MOSPEC

COMPLEMENTARY SILICON HIGH-POWER TRANSISTORS

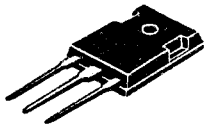
General Purpose-Amplifier and Switching Application..

FEATURES:

* Collector-Emitter Sustaining Voltage -
  $V_{CEO(sus)}$=120V (Min)- TIP35D,TIP36D
  140V (Min)- TIP35E,TIP36E
  160V (Min)- TIP35F,TIP36F
* Current Gain-Bandwidth Product-
  f_T= 3.0MHz(Min)@I_C= 1A

NPN	PNP
TIP35D	TIP36D
TIP35E	TIP36E
TIP35F	TIP36F

25 AMPERE
COMPLEMENTARY SILICON
POWER TRANSISTORS
120-160 VOLTS
125 WATTS



TO-247 (3P)

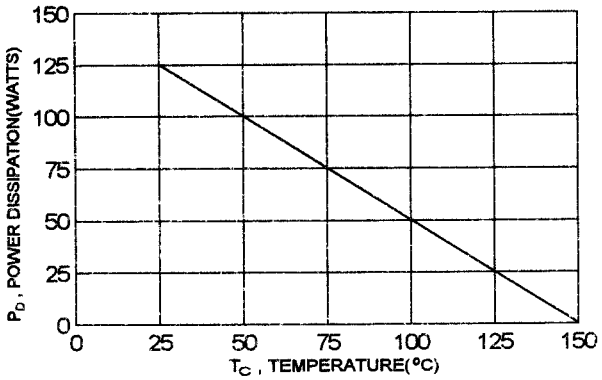
MAXIMUM RATINGS

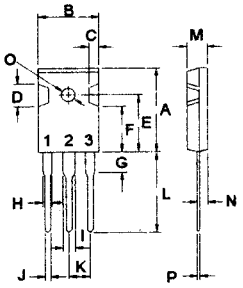
Characteristic	Symbol	TIP35D TIP36D	TIP35E TIP36E	TIP35F TIP36F	Unit
Collector-Emitter Voltage	V_{CEO}	120	140	160	V
Collector-Base Voltage	V_{CBO}	160	180	200	V
Emitter-Base Voltage	V_{EBO}	5			V
Collector Current - Continuous - Peak	I_C	25 40			A
Base Current	I_B	5			A
Total Power Dissipation@T_C = 25°C Derate above 25°C	P_D	125 1.0			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	1.0	°C/W

FIGURE -1 POWER DERATING





PIN 1.BASE
2.COLLECTOR
3.EMITTER
4.COLLECTOR

DIM	MILLIMETERS	
	MIN	MAX
A	20.63	22.38
B	15.38	16.20
C	1.90	2.70
D	5.10	6.10
E	14.81	15.22
F	11.72	12.84
G	4.20	4.50
H	1.82	2.46
I	2.92	3.23
J	0.89	1.53
K	5.26	5.66
L	18.50	21.50
M	4.76	5.24
O	3.25	3.65

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

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector -Emitter Breakdown Voltage (1) (I_C =30 mA, I_B= 0)	TIP35D,TIP36D TIP35E,TIP36E TIP35F,TIP36F	$V_{(BR)CEO}$	 120 140 160		V
Collector Cutoff Current (V_{CE}= 90 V, I_B= 0)		I_{CEO}		 1.0	mA
Collector Cutoff Current (V_{CE}= 160 V, V_{BE}= 0) (V_{CE}= 180 V, V_{BE}= 0) (V_{CE}= 200 V, V_{BE}= 0)	 TIP35D,TIP36D TIP35E,TIP36E TIP35F,TIP36F	I_{CES}		 0.7 0.7 0.7	mA
Emitter-Base Cutoff Current (V_{EB}= 5.0 V, I_C= 0)		I_{EBO}		 1.0	mA
ON CHARACTERISTICS (1)					
DC Current Gain (I_C= 1.5 A, V_{CE}= 4.0V) (I_C= 15 A, V_{CE}= 4.0V)		h_{FE}	 25 8.0		
Collector-Emitter Saturation Voltage (I_C =15 A, I_B =3.0 A) (I_C= 25 A,I_B= 6.25 A)		$V_{CE(sat)}$		 2.5 5.0	V
Base-Emitter On Voltage (I_C= 15 A, V_{CE}= 4.0 V) (I_C= 25 A, V_{CE}= 4.0 V)		$V_{BE(on)}$		 2.0 4.0	V
DYNAMIC CHARACTERISTICS					
Current-Gain-Bandwidth Product . (I_C = 1.0 A, V_{CE} = 10 V, f = 1.0 MHz)		f_T	3.0		MHz
Small-Signal Current Gain (I_C = 1.0A, V_{CE} = 4.0 V, f = 1.0 KHz)		h_{fe}	12		
SWITCHING CHARACTERISTICS					
Turn On Time	I_C= 15A , I_{B1}= -I_{B2}= 1.5A $V_{BE(off)}$= 4.15V,R_L= 2 Ω	t_{on}		1.2	us
Off Time		t_{off}		0.9	us

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

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

FIG-2 DC CURRENT GAIN

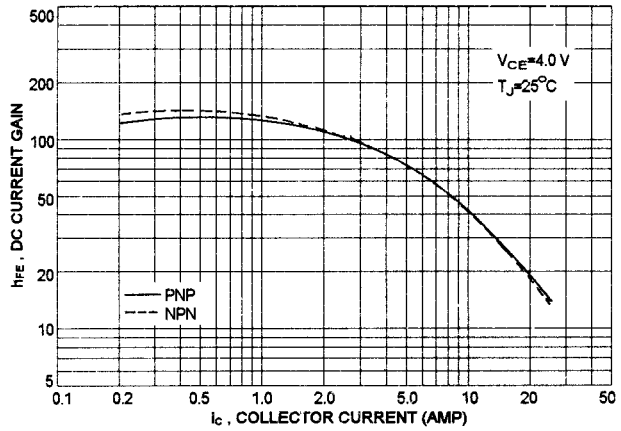


FIG-3 TURN-OFF TIME

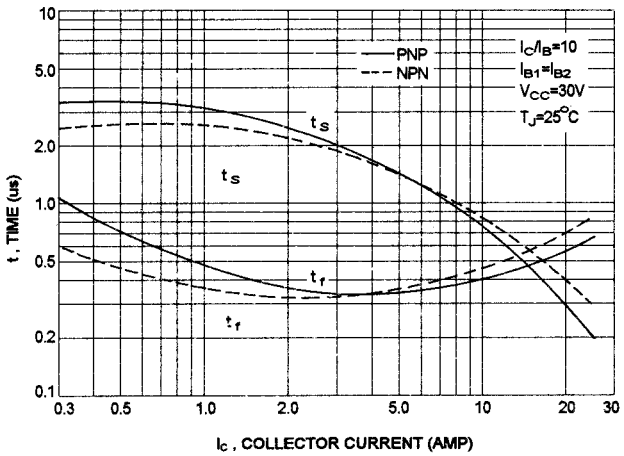


FIG-4 TURN-ON TIME

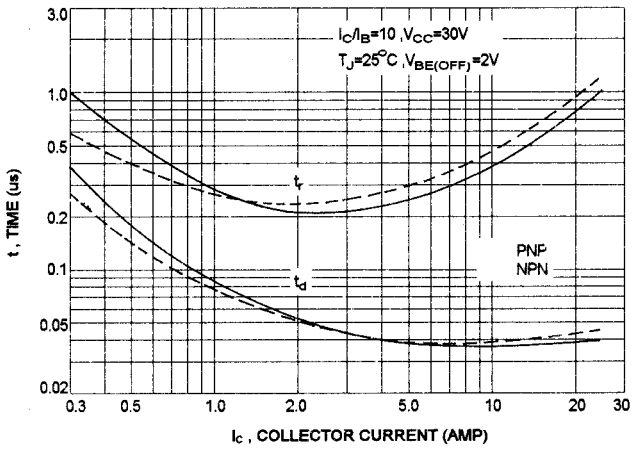


FIG-5 REVERSE BIASE SAFE OPERATING AREA

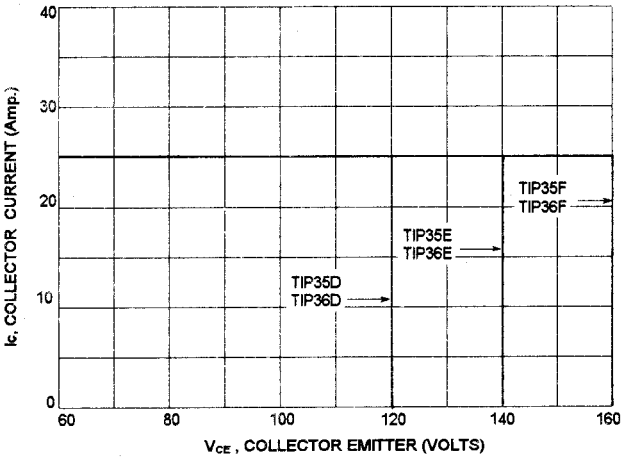
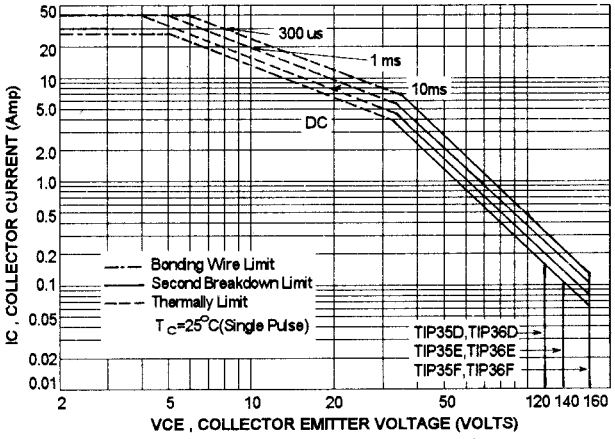


FIG-6 ACTIVE REGION SAFE OPERATING AREA



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 is base on T_C=25 °C;$T_{J(PK)}$ is variable depending on power level. second breakdown pulse limi -ts are valid for duty cycles to 10% but must be derated when T_C≥25°C, Second breakdown limitations do not der - ate the same as thermal limitations.