

NTE3083 Optoisolator NPN Darlington Transistor Output

Description:

The NTE3083 contains a gallium arsenide infrared emitter optically coupled to a silicon planar photo-darlington in a 6-Lead DIP type package.

Features:

- High Sensitivity: 1mA on the Input will Sink a TTL gate
- High Isolation: 3550VDC, $10^{12}\Omega$, 0.5pF

Absolute Maximum Ratings:

Storage Temperature Range, T_{stg} -65° to $+150^{\circ}\text{C}$
 Operating Temperature Range, T_{opr} -55° to $+100^{\circ}\text{C}$
 Lead Temperature (During Soldering, 10sec), T_L $+260^{\circ}\text{C}$
 Total Power Dissipation ($T_A = +25^{\circ}\text{C}$), P_D 250mW
 Derate Linearly to 100°C 3.3mW/ $^{\circ}\text{C}$
 Input to Output Isolation Voltage (1sec), V_{ISOL} 3550VDC

Input Diode

Forward Current, I_F 60mA
 Reverse Voltage, V_R 3V
 Peak Forward Current (1 μ s pulse, 300pps), I_{Fpeak} 3A

Output Darlington

Collector–Emitter Voltage, V_{CEO} 30V
 Collector–Base Voltage, V_{CBO} 30V
 Emitter–Base Voltage, V_{EBO} 6V
 Collector Current, I_C 125mA

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Isolation Between Emitter and Detector						
Capacitance	C_{iso}	$f = 1\text{MHz}$	–	0.5	–	pF
Resistance	R_{iso}	$V = 500\text{VDC}$	10^{11}	10^{12}	–	Ω
Voltage Breakdown	V_{iso}	$t = 1\text{sec}$	3550	–	–	VDC

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Emitter (GaAs LED)						
Forward Voltage	V_F	$I_F = 20\text{mA}$	–	1.15	1.50	V
Reverse Voltage	V_R	$I_R = 10\mu\text{A}$	3.0	25.0	–	V
Junction Capacitance	C_J	$V_R = 0\text{V}$	–	50	–	pF
Detector (Silicon Photo-Darlington)						
Collector Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 1\text{mA}$	30	60	–	V
Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 10\mu\text{A}$	30	60	–	V
Emitter Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 10\mu\text{A}$	6	8	–	V
Collector Leakage Current	I_{CEO}	$V_{CE} = 10\text{V}$	–	1	100	nA
Saturation Voltage	$V_{CE(sat)}$	$I_C = 2\text{mA}, I_F = 1\text{mA}$	–	0.8	1.0	V
		$I_C = 10\text{mA}, I_F = 5\text{mA}$	–	0.8	1.0	V
		$I_C = 50\text{mA}, I_F = 10\text{mA}$	–	0.9	1.2	V
Base Photo-Current	I_B	$V_{CB} = 5\text{V}, I_F = 10\text{mA}$	–	2	–	μA
Darlington Gain	h_{FE}	$I_B = 1\mu\text{A}, V_{CE} = 1\text{V}$	–	50k	–	
Collector-Emitter Capacitance	C_{CE}	$V_{CE} = 10\text{V}$	–	6	–	pF
Switching Times, Coupled						
Rise Time, Fall Time	t_r, t_f	$V_{CC} = 10\text{V}, I_C = 10\text{mA}, R_L = 100\Omega$	–	80	–	μs
TTL Gate Turn-On Time	t_{ON}	$I_F = 1\text{mA}$	–	200	–	μs
TTL Gate Turn-Off Time	t_{OFF}	$I_F = 1\text{mA}$	–	400	–	μs
DC Collector Current Transfer Ratio	CTR	$I_F = 10\text{mA}, V_{CE} = 5\text{V}$	200	400	–	%

