ELECTRONICS, INC.
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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

- ≤ 100Ω to ≥ 300MΩ
- ≥ 99.9% Linearity
- ≤ 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 Latchup
- t_{on}, t_{off} ≤ 15μs

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

Infrared Emitting Diode

Power Dissipation (T_A = +25°C), P_D 150mW
Derate Above 25°C . . . . . 2.0mW/°C

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

Reverse Voltage, V_R 6V

Photo Detector

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

Breakdow Voltage, $V_{(BR)46}$ . . . . . ±30V

Continouos Detector Current, I_D . . . . . ±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°C

Storage Temperature Range, T_{stg} . . . . . –55° to +150°C

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

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

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