



RF Exposure Evaluation Report

Equipment : Wireless Access Point Radio module
Brand Name : XIRRUS
Model No. : XDR241
FCC ID : SK6-XDR241
Standard : 47 CFR Part 2.1091
Applicant : Xirrus, Inc.
2101 Corporate Center Drive, Thousand Oaks, CA
91320 USA
Manufacturer : Lite-On Network Communication (Dongguan)
Limited
30#Keji Rd., Yin Hu Industrial Area, Qingxi Town,
DongGuan City, Guangdong, China

The product sample received on Jul. 22, 2016 and completely tested on Sep. 09, 2016. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with 47 CFR Part 2.1091, and pass the limit.

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Sam Chen
SPORTON INTERNATIONAL INC.





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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA681228	Rev. 01	Initial issue of report	Sep. 14, 2016

1 General Description

1.1 EUT General Information

RF General Information			
Evaluation Mode	Frequency Range (MHz)	Operating Frequency (MHz)	Modulation Type
5GHz WLAN	5150-5250 5725-5850	5180-5240 5745-5825	802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)

Note 1: The EUT is a limited module which only limited to the Wireless Access Point (brand: XIRRUS / model: XA4240).

The EUT was installed to the Wireless Access Point (brand: XIRRUS / model: XA4240) to perform all the tests.

Note 2: The Wireless Access Point (brand: XIRRUS / model:

XA4240) will install four radio modules (Radio 1(FCC ID: SK6-XDR240), Radio 2~ Radio 4(FCC ID: SK6-XDR241)). These four radios will be operated in different bands.

1.2 Testing Location

Testing Location		
<input type="checkbox"/>	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
<input checked="" type="checkbox"/>	JHUBEI	ADD : No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C. TEL : 886-3-656-9065 FAX : 886-3-656-9085

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 34 cm for this 5GHz device and 34 cm for system device to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

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

E = Electric field (V/m)

P = 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 Dipole Antenna:

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)
5.8G;D1D	9.02	26.94	35.96	3.94457	20	0.78475	1

For Directional Antenna:

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)
5.8G;D1D	9.40	26.57	35.97	3.95367	20	0.78656	1

For Simultaneous Transmission Analysis

For Dipole Antenna:

Mode 1: Radio 1 (2.4GHz) + 5GHz Band 1 (one of the radio 2~4) + 5GHz Band 4(one of the radio 2~4)

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)	Ratio (S/Limit)
Radio 1 2.4GHz	8.02	26.30	34.32	2.7040	34	0.1862	1	0.1862
5GHz Band 1 (one of the radio 2~4)	9.02	26.72	35.74	3.7497	34	0.3120	1	0.3120
5GHz Band 4 (one of the radio 2~4)	9.02	26.94	35.96	3.9446	34	0.2729	1	0.2729
							Sum Ratio	0.7711
							Ratio Limit	1

Mode 2: Radio 1 (5GHz Band 1) + 5GHz Band 4 (one of the radio 2~4)

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)	Ratio (S/Limit)
Radio 1 5GHz Band 1	9.02	24.50	33.52	2.2491	34	0.1863	1	0.1863
5GHz Band 4 (one of the radio 2~4)	9.02	26.94	35.96	3.9446	34	0.2729	1	0.2729
							Sum Ratio	0.4592
							Ratio Limit	1

Mode 3: Radio 1 (5GHz band 4) + 5GHz band 1(one of the radio 2~4)

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)	Ratio (S/Limit)
Radio 1 5GHz Band 4	9.02	25.68	34.70	2.9512	34	0.2041	1	0.2041
5GHz Band 1 (one of the radio 2~4)	9.02	26.72	35.74	3.7497	34	0.3120	1	0.3120
							Sum Ratio	0.5161
							Ratio Limit	1

Note: Radio 1 FCC ID: SK6-XDR240 and Radio 2 ~ Radio 4 FCC ID: SK6-XDR241.



For Simultaneous Transmission Analysis

For Directional Antenna:

Mode 1: Radio 1 (2.4GHz) + 5GHz Band 1 (one of the radio 2~4)+ 5GHz Band 4(one of the radio 2~4)

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)	Ratio (S/Limit)
Radio 1 2.4GHz	14.62	21.30	35.92	3.9084	34	0.2691	1	0.2691
5GHz Band 1 (one of the radio 2~4)	15.42	20.40	35.82	3.8194	34	0.2630	1	0.2630
5GHz Band 4 (one of the radio 2~4)	9.4	26.57	35.97	3.9537	34	0.2723	1	0.2723
							Sum Ratio	0.8044
							Ratio Limit	1

Mode 2: Radio 1 (5GHz Band 1) + 5GHz Band 4 (one of the radio 2~4)

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)	Ratio (S/Limit)
Radio 1 5GHz Band 1	15.42	20.52	35.94	3.9264	34	0.2704	1	0.2704
5GHz Band 4 (one of the radio 2~4)	9.4	26.57	35.97	3.9537	34	0.2723	1	0.2723
							Sum Ratio	0.5427
							Ratio Limit	1

Mode 3: Radio 1 (5GHz band 4) + 5GHz band 1(one of the radio 2~4)

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)	Ratio (S/Limit)
Radio 1 5GHz Band 4	15.42	20.47	35.89	3.8815	34	0.2673	1	0.2673
5GHz Band 1 (one of the radio 2~4)	15.42	20.40	35.82	3.8194	34	0.2630	1	0.2630
							Sum Ratio	0.5303
							Ratio Limit	1

Note: Radio 1 FCC ID: SK6-XDR240 and Radio 2 ~ Radio 4 FCC ID: SK6-XDR241.