Report No.: GTSE14070120002

TEST REPORT

Applicant:	Trane US, Inc.
Address of Applicant:	6200 Troup Highway Tyler TX 75707
Equipment Under Test (EUT)	
Product Name:	Color Touchscreen Wi-Fi Thermostat
Model No.:	TCONT850AC52UAA, ACONT850AC52UAA
FCC ID:	XVR-CONT8501
Applicable standards:	FCC CFR Title 47 Part 15 Subpart B:2013
Date of sample receipt:	August 04, 2014
Date of Test:	August 05, 2014
Date of report issue:	August 06, 2014
Test Result :	PASS *

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

Authorized Signature:

Robinson Lo
Laboratory Manager

2 Version

Version No.	Date	Description
00	*August 06, 2014*	*Original*

Prepared By: Edward.Pan ***Date:*** *August 06, 2014*

Project Engineer

Check By: Hank.Yan ***Date:*** *August 06, 2014*

Reviewer

3 Contents

4 Test Summary

Test Item	Section in CFR 47	Result
Radiated Emissions	Part15.109	PASS

PASS: The EUT complies with the essential requirements in the standard.

5 General Information

5.1 Client Information

Applicant:	Trane US, Inc.
Address of Applicant:	6200 Troup Highway Tyler TX 75707
Manufacturer:	COMPUTIME LTD.
Address of Manufacturer:	9/F, Tower One, Lippo Centre, 89 Queensway, Hong Kong
Factory:	Computime Electronics (shenzhen) Company Limited
Address of Factory:	YueKenguanyu Industrial Park, Kangqiao Road 88#, Danzhutou Community, Nanwan Street Office Longgang District, Shenzhen, China

5.2 General Description of EUT

Product Name:	Color Touchscreen Wi-Fi Thermostat
Model No.:	TCONT850AC52UAA, ACONT850AC52UAA
Power supply:	AC 24V

5.3 Test mode

Test mode:	
Operation mode	Keep the EUT in operation mode.
PC mode	Keep the EUT in data exchanging with PC mode.

5.4 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

● **CNAS —Registration No.: CNAS L5775**

CNAS has accredited Global United Technology Services Co., Ltd. To ISO/IEC 17025 General Requirements for the competence of testing and calibration laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

● **FCC —Registration No.: 600491**

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fuly described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files. Registration 600491, June 28, 2013.

● **Industry Canada (IC) —Registration No.: 9079A-2**

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 9079A-2, June 26, 2013.

5.5 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.
Address: 2nd Floor, Block No.2, Laodong Industrial Zone, Xixiang Road Baoan District, Shenzhen, China
Tel: 0755-27798480
Fax: 0755-27798960

5.6 Description of Support Units

Manufacturer	Description	Model	Serial Number	FCC approval
HP	Printer	CB495A	05257893	DoC
Lenovo	PC Host	M6900	EA05257893	DoC
DELL	KEYBOARD	SK-8115	N/A	DoC
DELL	MOUSE	MOC5UO	N/A	DoC
DELL	MONITOR	E178FPC	N/A	DoC
ET	AC/AC Linear Transformer	ETE40310F	N/A	Verification

5.7 Deviation from Standards

Biconical, log.per. antenna and horn antenna were used instead of dipole antenna.
Semi-anechoic Chamber was used as alternation of open air test sites, and all test suites were performed with radiated method in it.

5.8 Abnormalities from Standard Conditions

None.

5.9 Other Information Requested by the Customer

None.

6 Test Instruments list

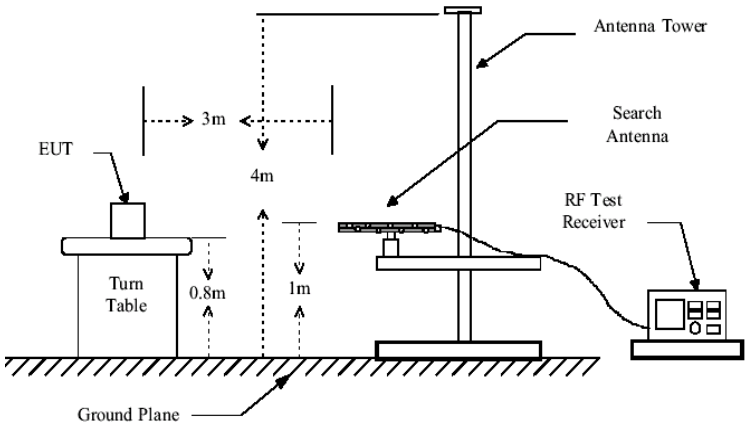
Radiated Emission:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.0(L)*6.0(W)* 6.0(H)	GTS250	Mar. 28 2014	Mar. 27 2015
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	ESU EMI Test Receiver	R&S	ESU26	GTS203	Jul. 05 2014	Jul. 04 2015
4	BiConiLog Antenna	SCHWARZBECK	VULB9163	GTS214	Mar. 08 2014	Mar. 07 2015
5	Double -ridged waveguide horn	SCHWARZBECK	9120D	GTS208	Mar. 08 2014	Mar. 07 2015
6	RF Amplifier	HP	8347A	GTS204	Jul. 05 2014	Jul. 04 2015
7	Preamplifier	HP	8349B	GTS206	Jul. 05 2014	Jul. 04 2015
8	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
9	Coaxial cable	GTS	N/A	GTS210	Jul. 05 2014	Jul. 04 2015
10	Coaxial Cable	GTS	N/A	GTS211	Jul. 05 2014	Jul. 04 2015
11	Thermo meter	N/A	N/A	GTS256	Jul. 05 2014	Jul. 04 2015

General used equipment:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	Barometer	ChangChun	DYM3	GTS257	July 08 2014	July 07 2015

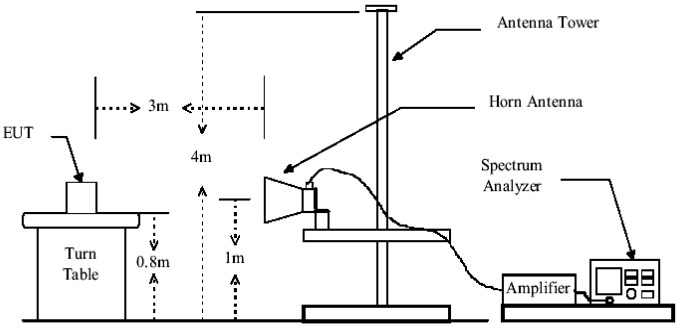
7 Test Results and Measurement Data

7.1 Radiated Emission

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 B Section 15.109</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.4:2003</td></tr>
<tr><td>Test Frequency Range:</td><td>30MHz to 6GHz</td></tr>
<tr><td>Test site:</td><td>Measurement Distance: 3m (Semi-Anechoic Chamber)</td></tr>
<tr><td>Receiver setup:</td><td>
<table>
<tr><th>Frequency</th><th>Detector</th><th>RBW</th><th>VBW</th><th>Remark</th></tr>
<tr><td>30MHz-1GHz</td><td>Quasi-peak</td><td>120kHz</td><td>300kHz</td><td>Quasi-peak Value</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr>
<tr><td>Peak</td><td>1MHz</td><td>10Hz</td><td>Average Value</td></tr>
</table>
</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><th>Frequency</th><th>Limit (dBuV/m @3m)</th><th>Remark</th></tr>
<tr><td>30MHz-88MHz</td><td>40.00</td><td>Quasi-peak Value</td></tr>
<tr><td>88MHz-216MHz</td><td>43.50</td><td>Quasi-peak Value</td></tr>
<tr><td>216MHz-960MHz</td><td>46.00</td><td>Quasi-peak Value</td></tr>
<tr><td>960MHz-1GHz</td><td>54.00</td><td>Quasi-peak Value</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>54.00</td><td>Average Value</td></tr>
<tr><td>74.00</td><td>Peak Value</td></tr>
</table>
</td></tr>
<tr><td>Test Procedure:</td><td>
1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
</td></tr>
<tr><td>Test setup:</td><td>Below 1GHz</td></tr>
</table>



Above 1GHz



Test environment:	Temp.: 25 °C Humid.: 52% Press.: 1 012mbar
Measurement Record:	Uncertainty: ± 4.5dB
Test Instruments:	Refer to section 6 for details
Test mode:	Pre-scan all modes in section 5.3, and found the PC mode which is the worst mode, so only the data of worst mode was show on the test report.
Test results:	Pass

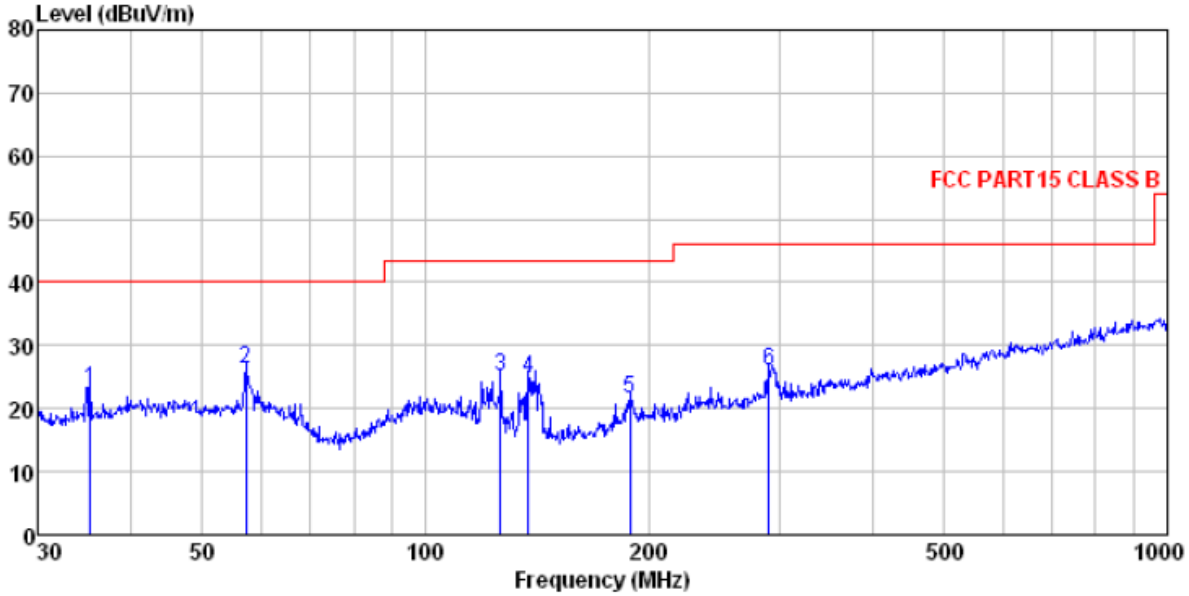
Note:
The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor

Measurement Data

Below 1GHz

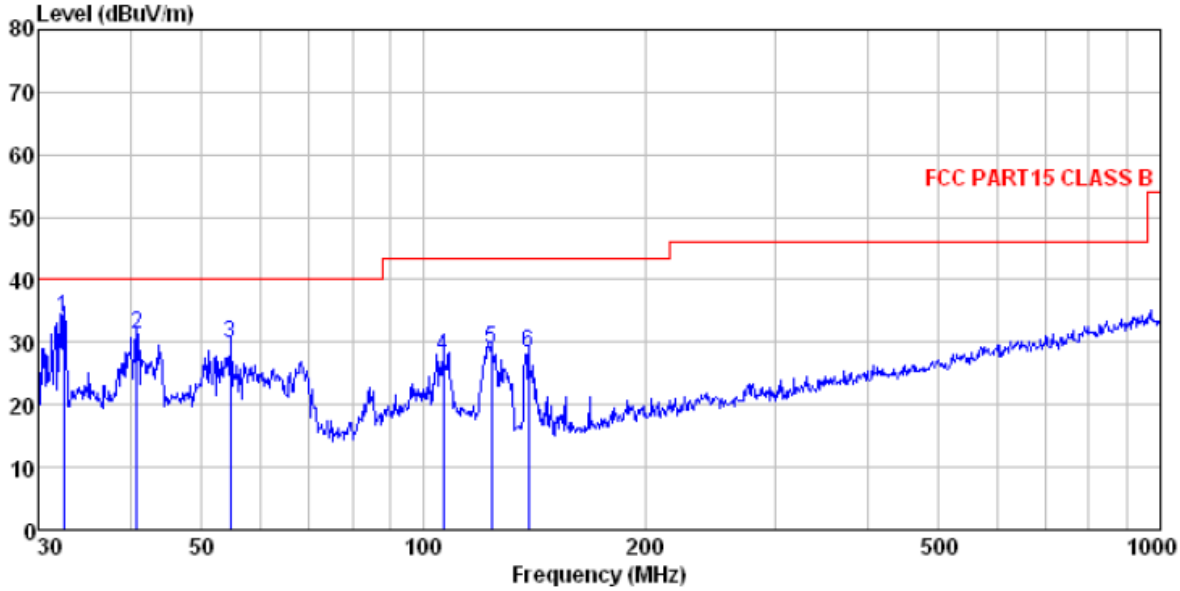
Horizontal:



Site : 3m chamber
Condition : FCC PART15 CLASS B 3m VULB9163-2013M HORIZONTAL
Job No. : 1200RF
Test Mode : PC mode
Test Engineer: Bing

	Freq	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	35.375	40.20	14.39	0.61	32.06	23.14	40.00	-16.86	QP
2	57.191	42.43	14.87	0.84	31.94	26.20	40.00	-13.80	QP
3	126.329	44.17	11.51	1.41	31.89	25.20	43.50	-18.30	QP
4	137.420	45.01	10.35	1.49	31.93	24.92	43.50	-18.58	QP
5	188.413	39.62	12.40	1.78	32.11	21.69	43.50	-21.81	QP
6	290.017	40.88	14.86	2.31	32.18	25.87	46.00	-20.13	QP

Vertical:

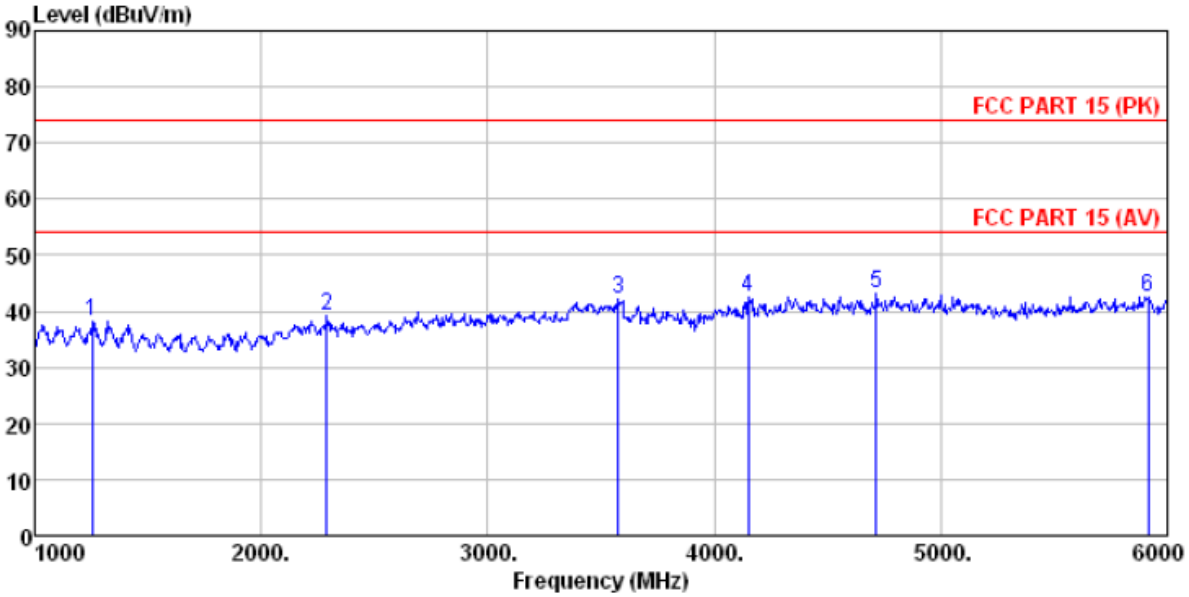


Site : 3m chamber
Condition : FCC PART15 CLASS B 3m VULB9163-2013M VERTICAL
Job No. : 1200RF
Test Mode : PC mode
Test Engineer: Bing

	Freq	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	32.520	51.00	14.31	0.58	32.06	33.83	40.00	-6.17	QP
2	40.845	46.96	15.57	0.67	32.05	31.15	40.00	-8.85	QP
3	54.643	45.85	15.03	0.81	31.95	29.74	40.00	-10.26	QP
4	106.385	43.70	14.59	1.25	31.79	27.75	43.50	-15.75	QP
5	123.699	47.54	11.90	1.39	31.88	28.95	43.50	-14.55	QP
6	138.874	48.59	10.24	1.50	31.94	28.39	43.50	-15.11	QP

Above 1GHz

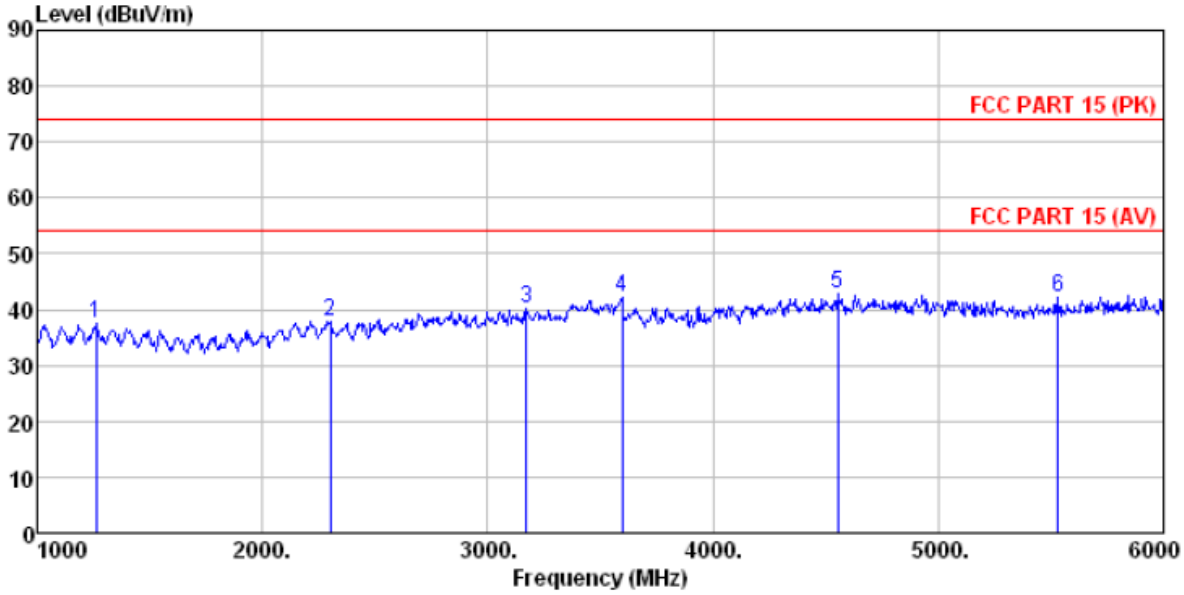
Horizontal:



Site : 3m chamber
Condition : FCC PART 15 (PK) 3m BBHA9120D ANT(>1GHZ) HORIZONTAL
Job No. : 1200RF
Test Mode : PC mode
Test Engineer: Bing

	Freq	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1255.000	41.17	25.54	4.51	33.18	38.04	74.00	-35.96	Peak
2	2290.000	39.95	27.98	5.28	34.13	39.08	74.00	-34.92	Peak
3	3575.000	38.50	29.11	7.11	32.67	42.05	74.00	-31.95	Peak
4	4150.000	36.59	30.06	8.01	32.01	42.65	74.00	-31.35	Peak
5	4715.000	34.93	31.66	8.53	32.05	43.07	74.00	-30.93	Peak
6	5915.000	31.79	32.78	10.09	32.18	42.48	74.00	-31.52	Peak

Vertical:



Site : 3m chamber
Condition : FCC PART 15 (PK) 3m BBHA9120D ANT(>1GHZ) VERTICAL
Job No. : 1200RF
Test Mode : PC mode
Test Engineer: Bing

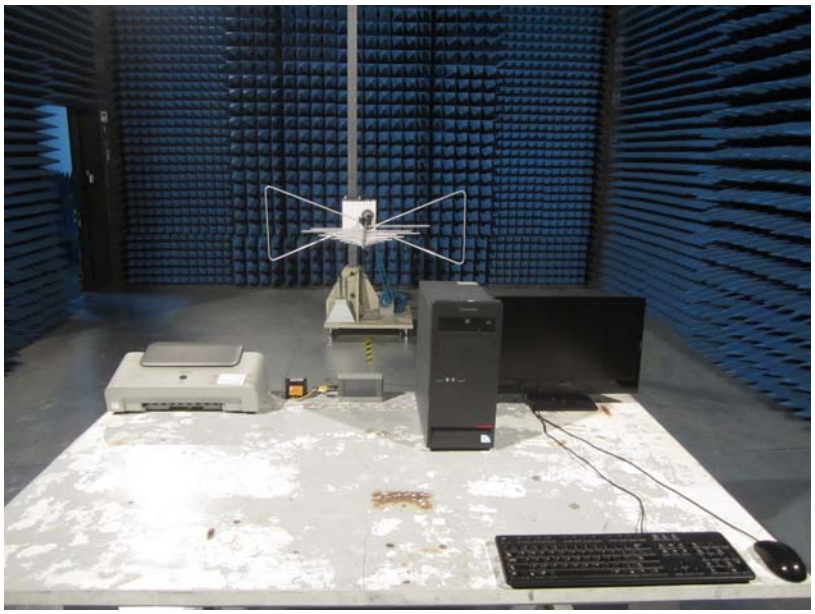
	Freq	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1260.000	40.54	25.55	4.51	33.18	37.42	74.00	-36.58	Peak
2	2300.000	38.87	27.97	5.29	34.13	38.00	74.00	-36.00	Peak
3	3170.000	38.20	28.82	6.29	33.12	40.19	74.00	-33.81	Peak
4	3595.000	38.68	29.13	7.15	32.64	42.32	74.00	-31.68	Peak
5	4555.000	35.08	31.44	8.39	31.96	42.95	74.00	-31.05	Peak
6	5530.000	32.95	32.05	9.56	32.42	42.14	74.00	-31.86	Peak

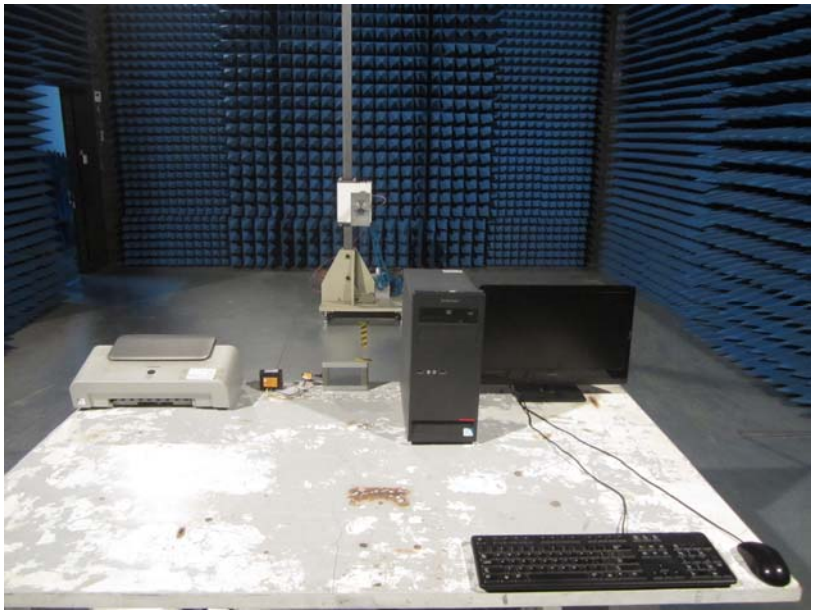
Remark:

1. The EUT was test at 3m in field chamber.
2. If the average limit is met when using a Peak detector, the EUT shall be deemed to meet both peak and average limits. And measurement with the average detector is unnecessary.

8 Test Setup Photo

Radiated Emission





9 EUT Constructional Details

Reference to the test report No. GTSE14070120001

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