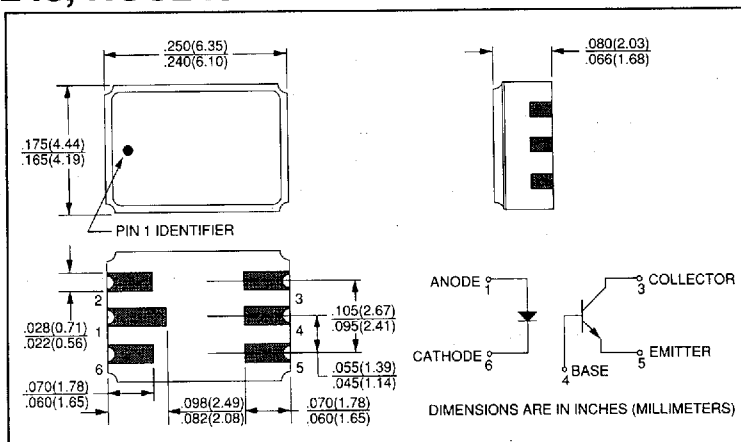
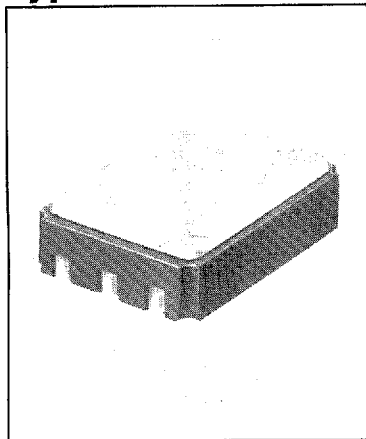


Surface Mount Optically Coupled Isolator

Types HCC247, HCC248, HCC249



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 optoisolators are available where higher breakdown voltages are required.

These solid state couplers are ideal for designs where board space and device weight are important design considerations.

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

Input-to-Output Isolation Voltage	± 1.0 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 $1.0 \text{ mW}/^\circ\text{C}$ above 65°C .
- (3) HCC247HV, HCC248HV, and HCC249HV are available rated at 55 V minimum.
- (4) Derate linearly $3.0 \text{ mW}/^\circ\text{C}$ above 25°C .

Types HCC247, HCC248, HCC249

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

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
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Input Diode

		0.80		1.50	V	$I_F = 10.0 \text{ mA}$
V_F	Forward Voltage	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	$I_C = 100 \mu\text{A}$, $I_E = 0$, $I_F = 0$
$V_{(BR)CEO}$	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	$I_E = 100 \mu\text{A}$, $I_C = 0$, $I_F = 0$
$I_{C(OFF)}$	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	$V_{CB} = 5.0 \text{ V}$, $I_E = 0$, $I_F = 10 \text{ mA}$
		HCC247		0.30	V	$I_C = 0.5 \text{ mA}$, $I_B = 0$, $I_F = 2.0 \text{ mA}$
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage	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	$V_{I-O} = 0.0 \text{ V}$, $f = 1.0 \text{ MHz}^{(1)}$
		HCC247		20.0	μs	$V_{CC} = 10.0 \text{ V}$,
t_r	Output Rise Time	HCC248		20.0	μs	$I_F = 5.0 \text{ mA}$,
		HCC249		25.0	μs	$R_L = 100 \Omega$
		HCC247		20.0	μs	$V_{CC} = 10.0 \text{ V}$,
t_f	Output Fall Time	HCC248		20.0	μs	$I_F = 5.0 \text{ mA}$,
		HCC249		25.0	μs	$R_L = 100 \Omega$

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 W. Crosby Road Carrollton, Texas 75006 (214) 323-2200 Fax (214) 323-2396