



FCC RADIO EXPOSURE TEST REPORT

FCC ID : Q87-03433

Equipment : LINKSYS MR9000 TRI-BAND WIFI 5 ROUTER,
LINKSYS MR9000X TRI-BAND WIFI 5 ROUTER,
LINKSYS MR8900 TRI-BAND WIFI 5 ROUTER,
LINKSYS MR8950 TRI-BAND WIFI 5 ROUTER

Brand Name : LINKSYS

Model Name : MR9000, MR9000X, MR8900, MR8950

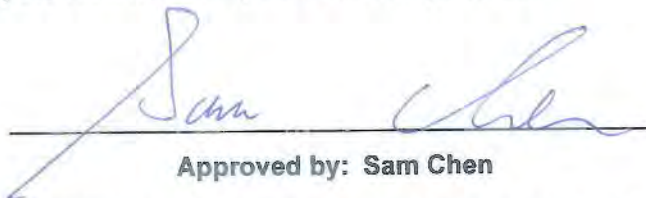
Applicant : Linksys LLC
121 Theory Drive, Irvine CA 92617, United States

Standard : 47 CFR Part 2.1091

The product was received on Apr. 02, 2019, and testing was started from Apr. 02, 2019 and completed on May 15, 2019. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in 47 CFR Part 2.1091 and shown compliance with the applicable technical standards.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The test results in this variant report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.



Approved by: Sam Chen

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)



Table of Contents

History of this test report.....	3
Summary of Test Result.....	4
1 General Description	5
1.1 EUT General Information	5
1.2 Table for EUT supports function	5
1.3 Table for Multiple Listing	5
1.4 Testing Location	6
2 Maximum Permissible Exposure	7
2.1 Limit of Maximum Permissible Exposure	7
2.2 MPE Calculation Method.....	7
2.3 Calculated Result and Limit.....	8

Photographs of EUT v01



TEL : 886-3-656-9065
FAX : 886-3-656-9085
Report Template No.: CB Ver1.0



Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
2	-	Exposure evaluation	PASS	-

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: Sam Chen

Report Producer: Viola Huang



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) VHT: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)
5GHz WLAN	5150-5250 5250-5350 5470-5725 5725-5850	5180-5240 5260-5320 5500-5700 5745-5825	802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)
Bluetooth	2400-2483.5	2402-2480	BR / EDR: FHSS (GFSK / $\pi/4$ -DQPSK / 8DPSK) LE: GFSK

1.2 Table for EUT supports function

Function	supports type
AP Router	Master

1.3 Table for Multiple Listing

The four equipment names and four model names in the following table are all refer to the identical product.

Equipment Name	Model Name	Description
LINKSYS MR9000 TRI-BAND WIFI 5 ROUTER	MR9000	Marketing purpose to sell in different retailers.
LINKSYS MR9000X TRI-BAND WIFI 5 ROUTER	MR9000X	
LINKSYS MR8900 TRI-BAND WIFI 5 ROUTER	MR8900	
LINKSYS MR8950 TRI-BAND WIFI 5 ROUTER	MR8950	

From the above models, model: MR9000 was selected as representative model for the test and its data was recorded in this report.



1.4 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

Test site Designation No. TW0006 with FCC.

Test site registered number IC 4086B with Industry Canada.



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 27 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)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)
2.4G;D1D	5.61	27.36	32.97	0.50	33.47	2.22331	27	0.24270	1.00000
5.2G;D1D (4T1S)	5.75	27.46	33.21	0.50	33.71	2.34963	27	0.25649	1.00000
5.3G;D1D (4T1S)	5.96	23.66	29.62	0.35	29.97	0.99312	27	0.10841	1.00000
5.6G;D1D (4T1S)	8.96	20.94	29.90	0.09	29.99	0.99770	27	0.10891	1.00000
5.6G;D1D (4T2S)	5.96	23.84	29.80	0.19	29.99	0.99770	27	0.10891	1.00000
5.8G;D1D (4T1S)	8.69	27.27	35.96	0.03	35.99	3.97192	27	0.43357	1.00000
5.8G;D1D (4T2S)	5.69	29.96	35.65	0.34	35.99	3.97192	27	0.43357	1.00000
2.4G;BT-BR	2.90	5.76	8.66	0.50	9.16	0.00824	27	0.00090	1.00000
2.4G;BT-LE	2.90	5.54	8.44	0.50	8.94	0.00783	27	0.00085	1.00000

Simultaneous Transmission Analysis Mode:

WLAN 2.4GHz + WLAN 5GHz B1~B2 + WLAN 5GHz B3~B4 + Bluetooth

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)	Ratio (S/Limit)
2.4G;D1D	5.61	27.36	32.97	0.50	33.47	2.22331	27	0.24270	1.00000	0.24270
5.2G;D1D (4T1S)	5.75	27.46	33.21	0.50	33.71	2.34963	27	0.25649	1.00000	0.25649
5.8G;D1D (4T1S)	8.69	27.27	35.96	0.03	35.99	3.97192	27	0.43357	1.00000	0.43357
2.4G;BT-BR	2.90	5.76	8.66	0.50	9.16	0.00824	27	0.00090	1.00000	0.00090
									Sum Ratio	0.93366
									Ratio Limit	1

Note: The above antenna gain was declared by manufacturer.

—THE END—