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NTE377 (NPN) & NTE378 (PNP) Silicon Complementary Transistors Power Amp Driver, Output, Switch TO-220 Type Package

Description:

The NTE377 (NPN) and NTE378 (PNP) are silicon complementary transistors in a TO-220 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: $V_{CE(sat)} = 1V$ 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_{thJC}	$2.5^{\circ}C/W$
Thermal Resistance, Junction-to-Ambient, R_{thJA}	$75^{\circ}C/W$
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} = 80V, V _{BE} = 0	–	–	10	μA
Emitter Cutoff Current	I _{EBO}	V _{EB} = 5V	–	–	100	μA
ON Characteristics						
DC Current Gain	h _{FE}	V _{CE} = 1V, I _C = 2A, T _J = +25°C	60	–	–	
		V _{CE} = 1V, I _C = 4A, T _J = +25°C	40	–	–	
Collector–Emitter Saturation Voltage	V _{CE(sat)}	I _C = 8A, I _B = 400mA	–	–	1.0	V
Base–Emitter Saturation Voltage	V _{BE(sat)}	I _C = 8A, I _b = 800mA	–	–	1.5	V
Dynamic Characteristics						
Collector Capacitance NTE377	C _{cb}	V _{CB} = 10V, f _{test} = 1MHz	–	130	–	pF
NTE378			–	230	–	pF
Gain Bandwidth Product NTE377	f _T	I _C = 500mA, V _{CE} = 10V, f = 20MHz	–	50	–	MHz
NTE378			–	40	–	MHz
Switching Times						
Delay and Rise Time NTE377	t _d + t _r	I _C = 5A, I _{B1} = 500mA	–	300	–	ns
NTE378			–	135	–	ns
Storage Time	t _s	I _C = 5A, I _{B1} = I _{B2} = 500mA	–	500	–	ns
Fall Time NTE377	t _f		–	140	–	ns
NTE378			–	100	–	ns

Note 2. Matched complementary pairs are available upon request (NTE377MCP). Matched complementary pairs have their gain specification (h_{FF}) matched to within 10% of each other.

