

Absolute Maximum Ratings ($T_A = +25^\circ\text{C}$)

VDD Supply Voltage between VDD and GND	4.0V
I ² C Bus Pin Voltage (SCL, SDA)	-0.2V to 4.0V
I ² C Bus Pin Current (SCL, SDA)	<10mA
R _{EXT} Pin Voltage	-0.2V to VDD + 0.5V
INT Pin Voltage	-0.5V to VDD + 0.5V
INT Pin Current	<10mA
ESD Rating	
Human Body Model	3kV

Thermal Information

Thermal Resistance (Typical)	θ_{JA} ($^\circ\text{C}/\text{W}$)
6 Ld ODFN (Note 5)	88
Maximum Die Temperature	+90 $^\circ\text{C}$
Storage Temperature	-40 $^\circ\text{C}$ to +100 $^\circ\text{C}$
Operating Temperature	-40 $^\circ\text{C}$ to +85 $^\circ\text{C}$
Pb-Free Reflow Profile	see TB477

Recommended Operating Conditions

Temperature	-40 $^\circ\text{C}$ to +85 $^\circ\text{C}$
Supply Voltage	2.25V to 3.63V

CAUTION: Do not operate at or near the maximum ratings listed for extended periods of time. Exposure to such conditions may adversely impact product reliability and result in failures not covered by warranty.

NOTE:

5. θ_{JA} is measured in free air with the component mounted on a high effective thermal conductivity test board with “direct attach” features. See Tech Brief [TB477](#).

Electrical Specifications $V_{DD} = 3.0\text{V}$, $T_A = +25^\circ\text{C}$, $R_{EXT} = 499\text{k}\Omega$ 1% tolerance, 16-bit ADC operation, unless otherwise specified.

PARAMETER	DESCRIPTION	TEST CONDITIONS	MIN (Note 6)	TYP	MAX (Note 6)	UNIT
V _{DD}	Power Supply Range		2.25		3.63	V
I _{DD}	Supply Current			65	75	μA
I _{DD1}	Supply Current when Powered Down	Software disabled or auto power-down		0.01	0.3	μA
V _{I2C}	Supply Voltage Range for I ² C Interface		1.70		3.63	V
f _{OSC}	Internal Oscillator Frequency		600	670	740	kHz
t _{INT}	ADC Integration/Conversion Time	16-bit ADC data		100		ms
F _{I2C}	I ² C Clock Rate Range			1 to 400		kHz
DATA_0	Count Output when Dark	E = 0 lux, Range 1 (125 lux)		1	5	Counts
DATA_F	Full Scale ADC Code				65535	Counts
$\frac{\Delta\text{DATA}}{\text{DATA}}$	Count Output Variation Over Three Light Sources: Fluorescent, Incandescent and Sunlight	Ambient light sensing		± 10		%
DATA_1	Light Count Output with LSB of 0.0019 lux/Count	E = 37.5 lux, fluorescent light (Note 7), ambient light sensing, Range 1 (125 lux)	16000	20000	24000	Counts
DATA_2	Light Count Output with LSB of 0.0075 lux/Count	E = 37.5 lux, fluorescent light (Note 7), ambient light sensing, Range 2 (500 lux)		5000		Counts
DATA_3	Light Count Output with LSB of 0.03 lux/Count	E = 37.5 lux, fluorescent light (Note 7), ambient light sensing, Range 3 (2k lux)		1250		Counts
DATA_4	Light Count Output with LSB of 0.12 lux/Count	E = 37.5 lux, fluorescent light (Note 7), ambient light sensing, Range 4 (8k lux)		312		Counts
DATA_IR1	Infrared Count Output	E = 20 lux solar light (Note 8), ambient light sensing, Range 1 (125 lux)	16000	20000	24000	Counts
DATA_IR2	Infrared Count Output	E = 20 lux solar light (Note 8), ambient light sensing, Range 2 (500 lux)		5000		Counts
DATA_IR3	Infrared Count Output	E = 20 lux solar light (Note 8), ambient light sensing, Range 3 (2000 lux)		1250		Counts
DATA_IR4	Infrared Count Output	E = 20 lux solar light (Note 8), ambient light sensing, Range 4 (8000 lux)		312		Counts

Electrical Specifications $V_{DD} = 3.0V$, $T_A = +25^\circ C$, $R_{EXT} = 499k\Omega$ 1% tolerance, 16-bit ADC operation, unless otherwise specified.
 (Continued)

PARAMETER	DESCRIPTION	TEST CONDITIONS	MIN (Note 6)	TYP	MAX (Note 6)	UNIT
V_{REF}	Voltage of R_{EXT} Pin			0.52		V
V_{IL}	SCL and SDA Input Low Voltage				0.55	V
V_{IH}	SCL and SDA Input High Voltage		1.25			V
I_{SDA}	SDA Current Sinking Capability	$V_{OL} = 0.4V$	4	5		mA
I_{INT}	\overline{INT} Current Sinking Capability	$V_{OL} = 0.4V$	4	5		mA

Electrical Specifications $V_{DD} = 3.0V$, $T_A = +25^\circ C$, $R_{EXT} = 1M\Omega$ 1% tolerance, 16-bit ADC operation, unless otherwise specified.

PARAMETER	DESCRIPTION	TEST CONDITIONS	MIN (Note 6)	TYP	MAX (Note 6)	UNIT
V_{DD}	Power Supply Range		2.25		3.63	V
I_{DD}	Supply Current			42	50	μA
I_{DD1}	Supply Current when Powered Down	Software disabled or auto power-down		0.01	0.3	μA
V_{I2C}	Supply Voltage Range for I ² C Interface		1.70		3.63	V
f_{OSC}	Internal Oscillator Frequency		305	340	385	kHz
t_{INT}	ADC Integration/Conversion Time	16-bit ADC data		200		ms
F_{I2C}	I ² C Clock Rate Range			1 to 400		kHz
DATA_0	Count Output when Dark	$E = 0$ lux, Range 1 (125 lux)		1	10	Counts
DATA_F	Full Scale ADC Code				65535	Counts
$\frac{\Delta DATA}{DATA}$	Count Output Variation Over Three Light Sources: Fluorescent, Incandescent and Sunlight	Ambient Light Sensing		± 10		%
DATA_1	Light Count Output with LSB of 0.00095 lux/Count	$E = 18.75$ lux, fluorescent light (Note 7), ambient light sensing, Range 1 (62.5 lux)	15000	20000	25000	Counts
DATA_2	Light Count Output with LSB of 0.000375 lux/Count	$E = 18.75$ lux, fluorescent light (Note 7), ambient light sensing, Range 2 (250 lux)		5000		Counts
DATA_3	Light Count Output with LSB of 0.015 lux/Count	$E = 18.75$ lux, fluorescent light (Note 7), ambient light sensing, Range 3 (1k lux)		1250		Counts
DATA_4	Light Count Output with LSB of 0.6 lux/Count	$E = 18.75$ lux, fluorescent light (Note 7), ambient light sensing, Range 4 (4k lux)		312		Counts
DATA_IR1	Infrared Count Output	$E = 10$ lux solar light (Note 8), ambient light sensing, Range 1 (62.5 lux)	15000	20000	25000	Counts
DATA_IR2	Infrared Count Output	$E = 10$ lux solar light (Note 8), ambient light sensing, Range 2 (250 lux)		5000		Counts
DATA_IR3	Infrared Count Output	$E = 10$ lux solar light (Note 8), ambient light sensing, Range 3 (1000 lux)		1250		Counts
DATA_IR4	Infrared Count Output	$E = 10$ lux solar light (Note 8), ambient light sensing, Range 4 (4000 lux)		312		Counts
V_{REF}	Voltage of R_{EXT} Pin			0.52		V
V_{IL}	SCL and SDA Input Low Voltage				0.55	V
V_{IH}	SCL and SDA Input High Voltage		1.25			V
I_{SDA}	SDA Current Sinking Capability	$V_{OL} = 0.4V$	4	5		mA
I_{INT}	\overline{INT} Current Sinking Capability	$V_{OL} = 0.4V$	4	5		mA