

**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
Operating Temperature Range	T <sub>opr</sub>	-40 to +85	°C
Storage Temperature Range	T <sub>stg</sub>	-40 to +100	°C
Maximum Junction Temperature	T <sub>jmax</sub>	100	°C

**Caution:** 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.

**Thermal Resistance** (Note 1)

Parameter	Symbol	Thermal Resistance (Typ)		Unit
		1s <small>(Note 3)</small>	2s2p <small>(Note 4)</small>	
WSON008X2120				
Junction to Ambient	$\theta_{JA}$	384.2	54.2	°C/W
Junction to Top Characterization Parameter <small>(Note 2)</small>	$\Psi_{JT}$	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.

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

Top	
Copper Pattern	Thickness
Footprints and Traces	70μm

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

Layer Number of Measurement Board	Material	Board Size	Thermal Via <small>(Note 5)</small>		
			Pitch	Diameter	
4 Layers	FR-4	114.3mm x 76.2mm x 1.6mmt	1.20mm	Φ0.30mm	
Top		2 Internal Layers		Bottom	
Copper Pattern	Thickness	Copper Pattern	Thickness	Copper Pattern	Thickness
Footprints and Traces	70μm	74.2mm x 74.2mm	35μm	74.2mm x 74.2mm	70μm

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

**Recommended Operating Conditions (Ta = -40°C to +85°C)**

Parameter	Symbol	Min	Typ	Max	Unit
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 = 2.5V, Ta = 25°C, ADC\_EN=1, WAIT\_EN=1, ITIME=0xDA, x1 gain mode)** *(Note 1)*

Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Supply Current	Icc1	-	75	125	μA	E <sub>V</sub> = 100 lx
Power Down Current	Icc2	-	0.8	1.5	μA	No input Light All registers are default.
ADC Count Value in DATA0	D1k_0	3400	4000	4600	count	E <sub>V</sub> = 1000 lx
ADC Count Value in DATA1	D1k_1	425	500	575	count	E <sub>V</sub> = 1000 lx
Dark ( 0 lx ) Sensor Out in DATA0	S0_0	-	0	2	count	No input Light
Dark ( 0 lx ) Sensor Out in DATA1	S0_1	-	0	2	count	No input Light
Measurement Time	Tmt1	123.3	137.0	150.7	ms	ITIME = 0xCE
Internal Clock Period	Tint	-	2.8	4.0	μs	
Interval Time	Twt	-	300	430	ms	
INT Output 'L' Voltage	V <sub>INTL</sub>	0	-	0.4	V	IOL = 3mA
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	IOL = 3mA
ADDR Input 'H' Voltage	V <sub>ADDRH</sub>	0.7*VCC	-	-	V	
ADDR Input 'L' Voltage	V <sub>ADDRL</sub>	-	-	0.3*VCC	V	

*(Note 1)*White LED is used as optical source.

**Typical Performance Curves**

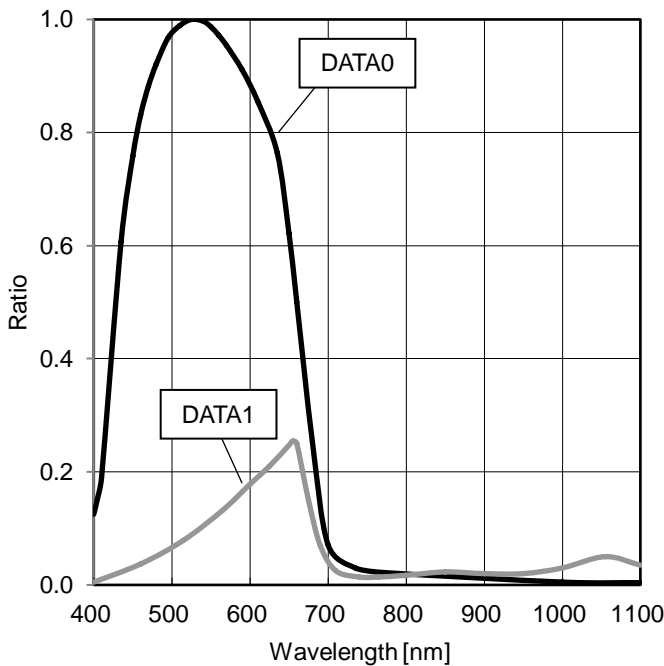


Figure 1. Ratio vs Wavelength  
(Spectral Response)