STS LAB

EMC TESTREPORT

Report No: STS1711221E01

Issued for

Vonino Electronics LTD

Unit 1109, 11/F., Kowloon Centre, 33 Ashley Road, Tsim Sha Tsui, Kowloon, Hong Kong

Product Name:	mobilephone
Brand Name:	Vonino
Model Name:	NONO33
Series Model:	Nono M, Nono J, Nono Q, Nono Z
Test Standard:	Draft ETSI EN 301 489-1 V2.2.0 (2017-03)
	Draft ETSI EN 301 489-17 V3.2.0 (2017-03)
	Draft ETSI EN 301 489-52 V1.1.0 (2016-11)

Shenzhen STS Test Services Co., Ltd.
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TEST REPORT CERTIFICATION

Applicant's name ..... :	Vonino Electronics LTD
Address ..... :	Unit 1109, 11/F., Kowloon Centre, 33 Ashley Road, Tsim Sha Tsui, Kowloon, Hong Kong
Manufacturer's Name ..... :	Hona (HK) Technology Limited
Address ..... :	Room 603, 6/F, Block R2-B, No.20, Gaoxin S.Ave.7th, Southern Section, Hi-tech Industrial Park, Nanshan District, Shenzhen, China

Product description

Product name ..... :	mobilephone
Brand Name ..... :	Vonino
Model Name	NONO33
Series Model ..... :	Nono M, Nono J, Nono Q, Nono Z
Standards ..... :	Draft ETSI EN 301 489-1 V2.2.0 (2017-03) Draft ETSI EN 301 489-17 V3.2.0 (2017-03) Draft ETSI EN 301 489-52 V1.1.0 (2016-11)

This device described above has been tested by STS, and the test results show that the equipment under test (EUT) is in compliance with the 2014/53/EU RED Directive Art3.1b requirements. And it is applicable only to the tested sample identified in the report.

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Date of Test ..... :

Date (s) of performance of tests..... :	21 Nov. 2017~22 Nov.2017
Date of Issue..... :	23 Nov. 2017
Test Result ..... :	**Pass**

Testing Engineer :

(Kyle Rao)

Technical Manager :

(Chopin Xiao)

Authorized Signatory :

(Vita Li)

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Revision History

Rev.	Issue Date	Report NO.	Effect Page	Contents
00	23 Nov. 2017	STS1711221E01	ALL	Initial Issue
Note: **Format version** of the report -V01				

1.TEST SUMMARY

Test procedures according to the technical standards:

Draft ETSI EN 301 489-1 V2.2.0 (2017-03)
Draft ETSI EN 301 489-17 V3.2.0 (2017-03)
Draft ETSI EN 301 489-52 V1.1.0 (2016-11)

EMC Emission				
Standard	Test Item	Limit	Judgment	Remark
EN 55032:2015	Conducted Emission On AC And Telecom Port 150kHz to 30MHz	Class B	PASS	
	Radiated Emission 30MHz to 1000MHz	Class B	PASS	
	Radiated Emission 1GHz to 6GHz	Class B	PASS	NOTE (1)
EN61000-3-2:2014	Harmonic Current Emission	Class A	N/A	NOTE (2)
EN 61000-3-3:2013	Voltage Fluctuations & Flicker	------	PASS	
EMC Immunity				
Section	Test Item	Performance Criteria	Judgment	Remark
EN 61000-4-2:2009	Electrostatic Discharge	B	PASS	
EN 61000-4-3:2006+A1:2008+A2:2010	RF electromagnetic field	A	PASS	
EN 61000-4-4:2012	Fast transients	B	PASS	
EN 61000-4-5:2006	Surges	B	PASS	
EN 61000-4-6:2009	Injected Current	A	PASS	
EN 61000-4-11:2004	Volt. Interruptions Volt. Dips	B / C / C / C NOTE (3)	PASS	

Note:

(1)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 1GHz, 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.

(2)The power consumption of EUT is less than 75W and no Limits apply.

(3)Voltage dip: 100% reduction – Performance Criteria **B**

Voltage dip: 30% reduction – Performance Criteria **C**

Voltage dip: 40% reduction – Performance Criteria **C**

Voltage Interruption: 100% Interruption – Performance Criteria **C**

For GSM mode add Special conditions for EMC immunity tests

(4) For client's request and manual description, the test will not be executed.

(5) "N/A" denotes test is not applicable in this Test Report

1.1 TEST FACTORY

Company Name:	Shenzhen STS Test Services Co. Ltd.
Address:	1/F., Building B, Zhuoke Science Park, No.190, Chongqing Road, Fuyong Street, Bao'an District, Shenzhen, Guangdong,China
Telephone:	+86-755 3688 6288
Fax:	+86-755 3688 6277
Registration No.:	CNAS Registration No.: L7649; FCC Registration No.: 625569
	IC Registration No.: 12108A; A2LA Certificate No.: 4338.01;

1.2 MEASUREMENT UNCERTAINTY

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

A. Conducted Measurement :

Test Site	Method	Measurement Frequency Range	U，(dB)	NOTE
STSC01	ANSI	9KHz ~ 150KHz	2.88	
		150 KHz ~ 30MHz	2.67	

B. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	U，(dB)	NOTE
STSC02	ANSI	30MHz ~ 200MHz	3.80	
		200MHz ~ 1000MHz	3.97	
		1GHz ~ 6 GHz	3.03	

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product Name	mobilephone	
Brand Name	Vonino	
Model Name	NONO33	
Series Model	Nono M, Nono J, Nono Q, Nono Z	
Model Difference	Only different in model name,appearance and colors	
Frequency Bands	GSM	900: 880.2 MHz to 914.8 MHz 1800: 1710.2 MHz to 1784.8 MHz
	Bluetooth	2402 MHz to 2480 MHz
Modulation Mode	GSM	GMSK for GPRS
	Bluetooth	BT(1Mbps): GFSK
SIM Card	SIM 1 and SIM 2 is a chipset unit and tested as single chipset,SIM 1 is used to tested	
Power Rating	DC 3.7V from battery	
Adapter	Power supply and ADP(rating): Input: AC100~240V,200mA,50/60Hz output: DC 5V,500mA	
Battery	Battery(rating): Rated Voltage: 3.7V Charge Limit: 4.2V Capacity:800mAh	
Hardware version number	H668M10-C10	
Software version number	Nono_33_6531E_QQVGA_V07_20171110	

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.

Pretest Mode	Description
Mode 1	GSM 900 Mode
Mode 2	GPRS 900 Mode
Mode 3	BT Mode
Mode 4	GSM 1800 Mode
Mode 5	GPRS 1800 Mode

For Conducted Test	
Final Test Mode	Description
Mode 1	GSM 900 Mode

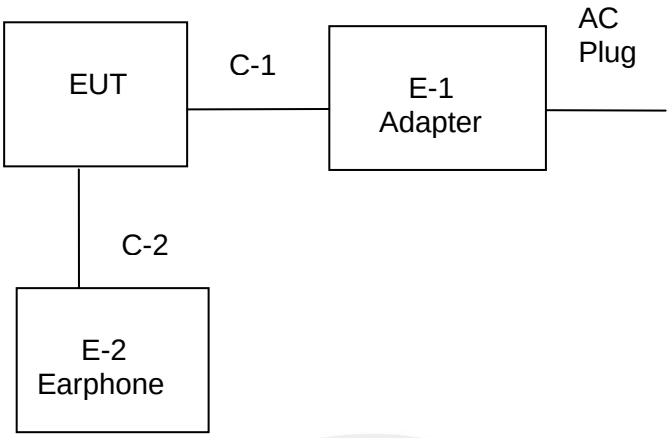
For Radiated Test	
Final Test Mode	Description
Mode 4	GSM 1800 Mode

For EMS Test	
Final Test Mode	Description
Mode 1	GSM 900 Mode
Mode 2	GPRS 900 Mode
Mode 3	BT Mode
Mode 4	GSM 1800 Mode
Mode 5	GPRS 1800 Mode

Note: The test modes were carried out for all operation modes(include link and idle).

The worst test mode for the final conducted data of EUT is Mode 1 and the worst test mode for radiation data is Mode 4, test data display.

2.3 DESCRIPTION OF TEST SETUP



2.4 DESCRIPTION OF SUPPORT UNITS

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	Mfr/Brand	Model/Type No.	Note
E-1	Adapter	vonino	VNA-NN177033	EUT
E-2	Earphone	vonino	NONO33	Auxiliary equipment

Item	Shielded Type	Ferrite Core	Length	Note
C-1	Shielded	NO	95cm	Auxiliary equipment
C-2	Unshielded	NO	100cm	Auxiliary equipment

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

2.5.1CONDUCTED TEST SITE

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibrated Until
EMI Test Receiver	R&S	ESPI	102086	2017.10.15	2018.10.14
LISN	R&S	ENV216	101242	2017.10.15	2018.10.14
LISN	EMCO	3810/2NM	000-23625	2017.10.15	2018.10.14
Absorbing clamp	R&S	MDS-21	100668	2017.10.20	2018.10.19
Universal Radio Communication Tester	R&S	CMW500	117239	2017.10.15	2018.10.14

2.5.2 RADIATED TEST SITE

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last Calibration	Calibrated Until
EMI Test Receiver	R&S	ESCI	101427	2017.10.15	2018.10.14
Bilog Antenna	TESEQ	CBL6111D	34678	2017.03.24	2018.03.23
Horn Antenna	SCHWARZBECK	BBHA 9120D(1201)	9120D-1343	2017.03.06	2018.03.05
Power Amplifier	Agilent	8449B	60538	2017.10.15	2018.10.14
Spectrum Analyzer	Agilent	E4407B	MY50140340	2017.03.11	2018.03.10
Pre-mplifier(0.1M-3GHz)	EM	EM330	60538	2017.03.12	2018.03.11
Spectrum Analyzer	Agilent	N9020A	MY49100060	2017.03.11	2018.03.10
EMI Test Receiver	ESW	R&S	101535	2017.06.01	2018.05.31
Universal Radio Communication Tester	R&S	CMW500	117239	2017.10.15	2018.10.14

2.5.3HARMONICS AND FLICKER

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Harmonic Voltage & Flicker	LAPLACE	AC 2000A	311217	2017.10.15	2018.10.14
AC Power Source	MTONI	PHF-5010	631169	2017.10.15	2018.10.14
Universal Radio Communication Tester	R&S	CMW500	117239	2017.10.15	2018.10.14

2.5.4ESD

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
ESD TEST GENERATOR	HAEFELY	ONYX 16	173835	2017.10.20	2018.10.19
Universal Radio Communication Tester	R&S	CMW500	117239	2017.10.15	2018.10.14

2.5.5 SURGE, EFT/BURST, VOLTAGE INTERRUPTION/DIPS

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Surger Generator	HTEC	HCWG71	143804	2017.10.15	2018.10.14
Surger Generator	HTEC	SCDN161P	143805	2017.10.15	2018.10.14
VOLTAGE DIPS & INTERRUPTIONS Generator	HTEC	HPFS 161P	143803	2017.10.15	2018.10.14
EFT/B Generator	HTEC	HEFT 51	143801	2017.10.15	2018.10.14
Universal Radio Communication Tester	R&S	CMW500	117239	2017.10.15	2018.10.14

2.5.6RS

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
RF Relay matrix tsj	TSJ	RFM-S621	04261	2017.06.28	2018.06.27
Power meter	Agilent	E4419B	MY45102079	2017.06.28	2018.06.27
Power Sensor	Agilent	8481A	MY41496625	2017.06.28	2018.06.27
Power Sensor	Agilent	8481A	MY41496628	2017.06.28	2018.06.27
MXG analog signal generator	Agilent	N5181A	MY46240859	2017.06.28	2018.06.27
Power Amplifier	Schaffner	CBA9429	T4306S	2017.06.28	2018.06.27
Power Amplifier	Schaffner	CBA9433	T435F4	2017.06.28	2018.06.27
Logarithmic-periodic Antenna	Schwarzbeck	VULP9118E	820	2017.06.28	2018.06.27
Microwave Horn Antenna	Schwarzbeck	BBHA 9120LF	F01008	2017.06.28	2018.06.27
Universal Radio Communication Tester	R&S	CMU200	111764	2017.10.15	2018.10.14
Universal Radio Communication Tester	R&S	CMW500	117239	2017.10.15	2018.10.14
Audio Analyzer	R&S	UPV	100419	2017.03.07	2018.03.06
Power Amplifier	MICOTOP	MPA-3000-6000-50	MPA1706275	2017.06.28	2018.06.27

2.5.7INJECTION CURRENT

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
CS	SCHLODER	CDG-6000-25	126A1280/2014	2017.10.15	2018.10.14
CDN	SCHLODER	CDN-M2+3	A2210275/2014	2017.10.15	2018.10.14
EM Clamp	SCHLODER	EMCL-20	132A1283	2017.10.20	2018.10.19

Attenuator	HTEC	ATT-6DB-100	A100W224	2017.10.15	2018.10.14
Audio Power Amplifier	B&K	2716-C-001	2610976	2017.03.07	2018.03.06
Mouth Simulator	B&K	4227	2630621	2017.03.07	2018.03.06
Sound Calibrator	B&K	4231	2637486	2017.03.07	2018.03.06
1/2” Pressure-field Microphone	B&K	4192	2641678	2017.03.07	2018.03.06
Ear Simulator for Telephonometry	B&K	4185	2553612	2017.03.07	2018.03.06
Telephone Test Head	B&K	4185	2631728	2017.03.07	2018.03.06
Universal Radio Communication Tester	R&S	CMU200	111764	2017.10.15	2018.10.14
Audio Analyzer	R&S	UPV	100419	2017.03.07	2018.03.06
RF Communications	HEWLETT PACKARD	8920A	0.4-1000M	2017.03.07	2018.03.06
Universal Radio Communication Tester	R&S	CMW500	117239	2017.10.15	2018.10.14

2.5.8PFMF

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
MF Generator	HTEC	HMFG-COMB	143903	2017.10.15	2018.10.14
Magnetic field coil	HTEC	HCOIL 100	143808	2017.10.15	2018.10.14
Universal Radio Communication Tester	R&S	CMW500	117239	2017.10.15	2018.10.14

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION

(Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *
0.50 -5.0	73.00	60.00	56.00	46.00
5.0 -30.0	73.00	60.00	60.00	50.00

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.

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

3.1.2TEST PROCEDURE

a. The EUT was placed 0.4 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.

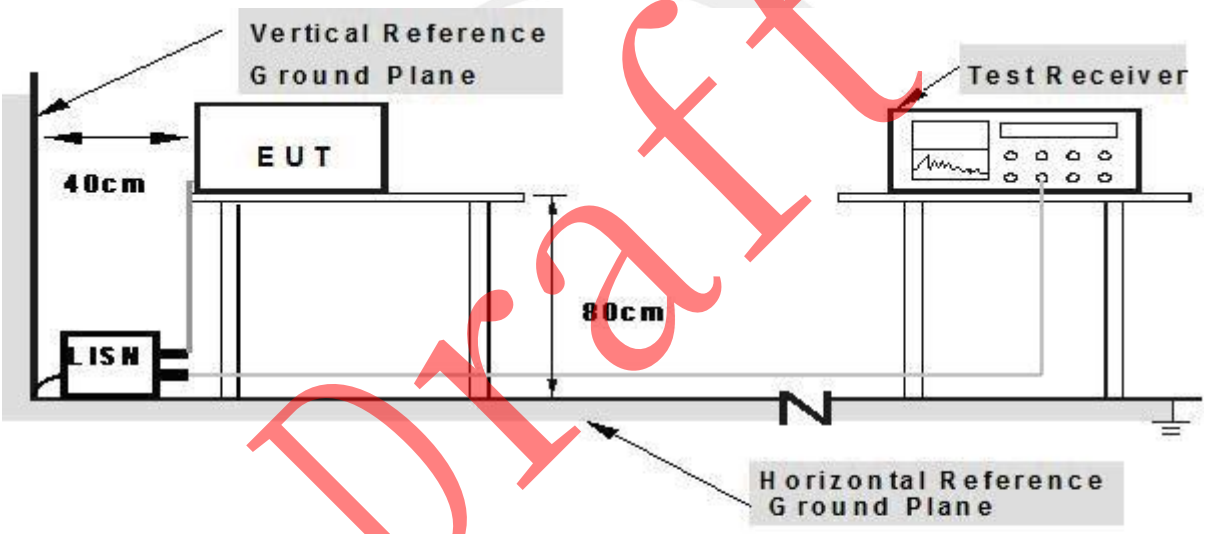
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.

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.

3.1.3TEST SETUP



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

3.1.4EUT OPERATING CONDITIONS

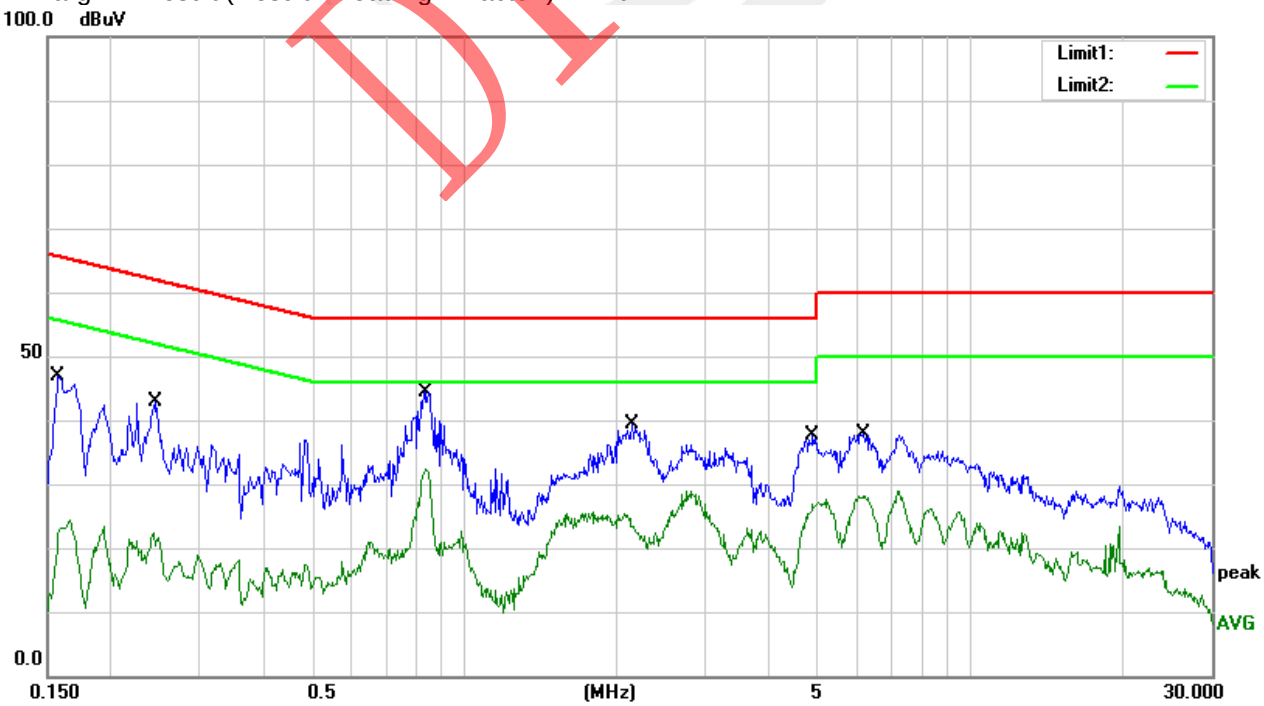
The EUT tested system was configured as the statements of **2.3** Unless otherwise a special operating condition is specified in the follows during the testing.

3.1.5TEST RESULTS

Temperature:	26.5℃	Relative Humidity:	68%
Pressure:	1010hPa	Phase:	L
Test Voltage:	AC 230V/50Hz	Test Mode:	Mode 1

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1580	37.16	9.77	46.93	65.57	-18.64	QP
2	0.1580	12.41	9.77	22.18	55.57	-33.39	AVG
3	0.2460	32.76	10.05	42.81	61.89	-19.08	QP
4	0.2460	10.63	10.05	20.68	51.89	-31.21	AVG
5	0.8420	34.60	9.84	44.44	56.00	-11.56	QP
6	0.8420	22.44	9.84	32.28	46.00	-13.72	AVG
7	2.1540	29.45	9.88	39.33	56.00	-16.67	QP
8	2.1540	13.58	9.88	23.46	46.00	-22.54	AVG
9	4.8940	27.59	9.93	37.52	56.00	-18.48	QP
10	4.8940	16.95	9.93	26.88	46.00	-19.12	AVG
11	6.1780	28.03	9.90	37.93	60.00	-22.07	QP
12	6.1780	18.10	9.90	28.00	50.00	-22.00	AVG

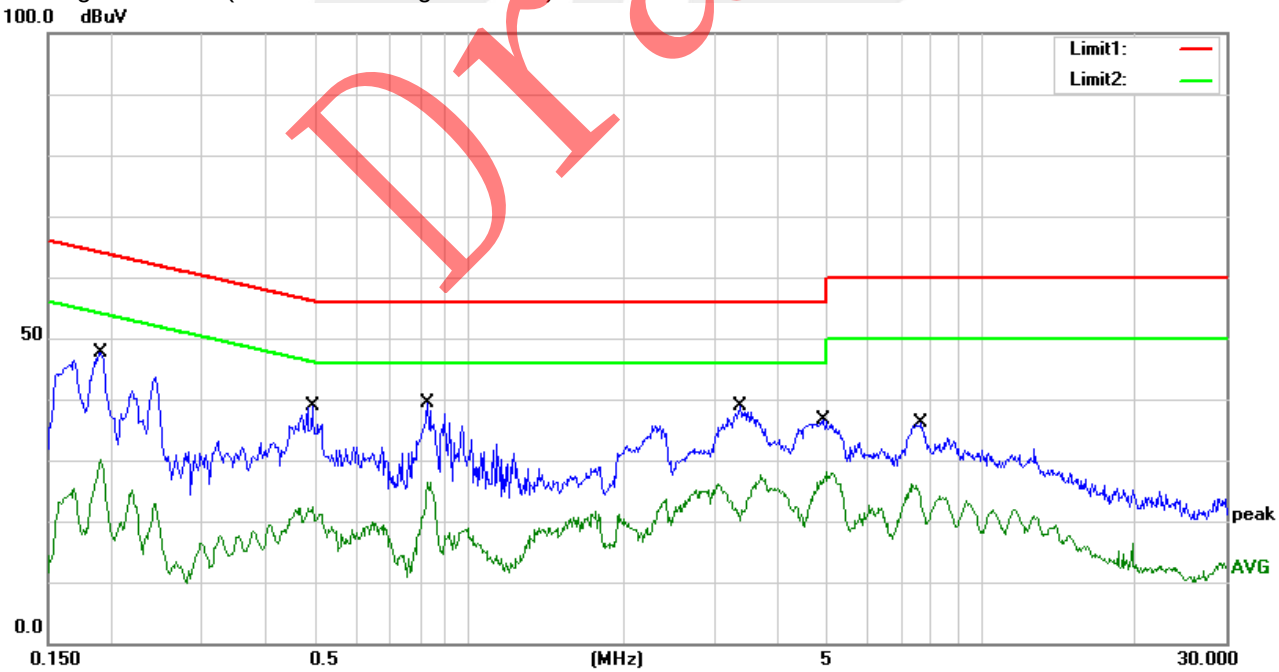
Remark:
1. All readings are Quasi-Peak and Average values.
2. Margin = Result (Result =Reading + Factor)–Limit



Temperature:	26.5℃	Relative Humidity:	68%
Pressure:	1010hPa	Phase:	N
Test Voltage:	AC 230V/50Hz	Test Mode:	Mode 1

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1900	37.79	9.85	47.64	64.04	-16.40	QP
2	0.1900	20.11	9.85	29.96	54.04	-24.08	AVG
3	0.4940	29.01	9.98	38.99	56.10	-17.11	QP
4	0.4940	10.11	9.98	20.09	46.10	-26.01	AVG
5	0.8300	29.56	9.84	39.40	56.00	-16.60	QP
6	0.8300	16.52	9.84	26.36	46.00	-19.64	AVG
7	3.3660	29.01	9.92	38.93	56.00	-17.07	QP
8	3.3660	10.26	9.92	20.18	46.00	-25.82	AVG
9	4.9020	26.71	9.93	36.64	56.00	-19.36	QP
10	4.9020	16.52	9.93	26.45	46.00	-19.55	AVG
11	7.6180	26.24	9.90	36.14	60.00	-23.86	QP
12	7.6180	13.03	9.90	22.93	50.00	-27.07	AVG

Remark:
1. All readings are Quasi-Peak and Average values.
2. Margin = Result (Result =Reading + Factor)–Limit



3.2 RADIATED EMISSION MEASUREMENT

3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT(Below 1000MHz)

FREQUENCY (MHz)	Class A		Class B	
	At 10m	At 3m	At 10m	At 3m
	dBuV/m	dBuV/m	dBuV/m	dBuV/m
30 – 230	40	50	30	40
230 – 1000	47	57	37	47

3.2.2 LIMITS OF RADIATED EMISSION MEASUREMENT(Above 1000MHz)

FREQUENCY (MHz)	Class A (at 3m) dBuV/m		Class B (at 3m) dBuV/m	
	Peak	AVG	Peak	AVG
1000-3000	76	56	70	50
3000-6000	80	60	74	54

Notes:

(1) The limit for radiated test was performed according to CISPR 32.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

3.2.3 TEST PROCEDURE

a. The measuring distance of at 3 m 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 thehighest radiation.
c. The height of the equipment 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 Modemeasurement 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 Setup Frequency Below 1 GHz

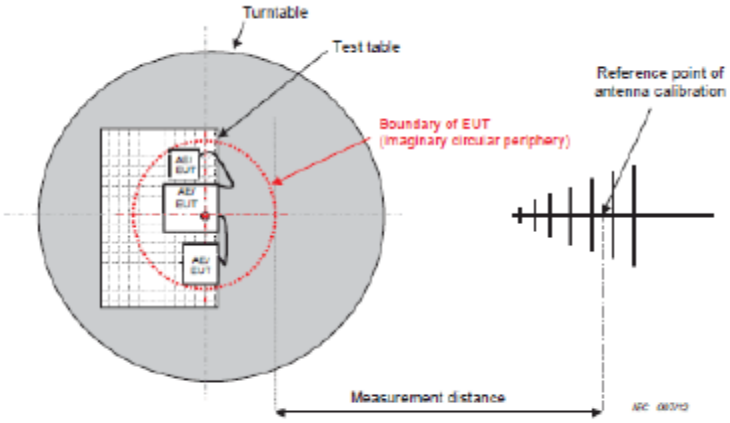


Figure C.1 – Measurement distance

(B) Radiated Emission Test Setup Frequency Above 1GHz

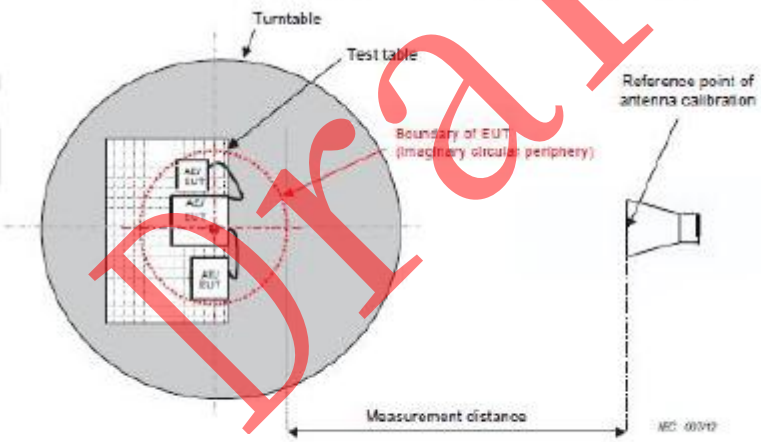


Figure C.1 – Measurement distance

3.2.5 EUT OPERATING CONDITIONS

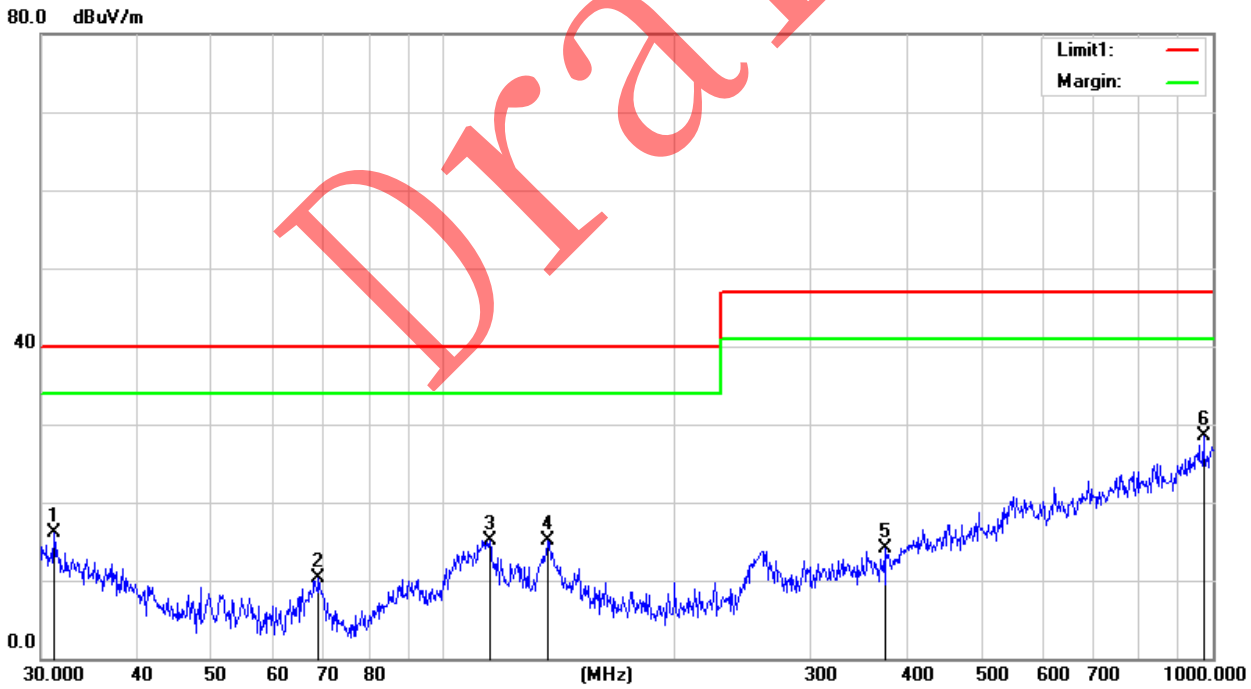
The EUT tested system was configured as the statements of **2.3** Unless otherwise a specialoperating condition is specified in the follows during the testing.

3.2.6TEST RESULTS(30 - 1000 MHz)

Temperature:	24.4℃	Relative Humidity:	57%
Pressure:	1010hPa	Phase:	Horizontal
Test Voltage:	AC 230V/50Hz	Test Mode:	Mode 4

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	31.1798	27.81	-11.79	16.02	40.00	-23.98	QP
2	68.8721	34.48	-24.13	10.35	40.00	-29.65	QP
3	114.9170	33.17	-18.02	15.15	40.00	-24.85	QP
4	136.9391	32.65	-17.52	15.13	40.00	-24.87	QP
5	375.9385	26.93	-12.73	14.20	47.00	-32.80	QP
6	972.3374	28.60	-0.14	28.46	47.00	-18.54	QP

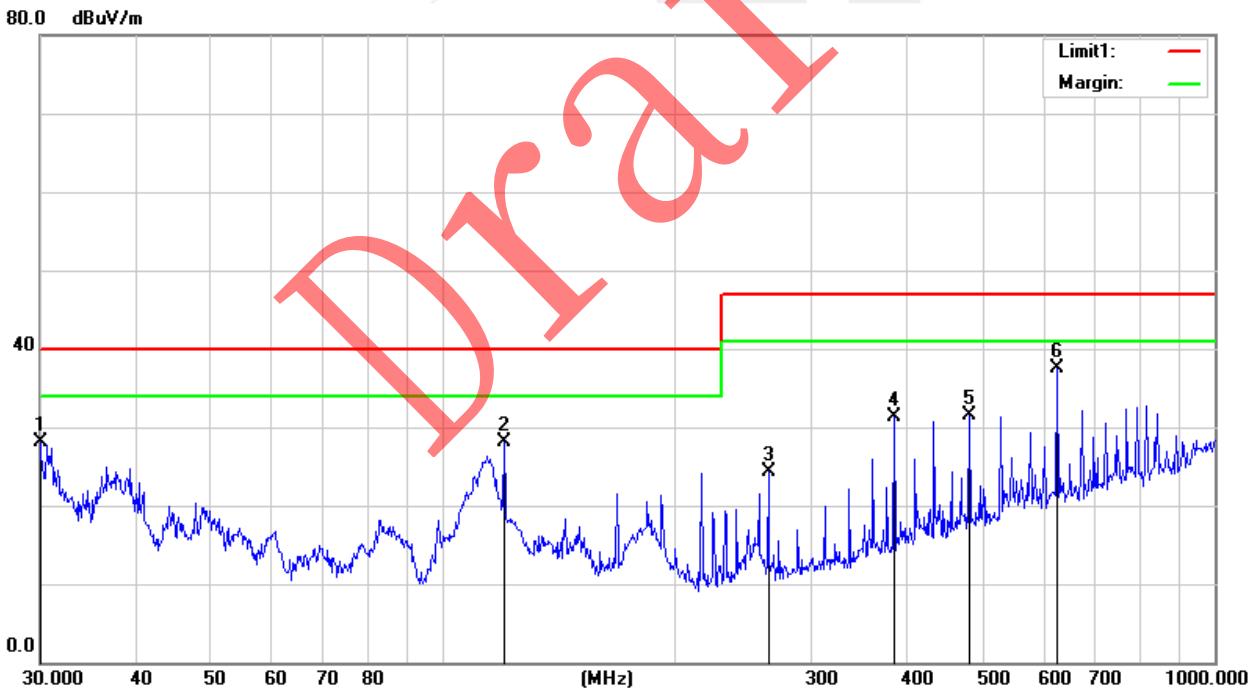
Remark:
1. All readings are Quasi-Peak.
2. Margin = Result (Result =Reading + Factor)–Limit



Temperature:	24.4℃	Relative Humidity:	57%
Pressure:	1010hPa	Phase:	Vertical
Test Voltage:	AC 230V/50Hz	Test Mode:	Mode 4

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Results (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	30.0000	39.33	-11.19	28.14	40.00	-11.86	QP
2	119.8556	45.82	-17.70	28.12	40.00	-11.88	QP
3	263.8190	39.59	-15.22	24.37	47.00	-22.63	QP
4	383.9318	43.67	-12.35	31.32	47.00	-15.68	QP
5	480.5276	40.95	-9.38	31.57	47.00	-15.43	QP
6	625.0780	43.87	-6.43	37.44	47.00	-9.56	QP

Remark:
1. All readings are Quasi-Peak.
2. Margin = Result (Result =Reading + Factor)–Limit



3.2.7 TEST RESULT (1000 - 6000MHz)

Temperature:	26℃	Relative Humidity:	60%
Pressure:	1010hPa	Test Mode:	Mode 4
Test Power:	AC 230V/50Hz		

Freq. (MHz)	Reading (dBuV)	Corr.Factor (dB)	Measured (dBuV/m)	Limits (dBuV/m)	Margins (dBuV/m)	Ant. H/V	Mark
1325.26	66.30	-10.98	55.32	70.00	-14.68	V	PK
1325.26	50.63	-10.98	39.65	50.00	-10.35	V	AVG
2365.14	66.20	-10.54	55.66	70.00	-14.34	V	PK
2365.14	52.41	-10.54	41.87	50.00	-8.13	V	AVG
1325.26	67.13	-11.52	55.61	70.00	-14.39	H	PK
1325.26	50.26	-11.52	38.74	50.00	-11.26	H	AVG
2365.14	65.03	-10.08	54.95	70.00	-15.05	H	PK
2365.14	51.63	-10.08	41.55	50.00	-8.45	H	AVG

Remark:
Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level - Limit

3.3 HARMONICS CURRENT

3.3.1 LIMITS OF HARMONICS CURRENT

IEC 555-2					
Table - I			Table - II		
Equipment Category	Harmonic Order n	Max. Permissible Harmonic Current (in Ampers)	Equipment Category	Harmonic Order n	Max. Permissible Harmonic Current (in Ampers)
Non Portable Tools or TV Receivers	Odd Harmonics		TV Receivers	Odd Harmonics	
	3	2.30		3	0.80
	5	1.14		5	0.60
	7	0.77		7	0.45
	9	0.40		9	0.30
	11	0.33		11	0.17
	13	0.21		13	0.12
	15≤n≤39	0.15 · 15/n		15≤n≤39	0.10 · 15/n
	Even Harmonics			Even Harmonics	
	2	1.08		2	0.30
	4	0.43		4	0.15
	8	0.30			
	8≤n≤40	0.23 · 8/n		DC	0.05

EN 61000-3-2/IEC 61000-3-2					
Equipment Category	Max. Permissible Harmonic Current (in Ampers)	Equipment Category	Harmonic Order n	Max. Permissible Harmonic Current (in A)	(mA/w)
Class A	Same as Limits Specified in 4-2.1, Table - I, but only odd harmonics required	Class D	3	2.30	3.4
			5	1.14	1.9
			7	0.77	1.0
			9	0.40	0.5
			11	0.33	0.35
			13≤n≤39	see Table I	3.85/n
			only odd harmonics required		

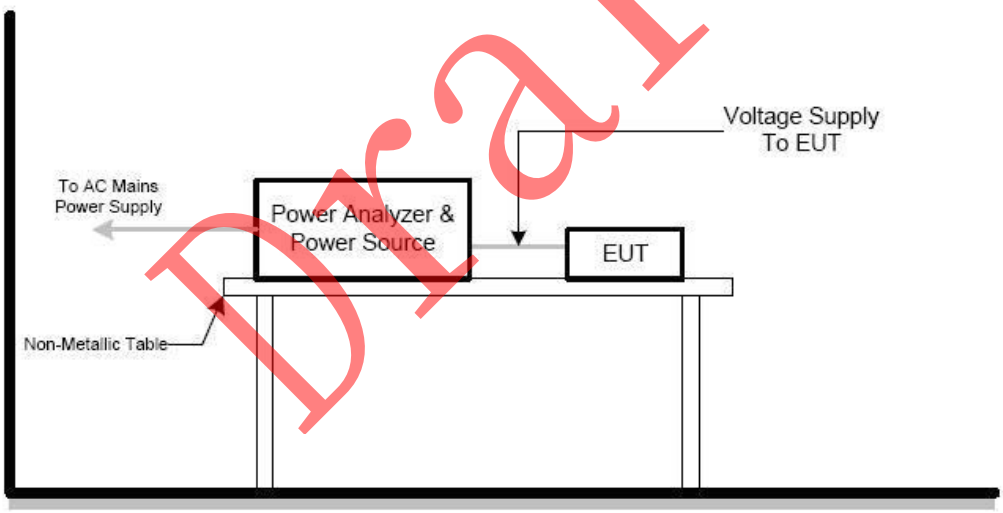
3.3.2 TEST PROCEDURE

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 61000-3-2. The EUT isclassified as follows:
Class A: Balanced three-phase equipment, Household appliances excluding equipment asClass D, Tools excluding portable tools, Dimmers for incandescent lamps, audioequipment, equipment not specified in one of the three other classes.
Class B: Portable tools. Portable tools.; Arc welding equipment which is not professionalequipment.
Class C: Lighting equipment.
Class D: Equipment having a specified power less than or equal to600W of the followingtypes: Personal computers and personal computer monitors and televisionreceivers.
c. The correspondent test program of test instrument to measure the current harmonicsemanated from EUT is chosen. The measure time shall be not less than the time necessary forthe EUT to be exercised.

3.3.3 EUT OPERATING CONDITIONS

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

3.3.4 TEST SETUP



3.3.5TEST RESULTS

Temperature:	26℃	Relative Humidity:	45%
Pressure:	1010hPa	Test Voltage:	N/A

Note: The above limits for all equipment except for lighting equipment having an active input power>75 W and 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

Tests	Measurement Value	Limit	Descriptions
	IEC555-3	IEC/EN 61000-3-3	
P_{st}	≤ 1.0,Tp= 10 min.	≤ 1.0,Tp= 10 min.	Short Term Flicker Indicator
P_{lt}	N/A	≤0.65, Tp=2 hr.	Long Term Flicker Indicator
$T_{dt(s)}$	≤ 3%	≤ 3.3%	Relative Steady-State V-Chang
d_{max}(%)	≤ 4%	≤ 4%	Maximum Relative V-Chang
d_c(%)	N/A	≤3.3% for > 500 ms	Relative V-change Characteristic

3.4.2 TEST PROCEDURE

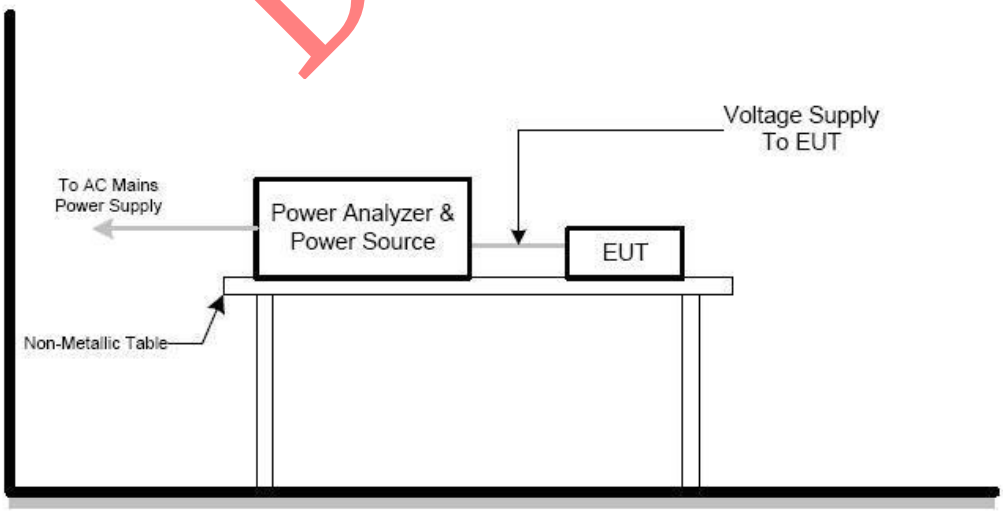
a. Fluctuation and Flickers Test:
Tests was performed according to the Test Conditions/Assessment of Voltage Fluctuations specified in Clause 5.0/6.0 of IEC555-3 and/or Clause 6.0/4.0 of IEC/EN 61000-3-3 depend On which standard adopted for compliance measurement.

b. All types of voltage fluctuation in this report are assessed by direct measurement using flicker-meter.

3.4.3 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.

3.4.4TEST SETUP



3.4.5TEST RESULTS

Temperature:	24.3℃	Relative Humidity:	45%
Pressure:	1010hPa	Test Voltage:	AC 230V/50Hz

Test Parameter	Measurement Value	Limit	Remarks
P_{st}	0.00	1.0	Pass
P_{lt}	--	0.65	--
$T_{dt(s)}$	0.00	0.5	Pass
d_{max}(%)	0.00%	4%	Pass
d_c(%)	0.00%	3.3%	Pass

4. EMC IMMUNITY TEST

4.1 GENERAL PERFORMANCE CRITERIA

4.1.1PERFORMANCE CRITERIA (GSM)

According to **Draft ETSI EN 301 489-52**standard, the general performance criteria as following:

Performance criteria for Continuous phenomena applied to Transmitters (CT)

A communication link shall be established at the start of the test, and maintained during the test, see clauses 4.2.3 and 4.2.4.

NOTE: When there is a high level background noise present the filter bandwidth can be reduced down to a minimum of 40 Hz.

At the conclusion of the test, the EUT shall operate as intended with no loss of user control functions or stored data, and the communication link shall have been maintained. In addition to confirming the above performance during a call, the test shall also be performed in idle mode, and the transmitter shall not unintentionally operate.

Performance criteria for Transient phenomena applied to Transmitters (TT)

A communications link shall be established at the start of the test, see appropriate clauses 4.2 to 4.2.4.

At the conclusion of each exposure the EUT shall operate with no user noticeable loss of the communication link.

At the conclusion of the total test comprising the series of individual exposures, the EUT shall operate as intended with no loss of user control functions or stored data, as declared by the manufacturer, and the communication link shall have been maintained.

In addition to confirming the above performance during a call, the test shall also be performed in idle mode, and the transmitter shall not unintentionally operate.

Performance criteria for Continuous phenomena applied to Receivers (CR)

A communications link shall be established at the start of the test, see appropriate clauses 4.2 to 4.2.6.

During the test, the RXQUAL of the downlink shall not exceed the value of three, measured during each individual exposure in the test sequence.

During the test, the downlink speech output level shall be at least 35 dB less than the previously recorded reference levels, when measured through an audio band pass filter of width 200 Hz, centred on 1 kHz (audio breakthrough check).

NOTE: When there is a high level background noise present the filter bandwidth can be reduced down to a minimum of 40 Hz.

At the conclusion of the test, the EUT shall operate as intended with no loss of user control functions or stored data, and the communication link shall have been maintained.

Performance criteria for Transient phenomena applied to Receivers(TR)

A communications link shall be established at the start of the test, see appropriate clauses 4.2. to 4.2.6. At the conclusion of each exposure the EUT shall operate with no user noticeable loss of the communication link.

At the conclusion of the total test comprising the series of individual exposures, the EUT shall operate as intended with no loss of user control functions or stored data, as declared by the manufacturer, and the communication link shall have been maintained.

Performance criteria for ancillary equipment tested on a stand alone basis

The provision of Draft ETSI EN 301 489-1 [1], clause 6.4 shall apply.

4.1.2 PERFORMANCE CRITERIA(Bluetooth)

According to **Draft ETSI EN 301 489-17** standard, the general performance criteria as following:

Criteria	During the test	After the test
A	Shall operate as intended May show degradation of performance (see note 1) Shall be no loss of function Shall be no unintentional transmissions	Shall operate as intended Shall be no degradation of performance (see note 2) 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 (see note 1) No unintentional transmissions	Functions shall be self-recoverable Shall operate as intended after recovering Shall be no degradation of performance (see note 2) 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 no degradation of performance (see note 2)

NOTE 1: Degradation of performance during the test is understood as a degradation to a level not below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance. If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.

NOTE 2: no degradation of performance after the test is understood as any degradation below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance. After the test no change of actual operating data or user retrievable data is allowed. If the minimum performance level or the permissible performance degradation is not specified by the manufacturer then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.

Performance for TT

The performance criteria B shall apply, except for voltage dips of 100 ms and voltage interruptions of 5 000 ms duration, for which performance criteria C shall apply. Tests shall be repeated with the EUT in standby mode (if applicable) to ensure that unintentional transmission does not occur. In systems using acknowledgement signals, it is recognized that an acknowledgement (ACK) or not-acknowledgement (N/ACK) transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

Performance for TR

The performance criteria B shall apply, except for voltage dips of 100 ms and voltage interruptions of 5 000 ms duration for which performance criteria C shall apply. Where the EUT is a transceiver, under no circumstances, shall the transmitter operate unintentionally during the test. In systems using acknowledgement signals, it is recognized that an ACK or N/ACK transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

Performance for CT

The performance criteria A shall apply. Tests shall be repeated with the EUT in standby mode (if applicable) to ensure that unintentional transmission does not occur. In systems using acknowledgement signals, it is recognized that an Acknowledgement (ACK) or Not Acknowledgement (N/ACK) transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

Performance for CR

The performance criteria A shall apply. Where the EUT is a transceiver, under no circumstances, shall the transmitter operate unintentionally during the test. In systems using acknowledgement signals, it is recognized that an ACK or N/ACK transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.

4.1.3 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.

4.2 ESD TESTING

4.2.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-2
Discharge Impedance:	330 ohm / 150 pF
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. 200 times in total
Discharge Mode:	Single Discharge
Discharge Period:	1 second minimum

4.2.2 TEST PROCEDURE

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

a. Contact discharge was applied to conductive surfaces and coupling planes of the EUT.

During the test, it was performed with single discharges. For the single discharge time between successive single discharges was at least 1 second. The EUT shall be exposed to at least 200 discharges, 100 each at negative and positive polarity, at a minimum of four test points. One of the test points shall be subjected to at least 50 indirect discharges to the center of the front edge of the horizontal coupling plane. The remaining three test points shall each receive at least 50 direct contact discharges.

If no direct contact test points are available, then at least 200 indirect discharges shall be applied in the indirect mode. Test shall be performed at a maximum repetition rate of one discharge per second.

Vertical Coupling Plane (VCP):

The coupling plane of dimensions 0.5m x 0.5m, is placed parallel to, and positioned at a distance 0.1m from the EUT, with the Discharge Electrode touching the coupling plane.

The four faces of the EUT will be performed with electrostatic discharge.

Horizontal Coupling Plane (HCP):

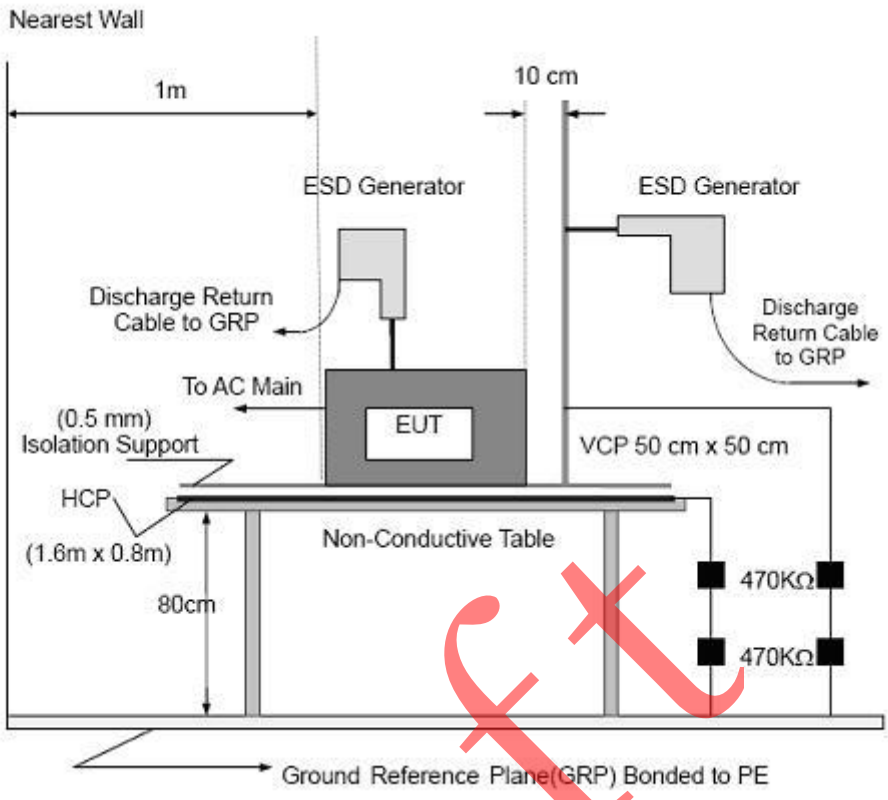
The coupling plane is placed under to the EUT. The generator shall be positioned vertically at a distance of 0.1m from the EUT, with the Discharge Electrode touching the coupling plane.

The four faces of the EUT will be performed with electrostatic discharge.

b. Air discharges at insulation surfaces of the EUT.

It was at least ten single discharges with positive and negative at the same selected point.

4.2.3 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 0.25 mm 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 of1-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 of0.1-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.

4.2.4 TEST RESULT

Temperature:	22.7℃	Relative Humidity:	43%
Pressure:	1010hPa	Test Voltage:	AC 230V/50Hz
Test Mode:	Mode1/2/3/4/5		

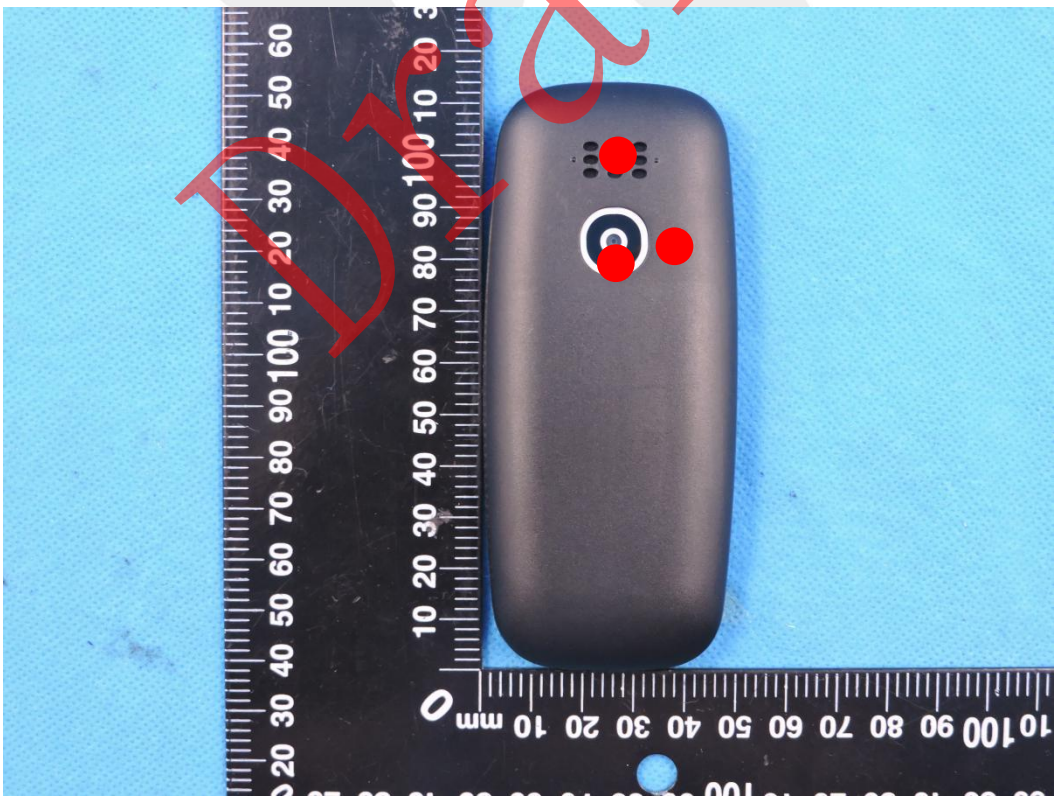
BT TEST RESULT

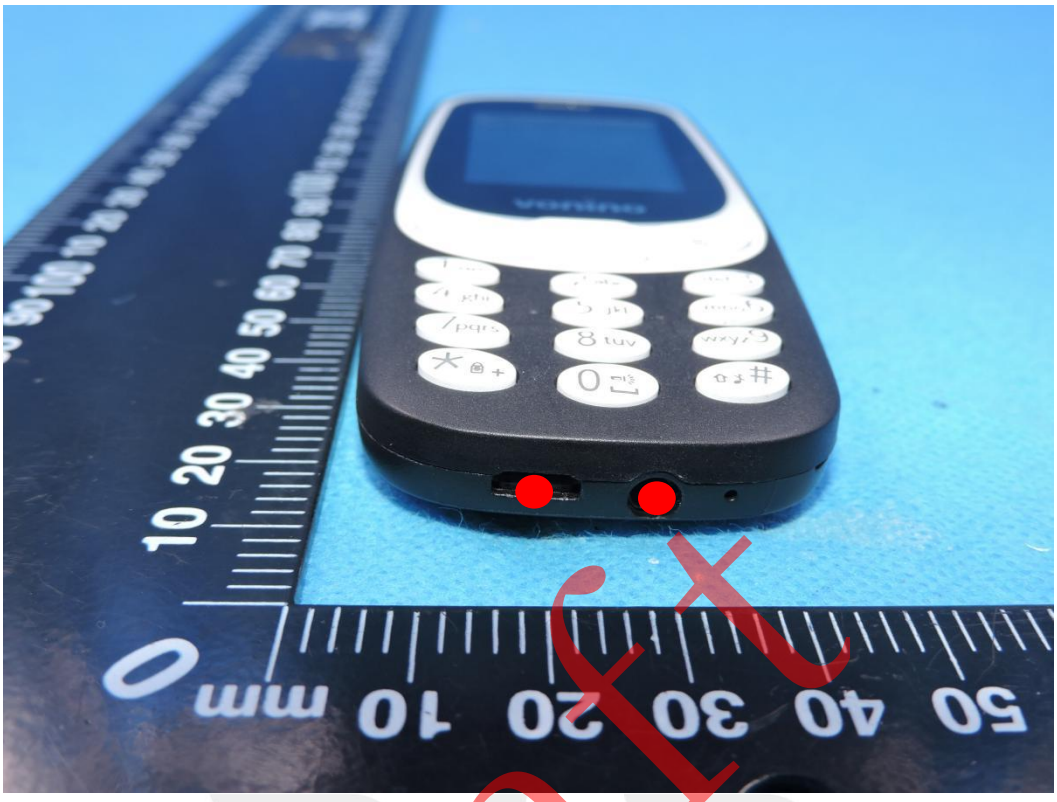
Mode	Air Discharge								Contact Discharge								Observation	Criterion	Result
Test level (KV)	2		4		8		15		2		4		6		8				
Test Location	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-			
HCP									A	A	A	A					TT,TR	B	PASS
VCP									A	A	A	A							PASS
Keying	A	A	A	A	A	A													PASS
Charge Port	A	A	A	A	A	A													PASS
Crevice	A	A	A	A	A	A													PASS
Earphone	A	A	A	A	A	A													PASS
Headphone Port	A	A	A	A	A	A													PASS
Rear camera	A	A	A	A	A	A													PASS
Horn	A	A	A	A	A	A													PASS
Flash lamp	A	A	A	A	A	A													PASS

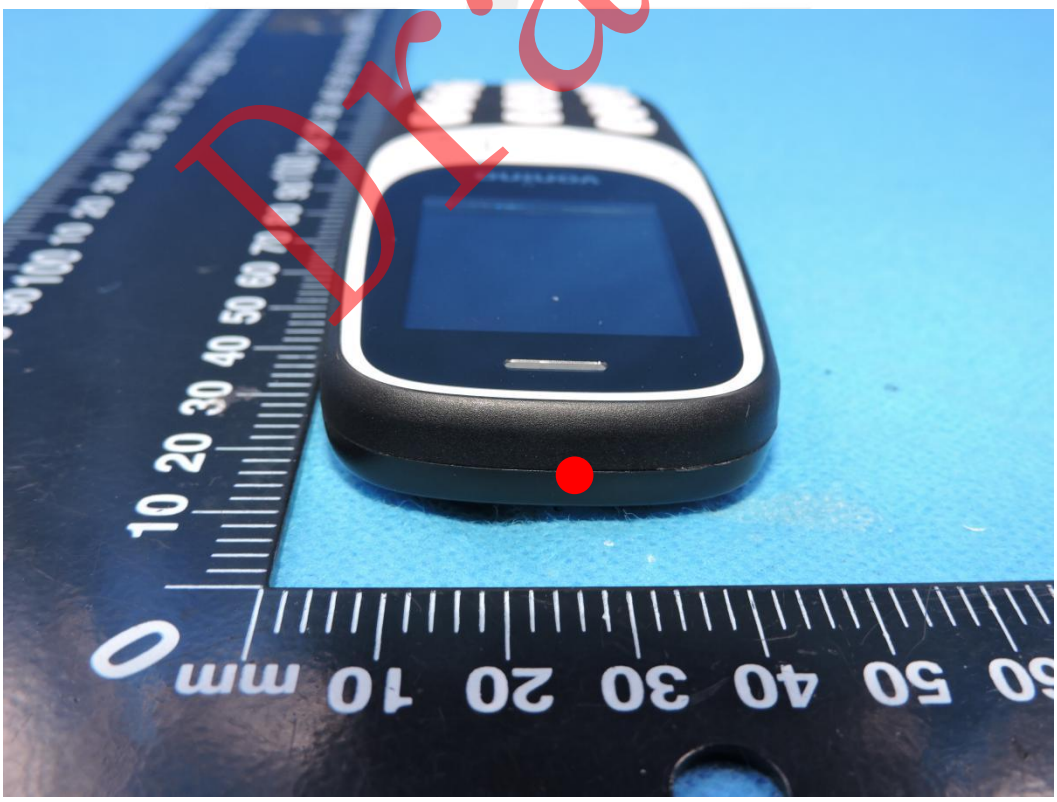
GSM/GPRS TEST RESULT

Mode	Air Discharge								Contact Discharge								Observation	Criterion	Result
Test level (KV)	2		4		8		15		2		4		6		8				
Test Location	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-			
HCP									A	A	A	A					TT,TR	B	PASS
VCP									A	A	A	A							PASS
Keying	A	A	A	A	A	A													PASS
Charge Port	A	A	A	A	A	A													PASS
Crevice	A	A	A	A	A	A													PASS
Earphone	A	A	A	A	A	A													PASS
Headphone Port	A	A	A	A	A	A													PASS
Rear camera	A	A	A	A	A	A													PASS
Horn	A	A	A	A	A	A													PASS
Flash lamp	A	A	A	A	A	A													PASS

The Photo for Discharge Points of EUT







Red Dot —Air Discharged
Blue Dot —Contact Discharged

4.3 RS TESTING

4.3.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-3
Required Performance:	A
Frequency Range:	80 MHz - 6000 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:	at least 3 seconds

4.3.2 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.

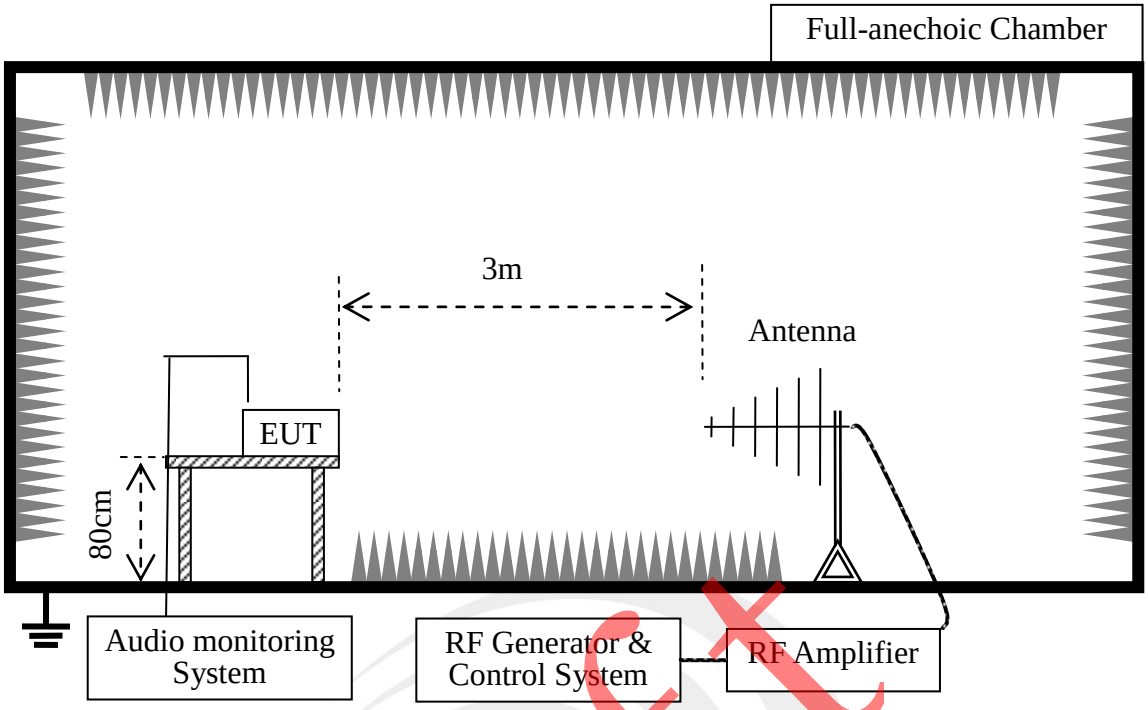
The other condition as following manner:

a. The frequency range is swept from 80 MHz to 6000 MHz with the signal 80%amplitude modulated with a 1kHz sine wave. The rate of sweep did not exceed 1.5x 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.

c. The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.

4.3.3 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 wasconnected to the power and signal wire according to relevant installation instructions.

4.3.4TEST RESULTS

Temperature:	24.3℃	Relative Humidity:	45%
Pressure:	1010hPa	Test Voltage:	AC 230V/50Hz
Test Mode:	Mode 1/2/3/4/5		

GSM Uplink/Downlink

Frequency Range (MHz)	RF Field Position	R.F. Field Strength	Azimuth	Observation	Perform. Criteria	Results	Judgment
80-6000	H / V	3 V/m (rms) AM Modulated 1000Hz, 80%	Front	**CT,CR**	**A**	**A**	**PASS**
			Rear				
			Left				
			Right				

Note: During the test,the Maximum Bit Error Ratio was less than 1×10^{-3}, the Uplink/Downlink speech output level shall be at least 35 dB less than the previously recorded reference levels, when measured through an audio band pass filter of width 200 Hz, centred on 1 kHz (audio breakthrough check).
The RXQUAL of the downlink is not exceeding the value of three, measured during each individual exposure in the test sequence. Or During and after the test, the apparatus continue to operate as intended. No degradation of performance or loss of function is allowed below a permissible performance level.
At the conclusion of the test, the EUT shall operate as intended with no loss of user control functions or stored data, and the communication link shall have been maintained. In addition to confirming the above performance during a call, the test shall also be performed in idle mode, and the transmitter shall not unintentionally operate.

GPRS Uplink

Frequency Range (MHz)	RF Field Position	R.F. Field Strength	Azimuth	Observation	Perform. Criteria	Results	Judgment
80-6000	H / V	3 V/m (rms) AM Modulated 1000Hz, 80%	Front	**CT,CR**	**A**	**A**	**PASS**
			Rear				
			Left				
			Right				

Note: During the test, the Maximum Bit Error Ratio was less than 1×10^{-3}

BT TEST RESULTS

Frequency Range (MHz)	RF Field Position	R.F. Field Strength	Azimuth	Observation	Perform. Criteria	Results	Judgment
80-6000	H / V	3 V/m (rms) AM Modulated 1000Hz, 80%	Front	**CT,CR**	**A**	**A**	**PASS**
			Rear				
			Left				
			Right				

Note: "A" stand for, during test, operate as intended no loss of function, no degradation of performance, no unintentional transmissions and after test, no degradation of performance, no loss of function, no loss of stored data or user programmable functions.

Note:

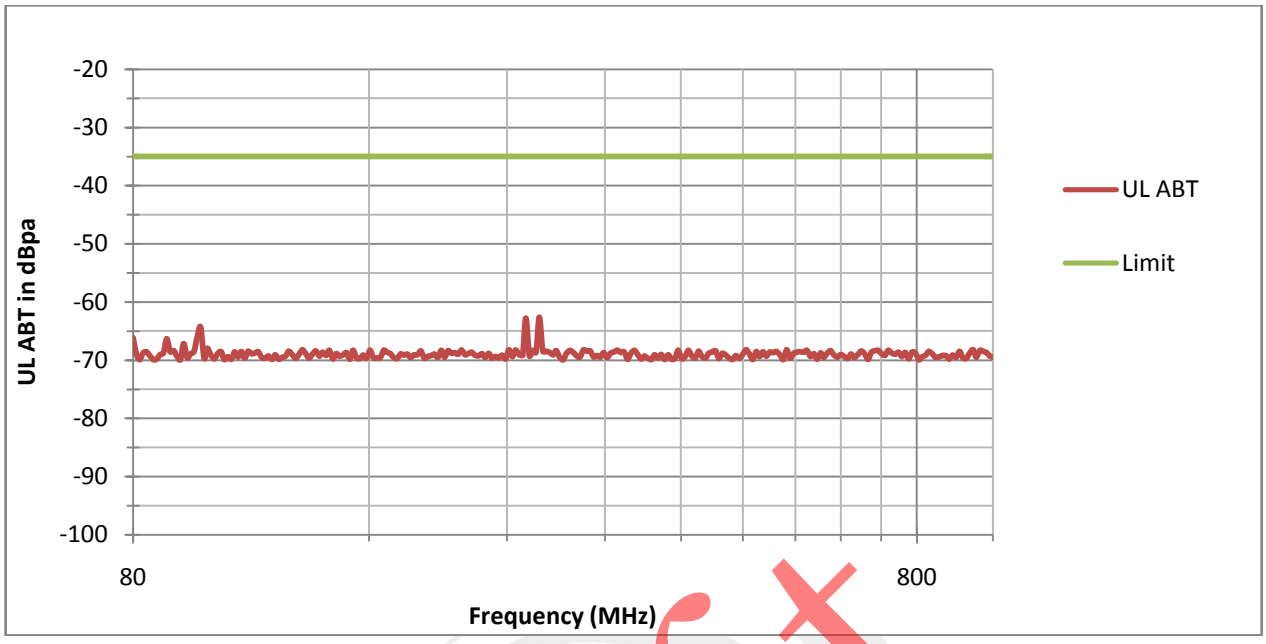
1) N/A - denotes test is not applicable in this test report.

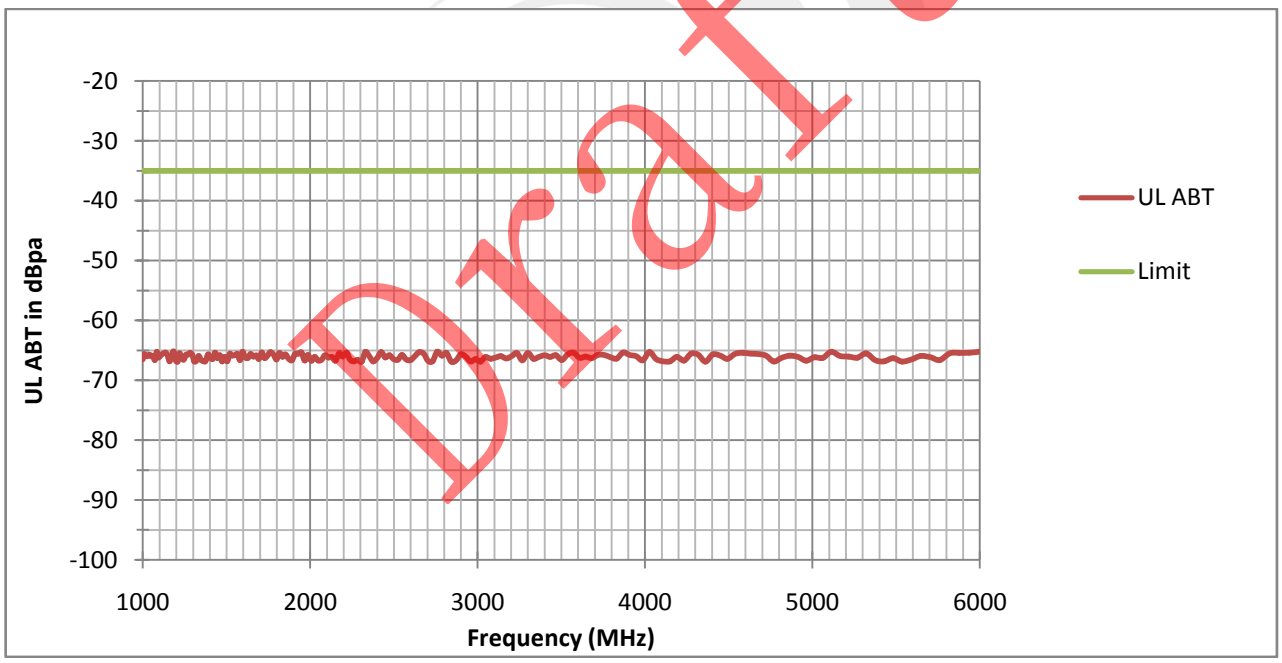
2) Criteria A: There was no change operated with initial operating during the test.

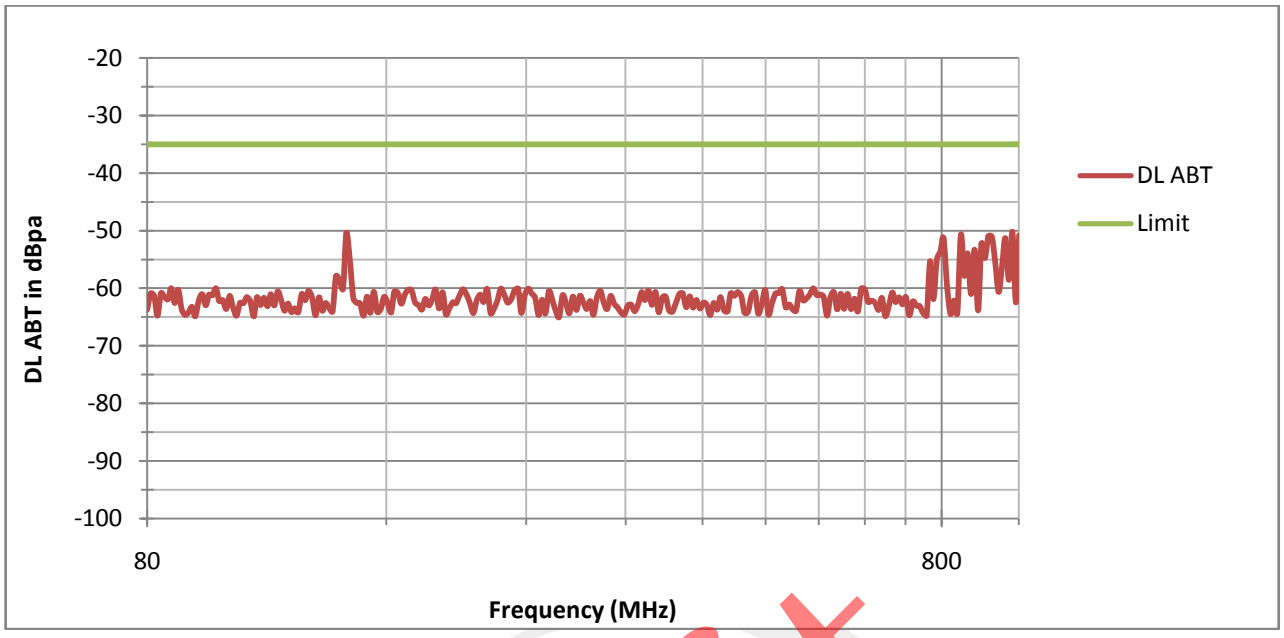
3) Criteria B: The EUT function loss during the test, but self-recoverable after the test.

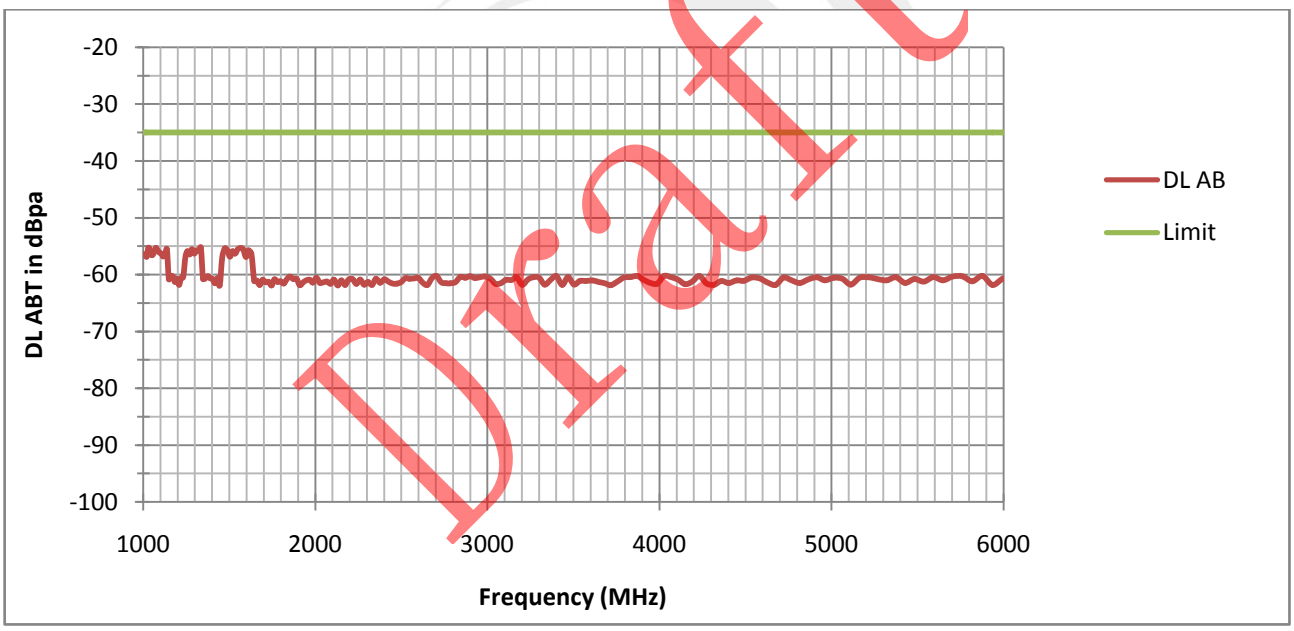
4) Criteria C: The system shut down during the test.

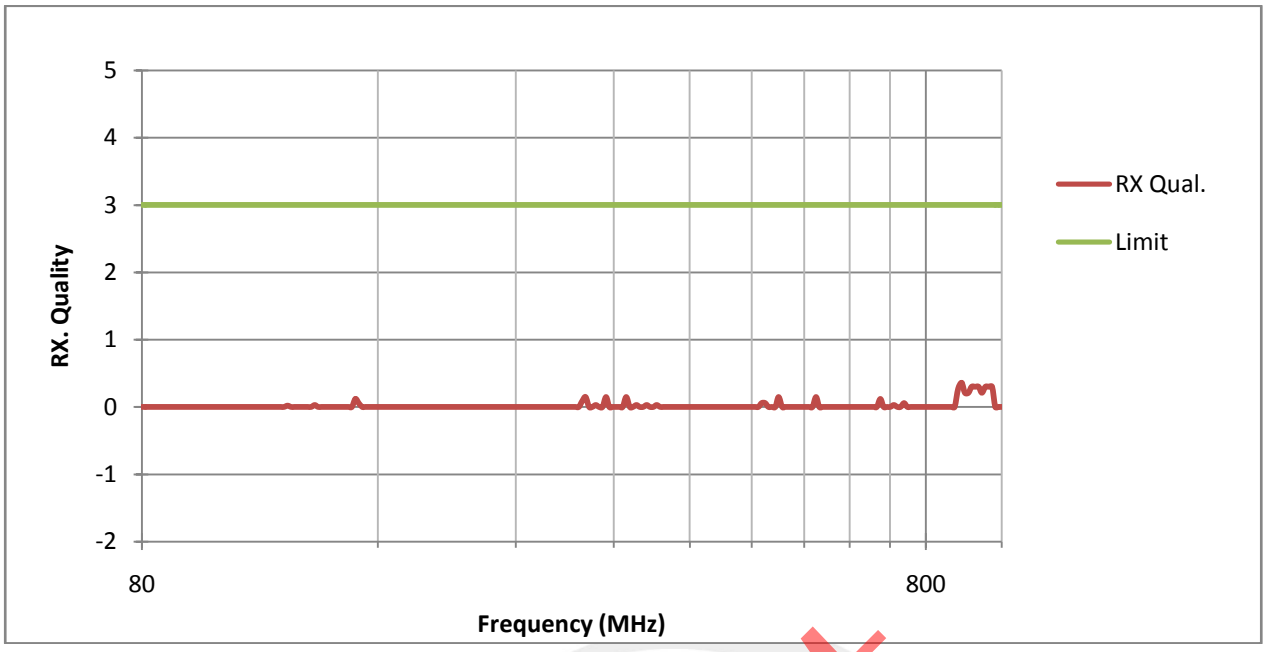
Worst case (GSM 900)

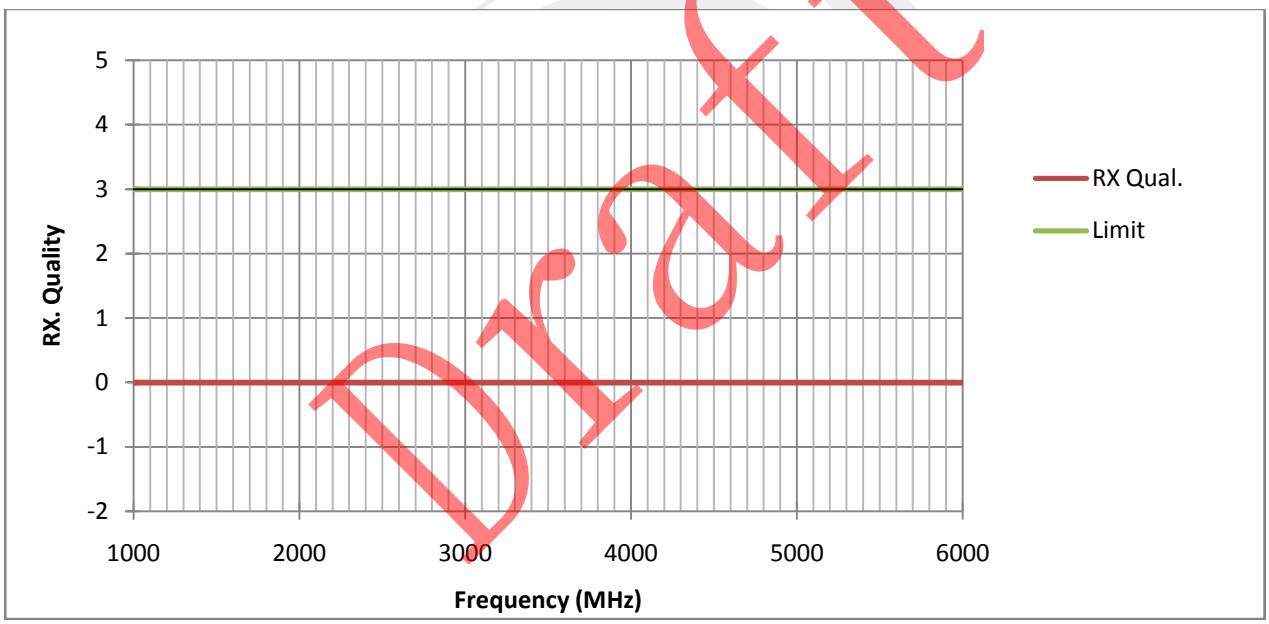





-20
-30
-40
-50
-60
-70
-80
-90
-100
DL ABT in dBpa
80
800
Frequency (MHz)
DL ABT
Limit


-20
-30
-40
-50
-60
-70
-80
-90
-100
DL ABT in dBpa
1000
2000
3000
4000
5000
6000
Frequency (MHz)
DL AB
Limit


5
4
3
2
1
0
-1
-2
RX. Quality
80
800
Frequency (MHz)
RX Qual.
Limit


5
4
3
2
1
0
-1
-2
RX. Quality
1000
2000
3000
4000
5000
6000
Frequency (MHz)
RX Qual.
Limit

4.4 EFT/BURST TESTING

4.4.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-4
Required Performance:	B
Test Voltage:	Power Line: 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:	Not less than 2 min.

4.4.2 TEST PROCEDURE

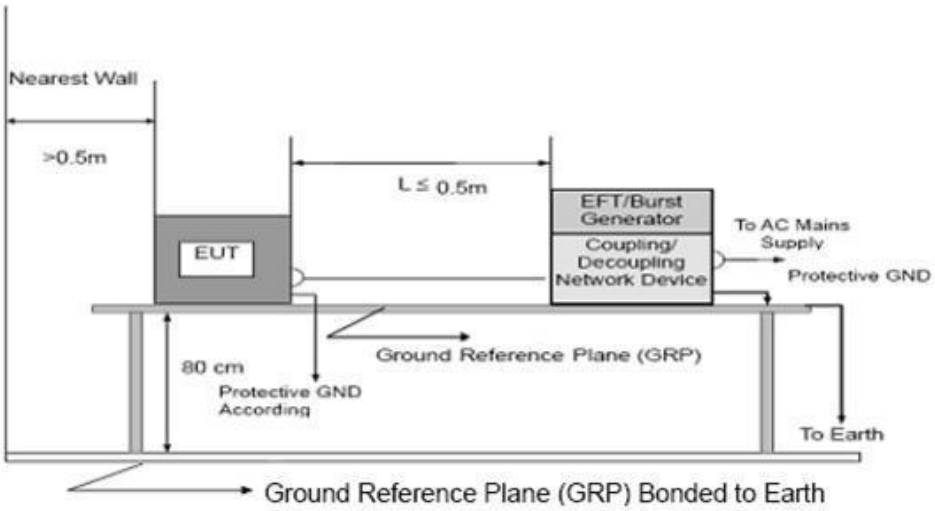
The EUT and support equipment, are placed on a table that is 0.8 meter above a metal ground plane measured 1m*1m min and 0.65mm thick min.
The other condition as following manner:

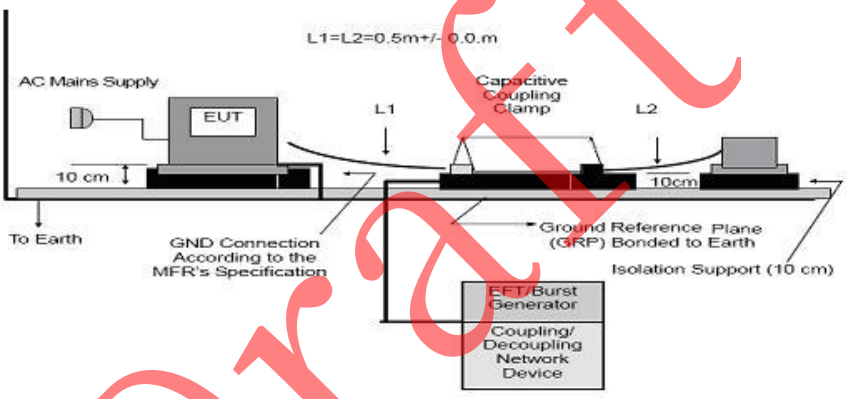
a. The length of power cord between the coupling device and the EUT should not exceed 1 meter.

b. Both positive and negative polarity discharges were applied.

c. The duration time of each test sequential was 2 minute

4.4.3 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.

4.4.4TEST RESULTS

Temperature:	24.3℃	Relative Humidity:	45%
Pressure:	1010hPa	Test Voltage:	AC 230V/50Hz
Test Mode:	Mode1/2/3/4/5		

BT TEST RESULT

Coupling Line		Test level (KV)								Observation	Criterion	Result
		0.5		1		2		4				
		+	-	+	-	+	-	+	-			
AC line	L	A	A	A	A					TT,TR	B	**PASS**
	N	A	A	A	A							**PASS**
	PE											
	L+N	A	A	A	A							**PASS**
	L+PE											
	N+PE											
	L+N+PE											
DC Line												
Signal Line												

GSM/GPRS TEST RESULT

Coupling Line		Test level (KV)								Observation	Criterion	Result
		0.5		1		2		4				
		+	-	+	-	+	-	+	-			
AC line	L	A	A	A	A					TT,TR	B	**PASS**
	N	A	A	A	A							**PASS**
	PE											
	L+N	A	A	A	A							**PASS**
	L+PE											
	N+PE											
	L+N+PE											
DC Line												
Signal Line												

Note:

1) P/N denotes the Positive/Negative polarity of the output voltage.

2) N/A - denotes test is not applicable in this test report

3) There was not any unintentional transmission in standby mode

4.5 SURGE TESTING

4.5.1 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 ~ line to line: 1 KV line to ground: 2KV Telecommunication line: 1 KV
Surge Input/Output:	L-N, L-PE, N-PE
Generator Source:	(L-N)2 ohm between networks
Impedance:	(L-PE, N-PE)12 ohm between network and ground
Polarity:	Positive/Negative
Phase Angle:	0 /90/180/270°
Pulse Repetition Rate:	1 time / min. (maximum)
Number of Tests:	5 positive and 5 negative at selected points

4.5.2 TEST PROCEDURE

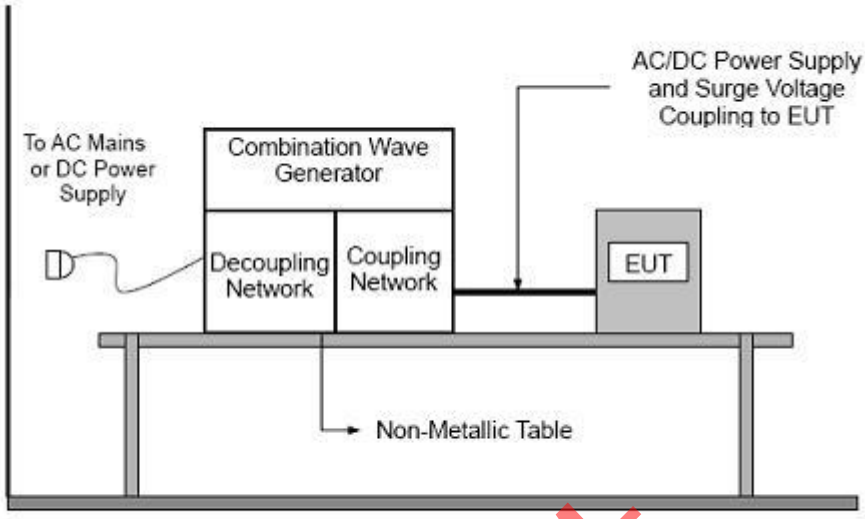
a. For EUT power supply:

b. 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).

c. For test applied to unshielded unsymmetrically operated interconnection lines of EUT:

d. 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).

4.5.3 TEST SETUP



4.5.4TEST RESULTS

Temperature:	24.3℃	Relative Humidity:	45%
Pressure:	1010hPa	Test Voltage:	AC 230V/50Hz
Test Mode:	Mode1/2/3/4/5		

BT TEST RESULT

Coupling Line			Test level								Observation	Criterion	Result
			0.5 KV		1 KV		2 KV		4 KV				
			+	-	+	-	+	-	+	-			
AC line	L-N	0°	A	A	A	A					TT,TR	B	PASS
		90°	A	A	A	A							
		180°	A	A	A	A							
		270°	A	A	A	A							
	L-PE	0°											
		90°											
		180°											
		270°											
	N-PE	0°											
		90°											
		180°											
		270°											
DC Line													
Signal Line													

GSM/GPRS TEST RESULT

Coupling Line			Test level								Observation	Criterion	Result
			0.5 KV		1 KV		2 KV		4 KV				
			+	-	+	-	+	-	+	-			
AC line	L-N	0°	A	A	A	A					TT,TR	B	PASS
		90°	A	A	A	A							
		180°	A	A	A	A							
		270°	A	A	A	A							
	L-PE	0°											
		90°											
		180°											
		270°											
	N-PE	0°											
		90°											
		180°											
		270°											
DC Line													
Signal Line													

Note:

1) Polarity and Numbers of Impulses：5 Pst / Ngt at each tested mode

2) N/A - denotes test is not applicable in this Test Report

3) There was not any unintentional transmission in standby mode

4.6 INJECTION CURRENT TESTING

4.6.1 TEST SPECIFICATION

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

4.6.2 TEST PROCEDURE

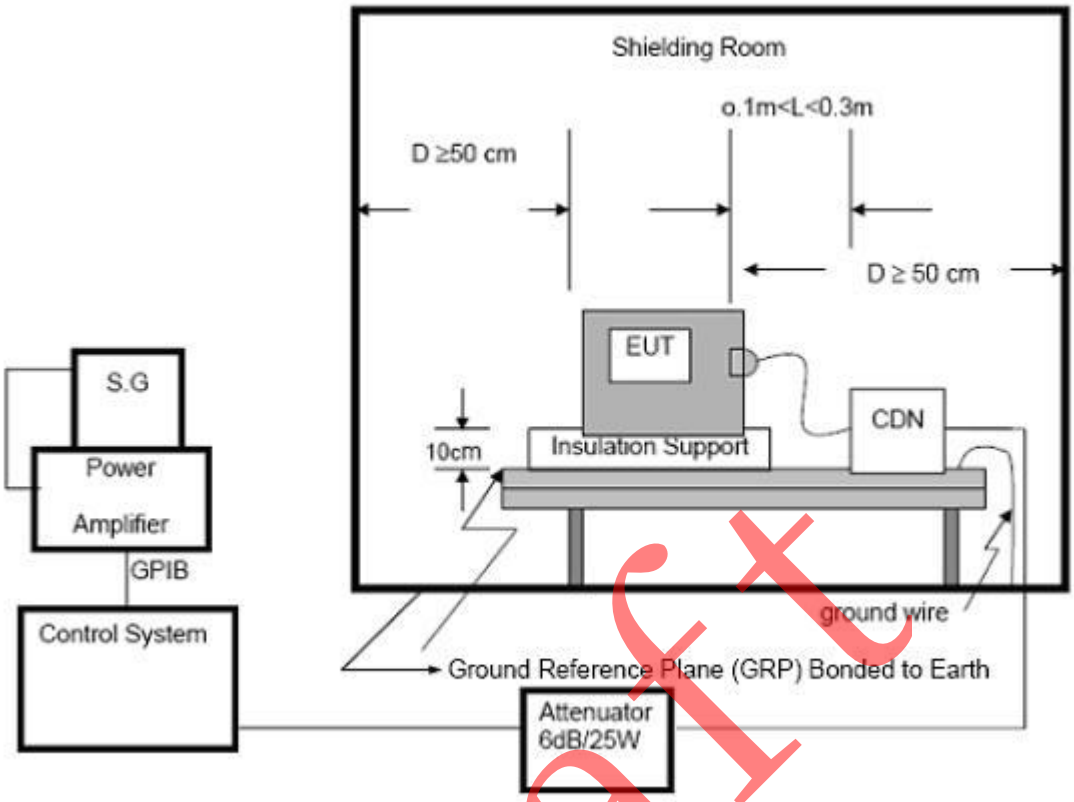
The EUT and support equipment, are placed on a table that is 0.8 meter above a metal ground plane measured 1m*1m min. and 0.65mm thick min.

The other condition as following manner:

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 1.5x 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.

4.6.3 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.

4.6.4TEST RESULTS

Temperature:	22.7℃	Relative Humidity:	43%
Pressure:	1010hPa	Test Voltage:	AC 230V/50Hz
Test Mode:	Mode1/2/3/4/5		

GSM Uplink/Downlink

Test Ports (Mode)	Freq. Range MHz)	Field Strength	Observation	Perform. Criteria	Results	Judgment
Input/ Output AC. Power Port	0.15 ---80	3V(rms) AM Modulated 1000Hz, 80%	**CT, CR**	**A**	**A**	**PASS**
Input/ Output DC. Power Port	0.15 --- 80		**N/A**	**N/A**	**N/A**	**N/A**
Signal Line	0.15 --- 80		**N/A**	**N/A**	**N/A**	**N/A**

Note: During the test, the Maximum Bit Error Ratio was less than 1×10^{-3}."A" stand for, the uplink/downlink speech output level shall be at least 35 dB less than the previously recorded reference levels, when measured through an audio band pass filter of width 200 Hz, centred on 1 kHz (audio breakthrough check). The RXQUAL of the downlink is not exceeding the value of three, measured during each individual exposure in the test sequence. Or During and after the test, the apparatus continue to operate as intended. No degradation of performance or loss of function is allowed below a permissible performance level.

GPRS Uplink/Downlink

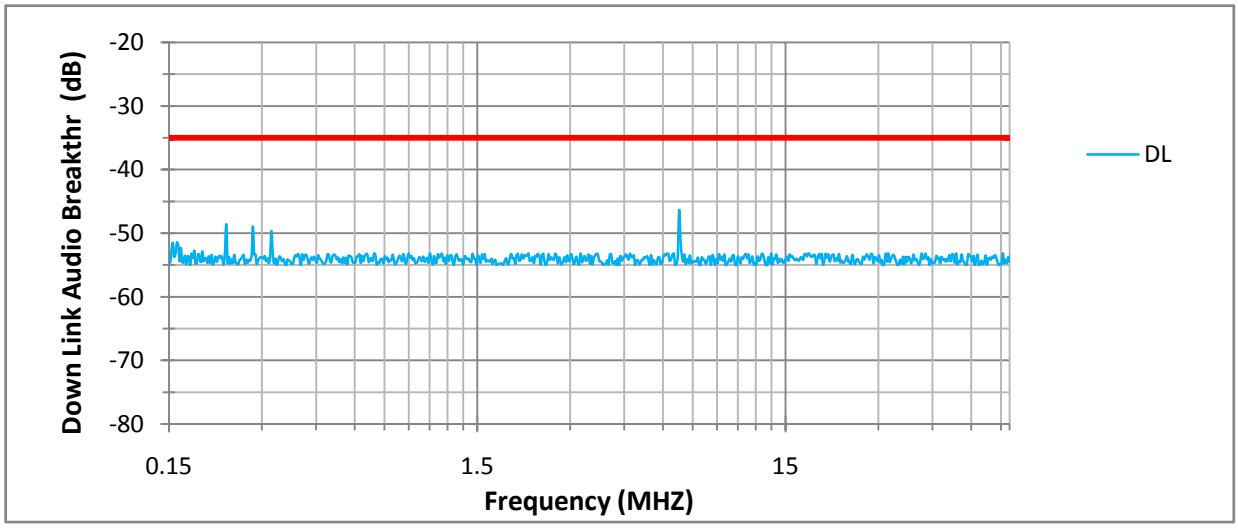
Test Ports (Mode)	Freq. Range MHz)	Field Strength	Observation	Perform. Criteria	Results	Judgment
Input/ Output AC. Power Port	0.15 ---80	3V(rms) AM Modulated 1000Hz, 80%	**CT, CR**	**A**	**A**	**PASS**
Input/ Output DC. Power Port	0.15 --- 80		**N/A**	**N/A**	**N/A**	**N/A**
Signal Line	0.15 --- 80		**N/A**	**N/A**	**N/A**	**N/A**

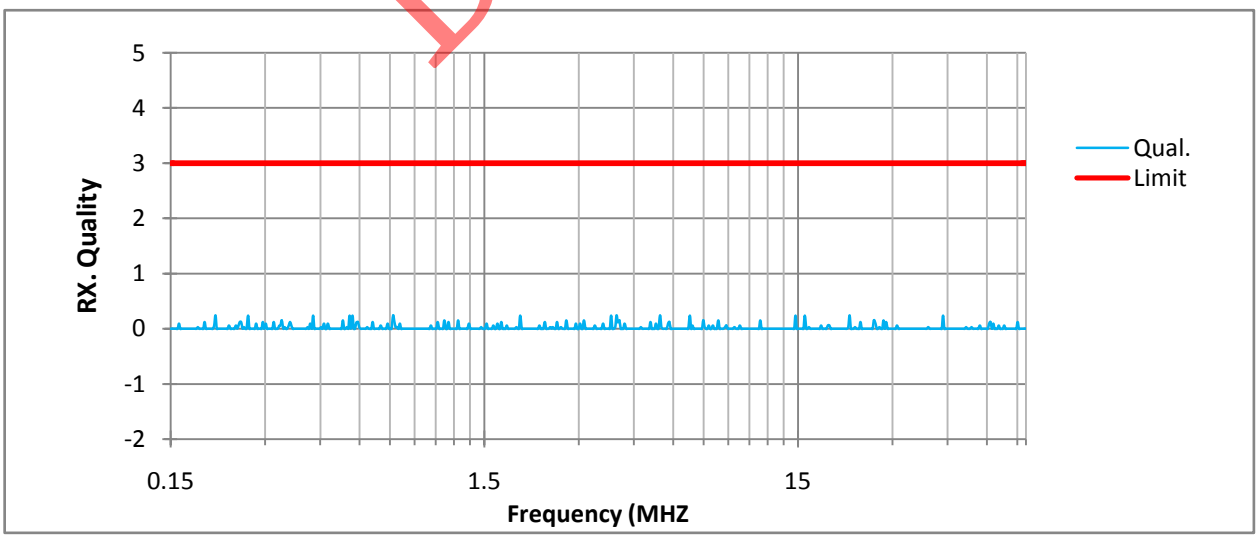
Note: During the test, the Maximum Bit Error Ratio was less than 1×10^{-3}

BT TEST RESULTS

Test Ports (Mode)	Freq. Range MHz)	Field Strength	Observation	Perform. Criteria	Results	Judgment
Input/ Output AC. Power Port	0.15 ---80	3V(rms) AM Modulated 1000Hz, 80%	**CT, CR**	**A**	**A**	**PASS**
Input/ Output DC. Power Port	0.15 --- 80		**N/A**	**N/A**	**N/A**	**N/A**
Signal Line	0.15 --- 80		**N/A**	**N/A**	**N/A**	**N/A**
Note: "A" stand for, during test, operate as intended no loss of function, no degradation ofperformance, no unintentional transmissions and after test, no degradation of performance, no loss of function, no loss of stored data or user programmable functions.						

Worst case(GSM 900)





4.7 VOLTAGE INTERRUPTION/DIPS TESTING

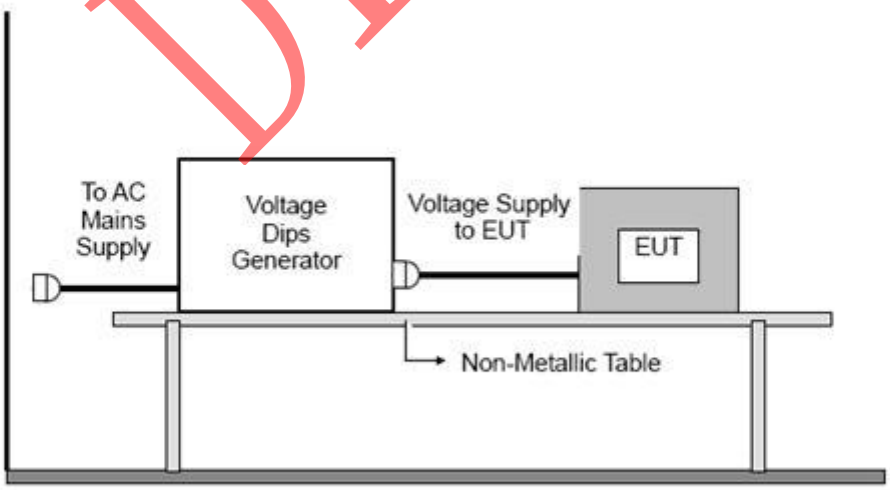
4.7.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-11
Required Performance:	B (For 100% Voltage Dips, 0.5 Cycle) B (For 100% Voltage Dips,1 Cycle) C (For 30% Voltage Dips, 25 Cycles) C (For 100% Voltage Interruptions, 250 Cycles) B(For 30% Voltage Dips, 10ms)
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

4.7.2 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). Eachrepresentative mode of operation shall be tested. Abrupt changes in supply voltage shall occur at zero crossings of the voltage waveform.

4.7.3 TEST SETUP



4.7.4TEST RESULTS

Temperature:	24.3℃	Relative Humidity:	45%
Pressure:	1010hPa	Test Voltage:	AC 230V/50Hz
Test Mode:	Mode1/2/3/4/5		

BT TEST RESULT

Voltage Reduction	Duration (ms)	Observation	Perform Criteria	Results	Judgment
Voltage dip 0%	10	**TT, TR**	**B**	**B**	**PASS**
Voltage dip 0%	20	**TT, TR**	**B**	**B**	**PASS**
Voltage dip 70%	500	**TT, TR**	**C**	**B**	**PASS**
Voltage interruptions	5000	**TT, TR**	**C**	**B**	**PASS**

GSM/GPRS TEST RESULT

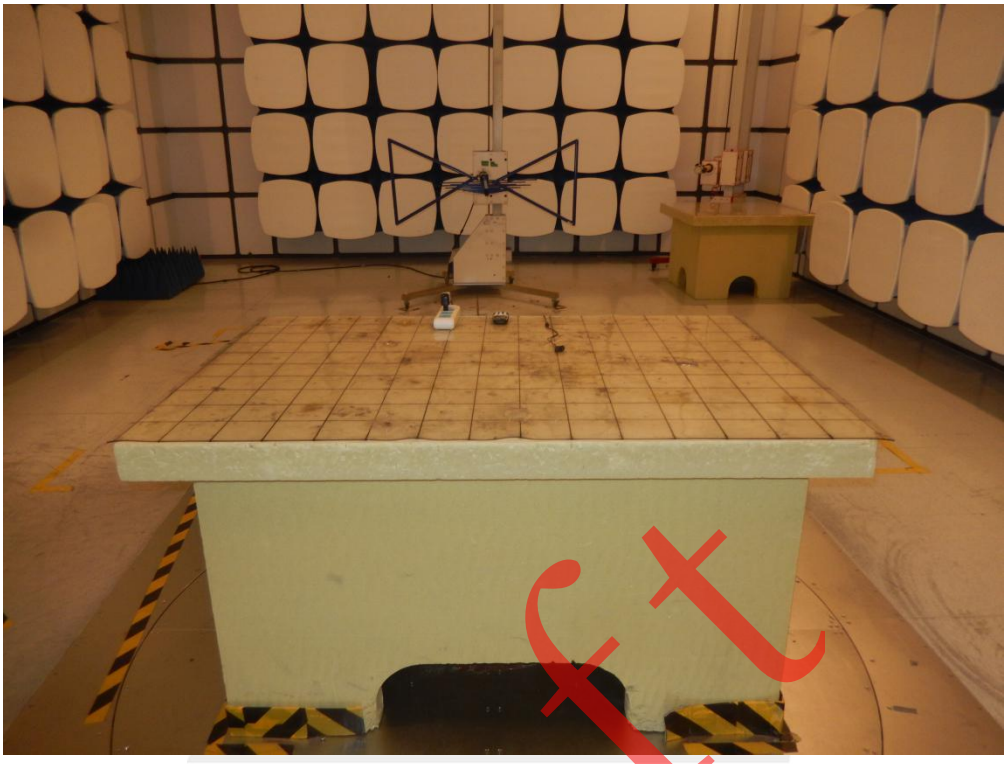
Voltage Reduction	Duration (ms)	Observation	Perform Criteria	Results	Judgment
Voltage dip 0%	10	**TT, TR**	**B**	**B**	**PASS**
Voltage dip 0%	20	**TT, TR**	**B**	**B**	**PASS**
Voltage dip 70%	500	**TT, TR**	**C**	**B**	**PASS**
Voltage interruptions	5000	**TT, TR**	**C**	**B**	**PASS**
Voltage dip 30%	10	**TT, CR**	**B**	**B**	**PASS**

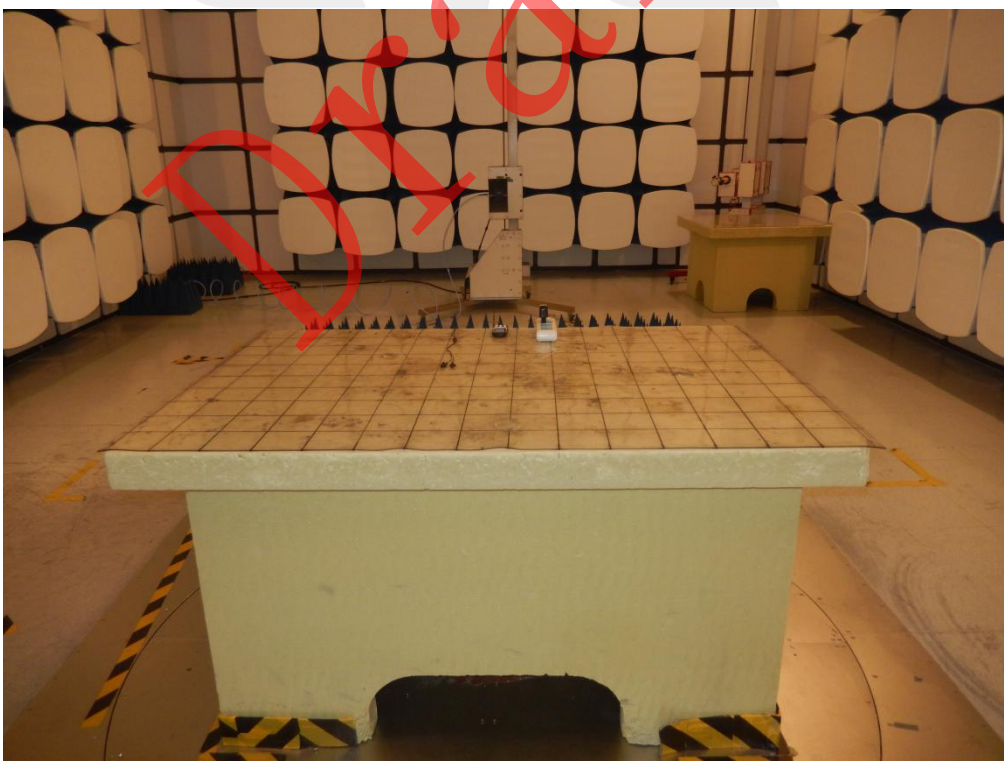
Note:

1) There was not any unintentional transmission in standby mode

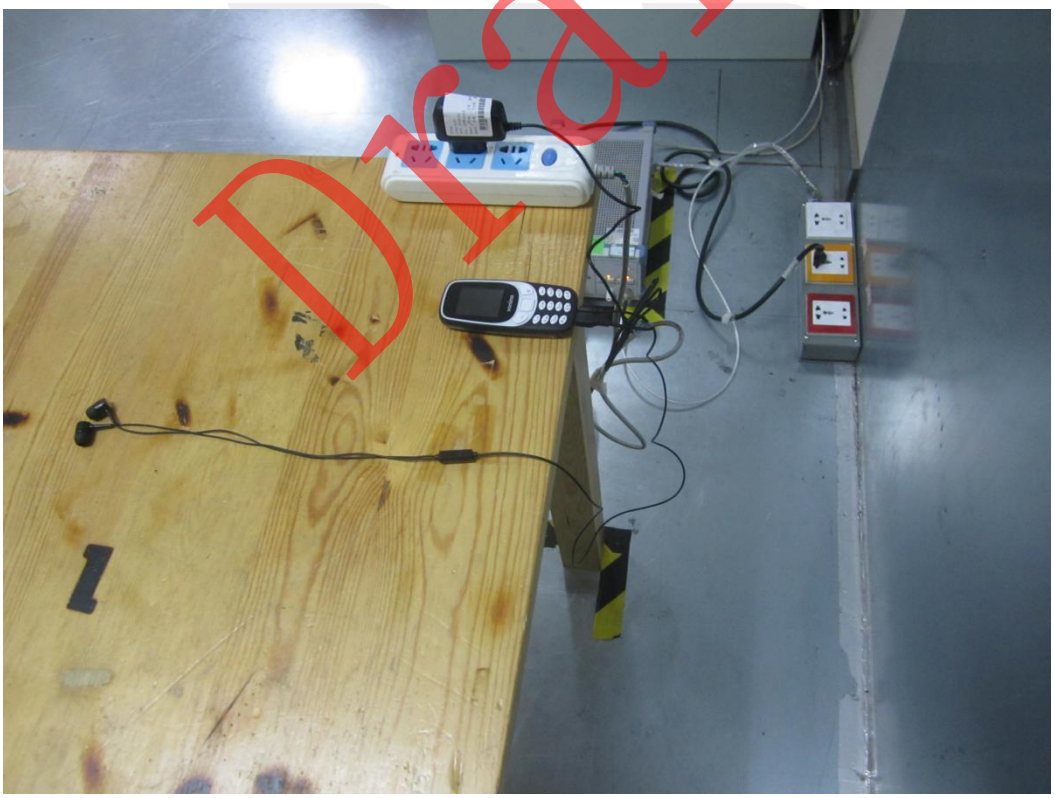
APPENDIX I-PHOTOGRAPHS OF EUT

RE

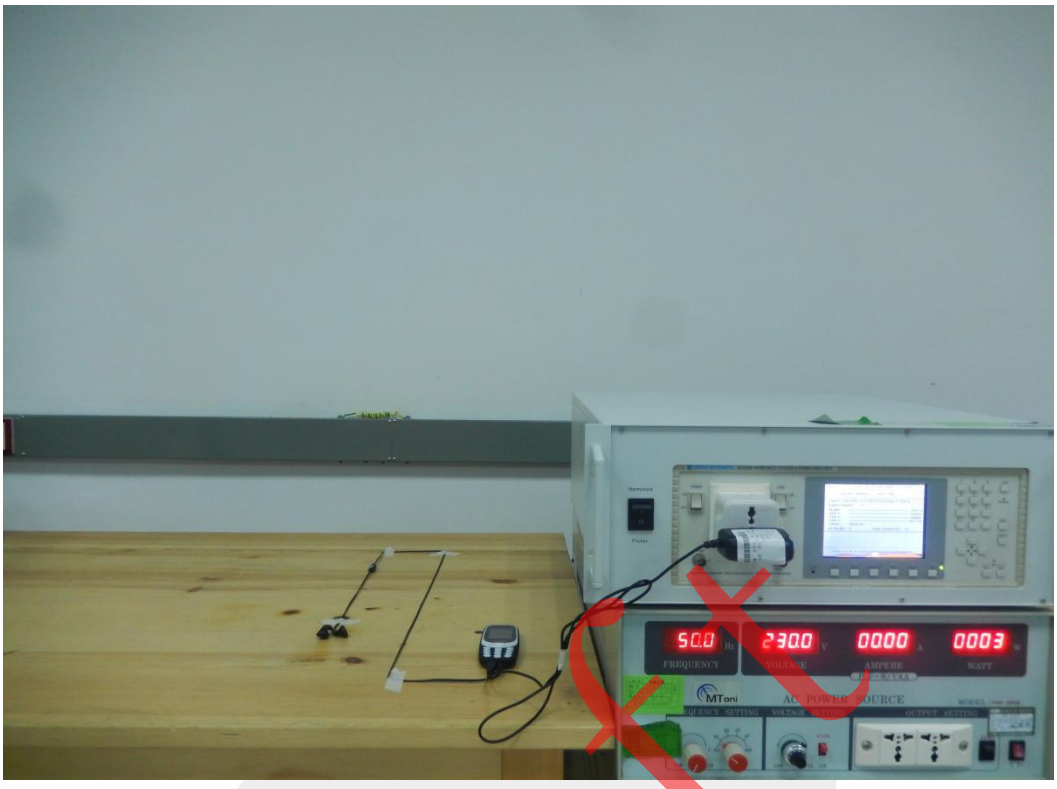




CE

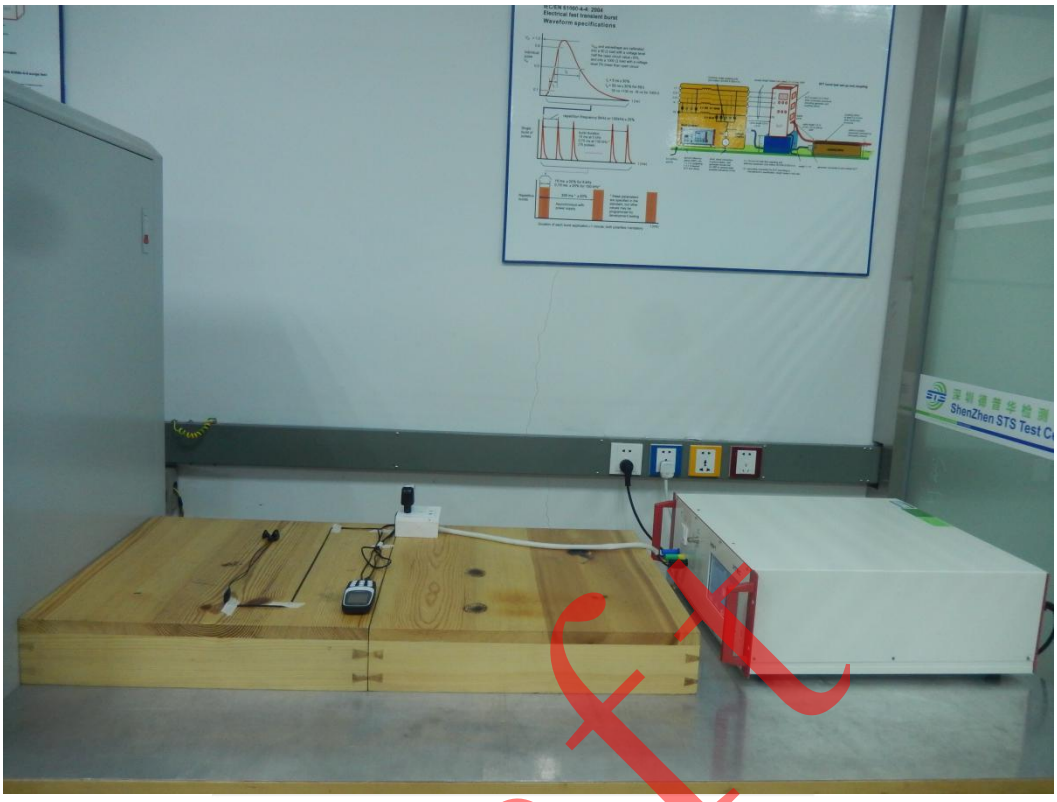


FLICKER

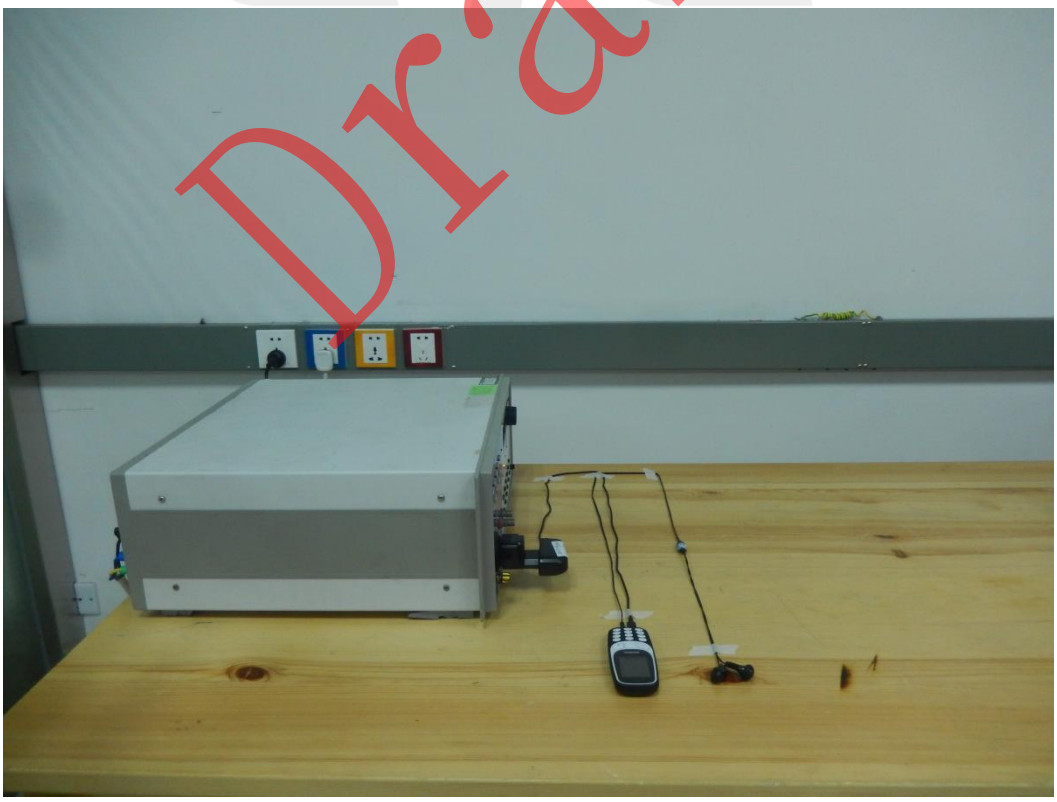


SURGE

EFT

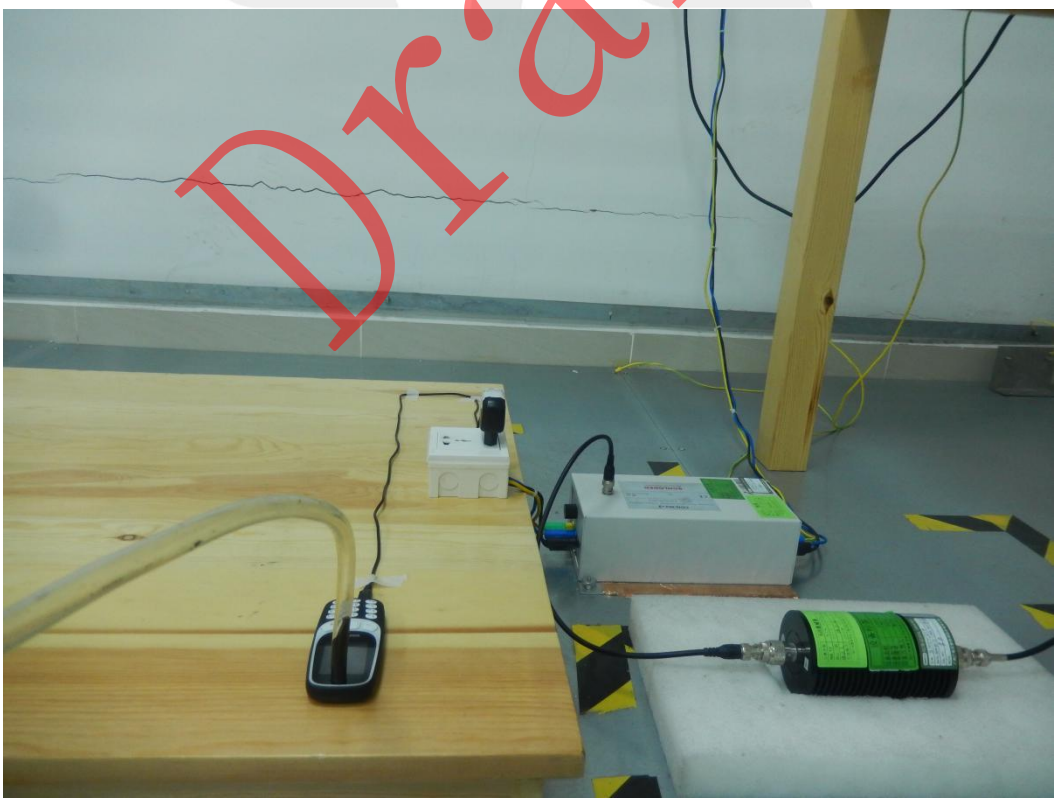


DIPS

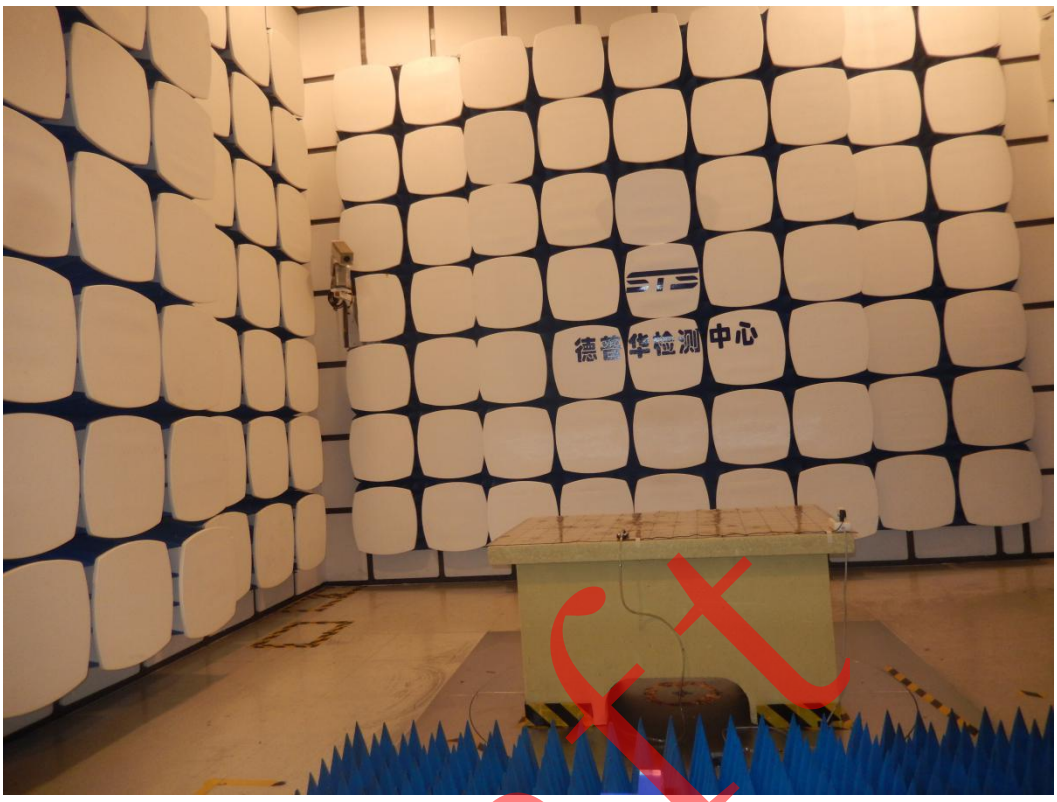


ESD

CS



RS



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