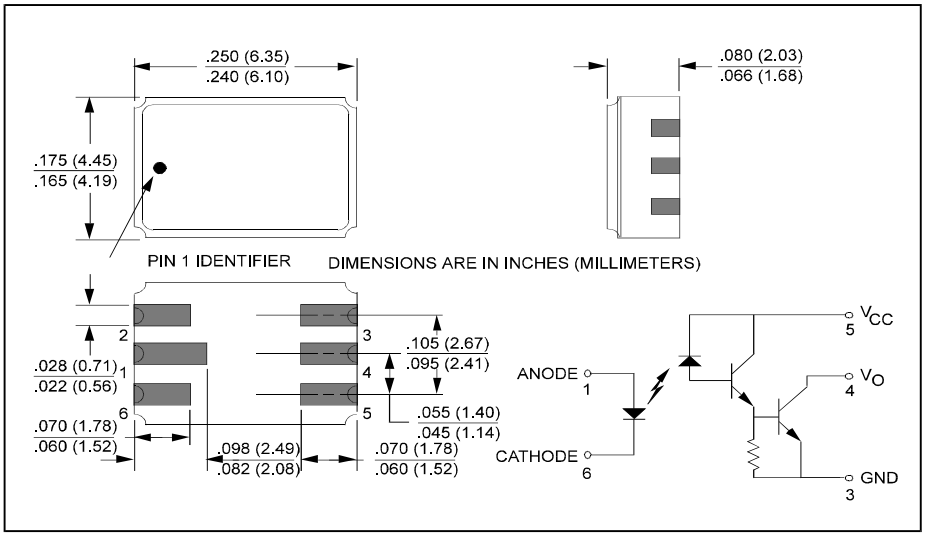
Surface Mount Optically Coupled Isolator
Types HCC640, HCC640B



Features

- Surface mountable on ceramic or PC board
- 6N140A operating compatibility
- Key parameters guaranteed over -55° C to +125° C ambient temperature range
- Hermetically sealed
- Low power consumption
- High current transfer ratio
- Low input current requirement
- 1500 VDC isolation voltage

Description

The HCC 640 is a hermetically sealed, ceramic surface-mount optocoupler, consisting of a GaAlAs IRED coupled to an integrated high gain photodiode. The HCC640 is designed to be electrically equivalent to a single channel of the JEDEC 6N140 quad-channel device. The high gain, open-collector output provides both lower output saturation voltage and faster switching speeds than possible with standard photodarlington optocouplers. The high current transfer ratio at very low input currents makes the HCC640 ideal for use in MOS, CMOS and low power logic interfacing. The HCC640 is capable of operation and storage over the full military temperature range and can be supplied with full processing per Optek's Military screening procedure (based on MIL-STD-883) upon request.

Absolute Maximum Ratings (T_A = 25° C unless otherwise noted)

Operating Temperature Range . . . . . -55° C to +125° C
Storage Temperature Range . . . . . -65° C to +150° C
Soldering Temperature (vapor phase reflow for 30 sec.) . . . . . 215° C
Soldering Temperature (heated collet for 5 sec.) . . . . . 260° C

Input Diode

Peak Input Current (≤1 ms duration, 500 pps) . . . . . 20 mA
Average Input Current, I_F (each channel) . . . . . 10 mA(1)
Reverse Input Voltage, V_R . . . . . 5 V

Output Photodetector

Output Current, I_O. . . . . 40 mA
Output Voltage, V_O . . . . . -0.5 V to 20 V
Supply Voltage, V_{CC} . . . . . -0.5 V to 20 V
Output Power Dissipation. . . . . 75 mW(3)

Notes:
(1) Derate I_F at 0.66 mA/° C above 110° C.
(2) Output power is collector output power plus one half of the total supply power. Derate at 5 mW/° C above 110° C.

Typical screening and lot acceptance tests are provided on page 13-4.
For Hi-Rel order HCC640B. Minimum orders may apply.

Types HCC640, HCC640B

Electrical Characteristics (T_A = -55° C to +125° C unless otherwise noted)

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Input Diode						
V_F	Forward Voltage			1.70	V	I_F = 1.60 mA, T_A = 25° C
BV_R	Reverse Breakdown Voltage	5.0			V	I_R = 10 µA, T_A = 25° C
$\frac{\Delta V_F}{\Delta T_A}$	Temperature Coefficient of Forward Voltage		-1.80		mV/° C	I_F = 1.60 mA
Coupled						
CTR	Current Transfer Ratio	300	1500		%	I_F = 0.5 mA, V_O = 0.4 V, V_{CC} = 4.5 V
		300	1000		%	I_F = 1.60 mA, V_O = 0.4 V, V_{CC} = 4.5 V
		200	500		%	I_F = 5.0 mA, V_O = 0.4 V, V_{CC} = 4.5 V
V_{OL}	Logic Low Output Voltage		0.1	0.4	V	I_F = 0.5 mA, I_{OL} = 1.50 mA, V_{CC} = 4.5V
V_{OL}	Logic Low Output Voltage		0.2	0.4	V	I_F = 5.0 mA, I_{OL} = 10 mA, V_{CC} = 4.5 V
I_{OH}	Logic High Output Current		0.001	250	µA	V_O = V_{CC} = 18 V
I_{CCL}	Logic Low Supply Current		0.40	1.0	mA	I_F = 1.60 mA, V_{CC} = 18 V
I_{CCH}	Logic High Supply Current		0.001	10	µA	I_F = 0, V_{CC} = 18 V
I_{I-O}	Input-Output Insulation Leakage Current			1.0	µA	45% Relative Humidity, T_A = 25° C t = 5 sec, V_{I-O} = 1500 Vdc
R_{I-O}	Resistance (Input-Output)		10^{12}		Ω	V_{I-O} = 500 Vdc
C_{I-O}	Capacitance (Input-Output)		1.5		pF	f = 1 MHz, T_A = 25° C
C_{I-I}	Capacitance (Input-Input)		1.0		pF	f = 1 MHz, T_A = 25° C
C_{IN}	Input Capacitance		60		pF	f = 1 MHz, V_F = 0, T_A = 25° C
I_{I-I}	Input-Input Insulation Leakage Current		0.5		nA	45% Relative Humidity, V_{I-I} = 500 V T_A = 25° C, t = 5 sec
R_{I-I}	Resistance (Input-Input)		10^{12}		Ω	V_{I-I} = 500 V, T_A = 25° C
Switching Specification (T_A = 25° C)						
t_{PLH}	Propagation Delay Time to Logic High at Output		6.0	60	µs	I_F = 0.5 mA, R_L = 4.7 kΩ, V_{CC} = 5 V
			4.0	20	µs	I_F = 5 mA, R_L = 680 Ω, V_{CC} = 5 V
t_{PHL}	Propagation Delay Time to Logic Low at Output		30	100	µs	I_F = 0.5 mA, R_L = 4.7 kΩ, V_{CC} = 5 V
			2.0	5.0	µs	I_F = 5 mA, R_L = 680 Ω, V_{CC} = 5 V
CM_H	Common Mode Transient Immunity at Logic High Level Level Output	500	1000		V/µs	I_F = 0, R_L = 1.5 kΩ $\lvert V_{CM} \rvert$ = 50 V_{P-P} V_{CC} = 5 V
CM_L	Common Mode Transient Immunity at Logic Low Level Level Output	-500	-1000		V/µs	I_F = 1.60 mA, R_L = 1.5 kΩ $\lvert V_{CM} \rvert$ = 50 V_{P-P} V_{CC} = 5 V

HI-REL SURFACE MOUNT