

CE/EMC TEST REPORT

Prepared for : GlobTek, Inc.

Address : 186 Veterans Dr. Northvale, NJ 07647 USA

Trade Name : N/A
E.U.T : DC/DC Switching Power Supply
Part Number : DR6SM6000USBC-USBAPD

Applicant:	186 Veterans Dr. Northvale, NJ 07647 USA
Address:	
E.U.T:	DC/DC Switching Power Supply
Model Number:	GTD9X0300-30PD
Trade Name:	N/A
Test Specification :	EN 55032:2015+A1:2020 EN 55035:2017+A11:2020
Test Result:	The equipment under test was found to be compliance with the requirements of the standards applied.
Other Aspects:	None.
Abbreviations: OK/P=passed fail/F=failed n.a/N=not applicable E.U.T=equipment under tested	
This test report is based on a single evaluation of one sample of above mentioned products.	

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1. GENERAL PRODUCT INFORMATION

1.1.Product Function

Refer to Technical Construction Form and User Manual.

1.2.Description of Device (EUT)

Description : DC/DC Switching Power Supply
M/N : GTD9X0300-30PD
Power Input : 12-24VDC
Power : 30W Max.
Output : QC3.0: 5Vdc, 3A/ 9Vdc, 2A/ 12Vdc, 1.5A
PD: 5Vdc, 3A/ 9Vdc, 3A/ 12Vdc, 2.5A
Operation frequency : <108MHz

1.3.Difference between Model Numbers

None.

1.4.Independent Operation Modes

The basic operation mode is:

Pretest Mode	Description
Mode 1	Full Load(DC 24V): 5V/3A+ 5V/3A
Mode 2	Full Load(DC 24V): 12V/1.5A+ 12V/1.5A
Mode 3	Full Load(DC 12V): 5V/3A+ 5V/3A
Mode 4	Full Load(DC 12V): 12V/1.5A+ 12V/1.5A

1.5.Test Supporting System

None.

1.6.The Main Test Models

Test Model	
GTD9X0300-30PD	

2. TEST SITES

2.1. Test Summary

Test Item	Condition	Standard	Result
Conducted disturbance at mains terminals	150kHz to 30MHz	EN 55032:2015+A1:2020	N/A
Conducted disturbance at telecommunication ports	150kHz to 30MHz	EN 55032:2015+A1:2020	N/A
Radiated Emission (below 1 GHz)	30MHz to 1GHz	EN 55032:2015+A1:2020	Pass
Radiated Emission (above 1 GHz)	1GHz to 6GHz	EN 55032:2015+A1:2020	N/A
Harmonic of current *	CLASS A	EN IEC 61000-3-2:2019+A1:2021	N/A
Flicker	4%	EN 61000-3-3:2013+A2:2021	N/A
ESD	C:±4kV; A:±8kV	EN 55035:2017+A11:2020 Reference: EN 61000-4-2:2009	Pass
Continuous RF electromagnetic field disturbances, swept test	80MHz to 1000MHz, 3V/m	EN 55035:2017+A11:2020 Reference: EN 61000-4-3:2010	Pass
Continuous RF electromagnetic field disturbances, spot test	1800 MHz, 2600 MHz, 3500 MHz, 5000 MHz 3V/m		
Electrical fast transients/burst	±1kV	EN 55035:2017+A11:2020 Reference: EN 61000-4-4:2012	N/A
Surges	☒ Line to Line:±1.0kV; ☐ Line to earth:±2.0kV	EN 55035:2017+A11:2020 Reference: EN 61000-4-5:2014	N/A
Continuous induced RF disturbances	0.15MHz to 10MHz 3V 10MHz to 30MHz 3V to 1V 30MHz to 80MHz 1V	EN 55035:2017+A11:2020 Reference: EN 61000-4-6:2014	N/A
Power Frequency Magnetic Field test**	1A/m	EN 55035:2017+A11:2020 Reference: EN 61000-4-8:2010	N/A
Voltage dips and interruption test	0%, 70%, 0%, of U_T	EN 55035:2017+A11:2020 Reference: EN 61000-4-11:2004	N/A
Remark: 1. The symbol "N/A" in above table means <u>Not Applicable</u> . 2. "*" According to EN IEC 61000-3-2: 2019, for products ≤ 75 watts, no limits are defined for the harmonics test. The EUT is deemed to comply with the standard without test. 3. "**" Applicable only to EUT containing devices susceptible to magnetic fields, such as CRT monitors, Hall elements, electrodynamic microphones, magnetic field sensors, etc. 4. When determining the test results, measurement uncertainty of tests has been considered.			

System Measurement Uncertainty	
Test Items	Extended Uncertainty
Uncertainty for Radiated Emission in 3m chamber	3.29dB
Uncertainty for Conducted Emission.	2.16dB

2.2.List of Test and Measurement Instruments

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
For conducted emission at the mains terminals and signal port test					☐
EMI Test Receiver	Rohde&Schwarz	ESCI	101156	Apr 11,22	Apr 10,23
Artificial Mains Network	Rohde&Schwarz	ENV216	101315	Apr 11,22	Apr 10,23
Artificial Mains Network (AUX)	Rohde&Schwarz	ENV216	101314	Apr 11,22	Apr 10,23
RF Cable	FUJIKURA	3D-2W	944 Cable	Apr 11,22	Apr 10,23
ISN-CAT5	Schwarzbeck	CAT5 8158	#282	Apr 11,22	Apr 10,23
ISN-CAT6	Schwarzbeck	CAT6 8158	#284	Apr 11,22	Apr 10,23
For radiated emission test (30MHz-1GHz)					☒
EMI Test Receiver	Rohde&Schwarz	ESCI	101156	Apr 11,22	Apr 10,23
TRILOG Broadband Antenna	Schwarzbeck	VULB 9168	00829	Apr 12,22	Apr 11,23
3m Semi-anechoic Chamber	ETS-LINDGREN	966	170326	Apr 11,22	Apr 10,23
RF Cable	Junkosha	MWX322-2m	1305G007	Apr 11,22	Apr 10,23
RF Cable	Junkosha	MWX322-8m	1305G008	Apr 11,22	Apr 10,23
MULTI-DEVICE Controller	ETS-LINDGREN	2090	126913	N/A	N/A
Antenna Holder	ETS-LINDGREN	2070B	00109601	N/A	N/A
For radiated emission test (Above 1GHz)					☐
EMI Test Receiver	Rohde&Schwarz	ESCI	101156	Apr 11,22	Apr 10,23
Horn Antenna	DAZE	ZN30701	11003	Apr 10,22	Apr 10,23
Spectrum Analyzer	Keysight	N9020A	MY56070279	Apr 11,22	Apr 10,23
3m anechoic Chamber	ETS-LINDGREN	966	170326	Apr. 12,22	Apr 11,23
Signal Amplifier	ZHINAN	ZN3380C	11001	Apr 11,22	Apr 10,23
RF Cable	Junkosha	MWX322-1m	1305G006	Apr 11,22	Apr 10,23
RF Cable	Junkosha	MWX322-2m	1305G007	Apr 11,22	Apr 10,23
RF Cable	Junkosha	MWX322-8m	1305G008	Apr 11,22	Apr 10,23
MULTI-DEVICE Controller	ETS-LINDGREN	2090	126913	N/A	N/A
Antenna Holder	ETS-LINDGREN	2070B	00109601	N/A	N/A
For harmonic current emissions and voltage fluctuations/flicker test					☐
5kVA AC Power Source	California Instruments	5001iX	60138	Apr 11,22	Apr 10,23
Harmonic/Flicker Test System	California Instruments	PACS-1	72847	Apr 11,22	Apr 10,23
For electrostatic discharge immunity test					☒
ESD Generator	TESEQ	NSG437	433	Apr 12,22	Apr 10,23
For electrical fast transient/burst immunity test					☐
EFT Tester	EMtest	EFT500N5	V1105108698	Apr 11,22	Apr 10,23
EFT Coupling Clamp	EMtest	HFK	0211-168	Apr 11,22	Apr 10,23

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
For surge immunity test					☐
Surge Tester	EMtest	UCS500N7	V1105108699	Apr 11,22	Apr 10,23
For injected currents susceptibility test					☐
C/S Test System	Schloder	CDG 6000	0021040	Apr 11,22	Apr 10,23
CDN	Luthi	L-801 M2/M3	2789	Apr 11,22	Apr 10,23
Electromagnetic Injection Clamp	Luthi	EM101	36041	Apr 12,22	Apr 10,23
For power frequency magnetic field immunity test					☐
Magnetic Field Generator	EVERFINE	EMS61000-8 K	YG100376N11 080002	Apr 11,22	Apr 10,23
For voltage dips and short interruptions immunity test					☐
Dips Tester	EVERFINE	EMS61000-11 K	YG100319N11 040005	Apr 11,22	Apr 10,23
For radio frequency electromagnetic field immunity (R/S) test					☒
Bilog Antenna	ETS	3142D	00135452	Apr 12,22	Apr 11,23
Amplifier (80-1000MHz)	SKET	AP801000_250	MPA1708341	Apr 11,22	Apr 10,23
Amplifier (1-3GHz)	SKET	AP0103_75	MPA1708342	Apr 11,22	Apr 10,23
Amplifier (3-6GHz)	SKET	AP0206_50	MPA1708343	Apr 11,22	Apr 10,23
RF Switch	EMC TOYO	/	/	Apr 11,22	Apr 10,23
Power Sensor	Agilent	/	MY41496069	Apr 11,22	Apr 10,23
Signal Generator	Agilent	N5181B	MY53050432	Apr 11,22	Apr 10,23
Power Meter	Agilent	E4418B	MY41294414	Apr 11,22	Apr 10,23
Note: ☒ Used ☐ Not Used					

3. TEST SET-UP AND OPERATION MODES

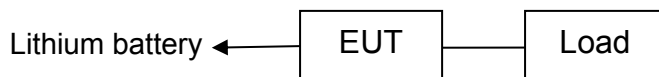
3.1.Principle of Configuration Selection

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the Operating Instructions.

Immunity: The equipment under test (EUT) was configured to the representative operating mode and conditions.

3.2.Block Diagram of Test Set-up

System Diagram of Connections between EUT and Simulators



(EUT: DC/DC Switching Power Supply)

3.3.Test Operation Mode and Test Software

Refer to Test Setup in clause 4 & 5.

3.4.Special Accessories and Auxiliary Equipment

None.

3.5.Countermeasures to Achieve EMC Compliance

None.

4. TEST RESULTS

4.1. Conducted Emission at the Mains Terminals Test

Result	:	N/A
Test Site	:	944 Shielded Room
Limits	:	EN 55032 Class B

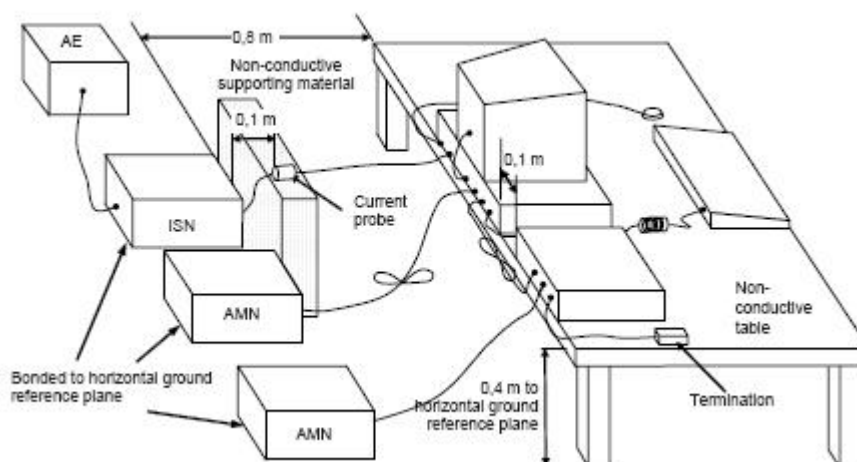
Frequency range MHz	Limits dB(μ V)	
	Quasi-peak	Average
0,15 to 0,50	66 to 56	56 to 46
0,50 to 5	56	46
5 to 30	60	50

NOTE: 1.The lower limit shall apply at the transition frequencies.
2.The limit decreases linearly with the logarithm of the frequency in the range 0,15 MHz to 0.50 MHz.

Test Specification

- 1.The EUT was put on a wooden table which was 0.8 m high above the ground and connected to the AC mains through the Artificial Mains Network (AMN). Where the mains cable supplied by the manufacture was longer than 1 m, the excess was folded back and forth parallel to the cable at the centre so as to form a bundle no longer than 0.4 m.
- 2.The EUT was kept 0.4 m from any other earthed conducting surface. Both sides of AC line were checked to find out the maximum conducted emission levels according to the test procedure during the conducted emission test.
- 3.The bandwidth of the test receiver was set at 9 kHz.
- 4.The worst test data were reported on the following page.

Block Diagram of Test Set-up



4.2. Conducted disturbance at telecommunication ports Test

Result : N/A
Test Site : 944 Shielded Room
Limits : EN 55032 Class B

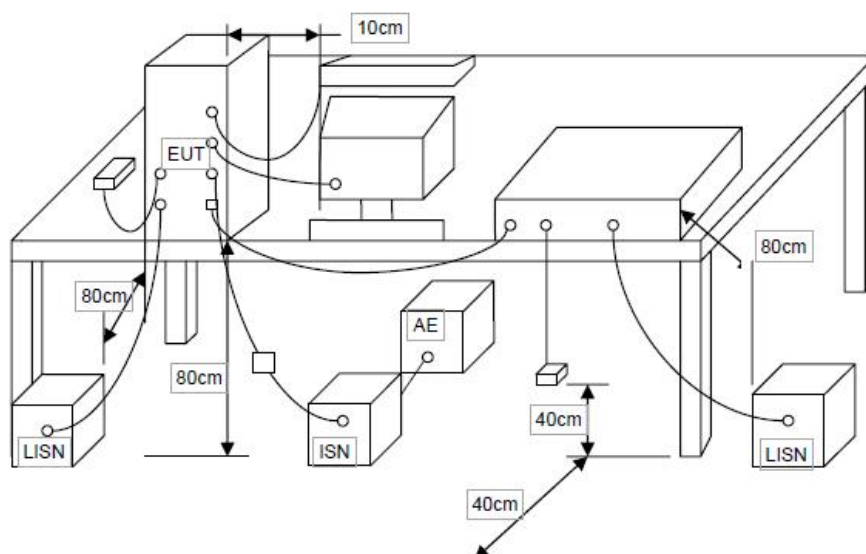
Frequency range MHz	Limits dB(μ V)	
	Quasi-peak	Average
0,15 to 0,50	84 to 74	74 to 64
0,50 to 30	74	64

Note: 1.The limits decrease linearly with the logarithm of the frequency in the range 0,15 MHz to 0,5 MHz.
2.The current and voltage disturbance limits are derived for use with an impedance stabilization network (ISN) which presents a common mode (asymmetric mode) impedance of 150Ω to the telecommunication port under test (conversion factor is $20 \log_{10} 150 / I = 44 \text{ dB}$).

Test Setup

- 1.The EUT was put on a wooden table which was 0.8 m high above the ground and connected to the AC mains through the Artificial Mains Network (AMN). Where the mains cable supplied by the manufacture was longer than 1 m, the excess was folded back and forth parallel to the cable at the centre so as to form a bundle no longer than 0.4 m.
- 2.The EUT was kept 0.4 m from any other earthed conducting surface. Both sides of AC line were checked to find out the maximum conducted emission levels according to the test procedure during the conducted emission test.
- 3.The bandwidth of the test receiver was set at 9 kHz.

Block Diagram of Test Set-up



4.3.Radiated Emission Test (below 1 GHz)

Result : **Pass**
Test Site : 966 Chamber
Limits : EN 55032 Class B

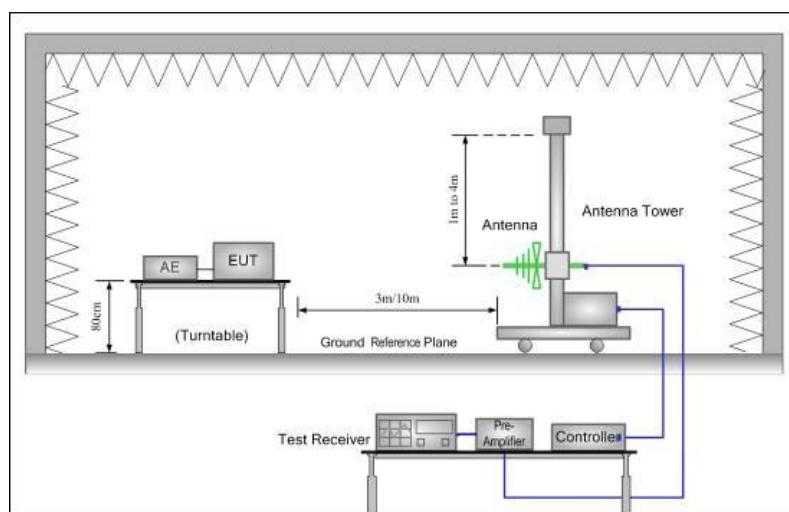
Frequency range MHz	Quasi-peak limits dB(μ V/m)
30-230	40
230-1000	47

Note: 1.The lower limit shall apply at the transition frequency.
2.Additional provisions may be required for cases where interference occurs.

Test Setup

- 1.The EUT was placed on a turn table which was 0.8 m above the ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was set 3 m away from the receiving antenna which was mounted on an antenna tower. The measuring antenna moved up and down to find out the maximum emission level. It moved from 1 m to 4 m for both horizontal and vertical polarizations.
- 2.The highest frequency of the internal sources of the EUT is less than 108 MHz, the measurement shall only be made up to 1 GHz.
- 3.The EUT was tested in the Chamber Site. It was pre-scanned with a Peak detector from the spectrum, and all the final readings from the test receiver were measured with the Quasi-Peak detector.
- 4.The bandwidth setting on the test receiver was 120 kHz.
- 5.The worst test data were reported on the following page.
- 6.Emission Level = Antenna Factor + Cable Loss + Meter Reading.

Block Diagram of Test Set-up



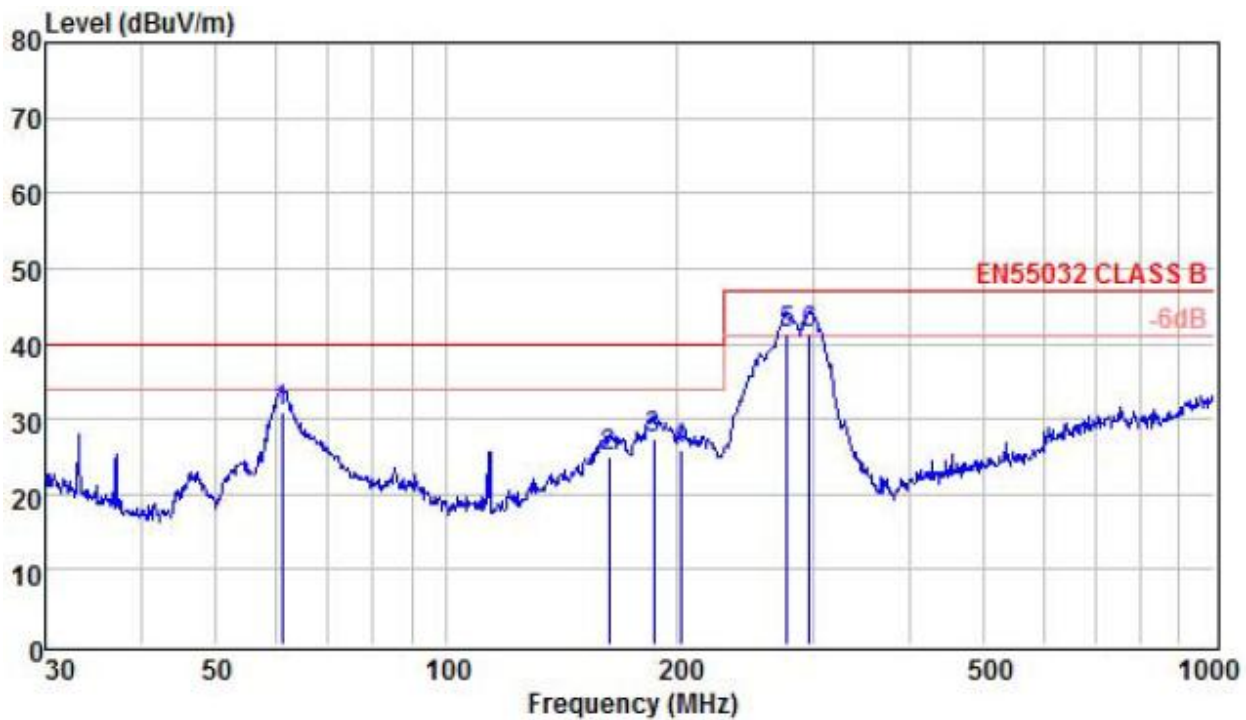
M/N : GTD9X0300-30PD

Operation Mode : Mode 1

Test Voltage : DC 24V

Test Specification : Vertical

Temperature (° C) : 24.8 Relative Humidity (%) : 56 Atmospheric Pressure(mbar) : 1015



	Freq	ReadAntenna	Cable		Limit	Over	
	Level	Factor	Loss	Level	Line	Limit	Remark
	MHz	dBuV	dB/m	dB	dBuV/m	dBuV/m	dB
1	61.13	23.31	7.32	0.30	30.93	40.00	-9.07 QP
2	162.61	14.68	9.43	0.84	24.95	40.00	-15.05 QP
3	186.44	16.26	10.21	0.86	27.33	40.00	-12.67 QP
4	202.10	14.04	11.10	0.88	26.02	40.00	-13.98 QP
5 !	278.07	27.22	13.10	1.04	41.36	47.00	-5.64 QP
6 !	297.22	26.66	13.71	1.07	41.44	47.00	-5.56 QP

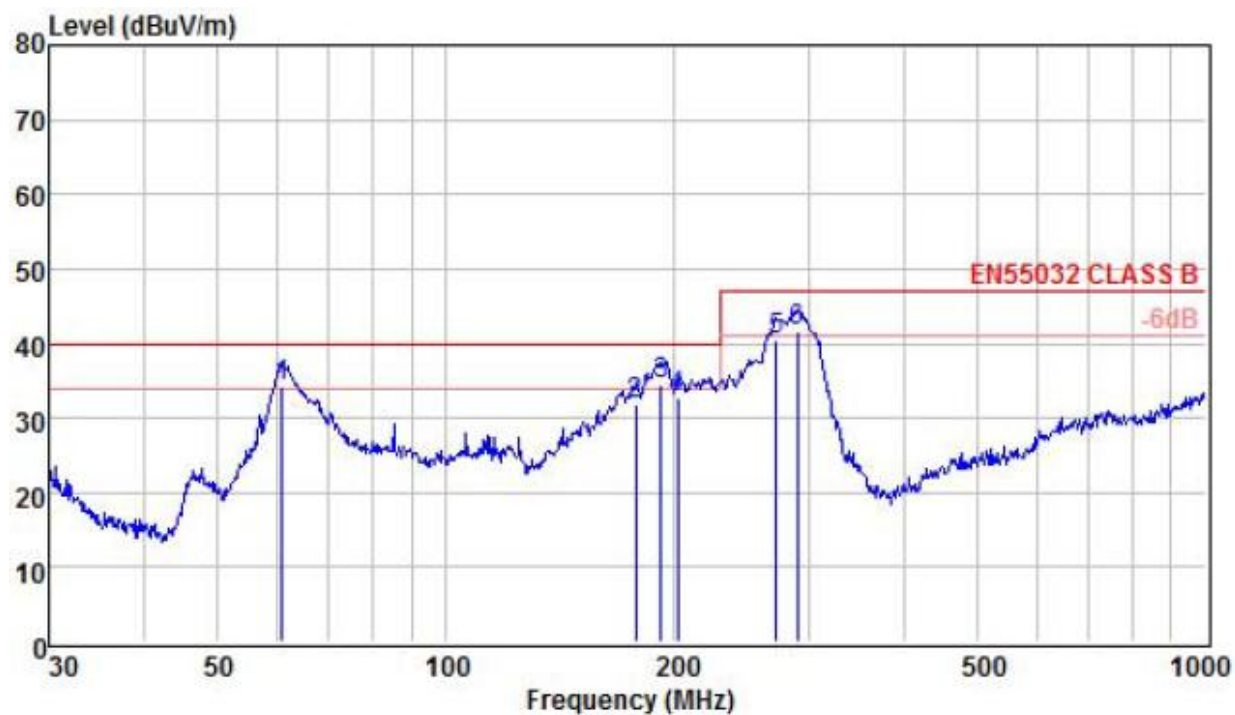
M/N : GTD9X0300-30PD

Operation Mode : Mode 1

Test Voltage : DC 24V

Test Specification : Horizontal

Temperature (° C) : 24.8 Relative Humidity (%) : 56 Atmospheric Pressure(mbar) : 1015



		ReadAntenna	Cable		Limit	Over	
	Freq	Level	Factor	Loss	Level	Line	Limit Remark
	MHz	dBuV	dB/m	dB	dBuV/m	dBuV/m	dB
1 !	60.92	26.59	7.30	0.30	34.19	40.00	-5.81 QP
2	177.51	20.61	10.25	0.85	31.71	40.00	-8.29 QP
3 !	191.75	23.00	10.55	0.86	34.41	40.00	-5.59 QP
4	202.10	20.88	11.00	0.88	32.76	40.00	-7.24 QP
5	272.28	26.30	12.98	1.03	40.31	47.00	-6.69 QP
6 !	290.02	27.24	13.40	1.06	41.70	47.00	-5.30 QP

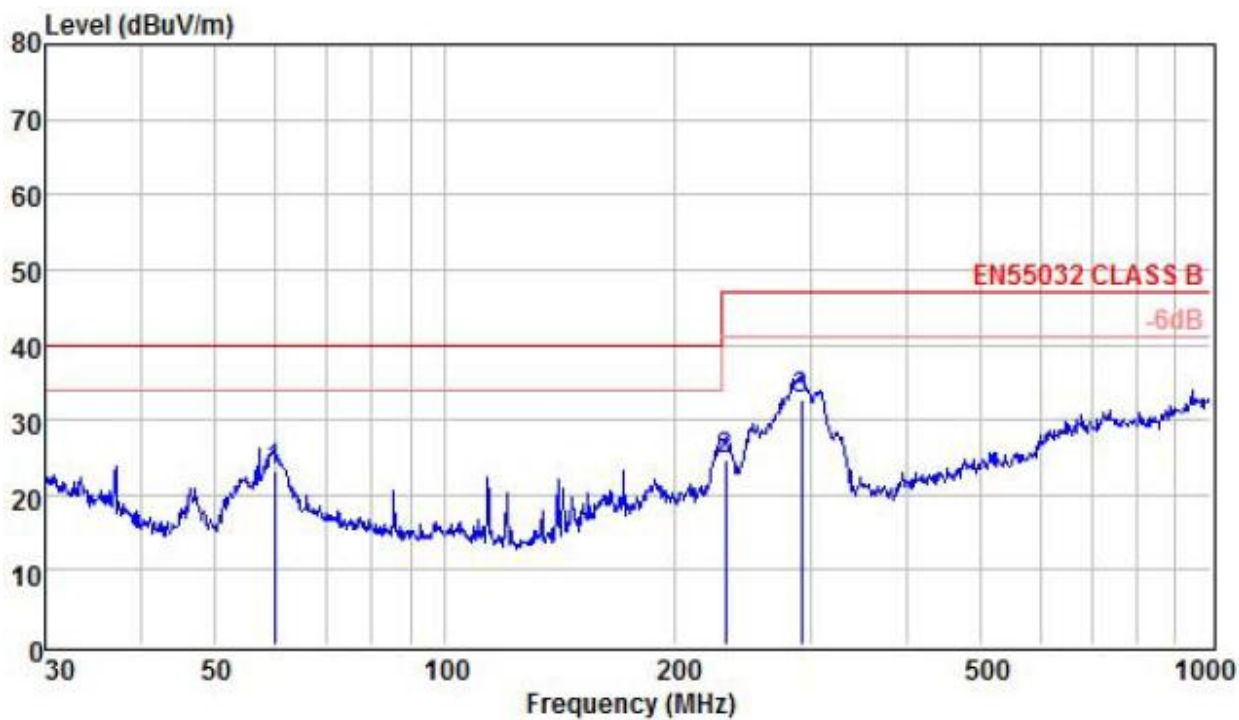
M/N GTD9X0300-30PD

Operation Mode : Mode 2

Test Voltage : DC 24V

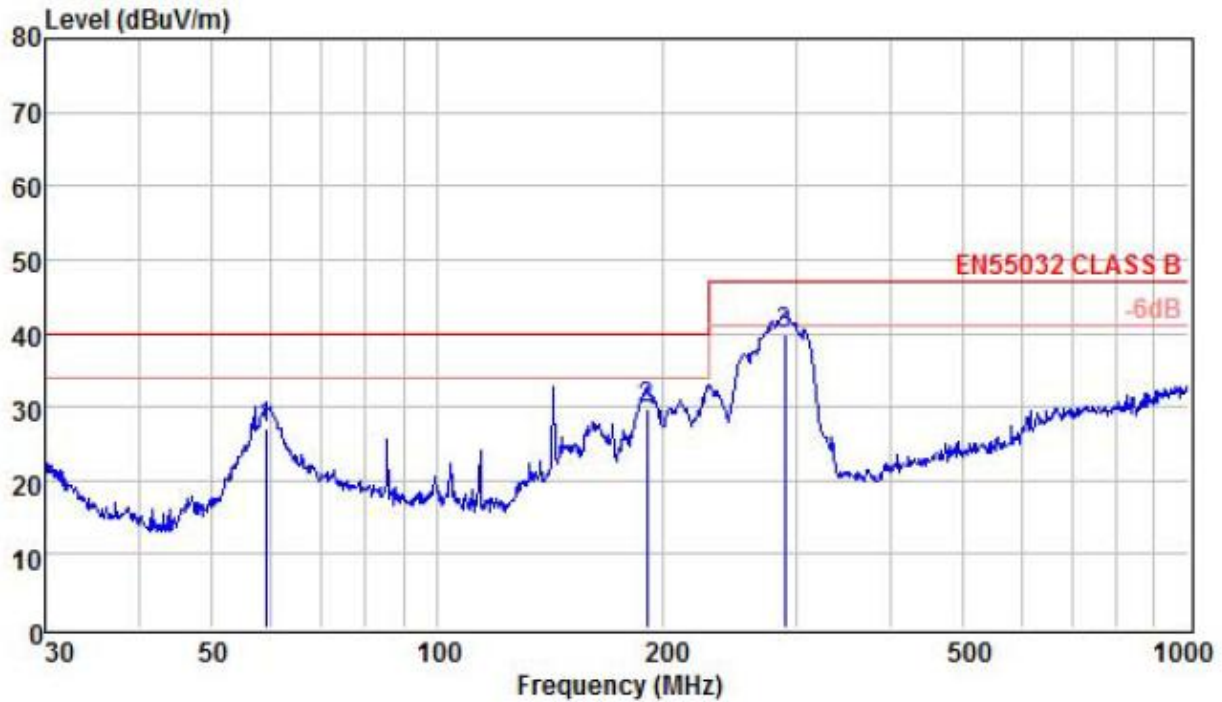
Test Specification : Vertical

Temperature (° C) : 24.8 Relative Humidity (%) : 56 Atmospheric Pressure(mbar) : 1015



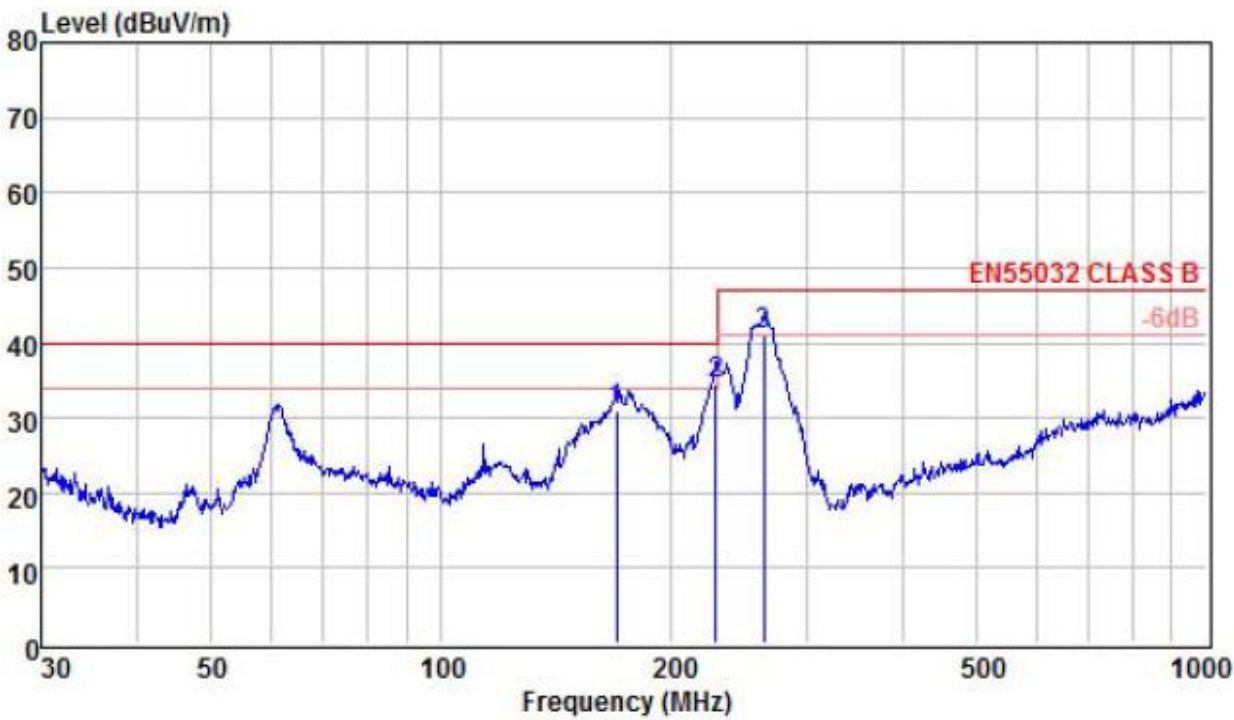
	Freq	ReadAntenna	Cable		Limit	Over	
	Level	Factor	Loss	Level	Line	Limit	Remark
	MHz	dBuV	dB/m	dB	dBuV/m	dBuV/m	dB
1	59.86	15.47	7.32	0.29	23.08	40.00	-16.92 QP
2	232.53	11.22	12.41	0.95	24.58	47.00	-22.42 QP
3	292.06	18.23	13.55	1.07	32.85	47.00	-14.15 QP

M/N : GTD9X0300-30PD
 Operation Mode : Mode 2
 Test Voltage : DC 24V
 Test Specification : Horizontal
 Temperature (° C) : 24.8 Relative Humidity (%) : 56 Atmospheric Pressure(mbar) : 1015



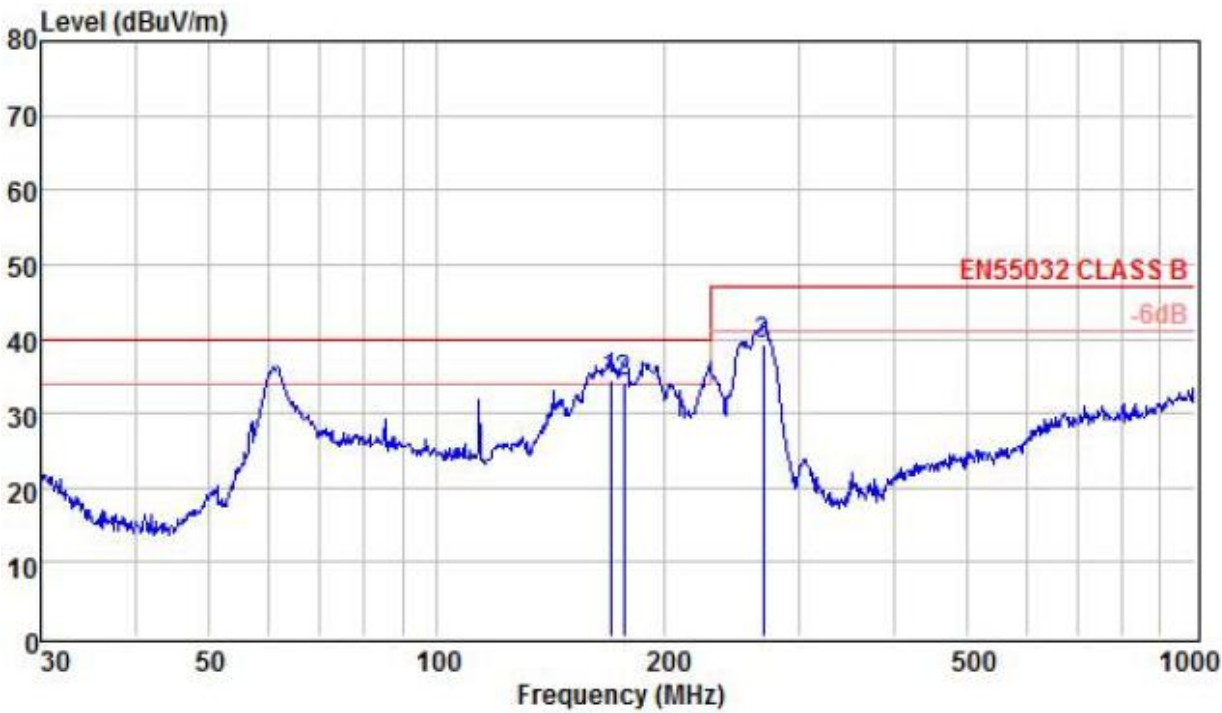
	Freq	ReadAntenna Level	Antenna Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dBuV/m	dBuV/m	dB	
1	59.03	19.37	7.30	0.29	26.96	40.00	-13.04	QP
2	189.74	18.75	10.10	0.86	29.71	40.00	-10.29	QP
3	290.02	25.41	13.40	1.06	39.87	47.00	-7.13	QP

M/N : GTD9X0300-30PD
Operation Mode : Mode 3
Test Voltage : DC 12V
Test Specification : Vertical
Temperature (° C) : 24.8 Relative Humidity (%) : 56 Atmospheric Pressure(mbar) : 1015



	Freq	ReadAntenna	Cable		Limit	Over	
	Level	Factor	Loss	Level	Line	Limit	Remark
	MHz	dBuV	dB/m	dB	dBuV/m	dBuV/m	dB
1	169.60	19.98	10.06	0.84	30.88	40.00	-9.12 QP
2 !	228.49	21.28	12.30	0.94	34.52	40.00	-5.48 QP
3 !	263.82	27.18	12.96	1.01	41.15	47.00	-5.85 QP

M/N : GTD9X0300-30PD
Operation Mode : Mode 3
Test Voltage : DC 12V
Test Specification : Horizontal
Temperature (° C) : 24.8 Relative Humidity (%) : 56 Atmospheric Pressure(mbar) : 1015



		ReadAntenna		Cable		Limit	Over	
	Freq	Level	Factor	Loss	Level	Line	Limit	Remark
	MHz	dBuV	dB/m	dB	dBuV/m	dBuV/m	dB	
1 !	169.60	23.49	10.10	0.84	34.43	40.00	-5.57	QP
2 !	176.27	23.16	10.25	0.85	34.26	40.00	-5.74	QP
3	269.43	25.35	12.98	1.02	39.35	47.00	-7.65	QP

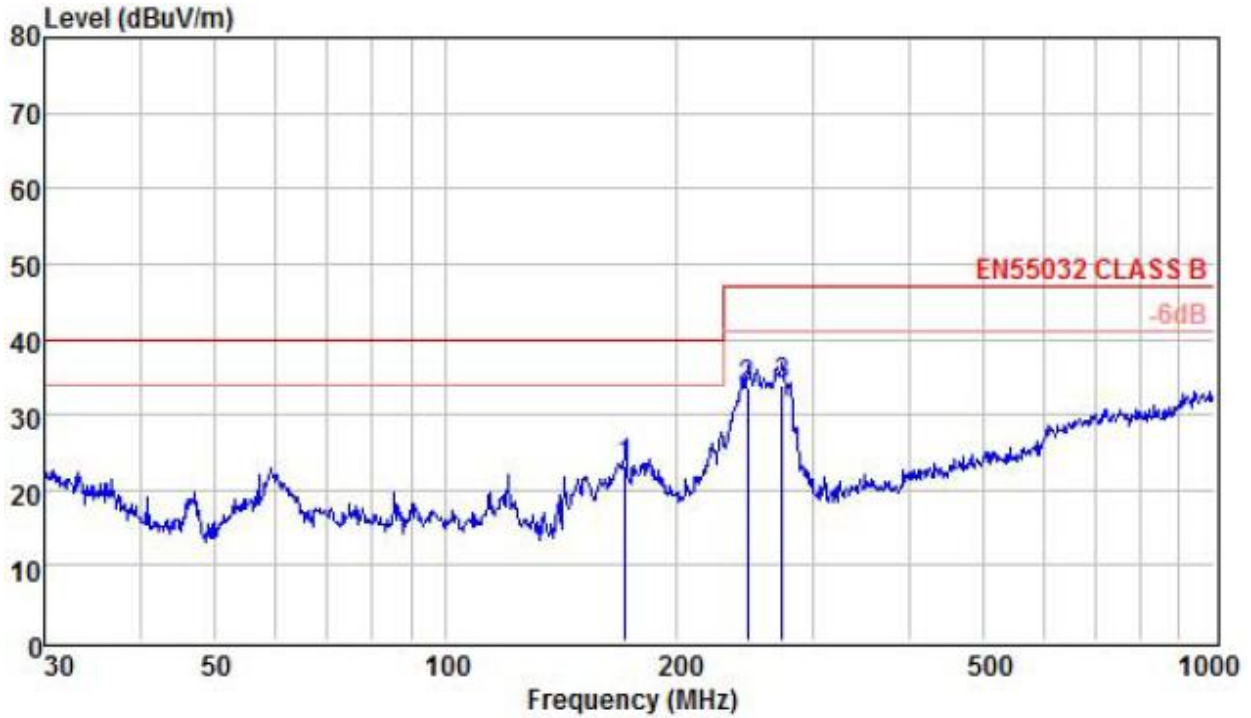
M/N : GTD9X0300-30PD

Operation Mode : Mode 4

Test Voltage : DC 12V

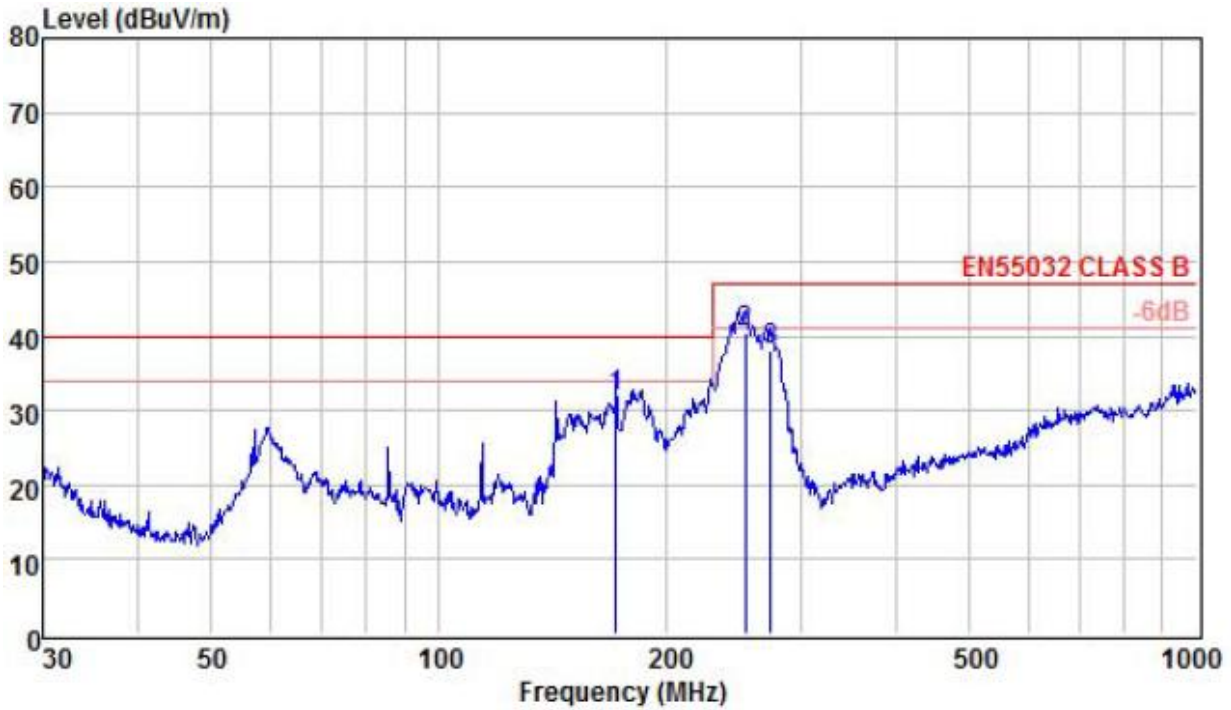
Test Specification : Vertical

Temperature (° C) : 24.8 Relative Humidity (%) : 56 Atmospheric Pressure(mbar) : 1015



	Freq	ReadAntenna	Cable		Limit	Over	
	Level	Factor	Loss	Level	Line	Limit	Remark
	MHz	dBuV	dB/m	dB	dBuV/m	dBuV/m	dB
1	171.39	12.32	10.14	0.85	23.31	40.00	-16.69 QP
2	246.81	19.68	12.81	0.98	33.47	47.00	-13.53 QP
3	274.19	19.76	13.00	1.03	33.79	47.00	-13.21 QP

M/N : GTD9X0300-30PD
 Operation Mode : Mode 4
 Test Voltage : DC 12V
 Test Specification : Horizontal
 Temperature (° C) : 24.8 Relative Humidity (%) : 56 Atmospheric Pressure(mbar) : 1015



	Freq	Read Level	Antenna Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dBuV/m	dBuV/m	dB	
1	171.39	20.83	10.10	0.85	31.78	40.00	-8.22	QP
2	253.84	26.62	12.92	0.99	40.53	47.00	-6.47	QP
3	274.19	24.11	13.00	1.03	38.14	47.00	-8.86	QP

4.4.Radiated Emission Test (above 1 GHz)

Result : N/A
Test Site : 966 Chamber
Limits : EN 55032 Class B

Frequency range GHz	Average limit dB(μV/m)	Peak limit dB(μV/m)
1-3	50	70
3-6	54	74
Note: The lower limit applies at the transition frequency		

Conditional testing procedure

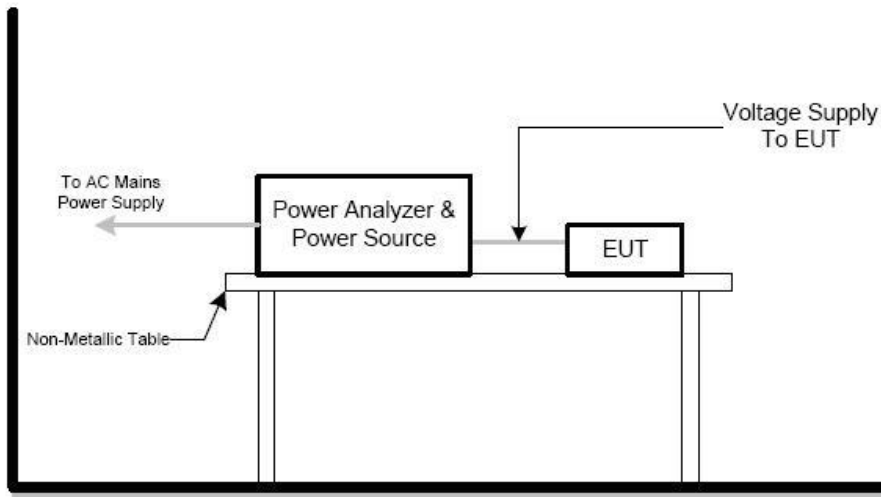
- 1.The EUT was placed on a turn table which was 0.8 m above the ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was set 3 m away from the receiving antenna which was mounted on an antenna tower. The measuring antenna moved up and down to find out the maximum emission level. It moved from 1 m to 4 m for both horizontal and vertical polarizations.
- 2.The EUT was tested in the 3m Chamber Site. It was pre-scanned with a Peak detector from the spectrum.
- 3.The bandwidth setting on the test receiver was 1 MHz.
4. Emission Level = Antenna Factor + Cable Loss + Meter Reading - Preamp Factor.
 - ☐ the highest frequency of the internal sources of the EUT is between 108 MHz and 500 MHz, the measurement shall only be made up to 2 GHz.
 - ☐ the highest frequency of the internal sources of the EUT is between 500 MHz and 1 GHz, the measurement shall only be made up to 5 GHz.
 - ☐ the highest frequency of the internal sources of the EUT is above 1 GHz, the measurement shall be made up to 5 times the highest frequency or 6 GHz, whichever is less.

4.5. Harmonic Current Emissions on AC Mains Test

Result : N/A

Limits : EN IEC 61000-3-2 Class A

Block Diagram of Test Set-up



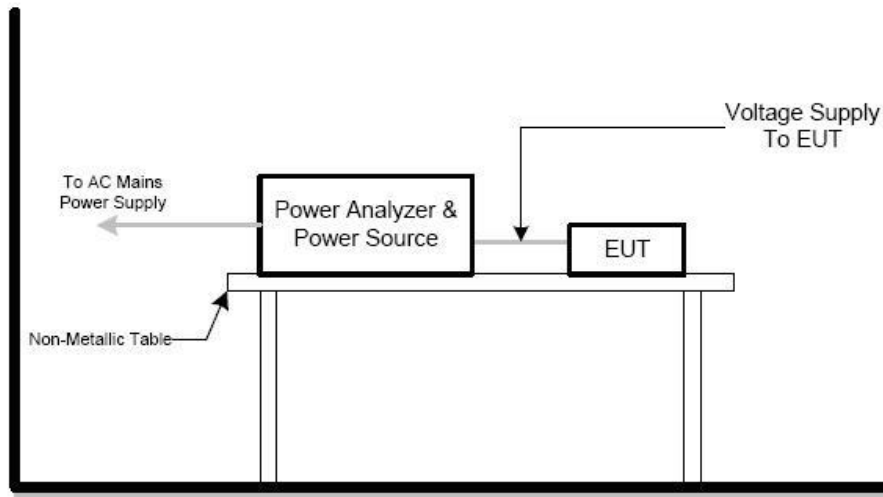
According to EN IEC 61000-3-2:2019+A1:2021, for products ≤ 75 watts, no limits are defined for the harmonics test. The EUT is deemed to comply with the standard without test.

4.6.Voltage Fluctuations and Flicker on AC Mains Test

Result : **N/A**

Limits : EN 61000-3-3

Block Diagram of Test Set-up



The test data of the worst case condition(s) was reported on the page below.

Test Data

M/N :

Operation Mode :

Test Voltage :

Temperature (° C) : 23.8 Relative Humidity (%) : 55.8 Atmospheric Pressure(mbar) : 1015

Voltage Fluctuation	Limit	Value
Relative Voltage Change Characteristic T(max) (dc>3%)	500 ms	0 ms
Maximum Relative Voltage Change dmax	4%	0.00
	6%	/
	7%	/
Relative Steady-state Voltage Change dc	3.3%	0.00
Flicker	Limit	Value
Short-term Flicker Indicator Pst	1.0	0.064
Long-term Flicker Indicator Plt	0.65	/

5. IMMUNITY TEST RESULTS

5.1. Description of Performance Criteria

Performance criteria A

The equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

Performance criteria B

After the test, the equipment 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 equipment 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 equipment if used as intended.

Performance criteria C

Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions. Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

5.2. Electrostatic Discharge Immunity Test

Result	: Pass
Test Procedure	: EN 55035
Test Specification	: ± 4 kV (Contact discharge); ± 8 kV (Air discharge)
Number of Discharges	: 10 (Air discharge for single polarity discharge) 10 (Contact discharge for single polarity discharge)
Repetition Rate	: One discharge per second
Performance Criterion	: B

Test Specification

The EUT was put on a 0.8m high wooden table/0.1m high for floor standing equipment standing on the ground reference plane (GRP) 3m by 2m in size, made by iron 1.0 mm thick.

A horizontal coupling plane (HCP) 1.6m by 0.8m in size was placed on the table, and the EUT with its cables were isolated from the HCP by an insulating support thick than 0.5mm. The VCP 0.5m by 0.5m in size & HCP were constructed from the same material type & thickness as that of the GRP, and connected to the GRP via a 470k Ω resistor at each end.

The distance between EUT and any of the other metallic surface excepted the GRP, HCP & VCP was greater than 1m.

The EUT was arranged and connected according to its functional requirements.

Direct static electricity discharges were applied only to those points and surface which are accessible to personnel during normal usage

On each preselected points 10 times of each polarity single discharge were applied. The time interval between successive single discharges is at least 1s.

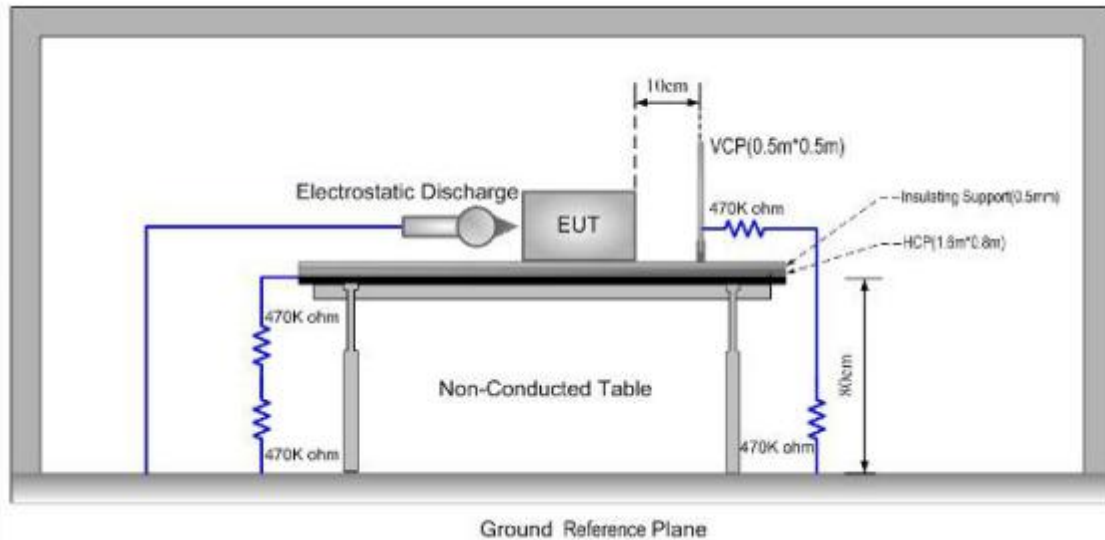
The ESD generator was held perpendicular to the surface to which the discharge is applied. The discharge return cable of the generator was kept at a distance of 0.2m whilst the discharge is being applied. During the contact discharges, the tip of the discharge electrode was touch the EUT before the discharge switch is operated. During the air discharges, the round discharge tip of the discharge electrode was approached as fast as possible to touch the EUT.

Indirect discharge was conducted to objects placed near the EUT, simulated by applying the discharges of the ESD generator to a coupling plane, in the contact discharge mode.

After each discharge, the ESD generator was removed from the EUT, the generator is then retriggered for a new single discharge. For ungrounded product, a grounded carbon fibre brush with bleeder resistors (2 $\times$ 470 k Ω) in the grounding cable was used after each discharge to remove remnant electrostatic voltage.

10 times of each polarity single discharge were applied to HCP and VCP. The detail selected points are listed in the following table.

Block Diagram of Test Set-up



Test data

M/N : GTD9X0300-30PD

Operation Mode : All Mode

Test Voltage : DC 24V

Temperature (° C) : 24.9 Relative Humidity (%) : 55 Atmospheric Pressure(mbar) : 1015

Discharge Location		Type of Discharge	Result
HCP	4 points	Contact	Pass
VCP	4 points	Contact	Pass
Output Port	2 points	Contact	Pass
Gap	4 points	Air	Pass

*Remark: 1. No obvious change of function was found after the test.
 2. Discharge should be considered on Contact, Air, Horizontal Coupling Plane (HCP) and Vertical Coupling Plane (VCP).*

5.3. Radio Frequency Electromagnetic Field Immunity Test

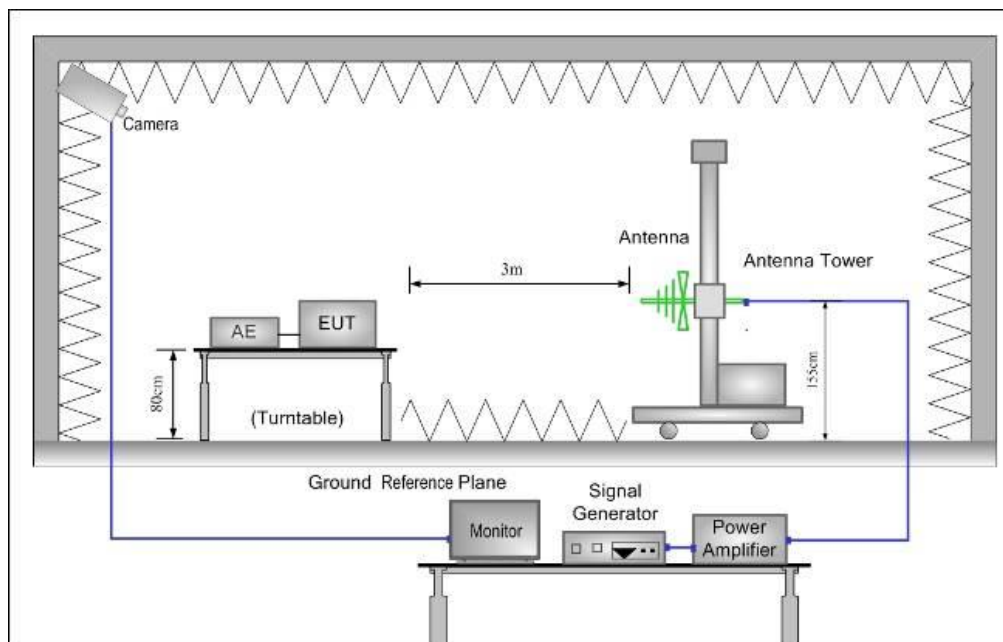
Result : **Pass**
Test Procedure : EN 55035
Performance Criterion : A
Test Site : Full Anechoic Room

Test Specification

The EUT and its simulators were placed on a turn table which was 0.8 meter above the ground. The EUT was set 3 m away from the transmitting antenna which was mounted on an antenna tower. Both horizontal and vertical polarizations of the antenna were set on the test. Each of the four sides of the EUT was faced the transmitting antenna and measured individually.

The test was carried out in the Anechoic Chamber which was that of a size adequate to maintain a uniform field of sufficient dimensions with respect to the EUT. Additional absorbers were used to damp reflections in chambers which were not fully lined.

Block Diagram of Test Set-up



Test data

M/N : GTD9X0300-30PD

Operation Mode : All Mode

Test Voltage : DC 24V

Temperature (° C) : 24.9 Relative Humidity (%) : 56 Atmospheric Pressure(mbar) : 1015

Position	Test Level	Frequency Range	Modulated Signal	Freq. Step	Dwell Time	Result
Front	3 V/m	80 to 1000 MHz	AM 80%, 1kHz sine wave	1%	3 s	Pass
Right						Pass
Rear						Pass
Left						Pass
Front	3 V/m	1800 MHz	AM 80%, 1kHz sine wave	1%	3 s	Pass
Right						Pass
Rear						Pass
Left						Pass
Front	3 V/m	2600 MHz	AM 80%, 1kHz sine wave	1%	3 s	Pass
Right						Pass
Rear						Pass
Left						Pass
Front	3 V/m	3500 MHz	AM 80%, 1kHz sine wave	1%	3 s	Pass
Right						Pass
Rear						Pass
Left						Pass
Front	3 V/m	5000 MHz	AM 80%, 1kHz sine wave	1%	3 s	Pass
Right						Pass
Rear						Pass
Left						Pass
Remark: The EUT was operated as intended during and after the test.						

5.4. Electrical Fast Transient/Burst Immunity Test

Result : N/A

Test Procedure : EN 55035

Performance Criterion : B

Waveshape of the pulse : $T_r/T_d = 5/50$ ns

Repetition Frequency: 5 kHz; Burst Duration: 15 ms; Burst Period: 300 ms;
Test Duration: 60 s

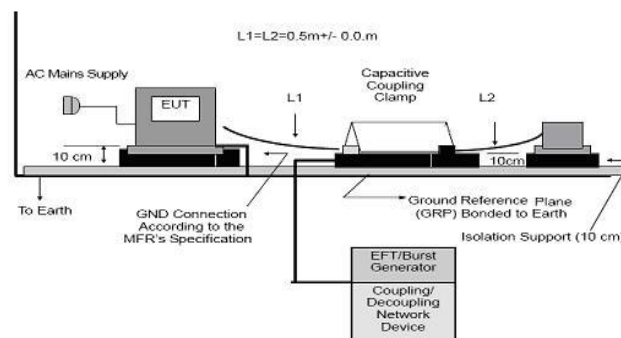
Test Site : LAB 3

Test Specification

1. The test generator and the coupling/decoupling network were placed directly on, and bonded to, the ground reference plane. The ground reference plane projected beyond the EUT or/and the coupling clamp by at least 0.1 m on all sides. And the minimum area was 1 m x 1 m. The minimum distance between the EUT and all other conductive structures, except the ground plane was more than 0.5 m.

2. EUT and its simulators were placed on the insulation support 0.1 m above the ground reference plane. The length of the cables between the coupling device and the EUT was 0.5 m. If it was more than 0.5 m, the excess length of this cable was folded to avoid a flat coil and situated at a distance of 0.1 m above the ground reference plane.

Block Diagram of Test Set-up



Test data

M/N :

Operation Mode :

Test Voltage :

Temperature (° C) : 24.9 Relative Humidity (%) : 55 Atmospheric Pressure(mbar) : 1015

Coupling Ports			Coupling Voltage	Inject Method	Result
AC Power Ports	L	☐	±1 kV	Direct	N/A
	N	☐	±1 kV		N/A
	L-N	☐	±1 kV		N/A
	PE	☐	±1 kV		N/A
	L-PE	☐	±1 kV		N/A
	N-PE	☐	±1 kV		N/A
	L-N-PE	☐	±1 kV		N/A
Signal line		☐	±0.5 kV	Clamp	N/A
Remark: No obvious change of function was found after the test.					

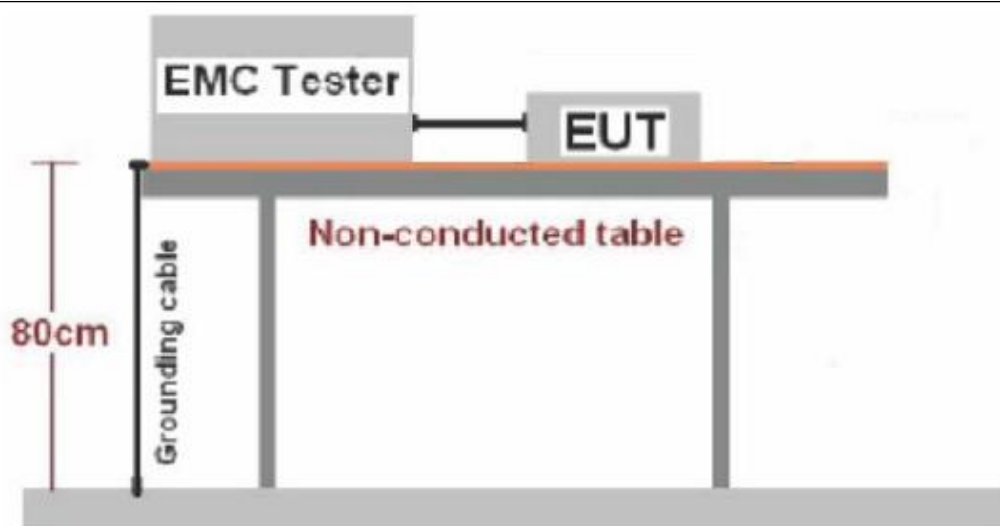
5.5.Surge Immunity Test

Result	: N/A
Test Procedure	: EN 55035
Performance Criterion	: B
Waveform Parameters	: Open-circuit voltage: 1.2/50 μ s Short-circuit current: 8/20 μ s
Test Site	: LAB 3

Test Specification

- 1.The effective output impedance of the generator was 2 Ω for L-N test, and 12 Ω for L-PE and N-PE test.
- 2.For d.c. power ports and interconnection lines, the surge pulses were 5 positive and 5 negative. For a.c. power ports, the surge pulses were 5 positive and 5 negative each at 0°, 90°, 180°and at 270°. The time between successive pulses was 1 minute.
- 3.For double-insulated products without PE or external earth connections, the test was done in a similar way as for grounded products but without additional external grounded connections. If there were no other possible connections to earth, line-to-ground tests were omitted. The power cord or/and interconnection line between the EUT and the coupling/decoupling network was less than 2 m in length.

Block Diagram of Test Set-up



Test data

M/N :

Operation Mode :

Test Voltage :

Temperature (° C) : 24.9 Relative Humidity (%) : 55 Atmospheric Pressure(mbar) : 1015

Coupling Ports			Repetition Rate	Coupling Voltage	Coupling Phase / Result			
					0°	+90°	180°	-270°
AC power ports	L-N	☐	60 s	1 kV	N/A	N/A	N/A	N/A
	L-PE	☐	60 s	2 kV	N/A	N/A	N/A	N/A
	N-PE	☐	60 s	2 kV	N/A	N/A	N/A	N/A
Signal		☐	60 s	0.5 kV	N/A	N/A	N/A	N/A

Remark: No obvious change of function was found after the test.

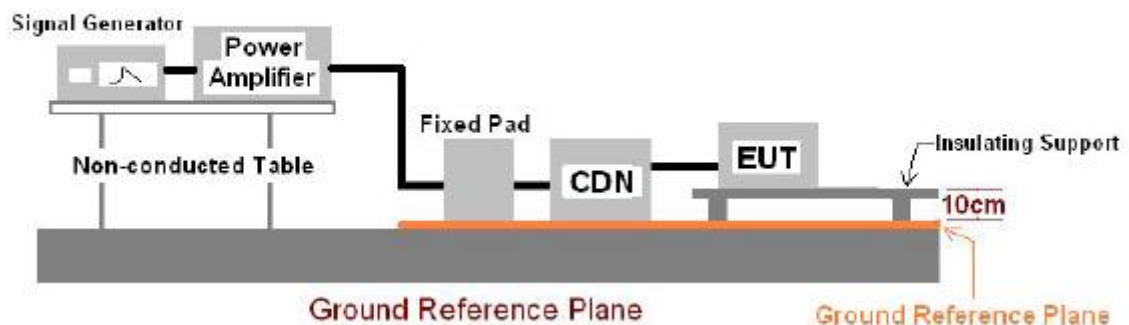
5.6. Injected Currents Susceptibility Test

Result	: N/A
Test Procedure	: EN 55035
Performance Criterion	: A
Test Site	: LAB 4

Test Specification

1. The EUT was placed on an insulating support of 0.1m height above the ground reference plane. All cables exiting the EUT were supported at a height of 30 mm above the ground reference plane. CDN (coupling and decoupling device) was placed on the ground reference plane about 0.3 m from the EUT. The cables between the CDN and EUT were as short as possible (0.1 m to 0.3 m) and were not to be bundled or wrapped. Their height above the ground reference plane was 30 mm.
2. The frequency range was swept from 150 kHz to 80 MHz, using the signal levels established during the setting process, and with the disturbance signal 80% amplitude modulated with a 1kHz sine wave.
3. The frequency was swept incrementally, the step size was 1% of the preceding frequency value. The dwell time of the amplitude modulated carrier at each frequency was 1.5 s.

Block Diagram of Test Set-up



Test data

M/N :

Operation Mode :

Test Voltage :

Temperature (° C) : 24.8 Relative Humidity (%) : 57 Atmospheric Pressure(mbar) : 1015

Coupling ports	Voltage (r.m.s)	Frequency Range	Modulation Signal	Freq. Step	Dwell Time	Coupling Method	Result
AC Power Ports	3 V	0.15MHz to 10 MHz	AM 80%, 1kHz sine wave	1%	1.5 s	CDN	N/A
AC Power Ports	3-1 V	10 MHz to 30 MHz	AM 80%, 1kHz sine	1%	1.5 s	CDN	N/A
AC Power Ports	1V	30 MHz to 80 MHz	AM 80%, 1kHz sine	1%	1.5 s	CDN	N/A

Remark: The EUT was operated as intended during and after the test.

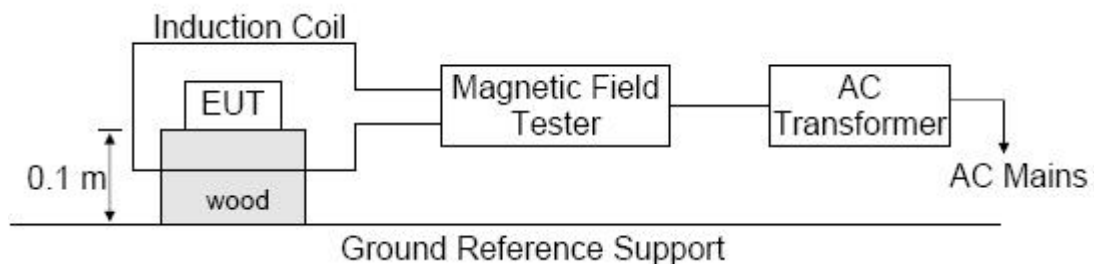
5.7.Power Frequency Magnetic Field Immunity Test

Result	: N/A
Test Procedure	: EN 55035
Performance Criterion	: A
Test Site	: LAB 2

Test Specification

- 1.The EUT was subjected to the test magnetic field by using the standard inductive coil 1 m x 1 m. The plane of the inductive coil then was rotated by 90°in order to expose the EUT to the test field with different orientations.
- 2.The magnetic field strength was expressed in A/m; 1 A/m corresponded to a free space magnetic flux density of $1.26 \mu\text{T}$.
- 3.The electromagnetic conditions of the laboratory were such as to guarantee the correct operation of the EUT in order to influence the test results. And the power frequency magnetic field value of the laboratory was at least 20 dB lower than the selected test level.

Block Diagram of Test Set-up



Applicable only to EUT containing devices susceptible to magnetic fields, such as CRT monitors, Hall elements, electrodynamic microphones, magnetic field sensors, etc.

Test data

M/N :

Operation Mode :

Test Voltage :

Temperature (° C) : 24.9 Relative Humidity (%) : 55 Atmospheric Pressure(mbar) : 1015

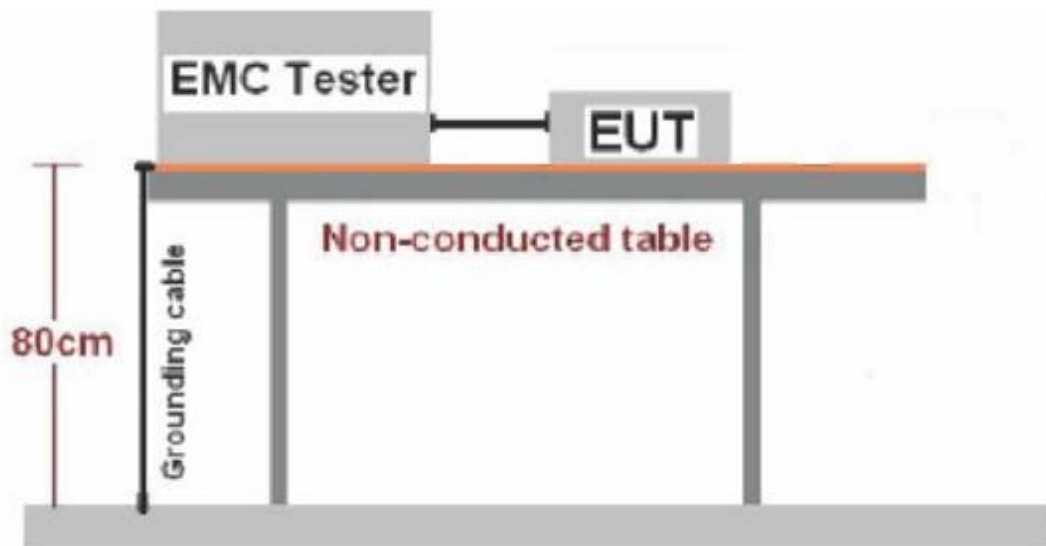
Test Level	Testing Duration	Coil Orientation	Criterion	Result
1 A/m	5 min	X	A	N/A
1 A/m	5 min	Y	A	N/A
1 A/m	5 min	Z	A	N/A
Remark: The EUT was operated as intended during and after the test.				

5.8.Voltage Dips and Short Interruptions Immunity Test

Result	: N/A
Test Procedure	: EN 55035
Criterion	: B, C, C
Test Site	: LAB 4
Test Specification	

- 1.The test was performed with the EUT connected to the test generator with the shortest possible length suitable to the application of the EUT.
- 2.The EUT was tested for each selected combination of test level and duration with a sequence of three dips/interruptions with intervals of 10 s (between each test event). Each representative mode of operation was to be tested.
- 3.For voltage dips and short interruptions, changes in supply voltage were to occur at zero crossings of the voltage.

Block Diagram of Test Set-up



Test data

M/N :

Operation Mode :

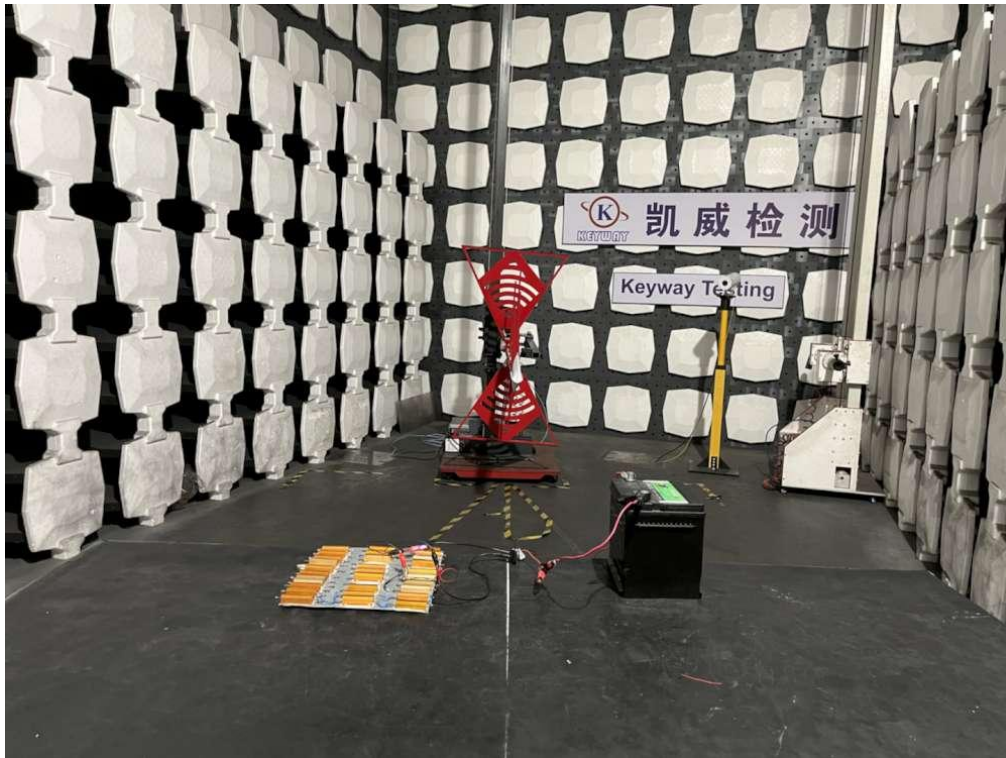
Test Voltage :

Temperature (° C) : 24.9 Relative Humidity (%) : 55 Atmospheric Pressure(mbar) : 1015

Test Level in % U_T	Voltage Dips & Short Interruptions in % U_T	Durations (in Period)	Criterion	Result
0	100	0.5 P	B	N/A
70	30	25 P	C	N/A
0	100	250 P	C	N/A
<i>Remark: No obvious change of function was found after the test.</i>				

6. PHOTOGRAPHS OF TEST SET-UP

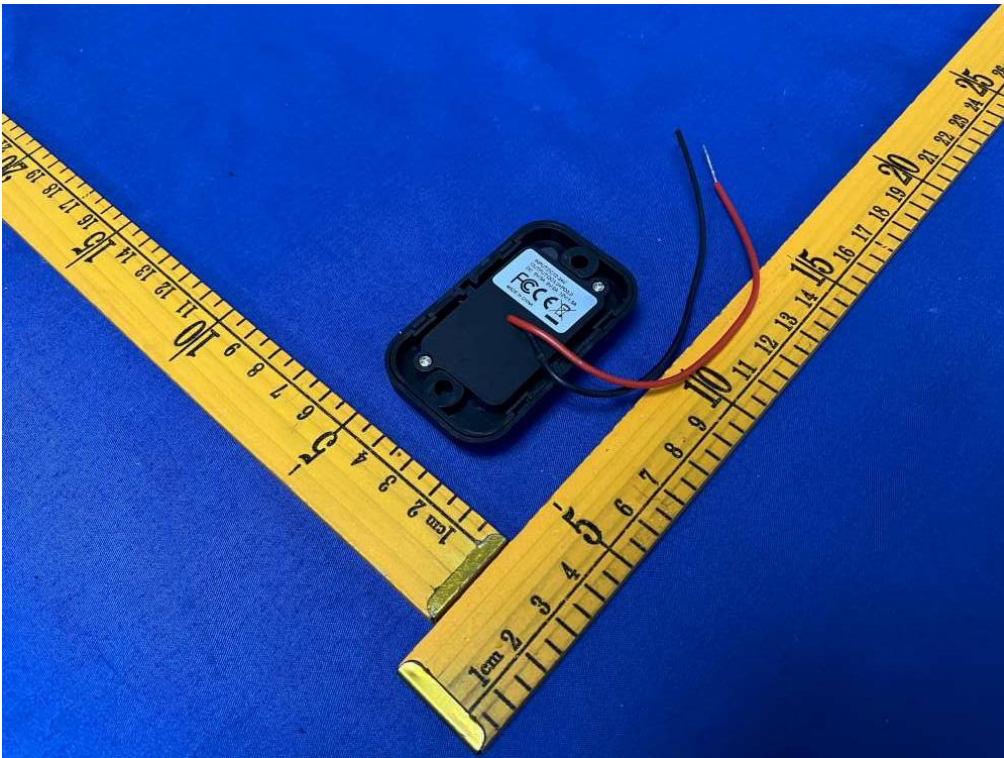
Radiated Emission Test

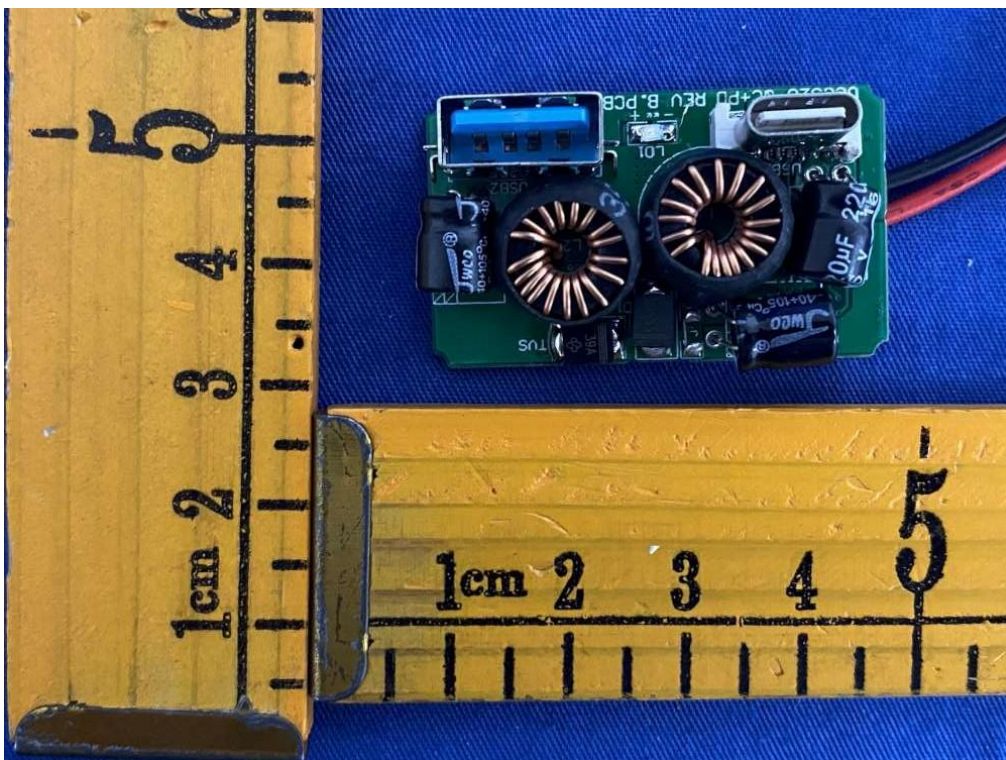
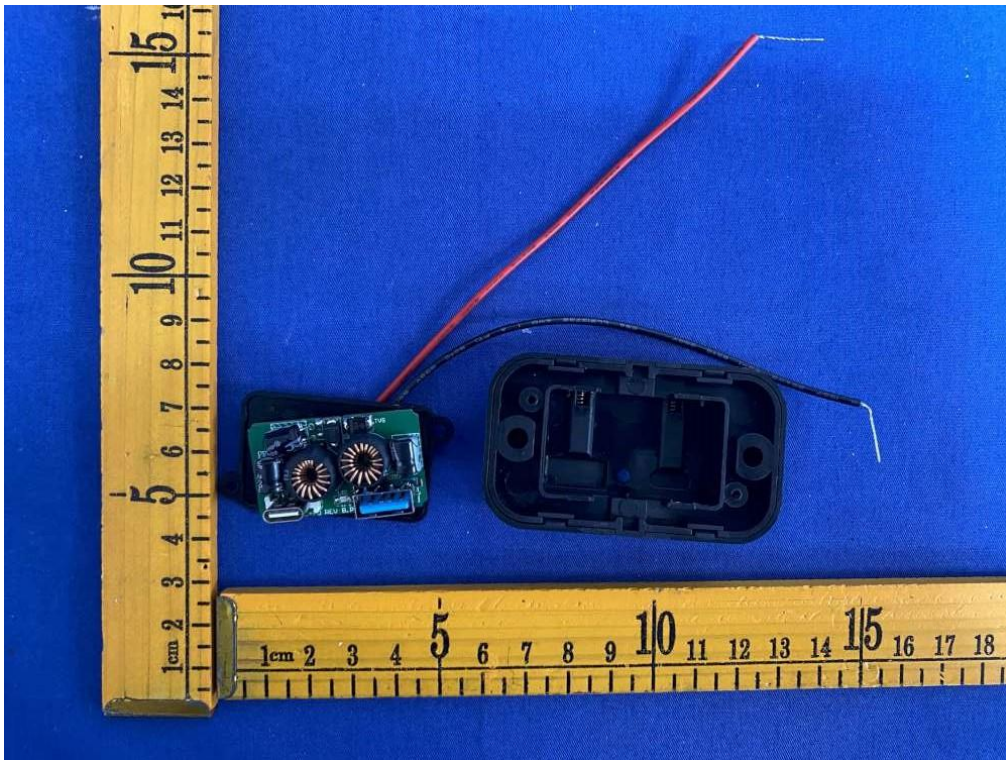


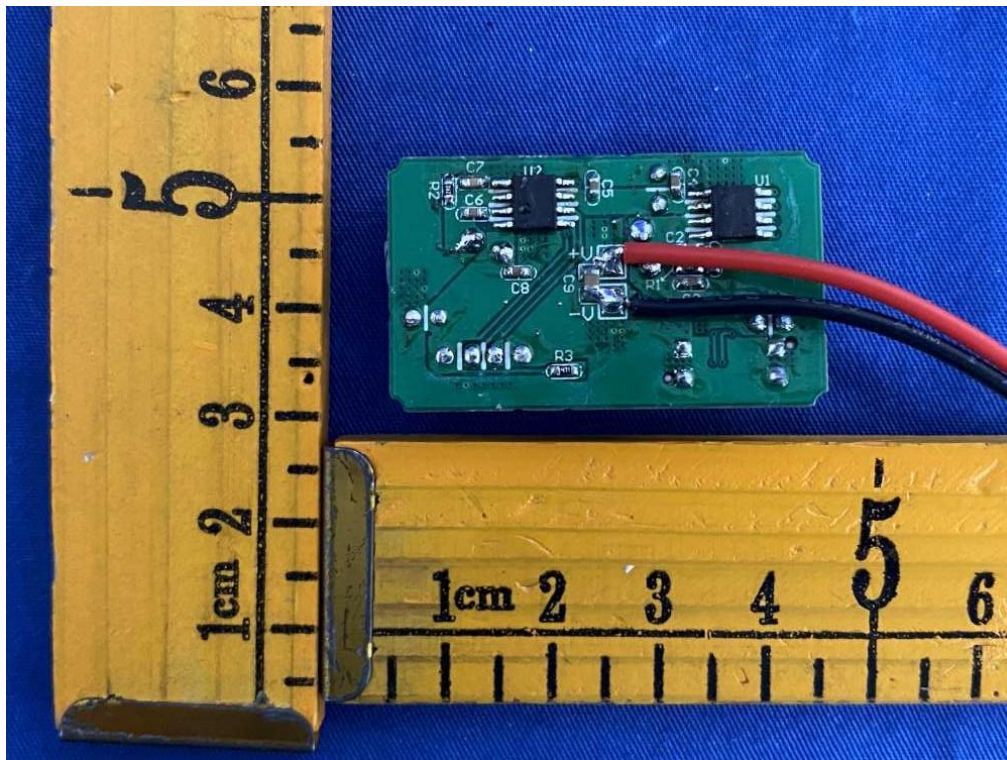
Electrostatic Discharge Immunity Test



7. PHOTOGRAPHS OF THE EUT







*** the end of report ***