



FCC RADIO EXPOSURE TEST REPORT

FCC ID : NKR-ATTC71KW
Equipment : Wireless STB
Brand Name : AT&T
Model Name : C71KW-400, C71KWBP-400
Applicant : Wistron NeWeb Corporation
20 Park Avenue II Hsinchu Science Park Hsinchu, 308 Taiwan
Manufacturer : Wistron NeWeb Corporation
20 Park Avenue II Hsinchu Science Park Hsinchu, 308 Taiwan
Standard : 47 CFR Part 2.1091

The product was received on May 09, 2019, and testing was started from Nov. 08, 2019 and completed on Nov. 23, 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

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Photographs of EUT v01



History of this test report

Report No.	Version	Description	Issued Date
FA791514-01	01	Initial issue of report	Jan. 20, 2020



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) 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)
Bluetooth	2400-2483.5	2402-2480	BR / EDR: FHSS (GFSK / $\pi/4$ -DQPSK / 8DPSK) LE: DSSS (GFSK)

1.2 Table for Multiple Listing

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

Brand Name	Model Name	Description
AT&T	C71KW-400 C71KWBP-400	There is nothing different of two models, just for different marketing use.

From the above models, model: C71KW-400 was selected as representative model for the test and its data was recorded in this report.

1.3 Table for FEM Information

FEM	Brand name	Model Name
Original	SKYWORKS	SKY85809
New	SKYWORKS	SKY85818
New	QORVO	QPF4800



1.4 Table for Class II Change

This product is an extension of original one reported under Sporton project number: FA791514

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

Modifications	Performance Checking
Changing FEM (Front-end Module) of WLAN for this device. (Please refer to section 1.3 for detail FEM information.)	MPE

Note: The Bluetooth MPE results were based on original report.



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:

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

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 Mode 1:

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	6.30	28.09	34.39	0.50	34.89	3.08319	20	0.61338	1.00000
5.2G;D1D	7.60	27.98	35.58	0.41	35.99	3.97192	20	0.79017	1.00000
5.3G;D1D	7.50	22.03	29.53	0.46	29.99	0.99770	20	0.19849	1.00000
5.6G;D1D	7.00	22.69	29.69	0.30	29.99	0.99770	20	0.19849	1.00000
5.8G;D1D	7.10	27.89	34.99	0.50	35.49	3.53997	20	0.70425	1.00000
2.4G; BT-BR	1.11	10.98	12.09	0.50	12.59	0.01816	20	0.00361	1.00000

Simultaneous Transmission Analysis Mode: WLAN 2.4GHz + 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; BT-BR	1.11	10.98	12.09	0.50	12.59	0.01816	20	0.00361	1	0.00361
2.4G;D1D	6.30	28.09	34.39	0.50	34.89	3.08319	20	0.61337	1	0.61337
									Sum Ratio	0.61698
									Ratio Limit	1

Simultaneous Transmission Analysis Mode: WLAN 5GHz + 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; BT-BR	1.11	10.98	12.09	0.50	12.59	0.01816	20	0.00361	1	0.00361
5.2G;D1D	7.60	27.98	35.58	0.41	35.99	3.97192	20	0.79017	1	0.79017
									Sum Ratio	0.79378
									Ratio Limit	1



For Mode 2:

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	6.30	29.21	35.51	0.48	35.99	3.97192	20	0.79017	1.00000
5.2G;D1D	7.60	28.03	35.63	0.36	35.99	3.97192	20	0.79017	1.00000
5.3G;D1D	7.50	22.44	29.94	0.05	29.99	0.99770	20	0.19849	1.00000
5.6G;D1D	7.00	22.75	29.75	0.24	29.99	0.99770	20	0.19849	1.00000
5.8G;D1D	7.10	27.61	34.71	0.50	35.21	3.31894	20	0.66028	1.00000
2.4G; BT-BR	1.11	10.98	12.09	0.50	12.59	0.01816	20	0.00361	1.00000

Simultaneous Transmission Analysis Mode: WLAN 2.4GHz + 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; BT-BR	1.11	10.98	12.09	0.50	12.59	0.01816	20	0.00361	1	0.00361
2.4G;D1D	6.30	29.21	35.51	0.48	35.99	3.97192	20	0.79017	1	0.79017
									Sum Ratio	0.79378
									Ratio Limit	1

Simultaneous Transmission Analysis Mode: WLAN 5GHz + 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; BT-BR	1.11	10.98	12.09	0.50	12.59	0.01816	20	0.00361	1	0.00361
5.2G;D1D	7.60	28.03	35.63	0.36	35.99	3.97192	20	0.79017	1	0.79017
									Sum Ratio	0.79378
									Ratio Limit	1

Note: The above antenna gain was declared by manufacturer.

————THE END————