

## Absolute Maximum Ratings (Ta=25 °C)

Parameter	Symbol	Rating	Unit
Supply Voltage	V <sub>CC_MR</sub>	4.5	V
Input Voltage 1 [INT,SCL,SDA]	V <sub>IN1_MR</sub>	-0.3 to +4.5	V
Input Voltage 2 [ADDR]	V <sub>IN2_MR</sub>	-0.3 to (V <sub>CC</sub> +0.3) or +4.5 whichever is less	V
Storage Temperature Range	T <sub>stg</sub>	-40 to +100	°C
Maximum Junction Temperature	T <sub>jmax</sub>	100	°C

**Caution 1:** Operating the IC over the absolute maximum ratings may damage the IC. The damage can either be a short circuit between pins or an open circuit between pins and the internal circuitry. Therefore, it is important to consider circuit protection measures, such as adding a fuse, in case the IC is operated over the absolute maximum ratings.

**Caution 2:** Should by any chance the maximum junction temperature rating be exceeded the rise in temperature of the chip may result in deterioration of the properties of the chip. In case of exceeding this absolute maximum rating, design a PCB boards with thermal resistance taken into consideration by increasing board size and copper area so as not to exceed the maximum junction temperature rating.

Thermal Resistance<sup>(Note 1)</sup>

Parameter	Symbol	Thermal Resistance (Typ)		Unit
		1s <sup>(Note 3)</sup>	2s2p <sup>(Note 4)</sup>	
WSON008X2120				
Junction to Ambient	θ <sub>JA</sub>	384.2	54.2	°C/W
Junction to Top Characterization Parameter <sup>(Note 2)</sup>	Ψ <sub>JT</sub>	82	12	°C/W

(Note 1) Based on JESD51-2A(Still-Air).

(Note 2) The thermal characterization parameter to report the difference between junction temperature and the temperature at the top center of the outside surface of the component package.

(Note 3) Using a PCB board based on JESD51-3.

(Note 4) Using a PCB board based on JESD51-5, 7.

Layer Number of Measurement Board	Material	Board Size
Single	FR-4	114.3 mm x 76.2 mm x 1.57 mmt

Top	
Copper Pattern	Thickness
Footprints and Traces	70 μm

Layer Number of Measurement Board	Material	Board Size	Thermal Via <sup>(Note 5)</sup>	
			Pitch	Diameter
4 Layers	FR-4	114.3 mm x 76.2 mm x 1.6 mmt	1.20 mm	Φ0.30 mm

Top		2 Internal Layers		Bottom	
Copper Pattern	Thickness	Copper Pattern	Thickness	Copper Pattern	Thickness
Footprints and Traces	70 μm	74.2 mm x 74.2 mm	35 μm	74.2 mm x 74.2 mm	70 μm

(Note 5) This thermal via connects with the copper pattern of all layers.

## Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Unit
Operating Temperature	T <sub>opr</sub>	-40	+25	+85	°C
Supply Voltage	V <sub>CC</sub>	2.3	2.5	3.6	V
Input Voltage [INT,SCL,SDA]	V <sub>IN</sub>	0	-	3.6	V

**Electrical Characteristics (Unless otherwise specified, VCC=2.5 V, Ta=25 °C, 35 ms mode, x1 gain mode)**

Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Current Consumption	I <sub>CC1</sub>	-	190	295	μA	Ev=100 lx <sup>(Note 1)</sup>
Power Down Current	I <sub>CC2</sub>	-	0.8	1.5	μA	Power down mode No input light
Red Data Count Value	D <sub>RED</sub>	60	71	82	count	Ev=20 μW/cm <sup>2</sup> <sup>(Note 2)</sup>
Green Data Count Value	D <sub>GREEN</sub>	84	99	114	count	Ev=20 μW/cm <sup>2</sup> <sup>(Note 3)</sup>
Blue Data Count Value	D <sub>BLUE</sub>	59	70	81	count	Ev=20 μW/cm <sup>2</sup> <sup>(Note 4)</sup>
Ir Data Count Value	D <sub>IR</sub>	18	25	32	count	Ev=20 μW/cm <sup>2</sup> <sup>(Note 5)</sup>
Dark Count Value	S <sub>0_0</sub>	-	-	3	count	No input light
Measurement Time	t <sub>MT</sub>	-	35	50	ms	
INT Output 'L' Voltage	V <sub>INTL</sub>	0	-	0.4	V	I <sub>OL</sub> =3 mA
SCL SDA Input 'H' Voltage	V <sub>IH</sub>	1.26	-	-	V	
SCL SDA Input 'L' Voltage	V <sub>IL</sub>	-	-	0.54	V	
SDA Output 'L' Voltage	V <sub>OL</sub>	0	-	0.4	V	I <sub>OL</sub> =3 mA
ADDR Input 'H' Voltage	V <sub>ADDRH</sub>	0.7*V <sub>CC</sub>	-	-	V	
ADDR Input 'L' Voltage	V <sub>ADDRL</sub>	-	-	0.3*V <sub>CC</sub>	V	

(Note 1) White LED is used.

(Note 2) Red LED is used.

(Note 3) Green LED is used.

(Note 4) Blue LED is used.

(Note 5) Infrared LED is used.

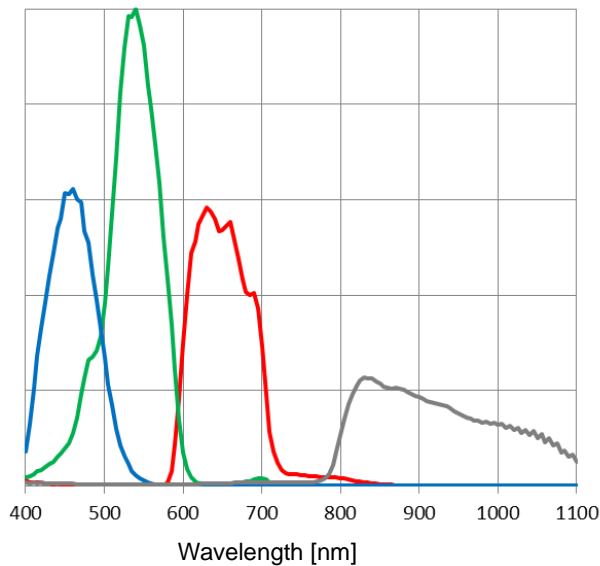
**Typical Performance Curves**

Figure 1. Ratio vs Wavelength  
(Spectral Response)