

APPROVAL

Customer	LG Electronics Inc.
Product Name	RF Dongle
Customer Model	PWFMDD202
Customer P/N	EBR24269701
Supplier Model	S905 TYPE

DATE 2024. 12. 05.		RA20240056
DESIGNED BY	CHECKED BY	APPROVED BY
D.I KANG	D.J JUNG	M.K YOON

1. Features

1.1 General

- IEEE® 802.11 b/g/n (20 MHz) (1x1) solution
- Integrated PCB antenna
- SIZE : 48mm x 68mm x 14.2mm
- CMOS MAC, Baseband PHY, and RF in a single chip for 802.11 b/g/n compatible WLAN
- Complete 802.11n solution for 2.4 GHz band
- 65 Mbps receive PHY rate and 65 Mbps transmit PHY rate using 20 MHz bandwidth
- Compatible with 802.11n specification
- Backward compatible with 802.11b/g devices while operating in 802.11n mode
- Bluetooth 5.0 Low Energy (F/W supported)

1.2 Ordering Information

Model	Description
PWFMDD202	802.11 b/g/n (HT20) USB Dongle Bluetooth® low energy mode

2. Product Specifications

2.1 Electrical Specifications

2.1.1 Absolute Maximum Ratings

Description	Min.	Typ	Max.	Unit
Storage Temperature	-30		+85	°C
Storage Humidity			85	%

2.1.2 Operating conditions

Description	Min.	Typ	Max.	Unit
Supply Voltage	4.5		13.2	Vdc
Ambient Temperature	-20		+85	°C
Ambient Humidity			85	%

2.2 Standard Test Conditions

The Test for electrical specification shall be performed under the following condition

Otherwise this following conditions, not guaranteed this performance

2.2.1 Ambient Condition

Description	Min.	Typ	Max.	Unit
Ambient Temperature	20		30	°C
Ambient Humidity	30		70	%

2.2.2 Power Supply Voltages

Input power	Unit
VDD_5 V	5 V $\pm$ 0.5 V
VDD_12 V	12 V $\pm$ 1.2 V

2.2.3 ESD Information

ESD	Unit
Air discharge	$\pm$ 8 kV
Contact discharge	$\pm$ 4 kV

2.2.4 Current Consumption (Wi-Fi)

Device state	Code rate	Output power [dBm]	Current consumption
			Max
ON_Transmit	802.11b 11 Mbps	17±2	270 mA
	802.11g 54 Mbps	15±2	190 mA
	802.11n MCS7(HT20)	14±2	180 mA
ON_Receive	802.11b 11 Mbps	N/A	80 mA
	802.11g 54 Mbps	N/A	80 mA
	802.11n MCS 7 (HT20)	N/A	80 mA

2.2.5 Current Consumption (BLE)

Device state	Code rate	Output power [dBm]	Current consumption
			Max
ON_Transmit	1 Mbps	3.4±2	90 mA

2.3 Standard Rated Specification

Radio performance under typical conditions: VDD @ 5.0 V, VD33@ 3.3 V, temp. 25°C

2.3.1 Wi-Fi

Division	Characteristic
WLAN Standard	IEEE 802.11 b/g/n HT20
Host Interface	UART
Frequency Range	2400 MHz ~ 2483.5 MHz
Dimension	L x W x H : 48 x 68 x 14.2 (typical) mm
Modulation	802.11b : DSSS, CCK, DPSK, DQPSK
	802.11g/n : OFDM, BPSK, QPSK, 16-QAM, 64-QAM
Data Rate	802.11b : 1, 2, 5.5, 11 Mbps
	802.11g : 6, 9, 12, 18, 24, 36, 48, 54 Mbps
Data Rate (20 MHz)	802.11n : MCS0, MCS1, MCS2, MCS3, MCS4, MCS5, MCS6, MCS7

2.3.2 BLE

Division	Characteristic
WPAN Standard	IEEE 802.15.1
Host Interface	UART
Frequency Range	2402 MHz ~ 2480 MHz
Dimension	L x W x H : 48 x 68 x 14.2 (typical) mm
Spread Spectrum	FHSS (Frequency Hopping Spread Spectrum)
Data Rate	1 Mbps

3. PCBA Test Plan

Classification	Item	Test methods and conditions	Specifications	Remark
Function Test	Version check / communication check	Check version and communication operation with PC test tool.	Must be normal operate	
Initial product test	Moisture resistance test	Check the operation after leaving the samples 48 hours at $40\pm1^{\circ}\text{C}$ and $90\pm5\%$ RH without power applied.	After the test, leave the sample at room temperature for 2hours and operate normally. (Remove water and moisture on the PCB parts completely and then leave them)	
	Temperature Cycle	Leave the sample in RT $-20\pm1^{\circ}\text{C}$ for 12 hours, RT $70\pm1^{\circ}\text{C}$ for 12 hours without power applied. (1 Cycle) Repeat the test 5 cycle and check the operation.		
	Low Temperature resistance test	Leave the sample in RT -20°C for 24 hours without power applied.		
	High Temperature resistance test	Leave the sample in RT 70°C for 24 hours without power applied.		
	Voltage fluctuation test	Apply $\pm 10\%$ of rated voltage(5 V) for 9 hours (3 hours each) at normal temperature and humidity ($20\sim 30^{\circ}\text{C}$, $30\sim 70\%$)	Must be normal operate	
	Vibration test	Test and check the operation without power applied. CPM : 1500 cpm Amplitude : 4MM Duration : 120 minutes (X, Y, Z direction)		
Additional initial product test	PCBA bending test	Increase from 1 kg to 5 kg in the central part of PCBA (2 seconds intervals in 1 kg increments) without power applied. After 2 second, remove the pressure and check the operation.	Must be normal operate	

PCBA Reliability Test	Temperature Shock	Leave the sample in -40°C for 30 minutes, 85°C for 30 minutes without power applied. (1 Cycle) Repeat the test 300 cycle and check the operation. (The time of temperature rise and fall should be within 3 minutes.)	Must be normal operate	
	THB	In state of 5 V power applied, leave the sample in RT 85°C, RH 85% for 500 hours and check the operation.		

Wi-Fi&BLE Combo USB Dongle Certification [PWFMD202]

P/N : EBR24269701

Model Name : PWFMD202

No	Country	Logo Information
1	KC	-
2	FCC	-
3	CE	
4	IC	-
5	UKCA	

Software Information

H/W : V 1.0

S/W : V 1.0

[Certification Mark / Certification Number]

FCC ID : BEJ-PWFMDD202

IC : 2703N-PWFMDD202

CE, UKCA : Marking (min. 5mm)

Manufacturer : LG Electronics Inc.

**The postal address: 84, Wanam-ro, Seongsan-gu, Changwon-si, Gyeongsangnam-do,
Republic of Korea, 51554**

FCC Part 15.19

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Part 15.21

Any changes or modifications (including the antennas) to this device that are not expressly approved by the manufacturer may void the user's authority to operate the equipment.

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

(1) This device may not cause interference.

(2) This device must accept any interference, including interference that may cause undesired operation of the device.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

(1) L'appareil ne doit pas produire de brouillage;

(2) L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

FCC and IC RF Radiation Exposure Statement: This equipment complies with FCC and IC RF Radiation exposure limits set forth for an uncontrolled environment. This device and its antenna must not be co-located or operating in conjunction with any other antenna or transmitter.

This equipment should be installed and operated with a minimum distance of 20 cm between the radiator and your body.

RF du FCC et IC d'exposition aux radiations: Cet équipement est conforme à l'exposition de FCC et IC rayonnements RF limites é-tablies pour un environnement non contrôlé. L'antenne pour ce transmetteur ne doit pas être même endroit avec d'autres émetteur sauf conformément à FCC et IC procédures de produits Multi-émetteur.

Cet équipement doit être installé et utilisé avec une distance minimale de 20 cm entre le radiateur et votre corps.