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Project No: CB10505231

Maximum Permissible Exposure Report

Applicant's company	Xirrus, Inc.
Applicant Address	2101 Corporate Center Drive, Thousand Oaks, CA 91320 USA
FCC ID	SK6-XDR240
Manufacturer's company	Lite-On Network Communication (Dongguan) Limited
Manufacturer Address	30#Keji Rd.,Yin Hu Industrial Area, Qingxi Town, DongGuan City, Guangdong, China

Product Name	Wireless Access Point Radio module
Brand Name	XIRRUS
Model Name	XDR240
Ref. Standard(s)	47 CFR FCC Part 2 Subpart J, section 2.1091
Received Date	Dec. 10, 2015
Final Test Date	May 12, 2016
Submission Type	Class II Change

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SPORTON INTERNATIONAL INC.



Testing Laboratory
1190

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History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA5D1826-01	Rev. 01	Initial issue of report	Jun. 02, 2016

1. GENERAL DESCRIPTION

1.1. EUT General Information

RF General Information			
Evaluation Mode	Frequency Range (MHz)	Operating Frequency (MHz)	Modulation Type
2.4GHz WLAN	2400-2483.5	2412-2462	802.11b: DSSS (DBPSK, DQPSK, CCK) 802.11g/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)
5GHz WLAN	5150-5250 5250-5350 5470-5725 5725-5850	5180-5240 5260-5320 5500-5720 5745-5825	802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)

1.2. Table for Class II Change

This product is an extension of original one reported under Sporton project number: FA5D1826

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

Modifications
Adding Band 2 and Band 3 (5250~5350 MHz, 5470~5725 MHz) for this device, and it evaluated for Maximum Permissible Exposure.

1.3. Testing Location

Testing Location		
☐	HWA YA	ADD : No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL : 886-3-327-3456 FAX : 886-3-327-0973
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2. MAXIMUM PERMISSIBLE EXPOSURE

2.1. Limit of Maximum Permissible Exposure

(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/ cm ²)	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/ cm ²)	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

The MPE was calculated at 20 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

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

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

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

2.3. Calculated Result and Limit

Exposure Environment: General Population / Uncontrolled Exposure

For 5GHz Band 1 and Band 4:

Antenna Type : PIFA Antenna

Conducted Power for IEEE 802.11ac MCS0/Nss1 (VHT20): 25.47 dBm

Distance (cm)	Test Freq. (MHz)	Directional Gain (dBi)	Antenna Gain (numeric)	The maximum combined Average Output Power		Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
				(dBm)	(mW)			
20	5785	10.23	10.5510	25.4653	351.9862	0.739212	1	Complies

Note: $Directional\ Gain = 10 \log \left[\frac{\sum_{j=1}^{N_{ss}} \left\{ \sum_{K=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$

For 5GHz Band 2 and Band 3:

Antenna Type : PIFA Antenna

Conducted Power for IEEE 802.11ac MCS0/Nss1 (VHT80): 18.70 dBm

Distance (cm)	Test Freq. (MHz)	Directional Gain (dBi)	Antenna Gain (numeric)	The maximum combined Average Output Power		Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
				(dBm)	(mW)			
20	5610	11.24	13.3027	18.6980	74.0961	0.196194	1	Complies

Note: $Directional\ Gain = 10 \log \left[\frac{\sum_{j=1}^{N_{ss}} \left\{ \sum_{K=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$

For 2.4GHz Band:

Antenna Type : PIFA Antenna

Conducted Power for IEEE 802.11ac MCS0/Nss1 (VHT20): 27.05 dBm

Distance (cm)	Test Freq. (MHz)	Directional Gain (dBi)	Antenna Gain (numeric)	The maximum combined Average Output Power		Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
				(dBm)	(mW)			
20	2437	6.21	4.1800	27.0452	506.4299	0.421351	1	Complies

Note: $Directional\ Gain = 10 \log \left[\frac{\sum_{j=1}^{N_{ss}} \left\{ \sum_{K=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$

Note: The EUT is a limited module which only limited to the Wireless Access Point (brand: XIRRUS / model: XD4240).