Project No: CB10403240

Maximum Permissible Exposure

Applicant's company	**Hewlett-Packard Company**
Applicant Address	3000 Hanover Street Palo Alto, California 94304 U.S.A.
FCC ID	**B94MRLBB1301**
Manufacturer's company	**Joy Technology (ShenZhen) Corporation**
Manufacturer Address	Building A,B,C,D, HengKeng Ind., Shangpai, Shangwu,Aiqun Rd., Shiyan Town,Shenzhen 518135 China

Product Name	802.11ac WLAN Radio Module
Brand Name	HP
Model Name	MRLBB-1301
Ref. Standard(s)	47 CFR FCC Part 2 Subpart J, section 2.1091
EUT Freq. Range	5150 ~ 5350MHz / 5470 ~ 5725MHz / 5725 ~ 5850 MHz
Received Date	Jun. 28, 2013
Final Test Date	Apr. 08, 2015
Submission Type	Class II Change

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History of This Assessment Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA321924-07	Rev. 01	Initial issue of report	Apr. 29, 2015

1. TABLE FOR CLASS II CHANGE

1.1. Table for Class II Change

This product is an extension of original one reported under Sporton project number: FA321924-02

Below is the table for the change of the product with respect to the original one.

Modifications
1. Updating test rule of 5GHz band 1~4 (5150~5350MHz / 5470~5725MHz / 5725~5850 MHz) to "New Rules" from "Old Rules". 2. Adding weather band (5600~5650MHz) for this device.
Performance Checking
Maximum Permissible Exposure.

2. MAXIMUM PERMISSIBLE EXPOSURE

2. 1. Applicable Standard

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby that distance of at least 0.2 m is normally maintained between the user and the device.

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm²)	Averaging Time |E|², |H|² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842 / f	4.89 / f	(900 / f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-100,000			5	6

(B) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm²)	Averaging Time |E|², |H|² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30

Note: f = frequency in MHz ; *Plane-wave equivalent power density

2.2. MPE Calculation Method

E (V/m) = $\frac{\sqrt{30 \times P \times G}}{d}$ Power Density: *Pd* (W/m²) = $\frac{E^2}{377}$

E = Electric field (V/m)

P = Peak RF output power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

Pd = $\frac{30 \times P \times G}{377 \times d^2}$

From the EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the gain of the used antenna, the RF power density can be obtained.

2.3. Calculated Result and Limit

Exposure Environment: General Population / Uncontrolled Exposure

Test Mode : Mode 1

Antenna Type : Dipole Antenna

Conducted Power for IEEE 802.11ac MCS0/Nss1 (VHT20) : 24.08 dBm

Distance (m)	Test Freq. (MHz)	Antenna Gain (dBi)	Antenna Gain (numeric)	The maximum combined Average Output Power		Power Density (S) (mW/cm²)	Limit of Power Density (S) (mW/cm²)	Test Result
				(dBm)	(mW)			
0.2	5240	1.00	1.2589	24.0797	255.8425	0.064110	1	Complies

Test Mode : Mode 2

Antenna Type : Omnidirectional Antenna

Conducted Power for IEEE 802.11ac MCS0/Nss3 (VHT20): 24.09 dBm

Distance (m)	Test Freq. (MHz)	Antenna Gain (dBi)	Antenna Gain (numeric)	The maximum combined Average Output Power		Power Density (S) (mW/cm²)	Limit of Power Density (S) (mW/cm²)	Test Result
				(dBm)	(mW)			
0.2	5260	6.70	4.6774	24.0929	256.6194	0.238913	1	Complies

Test Mode : Mode 3

Antenna Type : Panel Antenna

Conducted Power for IEEE 802.11a: 24.10 dBm

Distance (m)	Test Freq. (MHz)	Antenna Gain (dBi)	Antenna Gain (numeric)	The maximum combined Average Output Power		Power Density (S) (mW/cm²)	Limit of Power Density (S) (mW/cm²)	Test Result
				(dBm)	(mW)			
0.2	5240	9.20	8.3176	24.1041	257.2846	0.425955	1	Complies

Test Mode : Mode 4

Antenna Type : PCB Antenna

Conducted Power for IEEE 802.11ac MCS0/Nss1 (VHT20): 24.35 dBm

Distance (m)	Test Freq. (MHz)	Antenna Gain (dBi)	Antenna Gain (numeric)	The maximum combined Average Output Power		Power Density (S) (mW/cm²)	Limit of Power Density (S) (mW/cm²)	Test Result
				(dBm)	(mW)			
0.2	5785	5.74	3.7497	24.3524	272.4206	0.203325	1	Complies