ELECTRONICS, INC.
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NTE3092
Optoisolator
Open Collector, NPN Transistor Output

Features:
- High Isolation Voltage
- High Speed: t_{PHL} = 0.2µs, t_{PLH} = 1.0µs (Typ)
- Current Transfer Ratio: 19% Min

Applications:
- Digital Logic Isolation
- Line Receiver Feedback Control
- Power Supply Control
- Switching Power Supply
- Transistor Invertor

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

Input LED

Forward Current, I_F 25mA
Derate Above 70°C . . . . . 0.8mA/°C
Pulsed Forward Current (Pulse Width = 1ms, Duty Cycle = 50%), I_{FP} 50mA
Derate Above 70°C . . . . . 1.6mA/°C
Total Pulsed Forward Current (Pulse Width = 1s, 300pps), I_{FPT} 1A
Reverse Voltage, V_R 5V
Diode Power Dissipation, P_D 45mW
Derate Above 70°C . . . . . 0.9mW/°C

Detector

Output Current, I_O 8mA
Peak Output Current, I_{OP} 16mA
Emitter–Base Reverse Voltage, V_{EB} 5V
Supply Voltage, V_{CC} . . . . . –0.5 to 15V
Output Voltage, V_O . . . . . –0.5 to 15V
Base Current, I_B 5mA
Output Power Dissipation, P_D 100mW
Derate Above 70°C . . . . . 2mW/°C

Coupled

Operating Temperature Range, T_{opr} . . . . . –55° to +100°C
Storage Temperature Range, T_{stg} . . . . . –55° to +125°C

Electrical Characteristics: (T_A = 0° to +70°C, Note 1 unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Current Transfer Ratio	CTR	V_{CC} = 4.5V, I_F = 16mA, V_O = 0.4V, T_A = +25°C, Note 2	19	24	–	%
		V_{CC} = 4.5V, I_F = 16mA, V_O = 0.5V, Note 2	15	21	–	%
Logic Low Output Voltage	V_{OL}	V_{CC} = 4.5V, I_F = 16mA, I_O = 2.4mA	–	0.1	0.4	V
Logic High Output Current	I_{OH}	I_F = 0mA, V_O = V_{CC} = 5.5V, T_A = +25°C	–	3	500	nA
		I_F = 0mA, V_O = V_{CC} = 15V, T_A = +25°C	–	0.1	100	µA
		I_F = 0mA, V_O = V_{CC} = 15V	–	–	250	µA
Logic Low Supply Current	I_{CCL}	I_F = 16mA, V_O = Open, V_{CC} = 15V	–	40	–	µA
Logic High Supply Current	I_{CCH}	I_F = 0mA, V_O = Open, V_{CC} = 15V, T_A = +25°C	–	0.01	1.0	µA
		I_F = 0mA, V_O = Open, V_{CC} = 15V	–	–	2.0	µA
Input Forward Voltage	V_F	I_F = 16mA, T_A = +25°C	–	1.65	1.7	V
Temperature Coefficient of Forward Voltage		I_F = 16mA	–	–1.9	–	mV/°C
Input Reverse Breakdown Voltage	$V_{(BR)R}$	I_R = 10µA, T_A = +25°C	5	–	–	V
Input Capacitance	C_{IN}	V_F = 0, f = 1MHz	–	60	–	pF
Input–Output Insulation Leakage Current	$I_{I–O}$	45% Relative Humidity, t = 5s, $V_{I–O}$ = 3000V_{dc}, T_A = +25°C, Note 3	–	–	1.0	µA
Resistance (Input–Output)	$R_{I–O}$	$V_{I–O}$ = 500V_{dc}, Note 3	–	10^{12}	–	Ω
Capacitance (Input–Output)	$C_{I–O}$	f = 1MHz, Note 3	–	0.6	–	pF
Transistor DC Current Gain	h_{FE}	V_O = 5V, I_O = 3mA	–	80	–	

Note 1. All typicals are at T_A = +25°C.

Note 2. DC Current Transfer Ratio is defined as the ratio of output collector current, I_O, to the forward LED input current, I_F, times 100%.

Note 3. Device is considered a two–terminal device: Pin1, Pin2, Pin3, and Pin4 shorted together and Pin8 shorted together.

Switching Characteristics: (T_A = +25°C, V_{CC} = 5V, I_F = 16mA, R_L = 1.9kΩ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Propagation Delay Time to Logic Low at Output	t_{PHL}	R_L = 1.9kΩ	–	0.2	0.8	µs
Propagation Delay Time to Logic High at Output	t_{PLH}	R_L = 1.9kΩ	–	0.5	0.8	µs
Common Mode Transient Immunity at Logic High Level Output	CM_H	I_F = 0mA, V_{CM} = 10$V_{P–P}$, Note 4	–	1000	–	V/µs
Common Mode Transient Immunity at Logic Low Level Output	CM_L	V_{CM} = 10$V_{P–P}$, Note 4	–	–1000	–	V/µs
Bandwidth	BW	R_L = 100Ω, Note 5	–	2	–	MHz

Note 4. Common mode transient immunity in High Logic level is the maximum tolerable (positivea) dV_{cm}/dt on the leading edge of the common mode pulse, V_{cm}, to assure that the output will remain in a Logic High state (i.e., V_O > 2V). Common mode mode transient immunity in the Logic Low level is the maximum tolerable (negative) dV_{cm}/dt on the trailing edge of the common mode pulse signal, V_{cm}, to assure that the output will remain in a Logic Low state (i.e., V_O < 0.8V).

Note 5. The frequency at which the AC output voltage is 3dB below the low frequency asymptote.

Pin Connection Diagram