



Test Report issued under the responsibility of:

TEST REPORT IEC 60601-1-2 Medical Electrical Equipment PART 1-2: General Requirements for Basic Safety and Essential Performance Collateral Standard: Electromagnetic Compatibility	
Base On Test Report No.....: MH/2018/40123	
Approved by(+signature)	Wisely Huang  Reviewer
Date of issue:	Oct. 17, 2018
Total number of pages:	111
Name of Testing Laboratory preparing the Report.....:	SGS Taiwan LTD. Electronics & Communication Laboratory No.2, Keji 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)
Applicant's name.....:	TRACO ELECTRONIC AG
Address	Sihlbruggstrasse 111 CH-6340 Baar Switzerland
Test specification: Standard IEC 60601-1-2:2014 (Fourth Edition) EN 60601-1-2:2015 Test procedure Test Scheme Non-standard test method.....: N/A	
Test Report Form No.....: SGS_IEC 60601-1-2:2014 Test Report Form(s) Originator UL Master TRF Dated 2014-12 Copyright © 2014 IEC System of Conformity Assessment Schemes for Electrotechnical Equipment and Components (IECEE System). All rights reserved. This publication may be reproduced in whole or in part for non-commercial purposes as long as the IECEE is acknowledged as copyright owner and source of the material. IECEE takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.	
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Test item description	AC-DC POWER SUPPLY
Trade Mark.....	
Manufacturer	TRACO ELECTRONIC AG
Model/Type reference.....	TPP 450-124A-MB4; TPP 450-124-MB3; TPP 450-124-MB2
Model/Type difference.....	See the following note
Ratings.....	AC 100~240V, 50~60Hz
Summary of testing:	
Tests performed (name of test and test clause):	Testing location:
Conducted Emission (IEC 60601-1-2:2014, clause 7.1.1)	SGS Taiwan LTD. Electronics & Communication Laboratory
Radiated Emission (IEC 60601-1-2:2014, clause 7.1.1)	No.2, Keji 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)
Harmonic distortion (IEC 60601-1-2:2014, clause 7.2.1)	
Voltage fluctuations and flicker (IEC 60601-1-2:2014, clause 7.2.2)	
ESD (IEC 60601-1-2:2014, clause 8.9)	
RS_Radiated RF EM fields (IEC 60601-1-2:2014, clause 8.9)	
RS_Proximity fields from RF wireless communications equipment (IEC 60601-1-2:2014, clause 8.9)	
EFT (IEC 60601-1-2:2014, clause 8.9)	
Surge (IEC 60601-1-2:2014, clause 8.9)	
CS (IEC 60601-1-2:2014, clause 8.9)	
PFMF (IEC 60601-1-2:2014, clause 8.9)	
Voltage dips and interruptions (IEC 60601-1-2:2014, clause 8.9)	
Summary of compliance with National Differences:	
List of countries addressed	
None	

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Note: 1. The different between of model numbers are list as below.

Model Number	Input Range	Output Voltage	Output Current @ 230VAC			
			Natural convection	Conduction cooling	Forced air cooling	
					21 CFM External Fan	Internal Fan
	VAC	VDC	A	A	A	A
TPP 450-112A-MB4	85 ~ 264	12	20.8	23.3	37.5	---
TPP 450-115A-MB4	85 ~ 264	15	16.6	18.6	30	---
TPP 450-124A-MB4	85 ~ 264	24	13.3	14.55	18.75	---
TPP 450-128A-MB4	85 ~ 264	28	11.4	12.5	16.1	---
TPP 450-136A-MB4	85 ~ 264	36	8.9	9.72	12.5	---
TPP 450-148A-MB4	85 ~ 264	48	6.65	7.3	9.4	---
TPP 450-153A-MB4	85 ~ 264	53	6.05	6.6	8.55	---
TPP 450-112A-M	85 ~ 264	12	20.8	23.3	37.5	---
TPP 450-115A-M	85 ~ 264	15	16.6	18.6	30	---
TPP 450-124A-M	85 ~ 264	24	13.3	14.55	18.75	---
TPP 450-128A-M	85 ~ 264	28	11.4	12.5	16.1	---
TPP 450-136A-M	85 ~ 264	36	8.9	9.72	12.5	---
TPP 450-148A-M	85 ~ 264	48	6.65	7.3	9.4	---
TPP 450-153A-M	85 ~ 264	53	6.05	6.6	8.55	---
TPP 450-112-MB3	85 ~ 264	12	---	---	---	37.5
TPP 450-115-MB3	85 ~ 264	15	---	---	---	30
TPP 450-124-MB3	85 ~ 264	24	---	---	---	18.75
TPP 450-128-MB3	85 ~ 264	28	---	---	---	16.1
TPP 450-136-MB3	85 ~ 264	36	---	---	---	12.5
TPP 450-148-MB3	85 ~ 264	48	---	---	---	9.4
TPP 450-153-MB3	85 ~ 264	53	---	---	---	8.55
TPP 450-112-MB2	85 ~ 264	12	---	---	---	37.5
TPP 450-115-MB2	85 ~ 264	15	---	---	---	30
TPP 450-124-MB2	85 ~ 264	24	---	---	---	18.75
TPP 450-128-MB2	85 ~ 264	28	---	---	---	16.1
TPP 450-136-MB2	85 ~ 264	36	---	---	---	12.5
TPP 450-148-MB2	85 ~ 264	48	---	---	---	9.4
TPP 450-153-MB2	85 ~ 264	53	---	---	---	8.55
TPP 450-112-MB1	85 ~ 264	12	---	---	---	37.5
TPP 450-115-MB1	85 ~ 264	15	---	---	---	30
TPP 450-124-MB1	85 ~ 264	24	---	---	---	18.75
TPP 450-128-MB1	85 ~ 264	28	---	---	---	16.1
TPP 450-136-MB1	85 ~ 264	36	---	---	---	12.5
TPP 450-148-MB1	85 ~ 264	48	---	---	---	9.4
TPP 450-153-MB1	85 ~ 264	53	---	---	---	8.55

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			Natural convection	Conduction cooling	Forced air cooling	
					21 CFM External Fan	Internal Fan
	VAC	VDC	A	A	A	A
TPP 450-112-M	85 ~ 264	12	---	---	---	37.5
TPP 450-115-M	85 ~ 264	15	---	---	---	30
TPP 450-124-M	85 ~ 264	24	---	---	---	18.75
TPP 450-128-M	85 ~ 264	28	---	---	---	16.1
TPP 450-136-M	85 ~ 264	36	---	---	---	12.5
TPP 450-148-M	85 ~ 264	48	---	---	---	9.4
TPP 450-153-M	85 ~ 264	53	---	---	---	8.55
TPP 450-112-MB6	85 ~ 264	12	20.8	23.3	37.5	---
TPP 450-115-MB6	85 ~ 264	15	16.6	18.6	30	---
TPP 450-124-MB6	85 ~ 264	24	13.3	14.55	18.75	---
TPP 450-128-MB6	85 ~ 264	28	11.4	12.5	16.1	---
TPP 450-136-MB6	85 ~ 264	36	8.9	9.72	12.5	---
TPP 450-148-MB6	85 ~ 264	48	6.65	7.3	9.4	---
TPP 450-153-MB6	85 ~ 264	53	6.05	6.6	8.55	---
TPP 450-112-MB5	85 ~ 264	12	20.8	23.3	37.5	---
TPP 450-115-MB5	85 ~ 264	15	16.6	18.6	30	---
TPP 450-124-MB5	85 ~ 264	24	13.3	14.55	18.75	---
TPP 450-128-MB5	85 ~ 264	28	11.4	12.5	16.1	---
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Test item particulars : None	
Classification of installation and use : Internal	
Supply Connection : Non-detachable cord	
Possible test case verdicts: - test case does not apply to the test object..... : N/A - test object does meet the requirement..... : P (Pass) - test object does not meet the requirement..... : F (Fail)	
Testing : Date of receipt of test item : 2018/04/25	
General remarks:	
"(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report. Throughout this report a <input type="checkbox"/> comma / <input checked="" type="checkbox"/> point is used as the decimal separator.	
Manufacturer's Declaration per sub-clause 4.2.5 of IEC 60950-1:	
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided :	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> Not applicable
When differences exist; they shall be identified in the General product information section.	
Name and address of factory (ies) : TRACO ELECTRONIC AG Sihlbruggstrasse 111 CH-6340 Baar Switzerland	

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General product information:

Classification of installation and use : Internal
Device type (component/sub-assembly/equipment/system) : Equipment
Intended use (including type of patient, application location) : Home
Mode of operation : See following 1.2 EUT Operation Modes
Supply connection : Continuous
Other options included : None

Software and Firmware Version: N/A

Prototype : ☐ Production Version: ☒

Unit(s) Tested (include serial numbers):

Unit(s): 3

Series numbers: TPP 450-124A-M; TPP 450-124-MB3; TPP 450-124-MB2

Rationale for number of samples tested:

3

Intended Use:

The intention is to qualify the EUTs to 60601-1-2, so the EUT can be incorporated into another manufacturer's final product (whether it's an ME or ME System).

Intended healthcare environments (Specify environment: Professional, Home, Aircraft, Special or Other (if other please describe)):

Home.

Any deviations from the Basic EMC standards or from this collateral standard:

None

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1.1 Equipment Description

N/A

1.1.1 Equipment Marking Plate



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1.1.2 Supporting Equipment Used During Test:

Use*	Product Type	Manufacturer	Model	Comments
EUT	AC-DC POWER SUPPLY	TRACO	TPP 450-124A-MB4	N/A
EUT	AC-DC POWER SUPPLY	TRACO	TPP 450-124-MB2	N/A
EUT	AC-DC POWER SUPPLY	TRACO	TPP 450-124-MB3	N/A

Note: * Use one of the following:

EUT - Equipment Under Test

AE - Auxiliary/Associated Equipment

SIM - Simulator (Not Subjected to Test) *Note: Use abbreviations:

1.1.3 Input/output Ports:

Port No.	Name	Type*	Cable Max. >3m	Cable Shielded	Comments (Sip/Sop lines must include description of use)
0	Enclosure	N/E	—	—	-
1	Power Cable	AC	1m	Non-shielding	Input port
2	DC Output	DC	1m	Non-shielding	Output port

Supplementary information:

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

1.1.4 EUT Internal Operating Frequencies:

Frequency (MHz)	Description	Frequency (MHz)	Description
<108 MHz	N/A	N/A	N/A
-	-	-	-
-	-	-	-

Supplementary information:

None

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1.1.5 Power Interface

Mode No.	Voltage (V)	Current (A)	Power (W)	Frequency (DC/AC-Hz)	Phases (No.)	Comments
Rated	AC100~240V	5.8	-	AC	-	AC Input port
Rated	AC100~240V	18.75	-	DC	-	DC Output port
Supplementary information: None						

1.2 EUT Operation Modes:

Mode #	Description
1	EUT(TPP 450-124A-MB4) + Full Load + GND
2	EUT(TPP 450-124-MB2) + Full Load + GND
3	EUT(TPP 450-124-MB3) + Full Load + GND
Supplementary information: None	

1.3 EUT Configuration Modes

Mode #	Description
1, 2, 3	<ol style="list-style-type: none"> Place the EUT on the iron plate, connect the resistor and INPUT power cord according to the instructions. The ground wire of the power cord is locked on the iron plate, and the specified power supply is switched on. Due to overheating in the full load, please add fan cooling Start the test
Supplementary information: None	

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

Description of Basic Safety and Essential Performance

The intention is to qualify the EUTs to 60601-1-2, so the EUT can be incorporated into another manufacturer's final product (whether it's an ME or ME System).

Description how the BASIC SAFETY and ESSENTIAL PERFORMANCE were monitored during each test

During the test, observe whether the EUT is normally supplied.

Immunity Pass/Fail Criteria

PASS Criteria: EUT normal operation.

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1.5 Configuration Block Diagram

EMI&EMS
Mode 1~3:



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1.6 Compliance Summary

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

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

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1.7 Result Summary

Requirement – Test	Result/Comments	Verdict
Clause 7 - Emissions		
Classification		—
Class A or B.....:	Class B	—
Group 1 or 2	Group 1	—
CISPR 11, 14-1, 32 or ISO 7137	CISPR 11	—
Conducted RF Emissions		P
Radiated RF Emissions		P
Disturbance Power (if applicable).....:	N/A	N/A
Harmonic Distortion per IEC61000-3-2 (Class A, B, C, D):	Class A、D	P
Voltage Fluctuations and Flicker per IEC61000-3-3		P
Clause 8 - Immunity		
Electrostatic Discharges		P
Radiated RF EM Fields and Proximity Wireless fields		P
Electrical Fast Transients and bursts		P
Surges		P
Conducted Disturbances, induced by RF fields		P
Voltage Dips and Interruptions		P
Rated Power-frequency Magnetic Field		P

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1.8 Test Conditions and Results – Conducted Emissions

CISPR 11	TEST: Limits of mains terminal disturbance voltage				Verdict
Method: The AMN placed 0,8 m from the boundary of the unit under test and bonded to a ground reference plane. This distance was between the closest points of the AMN and the EUT. All other units of the EUT and associated equipment were at least 0,8 m from the AMN. All power was connected to the system through Artificial Mains Network (AMN). Conducted voltage measurements on mains lines were made at the output of the AMN.					P
Laboratory Parameters		Required prior to the test		During the test	
Ambient Temperature		10 to 40 °C		22°C	
Relative Humidity		10 to 90 %		50%	
Fully configured sample scanned over the following frequency range		Frequency range on each side of line	Measurement Point		
		150kHz to 30MHz	Mains		
Equipment mode		Power interface mode	AC 230V, 50Hz		
		EUT configurations mode			
		Operation mode	Mode 1, 2, 3		
Limits – Group 1 - Class A					
Frequency (MHz)	Limit dB (µV)				
	Quasi-Peak	Result*	Average	Result*	
0.15 to 0.50	79	-	66	-	
0.50 to 30	73	-	60	-	
Limits - Group 2 - Class A					
Frequency (MHz)	Limit dB (µV)				
	Quasi-Peak	Result*	Average	Result*	
0.15 to 0.50	100	-	90	-	
0.50 to 5	86	-	76	-	
5 to 30	90 to 70	-	80 to 60	-	
Limits - Group 2 - Class A					
Mains supply currents in excess of 100 A per phase					
Frequency (MHz)	Limit dB (µV)				
	Quasi-Peak	Result*	Average	Result*	
0.15 to 0.50	130	-	120	-	
0.50 to 5	125	-	115	-	
5 to 30	115	-	105	-	

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

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

SGS Conducted_Emission HWAYA Conducted Room No.A EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
EMI Test Receiver	R&S	ESCI 3	101311	2017/6/23	2018/6/22
Coaxial Cables	EMC Instruments Corp	EMCRG58-BM-BM-3000	160812	2017/8/12	2018/8/11
LISN	SCHWARZBECK	NSLK 8127	8127-648	2017/6/18	2018/6/17
Pulse Limiter	Narda S.T.S.	PMM PL01	1110X30602	2017/8/12	2018/8/11
LISN	Schwarzbeck	NSLK 8128	NSLK8128-300	2017/9/4	2018/9/3
Test S/W	Farad	EZ-EMC	Ver. SGS-03A2	N.C.R.	N.C.R.

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No.2, Keji 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)
Measurement Uncertainty of Conducted Emission
Expanded uncertainty U_{lab}(K=2) of conducted emission is 2.25 dB
Theory values uncertainty U_{cispr 16-4-2 :2011+A1_2014} (K=2) of AC mains conducted Emission is 3.44dB

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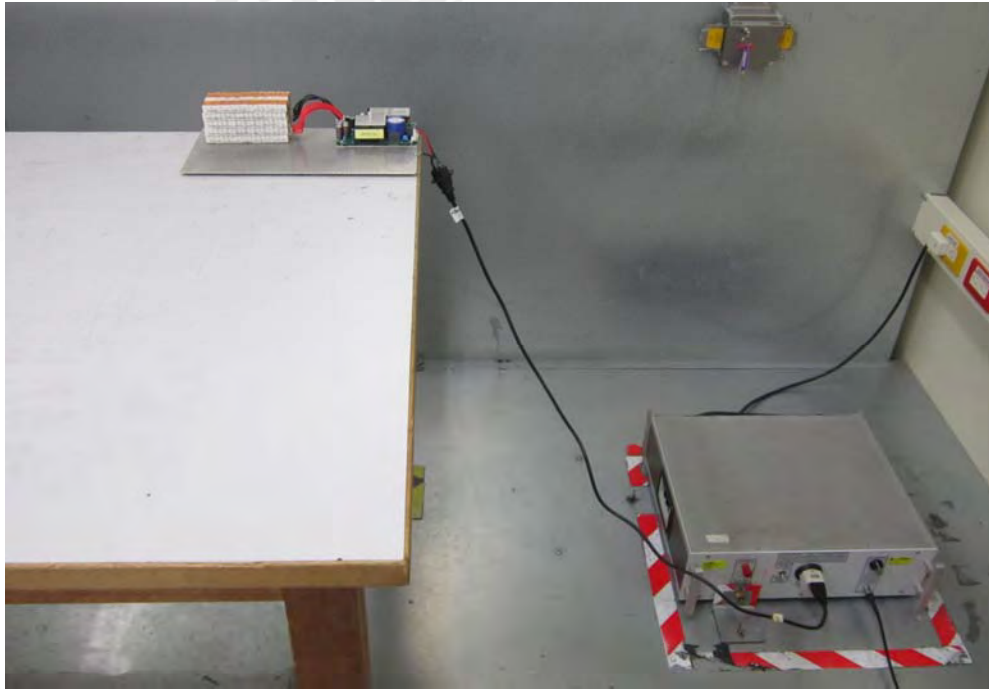
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Photo of test setup for Mains Terminal Disturbance Voltage Measurement

Model: TPP 450-124A-MB4

Mode 1_ +



Mode 1_ -



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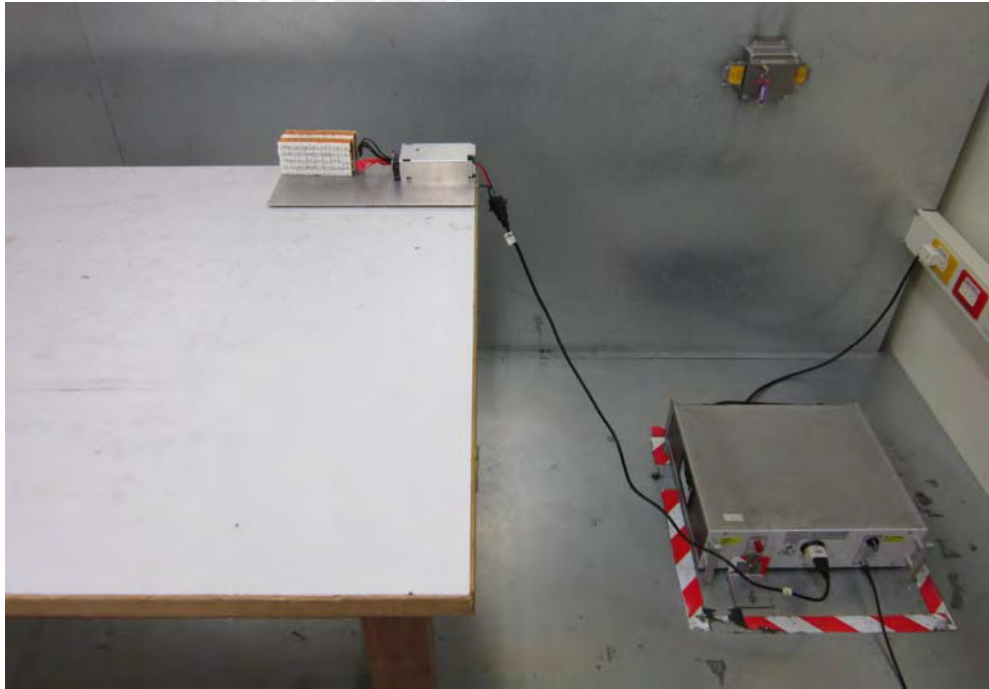
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Photo of test setup for Mains Terminal Disturbance Voltage Measurement

Model: TPP 450-124-MB2

Mode 2_ +



Mode 2_ -



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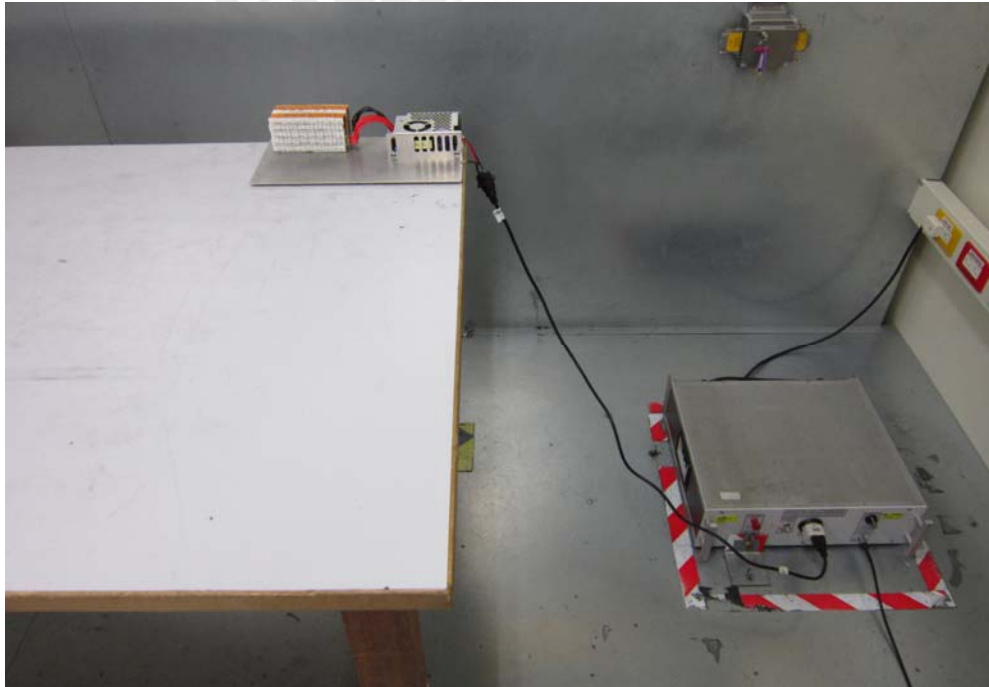
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Photo of test setup for Mains Terminal Disturbance Voltage Measurement

Model: TPP 450-124-MB3

Mode 3_+



Mode 3_-



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Graphical representation of Mains Terminal Disturbance Voltage Measurement

Model: TPP 450-124A-MB4
Mode_1_L

Site : Conduction Room

Phase: L1

Temperature: 22 °C

Limit: CISPR11 Class B Conduction(QP)

Power: AC 230V/50Hz

Humidity: 50 %

Mode: Mode_1

Note:

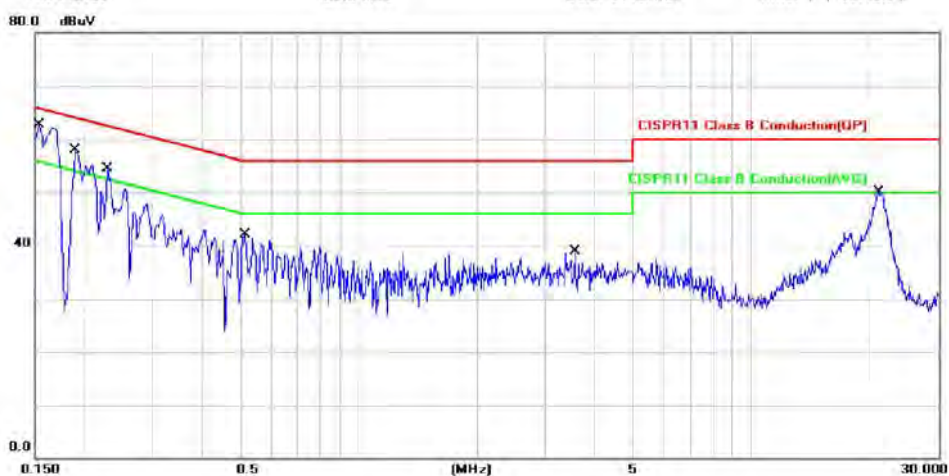
Conducted Emission

File : 40123

Data : #56

Date: 2018/4/27

Time: 下午 06:12:34



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1	*	0.1540	62.03	0.04	62.07	65.78	-3.71	QP	
2		0.1540	46.53	0.04	46.57	55.78	-9.21	AVG	
3		0.1900	54.71	0.03	54.74	64.04	-9.30	QP	
4		0.1900	37.29	0.03	37.32	54.04	-16.72	AVG	
5		0.2300	51.06	0.03	51.09	62.45	-11.36	QP	
6		0.2300	34.26	0.03	34.29	52.45	-18.16	AVG	
7		0.5140	38.92	0.05	38.97	56.00	-17.03	QP	
8		0.5140	23.77	0.05	23.82	46.00	-22.18	AVG	
9		3.5580	31.32	0.35	31.67	56.00	-24.33	QP	
10		3.5580	21.04	0.35	21.39	46.00	-24.61	AVG	
11		21.1020	44.02	1.01	45.03	60.00	-14.97	QP	
12		21.1020	35.81	1.01	36.82	50.00	-13.18	AVG	

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

File : 40123\Data : #56

Page: 1

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Graphical representation of Mains Terminal Disturbance Voltage Measurement

Mode_1_N

Site : Conduction Room

Phase: N

Temperature: 22 °C

Limit: CISPR11 Class B Conduction(QP)

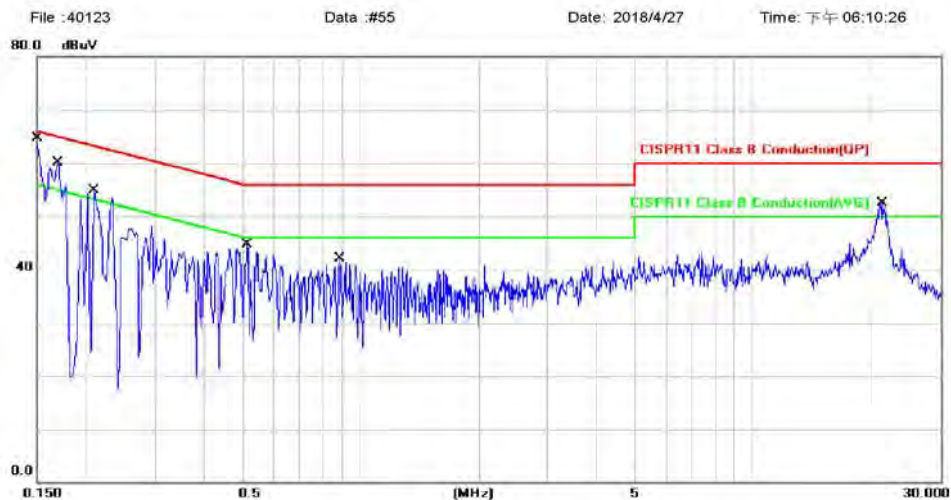
Power: AC 230V/50Hz

Humidity: 50 %

Mode: Mode_1

Note:

Conducted Emission



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1	*	0.1500	61.84	0.12	61.96	66.00	-4.04	QP	
2		0.1500	47.15	0.12	47.27	56.00	-8.73	AVG	
3		0.1700	57.05	0.12	57.17	64.96	-7.79	QP	
4		0.1700	37.56	0.12	37.68	54.96	-17.28	AVG	
5		0.2100	51.36	0.11	51.47	63.21	-11.74	QP	
6		0.2100	35.90	0.11	36.01	53.21	-17.20	AVG	
7		0.5180	41.20	0.12	41.32	56.00	-14.68	QP	
8		0.5180	25.39	0.12	25.51	46.00	-20.49	AVG	
9		0.8860	38.56	0.13	38.69	56.00	-17.31	QP	
10		0.8860	26.04	0.13	26.17	46.00	-19.83	AVG	
11		21.3500	45.79	0.77	46.56	60.00	-13.44	QP	
12		21.3500	37.33	0.77	38.10	50.00	-11.90	AVG	

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

File : 40123\Data : #55

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Graphical representation of Mains Terminal Disturbance Voltage Measurement

Model: TPP 450-124-MB2
Mode 2_L

Site : Conduction Room

Phase: L1

Temperature: 22 °C

Limit: CISPR11 Class B Conduction(QP)

Power: AC 230V/50Hz

Humidity: 50 %

Mode: Mode_2

Note:

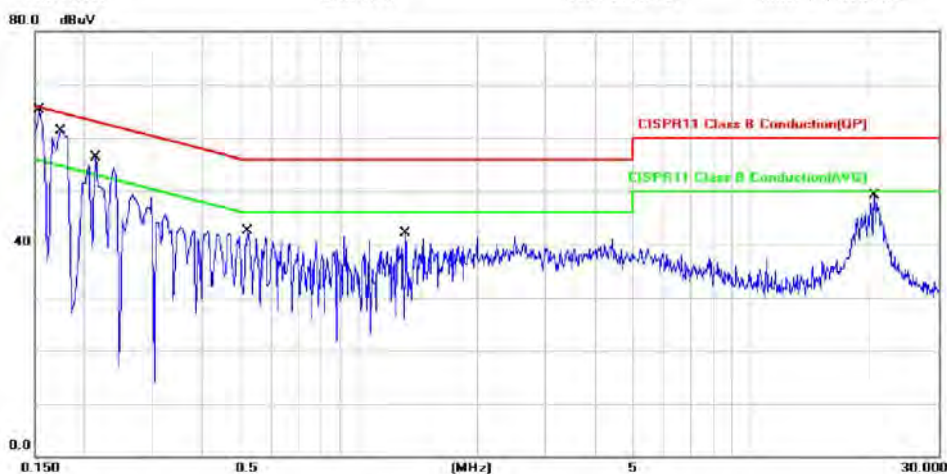
Conducted Emission

File : 40123

Data : #58

Date: 2018/4/27

Time: 下午 06:27:38



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1	*	0.1540	62.84	0.04	62.88	65.78	-2.90	QP	
2		0.1540	47.71	0.04	47.75	55.78	-8.03	AVG	
3		0.1740	58.30	0.04	58.34	64.77	-6.43	QP	
4		0.1740	36.81	0.04	36.85	54.77	-17.92	AVG	
5		0.2140	53.26	0.03	53.29	63.05	-9.76	QP	
6		0.2140	37.65	0.03	37.68	53.05	-15.37	AVG	
7		0.5220	38.04	0.05	38.09	56.00	-17.91	QP	
8		0.5220	25.79	0.05	25.84	46.00	-20.16	AVG	
9		1.3180	36.88	0.12	37.00	56.00	-19.00	QP	
10		1.3180	24.33	0.12	24.45	46.00	-21.55	AVG	
11		20.5500	37.57	1.00	38.57	60.00	-21.43	QP	
12		20.5500	29.43	1.00	30.43	50.00	-19.57	AVG	

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

File : 40123\Data : #58

Page: 1

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Graphical representation of Mains Terminal Disturbance Voltage Measurement

Mode_2_N

Site : Conduction Room

Phase: N

Temperature: 22 °C

Limit: CISPR11 Class B Conduction(QP)

Power: AC 230V/50Hz

Humidity: 50 %

Mode: Mode_2

Note:

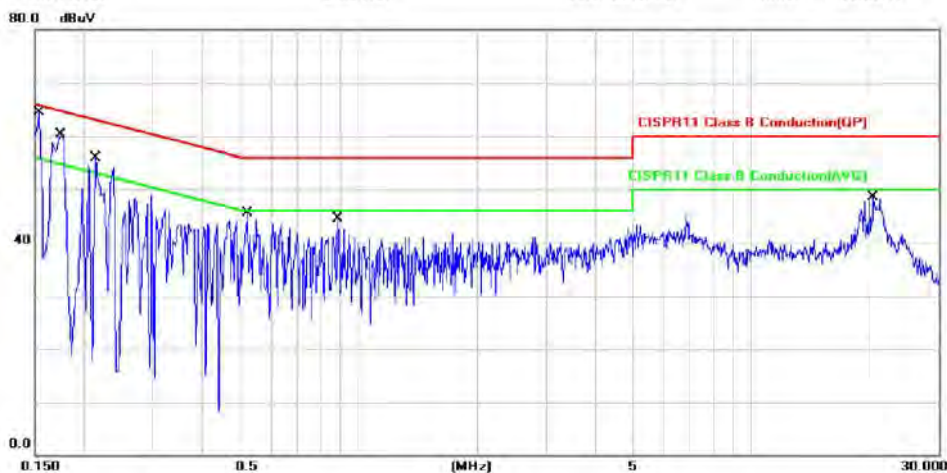
Conducted Emission

File :40123

Data :#57

Date: 2018/4/27

Time: 下午 06:25:17



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Detector	Comment
		MHz	Level	Factor	ment				
			dBuV	dB	dBuV	dBuV	dB		
1	*	0.1540	61.73	0.12	61.85	65.78	-3.93	QP	
2		0.1540	47.26	0.12	47.38	55.78	-8.40	AVG	
3		0.1740	57.28	0.12	57.40	64.77	-7.37	QP	
4		0.1740	35.99	0.12	36.11	54.77	-18.66	AVG	
5		0.2140	52.96	0.11	53.07	63.05	-9.98	QP	
6		0.2140	37.16	0.11	37.27	53.05	-15.78	AVG	
7		0.5220	40.61	0.12	40.73	56.00	-15.27	QP	
8		0.5220	27.20	0.12	27.32	46.00	-18.68	AVG	
9		0.8860	39.07	0.13	39.20	56.00	-16.80	QP	
10		0.8860	27.64	0.13	27.77	46.00	-18.23	AVG	
11		20.4620	39.26	0.75	40.01	60.00	-19.99	QP	
12		20.4620	30.55	0.75	31.30	50.00	-18.70	AVG	

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

File :40123\Data :#57

Page: 1

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Graphical representation of Mains Terminal Disturbance Voltage Measurement

Model: TPP 450-124-MB3
Mode 3_L

Site : Conduction Room

Phase: L1

Temperature: 22 °C

Limit: CISPR11 Class B Conduction(QP)

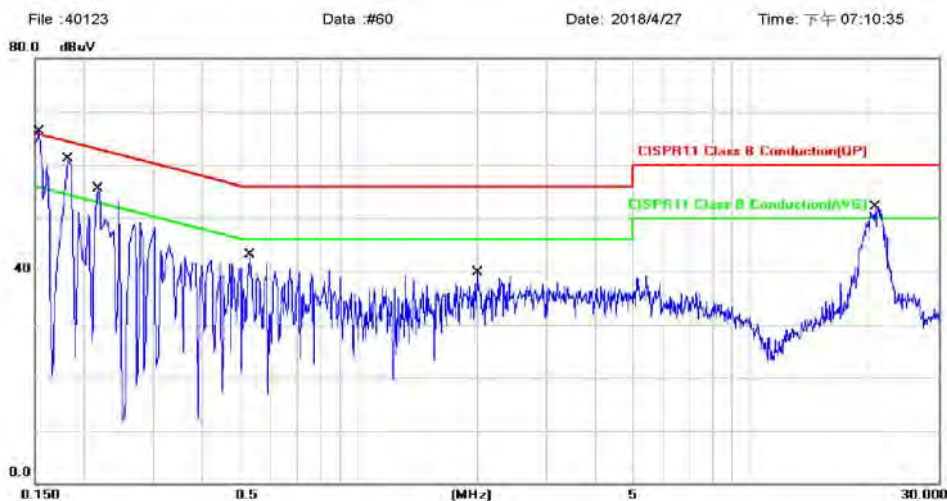
Power: AC 230V/50Hz

Humidity: 50 %

Mode: Mode_3

Note:

Conducted Emission



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1	*	0.1540	63.01	0.04	63.05	65.78	-2.73	QP	
2		0.1540	47.68	0.04	47.72	55.78	-8.06	AVG	
3		0.1820	56.70	0.03	56.73	64.39	-7.66	QP	
4		0.1820	34.44	0.03	34.47	54.39	-19.92	AVG	
5		0.2180	53.84	0.03	53.87	62.89	-9.02	QP	
6		0.2180	36.84	0.03	36.87	52.89	-16.02	AVG	
7		0.5300	37.85	0.05	37.90	56.00	-18.10	QP	
8		0.5300	24.49	0.05	24.54	46.00	-21.46	AVG	
9		2.0060	33.41	0.24	33.65	56.00	-22.35	QP	
10		2.0060	21.94	0.24	22.18	46.00	-23.82	AVG	
11		20.6860	42.85	1.01	43.86	60.00	-16.14	QP	
12		20.6860	30.89	1.01	31.90	50.00	-18.10	AVG	

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

File : 40123\Data : #60

Page: 1

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Graphical representation of Mains Terminal Disturbance Voltage Measurement

Mode_3_N

Site : Conduction Room

Phase: N

Temperature: 22 °C

Limit: CISPR11 Class B Conduction(QP)

Power: AC 230V/50Hz

Humidity: 50 %

Mode: Mode_3

Note:

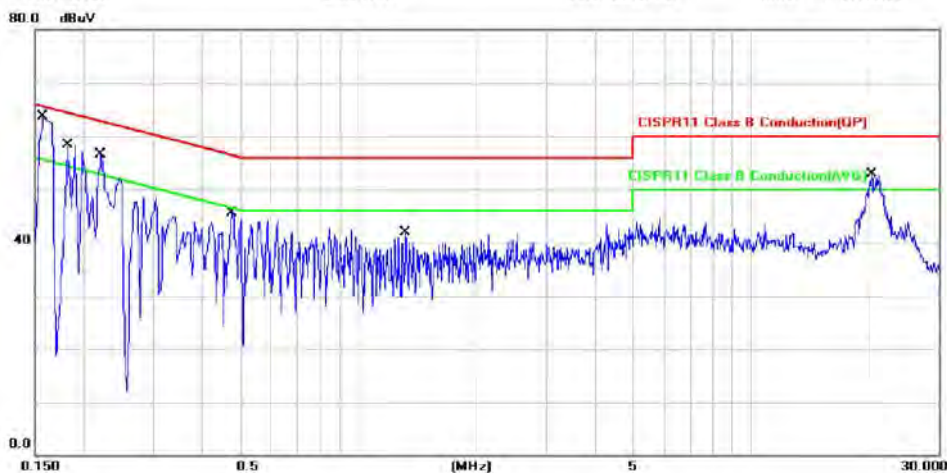
Conducted Emission

File :40123

Data :#59

Date: 2018/4/27

Time: 下午 07:08:58



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1	*	0.1580	60.93	0.12	61.05	65.57	-4.52	QP	
2		0.1580	45.99	0.12	46.11	55.57	-9.46	AVG	
3		0.1820	55.59	0.11	55.70	64.39	-8.69	QP	
4		0.1820	33.27	0.11	33.38	54.39	-21.01	AVG	
5		0.2220	53.15	0.11	53.26	62.74	-9.48	QP	
6		0.2220	35.76	0.11	35.87	52.74	-16.87	AVG	
7		0.4780	41.80	0.12	41.92	56.37	-14.45	QP	
8		0.4780	30.22	0.12	30.34	46.37	-16.03	AVG	
9		1.3220	36.48	0.17	36.65	56.00	-19.35	QP	
10		1.3220	23.61	0.17	23.78	46.00	-22.22	AVG	
11		20.2300	42.22	0.74	42.96	60.00	-17.04	QP	
12		20.2300	30.93	0.74	31.67	50.00	-18.33	AVG	

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

File :40123\Data :#59

Page: 1

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CISPR 32	TEST: Limits of mains terminal disturbance voltage (CISPR 32:2015)			Verdict
Method: The AMN placed 0,8 m from the boundary of the unit under test and bonded to a ground reference plane. This distance was between the closest points of the AMN and the EUT. All other units of the EUT and associated equipment were at least 0,8 m from the AMN. All power was connected to the system through Artificial Mains Network (AMN). Conducted voltage measurements on mains lines were made at the output of the AMN.				N/A
Laboratory Parameters		Required prior to the test		During the test
Ambient Temperature		10 to 40 °C		-
Relative Humidity		10 to 90 %		-
Fully configured sample scanned over the following frequency range		Frequency range on each side of line	Measurement Point	
		150kHz to 30MHz	Mains	
Equipment mode		Power interface mode	-	
		EUT configurations mode	-	
		Operation mode	-	
Limits – Class A				
Frequency (MHz)	Limit dB (µV)			
	Quasi-Peak	Result *	Average	Result *
0.15 to 0.50	79	-	66	-
0.50 to 30	73	-	60	-
Limits - Class B				
Frequency (MHz)	Limit dB (µV)			
	Quasi-Peak	Result *	Average	Result *
0.15 to 0.50	66 to 56	-	56 to 46	-
0.50 to 5	56	-	46	-
5 to 30	60	-	50	-
Supplementary information: * - The result in tables may be a minimum margin to the limit.				
EUT powered at one of the Nominal input voltages and frequencies.				

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

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Limits – Asymmetric mode conducted emissions from Class B equipment

Frequency (MHz)	Limit dB (μV)				
	Coupling device	Detector type / bandwidth	Class B voltage limits dB(uV)	Class B current limits dB(μA)	Result *
0.15 to 0.50	AAN	Quasi Peak / 9 kHz	84 to 74	n/a	-
0.50 to 30			74		-
0.15 to 0.50	AAN	Average / 9 kHz	74 to 64		-
0.50 to 30			64		-
0.15 to 0.50	CVP and current probe	Quasi Peak / 9 kHz	84 to 74	40 to 30	-
0.50 to 30			74	30	-
0.15 to 0.50	CVP and current probe	Average / 9 kHz	74 to 64	30 to 20	-
0.50 to 30			64	20	-
0.15 to 0.50	Current probe	Quasi Peak / 9 kHz	n/a	40 to 30	-
0.50 to 30				30	-
0.15 to 0.50	Current probe	Average / 9 kHz		30 to 20	-
0.50 to 30				20	-

Supplementary information: * - The result in tables may be a minimum margin to the limit.

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

Test Equipment Used

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

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Photo of test setup for Mains Terminal Disturbance Voltage Measurement

N/A

Graphical representation of Mains Terminal Disturbance Voltage Measurement

N/A

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CISPR 14	TEST: Limits of terminal disturbance voltage				Verdict
Method: The AMN was placed 0,8 m from the boundary of the unit under test and bonded to a ground reference plane. This distance was between the closest points of the AMN and the EUT. All other units of the EUT and associated equipment was at least 0,8 m from the AMN. All power was connected to the system through Artificial Mains Network (AMN). Conducted voltage measurements on mains lines were made at the output of the AMN.					N/A
Laboratory Parameters:		Required prior to the test		During the test	
Ambient Temperature		10 to 40 °C		-	
Relative Humidity		10 to 90 %		-	
Fully configured sample scanned over the following frequency range (see note 1)		Frequency range on each side of line	Measurement Point		
		148.5 kHz to 30MHz	Mains, Load Terminals, Additional Terminals		
Equipment mode		Power interface mode	-		
		EUT configurations mode	-		
		Operation mode	-		
Limits – Mains Terminal					
Frequency (MHz)	Limit dB (µV)				
	Quasi-Peak	Result *	Average	Result *	
0.15 to 0.50	66 to 56	-	59 to 46	-	
0.50 to 5	56	-	46	-	
5 to 30	60	-	50	-	
Limits - Load /Additional Terminals					
Frequency (MHz)	Limit dB (µV)				
	Quasi-Peak	Result *	Average	Result *	
0.15 to 0.50	80	-	70	-	
0.50 to 5	74	-	64	-	
5 to 30	74	-	64	-	
Supplementary information: * - The result in this table may be a minimum margin to the limit.					
EUT powered at one of the Nominal input voltages and frequencies.					
Note 1: the World Administrative Radio-Communications Conference (WARC) has in 1979 reduced the lower frequency limit in region 1 to 148.5 kHz; for applications falling in the scope of this standard, tests at 150 kHz are considered adequate, since 148,5 kHz falls within the receiver bandwidth. In limit tables 150 kHz used.					

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ISO 7137	TEST: Limits of mains terminal and I/O disturbance current		Verdict
<u>Method:</u> Measurements are made with a current probe. Tests are setup per Figure 21-6 of DO-160G. The current probe is installed five centimetres from the EUT. If the EUT connector plus back shell length exceeds five centimetres the probe shall be placed as close to the connector back shell as possible and the position noted.			N/A
Laboratory Parameters	Required prior to the test	During the test	
Ambient Temperature	10 to 40 °C	-	
Relative Humidity	10 to 90 %	-	
Fully configured sample scanned over the following frequency range	Frequency range on each side of line	Measurement Point	
	150kHz to 152MHz	Mains	
	150kHz to 152MHz	I/O	
Equipment mode	Power interface mode	-	
	EUT configurations mode	-	
	Operation mode	-	
Limits – Power Lines			
Frequency (MHz)	Limit dB (µA)		
	Quasi-Peak	Results *	
0.15 to 2	53 to 20	-	
2 to 30	2	-	
30 to 152	30	-	
Limits – I/O Line			
Frequency (MHz)	Limit dB (µA)		
	Quasi-Peak	Results *	
0.15 to 2	73 to 40	-	
2 to 30	40	-	
30 to 108	50	-	
30 to 152	40	-	
Supplementary information: * - The result in tables may be a minimum margin to the limit. EUT powered at one of the Nominal input voltages and frequencies.			

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Test Equipment Used					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

Graphical representation of Input/Output Terminal Disturbance Current Measurement
N/A

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

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

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1.9 Test Conditions and Results – Radiated Emissions

CISPR 11	TEST: Limits for radiated disturbance 30 MHz –1 GHz		Verdict
Method: Measurements were made in a 10-meter semi-anechoic chamber or Open Area Test Site that complies to CISPR 16. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of listed below. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in horizontal and vertical polarities. Final measurements (quasi-peak) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4 m. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.			P
Laboratory Parameters:	Required prior to the test	During the test	
Ambient Temperature	10 to 40 °C	20°C	
Relative Humidity	10 to 90 %	52%	
Fully configured sample scanned over the following frequency range	Frequency range on each side of line	Measurement Point	
	30MHz – 1GHz	10 m measurement distance***	
Equipment mode	Power interface mode	AC 230V, 50Hz	
	EUT configurations mode		
	Operation mode	Mode 1, 2, 3	
Limits – Group 1 Class A			
Frequency (MHz)	Limit dB (µV/m)		
	Quasi-Peak	Results *	
30 to 230	40(10m), 50(3m)	P	
230 to 1000	47(10m), 57(3m)	P	
Limits – Group 1 Class B			
Frequency (MHz)	Limit dB (µV/m)		
	Quasi-Peak	Results *	
30 to 230	30(10m), 40(3m)	--	
230 to 1000	37(10m), 47(3m)	--	
Limits – Group 2 Class A			
Frequency (MHz)	Limit dB (µV/m)		
	Quasi-Peak	Results *	
30 to 1000	See standard	-	

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Limits – Group 2 Class B			
Frequency (MHz)	Limit dB (µV/m)		
	Quasi-Peak	Average**	Results *
30 to 80,872	30	25	-
80,872 to 81,848	50	45	-
81,848 to 134,786	30	25	-
134,786 to 136,414	50	45	-
136,414 to 230	30	25	-
230 to 1000	37	32	-
Supplementary information: EUT powered at one of the Nominal input voltages and frequencies.			
* - The result in this table may be a minimum margin to the limit.			
** - The Average Limits Apply To Magnetron Driven Equipment Only.			
*** - Test distance used shall follow guidance from CISPR 11			

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SGS Radiated_Below_1GHz HWAYA 10m EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
EMI Test Receiver	R&S	ESCI 7	100950	2017/12/12	2018/12/11
EMI Test Receiver	R&S	ESCI 3	101343	2018/1/31	2019/1/30
Broadband Antenna	SCHWAZBECK	VULB9168	9168-628	2017/9/8	2018/9/7
Broadband Antenna	SCHWAZBECK	VULB9168	9168-629	2017/9/12	2018/9/11
Pre Amplifier	EMC Instruments Corp.	EMC330	980178	2018/3/31	2019/3/30
Pre Amplifier	EMC Instruments Corp.	EMC330	980179	2018/3/31	2019/3/30
Coaxial Cable	EMC Instruments	EMCCFD400-NM-NM	150917	2017/9/18	2018/9/17
Coaxial Cable	EMC Instruments	EMCCFD400-NM-NM	150919	2017/9/18	2018/9/17
Coaxial Cable	EMC Instruments	EMCCFD400-NM-NM	150820	2017/9/18	2018/9/17
Coaxial Cable	EMC Instruments	EMCCFD400-NM-NM	150918	2017/9/18	2018/9/17
Coaxial Cable	EMC Instruments	EMCCFD400-NM-NM	150821	2017/9/18	2018/9/17
Coaxial Cable	EMC Instruments	EMCCFD400-NM-NM	150822	2017/9/18	2018/9/17
Controller	MF	MF-7802	N/A	N.C.R.	N.C.R.
Controller	MF	MF-7802	N/A	N.C.R.	N.C.R.
Antenna Master	MF	N/A	N/A	N.C.R.	N.C.R.
Antenna Master	MF	N/A	N/A	N.C.R.	N.C.R.
Antenna Master	MF	N/A	N/A	N.C.R.	N.C.R.
Turn Table	MF	N/A	N/A	N.C.R.	N.C.R.
Site NSA	Chance Most	10M Chamber	10M SAC	2017/12/31	2018/12/30
Test S/W	Farad	EZ-EMC	Ver. SGS-03A2	N.C.R.	N.C.R.
SGS Taiwan LTD. Electronics & Communication Laboratory No.2, Keji 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.) Measurement Uncertainty of Radiated Emission Expanded uncertainty U _{lab} (K=2) of radiated emission is 4.09 dB. (30MHz ~ 1000MHz) Theory values uncertainty U _{cispr} 16-4-2:2011+A1:2014 (K=2) of radiated emission is 5.22 dB. (30MHz ~ 1000MHz)					

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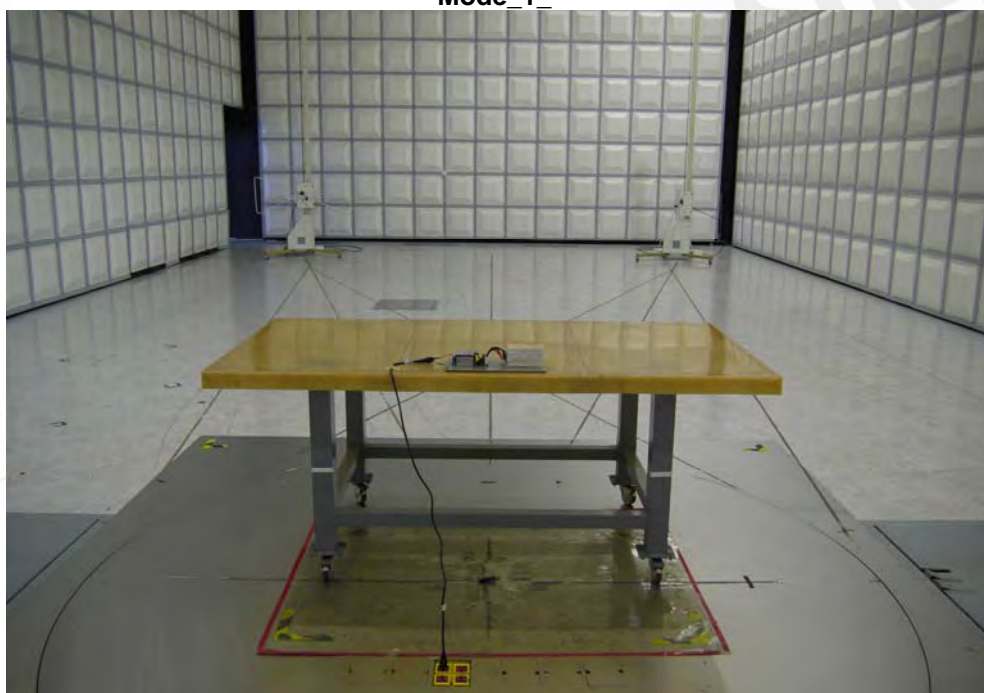
Photo of test setup for Radiated Disturbance

Model: TPP 450-124A-MB4

Mode_1_+



Mode_1_-



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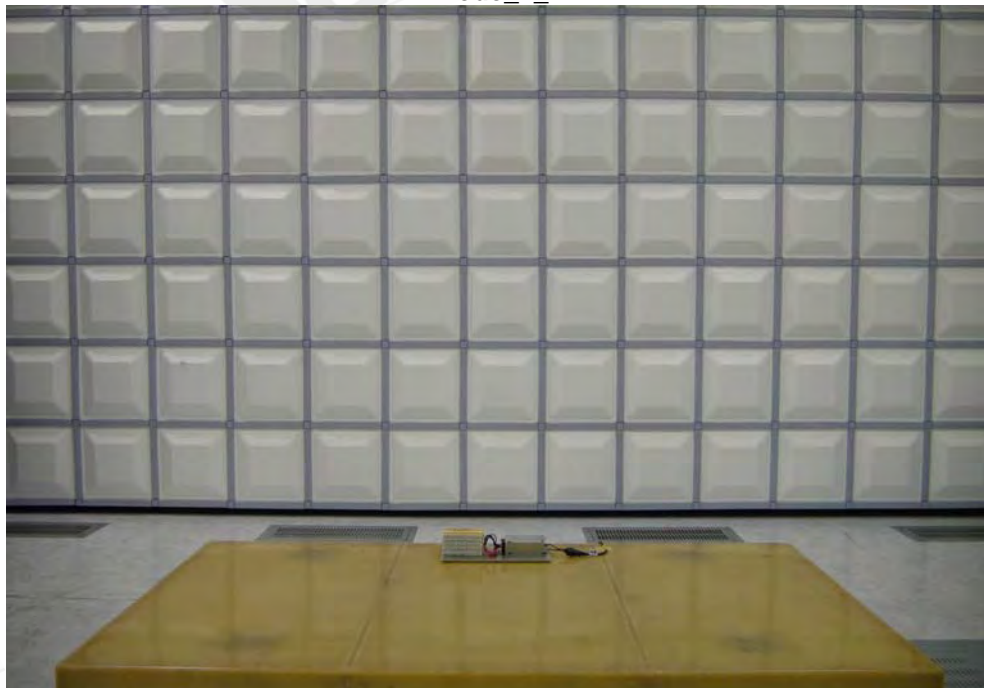
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Photo of test setup for Radiated Disturbance

Model: TPP 450-124-MB2

Mode 2_+



Mode 2_-



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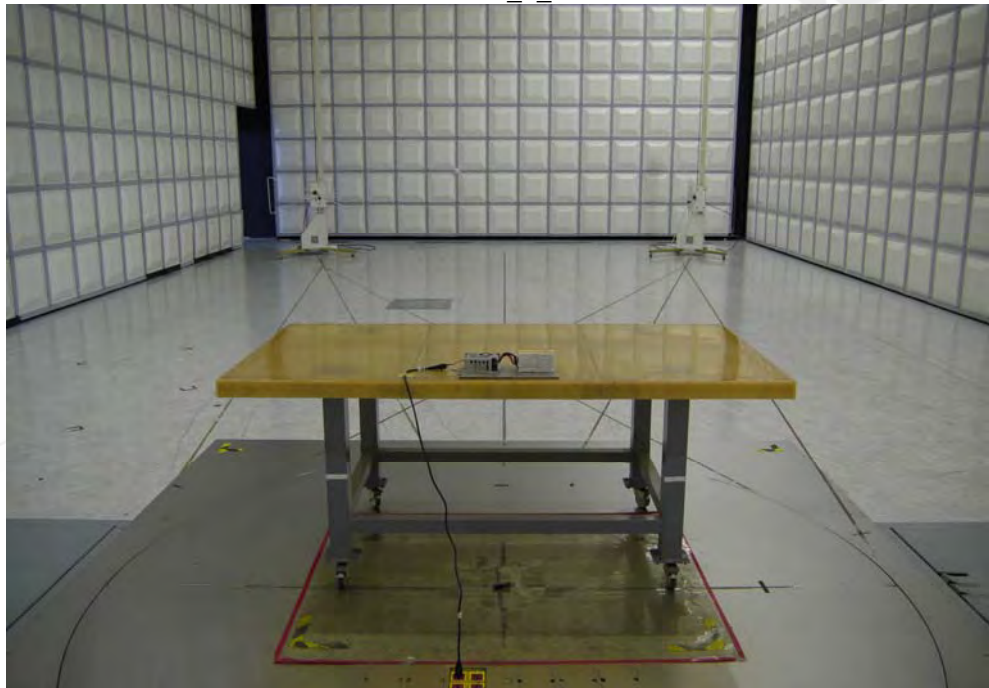
Photo of test setup for Radiated Disturbance

Model: TPP 450-124-MB3

Mode_3_+



Mode_3_-



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Graphical representation of Radiated Disturbance Measurement

Model: TPP 450-124A-MB4
Mode_1_HSite: SGS 10m Chamber
Limit: CISPR11 Class A 10M Radiation
Mode: Mode_1
Note:Polarization: **Horizontal**
Power: AC 230V/50Hz
Distance: 10mTemperature: 20 °C
Humidity: 52 %

Radiated Emission



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

File: MH-2018-40123\Data: #8

Page: 1

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Graphical representation of Radiated Disturbance Measurement

Mode_1_V

Site: SGS 10m Chamber
Limit: CISPR11 Class A 10M Radiation
Mode: Mode_1
Note:

Polarization: **Vertical**
Power: AC 230V/50Hz
Distance: 10m

Temperature: 20 °C
Humidity: 52 %

Radiated Emission



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		35.7500	33.30	-11.92	21.38	40.00	-18.62	QP	
2		51.6800	34.09	-10.83	23.26	40.00	-16.74	QP	
3 *		128.3200	49.29	-12.57	36.72	40.00	-3.28	QP	
4		182.4500	38.82	-12.64	26.18	40.00	-13.82	QP	
5		199.5900	38.08	-14.19	23.89	40.00	-16.11	QP	
6		223.1400	40.13	-14.15	25.98	40.00	-14.02	QP	

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

File: MH-2018-40123\Data: #7

Page: 1

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Graphical representation of Radiated Disturbance Measurement

Model: TPP 450-124-MB2
Mode_2_H

Site: SGS 10m Chamber

Limit: CISPR11 Class A 10M Radiation

Mode: Mode_2

Note:

Polarization: Horizontal

Power: AC 230V/50Hz

Distance: 10m

Temperature: 20 °C

Humidity: 52 %

Radiated Emission

File: MH-2018-40123

Data: #10

Date: 2018/4/26

Time: 下午 09:31:45



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		86.2600	42.11	-16.99	25.12	40.00	-14.88	QP	
2		109.3000	36.02	-14.81	21.21	40.00	-18.79	QP	
3		129.1400	36.45	-12.77	23.68	40.00	-16.32	QP	
4		184.2300	38.94	-12.99	25.95	40.00	-14.05	QP	
5 *		195.8700	41.58	-14.03	27.55	40.00	-12.45	QP	
6		221.0900	37.48	-14.26	23.22	40.00	-16.78	QP	

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

File: MH-2018-40123\Data: #10

Page: 1

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Graphical representation of Radiated Disturbance Measurement

Mode_2_V

Site: SGS 10m Chamber

Limit: CISPR11 Class A 10M Radiation

Mode: Mode_2

Note:

Polarization: Vertical

Power: AC 230V/50Hz

Distance: 10m

Temperature: 20 °C

Humidity: 52 %

Radiated Emission

File: MH-2018-40123

Data: #9

Date: 2018/4/26

Time: 下午 09:31:43



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		86.3200	42.90	-16.69	26.21	40.00	-13.79	QP	
2		114.9900	36.64	-13.80	22.84	40.00	-17.16	QP	
3	*	128.7100	39.40	-12.53	26.87	40.00	-13.13	QP	
4		181.3200	34.34	-12.44	21.90	40.00	-18.10	QP	
5		198.9400	37.21	-14.18	23.03	40.00	-16.97	QP	
6		215.5100	37.45	-14.30	23.15	40.00	-16.85	QP	

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

File: MH-2018-40123\Data: #9

Page: 1

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Graphical representation of Radiated Disturbance Measurement

Model: TPP 450-124-MB3
Mode_3_HSite: SGS 10m Chamber
Limit: CISPR11 Class A 10M Radiation
Mode: Mode_3
Note:Polarization: **Horizontal**
Power: AC 230V/50Hz
Distance: 10mTemperature: 20 °C
Humidity: 52 %

Radiated Emission



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		116.3300	37.16	-13.95	23.21	40.00	-16.79	QP	
2	*	126.0300	40.06	-13.02	27.04	40.00	-12.96	QP	
3		177.4400	36.47	-12.09	24.38	40.00	-15.62	QP	
4		192.9600	36.24	-13.92	22.32	40.00	-17.68	QP	
5		216.2400	37.68	-14.41	23.27	40.00	-16.73	QP	
6		946.6500	23.76	1.92	25.68	47.00	-21.32	QP	

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

File: MH-2018-40123\Data: #12

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Graphical representation of Radiated Disturbance Measurement

Mode_3_V

Site: SGS 10m Chamber
Limit: CISPR11 Class A 10M Radiation
Mode: Mode_3
Note:

Polarization: **Vertical**
Power: AC 230V/50Hz
Distance: 10m

Temperature: 20 °C
Humidity: 52 %

Radiated Emission



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		30.4000	33.02	-12.37	20.65	40.00	-19.35	QP	
2		35.8200	32.32	-11.92	20.40	40.00	-19.60	QP	
3		77.1700	31.27	-15.20	16.07	40.00	-23.93	QP	
4	*	126.0800	40.68	-12.79	27.89	40.00	-12.11	QP	
5		177.1600	39.05	-12.06	26.99	40.00	-13.01	QP	
6		194.9000	38.49	-14.10	24.39	40.00	-15.61	QP	

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

File: MH-2018-40123\Data: #11

Page: 1

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CISPR 32	TEST: Limits for radiated disturbance 30 MHz –XX GHz**		Verdict
Method: Measurements were made in a 10-meter semi-anechoic chamber or Open Area Test Site that complies to CISPR 16. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 10 meter below 1GHz and 3 meter above 1GHz. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in horizontal and vertical polarities. Final measurements (quasi-peak detector below 1GHz and average detector above 1GHz) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4 m. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.			N/A
Laboratory Parameters:	Required prior to the test	During the test	
Ambient Temperature	10 to 40 °C	-	
Relative Humidity	10 to 90 %	-	
Fully configured sample scanned over the following frequency range	Frequency range on each side of line	Measurement Point	
	30MHz – 1GHz	10 m measurement distance	
	1GHz – 6GHz	3 m measurement distance	
Equipment mode	Power interface mode	-	
	EUT configurations mode	-	
	Operation mode	-	
Limits – Class A			
Frequency (MHz)	Limit dB (µV/m)		
	Detector	Results *	
30 to 230	40 Quasi-Peak	-	
230 to 1000	47 Quasi-Peak	-	
1000 to 3000	56 Average, 76 Peak	-	
3000 to 6000	76 Average, 80 Peak	-	
Limits – Class B			
Frequency (MHz)	Limit dB (µV/m)		
	Detector	Results *	
30 to 230	30 Quasi-Peak	-	
230 to 1000	37 Quasi-Peak	-	
1000 to 3000	50 Average, 70 Peak	-	
3000 to 6000	54 Average, 74 Peak	-	
Supplementary information: EUT powered at one of the Nominal input voltages and frequencies.			
* - The result in this table may be a minimum margin to the limit.			
** - Input highest test frequency based on internal frequency used in the ME equipment			

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CISPR 14-1	TEST: Limits for radiated disturbance 30 MHz –1 GHz		Verdict
Method: Measurements were made in a 10-meter semi-anechoic chamber or Open Area Test Site that complies to CISPR 16. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 10 meter. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in horizontal and vertical polarities. Final measurements (quasi-peak) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4 m. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.			N/A
Laboratory Parameters:	Required prior to the test	During the test	
Ambient Temperature	10 to 40 °C	-	
Relative Humidity	10 to 90 %	-	
Fully configured sample scanned over the following frequency range	Frequency range on each side of line	Measurement Point	
	30MHz – 1GHz	10 m measurement distance	
Equipment mode	Power interface mode	-	
	EUT configurations mode	-	
	Operation mode	-	
Limits – CISPR 14-1			
Frequency (MHz)	Limit dB (µV/m)		
	Quasi-Peak	Results *	
30 to 230	30	-	
230 to 1000	37	-	
Supplementary information: EUT powered at one of the Nominal input voltages and frequencies.			
* -The result in this table may be a minimum margin to the limit.			

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ISO 7137	TEST: Limits for radiated disturbance 100 MHz –6 GHz	Verdict
<p>Method: Measurements were made in a shielded enclosure. RF absorber shall be placed above, behind, and on both sides of test setup boundary, from ceiling to ground plane. The absorber shall extend ≥ 50 cm in front of the ground plane. RF absorber shall be placed behind the test antenna, from ceiling to floor. The distance between the absorber and the antenna shall be ≥ 30 cm. Linearly polarized antennas are required for radiated tests. Measure radiated emissions using both vertically and horizontally polarized orientations. Other requirements in DO-160G, clause 21.5, shall be followed.</p> <p>If radiated RF emissions are conducted in a reverberation chamber, the procedures in DO-160G, clause 21.6, shall be followed.</p>		N/A
Laboratory Parameters:	Required prior to the test	During the test
Ambient Temperature	10 to 40 °C	-
Relative Humidity	10 to 90 %	-
Fully configured sample scanned over the following frequency range	Frequency range on each side of line	Measurement Point
	100MHz – 1GHz	0.9 m from the front of the test table
	1GHz – 6GHz	
Equipment mode	Power interface mode	-
	EUT configurations mode	-
	Operation mode	-
Limits		
Frequency (MHz)	Limit dB (μ V/m)	
	Detector	Results *
100 to 108	44.6 to 45.2 (QP)	-
108 to 152	35 to 37.5 (QP)	-
152 to 960	47.5 to 60.2 (QP)	-
960 to 1215	50.3 to 52 (AV)	-
1215 to 1525	61.9 to 63.5 (AV)	-
1525 to 1680	53.5 to 54 (AV)	-
1680 to 6000	64 to 73 (AV)	-
Supplementary information: EUT powered at one of the Nominal input voltages and frequencies.		
* -The result in this table may be a minimum margin to the limit.		

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Test Equipment Used					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

Photo of test setup for Radiated Disturbance
N/A

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Tabulated Results for Radiated Disturbance

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

Supplementary information:

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

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1.10 Test Conditions and Results – Disturbance Power Emissions

CISPR 14-1	TEST: Limits of disturbance power			Verdict
Method: Measurements were made on a ground plane that extends 1-meter minimum beyond all sides of the system under test. All power was connected to the system through Line Impedance Stabilization Networks (LISN). The lead to be measured on is stretched in a straight line for a distance sufficient to accommodate the absorbing clamp, and to permit the necessary measuring adjustment of position for tuning. The clamp is placed around the lead so as to measure a quantity proportional to the disturbance on the lead.				N/A
Laboratory Parameters:		Required prior to the test	During the test	
Ambient Temperature		15 to 35 °C	-	
Relative Humidity		30 to 60 %	-	
Fully configured sample scanned over the following frequency range		Frequency range	Measurement point	
		30 MHz to 300 MHz	Mains	
Equipment mode		Power interface mode	-	
		EUT configurations mode	-	
		Operation mode	-	
Limits disturbance power on terminals				
Frequency 30 – 300 MHz	dB(pW)			
	Quasi-Peak	Result *	Average	Result *
Household and Tools < 700 W	45 to 55	-	35 to 45	-
700 W < Tools < 1000 W	49 to 59	-	39 to 49	-
Tools >1000 W	55 to 65	-	45 to 55	-
Supplementary information: * - The result in this table may be a minimum margin to the limit.				
EUT powered at one of the Nominal input voltages and frequencies.				

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Test Equipment Used					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

Photo of test setup for Disturbance Power Emissions
N/A

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

Supplementary information:

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

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1.11 Test Conditions and Results – Harmonic Distortion

61000-3-2	TEST: Limits for Harmonic current emissions (IEC 61000-3-2:2014)		Verdict
Method: This test consists on the measurement of harmonics components of the input current which may be produced by equipment having an input current up to and including 16 A per phase, and intended to be connected to public low-voltage distribution systems. The equipment is tested under specified conditions of operation.			P
Laboratory Parameters:	Required prior to the test	During the test	
Ambient Temperature	15 to 35 °C	22°C	
Relative Humidity	30 to 60 %	50%	
Equipment mode	Power interface mode	AC 230V, 50Hz	
	EUT configurations mode		
	Operation mode	Mode 3	
Classification of Equipment.....:		Class A 、 D	
Supplementary information:			
None			

SGS Harmonic EN61000-3-2 HWAYA EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
Power Analyzer	TESEQ	CCN 1000-1	1504A02654	2018/3/23	2019/3/22
AC Power Source	TESEQ	NSG 1007	1504A02654	2018/3/23	2019/3/22
Test Software	TESEQ	Win2100 V4	Ver. 4.5.8	N.C.R.	N.C.R.
SGS Taiwan LTD. Electronics & Communication Laboratory No.2, Keji 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)					

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Photo of test setup for Harmonic Current Emissions

Model: TPP 450-124-MB3

Mode_3



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Tabulated Results for Harmonic Current Emissions

Model: TPP 450-124-MB3
Class A
Mode_3

Teseq Profile
4542 Luterbach, Switzerland

5/22/2018
7:22 PM

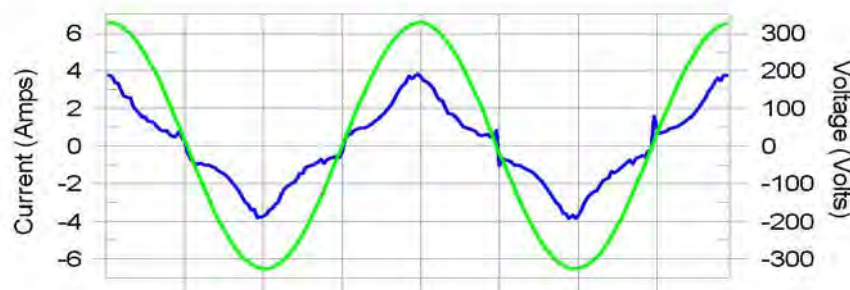
Harmonics – Class-A per Ed. 4.0 (2014)(Run time)

EUT:
Test category: Class-A per Ed. 4.0 (2014) (European limits)
Test date: 2018/5/22
Test duration (min): 10
Comment:
Customer:

Tested by:
Test Margin: 100
Start time: 下午 07:10:42
End time: 下午 07:20:54
Data file name: H-000527.cts_data

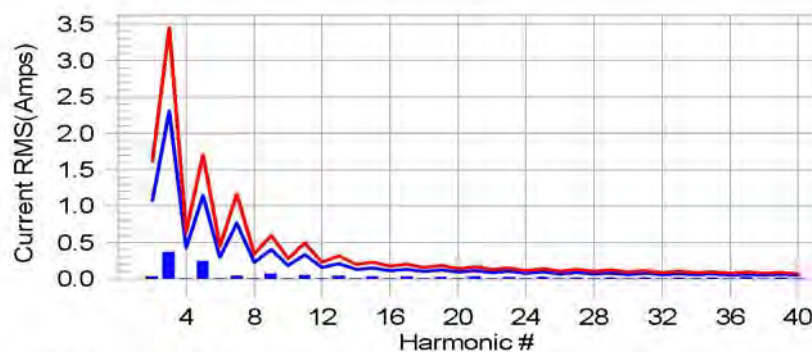
Test Result: Pass Source qualification: Normal

Current & voltage waveforms



Harmonics and Class A limit line

European Limits



Test result: Pass Worst harmonics H37-21.4% of 150% limit, H37-29.7% of 100% limit

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Teseq Proflin
4542 Luterbach, Switzerland

5/22/2018
7:22 PM

Current Test Result Summary (Run time)

EUT:
Test category: Class-A per Ed. 4.0 (2014) (European limits)
Test date: 2018/5/22
Test duration (min): 10
Comment:
Customer:

Tested by:
Test Margin: 100
Start time: 下午 07:10:42
End time: 下午 07:20:54
Data file name: H-000527.cts_data

Test Result: Pass Source qualification: Normal
THC(A): 0.465 I-THD(%): 22.8 POHC(A): 0.056 POHC Limit(A): 0.251

Highest parameter values during test:

V_{RMS} (Volts): 230.85
I_{Peak} (Amps): 3.972
I_{Fund} (Amps): 2.040
Power (Watts): 469.8

Frequency(Hz): 50.00
I_{RMS} (Amps): 2.096
Crest Factor: 1.899
Power Factor: 0.972

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.030	1.080	2.7	0.035	1.620	2.2	Pass
3	0.372	2.300	16.2	0.373	3.450	10.8	Pass
4	0.005	0.430	N/A	0.008	0.645	N/A	Pass
5	0.249	1.140	21.8	0.251	1.710	14.7	Pass
6	0.003	0.300	N/A	0.006	0.450	N/A	Pass
7	0.044	0.770	5.7	0.049	1.155	4.3	Pass
8	0.005	0.230	N/A	0.008	0.345	N/A	Pass
9	0.066	0.400	16.5	0.068	0.600	11.3	Pass
10	0.003	0.184	N/A	0.005	0.276	N/A	Pass
11	0.046	0.330	13.9	0.049	0.495	10.0	Pass
12	0.003	0.153	N/A	0.006	0.230	N/A	Pass
13	0.036	0.210	17.1	0.039	0.315	12.3	Pass
14	0.003	0.131	N/A	0.006	0.197	N/A	Pass
15	0.028	0.150	18.9	0.032	0.225	14.2	Pass
16	0.003	0.115	N/A	0.005	0.173	N/A	Pass
17	0.033	0.132	24.8	0.035	0.198	17.7	Pass
18	0.003	0.102	N/A	0.005	0.153	N/A	Pass
19	0.020	0.118	16.7	0.022	0.178	12.6	Pass
20	0.003	0.092	N/A	0.006	0.138	N/A	Pass
21	0.028	0.107	26.4	0.032	0.161	20.2	Pass
22	0.003	0.084	N/A	0.005	0.125	N/A	Pass
23	0.022	0.098	22.8	0.025	0.147	16.8	Pass
24	0.003	0.077	N/A	0.005	0.115	N/A	Pass
25	0.019	0.090	21.4	0.027	0.135	19.8	Pass
26	0.003	0.071	N/A	0.007	0.107	N/A	Pass
27	0.013	0.083	15.0	0.014	0.125	11.2	Pass
28	0.003	0.066	N/A	0.005	0.099	N/A	Pass
29	0.017	0.078	22.5	0.020	0.116	17.2	Pass
30	0.003	0.061	N/A	0.005	0.092	N/A	Pass
31	0.013	0.073	18.1	0.017	0.109	15.8	Pass
32	0.003	0.058	N/A	0.006	0.086	N/A	Pass
33	0.012	0.068	N/A	0.014	0.102	N/A	Pass
34	0.002	0.054	N/A	0.005	0.081	N/A	Pass
35	0.015	0.064	23.6	0.018	0.096	19.0	Pass
36	0.003	0.051	N/A	0.005	0.077	N/A	Pass
37	0.018	0.061	29.7	0.020	0.091	21.4	Pass
38	0.003	0.048	N/A	0.005	0.073	N/A	Pass
39	0.012	0.058	N/A	0.014	0.087	N/A	Pass
40	0.002	0.046	N/A	0.005	0.069	N/A	Pass

Teseq AG Win2100 V4.14.0

Page 2 of 3

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Teseq Profile
4542 Luterbach, Switzerland5/22/2018
7:22 PM

Voltage Source Verification Data (Run time)

EUT:
Test category: Class-A per Ed. 4.0 (2014) (European limits)
Test date: 2018/5/22
Test duration (min): 10
Comment:
Customer:

Tested by:
Test Margin: 100
Start time: 下午 07:10:42
End time: 下午 07:20:54
Data file name: H-000527.cts_data

Test Result: Pass Source qualification: Normal

Highest parameter values during test:

Voltage (Vrms): 230.85
I_{Peak} (Amps): 3.972
I_{Fund} (Amps): 2.040
Power (Watts): 469.8

Frequency(Hz): 50.00
I_{RMS} (Amps): 2.096
Crest Factor: 1.899
Power Factor: 0.972

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.032	0.462	6.94	OK
3	0.519	2.077	25.01	OK
4	0.020	0.462	4.43	OK
5	0.047	0.923	5.07	OK
6	0.024	0.462	5.27	OK
7	0.048	0.692	6.94	OK
8	0.019	0.462	4.21	OK
9	0.035	0.462	7.60	OK
10	0.016	0.462	3.50	OK
11	0.033	0.231	14.27	OK
12	0.020	0.231	8.62	OK
13	0.030	0.231	12.79	OK
14	0.011	0.231	4.62	OK
15	0.027	0.231	11.91	OK
16	0.014	0.231	5.88	OK
17	0.025	0.231	10.85	OK
18	0.016	0.231	6.73	OK
19	0.022	0.231	9.65	OK
20	0.022	0.231	9.34	OK
21	0.029	0.231	12.42	OK
22	0.013	0.231	5.57	OK
23	0.023	0.231	9.91	OK
24	0.013	0.231	5.70	OK
25	0.025	0.231	10.78	OK
26	0.013	0.231	5.67	OK
27	0.019	0.231	8.05	OK
28	0.011	0.231	4.95	OK
29	0.022	0.231	9.68	OK
30	0.012	0.231	5.41	OK
31	0.022	0.231	9.56	OK
32	0.011	0.231	4.89	OK
33	0.020	0.231	8.68	OK
34	0.012	0.231	5.09	OK
35	0.025	0.231	10.96	OK
36	0.013	0.231	5.67	OK
37	0.029	0.231	12.74	OK
38	0.014	0.231	6.07	OK
39	0.022	0.231	9.34	OK
40	0.020	0.231	8.55	OK

Teseq AG Win2100 V4.14.0

Page 3 of 3

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Tabulated Results for Harmonic Current Emissions

Model: TPP 450-124-MB3

Class D

Mode_3

Teseq Proflin
4542 Luterbach, Switzerland5/22/2018
7:35 PM

Harmonics – Class-D per Ed. 4.0 (2014)(Run time)

EUT:

Test category: Class-D per Ed. 4.0 (2014) (European limits)

Test date: 2018/5/22

Test duration (min): 10

Comment:

Customer:

Tested by:

Test Margin: 100

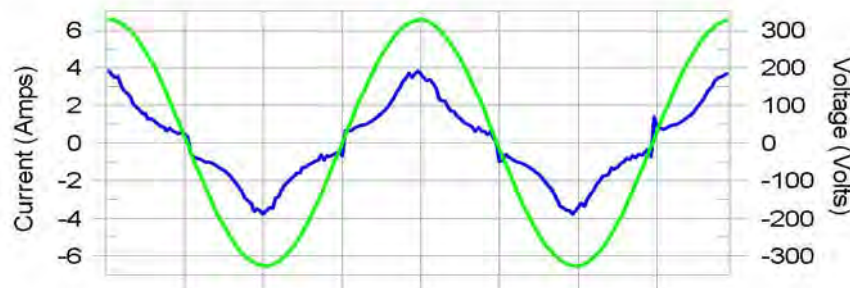
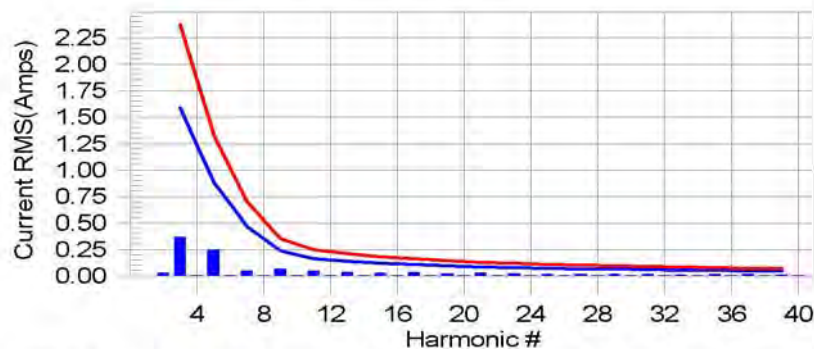
Start time: 下午 07:23:46

End time: 下午 07:33:57

Data file name: H-000528.cts_data

Test Result: Pass

Source qualification: Normal

Current & voltage waveformsHarmonics and Class D limit lineEuropean Limits

Test result: Pass Worst harmonics H37-26.4% of 150% limit, H37-36.9% of 100% limit

Teseq AG Win2100 V4.14.0

Page 1 of 4

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Teseq Proflin
4542 Luterbach, Switzerland5/22/2018
7:35 PM

Current Test Result Summary (Run time)

EUT: Test category: Class-D per Ed. 4.0 (2014) (European limits) Tested by: Test Margin: 100
 Test date: 2018/5/22 Start time: 下午 07:23:46 End time: 下午 07:33:57
 Test duration (min): 10 Data file name: H-000528.cts_data
 Comment:
 Customer:

Test Result: Pass Source qualification: Normal
 THCA: 0.463 I-THD(%): 22.9 POHC(A): 0.055 POHC Limit(A): 0.200

Highest parameter values during test:

V_{RMS} (Volts): 230.86 Frequency(Hz): 50.00
 I_{Peak} (Amps): 3.942 I_{RMS} (Amps): 2.075
 I_{Fund} (Amps): 2.019 Crest Factor: 1.903
 Power (Watts): 465.0 Power Factor: 0.972

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.029	0.000	N/A	0.031	0.000	N/A	Pass
3	0.371	1.581	23.5	0.373	2.372	15.7	Pass
4	0.004	0.000	N/A	0.006	0.000	N/A	Pass
5	0.247	0.884	27.9	0.248	1.325	18.7	Pass
6	0.003	0.000	N/A	0.004	0.000	N/A	Pass
7	0.043	0.465	9.2	0.045	0.698	6.5	Pass
8	0.006	0.000	N/A	0.007	0.000	N/A	Pass
9	0.066	0.233	28.2	0.068	0.349	19.4	Pass
10	0.003	0.000	N/A	0.005	0.000	N/A	Pass
11	0.044	0.163	27.3	0.046	0.244	18.9	Pass
12	0.002	0.000	N/A	0.004	0.000	N/A	Pass
13	0.035	0.140	25.4	0.037	0.209	17.7	Pass
14	0.003	0.000	N/A	0.006	0.000	N/A	Pass
15	0.028	0.121	22.9	0.029	0.181	16.1	Pass
16	0.003	0.000	N/A	0.005	0.000	N/A	Pass
17	0.032	0.107	30.2	0.034	0.160	21.1	Pass
18	0.003	0.000	N/A	0.005	0.000	N/A	Pass
19	0.019	0.094	20.6	0.021	0.142	14.6	Pass
20	0.003	0.000	N/A	0.006	0.000	N/A	Pass
21	0.028	0.085	32.6	0.030	0.128	23.2	Pass
22	0.002	0.000	N/A	0.005	0.000	N/A	Pass
23	0.023	0.078	29.1	0.026	0.116	22.2	Pass
24	0.003	0.000	N/A	0.005	0.000	N/A	Pass
25	0.018	0.072	25.1	0.019	0.107	18.2	Pass
26	0.003	0.000	N/A	0.006	0.000	N/A	Pass
27	0.012	0.066	N/A	0.015	0.100	N/A	Pass
28	0.003	0.000	N/A	0.005	0.000	N/A	Pass
29	0.017	0.062	28.1	0.020	0.093	21.1	Pass
30	0.003	0.000	N/A	0.005	0.000	N/A	Pass
31	0.013	0.058	22.2	0.014	0.086	16.4	Pass
32	0.003	0.000	N/A	0.006	0.000	N/A	Pass
33	0.011	0.054	N/A	0.013	0.081	N/A	Pass
34	0.003	0.000	N/A	0.005	0.000	N/A	Pass
35	0.016	0.051	31.2	0.018	0.077	24.1	Pass
36	0.003	0.000	N/A	0.004	0.000	N/A	Pass
37	0.018	0.048	36.9	0.019	0.073	26.4	Pass
38	0.003	0.000	N/A	0.004	0.000	N/A	Pass
39	0.011	0.046	N/A	0.012	0.069	N/A	Pass
40	0.003	0.000	N/A	0.005	0.000	N/A	Pass

Teseq AG Win2100 V4.14.0

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Teseq Proflin
4542 Luterbach, Switzerland

5/22/2018
7:35 PM

Note: Dynamic limits were applied for this test. The highest harmonics values in the above table may not occur at the same window as the maximum harmonics/limit ratio.

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Teseq Profline
4542 Luterbach, Switzerland5/22/2018
7:35 PM

Voltage Source Verification Data (Run time)

EUT: Tested by:
Test category: Class-D per Ed. 4.0 (2014) (European limits) Test Margin: 100
Test date: 2018/5/22 Start time: 下午 07:23:46 End time: 下午 07:33:57
Test duration (min): 10 Data file name: H-000528.cts_data
Comment:
Customer:

Test Result: Pass Source qualification: Normal

Highest parameter values during test:

Voltage (Vrms):	230.86	Frequency(Hz):	50.00
I _{Peak} (Amps):	3.942	I _{RMS} (Amps):	2.075
I _{Fund} (Amps):	2.019	Crest Factor:	1.903
Power (Watts):	465.0	Power Factor:	0.972

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.032	0.462	6.82	OK
3	0.519	2.078	24.99	OK
4	0.019	0.462	4.16	OK
5	0.046	0.923	4.99	OK
6	0.026	0.462	5.71	OK
7	0.046	0.692	6.65	OK
8	0.020	0.462	4.30	OK
9	0.036	0.462	7.88	OK
10	0.017	0.462	3.73	OK
11	0.033	0.231	14.39	OK
12	0.018	0.231	7.99	OK
13	0.033	0.231	14.33	OK
14	0.010	0.231	4.47	OK
15	0.025	0.231	11.00	OK
16	0.013	0.231	5.84	OK
17	0.026	0.231	11.33	OK
18	0.015	0.231	6.64	OK
19	0.021	0.231	9.06	OK
20	0.022	0.231	9.37	OK
21	0.029	0.231	12.47	OK
22	0.010	0.231	4.54	OK
23	0.023	0.231	9.93	OK
24	0.013	0.231	5.79	OK
25	0.021	0.231	9.30	OK
26	0.012	0.231	5.17	OK
27	0.017	0.231	7.50	OK
28	0.012	0.231	5.28	OK
29	0.021	0.231	9.18	OK
30	0.013	0.231	5.46	OK
31	0.021	0.231	8.93	OK
32	0.012	0.231	5.16	OK
33	0.020	0.231	8.53	OK
34	0.012	0.231	5.24	OK
35	0.028	0.231	11.96	OK
36	0.013	0.231	5.61	OK
37	0.029	0.231	12.76	OK
38	0.012	0.231	5.05	OK
39	0.022	0.231	9.64	OK
40	0.021	0.231	9.24	OK

Teseq AG Win2100 V4.14.0

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1.12 Test Conditions and Results – Voltage Fluctuations and Flicker

61000-3-3	TEST: Limitation of Voltage Fluctuations And Flicker (IEC 61000-3-3:2013)		Verdict
Method: The test circuit consists of a test supply voltage, reference impedance, the equipment under test and a flicker meter compliant with IEC 60868. The equipment shall be tested in the condition in which the manufacturer supplies it.			P
Laboratory Parameters:	Required prior to the test	During the test	
Ambient Temperature	15 to 35 °C	22°C	
Relative Humidity	30 to 60 %	50%	
Equipment mode	Power interface mode..... :	AC 230V, 50Hz	
	EUT configurations mode :		
	Operation mode..... :	Mode 3	
Control Method of Equipment (see below).....:			
1 - without additional conditions			
2 - switched manually, or switched automatically more frequently than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds), or manual restart, after a power supply interruption.			
3 - attended while in use (for example: hair dryers, vacuum cleaners, kitchen equipment such as mixers, garden equipment such as lawn mowers, portable tools such as electric drills), or switched on automatically, or is intended to be switched on manually, no more than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds) or manual restart, after a power supply interruption.			
Supplementary information:			

SGS Flicker EN61000-3-3 HWAYA EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
Power Analyzer	TESEQ	CCN 1000-1	1504A02654	2018/3/23	2019/3/22
AC Power Source	TESEQ	NSG 1007	1504A02654	2018/3/23	2019/3/22
Test Software	TESEQ	Win2100 V4	Ver. 4.5.8	N.C.R.	N.C.R.
SGS Taiwan LTD. Electronics & Communication Laboratory No.2, Keji 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)					

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Photo of test setup for Voltage Fluctuations And Flicker

Model: TPP 450-124-MB3
Mode_3

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Tabulated Results for Voltage Fluctuations And Flicker

Model: TPP 450-124-MB3

Mode_3

Teseq Proline
4542 Luterbach, Switzerland5/22/2018
7:56 PM

Flicker Test Summary per EN/IEC61000-3-3 Ed. 3.0 (2013) (Run time)

EUT:

Test category: All parameters (European limits)

Tested by:

Test date: 2018/5/22

Start time: 下午 07:36:34

Test Margin: 100

Test duration (min): 10

Data file name: F-000529.cts_data

End time: 下午 07:47:01

Comment:

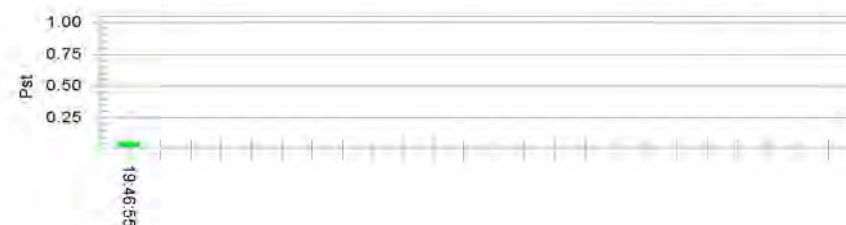
Customer:

Test Result: Pass

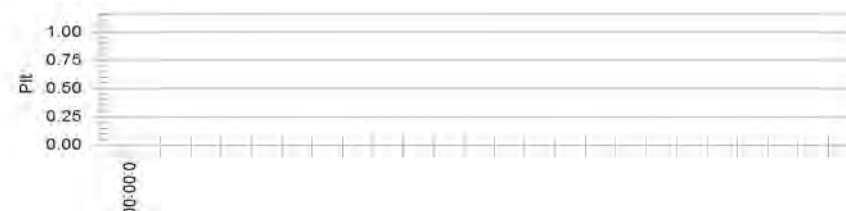
Status: Test Completed

Pst and limit line

European Limits



Pit and limit line



Parameter values recorded during the test:

Vrms at the end of test (Volt): 230.03
Highest dt (%): 0.00
T-max (mS): 0
Highest dc (%): 0.00
Highest dmax (%): 0.00
Highest Pst (10 min. period): 0.064
Highest Pit (2 hr. period): 0.028

Test limit (%):	N/A	N/A
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

Teseq AG Win2100 V4.14.0

Page 1 of 1

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1.13 Test Conditions and Results – Immunity to Electrostatic Discharges

61000-4-2	TEST: Electrostatic discharges (IEC 61000-4-2:2008)			Verdict
Method: The test is intended to demonstrate the immunity of equipment subjected to static electricity discharges from operators directly and to adjacent objects. The table top equipment under test is placed on a wooden table, 0.8 m high, standing on the ground reference plane. A horizontal coupling plane (HCP), 1.6 x 0.8 m, is placed on the table. The EUT and the cables are isolated from the coupling plane by an insulating support 0.5 mm thick. The floor standing equipment is isolated from the ground reference plane by an insulating support about 0.1 m thick. The vertical coupling plane (VCP) of dimensions 0.5 m x 0.5 m is placed parallel to, and positioned at a distance of 0.1 m from, the EUT.				P
Laboratory Parameters:		Required prior to the test	During the test	
Ambient Temperature		15 to 35 °C	24°C	
Relative Humidity		30 to 60 %	40%	
Equipment mode		Power interface mode	AC 230V, 50Hz	
		EUT configurations mode		
		Operation mode	Mode 3	
Test Levels				
Discharge type	Discharge Level (kV)		Number of discharges per location (each polarity)	
	Positive	Negative		
Air – Direct	2,4,8,15	2,4,8,15	10	
Contact – Direct	8	8	10	
Contact – Indirect	8	8	10	
Discharge location	See photo documentation of the test set-up All external locations accessible by hand, Horizontal plate (HCP) Vertical coupling plate (VCP)			
Supplementary information: EUT powered at one of the Nominal input voltages and frequencies				

SGS ESD EN61000-4-2 HwaYa No.2_EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
ESD Simulator	NoiseKen	ESS-B3011	ESS12Z5075	2017/6/3	2018/6/2
HCP	N/A	1.6 x 0.8 m	N/A	N.C.R.	N.C.R.
VCP	N/A	0.5 x 0.5 m	N/A	N.C.R.	N.C.R.
SGS Taiwan LTD. Electronics & Communication Laboratory No.2, Keji 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)					

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Photo of test setup for Immunity to Electrostatic Discharges

Model: TPP 450-124-MB3
Mode_3

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

Tabulated Results for Electrostatic Discharges			
Nominal Voltage (V)			AC 230V
Nominal Frequency (Hz)			50
Direct discharges: Air and Contact			
Discharge location	Air discharge voltage (kV)	Polarity	Result
Plastic connector	2, 4, 8, 15	+ and -	1
Discharge location	Contact discharge voltage (kV)	Polarity	Result
Surface of case (by client)	2, 4, 8	+ and -	1
Screw (by client)	2, 4, 8	+ and -	1

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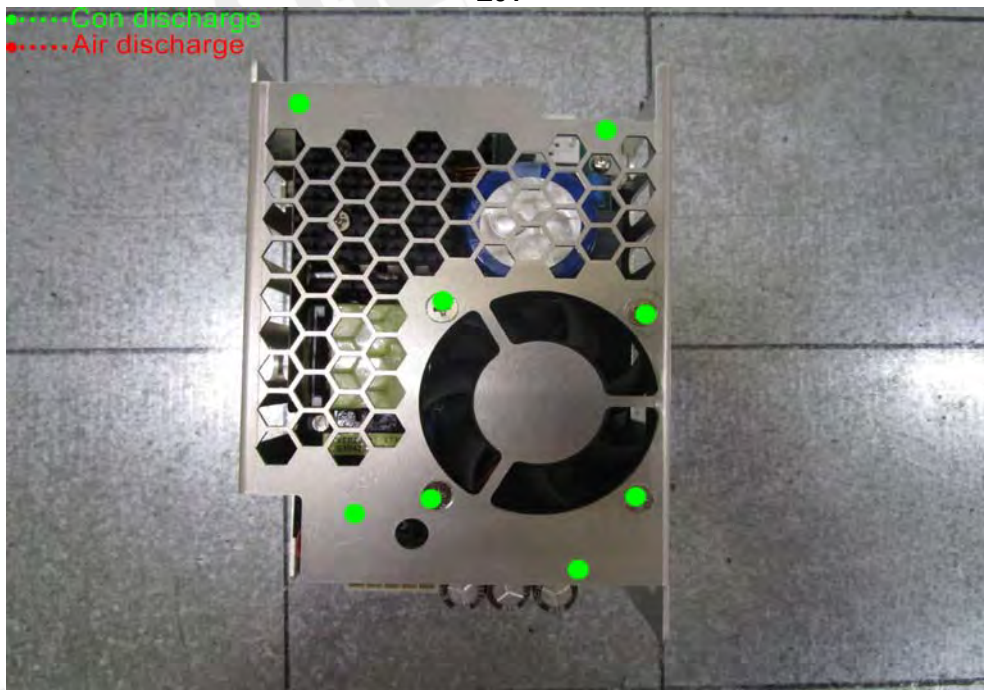
Indirect discharges			
Discharge location	Contact discharge voltage (kV)	Polarity	Result
HCP - Front	2, 4, 6, 8	+ and -	1
HCP - Left	2, 4, 6, 8	+ and -	1
HCP - Right	2, 4, 6, 8	+ and -	1
HCP - Rear	2, 4, 6, 8	+ and -	1
VCP - Front	2, 4, 6, 8	+ and -	1
VCP - Left	2, 4, 6, 8	+ and -	1
VCP - Right	2, 4, 6, 8	+ and -	1
VCP - Rear	2, 4, 6, 8	+ and -	1
Results Descriptions: X - Not Performed nor required. 1 – Compliant - No perceived discharge, no observed response from EUT. 2 – Compliant – Discharge observed, no observed response from EUT..			
Note: Description of the response should detail observations during testing.			

Photo of Electrostatic Discharges Test Locations
N/A

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Photo of Electrostatic Discharges Test Locations

Model: TPP 450-124-MB3
E01

E02



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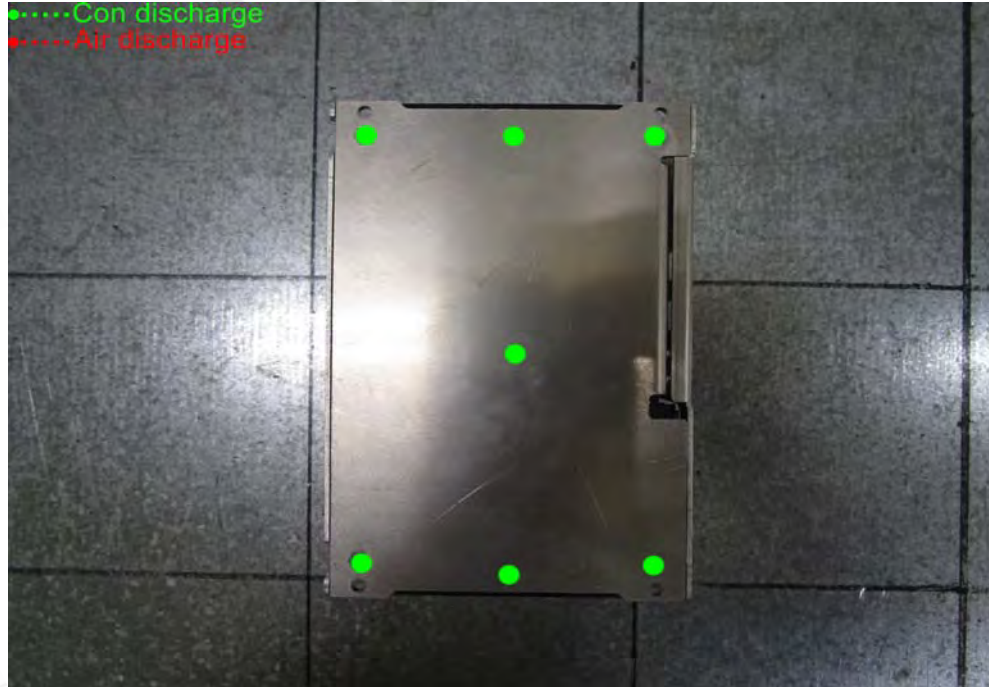
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Photo of Electrostatic Discharges Test Locations

Model: TPP 450-124-MB3
E03

E04



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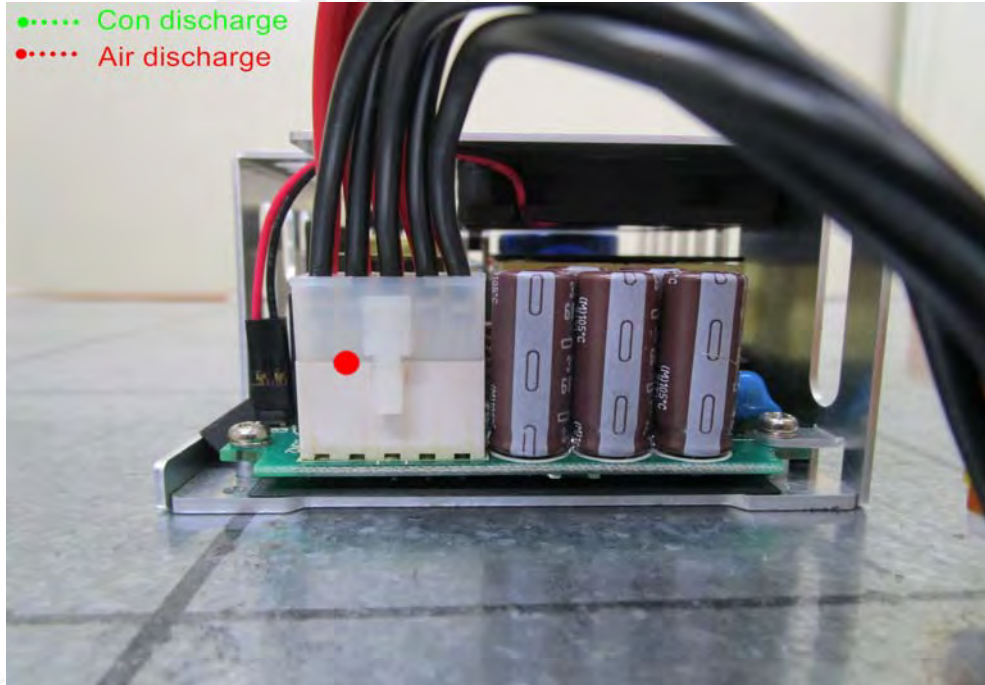
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Photo of Electrostatic Discharges Test Locations

Model: TPP 450-124-MB3
E05

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

61000-4-3		TEST: RF electromagnetic fields (IEC 61000-4-3:2006 A1:2007 A2:2010)		Verdict
Method: The test allows estimating of the radiated immunity of electrical and electronic equipment to electromagnetic disturbances coming from intended radio-frequency (RF) transmitters in the frequency range 80 MHz to 2700 MHz. The interference is applied on the enclosure of the equipment by using transmitting antennas.				P
Laboratory Parameters:		Required prior to the test		During the test
Ambient Temperature		15 to 35 °C		25°C
Relative Humidity		30 to 60 %		56%
Equipment mode		Power interface mode		AC 230V, 50Hz
		EUT configurations mode		
		Operation mode		Mode 3
Test specifications				
Calibration Requirements		Uniform field area (UFA)	1.5 m x 1.5 m, 16 points with a minimum UFA size 0.5 m x 0.5 m	
			75 % of calibration points within specifications if UFA is larger than 0.5 m x 0.5 m. 100 % (all 4 points) in the specifications for 0.5 x 0.5 m UFA	
Frequency bandwidth		80 MHz to 2700 MHz		
Modulation		80% AM at 1kHz*		
Level	Professional Healthcare Environment	3 V/m		
	Home Healthcare Environment	10 V/m		
Frequency step		1%		
Supplementary information:				
EUT powered at one of the Nominal input voltages and frequencies.				
Dwell time minimum 1 s. Actual dwell time noted in results table.				
Actual test level noted in results table.				
Note * - Testing may be performed at other modulation frequencies identified by the Risk Management Process.				

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SGS RS EN61000-4-3 HWAYA SAC-F EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
Semi Anechoic Chamber RS 16 grid points	Chance Most	8x5X3	SAC-F	2018/4/7	2019/4/6
Signal Generator	R&S	SMJ 100A	101258	2017/9/7	2018/9/6
Power Sensor	R&S	NRP-Z11	112186	2018/3/27	2019/3/26
Power Sensor	R&S	NRP-Z11	111682	2018/4/10	2019/4/9
Power Amplifier	R&S	BBA100	101075	N.C.R.	N.C.R.
Power Amplifier	R&S	BBA100	101021	N.C.R.	N.C.R.
Power Amplifier	R&S	BBA150	102229	N.C.R.	N.C.R.
High Gain Log-Periodic Antenna	R&S	HL046E	100112	N.C.R.	N.C.R.
Calibrated Broadband Log-Per. Test-Antenna	SCHWARZBECK	STLP 9149	9149-151	N.C.R.	N.C.R.
EMC Field Probes	Narda	NBM-550	F-0375	2018/2/22	2019/2/21
Test Software	R&S	EMC 32	V10.20.01	N.C.R.	N.C.R.
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Photo of test setup for Radio Frequency Electromagnetic Fields

Model: TPP 450-124-MB3

Mode_3



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

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

61000-4-3	TEST: Proximity fields from RF wireless communications equipment (IEC 61000-4-3:2006 A1:2007 A2:2010)		Verdict
Method: The test allows estimating of the radiated immunity of electrical and electronic equipment to electromagnetic disturbances coming from RF communications equipment. The interference is applied on the enclosure of the equipment by using transmitting antennas.			P
Laboratory Parameters:	Required prior to the test	During the test	
Ambient Temperature	15 to 35 °C	25°C	
Relative Humidity	30 to 60 %	56%	
Equipment mode	Power interface mode	AC 230V, 50Hz	
	EUT configurations mode		
	Operation mode	Mode 3	
Test specifications			
Calibration Requirements	Uniform field area (UFA)	1.5 m x 1.5 m, 16 points with a minimum UFA size / 0.5 m x 0.5 m	
		75 % of calibration points within specifications if UFA is larger than 0.5 m x 0.5 m. 100 % (all 4 points) in the specifications for 0.5 x 0.5 m UFA	

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

Supplementary information:

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

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

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

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

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SGS RS EN61000-4-3 Above 18V HWAYA EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
RS Site	Chance Most	8x5x3	SAC-F	2018/4/7	2019/4/6
Signal Generator	R&S	SMB 100A	114674	2017/11/9	2018/11/8
Power Sensor	R&S	NRP-Z11	112186	2018/3/27	2019/3/26
Power Sensor	R&S	NRP-Z91	100547	2018/2/21	2019/2/20
Power Amplifier	R&S	BBA100	101075	N.C.R.	N.C.R.
Power Amplifier	R&S	BBA100	101021	N.C.R.	N.C.R.
Power Amplifier	R&S	BBA150	102229	N.C.R.	N.C.R.
E-Field Generating Antenna	ifi	EFG-3	U2137-0217	N.C.R.	N.C.R.
High Gain Log-Periodic Antenna	R&S	HL046E	100112	N.C.R.	N.C.R.
Stacked Log-Periodic Antenna	SCHWARZBECK	STLP 9149	9149-151	N.C.R.	N.C.R.
Field Probes	Narda	NBM-550	F-0375	2018/2/22	2019/2/21
Test Software	R&S	EMC 32	V10.20.01	N.C.R.	N.C.R.
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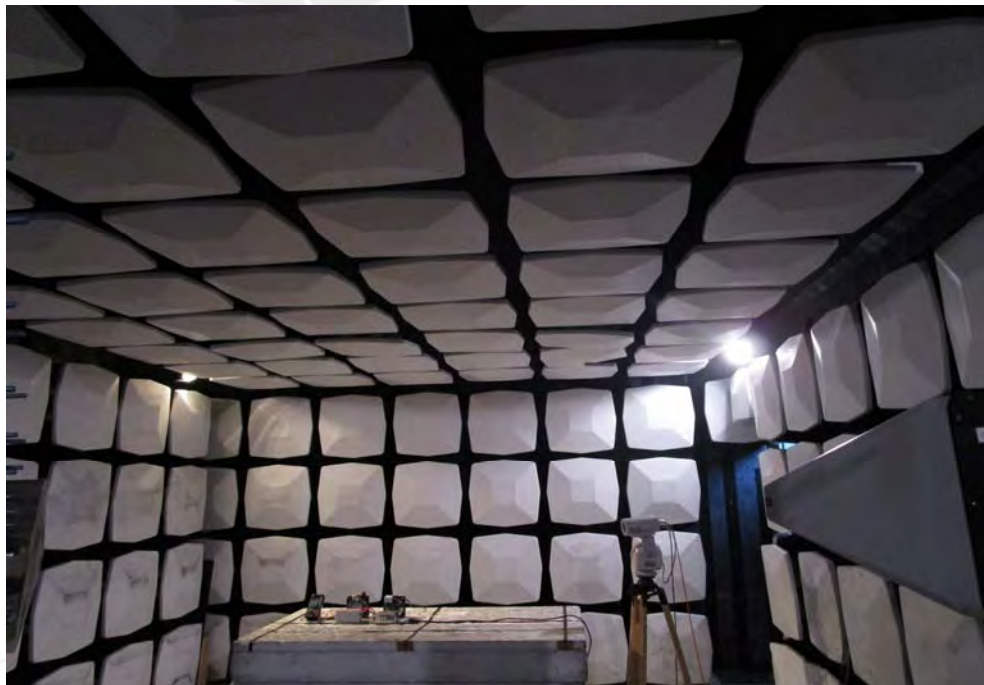
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Photo of test setup for Proximity fields from RF wireless communications equipment

Model: TPP 450-124-MB3

Mode_3



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

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

Results Descriptions:**X - Not performed nor required.****1 – Compliant - No observed response from EUT.**

Supplementary information: None

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1.16 Test Conditions and Results – Electrical Fast Transients

61000-4-4	TEST: Fast Transients – (IEC61000-4-4:2012)			Verdict
Method: Measurements were made on a ground plane that extends 1-meter minimum beyond all sides of the system under test. Mains power tests were conducted with the product connected to a Coupling/Decoupling Network (CDN). I/O lines were tested in a Capacitive Coupling Clamp. One of each unique interface was tested for a period of one (1) minute per polarity.				P
Laboratory Parameters:		Required prior to the test		During the test
Ambient Temperature		10 to 40 °C		26°C
Relative Humidity		10 to 90 %		48%
Fully configured sample subject to the levels shown below.		Measurement Point		
		Input a.c. Power Ports		
Equipment mode		Power interface mode		AC 100V, 50Hz; AC 240V,50Hz
		EUT configurations mode		
		Operation mode		Mode 3
Applied Level				
Application Point		(kV)	Coupling Method	Repetition Frequency (kHz)
Input a.c. Power Ports		±2	Direct Injection	100
Input d.c. Power Ports		±2	Direct Injection	100
Signal Input/Output Ports*		±1	Capacitive Clamp	100
Input d.c. Power ports (transportation)		See ISO 7637-2		
Supplementary information:				
EUT powered at one of the Nominal input voltages and frequencies.				
Note* - SIP/SOPS whose maximum cable length is less than 3m are excluded				

SGS EFT EN61000-4-4 HwaYa No.2_EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
Burst Generator	TESEQ	NSG3060	1763	2018/5/7	2019/5/6
EFT Clamp	Thermo	CCL	612359	2017/12/21	2018/12/20
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**Electrical Fast Transients Waveform Verification
(Optional)**

None

None

2000V Amplitude and Rise Time

2000V Duration @ 50% amplitude

None

2000V Repetition Frequency

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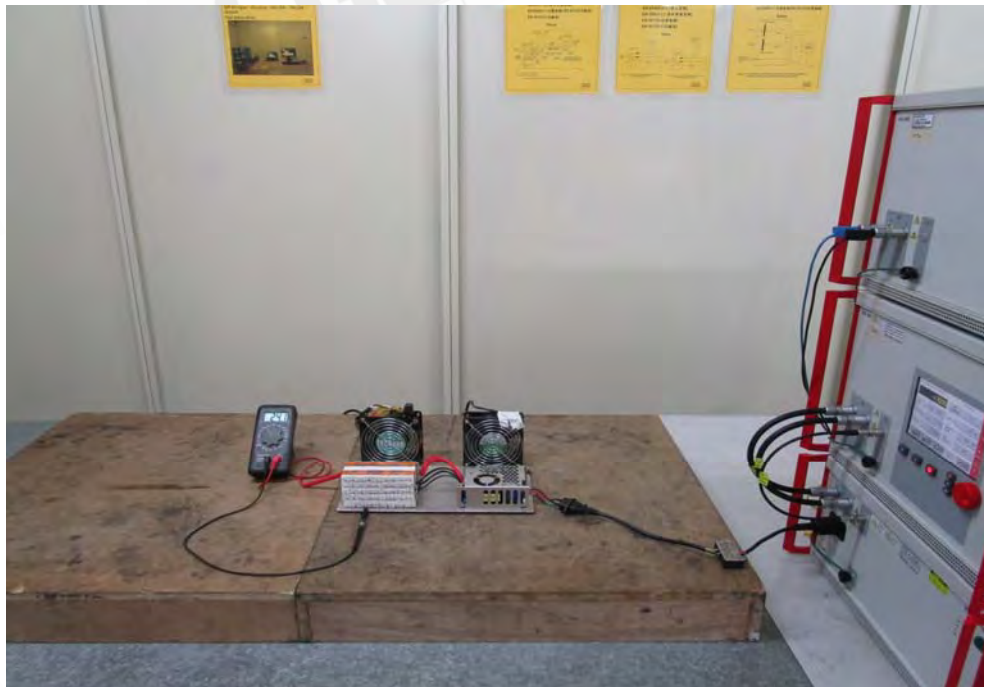
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Photo of test setup for Electrical Fast Transients

Model: TPP 450-124-MB3
Mode_3

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Tabulated Results for Electrical Fast Transients	
Point of application	Results
Mains	1
I/O Line 1 -	X
I/O Line 2 -	X
Results Descriptions: X - Not performed nor required. 1 - Compliant - No observed response from EUT.	
Supplementary information: None.	

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1.17 Test Conditions and Results – Surge Immunity

61000-4-5	TEST: Surge Immunity Test – (IEC61000-4-5:2014)		Verdict
Method: Mains power tests were conducted with the product connected to a Coupling/Decoupling Network (CDN). The test voltage was increased from the lowest indicated level up to the maximum level. Five (5) positive surges and five (5) negative surges were applied at each of phases of the a.c. waveform: 0°, 90°, 180° and 270°. Each surge was applied 60 seconds after the previous surge. Signal and Telecommunications ports were subject to five (5) positive and five (negative) surges applied through the appropriate Coupling/Decoupling Network (CDN).			P
Laboratory Parameters:	Required prior to the test	During the test	
Ambient Temperature	10 to 40 °C	26°C	
Relative Humidity	10 to 90 %	48%	
Fully configured sample subject to the levels shown below.	Measurement Point		
	Input AC and DC Power Ports		
Equipment mode	Power interface mode	AC 100V, 50Hz; AC 240V,50Hz	
	EUT configurations mode		
	Operation mode	Mode 3	
Applied Level			
Application Point	[kV]	Required Surge Waveform	
Input Power Ports	0.5 and 1.0 (Line to Line)	Combination Wave (2µs x 50µs Voltage, 8µs x 20µs Current)	
	0.5, 1.0 and 2.0 (Line to Earth)	Combination Wave (2µs x 50µs Voltage, 8µs x 20µs Current)	
Signal input/output*	2.0 (Line to Earth)	Combination Wave (2µs x 50µs Voltage, 8µs x 20µs Current)	
ME EQUIPMENT and ME SYSTEMS that do not have a surge protection device in the primary power circuit may be tested only at 2 kV line(s) to earth and 1 kV line(s) to line(s).			
Supplementary information:			
EUT powered at one of the Nominal input voltages and frequencies.			
Note* - Applicable to output lines intended to connect directly to outdoor cables			

SGS Surge EN61000-4-5 HwaYa No.2_EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
Surge Tester	TESEQ	NSG3060	1763	2018/5/7	2019/5/6
Surge Tester	TESEQ	NSG3060	1976	2018/5/7	2019/5/6
Surge Tester	TESEQ	CDN3061	1541	2018/5/7	2019/5/6
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Surge Waveform Verification (Optional)	
None	None
2000V Amplitude and Rise Time Open Circuit Voltage	2000V Duration @ 50% Amplitude Open Circuit Voltage
None	None
2000V Amplitude and Rise Time Short Circuit Current	2000V Duration @ 50% Amplitude Short Circuit Current

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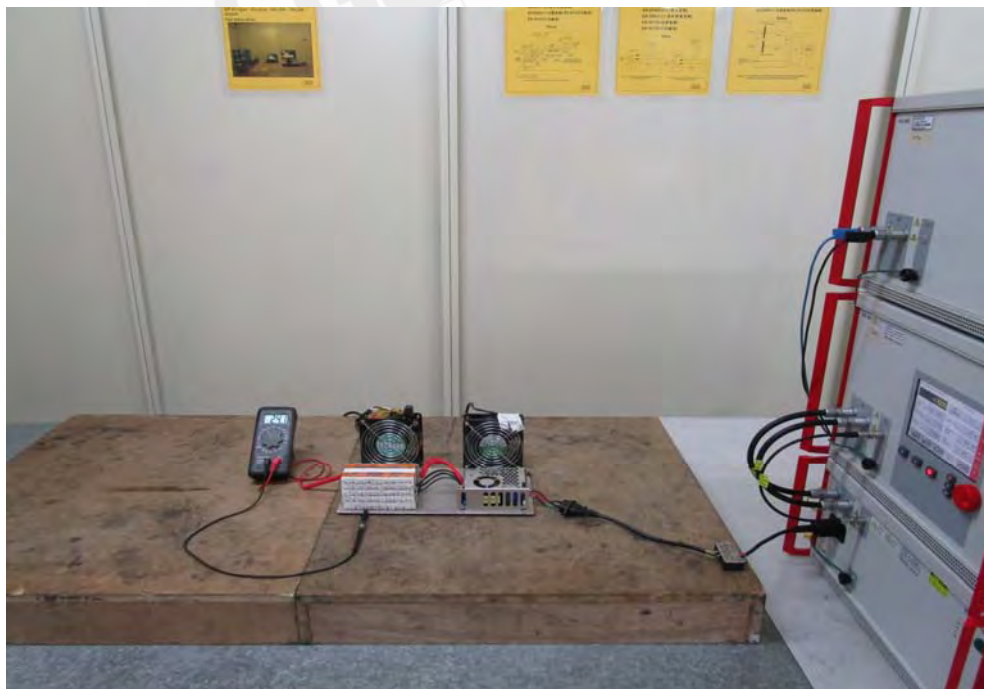
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Photo of test setup for Surge Immunity

Model: TPP 450-124-MB3

Mode_3



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Tabulated Results for Surge - Mains				
Mode of Application	Level	Polarity	Results	
			AC 100V, 50Hz	AC 240V, 50Hz
Line 1 to Line 2 (Differential mode)	0.5kV	Positive	1	1
		Negative	1	1
	1.0kV	Positive	1	1
		Negative	1	1
Line 1 to Earth (Common mode)	0.5kV	Positive	1	1
		Negative	1	1
	1.0kV	Positive	1	1
		Negative	1	1
	2.0kV	Positive	1	1
		Negative	1	1
Line 2 to Earth (Common mode)	0.5kV	Positive	1	1
		Negative	1	1
	1.0kV	Positive	1	1
		Negative	1	1
	2.0kV	Positive	1	1
		Negative	1	1
Results Descriptions:				
X - Not performed nor required.				
1 – Compliant - No observed response from EUT.				
Supplementary information:				
None				

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Tabulated Results for Surge – Signal Input/output Lines Directly Connected to Outdoor Lines			
Mode of Application	Level	Polarity	Results
Line 1 to Earth (Common mode)	2kV	Positive	X
		Negative	X
Line 2 to Earth (Common mode)	2kV	Positive	X
		Negative	X
Results Descriptions: X - Not performed nor required. 1 – Compliant - No observed response from EUT.			
Supplementary information: Note: Description of the response should detail observations during testing.			

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1.18 Test Conditions and Results – Conducted Disturbances Immunity

61000-4-6		TEST: RF Continuous Conducted – (IEC61000-4-6:2013)		Verdict
Method: Measurements were made on a ground plane that extends 0.5-meter minimum beyond all sides of the system under test. The EUT was located 10cm above the reference ground plane and any associated I/O cables attached to the EUT were located between 30mm and 50mm above the ground plane. The indicated field was pre-calibrated prior to placement of the system under test.				P
Laboratory Parameters:		Required prior to the test	During the test	
Ambient Temperature		10 to 40 °C	22°C	
Relative Humidity		10 to 90 %	40%	
Equipment mode		Power interface mode	AC 230V, 50Hz	
		EUT configurations mode		
		Operation mode	Mode 3	
Test Specifications:		Frequency range	Measurement Point	
Fully configured sample scanned over the following frequency range		150kHz to 80MHz	Input a.c. Power Ports	
Level	Home Healthcare Environment	3 V RMS outside the ISM band, 6 V RMS in the ISM and amateur radio bands		
	Professional Healthcare Environment	3 V RMS outside the ISM band, 6 V RMS in the ISM band		
Frequency step		1%		
Modulation		80% Am at 1kHz*		
Supplementary information:				
EUT powered at one of the Nominal input voltages and frequencies.				
Dwell time minimum 1 s.				
Note * - Testing may be performed at other modulation frequencies identified by the Risk Management Process.				

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SGS CS EN61000-4-6 HWAYA SR-D EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
Signal Generator	R&S	SMC100A	102920	2018/5/14	2019/5/13
Power Sensor	R&S	NRVD	837794/029	2017/8/10	2018/8/9
Power Sensor	R&S	URV5-Z2	835640/015	2017/8/10	2018/8/9
Power Sensor	R&S	URV5-Z2	835640/016	2017/8/10	2018/8/9
Dual Directional Coupler	OSR	C21A8	33	N.C.R.	N.C.R.
Conducted Immunity System	Frankonia	CIT-10	102D3226	N.C.R.	N.C.R.
CDN	TESEQ	CDN M016	35853	2018/1/31	2019/1/30
CDN	TESEQ	CDN M116	37673	2018/4/26	2019/4/25
CDN	TESEQ	CDN ST08A	30191	2018/2/14	2019/2/13
Test Software	ar	emcware	V3.4.0	N.C.R.	N.C.R.
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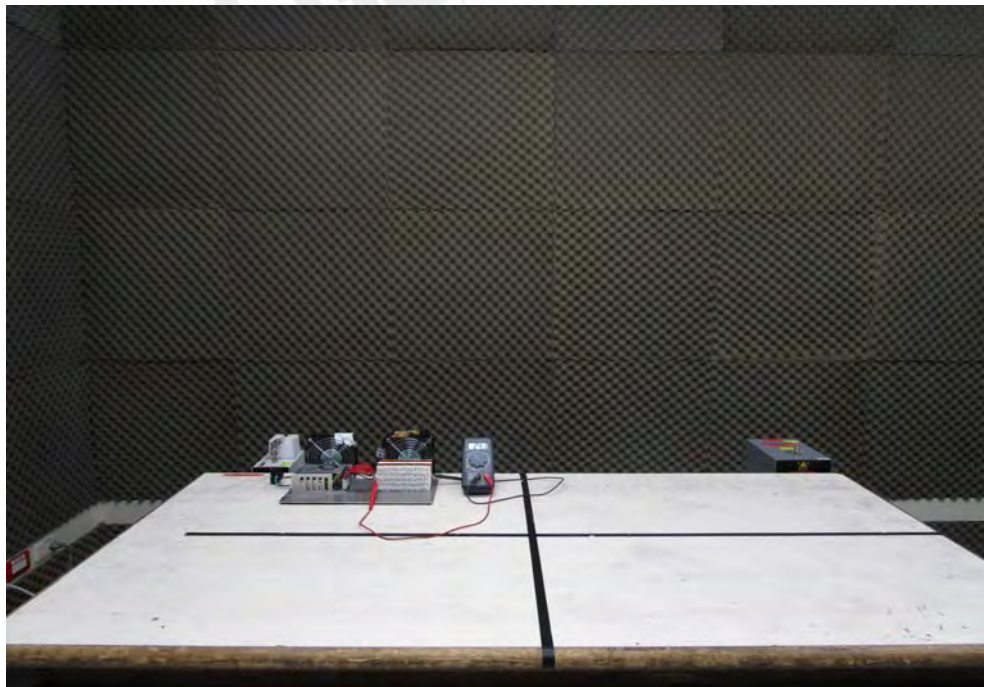
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Photo of test setup for Conducted Disturbances

Model: TPP 450-124-MB3
Mode_3

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Tabulated Results for Conducted Disturbances		
Point of Application	Results	Dwell Time (second)
Mains	1 (by client (10, 20Vrms))	3
Sip/Sop 1 –	X	X
Sip/Sop 2 -	X	X
Sip/Sop 3 -	X	X
Patient Connected Port 1 -	X	X
Patient Connected Port 2 -	X	X
Supplementary information: Results Descriptions: X - Not performed nor required. 1 – Compliant - No observed response from EUT. Note: Description of the response should detail observations during testing.		

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1.19 Test Conditions and Results – Power- Frequency Magnetic Fields

61000-4-8	TEST: Power-frequency magnetic field – (IEC61000-4-8:2009)		Verdict
Method: Measurements were made on a ground plane that extends 1-meter minimum beyond sides of the system under test. Table top EUT is located 80cm above the reference ground plane and floor-standing EUT is located 10cm above the reference ground plane. The indicated field was pre-calibrated prior to placement of the EUT under test.			P
Laboratory Parameters:		Required prior to the test	During the test
Ambient Temperature		10 to 40 °C	26°C
Relative Humidity		10 to 90 %	48%
Equipment mode		Power interface mode	AC 230V, 50Hz
		EUT configurations mode	
		Operation mode	Mode 3
Fully configured sample tested at the power line frequency (See Note 1)		Frequency	Application Point
		50Hz/ 60 Hz	Enclosure
Test Level		30 (A/m)	
Supplementary information:			
EUT powered at one of the Nominal input voltages and frequency of either 50Hz or 60Hz. During the test, the frequency of the field and line frequency of the ME equipment shall be the same.			

SGS PFMF EN61000-4-8 HWAYA EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
Magnetic Field Generator	Narda S.T.S.	PMM 1008	0100X30601	2017/11/21	2018/11/20
AC CLAMP METER	CHAUVIN ARNOUX	96	12002769	2017/9/4	2018/9/3
Triax Elf Magnetic Field Meter	F.W. BELL	4180	1248004	2017/7/20	2018/7/19
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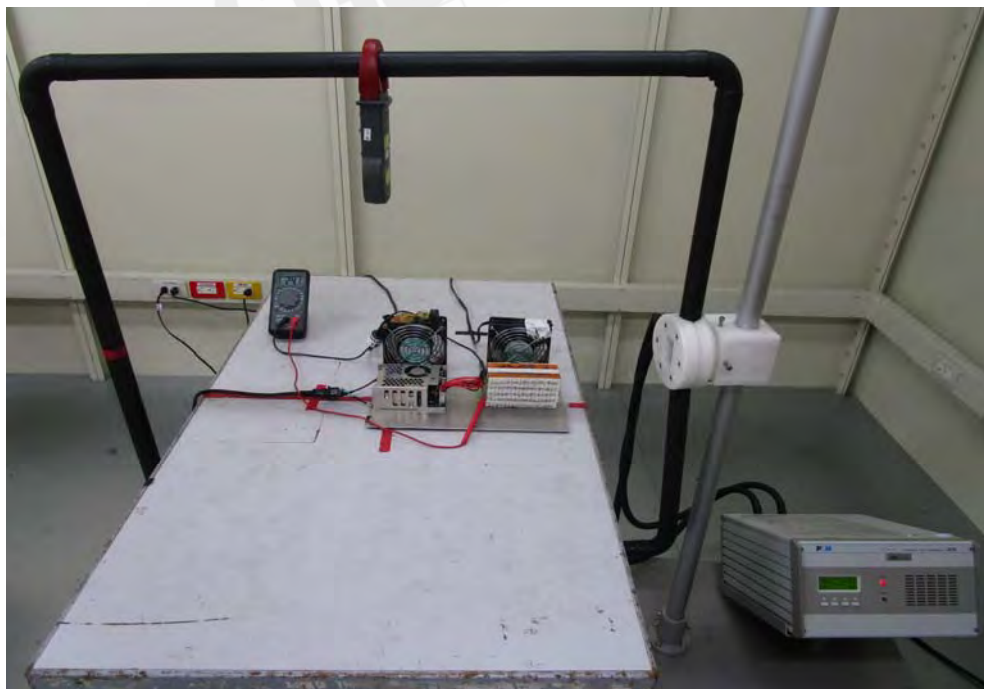
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Photo of test setup for Power- Frequency Magnetic Fields

Model: TPP 450-124-MB3

Mode_3



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Tabulated Results for Power Frequency Magnetic Field	
Point of application	Results
X-Axis	1
Y-Axis	1
Z-Axis	1
Supplementary information: Results Descriptions: X - Not performed nor required. 1 – Compliant - No observed response from EUT. Note: Description of the response should detail observations during testing.	

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

61000-4-11	TEST: Voltage Dips and Interruptions – (IEC61000-4-11:2004)		Verdict
Method: The product was subjected to voltage dips and interruptions. Testing was performed with the product connected directly to a generator capable of simulating the voltage drops and interrupts as described.			P
Laboratory Parameters:	Required prior to the test	During the test	
Ambient Temperature	10 to 40 °C	26°C	
Relative Humidity	10 to 90 %	48%	
Fully configured subjected to the levels indicated below.	Measurement Point		
	Input A.C. Power Ports		
Equipment mode	Power interface mode	AC 100V, 50Hz; AC 240V,50Hz	
	EUT configurations mode		
	Operation mode	Mode 3	
Applied Levels			
Voltage Dips % U _T	Cycles	Sync Angle (degrees)	
0	0.5*	0,45,90,135,180,225,270,315	
0	1	0	
70	25 (50Hz) 30 (60Hz)	0	
Voltage Interruption % U _T	Cycles	Sync Angle [degrees]	
0	250 (50Hz),300 (60Hz)	0	
Supplementary information:			
If the Rated voltage range <25% of the lowest rated input voltage, one rated input voltage. Otherwise, minimum and maximum rated voltage. EUT powered at one of the Nominal input frequencies.			
ME EQUIPMENT and ME SYSTEMS with power input voltage selection by transformer taps shall be tested at only one tap setting.			
Note* - Only applicable to ME equipment with single phase a.c. mains			

Supply Voltage Range	Difference of Max Voltage – Min Voltage	25% of Lowest Rated input Voltage	Test at Min/Max Voltages required (Y/N)
AC 100-240V	140V	N	Y

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SGS DIP EN61000-4-11 HwaYa No.2_EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
EMS Multi-Tester	TESEQ	INA 6502	209	2018/5/7	2019/5/6
EMS Multi-Tester	TESEQ	NSG3060	1763	2018/5/7	2019/5/6
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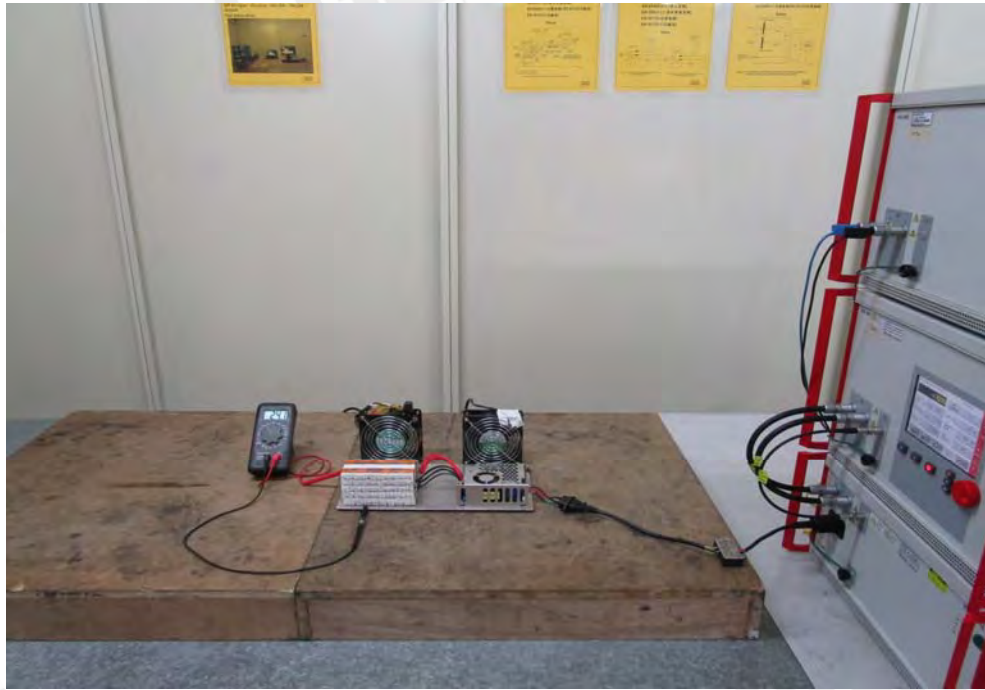
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Photo of test setup for Voltage Dips, Interruptions, and Variations

Model: TPP 450-124-MB3

Mode_3



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

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Tabulated Results for Voltage Dips and Interruptions			
Minimum Rated Voltage (V).....			AC 100V; AC 240V
Frequency (Hz)			50/60
Point of application	Voltage Dips	Period (Cycles)	Results
Mains	>95	0.5	1
Mains	60	1	1
Mains	30	25/30 (50/60Hz)	1
Point of application	Voltage interruption	Period (Cycles)	Results
Mains	>95	250/300 (50/60Hz)	1

Supplementary information:

Results Descriptions:

X - Not performed nor required.

1 – Compliant - No observed response from EUT.

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

According to customer requested test:

Tabulated Results for Voltage Dips and Interruptions			
Minimum Rated Voltage (V).....			AC 100V; AC 240V
Frequency (Hz)			50/60
Point of application	Voltage Dips	Period (Cycles)	Results
Mains	100	0.5	1
Mains	100	1	1
Mains	30	25	1
Point of application	Voltage interruption	Period (Cycles)	Results
Mains	100	250	1

Supplementary information:

Results Descriptions:

X - Not performed nor required.

1 – Compliant - No observed response from EUT.

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

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

ISO 7637-2	TEST: Electrical transient conduction along supply lines	Verdict
<p>Method: The DUT shall be placed on a non-conductive low relative permittivity ($\epsilon_r \leq 1.4$) support with a thickness of (50 ± 5) mm. Grounding of the DUT case to the ground plane shall reflect the vehicle installation. Preferably, the load simulator shall be placed directly on the ground plane. If the load simulator has a metallic case, this case shall be bonded to the ground plane. The peak voltage U_s shall be adjusted to be the required test level with the tolerances of +10 % and 0 %.</p>		N/A
Laboratory Parameters:		
		Required prior to the test
		During the test
Ambient Temperature		10 to 40 °C
Relative Humidity		10 to 90 %
Fully configured sample subject to the levels shown below.		
Equipment mode		Power interface mode
		EUT configurations mode
		Operation mode
Applied Level		
Application Point	Test pulse and level	Coupling Method
Input d.c. Power ports (transportation)	1 (-150V)	Direct Injection
	2a (+112V)	Direct Injection
	2b (10V for 12V system; 20V for 24V system)	Direct Injection
	3a (-220V for 12V system; -300V for 24V system)	Direct Injection
	3b (+150V for 12V system; +300 for 24V system)	Direct Injection
Supplementary information: For ME EQUIPMENT and ME SYSTEMS intended to be installed in passenger cars and light commercial vehicles including ambulances fitted with 12 V electrical systems or commercial vehicles including ambulances fitted with 24 V electrical systems.		

Test Equipment Used					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

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

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Photo of test setup for Electrical Transient Conduction Along Supply Lines

None

Tabulated Results for Electrical Transient Conduction Along Supply Lines

Point of application	Results
Mains Pulse 1	X
Mains Pulse 2a	X
Mains Pulse 2b	X
Mains Pulse 3a	X
Mains Pulse 3b	X
Results Descriptions: X - Not performed nor required. 1 – Compliant - No observed response from EUT.	
Note: Description of the response should detail observations during testing.	

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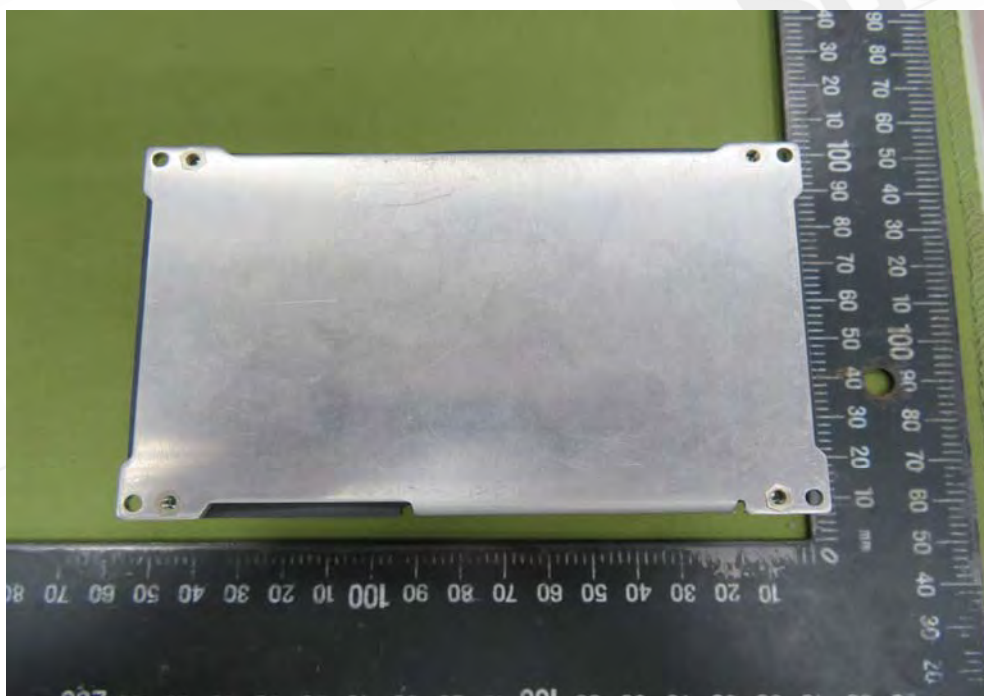
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1.22 Photographs of Product Exterior:

Model No.: TPP 450-124A-MB4



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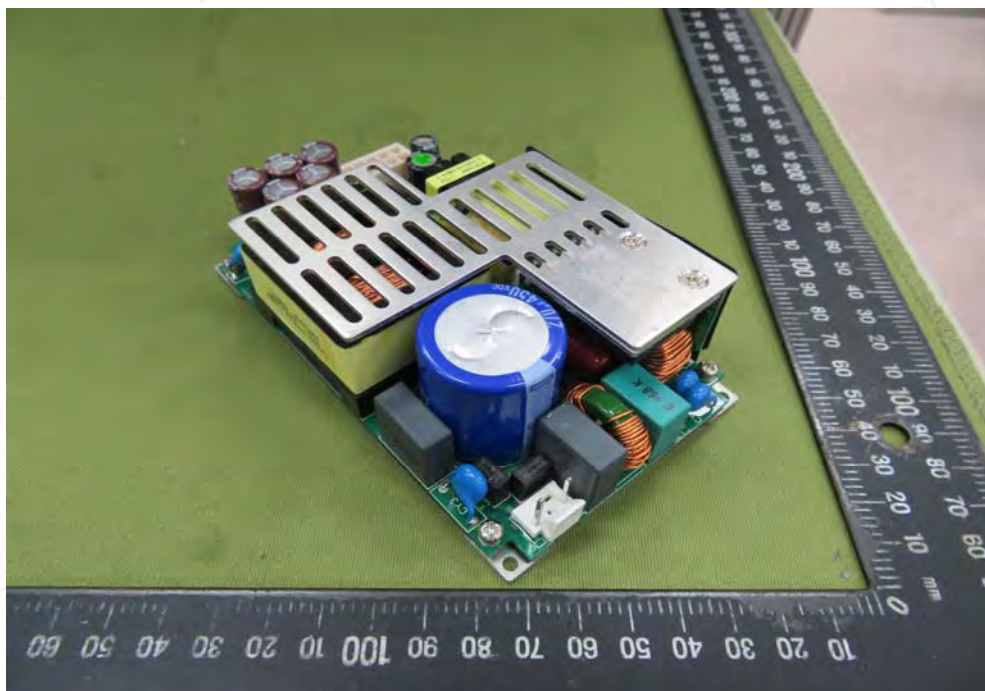
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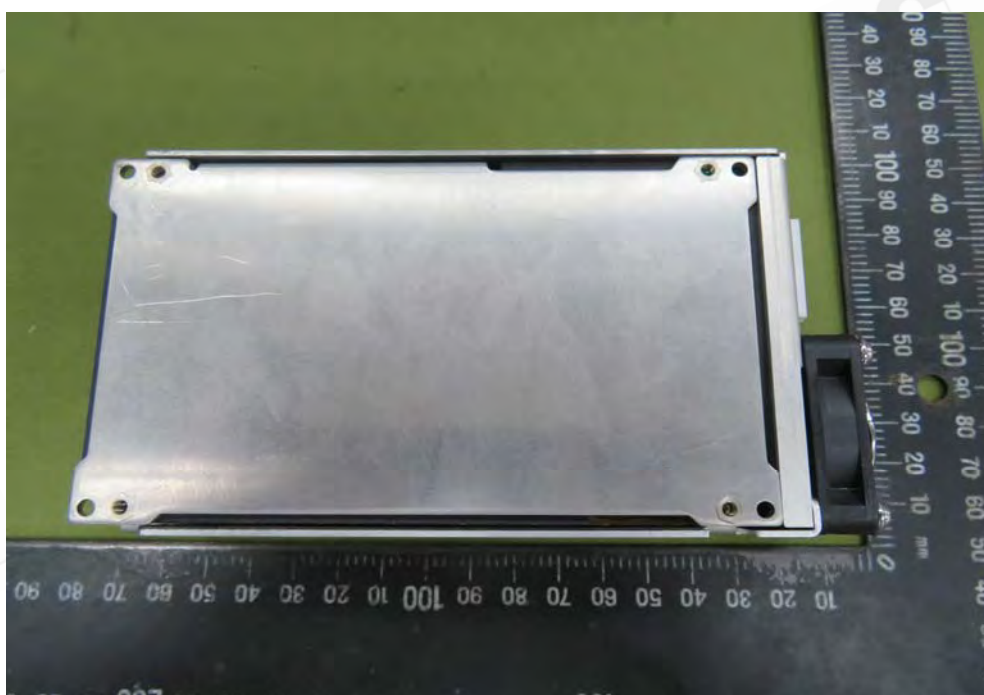
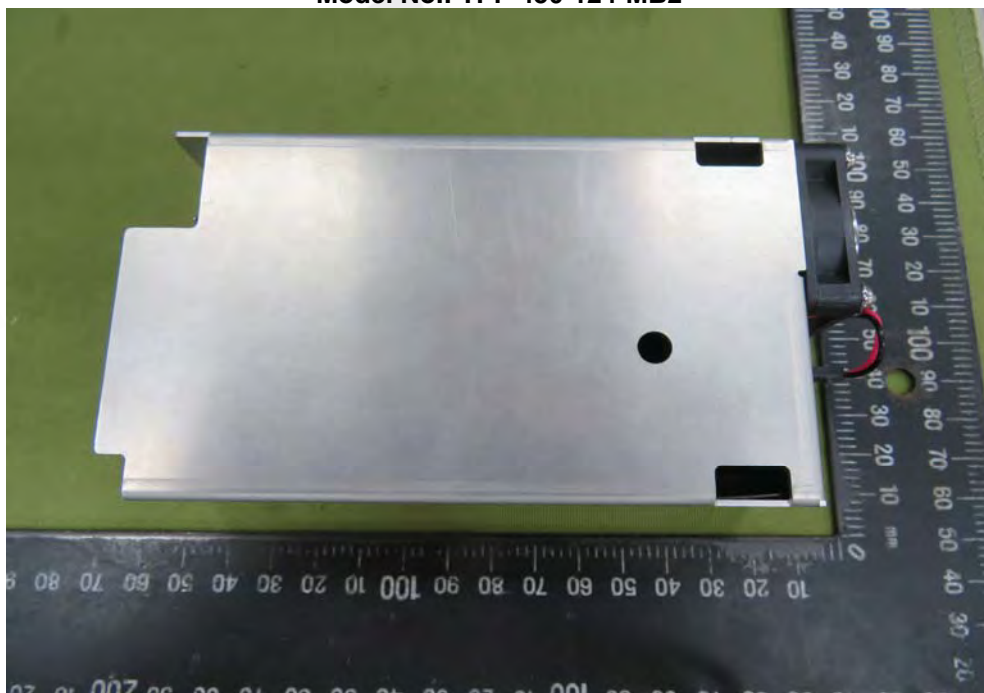
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Model No.: TPP 450-124-MB2



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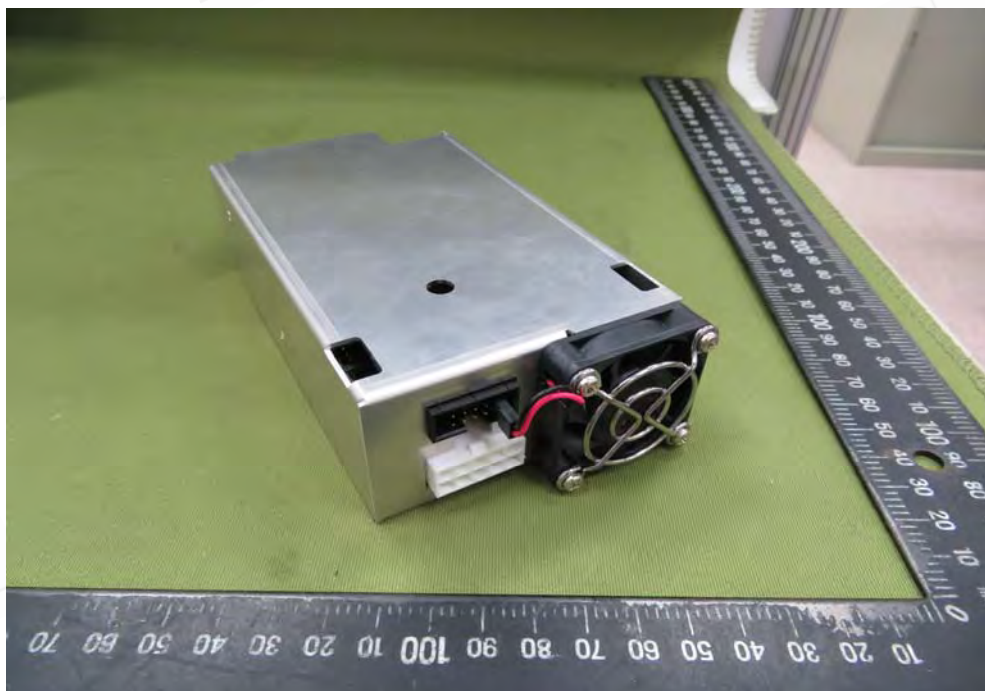
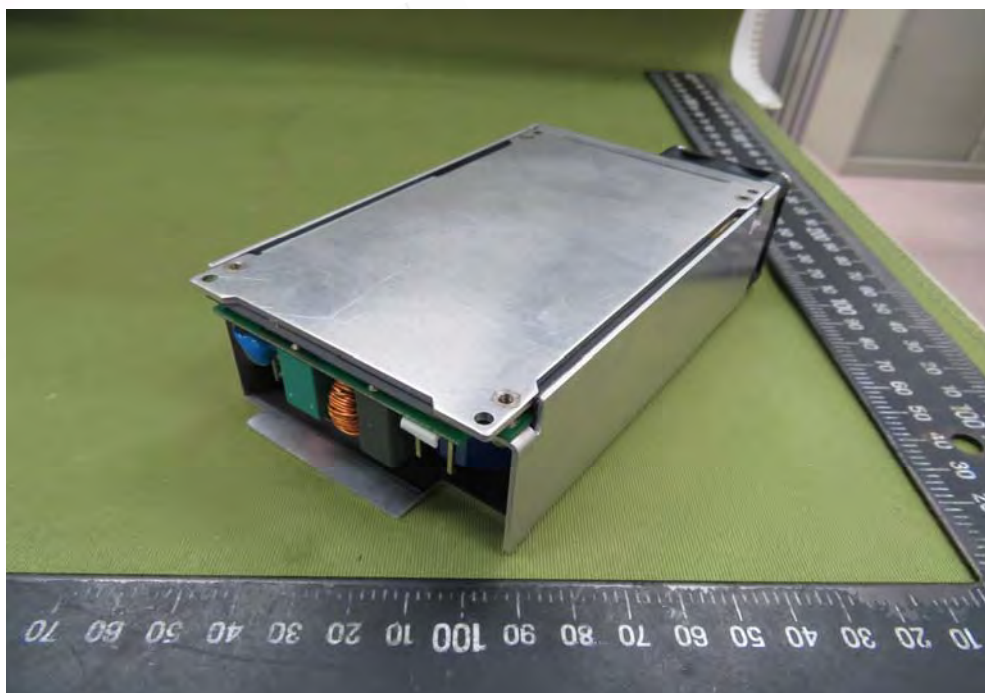
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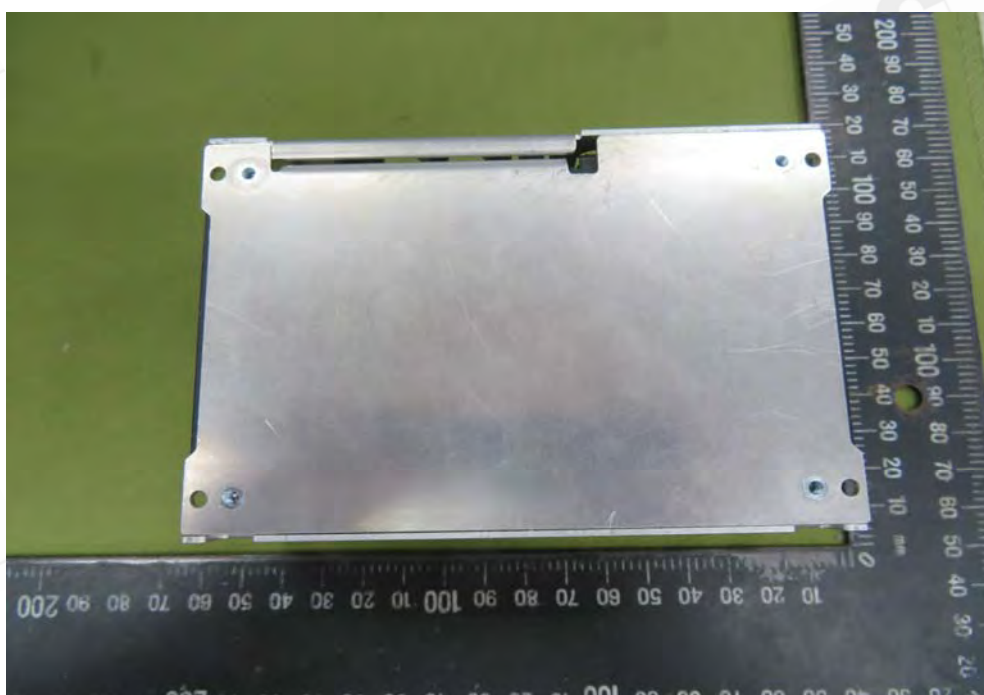
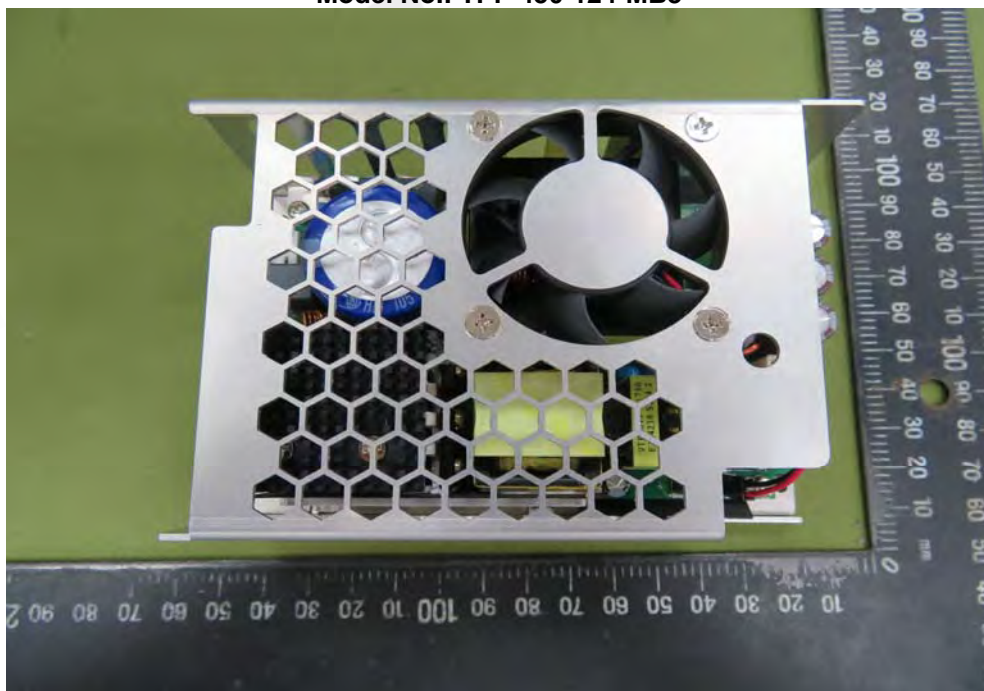
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End of the Report

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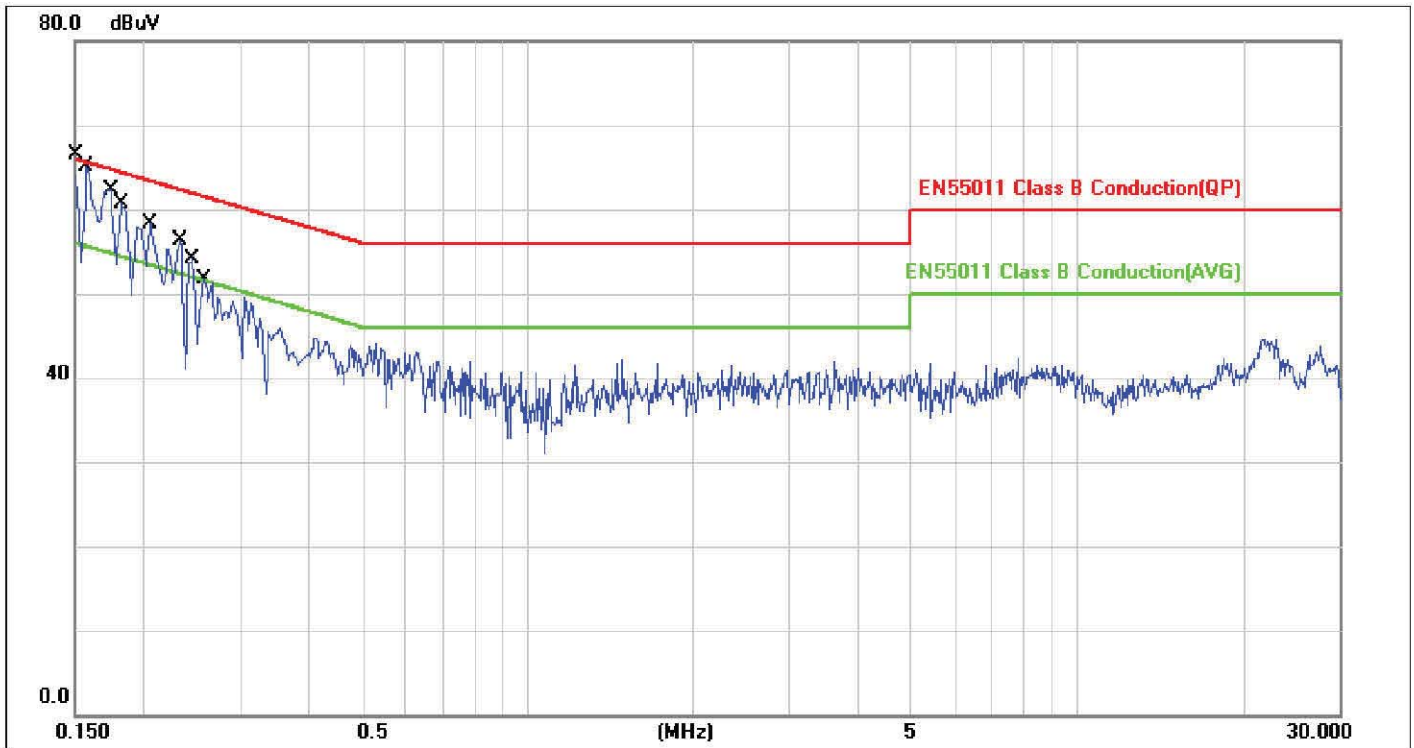
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Site:	: Conduction Room	Date: 2018/5/14	Time: 上午 09:18:34
Limit:	EN55011 Class B Conduction(QP)	Probe:L1	Temperature: 20℃
EUT:		Power:AC 230V/50Hz	Humidity:48%RH
M/N:	TPP 450-148-M		Air Pressure:1023
Mode:			
Note:	with ground		

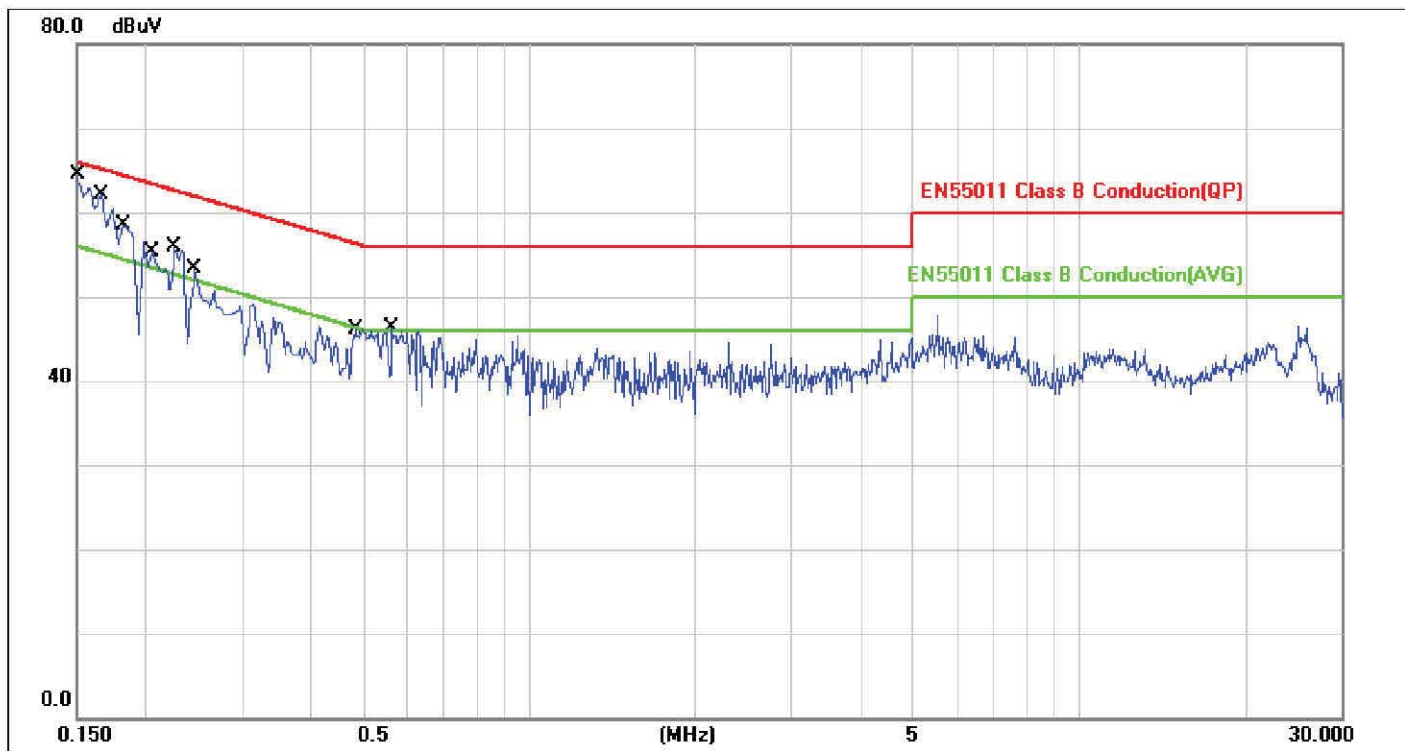


No.	Mk.	Freq. (MHz)	Reading dBuV	Factor (dB)	Measurement (dBuV)	Limit (dBuV)	Over (dB)	Detector	Comment
1	*	0.1500	44.00	19.65	63.65	66.00	-2.35	QP	
2		0.1500	29.30	19.65	48.95	56.00	-7.05	AVG	
3		0.1580	42.68	19.65	62.33	65.57	-3.24	QP	
4		0.1580	27.24	19.65	46.89	55.57	-8.68	AVG	
5		0.1740	39.70	19.65	59.35	64.77	-5.42	QP	
6		0.1740	22.20	19.65	41.85	54.77	-12.92	AVG	
7		0.1825	37.30	19.64	56.94	64.37	-7.43	QP	
8		0.1825	16.60	19.64	36.24	54.37	-18.13	AVG	
9		0.2060	35.41	19.65	55.06	63.37	-8.31	QP	
10		0.2060	22.92	19.65	42.57	53.37	-10.80	AVG	
11		0.2340	33.60	19.70	53.30	62.31	-9.01	QP	
12		0.2340	16.22	19.70	35.92	52.31	-16.39	AVG	
13		0.2460	31.10	19.72	50.82	61.89	-11.07	QP	
14		0.2460	14.45	19.72	34.17	51.89	-17.72	AVG	
15		0.2580	28.92	19.74	48.66	61.50	-12.84	QP	
16		0.2580	10.22	19.74	29.96	51.50	-21.54	AVG	



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Tel:+886 2 2299 3279

Site:	: Conduction Room	Date: 2018/5/14	Time: 上午 09:24:32
Limit:	EN55011 Class B Conduction(QP)	Probe:N	Temperature: 20℃
EUT:		Power:AC 230V/50Hz	Humidity:48%RH
M/N:	TPP 450-148-M		Air Pressure:1023
Mode:			
Note:	with ground		

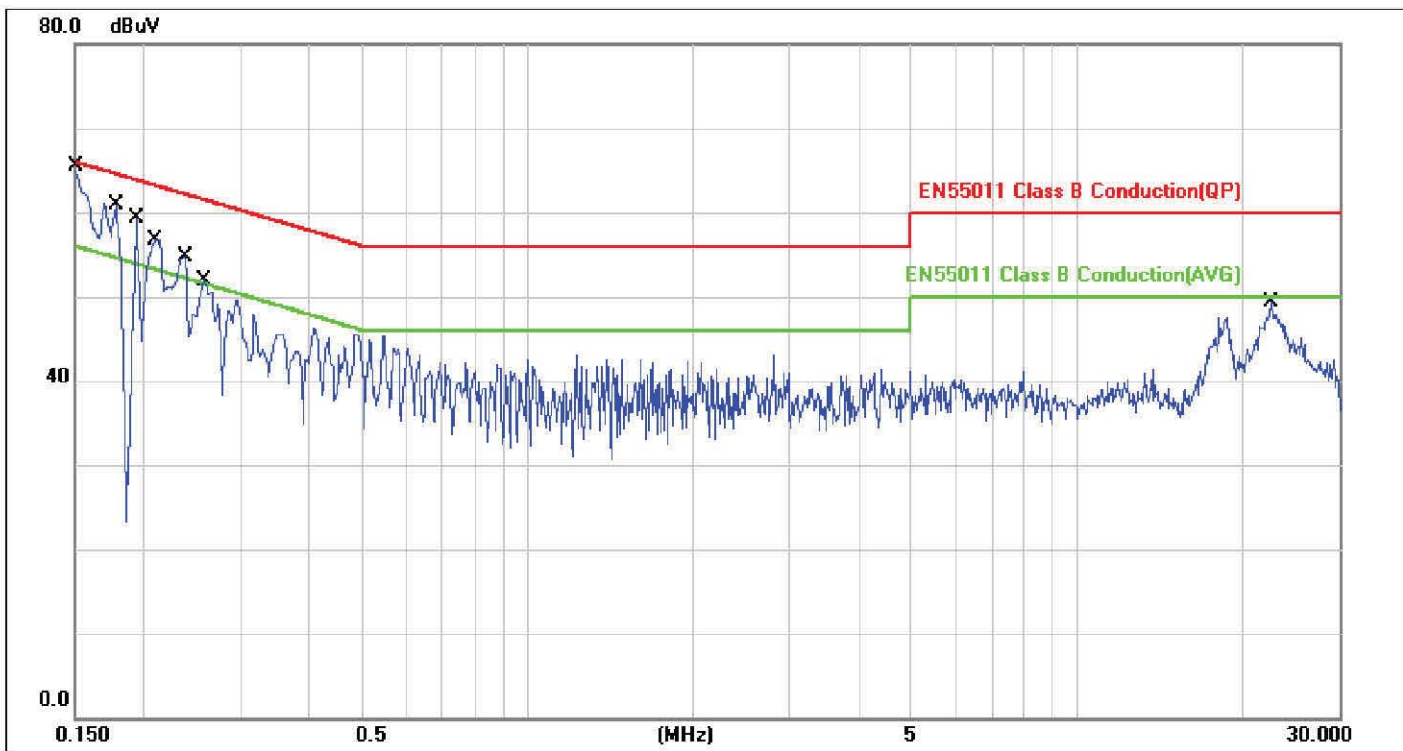


No.	Mk.	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Comment
		(MHz)	dBuV	(dB)	(dBuV)	(dBuV)	(dB)		
1	*	0.1500	42.39	19.64	62.03	66.00	-3.97	QP	
2		0.1500	28.44	19.64	48.08	56.00	-7.92	AVG	
3		0.1660	39.20	19.63	58.83	65.16	-6.33	QP	
4		0.1660	24.10	19.63	43.73	55.16	-11.43	AVG	
5		0.1835	37.10	19.63	56.73	64.33	-7.60	QP	
6		0.1835	17.20	19.63	36.83	54.33	-17.50	AVG	
7		0.2060	33.60	19.63	53.23	63.37	-10.14	QP	
8		0.2060	19.53	19.63	39.16	53.37	-14.21	AVG	
9		0.2260	33.30	19.66	52.96	62.60	-9.64	QP	
10		0.2260	16.50	19.66	36.16	52.60	-16.44	AVG	
11		0.2460	32.40	19.70	52.10	61.89	-9.79	QP	
12		0.2460	15.50	19.70	35.20	51.89	-16.69	AVG	
13		0.4820	23.30	20.09	43.39	56.30	-12.91	QP	
14		0.4820	12.00	20.09	32.09	46.30	-14.21	AVG	
15		0.5620	22.22	20.08	42.30	56.00	-13.70	QP	
16		0.5620	7.95	20.08	28.03	46.00	-17.97	AVG	



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Site:	: Conduction Room	Date: 2018/5/14	Time: 上午 09:55:55
Limit:	EN55011 Class B Conduction(QP)	Probe:L1	Temperature: 20℃
EUT:		Power:AC 230V/50Hz	Humidity:48%RH
M/N:	TPP 450-148-M		Air Pressure:1023
Mode:			
Note:	with PE/without Base plate		

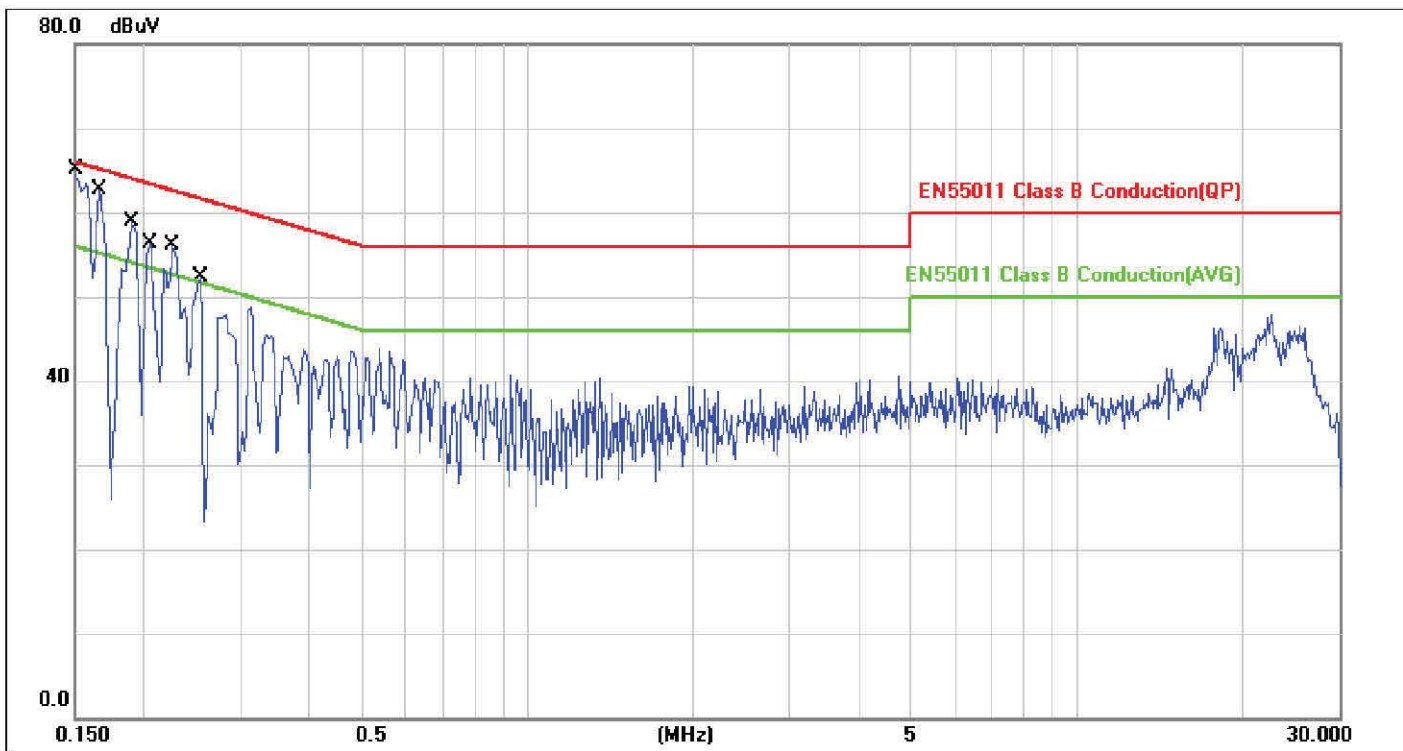


No.	Mk.	Freq. (MHz)	Reading dBuV	Factor (dB)	Measurement (dBuV)	Limit (dBuV)	Over (dB)	Detector	Comment
1	*	0.1500	43.20	19.65	62.85	66.00	-3.15	QP	
2		0.1500	28.93	19.65	48.58	56.00	-7.42	AVG	
3		0.1780	38.30	19.64	57.94	64.58	-6.64	QP	
4		0.1780	18.60	19.64	38.24	54.58	-16.34	AVG	
5		0.1940	35.70	19.64	55.34	63.86	-8.52	QP	
6		0.1940	14.54	19.64	34.18	53.86	-19.68	AVG	
7		0.2100	34.16	19.66	53.82	63.21	-9.39	QP	
8		0.2100	20.36	19.66	40.02	53.21	-13.19	AVG	
9		0.2380	32.78	19.70	52.48	62.17	-9.69	QP	
10		0.2380	15.66	19.70	35.36	52.17	-16.81	AVG	
11		0.2580	28.63	19.74	48.37	61.50	-13.13	QP	
12		0.2580	10.25	19.74	29.99	51.50	-21.51	AVG	
13		22.5380	23.30	20.19	43.49	60.00	-16.51	QP	
14		22.5380	13.80	20.19	33.99	50.00	-16.01	AVG	



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Site:	: Conduction Room	Date: 2018/5/14	Time: 上午 09:58:51
Limit:	EN55011 Class B Conduction(QP)	Probe:N	Temperature: 20℃
EUT:		Power:AC 230V/50Hz	Humidity:48%RH
M/N:	TPP 450-148-M		Air Pressure:1023
Mode:			
Note:	with PE/without Base plate		

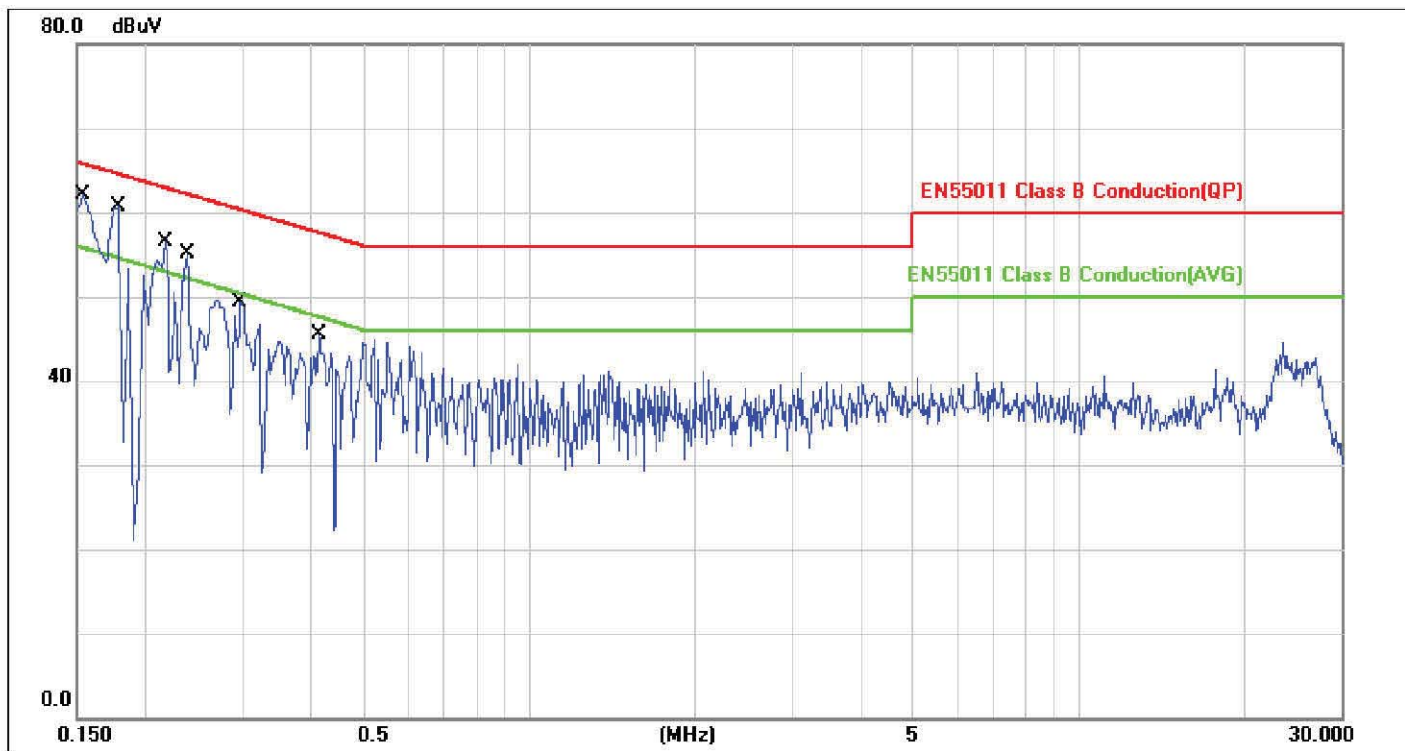


No.	Mk.	Freq. (MHz)	Reading dBuV	Factor (dB)	Measurement (dBuV)	Limit (dBuV)	Over (dB)	Detector	Comment
1	*	0.1500	43.05	19.64	62.69	66.00	-3.31	QP	
2		0.1500	28.74	19.64	48.38	56.00	-7.62	AVG	
3		0.1660	41.50	19.63	61.13	65.16	-4.03	QP	
4		0.1660	26.10	19.63	45.73	55.16	-9.43	AVG	
5		0.1900	35.42	19.62	55.04	64.04	-9.00	QP	
6		0.1900	14.06	19.62	33.68	54.04	-20.36	AVG	
7		0.2060	34.46	19.63	54.09	63.37	-9.28	QP	
8		0.2060	21.55	19.63	41.18	53.37	-12.19	AVG	
9		0.2260	33.20	19.66	52.86	62.60	-9.74	QP	
10		0.2260	15.76	19.66	35.42	52.60	-17.18	AVG	
11		0.2540	28.80	19.71	48.51	61.63	-13.12	QP	
12		0.2540	11.71	19.71	31.42	51.63	-20.21	AVG	



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Site:	: Conduction Room	Date: 2018/5/14	Time: 上午 09:43:01
Limit:	EN55011 Class B Conduction(QP)	Probe:L1	Temperature: 20℃
EUT:		Power:AC 230V/50Hz	Humidity:48%RH
M/N:	TPP 450-148-M		Air Pressure:1023
Mode:			
Note:	without ground		

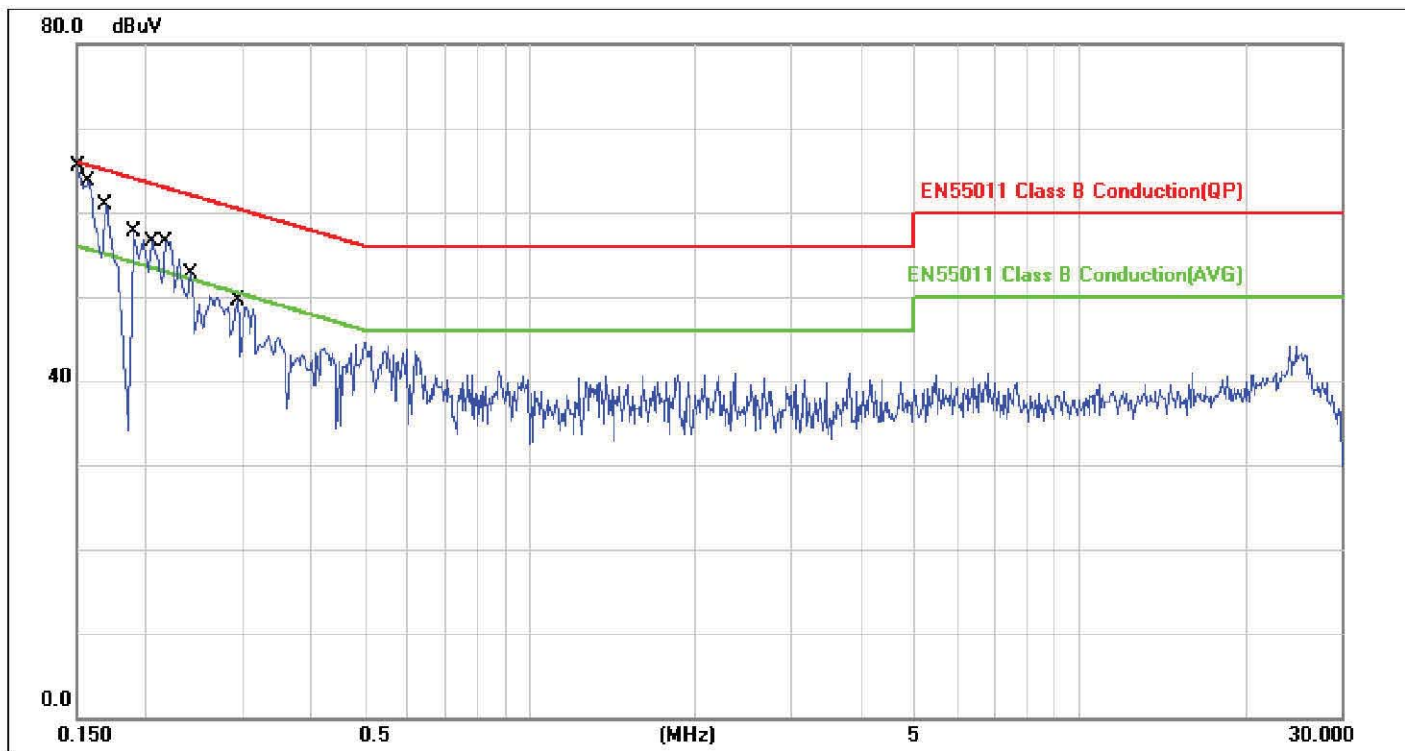


No.	Mk.	Freq. (MHz)	Reading dBuV	Factor (dB)	Measurement (dBuV)	Limit (dBuV)	Over (dB)	Detector	Comment
1	*	0.1540	42.41	19.65	62.06	65.78	-3.72	QP	
2		0.1540	27.73	19.65	47.38	55.78	-8.40	AVG	
3		0.1780	37.64	19.64	57.28	64.58	-7.30	QP	
4		0.1780	16.97	19.64	36.61	54.58	-17.97	AVG	
5		0.2180	34.60	19.67	54.27	62.89	-8.62	QP	
6		0.2180	21.30	19.67	40.97	52.89	-11.92	AVG	
7		0.2380	33.10	19.70	52.80	62.17	-9.37	QP	
8		0.2380	15.60	19.70	35.30	52.17	-16.87	AVG	
9		0.2980	26.70	19.80	46.50	60.30	-13.80	QP	
10		0.2980	10.50	19.80	30.30	50.30	-20.00	AVG	
11		0.4140	22.80	19.99	42.79	57.57	-14.78	QP	
12		0.4140	10.20	19.99	30.19	47.57	-17.38	AVG	



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Site:	: Conduction Room	Date: 2018/5/14	Time: 上午 09:36:18
Limit:	EN55011 Class B Conduction(QP)	Probe:N	Temperature: 20℃
EUT:		Power:AC 230V/50Hz	Humidity:48%RH
M/N:	TPP 450-148-M		Air Pressure:1023
Mode:			
Note:	without ground		

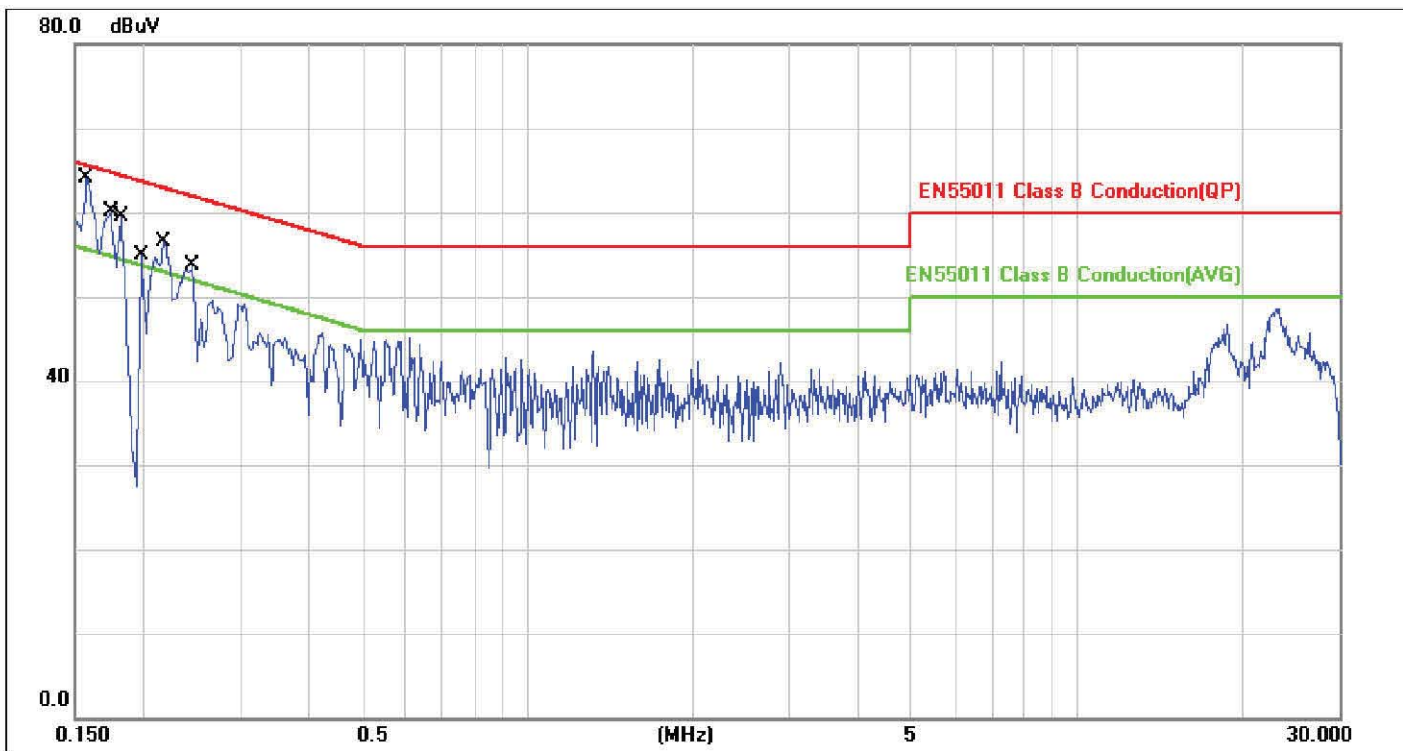


No.	Mk.	Freq. (MHz)	Reading dBuV	Factor (dB)	Measurement (dBuV)	Limit (dBuV)	Over (dB)	Detector	Comment
1	*	0.1500	43.14	19.64	62.78	66.00	-3.22	QP	
2		0.1500	28.78	19.64	48.42	56.00	-7.58	AVG	
3		0.1580	41.80	19.64	61.44	65.57	-4.13	QP	
4		0.1580	26.62	19.64	46.26	55.57	-9.31	AVG	
5		0.1700	38.72	19.63	58.35	64.96	-6.61	QP	
6		0.1700	21.92	19.63	41.55	54.96	-13.41	AVG	
7		0.1900	36.10	19.62	55.72	64.04	-8.32	QP	
8		0.1900	14.80	19.62	34.42	54.04	-19.62	AVG	
9		0.2060	34.46	19.63	54.09	63.37	-9.28	QP	
10		0.2060	21.53	19.63	41.16	53.37	-12.21	AVG	
11		0.2180	24.60	19.65	44.25	62.89	-18.64	QP	
12		0.2180	21.20	19.65	40.85	52.89	-12.04	AVG	
13		0.2420	32.80	19.69	52.49	62.03	-9.54	QP	
14		0.2420	15.70	19.69	35.39	52.03	-16.64	AVG	
15		0.2940	26.81	19.78	46.59	60.41	-13.82	QP	
16		0.2940	11.02	19.78	30.80	50.41	-19.61	AVG	



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Site:	: Conduction Room	Date: 2018/5/14	Time: 上午 10:05:13
Limit:	EN55011 Class B Conduction(QP)	Probe:L1	Temperature: 20℃
EUT:		Power:AC 230V/50Hz	Humidity:48%RH
M/N:	TPP 450-148-M		Air Pressure:1023
Mode:			
Note:	without PE/without Base plate		

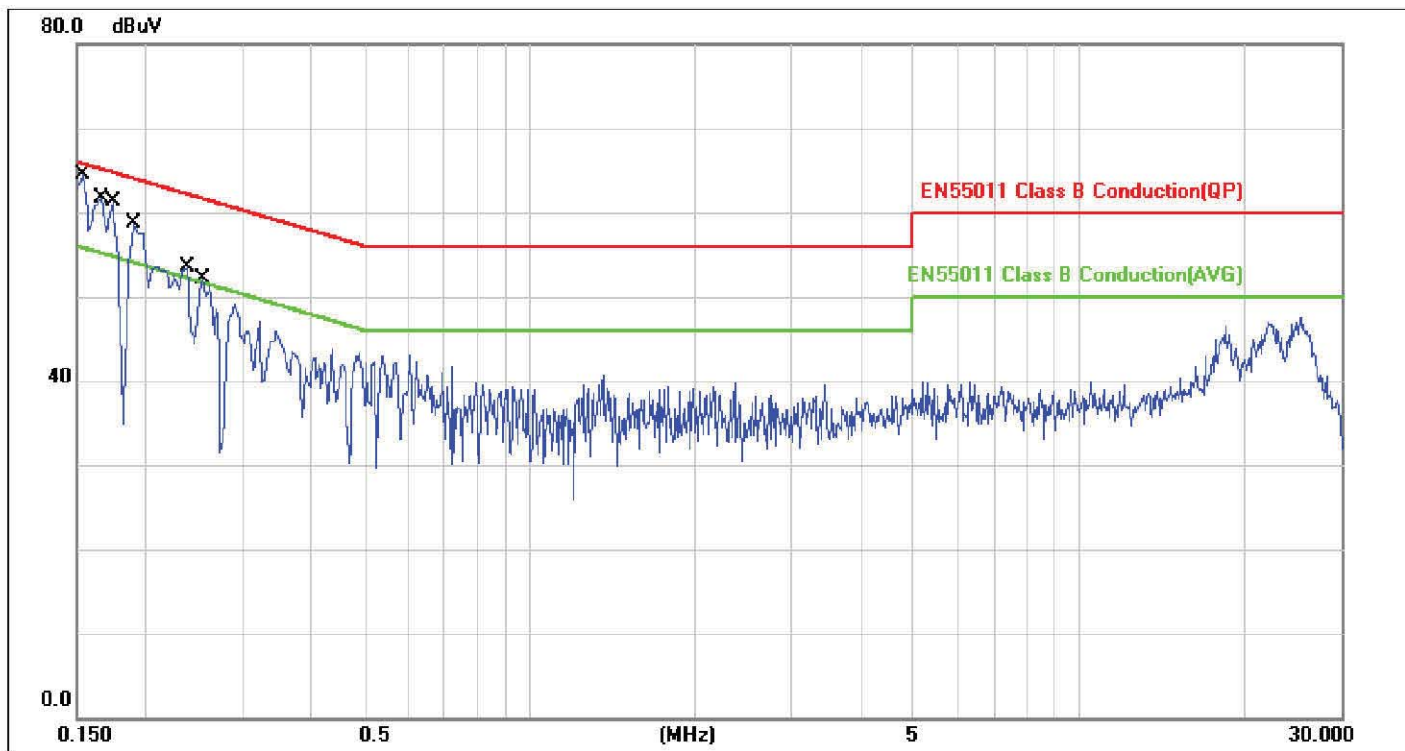


No.	Mk.	Freq. (MHz)	Reading dBuV	Factor (dB)	Measurement (dBuV)	Limit (dBuV)	Over (dB)	Detector	Comment
1	*	0.1580	41.90	19.65	61.55	65.57	-4.02	QP	
2		0.1580	26.80	19.65	46.45	55.57	-9.12	AVG	
3		0.1740	38.30	19.65	57.95	64.77	-6.82	QP	
4		0.1740	20.00	19.65	39.65	54.77	-15.12	AVG	
5		0.1820	35.60	19.64	55.24	64.39	-9.15	QP	
6		0.1820	14.72	19.64	34.36	54.39	-20.03	AVG	
7		0.1980	34.21	19.64	53.85	63.69	-9.84	QP	
8		0.1980	16.08	19.64	35.72	53.69	-17.97	AVG	
9		0.2180	33.80	19.67	53.47	62.89	-9.42	QP	
10		0.2180	17.75	19.67	37.42	52.89	-15.47	AVG	
11		0.2460	30.51	19.72	50.23	61.89	-11.66	QP	
12		0.2460	13.44	19.72	33.16	51.89	-18.73	AVG	



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Site:	: Conduction Room	Date: 2018/5/14	Time: 上午 10:02:26
Limit:	EN55011 Class B Conduction(QP)	Probe:N	Temperature: 20℃
EUT:		Power:AC 230V/50Hz	Humidity:48%RH
M/N:	TPP 450-148-M		Air Pressure:1023
Mode:			
Note:	without PE/without Base plate		



No.	Mk.	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Comment
		(MHz)	dBuV	(dB)	(dBuV)	(dBuV)	(dB)		
1	*	0.1540	42.20	19.64	61.84	65.78	-3.94	QP	
2		0.1540	27.60	19.64	47.24	55.78	-8.54	AVG	
3		0.1660	39.54	19.63	59.17	65.16	-5.99	QP	
4		0.1660	23.83	19.63	43.46	55.16	-11.70	AVG	
5		0.1740	38.19	19.63	57.82	64.77	-6.95	QP	
6		0.1740	19.43	19.63	39.06	54.77	-15.71	AVG	
7		0.1900	35.34	19.62	54.96	64.04	-9.08	QP	
8		0.1900	14.08	19.62	33.70	54.04	-20.34	AVG	
9		0.2380	32.32	19.68	52.00	62.17	-10.17	QP	
10		0.2380	15.28	19.68	34.96	52.17	-17.21	AVG	
11		0.2540	28.76	19.71	48.47	61.63	-13.16	QP	
12		0.2540	11.87	19.71	31.58	51.63	-20.05	AVG	