

NTE385

Silicon NPN Transistor

Audio Power Amp, Switch

Description:

The NTE385 is a silicon NPN transistor in a TO3 type package designed for high voltage, high speed, power switching in inductive circuits where fall time is critical. It is particularly suited for line operated switch mode applications.

Features:

- Fast Turn-Off Times

Absolute Maximum Ratings:

Collector-Emitter Voltage, $V_{CEO(sus)}$	400V
Collector-Emitter Voltage ($V_{BE} = -1.5V$), V_{CEX}	850V
Emitter-Base Voltage, V_{EB}	7V
Collector Current, I_C	
Continuous	15A
Peak (Note 1)	30A
Overload	60A
Base Current, I_B	
Continuous	5A
Peak (Note 1)	20A
Total Power Dissipation ($T_C = +25^\circ C$), P_D	175W
Derate Above $25^\circ C$	1.0W/ $^\circ C$
Total Power Dissipation ($T_C = +100^\circ C$), P_D	100W
Operating Junction Temperature Range, T_J	-65° to $+200^\circ C$
Storage Temperature Range, T_{stg}	-65° to $+200^\circ C$
Thermal Resistance, Junction-to-Case, R_{thJC}	1.0 $^\circ C/W$
Lead Temperature (During Soldering, 1/8" from case, 5sec), T_L	$+275^\circ C$

Note 1. Pulse test: Pulse Width = 5ms, Duty Cycle $\leq 10\%$.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF Characteristics (Note 2)						
Collector-Emitter Sustaining Voltage	$V_{CEO(sus)}$	$I_C = 200mA$, $I_B = 0$, $L = 25mH$	400	—	—	V
Collector Cutoff Current	I_{CEX}	$V_{CEX} = 850V$, $V_{BE(off)} = 1.5V$	—	—	0.2	mA
		$V_{CEV} = 850V$, $V_{BE(off)} = 1.5V$, $T_C = +125^\circ C$	—	—	2.0	mA
	I_{CER}	$V_{CE} = 850V$, $R_{BE} = 10\Omega$	—	—	0.5	mA
		$V_{CE} = 850V$, $R_{BE} = 10\Omega$, $T_C = +100^\circ C$	—	—	3.0	mA
Emitter Cutoff Current	I_{EBO}	$V_{BE} = 5V$, $I_C = 0$	—	—	0.1	mA
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = 50mA$, $-I_C = 0$	7	—	—	V

Note 2. Pulse test: Pulse Width = 300 μs , Duty Cycle $\leq 2\%$, $V_{cl} = 300V$, $V_{BE(off)} = 5V$, $L_C = 180\mu H$.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
ON Characteristics (Note 2)						
DC Current Gain	h_{FE}	$V_{CE} = 5V, I_C = 10A$	8	—	—	
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 10A, I_B = 2A$	—	—	1.5	V
		$I_C = 10A, I_B = 2A, T_C = +100^{\circ}C$	—	—	2.0	V
		$I_C = 8A, I_B = 1.6A$	—	—	1.5	V
		$I_C = 8A, I_B = 1.6A, T_C = +100^{\circ}C$	—	—	2.0	V
Base–Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 10A, I_B = 2A$	—	—	1.6	V
		$I_C = 10A, I_B = 2A, T_C = +100^{\circ}C$	—	—	1.6	V
Dynamic Characteristics						
Output Capacitance	C_{ob}	$V_{CB} = 10V, I_E = 0, f_{test} = 1kHz$	—	—	350	pF
Switching Characteristics (Resistive Load)						
Delay Time	t_d	$V_{CC} = 300V, I_C = 10A, I_B = 2A,$ $t_p = 30\mu s, \text{Duty Cycle} = 2\%,$ $V_{BE(off)} = 5V$	—	0.1	0.2	μs
Rise Time	t_r		—	0.4	0.7	μs
Storage Time	t_s		—	1.3	2.0	μs
Fall Time	t_f		—	0.2	0.4	μs
Switching Characteristics (Inductive Load, Clamped)						
Storage Time	t_{sv}	$I_C = 10A, I_{B1} = 2A, T_C = +25^{\circ}C$	—	1.3	—	μs
Fall Time	t_{fi}		—	0.06	—	μs
Storage Time	t_{sv}	$I_C = 10A, I_{B1} = 2A, T_C = +100^{\circ}C$	—	1.5	2.5	μs
Crossover Time	t_c		—	0.3	0.6	μs
Fall Time	t_{fi}		—	0.17	0.35	μs

Note 2. Pulse test: Pulse Width = $300\mu\text{s}$, Duty Cycle $\leq 2\%$, $V_{cl} = 300V$, $V_{BE(off)} = 5V$, $L_C = 180\mu\text{H}$.

