

QVE00118 Phototransistor Optical Interrupter Switch

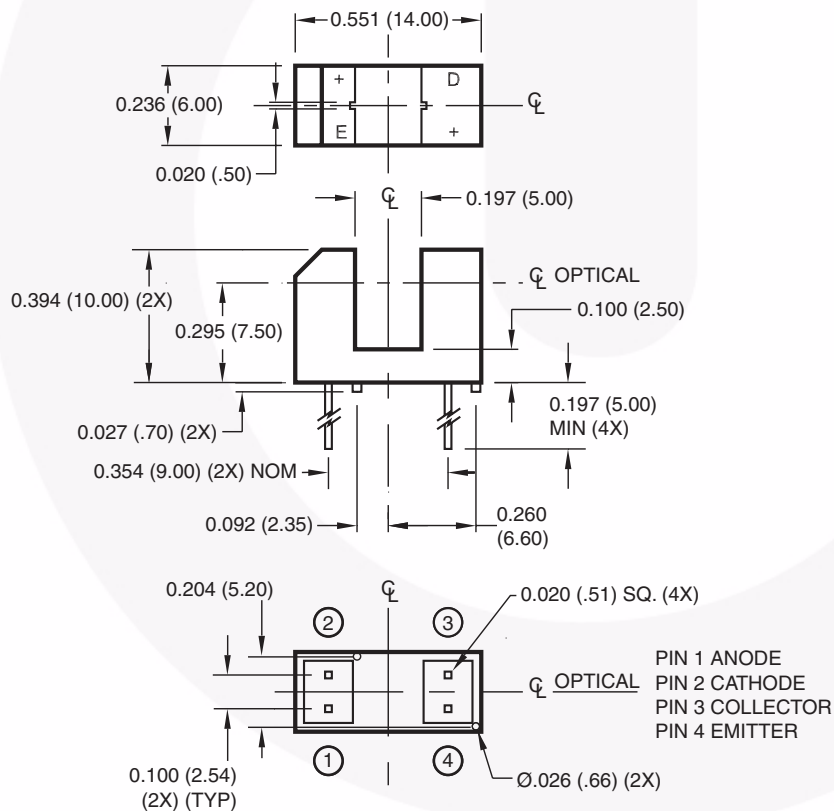
Features

- No contact sensing
- 5mm gap
- 0.5mm aperture width
- Low profile
- PCB mount
- Transistor output

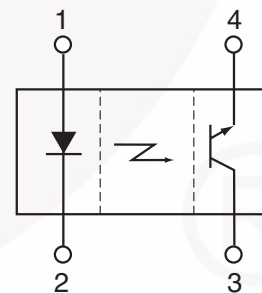
Description

The QVE00118 consists of an infrared light emitting diode coupled to an NPN silicon phototransistor packaged into an injection molded housing. The housing is designed for wide-gap, non-contact sensing.

Package Dimensions



Schematic



Notes:

1. Dimensions for all drawings are in inches (millimeters).
2. Tolerance of $\pm .010$ (.25) on all non-nominal dimensions unless otherwise specified.

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

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only.

Symbol	Parameter	Rating	Units
T_{OPR}	Operating Temperature	-55 to +100	$^\circ\text{C}$
T_{STG}	Storage Temperature	-55 to +100	$^\circ\text{C}$
$T_{\text{SOL-I}}$	Soldering Temperature (Iron) ⁽²⁾⁽³⁾	240 for 5 sec	$^\circ\text{C}$
$T_{\text{SOL-F}}$	Soldering Temperature (Flow) ⁽²⁾⁽³⁾	260 for 10 sec	$^\circ\text{C}$
EMITTER			
I_F	Continuous Forward Current	50	mA
V_R	Reverse Voltage	5	V
P_D	Power Dissipation ⁽¹⁾	100	mW
SENSOR			
V_{CEO}	Collector-Emitter Voltage	30	V
V_{ECO}	Emitter-Collector Voltage	4.5	V
I_C	Collector Current	20	mA
P_D	Power Dissipation ⁽¹⁾	100	mW

Notes:

1. Derate power dissipation linearly, on each component, 1.33mW/ $^\circ\text{C}$ above 25°C .
2. RMA flux is recommended.
3. Methanol or isopropyl alcohols are recommended as cleaning agents.
4. Soldering iron tip 1/16" (1.6mm) from housing.

Electrical/Optical Characteristics ($T_A = 25^\circ\text{C}$)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
EMITTER						
V_F	Forward Voltage	$I_F = 20\text{mA}$		1.2	1.5	V
I_R	Reverse Current	$V_R = 4\text{V}$			10	μA
I_{PE}	Peak Emission Wavelength	$I_F = 20\text{mA}$		940		nm
SENSOR						
I_D	Dark Current	$V_{\text{CE}} = 10\text{V}$, $I_F = 0\text{mA}$			200	nA
COUPLED						
$I_{\text{C(ON)}}$	Collector Current	$I_F = 20\text{mA}$, $V_{\text{CE}} = 10\text{V}$	0.5		14	mA
$V_{\text{CE (SAT)}}$	Collector Emitter Saturation Voltage	$I_F = 20\text{mA}$, $I_C = 0.1\text{mA}$			0.4	V
t_r	Rise Time	$V_{\text{CC}} = 5\text{V}$, $R_L = 100\Omega$, $I_C = 5\text{mA}$		4		μs
t_f	Fall Time			4		μs

Typical Performance Characteristics

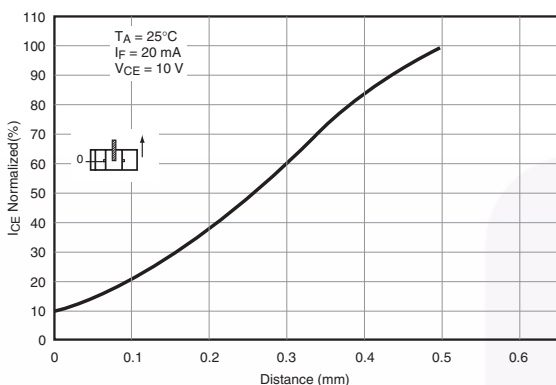


Fig. 1 Collector Current vs. Shield distance

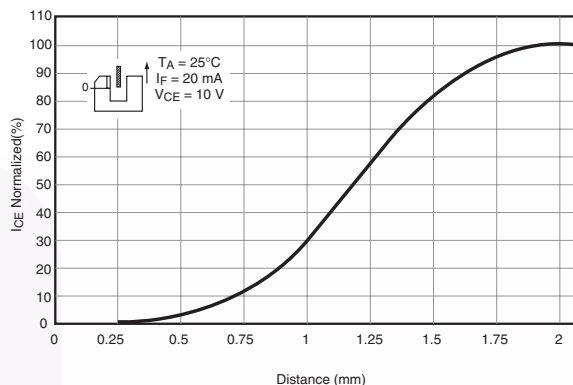


Fig. 2 Collector Current vs. Shield distance

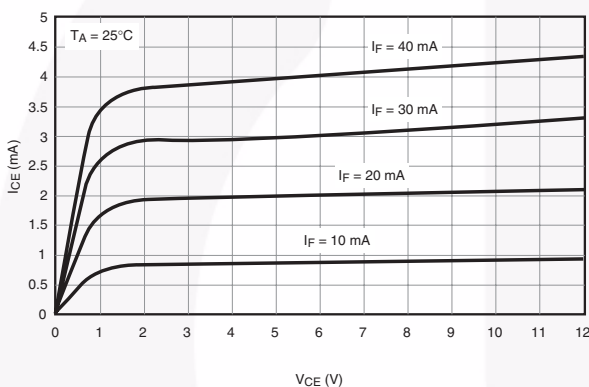


Fig. 3 Collector-Emitter Voltage vs. Collector Current

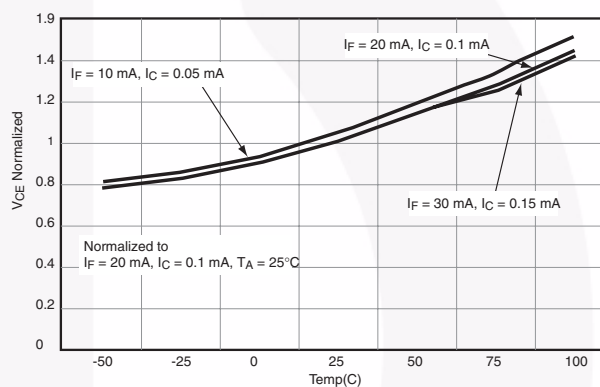


Fig. 4 Collector-Emitter Voltage vs. Temperature

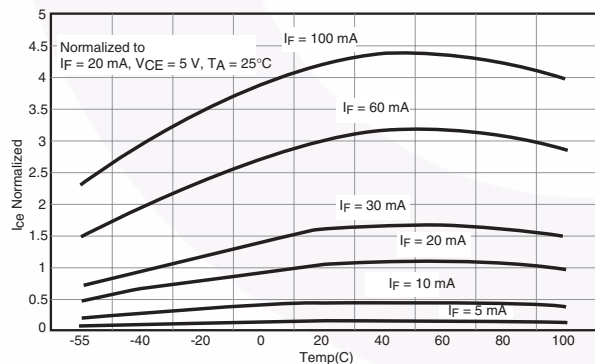


Fig. 5 Collector Current vs. Temperature

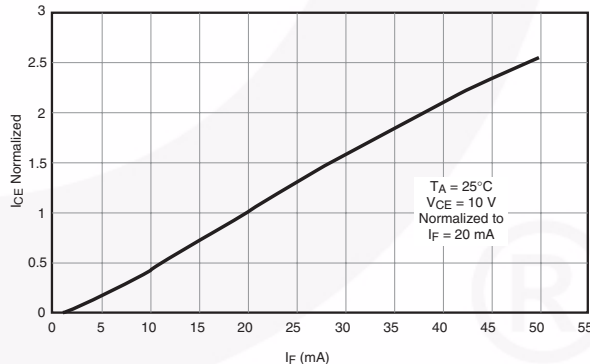


Fig. 6 Collector Current vs. Forward Current

Typical Performance Characteristics (Continued)

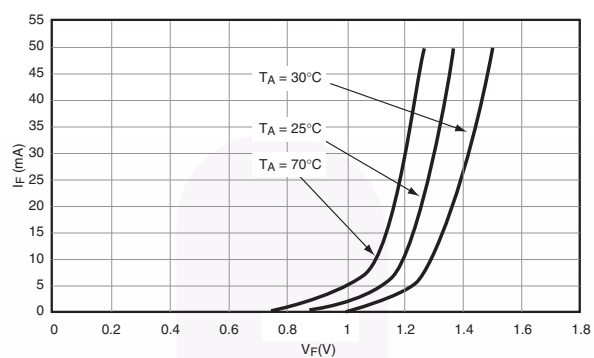


Fig. 7 Forward Voltage vs. Forward Current

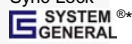


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