

# TEST REPORT

**Test Report No.:** T210611D13-E

**Applicant:** AAEON Technology Inc.

**Address:** 5F, No.135, Lane 235, Pao Chiao Rd, Hsin-Tien Dist., New Taipei City, Taiwan, R.O.C.

**Manufacturer:** AAEON Technology Inc.

**Address:** 5F, No.135, Lane 235, Pao Chiao Rd, Hsin-Tien Dist., New Taipei City, Taiwan, R.O.C.

**Equipment Under Test (EUT):**

**Name:** UP Xtreme i11 Board; UP Xtreme i11 EDGE Computing system; AI Core X module

**Brand Name:** AAEON

**Model No.:** xUPXxTGLx

**Added Model(s):** xUPXxEDGExTGLx; xPERxTAIXx (X-where x may be combination of alphanumeric characters or “-“ or blank)

## Standards:

EN 55032: 2015 / A11: 2020	
CISPR 32: 2015 (Ed 2.0) / C1: 2016	
EN 61000-3-2: 2014	EN 61000-3-3: 2013
EN 55035: 2017 / A11: 2020	
IEC 61000-4-2: 2008 / EN 61000-4-2: 2009	IEC 61000-4-6: 2013 + COR1: 2015 / EN 61000-4-6: 2014 + AC: 2015
IEC 61000-4-3: 2006 + A1: 2007 + A2: 2010 / EN 61000-4-3: 2006 + A1: 2008 + A2: 2010	IEC 61000-4-8: 2009 / EN 61000-4-8: 2010
IEC 61000-4-4: 2012 / EN 61000-4-4: 2012	IEC 61000-4-11: 2004 + A1: 2017 / EN 61000-4-11: 2004 + A1: 2017
IEC 61000-4-5: 2014 + A1: 2017 / EN 61000-4-5: 2014 + A1: 2017	

**Date of Sample Receipt :** June 11, 2021

**Date of Test :** June 29, 2021

**Date of Issue :** July 21, 2021

## Remarks:

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## Disclaimer

Variants information between/among model numbers / trademarks is provided by the applicant, test results of this test report are applicable to the sample EUT received of main test model name.

**Approved By**

**Date**

**July 21, 2021**

**Sam Hu ( Assistant Manager)**



Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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## Revision History

Revision	Report Number	Description	Issue Date
00	T210611D13-E	Original.	July 21, 2021

Note:

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# 1. General Description

## 1.1 General Description of EUT

Name of EUT	UP Xtreme i11 Board; UP Xtreme i11 EDGE Computing system; AI Core X module
Brand Name	AAEON
Model No.(s)	xUPXxTGLx
Added Model(s)	xUPXxEDGExTGLx; xPERxTAIXx (X-where x may be combination of alphanumeric characters or “- “ or blank)

### Model Differences

Model	Difference	Tested (Check)
UPX-TGL01	UP Xtreme i11 Board	<input checked="" type="checkbox"/>
UPX-EDGE-TGL01	UP Xtreme i11 EDGE Computing system	<input checked="" type="checkbox"/>
PER-TAIX2-A20-2280	AI Core X module	<input checked="" type="checkbox"/>
xUPXxTGLx; xUPXxEDGExTGLx; xPERxTAIXx	1. For marketing purpose only. 2. X-where x may be combination of alphanumeric characters or “- “ or blank	<input type="checkbox"/>

## 1.2 Details of EUT

EUT Power Rating	12VDC from Adaptor
Adaptor Manufacturer	FSP
Adaptor Model	FSP096-AHAN3
Adaptor Power Rating	I/P: 100-240VAC, 1.8A, 50-60Hz O/P: 12VDC, 8A
Highest internal frequency	1800MHz

### Accessories Cable List

Cable Type	Core	Length	Category	Shielding/Non-shielding
DC power cable	1 Core	1.5m	N/A	Non-shielding

### 1.3 Description of Support Units

#### Host PC Devices:

No.	Equipment	Model No.	Brand Name
1	CPU (1.80GHz)	Intel® TIGER LAKE UP3 I7-1185GRE	Intel
2	Memory (4G DDR4 2666) X2	TS512MSH64V6H-I	Transcend
3	Power Supply	FSP096-AHAN3	FSP
4	2.5" SSD (128GB)	TS128GSSD420K	Transcend

#### Peripherals Devices:

No.	PRODUCT	MANUFACTURER	MODEL NO.	SERIAL NO.
1	USB Mouse	LOGITECH	M-U0026	N/A
2	USB Keyboard	LOGITECH	Y-U0011	N/A
3-4	USB HDD	Transcend	TS1TSJ25MC	N/A
5	Earphone	HAWK	X710	N/A
6	USB HDD	Transcend	ESD240C	N/A
7	Monitor	ASUS	VP28U	KCLMTF168414
8-9	Modem	GALILEO	AL-56EI	7MEI037A0123
10	Monitor	DELL	U2718Qb	CN-0M5R5F-QDC00-9CL-0C VL-A10
11	Server PC	DELL	T3500	BX36VBX
12	Server PC	DELL	T3500	9X36VBX

#### Support Equipment Used in Tested Cable

No.	Cable Type	Core	Length	Shielding/Non-shielding
1	USB	N/A	1.5m	Shielding
2	USB	N/A	1.5m	Shielding
3-4	USB	N/A	1.8m	Shielding
5	Audio	N/A	1.8m	Non-shielding
6	USB	N/A	0.6m	Shielding
7	HDMI	N/A	1.5m	Shielding
8-9	COM	N/A	1.8m	Shielding
10	DP	N/A	1.5m	Shielding
11	RJ45	N/A	10m	Non-shielding
12	RJ45	N/A	10m	Non-shielding

### 1.4 I/O Port Description

I/O Port Types	Q'TY
1. GPIO Port	1
2. LAN Port	2
3. HDMI Port	1
4. DP Port	1
5. USB 3.2 Port	3
6. USB 2.0 Port	1
7. USB 4.0 Port	1
8. COM Port	2
9. Earphone Port	1
10. Antenna Port	2

### 1.5 Decision of Test Mode

The test configuration/ modes are as the following:

#### Conduction Modes (Power port):

1	HDMI+DP 3840*2160, VF=60Hz	100VAC / 50Hz
2		230VAC / 50Hz

#### Conduction Modes (Wired network port):

1	LAN 1	10Mbps
2		100Mbps
3		1Gbps
4	LAN 2	10Mbps
5		100Mbps
6		1Gbps
7		2.5Gbps

#### Radiation Modes:

1	HDMI+DP 3840*2160, VF=60Hz	100VAC / 50Hz
2		HDMI+DP 3840*2160, VF=60Hz / 1-6GHz

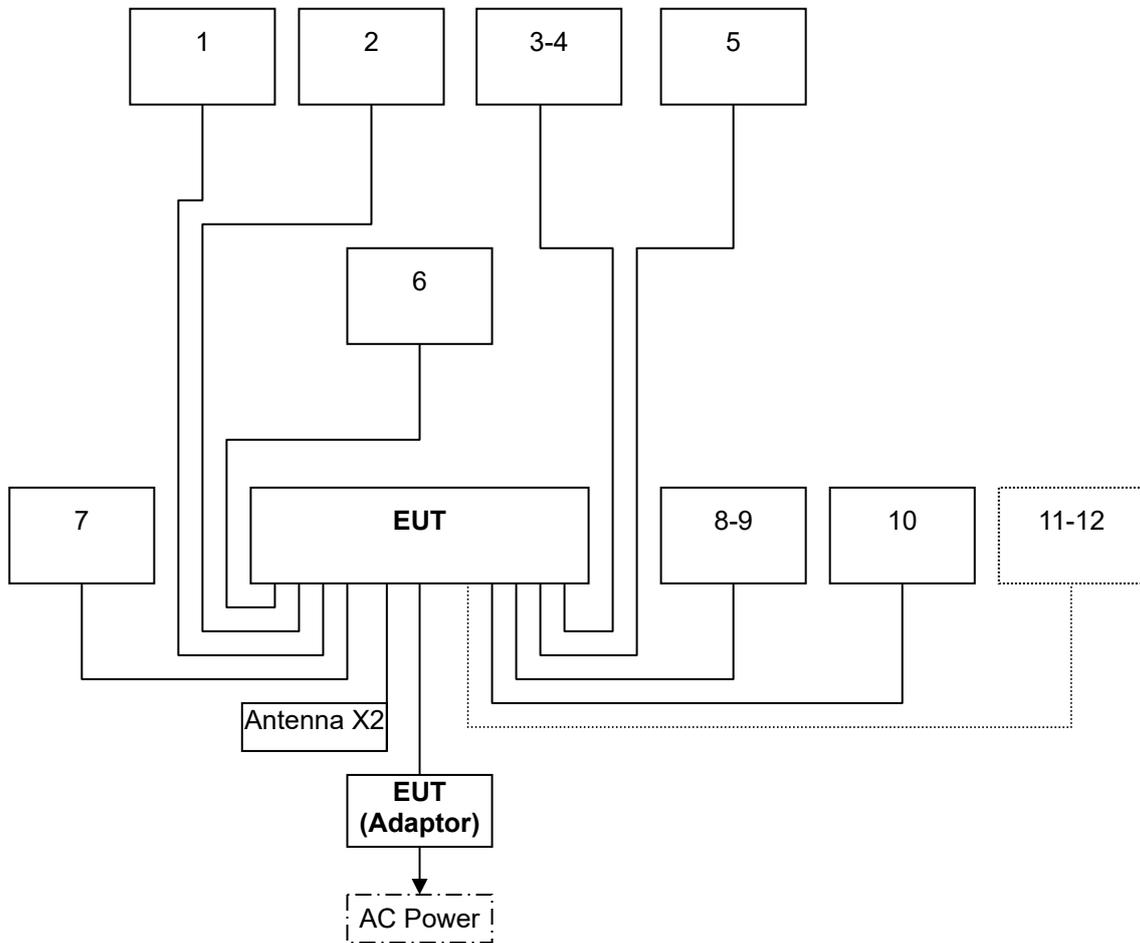
### 1.6 The Final Test Mode of the EUT

After the preliminary scan, the following test mode was found to produce the highest emission level.

Final Test Mode	
Conducted Emission	<b>Mode 2</b>
ISN	<b>Mode 4</b>
Radiated Emission Below 1GHz	<b>Mode 2</b>
Radiated Emission Above 1GHz	<b>Mode 2</b>
Harmonics & Flicker	<b>Mode 2</b>
Immunity	<b>Mode 2</b>

Then, the above highest emission mode of the configuration of the EUT and cable was chosen for all final test items.

### 1.7 Configuration of Tested System



### 1.8 Operation Procedure

1. Windows 10 boots system.
2. Run colorbarmove.mp4 to activate all peripherals for test EUT.
3. Run Winemc.exe and choose media player to play music.
4. Run Winemc.exe and choose "E:/ & F:/ & G:/" to test EUT.
5. Press the start menu, select executive and type ping 192.168.1.1&2 -t (EUT), ping 192.168.1.10&20 -t (Server PC).

## 1.9 Summary of Results

Emission		
Standard	Test Type	Result
EN 55032: 2015 / A11: 2020 CISPR 32: 2015 (Ed 2.0) / C1: 2016	Conducted Emission	PASS
	ISN	PASS
	Radiated Emission	PASS
EN 61000-3-2: 2014	Harmonic current emissions	PASS
EN 61000-3-3: 2013	Voltage changes, voltage fluctuations & flicker	PASS

Immunity			
Standard	Test Type	Result	Performance Criteria
IEC 61000-4-2: 2008 / EN 61000-4-2: 2009	ESD	PASS	B
IEC 61000-4-3: 2006 + A1: 2007 + A2: 2010 / EN 61000-4-3: 2006 + A1: 2008 + A2: 2010	RS	PASS	A
IEC 61000-4-4: 2012 / EN 61000-4-4: 2012	EFT	PASS	B
IEC 61000-4-5: 2014 + A1: 2017 / EN 61000-4-5: 2014 + A1: 2017	Surge	PASS	B
IEC 61000-4-6: 2013 + COR1: 2015 / EN 61000-4-6: 2014 + AC: 2015	CS	PASS	A
IEC 61000-4-8: 2009 / EN 61000-4-8: 2010	PFMF	N/A	A
IEC 61000-4-11: 2004 + A1: 2017 / EN 61000-4-11: 2004 + A1: 2017	DIP	PASS	C/C/B

## 1.10 Reporting Statements of Conformity

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

## 1.11 Deviation

No deviation from the mentioned test methods and applicable standards.

## 2.EMISSION

### 2.1 Limit

#### Maximum permissible level of Line Conducted Emission

FREQUENCY (MHz)	Class A(dBuV)		Class B(dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

Note: The lower limit shall apply at the transition frequency.

#### Maximum permissible level of Common Mode Conducted Emission (Telecommunication Ports)

##### Class A

FREQUENCY (MHz)	Voltage Limit(dBuV)		Current Limit(dBuA)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	97 - 87	84 - 74	53 - 43	40 - 30
0.5 - 30.0	87	74	43	30

##### Class B

FREQUENCY (MHz)	Voltage Limit(dBuV)		Current Limit(dBuA)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	84 - 74	74 - 64	40 - 30	30 - 20
0.5 - 30.0	74	64	30	20

Note: The lower limit shall apply at the transition frequency.

#### Maximum permissible level of Radiated Emission measured at 10 meter

FREQUENCY (MHz)	Class A(dBuV/m)	Class B(dBuV/m)
	Quasi - peak	Quasi - peak
30 - 230	40	30
230 - 1000	47	37

Note: The lower limit shall apply at the transition frequency.

**Maximum permissible level of Radiated Emission measured at 3 meter**

Frequency range (MHz)	Class A(dBuV/m)	Class B(dBuV/m)
	Quasi - peak	Quasi - peak
30 - 230	50	40
230 - 1000	57	47

Note: The lower limit shall apply at the transition frequency.

**Limits above 1 GHz**

**Limits for radiated disturbance of Class A ITE at a measurement distance of 3m**

Frequency range (GHz)	Average Limit dB(μV/m)	Peak Limit dB(μV/m)
1 - 3	56	76
3 - 6	60	80

Note: The lower limit applies at the transition frequency.

**Limits for radiated disturbance of Class B ITE at a measurement distance of 3m**

Frequency range (GHz)	Average Limit dB(μV/m)	Peak Limit dB(μV/m)
1 - 3	50	70
3 - 6	54	74

Note: The lower limit applies at the transition frequency.

**Requirements for radiated emissions from FM receivers**

Frequency range (MHz)	Measurement				Class B Limit dB(μV/m)
	Facility	Distance (m)	Detector type / Bandwidth	Fundamental	Harmonics
30 - 230	OATS/SAC	10	Quasi Peak / 120 kHz	50	42
230 - 300					42
300 - 1000					46
30 - 230	OATS/SAC	3	Quasi Peak / 120 kHz	60	52
230 - 300					52
300 - 1000					56

These relaxed limits apply only to emissions at the fundamental and harmonic frequencies of the LO. Signals at all other frequencies shall be compliant with the limits

Note: SAC: Semi Anechoic Chamber  
OATS: Open Area Test Site

## 2.2 Conducted Emission

### 2.2.1 Test Instruments

Conducted Emission Room # B					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
Attenuator	MCL	HAT-10	SD-C012	03/24/2021	03/23/2022
BNC Cable	EMCI	CFD300-NL	BNC#B5	01/05/2021	01/04/2022
EMI Test Receiver	R&S	ESR3	102166	04/13/2021	04/12/2022
ISN	Teseq	ISN T800	30847	04/14/2021	04/13/2022
LISN	Schwarzbeck	NSLK 8127	8127382	04/14/2021	04/13/2022
LISN(EUT)	Schwarzbeck	NSLK 8127	8127526	04/14/2021	04/13/2022
Thermo-Hygro Meter	Wisewind	N/A	SD-S017	09/09/2020	09/08/2021
ISN	Teseq	ISN T8-Cat6	53575	05/18/2021	05/17/2022
Test S/W	EZ-EMC				
Testing Site : No.163-1, Jhongsheng Rd., Xindian Dist., New Taipei City, Taiwan					
Measurement Uncertainty of Conducted Emission					
Expanded uncertainty U <sub>lab</sub> (k=2) of Conducted Emission is 2.8 dB.					
Expanded uncertainty U <sub>lab</sub> (k=2) of ISN Conducted Emission is 3.2 dB					
Expanded uncertainty CISPR 16-4-2:2011+A1:2014+A2:2018 (k=2) of Conducted Emission measurement is 3.8 dB.					
Expanded uncertainty CISPR 16-4-2:2011+A1:2014+A2:2018 (k=2) of ISN Conducted Emission measurement is 5.0 dB.					

### 2.2.2 Measurement Level Calculation

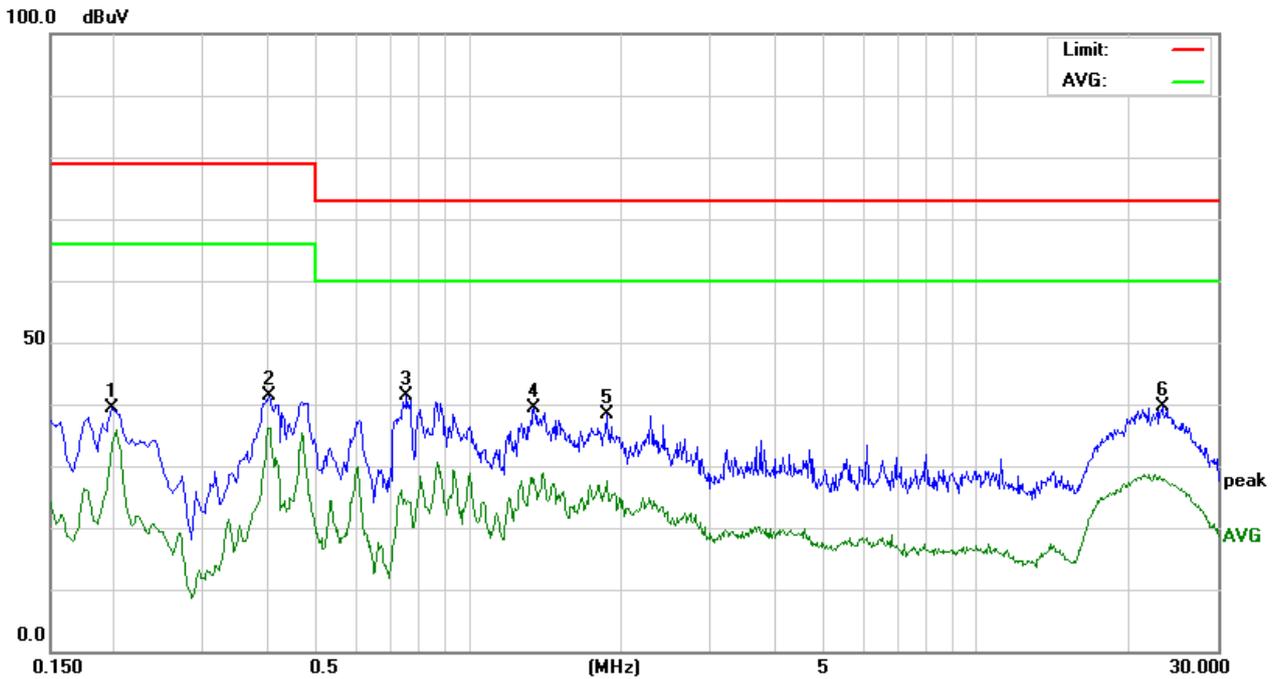
Factor = LISN insertion loss + Cable loss + Pulse Limiter insertion loss

Measurement Level = Reading Level + Factor

Over (Margin) = Measurement Level – Limit

### 2.2.3 Measurement Data (CE)

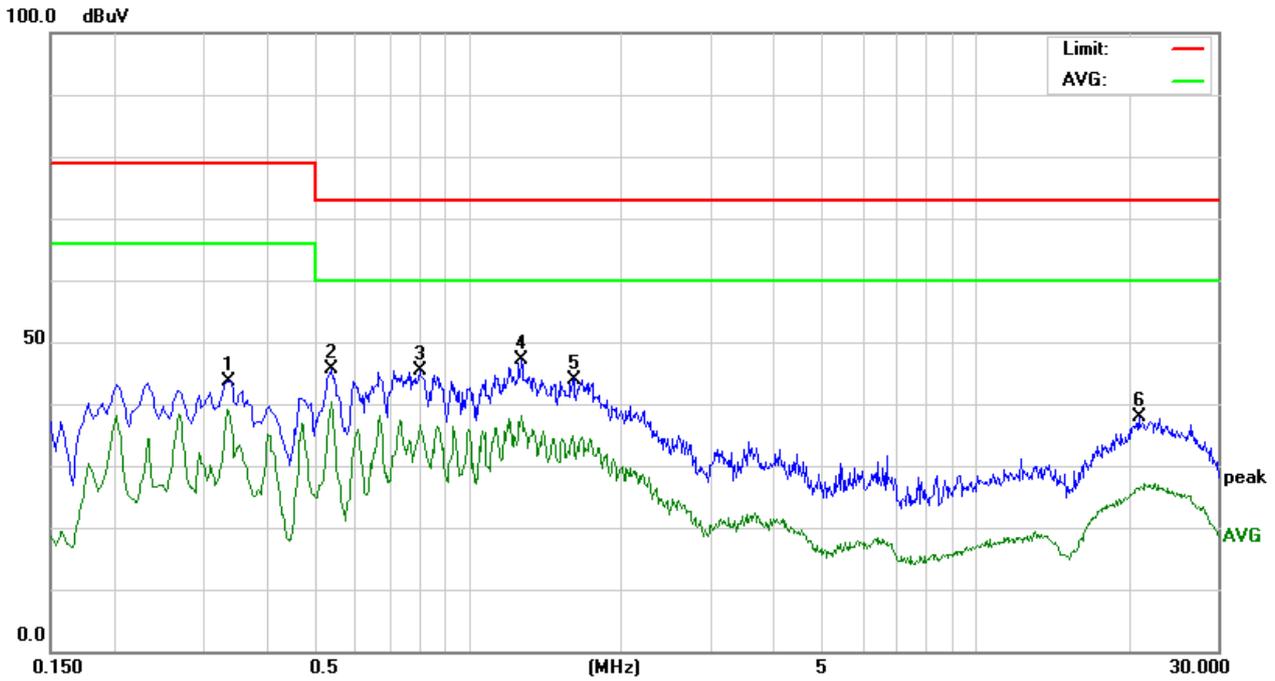
<b>Model No.</b>	UPX-TGL01; UPX-EDGE-TGL01; PER-TAIX2-A20-2280	<b>6dB Bandwidth</b>	9 kHz
<b>Environmental Conditions</b>	26°C, 66% RH	<b>Test Mode</b>	Mode 2
<b>Tested by</b>	Lion Lee	<b>Phase</b>	L1
<b>Standard</b>	EN 55032 CLASS A		



Conducted Emission Readings							
Frequency Range Investigated				150 kHz to 30 MHz			
Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector (P/Q/A)	Line (L1/L2)
0.1980	29.34	10.10	39.44	79.00	-39.56	P	L1
0.4060	31.34	10.09	41.43	79.00	-37.57	P	L1
0.7580	31.17	10.14	41.31	73.00	-31.69	P	L1
1.3460	29.11	10.20	39.31	73.00	-33.69	P	L1
1.8740	28.00	10.26	38.26	73.00	-34.74	P	L1
23.3340	28.73	10.94	39.67	73.00	-33.33	P	L1

Note: 1. L1 = Line One (Live Line) / L2 = Line Two (Neutral Line).

<b>Model No.</b>	UPX-TGL01; UPX-EDGE-TGL01; PER-TAIX2-A20-2280	<b>6dB Bandwidth</b>	9 kHz
<b>Environmental Conditions</b>	26°C, 66% RH	<b>Test Mode</b>	Mode 2
<b>Tested by</b>	Lion Lee	<b>Phase</b>	L2
<b>Standard</b>	EN 55032 CLASS A		

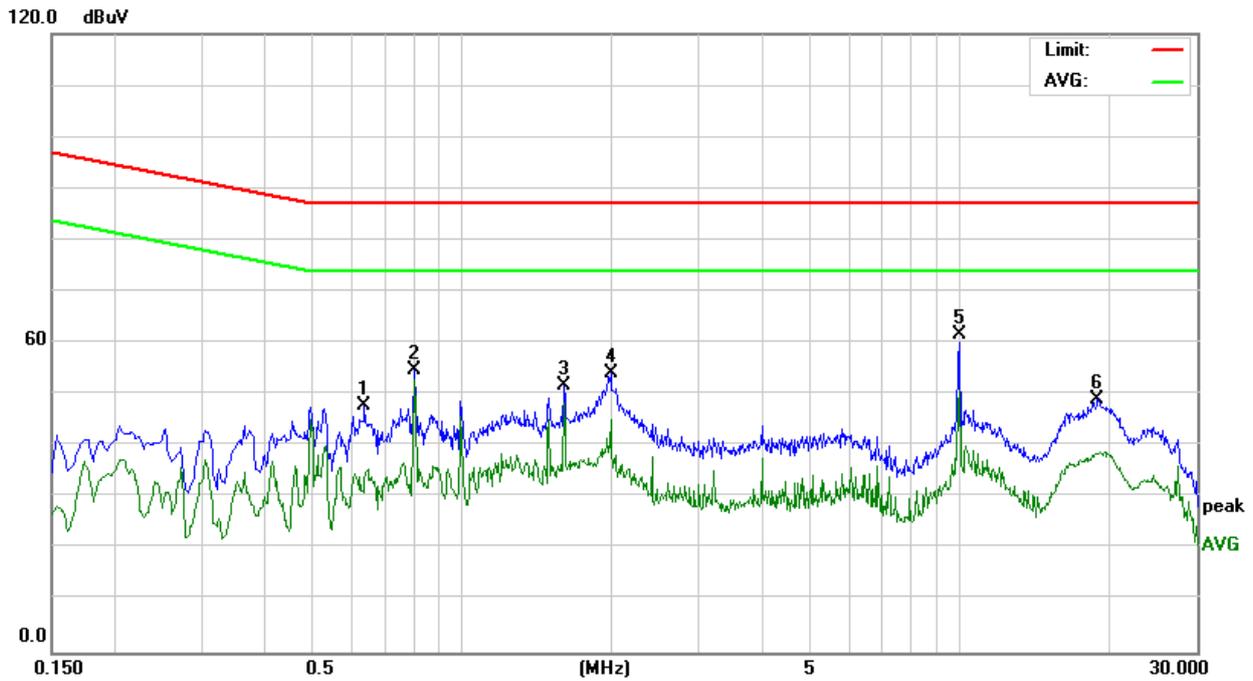


Conducted Emission Readings							
Frequency Range Investigated				150 kHz to 30 MHz			
Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector (P/Q/A)	Line (L1/L2)
0.3379	33.65	10.09	43.74	79.00	-35.26	P	L2
0.5380	35.47	10.10	45.57	73.00	-27.43	P	L2
0.8020	35.23	10.14	45.37	73.00	-27.63	P	L2
1.2700	36.94	10.19	47.13	73.00	-25.87	P	L2
1.6140	33.79	10.21	44.00	73.00	-29.00	P	L2
20.9860	26.95	10.86	37.81	73.00	-35.19	P	L2

Note: 1. L1 = Line One (Live Line) / L2 = Line Two (Neutral Line).

### 2.2.4 Measurement Data (ISN)

<b>Model No.</b>	UPX-TGL01; UPX-EDGE-TGL01; PER-TAIX2-A20-2280	<b>6dB Bandwidth</b>	9 kHz
<b>Environmental Conditions</b>	26°C, 66% RH	<b>Test Mode</b>	Mode 4
<b>Tested by</b>	Lion Lee	<b>Standard</b>	EN 55032 CLASS A



Conducted Emission Readings						
Frequency Range Investigated				150 kHz to 30 MHz		
Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector (P/Q/A)
0.6380	28.21	19.70	47.91	87.00	-39.09	P
0.8059	35.00	19.69	54.69	87.00	-32.31	P
1.6100	32.14	19.68	51.82	87.00	-35.18	P
1.9980	34.46	19.68	54.14	87.00	-32.86	P
10.0180	42.04	19.73	61.77	87.00	-25.23	P
19.0180	29.05	19.94	48.99	87.00	-38.01	P

## 2.3 Radiated Emission

### 2.3.1 Test Instruments

#### Below 1GHz

Open Area Test Site # H					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
Bilog Antenna	Teseq	CBL 6112D	40529	08/24/2020	08/23/2021
Cable	EMEC	CFD400NL-LW	N-Type#H11	08/14/2020	08/13/2021
EMI Test Receiver	R&S	ESCI	101340	02/26/2021	02/25/2022
Pre-Amplifier	HP	8447D	1937A01554	09/26/2020	09/25/2021
Thermo-Hygro Meter	Wisewind	201A	No. 03	05/20/2021	05/19/2022
Test S/W	EZ-EMC				
Testing Site : No.163-1, Jhongsheng Rd., Xindian Dist., New Taipei City, Taiwan					
Measurement Uncertainty of Radiated Emission					
Expanded uncertainty Ulab (k=2) of Radiated Emission is 5.2 dB.(30MHz-1000MHz)					
Expanded uncertainty CISPR 16-4-2:2011+A1:2014+A2:2018 (k=2) of Radiated Emission measurement is 5.2 dB.(30MHz-1000MHz)					

#### Above 1GHz

Chamber # E					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
Horn Antenna	ETS	3117	00139062	07/22/2020	07/21/2021
Microflex Cable	EMCI	EMC107-NM-NM-7000	200701	07/20/2020	07/19/2021
K-Type Cable	EMCI	EMC101G-KM-KM-1000	200702	07/20/2020	07/19/2021
Pre-Amplifier	Com-Power	PAM-118A	551041	07/20/2020	07/19/2021
Signal Analyzer	R&S	FSV40	101269	07/20/2020	07/19/2021
Thermo-Hygro Meter	Wisewind	201A	SD-R046	09/09/2020	08/12/2021
Test S/W	EZ-EMC				
Testing Site : No.163-1, Jhongsheng Rd., Xindian Dist., New Taipei City, Taiwan					
Measurement Uncertainty of Radiated Emission					
Expanded uncertainty (k=2) of Radiated Emission measurement is 4.6 dB.(1-6GHz)					
Expanded uncertainty CISPR 16-4-2:2011+A1:2014+A2:2018 (k=2) of Radiated Emission measurement is 5.5 dB.(1-6GHz)					

### 2.3.2 Measurement Level Calculation

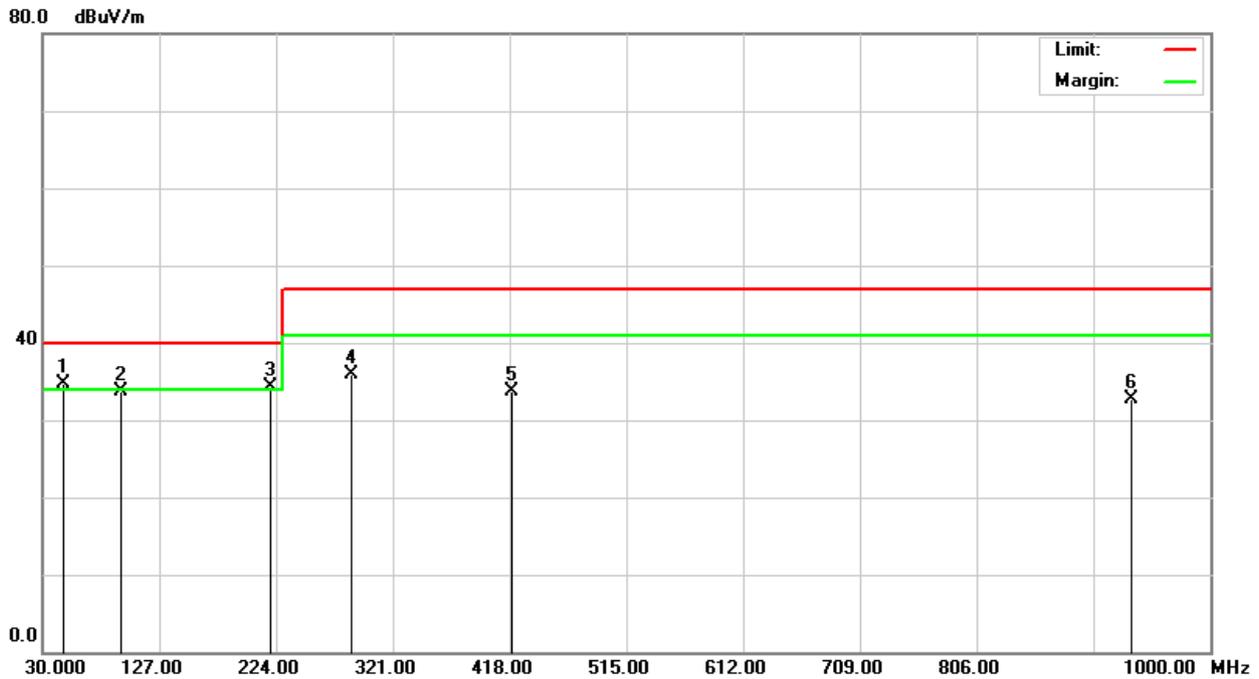
Correction Factor = Antenna Factor + Cable loss- Amplifier Gain

Measurement Level = Reading Level + Correction Factor

Over (Margin) = Measurement Level – Limit

**2.3.3 Measurement Data**  
**Below 1GHz**

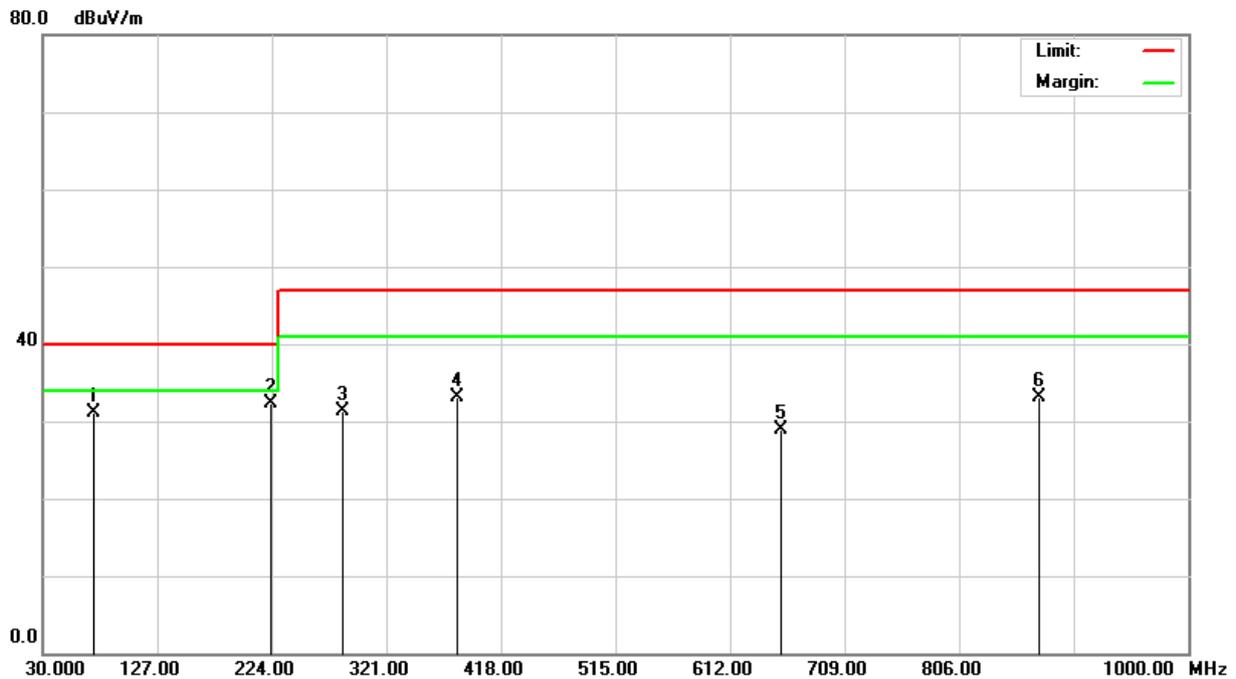
<b>Model No.</b>	UPX-TGL01; UPX-EDGE-TGL01; PER-TAIX2-A20-2280	<b>Test Mode</b>	Mode 2
<b>Environmental Conditions</b>	26°C, 64% RH	<b>6dB Bandwidth</b>	120 kHz
<b>Antenna Pole</b>	Vertical	<b>Antenna Distance</b>	10m
<b>Detector Function</b>	Quasi-peak.	<b>Tested by</b>	Lion Lee
<b>Standard</b>	EN 55032 CLASS A		



Radiated Emission Readings									
Frequency Range Investigated				30 MHz to 1000 MHz at 10m					
Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Detector (P/Q)	Pol. (H/V)
46.8200	45.80	-11.09	34.71	40.00	-5.29	100	163	Q	V
95.3800	44.00	-10.22	33.78	40.00	-6.22	100	285	Q	V
219.3300	44.20	-9.84	34.36	40.00	-5.64	100	92	Q	V
287.2400	41.70	-5.88	35.82	47.00	-11.18	100	111	Q	V
420.2800	35.40	-1.78	33.62	47.00	-13.38	400	279	Q	V
934.1690	27.20	5.50	32.70	47.00	-14.30	400	203	Q	V

**Note:** 1. P= Peak Reading; Q= Quasi-peak Reading.

<b>Model No.</b>	UPX-TGL01; UPX-EDGE-TGL01; PER-TAIX2-A20-2280	<b>Test Mode</b>	Mode 2
<b>Environmental Conditions</b>	26°C, 64% RH	<b>6dB Bandwidth</b>	120 kHz
<b>Antenna Pole</b>	Horizontal	<b>Antenna Distance</b>	10m
<b>Detector Function</b>	Quasi-peak.	<b>Tested by</b>	Lion Lee
<b>Standard</b>	EN 55032 CLASS A		



Radiated Emission Readings									
Frequency Range Investigated				30 MHz to 1000 MHz at 10m					
Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Detector (P/Q)	Pol. (H/V)
73.2400	45.30	-14.25	31.05	40.00	-8.95	400	226	Q	H
223.1850	41.90	-9.57	32.33	40.00	-7.67	400	74	Q	H
284.2600	37.20	-5.95	31.25	47.00	-15.75	400	293	Q	H
381.2400	36.30	-3.27	33.03	47.00	-13.97	400	277	Q	H
655.4800	27.00	1.89	28.89	47.00	-18.11	100	214	Q	H
874.0600	28.40	4.77	33.17	47.00	-13.83	100	328	Q	H

Note: 1. P= Peak Reading; Q= Quasi-peak Reading.

**Above 1GHz**

<b>Model No.</b>	UPX-TGL01; UPX-EDGE-TGL01; PER-TAIX2-A20-2280	<b>Test Mode</b>	Mode 2
<b>Environmental Conditions</b>	23°C, 61% RH	<b>6dB Bandwidth</b>	1 MHz
<b>Antenna Pole</b>	Vertical / Horizontal	<b>Antenna Distance</b>	3m
<b>Highest frequency generated or used</b>	1800MHz	<b>Upper frequency</b>	6000MHz
<b>Detector Function</b>	Peak and average.	<b>Tested by</b>	Lion Lee
<b>Standard</b>	EN 55032 CLASS A		

<b>Radiated Emission Readings</b>							
<b>Frequency Range Investigated</b>				<b>Above 1GHz at 3m</b>			
Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector (P/A)	Pol. (H/V)
<b>1075.000</b>	<b>60.85</b>	<b>-8.16</b>	<b>52.69</b>	<b>76.00</b>	<b>-23.31</b>	<b>P</b>	<b>V</b>
<b>1675.000</b>	<b>61.72</b>	<b>-7.52</b>	<b>54.20</b>	<b>76.00</b>	<b>-21.80</b>	<b>P</b>	<b>V</b>
<b>2400.000</b>	<b>57.50</b>	<b>-4.73</b>	<b>52.77</b>	<b>76.00</b>	<b>-23.23</b>	<b>P</b>	<b>V</b>
<b>2945.000</b>	<b>58.69</b>	<b>-4.37</b>	<b>54.32</b>	<b>76.00</b>	<b>-21.68</b>	<b>P</b>	<b>V</b>
<b>4995.000</b>	<b>56.40</b>	<b>-1.72</b>	<b>54.68</b>	<b>80.00</b>	<b>-25.32</b>	<b>P</b>	<b>V</b>
<b>5885.000</b>	<b>54.56</b>	<b>-0.47</b>	<b>54.09</b>	<b>80.00</b>	<b>-25.91</b>	<b>P</b>	<b>V</b>

<b>Radiated Emission Readings</b>							
<b>Frequency Range Investigated</b>				<b>Above 1GHz at 3m</b>			
Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector (P/A)	Pol. (H/V)
<b>1495.000</b>	<b>63.64</b>	<b>-8.69</b>	<b>54.95</b>	<b>76.00</b>	<b>-21.05</b>	<b>P</b>	<b>H</b>
<b>1725.000</b>	<b>59.47</b>	<b>-6.97</b>	<b>52.50</b>	<b>76.00</b>	<b>-23.50</b>	<b>P</b>	<b>H</b>
<b>1920.000</b>	<b>55.72</b>	<b>-5.52</b>	<b>50.20</b>	<b>76.00</b>	<b>-25.80</b>	<b>P</b>	<b>H</b>
<b>2480.000</b>	<b>55.77</b>	<b>-4.69</b>	<b>51.08</b>	<b>76.00</b>	<b>-24.92</b>	<b>P</b>	<b>H</b>
<b>2940.000</b>	<b>58.51</b>	<b>-4.36</b>	<b>54.15</b>	<b>76.00</b>	<b>-21.85</b>	<b>P</b>	<b>H</b>
<b>4855.000</b>	<b>57.44</b>	<b>-1.99</b>	<b>55.45</b>	<b>80.00</b>	<b>-24.55</b>	<b>P</b>	<b>H</b>

Note: 1. P= Peak Reading; A= Average Reading.

# 3. Harmonics

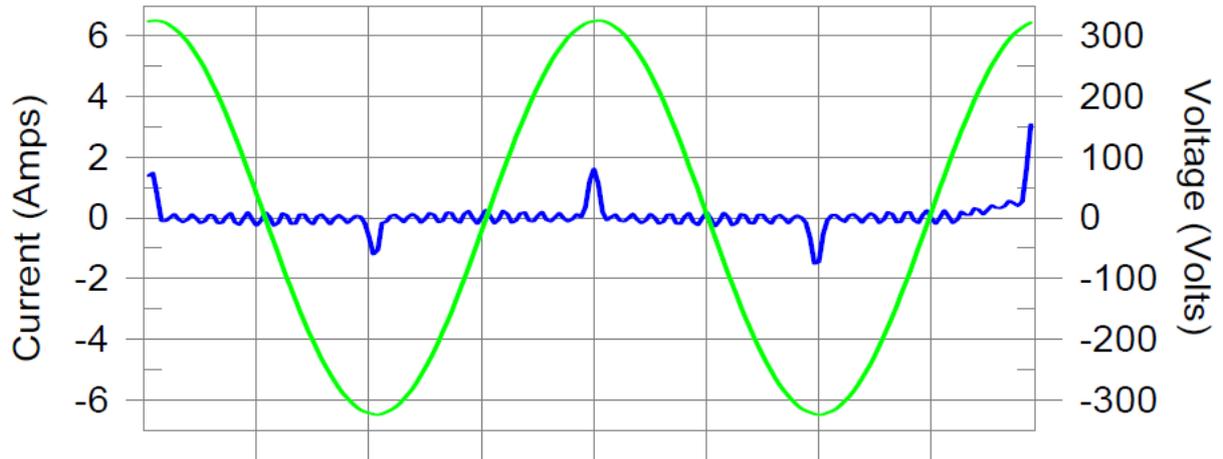
## 3.1 Test Instruments

Immunity A					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
5kVA Power Source	Teseq	NSG 1007-5	1537A01296	03/10/2021	03/09/2022
Signal Conditioning Unit	Teseq	NSG 1000-1	1846A01831	03/10/2021	03/09/2022
Test Software	CTS 4 Ver. 4.2				
Testing Site : No.163-1, Jhongsheng Rd., Xindian Dist., New Taipei City, Taiwan					

### 3.2 Measurement Data

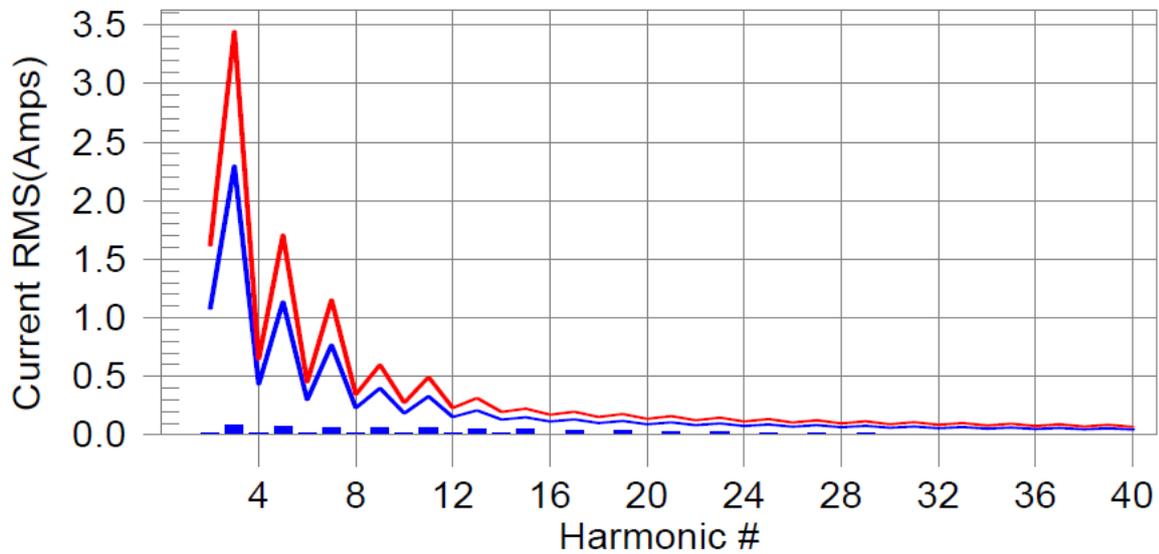
Test Result: Pass      Source qualification: Normal

Current & voltage waveforms



Harmonics and Class A limit line

European Limits



Test result: Pass      Worst harmonics H15-37.1% of 150% limit, H17-30.8% of 100% limit

Test Result: Pass      Source qualification: Normal  
 THC(A): 0.188      I-THD(%): 50.5      POHC(A): 0.051      POHC Limit(A): 0.251

Highest parameter values during test:

V_RMS (Volts):	229.83	Frequency(Hz):	50.00
I_Peak (Amps):	3.619	I_RMS (Amps):	0.496
I_Fund (Amps):	0.373	Crest Factor:	13.844
Power (Watts):	82.0	Power Factor:	0.874

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.013	1.080	1.2	0.019	1.620	1.2	Pass
3	0.088	2.300	3.8	0.135	3.450	3.9	Pass
4	0.013	0.430	3.0	0.020	0.645	3.1	Pass
5	0.069	1.140	6.1	0.127	1.710	7.4	Pass
6	0.012	0.300	4.1	0.019	0.450	4.3	Pass
7	0.066	0.770	8.6	0.122	1.155	10.5	Pass
8	0.012	0.230	5.2	0.018	0.345	5.2	Pass
9	0.061	0.400	15.1	0.113	0.600	18.9	Pass
10	0.012	0.184	6.3	0.018	0.276	6.4	Pass
11	0.056	0.330	17.0	0.104	0.495	21.1	Pass
12	0.011	0.153	7.2	0.017	0.230	7.2	Pass
13	0.051	0.210	24.4	0.094	0.315	29.9	Pass
14	0.010	0.131	8.0	0.016	0.197	8.0	Pass
15	0.046	0.150	30.6	0.083	0.225	37.1	Pass
16	0.010	0.115	8.6	0.015	0.173	8.6	Pass
17	0.041	0.132	30.8	0.072	0.198	36.6	Pass
18	0.009	0.102	9.0	0.014	0.153	8.8	Pass
19	0.035	0.118	29.9	0.061	0.178	34.6	Pass
20	0.008	0.092	9.2	0.012	0.138	9.0	Pass
21	0.030	0.107	28.1	0.051	0.161	31.7	Pass
22	0.008	0.084	9.2	0.011	0.125	8.8	Pass
23	0.025	0.098	25.8	0.041	0.147	27.8	Pass
24	0.007	0.077	8.9	0.010	0.115	8.4	Pass
25	0.021	0.090	23.0	0.032	0.135	23.8	Pass
26	0.006	0.071	8.4	0.008	0.107	7.8	Pass
27	0.016	0.083	19.7	0.025	0.125	19.7	Pass
28	0.005	0.066	7.6	0.007	0.099	7.1	Pass
29	0.013	0.078	16.4	0.018	0.116	15.7	Pass
30	0.004	0.061	N/A	0.006	0.092	N/A	Pass
31	0.010	0.073	13.3	0.013	0.109	12.0	Pass
32	0.004	0.058	N/A	0.005	0.086	N/A	Pass
33	0.007	0.068	10.4	0.009	0.102	9.2	Pass
34	0.003	0.054	N/A	0.004	0.081	N/A	Pass
35	0.005	0.064	7.9	0.007	0.096	7.0	Pass
36	0.002	0.051	N/A	0.003	0.077	N/A	Pass
37	0.004	0.061	N/A	0.005	0.091	N/A	Pass
38	0.002	0.048	N/A	0.004	0.073	N/A	Pass
39	0.004	0.058	N/A	0.006	0.087	N/A	Pass
40	0.001	0.046	N/A	0.004	0.069	N/A	Pass

Test Result: Pass      Source qualification: Normal

Highest parameter values during test:

Voltage (Vrms):	229.83	Frequency(Hz):	50.00
I_Peak (Amps):	3.619	I_RMS (Amps):	0.496
I_Fund (Amps):	0.373	Crest Factor:	13.844
Power (Watts):	82.0	Power Factor:	0.874

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.043	0.460	9.45	OK
3	0.293	2.068	14.14	OK
4	0.022	0.459	4.84	OK
5	0.085	0.919	9.26	OK
6	0.027	0.459	5.86	OK
7	0.038	0.689	5.44	OK
8	0.008	0.460	1.84	OK
9	0.046	0.460	10.09	OK
10	0.013	0.460	2.89	OK
11	0.052	0.230	22.57	OK
12	0.018	0.230	7.91	OK
13	0.053	0.230	22.95	OK
14	0.009	0.230	4.12	OK
15	0.048	0.230	20.97	OK
16	0.010	0.230	4.28	OK
17	0.050	0.230	21.77	OK
18	0.016	0.230	7.01	OK
19	0.050	0.230	21.61	OK
20	0.029	0.230	12.48	OK
21	0.048	0.230	20.72	OK
22	0.011	0.230	4.91	OK
23	0.042	0.230	18.44	OK
24	0.012	0.230	5.09	OK
25	0.032	0.230	14.14	OK
26	0.009	0.230	3.76	OK
27	0.023	0.230	10.20	OK
28	0.008	0.230	3.64	OK
29	0.023	0.230	9.97	OK
30	0.006	0.230	2.82	OK
31	0.016	0.230	6.89	OK
32	0.006	0.230	2.63	OK
33	0.012	0.230	5.18	OK
34	0.005	0.230	2.18	OK
35	0.009	0.230	3.96	OK
36	0.004	0.230	1.68	OK
37	0.007	0.230	2.95	OK
38	0.004	0.230	1.59	OK
39	0.008	0.230	3.47	OK
40	0.017	0.230	7.39	OK

# 4. Flicker

## 4.1 Test Instruments

Immunity A					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
5kVA Power Source	Teseq	NSG 1007-5	1537A01296	03/10/2021	03/09/2022
Signal Conditioning Unit	Teseq	NSG 1000-1	1846A01831	03/10/2021	03/09/2022
Test Software	CTS 4 Ver. 4.2				
Testing Site : No.163-1, Jhongsheng Rd., Xindian Dist., New Taipei City, Taiwan					

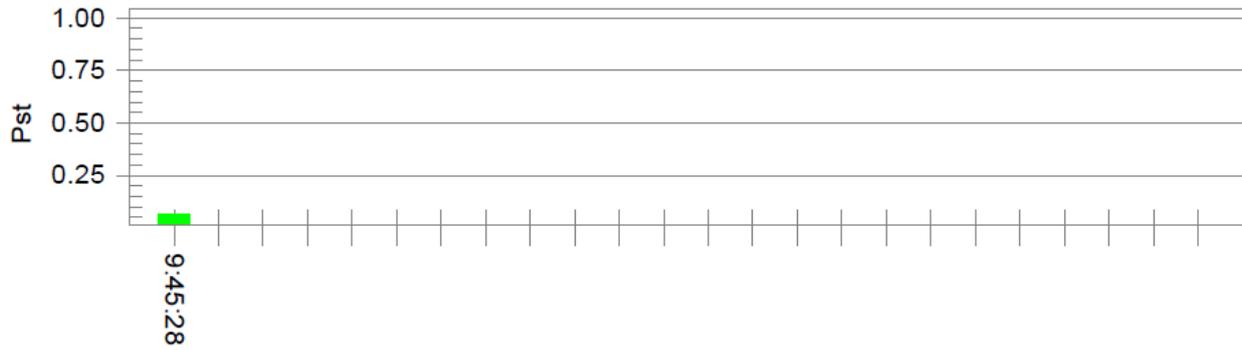
## 4.2 Measurement Data

Test Result: Pass

Status: Test Completed

### Pst<sub>i</sub> and limit line

### European Limits



### Plt and limit line



### Parameter values recorded during the test:

Vrms at the end of test (Volt):	229.63		
T-max (mS):	0	Test limit (mS):	500.0 Pass
Highest dc (%):	0.00	Test limit (%):	3.30 Pass
Highest dmax (%):	0.00	Test limit (%):	4.00 Pass
Highest Pst (10 min. period):	0.064	Test limit:	1.000 Pass
Highest Plt (2 hr. period):	0.028	Test limit:	0.650 Pass

## 5. IMMUNITY

### 5.1 STANDARD PERFORMANCE CRITERIA DESCRIPTION

- Criterion A - The apparatus shall continue to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended.
- Criterion B - The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended.
- Criterion C - Temporary loss of function is allowed, provided the function is self recoverable or can be restored by the operation of the controls.

## 5.2 SPECIAL PERFORMANCE CRITERIA DESCRIPTION

### 5.2.1 Performance Criteria Description for Print function

Criterion A - Apply criterion A as defined in 8.2. Additionally, the following shall not occur as a consequence of the application of the disturbance:

- change of operating state;
- unintended pausing of the print operation;
- a change of print quality or legibility, as appropriate to the test pattern;
- change of character font;
- unintended line feed;
- unintended page feed;
- paper feed failure.

Criterion B - Apply criterion B as defined in 8.3 with the following specifics and additional limitations. Paper feed failures are allowed only if, after removal of the jammed sheets, the job is automatically recovered and there is no loss of printed information. Any low-quality print output caused by the application of the disturbance shall not continue beyond the sheet of media being printed, or beyond the typical length of a finished page or sheet printed from continuous roll media. False indicators are permitted during the test provided that a normal operator response to that false indicator is simple (such as pressing a button). False indicators are not acceptable if they would cause the user to discard printing supplies such as ink, toner or paper, when those supplies are actually not empty or faulty. Any false indicator shall either clear automatically or after the operator's response. After the disturbance, the print function may print the remainder of the print job at a quality level within the manufacturer's specifications. Alternately, the print function may halt processing of a print job as a result of the disturbance, but only if the operator is capable of reprinting the job (for example, a fax printing job where the image to be printed still resides in local memory). Automatically restarting the print job from the beginning is also acceptable. In any scenario, the pairing of front and back images during double-sided printing shall be correct.

Criterion C - Temporary loss of function is allowed, provided the function is self recoverable or can be restored by the operation of the controls.

### 5.2.2 Performance Criteria Description for Scan function

Criterion A - Apply criterion A as defined in 8.2. Additionally, the following shall not occur as a consequence of the application of the test:

- change of settings, such as which side(s) of the page to be scanned, colour or monochrome, and resolution;
- corruption of the image, for example stretching, compressing or change in colour;
- paper feed failures;
- errors in the reading of bar codes.

Criterion B - Apply criterion B as defined in 8.3 with the following specifics and additional limitations.

- Document feed failures are allowed only if the original documents are undamaged and, after removal of the jammed sheets, the job is automatically recovered and there is no loss of scanned information.
- During the test, the representation of the image shall not be degraded such that reading mistakes occur.

Criterion C - Temporary loss of function is allowed, provided the function is self recoverable or can be restored by the operation of the controls.

### 5.2.3 Performance Criteria Description for Display and display output function

Criterion A - Apply criterion A as defined in 8.2. Additionally, an increase in any degradation greater than just perceptible by observation of the image shall not occur as a consequence of the application of the test.

Examples of such degradations are:

- superimposed patterning;
- positional disturbances due to synchronisation errors;
- geometric distortion;
- change of contrast or brightness;
- picture artefacts;
- freezing or disturbance of motion;
- image loss;
- video data or decoding errors.

Criterion B - The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended.

Criterion C - Temporary loss of function is allowed, provided the function is self recoverable or can be restored by the operation of the controls.

#### 5.2.4 Performance Criteria Description for Musical tone generating function

- Criterion A - Performance criterion A is subdivided according to the type of equipment and its use. Three subgroups corresponding to different equipment types are defined in Table E.1 and have corresponding performance criteria A1, A2 and A3. The relevant subgroup shall be selected by the manufacturer in accordance with the product specification. The description of criteria A1, A2 and A3 are presented in Table E.2.
- Criterion B - During the test, degradation of performance beyond that defined in criterion A1 of Table E.2 is allowed. However, sudden amplification of tone to a level that exceeds the expected level by more than 6 dB is not allowed. After the test, normal operation of the EUT shall be self-recovered. In the case of unintended tone holding caused by a MIDI protocol communication error, the EUT can be re-initialised by the operation of the controls by the user controls in accordance with the manufacturer's instructions. Due to the nature of the MIDI protocol, it is necessary to modify the performance criterion B to allow user intervention when the unintended tone holding is caused by a missing MIDI communication error (for example missing a 'NOTE OFF' message).
- Criterion C - Degradation of the performance beyond that defined in criterion A1 of Table E.2 is permitted provided that the normal operation of the EUT can be restored after the test by operator intervention. However, sudden amplification of tone to a level that exceeds the expected level by more than 6 dB is not allowed.

### 5.2.5 Performance Criteria Description for Networking function

Criterion A - Where relevant, during the application of the test the network function shall, as a minimum, operate ensuring that:

- established connections shall be maintained throughout the application of the test;
- no change of operational state or corruption of stored data occurs;
- no increase in error rate above the figure defined by the manufacturer occurs. The manufacturer should select the most appropriate performance measurement criteria for the product or system, for example bit error rate, block error rate;
- no request for retry above the figure defined by the manufacturer;.
- the data transmission rate does not reduce below the figure defined by the manufacturer;
- no protocol failure occurs;
- the audio noise level at a two-wire analogue interface (supporting telephony) shall satisfy the requirements of Table G.3. The audio level measurements shall be performed at the demodulated frequency of the disturbance using a narrowband filter with a 3 dB bandwidth of 100 Hz using the method defined in table clause G.1.4. See G.6.1. As described in the example given in J.3.5 the networking function is monitored during testing using direct functions specified elsewhere in this document. If needed to verify the operation of the protocol, the following functions shall be verified as described in Table H.1 when performing the additional spot frequency tests contained in Clause 5:
  - ability to establish a connection,
  - ability to clear a connection.

Where an EUT has supervisory functions they shall not be affected. Elements that should be monitored include, but are not limited to:

- alarms,
- signalling lamps,
- printer output errors,
- network traffic rates,
- network monitor errors,
- measured network parameters.

Criterion B - Established connections shall be maintained throughout the test, or shall self-recover in a way and timescale that is imperceptible to the user.

The error rate, request for retry and data transmission rates may be degraded during the application of the test. Degradation of the performance as described in criterion A is permitted, provided that the normal operation of the EUT is self-recoverable to the condition established prior to the application of the test. Where required, as defined in Clause 5, the acceptable operation of the function shall be verified at the completion of the test as described in Table H.1, by confirming the following:

- the EUT's ability to establish a connection,
- the EUT's ability to clear a connection.

During surge testing disconnection is allowed on the analogue/digital data port being tested. If the EUT is a supervisory equipment, it shall not impact the normal operation of the network being monitored. In addition, any supervisory functions impacted during the period of the test shall return to the state prior to the test. Elements to consider include:

- alarms,
- signalling lamps,
- printer output,
- network traffic rates,
- network monitoring. is used as intended.

Criterion C - Degradation of performance as described in criteria A and B is permitted provided that the normal operation of the EUT is self-recoverable to the condition immediately before the application of the test, or can be restored after the test by the operator.

### 5.2.6 Performance Criteria Description for Audio output function

Criterion A - The interference ratio (electrical or acoustic) shall meet the limits in column 3; or,  
the acoustic level of the demodulated audio shall be less than the limits in column 4; or,  
the digitally coded level of demodulated audio shall be less than limits in column 5; or,  
the analogue level of the demodulated audio shall be less than the limits in column 6.

Criterion B - The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended.

Criterion C - Temporary loss of function is allowed, provided the function is self recoverable or can be restored by the operation of the controls.

### 5.2.7 Performance Criteria Description for Telephony function

Function to be exercised	Performance criteria		
	A	B	C
Establish new communication	At the additional spot frequency tests a, c	Performed before and after the application of the test or disturbance	Performed before and after the application of the test or disturbance
Maintain established communication	Yes In addition, the requirements of Annex G for the audio output function shall be satisfied c	Yes b	No
Terminate established communication	At the additional spot frequency tests a, c	Performed before and after the application of the test or disturbance	Performed before and after the application of the test or disturbance

Communication refers to a telephone call or other form of voice connection.

a Applicable to TTE with a dial function that provides dedicated emergency service/safety of life call capability. Where the EUT does not provide this functionality, this limitation shall be stated in the equipment user manual.

b Communication shall be established prior to the application of the disturbance, the communication shall be maintained and the quality of that communication (for example, volume setting, the level of background noise) shall be maintained after completion of the test or disturbance.

c Where defined in Clause 5 (for the tests in Table 1 to Table 4), these functional tests shall be performed during the additional spot frequency tests.

### 5.3 Test of IEC/EN 61000-4-2

#### 5.3.1 Test Instruments

Immunity Shielded Room					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
Aneroid Barometer	SATO	7610-20	89090	09/01/2020	08/31/2021
ESD Simulator	Teseq	NSG 437	1189	04/19/2021	04/18/2022
Thermo-Hygro Meter	Wisewind	201A	SD-S039	01/06/2021	01/05/2022

Testing Site : No.163-1, Jhongsheng Rd., Xindian Dist., New Taipei City, Taiwan

#### 5.3.2 EUT Operating Condition

Environment:

Temperature	Humidity	Air Pressure
19 °C	43 %RH	1010 hpa

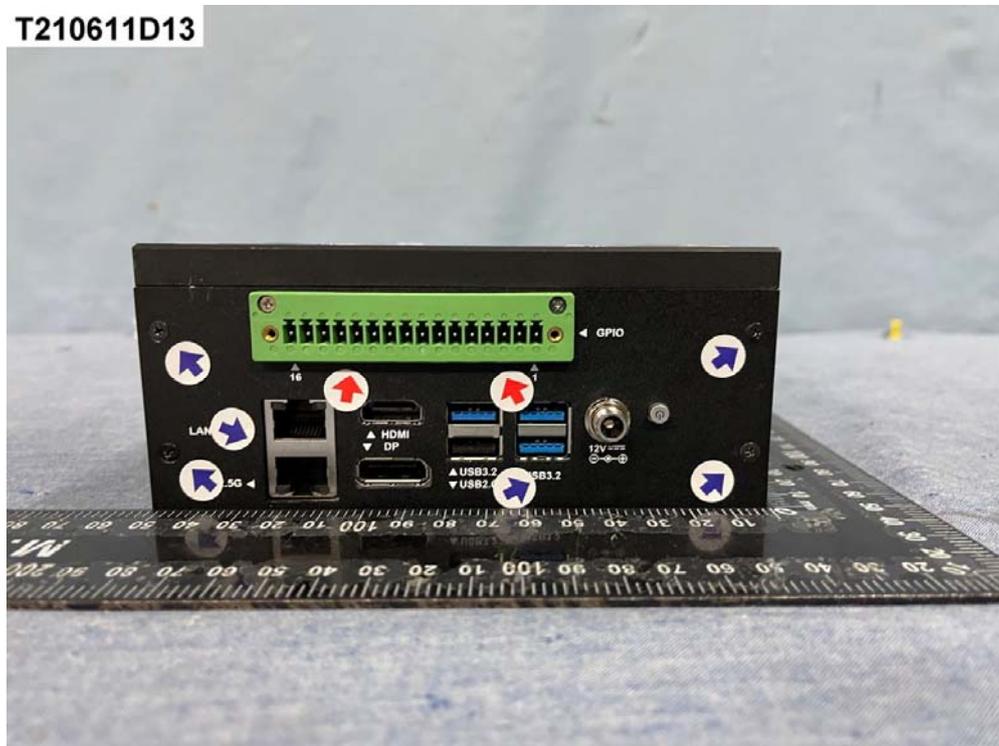


## ESD Test point

### Front



### Back

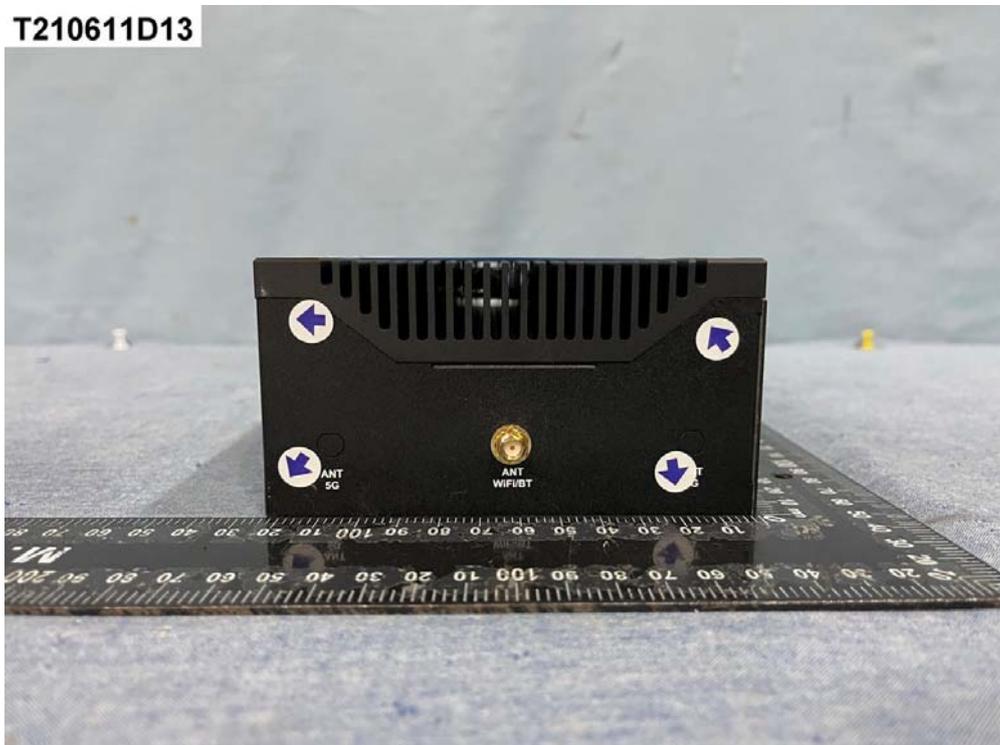


Air Discharge: ↑  
 Contact Discharge: ↑

### Left

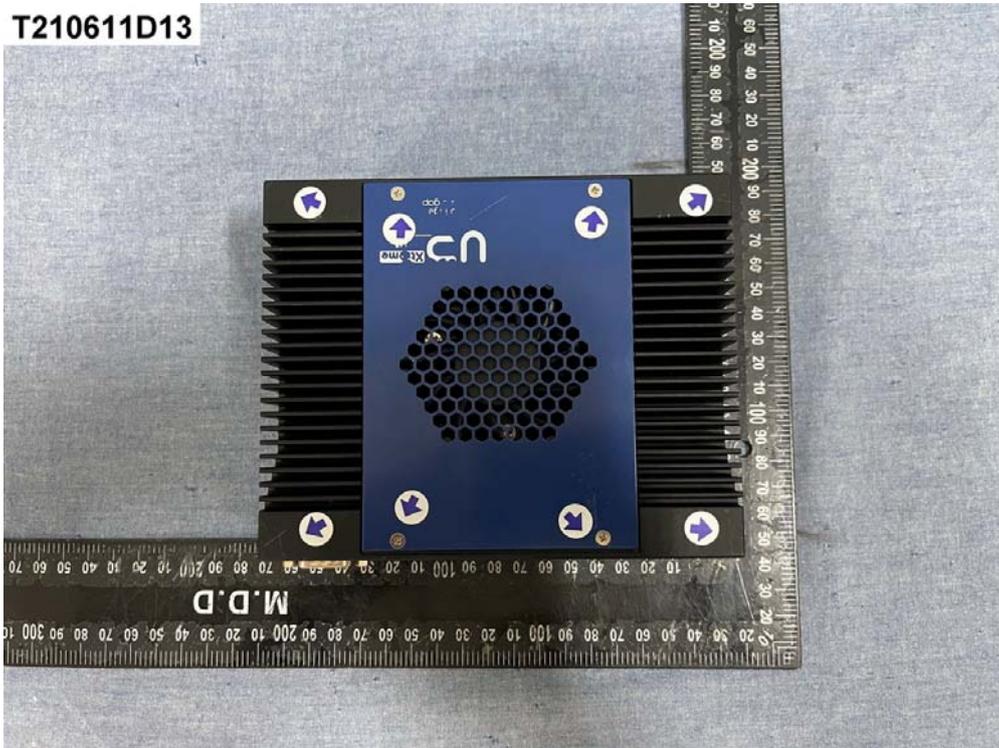


### Right

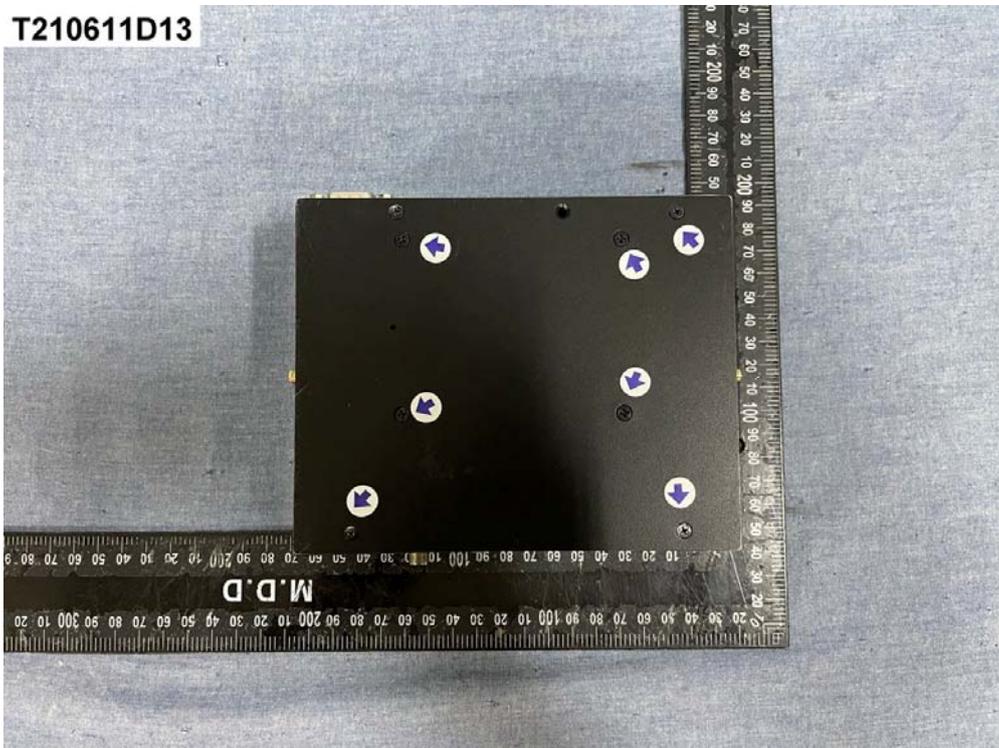


Air Discharge: ↑  
Contact Discharge: ↑

### Top



### Bottom



Air Discharge: ↑  
Contact Discharge: ↑

## 5.4 Test of IEC/EN 61000-4-3

### 5.4.1 Test Instruments

844 RS Chamber					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
Electric Field Probe	AR	FL7006	0356656	10/14/2020	10/13/2021
Field of Calibration	CCS	Chamber#RS	80-1000MHz	02/26/2021	02/25/2022
RF Power Meter	Boonton	4242	17419	03/17/2021	03/16/2022
Power Sensor	Boonton	51011A-EMC	36833	03/17/2021	03/16/2022
Power Sensor	Boonton	51011A-EMC	36834	03/17/2021	03/16/2022
Signal Generator	Agilent	N5181A	MY47421336	11/15/2020	11/14/2021
Thermo-Hygro Meter	Wisewind	N/A	SD-S019	10/19/2020	10/18/2021
Broadband Antenna	Schwarzbeck	VUSLP 9111E	D-69250	N.C.R	N.C.R
Power Amplifier	Milmega	80RF1000-600	1079361	N.C.R	N.C.R
Field of Calibration	CCS	Chamber#RS	1000-6000M	02/25/2021	02/24/2022
Direction Coupler	AR	DC7144A	306217	N.C.R	N.C.R
Microwave Antenna	Schwarzbeck	STLP 9149	767	N.C.R	N.C.R
Power Amplifier	AR	60S1G3	302728	N.C.R	N.C.R
Power Amplifier	Milmega	AS1860-100	1075832	N.C.R	N.C.R
Power Amplifier	Teseq	CBA6G-100D	1087370	N.C.R	N.C.R
Test Software	EmcwareVer. 2.6.0.16				
Testing Site : No.163-1, Jhongsheng Rd., Xindian Dist., New Taipei City, Taiwan					

### 5.4.2 EUT Operating Condition

Environment:

Temperature	Humidity	Air Pressure
23 °C	60 %RH	1010 hpa

### 5.4.3 Results of Radiated Radio Frequency Electromagnetic (RS)

Model No. : UPX-TGL01; UPX-EDGE-TGL01; PER-TAIX2-A20-2280  
 Tested By : Mike Xie  
 Tested Date : June 29, 2021  
 Test Mode : Mode 2  
 Basic Standard : IEC/EN 61000-4-3  
 Frequency range : 80 MHz - 1000 MHz  
 Frequency range : 1800 MHz, 2600 MHz, 3500 MHz, 5000 MHz ( $\pm 1\%$ )  
 Field strength : 3 V/m  
 Modulation : 80% AM (1kHz)  
 Frequency step : 1 % of fundamental  
 Polarity of Antenna : Horizontal and Vertical  
 Dwell Time : 3 seconds  
 Test distance : 3 m

No.	Frequency (MHz)	Antenna Orientation	Observation	EUT Orientation
1	80 - 1000	Vertical/Horizontal	A	0 degree
2	80 - 1000	Vertical/Horizontal	A	90 degree
3	80 - 1000	Vertical/Horizontal	A	180 degree
4	80 - 1000	Vertical/Horizontal	A	270 degree

**Remark:** A: No degradation of performance or loss of function.

No.	Frequency (MHz)	Antenna Orientation	Observation	EUT Orientation
1	1800, 2600, 3500, 5000 ( $\pm 1\%$ )	Vertical/Horizontal	A	0 degree
2	1800, 2600, 3500, 5000 ( $\pm 1\%$ )	Vertical/Horizontal	A	90 degree
3	1800, 2600, 3500, 5000 ( $\pm 1\%$ )	Vertical/Horizontal	A	180 degree
4	1800, 2600, 3500, 5000 ( $\pm 1\%$ )	Vertical/Horizontal	A	270 degree

**Remark:** A: No degradation of performance or loss of function.

Model No. : UPX-TGL01; UPX-EDGE-TGL01; PER-TAIX2-A20-2280  
 Tested By : Mike Xie  
 Tested Date : June 29, 2021  
 Test Mode : Mode 2 (Audio out)  
 Basic Standard : IEC/EN 61000-4-3  
 Frequency range : 80 MHz - 1000 MHz  
 Frequency range : 1800 MHz, 2600 MHz, 3500 MHz, 5000 MHz ( $\pm 1\%$ )  
 Field strength : 3 V/m  
 Modulation : 80% AM (1kHz)  
 Frequency step : 1 % of fundamental  
 Polarity of Antenna : Horizontal and Vertical  
 Dwell Time : 3 seconds  
 Test distance : 3 m

No.	Frequency (MHz)	Antenna Orientation	Observation	EUT Orientation
1	80 - 1000	Vertical/Horizontal	A	0 degree
2	80 - 1000	Vertical/Horizontal	A	90 degree
3	80 - 1000	Vertical/Horizontal	A	180 degree
4	80 - 1000	Vertical/Horizontal	A	270 degree

**Remark:** A: No degradation of performance or loss of function.

No.	Frequency (MHz)	Antenna Orientation	Observation	EUT Orientation
1	1800, 2600, 3500, 5000 ( $\pm 1\%$ )	Vertical/Horizontal	A	0 degree
2	1800, 2600, 3500, 5000 ( $\pm 1\%$ )	Vertical/Horizontal	A	90 degree
3	1800, 2600, 3500, 5000 ( $\pm 1\%$ )	Vertical/Horizontal	A	180 degree
4	1800, 2600, 3500, 5000 ( $\pm 1\%$ )	Vertical/Horizontal	A	270 degree

**Remark:** A: No degradation of performance or loss of function.

## 5.5 Test of IEC/EN 61000-4-4

### 5.5.1 Test Instruments

Immunity Shield Room					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
Capacitive Clamp	EMC-Partner	CN-EFT1000	589	06/07/2021	06/06/2022
EMC Test System	Teseq	NSG 3060	1718	12/15/2020	12/14/2021
Software	WIN 3000Ver. 1.3.2				
Testing Site : No.163-1, Jhongsheng Rd., Xindian Dist., New Taipei City, Taiwan					

### 5.5.2 EUT Operating Condition

Environment:

Temperature	Humidity	Air Pressure
20 °C	50 %RH	1010 hpa

### 5.5.3 Results of Electrical Fast Transient (EFT)

Model No. : UPX-TGL01; UPX-EDGE-TGL01; PER-TAIX2-A20-2280  
 Tested By : Mike Xie  
 Tested Date : June 29, 2021  
 Test Mode : Mode 2  
 Basic Standard : IEC/EN 61000-4-4  
 Test Voltage : AC Input: ± 1 kV  
 Signal/Comm. : ± 0.5 kV  
 Polarity : Positive/Negative  
 Impulse Frequency : 5 kHz  
 Tr/Th : 5/50ns  
 Burst : 15ms/300ms

**Observation:**

Test Point	Polarity	Test Level (kV)	Results
L	+/-	1	A
N	+/-	1	A
PE	+/-	1	A
L-N	+/-	1	A
L-PE	+/-	1	A
N-PE	+/-	1	A
L-N-PE	+/-	1	A
RJ45	+/-	0.5	A
RJ45 (2.5Gbps)	+/-	0.5	A

**Remark:** A: No degradation of performance or loss of function

## 5.6 Test of IEC/EN 61000-4-5

### 5.6.1 Test Instruments

Immunity Shield Room					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
CDN	EMC-Partner	CDN-UTP8	1505	12/15/2020	12/14/2021
EMC Test System	Teseq	NSG 3060	1718	12/15/2020	12/14/2021
Software	WIN 3000Ver. 1.3.2				
Testing Site : No.163-1, Jhongsheng Rd., Xindian Dist., New Taipei City, Taiwan					

### 5.6.2 EUT Operating Condition

Environment:

Temperature	Humidity	Air Pressure
20 °C	50 %RH	1010 hpa

### 5.6.3 Results of Surge Test

Model No. : UPX-TGL01; UPX-EDGE-TGL01; PER-TAIX2-A20-2280  
 Tested By : Mike Xie  
 Tested Date : June 29, 2021  
 Test Mode : Mode 2  
 Basic Standard : IEC/EN 61000-4-5  
 Test Rate : 1 pulse every minute  
 No. of Tests : 5 positive and 5 negative pulses  
 Waveform : 1.2/50 $\mu$ s (8/20 $\mu$ s)

#### Observation Description

AC input line:

Test Point	Phase Angle (degree)	Polarity (+/-)	Test Level (kV)	Observation
L – N	0, 90, 180, 270	+/-	1	A
L – PE	0, 90, 180, 270	+/-	2	A
N – PE	0, 90, 180, 270	+/-	2	A

**Remark:** A: No degradation of performance or loss of function.

Signal line:

Test Rate : 1 pulse every minute  
 No. of Tests : 5 positive and 5 negative pulses  
 Waveform : 10/700 $\mu$ s

#### Observation Description

Signal line:

Test Point	Phase Angle (degree)	Polarity (+/-)	Test Level (kV)	Observation
RJ45	No phase angle (degree)	+/-	1	A
RJ45 (2.5Gbps)	No phase angle (degree)	+/-	0.5	A

**Remark:** A: No degradation of performance or loss of function.

## 5.7 Test of IEC/EN 61000-4-6

### 5.7.1 Test Instruments

CS Room					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
CDN	Teseq	CDN S751A	46649	11/16/2020	11/15/2021
CDN	Teseq	CDN M016	35821	11/16/2020	11/15/2021
CDN	TESEQ	CDN T400A	28547	11/16/2020	11/15/2021
CDN	FCC	FCC-801-M3-25A	9973	11/16/2020	11/15/2021
CDN	Teseq	CDN T8A-10	57182	05/26/2021	05/25/2022
Compact Immunity Test System	TESEQ	NSG 4070	39581	11/20/2020	11/19/2021
EM Clamp	Schaffner	KEMZ 801	19227	12/21/2020	12/20/2021
Test Software	NSG 4070 Control Program V1.2.0				
Testing Site : No.163-1, Jhongsheng Rd., Xindian Dist., New Taipei City, Taiwan					

### 5.7.2 EUT Operating Condition

Environment:

Temperature	Humidity	Air Pressure
21 °C	60 %RH	1009 hpa

### 5.7.3 Results of Immunity to Conducted Disturbances (CS)

Model No. : UPX-TGL01; UPX-EDGE-TGL01; PER-TAIX2-A20-2280  
 Tested By : Mike Xie  
 Tested Date : June 29, 2021  
 Test Mode : Mode 2  
 Basic Standard : IEC/EN 61000-4-6  
 Frequency range : 0.15 MHz -10 MHz  
 Field strength : 3 Vrms  
 Frequency range : 10 MHz - 30 MHz  
 Field strength : 3 V to 1Vrms  
 Frequency range : 30 MHz - 80 MHz  
 Field strength : 1 Vrms  
 Modulation : 80% AM, 1 kHz Sinewave  
 Frequency step : 1 % of fundamental  
 Dwell Time : 3 seconds  
 Coupling Method : CDN-M3; CDN-T8; EM-Clamp

Cable Description	Frequency (MHz)	Observation
AC input	0.15 – 80	A

Signal Ports

Cable Description	Frequency (MHz)	Observation
RJ45	0.15 – 80	A
RJ45 (2.5Gbps)	0.15 – 80	A

**Remark:** A: No degradation of performance or loss of function.

Model No. : UPX-TGL01; UPX-EDGE-TGL01; PER-TAIX2-A20-2280  
 Tested By : Mike Xie  
 Tested Date : June 29, 2021  
 Test Mode : Mode 2 (Audio out)  
 Basic Standard : IEC/EN 61000-4-6  
 Frequency range : 0.15 MHz -10 MHz  
 Field strength : 3 Vrms  
 Frequency range : 10 MHz - 30 MHz  
 Field strength : 3 V to 1Vrms  
 Frequency range : 30 MHz - 80 MHz  
 Field strength : 1 Vrms  
 Modulation : 80% AM, 1 kHz Sinewave  
 Frequency step : 1 % of fundamental  
 Dwell Time : 3 seconds  
 Coupling Method : CDN-M3; CDN-T8; EM-Clamp

Cable Description	Frequency (MHz)	Observation
AC input	0.15 – 80	A

Signal Ports

Cable Description	Frequency (MHz)	Observation
RJ45	0.15 – 80	A
RJ45 (2.5Gbps)	0.15 – 80	A

**Remark:** A: No degradation of performance or loss of function.



## 5.9 Test of IEC/EN 61000-4-11

### 5.9.1 Test Instruments

Immunity Shielded Room					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
AC/DC Clamp Meter	Lutron	CM-9930R	I.200121	05/02/2021	05/01/2022
EMC Test System	Teseq	NSG 3060	1718	12/15/2020	12/14/2021
Software	WIN 3000Ver. 1.3.2				
Testing Site : No.163-1, Jhongsheng Rd., Xindian Dist., New Taipei City, Taiwan					

### 5.9.2 EUT Operating Condition

Environment:

Temperature	Humidity	Air Pressure
20 °C	59 %RH	1010 hpa

### 5.9.3 Results of Voltage Dips Immunity Test

Model No. : UPX-TGL01; UPX-EDGE-TGL01; PER-TAIX2-A20-2280  
 Tested By : Mike Xie  
 Tested Date : June 29, 2021  
 Test Mode : Mode 2  
 Basic Standard : IEC/EN 61000-4-11  
 EUT Rated Voltage : 230 Volts.  
 Reduction Voltage : 30, >95 % Ut  
 Phase Angle : 0,180 degree  
 Total events : 3 dropouts  
 Event interval : 10 seconds

Test Power: 230Vac, 50Hz			
Environmental phenomena	Test specification (% reduction)	Duration (in periods of the rated frequency)	Observation
Voltage Interruptions	>95	250	C
Voltage dips	>95	0.5	A
	30	25	A

Test Power: 230Vac, 60Hz			
Environmental phenomena	Test specification (% reduction)	Duration (in periods of the rated frequency)	Observation
Voltage Interruptions	>95	300	C
Voltage dips	30	30	A

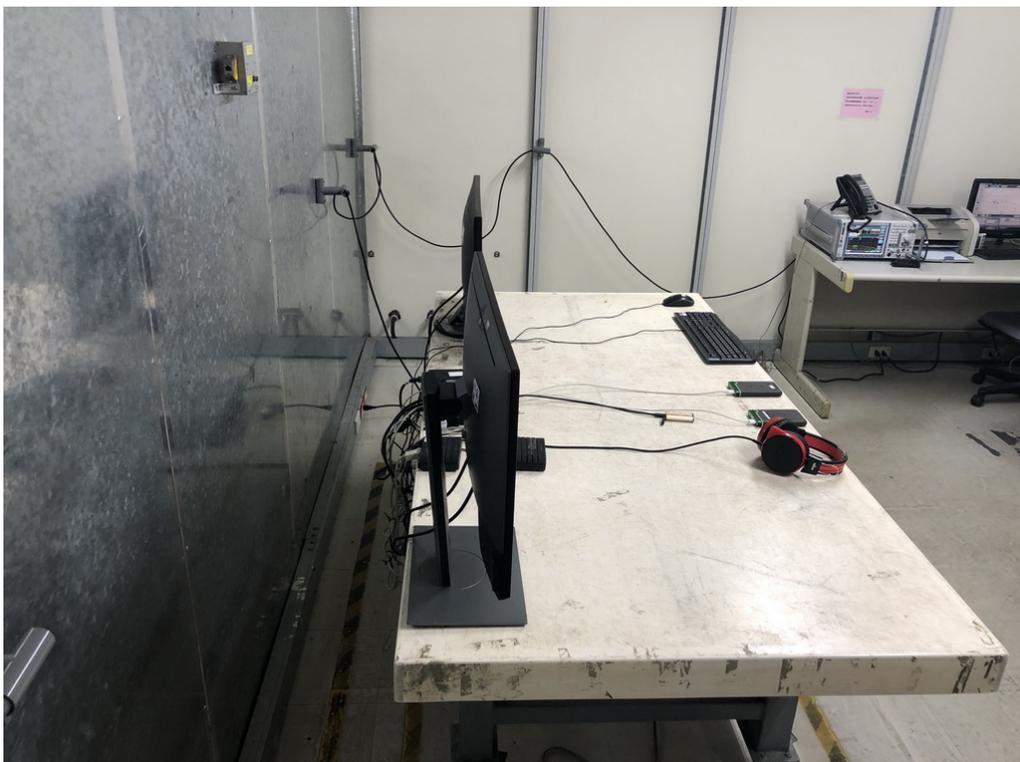
**Remark:** A: No degradation of performance or loss of function.

C: EUT shut down, it could not become normal except reinstalled by operator.

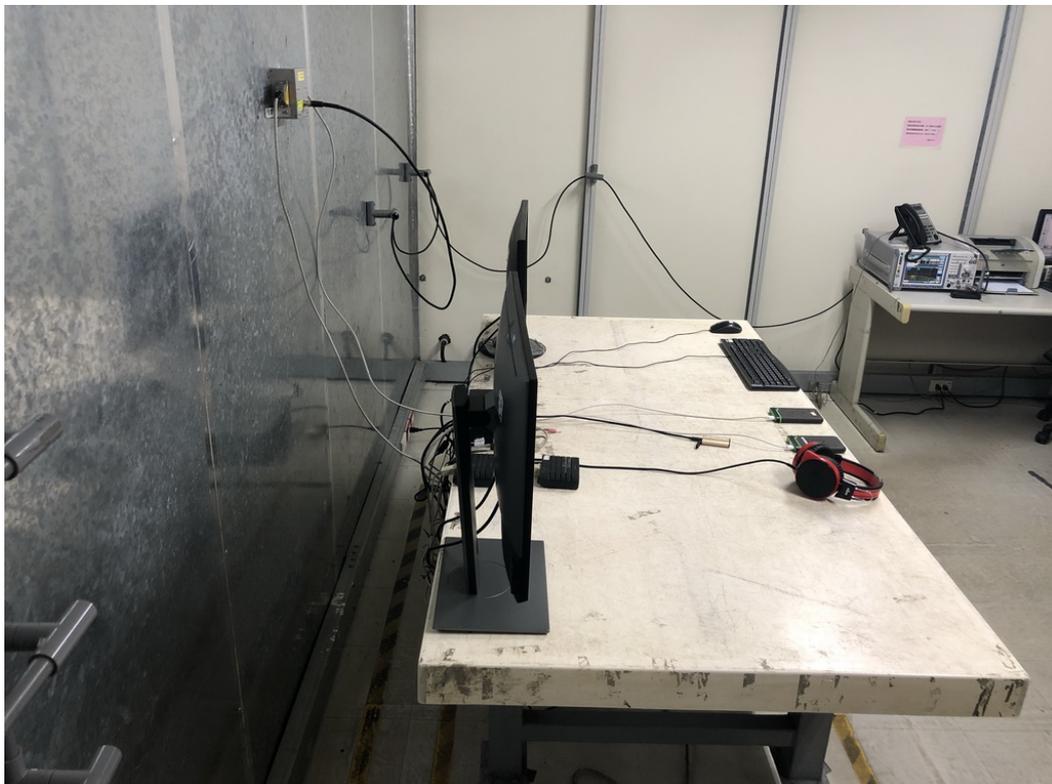
# APPENDIX

## Photograph of Testing General Set-up

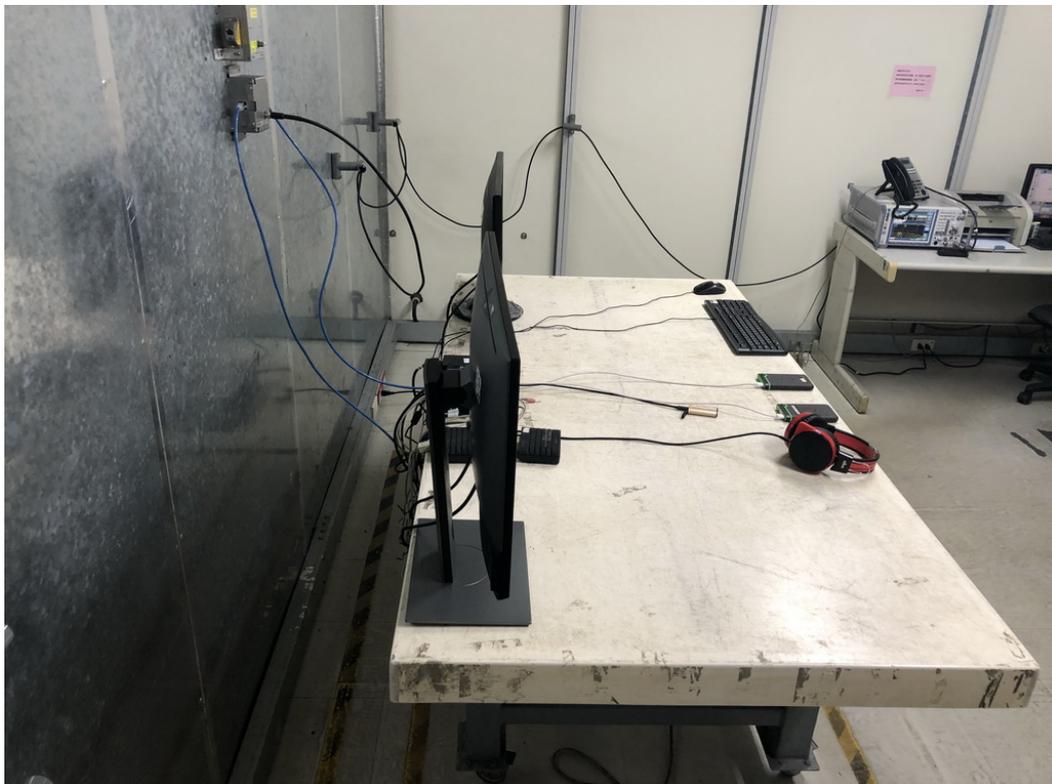
### CE Testing Set-up



## ISN Testing Set-up

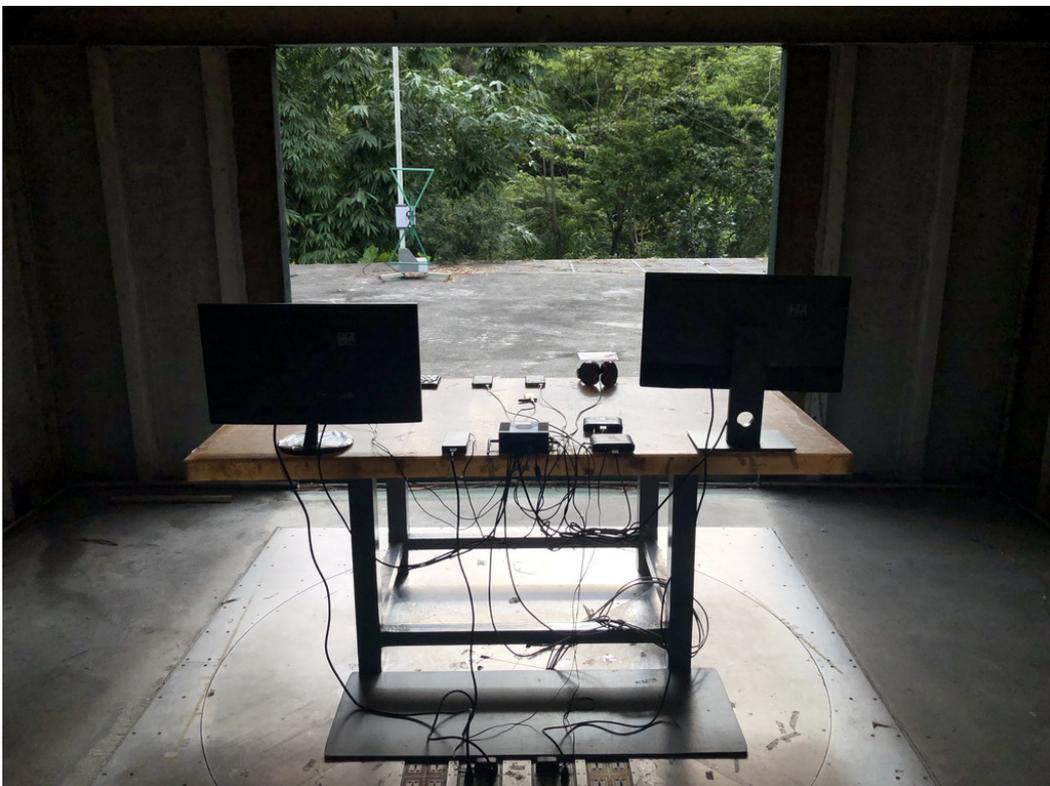


## ISN Testing Set-up (2.5Gbps)

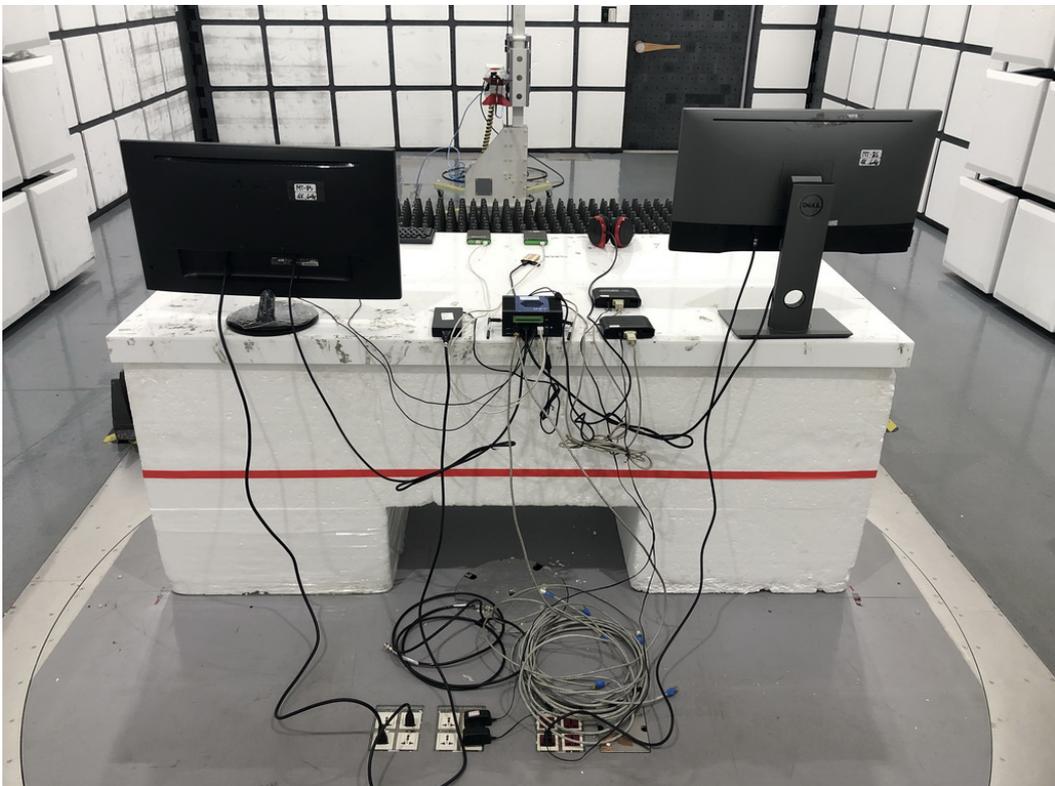


## RE Testing Set-up

### Below 1GHz



## Above 1GHz



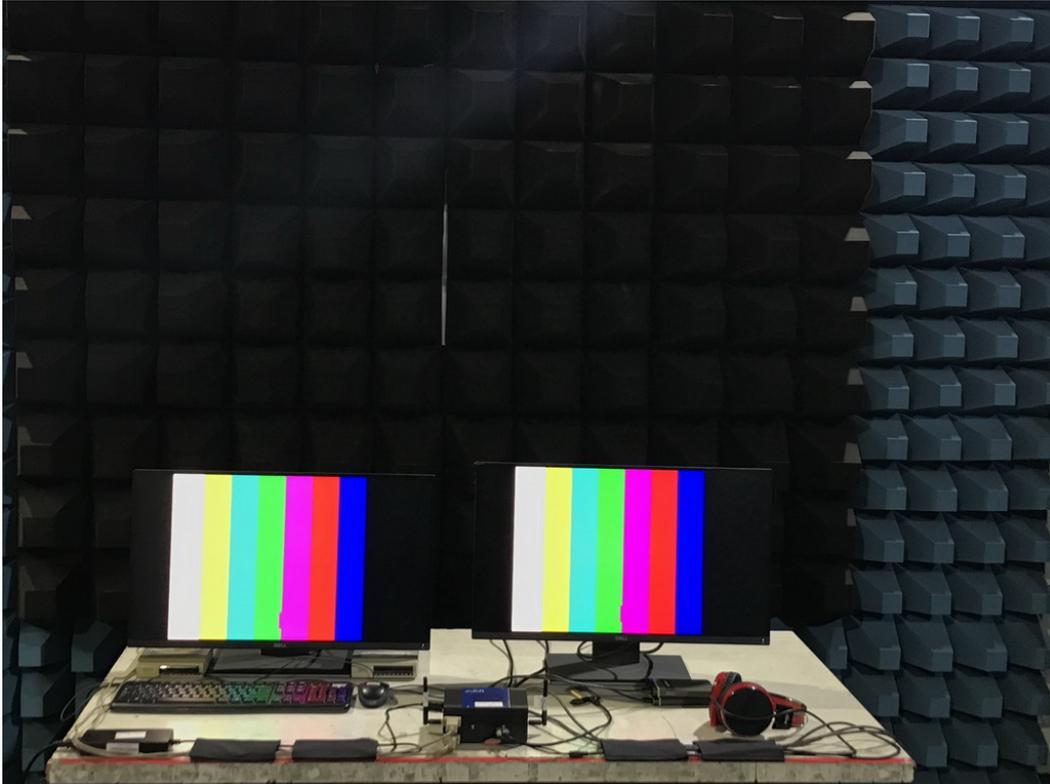
## HARMONIC & FLICKER Testing Set-up



## ESD Testing Set-up



## RS Testing Set-up



## RS Testing Set-up (Audio out)



## EFT Testing Set-up



## EFT For I/O Testing Set-up



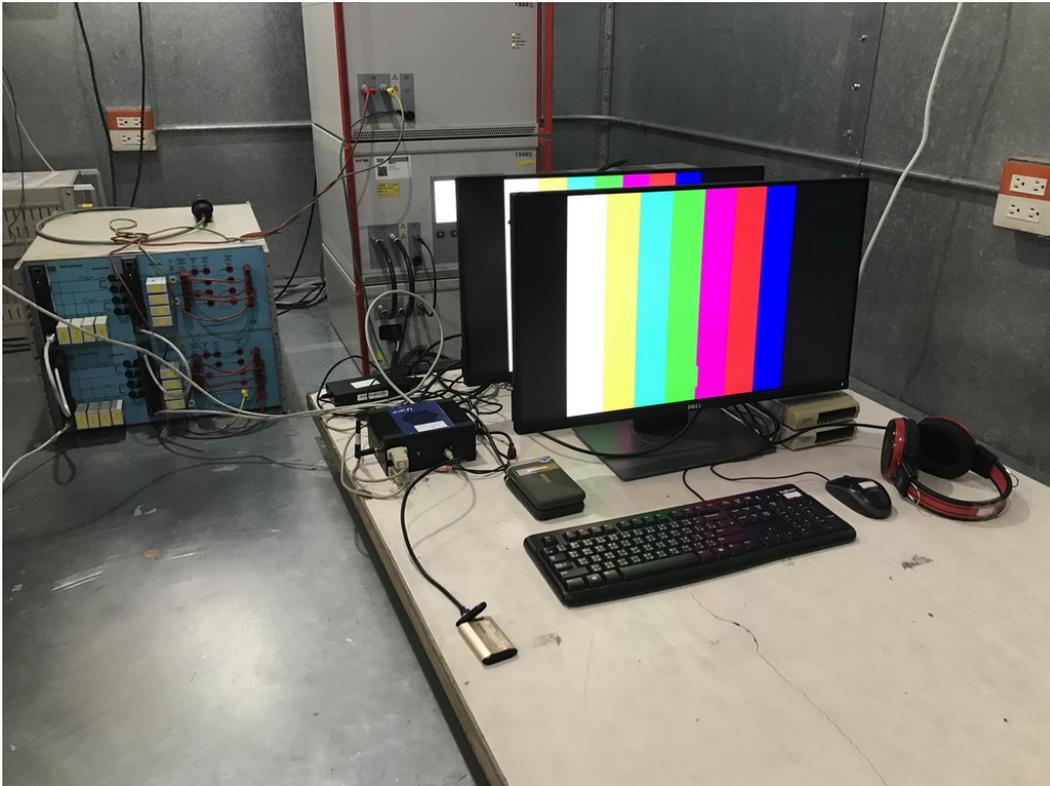
## EFT For I/O Testing Set-up (2.5Gbps)



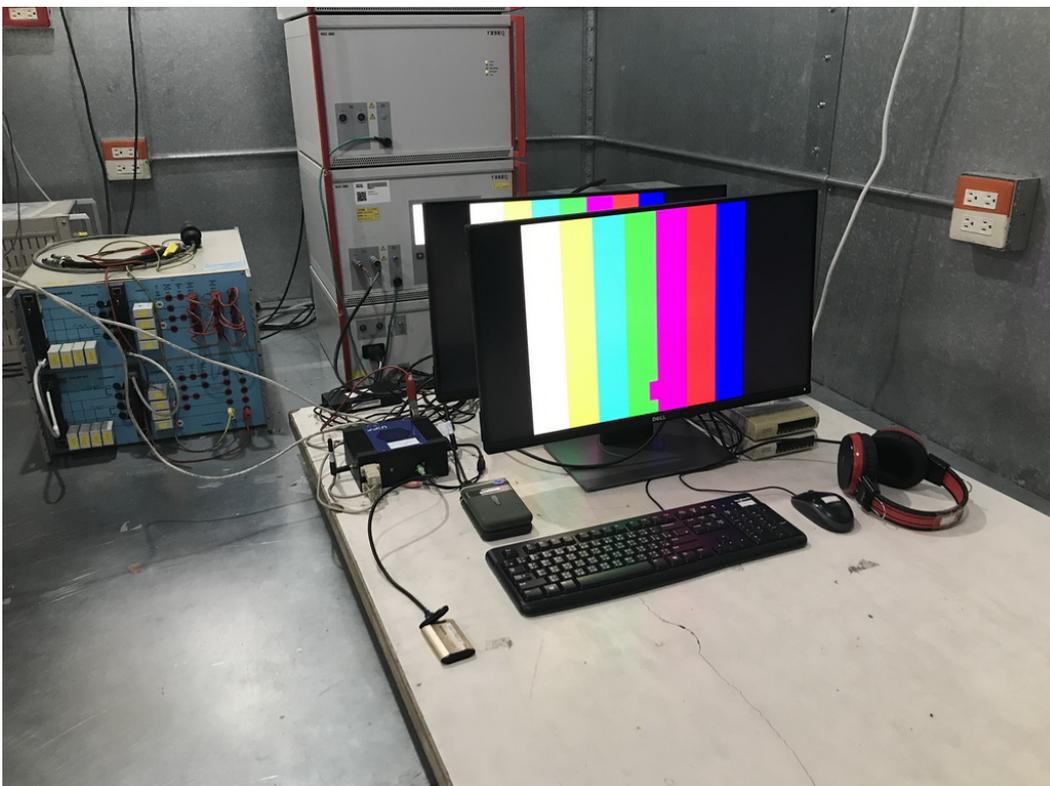
## Surge Testing Set-up



## Surge For I/O Testing Set-up



## Surge For I/O Testing Set-up (2.5Gbps)



## CS Testing Set-up



## CS For I/O Testing Set-up



## CS For I/O Testing Set-up (2.5Gbps)



## CS Testing Set-up (Audio out)



### CS For I/O Testing Set-up (Audio out)



### CS For I/O Testing Set-up (Audio out / 2.5Gbps)



## DIP Testing Set-up

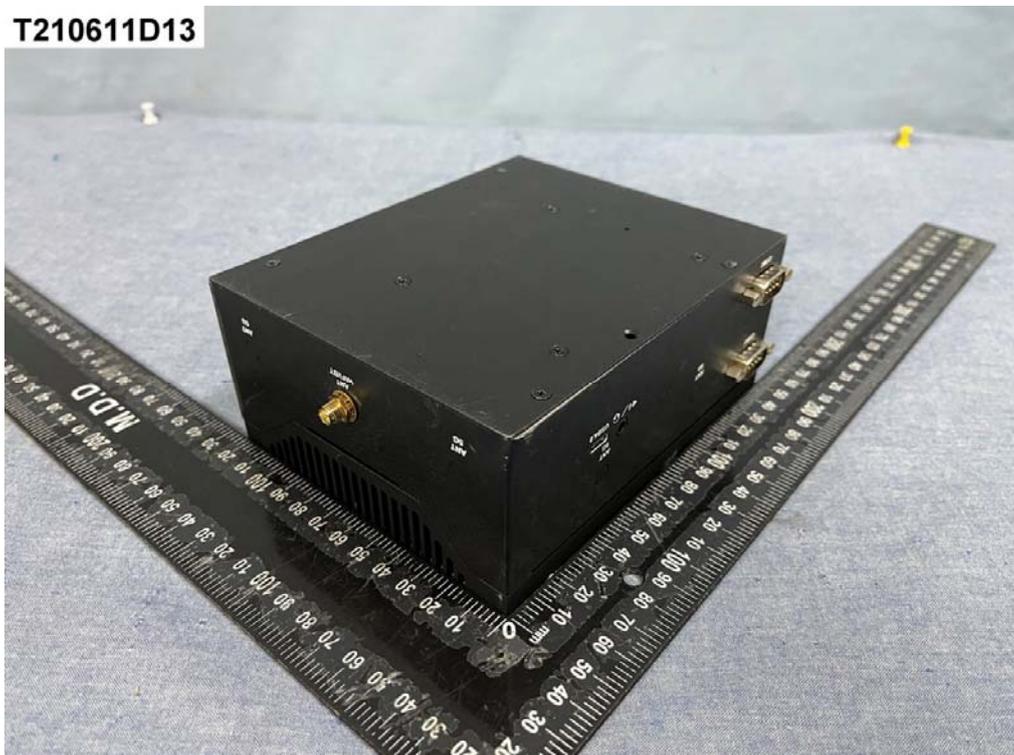


## Photographs of EUT Unit Exterior

T210611D13



T210611D13



T210611D13



T210611D13



T210611D13



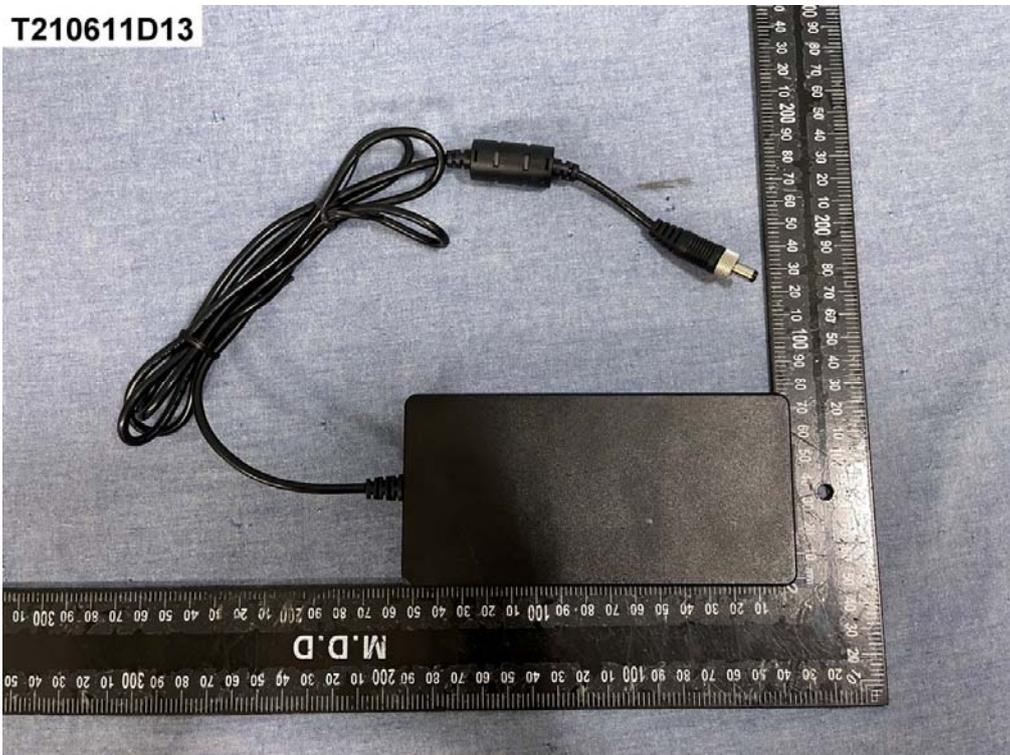
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T210611D13



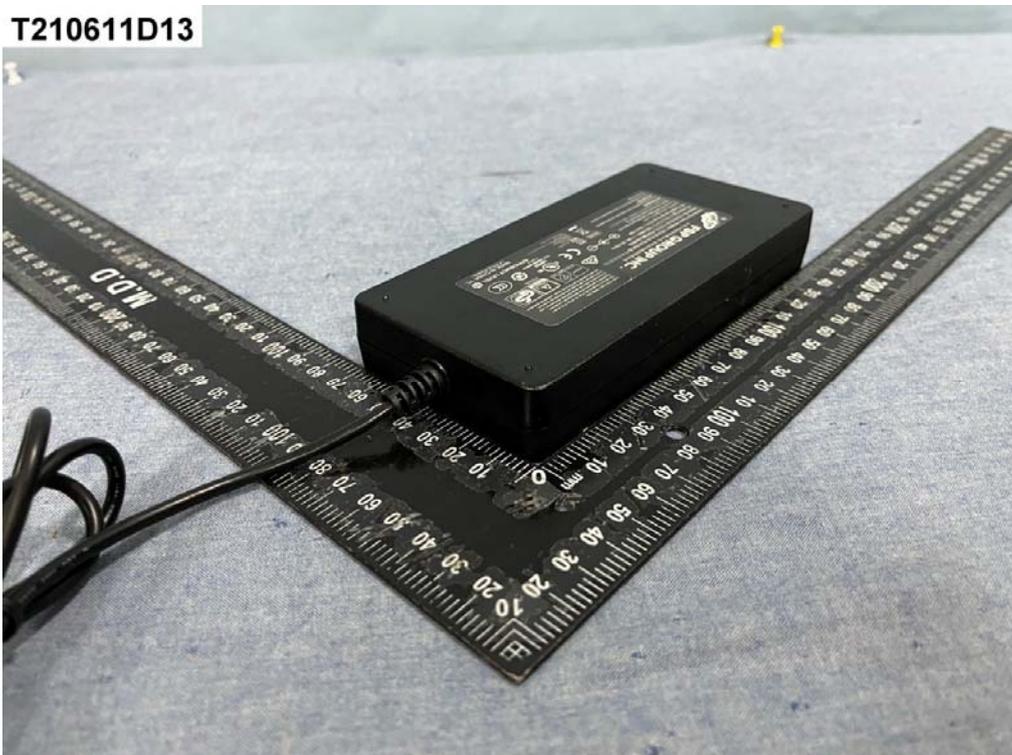
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T210611D13



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T210611D13



**\*\* End of Report \*\***