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## **NTE390 (NPN) & NTE391 (PNP) Silicon Complementary Transistors General Purpose**

**Description:**

The NTE390 (NPN) and NTE391 (PNP) are silicon complementary transistors in a TO218 type package designed for general purpose power amplifier and switching applications.

**Features:**

- 10A Collector Current
- Low Leakage Current:  $I_{CEO} = 0.7\text{mA}$  @  $V_{CE} = 60\text{V}$
- Excellent DC Gain:  $h_{FE} = 40$  Typ @ 3A
- High Current Gain Bandwidth Product:  $h_{fe} = 3$  Min @  $I_C = 500\text{mA}$ ,  $f = 1\text{MHz}$

**Absolute Maximum Ratings:**

Collector–Emitter Voltage, $V_{CEO}$ .....	100V
Collector–Base Voltage, $V_{CB}$ .....	100V
Emitter–Base Voltage, $V_{EB}$ .....	5V
Collector Current, $I_C$	
Continuous .....	10A
Peak (Note 1) .....	15A
Continuous Base Current, $I_B$ .....	3A
Total Power Dissipation ( $T_C = +25^\circ\text{C}$ ), $P_D$ .....	80W
Derate Above $25^\circ\text{C}$ .....	0.64W/ $^\circ\text{C}$
Operating Junction Temperature Range, $T_J$ .....	$-65^\circ$ to $+150^\circ\text{C}$
Storage Temperature Range, $T_{stg}$ .....	$-65^\circ$ to $+150^\circ\text{C}$
Thermal Resistance, Junction–to–Case, $R_{thJC}$ .....	1.56 $^\circ\text{C/W}$
Thermal Resistance, Junction–to–Ambient, $R_{thJA}$ .....	35.7 $^\circ\text{C/W}$

Note 1. Pulse Test: Pulse Width = 10ms, Duty Cycle  $\leq$  10%.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>OFF Characteristics</b>						
Collector–Emitter Sustaining Voltage	$V_{CEO(sus)}$	$I_C = 30\text{mA}, I_B = 0$ , Note 2	100	–	–	V
Collector–Emitter Cutoff Current	$I_{CEO}$	$V_{CE} = 60\text{V}, I_B = 0$	–	–	0.7	mA
	$I_{CES}$	$V_{CE} = 100\text{V}, V_{EB} = 0$	–	–	0.4	mA
Emitter–Base Cutoff Current	$I_{EBO}$	$V_{EB} = 5\text{V}, I_C = 0$	–	–	1	mA
<b>ON Characteristics (Note 2)</b>						
DC Current Gain	$h_{FE}$	$I_C = 1\text{A}, V_{CE} = 4\text{V}$	40	–	–	
		$I_C = 3\text{A}, V_{CE} = 4\text{V}$	20	–	100	
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 3\text{A}, I_B = 0.3\text{A}$	–	–	1	V
		$I_C = 10\text{A}, I_B = 2.5\text{A}$	–	–	4	V
Base–Emitter ON Voltage	$V_{BE(on)}$	$I_C = 3\text{A}, V_{CE} = 4\text{V}$	–	–	1.6	V
		$I_C = 10\text{A}, V_{CE} = 4\text{V}$	–	–	3.0	V
<b>Dynamic Characteristics</b>						
Small–Signal Current Gain	$h_{fe}$	$I_C = 0.5\text{A}, V_{CE} = 10\text{V}, f = 1\text{kHz}$	20	–	–	
Current–Gain Bandwidth Product	$f_T$	$I_C = 0.5\text{A}, V_{CE} = 10\text{V}, f = 1\text{MHz}$ , Note 3	3	–	–	MHz

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

Note 3.  $f_T = |h_{fe}| \cdot f_{test}$

