



NTE3220 & NTE3221 Optoisolator NPN Transistor Output

Features:

- Current Transfer Ratio: CTR: 50% Min @ $I_F = 5\text{mA}$, $V_{CE} = 5\text{V}$
- High Input–Output Isolation Voltage: $V_{ISO} = 5000V_{\text{rms}}$
- Compact DIP Package:
NTE3220: 2–Channel Type (8–Lead DIP)
NTE3221: 4–Channel Type (16–Lead DIP)

Applications:

- Computer Terminals
- System Appliances, Measuring Instruments
- Registers, Copiers, Automatic Vending Machines
- Electric Home Appliances such as Fan Heaters, Etc.
- Medical Instruments, Physical and Chemical Equipment
- Signal Transmission between Circuits of Different Potentials and Impedances

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

Input

Forward Current, I_F	50mA
Peak Forward Current (Note 1), I_{FM}	1A
Reverse Voltage, V_R	6V
Power Dissipation, P_D	70mW

Output

Collector–Emitter Voltage, V_{CEO}	35V
Emitter–Collector Voltage, V_{ECO}	6V
Collector Current, I_C	50mA
Collector Power Dissipation, P_C	150mW

Total Device

Isolation Voltage (Note 2), V_{ISO}	5000V _{rms}
Total Power Dissipation, P_{tot}	200mW
Operating Temperature Range, T_{opr}	-30° to $+100^\circ\text{C}$
Storage Temperature Range, T_{stg}	-55° to $+125^\circ\text{C}$
Lead Temperature (During Soldering, 10sec), T_L	$+260^\circ\text{C}$

Note 1. Pulse Width $\leq 100\mu\text{s}$, Duty Ratio: 0.001.

Note 2. AC for 1 minute, 40% to 60% R.H.

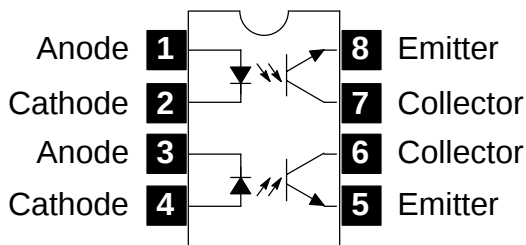
Electro-Optical Characteristics: ($T_A = +25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Input						
Forward Voltage	V_F	$I_F = 20\text{mA}$	—	1.2	1.4	V
Peak Forward Voltage	V_{FM}	$I_{FM} = 500\text{mA}$	—	—	3	V
Reverse Current	I_R	$V_R = 4\text{V}$	—	—	10	μA
Terminal Capacitance	C_t	$V = 0, f = 1\text{kHz}$	—	30	250	pF
Output						
Collector Dark Current	I_{CEO}	$V_{CE} = 20\text{V}, I_F = 0, R_{BE} = \infty$	—	—	100	nA
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 0.1\text{mA}, I_F = 0$	35	—	—	V
Emitter-Collector Breakdown Voltage	$V_{(BR)ECO}$	$I_E = 10\mu\text{A}, I_F = 0$	6	—	—	V
Transfer Characteristics						
Collector Current	I_C	$I_F = 5\text{mA}, V_{CE} = 5\text{V}, \text{Note 3}$	2.5	—	—	mA
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_F = 20\text{mA}, I_C = 1\text{mA}$	—	0.1	0.2	V
Isolation Resistance	R_{ISO}	500V DC, 40% to 60% R.H.	5×10^{10}	10^{11}	—	Ω
Floating Capacitance	C_f	$V = 0, f = 1\text{MHz}$	—	0.6	1.0	pF
Cut-Off Frequency	f_C	$V_{CE} = 5\text{V}, I_C = 2\text{mA}, R_L = 100\Omega, -3\text{dB}$	—	80	—	kHz
Response Time (Rise)	t_r	$V_{CE} = 2\text{V}, I_C = 2\text{mA}, R_L = 100\Omega$	—	4	18	μs
Response Time (Fall)	t_f		—	3	18	μs

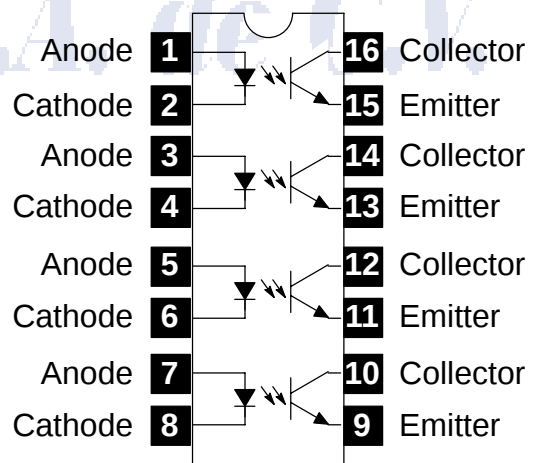
Note 3. $\text{CTR} = \frac{I_C}{I_F} \times 100\%$

Pin Connection Diagram

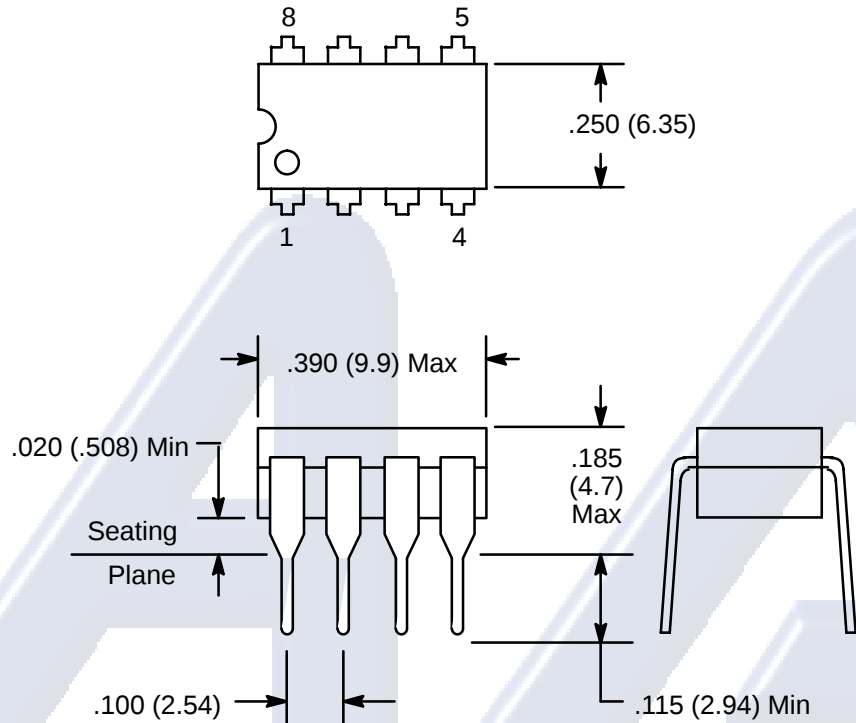
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