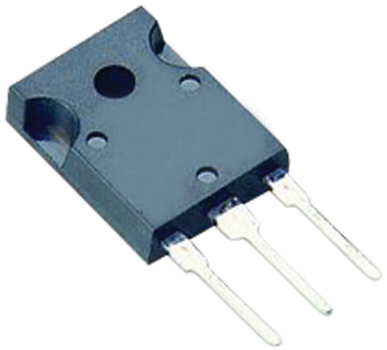
Complementary Power Transistor



Description:

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

Features:

- Collector-Emitter sustaining Voltage.
  $V_{CEO(sus)}$ = 100V (Min.)
- 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}	115	
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 Breakdown Voltage (1) I_C = 30mA, I_B = 0	$V_{(BR)CEO}$	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 V_{CE} = 4V, I_C = 1.5A V_{CE} = 4V, I_C = 15A V_{CE} = 4V, I_C = 25A	h_{FE}	25 10 5	-	-
Collector-Emitter Saturation Voltage I_C = 15A, I_B = 1.5A I_C = 25A, I_B = 5A	$V_{CE(sat)}$	-	1.8 4	V
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 = 1A, V_{CE} = 10V, f = 1MHz	f_T	3	-	MHz

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

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

Figure - 1 Power Derating

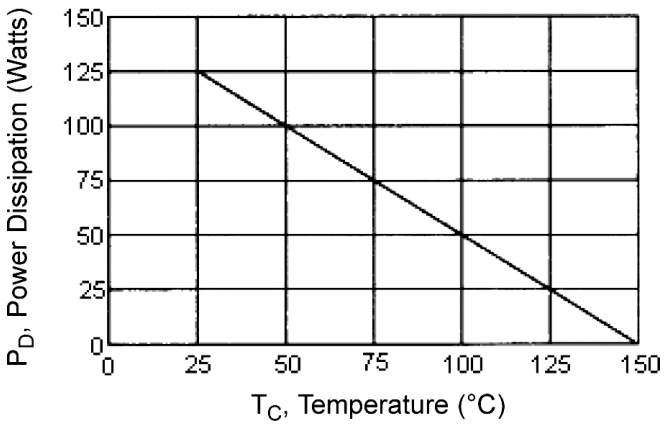


Figure - 2 DC Current Gain

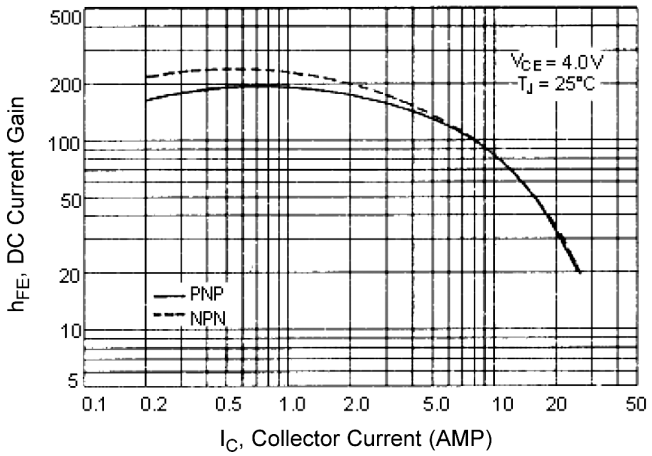


Figure - 3 Turn-Off Time

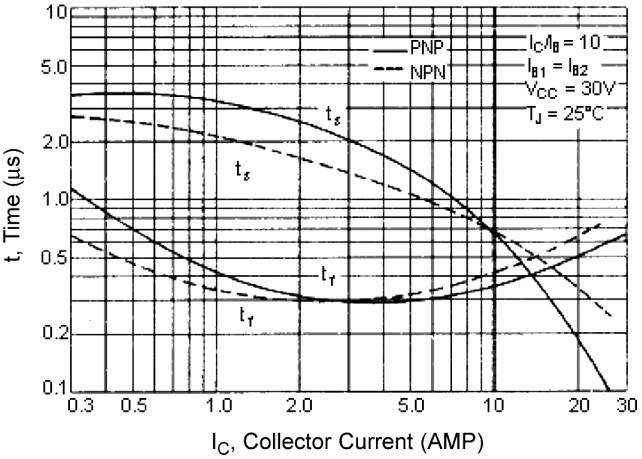


Figure - 4 Turn-On time

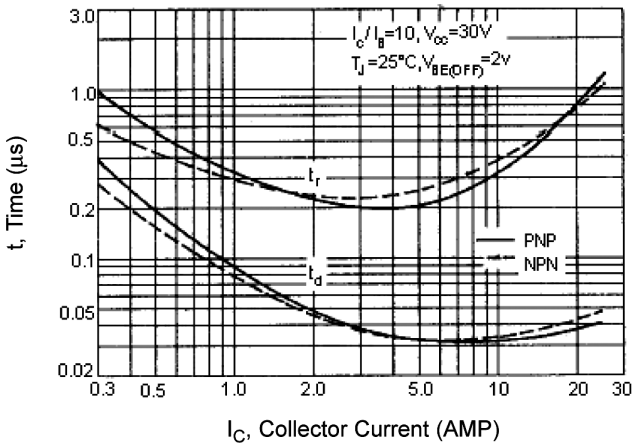


Figure - 5 Reverse Base Safe Operating Area

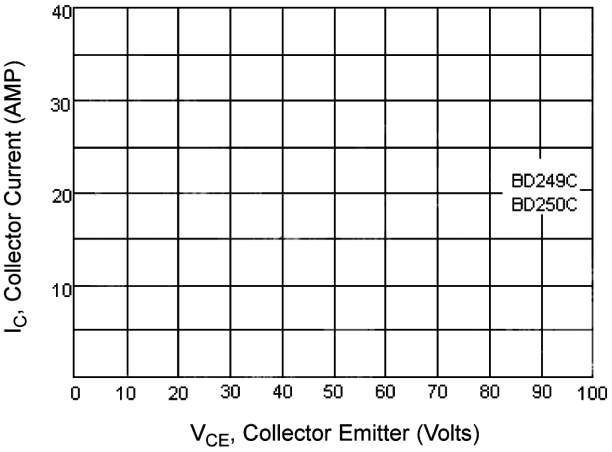
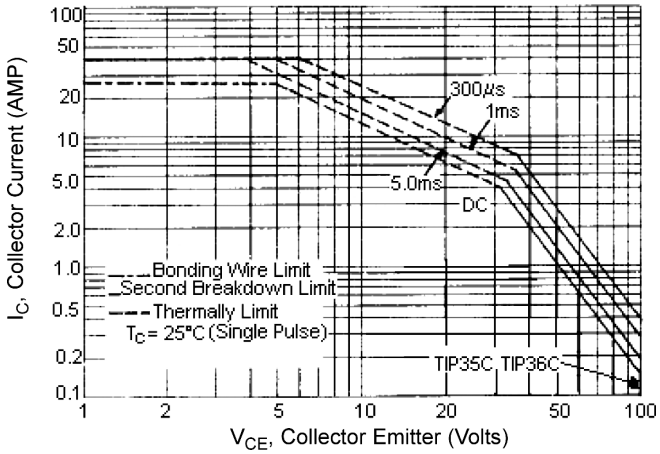
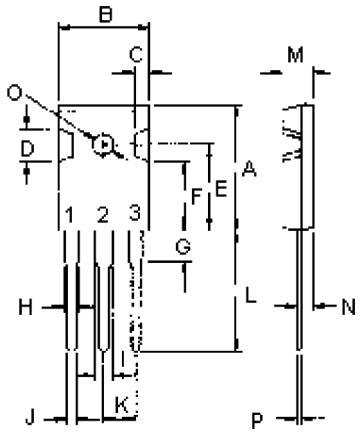


Figure - 6 Active Region Safe Operating Area



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 SOA curve is based on $T_{J(PK)}$ = 150°C; T_C is variable depending on conditions. Second breakdown pulse limits are valid for duty cycles to 10% provided $T_{J(PK)}$ ≤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.



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	BD249C
Transistor, PNP, TO-247	BD250C