

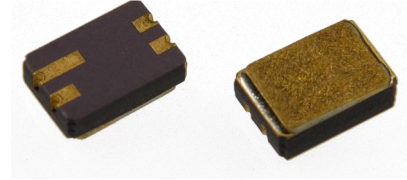
Surface Mount Optically Coupled Isolator

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⁽⁶⁾



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 JEDCEC registered 4N22A and 4N24A. These solid state couplers are ideal for designs where board space and device weight are important design considerations.

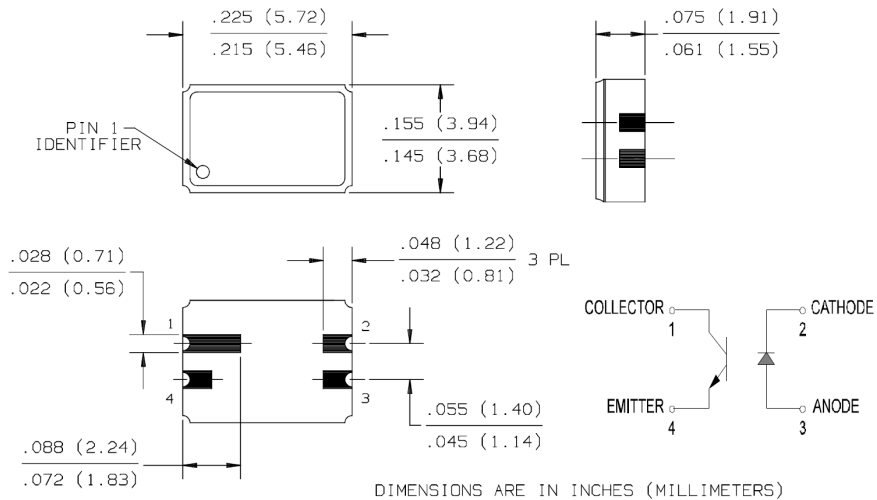
TX and TXV devices are processed to OPTEK's military screening program patterned after MIL-PRF-19500.

TX products receive a V_{GS} HTRB at 24 V for 48 hrs. at 150° C and a V_{DS} HTRB at 48 V for 260 hrs. at 150° C.

Applications:

- XX

Part Number	Sensor Type	CTR Min/Max	Isolation Voltage (Min ,000)	I_f (mA) Typ/Max	$V_{CE(V)}$ Typ/Max	Rise/Fall Times Max. μ s	Package
HCC240	Transistor	25/60	1	10/40	5.0/30	15/15	4-Pin Ceramic
HCC240TX							
HCC240TXV							
HCC242	100/150	1	10/40	5.0/30	20/20		
HCC242TX							
HCC242TXV							



General Note

TT Electronics reserves the right to make changes in product specification without notice or liability. All information is subject to TT Electronics' own data and is considered accurate at time of going to print.

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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 below)	40 mA
Reverse Voltage	2.0 V
Power Dissipation	$60\text{ mW}^{(2)}$
Output Phototransistor	
Continuous Collector Current	50 mA
Collector—Emitter Voltage	$30\text{ V}^{(3)}$
Emitter-Collector Voltage	$5.0\text{ V}^{(4)}$
Power Dissipation	$300\text{ mW}^{(5)}$

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

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Input Diode						
V_F	Forward Voltage	0.80		1.5	V	$I_F = 10.0\text{ mA}$
		1.00		1.7	V	$I_F = 10.0\text{ mA}$, $T_A = -55^\circ\text{C}$
		0.70		1.3	V	$I_F = 10.0\text{ mA}$, $T_A = 100^\circ\text{C}$
I_R	Reverse Current			100	μA	$V_R = 2.0\text{ V}$
Output Phototransistor						
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage ⁽³⁾	30			V	$I_C = 1.0\text{ mA}$, $I_F = 0$
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage ⁽⁴⁾					
$I_{C(OFF)}$	Collector-Emitter Dark Current			100	nA	$V_{CE} = 20\text{ V}$, $I_F = 0$
				100	μA	$V_{CE} = 20\text{ V}$, $I_F = 0$, $T_A = 100^\circ\text{C}$

Note:

- 1) Measured with inputs shorted together and outputs shorted together.
- 2) Derate linearly $1.0\text{ mW}/^\circ\text{C}$ 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 minimum.
- 5) Derate linearly $3.0\text{ mW}/^\circ\text{C}$.
- 6) Some deviations from ESA 5000 apply.

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

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
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 = 0.0 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
	On-State Collector Current 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 = 0.0 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 HCC242			15.0 20.0	μs μs	V _{CC} = 10.0 V, I _F = 10.0 mA, R _L = 100 Ω
	Output Fall Time HCC240 Hcc242			15.0 20.0	μs μs	V _{CC} = 10.0 V, I _F = 10.0 mA, R _L = 100 Ω

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