

Absolute Maximum Ratings

VDD to GND	+4.0V
I ² C Bus (SCL, SDA) and INT Pin Voltage	-0.2V to 4.0V
I ² C Bus (SCL, SDA) and INT Pin Current	<10mA
Input Voltage Slew Rate (Max)	0.1V/μs
ESD Ratings	
Human Body Model (HBM)	2.5kV
Machine Model (MM)	300V
Charged Device Model (CDM)	2kV

Thermal Information

Thermal Resistance (Typical)	θ _{JA} (°C/W)
6 Ld ODFN Package (Note 4)	260
Maximum Junction Temperature (T _{JMAX})	+90°C
Storage Temperature Range	-40°C to +100°C
Operating Temperature	-40°C to +85°C
Pb-Free Reflow Profile	see TB493

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:

- θ_{JA} is measured with the component mounted on a high effective thermal conductivity test board in free air. See Tech Brief [TB379](#) for details.

Electrical Specifications

V_{DD} = 3.0V, T_A = +25°C, 16-bit ADC operation, unless otherwise specified.

SYMBOL	PARAMETER	TEST CONDITIONS	MIN (Note 6)	TYP	MAX (Note 6)	UNIT
V _{DD}	Power Supply Range		2.25		3.63	V
I _{DD}	Supply Current			56	85	μA
I _{DD1}	Supply Current when Standby	Software disabled		29	37	μA
I _{DD2}	Supply Current when Powered Down	Software disabled		0.50	1.45	μA
V _{I2C}	Supply Voltage Range for I ² C Interface		1.70		3.63	V
t _{INT}	ADC Integration/Conversion Time	16-bit ADC data		101		ms
f _{I2C}	I ² C Clock Rate Range			500		kHz
D _{Dark}	Count Output when Dark	Lux = 0 lux, Range = 0 (375 lux)		1	5	Counts
CCT	Corrected Color Temperature Accuracy	Illuminant A is at 300 lux (see Note 11 on page 11 and " References " on page 15 about CIE 1931, Planckian locus and standard illuminants)		±5		%
D _{FS}	Full Scale ADC Code	ADC 16 bits			65535	Counts
	Full Scale on Range 0	Green = 565nm		18		μW/cm ²
		Red = 620nm		20		μW/cm ²
		Blue = 485nm		30		μW/cm ²

NOTES:

- 565nm Green, 620nm Red LED, 485nm Blue in white LED is used in production test. Its irradiance is calibrated to produce the same DATA count against an illuminance level of 130 lux fluorescent light.
- Compliance to datasheet limits is assured by one or more methods: production test, characterization and/or design.
- SDA and INT current sinking capability are assured by design.

I²C Interface Specifications

$V_{DD} = 3.0V$, $T_A = +25^\circ C$, 16-bit ADC operation, unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN (Note 6)	TYP	MAX (Note 6)	UNIT
V_{IL}	SDA and SCL Input Buffer LOW Voltage				0.55	V
V_{IH}	SDA and SCL Input Buffer HIGH Voltage		1.25			V
V_{Hys} (Note 8)	SDA and SCL Input Buffer Hysteresis			0.05x V_{DD}		V
V_{OL} (Note 8)	SDA Output Buffer LOW Voltage (Open-Drain), Sinking 4mA		0		0.4	V
C_{PIN} (Note 8)	SDA and SCL Pin Capacitance	$T_A = +25^\circ C$, $f = 1MHz$, $V_{DD} = 5V$, $V_{IN} = 0V$, $V_{OUT} = 0V$			10	pF
f_{SCL}	SCL Frequency				500	kHz
t_{IN}	Pulse Width Suppression Time at SDA and SCL Inputs	Any pulse narrower than the maximum specification is suppressed			50	ns
t_{AA}	SCL Falling Edge to SDA Output Data Valid				900	ns
t_{BUF}	Time the Bus Must be Free Before the Start of a New Transmission		1300			ns
t_{LOW}	SCL LOW Time		1300			ns
t_{HIGH}	SCL HIGH Time		600			ns
$t_{SU:STA}$	START Condition Set-Up Time		600			ns
$t_{HD:STA}$	START Condition Hold Time		600			ns
$t_{SU:DAT}$	Input Data Set-Up Time		100			ns
$t_{HD:DAT}$	Input Data Hold Time		30			ns
$t_{SU:STO}$	STOP Condition Set-Up Time		600			ns
$t_{HD:STHD:ST}$	STOP Condition Hold Time		600			ns
$t_{HD:ST}$	Output Data Hold Time		0			ns
$t_{HD:ST}$ (Note 8)	SDA and SCL Rise Time		20+0.1xC _b			ns
$t_{HD:ST}$ (Note 8)	SDA and SCL Fall Time		20+0.1xC _b			ns
C_b (Note 8)	Capacitive Loading of SDA or SCL	Total on-chip and off-chip			400	pF
R_{PU} (Note 8)	SDA and SCL Bus Pull-Up Resistor Off-Chip	Maximum is determined by t_R and t_F For $C_b = 400pF$, maximum is about 2k Ω ~ 2.5k Ω For $C_b = 40pF$, maximum is about 15k Ω ~ 20k Ω	1			k Ω

NOTES:

8. Limits should be considered typical and are not production tested.
9. These are I²C specific parameters and are not tested, however, they are used to set conditions for testing devices to validate specification.
10. C_b is the capacitance of the bus in pF.