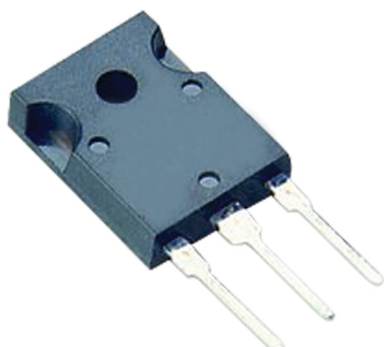


Complementary Power Transistor



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 $T_C = 25^\circ C$ 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	$^\circ C/W$

Complementary Power Transistor

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	

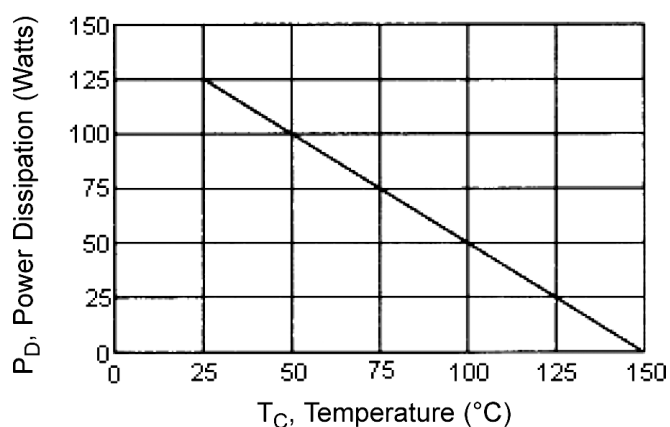
Dynamic Characteristics

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



Complementary Power Transistor

Figure - 2 DC Current Gain

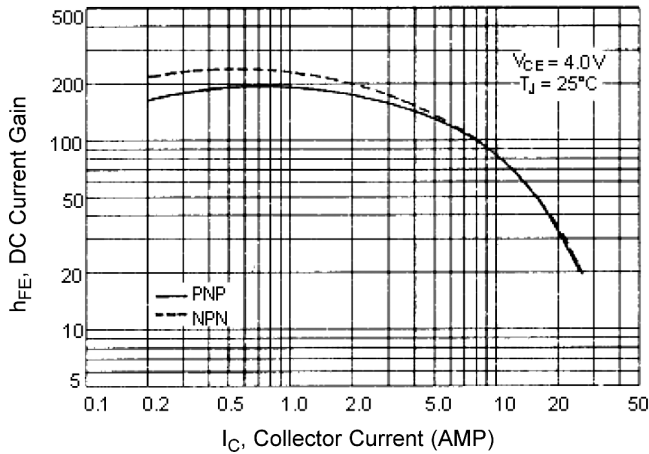


Figure - 3 Turn-Off Time

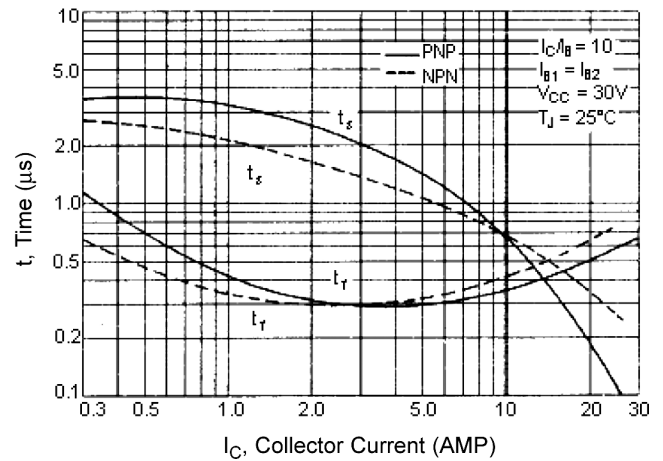


Figure - 4 Turn-On time

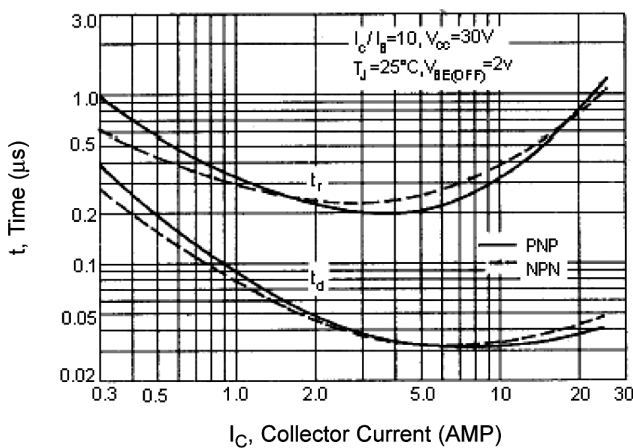


Figure - 5 Reverse Base Safe Operating Area

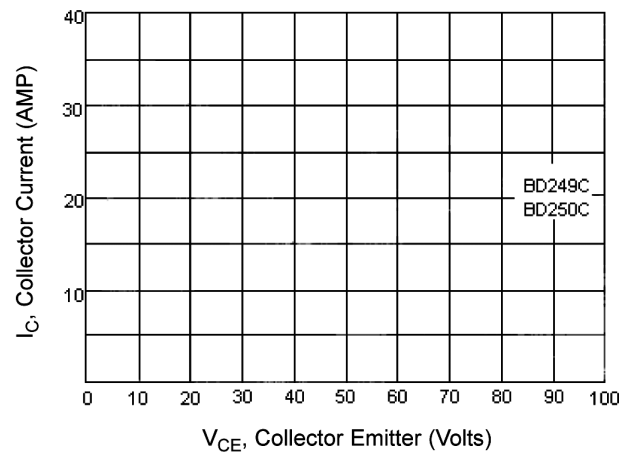
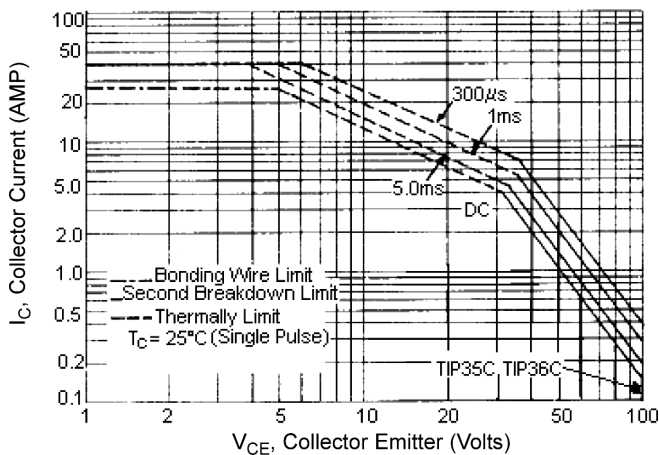


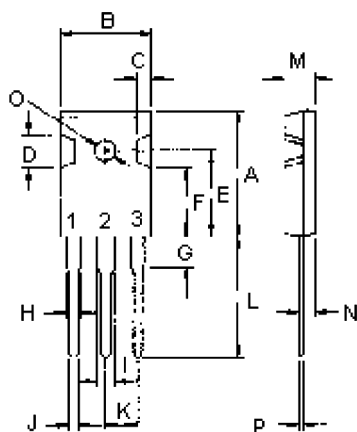
Figure - 6 Active Region Safe Operating Area



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.

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	BD249C
Transistor, PNP, TO-247	BD250C

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