

EMC Measurement and Test Report

For

Shenzhen Jumaoyuan Science and Technology Co., Ltd.

Floor 6, Bld. G, No.1 Guanlong Industrial Zone, Xili Town, Nanshan District,

Shenzhen, Guangdong, China

Test Standards: EN 61000-6-1:2007
EN 61000-6-3:2007/A1:2011/AC:2012

Product Description: Wood Moisture Meter

Tested Model: GM605

Report No.: WTX19X09062404E

Tested Date: 2019-09-09 to 2019-09-11

Issued Date: 2019-09-11

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Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior permitted by Shenzhen SEM Test Technology Co., Ltd.

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1.GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: Shenzhen Jumaoyuan Science and Technology Co., Ltd.
Address of applicant: Floor 6, Bld. G, No.1 Guanlong Industrial Zone, Xili
Town, Nanshan District, Shenzhen, Guangdong, China

Manufacturer: Shenzhen Jumaoyuan Science and Technology Co., Ltd.
Address of manufacturer: Floor 6, Bld. G, No.1 Guanlong Industrial Zone, Xili
Town, Nanshan District, Shenzhen, Guangdong, China

General Description of EUT	
Product Name:	Wood Moisture Meter
Trade Name:	BENETECH
Model No.:	GM605
Adding Model(s):	GM610, GM611, GM620, GM640, GM630
<i>Note: The test data is gathered from a production sample, provided by the manufacturer. The appearance of others models listed in the report is different from main-test model GM605, but the circuit and the electronic construction do not change, declared by the manufacturer.</i>	

Technical Characteristics of EUT	
Rated Voltage:	DC 3V
Rated Current:	/
Rated Power:	/
Power Adaptor Model:	/
Highest Internal Frequency:	Below 108MHz

1.2 Test Standards

The tests were performed according to following standards:

EN 61000-6-1:2007 Electromagnetic compatibility (EMC) —Part 6-1: Generic standards —Immunity for residential, commercial and light-industrial environments.

EN 61000-6-3:2007/A1:2011/AC:2012 Electromagnetic compatibility (EMC) —Part 6-3: Generic standards — Emission standard for residential, commercial and light-industrial environments.

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 standards EN61000-6-3, and EN61000-6-1 for residential, commercial and light-industrial environments, and all related testing and measurement techniques intentional standards.

1.4 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	Power Supply Mode
TM1	Working	/	DC3V

EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
/	/	/	/

Auxiliary Equipment List and Details

Description	Manufacturer	Model	Serial Number
/	/	/	/

Special Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
/	/	/	/

1.5 Performance Criteria for EMS

All the test data has been collected, reduced, and analyzed within this report in accordance with Immunity requires the following as specific performance criteria:

- 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 manufacture. 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.

1.6 Test Equipment List and Details

Description	Manufacturer	Model	Serial No.	Cal. Date	Due. Date
Spectrum Analyzer	Rohde & Schwarz	FSP	836079/035	2019-04-30	2020-04-29
EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2019-04-30	2020-04-29
Amplifier	Agilent	8447F	3113A06717	2019-04-30	2020-04-29
Amplifier	C&D	PAP-1G18	2002	2019-04-30	2020-04-29
Trilog Broadband Antenna	Schwarz beck	VULB9163	9163-333	2019-05-05	2021-05-04
Trilog Broadband Antenna	Schwarz beck	VULB9163(B)	9163-333	2019-05-05	2021-05-04
Horn Antenna	ETS	3117	00086197	2019-05-05	2021-05-04
Loop Antenna	Schwarz beck	FMZB 1516	9773	2019-05-05	2021-05-04
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2019-04-30	2020-04-29
Clamp	Luthi	MDS21	3809	2019-04-30	2020-04-29
EMI Test Receiver	Rohde & Schwarz	ESPI	101391	2019-04-30	2020-04-29
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2019-04-30	2020-04-29
AC LISN	Schwarz beck	NSLK8126	8126-224	2019-04-30	2020-04-29
8-WIRE LISN	Schwarz beck	8158	CAT3-8158-0059	2019-04-30	2020-04-29
8-WIRE LISN	Schwarz beck	8158	CAT5-8158-0117	2019-04-30	2020-04-29
DC LISN	Schwarz beck	NNBM8126D	279	2019-04-30	2020-04-29
DC LISN	Schwarz beck	NNBM8126D	280	2019-04-30	2020-04-29
PMF Generator	LIONCEL	PMF-801C-C	0171101	2019-04-30	2020-04-29
PMF Antenna	LIONCEL	PMF-801C-A	0180302	2019-04-30	2020-04-29
Instantaneous PMF Generator Module	LIONCEL	PMF-801C-T	0171001	2019-05-05	2020-05-04
Digital Power Analyzer	California Instrument	CTS	72831	2019-04-30	2020-04-29
Power Source	California Instrument	5001IX-CTS-400	25965	2019-04-30	2020-04-29
ESD Generator	LIONCEL	ESD-203B	0170901	2019-05-05	2020-05-04
Amplifier	Agilent	8447D	2944A10179	2019-04-30	2020-04-29
Transient 2000	EMC PARTNER	TRA2000	863	2019-05-21	2020-05-20
Couple Clamp	EMC PARTNER	CN-EFT1000	513	2019-05-21	2020-05-20
CS Immunity Tester	SCHAFFNER	NSG2070	1123	2019-04-30	2020-04-29
Attenuator	EMTEST	MA-5100/6BF2	1009	2019-04-30	2020-04-29
CDN	Luthi	L-801M2/M3	2665	2019-04-30	2020-04-29
Signal Generator	R&S	SMB100A	105942	2019-09-09	2020-09-08
Power Meter	R&S	NRP2	102031	2019-09-09	2020-09-08
RF Power Amplifier	BONN Elektronik	BLWA0830-160/100/40D	128740	2019-09-09	2020-09-08
RF Power Amplifier	NJNT	NTWPAS-2560025	2560025	2019-09-09	2020-09-08
Antenna	SCHWARZBECK	STLP9128D	043	2017-09-11	2020-09-10
Antenna	SCHWARZBECK	BBHA 9120 D	667	2017-09-11	2020-09-10

CS Generator	MARCONI	2024	112260/042	2019-05-31	2020-05-30
Attenuator	FRANKONIA	75-A-FFN-06	1001698	2019-05-31	2020-05-30
CDN	FRANKONIA	CDN M2+M3	A3027019	2019-05-31	2020-05-30
EM Injection Clamp	FCC	F-203I-23mm	91536	2019-05-31	2020-05-30
RF POWER AMPLIFIER	FRANKONIA	FLL-75	102A1109	2019-05-31	2020-05-30

2. SUMMARY OF TEST RESULTS

Standards	Description of Test Item	Result
EN61000-6-3	Conducted Emission	N/A
	Radiated Emission	Compliant
EN61000-3-2	Harmonic Current Emission	N/A
EN61000-3-3	Voltage Fluctuation And Flicker	N/A
EN61000-6-1	Electrostatic Discharge Immunity in accordance with EN 61000-4-2	Compliant
	Radiated RF-Electromagnetic Field Immunity in accordance with EN 61000-4-3	Compliant
	Electrical Fast Transient/Burst Immunity in accordance with EN 61000-4-4	N/A
	Surge Immunity in accordance with EN 61000-4-5	N/A
	Conducted disturbances Immunity in accordance with EN 61000-4-6	N/A
	Power-frequency magnetic field Immunity in accordance with EN 61000-4-8	Compliant
	Voltage Dips/Interruptions Immunity in accordance with EN 61000-4-11	N/A

N/A: not applicable

3. RADIATED EMISSION

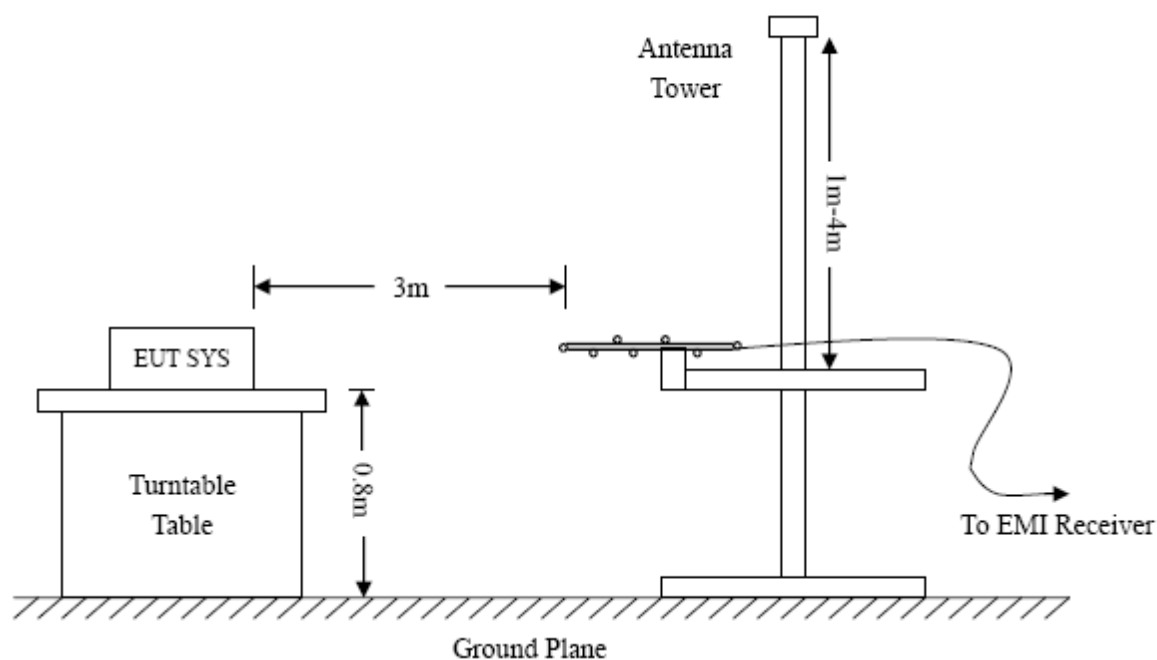
3.1 Measurement Uncertainty

Base on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any radiation emissions measurement

Measurement uncertainty		
Parameter	Conditions	Uncertainty
Radiated Emissions	Radiated	30-200MHz $\pm 4.52\text{dB}$
		0.2-1GHz $\pm 5.56\text{dB}$
		1-6GHz $\pm 3.84\text{dB}$
		6-18GHz $\pm 3.92\text{dB}$

3.2 Test Procedure

Test is conducting under the description of EN61000-6-3, Radio disturbance characteristics - Limits and methods of measurement.



3.3 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:

$$\begin{aligned}\text{Corr. Ampl.} &= \text{Indicated Reading} + \text{Correct} \\ \text{Correct} &= \text{Ant.Factor} + \text{Cable Loss} - \text{Ampl.Gain}\end{aligned}$$

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. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{EN61000-6-3 Limit}$$

3.4 Environmental Conditions

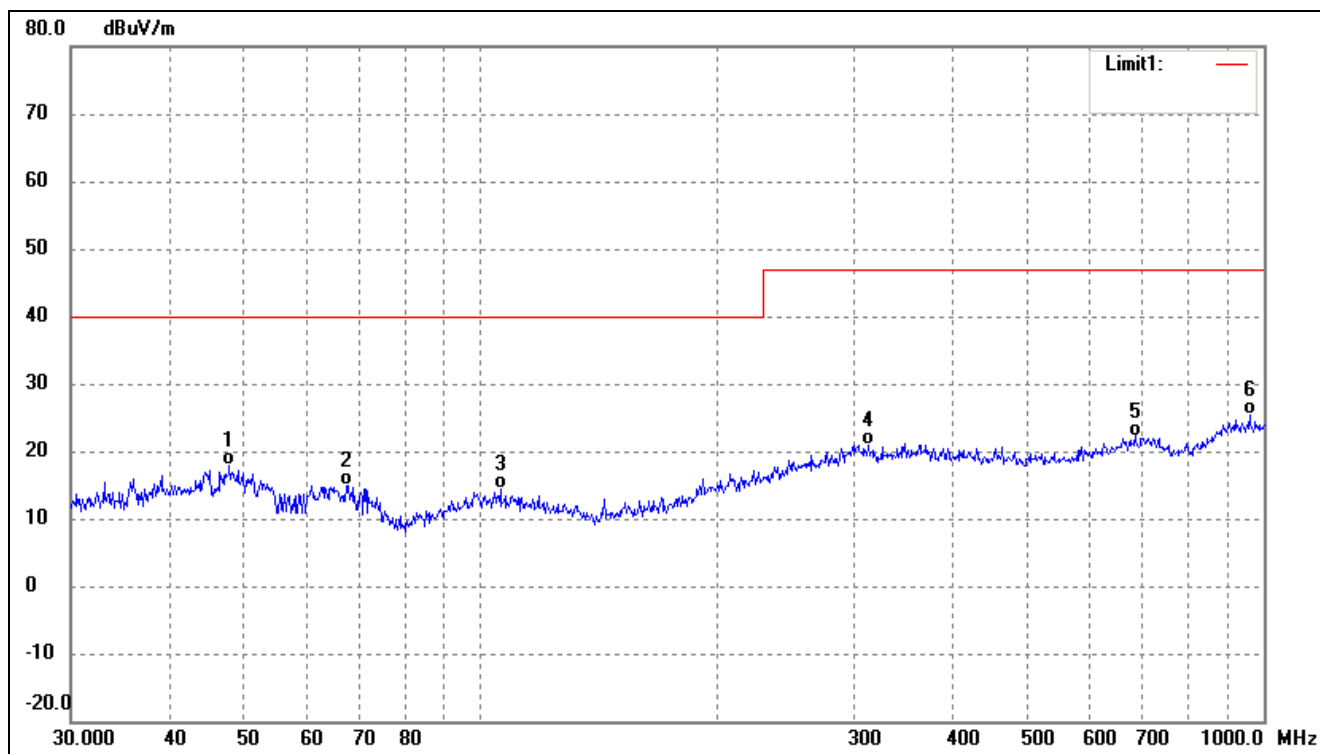
Temperature:	23° C
Relative Humidity:	53%
ATM Pressure:	1011 mbar

3.5 Summary of Test Results/Plots

According to the data in section 4.5, the EUT complied with the EN61000-6-3 standards, and had the worst margin is:

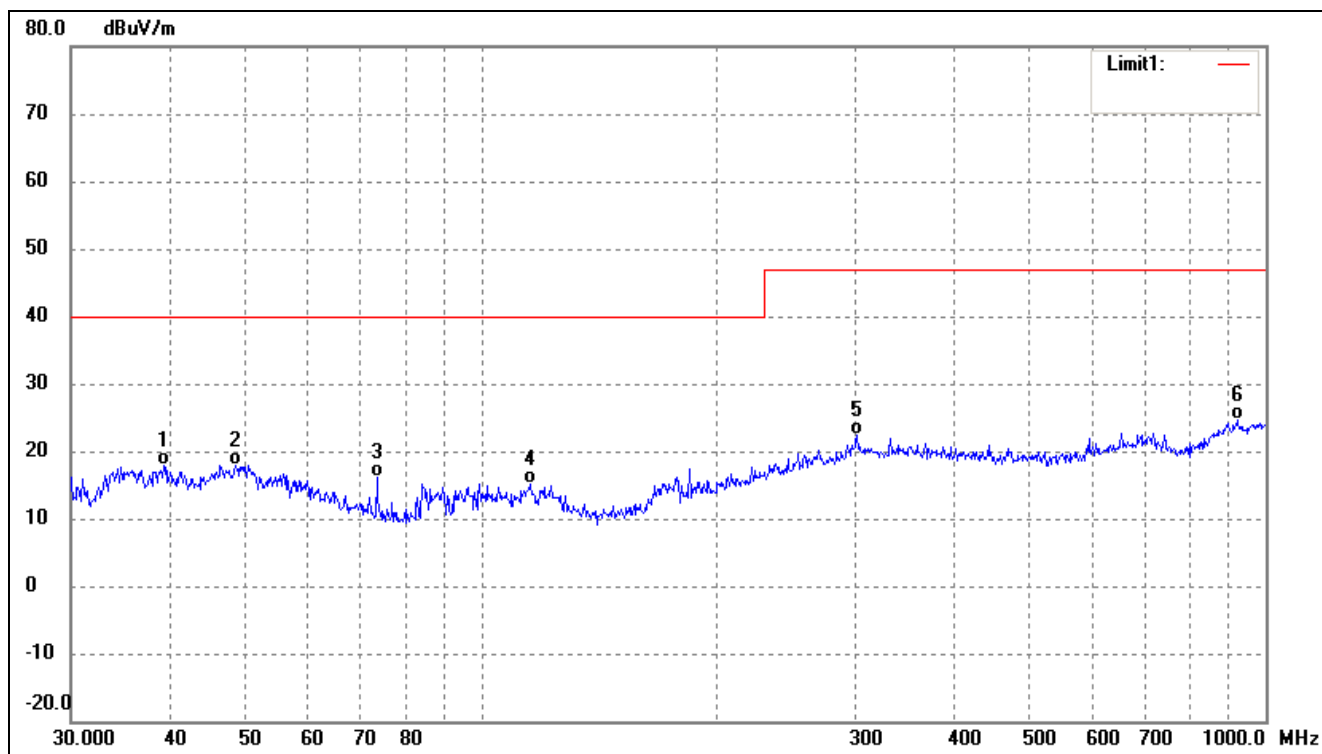
-21.59 dB at 958.7943 MHz in the Horizontal polarization, 30 MHz to 1 GHz, 3 Meters

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	47.8260	31.58	-13.76	17.82	40.00	-22.18	77	100	QP
2	67.4382	31.35	-16.49	14.86	40.00	-25.14	184	100	QP
3	106.0126	29.25	-14.83	14.42	40.00	-25.58	65	100	QP
4	313.2760	29.13	-8.17	20.96	47.00	-26.04	139	100	QP
5	684.7454	27.58	-5.33	22.25	47.00	-24.75	173	100	QP
6	958.7943	26.50	-1.09	25.41	47.00	-21.59	180	100	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	39.4371	32.27	-14.37	17.90	40.00	-22.10	337	100	QP
2	48.6719	31.61	-13.71	17.90	40.00	-22.10	148	100	QP
3	73.6170	34.12	-17.91	16.21	40.00	-23.79	55	100	QP
4	115.7256	30.28	-15.27	15.01	40.00	-24.99	329	100	QP
5	301.4223	30.20	-7.86	22.34	47.00	-24.66	125	100	QP
6	919.2866	25.54	-0.88	24.66	47.00	-22.34	90	100	QP

4. Electrostatic Discharges (ESD)

4.1 Test Procedure

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

Test Performance

Performance Criterion: B

Environmental Conditions

Temperature:	26 °C
Relative Humidity:	55%
ATM Pressure:	1011 mbar

4.2 Electrostatic Discharge Immunity Test Data

Table 1: Electrostatic Discharge Immunity (Air Discharge)

EN 61000-4-2	Test Levels (kV)									
Test Points	-2	+2	-4	+4	-6	+6	-8	+8	-15	+15
Display panel	A	A	A	A	B	B	B	B	/	/
Buttons	A	A	A	A	B	B	B	B	/	/
All plastic seams	A	A	A	A	B	B	B	B	/	/

Table 2: Electrostatic Discharge Immunity (Direct Contact)

EN 61000-4-2	Test Levels (kV)									
Test Points	-2	+2	-4	+4	-6	+6	-8	+8	-15	+15
Metal stylet	A	A	B	B	/	/	/	/	/	/

Table 3: Electrostatic Discharge Immunity (Indirect Contact HCP & VCP)

EN 61000-4-2	Test Levels (kV)									
Test Points	-2	+2	-4	+4	-6	+6	-8	+8	-15	+15
HCP (6 Sides)	A	A	A	A	/	/	/	/	/	/
VCP (4 Sides)	A	A	A	A	/	/	/	/	/	/

Test Result: Pass

5. Continuous Radiated Disturbances (R/S)

5.1 Test Procedure

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

Test Performance

Performance Criterion: A

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	52%
ATM Pressure:	1010 mbar

5.2 Continuous Radiated Disturbances Test Data

Frequency step: 1% of fundamental

Dwell time: 1 second

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

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
1400-2000	3	A	A	A	A	A	A	A	A
2000-2700	1	A	A	A	A	A	A	A	A

Test Result: Pass

6. Power-Frequency Magnetic Fields (PFMF)

6.1 Test Procedure

Test is conducting under the description of EN 61000-4-8.

Test Performance

Performance Criterion: A

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	50%
ATM Pressure:	1011 mbar

6.2 Power-Frequency Magnetic Field Test Data

Level	Magnetic Field Strength (r.m.s) A/m	Frequency Hz	Induction Coil Postion	Pass	Fail
1	1	50	X, Y, Z	/	/
2	3	50	X, Y, Z	A	/
3	10	50	X, Y, Z	/	/
X	Special	/	/	/	/

Test Result: Pass

EXHIBIT 1 - PRODUCT LABELING

Proposed CE Label Format

Wood Moisture Meter	
Model: GM605	
Brand: BENETECH	
Importer Name: XXX	
Importer Address: XXX	
Shenzhen Jumaoyuan Science and Technology Co., Ltd.	
Floor 6, Bld. G, No.1 Guanlong Industrial Zone, Xili Town,	
Nanshan District, Shenzhen, Guangdong, China	

Specifications: Text is Black in color and is justified. Labels are printed in indelible ink on permanent adhesive backing or silk-screened onto the EUT or shall be affixed at a conspicuous location on the EUT. The 'CE' marking must be affixed to the EUT or to its data plate. Where this is not possible or not warranted on account of the nature of the apparatus, it must be affixed to the packaging, if any, and to the accompanying documents. The 'CE' marking is allowed less than 5 mm but must clear. If the 'CE' marking is reduced or enlarged the proportions given in the above graduated drawing must be respected. The Importer name, address and Manufacturer name and address should indicate on marking label or packaging or in a document accompanying

Proposed Label Location on EUT

CE Label Location

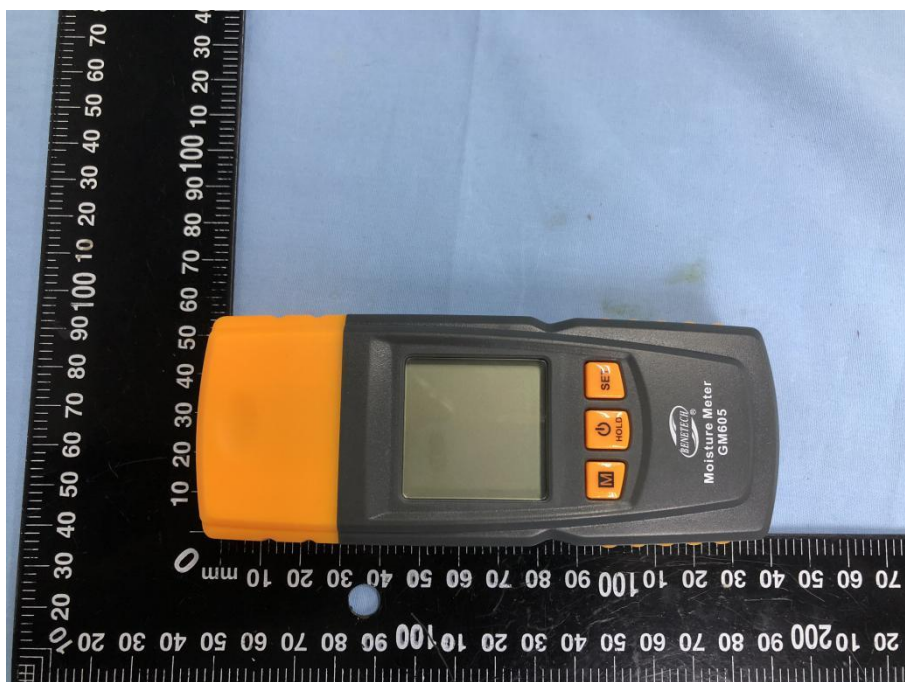


EXHIBIT 2 - EUT PHOTOGRAPHS

EUT View 1



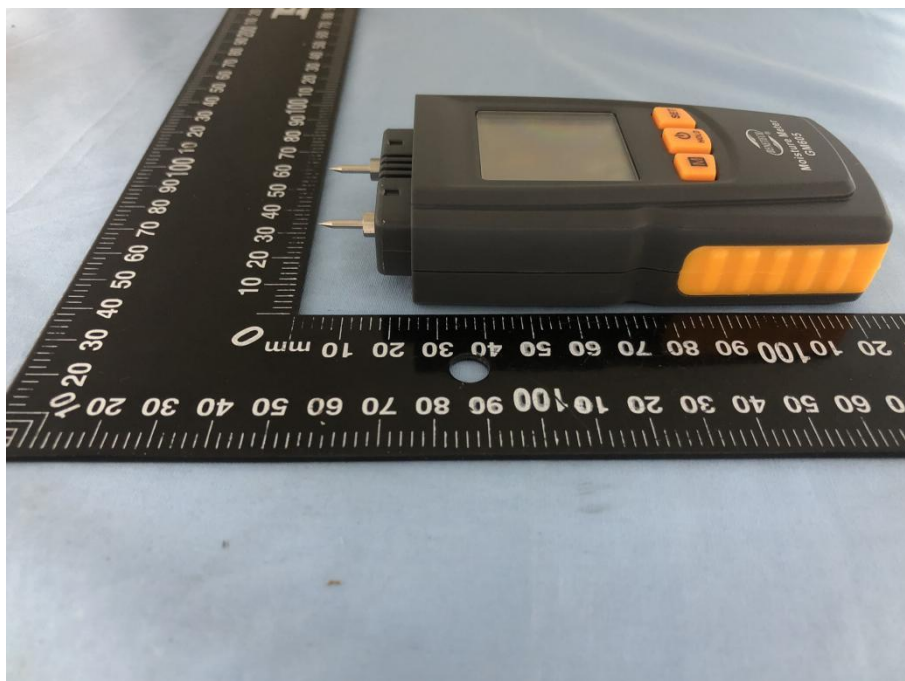
EUT View 2



EUT View 3



EUT View 4



EUT View 5



EUT View 6



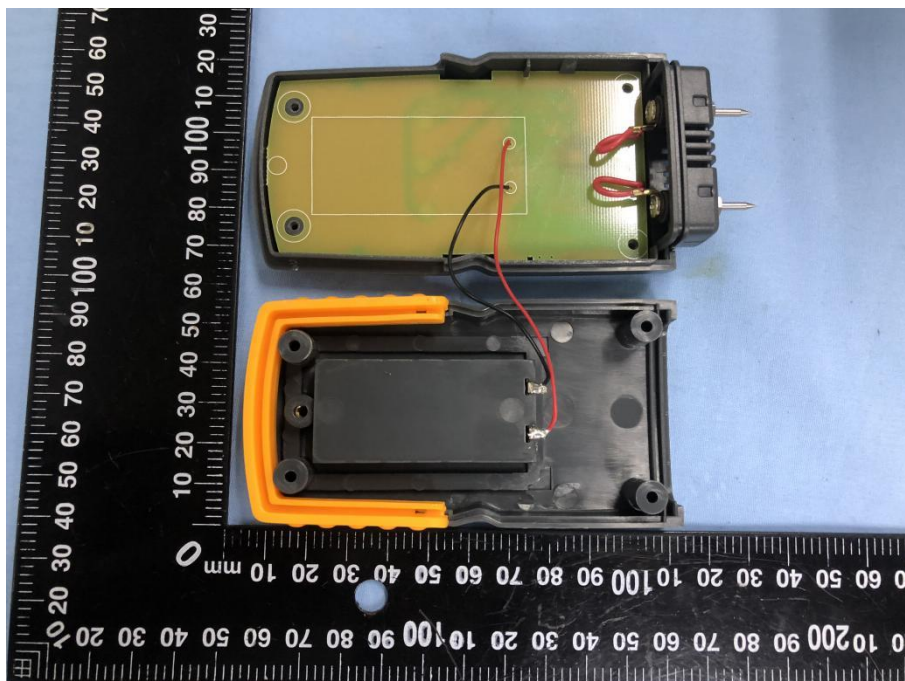
EUT View 7



EUT Housing and Board View 1



Solder Board-Component View 1



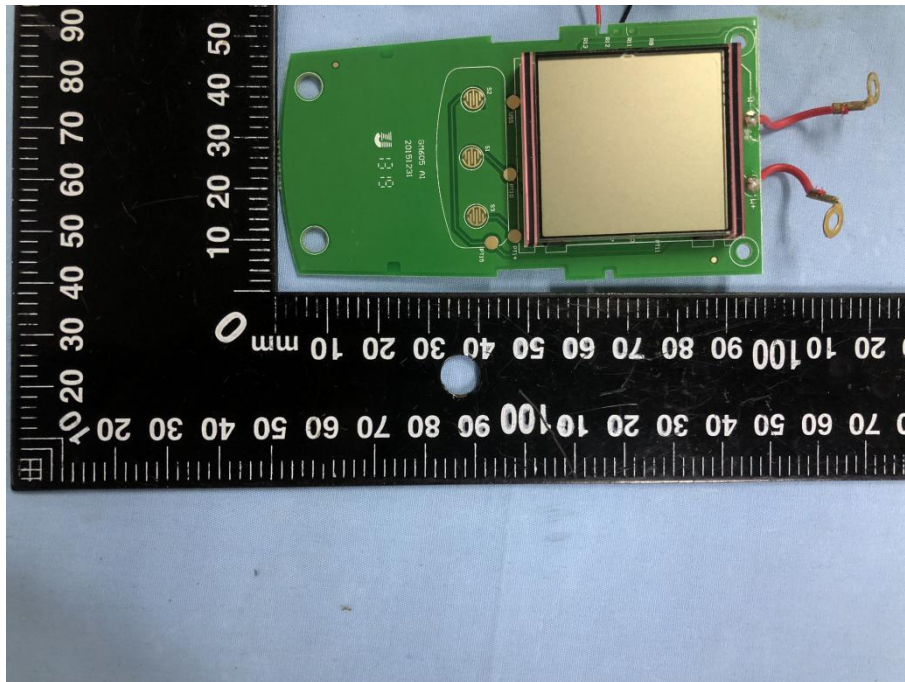
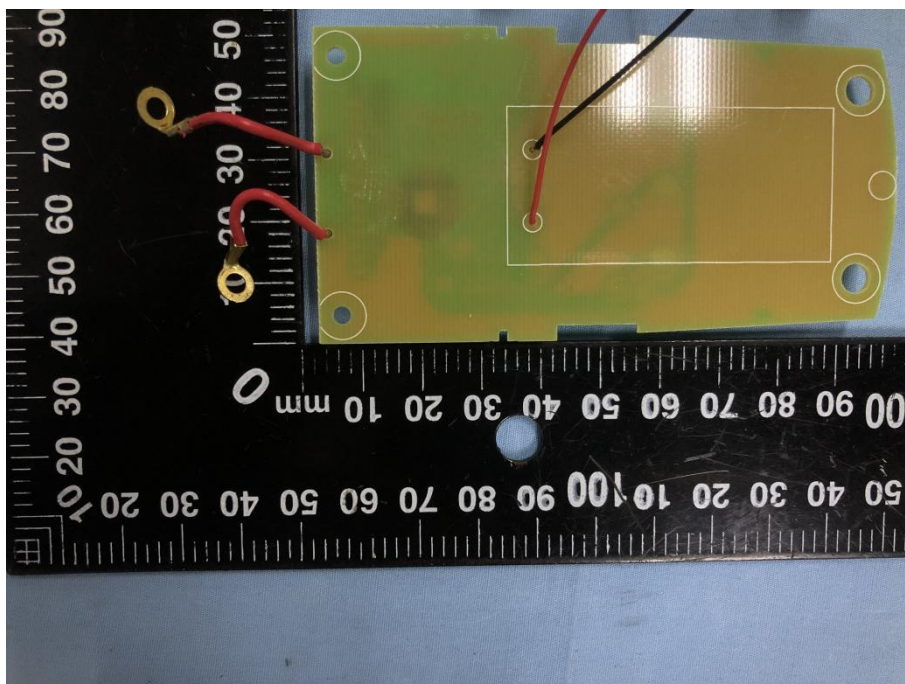
Solder Board-Component View 2**Solder Board-Component View 3**

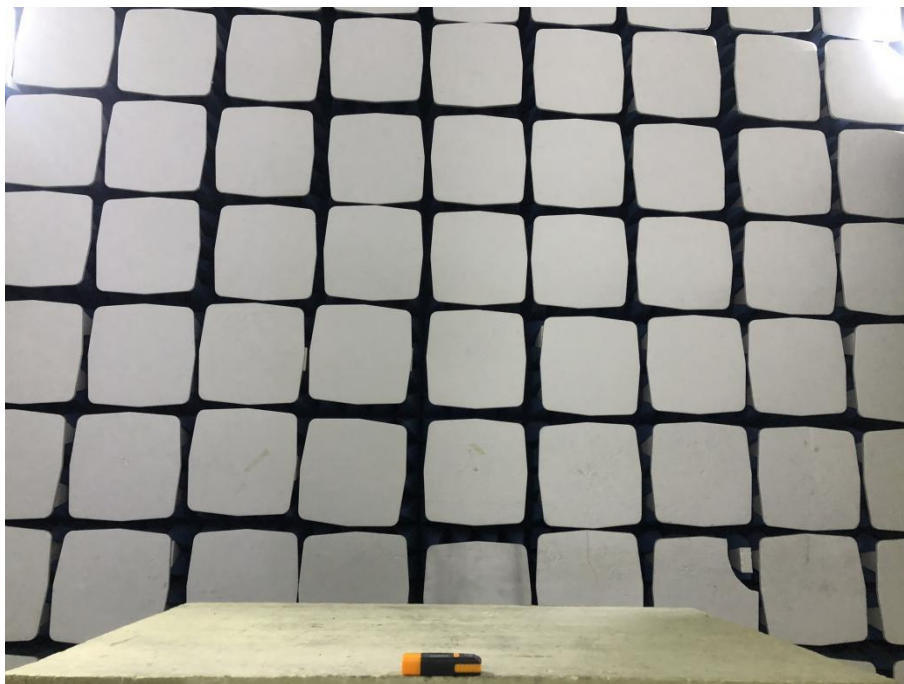
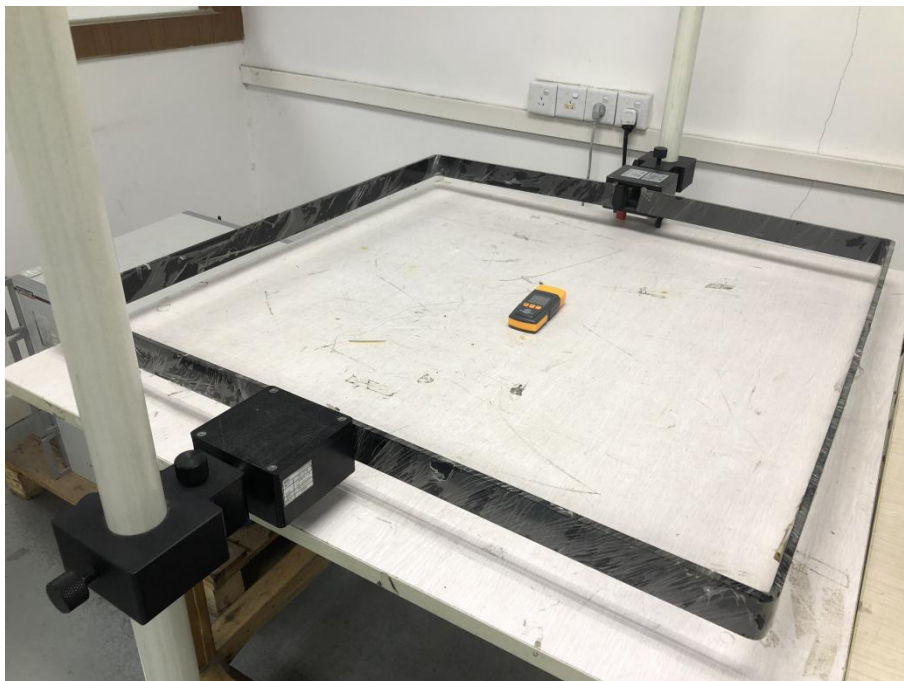
EXHIBIT 3 - TEST SETUP PHOTOGRAPHS

Radiation Emission Test View



EN 61000-4-2 Test View



EN 61000-4-3 Test View**EN 61000-4-8 Test View**

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