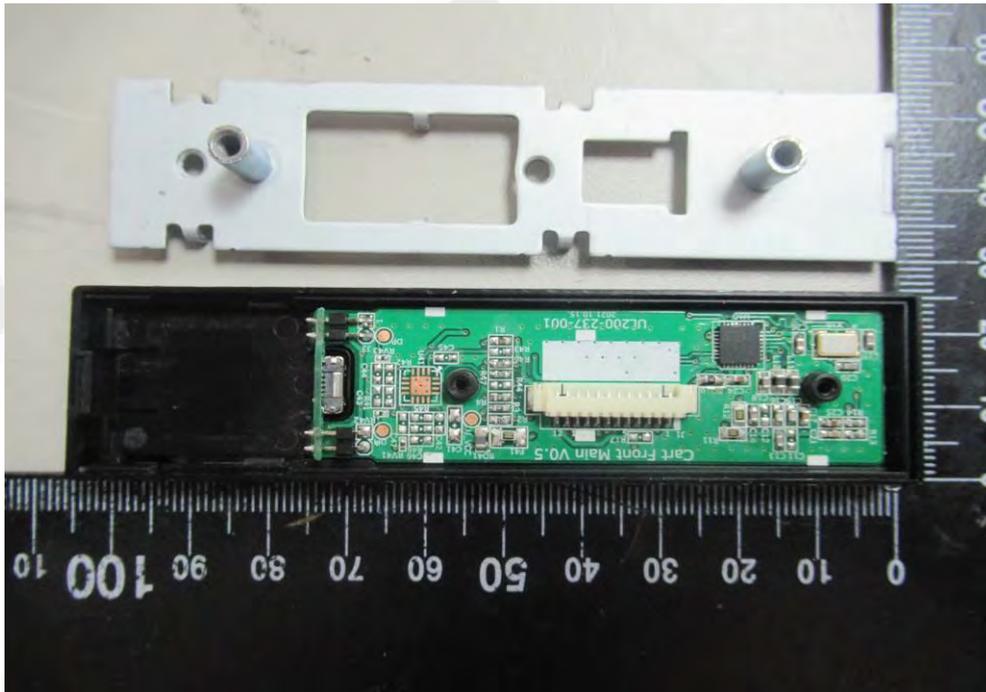
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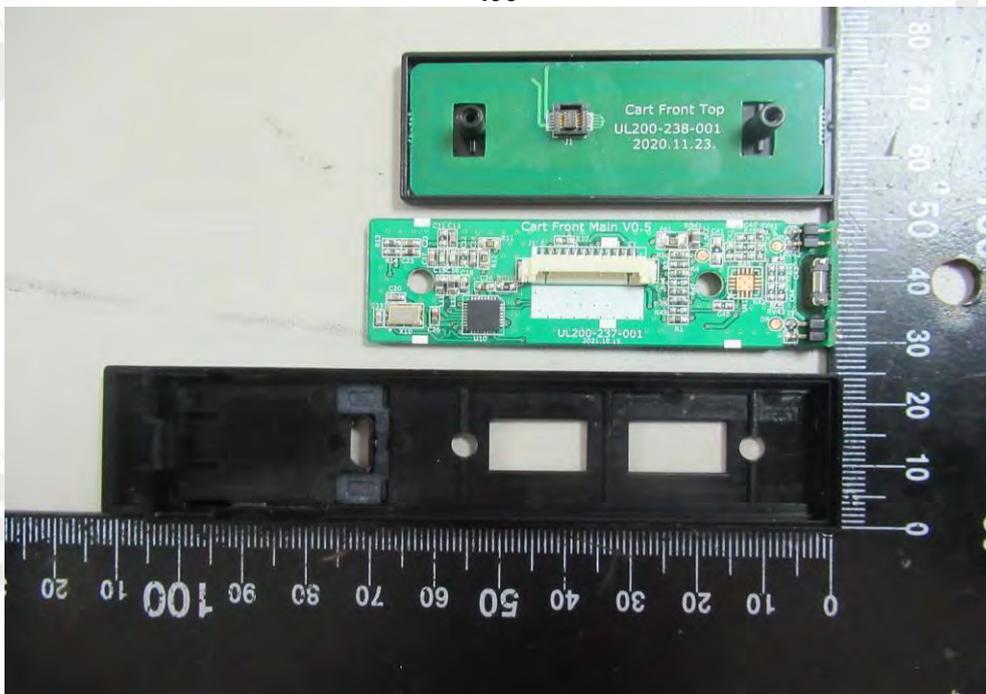
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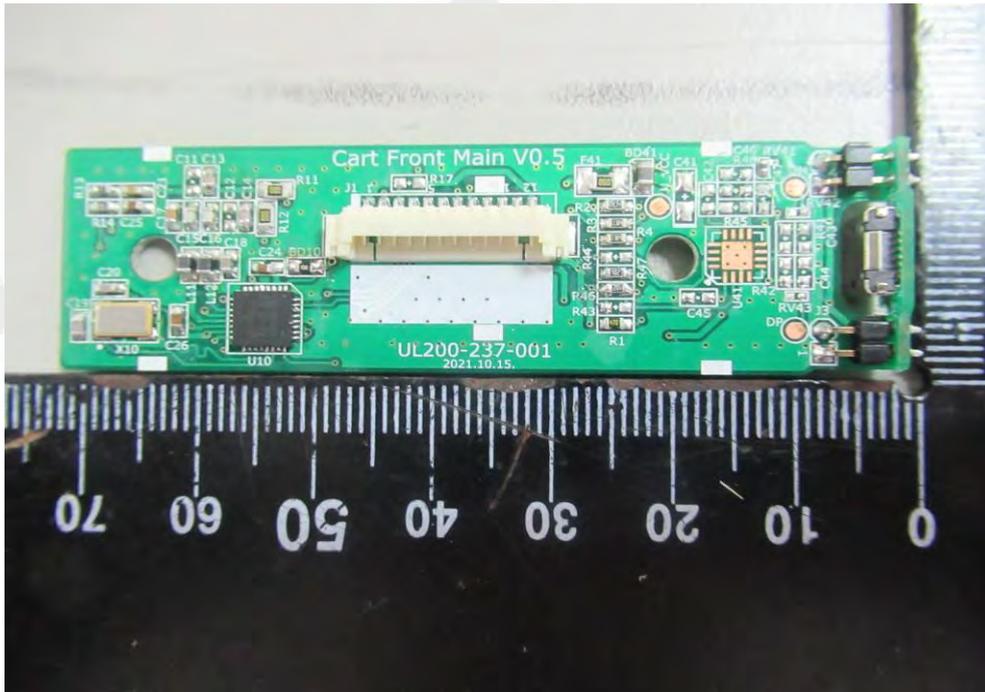
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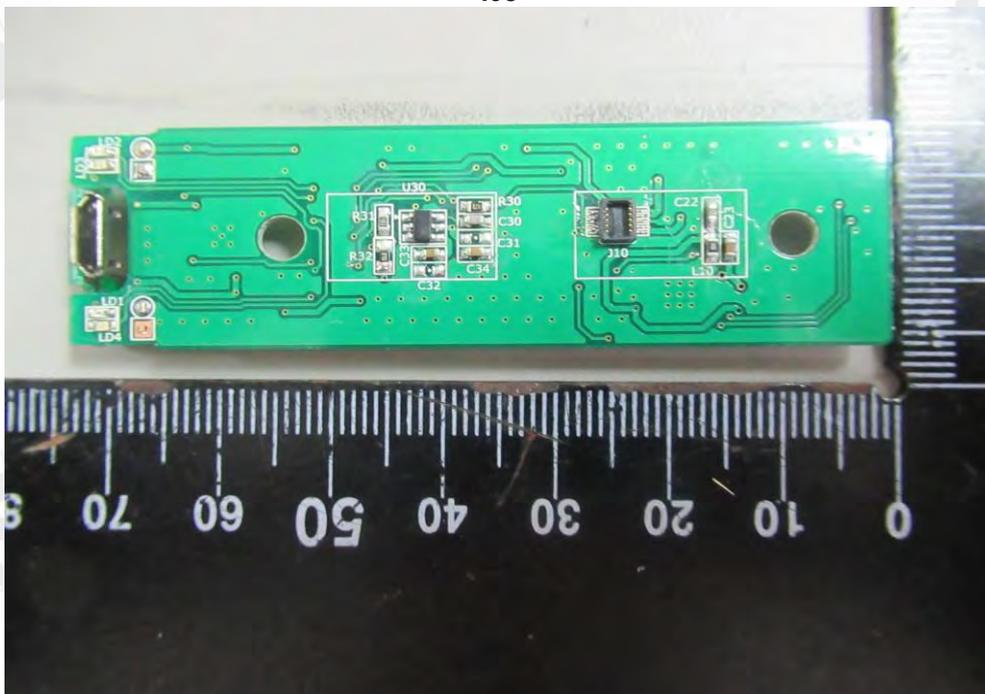
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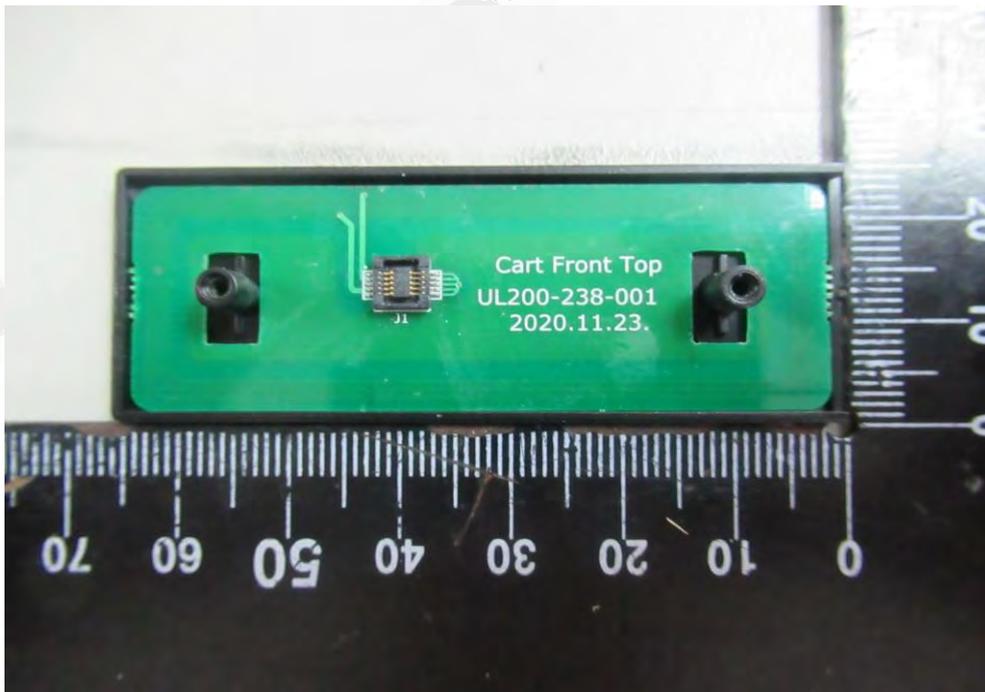
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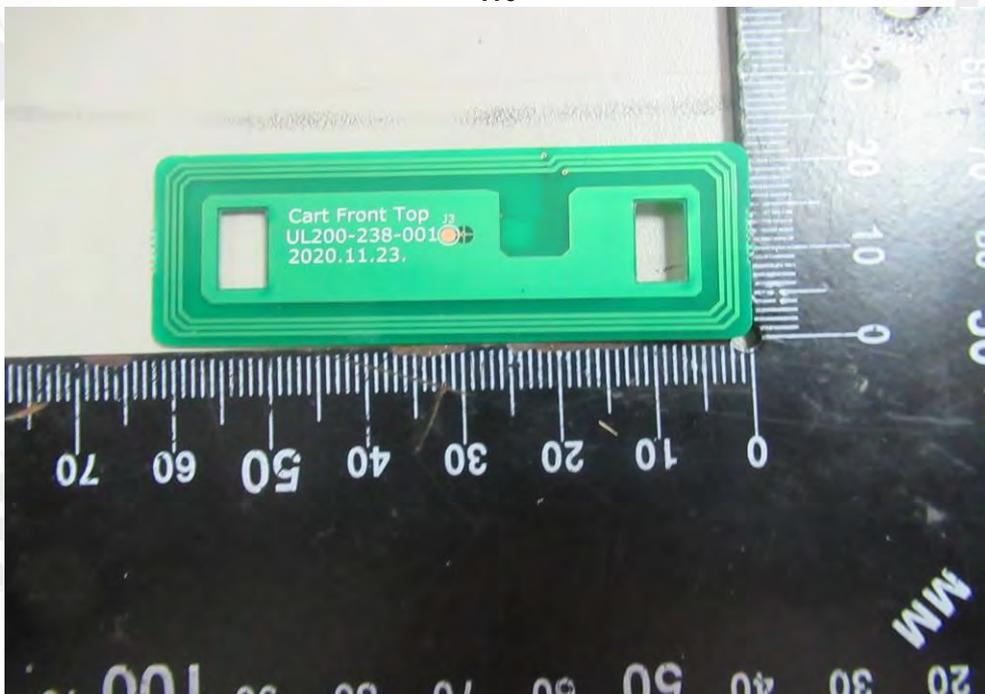
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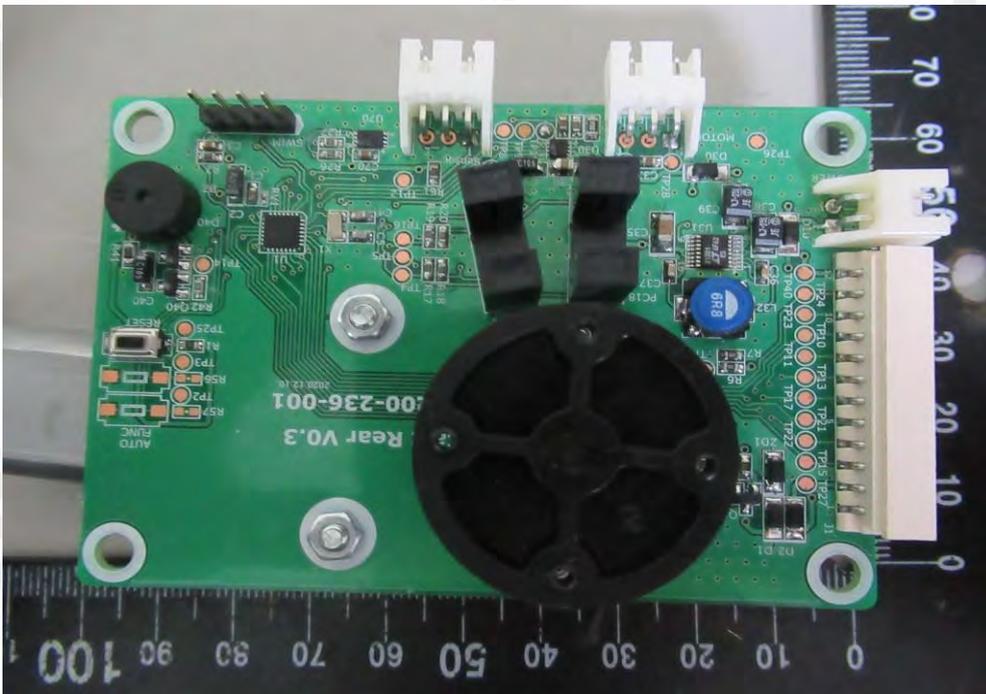
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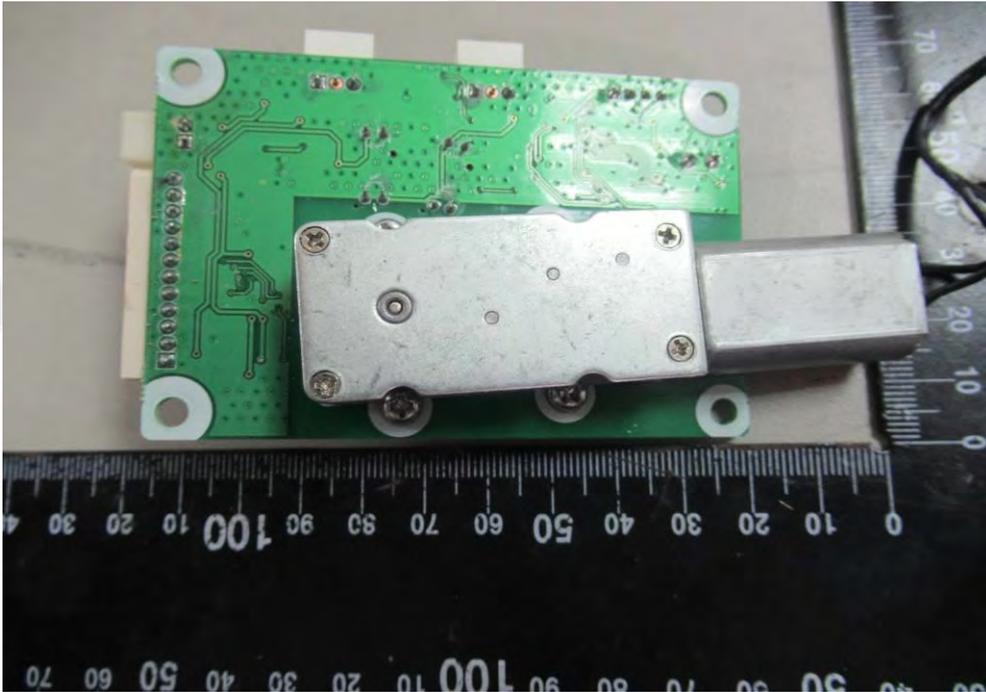


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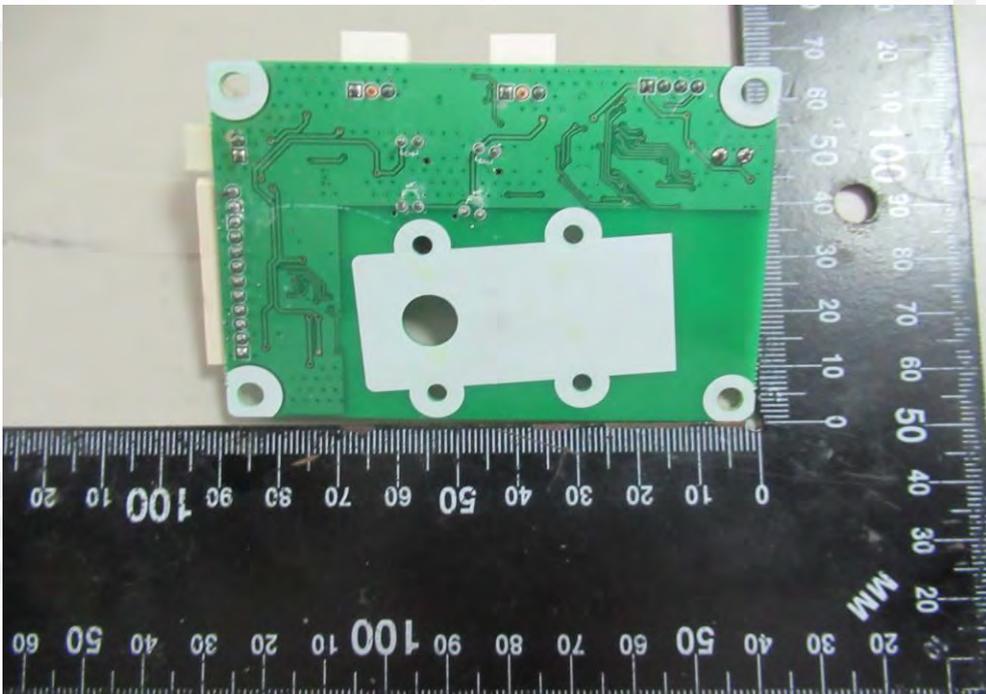
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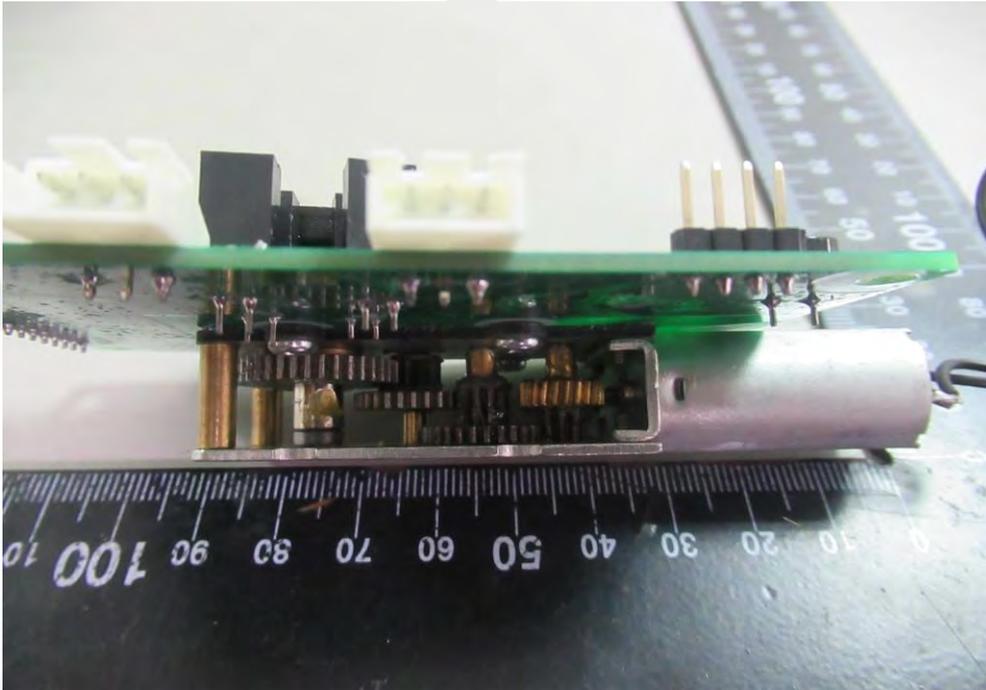
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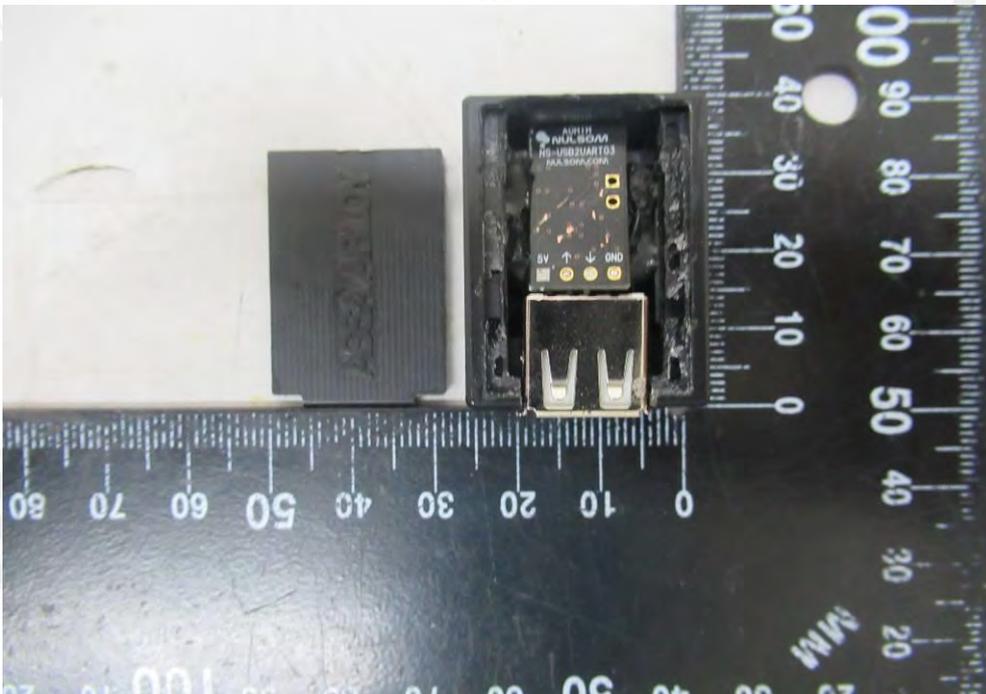
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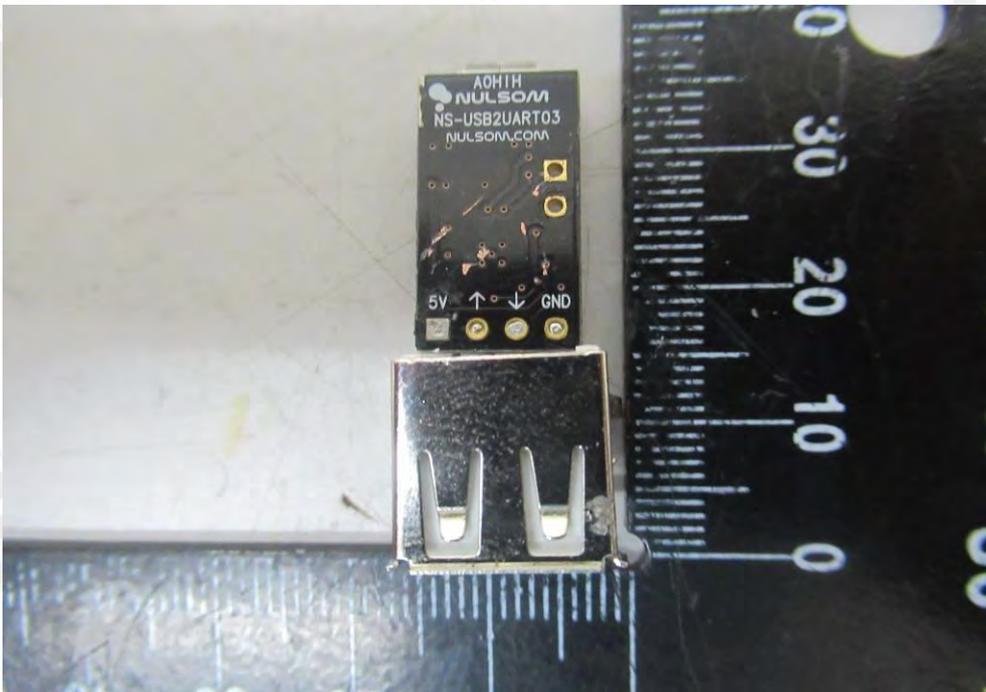
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