

TEST REPORT

of

EN62479: 2010

Product : Bluetooth Low Energy (BLE) 5 Module

Brand Name: FANSTEL

Model: BT832; BT832A; BT832F; BT832AF

Model Difference: Please see page 5 model summaries table

Applicant: Fanstel Corporation, Taipei

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Test Performed by:

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Report No.: **ISL-17LR237EMPE**

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Test results given in this report apply only to the specific sample(s) tested and are traceable to national or international standard through calibration of the equipment and evaluating measurement uncertainty herein.

This report **MUST** not be used to claim product endorsement by TAF, NEMKO or any agency of the Government.




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VERIFICATION OF COMPLIANCE

Applicant: Fanstel Corporation, Taipei
Equipment Under Test: Bluetooth Low Energy (BLE) 5 Module
Brand Name: FANSTEL
Model Number: BT832; BT832A; BT832F; BT832AF
Model Different: Please see page 5 model summaries table
Date of Test: 2017/08/09 ~ 2017/08/23
Date of EUT Received: 2017/08/09

APPLICABLE STANDARDS	
STANDARD	TEST RESULT
EN62479: 2010	Complied

The above equipment was tested by International Standards Laboratory for compliance with the requirements set forth in the European Standard EN62479: 2010 under 3.1 (a) of R&TTE Directive 1999/5/EC and RE Directive 2014/53/EU. The results of in this report apply to the product system that was used only.

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Version

Version No.	Date	Description
00	2017/08/24	Initial creation of document

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1. DESCRIPTION OF EQUIPMENT UNDER TEST (EUT)

General:

Product Name:	Bluetooth Low Energy (BLE) 5 Module
Brand:	FANSTEL
Model:	BT832; BT832A; BT832F; BT832AF
Model different:	Please see model summaries table
Type of Equipment:	Embed Modular
Temperature Range:	-40°C to + 85°C
Geo-location capability:	no
Simultaneous transmissions:	N/A

Model Summaries

module	BT832	BT832A	BT832F	BT832AF
MCU	Cortex M4F	Cortex M4	Cortex M4F	Cortex M4
Flash/RAM	512KB/64KB	192KB/24KB	512KB/64KB	192KB/24KB
Size	14x16x1.9mm	14x16x1.9mm	15x20.8x1.9mm	15x20.8x1.9mm
Average Bluetooth range	100 meters	100 meters	270 meters	270 meters
FCC ID	X8WBT832		X8WBT832	
Canada IC ID	4100A-BT832		4100A-BT832	
Europe				
QDID		97989		97989

BT BLE: 1TX/1RX

Bluetooth Version	BT 4.2 (GFSK)	
Frequency Range:	2402 – 2480MHz	
Channel number:	40 channels	
Modulation type:	Wide band Modulation	
Transmit Power: (EIRP)	BT832; BT832A: -4.88dBm BT832F; BT832AF: 1.32dBm	
Dwell Time:	N/A	
Operating Mode:	Point-to-Point	
Adaptive/ Non-Adaptive	Adaptive:Yes	NON-Adaptive
Occupied Channel Bandwidth	Within 2400-2483.5MHz	
Duty Cycle	N/A	
Antenna Beam forming	No	
Antenna Designation:	Revised SMA Type: PCB Antenna BT832; BT832A: -3.38dBi BT832F; BT832AF: 2.82dBi	

The EUT is compliance with BLE.

This test report applies for BT BLE.

2. DESCRIPTION OF TEST MODES

The EUT has been tested under Operating condition. And used to control the EUT for staying in continuous max. transmitting and receiving mode. Channel lowest, Mid and Highest for each with lowest data rate are chosen for testing which has worst case.

3. GENERAL DESCRIPTION OF APPLIED STANDARDS

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

EN 62311:2008 – Generic standard to demonstrate the compliance of electrical apparatus with the basic restrictions related to human exposure to electromagnetic fields (0Hz-300GHz)

EN 62479:2010 – Assessment of the compliance of low power electronic and electrical equipment with the basic restrictions related to human exposure to electromagnetic fields (10MHz to 300GHz)

4. RF EXPOSURE EVALUATION

4.1. Limit:

According to EN 62311: 2008. the criteria listed in the bellowing table shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified 1999/519/EC.

Reference levels for electric, magnetic and electromagnetic fields
(0 Hz to 300 GHz, unperturbed rms values)

Frequency Range	E-field Strength (V/m)	H-Field Strength (A/m)	B-field (uT)	Equivalent plane wave power density S (W/m ²)
0-1 Hz	--	3.2×10^4	4×10^4	--
1-8 Hz	10000	$3.2 \times 10^4 / f^2$	$4 \times 10^4 / f^2$	--
8-25 Hz	10000	4000/f	5000/f	--
0.025-0.8kHz	250/f	4/f	5/f	--
0.8-3kHz	250/f	5	6.25	--
3-150kHz	87	5	6.25	--
0.15-1MHz	87	0.73/f	0.92/f	--
1-10MHz	$87/f^{1/2}$	0.073/f	0.92/f	--
10-400MHz	28	0.073	0.092	2
400-2000MHz	$1.375 f^{1/2}$	$0.0037 f^{1/2}$	$0.0046 f^{1/2}$	f/200
2-300GHz	61	0.16	0.20	1.0

Notes:

1. f as indicated in the frequency range column.

According to section 4.2 Low-power exclusion level (P_{max}) of EN 62479: 2010 . and Annex A, Table A.1 – Example values of SAR-based P_{max} for some cases described by ICNIRP, IEEE Std C95.1-1999 and IEEE Std C95.1-2005

Table A.1 – Example values of SAR-based P_{max} for some cases described by ICNIRP, IEEE Std C95.1-1999 and IEEE Std C95.1-2005

Guideline / Standard	SAR limit, SAR_{max} W/kg	Averaging mass, m g	P_{max} mW	Exposure tier*	Region of body ²
ICNIRP [1]	2	10	20	General public	Head and trunk
	4	10	40	General public	Limbs
	10	10	100	Occupational	Head and trunk
	20	10	200	Occupational	Limbs
IEEE Std C95.1-1999 [2]	1.6	1	1.6	Uncontrolled environment	Head, trunk, arms, legs
	4	10	40	Uncontrolled environment	Hands, wrists, feet and ankles
	8	1	8	Controlled environment	Head, trunk, arms, legs
	20	10	200	Controlled environment	Hands, wrists, feet and ankles
IEEE Std C95.1-2005 [3]	2	10	20	Action level	Body except extremities and pinnae
	4	10	40	Action level	Extremities and pinnae
	10	10	100	Controlled environment	Body except extremities and pinnae
	20	10	200	Controlled environment	Extremities and pinnae

* Consult the appropriate standard for more information and definitions of terms.

4.2. Classification of the assessment method:

The antenna of the product, under normal use condition is at least 20cm away from the body of the user. Warning statement to the user for keeping at least 20 cm separation distance and the prohibition of operating to a person has been printed on the user’s manual. So, this product under normal use is located on electromagnetic far field between the human body.

Far Field Calculation Formula

$$E = \frac{\sqrt{30PG(\theta, \phi)}}{r}$$

G = antenna gain relative to an isotropic antenna
 θ, ϕ = elevation and azimuth angles to point of investigation
 r = distance from observation point to the antenna

4.3. EUT operating condition:

The software provided by Manufacturer enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

4.1. Test Results:

Ambient temperature: 25°C **Relative humidity:** 60% **Test Date:** 2017/08/21

BT Mode:

EIRP Measurement: EN 62479: 2010

Bluetooth Version	BLE (GFSK)
Frequency Range:	2402MHz – 2480MHz
Transmit Power: (EIRP)	BT832; BT832A: -4.88dBm BT832F; BT832AF: 1.32dBm

Evaluation Results:

The max. EIRP measurement value is 1.32dBm (1.36mW) for BT832F; BT832AF and -4.88dBm (0.33mW) for BT832; BT832A, therefore this device always meets EN62479:2010 Annex A Tablet A.1 Pmax of ICNIRP requirements 20mW.

APPENDIX 1

PHOTOGRAPHS OF EUT

Refer to ISL-17LR237E328

~ End of Report ~