



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

## 2N3390, 2N3391, 2N3392 Silicon NPN Transistor General Purpose Amplifier TO-92 Type Package

**Absolute Maximum Ratings:** ( $T_A = +25^\circ\text{C}$ , Note 1 unless otherwise specified)

Collector-Emitter Voltage, $V_{CEO}$ .....	25V
Collector-Base Voltage, $V_{CBO}$ .....	25V
Emitter-Base Voltage, $V_{EBO}$ .....	5V
Continuous Collector Current, $I_C$ .....	500mA
Total Device Dissipation ( $T_A = +25^\circ\text{C}$ ), $P_D$ .....	625mW
Derate Above $25^\circ\text{C}$ .....	5.0mW/ $^\circ\text{C}$
Operating Junction Temperature Range, $T_J$ .....	$-55^\circ$ to $+150^\circ\text{C}$
Storage Temperature Range, $T_{stg}$ .....	$-55^\circ$ to $+150^\circ\text{C}$
Thermal Resistance, Junction-to-Case, $R_{thJC}$ .....	83.3 $^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Ambient, $R_{thJA}$ .....	200 $^\circ\text{C}/\text{W}$

Note 1. These ratings are limiting values above which the serviceability of any semiconductor may be impaired.

Note 2. These ratings are based on a maximum junction temperature of  $150^\circ\text{C}$ .

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>OFF Characteristics</b>						
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = 10\text{mA}$ , $I_B = 0$ , Note 3	25	-	-	V
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = 10\mu\text{A}$ , $I_E = 0$	25	-	-	V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 10\mu\text{A}$ , $I_C = 0$	5.0	-	-	V
Collector Cutoff Current	$I_{CBO}$	$V_{CB} = 18\text{V}$ , $I_E = 0$	-	-	100	nA
Emitter Cutoff Current	$I_{EBO}$	$V_{BE} = 5\text{V}$ , $I_C = 0$	-	-	100	nA

Note 3. Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2\%$

**Electrical Characteristics (Cont'd):** ( $T_A = +25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>ON Characteristics</b> (Note 3)						
DC Current Gain 2N3390	$h_{FE}$	$V_{CE} = 4.5\text{V}, I_C = 2\text{mA}$	400	-	800	
2N3391			250	-	500	
2N3392			150	-	300	
<b>Small Signal Characteristics</b>						
Output Capacitance	$C_{ob}$	$V_{CB} = 10\text{V}, f = 1.0\text{MHz}$	2.0	-	10	pF
Small-Signal Current Gain 2N3390	$h_{fe}$	$V_{CE} = 4.5\text{V}, I_C = 2\text{mA},$ $f = 1.0\text{kHz}$	400	-	1250	
2N3391			250	-	800	
2N3392			150	-	500	
Noise Figure	$V_{BE(sat)}$	$V_{CE} = 4.5\text{V}, I_C = 100\mu\text{A},$ $B_W = 15.7\text{kHz}$	-	-	5.0	dB

Note 3. Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2\%$

