FCC REPORT

Applicant:	Orbit Communications Pty Ltd
Address of Applicant:	Unit 1,16 Donaldson Street,Wyong,NSW 2259,Australia
Equipment Under Test (EUT)	
Product Name:	BodyGuard Sensor
Model No.:	BOD0103, BOD0119
FCC ID:	2AI6A-001
Applicable standards:	FCC CFR Title 47 Part 15 Subpart C Section 15.249:2015
Date of sample receipt:	July 01, 2016
Date of Test:	July01-20, 2016
Date of report issued:	July 20, 2016
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	*July 20, 2016*	*Original*

Prepared By: Edward.Pan ***Date:*** *July 20, 2016*

Project Engineer

Check By: Andy.Wu ***Date:*** *July 20, 2016*

Reviewer

3 Contents

Page

4 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203	Pass
AC Power Line Conducted Emission	15.207	Pass
Radiated Emission	15.209	Pass
20dB Bandwidth	15.205	Pass

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

Remark: Test according to ANSI C63.10 2013 and ANSI C63.4: 2014

4.1 Measurement Uncertainty

Test Item	Frequency Range	Measurement Uncertainty	Notes
Radiated Emission	9kHz ~ 30MHz	± 4.34dB	(1)
Radiated Emission	30MHz ~ 1000MHz	± 4.24dB	(1)
Radiated Emission	1GHz ~ 26.5GHz	± 4.68dB	(1)
AC Power Line Conducted Emission	0.15MHz ~ 30MHz	± 3.45dB	(1)
Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.			

5 General Information

5.1 Client Information

Applicant:	Orbit Communications Pty Ltd
Address of Applicant:	Unit 1,16 Donaldson Street,Wyong,NSW 2259,Australia
Manufacturer:	Orbit Communications Pty Ltd
Address of Manufacturer:	Unit 1,16 Donaldson Street,Wyong,NSW 2259,Australia

5.2 General Description of EUT

Product Name:	BodyGuard Sensor
Model No.:	BOD0103, BOD0119
Operation Frequency:	125KHz
Modulation type:	ASK
Antenna Type:	Integral antenna
Antenna gain:	0dBi (declared by manufacturer)
Power supply:	DC 12.0V

Note:

In section 15.31(m), regards to the operating frequency range less than 1 MHz, only the middle frequency of channel was selected to perform the test, and the selected channel see below:

Channel	Frequency
Test channel	125KHz

5.3 Test mode

Transmitting mode	Keep the EUT in continuously transmitting and charging mode

5.4 Description of Support Units

Manufacturer	Description	Model	Serial Number	FCC Approval
GS	Lead–Acid battery	S5D26R-MFZ	9442804454	N/A

5.5 Test Facility

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

● **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 22, 2016.

● **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.

5.6 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.
Address: No. 301-309, 3/F., Jinyuan Business Building, No.2, Laodong Industrrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102
Tel: 0755-27798480
Fax: 0755-27798960

5.7 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	July. 03 2015	July. 02 2020
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	Spectrum Analyzer	Agilent	E4440A	GTS533	Jun. 29 2016	Jun. 28 2017
4	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	Jun. 29 2016	Jun. 28 2017
5	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	Jun. 29 2016	Jun. 28 2017
6	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	9120D-829	GTS208	Jun. 25 2016	Jun. 24 2017
7	Horn Antenna	ETS-LINDGREN	3160	GTS217	Mar. 26 2016	Mar. 25 2017
8	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
9	Coaxial Cable	GTS	N/A	GTS213	Mar. 26 2016	Mar. 25 2017
10	Coaxial Cable	GTS	N/A	GTS211	Mar. 26 2016	Mar. 25 2017
11	Coaxial cable	GTS	N/A	GTS210	Mar. 26 2016	Mar. 25 2017
12	Coaxial Cable	GTS	N/A	GTS212	Mar. 26 2016	Mar. 25 2017
13	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	Jun. 29 2016	Jun. 28 2017
14	Amplifier(2GHz-20GHz)	HP	8349B	GTS206	Jun. 29 2016	Jun. 28 2017
15	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	Jun. 25 2016	Jun. 24 2017
16	Band filter	Amindeon	82346	GTS219	Mar. 26 2016	Mar. 25 2017

7 Test results and Measurement Data

7.1 Antenna requirement:

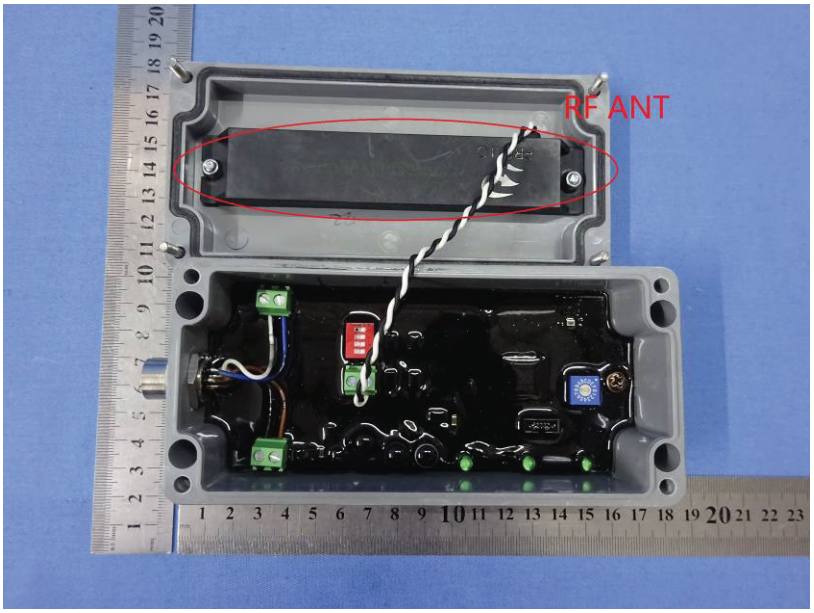
Standard requirement:	FCC Part15 C Section 15.203

15.203 requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

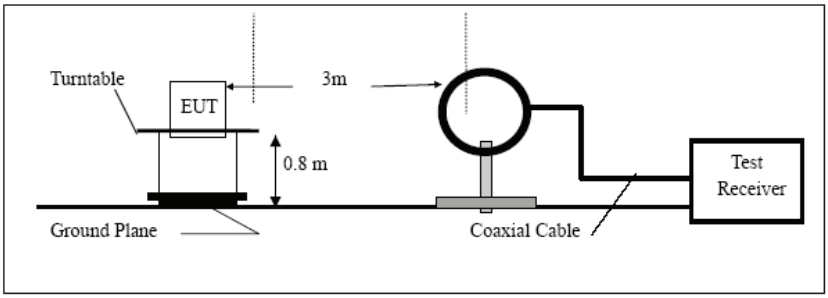
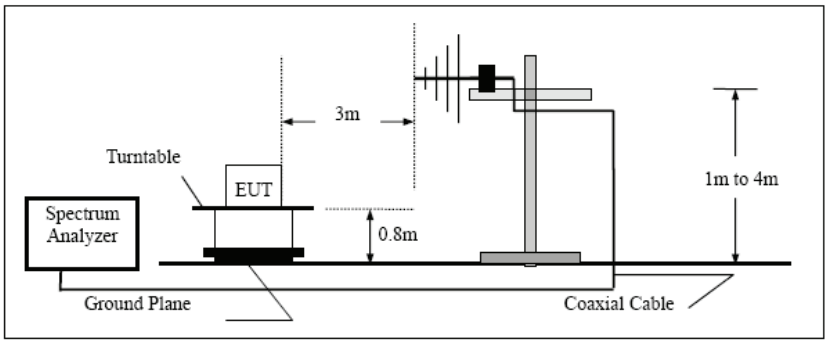
E.U.T Antenna:

The antenna is Integral Antenna, the best case gain of the antenna is 0dBi



7.2 Radiated Emission Method

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 C Section 15.209</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.4:2014</td></tr>
<tr><td>Test Frequency Range:</td><td>9kHz to 1GHz</td></tr>
<tr><td>Test site:</td><td>Measurement Distance: 3m</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>9kHz - 30MHz</td><td>Quasi-peak</td><td>10kHz</td><td>30kHz</td><td>Quasi-peak Value</td></tr>
<tr><td>30MHz-1GHz</td><td>Quasi-peak</td><td>120kHz</td><td>300kHz</td><td>Quasi-peak Value</td></tr>
</table>
Remark: For the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission test in these three bands are based on measurements employing an average detector.
</td></tr>
<tr><td>Limit:
(Spurious Emissions)</td><td>
Limits for frequency below 30MHz
<table>
<tr><th>Frequency</th><th>Limit (uV/m)</th><th>Measurement Distance(m)</th><th>Remark</th></tr>
<tr><td>0.009-0.490</td><td>2400/F(kHz)</td><td>300</td><td>Quasi-peak Value</td></tr>
<tr><td>0.490-1.705</td><td>24000/F(kHz)</td><td>30</td><td>Quasi-peak Value</td></tr>
<tr><td>1.705-30</td><td>30</td><td>30</td><td>Quasi-peak Value</td></tr>
</table>
Limits for frequency Above 30MHz
<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>
Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.
</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
</td></tr>
</table>

	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. 7. The radiation measurements are performed in X, Y, Z axis positioning. And found the Y axis positioning which it is worse case, only the test worst case mode is recorded in the report.
Test setup:	Below 30MHz  30MHz ~ 1000MHz 
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

Measurement data:

Measurement data:

Note: Limit dBuV/m @3m = Limit dBuV/m @300m+ 80

Limit dBuV/m @3m = Limit dBuV/m @30m + 40

Below 30MHz

Average Value:

Frequency (kHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Level (dBuV/m)	Limit @3m (dBuV/m)	Over Limit (dB)	Result
125.00	64.58	23.64	0.18	88.4	105.66	-17.26	Pass

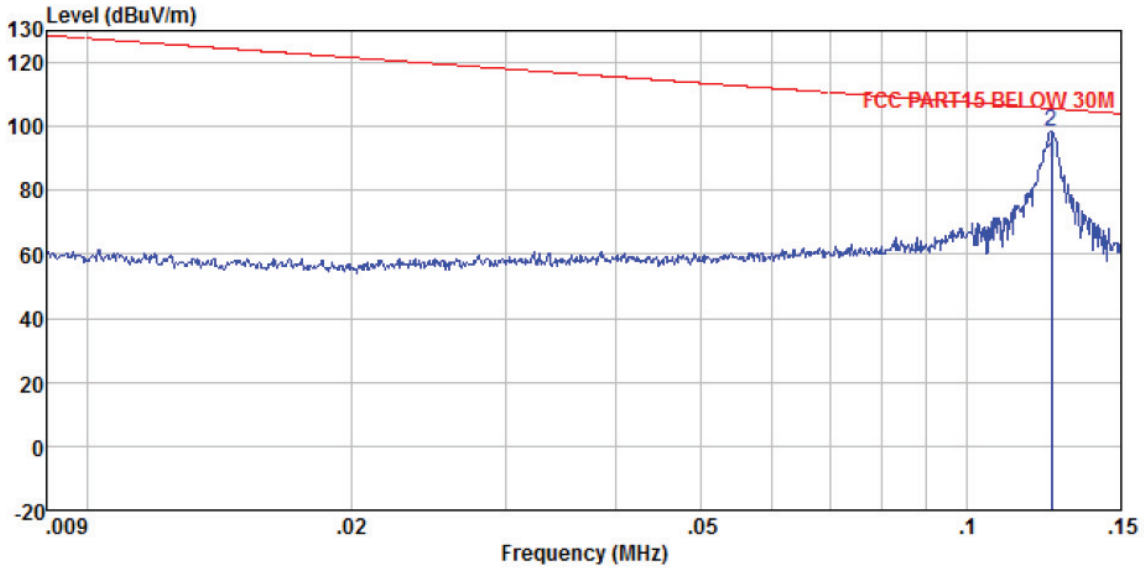
Peak Value:

Frequency (kHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Level (dBuV/m)	Limit @3m (dBuV/m)	Over Limit (dB)	Result
125.00	74.75	23.64	0.18	98.57	125.66	-27.09	Pass

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*

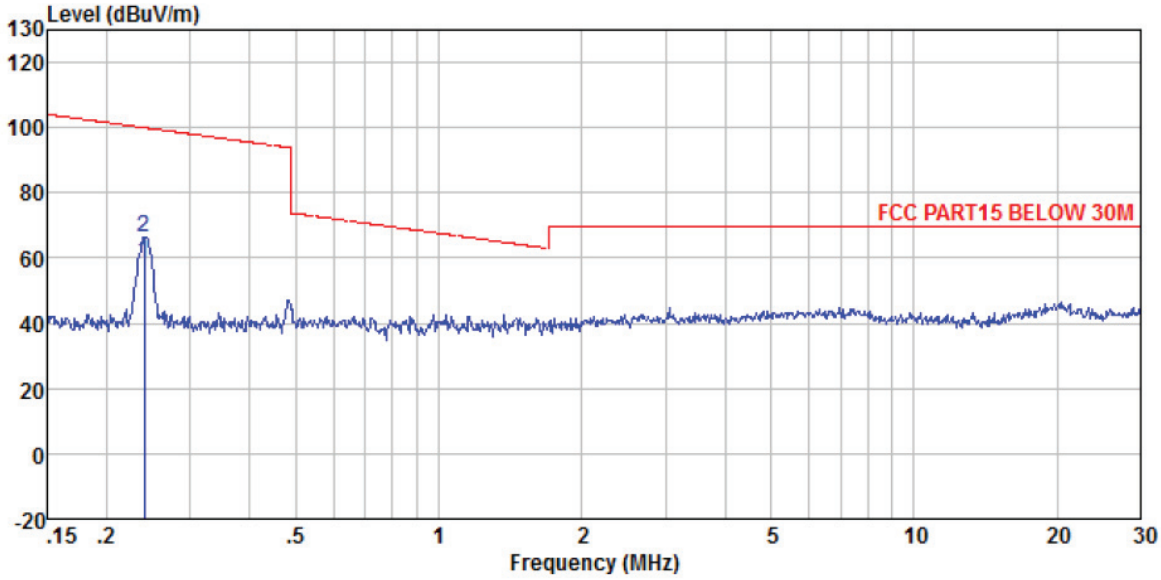
9kHz ~ 30MHz



Site : 3m chamber
Condition : FCC PART15 BELOW 30M ZN309000A(<30M)-2013
Job NO. : 0372
Test Mode : Transmitting mode
Test Engineer: Sky

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	0.125	64.58	23.64	0.18	0.00	88.40	105.66	-17.26	Average
2	0.125	74.75	23.64	0.18	0.00	98.57	125.66	-27.09	Peak

150kHz~30MHz

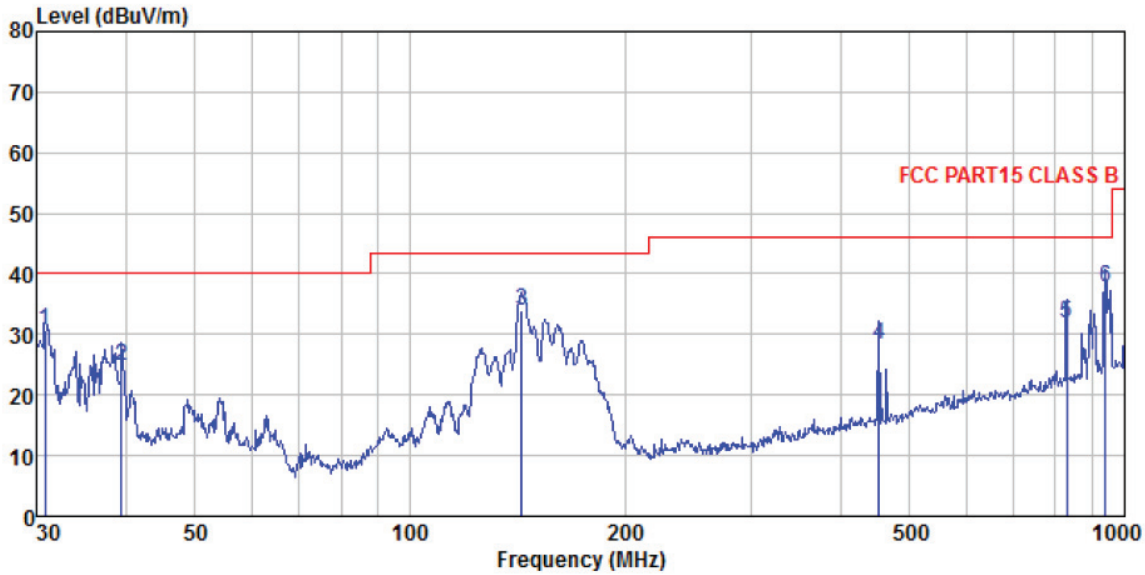


Site : 3m chamber
Condition : FCC PART15 BELOW 30M ZN309000A(<30M)-2013
Job NO. : 0372
Test Mode : Transmitting mode
Test Engineer: Sky

	Freq	ReadLevel	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	0.240	36.77	21.80	0.23	0.00	58.80	99.99	-41.19	Average
2	0.240	44.57	21.80	0.23	0.00	66.60	119.99	-53.39	Peak

30MHz~1GHz

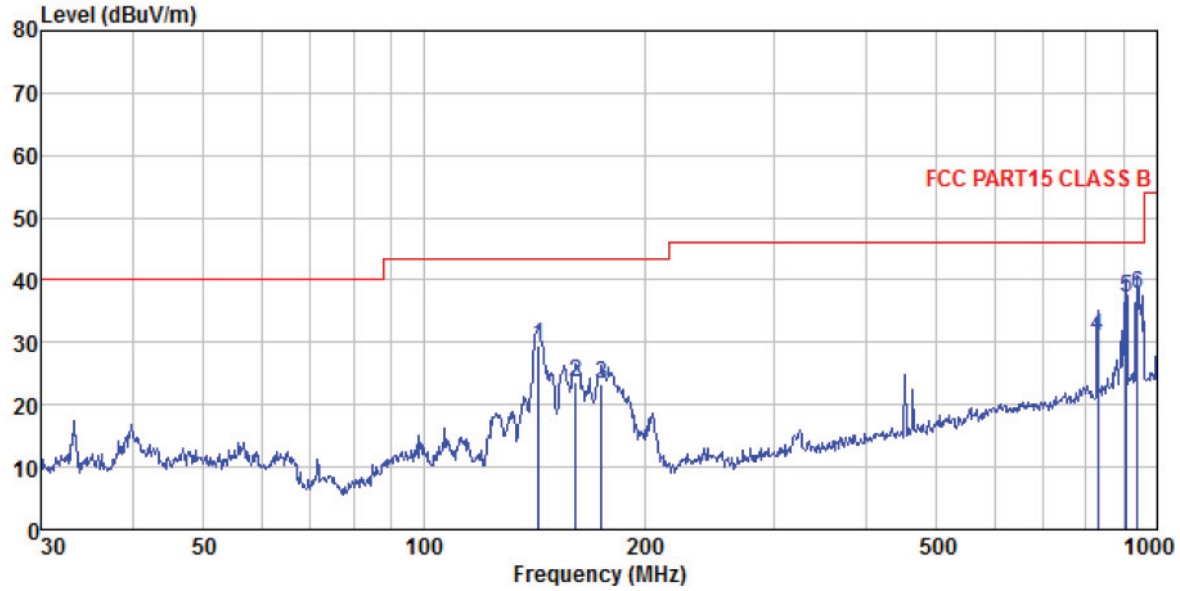
Vertical:



Site : 3m chamber
Condition : FCC PART15 CLASS B VULB9163-2013M VERTICAL
Job No. : 0372
Test Mode : Transmitting mode
Test Engineer: Sky

	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	30.853	46.01	14.32	0.56	30.09	30.80	40.00	-9.20	QP
2	39.437	38.64	15.44	0.65	30.05	24.68	40.00	-15.32	QP
3	143.326	51.59	10.22	1.53	29.44	33.90	43.50	-9.60	QP
4	452.720	36.93	17.58	3.10	29.39	28.22	46.00	-17.78	QP
5	830.400	34.04	22.37	4.58	29.17	31.82	46.00	-14.18	QP
6	938.833	38.55	23.34	4.99	29.10	37.78	46.00	-8.22	QP

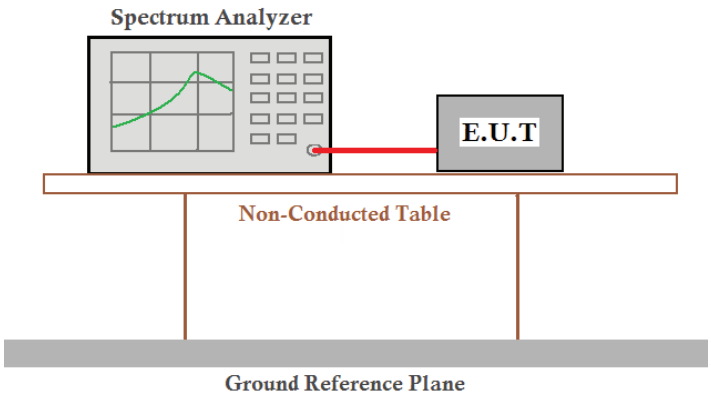
Horizontal:



Site : 3m chamber
Condition : FCC PART15 CLASS B VULB9163-2013M HORIZONTAL
Job No. : 0372
Test Mode : Transmitting mode
Test Engineer: Sky

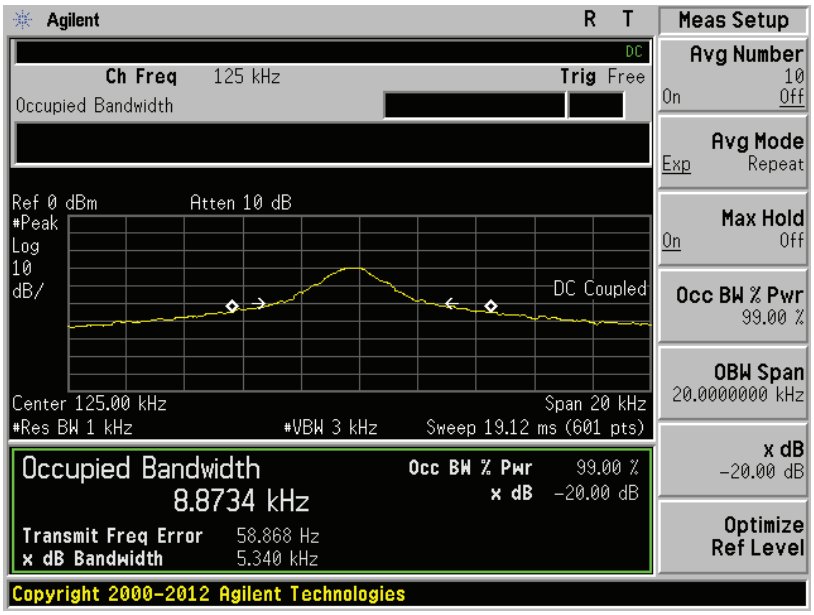
	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	143.326	47.19	10.22	1.53	29.44	29.50	43.50	-14.00	QP
2	160.909	40.54	10.69	1.63	29.36	23.50	43.50	-20.00	QP
3	174.424	39.59	11.29	1.71	29.30	23.29	43.50	-20.21	QP
4	830.400	33.22	22.37	4.58	29.17	31.00	46.00	-15.00	QP
5	906.482	38.14	23.15	4.88	29.10	37.07	46.00	-8.93	QP
6	938.833	38.59	23.34	4.99	29.10	37.82	46.00	-8.18	QP

7.3 20dB Occupy Bandwidth

Test Requirement:	FCC Part15 C Section 15.215
Test Method:	ANSI C63.10: 2013
Test setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.3 for details
Test results:	Pass

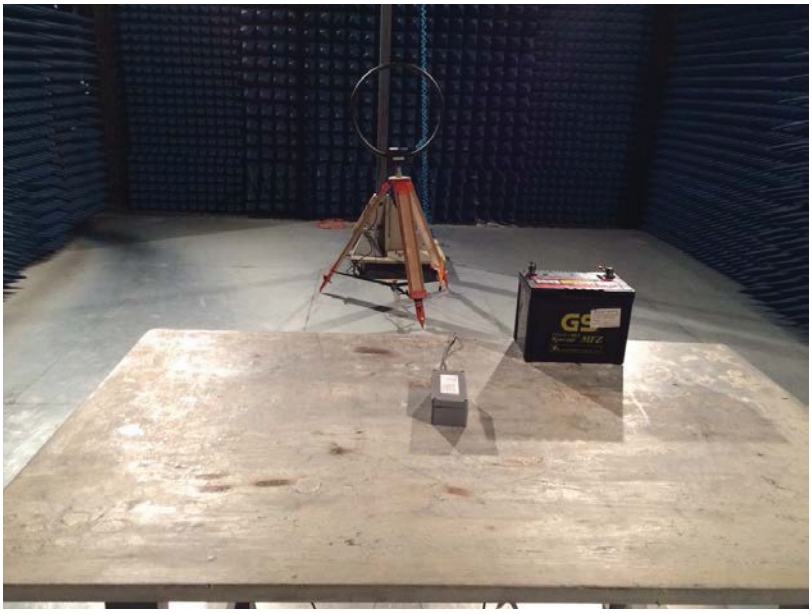
Measurement Data

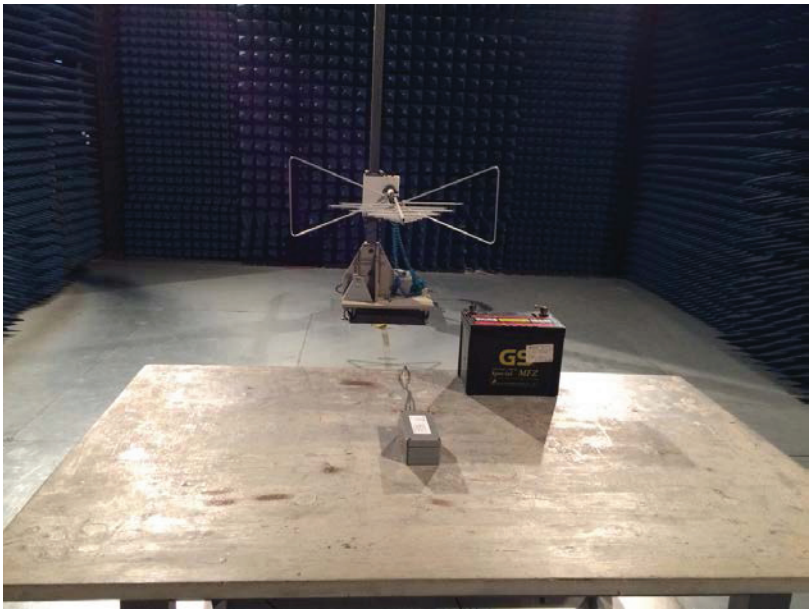
Test frequency	20dB bandwidth(KHz)	Result
125KHz	5.34	Pass



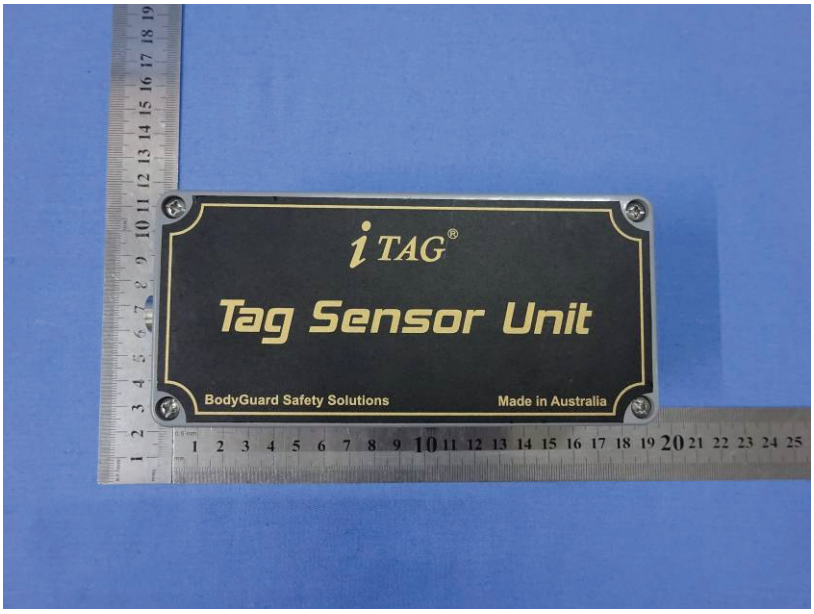
8 Test Setup Photo

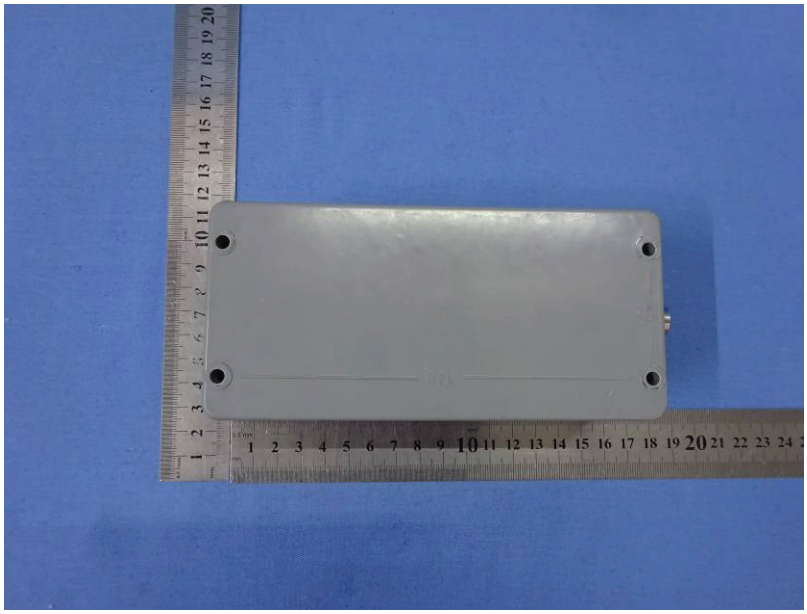
Radiated Emission

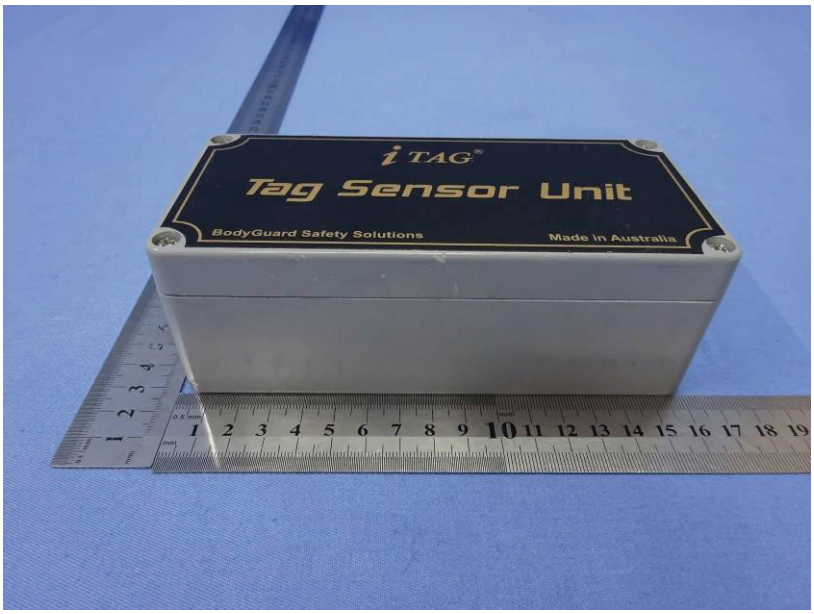


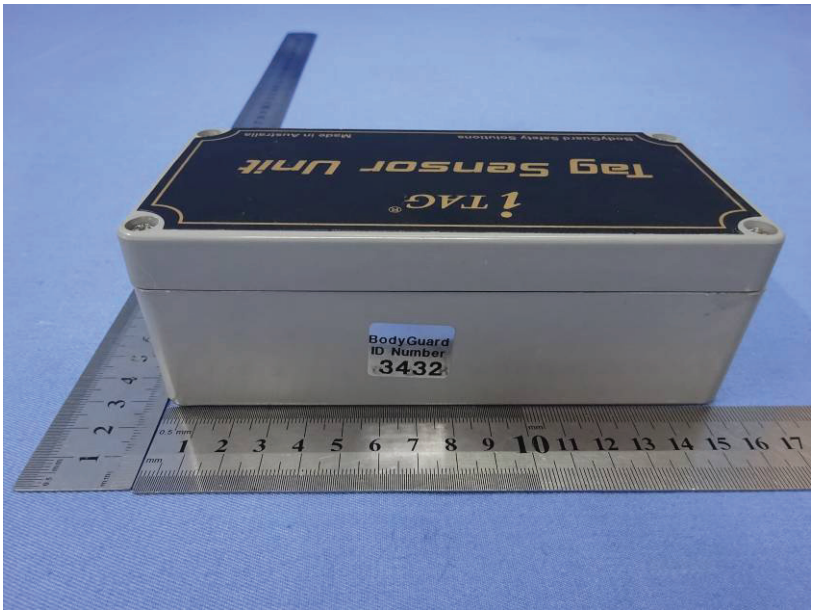


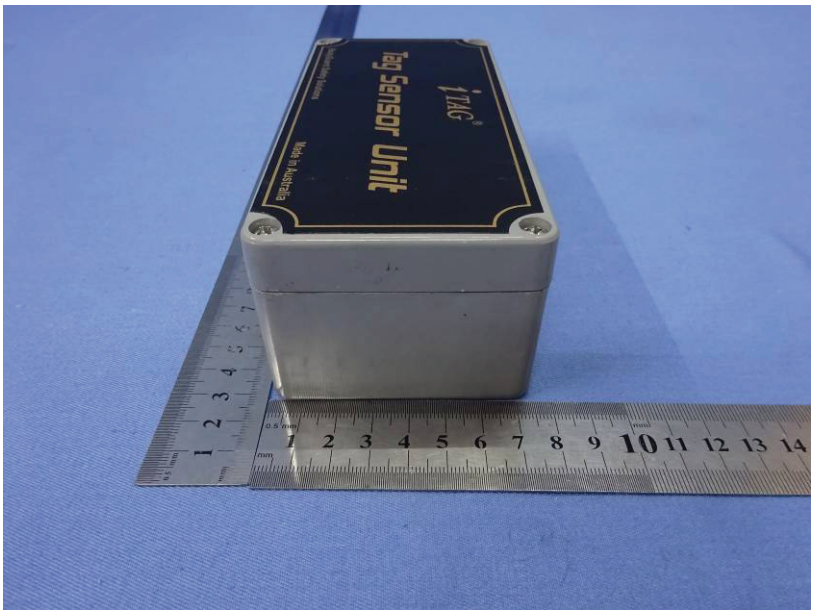
9 EUT Constructional Details

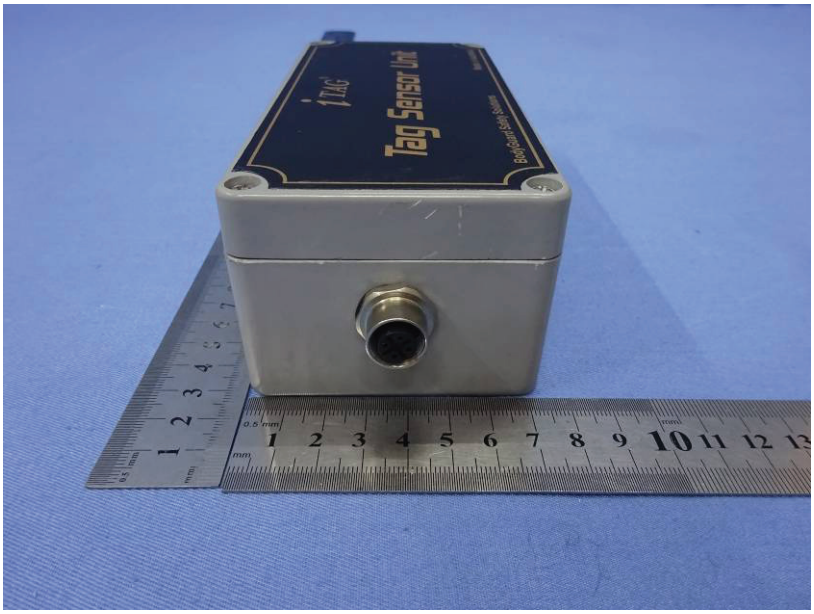


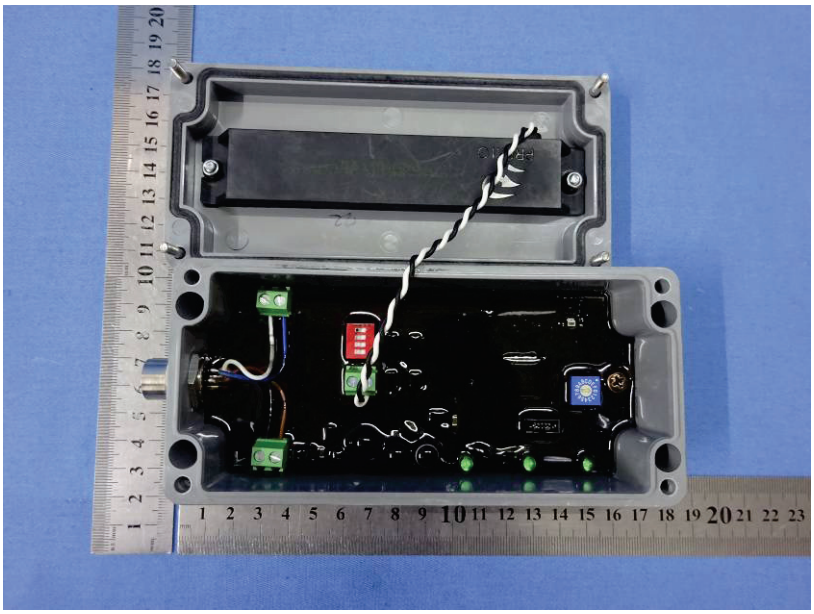


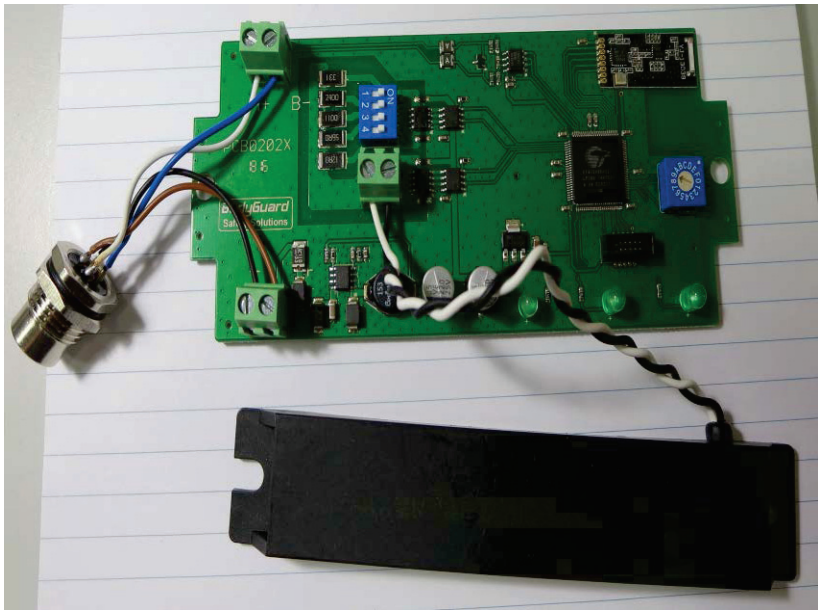

iTAG
Tag Sensor Unit
BodyGuard Safety Solutions
Made in Australia

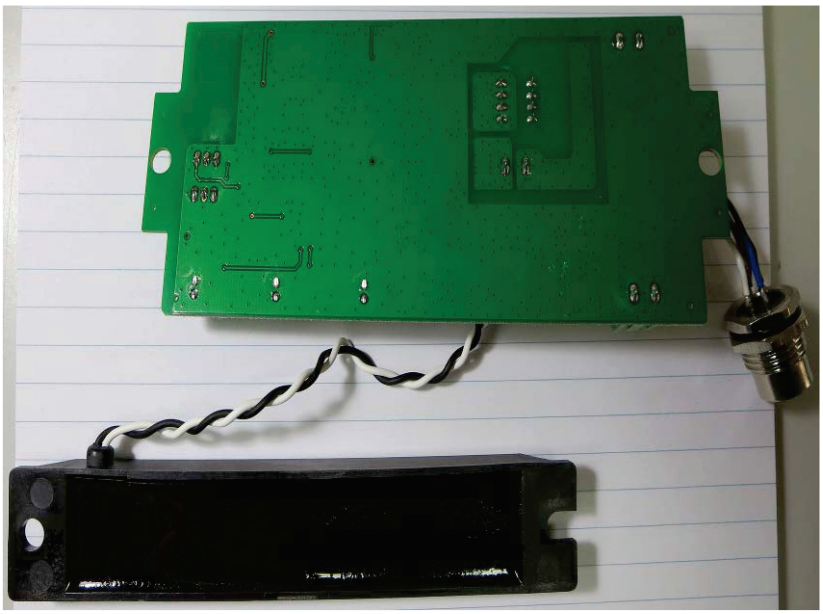

BodyGuard
ID Number
3432

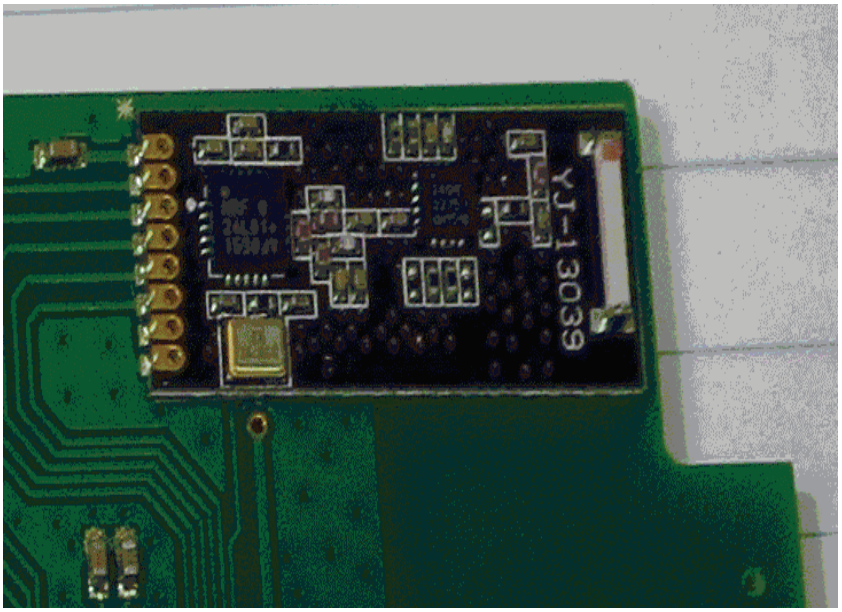

iTAG
Tag Sensor Unit
Made in Australia


iTAG
Tag Sensor Unit









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