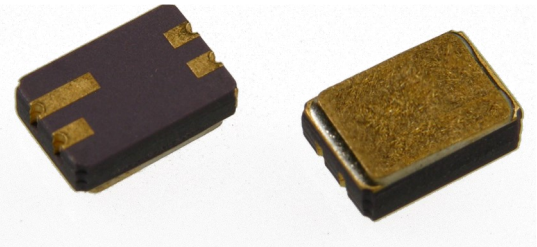
Surface Mount Optically Coupled Isolator

HCC240, HCC242 (TX, TXV, ESA-XN)

Features:

- Surface mountable on ceramic or printed circuit board
- Miniature package saves circuit board area
- Electrical performance similar to 4N22A and 4N24A
- Hermetically sealed
- Screened per MIL-PRF-19500 TX and TXV equivalent levels or per ESA 5000



Description:

The HCC240 and HCC242 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. The HCC240 and HCC242 are identical except for the DC current transfer ratio. Electrical parameters are similar to the JEDEC registered 4N22A and 4N24A. These solid state couplers are ideal for designs where board space and device weight are important design considerations. Typical screening and lot acceptance tests are provided on page 13-4. The burn-in condition is VCE = 9 V, PD = 275 mW, IF = 20-50 mA (adjusted to achieve PD). No HTRB is performed on this device.

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

Input-to-Output Isolation Voltage	±1.0 kVDC(1)
Operating Temperature	-55° C to +125° C
Storage Temperature	-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	
Forward DC Current (65° C below)	40 mA
Reverse Voltage	2.0 V
Power Dissipation	60 mW(2)
Output Phototransistor	
Continuous Collector Current	50 mA
Collector-Emitter Voltage	30 V(3)
Emitter-Collector Voltage	5.0 V(4)
Power Dissipation	300 mW(5)

Notes:

(1) Measured with inputs shorted together and outputs shorted together.
(2) Derate linearly 1.0 mW/° C above 65° C.
(3) HCC240HV and HCC242HV are available rated at 55 V minimum.
(4) HCC240HV and HCC242HV are available rated at 7.0 V minimim.
(5) Derate linearly 3.0 mW/° C above 25° C.
(6) Some deviations from ESA 5000 apply. See page 13-4 for details.

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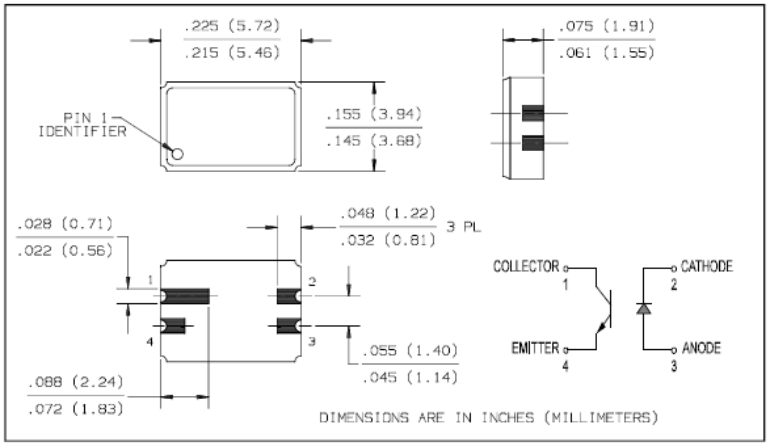
Performance

Electrical Characteristics (T_A = 25° C unless otherwise noted)

SYMBOL	PARAMETER		MIN	TYP	MAX	UNITS	TEST CONDITIONS
Input Diode							
V_F	Forward Voltage		0.80		1.5	V	I_F = 10.0 mA
			1.00		1.7	V	I_F = 10.0 mA, T_A = -55° C
			0.70		1.3	V	I_F = 10.0 mA, T_A = 100° C
I_R	Reverse Current				100	µA	V_R = 2.0 V
Output Phototransistor							
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage(3)		30			V	I_C = 1.0 mA, I_F = 0
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage(4)		5.0			V	I_E = 100 µA, I_F = 0
$I_{C(OFF)}$	Collector-Emitter Dark Current				100	nA	V_{CE} = 20 V, I_F = 0
					100	µA	V_{CE} = 20 V, I_F = 0, T_A = 100° C
Coupled							
$I_{C(ON)}$	On-State Collector Current	HCC240	0.15			mA	V_{CE} = 5.0 V, I_F = 2.0 mA
			2.5	6.0		mA	V_{CE} = 5.0 V, I_F = 10.0 mA
			1.0			mA	V_{CE} = 5.0 V, I_F = 10.0 mA, T_A = -55° C
			1.0			mA	V_{CE} = 5.0 V, I_F = 10.0 mA, T_A = 100° C
		HCC242	0.40			mA	V_{CE} = 5.0 V, I_F = 2.0 mA
			10.0	15.0		mA	V_{CE} = 5.0 V, I_F = 10.0 mA
			4.0			mA	V_{CE} = 5.0 V, I_F = 10.0 mA, T_A = -55° C
			4.0			mA	V_{CE} = 5.0 V, I_F = 10.0 mA, T_A = 100° C
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage	HCC240			0.30	V	I_C = 2.5 mA, I_F = 20.0 mA
		HCC242			0.30	V	I_C = 10.0 mA, I_F = 20.0 mA
R_{I-O}	Resistance (Input to Output)		10^{11}			Ω	V_{I-O} = ±1000 VDC(1)
C_{I-O}	Capacitance (Input to Output)				5.0	pF	V_{I-O} = 0.0 V, f = 1.0 MHz(1)
t_r	Output Rise Time	HCC240			15.0	µs	V_{CC} = 10.0 V, I_F = 10.0 mA, R_L = 100 Ω
		HCC242			20.0	µs	
t_f	Output Fall Time	HCC240			15.0	µs	V_{CC} = 10.0 V, I_F = 10.0 mA, R_L = 100 Ω
		HCC242			20.0	µs	



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