

Electrical Characteristics ($T_A = -40^{\circ}\text{C}$ to $+85^{\circ}\text{C}$, $V_{CC} = 4.5\text{V}$ to 16V)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
Ee(+)	Positive Going Threshold Irradiance ⁽⁵⁾	T _A = 25°C	0.025		0.250	mW/cm ²
Ee(+)/Ee(-)	Hysteresis Ratio		1.10		2.00	
I _{CC}	Supply Current ⁽⁵⁾	Ee = 0 or 0.3mW/cm ²			5.0	mA
	Peak to Peak Ripple which will Cause False Triggering	f = DC to 50MHz			2.00	V
QSE156/C (Buffer Totem Pole)						
V _{OH}	High Level Output Voltage ⁽⁵⁾	Ee = 0.3mW/cm ² , I _{OH} = -10mA	V _{CC} – 2.1			V
V _{OL}	Low Level Output Voltage	Ee = 0, I _{OL} = 16mA			0.40	V
QSE157/C (Inverter Totem Pole)						
V _{OH}	High Level Output Voltage	Ee = 0, I _{OH} = -10mA	V _{CC} – 2.1			V
V _{OL}	Low Level Output Voltage ⁽⁵⁾	Ee = 0.3mW/cm ² , I _{OL} = 16mA			0.40	V
QSE158/C (Buffer Open Collector)						
I _{OH}	High Level Output Current ⁽⁵⁾	Ee = 0.3mW/cm ² , V _{OH} = 30V			100	µA
V _{OL}	Low Level Output Voltage	Ee = 0, I _{OL} = 16mA			0.40	V
QSE159/C (Inverter Open Collector)						
I _{OH}	High Level Output Current	Ee = 0, V _{OH} = 30V			100	µA
V _{OL}	Low Level Output Voltage ⁽⁵⁾	Ee = 0.3mW/cm ² , I _{OL} = 16mA			0.40	V
QSE156/C, QSE157/C						
t _R , t _F	Output Rise, Fall Times	Ee = 0 or 0.3mW/cm ² , f = 10kHz, DC = 50%, R _L = 360Ω ⁽⁵⁾			70	nS
t _{PHL} , t _{PLH}	Propagation Delay			6.0		µS
QSE158/C, QSE159/C						
t _R , t _F	Output Rise, Fall Times	Ee = 0 or 0.3mW/cm ² , f = 10kHz, DC = 50%, R _L = 360Ω ⁽⁵⁾			100	nS
t _{PHL} , t _{PLH}	Propagation Delay			6.0		µS

Note:5. $\lambda = 880\text{nm}$ (AlGaAs).

Typical Performance Curves (Sensor Coupled to QEE113 Emitter)

Fig. 1 Output Voltage vs. Input Current (Inverters)

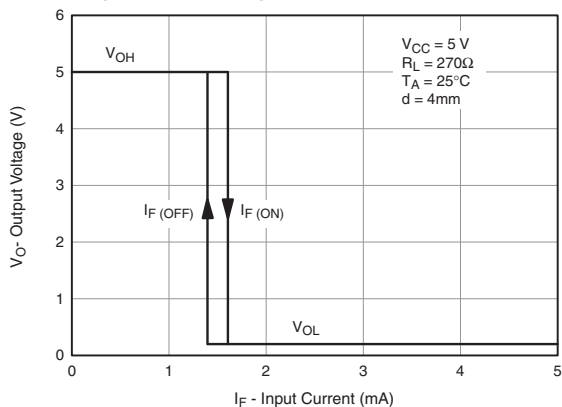


Fig. 2 Output Voltage vs. Input Current (Buffers)

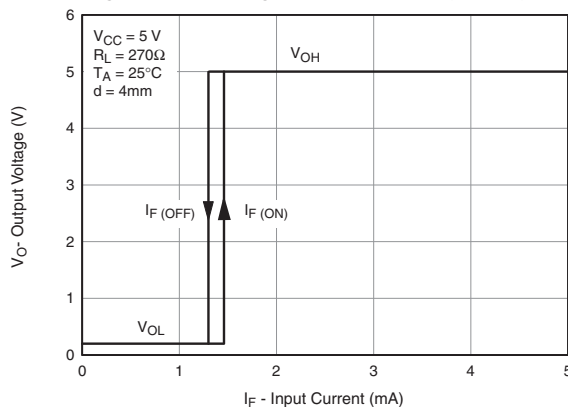


Fig. 3 Threshold Current vs. Distance

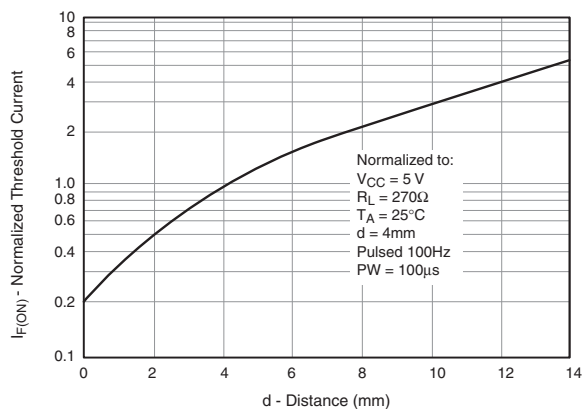


Fig. 4 Normalized Threshold Current vs. Supply Voltage

