ELECTRONICS, INC.
44 FARRAND STREET
BLOOMFIELD, NJ 07003
(973) 748–5089
http://www.nteinc.com

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NTE3085
Optoisolator
Photon Coupled Bilateral Analog FET

Description:

The NTE3085 consists of a gallium–aluminum–arsenide IRED emitting diode coupled to a symmetrical bilateral 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
- ≤ 100Ω to ≥ 300MΩ
- ≤ 15pF Shunt Capacitance
- ≥ 100GΩ I/O Isolation Resistance

As An Analog Signal Switch
- Extremely Low Offset Voltage
- $60V_{P-P}$ Signal Capability
- No Charge Injection or Latch–up
- t_{on}, t_{off} ≤ 15μs

Applications:

As A Remote Variable Resistor
- Isolated Variable Attenuator
- Automatic Gain Control
- Active Filter Fine Tuning/Band Switching

As An Analog Signal Switch
- Isolated Sample and Hold Circuit
- Multiplexed, Optically Isolated A/D Conversion

Absolute Maximum Ratings: (T_A = +25°C, Note 1 unless otherwise specified)

Infrared Emitting Diode

Forward Current, I_F
- Continuous 60mA
- Peak (10μs pulse, 1% duty cycle) 1A

Power Dissipation (T_A = +25°C), P_D 100mW
- Derate Above 25°C . . . . . 1.33mW/°C

Reverse Voltage, V_R 5V

Photo Detector

Power Dissipation (T_A = +25°C), P_D 300mW
- Derate Above 25°C . . . . . 4.0mW/°C

Breakdown Voltage, $V_{(BR)4-6}$ . . . . . ±30V

Continuous Detector Current (either polarity, I_{4-6} . . . . . ±100mA

Total Device

Storage Temperature Range, T_{stg} . . . . . –40° to +150°C

Operating Temperature Range, T_{opr} . . . . . –40° to +100°C

Lead Temperature (During Soldering, for 10sec max.), T_L . . . . . +260°C

Note 1. Stresses exceeding the “Absolute Maximum Ratings” may damage the device. The device may not function or be operated above the recommended operation conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operation conditions may affect device reliability. The “Absolute Maximum Ratings” are stress ratings only.

Electrical Characteristics: (T_A = +25°C, Note 2 unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Infrared Emitting Diode						
Input Forward Voltage	V_F	I_F = 16mA	–	1.3	1.75	V
Reverse Leakage Current	I_R	V_R = 6V	–	–	10	μA
Capacitance	C_J	V = 0, f = 1MHz	–	50	–	pF
Photo−Detector (Either Polarity)						
Breakdown Voltage	$V_{(BR)4-6}$	I_{4-6} = 10μA, I_F = 0	30	–	–	V
Off−State Dark Current	I_{4-6}	V_{4-6} = 15V, I_F = 0	–	–	50	nA
		V_{4-6} = 15V, I_F = 0, T_A = +100°C	–	–	50	μA
Off−State Resistance	R_{4-6}	V_{4-6} = 15V, I_F = 0	300	–	–	MΩ
Capacitance	C_{4-6}	V_{4-6} = 0, I_F = 0, f = 1MHz	–	–	15	pF
Coupled Electrical Characteristics						
On−State Resistance	R_{4-6}	I_F = 16mA, I_{4-6} = 100μA	–	–	200	W
	R_{6-4}	I_F = 16mA, I_{6-4} = 100μA	–	–	200	Ω
Resistance, Non−Linearity and Asymmetry		I_F = 16mA, I_{4-6} = 25μA_{RMS}, f = 1kHz	–	2	–	%
Turn−On Time	t_{on}	I_F = 16mA, R_L = 50Ω, V_{4-6} = 5V	–	–	25	μs
Turn−Off Time	t_{off}		–	–	25	μs
Isolation Voltage	V_{ISO}	f = 60Hz, f = 1sec	7500	–	–	V_{AC}PEAK
Isolation Resistance	R_{ISO}	V_{I-O} = 500VDC	10^{11}	–	–	Ω
Isolation Capacitance	C_{ISO}	f = 1MHz	–	0.2	–	pF

Note 2. All Typical values at T_A = +25°C.