

## 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 $T_C = 25^\circ C$ Derate above $25^\circ C$	$P_D$	125 1	W W/ $^\circ C$
Operating and Storage Junction Temperature Range	$T_J, T_{STG}$	-65 to +150	$^\circ C$

## Thermal Characteristics

Characteristic	Symbol	Max.	Unit
Thermal Resistance Junction to Case	$R\theta_{jc}$	1	$^\circ C/W$

## Electrical Characteristics:

( $T_C = 25^\circ\text{C}$  unless otherwise noted)

Characteristic	Symbol	Min.	Max.	Unit
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### OFF Characteristics

Collector-Emitter Breakdown Voltage (1) $I_C = 30\text{mA}, I_B = 0$	$V_{(BR)CEO}$	100	-	V
Collector Cut off Current $V_{CE} = 60\text{V}, I_B = 0$	$I_{CEO}$	-	1	mA
Collector Cut off Current $V_{CE} = 100\text{V}, V_{EB} = 0$	$I_{CES}$	-	0.7	
Emitter Cut off Current $V_{EB} = 5\text{V}, I_C = 0$	$I_{EBO}$	-	1	

### ON Characteristics (1)

DC Current Gain $V_{CE} = 4\text{V}, I_C = 1.5\text{A}$ $V_{CE} = 4\text{V}, I_C = 15\text{A}$ $V_{CE} = 4\text{V}, I_C = 25\text{A}$	$h_{FE}$	25 10 5	-	-
Collector-Emitter Saturation Voltage $I_C = 15\text{A}, I_B = 1.5\text{A}$ $I_C = 25\text{A}, I_B = 5\text{A}$	$V_{CE(sat)}$	-	1.8 4	V
Base-Emitter On Voltage $I_C = 15\text{A}, V_{CE} = 4\text{V}$ $I_C = 25\text{A}, V_{CE} = 4\text{V}$	$V_{BE(on)}$	-	2 4	

### Dynamic Characteristics

Current Gain Bandwidth Product (2) $I_C = 1\text{A}, V_{CE} = 10\text{V}, f = 1\text{MHz}$	$f_T$	3	-	MHz
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(1) Pulse Test: Pulse Width = 300 $\mu\text{s}$ , Duty Cycle  $\leq 2\%$

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

Figure - 1 Power Derating

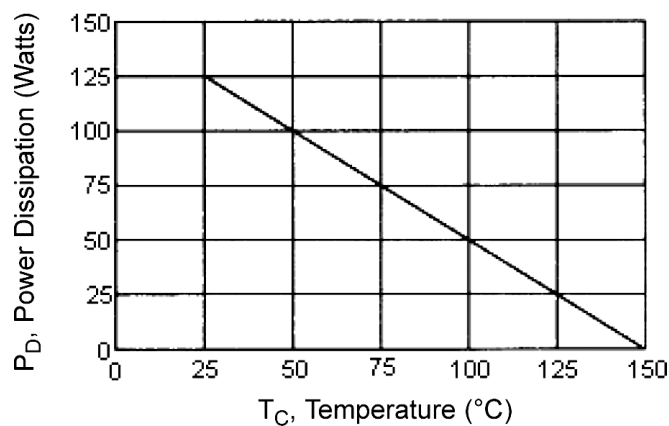


Figure - 2 DC Current Gain

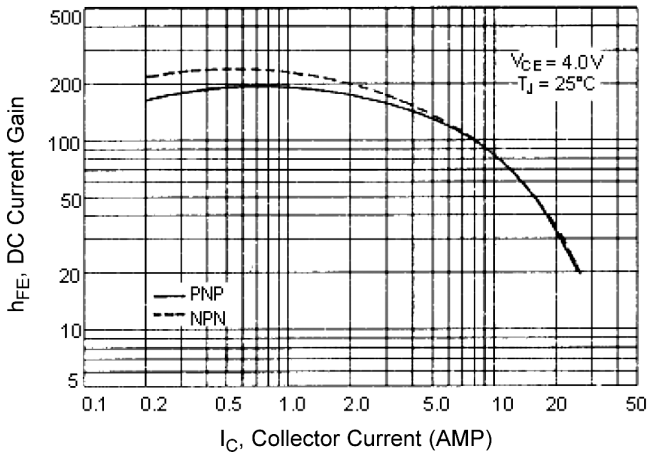


Figure - 3 Turn-Off Time

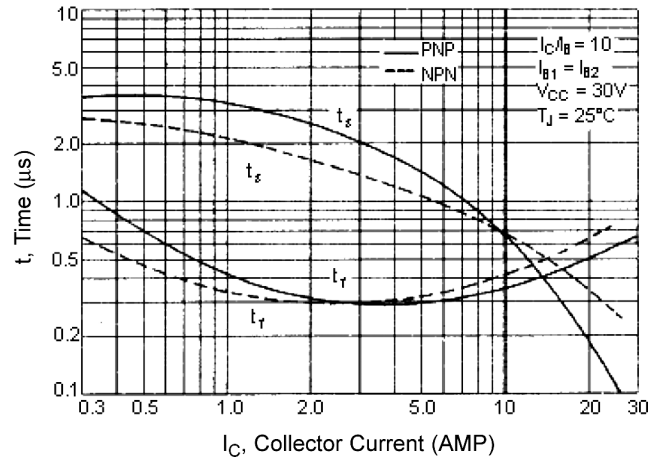


Figure - 4 Turn-On time

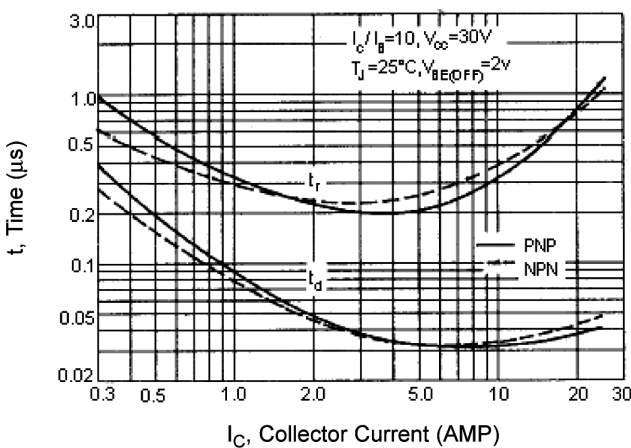


Figure - 5 Reverse Base Safe Operating Area

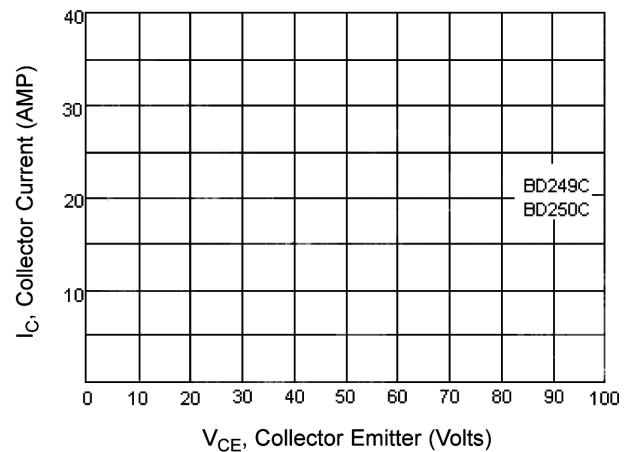
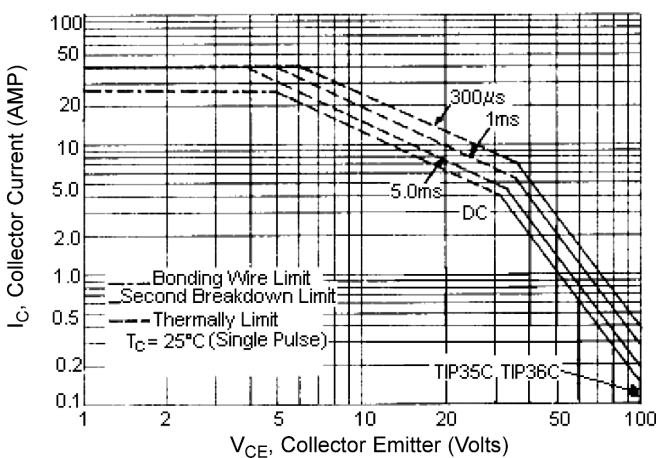
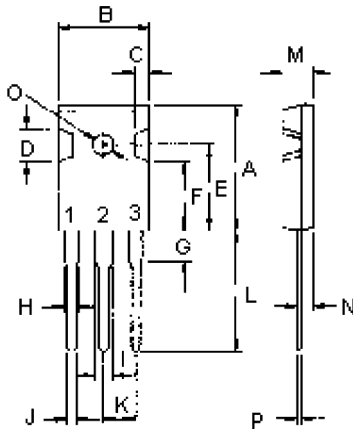


Figure - 6 Active Region Safe Operating Area



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  $T_{J(PK)} = 150^\circ C$ ;  $T_C$  is variable depending on conditions. Second breakdown pulse limits are valid for duty cycles to 10% provided  $T_{J(PK)} \leq 150^\circ C$ . 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

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