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## NTE3086 Optoisolator Dual NPN Transistor Output

**Description:**

The NTE3086 is a standard dual optocoupler consisting of a GaAs Infrared LED and a silicon photo-transistor per channel. This device is constructed with a high voltage insulation, double molded packaging process which offers 7.5KV withstand test capability.

**Features:**

- Two isolated Channels per Package
- 7500V Withstand Test Voltage
- CTR Minimum: 20%

**Absolute Maximum Ratings:**

**Gallium Arsenide LED (Each Channel)**

Power Dissipation ( $T_A = +25^\circ\text{C}$ ), $P_D$ .....	100mW
Derate Above $25^\circ\text{C}$ .....	1.3mW/ $^\circ\text{C}$
Forward Current, $I_F$	
Continuous .....	60mA
Peak (Pulse Width 1 $\mu$ s, 300pps) .....	3A

**Phototransistor (Each Channel)**

Power Dissipation ( $T_A = +25^\circ\text{C}$ ), $P_D$ .....	150mW
Derate Above $25^\circ\text{C}$ .....	2.0mW/ $^\circ\text{C}$
Collector–Emitter Breakdown Voltage, $V_{(BR)CEO}$ .....	30V
Collector–Base Breakdown Voltage, $V_{(BR)CBO}$ .....	80V
Emitter–Collector Breakdown Voltage, $V_{(BR)ECO}$ .....	6V

**Total Device**

Power Dissipation ( $T_A = +25^\circ\text{C}$ ), $P_D$ .....	400mW
Derate Above $25^\circ\text{C}$ .....	5.33mW/ $^\circ\text{C}$
Operating Temperature Range, $T_{opr}$ .....	$-55^\circ$ to $+100^\circ\text{C}$
Storage Temperature Range, $T_{stg}$ .....	$-55^\circ$ to $+150^\circ\text{C}$
Lead Temperature (During Soldering, 10sec Max), $T_L$ .....	$+250^\circ\text{C}$

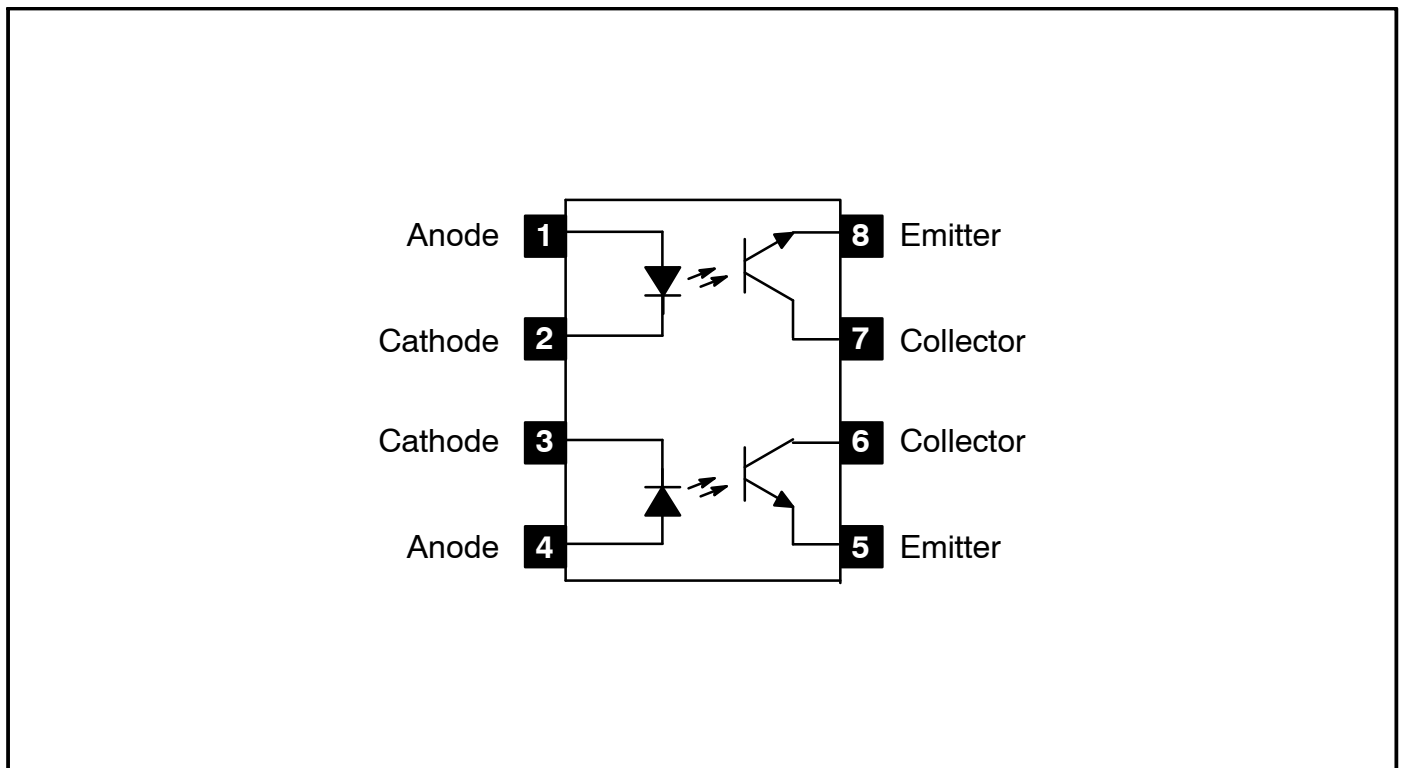
**Electrical Characteristics:** ( $T_A = +25^\circ\text{C}$  unless otherwise specified)

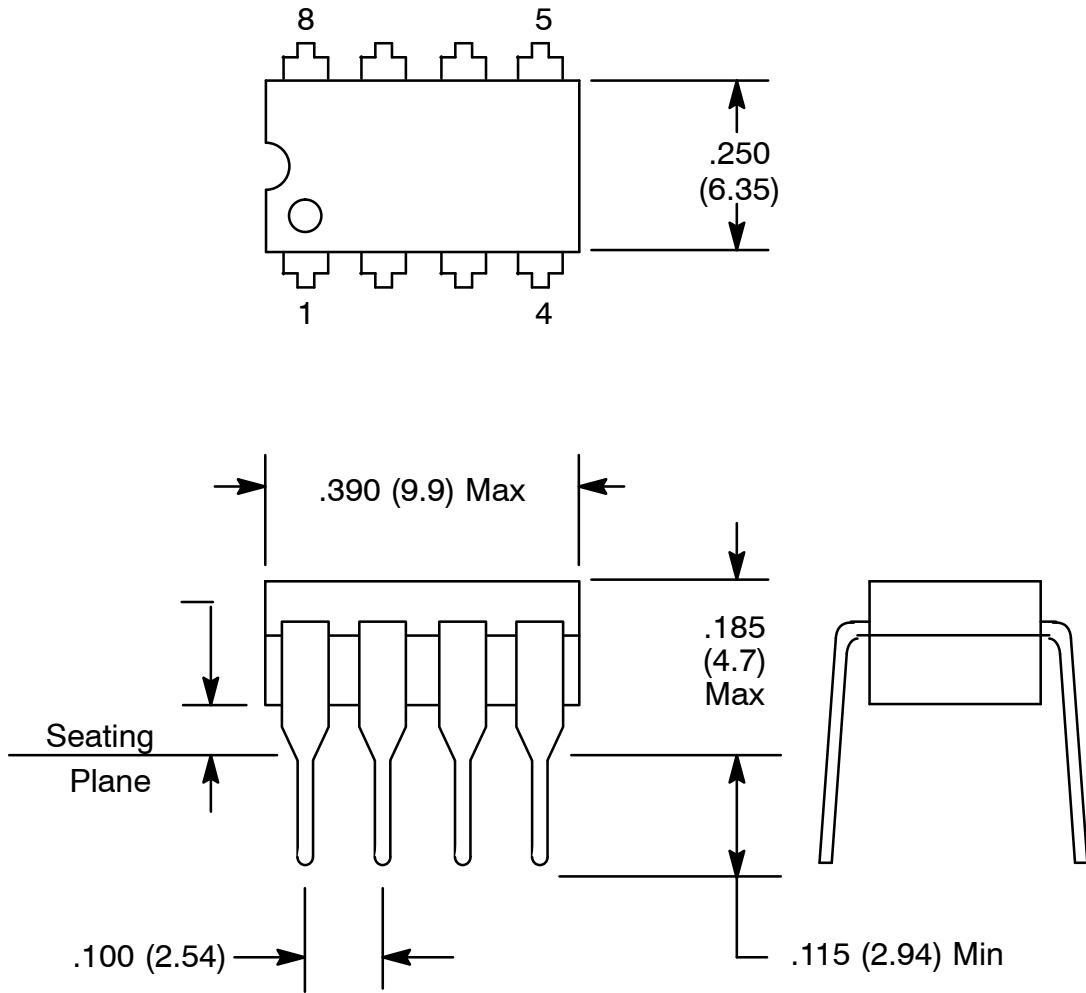
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Gallium Arsenide LED</b>						
Forward Voltage	$V_F$	$I_F = 20\text{mA}$	–	1.1	1.5	V
Reverse Voltage	$V_R$	$I_R = 10 \text{ A}$	3	25	–	V
Reverse Current	$I_R$	$V_R = 3\text{V}$	–	–	10	A
Junction Capacitance		$V = 0, f = 1\text{MHz}$	–	80	–	pF

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Phototransistor Detector</b>						
Collector–Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 100\text{ A}, I_F = 0$	30	85	–	V
Emitter–Collector Breakdown Voltage	$V_{(BR)ECO}$	$I_E = 100\text{ A}, I_F = 0$	6	13	–	V
Collector–Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 10\text{ A}, I_F = 0$	80	–	–	V
Collector–Emitter Leakage Current	$I_{CEO}$	$V_{CE} = 10\text{V}, I_F = 0$	–	5	100	nA
Collector–Emitter Capacitance	$C_{CE}$	$V_{CE} = 0, I_F = 0$	–	8	–	pF
<b>Coupled Electrical Characteristics</b>						
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 2\text{mA}, I_F = 16\text{mA}$	–	0.2	0.4	V
DC Current Transfer Ratio	CTR	$V_{CE} = 10\text{V}, I_F = 10\text{mA}$	20	50	–	%
Isolation Voltage	$V_{(BR)(I-O)}$	$t = 1\text{sec}$	1500	2500	–	V
Isolation Resistance	$R_{(I-O)}$	$V_{I-O} = 500\text{V}$	$10^{11}$	$10^{12}$	–	$^\circ$
Input to Output Capacitance		$f = 1\text{MHz}$	–	0.4	–	pF
Bandwidth	BW	$I_C = 2\text{mA}, V_{CC} = 10\text{V}, R_L = 100^\circ$	–	150	–	kHz
<b>Switching Times</b>						
Non–Saturated Rise Time, Fall Time	$t_r, t_f$	$V_{CC} = 10\text{V}, I_C = 2\text{mA}, R_L = 100^\circ$ , Note 1	–	2.4	–	s
Non–Saturated Rise Time, Fall Time	$t_r, t_f$	$V_{CC} = 10\text{V}, I_C = 2\text{mA}, R_L = 1\text{k}^\circ$ , Note 1	–	15	–	s
Saturated Turn–On Time (From 5V to 0.8V)	$t_{on(sat)}$	$R_L = 2\text{k}^\circ, I_F = 40\text{mA}$	–	5	–	s
Saturated Turn–Off Time (From Saturation to 2V)	$t_{off(sat)}$	$R_L = 2\text{k}^\circ, I_F = 40\text{mA}$	–	25	–	s

Note 1. The frequency at which  $I_C$  is 3dB down from the 1kHz value.





**NOTE:** Pin1 locator dot is for reference ONLY.  
 For additional Pin1 location options, [click here](#).