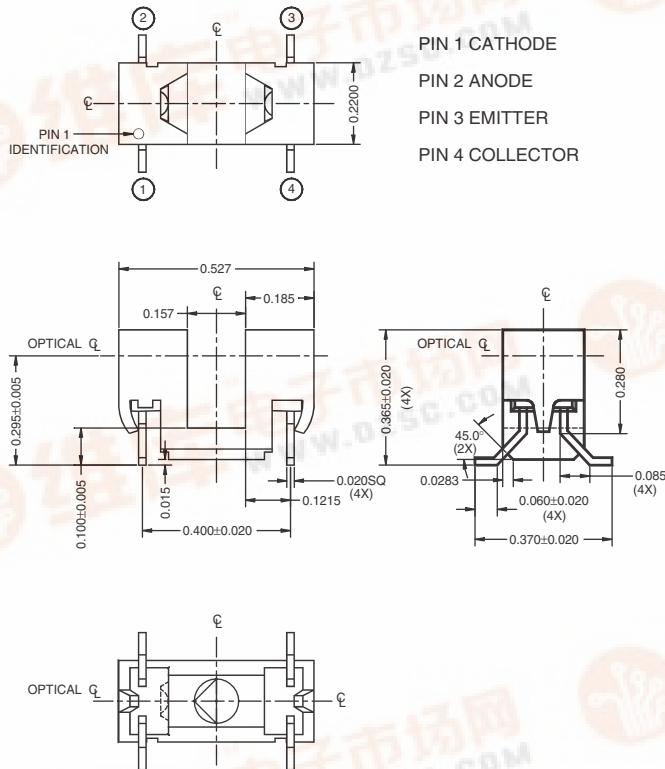


FAIRCHILD
SEMICONDUCTOR®

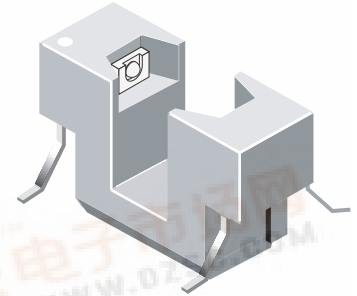
PHOTODARLINGTON OPTICAL INTERRUPTER SWITCH

QCK3 QCK4

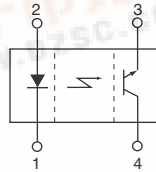
PACKAGE DIMENSIONS



PIN 1 CATHODE
PIN 2 ANODE
PIN 3 EMITTER
PIN 4 COLLECTOR



SCHEMATIC



NOTES:

1. Dimensions for all drawings are in inches.
2. Tolerance of $\pm .010$ on all non-nominal dimensions unless otherwise specified.
3. All leads are coplanar within .006".
4. Housing material is electrically conductive.

DESCRIPTION

The QCK3/QCK4 is a slotted optical switch designed for surface mount applications where extreme temperatures are experienced during solder reflow. The switch consists of a GaAs LED and a silicon photodarlington facing each other across a .157" (4.0 mm) gap. The leads are formed to sit flush on a PCB during solder reflow.

FEATURES

- Unique single piece housing designed to reduce cost.
- High temperature housing material to withstand extreme temperature.
- Shipped in plastic tubes for protection of leads and to feed automatic placement equipment.
- Sensor package is infrared transparent and tinted to attenuate visible light.



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise specified)			
Parameter	Symbol	Rating	Units
Operating Temperature	T_{OPR}	-55 to +100	$^\circ\text{C}$
Storage Temperature	T_{STG}	-40 to +85	$^\circ\text{C}$
Soldering Temperature (Flow)	T_{SOL-F}		
Preheating Stage for 60 sec		183	$^\circ\text{C}$
Reflow Stage for 5 sec		230	$^\circ\text{C}$
Rate of Temperature Rise		3 to 10	$^\circ\text{C/S}$
EMITTER			
Continuous Forward Current	I_F	50	mA
Reverse Voltage	V_R	6	V
Power Dissipation ⁽¹⁾	P_D	100	mW
SENSOR			
Collector-Emitter Voltage	V_{CEO}	30	V
Emitter-Collector Voltage	V_{ECO}	6	V
Collector Current	I_C	40	mA
Power Dissipation ⁽¹⁾	P_D	150	mW

NOTE:

1. Derate power dissipation linearly 1.33 mW/ $^\circ\text{C}$ above 25 $^\circ\text{C}$.

PARAMETER	DEVICES	TEST CONDITIONS	SYMBOL	MIN	TYP	MAX	UNITS
EMITTER							
Forward Voltage		$I_F = 20 \text{ mA}$	V_F	—	—	1.4	V
Reverse Current		$V_R = 2 \text{ V}$	I_R	—	—	100	μA
SENSOR							
Collector-Emitter Breakdown		$I_C = 1 \text{ mA}, E_e = 0$	BV_{CEO}	30	—	—	V
Collector-Emitter Leakage		$V_{CE} = 5.25 \text{ V}, E_e = 0$	I_{CEO}	—	—	30	μA
COUPLED							
On-State Collector Current	QCK3	$I_F = 5.0 \text{ mA}, V_{CE} = 5 \text{ V}$	$I_{C(ON)}$	1.0	—	—	mA
	QCK4			3.0	—	15.0	
Saturation Voltage		$I_F = 5 \text{ mA}, I_C = 5.0 \text{ mA}$	$V_{CE(SAT)}$	—	—	1.0	V

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2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.