TEST REPORT

of

Australian/New Zealand Standard AS/NZS 4268:2017

Product :	**BT module**
Brand:	**FANSTEL**
Model:	**BM832; BM832A; BM832E**
Model Difference:	**Please see page 5 model summaries table**
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; IC: IC4067B-4;
*Address:
No. 120, Lane 180, Hsin Ho Rd.,
Lung-Tan Dist., Tao Yuan City 325, Taiwan
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Report No.: **ISL-18LR304ANZ**

Issue Date : **2018/11/28**

VERIFICATION OF COMPLIANCE

Applicant:	Fanstel Corporation, Taipei
Product Description:	BT module
Brand Name:	FANSTEL
Model No.:	BM832; BM832A; BM832E
Model Difference:	Please see page 5 model summaries table
Date of test:	2018/10/02 ~ 2018/11/27
Date of EUT Received:	2018/10/02

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: Barry Lee ***Date:*** 2018/11/28

Barry Lee / Senior Engineer

Prepared By: Gigi yeh ***Date:*** 2018/11/28

Gigi Yeh / Senior Engineer

Approved By: Dino Chen ***Date:*** 2018/11/28

Dino Chen / Senior Engineer

Version

Version No.	Date	Description
00	2018/11/28	Initial creation of document

Table of Contents

1 Description of Equipment Under Test (EUT)

General:

Product Name:	BT module
Brand Name:	FANSTEL
Model Name:	BM832; BM832A; BM832E
Model Difference:	Please see page 5 model summaries table
Type of Equipment:	Stand-alone equipment
Temperature Range:	-25°C to + 75°C
Simultaneous transmissions:	No
Geo-location capability:	No
Power Supply	5Vdc

Model Summaries

module	BM832	BM832A	BM832E
Flash/RAM	512KB/64KB	192KB/24KB	512KB/64KB
Size	10.2x15x1.9mm	10.2x15x1.9mm	10.2x15x1.9mm
GPIO	32	32	32
Antenna	PCB Trace	PCB Trace	u.FL
BT range, antenna at LMPI	340 meters	340 meters	
BT range, antenna at 1.52 M	270 meters	270 meters	
Availability	Sample	Sample	Sample

Bluetooth:

Frequency Range:	2402 – 2480MHz
Bluetooth Version:	V4.0
Channel number:	40 channels, 2MHz step
Modulation type:	Wide band Modulation, GFSK
Transmit Power: (EIRP)	BM832 & BM832A: 5.44dBm BM832E: 5.74 dBm
Occupied Channel Bandwidth:	Within 2400-2483.5MHz
Duty Cycle:	N/A
Adaptive/ Non-Adaptive:	Adaptive
LBT (Listen Before Talk):	Yes
	■ Adaptive Frequency Hopping using LBT based DAA ☐ Adaptive Frequency Hopping using other forms of DAA (non-LBT based) ☐ Short Control Signaling Transmissions
Antenna Beamforming:	No
Antenna Designation:	BM832 & BM832A : PCB Antennas: 0.24dBi BM832E : PCB Antenna: 0.54dBi

The EUT is compliance with Bluetooth BLE Standard.

This test report applies for Bluetooth BLE

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

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 : + 15℃ to 35 ℃
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 +55 degree and at a lower value of -10 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 300 440-1V1.6.1 – 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

NEMKO Laboratory Authorization No.: ELA 113B

5 Support Equipment

Fig. 5-1 Configuration of Tested System (Fixed channel)

Table 5-1 Equipment Used in Tested System

Item	Equipment	Mrf/Brand	Model name	Series No	Data Cable	Power Cable
1	JIG	NA	NA	NA	Non-Shielded	Non-Shielded
2	NB	HP	440G1	NA	Non-Shielded	Non-Shielded

6 Maximum EIRP Measurement

6.1. Limit:

4W(36dBm) for Row 59

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

6.2. Measurement Equipment Used:

Conducted Emission Test Site					
Equipment Type	**Manufacturer**	**Model Number**	**Serial Number**	**Last Cal.**	**Cal. Due.**
Power Meter 05	Anritsu	ML2495A	1116010	10/28/2018	10/27/2019
Power Sensor 05	Anritsu	MA2411B	34NKF50	10/28/2018	10/27/2019
Power Sensor 06	DARE	RPR3006W	13I00030SNO33	12/12/2017	12/11/2018
Power Sensor 07	DARE	RPR3006W	13I00030SNO34	12/12/2017	12/11/2018
Temperature Chamber	KSON	THS-B4H100	2287	12/02/2017	12/01/2018
DC Power supply	ABM	8185D	N/A	11/16/2018	11/15/2019
AC Power supply	EXTECH	CFC105W	NA	12/25/2017	12/24/2018
Attenuator	Woken	Watt-65m3502	11051601	NA	NA
Splitter	MCLI	PS4-199	12465	12/26/2017	12/25/2019
Spectrum analyzer	keysight	N9010A	MY56070257	10/15/2018	10/14/2019
Spectrum analyzer	R&S	FSP40	100143	11/02/2018	11/01/2019
Test Sofware	DARE	Radimation 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:

Ambient temperature: 25℃ Relative humidity: 60% Test Date: 2018/10/23

Model: BM832

Test Mode: BT LE

Pburst values (value "A" in dBm)

antenna assembly gain "G" in dBi 0.24 dBi

beamforming gain "Y" in dB dB

Cable Loss= 21.00 dB

Test Conditions		Transmitter Power		
		Lowest Frequency	Middle Frequency	Highest Frequency
Temp -40 °C	Vmin 4.5 V	P 4.74 dBm A 4.50 dBm Reading -16.50 dBm	P 4.84 dBm A 4.60 dBm Reading -16.40 dBm	P 5.44 dBm A 5.20 dBm Reading -15.80 dBm
	Vmax 5.5 V	P 4.74 dBm A 4.50 dBm Reading -16.50 dBm	P 4.74 dBm A 4.50 dBm Reading -16.50 dBm	P 5.44 dBm A 5.20 dBm Reading -15.80 dBm
Temp 25 °C	Vnom 5 V	P 3.34 dBm A 3.10 dBm Reading -17.90 dBm	P 3.34 dBm A 3.10 dBm Reading -17.90 dBm	P 4.14 dBm A 3.90 dBm Reading -17.10 dBm
Temp 85 °C	Vmin 4.5 V	P 3.44 dBm A 3.20 dBm Reading -17.80 dBm	P 3.44 dBm A 3.20 dBm Reading -17.80 dBm	P 4.04 dBm A 3.80 dBm Reading -17.20 dBm
	Vmax 5.5 V	P 3.44 dBm A 3.20 dBm Reading -17.80 dBm	P 3.34 dBm A 3.10 dBm Reading -17.90 dBm	P 4.04 dBm A 3.80 dBm Reading -17.20 dBm
Limit(P)		36dBm		
Measurement uncertainty		+ 0.28dB / - 0.30dB		

Model: BM832E

Test Mode: BT LE

Pburst values (value "A" in dBm)

antenna assembly gain "G" in dBi 0.54 dBi

beamforming gain "Y" in dB dB

Cable Loss= 21.00 dB

Test Conditions		Transmitter Power		
		Lowest Frequency	Middle Frequency	Highest Frequency
Temp -40 °C	Vmin 4.5 V	P 5.04 dBm	P 5.14 dBm	P 5.74 dBm
		A 4.50 dBm	A 4.60 dBm	A 5.20 dBm
		Reading -16.50 dBm	Reading -16.40 dBm	Reading -15.80 dBm
	Vmax 5.5 V	P 5.04 dBm	P 5.04 dBm	P 5.74 dBm
		A 4.50 dBm	A 4.50 dBm	A 5.20 dBm
		Reading -16.50 dBm	Reading -16.50 dBm	Reading -15.80 dBm
Temp 25 °C	Vnom 5 V	P 3.64 dBm	P 3.64 dBm	P 4.44 dBm
		A 3.10 dBm	A 3.10 dBm	A 3.90 dBm
		Reading -17.90 dBm	Reading -17.90 dBm	Reading -17.10 dBm
Temp 85 °C	Vmin 4.5 V	P 3.74 dBm	P 3.74 dBm	P 4.34 dBm
		A 3.20 dBm	A 3.20 dBm	A 3.80 dBm
		Reading -17.80 dBm	Reading -17.80 dBm	Reading -17.20 dBm
	Vmax 5.5 V	P 3.74 dBm	P 3.64 dBm	P 4.34 dBm
		A 3.20 dBm	A 3.10 dBm	A 3.80 dBm
		Reading -17.80 dBm	Reading -17.90 dBm	Reading -17.20 dBm
Limit(P)		36dBm		
Measurement uncertainty		+ 0.28dB / - 0.30dB		

7 Transmitter Spurious Emissions Measurement

7.1. Limit:

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

Model: BM832

Ambient temperature: 25 ℃ Relative humidity: 60 % Test Date: 2018/10/23

Test Mode: Bluetooth BLE mode, TX CH Low

No	Freq MHz	Reading dBm	Aux dB	Level dBm	Limit dBm	Margin dB	Pol V/H
1	60.07	-66.31	4.24	-62.07	-40.00	-22.07	Vertical
2	84.32	-50.57	1.00	-49.57	-40.00	-9.57	Vertical
3	227.88	-70.33	3.50	-66.83	-40.00	-26.83	Vertical
4	547.98	-79.06	8.91	-70.15	-40.00	-30.15	Vertical
5	695.42	-81.63	13.72	-67.91	-40.00	-27.91	Vertical
6	833.16	-81.47	14.39	-67.08	-40.00	-27.08	Vertical
7	4804.00	-56.50	15.71	-40.79	-40.00	-0.79	Vertical
8	7206.00	-65.11	22.45	-42.66	-40.00	-2.66	Vertical
1	95.96	-60.18	0.55	-59.63	-40.00	-19.63	Horizontal
2	180.35	-76.18	2.42	-73.76	-40.00	-33.76	Horizontal
3	551.86	-80.72	10.09	-70.63	-40.00	-30.63	Horizontal
4	626.55	-75.89	11.46	-64.43	-40.00	-24.43	Horizontal
5	728.40	-81.26	13.54	-67.72	-40.00	-27.72	Horizontal
6	794.36	-81.50	14.17	-67.33	-40.00	-27.33	Horizontal
7	4804.00	-63.05	15.63	-47.42	-40.00	-7.42	Horizontal
8	7206.00	-64.93	23.43	-41.50	-40.00	-1.50	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. The result basic equation calculation is as follows:
4. ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) – Cable loss (dB)
5. Measurement Range upto 40GHz.

Ambient temperature: 25 ℃ Relative humidity: 60 % Test Date: 2018/10/23

Test Mode: Bluetooth BLE mode, TX CH High

No	Freq MHz	Reading dBm	Aux dB	Level dBm	Limit dBm	Margin dB	Pol V/H
1	95.96	-59.35	-0.12	-59.47	-40.00	-19.47	Vertical
2	186.17	-66.22	2.72	-63.50	-40.00	-23.50	Vertical
3	545.07	-77.90	8.91	-68.99	-40.00	-28.99	Vertical
4	652.74	-81.42	12.18	-69.24	-40.00	-29.24	Vertical
5	705.12	-80.89	13.86	-67.03	-40.00	-27.03	Vertical
6	807.94	-81.80	13.66	-68.14	-40.00	-28.14	Vertical
7	4960.00	-66.23	16.40	-49.83	-40.00	-9.83	Vertical
8	7440.00	-66.30	23.04	-43.26	-40.00	-3.26	Vertical
1	95.96	-58.89	0.55	-58.34	-40.00	-18.34	Horizontal
2	211.39	-68.37	2.07	-66.30	-40.00	-26.30	Horizontal
3	555.74	-78.52	10.18	-68.34	-40.00	-28.34	Horizontal
4	615.88	-74.15	11.37	-62.78	-40.00	-22.78	Horizontal
5	739.07	-82.01	13.91	-68.10	-40.00	-28.10	Horizontal
6	778.84	-81.21	14.21	-67.00	-40.00	-27.00	Horizontal
7	4960.00	-68.86	16.15	-52.71	-40.00	-12.71	Horizontal
8	7440.00	-67.89	23.28	-44.61	-40.00	-4.61	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. The result basic equation calculation is as follows:
4. ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) – Cable loss (dB)
5. Measurement Range upto 40GHz.

Model: BM832E
Ambient temperature: 25 ℃ Relative humidity: 60 % Test Date: 2018/10/23

Test Mode: Bluetooth BLE mode, TX CH Low

No	Freq MHz	Reading dBm	Aux dB	Level dBm	Limit dBm	Margin dB	Pol V/H
1	95.96	-58.70	-0.12	-58.82	-40.00	-18.82	Vertical
2	180.35	-61.91	3.23	-58.68	-40.00	-18.68	Vertical
3	537.31	-80.70	8.92	-71.78	-40.00	-31.78	Vertical
4	650.80	-80.38	12.11	-68.27	-40.00	-28.27	Vertical
5	717.73	-80.99	13.82	-67.17	-40.00	-27.17	Vertical
6	831.22	-82.18	14.33	-67.85	-40.00	-27.85	Vertical
7	4804.00	-70.08	15.71	-54.37	-40.00	-14.37	Vertical
8	7206.00	-69.73	22.45	-47.28	-40.00	-7.28	Vertical
1	95.96	-62.95	0.55	-62.40	-40.00	-22.40	Horizontal
2	223.03	-79.50	2.88	-76.62	-40.00	-36.62	Horizontal
3	523.73	-81.75	9.21	-72.54	-40.00	-32.54	Horizontal
4	627.52	-83.40	11.47	-71.93	-40.00	-31.93	Horizontal
5	734.22	-83.14	13.74	-69.40	-40.00	-29.40	Horizontal
6	842.86	-83.24	14.86	-68.38	-40.00	-28.38	Horizontal
7	4804.00	-64.96	15.63	-49.33	-40.00	-9.33	Horizontal
8	6852.00	-72.96	23.65	-49.31	-40.00	-9.31	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. The result basic equation calculation is as follows:
4. ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) – Cable loss (dB)
5. Measurement Range upto 40GHz.

Ambient temperature: 25 ℃ Relative humidity: 60 % Test Date: 2018/10/23

Test Mode: Bluetooth BLE mode, TX CH High

No	Freq MHz	Reading dBm	Aux dB	Level dBm	Limit dBm	Margin dB	Pol V/H
1	95.96	-56.91	-0.12	-57.03	-40.00	-17.03	Vertical
2	180.35	-65.52	3.23	-62.29	-40.00	-22.29	Vertical
3	547.01	-79.82	8.91	-70.91	-40.00	-30.91	Vertical
4	631.40	-81.82	11.38	-70.44	-40.00	-30.44	Vertical
5	672.14	-81.64	12.89	-68.75	-40.00	-28.75	Vertical
6	814.73	-80.89	13.86	-67.03	-40.00	-27.03	Vertical
7	4960.00	-71.02	16.40	-54.62	-40.00	-14.62	Vertical
8	7440.00	-72.59	23.04	-49.55	-40.00	-9.55	Vertical
1	107.60	-62.87	1.20	-61.67	-40.00	-21.67	Horizontal
2	191.99	-74.69	1.70	-72.99	-40.00	-32.99	Horizontal
3	525.67	-81.03	9.27	-71.76	-40.00	-31.76	Horizontal
4	601.33	-78.48	11.24	-67.24	-40.00	-27.24	Horizontal
5	724.52	-81.68	13.40	-68.28	-40.00	-28.28	Horizontal
6	841.89	-81.60	14.84	-66.76	-40.00	-26.76	Horizontal
7	4960.00	-71.60	16.15	-55.45	-40.00	-15.45	Horizontal
8	6698.00	-73.61	23.74	-49.87	-40.00	-9.87	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. The result basic equation calculation is as follows:
4. ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) – Cable loss (dB)
5. Measurement Range upto 40GHz.

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:

Ambient temperature: 25 ℃ Relative humidity: 60 % Test Date: 2018/10/23

	Channel	Measured Frequency (MHz)	Limit (MHz)
Bluetooth LE	Lower Frequency	2401.005	≥ 2400.00
	Upper Frequency	2480.99	≤ 2483.50

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:

Test Results: Bluetooth LE mode

Ambient temperature: 25 ℃ Relative humidity: 60 % Test Date: 2018/10/23

Model: BM832

antenna assembly gain "G" in dBi	0.24	dBi
beamforming gain "Y" in dB	0.00	dB
Cable Loss=	1.00	dB

TEST CONDITIONS				FREQUENCY (MHz)	
				Lowest	Highest
Temp -40 °C	V_{min}	4.50	V	2402.0019	2480.0012
	V_{max}	5.50	V	2402.0015	2480.0010
Temp 25 °C	V_{nom}	5.00	V	2402.0013	2480.0010
Temp 85 °C	V_{min}	4.50	V	2402.0017	2480.0009
	V_{max}	5.50	V	2402.0011	2480.0012
Measured frequencies (lowest and highest)				f_L = 2402.0011 MHz	f_H = 2480.0012 MHz
Limit				2400.0000 MHz	2483.5000 MHz
Measurement Uncertainty				+/- 120kHz	

Model: BM832E

antenna assembly gain "G" in dBi	0.54	dBi
beamforming gain "Y" in dB	0.00	dB
Cable Loss=	1.00	dB

TEST CONDITIONS				FREQUENCY (MHz)	
				Lowest	Highest
Temp -40 °C	V_{min}	4.50	V	2402.0019	2480.0012
	V_{max}	5.50	V	2402.0015	2480.0010
Temp 25 °C	V_{nom}	5.00	V	2402.0013	2480.0010
Temp 85 °C	V_{min}	4.50	V	2402.0017	2480.0009
	V_{max}	5.50	V	2402.0011	2480.0012
Measured frequencies (lowest and highest)				f_L = 2402.0011 MHz	f_H = 2480.0012 MHz
Limit				2400.0000 MHz	2483.5000 MHz
Measurement Uncertainty				+/- 120kHz	

10 Receiver Emissions Measurement

10.1. Limit:

According to section 7.2 of AS/NZS 4268:2017

25MHz to 1 GHz 3.3 nW EIRP (-54.82 dBm), or 2.0 nW ERP (-56.98 dBm).

1GHz to 40 GHz 32.8 nW EIRP(-44.84 dBm), or 20nW ERP (-46.98 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:

Model: BM832

Ambient temperature: 25℃ Relative humidity: 60% Test Date: 2018/10/23

Test Mode: Bluetooth LE mode, RX CH Low

No	Freq MHz	Reading dBm	Aux dB	Level dBm	Limit dBm	Margin dB	Pol V/H
1	95.96	-60.15	-0.12	-60.27	-54.82	-5.45	Vertical
2	167.74	-71.83	4.40	-67.43	-54.82	-12.61	Vertical
3	240.49	-76.78	4.30	-72.48	-54.82	-17.66	Vertical
4	321.97	-75.22	4.83	-70.39	-54.82	-15.57	Vertical
5	528.58	-82.39	8.93	-73.46	-54.82	-18.64	Vertical
6	743.92	-83.26	13.73	-69.53	-54.82	-14.71	Vertical
7	2876.00	-71.09	6.92	-64.17	-44.84	-19.33	Vertical
8	5424.00	-73.75	17.64	-56.11	-44.84	-11.27	Vertical
1	95.96	-62.93	0.55	-62.38	-54.82	-7.56	Horizontal
2	249.22	-76.66	4.56	-72.10	-54.82	-17.28	Horizontal
3	359.80	-77.92	5.55	-72.37	-54.82	-17.55	Horizontal
4	580.96	-82.01	10.79	-71.22	-54.82	-16.40	Horizontal
5	638.19	-82.80	11.55	-71.25	-54.82	-16.43	Horizontal
6	855.47	-82.77	15.06	-67.71	-54.82	-12.89	Horizontal
7	2498.00	-71.39	6.21	-65.18	-44.84	-20.34	Horizontal
8	6404.00	-75.19	22.98	-52.21	-44.84	-7.37	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. The result basic equation calculation is as follows:
4. ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) – Cable loss (dB)
5. Measurement Range upto 40GHz.

Ambient temperature: 25℃ Relative humidity: 60% Test Date: 2018/10/23

Test Mode: Bluetooth LE mode, RX CH High

No	Freq MHz	Reading dBm	Aux dB	Level dBm	Limit dBm	Margin dB	Pol V/H
1	95.96	-58.50	-0.12	-58.62	-54.82	-3.80	Vertical
2	166.77	-71.16	4.49	-66.67	-54.82	-11.85	Vertical
3	239.52	-76.86	4.24	-72.62	-54.82	-17.80	Vertical
4	335.55	-76.08	5.16	-70.92	-54.82	-16.10	Vertical
5	484.93	-81.36	8.98	-72.38	-54.82	-17.56	Vertical
6	719.67	-83.45	13.81	-69.64	-54.82	-14.82	Vertical
7	3002.00	-72.43	7.27	-65.16	-44.84	-20.32	Vertical
8	6432.00	-74.78	19.43	-55.35	-44.84	-10.51	Vertical
1	95.96	-62.97	0.55	-62.42	-54.82	-7.60	Horizontal
2	252.13	-76.87	4.57	-72.30	-54.82	-17.48	Horizontal
3	348.16	-78.62	5.15	-73.47	-54.82	-18.65	Horizontal
4	475.23	-82.60	8.39	-74.21	-54.82	-19.39	Horizontal
5	646.92	-82.09	11.63	-70.46	-54.82	-15.64	Horizontal
6	815.70	-81.91	14.42	-67.49	-54.82	-12.67	Horizontal
7	3779.00	-73.54	11.31	-62.23	-44.84	-17.39	Horizontal
8	6488.00	-74.63	23.75	-50.88	-44.84	-6.04	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. The result basic equation calculation is as follows:
4. ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) – Cable loss (dB)
5. Measurement Range upto 40GHz.

Model: BM832E

Ambient temperature: 25℃ Relative humidity: 60% Test Date: 2018/10/23

Test Mode: Bluetooth LE mode, RX CH Low

No	Freq MHz	Reading dBm	Aux dB	Level dBm	Limit dBm	Margin dB	Pol V/H
1	95.96	-59.63	-0.12	-59.75	-54.82	-4.93	Vertical
2	167.74	-72.06	4.40	-67.66	-54.82	-12.84	Vertical
3	232.73	-76.29	3.82	-72.47	-54.82	-17.65	Vertical
4	335.55	-76.92	5.16	-71.76	-54.82	-16.94	Vertical
5	552.83	-82.07	8.98	-73.09	-54.82	-18.27	Vertical
6	738.10	-82.96	13.75	-69.21	-54.82	-14.39	Vertical
7	3072.00	-72.24	7.58	-64.66	-44.84	-19.82	Vertical
8	6103.00	-74.50	18.83	-55.67	-44.84	-10.83	Vertical
1	95.96	-58.91	0.55	-58.36	-54.82	-3.54	Horizontal
2	240.49	-76.10	4.02	-72.08	-54.82	-17.26	Horizontal
3	335.55	-77.17	4.78	-72.39	-54.82	-17.57	Horizontal
4	603.27	-83.10	11.26	-71.84	-54.82	-17.02	Horizontal
5	750.71	-82.83	14.28	-68.55	-54.82	-13.73	Horizontal
6	3912.00	-71.81	12.15	-59.66	-44.84	-14.82	Horizontal
7	6719.00	-74.29	23.73	-50.56	-44.84	-5.72	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. The result basic equation calculation is as follows:
4. ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) – Cable loss (dB)
5. Measurement Range upto 40GHz.

Ambient temperature: 25℃ Relative humidity: 60% Test Date: 2018/10/23

Test Mode: Bluetooth LE mode, RX CH High

No	Freq MHz	Reading dBm	Aux dB	Level dBm	Limit dBm	Margin dB	Pol V/H
1	95.96	-63.13	-0.12	-63.25	-54.82	-8.43	Vertical
2	167.74	-77.66	4.40	-73.26	-54.82	-18.44	Vertical
3	248.25	-77.99	4.77	-73.22	-54.82	-18.40	Vertical
4	354.95	-78.43	5.57	-72.86	-54.82	-18.04	Vertical
5	460.68	-81.77	9.03	-72.74	-54.82	-17.92	Vertical
6	602.30	-81.28	10.23	-71.05	-54.82	-16.23	Vertical
7	3527.00	-72.34	9.51	-62.83	-44.84	-17.99	Vertical
8	6152.00	-73.77	18.92	-54.85	-44.84	-10.01	Vertical
1	95.96	-60.26	0.55	-59.71	-54.82	-4.89	Horizontal
2	167.74	-73.59	3.25	-70.34	-54.82	-15.52	Horizontal
3	239.52	-76.43	3.96	-72.47	-54.82	-17.65	Horizontal
4	323.91	-76.71	4.44	-72.27	-54.82	-17.45	Horizontal
5	475.23	-82.71	8.39	-74.32	-54.82	-19.50	Horizontal
6	727.43	-83.58	13.50	-70.08	-54.82	-15.26	Horizontal
7	3870.00	-70.20	11.89	-58.31	-44.84	-13.47	Horizontal
8	6334.00	-74.57	22.32	-52.25	-44.84	-7.41	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. The result basic equation calculation is as follows:
4. ERP/EIRP (dBm) = SG Setting(dBm) + Antenna Gain (dB/dBi) – Cable loss (dB)
5. Measurement Range upto 40GHz.

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 11.2.

11.3. Test Setup:

Refer to section 11.3.

11.4. Test Procedure:

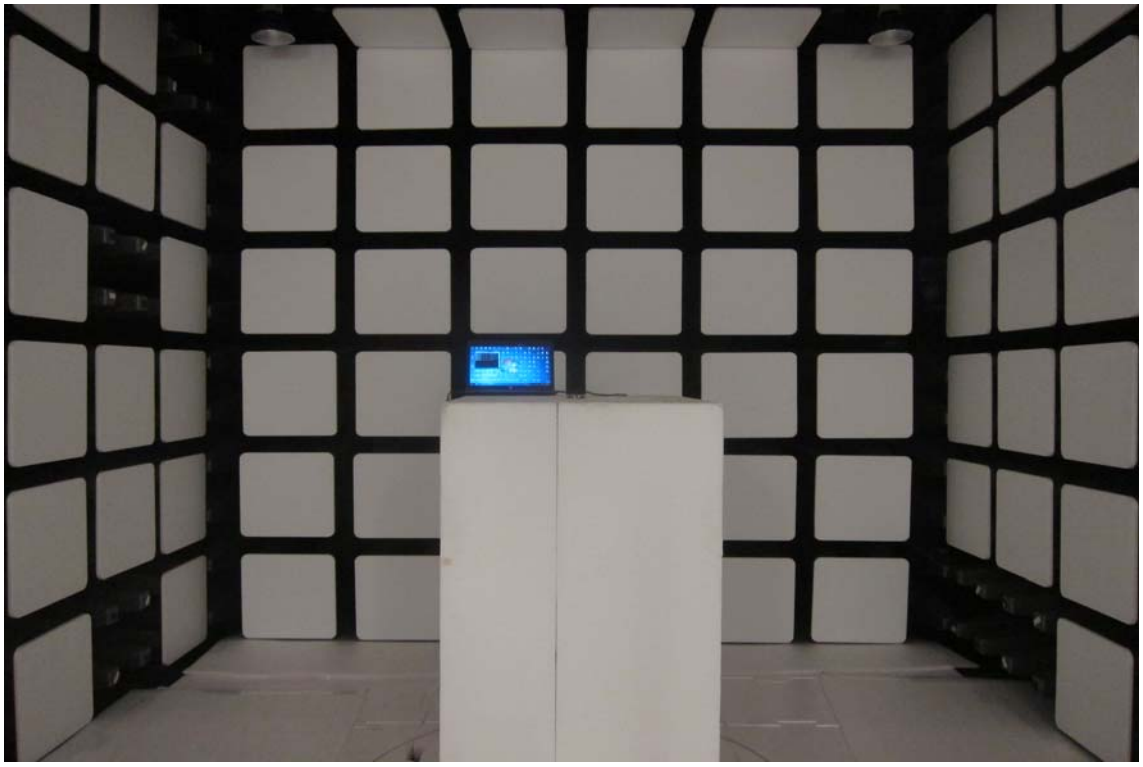
1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW = 3kHz, VBW = 10kHz, Span = 1.5MHz, Sweep=100s, Record the max. reading.
4. Repeat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

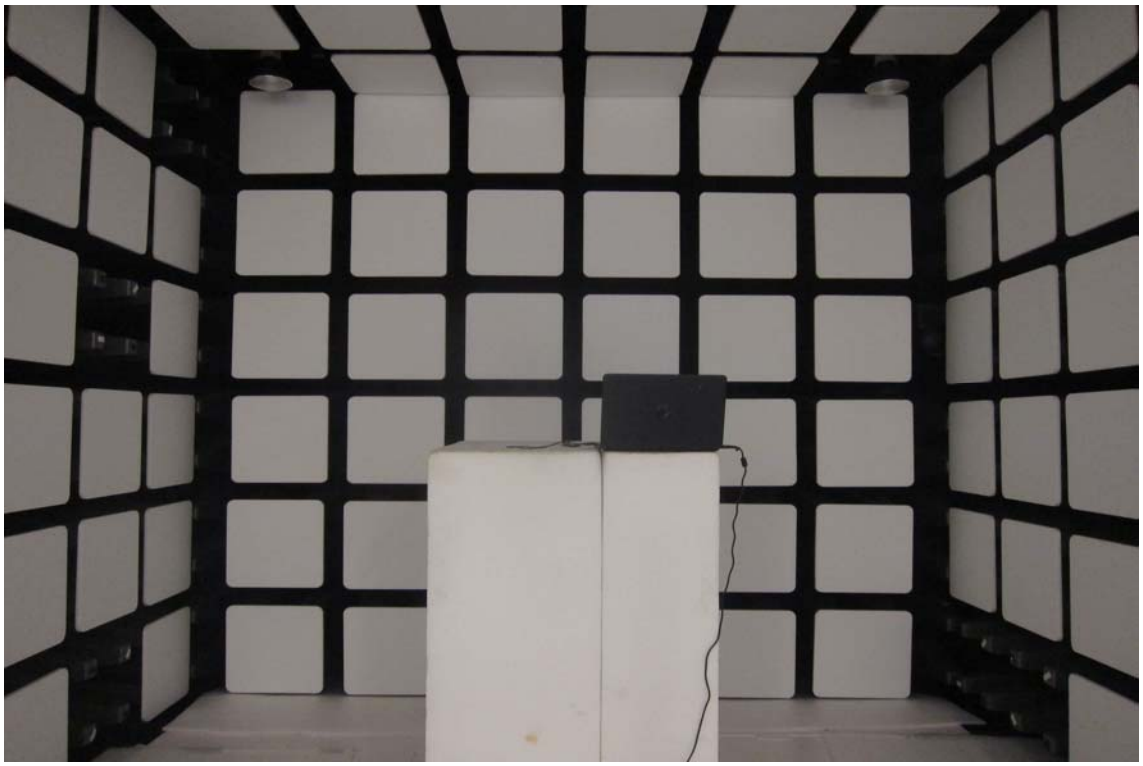
11.5. Measurement Result:

LE mode

Frequency	Power Density	Maximum Limit
MHz	Level (dBm)/3kHz	(dBm)
Low	3.04	13.97
Mid	3.12	13.97
High	3.11	13.97

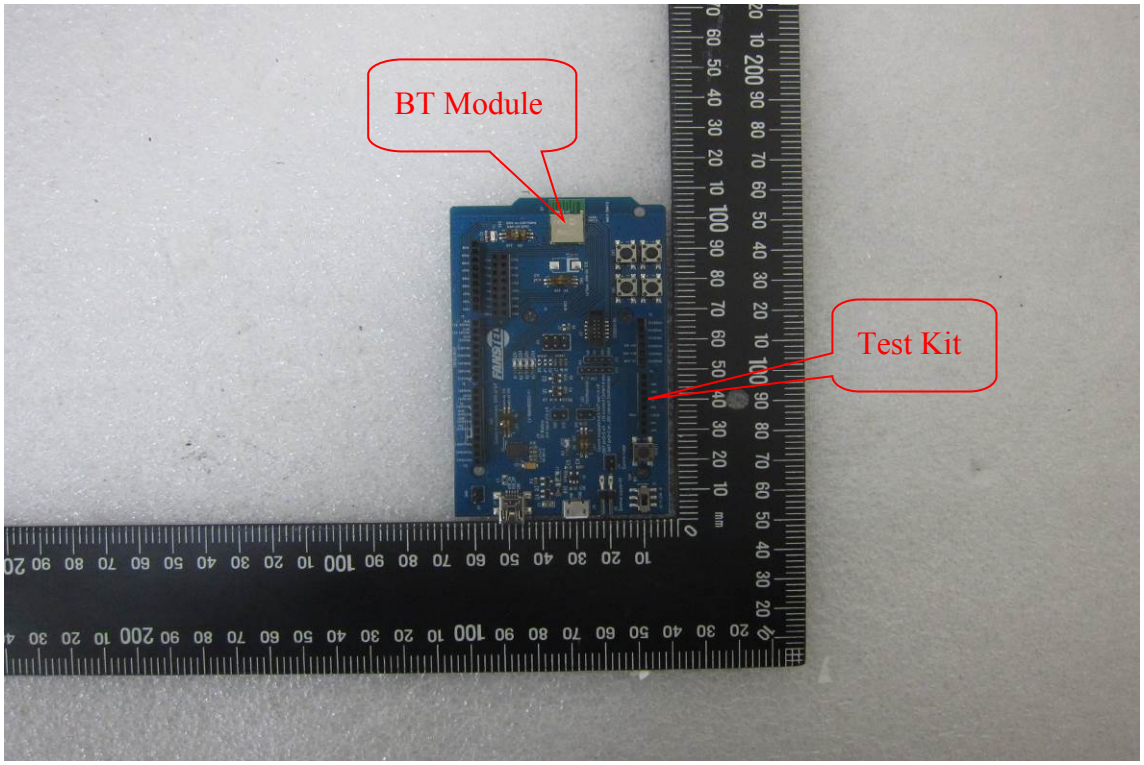
Appendix 1
Photographs of Test Setup



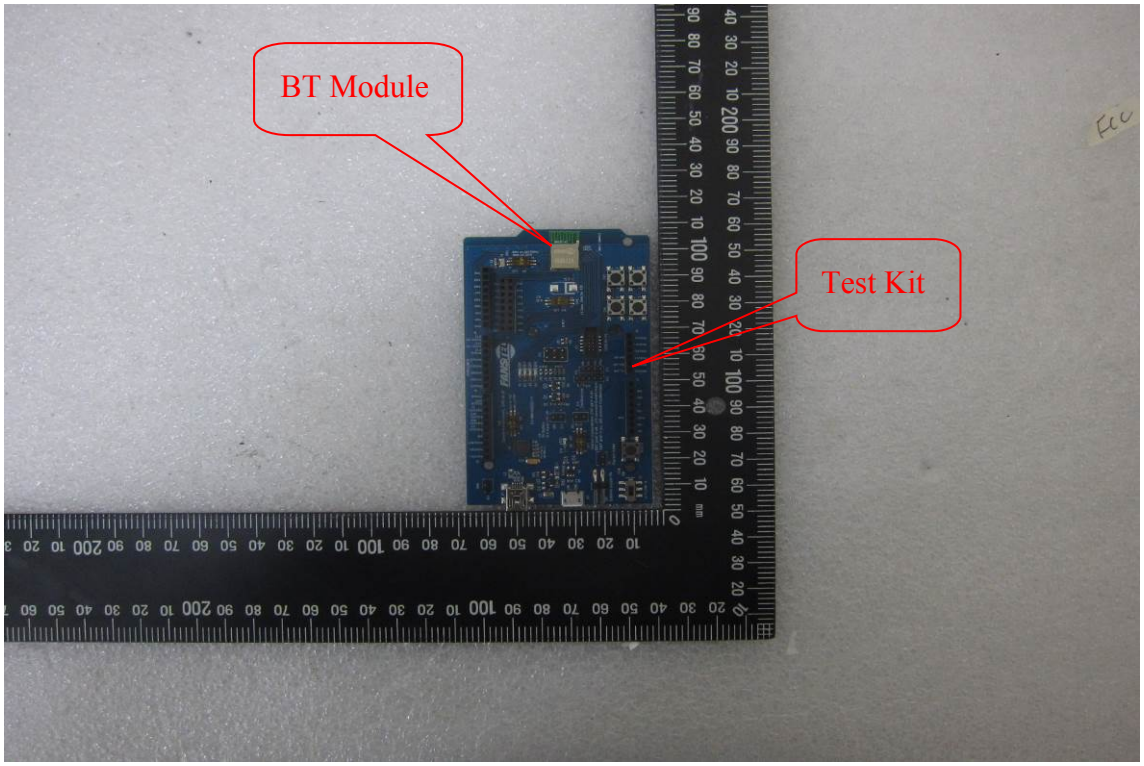


Appendix 2
Photographs of EUT

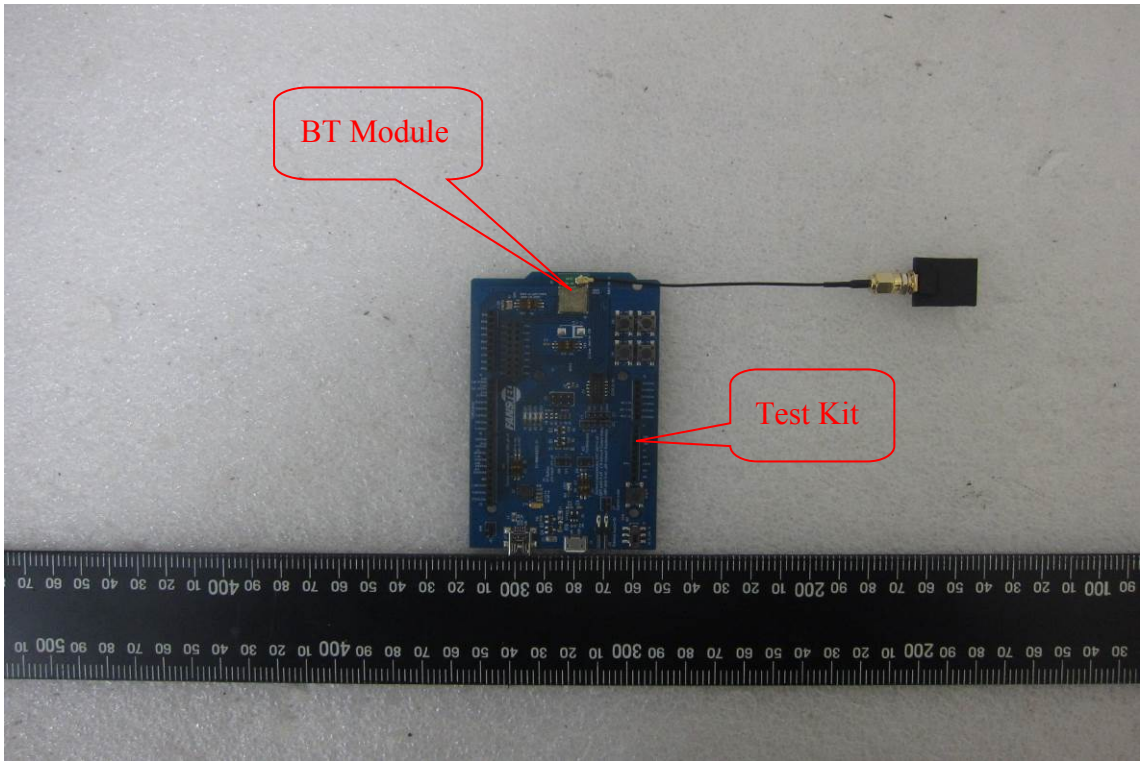
EUT 1 BM832



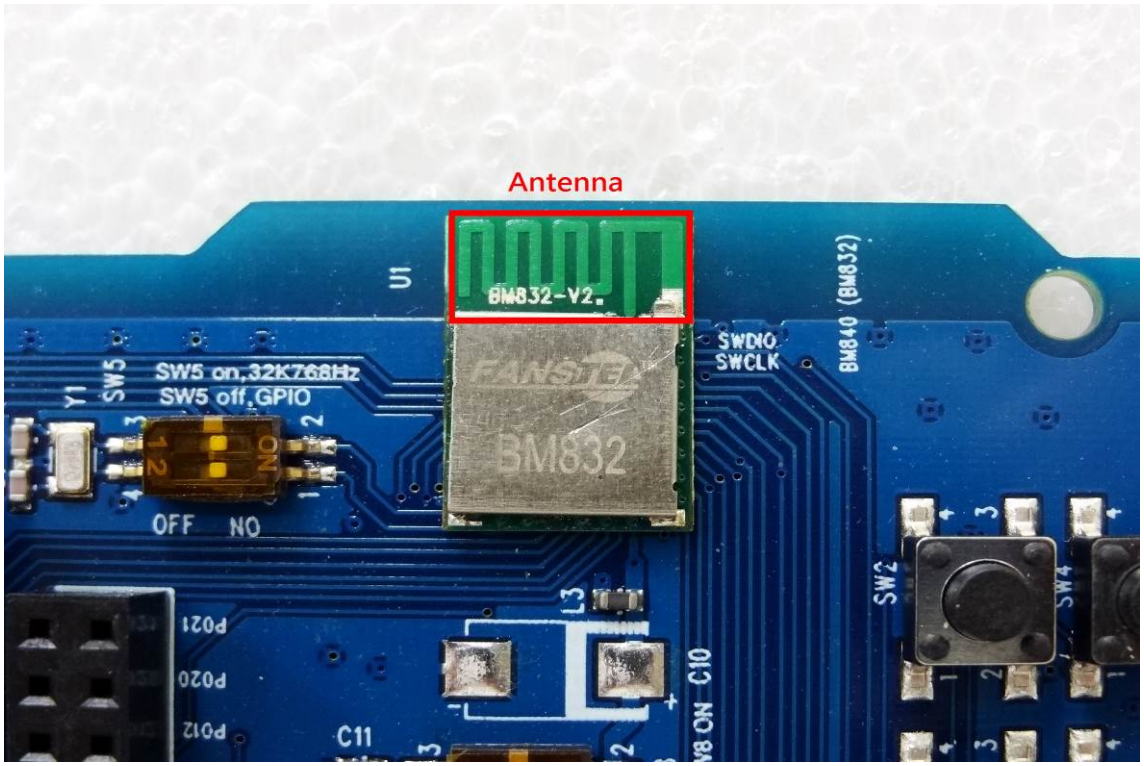
EUT 2 BM832A



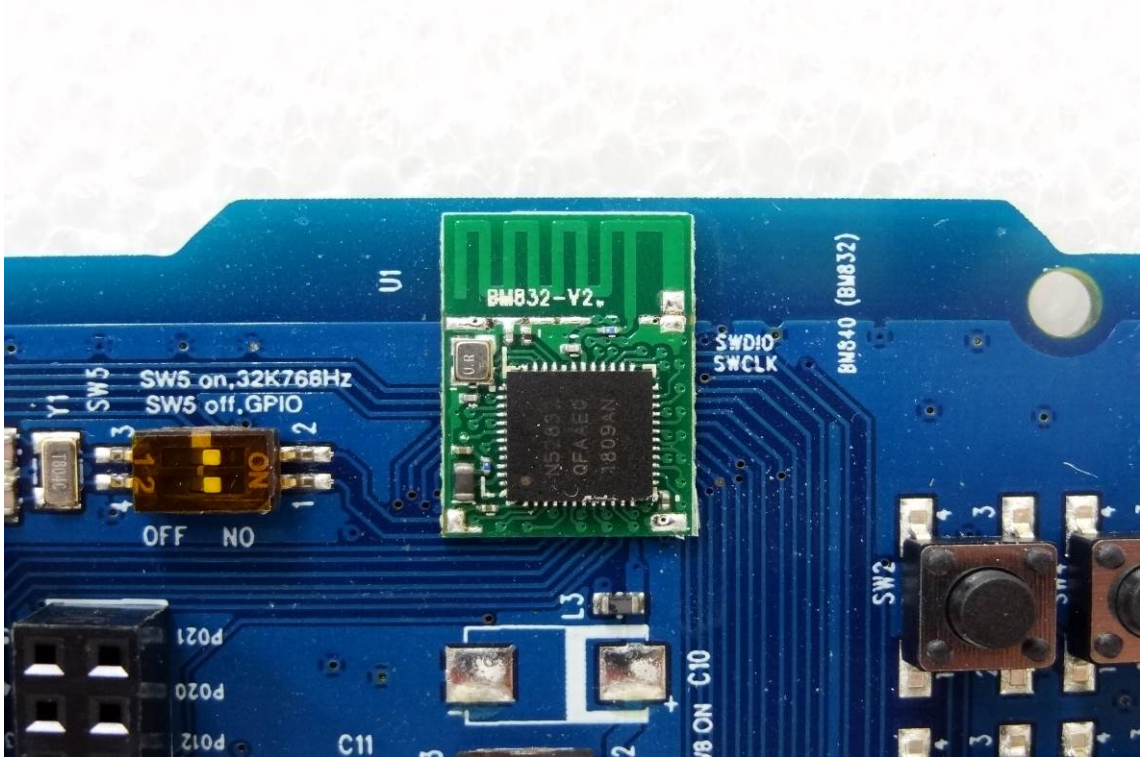
EUT 3 BM832E



EUT 4 BM832



EUT 5 BM832



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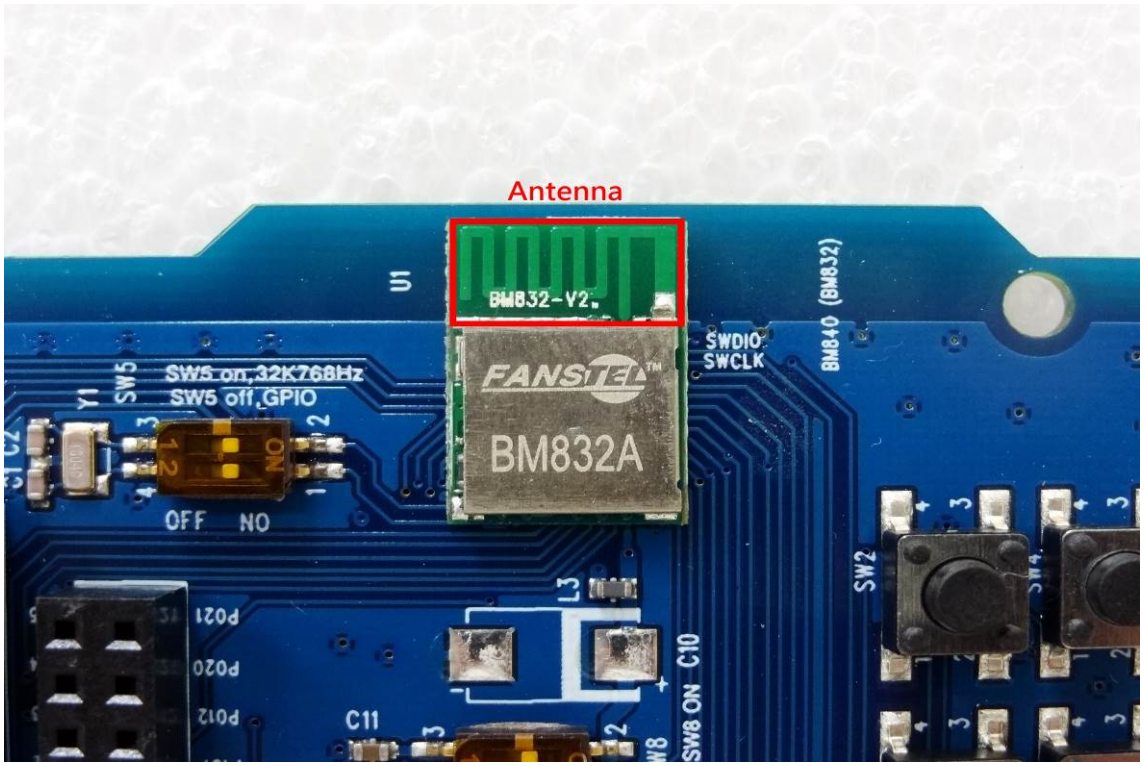

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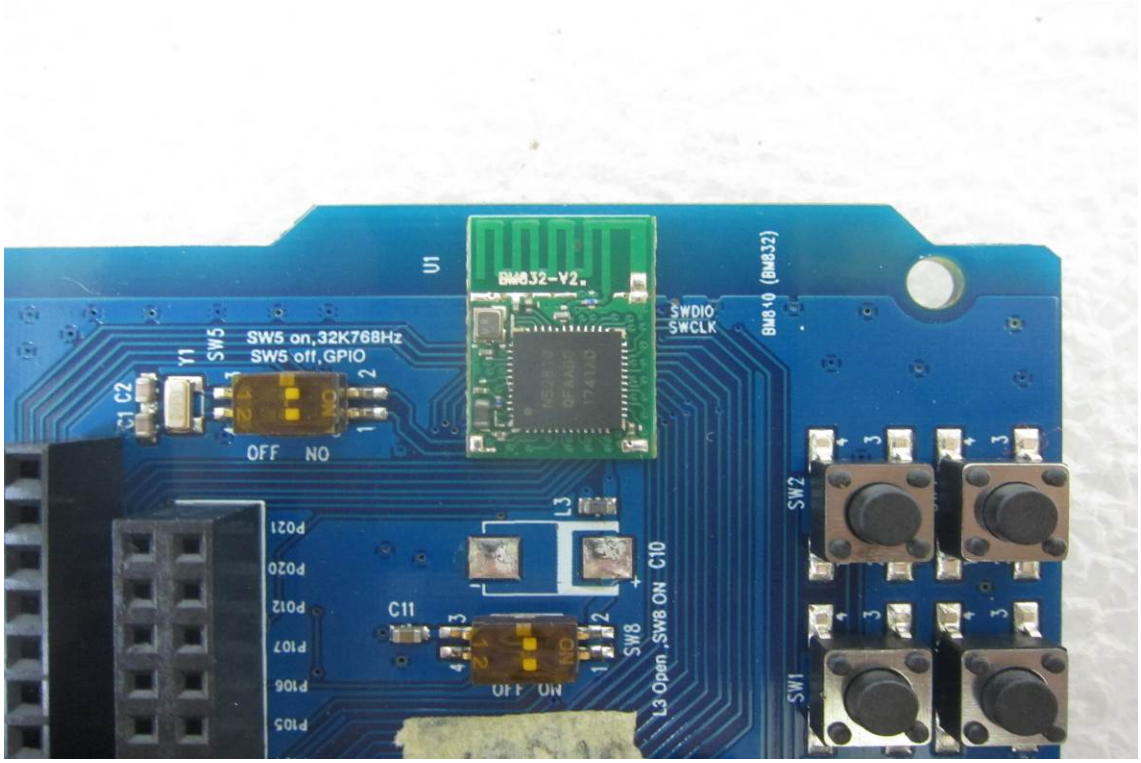
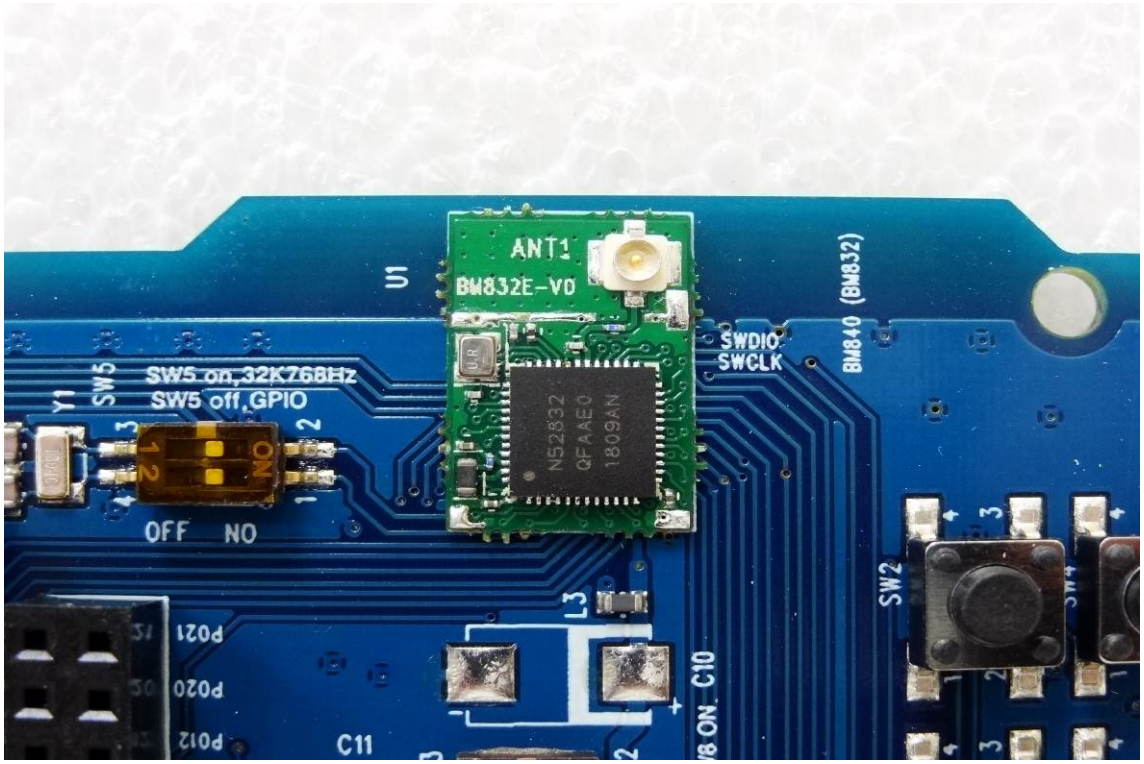
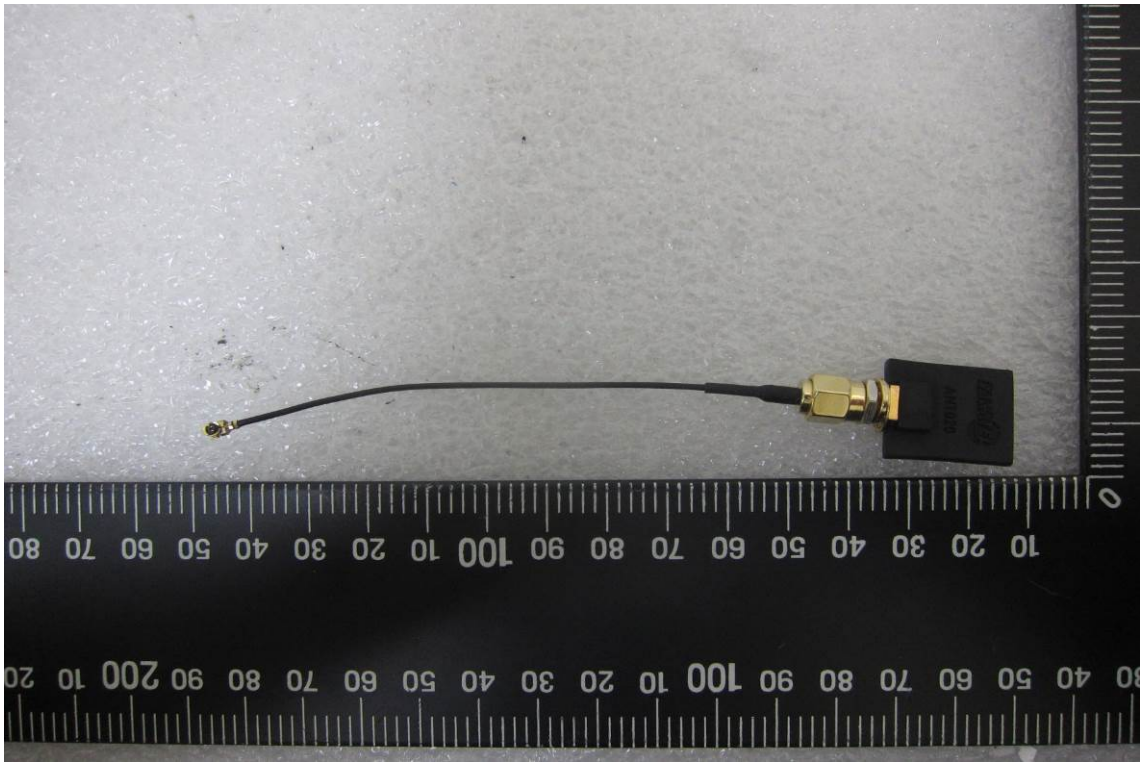


EUT 8 BM832E

EUT 9 BM832E



EUT 10 BM832E Antenna



~ End of Report ~