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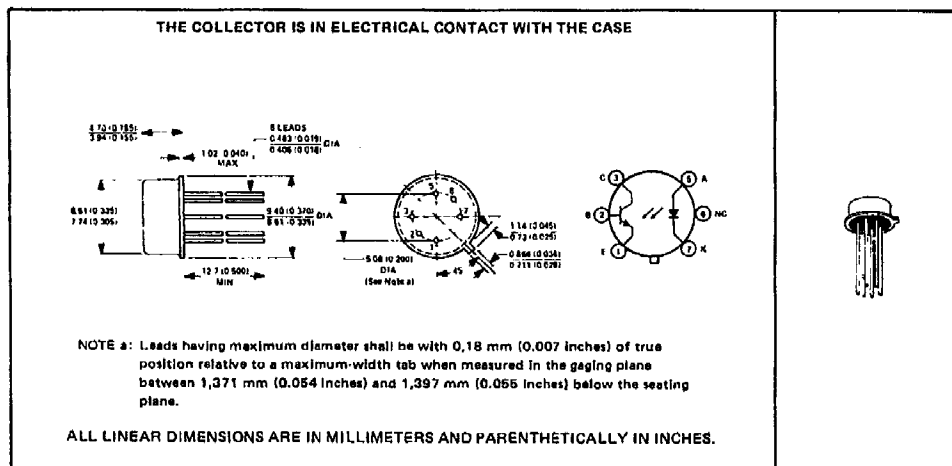
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TIL102, TIL103 OPTOCOUPERS

GALLIUM ARSENIDE DIODE INFRARED SOURCE OPTICALLY COUPLED TO A HIGH-GAIN N-P-N SILICON PHOTOTRANSISTOR

- Photon Coupling for Isolator Applications
- Base Lead Provided for Conventional Transistor Biasing
- High Overall Current Gain . . . 1.5 Typ (TIL103)
- High-Voltage Transistor . . . $V_{(BR)CEO} = 35 \text{ V Min}$
- High-Voltage Electrical Isolation . . . 1-kV Rating
- Stable over Wide Temperature Range

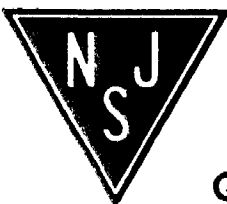
mechanical data



absolute maximum ratings at 25°C free-air temperature (unless otherwise noted)

Input-to-Output Voltage	±1 kV
Collector-Emitter Voltage	35 V
Collector-Base Voltage	35 V
Emitter-Base Voltage	4 V
Input Diode Reverse Voltage	2 V
Input Diode Continuous Forward Current at (or below) 65°C Free-Air Temperature (See Note 1)	40 mA
Continuous Collector Current	50 mA
Continuous Transistor Power Dissipation at (or below) 25°C Free-Air Temperature (See Note 2)	300 mW
Storage Temperature Range	-55°C to 125°C
Lead Temperature 1.6 mm (1/16 Inch) from Case for 10 Seconds	240°C

NOTES: 1. Derate linearly to 125°C free air temperature at the rate of 0.67 mW/°C.
2. Derate linearly to 125°C free air temperature at the rate of 3 mW/°C.



NJ Semi-Conductors reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by NJ Semi-Conductors is believed to be both accurate and reliable at the time of going to press. However, NJ Semi-Conductors assumes no responsibility for any errors or omissions discovered in its use. NJ Semi-Conductors encourages customers to verify that datasheets are current before placing orders.

Quality Semi-Conductors

TIL102, TIL103 **OPTOCOUPERS**

electrical characteristics at 25°C free-air temperature (unless otherwise noted)

PARAMETER		TEST CONDITIONS	TIL102			TIL103			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	$I_C = 100 \mu A, I_E = 0, I_F = 0$	35			35			V
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	$I_C = 1 mA, I_B = 0, I_F = 0$	35			35			V
$V_{(BR)EBO}$	Emitter-Base Breakdown Voltage	$I_E = 100 \mu A, I_C = 0, I_F = 0$	4			4			V
I_R	Input Diode Static Reverse Current	$V_R = 2 V$		100			100		μA
$I_{C(on)}$	On-State Collector Current	Phototransistor Operation $V_{CE} = 5 V, I_B = 0, I_F = 10 mA$	2.5	6		10	15		mA
		Photodiode Operation $V_{CB} = 5 V, I_E = 0, I_F = 10 mA$		40			40		μA
$I_{C(off)}$	Off-State Collector Current	Phototransistor Operation $V_{CE} = 20 V, I_B = 0, I_F = 0$		6	100		6	100	nA
		Phototransistor Operation $V_{CE} = 20 V, I_B = 0, I_F = 0, T_A = 100^\circ C$		4			4		μA
		Photodiode Operation $V_{CB} = 20 V, I_E = 0, I_F = 0$		0.1			0.1		nA
h_{FE}	Transistor Static Forward Current Transfer Ratio	$V_{CE} = 5 V, I_C = 10 mA, I_F = 0$		300			500		
V_F	Input Diode Static Forward Voltage	$I_F = 10 mA$		1.3			1.3		V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$I_C = 2.5 mA, I_B = 0, I_F = 20 mA$		0.3					V
		$I_C = 10 mA, I_B = 0, I_F = 20 mA$					0.3		
r_{IO}	Input-to-Output Internal Resistance	$V_{in-out} = \pm 1 kV$, See Note 3	10^{11}	10^{12}		10^{11}	10^{12}		Ω
C_{IO}	Input-to-Output Capacitance	$V_{in-out} = 0, f = 1 MHz$, See Note 3		2.5			2.5		pF

NOTE 3: These parameters are measured between both input diode leads shorted together and all the phototransistor leads shorted together.

switching characteristics at 25°C free-air temperature

PARAMETER		TEST CONDITIONS	TIL102	TIL103	UNIT
			TYP	TYP	
t_r	Rise Time	Phototransistor Operation $V_{CC} = 20 V, I_B = 0, I_{C(on)} = 5 mA, R_L = 100 \Omega$, See Test Circuit A of Figure 1	3	6	μs
t_f	Fall Time		3	6	
t_r	Rise Time	Photodiode Operation $V_{CC} = 20 V, I_E = 0, I_{C(on)} = 60 \mu A, R_L = 100 \Omega$, See Test Circuit B of Figure 1	150	160	ns
t_f	Fall Time		150	150	