TEST REPORT

of

Australian/New Zealand Standard AS/NZS 4268:2017

Product :	**IOT Gateway**
Brand:	**Fanstel**
Model:	**BWG840F; BWG840X; BWG840XE; BWG840E; BWG32**
Model Difference:	**Please see page 6 for detail**
Applicant:	**Fanstel Corporation, Taipei**
Address:	**10F-10, No. 79, Sec. 1, Hsin Tai Wu Rd., Hsi-Chih, New Taipei City 221 Taiwan**

Test Performed by:
International Standards Laboratory Corp.
<LT Lab.>
*Site Registration No.
BSMI: SL2-IN-E-0013; MRA TW1036; TAF: 0997
*Address:
No. 120, Lane 180, Hsin Ho Rd.,
Lung-Tan Dist., Tao Yuan City 325, Taiwan
*Tel : 886-3-407-1718; Fax: 886-3-407-1738

Report No.: **ISL-19LR286ANZ**

Issue Date : **2019/11/04**

VERIFICATION OF COMPLIANCE

Applicant:	Fanstel Corporation, Taipei
Product Description:	IOT Gateway
Brand Name:	Fanstel
Model No.:	BWG840F; BWG840X; BWG840XE; BWG840E; BWG32
Model Difference:	Please see page 6 for detail
Date of test:	2019/09/25 ~ 2019/11/01
Date of EUT Received:	2019/09/25

APPLICABLE STANDARDS	
STANDARD	**TEST RESULT**
AS/NZS 4268:2017, Row 59	Complied

We hereby certify that:

All the tests in this report have been performed and recorded in accordance with the standards described above and performed by an independent electromagnetic compatibility consultant, International Standards Laboratory Corp.

The test results contained in this report accurately represent the measurements of the characteristics and the energy generated by sample equipment under test at the time of the test. The sample equipment tested as described in this report is in compliance with the limits of above standards.

Test By:	Weitin Chen	***Date:***	2019/11/04
	Weitin Chen / Senior Engineer		
Prepared By:	Gigi yeh	***Date:***	2019/11/04
	Gigi Yeh / Senior Engineer		
Approved By:	Jerry Liu	***Date:***	2019/11/04
	Jerry Liu / Technical Manager		

Version

Version No.	Date	Description
00	2019/11/04	Initial creation of document

Table of Contents

1 Description of Equipment Under Test (EUT)

General:

Product Name:	IOT Gateway	
Brand Name:	Fanstel	
Model Name:	BWG840F; BWG840X; BWG840XE; BWG840E; BWG32	
Model Difference:	Please see table below for detail.	
Type of Equipment:	Stand-alone equipment	
Temperature Range:	-40°C to +85°C	
Simultaneous transmissions:	Yes	
Geo-location capability:	No	
Antenna Designation	Dipole Antenna : 0 dBi (BWG840E & BWG840XE) PCB Antenna : 1.61dBi(BWG840X) 、0.54 dBi(BWG840F) PCB Antenna for WIFI : 2 dBi	
Power Supply	100-240Vac change to 5Vdc form adapter	
	Adaptor:	Model: CH005A05010001
Modular Report:	Bluetooth 5.0, 802.15.4 module BLE Report Number: 19LR205E328(EN 300 328 V2.1.1): Prepared by: International Standards Laboratory Corp. WIFI &Bluetooth Module WiFi Report Number: RSHA180116002-01C_EN300328 V2.1.1_2.4G Wi-Fi (EN 300 328 V2.1.1): Prepared by: Bay Area Compliance Laboratories Corp. (Kunshan)	

This test report applies for 2.4GHz Wifi + BLE.

Remark: The above DUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

Model Summaries

Gateway	BWG840F	BWG840E	BWG840X	BWG840XE
WiFi module	ESP 32	ESP 32	ESP 32	ESP 32
BLE module	BT840F	BT840E	BT840X	BT840XE
Max module range	2300M at 125 kbps	2300M at 125 kbps	>4500M at 125 Kbps	>4500M at 125 Kbps
FCC ID	X8WBT840F	X8WBT840F	X8WBT840X	X8WBT840X
ISED	4100A-BT840F	4100A-BT840F	4100A-BT840X	4100A-BT840X
ODID	108621	108621	108621	108621

Gateway	BWG32
WiFi module	ESP 32
BLE module	
Max module range	
FCC ID	
ISED	
ODID	108621

2 Description of Test Modes and Test Condition

The EUT has been tested under Operating and standby condition. And used to control the EUT for staying in continuous transmitting and receiving mode is programmed. Channel lower, mid and higher of Bluetooth BLE modes were chosen for testing.

Normal test conditions:

Temperature : -20℃ to 55℃
Relative humidity: 20 % to 75 %
5Vdc Voltage

Extreme Temperatures

For test at extreme temperatures, measurements shall be in accordance with the procedures specified in section 5.3 of AS/NZS 4268 at upper value of +85 degree and at a lower value of -40 degree.

Extreme Test Source Voltages

Low voltage is 4.5Vdc and 5.5Vdc for high voltage nominal voltage 5Vdc

3 General Description of Apply Standards

The EUT According to the Specifications, it must comply with the requirements of the following standards:

AS/NZS 4268:2017, – Radio equipment and systems – Short range devices – Limits and methods of measurement.

Row 59: Digital modulation transmitters

EN 300 440 V1.6.1 – Part 1: Technical characteristics and test method.

4 Test Facility

International Standards Laboratory Corp.
<LT Lab.>
No. 120, Lane 180, Hsin Ho Rd., Lung-Tan Dist., Tao Yuan City 325, Taiwan

A fully anechoic chamber was used for the radiated spurious emissions test.

TAF Accreditation Lab. Lab number: 0997

5 Support Equipment

Fig. 5-1 Configuration of Tested System

Table 5-1 Equipment Used in Tested System

Item	Equipment	Mrf/Brand	Model name	Series No	Data Cable	Power Cable
1	NB	Lenovo	X220i	Non-Shielding	Non-Shielding	Non-Shielding
2	Kit	NA	NA	NA	Non-Shielding	Non-Shielding

6 Maximum EIRP Measurement

6.1. Limit:

4W(36dBm) for Row 59

10W(20dBm) for Row 21

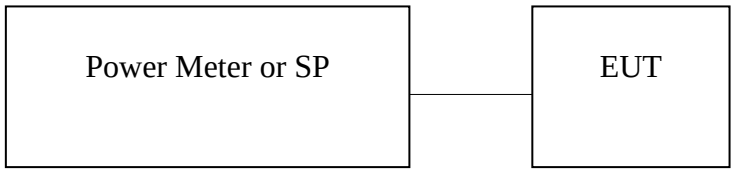
According to AS/NZS 4268:2017, Table 1, row 59: Digital modulation transmitters

According to AS/NZS 4268:2017, Table 1, row 21: All transmitters

6.2. Measurement Equipment Used:

Conducted Emission Test Site					
Equipment Type	**Manufacturer**	**Model Number**	**Serial Number**	**Last Cal.**	**Cal. Due.**
Power Sensor 08	DARE	RPR3006W	14I00889SNO35	06/27/2019	06/26/2020
Power Sensor 09	DARE	RPR3006W	14I00889SNO36	06/27/2019	06/26/2020
Temperature Chamber	KSON	THS-B4H100	2287	02/19/2019	02/18/2020
DC Power supply	ABM	8185D	N/A	01/10/2019	01/09/2020
AC Power supply	EXTECH	CFC105W	NA	N/A	N/A
Attenuator	Woken	Watt-65m3502	11051601	NA	NA
Splitter	MCLI	PS4-199	12465	12/26/2017	12/25/2019
Spectrum analyzer	keysight	N9010A	MY56070257	10/05/2019	10/04/2020
Spectrum analyzer	R&S	FSP40	100116	01/10/2019	01/09/2020
Test Software	DARE	Radiation Ver:2013.1.23	NA	NA	NA

6.3. Test Setup:



6.4. Test Procedure:

Refer to ETSI EN 300 440-1 V1.6.1, clause 7.1.

Refer to ETSI EN 300 328 V2.1.1,

See Sub-Clause 5.3.2.1 of ETSI EN 300 328 for the test conditions

See Sub-Clause 5.3.2.2.1.1 of ETSI EN 300 328 for conducted method.

6.5. Measurement Result: Refer to next page for the details.

6.5.1. Test Results: N/A

7 Transmitter Spurious Emissions Measurement

7.1. Limit:

According to AS/NZS 4268:2017, Table 1, row 59: Digital modulation transmitters

According to AS/NZS 4268:2017, Table 1, row 21: All transmitters

7.2. Measurement Equipment Used:

Refer to section 6.2 of present report.

7.3. Test Setup:

Refer to section 6.3 of present report.

7.4. Test Procedure:

Refer to ETSI EN 300 440-1 V1.6.1, clause 7.3.

7.5. Measurement Result:

Refer to next page for the details.

7.5.1. Test Results: (Radiated)

Test Mode: 802.11b mode, TX CH low

Ambient temperature: 25℃ Relative humidity: 60% Test Date: 2019-10-28

No	Freq MHz	Reading dBm	Aux dB	Level dBm	Limit dBm	Margin dB	Pol V/H
1	106.63	-67.79	0.49	-67.30	-54.00	-13.30	VERTICAL
2	258.92	-71.58	4.76	-66.82	-36.00	-30.82	VERTICAL
3	296.75	-73.78	4.30	-69.48	-36.00	-33.48	VERTICAL
4	370.47	-76.32	5.78	-70.54	-36.00	-34.54	VERTICAL
5	525.67	-80.24	8.93	-71.31	-54.00	-17.31	VERTICAL
6	703.18	-81.50	13.87	-67.63	-54.00	-13.63	VERTICAL
7	4824.00	-63.88	15.80	-48.08	-30.00	-18.08	VERTICAL
8	7111.00	-74.42	22.20	-52.22	-30.00	-22.22	VERTICAL
1	106.63	-63.67	1.11	-62.56	-54.00	-8.56	HORIZONTAL
2	333.61	-72.27	4.73	-67.54	-36.00	-31.54	HORIZONTAL
3	594.54	-78.83	11.10	-67.73	-54.00	-13.73	HORIZONTAL
4	668.26	-78.57	11.98	-66.59	-54.00	-12.59	HORIZONTAL
5	740.04	-80.68	13.94	-66.74	-54.00	-12.74	HORIZONTAL
6	813.76	-77.49	14.39	-63.10	-54.00	-9.10	HORIZONTAL
7	4824.00	-61.79	15.70	-46.09	-30.00	-16.09	HORIZONTAL
8	6460.00	-73.61	23.49	-50.12	-30.00	-20.12	HORIZONTAL

Measurement uncertainty	30MHz - 80MHz: 5.04dB
	80MHz -1000MHz: 3.76dB
	1GHz - 26GHz: 4.45dB

Remark:

1. The emission behaviors belong to narrowband spurious emission.
2. Remark " --- " means that the emission level is too low to be measured
3. Aux: Field strength to EIRP correction factor
4. Level (dBm) = Reading (dBm)+Aux(dB)
5. Measurement Range upto 12.75GHz.

Test Mode: 802.11b mode, TX CH High

Ambient temperature: 25℃ Relative humidity: 60% Test Date: 2019-10-28

No	Freq MHz	Reading dBm	Aux dB	Level dBm	Limit dBm	Margin dB	Pol V/H
1	106.63	-63.88	0.49	-63.39	-54.00	-9.39	VERTICAL
2	295.78	-74.41	4.31	-70.10	-36.00	-34.10	VERTICAL
3	371.44	-75.51	5.79	-69.72	-36.00	-33.72	VERTICAL
4	593.57	-80.57	9.99	-70.58	-54.00	-16.58	VERTICAL
5	721.61	-82.38	13.81	-68.57	-54.00	-14.57	VERTICAL
6	843.83	-81.47	14.69	-66.78	-54.00	-12.78	VERTICAL
7	4944.00	-56.50	16.33	-40.17	-30.00	-10.17	VERTICAL
8	6880.00	-74.29	21.36	-52.93	-30.00	-22.93	VERTICAL
1	106.63	-64.29	1.11	-63.18	-54.00	-9.18	HORIZONTAL
2	517.91	-77.91	9.02	-68.89	-54.00	-14.89	HORIZONTAL
3	593.57	-78.96	11.08	-67.88	-54.00	-13.88	HORIZONTAL
4	667.29	-80.16	11.96	-68.20	-54.00	-14.20	HORIZONTAL
5	741.01	-81.23	13.97	-67.26	-54.00	-13.26	HORIZONTAL
6	813.76	-80.44	14.39	-66.05	-54.00	-12.05	HORIZONTAL
7	4944.00	-58.09	16.10	-41.99	-30.00	-11.99	HORIZONTAL
8	6656.00	-73.50	23.77	-49.73	-30.00	-19.73	HORIZONTAL

Measurement uncertainty	30MHz - 80MHz: 5.04dB
	80MHz -1000MHz: 3.76dB
	1GHz - 26GHz: 4.45dB

Remark:

1. The emission behaviors belong to narrowband spurious emission.
2. Remark " --- " means that the emission level is too low to be measured
3. Aux: Field strength to EIRP correction factor
4. Level (dBm) = Reading (dBm)+Aux(dB)
5. Measurement Range upto 12.75GHz.

Test Mode: BLE mode, TX CH low (Mode name: BWG840E, 2dBm)

Ambient temperature: 25℃ Relative humidity: 60% Test Date: 2019-10-28

No	Freq MHz	Reading dBm	Aux dB	Level dBm	Limit dBm	Margin dB	Pol V/H
1	106.63	-61.31	0.49	-60.82	-54.00	-6.82	VERTICAL
2	246.31	-75.29	4.66	-70.63	-36.00	-34.63	VERTICAL
3	499.48	-79.33	8.95	-70.38	-54.00	-16.38	VERTICAL
4	664.38	-81.90	12.61	-69.29	-54.00	-15.29	VERTICAL
5	698.33	-80.33	13.82	-66.51	-54.00	-12.51	VERTICAL
6	833.16	-78.86	14.39	-64.47	-54.00	-10.47	VERTICAL
7	4804.00	-58.85	15.71	-43.14	-30.00	-13.14	VERTICAL
8	7206.00	-61.22	22.45	-38.77	-30.00	-8.77	VERTICAL
1	106.63	-65.07	1.11	-63.96	-54.00	-9.96	HORIZONTAL
2	247.28	-76.63	4.44	-72.19	-36.00	-36.19	HORIZONTAL
3	399.57	-76.90	6.86	-70.04	-36.00	-34.04	HORIZONTAL
4	499.48	-77.48	8.42	-69.06	-54.00	-15.06	HORIZONTAL
5	654.68	-80.57	11.74	-68.83	-54.00	-14.83	HORIZONTAL
6	726.46	-79.69	13.47	-66.22	-54.00	-12.22	HORIZONTAL
7	4804.00	-56.56	15.63	-40.93	-30.00	-10.93	HORIZONTAL
8	7206.00	-59.06	23.43	-35.63	-30.00	-5.63	HORIZONTAL

Measurement uncertainty	30MHz - 80MHz: 5.04dB
	80MHz -1000MHz: 3.76dB
	1GHz - 26GHz: 4.45dB

Remark:

1. The emission behaviors belong to narrowband spurious emission.
2. Remark " --- " means that the emission level is too low to be measured
3. Aux: Field strength to EIRP correction factor
4. Level (dBm) = Reading (dBm)+Aux(dB)
5. Measurement Range upto 12.75GHz.

Test Mode: BLE mode, TX CH High (Mode name: BWG840E, 2dBm)

Ambient temperature: 25℃ Relative humidity: 60% Test Date: 2019-10-28

No	Freq MHz	Reading dBm	Aux dB	Level dBm	Limit dBm	Margin dB	Pol V/H
1	106.63	-61.23	0.49	-60.74	-54.00	-6.74	VERTICAL
2	249.22	-75.37	4.83	-70.54	-36.00	-34.54	VERTICAL
3	399.57	-75.69	6.14	-69.55	-36.00	-33.55	VERTICAL
4	499.48	-76.44	8.95	-67.49	-54.00	-13.49	VERTICAL
5	666.32	-81.18	12.68	-68.50	-54.00	-14.50	VERTICAL
6	833.16	-79.53	14.39	-65.14	-54.00	-11.14	VERTICAL
7	4960.00	-61.31	16.40	-44.91	-30.00	-14.91	VERTICAL
8	7440.00	-61.85	23.04	-38.81	-30.00	-8.81	VERTICAL
1	106.63	-60.68	1.11	-59.57	-54.00	-5.57	HORIZONTAL
2	249.22	-75.65	4.56	-71.09	-36.00	-35.09	HORIZONTAL
3	398.60	-77.51	6.83	-70.68	-36.00	-34.68	HORIZONTAL
4	581.93	-80.86	10.81	-70.05	-54.00	-16.05	HORIZONTAL
5	664.38	-80.27	11.91	-68.36	-54.00	-14.36	HORIZONTAL
6	823.46	-80.79	14.55	-66.24	-54.00	-12.24	HORIZONTAL
7	4960.00	-59.49	16.15	-43.34	-30.00	-13.34	HORIZONTAL
8	7440.00	-59.40	23.28	-36.12	-30.00	-6.12	HORIZONTAL

Measurement uncertainty	30MHz - 80MHz: 5.04dB
	80MHz -1000MHz: 3.76dB
	1GHz - 26GHz: 4.45dB

Remark:

1. The emission behaviors belong to narrowband spurious emission.
2. Remark " --- " means that the emission level is too low to be measured
3. Aux: Field strength to EIRP correction factor
4. Level (dBm) = Reading (dBm)+Aux(dB)
5. Measurement Range upto 12.75GHz.

Test Mode: BLE mode, TX CH low (Mode name: BWG840E, 6dBm)

Ambient temperature: 25℃ Relative humidity: 60% Test Date: 2019-10-28

No	Freq MHz	Reading dBm	Aux dB	Level dBm	Limit dBm	Margin dB	Pol V/H
1	106.63	-60.32	0.49	-59.83	-54.00	-5.83	VERTICAL
2	213.33	-76.20	2.53	-73.67	-54.00	-19.67	VERTICAL
3	245.34	-74.34	4.60	-69.74	-36.00	-33.74	VERTICAL
4	447.10	-78.47	8.89	-69.58	-36.00	-33.58	VERTICAL
5	639.16	-80.54	11.67	-68.87	-54.00	-14.87	VERTICAL
6	764.29	-80.43	13.63	-66.80	-54.00	-12.80	VERTICAL
7	4804.00	-58.32	15.71	-42.61	-30.00	-12.61	VERTICAL
8	7206.00	-53.67	22.45	-31.22	-30.00	-1.22	VERTICAL
1	106.63	-64.44	1.11	-63.33	-54.00	-9.33	HORIZONTAL
2	154.16	-79.76	4.23	-75.53	-36.00	-39.53	HORIZONTAL
3	286.08	-75.26	3.92	-71.34	-36.00	-35.34	HORIZONTAL
4	398.60	-76.93	6.83	-70.10	-36.00	-34.10	HORIZONTAL
5	562.53	-80.75	10.35	-70.40	-54.00	-16.40	HORIZONTAL
6	677.96	-80.53	12.15	-68.38	-54.00	-14.38	HORIZONTAL
7	4804.00	-58.31	15.63	-42.68	-30.00	-12.68	HORIZONTAL
8	7206.00	-56.07	23.43	-32.64	-30.00	-2.64	HORIZONTAL

Measurement uncertainty	30MHz - 80MHz: 5.04dB
	80MHz -1000MHz: 3.76dB
	1GHz - 26GHz: 4.45dB

Remark:

1. The emission behaviors belong to narrowband spurious emission.
2. Remark " --- " means that the emission level is too low to be measured
3. Aux: Field strength to EIRP correction factor
4. Level (dBm) = Reading (dBm)+Aux(dB)
5. Measurement Range upto 12.75GHz.

Test Mode: BLE mode, TX CH High (Mode name: BWG840E, 6dBm)

Ambient temperature: 25℃ Relative humidity: 60% Test Date: 2019-10-28

No	Freq MHz	Reading dBm	Aux dB	Level dBm	Limit dBm	Margin dB	Pol V/H
1	106.63	-59.59	0.49	-59.10	-54.00	-5.10	VERTICAL
2	230.79	-75.42	3.69	-71.73	-36.00	-35.73	VERTICAL
3	399.57	-76.33	6.14	-70.19	-36.00	-34.19	VERTICAL
4	592.60	-80.77	9.96	-70.81	-54.00	-16.81	VERTICAL
5	693.48	-80.35	13.65	-66.70	-54.00	-12.70	VERTICAL
6	813.76	-81.43	13.83	-67.60	-54.00	-13.60	VERTICAL
7	4960.00	-62.47	16.40	-46.07	-30.00	-16.07	VERTICAL
8	7440.00	-54.17	23.04	-31.13	-30.00	-1.13	VERTICAL
1	106.63	-61.22	1.11	-60.11	-54.00	-6.11	HORIZONTAL
2	247.28	-75.71	4.44	-71.27	-36.00	-35.27	HORIZONTAL
3	398.60	-77.65	6.83	-70.82	-36.00	-34.82	HORIZONTAL
4	571.26	-80.76	10.56	-70.20	-54.00	-16.20	HORIZONTAL
5	719.67	-80.55	13.23	-67.32	-54.00	-13.32	HORIZONTAL
6	829.28	-80.78	14.64	-66.14	-54.00	-12.14	HORIZONTAL
7	4960.00	-58.29	16.15	-42.14	-30.00	-12.14	HORIZONTAL
8	7440.00	-57.43	23.28	-34.15	-30.00	-4.15	HORIZONTAL

Measurement uncertainty	30MHz - 80MHz: 5.04dB
	80MHz -1000MHz: 3.76dB
	1GHz - 26GHz: 4.45dB

Remark:

1. The emission behaviors belong to narrowband spurious emission.
2. Remark " --- " means that the emission level is too low to be measured
3. Aux: Field strength to EIRP correction factor
4. Level (dBm) = Reading (dBm)+Aux(dB)
5. Measurement Range upto 12.75GHz.

Test Mode: BLE mode, TX CH low (Mode name: BWG840X, 2dBm)

Ambient temperature: 25℃ Relative humidity: 60% Test Date: 2019-10-28

No	Freq MHz	Reading dBm	Aux dB	Level dBm	Limit dBm	Margin dB	Pol V/H
1	106.63	-61.15	0.49	-60.66	-54.00	-6.66	VERTICAL
2	152.22	-79.99	5.96	-74.03	-36.00	-38.03	VERTICAL
3	298.69	-77.67	4.27	-73.40	-36.00	-37.40	VERTICAL
4	398.60	-76.60	6.13	-70.47	-36.00	-34.47	VERTICAL
5	481.05	-78.53	8.99	-69.54	-54.00	-15.54	VERTICAL
6	714.82	-80.51	13.83	-66.68	-54.00	-12.68	VERTICAL
7	4808.00	-59.80	15.73	-44.07	-30.00	-14.07	VERTICAL
8	7202.00	-62.06	22.44	-39.62	-30.00	-9.62	VERTICAL
1	106.63	-62.23	1.11	-61.12	-54.00	-7.12	HORIZONTAL
2	256.01	-78.06	4.49	-73.57	-36.00	-37.57	HORIZONTAL
3	398.60	-77.39	6.83	-70.56	-36.00	-34.56	HORIZONTAL
4	601.33	-80.67	11.24	-69.43	-54.00	-15.43	HORIZONTAL
5	755.56	-81.48	14.27	-67.21	-54.00	-13.21	HORIZONTAL
6	849.65	-80.19	14.96	-65.23	-54.00	-11.23	HORIZONTAL
7	4804.00	-56.24	15.63	-40.61	-30.00	-10.61	HORIZONTAL
8	7206.00	-57.11	23.43	-33.68	-30.00	-3.68	HORIZONTAL

Measurement uncertainty	30MHz - 80MHz: 5.04dB
	80MHz -1000MHz: 3.76dB
	1GHz - 26GHz: 4.45dB

Remark:

1. The emission behaviors belong to narrowband spurious emission.
2. Remark " --- " means that the emission level is too low to be measured
3. Aux: Field strength to EIRP correction factor
4. Level (dBm) = Reading (dBm)+Aux(dB)
5. Measurement Range upto 12.75GHz.

Test Mode: BLE mode, TX CH High (Mode name: BWG840X, 2dBm)

Ambient temperature: 25℃ Relative humidity: 60% Test Date: 2019-10-28

No	Freq MHz	Reading dBm	Aux dB	Level dBm	Limit dBm	Margin dB	Pol V/H
1	106.63	-60.39	0.49	-59.90	-54.00	-5.90	VERTICAL
2	163.86	-78.62	4.78	-73.84	-36.00	-37.84	VERTICAL
3	398.60	-76.62	6.13	-70.49	-36.00	-34.49	VERTICAL
4	614.91	-80.31	10.73	-69.58	-54.00	-15.58	VERTICAL
5	722.58	-81.20	13.80	-67.40	-54.00	-13.40	VERTICAL
6	833.16	-79.98	14.39	-65.59	-54.00	-11.59	VERTICAL
7	4960.00	-61.45	16.40	-45.05	-30.00	-15.05	VERTICAL
8	7440.00	-61.96	23.04	-38.92	-30.00	-8.92	VERTICAL
1	106.63	-61.27	1.11	-60.16	-54.00	-6.16	HORIZONTAL
2	254.07	-78.26	4.53	-73.73	-36.00	-37.73	HORIZONTAL
3	399.57	-77.05	6.86	-70.19	-36.00	-34.19	HORIZONTAL
4	499.48	-77.34	8.42	-68.92	-54.00	-14.92	HORIZONTAL
5	695.42	-80.64	12.45	-68.19	-54.00	-14.19	HORIZONTAL
6	767.20	-80.66	14.24	-66.42	-54.00	-12.42	HORIZONTAL
7	4960.00	-59.75	16.15	-43.60	-30.00	-13.60	HORIZONTAL
8	7440.00	-61.28	23.28	-38.00	-30.00	-8.00	HORIZONTAL

Measurement uncertainty	30MHz - 80MHz: 5.04dB
	80MHz -1000MHz: 3.76dB
	1GHz - 26GHz: 4.45dB

Remark:

1. The emission behaviors belong to narrowband spurious emission.
2. Remark " --- " means that the emission level is too low to be measured
3. Aux: Field strength to EIRP correction factor
4. Level (dBm) = Reading (dBm)+Aux(dB)
5. Measurement Range upto 12.75GHz.

Test Mode: BLE mode, TX CH low (Mode name: BWG840X, 6dBm)

Ambient temperature: 25℃ Relative humidity: 60% Test Date: 2019-10-28

No	Freq MHz	Reading dBm	Aux dB	Level dBm	Limit dBm	Margin dB	Pol V/H
1	106.63	-62.15	0.49	-61.66	-54.00	-7.66	VERTICAL
2	151.25	-79.58	6.07	-73.51	-36.00	-37.51	VERTICAL
3	260.86	-78.24	4.73	-73.51	-36.00	-37.51	VERTICAL
4	465.53	-80.00	9.02	-70.98	-36.00	-34.98	VERTICAL
5	622.67	-79.74	11.04	-68.70	-54.00	-14.70	VERTICAL
6	804.06	-79.44	13.55	-65.89	-54.00	-11.89	VERTICAL
7	4804.00	-57.88	15.71	-42.17	-30.00	-12.17	VERTICAL
8	7206.00	-56.44	22.45	-33.99	-30.00	-3.99	VERTICAL
1	106.63	-60.51	1.11	-59.40	-54.00	-5.40	HORIZONTAL
2	255.04	-78.77	4.51	-74.26	-36.00	-38.26	HORIZONTAL
3	398.60	-76.98	6.83	-70.15	-36.00	-34.15	HORIZONTAL
4	580.96	-80.22	10.79	-69.43	-54.00	-15.43	HORIZONTAL
5	686.69	-81.28	12.30	-68.98	-54.00	-14.98	HORIZONTAL
6	833.16	-79.27	14.70	-64.57	-54.00	-10.57	HORIZONTAL
7	4804.00	-55.06	15.63	-39.43	-30.00	-9.43	HORIZONTAL
8	7206.00	-57.75	23.43	-34.32	-30.00	-4.32	HORIZONTAL

Measurement uncertainty	30MHz - 80MHz: 5.04dB
	80MHz -1000MHz: 3.76dB
	1GHz - 26GHz: 4.45dB

Remark:

1. The emission behaviors belong to narrowband spurious emission.
2. Remark " --- " means that the emission level is too low to be measured
3. Aux: Field strength to EIRP correction factor
4. Level (dBm) = Reading (dBm)+Aux(dB)
5. Measurement Range upto 12.75GHz.

Test Mode: BLE mode, TX CH High (Mode name: BWG840X, 6dBm)

Ambient temperature: 25℃ Relative humidity: 60% Test Date: 2019-10-28

No	Freq MHz	Reading dBm	Aux dB	Level dBm	Limit dBm	Margin dB	Pol V/H
1	106.63	-60.80	0.49	-60.31	-54.00	-6.31	VERTICAL
2	153.19	-78.58	5.86	-72.72	-36.00	-36.72	VERTICAL
3	246.31	-78.00	4.66	-73.34	-36.00	-37.34	VERTICAL
4	453.89	-79.38	9.04	-70.34	-36.00	-34.34	VERTICAL
5	654.68	-81.10	12.25	-68.85	-54.00	-14.85	VERTICAL
6	833.16	-79.82	14.39	-65.43	-54.00	-11.43	VERTICAL
7	4960.00	-60.70	16.40	-44.30	-30.00	-14.30	VERTICAL
8	7440.00	-54.77	23.04	-31.73	-30.00	-1.73	VERTICAL
1	106.63	-61.36	1.11	-60.25	-54.00	-6.25	HORIZONTAL
2	249.22	-78.13	4.56	-73.57	-36.00	-37.57	HORIZONTAL
3	398.60	-76.86	6.83	-70.03	-36.00	-34.03	HORIZONTAL
4	462.62	-78.66	8.37	-70.29	-36.00	-34.29	HORIZONTAL
5	564.47	-80.30	10.40	-69.90	-54.00	-15.90	HORIZONTAL
6	748.77	-80.56	14.24	-66.32	-54.00	-12.32	HORIZONTAL
7	4960.00	-57.72	16.15	-41.57	-30.00	-11.57	HORIZONTAL
8	7440.00	-56.19	23.28	-32.91	-30.00	-2.91	HORIZONTAL

Measurement uncertainty	30MHz - 80MHz: 5.04dB
	80MHz -1000MHz: 3.76dB
	1GHz - 26GHz: 4.45dB

Remark:

1. The emission behaviors belong to narrowband spurious emission.
2. Remark " --- " means that the emission level is too low to be measured
3. Aux: Field strength to EIRP correction factor
4. Level (dBm) = Reading (dBm)+Aux(dB)
5. Measurement Range upto 12.75GHz.

8 Emission Bandwidth Measurement

8.1. Limit:

99% power emission bandwidth shall within 2400MHz and 2483.5MHz.

According to AS/NZS 4268:2017, section 6.5.

8.2. Measurement Equipment Used:

Refer to section 6.2 of present report.

8.3. Test Setup:

Refer to section 6.3 of present report.

8.4. Test Procedure:

Refer to section 6.5 of AS/NZS 4268 for the details.

8.5. Measurement Result:

N/A

9 Operating Frequencies Measurement

9.1. Limit:

2400MHz and 2483.5MHz.

According to AS/NZS 4268:2017 section 6.6.

9.2. Measurement Equipment Used:

Refer to section 6.2 of present report.

9.3. Test Setup:

Refer to section 6.3 of present report.

9.4. Test Procedure:

Refer to ETSI EN 300 440-1 V1.6.1, clause 7.2.2 and 7.2.3.

Refer to ETSI EN 300 328 V2.1.1, clause 4.3.2.7

9.5. Measurement Result:

N/A

10 Receiver Emissions Measurement

10.1. Limit:

According to section 7.2 of AS/NZS 4268:2017

25MHz to 1 GHz 2 nW ERP (-57 dBm).

1GHz to 40 GHz 20 nW ERP (-47 dBm).

10.2. Measurement Equipment Used:

Refer to section 6.2 of present report.

10.3. Test Setup:

Refer to section 6.3 of present report.

10.4. Test Procedure:

Refer to ETSI EN 300 440-1 V1.6.1, clause 8.4.

10.5. Measurement Result:

Test Mode: 802.11b mode, RX CH low

Ambient temperature: 25℃ Relative humidity: 60% Test Date: 2019-10-28

No	Freq MHz	Reading dBm	Aux dB	Level dBm	Limit dBm	Margin dB	Pol V/H
1	106.63	-68.34	0.49	-67.85	-57.00	-10.85	VERTICAL
2	258.92	-70.79	4.76	-66.03	-57.00	-9.03	VERTICAL
3	333.61	-76.03	5.11	-70.92	-57.00	-13.92	VERTICAL
4	453.89	-80.18	9.04	-71.14	-57.00	-14.14	VERTICAL
5	654.68	-82.02	12.25	-69.77	-57.00	-12.77	VERTICAL
6	740.04	-81.31	13.74	-67.57	-57.00	-10.57	VERTICAL
7	3751.00	-71.65	10.91	-60.74	-47.00	-13.74	VERTICAL
8	5900.00	-73.22	18.47	-54.75	-47.00	-7.75	VERTICAL
1	106.63	-64.85	1.11	-63.74	-57.00	-6.74	HORIZONTAL
2	223.03	-73.53	2.88	-70.65	-57.00	-13.65	HORIZONTAL
3	296.75	-71.54	3.74	-67.80	-57.00	-10.80	HORIZONTAL
4	371.44	-78.56	5.94	-72.62	-57.00	-15.62	HORIZONTAL
5	519.85	-78.69	9.08	-69.61	-57.00	-12.61	HORIZONTAL
6	593.57	-79.34	11.08	-68.26	-57.00	-11.26	HORIZONTAL
7	3849.00	-71.57	11.75	-59.82	-47.00	-12.82	HORIZONTAL
8	6446.00	-74.01	23.36	-50.65	-47.00	-3.65	HORIZONTAL

Measurement uncertainty	30MHz - 80MHz: 5.04dB
	80MHz -1000MHz: 3.76dB
	1GHz - 26GHz: 4.45dB

Remark:

1. The emission behaviors belong to narrowband spurious emission.
2. Remark " --- " means that the emission level is too low to be measured
3. Aux: Field strength to EIRP correction factor
4. Level (dBm) = Reading (dBm)+Aux(dB)
5. Measurement Range upto 12.75GHz.

Test Mode: 802.11b mode, RX CH High

Ambient temperature: 25℃ Relative humidity: 60% Test Date: 2019-10-28

No	Freq MHz	Reading dBm	Aux dB	Level dBm	Limit dBm	Margin dB	Pol V/H
1	106.63	-60.90	0.49	-60.41	-57.00	-3.41	VERTICAL
2	259.89	-71.11	4.74	-66.37	-57.00	-9.37	VERTICAL
3	295.78	-72.93	4.31	-68.62	-57.00	-11.62	VERTICAL
4	369.50	-75.22	5.76	-69.46	-57.00	-12.46	VERTICAL
5	483.96	-80.03	8.98	-71.05	-57.00	-14.05	VERTICAL
6	740.04	-80.45	13.74	-66.71	-57.00	-9.71	VERTICAL
7	1994.00	-63.20	4.60	-58.60	-47.00	-11.60	VERTICAL
8	4395.00	-72.38	13.92	-58.46	-47.00	-11.46	VERTICAL
1	106.63	-63.90	1.11	-62.79	-57.00	-5.79	HORIZONTAL
2	296.75	-72.04	3.74	-68.30	-57.00	-11.30	HORIZONTAL
3	445.16	-77.49	8.21	-69.28	-57.00	-12.28	HORIZONTAL
4	519.85	-78.28	9.08	-69.20	-57.00	-12.20	HORIZONTAL
5	591.63	-79.03	11.04	-67.99	-57.00	-10.99	HORIZONTAL
6	665.35	-79.86	11.93	-67.93	-57.00	-10.93	HORIZONTAL
7	4871.00	-71.12	15.86	-55.26	-47.00	-8.26	HORIZONTAL
8	6705.00	-74.72	23.74	-50.98	-47.00	-3.98	HORIZONTAL

Measurement uncertainty	30MHz - 80MHz: 5.04dB
	80MHz -1000MHz: 3.76dB
	1GHz - 26GHz: 4.45dB

Remark:

1. The emission behaviors belong to narrowband spurious emission.
2. Remark " --- " means that the emission level is too low to be measured
3. Aux: Field strength to EIRP correction factor
4. Level (dBm) = Reading (dBm)+Aux(dB)
5. Measurement Range upto 12.75GHz.

Test Mode: BLE mode, RX CH low (Mode name: BWG840E, 2dBm)

Ambient temperature: 25℃ Relative humidity: 60% Test Date: 2019-10-28

No	Freq MHz	Reading dBm	Aux dB	Level dBm	Limit dBm	Margin dB	Pol V/H
1	148.34	-89.49	6.01	-83.48	-57.00	-26.48	VERTICAL
2	268.62	-89.01	4.63	-84.38	-57.00	-27.38	VERTICAL
3	437.40	-88.24	8.35	-79.89	-57.00	-22.89	VERTICAL
4	681.84	-88.95	13.24	-75.71	-57.00	-18.71	VERTICAL
5	821.52	-86.82	14.06	-72.76	-57.00	-15.76	VERTICAL
6	925.31	-87.46	17.25	-70.21	-57.00	-13.21	VERTICAL
7	3793.00	-72.12	11.17	-60.95	-47.00	-13.95	VERTICAL
8	5634.00	-73.64	18.04	-55.60	-47.00	-8.60	VERTICAL
1	154.16	-88.76	4.23	-84.53	-57.00	-27.53	HORIZONTAL
2	325.85	-88.97	4.50	-84.47	-57.00	-27.47	HORIZONTAL
3	442.25	-89.21	8.13	-81.08	-57.00	-24.08	HORIZONTAL
4	561.56	-88.22	10.32	-77.90	-57.00	-20.90	HORIZONTAL
5	725.49	-86.97	13.44	-73.53	-57.00	-16.53	HORIZONTAL
6	876.81	-87.68	15.39	-72.29	-57.00	-15.29	HORIZONTAL
7	4234.00	-73.22	13.60	-59.62	-47.00	-12.62	HORIZONTAL
8	6733.00	-74.41	23.72	-50.69	-47.00	-3.69	HORIZONTAL

Measurement uncertainty	30MHz - 80MHz: 5.04dB
	80MHz -1000MHz: 3.76dB
	1GHz - 26GHz: 4.45dB

Remark:

1. The emission behaviors belong to narrowband spurious emission.
2. Remark " --- " means that the emission level is too low to be measured
3. Aux: Field strength to EIRP correction factor
4. Level (dBm) = Reading (dBm)+Aux(dB)
5. Measurement Range upto 12.75GHz.

Test Mode: BLE mode, RX CH High (Mode name: BWG840E, 2dBm)

Ambient temperature: 25℃ Relative humidity: 60% Test Date: 2019-10-28

No	Freq MHz	Reading dBm	Aux dB	Level dBm	Limit dBm	Margin dB	Pol V/H
1	148.34	-89.24	6.01	-83.23	-57.00	-26.23	VERTICAL
2	315.18	-89.00	4.66	-84.34	-57.00	-27.34	VERTICAL
3	437.40	-89.00	8.35	-80.65	-57.00	-23.65	VERTICAL
4	483.96	-87.91	8.98	-78.93	-57.00	-21.93	VERTICAL
5	660.50	-88.23	12.47	-75.76	-57.00	-18.76	VERTICAL
6	766.23	-87.40	13.62	-73.78	-57.00	-16.78	VERTICAL
7	4458.00	-72.63	14.16	-58.47	-47.00	-11.47	VERTICAL
8	6922.00	-72.89	21.55	-51.34	-47.00	-4.34	VERTICAL
1	264.74	-88.83	4.32	-84.51	-57.00	-27.51	HORIZONTAL
2	411.21	-88.22	7.22	-81.00	-57.00	-24.00	HORIZONTAL
3	555.74	-89.21	10.18	-79.03	-57.00	-22.03	HORIZONTAL
4	684.75	-89.12	12.27	-76.85	-57.00	-19.85	HORIZONTAL
5	772.05	-86.93	14.23	-72.70	-57.00	-15.70	HORIZONTAL
6	880.69	-87.04	15.45	-71.59	-57.00	-14.59	HORIZONTAL
7	3891.00	-70.88	12.02	-58.86	-47.00	-11.86	HORIZONTAL
8	7027.00	-73.05	23.55	-49.50	-47.00	-2.50	HORIZONTAL

Measurement uncertainty	30MHz - 80MHz: 5.04dB
	80MHz -1000MHz: 3.76dB
	1GHz - 26GHz: 4.45dB

Remark:

1. The emission behaviors belong to narrowband spurious emission.
2. Remark " --- " means that the emission level is too low to be measured
3. Aux: Field strength to EIRP correction factor
4. Level (dBm) = Reading (dBm)+Aux(dB)
5. Measurement Range upto 12.75GHz.

Test Mode: BLE mode, RX CH low (Mode name: BWG840E, 6dBm)

Ambient temperature: 25℃ Relative humidity: 60% Test Date: 2019-10-28

No	Freq MHz	Reading dBm	Aux dB	Level dBm	Limit dBm	Margin dB	Pol V/H
1	256.01	-89.00	4.80	-84.20	-57.00	-27.20	VERTICAL
2	429.64	-89.16	7.91	-81.25	-57.00	-24.25	VERTICAL
3	605.21	-89.24	10.35	-78.89	-57.00	-21.89	VERTICAL
4	714.82	-88.12	13.83	-74.29	-57.00	-17.29	VERTICAL
5	838.98	-88.22	14.55	-73.67	-57.00	-16.67	VERTICAL
6	911.73	-88.34	17.00	-71.34	-57.00	-14.34	VERTICAL
7	4171.00	-71.50	13.07	-58.43	-47.00	-11.43	VERTICAL
8	7034.00	-74.79	22.00	-52.79	-47.00	-5.79	VERTICAL
1	313.24	-89.29	4.11	-85.18	-57.00	-28.18	HORIZONTAL
2	452.92	-87.91	8.35	-79.56	-57.00	-22.56	HORIZONTAL
3	587.75	-89.18	10.95	-78.23	-57.00	-21.23	HORIZONTAL
4	720.64	-88.65	13.27	-75.38	-57.00	-18.38	HORIZONTAL
5	805.03	-87.89	14.24	-73.65	-57.00	-16.65	HORIZONTAL
6	891.36	-87.62	15.61	-72.01	-57.00	-15.01	HORIZONTAL
7	4339.00	-71.81	13.99	-57.82	-47.00	-10.82	HORIZONTAL
8	6677.00	-73.60	23.75	-49.85	-47.00	-2.85	HORIZONTAL

Measurement uncertainty	30MHz - 80MHz: 5.04dB
	80MHz -1000MHz: 3.76dB
	1GHz - 26GHz: 4.45dB

Remark:

1. The emission behaviors belong to narrowband spurious emission.
2. Remark " --- " means that the emission level is too low to be measured
3. Aux: Field strength to EIRP correction factor
4. Level (dBm) = Reading (dBm)+Aux(dB)
5. Measurement Range upto 12.75GHz.

Test Mode: BLE mode, RX CH High (Mode name: BWG840E, 6dBm)

Ambient temperature: 25℃ Relative humidity: 60% Test Date: 2019-10-28

No	Freq MHz	Reading dBm	Aux dB	Level dBm	Limit dBm	Margin dB	Pol V/H
1	242.43	-88.91	4.42	-84.49	-57.00	-27.49	VERTICAL
2	418.97	-89.22	7.29	-81.93	-57.00	-24.93	VERTICAL
3	482.99	-88.35	8.98	-79.37	-57.00	-22.37	VERTICAL
4	663.41	-87.73	12.58	-75.15	-57.00	-18.15	VERTICAL
5	741.98	-87.12	13.74	-73.38	-57.00	-16.38	VERTICAL
6	899.12	-87.93	16.75	-71.18	-57.00	-14.18	VERTICAL
7	4654.00	-72.97	15.03	-57.94	-47.00	-10.94	VERTICAL
8	6859.00	-73.90	21.26	-52.64	-47.00	-5.64	VERTICAL
1	269.59	-88.30	4.23	-84.07	-57.00	-27.07	HORIZONTAL
2	379.20	-89.53	6.20	-83.33	-57.00	-26.33	HORIZONTAL
3	529.55	-89.00	9.40	-79.60	-57.00	-22.60	HORIZONTAL
4	597.45	-88.33	11.17	-77.16	-57.00	-20.16	HORIZONTAL
5	769.14	-86.77	14.23	-72.54	-57.00	-15.54	HORIZONTAL
6	879.72	-87.35	15.43	-71.92	-57.00	-14.92	HORIZONTAL
7	4003.00	-70.22	12.69	-57.53	-47.00	-10.53	HORIZONTAL
8	6551.00	-72.98	23.83	-49.15	-47.00	-2.15	HORIZONTAL

Measurement uncertainty	30MHz - 80MHz: 5.04dB
	80MHz -1000MHz: 3.76dB
	1GHz - 26GHz: 4.45dB

Remark:

1. The emission behaviors belong to narrowband spurious emission.
2. Remark " --- " means that the emission level is too low to be measured
3. Aux: Field strength to EIRP correction factor
4. Level (dBm) = Reading (dBm)+Aux(dB)
5. Measurement Range upto 12.75GHz.

Test Mode: BLE mode, RX CH low (Mode name: BWG840X, 2dBm)

Ambient temperature: 25℃ Relative humidity: 60% Test Date: 2019-10-28

No	Freq MHz	Reading dBm	Aux dB	Level dBm	Limit dBm	Margin dB	Pol V/H
1	377.26	-88.31	5.87	-82.44	-57.00	-25.44	VERTICAL
2	459.71	-88.43	9.03	-79.40	-57.00	-22.40	VERTICAL
3	641.10	-88.70	11.75	-76.95	-57.00	-19.95	VERTICAL
4	732.28	-87.51	13.77	-73.74	-57.00	-16.74	VERTICAL
5	883.60	-88.41	16.16	-72.25	-57.00	-15.25	VERTICAL
6	919.49	-87.60	17.14	-70.46	-57.00	-13.46	VERTICAL
7	3779.00	-71.45	11.08	-60.37	-47.00	-13.37	VERTICAL
8	6677.00	-73.82	20.41	-53.41	-47.00	-6.41	VERTICAL
1	405.39	-89.55	7.04	-82.51	-57.00	-25.51	HORIZONTAL
2	471.35	-89.92	8.38	-81.54	-57.00	-24.54	HORIZONTAL
3	583.87	-90.12	10.86	-79.26	-57.00	-22.26	HORIZONTAL
4	675.05	-88.78	12.10	-76.68	-57.00	-19.68	HORIZONTAL
5	776.90	-88.74	14.21	-74.53	-57.00	-17.53	HORIZONTAL
6	903.97	-88.63	15.85	-72.78	-57.00	-15.78	HORIZONTAL
7	4262.00	-72.43	13.70	-58.73	-47.00	-11.73	HORIZONTAL
8	6600.00	-73.71	23.80	-49.91	-47.00	-2.91	HORIZONTAL

Measurement uncertainty	30MHz - 80MHz: 5.04dB
	80MHz -1000MHz: 3.76dB
	1GHz - 26GHz: 4.45dB

Remark:

1. The emission behaviors belong to narrowband spurious emission.
2. Remark " --- " means that the emission level is too low to be measured
3. Aux: Field strength to EIRP correction factor
4. Level (dBm) = Reading (dBm)+Aux(dB)
5. Measurement Range upto 12.75GHz.

Test Mode: BLE mode, RX CH High (Mode name: BWG840X, 2dBm)

Ambient temperature: 25℃ Relative humidity: 60% Test Date: 2019-10-28

No	Freq MHz	Reading dBm	Aux dB	Level dBm	Limit dBm	Margin dB	Pol V/H
1	410.24	-88.82	6.77	-82.05	-57.00	-25.05	VERTICAL
2	489.78	-88.26	8.97	-79.29	-57.00	-22.29	VERTICAL
3	592.60	-88.90	9.96	-78.94	-57.00	-21.94	VERTICAL
4	680.87	-88.92	13.21	-75.71	-57.00	-18.71	VERTICAL
5	791.45	-87.60	13.48	-74.12	-57.00	-17.12	VERTICAL
6	891.36	-87.86	16.46	-71.40	-57.00	-14.40	VERTICAL
7	5067.00	-73.80	16.74	-57.06	-47.00	-10.06	VERTICAL
8	6936.00	-74.36	21.62	-52.74	-47.00	-5.74	VERTICAL
1	391.81	-86.32	6.61	-79.71	-57.00	-22.71	HORIZONTAL
2	550.89	-89.44	10.06	-79.38	-57.00	-22.38	HORIZONTAL
3	658.56	-89.17	11.81	-77.36	-57.00	-20.36	HORIZONTAL
4	732.28	-87.36	13.67	-73.69	-57.00	-16.69	HORIZONTAL
5	842.86	-87.48	14.86	-72.62	-57.00	-15.62	HORIZONTAL
6	909.79	-86.53	16.00	-70.53	-57.00	-13.53	HORIZONTAL
7	4465.00	-72.77	14.45	-58.32	-47.00	-11.32	HORIZONTAL
8	6838.00	-72.70	23.66	-49.04	-47.00	-2.04	HORIZONTAL

Measurement uncertainty	30MHz - 80MHz: 5.04dB
	80MHz -1000MHz: 3.76dB
	1GHz - 26GHz: 4.45dB

Remark:

1. The emission behaviors belong to narrowband spurious emission.
2. Remark " --- " means that the emission level is too low to be measured
3. Aux: Field strength to EIRP correction factor
4. Level (dBm) = Reading (dBm)+Aux(dB)
5. Measurement Range upto 12.75GHz.

Test Mode: BLE mode, RX CH low (Mode name: BWG840X, 6dBm)

Ambient temperature: 25℃ Relative humidity: 60% Test Date: 2019-10-28

No	Freq MHz	Reading dBm	Aux dB	Level dBm	Limit dBm	Margin dB	Pol V/H
1	416.06	-88.80	7.12	-81.68	-57.00	-24.68	VERTICAL
2	463.59	-88.14	9.02	-79.12	-57.00	-22.12	VERTICAL
3	530.52	-88.32	8.93	-79.39	-57.00	-22.39	VERTICAL
4	694.45	-88.33	13.69	-74.64	-57.00	-17.64	VERTICAL
5	774.96	-87.78	13.57	-74.21	-57.00	-17.21	VERTICAL
6	899.12	-88.41	16.75	-71.66	-57.00	-14.66	VERTICAL
7	3009.00	-72.10	7.30	-64.80	-47.00	-17.80	VERTICAL
8	5242.00	-72.70	17.19	-55.51	-47.00	-8.51	VERTICAL
1	394.72	-88.49	6.70	-81.79	-57.00	-24.79	HORIZONTAL
2	529.55	-88.54	9.40	-79.14	-57.00	-22.14	HORIZONTAL
3	714.82	-87.40	13.06	-74.34	-57.00	-17.34	HORIZONTAL
4	749.74	-87.89	14.27	-73.62	-57.00	-16.62	HORIZONTAL
5	853.53	-87.92	15.03	-72.89	-57.00	-15.89	HORIZONTAL
6	939.86	-87.97	16.79	-71.18	-57.00	-14.18	HORIZONTAL
7	4437.00	-72.29	14.35	-57.94	-47.00	-10.94	HORIZONTAL
8	6656.00	-73.72	23.77	-49.95	-47.00	-2.95	HORIZONTAL

Measurement uncertainty	30MHz - 80MHz: 5.04dB
	80MHz -1000MHz: 3.76dB
	1GHz - 26GHz: 4.45dB

Remark:

1. The emission behaviors belong to narrowband spurious emission.
2. Remark " --- " means that the emission level is too low to be measured
3. Aux: Field strength to EIRP correction factor
4. Level (dBm) = Reading (dBm)+Aux(dB)
5. Measurement Range upto 12.75GHz.

Test Mode: BLE mode, RX CH High (Mode name: BWG840X, 6dBm)

Ambient temperature: 25℃ Relative humidity: 60% Test Date: 2019-10-28

No	Freq MHz	Reading dBm	Aux dB	Level dBm	Limit dBm	Margin dB	Pol V/H
1	345.25	-89.42	5.39	-84.03	-57.00	-27.03	VERTICAL
2	432.55	-89.45	8.08	-81.37	-57.00	-24.37	VERTICAL
3	534.40	-88.07	8.92	-79.15	-57.00	-22.15	VERTICAL
4	709.97	-89.36	13.85	-75.51	-57.00	-18.51	VERTICAL
5	722.58	-87.52	13.80	-73.72	-57.00	-16.72	VERTICAL
6	889.42	-87.96	16.38	-71.58	-57.00	-14.58	VERTICAL
7	4164.00	-71.45	13.04	-58.41	-47.00	-11.41	VERTICAL
8	6845.00	-74.01	21.20	-52.81	-47.00	-5.81	VERTICAL
1	373.38	-89.23	6.01	-83.22	-57.00	-26.22	HORIZONTAL
2	482.02	-88.36	8.40	-79.96	-57.00	-22.96	HORIZONTAL
3	536.34	-88.57	9.61	-78.96	-57.00	-21.96	HORIZONTAL
4	632.37	-88.72	11.51	-77.21	-57.00	-20.21	HORIZONTAL
5	749.74	-86.96	14.27	-72.69	-57.00	-15.69	HORIZONTAL
6	881.66	-87.05	15.46	-71.59	-57.00	-14.59	HORIZONTAL
7	4374.00	-73.01	14.12	-58.89	-47.00	-11.89	HORIZONTAL
8	6761.00	-74.53	23.71	-50.82	-47.00	-3.82	HORIZONTAL

Measurement uncertainty	30MHz - 80MHz: 5.04dB
	80MHz -1000MHz: 3.76dB
	1GHz - 26GHz: 4.45dB

Remark:

1. The emission behaviors belong to narrowband spurious emission.
2. Remark " --- " means that the emission level is too low to be measured
3. Aux: Field strength to EIRP correction factor
4. Level (dBm) = Reading (dBm)+Aux(dB)
5. Measurement Range upto 12.75GHz.

11 Radiated Peak Power Spectral Density Measurement

11.1. Limit:

According to AS/NZS 4268:2017, Table 1, Note 2.

The radiated peak power spectral density in any 3kHz is limited to 25mW per 3kHz.

11.2. Measurement Equipment Used:

Refer to section 6.2.

11.3. Test Setup:

Refer to section 6.3.

11.4. Test Procedure:

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW = 3kHz, VBW = 10kHz, Span = 1.5MHz, Sweep=100s, Record the max. reading.
4. Repeat above procedures until all frequency measured were complete.

11.5. Measurement Result:

Dipole Antenna

BT 4.0LE

Channel	Power Density Reading (dBm)	Antenna Gian (dBi)	EIRP	Maximum Limit (dBm)
Low	-3.60	0.00	-3.60	13.97
Mid	-4.12	0.00	-4.12	13.97
High	-4.90	0.00	-4.90	13.97

PCB Antenna

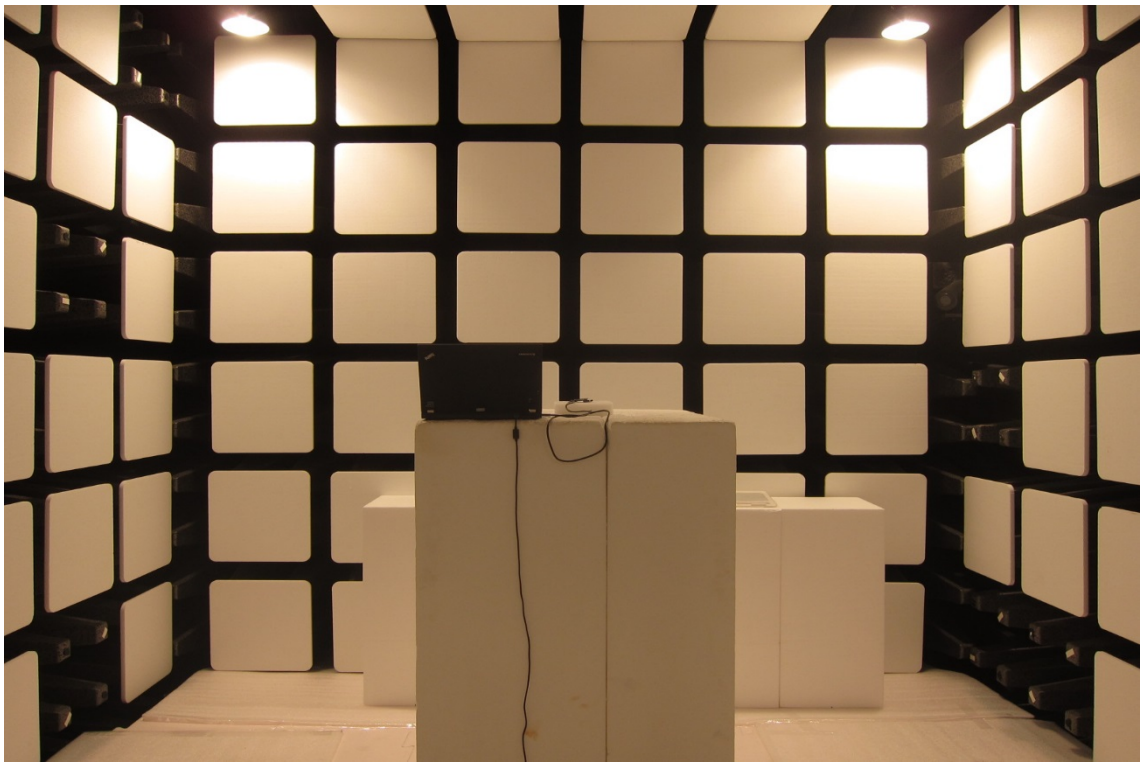
BT 4.0LE

Channel	Power Density Reading (dBm)	Antenna Gian (dBi)	EIRP	Maximum Limit (dBm)
Low	-3.60	0.51	-3.09	13.97
Mid	-4.12	0.51	-3.61	13.97
High	-4.90	0.51	-4.39	13.97

Appendix 1
Photographs of Test Setup

Radiated Emission Test

PCB Antenna

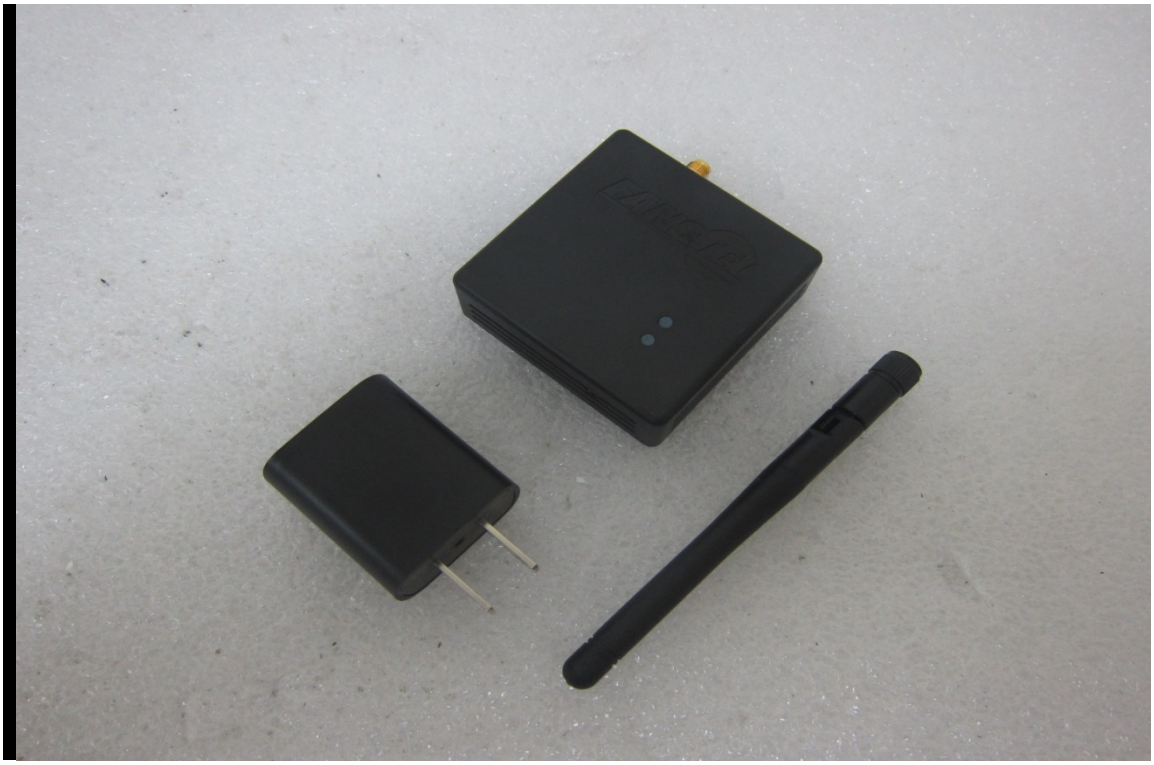


Radiated Emission Test

Dipole Antenna

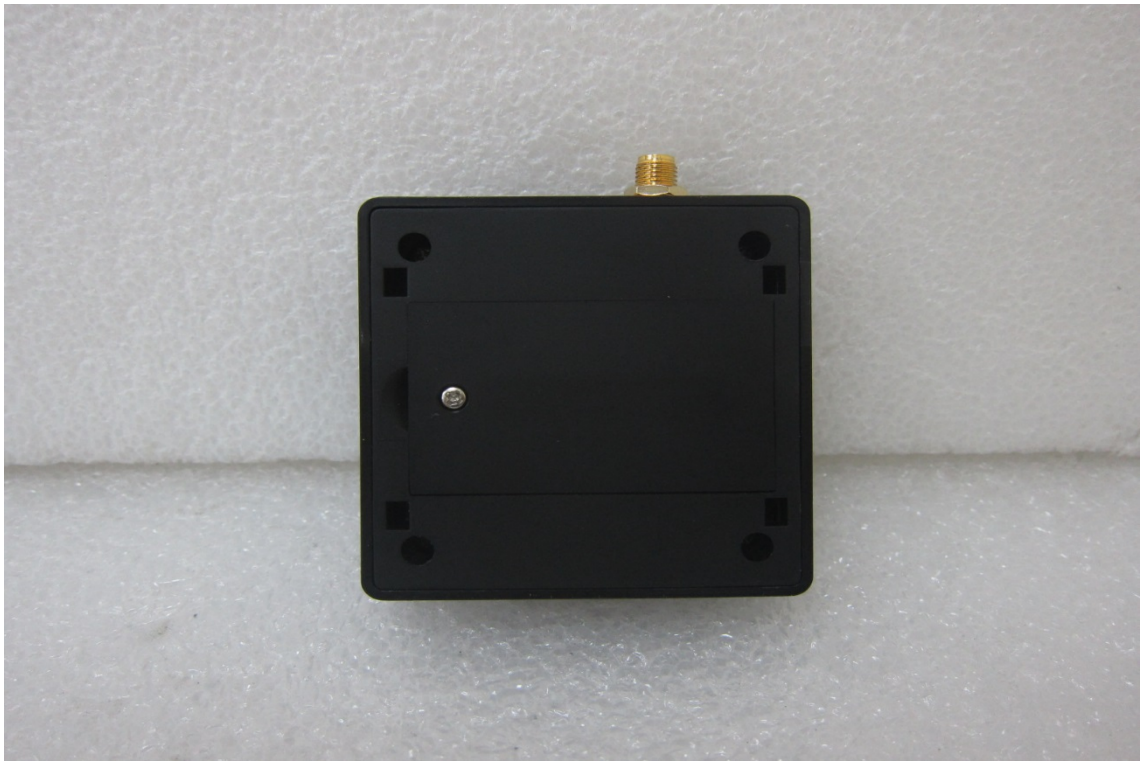
Appendix 2
Photographs of EUT

EUT 1



EUT 2 BGW840E

EUT 3 BGW840E



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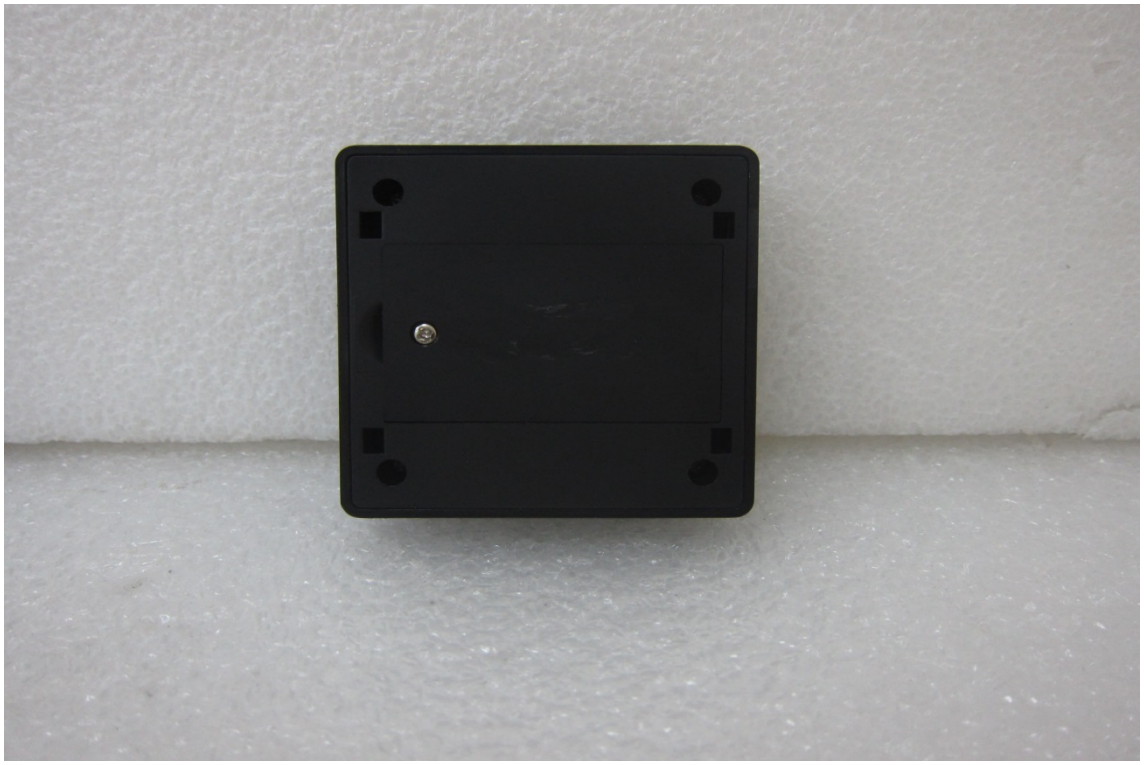
EUT 5 BGW840E

EUT 6 BGW840E

EUT 7 BGW840E

EUT 8 BWG840F

EUT 9 BWG840F



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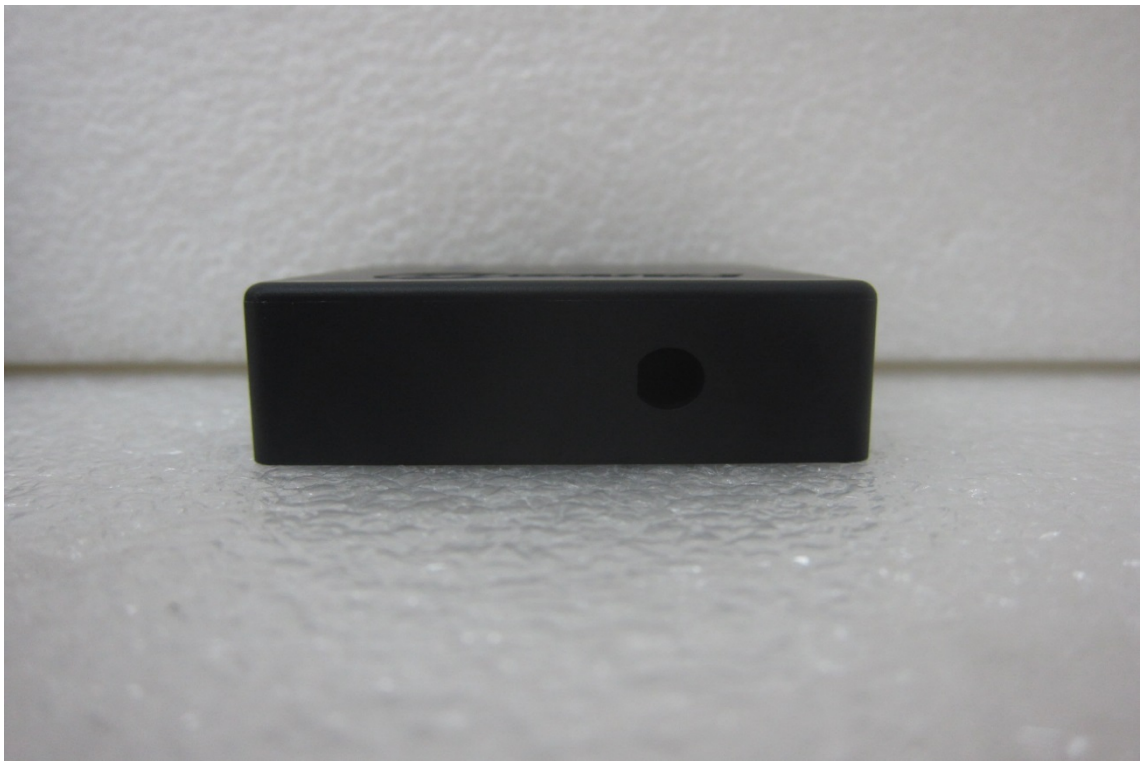

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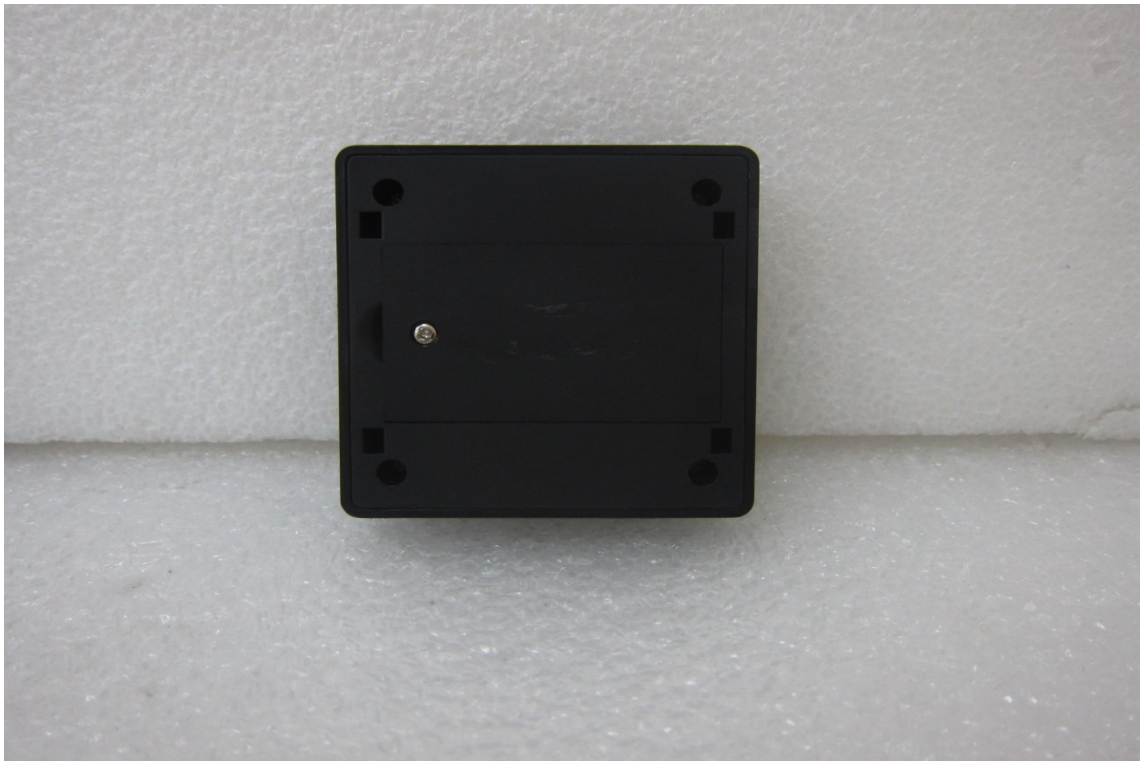
EUT 12 BWG840F

EUT 13 BWG840F

EUT 14 BWG840X

EUT 15 BWG840X



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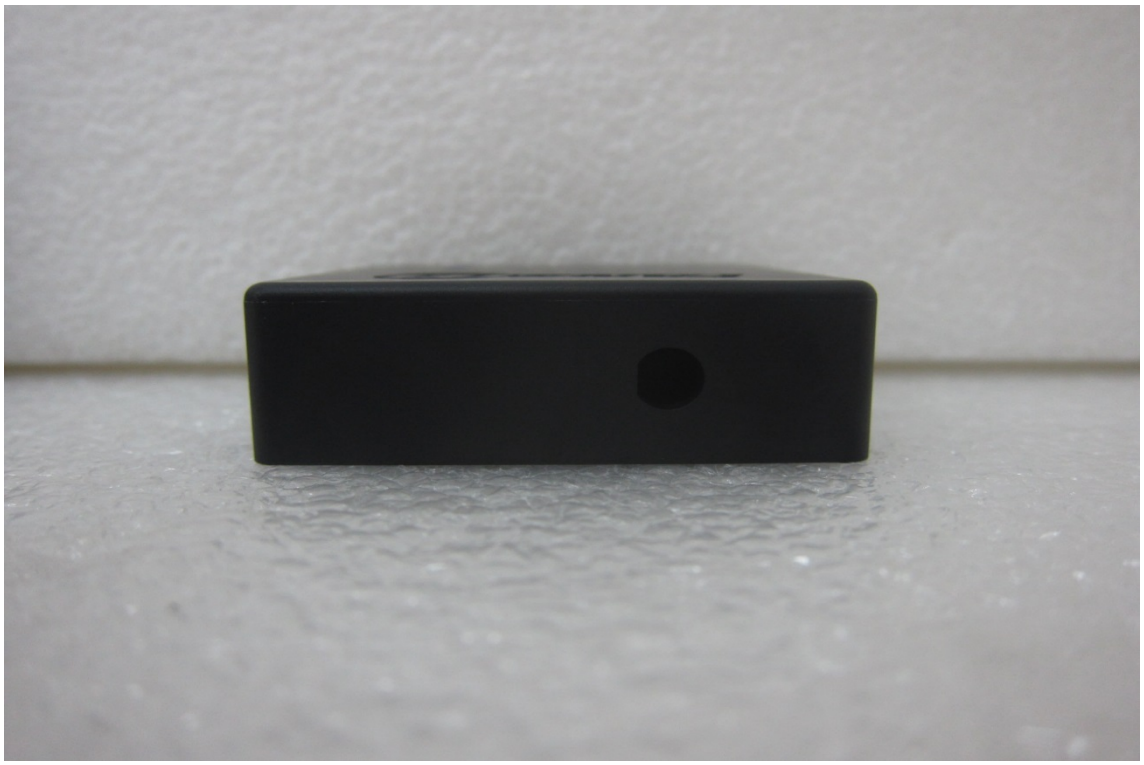


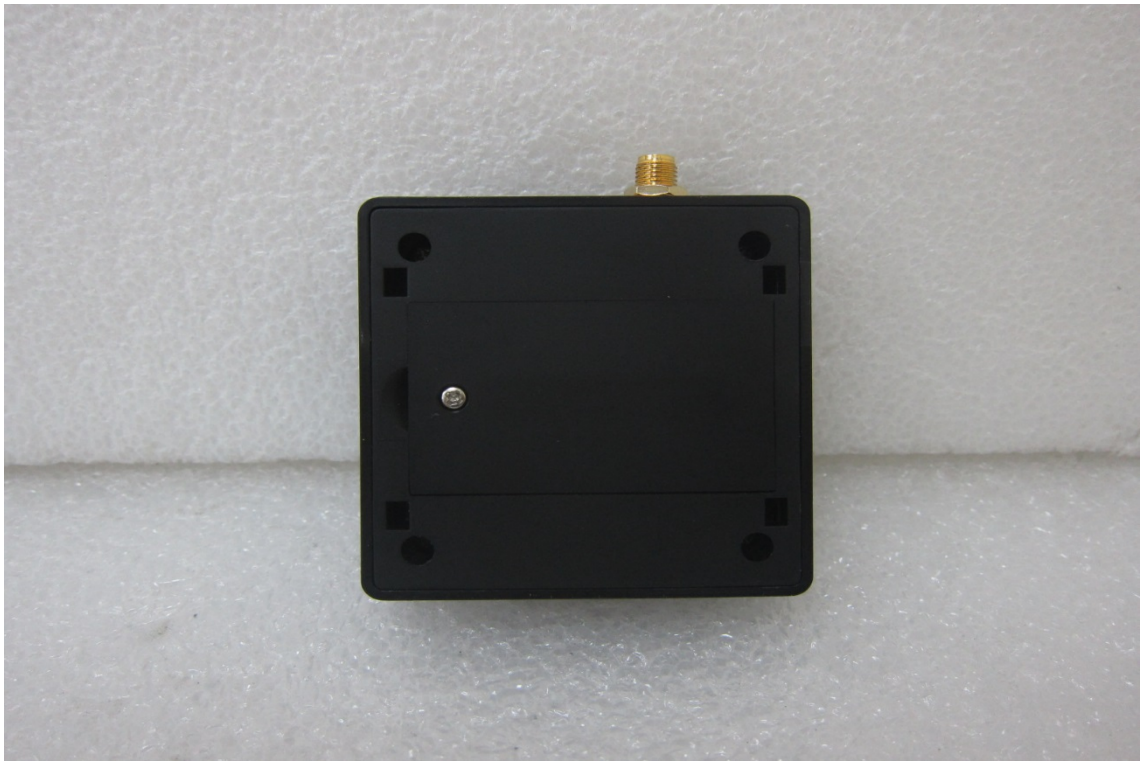
EUT 17 BWG840X

EUT 18 BWG840X

EUT 19 BWG840X

EUT 20 BWG840XE

EUT 21 BWG840XE



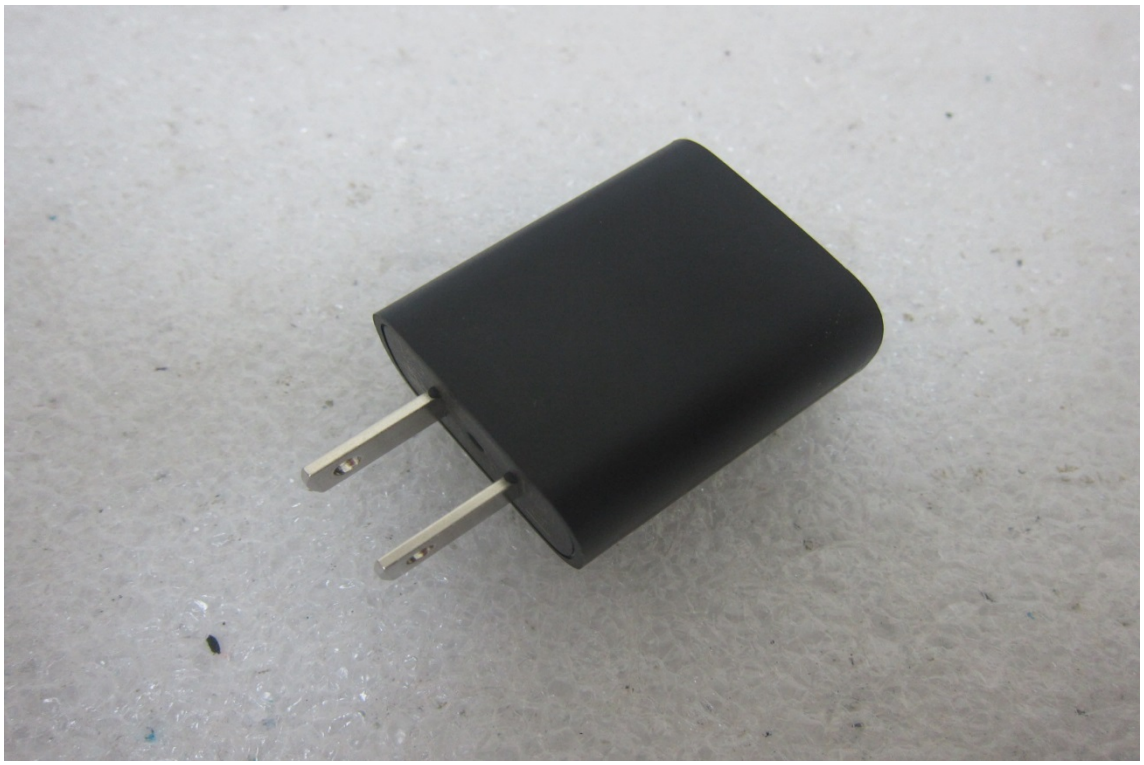
EUT 22 BWG840XE

EUT 23 BWG840XE

EUT 24 BWG840XE

EUT 25 BWG840XE

EUT 26



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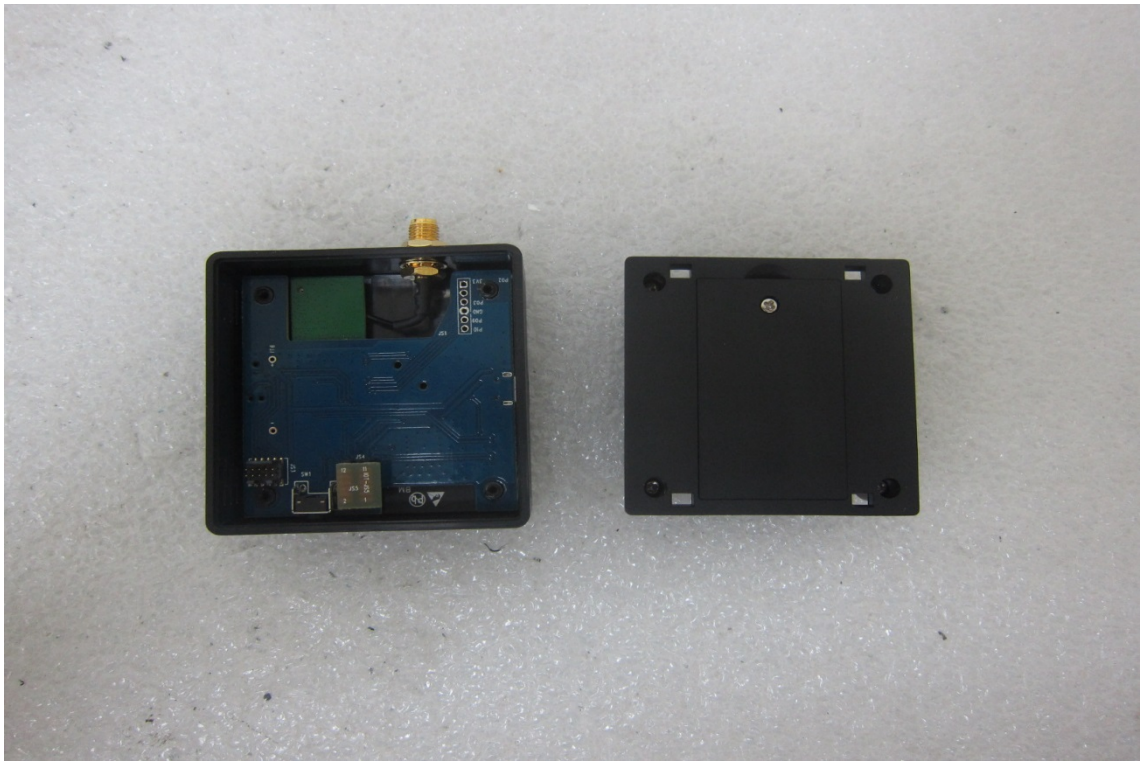

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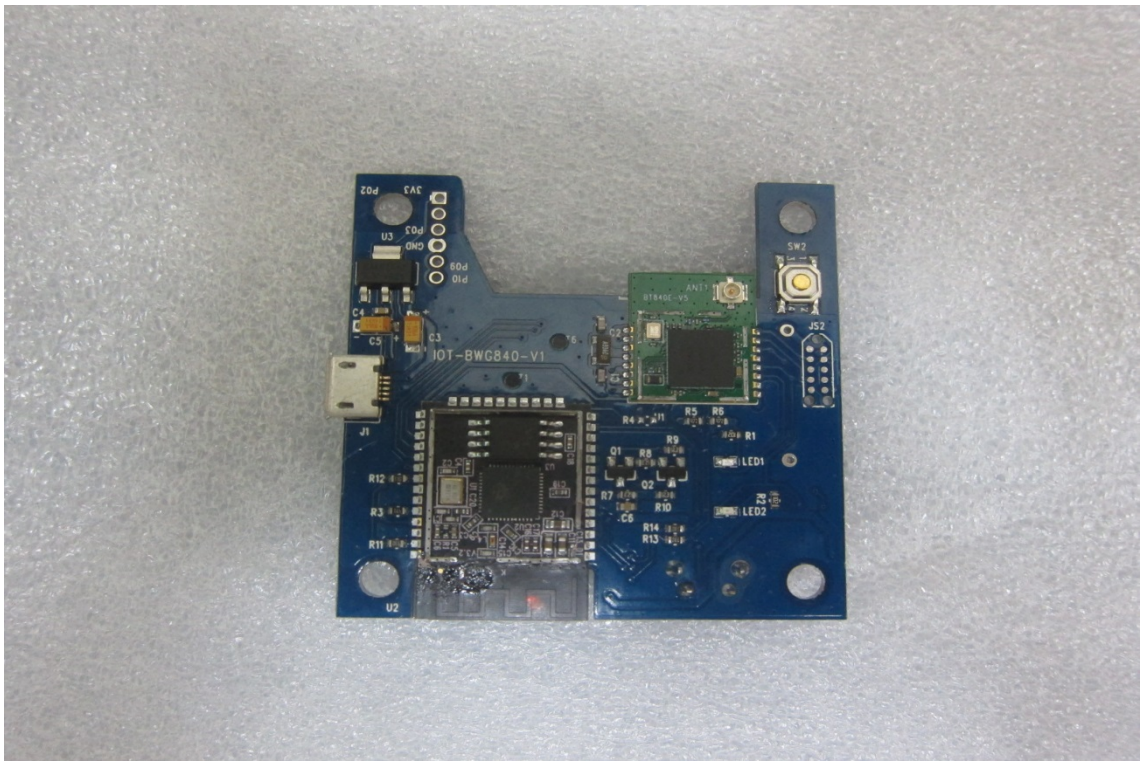
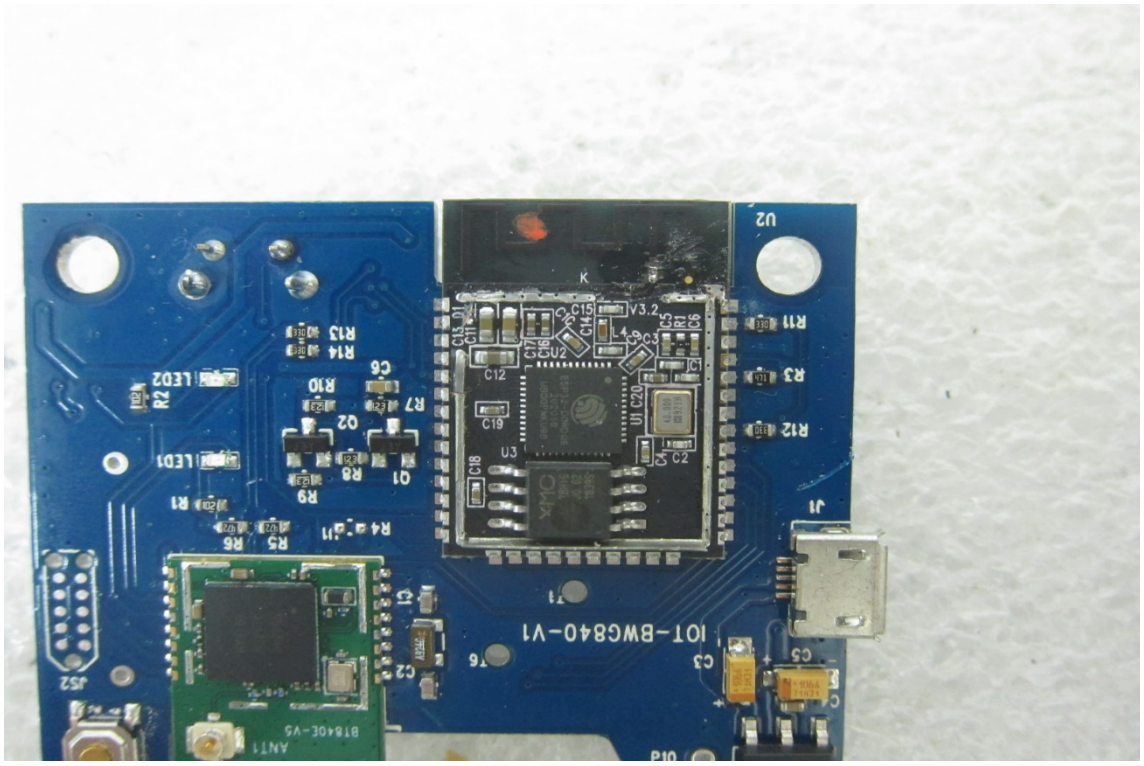


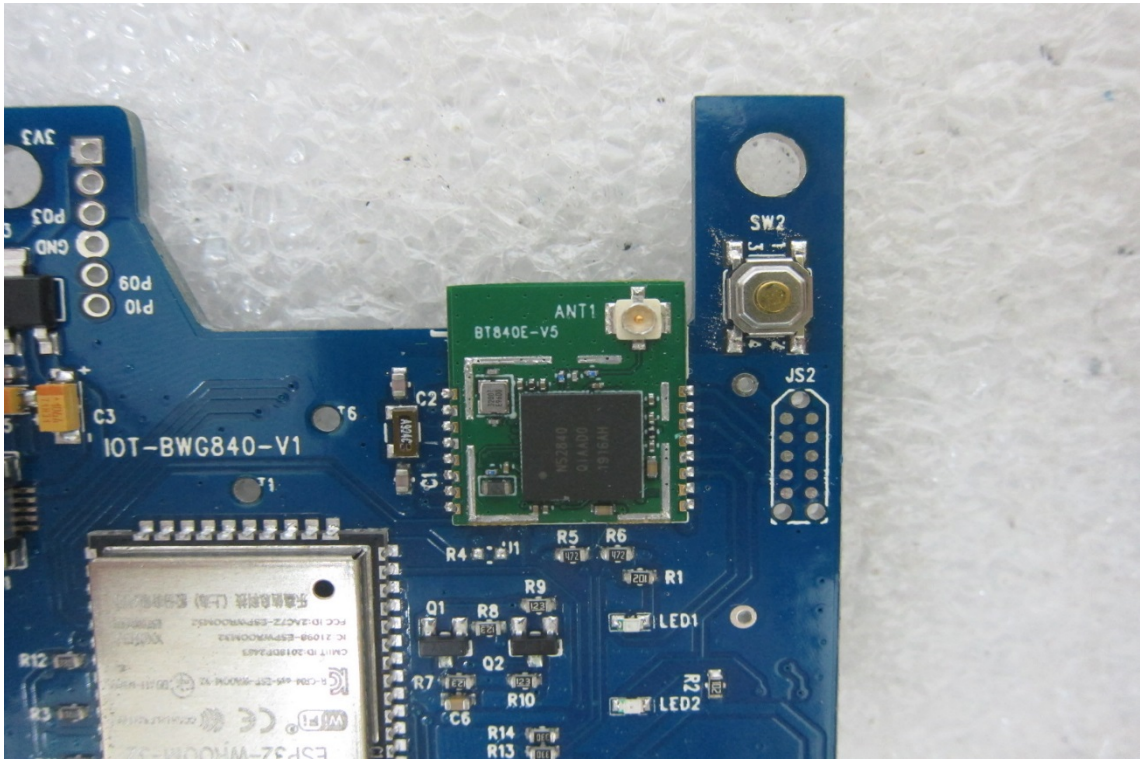
EUT 29 BWG840E

EUT 30 BWG840E (WiFi Module)

EUT 31 BWG840E (WiFi Module)

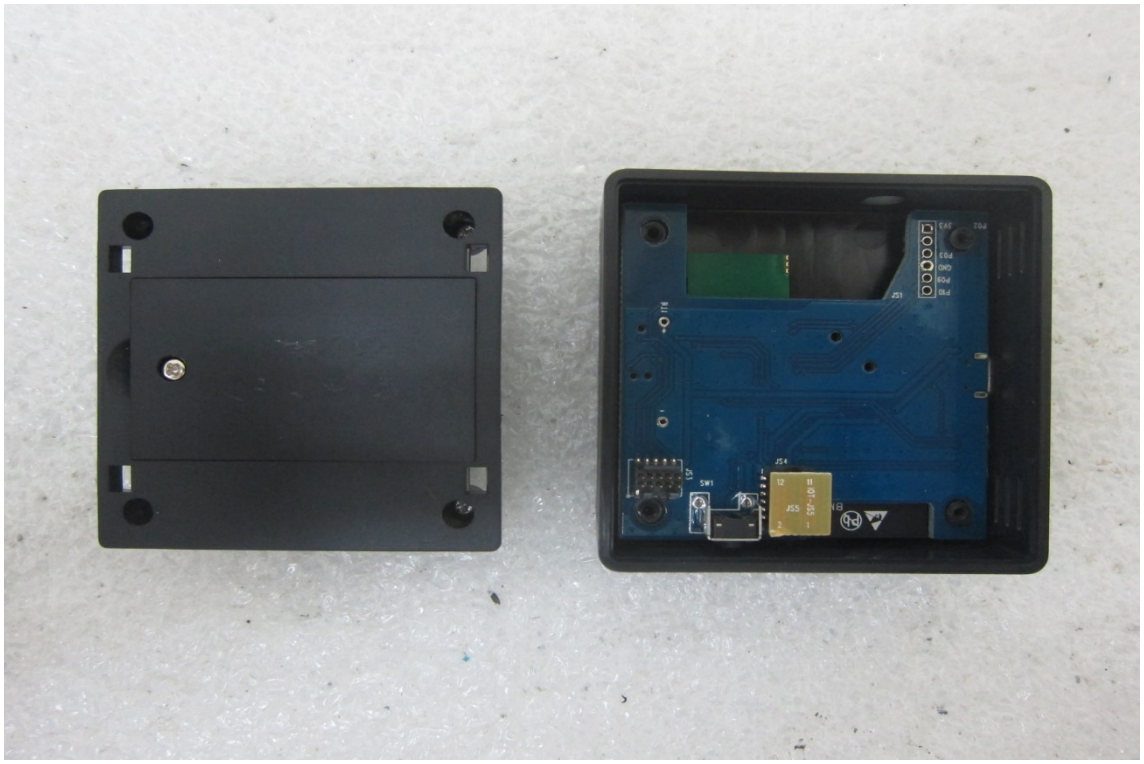


EUT 32 BWG840E (BLE module)



EUT 33 BWG840E

EUT 34 BWG840F



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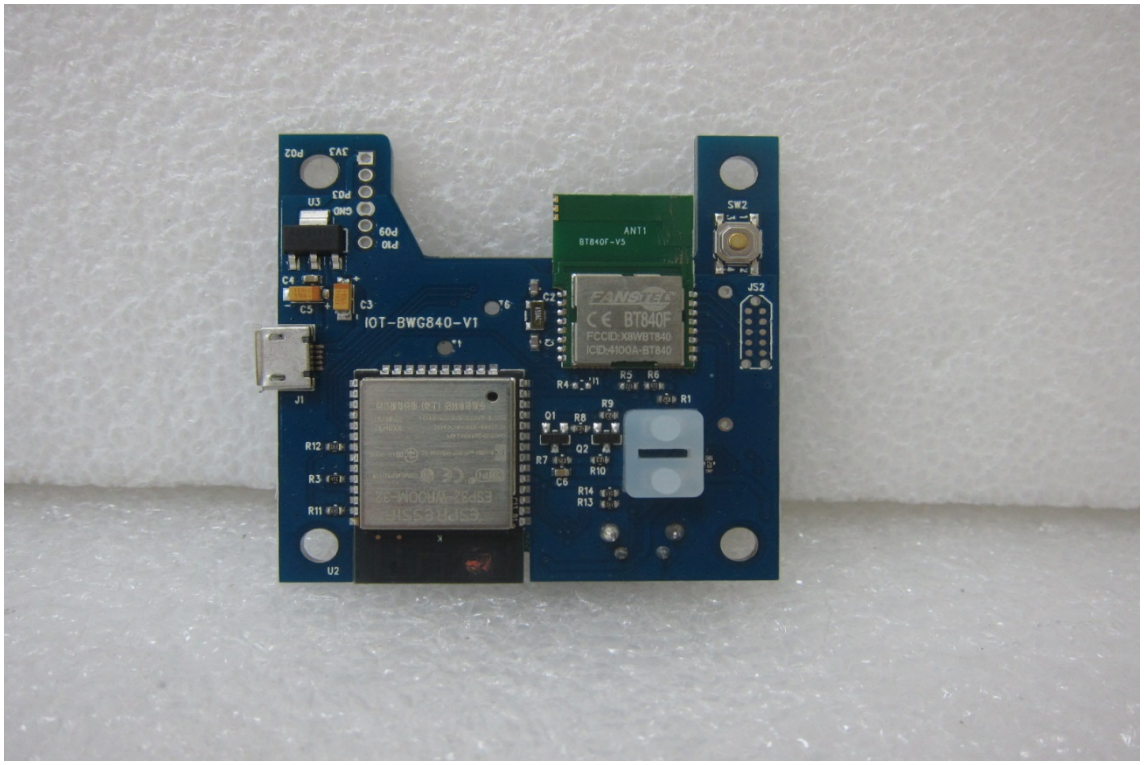

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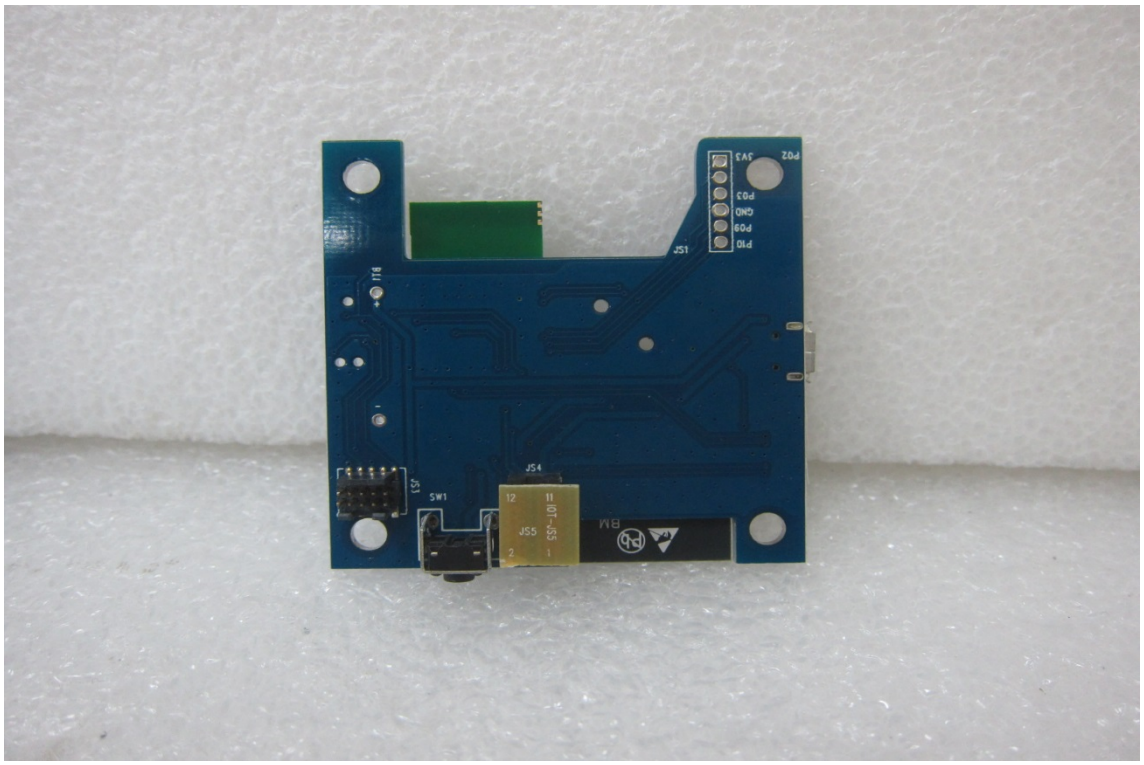
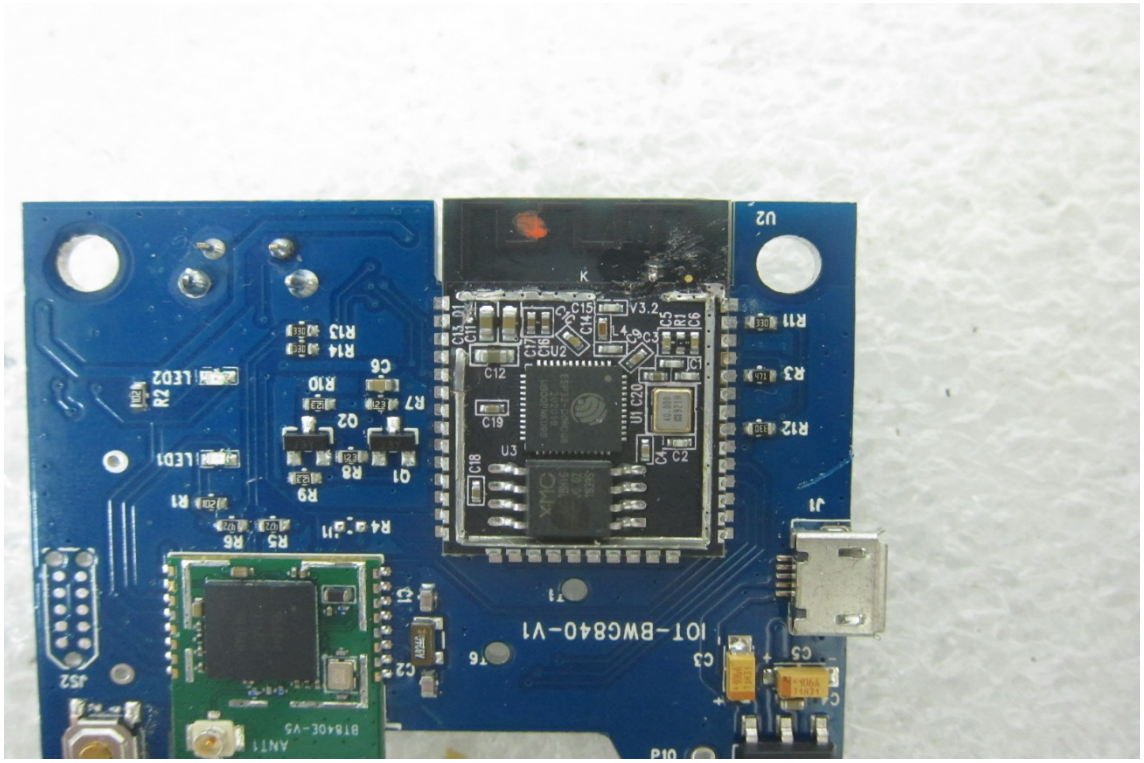


EUT 37 BWG840F (WiFi module)

EUT 38 BWG840F (WiFi module)



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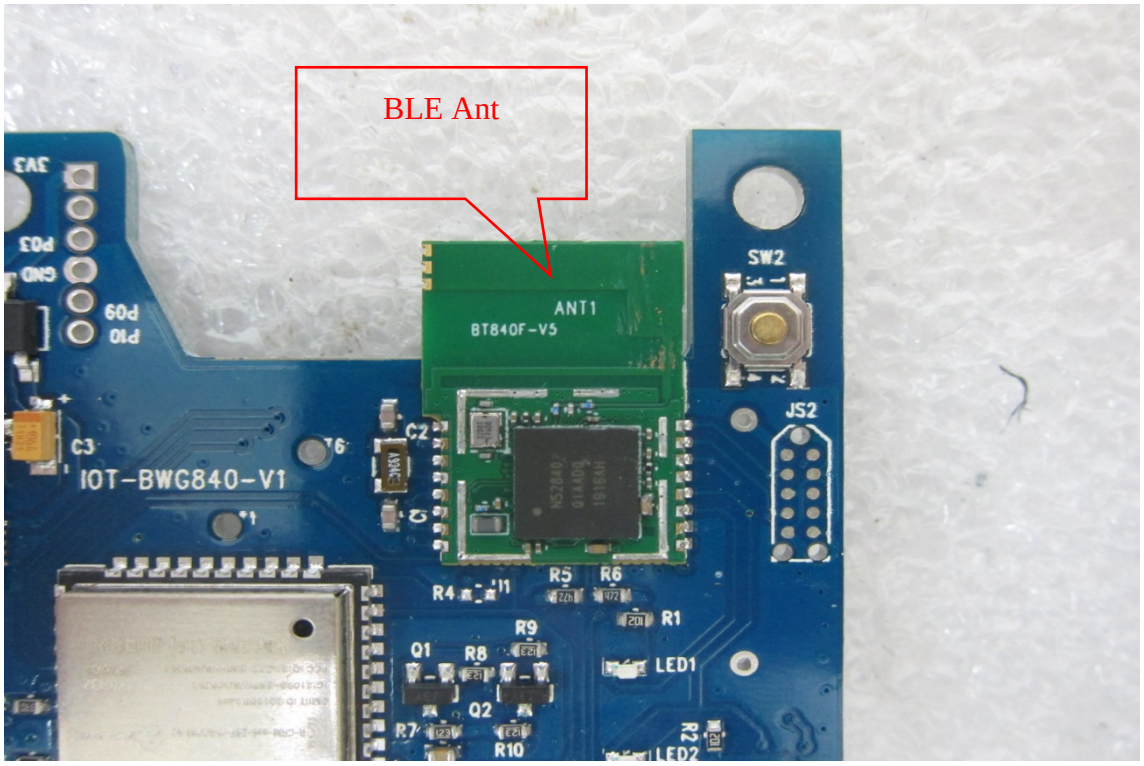

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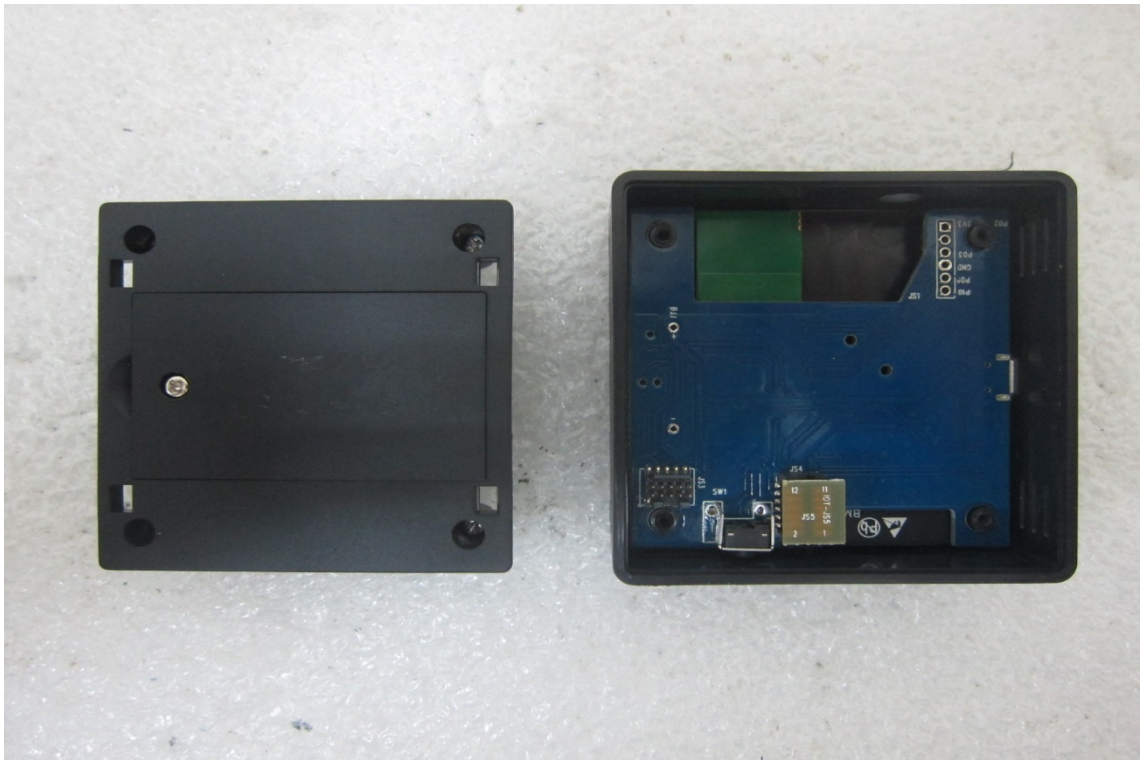

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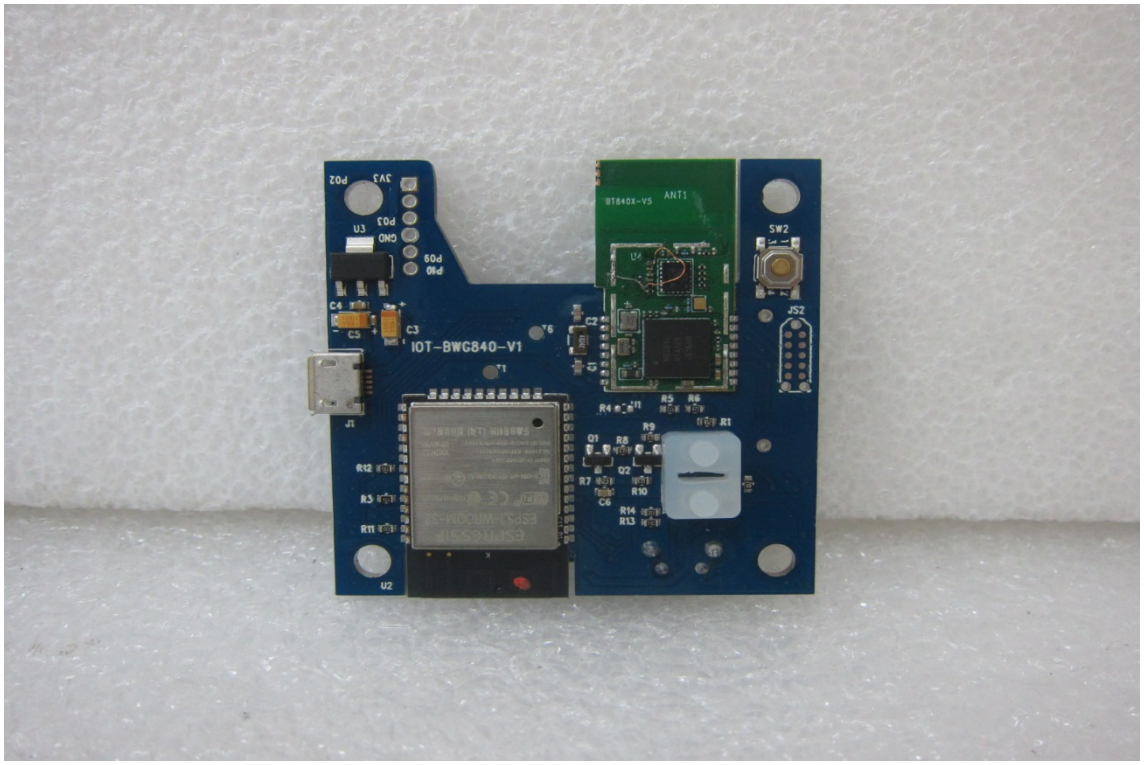

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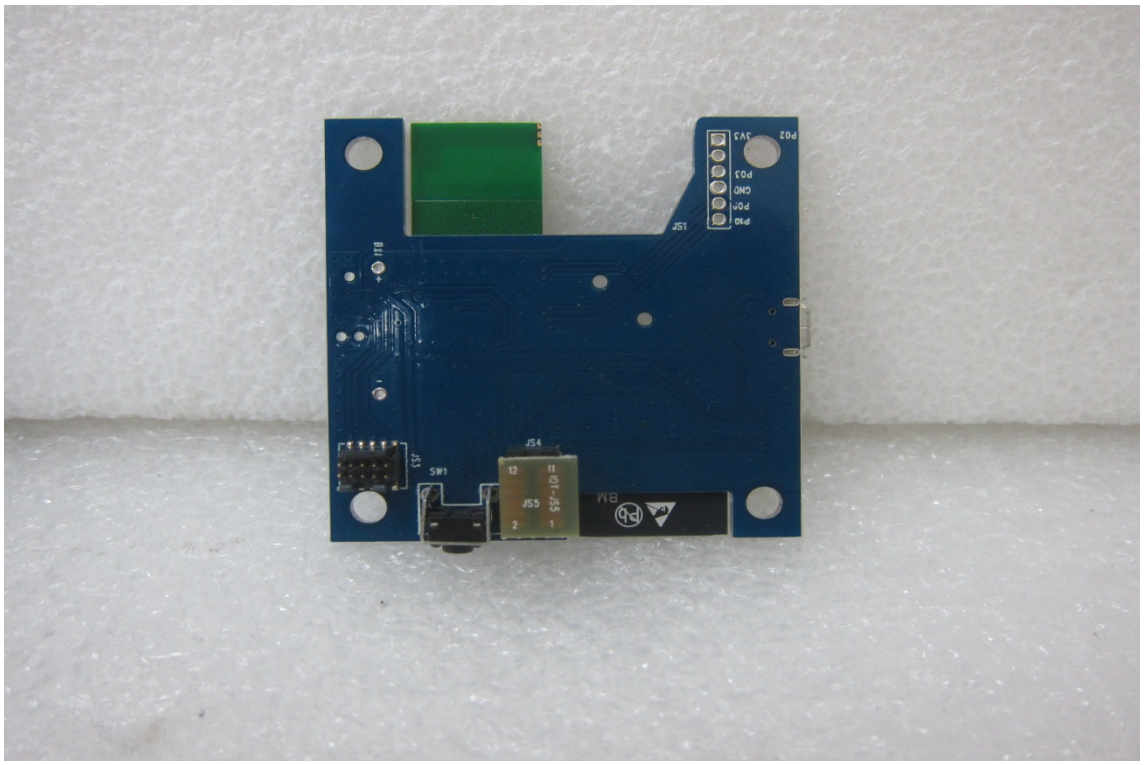
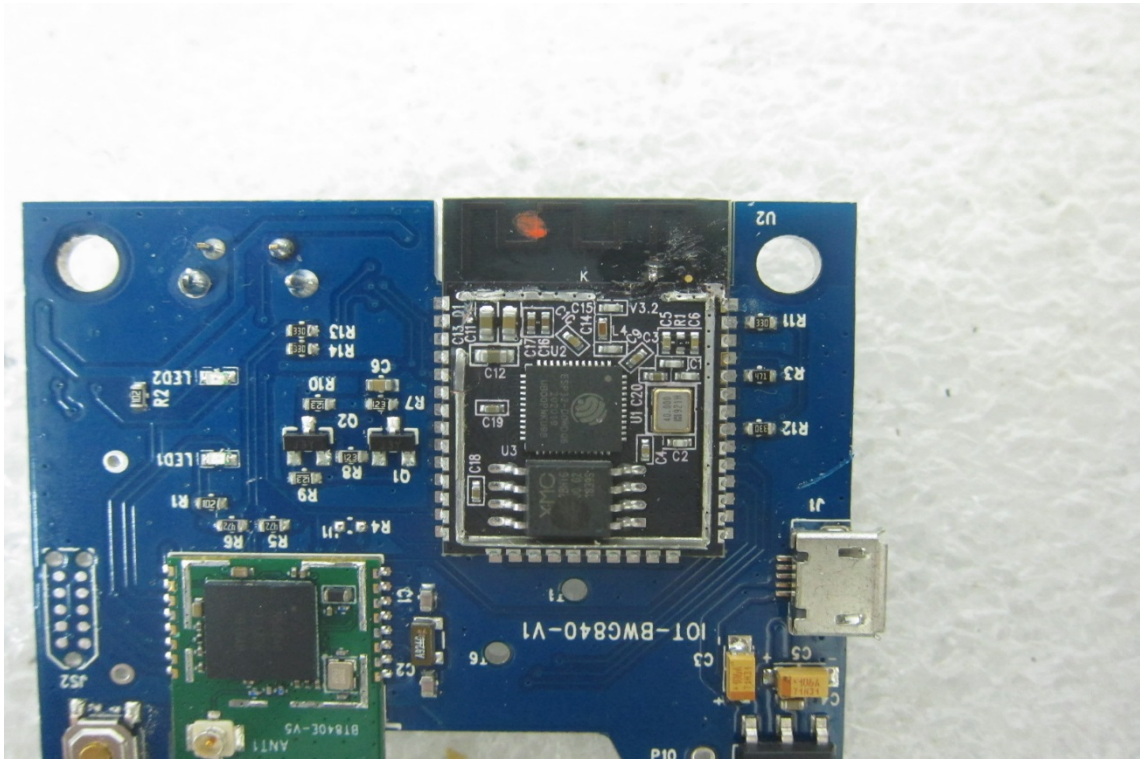


EUT 43 BWG840X (WiFi Module)

EUT 44 BWG840X (WiFi Module)



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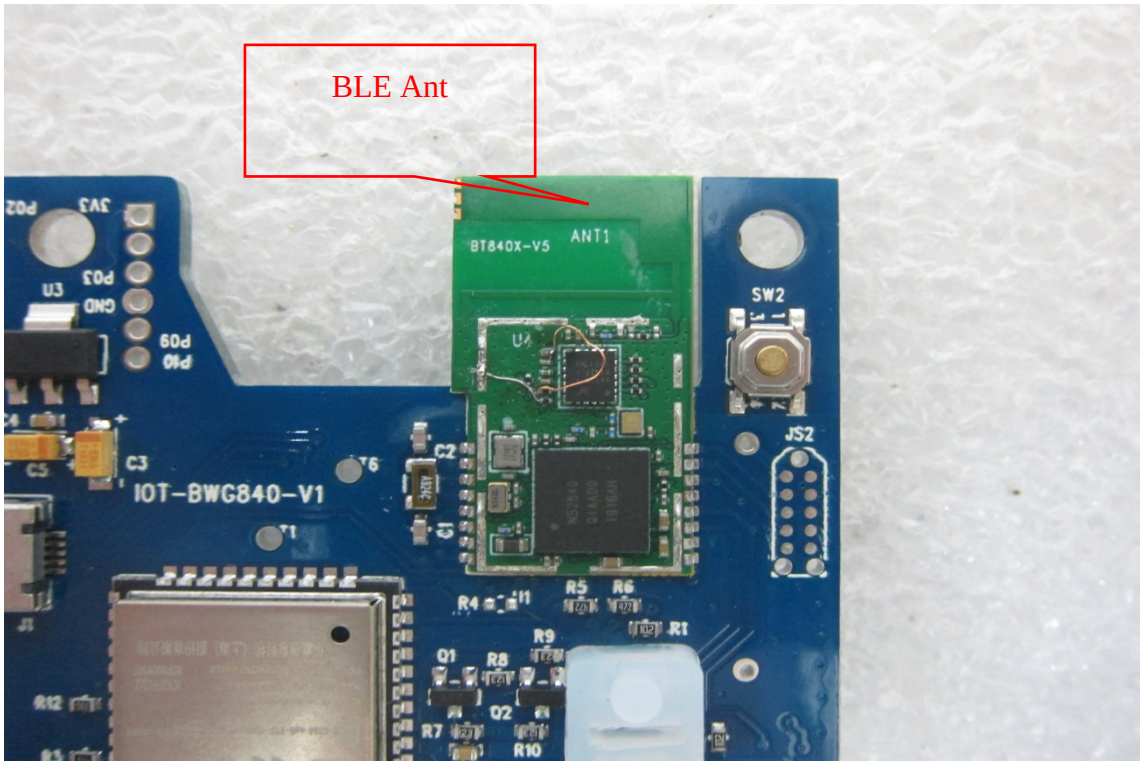

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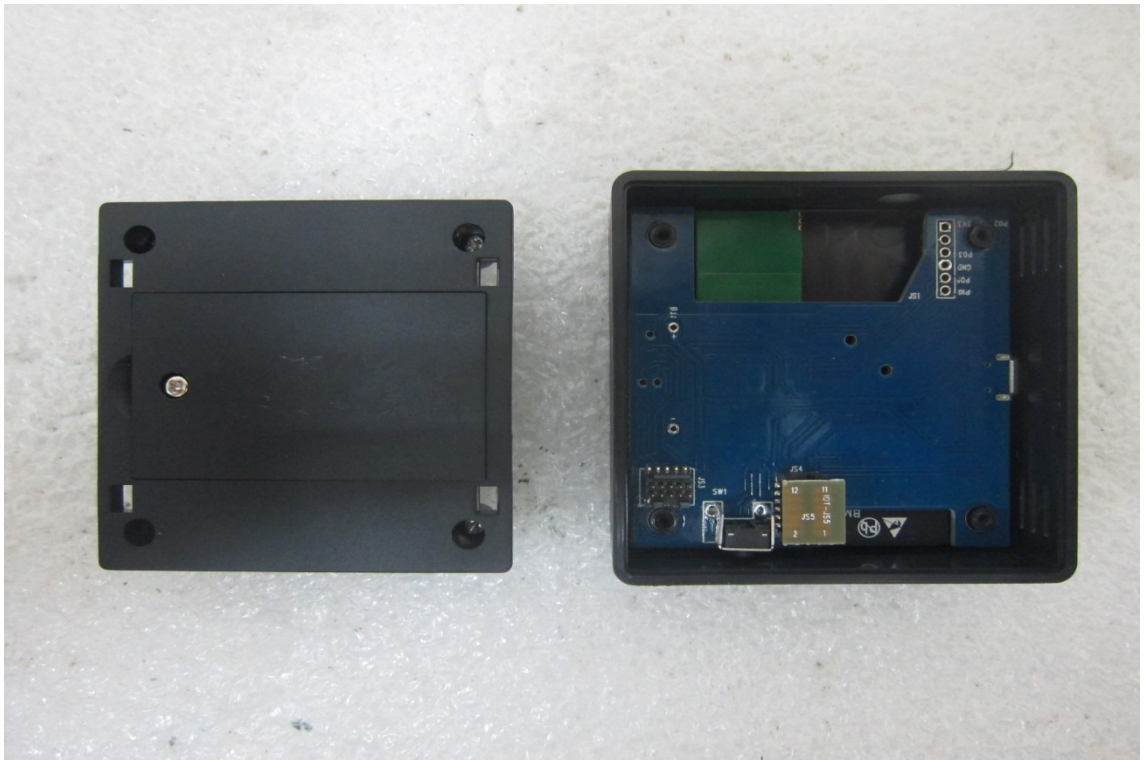

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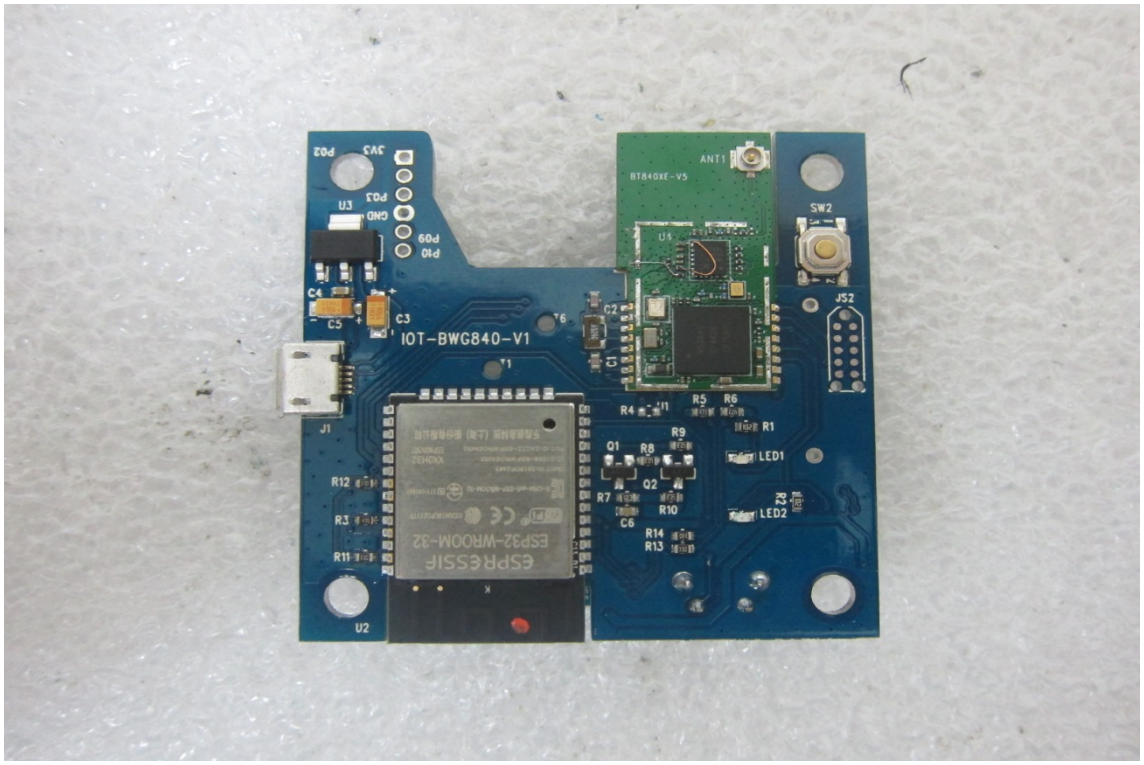

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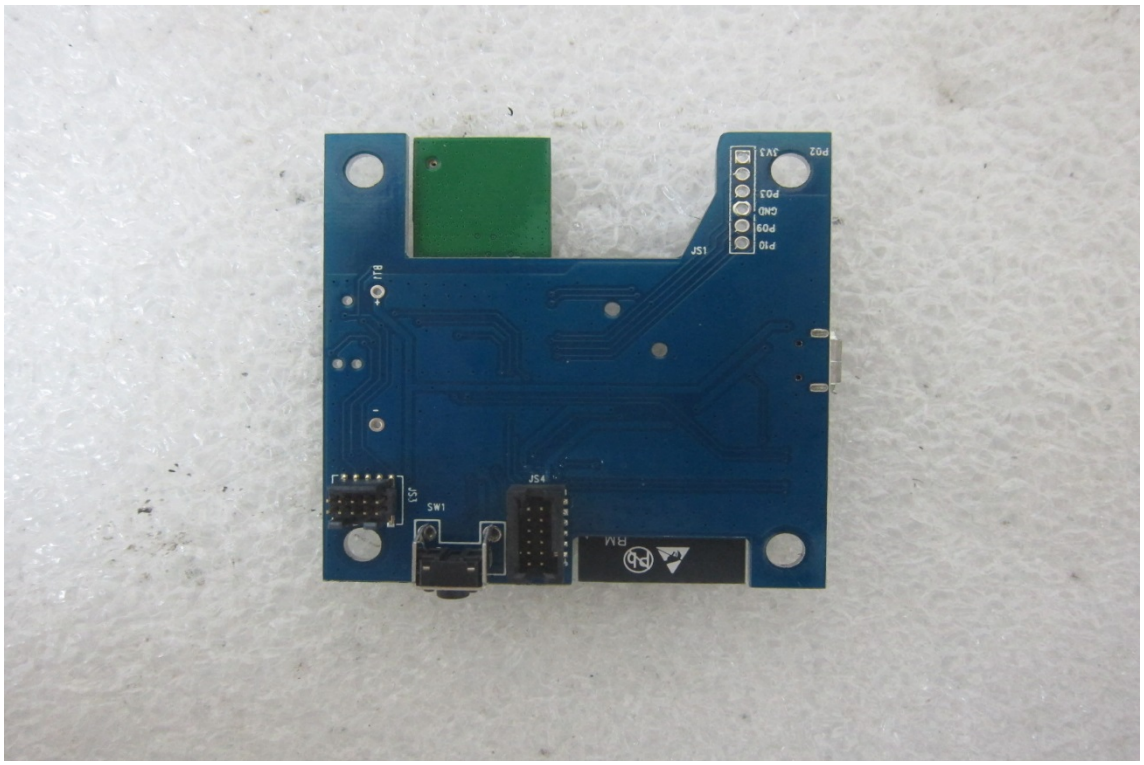
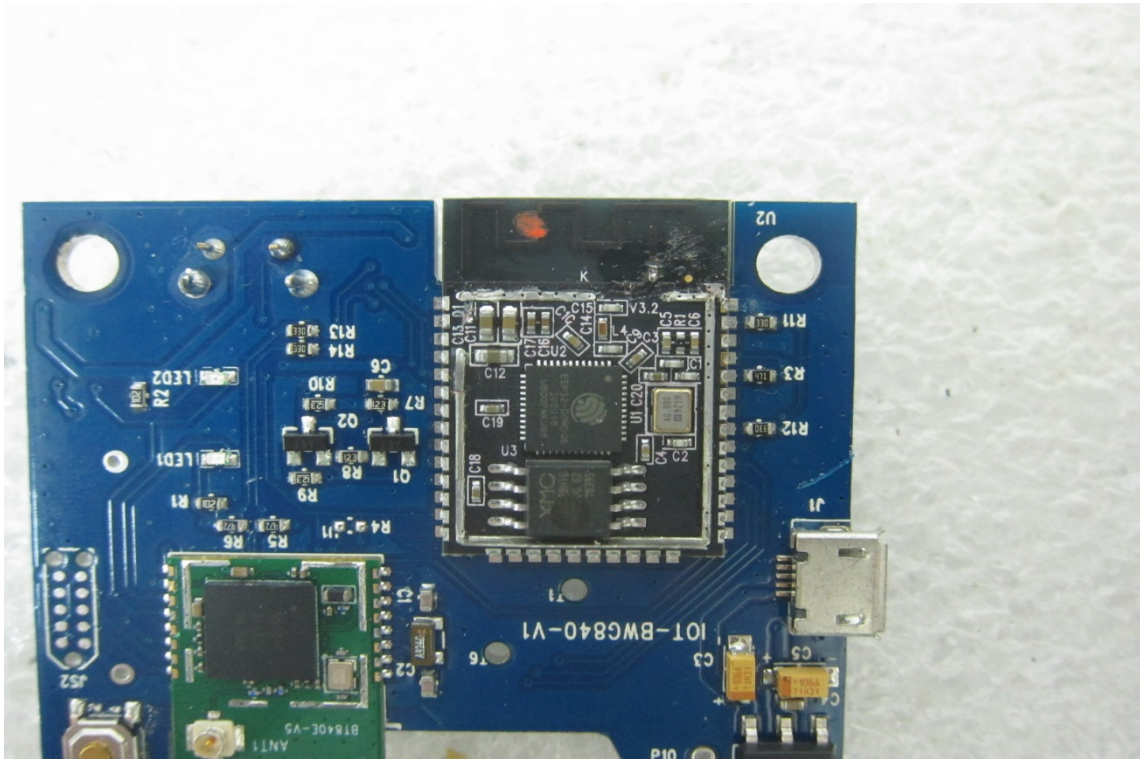


EUT 49 BWG840XE (WiFi module)

EUT 50 BWG840XE (WiFi module)



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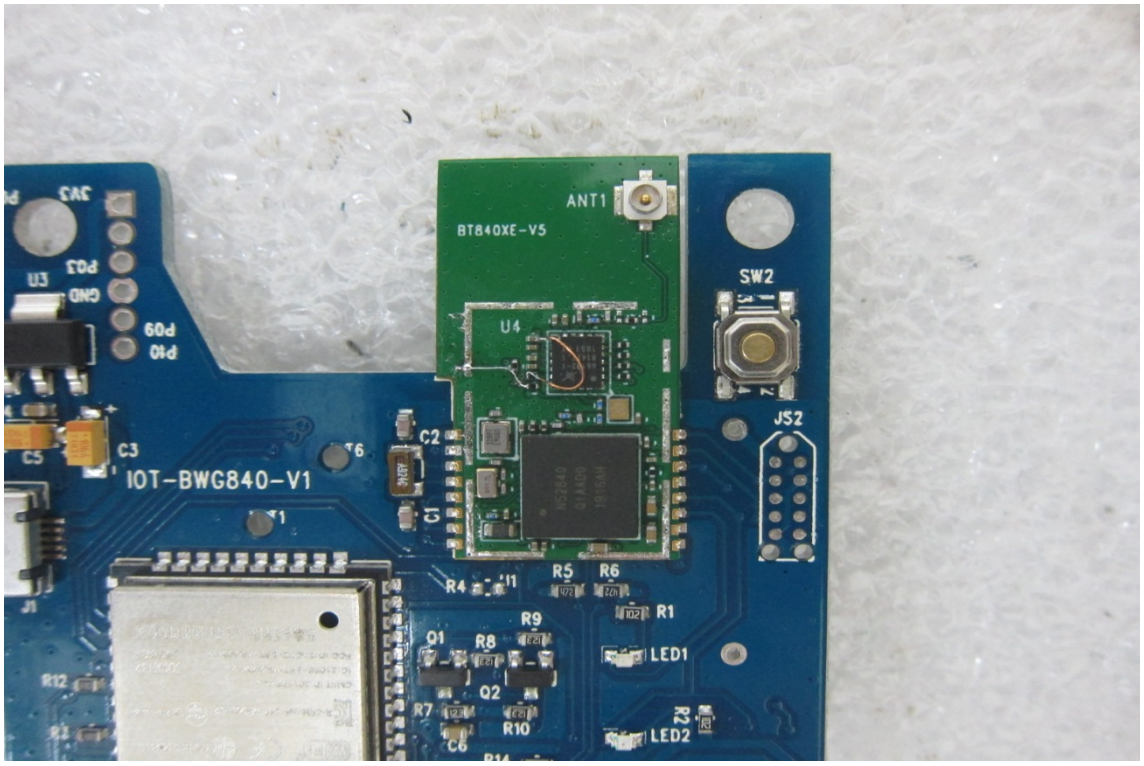

EUT 52 BWG840XE

~ End of Report ~