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## NTE263 (NPN) & NTE264 (PNP) Silicon Complementary Transistors Darlington Power Amplifier

### **Description:**

The NTE263 (NPN) and NTE264 (PNP) are complementary silicon Darlington power transistors in a TO220 type package designed for general purpose amplifier and low-speed switching applications.

### **Features:**

- High DC Current Gain:  
 $h_{FE} = 2500 \text{ Typ (NTE263)}$   
 $h_{FE} = 3500 \text{ Typ (NTE264)}$
- Collector–Emitter Sustaining Voltage:  $V_{CEO(sus)} = 100V \text{ Min}$
- Low Collector–Emitter Saturation Voltage:  
 $V_{CE(sat)} = 2V \text{ Max @ } I_C = 5A$
- Monolithic Construction with Built–In Base–Emitter Shunt Resistor

### **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 .....	15A
Base Current, $I_B$ .....	250mA
Total Power Dissipation ( $T_C = +25^\circ C$ ), $P_D$ .....	65W
Derate Above $25^\circ C$ .....	0.52W/ $^\circ C$
Total Power Dissipation ( $T_A = +25^\circ C$ ), $P_D$ .....	2W
Derate Above $25^\circ C$ .....	0.016W/ $^\circ C$
Operating Junction Temperature range, $T_J$ .....	$-65^\circ$ to $+150^\circ C$
Storage Temperature range, $T_{stg}$ .....	$-65^\circ$ to $+150^\circ C$
Thermal Resistance, Junction–to–Case, $R_{thJC}$ .....	1.92 $^\circ C/W$
Thermal Resistance, Junction–to–Ambient, $R_{thJA}$ .....	62.5 $^\circ C/W$

**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	$V_{CEO(sus)}$	$I_C = 200\text{mA}, I_B = 0$ , Note 1	100	–	–	V
Collector Cutoff Current	$I_{CEO}$	$V_{CE} = 100\text{V}, I_B = 0$	–	–	1.0	mA
	$I_{CEX}$	$V_{CE} = 100\text{V}, V_{EB(off)} = 1.5\text{V}$	–	–	300	$\mu\text{A}$
		$V_{CE} = 100\text{V}, V_{EB(off)} = 1.5\text{V}, T_C = +125^\circ\text{C}$	–	–	3	mA
Emitter Cutoff Current	$I_{EBO}$	$V_{BE} = 5\text{V}, I_C = 0$	–	–	5	mA
<b>ON Characteristics</b> (Note 1)						
DC Current Gain	$h_{FE}$	$I_C = 5\text{A}, V_{CE} = 3\text{V}$	1000	–	20000	
		$I_C = 10\text{A}, V_{CE} = 3\text{V}$	100	–	–	
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 5\text{A}, I_B = 0.01\text{A}$	–	–	2	V
		$I_C = 10\text{A}, I_B = 0.1\text{A}$	–	–	3	V
Base–Emitter ON Voltage	$V_{BE(on)}$	$I_C = 3\text{A}, V_{CE} = 3\text{V}$	–	–	2.8	V
		$I_C = 10\text{A}, V_{CE} = 3\text{V}$	–	–	4.5	V
<b>Dynamic Characteristics</b>						
Small–Signal Current Gain	$ h_{fe} $	$I_C = 1\text{A}, V_{CE} = 5\text{V}, f_{test} = 1\text{MHz}$	20	–	–	
Output Capacitance	$C_{ob}$	$V_{CB} = 10\text{V}, I_E = 0, f = 1\text{MHz}$	–	–	200	pF
Small–Signal Current Gain	$h_{fe}$	$I_C = 1\text{A}, V_{CE} = 5\text{V}, f = 1\text{kHz}$	1000	–	–	

Note 1. Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2\%$ .

