

NPN POWER TRANSISTOR

These devices are high voltage, high speed transistors for horizontal deflection output stages of TV's and CTV's circuits.

FEATURES:

- * Collector-Emitter Sustaining Voltage -
 $V_{CEV} = 330\text{ V (Min.) - BU407}$
 $= 400\text{ V (Min.) - BU406}$
- * Low Saturation Voltage
 $V_{CE(sat)} = 1.0\text{V (Max) @ } I_C = 5.0\text{A}$
- * Fast Switching Speed: $t_f = 0.75\text{ us (Max)}$

Boca Semiconductor Corp.
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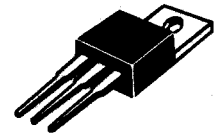
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NPN
BU406
BU407

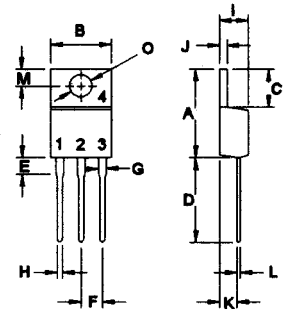
7 AMPERE
POWER
TRANSISTORS
150-200 VOLTS
60 WATTS

MAXIMUM RATINGS

Characteristic	Symbol	BU406	BU407	Unit
Collector-Emitter Voltage	V_{CEO}	200	150	V
Collector-Emitter Voltage	V_{CEV}	400	330	V
Collector-Base Voltage	V_{CBO}	400	330	V
Emitter-Base Voltage	V_{EBO}	6.0		V
Collector Current - Continuous - Peak	I_C	7.0 10		A
Base Current - Continuous	I_B	4.0		A
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	60 0.48		W W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{STG}	- 65 to +150		$^\circ\text{C}$



TO-220



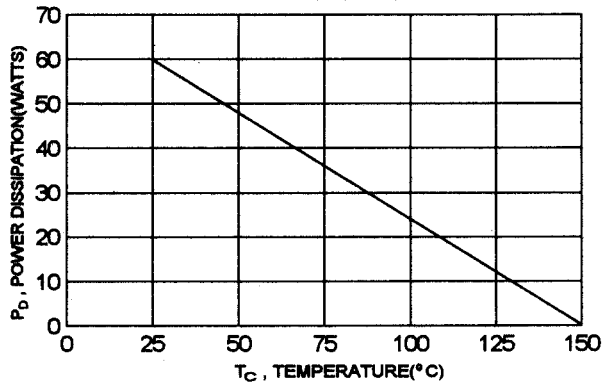
PIN 1.BASE
2.COLLECTOR
3.EMITTER
4.COLLECTOR(CASE)

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance Junction to Case	$R_{\theta jc}$	2.08	$^\circ\text{C/W}$

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) ($I_C = 100\text{ mA}$, $I_B = 0$)	BU406 BU407	$V_{CEO(sus)}$	200 150	V
Collector Cutoff Current ($V_{CE} = 400\text{ V}$, $V_{BE} = 0$) ($V_{CE} = 330\text{ V}$, $V_{BE} = 0$)	BU406 BU407	I_{CES}	5.0 5.0	mA
Emitter Cutoff Current ($V_{EB} = 6.0\text{ V}$, $I_C = 0$)		I_{EBO}	1.0	mA

ON CHARACTERISTICS (1)

DC Current Gain ($I_C = 2.0\text{ A}$, $V_{CE} = 5.0\text{ V}$)		h_{FE}	30(typ)	
Collector - Emitter Saturation Voltage ($I_C = 5.0\text{ A}$, $I_B = 0.5\text{ A}$)		$V_{CE(sat)}$	1.0	V
Base - Emitter Saturation Voltage ($I_C = 5.0\text{ A}$, $I_B = 0.5\text{ A}$)		$V_{BE(sat)}$	1.2	V

DYNAMIC CHARACTERISTICS

Current Gain - Bandwidth Product ($I_C = 0.5\text{ A}$, $V_{CE} = 10\text{ V}$, $f = 1.0\text{ MHz}$)		f_T	10	MHz
Output Capacitance ($V_{CE} = 10\text{ V}$, $I_E = 0$, $f = 1.0\text{ MHz}$)		C_{ob}	80(typ)	pF

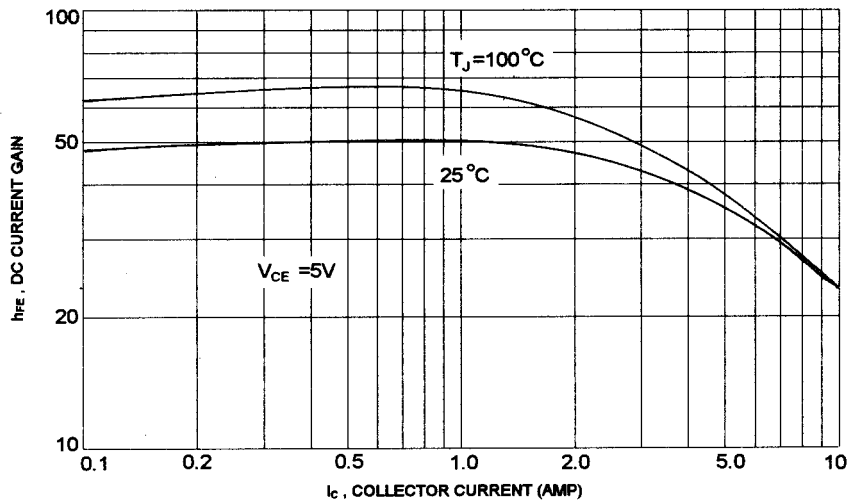
SWITCHING CHARACTERISTICS

Fall Time ($V_{CC} = 40\text{ V}$, $I_C = 5.0\text{ A}$, $I_{B1} = -I_{B2} = 0.6\text{ A}$, $L = 150\text{ }\mu\text{H}$)		t_f	0.75	us
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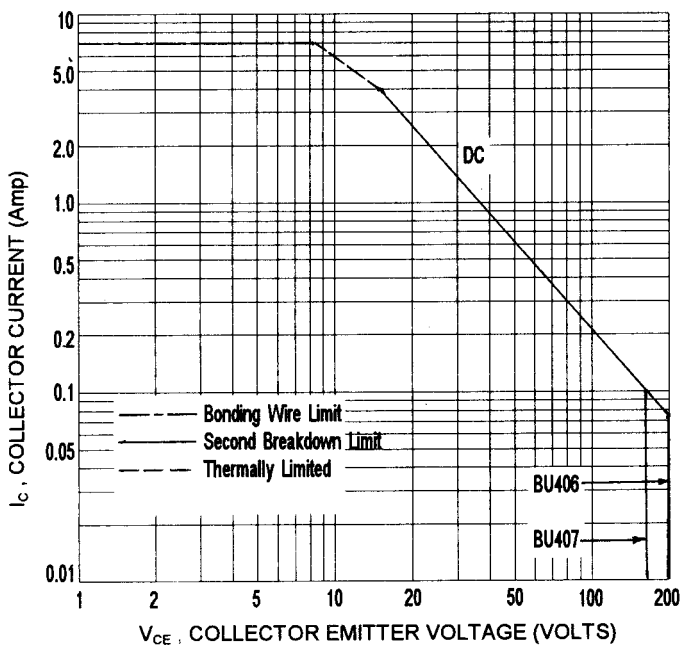
(1) Pulse Test: Pulse width $\leq 300\text{ }\mu\text{s}$, Duty Cycle $\leq 2.0\%$

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DC CURRENT GAIN



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.