



RF Exposure Evaluation Declaration

Product Name : EZ-BT WICED Module with Mesh
Model No. : CYBT-413034-02
FCC ID : WAP3034
IC : 7922A-3034

Applicant : Cypress Semiconductor
Address : 198 Champion Ct, San Jose, California 95134
United States

Date of Receipt : Mar. 30, 2018
Issued Date : Jun. 19, 2018
Report No. : 1832180R-RF-US- P20V01
Report Version : V 1.0

The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration of the equipment and evaluated measurement uncertainty herein.

This report must not be used to claim product endorsement by TAF, A2LA or any agency of the government.

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Test Report Certification

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Manufacturer : Cypress Semiconductor
Address : 198 Champion Ct, San Jose, California 95134
United States
Model No. : CYBT-413034-02
FCC ID : WAP3034
IC : 7922A-3034
EUT Voltage : DC 1.8~3.6V
Test Voltage : AC120V/60Hz
Applicable Standard : KDB 447498D01V06
FCC Part1.1310
RSS-102: Issue 5, 2015
Test Result : Complied
Performed Location : DEKRA Testing and Certification (Suzhou) Co., Ltd.
No.99 Hongye Rd., Suzhou Industrial Park, Suzhou, 215006,
Jiangsu, China
TEL: +86-512-6251-5088 / FAX: +86-512-6251-5098
FCC Designation Number: CN1199; IC Lab Code: 4075B

Documented By : Kathy Feng
(Project Assistant: Kathy Feng)

Reviewed By : Frank He
(Senior Project Manager: Frank He)

Approved By : Harry Zhao
(Engineering Manager: Harry Zhao)

1. RF Exposure Evaluation

1.1.Limits

For FCC:

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Average Time (Minutes)
(A) Limits for Occupational/ Control Exposures				
300-1500	--	--	F/300	6
1500-100,000	--	--	5	6
(B) Limits for General Population/ Uncontrolled Exposures				
300-1500	--	--	F/1500	6
1500-100,000	--	--	1	30

F= Frequency in MHz

Friis Formula

Friis transmission formula: $P_d = (P_{out} * G) / (4 * \pi * r^2)$

Where

P_d = power density in mW/ cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in cm

P_d is the limit of MPE, 1 mW/cm² . If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

For ISED:

According to RSS 102 Issue 5: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in RSS 102 Clause 4

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field (V/m rms)	Magnetic Field (A/m rms)	Power Density (W/m²)	Reference Period (minutes)
0.003-10 ²¹	83	90	-	Instantaneous*
0.1-10	-	0.73/ <i>f</i>	-	6**
1.1-10	87/ <i>f</i> ^{0.5}	-	-	6**
10-20	27.46	0.0728	2	6
20-48	58.07/ <i>f</i> ^{0.25}	0.1540/ <i>f</i> ^{0.25}	8.944/ <i>f</i> ^{0.5}	6
48-300	22.06	0.05852	1.291	6
300-6000	3.142 <i>f</i> ^{0.3417}	0.008335 <i>f</i> ^{0.3417}	0.02619 <i>f</i> ^{0.6834}	6
6000-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	616000/ <i>f</i> ^{1.2}
150000-300000	0.158 <i>f</i> ^{0.5}	4.21 x 10 ⁻⁴ <i>f</i> ^{0.5}	6.67 x 10 ⁻⁵ <i>f</i>	616000/ <i>f</i> ^{1.2}
<p>Note: <i>f</i> is frequency in MHz. *Based on nerve stimulation (NS). ** Based on specific absorption rate (SAR).</p>				

F= Frequency in MHz

Friis Formula

Friis transmission formula: $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot r^2)$

Where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in cm

P_d is the limit of MPE, 0.540 mW/cm² for 2.4GHz . If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

1.2. Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

The temperature and related humidity: 18°C and 78% RH.

1.3. Test Result of RF Exposure Evaluation

Product	:	EZ-BT WICED Module with Mesh
Test Item	:	RF Exposure Evaluation
Test Site	:	AC-6

● **Antenna Information:**

Antenna manufacturer	N/A		
Antenna Delivery	<input checked="" type="checkbox"/>	1*TX+1*RX	<input type="checkbox"/> 2*TX+2*RX <input type="checkbox"/> 3*TX+3*RX
Antenna technology	<input checked="" type="checkbox"/>	SISO	
	<input type="checkbox"/>	MIMO	<input type="checkbox"/> Basic
			<input type="checkbox"/> Sectorized antenna systems
			<input type="checkbox"/> Cross-polarized antennas
			<input type="checkbox"/> Unequal antenna gains, with equal transmit powers
			<input type="checkbox"/> Spatial Multiplexing
			<input type="checkbox"/> CDD
Antenna Type	<input type="checkbox"/>	External	<input type="checkbox"/> Dipole Antenna
	<input checked="" type="checkbox"/>	Internal	<input type="checkbox"/> PIFA Antenna
			<input checked="" type="checkbox"/> PCB Antenna
			<input type="checkbox"/> Slot Antenna
			<input type="checkbox"/> Ceramic Chip Antenna
			<input type="checkbox"/> Metal plate type F antenna
	<input type="checkbox"/>		<input type="checkbox"/> Cross-polarize Antenna
Antenna Gain	-0.5dBi		

- **Power Density:**

The maximum conducted tune-up power is 4.5 dBm for BT3.0 & BLE:

Test Mode	Frequency Band (MHz)	EIRP (dBm)	Limit of Power Density S(mW/cm ²)		Power Density at R = 20 cm (mW/cm ²)
			FCC	IC	
BT3.0 & BLE	2402 ~ 2480	4	1	0.54	0.0005

Note:

1. The maximum power of related plane is calculated for simultaneous MPE.
2. The power density is 0.0005mW/cm² for EZ-BT WICED Module with Mesh without any other radio equipment.

————— The End —————