

# MAX44000

## Ambient and Infrared Proximity Sensor

### ELECTRICAL CHARACTERISTICS (continued)

(V<sub>DD</sub> = 1.8V, T<sub>MIN</sub> – T<sub>MAX</sub> = -40°C to +105°C, T<sub>A</sub> = +25°C, unless otherwise noted.) (Note 1)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
<b>IR LED TRANSMITTER</b>						
Minimum IR LED Drive Current Sink				10		mA
Maximum IR LED Drive Current Sink				110		mA
Current Control Step				10		mA
Current Control Accuracy		I <sub>OUT</sub> = 110mA, V <sub>DRV</sub> = 1.5V			12	%
		I <sub>OUT</sub> = 50mA, V <sub>DRV</sub> = 1.5V			10	
		I <sub>OUT</sub> = 10mA, V <sub>DRV</sub> = 1.5V			12	
DRV Leakage Current		I <sub>OUT</sub> = 0mA, V <sub>DRV</sub> = 3.6V			0.1	μA
Voltage Compliance of DRV Pin		I <sub>DRV</sub> = 110mA, ΔI <sub>OUT</sub> = 10%; V <sub>DRV</sub> = 3.6V			0.5	V
		I <sub>DRV</sub> = 100mA, ΔI <sub>OUT</sub> = 2%, V <sub>DRV</sub> = 3.6V			0.6	
Internal Transmit Pulse Width				100		μs
<b>POWER SUPPLY</b>						
Power-Supply Voltage	V <sub>DD</sub>		1.7		3.6	V
Quiescent Current (Ambient Mode)	I <sub>s</sub>			5	10	μA
Software Shutdown Current	I <sub>SHDN</sub>	T <sub>A</sub> = +25°C		0.1	0.3	μA
		T <sub>A</sub> = -40°C to +105°C			0.6	
Quiescent Current Proximity		During IR LED pulsed operation		375	600	μA
Quiescent Current (ALS + Proximity, Time Average)		With proximity and ALS sensing on		6.8		μA
Power-Up Time	t <sub>ON</sub>			100		ms
<b>DIGITAL CHARACTERISTICS (SDA, SCL, INT)</b>						
Output Low Voltage (SDA, INT)	V <sub>OL</sub>	I <sub>SINK</sub> = 6mA		0.06	0.4	V
INT Leakage Current				0.01	1000	nA
SDA, SCL Input Current				0.01	1000	nA
I <sup>2</sup> C Input Low Voltage	V <sub>IL_I2C</sub>	SDA, SCL			0.4	V
I <sup>2</sup> C Input High Voltage	V <sub>IH_I2C</sub>	SDA, SCL	1.6			V
Input Capacitance				3		pF

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PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
<b>I<sup>2</sup>C TIMING CHARACTERISTICS</b>						
Serial-Clock Frequency	f <sub>SCL</sub>				400	kHz
Bus Free Time Between STOP and START	t <sub>BUF</sub>		1.3			μs
Hold Time (Repeated) START Condition	t <sub>HD,STA</sub>		0.6			μs
Low Period of the SCL Clock	t <sub>LOW</sub>		1.3			μs
High Period of the SCL Clock	t <sub>HIGH</sub>		0.6			μs
Setup Time for a REPEATED START	t <sub>SU,STA</sub>		0.6			μs
Data Hold Time	t <sub>HD,DAT</sub>		0		0.9	μs
Data Setup Time	t <sub>SU,DAT</sub>		100			ns
SDA Transmitting Fall Time	t <sub>F</sub>	I <sub>SINK</sub> ≤ 6mA, t <sub>R</sub> and t <sub>F</sub> between 0.3 × V <sub>DD</sub> and 0.7 × V <sub>DD</sub>		100		ns
Setup Time for STOP Condition	t <sub>SU,STO</sub>		0.6			μs
Pulse Width of Suppressed Spike	t <sub>SP</sub>		0		50	ns

**Note 1:** All devices are 100% production tested at T<sub>A</sub> = +25°C. Temperature limits are guaranteed by design.

**Note 2:** Guaranteed by design. Green 538nm LED chosen for production so that the IC responds to 100 lux fluorescent light with 100 lux.

### Typical Operating Characteristics

(V<sub>DD</sub> = 1.8V, T<sub>MIN</sub> – T<sub>MAX</sub> = -40°C to +85°C, unless otherwise noted. All devices are 100% production tested at T<sub>A</sub> = +25°C. Temperature limits are guaranteed by design.)

