TEST REPORT

SABS	South African Bureau of Standards Dr. Lategan Street, Groenkloof, 0001 Pretoria, South Africa info@sabs.co.za I www.sabs.co.za	Report No.: 001261 Page (1) / (85) Pages	BTL / TAF Testing Laboratory 0659

1	Test Report No		001261			
2	Applicant	▪ Name	iSERT(Pty) Ltd.			
		▪ Street Address	129 Khai-Apple street, Montana, pretoria			
		▪ Postal Address	129 Khai-Apple street, Montana, pretoria			
		▪ Date of Receipt	May 07, 2019			
		▪ Contact Person	Johan Deysel			
		▪ Telephone No	012 548 0940	▪ Fax No	N/A	
3	Manufacturer	▪ Name	GlobTek,Inc./GlobTek (Suzhou) Co., Ltd			
		▪ Address	186 Veterans Dr. Northvale, NJ 07647 USA/Building 4, No. 76 JinLing East Road, Suzhou Industrial Park, Suzhou, JiangSu, 215021, China			
		▪ Telephone No	(0086) 0512 62790301-189	▪ Fax No	(0086) 0512 62790355	
4	Use of Report		For SABS COC application.			
5	Kind of Product		ITE Power Supply			
6	Model Name		GT-46180-1812			
7	Variant Model		GT-46180-1824/GT-46180-1809/GT-46180-1605			
8	Serial Number		647364116/19, 647365116/19, 647366116/19, 647367116/19			
9	Sample Receipt Date		May 07, 2019			
10	Issuance Date		Jun. 11, 2019			
11	Test Period		May 08, 2019 ~ May 14, 2019 Jun. 03, 2019 ~ Jun. 06, 2019			
12	Test Standard(method) used		**SANS 2332:2017 Class B** **SANS 61000-3-2:2009** **SANS 61000-3-3:2009** **SANS 2335:2018**			
13	Test Results		**Pass**			

The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
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Conformation	Reviewed by Pike Lee EMC Test Engineer	Approved by Andy Chiu Authorized Signatory

REPORT REVISION HISTORY

Date	Revision	Page No
Jun. 11, 2019	This is a supplementary report to the original test report (1905H004_SABS_001261). The difference compared with original report is added EMS test data, the rest are kept the same.	All

TABLE OF CONTENTS

1.0 General Product Description

1.0.1 Product Specification

No.	ITEM	APPLICATION
1	Test Sample	ITE Power Supply
2	Model	GT-46180-1812
3	Variant Model/Type No.	GT-46180-1824/GT-46180-1809/GT-46180-1605
4	Test Sample Serial Number	647364116/19, 647365116/19, 647366116/19, 647367116/19
5	Dimensions (W x L x H)	Gift Box Size to 90.5*83*58 mm change Master Carton Size to 520*370*205 mm
6	Maximum Clock Frequency	85.5 MHz
7	Test Sample	Engineering Sample No.: SH19050734/SH19050734-1/SH19050734-2/SH19050734-3

1.0.2 Electrical Ratings

Input: 100-240V~, 50-60Hz, 0.6 A

Output: 5V⎓3.2A 16W / 9V⎓2A 18W / 12V⎓1.5A 18W / 24V⎓0.75A 18W

1.0.3 Test Voltage & Frequency

Unless indicated otherwise on the individual data sheet or test results, the test voltage and frequency was as indicated below.

Power supply voltage

- ■ 230V/50 Hz / 1ϕ
- ☐ 400V/50 Hz 3PE
- ☐ 12V DC
- ☐ 220V/50 Hz / 1ϕ
- ☐ 115V/60Hz / 1ϕ
- ☐ 400V/50 Hz 3NPE
- ☐ 24V DC

1.1 Model Differences

Not applicable

1.2 Device Modifications

Not applicable

1.3 Difference Table between Basic Model and Variant Models

Only differ in model name.

1.4 EUT Configuration(s)

See Appendix A for individual test set-up configuration(s). The following peripheral devices and/or interface cables were connected during the measurement:

☒ Peripheral Devices

Device	Model No.	Serial No.	Manufacturer
Load	N/A	N/A	N/A

☒ Cable Description

No.	From		To		Type of Cable		
	Device	I/O Port	Device	I/O Port	Length (m)	Shielded or Unshielded	Ferrite Core [Y/N]
1	Adapter	AC IN	AC mains	N/A	1.8M	U	N
2	Load	DC	Adapter	DC	1.5M	U	N

* Shielded or Unshielded: Unshielded=U, Shielded=S

1.5 Test Software

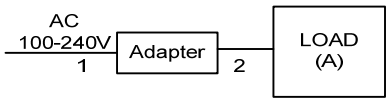
EZ-EMC(Ver. NB-03A1-01)

1.6 EUT Operating Mode(s)

Equipment under test was operated during the measurement under the following conditions:

Operating Mode	Function	Test Item
1	FULL LOAD	Article 3.1, 3.2, 3.3, 3.4, 3.5, 3.7, 3.8, 3.9, 3.10, 3.11, 3.12, 3.13

1.7 Configuration



Ground plane

Remote System

■ Ferrite core

1.8 Calibration Details of Equipment Used for Measurement

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less. All test equipment calibrations are traceable, therefore, all test data recorded in this report is traceable.

1.9 Test Facility

The measurement facility is BTL Inc.

The sites are constructed in conformance with the requirements of **CISPR 16-1-4**.

1.10 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Registration Number	Logo
Taiwan	Taiwan Accreditation Forum (TAF)	**CISPR 32, CISPR 35, IEC 61000-3-2, IEC 61000-3-3, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11**	0659	ilac-MRA TAF Testing Laboratory 0659

1.11 Measurement Uncertainty

The reported uncertainty of measurement **y ± U**, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of **k=2**, providing a level of confidence of approximately 95%.
The measurement instrumentation uncertainty considerations contained in **CISPR 16-4-2**.
The BTL measurement uncertainty is less than the **CISPR 16-4-2** U_{CISPR} requirement.

1.11.1 Radiated disturbance (Up to 1 GHz)

Test Site	Method	Measurement Frequency Range	Ant. H / V	U,(dB)
CB08 (10m)	**CISPR**	30MHz ~ 200MHz	V	3.48
		30MHz ~ 200MHz	H	3.08
		200MHz ~ 1,000MHz	V	3.94
		200MHz ~ 1,000MHz	H	3.46

1.11.2 Radiated disturbance (Above 1 GHz)

Test Site	Method	Measurement Frequency Range	Ant. H / V	U,(dB)
CB08 (3m)	**CISPR**	1 ~ 6 GHz	V	4.40
		1 ~ 6 GHz	H	3.88
		6 ~18 GHz	V	4.70
		6 ~18 GHz	H	4.08

1.11.3 Conducted emissions AC mains power port

Test Site	Method	Measurement Frequency Range	U,(dB)
C05	**CISPR**	150 kHz ~ 30MHz	2.68

1.11.4 Harmonic current emissions and Voltage changes, voltage fluctuations and flicker

Test Site	Method	Test Item	U(%)
SR09	**IEC 61000-3-2** **IEC 61000-3-3**	Voltage	0.10
		Current	0.15

1.11.5 Immunity

Test Site	Method	Test Item		U
SR02	**IEC 61000-4-2**	Rise time		9.346 %
		Peak Current		2.5 %
		Current at 30ns		4.876 %
		Current at 60ns		4.876 %
CB17	**IEC 61000-4-3**	Calibration process	80MHz ~ 1GHz	1.363 dB
			1GHz ~ 6GHz	1.479 dB
		Level setting	80MHz ~ 1GHz	2.727 dB
			1GHz ~ 6GHz	2.958 dB
SR01	**IEC 61000-4-4**	Voltage Rise Time		10.00 %
		Voltage peak value		7.60 %
		Voltage pulse width		6.00 %
SR01	**IEC 61000-4-5**	Voltage front Time		7.20 %
		Voltage peak value		5.60 %
		Voltage duration		0.60 %
SR09	**IEC 61000-4-6**	CDN level setting process		1.18 dB
		CDN test process		1.24 dB
		EM Clamp level setting process		1.18 dB
		EM Clamp test process		3.16 dB
SR01	**IEC 61000-4-8**	PFMF mG Calibration		2.76 %
SR01	**IEC 61000-4-11**	Voltage Dips voltage fall time		2.0 %
		Voltage Dips Function Check		1.7 %

Note: Unless specifically mentioned, the uncertainty of measurement has not been taken into account to declare the compliance or non-compliance to the specification.
Our calculated Measurement Instrumentation Uncertainty is shown in the tables above. These are our U_{lab} values in **CISPR 16-4-2** terminology.
Since Table 1 of **CISPR 16-4-2** has values of measurement instrumentation uncertainty, called U_{CISPR}, as follows:

Conducted Disturbance (mains port) – 150 kHz – 30 MHz: 3.6 dB
Radiated Disturbance (electric field strength on an open area test site or alternative test site) – 30 MHz – 1000 MHz: 5.2 dB

It can be seen that our U_{lab} values are smaller than U_{CISPR}.

2.0 EMC Test Regulations/Standards

The tests were performed according to following regulations:

EMC – SANS 2332:2017
EMC – SANS 61000-3-2:2009
EMC – SANS 61000-3-3:2009
EMC – SANS 2335:2018

2.1 Emission and Immunity Test Regulations/Standards

Information technology equipment — Radio disturbance characteristics — Limits and methods of measurement

Electromagnetic compatibility (EMC)

Part 3-2: Limits — Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)

Electromagnetic compatibility (EMC)

Part 3-3: Limits — Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤16 A per phase and not subject to conditional connection

Information technology equipment — Immunity characteristics — Limits and methods of measurement

2.2 Purpose of Test

To determine whether the equipment under test fulfils the EMC emission and immunity requirements of the standards.

2.3 Name and Address of the Laboratory

Name: BTL Inc.
Address: No.18, Ln. 171, Sec. 2, Jiuzong Rd., Neihu Dist., Taipei City 114, Taiwan (R.O.C.)

2.4 Summary of Test Results

Applied standard	Title		Applied	Test Result
SANS 2332:2017	Radiated emissions up to 1 GHz		YES	**Pass**
	Radiated emissions above 1 GHz		YES	**Pass** **NOTE (2)**
	Radiated emissions from FM receivers		NO	**N/A** **NOTE (1)**
	Conducted emissions AC mains power port		YES	**Pass**
	Asymmetric mode conducted emissions	AAN	NO	**N/A** **NOTE (1)**
		Current Probe	NO	**N/A** **NOTE (1)**
		CVP	NO	**N/A** **NOTE (1)**
	Conducted differential voltage emissions		NO	**N/A** **NOTE (1)**

NOTE: (1) "N/A" denotes test is not applicable in this Test Report.
(2) The EUT's max operating frequency exceeds 108 MHz, so the test will be performed.
(3)

Cable Type	Number of pairs	Measurement type	Procedures
Balanced Unscreened	1 (2 wire) ;2 (4 wire); 3 (6 wire) ;4 (8 wire)	Voltage	AAN
Balanced Unscreened	See a)	Voltage and Current	CP+CVP
Screened or Coaxial	n/a	Voltage	AAN
Screened or Coaxial	n/a	Voltage or Current	CP or CVP
Unbalanced cables	n/a	Voltage and Current	CP+CVP

Ports connected to cables with more than 4 balanced pairs or where the port is unable to function correctly when connected through an AAN.

Applied standard	Title	Applied	Test Result
SANS 61000-3-2:2009	Harmonic current emissions	YES	**Pass** **NOTE (2)**
SANS 61000-3-3:2009	Voltage changes, voltage fluctuations and flicker	YES	**Pass**

NOTE: (1) "N/A" denotes test is not applicable in this Test Report.
(2) For equipment with a rated power of 75 W or less, limits are not specified.

Applied standard	Title	Applied	Test Result
SANS 2335:2018	Electrostatic discharge immunity	YES	**Pass**
	Radiated, radio-frequency, electromagnetic field immunity	YES	**Pass**
	Electrical fast transient/burst immunity	YES	**Pass**
	Surge immunity	YES	**Pass**
	Immunity to conducted disturbances, induced by radio-frequency fields	YES	**Pass**
	Power frequency magnetic field immunity	YES	**Pass**
	Voltage dips, short interruptions and voltage variations immunity	YES	**Pass**

NOTE: (1) ”N/A” denotes test is not applicable in this Test Report.
(2) RS Acoudtic: The Front, Rear, Left and Right were evaluated. For audio output port the worst placement direction is Front, for loudspeaker the worst placement direction is Rear and recorded in this report.

3.0 Results of Individual Test

3.1 Radiated Disturbance (Up to 1 GHz)

3.1.1 Test Date

2019/05/10

3.1.2 Test Location

CB08: No. 68-1, Ln. 169, Sec. 2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)

3.1.3 Limits for radiated disturbance

Table 1 – Requirements for radiated emissions at frequencies up to 1 GHz for Class A equipment.

Table clause	Frequency range MHz	Measurement			Class A limits dB(μV/m)
		Facility (see Table A.1)	Distance m	Detector type / bandwidth	
A2.1	30 to 230	OATS/SAC	10	Quasi Peak / 120 kHz	40
	230 to 1 000				47
A2.2	30 to 230	OATS/SAC	3		50
	230 to 1 000				57
A2.3	30 to 230	FAR	10	Quasi Peak / 120 kHz	42 to 35
	230 to 1 000				42
A2.4	30 to 230	FAR	3		52 to 45
	230 to 1 000				52
Apply only A2.1 or A2.2 or A2.3 or A2.4 across the entire frequency range.					

Table 2 – Requirements for radiated emissions at frequencies up to 1 GHz for Class B equipment.

Table clause	Frequency range MHz	Measurement			Class B limits dB(μV/m)
		Facility (see Table A.1)	Distance m	Detector type / bandwidth	
A4.1	30 to 230	OATS/SAC	10	Quasi Peak / 120 kHz	30
	230 to 1 000				37
A4.2	30 to 230	OATS/SAC	3		40
	230 to 1 000				47
A4.3	30 to 230	FAR	10	Quasi Peak / 120 kHz	32 to 25
	230 to 1 000				32
A4.4	30 to 230	FAR	3		42 to 35
	230 to 1 000				42
Apply only table clause A4.1 or A4.2 or A4.3 or A4.4 across the entire frequency range. These requirements are not applicable to the local oscillator and harmonics frequencies of equipment covered by Table A.6.					

The test result calculated as following:
Measurement Value = Reading Level + Correct Factor
Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain(if use)
Margin Level = Measurement Value - Limit Value

3.1.4 Test Procedure

The radiated emissions test will then be repeated on the open site or chamber to measure the amplitudes accurately and without the multiple reflections existing in the shielded room. The EUT and support equipment are set up on the turntable of 10 meter semi anechoic chamber. Desktop EUT are set up on a wooden stand 0.8 meter above the ground or floor-standing arrangement shall be placed on the horizontal ground reference plane. The test volume for a height of up to 30 cm may be obstructed by absorber placed on the ground plane.

Cables connecting to AE located outside the measurement area drop directly to, but be insulated from, the RGP (or turntable where applicable), and then be routed directly to the place where they leave the test site. The thickness of the insulation is not more than 150 mm. However, cables which would normally be bonded to ground should be bonded to the RGP in accordance with normal practice or the manufacturer's recommendation.

For the initial measurements, the receiving antenna is varied from 1-4 meter height and is changed in the vertical plane from vertical to horizontal polarization at each frequency. The highest emissions between 30 MHz to 1000 MHz were analyzed in details by operating the spectrum analyzer and/or EMI receiver in quasi-peak mode to determine the precise amplitude of the emissions.

At the highest amplitudes observed, the EUT is rotated in the horizontal plane while changing the antenna polarization in the vertical plane to maximize the reading. The interconnecting cables were arranged and moved to get the maximum measurement. Once the maximum reading is obtained, the antenna elevation and polarization will be varied between specified limits to maximize the readings.
All of the interface cables were manipulated according to CISPR 32 requirements.

3.1.5 Test Equipment

Name of Equipment	Model No.	Manufacturer	Serial No.	Due Date	Applied
Log-Bicon Antenna	VULB 9168	Schwarzbeck	9168-641	Feb. 11, 2020	YES
Attenuator	EMCI-N-6-05	Inmet	AT-N0507	Feb. 11, 2020	YES
Pre-Amplifier	EMC 9135	EMCI	980282	Oct. 19, 2019	YES
Test Cable	EMC8D-NM-NM-5000	EMCI	150105	Feb. 11, 2020	YES
Test Cable	EMCCFD400-NM-NM-15000	EMCI	180301	Feb. 11, 2020	YES
Test Cable	EMC104-SM-SM-600	EMCI	150333	Feb. 11, 2020	YES
Test Cable	EMC104-SM-SM-800	EMCI	150332	Feb. 11, 2020	YES
EMI Receiver	EMC104-SM-SM-800	EMCI	150332	Mar. 13, 2020	YES
Log-Bicon Antenna	VULB 9168	Schwarzbeck	9168-673	Mar. 14, 2020	YES
Attenuator	EMCI-N-6-06	Inmet	AT-N0615	Mar. 14, 2020	YES
Pre-Amplifier	EMC 9135	EMCI	980281	Oct. 19, 2019	YES
Test Cable	EMC8D-NM-NM-5000	EMCI	150106	Feb. 11, 2020	YES
Test Cable	EMCCFD400-NM-NM-20000	EMCI	180529	Feb. 11, 2020	YES
Test Cable	EMC104-SM-SM-1000	EMCI	150330	Feb. 11, 2020	YES
Test Cable	EMC104-SM-SM-1000	EMCI	150331	Feb. 11, 2020	YES
EXA Spectrum Analyzer	N9010A	Keysight	MY54200483	Oct. 11, 2019	YES
Measurement Software	EZ_EMC (Ver. NB-03A1-01)	Farad	N/A	N/A	YES

3.1.6 Test Software

EZ-EMC(Ver. NB-03A1-01)

3.1.7 Frequency Range of Measurement

30 MHz to 1 GHz

3.1.8 Instrument Setting

Band Width: 120 kHz.

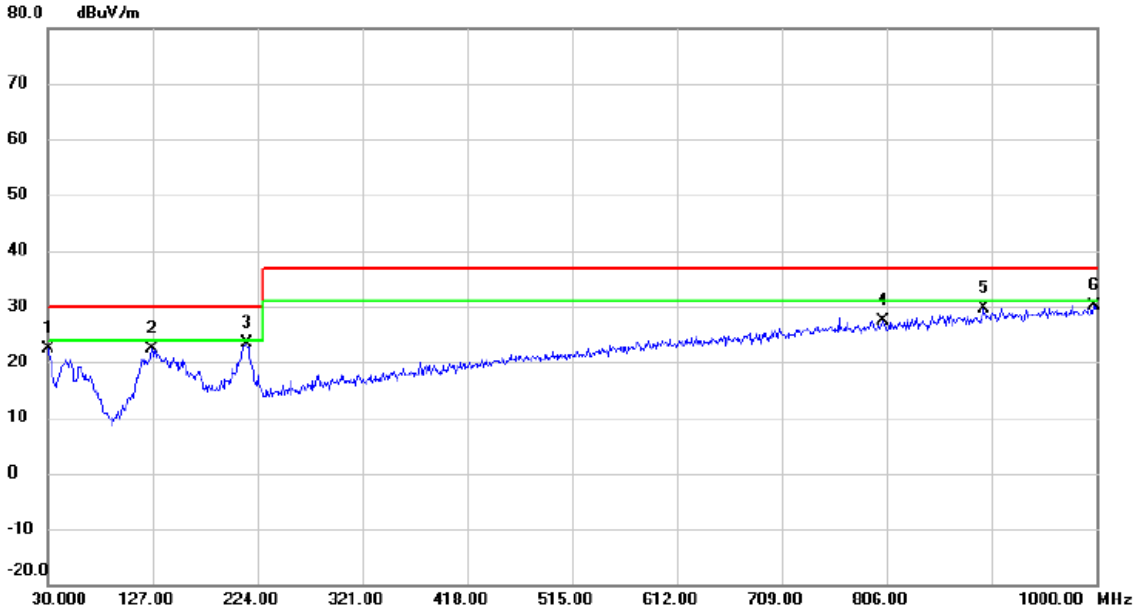
3.1.9 Climate Condition

Temperature: 25°C
Relative Humidity: 60%

■ Operating Mode 1: Vertical

▪ Test Data & Graph

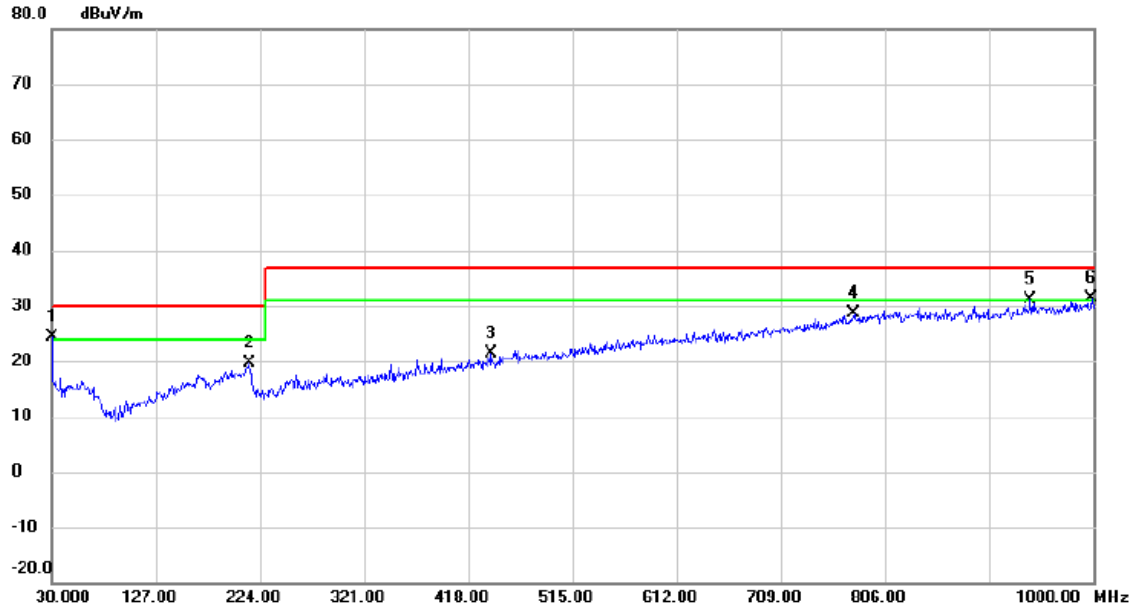
Adapter: GT-46180-1809



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		30.000	39.42	-17.15	22.27	30.00	-7.73	QP	
2		126.030	39.23	-16.91	22.32	30.00	-7.68	QP	
3	*	213.815	40.51	-17.04	23.47	30.00	-6.53	QP	
4		802.605	30.91	-3.62	27.29	37.00	-9.71	QP	
5		895.725	31.94	-2.29	29.65	37.00	-7.35	QP	
6		997.575	30.79	-0.65	30.14	37.00	-6.86	QP	

■ Operating Mode 1: Horizontal

▪ Test Data & Graph

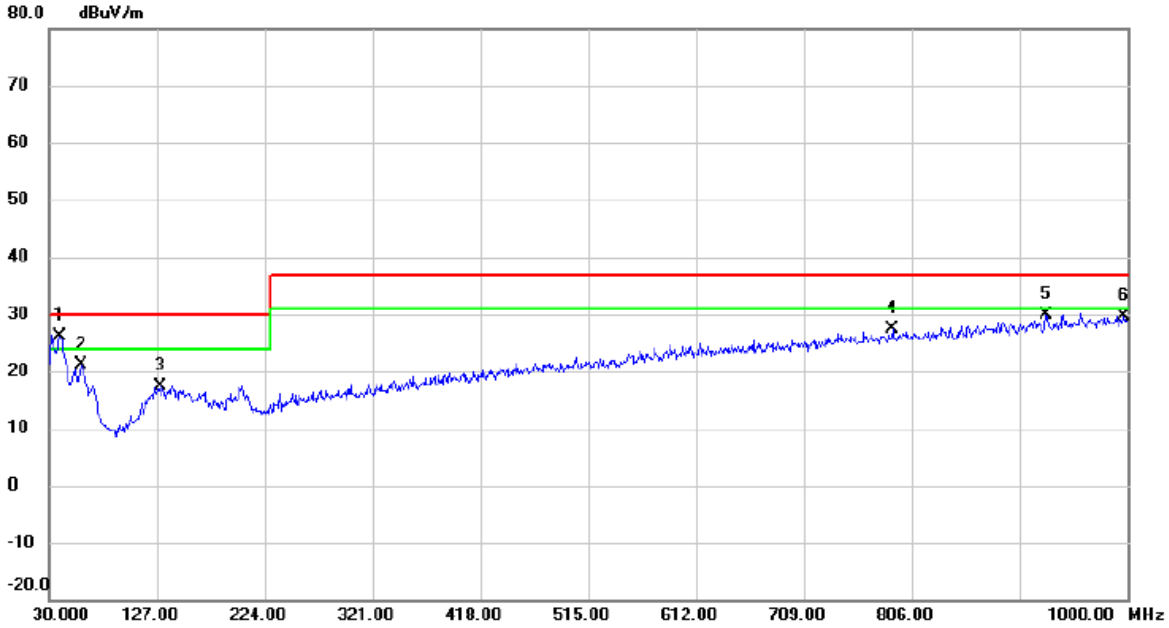


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	30.000	41.24	-16.80	24.44	30.00	-5.56	QP	
2		214.785	37.38	-17.82	19.56	30.00	-10.44	QP	
3		439.825	31.95	-10.62	21.33	37.00	-15.67	QP	
4		777.385	32.31	-3.75	28.56	37.00	-8.44	QP	
5	!	940.830	33.05	-2.04	31.01	37.00	-5.99	QP	
6	!	998.545	32.26	-0.98	31.28	37.00	-5.72	QP	

■ Operating Mode 1: Vertical

▪ Test Data & Graph

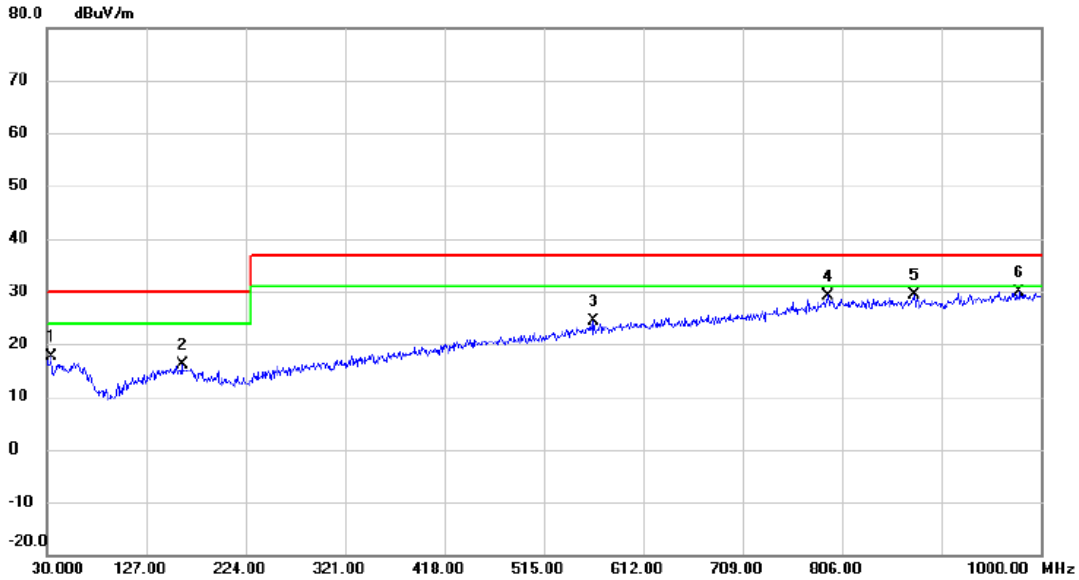
Adapter: GT-46180-1812



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	39.700	42.38	-16.23	26.15	30.00	-3.85	QP	
2		59.100	37.29	-16.14	21.15	30.00	-8.85	QP	
3		129.910	33.88	-16.51	17.37	30.00	-12.63	QP	
4		789.025	31.51	-4.18	27.33	37.00	-9.67	QP	
5		926.765	32.23	-2.34	29.89	37.00	-7.11	QP	
6		996.120	31.00	-1.34	29.66	37.00	-7.34	QP	

■ Operating Mode 1: Horizontal

▪ Test Data & Graph

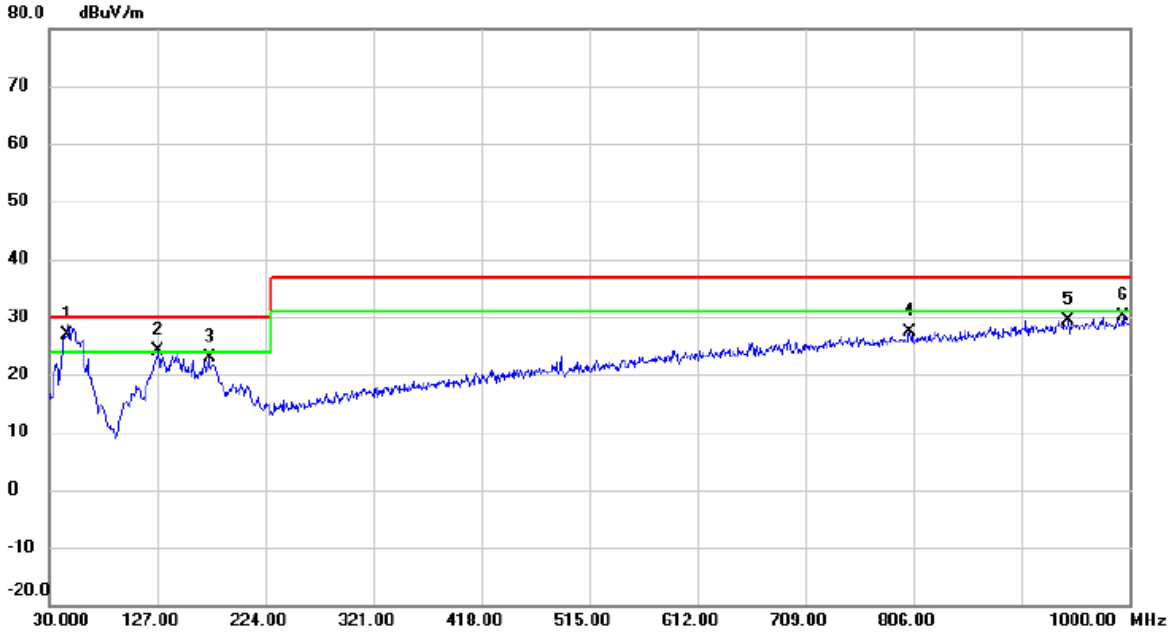


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		34.850	35.26	-17.70	17.56	30.00	-12.44	QP	
2		162.405	31.78	-15.66	16.12	30.00	-13.88	QP	
3		563.500	32.57	-8.12	24.45	37.00	-12.55	QP	
4		791.935	33.05	-3.80	29.25	37.00	-7.75	QP	
5		876.325	33.01	-3.54	29.47	37.00	-7.53	QP	
6	*	979.145	31.93	-2.08	29.85	37.00	-7.15	QP	

■ Operating Mode 1: Vertical

▪ Test Data & Graph

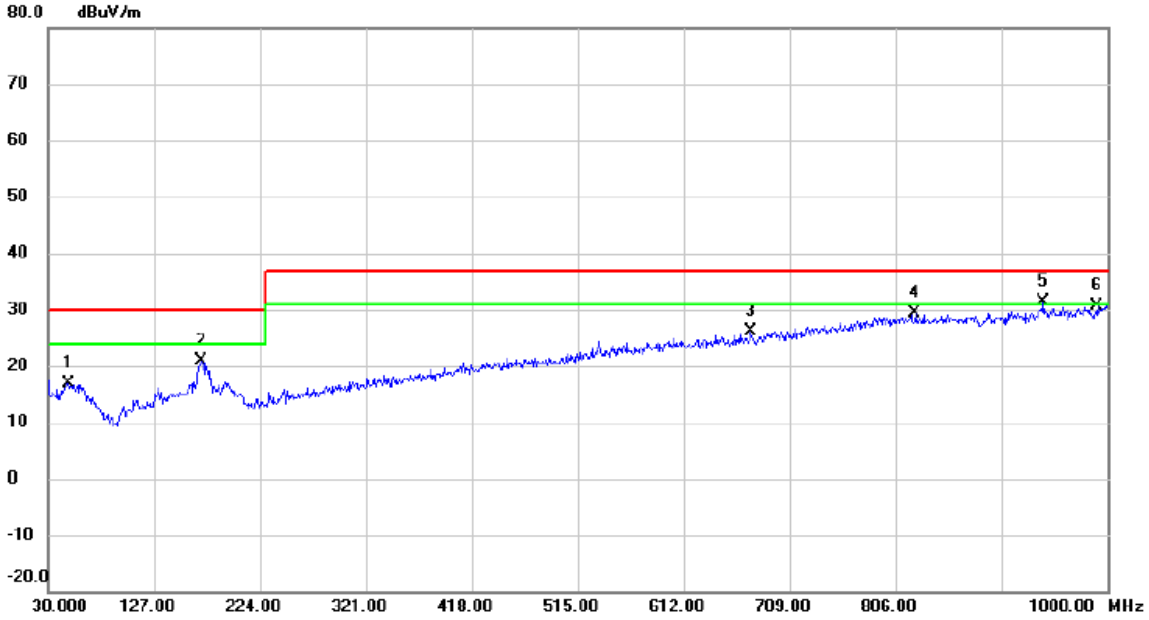
Adapter: GT-46180-1824



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	46.490	42.60	-15.72	26.88	30.00	-3.12	QP	
2	!	127.970	40.94	-16.74	24.20	30.00	-5.80	QP	
3		173.560	38.17	-15.32	22.85	30.00	-7.15	QP	
4		802.120	31.40	-4.04	27.36	37.00	-9.64	QP	
5		944.710	31.34	-1.88	29.46	37.00	-7.54	QP	
6		994.665	31.52	-1.38	30.14	37.00	-6.86	QP	

■ Operating Mode 1: Horizontal

▪ Test Data & Graph

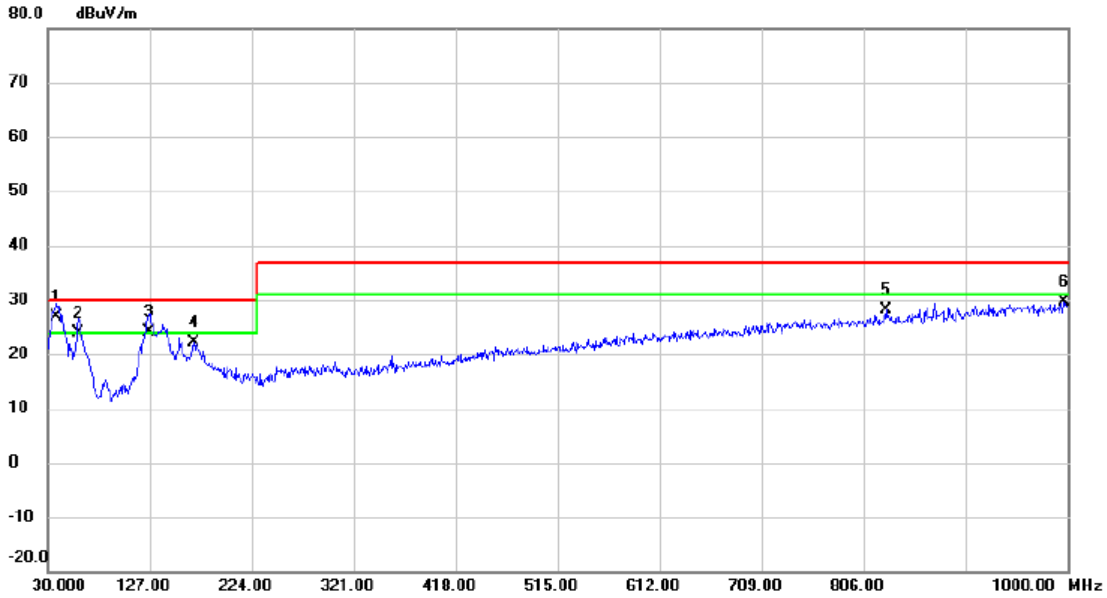


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		48.430	33.26	-16.33	16.93	30.00	-13.07	QP	
2		169.680	36.64	-15.72	20.92	30.00	-9.08	QP	
3		673.595	32.17	-6.12	26.05	37.00	-10.95	QP	
4		823.945	32.49	-3.22	29.27	37.00	-7.73	QP	
5	*	940.830	33.35	-2.04	31.31	37.00	-5.69	QP	
6		990.785	31.98	-1.27	30.71	37.00	-6.29	QP	

■ Operating Mode 1: Vertical

▪ Test Data & Graph

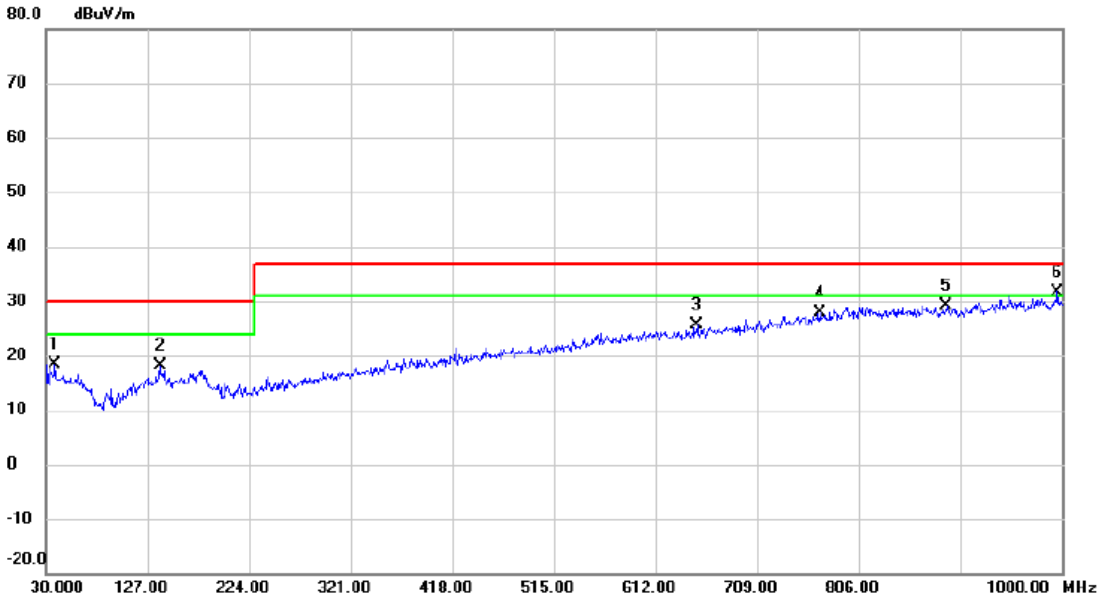
Adapter: GT-46180-1605



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	38.730	43.24	-16.36	26.88	30.00	-3.12	QP	
2		59.585	40.05	-16.17	23.88	30.00	-6.12	QP	
3	!	126.515	41.09	-16.92	24.17	30.00	-5.83	QP	
4		169.195	37.05	-14.94	22.11	30.00	-7.89	QP	
5		827.340	31.82	-3.80	28.02	37.00	-8.98	QP	
6		996.605	31.05	-1.33	29.72	37.00	-7.28	QP	

■ Operating Mode 1: Horizontal

▪ Test Data & Graph



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		38.730	35.90	-17.54	18.36	30.00	-11.64	QP	
2		139.125	34.85	-16.66	18.19	30.00	-11.81	QP	
3		651.770	32.02	-6.50	25.52	37.00	-11.48	QP	
4		769.625	31.74	-3.96	27.78	37.00	-9.22	QP	
5		889.905	32.07	-3.06	29.01	37.00	-7.99	QP	
6	*	995.635	32.84	-1.09	31.75	37.00	-5.25	QP	

3.2 Conducted emissions AC mains power port

3.2.1 Test Date

2019/05/09

3.2.2 Test Location

C05: No. 68-1, Ln. 169, Sec. 2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)

3.2.3 Limits of conducted emissions AC mains power port

Table 5 – Requirements for conducted emissions from the AC mains power ports of Class A equipment.

Applicable to 1. AC mains power ports (3.1.1)				
Table clause	**Frequency range MHz**	**Coupling device (see Table A.8)**	**Detector type / bandwidth**	**Class A limits dB(µV)**
A9.1	0,15 to 0,5	AMN	Quasi Peak / 9 kHz	79
	0,5 to 30			73
A9.2	0,15 to 0,5	AMN	Average / 9 kHz	66
	0,5 to 30			60
Apply A9.1 and A9.2 across the entire frequency range.				

Table 6 – Requirements for conducted emissions from the AC mains power ports of Class B equipment.

Applicable to 1. AC mains power ports (3.1.1)				
Table clause	**Frequency range MHz**	**Coupling device (see Table A.8)**	**Detector type / bandwidth**	**Class B limits dB(µV)**
A10.1	0,15 to 0,5	AMN	Quasi Peak / 9 kHz	66 to 56
	0,5 to 5			56
	5 to 30			60
A10.2	0,15 to 0,5	AMN	Average / 9 kHz	56 to 46
	0,5 to 5			46
	5 to 30			50
Apply A10.1 and A10.2 across the entire frequency range.				

The test result calculated as following:
Measurement Value = Reading Level + Correct Factor
Correct Factor = Insertion Loss + Cable Loss + Attenuator Factor (if use)
Margin Level = Measurement Value – Limit Value

3.2.4 Test Procedure

The EUT was placed on non-conduction table, which is 0.8 meters above an earth-grounded.

Power to the EUT was provided through the LISN which has the Impedance (50ohm/50uH) vs. Frequency Characteristic in accordance with the standard. Power to the LISNs were filtered to eliminate ambient signal interference and these filters were bonded to the ground plane. Peripheral equipment required to provide a functional system (support equipment) for EUT testing was powered from the second LISN through a ganged, metal power outlet box which is bonded to the ground plane at the LISN.

Cables connecting to AE located outside the measurement area drop directly to, but be insulated from, the RGP (or turntable where applicable), and then be routed directly to the place where they leave the test site. The thickness of the insulation is not more than 150 mm. However, cables which would normally be bonded to ground should be bonded to the RGP in accordance with normal practice or the manufacturer's recommendation.

The interconnecting cables were arranged and moved to get the maximum measurement. Both the line of power cord, hot and neutral, were measured. All of the interface cables were manipulated according to CISPR 32 requirements.

The highest emissions were analyzed in details by operating the spectrum analyzer in fixed tuned mode to determine the nature of the emissions and to provide information which could be useful in reducing their amplitude.

3.2.5 Test Equipment

Name of Equipment	Model No.	Manufacturer	Serial No.	Due Date	Applied
TWO-LINE V-NETWORK	ENV216	R&S	101050	Mar. 17, 2020	YES
Test Cable	EMCCFD300-BM-BMR-6000	EMCI	170715	Aug. 07, 2019	YES
EMI Test Receiver	ESR7	R&S	101433	Dec. 04, 2019	YES
Measurement Software	EZ_EMC (Version NB-03A)	Farad	N/A	N/A	YES

3.2.6 Test Software

EZ-EMC(Ver. NB-03A1-01)

3.2.7 Frequency Range of Measurement

150 kHz to 30 MHz

3.2.8 Instrument Setting

Band Width: 9 kHz.

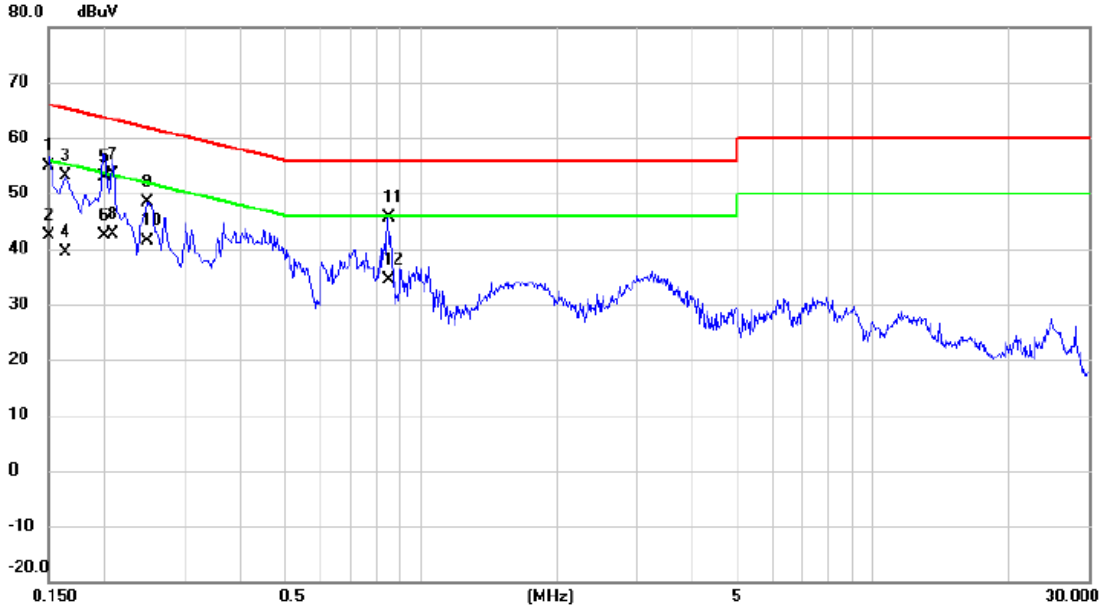
3.2.9 Climate Condition

Temperature: 21°C
Relative Humidity: 50%

■ Operating Mode 1: Line L1

▪ Test Data & Graph

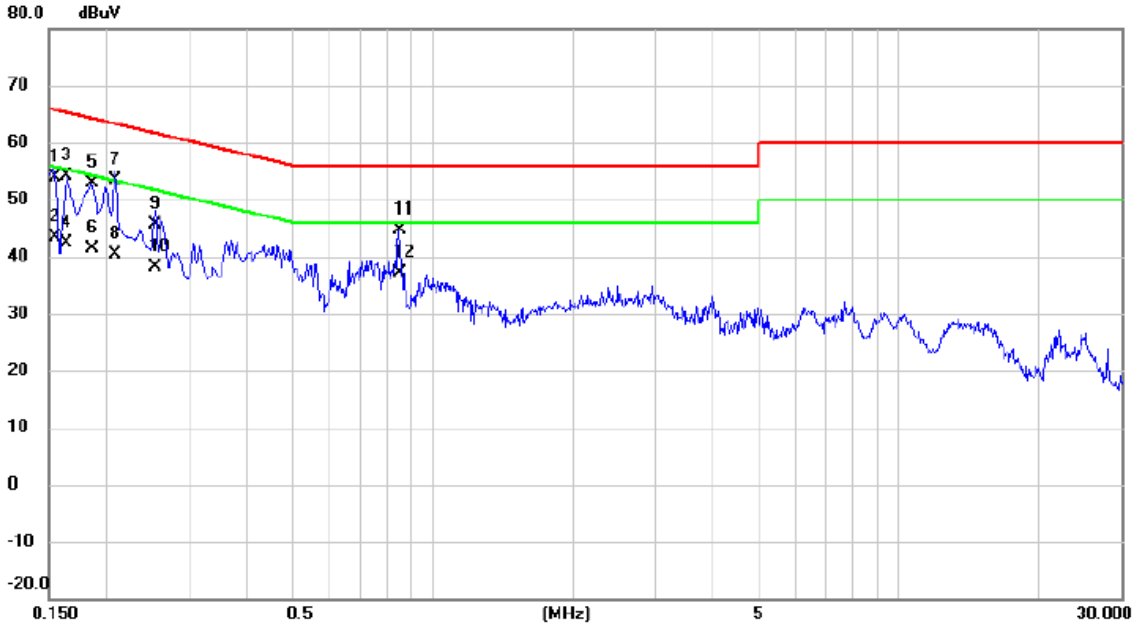
Adapter: GT-46180-1809



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1500	45.37	9.63	55.00	66.00	-11.00	QP	
2		0.1500	32.67	9.63	42.30	56.00	-13.70	AVG	
3		0.1635	43.60	9.63	53.23	65.28	-12.05	QP	
4		0.1635	29.77	9.63	39.40	55.28	-15.88	AVG	
5		0.1995	43.21	9.63	52.84	63.63	-10.79	QP	
6		0.1995	32.67	9.63	42.30	53.63	-11.33	AVG	
7	*	0.2085	43.68	9.63	53.31	63.26	-9.95	QP	
8		0.2085	33.12	9.63	42.75	53.26	-10.51	AVG	
9		0.2490	38.78	9.64	48.42	61.79	-13.37	QP	
10		0.2490	31.68	9.64	41.32	51.79	-10.47	AVG	
11		0.8475	36.03	9.67	45.70	56.00	-10.30	QP	
12		0.8475	24.68	9.67	34.35	46.00	-11.65	AVG	

■ Operating Mode 1: Line N

▪ Test Data & Graph

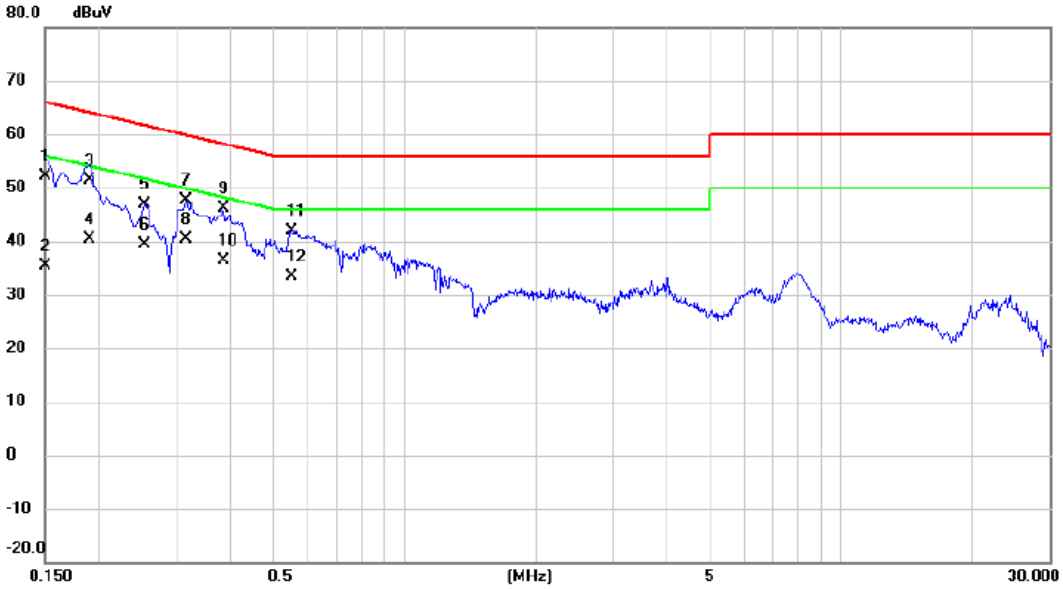


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1545	44.37	9.62	53.99	65.75	-11.76	QP	
2		0.1545	33.73	9.62	43.35	55.75	-12.40	AVG	
3		0.1635	44.60	9.62	54.22	65.28	-11.06	QP	
4		0.1635	32.64	9.62	42.26	55.28	-13.02	AVG	
5		0.1860	43.29	9.61	52.90	64.21	-11.31	QP	
6		0.1860	31.72	9.61	41.33	54.21	-12.88	AVG	
7		0.2085	43.76	9.61	53.37	63.26	-9.89	QP	
8		0.2085	30.68	9.61	40.29	53.26	-12.97	AVG	
9		0.2535	36.12	9.63	45.75	61.64	-15.89	QP	
10		0.2535	28.38	9.63	38.01	51.64	-13.63	AVG	
11		0.8475	34.97	9.66	44.63	56.00	-11.37	QP	
12	*	0.8475	27.40	9.66	37.06	46.00	-8.94	AVG	

Operating Mode 1: Line L1

▪ Test Data & Graph

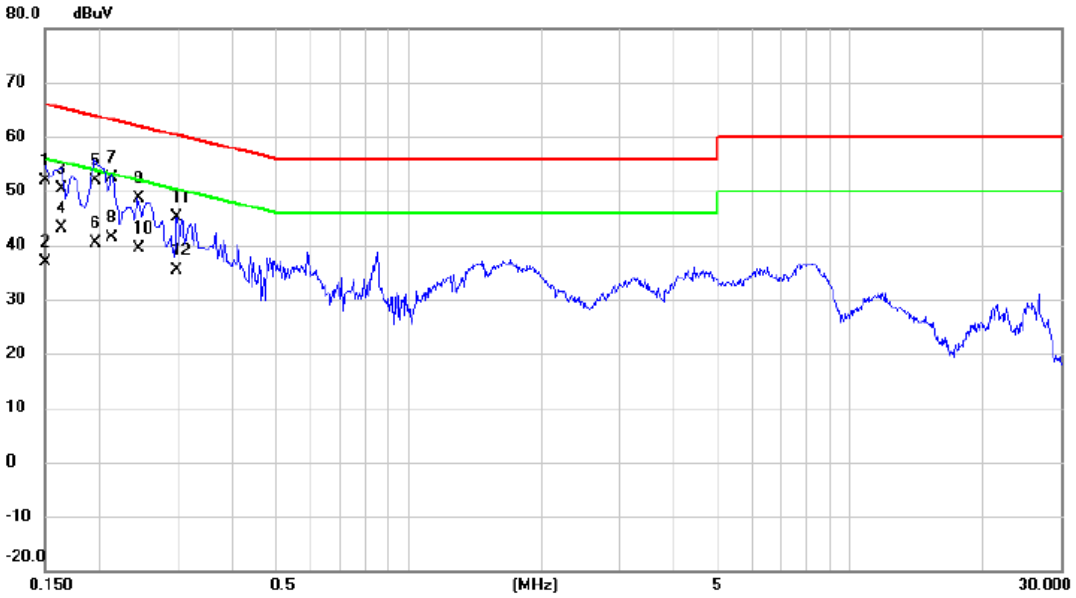
Adapter: GT-46180-1812



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1500	42.38	9.63	52.01	66.00	-13.99	QP	
2		0.1500	25.76	9.63	35.39	56.00	-20.61	AVG	
3		0.1905	41.65	9.63	51.28	64.01	-12.73	QP	
4		0.1905	30.86	9.63	40.49	54.01	-13.52	AVG	
5		0.2535	37.16	9.65	46.81	61.64	-14.83	QP	
6		0.2535	29.72	9.65	39.37	51.64	-12.27	AVG	
7		0.3165	37.99	9.65	47.64	59.80	-12.16	QP	
8	*	0.3165	30.67	9.65	40.32	49.80	-9.48	AVG	
9		0.3840	36.51	9.65	46.16	58.19	-12.03	QP	
10		0.3840	26.83	9.65	36.48	48.19	-11.71	AVG	
11		0.5505	32.21	9.66	41.87	56.00	-14.13	QP	
12		0.5505	23.68	9.66	33.34	46.00	-12.66	AVG	

■ Operating Mode 1: Line N

▪ Test Data & Graph

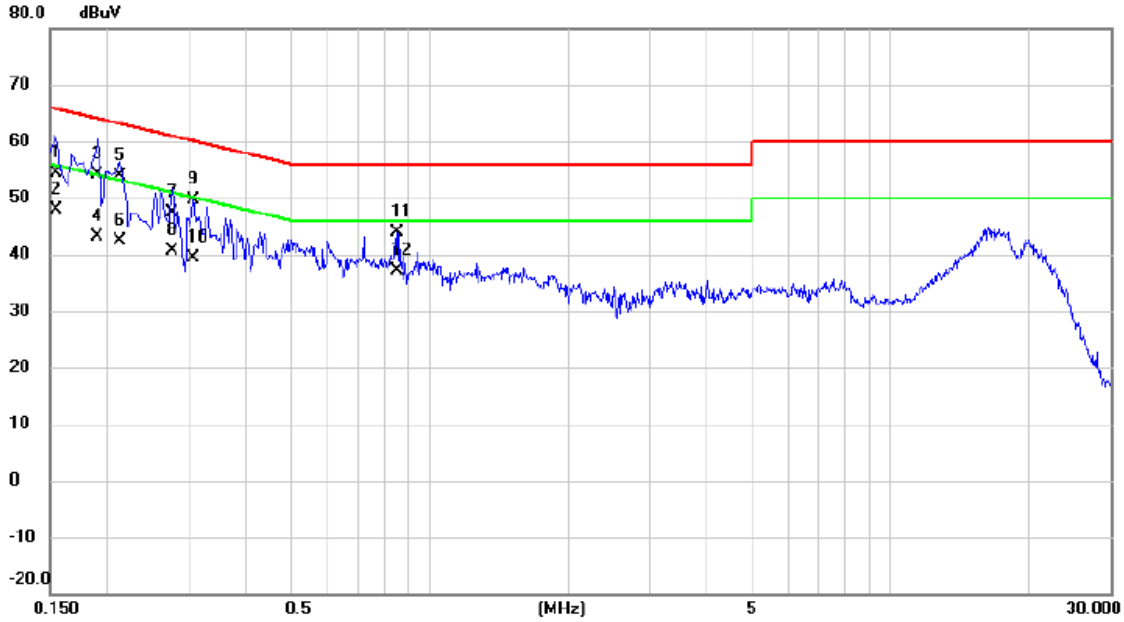


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1507	42.38	9.62	52.00	65.96	-13.96	QP	
2		0.1507	27.31	9.62	36.93	55.96	-19.03	AVG	
3		0.1635	40.68	9.62	50.30	65.28	-14.98	QP	
4		0.1635	33.54	9.62	43.16	55.28	-12.12	AVG	
5		0.1950	42.33	9.61	51.94	63.82	-11.88	QP	
6		0.1950	30.67	9.61	40.28	53.82	-13.54	AVG	
7	*	0.2130	42.67	9.61	52.28	63.09	-10.81	QP	
8		0.2130	31.85	9.61	41.46	53.09	-11.63	AVG	
9		0.2445	39.04	9.62	48.66	61.94	-13.28	QP	
10		0.2445	29.75	9.62	39.37	51.94	-12.57	AVG	
11		0.2985	35.60	9.64	45.24	60.28	-15.04	QP	
12		0.2985	25.64	9.64	35.28	50.28	-15.00	AVG	

Operating Mode 1: Line L1

▪ Test Data & Graph

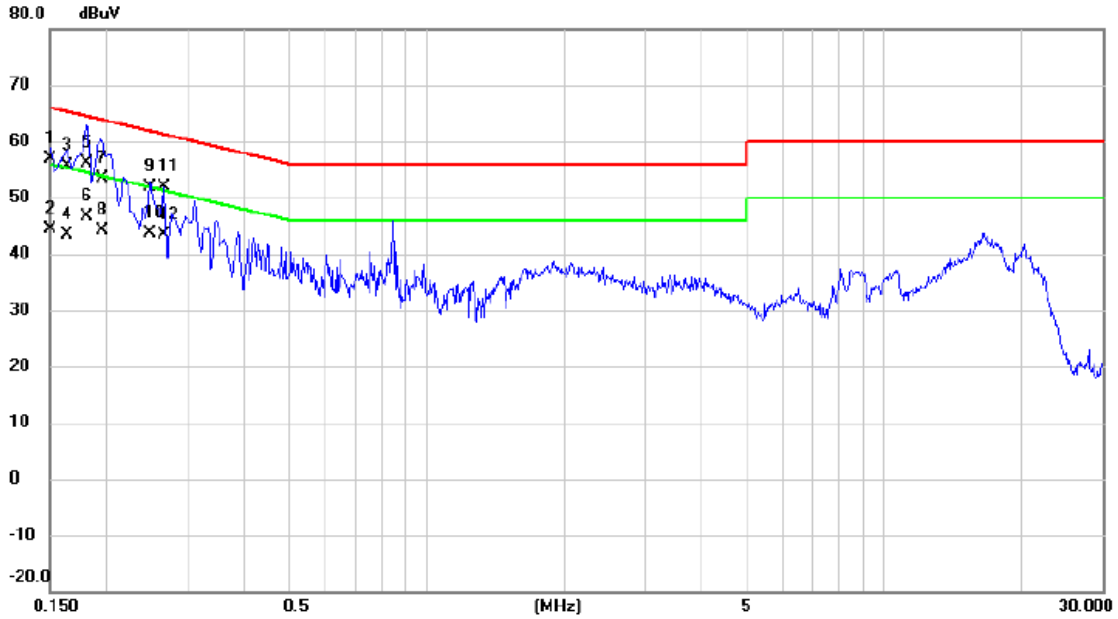
Adapter: GT-46180-1824



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1545	44.72	9.63	54.35	65.75	-11.40	QP	
2	*	0.1545	38.32	9.63	47.95	55.75	-7.80	AVG	
3		0.1905	44.50	9.63	54.13	64.01	-9.88	QP	
4		0.1905	33.60	9.63	43.23	54.01	-10.78	AVG	
5		0.2130	44.21	9.63	53.84	63.09	-9.25	QP	
6		0.2130	32.69	9.63	42.32	53.09	-10.77	AVG	
7		0.2760	37.61	9.65	47.26	60.94	-13.68	QP	
8		0.2760	30.98	9.65	40.63	50.94	-10.31	AVG	
9		0.3075	39.92	9.65	49.57	60.04	-10.47	QP	
10		0.3075	29.76	9.65	39.41	50.04	-10.63	AVG	
11		0.8520	34.09	9.67	43.76	56.00	-12.24	QP	
12		0.8520	27.34	9.67	37.01	46.00	-8.99	AVG	

■ Operating Mode 1: Line N

▪ Test Data & Graph

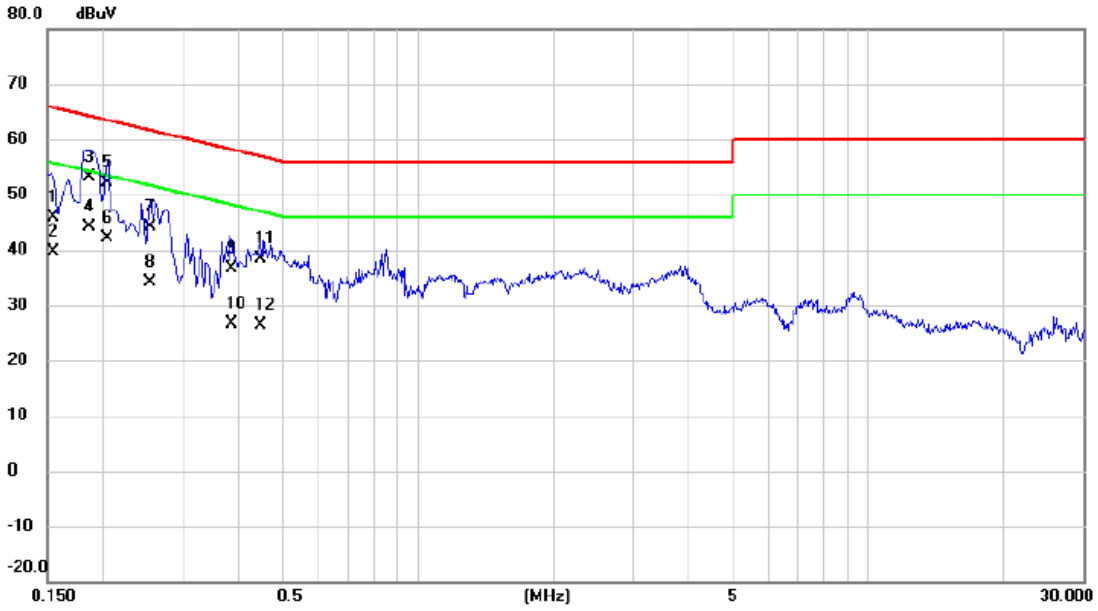


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1500	47.31	9.62	56.93	66.00	-9.07	QP	
2		0.1500	34.68	9.62	44.30	56.00	-11.70	AVG	
3		0.1635	46.12	9.62	55.74	65.28	-9.54	QP	
4		0.1635	33.79	9.62	43.41	55.28	-11.87	AVG	
5		0.1815	46.50	9.61	56.11	64.42	-8.31	QP	
6	*	0.1815	37.10	9.61	46.71	54.42	-7.71	AVG	
7		0.1950	43.76	9.61	53.37	63.82	-10.45	QP	
8		0.1950	34.62	9.61	44.23	53.82	-9.59	AVG	
9		0.2490	42.35	9.62	51.97	61.79	-9.82	QP	
10		0.2490	33.98	9.62	43.60	51.79	-8.19	AVG	
11		0.2670	42.15	9.63	51.78	61.21	-9.43	QP	
12		0.2670	33.69	9.63	43.32	51.21	-7.89	AVG	

■ Operating Mode 1: Line L1

▪ Test Data & Graph

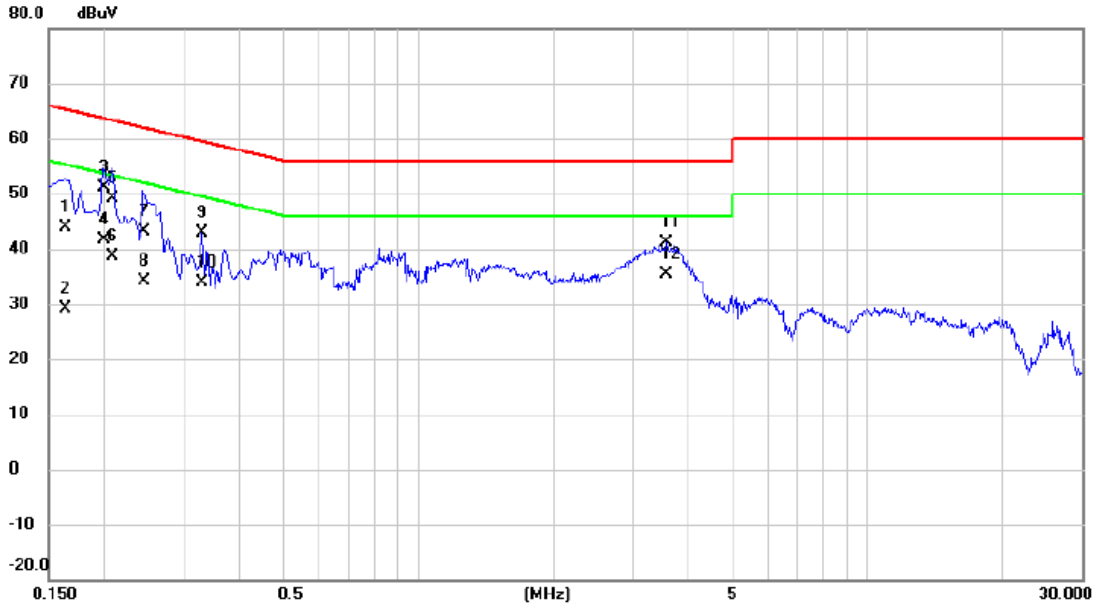
Adapter: GT-46180-1605



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1545	36.20	9.63	45.83	65.75	-19.92	QP	
2		0.1545	29.90	9.63	39.53	55.75	-16.22	AVG	
3		0.1860	43.40	9.63	53.03	64.21	-11.18	QP	
4	*	0.1860	34.60	9.63	44.23	54.21	-9.98	AVG	
5		0.2040	42.50	9.63	52.13	63.45	-11.32	QP	
6		0.2040	32.40	9.63	42.03	53.45	-11.42	AVG	
7		0.2535	34.50	9.65	44.15	61.64	-17.49	QP	
8		0.2535	24.60	9.65	34.25	51.64	-17.39	AVG	
9		0.3840	26.90	9.65	36.55	58.19	-21.64	QP	
10		0.3840	16.90	9.65	26.55	48.19	-21.64	AVG	
11		0.4470	28.60	9.66	38.26	56.93	-18.67	QP	
12		0.4470	16.70	9.66	26.36	46.93	-20.57	AVG	

■ Operating Mode 1: Line N

▪ Test Data & Graph



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1635	34.20	9.62	43.82	65.28	-21.46	QP	
2		0.1635	19.60	9.62	29.22	55.28	-26.06	AVG	
3		0.1995	41.60	9.61	51.21	63.63	-12.42	QP	
4		0.1995	31.90	9.61	41.51	53.63	-12.12	AVG	
5		0.2085	39.50	9.61	49.11	63.26	-14.15	QP	
6		0.2085	28.90	9.61	38.51	53.26	-14.75	AVG	
7		0.2445	33.40	9.62	43.02	61.94	-18.92	QP	
8		0.2445	24.50	9.62	34.12	51.94	-17.82	AVG	
9		0.3300	33.18	9.64	42.82	59.45	-16.63	QP	
10		0.3300	24.35	9.64	33.99	49.45	-15.46	AVG	
11		3.5655	31.42	9.72	41.14	56.00	-14.86	QP	
12	*	3.5655	25.69	9.72	35.41	46.00	-10.59	AVG	

3.3 Harmonic current emissions

3.3.1 Test Date

2019/05/10

3.3.2 Test Location

SR09: No. 68-1, Ln. 169, Sec. 2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)

3.3.3 Limits for harmonic current emissions

Table 1 – Limits for harmonic current emissions.

Equipment Category	Harmonic Order n	Max. Permissible Harmonic Current A	Equipment Category	Harmonic Order n	Max. Permissible Harmonic Current A	mA/w
Class A	Odd Harmonics		Class D	Odd Harmonics only		
	3	2.30		3	2.30	3.4
	5	1.14		5	1.14	1.9
	7	0.77		7	0.77	1.0
	9	0.40		9	0.40	0.5
	11	0.33		11	0.33	0.35
	13	0.21		13	0.21	0.30
	15≤n≤39	0.15 x 15/n		15≤n≤39	0.15 x 15/n	3.85/n
	Even Harmonics					
	2	1.08				
	4	0.43				
	6	0.30				
	8≤n≤40	0.23 x 8/n				

3.3.4 Conditional Testing Procedure

The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the maximum harmonic components under normal operating conditions.

The classification of EUT is according to of **SANS 61000-3-2/IEC 61000-3-2**.The EUT is classified as follows:
Class A: Balanced three-phase equipment, Household appliances excluding equipment as Class D, Tools excluding portable tools, Dimmers for incandescent lamps, audio equipment, equipment not specified in one of the three other classes.
Class B: Portable tools; Arc welding equipment which is not professional equipment.
Class C: Lighting equipment.
Class D: Equipment having a specified power less than or equal to 600 W of the following types: Personal computers and personal computer monitors and television receivers.

The correspondent test program of test instrument to measure the current harmonics emanated from EUT is chosen. The measure time shall be not less than the time necessary for the EUT to be exercised.

3.3.5 Test Equipment

Name of Equipment	Model No.	Manufacturer	Serial No.	Due Date	Applied
Signal conditioning unit	PACS-1	California	72345	Mar. 21, 2020	YES
Power Source	3001iX	California	56310	Mar. 21, 2020	YES
Measurement Software	CTS 4(Version 4.20)	TESEQ	N/A	N/A	YES

3.3.6 Test Software

CTS 4(Version 4.20)

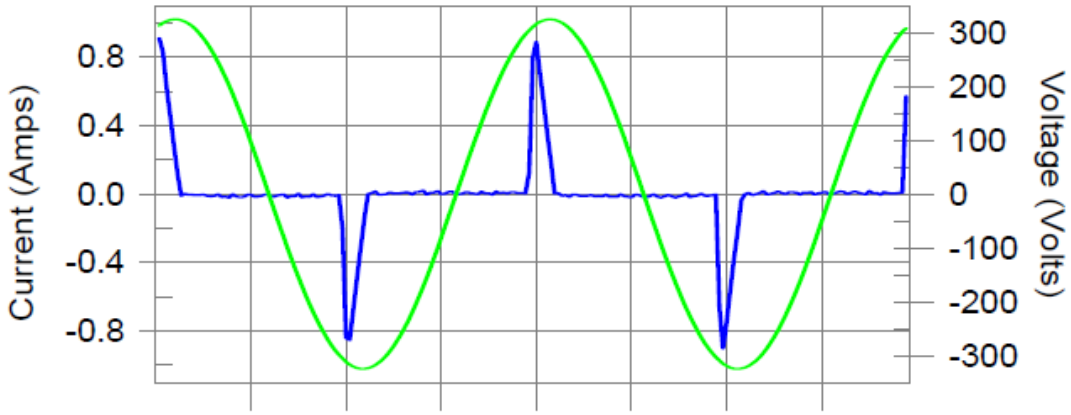
3.3.7 Climate Condition

Temperature: 25°C
Relative Humidity: 55%

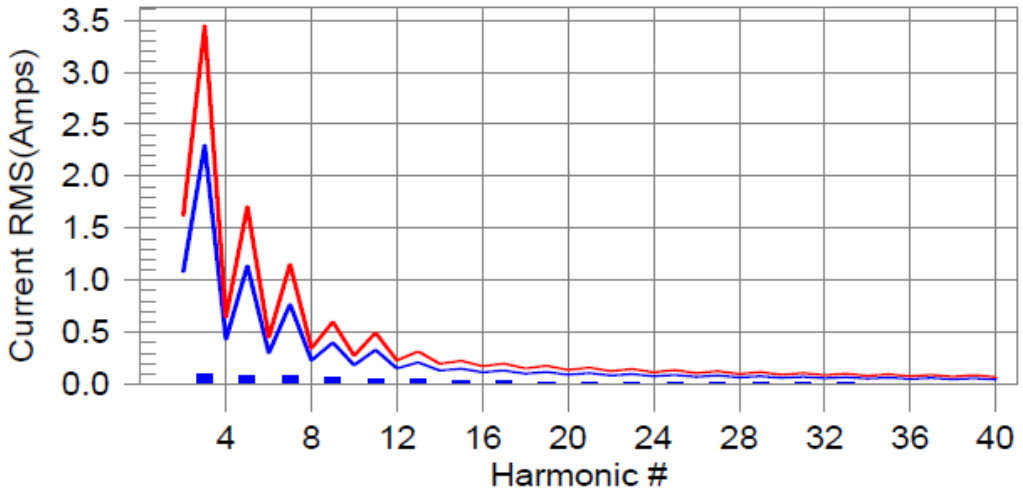
■ Operating Mode 1: Harmonics

▪ Test Data & Graph

Current & voltage waveforms



Harmonics and Class A limit line **European Limits**



Test result: Pass Worst harmonics H15-14.7% of 150% limit, H15-21.5% of 100% limit

■ Operating Mode 1: Current Test Result Summary (Run time)

▪ Test Data & Graph

Highest parameter values during test:

V_RMS (Volts):	229.73	Frequency(Hz):	50.00
I_Peak (Amps):	0.933	I_RMS (Amps):	0.214
I_Fund (Amps):	0.100	Crest Factor:	4.366
Power (Watts):	22.3	Power Factor:	0.455

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.001	1.080	N/A	0.002	1.620	N/A	Pass
3	0.094	2.300	4.1	0.096	3.450	2.8	Pass
4	0.001	0.430	N/A	0.002	0.645	N/A	Pass
5	0.087	1.140	7.7	0.088	1.710	5.1	Pass
6	0.001	0.300	N/A	0.001	0.450	N/A	Pass
7	0.078	0.770	10.1	0.078	1.155	6.8	Pass
8	0.001	0.230	N/A	0.001	0.345	N/A	Pass
9	0.067	0.400	16.7	0.067	0.600	11.2	Pass
10	0.001	0.184	N/A	0.001	0.276	N/A	Pass
11	0.055	0.330	16.6	0.055	0.495	11.1	Pass
12	0.001	0.153	N/A	0.001	0.230	N/A	Pass
13	0.043	0.210	20.4	0.043	0.315	13.8	Pass
14	0.001	0.131	N/A	0.001	0.197	N/A	Pass
15	0.032	0.150	21.5	0.033	0.225	14.7	Pass
16	0.001	0.115	N/A	0.001	0.173	N/A	Pass
17	0.024	0.132	18.3	0.025	0.198	12.6	Pass
18	0.001	0.102	N/A	0.001	0.153	N/A	Pass
19	0.019	0.118	16.3	0.020	0.178	11.2	Pass
20	0.001	0.092	N/A	0.001	0.138	N/A	Pass
21	0.017	0.107	16.2	0.018	0.161	11.1	Pass
22	0.001	0.084	N/A	0.001	0.125	N/A	Pass
23	0.017	0.098	17.2	0.017	0.147	11.7	Pass
24	0.001	0.077	N/A	0.001	0.115	N/A	Pass
25	0.016	0.090	18.0	0.017	0.135	12.3	Pass
26	0.001	0.071	N/A	0.001	0.107	N/A	Pass
27	0.015	0.083	17.8	0.015	0.125	12.3	Pass
28	0.001	0.066	N/A	0.001	0.099	N/A	Pass
29	0.013	0.078	16.5	0.013	0.116	11.5	Pass
30	0.001	0.061	N/A	0.001	0.092	N/A	Pass
31	0.010	0.073	14.4	0.011	0.109	10.1	Pass
32	0.001	0.058	N/A	0.001	0.086	N/A	Pass
33	0.008	0.068	12.2	0.009	0.102	8.6	Pass
34	0.001	0.054	N/A	0.001	0.081	N/A	Pass
35	0.007	0.064	10.6	0.007	0.096	7.4	Pass
36	0.001	0.051	N/A	0.001	0.077	N/A	Pass
37	0.006	0.061	10.2	0.006	0.091	7.0	Pass
38	0.001	0.048	N/A	0.001	0.073	N/A	Pass
39	0.006	0.058	10.6	0.006	0.087	7.2	Pass
40	0.001	0.046	N/A	0.001	0.069	N/A	Pass

■ Operating Mode 1: Voltage Source Verification Data (Run time)

▪ Test Data & Graph

Highest parameter values during test:

Voltage (Vrms):	229.73	Frequency(Hz):	50.00
I_Peak (Amps):	0.933	I_RMS (Amps):	0.214
I_Fund (Amps):	0.100	Crest Factor:	4.366
Power (Watts):	22.3	Power Factor:	0.455

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.065	0.459	14.16	OK
3	0.459	2.068	22.20	OK
4	0.035	0.459	7.55	OK
5	0.029	0.919	3.12	OK
6	0.017	0.459	3.59	OK
7	0.043	0.689	6.25	OK
8	0.012	0.459	2.68	OK
9	0.032	0.459	6.92	OK
10	0.015	0.459	3.33	OK
11	0.035	0.230	15.35	OK
12	0.012	0.230	5.07	OK
13	0.028	0.230	11.98	OK
14	0.004	0.230	1.70	OK
15	0.030	0.230	13.03	OK
16	0.005	0.230	2.14	OK
17	0.021	0.230	9.02	OK
18	0.008	0.230	3.46	OK
19	0.017	0.230	7.49	OK
20	0.010	0.230	4.50	OK
21	0.016	0.230	6.89	OK
22	0.005	0.230	2.05	OK
23	0.016	0.230	7.00	OK
24	0.005	0.230	2.13	OK
25	0.019	0.230	8.36	OK
26	0.004	0.230	1.63	OK
27	0.017	0.230	7.32	OK
28	0.004	0.230	1.81	OK
29	0.020	0.230	8.49	OK
30	0.003	0.230	1.43	OK
31	0.017	0.230	7.32	OK
32	0.003	0.230	1.32	OK
33	0.014	0.230	6.10	OK
34	0.003	0.230	1.11	OK
35	0.012	0.230	5.31	OK
36	0.003	0.230	1.12	OK
37	0.010	0.230	4.55	OK
38	0.002	0.230	0.85	OK
39	0.009	0.230	4.12	OK
40	0.008	0.230	3.48	OK

3.4 Voltage changes, voltage fluctuations and flicker

3.4.1 Test Date

2019/05/10

3.4.2 Test Location

SR09: No. 68-1, Ln. 169, Sec. 2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)

3.4.3 Limits for voltage changes, voltage fluctuations and flicker

Table 2 – Limits for voltage changes, voltage fluctuations and flicker.

Tests	Limits	Descriptions
Pst	≤ 1.0, Tp= 10 min.	Short Term Flicker Indicator
Plt	≤ 0.65, Tp=2 hr.	Long Term Flicker Indicator
dc	≤ 3.3%	Relative Steady-State V-change
dmax	≤ 4%	Maximum Relative V-change
d (t)	≤ 500 ms	Relative V-change characteristic

3.4.4 Conditional Testing Procedure

Tests was performed according to the Test Conditions/Assessment of Voltage Fluctuations specified in **SANS 61000-3-3/IEC 61000-3-3** depend on which standard adopted for compliance measurement.

All types of harmonic current and/or voltage fluctuation in this report are assessed by direct measurement using flicker-meter.

3.4.5 Test Equipment

Name of Equipment	Model No.	Manufacturer	Serial No.	Due Date	Applied
Signal conditioning unit	PACS-1	California	72345	Mar. 21, 2020	YES
Power Source	3001iX	California	56310	Mar. 21, 2020	YES
Measurement Software	CTS 4(Version 4.20)	TESEQ	N/A	N/A	YES

3.4.6 Test Software

CTS 4(Version 4.20)

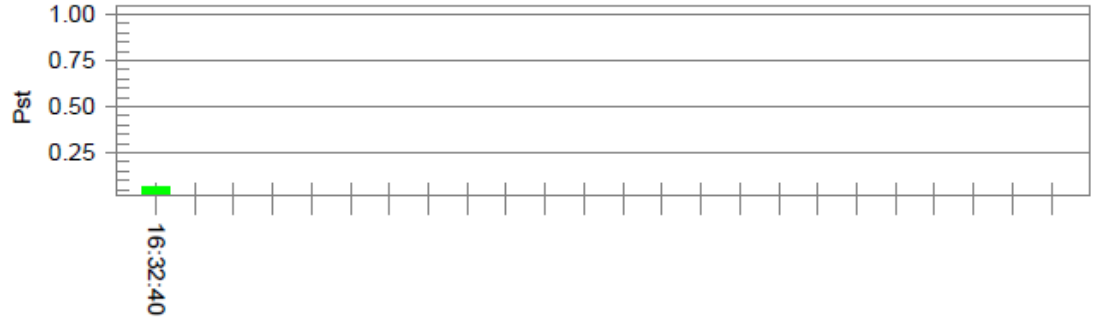
3.4.7 Climate Condition

Temperature: 21°C
Relative Humidity: 50%

■ Operating Mode 1:

▪ Test Data & Graph

Pst 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

3.5 Immunity Performance Criteria and Requirements

3.5.1 Performance Criteria

Criterion A	The equipment shall continue to operate as intended without operator intervention. No degradation of performance, loss of function or change of operating state is allowed below a performance level specified by the manufacturer when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.
Criterion B	During the application of the disturbance, degradation of performance is allowed. However, nounintended change of actual operating state or stored data is allowed to persist after the test. After the test, the equipment shall continue to operate as intended without operator intervention; no degradation of performance or loss of function is allowed, below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level (or the permissible performance loss), or recovery time, is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.
Criterion C	Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions. A reboot or re-start operation is allowed. Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

3.5.2 Requirements

Table 3 – Requirements for immunity

Environmental phenomenon and	Test Specification	Test Ports	Performance Criterion
Electrostatic discharge immunity	±8 kV air discharge ±4 kV contact discharge	Enclosure port	B
	±4 kV HCP discharge ±4 kV VCP discharge		B
Radiated, radio-frequency, electromagnetic field immunity	80 MHz to 1000 MHz 3V/m(unmodulated, r.m.s), 1 kHz, 80%, AM modulated	Enclosure port	A
	1800 MHz, 2600MHz, 3500 MHz, 5000MHz(±1 %) 3V/m(unmodulated, r.m.s), 1 kHz, 80%, AM modulated	Enclosure port	A
Electrical fast transient/burst immunity	±0.5kV(peak) 5/50ns Tr/Th 5kHz Repetition Frequency (100kHz Repetition Frequency for xDSL port)	Analogue/digital data ports	B
	±0.5kV(peak) 5/50ns Tr/Th 5kHz Repetition Frequency	DC network power ports	B
	±1 kV(peak) 5/50ns Tr/Th 5kHz Repetition Frequency	AC mains power ports	B

Surge immunity	Port Type: unshielded symmetrical Apply: lines to ground		
	Primary protection is Intended ±1 kV and ±4 kV 10/700(5/320)Tr/Th µs	Analogue/digital data ports	C
	Primary protection is not Intended ±1 kV 10/700(5/320) Tr/Th µs		C
	Port type: coaxial or shielded Apply: shield to ground		
	±0.5 kV 1.2/50(8/20) Tr/Th µs	Analogue/digital data ports	B
	line to reference ground for each individual line: ±0.5 kV(peak) 1.2/50(8/20) Tr/Th µs	DC network power ports	B
	±1 kV(peak) 1.2/50(8/20) Tr/Th µs (line to line) ±2 kV(peak) 1.2/50(8/20) Tr/Th µs (line to earth or ground)	AC mains power ports	B
Immunity to conducted disturbances, induced by radio-frequency fields	0.15 MHz to 10 MHz 3V(unmodulated, r.m.s), 10 MHz to 30 MHz 3V to 1V(unmodulated, r.m.s), 30 MHz to 80 MHz 1V(unmodulated, r.m.s), 1kHz 80%, AM 150Ω source impedance	Analogue/digital data ports	A
	0.15 MHz to 10 MHz 3V(unmodulated, r.m.s), 10 MHz to 30 MHz 3V to 1V(unmodulated, r.m.s), 30 MHz to 80 MHz 1V(unmodulated, r.m.s), 1kHz 80%, AM 150Ω source impedance	DC network power ports	A
	0.15 MHz to 10 MHz 3V(unmodulated, r.m.s), 10 MHz to 30 MHz 3V to 1V(unmodulated, r.m.s), 30 MHz to 80 MHz 1V(unmodulated, r.m.s), 1kHz 80%, AM 150Ω source impedance	AC mains power ports	A

Power frequency magnetic field immunity	50, 60 Hz, 1 A/m (r.m.s)	Enclosure port	A
Voltage dips, short interruptions and voltage variations immunity	Voltage dips: Residual voltage < 5% 0.5 cycle Residual voltage < 70% 25 cycle(50Hz), 30 cycle(60Hz) Voltage interruptions: Residual voltage < 5% 250 cycle(50Hz), 300 cycle(60Hz)	Input a.c. power ports	B C C

3.6 Electrostatic discharge immunity

3.6.1 Test Date

2019/06/04

3.6.2 Test Location

SR02: No. 68-1, Ln. 169, Sec. 2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)

3.6.3 Test Specification

Discharge Impedance	330 ohm / 150 pF
Required Performance	B
Discharge Voltage	Air Discharge: ±2 kV, ±4 kV, ±8 kV (Direct) Contact Discharge: ±2 kV, ±4 kV (Indirect)
Polarity	Positive & Negative
Number of Discharge	Air Discharge: min. 20 times at each test point Contact Discharge: min. 20 times at each test point
Discharge Mode	Single Discharge
Discharge Period	1 second minimum

3.6.4 Conditional Testing Procedure

The test generator necessary to perform direct and indirect application of discharges to the EUT in the following manner:

a. The test shall be performed with single discharges. On each pre-selected point at least 10single discharges (in the most sensitive polarity) shall be applied.
NOTE 1 The minimum number of discharges applied is depending on the EUT; for products with synchronized circuits the number of discharges should be larger. For the time interval between successive single discharges an initial value of 1 s is recommended. Longer intervals may be necessary to determine whether a system failure
has occurred. NOTE 2 The points to which the discharges should be applied may be selected by means of an exploration carried out at a repetition rate of 20 discharges per second, or more.
Vertical Coupling Plane (VCP):
The coupling plane, of dimensions 0.5m x 0.5m, is placed parallel to, and positioned at a distance 0.1m from, the EUT, with the Discharge Electrode touching the coupling plane.
The four faces of the EUT will be performed with electrostatic discharge.
Horizontal Coupling Plane (HCP):
The coupling plane is placed under to the EUT. The generator shall be positioned vertically at a distance of 0.1m from the EUT, with the Discharge Electrode touching the coupling plane.
The four faces of the EUT will be performed with electrostatic discharge.

b. Air discharges at insulation surfaces of the EUT.
It was at least ten single discharges with positive and negative at the same selected point.

3.6.5 Test Equipment

Name of Equipment	Model No.	Manufacturer	Serial No.	Due Date	Applied
ESD Simulator	ESS-B3011A/GT-30RA	NoiseKen	ESS16Y4503/ ESS1837947	Jul. 15, 2019	YES

3.6.6 Test Software

N/A

3.6.7 Climate Condition

Temperature: 19°C
Relative Humidity: 51%
Atmospheric Pressure: 1008hPa

■ Operating Mode 1:

▪ Test Data & Graph

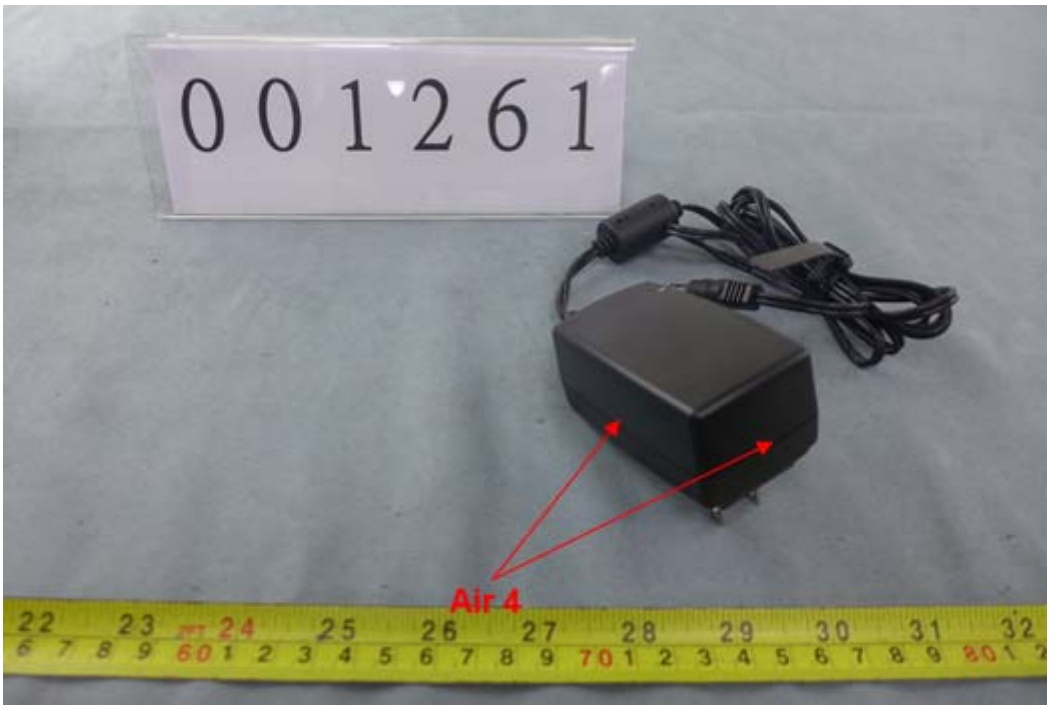
Mode	Air Discharge								Contact Discharge							
Level	2 kV		4 kV		8 kV		15 kV		2 kV		4 kV		6 kV		8 kV	
Location	P	N	P	N	P	N	P	N	P	N	P	N	P	N	P	N
Number	10	10	10	10	10	10	10	10	25	25	25	25	25	25	25	25
1	A	A	A	A	A	A	-	-	-	-	-	-	-	-	-	-
2	A	A	A	A	A	A	-	-	-	-	-	-	-	-	-	-
3	A	A	A	A	A	A	-	-	-	-	-	-	-	-	-	-
4	A	A	A	A	A	A	-	-	-	-	-	-	-	-	-	-
5	A	A	A	A	A	A	-	-	-	-	-	-	-	-	-	-
6	A	A	A	A	A	A	-	-	-	-	-	-	-	-	-	-
7	A	A	A	A	A	A	-	-	-	-	-	-	-	-	-	-
8	A	A	A	A	A	A	-	-	-	-	-	-	-	-	-	-
Perform Criterion	B						-		B				-			
Result	A						-		N/A				-			
Judgment	PASS						-		N/A				-			

Mode	HCP Discharge								VCP Discharge							
Level	2 kV		4 kV		6 kV		8 kV		2 kV		4 kV		6 kV		8 kV	
Location	P	N	P	N	P	N	P	N	P	N	P	N	P	N	P	N
Number	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
1	A	A	A	A	-	-	-	-	A	A	A	A	-	-	-	-
2	A	A	A	A	-	-	-	-	A	A	A	A	-	-	-	-
3	A	A	A	A	-	-	-	-	A	A	A	A	-	-	-	-
4	A	A	A	A	-	-	-	-	A	A	A	A	-	-	-	-
Perform Criterion	B				-				B				-			
Result	A				-				A				-			
Judgment	PASS				-				PASS				-			

NOTE: (1) P/N denotes the Positive/Negative polarity of the output voltage.
(2) Test condition:
Air discharges: Minimum 20 times (Positive/Negative) at each point.
Direct/Indirect (HCP/VCP) discharges: Minimum 50 times (Positive/Negative) at each point.
(3) Test location(s) in which discharge (Air and contact discharge) to be applied illustrated by photos shown in next page(s)
(4) The Indirect (HCP/VCP) discharges description of test point as following:
1. left side; 2.right side; 3.front side; 4.rear side.
(5) N/A - denotes test is not applicable in this test report
(6) Situation: Criterion B for screen flickering and self-recovered.

PHOTO(S) SHOWN THE LOCATION(S) OF ESD EVALUATED


001261
Air 3


001261
Air 4


001261
Air 5


001261
Air 6


001261
Air 7


001261
Air 8

3.7 Radiated, radio-frequency, electromagnetic field immunity

3.7.1 Test Date

2019/06/04

3.7.2 Test Location

CB17: No. 68-1, Ln. 169, Sec. 2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)

3.7.3 Test Specification

Required Performance	A
Frequency Range	80 MHz - 1000 MHz 1800 MHz, 2600 MHz, 3500 MHz, 5000MHz
Field Strength	3 V/m(unmodulated, r.m.s)
Modulation	1 kHz Sine Wave, 80%, AM Modulation
Frequency Step	1% of fundamental
Polarity of Antenna	Horizontal and Vertical
Test Distance	3 m
Antenna Height	1.55 m
Dwell Time	at least 3 seconds

3.7.4 Conditional Testing Procedure

The EUT and support equipment, which are placed on a table that is 0.8 meter above ground and the testing was performed in a fully-anechoic chamber.
The testing distance from antenna to the EUT was 3 meters.
The other condition as following manner:

a. The field strength is 3 V/m (unmodulated, r.m.s.).
b. The frequency ranges are swept with the signal 80% amplitude modulated with a 1 kHz sine wave. The rate of sweep did not exceed 1.5x 10-3 decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.
c. The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.
d. The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.

For Acoustic measurements:

a. The frequency range is swept from 80 MHz to 1000 MHz with the signal 80%amplitude modulated with a 1 kHz sine wave. The rate of sweep did not exceed 1.5x 10-3 decade/s.
   Where the frequency range is swept incrementally, the step size was 1% of fundamental.
b. Apply an appropriate input signal to the EUT so that a sine wave (tone) at the frequency that will be used to modulate the applied disturbance (typically 1 kHz) is generated from the port under test at a level equal to the acoustic reference level. The setup of the EUT may need additional adjustment in accordance with Clause 5.4.5 b (1).
c. Record the resulting dB (SPL) level (or other appropriate dB unit) as the value of L0. (BTL lab u ses the software to take Lo as the referecne value and make it return to zero.)
d. Change the input to the EUT so that the port under test is silent, or represents silence. This change shall not alter the terminating impedance at the EUT's input.
e. Apply the RF disturbance to the applicable port of the EUT and record the resulting demodulated audio level in dB (SPL) (or other dB unit used in step d)) as the value of L_1.
f. Ensure that non-linear processing does not impact the measurements.
g. Calculate the acoustic interference ratio using the following formula:
   Acoustic interference ratio = $L_1 – L_0$. (For step e-g,
   BTL lab proceeds the test with software and calculate Acoustic interference ratio = $L_1 – L_0$).
h. The measured acoustic interference ratio and/or the measured electrical interference ratio during the test shall be –20 dB or better.

3.7.5 Test Equipment

Name of Equipment	Model No.	Manufacturer	Serial No.	Due Date	Applied
Signal Generator	N5172B	KETSIGHT	MY56200462	Apr. 21, 2020	YES
Log-Periodic Antenna	AT1080	AR	320290	N/A	YES
Power Amplifier	80RF1000-300	AMETEK	1079823	N/A	YES
LASER DATA INTERFACE	HI-6113	ETS-LINDGEN	00204647	Dec. 31, 2019	YES
Field Probe	HI-6105	ETS-LINDGEN	00204618	Dec. 31, 2019	YES
RF Power Meter	4232A	BOONTON	10179	Feb. 26, 2020	YES
Power Sensor	51011-EMC	BOONTON	34150	Feb. 26, 2020	YES
Measurement Software	i2 (Version 5.161006)	AUDIX	N/A	N/A	YES

3.7.6 Test Software

i2(Version 5.161006)

3.7.7 Climate Condition

Temperature: 19˚C
Relative Humidity: 51%

■ Operating Mode 1:

▪ Test Data

Frequency (MHz)	Applied Voltage(V/m) – 80% AM 1kHz	Polarity	Azimuth	Criterion	Observation	Result
80~1000	3	V & H	Rear	A	A	PASS
			Front		A	
			Left		A	
			Right		A	
1800(±1%)	3	V & H	Rear	A	A	PASS
			Front		A	
			Left		A	
			Right		A	
2600(±1%)	3	V & H	Rear	A	A	PASS
			Front		A	
			Left		A	
			Right		A	
3500(±1%)	3	V & H	Rear	A	A	PASS
			Front		A	
			Left		A	
			Right		A	
5000(±1%)	3	V & H	Rear	A	A	PASS
			Front		A	
			Left		A	
			Right		A	

NOTE: (1) N/A - denotes test is not applicable in this test report

3.8 Electrical fast transient/burst immunity

3.8.1 Test Date

2019/06/04

3.8.2 Test Location

SR01: No. 68-1, Ln. 169, Sec. 2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)

3.8.3 Test Specification

Required Performance	B
Test Voltage	AC mains power ports: ±1 kV
Polarity	Positive & Negative
Impulse Frequency	5 kHz: except for xDSL ports 100 kHz: only for single lines of xDSL ports.
Impulse Wave shape	5/50 ns
Burst Duration	15 ms
Burst Period	300 ms
Test Duration	Not less than 1 min.
Dwell Time	at least 3 seconds

3.8.4 Conditional Testing Procedure

The EUT and support equipment(s) are placed on a table that is 0.8 meter high above a metal ground plane and should be located 0.1 m+/- 0.01m high above the Ground Reference Plane (1m*1m min. and 0.65mm thick min).
The other condition as following manner:
a. Both positive and negative polarity discharges were applied.
b. The duration time of each test sequential was 1 minute.

3.8.5 Test Equipment

Name of Equipment	Model No.	Manufacturer	Serial No.	Due Date	Applied
EMC Immunity Test System	NSG 3060	TESEQ	4026	Dec. 03, 2019	YES
EMC Immunity Test System	CDN 3061	TESEQ	5012	Dec. 03, 2019	YES
Single motor driven variable transformer	VAR 3005-S16	TESEQ	3009	Dec. 03, 2019	YES
Capacitive Clamp	CDN 3425	TESEQ	3021	Dec. 03, 2019	YES
Measurement Software	SUI 3000(V02.31)	TESEQ	4026	N/A	YES

3.8.6 Test Software

SUI 3000(V02.31)

3.8.7 Climate Condition

Temperature: 20˚C
Relative Humidity: 50%

■ Operating Mode 1:

▪ Test Data

AC Power Ports –5/50Tr/Th ns						
Tested on	Test Voltage(kV)		Pulse Rate	Criterion	Observation	Result
L	+/-	1	5kHz	B	A	PASS
N	+/-	1	5kHz	B	B	
L+N	+/-	1	5kHz	B	A	

NOTE: (1) +/- denotes the Positive/Negative polarity of the output voltage.
(2) N/A - denotes test is not applicable in this test report.

3.9 Surge immunity

3.9.1 Test Date

2019/06/04

3.9.2 Test Location

SR01: No. 68-1, Ln. 169, Sec. 2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)

3.9.3 Test Specification

Required Performance	B/C
Waveform	Input a.c. power ports: 1.2/50 µs Open Circuit Voltage 8 /20 µs Short Circuit Current
Test Voltage	Input a.c. power ports: Line to line: ±1 kV
Surge Input/Output	L-N, L-PE, N-PE
Generator Source Impedance	2 Ω of the low-voltage power supply network. 12 Ω (10Ω+2Ω) of the low-voltage power supply network and ground.
Phase Angle and Polarity:	Five positive pulses line-to-neutral at 90°phase Five negative pulses line-to-neutral at 270°phase Five positive pulses line-to-earth at 90°phase Five negative pulses line-to-earth at 270°phase Five negative pulses neutral-to-earth at 90°phase Five positive pulses neutral-to-earth at 270°phase
Pulse Repetition Rate	1 time / min. (maximum)
Number of Tests	5 positive and 5 negative at selected points

3.9.4 Conditional Testing Procedure

a. For EUT power supply:
The surge is to be applied to the EUT power supply terminals via the capacitive coupling network. Decoupling networks are required in order to avoid possible adverse effects on equipment not under test that may be powered by the same lines, and to provide sufficient decoupling impedance to the surge wave. The power cord between the EUT and the coupling/decoupling networks shall be 2meters in length (or shorter).

b. For test applied to unshielded unsymmetrically operated interconnection lines of EUT:
The surge is applied to the lines via the capacitive coupling. The coupling /decoupling networks shall not influence the specified functional conditions of the EUT. The interconnection line between the EUT and the coupling/decoupling networks shall be 2 meters in length (or shorter).

c. For test applied to unshielded symmetrically operated interconnection /telecommunication lines of EUT:
The surge is applied to the lines via gas arrestors coupling. Test levels below the ignition point of the coupling arrestor cannot be specified. The interconnection line between the EUT and the coupling/decoupling networks shall be 2 meters in length (or shorter).

3.9.5 Test Equipment

Name of Equipment	Model No.	Manufacturer	Serial No.	Due Date	Applied
EMC Immunity Test System	NSG 3060	TESEQ	4026	Dec. 03, 2019	YES
EMC Immunity Test System	CDN 3061	TESEQ	5012	Dec. 03, 2019	YES
Single motor driven variable transformer	VAR 3005-S16	TESEQ	3009	Dec. 03, 2019	YES
CDN for unshielded symmetrical high speed communication lines	CDN HSS-2	TESEQ	34272	Jul. 19, 2019	YES
Measurement Software	SUI 3000(V02.31)	TESEQ	4026	N/A	YES

3.9.6 Test Software

SUI 3000(V02.31)

3.9.7 Climate Condition

Temperature: 20°C
Relative Humidity: 50%

■ Operating Mode 1:

▪ Test Data

Test Result for AC Power – 1.2/50(8/20)Tr/Thμs								
Tested on	Polarity	Test Voltage(kV)				Criterion	Observation	Result
		0.5	1	2	4			
L+N	+/-	A	A	-	-	B	B	PASS

NOTE: (1) Polarity and Numbers of Impulses: 5 Pst / Ngt at each tested mode.
(2) N/A - denotes test is not applicable in this test report

3.10 Immunity to conducted disturbances, induced by radio-frequency fields

3.10.1 Test Date

2019/06/04

3.10.2 Test Location

SR09: No. 68-1, Ln. 169, Sec. 2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)

3.10.3 Test Specification

Required Performance	A
Frequency Range	0.15 to 80 MHz
Field Strength	3 V (unmodulated, r.m.s.)
Modulation	1 kHz Sine Wave, 80 %, AM Modulation
Frequency Step	1 % of fundamental
Dwell Time	at least 3 seconds

3.10.4 Conditional Testing Procedure

The EUT and support equipment, are placed on a table that is 0.8 meter above a metal ground plane measured 1 m x 1 m minimum and 0.65 mm thick minimum.
The other condition as following manner:

a. The field strength is 3 V (unmodulated, r.m.s.).
b. The frequency range is swept from 0.15 to 80 MHz, with the signal 80% amplitude modulated with a 1 kHz sine wave. The rate of sweep did not exceed 1.5 x 10^{-3} decade/s. Where the frequency range is swept incrementally, the step size was 1 % of fundamental.
c. The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.

For Acoustic measurements:

i. The frequency range is swept from 80 MHz to 1000 MHz with the signal 80%amplitude modulated with a 1 kHz sine wave. The rate of sweep did not exceed 1.5x 10-3 decade/s.
Where the frequency range is swept incrementally, the step size was 1% of fundamental.
j. Apply an appropriate input signal to the EUT so that a sine wave (tone) at the frequency that will be used to modulate the applied disturbance (typically 1 kHz) is generated from the port under test at a level equal to the acoustic reference level. The setup of the EUT may need additional adjustment in accordance with Clause 5.4.5 b (1).
k. Record the resulting dB (SPL) level (or other appropriate dB unit) as the value of L0. (BTL lab u ses the software to take Lo as the referecne value and make it return to zero.)
l. Change the input to the EUT so that the port under test is silent, or represents silence. This change shall not alter the terminating impedance at the EUT's input.
m. Apply the RF disturbance to the applicable port of the EUT and record the resulting demodulated audio level in dB (SPL) (or other dB unit used in step d)) as the value of L_1.
n. Ensure that non-linear processing does not impact the measurements.
o. Calculate the acoustic interference ratio using the following formula:
Acoustic interference ratio = $L_1 – L_0$. (For step e-g,
BTL lab proceeds the test with software and calculate Acoustic interference ratio = $L_1 – L_0$).

The measured acoustic interference ratio and/or the measured electrical interference ratio during the test shall be –20 dB or better.

3.10.5 Test Equipment

Name of Equipment	Model No.	Manufacturer	Serial No.	Due Date	Applied
Test System for Conducted and Radiated Immunity	NSG 4070	TESEQ	30593	Apr. 23, 2020	YES
CDN (M3)	CDN M016	TESEQ	42157	Dec. 08, 2019	YES
Measurement Software	NSG 4070 Control Program (Version 1.2)	TESEQ	N/A	N/A	YES

3.10.6 Test Software

NSG 4070 Control Program(Version 1.2)

3.10.7 Climate Condition

Temperature: 20˚C
Relative Humidity: 56%

■ Operating Mode 1:

▪ Test Data

Test Result for Power – 80% AM 1kHz					
Tested on	Frequency (MHz)	Applied Voltage (V (unmodulated, r.m.s.))	Criterion	Observation	Result
AC	0.15 - 10	3	A	A	PASS
	10 - 30	3 - 1	A	A	PASS
	30 - 80	1	A	A	PASS

NOTE: (1) N/A - denotes test is not applicable in this test report

3.11 Power frequency magnetic field immunity

3.11.1 Test Date

2019/06/04

3.11.2 Test Location

SR01: No. 68-1, Ln. 169, Sec. 2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)

3.11.3 Test Specification

Required Performance	A
Frequency Range	50 or 60 Hz
Field Strength	1 A/m
Observation Time	1 minute
Inductance Coil	Rectangular type, 1mx1m

3.11.4 Conditional Testing Procedure

The EUT and support equipment, are placed on a table that is 0.8 meter above a metal ground plane measured 1 m x 1 m minimum and 0.65 mm thick minimum.
The other condition as following manner:

a. The equipment cabinets shall be connected to the safety earth directly on the GRP via the earth terminal of the EUT.
b. The cables supplied or recommended by the equipment manufacturer shall be used. 1 meter of all cables used shall be exposed to the magnetic field.

3.11.5 Test Equipment

Name of Equipment	Model No.	Manufacturer	Serial No.	Due Date	Applied
Triaxial ELF Magnetic Fiedl Meter	4190	F.W. BELL	0932008	Oct. 13, 2019	YES
Magnetic Field Test Generator	F-1000-4-8-G-125A	FCC	04029	N/A	YES
Magnetic Field Immunity Loop	F-1000-4-8/9/10-L-1M	FCC	04018	N/A	YES

3.11.6 Test Software

N/A

3.11.7 Climate Condition

Temperature: 21˚C
Relative Humidity: 52%

■ Operating Mode 1:

▪ Test Data

Test Frequency (Hz)	Magnetic Field (A/m)	Direction	Criterion	Observation	Result
50	1	X Y Z	A	A	PASS
60	1	X Y Z	A	A	PASS

NOTE: (1) N/A - denotes test is not applicable in this test report

3.12 Voltage dips, short interruptions and voltage variations immunity

3.12.1 Test Date

2019/05/17

3.12.2 Test Location

SR01: No. 68-1, Ln. 169, Sec. 2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)

3.12.3 Test Specification

Required Performance	Voltage dips: (B) Residual voltage < 5% 0.5 cycle (C) Residual voltage70% 25 cycle (50Hz),30 cycle (60Hz) Voltage interruptions: (C) Residual voltage < 5%250 cycle (50Hz), 300 cycle (60Hz)
Test Duration Time	Minimum three test events in sequence
Interval between Event	10 s minimum
Phase Angle	0°/180°
Test Cycle	3 times

3.12.4 Conditional Testing Procedure

The EUT shall be tested for each selected combination of test levels and duration with a sequence of three dips/interruptions with intervals of 10 s minimum (between each test event). Each representative mode of operation shall be tested. Abrupt changes in supply voltage shall occur at zero crossings of the voltage waveform.

3.12.5 Test Equipment

Name of Equipment	Model No.	Manufacturer	Serial No.	Due Date	Applied
EMC Immunity Test System	NSG 3060	TESEQ	4026	Dec. 03, 2019	YES
EMC Immunity Test System	CDN 3061	TESEQ	5012	Dec. 03, 2019	YES
Single motor driven variable transformer	VAR 3005-S16	TESEQ	3009	Dec. 03, 2019	YES
Measurement Software	SUI 3000 (V02.31)	TESEQ	4026	N/A	YES

3.12.6 Test Software

SUI 3000(V02.31)

3.12.7 Climate Condition

Temperature: 21°C
Relative Humidity: 54%

■ Operating Mode 1:

▪ Test Data

100Vac/50Hz					
Item	Residual Voltage	Periods	Criterion	Observation	Result
Voltage dips	< 5%	0.5	B	A	PASS
Voltage dips	70%	25	C	A	
Voltage Interruption	< 5%	250	C	C	

220Vac/50Hz					
Item	Residual Voltage	Periods	Criterion	Observation	Result
Voltage dips	< 5%	0.5	B	A	PASS
Voltage dips	70%	25	C	A	
Voltage Interruption	< 5%	250	C	C	

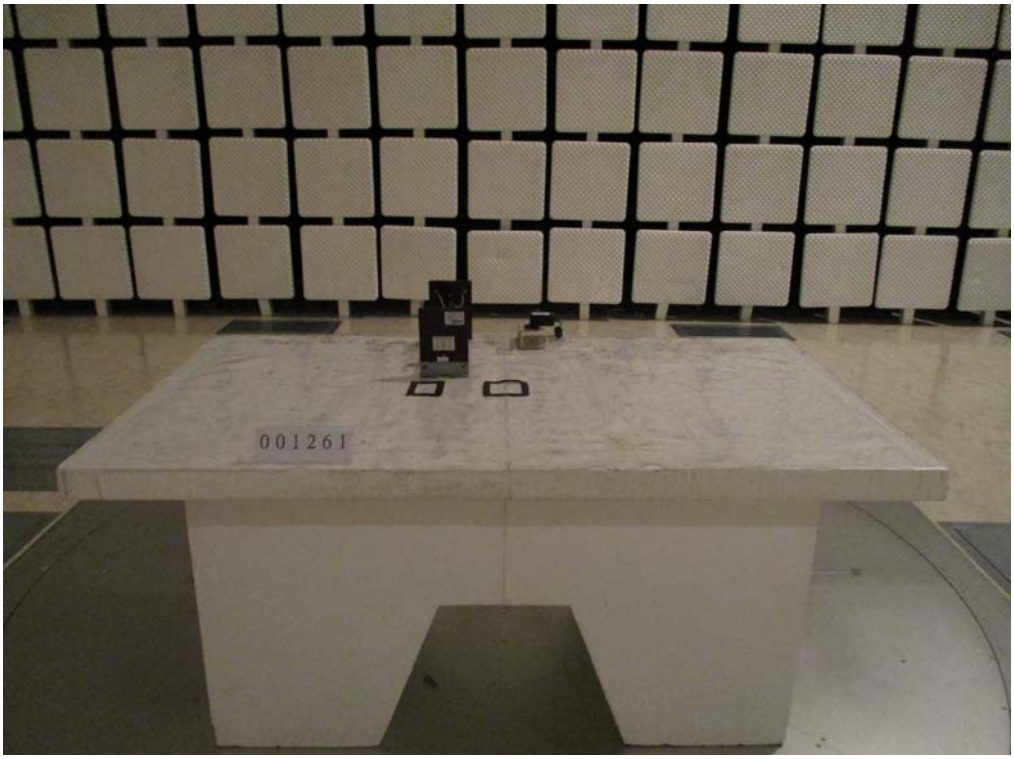
240Vac/50Hz					
Item	Residual Voltage	Periods	Criterion	Observation	Result
Voltage dips	< 5%	0.5	B	A	PASS
Voltage dips	70%	25	C	A	
Voltage Interruption	< 5%	250	C	C	

NOTE: (1) N/A - denotes test is not applicable in this test report
(2) C is the system shutdown after power off and could not self-recover.

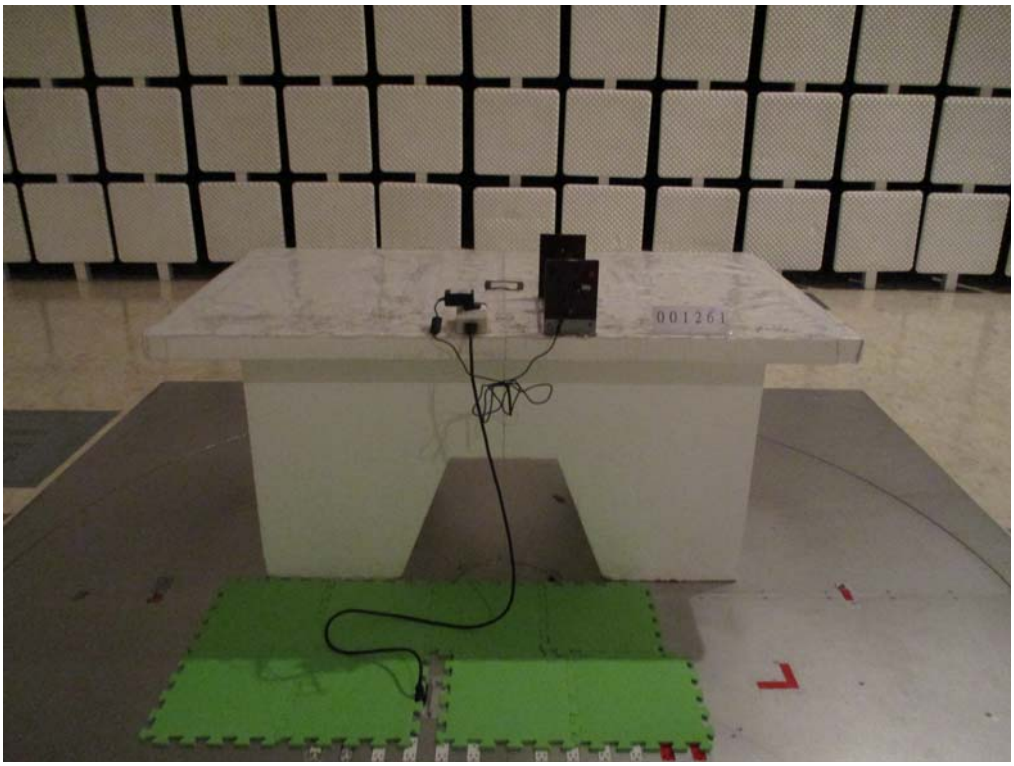
4.0 APPENDIX A - Test Setup Photos and Configuration

CONTINUE ON NEXT PAGE

4.1 Radiated disturbance (Up to 1 GHz)



[Front]



[Rear]

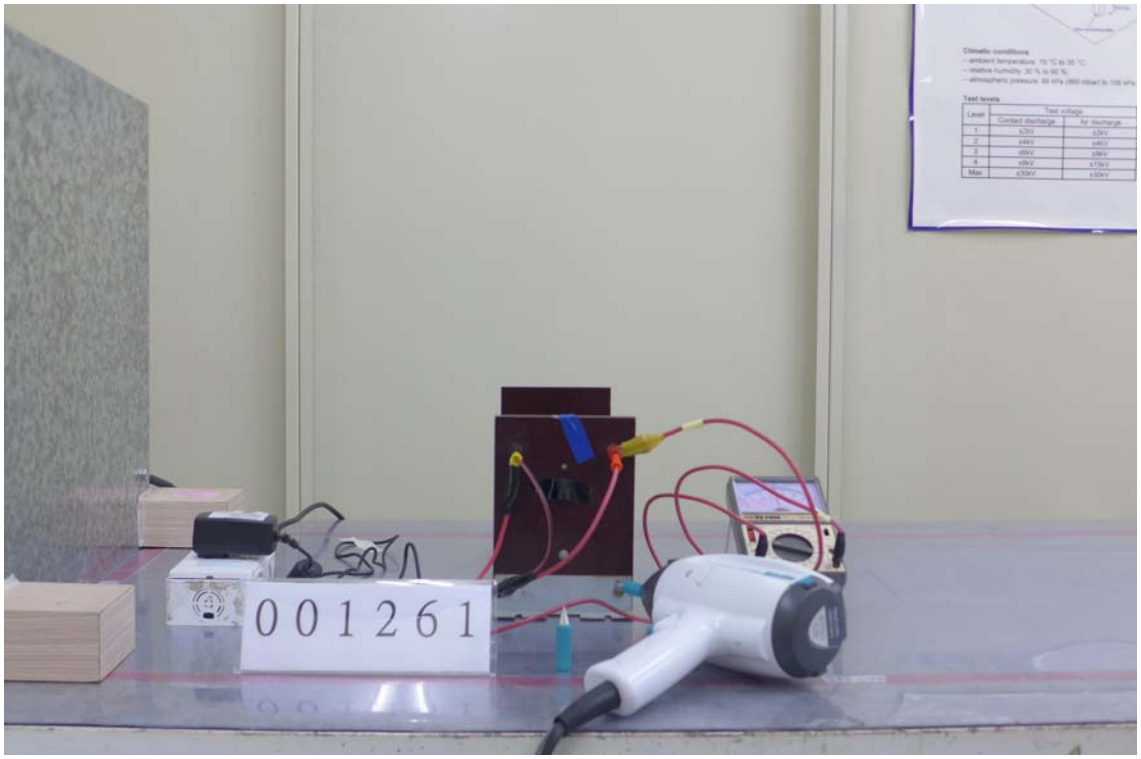
4.2 Conducted emissions AC mains power port

[Front]

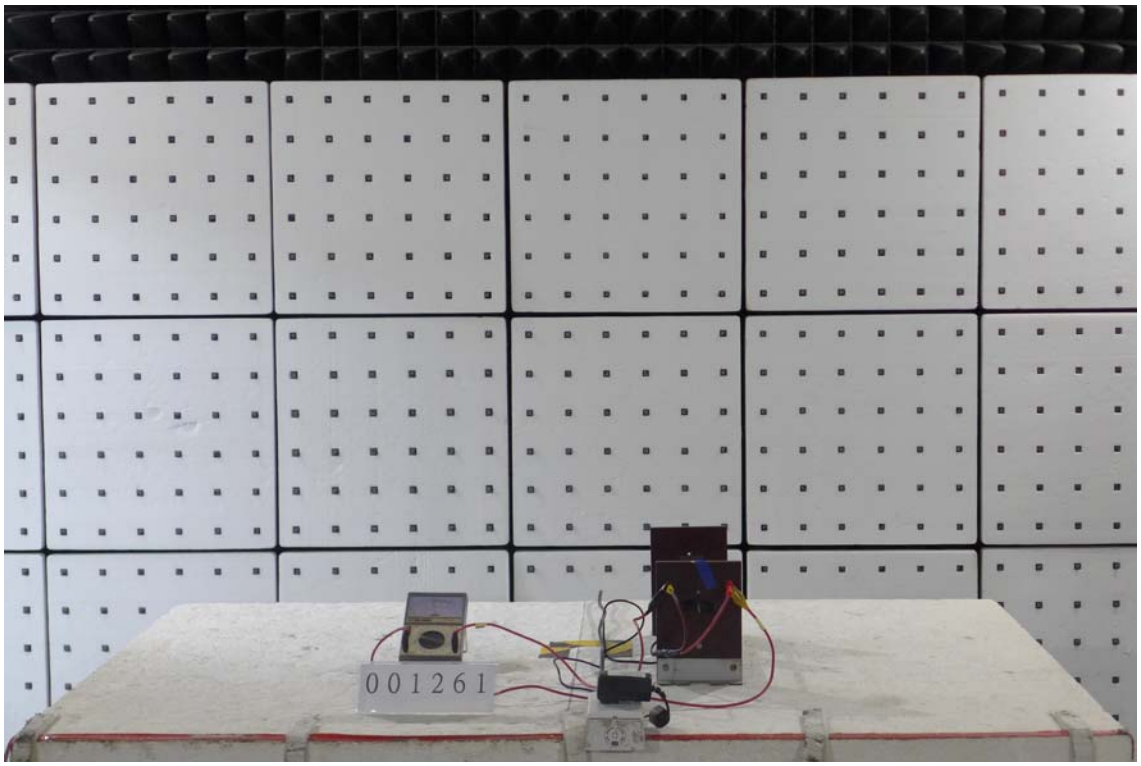
[Rear]

4.3 Harmonic current emissions & Voltage changes, voltage fluctuations and flicker

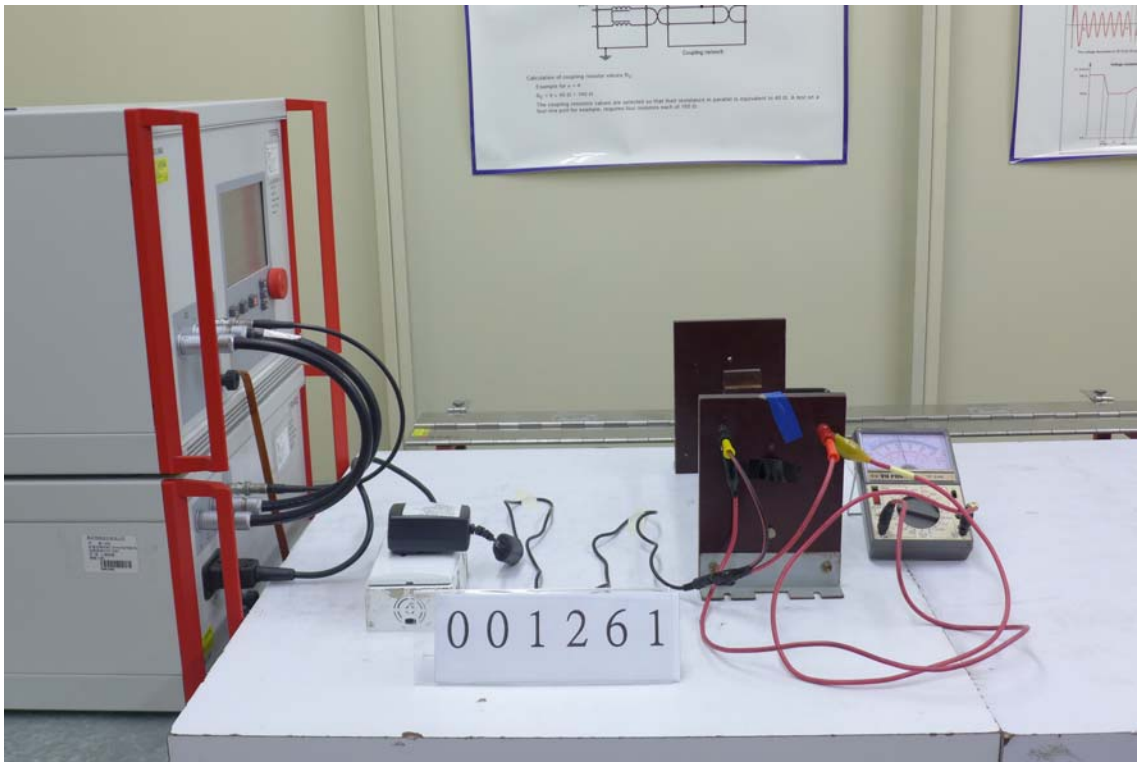
4.4 Electrostatic discharge immunity



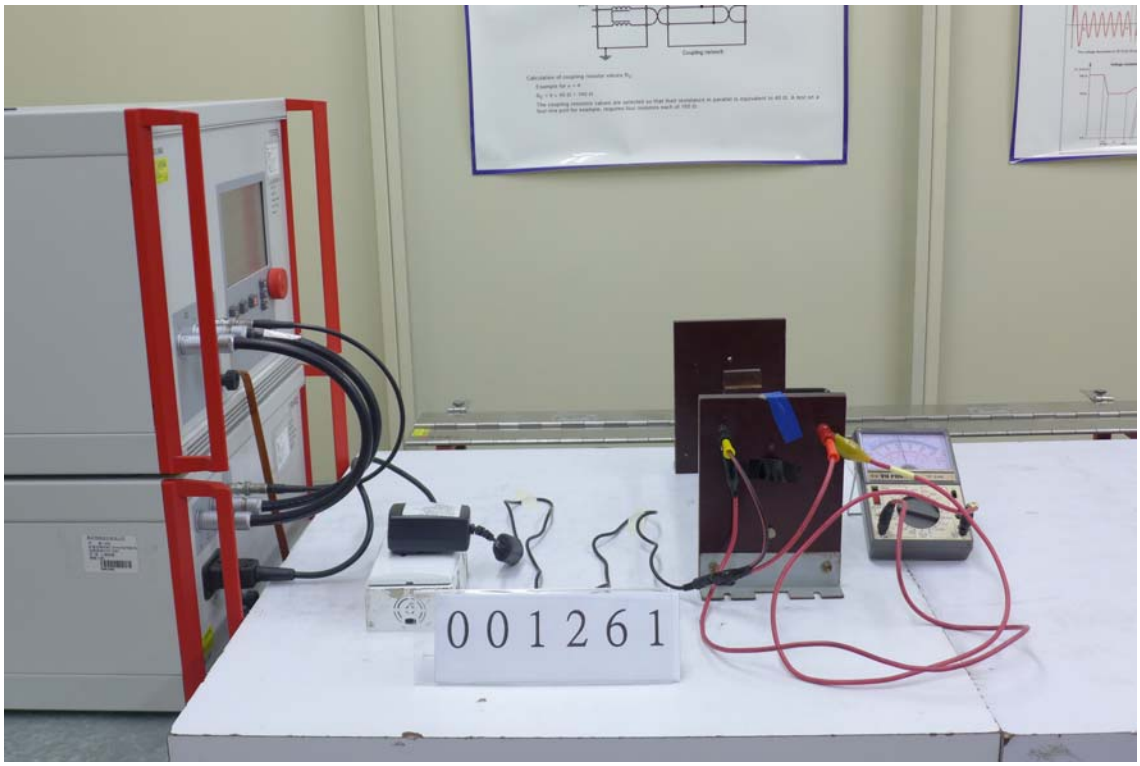
4.5 Radiated, radio-frequency, electromagnetic field immunity



4.6 Electrical fast transient/burst immunity

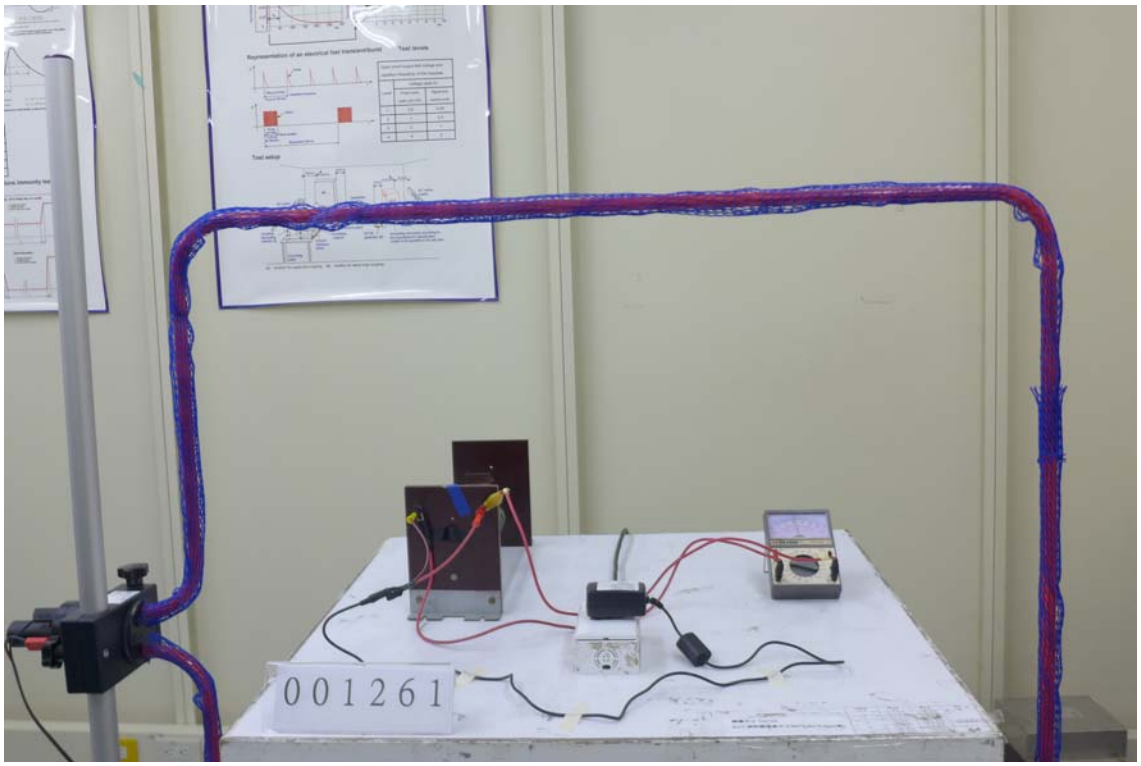


4.7 Surge immunity

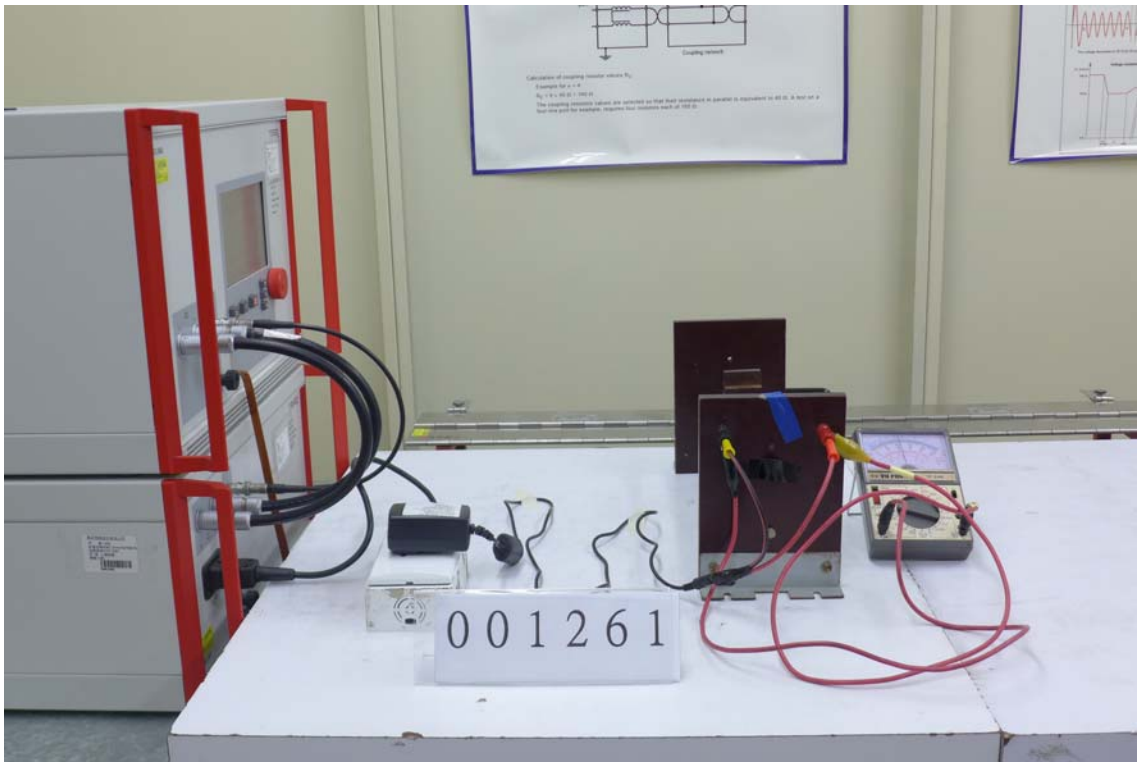


4.8 Immunity to conducted disturbances, induced by radio-frequency fields

4.9 Power frequency magnetic field immunity



4.10 Voltage dips, short interruptions and voltage variations immunity



5.0 APPENDIX B – EUT Photographs

CONTINUE ON NEXT PAGE

5.1 EUT External Photographs

Adapter: GT-46180-1809

Adapter [Front]

Adapter [Rear]

Adapter [label]

Adapter: GT-46180-1812

Adapter [Front]

Adapter [Rear]

Adapter [label]

Adapter: GT-46180-1824

Adapter [Front]

Adapter [Rear]

Adapter [label]

Adapter: GT-46180-1605

Adapter [Front]

Adapter [Rear]

Adapter [label]

6.0 APPENDIX C – Critical Component List

CONTINUE ON NEXT PAGE

Critical Component List

No	Parts, Components	Location Number	Model	Specification	Manufacturer	Factory	Use Option	Remark
1	Adapter	/	GT-46180-1605	INPUT：100-240Vac, 50-60Hz, 0.6A; Output：5Vdc, 3.2A,	GlobTek,Inc.	GlobTek,Inc.	/	/
			GT-46180-1809	INPUT：100-240Vac, 50-60Hz, 0.6A; Output：9Vdc, 2A,				
			GT-46180-1812	INPUT：100-240Vac, 50-60Hz, 0.6A; Output：12Vdc, 1.5A,				
			GT-46180-1824	INPUT：100-240Vac, 50-60Hz, 0.6A; Output：24Vdc, 0.75A,				

End of Test Report