

SWITCHMODE SERIES NPN POWER TRANSISTORS

... designed for use in high-voltage, high-speed, power switching in inductive circuit, they are particularly suited for 115 and 220 V switchmode applications such as switching regulator's, inverters.

FEATURES:

* Collector-Emitter Sustaining Voltage -

$$V_{CE(sus)} = 400 \text{ V (Min)}$$

* Collector-Emitter Saturation Voltage -

$$V_{CE(sat)} = 0.7 \text{ V (Max.) @ } I_C = 3.0 \text{ A, } I_B = 0.3 \text{ A}$$

* Switching Time - $t_f = 0.7 \text{ us (Max.) @ } I_C = 3.0 \text{ A}$

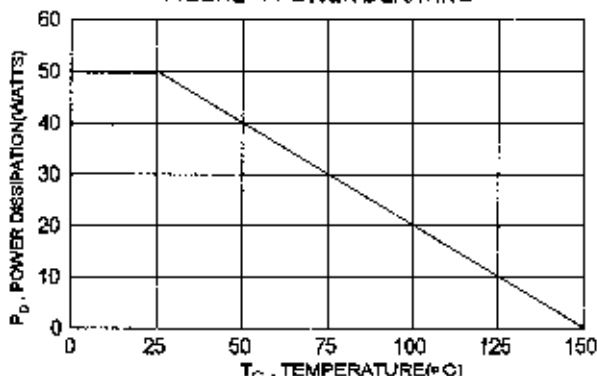
MAXIMUM RATINGS

Characteristic	Symbol	2SC2502	Unit
Collector-Emitter Voltage	V_{CEO}	400	V
Collector-Base Voltage	V_{CBO}	500	V
Emitter-Base Voltage	V_{EBO}	7.0	V
Collector Current - Continuous - Peak	I_C I_{CM}	6.0 12	A
Base current	I_B	2.0	A
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	50 0.4	W W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance Junction to Case	$R_{\theta jc}$	2.5	$^\circ\text{C/W}$

FIGURE -1 POWER DERATING



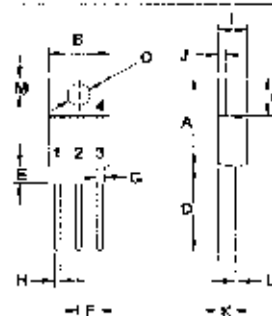
NPN

2SC2502

**6.0 AMPERE
SILICON POWER
TRANSISTORS
400 VOLTS
50 WATTS**



TO-220



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

DIM	MILLIMETERS	
	MIN	MAX
A	14.88	15.31
B	9.78	10.42
C	5.01	8.52
D	13.06	14.62
E	3.57	4.07
F	2.42	3.66
G	1.12	1.36
H	0.72	0.98
I	4.22	4.98
J	1.14	1.38
K	2.20	2.97
L	0.33	0.56
M	2.48	2.98
Q	3.70	3.90

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 ($I_C = 100\text{ mA}$, $I_B = 0$)	$V_{CE(sus)}$	400		V
Collector Cutoff Current ($V_{CE} = 320\text{ V}$, $I_B = 0$)	I_{CEO}		100	μA
Collector Cutoff Current ($V_{CB} = 500\text{ V}$, $I_E = 0$)	I_{CBO}		100	μA
Emitter Cutoff Current ($V_{EB} = 7.0\text{ V}$, $I_C = 0$)	I_{EBO}		1.0	mA

ON CHARACTERISTICS (1)

DC Current Gain ($I_C = 3.0\text{ A}$, $V_{CE} = 2.0\text{ V}$) ($I_C = 6.0\text{ A}$, $V_{CE} = 2.0\text{ V}$)	h_{FE}	15 8.0		
Collector-Emitter Saturation Voltage ($I_C = 3.0\text{ A}$, $I_B = 300\text{ mA}$)	$V_{CE(sat)}$		0.7	V
Base-Emitter Saturation Voltage ($I_C = 3.0\text{ A}$, $I_B = 300\text{ mA}$)	$V_{BE(sat)}$		1.5	V

DYNAMIC CHARACTERISTICS

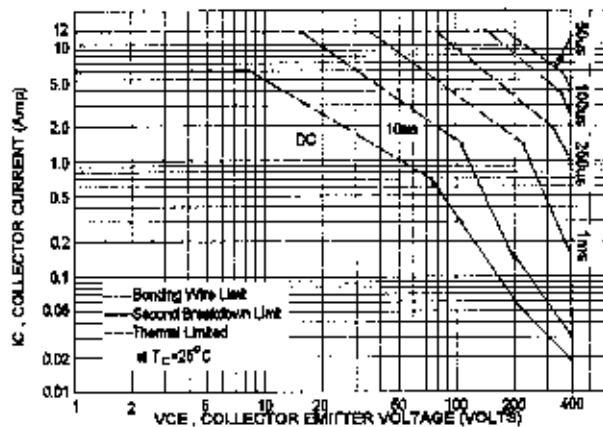
Current-Gain-Bandwidth Product ($I_C = 0.6\text{ A}$, $V_{CE} = 10\text{ V}$, $f = 1.0\text{ MHz}$)	f_T	10		MHz
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SWITCHING CHARACTERISTICS

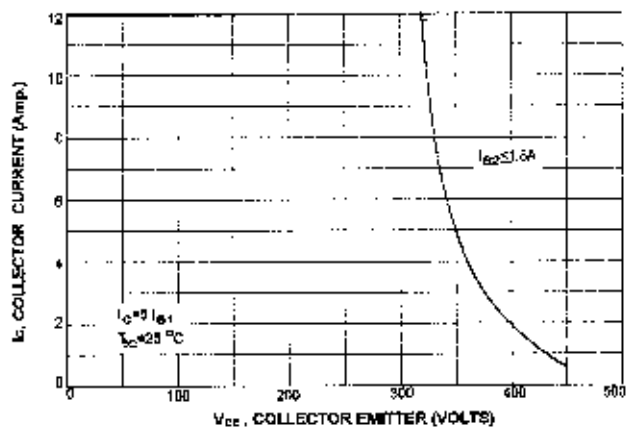
On Time	$V_{CC} = 30\text{ V}$, $I_C = 3.0\text{ A}$ $I_{B1} = I_{B2} = 600\text{ mA}$ $R_L = 10\text{ ohm}$	t_{on}	1.0	μs
Storage Time		t_s	3.0	μs
Fall Time		t_f	0.7	μs

(1) Pulse Test: Pulse Width $\approx 300\text{ }\mu\text{s}$, Duty Cycle $\leq 2.0\%$

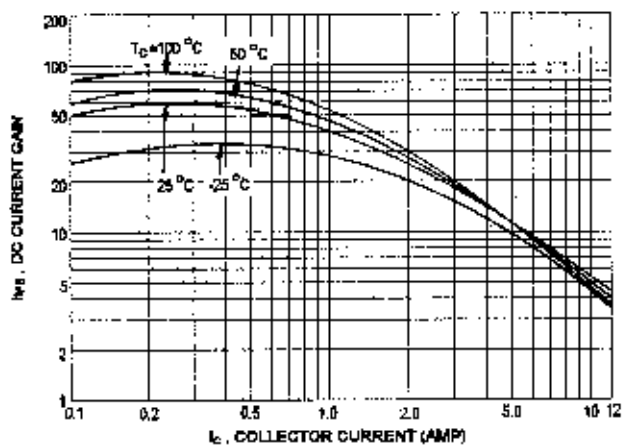
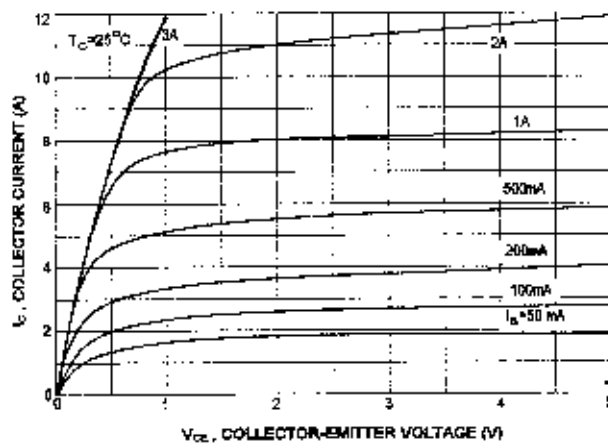
SAFE OPERATING AREA



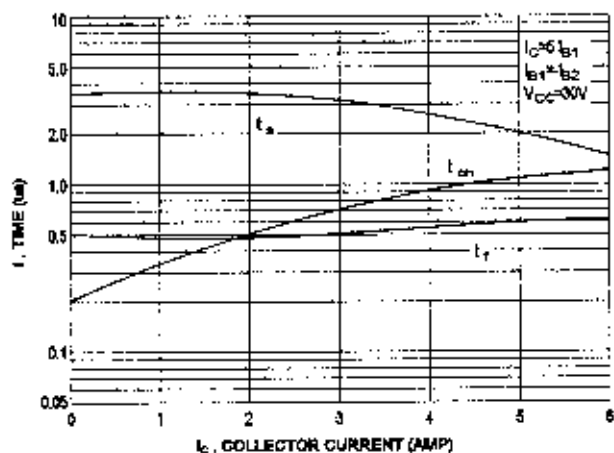
REVERSE BIASE SAFE OPERATING AREA



DC CURRENT GAIN

 $I_C - V_{CE}$ 

SWITCHING TIME



COLLECTOR SATURATION REGION

