

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°C 1.3mW/ $^\circ\text{C}$

Forward Current, I_F
Continuous 60mA
Peak (Pulse Width 1 μs , 300pps) 3A

Phototransistor (Each Channel)

Power Dissipation ($T_A = +25^\circ\text{C}$), P_D 150mW
Derate Above 25°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°C 5.33mW/ $^\circ\text{C}$

Operating Temperature Range, T_{opr} -55° to $+100^\circ\text{C}$
Storage Temperature Range, T_{stg} -55° 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
Gallium Arsenide LED						
Forward Voltage	V_F	$I_F = 20\text{mA}$	–	1.1	1.5	V
Reverse Voltage	V_R	$I_R = 10\mu\text{A}$	3	25	–	V
Reverse Current	I_R	$V_R = 3\text{V}$	–	–	10	μA
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
Phototransistor Detector						
Collector–Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 100\mu\text{A}$, $I_F = 0$	30	85	–	V
Emitter–Collector Breakdown Voltage	$V_{(BR)ECO}$	$I_E = 100\mu\text{A}$, $I_F = 0$	6	13	–	V
Collector–Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 10\mu\text{A}$, $I_F = 0$	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
Coupled Electrical Characteristics						
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}	–	Ω
Input to Output Capacitance		$f = 1\text{MHz}$	–	0.4	–	pF
Bandwidth	BW	$I_C = 2\text{mA}$, $V_{CC} = 10\text{V}$, $R_L = 100\Omega$	–	150	–	kHz
Switching Times						
Non–Saturated Rise Time, Fall Time	t_r , t_f	$V_{CC} = 10\text{V}$, $I_C = 2\text{mA}$, $R_L = 100\Omega$, Note 1	–	2.4	–	μs
Non–Saturated Rise Time, Fall Time	t_r , t_f	$V_{CC} = 10\text{V}$, $I_C = 2\text{mA}$, $R_L = 1\text{k}\Omega$, Note 1	–	15	–	μs
Saturated Turn–On Time (From 5V to 0.8V)	$t_{on(sat)}$	$R_L = 2\text{k}\Omega$, $I_F = 40\text{mA}$	–	5	–	μs
Saturated Turn–Off Time (From Saturation to 2V)	$t_{off(sat)}$	$R_L = 2\text{k}\Omega$, $I_F = 40\text{mA}$	–	25	–	μs

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



