TEST REPORT

Product Name:	Solar Micro Inverter
Trademark:	N/A
Model Number:	WVC-600, WVC-350, WVC-1200, WVC-300, WVC-295, WVC-700, WVC-1400
Prepared For:	Dongguan Kaideng Energy Technology Co., Ltd.
Address:	4th Floor, Fuyuan Business Building, No.1, Lane 13, Maiyuan Road, Xin'an Community, Chang'an Town, Dongguan, Guangdong, China
Manufacturer:	Dongguan Kaideng Energy Technology Co., Ltd.
Address:	4th Floor, Fuyuan Business Building, No.1, Lane 13, Maiyuan Road, Xin'an Community, Chang'an Town, Dongguan, Guangdong, China
Prepared By:	ShenZhen SJS Testing Technology Co., Ltd.
Address:	4th Floor, Building C, Youth E-commerce Center, No. 2 Lianwei Street, Hualian Community, Longhua Street, Longhua District, Shenzhen, China
Sample Received Date:	October 25, 2019
Sample tested Date:	October 25, 2019 to November 05, 2019
Issue Date:	November 05, 2019
Report No.:	SJS20191000217E01
Test Standards	EN 55032:2015, EN 55035: 2017 EN 61000-3-2: 2014, EN 61000-3-3: 2013
Test Results	PASS

Compiled by:	Reviewed by:	Approved by:
Cora Chan	Sam Zhu	Helen Lin/Manager

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TABLE OF CONTENT

(Note: N/A means not applicable)

1. VERSION

Report No.	Issue Date	Description	Approved
SJS20191000217E01	November 05, 2019	Original	Valid

2. TEST SUMMARY

The Product has been tested according to the following specifications:

EMISSION		
Standard	**Test Item**	**Test result**
EN 55032	Conducted emissions from the AC mains power ports	Pass
EN 55032	Asymmetric mode conducted emissions	N/A[1]
EN 55032	Conducted differential voltage emissions	N/A[1]
EN 55032	Radiated emissions	Pass
EN 61000-3-2	Harmonic current emission(H)	N/A[2]
EN 61000-3-3	Voltage fluctuations & flicker(F)	Pass

IMMUNITY (EN 55035)		
Standard	**Test Item**	**Test result**
IEC 61000-4-2	Electrostatic discharge (ESD)	Pass
IEC 61000-4-3	Continuous RF electromagnetic field disturbances(RS)	Pass[#]
IEC 61000-4-4	Electrical fast transients/burst (EFT)	Pass
IEC 61000-4-5	Surges	Pass
IEC 61000-4-6	Continuous induced RF disturbances (CS)	Pass
IEC 61000-4-6	Broadband impulse noise disturbances, repetitive	N/A[3]
IEC 61000-4-6	Broadband impulse noise disturbances, isolated	N/A[3]
IEC 61000-4-8	Power frequency magnetic field (PFMF)	N/A[4]
IEC 61000-4-11	Voltage dips and interruptions (DIPS)	Pass

Remark:
"#"indicates the testing item(s) was (were) fulfilled by subcontracted lab.
1. The Product only has USB port.
2. The Product belongs to Class A, and its power is less than 75W, so it deems to fulfil this standard without testing.
3. Applicable only to CPE xDSL ports.
4. The Product doesn't contain any device susceptible to magnetic fields.

3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Test item	Value (dB)
Conducted Emission (150kHz-30MHz)	3.20
Radiated Emission(30MHz~1GHz)	4.80
Radiated Emission(1GHz~6GHz)	4.90

4. PRODUCT INFORMATION AND TEST SETUP

4.1 Product Information

Ratings: Input: DC 22-50V, 1-25A, 630W
Output: AC110/220V, 5A/2.5A, 590W

The highest frequency of the internal sources of the EUT is (less than 108)MHz:
☒ less than 108 MHz, the measurement shall only be made up to 1 GHz.
☐ between 108 MHz and 500 MHz, the measurement shall only be made up to 2 GHz.
☐ between 500 MHz and 1 GHz, the measurement shall only be made up to 5 GHz.
☐ above 1 GHz, the measurement shall be made up to 5 times the highest frequency or 6 GHz, whichever is less.

Model difference: All models are identical except for the appearance color, the test model is AXY-001 and the test results are applicable to other tests.

4.2 Test Setup Configuration

See test photographs attached in EUT TEST SETUP PHOTOGRAPHS for the actual connections between Product and support equipment.

4.3 Support Equipment

No	Device Type	Brand	Model	Series No.	Data Cable	Power Cord
1.	Multimeter	Fluke	15B	---	---	---

Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer’s requirements and conditions for the intended use.

4.4 Test Mode

Test item	Test Mode	Test Voltage
Conducted emissions from the AC mains power ports (150KHz-30MHz) Class B	Full load	AC 230V/50Hz*
Radiated emissions(30MHz-1GHz) Class B	Full load	AC 230V/50Hz*
Voltage fluctuations & flicker(F)	Full load	AC 230V/50Hz*
Electrostatic discharge (ESD) B ☒Air Discharge: ±8kV ☒Contact Discharge: ±4kV ☒HCP & VCP: ±4kV	Full load	AC 230V/50Hz*
Continuous RF electromagnetic field disturbances(RS) A 80MHz-1000MHz,2600MHz,3500MHz, 5000MHz, 3V/m,80%	Full load	AC 230V/50Hz*
Electrical fast transients/burst (EFT) B ☒1kV AC(Input) ☐0.5kV DC(Input) ☐0.5kV signal,Telec,control	Full load	AC 230V/50Hz*
Surges ☒1kV Line-Line, B ☐2kV Line-PE, N-PE B ☐0.5kVDC(Input) B ☐1KV,☐4KV signal,Telec, control C Line-Line:90°+1kV,270°-1kV Line-PE:90°+2kV,270°-2kV N-PE:90°-2kV,270°+2kV	Full load	AC 230V/50Hz*
Continuous induced RF disturbances (CS) A 0.15MHz to 10MHz 3V,10MHz-30MHz 3 to 1V, 30MHz-80MHz 1V ☒ AC(Input) ☐ DC(Input) ☐ signal,control	Full load	AC 230V/50Hz*
Voltage dips and interruptions (DIPS) Less 5% 0.5P B 70% 500ms C Voltage Interruptions less5% 5000ms C	Full load	AC 230V/50Hz*
All test mode were tested and passed, only Conducted Emissions, Radiated Emissions Voltage Fluctuations and Flicker shows (*) is the worst case mode which were recorded in this report.		

5. TEST FACILITY AND TEST INSTRUMENT USED

5.1 Test Facility

All measurement facilities used to collect the measurement data are located at 4th Floor, Building C, Youth E-commerce Center, No. 2 Lianwei Street, Hualian Community, Longhua Street, Longhua District, Shenzhen, China .The site and apparatus are constructed in conformance with the requirements of ANSI C63.4 and CISPR 16-1-1 other equivalent standards.

5.2 Test Instrument Used

Conducted emissions Test					
Equipment	**Manufacturer**	**Model#**	**Serial#**	**Last Cal.**	**Next Cal.**
Receiver	R&S	ESR	102075	Aug. 14, 2019	Aug. 14, 2020
LISN	R&S	ENV216	101375	Aug. 14, 2019	Aug. 14, 2020
ISN	HPX	ISN T800	S1509001	Aug. 14, 2019	Aug. 14, 2020

Radiated emissions Test (966 chamber)					
Equipment	**Manufacturer**	**Model#**	**Serial#**	**Last Cal.**	**Next Cal.**
966 chamber	ChengYu	966 Room	966	Aug. 25, 2019	Aug. 24, 2020
Receiver	R&S	ESRP	101154	Aug. 14, 2019	Aug. 13, 2020
Amplifier	Schwarzbeck	BBV9718	9718-309	Aug. 14, 2019	Aug. 13, 2020
Amplifier	Schwarzbeck	BBV9744	9744-0037	Aug. 14, 2019	Aug. 13, 2020
TRILOG Broadband Antenna	schwarzbeck	VULB 9163	VULB9163-942	Aug. 13, 2019	Aug. 12, 2020
Horn Antenna	SCHWARZBECK	BBHA9120D	1201	Aug. 16, 2019	Aug. 15, 2020

Harmonic / Flicker Test					
Equipment	**Manufacturer**	**Model#**	**Serial#**	**Last Cal.**	**Next Cal.**
Harmonic & Flicker Tester	LAPLAEC	AC2000A	439263	Aug. 14, 2019	Aug. 13, 2020
AC Power Supply	LAPLAEC	PCR4000M	631589	Aug. 14, 2019	Aug. 13, 2020

Electrostatic discharge Test					
Equipment	**Manufacturer**	**Model#**	**Serial#**	**Last Cal.**	**Next Cal.**
ESD Tester	3C TEST	EDS 30V	ES0121614	Aug. 16, 2019	Aug. 15, 2020
ESD Tester	KIKISUI	KES4201 A	UH002321	Aug. 15, 2019	Aug. 14, 2020

Continuous RF electromagnetic field disturbances Test (SMQ --- site)					
Equipment	**Manufacturer**	**Model#**	**Serial#**	**Last Cal.**	**Next Cal.**
Signal Generator	HP	8648A	3625U00573	Sep. 26, 2019	Sep. 26, 2020
Amplifier	A&R	500A100	17034	Sep. 26, 2019	Sep. 26, 2020
Amplifier	A&R	100W/1000 M1	17028	Sep. 26, 2019	Sep. 26, 2020
Audio Analyzer (20Hz~1GHz)	Panasonic	2023B	202301/428	Sep. 26, 2019	Sep. 26, 2020
Isotropic Field Probe	A&R	FP2000	16755	Sep. 26, 2019	Sep. 26, 2020
Antenna	EMCO	3108	9507-2534	Sep. 26, 2019	Sep. 26, 2020
Log-periodic Antenna	A&R	AT1080	16812	Sep. 26, 2019	Sep. 26, 2020

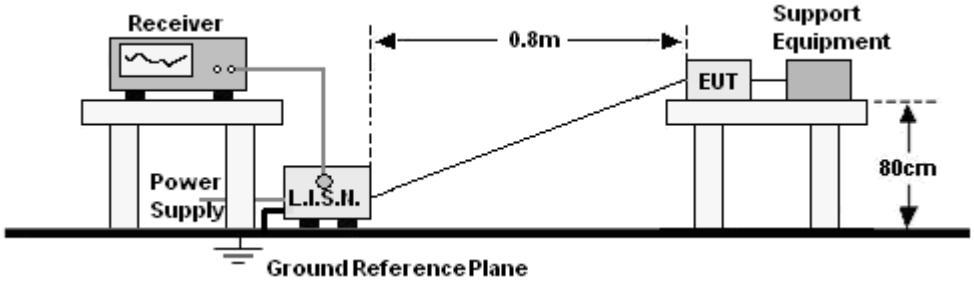
EFT and Surge and Voltage dips and interruptions Test					
Equipment	**Manufacturer**	**Model#**	**Serial#**	**Last Cal.**	**Next Cal.**
Compact Generator	TRANSIENT	TRA2000	646	Aug. 14, 2019	Aug. 13, 2020
Coupling Clamp	PARTNER	CN-EFT1000	CN-EFT1000-1624	Aug. 14, 2019	Aug. 13, 2020

Continuous induced RF disturbances Test					
Equipment	**Manufacturer**	**Model#**	**Serial#**	**Last Cal.**	**Next Cal.**
C/S Test System	SCHLODER	CDG-6000-75	126B1405/2016	Aug. 14, 2019	Aug. 13, 2020
Attenuator	SCHLODER	6DB DC-1G	HA1630	Aug. 14, 2019	Aug. 13, 2020
CDN	SCHLODER	CDN M2/M3	A2210389/2016	Aug. 14, 2019	Aug. 13, 2020
Injection Clamp	SCHLOBER	EMCL-20	132A1272/2016	Aug. 14, 2019	Aug. 13, 2020

6. CONDUCTED EMISSIONS

6.1 Block Diagram Of Test Setup

For mains ports:



6.2 Limit

Limits for Conducted emissions at the mains ports of Class B MME

Frequency range (MHz)	Limits dB(μV)	
	Quasi-peak	Average
0,15 to 0,50	66 to 56*	56 to 46*
0,50 to 5	56	46
5 to 30	60	50

Notes: 1. *Decreasing linearly with logarithm of frequency.
2. The lower limit shall apply at the transition frequencies.

6.3 Test procedure

For mains ports:

a. The Product was placed on a nonconductive table 0. 1 m above the horizontal ground reference plane, and 0.4 m from the vertical ground reference plane, and connected to the main through Line Impedance Stability Network (L.I.S.N).

b. The RBW of the receiver was set at 9 kHz in 150 kHz ~ 30MHz with Peak and AVG detector in Max Hold mode. Run the receiver's pre-scan to record the maximum disturbance generated from Product in all power lines in the full band.

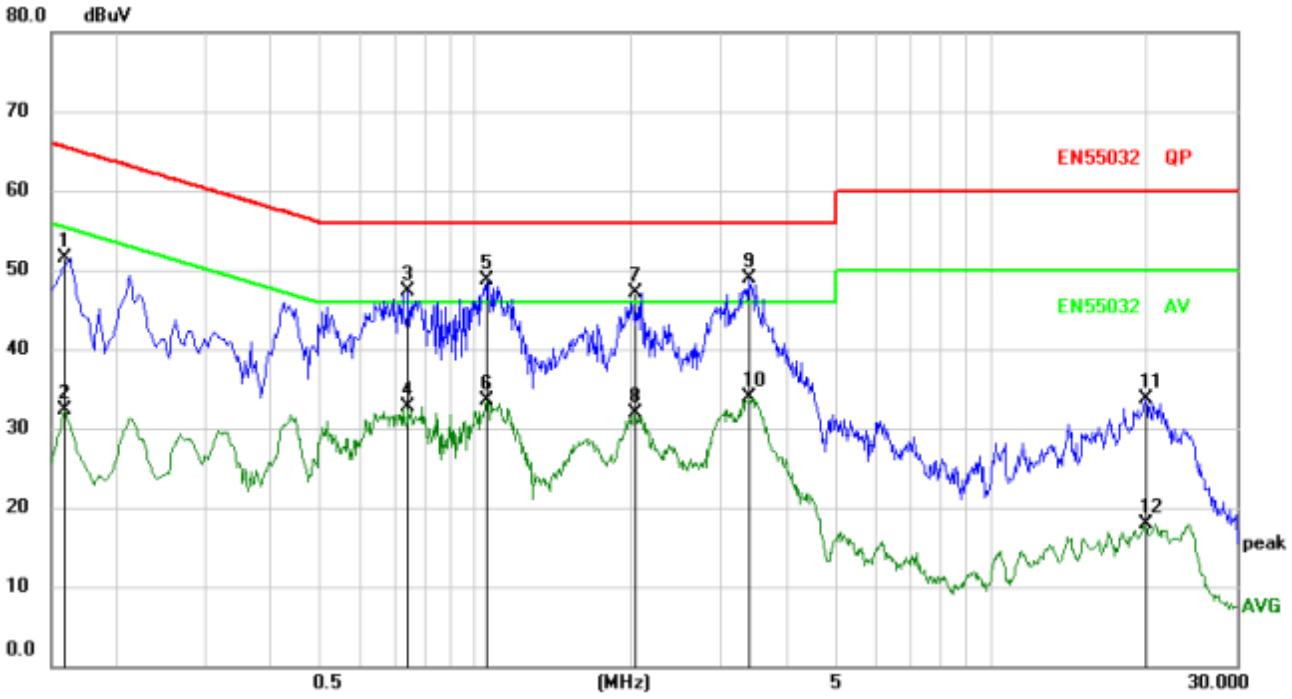
c. For each frequency whose maximum record was higher or close to limit, measure its QP and AVG values and record.

6.4 Test Result

Temperature:	23 ℃	Relative Humidity:	50%
Pressure:	101KPa	Phase :	Line
Test Voltage :	AC 230V/50Hz	Test Mode:	Full load

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1590	44.67	9.77	54.44	65.52	-11.08	QP	
2		0.1590	22.64	9.77	32.41	55.52	-23.11	AVG	
3		0.4245	37.26	9.72	46.98	57.36	-10.38	QP	
4		0.4245	19.82	9.72	29.54	47.36	-17.82	AVG	
5		1.0455	37.04	9.77	46.81	56.00	-9.19	QP	
6		1.0455	22.00	9.77	31.77	46.00	-14.23	AVG	
7		2.0579	36.45	9.79	46.24	56.00	-9.76	QP	
8		2.0579	20.36	9.79	30.15	46.00	-15.85	AVG	
9	*	3.4350	40.12	9.84	49.96	56.00	-6.04	QP	
10		3.4350	24.24	9.84	34.08	46.00	-11.92	AVG	
11		24.1440	28.16	10.12	38.28	60.00	-21.72	QP	
12		24.1440	10.33	10.12	20.45	50.00	-29.55	AVG	

Temperature:	23℃	Relative Humidity:	50%
Pressure:	101KPa	Phase :	Neutral
Test Voltage :	AC 230V/50Hz	Test Mode:	Full load



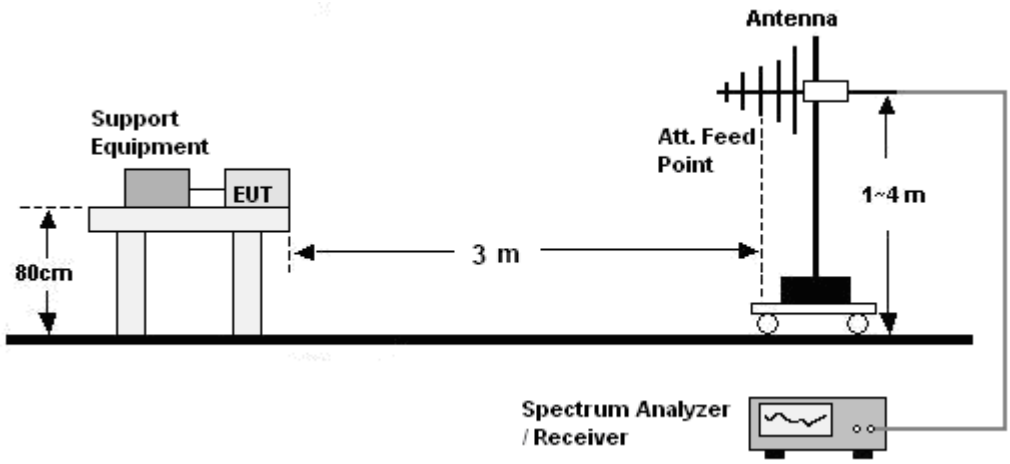
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1590	41.78	9.77	51.55	65.52	-13.97	QP	
2		0.1590	22.53	9.77	32.30	55.52	-23.22	AVG	
3		0.7395	37.44	9.84	47.28	56.00	-8.72	QP	
4		0.7395	22.94	9.84	32.78	46.00	-13.22	AVG	
5		1.0500	38.89	9.77	48.66	56.00	-7.34	QP	
6		1.0500	23.70	9.77	33.47	46.00	-12.53	AVG	
7		2.0445	37.39	9.79	47.18	56.00	-8.82	QP	
8		2.0445	22.15	9.79	31.94	46.00	-14.06	AVG	
9	*	3.3900	38.97	9.84	48.81	56.00	-7.19	QP	
10		3.3900	24.16	9.84	34.00	46.00	-12.00	AVG	
11		19.9545	23.63	10.09	33.72	60.00	-26.28	QP	
12		19.9545	7.83	10.09	17.92	50.00	-32.08	AVG	

Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

7. RADIATED EMISSIONS TEST

7.1 Block Diagram Of Test Setup

30MHz ~ 1GHz:



7.2 Limits

Limits for radiated disturbance of Class B MME

Frequency (MHz)	Quasi-peak limits at 3m dB(μV/m)
30-230	40
230-1000	47

7.3 Test Procedure

30MHz ~ 1GHz:

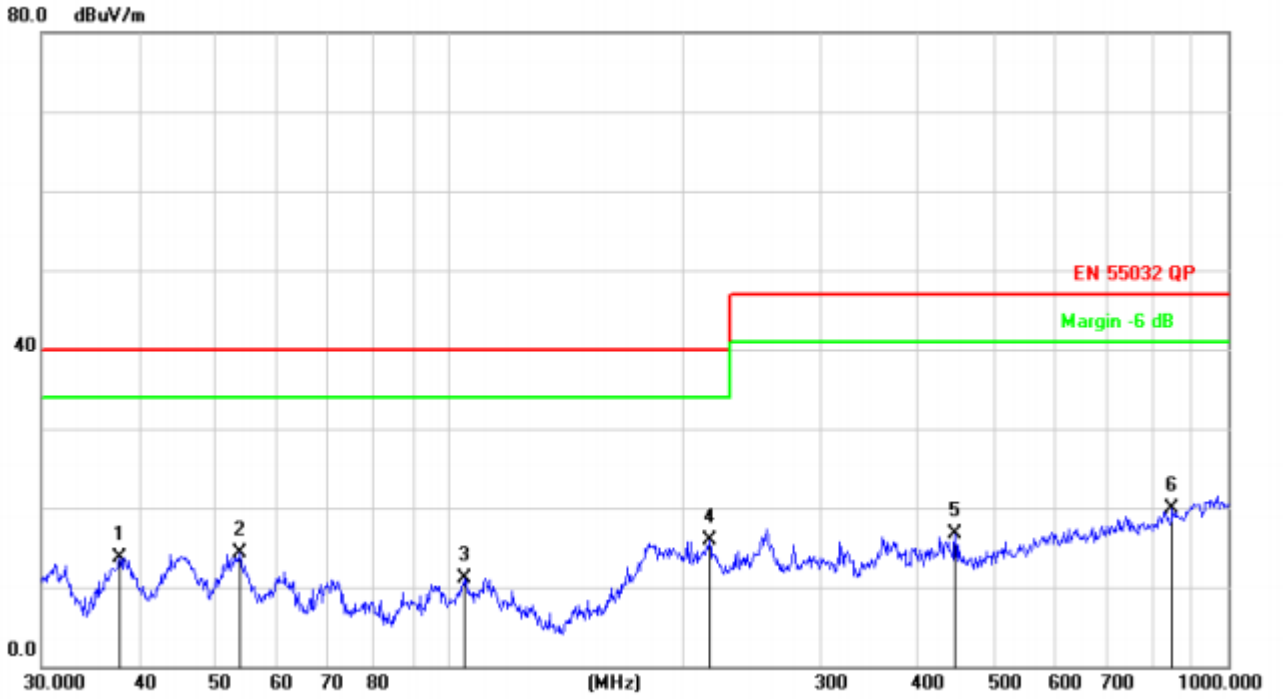
a. The Product was placed on the nonconductive turntable 0.1 m above the ground in a semi anechoic chamber.

b. Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 120 kHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied between 1~4 m in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.

c. For each frequency whose maximum record was higher or close to limit, measure its QP value: vary the antenna's height and rotate the turntable from 0 to 360 degrees to find the height and degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to QP Detector and specified bandwidth with Maximum Hold Mode, and record the maximum value.

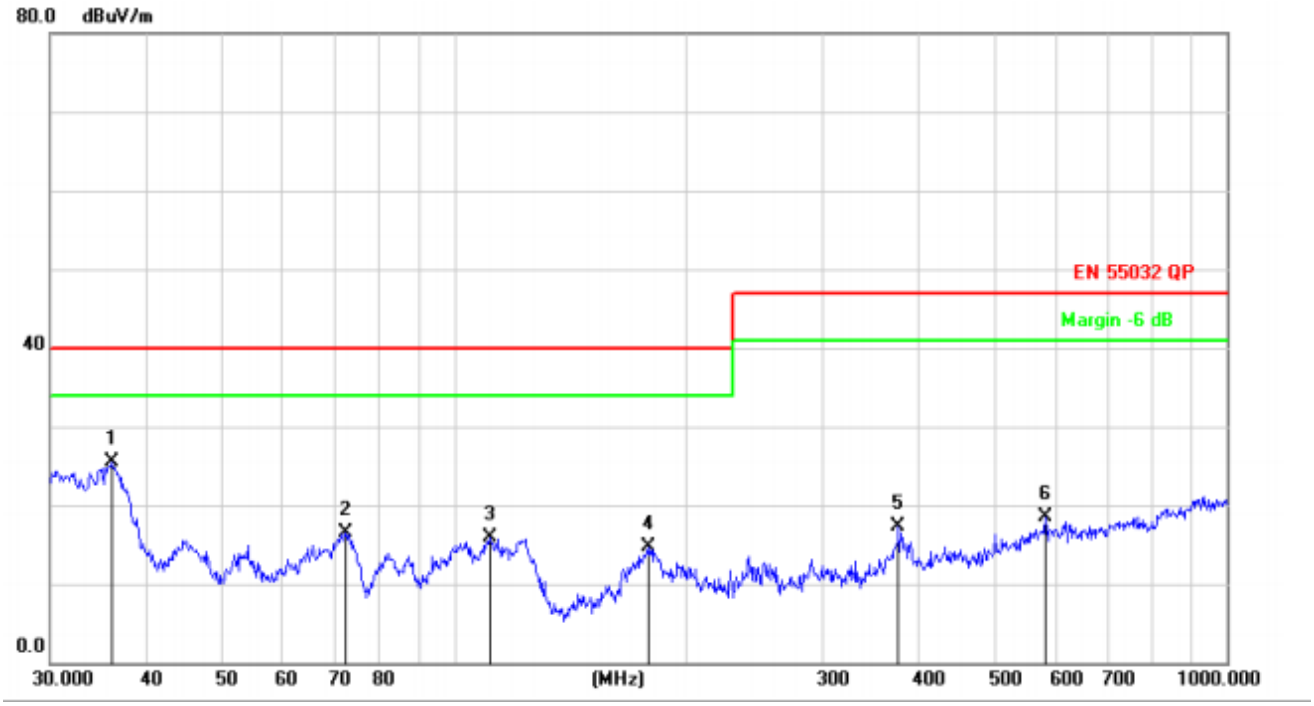
7.4 Test Results

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101KPa	Phase :	Horizontal
Test Voltage :	AC 230V/50Hz	Test Mode:	Full load



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector	cm	degree	Comment
1		37.8121	29.20	-15.50	13.70	40.00	-26.30	QP			
2		53.8818	28.91	-14.59	14.32	40.00	-25.68	QP			
3		104.9033	26.82	-15.64	11.18	40.00	-28.82	QP			
4	*	216.0240	32.12	-16.19	15.93	40.00	-24.07	QP			
5		446.4141	27.28	-10.65	16.63	47.00	-30.37	QP			
6		848.0563	23.35	-3.52	19.83	47.00	-27.17	QP			

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101KPa	Phase :	Vertical
Test Voltage :	AC 230V/50Hz	Test Mode:	Full load

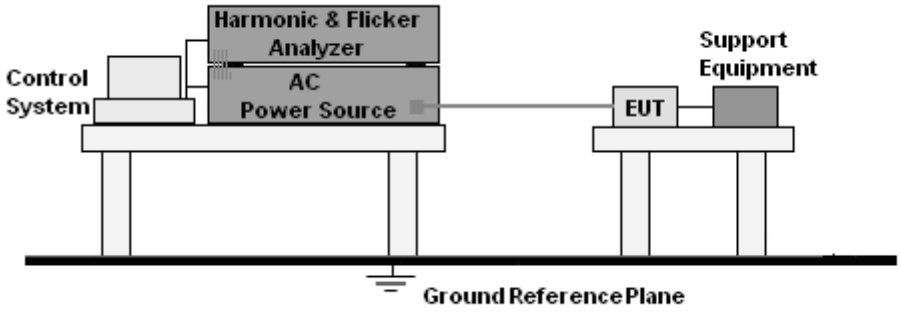


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector	cm	degree	Comment
1	*	36.1272	41.66	-16.08	25.58	40.00	-14.42	QP			
2		72.3376	34.53	-18.07	16.46	40.00	-23.54	QP			
3		111.3468	31.94	-15.97	15.97	40.00	-24.03	QP			
4		178.1327	32.79	-18.17	14.62	40.00	-25.38	QP			
5		375.9385	29.54	-12.19	17.35	47.00	-29.65	QP			
6		582.7425	25.42	-6.97	18.45	47.00	-28.55	QP			

Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

8. VOLTAGE FLUCTUATIONS & FLICKER(F)

8.1 Block Diagram of Test Setup



8.2 Limit

EN 61000-3-3:2013 Clause 5.

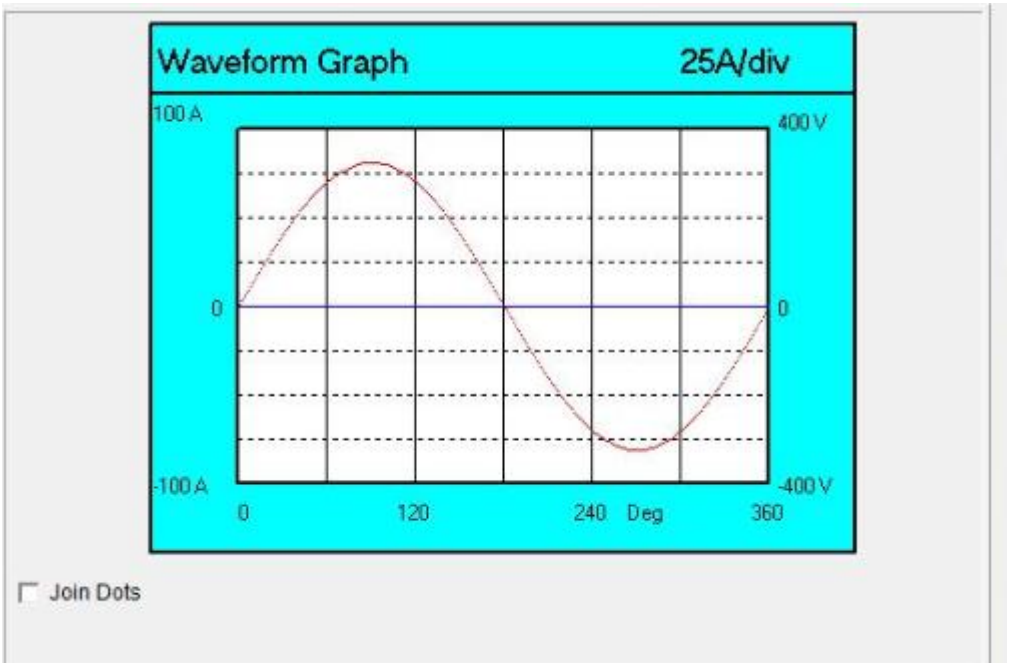
8.3 Test Procedure

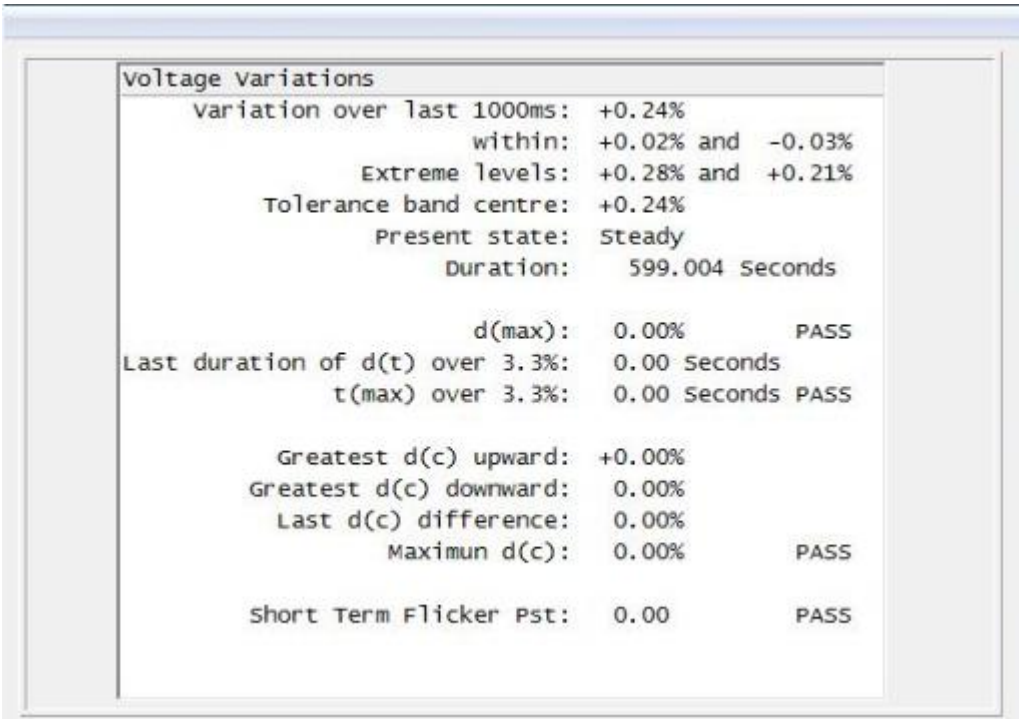
a. The Product was placed on the top of a non-conductive table above the ground and operated to produce the most unfavorable sequence of voltage changes under normal operating conditions.

b. During the flick test, the measure time shall include that part of whole operation cycle in which the Product produce the most unfavorable sequence of voltage changes. The observation period for short-term flicker indicator is 10 minutes and the observation period for long-term flicker indicator is 2 hours.

8.4 Test Results

Temperature:	23℃	Relative Humidity:	50%
Pressure:	101KPa	Test Mode:	Full load
Test Voltage :	AC 230V/50Hz		





Voltage Variations

Variation over last 1000ms:	+0.24%	
within:	+0.02% and -0.03%	
Extreme levels:	+0.28% and +0.21%	
Tolerance band centre:	+0.24%	
Present state:	Steady	
Duration:	599.004 Seconds	
d(max):	0.00%	PASS
Last duration of d(t) over 3.3%:	0.00 Seconds	
t(max) over 3.3%:	0.00 Seconds	PASS
Greatest d(c) upward:	+0.00%	
Greatest d(c) downward:	0.00%	
Last d(c) difference:	0.00%	
Maximun d(c):	0.00%	PASS
Short Term Flicker Pst:	0.00	PASS

9. IMMUNITY TEST OF GENERAL THE PERFORMANCE CRITERIA

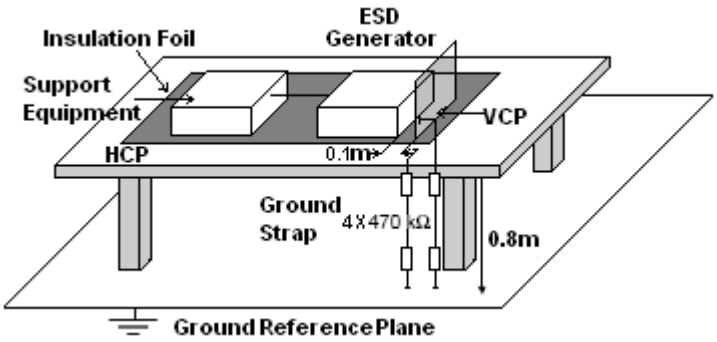
Product Standard	EN 55035:2017 clause 5
CRITERION A	The equipment shall continue to operate as intended without operator intervention. No degradation of performance, loss of function or change of operating state is allowed below a performance level specified by the manufacturer when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.
CRITERION B	During the application of the disturbance, degradation of performance is allowed. However, no unintended change of actual operating state or stored data is allowed to persist after the test. After the test, the equipment shall continue to operate as intended without operator intervention; no degradation of performance or loss of function is allowed, below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level (or the permissible performance loss), or recovery time, is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.
CRITERION C	Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions. A reboot or re-start operation is allowed. Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

10. ELECTROSTATIC DISCHARGE (ESD)

10.1 Test Specification

Test Port	**:**	Enclosure port
Discharge Impedance	**:**	330 ohm / 150 pF
Discharge Mode	**:**	Single Discharge
Discharge Period	**:**	one second between each discharge

10.2 Block Diagram of Test Setup



10.3 Test Procedure

a. Electrostatic discharges were applied only to those points and surfaces of the Product that are accessible to users during normal operation.

b. The test was performed with at least ten single discharges on the pre-selected points in the most sensitive polarity.

c. The time interval between two successive single discharges was at least 1 second.

d. The ESD generator was held perpendicularly to the surface to which the discharge was applied and the return cable was at least 0.2 meters from the Product.

e. Contact discharges were applied to the non-insulating coating, with the pointed tip of the generator penetrating the coating and contacting the conducting substrate.

f. Air discharges were applied with the round discharge tip of the discharge electrode approaching the Product as fast as possible (without causing mechanical damage) to touch the Product. After each discharge, the ESD generator was removed from the Product and re-triggered for a new single discharge. The test was repeated until all discharges were complete.

g. At least ten single discharges (in the most sensitive polarity) were applied to the center of one vertical edge of the Vertical Coupling Plane in sufficiently different positions that the four

faces of the Product were completely illuminated. The VCP (dimensions 0.5m x 0.5m) was placed vertically to and 0.1 meters from the Product.

10.4 Test Results

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101KPa	Test Mode:	Full load
Test Voltage :	AC 230V/50Hz		

Discharge Method	Discharge Position	Voltage (±kV)	Min. No. of Discharge per polarity (Each Point)	Required Level	Performance Criterion
Contact Discharge	Conductive Surfaces	4	10	B	A
	Indirect Discharge HCP	4	10	B	A
	Indirect Discharge VCP	4	10	B	A
Air Discharge	Slots, Apertures, and Insulating Surfaces	8	10	B	A
Note: N/A					

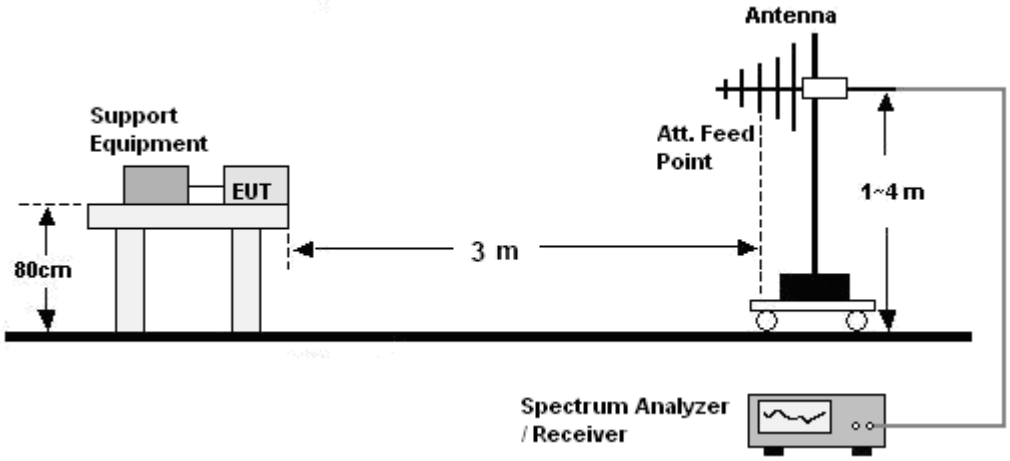
11. CONTINUOUS RF ELECTROMAGNETIC FIELD DISTURBANCES(RS)

11.1 Test Specification

Test Port	:	Enclosure port
Step Size	:	1%
Modulation	:	1kHz, 80% AM
Dwell Time	:	1 second
Polarization	:	Horizontal & Vertical

11.2 Block Diagram of Test Setup

Below 1GHz:
For Floor Stand:



11.3 Test Procedure

a. The testing was performed in a fully-anechoic chamber. The transmit antenna was located at a distance of 3 meters from the Product.

b. The frequency range is swept from 80MHz to 1000MHz, 1800MHz, 2600MHz, 3500MHz, 5000MHz,with the signal 80% amplitude modulated with a 1 kHz sine wave,and the step size was 1%.

c. The dwell time at each frequency shall not be less than the time necessary for the EUT to be exercised and to be able to respond, but should not exceed 5 s at each of the frequencies during the scan.

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

e. For Broadcast reception function:Group 2 not apply in this test.

11.4 Test Results

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101KPa	Test Mode:	Full load
Test Voltage :	AC 230V/50Hz		

Frequency	Position	Field Strength (V/m)	Required Level	Performance Criterion
80 - 1000MHz, 1800MHz, 2600MHz, 3500MHz, 5000MHz	Front, Right, Back, Left	3	A	A
Note: N/A				

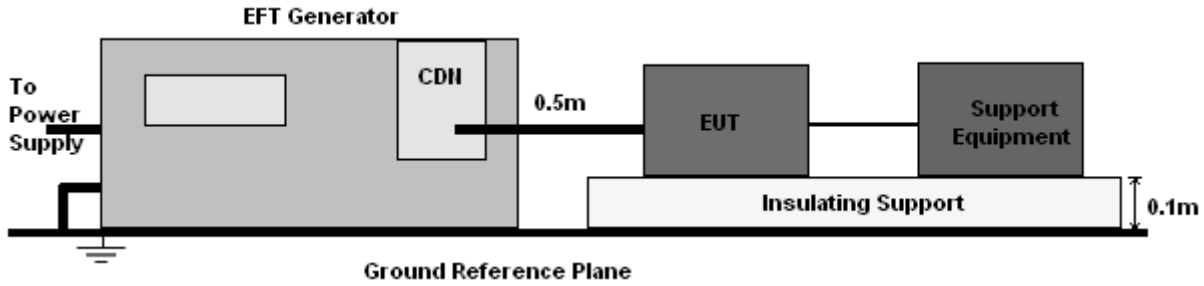
12. ELECTRICAL FAST TRANSIENTS/BURST (EFT)

12.1 Test Specification

Test Port	**:**	input a.c. power port
Impulse Frequency	**:**	5 kHz
Impulse Wave-shape	**:**	5/50 ns
Burst Duration	**:**	15 ms
Burst Period	**:**	300 ms
Test Duration	**:**	2 minutes per polarity

12.2 Block Diagram of EUT Test Setup

For input a.c. power port:



12.3 Test Procedure

a. The Product and support units were located on a non-conductive table above ground reference plane.

b. A 0.5m-long power cord was attached to Product during the test.

12.4 Test Results

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101KPa	Test Mode:	Full load
Test Voltage :	AC 230V/50Hz		

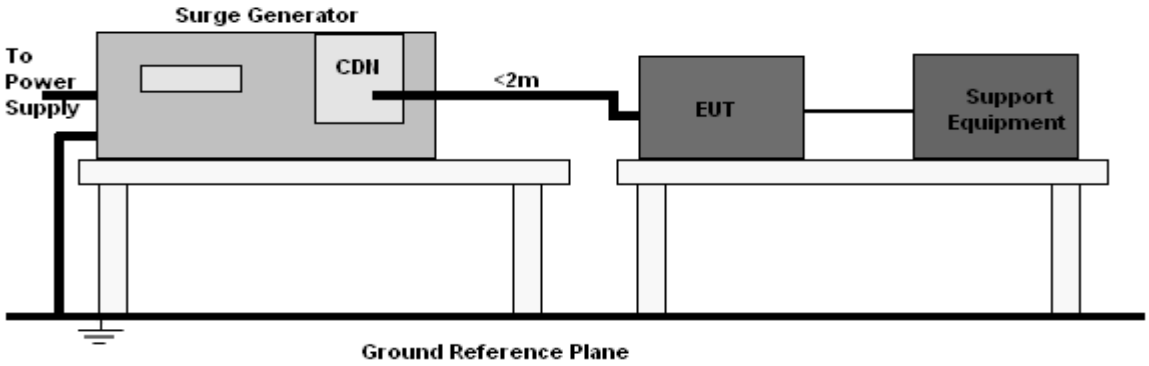
Coupling	Voltage (kV)	Polarity	Required Level	Performance Criterion
AC MainsL-N	1.0	±	B	A
Note: N/A				

13. SURGES IMMUNITY TEST

13.1 Test Specification

Test Port	:	input a.c. power port
Wave-Shape	:	Open Circuit Voltage - 1.2 / 50 us Short Circuit Current - 8 / 20 us
Pulse Repetition Rate	:	1 pulse / min.
Phase Angle	:	0° / 90° / 180° / 270°
Test Events	:	5 pulses (positive & negative) for each polarity

13.2 Block Diagram of EUT Test Setup



13.3 Test Procedure

a. The surge is to be applied to the Product 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.

b. The power cord between the Product and the coupling/decoupling networks shall be 2 meters in length (or shorter). Interconnection line between the Product and the coupling/decoupling networks shall be 2 meters in length (or shorter).

13.4 Test Result

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101KPa	Test Mode:	Full load
Test Voltage :	AC 230V/50Hz		

Coupling Line	Voltage (kV)	Phase Angle	Required Level	Performance Criterion
L - N	+1	90°	B	A
	-1	270°	B	A

Note: N/A

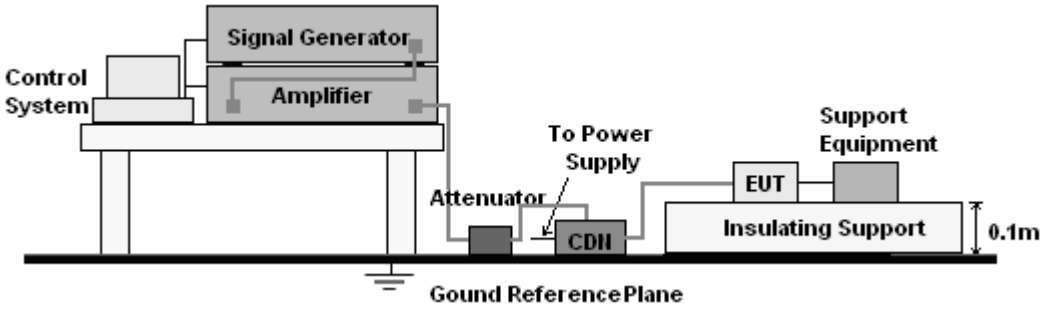
14. CONTINUOUS INDUCED RF DISTURBANCES (CS)

14.1 Test Specification

Test Port	**:**	input a.c. power port
Step Size	**:**	1%
Modulation	**:**	1kHz, 80% AM
Dwell Time	**:**	1 second

14.2 Block Diagram of EUT Test Setup

For input a.c. power port:



14.3 Test Procedure

For input a.c.. power port:

a. The Product and support units were located at a ground reference plane with the interposition of a 0.1 m thickness insulating support and the CDN was located on GRP directly.

b. The frequency range is swept from 150 kHz to 10MHz, 10MHz to 30MHz, 30MHz to 80MHz with the signal 80% amplitude modulated with a 1 kHz sine wave, and the step size was 1% of fundamental.

c. The dwell time at each frequency shall be not less than the time necessary for the Product to be able to respond.

14.4 Test Result

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101KPa	Test Mode:	Full load
Test Voltage :	AC 230V/50Hz		

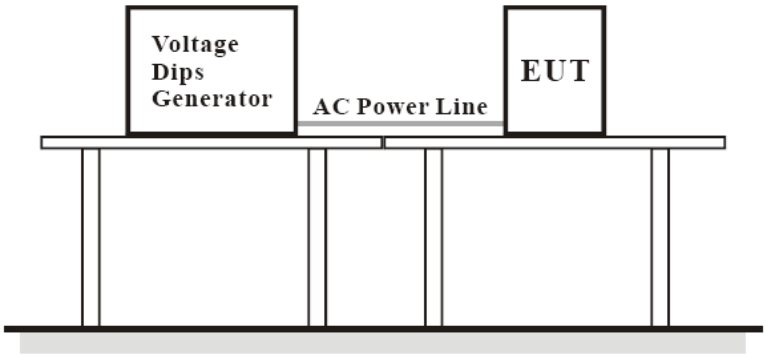
Inject Line	Frequency (MHz)	Voltage Level (V r.m.s.)	Required Level	Performance Criterion
a.c. port	0.15 - 10	3	A	A
	10 to 30	3 to 1	A	A
	30 to 80	1	A	A
Note: N/A				

15. VOLTAGE DIPS AND INTERRUPTIONS (DIPS)

15.1 Test Specification

Test Port : input a.c. power port
Phase Angle : 0°, 180°
Test cycle : 3 times

15.2 Block Diagram of EUT Test Setup



15.3 Test Procedure

a. The Product and support units were located on a non-conductive table above ground floor.

b. Set the parameter of tests and then perform the test software of test simulator.

c. Conditions changes to occur at 0 degree crossover point of the voltage waveform.

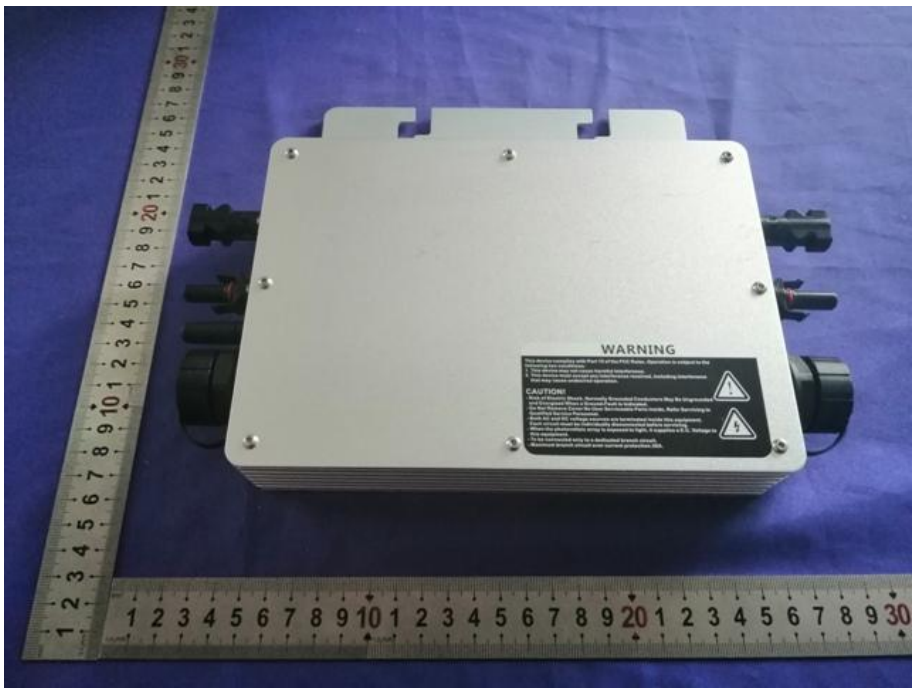
15.4 Test Result

Temperature:	26℃	Relative Humidity:	54%
Pressure:	101KPa	Test Mode:	Full load
Test Voltage :	AC 230V/50Hz		

Test Level % U_T	Voltage dips in % U_T	Duration (ms)	Required Level	Performance Criterion
< 5	≥95	10	B	A
70	30	500	C	A
Voltage Interruptions:				
< 5	≥95	5000	C	A
Note: N/A				

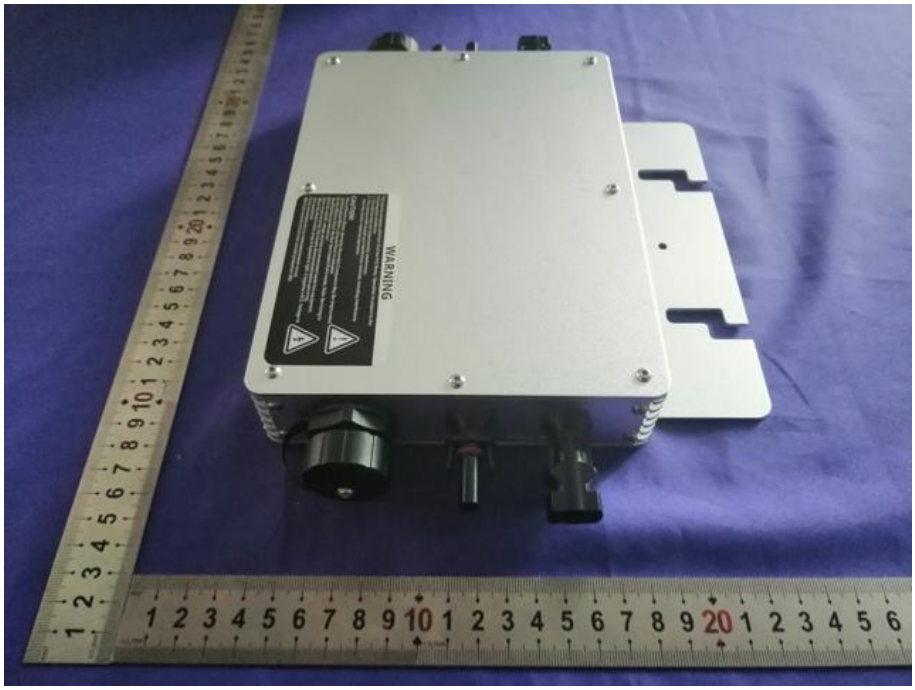
16. EUT PHOTOGRAPHS

EUT Photo 1(Model WVC-600)



EUT Photo 2

EUT Photo 3



EUT Photo 4

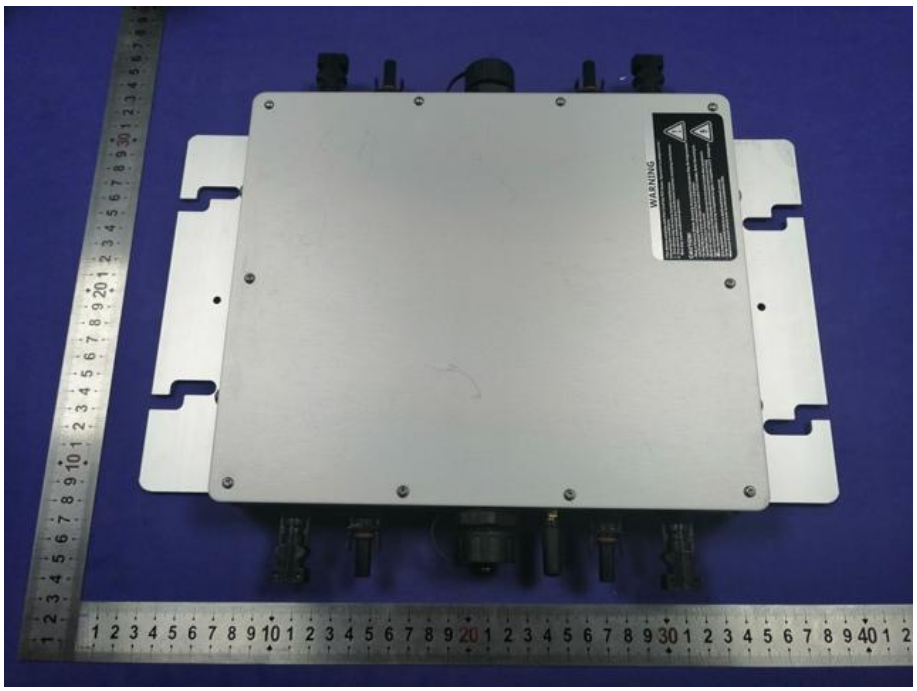
EUT Photo 5

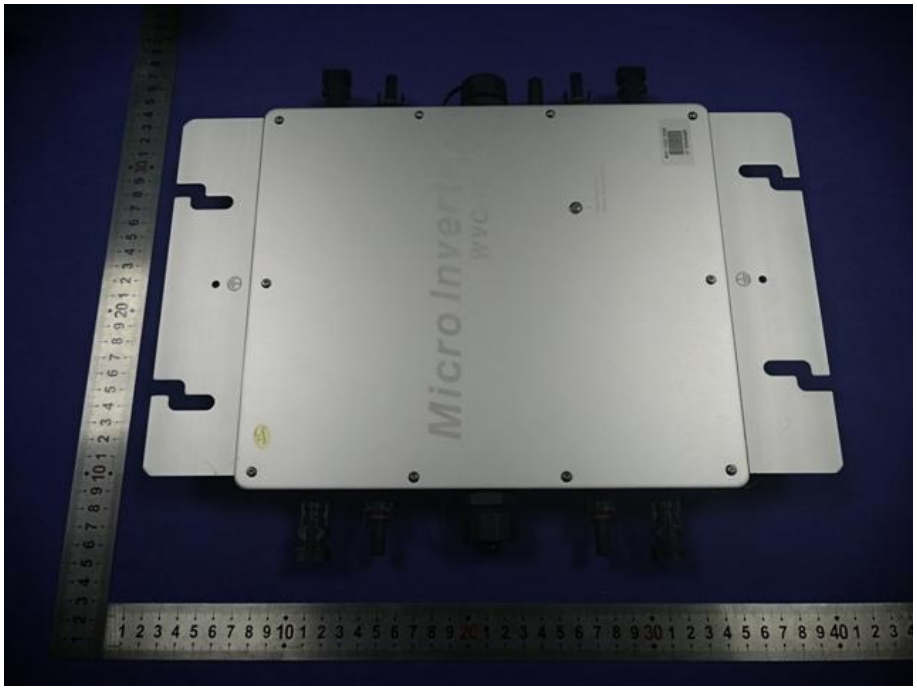
EUT Photo 6

EUT Photo 7(Model WVC-300)

EUT Photo 8

EUT Photo 9(Model WVC-1200)





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