



TEST REPORT

Reference No. : WTX23X05117108W008

Manufacturer : Xontel Technology Company

Address : Kuwait City Aladel Tower,F21 QIBLA

Product Name : WIFI Phone

Model No. : XT-16W

EN 55032:2015+A1:2020; EN 55035:2017+A11:2020

EN IEC 61000-3-2:2019+A1:2021; EN 61000-3-3:2013+A2:2021

Standards : ETSI EN 301 489-1 V2.2.3 (2019-11)

ETSI EN 301 489-17 V3.2.4 (2020-09)

ETSI EN 301 489-19 V2.2.1 (2022-09)

ETSI EN 301 489-52 V1.2.1 (2021-11)

Date of Receipt sample : 2023-05-30

Date of Test : 2023-05-30 to 2023-07-04

Date of Issue : 2023-07-05

Test Report Form No. : WTX_ESI EN 301 489_1_2019W

Test Result : Pass

Remarks:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of approver.

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Report version

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Rev.00	2023-07-05	Original
/	/	/

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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

General Description of EUT	
Product Name:	WIFI Phone
Trade Name:	Xontel
Model No.:	XT-16W
Adding Model(s):	/
Rated Voltage:	DC3.7V
Battery Capacity:	2000mAh
Adapter Model:	CT-083 Input:AC110-240 50/60Hz 0.2A Output:DC5V1.0A
Software Version:	/
Hardware Version:	/

Note: The test data is gathered from a production sample provided by the manufacturer.



Technical Characteristics of EUT	
2G	
Support Networks:	GSM, GPRS, EDGE
Support Bands:	GSM900, DCS1800
Frequency Range:	GSM900: Tx: 880-915MHz, Rx: 925-960MHz DCS1800: Tx: 1710-1785MHz, Rx: 1805-1880MHz
RF Output Power:	GSM900: 32.34dBm, GSM1800: 29.20dBm EDGE900: 27.20dBm, EDGE1800: 25.92dBm
Modulation Type:	GMSK, 8PSK
Type of Antenna:	Integral Antenna
Antenna Gain:	GSM900: 0.48dBi, DCS1800: 1.17dBi
GPRS/EDGE Class:	Class 12
3G	
Support Networks:	WCDMA, HSDPA, HSUPA
Support Bands:	WCDMA Band 1, WCDMA Band 8
Frequency Range:	WCDMA Band 1: Tx: 1920-1980MHz, Rx: 2110-2170MHz WCDMA Band 8: Tx: 880-915MHz, Rx: 925-960MHz
RF Output Power:	WCDMA Band 1: 23.56dBm, WCDMA Band 8: 23.27dBm
Modulation Type:	BPSK, QPSK, 16QAM
Antenna Type:	Integral Antenna
Antenna Gain:	WCDMA Band 1: 1.17dBi, WCDMA Band 8: 0.48dBi
4G	
Support Bands:	FDD-LTE Band 1, 3, 7, 8, 20, 28 TDD-LTE Band 38, 40
Frequency Range:	FDD-LTE Band 1: Tx: 1920-1980MHz, Rx: 2110-2170MHz FDD-LTE Band 3: Tx: 1710-1785MHz, Rx: 1805-1880MHz FDD-LTE Band 7: Tx: 2500-2570MHz, Rx: 2620-2690MHz FDD-LTE Band 8: Tx: 880-915MHz, Rx: 925-960MHz FDD-LTE Band 20: Tx: 832-862MHz, Rx: 791-821MHz FDD-LTE Band 28: Tx: 703-748MHz, Rx: 758-803MHz TDD-LTE Band 38: Tx: 2570-2620MHz, Rx: 2570-2620MHz TDD-LTE Band 40: Tx: 2300-2400MHz, Rx: 2300-2400MHz
Max.RF Output Power:	FDD-LTE Band 1: 22.43dBm, FDD-LTE Band 3: 22.89dBm, FDD-LTE Band 7: 23.89dBm, FDD-LTE Band 8: 22.95dBm, FDD-LTE Band 20: 22.45dBm, FDD-LTE Band 28: 22.99dBm, TDD-LTE Band 38: 21.75dBm, TDD-LTE Band 40: 21.72dBm
Modulation Type:	QPSK, 16QAM
Antenna Type:	Integral Antenna
Antenna Gain:	FDD-LTE Band 1: 1.14dBi, FDD-LTE Band 3: 1.14dBi, FDD-LTE Band 7: 1.32dBi, FDD-LTE Band 8: 0.29dBi, FDD-LTE Band 20: 0.37dBi, FDD-LTE Band 28: 1.34dBi,



	TDD-LTE Band 38: 1.31dBi, TDD-LTE Band 40: 2.29dBi,
Bluetooth	
Bluetooth Version:	Bluetooth V4.2
Frequency Range:	2402-2480MHz
Max.RF Output Power:	8.64dBm (EIRP)
Type of Modulation:	GFSK, π/4 DQPSK, 8DPSK
Data Rate:	1Mbps, 2Mbps, 3Mbps
Quantity of Channels	79/40
Channel Separation:	1MHz/2MHz
Type of Antenna:	Integral Antenna
Antenna Gain:	2.19dBi
Wi-Fi (2.4GHz)	
Support Standards:	802.11b, 802.11g, 802.11n-HT20/40
Frequency Range:	2412-2472MHz for 802.11b/g/n(HT20) 2422-2462MHz for 802.11n(HT40)
Max.RF Output Power:	15.49dBm (EIRP)
Type of Modulation:	CCK, OFDM, QPSK, BPSK, 16QAM, 64QAM
Quantity of Channels	13 for 802.11b/g/n(HT20), 9 for 802.11n(HT40)
Channel Separation:	5MHz
Type of Antenna:	Integral Antenna
Antenna Gain:	2.19dBi
GPS	
Frequency Range:	1575.42MHz
FM	
Frequency Range:	87.5~108.0MHz Receiving



1.2 Test Standards

The tests were performed according to following standards:

EN 55032:2015+A1:2020: Electromagnetic compatibility of multimedia equipment - Emission requirements

EN 55035:2017+A11:2020: Electromagnetic compatibility of multimedia equipment - Immunity requirements.

EN IEC 61000-3-2:2019+A1:2021: Electromagnetic compatibility (EMC) -- Part 3-2: Limits - Limits for harmonic current emissions (equipment input current up to and including 16 A per phase).

EN 61000-3-3:2013+A2:2021: 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.

ETSI EN 301 489-1 V2.2.3 (2019-11): Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised Standard for Electromagnetic Compatibility

ETSI EN 301 489-17 V3.2.4 (2020-09): ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 17: Specific conditions for Broadband Data Transmission Systems; Harmonised Standard for ElectroMagnetic Compatibility.

ETSI EN 301 489-19 V2.2.1 (2022-09): ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 19: Specific conditions for Receive Only Mobile Earth Stations (ROMES) operating in the 1,5 GHz band providing data communications and GNSS receivers operating in the RNSS band providing positioning, navigation, and timing data; Harmonised Standard for ElectroMagnetic Compatibility

ETSI EN 301 489-52 V1.2.1 (2021-11): ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 52: Specific conditions for Cellular Communication User Equipment (UE) radio and ancillary equipment; Harmonised Standard for ElectroMagnetic Compatibility

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product maybe which result in lowering the emission/immunity should be checked to ensure compliance has been maintained.

1.3 Test Methodology

All measurements contained in this report were conducted with the standard ETSI EN 301489-1, Electromagnetic compatibility and Radio spectrum Matters (ERM); Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements.



1.4 Test Facility

Address of the test laboratory

Laboratory: Waltek Testing Group (Shenzhen) Co., Ltd.

Address: 1/F., Room 101, Building 1, Hongwei Industrial Park, Liuxian 2nd Road, Block 70 Bao'an District, Shenzhen, Guangdong, China

FCC – Registration No.: 125990

Waltek Testing Group (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. The Designation Number is CN5010, and Test Firm Registration Number is 125990.

Industry Canada (IC) Registration No.: 11464A

The 3m Semi-anechoic chamber of Waltek Testing Group (Shenzhen) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A.

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1.5 EUT Setup and Operation Mode

The equipment under test (EUT) was configured to measure its highest possible emission/immunity level. The test modes were adapted according to the operation manual for use, more detailed description as follows:

Test Mode List			
Test Mode	Description	Remark	
TM1	Charging And Playing	(Connect to the Adapter; AC230V 50Hz for adapter)	
TM2	Downloading	(Connect to the Notebook; AC230V 50Hz for PC)	
TM3	Camera	(Camera On; AC230V 50Hz for adapter)	
TM4	FM	(Worst case FM 98MHz; AC230V 50Hz for adapter)	
TM5	GPS Receiving	Receive 1575.42MHz	
TM6	Wi-Fi (2.4GHz)	TR, CR, TT, CT for EMS testing	
TM7	Bluetooth	TR, CR, TT, CT for EMS testing	
TM8	GSM900	TR, CR, TT, CT for EMS testing	
TM9	GSM1800	TR, CR, TT, CT for EMS testing	
TM10	WCDMA Band 1	TR, CR, TT, CT for EMS testing	
TM11	WCDMA Band 8	TR, CR, TT, CT for EMS testing	
TM12	LTE Band 1	TR, CR, TT, CT for EMS testing	
TM13	LTE Band 3	TR, CR, TT, CT for EMS testing	
TM14	LTE Band 7	TR, CR, TT, CT for EMS testing	
TM15	LTE Band 8	TR, CR, TT, CT for EMS testing	
TM16	LTE Band 20	TR, CR, TT, CT for EMS testing	
TM17	LTE Band 28	TR, CR, TT, CT for EMS testing	
TM18	LTE Band 38	TR, CR, TT, CT for EMS testing	
TM19	LTE Band 40	TR, CR, TT, CT for EMS testing	

EUT Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
USB Cable	1.45	Unshielded	Without Ferrite

Auxiliary Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
Earphone Cable	1.0	Unshielded	Without Ferrite

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
Notebook	Lenovo	TianYi 100-14IBD	PF0F4ABV



1.6 Performance Criteria for EMS

➤ EN 301 489-17, The performance criteria are:

- performance criteria A for immunity tests with phenomena of a continuous nature;
- performance criteria B for immunity tests with phenomena of a transient nature;
- performance criteria C for immunity tests with power interruptions exceeding a certain time.

The equipment shall meet the minimum performance criteria as specified in the following clauses.

Table 1: Performance criteria

Criteria	During test	After test
A	Shall operate as intended. (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 3). Shall be no loss of function. Shall be no loss of stored data or user programmable
B	May show loss of function (one or more). May show degradation of performance (see note 2). Shall be no unintentional transmissions.	Functions shall be self-recoverable. Shall operate as intended after recovering. Shall be no degradation of performance (see note 3). 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 3).

NOTE 1: Operate as intended during the test allows a level of degradation 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: 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 3: No degradation of performance after the test is understood as no 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.



➤ EN 301 489-19, The performance criteria are:

The present document, together with ETSI EN 301 489-1 [1], covers the assessment of Receive Only Mobile Earth Stations (ROMES) and GNSS receivers operating in the RNSS band (ROGNSS), as defined in annex B, and associated ancillary equipment in respect of Electro Magnetic Compatibility (EMC).

Technical specifications related to the antenna port and emissions from the enclosure port of ROMES are not included in the present document. Such technical specifications are found in the relevant product standards for the effective use of the radio spectrum.

The present document specifies the applicable test conditions, performance assessment and performance criteria for ROMES and associated ancillary equipment. ROMESs can have several configurations, including:

- vehicular equipment;
- portable equipment;
- fixed equipment;
- a number of modules including a display/control interface to the user.

The performance criteria used in the present document require that the satellite communications system of which the ROMES is a part provides reliable delivery of data or messages.

The environmental classification and the emission and immunity requirements used in the present document are as stated in ETSI EN 301 489-1 [1], except for any special conditions included in the present document.

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➤ **EN 301 489-52, The performance criteria are:**

According to the section 6.1 and 6.2 EN301489-52, the test data has been collected, reduced, and analyzed within this report in accordance with Immunity requires the following as specific performance criteria:

The equipment shall meet the performance criteria specified in this clause and clauses 6.1.1 to 6.1.4, as appropriate.

Portable equipment intended for use whilst powered by the main battery of a vehicle shall additionally fulfil the applicable requirements set out in ETSI EN 301 489-1 [1], clauses 7.1 and 7.2 for mobile equipment.

Portable or mobile equipment powered by the AC mains shall additionally fulfil the applicable requirements of ETSI EN 301 489-1 [1], clauses 7.1 and 7.2 for radio and ancillary equipment for fixed use.

The establishment and maintenance of a communications link, the assessment of RXQUAL, and the assessment of the audio breakthrough by monitoring the speech output signal level, are used as performance criteria to ensure that all primary functions of the transmitter and receiver are evaluated during the immunity tests. In addition, the test shall also be performed in idle mode to ensure the transmitter does not unintentionally operate.

The maintenance of a communications link shall be assessed using an indicator which may be part of the test system or the EUT.

If an equipment is of a specialized nature, such that the performance criteria described in the following clauses are not appropriate, then the manufacturer shall declare, for inclusion in the test report, his own specification for an acceptable level of performance or degradation of performance during and/or after the immunity tests. The performance specification shall be included in the product description and documentation.

The performance criteria specified by the manufacturer shall give the same degree of immunity protection as called for in the following clauses.

The equipment shall meet the performance criteria specified in this clause and clauses 6.2.2 and 6.2.3 as appropriate.

The maintenance of a communications link shall be assessed by using an indicator, which may be part of the test system or the equipment under test.

If an equipment is of a specialized nature, that the performance criteria described in the following clauses are not appropriate, then the manufacturer shall declare, for inclusion in the test report, his own specification for an acceptable level of performance or degradation of performance during and/or after testing, as required by the present document.

The performance criteria specified by the manufacturer shall give the same degree of immunity protection as called for in the following clauses.

In addition, the test shall also be performed in idle mode to ensure the transmitter does not unintentionally operate.

The requirements apply to all types of UTRA and E-UTRA (FDD or TDD) for the UE.



➤ EN 55035, The performance criteria are:

- A. The apparatus shall continue to operate as intended during and after the test. The manufacturer specifies some minimum performance level. The performance level may be specified by the manufacturer as a permissible loss of performance.
- B. The apparatus shall continue to operate as intended after the test. This indicates that the EUT does not need to function at normal performance levels during the test, but must recover. Again some minimal performance is defined by the manufacturer. No change in operating state or loss or data is permitted.
- C. Temporary loss of function is allowed. Operation of the EUT may stop as long as it is either automatically reset or can be manually restored by operation of the controls.

➤ Monitoring EUT in Immunity Test:

Monitoring for Continuous Phenomena Applied to EUT

GSM

At the start of the test, a communication link shall be established.

During the test, the operator shall observe whether the communication link is maintained and set the EUT volume to provide center audio level.

For GSM voice service, use an audio analyzer to measure uplink and downlink speech output levels to see whether audio breakthroughs are at least 35 dB less than reference measurement values of audio calibration.

For GSM voice service, RXQUAL is measured by SS. It should be not more than 3.

At the conclusion of the test, the operator shall directly check whether the EUT operate as intended with no loss of user control functions or stored data.

In addition to confirming the above performance during traffic mode, the test is also been performed in idle mode, with an interference receiver to monitor whether the transmitter unintentionally operates.

WCDMA

At the start of the test, a communication link shall be established.

During the test, the operator shall observe whether the communication link is maintained and set the EUT volume to provide center audio level.

For WCDMA voice service, use an audio analyzer to measure uplink and downlink speech output levels to see whether audio breakthroughs are at least 35 dB less than reference measurement values of audio calibration.

For WCDMA voice service, RXQUAL is measured by SS. It should be not more than 3.

For WCDMA data service, the BLER shall not exceed 0,01 during the test sequence.

At the conclusion of the test, the operator shall directly check whether the EUT operate as intended with no loss of user control functions or stored data.

In addition to confirming the above performance during traffic mode, the test is also been performed in idle



mode, with an interference receiver to monitor whether the transmitter unintentionally operates.

LTE

At the start of the test, a communication link shall be established.

During the test, the operator shall observe whether the communication link is maintained and set the EUT volume to provide center audio level.

For LTE data service, the throughput shall be $\geq 95\%$ of the maximum throughput.

At the conclusion of the test, the operator shall directly check whether the EUT operate as intended with no loss of user control functions or stored data.

In addition to confirming the above performance during traffic mode, the test is also been performed in idle mode, with an interference receiver to monitor whether the transmitter unintentionally operates.

Wi-Fi

The communication link should be maintained and there should be no loss of data packets during the test.

In addition to confirming the above performance during a communication, the test is also been performed in idle mode, with an interference receiver to monitor if the transmitter unintentionally operates.

For equipment that supports a PER or FER, the minimum performance level shall be a PER or FER less than or equal to 10 %.

For equipment that does not support a PER or a FER, the minimum performance level shall be no loss of the wireless transmission function needed for the intended use of the equipment.

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1.7 Measurement Uncertainty

Measurement uncertainty	
Parameter	Uncertainty
Uncertainty for Radiated Emission in 3m chamber	@ 30-200MHz $\pm 4.52\text{dB}$ @ 0.2-1GHz $\pm 5.56\text{dB}$ @ 1-6GHz $\pm 3.84\text{dB}$ @ 6-18GHz $\pm 3.92\text{dB}$
Uncertainty for Conducted Emission	@ 9-150kHz $\pm 3.74\text{dB}$ @ 0.15-30MHz $\pm 3.34\text{dB}$
Uncertainty for Harmonic test	3.26%
Uncertainty for Flicker test	4.76%
Uncertainty for RS test	21%, k=2
Uncertainty for CS test	29%, k=2
Uncertainty for ESD test	The immunity measurement system uncertainty is within standard requirement and is based on a standard uncertainty multiplied by a coverage factor k=2, providing a level of confidence of approximately 95%.
Uncertainty for EFT test	
Uncertainty for Surges test	
Uncertainty for Voltage Dips, Voltage Variations and Short Interruptions Test	
Uncertainty for PFMF test	



1.8 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal Date	Due Date
<input type="checkbox"/> Chamber A: Below 1GHz					
Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2023-02-25	2024-02-24
EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2023-02-25	2024-02-24
Amplifier	HP	8447F	2805A03475	2023-02-25	2024-02-24
Loop Antenna	Schwarz beck	FMZB 1516	9773	2021-03-20	2024-03-19
Trilog Broadband Antenna	Schwarzbeck	VULB9163	9163-333	2023-03-20	2026-03-19
<input type="checkbox"/> Chamber A: Above 1GHz					
Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2023-02-25	2024-02-24
Spectrum Analyzer	Rohde & Schwarz	FSP40	100612	2023-02-25	2024-02-24
EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2023-02-25	2024-02-24
Amplifier	C&D	PAP-1G18	14918	2023-02-25	2024-02-24
Horn Antenna	ETS	3117	00086197	2021-03-19	2024-03-18
DRG Horn Antenna	A.H. SYSTEMS	SAS-574	571	2021-03-19	2024-03-18
Pre-amplifier	Schwarzbeck	BBV 9721	9721-031	2023-02-25	2024-02-24
<input type="checkbox"/> Chamber B: Below 1GHz					
Trilog Broadband Antenna	Schwarzbeck	VULB9163(B)	9163-635	2021-04-09	2024-04-08
Amplifier	Agilent	8447D	2944A10179	2023-02-25	2024-02-24
EMI Test Receiver	Rohde & Schwarz	ESPI	101391	2023-02-25	2024-02-24
<input checked="" type="checkbox"/> Chamber C: Below 1GHz					
EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2023-02-25	2024-02-24
Trilog Broadband Antenna	Schwarzbeck	VULB 9168	1194	2021-05-28	2024-05-27
Amplifier	HP	8447F	2944A03869	2023-02-25	2024-02-24
<input checked="" type="checkbox"/> Chamber C: Above 1GHz					
EMI Test Receiver	Rohde & Schwarz	ESIB 26	100401	2023-02-25	2024-02-24
Horn Antenna	POAM	RTF-11A	LP228060221	2023-03-10	2026-03-09
Amplifier	Tonscend	TAP01018050	AP22E806235	2023-02-25	2024-02-24
<input checked="" type="checkbox"/> Conducted Room 1#					
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2023-02-25	2024-02-24
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2023-02-25	2024-02-24
AC LISN	Schwarzbeck	NSLK8126	8126-224	2023-02-25	2024-02-24
8-WIRE LISN	Schwarzbeck	8158	CAT3-8158-0059	2023-02-25	2024-02-24
8-WIRE LISN	Schwarzbeck	8158	CAT5-8158-0117	2023-02-25	2024-02-24
<input type="checkbox"/> Conducted Room 2#					
EMI Test Receiver	Rohde & Schwarz	ESPI	10129	2023-02-25	2024-02-24
LISN	Rohde & Schwarz	ENV 216	100097	2023-02-25	2024-02-24



EMF					
VDH Test Head	AFJ	VDH 30	SC022Z	2023-02-25	2024-02-24
3 Loop Antenna					
Loop Antenna	ZHINAN	ZN30401	19037	2023-02-25	2025-02-24
Clamp					
Clamp	Luthi	MDS21	3809	2023-02-27	2024-02-26
PFMF					
PMF Generator	LIONCEL	PMF-801C-C	0171101	2023-02-25	2024-02-24
PMF Antenna	LIONCEL	PMF-801C-A	0180302	2023-02-25	2024-02-24
Instantaneous PMF Generator Module	LIONCEL	PMF-801C-T	0171001	2023-02-25	2024-02-24
H/F					
Digital Power Analyzer	California Instrument	CTS	72831	2023-02-25	2024-02-24
Power Source	California Instrument	5001IX-CTS-400	25965	2023-02-25	2024-02-24
ESD					
ESD Generator	LIONCEL	ESD-203B	0170901	2023-03-14	2024-03-13
EFT/SURGE/DIPS					
Transient 2000	EMC PARTNER	TRA2000	863	2023-02-25	2024-02-24
Couple Clamp	EMC PARTNER	CN-EFT1000	513	2023-02-25	2024-02-24
CS					
CONDUCTED IMMUNITY TEST SYSTEM	FRANKONIA	CIT-10/75	126B1247/2013	2023-02-25	2024-02-24
Attenuator	EMTEST	MA-5100/6BF2	1009	2023-02-25	2024-02-24
CDN	Luthi	L-801M2/M3	2665	2023-02-25	2024-02-24
CDN	LIONCEL	CDN-T8	0210401	2023-02-25	2024-02-24
EM Clamp	TESEQ	KEMZ801A	45028	2023-02-25	2024-02-24
RS					
Signal Generator	HP	8688B	3438A00604	2023-02-25	2024-02-24
Power Meter	KEITHLEY	3500	1162591	2023-02-25	2024-02-24
Power Meter	KEITHLEY	3500	1121428	2023-02-25	2024-02-24
RF Power Amplifier	MicoTop	MPA-80-1000-250	MPA1906239	2023-02-25	2024-02-24
RF Power Amplifier	MicoTop	MPA-80-6000-100	MPA1906238	2023-02-25	2024-02-24
Antenna	SCHWARZBECK	STLP 9129	9129 114	N/A	N/A
Power Meter	Agilent	E4419B	GB42420578	2023-02-25	2024-02-24
Communication Tester					
Universal Radio	Rohde & Schwarz	CMW500	148650	2023-02-25	2024-02-24



Communication Tester					
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Software List			
Description	Manufacturer	Model	Version
EMI Test Software (Radiated Emission)*	Farad	EZ-EMC	RA-03A1
EMI Test Software (Conducted Emission)*	Farad	EZ-EMC	RA-03A1

*Remark: indicates software version used in the compliance certification testing.

WALTEK



2. SUMMARY OF TEST RESULTS

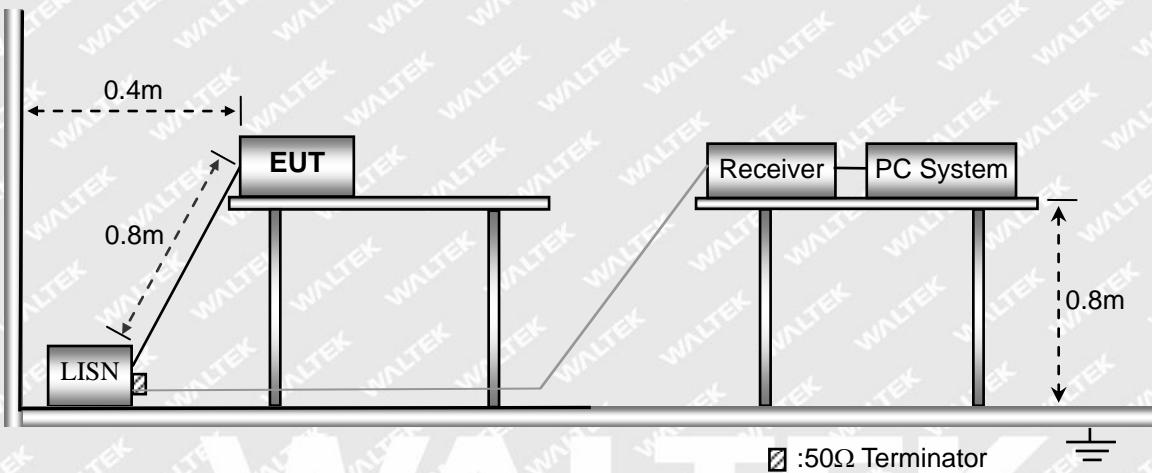
Standards	Reference	Description of Test Item	Result
ETSI EN 301 489-1	8.2	Radiated Emissions	Pass
	8.3	Conducted Emissions for DC Power Port	N/A
	8.4	Conducted Emissions for AC Power Port	Pass
	8.5	Harmonic Current Emissions	Pass
	8.6	Voltage Fluctuations and Flicker	Pass
	8.7	Telecommunication Ports	N/A
	9.2	Radio Frequency Electromagnetic Field	Pass
	9.3	Electrostatic Discharge	Pass
	9.4	Fast Transients, Common Mode	Pass
	9.5	Radio Frequency, Common Mode	Pass
	9.6	Transient and Surges in the Vehicular Environment	N/A
	9.7	Voltage Dips and Interruptions	Pass
	9.8	Surges	Pass
Pass: The EUT complies with the essential requirements in the standard. Fail: The EUT does not comply with the essential requirements in the standard. N/A: Not applicable.			

3. Conducted Emissions

3.1 Test Procedure

Test is conducting under the description of EN55032 Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement.

3.2 Basic Test Setup Block Diagram

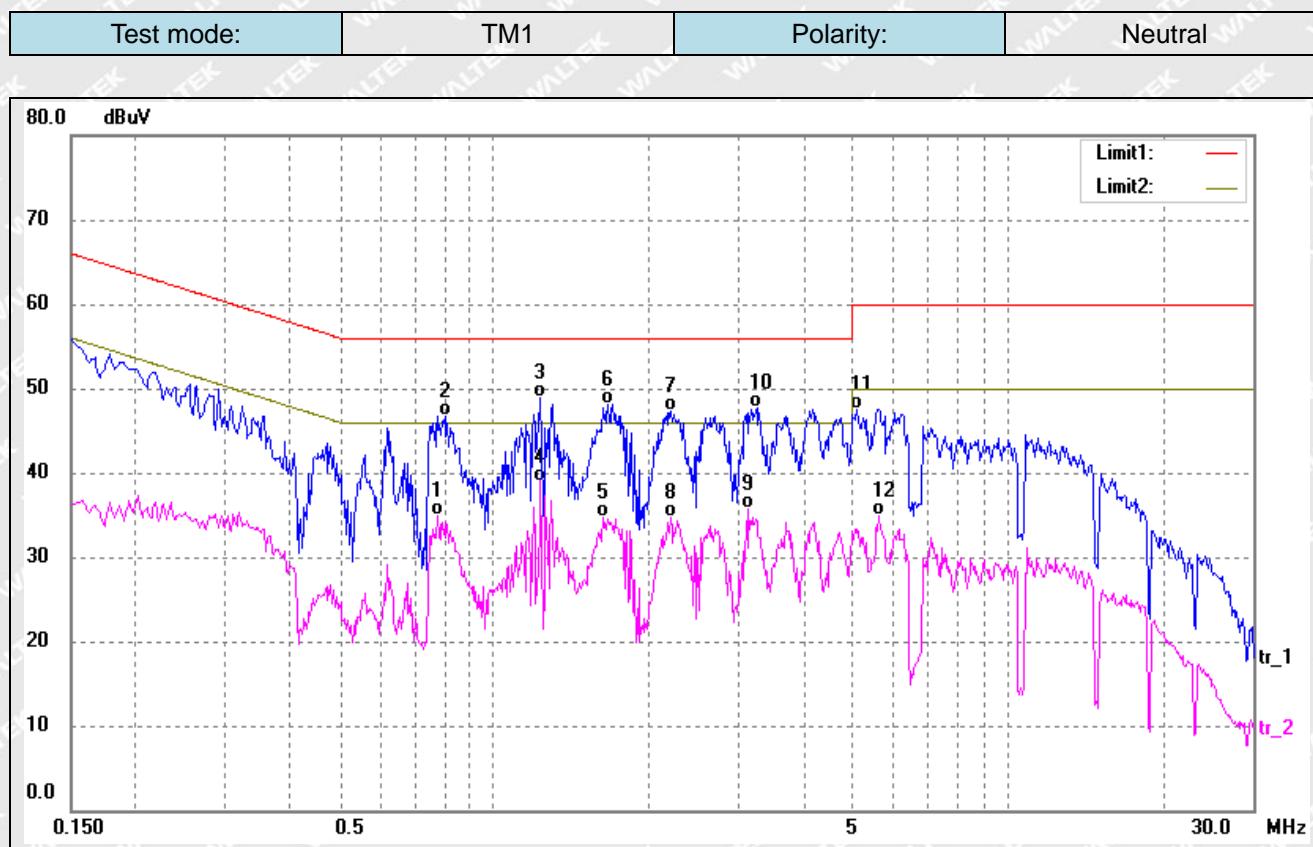


3.3 Environmental Conditions

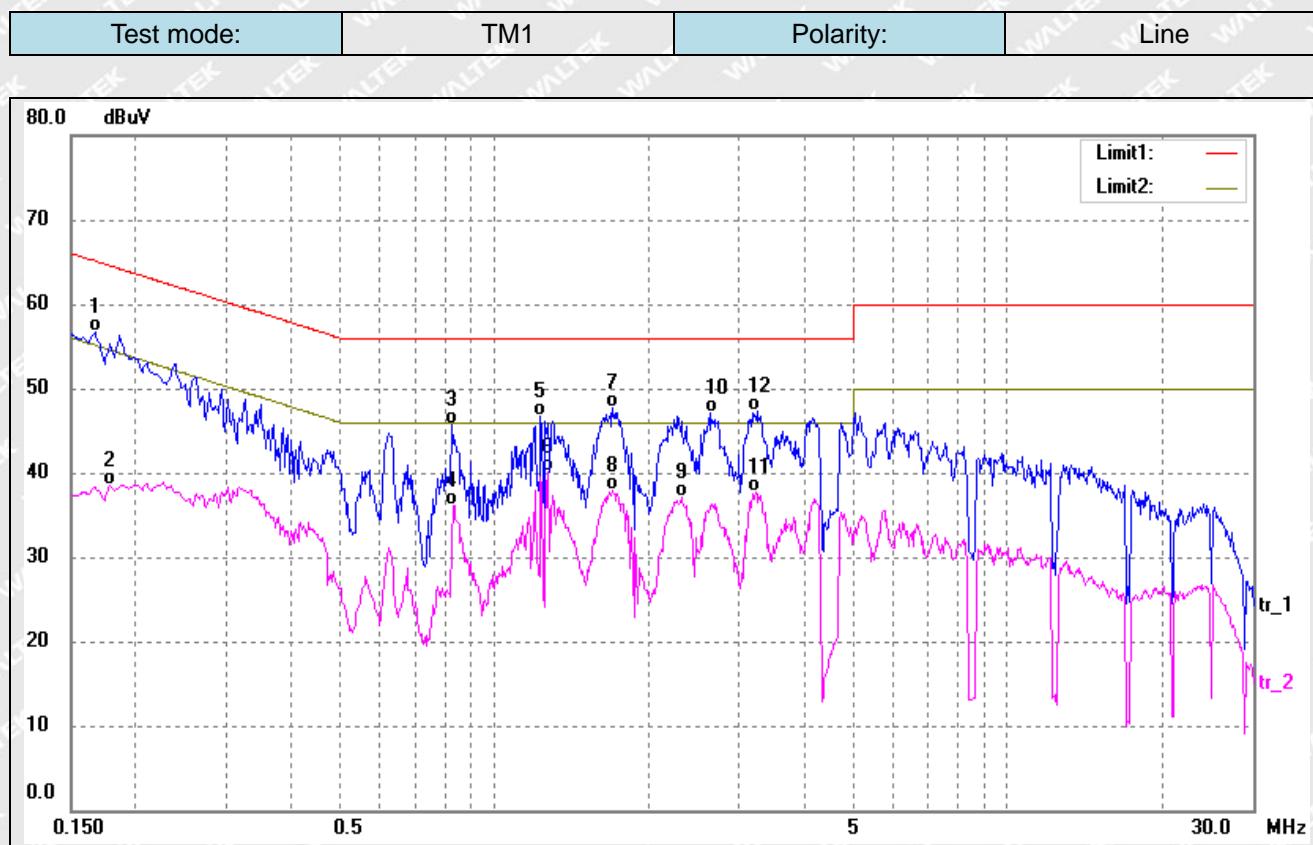
Temperature:	23.5 °C
Relative Humidity:	54 %
ATM Pressure:	1015 mbar

3.4 Conducted Emissions Test Data

Note: Only show the worst case in the test report



No.	Frequency (MHz)	Reading (dB _{uV})	Correct (dB/m)	Result (dB _{uV})	Limit (dB _{uV})	Margin (dB)	Detector
1	0.7780	24.65	10.18	34.83	46.00	-11.17	Avg
2	0.8020	36.54	10.18	46.72	56.00	-9.28	QP
3	1.2300	38.65	10.18	48.83	56.00	-7.17	QP
4*	1.2300	28.82	10.18	39.00	46.00	-7.00	Avg
5	1.6340	24.42	10.26	34.68	46.00	-11.32	Avg
6	1.6660	37.76	10.27	48.03	56.00	-7.97	QP
7	2.2100	36.90	10.33	47.23	56.00	-8.77	QP
8	2.2100	24.28	10.33	34.61	46.00	-11.39	Avg
9	3.1340	25.40	10.35	35.75	46.00	-10.25	Avg
10	3.2500	37.34	10.35	47.69	56.00	-8.31	QP
11	5.0620	37.18	10.38	47.56	60.00	-12.44	QP
12	5.6100	24.61	10.38	34.99	50.00	-15.01	Avg



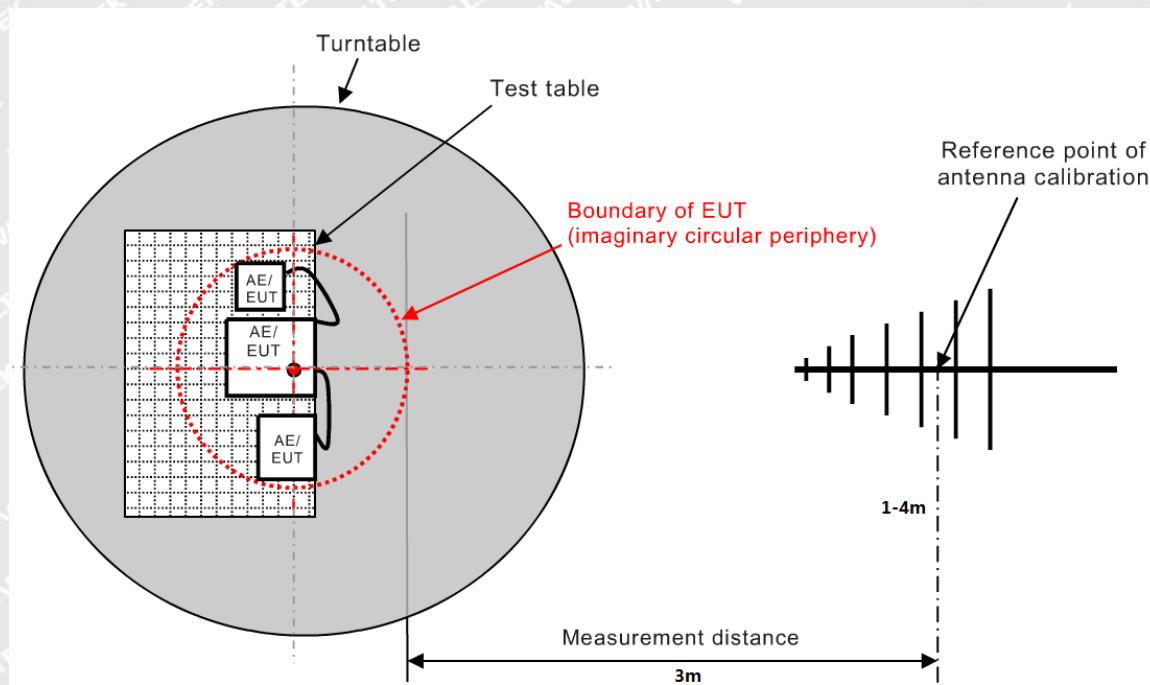
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1660	46.21	10.40	56.61	65.15	-8.54	QP
2	0.1780	28.21	10.39	38.60	54.57	-15.97	AVG
3	0.8300	35.58	10.17	45.75	56.00	-10.25	QP
4	0.8340	25.84	10.17	36.01	46.00	-9.99	AVG
5	1.2340	36.46	10.18	46.64	56.00	-9.36	QP
6*	1.2700	29.83	10.19	40.02	46.00	-5.98	AVG
7	1.7020	37.34	10.27	47.61	56.00	-8.39	QP
8	1.7020	27.67	10.27	37.94	46.00	-8.06	AVG
9	2.3100	26.70	10.33	37.03	46.00	-8.97	AVG
10	2.6300	36.81	10.34	47.15	56.00	-8.85	QP
11	3.2340	27.43	10.35	37.78	46.00	-8.22	AVG
12	3.2500	37.05	10.35	47.40	56.00	-8.60	QP



4. Radiated Emissions

4.1 Test Procedure

Test is conducting under the description of EN55032 Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement.



4.2 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dB μ V means the emission is 6dB μ V below the maximum limit for Class B device. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{EN 301489 Class B Limit}$$



4.3 Environmental Conditions

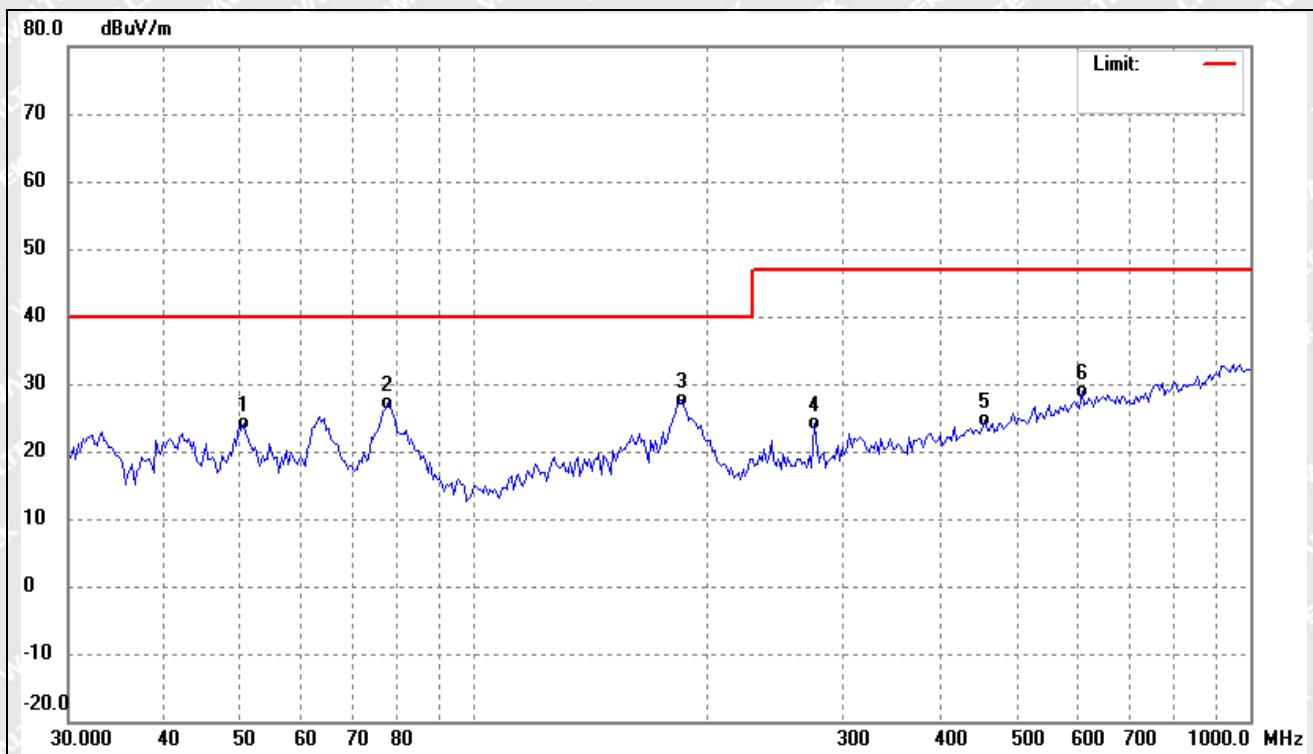
Temperature:	23° C
Relative Humidity:	53%
ATM Pressure:	1011 mbar

4.4 Summary of Test Results/Plots

Note: Only show the worst case in the test report

➤ 30MHz to 1GHz

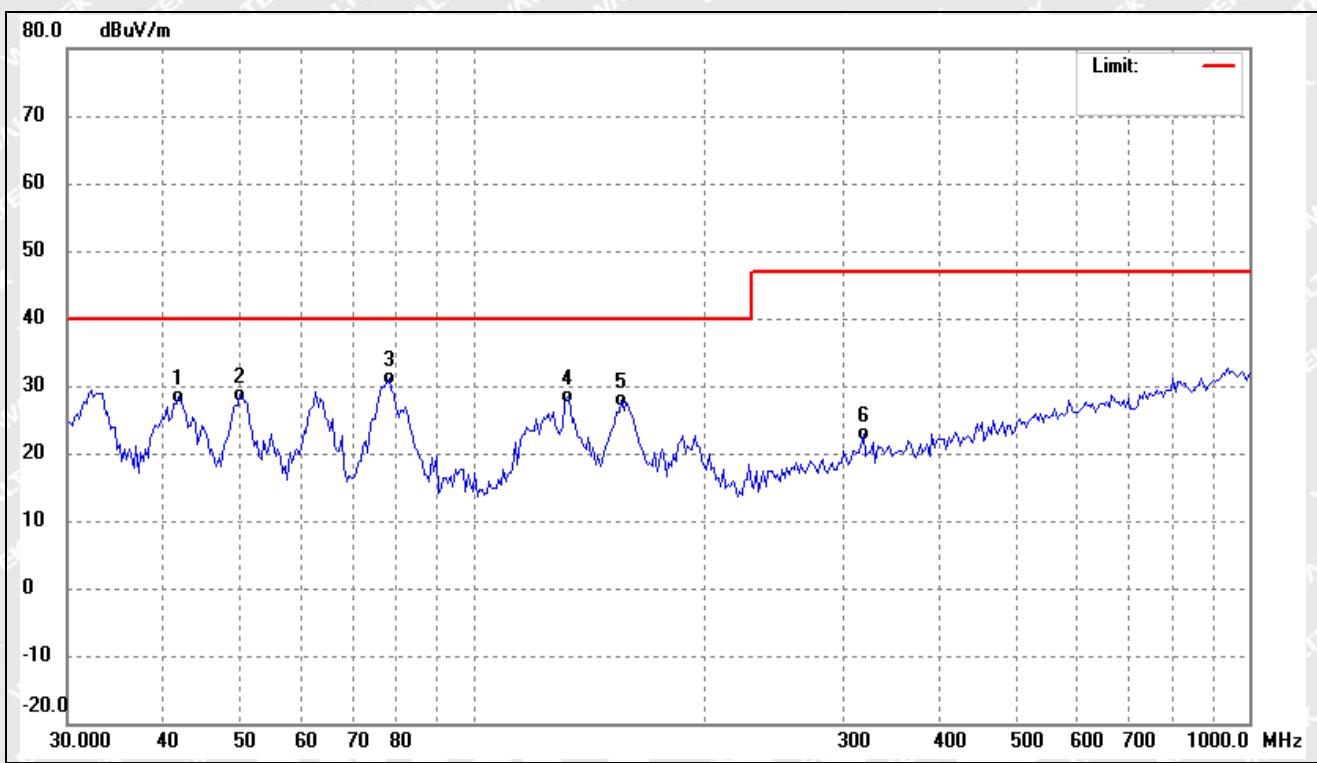
Test mode:	TM1	Polarity:	Horizontal
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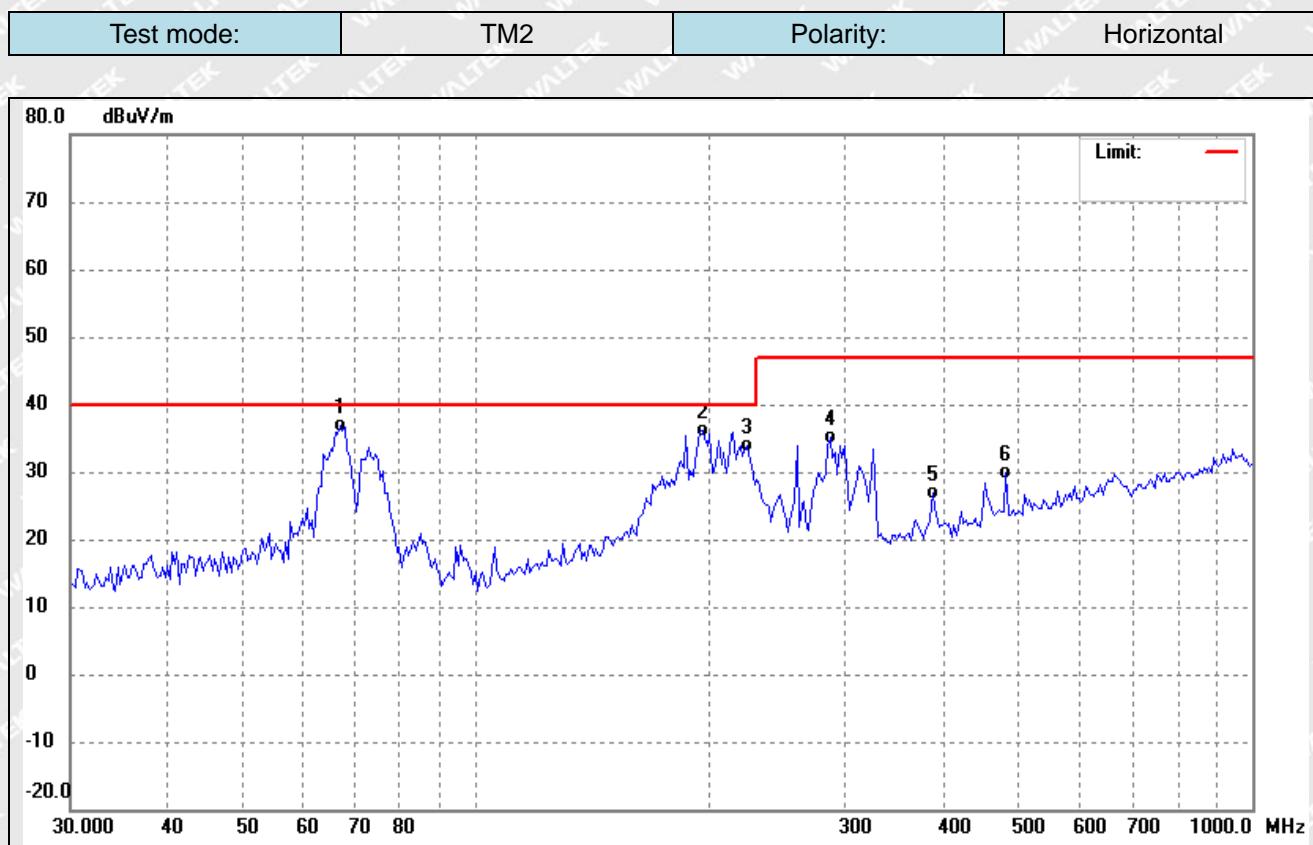
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	50.4614	32.17	-8.14	24.03	40.00	-15.97	-	-	QP
2	77.4680	39.56	-12.41	27.15	40.00	-12.85	-	-	QP
3	185.1626	38.58	-10.89	27.69	40.00	-12.31	-	-	QP
4	274.4464	33.29	-9.13	24.16	47.00	-22.84	-	-	QP
5	455.1888	29.03	-4.52	24.51	47.00	-22.49	-	-	QP
6	607.1806	30.58	-1.64	28.94	47.00	-18.06	-	-	QP



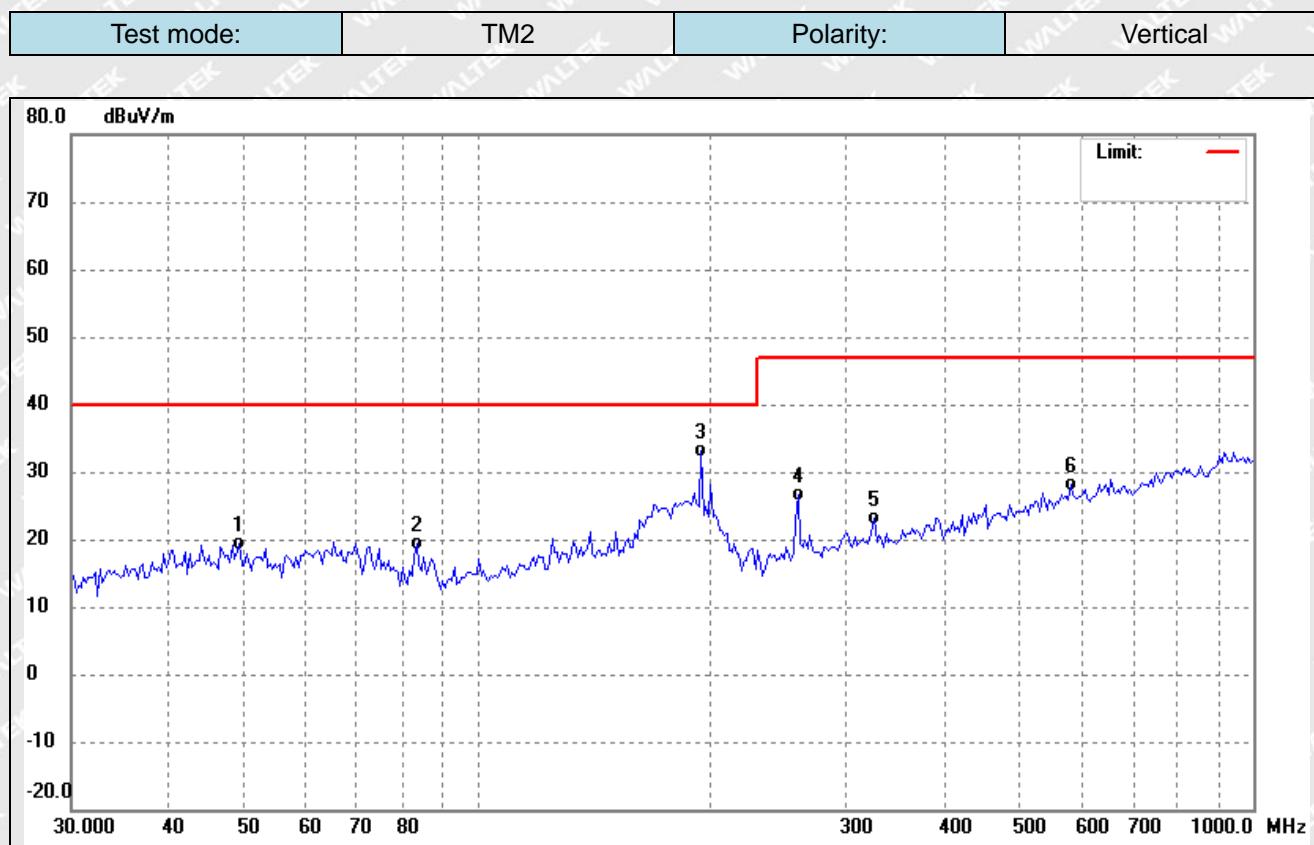
Test mode:	TM1	Polarity:	Vertical
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No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	41.7406	36.77	-8.47	28.30	40.00	-11.70	-	-	QP
2	50.1080	36.77	-8.09	28.68	40.00	-11.32	-	-	QP
3	78.0143	43.55	-12.53	31.02	40.00	-8.98	-	-	QP
4	132.1490	38.18	-9.76	28.42	40.00	-11.58	-	-	QP
5	155.3305	36.44	-8.61	27.83	40.00	-12.17	-	-	QP
6	318.0875	30.61	-7.75	22.86	47.00	-24.14	-	-	QP



No.	Frequency (MHz)	Reading (dB μ V/m)	Correct dB/m	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	66.8395	47.15	-10.18	36.97	40.00	-3.03	-	-	QP
2	195.8701	47.81	-11.75	36.06	40.00	-3.94	-	-	QP
3	223.8482	45.74	-11.89	33.85	40.00	-6.15	-	-	QP
4	286.2653	43.93	-8.72	35.21	47.00	-11.79	-	-	QP
5	387.2565	33.02	-6.22	26.80	47.00	-20.20	-	-	QP
6	481.5112	33.97	-4.15	29.82	47.00	-17.18	-	-	QP



No.	Frequency (MHz)	Reading (dB μ V/m)	Correct dB/m	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	49.4087	27.44	-8.13	19.31	40.00	-20.69	-	-	QP
2	83.6937	32.44	-13.01	19.43	40.00	-20.57	-	-	QP
3	194.4985	44.88	-11.67	33.21	40.00	-6.79	-	-	QP
4	259.4434	36.35	-9.79	26.56	47.00	-20.44	-	-	QP
5	324.8645	30.62	-7.55	23.07	47.00	-23.93	-	-	QP
6	582.1122	30.36	-2.11	28.25	47.00	-18.75	-	-	QP

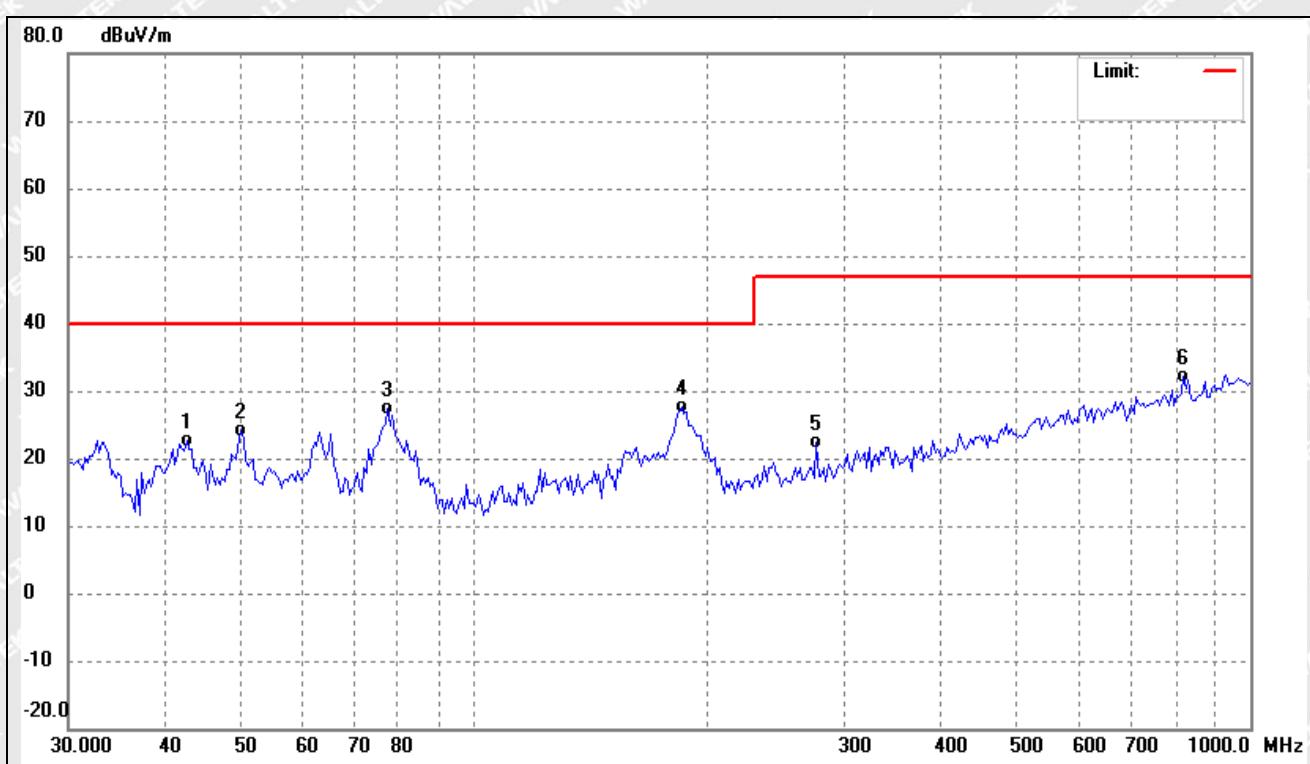


Test mode:

TM3

Polarity:

Horizontal



No.	Frequency (MHz)	Reading (dB μ V/m)	Correct dB/m	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	42.6299	31.05	-8.48	22.57	40.00	-17.43	-	-	QP
2	50.1080	32.30	-8.09	24.21	40.00	-15.79	-	-	QP
3	77.4680	39.78	-12.41	27.37	40.00	-12.63	-	-	QP
4	185.1626	38.56	-10.89	27.67	40.00	-12.33	-	-	QP
5	276.3818	31.41	-9.06	22.35	47.00	-24.65	-	-	QP
6	821.3871	31.59	0.49	32.08	47.00	-14.92	-	-	QP

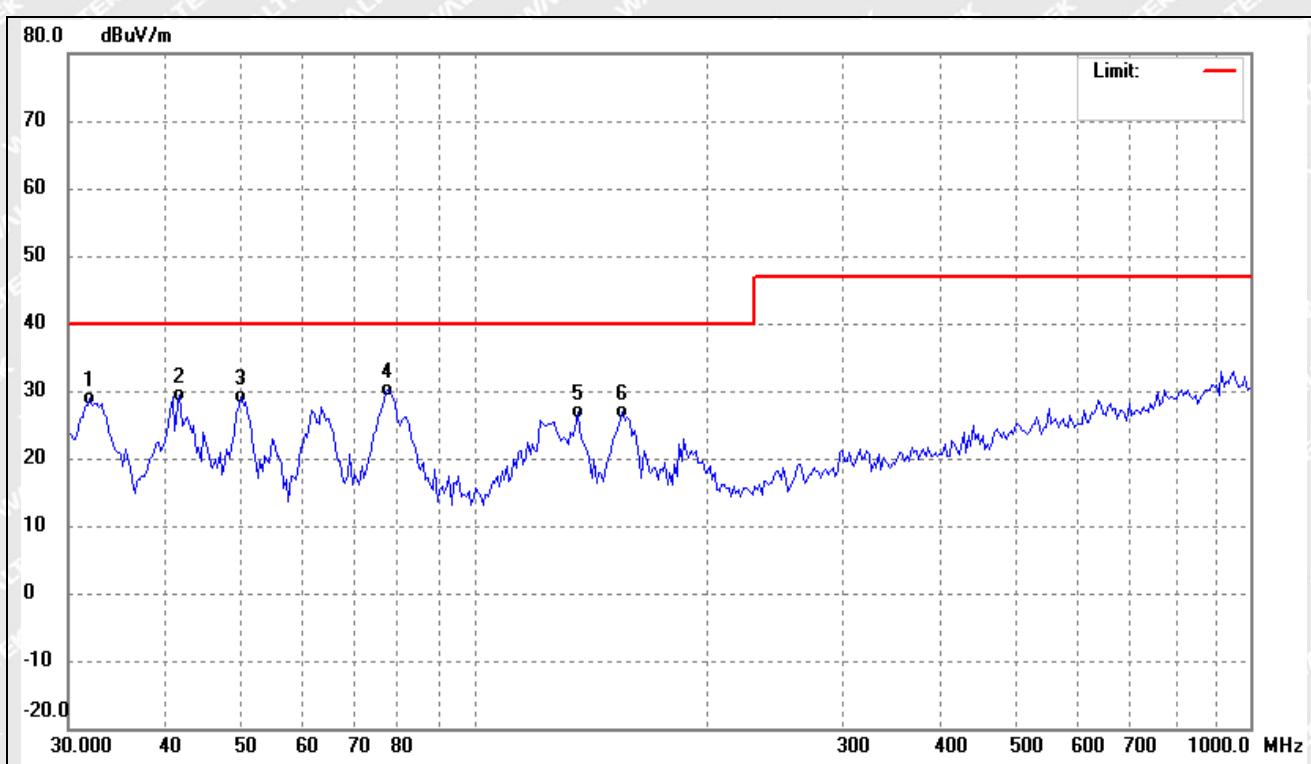


Test mode:

TM3

Polarity:

Vertical



No.	Frequency (MHz)	Reading (dB μ V/m)	Correct dB/m	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	31.9586	38.78	-9.94	28.84	40.00	-11.16	-	-	QP
2	41.7406	37.90	-8.47	29.43	40.00	-10.57	-	-	QP
3	50.1080	37.10	-8.09	29.01	40.00	-10.99	-	-	QP
4	77.4680	42.45	-12.41	30.04	40.00	-9.96	-	-	QP
5	135.9163	36.47	-9.61	26.86	40.00	-13.14	-	-	QP
6	155.3305	35.37	-8.61	26.76	40.00	-13.24	-	-	QP

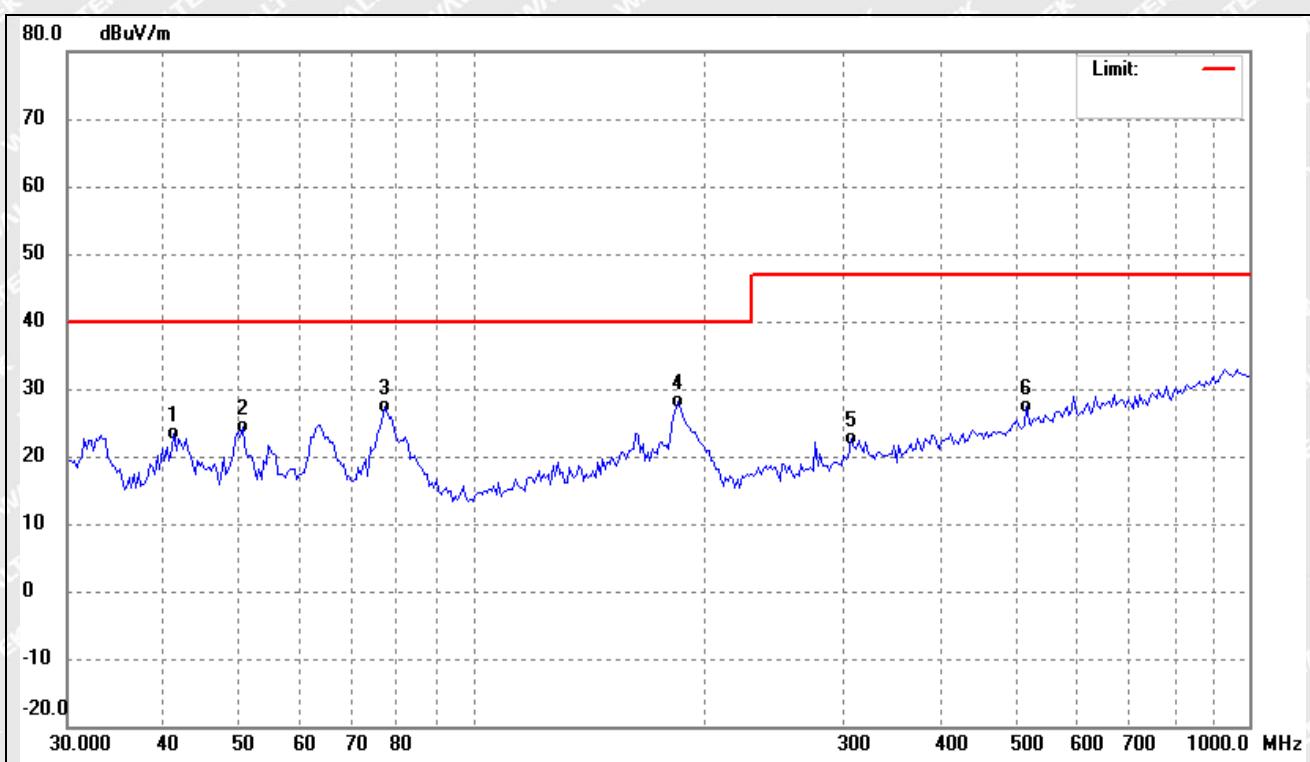


Test mode:

TM4

Polarity:

Horizontal



No.	Frequency (MHz)	Reading (dB μ V/m)	Correct dB/m	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	41.1581	31.76	-8.48	23.28	40.00	-16.72	-	-	QP
2	50.4614	32.59	-8.14	24.45	40.00	-15.55	-	-	QP
3	76.9256	39.66	-12.28	27.38	40.00	-12.62	-	-	QP
4	183.8660	38.87	-10.74	28.13	40.00	-11.87	-	-	QP
5	307.1053	30.78	-8.06	22.72	47.00	-24.28	-	-	QP
6	516.5651	30.99	-3.65	27.34	47.00	-19.66	-	-	QP

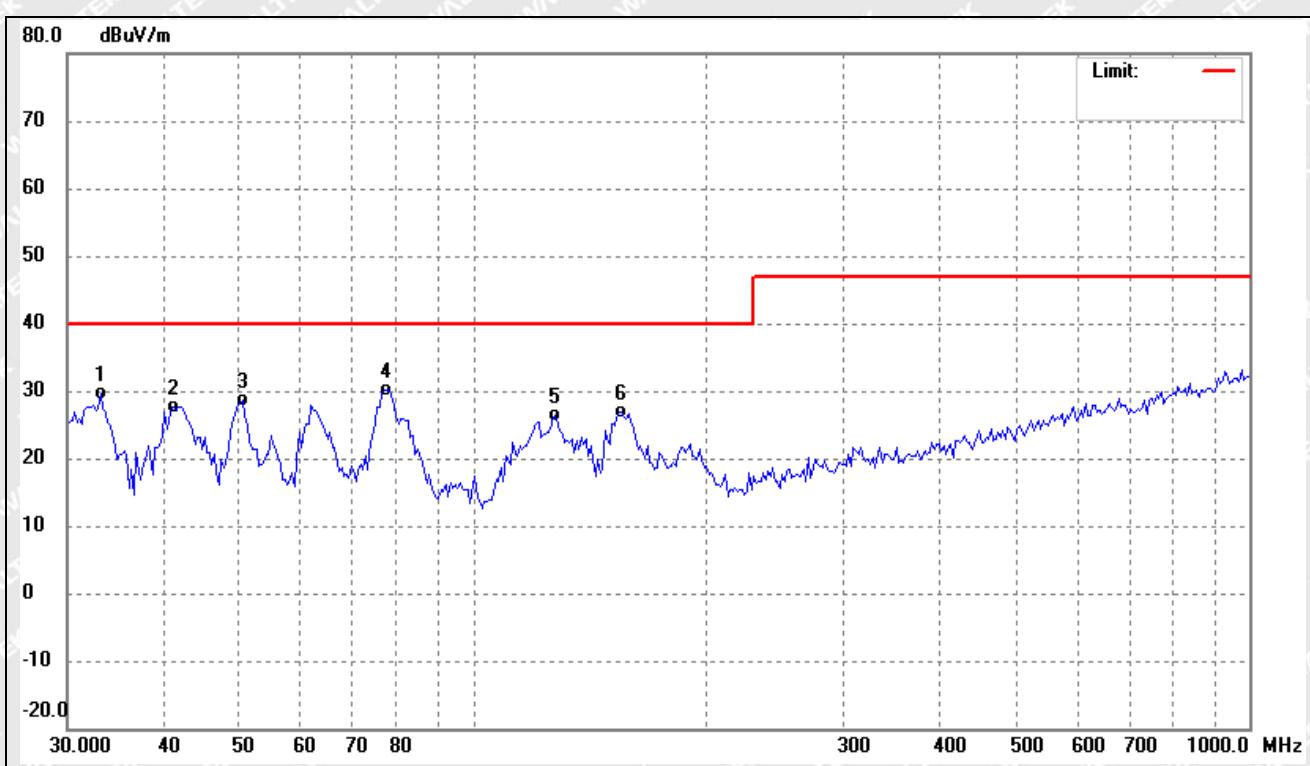


Test mode:

TM4

Polarity:

Vertical

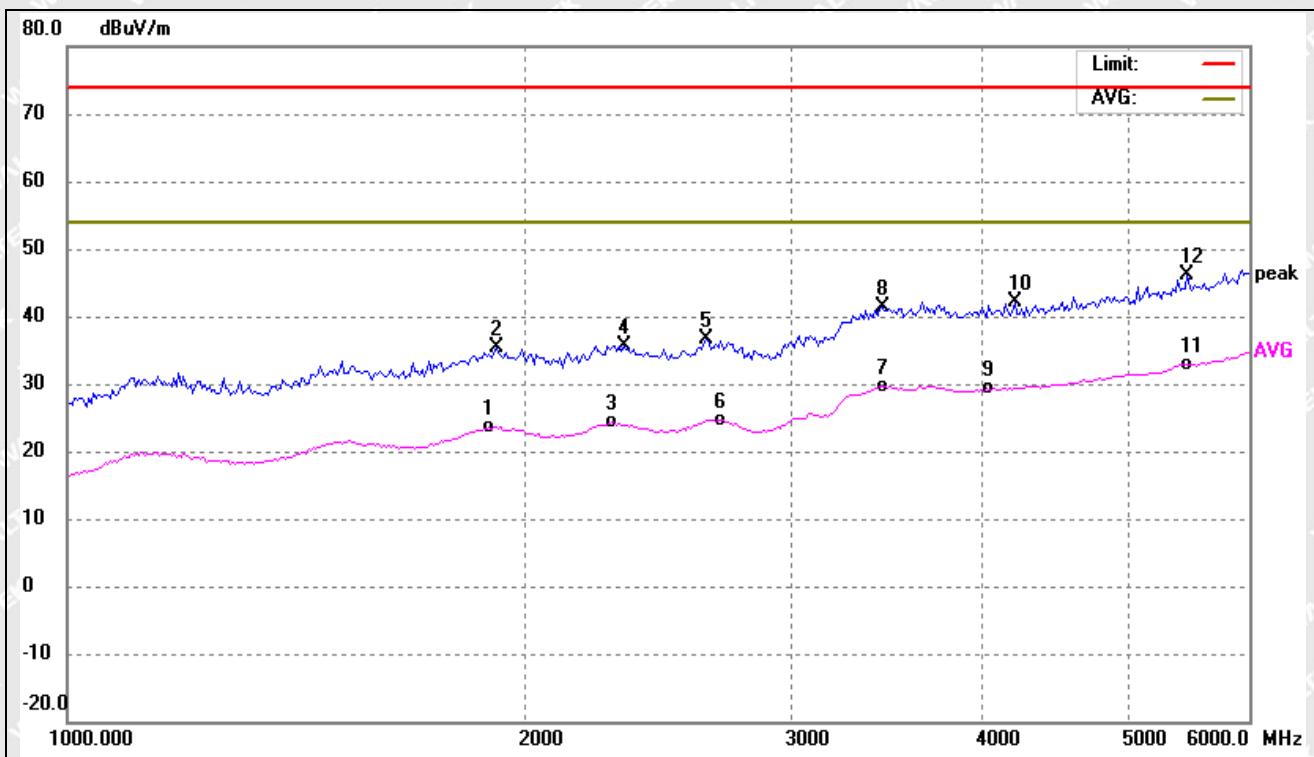


No.	Frequency (MHz)	Reading (dB μ V/m)	Correct dB/m	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	33.1015	39.55	-9.80	29.75	40.00	-10.25	-	-	QP
2	41.1581	36.23	-8.48	27.75	40.00	-12.25	-	-	QP
3	50.4614	36.67	-8.14	28.53	40.00	-11.47	-	-	QP
4	76.9256	42.51	-12.28	30.23	40.00	-9.77	-	-	QP
5	127.5865	36.37	-10.01	26.36	40.00	-13.64	-	-	QP
6	154.2428	35.39	-8.60	26.79	40.00	-13.21	-	-	QP

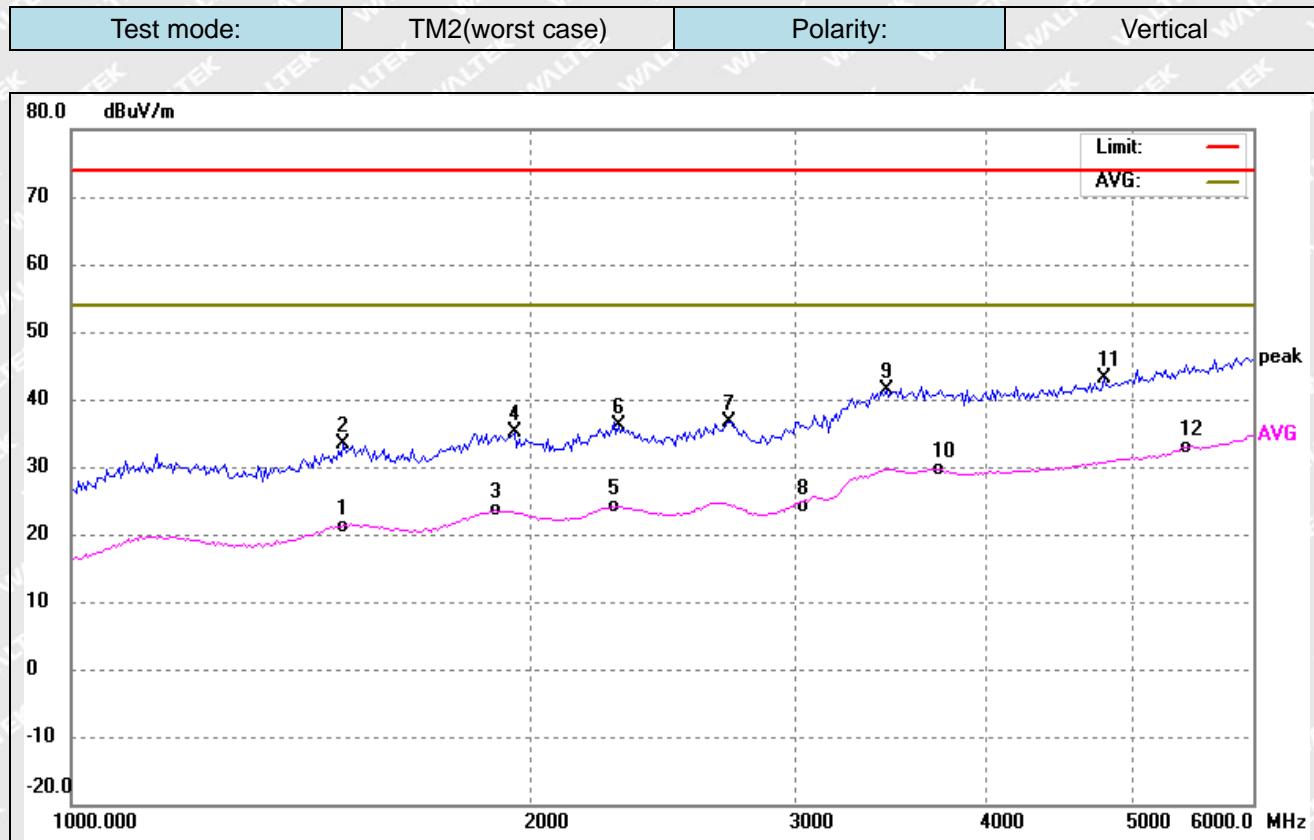


➤ Above 1GHz

Test mode:	TM2(worst case)	Polarity:	Horizontal
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No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	1894.859	43.79	-20.25	23.54	54.00	-30.46	-	-	AVG
2	1915.381	55.54	-20.13	35.41	74.00	-38.59	-	-	peak
3	2283.846	43.34	-19.07	24.27	54.00	-29.73	-	-	AVG
4	2325.220	54.72	-18.99	35.73	74.00	-38.27	-	-	peak
5	2636.597	55.09	-18.37	36.72	74.00	-37.28	-	-	peak
6	2694.017	42.99	-18.26	24.73	54.00	-29.27	-	-	AVG
7	3426.743	44.28	-14.70	29.58	54.00	-24.42	-	-	AVG
8	3439.069	56.07	-14.62	41.45	74.00	-32.55	-	-	peak
9	4027.685	44.09	-14.69	29.40	54.00	-24.60	-	-	AVG
10	4205.025	56.28	-14.10	42.18	74.00	-31.82	-	-	peak
11	5426.096	43.18	-10.30	32.88	54.00	-21.12	-	-	AVG
12	5465.203	56.14	-10.10	46.04	74.00	-27.96	-	-	peak



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ()	Height (cm)	Remark
1	1500.426	43.87	-22.62	21.25	54.00	-32.75	-	-	AVG
2	1511.240	55.87	-22.55	33.32	74.00	-40.68	-	-	peak
3	1901.676	43.92	-20.21	23.71	54.00	-30.29	-	-	AVG
4	1957.094	55.02	-19.88	35.14	74.00	-38.86	-	-	peak
5	2283.846	43.23	-19.07	24.16	54.00	-29.84	-	-	AVG
6	2292.062	55.18	-19.06	36.12	74.00	-37.88	-	-	peak
7	2713.433	54.92	-18.22	36.70	74.00	-37.30	-	-	peak
8	2989.672	41.90	-17.66	24.24	54.00	-29.76	-	-	AVG
9	3439.069	55.88	-14.62	41.26	74.00	-32.74	-	-	peak
10	3708.419	44.17	-14.44	29.73	54.00	-24.27	-	-	AVG
11	4785.284	55.89	-12.69	43.20	74.00	-30.80	-	-	peak
12	5406.647	43.17	-10.38	32.79	54.00	-21.21	-	-	AVG

Remark: '-'Means' the test Degree and Height are not recorded by the test software and only show the worst case in the test report.

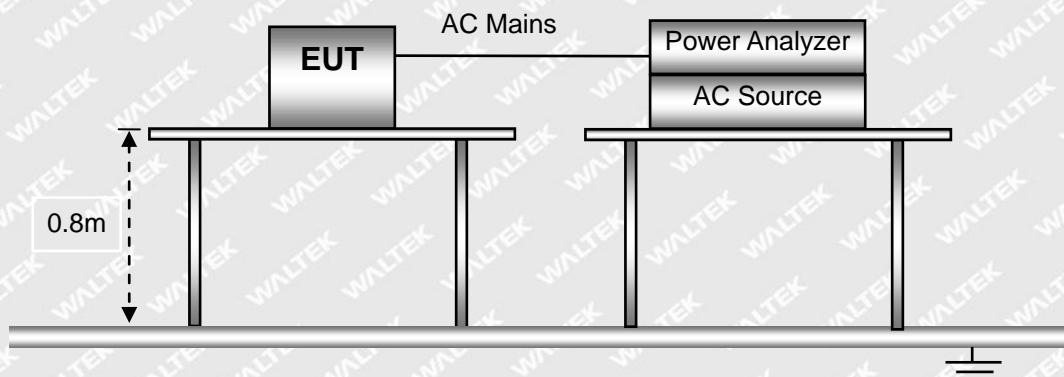


5. Harmonic Current Emissions

5.1 Test Procedure

Test is conducting under the description of EN IEC 61000-3-2.

5.2 Test Setup Block Diagram



5.3 Test Standards

EN IEC 61000-3-2, Clause 7.2 Limits for Class A equipment.

5.4 Environmental Conditions

Temperature:	22 °C
Relative Humidity:	53%
ATM Pressure:	1015 mbar

5.5 Harmonic Current Emissions Test Data



Harmonics – Class-A

Test category: Class-A (European limits)

Test Margin: 100

Test date: 2023/6/16

Start time: 14:23:06

End time: 14:25:47

Test duration (min): 2.5

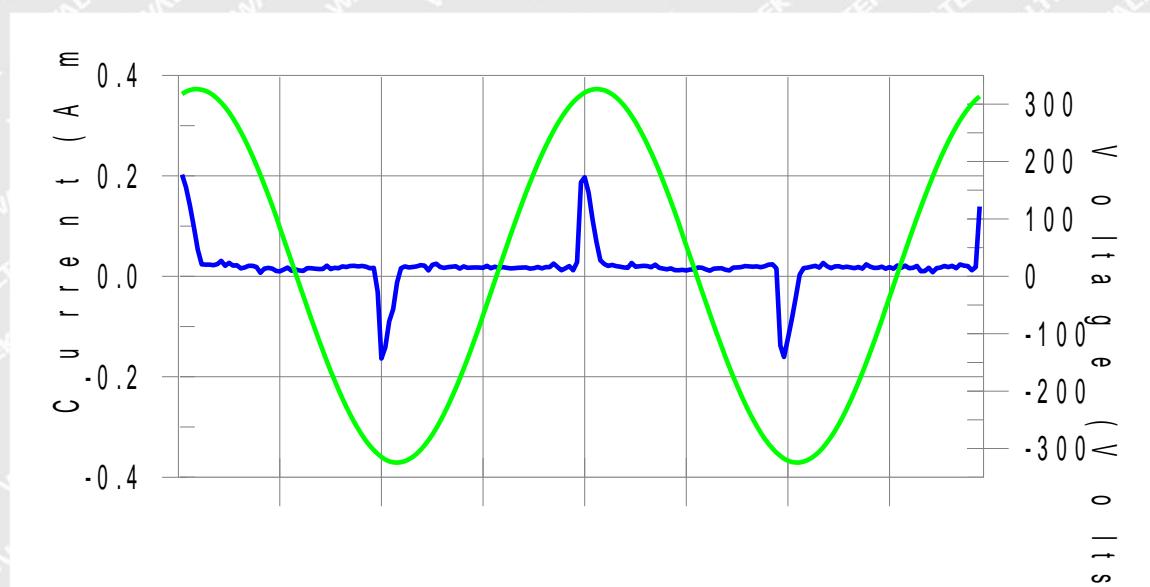
Data file name: H-000415.cts_data

Comment: TM1

Test Result: Pass

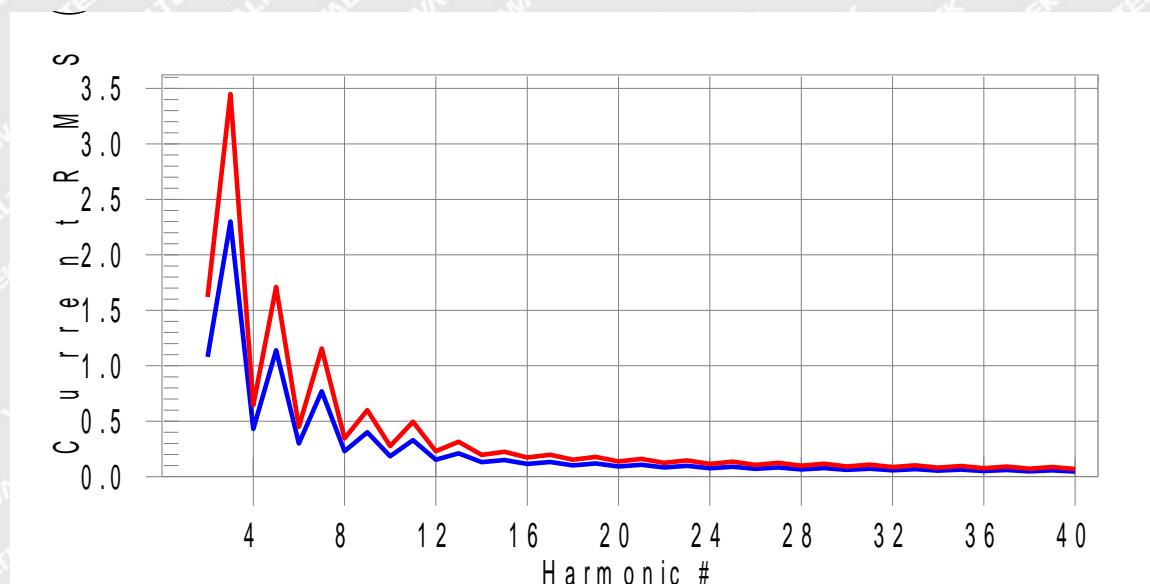
Source qualification: Normal

Current & voltage waveforms



Harmonics and Class A limit line

European Limits



Test result: Pass

Worst harmonics H15-3.4% of 150% limit, H15-4.5% of 100% limit



Current Test Result Summary (Run time)

Test category: Class-A (European limits)

Test Margin: 100

Test date: 2023/6/16

Start time: 14:23:06

End time: 14:25:47

Test duration (min): 2.5

Data file name: H-000415.cts_data

Comment: TM1

Test Result: Pass

Source qualification: Normal

THC(A): 0.033

I-THD(%): 179.7

POHC(A): 0.008

POHC Limit(A): 0.251

Highest parameter values during test:

V_RMS (Volts):	230.14	Frequency(Hz):	50.00
I_Peak (Amps):	0.222	I_RMS (Amps):	0.046
I_Fund (Amps):	0.018	Crest Factor:	9.455
Power (Watts):	4.2	Power Factor:	0.408

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.001	1.080	N/A	0.001	1.620	N/A	Pass
3	0.015	2.300	0.7	0.018	3.450	0.5	Pass
4	0.001	0.430	N/A	0.001	0.645	N/A	Pass
5	0.015	1.140	1.3	0.016	1.710	1.0	Pass
6	0.000	0.300	N/A	0.001	0.450	N/A	Pass
7	0.013	0.770	1.7	0.015	1.155	1.3	Pass
8	0.000	0.230	N/A	0.000	0.345	N/A	Pass
9	0.012	0.400	3.0	0.013	0.600	2.2	Pass
10	0.000	0.184	N/A	0.000	0.276	N/A	Pass
11	0.010	0.330	3.1	0.012	0.495	2.3	Pass
12	0.000	0.153	N/A	0.000	0.230	N/A	Pass
13	0.008	0.210	4.0	0.010	0.315	3.1	Pass
14	0.000	0.131	N/A	0.000	0.197	N/A	Pass
15	0.007	0.150	4.5	0.008	0.225	3.4	Pass
16	0.000	0.115	N/A	0.000	0.173	N/A	Pass
17	0.005	0.132	4.0	0.006	0.198	3.1	Pass
18	0.000	0.102	N/A	0.000	0.153	N/A	Pass
19	0.004	0.118	N/A	0.005	0.178	N/A	Pass
20	0.000	0.092	N/A	0.000	0.138	N/A	Pass
21	0.003	0.107	N/A	0.004	0.161	N/A	Pass
22	0.000	0.084	N/A	0.000	0.125	N/A	Pass
23	0.003	0.098	N/A	0.003	0.147	N/A	Pass
24	0.000	0.077	N/A	0.000	0.115	N/A	Pass
25	0.003	0.090	N/A	0.003	0.135	N/A	Pass
26	0.000	0.071	N/A	0.000	0.107	N/A	Pass



27	0.003	0.083	N/A	0.003	0.125	N/A	Pass
28	0.000	0.066	N/A	0.000	0.099	N/A	Pass
29	0.003	0.078	N/A	0.003	0.116	N/A	Pass
30	0.000	0.061	N/A	0.000	0.092	N/A	Pass
31	0.002	0.073	N/A	0.003	0.109	N/A	Pass
32	0.000	0.058	N/A	0.000	0.086	N/A	Pass
33	0.002	0.068	N/A	0.002	0.102	N/A	Pass
34	0.000	0.054	N/A	0.000	0.081	N/A	Pass
35	0.002	0.064	N/A	0.002	0.096	N/A	Pass
36	0.000	0.051	N/A	0.000	0.077	N/A	Pass
37	0.002	0.061	N/A	0.002	0.091	N/A	Pass
38	0.000	0.048	N/A	0.000	0.073	N/A	Pass
39	0.001	0.058	N/A	0.002	0.087	N/A	Pass
40	0.000	0.046	N/A	0.000	0.069	N/A	Pass

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Voltage Source Verification Data (Run time)

Test category: Class-A (European limits)

Test Margin: 100

Test date: 2023/6/16

Start time: 14:23:06

End time: 14:25:47

Test duration (min): 2.5

Data file name: H-000415.cts_data

Comment: TM1

Test Result: Pass

Source qualification: Normal

Highest parameter values during test:

Voltage (Vrms):	230.14	Frequency(Hz):	50.00
I_Peak (Amps):	0.222	I_RMS (Amps):	0.046
I_Fund (Amps):	0.018	Crest Factor:	9.455
Power (Watts):	4.2	Power Factor:	0.408

Harm#	Harmonics	V-rms	Limit V-rms	% of Limit	Status
2		0.068	0.460	14.82	OK
3		0.516	2.071	24.91	OK
4		0.080	0.460	17.43	OK
5		0.063	0.920	6.82	OK
6		0.031	0.460	6.79	OK
7		0.029	0.690	4.19	OK
8		0.015	0.460	3.27	OK
9		0.016	0.460	3.37	OK
10		0.011	0.460	2.39	OK
11		0.018	0.230	7.66	OK
12		0.011	0.230	4.74	OK
13		0.013	0.230	5.53	OK
14		0.007	0.230	2.93	OK
15		0.017	0.230	7.60	OK
16		0.008	0.230	3.36	OK
17		0.012	0.230	5.05	OK
18		0.012	0.230	5.09	OK
19		0.014	0.230	5.90	OK
20		0.015	0.230	6.65	OK
21		0.008	0.230	3.57	OK
22		0.004	0.230	1.56	OK
23		0.007	0.230	3.08	OK
24		0.003	0.230	1.43	OK
25		0.007	0.230	3.07	OK
26		0.003	0.230	1.45	OK
27		0.010	0.230	4.37	OK



28	0.004	0.230	1.77	OK
29	0.008	0.230	3.52	OK
30	0.004	0.230	1.65	OK
31	0.007	0.230	3.04	OK
32	0.003	0.230	1.20	OK
33	0.008	0.230	3.37	OK
34	0.002	0.230	1.07	OK
35	0.006	0.230	2.75	OK
36	0.003	0.230	1.22	OK
37	0.007	0.230	3.03	OK
38	0.002	0.230	1.07	OK
39	0.006	0.230	2.57	OK
40	0.007	0.230	3.24	OK

A large, semi-transparent watermark of the word 'WALTEK' in a bold, white, sans-serif font.

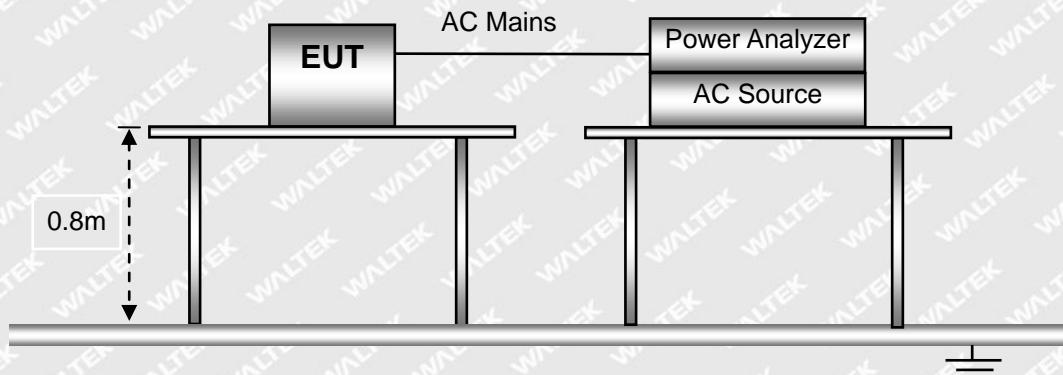


6. Voltage Fluctuation and Flicker

6.1 Test Procedure

Test is conducting under the description of EN 61000-3-3.

6.2 Test Setup Block Diagram



6.3 Test Standards

EN 61000-3-3, Limit: Clause 5.

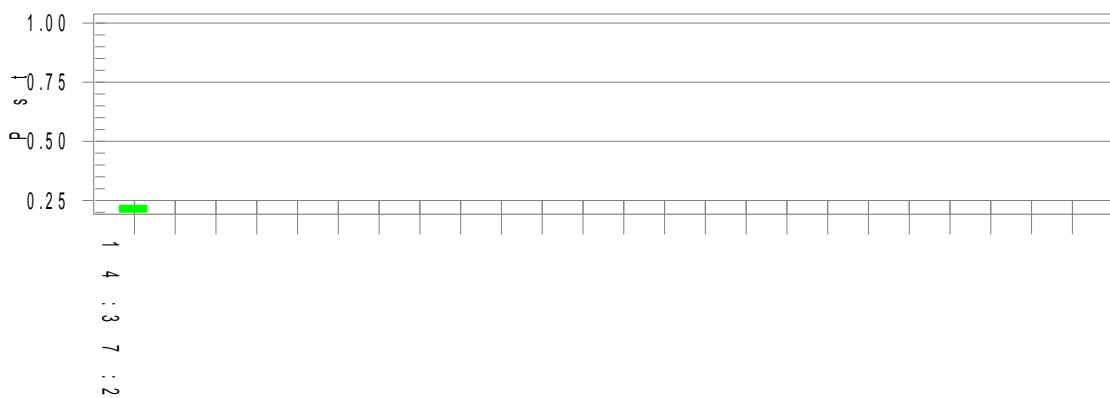
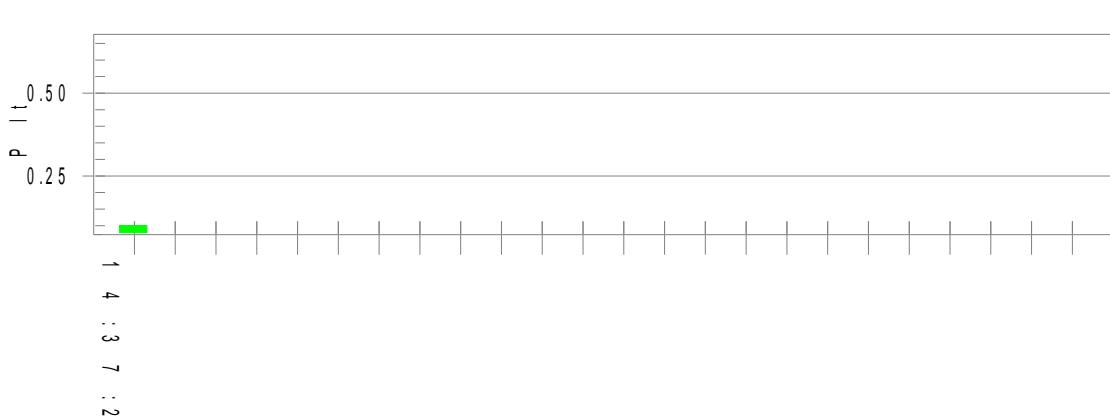
6.4 Environmental Conditions

Temperature:	22 °C
Relative Humidity:	53%
ATM Pressure:	1015 mbar

6.5 Voltage Fluctuation and Flicker Test Data



Test mode:	TM1(worst case)
------------	-----------------

Test Result: Pass**Status: Test Completed****Pst_i and limit line****European Limits****Plt and limit line****Parameter values recorded during the test:**

Vrms at the end of test (Volt): 230.07

Highest dt (%):

T-max (mS):	0	Test limit (%):	500.0	Pass
Highest dc (%):	0.00	Test limit (%):	3.30	Pass
Highest dmax (%):	0.00	Test limit (%):	4.00	Pass
Highest Pst (10 min. period):	0.230	Test limit:	1.000	Pass
Highest Plt (2 hr. period):	0.101	Test limit:	0.650	Pass

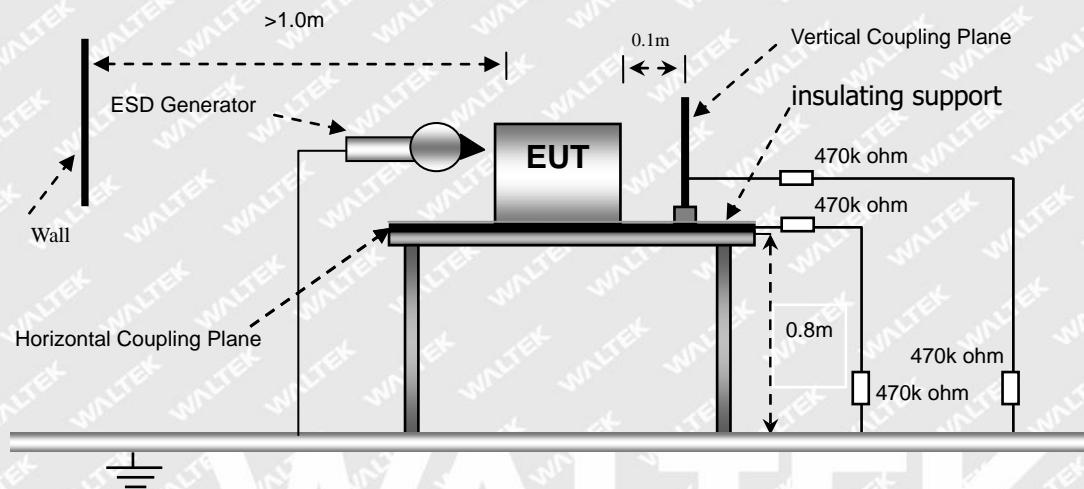


7. Electrostatic Discharge (ESD)

7.1 Test Procedure

Test is conducting under the description of EN 61000-4-2.

7.2 Test Setup Block Diagram



7.3 Test Performance

Required Performance Criterion:	B
Mode:	TM1-TM19
Note: TM6-TM19 for TT,TR; TM5 for TR	

7.4 Environmental Conditions

Temperature:	22 °C
Relative Humidity:	53%
ATM Pressure:	1011 mbar

7.5 Electrostatic Discharge Immunity Test Data



Test mode	TM1-TM7							
EN 61000-4-2	Test Levels (kV)							
	-2	+2	-4	+4	-6	+6	-8	+8
Air Discharge								
Button	A	A	A	A	A	A	A	A
Screen	A	A	A	A	A	A	A	A
Gap	A	A	A	A	A	A	A	A
Camera	A	A	A	A	A	A	A	A
Earphone Port	A	A	A	A	A	A	A	A
USB Port	A	A	A	A	A	A	A	A
Direct Contact Discharge								
/	/	/	/	/	/	/	/	/
Indirect Contact Discharge								
HCP (6 Sides)	A	A	A	A	/	/	/	/
VCP (4 Sides)	A	A	A	A	/	/	/	/

Test mode	TM8-TM19							
EN 61000-4-2	Test Levels (kV)							
	-2	+2	-4	+4	-6	+6	-8	+8
Air Discharge								
Button	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Screen	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Gap	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Camera	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Earphone Port	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
USB Port	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
Direct Contact Discharge								
/	/	/	/	/	/	/	/	/
Indirect Contact Discharge								
HCP (6 Sides)	Pass	Pass	Pass	Pass	/	/	/	/
VCP (4 Sides)	Pass	Pass	Pass	Pass	/	/	/	/

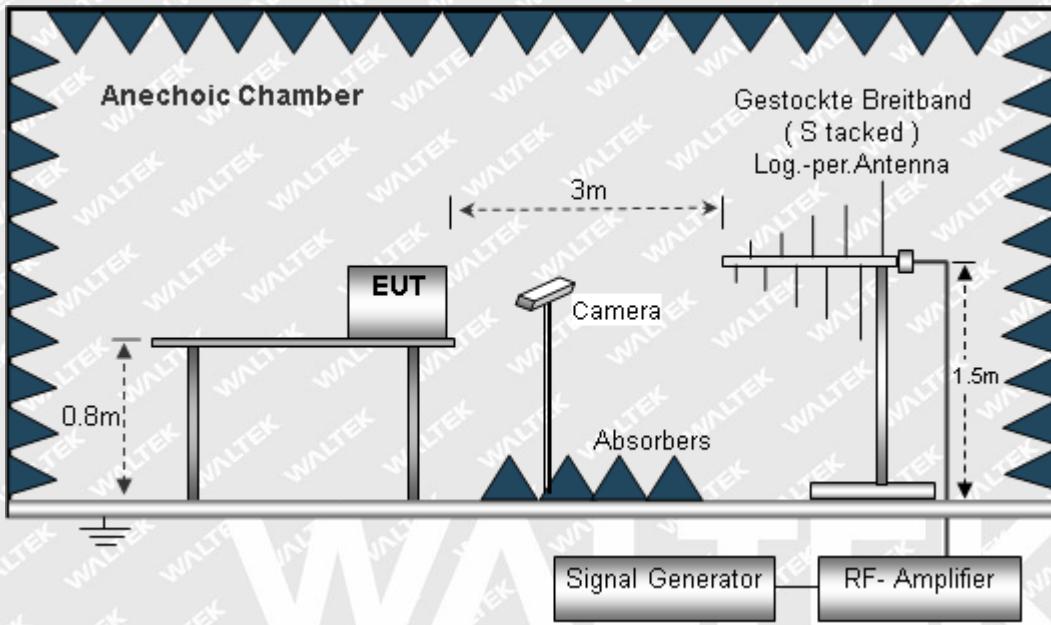


8. Radio Frequency Electromagnetic Field (R/S)

8.1 Test Procedure

Test is conducting under the description of EN 61000-4-3.

8.2 Test Setup Block Diagram



8.3 Test Performance

Required Performance Criterion:	A
Mode:	TM1-TM19
Note: TM6-TM19 for CT, CR; TM5 for CR	

8.4 Environmental Conditions

Temperature:	22 °C
Relative Humidity:	53%
ATM Pressure:	1011 mbar

8.5 Continuous Radiated Disturbances Test Data

Frequency step: 1% of fundamental

Dwell time: 1 second

Modulation: AM by 1kHz sine wave with 80% modulation depth



Test mode		TM1-TM3,TM6-TM7							
Frequency Range(MHz)	Field (V/m)	Front		Rear		Left Side		Right Side	
		VERT	HORI	VERT	HORI	VERT	HORI	VERT	HORI
80-1000	3	A	A	A	A	A	A	A	A
1000-3000	3	A	A	A	A	A	A	A	A
3000-6000	3	A	A	A	A	A	A	A	A

Test mode		GPS							
Frequency Range(MHz)	Field (V/m)	Front		Rear		Left Side		Right Side	
		VERT	HORI	VERT	HORI	VERT	HORI	VERT	HORI
80-1000	3	A	A	A	A	A	A	A	A
1000-3000	3	A	A	A	A	A	A	A	A
3000-6000	3	A	A	A	A	A	A	A	A

Test mode		FM							
Frequency Range(MHz)	Field (V/m)	Front		Rear		Left Side		Right Side	
		VERT	HORI	VERT	HORI	VERT	HORI	VERT	HORI
80-1000	3	A	A	A	A	A	A	A	A
Additional test frequency									
Spot frequencies	Field (V/m)	Front		Rear		Left Side		Right Side	
		VERT	HORI	VERT	HORI	VERT	HORI	VERT	HORI
1800	3	A	A	A	A	A	A	A	A
2600	3	A	A	A	A	A	A	A	A
3500	3	A	A	A	A	A	A	A	A
5000	3	A	A	A	A	A	A	A	A



Test mode:		TM8-TM19			
Type	Antenna Polar.	Observation item	Test Result	Limit	Result
GSM900	VERT/HORI	Speech output level	-45.57dB	<-35	Pass
		RXQUAL value	1.24	<3	
DCS1800	VERT/HORI	Speech output level	-45.69dB	<-35	Pass
		RXQUAL value	0.97	<3	
WCDMA Band 1	VERT/HORI	Speech output level	-46.54dB	<-35	Pass
		BER	0	<0.001	
WCDMA Band 8	VERT/HORI	Speech output level	-45.26dB	<-35	Pass
		BER	0	<0.001	
LTE Band 1	VERT/HORI	Throughput	100	>95	Pass
LTE Band 3	VERT/HORI	Throughput	100	>95	Pass
LTE Band 7	VERT/HORI	Throughput	100	>95	Pass
LTE Band 8	VERT/HORI	Throughput	100	>95	Pass
LTE Band 20	VERT/HORI	Throughput	100	>95	Pass
LTE Band 28	VERT/HORI	Throughput	100	>95	Pass
LTE Band 39	VERT/HORI	Throughput	100	>95	Pass
LTE Band 40	VERT/HORI	Throughput	100	>95	Pass

Idle mode cannot get any unintentionally operation.

Test Result: Pass



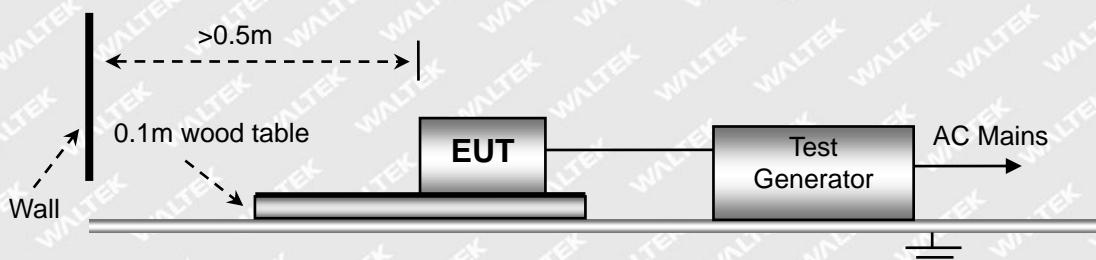
9. Fast Transients, Common Mode (EFT)

9.1 Test Procedure

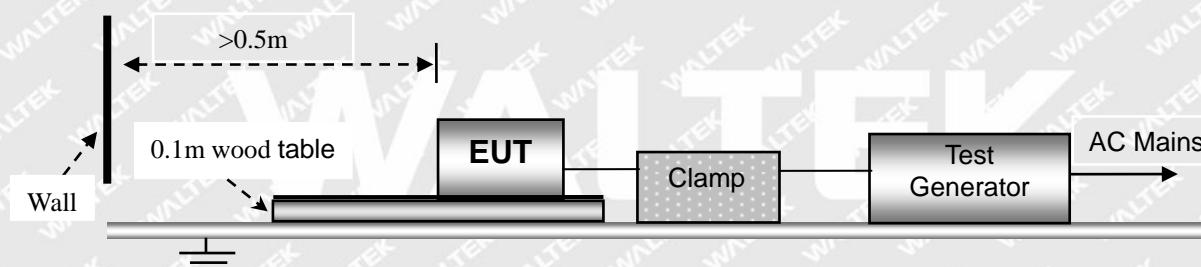
Test is conducting under the description of EN 61000-4-4.

9.2 Test Setup Block Diagram

For AC Mains or DC Ports:



For Signal or Telecommunication Ports:



9.3 Test Performance

Required Performance Criterion:	B
Mode:	TM1-TM19
Note: TM6-TM19 for TT,TR; TM5 for TR	

9.4 Environmental Conditions

Temperature:	22 °C
Relative Humidity:	53%
ATM Pressure:	1011 mbar

9.5 Electrical Fast Transients Test Data



Test Mode		TM1-TM7							
EN 61000-4-4 Test Line		Test Levels (kV)							
		+0.5	-0.5	+1.0	-1.0	+2.0	-2.0	+4.0	-4.0
AC Main Power port	L	A	A	A	A	/	/	/	/
	N	A	A	A	A	/	/	/	/
	PE	/	/	/	/	/	/	/	/
	L-N	A	A	A	A	/	/	/	/
	L-PE	/	/	/	/	/	/	/	/
	N-PE	/	/	/	/	/	/	/	/
	L-N-PE	/	/	/	/	/	/	/	/
Signal ports	/	/	/	/	/	/	/	/	/

Test Mode		TM8-TM19							
EN 61000-4-4 Test Line		Test Levels (kV)							
		+0.5	-0.5	+1.0	-1.0	+2.0	-2.0	+4.0	-4.0
AC Main Power port	L	Pass	Pass	Pass	Pass	/	/	/	/
	N	Pass	Pass	Pass	Pass	/	/	/	/
	PE	/	/	/	/	/	/	/	/
	L-N	Pass	Pass	Pass	Pass	/	/	/	/
	L-PE	/	/	/	/	/	/	/	/
	N-PE	/	/	/	/	/	/	/	/
	L-N-PE	/	/	/	/	/	/	/	/
Signal ports	/	/	/	/	/	/	/	/	/



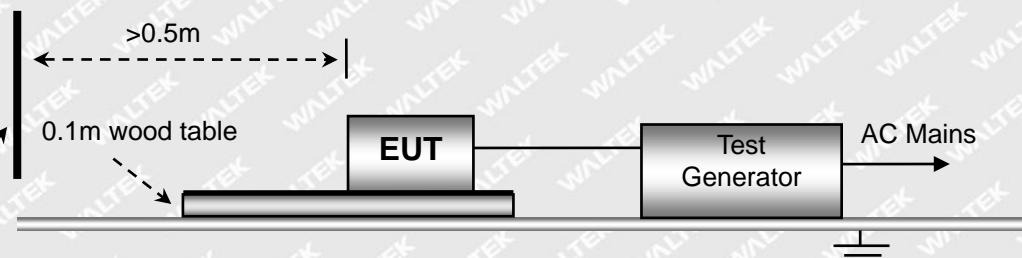
10. Surges

10.1 Test Procedure

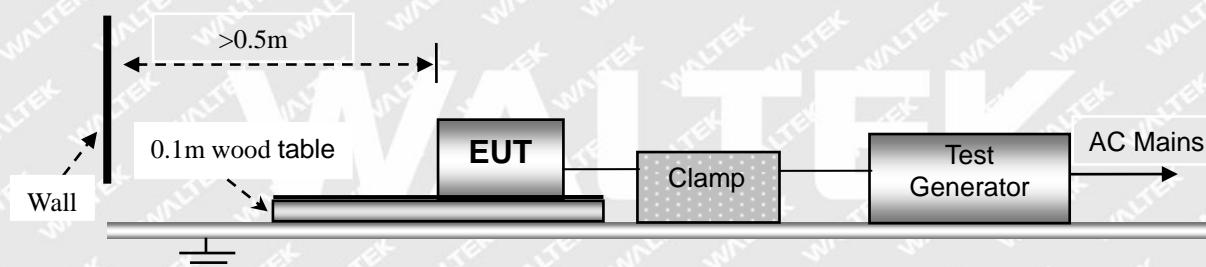
Test is conducting under the description of EN 61000-4-5.

10.2 Test Setup Block Diagram

For AC Mains or DC Ports:



For Signal or Telecommunication Ports:



10.3 Test Performance

Required Performance Criterion:	B
Mode:	TM1-TM19
Note: TM6-TM19 for TT,TR; TM5 for TR	

10.4 Environmental Conditions

Temperature:	22 °C
Relative Humidity:	53%
ATM Pressure:	1011 mbar

10.5 Surge Test Data



Test Mode	TM1-TM7			
Voltage	Poll	Path	Pass	Fail
0.5kV	±	L-N	A	/
1kV	±	L-N	A	/
2kV	±	L-N, L-PE, N-PE	/	/
4kV	±	L-N, L-PE, N-PE	/	/

Test Mode	TM8-TM19			
Voltage	Poll	Path	Pass	Fail
0.5kV	±	L-N	Pass	/
1kV	±	L-N	Pass	/
2kV	±	L-N, L-PE, N-PE	/	/
4kV	±	L-N, L-PE, N-PE	/	/



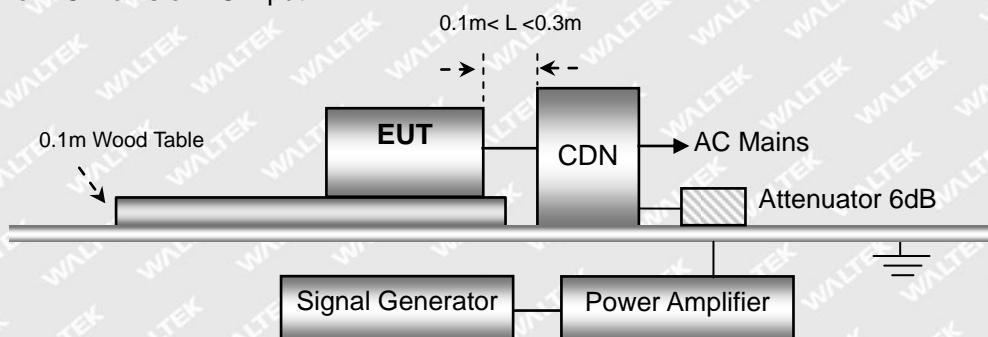
11. Radio Frequency, Common Mode (C/S)

11.1 Test Procedure

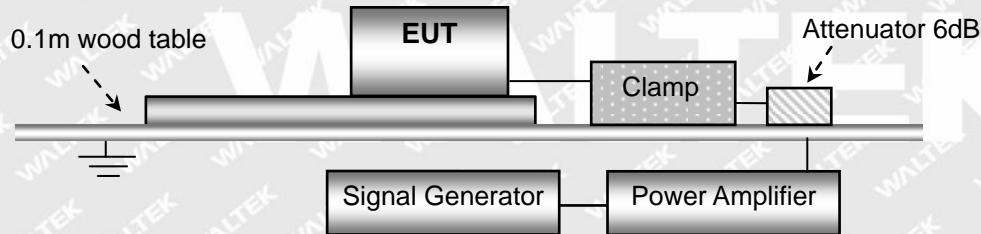
Test is conducting under the description of EN 61000-4-6.

11.2 Test Setup Block Diagram

For AC Mains or DC Input:



For Signal or Telecommunication Ports:



11.3 Test Performance

Required Performance Criterion:	A
Mode:	TM1-TM19
Note: TM6-TM19 for CT, CR; TM5 for CR	

11.4 Environmental Conditions

Temperature:	22 °C
Relative Humidity:	53%
ATM Pressure:	1011 mbar

11.5 Continuous Conducted Disturbances Test Data

Sweep frequency range: 150kHz~80MHz

Frequency step: 1% of fundamental

Dwell time: 1 second



Test Mode		TM1-TM3,TM5-TM7		
Level	Voltage (V) (rms, unmodulated)	Modulation:	Pass	Fail
1	1	AM 80%, 1kHz sinewave	/	/
2	3	AM 80%, 1kHz sinewave	A	/
3	10	AM 80%, 1kHz sinewave	/	/
X	Special	/	/	/

Test Mode		FM	Pass	Fail
Frequency (MHz)	Voltage (V) (rms, unmodulated)	Modulation:	Pass	Fail
0.15-80	3	AM 80%, 1kHz sinewave	A	/
10-30	3 to 1	AM 80%, 1kHz sinewave	A	/
30-80	1	AM 80%, 1kHz sinewave	A	/

Test Mode		TM11-TM18			
Type	Injected Position	Observation item	Test Result	Limit	Result
GSM900	AC Mains	Speech output level	-46.33dB	<-35	Pass
		RXQUAL value	1.01	<3	
DCS1800	AC Mains	Speech output level	-45.72dB	<-35	Pass
		RXQUAL value	1.08	<3	
WCDMA Band 1	AC Mains	Speech output level	-46.57dB	<-35	Pass
		BER	0	<0.001	
WCDMA Band 8	AC Mains	Speech output level	-46.61dB	<-35	Pass
		BER	0	<0.001	
LTE Band 1	AC Mains	Throughput	100	>95	Pass
LTE Band 3	AC Mains	Throughput	100	>95	Pass
LTE Band 7	AC Mains	Throughput	100	>95	Pass
LTE Band 8	AC Mains	Throughput	100	>95	Pass
LTE Band 20	AC Mains	Throughput	100	>95	Pass
LTE Band 28	AC Mains	Throughput	100	>95	Pass
LTE Band 38	AC Mains	Throughput	100	>95	Pass



LTE Band 40	AC Mains	Throughput	100	>95	Pass
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Idle mode cannot get any unintentionally operation.

Test Result: Pass

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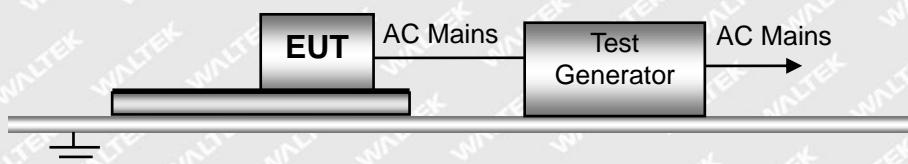


12. Voltage Dips and Interruptions

12.1 Test Procedure

Test is conducting under the description of EN 61000-4-11.

12.2 Test Setup Block Diagram



12.3 Test Performance

Required Performance Criterion:	B for voltage dip/ C for voltage interruption
Mode:	TM1-TM19
Note: TM6-TM19 for TT,TR; TM5 for TR	

12.4 Environmental Conditions

Temperature:	22 °C
Relative Humidity:	53%
ATM Pressure:	1011 mbar

12.5 Voltage Dips And Interruptions Test Data

U: Voltage dips in % U_T (U_T is rated voltage for the EUT)

T: Test duration

Level	U	T	Phase Angle	N	Pass	Fail
1	100%	10ms	0/90/180/270	3	A	/
2	100%	20ms	0/90/180/270	3	B	/
3	30%	500ms	0/90/180/270	3	B	/
4	100%	5000ms	0/90/180/270	3	B	/

Idle mode cannot get any unintentionally operation.

Test Result: Pass



EXHIBIT 1 - EUT PHOTOGRAPHS

Please refer to "ANNEX".

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EXHIBIT 2 - TEST SETUP PHOTOGRAPHS

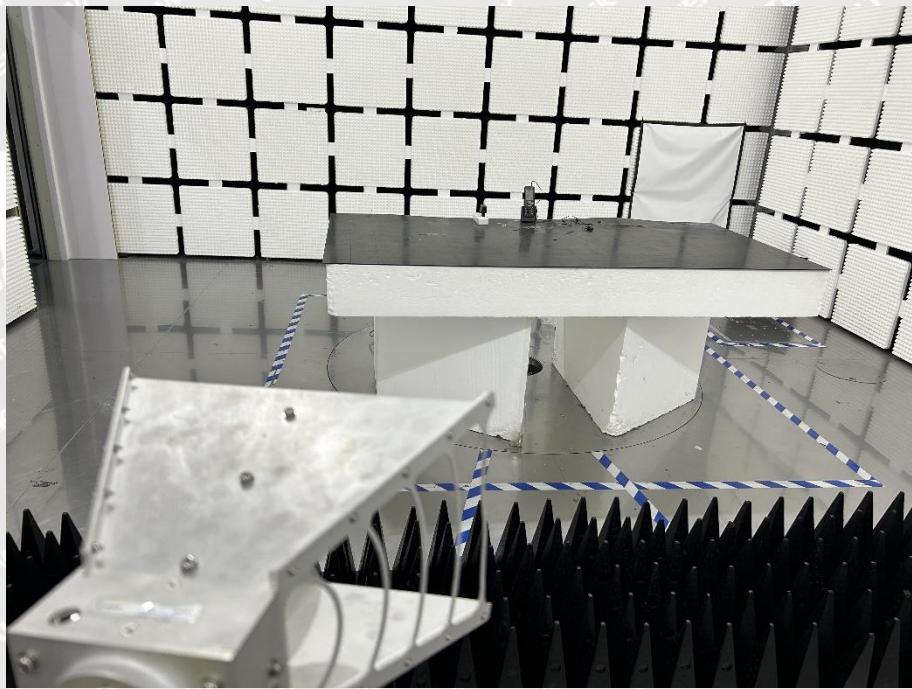
<p>Conducted Emission Test Setup</p>	 A photograph showing the conducted emission test setup. On the left, a blue and silver signal generator sits on a white bench. A black power cord connects it to a metal chassis on the floor. The chassis has several red knobs and a small green label. A black cable runs from the chassis up to a power strip mounted on a wall. To the right of the power strip, there's a red emergency stop button. Further right, a black device with a green label sits on the floor. In the background, a white telephone sits on a wooden surface.
<p>Radiation Emission Test View(30MHz to 1GHz)</p>	 A photograph of the radiation emission test view. A black rectangular device is positioned on a white rectangular platform. The platform sits on a circular white base. The entire setup is surrounded by a metal cage with a grid pattern. The floor is made of polished stainless steel. Blue and white striped caution tape is visible at the bottom of the cage.



**Radiation Emission
Test View(30MHz to
1GHz)**

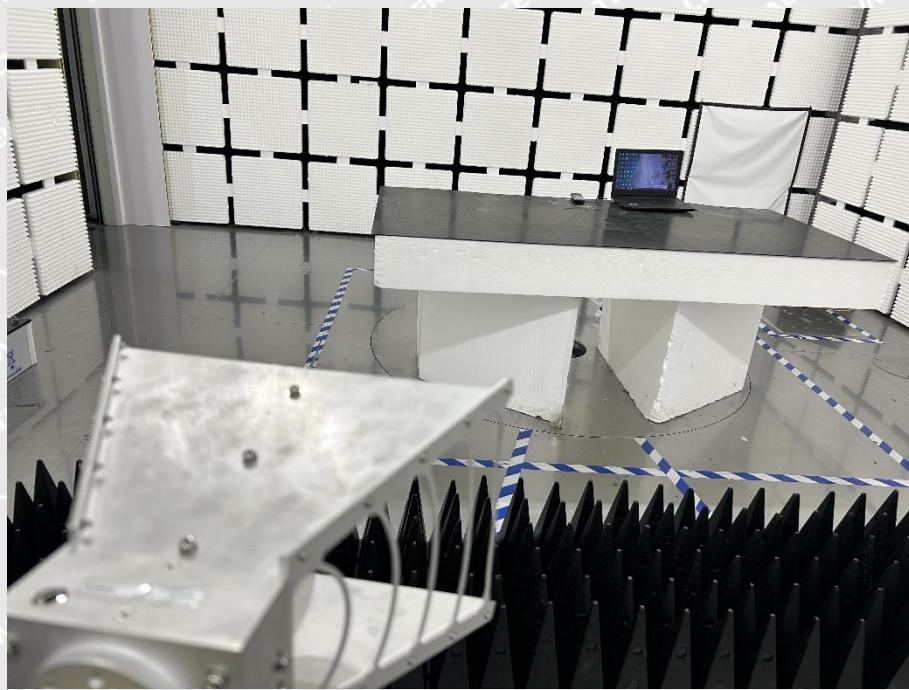


**Radiation Emission
Test Setup (Above
1GHz)**

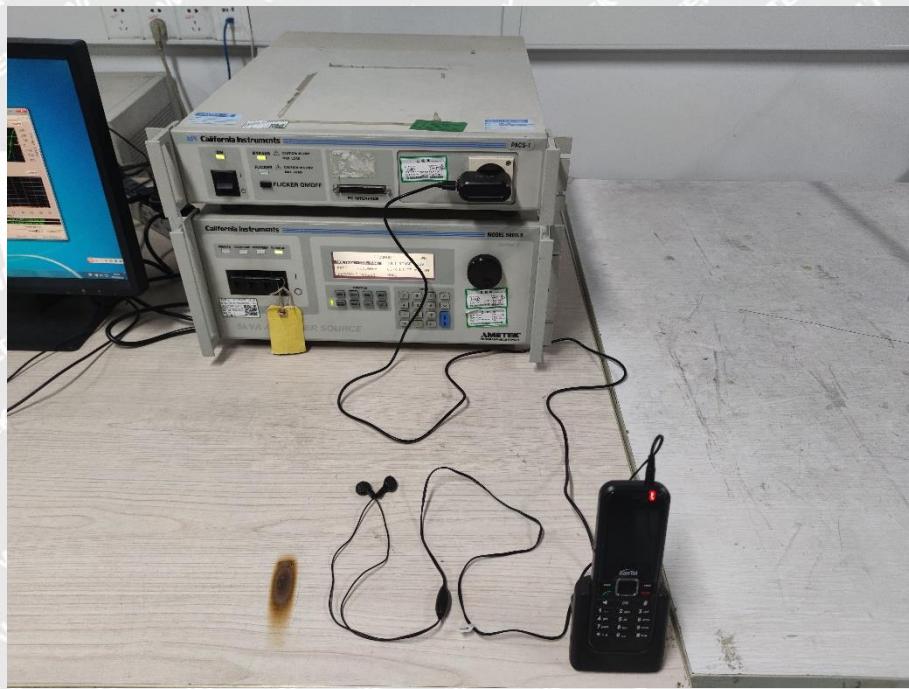


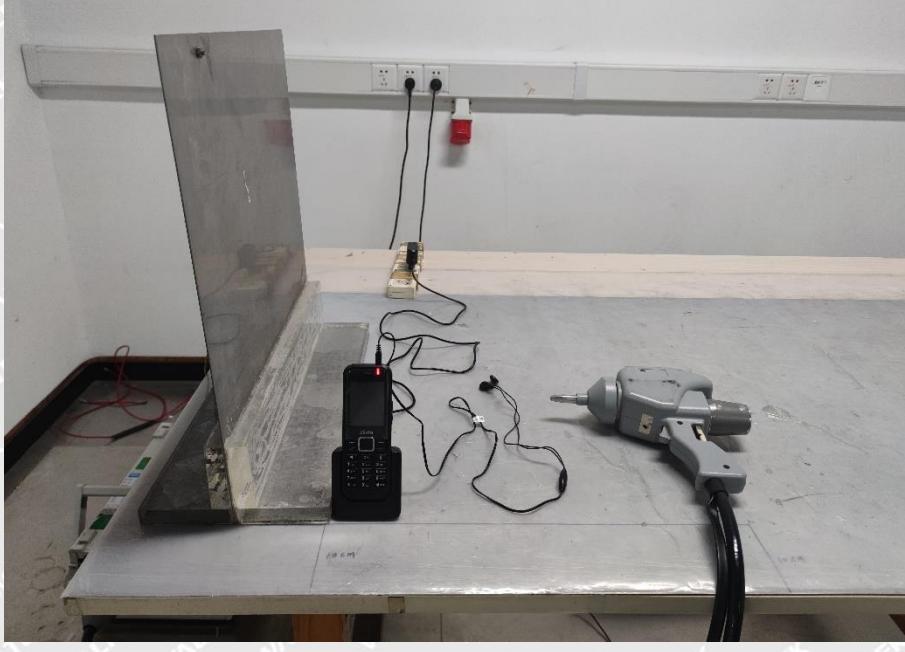


**Radiation Emission
Test Setup (Above
1GHz)**



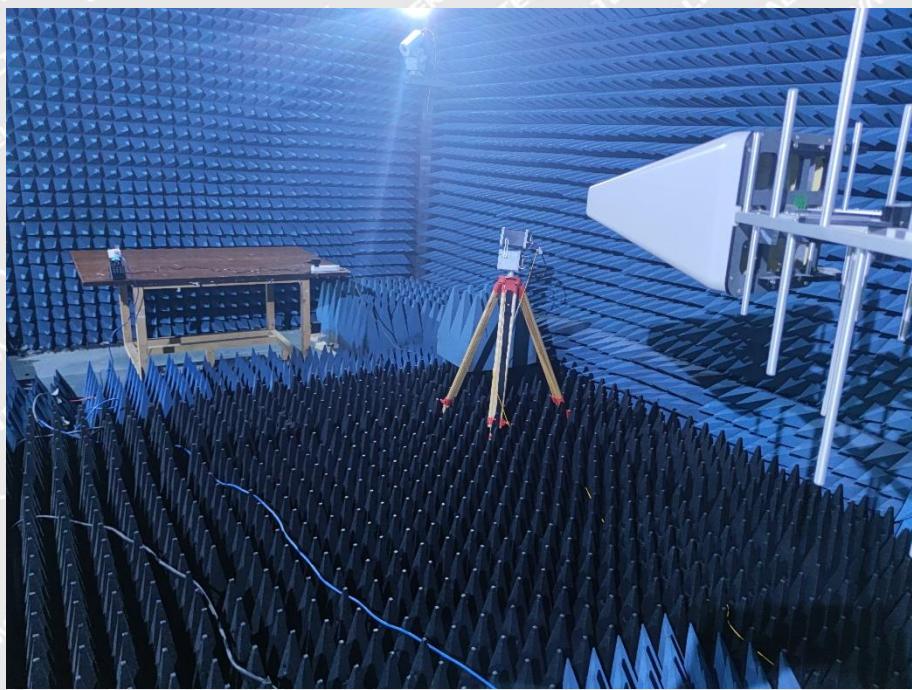
**Harmonic/Flicker Test
View**



EN 61000-4-2 Test View	
EN 61000-4-2 Test View	



EN 61000-4-3 Test View



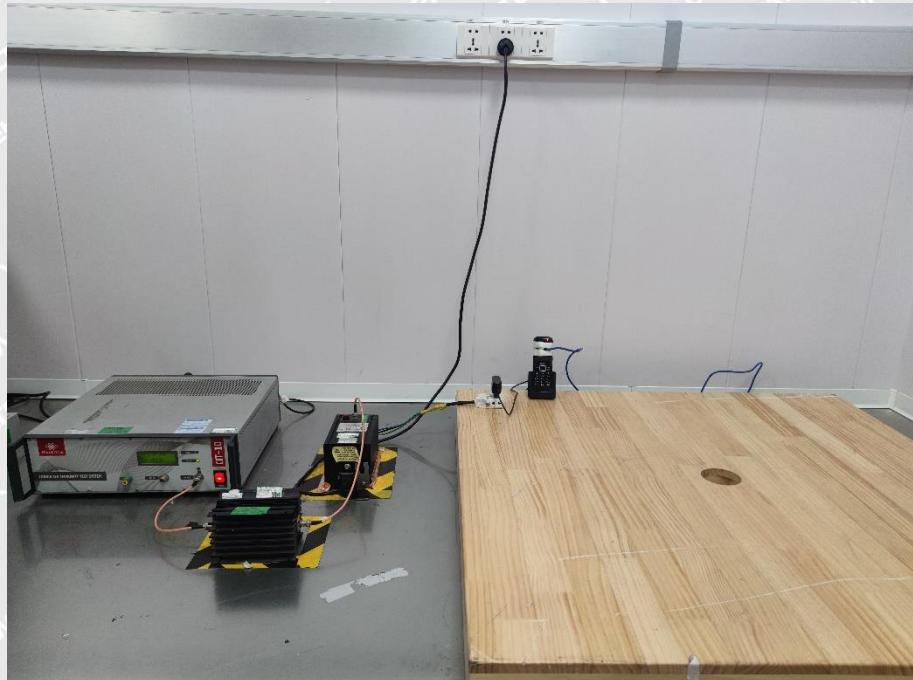
EN 61000-4-3 Test View



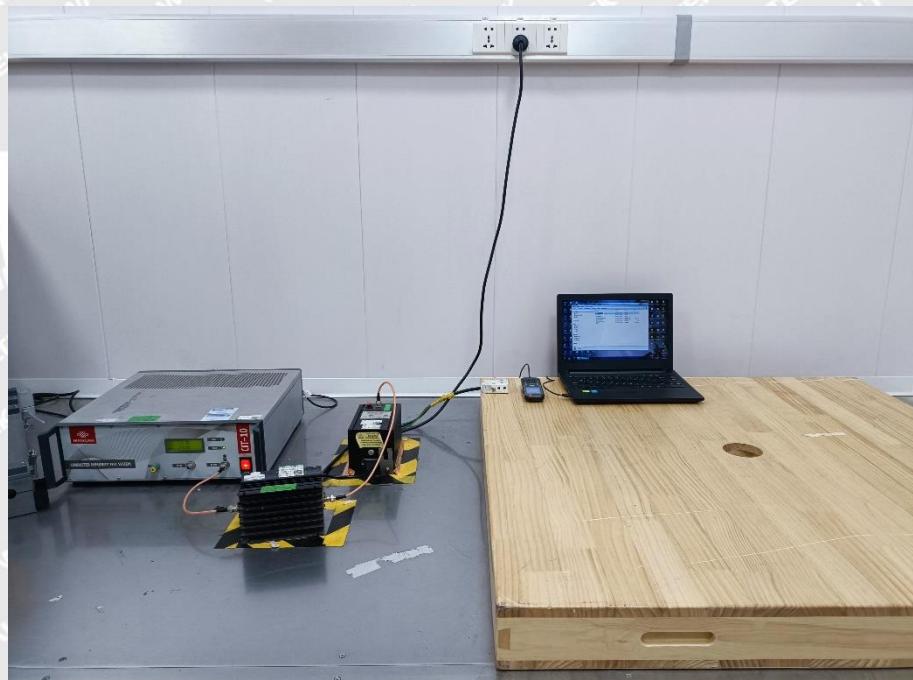
<p>EN 61000-4-4/5/11 Test</p> <p>View</p>	
<p>EN 61000-4-4/5/11 Test</p> <p>View</p>	 <p>未经许可请勿 拍照、视频等。</p>



EN 61000-4-6 Test View



EN 61000-4-6 Test View



***** END OF REPORT *****