



RF Exposure Evaluation Report

Equipment : MAX-STREAM AC4000 MU-MIMO TRI-BAND ROUTER
Brand Name : LINKSYS
Model No. : EA9300, EA9250
FCC ID : Q87-EA9300
Standard : 47 CFR Part 2.1091
Applicant : Linksys LLC
121 Theory Drive, Irvine, CA 92617, USA

The product sample received on Dec. 27, 2016 and completely tested on Jan. 05, 2017. 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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Cliff Chang
SPORTON INTERNATIONAL INC.





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PHOTOGRAPHS OF EUT V01		

REVISION HISTORY

[illegible]

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)
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)

1.2 Table for Multiple Model Name

The EUT has two model names which are identical to each other in all aspects except for the following table:

Model Name	Description
EA9300	All the models are identical, the different model names served as marketing strategy.
EA9250	

Note: From the above models, model: EA9300 was selected as representative model for the test and its data was recorded in this report.

1.3 Table for Multiple Source

The EUT has two Source names which are identical to each other in all aspects except for the following table:

Source	Brand Name	VENDORNO	PARTDESC
First source	SK HYNIX	H5TC2G63GFR-PBA	MEMORY,SDRAM DDR3,128MX16,FBGA, 96PIN,H5TC2G63GFR-PBA,0~+95,CLASS 2
Second source	WINBOND	W632GU6KB-12	MEMORY,SDRAM DDR3,128MX16,WBGA, 96PIN,W632GU6KB,0~+85,CLASS 2



1.4 Table for Class II Change

This product is an extension of original one reported under Sporton project number: FA6D1310

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

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

Note: Maximum Permissible Exposure of 2.4GHz Band and 5GHz Band 1/4 are based on original test report.

1.5 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
☒	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 32 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 = 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

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)
2.4G;G1D (Radio2)	6.35	29.52	35.87	36.00	3.98107	32	0.30953	1.00000
5.2G;D1D (Band 1/Radio3)	7.18	28.79	35.97	36.00	3.98107	32	0.30953	1.00000
5.3G;D1D (Band 2/Radio3)	7.18	22.74	29.92	30.00	1.00000	32	0.07775	1.00000
5.6G;D1D (Band 3/Radio1)	6.62	23.33	29.95	30.00	1.00000	32	0.07775	1.00000
5.8G;D1D (Band 4/Radio1)	6.62	29.18	35.80	36.00	3.98107	32	0.30953	1.00000

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)	Ratio (S/Limit)
2.4G;G1D (Radio2)	6.35	29.52	35.87	36.00	3.98107	32	0.310	1.00000	0.30953
5.2G;D1D (Band 1/Radio3)	7.18	28.79	35.97	36.00	3.98107	32	0.310	1.00000	0.30953
5.8G;D1D (Band 4/Radio1)	6.62	29.18	35.80	36.00	3.98107	32	0.310	1.00000	0.30953
								Sum Ratio	0.92859
								Ratio Limit	1