

NTE3085 Optoisolator Photon Coupled Bilateral Analog FET

Description:

The NTE3085 consists of a gallium arsenide infrared emitting diode coupled to a symmetrical silicon photo detector. The detector is electrically isolated from the input and performs like an ideal isolated FET designed for distortion-free control of low AC and DC analog signals.

Features:

As A Remote Variable Resistor

- $\leq 100\Omega$ to $\geq 300M\Omega$
- $\geq 99.9\%$ Linearity
- $\leq 15pF$ Shunt Capacitance
- $\geq 100G\Omega$ I/O Isolation Resistance

As An Analog Signal Switch

- Extremely Low Offset Voltage
- $60V_{P-P}$ Signal Capability
- No Charge Injection or Latchup
- $t_{on}, t_{off} \leq 15\mu s$

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

Infrared Emitting Diode

Power Dissipation ($T_A = +25^\circ C$), P_D 150mW
 Derate Above $25^\circ C$ 2.0mW/ $^\circ C$

Forward Current, I_F
 Continuous 60mA
 Peak (Pulse Width 100 μs , 100pps) 500mA
 Peak (Pulse Width 1 μs , 300pps) 3A

Reverse Voltage, V_R 6V

Photo Detector

Power Dissipation ($T_A = +25^\circ C$), P_D 300mW
 Derate Above $25^\circ C$ 4.0mW/ $^\circ C$

Breakdown Voltage, $V_{(BR)46}$ $\pm 30V$

Continuous Detector Current, I_D $\pm 100mA$

Total Device

Surge Isolation Voltage (Input to Output), V_{ISO}
 Peak 2500V
 RMS 1770V

Steady-State Isolation Voltage (Input to Output), V_{ISO}
 Peak 1500V
 RMS 1060V

Operating Temperature Range, T_{opr} -55° to $+100^\circ C$

Storage Temperature Range, T_{stg} -55° to $+150^\circ C$

Lead Temperature (During Soldering, 10sec Max), T_L $+260^\circ C$

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Infrared Emitting Diode						
Forward Voltage	V_F	$I_F = 16\text{mA}$	–	1.1	1.75	V
Reverse Current	I_R	$V_R = 6\text{V}$	–	–	10	μA
Capacitance		$V = 0, f = 1\text{MHz}$	–	50	–	pF
Photo-Detector (Either Polarity)						
Breakdown Voltage	$V_{(BR)46}$	$I_{46} = 10\mu\text{A}, I_F = 0$	30	–	–	V
Off-State Dark Current	I_{46}	$V_{46} = 15\text{V}, I_F = 0$	–	–	50	nA
		$V_{46} = 15\text{V}, I_F = 0, T_A = +100^\circ\text{C}$	–	–	50	μA
Off-State Resistance	r_{46}	$V_{46} = 15\text{V}, I_F = 0$	300	–	–	$\text{M}\Omega$
Capacitance	C_{46}	$V_{46} = 0, I_F = 0, f = 1\text{MHz}$	–	–	15	pF
Coupled Electrical Characteristics						
On-State Resistance	r_{46}	$I_F = 16\text{mA}, I_{46} = 100\mu\text{A}$	–	–	200	Ω
		$I_F = 16\text{mA}, I_{64} = 100\mu\text{A}$	–	–	200	Ω
Isolation Resistance (Input to Output)	V_{ISO}	$V_{10} = 500\text{V}$	100	–	–	$\text{G}\Omega$
Input to Output Capacitance		$V_{10} = 0, f = 1\text{MHz}$	–	–	2.5	pF
Turn-On Time	t_{on}	$I_F = 16\text{mA}, R_L = 50\Omega, V_{46} = 5\text{V}$	–	–	15	μs
Turn-Off Time	t_{off}		–	–	15	μs
Resistance, Non-Linearity and Asymmetry		$I_F = 16\text{mA}, i_{46} = 25\mu\text{A}_{RMS}, f = 1\text{kHz}$	–	–	0.1	%

