

**Absolute Maximum Ratings (unless otherwise specified,  $T_a = 25^\circ\text{C}$ )**

Parameter	Symbol	Min.	Max.	Unit
Supply voltage	$V_{DD}$		4.0	V
LED supply voltage	$V_{LED}$		4.6	V
LED pulse current <sup>[1]</sup>	$I_{LED}$		2	A
I <sup>2</sup> C-bus pin, Int pin voltage	$V_{BUS}$	-0.3	$V_{DD} + 0.3$	V
I <sup>2</sup> C-bus pin, Int pin current	$I_{BUS}$		10	mA

**Recommended Operating Conditions (unless otherwise specified,  $T_a = 25^\circ\text{C}$ )**

Parameter	Symbol	Min.	Typ.	Max.	Unit
Operating temperature	$T_A$	-20		+70	$^\circ\text{C}$
Operating supply voltage	$V_{DD}$	2.8		3.6	V
LED supply voltage	$V_{LED}$	3.0		4.2	V
Peak LED pulse current <sup>[1]</sup>	$I_{LED}$		720	860	mA
I <sup>2</sup> C-bus pin, INT pin voltage	$V_{BUS}$	1.8		3.3	V
I <sup>2</sup> C-bus pin, INT pin current	$I_{BUS}$			5	mA

Note:

1. Pulse width < 500  $\mu\text{s}$ , duty cycle < 5%

**Operating Characteristics (unless otherwise specified,  $T_a = 25^\circ\text{C}$ ,  $V_{DD} = 2.8\text{V}$ )**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Suspend current	$I_{DD\_SUS}$		15		$\mu\text{A}$	See Figure 13
Standby state 1 current	$I_{DD\_ST1}$		0.57		mA	See Figure 11
Standby state 2 current	$I_{DD\_ST2}$		0.37		mA	See Figure 12
Current consumption for proximity detection			0.2		mA	1. Register R_AE_Exposure_UB, 0x48 = 0x10 2. Register R_AE_Exposure_UB, 0x49 = 0x00 3. Register R_IDLE_TIME, 0x65 = 0xCE 4. Register R_IDLE_TIME, 0x66 = 0x0B
Current consumption for gesture detection			1		mA	1. Register R_AE_Exposure_UB, 0x48 = 0x48 2. Register R_AE_Exposure_UB, 0x49 = 0x00 3. Register R_IDLE_TIME, 0x65 = 0x96 4. Register R_IDLE_TIME, 0x66 = 0x00
I <sup>2</sup> C-bus input high voltage	$V_{IH}$	$0.7 \times V_{BUS}$		$V_{BUS} + 0.3$	V	
I <sup>2</sup> C-bus input low voltage	$V_{IL}$	-0.3		$0.3 \times V_{BUS}$	V	
INT, I <sup>2</sup> C_SDA output low voltage	$V_{OL}$			$0.1 \times V_{BUS}$	V	

**Proximity Characteristics (unless otherwise specified,  $T_a = 25^\circ\text{C}$ ,  $V_{DD} = 2.8\text{V}$ )**

Parameter	Min.	Typ.	Max.	Unit	Test Conditions
PS ADC Count Value (No Object)	0	5	5	counts	1. Dedicated duo power supply, $V_{DD} = 2.8\text{V}$ and $V_{LED} = 3\text{V}$ 2. R_LensShadingComp_EnH Register, $0x25 = 0x14$ 3. R_LED1_DAC_UB Register, $0x32 = 0x14$ 4. R_AE_Exposure_UB Register, $0x48 = 0x10$ 5. R_AE_Exposure_UB Register, $0x49 = 0x00$ 6. Open view (no glass) and no reflective object above the module.
PS ADC Count Value (100 mm Distance Object)	47	56	65	counts	1. Dedicated duo power supply, $V_{DD} = 2.8\text{V}$ and $V_{LED} = 3\text{V}$ 2. Reflecting object – 73 mm $\times$ 83 mm Kodak 90% grey card, 100 mm distance 3. R_LensShadingComp_EnH Register, $0x25 = 0x14$ 4. R_LED1_DAC_UB Register, $0x32 = 0x14$ 5. R_AE_Exposure_UB Register, $0x48 = 0x10$ 6. R_AE_Exposure_UB Register, $0x49 = 0x00$ 7. Open view (no glass) above the module.

**AC Electrical Characteristics,  $V_{DD} = 3\text{V}$ ,  $T_A = 25^\circ\text{C}$  (unless otherwise noted) \***

Parameter	Symbol	Min.	Max.	Unit
Clock frequency (I <sup>2</sup> C-bus only)	$f_{SCL}$	10	400	kHz
Bus free time between a STOP and START condition	$t_{BUF}$	1.3	–	$\mu\text{s}$
Hold time (repeated) START condition. After this period, the first clock pulse is generated	$t_{HD;STA}$	0.6	–	$\mu\text{s}$
Set-up time for a repeated START condition	$t_{SU;STA}$	0.6	–	$\mu\text{s}$
Set-up time for STOP condition	$t_{SU;STO}$	0.6	–	$\mu\text{s}$
Data hold time	$t_{HD;DAT}$	0	–	ns
Data set-up time	$t_{SU;DAT}$	100	–	ns
LOW period of the SCL clock	$t_{LOW}$	1.3	–	$\mu\text{s}$
HIGH period of the SCL clock	$t_{HIGH}$	0.6	–	$\mu\text{s}$
Clock/data fall time	$t_f$	–	300	ns
Clock/data rise time	$t_r$	–	300	ns
Input pin capacitance	$C_i$	–	10	pF

\* Specified by design and characterization; not production tested.

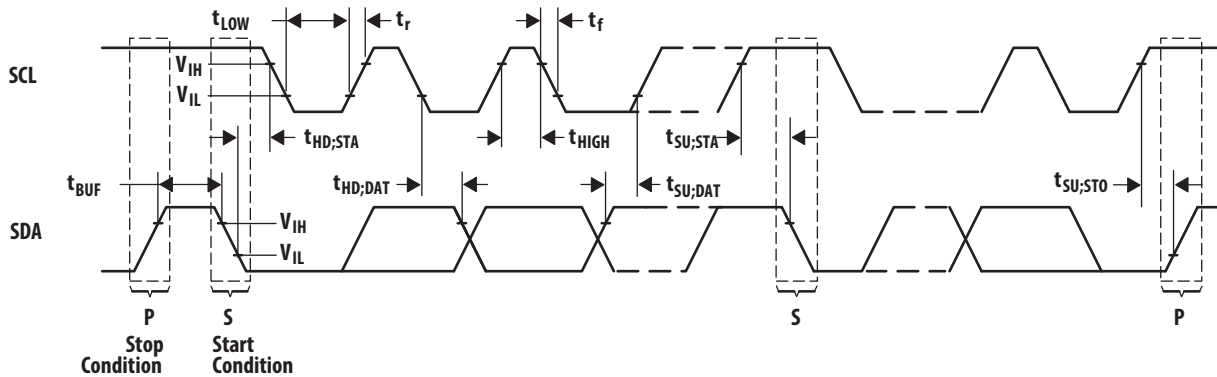


Figure 1. Timing Diagrams