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## NTE3040 Optoisolator NPN Transistor Output

**Description:**

The NTE3040 is a gallium arsenide, infrared emitting diode in a 6-Lead DIP type package coupled with a silicon phototransistor.

**Applications:**

- Power Supply Regulators
- Digital Logic Inputs
- Microprocessor Inputs

**Absolute Maximum Ratings:** ( $T_A = +25^\circ\text{C}$ , unless otherwise specified)

**Infrared Emitting Diode**

Power Dissipation, $P_D$ .....	150mW
Derate above $25^\circ\text{C}$ ambient .....	2.0mW/ $^\circ\text{C}$
Forward Current, $I_C$	
Continuous .....	100mA
Peak (Pulse Width $1\mu\text{sec}$ , 300pps) .....	3A
Reverse Voltage, $V_R$ .....	6V

**Phototransistor**

Power Dissipation, $P_D$ .....	150mW
Derate above $25^\circ\text{C}$ ambient .....	2.0mW/ $^\circ\text{C}$
Collector-to-Emitter Voltage, $V_{CEO}$ .....	30V
Collector-to-Base Voltage, $V_{CBO}$ .....	70V
Emitter-to-Collector Voltage, $V_{ECO}$ .....	7V

**Total Device**

Power Dissipation, $P_D$ .....	250mW
Derate above $25^\circ\text{C}$ ambient .....	3.3mW/ $^\circ\text{C}$
Storage Temperature, $T_{stg}$ .....	$-55^\circ$ to $+150^\circ\text{C}$
Operating Temperature, $T_{opr}$ .....	$-55^\circ$ to $+100^\circ\text{C}$
Lead Soldering Temperature (10 seconds) .....	$+260^\circ\text{C}$

**Electrical Characteristics:** ( $T_A = +25^\circ\text{C}$ , Note 1, unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Infrared Emitting Diode</b>						
Input Forward Voltage	$V_F$	$I_F = 10\text{mA}$	-	1.18	1.50	V
Reverse Leakage Current	$I_R$	$V_R = 6\text{V}$	-	0.001	10	$\mu\text{A}$

Note 1. Typical values at  $T_A = +25^\circ\text{C}$ .

**Electrical Characteristics (Cont'd):** ( $T_A = +25^\circ\text{C}$ , Note 1, unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Phototransistor</b>						
Collector–Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 1.0\text{mA}$ , $I_F = 0$	30	100	–	V
Collector–Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 100\mu\text{A}$ , $I_F = 0$	70	120	–	V
Emitter–Collector Breakdown Voltage	$V_{(BR)ECO}$	$I_E = 100\mu\text{A}$ , $I_F = 0$	7	10	–	V
Collector–Emitter Dark Current	$I_{CEO}$	$V_{CE} = 10\text{V}$ , $I_F = 0$	–	1	50	nA
Collector–Base Dark Current	$I_{CBO}$	$V_{CEB} = 10\text{V}$	–	–	20	nA
Capacitance	$C_{CE}$	$V_{CE} = 10\text{V}$ , $f = 1\text{MHz}$	–	8	–	pf
<b>Isolation Characteristics</b>						
Input–Output Isolation Voltage RMS	$V_{ISO}$	$f = 60\text{Hz}$ , $t = 1 \text{ min.}$	5300	–	–	$V_{AC}$
		$f = 60\text{Hz}$ , $t = 1 \text{ sec.}$	7500	–	–	$V_{AC}$
Isolation Resistance	$R_{ISO}$	$V_{I-O} = 500\text{V}_{DC}$	$10^{11}$	–	–	$\Omega$
Isolation Capacitance	$C_{ISO}$	$V_{I-O} = 0$ , $f = 1\text{MHz}$	–	0.5	–	pF
<b>Transfer Characteristics</b>						
DC Current Transfer Ratio	CTR	$I_F = 10\text{mA}$ , $V_{CE} = 10\text{V}$	20	–	–	%
Collector–Emitter Saturation Voltage	$V_{CEO(sat)}$	$I_F = 50\text{mA}$ , $I_C = 2\text{mA}$	–	–	0.5	V
Switching Speeds	$T_{ON}$ , $T_{OFF}$	$I_F = 10\text{mA}$ , $V_{CC} = 10\text{V}$ , $R_L = 100\Omega$	–	2	–	$\mu\text{s}$

Note 1. Typical values at  $T_A = +25^\circ\text{C}$ .

