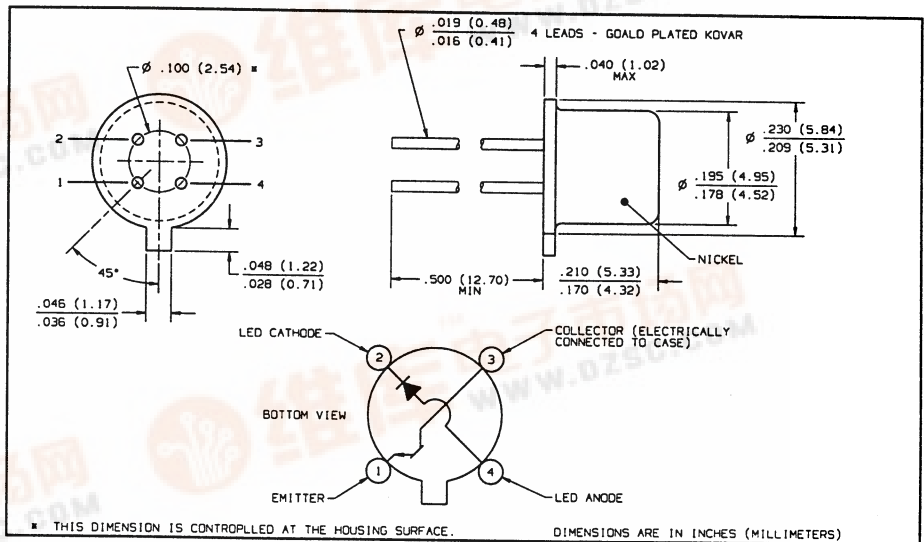
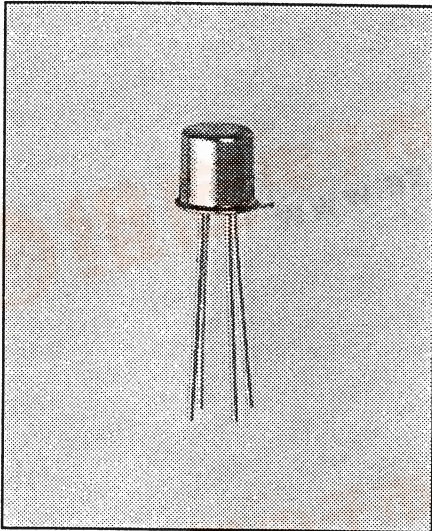


Product Bulletin 3N243, 3N243TX  
September 1996

# High Reliability Optically Coupled Isolators

## Types 3N243, 3N244, 3N245, 3N243TX, 3N244TX, 3N245TX



### Features

- TX versions processed to Optek's military screening program patterned after MIL-PRF-19500
- TO-72 hermetically sealed package
- 1 kVDC electrical isolation

### Description

Each device in the series is a high reliability design optically coupled isolator consisting of an infrared emitting diode and an NPN silicon phototransistor mounted in a hermetically sealed TO-72 package.

Typical screening and lot acceptance tests are provided on page13-4.

### Replaces

3N243R, 3N244R, 3N245R

### Absolute Maximum Ratings (T<sub>A</sub> = 25° C unless otherwise noted)

Input-to-Output Isolation Voltage	± 1.00 kVDC <sup>(1)</sup>
Storage Temperature Range	-65° C to +150° C
Operating Temperature Range	-55° C to +125° C
Lead Soldering Temperature [1/16 inch (1.6 mm) from case for 5 sec. with soldering iron]	240° C <sup>(2)</sup>

### Input Diode

Forward DC Current	40 mA
Reverse Voltage	2.0 V
Power Dissipation	60 mW <sup>(3)</sup>

### Output Phototransistor

Continuous Collector Current	30 mA
Collector-Emitter Voltage	30 V
Emitter-Collector Voltage	5.0 V
Power Dissipation	200 mW <sup>(4)</sup>

### Notes:

- (1) Measured with input leads shorted together and output leads shorted together.
- (2) RMA flux is recommended. Duration can be extended to 10 sec. max. when flow soldering.
- (3) Derate linearly 0.60 mW/° C above 65° C.
- (4) Derate linearly 2.0 mW/° C above 25° C.
- (5) The input waveform is supplied by a generator with the following characteristics:  
Z<sub>OUT</sub> = 50 Ω, t<sub>r</sub> ≤ 15 ns, duty cycle ≅ 1%, pulse width ≅ 100 ms.



# Types 3N243, 3N244, 3N245 3N243TX, 3N244TX, 3N245TX

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

Symbol	Parameter	3N243TX			3N244TX			3N245TX			Units	Test Conditions
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max		
<b>Input Diode</b>												
$V_F$	Forward Voltage	0.80		1.30	0.80		1.30	0.80		1.30	V	$I_F = 10.0\text{ mA}$
		1.00		1.50	1.00		1.50	1.00		1.50	V	$I_F = 10.0\text{ mA}, T_A = -55^\circ\text{C}$
		0.70		1.20	0.70		1.20	0.70		1.20	V	$I_F = 10.0\text{ mA}, T_A = 100^\circ\text{C}$
$I_R$	Reverse Current			100			100			100	$\mu\text{A}$	$V_R = 2.0\text{ V}$
<b>Output Phototransistor</b>												
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	30			30			30			V	$I_C = 1.00\text{ mA}$
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage	5.0			5.0			5.0			V	$I_E = 100\ \mu\text{A}$
$I_{CEO}$	Collector Dark Current			100			100			100	nA $\mu\text{A}$	$V_{CE} = 10.0\text{ V}$ $V_{CE} = 10.0\text{ V}, T_A = 100^\circ\text{C}$
<b>Coupled</b>												
$I_{C(on)}$	On-State Collector Current	1.50			3.00			6.00			mA	$I_F = 10.0\text{ mA}, V_{CE} = 10.0\text{ V}$
		0.30			0.80			1.50			mA	$I_F = 3.0\text{ mA}, V_{CE} = 10.0\text{ V}$
		0.50			1.00			1.50			mA	$I_F = 10.0\text{ mA}, V_{CE} = 10.0\text{ V}, T_A = -55^\circ\text{C}$
		0.50			1.00			1.50			mA	$I_F = 10.0\text{ mA}, V_{CE} = 10.0\text{ V}, T_A = 100^\circ\text{C}$
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage			0.30							V	$I_F = 20\text{ mA}, I_C = 1.50\text{ mA}$
							0.30				V	$I_F = 20\text{ mA}, I_C = 3.0\text{ mA}$
									0.30		V	$I_F = 20\text{ mA}, I_C = 6.0\text{ mA}$
$I_{IO}$	Leakage Input-to-Output			100			100			100	nA	$V_{IO} = \pm 1.00\text{ kVDC}^{(1)}$
$C_{IO}$	Capacitance Input-to-Output			5.0			5.0			5.0	pF	$V_{IO} = 0\text{ V}, f = 1.00\text{ MHz}^{(1)}$
$t_r$	Output Rise Time			10.0			10.0			10.0	$\mu\text{s}$	$V_{CC} = 10.0\text{ V}, I_F = 10.0\text{ mA},^{(5)}$ $R_L = 100\ \Omega$
$t_f$	Output Fall Time			10.0			10.0			10.0	$\mu\text{s}$	

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