

# Test Report



(Declaration of Conformity)

for  
Electromagnetic Compatibility  
of

Product : **DC/DC Converter**

Trade Name : N/A

Model Number : Refer to section 1.2

Prepared for

**TRACO ELECTRONIC AG**

SIHLBRUGGSTASSE 111 CH-6340 BAAR, SWITZERLAND

Prepared by

**Interocean EMC Technology Corp.**

**Interocean EMC Technology Tin-Fu Laboratory**

No. 5-2, Lin 1, Tin-Fu, Lin-Kou Dist., New Taipei City,  
Taiwan 244, R.O.C.

TEL.: +886 2 2600 6861

FAX.: +886 2 2600 6859

**Remark:**

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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:** DC/DC Converter

**Model No.:** Refer to section 1.2

**Tested Power Voltage:** DC 24 V; DC 110 V

**Date of Final Test:** May 30, 2018

**Revision of Report:** Rev. 00

### Measurement Procedures and Standards Used :

Emission:

☒ EN 55032: 2015+AC: 2016

Immunity:

☒ EN 55024: 2010+A1: 2015

☒ IEC 61000-4-2: 2008

☒ IEC 61000-4-3: 2006+A1: 2007+A2: 2010

☒ IEC 61000-4-4: 2012

☒ IEC 61000-4-5: 2014

☒ IEC 61000-4-6: 2013

☒ IEC 61000-4-8: 2009

☒ IEC 61000-4-11: 2004

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.

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Report Issued: 2018/06/21

Project Engineer: Ceres Cheng Approved: Roy Chiang  
Ceres Cheng Roy Chiang

# 1 General Information

## 1.1 Description of Equipment Under Test

<b>Product</b>	: DC/DC Converter
<b>Model Number</b>	: Refer to section 1.2
<b>Applicant</b>	: <b>TRACO ELECTRONIC AG</b> SIHLBRUGGSTRASSE 111 CH-6340 BAAR, SWITZERLAND
<b>Manufacturer</b>	: <b>TRACO ELECTRONIC AG</b> SIHLBRUGGSTRASSE 111 CH-6340 BAAR, SWITZERLAND
<b>Power Supply</b>	: Please refer to section 1.3
<b>Date of Test</b>	: Dec. 20, 2016 ~ Jan. 04, 2017 (For Test Mode 1 & 2) May 30, 2018 (For Test Mode 3)
<b>Additional Description</b>	: 1) The test models are “ <b>TEQ 20-2411WIR; TEQ 20-7215WIR; TEQ 20-7223WIR</b> ” and included in this report. 2) The differences for all models included in this report, the details please refer to section 1.3. 3) For more detail specification about EUT, please refer to the user’s manual.

**1.2 Model Number List**

TEQ 20-2411WIR	TEQ 20-2411WIR-A1	TEQ 20-2412WIR
TEQ 20-2412WIR-A1	TEQ 20-2413WIR	TEQ 20-2413WIR-A1
TEQ 20-2415WIR	TEQ 20-2415WIR-A1	TEQ 20-4811WIR
TEQ 20-4811WIR-A1	TEQ 20-4812WIR	TEQ 20-4812WIR-A1
TEQ 20-4813WIR	TEQ 20-4813WIR-A1	TEQ 20-4815WIR
TEQ 20-4815WIR-A1	TEQ 20-7211WIR	TEQ 20-7211WIR-A1
TEQ 20-7212WIR	TEQ 20-7212WIR-A1	TEQ 20-7213WIR
TEQ 20-7213WIR-A1	TEQ 20-7215WIR	TEQ 20-7215WIR-A1
TEQ 20-2422WIR	TEQ 20-2423WIR	TEQ 20-4822WIR
TEQ 20-4823WIR	TEQ 20-7222WIR	TEQ 20-7223WIR
TEQ 20-2422WIR-A1	TEQ 20-2423WIR-A1	TEQ 20-4822WIR-A1
TEQ 20-4823WIR-A1	TEQ 20-7222WIR-A1	TEQ 20-7223WIR-A1

**1.3 Specifications Description**

Model Name	TP-Standard	Input Range	Output Voltage	DIN-Rail
		VDC	VDC	
TEQ 20-2411WIR	X	9 - 36	5	
TEQ 20-2412WIR	X	9 - 36	12	
TEQ 20-2413WIR	X	9 - 36	15	
TEQ 20-2415WIR	X	9 - 36	24	
TEQ 20-4811WIR	X	18 - 75	5	
TEQ 20-4812WIR	X	18 - 75	12	
TEQ 20-4813WIR	X	18 - 75	15	
TEQ 20-4815WIR	X	18 - 75	24	
TEQ 20-7211WIR	X	43 - 160	5	
TEQ 20-7212WIR	X	43 - 160	12	
TEQ 20-7213WIR	X	43 - 160	15	
TEQ 20-7215WIR	X	43 - 160	24	
TEQ 20-2411WIR-A1		9 - 36	5	X
TEQ 20-2412WIR-A1		9 - 36	12	X
TEQ 20-2413WIR-A1		9 - 36	15	X
TEQ 20-2415WIR-A1		9 - 36	24	X
TEQ 20-4811WIR-A1		18 - 75	5	X
TEQ 20-4812WIR-A1		18 - 75	12	X
TEQ 20-4813WIR-A1		18 - 75	15	X
TEQ 20-4815WIR-A1		18 - 75	24	X
TEQ 20-7211WIR-A1		43 - 160	5	X
TEQ 20-7212WIR-A1		43 - 160	12	X
TEQ 20-7213WIR-A1		43 - 160	15	X
TEQ 20-7215WIR-A1		43 - 160	24	X
TEQ 20-2422WIR	X	9 - 36	± 12	
TEQ 20-2423WIR	X	9 - 36	± 15	
TEQ 20-4822WIR	X	18 - 75	± 12	
TEQ 20-4823WIR	X	18 - 75	± 15	
TEQ 20-7222WIR	X	43 - 160	± 12	
TEQ 20-7223WIR	X	43 - 160	± 15	
TEQ 20-2422WIR-A1		9 - 36	± 12	X
TEQ 20-2423WIR-A1		9 - 36	± 15	X
TEQ 20-4822WIR-A1		18 - 75	± 12	X
TEQ 20-4823WIR-A1		18 - 75	± 15	X
TEQ 20-7222WIR-A1		43 - 160	± 12	X
TEQ 20-7223WIR-A1		43 - 160	± 15	X

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**1.4 Details of Tested Supporting System****1.4.1 Load (Model No.: TEQ 20-2411WIR)**

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

**1.4.2 Load (Model No.: TEQ 20-7215WIR)**

Full Load : 19.992 W (24 V, 0.833 A)

**1.4.3 Load (Model No.: TEQ 20-7223WIR)**Full Load : 20 W ( $\pm 15$  V, 0.667 A)**1.4.4 Test Cable**

Power Cable : Non-shielded, Detachable, 1.8 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)
  - Industry Canada (IC)  
OUR FILE: 46405-4437  
Registration No. (OATS 1): Site# 4437A-1  
Registration No. (OATS 3): Site# 4437A-3  
Registration No. (Chamber 3): Site# 4437A-5  
Registration No. (OATS 5): Site# 4437A-6
  - 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; G-10274
- 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
  - Vehicle Safety Certification Center (VSCC)  
Approval No.: TW16-11
  - TÜV NORD  
Certificate No: TNTW0801R

**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

## 1.7 Summary of Test Results

### 1.7.1 Test program according EN 55032

Emission test equipment intended	
<input type="checkbox"/>	Class A
<input checked="" type="checkbox"/>	Class B

Report Clause	Phenomenon	Application	Reference Clause(s)	Reference Standard	Result
2	Power Line Conducted Emission	DC Mains Power Port	Annex A.3	CISPR 16-2-1	PASS
	Asymmetric Mode Conducted Emissions	Wired Network Ports	Annex A.3	CISPR 16-2-1	Not Applicable
	Asymmetric Mode Conducted Emissions	Optical Fibre Ports	Annex A.3	--	Not Applicable
	Asymmetric Mode Conducted Emissions	Broadcast Receiver Tuner Ports	Annex A.3	--	Not Applicable
	Asymmetric Mode Conducted Emissions	Antenna Ports	Annex A.3	--	Not Applicable
	Conducted Differential Voltage Emissions	TV Broadcast Receiver Tuner Ports	Annex A.3	--	Not Applicable
	Conducted Differential Voltage Emissions	RF Modulator Output Ports	Annex A.3	--	Not Applicable
	Conducted Differential Voltage Emissions	FM Broadcast Receiver Tuner Ports	Annex A.3	--	Not Applicable
3	Radiated Emission (Below 1 GHz)	Enclosure Port	Annex A.2	CISPR 16-1-4	PASS
	Radiated Emission (Above 1 GHz)	Enclosure Port	Annex A.2	CISPR 16-1-4	Not Applicable <sup>a</sup>
	Radiated Emissions (FM Receivers)	Enclosure Port	Annex A.2	CISPR 16-1-4	Not Applicable

Note: <sup>a</sup> The highest frequency of the internal sources of the EUT is less than 108 MHz and therefore the measurement is not required.

### 1.7.2 Test program according EN 61000-3-2

Report Clause	Phenomenon	Application	Reference Clause	Reference Standard	Result
	Harmonic Current Emissions	AC Power Port	5	--	Not Applicable

### 1.7.3 Test program according EN 61000-3-3

Report Clause	Phenomenon	Application	Reference Clause	Reference Standard	Result
	Voltage Changes, Voltage Fluctuations and Flicker	AC Power Port	5	--	Not Applicable

## 1.7.4 Test program according EN 55024

Report Clause	Phenomenon	Application	Reference Clause(s)	Reference Standard	Result
5	Electrostatic Discharge (ESD)	Enclosure Port	4.2.1	IEC 61000-4-2	PASS
6	Radio-Frequency Electromagnetic Field	Enclosure Port	4.2.3.1	IEC 61000-4-3	PASS
7	Fast Transients	DC Power Port	4.2.2	IEC 61000-4-4	PASS
8	Surges	DC Power Port	4.2.5	IEC 61000-4-5	PASS
9	Radio-Frequency Continuous Conducted	DC Power Port	4.2.3.2	IEC 61000-4-6	PASS
10	Power-Frequency Magnetic Field	Enclosure Port	4.2.4	IEC 61000-4-8	PASS
	Voltage Dips and Interruptions	AC Power Port	4.2.6	IEC 61000-4-11	Not Applicable

## 1.8 Measured Mode

1.8.1 The test modes for preliminary test are as following:

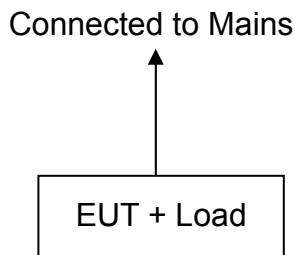
- Mode 1: Full Load (Model No.: TEQ 20-7215WIR)
- Mode 2: Full Load (Model No.: TEQ 20-2411WIR)
- Mode 3: Full Load (Model No.: TEQ 20-7223WIR)

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

## 1.9 Configuration of EUT Setup



## 1.10 Test Step of EUT

- 1.10.1 Set the EUT and peripheral as above.
- 1.10.2 Turn on the power of all equipments.
- 1.10.3 Confirm all functions are normal.
- 1.10.4 Execute the test.



## 2.3 Conducted Limits

Frequency (MHz)	<input type="checkbox"/> Class A (dB $\mu$ V)		<input checked="" type="checkbox"/> Class B (dB $\mu$ 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  $\mu$ 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  $\mu$ 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 as following pages.

Factor = Insertion Loss + Cable Loss

Level = Reading + Factor

Margin = Level - Limit

## Power Line Conducted Test Data

CLIENT: TRACO ELECTRONIC AG

OPERATOR: Mark

EUT: DC/DC Converter

TEST SITE: Conducted 1

MODEL: TEQ 20-7215WIR

POLARIZATION: Line

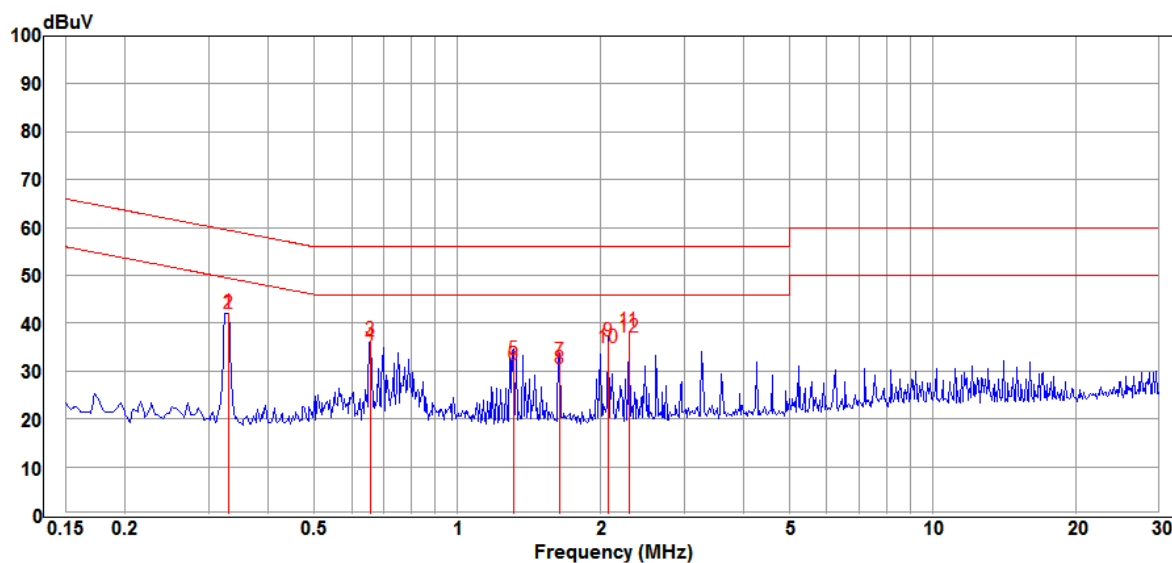
RATING: DC 110 V

TEMP/HUM: 23.9°C / 64%

COMMENT: Test Mode: Mode 1: Full Load (Model No.: TEQ 20-7215WIR)

Data:40

2016-12-20



Item Mark	Freq. MHz	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Margin dB	Remark
1	0.330	42.03	0.18	42.21	59.44	-17.23	QP
2	0.330	41.77	0.18	41.95	49.44	-7.49	Average
3	0.658	36.27	0.22	36.49	56.00	-19.51	QP
4	0.658	35.34	0.22	35.56	46.00	-10.44	Average
5	1.317	32.25	0.26	32.51	56.00	-23.49	QP
6	1.317	31.01	0.26	31.27	46.00	-14.73	Average
7	1.645	31.78	0.28	32.06	56.00	-23.94	QP
8	1.645	30.35	0.28	30.63	46.00	-15.37	Average
9	2.077	36.09	0.30	36.39	56.00	-19.61	QP
10	2.077	34.72	0.30	35.02	46.00	-10.98	Average
11	2.297	38.19	0.32	38.51	56.00	-17.49	QP
12	2.297	36.81	0.32	37.13	46.00	-8.87	Average



## Power Line Conducted Test Data

CLIENT: TRACO ELECTRONIC AG

OPERATOR: Mark

EUT: DC/DC Converter

TEST SITE: Conducted 1

MODEL: TEQ 20-7215WIR

POLARIZATION: Neutral

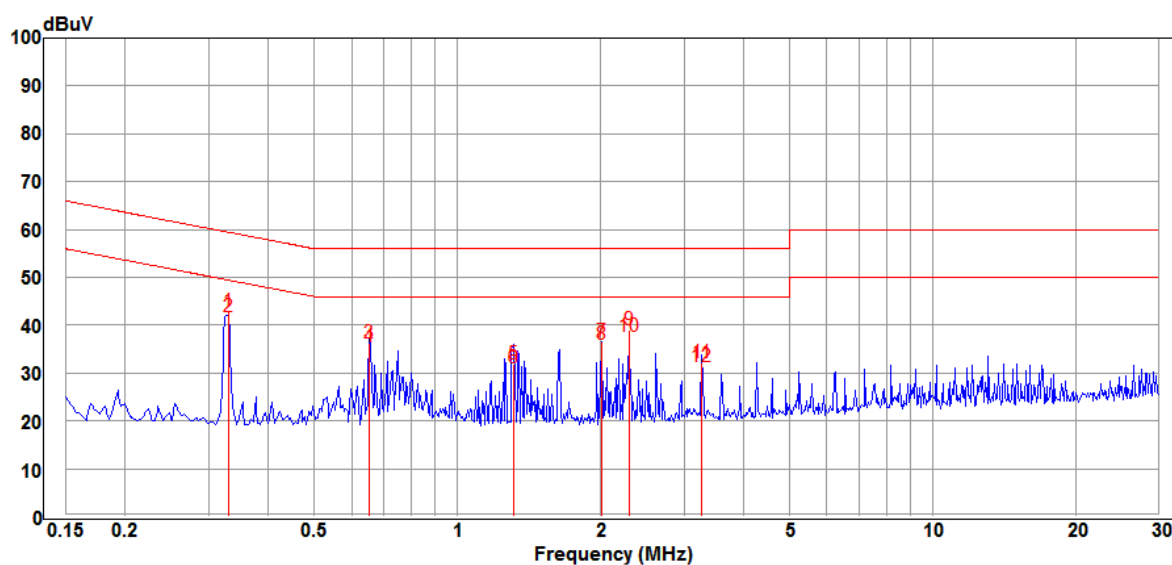
RATING: DC 110 V

TEMP/HUM: 23.9°C / 64%

COMMENT: Test Mode: Mode 1: Full Load (Model No.: TEQ 20-7215WIR)

Data:39

2016-12-20



Item Mark	Freq. MHz	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Margin dB	Remark
1	0.330	42.73	0.17	42.90	59.44	-16.54	QP
2	0.330	41.53	0.17	41.70	49.44	-7.74	Average
3	0.654	36.17	0.21	36.38	56.00	-19.62	QP
4	0.654	35.22	0.21	35.43	46.00	-10.57	Average
5	1.317	31.51	0.25	31.76	56.00	-24.24	QP
6	1.317	30.92	0.25	31.17	46.00	-14.83	Average
7	2.012	36.26	0.30	36.56	56.00	-19.44	QP
8	2.012	35.62	0.30	35.92	46.00	-10.08	Average
9	2.297	38.80	0.32	39.12	56.00	-16.88	QP
10	2.297	37.43	0.32	37.75	46.00	-8.25	Average
11	3.276	31.83	0.35	32.18	56.00	-23.82	QP
12	3.276	31.00	0.35	31.35	46.00	-14.65	Average

## Power Line Conducted Test Data

CLIENT: TRACO ELECTRONIC AG

OPERATOR: Vic

EUT: DC/DC Converter

TEST SITE: Conducted 1

MODEL: TEQ 20-2411WIR

POLARIZATION: Line

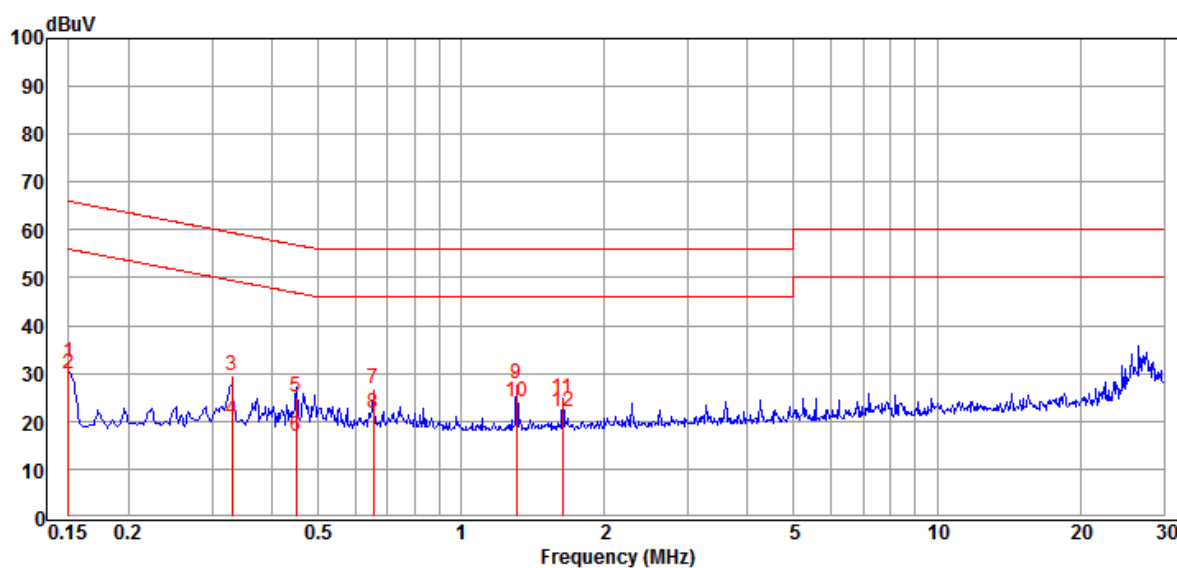
RATING: DC 24 V

TEMP/HUM: 23.7°C / 62%

COMMENT: Test Mode: Mode 2: Full Load (Model No.: TEQ 20-2411WIR)

Data:44

2017-01-04



Item Mark	Freq. MHz	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Margin dB	Remark
1	0.150	32.07	0.17	32.24	66.00	-33.76	QP
2	0.150	29.60	0.17	29.77	56.00	-26.23	Average
3	0.330	29.25	0.18	29.43	59.44	-30.01	QP
4	0.330	20.19	0.18	20.37	49.44	-29.07	Average
5	0.452	24.74	0.19	24.93	56.85	-31.92	QP
6	0.452	16.54	0.19	16.73	46.85	-30.12	Average
7	0.654	26.45	0.22	26.67	56.00	-29.33	QP
8	0.654	21.30	0.22	21.52	46.00	-24.48	Average
9	1.310	27.55	0.26	27.81	56.00	-28.19	QP
10	1.310	23.87	0.26	24.13	46.00	-21.87	Average
11	1.636	24.48	0.28	24.76	56.00	-31.24	QP
12	1.636	21.75	0.28	22.03	46.00	-23.97	Average

## Power Line Conducted Test Data

CLIENT: TRACO ELECTRONIC AG

OPERATOR: Vic

EUT: DC/DC Converter

TEST SITE: Conducted 1

MODEL: TEQ 20-2411WIR

POLARIZATION: Neutral

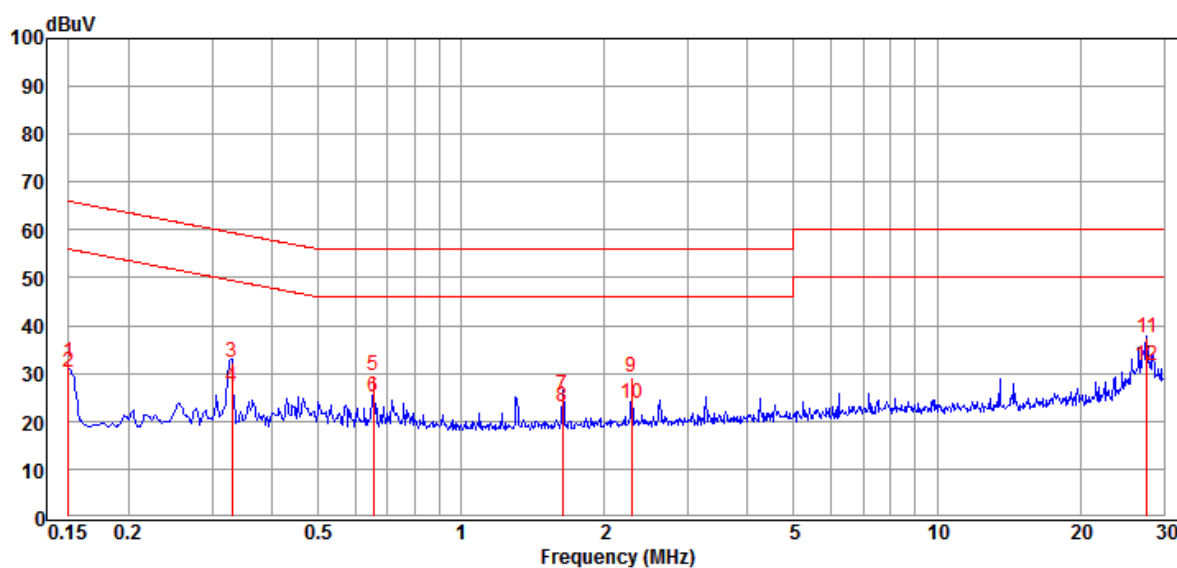
RATING: DC 24 V

TEMP/HUM: 23.7°C / 62%

COMMENT: Test Mode: Mode 2: Full Load (Model No.: TEQ 20-2411WIR)

Data:45

2017-01-04



Item Mark	Freq. MHz	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Margin dB	Remark
1	0.150	32.29	0.14	32.43	66.00	-33.57	QP
2	0.150	30.05	0.14	30.19	56.00	-25.81	Average
3	0.330	32.19	0.17	32.36	59.44	-27.08	QP
4	0.330	26.92	0.17	27.09	49.44	-22.35	Average
5	0.654	29.45	0.21	29.66	56.00	-26.34	QP
6	0.654	24.89	0.21	25.10	46.00	-20.90	Average
7	1.636	25.20	0.28	25.48	56.00	-30.52	QP
8	1.636	22.73	0.28	23.01	46.00	-22.99	Average
9	2.285	28.97	0.32	29.29	56.00	-26.71	QP
10	2.285	23.39	0.32	23.71	46.00	-22.29	Average
11	27.562	35.79	1.54	37.33	60.00	-22.67	QP
12	27.562	29.93	1.54	31.47	50.00	-18.53	Average

## Power Line Conducted Test Data

CLIENT: TRACO ELECTRONIC AG

OPERATOR: Ceres

EUT: DC/DC Converter

TEST SITE: Conducted 1

MODEL: TEQ 20-7223WIR

POLARIZATION: Line

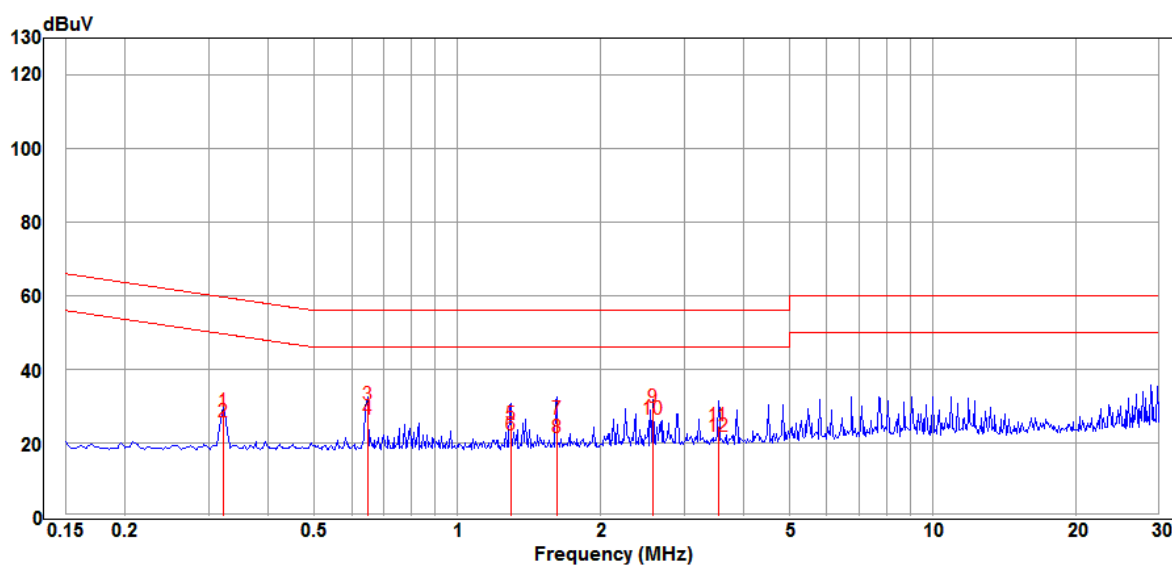
RATING: DC 110 V

TEMP/HUM: 26.3°C / 60%

COMMENT: Test Mode: Mode 3: Full Load (Model No.: TEQ 20-7223WIR)

Data:7

2018-05-30



Item Mark	Freq. MHz	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Margin dB	Remark
1	0.3217	18.37	10.24	28.61	59.66	-31.05	QP
2	0.3217	15.37	10.24	25.61	49.66	-24.05	Average
3	0.6474	20.03	10.27	30.30	56.00	-25.70	QP
4	0.6474	16.03	10.27	26.30	46.00	-19.70	Average
5	1.2960	14.70	10.33	25.03	56.00	-30.97	QP
6	1.2960	11.70	10.33	22.03	46.00	-23.97	Average
7	1.6190	16.07	10.37	26.44	56.00	-29.56	QP
8	1.6190	11.07	10.37	21.44	46.00	-24.56	Average
9	2.5810	19.15	10.45	29.60	56.00	-26.40	QP
10	2.5810	16.15	10.45	26.60	46.00	-19.40	Average
11	3.5470	14.28	10.48	24.76	56.00	-31.24	QP
12	3.5470	11.28	10.48	21.76	46.00	-24.24	Average

## Power Line Conducted Test Data

CLIENT: TRACO ELECTRONIC AG

OPERATOR: Ceres

EUT: DC/DC Converter

TEST SITE: Conducted 1

MODEL: TEQ 20-7223WIR

POLARIZATION: Neutral

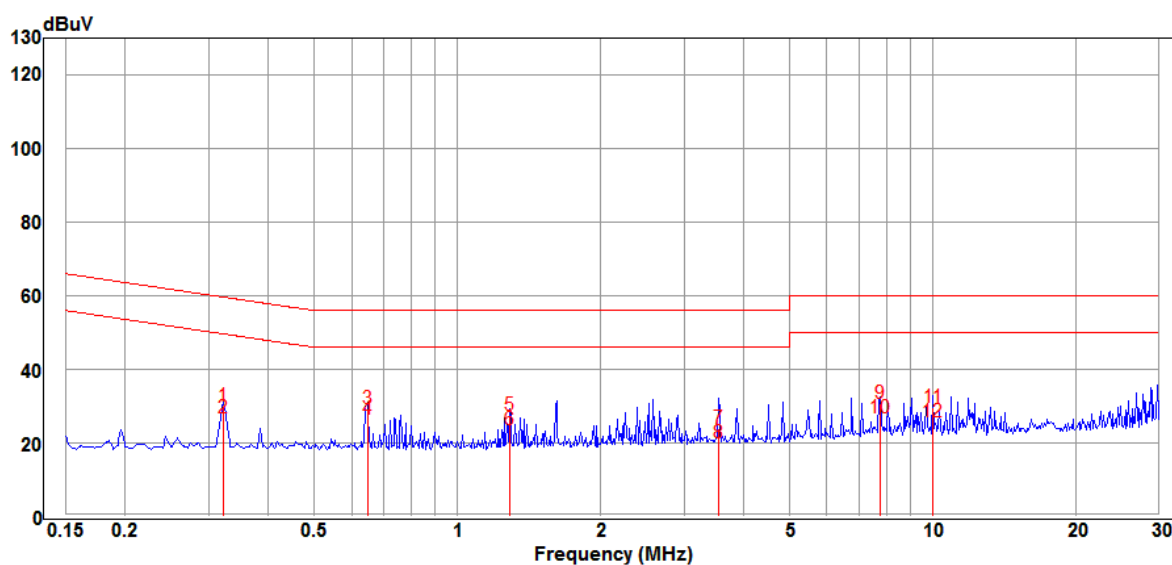
RATING: DC 110 V

TEMP/HUM: 26.3°C / 60%

COMMENT: Test Mode: Mode 3: Full Load (Model No.: TEQ 20-7223WIR)

Data:8

2018-05-30



Item Mark	Freq. MHz	Reading dBuV	Factor dB	Level dBuV	Limit dBuV	Margin dB	Remark
1	0.3217	19.60	10.26	29.86	59.66	-29.80	QP
2	0.3217	16.60	10.26	26.86	49.66	-22.80	Average
3	0.6474	19.18	10.28	29.46	56.00	-26.54	QP
4	0.6474	16.18	10.28	26.46	46.00	-19.54	Average
5	1.2890	17.07	10.36	27.43	56.00	-28.57	QP
6	1.2890	13.07	10.36	23.43	46.00	-22.57	Average
7	3.5470	13.49	10.52	24.01	56.00	-31.99	QP
8	3.5470	9.49	10.52	20.01	46.00	-25.99	Average
9	7.7690	19.91	10.76	30.67	60.00	-29.33	QP
10	7.7690	15.91	10.76	26.67	50.00	-23.33	Average
11	10.0190	18.88	10.76	29.64	60.00	-30.36	QP
12	10.0190	14.88	10.76	25.64	50.00	-24.36	Average

### 3 Radiated Emission (Below 1 GHz)

#### 3.1 Instrument

(For Mode 1 & 2)

Instrument	Manufacturer	Model	Serial No.	Next Cal. Date
EMI Test Receiver	Rohde & Schwarz	ESVS10	826148/011	2017/10/19
Biconical Antenna	Schwarzbeck	VHA 9103 & BBA 9106	VHA 9103-2418	2017/07/13
Log Antenna	Schwarzbeck	UHALP 9108-A	9108-A 0739	2017/07/13
Pre-Amplifier	Agilent	8447D	2944A09703	2017/08/02
RF Cable	EMCI	EMC8D-NM-NM-25000	140105	2017/08/02
RF Cable	Mini-Circuits	CBL-3FL-NMNM	CBL56	2017/08/02
Measurement Software	AUDIX-e3			

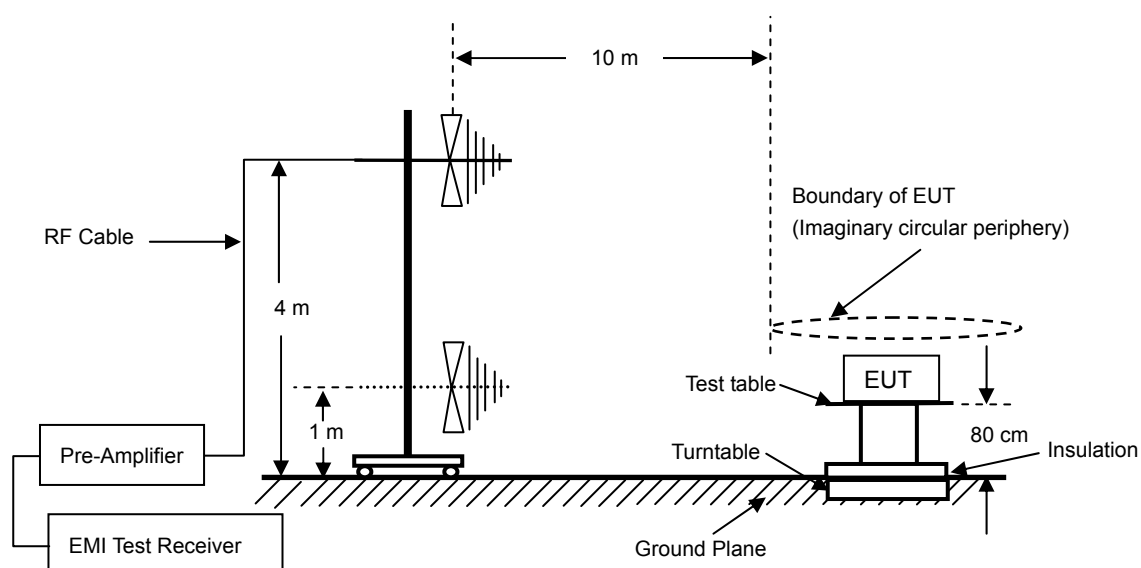
Note: The above equipments are within the valid calibration period.

(For Mode 3)

Instrument	Manufacturer	Model	Serial No.	Next Cal. Date
EMI Test Receiver	Rohde & Schwarz	ESCI	101116	2019/03/25
Biconical Antenna	Schwarzbeck	VHA 9103 & BBA 9106	VHA 9103-2418	2018/08/10
Log Antenna	Schwarzbeck	UHALP 9108-A	9108-A 0739	2018/08/10
Pre-Amplifier	Agilent	8447D	2944A09703	2018/07/31
RF Cable	EMCI	EMC8D-NM-NM-25000	140105	2018/07/31
RF Cable	Mini-Circuits	CBL-3FL-NMNM	CBL56	2018/07/31
Measurement Software	AUDIX-e3			

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

#### 3.2 Block Diagram of Test Configuration



### 3.3 Radiated Limits

Frequency (MHz)	<input type="checkbox"/> Class A	<input checked="" type="checkbox"/> Class B
	Quasi-Peak dB( $\mu$ V/m)	Quasi-Peak dB( $\mu$ 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

OPERATOR : Ceres

EUT: DC/DC Converter

TEST SITE : OATS 1

MODEL: TEQ 20-7215WIR

TEST DISTANCE : 10 m

RATING: DC 110 V

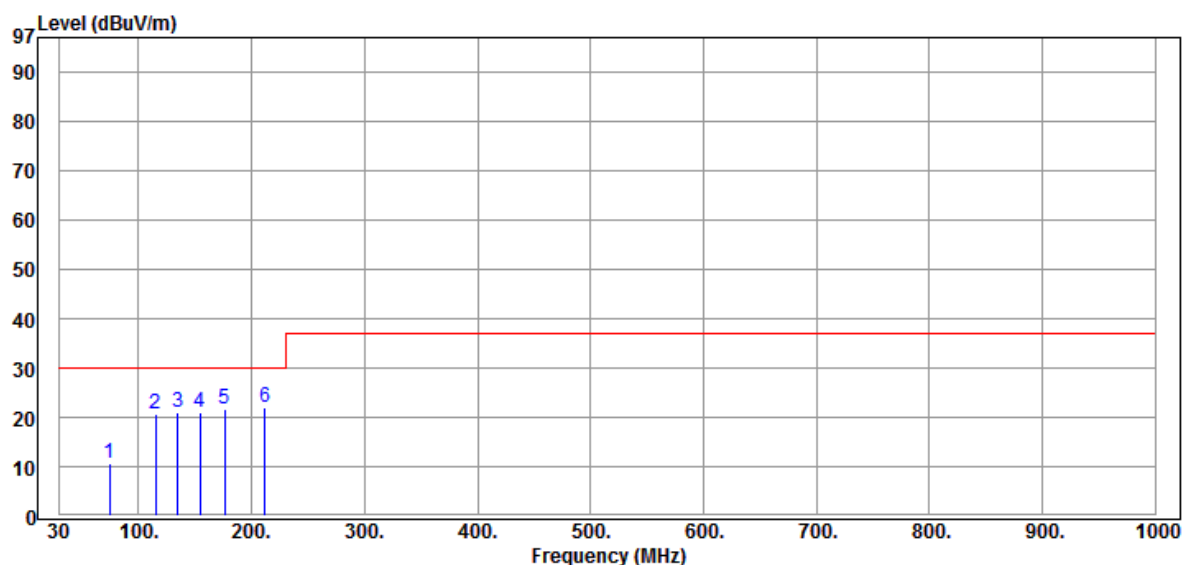
POLARIZATION : HORIZONTAL

COMMENT: Test Mode: Mode 1: Full Load (Model No.: TEQ 20-7215WIR)

TEMP/HUM : 27.9°C/51%

Data:37

2016-12-20



Item Mark	Freq. MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Remark
1	74.440	34.20	-23.37	10.83	30.00	-19.17	QP
2	114.810	37.70	-17.14	20.56	30.00	-9.44	QP
3	134.560	36.50	-15.56	20.94	30.00	-9.06	QP
4	154.550	35.40	-14.56	20.84	30.00	-9.16	QP
5	175.990	34.90	-13.12	21.78	30.00	-8.22	QP
6	211.540	34.40	-12.32	22.08	30.00	-7.92	QP



## Radiated Emission Measurement Data

CLIENT: TRACO ELECTRONIC AG

OPERATOR : Ceres

EUT: DC/DC Converter

TEST SITE : OATS 1

MODEL: TEQ 20-7215WIR

TEST DISTANCE : 10 m

RATING: DC 110 V

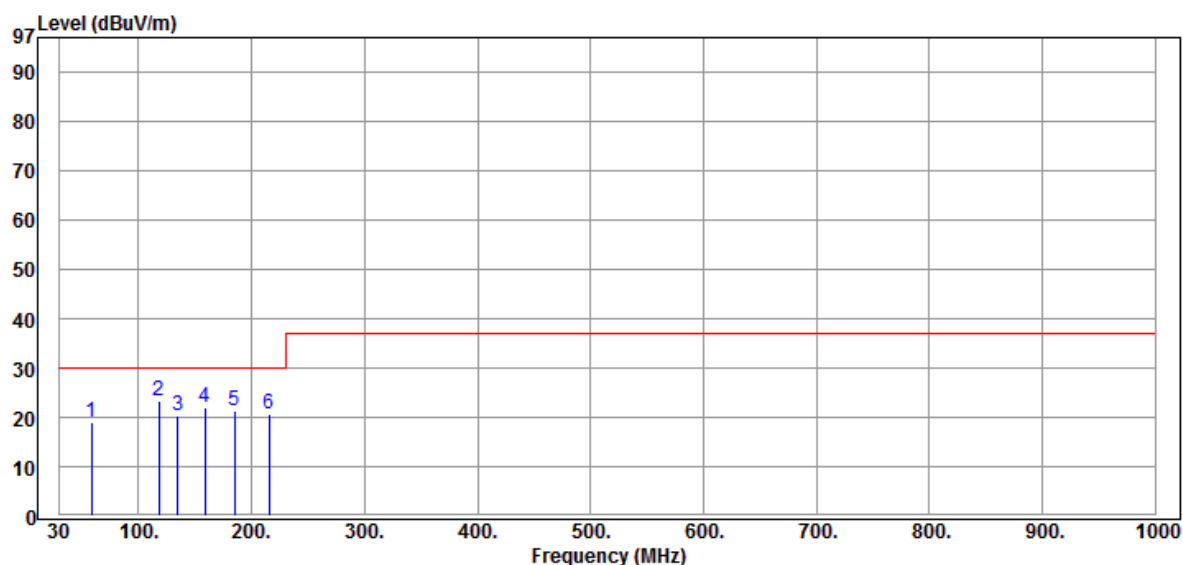
POLARIZATION : VERTICAL

COMMENT: Test Mode: Mode 1: Full Load (Model No.: TEQ 20-7215WIR)

TEMP/HUM : 27.9°C/51%

Data:35

2016-12-20



Item Mark	Freq. MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Remark
1	57.990	40.30	-21.32	18.98	30.00	-11.02	QP
2	117.660	40.00	-16.79	23.21	30.00	-6.79	QP
3	134.560	35.80	-15.56	20.24	30.00	-9.76	QP
4	158.850	36.20	-14.31	21.89	30.00	-8.11	QP
5	184.880	34.51	-13.01	21.50	30.00	-8.50	QP
6	215.700	33.00	-12.22	20.78	30.00	-9.22	QP

## Radiated Emission Measurement Data

CLIENT: TRACO ELECTRONIC AG

OPERATOR : Vic

EUT: DC/DC Converter

TEST SITE : OATS 1

MODEL: TEQ 20-2411WIR

TEST DISTANCE : 10 m

RATING: DC 24 V

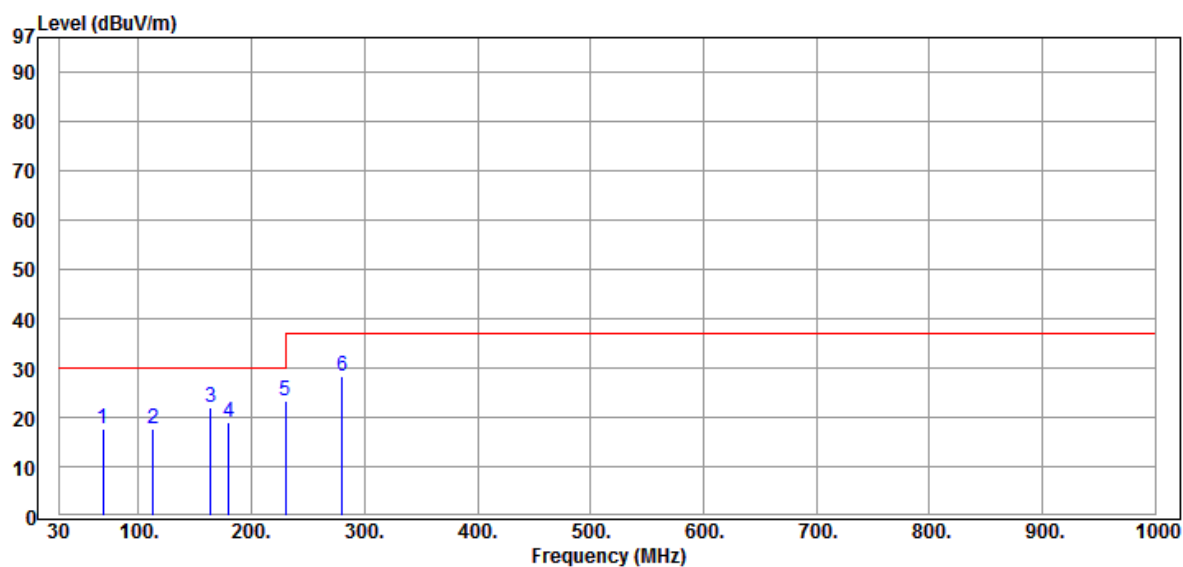
POLARIZATION : HORIZONTAL

COMMENT: Test Mode: Mode 2: Full Load (Model No.: TEQ 20-2411WIR)

TEMP/HUM : 25.4°C/53%

Data:45

2017-01-04



Item Mark	Freq. MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Remark
1	68.500	36.19	-18.64	17.55	30.00	-12.45	QP
2	112.690	30.59	-12.98	17.61	30.00	-12.39	QP
3	164.000	36.47	-14.48	21.99	30.00	-8.01	QP
4	180.000	34.18	-15.17	19.01	30.00	-10.99	QP
5	230.000	36.96	-13.58	23.38	30.00	-6.62	QP
6	280.000	39.12	-10.91	28.21	37.00	-8.79	QP

## Radiated Emission Measurement Data

CLIENT: TRACO ELECTRONIC AG

OPERATOR : Vic

EUT: DC/DC Converter

TEST SITE : OATS 1

MODEL: TEQ 20-2411WIR

TEST DISTANCE : 10 m

RATING: DC 24 V

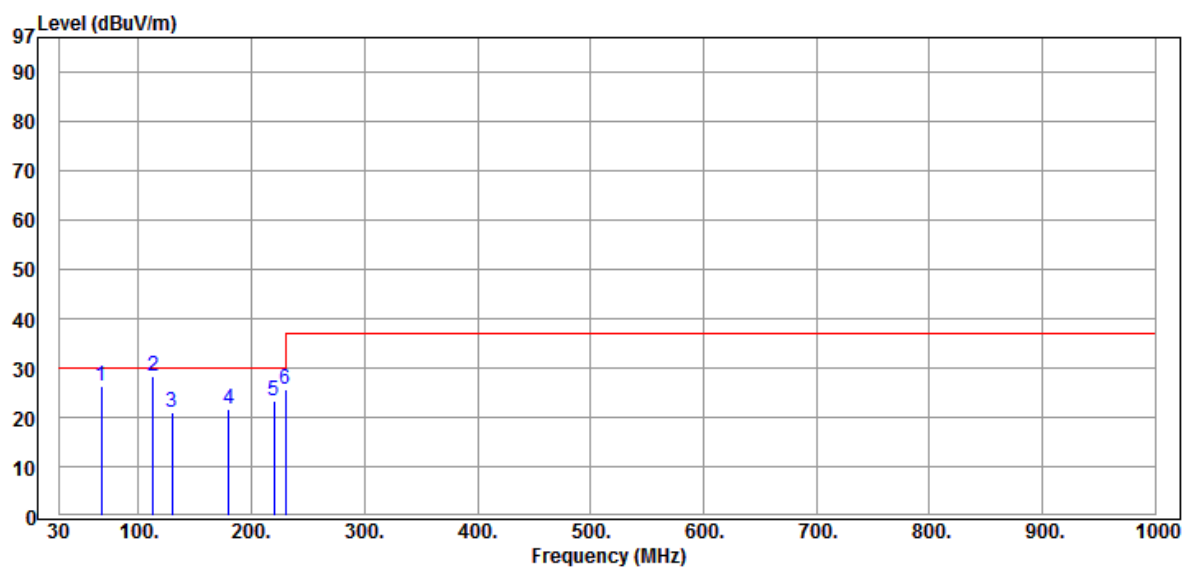
POLARIZATION : VERTICAL

COMMENT: Test Mode: Mode 2: Full Load (Model No.: TEQ 20-2411WIR)

TEMP/HUM : 25.4°C/53%

Data:44

2017-01-04



Item Mark	Freq. MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Remark
1	67.300	45.09	-18.67	26.42	30.00	-3.58	QP
2	112.820	41.20	-12.99	28.21	30.00	-1.79	QP
3	129.530	34.10	-13.08	21.02	30.00	-8.98	QP
4	180.000	36.90	-15.17	21.73	30.00	-8.27	QP
5	220.000	38.12	-14.72	23.40	30.00	-6.60	QP
6	229.900	39.10	-13.59	25.51	30.00	-4.49	QP

## Radiated Emission Measurement Data

CLIENT: TRACO ELECTRONIC AG

OPERATOR : Ceres

EUT: DC/DC Converter

TEST SITE : OATS 1

MODEL: TEQ 20-7223WIR

TEST DISTANCE : 10 m

RATING: DC 110 V

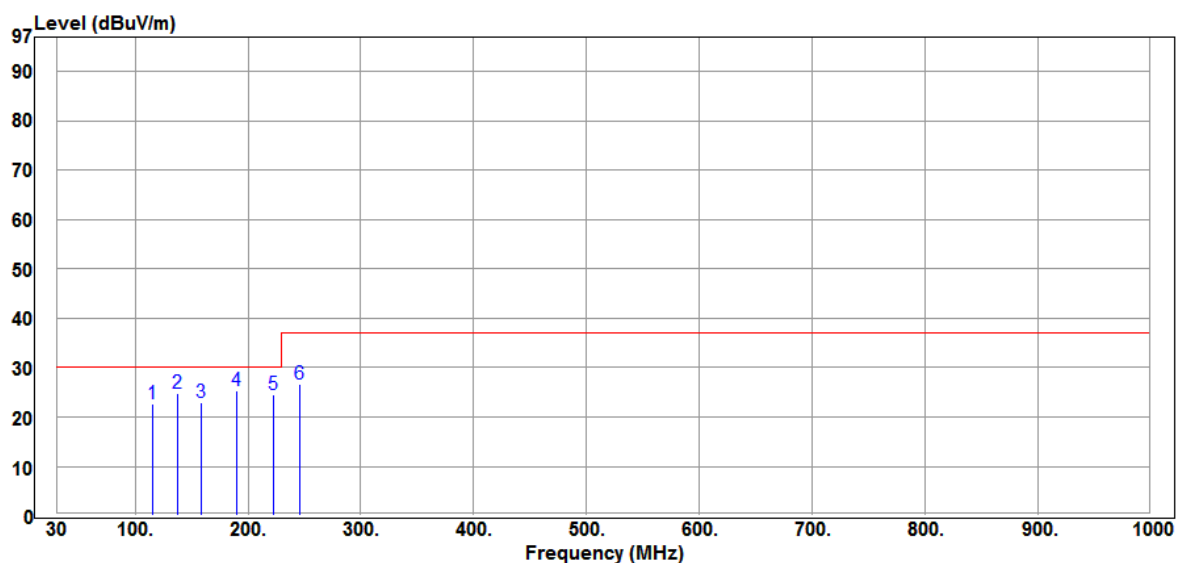
POLARIZATION : HORIZONTAL

COMMENT: Test Mode: Mode 3: Full Load (Model No.: TEQ 20-7223WIR)

TEMP/HUM : 25.2°C / 45%

Data:5

2018-05-30



Item Mark	Freq. MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Remark
1	115.660	35.50	-12.87	22.63	30.00	-7.37	QP
2	137.980	35.21	-10.44	24.77	30.00	-5.23	QP
3	158.850	32.60	-9.70	22.90	30.00	-7.10	QP
4	189.960	32.90	-7.57	25.33	30.00	-4.67	QP
5	222.540	31.80	-7.24	24.56	30.00	-5.44	QP
6	245.660	33.11	-6.46	26.65	37.00	-10.35	QP

## Radiated Emission Measurement Data

CLIENT: TRACO ELECTRONIC AG

OPERATOR : Ceres

EUT: DC/DC Converter

TEST SITE : OATS 1

MODEL: TEQ 20-7223WIR

TEST DISTANCE : 10 m

RATING: DC 110 V

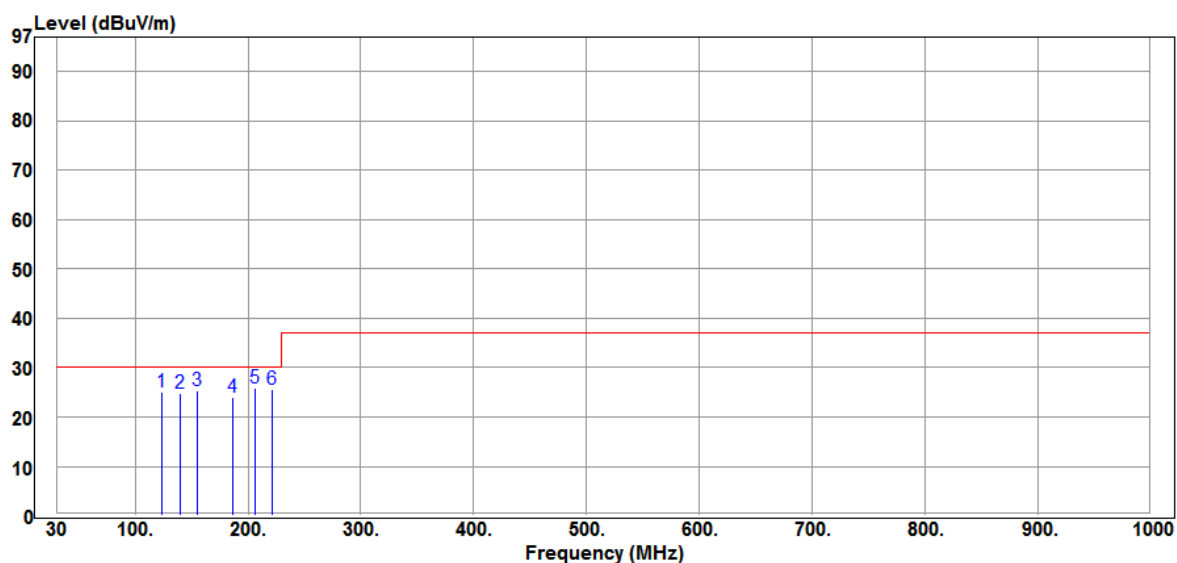
POLARIZATION : VERTICAL

COMMENT: Test Mode: Mode 3: Full Load (Model No.: TEQ 20-7223WIR)

TEMP/HUM : 25.2°C / 45%

Data:6

2018-05-30



Item Mark	Freq. MHz	Reading dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Margin dB	Remark
1	123.650	37.11	-11.95	25.16	30.00	-4.84	QP
2	139.980	34.90	-10.23	24.67	30.00	-5.33	QP
3	155.580	34.89	-9.67	25.22	30.00	-4.78	QP
4	185.870	31.91	-7.97	23.94	30.00	-6.06	QP
5	205.990	33.20	-7.27	25.93	30.00	-4.07	QP
6	221.312	32.90	-7.27	25.63	30.00	-4.37	QP

## 4 Performance Criterion of Immunity Test

### 4.1 EN 55024

General performance criteria	
Criterion	Description
A	During and after the test the EUT shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a minimum performance level specified by the manufacturer when the EUT is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the EUT if used as intended.
B	After the test, the EUT shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomena below a performance level specified by the manufacturer, when the EUT is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is allowed. However, no change of operating state or stored data is allowed to persist after the test. If the minimum performance level (or the permissible performance loss) is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the EUT if used as intended.
C	During and after testing, a temporary loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls or cycling of the power to the EUT by the user in accordance with the manufacturer's instructions.
Particular performance criteria	
<p>The particular performance criteria which are specified in the normative annexes B~H take precedence over the corresponding parts of the general performance criteria.</p> <p>Where particular performance criteria for specific functions are not given, then the general performance criteria shall apply.</p> <p>Annex B Data processing equipment: (Read, write and storage of data; Data display; Data input; Data printing; Data processing)</p> <p>Annex C Local area networks (LAN)</p> <p>Annex D Printers and plotters</p> <p>Annex E Copying machines</p> <p>Annex F Automatic teller machines (ATM)</p> <p>Annex G Point of sale terminals (POST)</p> <p>Annex H xDSL Terminal equipment</p>	

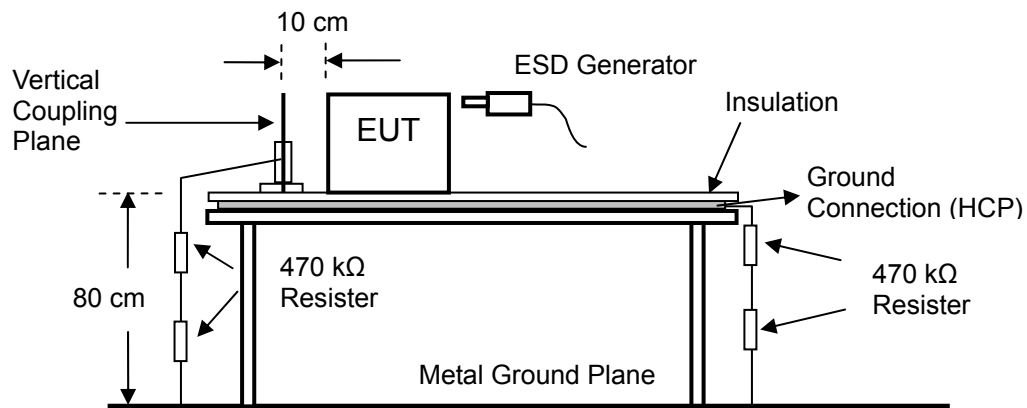
## 5 Electrostatic Discharge Immunity Test (IEC 61000-4-2)

### 5.1 Instrument

Instrument	Manufacturer	Model	Serial No.	Next Cal. Date
ESD Simulator	EMC PARTNER	ESD3000	276	2017/04/21

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

### 5.2 Block Diagram of Test Configuration



### 5.3 Test Requirement

IEC 61000-4-2 (EN 55024) require:

Air discharge:  $\pm 8$  kV

Contact discharge:  $\pm 4$  kV

Performance criterion: **B**

According to special request by client:

Air discharge:  $\pm 8$  kV

Contact discharge:  $\pm 6$  kV

Performance criterion: **A**

### 5.4 Configuration of Measurement

- 5.4.1 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:
- contact discharge to the conductive surfaces and to coupling planes;
  - air discharge at insulating surfaces.
- 5.4.2 The EUT shall be arranged in accordance with the manufacturer's instructions for installation.

## 5.5 Test Result

**PASS.**

The performance criterion after tested EN 55024:

Temperature: 21.0 °C ; Humidity: 53 % ; Atmospheric: 986 hPa ; Test Engineer: Vic

### Mode 1: Full Load (Model No.: TEQ 20-7215WIR)

Air discharge  $\pm 2$  kV,  $\pm 4$  kV,  $\pm 8$  kV: ☒ A ☐ B ☐ C

Contact discharge  $\pm 2$  kV,  $\pm 4$  kV,  $\pm 6$  kV: ☒ A ☐ B ☐ C

Indirect discharge (HCP)  $\pm 2$  kV,  $\pm 4$  kV,  $\pm 6$  kV: ☒ A ☐ B ☐ C

Indirect discharge (VCP)  $\pm 2$  kV,  $\pm 4$  kV,  $\pm 6$  kV: ☒ A ☐ B ☐ C



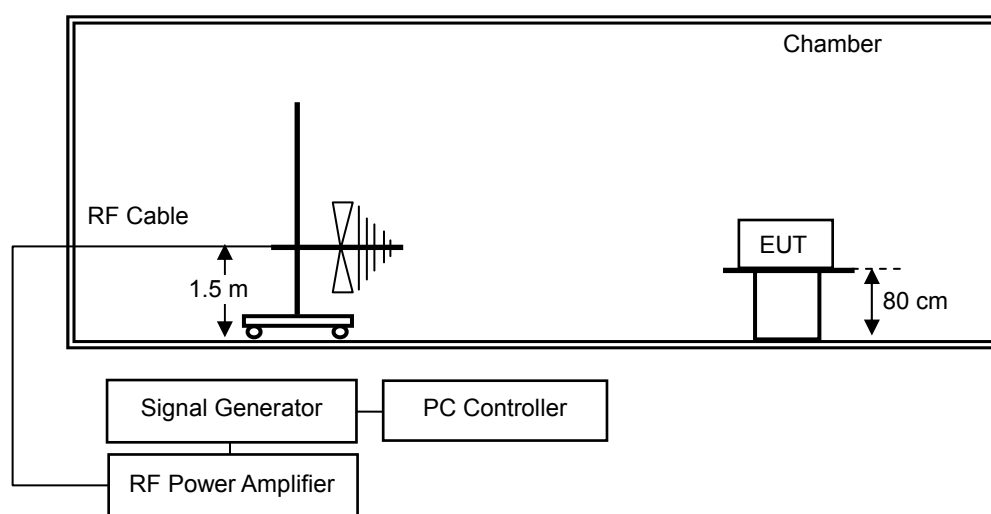
## 6 Radio- Frequency, Electromagnetic Field Immunity Test (IEC 61000-4-3)

### 6.1 Instrument

Instrument	Manufacturer	Model	Serial No.	Next Cal. Date
Signal Generator	KEYSIGHT	N5171B	MY53051802	2017/03/09
Power Amplifier	R&K	A080M102-5555R	B30850	2017/04/28
Log Antenna	Schwarzbeck	VULP 9118 G Special	9118GS912	2017/04/28

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

### 6.2 Block Diagram of Test Configuration



### 6.3 Test Requirement

IEC 61000-4-3 (EN 55024) require:

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

☒ Frequency range: **80 to 1000** MHz, Field strength: **3** V/m, 80 %AM (1 kHz),  
Performance criterion: **A**

According to special request by client:

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

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

## 6.4 Configuration of Measurement

- 6.4.1 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.
- 6.4.2 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.
- 6.4.3 Ferrite tiles/ absorbers were placed on the RGP between the EUT and the antenna to reduce the reflections from the RGP.
- 6.4.4 The distance between antenna and EUT is 1 meter.

## 6.5 Test Result

**PASS.**

The performance criterion after tested EN 55024:

Temperature: 24.0 °C ; Humidity: 51 % ; Atmospheric: 986 hPa ; Test Engineer: Mark

### Mode 1: Full Load (Model No.: TEQ 20-7215WIR)

☒ Frequency range: 80 to 1000 MHz, Field strength: 20 V/m, 80 % AM (1 kHz),  
Performance criterion: ☒ A ☐ B ☐ C

## 7 Electrical Fast Transient/Burst Immunity Test (IEC 61000-4-4)

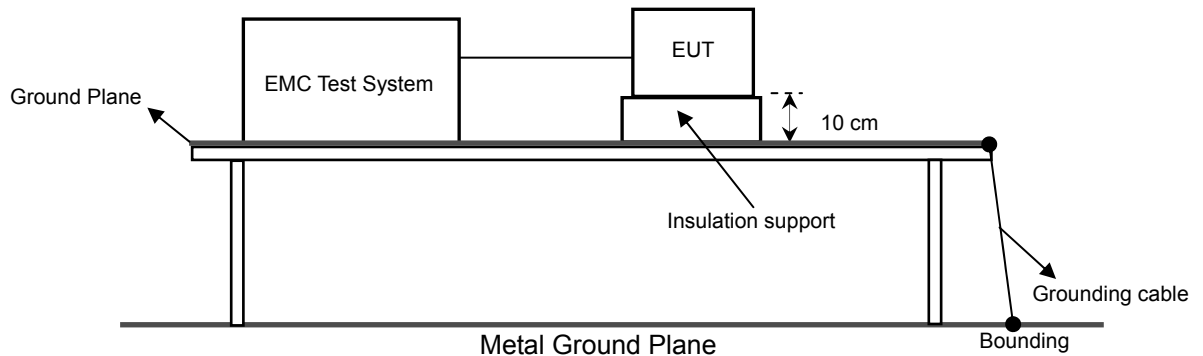
### 7.1 Instrument

Instrument	Manufacturer	Model	Serial No.	Next Cal. Date
EMC Test System	EMC PARTNER	TRANSIENT-2000	812	2017/03/06

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

### 7.2 Block Diagram of Test Configuration

For Power Ports.



### 7.3 Test Requirement

IEC 61000-4-4 (EN 55024) require:

5 kHz Repetition frequency

☐  $\pm 1.0$  kV input AC power ports.

☒  $\pm 0.5$  kV input DC power ports.

☐  $\pm 0.5$  kV Signal ports.

☐  $\pm 0.5$  kV for Telecommunication ports.

Performance criterion: **B**

According to special request by client:

5 kHz Repetition frequency

☒  $\pm 2.0$  kV input DC power ports.

Performance criterion: **A**

### 7.4 Configuration of Measurement

7.4.1 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×1 m and project beyond the EUT by at least 0.1 m on all sides. The ground plane is connected to the protective earth.

7.4.2 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 power cord between the coupling device and the EUT was less than 1 meter.

## 7.5 Test Result

**PASS.**

The performance criterion after tested EN 55024:

Temperature: 22.0 °C ; Humidity: 56 % ; Atmospheric: 986 hPa ; Test Engineer: Mark

### Mode 1: Full Load (Model No.: TEQ 20-7215WIR)

- ☒ ± 2.0 kV input DC power port: Line  
Performance criterion: ☒ A ☐ B ☐ C
- ☒ ± 2.0 kV input DC power port: Neutral  
Performance criterion: ☒ A ☐ B ☐ C
- ☒ ± 2.0 kV input DC power port: PE  
Performance criterion: ☒ A ☐ B ☐ C
- ☒ ± 2.0 kV input DC power port: Line + Neutral  
Performance criterion: ☒ A ☐ B ☐ C
- ☒ ± 2.0 kV input DC power port: Line + PE  
Performance criterion: ☒ A ☐ B ☐ C
- ☒ ± 2.0 kV input DC power port: Neutral + PE  
Performance criterion: ☒ A ☐ B ☐ C
- ☒ ± 2.0 kV input DC power port: Line + Neutral + PE  
Performance criterion: ☒ A ☐ B ☐ C

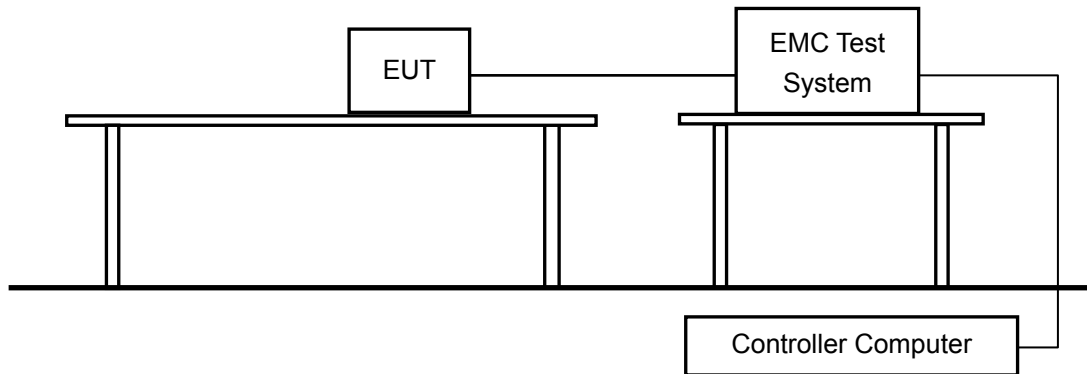
## 8 Surge Immunity Test (IEC 61000-4-5)

### 8.1 Instrument

Instrument	Manufacturer	Model	Serial No.	Next Cal. Date
EMC Pro Systems	KeyTek	EMC Pro	0003234	2017/02/26

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

### 8.2 Block Diagram of Test Configuration



### 8.3 Test Requirement

IEC 61000-4-5 (EN 55024) require:

- ☐ Input AC power ports: ☐ Line to line:  $\pm 1.0$  kV (peak), 1.2/50 (8/20) Tr/Th  $\mu$ s  
☐ Line to earth (ground):  $\pm 2.0$  kV (peak), 1.2/50 (8/20) Tr/Th  $\mu$ s

☒ Input DC power ports:  $\pm 0.5$  kV (peak): Line to earth, 1.2/50 (8/20) Tr/Th  $\mu$ s

Performance criterion: **B**

☐ Signal ports: ☐ without primary protections:  $\pm 1.0$  kV (peak): 10/700 Tr/Th  $\mu$ s

☐ Primary protectors:  $\pm 4.0$  kV (peak): 10/700 Tr/Th  $\mu$ s

☐ Telecommunication ports: ☐ without primary protections:  $\pm 1.0$  kV (peak): 10/700 Tr/Th  $\mu$ s

☐ Primary protectors:  $\pm 4.0$  kV (peak): 10/700 Tr/Th  $\mu$ s

Performance criterion: **C**

According to special request by client:

☒ Input DC power ports:  $\pm 1.0$  kV (peak): Line to earth, 1.2/50 (8/20) Tr/Th  $\mu$ s

Performance criterion: **A**

### 8.4 Configuration of Measurement

8.4.1 The EUT and support units were located on a wooden table 0.8 m away from ground floor.

8.4.2 The EUT was connected to the power mains through a coupling device that directly couples the Surge interference signal.

8.4.3 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.

## 8.5 Test Result

**PASS.**

The performance criterion after tested EN 55024:

Temperature: 20.0 °C ; Humidity: 53 % ; Atmospheric: 986 hPa ; Test Engineer: Vic

### Mode 1: Full Load (Model No.: TEQ 20-7215WIR)

☒ ± 0.5 kV (peak) Input DC power port: Line to earth

Performance criterion: ☒ A ☐ B ☐ C

☒ ± 1.0 kV (peak) Input DC power port: Line to earth

Performance criterion: ☒ A ☐ B ☐ C

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

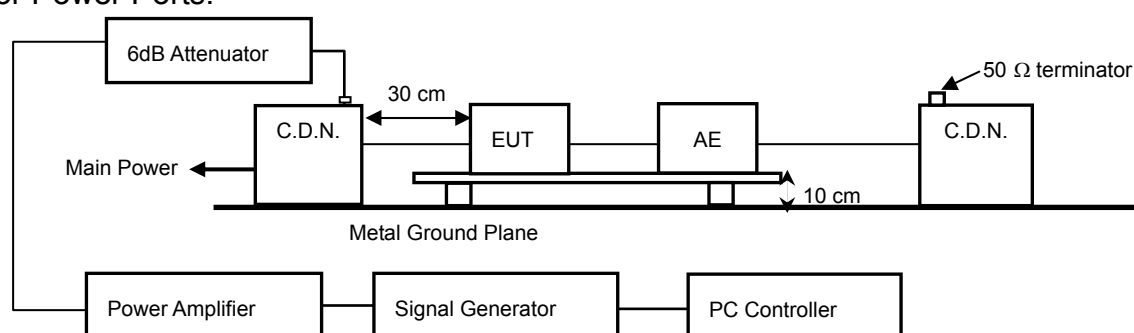
### 9.1 Instrument

Instrument	Manufacturer	Model	Serial No.	Next Cal. Date
Signal Generator	Marconi Instruments	2024	112246/087	2017/04/21
RF Power Amplifier	R&K	A009K101-5050R	B30850	2017/02/05
Attenuator	Microwave Device Inc.	MA-5250/6N	001052	2017/02/05
C.D.N	FCC	FCC-801-M3-25A	2045	2017/02/05
C.D.N	SCHAFFNER	M216	16394	2017/02/05

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 61000-4-6 (EN 55024) require:

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)

☐ Input AC power ports.

☒ Input DC power ports.

☐ Signal ports.

☐ Telecommunication ports.

Performance criterion: **A**

According to special request by client:

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

Frequency Range is from 0.15 to 80 MHz.

Field strength: **10 V**, 80 % AM (1 kHz)

☒ Input DC power ports.

Performance criterion: **A**

## 9.4 Configuration of Measurement

- 9.4.1 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.
- 9.4.2 The EUT was connected to the power mains through a Coupling and Decoupling Networks (CDN).
- 9.4.3 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  $\Omega$  terminator.
- 9.4.4 The frequency range was swept from 150 kHz to 80 MHz. 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  $1.5 \times 10^{-3}$  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.
- 9.4.5 The EUT was fully excised during the testing and all the selected excise modes were fully interrogated for susceptibility.

## 9.5 Test Result

**PASS.**

The performance criterion after tested EN 55024:

Temperature: 23.0 °C ; Humidity: 52 % ; Atmospheric: 986 hPa ; Test Engineer: Mark

### Mode 1: Full Load (Model No.: TEQ 20-7215WIR)

Frequency range: 0.15 to 80 MHz, Field strength: 10 V, 80 % AM (1 kHz),

☒ Input DC power port.

Performance criterion: ☒ A ☐ B ☐ C



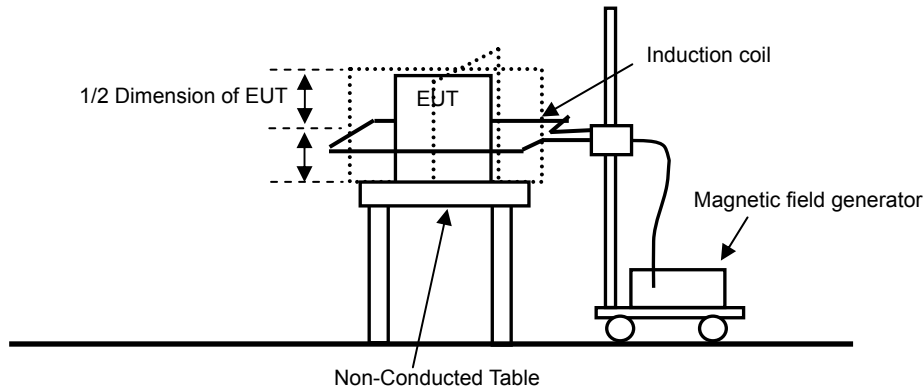
## 10 Power Frequency Magnetic Field Immunity Test (IEC 61000-4-8)

### 10.1 Instrument

Instrument	Manufacturer	Model	Serial No.	Next Cal. Date
Magnetic field generator	PMM	PMM1008	0000J00301	2017/06/19

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

### 10.2 Block Diagram of Test Configuration



### 10.3 Test Requirement

IEC 61000-4-8 (EN 55024) require:

Power Frequency is **50** Hz.

Magnetic field strength: **1** A/m

Performance criterion: **A**

According to special request by client:

Power Frequency is **50** Hz.

Magnetic field strength: **100** A/m

Magnetic field strength: **1000** A/m (1 sec)

Performance criterion: **A**

### 10.4 Configuration of Measurement

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

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

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

### 10.5 Test Result

**PASS.**

The performance criterion after tested EN 55024:

Temperature: 21.0 °C ; Humidity: 53 % ; Atmospheric: 986 hPa ; Test Engineer: Vic

#### Mode 1: Full Load (Model No.: TEQ 20-7215WIR)

☒ Power Frequency is 50 Hz, Magnetic field strength: **100** A/m

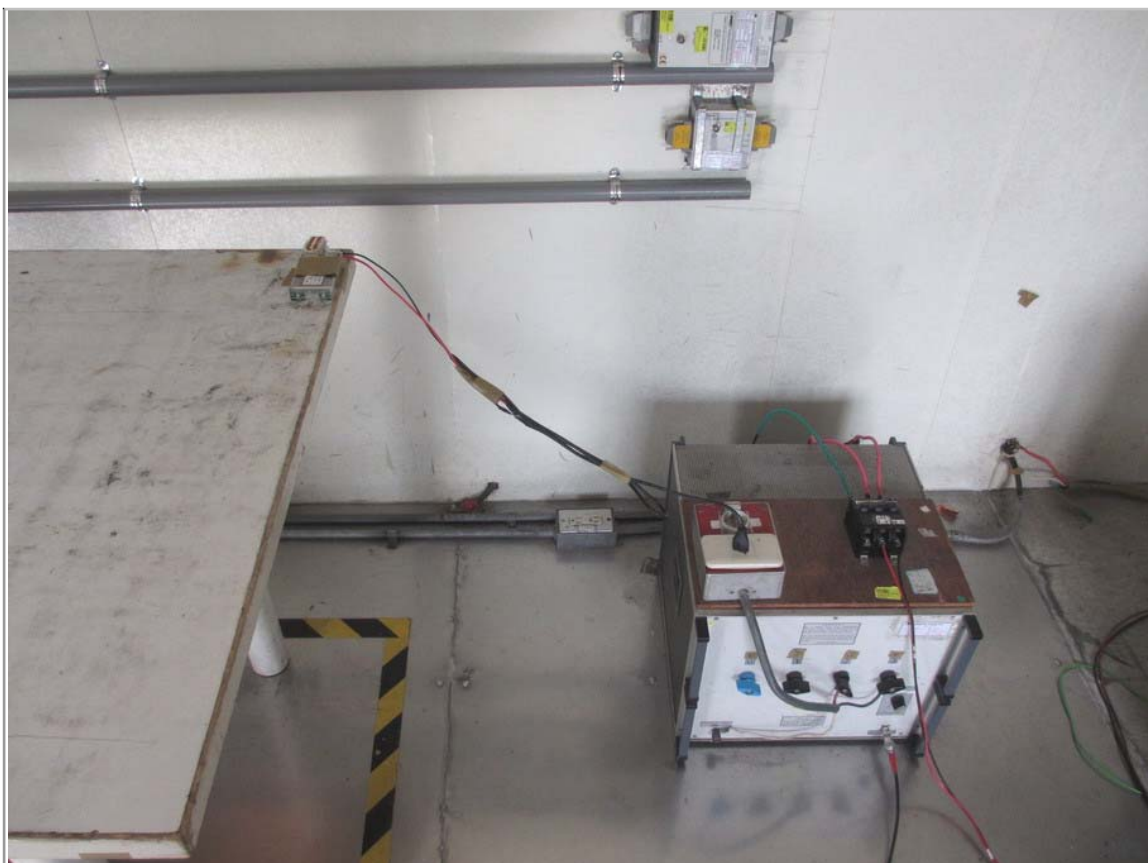
Performance criterion: ☒ **A** ☐ **B** ☐ **C**

☒ Power Frequency is 50 Hz, Magnetic field strength: **1000** A/m (1 sec)

Performance criterion: ☒ **A** ☐ **B** ☐ **C**

## 11 Photographs of Test

### 11.1 Conducted Emission Measurement



Front View



Rear View

## 11.2 Radiated Emission Measurement



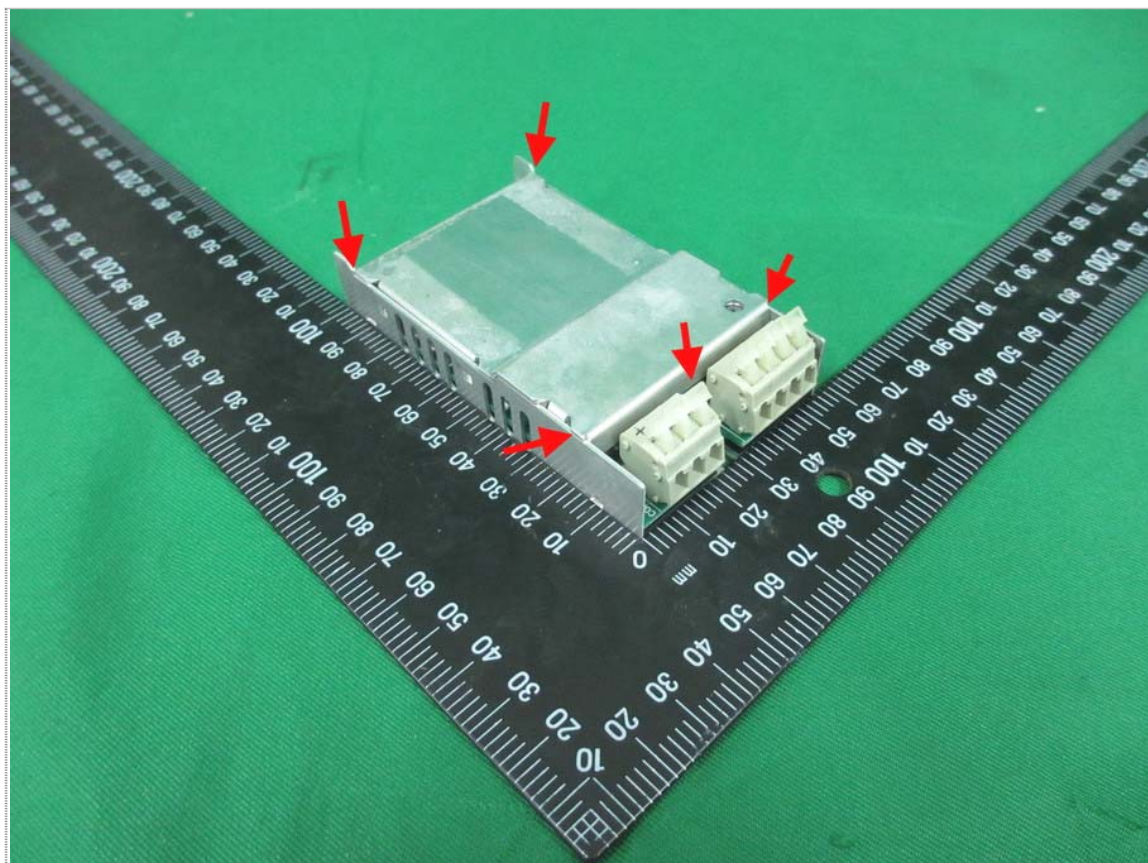
Front View



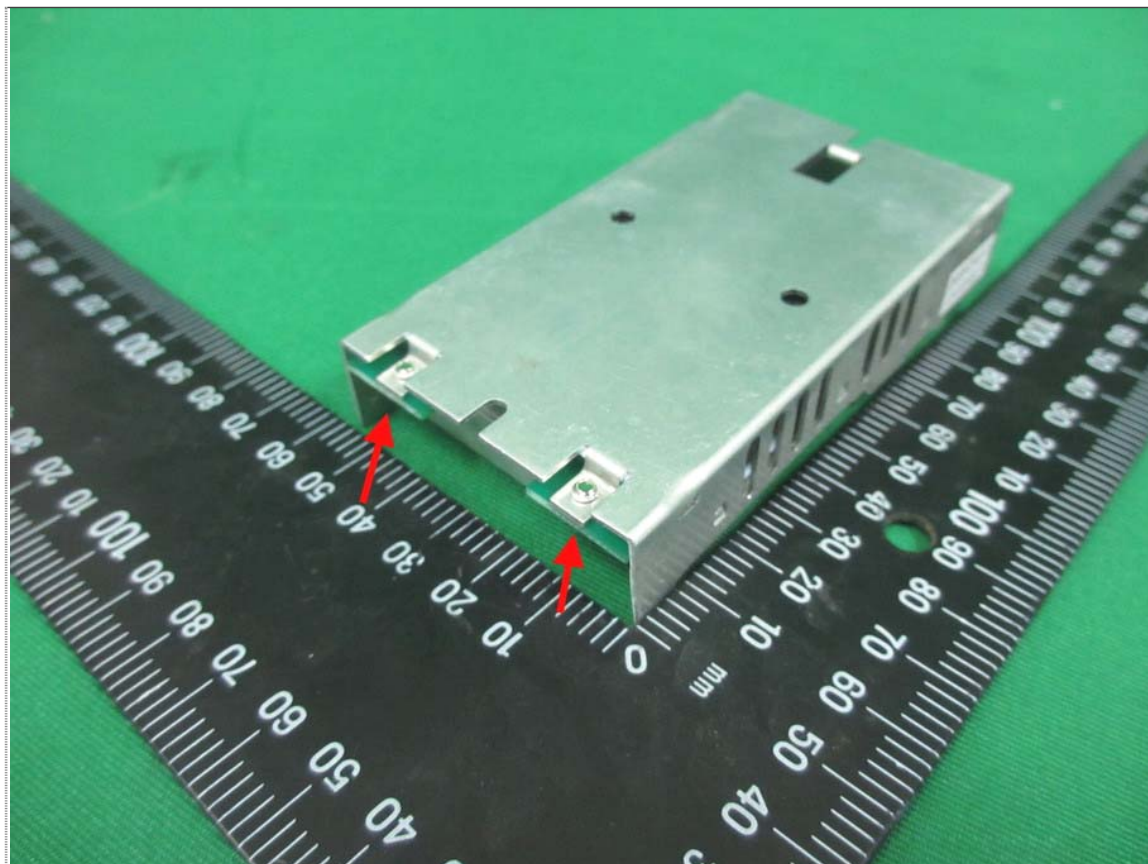
Rear View



### 11.3 Electrostatic Discharge Test Point



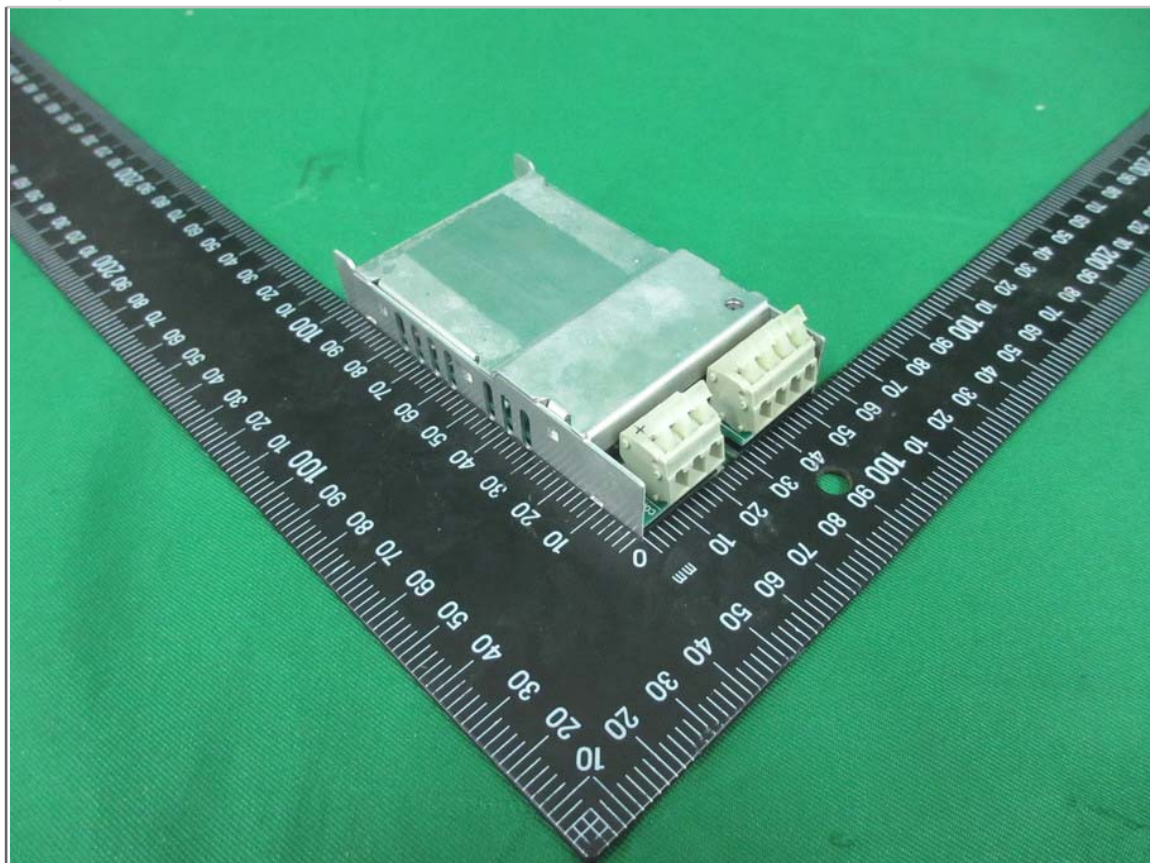
Discharge Point-1 (Red: Contact Discharge)



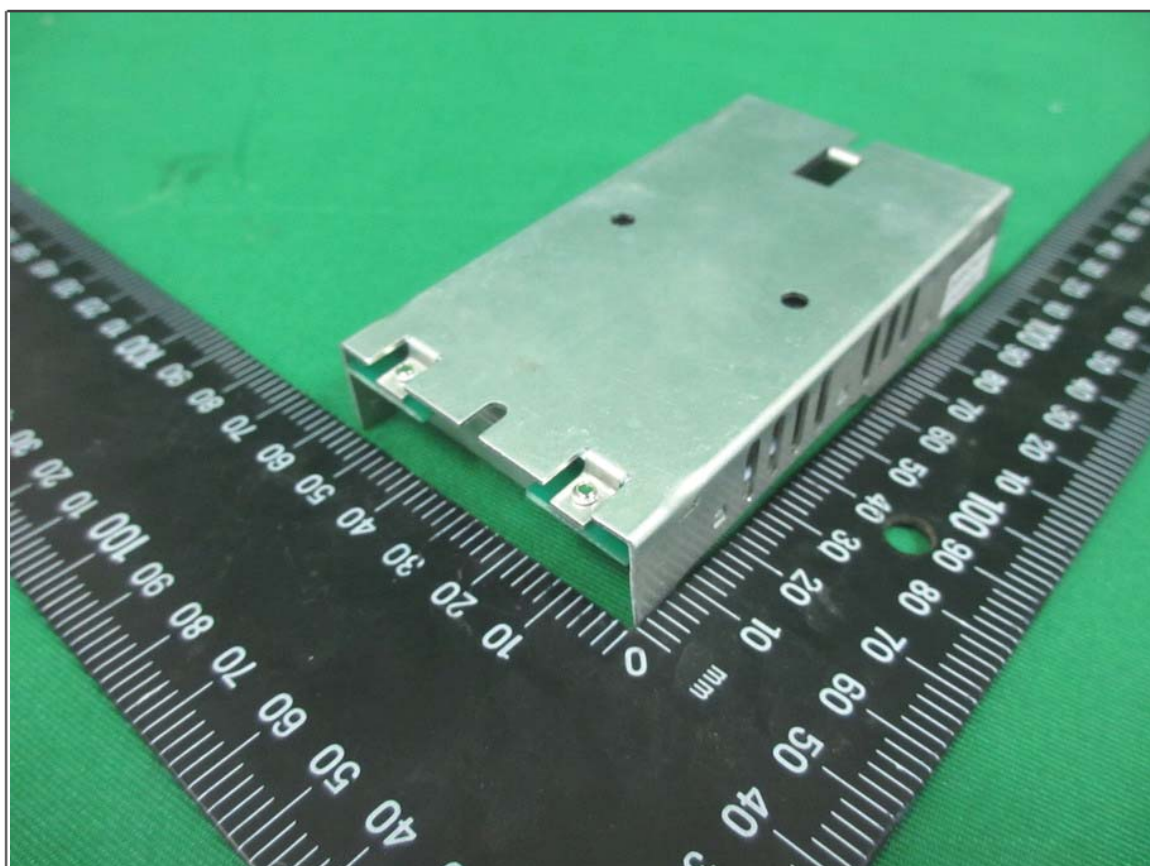
Discharge Point-2 (Red: Contact Discharge)



## 12 Photographs of EUT



Front View of EUT



Rear View of EUT