

I/O Pins Configuration

Pin	Name	Type	Description
1	SDA	I/O	I ² C serial data I/O terminal – serial data I/O for I ² C.
2	INT	O	Interrupt – open drain.
3	LDR	I	LED driver for proximity emitter – up to 100 mA, open drain.
4	LEDK	O	LED Cathode, connect to LDR pin in most systems to use internal LED driver circuit
5	LEDA	I	LED Anode, connect to VBATT on PCB
6	GND		Power supply ground. All voltages are referenced to GND.
7	SCL	I	I ² C serial clock input terminal – clock signal for I ² C serial data.
8	VDD		Power Supply voltage.

Absolute Maximum Ratings over operating free-air temperature range (unless otherwise noted)[†]

Parameter	Symbol	Min	Max	Units	Conditions
Power Supply voltage	V _{DD}		3.8	V	1
Digital voltage range		-0.5	3.8	V	
Digital output current	I _O	-1	20	mA	
Storage temperature range	T _{stg}	-40	85	°C	

[†] Stresses beyond those listed under “absolute maximum ratings” may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated under “recommended operating conditions” is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

Note:

- All voltages are with respect to GND.

Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Units
Operating Ambient Temperature	T _A	-30		85	°C
Supply voltage	V _{DD}	2.5	3.0	3.6	V
Interface Bus Power Supply Voltage	V _{BUS}		1.8		V
Supply Voltage Accuracy, V _{DD} total error including transients		-3		+3	%
LED Supply Voltage	V _{BATT}	2.5		4.5	V

Operating Characteristics, V_{DD} = 3 V, T_A = 25° C (unless otherwise noted)

Parameter	Symbol	Min	Typ	Max	Units	Test Conditions
Supply current ^[1]	I _{DD}		175	250	μA	Active
			70			Wait Mode
			2.5	4.0		Sleep Mode
INT SDA output low voltage	V _{OL}	0		0.4	V	3 mA sink current
		0		0.6		6 mA sink current
Leakage current, SDA, SCL, INT pins	I _{LEAK}	-5		5	μA	
Leakage current, LDR pin	I _{LEAK}			10	μA	
SCL, SDA input high voltage	V _{IH}	1.25			V	
SCL, SDA input low voltage	V _{IL}			0.54	V	
Oscillator frequency	f _{osc}	705	750	795	kHz	PON = 1

Note:

- The power consumption is raised by the programmed amount of Proximity LED Drive during the 8 μs the LED pulse is on. The nominal and maximum values are shown under Proximity Characteristics. There the I_{DD} supply current is I_{DD} Active + Proximity LED Drive programmed value.

Proximity Characteristics, $V_{DD} = 3\text{ V}$, $T_A = 25^\circ\text{ C}$, $PGAIN=1$, $PEN = 1$ (unless otherwise noted)

Parameter	Symbol	Min	Typ	Max	Units	Test Conditions
Supply current – LDR Pulse On	I_{DD}		3		mA	
ADC Conversion Time Step Size			2.72		ms	PTIME = 0xff
ADC Number of Integration Steps			1		steps	PTIME = 0xff
Full Scale ADC Counts per Steps				1023	counts	PTIME = 0xff
Proximity IR LED Pulse Count		0		255	pulses	
Proximity Pulse Period			16.3		μs	
Proximity Pulse – LED On Time			7.2		μs	
Proximity LED Drive			100		mA	PDRIVE=0 I_{SINK} Sink current
			50			PDRIVE = 1 @ 600 mV, LDR Pin
			25			PDRIVE = 2
			12.5			PDRIVE = 3
Proximity ADC count value, no object			100			LED driving 8 pulses, PDRIVE = 0, open view (no glass) and no reflective object above the module.
Proximity ADC Count Value		416	520	624	counts	Reflecting object – 73 x 83 mm Kodak 90% grey card, 100 mm distance, LED driving 8 pulses, PDRIVE = 0, open view (no glass) above the module.

IR LED Characteristics, $V_{DD} = 3\text{ V}$, $T_A = 25^\circ\text{ C}$

Parameter	Symbol	Min	Typ	Max	Units	Test Conditions
Forward Voltage	V_F		1.4	1.5	V	$I_F = 20\text{ mA}$
Reverse Voltage	V_R	5			V	$I_R = 10\ \mu\text{A}$
Radiant Power	P_O	4.5			mW	$I_F = 20\text{ mA}$
Peak Wavelength	λ_P		850		nm	$I_F = 20\text{ mA}$
Spectrum Width, Half Power	$\Delta\lambda$		40		nm	$I_F = 20\text{ mA}$
Optical Rise Time	T_R		20		ns	$I_F = 100\text{ mA}$
Optical Fall Time	T_F		20		ns	$I_F = 100\text{ mA}$

Wait Characteristics, $V_{DD} = 3\text{ V}$, $T_A = 25^\circ\text{ C}$, $WEN = 1$ (unless otherwise noted)

Parameter	Min	Typ	Max	Units	Test Conditions
Wait Step Size		2.72		ms	WTIME = 0xff
Wait Number of Step	1		256	steps	