R&TTE (1999/5/EC) Directive
EN 301 489-1/-3/-17
&
Australian /New Zealand Standard
AS/NZS CISPR 22:2009+A1:2010
TEST REPORT

FOR

Product Name:	**TomTom Golfer GPS watch**
Brand Name:	**TomTom**
Type No.:	**N/A**
Model No.:	**8RG0**
Added Model(s):	**N/A**
Model Difference:	**N/A**
Report No.:	**E1/2014/80001**
Issue Date:	**Sep. 09, 2014**
Prepared for:	**TomTom International B.V.**
	De Ruijterkade 154, Amsterdam 1011 AC Netherlands
Prepared by:	**SGS Taiwan Ltd.**
	No. 134, Wu Kung Rd., Wuku Industrial Zone,
	Taipei County, Taiwan.

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VERIFICATION OF COMPLIANCE

Applicant:	TomTom International B.V. De Ruijterkade 154, Amsterdam 1011 AC Netherlands
Manufacturer:	Tech-Giant(Shanghai)Computer Co., Ltd C#,No.1, South Rongteng Road, Songjiang Export Processing Zone, Shanghai, China
Product Name:	TomTom Golfer GPS watch
Brand Name:	TomTom
Type No.:	N/A
Model No.:	8RG0
Added Model(s):	N/A
Model Difference:	N/A
File Number:	E1/2014/80001
Date of EUT Received:	Aug. 01, 2014
Date of test:	Aug. 01 ~ 14, 2014

APPLICABLE STANDARDS		
EN 301 489 –1 $_{V\ 1.9.2}$: 2011		EN 301 489 –3 $_{v\ 1.6.1}$: 2013
EN 301 489 –17 $_{V\ 2.2.1}$: 2012		
EMI:	EN 55022 : 2010	
EMS:	EN 61000-4-2 : 2009	EN 61000-4-6 : 2009
	EN 61000-4-3 : 2010	ISO 7637-2 : 2004
	EN 61000-4-4 : 2012	AS/NZS CISPR 22 : 2009+A1:2010 Class B

In the configuration tested, the EUT complied with the standards specified above.

Remarks:

This report details the results of the testing carried out on one sample, the results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS Taiwan Ltd. Electronics & Communication Laboratory or testing done by in connection with distribution or use of the product described in this report must be approved by SGS Taiwan Ltd. Electronics & Communication Laboratory in writing.

Test By: Eddy Cheng **Date** Sep. 09, 2014

Eddy Cheng (Engineer)

Approved By: Victor Wen **Date** Sep. 09, 2014

Victor Wen(Assistant Manager)

Revision History

Report Number	Revision	Description	Issue Date
E1/2014/80001	00	Initial Version	Sep. 09, 2014

TABLE OF CONTENTS

1. General Description

1.1 DESCRIPTION OF EQUIPMENT UNDER TEST (EUT)

Product Name:	TomTom Golfer GPS watch
Brand Name:	TomTom
Type No.:	N/A
Model No.:	8RG0
Added Model(s):	N/A
Model Difference:	N/A
USB Dock: (1.0mm)	Model No.: 4UJ0, Supplier: TomTom
Car Charger:	Model No.: 4UUC3Z, Supplier: TomTom
Hardware Version:	REV.A
Software Version	0.24.1
Power Supply:	Battery:3.7Vdc (0.7Wh) Rechargeable Li-ion Battery

Bluetooth V4.0:

Bluetooth Version:	V4.0 single mode
Channel number:	40 channels
Modulation type:	GFSK
Rated Power (EIRP):	-3.41dBm
Frequency Range:	2.402GHz – 2.480GHz
Antenna Designation:	PIFA Antenna, -6.21dBi

GPS:

Receiver Frequency:	L1 Band, 1575.42MHz
Frequency Conversion oscillator:	26MHz
Antenna Designation:	Ceramic Antenna

1.2 General Requirements of Test Set up:

For EN 301489-1:

The signal source providing the transmitter under test with the modulation signal for the normal test modulation shall be located outside the test environment, unless the transmitter is modulated by its own internal source, see the relevant part of EN 301 489 series.

The transmitter shall be modulated with normal test modulation, by an internal or external signal source capable of delivering the normal test modulation as specified in the relevant part of EN 301 489 series.

The measuring equipment for the wanted RF output signal from the transmitter under test shall be located outside the test environment.

For transmitters with an integral antenna, the wanted RF output signal to establish a communication link shall be delivered from the EUT to an antenna located within the test environment. This antenna shall be connected to the external measuring equipment by a coaxial cable.

For transmitters with a removable antenna, the wanted RF output signal to establish a communication link shall be delivered from the antenna connector to the external measuring equipment by a shielded transmission line, such as a coaxial cable. Adequate measures shall be taken to minimize the effect of unwanted common mode currents on the external conductor of the transmission line at the point of entry to the transmitter.

Unless otherwise specified in the relevant part of EN 301 489 series [i.13] for the particular type of radio equipment, the level of the wanted RF output signal in transmit mode of operation shall be set to the maximum rated RF power for the EUT, modulated with the normal test modulation.

For EN 301489-3:

The transmitter shall be modulated with normal test modulation as specified for that type of equipment.

Where transmitters do not have a modulation input port, the internal equipment modulation shall be used.

The transmitter shall be operated at its maximum rated RF output power as specified for that type of equipment.

The manufacturer may provide a suitable companion receiver that can be used to set up a communications link and/or to receive messages.

GPS:

1. Via GPS simulator, transmit “satellite” simulated signal to EUT.
2. Activate the Manufacturer’s equipped software.
3. Monitor the status of connection by seeing the window.

For EN 301489-17:

The wanted signals and/or controls required to establish a communications link shall be defined by the manufacturer.

The transmitter shall be operated at maximum rated power.

The manufacturer may provide a suitable companion receiver that can be used to receive messages or to set up a communication link.

BT:

1. Enable BT function from EUT.
2. Links with BT drive(I phone).
3. Monitor the status of connection.

1.3 Description of Test Modes:

The following modes were selected for evaluation to find the worst mode (modes):

Modes/Function:

1. BT Link mode
2. GPS mode
3. Data Link + Charger mode
4. BT Standby mode
5. Car charger + BT + GPS mode

Then the following mode (modes) was found to be the worst one and reported as the worst case:

Worst case: 3. Data Link + Charger mode

1.4 Test Facility:

The radiated emission measurement facilities of 10 m semi-anechoic chamber used to collect test data are located at No.2, Keji 1st Rd., Guishan Township, Taoyuan County, Taiwan333. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

The radiated emission measurement facilities of 966 semi-anechoic chamber used to collect the data for above 1GHz are located at No.2, Keji 1st Rd., Guishan Township, Taoyuan County, Taiwan333. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

The AC power line conducted emission measurement facilities used to collect the data are located at No.2, Keji 1st Rd., Guishan Township, Taoyuan County, Taiwan333. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

The immunity test facilities used to collect the data are located at No.2, Keji 1st Rd., Guishan Township, Taoyuan County, Taiwan333.

1.5 Modification List:

No modification by SGS Taiwan Electronics & Communication Laboratory.

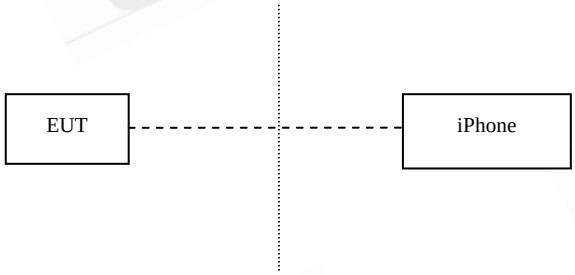
1.6 Test Condition:

Refer to EN 301 489-1, Section 4 and EN 301 489-3, EN 301 489-17, Section4 for the details.

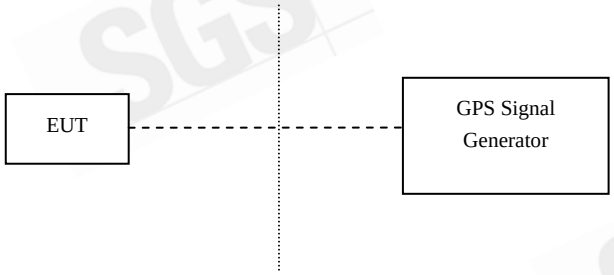
1.7 Configuration of Tested System

EMI/EMS

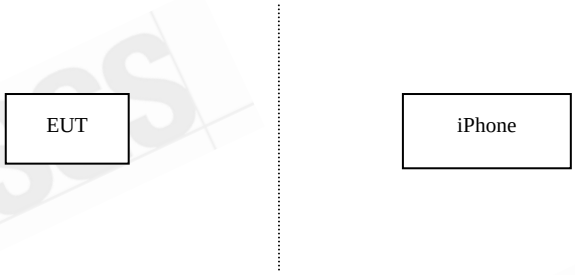
Test Mode 1



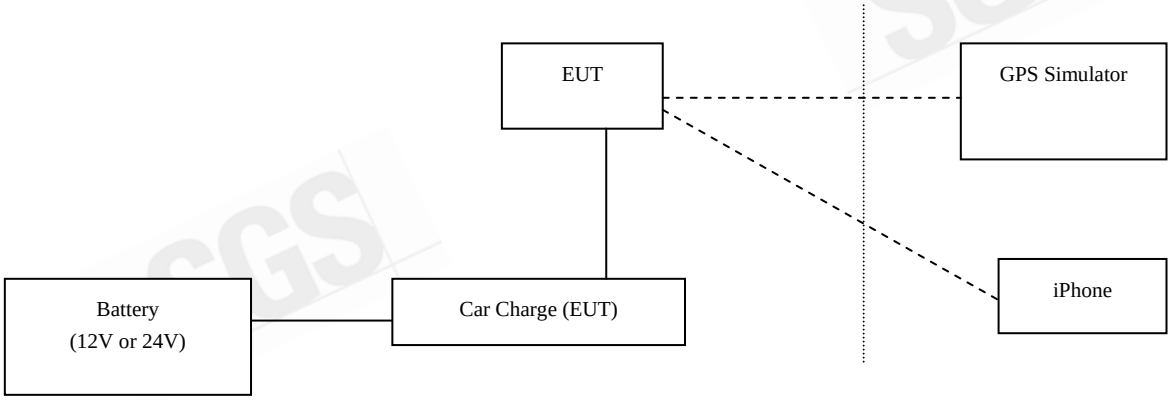
Test Mode 2



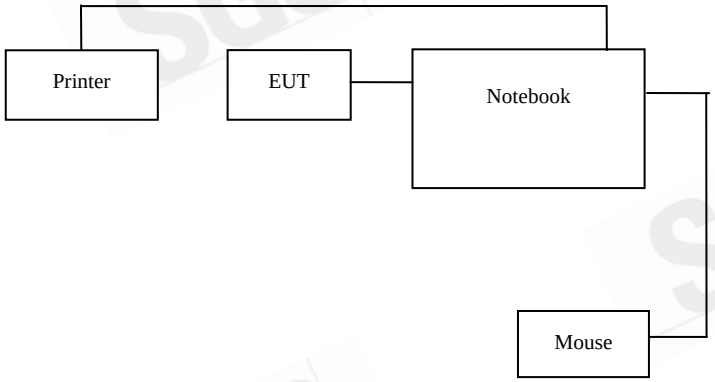
Test Mode 4



Test Mode 5



EMI
Test Mode 3



EMS
Test Mode 3

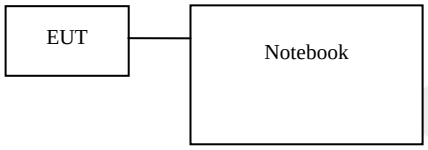


Table 1-1 Equipment Used in Tested System
EMI-Conducted Emission, Radiated Emission (Above 1GHz)

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.
1.	Notebook	Lenovo	TP00013A	LR-0X3RA
2.	Mouse	Lenovo	MOEUUO	44Pd564
3.	Printer	HP	Deskjet 3820	CN27J182DX
4.	GPS Signal Generator	Spectracom	GSG53 GNSS4	200218
5.	iPhone	Apple	A1387	N/A
6.	Battery	YUASA	SMF55B24L(S)	ST-CLN159

EMI- Radiated Emission (below 1GHz)

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.
1.	Notebook	DELL	P37G	H55Z0Z1
2.	Printer	HP	VCVRA-1004	CN33K19J3R
3.	Mouse	DELL	MS111-T	CN-OKW2YH-71616-345-OL7T
4.	GPS Signal Generator	Spectracom	GSG53 GNSS4	200218
5.	iPhone	Apple	A1387	N/A
6.	Battery	YUASA	SMF55B24L(S)	ST-CLN159

EMS

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.
1.	Notebook	Lenovo	L430	PK-0CGFB
2.	GPS Signal Generator	Spectracom	GSG53 GNSS4	200218
3.	iPhone	Apple	A1387	N/A
4.	Battery	YUASA	SMF55B24L(S)	ST-CLN159

Note: All the above equipment/cables were placed in worse case positions to maximize emission signals during emission test.

Grounding: Grounding was set in accordance with the manufacturer's requirements and conditions for intended use.

Table 1-2 Cable List

Cable Type	Length	Shielding/Non-shielding
USB cable	1.0 m	Shielding

2. EMISSION

EN 301 489-1 V 1.9.2 : 2011
EN 301 489-3 V 1.6.1 : 2013
EN 301 489-17 V 2.2.1 : 2012
AS/NZS CISPR 22:2009+A1:2010

2.1 Test Configuration:

Refer to EN 301 489-1, Section 8.1.

2.2 Special Conditions:

EN 301489-3

No special conditions shall apply to UE in the scope of the present document.

EN 301489-17

No special conditions shall apply to UE in the scope of the present document.

2.3 Summary of Test Results

Test Items	Reference section	Result
Enclosure of ancillary equipment measured on a stand alone basis, EN 55022, Class B	EN 301 489-1 Section 8.2	PASS
DC mains power input/output ports EN 55022, Class B	EN 301 489-1 Section 8.3	PASS
AC mains power input/output ports EN 55022, Class B	EN 301 489-1 Section 8.4	PASS
Harmonic current emission	EN 301 489-1 Section 8.5	N/A
Voltage fluctuations and flicker	EN 301 489-1 Section 8.6	N/A
Telecommunication Port	EN 301 489-1 Section 8.7	N/A

2.4 Enclosure of ancillary equipment measured on a stand alone basis. Refer to EN 301 489-1 Section 8.2

2.4.1 Test Method:

Standard	Edition	Description
EN 55022	2010/AC:2011	Information technology equipment – Radio disturbance characteristics - Limits and methods of measurement

2.4.2 Limit:

Frequency range MHz	Limits dBuV/m (10m)
	Quasi-peak
30 to 230	30
230 to 1000	37

Frequency range GHz	Limits dBuV/m (3m)	
	Average	Peak
1 to 3	50	70
3 to 6	54	74

If the highest frequency of the internal sources of the EUT is less than 108 MHz, the measurement shall only be made up to 1 GHz.

If the highest frequency of the internal sources of the EUT is between 108 MHz and 500 MHz, the measurement shall only be made up to 2 GHz.

If the highest frequency of the internal sources of the EUT is between 500 MHz and 1 GHz, the measurement shall only be made up to 5 GHz.

If the highest frequency of the internal sources of the EUT is above 1 GHz, the measurement shall be made up to 5 times the highest frequency or 6 GHz, whichever is less.

The highest internal source of EUT is higher than 1GHz.

2.4.3 Test Procedure:

1. The EUT was placed on a 0.8m wooden table.
2. Set up EUT with support units and turn on the power of all equipments.
3. Link the EUT with telecommunication tester, setup the test mode. The transmitter operates at continuously mode and max. rated output power.
4. The receive antenna is placed at 10m (3m for above 1GHz) distance from the EUT and search height from 1~4m.
5. The turntable was slowly rotated to locate the direction of maximum emission. Once maximum direction is determined, the search antenna was raised and lowered in both vertical and horizontal polarizations.

2.4.4 Test Instruments: Below 1GHz

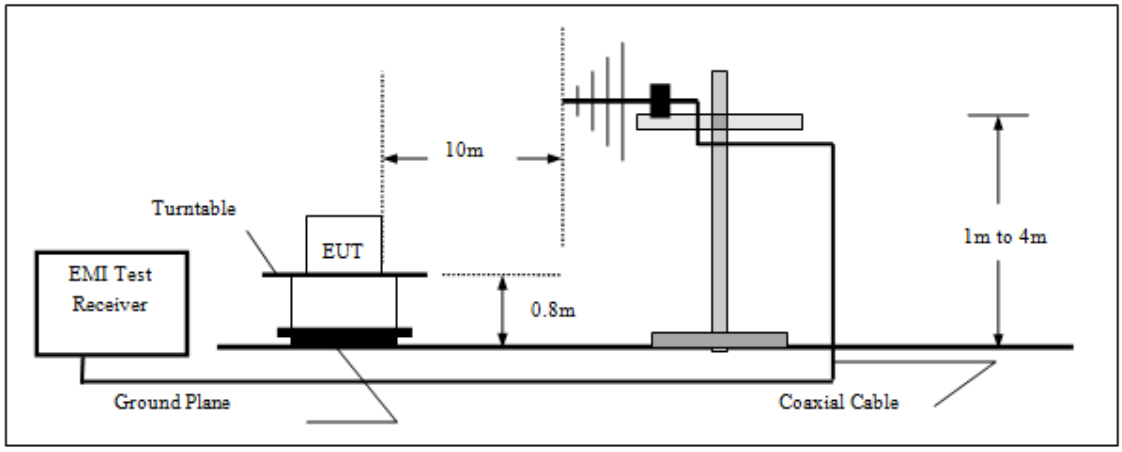
SGS 10m Chamber					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
EMI Test Receiver	R&S	ESCI 3	101342	Jan. 18, 2014	Jan. 17, 2015
EMI Test Receiver	R&S	ESCI 3	101343	Jan. 16, 2014	Jan. 15, 2015
Broadband Antenna	TESEQ	CBL 6112D	35241	Jan. 20, 2014	Jan. 19, 2015
Broadband Antenna	TESEQ	CBL 6112D	35242	Jan. 20, 2014	Jan. 19, 2015
Pre Amplifier	EMC Instruments	EMC330	980178	Apr. 03, 2014	Apr. 02, 2015
Pre Amplifier	EMC Instruments	EMC330	980179	Apr. 03, 2014	Apr. 02, 2015
Coaxial Cable	Huber+Suhner	RG 214/U	W30.02	Apr. 01, 2014	Mar. 31, 2015
Coaxial Cable	Huber+Suhner	RG 214/U	W31.02	Apr. 01, 2014	Mar. 31, 2015
Coaxial Cable	Huber+Suhner	RG 214/U	W30.03	Apr. 01, 2014	Mar. 31, 2015
Coaxial Cable	Huber+Suhner	RG 214/U	W31.03	Apr. 01, 2014	Mar. 31, 2015
Communication Tester	R&S	CMW500	131121	Jan.16, 2014	Jan.15, 2015
Communication Tester	Anritsu	MT8820C	6201107337	Apr. 23,2014	Apr. 22,2015
Controller	MF	MF-7802	N/A	N.C.R.	N.C.R.
Controller	MF	MF-7802	N/A	N.C.R.	N.C.R.
Antenna Master	MF	N/A	N/A	N.C.R.	N.C.R.
Antenna Master	MF	N/A	N/A	N.C.R.	N.C.R.
Antenna Master	MF	N/A	N/A	N.C.R.	N.C.R.
Turn Table	MF	N/A	N/A	N.C.R.	N.C.R.
Site NSA	SGS	10m Chamber	10M SAC	Jan. 12, 2014	Jan. 11, 2015
Test S/W	Farad	EZ-EMC	Ver. SGS-03A2	N.C.R.	N.C.R.

Above 1GHz

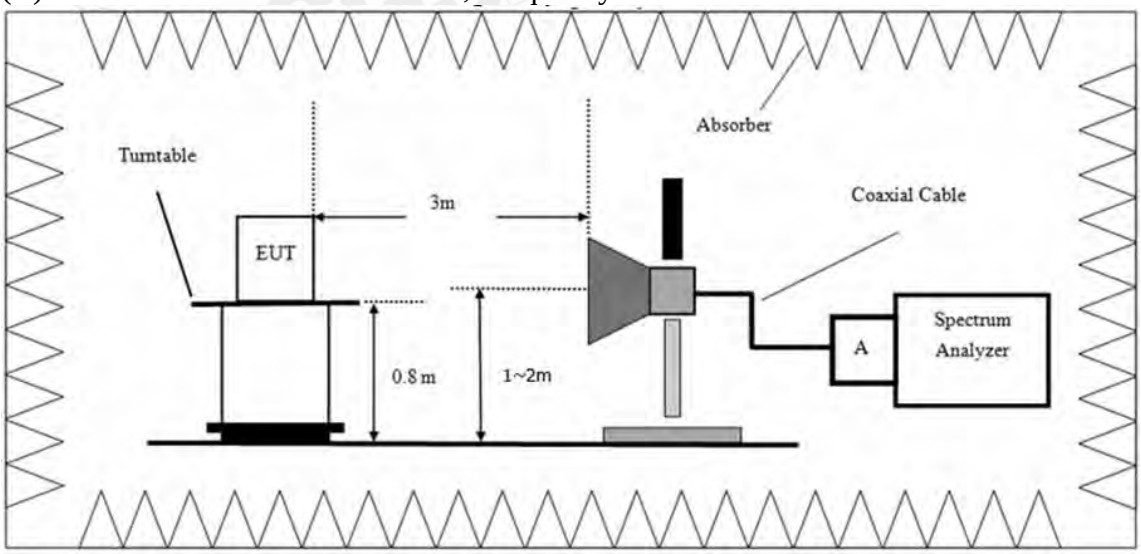
SGS 966 Chamber No. A					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
Spectrum Analyzer	R&S	FSV 40	101058	Jan. 13, 2014	Jan. 12, 2015
EMI Test Receiver	R&S	ESCI 7	100950	Jan. 11, 2014	Jan. 10, 2015
Horn Antenna	Schwarzbeck	BBHA9120D	BBHA9120D803	Jan. 24, 2014	Jan. 23, 2015
Horn Antenna	Schwarzbeck	BBHA9170	BBHA9170-184	Jan. 23, 2014	Jan. 22, 2015
Horn Antenna	ETS-Lindgren	3160-09	00117911	Jan. 22, 2014	Jan. 21, 2015
Horn Antenna	ETS-Lindgren	3160-10	00117783	Jan. 22, 2014	Jan. 21, 2015
Pre Amplifier	EMC Instruments	EMC051825	980152	Dec. 24, 2013	Dec. 23, 2014
Pre Amplifier	R&S	SCU-18	10203	Mar. 26, 2014	Mar. 25, 2015
Pre Amplifier	R&S	SCU-26	100780	Mar. 26, 2014	Mar. 25, 2015
Pre Amplifier	R&S	SCU-40	100356	Mar. 26, 2014	Mar. 25, 2015
Pre Amplifier	EMC Instruments	EMC184045	980135	Jan. 24, 2014	Jan. 23, 2015
Coaxial Cable	JUNFLOW	MWX221-NMSNMS	J0778929	Apr. 23, 2014	Apr. 22, 2015
Coaxial Cable	Huber+Suhner	SUCOFLEX 104PEA	30255/4PEA	Apr. 23, 2014	Apr. 22, 2015
Coaxial Cable	Huber+Suhner	SUCOFLEX 102	MY 2152/2	Jun. 06, 2014	Jun. 05, 2015
Coaxial Cable	Huber+Suhner	SUCOFLEX 102	MY 2153/2	Jun. 06, 2014	Jun. 05, 2015
Communication Tester	R&S	CMW500	131121	Jan.16, 2014	Jan.15, 2015
Communication Tester	Anritsu	MT8820C	6201107337	Apr. 23,2014	Apr. 22,2015
Controller	MF	MF-7802	N/A	N.C.R.	N.C.R.
Antenna Master	MF	N/A	N/A	N.C.R.	N.C.R.
Turn Table	MF	N/A	N/A	N.C.R.	N.C.R.
Site VSWR	SGS	966 Chamber A	SAC-A	Jan. 18, 2014	Jan. 17, 2015
Test Software	Farad	EZ-EMC	Ver. SGS-03A2	N.C.R.	N.C.R.

2.4.5 Test SET-UP (Block Diagram of Configuration):

(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(B) Radiated Emission Test Set-UP, Frequency Over 1 GHz



2.4.6 Uncertainty of Radiated Emission:

Expanded uncertainty (k=2) of radiated emission measurement is 4.16 dB. (30-1000MHz)
Expanded uncertainty (k=2) of radiated emission measurement is 5.02 dB. (1-6GHz)

2.4.7 Measurement level and Factor calculate method:

Factor = Antenna loss + Cable loss - Amplifier Gain
Measurement Level = Reading Level + Factor

2.4.8 Measurement Data:

Below 1GHz

Operation Mode	Test Mode 1	Test Date	Aug. 08, 2014
Tested by	Eddy Cheng	Pol.	Ver. and Hor.

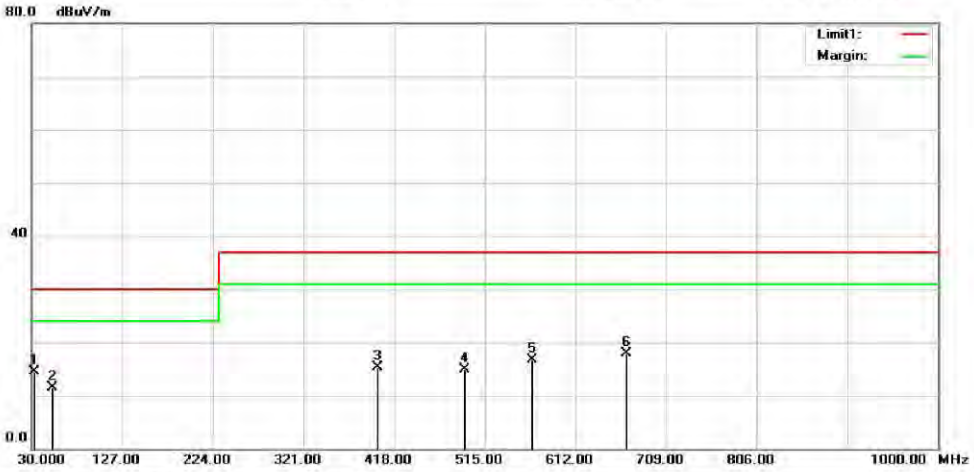
Site SGS 10m Chamber
Limit: EN 55022 / CISPR 22 Class B 10M Radiation
Mode: BT Link
Note:

Polarization: *Vertical*
Power: From Battery
Distance:

Temperature: 19 ℃
Humidity: 58 %

Radiated Emission

File :80001 Data :#29 Date: 2014/8/8 Time: 下午 05:16:00



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	32.1700	26.94	-12.51	14.43	30.00	-15.57	QP	
2		51.5900	33.89	-22.38	11.51	30.00	-18.49	QP	
3		399.9900	27.42	-12.12	15.30	37.00	-21.70	QP	
4		492.9400	24.66	-9.85	14.81	37.00	-22.19	QP	
5		565.8900	24.48	-7.86	16.62	37.00	-20.38	QP	
6		665.4400	24.94	-7.09	17.85	37.00	-19.15	QP	

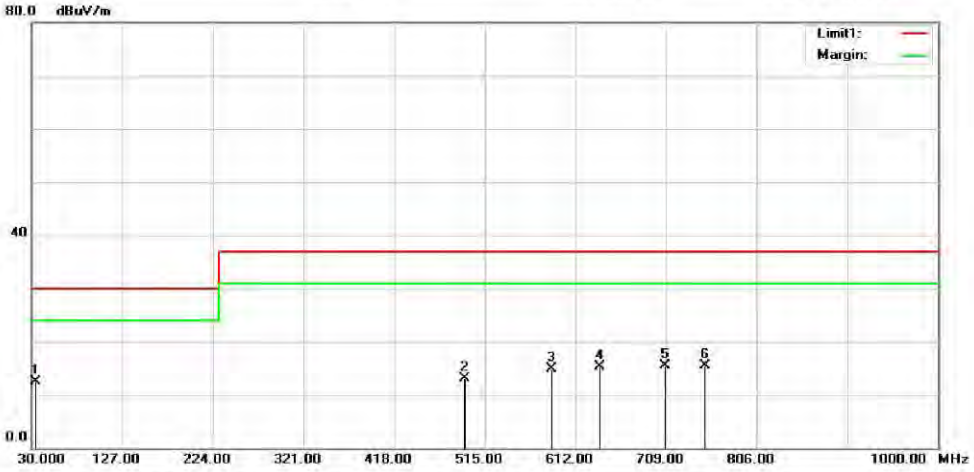
*:Maximum data x:Over limit !:over margin

File :80001\Data :#29 *Page: 1*

Site SGS 10m Chamber | Polarization: *Horizontal* | Temperature: 19 ℃
Limit: EN 55022 / CISPR 22 Class B 10M Radiation | Power: From Battery | Humidity: 58 %
Mode: BT Link | Distance:
Note:

Radiated Emission

File :80001 Data :#30 Date: 2014/8/8 Time: 下午 05:16:04



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	34.1100	26.62	-14.03	12.59	30.00	-17.41	QP	
2		493.2400	24.34	-11.18	13.16	37.00	-23.84	QP	
3		586.4700	24.07	-9.18	14.89	37.00	-22.11	QP	
4		637.8800	24.13	-8.87	15.26	37.00	-21.74	QP	
5		707.6000	23.92	-8.50	15.42	37.00	-21.58	QP	
6		750.4700	23.71	-8.11	15.60	37.00	-21.40	QP	

*:Maximum data x:Over limit !:over margin

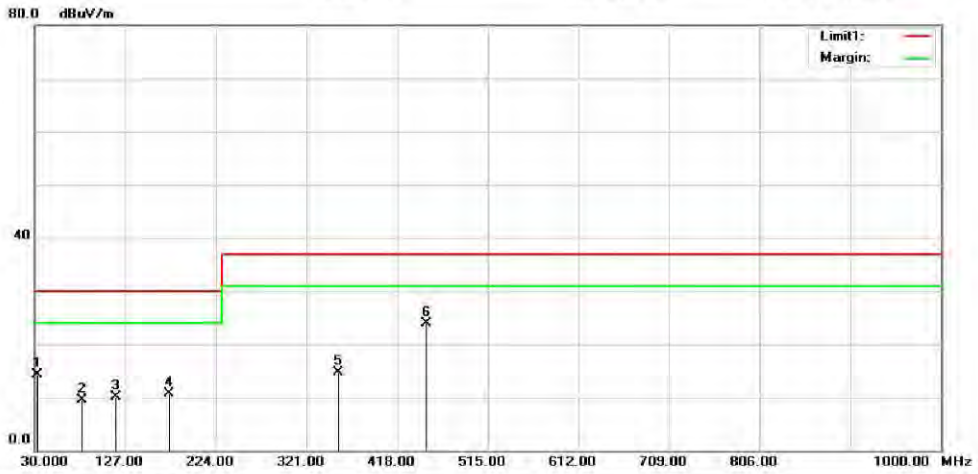
File :80001\Data :#30 *Page: 1*

Operation Mode	Test Mode 3	Test Date	Aug. 08, 2014
Tested by	Eddy Cheng	Pol.	Ver. and Hor.

Site SGS 10m Chamber | Polarization: *Vertical* | Temperature: 19 ℃
Limit: EN 55022 / CISPR 22 Class B 10M Radiation | Power: From System | Humidity: 58 %
Mode: Data Link+Charger | Distance:
Note:

Radiated Emission

File :80001 Data :#33 Date: 2014/8/8 Time: 下午 05:33:57



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		32.1400	26.88	-12.49	14.39	30.00	-15.61	QP	
2		80.3260	32.29	-22.73	9.56	30.00	-20.44	QP	
3		117.0800	27.50	-17.47	10.03	30.00	-19.97	QP	
4		174.1400	30.36	-19.73	10.63	30.00	-19.37	QP	
5		354.1100	27.96	-13.34	14.62	37.00	-22.38	QP	
6	*	450.0100	34.52	-10.62	23.90	37.00	-13.10	QP	

*:Maximum data x:Over limit !:over margin

File :80001\Data :#33 *Page: 1*

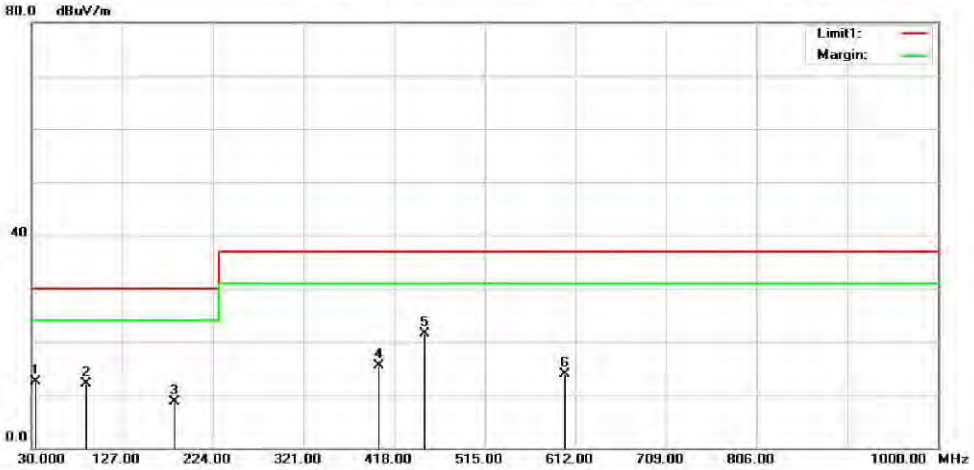
Site SGS 10m Chamber
Limit: EN 55022 / CISPR 22 Class B 10M Radiation
Mode: Data Link+Charger
Note:

Polarization: *Horizontal*
Power: From System
Distance:

Temperature: 19 ℃
Humidity: 58 %

Radiated Emission

File :80001 Data :#34 Date: 2014/8/8 Time: 下午 05:34:01



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		34.1500	26.56	-14.05	12.51	30.00	-17.49	QP	
2		87.8100	33.96	-21.80	12.16	30.00	-17.84	QP	
3		182.9800	29.31	-20.70	8.61	30.00	-21.39	QP	
4		401.4300	28.44	-12.98	15.46	37.00	-21.54	QP	
5	*	450.2220	33.40	-11.96	21.44	37.00	-15.56	QP	
6		600.5400	23.11	-9.12	13.99	37.00	-23.01	QP	

*:Maximum data x:Over limit !:over margin

File :80001\Data :#34 *Page: 1*

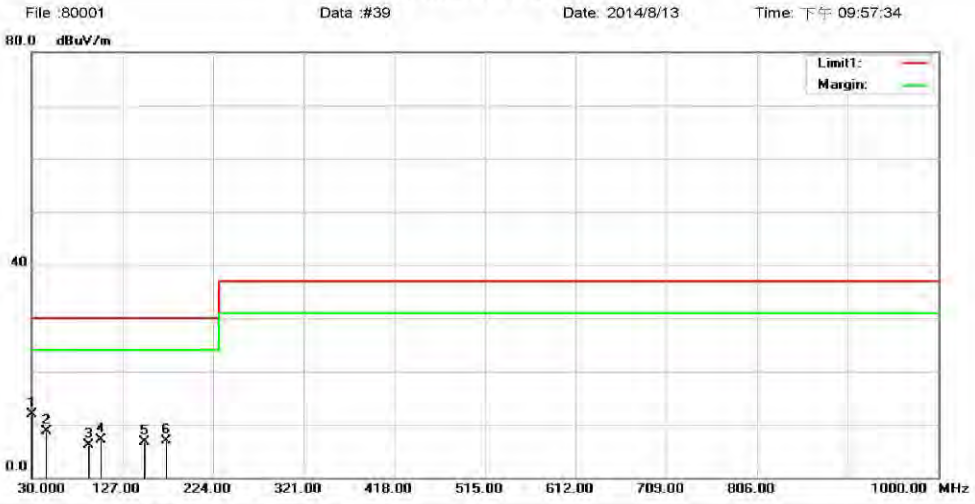
Operation Mode	Test Mode 5(DC 24V)	Test Date	Aug. 13, 2014
Tested by	Eddy Cheng	Pol.	Ver. and Hor.

Site SGS 10m Chamber
Limit: EN55022/CISPR22 Class B 10M Radiation
Mode: Car charger+BT+GPS
Note:

Polarization: *Vertical*
Power: DC 24V
Distance:

Temperature: 19 ℃
Humidity: 58 %

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	30.8160	23.81	-11.81	12.00	30.00	-18.00	QP	
2		45.6600	28.85	-20.09	8.76	30.00	-21.24	QP	
3		90.5000	27.10	-20.96	6.14	30.00	-23.86	QP	
4		104.6620	25.63	-18.51	7.12	30.00	-22.88	QP	
5		150.7480	25.39	-18.70	6.69	30.00	-23.31	QP	
6		173.9420	26.72	-19.72	7.00	30.00	-23.00	QP	

*:Maximum data x:Over limit !:over margin

File :80001\Data :#39 *Page: 1*

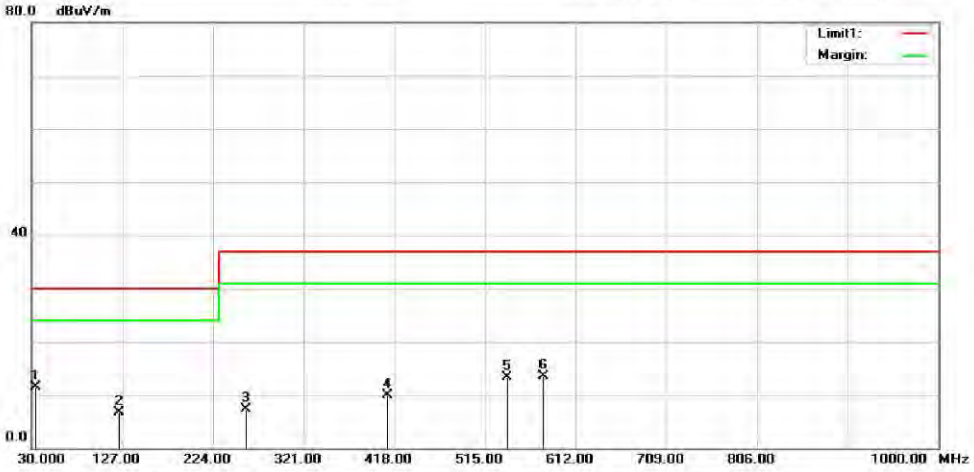
Site SGS 10m Chamber
Limit: EN55022/CISPR22 Class B 10M Radiation
Mode: Car charger+BT+GPS
Note:

Polarization: *Horizontal*
Power: DC 24V
Distance:

Temperature: 19 ℃
Humidity: 58 %

Radiated Emission

File :80001 Data :#40 Date: 2014/8/13 Time: 下午 09:57:38



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	33.7360	25.38	-13.83	11.55	30.00	-18.45	QP	
2		124.0280	24.91	-18.19	6.72	30.00	-23.28	QP	
3		258.8060	23.18	-15.78	7.40	37.00	-29.60	QP	
4		409.6140	22.74	-12.81	9.93	37.00	-27.07	QP	
5		539.1360	23.02	-9.74	13.28	37.00	-23.72	QP	
6		577.2820	22.71	-9.23	13.48	37.00	-23.52	QP	

*:Maximum data x:Over limit !:over margin

File :80001\Data :#40 *Page: 1*

Above 1GHz

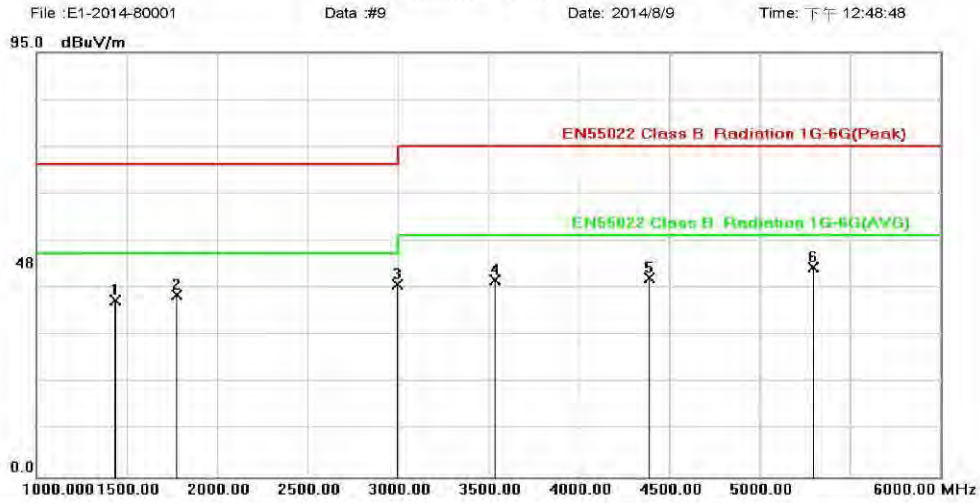
Operation Mode	Test Mode 1	Test Date	Aug. 09, 2014
Tested by	Eddy Cheng	Pol.	Ver. and Hor.

Site :966-2 Chamber
Limit: EN 55022 / CISPR 22 Class B Radiation 1G-6G
Mode: BT Link
Note:

Polarization: *Vertical*
Power: From Battery
Distance:

Temperature: 27 ℃
Humidity: 58 %

Radiated Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		1435.000	48.03	-8.37	39.66	70.00	-30.34	peak	
2		1775.000	47.38	-6.73	40.65	70.00	-29.35	peak	
3	*	2995.000	45.01	-1.82	43.19	70.00	-26.81	peak	
4		3535.000	45.47	-1.47	44.00	74.00	-30.00	peak	
5		4390.000	43.30	1.16	44.46	74.00	-29.54	peak	
6		5295.000	43.78	3.17	46.95	74.00	-27.05	peak	

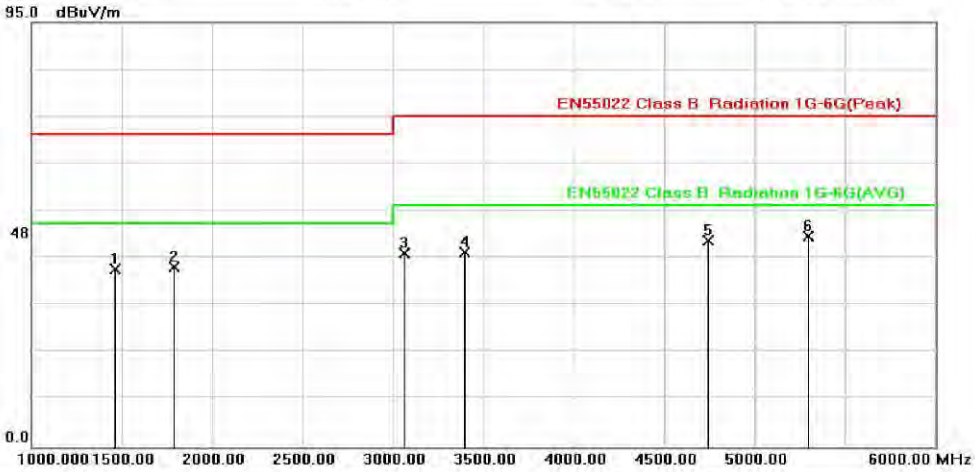
*:Maximum data x:Over limit !:over margin

File :E1-2014-80001\Data :#9 *Page: 1*

Site :966-2 Chamber | Polarization: *Horizontal* | Temperature: 27 ℃
Limit: EN 55022 / CISPR 22 Class B Radiation 1G-6G | Power: From Battery | Humidity: 58 %
Mode: BT Link | Distance:
Note:

Radiated Emission

File :E1-2014-80001 Data :#10 Date: 2014/8/9 Time: 下午 12:52:43



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		1460.000	47.91	-8.16	39.75	70.00	-30.25	peak	
2		1790.000	46.86	-6.66	40.20	70.00	-29.80	peak	
3		3060.000	45.00	-1.76	43.24	74.00	-30.76	peak	
4		3395.000	45.09	-1.61	43.48	74.00	-30.52	peak	
5		4740.000	43.95	2.15	46.10	74.00	-27.90	peak	
6	*	5295.000	43.94	3.17	47.11	74.00	-26.89	peak	

*:Maximum data x:Over limit !:over margin

File :E1-2014-80001\Data :#10 *Page: 1*

Operation Mode	Test Mode 2	Test Date	Aug. 09, 2014
Tested by	Eddy Cheng	Pol.	Ver. and Hor.

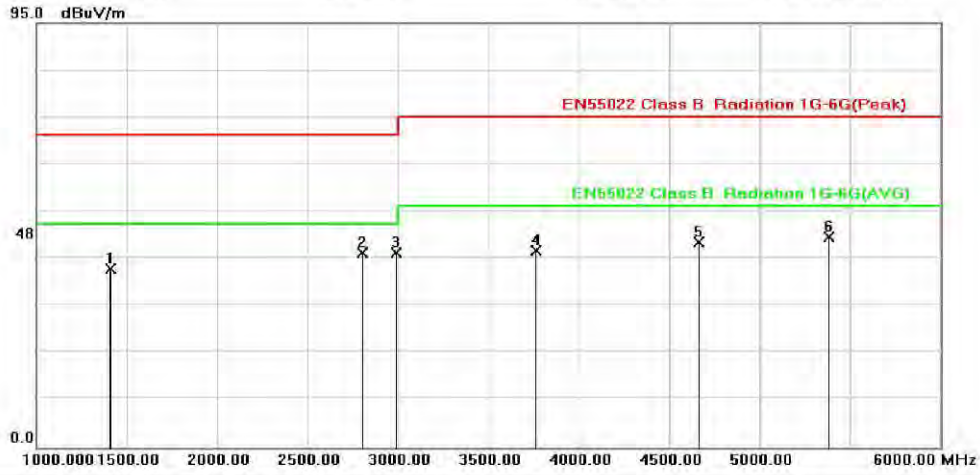
Site :966-2 Chamber
Limit: EN 55022/ CISPR 22 Class B Radiation 1G-6G
Mode: GPS
Note:

Polarization: *Vertical*
Power: From Battery
Distance:

Temperature: 27 ℃
Humidity: 58 %

Radiated Emission

File :E1-2014-80001 Data :#13 Date: 2014/8/9 Time: 下午 01:04:45



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		1410.000	48.51	-8.57	39.94	70.00	-30.06	peak	
2	*	2800.000	46.70	-3.04	43.66	70.00	-26.34	peak	
3		2990.000	45.36	-1.85	43.51	70.00	-26.49	peak	
4		3760.000	45.00	-0.89	44.11	74.00	-29.89	peak	
5		4660.000	44.05	1.95	46.00	74.00	-28.00	peak	
6		5385.000	43.96	3.29	47.25	74.00	-26.75	peak	

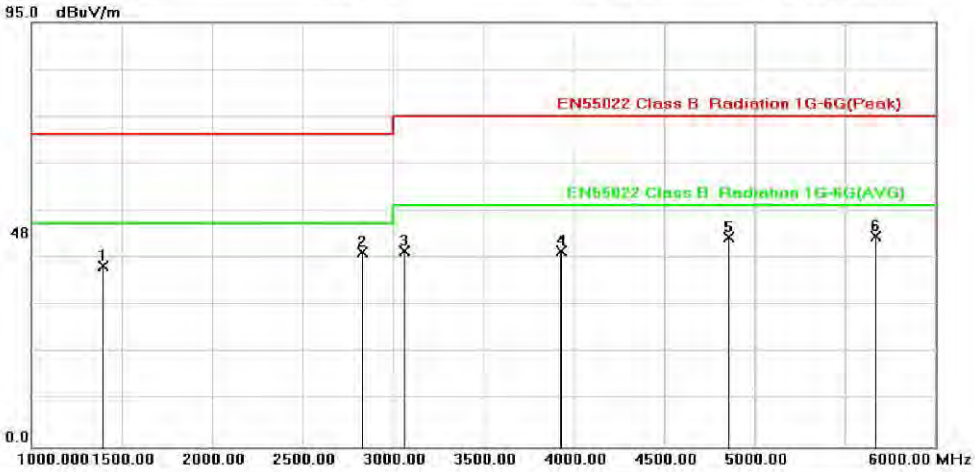
*:Maximum data x:Over limit !:over margin

File :E1-2014-80001\Data :#13 *Page: 1*

Site :966-2 Chamber | Polarization: *Horizontal* | Temperature: 27 ℃
Limit: EN 55022 / CISPR 22 Class B Radiation 1G-6G | Power: From Battery | Humidity: 58 %
Mode: GPS | Distance:
Note:

Radiated Emission

File :E1-2014-80001 Data :#14 Date: 2014/8/9 Time: 下午 01:07:44



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		1395.000	49.08	-8.69	40.39	70.00	-29.61	peak	
2	*	2830.000	46.32	-2.85	43.47	70.00	-26.53	peak	
3		3065.000	45.50	-1.77	43.73	74.00	-30.27	peak	
4		3930.000	44.34	-0.43	43.91	74.00	-30.09	peak	
5		4855.000	44.47	2.42	46.89	74.00	-27.11	peak	
6		5670.000	43.24	4.00	47.24	74.00	-26.76	peak	

*:Maximum data x:Over limit !:over margin

File :E1-2014-80001\Data :#14 *Page: 1*

Operation Mode	Test Mode 3	Test Date	Aug. 09, 2014
Tested by	Eddy Cheng	Pol.	Ver. and Hor.

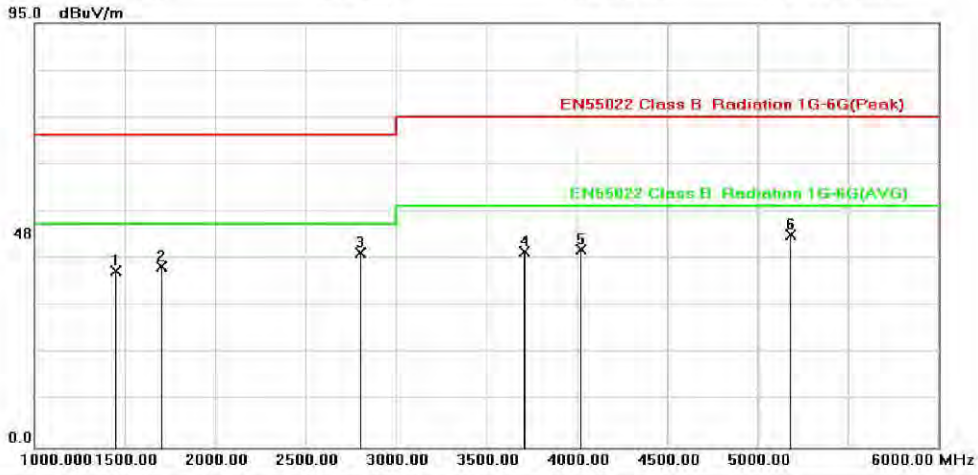
Site :966-2 Chamber
Limit: EN 55022/ CISPR 22 Class B Radiation 1G-6G
Mode: Data Link+Charger
Note:

Polarization: *Horizontal*
Power: From System
Distance:

Temperature: 27 ℃
Humidity: 58 %

Radiated Emission

File :E1-2014-80001 Data :#15 Date: 2014/8/9 Time: 下午 01:22:09



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		1450.000	47.79	-8.25	39.54	70.00	-30.46	peak	
2		1705.000	47.46	-7.01	40.45	70.00	-29.55	peak	
3	*	2805.000	46.64	-3.02	43.62	70.00	-26.38	peak	
4		3710.000	44.76	-1.02	43.74	74.00	-30.26	peak	
5		4025.000	44.48	-0.15	44.33	74.00	-29.67	peak	
6		5180.000	44.57	3.01	47.58	74.00	-26.42	peak	

*:Maximum data x:Over limit !:over margin

File :E1-2014-80001\Data :#15 *Page: 1*

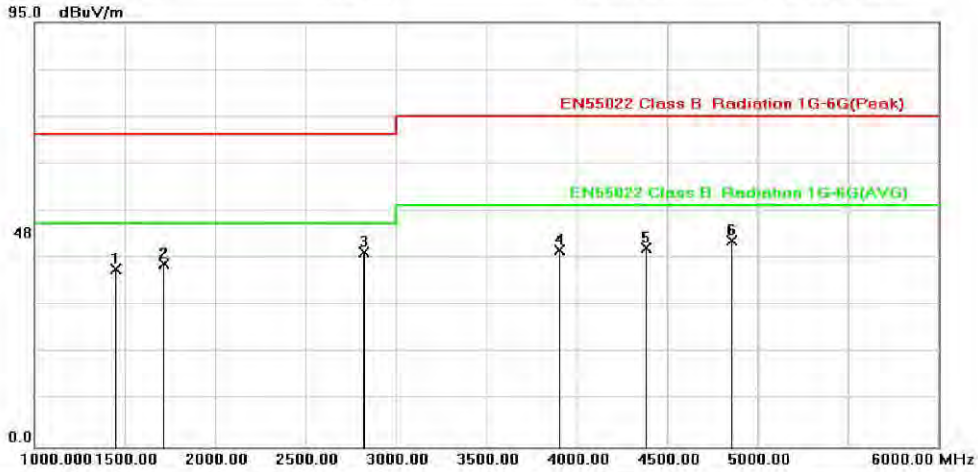
Site :966-2 Chamber
Limit: EN 55022 / CISPR 22 Class B Radiation 1G-6G
Mode: Data Link+Charger
Note:

Polarization: *Horizontal*
Power: From System
Distance:

Temperature: 27 ℃
Humidity: 58 %

Radiated Emission

File :E1-2014-80001 Data :#16 Date: 2014/8/9 Time: 下午 01:25:02



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		1450.000	48.09	-8.25	39.84	70.00	-30.16	peak	
2		1715.000	47.89	-6.96	40.93	70.00	-29.07	peak	
3	*	2820.000	46.53	-2.92	43.61	70.00	-26.39	peak	
4		3905.000	44.44	-0.50	43.94	74.00	-30.06	peak	
5		4385.000	43.29	1.15	44.44	74.00	-29.56	peak	
6		4855.000	43.76	2.42	46.18	74.00	-27.82	peak	

*:Maximum data x:Over limit !:over margin

File :E1-2014-80001\Data :#16 *Page: 1*

Operation Mode	Test Mode 4	Test Date	Aug. 09, 2014
Tested by	Eddy Cheng	Pol.	Ver. and Hor.

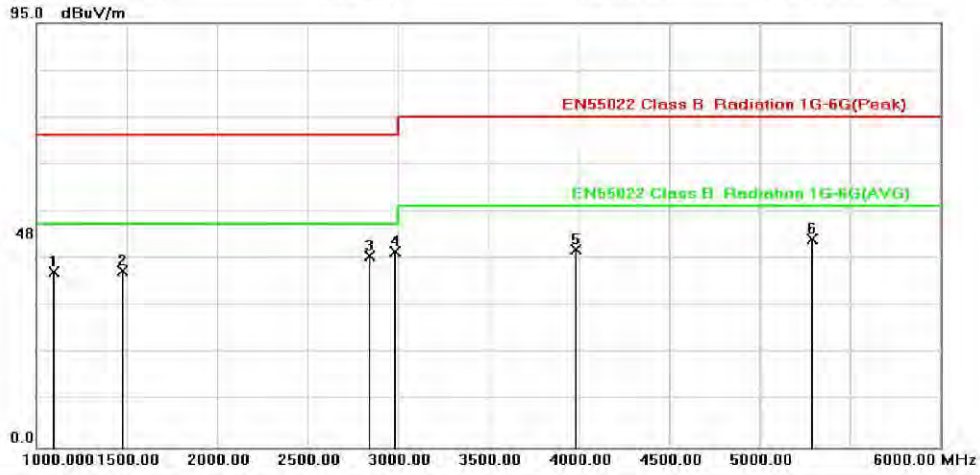
Site :966-2 Chamber
Limit: EN 55022 / CISPR 22 Class B Radiation 1G-6G
Mode: BT Stand by
Note:

Polarization: *Vertical*
Power: From Battery
Distance:

Temperature: 27 ℃
Humidity: 58 %

Radiated Emission

File :E1-2014-80001 Data :#11 Date: 2014/8/9 Time: 下午 12:56:51



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		1095.000	50.43	-11.14	39.29	70.00	-30.71	peak	
2		1475.000	47.65	-8.04	39.61	70.00	-30.39	peak	
3		2840.000	45.66	-2.80	42.86	70.00	-27.14	peak	
4	*	2985.000	45.76	-1.88	43.88	70.00	-26.12	peak	
5		3985.000	44.52	-0.28	44.24	74.00	-29.76	peak	
6		5290.000	43.46	3.16	46.62	74.00	-27.38	peak	

*:Maximum data x:Over limit !:over margin

File :E1-2014-80001\Data :#11 *Page: 1*

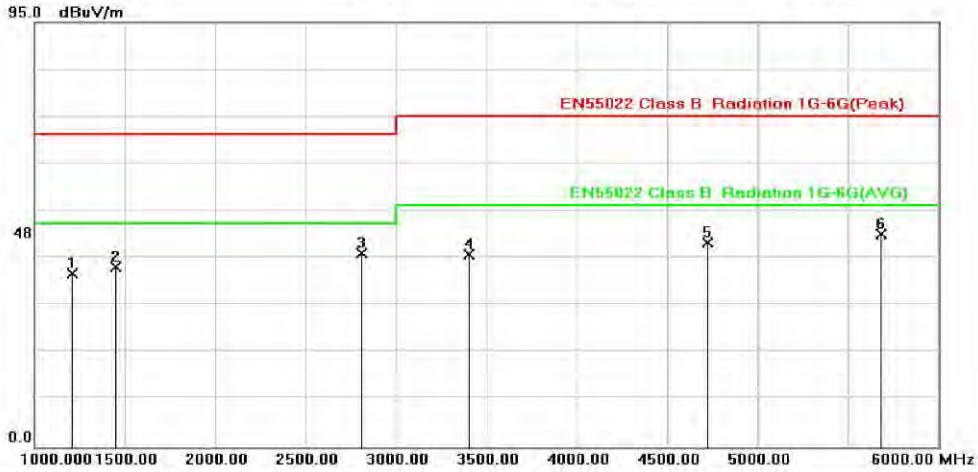
Site :966-2 Chamber
Limit: EN 55022 / CISPR 22 Class B Radiation 1G-6G
Mode: BT Stand by
Note:

Polarization: *Horizontal*
Power: From Battery
Distance:

Temperature: 27 ℃
Humidity: 58 %

Radiated Emission

File :E1-2014-80001 Data :#12 Date: 2014/8/9 Time: 下午 12:59:35



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		1210.000	48.97	-10.20	38.77	70.00	-31.23	peak	
2		1450.000	48.49	-8.25	40.24	70.00	-29.76	peak	
3		2810.000	46.26	-2.98	43.28	70.00	-26.72	peak	
4		3405.000	44.77	-1.62	43.15	74.00	-30.85	peak	
5		4725.000	43.60	2.11	45.71	74.00	-28.29	peak	
6	*	5680.000	43.51	4.03	47.54	74.00	-26.46	peak	

*:Maximum data x:Over limit !:over margin

File :E1-2014-80001\Data :#12 *Page: 1*

Operation Mode	Test Mode 5(DC 24V)	Test Date	Aug. 12, 2014
Tested by	Eddy Cheng	Pol.	Ver. and Hor.

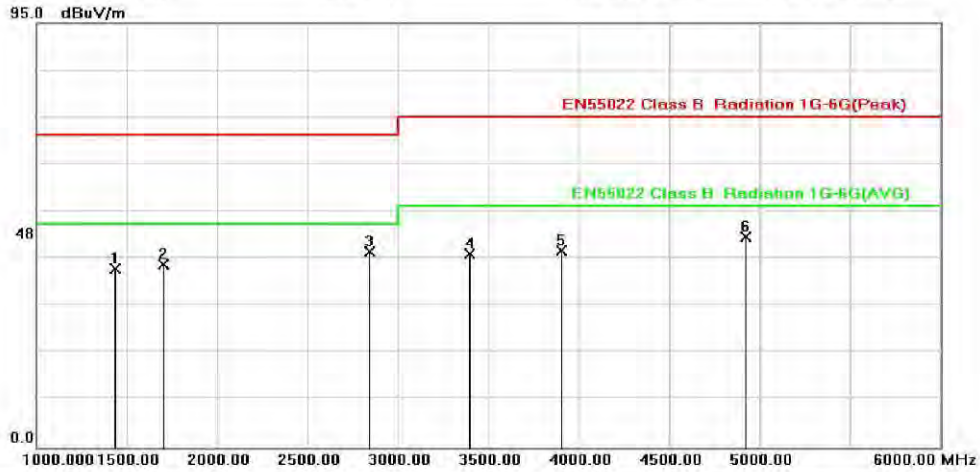
Site :966-2 Chamber
Limit: EN 55022 / CISPR 22 Class B Radiation 1G-6G
Mode: Car charger+BT+GPS
Note:

Polarization: *Vertical*
Power: DC 24V
Distance:

Temperature: 28 ℃
Humidity: 62 %

Radiated Emission

File :E1-2014-80001 Data :#21 Date: 2014/8/12 Time: 下午 09:04:21



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		1435.000	48.45	-8.37	40.08	70.00	-29.92	peak	
2		1705.000	48.00	-7.01	40.99	70.00	-29.01	peak	
3	*	2840.000	46.58	-2.80	43.78	70.00	-26.22	peak	
4		3395.000	45.03	-1.61	43.42	74.00	-30.58	peak	
5		3900.000	44.47	-0.52	43.95	74.00	-30.05	peak	
6		4925.000	44.60	2.59	47.19	74.00	-26.81	peak	

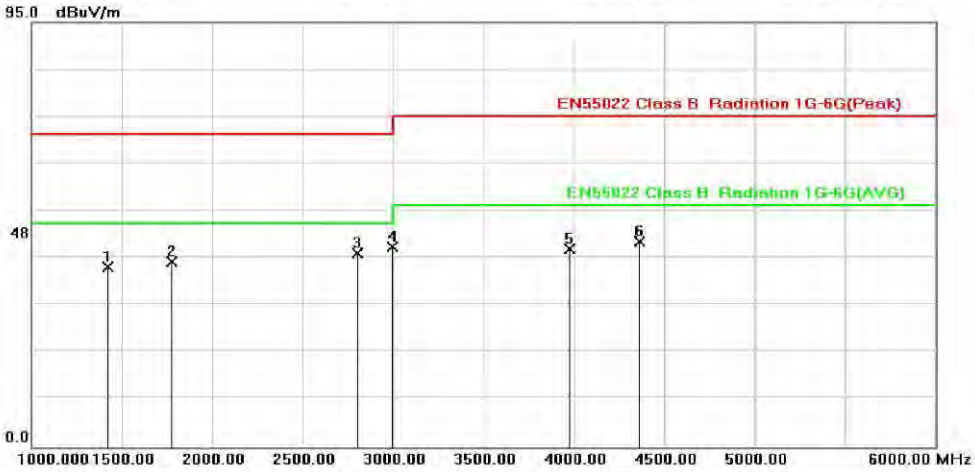
*:Maximum data x:Over limit !:over margin

File :E1-2014-80001\Data :#21 *Page: 1*

Site :966-2 Chamber | Polarization: *Horizontal* | Temperature: 28 ℃
Limit: EN 55022 / CISPR 22 Class B Radiation 1G-6G | Power: DC 24V | Humidity: 62 %
Mode: Car charger+BT+GPS | Distance:
Note:

Radiated Emission

File :E1-2014-80001 Data :#22 Date: 2014/8/12 Time: 下午 09:08:27



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		1425.000	48.80	-8.45	40.35	70.00	-29.65	peak	
2		1775.000	48.14	-6.73	41.41	70.00	-28.59	peak	
3		2800.000	46.42	-3.04	43.38	70.00	-26.62	peak	
4	*	2995.000	46.62	-1.82	44.80	70.00	-25.20	peak	
5		3975.000	44.51	-0.31	44.20	74.00	-29.80	peak	
6		4365.000	44.98	1.06	46.04	74.00	-27.96	peak	

*:Maximum data x:Over limit !:over margin

File :E1-2014-80001\Data :#22 *Page: 1*

2.5. DC power input/output ports measurement. Refer to EN 301 489-1 Section 8.3

2.5.1 Test Method:

Standard	Edition	Description
EN 55022	2010/AC:2011	Information technology equipment – Radio disturbance characteristics - Limits and methods of measurement

Refer to section 8.3.2 of EN 301489-1 for detail.

2.5.2 Limit:

Frequency range MHz	Limits dB(uV)	
	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
Note 1. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.		

2.5.3 Test Procedure:

1. The EUT was placed on a 0.8m wooden table above ground plane.
2. Set up EUT with support units and turn on the power of all equipments.
3. Link the EUT with telecommunication tester to setup the test mode. The transmitter operates at continuous mode and max. rated output power.
4. Procedure to find the maximum reading was performed on the six highest emissions to ensure EUT's compliance.
5. Repeat above procedures until all frequencies' measurement were completed.

2.5.4 Test Instruments:

SGS Conducted Emission Test Site No. A					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
EMI Test Receiver	R&S	ESCI 3	101311	Jun. 20, 2014	Jun. 19, 2015
Coaxial Cables	N/A	N30N30-1042-150 cm	N/A	Feb. 07, 2014	Feb. 06, 2015
LISN	Schwarzbeck	NSLK 8127	8127-648	Jun. 10, 2014	Jun. 09, 2015
Pulse Limiter	Narda S.T.S.	PMM PL01	1110X30602	Nov. 26, 2012	Nov. 25, 2014
LISN	Rolf-Heine	NNB-2/16Z	99012	Mar. 26, 2014	Mar. 25, 2015
ISN	TESEQ	ISN T800	34384	Mar. 06, 2014	Mar. 05, 2015
ISN	TESEQ	ISN ST08	36271	Oct. 02, 2013	Oct. 01, 2014
ISN	TESEQ	ISN PLT	32616	Oct. 11, 2013	Oct. 10, 2014
RF Current Probe	Schwarzbeck	SW 9605	SW 9605-138	Oct. 02, 2013	Oct. 01, 2014
Capacitive Voltage Probe	Schwarzbeck	CVP 9222	9222-031	Oct. 02, 2013	Oct. 01, 2014
DC LISN	Schwarzbeck	NNBM 8124	8124-564	Nov. 07, 2013	Nov. 06, 2014
DC LISN	Schwarzbeck	NNBM 8124	8124-565	Nov. 07, 2013	Nov. 06, 2014
High Voltage Probe	Schwarzbeck	TK 9420	TK 9420-5223	Mar. 07, 2014	Mar. 06, 2015
Communication Tester	R&S	CMW500	131121	Jan.16, 2014	Jan.15, 2015
Communication Tester	Anritsu	MT8820C	6201107337	Apr. 23,2014	Apr. 22,2015
Test Software	Farad	EZ-EMC	Ver. SGS-03A2	N.C.R.	N.C.R.

2.5.5 Test SET-UP (Block Diagram of Configuration):

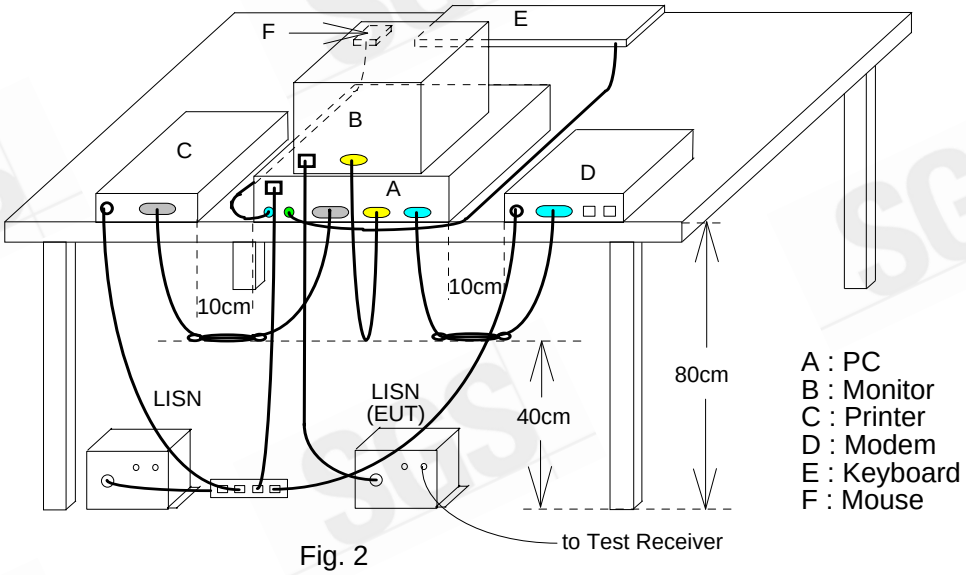


Fig. 2

2.5.6 Uncertainty of Conducted Emission:

Expanded uncertainty (K=2) of conducted emission is 2.20 dB.

2.5.7 Measurement Level Calculation:

Factor = LISN insertion loss + Cable loss
Measurement Level = Reading Level + Factor

2.5.8 Measurement Data:

Operation Mode:	Test Mode 5(DC 12V)	Test Date:	Aug. 13, 2014
Tested By:	Eddy Cheng	Pol.:	Positive(+)

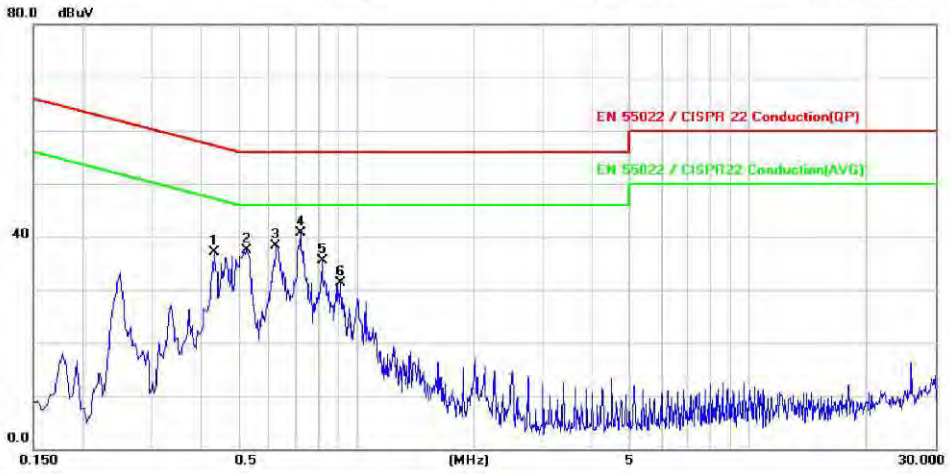
Site : Conduction Room
Limit: EN 55022 / CISPR 22 Conduction(QP)
Mode: Car charger+BT+GPS
Note:

Phase: +
Power: DC 12V

Temperature: 25 ℃
Humidity: 62 %

Conducted Emission

File :80001 Data :#1 Date: 2014/8/13 Time: 下午 03:48:29



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.4340	36.80	0.25	37.05	57.18	-20.13	peak	
2		0.5260	37.16	0.27	37.43	56.00	-18.57	peak	
3		0.6260	38.03	0.30	38.33	56.00	-17.67	peak	
4	*	0.7220	40.36	0.34	40.70	56.00	-15.30	peak	
5		0.8180	35.11	0.37	35.48	56.00	-20.52	peak	
6		0.9100	30.84	0.41	31.25	56.00	-24.75	peak	

*:Maximum data x:Over limit !:over margin

File :80001\Data :#1 *Page: 1*

Operation Mode:	Test Mode 5(DC 12V)	Test Date:	Aug. 13, 2014
Tested By:	Eddy Cheng	Pol.:	Negative(-)

Site : Conduction Room | Phase: - | Temperature: 25 ℃
Limit: EN 55022 / CISPR 22 Conduction(QP) | Power: DC 12V | Humidity: 62 %
Mode: Car charger+BT+GPS
Note:

Conducted Emission

File :80001 Data :#2 Date: 2014/8/13 Time: 下午 03:51:00

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.4340	36.10	0.25	36.35	57.18	-20.83	peak	
2		0.5300	39.39	0.27	39.66	56.00	-16.34	peak	
3		0.6220	40.14	0.30	40.44	56.00	-15.56	peak	
4	*	0.7220	41.26	0.34	41.60	56.00	-14.40	peak	
5		0.8180	35.32	0.37	35.69	56.00	-20.31	peak	
6		0.9060	35.15	0.40	35.55	56.00	-20.45	peak	

*:Maximum data x:Over limit !:over margin

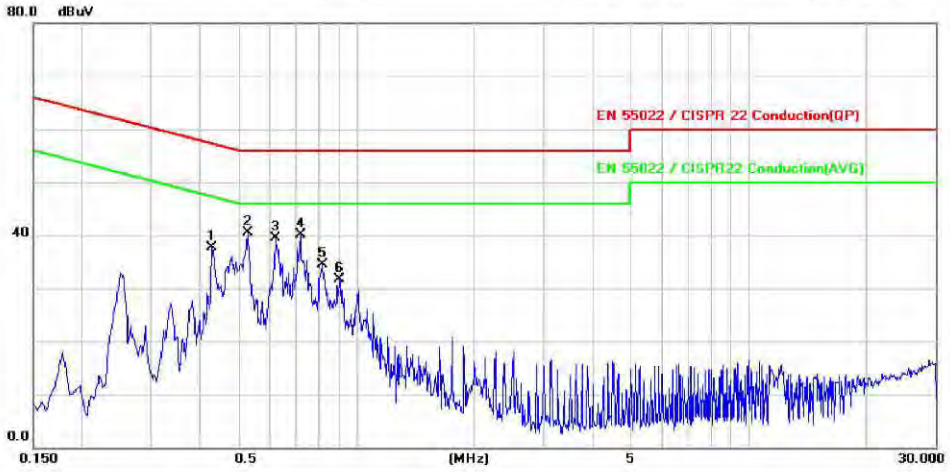
File :80001\Data :#2 *Page: 1*

Operation Mode:	Test Mode 5(DC 24V)	Test Date:	Aug. 13, 2014
Tested By:	Eddy Cheng	Pol.:	Positive(+)

Site : Conduction Room | Phase: + | Temperature: 25 ℃
Limit: EN 55022 / CISPR 22 Conduction(QP) | Power: DC 24V | Humidity: 62 %
Mode: Car charger+BT+GPS
Note:

Conducted Emission

File :80001 Data :#3 Date: 2014/8/13 Time: 下午 03:57:54



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.4300	37.53	0.25	37.78	57.25	-19.47	peak	
2	*	0.5300	40.16	0.27	40.43	56.00	-15.57	peak	
3		0.6260	39.25	0.30	39.55	56.00	-16.45	peak	
4		0.7220	39.76	0.34	40.10	56.00	-15.90	peak	
5		0.8180	34.20	0.37	34.57	56.00	-21.43	peak	
6		0.9060	31.36	0.40	31.76	56.00	-24.24	peak	

*:Maximum data x:Over limit !:over margin

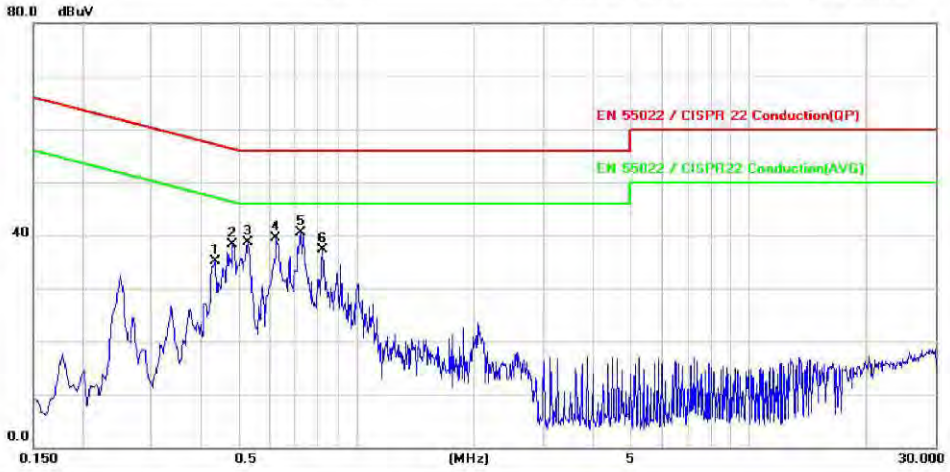
File :80001\Data :#3 *Page: 1*

Operation Mode:	Test Mode 5(DC 24V)	Test Date:	Aug. 13, 2014
Tested By:	Eddy Cheng	Pol.:	Negative(-)

Site : Conduction Room | Phase: - | Temperature: 25 ℃
Limit: EN 55022 / CISPR 22 Conduction(QP) | Power: DC 24V | Humidity: 62 %
Mode: Car charger+BT+GPS
Note:

Conducted Emission

File :80001 Data :#4 Date: 2014/8/13 Time: 下午 04:00:32



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.4380	34.86	0.25	35.11	57.10	-21.99	peak	
2		0.4860	37.95	0.26	38.21	56.24	-18.03	peak	
3		0.5300	38.49	0.27	38.76	56.00	-17.24	peak	
4		0.6260	39.21	0.30	39.51	56.00	-16.49	peak	
5	*	0.7220	40.19	0.34	40.53	56.00	-15.47	peak	
6		0.8180	36.95	0.37	37.32	56.00	-18.68	peak	

*:Maximum data x:Over limit !:over margin

File :80001\Data :#4 *Page: 1*

2.6 AC Mains power input/output ports measurement. Refer to EN 301 489-1 Section 8.4

2.6.1 Test Method:

Standard	Edition	Description
EN 55022	2010/AC:2011	Information technology equipment – Radio disturbance characteristics - Limits and methods of measurement

Refer to section 8.4.2 of EN 301489-1 for detail.

2.6.2 Limit:

Refer to 2.5.2

2.6.3 Test Procedure:

Refer to 2.5.3

2.6.4 Test Instruments:

Refer to 2.5.4

2.6.5 Conduction Emission Test Set-up:

Refer to 2.5.5

2.6.6 Uncertainty of Conducted Emission:

Expanded uncertainty (k=2) of radiated emission measurement is 2.20dB.

2.6.7 Measurement level and Factor calculate method:

Factor = LISN insertion loss + Cable loss
Measurement Level = Reading Level + Factor

2.6.8 Measurement Data:

Operation Mode:	Test Mode 3	Test Date:	Aug. 08, 2014
Tested By:	Eddy Cheng	Pol.:	Line

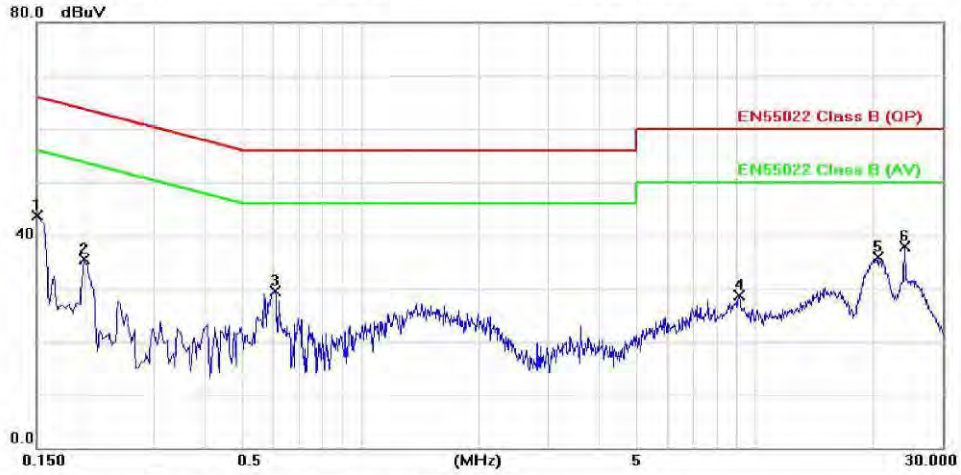
Site ConductionRoom
Limit: EN 55022 / CISPR 22 Conduction(QP)
Mode: Data Link+Charger
Note:

Phase: L1
Power: AC 230V/50Hz

Temperature: 26 ℃
Humidity: 60%

Conducted Emission

File :E1-2014-80001 Data :#2 Date: 2014/8/8 Time : 下午 08:21:08



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1500	43.68	0.07	43.75	66.00	-22.25	peak	
2		0.1980	35.51	0.07	35.58	63.69	-28.11	peak	
3		0.6060	29.41	0.07	29.48	56.00	-26.52	peak	
4		9.1100	28.40	0.30	28.70	60.00	-31.30	peak	
5		20.5980	35.24	0.61	35.85	60.00	-24.15	peak	
6	*	24.0180	37.18	0.73	37.91	60.00	-22.09	peak	

*:Maximum data x:Over limit !:over margin

File :E1-2014-80001\Data :#2 *Page: 1*

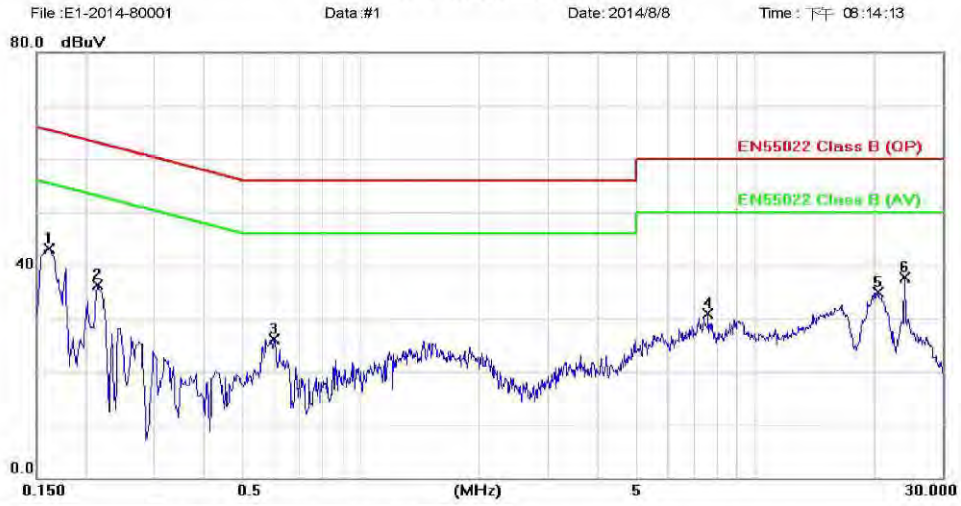
Operation Mode:	Test Mode 3	Test Date:	Aug. 08, 2014
Tested By:	Eddy Cheng	Pol.:	Neutral

Site ConductionRoom
Limit: EN 55022 / CISPR 22 Conduction(QP)
Mode: Data Link+Charger
Note:

Phase: N
Power: AC 230V/50Hz

Temperature: 26 ℃
Humidity: 60%

Conducted Emission



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1620	43.09	0.05	43.14	65.36	-22.22	peak	
2		0.2140	36.17	0.06	36.23	63.05	-26.82	peak	
3		0.6020	26.06	0.08	26.14	56.00	-29.86	peak	
4		7.6060	30.67	0.27	30.94	60.00	-29.06	peak	
5		20.5980	34.35	0.60	34.95	60.00	-25.05	peak	
6		24.0180	37.00	0.69	37.69	60.00	-22.31	peak	

*:Maximum data x:Over limit !:over margin

File :E1-2014-80001\Data :#1 *Page: 1*

2.7 Harmonic Current Emissions (AC mains input port) measurement. Refer to EN 301 489-1 Section 8.5

2.7.1 Test Method:

EN 61000-3-2:2006+A1:2009+A2:2009

2.7.2 Test Instruments:

Power Harmonic Measurement					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
Power Analyzer	EMC PARTNER	HAR1000-1P	HAR1000-1P 115V-0240	Jun. 04, 2014	Jun. 03, 2015
Test Software	EMC PARTNER	HARMONICS-1000	Ver. 4.20	N.C.R.	N.C.R.

2.7.3 Measurement Result:

N/A

2.8 Voltage Fluctuations and Flicker (AC mains input port) measurement. Refer to EN 301 489-1 Section 8.6

2.8.1 Test Method:

EN 61000-3-3:2008

2.8.2 Test Instruments:

Voltage Fluctuations/Flicker Measurement					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
Power Analyzer	EMC PARTNER	HAR1000-1P	HAR1000-1P 115V-0240	Jun. 04, 2014	Jun. 03, 2015
Test Software	EMC PARTNER	HARMONICS-1000	Ver. 4.20	N.C.R.	N.C.R.

2.8.3 Measurement Result:

N/A

2.9 Telecommunication Port measurement (Refer to EN 301 489-1 Section 8.7)

2.9.1 Test Method:

Standard	Edition	Description
EN 55022	2010/AC:2011	Information technology equipment – Radio disturbance characteristics - Limits and methods of measurement

Refer to section 8.7.2 of EN 301489-1 for detail.

2.9.2 Limit: Limits for conducted emission from telecommunication ports

Frequency range	**Voltage limits (**dBµV)		**Current limits (**dBµA)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 MHz to 0.5 MHz	84 to 74	74 to 64	40 to 30	30 to 20
0.5 MHz to 30 MHz	74	64	30	20

NOTE 1: The limits decrease linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

NOTE 2: The current and voltage disturbance limits are derived for use with an Impedance Stabilization Network (ISN) which presents a common mode (asymmetric mode) impedance of 150 to the telecommunication port under test (conversion factor is 20 log10 150/I = 44dB

NOTE 3: The emission requirement only applies to telecommunication ports as specified in EN 55022 [7]. The provisional relaxation of 10 dB will be reviewed no later than 3 years after the date of withdrawal based on the results and interference cases seen in this period. Wherever possible, it is recommended to comply with the limits without the provisional relaxation.

2.9.3 Test Procedure:

Refer to EN 55022

2.9.4 Test Instruments:

Refer to 2.5.4

2.9.5 Conduction Emission Test Set-up:

Refer to 2.5.5

2.9.6 Measurement Data:

N/A

3. IMMUNITY

EN 301 489-1 V 1.9.2 : 2011
EN 301 489-3 V 1.6.1 : 2013
EN 301 489-17 V 2.2.1 : 2012

3.1 Test Configuration:

Refer to EN 301 489-1, Section 9.1.

3.2 Special Conditions:

EN 301489-3

Reference to clauses in EN 301 489-1 [1]	Special product-related conditions, additional to or modifying the test conditions in EN 301 489-1 [1], clause 9
9.2.2: Test method; Radio frequency electromagnetic field	Attention: The width of the steps for the test frequency increments is device type-dependent: • for f device type 1 or device type2, the stepped frequency increments shall be 1 % of the momentary used test frequency; • for device type3, the stepped frequency increments shall be 10 % of the momentary used test frequency.
9.5.2: Test method; Radio frequency, common mode	Attention: The width of the steps for the test frequency increments is device type-dependent: • for device type1 or device type2, the stepped frequency increments shall be 1 % of the momentary used test frequency in the frequency range 5 MHz to 80 MHz; • for device type3, the stepped frequency increments shall be 10 % of the momentary used test frequency in the frequency range 5 MHz to 80 MHz.
9.7.3: Performance criteria; Voltage dips and interruptions	Attention: The performance criteria are device typedependent: For a voltage dip corresponding to a reduction of the supply voltage of 30 % for 10 ms the performance criteria CT or CR specified in clauses 6.4 or 6.6 shall apply as appropriate. For a voltage dip corresponding to a reduction of the supply voltage of 60 % for 100 ms the following class-dependent performance criteria shall apply: • for transmitters, belonging to device type1, the performance criteria CT (see clause 6.4); • for transmitters, belonging to device type2 or 3, the performance criteria TT (see clause 6.5); • for receivers, belonging to device type1, the performance criteria CR (see clause 6.6); • for receivers, belonging to device type2 or 3, the performance criteria TR (see clause 6.7). For a voltage interruption corresponding to a reduction of the supply voltage of > 95 % for 5 000 ms the performance criteria TT or TR specified in clauses 6.5 or 6.7 shall apply as appropriate.

EN 301489-17

No special conditions shall apply to UE in the scope of the present document.

3.3 Summary of Test Results:

Test Items	Reference Section	Result
Radio frequency electromagnetic filed (80 to 1000MHz and 1400MHz to 2700MHz)	EN 301 489-1 Section 9.2	PASS
Electrostatic discharge	EN 301 489-1 Section 9.3	PASS
Fast transients, common mode	EN 301 489-1 Section 9.4	PASS
Radio Frequency, common mode	EN 301 489-1 Section 9.5	PASS
Transients and surges in the vehicular environment	EN 301 489-1 Section 9.6	PASS
Voltage Dips and interruptions	EN 301 489-1 Section 9.7	N/A
Surges	EN 301 489-1 Section 9.8	N/A

3.4 Performance Criteria Description:

EN 301489-3

Equipment Type	Technical nature of the primary function
I	Transfer of messages (digital or analogue signals)
II	Transfer of audio (speech or music)
III	Others

Device Type 1		
Criteria	**During test**	**After test**
A	Operate as intended No loss of function For equipment with primary function type II the minimum performance shall be 12 dB SINAD No unintentional responses	Operate as intended For equipment with primary function type II the communication link shall be maintained No loss of function No degradation of performance No loss of stored data or user programmable functions
B	May be loss of function (one or more) No unintentional responses	Operate as intended Lost function(s) shall be self-recoverable No degradation of performance No loss of stored data or user programmable functions

Device Type 2		
Criteria	**During test**	**After test**
A	Operate as intended No loss of function For equipment with primary function type II the minimum performance shall be 6 dB SINAD No unintentional responses	Operate as intended For equipment with primary function type II the communication link shall be maintained No loss of function No degradation of performance No loss of stored data or user programmable functions
B	May be loss of function (one or more) No unintentional responses	Operate as intended Lost function(s) shall be self-recoverable No degradation of performance No loss of stored data or user programmable functions

Device Type 3		
Criteria	**During test**	**After test**
A and B	May be loss of function (one or more) No unintentional responses	Operate as intended, for equipment with primary function type II the communication link may be lost, but shall be recoverable by user No degradation of performance Lost functions shall be self-recoverable

Performance criteria for Continuous phenomena applied to Transmitters (CT)

For equipment with primary function type I or II including ancillary equipment tested on a stand alone basis, the performance criteria A of the applicable device type as given in clause 6.3 shall apply.

For equipment with primary function type II or III that requires a communication link that is maintained during the test, it shall be verified by appropriate means supplied by the manufacturer that the communication link is maintained during each individual exposure in the test sequence.

Where the EUT is a transmitter, tests shall be repeated with the EUT in standby mode to ensure that any unintentional transmission does not occur.

Performance criteria for Transient phenomena applied to Transmitters (TT)

For equipment with primary function type I or II, including ancillary equipment tested on a stand alone basis, the performance criteria B of the applicable device type as given in clause 6.3 shall apply, except for power interruptions exceeding a certain time the performance criteria deviations are specified in clause 7.2.2.

For equipment with primary function type II or III that requires a communication link that is maintained during the test, this shall be verified by appropriate means supplied by the manufacturer during each individual exposure in the test sequence.

Where the EUT is a transmitter, tests shall be repeated with the EUT in standby mode to ensure that any unintentional transmission does not occur.

Performance criteria for Continuous phenomena applied to Receivers (CR)

For equipment with primary function type I or II, including ancillary equipment tested on a stand alone basis, the performance criteria A of the applicable device type as given in clause 6.3 shall apply.

For equipment with primary function type II or III that requires a communication link that is maintained during the test, it shall be verified by appropriate means supplied by the manufacturer that the communication link is maintained during each individual exposure in the test sequence.

Where the EUT is a transceiver, under no circumstances shall the transmitter operate unintentionally during the test.

Performance criteria for Transient phenomena applied to Receivers (TR)

For equipment with primary function type I or II, including ancillary equipment tested on a stand alone basis, the performance criteria B of the applicable device type as given in clause 6.3 shall apply, except for power interruptions exceeding a certain time the performance criteria deviations are specified in clause 7.2.2.

For equipment with primary function type II or III that requires a communication link that is maintained during the test, this shall be verified by appropriate means supplied by the manufacturer during each individual exposure in the test sequence.

Where the EUT is a transceiver, under no circumstances shall the transmitter operate unintentionally during the test.

Performance criteria for ancillary equipment tested on a stand alone basis

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

EN 301489-17

During test	After test	Criteria
Shall operate as intended; May show degradation of performance (See note 1) Shall be no loss of function Shall be no unintentional transmissions	Shall Operate as intended; Shall be no degradation of performance (See note 2) Shall be no loss of function Shall be no loss of stored data or user programmable functions	A
May show loss of function (one or more) May show degradation of performance (see note 1) No unintentional transmissions	Functions shall be self-recoverable Shall operate as intended after recovering Shall be no degradation of performance (see note 2) Shall be no loss of stored data or user programmable functions	B
May be loss of function (one or more)	Functions shall be recoverable by the operator Shall operate as intended after recovering Shall be no degradation of performance (see note 2)	C

Note 1	Degradation of performance during the test is understood as degradation to a level not below a minimum performance level specified by the manufacturer for the use of the apparatus as intended. In some cases the specified minimum performance level may be replaced by a permissible degradation of performance. If the minimum performance level or the permissible performance degradation is not specified by the manufacturer, then either of these may be derived from the product description and documentation (including leaflets and advertising) and what the user may reasonably expect from the apparatus if used as intended.
Note 2	No degradation of performance after the test is understood as 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.

Performance criteria for Continuous phenomena applied to Transmitters and Receivers
The performance criteria A shall apply.

Performance criteria for Transient phenomena applied to Transmitters and Receivers
The performance criteria B shall apply, except for voltage dips of 100 ms and voltage interruptions of 5000ms duration, for which performance criteria C shall apply.

Performance criteria for equipment which does not provide a continuous communication link

For radio equipment which does not provide a continuous communication link, the performance criteria described in EN 301 489-1 clauses 6.1 and 6.2 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 related specifications set out in EN 301 489-1 clause 5.3 have also to be taken into account.

The performance criteria specified by the manufacturer shall give the same degree of immunity protection as called for in EN 301 489-1 clauses 6.1 and 6.2.

Performance criteria (while performing realistic test)

The establishment and maintenance of a communications link, the assessment of ACK or NACK, is used as performance criteria to ensure that all primary functions of the transmitter and receiver are evaluated during the immunity tests.

Pass/Fail verdict:

WIFI-RS/CS/Section 9.6 Pulse 3a/3b (CT/CR): During the test, the window of CMD executed by notebook shall continuously return acknowledge copy from EUT until the end of the test.

WIFI-other test items (TT/TR): During the test, the disconnection would occur if message of “TIME OUT” is displayed. Ack/NACK would automatically recover after the test.

BT (Data transfer)-RS/CS/Section 9.6 Pulse 3a/3b (CT/CR): During the test, the status bar on the screen of notebook would continuously progress without any halt until the completion of the test.

BT (Data transfer)-other test items (TT/TR): During the test, the status bar on the screen of notebook would discontinue with halt until the end of the test would be automatically recover.

BT Headset/BT Speaker-RS/CS/Section 9.6 Pulse 3a/3b (CT/CR):During the test, the voice (1kHz or 400Hz) would be monitor voice and communication with same quality.

BT Headset/BT Speaker-Other test items (TT/TR): During the tests, the voice or communication would be discontinued or variable voice frequency tone. After the test would be automatically recover.

Monitoring:

For WLAN: The status as displayed on CMD of notebook

3.5 Radio Frequency Electromagnetic Filed (80 to 1000MHz and 1400 to 2700MHz) Measurement. Refer to EN 301 489-1 Section 9.2

3.5.1 Test Method and Procedure:

EN 61000-4-3 :2010, and EN 301 489-1 Section 9.2.2.

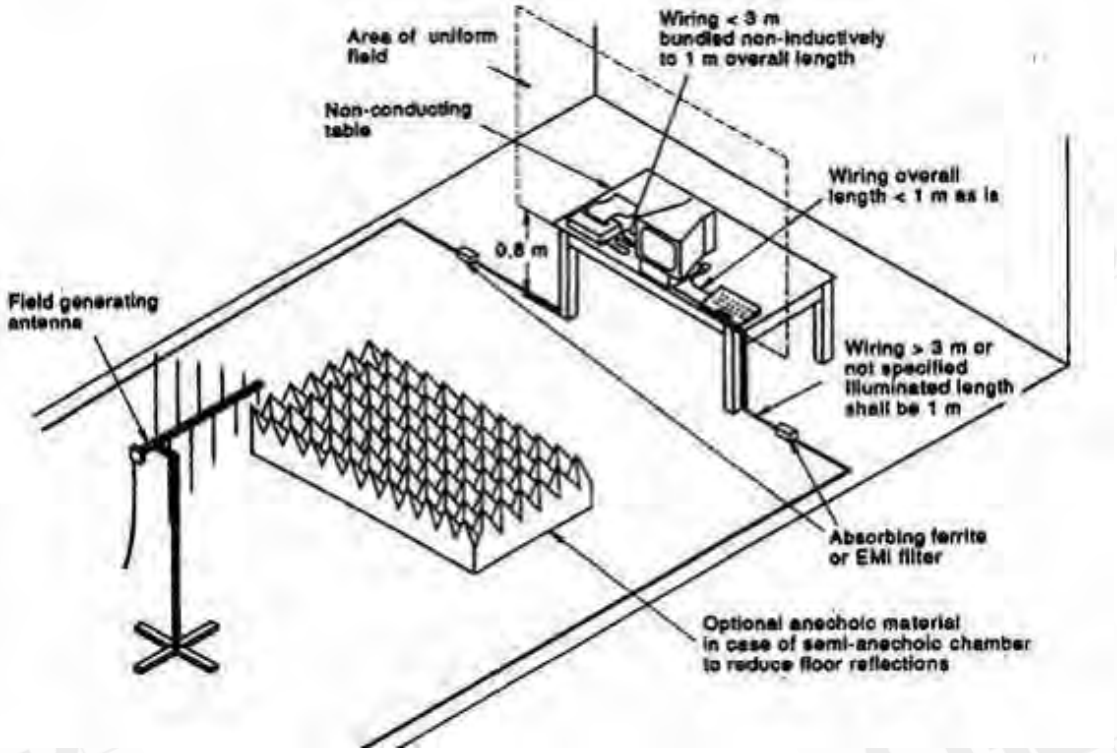
3.5.2 Performance criteria:

Refer to EN 301 489-1 Section 9.2.3.

3.5.3 Test Instruments:

Radiated Electromagnetic Field immunity Measurement					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
RS Test Site	Chance Most	9*6*6 Chamber	N/A	Nov. 29, 2013	Nov. 28, 2014
Signal Generator	R&S	SMC100A	102920	May 21, 2014	May 20, 2015
Power Sensor	R&S	NRP-Z91	101602	Feb. 10, 2014	Feb. 09, 2015
Power Sensor	R&S	NRP-Z91	101603	Feb. 10, 2014	Feb. 09, 2015
Power Amplifier	R&S	BBA100	101075	Apr. 29, 2014	Apr. 28, 2015
Power Amplifier	R&S	BBA100	101021	Apr. 21, 2014	Apr. 20, 2015
Power Amplifier	MILMEGA	AS0104-100/100	1049222	Apr. 21, 2014	Apr. 20, 2015
High Power Broadband Antenna	Schwarzbeck	VHBD 9134	9134-075	N.C.R.	N.C.R.
High Gain Log-Per. Antenna	R&S	HL046E	100112	N.C.R.	N.C.R.
Calibrated Broadband Log-Per. Test-Antenna	Schwarzbeck	STLP 9149	9149-151	N.C.R.	N.C.R.
EMC Field Probes	ETS-Lindgren	HI-6005	00135731	Mar. 07, 2014	Mar. 06, 2015
Communication Tester	R&S	CMU200	838392/058	Apr. 10, 2014	Apr. 09, 2015
Audio Analyzer	R&S	UPV	101825	Oct. 23, 2013	Oct. 22, 2014
Mouth Simulator	B&K	4227	2423926	N.C.R.	N.C.R.
Sound Level Calibrator	B&K	4231	3008232	Sep. 23, 2013	Sep. 22, 2014
Ear Simulator	B&K	4195	02447500	N.C.R.	N.C.R.
Ear Simulator	B&K	4192	2802343	N.C.R.	N.C.R.
Audio Power Amplifier	B&K	2176-C-001	2400477	N.C.R.	N.C.R.
Spectrum Analyzer	R&S	FSV 40	101058	Jan. 13, 2014	Jan. 12, 2015

3.5.4 Test SET-UP (Block Diagram of Configuration):



Configuration of Test Setup

3.5.5 Measurement Data:

Operation Mode:	Test Mode 1~5	Test Date:	Aug. 13, 2014
Temperature:	24 ℃	Humidity:	55 %
		Tested By:	Cone Lee

Basic Standard : EN 61000-4-3
Frequency Range : 80 to 1000MHz and 1400 to 2700 MHz
Field Strength : 3 V/m
Modulation : AM 80%, 1 kHz sinewave
Frequency Step : 1 % of fundamental
Dwell Time : 3 sec
Polarity of Antenna: Horizontal and Vertical
Test Distance : 3 m (EUT to antenna reference point)

No.	Frequency (MHz)	Antenna Orientation	Criterion	EUT Orientation
1	80 – 1000	Vertical/Horizontal	A	0 degree
2	80 – 1000	Vertical/Horizontal	A	90 degree
3	80 – 1000	Vertical/Horizontal	A	180 degree
4	80 – 1000	Vertical/Horizontal	A	270 degree

Observation:
A : No degradation in the performance of the EUT was observed.
N/A : Not Applicable.

No.	Frequency (MHz)	Antenna Orientation	Criterion	EUT Orientation
1	1400 – 2700	Vertical/Horizontal	A	0 degree
2	1400 – 2700	Vertical/Horizontal	A	90 degree
3	1400 – 2700	Vertical/Horizontal	A	180 degree
4	1400 – 2700	Vertical/Horizontal	A	270 degree

Observation:
A : No degradation in the performance of the EUT was observed.
N/A : Not Applicable.

3.6 Electrostatic Discharge Measurement. Refer to EN 301 489-1 Section 9.3

3.6.1 Test Method and Procedure:

EN 61000-4-2: 2009, and EN 301 489-1 Section 9.3.2.

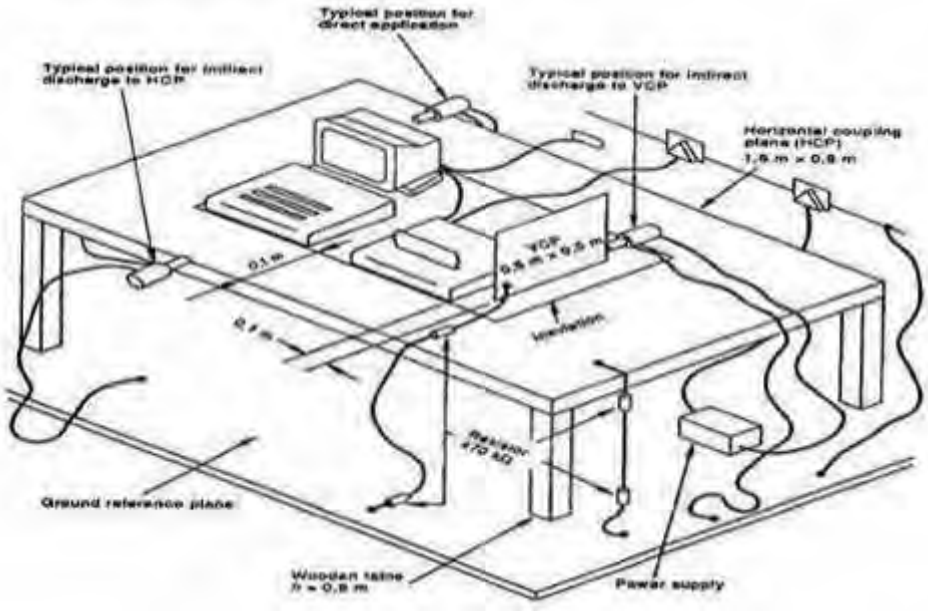
3.6.2 Performance criteria:

Refer to EN 301 489-1 Section 9.3.3.

3.6.3 Test Instruments:

ESD test					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
ESD Simulator	NoiseKen	ESS-100L/TC-815 R	ESS0635368	Jun. 10, 2014	Jun. 09, 2015
HCP	N/A	1.6 x 0.8 m	N/A	N.C.R.	N.C.R.
VCP	N/A	0.5 x 0.5 m	N/A	N.C.R.	N.C.R.
Spectrum Analyzer	R&S	FSV 40	101058	Jan. 13, 2014	Jan. 12, 2015

3.6.4 Test Setup (Block Diagram of Configuration):



3.6.5 Measurement Data:

Operation Mode:	Test Mode 1~5	Test Date:	Aug. 13 , 2014
Temperature:	25 ℃	Humidity:	48 %
		Tested By:	Cone Lee

Basic Standard : EN 61000-4-2
Discharge Impedance : 330 ohm /150 pF
Discharge Voltage : Air Discharge: +/- 2, 4, 8 kV
Contact Discharge: +/- 2, 4 kV
VCP/HCP: +/- 2, 4 kV
Polarity : Positive/Negative
Number of Discharge : Minimum 10/50 times at each test point
Discharge Mode : Single Discharge
Discharge Period : 1 second minimum

Note 1: For contact discharge, the EUT was exposed to at least 20 discharges, 10 each at negative and positive polarity.
Note 2: Refer to Appendix 1 of test report for test points.

A. Observations for following test points:
1. Surface of case. 2. Junction of case. 3. Power SW. 4. Control Button. 5. DC input jack. 6. Screw. 7. DC input(car charger). 8. LCD Panel.

Direct Application			Test Results	
Discharge Level (kV)	Polarity (+/-)	Test Point	Contact Discharge	Air Discharge
2, 4, 8	+/-	3 ~ 5, 8	N/A	A
2, 4, 8	+/-	1 ~ 2	N/A	B
2, 4	+/-	6, 7	A	N/A

Observation:
A : No degradation in the performance of the EUT was observed.
B : During test, the EUT's function degradation. After test, it recovery by itself.
N/A : Not Applicable.

B. Observations for following test points:
1. Front side 2. Rear side 3. Left side 4. Right side

Indirect Application			Test Results	
Discharge Level (kV)	Polarity (+/-)	Test Point	Horizontal Coupling	Vertical Coupling
2, 4	+/-	1 - 4	A	A

Observation:
A : No degradation in the performance of the EUT was observed.
N/A : Not Applicable.

3.7 Fast Transients, Common Mode Measurement. Refer to EN 301 489-1 Section 9.4

3.7.1 Test Method and Procedure:

EN 61000-4-4: 2012, and EN 301 489-1 Section 9.4.2.

3.7.2 Performance criteria:

Refer to EN 301 489-1 Section 9.4.3.

3.7.3 Test Instruments

Fast Transients / Burst Test					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
EMS Multi-Tester	EMC Partner	TRANSIENT 2000	648	Mar. 12, 2014	Mar. 11, 2015
Clamp	EMC Partner	CN-EFT1000	469	Mar. 12, 2014	Mar. 11, 2015
Spectrum Analyzer	R&S	FSV 40	101058	Jan. 13, 2014	Jan. 12, 2015

3.7.4 Test SET-UP (Block Diagram of Configuration):

Refer to Appendix 1 for setup photo.

3.7.5 Measurement Data:

Operation Mode:	Test Mode 5	Test Date:	Aug. 13, 2014
Temperature:	22 ℃	Humidity:	50 %
		Tested By:	Cone Lee

Basic Standard : EN 61000-4-4
Test Voltage :1 kV for AC Input/Output
Polarity : Positive/Negative
Impulse Frequency : 5 kHz
Tr/Tn : 5/50ns
Burst : 15/300ms

Mains

Test Point	Polarity	Test Level (kV)	Results
L	+/-	1	N/A
N	+/-	1	N/A
L+N	+/-	1	N/A
PE	+/-	1	N/A
L+N+PE	+/-	1	N/A

Observation:
N/A : Not Applicable.

DC input power

Test Point	Polarity	Test Level (kV)	Results
Car Charger DC Input power	+/-	1	A

Observation:
A : No degradation in the performance of the EUT was observed.
N/A : Not Applicable.

3.8 Radio Frequency, Common Mode Measurement. Refer to EN 301 489-1 Section 9.5

3.8.1 Test Method and Procedure:

EN 61000-4-6: 2009, and EN 301 489-1 Section 9.5.2.

3.8.2 Performance criteria:

Refer to EN 301 489-1 Section 9.5.3.

3.8.3 Test Instruments:

CS Test					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
Conducted Immunity System	FRANKONIA	CIT-10/75	126B1159	May 19, 2014	May 18, 2015
CDN	LUTHI	CDN M2	P1317118042	May 20, 2014	May 19, 2015
CDN	LUTHI	CDN M3	P1318118505	May 20, 2014	May 19, 2015
CDN	FCC	FCC-801-T2-RJ11	05032	Apr. 01, 2014	Mar. 31, 2015
CDN	FCC	FCC-801-T8-RJ45	05034	Apr. 01, 2014	Mar. 31, 2015
EM Injection Clamp	LUTHI	EM 101	36158	May 23, 2014	May 22, 2015
CDN	FRANKONIA	M2+M3	A3011070	N.C.R.	N.C.R.
Communication Tester	R&S	CMU200	838392/058	Apr. 10, 2014	Apr. 09, 2015
Audio Analyzer	R&S	UPV	101825	Oct. 23, 2013	Oct. 22, 2014
Mouth Simulator	B&K	4227	2423926	N.C.R.	N.C.R.
Sound Level Calibrator	B&K	4231	3008232	Sep. 23, 2013	Sep. 22, 2014
Ear Simulator	B&K	4195	02447500	N.C.R.	N.C.R.
Ear Simulator	B&K	4192	2802343	N.C.R.	N.C.R.
Audio Power Amplifier	B&K	2690-W-013	2809025	N.C.R.	N.C.R.
Test Software	Audix	i2	Ver. 4.110805a	N.C.R.	N.C.R.

3.8.4 Test Setup (Block Diagram of Configuration):

Refer to Appendix 1 for setup photo.

3.8.5 Measurement Data:

Operation Mode:	Test Mode 5	Test Date:	Aug. 13, 2014
Temperature:	25 ℃	Humidity:	60 %
		Tested By:	Cone Lee

Basic Standard : EN 61000-4-6
Frequency Range : 0.15 MHz - 80 MHz
Field Strength : 3 V_{rms}
Modulation : AM 80%, 1 kHz Sinewave
Frequency Step : 1 % of fundamental
Dwell Time : 3 seconds
Coupling Method : CDN 3 Lines

Port Description	Frequency (MHz)	Meet Criteria for
DC input(Car charger)	0.15 – 80	A

Observation:

A : No degradation in the performance of the EUT was observed.
N/A : Not Applicable.

Signal Ports

Cable Description	Frequency (MHz)	Meet Criteria for
Signal/Comm.	0.15 – 80	N/A

Observation:

N/A : Not Applicable.

3.9 Transients and surges in the vehicular environment measurement. Refer to EN 301 489-1 Section 9.6

3.9.1 Test Method and Procedure:

Refer to ISO 7637-2 for 12Vdc equipment. , and EN 301 489-1 Section 9.6.2.

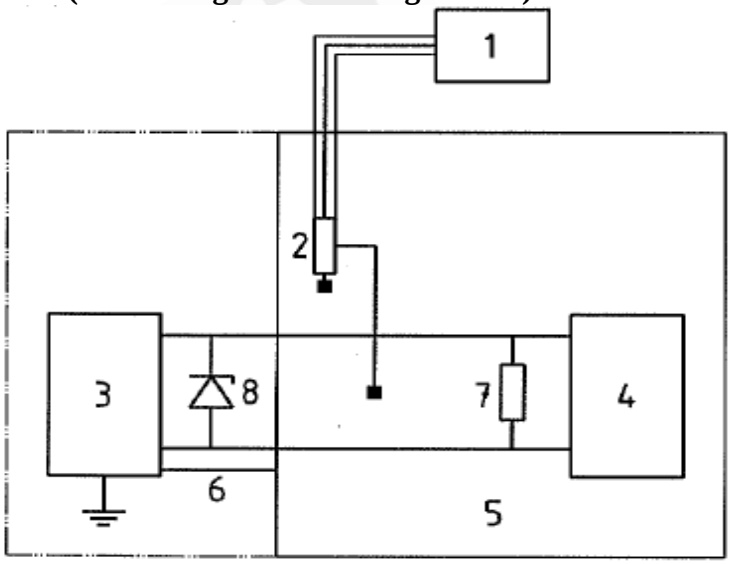
3.9.2 Performance criteria:

Refer to EN 301 489-1 Section 9.6.3.

3.9.3 Test Instruments:

ISO 7637-1 / ISO 7637-2					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
LISN	TESEQ	LISN2-S	F343	Jul. 08, 2013	Jul. 07, 2015
Load Dump	TESEQ	LD 5505	1233	Jul. 08, 2013	Jul. 07, 2015
Function Generator	TESEQ	FG 5620	1231	Jul. 08, 2013	Jul. 07, 2015
Power Amplifier	TESEQ	PA 5840-75	4106	Jul. 08, 2013	Jul. 07, 2015
Burst Attenuator	TESEQ	INA 5030B	1221	N.C.R.	N.C.R.
Micro Transient Generator	TESEQ	MT 5511	1241	Jul. 08, 2013	Jul. 07, 2015
Fast Transient Generator	TESEQ	FT 5530	123	Jul. 08, 2013	Jul. 07, 2015
Resistor Modul	TESEQ	RM 5505	1216	Jul. 08, 2013	Jul. 07, 2015
Oscilloscope	Agilent	DSOX3102A	MY53160306	Jul. 02, 2014	Jul. 01, 2015

3.9.4 Test SET-UP (Block Diagram of Configuration):



1 oscilloscope or equivalent
2 voltage probe
3 test pulse generator with internal power supply resistance R_i
4 DUT
5 ground plane
6 Ground connection (maximum length for test pulse 3: 100 mm)
7 optional resistor (R_v) [a]
8 optional diode bridge [b]

3.9.5 Measurement Data:

Test mode: Test Mode 5(DC 12V)

Test Results:

Test Pulse	Test Level III(V)	Test Pulse Events/Test Period	Meet Criteria for	Pass/Fail
1	-75	10 pulses	B	Pass
2a	+37	10 pulses	A	Pass
2b	+10	10 pluses	B	Pass
3a	-112	20 min	A	Pass
3b	+75	20 min	A	Pass
4	-6	10 pulses	A	Pass

Observation:

A : No degradation in the performance of the EUT was observed.

B : During the test, the charge indicator of the EUT disappeared. After the test, it recovered by itself.

N/A : Not Applicable.

Test mode: Test Mode 5(DC 24V)

Test Results:

Test Pulse	Test Level III(V)	Test Pulse Events/Test Period	Meet criteria for	Pass/Fail
1	-450	10 pulses	B	Pass
2a	+37	10 pulses	A	Pass
2b	+20	10 pluses	B	Pass
3a	-150	20 min	A	Pass
3b	+150	20 min	A	Pass
4	-12	10 pulses	A	Pass

Observation:

A : No degradation in the performance of the EUT was observed.

B : During the test, the charge indicator of the EUT disappeared. After the test, it recovered by itself.

N/A : Not Applicable.

3.10 Voltage Dips and Interruptions Measurement. Refer to EN 301 489-1 Section 9.7

3.10.1 Test Method and Procedure:

EN 61000-4-11: 2004, and EN 301 489-1 Section 9.7.2.

3.10.2 Performance criteria:

Refer to EN 301 489-1 Section 9.7.3.

3.10.3 Test Instruments:

Voltage Dips / Short Interruption and Voltage Variation Immunity test					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
EMS Multi-Tester	EMC Partner	TRANSIENT 2000	648	Mar. 12, 2014	Mar. 11, 2015
Spectrum Analyzer	R&S	FSV 40	101058	Jan. 13, 2014	Jan. 12, 2015

3.10.4 Test Setup (Block Diagram of Configuration):

Refer to Appendix 1 for setup photo

3.10.5 Measurement Data::

Operation Mode:	N/A	Test Date:	N/A
Temperature:	N/A	Humidity:	N/A
		Tested By:	N/A

EUT Rated Voltage : AC 230 V, 50/60 Hz
Residual Voltage : 0%, 30%, 60%, 70%, >95% U_t
Phase Angle : 0, 180 degree
Total Events : 3 dropouts
Event Interval : 10 seconds

Events	Cycles	Meet Criteria for
Voltage dip: 0 % residual voltage	0.5	N/A
Voltage dip: 0 % residual voltage	1	N/A
Voltage dip: 70 % residual voltage	25	N/A
Voltage interruption: 0 % residual voltage	250	N/A

Observation:
N/A : Not Applicable.

Events	Cycle(ms)	Observation
Voltage dip: 30 % residual voltage	10	N/A
Voltage dip: 60 % residual voltage	100	N/A
Voltage interruption: >95 % residual voltage	5000	N/A

Observation:
N/A : Not Applicable.

3.11 Surges Measurement. Refer to EN 301 489-1 Section 9.8

3.11.1 Test Method and Procedure:

EN 61000-4-5:2006, and EN 301 489-1 Section 9.8.2.

3.11.2 Performance criteria:

Refer to EN 301 489-1 Section 9.8.3.

3.11.3 Test Instruments:

Surge Immunity test					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
EMS Multi-Tester	EMC Partner	TRANSIENT 2000	648	Mar. 12, 2014	Mar. 11, 2015
Universal Surge CDN	EMC Partner	CDN-UTP4	015	Mar. 12, 2014	Mar. 11, 2015
Spectrum Analyzer	R&S	FSV 40	101058	Jan. 13, 2014	Jan. 12, 2015

3.11.4 Test Setup (Block Diagram of Configuration):

Refer to Appendix 1 for setup photo

3.11.5 Measurement Data:

Operation Mode:	N/A	Test Date:	N/A
Temperature:	N/A	Humidity:	N/A
		Tested By:	N/A

Test Rate : 1 pulse / minute
No. of Tests : 5 positive and 5 negative pulses

Observation Description

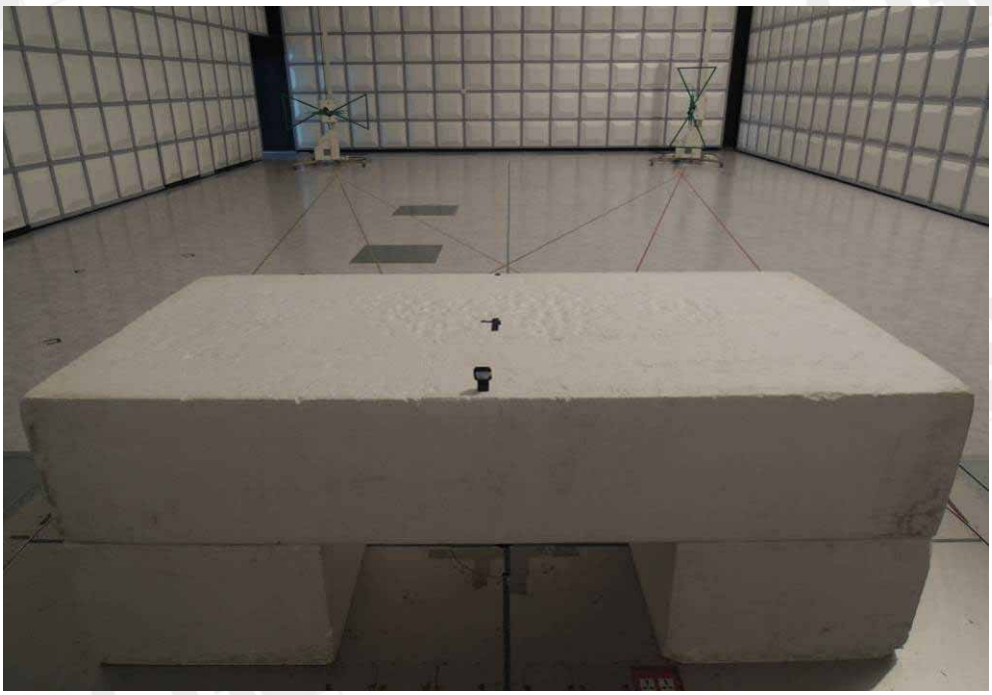
Test Point	Phase Angle (degree)	Polarity (+/-)	Test Level (kV)	Meet Criteria for
L – N	0, 90, 180, 270	+/-	0.5	N/A
L – PE	0, 90, 180, 270	+/-	2	N/A
N – PE	0, 90, 180, 270	+/-	2	N/A

Observation:

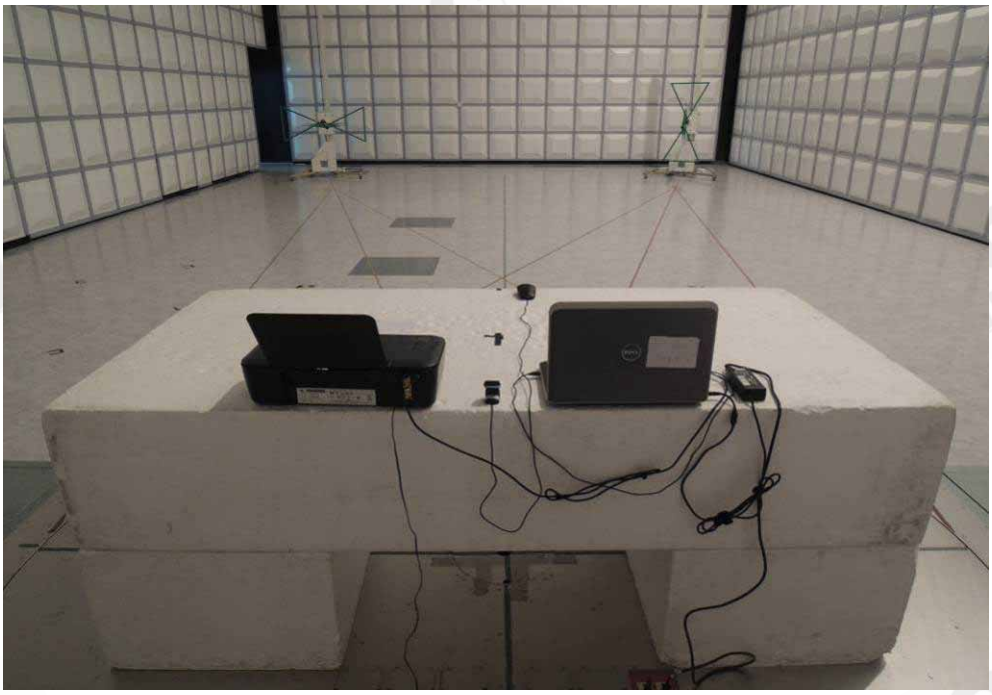
N/A : Not Applicable.

APPENDIX 1
PHOTOGRAPHS OF TEST SETUP

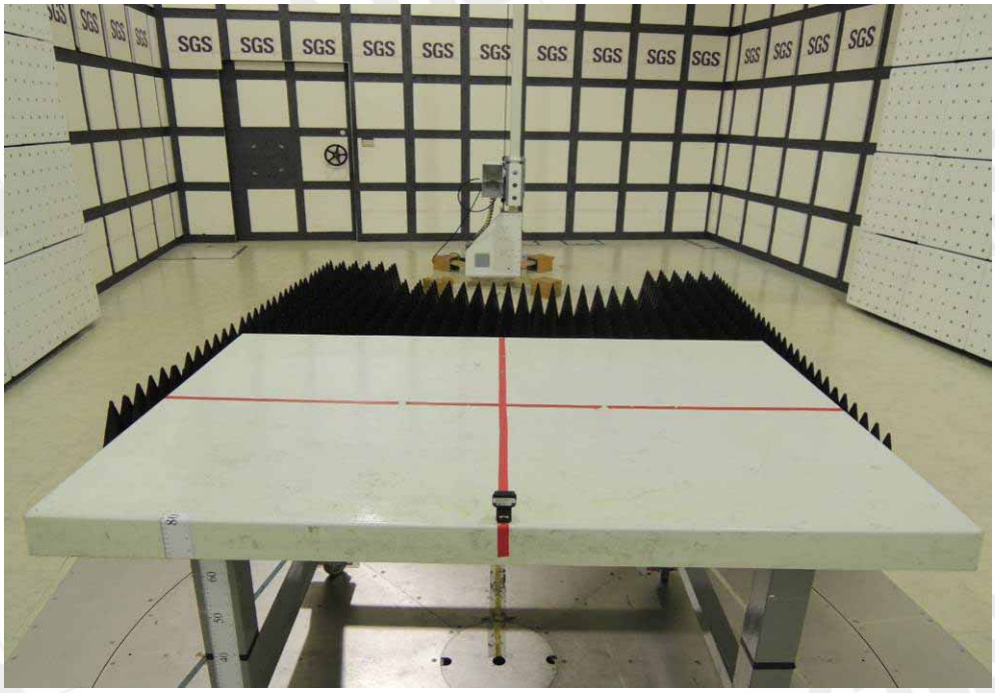
Radiated Emission Test Setup Photos - Below 1GHz
Test Mode 1

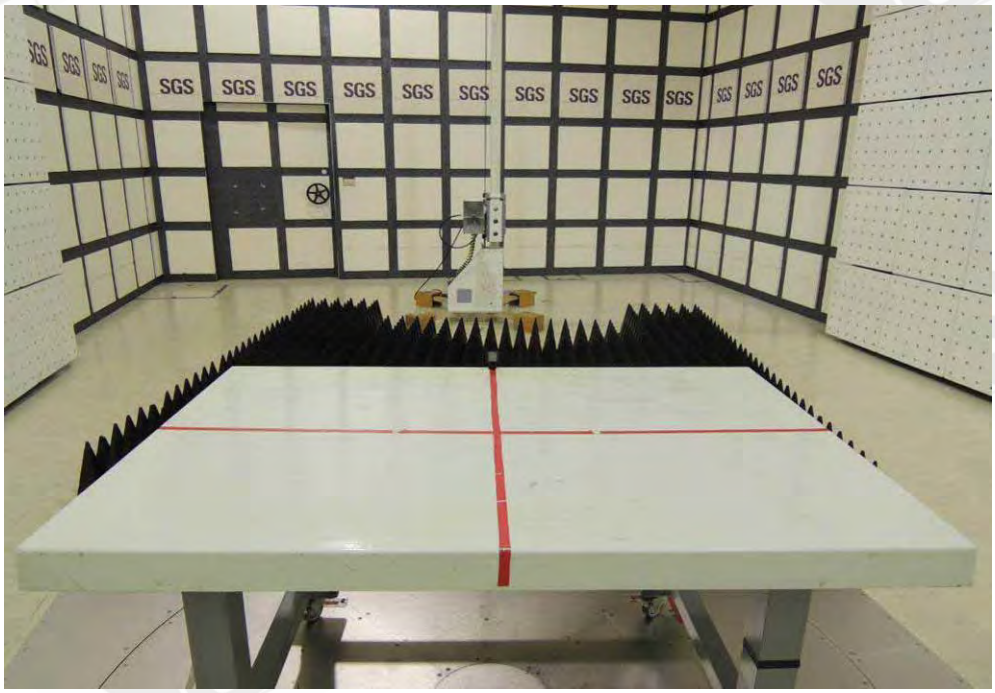


Test Mode 3

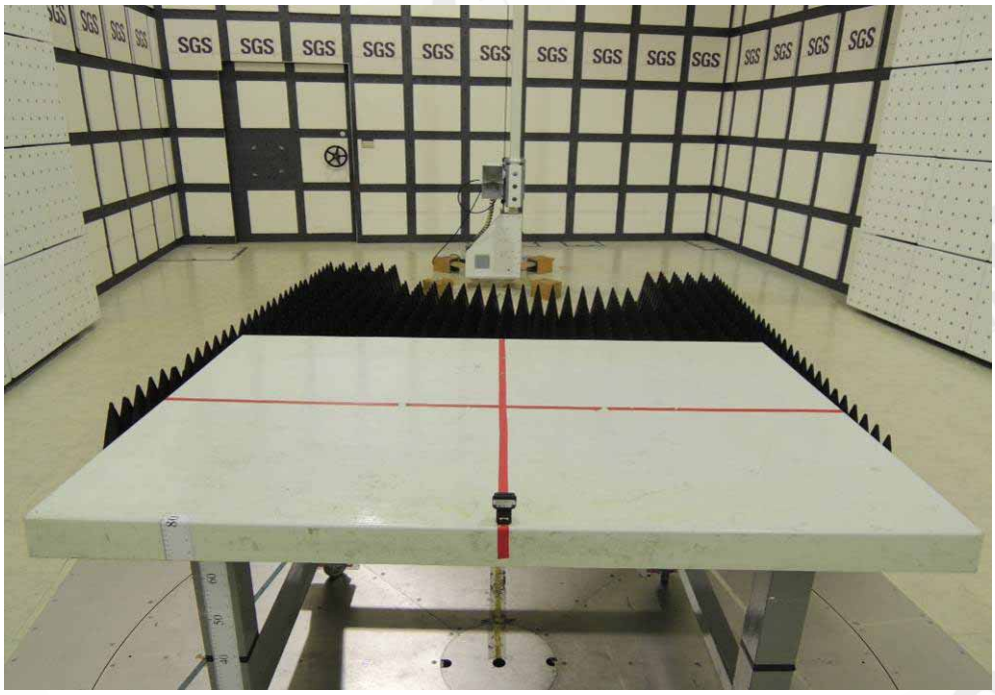


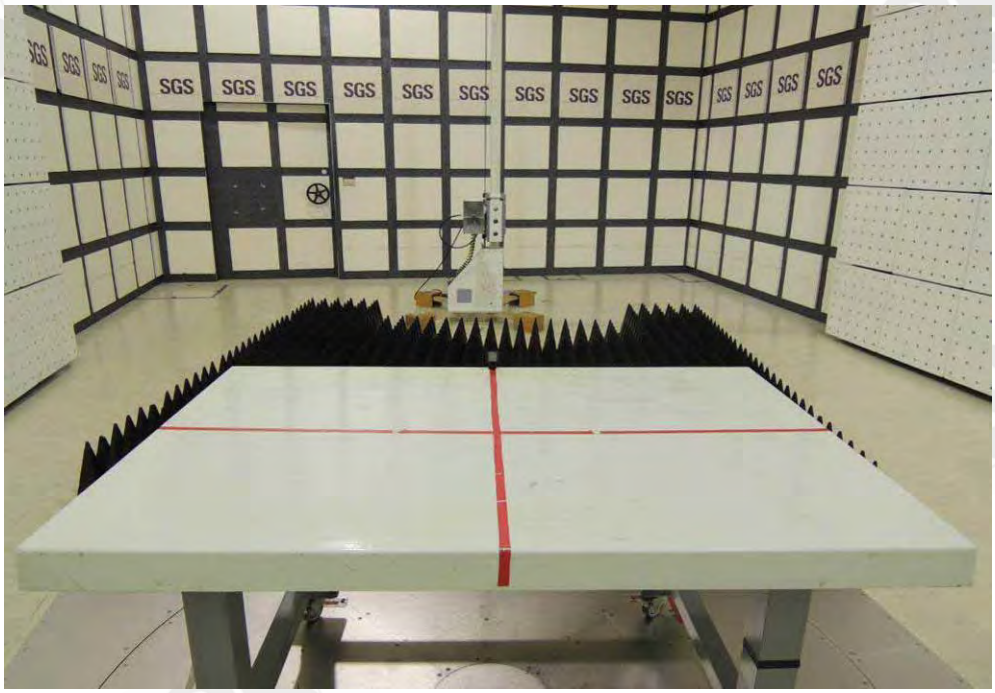
Radiated Emission Test Setup Photos - Above 1GHz
Test Mode 1
Test Mode 4



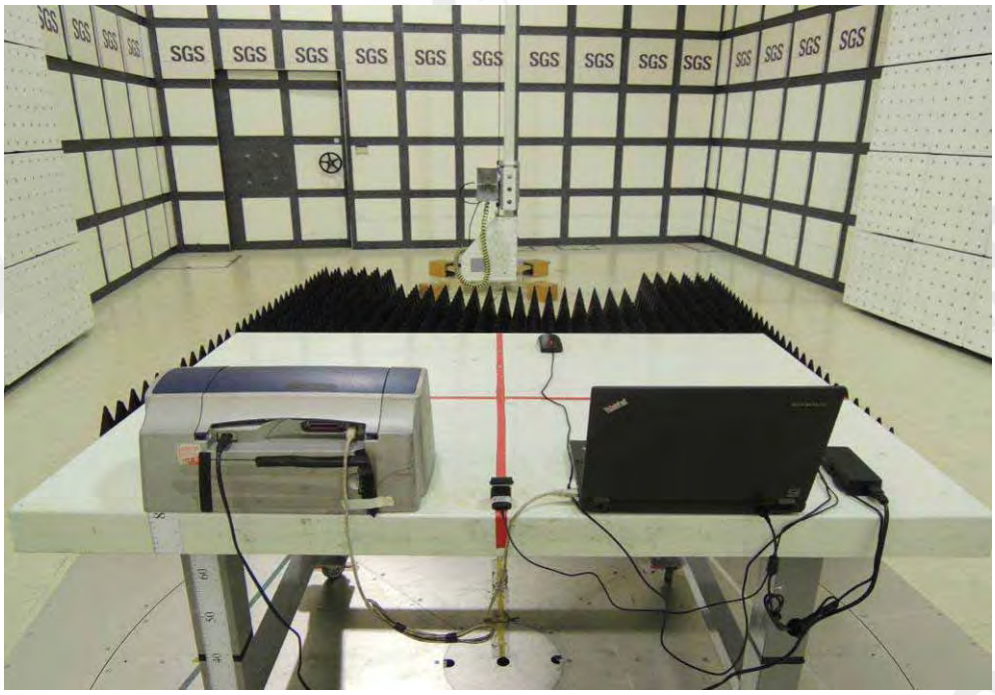


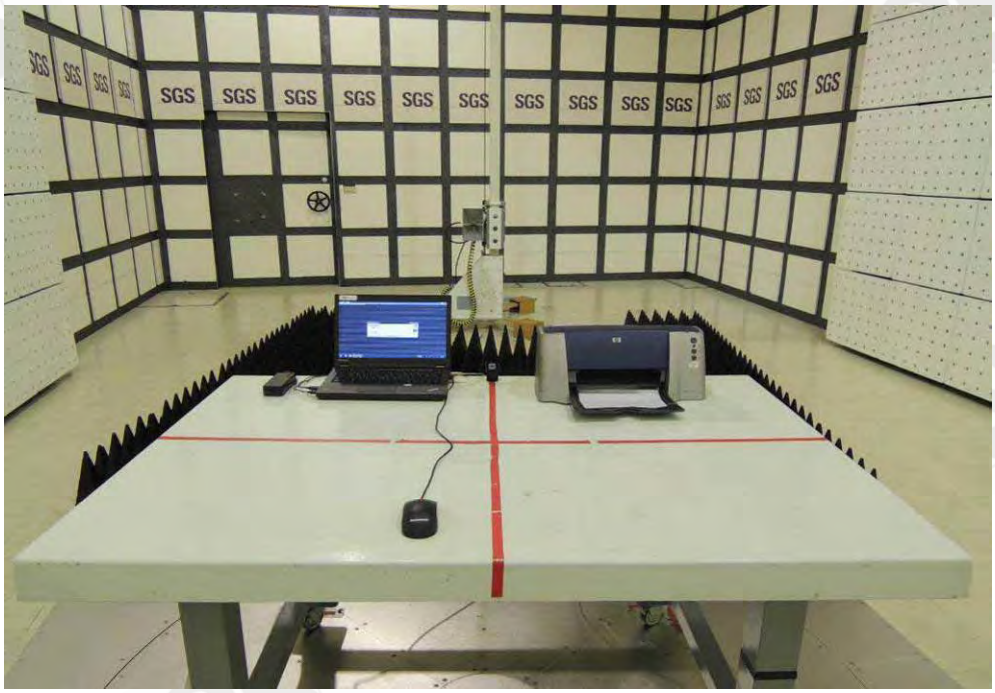
Test Mode 2



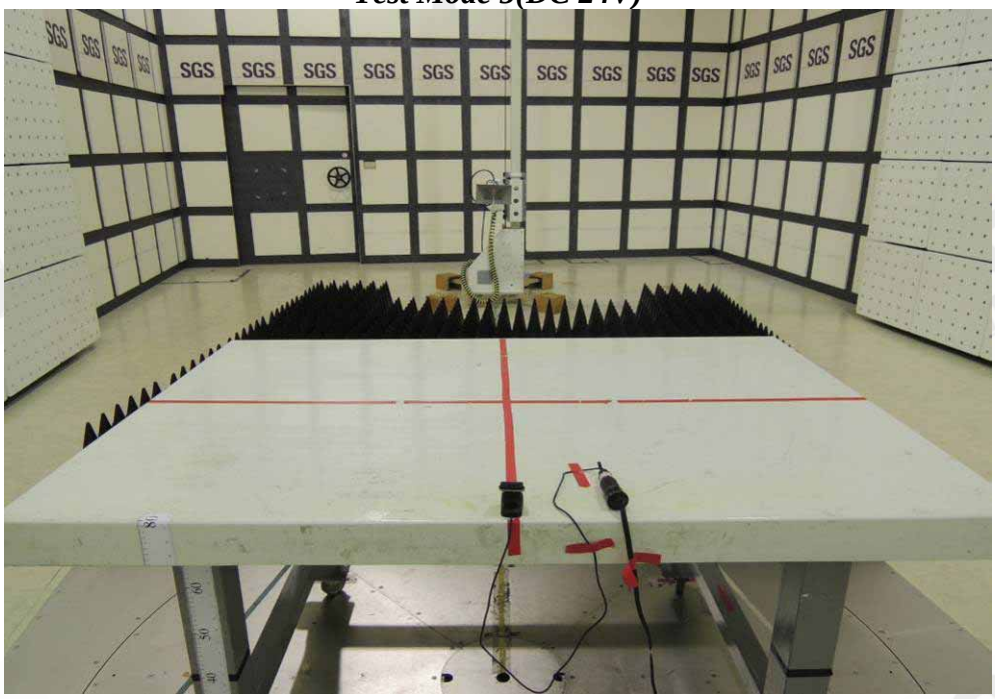


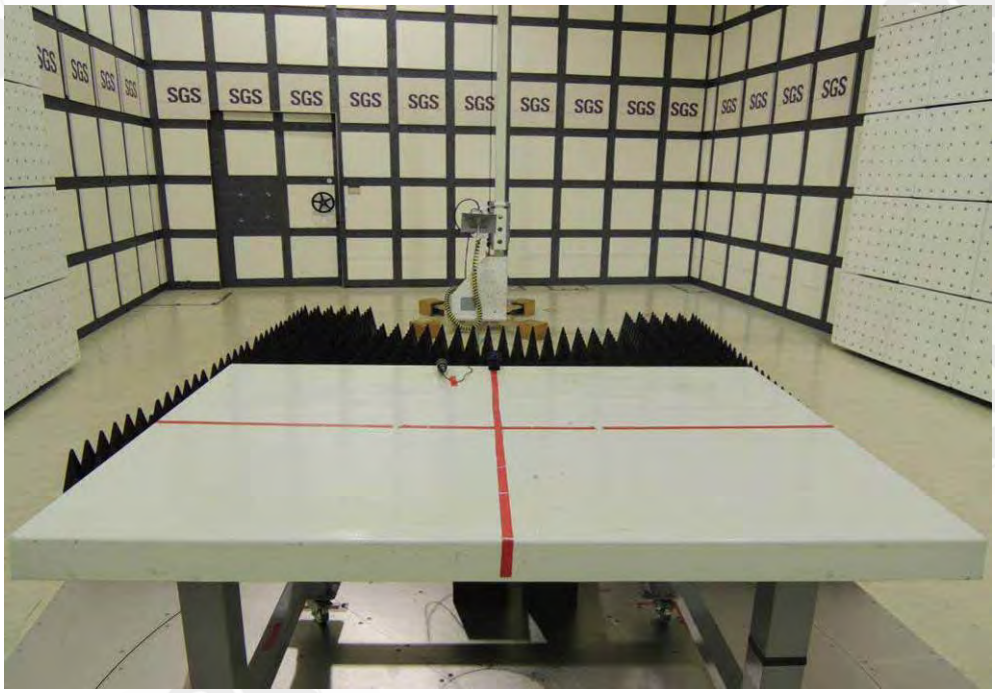
Test Mode 3





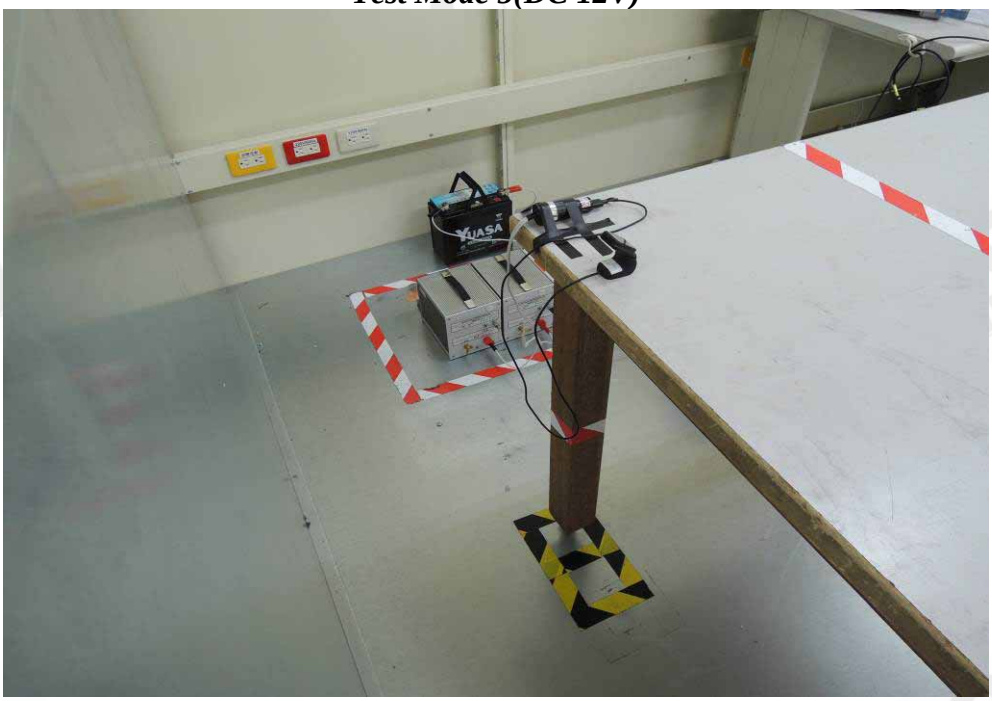
Test Mode 5(DC 24V)

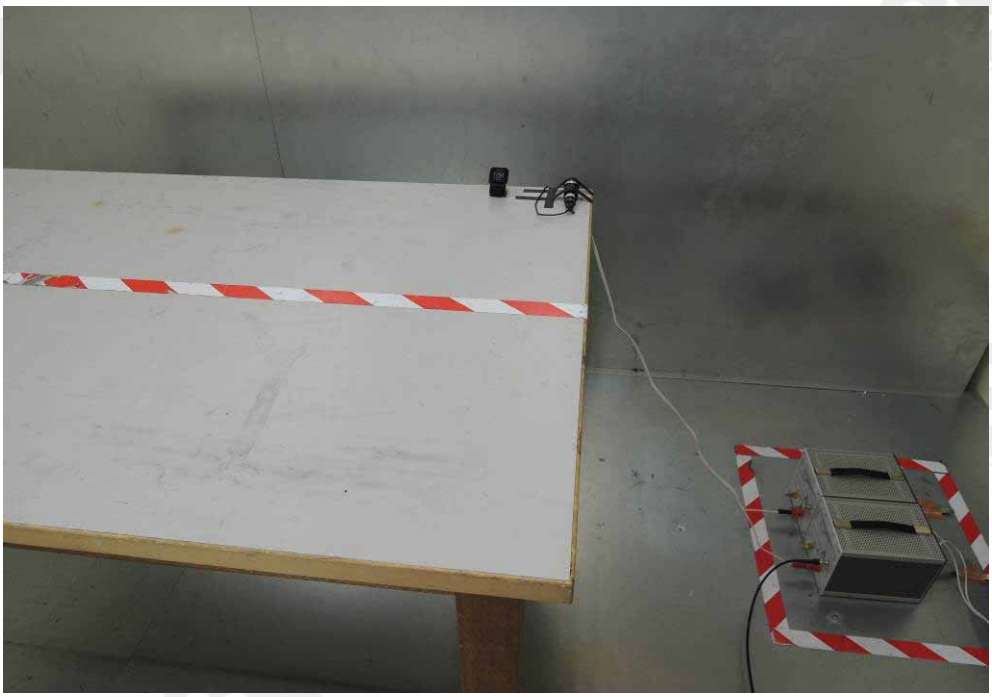




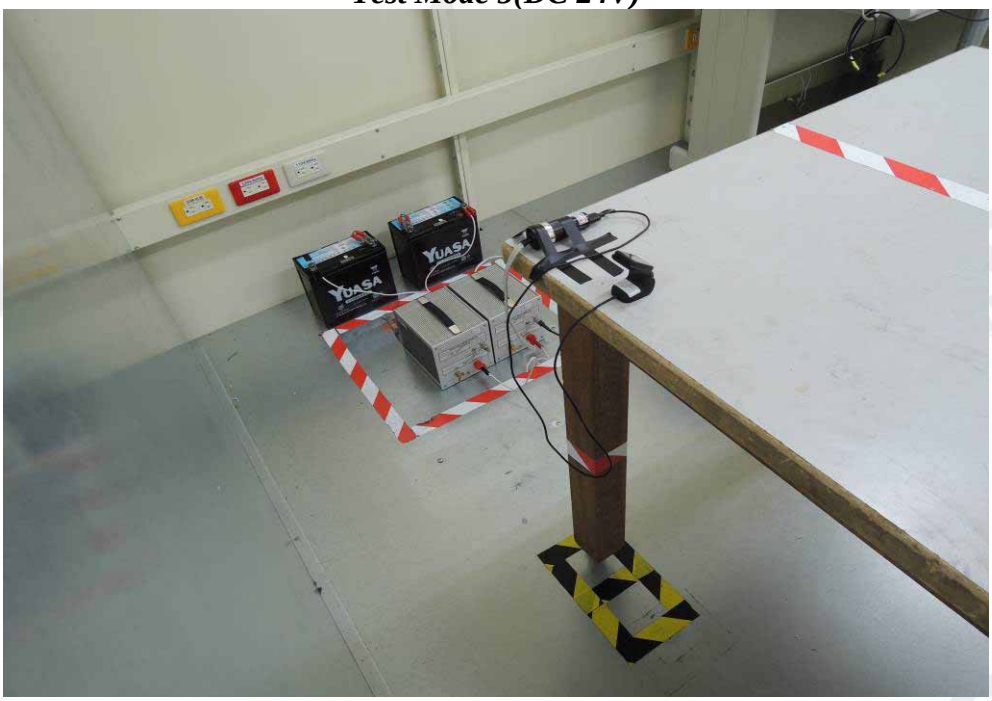
Conducted Emission Test Setup Photos
Test Mode 3

Test Mode 5(DC 12V)



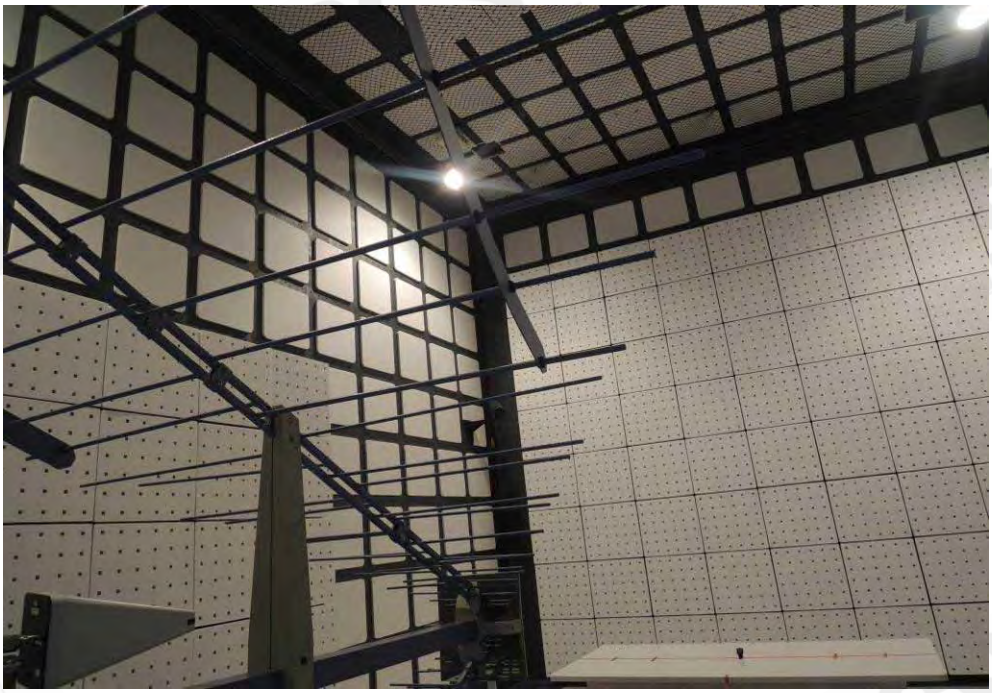


Test Mode 5(DC 24V)

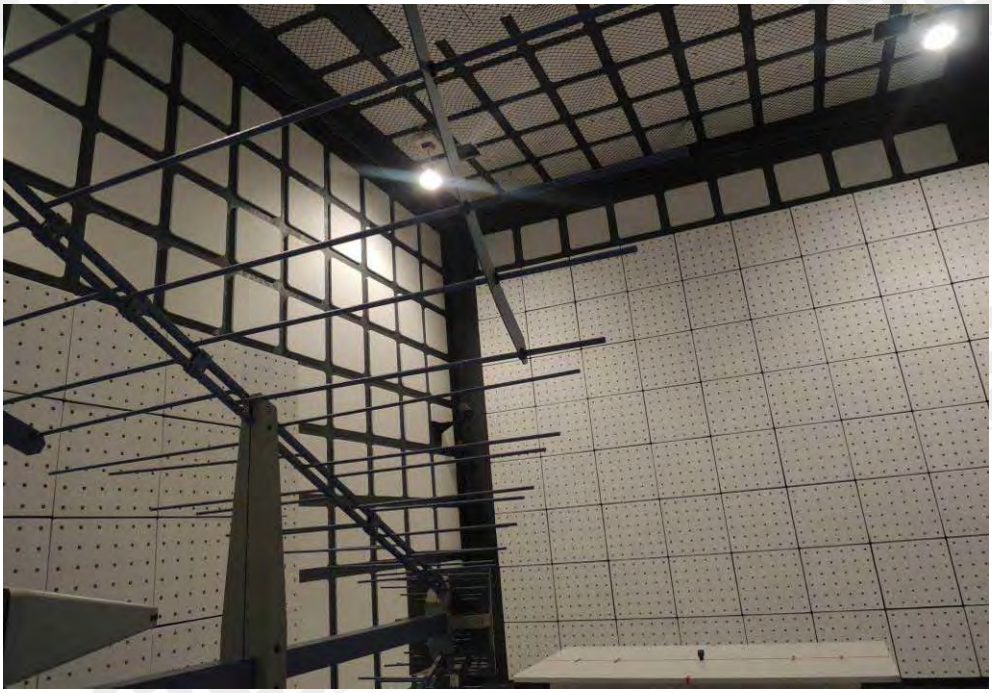


Radio Frequency Electromagnetic Field Test Setup Photos (EN 61000-4-3)

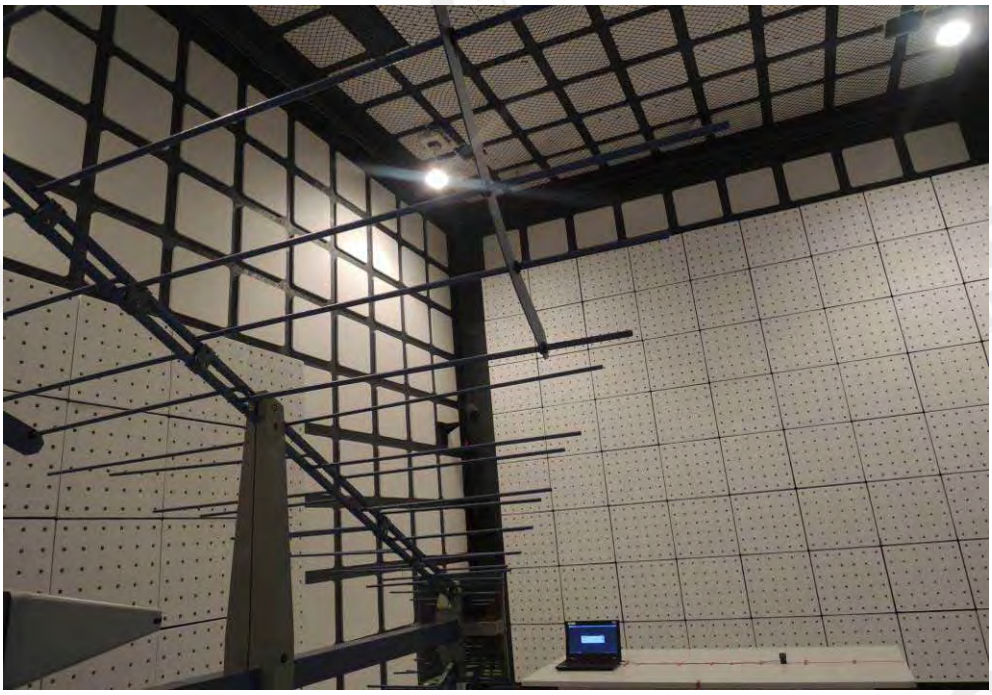
Test Mode 1



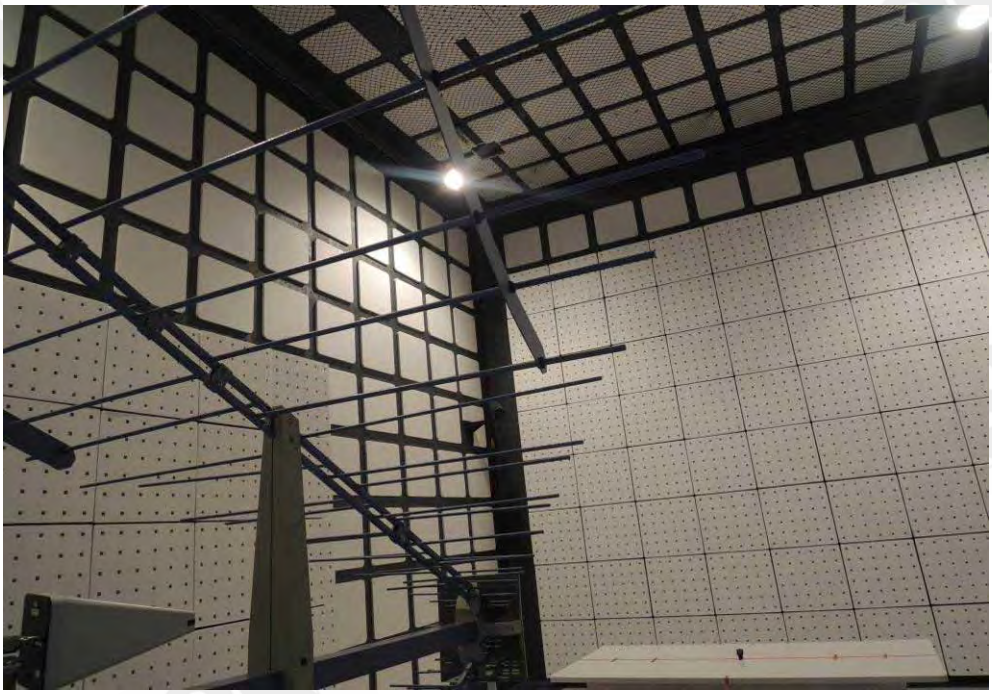
Test Mode 2



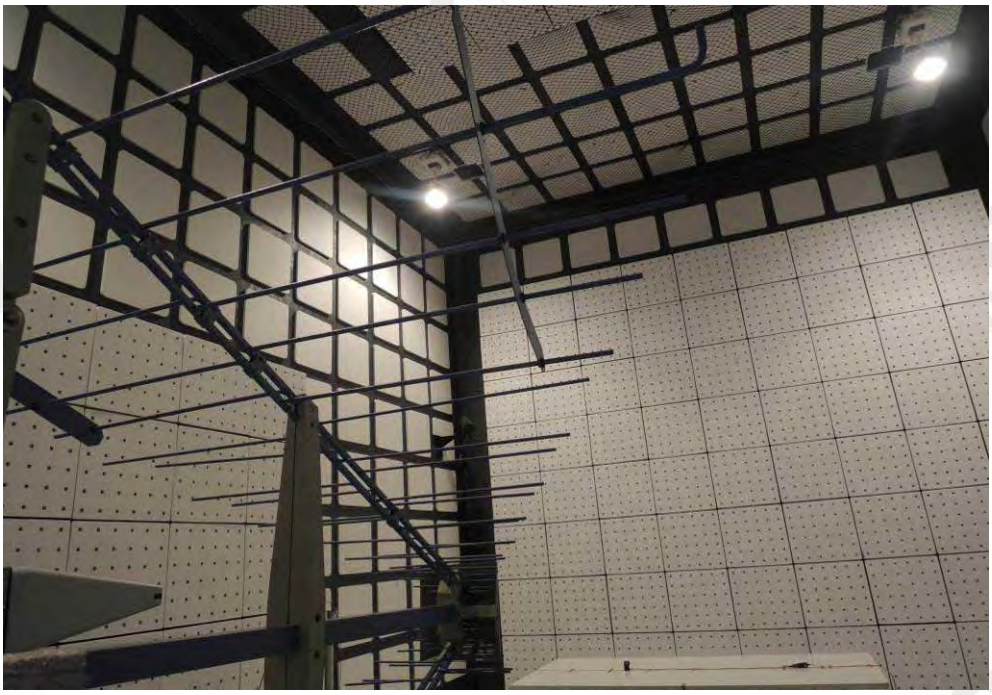
Test Mode 3



Test Mode 4



Test Mode 5



Electrostatic Discharge Measurement Test Setup Photos (EN 61000-4-2)

Test Mode 1

Test Mode 2

Test Mode 3

Test Mode 4

Test Mode 5

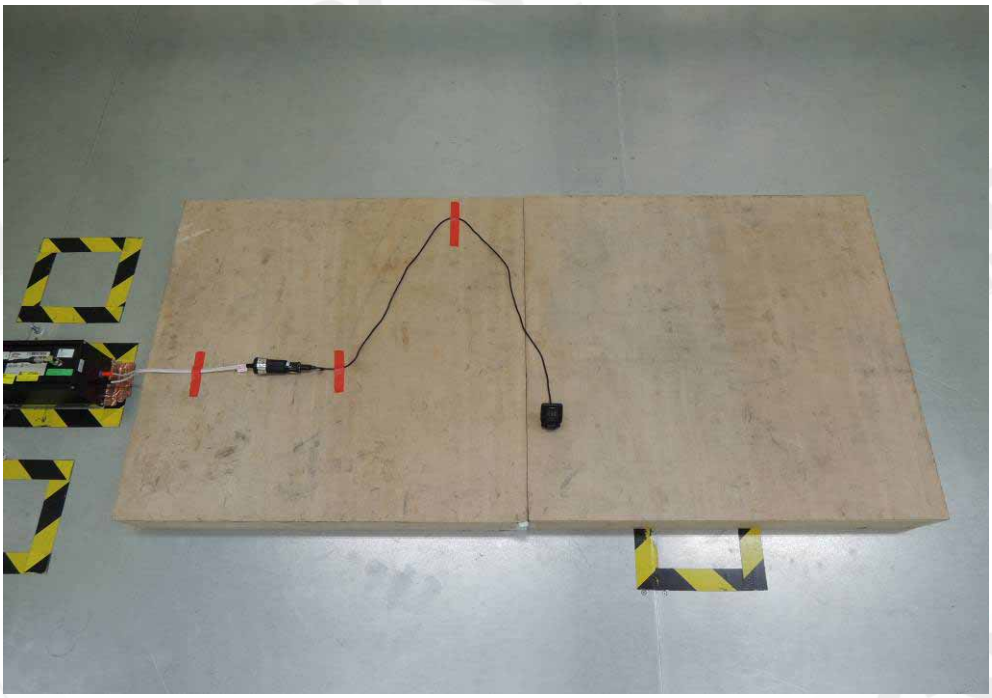
Test points

Air

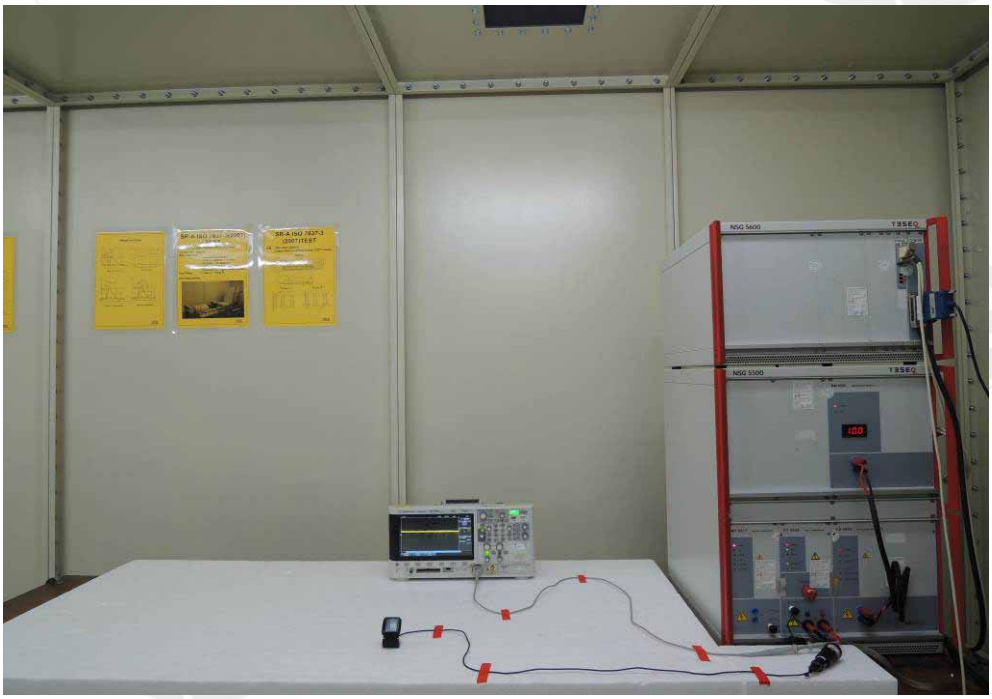
Cont.

Fast Transients, Common Mode Measurement Test Setup Photos (EN 61000-4-4)
Test Mode 5

Radio Frequency, Common Mode Measurement Test Setup Photos (EN 61000-4-6)
Test Mode 5

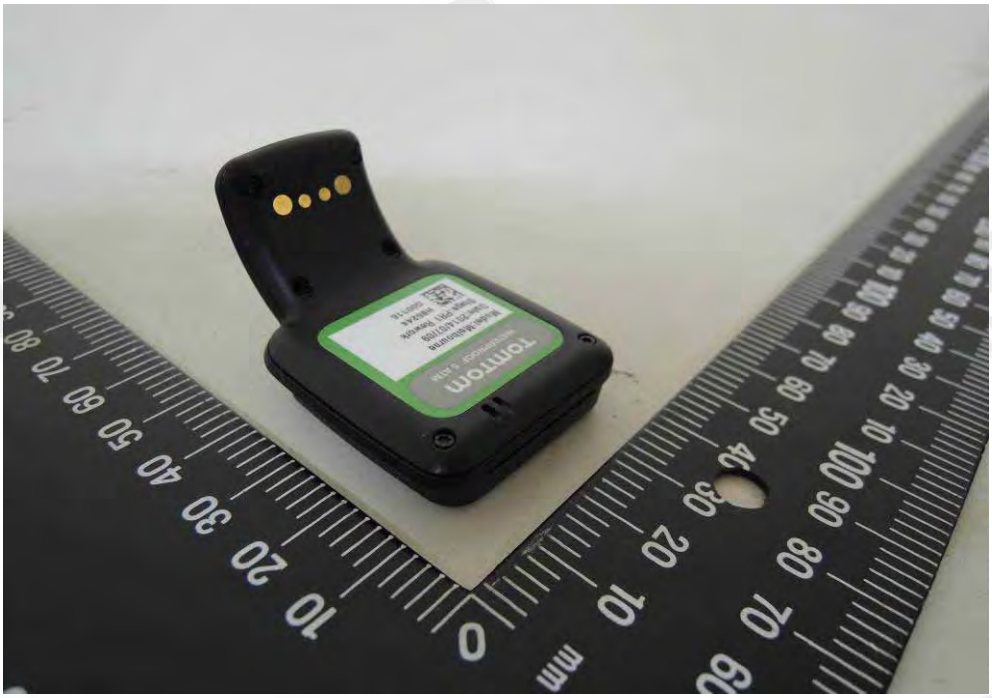


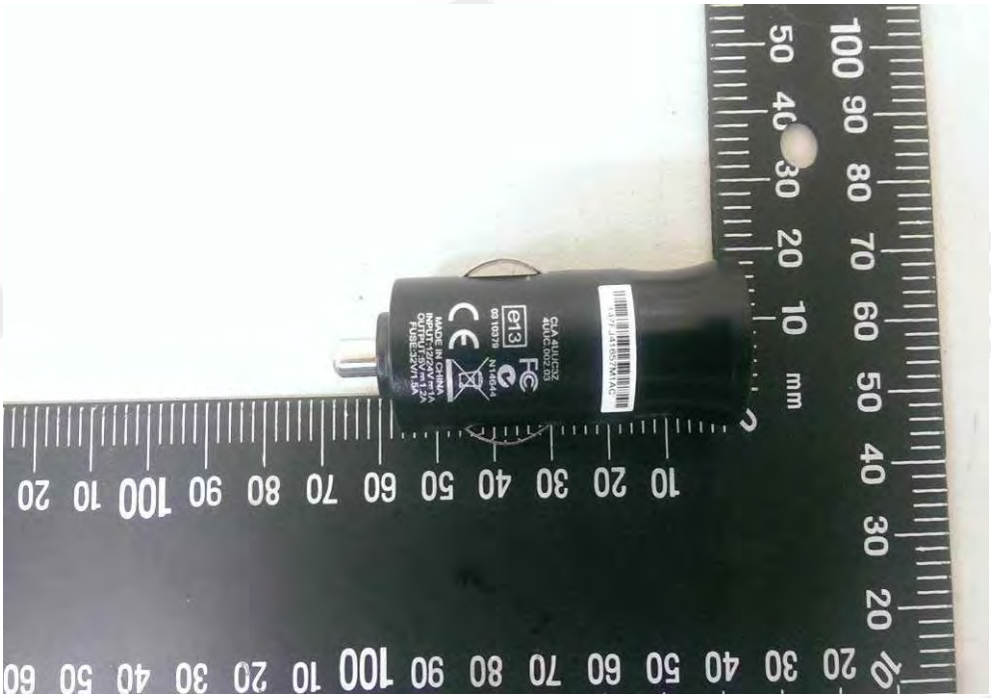
Transients and Surges in the Vehicular Environment Measurement Test Setup Photos
Test Mode 5

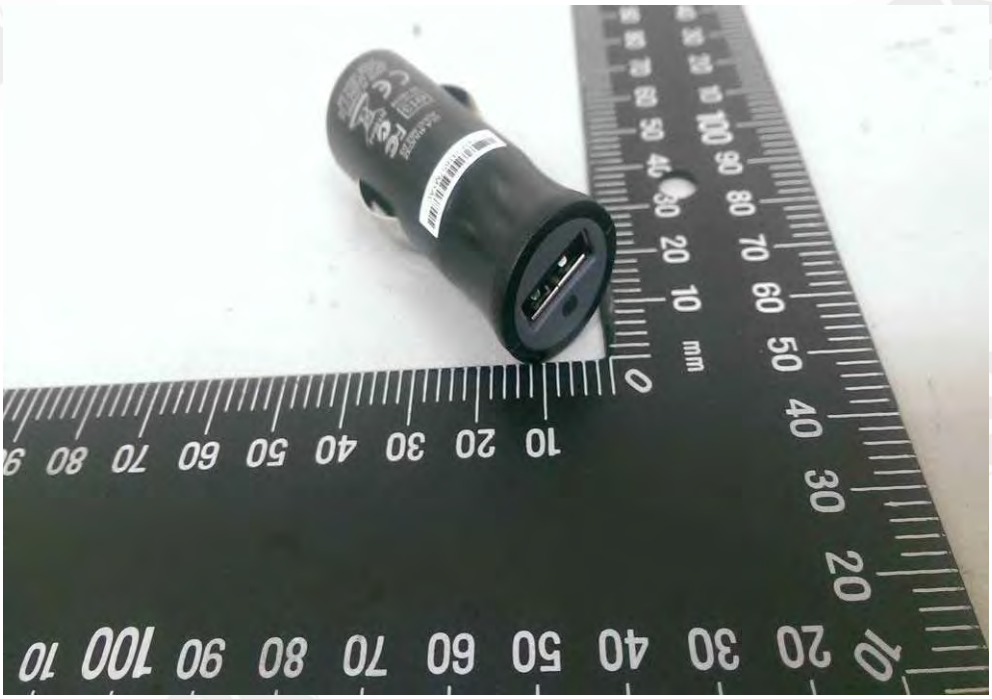


APPENDIX 2
PHOTOGRAPHS OF THE EUT

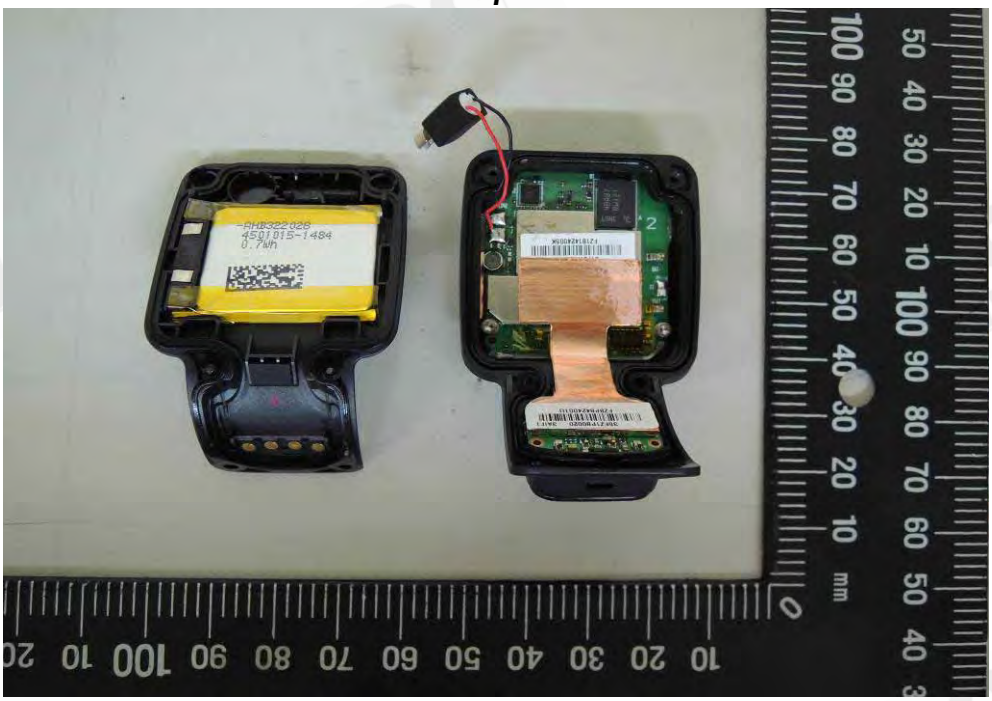
Exterior of the EUT

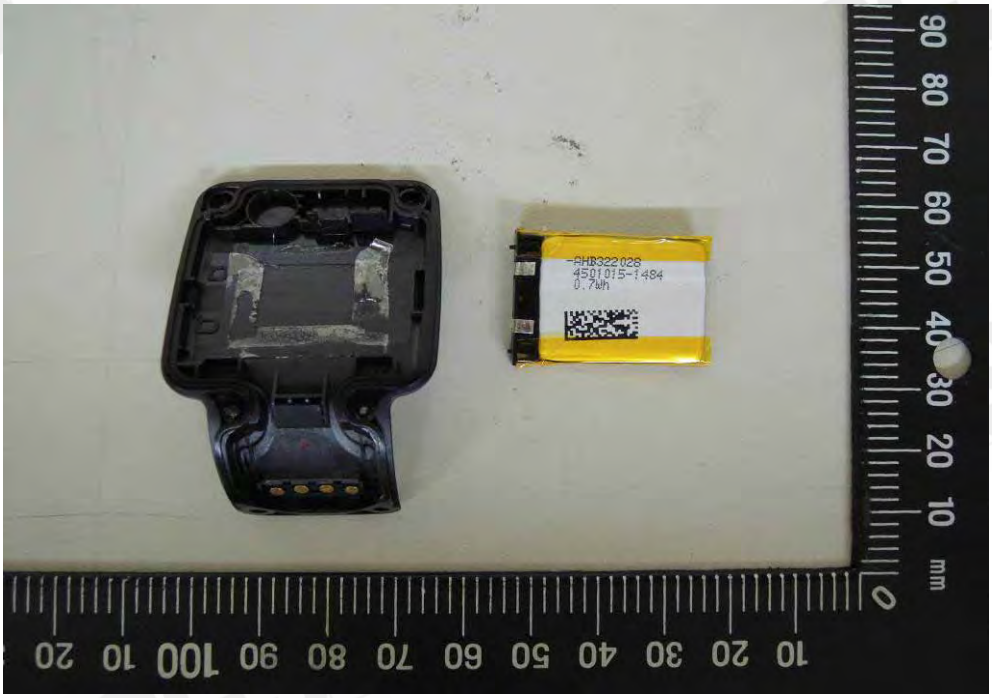


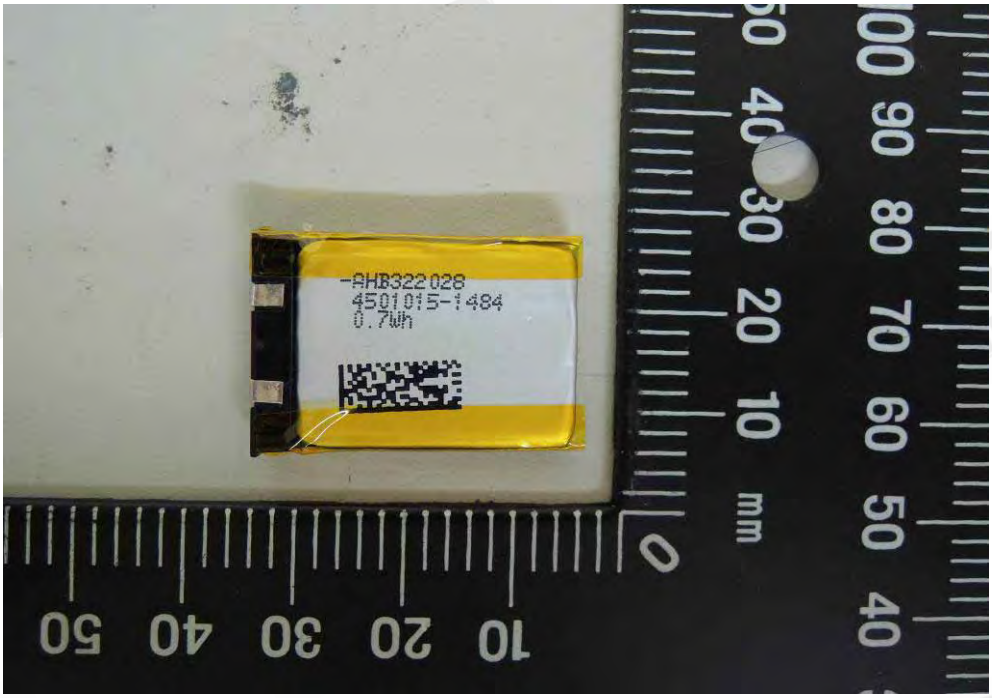


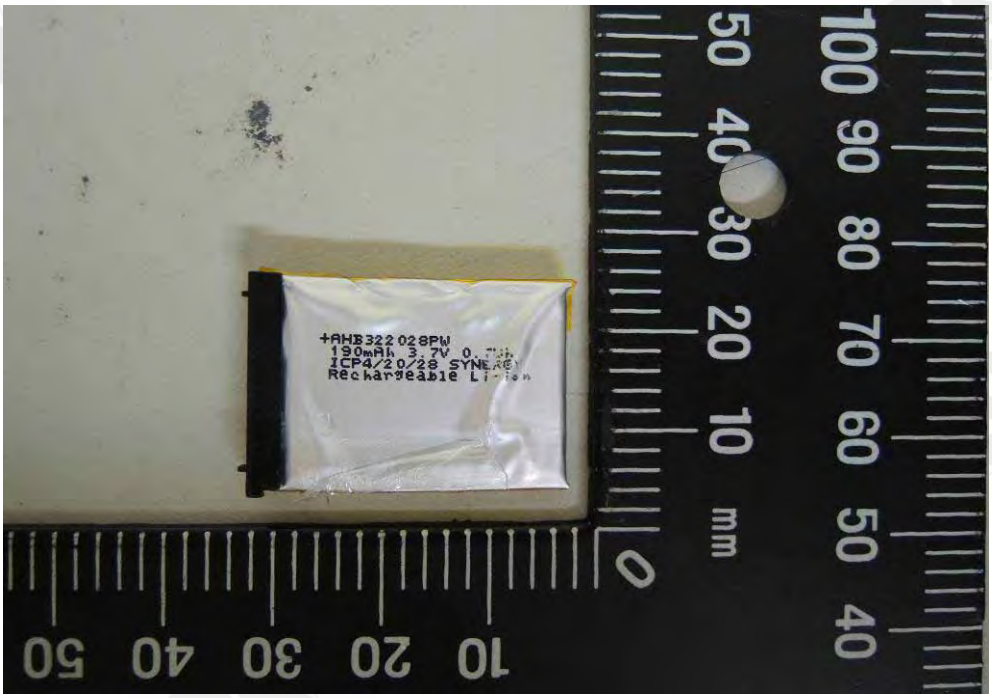


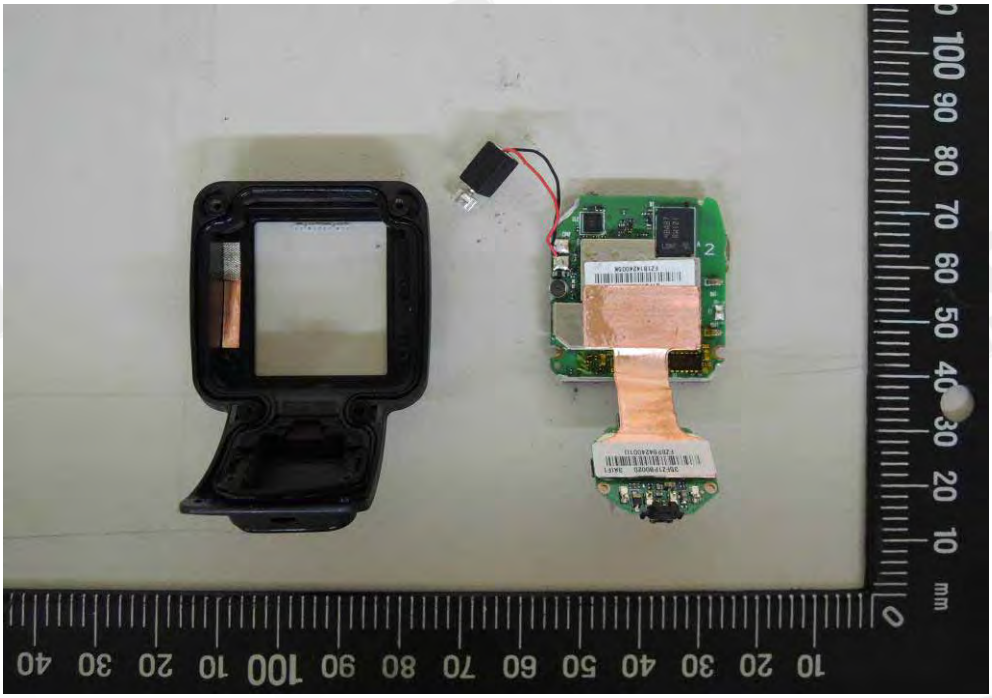
Interior of the EUT

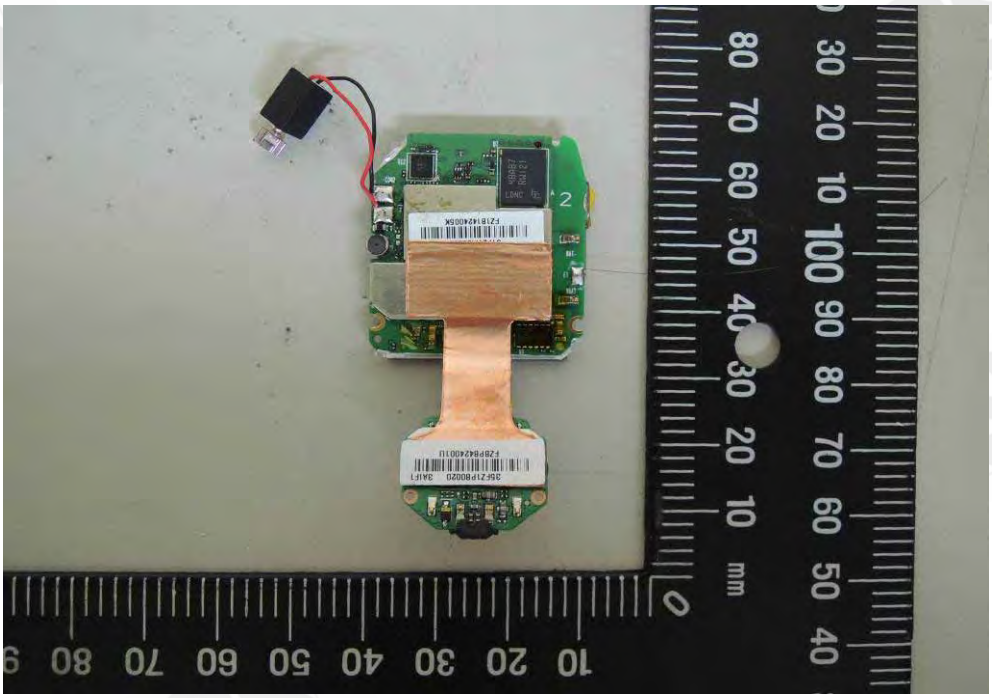


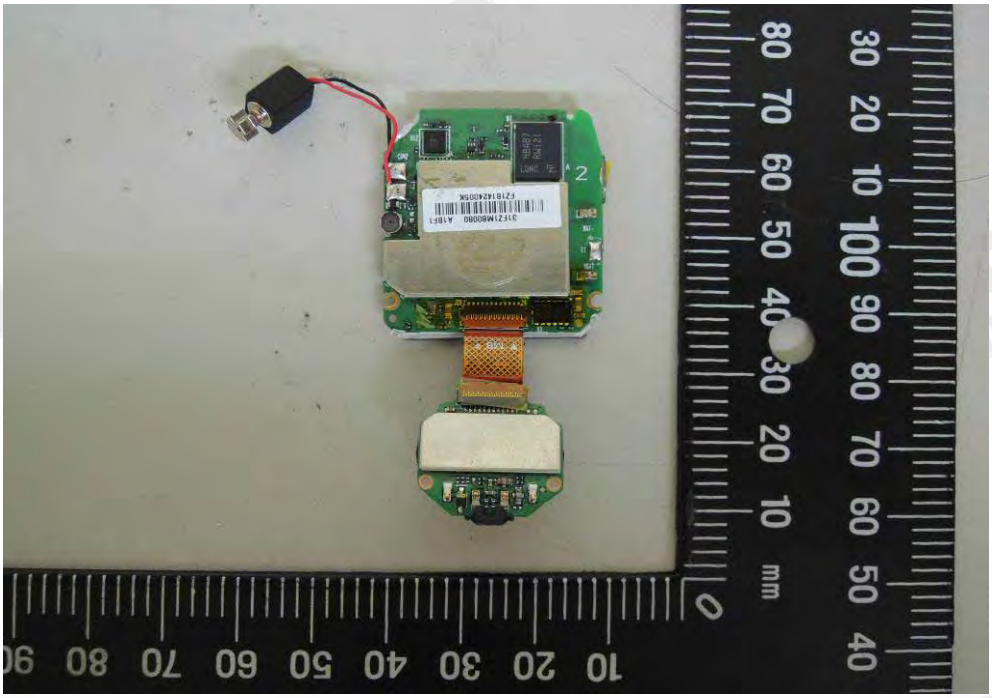


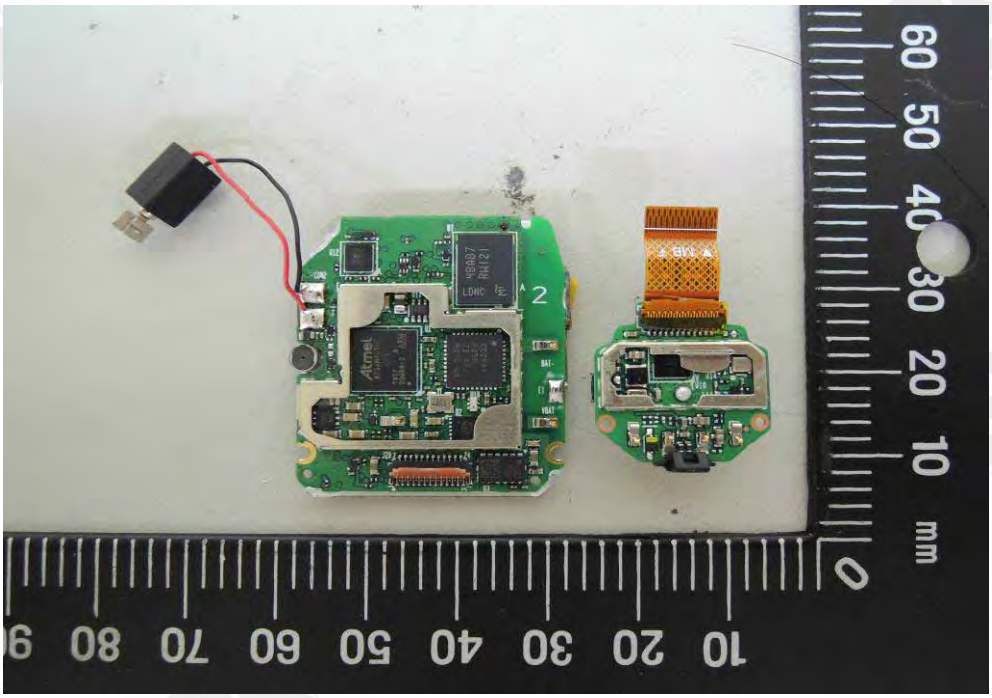


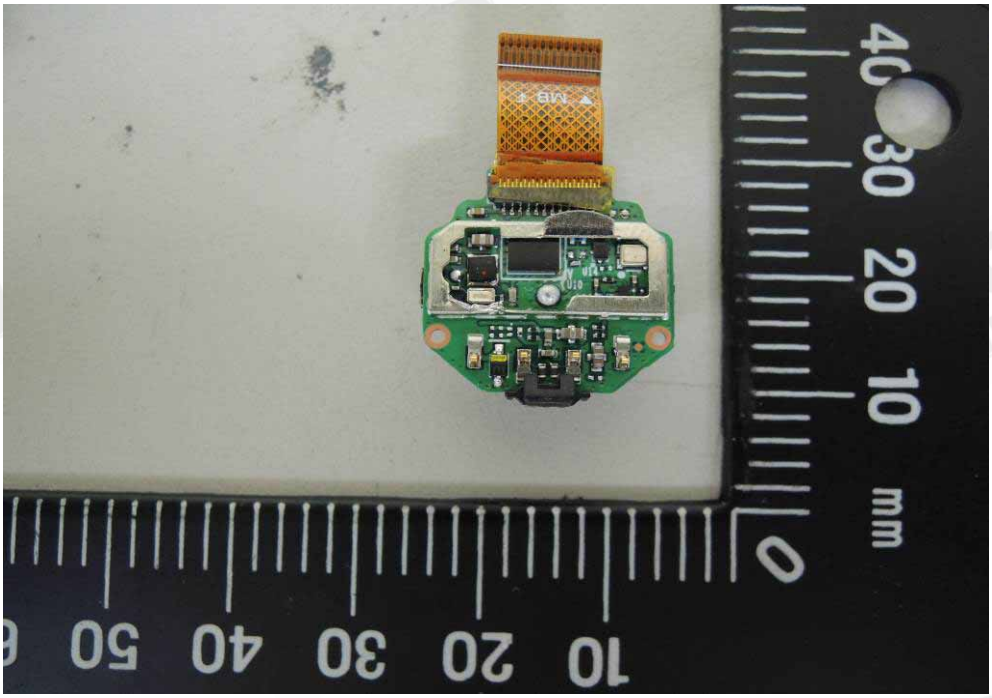


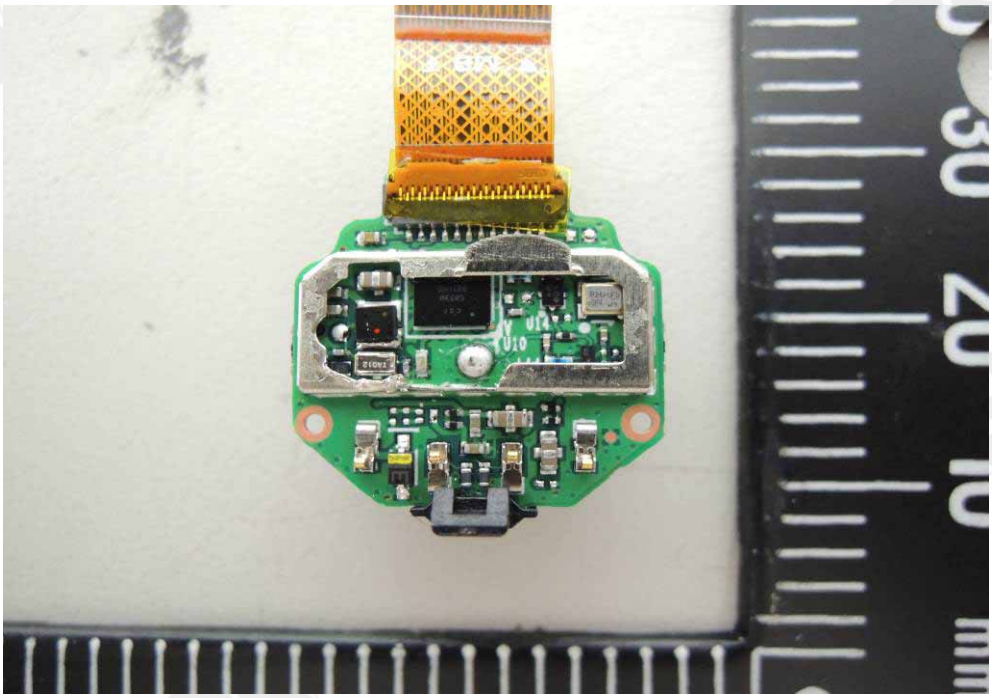


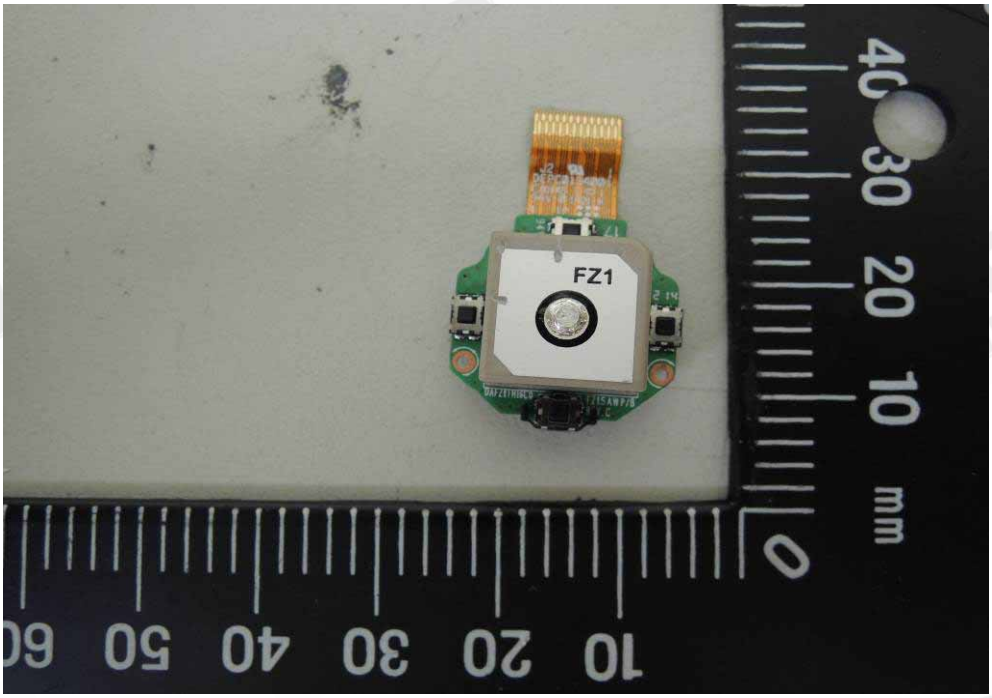


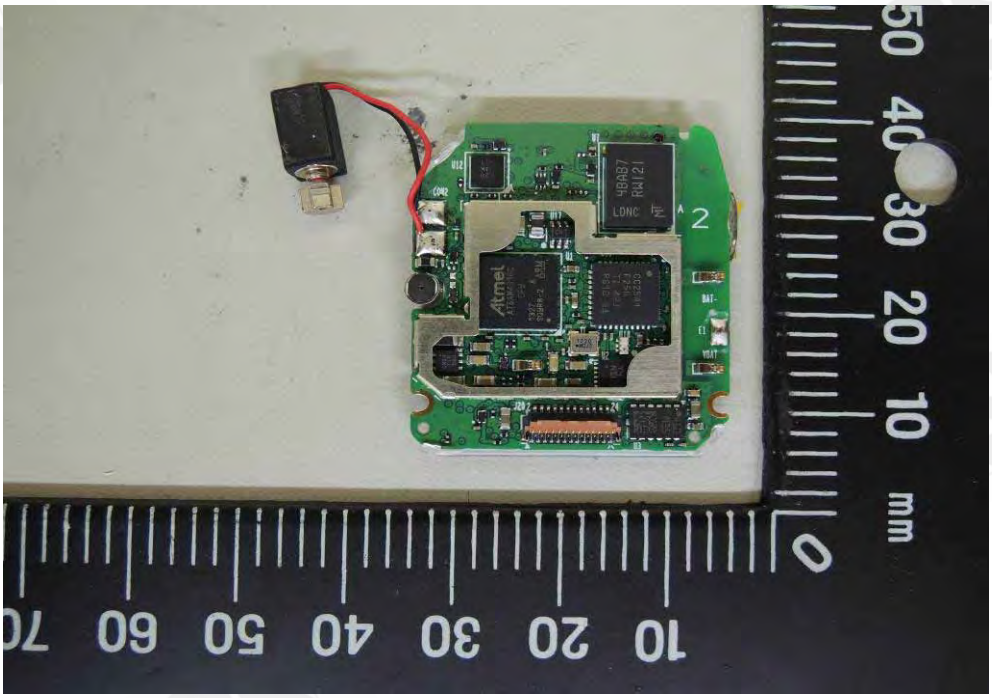


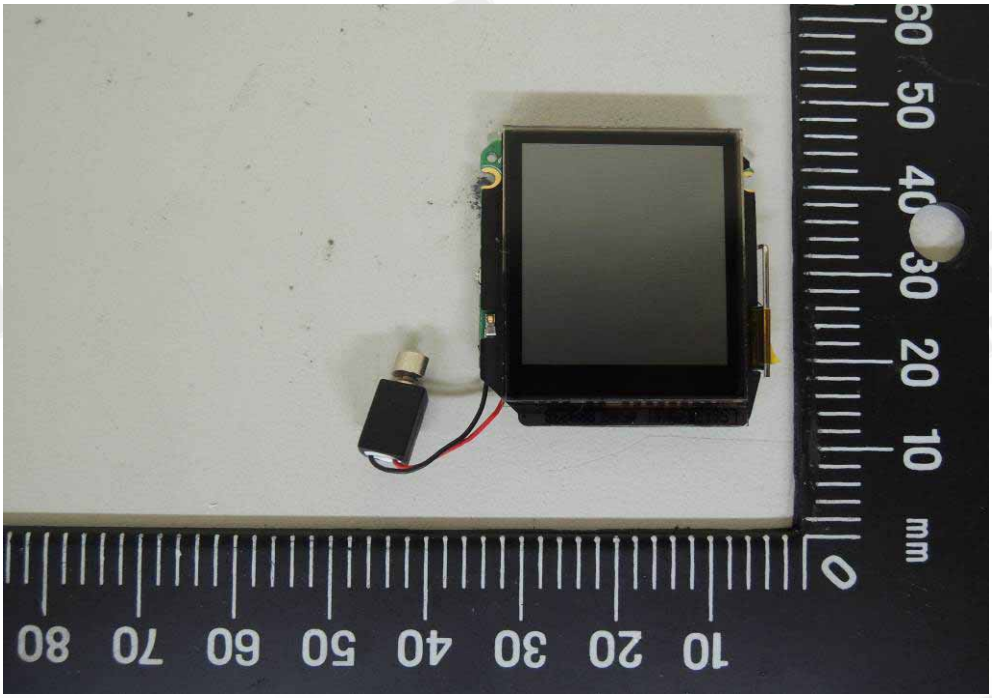












~ End of Report ~