

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	
Based On Report Reference Number. : E7/2017/80014	
Approved by(+signature)	Bill Cheng Reviewer <i>Bill Cheng</i>
Date of issue:	Jul. 23, 2018
Total number of pages:	119
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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
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Note: 1. The different between of model numbers are list as below.

Model Name	Output Voltage (Vdc)	Output Current (mA)	Max Output Power (W)	Case Type
TPP 30-103A-J	3.3	6000	19.8	2
TPP 30-105A-J	5	6000	30	2
TPP 30-107A-J	7.5	4000	30	2
TPP 30-109A-J	9	3340	30.06	2
TPP 30-112A-J	12	2500	30	2
TPP 30-112.1A-J	12	2500	30	2
TPP 30-115A-J	15	2000	30	2
TPP 30-115.1A-J	15	2000	30	2
TPP 30-118A-J	18	1670	30.06	2
TPP 30-124A-J	24	1250	30	2
TPP 30-128A-J	28	1080	30.24	2
TPP 30-136A-J	36	840	30.24	2
TPP 30-148A-J	48	630	30.24	2
TPP 30-153A-J	53	580	30.74	2
TPP 30-103-J	3.3	6000	19.8	1
TPP 30-105-J	5	6000	30	1
TPP 30-107-J	7.5	4000	30	1
TPP 30-109-J	9	3340	30.06	1
TPP 30-112-J	12	2500	30	1
TPP 30-112.1-J	12	2500	30	1
TPP 30-115-J	15	2000	30	1
TPP 30-115.1-J	15	2000	30	1
TPP 30-118-J	18	1670	30.06	1
TPP 30-124-J	24	1250	30	1
TPP 30-128-J	28	1080	30.24	1
TPP 30-136-J	36	840	30.24	1
TPP 30-148-J	48	630	30.24	1
TPP 30-153-J	53	580	30.74	1
TPP 30-103A	3.3	6000	19.8	2
TPP 30-105A	5	6000	30	2
TPP 30-107A	7.5	4000	30	2
TPP 30-109A	9	3340	30.06	2
TPP 30-112A	12	2500	30	2
TPP 30-112.1A	12	2500	30	2
TPP 30-115A	15	2000	30	2
TPP 30-115.1A	15	2000	30	2

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Model Name	Output Voltage (Vdc)	Output Current (mA)	Max Output Power (W)	Case Type
TPP 30-118A	18	1670	30.06	2
TPP 30-124A	24	1250	30	2
TPP 30-128A	28	1080	30.24	2
TPP 30-136A	36	840	30.24	2
TPP 30-148A	48	630	30.24	2
TPP 30-153A	53	580	30.74	2
TPP 30-103	3.3	6000	19.8	1
TPP 30-105	5	6000	30	1
TPP 30-107	7.5	4000	30	1
TPP 30-109	9	3340	30.06	1
TPP 30-112	12	2500	30	1
TPP 30-112.1	12	2500	30	1
TPP 30-115	15	2000	30	1
TPP 30-115.1	15	2000	30	1
TPP 30-118	18	1670	30.06	1
TPP 30-124	24	1250	30	1
TPP 30-128	28	1080	30.24	1
TPP 30-136	36	840	30.24	1
TPP 30-148	48	630	30.24	1
TPP 30-153	53	580	30.74	1
TPP 30-103A-M	3.3	6000	19.8	2
TPP 30-105A-M	5	6000	30	2
TPP 30-107A-M	7.5	4000	30	2
TPP 30-109A-M	9	3340	30.06	2
TPP 30-112A-M	12	2500	30	2
TPP 30-112.1A-M	12	2500	30	2
TPP 30-115A-M	15	2000	30	2
TPP 30-115.1A-M	15	2000	30	2
TPP 30-118A-M	18	1670	30.06	2
TPP 30-124A-M	24	1250	30	2
TPP 30-128A-M	28	1080	30.24	2
TPP 30-136A-M	36	840	30.24	2
TPP 30-148A-M	48	630	30.24	2
TPP 30-153A-M	53	580	30.74	2
TPP 30-103-M	3.3	6000	19.8	1
TPP 30-105-M	5	6000	30	1
TPP 30-107-M	7.5	4000	30	1

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Model Name	Output Voltage (Vdc)	Output Current (mA)	Max Output Power (W)	Case Type
TPP 30-109-M	9	3340	30.06	1
TPP 30-112-M	12	2500	30	1
TPP 30-112.1-M	12	2500	30	1
TPP 30-115-M	15	2000	30	1
TPP 30-115.1-M	15	2000	30	1
TPP 30-118-M	18	1670	30.06	1
TPP 30-124-M	24	1250	30	1
TPP 30-128-M	28	1080	30.24	1
TPP 30-136-M	36	840	30.24	1
TPP 30-148-M	48	630	30.24	1
TPP 30-153-M	53	580	30.74	1
TPP 30-103A-D	3.3	6000	19.8	2
TPP 30-105A-D	5	6000	30	2
TPP 30-107A-D	7.5	4000	30	2
TPP 30-109A-D	9	3340	30.06	2
TPP 30-112A-D	12	2500	30	2
TPP 30-112.1A-D	12	2500	30	2
TPP 30-115A-D	15	2000	30	2
TPP 30-115.1A-D	15	2000	30	2
TPP 30-118A-D	18	1670	30.06	2
TPP 30-124A-D	24	1250	30	2
TPP 30-128A-D	28	1080	30.24	2
TPP 30-136A-D	36	840	30.24	2
TPP 30-148A-D	48	630	30.24	2
TPP 30-153A-D	53	580	30.74	2
TPP 30-103-D	3.3	6000	19.8	1
TPP 30-105-D	5	6000	30	1
TPP 30-107-D	7.5	4000	30	1
TPP 30-109-D	9	3340	30.06	1
TPP 30-112-D	12	2500	30	1
TPP 30-112.1-D	12	2500	30	1
TPP 30-115-D	15	2000	30	1
TPP 30-115.1-D	15	2000	30	1
TPP 30-118-D	18	1670	30.06	1
TPP 30-124-D	24	1250	30	1
TPP 30-128-D	28	1080	30.24	1

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Model Name	Output Voltage (Vdc)	Output Current (mA)	Max Output Power (W)	Case Type
TPP 30-136-D	36	840	30.24	1
TPP 30-148-D	48	630	30.24	1
TPP 30-153-D	53	580	30.74	1
TPP 30-103A2-J	3.3	6000	19.8	1
TPP 30-105A2-J	5	6000	30	1
TPP 30-107A2-J	7.5	4000	30	1
TPP 30-109A2-J	9	3340	30.06	1
TPP 30-112A2-J	12	2500	30	1
TPP 30-112.1A2-J	12	2500	30	1
TPP 30-115A2-J	15	2000	30	1
TPP 30-115.1A2-J	15	2000	30	1
TPP 30-118A2-J	18	1670	30.06	1
TPP 30-124A2-J	24	1250	30	1
TPP 30-128A2-J	28	1080	30.24	1
TPP 30-136A2-J	36	840	30.24	1
TPP 30-148A2-J	48	630	30.24	1
TPP 30-153A2-J	53	580	30.74	1
TPP 30-103A2-M	3.3	6000	19.8	1
TPP 30-105A2-M	5	6000	30	1
TPP 30-107A2-M	7.5	4000	30	1
TPP 30-109A2-M	9	3340	30.06	1
TPP 30-112A2-M	12	2500	30	1
TPP 30-112.1A2-M	12	2500	30	1
TPP 30-115A2-M	15	2000	30	1
TPP 30-115.1A2-M	15	2000	30	1
TPP 30-118A2-M	18	1670	30.06	1
TPP 30-124A2-M	24	1250	30	1
TPP 30-128A2-M	28	1080	30.24	1
TPP 30-136A2-M	36	840	30.24	1
TPP 30-148A2-M	48	630	30.24	1
TPP 30-153A2-M	53	580	30.74	1
TPP 30-103A2	3.3	6000	19.8	1
TPP 30-105A2	5	6000	30	1
TPP 30-107A2	7.5	4000	30	1
TPP 30-109A2	9	3340	30.06	1
TPP 30-112A2	12	2500	30	1

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Model Name	Output Voltage (Vdc)	Output Current (mA)	Max Output Power (W)	Case Type
TPP 30-112.1A2	12	2500	30	1
TPP 30-115A2	15	2000	30	1
TPP 30-115.1A2	15	2000	30	1
TPP 30-118A2	18	1670	30.06	1
TPP 30-124A2	24	1250	30	1
TPP 30-128A2	28	1080	30.24	1
TPP 30-136A2	36	840	30.24	1
TPP 30-148A2	48	630	30.24	1
TPP 30-153A2	53	580	30.74	1
TPP 30-103BA-J	3.3	6000	19.8	2
TPP 30-105BA-J	5	6000	30	2
TPP 30-107BA-J	7.5	4000	30	2
TPP 30-109BA-J	9	3340	30.06	2
TPP 30-112BA-J	12	2500	30	2
TPP 30-112.1BA-J	12	2500	30	2
TPP 30-115BA-J	15	2000	30	2
TPP 30-115.1BA-J	15	2000	30	2
TPP 30-118BA-J	18	1670	30.06	2
TPP 30-124BA-J	24	1250	30	2
TPP 30-128BA-J	28	1080	30.24	2
TPP 30-136BA-J	36	840	30.24	2
TPP 30-148BA-J	48	630	30.24	2
TPP 30-153BA-J	53	580	30.74	2
TPP 30-103B-J	3.3	6000	19.8	1
TPP 30-105B-J	5	6000	30	1
TPP 30-107B-J	7.5	4000	30	1
TPP 30-109B-J	9	3340	30.06	1
TPP 30-112B-J	12	2500	30	1
TPP 30-112.1B-J	12	2500	30	1
TPP 30-115B-J	15	2000	30	1
TPP 30-115.1B-J	15	2000	30	1
TPP 30-118B-J	18	1670	30.06	1
TPP 30-124B-J	24	1250	30	1
TPP 30-128B-J	28	1080	30.24	1
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TPP 30-148B-J	48	630	30.24	1
TPP 30-153B-J	53	580	30.74	1

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Model Name	Output Voltage (Vdc)	Output Current (mA)	Max Output Power (W)	Case Type
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TPP 30-105BA	5	6000	30	2
TPP 30-107BA	7.5	4000	30	2
TPP 30-109BA	9	3340	30.06	2
TPP 30-112BA	12	2500	30	2
TPP 30-112.1BA	12	2500	30	2
TPP 30-115BA	15	2000	30	2
TPP 30-115.1BA	15	2000	30	2
TPP 30-118BA	18	1670	30.06	2
TPP 30-124BA	24	1250	30	2
TPP 30-128BA	28	1080	30.24	2
TPP 30-136BA	36	840	30.24	2
TPP 30-148BA	48	630	30.24	2
TPP 30-153BA	53	580	30.74	2
TPP 30-103B	3.3	6000	19.8	1
TPP 30-105B	5	6000	30	1
TPP 30-107B	7.5	4000	30	1
TPP 30-109B	9	3340	30.06	1
TPP 30-112B	12	2500	30	1
TPP 30-112.1B	12	2500	30	1
TPP 30-115B	15	2000	30	1
TPP 30-115.1B	15	2000	30	1
TPP 30-118B	18	1670	30.06	1
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TPP 30-107BA-M	7.5	4000	30	2
TPP 30-109BA-M	9	3340	30.06	2
TPP 30-112BA-M	12	2500	30	2
TPP 30-112.1BA-M	12	2500	30	2
TPP 30-115BA-M	15	2000	30	2
TPP 30-115.1BA-M	15	2000	30	2

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TPP 30-124B-M	24	1250	30	1
TPP 30-128B-M	28	1080	30.24	1
TPP 30-136B-M	36	840	30.24	1
TPP 30-148B-M	48	630	30.24	1
TPP 30-153B-M	53	580	30.74	1
TPP 30-103BA2-J	3.3	6000	19.8	1
TPP 30-105BA2-J	5	6000	30	1
TPP 30-107BA2-J	7.5	4000	30	1
TPP 30-109BA2-J	9	3340	30.06	1
TPP 30-112BA2-J	12	2500	30	1
TPP 30-112.1BA2-J	12	2500	30	1
TPP 30-115BA2-J	15	2000	30	1
TPP 30-115.1BA2-J	15	2000	30	1
TPP 30-118BA2-J	18	1670	30.06	1
TPP 30-124BA2-J	24	1250	30	1
TPP 30-128BA2-J	28	1080	30.24	1
TPP 30-136BA2-J	36	840	30.24	1
TPP 30-148BA2-J	48	630	30.24	1
TPP 30-153BA2-J	53	580	30.74	1

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Model Name	Output Voltage (Vdc)	Output Current (mA)	Max Output Power (W)	Case Type
TPP 30-103BA2-M	3.3	6000	19.8	1
TPP 30-105BA2-M	5	6000	30	1
TPP 30-107BA2-M	7.5	4000	30	1
TPP 30-109BA2-M	9	3340	30.06	1
TPP 30-112BA2-M	12	2500	30	1
TPP 30-112.1BA2-M	12	2500	30	1
TPP 30-115BA2-M	15	2000	30	1
TPP 30-115.1BA2-M	15	2000	30	1
TPP 30-118BA2-M	18	1670	30.06	1
TPP 30-124BA2-M	24	1250	30	1
TPP 30-128BA2-M	28	1080	30.24	1
TPP 30-136BA2-M	36	840	30.24	1
TPP 30-148BA2-M	48	630	30.24	1
TPP 30-153BA2-M	53	580	30.74	1
TPP 30-103BA2	3.3	6000	19.8	1
TPP 30-105BA2	5	6000	30	1
TPP 30-107BA2	7.5	4000	30	1
TPP 30-109BA2	9	3340	30.06	1
TPP 30-112BA2	12	2500	30	1
TPP 30-112.1BA2	12	2500	30	1
TPP 30-115BA2	15	2000	30	1
TPP 30-115.1BA2	15	2000	30	1
TPP 30-118BA2	18	1670	30.06	1
TPP 30-124BA2	24	1250	30	1
TPP 30-128BA2	28	1080	30.24	1
TPP 30-136BA2	36	840	30.24	1
TPP 30-148BA2	48	630	30.24	1
TPP 30-153BA2	53	580	30.74	1

2. There are two types of appearance for sales. The difference of two types is with/without case. Please refer to the following table and external photograph for detail information.

Type	Case
Type 1	○
Type 2	X

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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 : 2018/4/19	
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 IECEE 02:	
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)	

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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 30-105BA-J:01
TPP 30-105A-J:02
TPP 30-105:03

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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Note: To update all fields in this TRF, including the Page numbers on the Index page, click Select All on the Edit menu, and then press F9.

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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 30-105BA-J	N/A
EUT	AC-DC POWER SUPPLY	TRACO	TPP 30-105A-J	N/A
EUT	AC-DC POWER SUPPLY	TRACO	TPP 30-105	N/A
AE	Load	SGS	N/A	N/A
AE	Meter (EMS)	YU Fong	YF-370A	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
<108MHz	The EUT internal operating	30~60KHz	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	0.8	-	AC	-	AC Input port
Rated	AC100~240V	6	-	DC	-	DC Output port
Supplementary information: None						

1.2 EUT Operation Modes:

Mode #	Description
1	TPP 30-105A-J / Operation(Full Load)
2	TPP 30-105BA-J / Operation(Full Load) + ground
3	TPP 30-105 / Operation(Full Load)
Supplementary information: None	

1.3 EUT Configuration Modes

Mode #	Description
1, 2, 3	1. EUT link to power and load. 2. Begin 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.

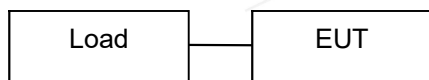
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1.5 Configuration Block Diagram

EMI
Mode 1~3:



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	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		24°C	
Relative Humidity		10 to 90 %		65%	
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 HWYEA 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	2017/8/30	2018/8/29
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.

SGS Taiwan LTD. Electronics & Communication Laboratory
No.2, Keji 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)
Measurement Uncertainty of Conducted Emission
Expanded uncertainty (K=2) of conducted emission is 2.25 dB

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Photo of test setup for Mains Terminal Disturbance Voltage Measurement

Model: TPP 30-105A-J

Mode_1_+



Mode_1_-



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Photo of test setup for Mains Terminal Disturbance Voltage Measurement

Model: TPP 30-105BA-J

Mode_2_+



Mode_2_-



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Photo of test setup for Mains Terminal Disturbance Voltage Measurement

Model: TPP 30-105

Mode_3_+



Mode_3_-



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Graphical representation of Mains Terminal Disturbance Voltage Measurement

Model: TPP 30-105A-J
Mode_1_LSite : Conduction Room
Limit: CISPR11 Class B Conduction(QP)
Mode: Mode_1
Note:Phase: L1
Power: AC 230V/50HzTemperature: 24 °C
Humidity: 65 %

Conducted Emission



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over		
		MHz	Level	Factor	ment			Detector	Comment
			dBuV	dB	dBuV	dBuV	dB		
1		0.1620	40.55	19.65	60.20	65.36	-5.16	QP	
2		0.1620	29.22	19.65	48.87	55.36	-6.49	AVG	
3		0.1900	36.45	19.64	56.09	64.04	-7.95	QP	
4		0.1900	24.90	19.64	44.54	54.04	-9.50	AVG	
5		0.2180	31.20	19.67	50.87	62.89	-12.02	QP	
6		0.2180	21.90	19.67	41.57	52.89	-11.32	AVG	
7		0.4780	25.33	20.09	45.42	56.37	-10.95	QP	
8 *		0.4780	23.01	20.09	43.10	46.37	-3.27	AVG	
9		1.2620	18.67	20.03	38.70	56.00	-17.30	QP	
10		1.2620	14.84	20.03	34.87	46.00	-11.13	AVG	
11		3.3260	17.10	20.34	37.44	56.00	-18.56	QP	
12		3.3260	13.30	20.34	33.64	46.00	-12.36	AVG	

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

File : E7-2017-80014\Data : #1

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Graphical representation of Mains Terminal Disturbance Voltage Measurement

Mode_1_N

Site : Conduction Room

Phase: N

Temperature: 24 °C

Limit: CISPR11 Class B Conduction(QP)

Power: AC 230V/50Hz

Humidity: 65 %

Mode: Mode_1

Note:

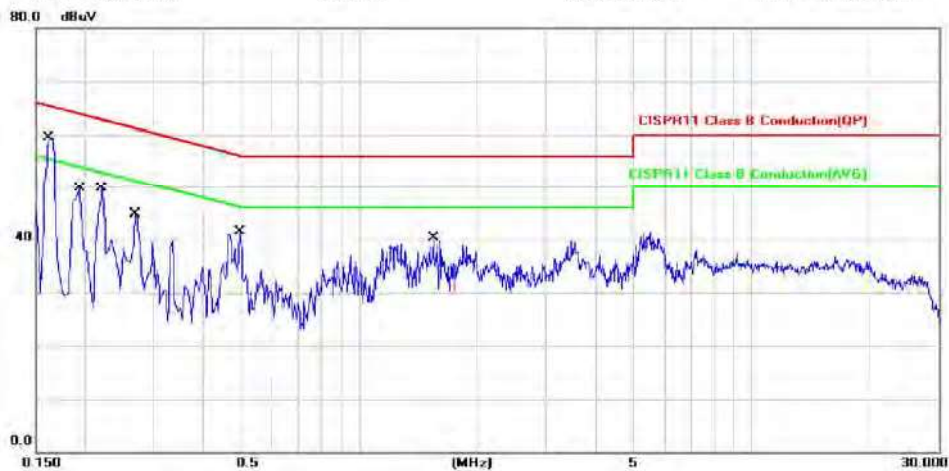
Conducted Emission

File : E7-2017-80014

Data :#2

Date: 2017/8/31

Time: 下午 03:57:45



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1	*	0.1620	38.50	19.50	58.00	65.36	-7.36	QP	
2		0.1620	26.80	19.50	46.30	55.36	-9.06	AVG	
3		0.1940	34.10	19.49	53.59	63.86	-10.27	QP	
4		0.1940	23.50	19.49	42.99	53.86	-10.87	AVG	
5		0.2220	31.30	19.53	50.83	62.74	-11.91	QP	
6		0.2220	21.90	19.53	41.43	52.74	-11.31	AVG	
7		0.2700	23.73	19.61	43.34	61.12	-17.78	QP	
8		0.2700	15.51	19.61	35.12	51.12	-16.00	AVG	
9		0.4980	19.20	19.99	39.19	56.03	-16.84	QP	
10		0.4980	18.10	19.99	38.09	46.03	-7.94	AVG	
11		1.5500	18.37	20.10	38.47	56.00	-17.53	QP	
12		1.5500	15.59	20.10	35.69	46.00	-10.31	AVG	

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

File : E7-2017-80014\Data :#2

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Graphical representation of Mains Terminal Disturbance Voltage Measurement

Model: TPP 30-105BA-J

Mode 2_L

Site : Conduction Room

Phase: L1

Temperature: 24 °C

Limit: CISPR11 Class B Conduction(QP)

Power: AC 230V/50Hz

Humidity: 65 %

Mode: Mode_2

Note:

Conducted Emission

File :E7-2017-80014

Data :#3

Date: 2017/8/31

Time: 下午 05:14:51



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1540	40.30	19.65	59.95	65.78	-5.83	QP	
2		0.1540	29.60	19.65	49.25	55.78	-6.53	AVG	
3		0.1750	36.60	19.65	56.25	64.72	-8.47	QP	
4		0.1750	25.90	19.65	45.55	54.72	-9.17	AVG	
5		0.2340	33.60	19.70	53.30	62.31	-9.01	QP	
6		0.2340	23.50	19.70	43.20	52.31	-9.11	AVG	
7		0.2900	27.30	19.79	47.09	60.52	-13.43	QP	
8		0.2900	18.80	19.79	38.59	50.52	-11.93	AVG	
9		0.4780	25.40	20.09	45.49	56.37	-10.88	QP	
10	*	0.4780	23.10	20.09	43.19	46.37	-3.18	AVG	
11		1.1980	21.51	19.99	41.50	56.00	-14.50	QP	
12		1.1980	19.60	19.99	39.59	46.00	-6.41	AVG	

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

File :E7-2017-80014\Data :#3

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Graphical representation of Mains Terminal Disturbance Voltage Measurement

Mode_2_N

Site : Conduction Room

Phase: N

Temperature: 24 °C

Limit: CISPR11 Class B Conduction(QP)

Power: AC 230V/50Hz

Humidity: 65 %

Mode: Mode_2

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	41.80	19.50	61.30	65.78	-4.48	QP	
2		0.1540	29.80	19.50	49.30	55.78	-6.48	AVG	
3		0.1860	37.50	19.49	56.99	64.21	-7.22	QP	
4		0.1860	26.50	19.49	45.99	54.21	-8.22	AVG	
5		0.2340	33.90	19.55	53.45	62.31	-8.86	QP	
6		0.2340	23.90	19.55	43.45	52.31	-8.86	AVG	
7		0.2900	27.40	19.64	47.04	60.52	-13.48	QP	
8		0.2900	18.60	19.64	38.24	50.52	-12.28	AVG	
9		0.4820	23.01	19.96	42.97	56.30	-13.33	QP	
10		0.4820	21.70	19.96	41.66	46.30	-4.64	AVG	
11		1.1660	18.90	19.83	38.73	56.00	-17.27	QP	
12		1.1660	17.00	19.83	36.83	46.00	-9.17	AVG	

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

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Graphical representation of Mains Terminal Disturbance Voltage Measurement

Model: TPP 30-105

Mode_3_L

Site : Conduction Room

Phase: L1

Temperature: 24 °C

Limit: CISPR11 Class B Conduction(QP)

Power: AC 230V/50Hz

Humidity: 65 %

Mode: Mode_3

Note:

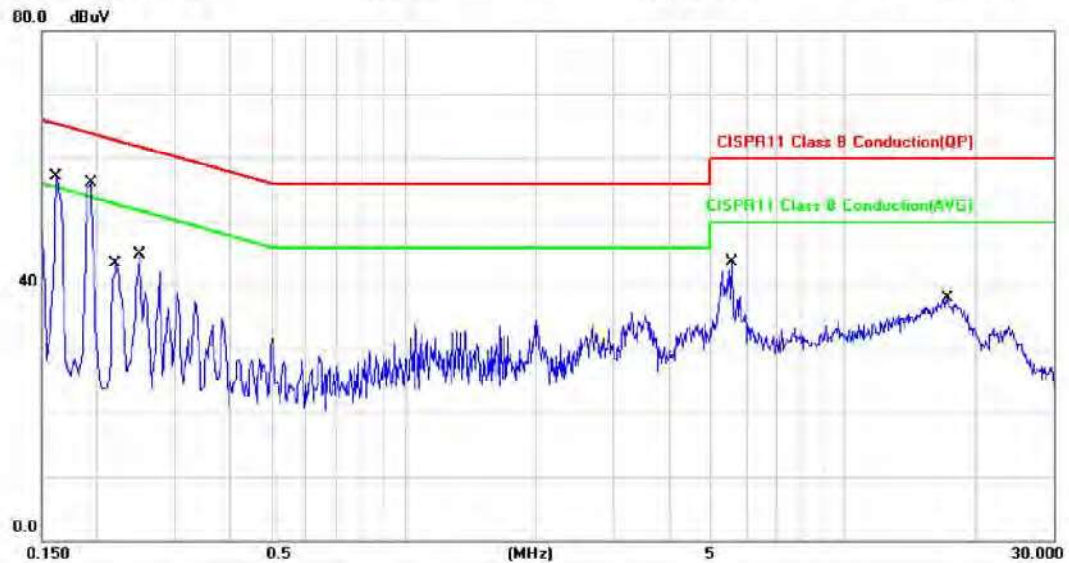
Conducted Emission

File :E7-2017-80014

Data :#5

Date: 2017/8/31

Time: 下午 06:47:08



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1620	39.61	19.50	59.11	65.36	-6.25	QP	
2		0.1620	27.56	19.50	47.06	55.36	-8.30	AVG	
3		0.1940	35.71	19.49	55.20	63.86	-8.66	QP	
4		0.1940	24.54	19.49	44.03	53.86	-9.83	AVG	
5		0.2220	32.50	19.53	52.03	62.74	-10.71	QP	
6		0.2220	22.60	19.53	42.13	52.74	-10.61	AVG	
7		0.2500	29.60	19.57	49.17	61.76	-12.59	QP	
8		0.2500	21.40	19.57	40.97	51.76	-10.79	AVG	
9		5.5820	21.40	19.96	41.36	60.00	-18.64	QP	
10		5.5820	6.79	19.96	26.75	50.00	-23.25	AVG	
11		17.2740	13.59	20.03	33.62	60.00	-26.38	QP	
12		17.2740	9.26	20.03	29.29	50.00	-20.71	AVG	

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

File :E7-2017-80014\Data :#5

Page: 1

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Graphical representation of Mains Terminal Disturbance Voltage Measurement

Mode_3_N

Site : Conduction Room

Phase: **N**

Temperature: 24 °C

Limit: CISPR11 Class B Conduction(QP)

Power: AC 230V/50Hz

Humidity: 65 %

Mode: Mode_3

Note:

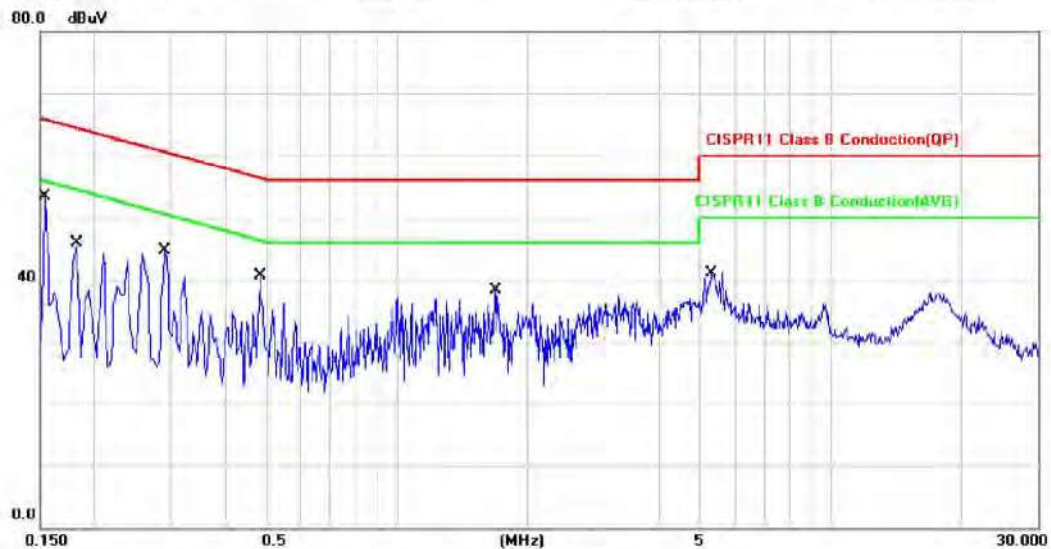
Conducted Emission

File :E7-2017-80014

Data :#6

Date: 2017/8/31

Time: 下午 06:52:18



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1540	37.20	19.50	56.70	65.78	-9.08	QP	
2		0.1540	26.80	19.50	46.30	55.78	-9.48	AVG	
3		0.1820	33.40	19.49	52.89	64.39	-11.50	QP	
4		0.1820	24.30	19.49	43.79	54.39	-10.60	AVG	
5		0.2900	25.81	19.64	45.45	60.52	-15.07	QP	
6		0.2900	21.00	19.64	40.64	50.52	-9.88	AVG	
7		0.4820	21.01	19.96	40.97	56.30	-15.33	QP	
8 *		0.4820	20.00	19.96	39.96	46.30	-6.34	AVG	
9		1.6820	15.42	20.20	35.62	56.00	-20.38	QP	
10		1.6820	5.85	20.20	26.05	46.00	-19.95	AVG	
11		5.3060	17.02	19.95	36.97	60.00	-23.03	QP	
12		5.3060	10.59	19.95	30.54	50.00	-19.46	AVG	

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

File :E7-2017-80014\Data :#6

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(µV)	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)		Results *
	Quasi-Peak		
0.15 to 2	53 to 20		-
2 to 30	2		-
30 to 152	30		-
Limits – I/O Line			
Frequency (MHz)	Limit dB (µA)		Results *
	Quasi-Peak		
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	22°C	
Relative Humidity	10 to 90 %	70%	
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)	-	
230 to 1000	47(10m), 57(3m)	-	
Limits – Group 1 Class B			
Frequency (MHz)	Limit dB (µV/m)		
	Quasi-Peak	Results *	
30 to 230	30(10m), 40(3m)	P	
230 to 1000	37(10m), 47(3m)	P	
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 966A EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
EMI Test Receiver	R&S	ESR 7	101459	2017/2/17	2018/2/16
Biconical Antenna	SCHWARZBECK	VULB 9168	9168-297	2017/5/26	2018/5/25
Biconical Antenna	SCHWARZBECK	VHBB 9124	9124-560	2016/12/6	2017/12/5
Log-Periodic Antenna	SCHWARZBECK	UHALP 9108 A	UHALP 9108-A 0990	2016/12/6	2017/12/5
Pre Amplifier	EMC Instruments Corp.	EMC330	980180	2017/5/19	2018/5/18
Coaxial Cable	Huber+Suhner	RG 214/U	539808	2017/4/23	2018/4/22
Coaxial Cable	EMC Instruments	EMC8D-NM-NM-6000	140922	2017/4/23	2018/4/22
Coaxial Cable	NA	8D	SAC-A-0.5M	2017/4/23	2018/4/22
Coaxial Cable	MF	MF-7802	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	SGS	966 Chamber A	SAC-A	2017/1/12	2018/1/11
Test Software	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 (k=2) of radiated emission measurement is 4.71 dB. (30-1000MHz)					

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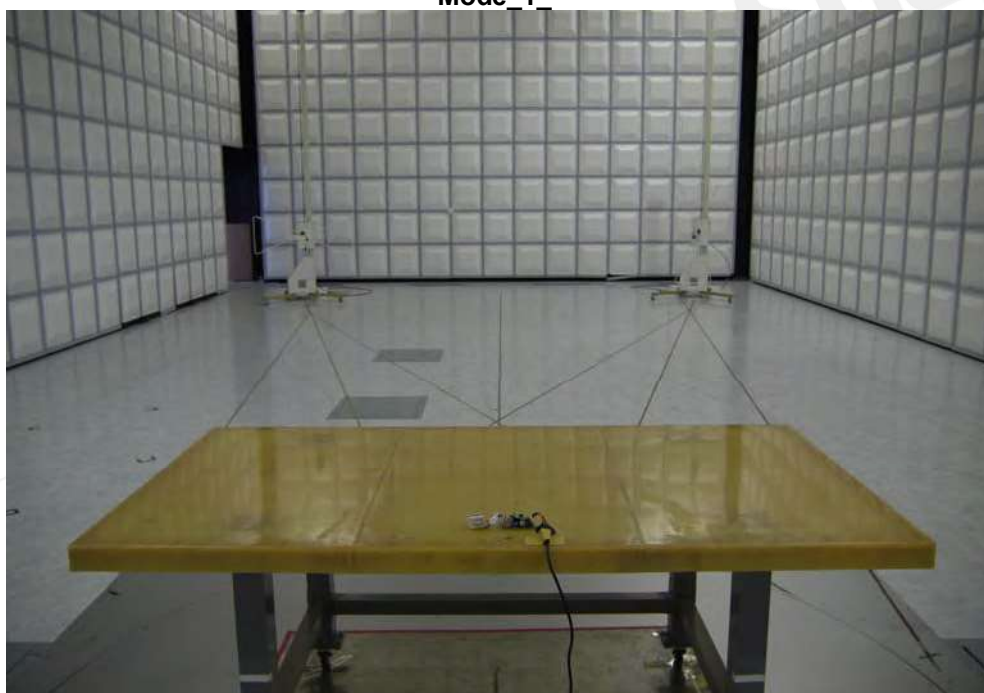
Photo of test setup for Radiated Disturbance

Model: TPP 30-105A-J

Mode_1_+



Mode_1_-



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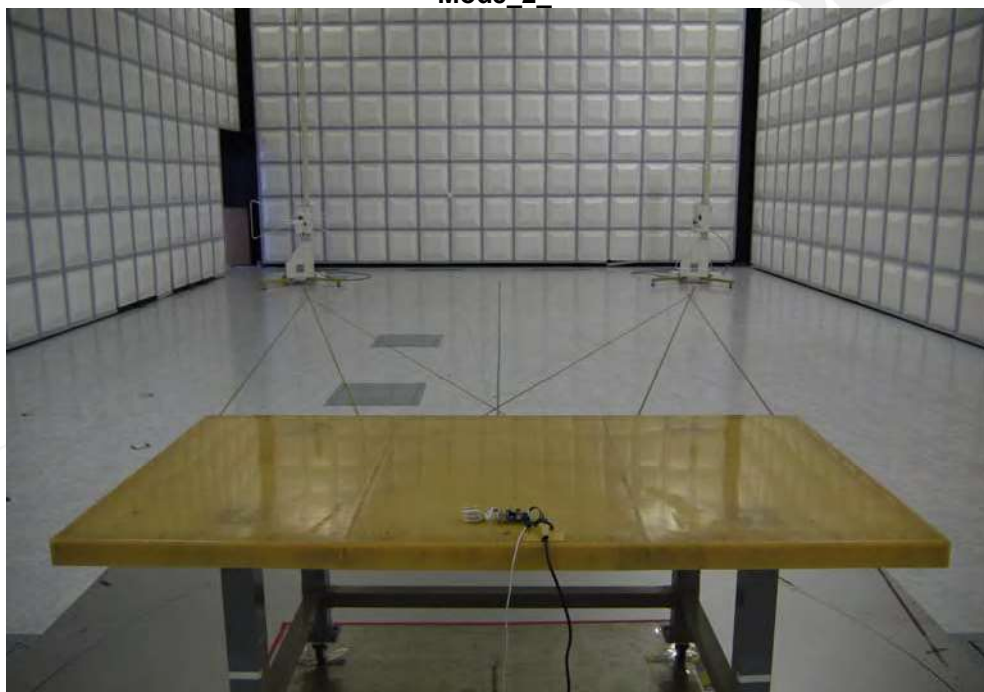
Photo of test setup for Radiated Disturbance

Model: TPP 30-105BA-J

Mode_2_+



Mode_2_-



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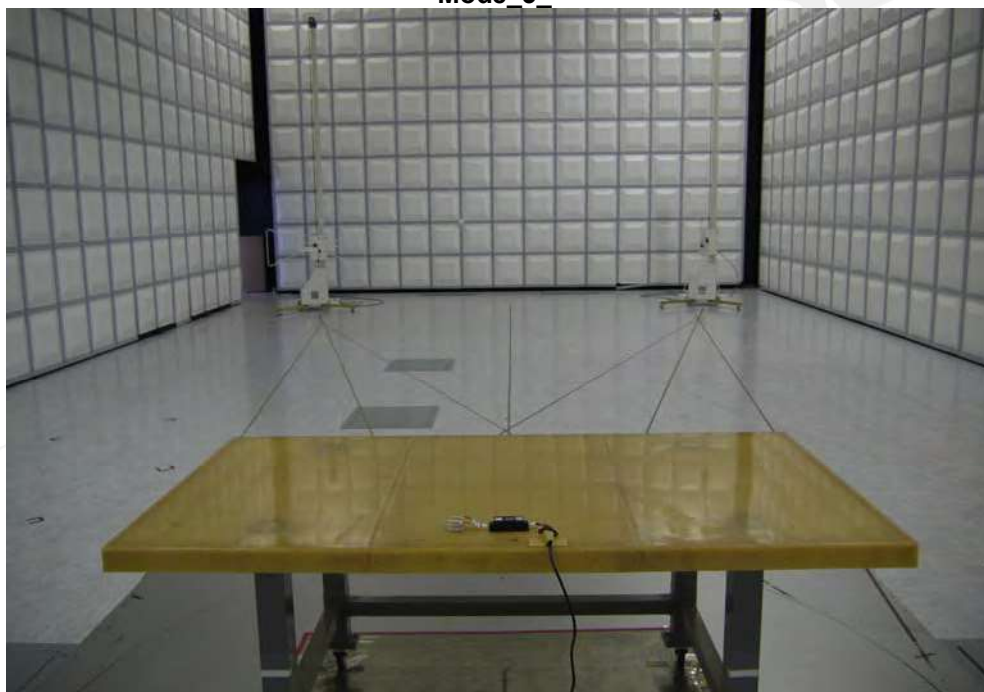
Photo of test setup for Radiated Disturbance

Model: TPP 30-105

Mode_3_+



Mode_3_-



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Graphical representation of Radiated Disturbance Measurement

Model: TPP 30-105A-J
Mode_1_HSite: SGS 10m Chamber
Limit: CISPR11 ClassB 10M Radiation
Mode: Full Load
Note: Mode 1Polarization: **Horizontal**
Power: AC 230V/50Hz
Distance:Temperature: 22 °C
Humidity: 70 %

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		43.5800	25.76	-11.88	13.88	30.00	-16.12	QP	
2		160.9500	24.75	-11.77	12.98	30.00	-17.02	QP	
3		226.9100	28.63	-14.02	14.61	30.00	-15.39	QP	
4		862.2600	23.75	-0.28	23.47	37.00	-13.53	QP	
5 *		956.3500	23.61	0.73	24.34	37.00	-12.66	QP	
6		996.1200	23.75	0.25	24.00	37.00	-13.00	QP	

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

File :80014\Data :#8

Page: 1

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Graphical representation of Radiated Disturbance Measurement

Mode_1_V

Site: SGS 10m Chamber
Limit: CISPR11 ClassB 10M Radiation
Mode: Full Load
Note: Mode 1

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

Temperature: 22 °C
Humidity: 70 %

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	*	44.4700	37.88	-11.83	26.05	30.00	-3.95	QP	
2		69.4400	29.59	-14.10	15.49	30.00	-14.51	QP	
3		155.1300	26.99	-11.99	15.00	30.00	-15.00	QP	
4		224.0000	31.36	-14.14	17.22	30.00	-12.78	QP	
5		902.0300	23.06	0.13	23.19	37.00	-13.81	QP	
6		987.3900	23.40	0.36	23.76	37.00	-13.24	QP	

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

File :80014\Data :#7

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Graphical representation of Radiated Disturbance Measurement

Model: TPP 30-105BA-J
Mode_2_HSite: SGS 10m Chamber
Limit: CISPR11 ClassB 10M Radiation
Mode: Full Load
Note: Mode 2Polarization: **Horizontal**

Temperature: 22 °C

Power: AC 230V/50Hz

Humidity: 70 %

Distance:

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		43.5800	24.84	-11.88	12.96	30.00	-17.04	QP	
2		160.9500	23.60	-11.77	11.83	30.00	-18.17	QP	
3		226.9100	29.04	-14.02	15.02	30.00	-14.98	QP	
4		862.2600	24.13	-0.28	23.85	37.00	-13.15	QP	
5	*	956.3500	23.26	0.73	23.99	37.00	-13.01	QP	
6		996.1200	22.92	0.25	23.17	37.00	-13.83	QP	

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

File :80014\Data :#10

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Graphical representation of Radiated Disturbance Measurement

Mode_2_V

Site: SGS 10m Chamber
Limit: CISPR11 ClassB 10M Radiation
Mode: Full Load
Note: Mode 2

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

Temperature: 22 °C
Humidity: 70 %

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	*	44.4700	36.00	-11.83	24.17	30.00	-5.83	QP	
2		69.4400	28.43	-14.10	14.33	30.00	-15.67	QP	
3		155.1300	26.58	-11.99	14.59	30.00	-15.41	QP	
4		224.0000	30.22	-14.14	16.08	30.00	-13.92	QP	
5		902.0300	21.98	0.13	22.11	37.00	-14.89	QP	
6		987.3900	23.66	0.36	24.02	37.00	-12.98	QP	

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

File :80014\Data :#9

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Graphical representation of Radiated Disturbance Measurement

Model: TPP 30-105
Mode_3_HSite: SGS 10m Chamber
Limit: CISPR11 ClassB 10M Radiation
Mode: Full Load
Note: Mode 3Polarization: **Horizontal**

Temperature: 22 °C

Power: AC 230V/50Hz

Humidity: 70 %

Distance:

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		43.5800	26.33	-11.88	14.45	30.00	-15.55	QP	
2		160.9500	25.42	-11.77	13.65	30.00	-16.35	QP	
3		226.9100	28.24	-14.02	14.22	30.00	-15.78	QP	
4		862.2600	23.83	-0.28	23.55	37.00	-13.45	QP	
5 *		956.3500	23.24	0.73	23.97	37.00	-13.03	QP	
6		996.1200	23.41	0.25	23.66	37.00	-13.34	QP	

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

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Graphical representation of Radiated Disturbance Measurement

Mode_3_V

Site: SGS 10m Chamber
Limit: CISPR11 ClassB 10M Radiation
Mode: Full Load
Note: Mode 3

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

Temperature: 22 °C
Humidity: 70 %

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	*	44.4700	35.90	-11.83	24.07	30.00	-5.93	QP	
2		69.4400	28.98	-14.10	14.88	30.00	-15.12	QP	
3		155.1300	27.03	-11.99	15.04	30.00	-14.96	QP	
4		224.0000	31.13	-14.14	16.99	30.00	-13.01	QP	
5		902.0300	22.73	0.13	22.86	37.00	-14.14	QP	
6		987.3900	23.48	0.36	23.84	37.00	-13.16	QP	

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

File :80014\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
Ambient Temperature		10 to 40 °C
Relative Humidity		10 to 90 %
Fully configured sample scanned over the following frequency range		During the test
		Measurement Point
		Frequency range on each side of line
		30MHz – 1GHz
		1GHz – 6GHz
		10 m measurement distance
		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	24°C	
Relative Humidity	30 to 60 %	60%	
Equipment mode	Power interface mode	AC 230V, 50Hz	
	EUT configurations mode		
	Operation mode	Mode 1, 2, 3	
Classification of Equipment..... :		Class A	
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	2017/3/20	2018/3/19
AC Power Source	TESEQ	NSG 1007	1504A02654	2017/3/20	2018/3/19
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 30-105A-J
Mode_1Model: TPP 30-105BA-J
Mode_2

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Photo of test setup for Harmonic Current Emissions

Model: TPP 30-105
Mode_3

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Tabulated Results for Harmonic Current Emissions

Model: TPP 30-105A-J

Mode_1

Teseq Profline
4542 Luterbach, Switzerland8/31/2017
11:34 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: 2017/8/31

Start time: 下午 10:39:02

Test duration (min): 10

Data file name: H-000069.cts_data

Comment:

Customer:

Tested by:

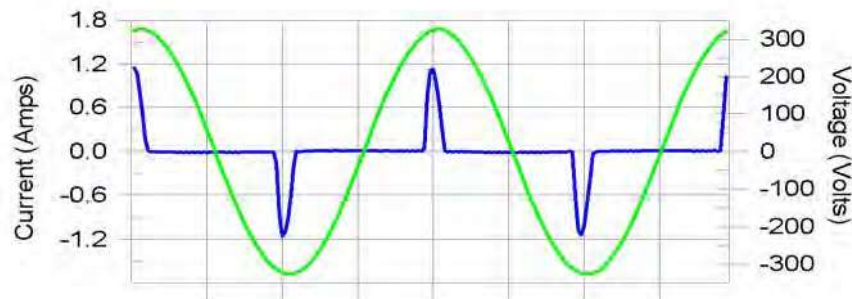
Test Margin: 100

End time: 下午 10:49:13

Test Result: Pass

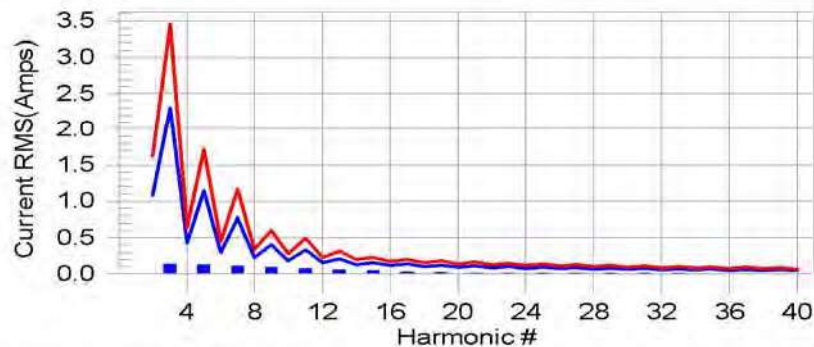
Source qualification: Normal

Current & voltage waveforms



Harmonics and Class A limit line

European Limits



Test result: Pass Worst harmonics H15-20.2% of 150% limit, H15-29.6% of 100% limit

Teseq AG Win2100 V4.14.0

Page 1 of 3

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Teseq Profile
4542 Luterbach, Switzerland

8/31/2017
11:34 PM

Current Test Result Summary (Run time)

EUT:
Test category: Class-A per Ed. 4.0 (2014) (European limits) Tested by:
Test date: 2017/8/31 Start time: 下午 10:39:02 Test Margin: 100
Test duration (min): 10 Data file name: H-000069.cts_data End time: 下午 10:49:13
Comment:
Customer:

Test Result: Pass Source qualification: Normal
THC(A): 0.262 I-THD(%): 188.5 POHC(A): 0.032 POHC Limit(A): 0.251

Highest parameter values during test:

V_RMS (Volts): 230.75 Frequency(Hz): 50.00
I_Peak (Amps): 1.177 I_RMS (Amps): 0.298
I_Fund (Amps): 0.139 Crest Factor: 3.966
Power (Watts): 31.7 Power Factor: 0.463

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.000	1.080	N/A	0.000	1.620	N/A	Pass
3	0.133	2.300	5.8	0.133	3.450	3.9	Pass
4	0.000	0.430	N/A	0.000	0.645	N/A	Pass
5	0.124	1.140	10.9	0.124	1.710	7.3	Pass
6	0.000	0.300	N/A	0.000	0.450	N/A	Pass
7	0.111	0.770	14.5	0.112	1.155	9.7	Pass
8	0.000	0.230	N/A	0.000	0.345	N/A	Pass
9	0.096	0.400	23.9	0.096	0.600	16.1	Pass
10	0.000	0.184	N/A	0.000	0.276	N/A	Pass
11	0.079	0.330	23.8	0.079	0.495	16.0	Pass
12	0.000	0.153	N/A	0.000	0.230	N/A	Pass
13	0.061	0.210	29.1	0.062	0.315	19.7	Pass
14	0.000	0.131	N/A	0.000	0.197	N/A	Pass
15	0.044	0.150	29.6	0.045	0.225	20.2	Pass
16	0.000	0.115	N/A	0.000	0.173	N/A	Pass
17	0.030	0.132	22.4	0.031	0.198	15.5	Pass
18	0.000	0.102	N/A	0.000	0.153	N/A	Pass
19	0.018	0.118	15.3	0.019	0.178	10.7	Pass
20	0.000	0.092	N/A	0.000	0.138	N/A	Pass
21	0.012	0.107	11.1	0.012	0.161	7.7	Pass
22	0.000	0.084	N/A	0.000	0.125	N/A	Pass
23	0.011	0.098	11.7	0.012	0.147	7.9	Pass
24	0.000	0.077	N/A	0.000	0.115	N/A	Pass
25	0.013	0.090	14.5	0.013	0.135	9.8	Pass
26	0.000	0.071	N/A	0.000	0.107	N/A	Pass
27	0.014	0.083	16.4	0.014	0.125	11.0	Pass
28	0.000	0.066	N/A	0.001	0.099	N/A	Pass
29	0.013	0.078	16.4	0.013	0.116	11.1	Pass
30	0.000	0.061	N/A	0.000	0.092	N/A	Pass
31	0.011	0.073	14.5	0.011	0.109	10.0	Pass
32	0.000	0.058	N/A	0.001	0.086	N/A	Pass
33	0.008	0.068	11.4	0.008	0.102	8.0	Pass
34	0.000	0.054	N/A	0.000	0.081	N/A	Pass
35	0.005	0.064	7.9	0.005	0.096	5.7	Pass
36	0.000	0.051	N/A	0.000	0.077	N/A	Pass
37	0.004	0.061	N/A	0.004	0.091	N/A	Pass
38	0.000	0.048	N/A	0.000	0.073	N/A	Pass
39	0.004	0.058	N/A	0.004	0.087	N/A	Pass
40	0.000	0.046	N/A	0.000	0.069	N/A	Pass

Teseq AG Win2100 V4.14.0

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Teseq Profile
4542 Luterbach, Switzerland

8/31/2017
11:34 PM

Voltage Source Verification Data (Run time)

EUT:
Test category: Class-A per Ed. 4.0 (2014) (European limits)
Test date: 2017/8/31
Test duration (min): 10
Comment:
Customer:
Tested by:
Test Margin: 100
Start time: 下午 10:39:02
End time: 下午 10:49:13
Data file name: H-000069.cts_data

Test Result: Pass Source qualification: Normal

Highest parameter values during test:

Voltage (Vrms):	230.75	Frequency(Hz):	50.00
I _{Peak} (Amps):	1.177	I _{RMS} (Amps):	0.298
I _{Fund} (Amps):	0.139	Crest Factor:	3.966
Power (Watts):	31.7	Power Factor:	0.463

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.022	0.461	4.81	OK
3	0.461	2.077	22.21	OK
4	0.020	0.461	4.33	OK
5	0.038	0.923	4.15	OK
6	0.016	0.461	3.38	OK
7	0.035	0.692	5.06	OK
8	0.014	0.461	3.13	OK
9	0.046	0.461	9.86	OK
10	0.012	0.461	2.51	OK
11	0.043	0.231	18.66	OK
12	0.010	0.231	4.20	OK
13	0.035	0.231	14.97	OK
14	0.004	0.231	1.62	OK
15	0.030	0.231	13.02	OK
16	0.004	0.231	1.76	OK
17	0.022	0.231	9.73	OK
18	0.011	0.231	4.73	OK
19	0.018	0.231	7.92	OK
20	0.015	0.231	6.33	OK
21	0.014	0.231	6.21	OK
22	0.004	0.231	1.74	OK
23	0.012	0.231	5.11	OK
24	0.003	0.231	1.21	OK
25	0.014	0.231	6.26	OK
26	0.002	0.231	0.99	OK
27	0.019	0.231	8.42	OK
28	0.002	0.231	1.01	OK
29	0.015	0.231	6.38	OK
30	0.004	0.231	1.58	OK
31	0.015	0.231	6.33	OK
32	0.002	0.231	0.92	OK
33	0.011	0.231	4.73	OK
34	0.002	0.231	0.87	OK
35	0.009	0.231	3.94	OK
36	0.002	0.231	0.98	OK
37	0.008	0.231	3.59	OK
38	0.002	0.231	0.97	OK
39	0.010	0.231	4.52	OK
40	0.013	0.231	5.56	OK

Teseq AG Win2100 V4.14.0

Page 3 of 3

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Tabulated Results for Harmonic Current Emissions

Model: TPP 30-105BA-J

Mode_2

Teseq Proflin
4542 Luterbach, Switzerland8/31/2017
11:34 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: 2017/8/31

Test duration (min): 10

Comment:

Customer:

Tested by:

Test Margin: 100

Start time: 下午 10:26:35

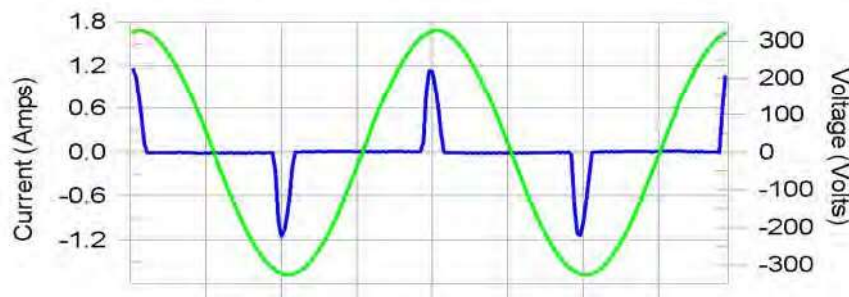
End time: 下午 10:36:46

Data file name: H-000068.cts_data

Test Result: Pass

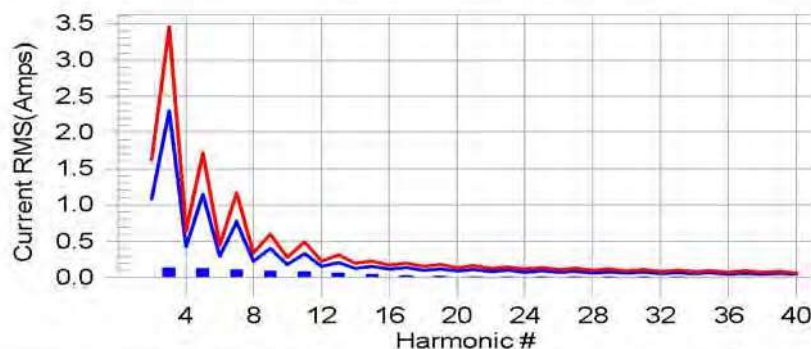
Source qualification: Normal

Current & voltage waveforms



Harmonics and Class A limit line

European Limits



Test result: Pass Worst harmonics H15-20.1% of 150% limit, H15-29.8% of 100% limit

Teseq AG Win2100 V4.14.0

Page 1 of 3

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11:34 PM

Current Test Result Summary (Run time)

EUT:
Test category: Class-A per Ed. 4.0 (2014) (European limits) Tested by:
Test date: 2017/8/31 Start time: 下午 10:26:35 Test Margin: 100
Test duration (min): 10 Data file name: H-000068.cts_data End time: 下午 10:36:46
Comment:
Customer:

Test Result: Pass Source qualification: Normal
THC(A): 0.263 I-THD(%): 188.6 POHC(A): 0.032 POHC Limit(A): 0.251

Highest parameter values during test:

V_RMS (Volts): 230.75 Frequency(Hz): 50.00
I_Peak (Amps): 1.186 I_RMS (Amps): 0.299
I_Fund (Amps): 0.140 Crest Factor: 3.983
Power (Watts): 31.8 Power Factor: 0.463

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.000	1.080	N/A	0.000	1.620	N/A	Pass
3	0.134	2.300	5.8	0.134	3.450	3.9	Pass
4	0.000	0.430	N/A	0.000	0.645	N/A	Pass
5	0.125	1.140	10.9	0.125	1.710	7.3	Pass
6	0.000	0.300	N/A	0.000	0.450	N/A	Pass
7	0.112	0.770	14.5	0.112	1.155	9.7	Pass
8	0.000	0.230	N/A	0.000	0.345	N/A	Pass
9	0.096	0.400	24.0	0.096	0.600	16.1	Pass
10	0.000	0.184	N/A	0.000	0.276	N/A	Pass
11	0.079	0.330	23.9	0.079	0.495	16.0	Pass
12	0.000	0.153	N/A	0.000	0.230	N/A	Pass
13	0.061	0.210	29.2	0.062	0.315	19.6	Pass
14	0.000	0.131	N/A	0.000	0.197	N/A	Pass
15	0.045	0.150	29.8	0.045	0.225	20.1	Pass
16	0.000	0.115	N/A	0.000	0.173	N/A	Pass
17	0.030	0.132	22.6	0.030	0.198	15.4	Pass
18	0.000	0.102	N/A	0.001	0.153	N/A	Pass
19	0.018	0.118	15.5	0.019	0.178	10.6	Pass
20	0.000	0.092	N/A	0.000	0.138	N/A	Pass
21	0.012	0.107	11.3	0.012	0.161	7.7	Pass
22	0.000	0.084	N/A	0.000	0.125	N/A	Pass
23	0.012	0.098	11.9	0.012	0.147	8.0	Pass
24	0.000	0.077	N/A	0.000	0.115	N/A	Pass
25	0.013	0.090	14.6	0.013	0.135	9.9	Pass
26	0.000	0.071	N/A	0.000	0.107	N/A	Pass
27	0.014	0.083	16.5	0.014	0.125	11.1	Pass
28	0.000	0.066	N/A	0.001	0.099	N/A	Pass
29	0.013	0.078	16.5	0.013	0.116	11.1	Pass
30	0.000	0.061	N/A	0.000	0.092	N/A	Pass
31	0.011	0.073	14.7	0.011	0.109	9.9	Pass
32	0.000	0.058	N/A	0.001	0.086	N/A	Pass
33	0.008	0.068	11.5	0.008	0.102	7.9	Pass
34	0.000	0.054	N/A	0.000	0.081	N/A	Pass
35	0.005	0.064	8.1	0.005	0.096	5.6	Pass
36	0.000	0.051	N/A	0.000	0.077	N/A	Pass
37	0.004	0.061	N/A	0.004	0.091	N/A	Pass
38	0.000	0.048	N/A	0.000	0.073	N/A	Pass
39	0.004	0.058	N/A	0.004	0.087	N/A	Pass
40	0.000	0.046	N/A	0.000	0.069	N/A	Pass

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Teseq Profile
4542 Luterbach, Switzerland

8/31/2017
11:34 PM

Voltage Source Verification Data (Run time)

EUT: Tested by:
Test category: Class-A per Ed. 4.0 (2014) (European limits) Test Margin: 100
Test date: 2017/8/31 Start time: 下午 10:26:35 End time: 下午 10:36:46
Test duration (min): 10 Data file name: H-000068.cts_data
Comment:
Customer:

Test Result: Pass Source qualification: Normal

Highest parameter values during test:

Voltage (Vrms):	230.75	Frequency(Hz):	50.00
I _{Peak} (Amps):	1.186	I _{RMS} (Amps):	0.299
I _{Fund} (Amps):	0.140	Crest Factor:	3.983
Power (Watts):	31.8	Power Factor:	0.463

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.022	0.461	4.75	OK
3	0.461	2.077	22.19	OK
4	0.020	0.461	4.29	OK
5	0.039	0.923	4.18	OK
6	0.017	0.461	3.68	OK
7	0.035	0.692	5.10	OK
8	0.014	0.461	3.08	OK
9	0.046	0.461	9.86	OK
10	0.012	0.461	2.53	OK
11	0.043	0.231	18.71	OK
12	0.010	0.231	4.15	OK
13	0.035	0.231	15.06	OK
14	0.004	0.231	1.62	OK
15	0.030	0.231	12.98	OK
16	0.004	0.231	1.78	OK
17	0.023	0.231	9.81	OK
18	0.012	0.231	5.10	OK
19	0.018	0.231	8.02	OK
20	0.015	0.231	6.43	OK
21	0.015	0.231	6.32	OK
22	0.004	0.231	1.82	OK
23	0.012	0.231	5.17	OK
24	0.003	0.231	1.40	OK
25	0.015	0.231	6.35	OK
26	0.003	0.231	1.12	OK
27	0.019	0.231	8.44	OK
28	0.002	0.231	1.00	OK
29	0.015	0.231	6.45	OK
30	0.004	0.231	1.68	OK
31	0.015	0.231	6.40	OK
32	0.002	0.231	0.91	OK
33	0.011	0.231	4.73	OK
34	0.002	0.231	1.01	OK
35	0.009	0.231	3.96	OK
36	0.003	0.231	1.10	OK
37	0.009	0.231	3.69	OK
38	0.002	0.231	1.01	OK
39	0.010	0.231	4.45	OK
40	0.013	0.231	5.57	OK

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Tabulated Results for Harmonic Current Emissions

Model: TPP 30-105

Mode_3

Teseq Proflin
4542 Luterbach, Switzerland8/31/2017
11:34 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: 2017/8/31

Test duration (min): 10

Comment:

Customer:

Tested by:

Test Margin: 100

Start time: 下午 09:42:22

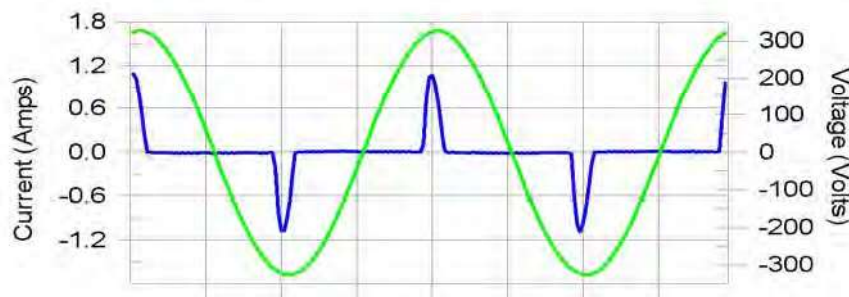
End time: 下午 09:52:34

Data file name: H-000065.cts_data

Test Result: Pass

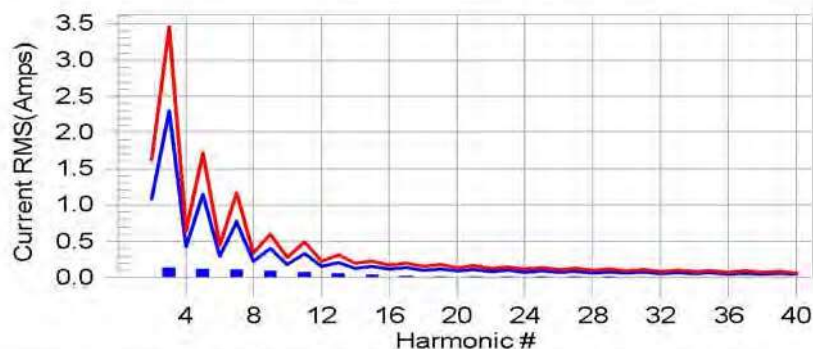
Source qualification: Normal

Current & voltage waveforms



Harmonics and Class A limit line

European Limits



Test result: Pass Worst harmonics H13-17.4% of 150% limit, H13-25% of 100% limit

Teseq AG Win2100 V4.14.0

Page 1 of 3

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Teseq Profile
4542 Luterbach, Switzerland

8/31/2017
11:34 PM

Current Test Result Summary (Run time)

EUT:
Test category: Class-A per Ed. 4.0 (2014) (European limits) Tested by:
Test date: 2017/8/31 Start time: 下午 09:42:22 Test Margin: 100
Test duration (min): 10 Data file name: H-000065.cts_data End time: 下午 09:52:34
Comment:
Customer:

Test Result: Pass Source qualification: Normal
THC(A): 0.253 I-THD(%): 176.8 POHC(A): 0.029 POHC Limit(A): 0.251

Highest parameter values during test:

V_RMS (Volts): 230.74 Frequency(Hz): 50.00
I_Peak (Amps): 1.113 I_RMS (Amps): 0.291
I_Fund (Amps): 0.143 Crest Factor: 3.830
Power (Watts): 32.5 Power Factor: 0.492

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.000	1.080	N/A	0.000	1.620	N/A	Pass
3	0.134	2.300	5.8	0.136	3.450	3.9	Pass
4	0.000	0.430	N/A	0.000	0.645	N/A	Pass
5	0.124	1.140	10.8	0.124	1.710	7.2	Pass
6	0.000	0.300	N/A	0.000	0.450	N/A	Pass
7	0.109	0.770	14.1	0.109	1.155	9.4	Pass
8	0.000	0.230	N/A	0.000	0.345	N/A	Pass
9	0.091	0.400	22.7	0.092	0.600	15.3	Pass
10	0.000	0.184	N/A	0.000	0.276	N/A	Pass
11	0.071	0.330	21.7	0.073	0.495	14.8	Pass
12	0.000	0.153	N/A	0.000	0.230	N/A	Pass
13	0.052	0.210	25.0	0.055	0.315	17.4	Pass
14	0.000	0.131	N/A	0.000	0.197	N/A	Pass
15	0.035	0.150	23.3	0.038	0.225	16.8	Pass
16	0.000	0.115	N/A	0.000	0.173	N/A	Pass
17	0.021	0.132	15.7	0.023	0.198	11.8	Pass
18	0.000	0.102	N/A	0.000	0.153	N/A	Pass
19	0.012	0.118	10.1	0.013	0.178	7.6	Pass
20	0.000	0.092	N/A	0.000	0.138	N/A	Pass
21	0.011	0.107	10.0	0.011	0.161	7.0	Pass
22	0.000	0.084	N/A	0.000	0.125	N/A	Pass
23	0.013	0.098	12.9	0.013	0.147	9.1	Pass
24	0.000	0.077	N/A	0.000	0.115	N/A	Pass
25	0.013	0.090	15.0	0.014	0.135	10.1	Pass
26	0.000	0.071	N/A	0.000	0.107	N/A	Pass
27	0.012	0.083	14.9	0.013	0.125	10.4	Pass
28	0.000	0.066	N/A	0.000	0.099	N/A	Pass
29	0.010	0.078	12.8	0.011	0.116	9.4	Pass
30	0.000	0.061	N/A	0.000	0.092	N/A	Pass
31	0.007	0.073	9.4	0.008	0.109	7.4	Pass
32	0.000	0.058	N/A	0.001	0.086	N/A	Pass
33	0.004	0.068	N/A	0.005	0.102	N/A	Pass
34	0.000	0.054	N/A	0.000	0.081	N/A	Pass
35	0.004	0.064	N/A	0.004	0.096	N/A	Pass
36	0.000	0.051	N/A	0.000	0.077	N/A	Pass
37	0.004	0.061	N/A	0.005	0.091	N/A	Pass
38	0.000	0.048	N/A	0.000	0.073	N/A	Pass
39	0.005	0.058	N/A	0.005	0.087	N/A	Pass
40	0.000	0.046	N/A	0.000	0.069	N/A	Pass

Teseq AG Win2100 V4.14.0

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Teseq Profile
4542 Luterbach, Switzerland

8/31/2017
11:34 PM

Voltage Source Verification Data (Run time)

EUT: Tested by:
Test category: Class-A per Ed. 4.0 (2014) (European limits) Test Margin: 100
Test date: 2017/8/31 Start time: 下午 09:42:22 End time: 下午 09:52:34
Test duration (min): 10 Data file name: H-000065.cts_data
Comment:
Customer:

Test Result: Pass Source qualification: Normal

Highest parameter values during test:

Voltage (Vrms):	230.74	Frequency(Hz):	50.00
I _{Peak} (Amps):	1.113	I _{RMS} (Amps):	0.291
I _{Fund} (Amps):	0.143	Crest Factor:	3.830
Power (Watts):	32.5	Power Factor:	0.492

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.023	0.461	4.91	OK
3	0.463	2.076	22.28	OK
4	0.020	0.461	4.31	OK
5	0.038	0.923	4.12	OK
6	0.017	0.461	3.61	OK
7	0.034	0.692	4.95	OK
8	0.014	0.461	3.00	OK
9	0.044	0.461	9.56	OK
10	0.012	0.461	2.53	OK
11	0.041	0.231	17.55	OK
12	0.010	0.231	4.33	OK
13	0.031	0.231	13.38	OK
14	0.004	0.231	1.62	OK
15	0.027	0.231	11.83	OK
16	0.004	0.231	1.59	OK
17	0.017	0.231	7.41	OK
18	0.010	0.231	4.47	OK
19	0.014	0.231	5.96	OK
20	0.015	0.231	6.33	OK
21	0.012	0.231	5.10	OK
22	0.004	0.231	1.68	OK
23	0.014	0.231	5.88	OK
24	0.003	0.231	1.29	OK
25	0.015	0.231	6.47	OK
26	0.002	0.231	0.92	OK
27	0.018	0.231	7.78	OK
28	0.002	0.231	0.97	OK
29	0.012	0.231	5.36	OK
30	0.004	0.231	1.73	OK
31	0.011	0.231	4.81	OK
32	0.002	0.231	0.89	OK
33	0.007	0.231	3.24	OK
34	0.002	0.231	0.85	OK
35	0.008	0.231	3.29	OK
36	0.002	0.231	0.99	OK
37	0.010	0.231	4.45	OK
38	0.002	0.231	0.91	OK
39	0.011	0.231	4.87	OK
40	0.013	0.231	5.54	OK

Teseq AG Win2100 V4.14.0

Page 3 of 3

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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	24°C	
Relative Humidity	30 to 60 %	60%	
Equipment mode	Power interface mode..... :	AC 230V, 50Hz	
	EUT configurations mode :		
	Operation mode..... :	Mode 1, 2, 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	2017/3/20	2018/3/19
AC Power Source	TESEQ	NSG 1007	1504A02654	2017/3/20	2018/3/19
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 30-105A-J
Mode_1Model: TPP 30-105BA-J
Mode_2

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Photo of test setup for Voltage Fluctuations And Flicker

Model: TPP 30-105

Mode_3



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Tabulated Results for Voltage Fluctuations And Flicker

Model: TPP 30-105A-J
Mode_1Teseq Profline
4542 Luterbach, Switzerland8/31/2017
11:33 PM

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

EUT:
Test category: All parameters (European limits)
Test date: 2017/8/31
Test duration (min): 10
Comment:
Customer:

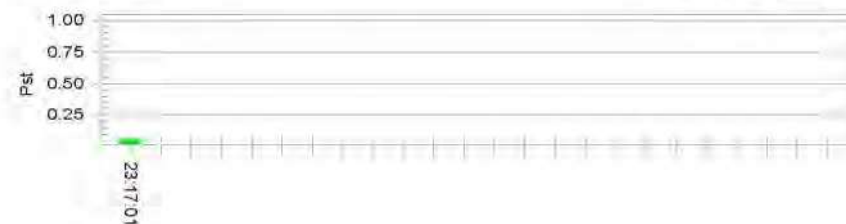
Tested by:
Test Margin: 100
Start time: 下午 11:06:40
End time: 下午 11:17:07
Data file name: F-000071.cts_data

Test Result: Pass

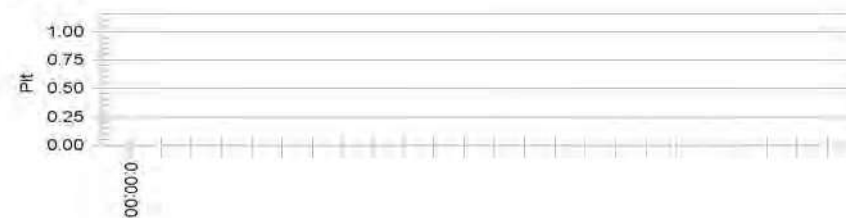
Status: Test Completed

Pst and limit line

European Limits



Plt and limit line



Parameter values recorded during the test:

Vrms at the end of test (Volt):	230.67		
Highest dt (%):	0.00	Test limit (%):	N/A
T-max (mS):	0	Test limit (mS):	500.0
Highest dc (%):	0.00	Test limit (%):	3.30
Highest dmax (%):	0.00	Test limit (%):	4.00
Highest Pst (10 min. period):	0.064	Test limit:	1.000
Highest Plt (2 hr. period):	0.028	Test limit:	0.650

Teseq AG Win2100 V4.14.0

Page 1 of 1

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Tabulated Results for Voltage Fluctuations And Flicker

Model: TPP 30-105BA-J
Mode_2Teseq Profline
4542 Luterbach, Switzerland8/31/2017
11:33 PM

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

EUT:

Test category: All parameters (European limits)

Test date: 2017/8/31

Test duration (min): 10

Comment:

Customer:

Tested by:

Test Margin: 100

Start time: 下午 10:14:55

End time: 下午 10:25:22

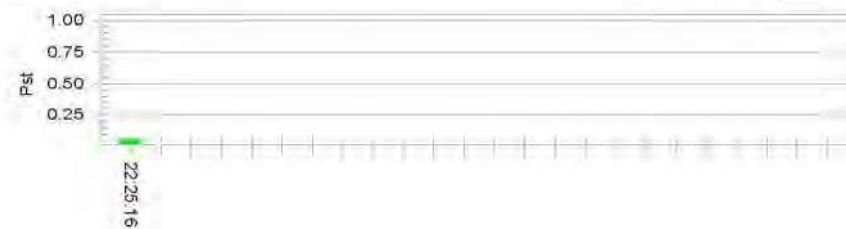
Data file name: F-000067.cts_data

Test Result: Pass

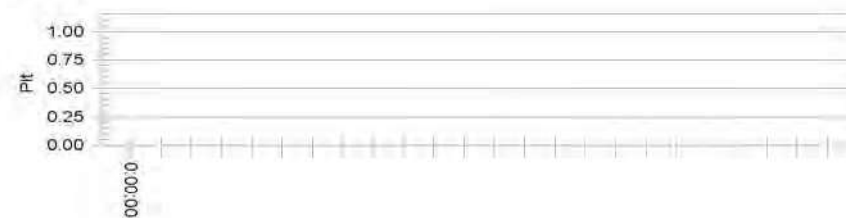
Status: Test Completed

Pst and limit line

European Limits



Plt and limit line



Parameter values recorded during the test:

Vrms at the end of test (Volt): 230.65

Highest dt (%): 0.00

T-max (mS): 0

Highest dc (%): 0.00

Highest dmax (%): 0.00

Highest Pst (10 min. period): 0.064

Highest Plt (2 hr. period): 0.028

Test limit (%): N/A

Test limit (mS): 500.0

Test limit (%): 3.30

Test limit (%): 4.00

Test limit: 1.000

Test limit: 0.650

N/A

Pass

Pass

Pass

Pass

Pass

Teseq AG Win2100 V4.14.0

Page 1 of 1

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Tabulated Results for Voltage Fluctuations And Flicker

Model: TPP 30-105

Mode_3

Teseq Profline
4542 Luterbach, Switzerland8/31/2017
11:34 PM

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

EUT:

Test category: All parameters (European limits)

Test date: 2017/8/31

Test duration (min): 10

Comment:

Customer:

Tested by:

Test Margin: 100

Start time: 下午 09:54:08

End time: 下午 10:04:35

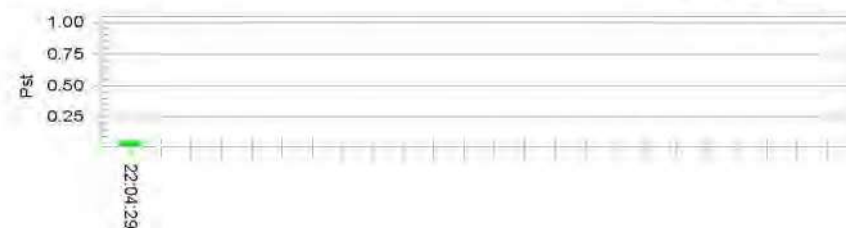
Data file name: F-000066.cts_data

Test Result: Pass

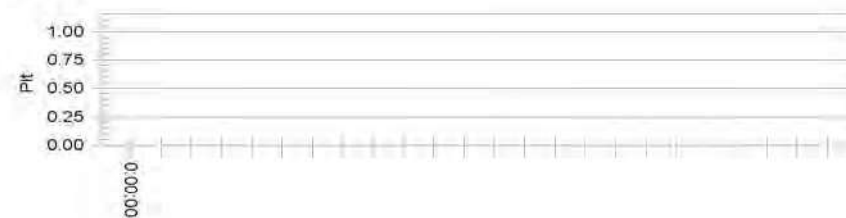
Status: Test Completed

Pst and limit line

European Limits



Plt and limit line



Parameter values recorded during the test:

Vrms at the end of test (Volt): 230.67

Highest dt (%): 0.00

T-max (mS): 0

Highest dc (%): 0.00

Highest dmax (%): 0.00

Highest Pst (10 min. period): 0.064

Highest Plt (2 hr. period): 0.028

Test limit (%): N/A

Test limit (mS): 500.0

Test limit (%): 3.30

Test limit (%): 4.00

Test limit: 1.000

Test limit: 0.650

N/A

Pass

Pass

Pass

Pass

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
<p><u>Method:</u> The test is intended to demonstrate the immunity of equipment subjected to static electricity discharges from operators directly and to adjacent objects. The table top equipment under test is placed on a wooden table, 0.8 m high, standing on the ground reference plane. A horizontal coupling plane (HCP), 1.6 x 0.8 m, is placed on the table. The EUT and the cables are isolated from the coupling plane by an insulating support 0.5 mm thick. The floor standing equipment is isolated from the ground reference plane by an insulating support about 0.1 m thick. The vertical coupling plane (VCP) of dimensions 0.5 m x 0.5 m is placed parallel to, and positioned at a distance of 0.1 m from, the EUT.</p>				P
Laboratory Parameters:		Required prior to the test	During the test	
Ambient Temperature		15 to 35 °C	21°C	
Relative Humidity		30 to 60 %	45%	
Equipment mode		Power interface mode	AC 230V, 50Hz	
		EUT configurations mode		
		Operation mode	Mode 1, 2, 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.1 EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
ESD Simulator	Thermo	MiniZap	612312	2017/6/16	2018/6/15
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.
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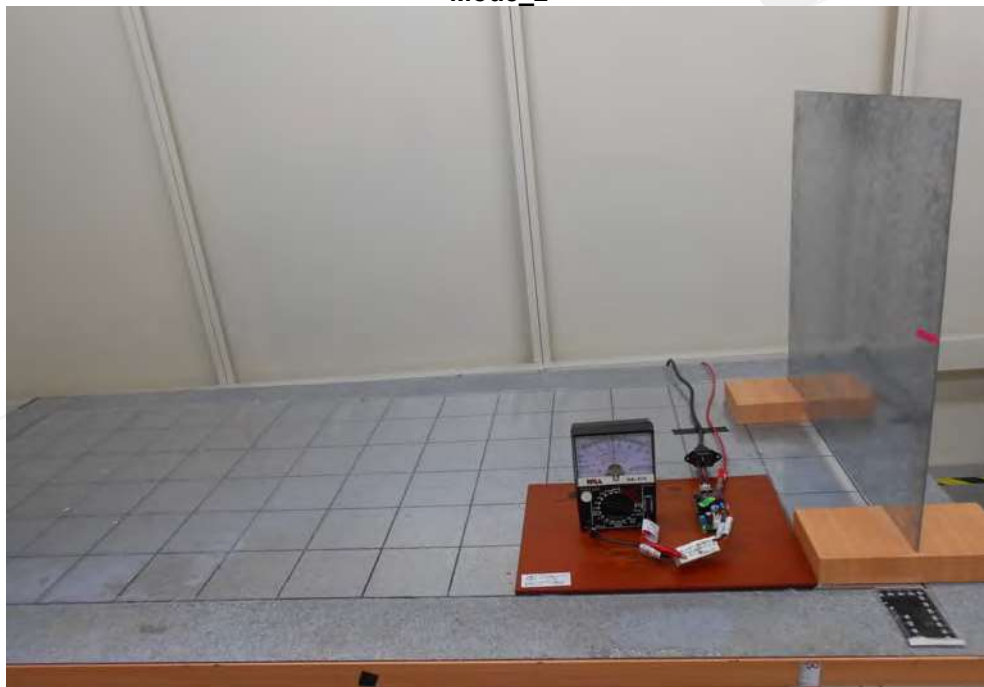
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Photo of test setup for Immunity to Electrostatic Discharges

Model: TPP 30-105A-J
Mode_1Model: TPP 30-105BA-J
Mode_2

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Photo of test setup for Immunity to Electrostatic Discharges

Model: TPP 30-105
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
N/A	2, 4, 8, 15	+ and -	1*
Discharge location	Contact discharge voltage (kV)	Polarity	Result
N/A	2, 4, 6, 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. *No any discharge events occurred on the test.			
Note: Description of the response should detail observations during testing.			

Photo of Electrostatic Discharges Test Locations
N/A

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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
<u>Method:</u> 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	21°C
Relative Humidity		30 to 60 %	45%
Equipment mode		Power interface mode	AC 230V, 50Hz
		EUT configurations mode	
		Operation mode	Mode 1, 2, 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-B EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
RS Test Site	Chance Most	9X6X6	SAC-B	2016/12/13	2017/12/12
Signal Generator	R&S	SMJ 100A	101258	2017/9/7	2018/9/9
Power Sensor	R&S	NRP-Z11	111682	2017/3/29	2018/3/28
Power Sensor	R&S	NRP-Z11	112186	2017/3/21	2018/3/20
Power Amplifier	R&S	BBA100	101075	N.C.R.	N.C.R.
Power Amplifier	R&S	BBA100	101021	N.C.R.	N.C.R.
E-Field Generating Antenna	ifi	EFG-3	U2137-0217	N.C.R.	N.C.R.
High Gain Log-Per. Antenna	R&S	HL046E	9149-151	N.C.R.	N.C.R.
Calibrated Broadband Log-Per. Test-Antenna	Schwarzbeck	STLP 9149	9149-151	N.C.R.	N.C.R.
Field Probes	Narda	NBM-550	V8.F-0375	2017/1/17	2018/1/16
Test Software	R&S	EMC 32	V9.21.00	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.)					

Photo of test setup for Radio Frequency Electromagnetic Fields

Model: TPP 30-105A-J
Mode_1



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Photo of test setup for Radio Frequency Electromagnetic Fields

Model: TPP 30-105BA-J
Mode_2



Model: TPP 30-105
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	10, 20	H	3	1
	10, 20	V	3	1
Back	10, 20	H	3	1
	10, 20	V	3	1
Left	10, 20	H	3	1
	10, 20	V	3	1
Right	10, 20	H	3	1
	10, 20	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	21°C	
Relative Humidity	30 to 60 %	45%	
Equipment mode	Power interface mode	AC 230V, 50Hz	
	EUT configurations mode		
	Operation mode	Mode 1, 2, 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	2017/9/24	2018/9/23
Signal Generator	R&S	SMT 06	100867	2017/3/13	2018/3/12
Power Sensor	R&S	NRP-Z11	111682	2017/3/21	2018/3/20
Power Sensor	R&S	NRP-Z11	112186	2017/3/21	2018/3/20
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	2017/1/17	2018/1/16
Test Software	R&S	EMC 32	V9.21.00	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.)					

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

Model: TPP 30-105A-J

Mode_1



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

Model: TPP 30-105BA-J
Mode_2Model: TPP 30-105
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
<u>Method</u> : Measurements were made on a ground plane that extends 1-meter minimum beyond all sides of the system under test. Mains power tests were conducted with the product connected to a Coupling/Decoupling Network (CDN). I/O lines were tested in a Capacitive Coupling Clamp. One of each unique interface was tested for a period of one (1) minute per polarity.				P
Laboratory Parameters:		Required prior to the test		During the test
Ambient Temperature		10 to 40 °C		21°C
Relative Humidity		10 to 90 %		45%
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 1, 2, 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 EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
Burst Generator	TESEQ	NSG 3025	35177	2016/12/6	2017/12/5
EFT Clamp	Thermo	CCL	612359	2016/12/6	2017/12/5
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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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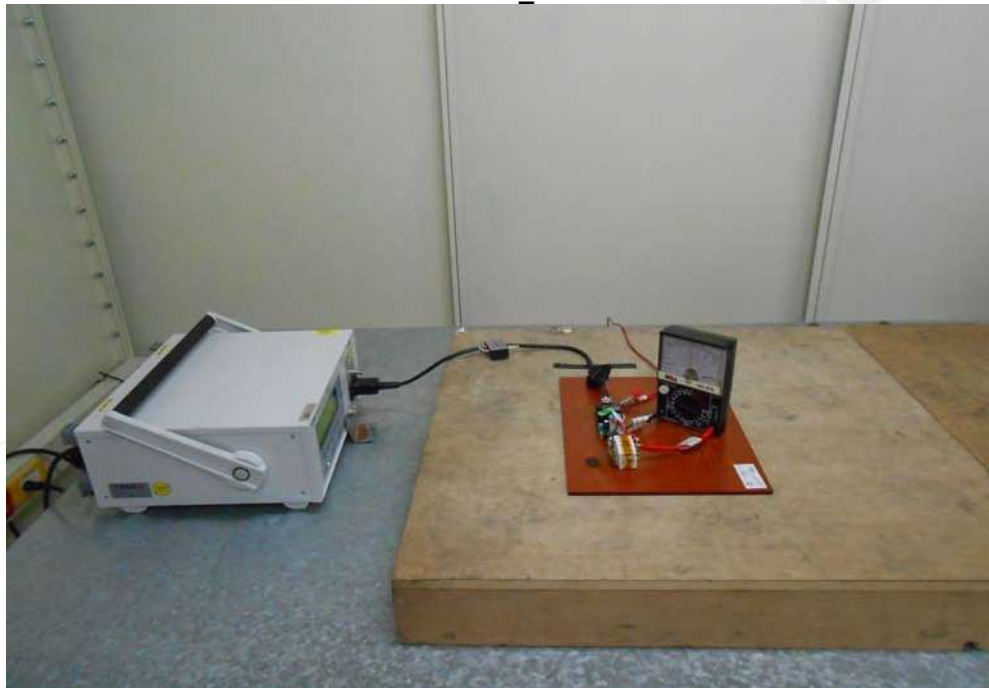
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Photo of test setup for Electrical Fast Transients

Model: TPP 30-105A-J
Mode_1



Model: TPP 30-105BA-J
Mode_2



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Photo of test setup for Electrical Fast Transients

Model: TPP 30-105

Mode_3



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Tabulated Results for Electrical Fast Transients	
Point of application	Results
Mains	1 (AC 100V, 50Hz; AC 240V, 50Hz)
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	21°C	
Relative Humidity	10 to 90 %	45%	
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 1, 2, 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 EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
Surge Tester	EMC Partner	MIG0603IN2 S-T	1515	2017/5/16	2018/5/15
Universal Surge CDN	EMC Partner	CDN-UTP8	CDN-UTP8-1516	2017/5/19	2018/5/18
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No.2, Keji 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)					

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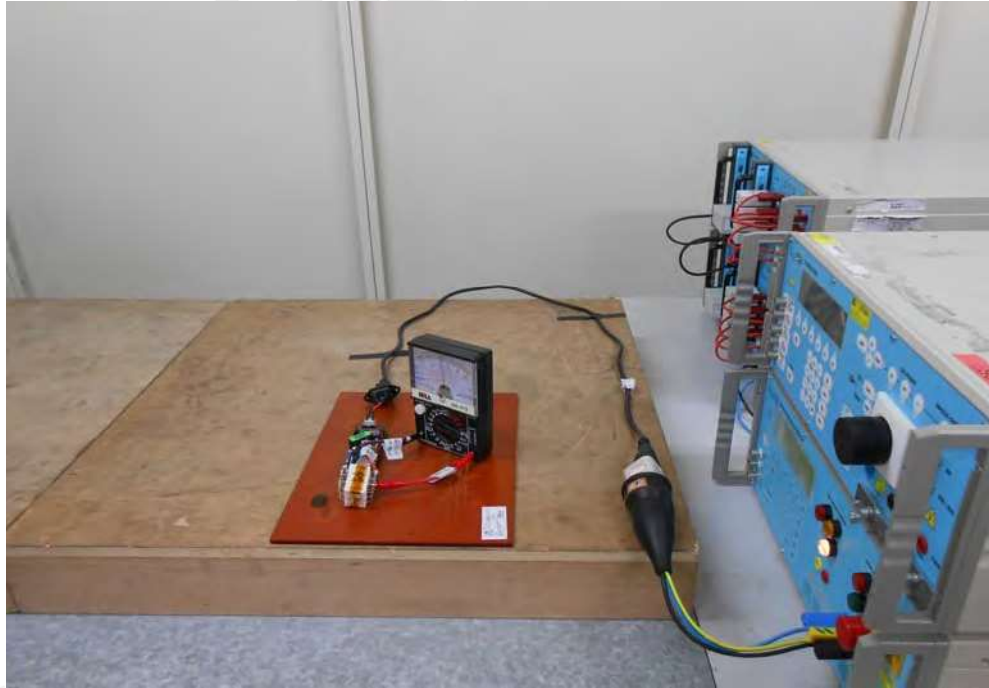
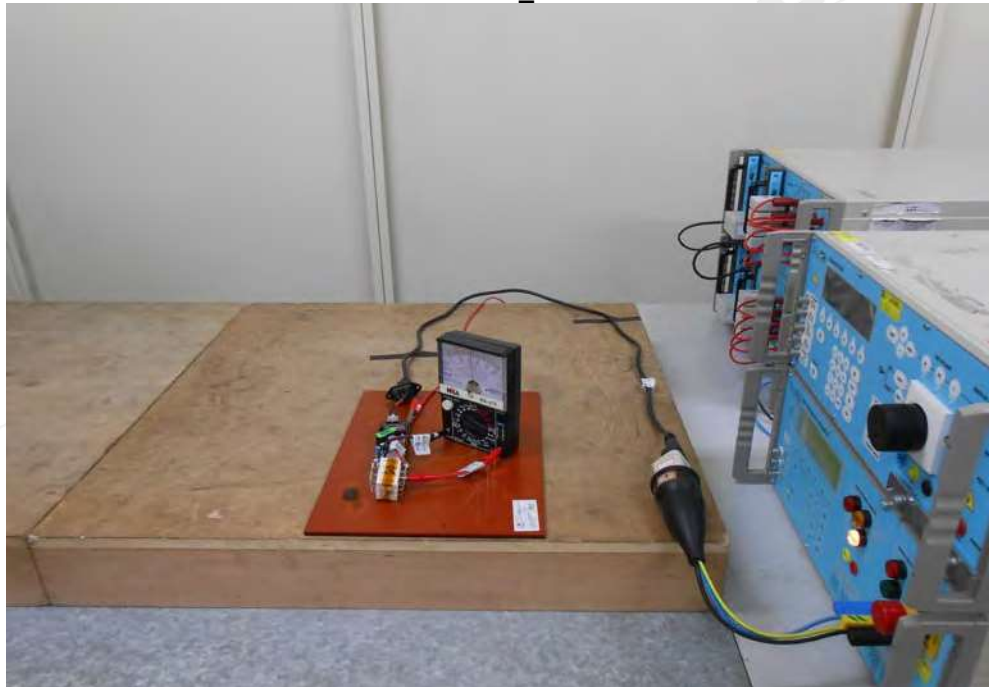
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Surge Waveform Verification (Optional)	
None	None
2000V Amplitude and Rise Time Open Circuit Voltage	2000V Duration @ 50% Amplitude Open Circuit Voltage
None	None
2000V Amplitude and Rise Time Short Circuit Current	2000V Duration @ 50% Amplitude Short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

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Photo of test setup for Surge Immunity

Model: TPP 30-105A-J
Mode_1Model: TPP 30-105BA-J
Mode_2

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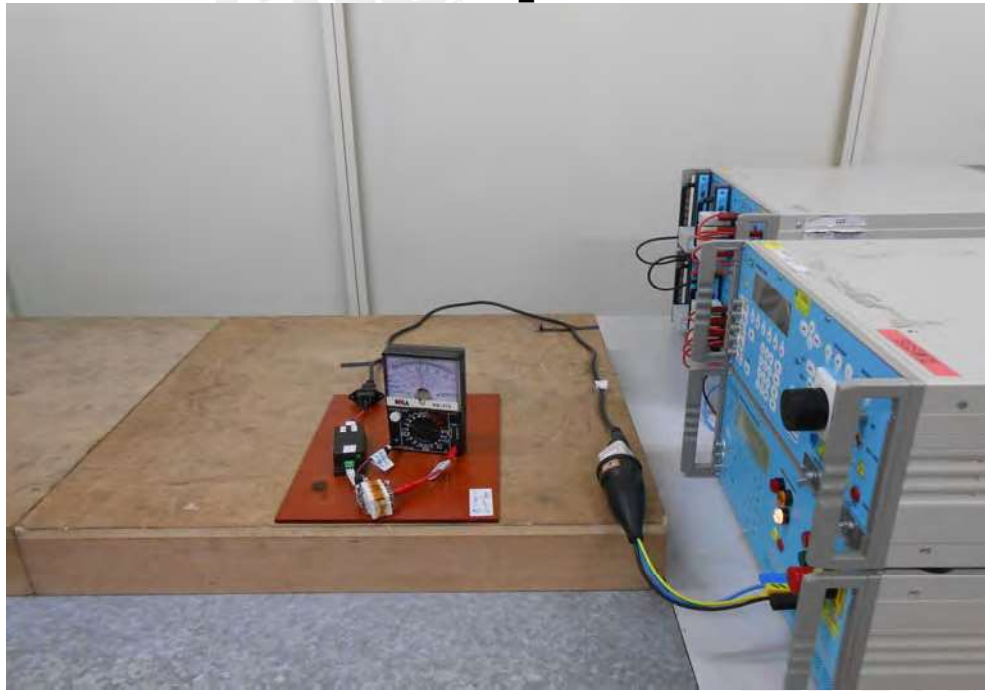
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Photo of test setup for Surge Immunity

Model: TPP 30-105

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 (For Mode 2)	1 (For Mode 2)
		Negative	1 (For Mode 2)	1 (For Mode 2)
	1.0kV	Positive	1 (For Mode 2)	1 (For Mode 2)
		Negative	1 (For Mode 2)	1 (For Mode 2)
	2.0kV	Positive	1 (For Mode 2)	1 (For Mode 2)
		Negative	1 (For Mode 2)	1 (For Mode 2)
Line 2 to Earth (Common mode)	0.5kV	Positive	1 (For Mode 2)	1 (For Mode 2)
		Negative	1 (For Mode 2)	1 (For Mode 2)
	1.0kV	Positive	1 (For Mode 2)	1 (For Mode 2)
		Negative	1 (For Mode 2)	1 (For Mode 2)
	2.0kV	Positive	1 (For Mode 2)	1 (For Mode 2)
		Negative	1 (For Mode 2)	1 (For Mode 2)
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	21°C	
Relative Humidity		10 to 90 %	45%	
Equipment mode		Power interface mode	AC 230V, 50Hz	
		EUT configurations mode		
		Operation mode	Mode 1, 2, 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.				

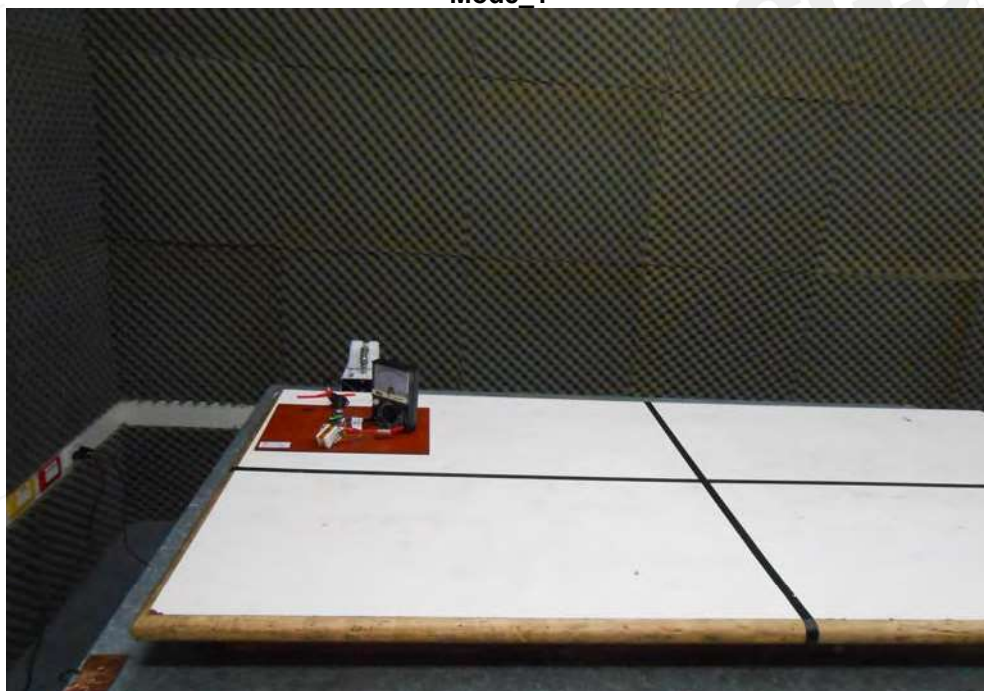
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SGS CS EN61000-4-6 HWAYA SR-D EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
Signal Generator	Agilent	8648C	4108A05772	2017/3/4	2018/3/3
Power Sensor	R&S	NRVD	837794/029	2017/8/10	2018/8/9
Power Sensor	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 M116	37673	2017/4/24	2018/4/23
CDN	TESEQ	CDN M016	35853	2016/11/3	2017/11/2
CDN	TESEQ	CDN T8-10	37212	2017/4/24	2018/4/23
CDN	TESEQ	CDN ST08A	30191	2017/2/24	2018/2/23
EM Injection Clamp	TESEQ	KEMZ 801A	33430	2017/5/12	2018/5/11
Test Software	ar	emcware	V3.4.0	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.)					

Photo of test setup for Conducted Disturbances

Model: TPP 30-105A-J
Mode 1



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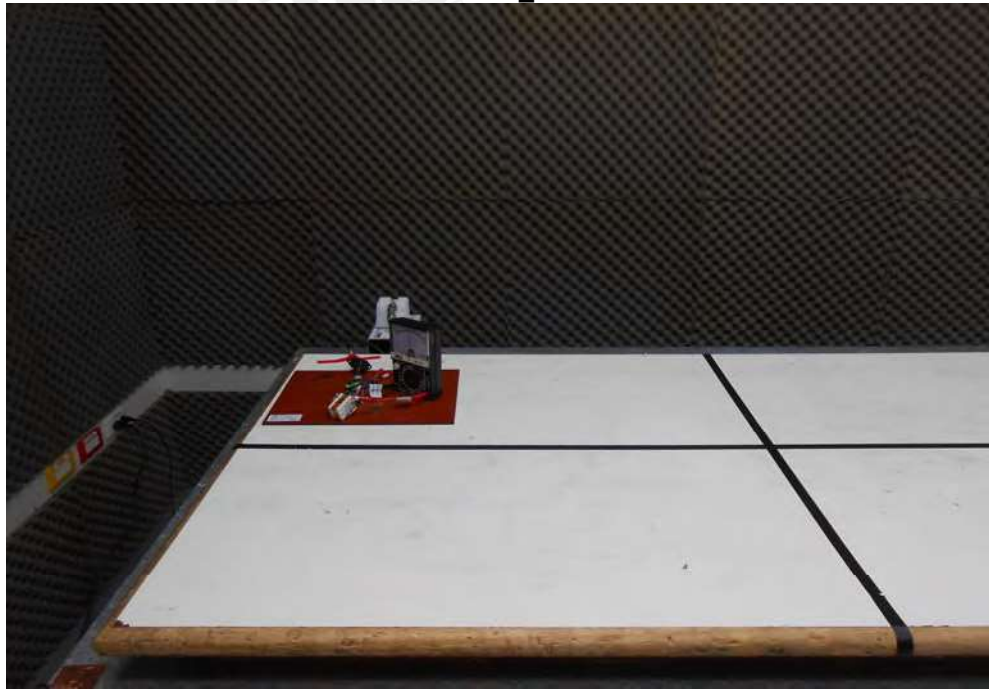
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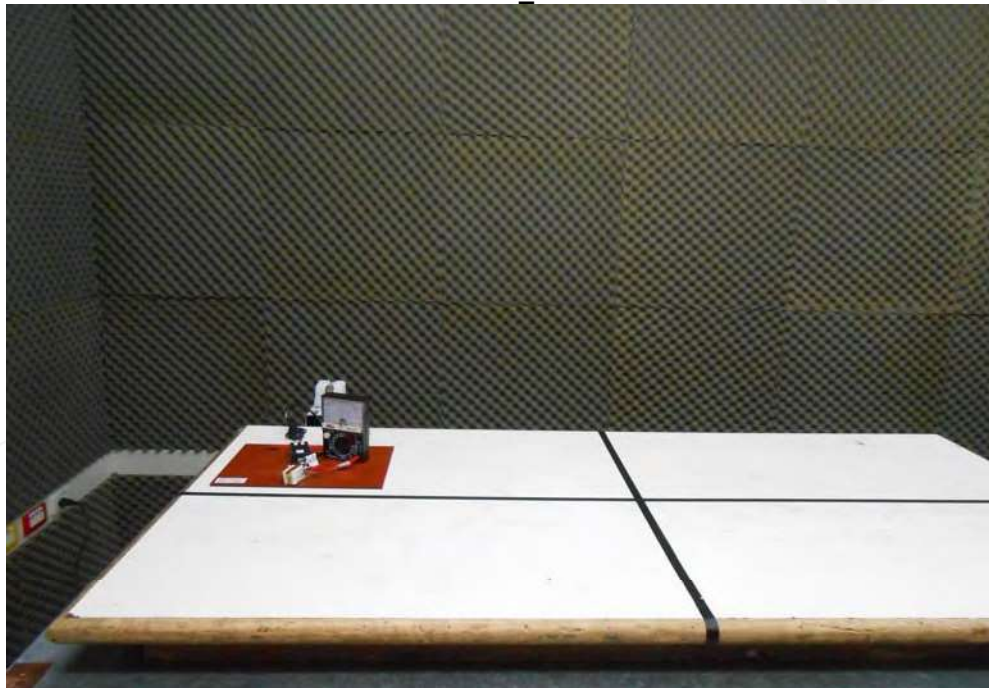
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Photo of test setup for Conducted Disturbances

Model: TPP 30-105BA-J
Mode_2



Model: TPP 30-105
Mode_3



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Tabulated Results for Conducted Disturbances		
Point of Application	Results	Dwell Time (second)
Mains	1 (10, 20 Vrms)	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
<u>Method:</u> 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	21°C
Relative Humidity		10 to 90 %	45%
Equipment mode		Power interface mode	AC 230V, 50Hz
		EUT configurations mode	
		Operation mode	Mode 1, 2, 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	2016/11/21	2017/11/20
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
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 Power- Frequency Magnetic Fields

Model: TPP 30-105A-J
Mode_1Model: TPP 30-105BA-J
Mode_2

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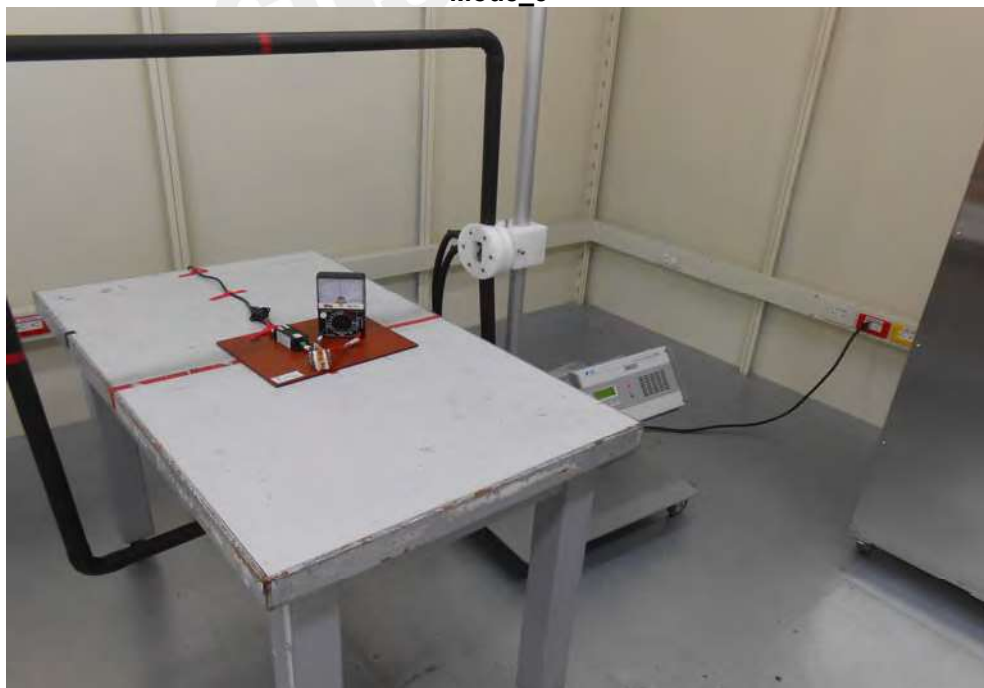
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Photo of test setup for Power- Frequency Magnetic Fields

Model: TPP 30-105
Mode_3

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	21°C	
Relative Humidity	10 to 90 %	45%	
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 1, 2, 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 EMC					
EQUIPMENT TYPE	Manufacturer	Model Number	Serial Number	Calibration Date	Calibration Due
EMS Multi-Tester	EMC Partner	TRANSIENT 3000D	D-1500	2017/5/5	2018/5/4
SGS Taiwan LTD. Electronics & Communication Laboratory No.2, Keji 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)					

Photo of test setup for Voltage Dips, Interruptions, and Variations**Model: TPP 30-105A-J
Mode_1**

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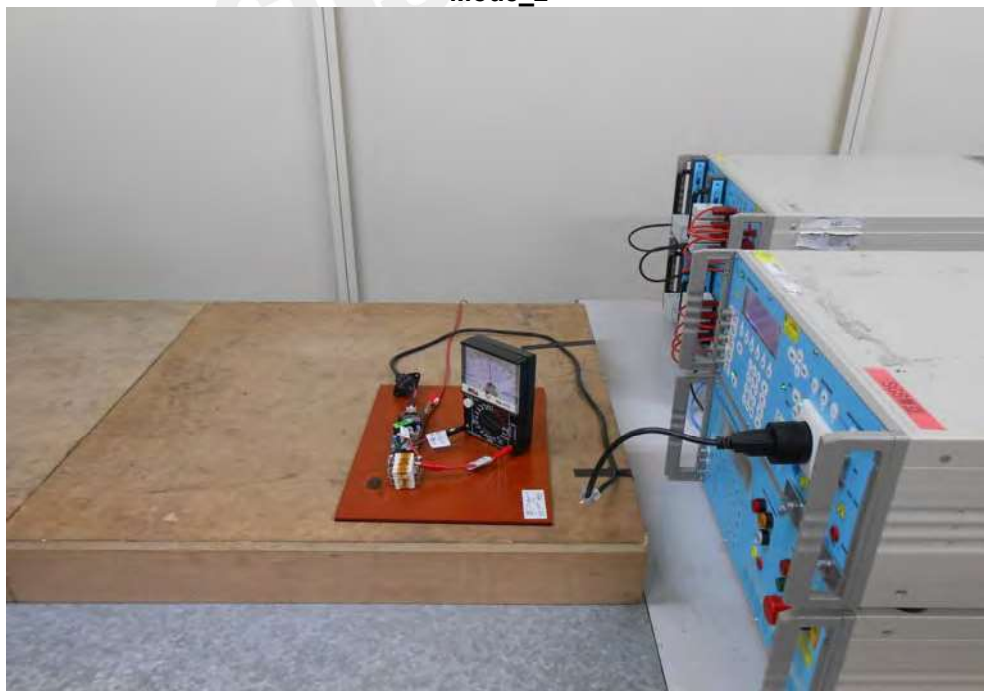
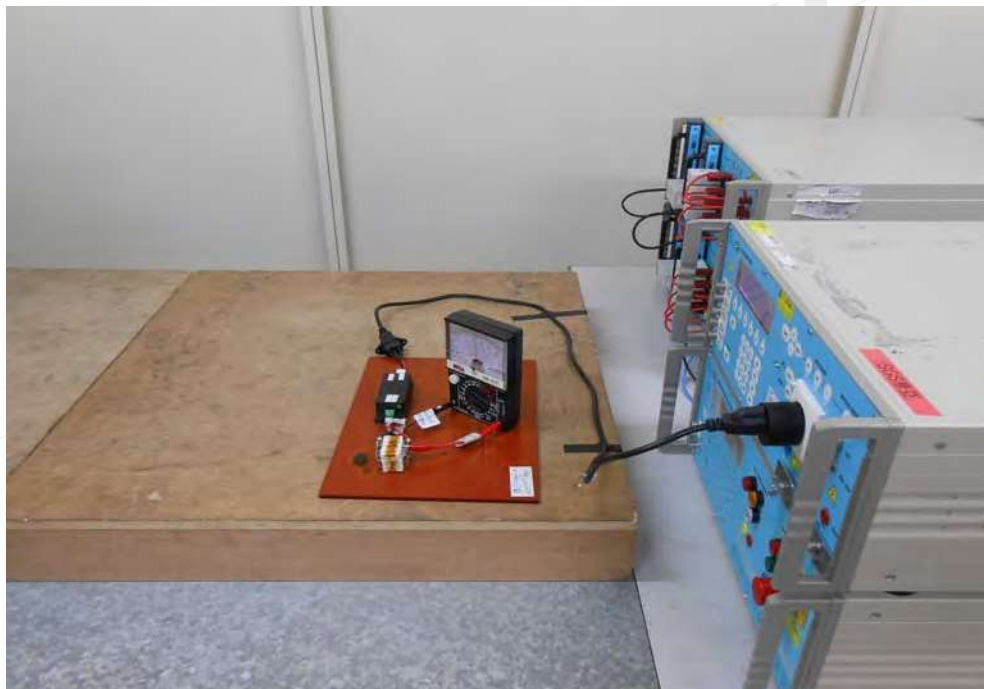
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Photo of test setup for Voltage Dips, Interruptions, and Variations

Model: TPP 30-105BA-J
Mode_2Model: TPP 30-105
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
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 %.		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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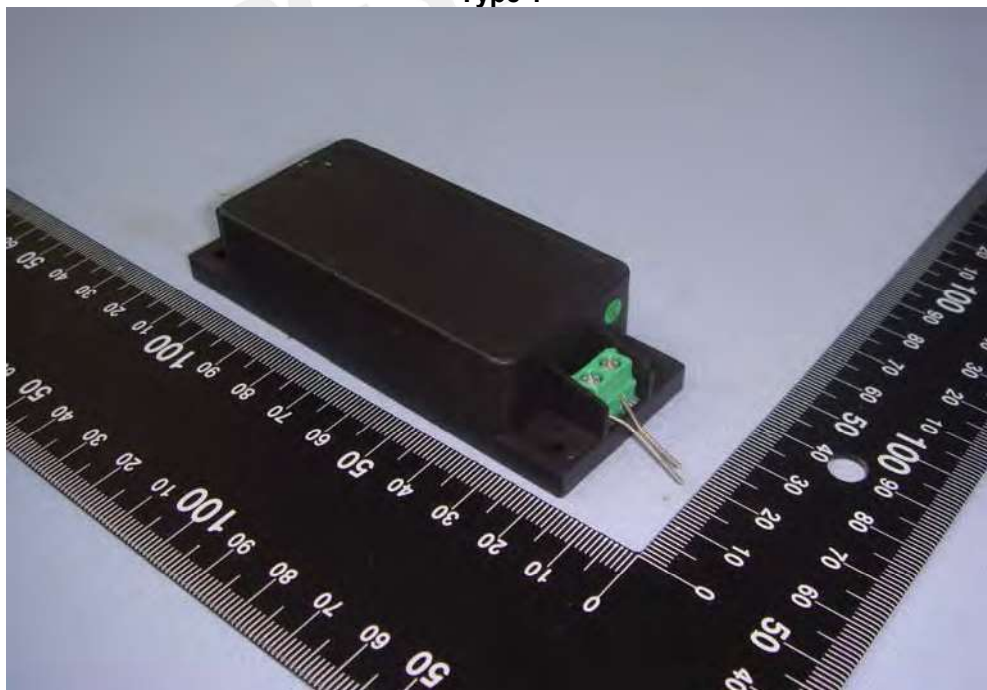
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1.22 Photographs of Product Exterior:

Type 1



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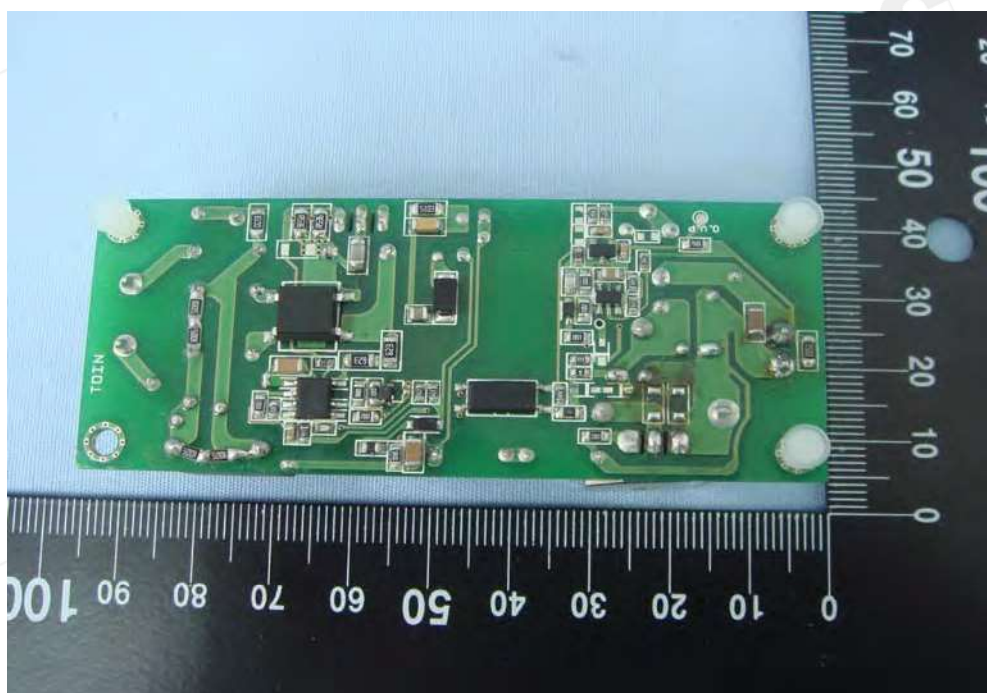
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Type 2



End of the Report

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