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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°C), P_D 175W
  Derate Above 25°C . . . . . 1.0W/°C
Total Power Dissipation (T_C = +100°C), P_D 100W
Operating Junction Temperature Range, T_J . . . . . –65° to +200°C
Storage Temperature Range, T_{stg} . . . . . –65° to +200°C
Thermal Resistance, Junction–to–Case, R_{thJC} . . . . . 1.0°C/W
Lead Temperature (During Soldering, 1/8” from case, 5sec), T_L . . . . . +275°C

Note 1. Pulse test: Pulse Width = 5ms, Duty Cycle ≤ 10%.

Electrical Characteristics: (T_C = +25°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°C	–	–	2.0	mA
	I_{CER}	V_{CE} = 850V, R_{BE} = 10Ω	–	–	0.5	mA
		V_{CE} = 850V, R_{BE} = 10Ω, T_C = +100°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 = 300μs, Duty Cycle ≤ 2%, V_{cl} = 300V, $V_{BE(off)}$ = 5V, L_C = 180μH.

Electrical Characteristics (Cont'd): (T_C = +25°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°C	–	–	2.0	V
		I_C = 8A, I_B = 1.6A	–	–	1.5	V
		I_C = 8A, I_B = 1.6A, T_C = +100°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°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 = 30µs, 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°C	–	1.3	–	µs
Fall Time	t_{fi}		–	0.06	–	µs
Storage Time	t_{sv}	I_C = 10A, I_{B1} = 2A, T_C = +100°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 = 300µs, Duty Cycle ≤ 2%, V_{cl} = 300V, $V_{BE(off)}$ = 5V, L_C = 180µH.