TEST REPORT

Product Name : CM3399 Core Board
Model Number : CM3399-V3

Prepared for	:	BOARDCON TECHNOLOGY LIMITED
Address	:	ROOM702, XINAN BUSINESS BUILDING, 45ZONE, BAOAN DISTRCT
Prepared by	:	EMTEK (SHENZHEN) CO., LTD.
Address	:	Building 69, Majialong Industry Zone, Nanshan District, Shenzhen, Guangdong, China Tel: (0755) 26954280 Fax: (0755) 26954282
Report Number	:	ENS2112140001E00201R
Date of Test	:	December 14, 2021 to December 20, 2021
Date of Report	:	December 20, 2021

TABLE OF CONTENT

TEST REPORT DESCRIPTION

Applicant	:	BOARDCON TECHNOLOGY LIMITED
Manufacturer	:	BOARDCON TECHNOLOGY LIMITED
Trade Mark	:	N/A
EUT	:	CM3399 Core Board
Model Number	:	CM3399-V3
Power supply	:	AC 230V/50Hz, AC 120V/60Hz

Measurement Procedure Used:
EN 55032:2015+A11:2020,
EN IEC 61000-3-2:2019,
EN 61000-3-3:2013+A1:2019,
EN 55035:2017+A11:2020
(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 device described above is tested by EMTEK (SHENZHEN) CO., LTD. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and EMTEK (SHENZHEN) CO., LTD. is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the EN 55032, EN 61000-3-2, EN 61000-3-3, EN 55035 requirements.
This report applies to above tested sample only and shall not be reproduced in part without written approval of EMTEK (SHENZHEN) CO., LTD.

Date of Test	:	December 14, 2021 to December 20, 2021
Prepared by	:	Junqin Cai/Editor
Reviewer	:	Joe Xia/Supervisor
Approved & Authorized Signer	:	Lisa Wang/Manager

Modified Information

Version	Report No.	Revision Date	Summary
Ver.1.0	ENS2112140001E00201R	/	Original Report

1. DESCRIPTION OF STANDARDS AND RESULTS (EUT)

EMISSION				
Description of Test Item		Standard	Limits	Results
Conducted Emissions From the AC Mains Power Ports		EN 55032	Class B	Pass
Asymmetric mode conducted emissions	Wired network ports		Class B	N/A
	Optical fibre ports		Class B	N/A
	Broadcast receiver tuner ports		Class B	N/A
	Antenna ports		Class B	N/A
Conducted differential voltage emissions	TV broadcast receiver tuner ports		Class B	N/A
	RF modulator output ports		Class B	N/A
	FM broadcast receiver tuner ports		Class B	N/A
Radiated emissions at frequencies up to 1 GHz			Class B	Pass
Radiated emissions at frequencies above 1 GHz			Class B	Pass
Radiated emissions from FM receivers			Table A.6	N/A
Outdoor units of home satellite receiving systems			Table A.7	N/A
Harmonic Current Emissions		EN 61000-3-2:2019	Class A	Pass
Voltage Fluctuation and Flicker		EN61000-3-3:2013+A1:2019	Section 5	Pass
IMMUNITY				
Description of Test Item		Basic Standard	Performance Criteria	Results
Electrostatic Discharge	Enclosure ports	IEC 61000-4-2:2008	B	Pass
Continuous RF electromagnetic field disturbances	Enclosure ports	IEC 61000-4-3:2006+A1:2007+A2:2010	A	Pass
Electrical fast transients/burst	AC mains power ports	IEC61000-4-4:2012	B	Pass
	Analogue/digital data ports		B	N/A
	DC network power ports		N/A	N/A
Surges	AC mains power ports	IEC 61000-4-5:2014	B	Pass
	Analogue/digital data ports		C	N/A
	DC network power ports		N/A	N/A
Continuous induced RF disturbances	AC mains power ports	IEC 61000-4-6:2013	A	Pass
	Analogue/digital data ports		A	N/A
	DC network power ports		N/A	N/A
Power frequency magnetic field	Enclosure ports	IEC 61000-4-8:2009	A	Pass
Voltage dips and interruptions	AC mains power ports	IEC 61000-4-11:2004	B, C	Pass
Note: N/A is an abbreviation for Not Applicable.				

2. GENERAL INFORMATION

2.1. Description of Device (EUT)

EUT	:	CM3399 Core Board
Model Number	:	CM3399-V3
Applicant	:	BOARDCON TECHNOLOGY LIMITED
Address	:	ROOM702, XINAN BUSINESS BUILDING, 45ZONE, BAOAN DISTRCT
Manufacturer	:	BOARDCON TECHNOLOGY LIMITED
Address	:	ROOM702, XINAN BUSINESS BUILDING, 45ZONE, BAOAN DISTRCT
Date of Received	:	December 14, 2021
Date of Test	:	December 14, 2021 to December 20, 2021

2.2. Independent Operation Modes

A. On

2.3. Test Manner

Test Items	Test Voltage	Operation Modes	Worst case
Conducted disturbance at mains Terminals	AC 230V/50Hz AC 120V/60Hz	Mode A Mode A	Mode A (AC 120V/60Hz)
Radiated emissions at frequencies up to 1 GHz	AC 230V/50Hz AC 120V/60Hz	Mode A Mode A	Mode A (AC 120V/60Hz)
Radiated emissions at frequencies above 1 GHz	AC 230V/50Hz AC 120V/60Hz	Mode A Mode A	Mode A (AC 120V/60Hz)
Harmonic Current Emissions	AC 230V/50Hz	Mode A	\
Voltage Fluctuation and Flicker	AC 230V/50Hz	Mode A	\
Electrostatic Discharge	AC 230V/50Hz	Mode A	\
Continuous RF electromagnetic field disturbances	AC 230V/50Hz	Mode A	\
Electrical fast transients/burst	AC 230V/50Hz	Mode A	\
Surges	AC 230V/50Hz	Mode A	\
Continuous induced RF disturbances	AC 230V/50Hz	Mode A	\
Power frequency magnetic field	AC 230V/50Hz	Mode A	\
Voltage dips and interruptions	AC 230V/50Hz AC 120V/60Hz	Mode A	\

2.4. Description of Support Device

N/A

2.5. Description of Test Facility

Site Description

EMC Lab. : Accredited by CNAS, 2018.11.30
The certificate is valid until 2022.10.28
The Laboratory has been assessed and proved to be in compliance with CNAS-CL01:2006 (identical to ISO/IEC 17025:2017)
The Certificate Registration Number is L2291.

Accredited by FCC, August 09, 2018
Designation Number: CN1204
Test Firm Registration Number: 882943

Accredited by A2LA, August 08, 2018
The Certificate Number is 4321.01.

Accredited by Industry Canada, November 09, 2018
The Conformity Assessment Body Identifier is CN0008

Name of Firm : EMTEK (SHENZHEN) CO., LTD.
Site Location : Building 69, Majialong, Industry Zone, Nanshan District, Shenzhen, Guangdong, China 516025

2.6. Measurement Uncertainty

Test Item		Uncertainty
Conducted Emission Uncertainty	:	2.08dB (9k~150kHz Conduction 1#) 2.40dB (150k-30MHz Conduction 1#)
Radiated Emission Uncertainty (3m 3# Chamber)	:	4.40dB (30M~1GHz Polarize: H) 5.04dB (30M~1GHz Polarize: V) 4.94dB (1~6GHz)
Uncertainty for Flicker test	:	0.07%
Uncertainty for Harmonic test	:	1.8%
Uncertainty for C/S Test	:	1.45(Using CDN Test) 2.37(Using EM Clamp Test)
Uncertainty for R/S Test	:	2.10dB(80MHz-200MHz) 1.76dB(200MHz-1000MHz)
Uncertainty for test site temperature and humidity	:	0.6℃ 4%

3. MEASURING DEVICE AND TEST EQUIPMENT

3.1. For Conducted Emissions At the AC Mains Power Ports

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
☑	EMI Test Receiver	Rohde & Schwarz	ESCI	101384	May 15, 2021	1 Year
☑	AMN	Rohde & Schwarz	ENV216	101161	May 15, 2021	1 Year
☑	AMN	Kyoritsu	KNW-407	8-1492-9	May 16, 2021	1 Year

3.2. For Radiated Emission Measurement (3m)

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
☑	EMI Test Receiver	Rohde & Schwarz	ESU 26	100154	May 15, 2021	1 Year
☑	Pre-Amplifie	Lunar EM	LNA10M1G-40	J10111309 12001	May 15, 2021	1 Year
☑	Bilog Antenna	Schwarzbeck	VULB9163	659	June 12, 2021	2 Year
☑	Horn antenna	Schwarzbeck	BBHA9120D	9120D-117 7	July 04, 2020	2 Year
☑	Pre-Amplifie	SKET	LNPA_0118G-45	SK201905 1801	May 15, 2021	1 Year

3.3. For Harmonic Current / Flicker Measurement

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
☑	45KVA AC Power source	Teseq	NSG 1007-45/45KVA	1305A02873	May 16, 2021	1 Year
☑	Signal conditioning Unit	Teseq	CCN 1000-3	1305A02873	May 16, 2021	1 Year
☑	Impedance network	Teseq	INA2197/37A	1305A02873	May 16, 2021	1 Year
☑	Impedance network	Teseq	INA 2196/75A	1305A02874	May 16, 2021	1 Year
☐	Profline 2100 AC Switching Unit	Teseq	NSG 2200-3	A22714	May 16, 2021	1 Year

3.4. For Electrostatic Discharge Immunity

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
☑	ESD Tester	TESEQ AG	NSG 438A	130	May 15, 2021	1 Year

3.5. For Continuous RF Electromagnetic Field Disturbances Immunity

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
☑	Power Amplifier	MILMEGA	AS0102-55	1018770	May 15, 2021	1 Year
☑	50ohm Diode Power Sensor	BOONTON	51011EMC	34236	May 16, 2021	1 Year
☑	RF Power Meter. Dual Channel	BOONTON	4232A	10539	May 15, 2021	1 Year
☑	Log.-Per. Antenna	SCHWARZBECK	VULP 9118E	811	N/A	N/A
☑	Signal Generator	Agilent	N5181A	MY50145187	May 15, 2021	1 Year
☑	50ohm Diode Power Sensor	BOONTON	51011EMC	36164	May 15, 2021	1 Year
☑	Broad-Band Horn Antenna	SCHWARZBECK	STLP 9149	9149-227	N/A	N/A
☑	Field Strength Meter	DARE	RSS1006A	10I00037SNO22	May 16, 2021	1 Year
☑	Multi-function interface system	DARE	CTR1009B	12I00250SNO72	N/A	N/A
☑	Automatic switch group	DARE	RSW1004A	N/A	N/A	N/A
☑	Power Amplifier	MILMEGA	AS1860-50	1059346	May 15, 2021	1 Year
☑	Power Amplifier	MILMEGA	80RF1000-175	1059345	May 15, 2021	1 Year

3.6. For Electrical Fast Transient / Burst Immunity

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
☑	Burst Tester	HAEFELY	PEFT4010	080981-16	May 16, 2021	1 Year
☑	Coupling Clamp	HAEFELY	IP-4A	147147	May 16, 2021	1 Year

3.7. For Surges Immunity

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
☑	Controller	HAEFELY	Psurge 8000	174031	May 16, 2021	1 Year
☑	Impulse Module	HAEFELY	PIM 100	174124	May 16, 2021	1 Year
☑	Coupling Decoupling	HAEFELY	PCD 130	172181	May 16, 2021	1 Year
☑	Coupling Module	HAEFELY	PCD122	174354	May 16, 2021	1 Year
☑	Impulse Module	HAEFELY	PIM 120	174435	May 16, 2021	1 Year
☑	Coupling Module	HAEFELY	PCD 126A	174387	May 16, 2021	1 Year
☑	Impulse Module	HAEFELY	PIM 110	174391	May 16, 2021	1 Year
☑	Impulse Module	HAEFELY	PIM 150	178707	May 16, 2021	1 Year

3.8. For Continuous Induced RF Disturbances Immunity

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
☑	Continuous Wave Simulator	EMTEST	CWS500C	0900-12	May 15, 2021	1 Year
☑	CDN	EMTEST	CDN-M2	510010010010	May 16, 2021	1 Year
☐	CDN	EMTEST	CDN-M3	0900-11	May 15, 2021	1 Year
☐	EM Injection Clamp	EMTEST	F-2031-23MM	368	May 15, 2021	1 Year
☑	Attenuator	EMTEST	100W 6dB DC-3G	/	May 15, 2021	1 Year
☑	Power meter	AGILENT	E4418B	MY45102886	May 15, 2021	1 Year
☑	Signal Generator	R&S	SMB100A	103041	May 15, 2021	1 Year

3.9. For Power Frequency Magnetic Field Immunity

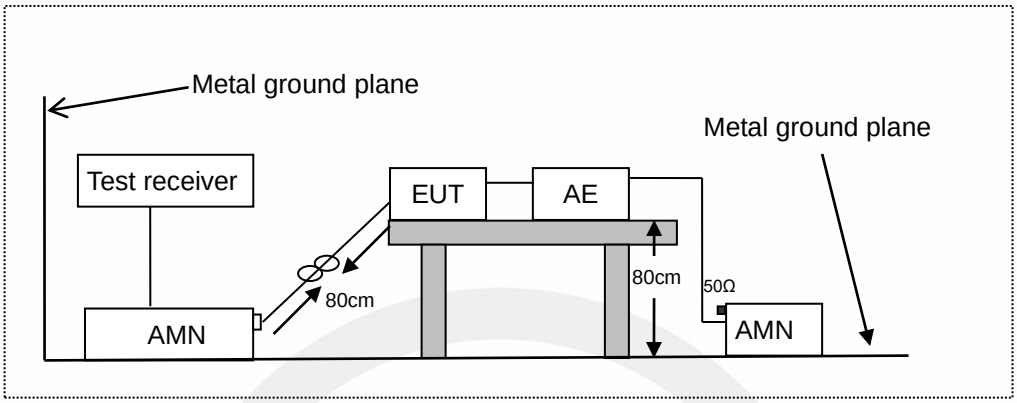
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
☑	Magnetic Field Tester	HAEFELY	MAG100	250040.1	May 15, 2021	1 Year

3.10.For Voltage Dips And Interruptions Immunity

Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
☑	45KVA AC Power source	Teseq	NSG 1007-45/45KVA	1305A02873	May 16, 2021	1 Year
☐	Signal conditioning Unit	Teseq	CCN 1000-3	1305A02873	May 16, 2021	1 Year
☐	Impedance network	Teseq	INA2197/37A	1305A02873	May 16, 2021	1 Year
☐	Impedance network	Teseq	INA 2196/75A	1305A02874	May 16, 2021	1 Year
☑	Profline 2100 AC Switching Unit	Teseq	NSG 2200-3	A22714	May 16, 2021	1 Year

4. CONDUCTED EMISSIONS FROM THE AC MAINS POWER PORTS

4.1. Block Diagram of Test Setup



AMN: Artificial Mains Network
AE: Associated equipment
EUT: Equipment under test

4.2. Limits

EN 55032, Class B, Table A.10

Frequency range MHz	Coupling device (see Table A.8)	Detector type / bandwidth	Class B limits dB(μV)
0.15 to 0.5	AMN	Quasi Peak / 9 kHz	66 to 56
0.5 to 5			56
5 to 30			60
0.15 to 0.5	AMN	Average / 9 kHz	56 to 46
0.5 to 5			46
5 to 30			50

4.3. Test Procedure

The EUT was placed on a plank 0.8 m height from the metal ground plane and 0.4 m from the conducting wall of the shielding room and it was kept at least 0.8 m from any other grounded conducting surface. The size of the table will nominally be 1.5 m x1.0 m.

The rear of the arrangement shall be flush with the back of the supporting tabletop unless that would not be possible or typical of normal use.

All units of equipment forming the system under test (includes the EUT as well as connected peripherals and associated equipment or devices) shall be arranged such that a nominal 0.1 m separation is achieved between the neighboring units.

Connect EUT to the power mains through a artificial mains network (AMN). Where the mains cable supplied by the manufacturer is longer than 1 m, the excess should be folded at the centre into a bundle

no longer than 0.4 m, so that its length is shortened to 1 m.

All the support units are connecting to the other AMN.

The AMN provides 50 ohm coupling impedance for the measuring instrument.

The CISPR states that the AMN with 50 ohm and 50 microhenry should be used.

Both sides of AC line were checked for maximum conducted interference.

The frequency range from 150 kHz to 30 MHz was sweep.

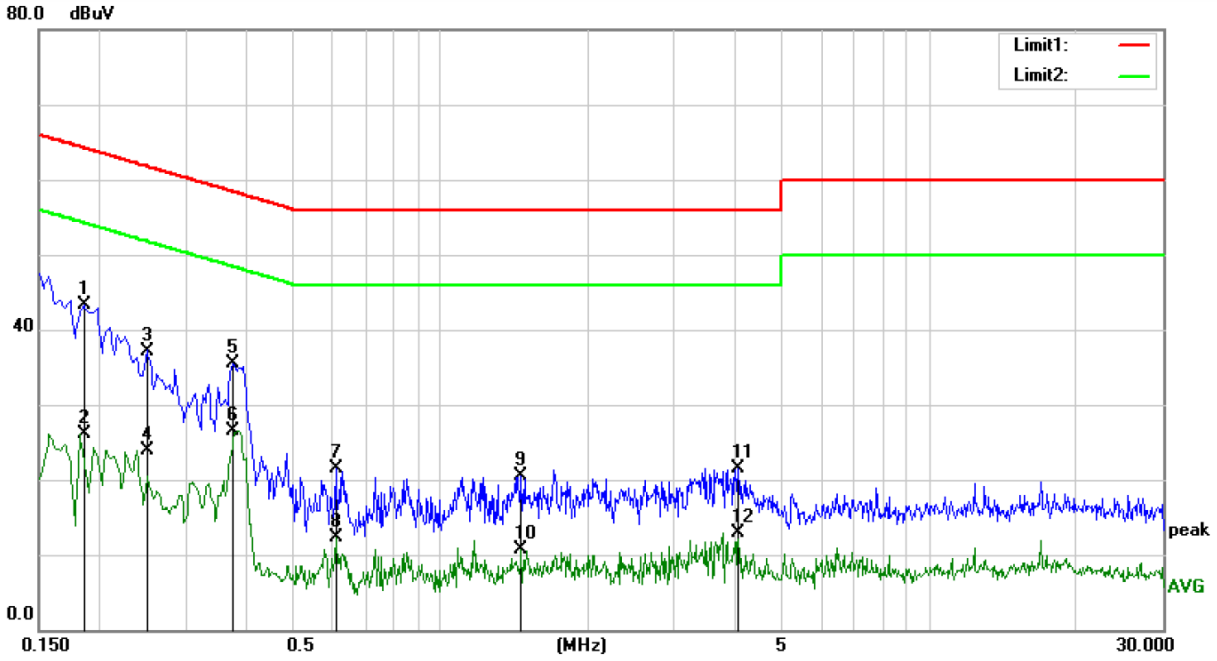
Set the test-receiver system to quasi peak detect function and average detect function, and to measure the conducted emissions values.

Test results were obtained from the following equation:
Emission Level (dBμV) = AMN Factor (dB) + Cable Loss (dB) + Reading (dBμV)
Margin (dB) = Emission Level (dBμV) - Limit (dBμV)

4.4. Measuring Results

PASS.

Please see the attached page.



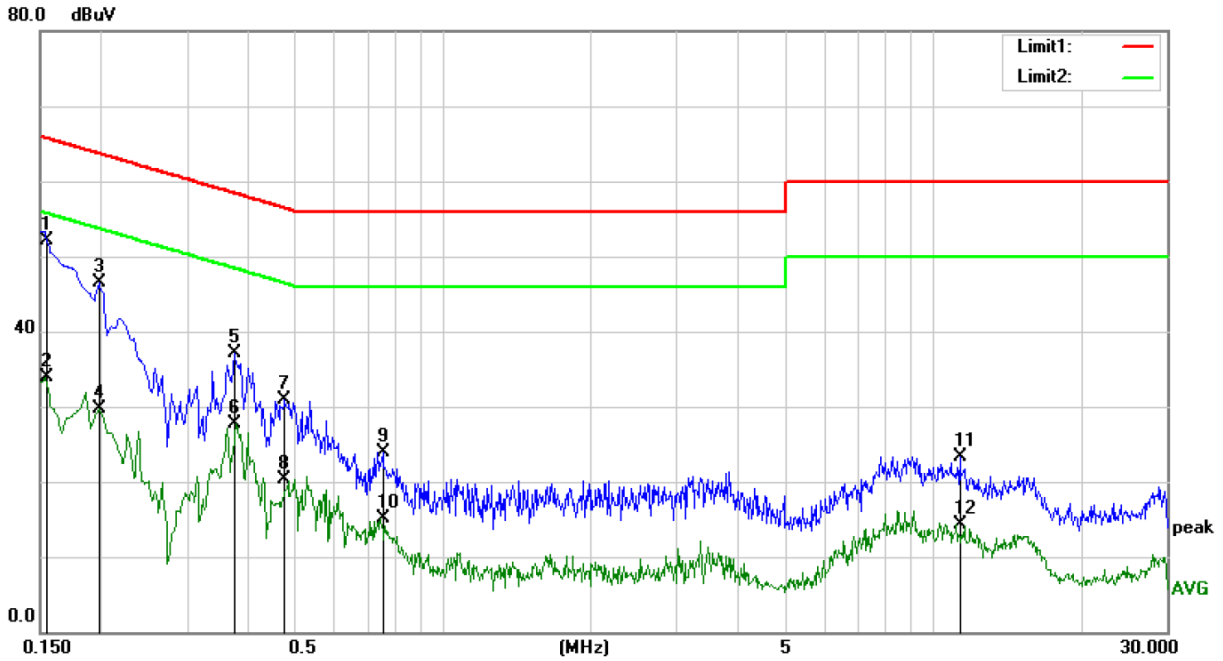
Site Conduction #1 Phase: *L1* Temperature: 22.8

Limit: (CE)EN55032 class B_QP Power: AC 120V/60Hz Humidity: 48 %

Mode: ON

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1860	33.78	9.46	43.24	64.21	-20.97	QP	
2		0.1860	16.57	9.46	26.03	54.21	-28.18	AVG	
3		0.2500	27.84	9.36	37.20	61.76	-24.56	QP	
4		0.2500	14.62	9.36	23.98	51.76	-27.78	AVG	
5		0.3740	26.09	9.32	35.41	58.41	-23.00	QP	
6		0.3740	17.11	9.32	26.43	48.41	-21.98	AVG	
7		0.6100	12.30	9.27	21.57	56.00	-34.43	QP	
8		0.6100	2.95	9.27	12.22	46.00	-33.78	AVG	
9		1.4580	10.62	9.92	20.54	56.00	-35.46	QP	
10		1.4580	0.74	9.92	10.66	46.00	-35.34	AVG	
11		4.0620	11.53	9.92	21.45	56.00	-34.55	QP	
12		4.0620	2.95	9.92	12.87	46.00	-33.13	AVG	



Site Conduction #1 Phase: N Temperature: 22.8

Limit: (CE)EN55032 class B_QP Power: AC 120V/60Hz Humidity: 48 %

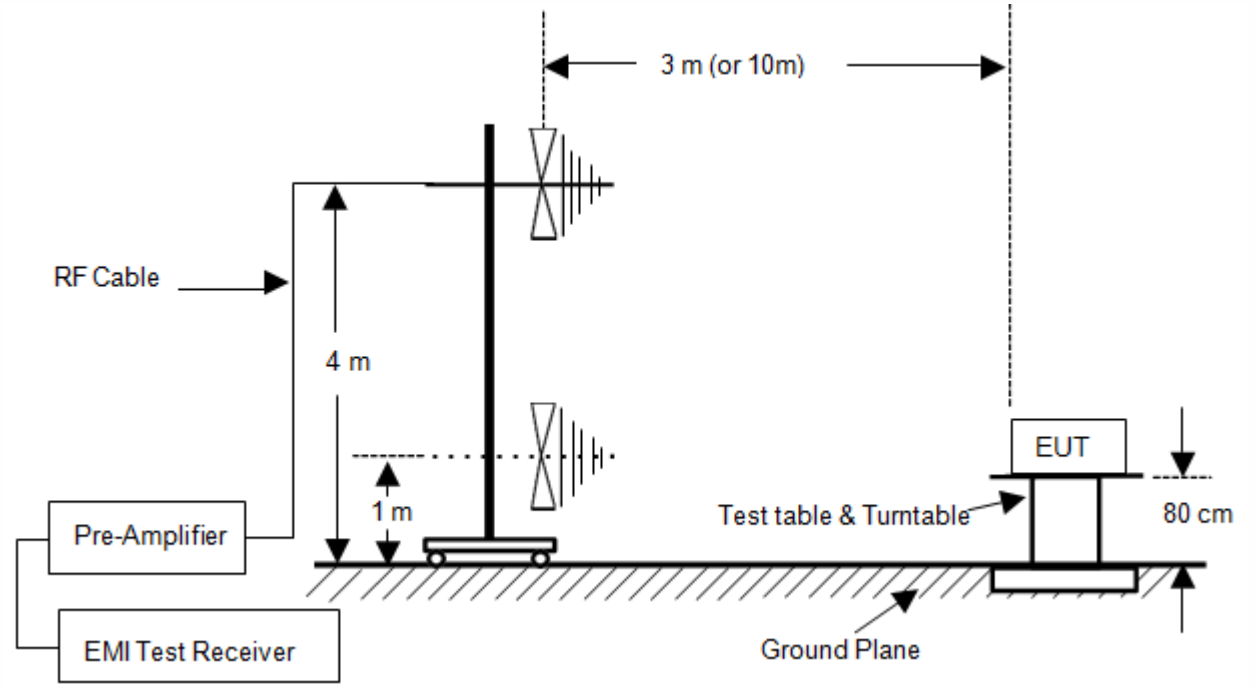
Mode: ON

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1548	42.61	9.56	52.17	65.74	-13.57	QP	
2		0.1548	24.25	9.56	33.81	55.74	-21.93	AVG	
3		0.1980	37.02	9.43	46.45	63.69	-17.24	QP	
4		0.1980	20.35	9.43	29.78	53.69	-23.91	AVG	
5		0.3740	27.69	9.32	37.01	58.41	-21.40	QP	
6		0.3740	18.38	9.32	27.70	48.41	-20.71	AVG	
7		0.4740	21.64	9.27	30.91	56.44	-25.53	QP	
8		0.4740	11.12	9.27	20.39	46.44	-26.05	AVG	
9		0.7540	14.56	9.39	23.95	56.00	-32.05	QP	
10		0.7540	5.64	9.39	15.03	46.00	-30.97	AVG	
11		11.3300	13.23	10.15	23.38	60.00	-36.62	QP	
12		11.3300	4.18	10.15	14.33	50.00	-35.67	AVG	

5. RADIATED EMISSION MEASUREMENT (UP TO 1GHz)

5.1. Block Diagram of Test Setup



5.2. Radiated Limit

EN 55032, Class B, Table A.4

Frequency range MHz	Measurement			Class A limits dB(μV/m)
	Facility	Distance (m)	Detector type / bandwidth	
30 to 230	OATS/SAC	10	Quasi Peak / 120 kHz	30
230 to 1 000				37
30 to 230	OATS/SAC	3		40
230 to 1 000				47

5.3. Test Procedure

The EUT was placed on a non-conductive table whose total height equaled 80cm. All units of equipment forming the system under test (includes the EUT as well as connected peripherals and associated equipment or devices) shall be arranged such that a nominal 0.1 m separation is achieved between the neighboring units. Where the mains cable supplied by the manufacturer is longer than 1 m, the excess should be folded at the centre into a bundle no longer than 0.4 m, so that its length is shortened to 1 m.

The EUT was set 3 meters (or 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.

The turntable can rotate 360 degree to determine the position of the maximum emission level.

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.

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.

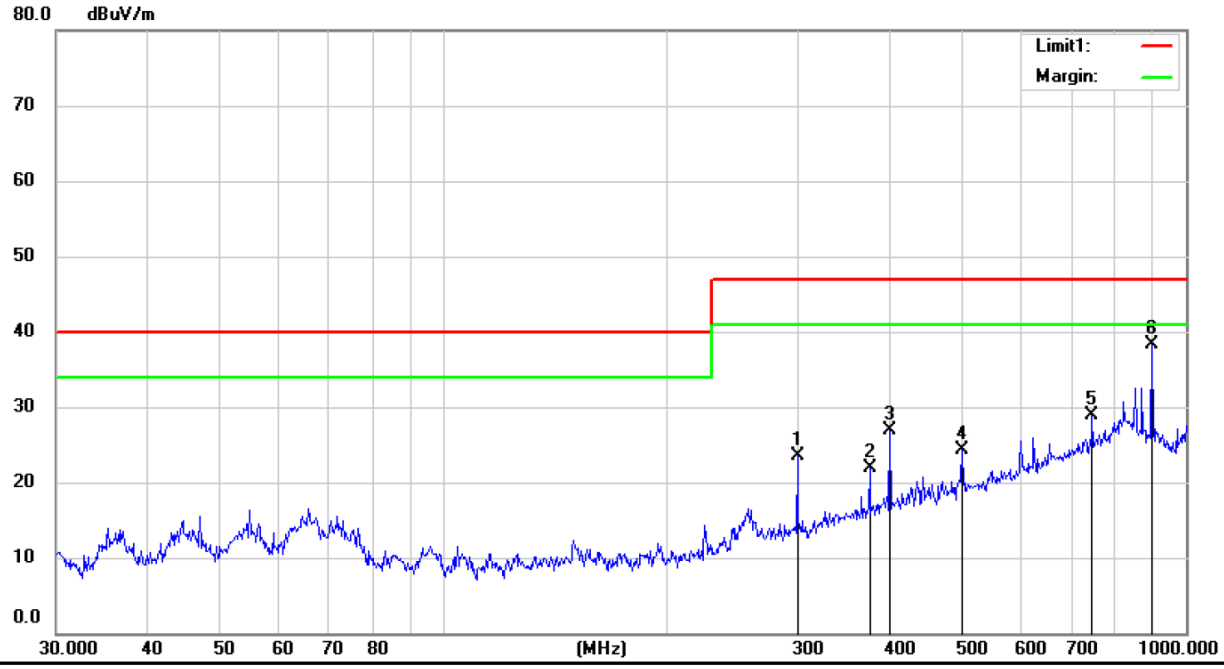
The bandwidth of the Receiver is set at 120 kHz.

Test results were obtained from the following equation:
Emission level (dBμV/m) = Antenna Factor - Amp Factor + Cable Loss + Reading
Margin (dB) = Emission Level (dBμV/m) - Limit (dBμV/m)

5.4. Measuring Results

PASS.

Please see the attached page.



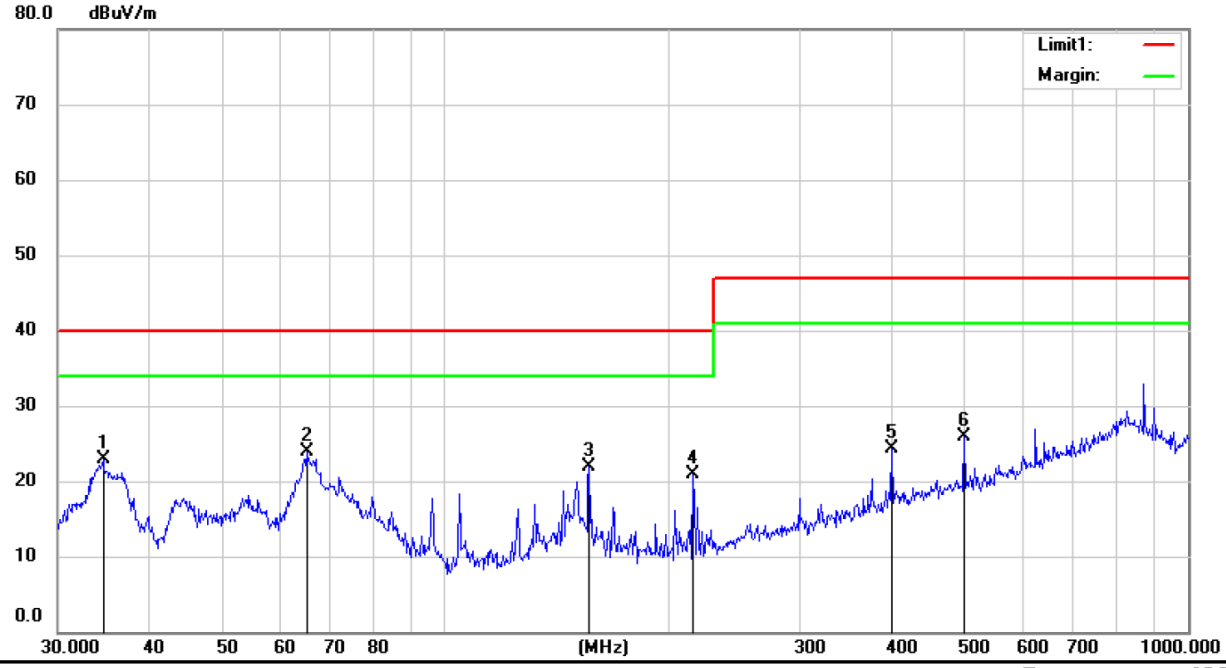
Site 3m Chamber #3 Polarization: *Horizontal* Temperature: 25.7 C

Limit: (RE)EN55032 class B Power: AC 120V/60Hz Humidity: 57 %

Mode:ON

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		300.1040	36.30	-12.81	23.49	47.00	-23.51	QP			
2		375.1155	32.16	-10.31	21.85	47.00	-25.15	QP			
3		400.0810	36.32	-9.41	26.91	47.00	-20.09	QP			
4		500.0818	31.44	-7.20	24.24	47.00	-22.76	QP			
5		750.1082	30.55	-1.56	28.99	47.00	-18.01	QP			
6	*	900.1474	38.92	-0.55	38.37	47.00	-8.63	QP			



Site 3m Chamber #3 Polarization: *Vertical* Temperature: 25.7 C

Limit: (RE)EN55032 class B Power: AC 120V/60Hz Humidity: 57 %

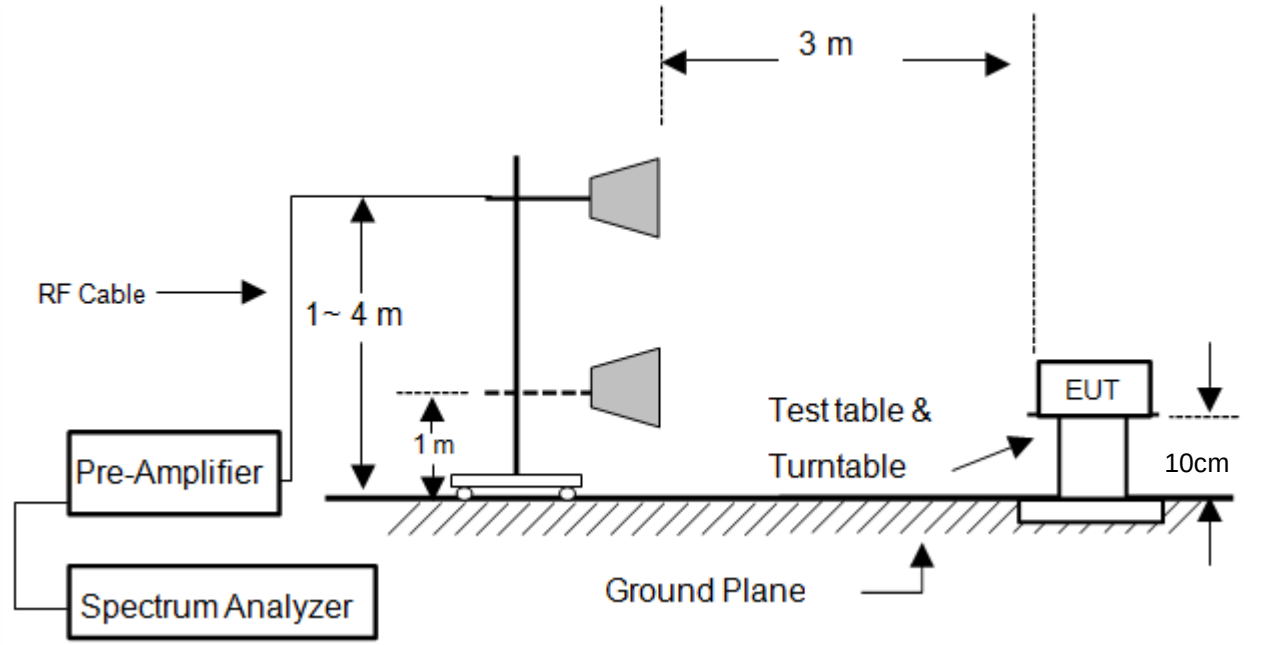
Mode:ON

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		34.6233	39.45	-16.64	22.81	40.00	-17.19	QP			
2	*	64.9720	38.71	-14.85	23.86	40.00	-16.14	QP			
3		155.9785	39.15	-17.30	21.85	40.00	-18.15	QP			
4		216.0240	37.58	-16.73	20.85	40.00	-19.15	QP			
5		400.0810	33.79	-9.41	24.38	47.00	-22.62	QP			
6		500.0818	33.14	-7.20	25.94	47.00	-21.06	QP			

6. RADIATED EMISSION MEASUREMENT (ABOVE 1GHz)

6.1. Block Diagram of Test Setup



6.2. Radiated Limit

EN 55032, Class B, Table A.50

Frequency range (MHz)	Measurement			Class A limits dB(μV/m)
	Facility	Distance (m)	Detector type/ bandwidth	
1000 to 3000	FSOATS	3	Average / 1 MHz	50
3000 to 6000				54
1000 to 3000			Peak /1 MHz	70
3000 to 6000				74
Note: The highest internal source of an EUT is defined as the highest frequency generated or used within the EUT or on which the EUT operates or tunes. If 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. If 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. If 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. If 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.				

6.3. Test Procedure

The EUT was placed on a non-conductive table whose total height equaled 80cm. All units of equipment forming the system under test (includes the EUT as well as connected peripherals and associated equipment or devices) shall be arranged such that a nominal 0.1 m separation is achieved between the neighboring units. Where the mains cable supplied by the manufacturer is longer than 1 m, the excess should be folded at the centre into a bundle no longer than 0.4 m, so that its length is shortened to 1 m.

The EUT was set 3 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.

The turntable can rotate 360 degree to determine the position of the maximum emission level.

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.

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.

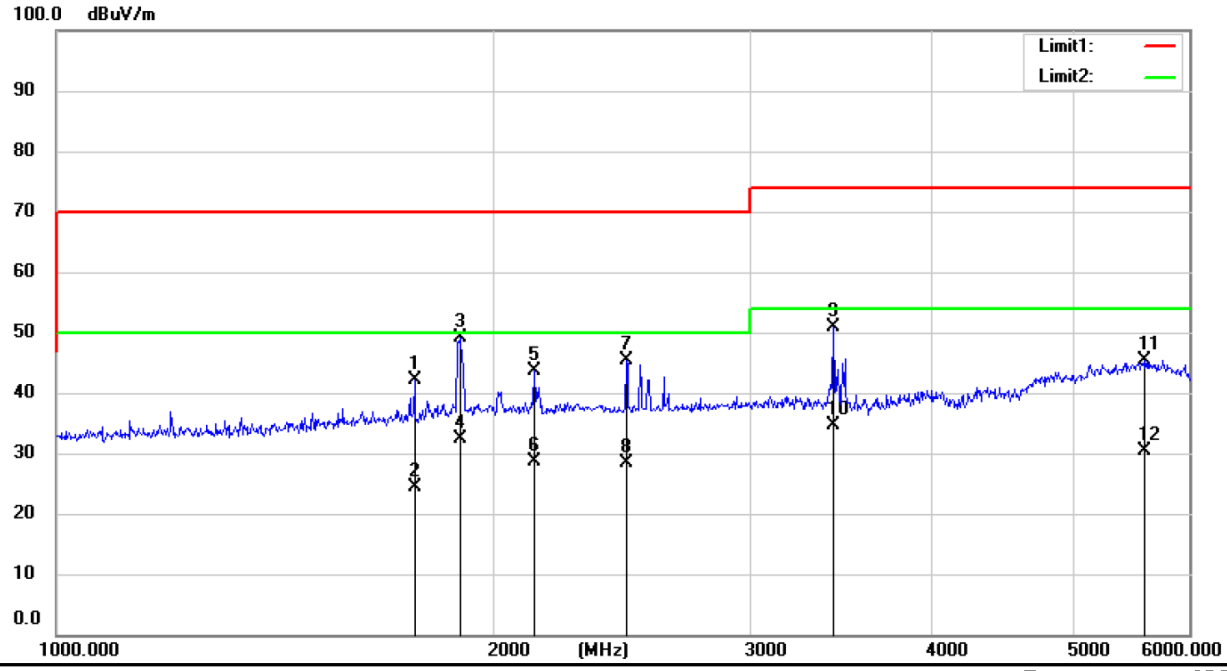
The frequency range above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz.

Test results were obtained from the following equation:
Emission level (dBμV/m) = Antenna Factor - Amp Factor + Cable Loss + Reading
Margin (dB) = Emission Level (dBμV/m) - Limit (dBμV/m)

6.4. Measuring Results

PASS

All the modes were tested and the data of the worst modes are attached the following pages.



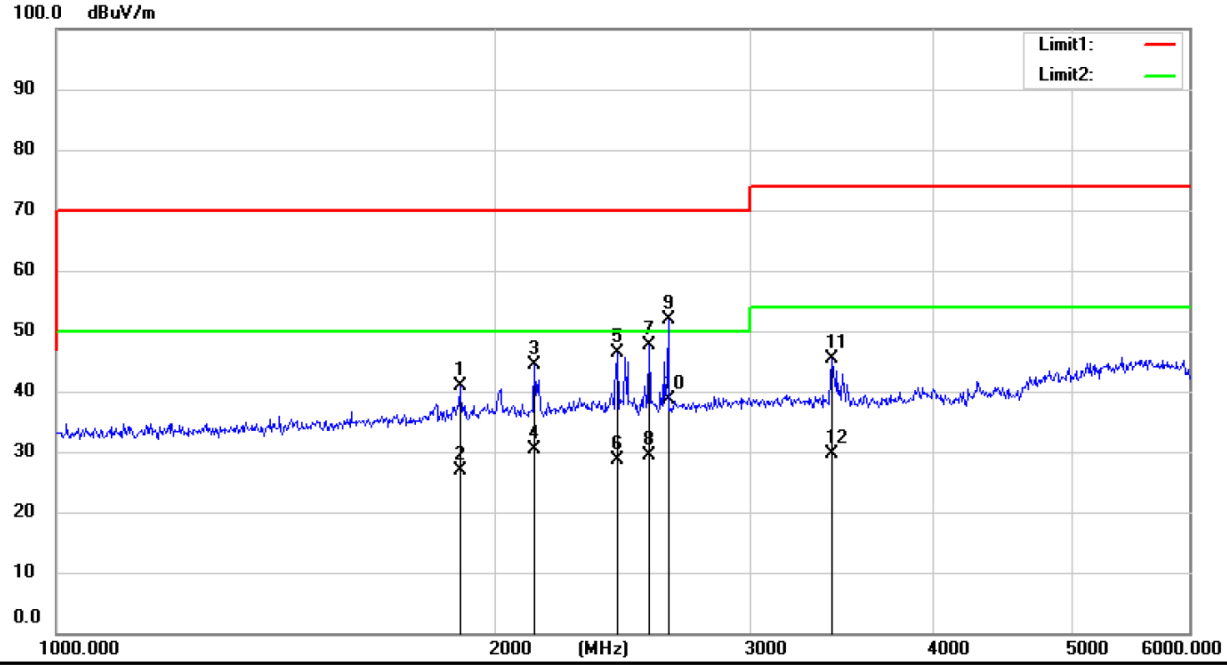
Site 3m Chamber #3 Polarization: *Horizontal* Temperature: 25.7 C

Limit: (RE)EN55032 class B Power: AC 120V/60Hz Humidity: 57 %

Mode:ON

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		1763.922	56.55	-14.43	42.12	70.00	-27.88	peak			
2		1763.922	38.93	-14.43	24.50	50.00	-25.50	AVG			
3		1897.532	62.85	-13.62	49.23	70.00	-20.77	peak			
4	*	1897.532	46.12	-13.62	32.50	50.00	-17.50	AVG			
5		2133.821	56.63	-12.95	43.68	70.00	-26.32	peak			
6		2133.821	41.55	-12.95	28.60	50.00	-21.40	AVG			
7		2465.451	58.20	-12.94	45.26	70.00	-24.74	peak			
8		2465.451	41.24	-12.94	28.30	50.00	-21.70	AVG			
9		3421.376	63.06	-12.16	50.90	74.00	-23.10	peak			
10		3421.376	46.76	-12.16	34.60	54.00	-19.40	AVG			
11		5602.566	50.31	-4.91	45.40	74.00	-28.60	peak			
12		5602.566	35.41	-4.91	30.50	54.00	-23.50	AVG			



Site 3m Chamber #3 Polarization: *Vertical* Temperature: 25.7 C

Limit: (RE)EN55032 class B Power: AC 120V/60Hz Humidity: 57 %

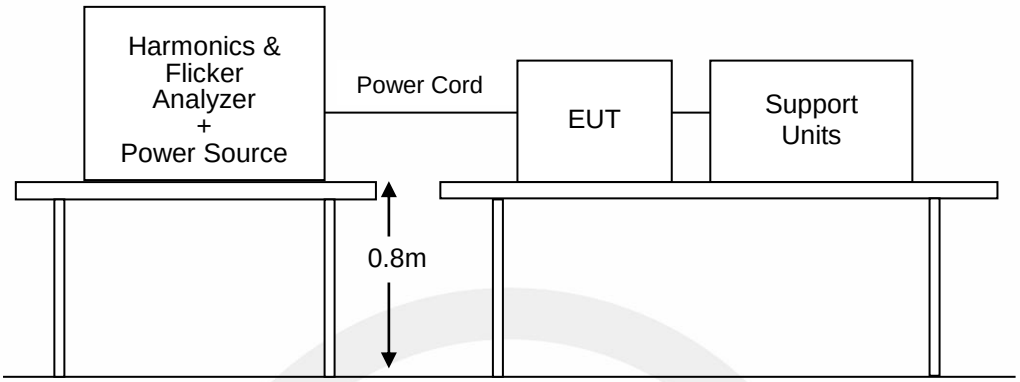
Mode:ON

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		1893.711	54.58	-13.65	40.93	70.00	-29.07	peak			
2		1893.711	40.45	-13.65	26.80	50.00	-23.20	AVG			
3		2131.433	57.31	-12.96	44.35	70.00	-25.65	peak			
4		2131.433	43.36	-12.96	30.40	50.00	-19.60	AVG			
5		2427.643	59.38	-12.93	46.45	70.00	-23.55	peak			
6		2427.643	41.63	-12.93	28.70	50.00	-21.30	AVG			
7		2555.403	60.38	-12.87	47.51	70.00	-22.49	peak			
8		2555.403	42.37	-12.87	29.50	50.00	-20.50	AVG			
9		2632.079	64.59	-12.77	51.82	70.00	-18.18	peak			
10	*	2632.079	51.37	-12.77	38.60	50.00	-11.40	AVG			
11		3415.251	57.59	-12.16	45.43	74.00	-28.57	peak			
12		3415.251	41.76	-12.16	29.60	54.00	-24.40	AVG			

7. HARMONIC CURRENT EMISSION MEASUREMENT

7.1. Block Diagram of Test Setup



7.2. Standard Limits

EN 61000-3-2, CLASS A
Harmonic current emissions evaluate the potential for the EUT to cause distortion on the AC power lines. It is applicable to electrical and electronic equipment having an input current≤16 A per phase, and intended to be connected to public low-voltage distribution systems

Table 1 - Limits for Class A equipment

Harmonic order n	Maximum permissible harmonic current (A)
Odd harmonics	
3 5 7 9 11 13 15 ≤ n ≤ 39	2.30 1.14 0.77 0.40 0.33 0.21 $0.15\ \frac{0.15}{n}$
Even harmonics	
2 4 6 8 ≤ n ≤ 40	1.08 0.43 0.30 $0.23\ \frac{8}{n}$

7.3. Test Procedure

The measurement of harmonic currents shall be performed as follows: i. For each harmonic order, measure the 1.5 s smoothed r.m.s. harmonic current in each DFT time window as defined in EN / IEC 61000-4-7:2009. ii. Calculate the arithmetic average of the measured values from the DFT time windows, over the entire observation period Short cyclic (T cycle≤2.5 min). Because of synchronisation to meet the requirements for repeatability in 5%.

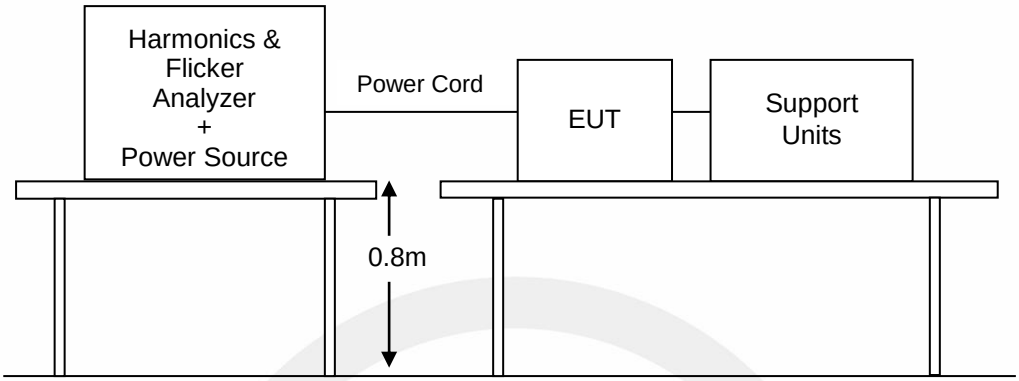
7.4. Test Results

N/A.

Because power of EUT less than 75W, According standard EN 61000-3-2, Harmonic current unnecessary to test.

8. VOLTAGE FLUCTUATION AND FLICKER MEASUREMENT

8.1. Block Diagram of Test Setup



8.2. Standard Limits

EN 61000-3-3 Limits
The objective of voltage changes, voltage fluctuations and flicker in public low voltage supply systems during equipment with rated current≤16 A per phase, ensures that home appliances and certain other electrical equipment do not adversely affect lighting equipment when connected to the same power system.
Voltage Fluctuation and Flicker Limits:
— the value of Pst shall not be greater than 1.0;
— the value of Plt shall not be greater than 0.65;
— the value of d(t) during a voltage change shall not exceed 3.3 % for more than 500 ms;
— the relative steady-state voltage change, dc, shall not exceed 3.3 %;
— the maximum relative voltage change, dmax, shall not exceed 4.0 %;

8.3. Test Procedure

The total impedance of the test circuit, excluding the appliance under test, but including the internal impedance of the supply source, shall be equal to the reference impedance. The stability and tolerance of the reference impedance shall be adequate to ensure that the overall accuracy of 8% is achieved during the whole assessment procedure.

8.4. Test Results

PASS

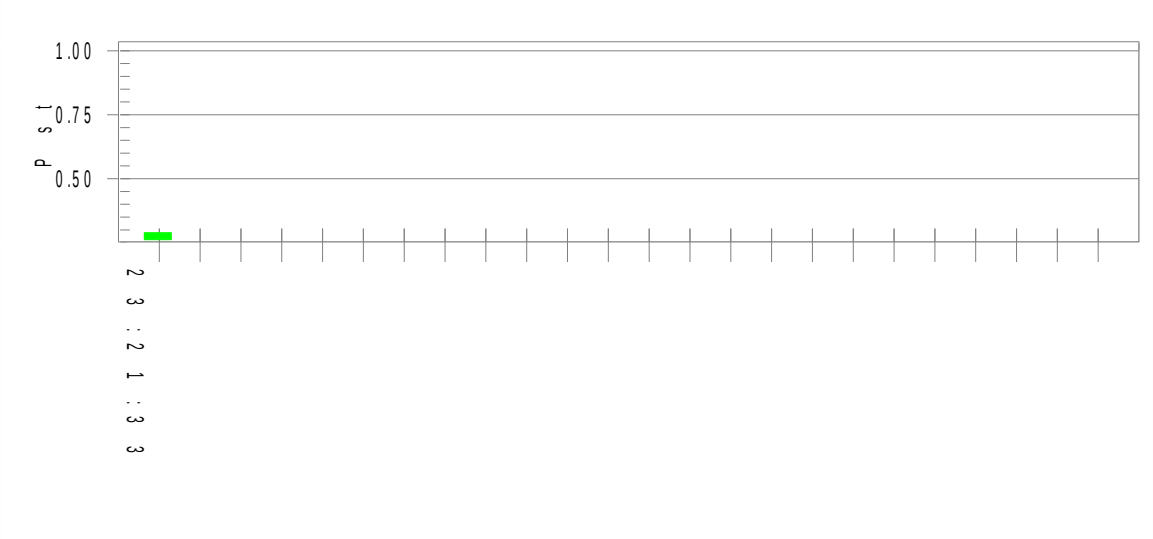
All the modes were tested and the data of the worst modes are attached the following pages.

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

EUT: CM3399-V3 **Tested by: LHT**
Test category: All parameters (European limits) **Test Margin: 100**
Test date: 2021/12/15 **Start time: 23:11:12** **End time: 23:21:39**
Test duration (min): 10 **Data file name: WIN2105_F-000026.cts_data**
Comment: ON
Customer: BOARDCON TECHNOLOGY LIMITED

Test Result: Pass **Status: Test Completed**

Pst_i and limit line **European Limits**



Parameter values recorded during the test:

Vrms at the end of test (Volt):	**220.72**			
T-max (mS):	**0.0**	**Test limit (mS):**	**500.0**	**Pass**
Highest dc (%):	**0.00**	**Test limit (%):**	**3.30**	**Pass**
Highest dmax (%):	**0.04**	**Test limit (%):**	**4.00**	**Pass**
Highest Pst (10 min. period):	**0.288**	**Test limit:**	**1.000**	**Pass**
Highest Plt (2 hr. period):	**0.126**	**Test limit:**	**0.650**	**Pass**

9. IMMUNITY GENERAL PERFORMANCE CRITERIA DESCRIPTION

General performance criteria are defined in EN 55035 clause 8.2, 8.3 and 8.4. These criteria shall be used during the testing of primary functions where no relevant annex is applicable.

When assessing the impact of a disturbance on a function, the assessment should take into consideration the function's performance prior to the application of the disturbance and only identify as failures those changes in performance that are a result of the disturbance.

EN 55035:
Performance criterion A
The equipment shall continue to operate as intended without operator intervention. No degradation of performance, loss of function or change of operating state 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 criterion B
During the application of the disturbance, degradation of performance is allowed. However, no unintended change of actual operating state or stored data is allowed to persist after the test.
After the test, 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), or recovery time, 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.

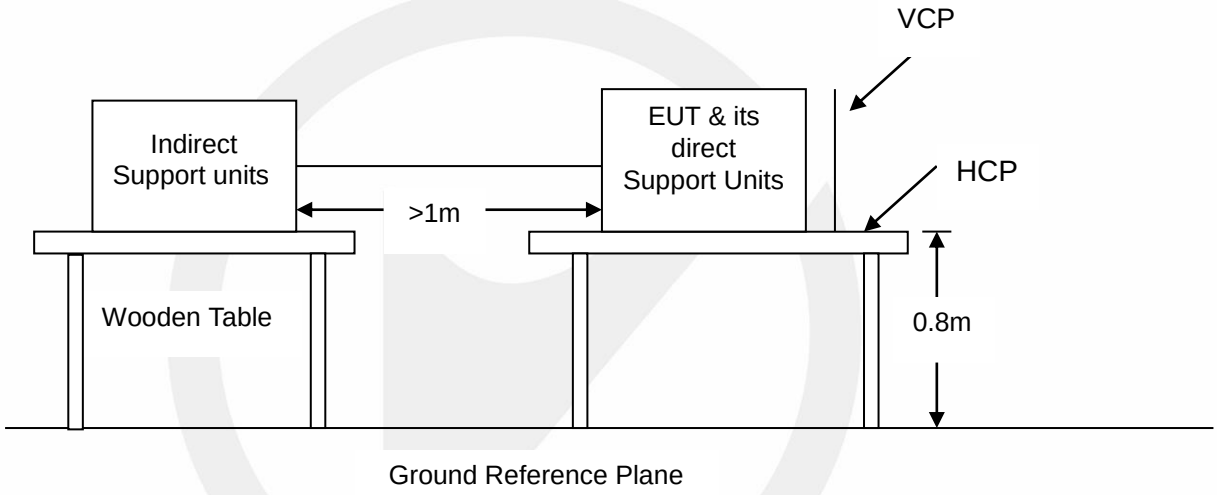
Performance criterion C
Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions. A reboot or re-start operation is allowed. Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

10. ELECTROSTATIC DISCHARGE

10.1. Test Specification

Test standard	:	EN 55035
Basic standard	:	IEC 61000-4-2
Performance criterion	:	B
Test level	:	±8.0kV (Air discharge) ±4.0kV (Contact discharge)

10.2. Block Diagram of Test Setup



10.3. Test Procedure

a. In the case of air discharge testing, the climatic conditions shall be within the following ranges:
- ambient temperature: 15°C to 35°C;
- relative humidity : 30% to 60%;
- atmospheric pressure : 86 kPa (860 mbar) to 106 kPa (1060 mbar)

b. Test programs and software shall be chosen so as to exercise all normal modes of operation of the EUT. The use of special exercising software is encouraged, but permitted only where it can be shown that the EUT is being comprehensively exercised.

c. In the case of contact discharges, the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

d. In the case of painted surface covering a conducting substrate, the following procedure shall be adopted : - If the coating is not declared to be an insulating coating by the equipment manufacturer, then the pointed tip of the generator shall penetrate the coating so as to make contact with the conducting substrate. - Coating declared as insulating by the manufacturer shall only be submitted to the air discharge. - The contact discharge test shall not be applied to such surfaces.

e. In the case of air discharges, the round discharge tip of the discharge electrode shall be approached as fast as possible (without causing mechanical damage) to touch the EUT. After each discharge, the ESD generator (discharge electrode) shall be removed from the EUT. The generator is then retriggered for a new single discharge. This procedure shall be repeated until the discharges are completed. In the case of an air discharge test, the discharge switch, which is used for contact discharge, shall be closed.

f. The test voltage shall be increased from the minimum to the selected test severity level, in order to

determine any threshold of failure. The final test level should not exceed the product specification value in order to avoid damage to the equipment.
g. The test shall be performed with both air discharge and contact discharge. The test shall be performed with single discharges. On each pre-selected point at least 10 single discharges (in the most sensitive polarity) shall be applied. For the time interval between successive single discharges an initial value of 1 s is recommended. Longer intervals may be necessary to determine whether a system failure has occurred.
h. Ensure that the applied charge on the EUT has been dis-charged before next ESD pulse.

10.4. Test Results

PASS

Temperature	:	23.3°C
Humidity	:	45%
Atmospheric Pressure	:	101kpa
Test Engineer	:	LHT
Test Date	:	2021-12-15

Air Discharge:

Test Voltage	Location	Actual criterion	Required performance criterion	Result (Pass/Fail)
±2; 4; 8 kV	SLOT	A	B	Pass

Contact Discharge

Test Voltage	Location	Actual criterion	Required performance criterion	Result (Pass/Fail)
±2; 4kV	USB/SCREW/HDMI/LAN	A	B	Pass

Indirect Discharge

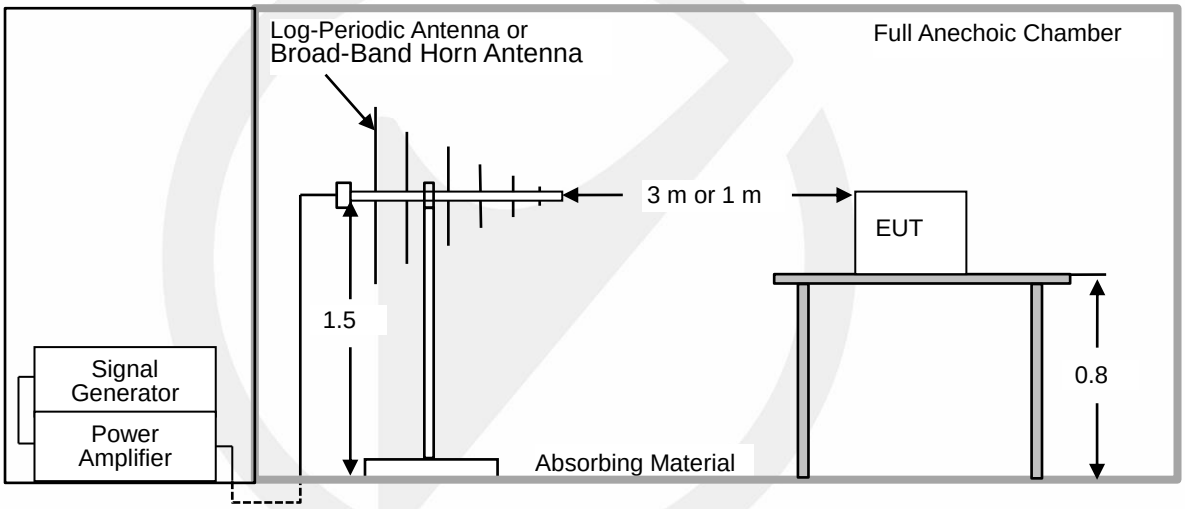
Test Voltage	Location	Actual criterion	Required performance criterion	Result (Pass/Fail)
±2; 4 kV	HCP	A	B	Pass
±2; 4kV	VCP	A	B	Pass

11. CONTINUOUS RF ELECTROMAGNETIC FIELD DISTURBANCES

11.1. Test Specification

Test standard	:	EN 55035	
Basic standard	:	IEC 61000-4-3	
Performance criterion	:	A	
Frequency range & Test level	:	☒80M-1000MHz	3V/m
		☒Spot frequency	3V/m
		☐Additional spot frequency	3V/m
Modulation	:	AM, 80%, 1kHz sine-wave	

11.2. Block Diagram of Test Setup



11.3. Test procedure

The procedure defined in this part requires the generation of electromagnetic fields within which the test sample is placed and its operation observed. To generate fields that are useful for simulation of actual (field) conditions may require significant antenna drive power and the resultant high field strength levels. To comply with local regulations and to prevent biological hazards to the testing personnel, it is recommended that these tests be carried out in a shielded enclosure or semi-anechoic chamber.

a. The antenna which is enabling the complete frequency range of 80-1000 MHz is placed 3m (or 1m) away from the equipment. The required field strength is determined by placing the field strength meter(s) on top of or directly alongside the equipment under test and monitoring the field strength meter via a remote field strength indicator outside the enclosure while adjusting the continuous-wave to the antenna.
b. The test is performed with the antenna facing the front and back sides of the EUT with. Both vertical and horizontal polarizations from antenna are tested.

11.4.Test results

PASS

Temperature	:	23.7°C
Humidity	:	52%
Atmospheric Pressure	:	101kpa
Test Engineer	:	LHT
Test Date	:	2021-12-15

☒ 80M-1000MHz:

Freq. Range (MHz)	Field	Modulation	Polarity	Position (°)	Actual criterion	Required performance criterion	Result
80-1000	3V/m	AM, 80%	H / V	0, 90,180, 270	A	A	Pass

☒ Spot frequency:

Freq (MHz)	Field	Modulation	Polarity	Position (°)	Actual criterion	Required performance criterion	Result
1800, 2600, 3500, 5000	3V/m	AM, 80%	H / V	0, 90,180, 270	A	A	Pass

☐ Additional spot frequency:

Freq (MHz)	Field	Modulation	Polarity	Position (°)	Actual criterion	Required performance criterion	Result
80, 120, 160, 230, 434, 460, 600, 863, 900	3V/m	AM, 80%	H / V	0, 90,180, 270	N/A	A	N/A

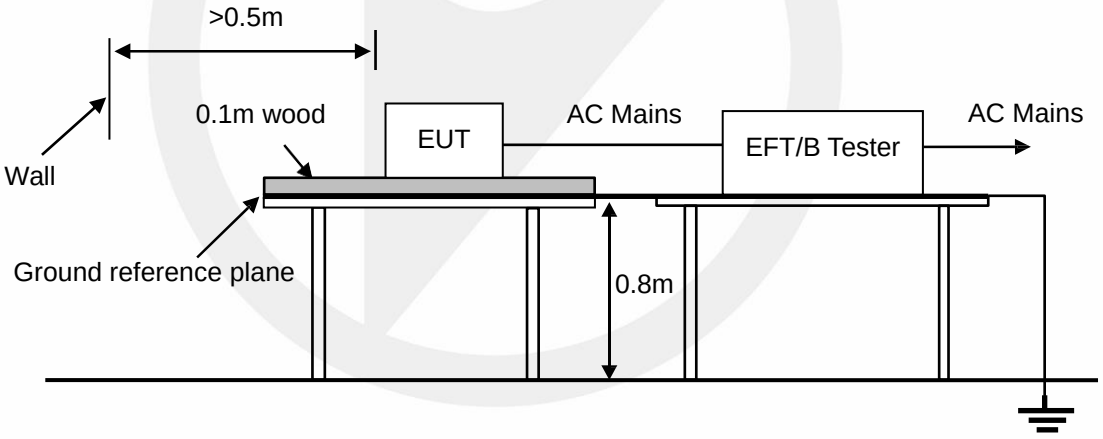
12. ELECTRICAL FAST TRANSIENTS/BURST

12.1. Test Specification

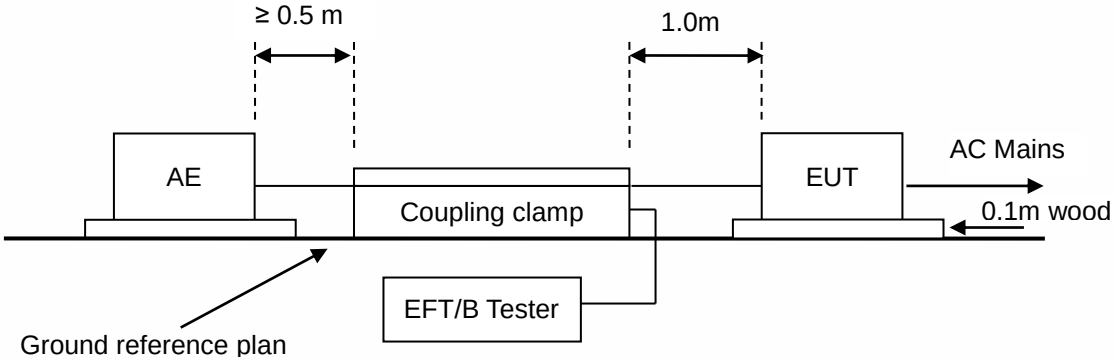
Test standard	:	EN 55035
Basic standard	:	IEC 61000-4-4
Performance criterion	:	B
Test level	:	☒1kV, AC mains power ports
		☐0.5kV, DC network power ports
		☐0.5kV, Analogue/digital data ports
Repetition frequency	:	☒5kHz, ☐100kHz(Only xDSL ports)
Tr/Th:	:	5/50ns
Burst period	:	300ms
Test time :	:	120s

12.2. Block Diagram of Test Setup

AC Lines:



Signal lines:



12.3. Test Procedure

The EUT is put on the table that is 0.1 meter high above the ground. This reference ground plane shall project beyond the EUT by at least 0.1m on all sides and the minimum distance between EUT and all other conductive structure, except the ground plane beneath the EUT, shall be more than 0.5m.

12.4. Test Results

PASS

Temperature	:	25.4°C
Humidity	:	50%
Atmospheric Pressure	:	101kpa
Test Engineer	:	LHT
Test Date	:	2021-12-15

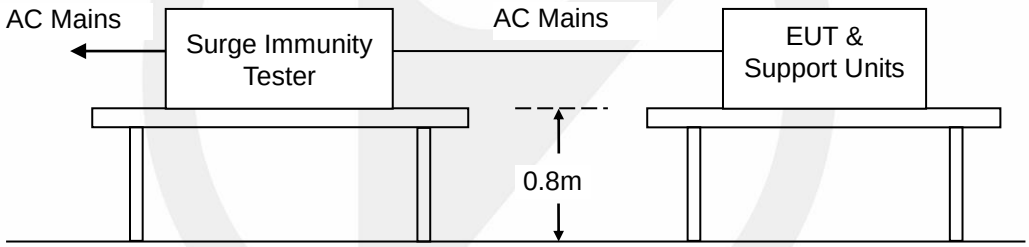
Injection Line	Voltage (kV)	Injected Method	Actual criterion	Required performance criterion	Result (Pass/Fail)
☒ AC mains power ports	± 1	☒ CDN ☐ Direct injection ☐ Capacitive coupling clamp	A	B	Pass
☐ DC network power ports	± 0.5	☐ CDN ☐ Direct injection ☐ Capacitive coupling clamp	N/A	N/A	N/A
☐ Analogue/digital data ports (Wired network port)	± 0.5	☐ CDN ☐ Direct injection ☐ Capacitive coupling clamp	A	B	N/A
☐ Analogue/digital data ports (Broadcast receiver tuner port)	± 0.5	☐ CDN ☐ Direct injection ☐ Capacitive coupling clamp	N/A	N/A	N/A
☐ Analogue/digital data ports (.....)	± 0.5	☐ CDN ☐ Direct injection ☐ Capacitive coupling clamp	N/A	N/A	N/A

13. SURGES

13.1. Test Specification

Test standard	:	EN 55035
Basic standard	:	IEC 61000-4-5
Test level	:	☒1kV, Line to Line, AC mains power ports, Criterion B
		☒2kV, Line to Earth, AC mains power ports, Criterion B
		☐0.5kV, Line to Reference ground, DC network power ports, Criterion B
		☐1.0kV, Lines to Ground, Unshielded symmetrical, Criterion C
		☐4.0kV, Lines to Ground, Unshielded symmetrical, Criterion C
		☐0.5kV, Shield to ground, Coaxial or shielded port, Criterion B
Number of surges	:	5 (for each combination of parameters)
Repetition rate	:	1 minute / time
Polarity:	:	Positive / Negative
Phase angle:	:	90º, 270º (Only AC mains power ports)

13.2. Block Diagram of Test Setup



13.3. Test Procedure

This test simulates a lightning event by inducing transients onto the AC/DC power supply lines in common mode (Line to Ground) and differential mode (Line to Line). Each device was tested in a total of two surge configurations: Line to Ground (L-G): Combination Wave, Line to Protective Earth with 9uF and 10Ohm and Neutral to Protective Earth with 9uF and 10Ohm, common mode, generator earthed.
Line to Line (L-L): Combination Wave,
Line to Neutral with 18uF, differential mode, generator floated.
2 ohm : the source impedance of the low-voltage power supply network.
12 ohm : the source impedance of the low-voltage power supply network and ground.

a. If not otherwise specified the surges have to be applied synchronized to the voltage phase at the zero-crossing and the peak value of the a.c. voltage wave (positive and negative).
b. The surges have to be applied line to line and line to earth. When testing line to earth, the test voltage has to be applied successively between each of the lines and earth, if there is no other specification.
c. The test procedure shall also consider the non-linear current-voltage characteristics of the equipment under test. Therefore the test voltage has to be increased by steps up to the test level specified in the product standard or test plan. All lower levels including the selected test level shall be satisfied.
d. For testing the secondary protection, the output voltage of the generator shall be increased up to the worst-case voltage breakdown level (let-through level) of the primary protection.
e. Testing shall be performed according to a Test Plan, which shall be included in the test report.

f. To find all critical points of the duty cycle of the equipment, a sufficient number of positive and negative test pulses shall be applied.

13.4. Test results

PASS

Temperature	:	25.4°C
Humidity	:	50%
Atmospheric Pressure	:	101kpa
Test Engineer	:	LHT
Test Date	:	2021-12-15

☒ AC mains power ports:

Coupling Line	Voltage (kV)	Waveform (μs)	Polarity	Actual criterion	Required performance criterion	Result (Pass/Fail)
☒ Line to line	0.5, 1	1.2/50 (8/20)	Pos./ Neg.	A	B	Pass
☒ Line to earth	0.5, 1, 2	1.2/50 (8/20)	Pos./ Neg.	A	B	Pass

☐ DC network power ports:

Coupling Line	Voltage (kV)	Waveform (μs)	Polarity	Actual criterion	Required performance criterion	Result (Pass/Fail)
Line to Reference ground	0.5	1.2/50 (8/20)	Pos./ Neg.	N/A	B	N/A

☐ Analogue/digital data ports:

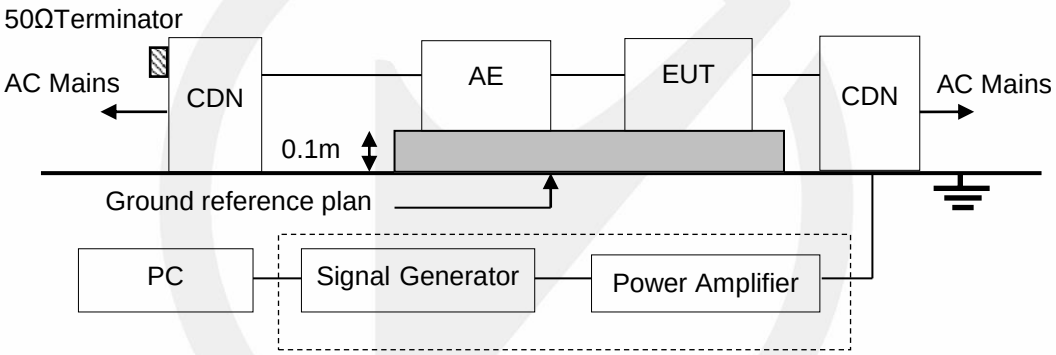
Port type	Coupling Line	Voltage (kV)	Waveform (μs)	Polarity	Actual criterion	Required performance criterion	Result (Pass/Fail)
☐ Unshielded symmetrical (Wired network port)	Lines to ground	0.5, 1	10/700 (5/320)	Pos./ Neg.	A	C	N/A
☐ Unshielded symmetrical (.....)	Lines to ground	0.5, 1	10/700 (5/320)	Pos./ Neg.	N/A	C	N/A
☐ Unshielded symmetrical	Lines to ground	0.5, 1, 2, 4	10/700 (5/320)	Pos./ Neg.	N/A	C	N/A
☐ Coaxial or shielded (Broadcast receiver tuner port)	Shield to ground	0.5	1.2/50 (8/20)	Pos./ Neg.	N/A	C	N/A
☐ Coaxial or shielded (.....)	Shield to ground	0.5	1.2/50 (8/20)	Pos./ Neg.	N/A	C	N/A

14. CONTINUOUS INDUCED RF DISTURBANCES

14.1. Test Specification

Test standard	:	EN 55035
Basic standard	:	IEC 61000-4-6
Performance criterion	:	A
Frequency range & Test level	:	0.15M to 10MHz, 3V 10M to 30MHz, 3V to 1V 30M to 80MHz, 1V
Modulation	:	AM 80%, 1kHz sine-wave
Frequency Step	:	1% of fundamental

14.2. Block Diagram of Test Setup



14.3. Test Procedure

a. The EUT shall be operated within its intended climatic conditions. The temperature and relative humidity should be recorded.
b. The EUT is placed on a 0.1m high test table, and a well grounded cable is connected to metallic plane above the test table.
c. All cables/wires must be laid out on test plate (3cm in thickness),and the EUT is set up on test plate (10 cm in thickness) as shown in test setup photo, and the cables/wires must not be in mid-air, they should be touching the surface of test plate. Ensure that the EUT is properly connected to the accessory equipment.
d. The test shall be 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 are terminated by a 50 ohm load resistor.
e. The frequency range is 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 1 kHz sine wave, pausing to adjust the RF-signal level or to switch coupling devices as necessary. The rate of sweep shall no exceed 1.5 x 10-3 decades/s. Where the frequency is swept incrementally, the step size shall no exceed 1% of the start and thereafter 1% of the preceding frequency value.
f. The dwell time at each frequency shall not be less than the time necessary for the EUT to be exercised, and able to respond. Sensitive frequencies e.g. clock frequency (ies) and harmonics or frequencies of dominant interest shall be analyzed separately.
g. Attempts should be made to fully exercise the EUT during testing, and to fully interrogate all exercise modes selected for susceptibility
h. Testing shall be performed according to a Test Plan, which shall be included in the test report.

14.4.Test results

PASS

Temperature	:	25.4°C
Humidity	:	50%
Atmospheric Pressure	:	101kpa
Test Engineer	:	LHT
Test Date	:	2021-12-15

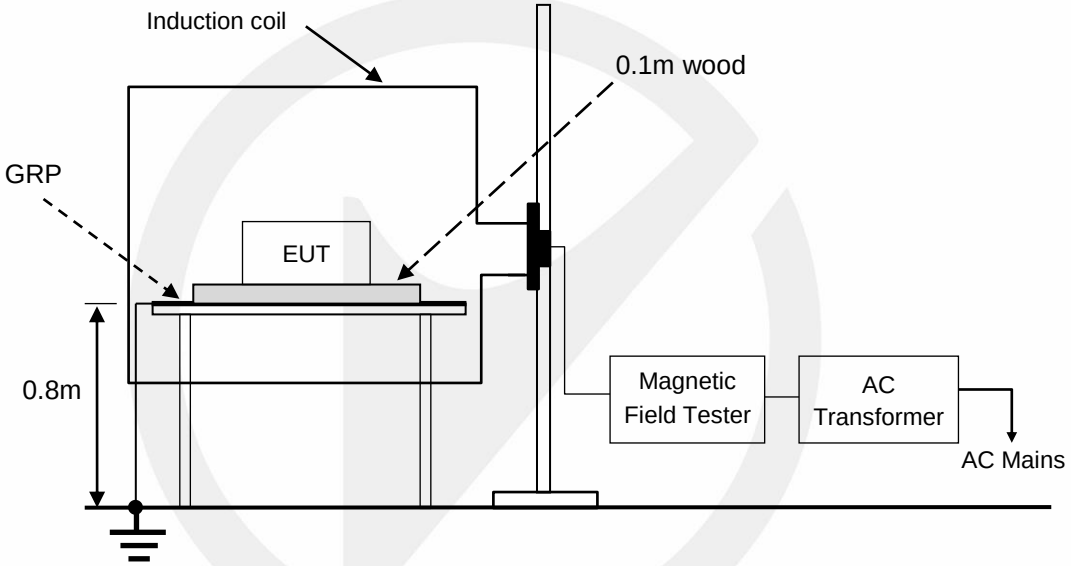
Range (MHz)	Levers (V)	Injection port	Coupling type	Actual criterion	Required performance criterion	Result (Pass/Fail)
0.15-10	3	☒AC mains power ports	☒CDN ☐EM Clamp ☐Current Clamp ☐Direct injection	A	A	Pass
10-30	3-1					
30-80	1					
0.15-10	3	☐DC network power ports	☐CDN ☐EM Clamp ☐Current Clamp ☐Direct injection	N/A	N/A	N/A
10-30	3-1					
30-80	1					
0.15-10	3	☐Analogue/digital data ports (Wired network port)	☐CDN ☐EM Clamp ☐Current Clamp ☐Direct injection	A	A	N/A
10-30	3-1					
30-80	1					
0.15-10	3	☐Analogue/digital data ports (Broadcast receiver tuner port)	☐CDN ☐EM Clamp ☐Current Clamp ☐Direct injection	N/A	N/A	N/A
10-30	3-1					
30-80	1					
0.15-10	3	☐Analogue/digital data ports (.....)	☐CDN ☐EM Clamp ☐Current Clamp ☐Direct injection	N/A	N/A	N/A
10-30	3-1					
30-80	1					

15. POWER FREQUENCY MAGNETIC FIELD

15.1. Test Specification

Test Standard	:	EN 55035
Basic Standard	:	IEC 61000-4-8
Performance criterion	:	A
Test level	:	1A/m

15.2. Block Diagram of Test Setup



GRP: Ground reference plane
EUT: Equipment under test

15.3. Test Procedure

The EUT is placed in the middle of a induction coil (1*1m), under which is a 1*1*0.1m (high) table, this small table is also placed on a larger table, 0.8 m above the ground. Both horizontal and vertical polarization of the induction coil is set on test, so that each side of the EUT is affected by the magnetic field. Also can reach the same aim by change the position of the EUT.

15.4. Test Results

PASS

Temperature	:	25.4°C
Humidity	:	50%
Atmospheric Pressure	:	101kpa
Test Engineer	:	LHT
Test Date	:	2021-12-15

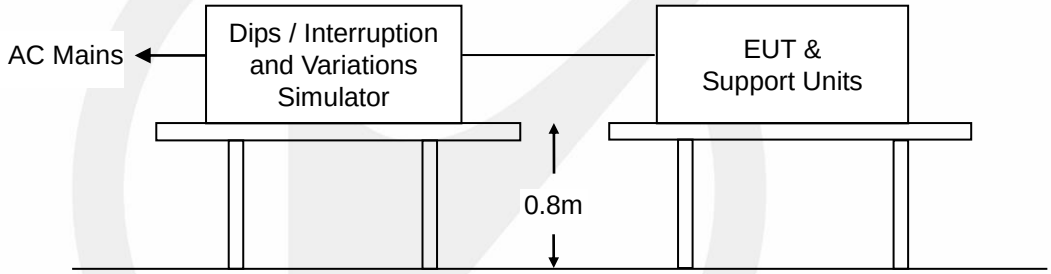
Test Level (A/m)	Frequency	Testing Duration	Coil Orientation	Actual criterion	Required performance criterion	Result (Pass/Fail)
1	☒ 50Hz ☒ 60Hz	5 mins	☒ x-axis ☒ y-axis ☒ z-axis	A	A	Pass

16. VOLTAGE DIPS AND INTERRUPTIONS

16.1. Test Specification

Test standard	:	EN 55035
Basic standard	:	IEC 61000-4-11
Test level	:	0%, 0.5 period, Criterion B
		☒70%, 25 periods for 50Hz, Criterion C
		☒70%, 30 periods for 60Hz, Criterion C
		☒0%, 250 periods for 50Hz, Criterion C
		☒0%, 300 periods for 60Hz, Criterion C

16.2. Block Diagram of Test Setup



16.3. Test Procedure

a. Where the equipment has a rated voltage the following shall apply - If the voltage range does not exceed 20% of the lower voltage specified for the rated voltage range, a single voltage within that range may be specified as a basis for test level specification.
- In all other cases, the test procedure shall be applied for both the lowest and highest voltages declared in the voltage range.
b. Test Conditions
- Select operated voltage and frequency of EUT - Test of interval : 10 sec.
- Level and duration : Sequence of 3 dips/interrupts.
- Voltage rise (and fall) time : 1.5 μs.

16.4.Test results

PASS

Temperature	:	25.4°C
Humidity	:	50%
Atmospheric Pressure	:	101kpa
Test Engineer	:	LHT
Test Date	:	2021-12-15

	Test Level (% UT)	Phase angle (°)	Input Voltage (V)	Freq (Hz)	Duration (periods)	Actual criterion	Required performance criterion	Result (Pass /Fail)
☒Voltage dips	0%	0º, 180º	AC 230V	50	0.5	A	B	Pass
☒Voltage dips	0%	0º, 180º	AC 120V	60	0.5	A	B	Pass
☒Voltage dips	70%	0º, 180º	AC 230V	50	25	A	C	Pass
☒Voltage dips	70%	0º, 180º	AC 120V	60	30	A	C	Pass
☒Voltage interruptions	0%	0º, 180º	AC 230V	50	250	B	C	Pass
☒Voltage interruptions	0%	0º, 180º	AC 120V	60	300	B	C	Pass

Note: 1. Dips to 0%, Duration 250P, EUT stopped operation, but can be automatically restored.
2. Dips to 0%, Duration 300P, EUT stopped operation, but can be automatically restored.

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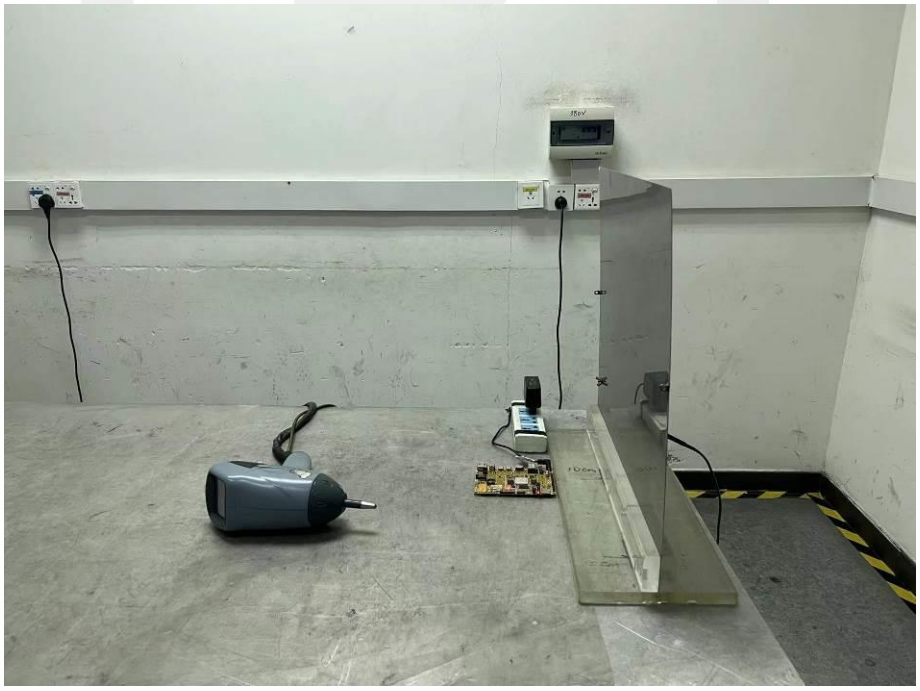
17. PHOTOGRAPHS

17.1. Photos of Conducted Emissions from the AC Mains Power Ports

17.2.Photos of Radiation Emission Measurement

17.3.Photo of Harmonic / Flicker Measurement

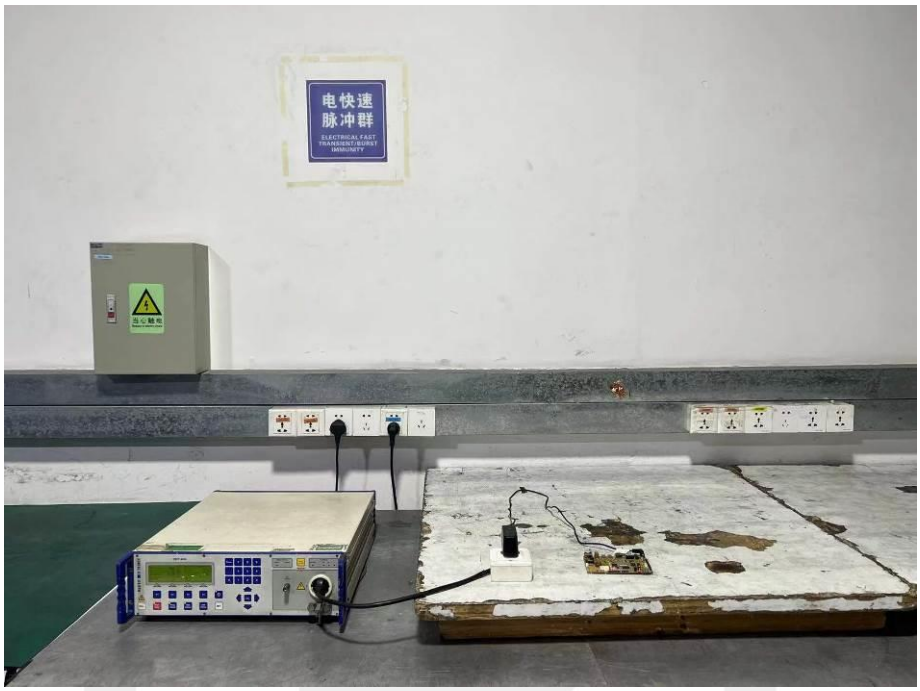
17.4.Photo of Electrostatic Discharges



17.5.Photo of Continuous RF Electromagnetic Field Disturbances

17.6.Photos of Electrical Fast Transients/Burst

AC Mains:

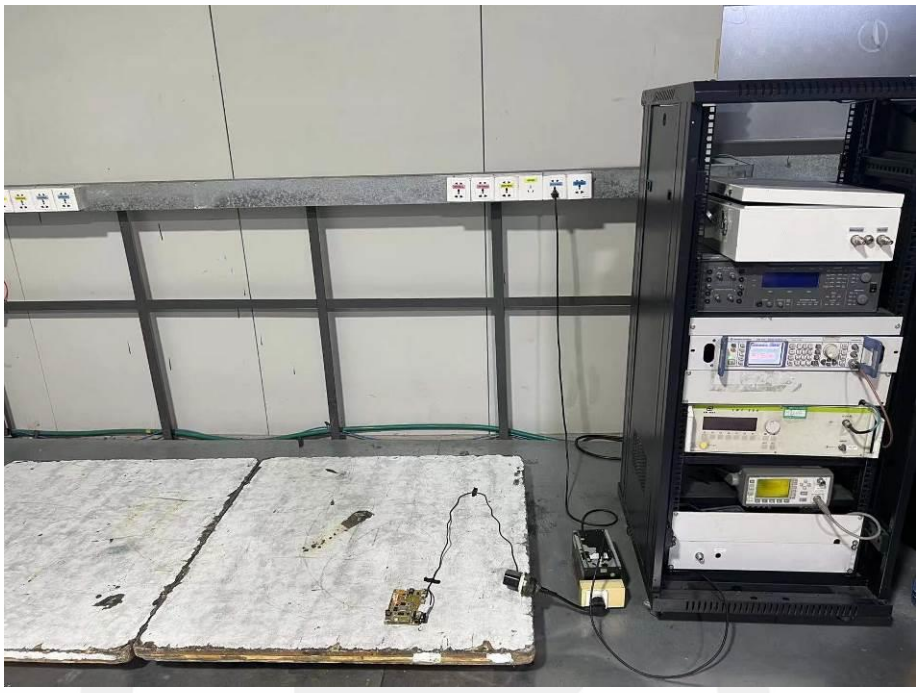


17.7.Photos of Surges

AC Mains:

17.8.Photos of Continuous Induced RF Disturbances

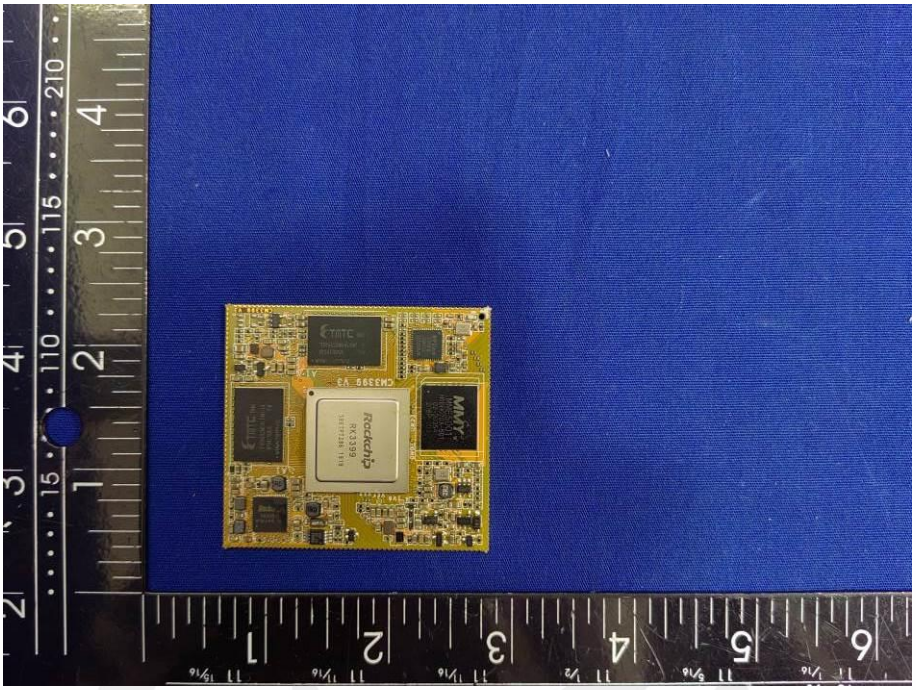
AC Mains:

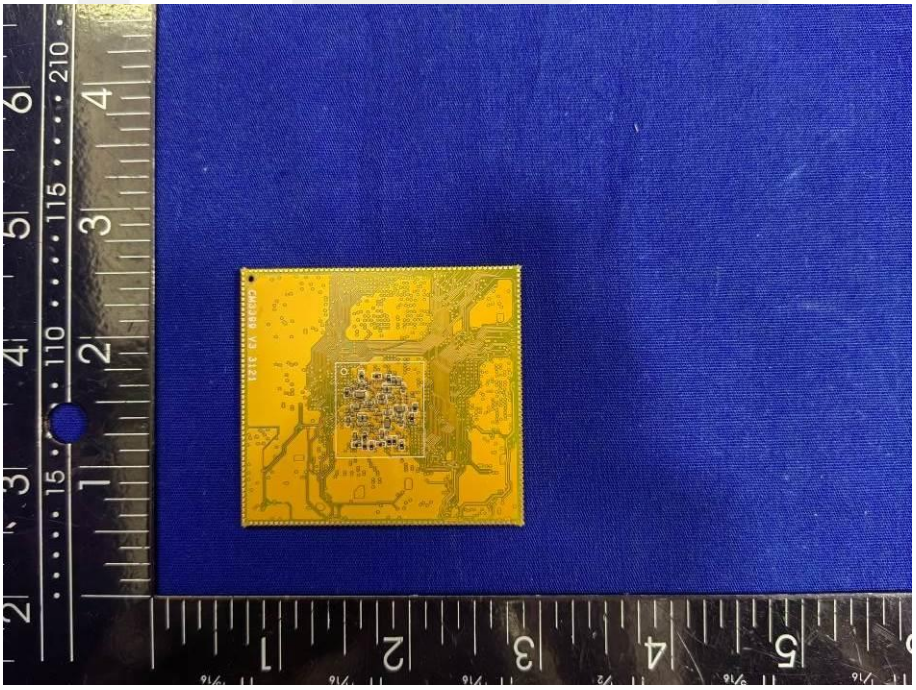


17.9.Photo of Power Frequency Magnetic Field

17.10.Photo of Voltage Dips and Interruptions

APPENDIX
(PHOTOS OF EUT)





*** End of Report ***