

NTE3081 Optoisolator NPN Transistor Output

Description:

The NTE3081 consists of a gallium arsenide infrared emitting diode coupled with a silicon phototransistor in a low cost plastic package with lead spacing compatible with dual-in-line packages.

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

Total Device

Surge Isolation Voltage (Input to Output), V_{ISO}

Peak	6000V
RMS	4242V

Steady-State Isolation Voltage (Input to Output), V_{ISO}

Peak	4500V
RMS	3200V

Operating Temperature Range, T_J -55° to $+85^\circ\text{C}$

Storage Temperature Range, T_{stg} -55° to $+85^\circ\text{C}$

Lead Temperature (During Soldering, 5sec Max), T_L $+260^\circ\text{C}$

Infrared Emitting Diode (Emitter)

Forward Current, I_F

Continuous	60mA
Peak (Pulse Width $\leq 1\mu\text{s}$, PRR $\leq 300\text{pps}$)	3A

Reverse Voltage, V_R 4V

Power Dissipation, P_E 100mW
Derate Above 25°C 1.67mW/ $^\circ\text{C}$

Phototransistor (Detector)

Continuous Collector Current, I_C 100mA

Collector-Emitter Voltage, V_{CEO} 30V

Emitter-Collector Voltage, V_{ECO} 6V

Power Dissipation, P_D 150mW
Derate Above 25°C 2.5mW/ $^\circ\text{C}$

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Infrared Emitting Diode						
Reverse Breakdown Voltage	$V_{(BR)R}$	$I_R = 10\mu\text{A}$	4	—	—	V
Forward Voltage	V_F	$I_F = 60\text{mA}$	—	—	1.7	V
Reverse Current	I_R	$V_R = 3\text{V}$	—	—	1.0	μA
Capacitance	C_i	$V = 0, f = 1\text{MHz}$	—	30	—	pF
Phototransistor						
Collector–Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 1\text{mA}, I_F = 0$	30	—	—	V
Emitter–Collector Breakdown Voltage	$V_{(BR)ECO}$	$I_E = 100\mu\text{A}, I_F = 0$	6	—	—	V
Collector Dark Current	I_{CEO}	$V_{CE} = 10\text{V}, I_F = 0$	—	5	100	nA
Capacitance	C_{ce}	$V_{CE} = 5\text{V}, f = 1\text{MHz}$	—	3.3	—	pF
Coupled Characteristics						
DC Current Transfer Ratio	CTR	$I_F = 10\text{mA}, V_{CE} = 10\text{V}$	20	—	—	%
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	$I_F = 10\text{mA}, I_C = 500\text{mA}$	—	0.1	0.4	V
Isolation Resistance	R_{IO}	Input to Output Voltage = 500V_{DC} , Note 1	100	—	—	$\text{G}\Omega$
Input to Output Capacitance	C_{io}	Input to Output Voltage = 0, $f = 1\text{MHz}$, Note 1	—	0.5	—	pF
Turn–On Time	t_{on}	$V_{CE} = 10\text{V}, I_C = 2\text{mA}, R_L = 100\Omega$	—	9	—	μs
		$V_{CE} = 5\text{V}, I_F = 10\text{mA}, R_L = 10\text{k}\Omega$	—	4	—	μs
Turn–Off Time	t_{off}	$V_{CE} = 10\text{V}, I_C = 2\text{mA}, R_L = 100\Omega$	—	6.5	—	μs
		$V_{CE} = 5\text{V}, I_F = 10\text{mA}, R_L = 10\text{k}\Omega$	—	165	—	μs

Note 1. Measured with input diode leads shorted together, and output detector leads shorted together.

