

# TEST REPORT

**Project No.: TM-2505000348P****Applicant: 7Starlake Co., Ltd.****Address: 2F., No.190, Sec 2, Zhongxing Rd., Xindian Dist.,  
New Taipei City, 23146, Taiwan.****Manufacturer: 7Starlake Co., Ltd.****Address: 2F., No.190, Sec 2, Zhongxing Rd., Xindian Dist.,  
New Taipei City, 23146, Taiwan.****Equipment Under Test (EUT):****Name: ROC286B-ET****Brand Name: 7Starlake****Model No.: ROC286B****Added Model(s): N/A****Standards:**

EN 55032: 2015 + A11: 2020 + A1: 2020, Class A CISPR 32: 2015 + A1: 2019	BS EN 55032: 2015 + A11: 2020 + A1: 2020
EN IEC 61000-3-2: 2019 + A1: 2021	BS EN IEC 61000-3-2: 2019 + A1: 2021
EN 61000-3-3: 2013 + A1: 2019 + A2: 2021 + AC: 2022	BS EN 61000-3-3: 2013 + A1: 2019 + A2: 2021
EN 55035: 2017 + A11: 2020	BS EN 55035: 2017 + A11: 2020
IEC 61000-4-2: 2008	IEC 61000-4-6: 2023
IEC 61000-4-3: 2020 (Ed. 4.0)	IEC 61000-4-8: 2009
IEC 61000-4-4: 2012	IEC 61000-4-11: 2020 + COR1: 2020 + COR2: 2022 (Ed. 3.0)
IEC 61000-4-5: 2014 + A1: 2017	

**Date of Sample Receipt : May 27, 2025****Date of Test : June 3, 2025****Date of Issue : June 25, 2025****Remarks:**

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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***Stanley Cheng***Date June 25, 2025****Stanley Cheng (Supervisor of engineering dept.)**

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	TMXD2505001972DE	Original.	June 25, 2025

Note:



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# 1. General Description

## 1.1 General Description of EUT

Name of EUT	ROC286B-ET
Brand Name	7Starlake
Model No.(s)	ROC286B
Added Model(s)	N/A
Variant Description	N/A

## 1.2 Details of EUT

EUT Power Rating	90~260VAC
Highest internal frequency	4000MHz

### Accessories Cable List

Cable Type	Core	Length	Category	Shielding/Non-shielding

## 1.3 Description of Support Units

### EUT Devices:

No.	Equipment	Model No.	Brand Name
1	MB	INS8365B	Perfectron
2	CPU (4.0GHz)	i7-8700T	Intel
3	Memory (16GB)	16GB DDR4	Innodisk
4	Storage (960GB)	960GB 2.5"SSD	Phison
5	Power	UHP-200R-12	Meanwell

**Peripherals Devices:**

No.	PRODUCT	MANUFACTURER	MODEL NO.	SERIAL NO.
1-4	USB HDD	Transcend	TS1TSJ25MC	N/A
5	Earphone & Microphone	INTOPIC	JAZZ-379	220805002
6	USB Mouse	Logitech	M-U0026	N/A
7	USB Keyboard	Logitech	YU0036	2325SC30W738
8	Monitor	GIGABYTE	M28U	SN23280B003398
9	Monitor	GIGABYTE	M28U	SN24010B003291
10	Monitor	GIGABYTE	M28U	SN24010B003292
11	LAN Hub	ZYXEL	GS-108B v3	S184305016657
12	Server PC	Dell	T3610	57TT032
13-14	COM Loopback	N/A	N/A	N/A
15	Ground Wired	N/A	N/A	N/A

**Support Equipment Used in Tested Cable**

No.	Cable Type	Core	Length	Shielding/Non-shielding
1-4	USB 3.1	N/A	1.8m	Shielding
5	Earphone & Microphone	N/A	1.8m	Non-shielding
6-7	USB 2.0	N/A	1.8m	Shielding
8-9	DP	N/A	1.8m	Shielding
10	HDMI	N/A	1.8m	Shielding
11	RJ45 (CAT6A)	N/A	20m X2	Non-shielding
12	RJ45 (CAT6A)	N/A	2.0m	Non-shielding
13-14	COM	N/A	2.0m	Shielding
15	Ground	N/A	2.0m	Non-shielding

**1.4 I/O Port Description**

I/O Port Types	Q'TY
1. DP Port	2
2. HDMI Port	1
3. USB 2.0 Port	2
4. USB 3.1 Port	4
5. Earphone Port	1
6. Microphone Port	1
7. COM Port	2
8. LAN Port	2

## 1.5 Decision of Test Mode

The test configuration/ modes are as the following:

### Conduction Modes (Power port):

1	DP*2 3840*2160@60Hz + HDMI 3840*2160@30Hz	100VAC, 50Hz
2	DP*2 3840*2160@60Hz + HDMI 3840*2160@30Hz	230VAC, 50Hz

### Conduction Modes (Wired network ports):

1		10Mbps
2	LAN 1	100Mbps
3		1Gbps
4	LAN 2	1Gbps

### Radiation Modes:

1	DP*2 3840*2160@60Hz + HDMI 3840*2160@30Hz	100VAC, 50Hz
2	DP*2 3840*2160@60Hz + HDMI 3840*2160@30Hz	230VAC, 50Hz
	DP*2 3840*2160@60Hz + HDMI 3840*2160@30Hz / 1-6GHz	

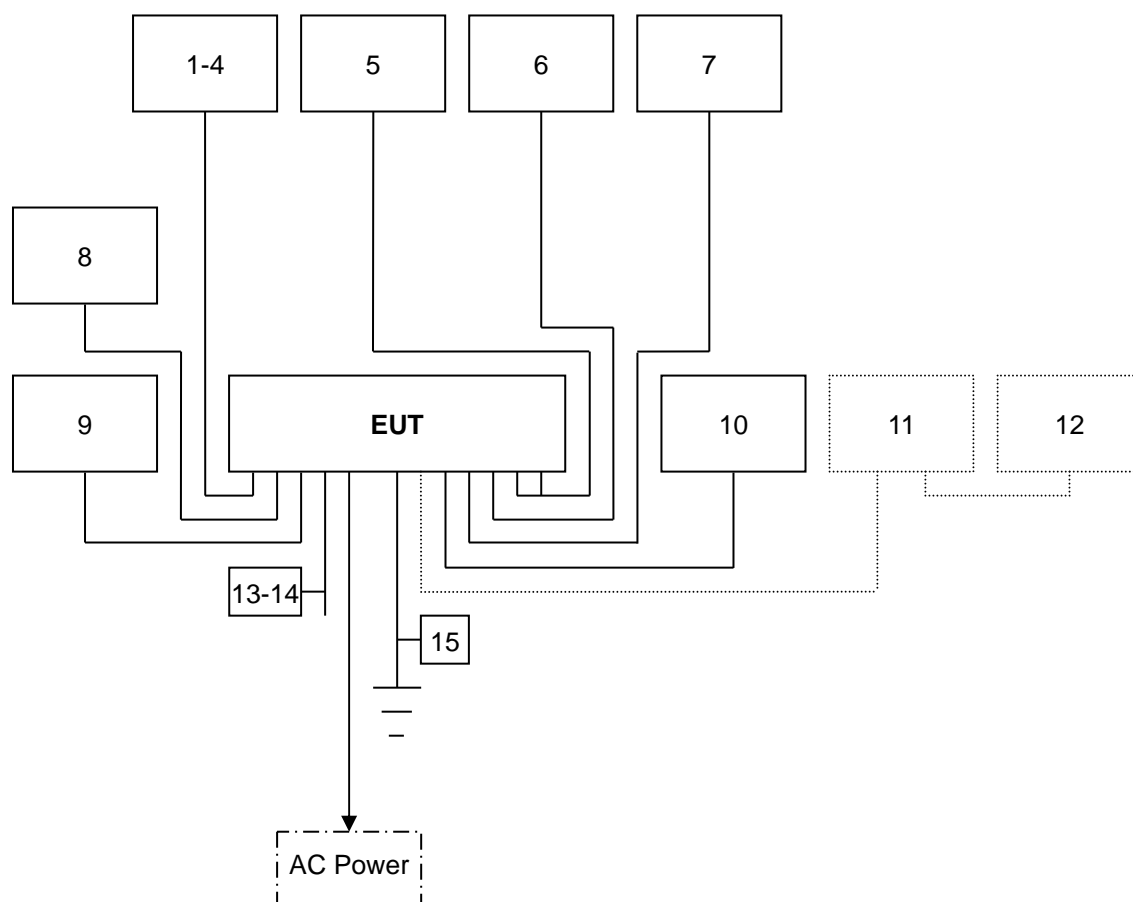
## 1.6 The Final Test Mode of the EUT

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

Final Test Mode	
Conducted Emission	Mode 2
ISN	Mode 1
Radiated Emission Below 1GHz	Mode 2
Radiated Emission Above 1GHz	Mode 2
Harmonics & Flicker	Mode 2
Immunity	Mode 2

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 Burnintest.exe to Disk (C:/ & E:/ & F:/ & G:/ & H:/), Audio, COM, 2D (H pattern), 3D (Video), CPU, RAN.
3. Run colorbarmove.mp4 to activate all peripherals for test EUT.
4. Run LANTEST.exe and type ping 192.168.1.1&2 -t (EUT), type ping 192.168.1.100 -t (Server PC).

## 1.9 Summary of Results

Emission		
Standard	Test Type	Result
EN 55032: 2015 + A11: 2020 + A1: 2020	Conducted Emission	PASS
CISPR 32: 2015 + A1: 2019	ISN	PASS
BS EN 55032: 2015 + A11: 2020 + A1: 2020	Radiated Emission	PASS
EN IEC 61000-3-2: 2019 + A1: 2021	Harmonic current emissions	PASS
BS EN IEC 61000-3-2: 2019 + A1: 2021		
EN 61000-3-3: 2013 + A1: 2019 + A2: 2021 + AC: 2022	Voltage changes, voltage fluctuations & flicker	PASS
BS EN 61000-3-3: 2013 + A1: 2019 + A2: 2021		

Immunity			
Standard	Test Type	Result	Performance Criteria
IEC 61000-4-2: 2008	ESD	PASS	B
IEC 61000-4-3: 2020 (Ed. 4.0)	RS	PASS	A
IEC 61000-4-4: 2012	EFT	PASS	B
IEC 61000-4-5: 2014 + A1: 2017	Surge	PASS	B
IEC 61000-4-6: 2023	CS	PASS	A
IEC 61000-4-8: 2009	PFMF	N/A	A
IEC 61000-4-11: 2020 + COR1: 2020 + COR2: 2022 (Ed. 3.0)	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 (Asymmetric Mode)

##### 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( $\mu$ V/m)	Peak Limit dB( $\mu$ V/m)
1 - 3	60	80
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( $\mu$ V/m)	Peak Limit dB( $\mu$ V/m)
1 - 3	54	74
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( $\mu$ V/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
Pulse Limiter	Schwarzbeck	VTSD 9561-F-N	01423	02/08/2025	02/07/2026
BNC Cable	EMEC	CFD300-NL	SD-C020	12/27/2024	12/26/2025
EMI Test Receiver	R&S	ESCI	101299	11/12/2024	11/11/2025
ISN	Teseq	ISN T800	30847	03/04/2025	03/03/2026
LISN	Schwarzbeck	NSLK 8127	01082	02/27/2025	02/26/2026
LISN(EUT)	Schwarzbeck	NSLK 8127	01084	02/27/2025	02/26/2026
Thermo-Hygro Meter	NDR.AV	GM-108A	SD-R100	08/19/2024	08/18/2025
Test S/W	EZ-EMC Ver.CCS-03A1				
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 3.1 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

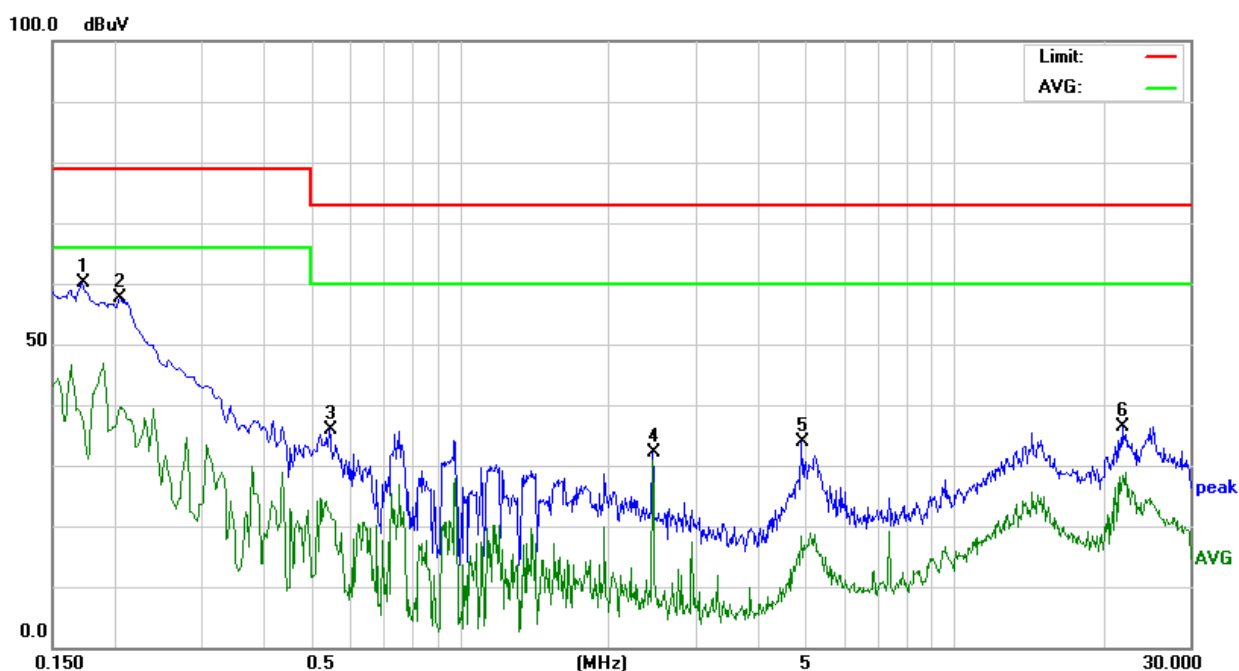
Factor = LISN insertion loss + Cable loss + Pulse Limiter insertion loss

Measurement Level = Reading Level + Factor

Over (Margin) = Measurement Level – Limit

### 2.2.3 Measurement Data (CE)

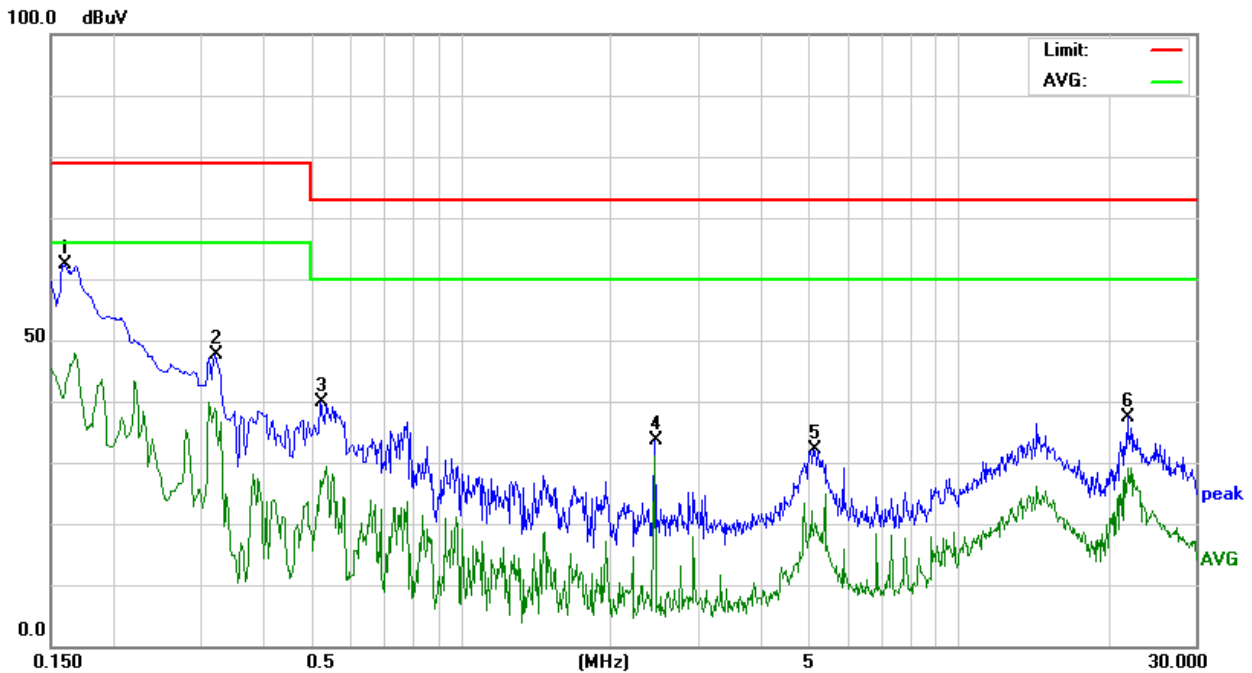
<b>Model No.</b>	ROC286B	<b>6dB Bandwidth</b>	9 kHz
<b>Environmental Conditions</b>	22.1°C, 54% RH	<b>Test Mode</b>	Mode 2
<b>Tested by</b>	Alex Wang	<b>Phase</b>	L1
<b>Standard</b>	EN 55032 CLASS A	<b>Test Date</b>	2025/06/03



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)
0.1725	50.02	10.08	60.10	79.00	-18.90	P	L1
0.2050	47.60	10.09	57.69	79.00	-21.31	P	L1
0.5460	25.82	10.11	35.93	73.00	-37.07	P	L1
2.4585	21.86	10.28	32.14	73.00	-40.86	P	L1
4.9110	23.47	10.36	33.83	73.00	-39.17	P	L1
21.8490	25.35	11.08	36.43	73.00	-36.57	P	L1

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

Model No.	ROC286B	6dB Bandwidth	9 kHz
Environmental Conditions	22.1°C, 54% RH	Test Mode	Mode 2
Tested by	Alex Wang	Phase	L2
Standard	EN 55032 CLASS A	Test Date	2025/06/03

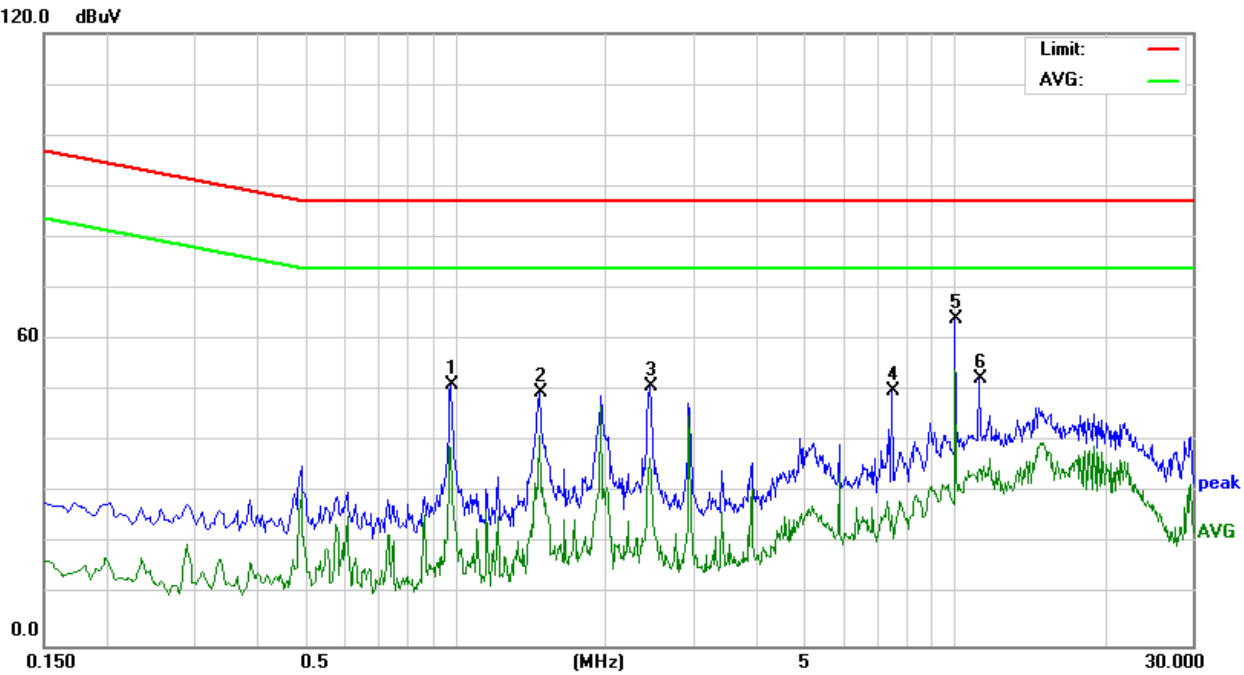


Conducted Emission Readings							
Frequency Range Investigated				150 kHz to 30 MHz			
Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector (P/Q/A)	Line (L1/L2)
0.1598	52.29	10.13	62.42	79.00	-16.58	P	L2
0.3209	37.60	10.07	47.67	79.00	-31.33	P	L2
0.5235	29.78	10.11	39.89	73.00	-33.11	P	L2
2.4539	23.23	10.28	33.51	73.00	-39.49	P	L2
5.1359	21.69	10.35	32.04	73.00	-40.96	P	L2
21.8490	26.44	11.06	37.50	73.00	-35.50	P	L2

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

### 2.2.4 Measurement Data (ISN)

Model No.	ROC286B	6dB Bandwidth	9 kHz
Environmental Conditions	22.1°C, 54% RH	Test Mode	Mode 1
Tested by	Alex Wang	Test Date	2025/06/03
Standard	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)
0.9825	31.43	19.80	51.23	87.00	-35.77	P
1.4775	29.84	19.80	49.64	87.00	-37.36	P
2.4495	30.88	19.82	50.70	87.00	-36.30	P
7.5120	30.20	19.80	50.00	87.00	-37.00	P
10.0320	44.22	19.84	64.06	87.00	-22.94	P
11.2245	32.36	19.91	52.27	87.00	-34.73	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	36995	05/18/2025	05/17/2026
Cable	EMEC	CFD400E-LW	SD-R074	08/08/2024	08/07/2025
EMI Test Receiver	R&S	ESCI	101340	01/14/2025	01/13/2026
Pre-Amplifier	HP	8447D	1937A01554	09/20/2024	09/19/2025
Thermo-Hygro Meter	NDR.AV	GM-108A	SD-R103	04/21/2025	04/20/2026
Test S/W	EZ-EMC Ver.CCS-03A1				
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 5.1 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-Lindgren	3117	00139062	05/20/2025	05/19/2026
Microflex Cable x 7m	JMT	LF01	SD-R097	05/22/2025	05/21/2026
K-Type Cable x 1m	JMT	LK01	SD-R087	05/22/2025	05/21/2026
Pre-Amplifier	Com-Power	PAM-118A	551041	05/21/2025	05/20/2026
Signal Analyzer	R&S	FSV40	101269	05/20/2025	05/19/2026
Thermo-Hygro Meter	NDR.AV	GM-108A	SD-R099	07/15/2024	07/14/2025
Test S/W	EZ-EMC Ver.CCS-03A1				
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

Model No.	ROC286B	Test Mode	Mode 2
Environmental Conditions	23.9°C, 65% RH	6dB Bandwidth	120 kHz
Antenna Pole	Vertical	Antenna Distance	10m
Detector Function	Quasi-peak.	Tested by	Alex Wang
Standard	EN 55032 CLASS A	Test Date	2025/06/03

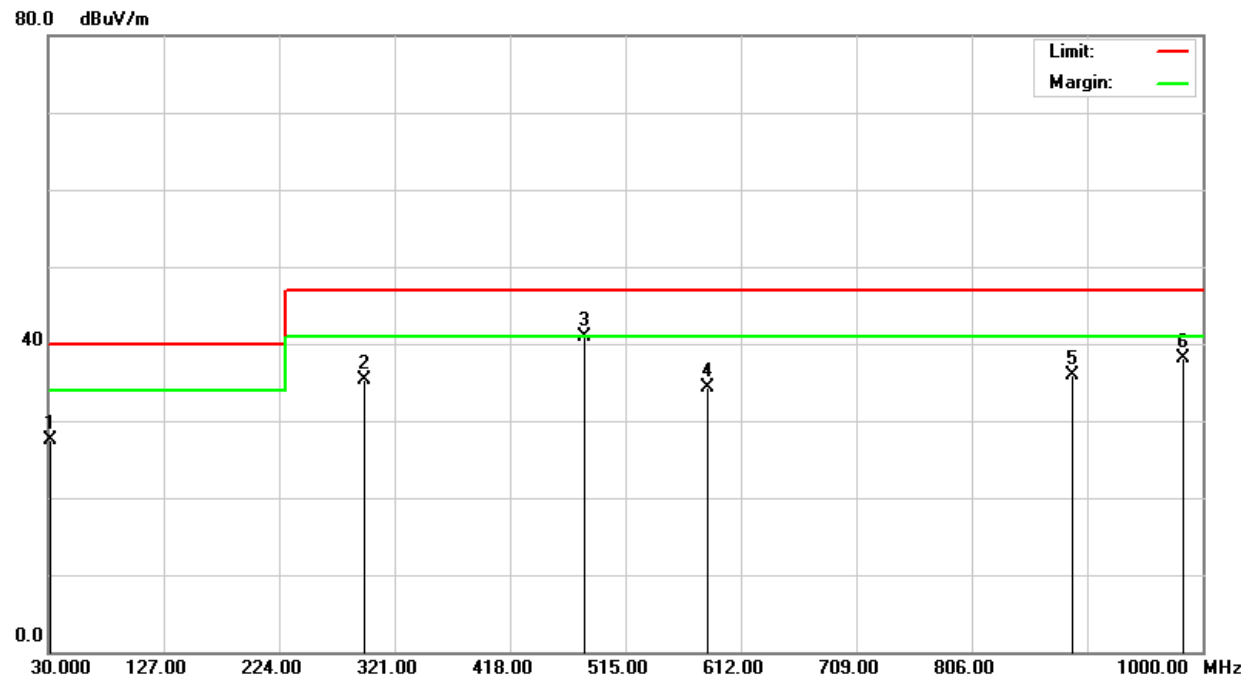


Radiated Emission Readings									
Frequency Range Investigated					30 MHz to 1000 MHz at 10m				
Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Detector (P/Q)	Pol. (H/V)
32.5400	37.50	-2.96	34.54	40.00	-5.46	100	218	Q	V
296.8500	41.20	-5.25	35.95	47.00	-11.05	100	45	Q	V
480.1700	36.50	-0.26	36.24	47.00	-10.76	400	320	Q	V
846.3300	28.60	5.44	34.04	47.00	-12.96	400	69	Q	V
890.5200	32.60	5.50	38.10	47.00	-8.90	400	115	Q	V
960.5100	27.50	6.33	33.83	47.00	-13.17	400	204	Q	V

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



Model No.	ROC286B	Test Mode	Mode 2
Environmental Conditions	23.9°C, 65% RH	6dB Bandwidth	120 kHz
Antenna Pole	Horizontal	Antenna Distance	10m
Detector Function	Quasi-peak.	Tested by	Alex Wang
Standard	EN 55032 CLASS A	Test Date	2025/06/03



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)
32.5099	30.50	-2.94	27.56	40.00	-12.44	400	62	Q	H
296.3500	40.50	-5.27	35.23	47.00	-11.77	400	102	Q	H
480.5700	41.10	-0.25	40.85	47.00	-6.15	100	95	Q	H
583.9200	32.60	1.74	34.34	47.00	-12.66	100	230	Q	H
890.1600	30.40	5.50	35.90	47.00	-11.10	100	321	Q	H
984.2200	31.60	6.49	38.09	47.00	-8.91	100	155	Q	H

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

### Above 1GHz

<b>Model No.</b>	ROC286B	<b>Test Mode</b>	Mode 2
<b>Environmental Conditions</b>	22.5°C, 54% 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>	4000MHz	<b>Upper frequency</b>	6000MHz
<b>Detector Function</b>	Peak and average.	<b>Tested by</b>	Alex Wang
<b>Standard</b>	EN 55032 CLASS A	<b>Test Date</b>	2025/06/03

Radiated Emission Readings							
Frequency Range Investigated				Above 1GHz at 3m			
Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector (P/A)	Pol. (H/V)
1055.000	61.09	-10.49	50.60	80.00	-29.40	P	V
1245.000	62.52	-9.39	53.13	80.00	-26.87	P	V
2015.000	55.13	-6.69	48.44	80.00	-31.56	P	V
2995.000	54.55	-6.03	48.52	80.00	-31.48	P	V
5400.000	55.81	-3.99	51.82	80.00	-28.18	P	V
5995.000	54.35	-2.87	51.48	80.00	-28.52	P	V

Radiated Emission Readings							
Frequency Range Investigated				Above 1GHz at 3m			
Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector (P/A)	Pol. (H/V)
1240.000	59.62	-9.44	50.18	80.00	-29.82	P	H
1375.000	58.38	-8.72	49.66	80.00	-30.34	P	H
1970.000	55.76	-6.46	49.30	80.00	-30.70	P	H
2545.000	56.42	-6.24	50.18	80.00	-29.82	P	H
2995.000	54.04	-6.03	48.01	80.00	-31.99	P	H
5400.000	56.50	-3.99	52.51	80.00	-27.49	P	H

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



### 3. Harmonics

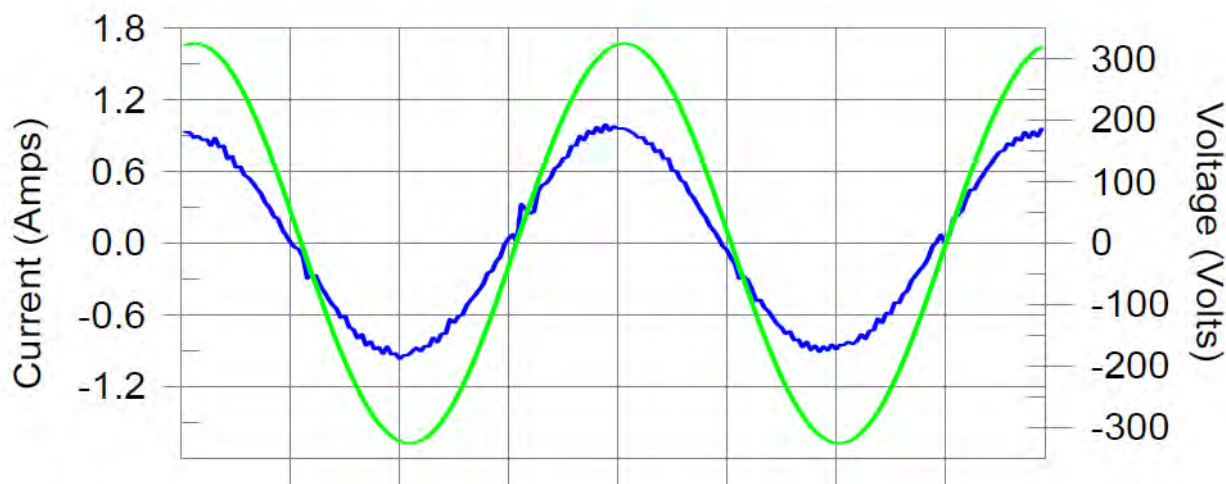
#### 3.1 Test Instruments

Immunity A					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
5kVA Power Source	Teseq	5001IX-208-SCH	1207A03643	12/17/2024	12/16/2025
Signal Conditioning Unit	Teseq	CCN 1000-1	1846A01831	12/17/2024	12/16/2025
Test Software	WIN2100V4 Ver. 4.22				
Testing Site : No.163-1, Jhongsheng Rd., Xindian Dist., New Taipei City, Taiwan					

### 3.2 Measurement Data

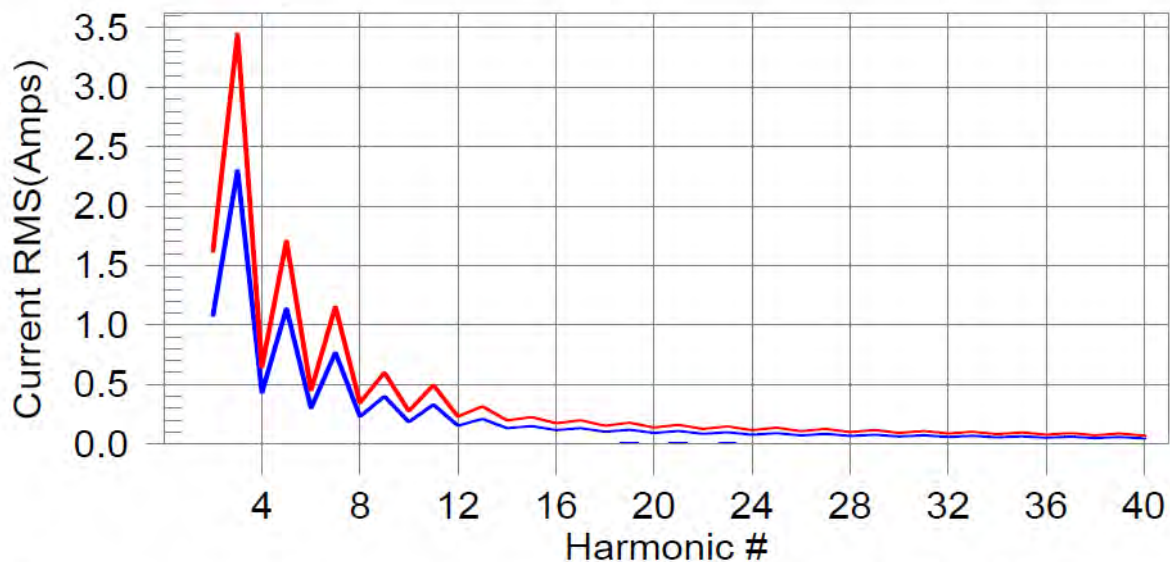
Test Result: Pass      Source qualification: Normal

#### Current & voltage waveforms



#### Harmonics and Class A limit line

#### European Limits



Test result: Pass      Worst harmonics H23-4.8% of 150% limit, H23-6.6% of 100% limit



Test Result: Pass Source qualification: Normal

THC(A): 0.021 I-THD(%): 3.3 POHC(A): 0.014 POHC Limit(A): 0.251

Highest parameter values during test:

V\_RMS (Volts): 229.98

I\_Peak (Amps): 1.022

I\_Fund (Amps): 0.623

Power (Watts): 141.8

Frequency(Hz): 50.00

I\_RMS (Amps): 0.661

Crest Factor: 1.813

Power Factor: 0.990

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.004	1.080	N/A	0.006	1.620	N/A	Pass
3	0.003	2.300	N/A	0.005	3.450	N/A	Pass
4	0.002	0.430	N/A	0.003	0.645	N/A	Pass
5	0.005	1.140	N/A	0.006	1.710	N/A	Pass
6	0.002	0.300	N/A	0.002	0.450	N/A	Pass
7	0.003	0.770	N/A	0.003	1.155	N/A	Pass
8	0.002	0.230	N/A	0.002	0.345	N/A	Pass
9	0.002	0.400	N/A	0.003	0.600	N/A	Pass
10	0.001	0.184	N/A	0.002	0.276	N/A	Pass
11	0.003	0.330	N/A	0.004	0.495	N/A	Pass
12	0.001	0.153	N/A	0.002	0.230	N/A	Pass
13	0.004	0.210	N/A	0.005	0.315	N/A	Pass
14	0.001	0.131	N/A	0.002	0.197	N/A	Pass
15	0.006	0.150	3.7	0.006	0.225	2.7	Pass
16	0.001	0.115	N/A	0.002	0.173	N/A	Pass
17	0.006	0.132	4.3	0.006	0.198	3.3	Pass
18	0.001	0.102	N/A	0.002	0.153	N/A	Pass
19	0.007	0.118	6.0	0.007	0.178	4.2	Pass
20	0.001	0.092	N/A	0.001	0.138	N/A	Pass
21	0.006	0.107	6.0	0.007	0.161	4.2	Pass
22	0.001	0.084	N/A	0.001	0.125	N/A	Pass
23	0.006	0.098	6.6	0.007	0.147	4.8	Pass
24	0.001	0.077	N/A	0.001	0.115	N/A	Pass
25	0.006	0.090	6.2	0.006	0.135	4.4	Pass
26	0.001	0.071	N/A	0.001	0.107	N/A	Pass
27	0.004	0.083	N/A	0.006	0.125	N/A	Pass
28	0.002	0.066	N/A	0.002	0.099	N/A	Pass
29	0.003	0.078	N/A	0.005	0.116	N/A	Pass
30	0.002	0.061	N/A	0.002	0.092	N/A	Pass
31	0.003	0.073	N/A	0.004	0.109	N/A	Pass
32	0.002	0.058	N/A	0.002	0.086	N/A	Pass
33	0.003	0.068	N/A	0.004	0.102	N/A	Pass
34	0.001	0.054	N/A	0.001	0.081	N/A	Pass
35	0.003	0.064	N/A	0.003	0.096	N/A	Pass
36	0.001	0.051	N/A	0.001	0.077	N/A	Pass
37	0.003	0.061	N/A	0.003	0.091	N/A	Pass
38	0.001	0.048	N/A	0.001	0.073	N/A	Pass
39	0.003	0.058	N/A	0.004	0.087	N/A	Pass
40	0.001	0.046	N/A	0.001	0.069	N/A	Pass



Test Result: Pass      Source qualification: Normal

Highest parameter values during test:

Voltage (Vrms):	229.98	Frequency(Hz):	50.00
I_Peak (Amps):	1.022	I_RMS (Amps):	0.661
I_Fund (Amps):	0.623	Crest Factor:	1.813
Power (Watts):	141.8	Power Factor:	0.990

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.036	0.460	7.84	OK
3	0.471	2.070	22.74	OK
4	0.025	0.460	5.51	OK
5	0.059	0.920	6.40	OK
6	0.033	0.460	7.12	OK
7	0.026	0.690	3.78	OK
8	0.005	0.460	1.02	OK
9	0.028	0.460	6.12	OK
10	0.009	0.460	1.90	OK
11	0.018	0.230	7.89	OK
12	0.016	0.230	7.02	OK
13	0.012	0.230	5.16	OK
14	0.004	0.230	1.67	OK
15	0.013	0.230	5.66	OK
16	0.008	0.230	3.64	OK
17	0.010	0.230	4.49	OK
18	0.018	0.230	7.64	OK
19	0.008	0.230	3.30	OK
20	0.013	0.230	5.46	OK
21	0.006	0.230	2.40	OK
22	0.004	0.230	1.89	OK
23	0.008	0.230	3.37	OK
24	0.002	0.230	1.08	OK
25	0.006	0.230	2.49	OK
26	0.004	0.230	1.61	OK
27	0.002	0.230	1.07	OK
28	0.003	0.230	1.35	OK
29	0.004	0.230	1.70	OK
30	0.004	0.230	1.65	OK
31	0.005	0.230	2.26	OK
32	0.002	0.230	1.04	OK
33	0.004	0.230	1.70	OK
34	0.002	0.230	0.90	OK
35	0.006	0.230	2.50	OK
36	0.002	0.230	0.96	OK
37	0.003	0.230	1.30	OK
38	0.002	0.230	0.81	OK
39	0.008	0.230	3.48	OK
40	0.006	0.230	2.77	OK





# 4.Flicker

## 4.1 Test Instruments

Immunity A					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
5kVA Power Source	Teseq	5001IX-208-SCH	1207A03643	12/17/2024	12/16/2025
Signal Conditioning Unit	Teseq	CCN 1000-1	1846A01831	12/17/2024	12/16/2025
Test Software	WIN2100V4 Ver. 4.22				
Testing Site : No.163-1, Jhongsheng Rd., Xindian Dist., New Taipei City, Taiwan					



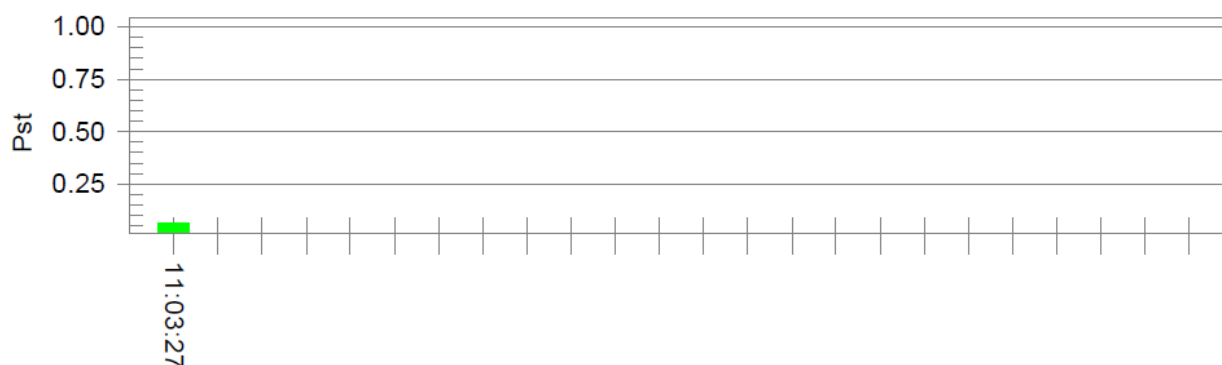
## 4.2 Measurement Data

Test Result: Pass

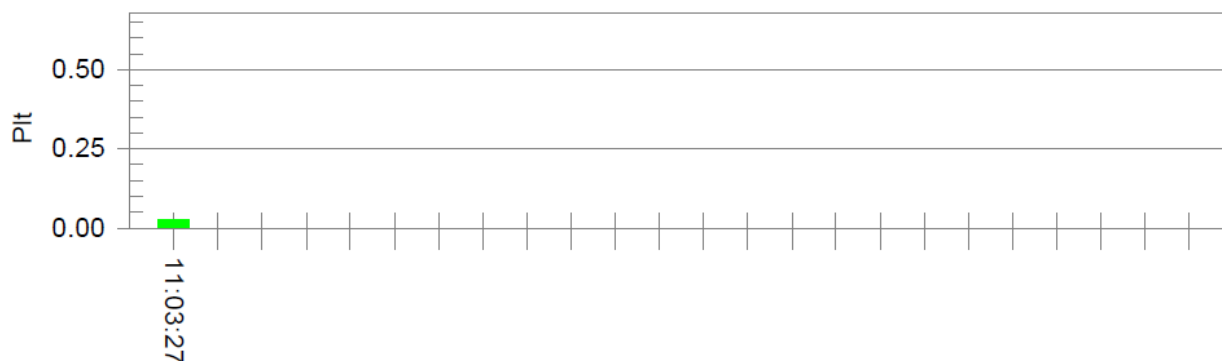
Status: Test Completed

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): 229.76

Highest dt (%):

T-max (mS): 0

Highest dc (%): 0.00

Highest dmax (%): 0.00

Highest Pst (10 min. period): 0.064

Highest Plt (2 hr. period): 0.028

Test limit (%):

Test limit (mS): 500.0 Pass

Test limit (%): 3.30 Pass

Test limit (%): 4.00 Pass

Test limit: 1.000 Pass

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 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	07/23/2024	07/22/2025
ESD Simulator	Teseq	NSG 438	1581	07/03/2024	07/02/2025
Thermo-Hygro Meter	NDR.AV	GM-108A	SD-S071	12/24/2024	12/23/2025
Testing Site : No.163-1, Jhongsheng Rd., Xindian Dist., New Taipei City, Taiwan					

#### 5.3.2 EUT Operating Condition

Environment:

Temperature	Humidity	Air Pressure
18.7 °C	47 %RH	1004 hpa



### 5.3.3 Results of Electrostatic Discharge Test (ESD)

Model No.	: ROC286B
Tested By	: Barry Chen
Tested Date	: June 3, 2025
Test Mode	: Mode 2
Basic Standard	: IEC 61000-4-2
Discharge Impedance	: 330 ohm / 150 pF
Discharge Voltage	: Air Discharge: $\pm 2, 4, 8$ kV Contact Discharge: $\pm 2, 4$ kV HCP/VCP: $\pm 2, 4$ kV
Polarity	: Positive/Negative
Number of Discharge	: 10 times at each test point
Discharge Mode	: Single Discharge
Discharge Period	: 1 second

### A.Observations:

**Test points:** 1. Front side. 2. Back side. 3. Left side. 4. Right side.  
5. Top side. 6. Bottom side.

Direct Application			Test Results	
Discharge Level (kV)	Polarity (+/-)	Test Point	Contact Discharge	Air Discharge
2, 4, 8 (Air.)	+/-	1	N/A	No discharge point
2, 4, 8 (Air.)	+/-	2	N/A	A
2, 4 (Cont.)	+/-	2	B	N/A
2, 4 (Cont.)	+/-	1, 3~5	A	N/A

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

B: The transmitting was interrupted during test. It could become normal after test stop.

N/A: Not Applicable.

### B.Observations:

**Test points:** 1. Front side. 2. Back side. 3. Left side. 4. Right side.

Indirect Application			Test Results	
Discharge Level (kV)	Polarity (+/-)	Test Point	Horizontal Coupling	Vertical Coupling
2, 4	+/-	1~4	A	A

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

## ESD Test point

### Front



### Back



Air Discharge: 

Contact Discharge: 

Left

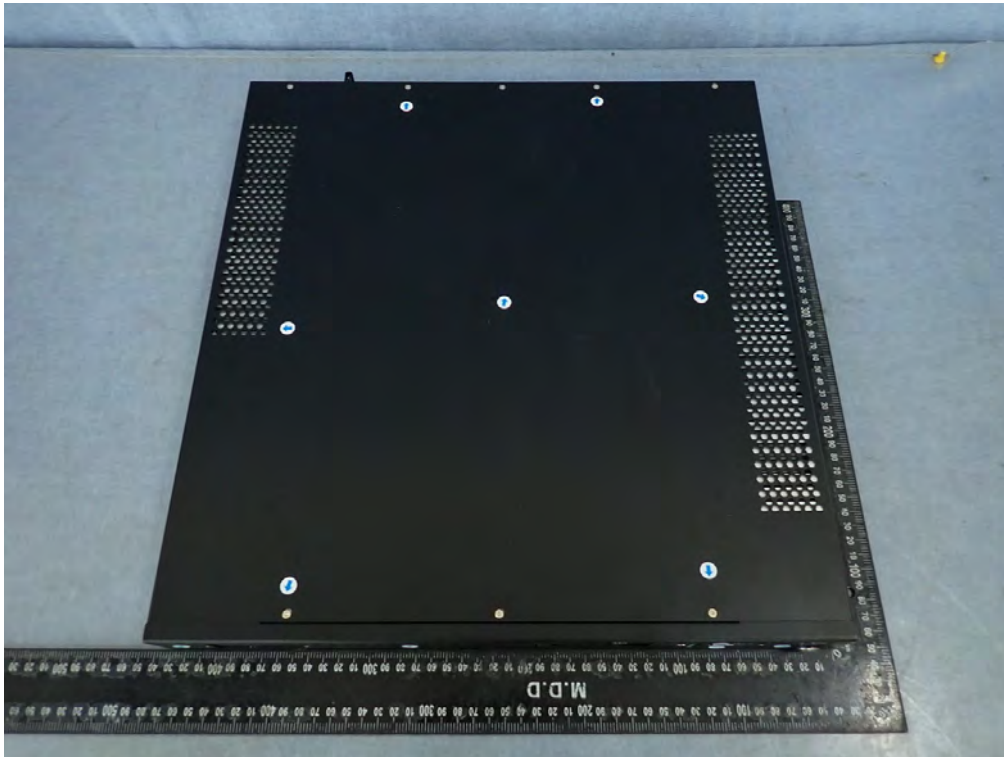


Right



Air Discharge:   
Contact Discharge: 

## Top



Air Discharge:   
Contact Discharge: 

## 5.4 Test of IEC 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	02/28/2025	02/27/2026
Field of Calibration	CCS	Chamber#RS	80-1000MHz	02/14/2025	02/13/2026
RF Power Meter	Boonton	4242	17419	01/21/2025	01/20/2026
Power Sensor	Boonton	51011A-EMC	36833	01/21/2025	01/20/2026
Power Sensor	Boonton	51011A-EMC	36834	01/21/2025	01/20/2026
Thermo-Hygro Meter	Wisewind	201A	SD-S019	09/10/2024	09/09/2025
Broadband Antenna	AR	AT1080	311819	N.C.R	N.C.R
Power Amplifier	Teseq	CBA1G-600D	1098099	N.C.R	N.C.R
Analog Signal Generator	Agilent	E8257D	MY48051214	05/23/2025	05/22/2026
Field of Calibration	C CS	Chamber#RS	1000-6000MHz	02/13/2025	02/12/2026
Microwave Antenna	Schwarzbeck	STLP 9149	767	N.C.R	N.C.R
Power Amplifier	Teseq	CBA6G-100D	1087370	N.C.R	N.C.R
Sound Level Calibrator	B&K	4231	3010869	07/17/2024	07/16/2025
Audio Bandpass Amp.	CCSRF	ABT-F	007	04/10/2025	04/09/2026
Test Software	EmcwareVer. 3.2 / CISPR 35 ABT Test (V-093)				
Testing Site : No.163-1, Jhongsheng Rd., Xindian Dist., New Taipei City, Taiwan					

### 5.4.2 EUT Operating Condition

Environment:

Temperature	Humidity	Air Pressure
22.3 °C	53 %RH	1006 hpa



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

Model No. : ROC286B  
 Tested By : Barry Chen  
 Tested Date : June 3, 2025  
 Test Mode : Mode 2  
 Basic Standard : IEC 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 the preceding frequency  
 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. : ROC286B  
 Tested By : Barry Chen  
 Tested Date : June 3, 2025  
 Test Mode : Mode 2 (Audio out)  
 Basic Standard : IEC 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 the preceding frequency  
 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 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	02/11/2025	02/10/2026
EMC Test System	EMC-Partner	IMU-MGE	109937-1545	02/11/2025	02/10/2026
DIP	EMC-Partner	VAR-EXT1000	103470-1724	02/11/2025	02/10/2026
Test Software	TEMA3000 v4.7.3				
Testing Site : No.163-1, Jhongsheng Rd., Xindian Dist., New Taipei City, Taiwan					

### 5.5.2 EUT Operating Condition

Environment:

Temperature	Humidity	Air Pressure
24.1 °C	51 %RH	1006 hpa

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

Model No. : ROC286B  
 Tested By : Barry Chen  
 Tested Date : June 3, 2025  
 Test Mode : Mode 2  
 Basic Standard : IEC 61000-4-4  
 Test Voltage : AC Input:  $\pm 1$  kV  
 Signal/Comm. :  $\pm 0.5$  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

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



## 5.6 Test of IEC 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	11/19/2024	11/18/2025
EMC Test System	EMC-Partner	IMU-MGE	109937-1545	02/11/2025	02/10/2026
DIP	EMC-Partner	VAR-EXT1000	103470-1724	02/11/2025	02/10/2026
Test Software	TEMA3000 v4.7.3				
Testing Site : No.163-1, Jhongsheng Rd., Xindian Dist., New Taipei City, Taiwan					

### 5.6.2 EUT Operating Condition

Environment:

Temperature	Humidity	Air Pressure
24.1 °C	51 %RH	1006 hpa

### 5.6.3 Results of Surge Test

Model No. : ROC286B  
Tested By : Barry Chen  
Tested Date : June 3, 2025  
Test Mode : Mode 2  
Basic Standard : IEC 61000-4-5  
Test Rate : 1 pulse every minute  
No. of Tests : 5 positive and 5 negative pulses  
Waveform : 1.2/50μs (8/20μs)

#### 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 : 10/700μs (5/320μs)

#### Observation Description

Signal line:

Test Point	Phase Angle (degree)	Polarity (+/-)	Test Level (kV)	Observation
RJ45	No phase angle (degree)	+/-	1	B

**Remark:** B: The transmitting was interrupted during test. It could become normal after test stop.



## 5.7 Test of IEC 61000-4-6

### 5.7.1 Test Instruments

CS Room					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
Attenuator	EMCI	SA3NL	10006F	N.C.R	N.C.R
CDN	Teseq	CDN M016	35820	11/14/2024	11/13/2025
CDN	SCHAFFNER	CDN M325	17457	11/14/2024	11/13/2025
CDN	Teseq	CDN T8-10	40378	07/15/2024	07/14/2025
Compact Immunity Test System	Teseq	NSG 4070B-35	39581	09/19/2024	09/18/2025
Sound Level Calibrator	B&K	4231	3010869	07/17/2024	07/16/2025
Power Module	G.R.A.S.	12AK	35913	N/A	N/A
Bandpass Filter	CCSRF	35-01	SD-S018	N/A	N/A
RF Counter	Agilent	53210A	MY50000797	03/30/2025	03/29/2026
Audio measurement system	CCSRF	ABT-CB0	006	06/11/2024	06/10/2025
Test Software	NSG 4070 Control Program Version: V1.2.0 / CISPR 35 ABT Test (V-090)				
Testing Site : No.163-1, Jhongsheng Rd., Xindian Dist., New Taipei City, Taiwan					

### 5.7.2 EUT Operating Condition

Environment:

Temperature	Humidity	Air Pressure
23.5 °C	53 %RH	1006 hpa

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

Model No. : ROC286B  
 Tested By : Barry Chen  
 Tested Date : June 3, 2025  
 Test Mode : Mode 2  
 Basic Standard : IEC 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 the preceding frequency  
 Dwell Time : 3 seconds  
 Coupling Method : CDN-M3; CDN-T8

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

#### Signal Ports

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

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

Model No. : ROC286B  
 Tested By : Barry Chen  
 Tested Date : June 3, 2025  
 Test Mode : Mode 2 (Audio out)  
 Basic Standard : IEC 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 the preceding frequency  
 Dwell Time : 3 seconds  
 Coupling Method : CDN-M3; CDN-T8

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

#### Signal Ports

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

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

## 5.8 Test of IEC 61000-4-8

### 5.8.1 Test Instruments

Immunity Shield Room					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
Testing Site : No.163-1, Jhongsheng Rd., Xindian Dist., New Taipei City, Taiwan					

### 5.8.2 EUT Operating Condition

Environment:

Temperature	Humidity	Air Pressure
N/A	N/A	N/A

### 5.8.3 Result of Immunity to Power Frequency Magnetic Field

Model No. : N/A  
 Tested By : N/A  
 Tested Date : N/A  
 Test Mode : N/A  
 Basic Standard : IEC 61000-4-8  
 Power Frequency : 50 Hz  
 Magnetic Field : 1 A/m(r.m.s)  
 Coil Orientation : X, Y, Z Axis  
 Observation : N/A

**Remark:** N/A: There is no any sensitive part for magnetic field test. Applicable only to equipment containing susceptible to magnetic field.

## 5.9 Test of IEC 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	03/04/2025	03/03/2026
EMC Test System	EMC-Partner	IMU-MGE	109937-1545	02/11/2025	02/10/2026
DIP	EMC-Partner	VAR-EXT1000	103470-1724	02/11/2025	02/10/2026
Test Software	TEMA3000 v4.7.3				
Testing Site : No.163-1, Jhongsheng Rd., Xindian Dist., New Taipei City, Taiwan					

### 5.9.2 EUT Operating Condition

Environment:

Temperature	Humidity	Air Pressure
24.1 °C	51 %RH	1006 hpa

### 5.9.3 Results of Voltage Dips Immunity Test

Model No. : ROC286B  
Tested By : Barry Chen  
Tested Date : June 3, 2025  
Test Mode : Mode 2  
Basic Standard : IEC 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	30	25	A
	>95	0.5	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.

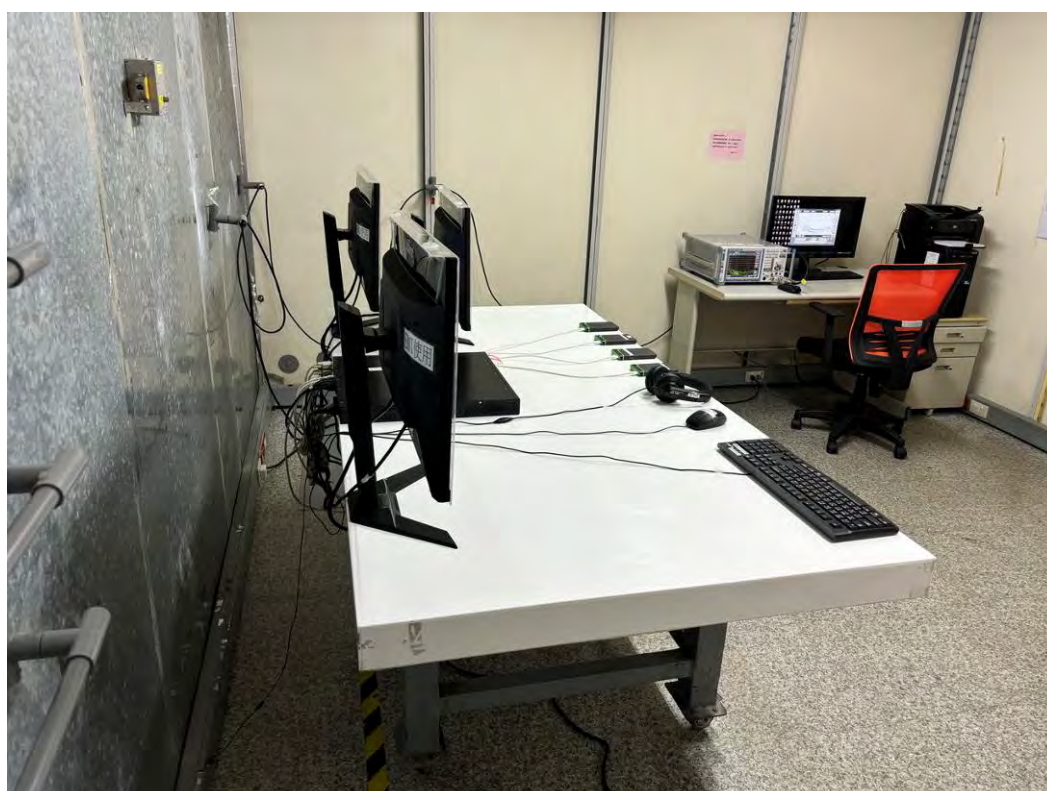
C: EUT shut down, it could not become normal except reinstalled by operator.



## APPENDIX

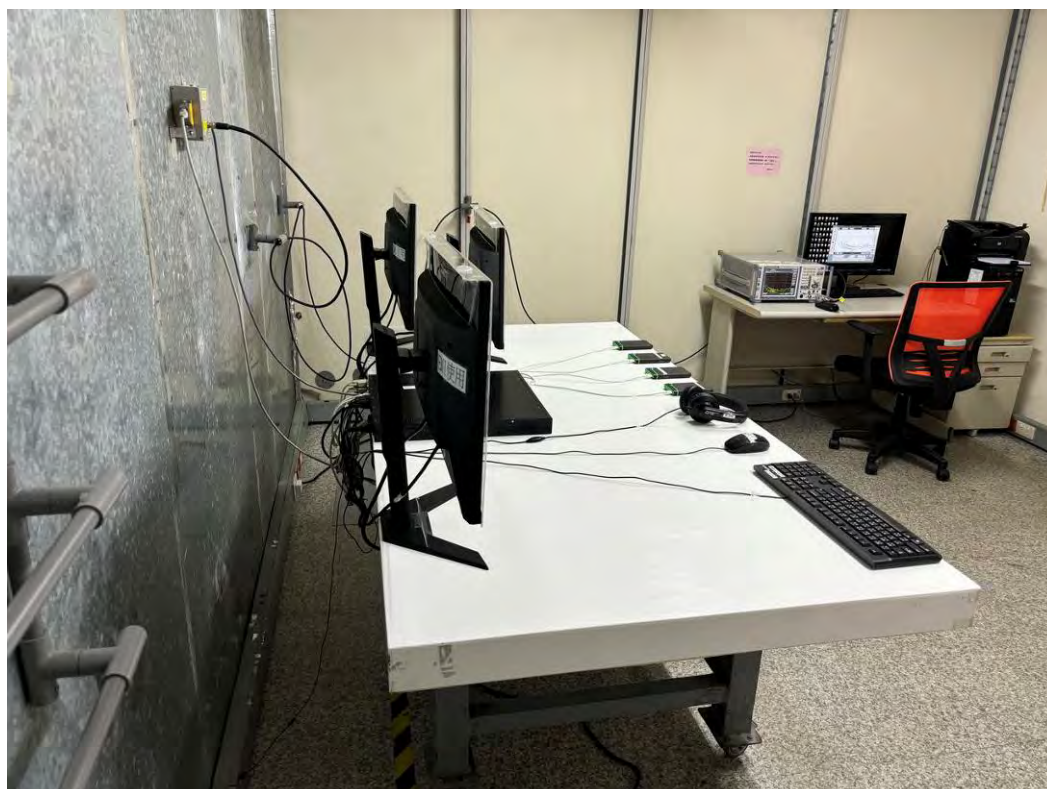
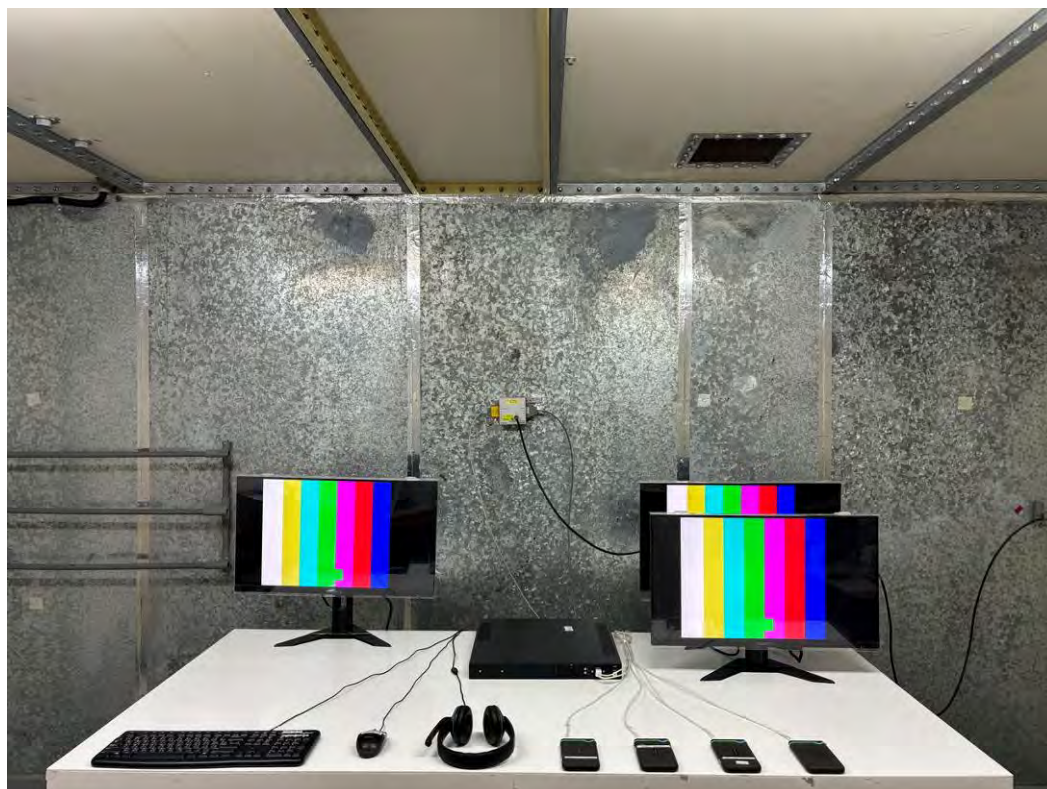
### Photograph of Testing General Set-up

#### CE Testing Set-up





## ISN Testing Set-up



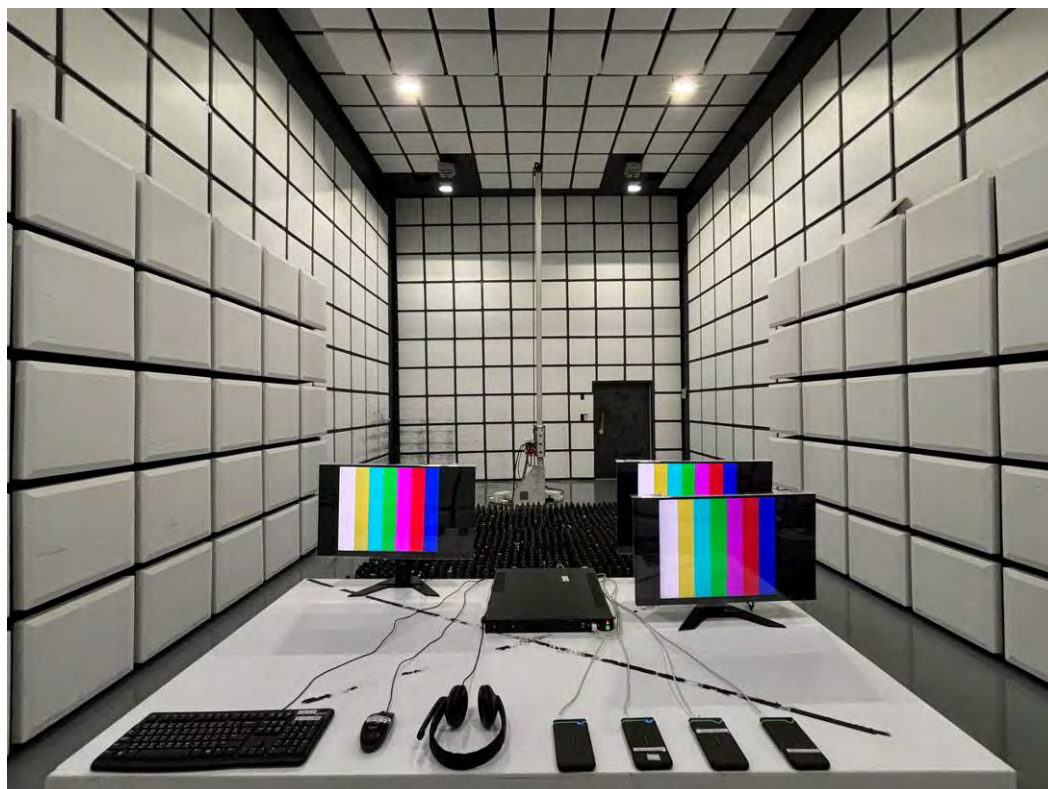


## RE Testing Set-up Below 1GHz





# Above 1GHz



## HARMONIC & FLICKER Testing Set-up



## ESD Testing Set-up

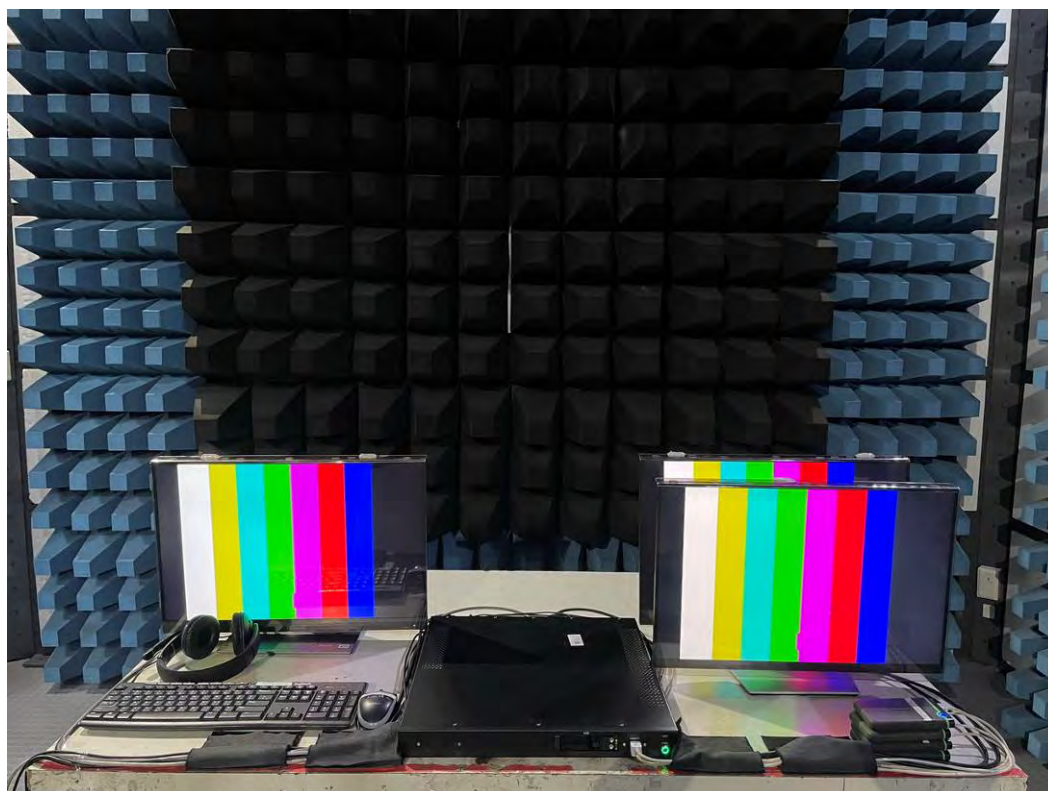




## RS Testing Set-up



## RS Testing Set-up (Audio out)



### EFT Testing Set-up



### EFT For RJ45 Testing Set-up





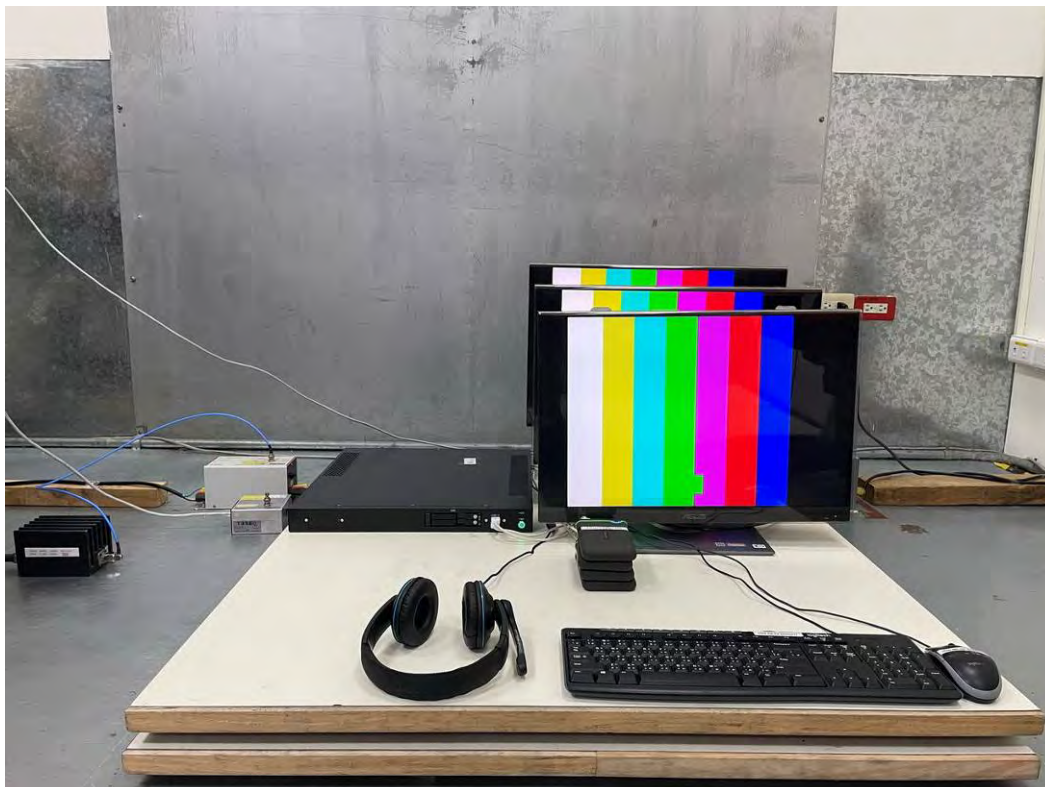
### Surge Testing Set-up



### Surge For RJ45 Testing Set-up



### CS Testing Set-up



### CS For RJ45 Testing Set-up





### CS Testing Set-up (Audio out)



### CS For RJ45 Testing Set-up (Audio out)



### DIP Testing Set-up



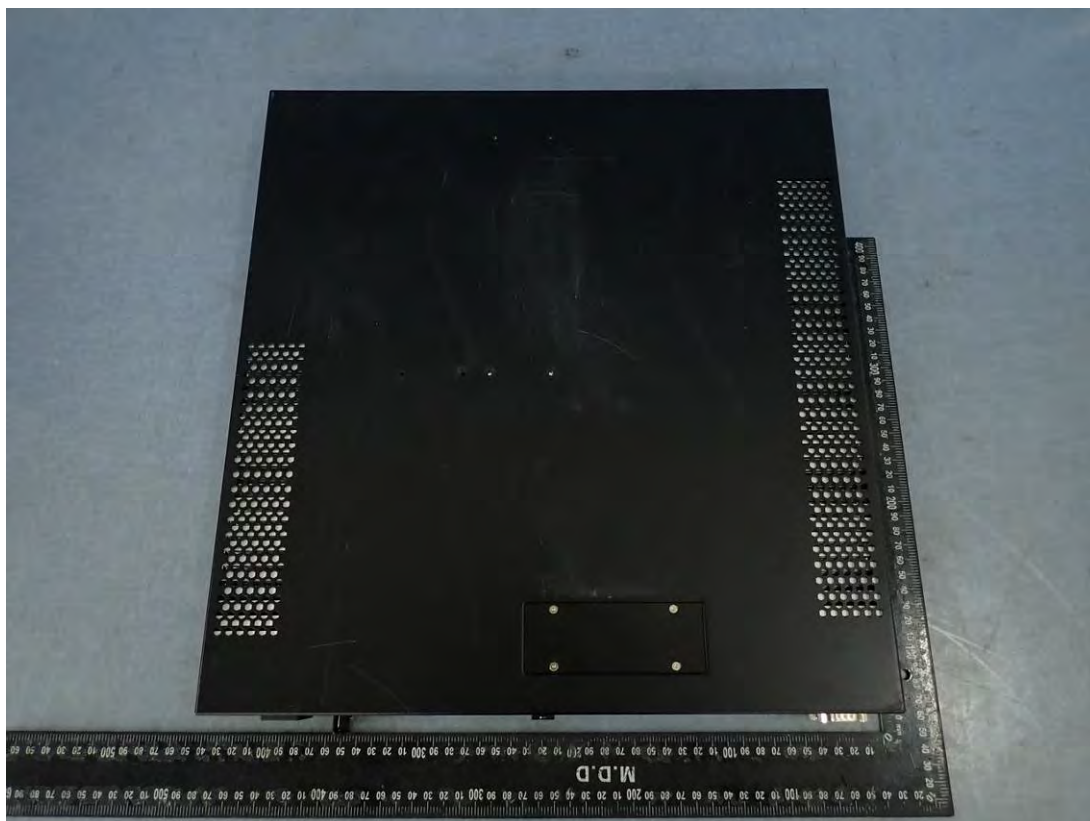
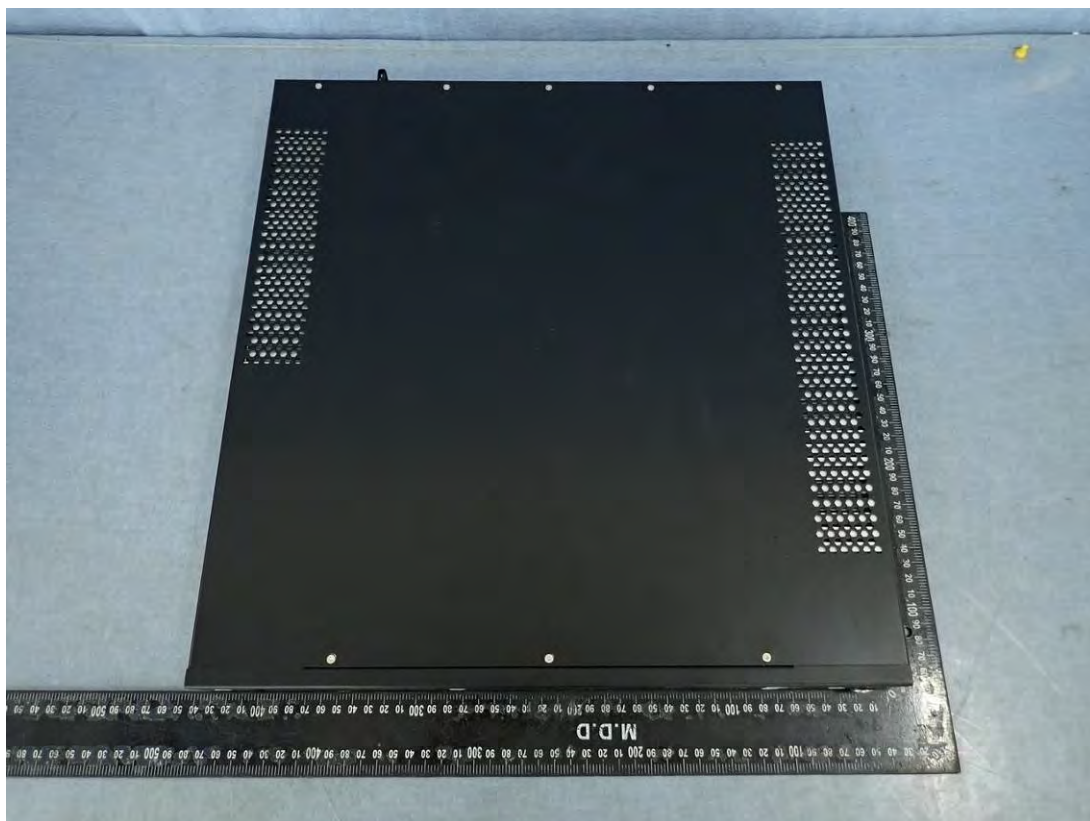


## Photographs of EUT Unit Exterior









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