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NTE3083
Optoisolator
NPN Darlington Transistor Output

Description:

The NTE3083 contains a gallium arsenide infrared emitter optically coupled to a silicon planer 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°C
Operating Temperature Range, T_{opr} . . . . . –55° to +100°C
Lead Temperature (During Soldering, 10sec), T_L . . . . . +260°C
Total Power Dissipation (T_A = +25°C), P_D 250mW
Derate Linearly to 100°C . . . . . 3.3mW/°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 (1μs pulse, 300pps), $I_F$peak 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°C unless otherwise specified)

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

Electro–Optical Characteristics (Cont'd): (T_A = +25°C unless otherwise specified)

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