

CE EMC Test Report



(Declaration of Conformity)

For
Electromagnetic compatibility
Of

Product : HMI touch integrated screen

Trade Mark : N/A

H070R01W, H070R01WG, H101R01W,
H101R01WG, H080R01W, H080R01WG,
H156K01W, H156K01WG, H116K01W,

Model Number : H116K01WG, H133K01W, H133K01WG,
H215K01W, H215K01WG, H185K01WG,
H270K01WG, H238K01WG, H170K01WG,
H190K01WG, H320K01WG

Prepared for

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Prepared by

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TEST RESULT CERTIFICATION

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Product description

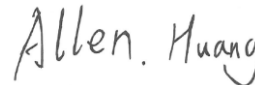
Product Name.....: HMI touch integrated screen
H070R01W, H070R01WG, H101R01W, H101R01WG, H080R01W, H080R01WG, H156K01W, H156K01WG, H116K01W,
Model Number: H116K01WG, H133K01W, H133K01WG, H215K01W, H215K01WG, H185K01WG, H270K01WG, H238K01WG, H170K01WG, H190K01WG, H320K01WG
EN 55032:2015+A1:2020
Standards: EN 55035:2017+A11:2020
EN IEC 61000-3-2:2019+A1:2021
EN 61000-3-3:2013+A2:2021

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Test Sample Number: S230904075002
Date of Test:
Date (s) of performance of tests: 07 Sep. 2023 ~ 18 Sep. 2023
Date of Issue.....: 18 Sep. 2023
Test Result: **Pass**

Testing Engineer

:



(Allen Huang)

Technical Manager

:



(Sky Zhang)

Authorized Signatory

:



(Alex)

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1. TEST SUMMARY

Test procedures according to the technical standards:

EMC Emission				
Standard	Test Item	Limit	Judgment	Remark
EN 55032:2015+A1:2020	Conducted Emission On AC And Telecom Port (150kHz to 30MHz)	Class B	PASS	
	Disturbance Voltage at the Antenna Terminals (30MHz To 2150MHz)	-----	N/A	
	Wanted signal and disturbance voltage at the RF output terminals (30MHz To 2150MHz)	-----	N/A	
	Radiated Emission (30MHz to 1000MHz)	Class B	PASS	
	Radiated Emission (1GHz to 6GHz)	-----	N/A	NOTE (2)
EN IEC 61000-3-2:2019+A1:2021	Harmonic Current Emission	Class A	N/A	NOTE (3)
EN 61000-3-3:2013+A2:2021	Voltage Fluctuations & Flicker	-----	PASS	
EMC Immunity				
Section	Test Item	Performance Criteria	Judgment	Remark
EN 55035:2017+A11:2020				
EN 61000-4-2	Electrostatic Discharge	B	PASS	
EN 61000-4-3	RF electromagnetic field	A	PASS	
EN 61000-4-4	Fast transients	B	PASS	
EN 61000-4-5	Surges	B	PASS	
EN 61000-4-6	Continuous radio frequency disturbances	A	PASS	
EN 61000-4-8	Power Frequency Magnetic Field	A	PASS	
EN 61000-4-11	Volt. Interruptions Volt. Dips	B / C / C	PASS	

NOTE:

- (1) "N/A" denotes test is not applicable in this Test Report
- (2) 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, 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.
- (3) The power consumption of EUT is less than 75W and no Limits apply.
- (4) For client's request and manual description, the test will not be executed.

1.1 TEST FACILITY

Shenzhen NTEK Testing Technology Co., Ltd.

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CNAS-Lab. : The Laboratory has been assessed and proved to be in compliance
with CNAS-CL01:2018 (identical to ISO/IEC 17025:2017)
The Certificate Registration Number is L5516

ISED-Registration : The Company Number: 9270A.
CAB identifier: CN0074.

FCC- Accredited : Test Firm Registration Number: 463705
Designation Number: CN1184

A2LA-Lab. : The Certificate Registration Number is 4298.01
This laboratory is accredited in accordance with the recognized
International Standard ISO/IEC 17025:2017 General requirements for
the competence of testing and calibration laboratories.
This accreditation demonstrates technical competence for a defined
scope and the operation of a laboratory quality management system
(refer to joint ISO-ILAC-IAF Communiqué dated April 2017).

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a
standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of
approximately **95** %.

Test Item	Measurement Frequency Range	K	U(dB)
Conducted Emission	0.009MHz ~ 0.15MHz	2	3.6
Conducted Emission	0.15MHz ~ 30MHz	2	3.1
Telecom Conducted Emission(Cat 3)	0.15MHz ~ 30MHz	2	3.1
Telecom Conducted Emission(Cat 5)	0.15MHz ~ 30MHz	2	3.6
Telecom Conducted Emission(Cat 6)	0.15MHz ~ 30MHz	2	4.2
Radiated Emission	30MHz ~ 1000MHz	2	5.2
Radiated Emission	1000MHz ~ 18000MHz	2	5.1
Power Clamp	30MHz ~ 300MHz	2	2.2

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	HMI touch integrated screen	
Model Number	H070R01W	
Additional Model Number(s)	H070R01WG, H101R01W, H101R01WG, H080R01W, H080R01WG, H156K01W, H156K01WG, H116K01W, H116K01WG, H133K01W, H133K01WG, H215K01W, H215K01WG, H185K01WG, H270K01WG, H238K01WG, H170K01WG, H190K01WG, H320K01WG	
Model Difference	All models are identical except model's name.	
Product Description	The EUT is a HMI touch integrated screen.	
	Operating frequency:	24 MHz (Declaration by Manufacturer)
	Connecting I/O port:	N/A
Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as a Multimedia Device. More details of EUT technical specification, please refer to the User's Manual.		
Power Source	AC Voltage	
Power Rating	Adapter Model: FX24E-120200C Adapter Rating: Input: AC 100-240V, 50/60Hz, 0.6A Max. Output: DC 12V, 2A	

2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively. All test modes in the table below are tested, the worst case is listed on this report.

Pretest Mode	Description
Mode 1	USB Playing
Mode 2	TF Playing
Mode 3	Ping

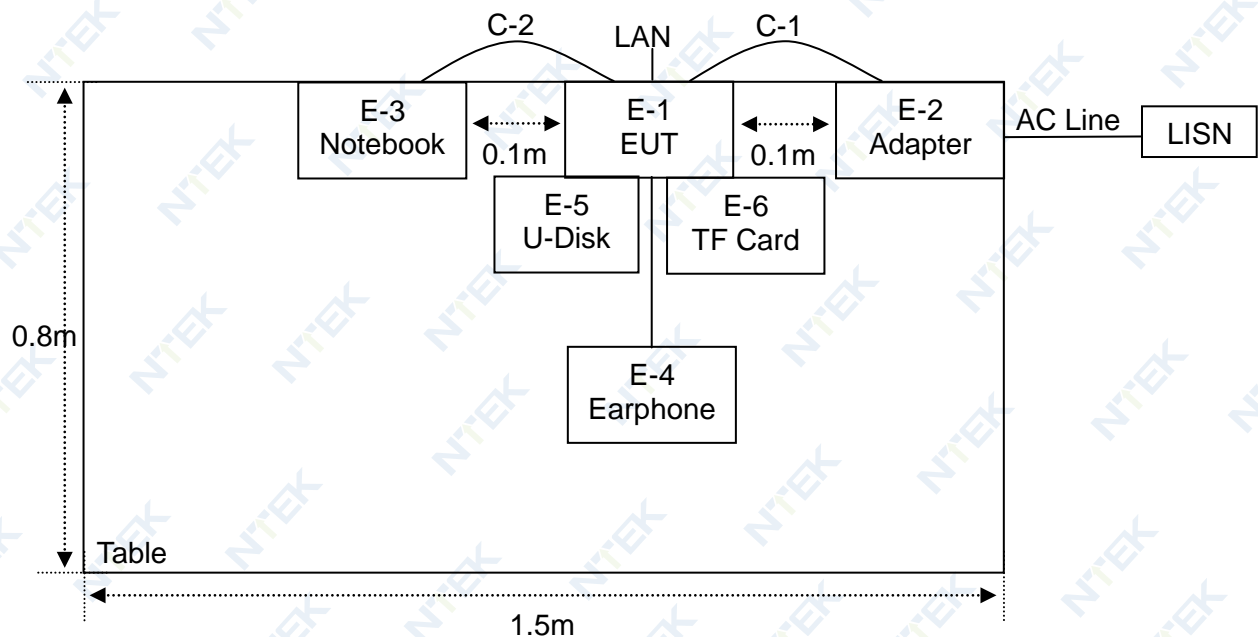
For Conducted Test	
Final Test Mode	Description
Mode 1	USB Playing
Mode 2	TF Playing
Mode 3	Ping

For Radiated Test	
Final Test Mode	Description
Mode 1	USB Playing
Mode 2	TF Playing

For EMS Test	
Final Test Mode	Description
Mode 1	USB Playing
Mode 2	TF Playing
Mode 3	Ping




2.3 DESCRIPTION OF TEST SETUP

Mode CE : TF Playing



2.4 DESCRIPTION TEST PERIPHERAL AND EUT PERIPHERAL

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Brand	Model/Type No.	Series No.	Note
E-1	HMI touch integrated screen	N/A	H070R01W	N/A	EUT
E-2	Adapter	N/A	FX24E-120200C	N/A	EUT
E-3	Notebook		Inspiron 5493	9M1NN63	
E-4	Earphone	N/A	N/A	N/A	
E-5	U-Disk		N/A	N/A	
E-6	TF Card		CO8G	N/A	

Item	Shielded Type	Ferrite Core	Length	Note
C-1	NO	NO	100cm	
C-2	YES	YES	120cm	

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.
- (3) "YES" means "shielded" "with core"; "NO" means "unshielded" "without core".

2.5 MEASUREMENT INSTRUMENTS LIST
2.5.1 CONDUCTED TEST

Item	Name of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Single Phase LISN	R&S	ENV216	101490	May 29, 2023	May 28, 2024	1 year
2	Single Phase LISN	R&S	ENV216	101313	Mar. 27, 2023	Mar. 26, 2024	1 year
3	Three-Phase LISN	SCHWARZBECK	NNLK 8129	8129245	Mar. 27, 2023	Mar. 26, 2024	1 year
4	Low Frequency Cable	N/A	R-03	N/A	Jun. 17, 2022	Jun. 16, 2025	3 years
5	50Ω Coaxial Switch	Anritsu	MP59B	6200983704	May 06, 2023	May 05, 2026	3 years
6	EMI Test Receiver	R&S	ESCI	101160	Mar. 27, 2023	Mar. 26, 2024	1 year

2.5.2 RADIATED TEST

Item	Name of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	3m Anechoic Chamber	N/A	9*6*6	N/A	May 14, 2021	May 13, 2024	3 years
2	3m Anechoic Chamber	N/A	9*6*6	N/A	Jul. 28, 2022	Jul. 27, 2025	3 years
3	EMI Test Receiver	R&S	ESPI7	101318	Mar. 27, 2023	Mar. 26, 2024	1 year
4	Bilog Antenna	TESEQ	CBL6111D	31216	Mar. 16, 2023	Mar. 15, 2024	1 year
5	50Ω Coaxial Switch	Anritsu	MP59B	6200983705	May 06, 2023	May 05, 2026	3 years
6	Cable	Talent Microwave	A81-NWMS MAM-12M	21120897	Dec. 16, 2021	Dec. 15, 2024	3 years
7	Cable	Talent Microwave	A81-NMN M-10M	22084896	Sep. 09, 2022	Sep. 08, 2025	3 years
8	Cable	Talent Microwave	A81-NMN M-2M	22084895	Sep. 09, 2022	Sep. 08, 2025	3 years
9	Log-Periodic Antenna	SCHWARZBECK	VULB 9162	584	Jan. 11, 2023	Jan. 10, 2024	1 year
10	Log-Periodic Antenna	SCHWARZBECK	VULB 9162	586	Jan. 11, 2023	Jan. 10, 2024	1 year
11	Attenuator	Eastsheep	5W-N-JK-6 G-6DB	N/A	Aug. 08, 2023	Aug. 07, 2024	1 year
12	Attenuator	Eastsheep	5W-N-JK-6 G-6DB	N/A	Jul. 31, 2023	Jul. 30, 2024	1 year
13	Broadband Horn Antenna	EM	EM-AH-10 180	2011071402	Mar. 31, 2022	Mar. 30, 2025	3 years
14	Broadband Horn Antenna	SCHWARZBECK	BBHA 9120 D	2816	Jan. 12, 2023	Jan. 11, 2024	1 year
15	Broadband Horn Antenna	SCHWARZBECK	BBHA 9120 D	2817	Jan. 12, 2023	Jan. 11, 2024	1 year
16	Spectrum Analyzer	Keysight	N9020A	MY53280244	Nov. 04, 2022	Nov. 03, 2023	1 year
17	Spectrum Analyzer	Agilent	E4440A	MY41000130	Mar. 27, 2023	Mar. 26, 2024	1 year
18	Pre-Amplifier	EMC	EMC05183 5SE	980246	May 29, 2023	May 28, 2024	1 year
19	Cable	Keysight	A40-2.92M 2.92M-2M	1808041	Nov. 01, 2022	Oct. 31, 2023	3 years

2.5.3 HARMONICS AND FLICKERS

Item	Name of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Power Analyzer	EVERFINE	HFA-1000	P626750CD 1411117	Sep. 19, 2022	Sep. 18, 2023	1 year
2	AC Power Source	EVERFINE	HFS-4000 V200	P624486CD 1411123	Sep. 19, 2022	Sep. 18, 2023	1 year

2.5.4 ESD

Item	Name of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	ESD Generator	EVERFINE	EMS61000-2A	P615727TA 1421113	Jul. 06, 2023	Jul. 05, 2024	1 year
2	Electrostatic Discharge Generator	Lioncel	ESD-203B	ESD203B01 50402	Aug. 11, 2023	Aug. 10, 2024	1 year

2.5.5 RS

Item	Name of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	RF Test System Controller	AR	SC1000	0350156	Feb. 22, 2021	Feb. 21, 2024	3 years
2	3m Anechoic Chamber	N/A	9*6*6	N/A	Mar. 24, 2023	Mar. 23, 2026	3 years
3	3m Anechoic Chamber	N/A	7*5*4	N/A	May 19, 2023	May 18, 2026	3 years
4	Broadband Amplifier	AR	60S1G6	0350414	Mar. 21, 2023	Mar. 20, 2024	1 year
5	Bilog Antenna	ETS	3142E	00214344	Nov. 04, 2022	Nov. 03, 2023	1 year
6	Power Amplifier	rflight	NTWPA-0 0810200	17063153	May 29, 2023	May 28, 2024	1 year
7	ESG Vector Signal Generator	Agilent	E4438C	MY45093347	Mar. 21, 2023	Mar. 20, 2024	1 year

2.5.6 EFT/BURST, SURGE, VOLTAGE INTERRUPTION/DIPS

Item	Name of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Electrical Intelligent Transient Generator	EVERFINE	EMS6100 0-4A	P612005CM 5421115	Jul. 04, 2023	Jul. 03, 2024	1 year
2	Capacitive Coupling Clamp	EVERFINE	EFTC-2-V1	910006	Mar. 27, 2023	Mar. 26, 2024	1 year
3	Surge Generator	EVERFINE	EMS6100 0-5A	P612004TJ6 421112	Jul. 04, 2023	Jul. 03, 2024	1 year
4	CCITT Surge Generator	EVERFINE	EMS6100 0-5D	P615656TD 1401113	Jul. 04, 2023	Jul. 03, 2024	1 year
5	Telecommunication Lines Cdn	EVERFINE	SGN-8	P619137TS 1411113	Jul. 04, 2023	Jul. 03, 2024	1 year
6	Signal Lines CDN	EVERFINE	SGN-5	P619136TJ6 421113	Aug. 08, 2023	Aug. 07, 2024	1 year
7	Voltage Dips And Interruptions Generator	EVERFINE	EMS6100 0-11K	P612006CJ 1421117	Jul. 04, 2023	Jul. 03, 2024	1 year

2.5.7 CONTINUOUS RADIO FREQUENCY DISTURBANCES

Item	Name of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Signal Generator	R&S	SML03	100954	Nov. 01, 2022	Oct. 31, 2023	1 year
2	Coupling and Decoupling Network	TESEQ	CDN M016	38722	May 29, 2023	May 28, 2024	1 year
3	Power Amplifier	TESEQ	CBA 230M-080	T44376	Aug. 08, 2023	Aug. 07, 2024	1 year
4	Attenuator	Jingtenghong	JTH-SJ-10 0W-6dB	1001451430 00686	Apr. 01, 2022	Mar. 31, 2025	3 years
5	EM Clamp	TESEQ	KEMZ 801A	47860	Nov. 01, 2022	Oct. 31, 2023	1 year

2.5.8 PFMF

Item	Name of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Magnetic Field Generator	EVERFINE	EMS61000-8K	1007001	Feb. 19, 2023	Feb. 18, 2024	1 year
2	Magnetic Field Coil	EVERFINE	N/A	N/A	Feb. 19, 2023	Feb. 18, 2024	1 year

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION (Frequency Range 150kHz-30MHz)

Table A.8 – Requirements for conducted emissions from the AC mains power ports of Class A equipment

Applicable to				
1. AC mains power ports (3.1.1)				
Table clause	Frequency range MHz	Coupling device (see Table A.7)	Detector type / bandwidth	Class A limits dB(μV)
A8.1	0,15 – 0,5	AMN	Quasi Peak / 9 kHz	79
	0,5 – 30			73
A8.2	0,15 – 0,5	AMN	Average / 9 kHz	66
	0,5 – 30			60

Apply A8.1 and A8.2 across the entire frequency range.

Table A.9 – Requirements for conducted emissions from the AC mains power ports of Class B equipment

Applicable to				
1. AC mains power ports (3.1.1)				
Table clause	Frequency range MHz	Coupling device (see Table A.7)	Detector type / bandwidth	Class B limits dB(μV)
A9.1	0,15 – 0,5	AMN	Quasi Peak / 9 kHz	66 – 56
	0,5 – 5			56
	5 – 30			60
A9.2	0,15 – 0,5	AMN	Average / 9 kHz	56 – 46
	0,5 – 5			46
	5 – 30			50

Apply A9.1 and A9.2 across the entire frequency range.

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

3.1.2 TELECOMMUNICATION PORT CONDUCTED EMISSION (VOLTAGE LIMITS) (Frequency Range 150kHz-30MHz)

Table A.10 – Requirements for asymmetric mode conducted emissions from Class A equipment

Applicable to					
1. wired network ports (3.1.30) 2. optical fibre ports (3.1.24) with metallic shield or tension members 3. antenna ports (3.1.3)					
Table clause	Frequency range MHz	Coupling device (see Table A.7)	Detector type / bandwidth	Class A voltage limits dB(μV)	Class A current limits dB(μA)
A10.1	0,15 – 0,5	AAN	Quasi Peak / 9 kHz	97 – 87	n/a
	0,5 – 30			87	
	0,15 – 0,5	AAN	Average / 9 kHz	84 – 74	
	0,5 – 30			74	
A10.2	0,15 – 0,5	CVP and current probe	Quasi Peak / 9 kHz	97 – 87	53 – 43
	0,5 – 30			87	43
	0,15 – 0,5	CVP and current probe	Average / 9 kHz	84 – 74	40 – 30
	0,5 – 30			74	30
A10.3	0,15 – 0,5	Current Probe	Quasi Peak / 9 kHz	n/a	53 – 43
	0,5 – 30				43
	0,15 – 0,5	Current Probe	Average / 9 kHz		40 – 30
	0,5 – 30				30
The choice of coupling device and measurement procedure is defined in Annex C. AC mains ports that also have the function of a wired network port shall meet the limits given in Table A.8. The test shall cover the entire frequency range. The application of the voltage and/or current limits is dependent on the measurement procedure used. Refer to Table C.1 for applicability. Testing is required at only one EUT supply voltage and frequency. Applicable to ports listed above and intended to connect to cables longer than 3 m.					

Table A.11 – Requirements for asymmetric mode conducted emissions from Class B equipment

Applicable to					
1. wired network ports (3.1.30) 2. optical fibre ports (3.1.24) with metallic shield or tension members 3. broadcast receiver tuner ports (3.1.8) 4. antenna ports (3.1.3)					
Table clause	Frequency range MHz	Coupling device (see Table A.7)	Detector type / bandwidth	Class B voltage limits dB(μV)	Class B current limits dB(μA)
A11.1	0,15 – 0,5	AAN	Quasi Peak / 9 kHz	84 – 74	n/a
	0,5 – 30			74	
	0,15 – 0,5	AAN	Average / 9 kHz	74 – 64	
	0,5 – 30			64	
A11.2	0,15 – 0,5	CVP and current probe	Quasi Peak / 9 kHz	84 – 74	40 – 30
	0,5 – 30			74	30
	0,15 – 0,5	CVP and current probe	Average / 9 kHz	74 – 64	30 – 20
	0,5 – 30			64	20
A11.3	0,15 – 0,5	Current Probe	Quasi Peak / 9 kHz	n/a	40 – 30
	0,5 – 30				30
	0,15 – 0,5	Current Probe	Average / 9 kHz		30 – 20
	0,5 – 30				20

The choice of coupling device and measurement procedure is defined in Annex C.

Screened ports including TV broadcast receiver tuner ports are tested with a common-mode impedance of 150 Ω. This is typically accomplished with the screen terminated by 150 Ω to earth.

AC mains ports that also have the function of a wired network port shall meet the limits given in Table A.9.

The test shall cover the entire frequency range.

The application of the voltage and/or current limits is dependent on the measurement procedure used. Refer to Table C.1 for applicability.

Testing is required at only one EUT supply voltage and frequency.

Applicable to ports listed above and intended to connect to cables longer than 3 m.

Table A.12 – Requirements for conducted differential voltage emissions from Class B equipment
Applicable to

1. TV broadcast receiver tuner ports (3.1.8) with an accessible connector
2. RF modulator output ports (3.1.27)
3. FM broadcast receiver tuner ports (3.1.8) with an accessible connector

Table clause	Frequency range MHz	Detector type/ bandwidth	Class B limits dB(μV) 75 Ω			Applicability
			Other	Local Oscillator Fundamental	Local Oscillator Harmonics	
A12.1	30 – 950	For frequencies ≤1 GHz	46	46	46	See a)
	950 – 2 150		46	54	54	
A12.2	950 – 2 150	Quasi Peak/ 120 kHz	46	54	54	See b)
A12.3	30 – 300		For frequencies ≥1 GHz	46	54	50
	300 – 1 000	52				
A12.4	30 – 300	Peak/ 1 MHz	46	76	59	See d)
	300 – 1 000				52	
A12.5	30 – 950	Peak/ 1 MHz	46	n/a	46	See e)
	950 – 2 150				54	

- a) Television receivers (analogue or digital), video recorders and PC TV broadcast receiver tuner cards working in channels between 30 MHz and 1 GHz, and digital audio receivers.
- b) Tuner units (not the LNB) for satellite signal reception.
- c) Frequency modulation audio receivers and PC tuner cards.
- d) Frequency modulation car radios.
- e) Applicable to EUTs with RF modulator output ports (for example DVD equipment, video recorders, camcorders and decoders etc.) designed to connect to TV broadcast receiver tuner ports.

Testing is required at only one EUT supply voltage and frequency.

The term 'other' refers to all emissions other than the fundamental and the harmonics of the local oscillator.

The test shall be performed with the device operating at each reception channel.

The test shall cover the entire frequency range.

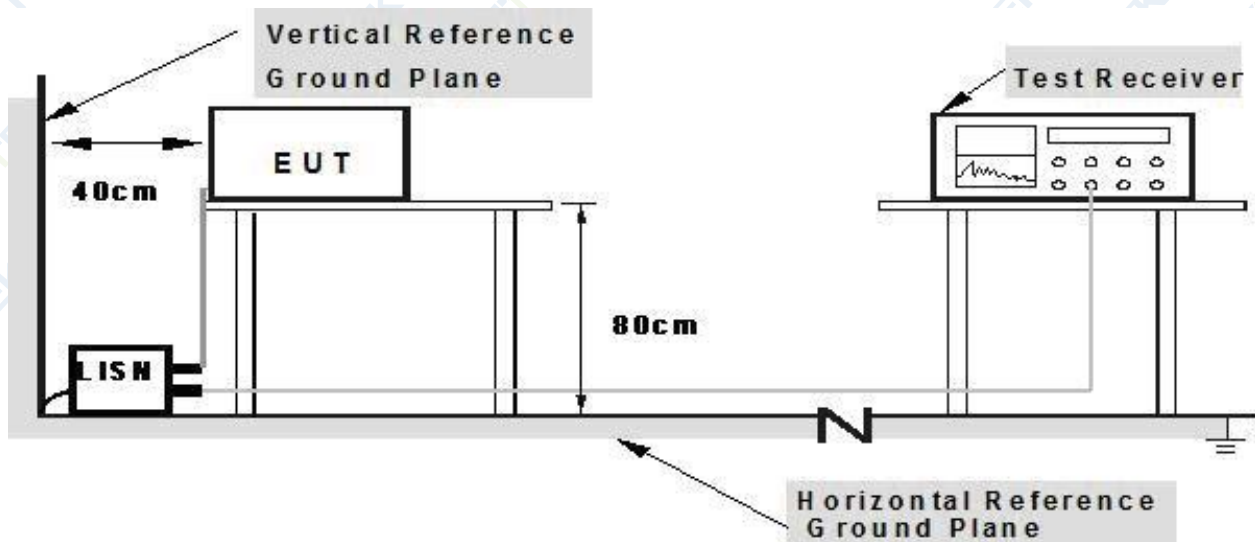
The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

3.1.3 TEST PROCEDURE

- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item -EUT Test Photos.

3.1.4 TEST SETUP



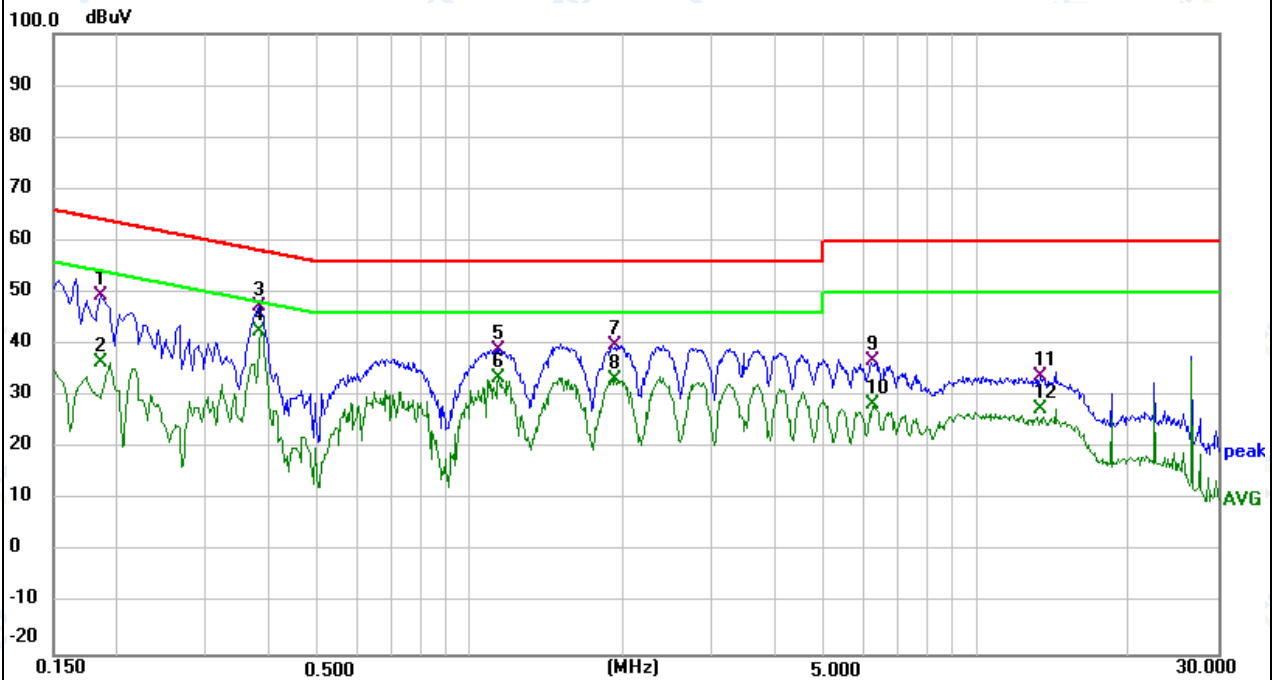
- Note: 1.Support units were connected to second LISN.**
2.Both of LISN s (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

3.1.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

3.1.6 TEST RESULTS

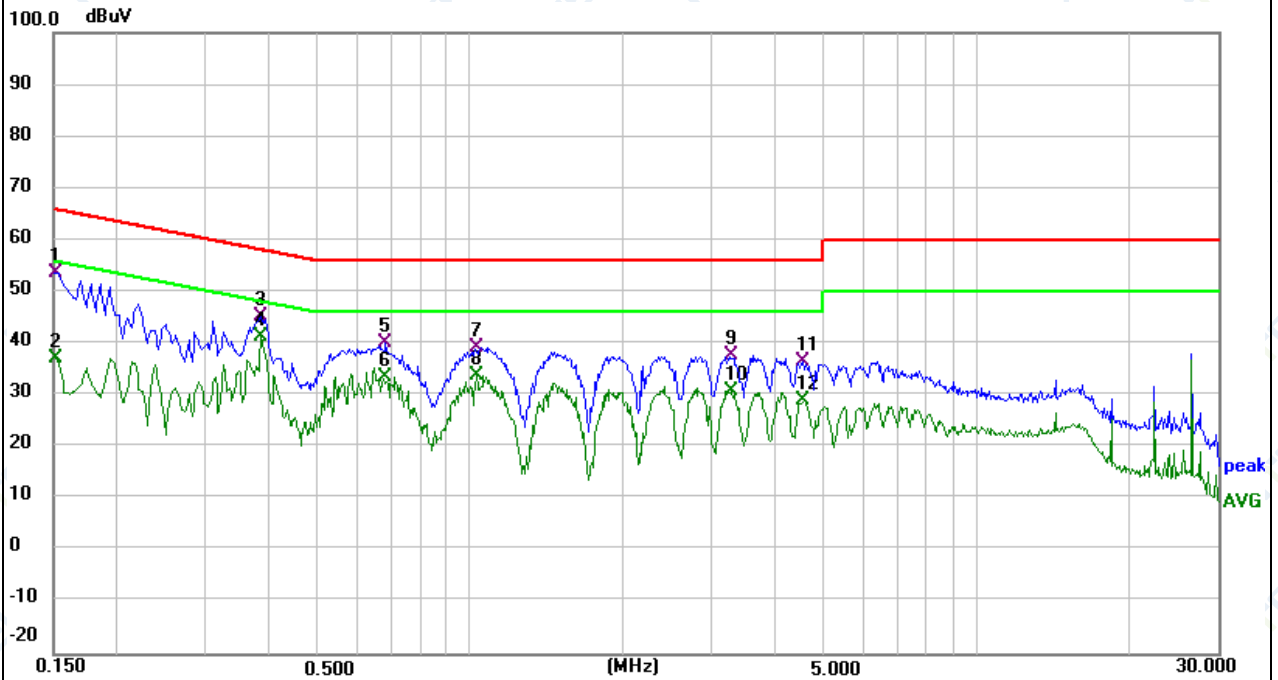
EUT:	HMI touch integrated screen	Model Name:	H070R01W
Temperature:	25.7°C	Relative Humidity:	57%
Pressure:	1010hPa	Test Date:	2023-09-09
Test Mode:	TF Playing	Phase:	L
Test Voltage:	AC 230V/50Hz		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1860	39.51	10.01	49.52	64.21	-14.69	QP	P	
2	0.1860	26.54	10.01	36.55	54.21	-17.66	AVG	P	
3	0.3820	36.94	10.40	47.34	58.24	-10.90	QP	P	
4 *	0.3820	32.25	10.40	42.65	48.24	-5.59	AVG	P	
5	1.1380	27.16	11.94	39.10	56.00	-16.90	QP	P	
6	1.1380	21.47	11.94	33.41	46.00	-12.59	AVG	P	
7	1.9340	26.41	13.52	39.93	56.00	-16.07	QP	P	
8	1.9340	19.79	13.52	33.31	46.00	-12.69	AVG	P	
9	6.2819	27.12	9.68	36.80	60.00	-23.20	QP	P	
10	6.2819	18.83	9.68	28.51	50.00	-21.49	AVG	P	
11	13.3580	24.14	9.70	33.84	60.00	-26.16	QP	P	
12	13.3580	17.85	9.70	27.55	50.00	-22.45	AVG	P	

Remark:
Factor = Insertion Loss + Cable Loss.

EUT:	HMI touch integrated screen	Model Name:	H070R01W
Temperature:	25.7°C	Relative Humidity:	57%
Pressure:	1010hPa	Test Date:	2023-09-09
Test Mode:	TF Playing	Phase:	N
Test Voltage:	AC 230V/50Hz		

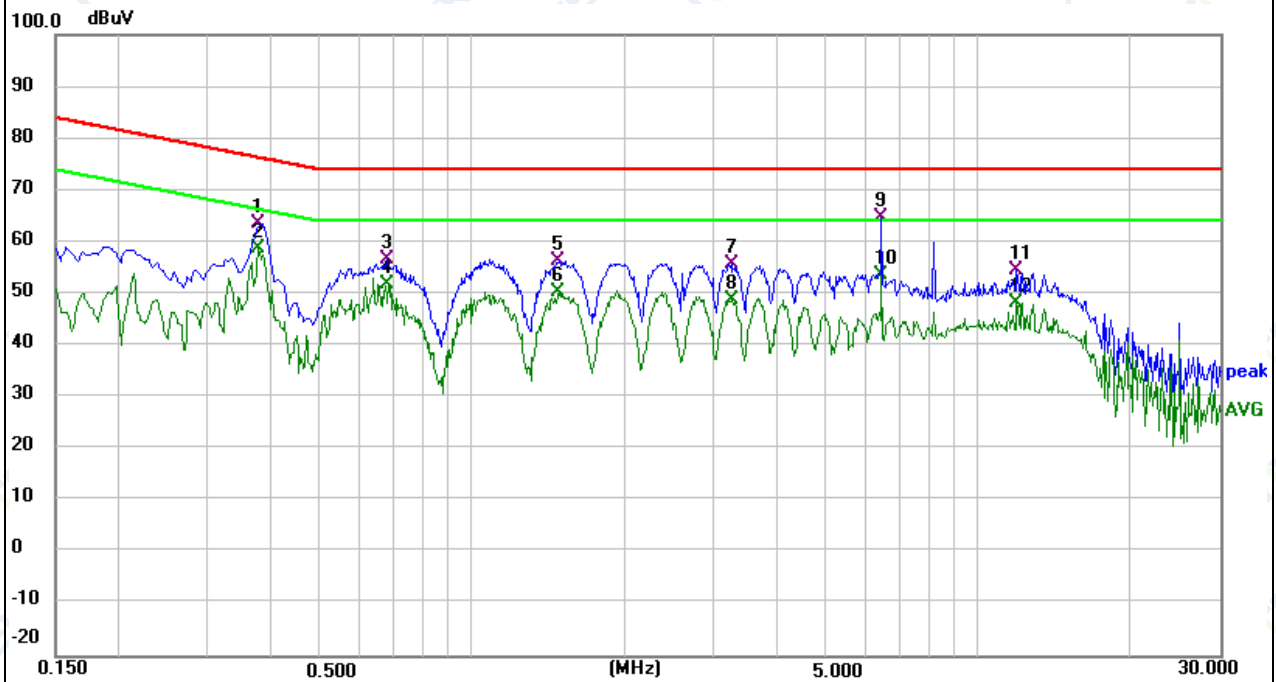


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1516	43.77	9.93	53.70	65.91	-12.21	QP	P	
2	0.1516	27.16	9.93	37.09	55.91	-18.82	AVG	P	
3	0.3860	34.93	10.42	45.35	58.15	-12.80	QP	P	
4 *	0.3860	30.86	10.42	41.28	48.15	-6.87	AVG	P	
5	0.6820	29.04	11.01	40.05	56.00	-15.95	QP	P	
6	0.6820	22.54	11.01	33.55	46.00	-12.45	AVG	P	
7	1.0300	27.63	11.72	39.35	56.00	-16.65	QP	P	
8	1.0300	22.23	11.72	33.95	46.00	-12.05	AVG	P	
9	3.2820	27.95	9.67	37.62	56.00	-18.38	QP	P	
10	3.2820	21.18	9.67	30.85	46.00	-15.15	AVG	P	
11	4.5420	26.87	9.67	36.54	56.00	-19.46	QP	P	
12	4.5420	19.49	9.67	29.16	46.00	-16.84	AVG	P	

Remark:

Factor = Insertion Loss + Cable Loss.

EUT:	HMI touch integrated screen	Model Name:	H070R01W
Temperature:	25.7°C	Relative Humidity:	57%
Pressure:	1010hPa	Test Date:	2023-09-09
Test Mode:	Ping	Test Port:	LAN Port
Test Voltage:	AC 230V/50Hz		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.3780	53.21	10.22	63.43	76.32	-12.89	QP	P	
2 *	0.3780	48.48	10.22	58.70	66.32	-7.62	AVG	P	
3	0.6780	45.65	10.97	56.62	74.00	-17.38	QP	P	
4	0.6780	40.99	10.97	51.96	64.00	-12.04	AVG	P	
5	1.4819	43.70	12.57	56.27	74.00	-17.73	QP	P	
6	1.4819	37.87	12.57	50.44	64.00	-13.56	AVG	P	
7	3.2540	46.03	9.67	55.70	74.00	-18.30	QP	P	
8	3.2540	39.25	9.67	48.92	64.00	-15.08	AVG	P	
9	6.4420	55.14	9.74	64.88	74.00	-9.12	QP	P	
10	6.4420	43.78	9.74	53.52	64.00	-10.48	AVG	P	
11	11.8940	44.79	9.90	54.69	74.00	-19.31	QP	P	
12	11.8940	38.43	9.90	48.33	64.00	-15.67	AVG	P	

Remark:

Factor = Insertion Loss + Cable Loss.

3.2 RADIATED EMISSION MEASUREMENT

3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT (Below 1000MHz)

Table A.2 – Requirements for radiated emissions at frequencies up to 1 GHz for Class A equipment

Table clause	Frequency range MHz	Measurement		Class A limits dB(μ V/m)
		Distance m	Detector type/ bandwidth	OATS/SAC (see Table A.1)
A2.1	30 – 230	10	Quasi Peak / 120 kHz	40
	230 – 1 000			47
A2.2	30 – 230	3		50
	230 – 1 000			57

Apply only A2.1 or A2.2 across the entire frequency range.

Table A.4 – Requirements for radiated emissions at frequencies up to 1 GHz for Class B equipment

Table clause	Frequency range MHz	Measurement		Class B limits dB(μ V/m)
		Distance m	Detector type/ bandwidth	OATS/SAC (see Table A.1)
A4.1	30 – 230	10	Quasi Peak / 120 kHz	30
	230 – 1 000			37
A4.2	30 – 230	3		40
	230 – 1 000			47

Apply only table clause A4.1 or A4.2 across the entire frequency range.

Table A.6 – Requirements for radiated emissions from FM receivers

Table clause	Frequency range MHz	Measurement		Class B limit dB(μ V/m)		
		Distance m	Detector type/ bandwidth	Fundamental	Harmonics	
				OATS/SAC (see Table A.1)	OATS/SAC (see Table A.1)	
A6.1	30 – 230	10	Quasi peak/ 120 kHz	50	42	
	230 – 300				42	
	300 – 1 000				46	
A6.2	30 – 230	3		Quasi peak/ 120 kHz	60	52
	230 – 300					52
	300 – 1 000					56

Apply only A.6.1 or A.6.2 across the entire frequency range.

These relaxed limits apply only to emissions at the fundamental and harmonic frequencies of the local oscillator. Signals at all other frequencies shall be compliant with the limits given in Table A.4.

3.2.2 LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

Table A.3 – Requirements for radiated emissions at frequencies above 1 GHz for class A equipment

Replace the existing table by the following new table:

Table clause	Frequency range MHz	Measurement			Class A limits dB(μV/m)
		Facility (see table A.1)	Distance m	Detector type / bandwidth	
A3.1	1 000 to 6 000	FSOATS	3	Average / 1 MHz	60
A3.2	1 000 to 6 000			Peak / 1 MHz	80

Apply A3.1 and A3.2 across the frequency range from 1 000 MHz to the highest required frequency of measurement derived from Table 1.

Table A.5 – Requirements for radiated emissions at frequencies above 1 GHz for class B equipment

Replace the existing table by the following new table:

Table clause	Frequency range MHz	Measurement			Class B limits dB(μV/m)
		Facility (see table A.1)	Distance m	Detector type/ bandwidth	
A5.1	1 000 to 6 000	FSOATS	3	Average/ 1 MHz	54
A5.2	1 000 to 6 000			Peak/ 1 MHz	74

Apply A5.1 and A5.2 across the frequency range from 1 000 MHz to the highest required frequency of measurement derived from Table 1 .

These requirements are not applicable to the local oscillator and harmonics frequencies of equipment covered by Table A.7.

Note:

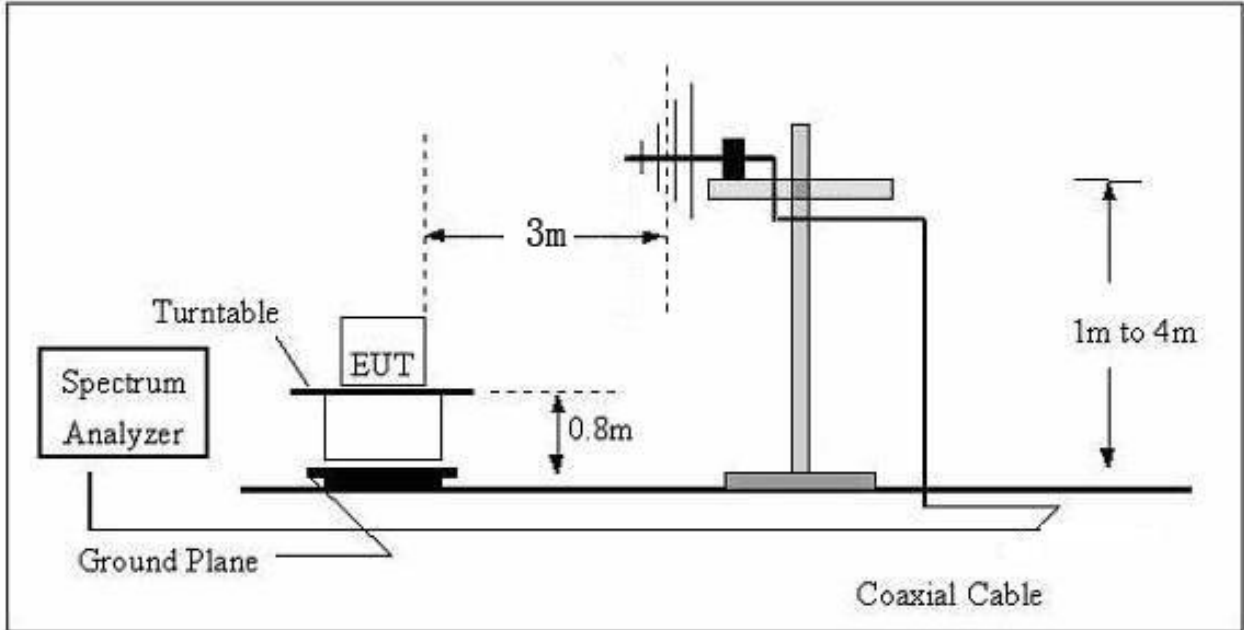
- (1) The limit for radiated test was performed according to as following: CISPR 32.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBμV/m)=20log Emission level (μV/m).

3.2.3 TEST PROCEDURE

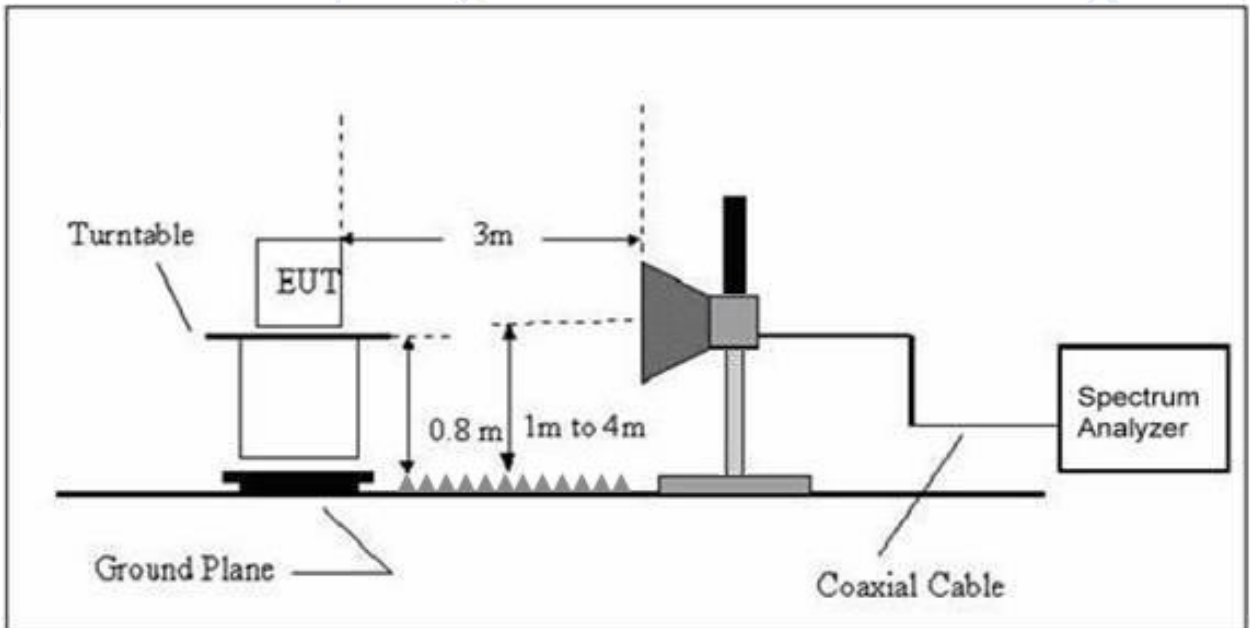
- a. The measuring distance of at 3m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured, above 1G Average detector mode will be instead.
- e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP(AV) Limits and then no additional QP Mode measurement performed.
- f. For the actual test configuration, please refer to the related Item -EUT Test Photos.

3.2.4 TEST SETUP

(A) Radiated Emission Test Set-Up Frequency Below 1 GHz



(B) Radiated Emission Test Set-Up Frequency Above 1GHz

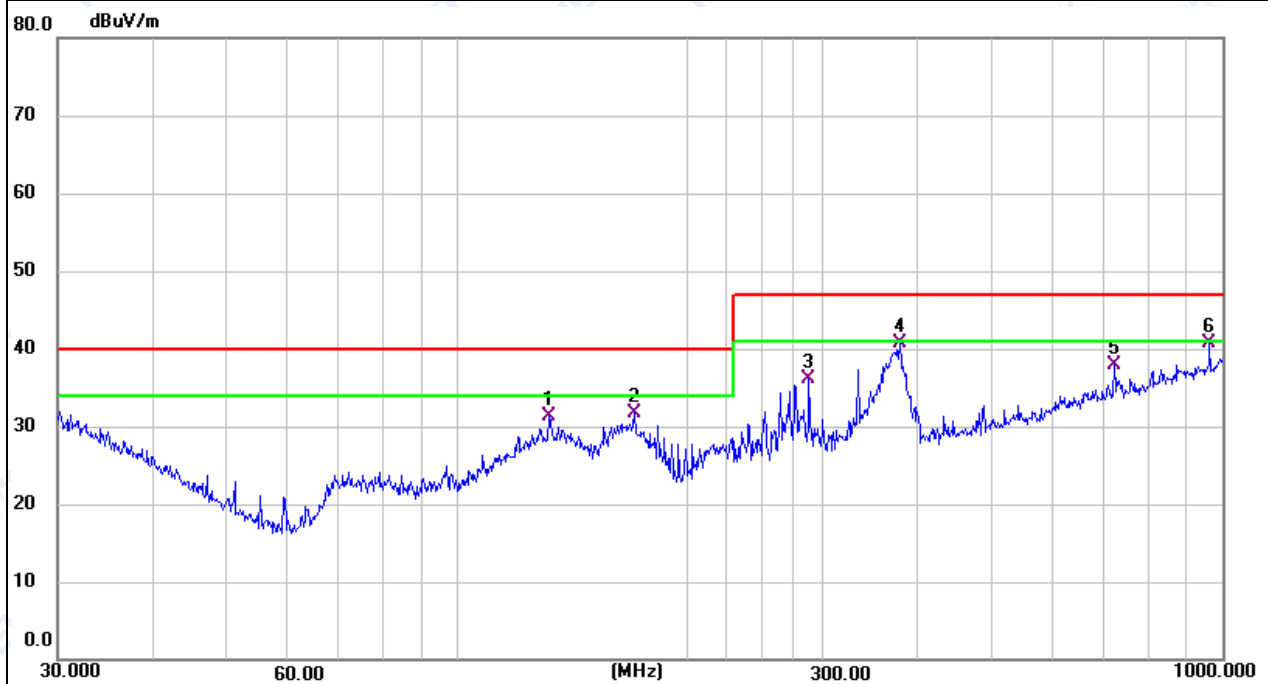


3.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

3.2.6 TEST RESULTS (30-1000MHz)

EUT:	HMI touch integrated screen	Model Name:	H070R01W
Temperature:	25.3°C	Relative Humidity:	53%
Pressure:	1010hPa	Test Date:	2023-09-16
Test Mode:	TF Playing	Polarization:	Horizontal
Test Power:	AC 230V/50Hz		

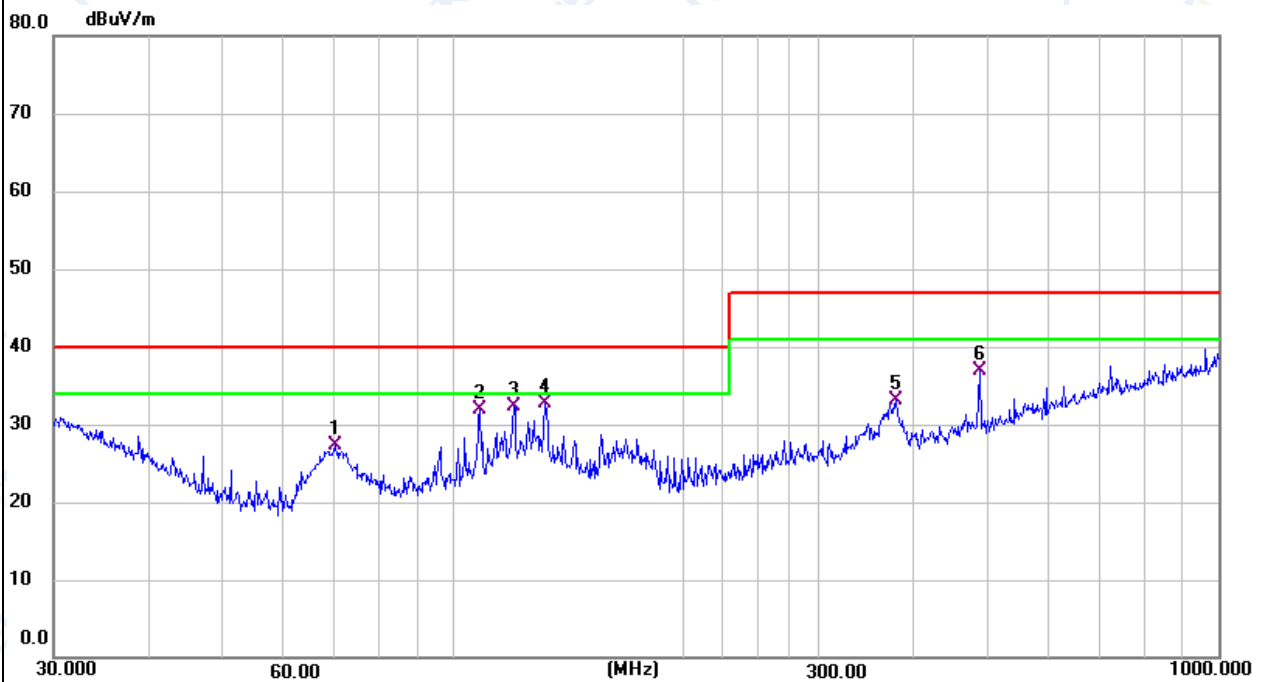


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	131.7577	12.49	18.84	31.33	40.00	-8.67	QP			P	
2	170.1948	14.31	17.48	31.79	40.00	-8.21	QP			P	
3	287.9904	16.07	20.07	36.14	47.00	-10.86	QP			P	
4	378.5843	17.90	22.76	40.66	47.00	-6.34	QP			P	
5	721.7259	9.56	28.28	37.84	47.00	-9.16	QP			P	
6 *	962.1623	9.36	31.41	40.77	47.00	-6.23	QP			P	

Remark:

Factor = Antenna Factor + Cable Loss.

EUT:	HMI touch integrated screen	Model Name:	H070R01W
Temperature:	25.3°C	Relative Humidity:	53%
Pressure:	1010hPa	Test Date:	2023-09-16
Test Mode:	TF Playing	Polarization:	Vertical
Test Power:	AC 230V/50Hz		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	70.0903	13.83	13.47	27.30	40.00	-12.70	QP			P	
2	108.2667	13.67	18.23	31.90	40.00	-8.10	QP			P	
3	119.8556	13.64	18.74	32.38	40.00	-7.62	QP			P	
4 *	131.7577	13.93	18.84	32.77	40.00	-7.23	QP			P	
5	378.5843	10.32	22.76	33.08	47.00	-13.92	QP			P	
6	487.3151	12.28	24.72	37.00	47.00	-10.00	QP			P	

Remark:

Factor = Antenna Factor + Cable Loss.

3.3 HARMONICS CURRENT

3.3.1 LIMITS OF HARMONICS CURRENT (CLASS A & CLASS D)

Table 1 - Limits for Class A equipment

Harmonic order (n)	Maximum permissible harmonic current (A)
Odd harmonics	
3	2.3
5	1.14
7	0.77
9	0.4
11	0.33
13	0.21
$15 \leq n \leq 39$	$0.15 * (15/n)$
Even harmonics	
2	1.08
4	0.43
6	0.30
$8 \leq n \leq 40$	$0.23 * (8/n)$

Table 2 - Limits for Class D equipment

Harmonic order (n)	Maximum permissible harmonic current per watt (mA/W)	Maximum permissible harmonic current (A)
3	3.4	2.30
5	1.9	1.14
7	1.0	0.77
9	0.5	0.40
11	0.35	0.33
$13 \leq n \leq 39$ (odd harmonics only)	$3.85/n$	See table 1

Note: Reference standard of the two tables above: EN IEC 61000-3-2.

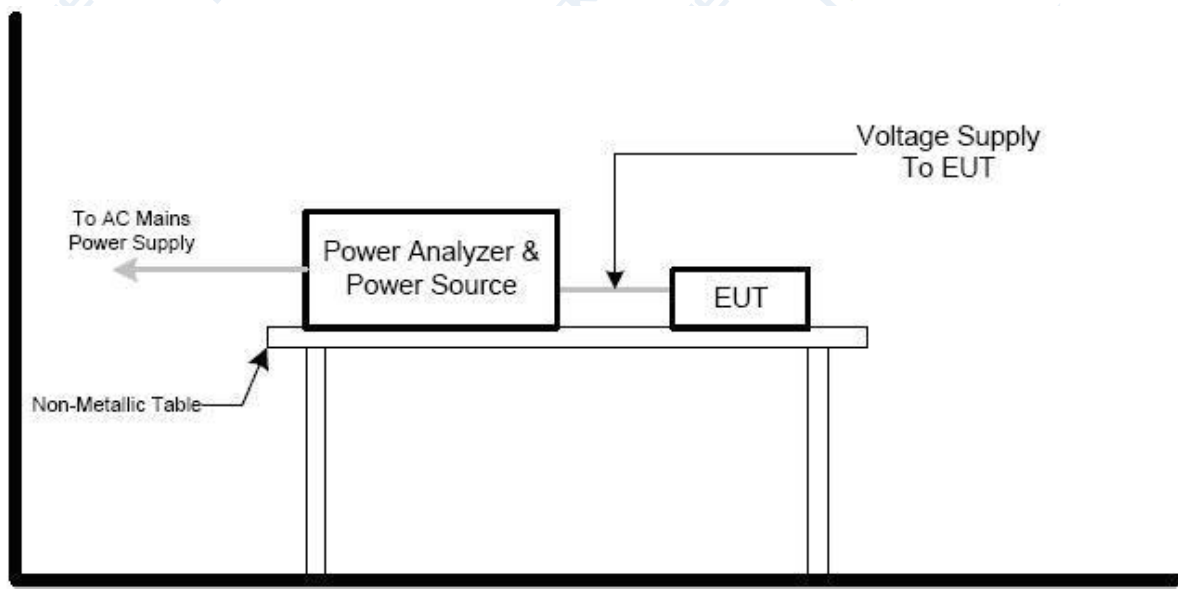
3.3.1.1 TEST PROCEDURE

- a. The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the maximum harmonic components under normal operating conditions.
- b. The classification of EUT is according to section 5 of EN IEC 61000-3-2. The EUT is classified as follows:
 - Class A: Balanced three-phase equipment, Household appliances excluding equipment as Class D, Tools excluding portable tools, Dimmers for incandescent lamps, audio equipment, equipment not specified in one of the three other classes.
 - Class B: Portable tools. Portable tools.; Arc welding equipment which is not professional equipment.
 - Class C: Lighting equipment.
 - Class D: Equipment having a specified power less than or equal to 600W of the following types: Personal computers and personal computer monitors and television receivers.
- c. The correspondent test program of test instrument to measure the current harmonics emanated from EUT is chosen. The measure time shall be not less than the time necessary for the EUT to be exercised.

3.3.1.2 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

3.3.1.3 TEST SETUP



3.3.2 TEST RESULTS

EUT:	HMI touch integrated screen	Model Name:	H070R01W
Temperature:	25.5°C	Relative Humidity:	56%
Pressure:	1010hPa	Test Date:	2023-09-11
Classification:	Class A	Test duration:	150s
Test Mode:	N/A		
Test Power:	N/A		

Note: The active input power of the EUT is less than 75 W. No limits apply for equipment with an active input power up to and including 75W.

3.4 VOLTAGE FLUCTUATION AND FLICKERS

3.4.1 LIMITS OF VOLTAGE FLUCTUATION AND FLICKERS

Test items	Limits(EN 61000-3-3)	Descriptions
P_{st}	$\leq 1.0, T_p=10min$	short-term flicker indicator
P_{lt}	$\leq 0.65, T_p=2h$	long-term flicker indicator
d_c	$\leq 3.3\%$	relative steady-state voltage change
d_{max}	$\leq 4\%$ (or 6% <small>Note(1)</small> , 7% <small>Note(2)</small>)	maximum relative voltage change
$d_{(t)}$	$\leq 3.3\%$, more than 500ms	relative voltage change characteristic

Note:

1. 6 % for equipment which is:
 - a. switched manually, or
 - b. switched automatically more frequently than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds), or manual restart, after a power supply interruption.
2. 7 % for equipment which is
 - a. attended whilst in use (for example: hair dryers, vacuum cleaners, kitchen equipment such as mixers, garden equipment such as lawn mowers, portable tools such as electric drills), or
 - b. switched on automatically, or is intended to be switched on manually, no more than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds) or manual restart, after a power supply interruption.

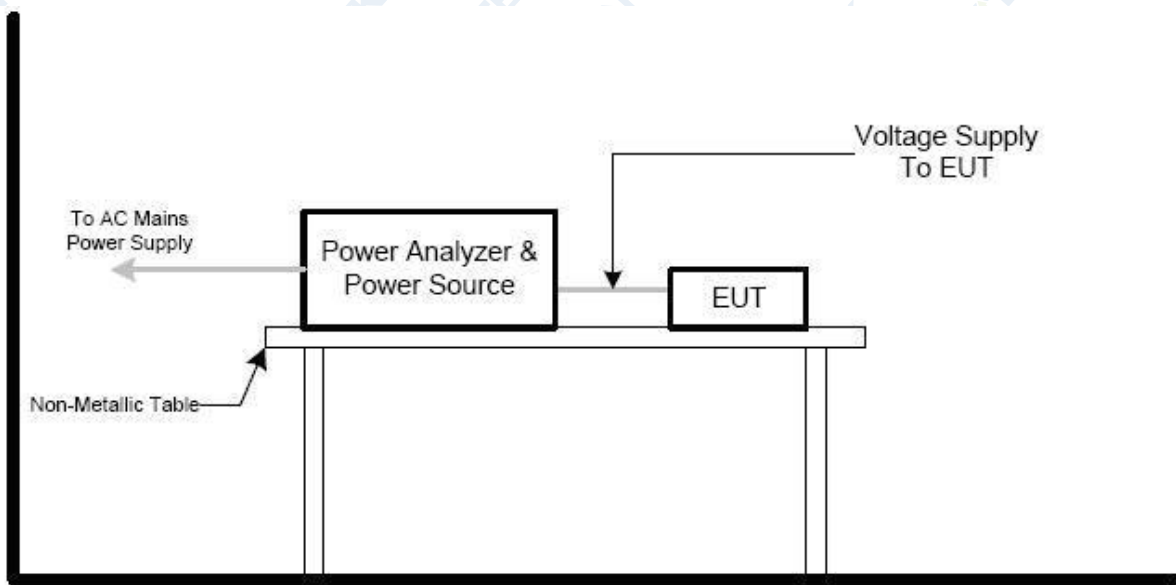
3.4.1.1 TEST PROCEDURE

- a. Fluctuation and Flickers Test:
Tests was performed according to the Test Conditions/Assessment of Voltage Fluctuations specified in Clause 6.0/4.0 of IEC/EN 61000-3-3 depend on which standard adopted for compliance measurement.
- b. All types of voltage fluctuation in this report are assessed by direct measurement using flicker-meter.

3.4.1.2 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

3.4.1.3 TEST SETUP

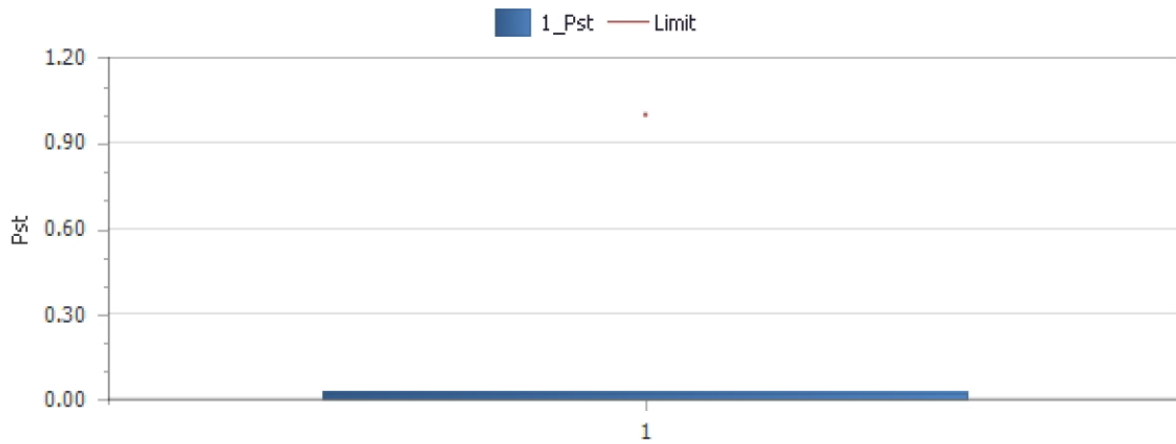


3.4.2 TEST RESULTS

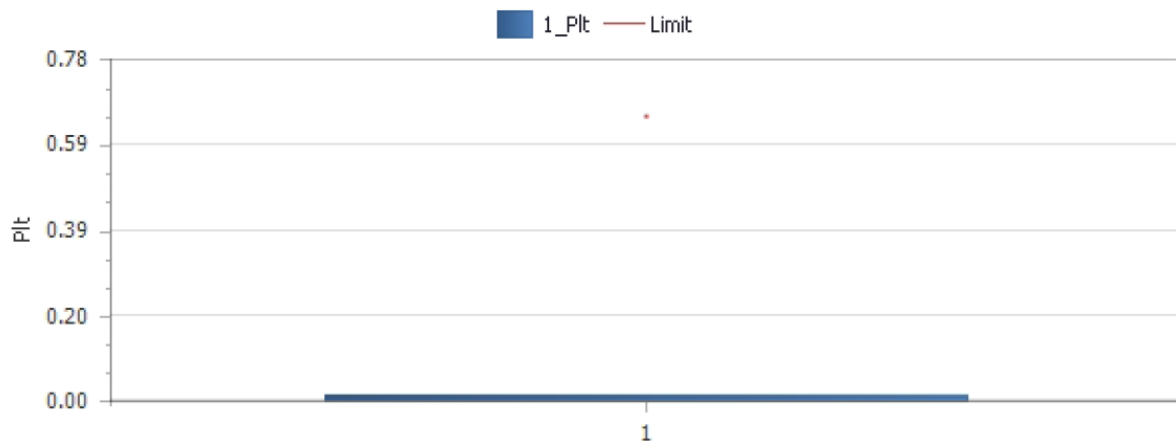
EUT:	HMI touch integrated screen	Model Name:	H070R01W
Temperature:	25.5°C	Relative Humidity:	56%
Pressure:	1010hPa	Test Date:	2023-09-11
Test Mode:	TF Playing		
Test Power:	AC 230V/50Hz		

Maximum Flicker results

Pst and Limit



Plt and Limit



Relevant Parameter and Judgement During Test Period

Vrms at the end of test(V)	230.08			
Error Max (%)		Test Limit (%)		
T-max (ms)	0.00	Test Limit (ms)	500	Pass
dc (%)	0.00	Test Limit (%)	3.30	Pass
dmax (%)	0.00	Test Limit (%)	4.00	Pass
Pst	0.025	Test Limit	1.000	Pass
Plt	0.011	Test Limit	0.650	Pass

Elem1 Test Parameters

Num	dc (%)	dmax (%)	Tmax (ms)	Pst	Plt
1	0.00	0.00	0.00	0.025	0.011

4. EMC IMMUNITY TEST

4.1 STANDARD COMPLIANCE/SEVERITY LEVEL/CRITERIA

Tests Standard No.	TEST SPECIFICATION	Test Mode Test Ports	Perform Criteria
1. ESD IEC/EN 61000-4-2	8kV air discharge 4kV contact discharge	Direct Mode	B
	4kV HCP discharge 4kV VCP discharge	Indirect Mode	B
2. RS IEC/EN 61000-4-3	80 MHz to 1000 MHz; 1800 MHz; 2600 MHz; 3500 MHz; 5000 MHz; 1 kHz, 80%, AM modulated	Enclosure	A
3. EFT/Burst IEC/EN 61000-4-4	5/50ns Tr/Th 5kHz Repetition Freq.	Power Supply Port	B
		CTL/Signal Port Data Line Port	B
4. Surges IEC/EN 61000-4-5	1.2/50(8/20) Tr/Th us	L-N	B
		L-PE N-PE	B
		CTL/Signal Port	B
5. Continuous radio frequency disturbances IEC/EN 61000-4-6	0.15 MHz to 80 MHz; 1 kHz, 80%, AM Modulated, 150Ω source impedance	AC Power Port	A
		DC Power Port	A
		CTL/Signal Port	A
6. Power Frequency Magnetic Field IEC/EN 61000-4-8	50 Hz	Enclosure	A
7. Volt. Interruptions Volt. Dips IEC/EN 61000-4-11	Voltage dips 100%	AC Power Port	B
	Voltage dips 30%		C
	Voltage Interruption 100%		C

4.2 GENERAL PERFORMANCE CRITERIA

According to **EN 55035** standard, the general performance criteria as following:

<p>Criterion A</p>	<p>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.</p> <p>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.</p>
<p>Criterion B</p>	<p>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.</p> <p>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.</p>
<p>Criterion C</p>	<p>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.</p> <p>Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.</p>

4.3 GENERAL PERFORMANCE CRITERIA TEST SETUP

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

4.4 ESD TESTING

4.4.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-2
Discharge Impedance:	330ohm / 150pF
Required Performance:	B
Discharge Voltage:	Air Discharge: 2kV/4kV/8kV (Direct) Contact Discharge: 2kV/4kV (Direct/Indirect)
Polarity:	Positive & Negative
Number of Discharge:	Air Discharge: min. 20 times at each test point Contact Discharge: min. 20 times at each test point
Discharge Mode:	Single Discharge
Discharge Period:	1 second minimum

4.4.2 TEST PROCEDURE

The test generator necessary to perform direct and indirect application of discharges to the EUT in the following manner:

a. Indirect application of the discharge:

Vertical Coupling Plane (VCP):

At least 10 single discharges (in the most sensitive polarity) shall be applied to the centre of one vertical edge of the coupling plane. The coupling plane, of dimensions 0,5 m × 0,5 m, is placed parallel to, and positioned at a distance of 0,1 m from, the EUT.

Discharges shall be applied to the coupling plane, with sufficient different positions such that the four faces of the EUT are completely illuminated. One VCP position is considered to illuminate 0,5 m × 0,5 m area of the EUT surface.

Horizontal Coupling Plane (HCP):

Discharge to the HCP shall be made horizontally to the edge of the HCP.

At least 10 single discharges (in the most sensitive polarity) shall be applied at the front edge of each HCP opposite the centre point of each unit (if applicable) of the EUT and 0.1m from the front of the EUT. The long axis of the discharge electrode shall be in the plane of the HCP and perpendicular to its front edge during the discharge.

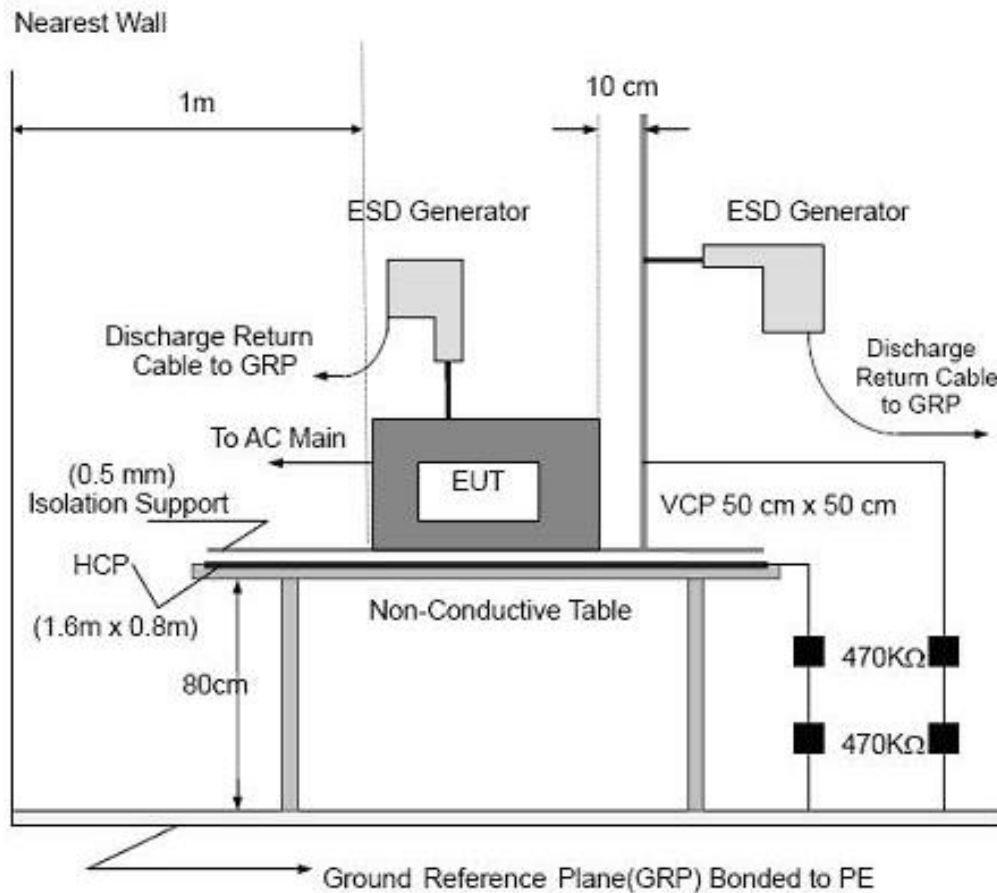
The discharge electrode shall be in contact with the edge of the HCP before the discharge switch is operated

b. Direct application of discharges to the EUT

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.

4.4.3 TEST SETUP



Note:

TABLE-TOP EQUIPMENT

The configuration consisted of a wooden table 0.8 meters high standing on the Ground Reference Plane. The GRP consisted of a sheet of aluminum at least 0.25mm thick, and 2.5 meters square connected to the protective grounding system. A Horizontal Coupling Plane (1.6m x 0.8m) was placed on the table and attached to the GRP by means of a cable with 940k total impedance. The equipment under test, was installed in a representative system as described in section 7 of IEC/EN 61000-4-2, and its cables were placed on the HCP and isolated by an insulating support of 0.5mm thickness. A distance of 1-meter minimum was provided between the EUT and the walls of the laboratory and any other metallic structure.

FLOOR-STANDING EQUIPMENT

The equipment under test was installed in a representative system as described in section 7 of IEC/EN 61000-4-2, and its cables were isolated from the Ground Reference Plane by an insulating support of 0.1-meter thickness. The GRP consisted of a sheet of aluminum that is at least 0.25mm thick, and 2.5meters square connected to the protective grounding system and extended at least 0.5 meters from the EUT on all sides.

4.4.4 TEST RESULTS

EUT:	HMI touch integrated screen	Model Name:	H070R01W
Temperature:	25.5°C	Relative Humidity:	56%
Pressure:	1010hPa	Test Date:	2023-09-11
Test Mode:	USB Playing / TF Playing		
Test Power:	AC 230V/50Hz		

Mode	Contact Discharge (Indirect)						Criterion	Result	
Test Level(kV)	Test Point	2		4		6			
Test Location		+	-	+	-	+			-
HCP	Front	P	P	P	P			B	Complies
	Rear	P	P	P	P				
	Left	P	P	P	P				
	Right	P	P	P	P				
VCP	Front	P	P	P	P				
	Rear	P	P	P	P				
	Left	P	P	P	P				
	Right	P	P	P	P				

Mode	Air Discharge								Contact Discharge								Criterion	Result	
Test Level(kV)	2		4		8		15		2		4		6		8				
Test Location	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-			
Gap	P	P	P	P	P	P												B	Complies
Screen	P	P	P	P	P	P													
USB port									P	P	P	P							
TF port									P	P	P	P							
LAN									P	P	P	P							

Note:

- (1) +/- denotes the Positive/Negative polarity of the output voltage.
- (2) In the table: 'P' represents 'PASS'; 'F' represents 'FAIL'.
- (3) Criteria A: Normal performance within limits specified by the manufacturer, requestor or purchaser.
- (4) Criteria B: Temporary loss of function or degradation of performance which ceases after the disturbance ceases, and from which the EUT recovers its normal performance, without operator intervention.
- (5) Criteria C: Temporary loss of function or degradation of performance, the correction of which requires operator intervention.
- (6) Criteria D: Loss of function or degradation of performance which is not recoverable, owing to damage to hardware or software, or loss of data.

4.5 RS TESTING

4.5.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-3
Required Performance:	A
Frequency Range:	80 MHz to 1000 MHz 1800 MHz 2600 MHz 3500 MHz 5000 MHz
Field Strength:	3 V/m
Modulation:	1kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1 % of fundamental
Polarity of Antenna:	Horizontal and Vertical
Test Distance:	3 m
Antenna Height:	1.5 m
Dwell Time:	3 seconds

4.5.2 TEST PROCEDURE

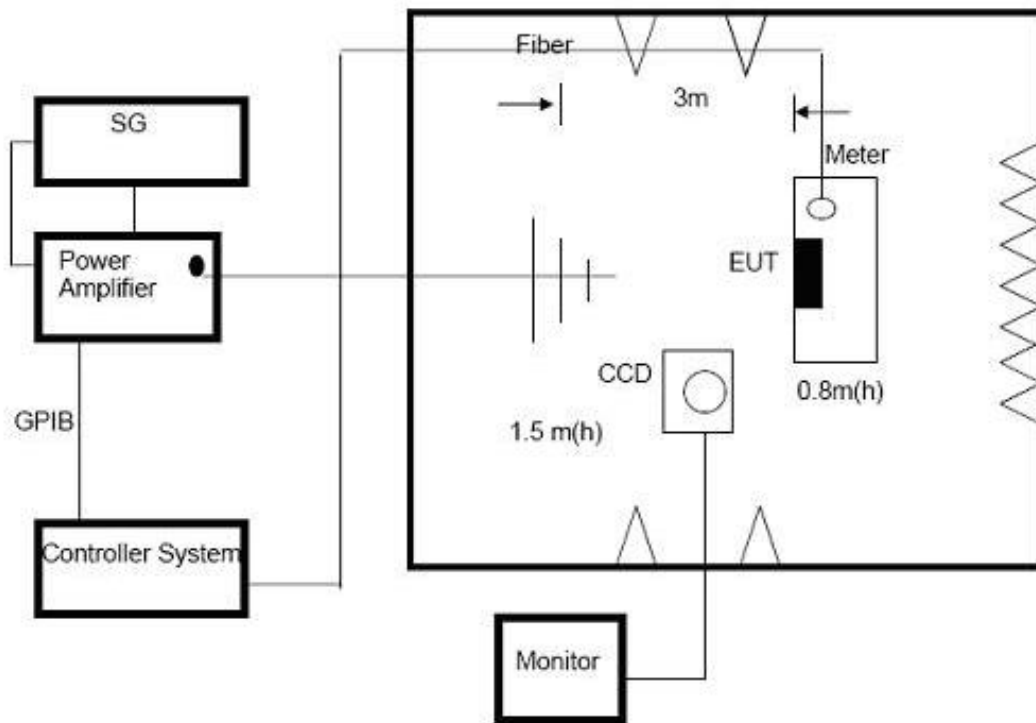
The EUT and support equipment, which are placed on a table that is 0.8 meter above ground and the testing was performed in a fully-anechoic chamber.

The testing distance from antenna to the EUT was 3 meters.

The other condition as following manner:

- a. The frequency range is swept from 80 MHz to 1000 MHz, 1800 MHz, 2600 MHz, 3500 MHz, 5000 MHz with the signal 80% amplitude modulated with a 1kHz sine wave. The rate of sweep did not exceed 1.5×10^{-3} decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.
- b. Sweep Frequency 900 MHz, with the Duty Cycle: 1/8 and Modulation: Pulse 217 Hz (if applicable)
- c. The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.
- d. The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.

4.5.3 TEST SETUP



Note:

TABLE-TOP EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC/EN 61000-4-3 was placed on a non-conductive table 0.8 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

FLOOR-STANDING EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC/EN 61000-4-3 was placed on a non-conductive wood support 0.1 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

4.5.4 TEST RESULTS

EUT:	HMI touch integrated screen	Model Name:	H070R01W
Temperature:	25.1°C	Relative Humidity:	52%
Pressure:	1010hPa	Test Date:	2023-09-13
Test Mode:	USB Playing / TF Playing		
Test Power:	AC 230V/50Hz		

Frequency Range (MHz)	RF Field Position	R.F. Field Strength	Azimuth	Criterion	Result
80 - 1000	H / V	3 V/m (r.m.s) AM Modulated 1000Hz, 80%	Front	A	Complies
1800			Rear		
2600			Left		
3500			Right		
5000					

Note:

- (1) Criteria A: There was no change operated with initial operating during the test.
- (2) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
- (3) Criteria C: The system shut down during the test.

4.6 EFT/BURST TESTING

4.6.1 TEST SPECIFICATION

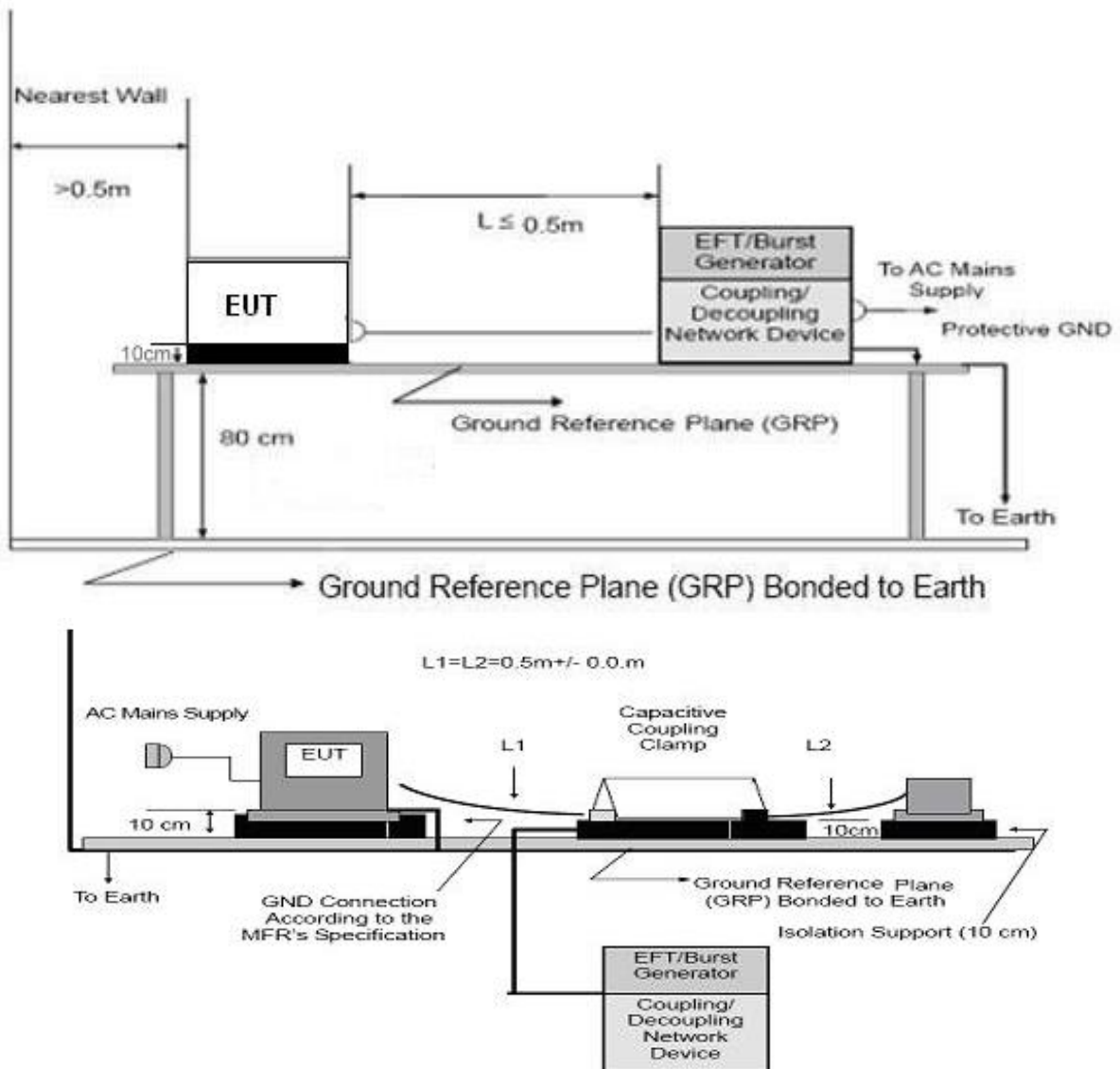
Basic Standard:	IEC/EN 61000-4-4
Required Performance:	B
Test Voltage:	Power Line: 0.5 kV, 1 kV Signal/Control Line: 0.5 kV
Polarity:	Positive & Negative
Impulse Frequency:	5 kHz
Impulse Wave shape :	5/50 ns
Burst Duration:	15 ms
Burst Period:	300 ms
Test Duration:	2 minutes

4.6.2 TEST PROCEDURE

The EUT and its simulators were placed on a ground reference plane and were insulated from it by a wood support 0.1m \pm 0.01m thick. The ground reference plane was 1m*1m metallic sheet with 0.65mm minimum thickness. The other condition as following manner:

- a. The length of power cord between the coupling device and the EUT should not exceed 0.5 meter.
- b. Both positive and negative polarity discharges were applied.
- c. The duration time of each test sequential was 2 minutes.

4.6.3 TEST SETUP



Note:

TABLE-TOP EQUIPMENT

The configuration consisted of a wooden table (0.8m high) standing on the Ground Reference Plane. The GRP consisted of a sheet of aluminum (at least 0.25mm thick and 2.5m square) connected to the protective grounding system. A minimum distance of 0.5m was provided between the EUT and the walls of the laboratory or any other metallic structure.

FLOOR-STANDING EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC/EN 61000-4-4 and its cables, were isolated from the Ground Reference Plane by an insulating support that is 0.1-meter thick. The GRP consisted of a sheet of aluminum (at least 0.25mm thick and 2.5m square) connected to the protective grounding system.

4.6.4 TEST RESULTS

EUT:	HMI touch integrated screen	Model Name:	H070R01W
Temperature:	25.5°C	Relative Humidity:	56%
Pressure:	1010hPa	Test Date:	2023-09-11
Test Mode:	USB Playing / TF Playing / Ping		
Test Power:	AC 230V/50Hz		

Coupling Line		Test Level (kV)								Criterion	Result
		0.5		1		2		4			
		+	-	+	-	+	-	+	-		
AC Line	L	P	P	P	P					B	Complies
	N	P	P	P	P						
	PE										
	L+N	P	P	P	P						
	L+PE										
	N+PE										
	L+N+PE										
DC Line										/	N/A
Signal Line		P	P							B	Complies

Note:

- (1) N/A - denotes test is not applicable in this Test Report.
- (2) +/- denotes the Positive/Negative polarity of the output voltage.
- (3) In the table: 'P' represents 'PASS'; 'F' represents 'FAIL'.
- (4) Criteria A: There was no change operated with initial operating during the test.
- (5) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
- (6) Criteria C: The system shut down during the test.

4.7 SURGE TESTING

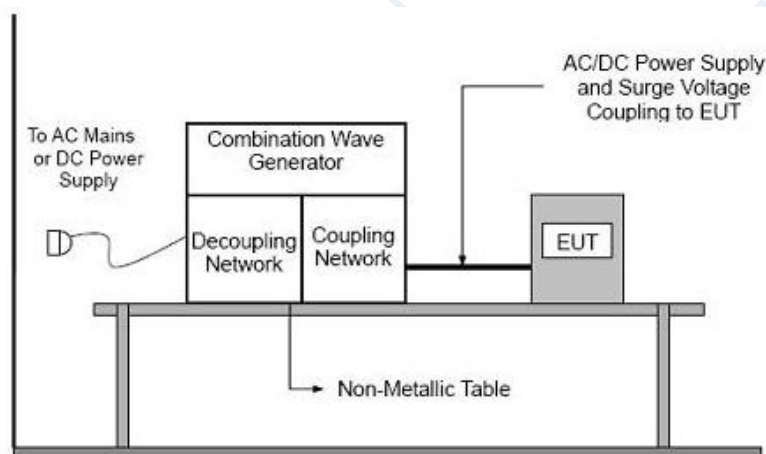
4.7.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-5
Required Performance:	B
Wave-Shape:	Combination Wave 1.2/50 us Open Circuit Voltage 8 /20 us Short Circuit Current
Test Voltage:	Power Line: 0.5 kV, 1 kV, 2 kV
Surge Input / Output:	L-N, L-PE, N-PE
Generator Source:	2 ohm between networks
Impedance:	12 ohm between network and ground
Polarity:	Positive/Negative
Phase Angle:	90°/270°
Pulse Repetition Rate:	1 time / min. (maximum)
Number of Tests:	5 positive and 5 negative at selected points

4.7.2 TEST PROCEDURE

- a. For EUT power supply:
The surge is to be applied to the EUT power supply terminals via the capacitive coupling network. Decoupling networks are required in order to avoid possible adverse effects on equipment not under test that may be powered by the same lines, and to provide sufficient decoupling impedance to the surge wave. The power cord between the EUT and the coupling/decoupling networks shall be 2meters in length (or shorter).
- b. For test applied to unshielded asymmetrically operated interconnection lines of EUT:
The surge is applied to the lines via the capacitive coupling. The coupling /decoupling networks shall not influence the specified functional conditions of the EUT. The interconnection line between the EUT and the coupling/decoupling networks shall be 2 meters in length (or shorter).
- c. For test applied to unshielded symmetrically operated interconnection /telecommunication lines of EUT:
The surge is applied to the lines via gas arrestors coupling. Test levels below the ignition point of the coupling arrestor cannot be specified. The interconnection line between the EUT and the coupling/decoupling networks shall be 2 meters in length (or shorter).

4.7.3 TEST SETUP



4.7.4 TEST RESULTS

EUT:	HMI touch integrated screen	Model Name:	H070R01W
Temperature:	25.5°C	Relative Humidity:	56%
Pressure:	1010hPa	Test Date:	2023-09-11
Test Mode:	USB Playing / TF Playing		
Test Power:	AC 230V/50Hz		

Coupling Line			Test Level (kV)								Criterion	Result
			0.5		1		2		4			
			+	-	+	-	+	-	+	-		
AC Line	L-N	0°									B	Complies
		90°	P		P							
		180°										
		270°		P		P						
	L-PE	0°										
		90°										
		180°										
		270°										
	N-PE	0°										
		90°										
		180°										
		270°										
DC Line										/	N/A	
Signal Line										/	N/A	

Note:

- (1) N/A - denotes test is not applicable in this Test Report.
- (2) +/- denotes the Positive/Negative polarity of the output voltage.
- (3) Polarity and Numbers of Impulses: 5 Pst / Ngt at each tested mode
- (4) In the table: 'P' represents 'PASS'; 'F' represents 'FAIL'.
- (5) Criteria A: There was no change operated with initial operating during the test.
- (6) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
- (7) Criteria C: The system shut down during the test.

4.8 CONTINUOUS RADIO FREQUENCY DISTURBANCES TESTING

4.8.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-6
Required Performance:	A
Frequency Range & Field Strength:	0.15 - 10 MHz: 3 Vr.m.s. 10 - 30 MHz: 3 to 1 Vr.m.s. 30 - 80 MHz: 1 Vr.m.s.
Modulation:	1kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1 % of fundamental
Dwell Time:	3 seconds

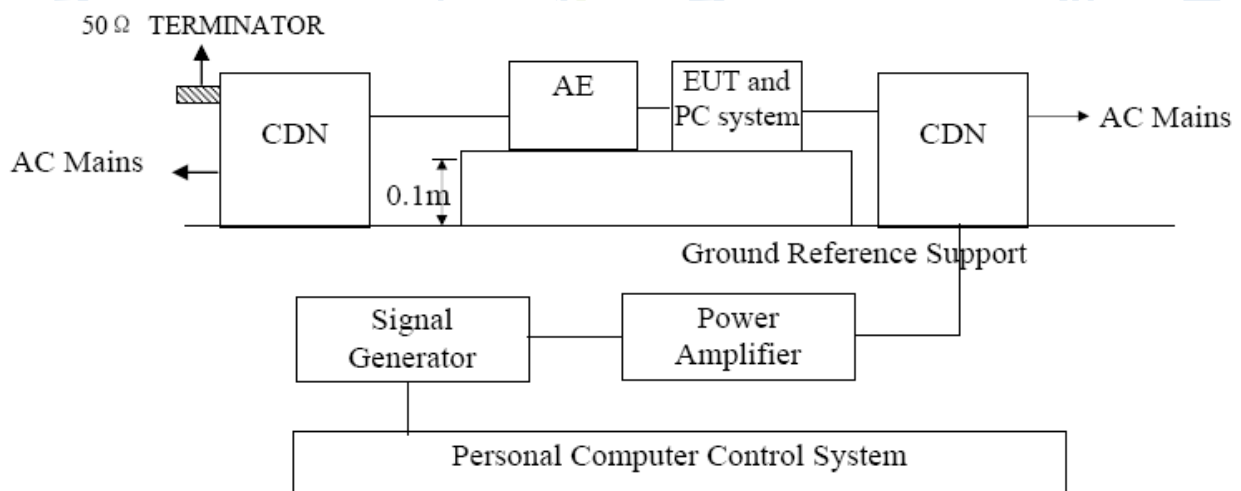
4.8.2 TEST PROCEDURE

The EUT are placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50mm (where possible). The disturbance signal described below is injected to EUT through CDN.

The other condition as following manner:

- a. The frequency range is swept from 150 kHz to 80 MHz, with the signal 80% amplitude modulated with a 1kHz sine wave. The rate of sweep did not exceed 1.5×10^{-3} decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.
- b. The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.

4.8.3 TEST SETUP



Note:

FLOOR-STANDING EQUIPMENT

The equipment to be tested is placed on an insulating support of 0.1 meters height above a ground reference plane. All relevant cables shall be provided with the appropriate coupling and decoupling devices at a distance between 0.1 meters and 0.3 meters from the projected geometry of the EUT on the ground reference plane.

4.8.4 TEST RESULTS

EUT:	HMI touch integrated screen	Model Name:	H070R01W
Temperature:	25.5°C	Relative Humidity:	56%
Pressure:	1010hPa	Test Date:	2023-09-11
Test Mode:	USB Playing / TF Playing / Ping		
Test Power:	AC 230V/50Hz		

Test Ports (Mode)	Freq. Range (MHz)	Field Strength	Result	Result
Input AC. Power Port	0.15 --- 10	3V(r.m.s) AM Modulated 1kHz, 80%	A	Complies
	10 --- 30	3 to 1V(r.m.s) AM Modulated 1kHz, 80%		
	30 --- 80	1V(r.m.s) AM Modulated 1kHz, 80%		
Input DC. Power Port	0.15 --- 10	3V(r.m.s) AM Modulated 1kHz, 80%	A	N/A
	10 --- 30	3 to 1V(r.m.s) AM Modulated 1kHz, 80%		
	30 --- 80	1V(r.m.s) AM Modulated 1kHz, 80%		
Signal Line	0.15 --- 10	3V(r.m.s) AM Modulated 1kHz, 80%	A	Complies
	10 --- 30	3 to 1V(r.m.s) AM Modulated 1kHz, 80%		
	30 --- 80	1V(r.m.s) AM Modulated 1kHz, 80%		

Note:

- (1) N/A - denotes test is not applicable in this Test Report.
- (2) Criteria A: There was no change operated with initial operating during the test.
- (3) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
- (4) Criteria C: The system shut down during the test.

4.9 POWER FREQUENCY MAGNETIC FIELD TESTING

4.9.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-8
Required Performance:	A
Frequency Range:	50Hz
Field Strength:	1 A/m
Observation Time:	5 minutes
Inductance Coil:	Rectangular type, 1mx1m

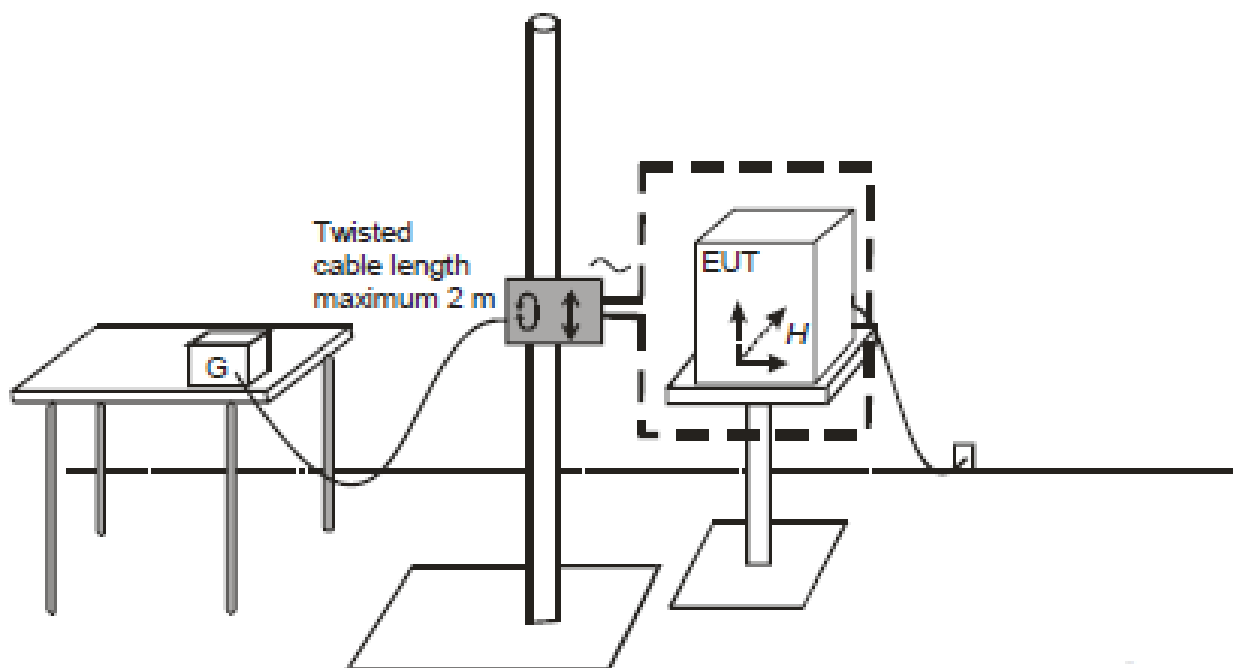
4.9.2 TEST PROCEDURE

The EUT and support equipment, are placed on a table that is 0.8 meter above a metal ground plane measured 1m*1m min. and 0.65mm thick min.

The other condition as following manner:

- The equipment cabinets shall be connected to the safety earth directly on the GRP via the earth terminal of the EUT.
- The cables supplied or recommended by the equipment manufacturer shall be used. 1 meter of all cables used shall be exposed to the magnetic field.

4.9.3 TEST SETUP



Note:

TABLE-TOP EQUIPMENT

The equipment shall be subjected to the test magnetic field by using the induction coil of standard dimension (1 m x 1 m). The induction coil shall then be rotated by 90 degrees in order to expose the EUT to the test field with different orientations.

FLOOR-STANDING EQUIPMENT

The equipment shall be subjected to the test magnetic field by using induction coils of suitable dimensions. The test shall be repeated by moving and shifting the induction coils, in order to test the whole volume of the EUT for each orthogonal direction. The test shall be repeated with the coil shifted to different positions along the side of the EUT, in steps corresponding to 50 % of the shortest side of the coil. The induction coil shall then be rotated by 90 degrees in order to expose the EUT to the test field with different orientations.

4.9.4 TEST RESULTS

EUT:	HMI touch integrated screen	Model Name:	H070R01W
Temperature:	25.5°C	Relative Humidity:	56%
Pressure:	1010hPa	Test Date:	2023-09-11
Test Mode:	USB Playing / TF Playing		
Test Power:	AC 230V/50Hz		

Test Mode	Test Level	Antenna aspect	Duration(s)	Result	Result
Enclosure	1 A/m	X	300 s	A	Complies
Enclosure	1 A/m	Y	300 s	A	Complies
Enclosure	1 A/m	Z	300 s	A	Complies

Note:

- (1) Criteria A: There was no change operated with initial operating during the test.
- (2) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
- (3) Criteria C: The system shut down during the test.

4.10 VOLTAGE INTERRUPTION/DIPS TESTING

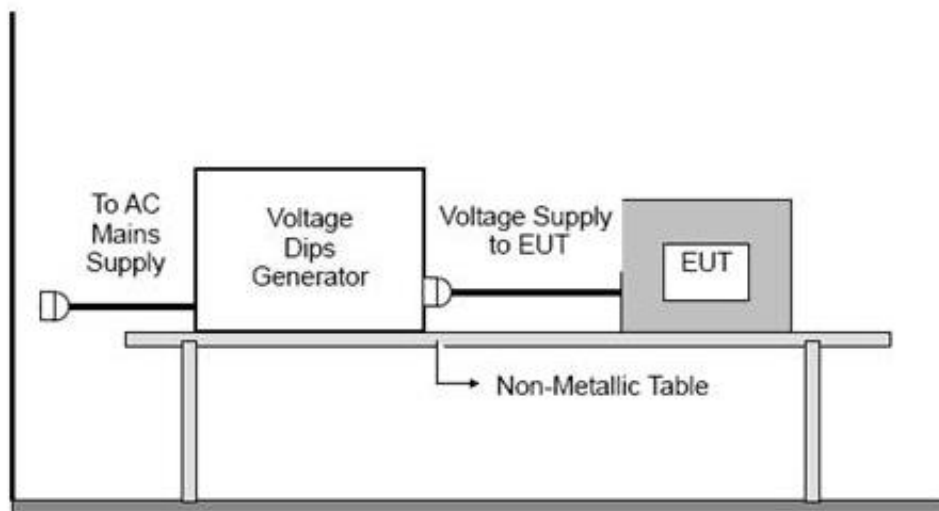
4.10.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-11
Required Performance:	B (For 100% Voltage Dips) C (For 30% Voltage Dips) C (For 100% Voltage Interruptions)
Test Duration Time:	Minimum three test events in sequence
Interval between Event:	Minimum ten seconds
Phase Angle:	0°/45°/90°/135°/180°/225°/270°/315°/360°
Test Cycle:	3 times

4.10.2 TEST PROCEDURE

The EUT shall be tested for each selected combination of test levels and duration with a sequence of three dips/interruptions with intervals of 10 s minimum (between each test event). Each representative mode of operation shall be tested. Abrupt changes in supply voltage shall occur at zero crossings of the voltage waveform.

4.10.3 TEST SETUP



4.10.4 TEST RESULTS

EUT:	HMI touch integrated screen	Model Name:	H070R01W
Temperature:	25.5°C	Relative Humidity:	56%
Pressure:	1010hPa	Test Date:	2023-09-11
Test Mode:	USB Playing / TF Playing		
Test Power:	AC 230V/50Hz		

Interruption & Dips	Duration(T)	Result	Result
Voltage dips 100%	0.5	B	Complies
Voltage dips 30%	25	C	Complies
Voltage Interruption 100%	250	C	Complies

Note:

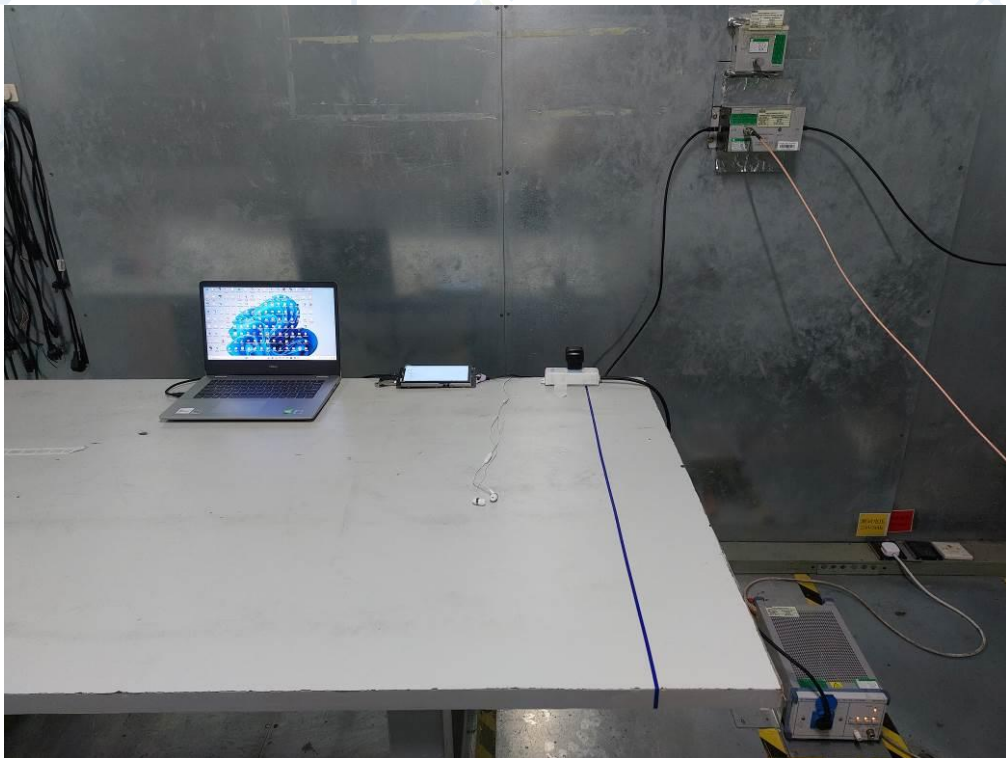
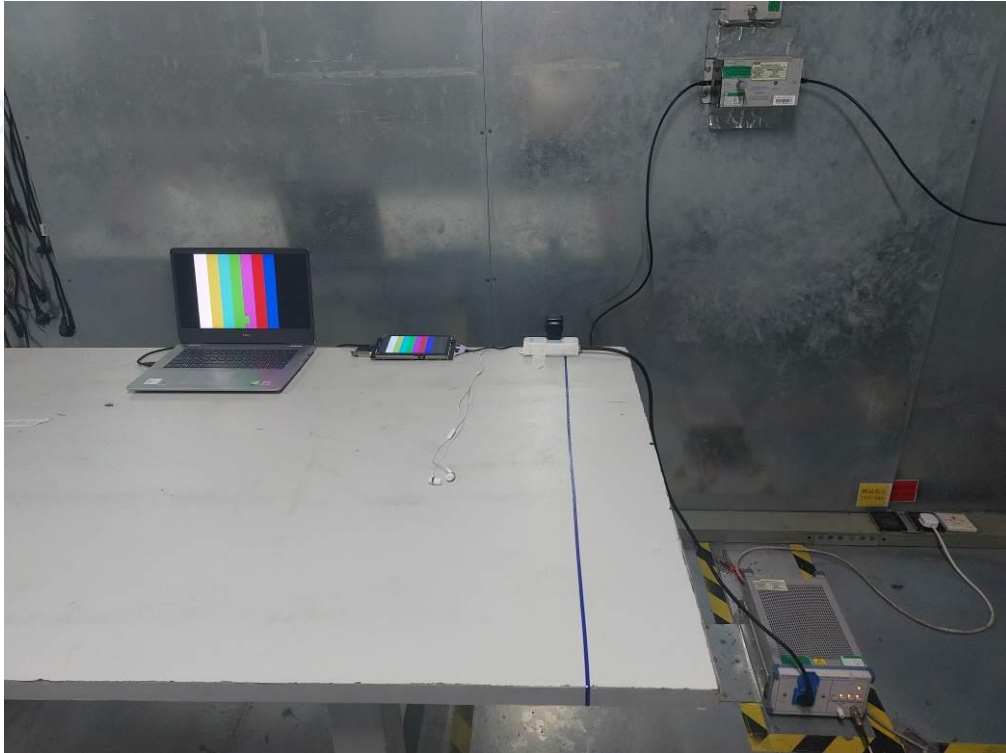
- (1) Criteria A: There was no change operated with initial operating during the test.
- (2) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
- (3) Criteria C: The system shut down during the test.

5. EUT TEST PHOTO

Radiated Measurement Photo



Conducted Measurement Photo



ATTACHMENT PHOTOGRAPHS OF EUT

Photo 1



Photo 2



Photo 3

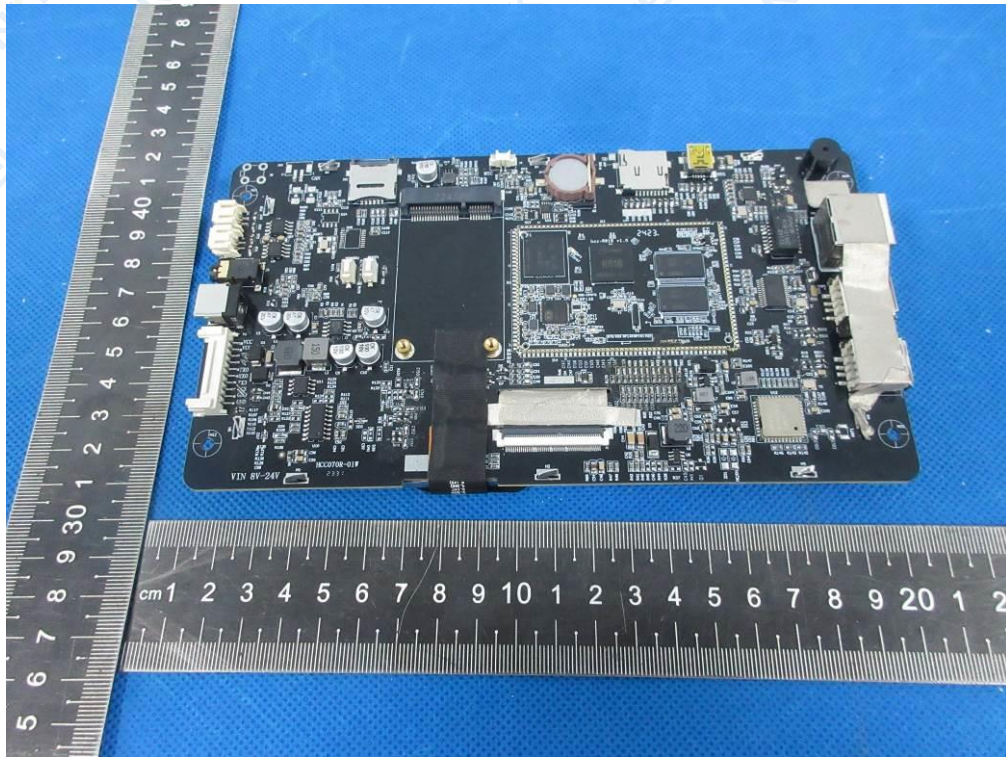


Photo 4

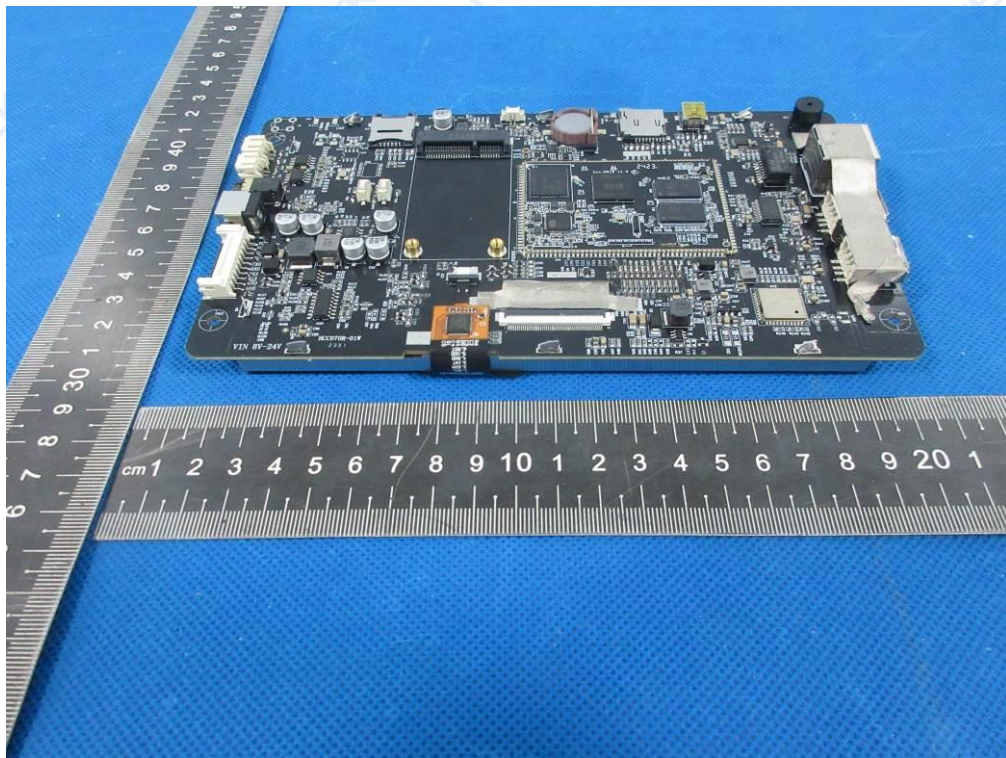


Photo 5



Photo 6

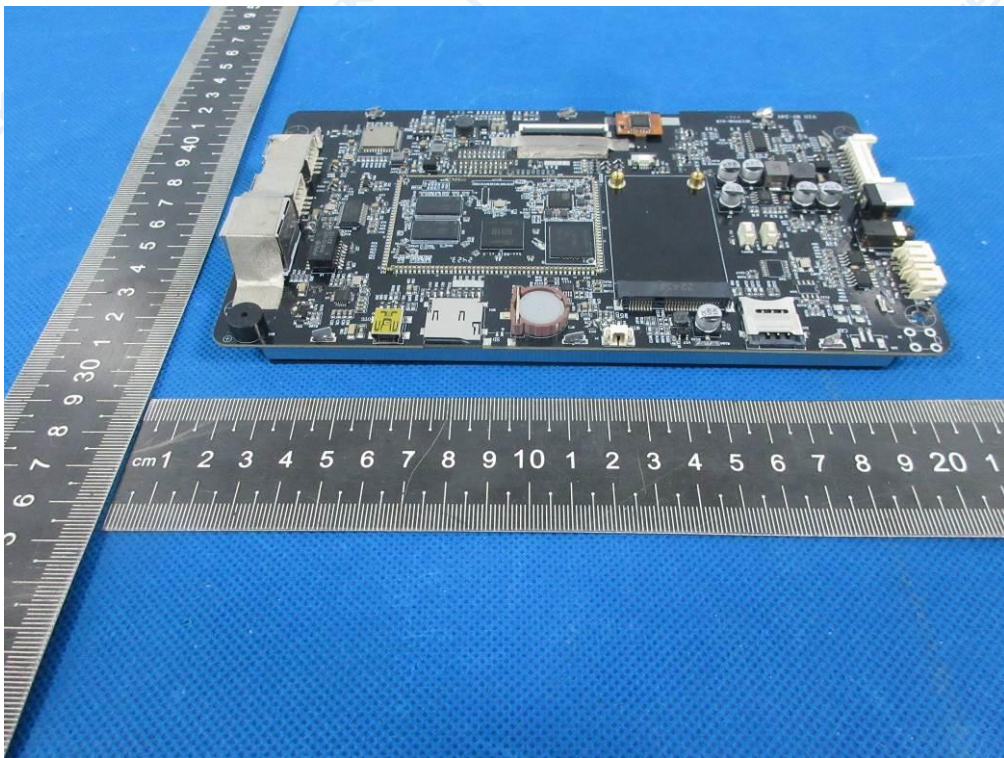


Photo 7

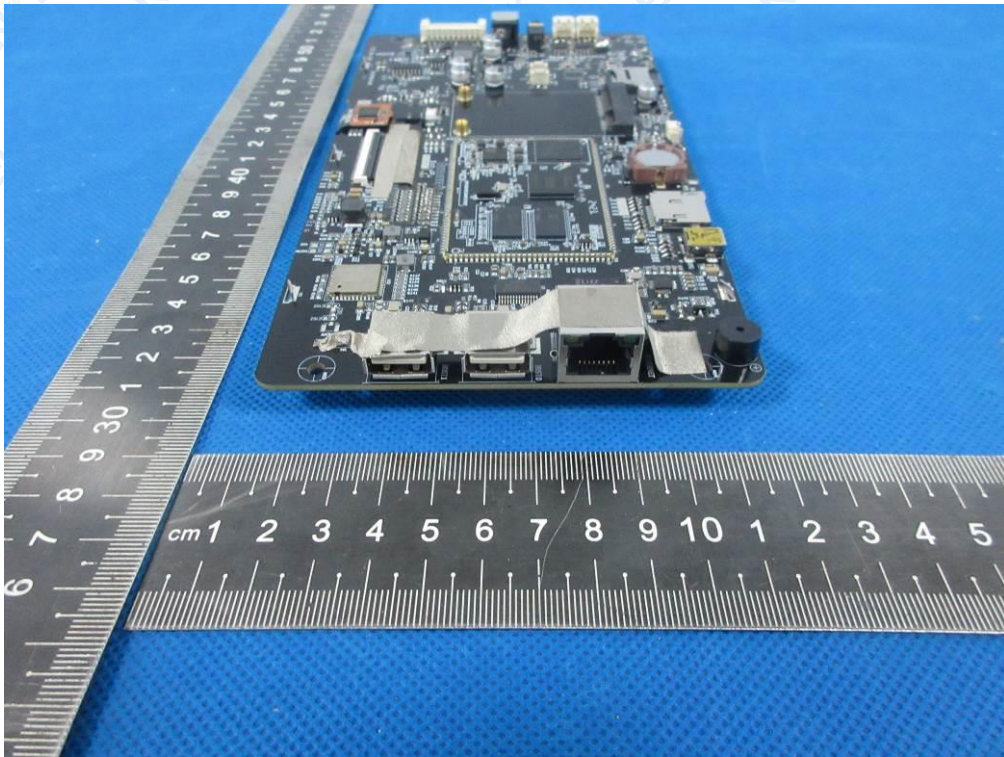


Photo 8



Photo 9



Photo 10



----- End of Report -----