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NTE377 (NPN) & NTE378 (PNP) Silicon Complementary Transistors Power Amp Driver, Output, Switch

Description:

The NTE377 (NPN) and NTE378 (PNP) are silicon complementary transistors in a TO220 type package designed for general purpose power amplification and switching such as output or driver stages in applications such as switching regulators, converters, and power amplifiers.

Features:

- Low Collector–Emitter Saturation Voltage: $V_{CE(sat)} = 1V \text{ Max @ } 8A$
- Fast Switching Speeds
- Complementary Pairs Simplifies Designs

Absolute Maximum Ratings:

Collector–Emitter Voltage, V_{CEO}	80V
Emitter–Base Voltage, V_{EB}	5V
Collector Current, I_C	
Continuous	10A
Peak (Note 1)	20A
Total Power Dissipation, P_D	
$T_C = +25^\circ C$	50W
$T_A = +25^\circ C$	1.67W
Operating Junction Temperature Range, T_J	-55° to $+150^\circ C$
Storage Temperature Range, T_{stg}	-55° to $+150^\circ C$
Thermal Resistance, Junction–to–Case, $R_{\theta JC}$	$2.5^\circ C/W$
Thermal Resistance, Junction–to–Ambient, $R_{\theta JA}$	$75^\circ C/W$
Maximum Lead Temperature (During Soldering, 1/8" from case, 5sec), T_L	$+275^\circ C$

Note 1. Pulse Width $\leq 6ms$, Duty Cycle $\leq 50\%$.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF Characteristics						
Collector Cutoff Current	I_{CES}	$V_{CE} = 80\text{V}, V_{BE} = 0$	–	–	10	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB} = 5\text{V}$	–	–	100	μA
ON Characteristics						
DC Current Gain	h_{FE}	$V_{CE} = 1\text{V}, I_C = 2\text{A}, T_J = +25^\circ\text{C}$	60	–	–	
		$V_{CE} = 1\text{V}, I_C = 4\text{A}, T_J = +25^\circ\text{C}$	40	–	–	
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 8\text{A}, I_B = 400\text{mA}$	–	–	1.0	V
Base–Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 8\text{A}, I_b = 800\text{mA}$	–	–	1.5	V
Dynamic Characteristics						
Collector Capacitance NTE377	C_{cb}	$V_{CB} = 10\text{V}, f_{test} = 1\text{MHz}$	–	130	–	pF
			–	230	–	pF
Gain Bandwidth Product NTE377	f_T	$I_C = 500\text{mA}, V_{CE} = 10\text{V}, f = 20\text{MHz}$	–	50	–	MHz
			–	40	–	MHz
Switching Times						
Delay and Rise Time NTE377	$t_d + t_r$	$I_C = 5\text{A}, I_{B1} = 500\text{mA}$	–	300	–	ns
			–	135	–	ns
Storage Time	t_s	$I_C = 5\text{A}, I_{B1} = I_{B2} = 500\text{mA}$	–	500	–	ns
Fall Time NTE377	t_f		–	140	–	ns
			–	100	–	ns

