



中国认可
国际互认
检测
TESTING
CNAS L2264

EN 55022&24 Test Report

Applicant	ID TECH
Brand	ID TECH
Product	EMV L1-L2 Chip and MagStripe Reader
Model	IDEM-851P
Report No.	RXA1608-0179EMC01
Date of issue	September 13, 2016

TA Technology (Shanghai) Co., Ltd.

No.145, Jintang Rd, Tangzhen Industry Park, Pudong Shanghai, China

TEL: +86-021-50791141/2/3

FAX: +86-021-50791141/2/3-8000

GENERAL SUMMARY

Reference Standard(s)	<p>EN 55022:2010+AC:2011 Information technology equipment-Radio disturbance characteristics-Limits and methods of measurement</p> <p>EN 61000-3-2:2006+A2:2009 Electromagnetic compatibility (EMC) –Part 3-2:Limits –Limits for harmonic current emissions(equipment input current ≤ 16 A per phase)</p> <p>EN 61000-3-3:2008 Electromagnetic compatibility (EMC) –Part 3-3:Limits – Limitation of voltage changes,voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection</p> <p>EN 55024:2010 Information technology equipment- Immunity characteristics-Limits and methods of measurement</p>
Conclusion	<p>This equipment has been measured in all cases requested by the relevant standards. Test results in Chapter 2 of this test report are below limits specified in the relevant standards.</p> <p>General Judgment: Pass</p>
Comment	<p>The test result only responds to the measured sample.</p>

Approved by Guangchang Fan

Guangchang Fan
Director

Revised by Wei Liu

Wei Liu
EMC Manager

Performed by Yunpu Li

Yunpu Li
EMC Engineer

TABLE OF CONTENT

1. Competence and Warranties.....	4
1.1. Notes of the test report	4
1.2. Testing laboratory	4
1.3. Applicant Information	5
1.4. Manufacturer Information.....	5
1.5. Information of EUT.....	6
1.6. Test Date	6
2. Test results.....	7
2.1. Summary of measurement results	7
2.2. Radiated Emission	8
2.3. Conducted Emission	13
2.4. RF Electromagnetic Field (RS)	18
2.5. Fast Transients Common Mode (EFT).....	21
2.6. Electrostatic Discharge	24
2.7. Surge	27
2.8. Radio Frequency Common Mode (CS).....	30
2.9. Power Frequency Magnetic Field.....	32
2.10. Voltage dips and interruptions	34
1. Main Test Instrument.....	36
ANNEX A: The EUT Appearance	37
ANNEX B: Test Configuration	38

1. Competence and Warranties

1.1. Notes of the test report

TA Technology (Shanghai) Co., Ltd. has obtained the accreditation of China National Accreditation Service for Conformity Assessment (CNAS), and accreditation number: L2264.

TA Technology (Shanghai) Co., Ltd. guarantees the reliability of the data presented in this test report, which is the results of measurements and tests performed for the items under test on the date and under the conditions stated in this test report and is based on the knowledge and technical facilities available at TA Technology (Shanghai) Co., Ltd. at the time of execution of the test.

TA Technology (Shanghai) Co., Ltd. is liable to the client for the maintenance by its personnel of the confidentiality of all information related to the items under test and the results of the test. The sample under test was selected by the Client. This report only refers to the item that has undergone the test.

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of **TA Technology (Shanghai) Co., Ltd.**

If the electrical report is inconsistent with the printed one, it should be subject to the latter.

1.2. Testing laboratory

Company: TA Technology (Shanghai) Co., Ltd.
Address: No.145, Jintang Rd, Tangzhen Industry Park, Pudong
City: Shanghai
Post code: 201201
Country: P. R. China
Contact: Xu Kai
Telephone: +86-021-50791141/2/3
Fax: +86-021-50791141/2/3-8000
Website: <http://www.ta-shanghai.com>
E-mail: xukai@ta-shanghai.com



1.3. Applicant Information

Company: ID TECH

Address: 10721 Walker Street, Cypress, CA 90630, United State

1.4. Manufacturer Information

Company: ID TECH

Address: 10721 Walker Street, Cypress, CA 90630, United State

1.5. Information of EUT

General information

SN:	632T000007
Hardware Version:	80146301
Software Version:	0.99.010

1.6. Test Date

The test is performed from August 25, 2016 to September 2, 2016.

2. Test results

2.1. Summary of measurement results

Emission			
Number	Summary of measurements of results	Rules	Verdict
1	Radiated Emission	EN 55022:2010+AC:2011	PASS
2	Conducted Emission	EN 55022:2010+AC:2011	PASS
3	Harmonic Current Emission	EN 61000-3-2:2014	N/A
4	Voltage fluctuation and flicker	EN 61000-3-3: 2013	N/A
Immunity(EN 55024:2010)			
Number	Summary of measurements of results	Rules	Verdict
5	Electrostatic discharge	EN 61000-4-2:2009	PASS
6	RF electromagnetic field	EN 61000-4-3:2006+A1:2008+A2:2010	PASS
7	Fast transients common mode	EN 61000-4-4:2012	PASS
8	Surge	EN 61000-4-5:2014	PASS
9	Radio frequency common mode	EN 61000-4-6:2014	PASS
10	Power Frequency Magnetic Field	EN 61000-4-8: 2010	PASS
11	Voltage dips and interruptions	EN 61000-4-11:2004	PASS
Note: N/A: Not Applicable			

2.2. Radiated Emission

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~26°C	45%~50%	101.5kPa

Methods of Measurement

Procedure of Preliminary Test

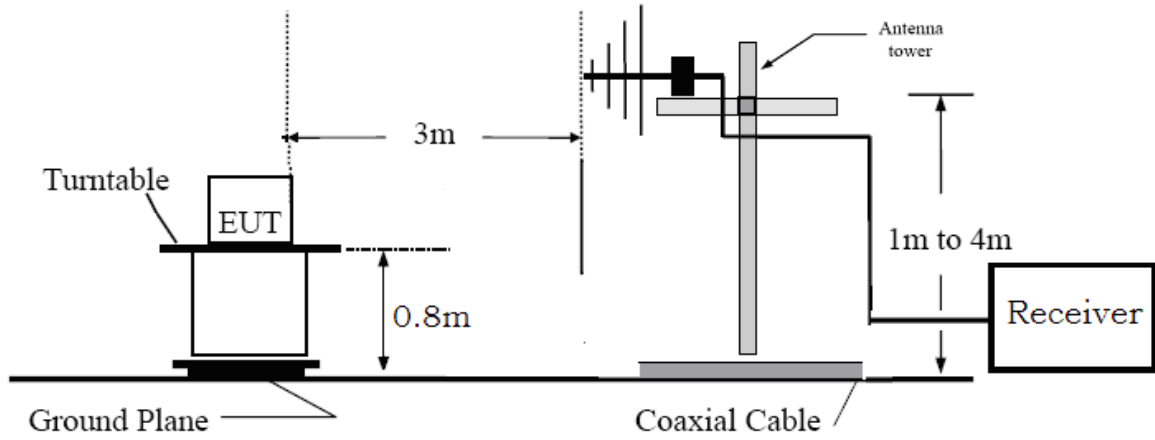
- The equipment was set up as per the test configuration to simulate typical usage per the user's manual. When the EUT is a tabletop system, a wooden turntable with a height of 0.8 meters is used which is placed on the ground plane. When the EUT is a floor standing equipment, it is placed on the ground plane which has a 15cm non-conductive covering to insulate the EUT from the ground plane.
- Support equipment, if needed, was placed as per EN 55022.
- All I/O cables were positioned to simulate typical usage as per EN 55022.
- The EUT received AC power source from the outlet socket under the turntable. All support equipment power received from another socket under the turntable.
- The antenna was placed at 3 meter away from the EUT as stated in EN 55022. The antenna connected to the Spectrum Analyzer via a cable and at times a pre-amplifier would be used.
- The Analyzer / Receiver quickly scanned from 30MHz to 1000MHz. The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
- After the preliminary scan, the worst configuration of EUT and cable of the highest emission level were recorded for the final test.

Procedure of Final Test

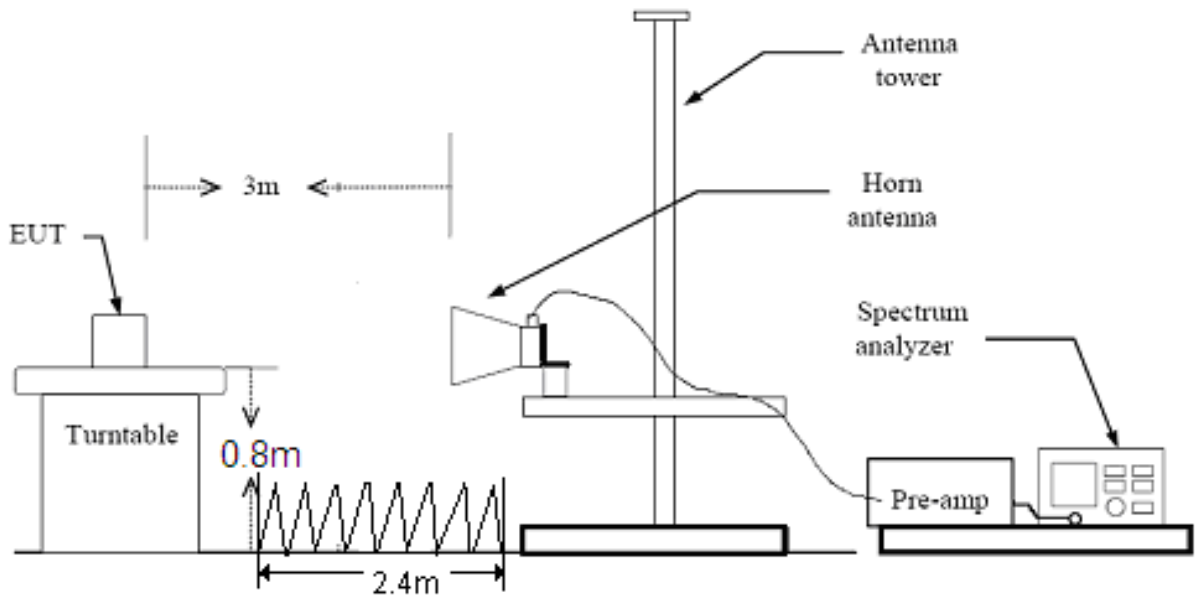
- EUT and support equipment were set up on the turntable as per the configuration with highest emission level in the preliminary test.
- The Analyzer / Receiver scanned from 30MHz to 1000MHz. Emissions were scanned and measured rotating the EUT to 360 degrees, varying cable placement and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
- Recording at least the six highest emissions. Emission frequency, amplitude, antenna position, polarization and turntable position were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit and only Q.P. reading is presented.
- The test data of the worst-case condition(s) was recorded.

Test Setup

Below 1 GHz



Above 1GHz



Note: Area side:2.4mX3.6m

Limits

Frequency (MHz)	Quasi-peak (dB μ V/m) At 3m	
	Class A	Class B
30 -230	50	40
230-1000	57	47

Frequency (GHz)	Class A (dBuV/m)		Class B (dBuV/m)	
	Average	Peak	Average	Peak
1 - 3	56	76	50	70
3 - 6	60	80	54	74

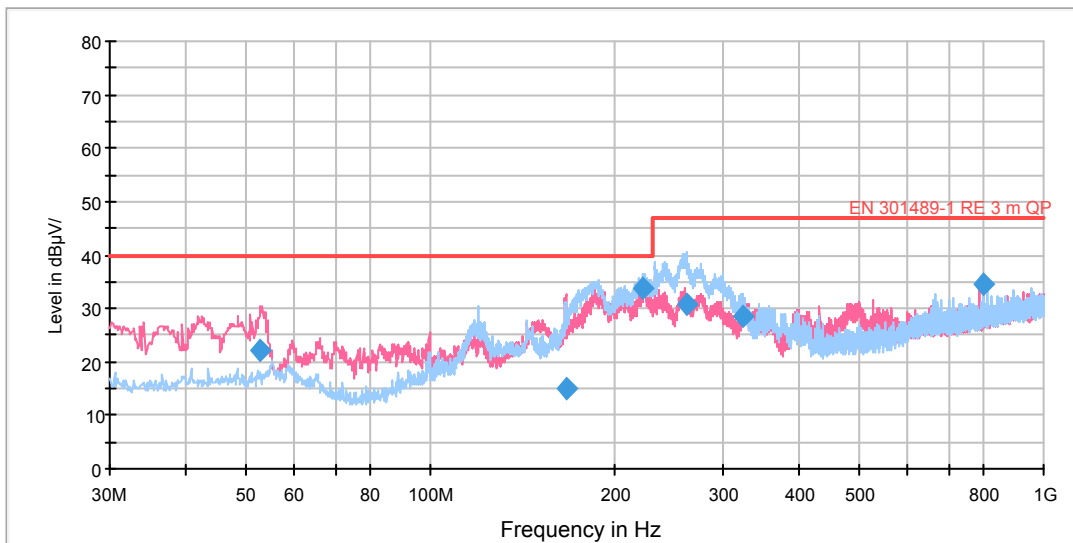
Note: The EUT should meet CLASS B limit.

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$. $U = 3.92$ dB.

Test Results:

RE 0.03-1GHz QP Class B

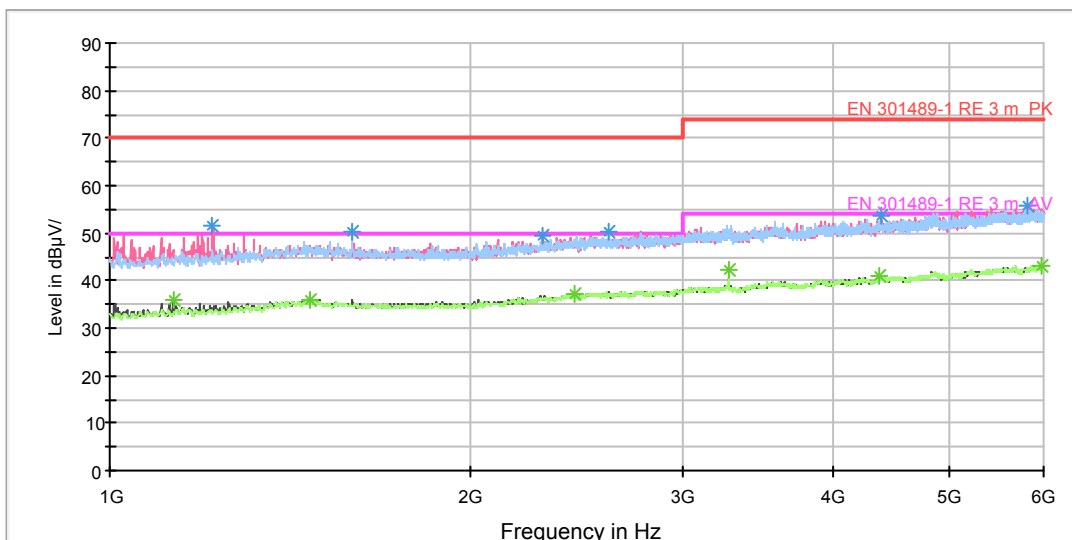


Note: Red trace display the vertical results. Blue trace display the Horizontal results.
Radiated Emission 30M-1GHz

Frequency (MHz)	Quasi-Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Reading value (dBuV/m)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
52.720000	22.3	100.0	V	42.0	35.2	12.9	17.7	40.0
166.285000	14.9	100.0	V	252.0	24.9	10.0	25.1	40.0
221.661250	33.9	125.0	H	281.0	46.9	13.0	6.1	40.0
261.472500	30.7	125.0	H	281.0	45.1	14.4	16.3	47.0
322.490000	28.4	100.0	H	25.0	44.5	16.1	18.6	47.0
798.200000	34.7	100.0	H	330.0	59.0	24.3	12.3	47.0

- Remark: 1. Quasi-Peak = Reading value + Correction factor
- 2. Correction Factor = Insertion loss + Cable loss
- 3. Margin = Limit – Quasi-Peak

RE 1G-6GHz PK+AV Class B



Radiated Emission 1G-6GHz

Frequency (MHz)	Peak (dBuV/m)	Reading value (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1218.750000	51.4	53.5	100.0	V	203.0	-2.1	18.6	70
1593.750000	50.1	50.3	100.0	H	0.0	-0.2	19.9	70
2295.000000	49.4	51.7	100.0	V	0.0	2.3	20.6	70
2602.500000	50.2	53.8	100.0	H	19.0	3.6	19.8	70
4386.250000	53.6	60.0	100.0	V	296.0	6.4	20.4	74
5823.750000	55.8	65.3	100.0	H	0.0	9.5	18.2	74

Frequency (MHz)	Average (dBuV/m)	Reading value (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
1130.000000	36.0	38.7	100.0	V	219.0	-2.7	14.0	50
1467.500000	36.1	36.6	100.0	H	19.0	0.5	13.9	50
2436.250000	37.2	40.2	100.0	V	328.0	3.0	12.8	50
3282.500000	42.4	47.2	100.0	H	220.0	4.8	11.6	54
4375.000000	40.8	47.3	100.0	V	349.0	6.5	13.2	54
5987.500000	43.1	52.9	100.0	V	0.0	9.8	10.9	54

2.3. Conducted Emission

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~26°C	45%~50%	101.5kPa

Methods of Measurement

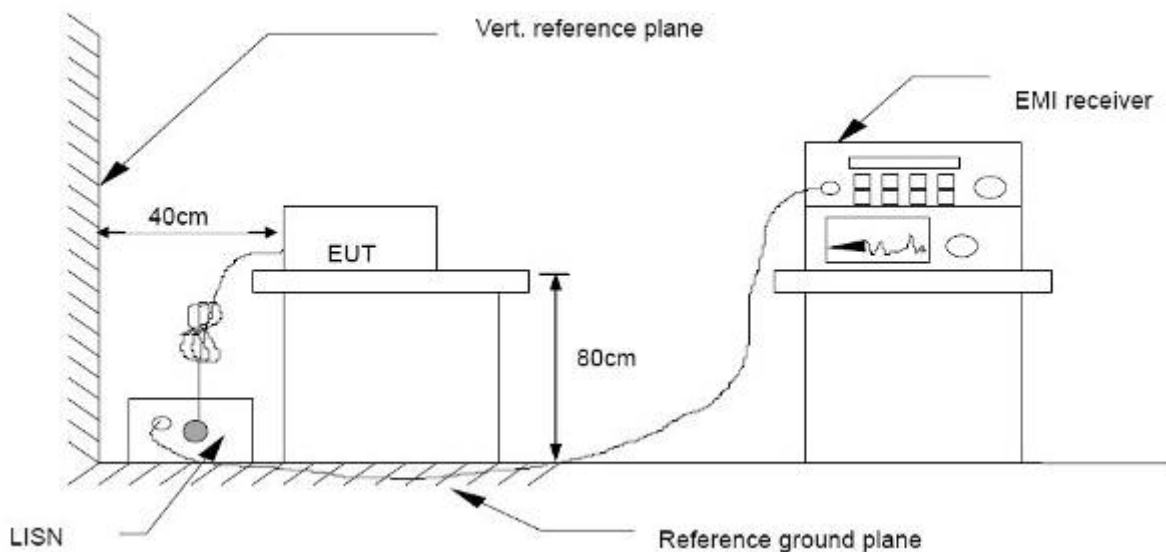
Procedure of Preliminary Test

- The EUT and support equipment, if needed, were set up as per the test configuration to simulate typical usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per EN 55022 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor standing equipment, it is placed on the ground plane, which has a 15cm non-conductive covering to insulate the EUT from the ground plane.
- All I/O cables were positioned to simulate typical actual usage as per EN 55022.
- The EUT installed by AC main power, through a Line Impedance Stabilization Network (LISN), which was supplied power source and was grounded to the ground plane.
- All support equipment power by a second LISN.
- The test program of the EUT was started. Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.
- The Receiver scanned from 150kHz to 30MHz for emissions in each of the test modes.
- During the above scans, the emissions were maximized by cable manipulation.
- After the preliminary scan, the worst configuration of EUT and cable of the highest emission level were recorded for reference of the final test.

Procedure of Final Test

- EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test.
- A scan was taken on both power lines, L and N, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.
- The test data of the worst-case condition(s) was recorded.

Test Setup



Limits

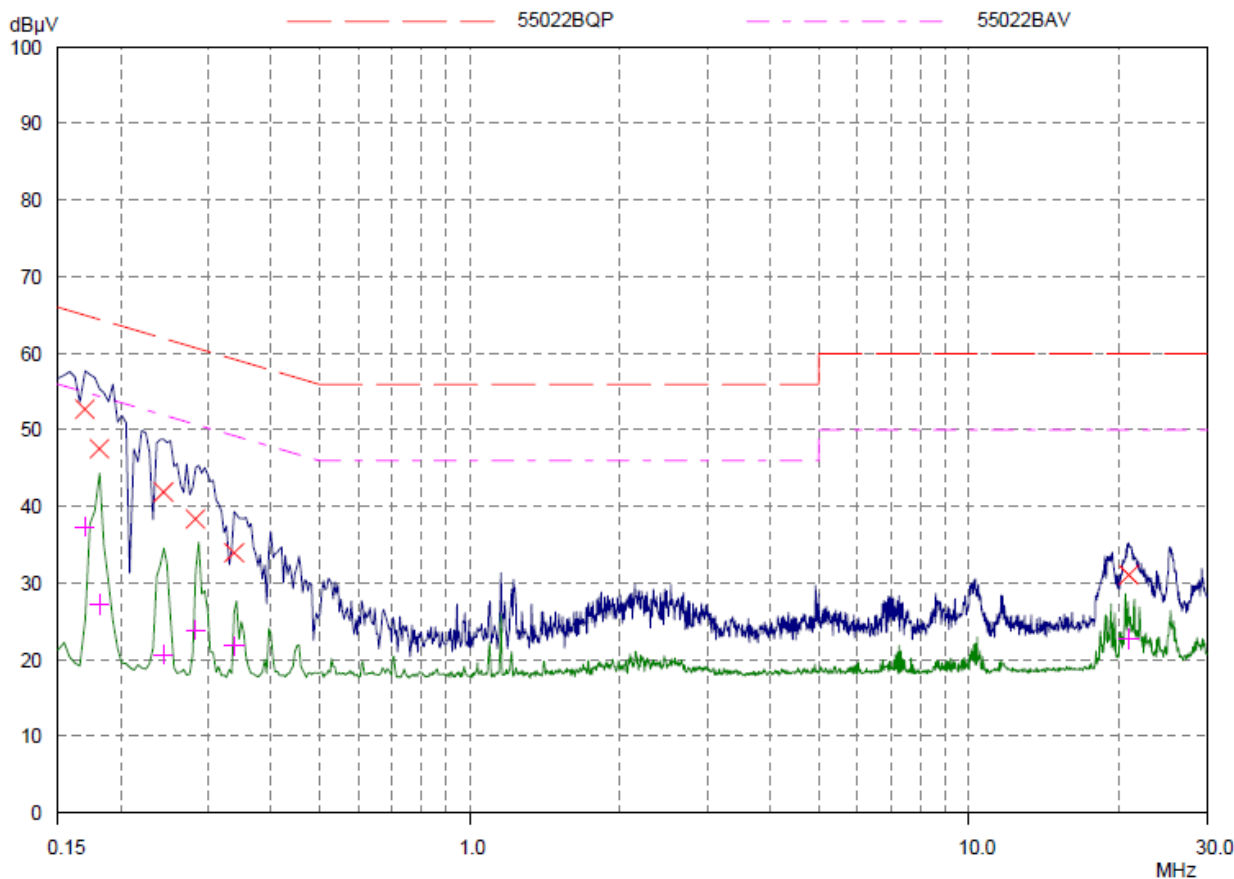
Frequency (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.5 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

Note: The EUT should meet CLASS B limit

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$. $U = 2.69$ dB.

Test Results:

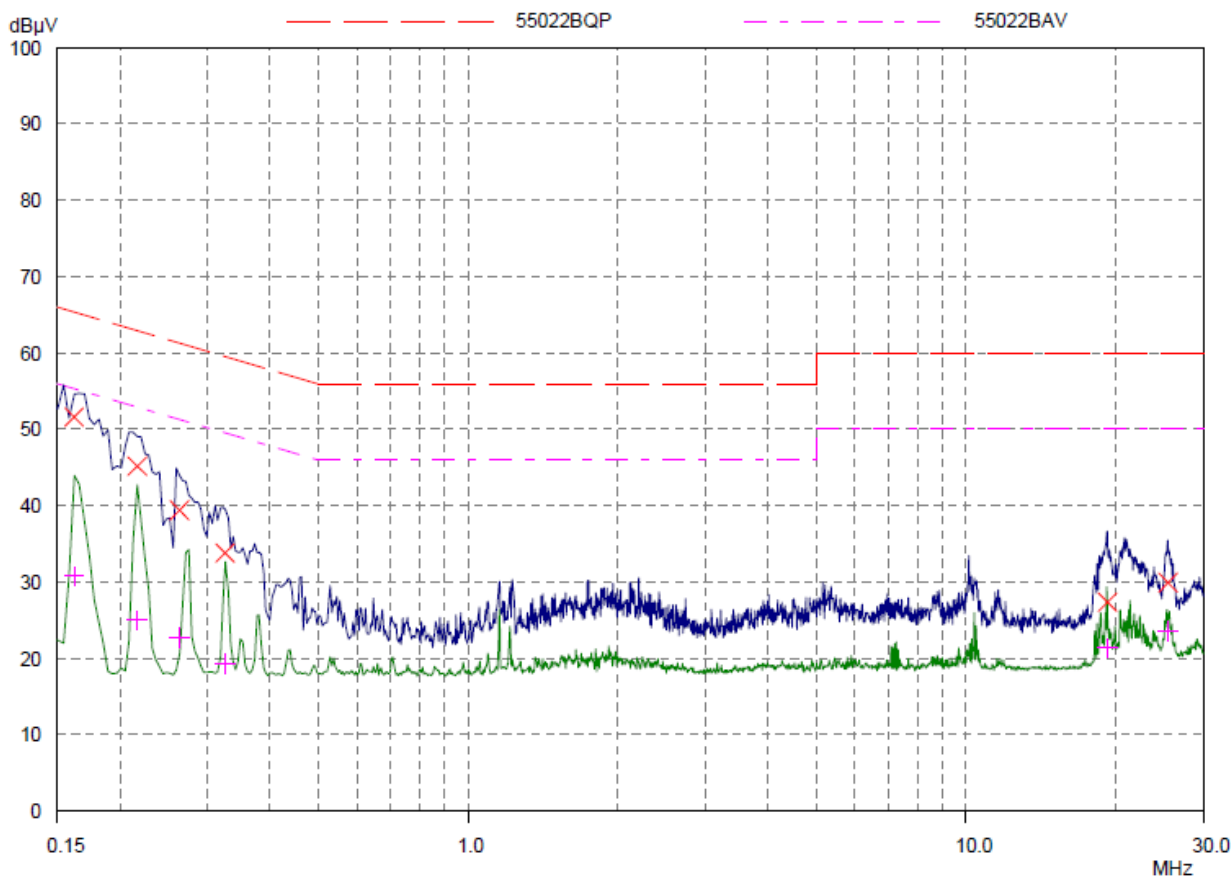


Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB	Phase -	PE -
0.16953	52.72	64.98	12.26	L1	gnd
0.18125	47.54	64.43	16.89	L1	gnd
0.24375	41.86	61.97	20.11	L1	gnd
0.28281	38.36	60.73	22.37	L1	gnd
0.3375	33.95	59.26	25.31	L1	gnd
20.9	31.04	60.00	28.96	L1	gnd

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB	Phase -	PE -
0.16953	37.38	54.98	17.60	L1	gnd
0.18125	27.26	54.43	27.17	L1	gnd
0.24375	20.60	51.97	31.37	L1	gnd
0.28281	23.88	50.73	26.85	L1	gnd
0.3375	21.83	49.26	27.43	L1	gnd
20.9	22.71	50.00	27.29	L1	gnd

Note: Blue trace uses the peak detection Green trace uses the average detection
L Line



Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB	Phase -	PE -
0.16171	51.61	65.38	13.77	N	gnd
0.2164	45.17	62.96	17.79	N	gnd
0.26328	39.41	61.33	21.92	N	gnd
0.32578	33.81	59.56	25.75	N	gnd
19.22031	27.35	60.00	32.65	N	gnd
25.4625	29.92	60.00	30.08	N	gnd

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB	Phase -	PE -
0.16171	30.77	55.38	24.61	N	gnd
0.2164	25.01	52.96	27.95	N	gnd
0.26328	22.76	51.33	28.57	N	gnd
0.32578	19.25	49.56	30.31	N	gnd
19.22031	21.34	50.00	28.66	N	gnd
25.4625	23.56	50.00	26.44	N	gnd

Note: Blue trace uses the peak detection Green trace uses the average detection
N Line



2.4. RF Electromagnetic Field (RS)

Ambient condition

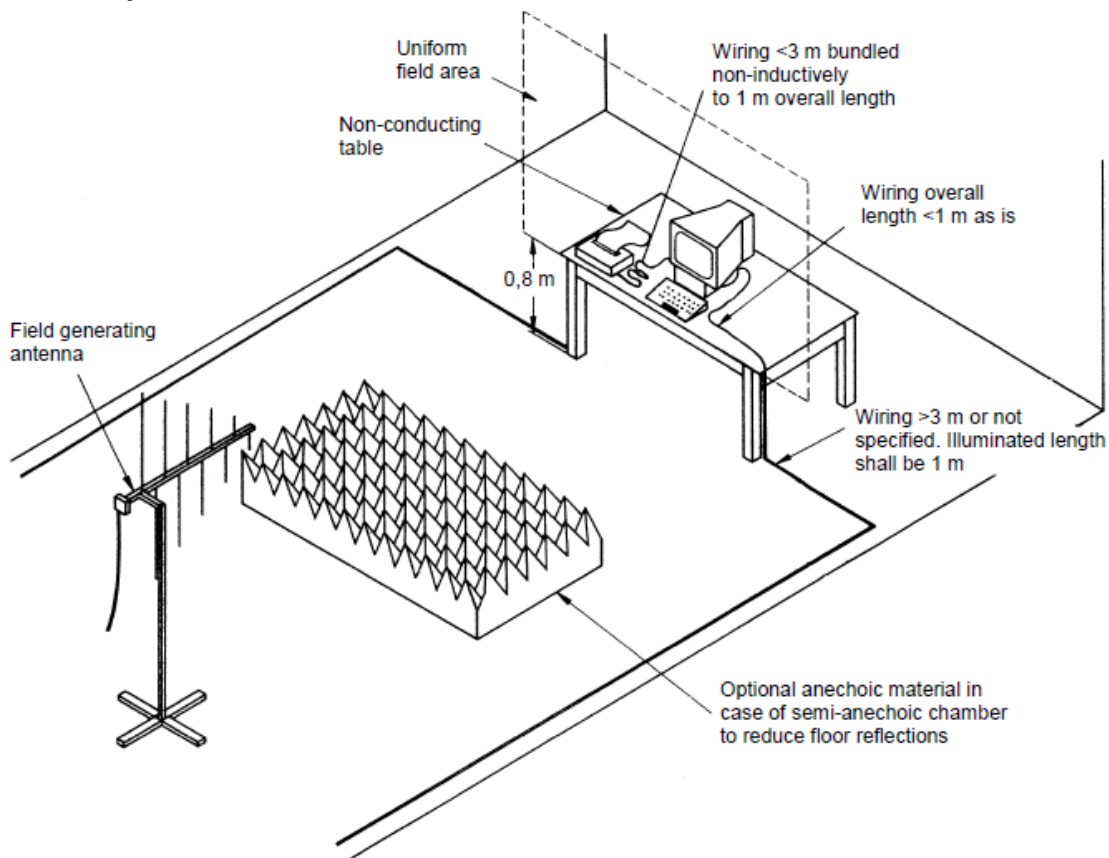
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Methods of Measurement

The test procedure was in accordance with EN 61000-4-3

- a) The testing was performed in a fully anechoic chamber. The transmit antenna was located at a distance of 3 meters from the EUT.
- b) The frequency range is swept from 80 MHz to 1000 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 preceding frequency value.
- c) The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.
- e) The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.

Test Setup



Test Specifications

Criteria	During test	After Test
A	Shall operate as intended May show degradation of performance Shall be no loss of function Shall be no unintentional transmissions	Shall operate as intended May show degradation of performance Shall be no loss of function Shall be no loss of stored data or user programmable functions
B	May show loss of function (one or more) May show degradation of performance No unintentional all transmissions	Function shall be self-recoverable Shall operate as intended after recovering Shall be no degradation of performance Shall be no loss of stored data or user Programmable functions
C	May be loss of function (one or more)	Functions shall be recoverable by the operator Shall operate as intended after recovering Shall be degradation of performance

Note: The Required Passing Criterion is criteria A.

**Test Results:**

Test Side	Level	Modulation	Polarization	Performance Criterion	Required Passing Criterion	Results
Front Side	3V/m	80 % AM (1kHz)	V	A	A	PASS
	3V/m	80 % AM (1kHz)	H	A	A	PASS

2.5. Fast Transients Common Mode (EFT)

Ambient condition

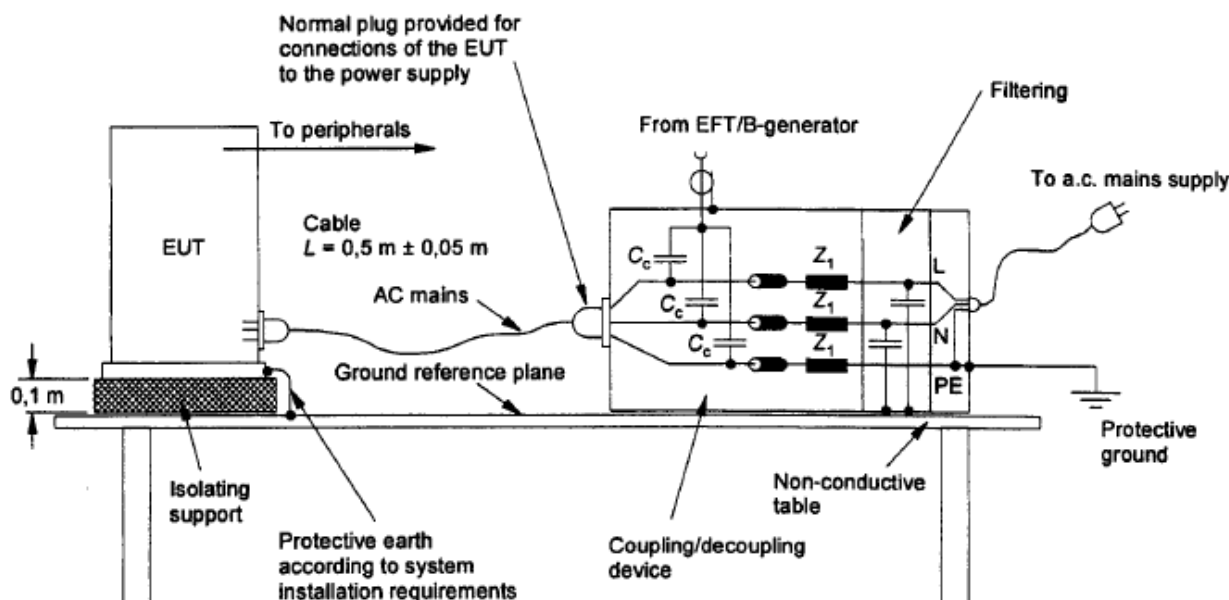
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Methods of Measurement

The test intended to show the immunity of the EUT when subjected to type of transient interference such as originating from switching transients. Bursts consisting of a number of transient are employed, coupled into power supply, control and signal inputs of EUT, The transients must be short rise-time, the repetition rate and the low energy. A performance criteria is classified as A, B, C, the recommendation is criteria B.

The EUT is arranged and connected according to its normal installation requirements. The length of the signal and power lines between the coupling device (clamp) and the EUT is $0.5m \pm 0.05m$. If a non-detachable cable more than 0.5m long with the equipment, the excess length of this cable is gathered into a flat coil with 0.4m diameter and situated at a distance of 0.1m above the ground reference plane. Bursts of 5ns/50ns pluses at a repetition rate of 5kHz with a duration of 15ms and period of 300ms, applied in both polarities between power supply terminals (including the protective earth) and a reference ground plane, or via a capacitate coupling clamp onto I/O circuits and communication lines for 3 minutes. The test level is 1kV on power supply, 0.5kV on I/O signal, data and control lines. The 0.5kV is applicable only to ports interfacing with cables whose total length according to the manufacturer’s functional specification may exceed 3m.

Test Setup



Test Specifications

Criteria	During test	After Test
A	Shall operate as intended May show degradation of performance Shall be no loss of function Shall be no unintentional transmissions	Shall operate as intended May show degradation of performance Shall be no loss of function Shall be no loss of stored data or user programmable functions
B	May show loss of function (one or more) May show degradation of performance No unintentional all transmissions	Function shall be self-recoverable Shall operate as intended after recovering Shall be no degradation of performance Shall be no loss of stored data or user Programmable functions
C	May be loss of function (one or more)	Functions shall be recoverable by the operator Shall operate as intended after recovering Shall be degradation of performance

Note: The Required Passing Criterion is criteria B.

**Test Results**

Connected	Voltage	Coupling Mode	Performance Criterion	Required Passing Criterion	Results
Power Line	±1.0 kV	L	A	B	PASS
Power Line	±1.0 kV	N	A	B	PASS
Power Line	±1.0 kV	L+N	A	B	PASS

2.6. Electrostatic Discharge

Ambient condition

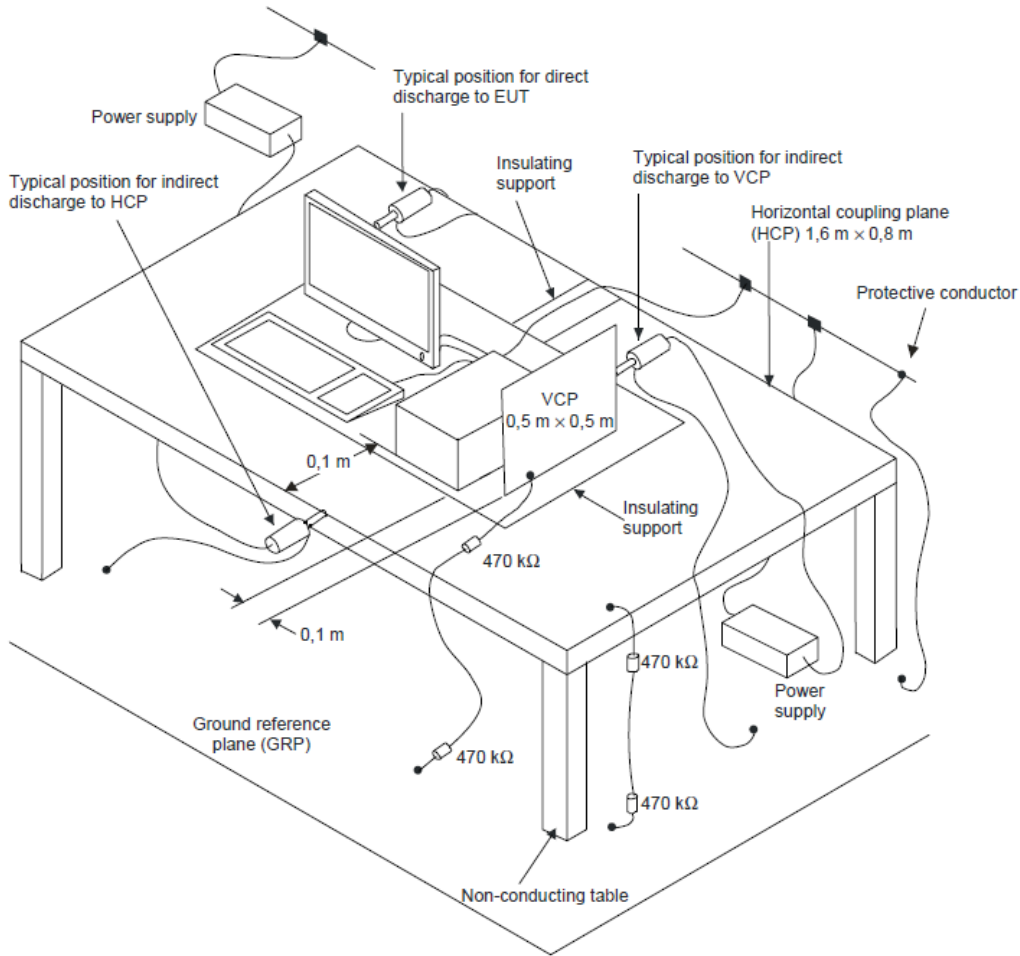
Temperature	Relative humidity	Pressure
23°C ~25°C	40%~45%	101.5kPa

Methods of Measurement

The basic test procedure was in accordance with IEC 61000-4-2:

- a) The EUT was located 0.1 m minimum from all side of the HCP (dimensions 1.6m x0.8m).
- b) The support units were located another table 30 cm away from the EUT, but direct support unit was/were located at same location as EUT on the HCP and keep at a distance of 10 cm with EUT.
- c) The time interval between two successive single discharges was at least 1 second.
- d) Contact discharges were applied to the non-insulating coating, with the pointed tip of the generator penetrating the coating and contacting the conducting substrate.
- e) Air discharges were applied with the round discharge tip of the discharge electrode approaching the EUT as fast as possible (without causing mechanical damage) to touch the EUT. After each discharge, the ESD generator was removed from the EUT and re-triggered for a new single discharge. The test was repeated until all discharges were complete.
- f) At least ten single discharges (in the most sensitive polarity) were applied at the front edge of each HCP opposite the center point of each unit of the EUT and 0.1 meters from the front of the EUT. The long axis of the discharge electrode was in the plane of the HCP and perpendicular to its front edge during the discharge.
- g) At least ten single discharges (in the most sensitive polarity) were applied to the center of one vertical edge of the Vertical Coupling Plane (VCP) in sufficiently different positions that the four faces of the EUT were completely illuminated. The VCP (dimensions 0.5m x 0.5m) was placed vertically to and 0.1 meters from the EUT.

Test Setup



Test Specifications

Criteria	During test	After Test
A	Shall operate as intended May show degradation of performance Shall be no loss of function Shall be no unintentional transmissions	Shall operate as intended May show degradation of performance Shall be no loss of function Shall be no loss of stored data or user programmable functions
B	May show loss of function (one or more) May show degradation of performance No unintentional all transmissions	Function shall be self-recoverable Shall operate as intended after recovering Shall be no degradation of performance Shall be no loss of stored data or user Programmable functions
C	May be loss of function (one or more)	Functions shall be recoverable by the operator Shall operate as intended after recovering Shall be degradation of performance

Note: The Required Passing Criterion is criteria B.

**Test Results**

Coupling	Voltage	Performance Criterion	Required Passing Criterion	Results
Air Discharge	±4kV	A	B	PASS
	±8kV	A	B	PASS
Contact Discharge	±2kV	A	B	PASS
	±4kV	A	B	PASS
Horizontal Coupling Plane	±2kV	A	B	PASS
	±4kV	A	B	PASS
Vertical Coupling Plane	±2kV	A	B	PASS
	±4kV	A	B	PASS

2.7. Surge

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Methods of Measurement

a) For EUT power supply:

The surge is 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 was shorter than 2 meters in length.

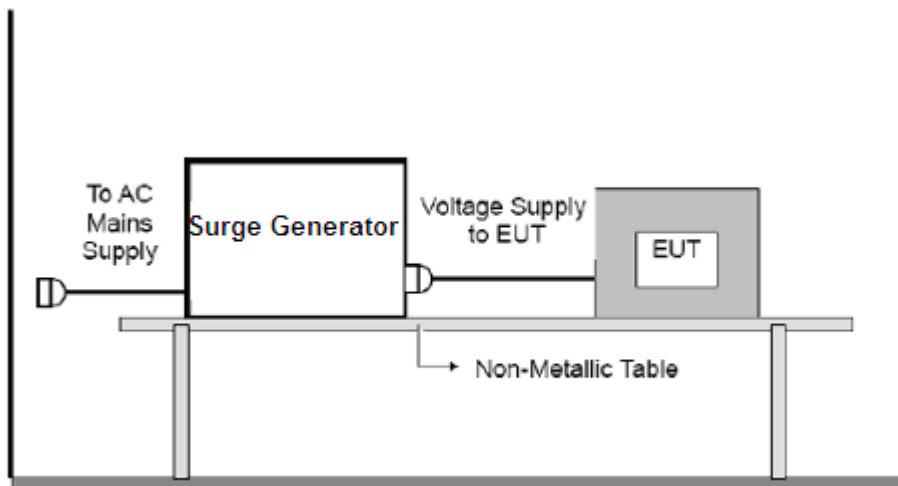
b) For test applied to unshielded un-symmetrically operated interconnection lines of EUT:

The surge was applied to the lines via the capacitive coupling. The coupling /decoupling networks didn't influence the specified functional conditions of the EUT. The interconnection line between the EUT and the coupling/decoupling networks was shorter than 2 meters in length.

c) For test applied to unshielded symmetrically operated interconnection /telecommunication lines of EUT:

The surge was applied to the lines via gas arrestors coupling. Test levels below the ignition point of the coupling arrestor were not specified. The interconnection line between the EUT and the coupling/decoupling networks was shorter than 2 meters in length.

Test Setup



Test Specifications

Criteria	During test	After Test
A	Shall operate as intended May show degradation of performance Shall be no loss of function Shall be no unintentional transmissions	Shall operate as intended May show degradation of performance Shall be no loss of function Shall be no loss of stored data or user programmable functions
B	May show loss of function (one or more) May show degradation of performance No unintentional all transmissions	Function shall be self-recoverable Shall operate as intended after recovering Shall be no degradation of performance Shall be no loss of stored data or user Programmable functions
C	May be loss of function (one or more)	Functions shall be recoverable by the operator Shall operate as intended after recovering Shall be degradation of performance

Note: The Required Passing Criterion is criteria B.

**Test Results**

Connected	Voltage	Coupling Mode	Angle	Performance Criterion	Required Passing Criterion	Results
Power Line	±1.0kV	L-N	0	A	B	PASS
		L-N	90	A	B	PASS
		L-N	180	A	B	PASS
		L-N	270	A	B	PASS

2.8. Radio Frequency Common Mode (CS)

Ambient condition

Temperature	Relative humidity	Pressure
23°C~26°C	45%~50%	101.5kPa

Methods of Measurement

The EUT shall be tested within its intended operating and climatic conditions.

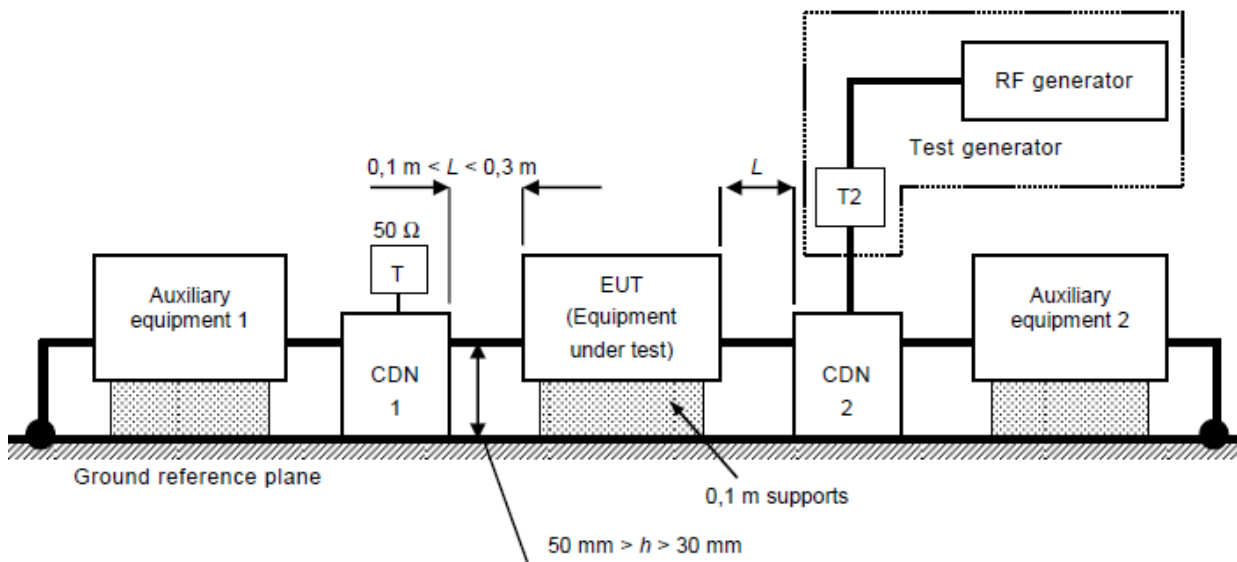
The test shall be performed with the test generator connected to each of the coupling and decoupling devices in turn, while the other non-excited RF input ports of the coupling devices are terminated by a 50-ohm load resistor.

The frequency range was swept from 150 kHz to 80 MHz, using the signal level established during the setting process and with a disturbance signal of 80 % amplitude. The signal was modulated with a 1 kHz sine wave, pausing to adjust the RF signal level or the switch coupling devices as necessary. The sweep rate was 1.5×10^{-3} decades/s. Where the frequency range is swept incrementally, the step size was 1 % of preceding frequency value from 150 kHz to 80 MHz.

The dwell time at each frequency was less than the time necessary for the EUT to be exercised, and able to respond. Sensitive frequencies such as clock frequency(ies) and harmonics or frequencies of dominant interest, was analyzed separately. Attempts were made to fully exercise the EUT during testing, and to fully interrogate all

exercise modes selected for susceptibility.

Test Setup



Test Specifications

Criteria	During test	After Test
A	Shall operate as intended May show degradation of performance Shall be no loss of function Shall be no unintentional transmissions	Shall operate as intended May show degradation of performance Shall be no loss of function Shall be no loss of stored data or user programmable functions
B	May show loss of function (one or more) May show degradation of performance No unintentional all transmissions	Function shall be self-recoverable Shall operate as intended after recovering Shall be no degradation of performance Shall be no loss of stored data or user Programmable functions
C	May be loss of function (one or more)	Functions shall be recoverable by the operator Shall operate as intended after recovering Shall be degradation of performance

Note: The Required Passing Criterion is criteria A.

Test Results

Test Port	Connected	Level (V)	dwell time (s)	Frequency (MHz)	Performance Criterion	Required Passing Criterion	Results
Power Port	CDN	3	1	0.15-80	A	A	PASS

2.9. Power Frequency Magnetic Field

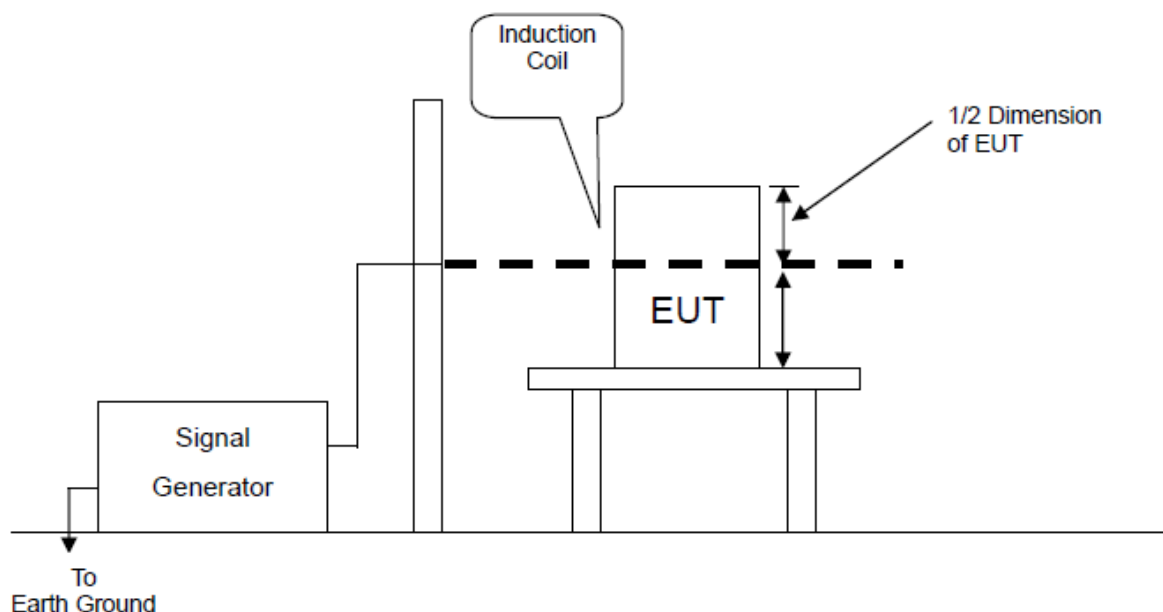
Ambient condition

Temperature	Relative humidity	Pressure
23°C~26°C	45%~50%	101.5kPa

Methods of Measurement

- The equipment was configured and connected to satisfy its functional requirements. It shall be placed on the GRP with the interposition of a 0.1m-thick insulating support.
- The equipment cabinets shall be connected to the safety earth directly on the GRP via the earth terminal of the EUT.
- The power supply, input and output circuits shall be connected to the sources of power supply, control and signal.
- 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.

Test Setup



Test Specifications

Criteria	During test	After Test
A	Shall operate as intended May show degradation of performance Shall be no loss of function Shall be no unintentional transmissions	Shall operate as intended May show degradation of performance Shall be no loss of function Shall be no loss of stored data or user programmable functions
B	May show loss of function (one or more) May show degradation of performance No unintentional all transmissions	Function shall be self-recoverable Shall operate as intended after recovering Shall be no degradation of performance Shall be no loss of stored data or user Programmable functions
C	May be loss of function (one or more)	Functions shall be recoverable by the operator Shall operate as intended after recovering Shall be degradation of performance

Note: The Required Passing Criterion is criteria A.

Test Results

Direction	Field Strength (A/m)	Performance Criterion	Required Passing Criterion	Results
X	3	A	A	PASS
Y	3	A	A	PASS
Z	3	A	A	PASS

2.10. Voltage dips and interruptions

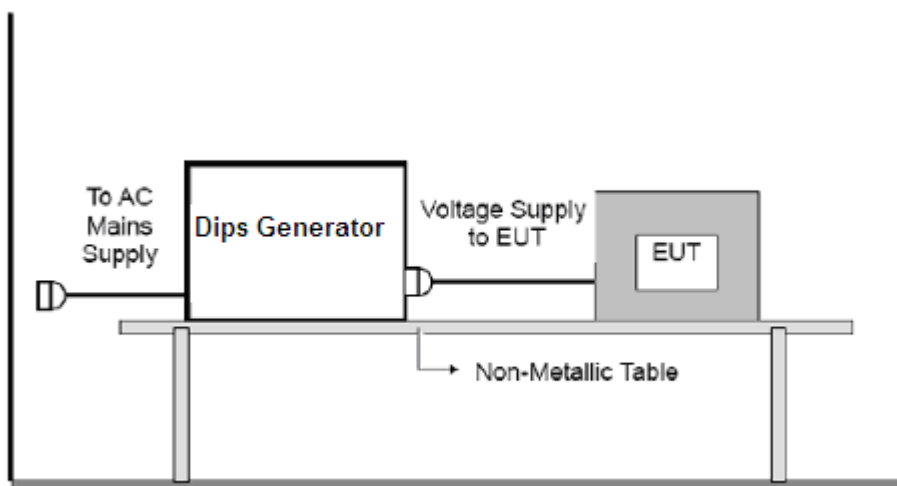
Ambient condition

Temperature	Relative humidity	Pressure
23°C~26°C	45%~50%	101.5kPa

Methods of Measurement

- The EUT and support units were located on a wooden table, 0.8 m away from ground floor.
- Setting the parameter of tests and then perform the test software of test simulator.
- Conditions changes to occur at 0 degree crossover point of the voltage waveform.
- Recording the test result in test record form.
- Removes the Battery Pack to test if any.

Test Setup



Test Specifications

Criteria	During test	After Test
A	Shall operate as intended May show degradation of performance Shall be no loss of function Shall be no unintentional transmissions	Shall operate as intended May show degradation of performance Shall be no loss of function Shall be no loss of stored data or user programmable functions
B	May show loss of function (one or more) May show degradation of performance No unintentional all transmissions	Function shall be self-recoverable Shall operate as intended after recovering Shall be no degradation of performance Shall be no loss of stored data or user Programmable functions
C	May be loss of function (one or more)	Functions shall be recoverable by the operator Shall operate as intended after recovering Shall be degradation of performance

Note: Voltage Dips:

- 1) >95% reduction Required Passing Criterion is B
- 2) 30% reduction Required Passing Criterion is C

Voltage Interruptions:

- 1) >95% reduction Required Passing Criterion is C.

Test Results

Level	Duration	Connected	Performance Criterion	Required Passing Criterion	Results
0%	0.5 Cycle	Power Port	A	B	PASS
0%	1 Cycle	Power Port	A	B	PASS
70%	25 Cycle	Power Port	A	C	PASS
0%	250 Cycle	Power Port	C	C	PASS

1. Main Test Instrument

Table 1: List of Main Instruments

No.	Name	Type	Manufacturer	Serial Number	Calibration Date	Calibration Date
01	Signal Analyzer	FSV30	R&S	100815	2015-12-17	2016-12-16
02	EMI Test Receiver	ESCI3	R&S	100948	2016-06-01	2017-05-31
03	TRILOG Broadband Antenna	VULB 9163	Schwarzbeck	9163-201	2014-12-06	2017-12-05
04	Double Ridged Waveguide Horn Antenna	HF907	R&S	100126	2014-12-06	2017-12-05
05	Horn Antenna	3160-09	ETS-Lindgren	00102643	2015-01-30	2018-01-29
06	EMI Test Receiver	ESCS30	R&S	100138	2015-12-17	2016-12-16
07	Artificial main network	ENV216	R&S	101171	2013-12-18	2016-12-17
08	Single phase Harmonics & Flicker Analyzer	DPA 500N	EM TEST	V0902104586	2015-06-26	2018-06-25
09	Electro-Static Discharger Generator	Nosieken	ESS-2002EX	ES1111144	2015-03-16	2017-03-15
10	Compact Simulator of Conducted Immunity	UCS 500N6	EM TEST	V0902104581	2015-06-26	2018-06-25
11	Audio Analyzer	UPV	R&S	101372	2016-05-21	2017-05-20
12	Power Amplifier	75A250A	AR	0331553	NA	NA
13	Power Amplifier	BLWA 0830-160/100/40C	BONN	097490	NA	NA
14	Signal Generator	SMB100A	R&S	102594	2016-05-21	2017-05-20
15	High Gain Log-Periodic Antenna	HL046E	R&S	100063	NA	NA
16	CDN	FCC-801-M2/M3-16A	FCC	091293	2016-05-21	2017-05-20
17	Magnetic Antenna	EM Test	MS100	0708-27	2015-07-18	2018-07-17

END OF REPORT BODY

ANNEX A: The EUT Appearance



a: Front



b: Back

Picture 1 Constituents of EUT

ANNEX B: Test Configuration



Picture 2 Radiated Emission Test Setup



Picture 3 Conducted Emission Test Setup



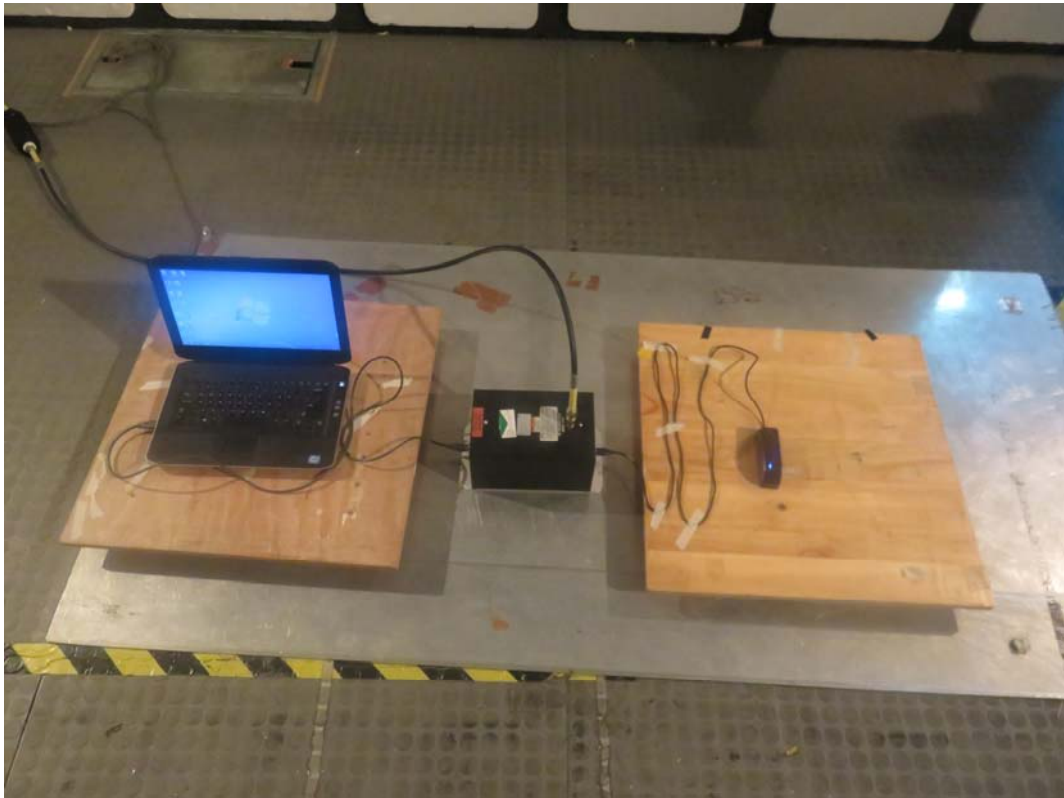
Picture 4 Electrostatic Discharge Test Setup



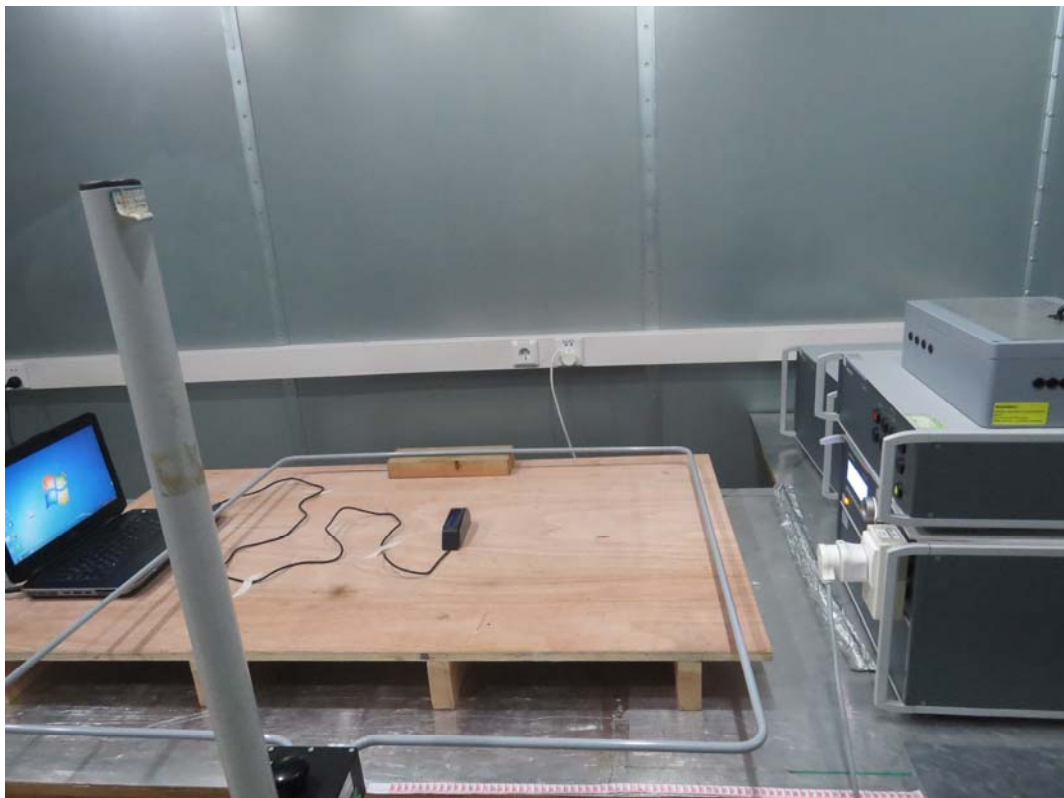
Picture 5 EFT & Surge & Dips Test Setup



Picture 6 RF Electromagnetic Field (RS) Test Setup



Picture 7: Radio Frequency Common Mode (CS) Test Setup



Picture 8 Power Frequency Magnetic Field Test Setup