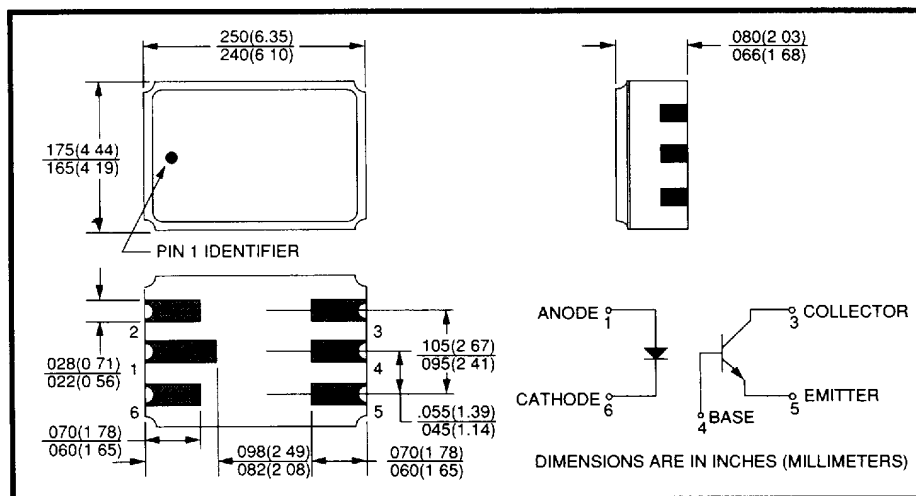
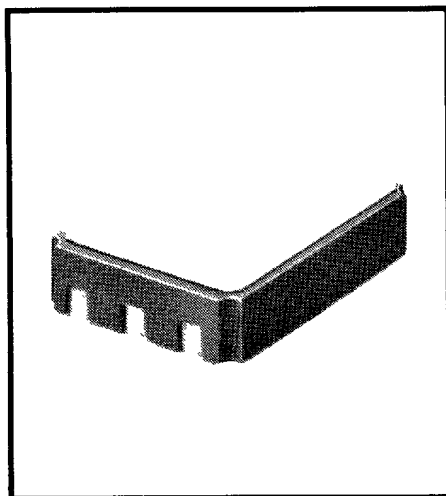


Surface Mount Optically Coupled Isolator

Types HCC247, HCC248, HCC249

T-41-83



Features

- Surface mountable on ceramic or printed circuit board
- Miniature package saves circuit board area
- Electrical performance similar to 4N47, 4N48, and 4N49
- Hermetically sealed
- Base pad provided for conventional transistor biasing
- Screened per MIL-S-19500 TX or TXV equivalent levels on request
- Higher breakdown voltage devices available as the "HV" series

Description

The HCC247, HCC248, and HCC249 are optically coupled isolators, consisting of a gallium aluminum arsenide LED and a silicon phototransistor mounted and coupled in a miniature surface mount hermetic leadless chip carrier. All electrical characteristics are identical to the JEDEC registered 4N47, 4N48, and 4N49. HCC247HV, HCC248HV, and HCC249HV series of optoisolators available when higher breakdown voltages are required.

These solid state couplers are ideal for designs where board space and device weight are important design considerations. High reliability processing performed in accordance with MIL-S-19500.

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

Input-to-Output Isolation Voltage	$\pm 1.0 \text{ kVDC}^{(1)}$
Operating Temperature	-55°C to $+125^\circ\text{C}$
Storage Temperature	-65°C to $+150^\circ\text{C}$
Soldering Temperature (vapor phase reflow for 30 sec.)	215°C
Soldering Temperature (heated collet for 5 sec.)	260°C

Input Diode

Forward DC Current (65°C or below)	40 mA
Reverse Voltage	3.0 V
Power Dissipation	60 mW ⁽²⁾

Output Phototransistor

Continuous Collector Current	50 mA
Collector-Base Voltage	45 V ⁽³⁾
Collector-Emitter Voltage	40 V ⁽³⁾
Emitter-Base Voltage	7.0 V
Power Dissipation	300 mW ⁽⁴⁾

Notes:

- (1) Measured with inputs shorted together and outputs shorted together
- (2) Derate linearly 0.67 mW/ $^\circ\text{C}$ above 65°C
- (3) HCC247HV, HCC248HV, and HCC249HV are available rated at 55 V minimum
- (4) Derate linearly 3.0 mW/ $^\circ\text{C}$ above 25°C

Types HCC247, HCC248, HCC249

Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Type	Min.	Typ.	Max.	Units	Test Conditions
--------	-----------	------	------	------	------	-------	-----------------

Input Diode

V_F	Forward Voltage	0.80		1.50	V	$I_F = 10.0\text{ mA}$
		1.00		1.70	V	$I_F = 10.0\text{ mA}, T_A = -55^\circ\text{C}$
		0.70		1.30	V	$I_F = 10.0\text{ mA}, T_A = 100^\circ\text{C}$
I_R	Reverse Current			100	μA	$V_R = 3.0\text{ V}$

Output Phototransistor

$V_{(BR)CBO}$	Collector-Base Breakdown Voltage ⁽³⁾	45			V	$I_C = 100\text{ }\mu\text{A}, I_E = 0, I_F = 0$
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage ⁽³⁾	40			V	$I_C = 1.0\text{ mA}, I_B = 0, I_F = 0$
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	7.0			V	$I_E = 100\text{ }\mu\text{A}, I_C = 0, I_F = 0$
$I_{C(OFF)}$	Collector-Emitter Dark Current			100	nA	$V_{CE} = 20\text{ V}, I_B = 0, I_F = 0$
				100	μA	$V_{CE} = 20\text{ V}, I_B = 0, I_F = 0, T_A = 100^\circ\text{C}$
$I_{CB(OFF)}$	Collector-Base Dark Current			10.0	nA	$V_{CB} = 20\text{ V}, I_E = 0, I_F = 0$

Coupled

$I_{C(ON)}$	On-State Collector Current	HCC247	0.5			mA	$V_{CE} = 5.0\text{ V}, I_B = 0, I_F = 1.0\text{ mA}$
			0.7			mA	$V_{CE} = 5.0\text{ V}, I_B = 0, I_F = 2.0\text{ mA}, T_A = -55^\circ\text{C}$
			0.5			mA	$V_{CE} = 5.0\text{ V}, I_B = 0, I_F = 2.0\text{ mA}, T_A = 100^\circ\text{C}$
		HCC248	1.0		5.0	mA	$V_{CE} = 5.0\text{ V}, I_B = 0, I_F = 1.0\text{ mA}$
			1.4			mA	$V_{CE} = 5.0\text{ V}, I_B = 0, I_F = 2.0\text{ mA}, T_A = -55^\circ\text{C}$
			1.0			mA	$V_{CE} = 5.0\text{ V}, I_B = 0, I_F = 2.0\text{ mA}, T_A = 100^\circ\text{C}$
		HCC249	2.0		10.0	mA	$V_{CE} = 5.0\text{ V}, I_B = 0, I_F = 1.0\text{ mA}$
			2.8			mA	$V_{CE} = 5.0\text{ V}, I_B = 0, I_F = 2.0\text{ mA}, T_A = -55^\circ\text{C}$
			2.0			mA	$V_{CE} = 5.0\text{ V}, I_B = 0, I_F = 2.0\text{ mA}, T_A = 100^\circ\text{C}$
$I_{CB(ON)}$	On-State Collector-Base Current		30			μA	$V_{CB} = 5.0\text{ V}, I_E = 0, I_F = 10\text{ mA}$
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage	HCC247			0.30	V	$I_C = 0.5\text{ mA}, I_B = 0, I_F = 2.0\text{ mA}$
		HCC248			0.30	V	$I_C = 1.0\text{ mA}, I_B = 0, I_F = 2.0\text{ mA}$
		HCC249			0.30	V	$I_C = 2.0\text{ mA}, I_B = 0, I_F = 2.0\text{ mA}$
$R_{I/O}$	Resistance (Input to Output)		10^{11}			Ω	$V_{I/O} = \pm 1000\text{ Vdc}^{(1)}$
$C_{I/O}$	Capacitance (Input to Output)				5.0	pF	$V_{I/O} = 0.0\text{ V}, f = 1.0\text{ MHz}^{(1)}$
t_r	Output Rise Time	HCC247			20.0	μs	$V_{CC} = 10.0\text{ V},$ $I_F = 5.0\text{ mA},$ $R_L = 100\text{ }\Omega$
		HCC248			20.0	μs	
		HCC249			25.0	μs	
t_f	Output Fall Time	HCC247			20.0	μs	$V_{CC} = 10.0\text{ V},$ $I_F = 5.0\text{ mA},$ $R_L = 100\text{ }\Omega$
		HCC248			20.0	μs	
		HCC249			25.0	μs	

Optek reserves the right to make changes at any time in order to improve design and to supply the best product possible.

Optek Technology, Inc., 1215 West Crosby Road, Carrollton, Texas 75006 (214) 323-2200 TLX 215849 Fax (214) 323-2396
Printed in USA