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NTE390 (NPN) & NTE391 (PNP) Silicon Complementary Transistors General Purpose TO-3PN Type Package

Description:

The NTE390 (NPN) and NTE391 (PNP) are silicon complementary transistors in a TO-3PN 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: $h_{FE} = 40 \text{ Typ} @ 3\text{A}$
- High Current Gain Bandwidth Product: $h_{fe} = 3 \text{ Min} @ I_C = 500\text{mA}, f = 1\text{MHz}$

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°C	0.64W/ $^\circ\text{C}$
Operating Junction Temperature Range, T_J	-65° to $+150^\circ\text{C}$
Storage Temperature Range, T_{stg}	-65° 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
OFF Characteristics						
Collector–Emitter Sustaining Voltage	$V_{CEO(sus)}$	$I_C = 30\text{mA}, I_B = 0, \text{Note 2}$	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
ON Characteristics (Note 2)						
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
Dynamic Characteristics						
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	$I_C = 0.5\text{A}, V_{CE} = 10\text{V}, f = 1\text{MHz}, \text{Note 3}$	3	–	–	MHz

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

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

