

HIGH VOLTAGE NPN SILICON POWER TRANSISTORS

... designed for high voltage inverters, switching regulators and line operated amplifier applications.

FEATURES:

- * Collector-Emitter Sustaining Voltage-
 $V_{CEO(SUS)} = 250 \text{ V (Min) -2N6497}$
 $= 300 \text{ V (Min) -2N6498}$
 $= 350 \text{ V (Min) -2N6499}$
- * DC Current Gain
 $hFE = 10-75 @ I_C = 2.5 \text{ A}$

Boca Semiconductor Corp.
(BSC)

NPN
2N6497
2N6498
2N6499

5 AMPERE
POWER TRANSISTORS

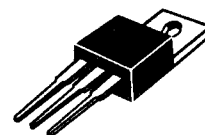
250-350 Volts
80 Watts

MAXIMUM RATINGS

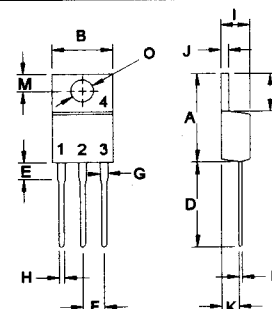
Characteristic	Symbol	2N6497	2N6498	2N6499	Unit
Collector-Emitter Voltage	V_{CEO}	250	300	350	V
Collector-Base Voltage	V_{CBO}	350	400	450	V
Emitter-Base Voltage	V_{EBO}	6.0			V
Collector Current - Continuous - Peak	I_C	5.0 10			A
Base Current	I_B	2.0			A
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	80 0.64			W W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{STG}	-65 to +150			$^\circ\text{C}$

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance Junction to Case	$R_{\theta JC}$	1.56	$^\circ\text{C/W}$



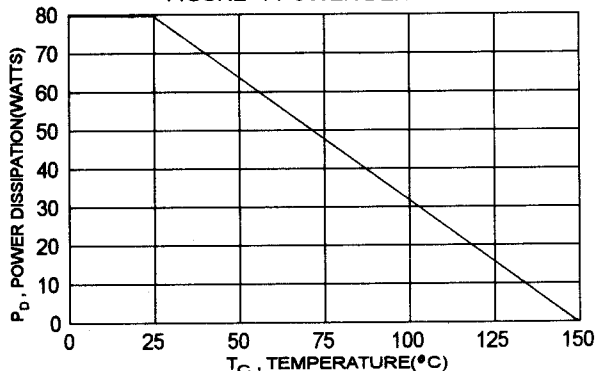
TO-220



PIN 1.BASE
2.COLLECTOR
3.EMITTER
4.COLLECTOR(CASE)

DIM	MILLIMETERS	
	MIN	MAX
A	14.68	15.31
B	9.78	10.42
C	5.01	6.52
D	13.06	14.62
E	3.57	4.07
F	2.42	3.66
G	1.12	1.36
H	0.72	0.96
I	4.22	4.98
J	1.14	1.38
K	2.20	2.97
L	0.33	0.55
M	2.48	2.98
O	3.70	3.90

FIGURE -1 POWER DERATING



ELECTRICAL CHARACTERISTICS ($T_c = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
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OFF CHARACTERISTICS

Collector - Emitter Sustaining Voltage (1) ($I_c = 25\text{ mA}$, $I_B = 0$)	2N6497 2N6498 2N6499	$V_{CEO(SUS)}$	250 300 350	V
Collector Cutoff Current ($V_{CE} = 350\text{ V}$, $V_{BE(off)} = 1.5\text{ V}$) ($V_{CE} = 400\text{ V}$, $V_{BE(off)} = 1.5\text{ V}$) ($V_{CE} = 450\text{ V}$, $V_{BE(off)} = 1.5\text{ V}$) ($V_{CE} = 175\text{ V}$, $V_{BE(off)} = 1.5\text{ V}$, $T_c = 100^\circ\text{C}$) ($V_{CE} = 200\text{ V}$, $V_{BE(off)} = 1.5\text{ V}$, $T_c = 100^\circ\text{C}$) ($V_{CE} = 225\text{ V}$, $V_{BE(off)} = 1.5\text{ V}$, $T_c = 100^\circ\text{C}$)	2N6497 2N6498 2N6499 2N6497 2N6498 2N6499	I_{CEX}	1.0 1.0 1.0 10 10 10	mA
Emitter Cutoff Current ($V_{EB} = 6.0\text{ V}$, $I_C = 0$)		I_{EBO}	1.0	mA

ON CHARACTERISTICS (1)

DC Current Gain ($I_c = 2.5\text{ A}$, $V_{CE} = 10\text{ V}$) ($I_c = 5.0\text{ A}$, $V_{CE} = 10\text{ V}$)		h_{FE}	10 3.0	75	
Collector-Emitter Saturation Voltage ($I_c = 2.5\text{ A}$, $I_B = 0.5\text{ A}$) ($I_c = 5.0\text{ A}$, $I_B = 2.0\text{ A}$)	2N6497 2N6498 2N6499 All Devices	$V_{CE(sat)}$		1.0 1.25 1.5 5.0	V
Base-Emitter Saturation Voltage ($I_c = 2.5\text{ A}$, $I_B = 0.5\text{ A}$) ($I_c = 5.0\text{ A}$, $I_B = 2.0\text{ A}$)		$V_{BE(sat)}$		1.5 2.5	V

DYNAMIC CHARACTERISTICS

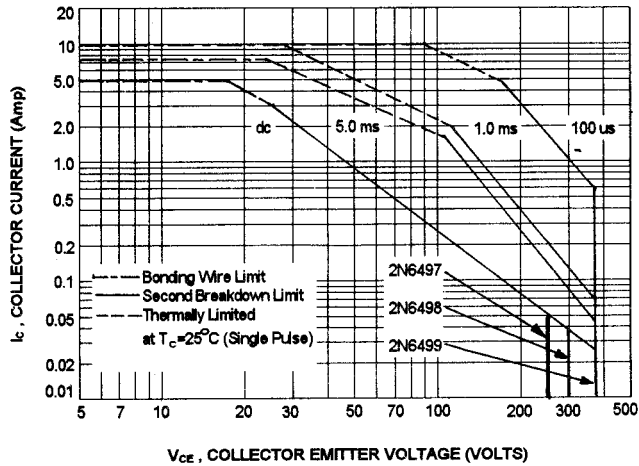
Current-Gain-Bandwidth Product (2) ($I_c = 250\text{ mA}$, $V_{CE} = 10\text{ V}$, $f = 1.0\text{ MHz}$)	f_T	5.0		MHz
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SWITCHING CHARACTERISTICS

Rise Time	$V_{CC} = 125\text{ V}$ $I_c = 2.5\text{ A}$ $I_{B1} = -I_{B2} = 0.5\text{ A}$ $t_p = 0.1\text{ ms}$ Duty Cycle $\leq 2.0\%$	t_r		1.0	us
Storage Time		t_s		2.5	us
Fall Time		t_f		1.0	us

(1) Pulse Test: Pulse width = $300\mu\text{s}$, Duty Cycle $\leq 2.0\%$ (2) $f_T = |h_{fe}| \cdot f_{test}$

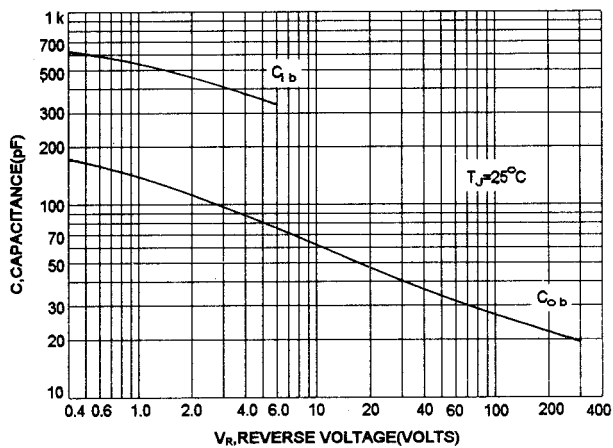
ACTIVE-REGION SAFE OPERATING AREA (SOA)



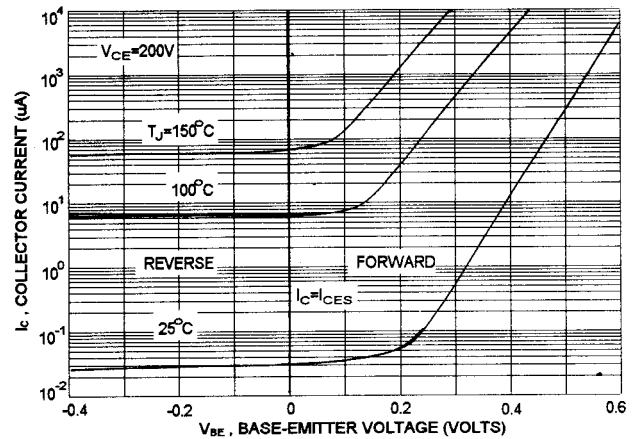
There are two limitation on the power handling ability of a transistor: average junction temperature and second breakdown safe operating area curves indicate I_C - V_{CE} limits of the transistor that must be observed for reliable operation i.e., the transistor must not be subjected to greater dissipation than curves indicate.

The data of SOA curve is base on $T_{J(PK)} = 150^\circ\text{C}$; T_C is variable depending on conditions. Second breakdown pulse limits are valid for duty cycles to 10% provided $T_{J(PK)} \leq 150^\circ\text{C}$. At high case temperatures, thermal limitation will reduce the power that can be handled to values less than the limitations imposed by second breakdown.

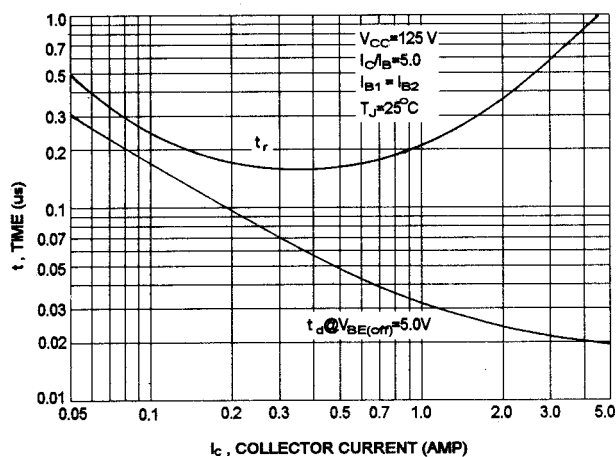
CAPACITANCES



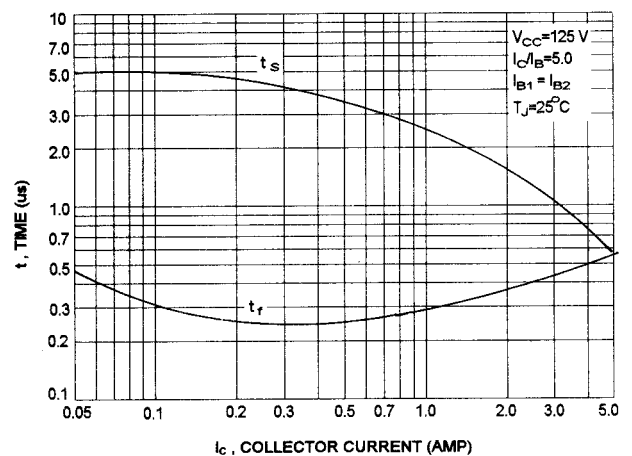
COLLECTOR CUT-OFF REGION



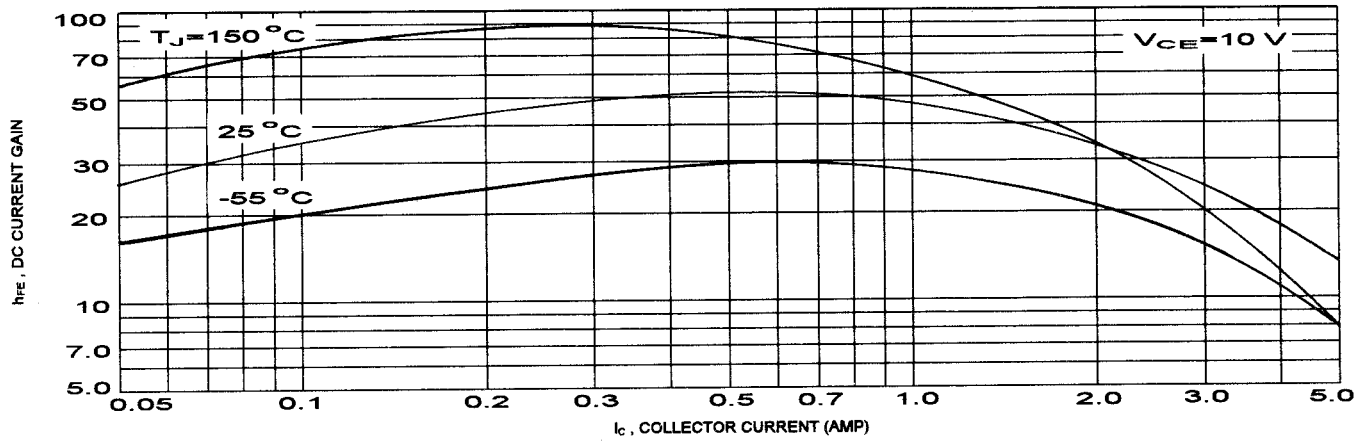
TURN-ON TIME



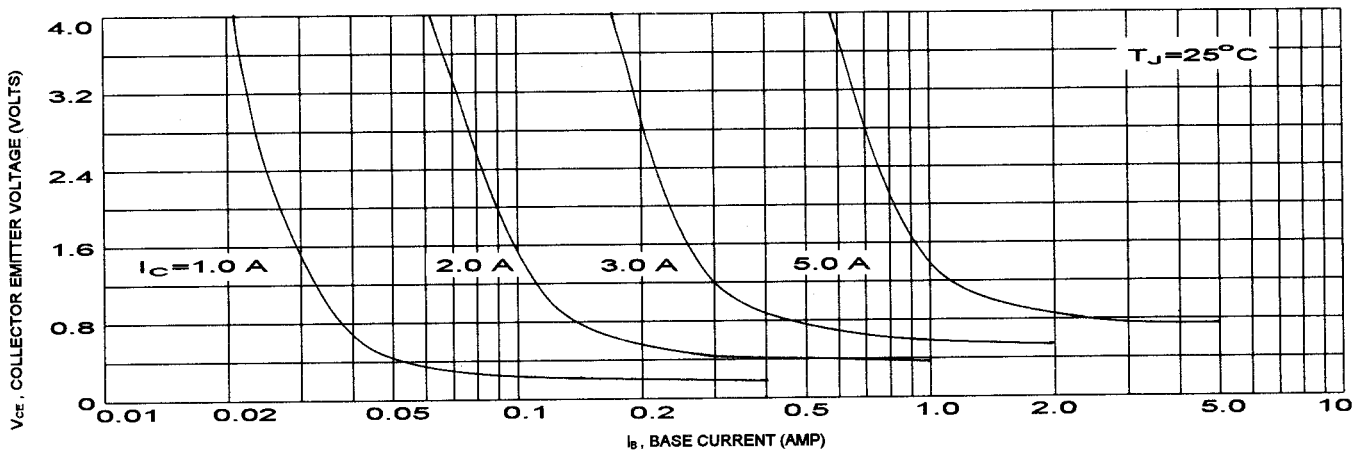
TURN-OFF TIME



DC CURRENT GAIN



COLLECTOR SATURATION REGION



"ON" VOLTAGES

