FCC&IC EMC TEST REPORT
No. 160601925SHA-002

Applicant	:	GE Sensing & Inspection (Changzhou) Co.Ltd Jintong International Industrial Park, No.8 Xihu Road, Wujing District, Changzhou, Jiangsu, 213164, P.R.China.
Manufacturer	:	GE Sensing & Inspection (Changzhou) Co.Ltd Jintong International Industrial Park, No.8 Xihu Road, Wujing District, Changzhou, Jiangsu, 213164, P.R.China.
Product Name	:	TransPort® PT900 Ultrasonic Flow Meter
Type/Model	:	PT900
FCC ID	:	2AI2D-001
TEST RESULT	**:**	**PASS**

SUMMARY

The equipment complies with the requirements according to the following standard(s) or specification:

47CFR Part 15 (2015): Radio Frequency Devices (Subpart B)

ANSI C63.4 (2014): American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

ICES-003 Issue 6 (2016): Information Technology Equipment (ITE) – Limits and methods of measurement

Date of issue: Aug 08,2016

Prepared by: Reviewed by:

Jesse Xu (*Project Engineer*) Daniel Zhao (*Reviewer*)

Content

1 GENERAL INFORMATION

1.1 Description of Equipment Under Test (EUT)

Product Name	:	TransPort® PT900 Ultrasonic Flow Meter
Type/Model	:	PT900
Description of EUT	:	There is only one model. We tested it and listed the worst data in this report.
Rating	:	Voltage:12V ⎓ 3A Adapter:100-240V~,50-60Hz,15A Output:12V ⎓ 5A
I/O Port	:	USB port
Category of EUT	:	Class B
EUT type	:	☒ Table top ☐ Floor standing
Highest operating frequency	:	Higher than 108MHz
Sample received date	:	June 15, 2016
Sample identification No.	:	-
Date of test	:	June 16, 2016 –July 15, 2016

1.2 Description of Client

Applicant : General Electric Company.
No.1 Hua Tuo Road, Shanghai,China

Name of contact : Chengtao CAO

Tel : +86 21 3877 7360

Fax : +86 21 3877 7503

Email : chengtao.cao@ge.com

Manufacturer : GE Sensing and Inspection (Changzhou) Co.,Ltd .
Jintong International Industrial, Building No. 9, Wujin district, Changzhou, China.

1.3 Description of Test Facility

☒ Name : Intertek Testing Service Shanghai

Address : Building 86, No. 1198 Qinzhou Road(North), Shanghai 200233, P.R. China

Telephone : 86 21 61278200

Telefax : 86 21 54262353

Subcontractor:

☐ Name : Shanghai Institute of Measurement Technology

Address : 716 Yishan Road, Shanghai 200233, P.R. China

Telephone : 86 21 64700066

Telefax :

2 TEST SPECIFICATIONS

2.1 Standards or specification

47CFR Part 15 (2015): Radio Frequency Device: Subpart B

ANSI C63.4 (2014): Interim Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40GHz.

ICES-003 Issue 6 (2016): Information Technology Equipment (ITE) – Limits and methods of measurement

2.2 Mode of operation during the test

Within this test report, EUT was tested with modulation and tested under its rating voltage and frequency.

2.3 Test software list

Test Items	Software	Manufacturer	Version
Conducted emission	ESxS-K1	R&S	V2.1.0
Radiated emission	ES-K1	R&S	V1.71

2.4 Test peripherals list

Item No.	Name	Band and Model	Description
1	Laptop computer	HP, EliteBook 2530P	

2.5 Instrument list

Selected	Instrument	EC no.	Model	Valid until date
☒	Shielded room	EC 2838	GB88	2017-1-8
☒	EMI test receiver	EC 2107	ESCS 30	2016-10-19
☒	A.M.N.	EC 3119	ESH2-Z5	2016-12-16
☐	A.M.N.	EC 3394	ENV 216	2017-8-1
☒	Semi anechoic chamber	EC 3048	-	2017-5-11
☒	EMI test receiver	EC 3045	ESIB26	2016-10-19
☐	Broadband antenna	EC 4206	CBL 6112D	2017-4-27
☐	Horn antenna	EC 3049	HF906	2017-4-27
☐	Horn antenna	EC 4792-1	3117	2017-4-21
☐	Horn antenna	EC 4792-3	HAP18-26W	2017-6-11
☐	Pre-amplifier	EC 5262	pre-amp 18	2017-5-25
☐	Pre-amplifier	EC 4792-2	TPA0118-40	2017-4-10
☐	High Pass Filter	EC 4797-1	WHKX 1.0/15G-10SS	2017-1-8
☐	High Pass Filter	EC 4797-2	WHKX 2.8/18G-12SS	2017-1-8
☐	High Pass Filter	EC 4797-3	WHKX 7.0/1.8G-8SS	2017-1-8
☐	Band Reject Filter	EC 4797-4	WRCGV2400/2483/10SS	2017-1-8
☐	Test Receiver	EC 4501	ESCI 7	2017-1-13
☐	PXA Signal Analyzer	EC5338	N9030A	2017-11-17
☐	Power sensor/Power meter	EC4318	N1911A/N1921A	2017-4-8
☐	Power sensor	EC5338-1	U2021XA	2017-3-5
☐	MXG Analog Signal Generator	EC5338-2	N5181A	2017-3-5
☐	MXG Vector Signal Generator	EC5175	N51812B	2017-1-8

2.6 Test Summary

This report applies to tested sample only. The test results have been compared directly with the limits, and the measurement uncertainty is recorded. This report shall not be reproduced in part without written approval of Intertek Testing Service Shanghai Limited.

TEST ITEM	FCC REFERANCE	RESULT
Conducted emission	15.107	Pass
Radiated emission	15.109	Pass

Notes: 1: NA =Not Applicable

3 Conducted emission

Test result: Pass

3.1 Limits

3.1.1 Limits for conducted emission of class A device

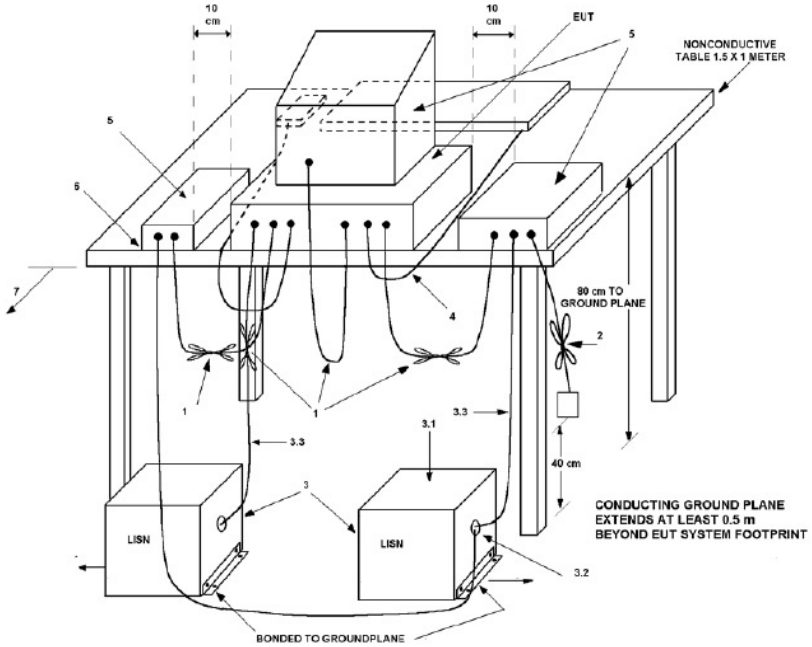
Frequency range (MHz)	Limits dB(μV) Quasi-peak	Average
0.15 ~ 0.5	79	66
0.5 ~ 30	73	60
Note: If the limit for the measurement with the average detector is met when using a receiver with a quasi-peak detector, the equipment under test shall be deemed to meet both limits and the measurement using the receiver with an average detector need not be carried out.		

3.1.2 Limits for conducted emission of class B device

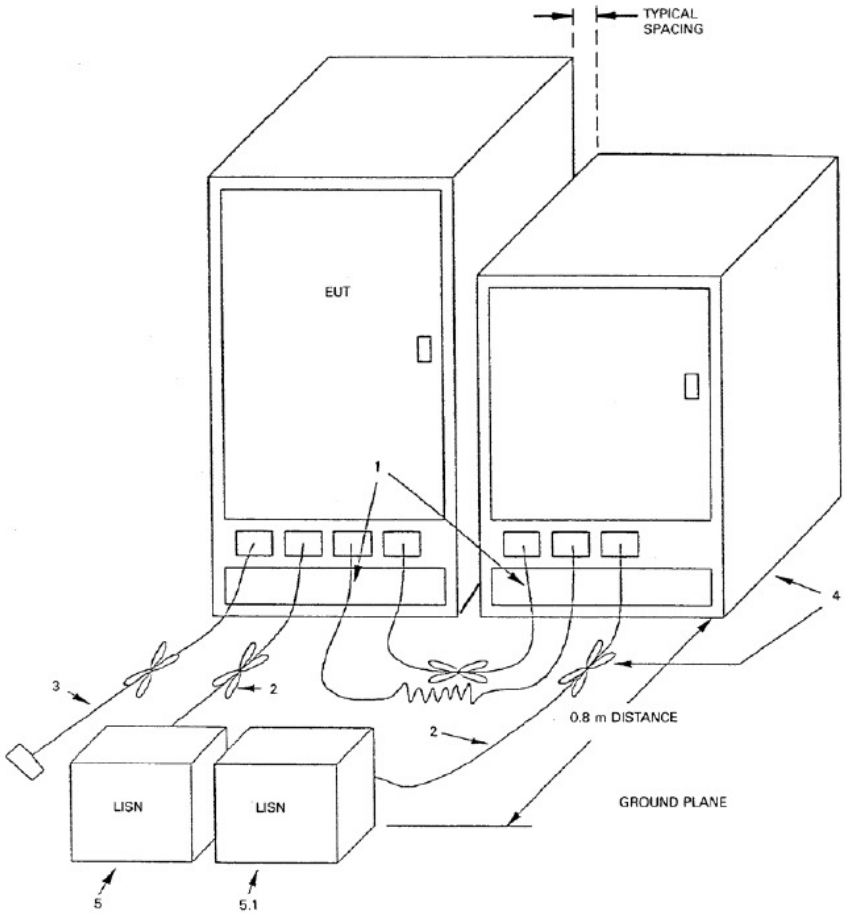
Frequency range (MHz)	Limits dB(μV) Quasi-peak	Average
0.15 ~ 0.5	66 ~ 56 *	56 ~ 46 *
0.5 ~ 5	56	46
5 ~ 30	60	50
Note: 1. * Means the limit decreasing linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz 2. If the limit for the measurement with the average detector is met when using a receiver with a quasi-peak detector, the equipment under test shall be deemed to meet both limits and the measurement using the receiver with an average detector need not be carried out.		

3.2 Test setup

☒ For table top equipment



☐ For floor standing equipment



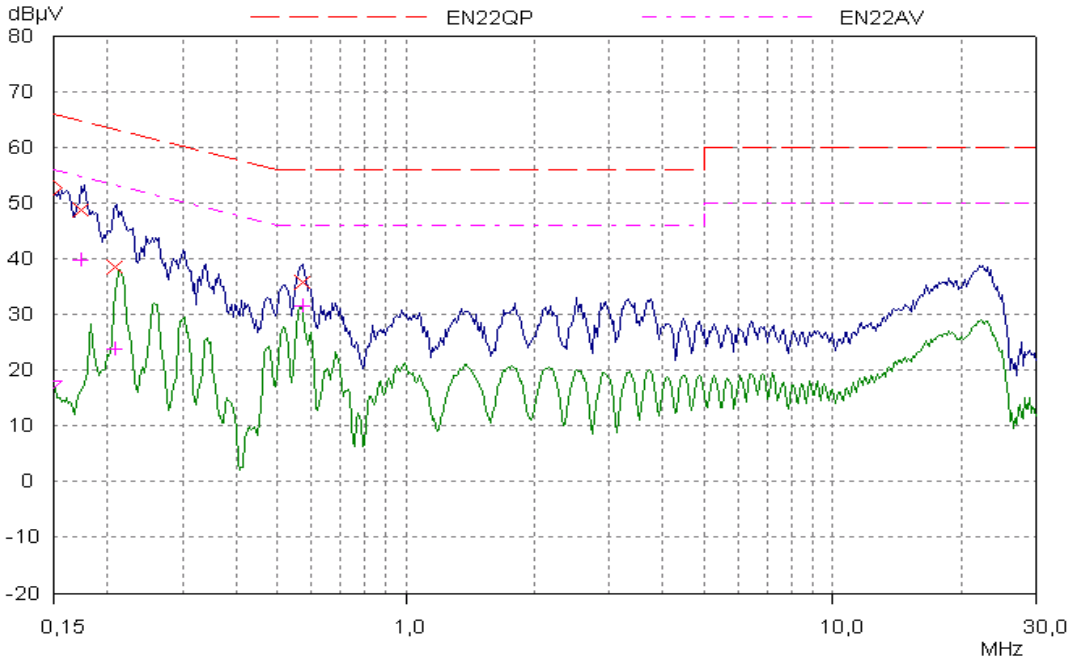
3.3 Test Setup and Test Procedure

Measurement was performed in shielded room, and instruments used were following clause 4 and clause 5 of ANSI 63.4.
Detailed test procedure was following clause 7.3 of ANSI 63.4.
EUT arrangement and operation conditions were according to clause 6 and clause 7 of ANSI 63.4.
Frequency range 150kHz – 30MHz was checked and EMI receiver measurement bandwidth was set to 9 kHz.

3.4 Test Protocol

Temperature : 24 °C
Relative Humidity : 42 %

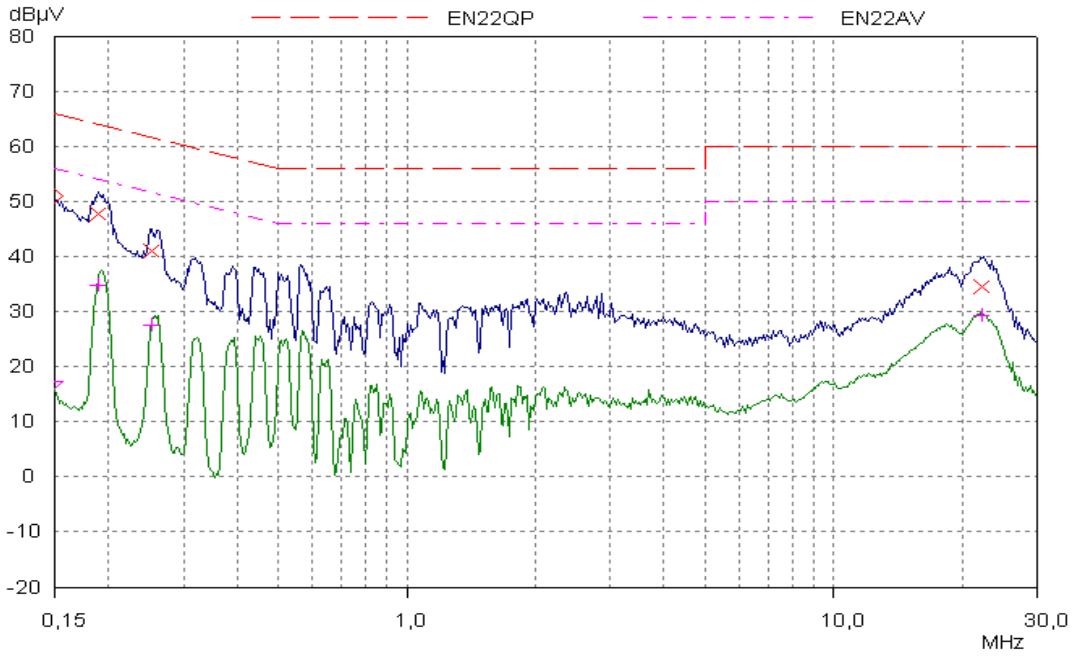
L-line



Test Data:

Frequency (MHz)	3.4.1.1.1.1 Quasi-peak			Average			Line
	level dB(µV)	Limit dB(µV)	Margin (dB)	level dB(µV)	limit dB(µV)	Margin (dB)	
0.17	48.63	64.77	16.14	39.74	54.77	15.03	L
0.20	38.59	63.31	24.72	23.81	53.31	29.50	L
0.39	*	58.00	*	*	48.00	*	L
0.57	35.77	56.00	20.23	31.42	46.00	14.80	L
1.67	*	56.00	*	*	46.00	*	L
6.92	*	60.00	*	*	50.00	*	L
Note: * means the emission level 20dB lower than the relevant limit.							

N-line



Test Data:

Frequency (MHz)	3.4.1.1.1.2 Quasi-peak			Average			Line
	level dB(µV)	Limit dB(µV)	Margin (dB)	level dB(µV)	limit dB(µV)	Margin (dB)	
0.18	47.78	64.11	16.33	34.65	54.11	19.46	N
0.25	40.99	61.69	20.70	27.54	51.69	24.15	N
1.167	*	*	*	*	*	*	N
1.719	*	*	*	*	*	*	N
2.229	*	*	*	*	*	*	N
22.21	48.21	60.00	25.56	29.17	50.00	20.83	N
Note: * means the emission level 20dB lower than the relevant limit.							

Notes: All possible modes of operation were investigated. Only the worst case emissions was measured.

4 Radiated emission

Test result: Pass

4.1 Radiated emission limits

4.1.1 Limits for radiated emission of class A device

Frequency (MHz)	Permitted limit in dBµV/m (Quasi-peak) of Measurement Distance 10m
30 – 88	39
88 – 216	43.5
216 – 960	46.4
Above 960	49.5
Note: for the measurement distance other than 3m and 10m, the limit is varied according to 20dB/10 decades.	

Frequency (GHz)	Permitted limit in dBµV/m (Average) of Measurement Distance 10m	Permitted limit in dBµV/m (Peak) of Measurement Distance 10m
>1	49.5	69.5

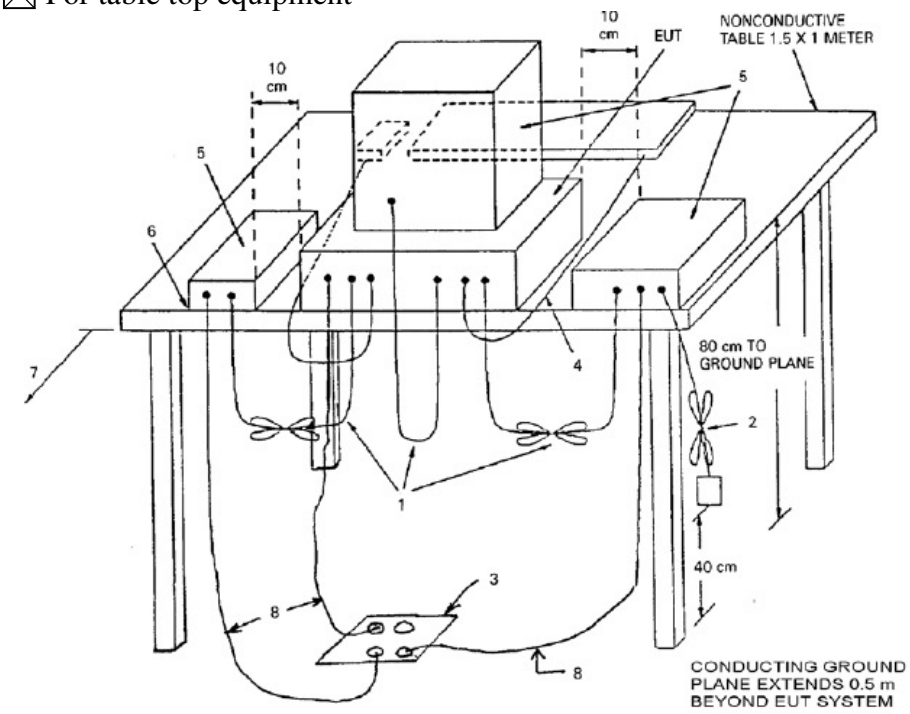
4.1.2 Limits for radiated emission of class B device

Frequency (MHz)	Permitted limit in dBµV/m (Quasi-peak) of Measurement Distance 3m
30 – 88	40.0
88 – 216	43.5
216 – 960	46.0
Above 960	54.0
Note: for the measurement distance other than 3m and 10m, the limit is varied according to 20dB/10 decades.	

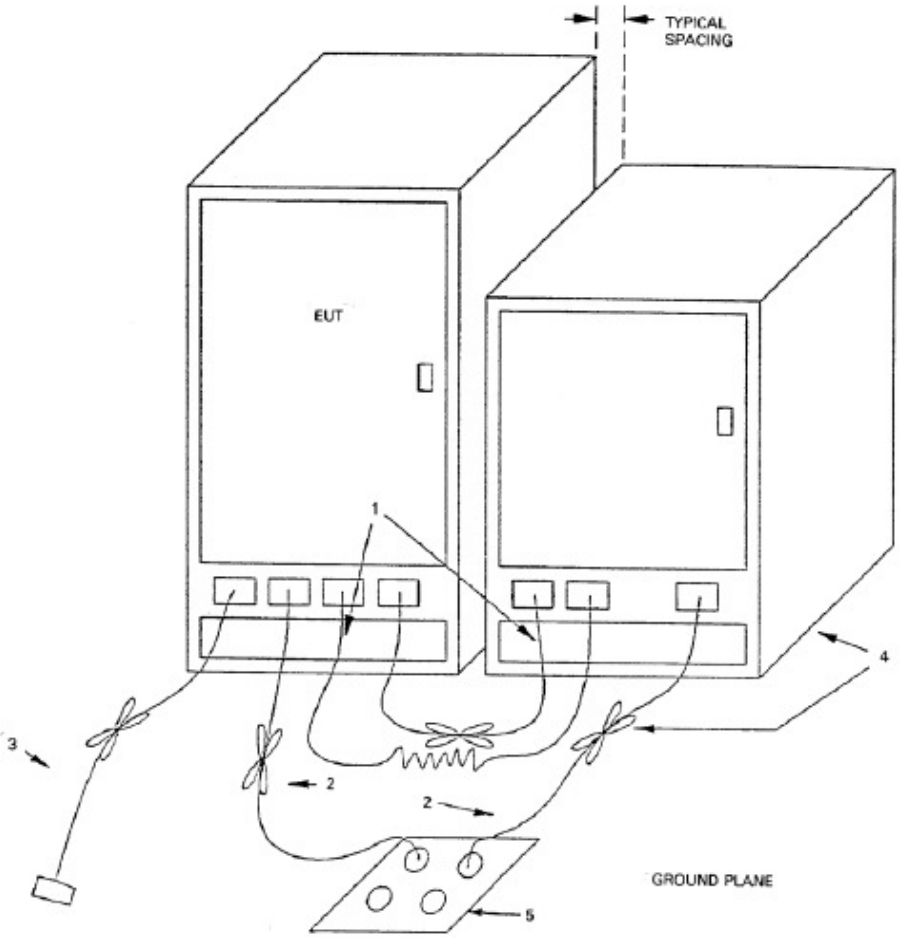
Frequency (GHz)	Permitted limit in dBµV/m (Average) of Measurement Distance 3m	Permitted limit in dBµV/m (Peak) of Measurement Distance 3m
>1	54	74

4.2 Block diagram and test set up

☒ For table top equipment



☐ For floor standing equipment



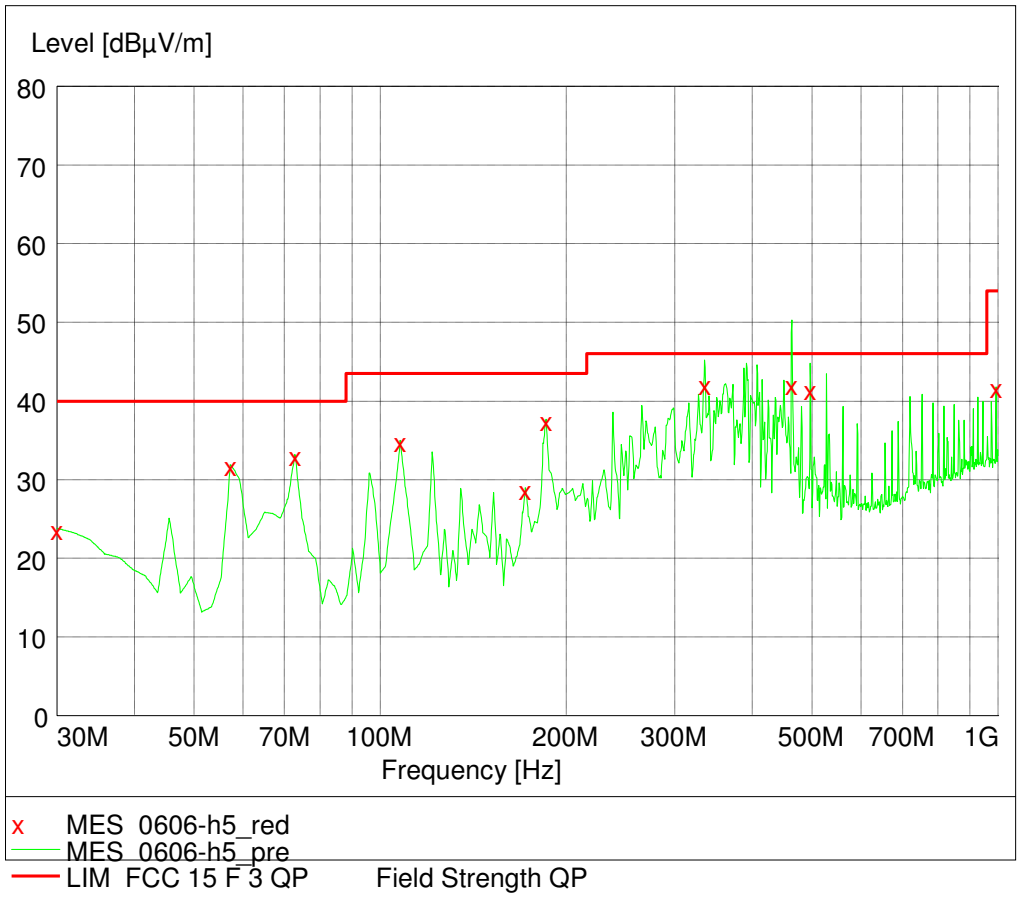
4.3 Test Setup and Test Procedure

The measurement was performed in a semi-anechoic chamber.
The distance from EUT to receiving antenna is 3 meter.
Measurement was performed according to clause 4 and clause 5 of ANSI 63.4.
Test procedure was according to clause 8.3 of ANSI 63.4.
EUT arrangement and operate condition were according to clause 6 and clause 8 of ANSI 63.4.
The bandwidth setting on R&S Test Receiver ESIB26 was 120 kHz.
The required measurement frequency range was checked.

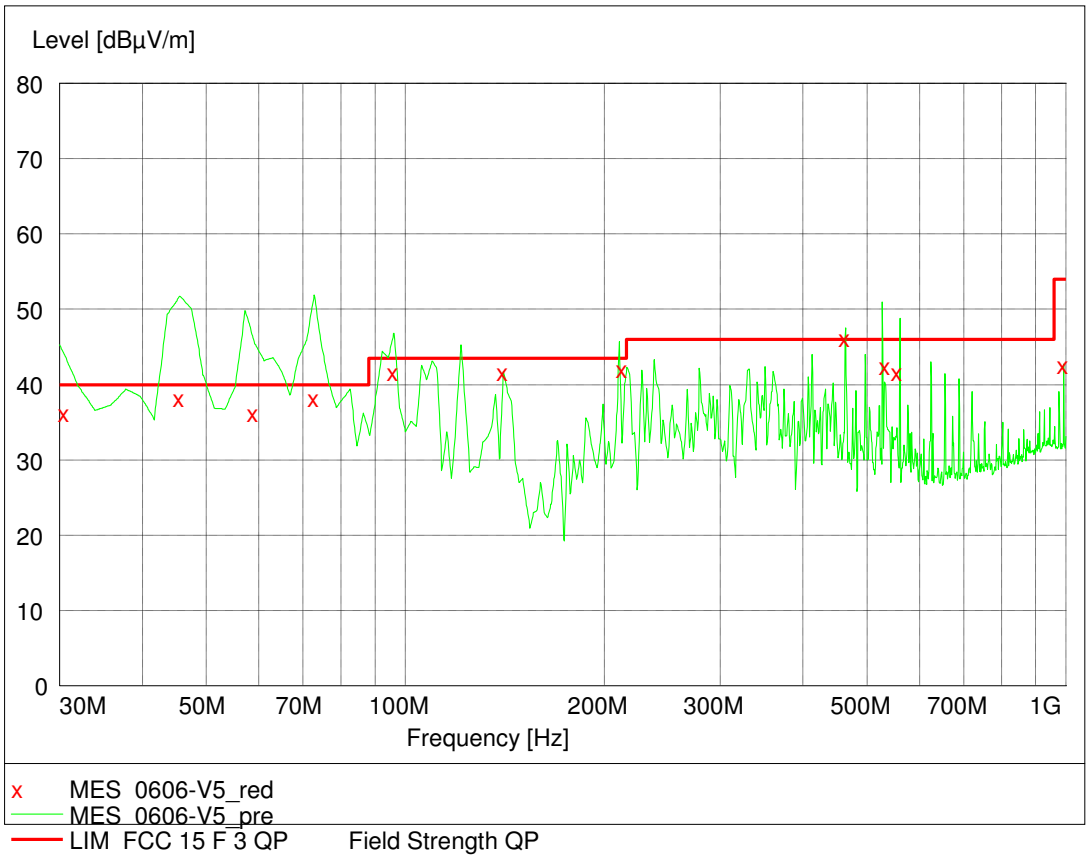
4.4 Test Protocol

Temperature : 23 °C
Relative Humidity : 55 %

30-1000MHz Horizontal (working)



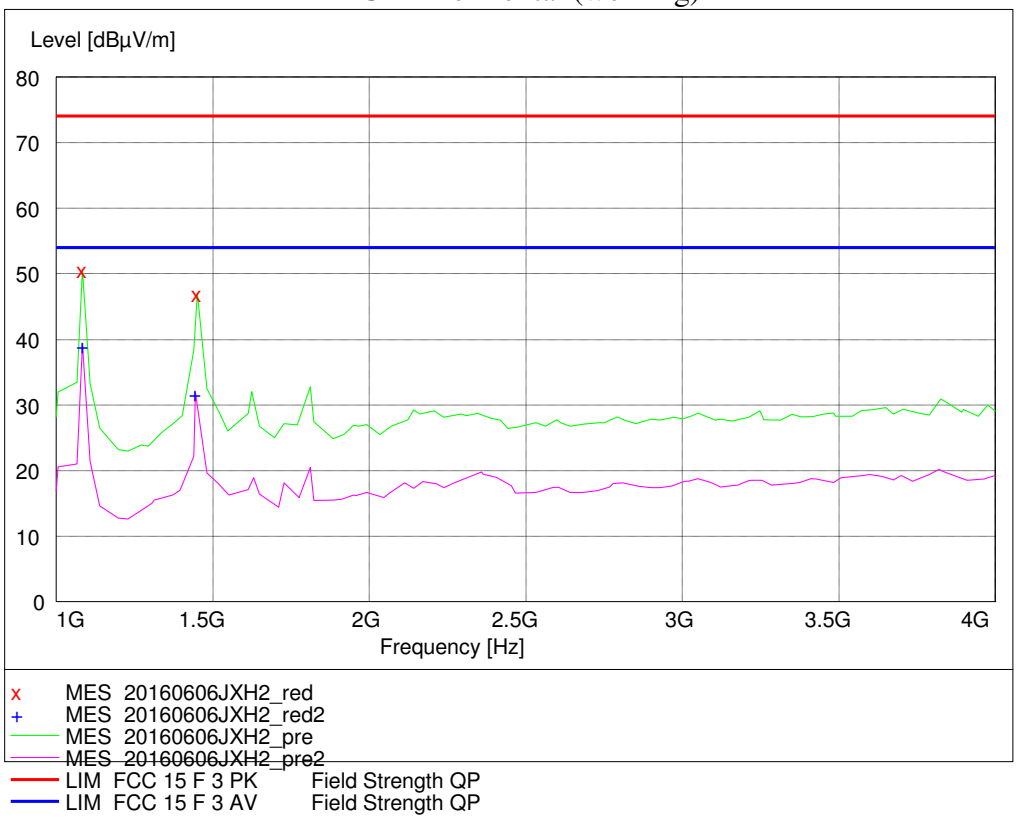
30-1000MHz Vertical (working)



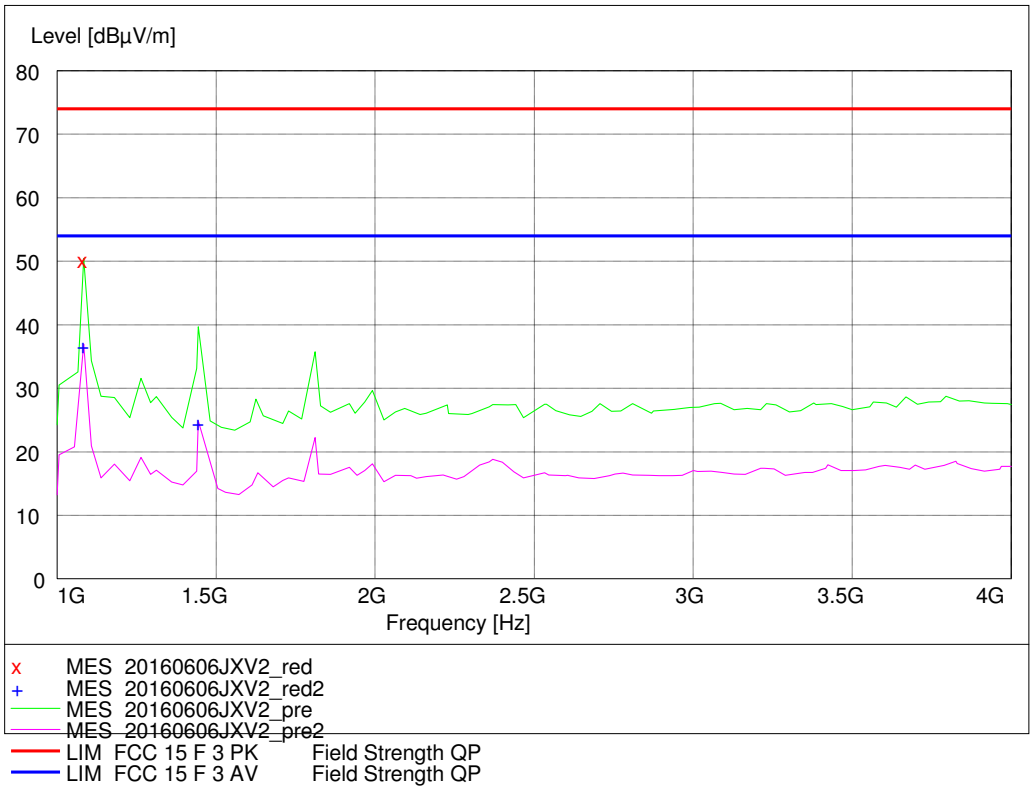
Test data:

Antenna	Frequency (MHz)	Corrected Reading (dBuV/m)	Correct Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector
H	335.00	42.11	13.18	46.00	3.89	QP
H	463.48	41.58	24.79	46.00	4.82	QP
H	496.53	40.08	19.86	46.00	5.92	QP
V	30.00	35.45	21.40	40.00	4.55	QP
V	45.15	38.19	12.70	40.00	1.81	QP
V	58.95	36.88	10.22	40.00	3.12	QP
V	72.76	38.54	9.30	40.00	1.46	QP
V	527.63	43.88	20.10	46.00	2.12	QP
V	560.68	42.10	20.70	46.00	3.90	QP

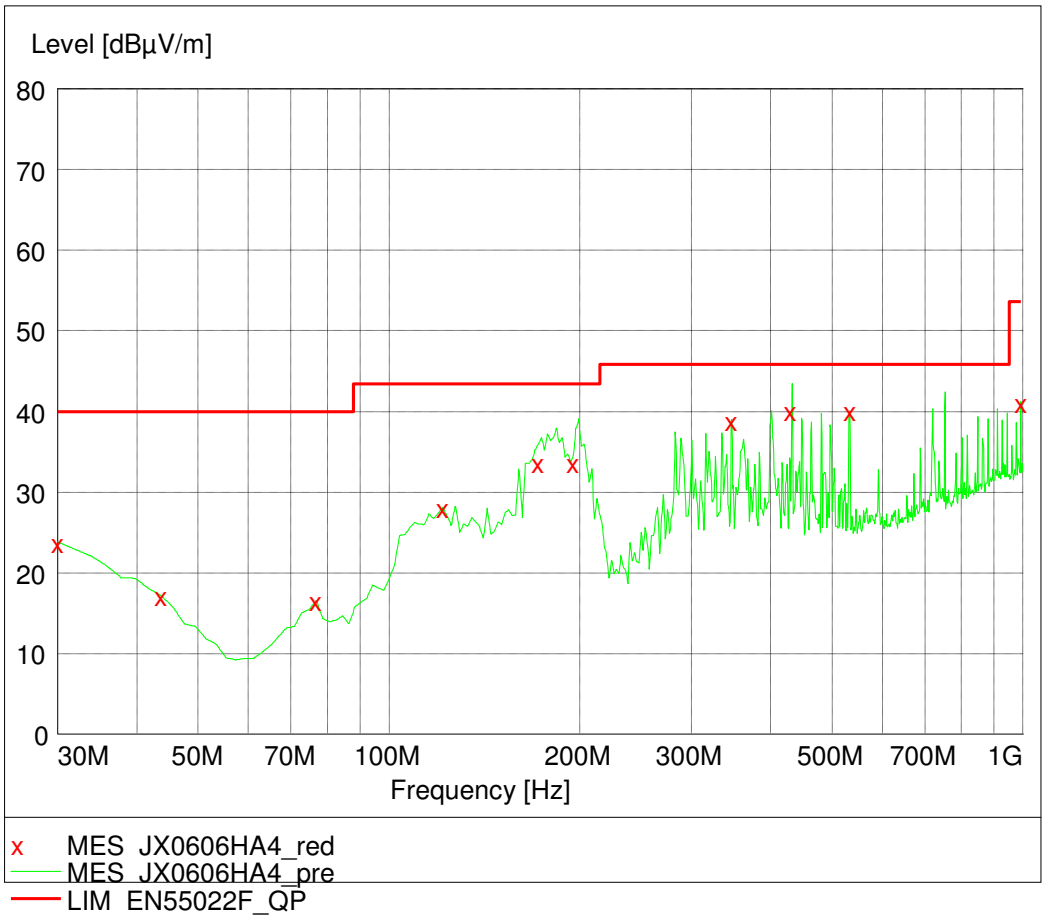
1-4GHz Horizontal (working)



1-4GHz Vertical (working)



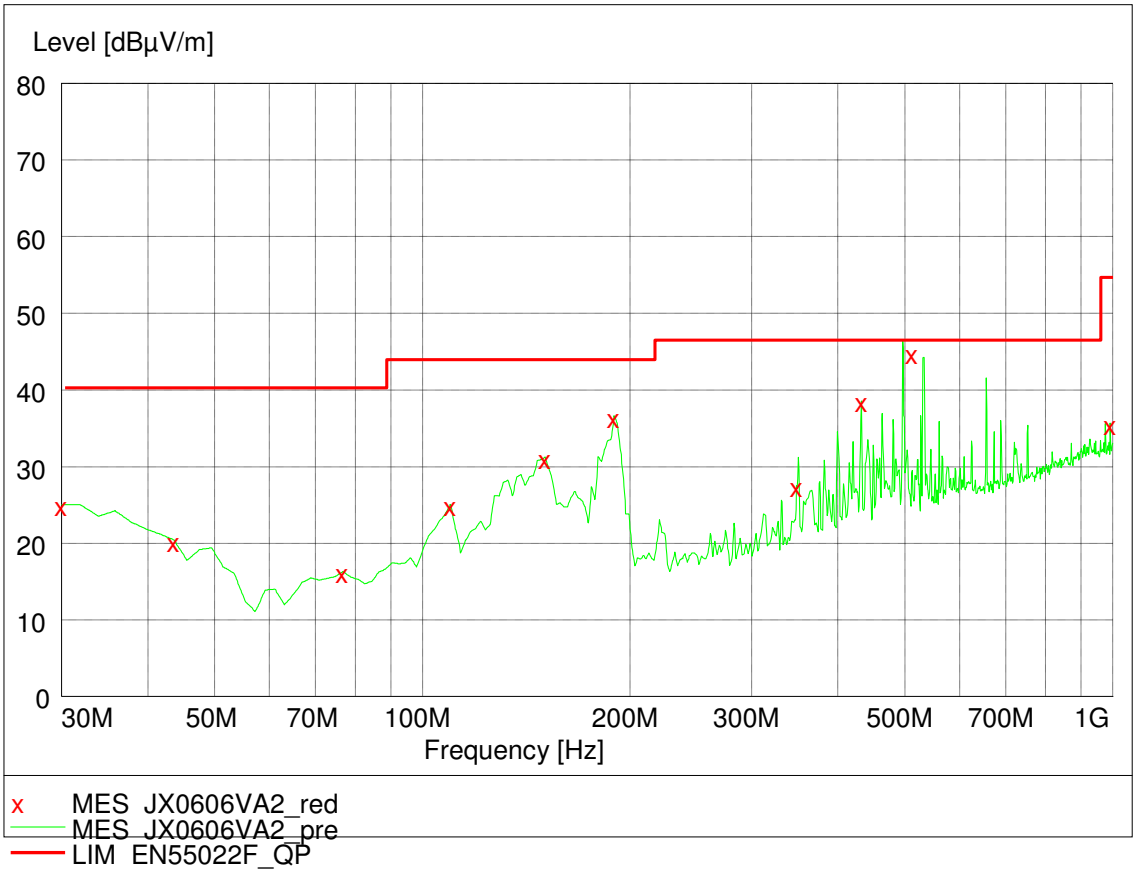
30-1000MHz Horizontal (charging)



Test data:

Frequency (MHz)	Emission level (dBµV/m)	Limits (dBµV/m)	Margin (dBµV/m)	Azimuth (Degrees)	Height (cm)	Polarization (H/V)
30.00	*	40.00	*	180	100	H
80.54	*	40.00	*	180	100	H
185.53	34.55	43.50	8.95	270	200	H
198.20	34.09	43.50	9.41	270	400	H
422.64	40.01	46.00	5.99	270	200	H
515.65	40.04	46.00	5.96	270	400	H
Note: * means the emission level 15dB lower than the relevant limit.						

30-1000MHz Vertical (charging)



Test data:

Frequency (MHz)	Emission level (dBµV/m)	Limits (dBµV/m)	Margin (dBµV/m)	Azimuth (Degrees)	Height (cm)	Polarization (H/V)
30.00	*	40.00	*	180	100	V
80.54	*	40.00	*	180	100	V
195.53	37.22	43.50	6.28	270	200	V
427.69	38.02	46.00	7.98	270	400	V
497.64	44.22	46.00	1.78	270	200	V
665.65	*	46.00	*	270	400	V

Note: * means the emission level 15dB lower than the relevant limit.

Notes:

1. All possible modes of operation were investigated. Only the worst case emissions measured.
2. * means the emission level 15dB below the relevant limit.

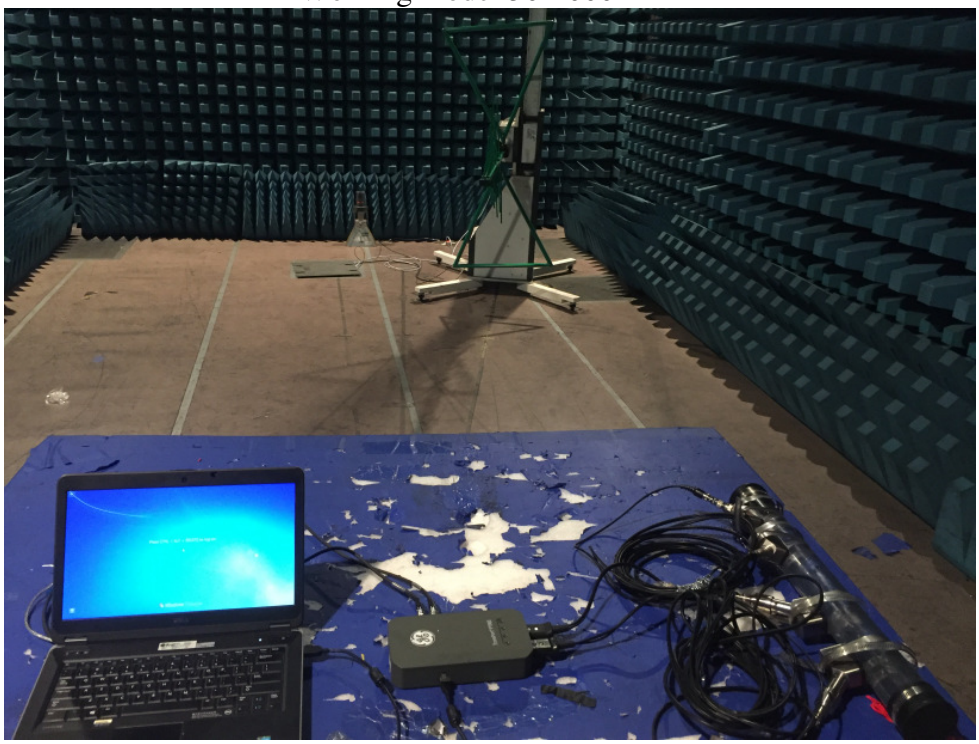
Remark: 1.Correct Factor = Antenna Factor + Cable Loss (+ Amplifier, for higher than 1GHz)
2. Corrected Reading = Original Receiver Reading + Correct Factor
3. Margin = Limit - Corrected Reading
4. If the PK Corrected Reading is lower than AV limit, the AV test can be elided.

Example: Assuming Antenna Factor = 30.20dB/m, Cable Loss = 2.00dB, Gain of Preamplifier = 32.00dB, Original Receiver Reading = 10.00dBuV, limit = 40.00dBuV/m.
Then Correct Factor = 30.20 + 2.00 – 32.00 = 0.20dB/m; Corrected Reading = 10dBuV + 0.20dB/m = 10.20dBuV/m; Margin = 40.00dBuV/m - 10.20dBuV/m = 29.80dB.

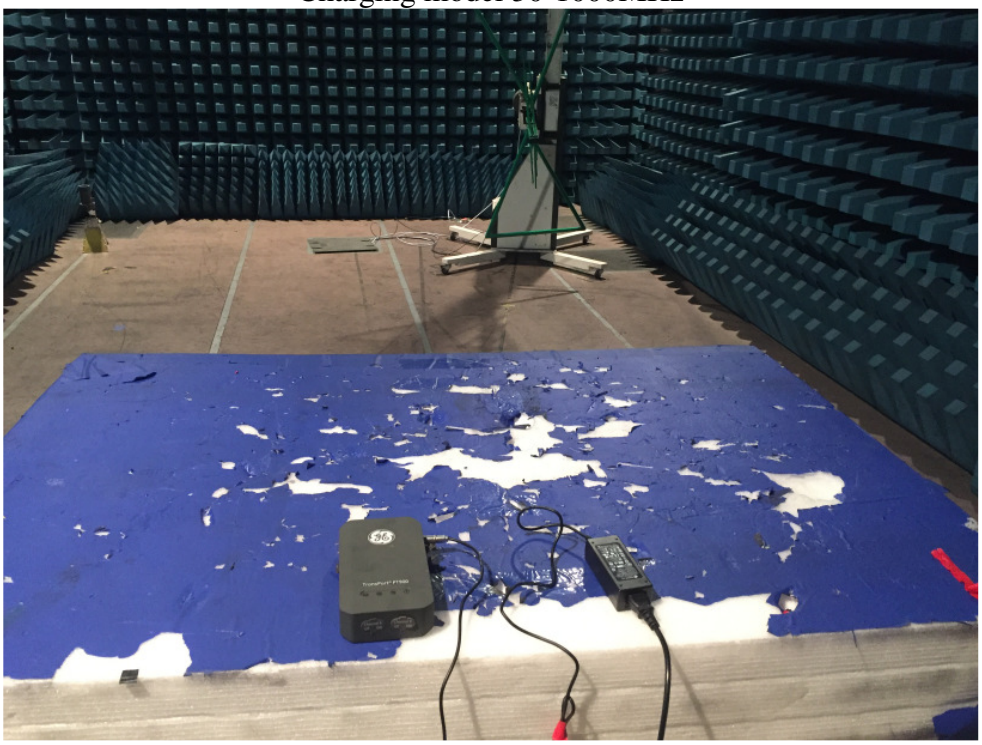
Appendix I: Photograph of test setup

Radiated emission

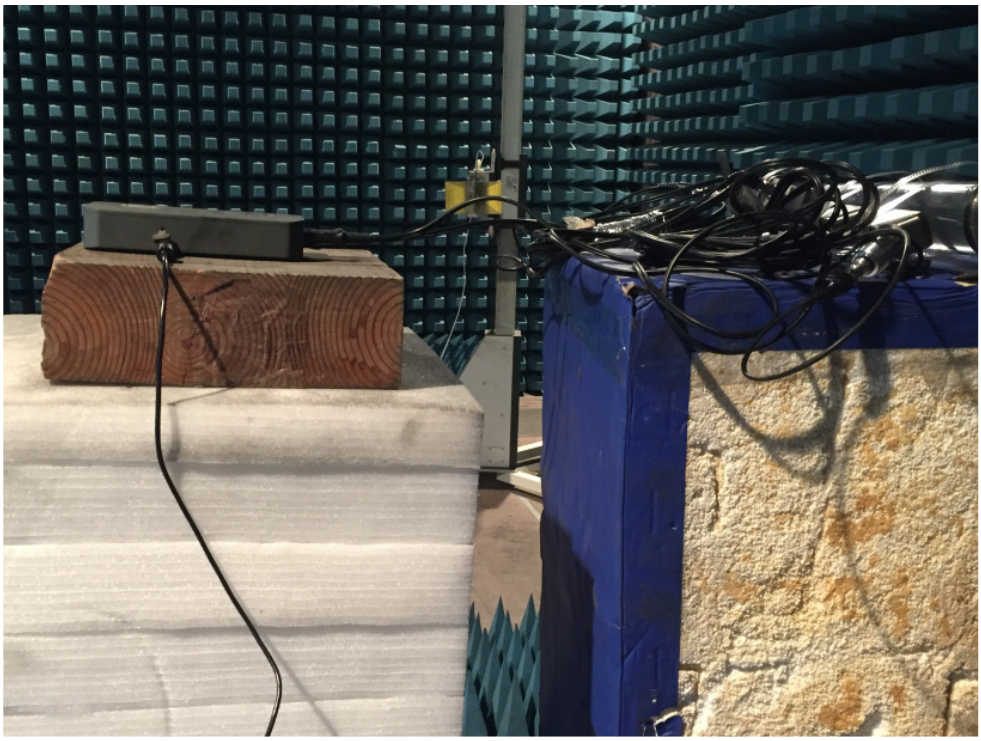
Working model 30-1000MHz



Charging model 30-1000MHz



Working model High frequency

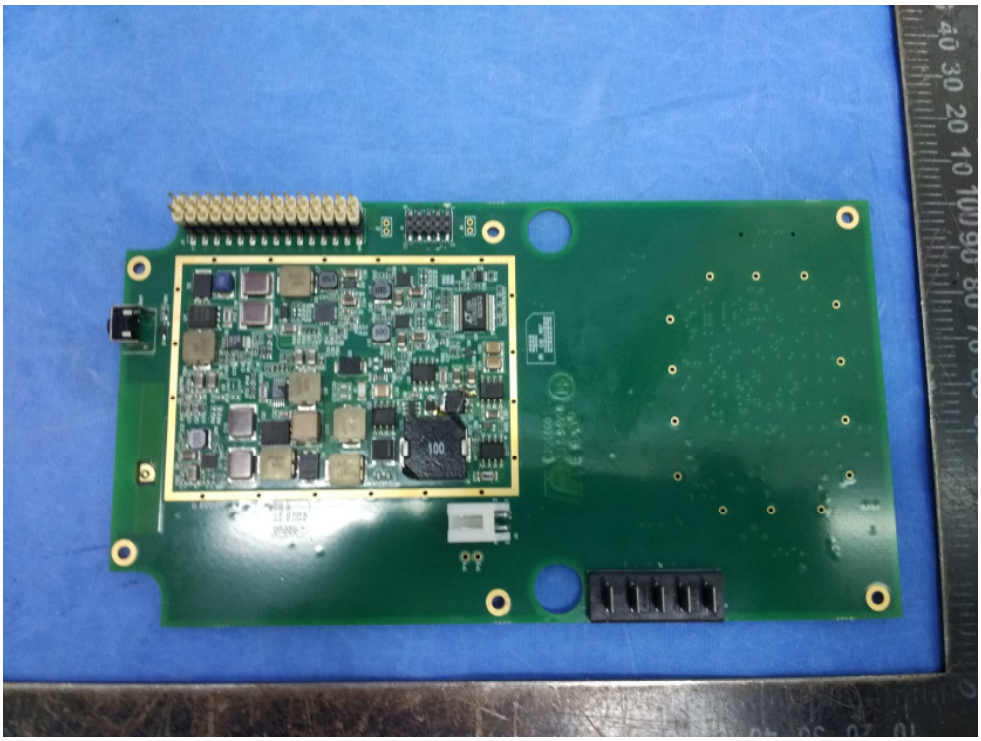


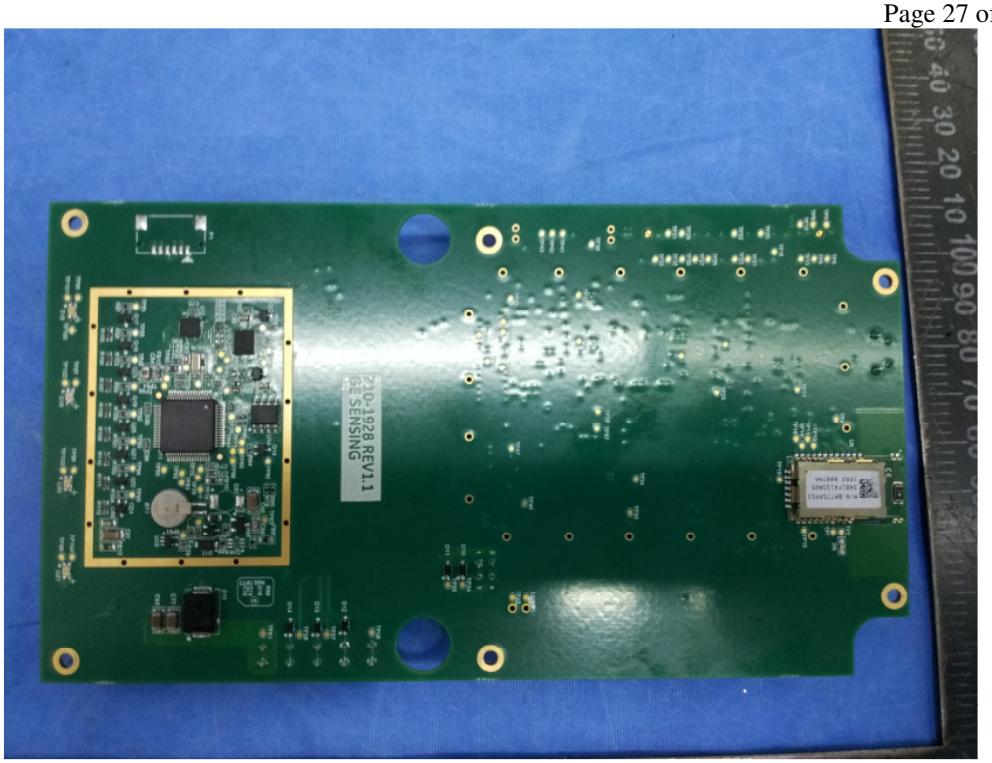
Conducted emission

Appendix II: Photograph of equipment under test


TransPort® PT900
AI/O
DI/O


TransPort® PT900
Channel A
UP
DN
Channel B
UP
DN




PID-1928 REV1.1
TOUCH SENSING


3-12


GlobTek, Inc.
IP40
LPS
0516