

Maximum Permissible Exposure

Equipment	:	RF Module
Brand Name	:	Chicony
Model No.	:	AR5B22
FCC ID	:	E8H-AR5B22
Standard	:	ANSI/IEEE C95.1
Applicant	:	Chicony Electronics Co., Ltd.
Manufacturer	:	No.25,Wugong 6th RD.,Wugu Dist., New Taipei City 248 , Taiwan (R.O.C)

The product sample received on Jun. 16, 2015 and completely tested on Jul. 21, 2015. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI/IEEE C95.1 and shown compliance with the applicable technical standards.

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

Reviewed by:


Vic Hsiao / Supervisor



Table of Contents

1	HUMAN EXPOSURE ASSESSMENT	4
1.1	Maximum Permissible Exposure	4

Revision History

[illegible]

1 Human Exposure Assessment

1.1 Maximum Permissible Exposure

1.1.1 Limit of Maximum Permissible Exposure

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 ²)*	6
30-300	61.4	0.163	1.0	6
300-1500	-	-	F/300	6
1500-100,000	-	-	5	6
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 ²)*	30
30-300	27.5	0.073	0.2	30
300-1500	-	-	F/1500	30
1500-100,000	-	-	1.0	30
Note 1: f = frequency in MHz ; *Plane-wave equivalent power density				
Note 2: For the applicable limit, see FCC 1.1310				

1.1.2 MPE Calculation Method

$$E \text{ (V/m)} = \frac{\sqrt{30 \times P \times G}}{d}$$

E = Electric field (V/m)

G = EUT Antenna numeric gain (numeric)

The formula can be changed to

$$Pd = \frac{30 \times P \times G}{377 \times d^2}$$

$$\text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

P = RF output power (W)

d = Separation distance between radiator and human body (m)

1.1.3 Result of Maximum Permissible Exposure (2.4G)

RF General Information					
Frequency Range (MHz)	IEEE Std. 802.11 Protocol	Ch. Frequency (MHz)	Channel Number	Number of Transmit Chains (N _{TX})	RF Output Power (dBm)
2400-2483.5	b	2412-2462	1-11 [11]	1	16.70
2400-2483.5	b	2412-2462	1-11 [11]	2	19.14
2400-2483.5	g	2412-2462	1-11 [11]	1	20.43
2400-2483.5	g	2412-2462	1-11 [11]	2	21.07
2400-2483.5	n (HT20)	2412-2462	1-11 [11]	2	20.93
2400-2483.5	n (HT40)	2422-2452	3-9 [7]	2	16.98
Note 1: RF output power specifies that Maximum Conducted (Average) Output Power.					

Worst Maximum RF Output Power Result							
Exposure Environment		General Population / Uncontrolled Exposure					
Separation Distance (cm)		20					
Condition		RF Output Power (dBm)					
Modulation Mode	N _{TX}	Chain-Port 1	Chain-Port 2	Sum Chain	DG (dBi)	EIRP Power	PD (S) (mW/cm ²)
g	2	17.94	18.17	21.07	1.79	22.86	0.038455
Maximum Permissible Exposure Limit (mW/cm ²)							1
Note 1: N _{TX} = Number of Transmit Chains							

1.1.4 Result of Maximum Permissible Exposure (Bluetooth)

RF General Information					
Frequency Range (MHz)	IEEE Std. 802.11 Protocol	Ch. Frequency (MHz)	Channel Number	Number of Transmit Chains (N _{TX})	RF Output Power (dBm)
2400-2483.5	BR / EDR	2402-2480	0-78 [79]	1	3.83
2400-2483.5	v4.0 LE	2402-2480	0-39 [40]	1	3.53
Note 1: RF output power specifies that Maximum Conducted (Average) Output Power.					

Worst Maximum RF Output Power Result				
Exposure Environment	General Population / Uncontrolled Exposure			
Separation Distance (cm)	20			
Condition	RF Output Power (dBm)			
Modulation Mode	RF Output Power	Antenna Gain (dBi)	EIRP Power	PD (S) (mW/cm ²)
BR / EDR	3.83	1.79	5.62	0.000726
v4.0 LE	3.53	1.79	5.32	0.000678
Maximum Permissible Exposure Limit (mW/cm ²)				1

1.1.5 Result of Maximum Permissible Exposure (5.2G)

RF General Information					
Frequency Range (MHz)	IEEE Std. 802.11 Protocol	Ch. Frequency (MHz)	Channel Number	Number of Transmit Chains (N _{TX})	RF Output Power (dBm)
5150-5250	a	5180-5240	36-48 [4]	1	14.63
5150-5250	a	5180-5240	36-48 [4]	2	14.34
5150-5250	n (HT20)	5180-5240	36-48 [4]	2	14.19
5150-5250	n (HT40)	5190-5230	38-46 [2]	2	16.45
Note 1: RF output power specifies that Maximum Conducted (Average) Output Power.					

Worst Maximum RF Output Power Result							
Exposure Environment		General Population / Uncontrolled Exposure					
Separation Distance (cm)		20					
Condition		RF Output Power (dBm)					
Modulation Mode	N _{TX}	Chain-Port 1	Chain-Port 2	Sum Chain	DG (dBi)	EIRP Power	PD (S) (mW/cm ²)
n (HT40)	2	14.26	12.45	16.45	3.01	19.46	0.017577
Maximum Permissible Exposure Limit (mW/cm ²)							1
Note 1: N _{TX} = Number of Transmit Chains							

1.1.6 Result of Maximum Permissible Exposure (5.3G)

RF General Information					
Frequency Range (MHz)	IEEE Std. 802.11 Protocol	Ch. Frequency (MHz)	Channel Number	Number of Transmit Chains (N _{TX})	RF Output Power (dBm)
5250-5350	a	5260-5320	52-64 [4]	1	17.29
5250-5350	a	5260-5320	52-64 [4]	2	18.59
5250-5350	n (HT20)	5260-5320	52-64 [4]	2	17.42
5250-5350	n (HT40)	5270-5310	54-62 [2]	2	17.91
Note 1: RF output power specifies that Maximum Conducted (Average) Output Power..					

Worst Maximum RF Output Power Result							
Exposure Environment		General Population / Uncontrolled Exposure					
Separation Distance (cm)		20					
Condition		RF Output Power (dBm)					
Modulation Mode	N _{TX}	Chain-Port 1	Chain-Port 2	Sum Chain	DG (dBi)	EIRP Power	PD (S) (mW/cm ²)
a	2	16.32	14.68	18.59	3.01	21.60	0.028771
Maximum Permissible Exposure Limit (mW/cm ²)							1
Note 1: N _{TX} = Number of Transmit Chains							

1.1.7 Result of Maximum Permissible Exposure (5.6G)

RF General Information					
Frequency Range (MHz)	IEEE Std. 802.11 Protocol	Ch. Frequency (MHz)	Channel Number	Number of Transmit Chains (N _{TX})	RF Output Power (dBm)
5470-5725	a	5500-5700	100-140 [8]	1	16.46
5470-5725	a	5500-5700	100-140 [8]	2	14.02
5470-5725	n (HT20)	5500-5700	100-140 [8]	2	14.31
5470-5725	n (HT40)	5510-5670	102-134 [3]	2	15.33
Note 1: RF output power specifies that Maximum Conducted (Average) Output Power..					

Worst Maximum RF Output Power Result					
Exposure Environment		General Population / Uncontrolled Exposure			
Separation Distance (cm)		20			
Condition		RF Output Power (dBm)			
Modulation Mode	N _{TX}	RF Output Power	DG (dBi)	EIRP Power	PD (S) (mW/cm ²)
a	1	16.46	3.01	19.47	0.017618
Maximum Permissible Exposure Limit (mW/cm ²)					1
Note 1: N _{TX} = Number of Transmit Chains					

1.1.8 Result of Maximum Permissible Exposure (5.8G)

RF General Information					
Frequency Range (MHz)	IEEE Std. 802.11 Protocol	Ch. Frequency (MHz)	Channel Number	Number of Transmit Chains (N _{TX})	RF Output Power (dBm) Co-location
5725-5850	a	5745-5825	149-165 [5]	1	15.41
5725-5850	a	5745-5825	149-165 [5]	2	13.93
5725-5850	n (HT20)	5745-5825	149-165 [5]	2	13.85
5725-5850	n (HT40)	5755-5795	151-159 [2]	2	15.04
Note 1: RF output power specifies that Maximum Conducted (Average) Output Power.					

Worst Maximum RF Output Power Result					
Exposure Environment		General Population / Uncontrolled Exposure			
Separation Distance (cm)		20			
Condition		RF Output Power (dBm)			
Modulation Mode	N _{TX}	RF Output Power	DG (dBi)	EIRP Power	PD (S) (mW/cm ²)
a	1	15.41	3.01	18.42	0.013834
Maximum Permissible Exposure Limit (mW/cm ²)					1
Note 1: N _{TX} = Number of Transmit Chains					

Worst Maximum RF Output Power Result							
Exposure Environment		General Population / Uncontrolled Exposure					
Separation Distance (cm)		20					
Condition		RF Output Power (dBm)					
Modulation Mode	N_{TX}	Chain-Port 1	Chain-Port 2	Sum Chain	DG (dBi)	EIRP Power	PD (S) (mW/cm²)
g	2	17.94	18.17	21.07	1.79	22.86	0.038455
a	2	16.32	14.68	18.59	3.01	21.60	0.028771
Co-location Total							0.067226
Maximum Permissible Exposure Limit (mW/cm²)							1
Note 1: N _{TX} = Number of Transmit Chains							