

6367254 MOTOROLA SC (XSTRS/R F)

96D 80871 D

T-33-13

**MOTOROLA SEMICONDUCTOR TECHNICAL DATA**

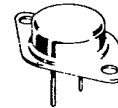
**BUX42**

**SWITCHMODE<sup>A</sup> SERIES  
NPN SILICON POWER TRANSISTOR**

... designed for high speed, high voltage, high power applications.

- Low  $V_{CE(sat)}$ .  $V_{CE(sat)}$  max. = 1.2 V at  $I_C = 4$  A
- Very fast switching times:  
 $T_F$  max. = 0.4  $\mu$ s at  $I_C = 6$  A

**12 AMPERES  
NPN SILICON  
POWER  
METAL TRANSISTOR  
250 VOLTS  
120 WATTS**

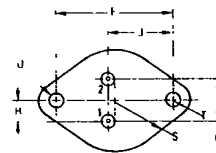
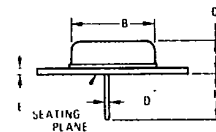


**MAXIMUM RATINGS**

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	$V_{CEO(sus)}$	250	Vdc
Collector-Base Voltage	$V_{CBO}$	300	Vdc
Emitter-Base Voltage	$V_{EBO}$	7	Vdc
Collector-Emitter Voltage ( $V_{BE} = -2.5$ V)	$V_{CEX}$	300	Vdc
Collector-Emitter Voltage ( $R_{BE} = 100 \Omega$ )	$V_{CER}$	290	Vdc
Collector-Current — continuous	$I_C$	12	A dc
— peak ( $p_w \leq 10$ ms)	$I_{CM}$	15	A pk
Base-Current continuous	$I_B$	2.4	A dc
Total Power Dissipation @ $T_C = 25^\circ C$	$P_D$	120	Watts
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-65 to 200	$^\circ C$

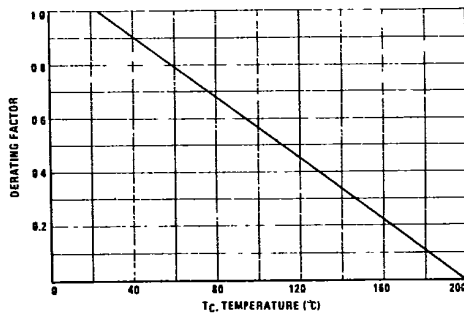
**THERMAL CHARACTERISTICS**

Characteristic	Symbol	Max.	Unit
Thermal Resistance, Junction to Case	$\theta_{JC}$	1.46	$^\circ C/W$



STYLE 1  
PIN 1 BASE  
2 EMITTER  
CASE COLLECTOR

FIGURE 1 — POWER DERATING



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
B	—	2.23	—	0.875
C	0.35	11.43	0.250	0.450
D	0.97	1.03	0.038	0.043
E	—	3.43	—	0.135
F	29.40	30.40	1.177	1.197
G	10.67	11.18	0.420	0.440
H	5.21	5.72	0.205	0.225
J	16.64	17.15	0.655	0.675
K	—	2.92	—	0.312
Q	3.84	4.00	0.151	0.161
S	—	13.34	—	0.525
T	—	4.78	—	0.188

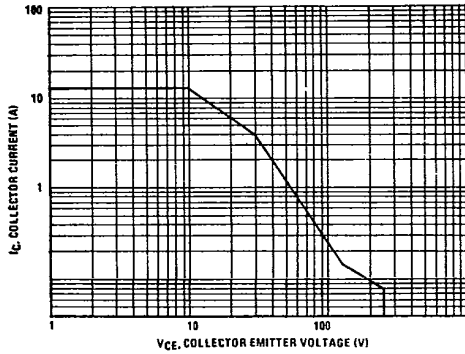
All JEDEC dimensions and pin 1 supply  
CASE 1 03  
(TO 3)



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FIGURE 2 - 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 IC VCE 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 figure 2 is based on TC = 25 C. TJ(pk) is variable depending on power level. Second breakdown limitations do not derate the same as thermal limitations. At high case temperatures, thermal limitations will reduce the power that can be handled to values less than the limitations imposed by second breakdown. (See AN415A)

FIGURE 3 - "ON" VOLTAGES

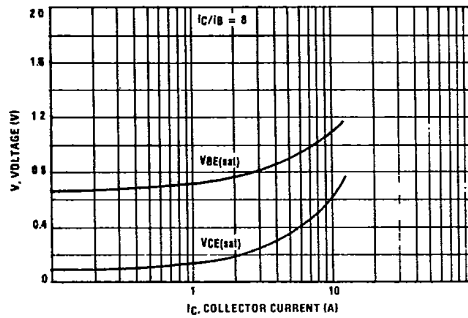


FIGURE 4 - DC CURRENT GAIN

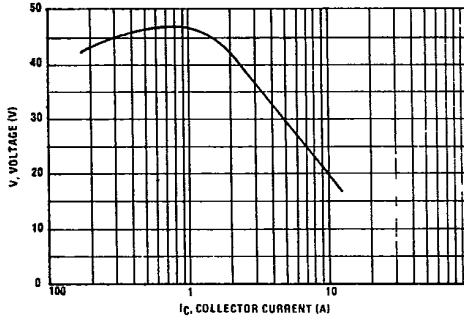


FIGURE 5 - RESISTIVE SWITCHING PERFORMANCE

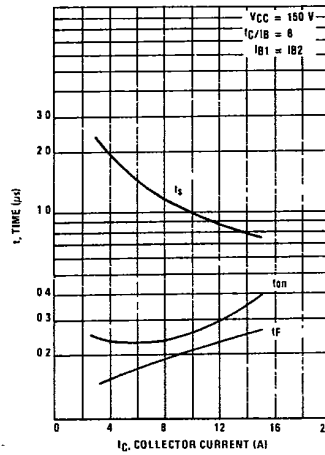
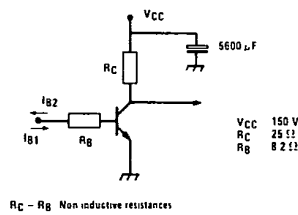


FIGURE 6 - SWITCHING TIMES TEST CIRCUIT





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