



FCC RADIO EXPOSURE TEST REPORT

FCC ID : L9VVR3071
Equipment : Home Gateway
Brand Name : COMTREND
Model Name : VR-3071 、 VR-3071u 、 WAP-5954u 、 PRT-6301
Applicant / Manufacturer : COMTREND Corporation
3F-1, 10 Lane 609, Chung Hsin Road, Section 5, San Chung Dist, New Taipei City 24159, Taiwan
Factory (1) : Datamax Electronics (Dong Guan) Co., Ltd.
Niu shan Foreign Economic Industrial park, Dong Cheng District, Dong Guan City, Guang Dong , China.
Factory (2) : GIANTA CO., LTD
No.130,Sec2,Yangxin Rd.,Yang Mei Dist,Taoyuan City326,Taiwan
Factory (3) : Intelligent Technology Inc.
Yuanhe Three Street , Tongsha Industrial Zone , Dongcheng Area, Dongguan City , Guangdong Province , China.
Standard : 47 CFR Part 2.1091

The product was received on Aug. 21, 2019, and testing was started from Aug. 28, 2019 and completed on Dec. 13, 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 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.)



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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) 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)
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) 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)

1.2 Table for Multiple Listing

The model names in the following table are all refer to the identical product except for the following table:

EUT	Model Name	Main Chip	DSL	Description
1	VR-3071	BCM63178	V	In addition to these differences, there are no other differences, mainly used as a market partition.
2	VR-3071u	BCM63178	V	
3	WAP-5954u	BCM63178	X	
4		BCM63177		
5	PRT-6301	BCM63178	X	
6		BCM63177		

From the above models, model: VR-3071 was selected as representative model for the test and its data was recorded in this report.

1.3 Accessories

Accessories			
Equipment Name	Brand Name	Model Name	Rating
Adapter 1	AMIGO	AMS241-1203000FU	Input: 100-240V, 50/60Hz, 1.2A Output: 12V, 3.0A
Adapter 2	AMIGO	AMS200-1202000FU	Input: 100-240V, 50/60Hz, 0.8A Max Output: 12V, 2.0A



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 4086D 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 21 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;G1D	4.04	26.39	30.43	0.50	30.93	1.23880	21	0.22353	1.00000
2.4G;D1D-BF	3.94	20.83	24.77	0.50	25.27	0.33651	21	0.06072	1.00000
5.2G;D1D	5.00	29.99	34.99	0.50	35.49	3.53997	21	0.63878	1.00000
5.2G;D1D-BF	7.48	28.49	35.97	0.02	35.99	3.97192	21	0.71671	1.00000
5.8G;D1D	3.90	29.99	33.89	0.50	34.39	2.74789	21	0.49585	1.00000
5.8G;D1D-BF	6.21	29.78	35.99	0.00	35.99	3.97192	21	0.71671	1.00000

Simultaneous Transmission Analysis Mode: WLAN 2.4GHz + WLAN 5GHz

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;G1D	4.04	26.39	30.43	0.50	30.93	1.23880	21	0.22353	1.00000	0.22353
5.8G;D1D-BF	6.21	29.78	35.99	0.00	35.99	3.97192	21	0.71671	1.00000	0.71671
									Sum Ratio	0.94024
									Ratio Limit	1

Note: The above antenna gain was declared by manufacturer.

————THE END————