ELECTRONICS, INC.
44 FARRAND STREET
BLOOMFIELD, NJ 07003
(973) 748–5089

NTE384
Silicon NPN Transistor
High Voltage Power Amp/Switch

Description:

The NTE384 is a multiple epitaxial silicon NPN power transistor in a TO66 type package utilizing a multiple–emitter site structure. Multiple–epitaxial construction maximizes the volt–ampere characteristic of the device and provides fast switching speeds. Multiple–emitter design ensures uniform current flow throughout the structure, which produces a high $I_{S/b}$ and a large safe–operation–area.

The NTE384 is characterized for use in inverters operating directly from a rectified 110V power line. The leakage current is specified at 450V; therefore the device can also be used in a series bridge configuration on a 220V line. The V_{EBO} rating of 9V eases requirements on the drive transformer in inverter applications.

Features:

- Maximum Safe–Area–of–Operation
- Low Saturation Voltages
- High Voltage Rating: $V_{CER(sus)}$ = 375V
- High Dissipation Rating: P_T = 45W

Absolute Maximum Ratings:

Collector–Base Voltage, V_{CBO} 375V

Collector–Emitter Sustaining Voltage

- With Base Open, $V_{CEO(sus)}$ 350V
- With Reverse Bias (V_{BE}) of –1.5V, $V_{CEX(sus)}$ 375V
- With External Base–Emitter Resistance (R_{BE}) ≤ 50Ω, $V_{CER(sus)}$ 375V

Emitter–Base Voltage, V_{EBO} 9V

Collector Current, I_C

- Continuous 7A
- Peak 10A

Continuous Base Current, I_B 4A

Transistor Dissipation (T_C ≤ +25°C, V_{CE} ≤ 40V), P_T 45W

Operating Junction Temperature Range, T_{opr} . . . . . –65° to +200°C

Storage Temperature Range, T_{stg} . . . . . –65° to +200°C

Lead Temperature (During Soldering, 1/32 in. (0.8mm) from case, 10sec max), T_L . . . . . +230°C

Thermal Resistance, Junction to Case (V_{CE} = 20V, I_C = 2.25A), $R_{\Theta JC}$ . . . . . 3.9°C/W

Electrical Characteristics: (T_C = +25°C unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector–Cutoff Current	I_{CEV}	V_{CE} = 450V, V_{BE} = –1.5V	–	–	0.5	mA
		V_{CE} = 450V, V_{BE} = –1.5V, T_C = +125°C	–	–	5.0	mA
Emitter–Cutoff Current	I_{EBO}	V_{BE} = –9V, I_C = 0	–	–	1.0	mA
Collector–Emitter Sustaining Voltage	$V_{CEO(sus)}$	I_C = 200mA, Note 1, Note 2	350	–	–	V
	$V_{CER(sus)}$	I_C = 200mA, R_{BE} = 50Ω, Note 1, Note 2	375	–	–	V
Emitter–Base Voltage	V_{EBO}	I_C = 0	9	–	–	V
DC Forward Current	h_{FE}	V_{CE} = 1V, I_C = 1.2A, Note 1	12	28	50	
Base–Emitter Saturation Voltage	$V_{BE(sat)}$	I_C = 1.2A, I_B = 200mA, Note 1	–	1.0	1.6	V
		I_C = 4A, I_B = 800mA, Note 1	–	1.3	2.0	V
Collector–Emitter Saturation Voltage	$V_{CE(sat)}$	I_C = 1.2A, I_B = 200mA, Note 1	–	0.15	0.5	V
		I_C = 4A, I_B = 800mA, Note 1	–	0.5	3.0	V
Output Capacitance	C_{obo}	V_{CB} = 10V, f = 1MHz	–	–	150	pF
Small–Signal Forward Current Transfer Ratio	$\|h_{fe}\|$	V_{CE} = 10V, I_C = 200mA, f = 1MHz	1	7	–	
Second Breakdown Collector Current	$I_{S/b}$	V_{CE} = 50V, with Base forward biased, Pulse duration (non–repetitive) = 1sec	0.9	–	–	A
Second Breakdown Energy	$E_{S/b}$	V_{BE} = –4V, I_C = 3A, with Base reverse biased, R_B = 50Ω, L = 100μH	0.45	–	–	mj
Delay Time	t_d	V_{CC} = 250V, I_{B1} = I_{B2} = 200mA, I_C = 1.2A	–	0.02	–	μs
Rise Time	t_r		–	0.3	0.75	μs
Storage Time	t_s		–	2.8	5.0	μs
Fall Time	t_f		–	0.3	0.75	μs

Note 1. Pulsed: Pulse Duration ≤ 350μs, Duty Factor = 2%.