

# Maximum Permissible Exposure

<b>Equipment</b>	:	<b>WIRELESS ADAPTER</b>
<b>Brand Name</b>	:	<b>SHARP</b>
<b>Model No.</b>	:	<b>PN-ZW01</b>
<b>FCC ID</b>	:	<b>APY-ZW0115B0001</b>
<b>Standard</b>	:	<b>ANSI/IEEE C95.1</b>
<b>Applicant</b>	:	<b>SHARP Corporation</b> 492 Minosho-cho, Yamatokoriyama-shi, Nara 639-1186 Japan
<b>Manufacturer</b>	:	<b>SparkLAN Communications, Inc</b> 8F., No.257, Sec. 2, Tiding Blvd., Neihu District, Taipei City 11493, Taiwan.

The product sample received on Oct. 06, 2014 and completely tested on Sep. 30, 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:



Kevin Liang / Assistant Manager



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# 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 <sup>2</sup> )	Averaging Time  E  <sup>2</sup> , H  <sup>2</sup> or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842 / f	4.89 / f	(900 / f <sup>2</sup> )*	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 <sup>2</sup> )	Averaging Time  E  <sup>2</sup> , H  <sup>2</sup> or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f <sup>2</sup> )*	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 <sub>TX</sub> )	RF Output Power (dBm)
2400-2483.5	b	2412-2462	1-11 [11]	1	21.21
2400-2483.5	g	2412-2462	1-11 [11]	1	22.75
2400-2483.5	n (HT20)	2412-2462	1-11 [11]	2	24.05
2400-2483.5	n (HT40)	2422-2452	3-9 [7]	2	20.95

Note 1: RF output power specifies that Maximum Conducted (Average) Output Power.

1.1.4 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 <sub>TX</sub> )	RF Output Power (dBm)
5150-5250	a	5180-5240	36-48 [4]	1	13.00
5150-5250	n (HT20)	5180-5240	36-48 [4]	2	12.35
5150-5250	n (HT40)	5190-5230	38-46 [2]	2	15.40

Note 1: RF output power specifies that Maximum Conducted (Average) Output Power.



1.1.5 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 <sub>TX</sub> )	RF Output Power (dBm)
5725-5850	a	5745-5825	149-165 [5]	1	10.46
5725-5850	n (HT20)	5745-5825	149-165 [5]	2	16.68
5725-5850	n (HT40)	5755-5795	151-159 [2]	2	14.12

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 <sub>TX</sub>	Power	Directional Gain(dBi)	EIRP Power	PD (S) (mW/cm <sup>2</sup> )
2.4GHz WLAN	2	24.05	6.8	30.85	0.24181
5GHz WLAN	2	16.68	9.65	26.33	0.08548
<b>Maximum Permissible Exposure Limit (mW/cm<sup>2</sup>)</b>					<b>1</b>

Note 1: N<sub>TX</sub> = Number of Transmit Chains