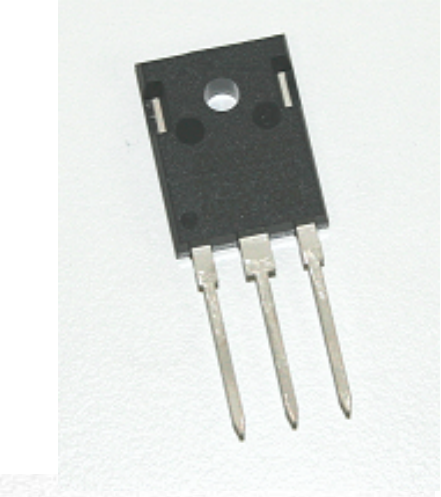
Complementary Power Transistor



Description:

Designed for use in general purpose power amplifier and switching applications.

Features:

- Collector-Emitter Sustaining Voltage
  $V_{CEO(sus)}$ = 100V (Min.) - TIP35C, TIP36C
- DC Current Gain h_{FE} = 25 (Min.) at I_C = 1.5A
- Current Gain-Bandwidth Product f_T = 3MHz (Min.) at I_C = 1A

Maximum Ratings

Characteristic	Symbol	Rating	Unit
Collector-Emitter Voltage	V_{CEO}	100	V
Collector-Base Voltage	V_{CBO}		
Emitter-Base Voltage	V_{EBO}	5	
Collector Current-Continuous -Peak	I_C	25 40	A
Base Current	I_B	5	
Total Power Dissipation at T_C = 25°C Derate above 25°C	P_D	125 1	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	°C/W

Electrical Characteristics (T_C = 25°C unless otherwise noted)

Characteristic	Symbol	Min.	Max.	Unit
OFF Characteristics				
Collector-Emitter Sustaining Voltage (1) I_C = 30mA, I_B = 0	$V_{CEO(SUS)}$	100	-	V
Collector Cut off Current V_{CE} = 60V, I_B = 0	I_{CEO}	-	1	mA
Collector Cut off Current V_{CE} = 100V, V_{EB} = 0	I_{CES}	-	0.7	
Emitter Cut off Current V_{EB} = 5V, I_C = 0	I_{EBO}	-	1	
ON Characteristics (1)				
DC Current Gain I_C = 1.5A, V_{CE} = 4V I_C = 15A, V_{CE} = 4V	h_{FE}	25 15	75	V
Collector-Emitter Saturation Voltage I_C = 15A, I_B = 1.5A I_C = 25A, I_B = 5A	$V_{CE(sat)}$	-	1.8 4	
Base-Emitter On Voltage I_C = 15A, V_{CE} = 4V I_C = 25A, V_{CE} = 4V	$V_{BE(on)}$	-	2 4	
Dynamic Characteristics				
Current Gain Bandwidth Product (2) I_C = 1mA, V_{CE} = 10V, f_{TEST} = 1MHz	f_T	3	-	MHz
Small-Signal Current Gain I_C = 1A, V_{CE} = 10V, f = 1kHz	h_{fe}	25	-	-

(1) Pulse Test: Pulse Width = 300µs, Duty Cycle ≤2%

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

Figure - 1 Power Derating

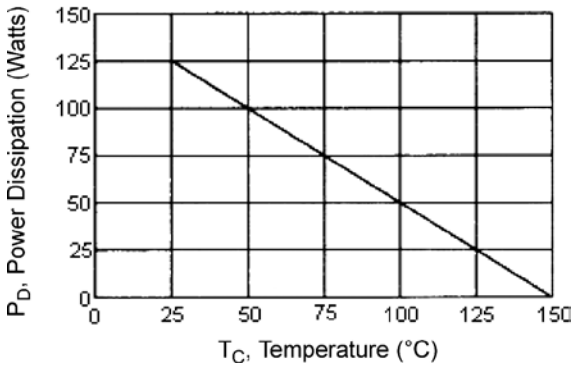


Figure - 2 DC Current Gain

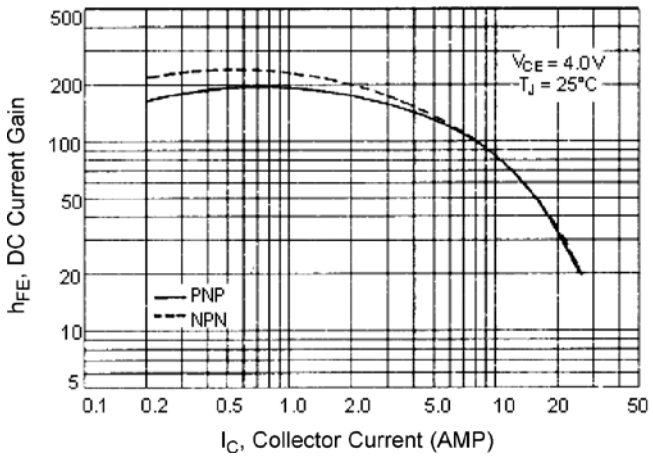


Figure - 3 Turn-Off Time

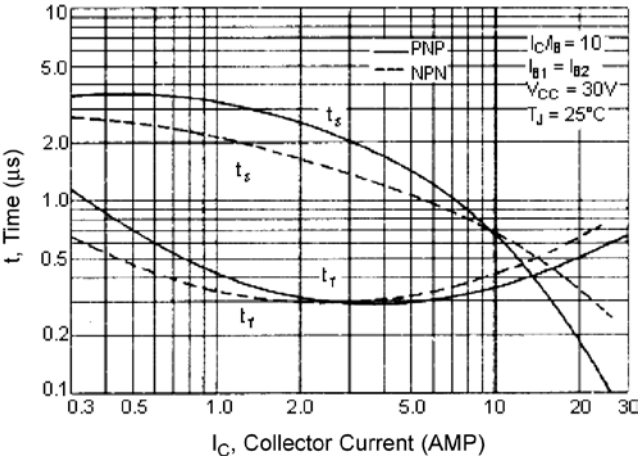


Figure - 4 Turn-On time

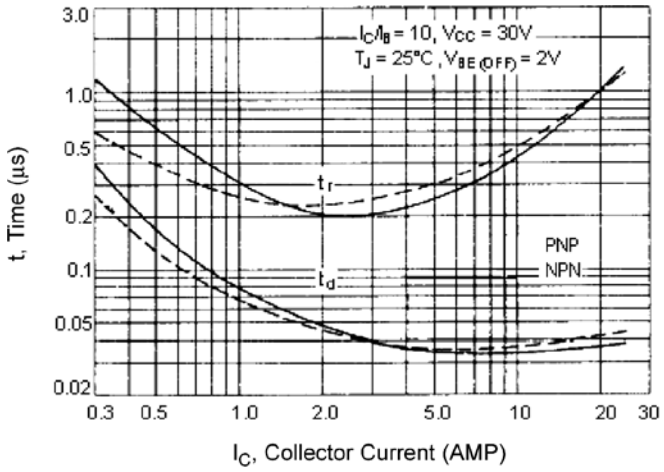


Figure - 5 Reverse Base Safe Operating Area

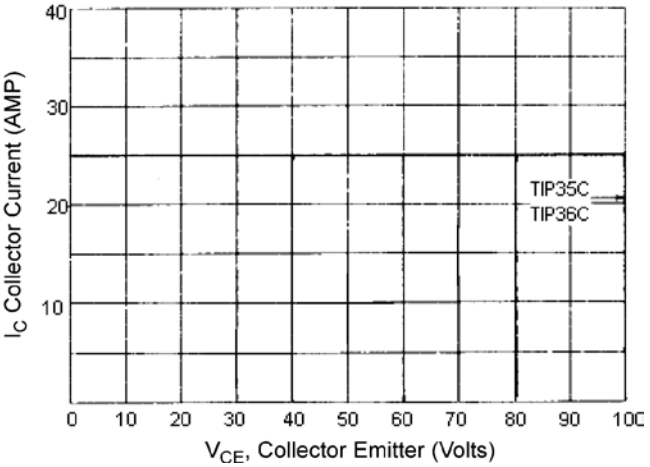
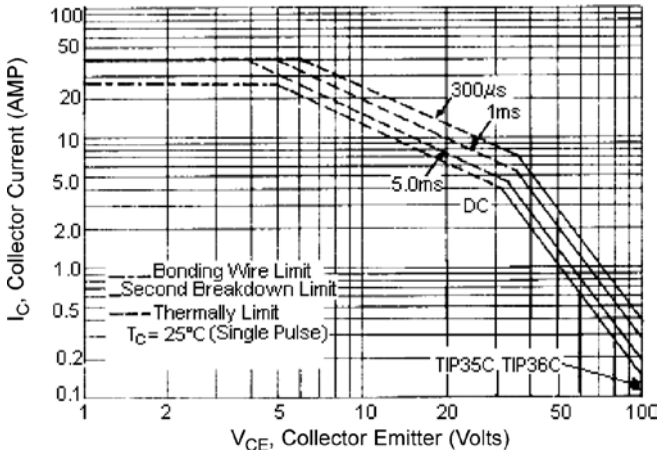


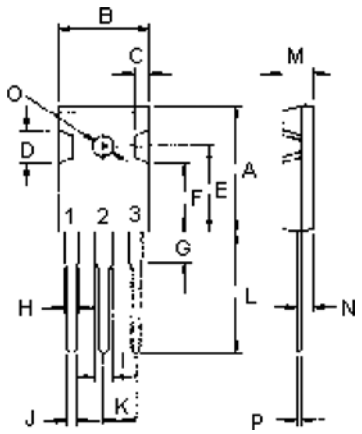
Figure - 6 Active Region Safe Operating Area



There are two limitations 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 the curves indicate.

The data of Figure - 6 is based on T_C = 25°C; $T_{J(pk)}$ is variable depending on power level . Second breakdown pulse limits are valid for duty cycle to 10% but must be derated when T_C ≥25°C, second breakdown limitations do not derate the same as thermal limitation.

Complementary Power Transistor



Pin Configuration:

1. Base
2. Collector
3. Emitter

Dimensions	Min.	Max.
A	20.63	22.38
B	15.38	16.2
C	1.9	2.7
D	5.1	6.1
E	14.81	15.22
F	11.72	12.84
G	4.2	4.5
H	1.82	2.46
I	2.92	3.23
J	0.89	1.53
K	5.26	5.66
L	18.5	21.5
M	4.68	5.36
N	2.4	2.8
O	3.25	3.65
P	0.55	0.7

Dimensions : Millimetres

Part Number Table

Description	Part Number
Transistor, NPN, TO-247	TIP35C
Transistor, PNP, TO-247	TIP36C