MOSPEC

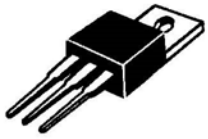
HIGH VOLTAGE NPN SILICON POWER TRANSISTORS

... designed for line operated audio output amplifier, and switching power supply drivers applications.

FEATURES:
* Collector-Emitter Sustaining Voltage -250-400V(Min)
* 1 A Rated Collector Current
* f_T= 10MHz(Min)@I_C= 200mA

NPN
TIP47
TIP48
TIP49
TIP50

1.0 AMPER
POWER
TRANSISTORS
250 -400 VOLTS
40 WATTS



TO-220

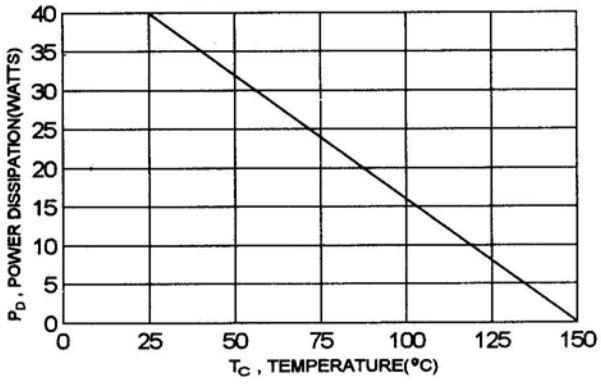
MAXIMUM RATINGS

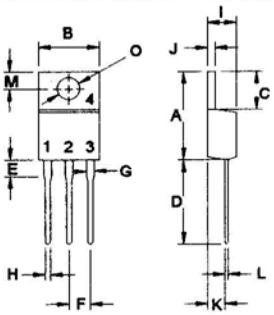
Characteristic	Symbol	TIP47	TIP48	TIP49	TIP50	Unit
Collector-Emitter Voltage	V_{CEO}	250	300	350	400	V
Collector-Base Voltage	V_{CBO}	350	400	450	500	V
Emitter-Base Voltage	V_{EBO}	5.0				V
Collector Current - Continuous - Peak	I_C	1.0 2.0				A
Base Current	I_B	0.6				A
Total Power Dissipation@T_C = 25°C Derate above 25°C	P_D	40 0.32				W W/°C
Operating and Storage Junction Temperature Range	T_J, T_{STG}	-65 to +150				°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance Junction to Case	Rθjc	3.125	°C/W

FIGURE -1 POWER DERATING





PIN 1.BASE
2.COLLECTOR
3.EMITTER
4.COLLECTOR(CASE)

DIM	MILLIMETERS	
	MIN	MAX
A	14.68	16.00
B	9.78	10.42
C	5.02	6.60
D	13.00	14.62
E	3.10	4.19
F	2.41	2.67
G	1.10	1.67
H	0.69	1.01
I	3.21	4.98
J	1.14	1.40
K	2.20	3.30
L	0.28	0.61
M	2.48	3.00
O	3.50	4.00

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Sustaining Voltage(1) (I_C= 30 mA, I_B= 0)	TIP47 TIP48 TIP49 TIP50	$V_{CEO(sus)}$	250 300 350 400		V
Collector Cutoff Current (V_{CE}= 150 V, I_B= 0) (V_{CE}= 200 V, I_B= 0) (V_{CE}= 250 V, I_B= 0) (V_{CE}= 300 V, I_B= 0)	 TIP47 TIP48 TIP49 TIP50	I_{CEO}		 1.0 1.0 1.0 1.0	mA
Collector Cutoff Current (V_{CE}= 350 V, V_{BE}= 0) (V_{CE}= 400 V, V_{BE}= 0) (V_{CE}= 450 V, V_{BE}= 0) (V_{CE}= 500 V, V_{BE}= 0)	 TIP47 TIP48 TIP49 TIP50	I_{CES}		 1.0 1.0 1.0 1.0	mA
Emitter Cutoff Current (V_{EB}= 5.0 V, I_C= 0)		I_{EBO}		1.0	mA
ON CHARACTERISTICS (1)					
DC Current Gain (I_C =0.3 A, V_{CE} = 10 V) (I_C= 1.0 A, V_{CE} = 10 V)		hFE	 30 10	150	
Collector-Emitter Saturation Voltage (I_C = 1.0 A, I_B =200 mA)		$V_{CE(sat)}$		1.0	V
Base-Emitter On Voltage (I_C =1.0 A, V_{CE}= 10 V)		$V_{BE(on)}$		1.5	V
DYNAMIC CHARACTERISTICS					
Current Gain - Bandwidth Product (2) (I_C = 200 mA , V_{CE} = 10 V , f_{TEST} = 2.0 MHz)		f_T	10		MHz
Small Signal Current Gain (I_C = 200 mA , V_{CE} = 10 V , f = 1.0 kHz)		h_{fe}	25		

(1) Pulse Test: Pulse width ≦ 300 μs , Duty Cycle ≦ 2.0 %

(2) $f_T = |h_{fe}| \cdot f_{TEST}$

FIG-2 DC CURRENT GAIN

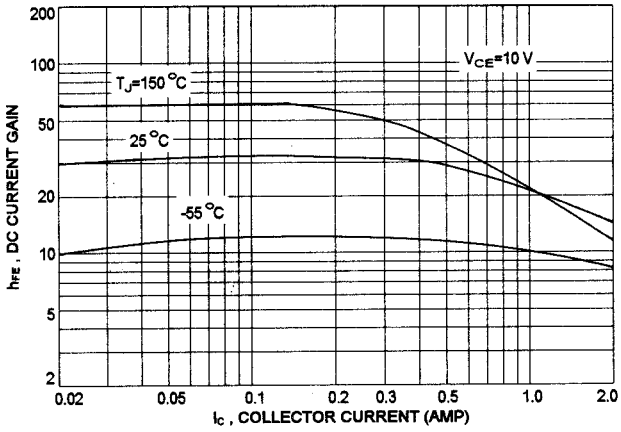


FIG-3 TURN-ON TIME

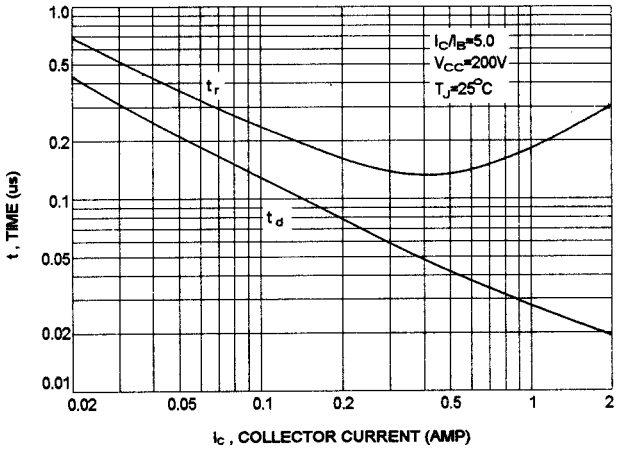


FIG-4 "ON" VOLTAGES

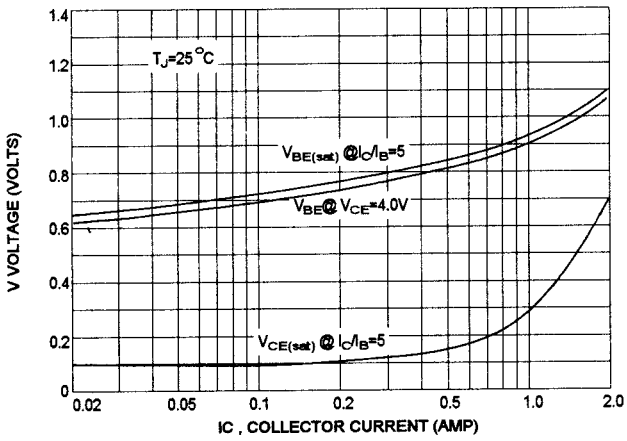


FIG-5 TURN-OFF TIME

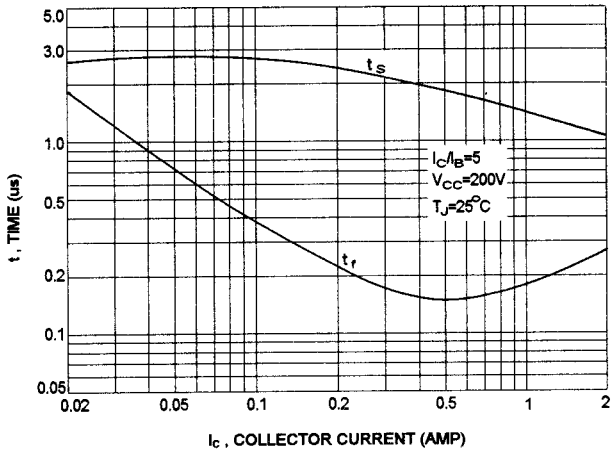
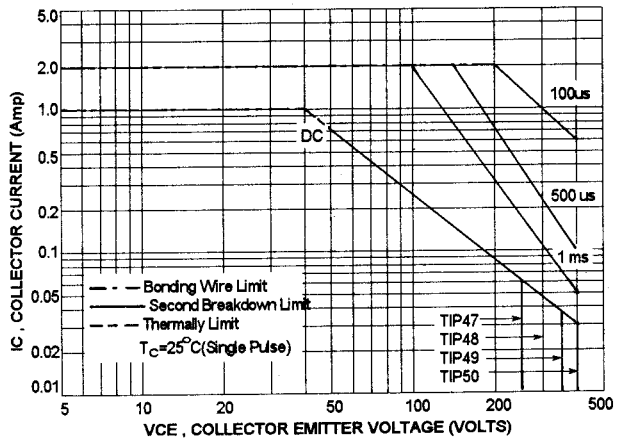


FIG-6 ACTIVE REGION SAFE OPERATING AREA



There are two limitation on the power handling ability of a transistor:average junction temperature and second breakdown safe operating area curves indicate I_C-V_{CE} limits of the transistor that must be observed for reliable operation i.e., the transistor must not be subjected to greater dissipation than curves indicate.

The data of FIG-6 curve is base on $T_{J(PK)}$=150 °C; T_C is variable depending on power level. second breakdown pulse limits are valid for duty cycles to 10% provided $T_{J(PK)} \leq$150°C,At high case temperatures,thermal limitation will reduce the power that can be handled to values less than the limitations imposed by second breakdown.

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