

TEST REPORT

Applicant: BYD Auto Industry Company Limited

Address of Applicant: No. 3001, 3007, Hengping Road, Pingshan, Shenzhen, 518118, P.R.China

Equipment Under Test (EUT)

Product Name: TPMS Receiver Module

Model No.: 3609TR10

Trade Mark: BYD

FCC ID: SD43609TR10

Applicable standards: FCC CFR Title 47 Part 15 Subpart B:2012

Date of sample receipt: March 18, 2013

Date of Test: March 19-22, 2013

Date of report issue: March 25, 2013

Test Result : PASS *

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

Authorized Signature:



Robinson Lo
Laboratory Manager

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 and does not permit the use of the GTS product certification mark. 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 GTS International Electrical Approvals or testing done by GTS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by GTS International Electrical Approvals in writing.

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2 Version

Version No.	Date	Description
00	March 25, 2013	Original

Prepared By:



Date:

March 25, 2013

Project Engineer

Check By:



Date:

March 25, 2013

Reviewer

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4 Test Summary

Test Item	Section in CFR 47	Result
Conducted Emission	Part15.107	N/A
Radiated Emissions	Part15.109	PASS

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

N/A: not applicable.

5 General Information

5.1 Client Information

Applicant:	BYD Auto Industry Company Limited
Address of Applicant:	No. 3001, 3007, Hengping Road, Pingshan, Shenzhen, 518118, P.R.China
Manufacturer:	BYD Auto Industry Company Limited
Address of Manufacturer	No. 3001, 3007, Hengping Road, Pingshan, Shenzhen, 518118, P.R.China

5.2 General Description of EUT

Product Name:	TPMS Receiver Module
Model No.:	3609TR10
Power supply:	DC 12V

5.3 Test mode

Receiving mode	Keep the EUT in Receiving mode.
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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 fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files. Registration 600491, July 20, 2010.

- **Industry Canada (IC)**

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-1.

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
GS	Supreme maintenance Free	S5D26R-MFZ	9442804454
BYD	TPMS Sensor Module	3609200	N/A
BYD	Controller Module	TM60	N/A

5.7 Deviation from Standards

None.

5.8 Abnormalities from Standard Conditions

None.

5.9 Other Information Requested by the Customer

None.

6 Test Instruments list

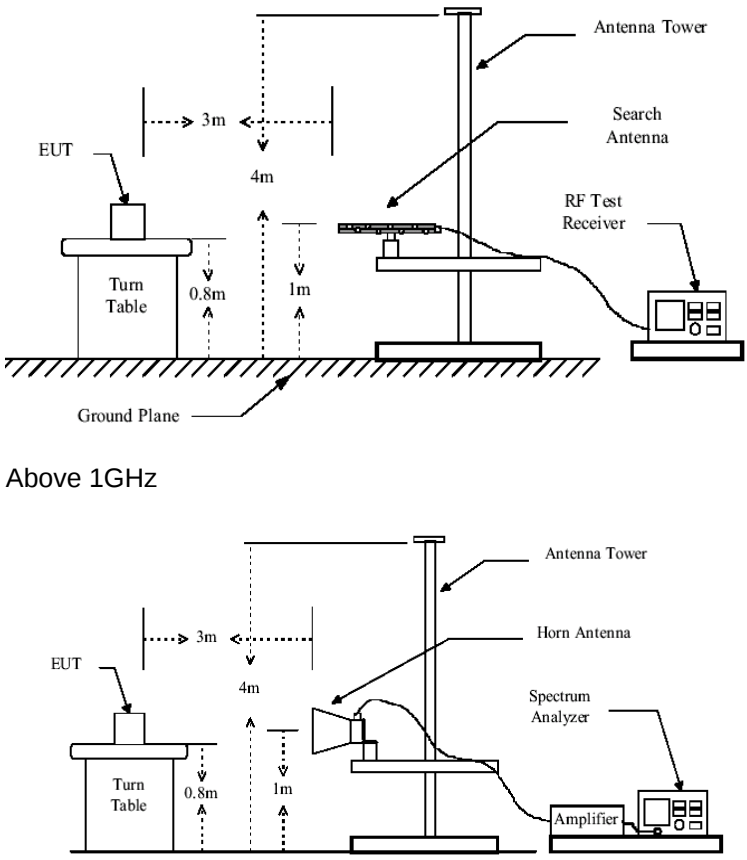
Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.0(L)*6.0(W)* 6.0(H)	GTS250	Mar. 30 2011	Mar. 29 2013
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	Jul. 03 2012	Jul. 02 2013
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	Feb. 24 2013	Feb. 23 2014
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	9120D-829	GTS208	June 29 2012	June 28 2013
6	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	Jul. 03 2012	Jul. 02 2013
7	Amplifier(2GHz-20GHz)	HP	8349B	GTS206	Jul. 03 2012	Jul. 02 2013
8	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
9	Coaxial cable	GTS	N/A	GTS210	Mar. 31 2012	Mar. 30 2013
10	Coaxial Cable	GTS	N/A	GTS211	Mar. 31 2012	Mar. 30 2013
11	Thermo meter	N/A	N/A	GTS256	Jul. 06 2012	Jul. 05 2013

General used equipment:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (dd-mm-yy)	Cal.Due date (dd-mm-yy)
1	Barometer	ChangChun	DYM3	GTS257	July 10 2012	July 09 2013

7 Test Results and Measurement Data

7.1 Radiated Emission

Test Requirement:	FCC Part15 B Section 15.109																																						
Test Method:	ANSI C63.4:2003																																						
Test Frequency Range:	30MHz to 2GHz																																						
Test site:	Measurement Distance: 3m (Semi-Anechoic Chamber)																																						
Receiver setup:	<table><tr><td>Frequency</td><td>Detector</td><td>RBW</td><td>VBW</td><td>Remark</td></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>					Frequency	Detector	RBW	VBW	Remark	30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak Value	Above 1GHz	Peak	1MHz	3MHz	Peak Value	Peak	1MHz	10Hz	Average Value															
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Peak		1MHz	10Hz	Average Value																																			
Limit:	<table><tr><td colspan="2">Frequency</td><td colspan="2">Limit (dBuV/m @3m)</td><td>Remark</td></tr><tr><td colspan="2">30MHz-88MHz</td><td colspan="2">40.00</td><td>Quasi-peak Value</td></tr><tr><td colspan="2">88MHz-216MHz</td><td colspan="2">43.50</td><td>Quasi-peak Value</td></tr><tr><td colspan="2">216MHz-960MHz</td><td colspan="2">46.00</td><td>Quasi-peak Value</td></tr><tr><td colspan="2">960MHz-1GHz</td><td colspan="2">54.00</td><td>Quasi-peak Value</td></tr><tr><td rowspan="2">Above 1GHz</td><td colspan="2">54.00</td><td colspan="2">Average Value</td></tr><tr><td colspan="2">74.00</td><td colspan="2">Peak Value</td></tr></table>					Frequency		Limit (dBuV/m @3m)		Remark	30MHz-88MHz		40.00		Quasi-peak Value	88MHz-216MHz		43.50		Quasi-peak Value	216MHz-960MHz		46.00		Quasi-peak Value	960MHz-1GHz		54.00		Quasi-peak Value	Above 1GHz	54.00		Average Value		74.00		Peak Value	
	Frequency		Limit (dBuV/m @3m)		Remark																																		
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	Above 1GHz	54.00		Average Value																																			
74.00		Peak Value																																					
Test Procedure:	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.																																						
Test setup:	Below 1GHz																																						

	 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:	Refer to section 5.3 for details
Test results:	Pass

Note:

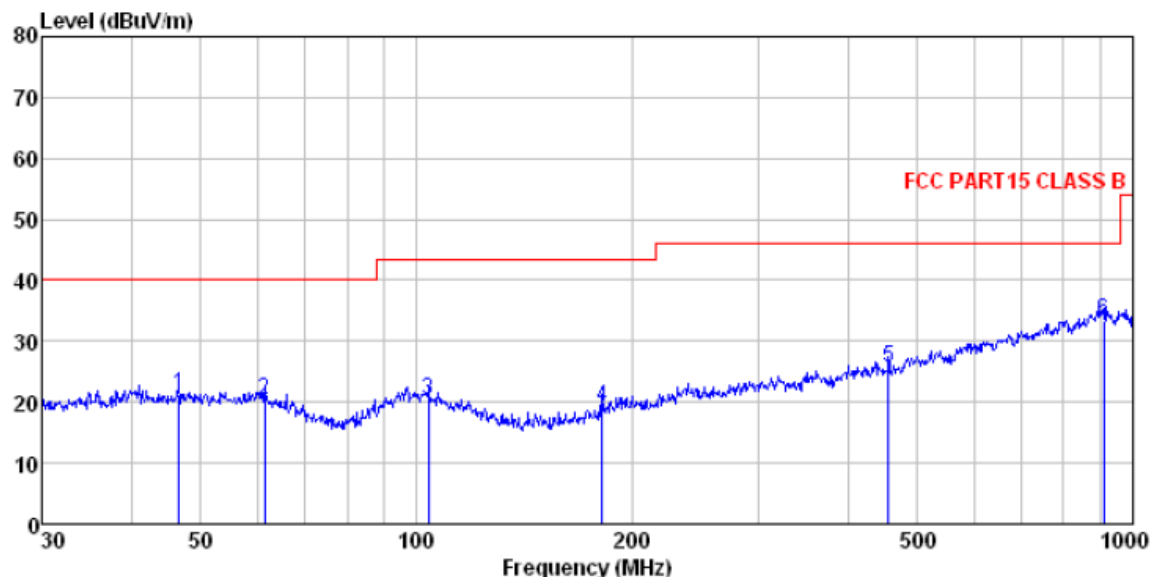
The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

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

Measurement Data

Below 1GHz

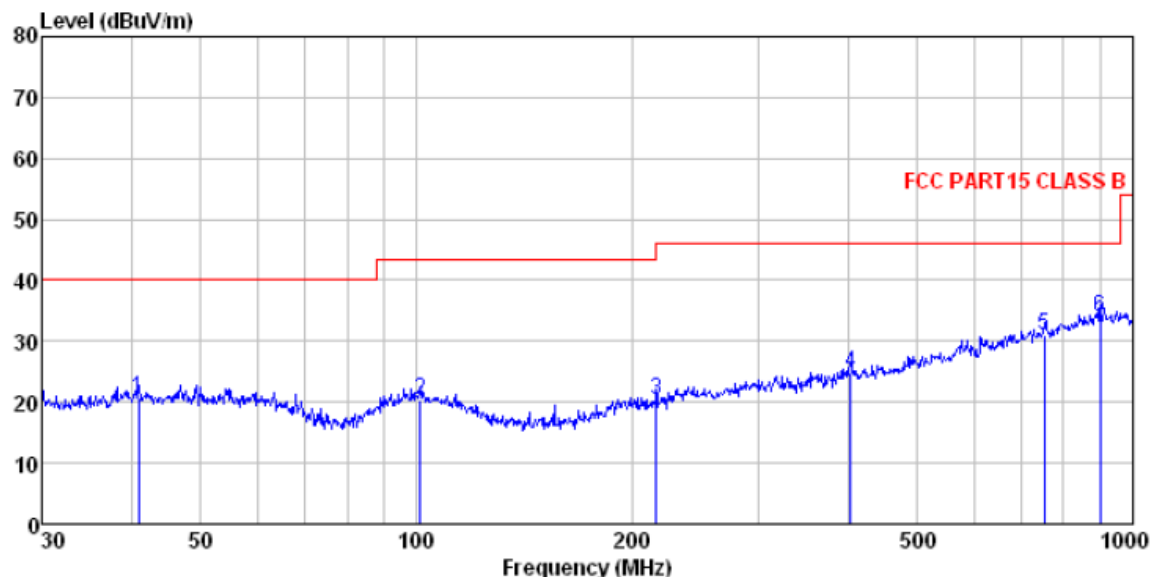
Horizontal:



Site : 3m chamber
 Condition : FCC PART15 CLASS B 3m VULB9163 -2012-05 HORIZONTAL
 Job No. : 288RF
 Test Mode : Receiving mode
 Test Engineer: Edward

	Freq	ReadAntenna	Cable Preamp		Limit	Over		
	MHz	Level	Factor	Loss Factor	Level	Line	Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	46.666	35.96	16.55	0.74	31.99	21.26	40.00	-18.74 QP
2	61.346	36.00	15.52	0.87	31.93	20.46	40.00	-19.54 QP
3	103.806	35.22	15.73	1.22	31.78	20.39	43.50	-23.11 QP
4	181.920	36.62	12.94	1.75	32.09	19.22	43.50	-24.28 QP
5	455.906	36.57	17.58	3.11	31.70	25.56	46.00	-20.44 QP
6	909.667	35.58	24.06	4.88	31.19	33.33	46.00	-12.67 QP

Vertical:

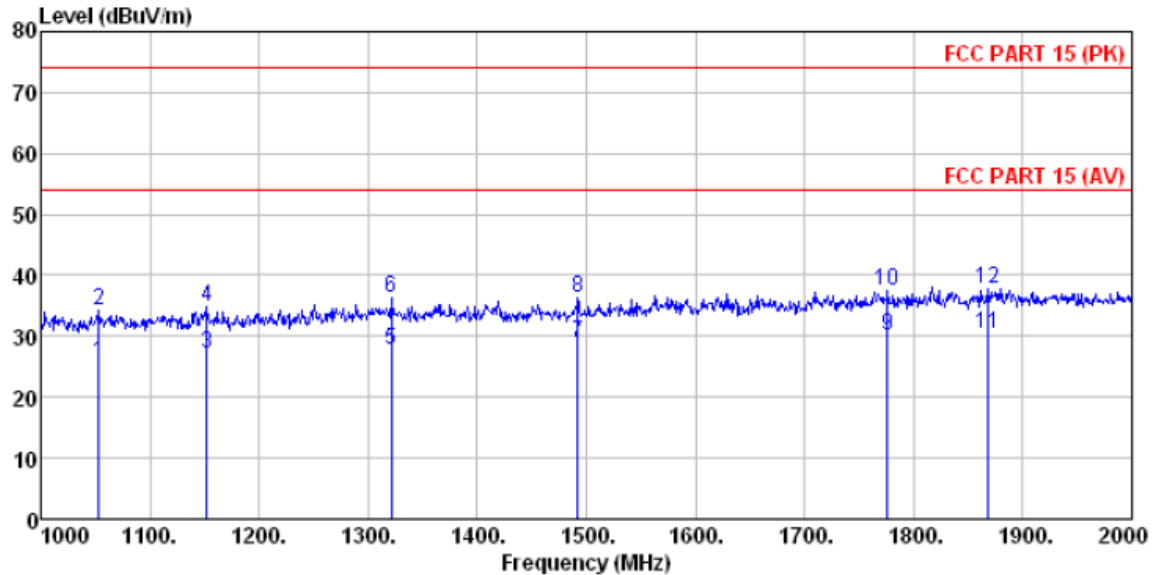


Site : 3m chamber
 Condition : FCC PART15 CLASS B 3m VULB9163 -2012-05 VERTICAL
 Job No. : 288RF
 Test Mode : Receiving mode
 Test Engineer: Edward

	ReadAntenna	Cable Preamp		Limit	Over		
Freq	Level	Factor	Loss Factor	Level	Line	Limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB
1	40.988	35.55	16.58	0.67	32.05	20.75	40.00 -19.25 QP
2	101.289	34.89	16.03	1.20	31.77	20.35	43.50 -23.15 QP
3	216.024	36.32	14.12	1.93	32.15	20.22	46.00 -25.78 QP
4	403.250	36.51	17.18	2.87	31.88	24.68	46.00 -21.32 QP
5	752.743	35.53	22.48	4.28	31.26	31.03	46.00 -14.97 QP
6	900.147	36.20	24.09	4.85	31.18	33.96	46.00 -12.04 QP

Above 1GHz

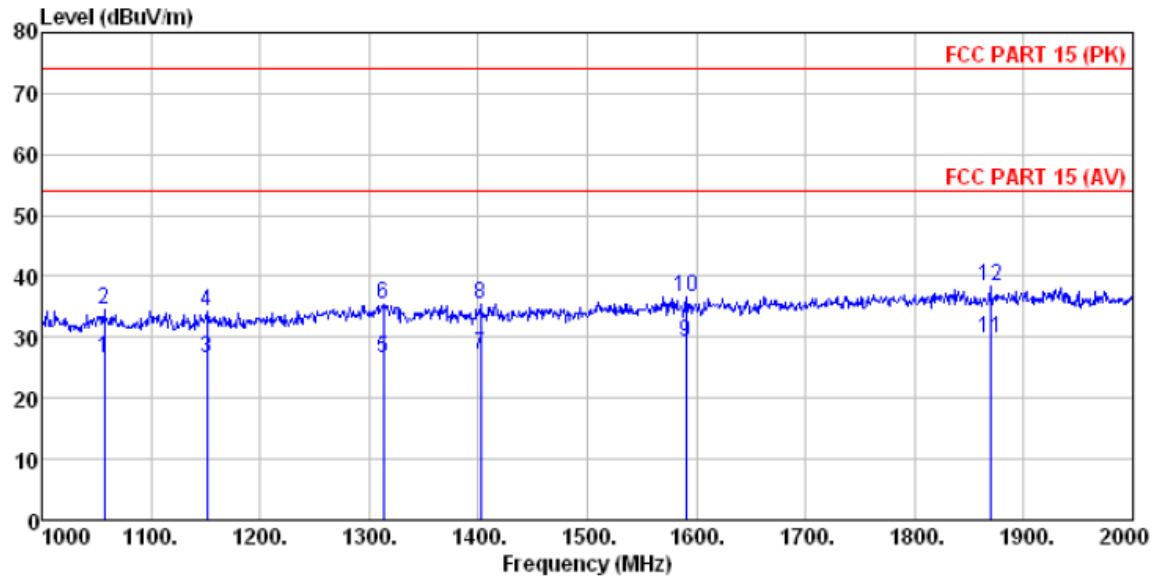
Horizontal:



Site : 3m chamber
 Condition : FCC PART 15 (PK) 3m VULB9163 -2012-05 HORIZONTAL
 Job No. : 288RF
 Test Mode : Receiving mode
 Test Engineer: Edward

	Freq	Read	Antenna	Cable	Preamp	Level	Limit	Over	
	MHz	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1053.000	28.78	23.90	4.34	31.30	25.72	54.00	-28.28	Average
2	1053.000	37.27	23.90	4.34	31.30	34.21	74.00	-39.79	Peak
3	1152.000	30.12	24.13	4.43	31.42	27.26	54.00	-26.74	Average
4	1152.000	37.75	24.13	4.43	31.42	34.89	74.00	-39.11	Peak
5	1321.000	29.31	25.60	4.56	31.59	27.88	54.00	-26.12	Average
6	1321.000	37.62	25.60	4.56	31.59	36.19	74.00	-37.81	Peak
7	1492.000	30.55	25.45	4.68	31.75	28.93	54.00	-25.07	Average
8	1492.000	38.01	25.45	4.68	31.75	36.39	74.00	-37.61	Peak
9	1776.000	29.52	27.15	4.85	31.37	30.15	54.00	-23.85	Average
10	1776.000	36.92	27.15	4.85	31.37	37.55	74.00	-36.45	Peak
11	1868.000	28.74	27.89	4.89	31.25	30.27	54.00	-23.73	Average
12	1868.000	36.29	27.89	4.89	31.25	37.82	74.00	-36.18	Peak

Vertical:

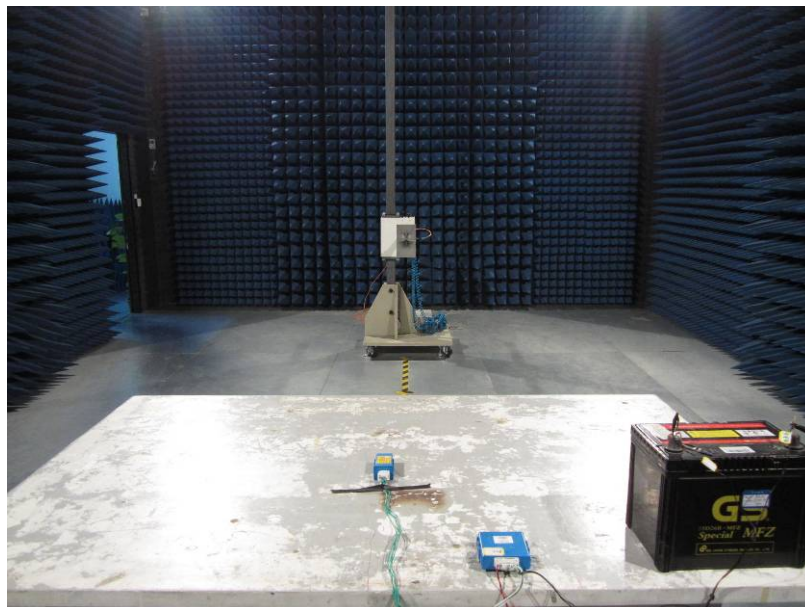
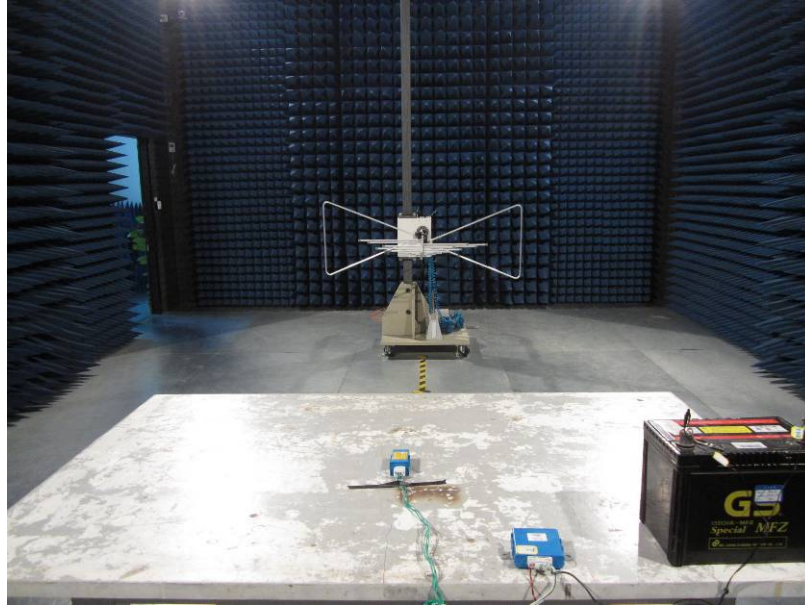


Site : 3m chamber
 Condition : FCC PART 15 (PK) 3m VULB9163 -2012-05 VERTICAL
 Job No. : 288RF
 Test Mode : Receiving mode
 Test Engineer: Edward

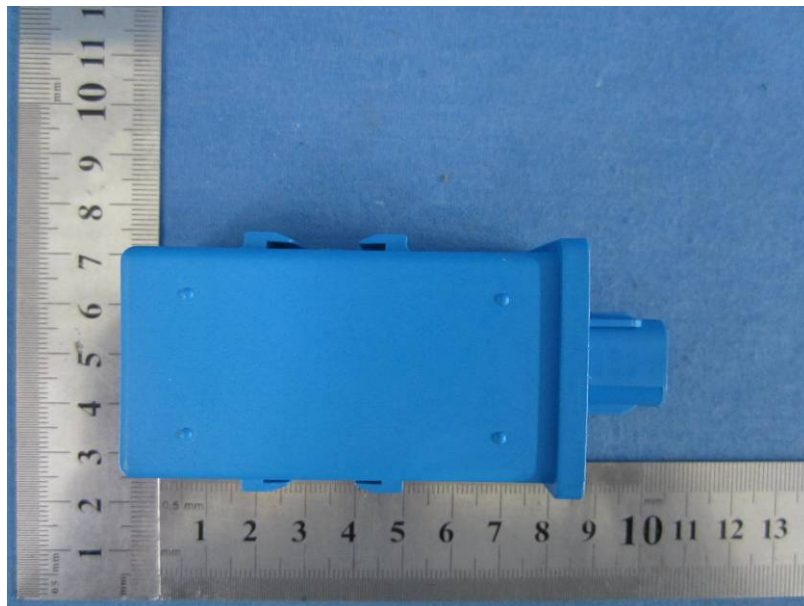
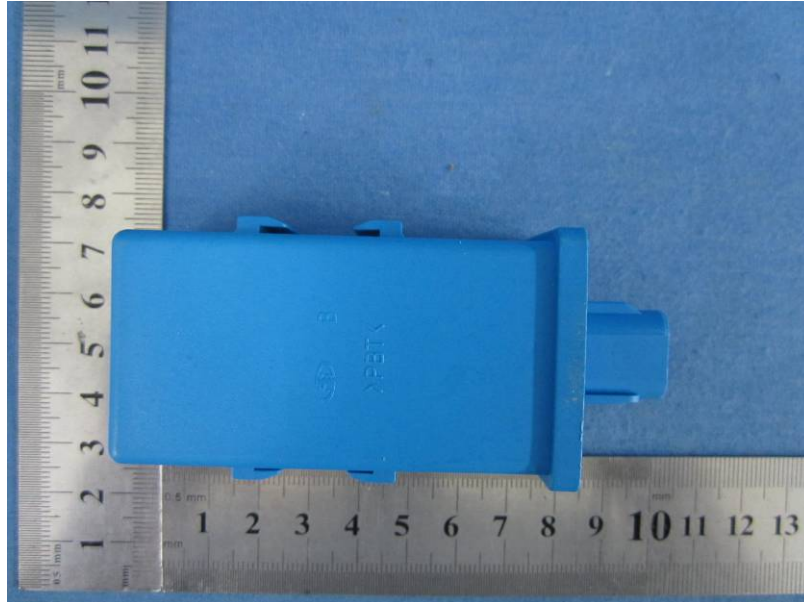
	Freq	Read	Antenna	Cable	Preamp	Level	Limit	Over	
	MHz	Level	Factor	Loss	Factor	Level	Line	Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1057.000	29.70	23.91	4.34	31.31	26.64	54.00	-27.36	Average
2	1057.000	37.45	23.91	4.34	31.31	34.39	74.00	-39.61	Peak
3	1151.000	29.35	24.13	4.43	31.42	26.49	54.00	-27.51	Average
4	1151.000	37.02	24.13	4.43	31.42	34.16	74.00	-39.84	Peak
5	1313.000	27.90	25.64	4.55	31.58	26.51	54.00	-27.49	Average
6	1313.000	36.88	25.64	4.55	31.58	35.49	74.00	-38.51	Peak
7	1402.000	28.96	25.31	4.62	31.67	27.22	54.00	-26.78	Average
8	1402.000	37.25	25.31	4.62	31.67	35.51	74.00	-38.49	Peak
9	1590.000	30.13	25.94	4.74	31.61	29.20	54.00	-24.80	Average
10	1590.000	37.47	25.94	4.74	31.61	36.54	74.00	-37.46	Peak
11	1869.000	28.32	27.89	4.89	31.25	29.85	54.00	-24.15	Average
12	1869.000	36.76	27.89	4.89	31.25	38.29	74.00	-35.71	Peak

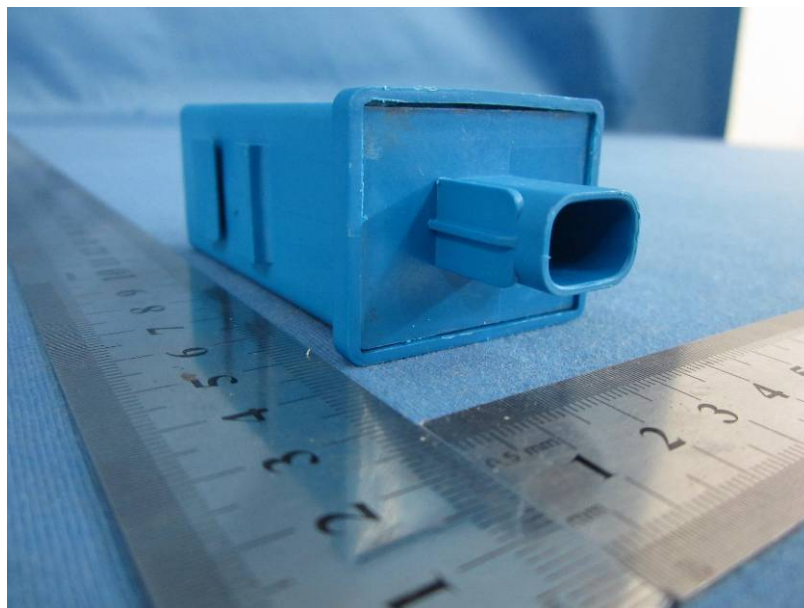
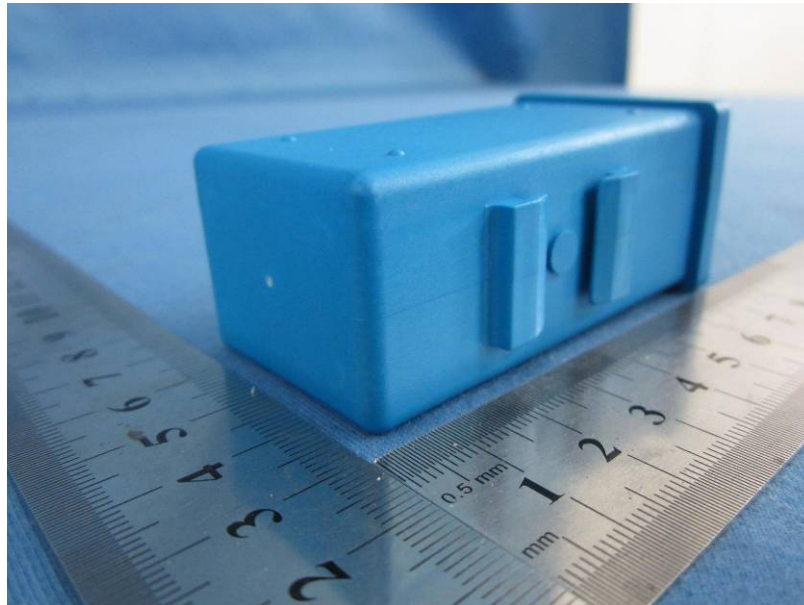
8 Test Setup Photo

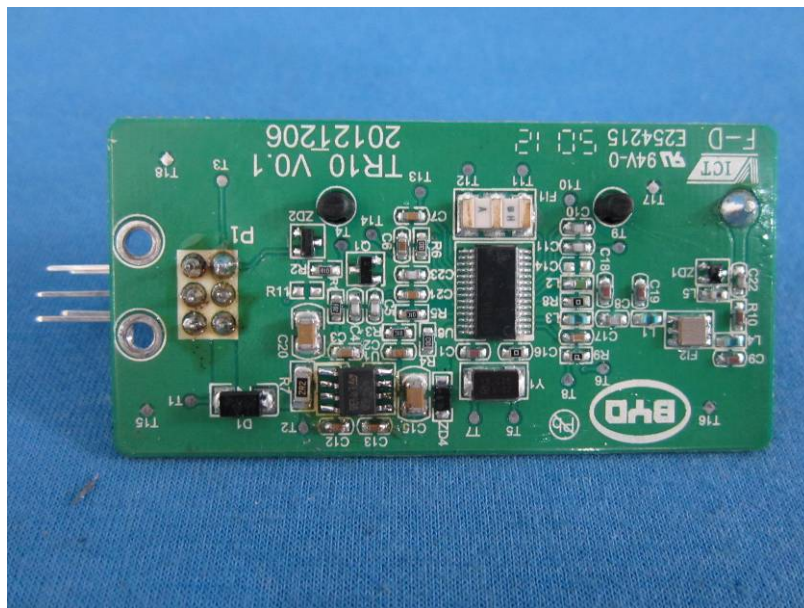
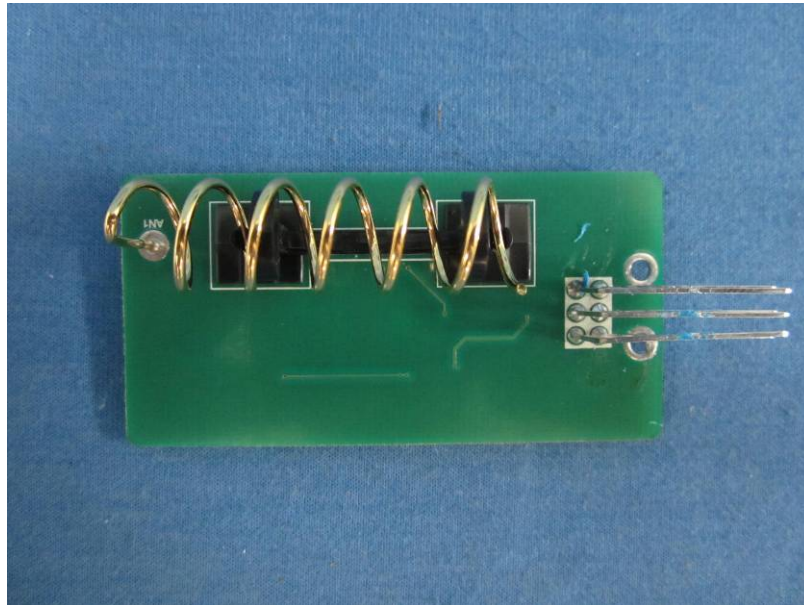
Radiated Emission



9 EUT Constructional Details







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