



Test Report

EN 60601-1-2: 2015

for

Electromagnetic Compatibility

of

Product : **AC/DC Converter**

Trade Name :



Model Number : Please refer to section 1.2

Prepared for

TRACO ELECTRONIC AG

Sihlbruggstrasse 111 CH-6340 Baar Switzerland

Prepared by

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The test result in this report is only subjected to the test sample.



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Statement of Compliance

Applicant: TRACO ELECTRONIC AG
Manufacturer: TRACO ELECTRONIC AG
Product: AC/DC Converter
Model No.: Please refer to section 1.2
Test Power Voltage 230 Vac, 50 Hz
Date of Final Test: Sep. 28, 2019
Revision of Report: Rev. 01

Measurement Procedures and Standards Used :

☒ EN 60601-1-2: 2015

Reference Basic Standards :

Emission:

- ☒ EN 55011: 2009+A1: 2010
- ☒ IEC 61000-3-2: 2014
- ☒ IEC 61000-3-3: 2013

Immunity:

- ☒ IEC 61000-4-2: 2008
- ☒ IEC 61000-4-3: 2006+A1: 2007+A2: 2010
- ☒ IEC 61000-4-4: 2012
- ☒ IEC 61000-4-5: 2014+A1: 2017
- ☒ IEC 61000-4-6: 2013+COR1: 2015
- ☒ IEC 61000-4-8: 2009
- ☒ IEC 61000-4-11: 2004+A1: 2017

The measurement results in this test report were performed at Interocean EMC Technology Corp. the responsibility of measurement result is only subjected to the tested sample. This report shows the EUT is technically compliance with the above official standards. This report shall not be partial reproduced without written approval by Interocean EMC Technology Corporation. Judgment of conformity is based on test result, regardless of measurement uncertainty.

Report Issued: 20202/11/04

Project Engineer: Scott Chang

Scott Chang

Approved: Edison Lee

Edison Lee



1 General Information

1.1 Description of Equipment Under Test

Product	: AC/DC Converter
Model Number	: Please refer to section 1.2
Applicant	: TRACO ELECTRONIC AG Sihlbruggstrasse 111 CH-6340 Baar Switzerland
Manufacturer	: TRACO ELECTRONIC AG Sihlbruggstrasse 111 CH-6340 Baar Switzerland
Power Supply	: Please refer to section 1.3
Date of Test	: Aug. 20 ~ Sep. 01, 2015 (For Other Tests) Sep. 28, 2019 (For RF Wireless Communications Equipment Immunity Test to 5.8 G)
Additional Description	: 1) The test models are " TPP 40-124BA; TPP 40-221BA; TPP 40-321M2BA ", designated by the applicant and included in this report. 2) The differences of all models in this report are provided by the applicant, please refer to section 1.3 "Specifications Description". 3) All the test data presented in this report are the test data of the original file No.: 15A081201E-E1; 19A092001E-E 4) For more detail specification about EUT, please refer to the user's manual.



1.2 Model Number List

TPP 40-105E-D	TPP 40-105BE-D	TPP 40-107E-D	TPP 40-107BE-D
TPP 40-109E-D	TPP 40-109BE-D	TPP 40-112E-D	TPP 40-112BE-D
TPP 40-112E-DB1	TPP 40-112BE-DB1	TPP 40-115E-D	TPP 40-115BE-D
TPP 40-115E-DB1	TPP 40-115BE-DB1	TPP 40-118E-D	TPP 40-118BE-D
TPP 40-124E-D	TPP 40-124BE-D	TPP 40-128E-D	TPP 40-128BE-D
TPP 40-136E-D	TPP 40-136BE-D	TPP 40-148E-D	TPP 40-148BE-D
TPP 40-153E-D	TPP 40-153BE-D	TPP 40-105BA	TPP 40-105BU
TPP 40-105B	TPP 40-105BD	TPP 40-105A	TPP 40-105U
TPP 40-105	TPP 40-105D	TPP 40-107BA	TPP 40-107BU
TPP 40-107B	TPP 40-107BD	TPP 40-107A	TPP 40-107U
TPP 40-107	TPP 40-107D	TPP 40-109BA	TPP 40-109BU
TPP 40-109B	TPP 40-109BD	TPP 40-109A	TPP 40-109U
TPP 40-109	TPP 40-109D	TPP 40-112BA	TPP 40-112BU
TPP 40-112B	TPP 40-112BD	TPP 40-112A	TPP 40-112U
TPP 40-112	TPP 40-112D	TPP 40-1L12BA	TPP 40-1L12BU
TPP 40-1L12B	TPP 40-1L12BD	TPP 40-1L12A	TPP 40-1L12U
TPP 40-1L12	TPP 40-1L12D	TPP 40-115BA	TPP 40-115BU
TPP 40-115B	TPP 40-115BD	TPP 40-115A	TPP 40-115U
TPP 40-115	TPP 40-115D	TPP 40-1L15BA	TPP 40-1L15BU
TPP 40-1L15B	TPP 40-1L15BD	TPP 40-1L15A	TPP 40-1L15U
TPP 40-1L15	TPP 40-1L15D	TPP 40-118BA	TPP 40-118BU
TPP 40-118B	TPP 40-118BD	TPP 40-118A	TPP 40-118U
TPP 40-118	TPP 40-118D	TPP 40-124BA	TPP 40-124BU
TPP 40-124B	TPP 40-124BD	TPP 40-124A	TPP 40-124U
TPP 40-124	TPP 40-124D	TPP 40-128BA	TPP 40-128BU
TPP 40-128B	TPP 40-128BD	TPP 40-128A	TPP 40-128U
TPP 40-128	TPP 40-128D	TPP 40-136BA	TPP 40-136BU
TPP 40-136B	TPP 40-136BD	TPP 40-136A	TPP 40-136U
TPP 40-136	TPP 40-136D	TPP 40-148BA	TPP 40-148BU
TPP 40-148B	TPP 40-148BD	TPP 40-148A	TPP 40-148U
TPP 40-148	TPP 40-148D	TPP 40-153BA	TPP 40-153BU
TPP 40-153B	TPP 40-153BD	TPP 40-153A	TPP 40-153U
TPP 40-153	TPP 40-153D	TPP 40-210BA	TPP 40-210BU
TPP 40-210B	TPP 40-210BD	TPP 40-210A	TPP 40-210U
TPP 40-210	TPP 40-210D	TPP 40-220BA	TPP 40-220BU
TPP 40-220B	TPP 40-220BD	TPP 40-220A	TPP 40-220U
TPP 40-220	TPP 40-220D	TPP 40-221BA	TPP 40-221BU
TPP 40-221B	TPP 40-221BD	TPP 40-221A	TPP 40-221U
TPP 40-221	TPP 40-221D	TPP 40-231BA	TPP 40-231BU
TPP 40-231B	TPP 40-231BD	TPP 40-231A	TPP 40-231U
TPP 40-231	TPP 40-231D	TPP 40-251BA	TPP 40-251BU
TPP 40-251B	TPP 40-251BD	TPP 40-251A	TPP 40-251U
TPP 40-251	TPP 40-251D	TPP 40-310M1BA	TPP 40-310M1BU
TPP 40-310M1B	TPP 40-310M1BD	TPP 40-310M1A	TPP 40-310M1U
TPP 40-310M1	TPP 40-310M1D	TPP 40-3102BA	TPP 40-3102BU
TPP 40-3102B	TPP 40-3102BD	TPP 40-3102A	TPP 40-3102U



TPP 40-3102	TPP 40-3102D	TPP 40-310M2BA	TPP 40-310M2BU
TPP 40-310M2B	TPP 40-310M2BD	TPP 40-310M2A	TPP 40-310M2U
TPP 40-310M2	TPP 40-310M2D	TPP 40-321M1BA	TPP 40-321M1BU
TPP 40-321M1B	TPP 40-321M1BD	TPP 40-321M1A	TPP 40-321M1U
TPP 40-321M1	TPP 40-321M1D	TPP 40-321M2BA	TPP 40-321M2BU
TPP 40-321M2B	TPP 40-321M2BD	TPP 40-321M2A	TPP 40-321M2U
TPP 40-321M2	TPP 40-321M2D	TPP 40-3201BA	TPP 40-3201BU
TPP 40-3201B	TPP 40-3201BD	TPP 40-3201A	TPP 40-3201U
TPP 40-3201	TPP 40-3201D	TPP 40-320M2BA	TPP 40-320M2BU
TPP 40-320M2B	TPP 40-320M2BD	TPP 40-320M2A	TPP 40-320M2U
TPP 40-320M2	TPP 40-320M2D	TPP 40-331M3BA	TPP 40-331M3BU
TPP 40-331M3B	TPP 40-331M3BD	TPP 40-331M3A	TPP 40-331M3U
TPP 40-331M3	TPP 40-331M3D	TPP 40-3512BA	TPP 40-3512BU
TPP 40-3512B	TPP 40-3512BD	TPP 40-3512A	TPP 40-3512U
TPP 40-3512	TPP 40-3512D	TPP 40-351M2BA	TPP 40-351M2BU
TPP 40-351M2B	TPP 40-351M2BD	TPP 40-351M2A	TPP 40-351M2U
TPP 40-351M2	TPP 40-351M2D		



1.3 Specifications Description

Model Number	Output	
	Voltage (VDC)	Current (A)
TPP 40-105E-D	5	8
TPP 40-105BE-D		
TPP 40-107E-D	7.5	5.34
TPP 40-107BE-D		
TPP 40-109E-D	9	4.45
TPP 40-109BE-D		
TPP 40-112E-D	12	3.34
TPP 40-112BE-D		
TPP 40-112E-DB1	12	3.34
TPP 40-112BE-DB1		
TPP 40-115E-D	15	2.67
TPP 40-115BE-D		
TPP 40-115E-DB1	15	2.67
TPP 40-115BE-DB1		
TPP 40-118E-D	18	2.23
TPP 40-118BE-D		
TPP 40-124E-D	24	1.67
TPP 40-124BE-D		
TPP 40-128E-D	28	1.43
TPP 40-128BE-D		
TPP 40-136E-D	36	1.12
TPP 40-136BE-D		
TPP 40-148E-D	48	0.84
TPP 40-148BE-D		
TPP 40-153E-D	53	0.77
TPP 40-153BE-D		
<div>1. All models may be followed by any number of alphanumeric or - or suffixes. 2. Connector option : -J, -D, -M, -T or J, D, M, T 3. Package option : -D1 or D1 3. All the model's rated voltage is 100 ~ 240 Vac; input range is 85 ~ 264 Vac. 4. The difference in model number with suffix “B” and without suffix “B” is only for different market.</div>		



Package Code				Output	
A	U	E	D	Voltage (VDC)	Current (A)
TPP 40-105BA	TPP 40-105BU	TPP 40-105B	TPP 40-105BD	5	8
TPP 40-105A	TPP 40-105U	TPP 40-105	TPP 40-105D		
TPP 40-107BA	TPP 40-107BU	TPP 40-107B	TPP 40-107BD	7.5	5.34
TPP 40-107A	TPP 40-107U	TPP 40-107	TPP 40-107D		
TPP 40-109BA	TPP 40-109BU	TPP 40-109B	TPP 40-109BD	9	4.45
TPP 40-109A	TPP 40-109U	TPP 40-109	TPP 40-109D		
TPP 40-112BA	TPP 40-112BU	TPP 40-112B	TPP 40-112BD	12	3.34
TPP 40-112A	TPP 40-112U	TPP 40-112	TPP 40-112D		
TPP 40-1L12BA	TPP 40-1L12BU	TPP 40-1L12B	TPP 40-1L12BD	12	3.34
TPP 40-1L12A	TPP 40-1L12U	TPP 40-1L12	TPP 40-1L12D		
TPP 40-115BA	TPP 40-115BU	TPP 40-115B	TPP 40-115BD	15	2.67
TPP 40-115A	TPP 40-115U	TPP 40-115	TPP 40-115D		
TPP 40-1L15BA	TPP 40-1L15BU	TPP 40-1L15B	TPP 40-1L15BD	15	2.67
TPP 40-1L15A	TPP 40-1L15U	TPP 40-1L15	TPP 40-1L15D		
TPP 40-118BA	TPP 40-118BU	TPP 40-118B	TPP 40-118BD	18	2.23
TPP 40-118A	TPP 40-118U	TPP 40-118	TPP 40-118D		
TPP 40-124BA	TPP 40-124BU	TPP 40-124B	TPP 40-124BD	24	1.67
TPP 40-124A	TPP 40-124U	TPP 40-124	TPP 40-124D		
TPP 40-128BA	TPP 40-128BU	TPP 40-128B	TPP 40-128BD	28	1.43
TPP 40-128A	TPP 40-128U	TPP 40-128	TPP 40-128D		
TPP 40-136BA	TPP 40-136BU	TPP 40-136B	TPP 40-136BD	36	1.12
TPP 40-136A	TPP 40-136U	TPP 40-136	TPP 40-136D		
TPP 40-148BA	TPP 40-148BU	TPP 40-148B	TPP 40-148BD	48	0.84
TPP 40-148A	TPP 40-148U	TPP 40-148	TPP 40-148D		
TPP 40-153BA	TPP 40-153BU	TPP 40-153B	TPP 40-153BD	53	0.77
TPP 40-153A	TPP 40-153U	TPP 40-153	TPP 40-153D		

1. All models may be followed by any number of alphanumeric or - or suffixes.
2. Package Code: A: Open type; U: U chassis type; E: Enclosed type; D: Din rail type.
The difference of all "package code" is only for different way package.
3. All the model's rated voltage is 100 ~ 240 Vac; input range is 85 ~ 264 Vac.
4. The difference in model number with suffix "B" and without suffix "B" is only for different market.



Package Code				Output 1		Output 2	
A	U	E	D	Voltage (VDC)	Current (A)	Voltage (VDC)	Current (A)
TPP 40-210BA	TPP 40-210BU	TPP 40-210B	TPP 40-210BD	5	5	3.3	0-4
TPP 40-210A	TPP 40-210U	TPP 40-210	TPP 40-210D				
TPP 40-220BA	TPP 40-220BU	TPP 40-220B	TPP 40-220BD	12	2.1	3.3	0-4
TPP 40-220A	TPP 40-220U	TPP 40-220	TPP 40-220D				
TPP 40-221BA	TPP 40-221BU	TPP 40-221B	TPP 40-221BD	12	2.1	5	0-4
TPP 40-221A	TPP 40-221U	TPP 40-221	TPP 40-221D				
TPP 40-231BA	TPP 40-231BU	TPP 40-231B	TPP 40-231BD	15	1.7	5	0-4
TPP 40-231A	TPP 40-231U	TPP 40-231	TPP 40-231D				
TPP 40-251BA	TPP 40-251BU	TPP 40-251B	TPP 40-251BD	24	1.05	5	0-4
TPP 40-251A	TPP 40-251U	TPP 40-251	TPP 40-251D				

1. All models may be followed by any number of alphanumeric or - or suffixes.
2. Package Code: A: Open type; U: U chassis type; E: Enclosed type; D: Din rail type.
The difference of all "package code" is only for different way package.
3. All the model's rated voltage is 100 ~ 240 Vac; input range is 85 ~ 264 Vac.
4. The difference in model number with suffix "B" and without suffix "B" is only for different market.



Package Code				Output 1		Output 2		Output 3	
A	U	E	D	Voltage (VDC)	Current (A)	Voltage (VDC)	Current (A)	Voltage (VDC)	Current (A)
TPP 40-310M1BA	TPP 40-310M1BU	TPP 40-310M1B	TPP 40-310M1BD	5	5	3.3	4	-5	0.5
TPP 40-310M1A	TPP 40-310M1U	TPP 40-310M1	TPP 40-310M1D						
TPP 40-3102BA	TPP 40-3102BU	TPP 40-3102B	TPP 40-3102BD	5	5	3.3	4	12	0.5
TPP 40-3102A	TPP 40-3102U	TPP 40-3102	TPP 40-3102D						
TPP 40-310M2BA	TPP 40-310M2BU	TPP 40-310M2B	TPP 40-310M2BD	5	5	3.3	4	-12	0.5
TPP 40-310M2A	TPP 40-310M2U	TPP 40-310M2	TPP 40-310M2D						
TPP 40-321M1BA	TPP 40-321M1BU	TPP 40-321M1B	TPP 40-321M1BD	12	2.1	5	4	-5	0.5
TPP 40-321M1A	TPP 40-321M1U	TPP 40-321M1	TPP 40-321M1D						
TPP 40-321M2BA	TPP 40-321M2BU	TPP 40-321M2B	TPP 40-321M2BD	12	2.1	5	4	-12	0.5
TPP 40-321M2A	TPP 40-321M2U	TPP 40-321M2	TPP 40-321M2D						
TPP 40-3201BA	TPP 40-3201BU	TPP 40-3201B	TPP 40-3201BD	12	2.1	3.3	4	5	0.5
TPP 40-3201A	TPP 40-3201U	TPP 40-3201	TPP 40-3201D						
TPP 40-320M2BA	TPP 40-320M2BU	TPP 40-320M2B	TPP 40-320M2BD	12	2.1	3.3	4	-12	0.5
TPP 40-320M2A	TPP 40-320M2U	TPP 40-320M2	TPP 40-320M2D						
TPP 40-331M3BA	TPP 40-331M3BU	TPP 40-331M3B	TPP 40-331M3BD	15	1.7	5	4	-15	0.5
TPP 40-331M3A	TPP 40-331M3U	TPP 40-331M3	TPP 40-331M3D						
TPP 40-3512BA	TPP 40-3512BU	TPP 40-3512B	TPP 40-3512BD	24	1.05	5	4	12	0.5
TPP 40-3512A	TPP 40-3512U	TPP 40-3512	TPP 40-3512D						
TPP 40-351M2BA	TPP 40-351M2BU	TPP 40-351M2B	TPP 40-351M2BD	24	1.05	5	4	-12	0.5
TPP 40-351M2A	TPP 40-351M2U	TPP 40-351M2	TPP 40-351M2D						

1. All models may be followed by any number of alphanumeric or - or suffixes.
2. Package Code: A: Open type; U: U chassis type; E: Enclosed type; D: Din rail type.
The difference of all "package code" is only for different way package.
3. All the model's rated voltage is 100 ~ 240 Vac; input range is 85 ~ 264 Vac.
4. The difference in model number with suffix "B" and without suffix "B" is only for different market.



1.4 Details of Tested Supporting System

1.4.1 Load (Model No.: TPP 40-124BA)

Full Load : 40.08 W (24 V, 1.67 A)

1.4.2 Load (Model No.: TPP 40-221BA)

Full Load : 25.2 W (12 V, 2.1 A)

Full Load : 20 W (5 V, 4 A)

1.4.3 Load (Model No.: TPP 40-321M2BA)

Full Load : 13.99 W (12 V, 1.166 A)

Full Load : 20 W (5 V, 4 A)

Full Load : 6 W (-12 V, 0.5 A)

1.4.4 Test Cable

Power Cord : Non-shielded, Detachable, 1.0 m, w/o core

Output Cable : Non-shielded, Detachable, 0.1 m, w/o core



1.5 Test Facility

- Site Description** : ☑Conducted 1 ☑OATS 1 ☑EMS Room
- Name of Firm** : Interocean EMC Technology Corp.
- Company web** : <http://www.ietc.com.tw>
- Location** : No. 5-2, Lin 1, Tin-Fu, Lin-Kou Dist., New Taipei City, Taiwan 244, R.O.C.
- Site Filing** : ● Federal Communication Commissions – USA
Designation No.: TW1020 (Test Firm Registration #: 651092)
Designation No.: TW1113 (Test Firm Registration #: 959554)
● Innovation, Science and Economic Development Canada (ISED)
CAB identifier: TW1113 (Ref. No 14962756)
● Voluntary Control Council for Interference by Information Technology Equipment (VCCI) – Japan
Member No.: 1349
Registration No. (Conducted Room): C-11094
Registration No. (Conducted Room): T-11562
Registration No. (OATS 1): R-11040
Registration No. (Chamber 3): G-20080
- Site Accreditation** : ● Bureau of Standards and Metrology and Inspection (BSMI) – Taiwan, R.O.C.
Accreditation No.:
SL2-IN-E-0026 for CNS 13438 / CISPR 22
SL2-R1-E-0026 for CNS 13439 / CISPR 13
SL2-R2-E-0026 for CNS 13439 / CISPR 13
SL2-L1-E-0026 for CNS 14115 / CISPR 15
● Taiwan Accreditation Foundation (TAF)
Accreditation No.: 1113
● American Association for Laboratory Accreditation (A2LA)
Certificate Number: 4891.01
● Vehicle Safety Certification Center (VSCC)
Approval No.: TW16-11

**1.6 Measurement Uncertainty**

Item	Value
Conduction 1:	
Conducted Emission - AMN (9 kHz to 30 MHz)	2.98 dB
Conducted Emission - AAN (ISN-T4) (150 kHz to 30 MHz)	3.70 dB
Conducted Emission - AAN (ISN-T8) (150 kHz to 30 MHz)	3.70 dB
Conducted Emission - CP (9 kHz to 30 MHz)	3.06 dB
Conducted Emission - VP (9 kHz to 30 MHz)	2.42 dB
Radiated Emission - LAS (2 m Loop) (9 kHz to 30 MHz)	3.26 dB
Conduction 2:	
Disturbance Power (30 MHz to 300 MHz)	4.04 dB
OATS 1:	
Radiated Emission Test (30 MHz to 1 GHz)	4.84 dB
Radiated Emission Test (1 GHz to 6 GHz)	4.84 dB
OATS 3:	
Radiated Emission Test (30 MHz to 1 GHz)	4.70 dB
OATS 5:	
Radiated Emission Test (30 MHz to 1 GHz)	4.70 dB
Chamber 3:	
Radiated Emission Test (9 kHz to 30 MHz)	3.12 dB
Radiated Emission Test (30 MHz to 1 GHz)	4.86 dB
Radiated Emission Test (1 GHz to 6 GHz)	4.78 dB
Induced Current Density (20 kHz to 10 MHz)	1.82 dB
Conducted Immunity Room:	
Conducted Immunity Test / CDN-M2	1.30 dB
Conducted Immunity Test / CDN-M3	1.30 dB
Conducted Immunity Test / EM Clamp	3.16 dB
The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%	



1.7 Summary of Test Results

1.7.1 Test program according EN 60601-1-2 (Emissions Test)

Emission test equipment intended	
<input type="checkbox"/>	CISPR 11, Group 1, Class A
<input checked="" type="checkbox"/>	CISPR 11, Group 1, Class B
<input type="checkbox"/>	CISPR 14-1
<input type="checkbox"/>	CISPR 32, Class A
<input type="checkbox"/>	CISPR 32, Class B

Report Clause	Phenomenon	Application	Reference Clause(s)	Reference Standard	Result
2	Conducted Emissions	Mains Power Port	7.3	CISPR 11	PASS
3	Radiated Emissions (Below 1 GHz)	Enclosure Port	7.3	CISPR 11	PASS
	Harmonic Current Emissions	AC Power Port	7.3	IEC 61000-3-2	PASS ^a
4	Voltage Fluctuations and Flicker Measurement	AC Power Port	7.3	IEC 61000-3-3	PASS

Note: “a” This rated power of EUT is ≤ 75 W, therefore according to EN 61000-3-2 “clause 7 Harmonic current limits” & “Figure 1 – Flowchart for determining conformity” regulation, the product no longer need be tested.



1.7.2 Test program according EN 60601-1-2 (Immunity Test)

Immunity test equipment intended	
<input checked="" type="checkbox"/>	Professional healthcare facility environment
<input type="checkbox"/>	HOME HEALTHCARE ENVIRONMENT

Report Clause	Phenomenon	Application	Reference Clause(s)	Reference Standard	Result
6	Electrostatic Discharge	Enclosure Port	8	IEC 61000-4-2	PASS
7	Radiated RF EM Fields	Enclosure Port	8	IEC 61000-4-3	PASS
8	RF Wireless Communications Equipment	Enclosure Port	8		PASS
9	Electrical Fast Transients / Bursts	AC Power Port	8	IEC 61000-4-4	PASS
10	Surges	AC Power Port	8	IEC 61000-4-5	PASS
11	Conducted Disturbances Induced by RF Fields	AC Power Port	8	IEC 61000-4-6	PASS
12	RATED Power Frequency Magnetic Fields	Enclosure Port	8	IEC 61000-4-8	PASS
13	Voltage Dips and Interruptions	AC Power Port	8	IEC 61000-4-11	PASS
	Transient Conduction Along Supply Lines	DC Power Port	8	ISO 7637-2	Not Applicable



1.8 Measured Mode

1.8.1 The test modes for preliminary test are as following:

- Mode 1: Full Load (Model No.: TPP 40-124BA)
- Mode 2: Full Load (Model No.: TPP 40-221BA)
- Mode 3: Full Load (Model No.: TPP 40-321M2BA)

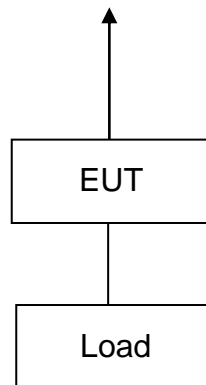
1.8.2 After preliminary test, EUT was selected the worst-case for the final testing.

The test modes are:

- For Emission: Mode 1 ~ 3
- For Immunity: Mode 1 & 2

1.9 Configuration of EUT Setup

Connected to Mains



1.10 Test Step of EUT

1.10.1 Set the EUT and peripheral as above.

1.10.2 Turn on the power of EUT.

1.10.3 Execute the test.

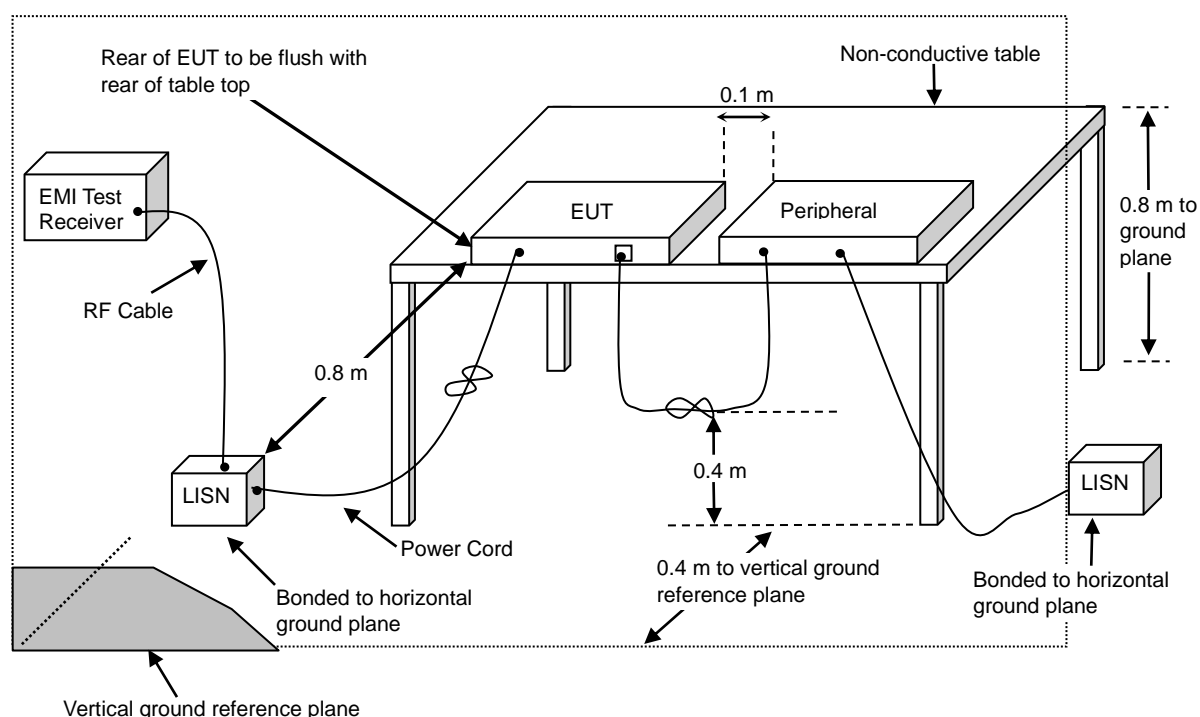
2 Conducted Emissions Measurement

2.1 Instrument

Instrument	Manufacturer	Model	Serial No.	Next Cal. Date
EMI Test Receiver	Rohde & Schwarz	ESCS 30	100127	2015/10/20
RF Cable	HARBOUR	RG58/U	CBL48	2016/07/27
L.I.S.N.	Schwarzbeck	NNLK8121	8121417	2015/08/27
L.I.S.N.	Schaffner	MN2050D	1597	2016/08/06

Note: The above equipments are within the valid calibration period.

2.2 Block Diagram of Test Configuration



2.3 Conducted Limit

CISPR 11

Frequency (MHz)	<input type="checkbox"/> Group 1, Class A (dB μ V)		<input checked="" type="checkbox"/> Group 1, Class B (dB μ V)	
	Q.P. (Quasi-Peak)	A.V. (Average)	Q.P. (Quasi-Peak)	A.V. (Average)
0.15 to 0.50	79	66	66 to 56	56 to 46
0.50 to 5.0	73	60	56	46
5.0 to 30	73	60	60	50



2.4 Instrument Configuration

- 2.4.1 Set the EMI test receiver frequency range from 150 kHz to 30 MHz.
- 2.4.2 Set the EMI test receiver bandwidth at 9 kHz.
- 2.4.3 Set the EMI test receiver detector as Quasi-Peak (Q.P.) and Average (AV).

2.5 Configuration of Measurement

- 2.5.1 The EUT was placed on a non-conductive table whose total height equaled 80 cm and vertical conducting plane located 40 cm to the rear of the EUT.
- 2.5.2 The EUT was connected to the main power through Line Impedance Stabilization Networks (LISN). This setup provided a 50 ohm / 50 μ H coupling impedance for the measuring equipment. The auxiliary equipment was also connected to the main power through a LISN that provided a 50 ohm/50 μ H coupling impedance with 50 ohm termination. (Refer to the block diagram of the test setup and photographs.)
- 2.5.3 The conducted disturbance was measured between the phase lead and the reference ground, and between the neutral lead and reference ground. The initial testing identified the frequency that has the highest disturbance relative to the limit while operating the EUT in typical modes of operation and cable positions in a test setup representative of typical system configuration.
- 2.5.4 The identification of the frequency of highest disturbance with respect to the limit was found by investigating disturbances at a number of significant frequencies. The probable frequency of maximum disturbance had been found and that the associated cable and EUT configuration and mode of operation had been identified.

2.6 Test Result

PASS.

The final test data is shown on as following pages.

Factor = Insertion Loss + Cable Loss

Level = Reading + Factor

Margin = Level - Limit



Power Line Conducted Test Data

CLIENT:TRACO ELECTRONIC AG

EUT: AC/DC Converter

MODEL: TPP 40-124BA

RATING: 230 Vac / 50 Hz

COMMENT: Test Mode: Mode 1: Full Load (Model No.: TPP 40-124BA)

OPERATOR: Vic

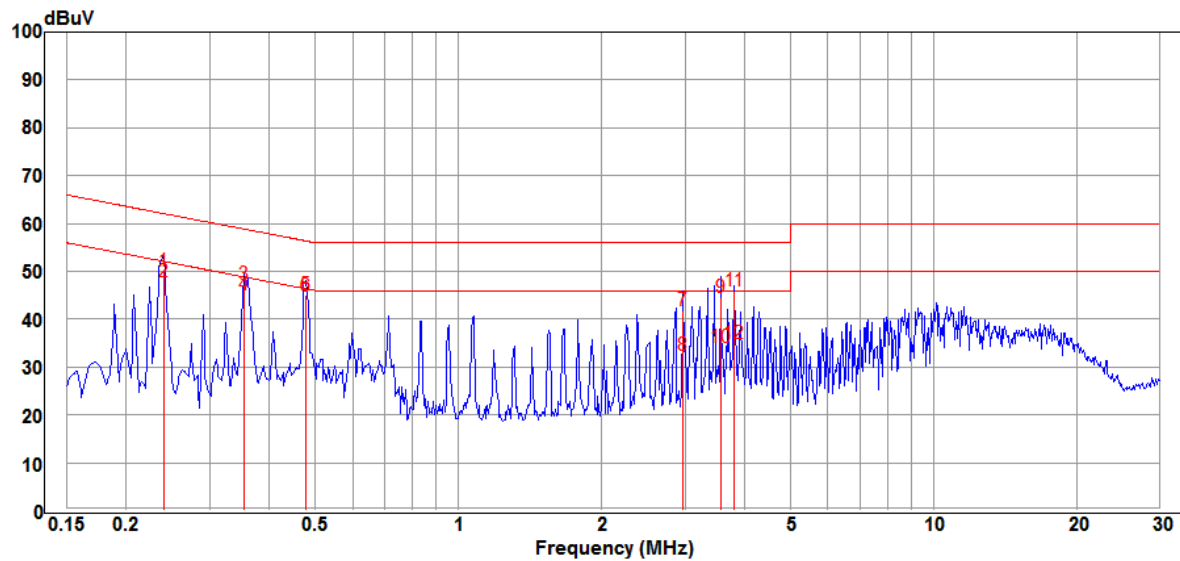
TEST SITE: Conducted 1

POLARIZATION: Line

TEMP/HUM: 28.8 °C / 58 %

Data:1

2015-08-21



Item Mark	Freq. MHz	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Margin dB	Remark
1	0.240	49.75	0.28	50.03	62.08	-12.05	QP
2	0.240	47.51	0.28	47.79	52.08	-4.29	Average
3	0.354	47.00	0.28	47.28	58.87	-11.59	QP
4	0.354	44.89	0.28	45.17	48.87	-3.70	Average
5	0.479	44.77	0.28	45.05	56.36	-11.31	QP
6	0.479	44.48	0.28	44.76	46.36	-1.60	Average
7	2.978	41.51	0.37	41.88	56.00	-14.12	QP
8	2.978	32.15	0.37	32.52	46.00	-13.48	Average
9	3.565	44.15	0.38	44.53	56.00	-11.47	QP
10	3.565	33.64	0.38	34.02	46.00	-11.98	Average
11	3.816	45.60	0.38	45.98	56.00	-10.02	QP
12	3.816	34.40	0.38	34.78	46.00	-11.22	Average



Power Line Conducted Test Data

CLIENT:TRACO ELECTRONIC AG

EUT: AC/DC Converter

MODEL: TPP 40-124BA

RATING: 230 Vac / 50 Hz

COMMENT: Test Mode: Mode 1: Full Load (Model No.: TPP 40-124BA)

OPERATOR: Vic

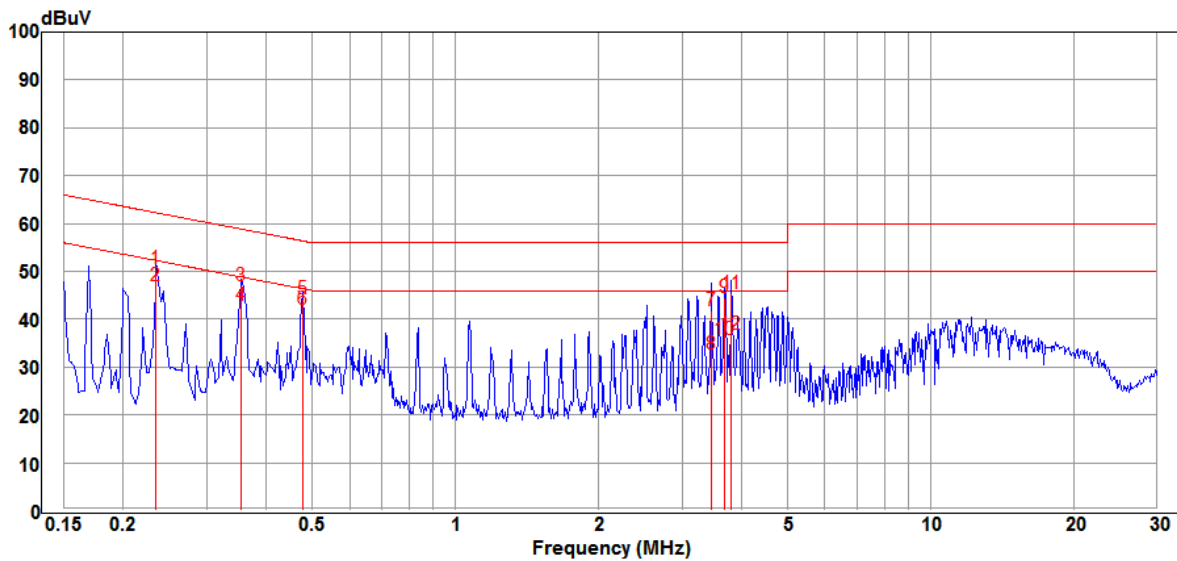
TEST SITE: Conducted 1

POLARIZATION: Neutral

TEMP/HUM: 28.8 °C / 58 %

Data:2

2015-08-21



Item Mark	Freq. MHz	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Margin dB	Remark
1	0.235	50.31	0.27	50.58	62.26	-11.68	QP
2	0.235	46.81	0.27	47.08	52.26	-5.18	Average
3	0.354	46.64	0.27	46.91	58.87	-11.96	QP
4	0.354	42.56	0.27	42.83	48.87	-6.04	Average
5	0.479	43.99	0.27	44.26	56.36	-12.10	QP
6	0.479	41.73	0.27	42.00	46.36	-4.36	Average
7	3.454	41.50	0.38	41.88	56.00	-14.12	QP
8	3.454	32.34	0.38	32.72	46.00	-13.28	Average
9	3.693	44.00	0.39	44.39	56.00	-11.61	QP
10	3.693	35.30	0.39	35.69	46.00	-10.31	Average
11	3.820	44.95	0.39	45.34	56.00	-10.66	QP
12	3.820	36.56	0.39	36.95	46.00	-9.05	Average



Power Line Conducted Test Data

CLIENT:TRACO ELECTRONIC AG

EUT: AC/DC Converter

MODEL: TPP 40-221BA

RATING: 230 Vac / 50 Hz

COMMENT: Test Mode: Mode 2: Full Load (Model No.: TPP 40-221BA)

OPERATOR: Vic

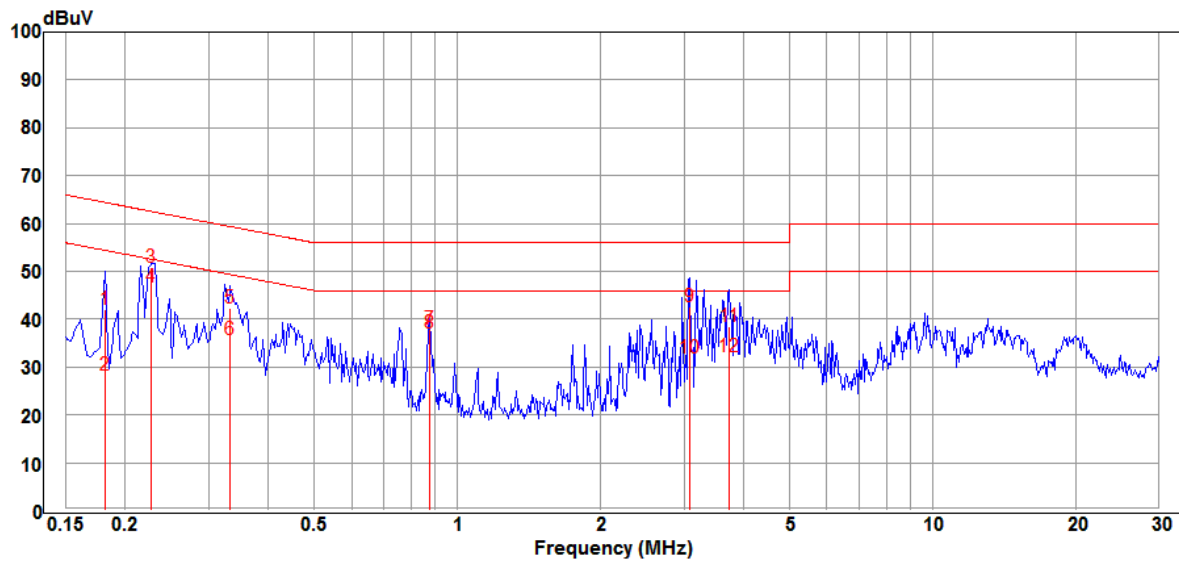
TEST SITE: Conducted 1

POLARIZATION: Line

TEMP/HUM: 28.8 °C / 58 %

Data:9

2015-08-21



Item Mark	Freq. MHz	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Margin dB	Remark
1	0.182	41.82	0.28	42.10	64.42	-22.32	QP
2	0.182	28.05	0.28	28.33	54.42	-26.09	Average
3	0.228	50.55	0.28	50.83	62.52	-11.69	QP
4	0.228	46.51	0.28	46.79	52.52	-5.73	Average
5	0.334	42.10	0.28	42.38	59.35	-16.97	QP
6	0.334	35.42	0.28	35.70	49.35	-13.65	Average
7	0.876	37.55	0.29	37.84	56.00	-18.16	QP
8	0.876	36.68	0.29	36.97	46.00	-9.03	Average
9	3.090	42.13	0.37	42.50	56.00	-13.50	QP
10	3.090	31.42	0.37	31.79	46.00	-14.21	Average
11	3.740	38.13	0.38	38.51	56.00	-17.49	QP
12	3.740	31.79	0.38	32.17	46.00	-13.83	Average



Power Line Conducted Test Data

CLIENT: TRACO ELECTRONIC AG

EUT: AC/DC Converter

MODEL: TPP 40-221BA

RATING: 230 Vac / 50 Hz

COMMENT: Test Mode: Mode 2: Full Load (Model No.: TPP 40-221BA)

OPERATOR: Vic

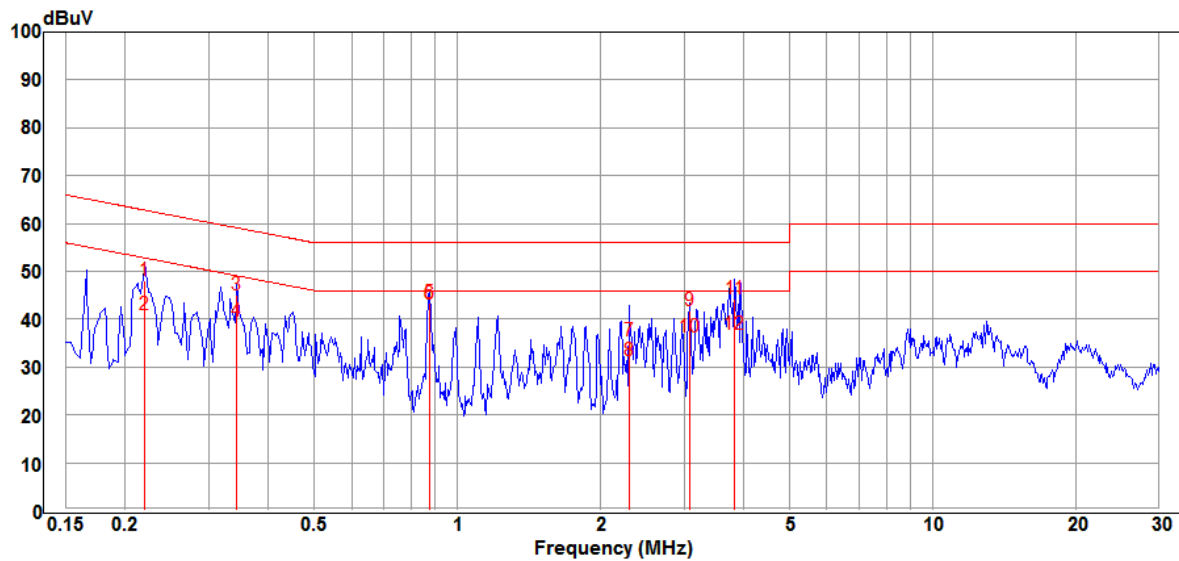
TEST SITE: Conducted 1

POLARIZATION: Neutral

TEMP/HUM: 28.8 °C / 58 %

Data: 10

2015-08-21



Item Mark	Freq. MHz	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Margin dB	Remark
1	0.221	47.92	0.27	48.19	62.79	-14.60	QP
2	0.221	40.64	0.27	40.91	52.79	-11.88	Average
3	0.345	44.68	0.27	44.95	59.09	-14.14	QP
4	0.345	39.18	0.27	39.45	49.09	-9.64	Average
5	0.876	43.25	0.29	43.54	56.00	-12.46	QP
6	0.876	42.89	0.29	43.18	46.00	-2.82	Average
7	2.306	35.00	0.35	35.35	56.00	-20.65	QP
8	2.306	31.10	0.35	31.45	46.00	-14.55	Average
9	3.090	41.35	0.38	41.73	56.00	-14.27	QP
10	3.090	36.02	0.38	36.40	46.00	-9.60	Average
11	3.840	43.91	0.39	44.30	56.00	-11.70	QP
12	3.840	36.35	0.39	36.74	46.00	-9.26	Average



Power Line Conducted Test Data

CLIENT:TRACO ELECTRONIC AG

EUT: AC/DC Converter

MODEL: TPP 40-321M2BA

RATING: 230 Vac / 50 Hz

COMMENT: Test Mode: Mode 3: Full Load (Model No.: TPP 40-321M2BA)

OPERATOR: Vic

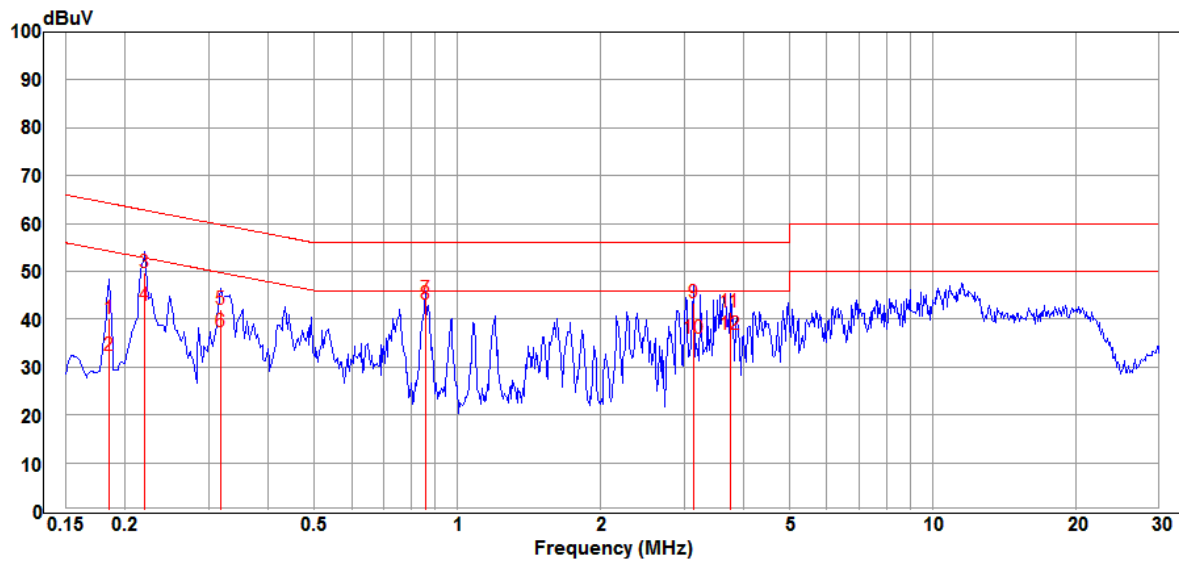
TEST SITE: Conducted 1

POLARIZATION: Line

TEMP/HUM: 28.8 °C / 58 %

Data:25

2015-08-21



Item Mark	Freq. MHz	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Margin dB	Remark
1	0.185	39.93	0.28	40.21	64.24	-24.03	QP
2	0.185	32.11	0.28	32.39	54.24	-21.85	Average
3	0.221	49.52	0.28	49.80	62.79	-12.99	QP
4	0.221	42.65	0.28	42.93	52.79	-9.86	Average
5	0.318	41.90	0.28	42.18	59.75	-17.57	QP
6	0.318	37.23	0.28	37.51	49.75	-12.24	Average
7	0.857	44.09	0.29	44.38	56.00	-11.62	QP
8	0.857	42.81	0.29	43.10	46.00	-2.90	Average
9	3.140	43.08	0.37	43.45	56.00	-12.55	QP
10	3.140	35.68	0.37	36.05	46.00	-9.95	Average
11	3.759	41.15	0.38	41.53	56.00	-14.47	QP
12	3.759	36.56	0.38	36.94	46.00	-9.06	Average



Power Line Conducted Test Data

CLIENT:TRACO ELECTRONIC AG

EUT: AC/DC Converter

MODEL: TPP 40-321M2BA

RATING: 230 Vac / 50 Hz

COMMENT: Test Mode: Mode 3: Full Load (Model No.: TPP 40-321M2BA)

OPERATOR: Vic

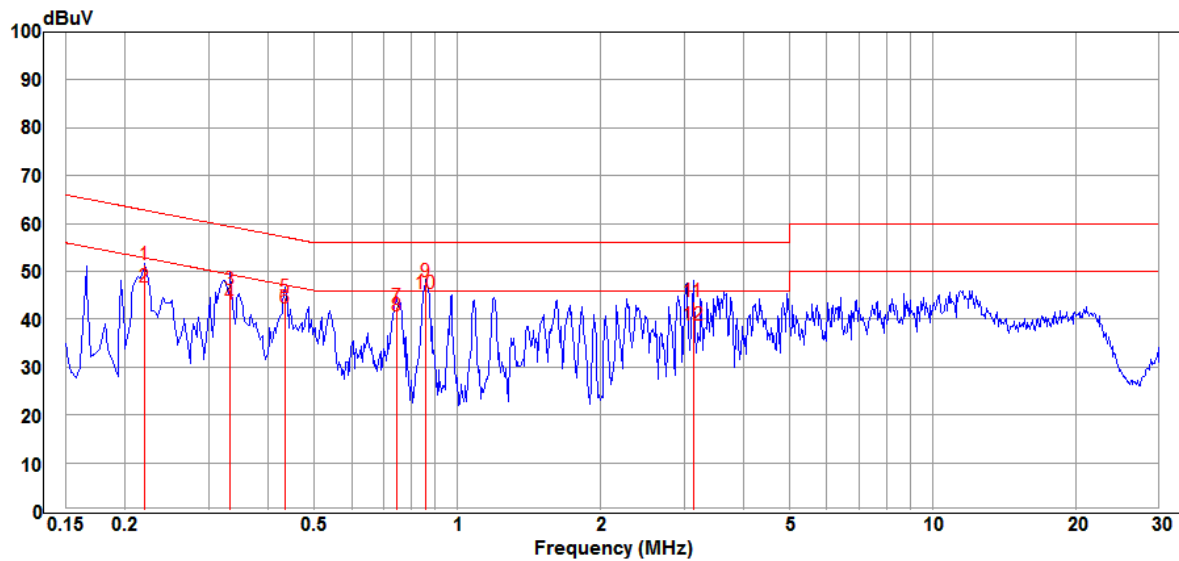
TEST SITE: Conducted 1

POLARIZATION: Neutral

TEMP/HUM: 28.8 °C / 58 %

Data:26

2015-08-21



Item Mark	Freq. MHz	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Margin dB	Remark
1	0.221	51.03	0.27	51.30	62.79	-11.49	QP
2	0.221	46.43	0.27	46.70	52.79	-6.09	Average
3	0.334	45.81	0.27	46.08	59.35	-13.27	QP
4	0.334	42.75	0.27	43.02	49.35	-6.33	Average
5	0.435	44.27	0.27	44.54	57.15	-12.61	QP
6	0.435	42.11	0.27	42.38	47.15	-4.77	Average
7	0.747	42.34	0.28	42.62	56.00	-13.38	QP
8	0.747	40.28	0.28	40.56	46.00	-5.44	Average
9	0.862	47.65	0.29	47.94	56.00	-8.06	QP
10	0.862	45.18	0.29	45.47	46.00	-0.53	Average
11	3.140	43.42	0.38	43.80	56.00	-12.20	QP
12	3.140	38.35	0.38	38.73	46.00	-7.27	Average



3 Radiated Emissions Measurement

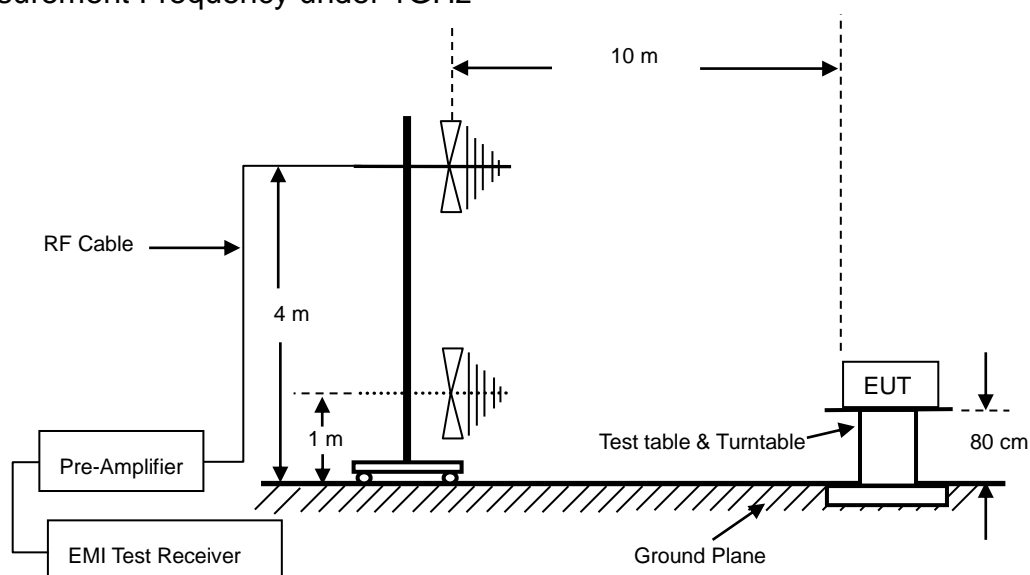
3.1 Instrument

Instrument	Manufacturer	Model	Serial No.	Next Cal. Date
EMI Test Receiver	Rohde & Schwarz	ESVS10	826148/011	2015/10/29
Biconical Antenna	Schwarzbeck	VHA 9103 & BBA 9106	VHA 9103-2418	2016/07/05
Log Antenna	Schwarzbeck	UHALP 9108-A	9108-A 0739	2016/07/19
Pre-Amplifier	Agilent	8447D	2944A09703	2016/04/28
RF Cable	EMCI	EMC8D-NM-NM-25000	140105	2016/02/15
RF Cable	Mini-Circuits	CBL-3FL-NMNM	CBL56	2015/08/29
RF Cable	Insulated Wire	CBL59	CBL59	2016/01/21

Note: The above equipments are within the valid calibration period.

3.2 Block Diagram of Test Configuration

Measurement Frequency under 1GHz



3.3 Radiated Limit

CISPR 11

Frequency (MHz)	<input type="checkbox"/> Group 1, Class A	<input checked="" type="checkbox"/> Group 1, Class B
	Quasi-Peak dB(μ V/m)	Quasi-Peak dB(μ V/m)
30 to 230	40.0	30.0
230 to 1000	47.0	37.0



3.4 Instrument Configuration

- 3.4.1 Set the EMI test receiver frequency range from 30 MHz to 1000 MHz.
- 3.4.2 Set the EMI test receiver bandwidth at 120 kHz.
- 3.4.3 Set the EMI test receiver detector as Quasi-Peak (Q.P.).

3.5 Configuration of Measurement

- 3.5.1 The EUT was placed on a non-conductive table whose total height equaled 80 cm. The turntable can rotate 360 degree to determine the position of the maximum emission level.
- 3.5.2 The EUT was set 10 meters away from the receiving antenna that was mounted on a non-conductive mast. The antenna can move up and down between 1 to 4 meters to find out the maximum emission level.
- 3.5.3 The initial testing identified the frequency that has the highest disturbance relative to the limit while operating the EUT in typical modes of operation and cable positions in a test setup representative of typical system configuration.
- 3.5.4 The identification of the frequency of highest emission with respect to the limit was found by investigating emissions at a number of significant frequencies. The probable frequency of maximum emission had been found and that the associated cable and EUT configuration and mode of operation had been identified.

3.6 Test Result

PASS.

The final test data is shown as following pages.

Factor = Antenna Factor + Cable Loss - Preamplifier Gain

Level = Reading + Factor

Margin = Level - Limit



Radiated Emission Measurement Data

CLIENT: TRACO ELECTRONIC AG

EUT: AC/DC Converter

MODEL: TPP 40-124BA

RATING: 230 Vac / 50 Hz

COMMENT: Test Mode: Mode 1: Full Load (Model No.: TPP 40-124BA)

OPERATOR : Ceres

TEST SITE : OATS 1

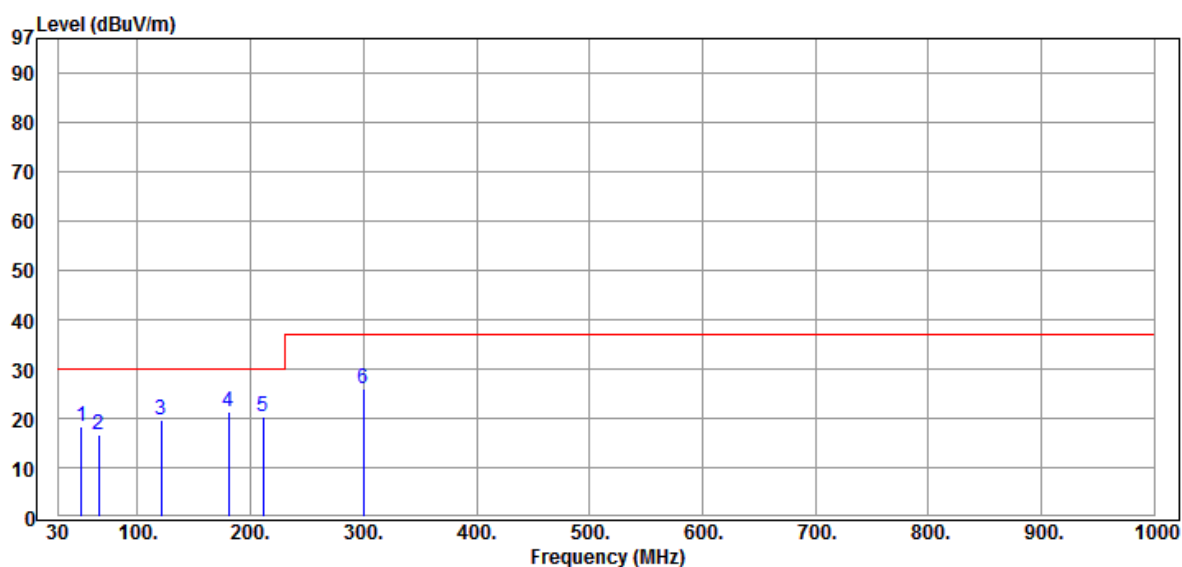
TEST DISTANCE : 10 m

POLARIZATION : HORIZONTAL

TEMP/HUM : 27.1 °C / 57 %

Data:2

2015-08-20



Item Mark	Freq. MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Margin dB	Remark
1	50.410	38.51	-20.32	18.19	30.00	-11.81	QP
2	65.870	40.50	-23.73	16.77	30.00	-13.23	QP
3	120.520	36.90	-17.08	19.82	30.00	-10.18	QP
4	180.520	35.49	-14.05	21.44	30.00	-8.56	QP
5	210.870	33.60	-13.17	20.43	30.00	-9.57	QP
6	299.870	35.90	-9.76	26.14	37.00	-10.86	QP



Radiated Emission Measurement Data

CLIENT: TRACO ELECTRONIC AG

EUT: AC/DC Converter

MODEL: TPP 40-124BA

RATING: 230 Vac / 50 Hz

COMMENT: Test Mode: Mode 1: Full Load (Model No.: TPP 40-124BA)

OPERATOR : Ceres

TEST SITE : OATS 1

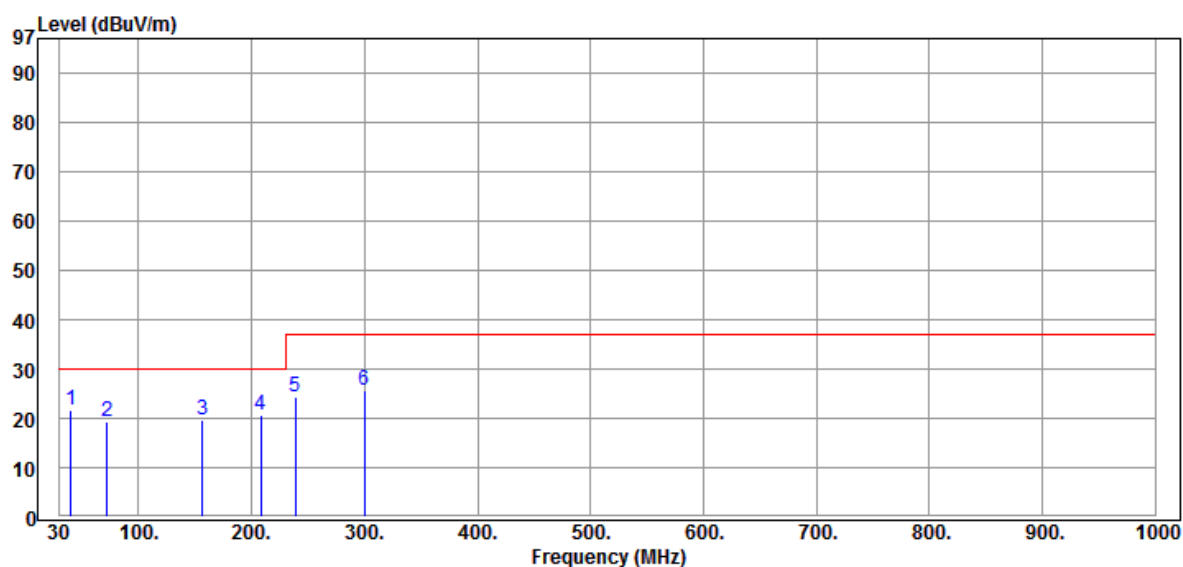
TEST DISTANCE : 10 m

POLARIZATION : VERTICAL

TEMP/HUM : 27.1 °C / 57 %

Data: 1

2015-08-20



Item Mark	Freq. MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Margin dB	Remark
1	40.123	38.50	-16.85	21.65	30.00	-8.35	QP
2	72.052	43.60	-24.43	19.17	30.00	-10.83	QP
3	156.870	34.60	-15.05	19.55	30.00	-10.45	QP
4	207.850	33.79	-13.25	20.54	30.00	-9.46	QP
5	238.980	36.59	-12.22	24.37	37.00	-12.63	QP
6	300.000	35.50	-9.76	25.74	37.00	-11.26	QP



Radiated Emission Measurement Data

CLIENT: TRACO ELECTRONIC AG

EUT: AC/DC Converter

MODEL: TPP 40-221BA

RATING: 230 Vac / 50 Hz

COMMENT: Test Mode: Mode 2: Full Load (Model No.: TPP 40-221BA)

OPERATOR : Ceres

TEST SITE : OATS 1

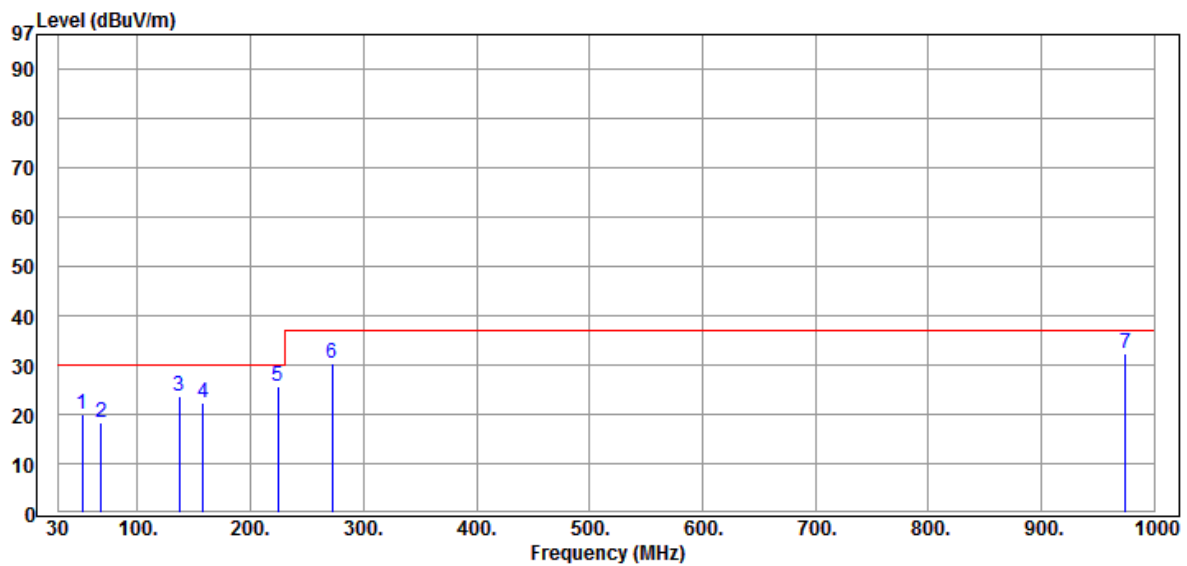
TEST DISTANCE : 10 m

POLARIZATION : HORIZONTAL

TEMP/HUM : 27.1 °C / 57 %

Data:10

2015-08-20



Item Mark	Freq. MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Margin dB	Remark
1	50.850	40.50	-20.43	20.07	30.00	-9.93	QP
2	67.870	42.50	-24.06	18.44	30.00	-11.56	QP
3	136.520	39.60	-16.04	23.56	30.00	-6.44	QP
4	157.990	37.20	-15.00	22.20	30.00	-7.80	QP
5	224.560	38.50	-12.71	25.79	30.00	-4.21	QP
6	271.980	41.24	-11.03	30.21	37.00	-6.79	QP
7	975.000	35.56	-3.18	32.38	37.00	-4.62	QP



Radiated Emission Measurement Data

CLIENT:TRACO ELECTRONIC AG

EUT: AC/DC Converter

MODEL: TPP 40-221BA

RATING: 230 Vac / 50 Hz

COMMENT: Test Mode: Mode 2: Full Load (Model No.: TPP 40-221BA)

OPERATOR : Ceres

TEST SITE : OATS 1

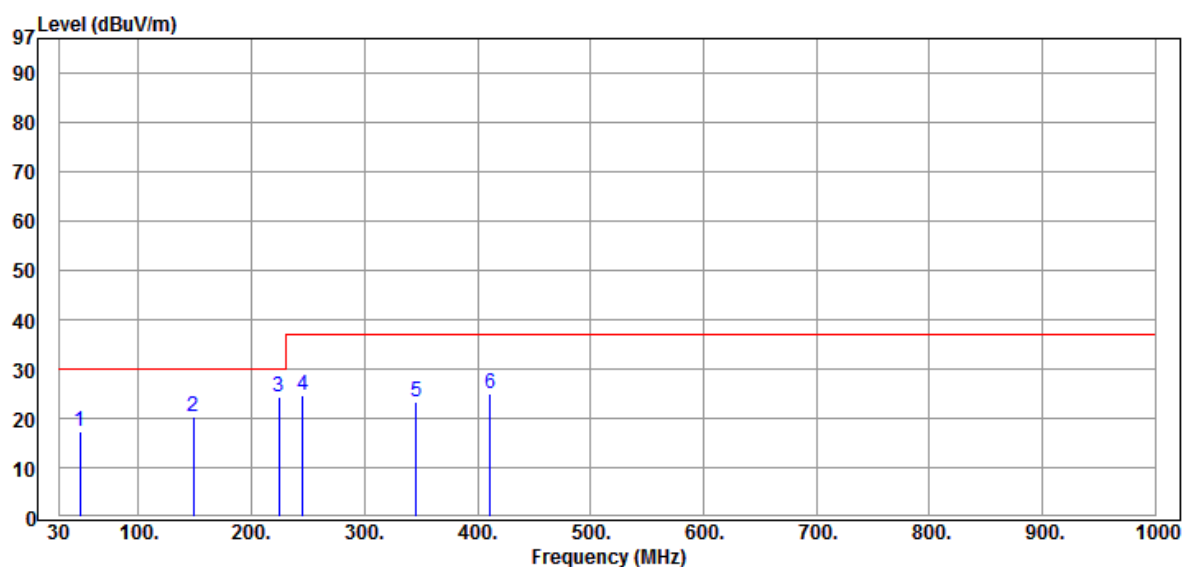
TEST DISTANCE : 10 m

POLARIZATION : VERTICAL

TEMP/HUM : 27.1 °C / 57 %

Data:9

2015-08-20



Item Mark	Freq. MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Margin dB	Remark
1	48.350	36.90	-19.63	17.27	30.00	-12.73	QP
2	148.560	35.91	-15.41	20.50	30.00	-9.50	QP
3	224.560	37.20	-12.71	24.49	30.00	-5.51	QP
4	245.260	36.80	-12.03	24.77	37.00	-12.23	QP
5	345.650	37.21	-14.03	23.18	37.00	-13.82	QP
6	411.560	36.81	-11.92	24.89	37.00	-12.11	QP



Radiated Emission Measurement Data

CLIENT: TRACO ELECTRONIC AG

EUT: AC/DC Converter

MODEL: TPP 40-321M2BA

RATING: 230 Vac / 50 Hz

COMMENT: Test Mode: Mode 3: Full Load (Model No.: TPP 40-321M2BA)

OPERATOR : Ceres

TEST SITE : OATS 1

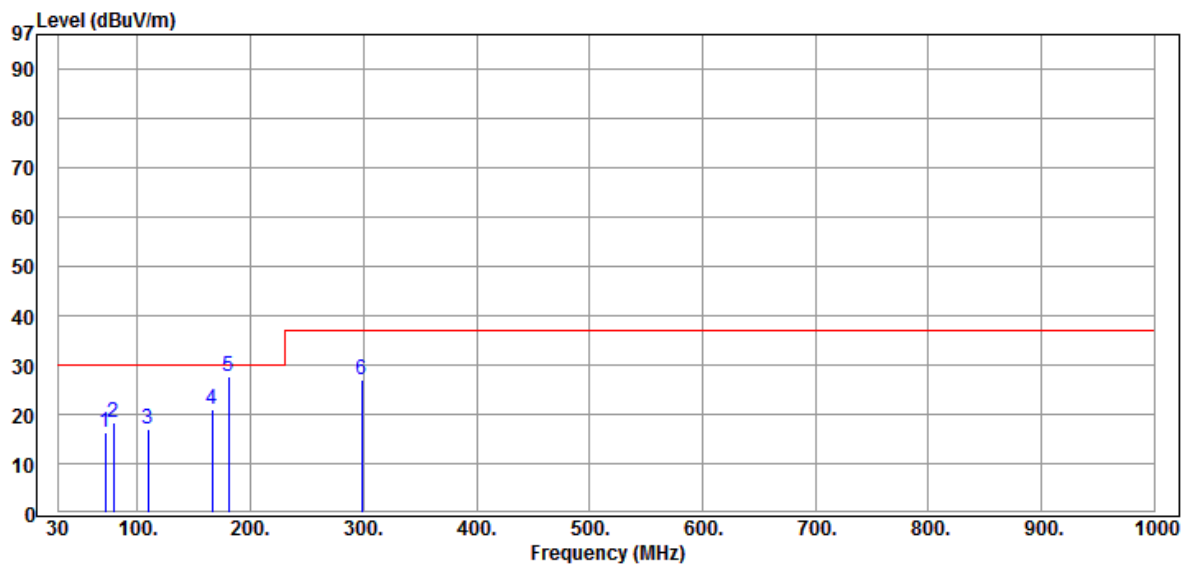
TEST DISTANCE : 10 m

POLARIZATION : HORIZONTAL

TEMP/HUM : 27.1 °C / 57 %

Data:31

2015-08-20



Item Mark	Freq. MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Margin dB	Remark
1	71.350	40.80	-24.42	16.38	30.00	-13.62	QP
2	78.390	42.80	-24.49	18.31	30.00	-11.69	QP
3	109.000	35.60	-18.75	16.85	30.00	-13.15	QP
4	165.980	35.60	-14.66	20.94	30.00	-9.06	QP
5	180.400	41.60	-14.06	27.54	30.00	-2.46	QP
6	298.300	36.71	-9.73	26.98	37.00	-10.02	QP



Radiated Emission Measurement Data

CLIENT: TRACO ELECTRONIC AG

OPERATOR : Ceres

EUT: AC/DC Converter

TEST SITE : OATS 1

MODEL: TPP 40-321M2BA

TEST DISTANCE : 10 m

RATING: 230 Vac / 50 Hz

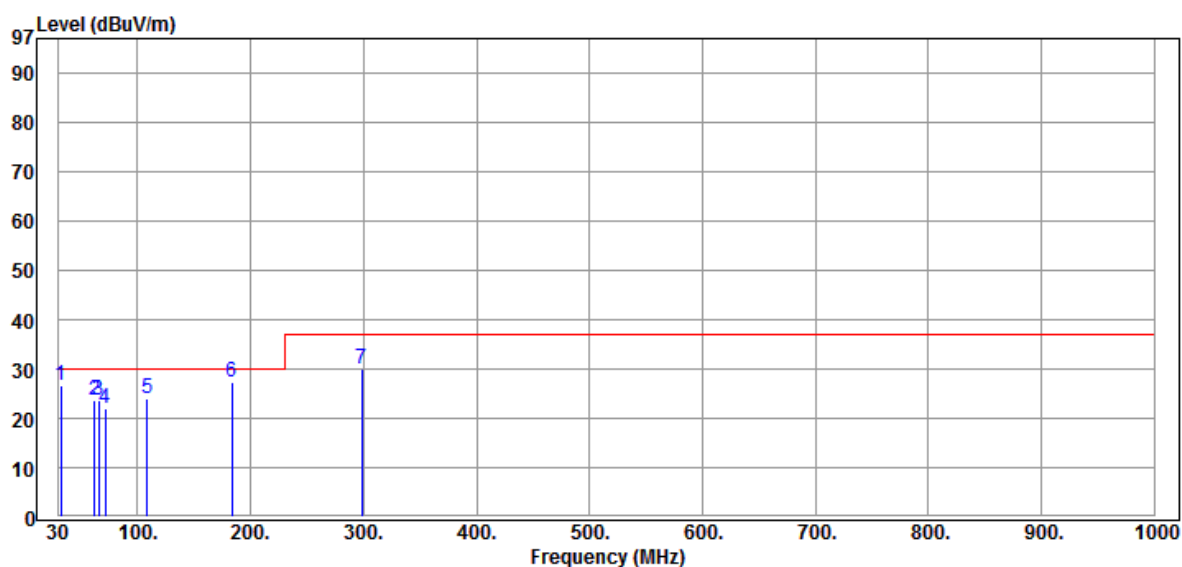
POLARIZATION : VERTICAL

COMMENT: Test Mode: Mode 3: Full Load (Model No.: TPP 40-321M2BA)

TEMP/HUM : 27.1 °C / 57 %

Data:30

2015-08-20



Item Mark	Freq. MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Margin dB	Remark
1	32.170	40.21	-13.60	26.61	30.00	-3.39	QP
2	61.610	46.80	-23.03	23.77	30.00	-6.23	QP
3	65.910	47.39	-23.73	23.66	30.00	-6.34	QP
4	71.440	46.50	-24.42	22.08	30.00	-7.92	QP
5	108.440	43.00	-18.84	24.16	30.00	-5.84	QP
6	183.300	41.20	-13.92	27.28	30.00	-2.72	QP
7	298.500	39.80	-9.73	30.07	37.00	-6.93	QP



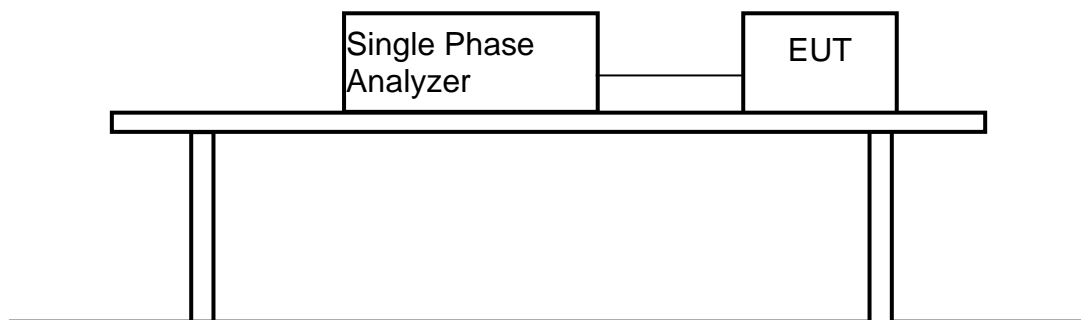
4 Voltage Fluctuations and Flicker Measurement (IEC 61000-3-3)

4.1 Instrument

Instrument	Manufacturer	Model	Serial No.	Next Cal. Date
Single Phase Analyzer	N4L	PPA5511	162-04145	2015/12/11

Note: The above equipments are within the valid calibration period.

4.2 Block Diagram of Test Configuration



4.3 Test Limit

The following limits apply:

- the value of P_{st} shall not be greater than 1.0;
- the value of P_{it} shall not be greater than 0.65;
- the relative steady-state voltage change, d_c , shall not exceed 3.3%;
- the maximum relative voltage change, d_{max} , shall not exceed 4%;
- the value of $d(t)$ during a voltage change shall not exceed 3.3% for more than 500 ms.

4.4 Configuration of Measurement


- 4.4.1 The EUT with power analyzer is in series and supplied from a power source with the same nominal voltage and frequency as the rated supply voltage.
- 4.4.2 Set the output of the power analyzer to the rated voltage and frequency of EUT (230V, 50Hz).
- 4.4.3 Select the test time of observation period for short-term ($T_p = 10$ min) and long-term ($T_p = 2$ hrs). The test result was collected and analyzed by the computer.

4.5 Test Result

PASS.

The measured result is shown on as following pages.

**Mode 1: Full Load (Model No.: TPP 40-124BA)**

21st August 2015 - 15:24:38		Page 1/3		IEC Soft V2.2d	
		IEC61000-3-3:2013 Ed.3.0 Flickermeter			
Instrument Details					
Instrument Model	PPA5511				
Instrument Serial	162-04145				
Instrument Firmware	2.124				
Instrument Last Calibrated	12th December 2014				
Instrument Version	Low Current				
Test Settings					
Class	Voltage				
Mode	Normal - 4%				
Minimum Current	300mA				
PST	10.00 minutes				
PLT	1 PSTs				
Equipment Under Test					
Model	TPP 40-124BA				
Serial	N/A				
Impedance Network ID	N/A				
Test Conditions					
	User Entered		Measured		
Rated Voltage	N/A		230.778 V		
Rated Current	N/A		N/A		
Rated Frequency	N/A		50.000 Hz		
Rated Power	N/A		N/A		
D max	0.0186% (Limit: 4%)				
T max	0.0000 s (Limit: 0.5 s)				
DC max	0.0010% (Limit: 3.3%)				
Additional Test Details					
Operator	Ceres				
Lab Name	N/A				
Location	N/A				
Notes	T:26.9°C H:32%				
Signature					
Results		Phase1: PASS			

21st August 2015 - 15:24:38				Ph:1 Page 2/3				IEC Soft V2.2d			
IEC61000-3-3:2013 Ed.3.0 Flickermeter											
Instrument Details											
Instrument Model			PPA5511								
Instrument Serial			162-04145								
Instrument Firmware			2.124								
Equipment Under Test											
Model			TPP 40-124BA								
Serial			N/A								
Flicker Test Results											
PST no.	Status		DC (%)	Dmax (%)	Tmax (s)	PST	PST Lim	PLT	PLT Lim		
1	Phase1: PASS		0.00105	0.018573	0	0.08226	1	0.08226	0.65		



21st August 2015 - 15:24:38

Ph:1 Page 3/3

IEC Soft V2.2d

IEC61000-3-3:2013 Ed.3.0 Flickermeter

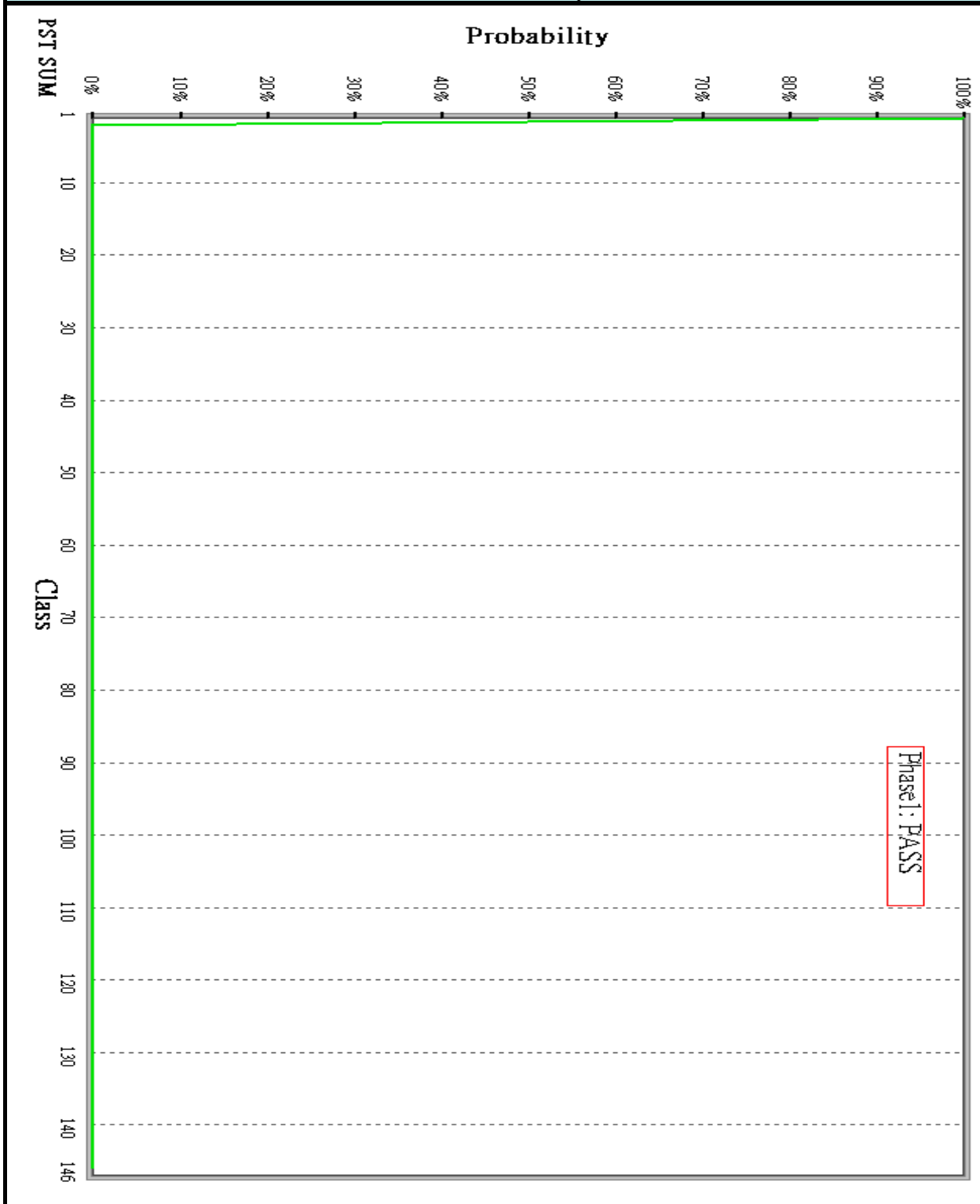
Instrument Details

Instrument Model	PPA5511
Instrument Serial	162-04145
Instrument Firmware	2.124


Equipment Under Test

Model	TPP 40-124BA
Serial	N/A

Flicker PST Sum Graph



**Mode 2: Full Load (Model No.: TPP 40-221BA)**

21st August 2015 - 16:24:05		Page 1/3		IEC Soft V2.2d	
		IEC61000-3-3:2013 Ed.3.0 Flickermeter			
Instrument Details					
Instrument Model	PPA5511				
Instrument Serial	162-04145				
Instrument Firmware	2.124				
Instrument Last Calibrated	12th December 2014				
Instrument Version	Low Current				
Test Settings					
Class	Voltage				
Mode	Normal - 4%				
Minimum Current	1A				
PST	10.00 minutes				
PLT	1 PSTs				
Equipment Under Test					
Model	TPP 40-221BA				
Serial	N/A				
Impedance Network ID	N/A				
Test Conditions					
	User Entered		Measured		
Rated Voltage	N/A		229.999 V		
Rated Current	N/A		N/A		
Rated Frequency	N/A		50.000 Hz		
Rated Power	N/A		N/A		
D max	0.2556% (Limit: 4%)				
T max	0.0000 s (Limit: 0.5 s)				
DC max	0.0000% (Limit: 3.3%)				
Additional Test Details					
Operator	Ceres				
Lab Name	N/A				
Location	N/A				
Notes	T:24.6°C H:27%				
Signature					
Results		Phase1: PASS			

21st August 2015 - 16:24:05				Ph:1 Page 2/3				IEC Soft V2.2d			
IEC61000-3-3:2013 Ed.3.0 Flickermeter											
Instrument Details											
Instrument Model			PPA5511								
Instrument Serial			162-04145								
Instrument Firmware			2.124								
Equipment Under Test											
Model			TPP 40-221BA								
Serial			N/A								
Flicker Test Results											
PST no.	Status		DC (%)	Dmax (%)	Tmax (s)	PST	PST Lim	PLT	PLT Lim		
1	Phase1: PASS		2.4E-05	0.255585	0	0.08226	1	0.08226	0.65		



21st August 2015 - 16:24:05

Ph:1 Page 3/3

IEC Soft V2.2d

IEC61000-3-3:2013 Ed.3.0 Flickermeter

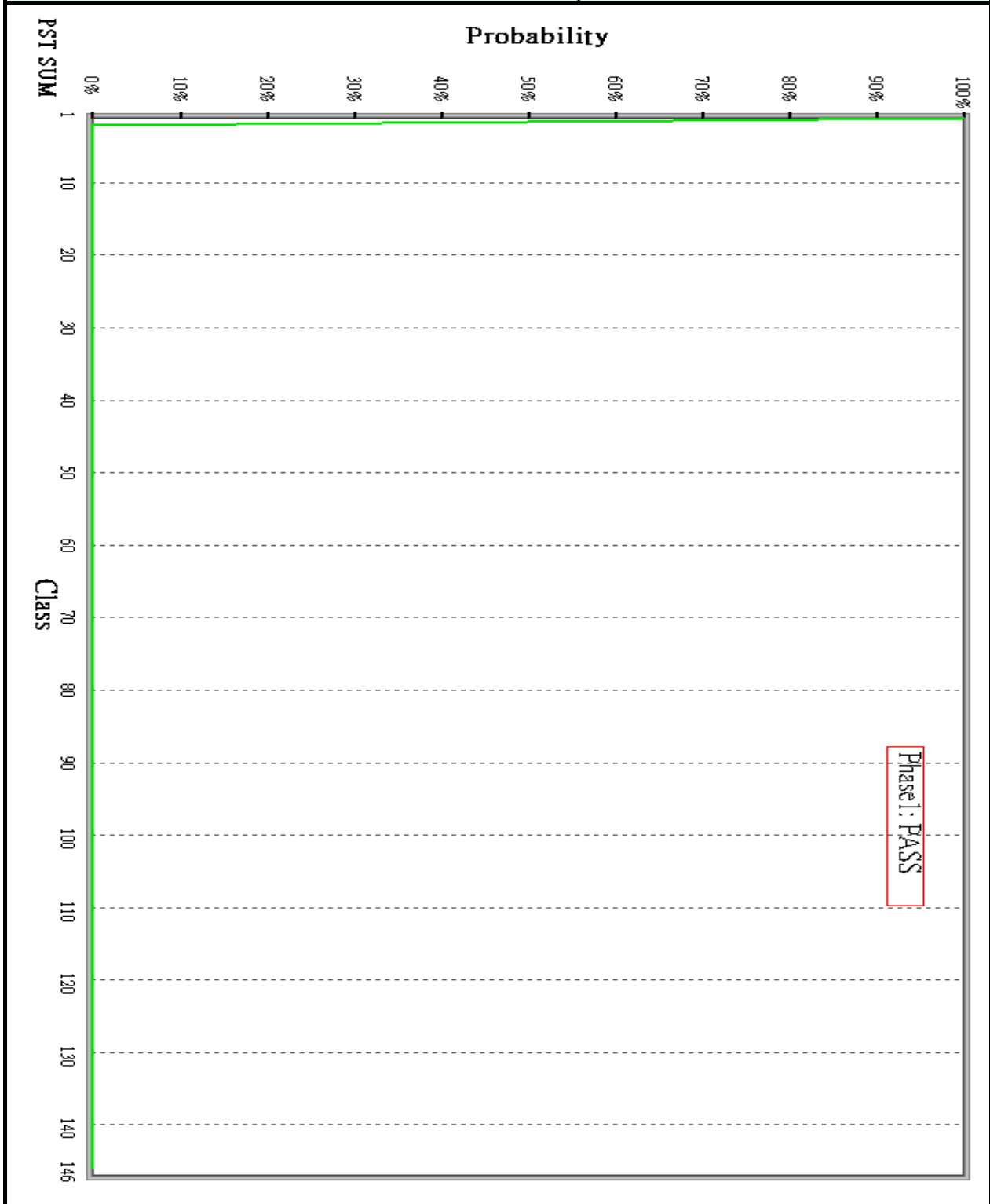
Instrument Details

Instrument Model	PPA5511
Instrument Serial	162-04145
Instrument Firmware	2.124


Equipment Under Test

Model	TPP 40-221BA
Serial	N/A

Flicker PST Sum Graph



**Mode 3: Full Load (Model No.: TPP 40-321M2BA)**

24th August 2015 - 14:34:54		Page 1/3		IEC Soft V2.2d	
		IEC61000-3-3:2013 Ed.3.0 Flickermeter			
Instrument Details					
Instrument Model	PPA5511				
Instrument Serial	162-04145				
Instrument Firmware	2.124				
Instrument Last Calibrated	12th December 2014				
Instrument Version	Low Current				
Test Settings					
Class	Voltage				
Mode	Normal - 4%				
Minimum Current	300mA				
PST	10.00 minutes				
PLT	1 PSTs				
Equipment Under Test					
Model	TPP 40-321M2BA				
Serial	N/A				
Impedance Network ID	N/A				
Test Conditions					
	User Entered		Measured		
Rated Voltage	N/A		230.813 V		
Rated Current	N/A		N/A		
Rated Frequency	N/A		50.000 Hz		
Rated Power	N/A		N/A		
D max	0.0178% (Limit: 4%)				
T max	0.0000 s (Limit: 0.5 s)				
DC max	0.0030% (Limit: 3.3%)				
Additional Test Details					
Operator	Boris				
Lab Name	N/A				
Location	N/A				
Notes	T28.8°C H46%				
Signature					
Results		Phase1: PASS			

24th August 2015 - 14:34:54				Ph:1 Page 2/3				IEC Soft V2.2d			
IEC61000-3-3:2013 Ed.3.0 Flickermeter											
Instrument Details											
Instrument Model				PPA5511							
Instrument Serial				162-04145							
Instrument Firmware				2.124							
Equipment Under Test											
Model				TPP 40-321M2BA							
Serial				N/A							
Flicker Test Results											
PST no.	Status			DC (%)	Dmax (%)	Tmax (s)	PST	PST Lim	PLT	PLT Lim	
1	Phase1: PASS			0.00299	0.017846	0	0.08226	1	0.08226	0.65	



24th August 2015 - 14:34:54

Ph:1 Page 3/3

IEC Soft V2.2d

IEC61000-3-3:2013 Ed.3.0 Flickermeter

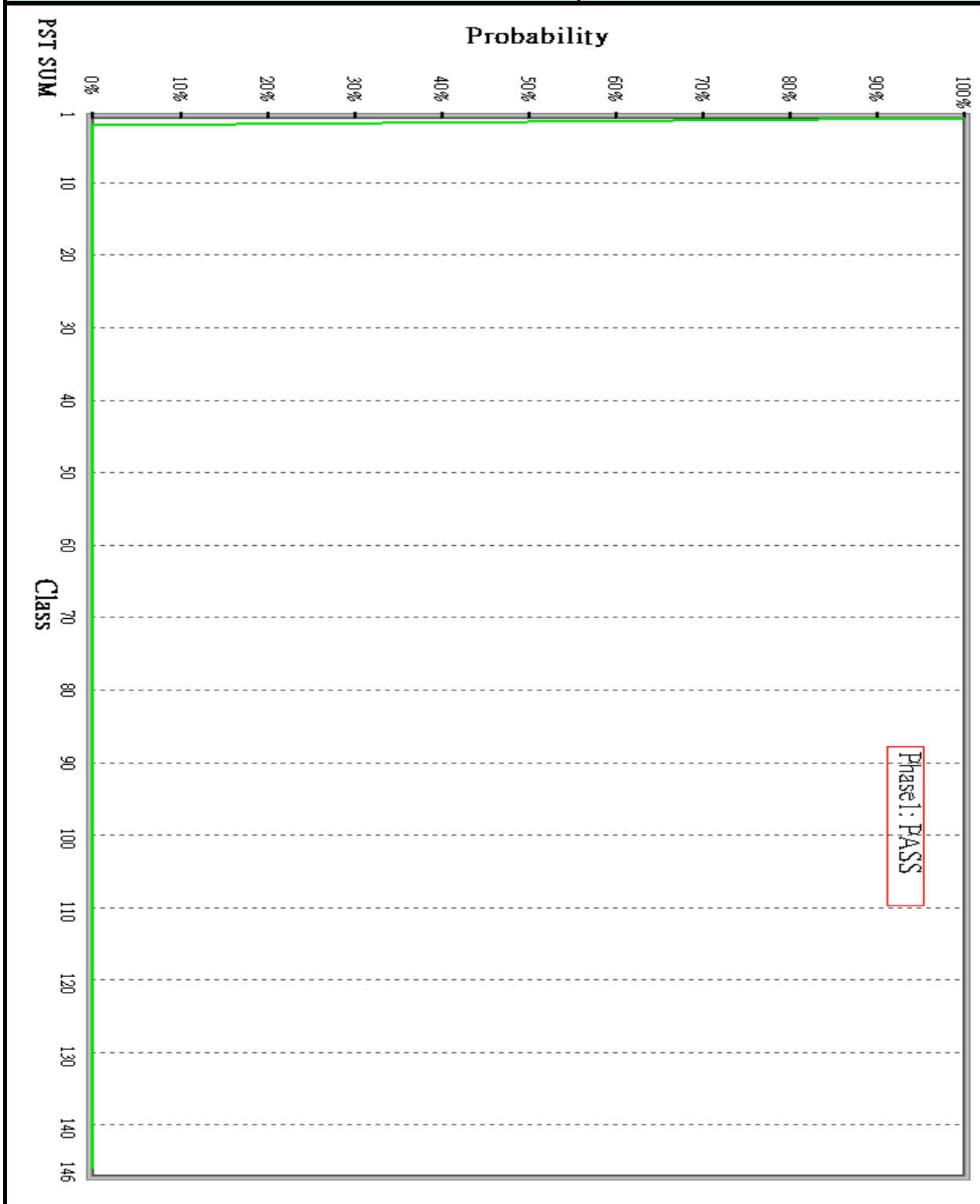
Instrument Details

Instrument Model	PPA5511
Instrument Serial	162-04145
Instrument Firmware	2.124

Equipment Under Test

Model	TPP 40-321M2BA
Serial	N/A

Flicker PST Sum Graph





5 Performance Criteria of Immunity Test

Before IMMUNITY testing begins, the MANUFACTURER shall determine specific, detailed IMMUNITY pass/fail criteria, based on applicable part two standards or RISK MANAGEMENT, for BASIC SAFETY and ESSENTIAL PERFORMANCE with regard to EM DISTURBANCES. The MANUFACTURER shall also determine how the ME EQUIPMENT or ME SYSTEM will be monitored during the tests to check for compliance with the specific pass/fail criteria. These pass/fail criteria and this monitoring specification should be included in the test plan and shall be included in the test report and the RISK MANAGEMENT FILE.

ME EQUIPMENT and ME SYSTEMS shall meet the IMMUNITY pass/fail criteria during and after the IMMUNITY tests. For transient phenomena for which it might not be practical to assess performance during the application of the transient, assessing performance before and after the test is acceptable.

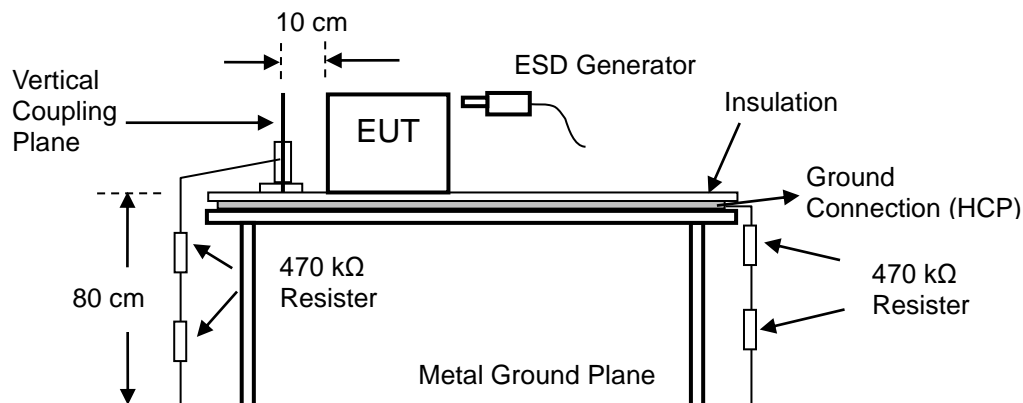
6 Electrostatic Discharge Immunity Test (IEC 61000-4-2)

6.1 Instrument

Instrument	Manufacturer	Model	Serial No.	Next Cal. Date
ESD Simulator	EMC PARTNER	ESD3000	276	2016/04/24

Note: The above equipments are within the valid calibration period.

6.2 Block Diagram of Test Configuration



6.3 Test Requirement

IEC 61000-4-2 (EN 60601-1-2) require:

☒ Professional healthcare facility environment:

☒ Enclosure Port

☐ Patient Coupling Port

☐ Signal input/output parts Port

Air discharge: ± 2 kV; ± 4 kV; ± 8 kV; ± 15 kV

Contact discharge: ± 8 kV

Performance criterion: **PASS**

☐ HOME HEALTHCARE ENVIRONMENT:

☐ Enclosure Port

☐ Patient Coupling Port

☐ Signal input/output parts Port

Air discharge: ± 2 kV; ± 4 kV; ± 8 kV; ± 15 kV

Contact discharge: ± 8 kV

Performance criterion: **PASS**

6.4 Configuration of Measurement

6.4.1 The test setup consists of the test generator, EUT and auxiliary instrumentation necessary to perform direct and indirect application of discharges to the EUT in the following manner:

a) Contact discharge to the conductive surfaces and to coupling planes;

b) Air discharge at insulating surfaces.

6.4.2 The EUT shall be arranged in accordance with the manufacturer's instructions for installation.



6.5 Test Result

PASS.

The performance criterion after tested EN 60601-1-2:

Temperature: 26.7 °C ; Humidity: 48 % ; Atm pres: 986 hPa ; Test Engineer: Boris

Mode 1: Full Load (Model No.: TPP 40-124BA)

Air discharge ± 2 kV, ± 4 kV, ± 8 kV, ± 15 kV

Contact discharge ± 2 kV, ± 4 kV, ± 6 kV, ± 8 kV

Indirect discharge (HCP) ± 2 kV, ± 4 kV, ± 6 kV, ± 8 kV

Indirect discharge (VCP) ± 2 kV, ± 4 kV, ± 6 kV, ± 8 kV

Performance criterion: **PASS**

Mode 2: Full Load (Model No.: TPP 40-221BA)

Air discharge ± 2 kV, ± 4 kV, ± 8 kV, ± 15 kV

Contact discharge ± 2 kV, ± 4 kV, ± 6 kV, ± 8 kV

Indirect discharge (HCP) ± 2 kV, ± 4 kV, ± 6 kV, ± 8 kV

Indirect discharge (VCP) ± 2 kV, ± 4 kV, ± 6 kV, ± 8 kV

Performance criterion: **PASS**



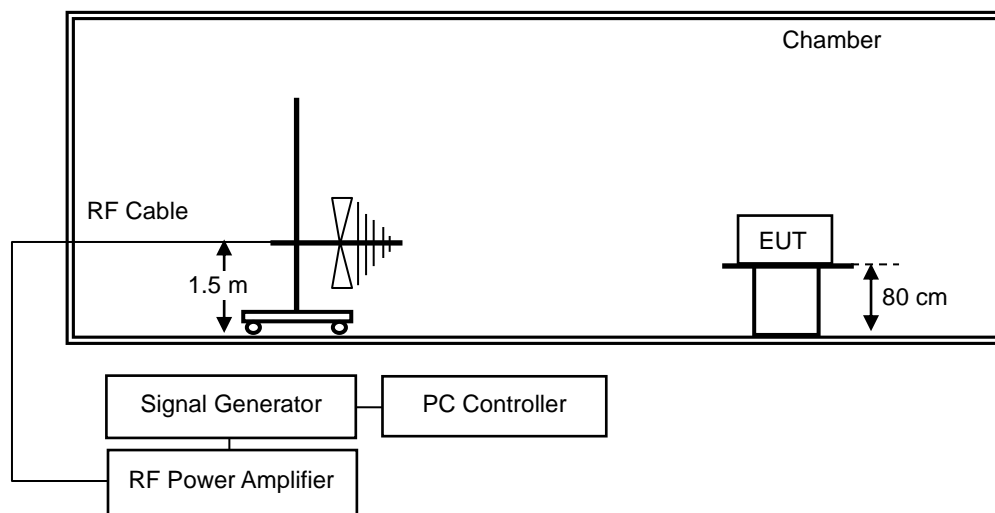
7 Radiated RF EM Fields Immunity Test (IEC 61000-4-3)

7.1 Instrument

Instrument	Manufacturer	Model	Serial No.	Next Cal. Date
Signal Generator	R&S	SMC100A	104370	2016/03/18
Power Amplifier	R&K	A080M102-5555R	B30850	2016/04/29
Power Amplifier	R&K	A701M402-4747R	B30850	2016/04/29
Log Antenna	Schwarzbeck	VULP 9118 G Special	9118GS912	2016/04/29
Horn Antenna	Schwarzbeck	BBHA 9120 E	BBHA9120E 586	2016/04/29

Note: The above equipments are within the valid calibration period.

7.2 Block Diagram of Test Configuration



7.3 Test Requirement

7.3.1 IEC 61000-4-3 (EN 60601-1-2) require:

☒ Professional healthcare facility environment:

☒ Enclosure Port

The frequency steps: 1%, Log sweep, Dwell time: 3.0 sec.

Frequency range: **80** to **2700** MHz, Field strength: **3** V/m, 80 % AM (1 kHz)

Performance criterion: **PASS**

☐ HOME HEALTHCARE ENVIRONMENT:

☐ Enclosure Port

The frequency steps: 1%, Log sweep, Dwell time: 3.0 sec.

Frequency range: **80** to **2700** MHz, Field strength: **10** V/m, 80 % AM (1 kHz)

Performance criterion: **PASS**

7.3.2 According to special request by client:

☒ Professional healthcare facility environment:

☒ Enclosure Port

The frequency steps: 1%, Log sweep, Dwell time: 3.0 sec.

Frequency range: **80** to **2700** MHz, Field strength: **20** V/m, 80 % AM (1 kHz)

Performance criterion: **PASS**



7.4 Configuration of Measurement

- 7.4.1 Before testing, the intensity of the established field strength was checked by placing the field sensor at a calibration grid point, and with the field generating antenna and cables in the same positions as used for the calibration, the forward and reverse power were measured. The forward power needed to give the calibrated field was evaluated.
- 7.4.2 The EUT was placed on a non-metallic table 0.8m above the reference ground plane (RGP) and was operated according to its specified operating mode.
- 7.4.3 Ferrite tiles/ absorbers were placed on the RGP between the EUT and the antenna to reduce the reflections from the RGP.
- 7.4.4 The distance between antenna and EUT is 1 meter.
- 7.4.5 During the test EUT performance has been monitoring by CCD camera.

7.5 Test Result

PASS.

The performance criterion after tested EN 60601-1-2:

Temperature: 25.4 °C ; Humidity: 47 % ; Atm pres: 986 hPa ; Test Engineer: Boris

Mode 1: Full Load (Model No.: TPP 40-124BA)

- ☒ Frequency range: **80** to **1000** MHz, Field strength: **20** V/m, 80 % AM (1 kHz),
Performance criterion: **PASS**
- ☒ Frequency range: **1000** to **2700** MHz, Field strength: **20** V/m, 80 % AM (1 kHz),
Performance criterion: **PASS**

Mode 2: Full Load (Model No.: TPP 40-221BA)

- ☒ Frequency range: **80** to **1000** MHz, Field strength: **20** V/m, 80 % AM (1 kHz),
Performance criterion: **PASS**
- ☒ Frequency range: **1000** to **2700** MHz, Field strength: **20** V/m, 80 % AM (1 kHz),
Performance criterion: **PASS**



8 RF Wireless Communications Equipment Immunity Test (IEC 61000-4-3)

8.1 Instrument

(For Test frequency 5240 MHz~5785 MHz)

Instrument	Manufacturer	Model	Serial No.	Next Cal. Date
Signal Generator	KEYSIGHT	N5171B	MY53051802	2020/03/18
Power Amplifier	R&K	A080M102-5555R	B30850	2020/04/25
Power Amplifier	R&K	A701M402-4747R	B35850	2020/04/25
Power Amplifier	R&K	GA252M602-4747R	B60243	2020/04/25
Log Antenna	Schwarzbeck	VULP 9118 G Special	9118GS912	2020/04/25
Horn Antenna	Schwarzbeck	BBHA 9120 E	BBHA9120E 586	2020/04/25

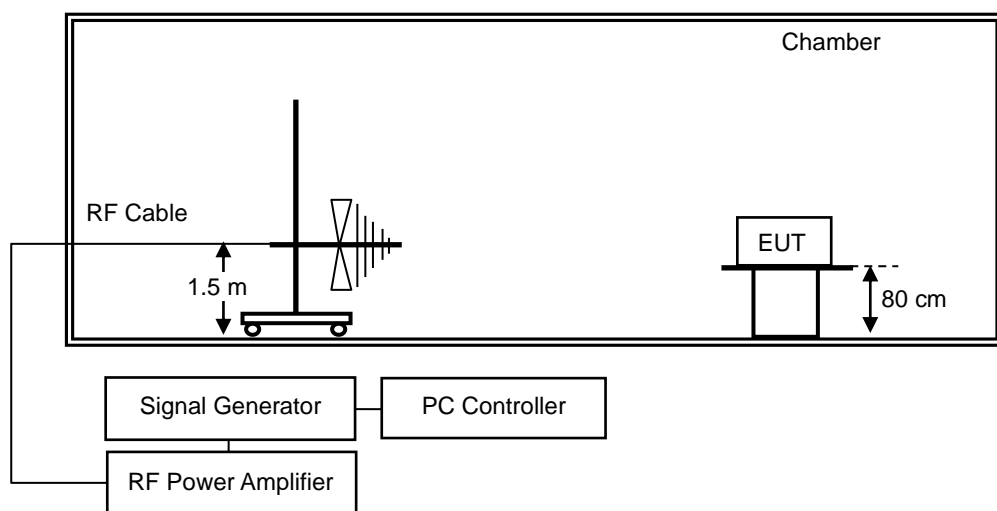
Note: The above equipments are within the valid calibration period.

(For Test frequency 385 MHz~2450 MHz)

Instrument	Manufacturer	Model	Serial No.	Next Cal. Date
Signal Generator	R&S	SMC100A	104370	2016/03/18
Power Amplifier	R&K	A080M102-5555R	B30850	2016/04/29
Power Amplifier	R&K	A701M402-4747R	B30850	2016/04/29
Log Antenna	Schwarzbeck	VULP 9118 G Special	9118GS912	2016/04/29
Horn Antenna	Schwarzbeck	BBHA 9120 E	BBHA9120E 586	2016/04/29

Note: The above equipments are within the valid calibration period.

8.2 Block Diagram of Test Configuration





8.3 Test Requirement

IEC 61000-4-3 (EN 60601-1-2) require;

Test frequency (MHz)	Band (MHz)	Service	Modulation	Immunity Test Level (V/m)
<input checked="" type="checkbox"/> 385	380 - 390	TETRA 400	Pulse modulation 18 Hz	27
<input checked="" type="checkbox"/> 450	430 - 470	GMRS 460, FRS 460	FM ± 5 kHz deviation 1 kHz sine	28
<input checked="" type="checkbox"/> 710	704 - 787	LTE Band 13, 17	Pulse modulation 217 Hz	9
<input checked="" type="checkbox"/> 745				
<input checked="" type="checkbox"/> 780				
<input checked="" type="checkbox"/> 810	800 - 960	GSM 800/900, TETRA 800, iDEN 820, CDMA 850, LTE Band 5	Pulse modulation 18 Hz	28
<input checked="" type="checkbox"/> 870				
<input checked="" type="checkbox"/> 930				
<input checked="" type="checkbox"/> 1720	1700 - 1990	GSM 1800; CDMA 1900; GSM 1900; DECT; LTE Band 1, 3, 4, 25; UMTS	Pulse modulation 217 Hz	28
<input checked="" type="checkbox"/> 1845				
<input checked="" type="checkbox"/> 1970				
<input checked="" type="checkbox"/> 2450	2400 - 2570	Bluetooth, WLAN, 802.11 b/g/n, RFID 2450, LTE Band 7	Pulse modulation 217 Hz	28
<input checked="" type="checkbox"/> 5240	5100 - 5800	WLAN 802.11 a/n	Pulse modulation 217 Hz	9
<input checked="" type="checkbox"/> 5500				
<input checked="" type="checkbox"/> 5785				
Performance criterion: PASS				

8.4 Configuration of Measurement

- 8.4.1 Before testing, the intensity of the established field strength was checked by placing the field sensor at a calibration grid point, and with the field generating antenna and cables in the same positions as used for the calibration, the forward and reverse power were measured. The forward power needed to give the calibrated field was evaluated.
- 8.4.2 The EUT was placed on a non-metallic table 0.8 m above the reference ground plane (RGP) and was operated according to its specified operating mode.
- 8.4.3 Ferrite tiles/ absorbers were placed on the RGP between the EUT and the antenna to reduce the reflections from the RGP.
- 8.4.4 The distance between antenna and EUT is 1 meter.
- 8.4.5 During the test EUT performance has been monitoring by CCD camera.

**8.5 Test Result****PASS.**

The performance criterion after tested EN 60601-1-2:

Temperature: 25.4 °C ; Humidity: 47 % ; Atm pres: 986 hPa ; Test Engineer: Boris

Mode 1: Full Load (Model No.: TPP 40-124BA)

Frequency Range (MHz)	E.U.T. Position (Angle)	Ant. Polarity (Hor. or Ver.)	Modulate	Field Strength (Modulated)		Results (Criterion)
385	0°, 90°, 180°, 270°	H 、 V	PM 18 Hz	27	(V/m)	PASS
450	0°, 90°, 180°, 270°	H 、 V	FM	28	(V/m)	PASS
710, 745, 780	0°, 90°, 180°, 270°	H 、 V	PM 217 Hz	9	(V/m)	PASS
810, 870, 930	0°, 90°, 180°, 270°	H 、 V	PM 18 Hz	28	(V/m)	PASS
1720, 1845, 1970, 2450	0°, 90°, 180°, 270°	H 、 V	PM 217 Hz	28	(V/m)	PASS

Mode 2: Full Load (Model No.: TPP 40-221BA)

Frequency Range (MHz)	E.U.T. Position (Angle)	Ant. Polarity (Hor. or Ver.)	Modulate	Field Strength (Modulated)		Results (Criterion)
385	0°, 90°, 180°, 270°	H 、 V	PM 18 Hz	27	(V/m)	PASS
450	0°, 90°, 180°, 270°	H 、 V	FM	28	(V/m)	PASS
710, 745, 780	0°, 90°, 180°, 270°	H 、 V	PM 217 Hz	9	(V/m)	PASS
810, 870, 930	0°, 90°, 180°, 270°	H 、 V	PM 18 Hz	28	(V/m)	PASS
1720, 1845, 1970, 2450	0°, 90°, 180°, 270°	H 、 V	PM 217 Hz	28	(V/m)	PASS

The performance criterion after tested EN 60601-1-2:

Temperature: 25.3 °C ; Humidity: 63 % ; Atm pres: 996 hPa ; Test Engineer: Scott

Mode 1: Full Load (Model No.: TPP 40-124BA)

Frequency Range (MHz)	E.U.T. Position (Angle)	Ant. Polarity (Hor. or Ver.)	Modulate	Field Strength (Modulated)		Results (Criterion)
5240, 5500, 5785	0°, 90°, 180°, 270°	H 、 V	PM 217 Hz	9	(V/m)	PASS

Mode 2: Full Load (Model No.: TPP 40-221BA)

Frequency Range (MHz)	E.U.T. Position (Angle)	Ant. Polarity (Hor. or Ver.)	Modulate	Field Strength (Modulated)		Results (Criterion)
5240, 5500, 5785	0°, 90°, 180°, 270°	H 、 V	PM 217 Hz	9	(V/m)	PASS

9 Electrical Fast Transients / Bursts Immunity Test (IEC 61000-4-4)

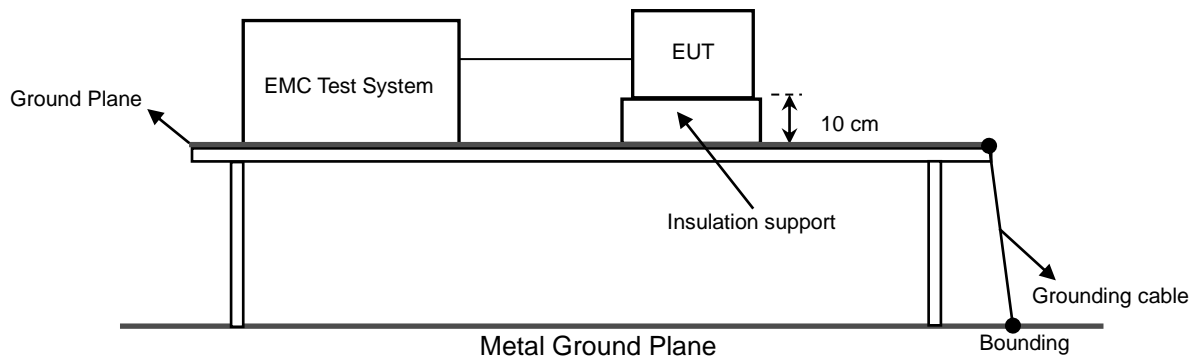
9.1 Instrument

Instrument	Manufacturer	Model	Serial No.	Next Cal. Date
EMC Test System	EMC PARTNER	TRANSIENT-2000	812	2015/09/16

Note: The above equipments are within the valid calibration period.

9.2 Block Diagram of Test Configuration

For Power Ports.



9.3 Test Requirement

IEC 61000-4-4 (EN 60601-1-2) require:

100 kHz Repetition frequency

☒ ± 2.0 kV input AC power port.

☐ ± 2.0 kV input DC power port.

☐ ± 1.0 kV signal input/output parts port.

Performance criterion: **PASS**

9.4 Configuration of Measurement

- 9.4.1 The EUT and the auxiliary equipment were placed on a wooden table of 0.8 meters height. The size of ground plane is greater than 1 m x 1 m and project beyond the EUT by at least 0.1 m on all sides.
- 9.4.2 The EUT was connected to the power mains through a coupling device that directly couples the EFT interference signal. Each of the Line, Neutral and Protective Earth (PE) conductors was impressed with burst noise for 1 minute. Both the voltage polarities were applied for each test level. The length of the signal and power lines between the coupling device and the EUT shall be $0.5 \text{ m} \pm 0.05 \text{ m}$.



9.5 Test Result

PASS.

The performance criterion after tested EN 60601-1-2:

Temperature: 27.5 °C ; Humidity: 50 % ; Atm pres: 986 hPa ; Test Engineer: Boris

Mode 1: Full Load (Model No.: TPP 40-124BA)

- ☒ ± 2.0 kV input AC power port: Line
Performance criterion: **PASS**
- ☒ ± 2.0 kV input AC power port: Neutral
Performance criterion: **PASS**
- ☒ ± 2.0 kV input AC power port: PE
Performance criterion: **PASS**
- ☒ ± 2.0 kV input AC power port: Line + Neutral
Performance criterion: **PASS**
- ☒ ± 2.0 kV input AC power port: Line + PE
Performance criterion: **PASS**
- ☒ ± 2.0 kV input AC power port: Neutral + PE
Performance criterion: **PASS**
- ☒ ± 2.0 kV input AC power port: Line + Neutral + PE
Performance criterion: **PASS**

Mode 2: Full Load (Model No.: TPP 40-221BA)

- ☒ ± 2.0 kV input AC power port: Line
Performance criterion: **PASS**
- ☒ ± 2.0 kV input AC power port: Neutral
Performance criterion: **PASS**
- ☒ ± 2.0 kV input AC power port: PE
Performance criterion: **PASS**
- ☒ ± 2.0 kV input AC power port: Line + Neutral
Performance criterion: **PASS**
- ☒ ± 2.0 kV input AC power port: Line + PE
Performance criterion: **PASS**
- ☒ ± 2.0 kV input AC power port: Neutral + PE
Performance criterion: **PASS**
- ☒ ± 2.0 kV input AC power port: Line + Neutral + PE
Performance criterion: **PASS**



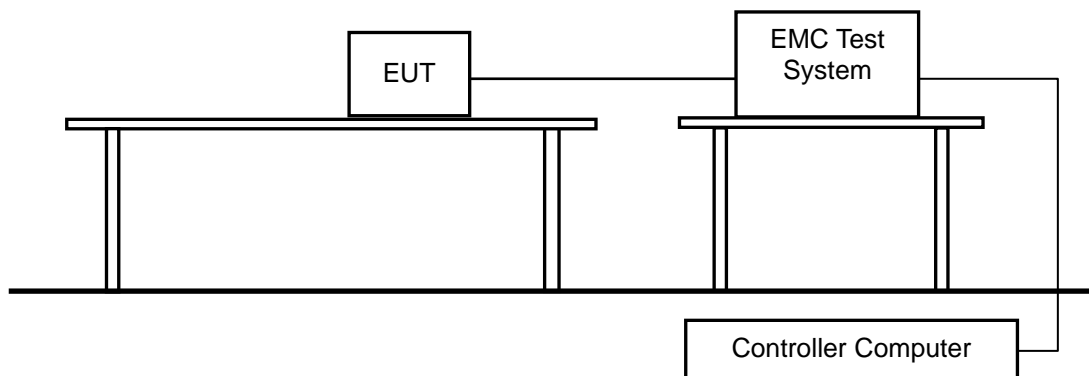
10 Surges Immunity Test (IEC 61000-4-5)

10.1 Instrument

Instrument	Manufacturer	Model	Serial No.	Next Cal. Date
EMC Test System	EMC PARTNER	TRANSIENT-2000	812	2015/09/16

Note: The above equipments are within the valid calibration period.

10.2 Block Diagram of Test Configuration



10.3 Test Requirement

IEC 61000-4-5 (EN 60601-1-2) require:

- ☒ Input AC power port: ☒ Line to line: $\pm 1.0\text{kV}$ (peak), 1.2/50 (8/20) Tr/Th μs
☒ Line to ground: $\pm 2.0\text{kV}$ (peak), 1.2/50 (8/20) Tr/Th μs
- ☐ Input DC power port: ☐ Line to line: $\pm 1.0\text{kV}$ (peak), 1.2/50 (8/20) Tr/Th μs
☐ Line to ground: $\pm 2.0\text{kV}$ (peak), 1.2/50 (8/20) Tr/Th μs
- ☐ Signal input/output parts Port: Line to ground: $\pm 2.0\text{kV}$ (peak), 1.2/50 (8/20) Tr/Th μs

Performance criterion: **PASS**

10.4 Configuration of Measurement

- 10.4.1 The EUT and support units were located on a wooden table 0.8 m away from ground floor.
- 10.4.2 The EUT was connected to the power mains through a coupling device that directly couples the Surge interference signal.
- 10.4.3 The surges were applied line to line and line(s) to earth. When testing line to earth the test voltage was applied successively between each of the lines and earth. Steps up to the test level specified increased the test voltage. All lower levels including the selected test level were tested. The polarity of each surge level included positive and negative test pulses.



10.5 Test Result

PASS.

The performance criterion after tested EN 60601-1-2:

Temperature: 27.9 °C ; Humidity: 46 % ; Atm pres: 986 hPa ; Test Engineer: Boris

Mode 1: Full Load (Model No.: TPP 40-124BA)

- ☒ ± 0.5 kV (peak) Input AC power port: Line to line
Performance criterion: **PASS**
- ☒ ± 1.0 kV (peak) Input AC power port: Line to line
Performance criterion: **PASS**
- ☒ ± 0.5 kV (peak) Input AC power port: Line to earth (ground)
Performance criterion: **PASS**
- ☒ ± 1.0 kV (peak) Input AC power port: Line to earth (ground)
Performance criterion: **PASS**
- ☒ ± 2.0 kV (peak) Input AC power port: Line to earth (ground)
Performance criterion: **PASS**

Mode 2: Full Load (Model No.: TPP 40-221BA)

- ☒ ± 0.5 kV (peak) Input AC power port: Line to line
Performance criterion: **PASS**
- ☒ ± 1.0 kV (peak) Input AC power port: Line to line
Performance criterion: **PASS**
- ☒ ± 0.5 kV (peak) Input AC power port: Line to earth (ground)
Performance criterion: **PASS**
- ☒ ± 1.0 kV (peak) Input AC power port: Line to earth (ground)
Performance criterion: **PASS**
- ☒ ± 2.0 kV (peak) Input AC power port: Line to earth (ground)
Performance criterion: **PASS**



11 Radio- Frequency, Conducted Disturbances Immunity Test (IEC 61000-4-6)

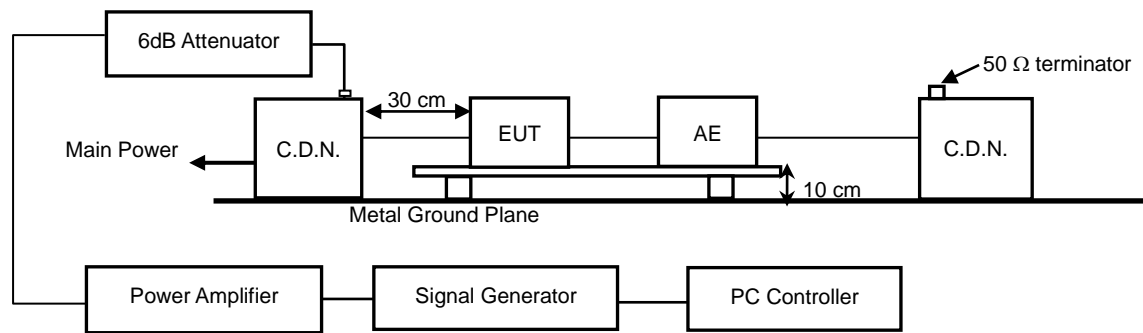
11.1 Instrument

Instrument	Manufacturer	Model	Serial No.	Next Cal. Date
Signal Generator	Marconi Instruments	2024	112246/087	2016/04/15
RF Power Amplifier	R&K	A009K101-5050R	B30850	2016/02/06
Attenuator	Microwave Device Inc.	MA-5250/6N	001052	2016/02/06
C.D.N	FCC	FCC-801-M3-25A	2045	2016/02/06
C.D.N	SCHAFFNER	M216	16394	2016/02/06

Note: The above equipments are within the valid calibration period.

11.2 Block Diagram of Test Configuration

For Power Ports.



11.3 Test Requirement

11.3.1 IEC 61000-4-6 (EN 60601-1-2) require:

- ☒ Professional healthcare facility environment:

The frequency steps: 1 %, Log sweep, Dwell time: 3.0 sec.

Frequency Range is from **0.15 to 80** MHz, Field strength: **3 V**, 80 % AM (1 kHz);

In ISM bands between **0.15 and 80** MHz, Field strength: **6 V**, 80 % AM (1 kHz)

- ☒ Input AC power port.
☐ Input DC power port.
☐ Patient Coupling port.
☐ Signal input/output parts port.

Performance criterion: **PASS**

- ☐ HOME HEALTHCARE ENVIRONMENT:

The frequency steps: 1 %, Log sweep, Dwell time: 3.0 sec.

Frequency Range is from **0.15 to 80** MHz, Field strength: **3 V**, 80 % AM (1 kHz);

In ISM and amateur radio bands between **0.15 and 80** MHz, Field strength: **6 V**, 80 % AM (1 kHz)

- ☐ Input AC power port.
☐ Input DC power port.
☐ Patient Coupling port.
☐ Signal input/output parts port.

Performance criterion: **PASS**



11.3.2 According to special request by client:

☒ Professional healthcare facility environment:

The frequency steps: 1 %, Log sweep, Dwell time: 3.0 sec.

Frequency Range is from **0.15 to 80** MHz, Field strength: **20** V, 80 % AM (1 kHz);

In ISM bands between **0.15 and 80** MHz, Field strength: **20** V, 80 % AM (1 kHz)

☒ Input AC power port.

Performance criterion: **PASS**

11.4 Configuration of Measurement

11.4.1 The EUT was placed on a table of is 0.1 m height. In Semi-Anechoic chamber A Ground reference plane was placed on the table and a 0.1 meter insulating support was inserted between the EUT and Ground reference plane.

11.4.2 The EUT was connected to the power mains through a Coupling and Decoupling Networks (CDN).

11.4.3 The test was performed with the test generator connected to each of the coupling and decoupling devices in turn while the other non-excited RF input ports of the coupling devices were terminated by a 50 Ω terminator.

11.4.4 The frequency range was swept from 150kHz to 80MHz. Using the signal levels established during the setting process, and without the disturbance signal 80% amplitude modulated with a 1 kHz sine wave, pausing to adjust the RF signal level or to switch coupling devices as necessary. The rate of sweep was less than 1.5×10^{-3} decades/s. And the step size of the frequency sweep was also less than 1% of the start and thereafter 1% of the preceding frequency value. The dwell time at each frequency was more than the time necessary for the EUT to be excited, and able to respond.

11.4.5 The EUT was fully excited during the testing and all the selected excise modes were fully interrogated for susceptibility.



11.5 Test Result

PASS.

The performance criterion after tested EN 60601-1-2:

Temperature: 27.5 °C ; Humidity: 47 % ; Atm pres: 986 hPa ; Test Engineer: Boris

Mode 1: Full Load (Model No.: TPP 40-124BA)

Frequency range: 0.15 to 80 MHz, Field strength: 3 V, 80 % AM (1 kHz),

☒ Input AC power port.

Performance criterion: **PASS**

Frequency range: 0.15 to 80 MHz, Field strength: 20 V, 80 % AM (1 kHz),

☒ Input AC power port.

Performance criterion: **PASS**

In ISM bands between 0.15 and 80 MHz, Field strength: 6 V, 80 % AM (1 kHz),

(The ISM (industrial, scientific and medical) bands between 150 kHz and 80 MHz are 6.765 MHz to 6.795 MHz; 13.553 MHz to 13.567 MHz; 26.957 MHz to 27.283 MHz; and 40.66 MHz to 40.70 MHz.)

☒ Input AC power port.

Performance criterion: **PASS**

In ISM bands between 0.15 and 80 MHz, Field strength: 20 V, 80 % AM (1 kHz),

(The ISM (industrial, scientific and medical) bands between 150 kHz and 80 MHz are 6.765 MHz to 6.795 MHz; 13.553 MHz to 13.567 MHz; 26.957 MHz to 27.283 MHz; and 40.66 MHz to 40.70 MHz.)

☒ Input AC power port.

Performance criterion: **PASS**

Mode 2: Full Load (Model No.: TPP 40-221BA)

Frequency range: 0.15 to 80 MHz, Field strength: 3 V, 80 % AM (1 kHz),

☒ Input AC power port.

Performance criterion: **PASS**

Frequency range: 0.15 to 80 MHz, Field strength: 20 V, 80 % AM (1 kHz),

☒ Input AC power port.

Performance criterion: **PASS**

In ISM bands between 0.15 and 80 MHz, Field strength: 6 V, 80 % AM (1 kHz),

(The ISM (industrial, scientific and medical) bands between 150 kHz and 80 MHz are 6.765 MHz to 6.795 MHz; 13.553 MHz to 13.567 MHz; 26.957 MHz to 27.283 MHz; and 40.66 MHz to 40.70 MHz.)

☒ Input AC power port.

Performance criterion: **PASS**

In ISM bands between 0.15 and 80 MHz, Field strength: 20 V, 80 % AM (1 kHz),

(The ISM (industrial, scientific and medical) bands between 150 kHz and 80 MHz are 6.765 MHz to 6.795 MHz; 13.553 MHz to 13.567 MHz; 26.957 MHz to 27.283 MHz; and 40.66 MHz to 40.70 MHz.)

☒ Input AC power port.

Performance criterion: **PASS**

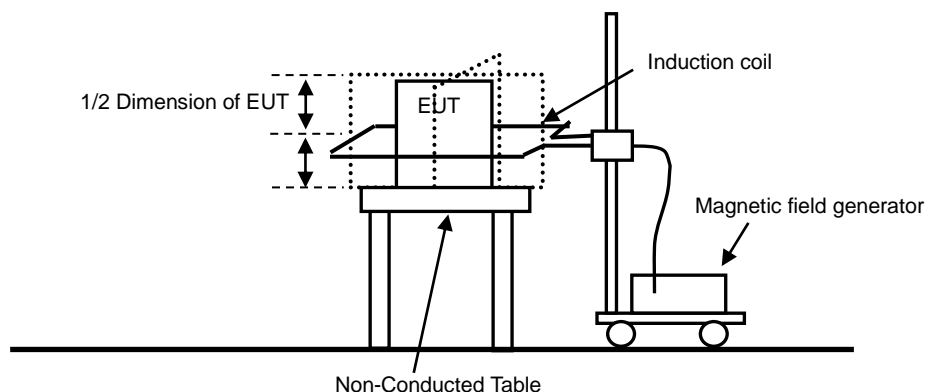
12 Power Frequency Magnetic Fields Immunity Test (IEC 61000-4-8)

12.1 Instrument

Instrument	Manufacturer	Model	Serial No.	Next Cal. Date
Magnetic field generator	PMM	PMM1008	0000J00301	2016/06/21

Note: The above equipments are within the valid calibration period.

12.2 Block Diagram of Test Configuration



12.3 Test Requirement

IEC 61000-4-8 (EN 60601-1-2) require:

Power Frequency is **50** or **60** Hz.

Magnetic field strength: **30** A/m

Performance criterion: **PASS**

12.4 Configuration of Measurement

12.4.1 The equipment is configured and connected to satisfy its functional requirements.

12.4.2 All cables shall be exposed to the magnetic field for 1m of their length.

12.4.3 Different induction coils may be selected for testing in the different orthogonal directions.

12.5 Test Result

PASS.

The performance criterion after tested EN 60601-1-2:

Temperature: 27.5 °C ; Humidity: 50 % ; Atm pres: 986 hPa ; Test Engineer: Boris

Mode 1: Full Load (Model No.: TPP 40-124BA)

Power Frequency is **50** Hz, Magnetic field strength: **30** A/m

Observation time: 1 minute

Direction X:

Performance criterion: **PASS**

Direction Y:

Performance criterion: **PASS**

Direction Z:

Performance criterion: **PASS**



Mode 2: Full Load (Model No.: TPP 40-221BA)

Power Frequency is **50** Hz, Magnetic field strength: **30** A/m

Observation time: 1 minute

Direction X:

Performance criterion: **PASS**

Direction Y:

Performance criterion: **PASS**

Direction Z:

Performance criterion: **PASS**

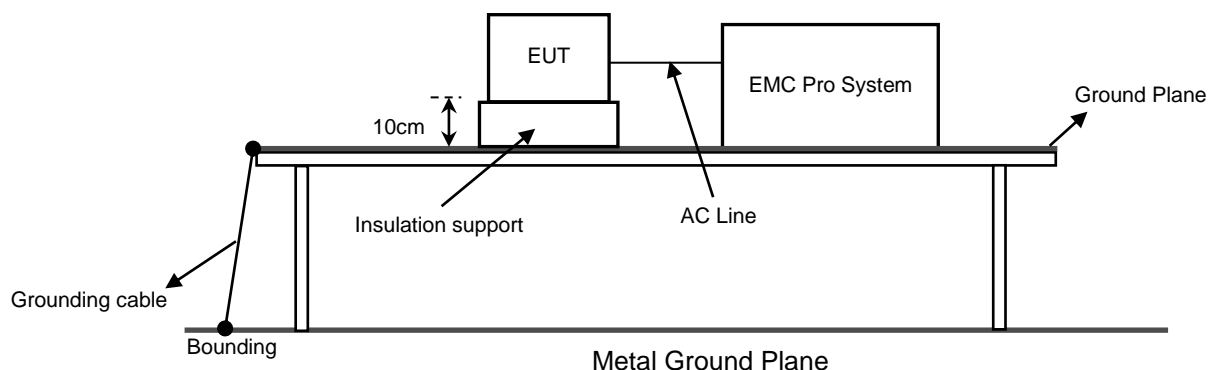
13 Voltage Dips and Interruptions Immunity Test (IEC 61000-4-11)

13.1 Instrument

Instrument	Manufacturer	Model	Serial No.	Next Cal. Date
EMC Pro System	KeyTek	EMC Pro	0003231	2016/05/31

Note: The above equipments are within the valid calibration period.

13.2 Block Diagram of Test Configuration



13.3 Test Requirement

IEC 61000-4-11 (EN 60601-1-2) require:

Voltage Dips: **0** % U_T , 0.5 cycle, At 0°, 45°, 90°, 135°, 180°, 225°, 270° and 315°

Voltage Dips: **0** % U_T , 1 cycle, Single phase: At 0°

Voltage Dips: **70** % U_T , 25 cycle (50 Hz) or 30 cycle (60 Hz), Single phase: At 0°

Short Interruptions: **0** % U_T , 250 cycle (50 Hz) or 300 cycle (60 Hz)

Performance criterion: **PASS**

13.4 Configuration of Measurement

- 13.4.1 The power cord was used as supplied by the manufacturer. The EUT was connected to the line output of the Voltage Dips and Interruption Generator.
- 13.4.2 According to EN 60601-1-2, the EUT was tested for (I) 100% voltage dip of supplied voltage with duration of 0.5 Cycle, (II) 100% voltage dip of supplied voltage and duration 1 Cycle, (III) 30% voltage dip of supplied voltage and duration 25 Cycle. All of the dip tests were carried out for a sequence of three voltage dips with intervals of 10 seconds, (VI) 100% voltage interruption of supplied voltage with duration of 250 Cycle was followed, which was a sequence of three voltage interruptions with intervals of 10 seconds.



13.5 Test Result

PASS.

The performance criterion after tested EN 60601-1-2:

Temperature: 27.5 °C ; Humidity: 50 % ; Atm pres: 986 hPa ; Test Engineer: Boris

Mode 1: Full Load (Model No.: TPP 40-124BA)

Input Voltage: 100 Vac, 50 Hz

- ☒ Voltage Dips: 0 % U_T , 0.5 cycle
Performance criterion: **PASS**
- ☒ Voltage Dips: 0 % U_T , 1 cycle
Performance criterion: **PASS**
- ☒ Voltage Dips: 70 % U_T , 25 cycle
Performance criterion: **PASS**
- ☒ Short Interruptions: 0 % U_T , 250 cycle
Performance criterion: **PASS** *(Note 1)*

Note 1: During voltage Interruptions the output voltage reset and auto recover after Interruptions.

Input Voltage: 240 Vac, 50 Hz

- ☒ Voltage Dips: 0 % U_T , 0.5 cycle
Performance criterion: **PASS**
- ☒ Voltage Dips: 0 % U_T , 1 cycle
Performance criterion: **PASS**
- ☒ Voltage Dips: 70 % U_T , 25 cycle
Performance criterion: **PASS**
- ☒ Short Interruptions: 0 % U_T , 250 cycle
Performance criterion: **PASS** *(Note 2)*

Note 2: During voltage Interruptions the output voltage reset and auto recover after Interruptions.



Mode 2: Full Load (Model No.: TPP 40-221BA)

Input Voltage: 100 Vac, 50 Hz

- ☒ Voltage Dips: **0** % U_T , 0.5 cycle
Performance criterion: **PASS**
- ☒ Voltage Dips: **0** % U_T , 1 cycle
Performance criterion: **PASS**
- ☒ Voltage Dips: **70** % U_T , 25 cycle
Performance criterion: **PASS**
- ☒ Short Interruptions: **0** % U_T , 250 cycle
Performance criterion: **PASS** *(Note 1)*

Note 1: During voltage Interruptions the output voltage reset and auto recover after Interruptions.

Input Voltage: 240 Vac, 50 Hz

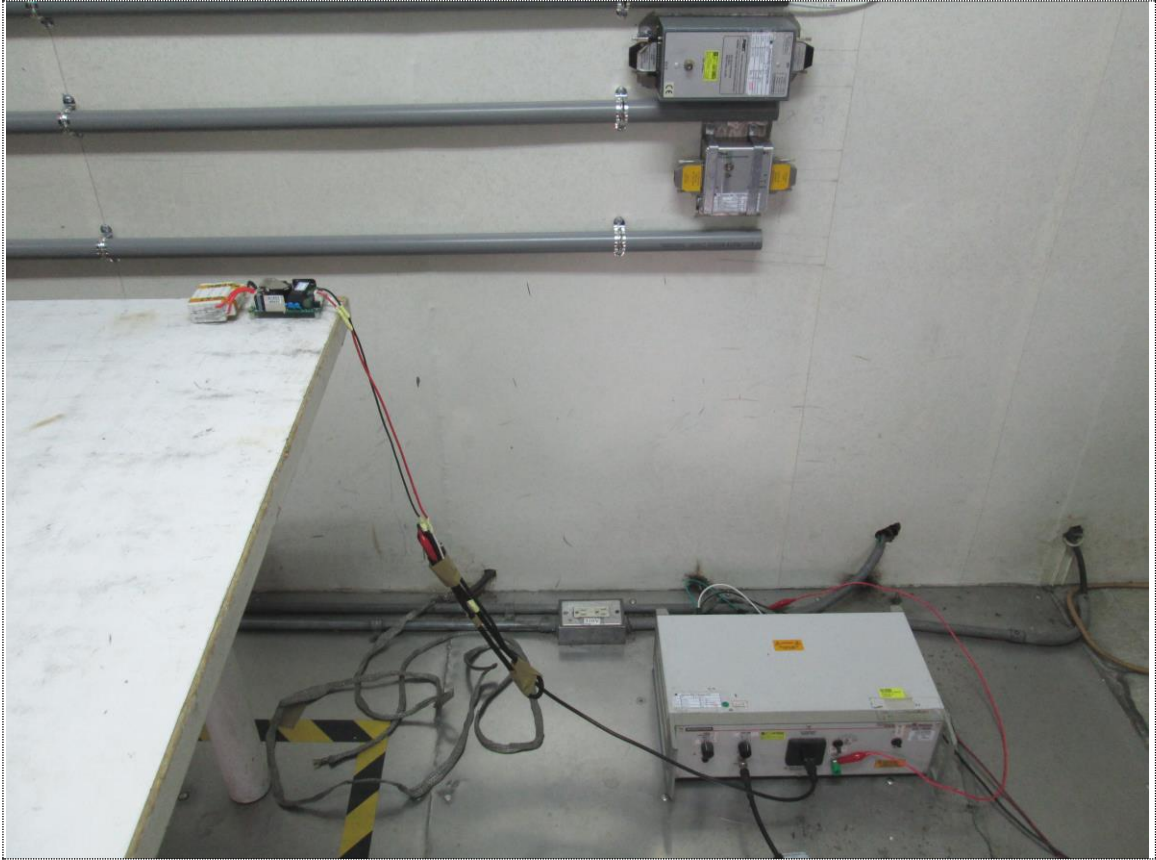
- ☒ Voltage Dips: **0** % U_T , 0.5 cycle
Performance criterion: **PASS**
- ☒ Voltage Dips: **0** % U_T , 1 cycle
Performance criterion: **PASS**
- ☒ Voltage Dips: **70** % U_T , 25 cycle
Performance criterion: **PASS**
- ☒ Short Interruptions: **0** % U_T , 250 cycle
Performance criterion: **PASS** *(Note 2)*

Note 2: During voltage Interruptions the output voltage reset and auto recover after Interruptions.



14 Photographs of Test

14.1 Conducted Emission Measurement



Front View



Rear View

14.2 Radiated Emission Measurement



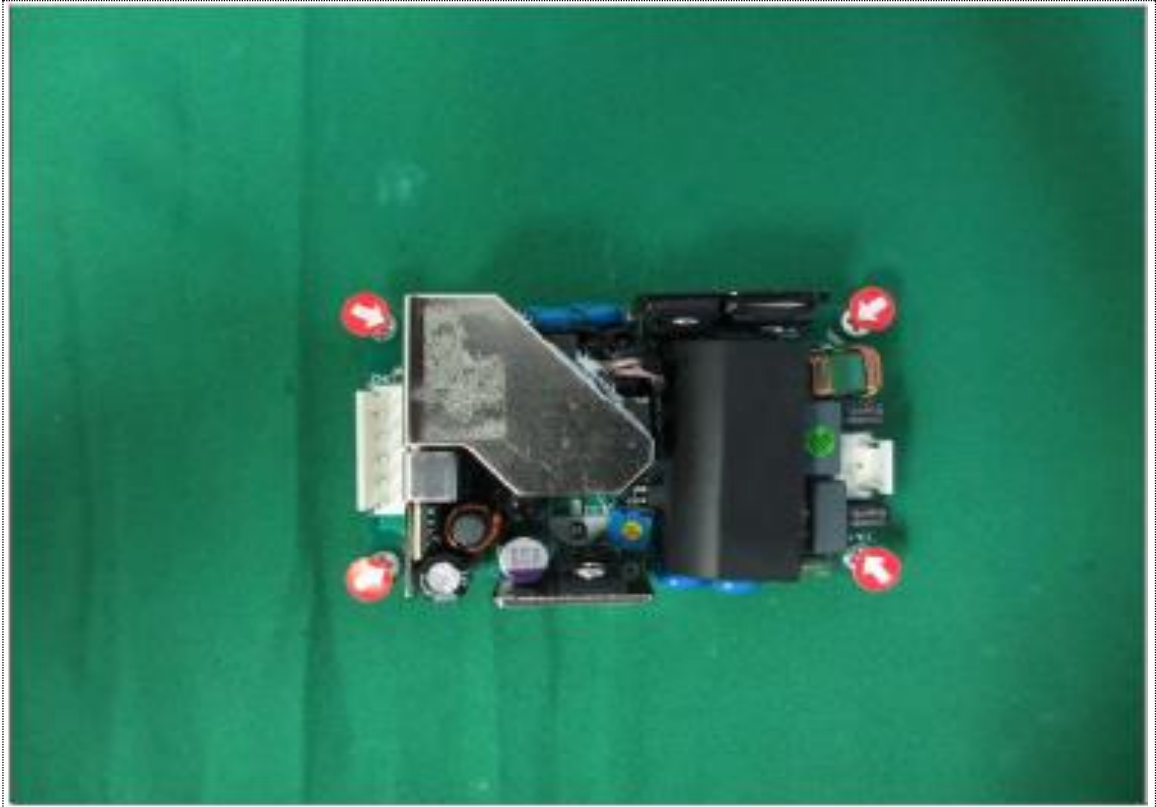
Front View



Rear View



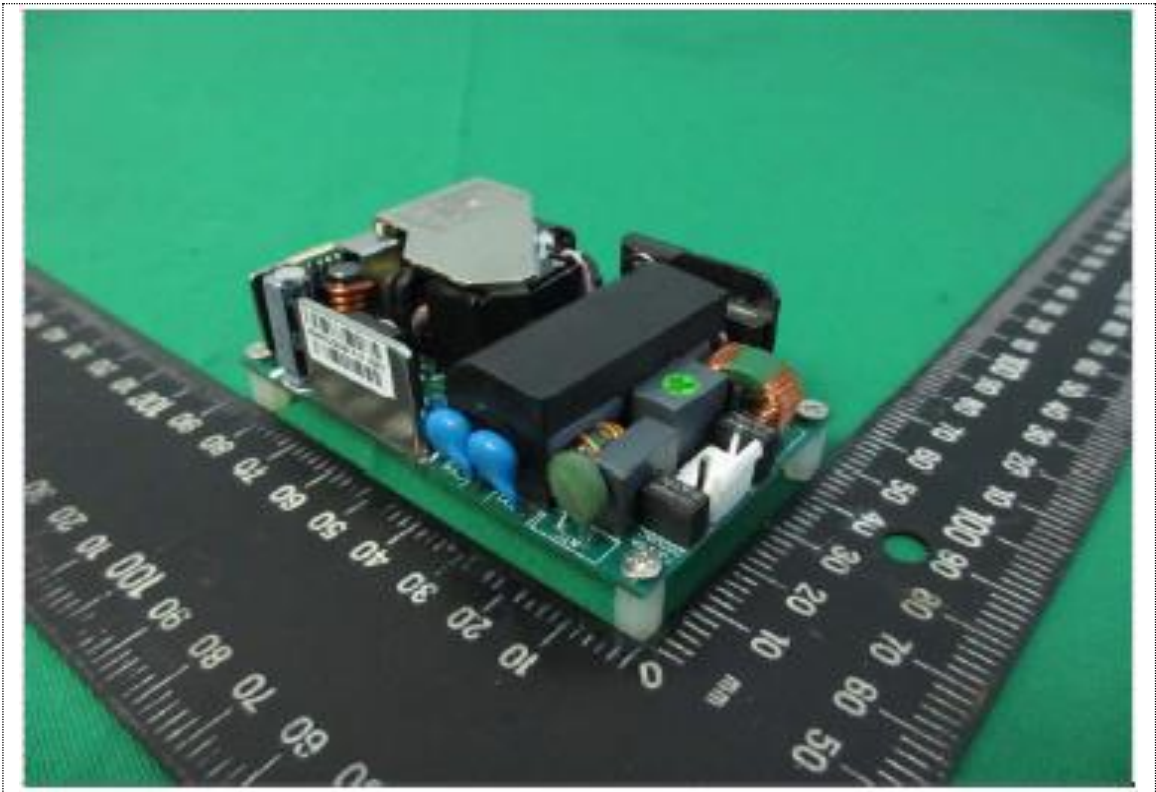
14.3 Electrostatic Discharge Test Point



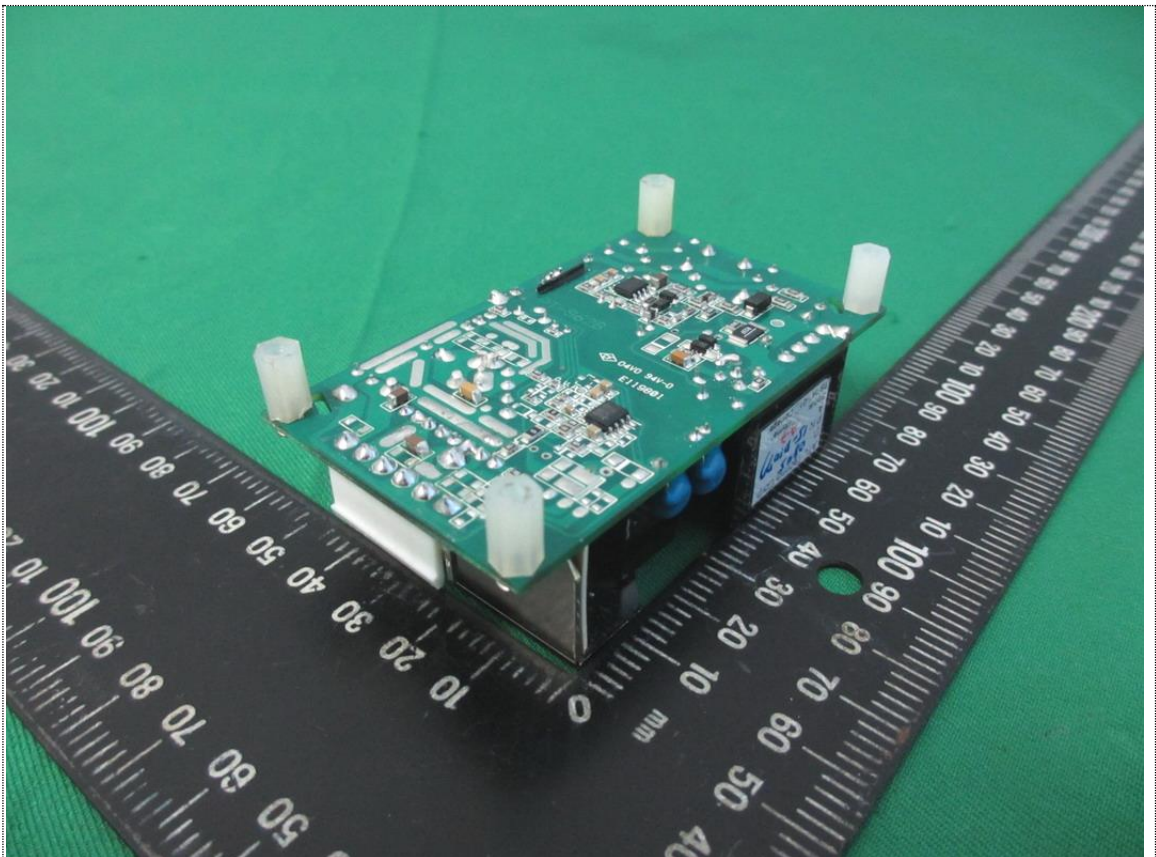
View of Discharge Point (Red: Contact Discharge)



15 Photographs of EUT



Front View of EUT



Rear View of EUT