



**ELECTRONICS, INC.**  
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## 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:  $V_{ISO} = 5000V_{rms}$
- 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 <sub>rms</sub>
Total Power Dissipation, $P_{tot}$ .....	200mW
Operating Temperature Range, $T_{opr}$ .....	-30° to +100°C
Storage Temperature Range, $T_{stg}$ .....	-55° to +125°C
Lead Temperature (During Soldering, 10sec), $T_L$ .....	+260°C

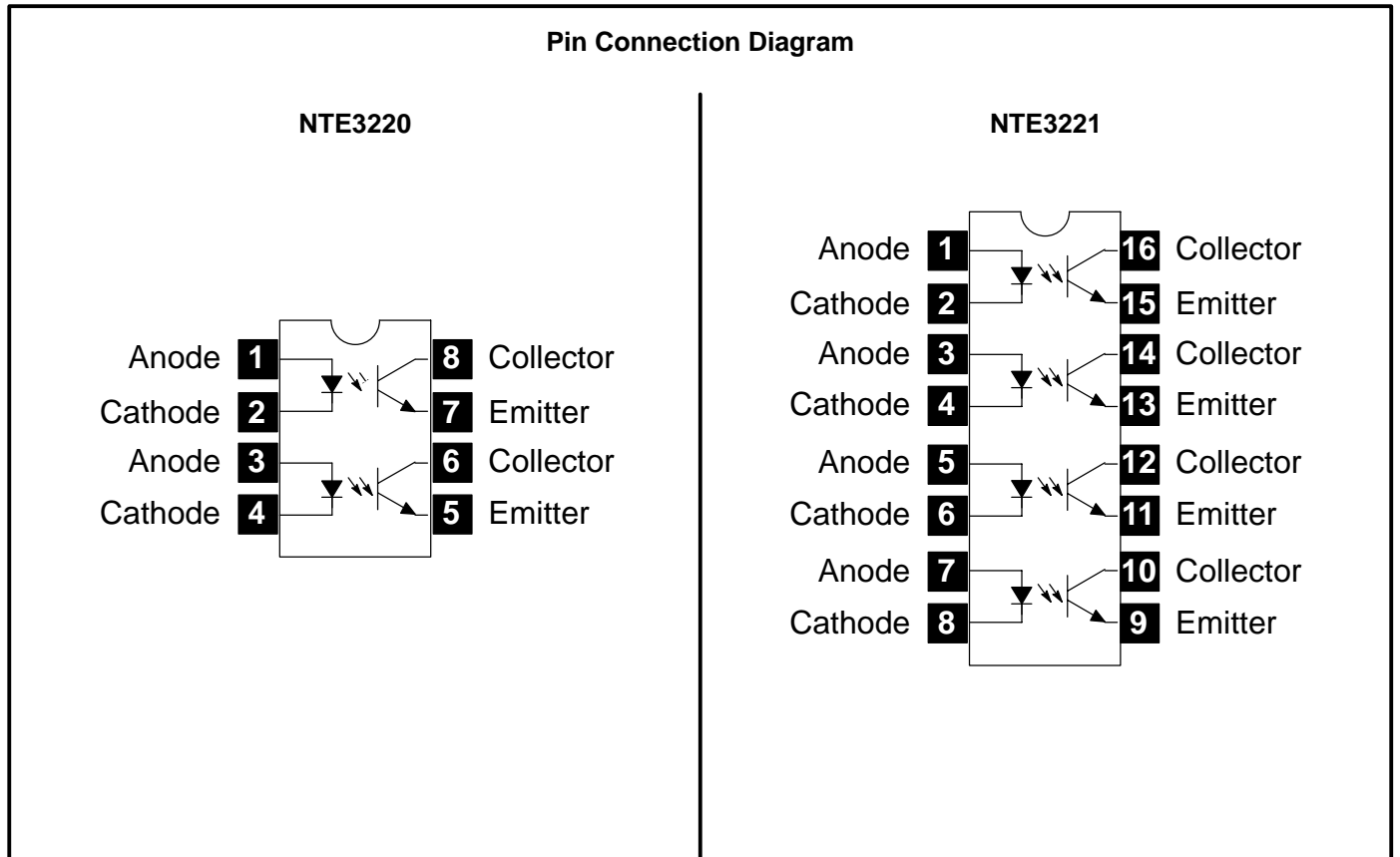
Note 1. Pulse Width  $\leq 100\mu\text{s}$ , Duty Ratio: 0.001.

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

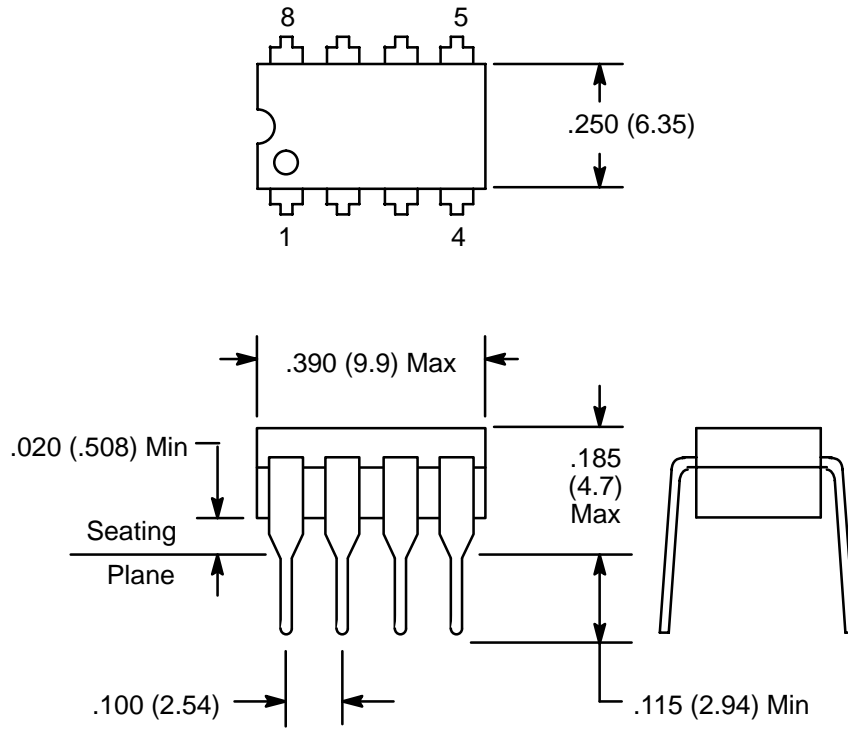
**Electro-Optical Characteristics:** ( $T_A = +25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Input</b>						
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	$\mu\text{A}$
Terminal Capacitance	$C_t$	$V = 0, f = 1\text{kHz}$	–	30	250	pF
<b>Output</b>						
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
<b>Transfer Characteristics</b>						
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.	$5 \times 10^{10}$	$10^{11}$	–	$\Omega$
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	$\mu\text{s}$
Response Time (Fall)	$t_f$		–	3	18	$\mu\text{s}$

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



### NTE3220



### NTE3221

