



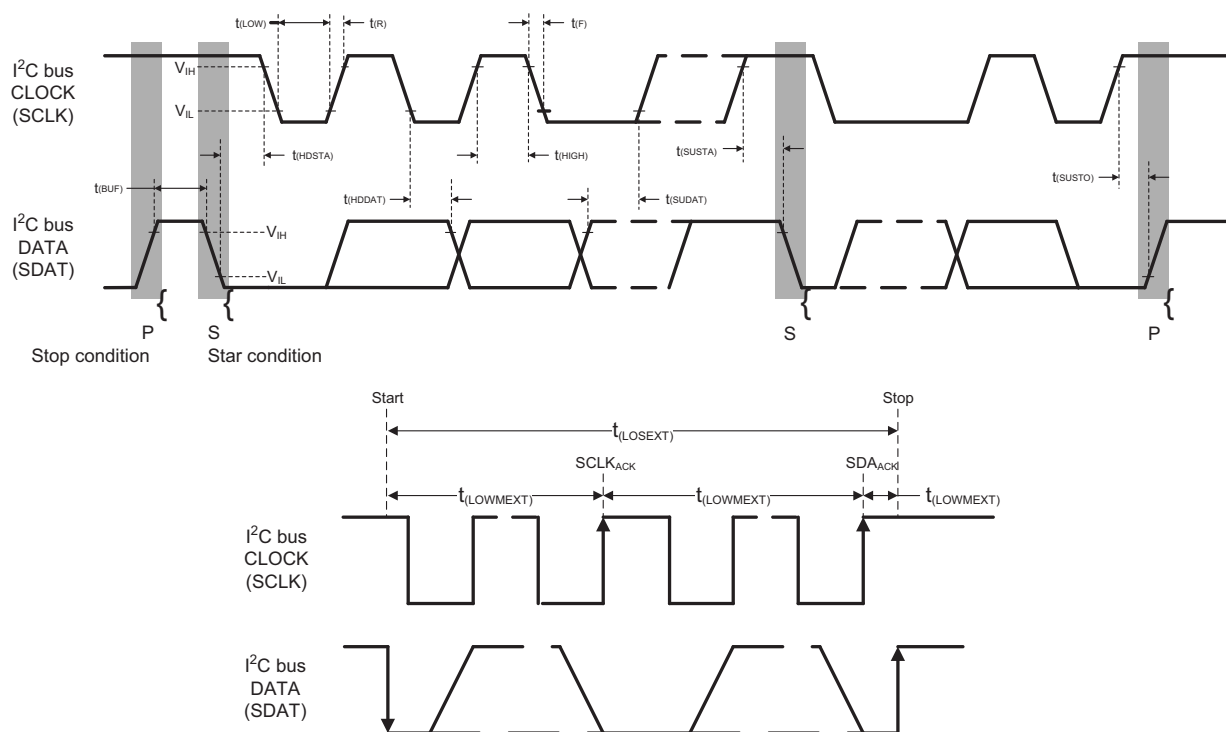
BASIC CHARACTERISTICS (T _{amb} = 25 °C, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply voltage		V _{DD}	2.5	-	3.6	V
Supply current	Excluded LED driving	I _{DD}	-	300	-	μA
	Light condition = dark, V _{DD} = 3.3 V	I _{DD} (SD)	-	0.2	-	μA
I ² C supply voltage		V _{PULL UP}	1.8	-	5.0	V
ALS shut down	ALS disable, PS enable	I _{ALSSD}	-	200	-	μA
PS shut down	ALS enable, PS disable	I _{PSSD}	-	260	-	μA
I ² C signal input	Logic high	V _{DD} = 3.3 V	V _{IH}	1.55	-	V
	Logic low		V _{IL}	-	0.4	
	Logic high	V _{DD} = 2.6 V	V _{IH}	1.4	-	V
	Logic low		V _{IL}	-	0.4	
Peak sensitivity wavelength of ALS		λ _p	-	550	-	nm
Peak sensitivity wavelength of PS		λ _p	-	850	-	nm
Full ALS counts	16-bit resolution		-	-	65 535	steps
Full PS counts	12-bit / 16-bit resolution		-	-	4096 / 65 535	steps
ALS sensing tolerance	White LED light source		-	-	± 10	%
Detectable intensity	Minimum	IT = 800 ms, 1 step ⁽¹⁾⁽²⁾	-	0.004	-	lx
	Maximum	IT = 50 ms, 65 535 step ⁽¹⁾⁽²⁾	-	4192	-	
ALS dark offset	IT = 50 ms, normal sensitivity ⁽¹⁾		0	-	3	steps
PS detection range	Kodak gray card ⁽³⁾		0	-	500	mm
Operating temperature range		T _{amb}	-40	-	+105	°C
Cathode (sensor) voltage			2.5	-	3.6	V
IRED driving current	⁽⁴⁾		-	-	200	mA

Notes

- ⁽¹⁾ Test condition: V_{DD} = 3.3 V, temperature: 25 °C
- ⁽²⁾ Maximum detection range to ambient light can be determined by ALS refresh time adjustment. Refer to table "ALS Resolution and Maximum Detection Range"
- ⁽³⁾ Depending on external IRED
- ⁽⁴⁾ Based on IRED on / off duty ratio = 1/40, 1/80, 1/160, and 1/320

I²C BUS TIMING CHARACTERISTICS ($T_{amb} = 25^{\circ}\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	STANDARD MODE		FAST MODE		UNIT
		MIN.	MAX.	MIN.	MAX.	
Clock frequency	$f_{(SMBCLK)}$	10	100	10	400	kHz
Bus free time between start and stop condition	$t_{(BUF)}$	4.7	-	1.3	-	μs
Hold time after (repeated) start condition; after this period, the first clock is generated	$t_{(HDSTA)}$	4.0	-	0.6	-	μs
Repeated start condition setup time	$t_{(SUSTA)}$	4.7	-	0.6	-	μs
Stop condition setup time	$t_{(SUSTO)}$	4.0	-	0.6	-	μs
Data hold time	$t_{(HDDAT)}$	-	3450	-	900	ns
Data setup time	$t_{(SUDAT)}$	250	-	100	-	ns
I ² C clock (SCK) low period	$t_{(LOW)}$	4.7	-	1.3	-	μs
I ² C clock (SCK) high period	$t_{(HIGH)}$	4.0	-	0.6	-	μs
Clock / data fall time	$t_{(F)}$	-	300	-	300	ns
Clock / data rise time	$t_{(R)}$	-	1000	-	300	ns


Fig. 1 - I²C Bus Timing Diagram