

## PNP SILICON POWER TRANSISTORS

...designed for use in power amplifier applications

### FEATURES:

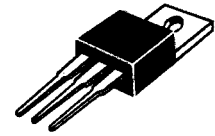
- \* Low Collector-Emitter Saturation Voltage  
 $V_{CE(sat)} = 0.4 \text{ V(Max) @ } I_C = 3.0\text{A}, I_B = 0.15\text{A}$
- \* DC Current Gain  
 $hFE = 70-240 @ I_C = 1.0\text{A}$
- \* High Speed Switching Time  
 $t_{stg} = 1.0 \text{ us (Typ.)}$

**PNP  
2SA1012**

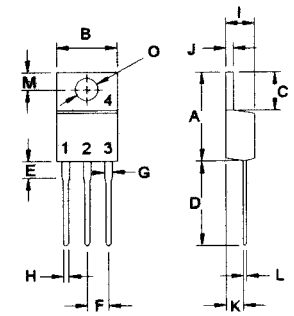
**5 AMPERE  
POWER  
TRANSISTORS  
50 VOLTS  
25 WATTS**

### MAXIMUM RATINGS

Characteristic	Symbol	2SA1012	Unit
Collector-Emitter Voltage	$V_{CEO}$	50	V
Collector-Base Voltage	$V_{CBO}$	60	V
Emitter-Base Voltage	$V_{EBO}$	5	V
Collector Current - Continuous - Peak	$I_C$ $I_{CM}$	5 8	A
Base current	$I_B$	1	A
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	25 0.2	W W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$



**TO-220**



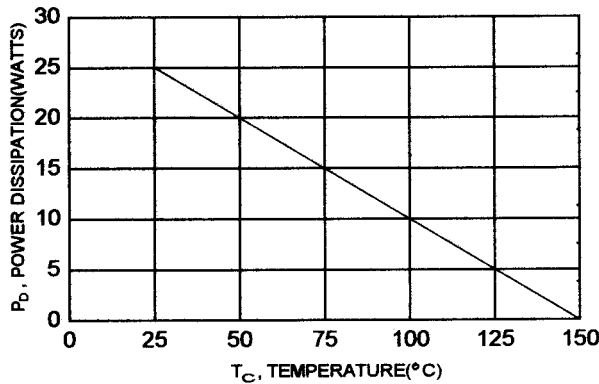
PIN 1.BASE  
2.COLLECTOR  
3.EMITTER  
4.COLLECTOR(CASE)

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

### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance Junction to Case	$R_{\theta jc}$	5.0	$^\circ\text{C/W}$

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 Breakdown Voltage ( $I_c = 10\text{ mA}$ , $I_B = 0$ )	$V_{(BR)CEO}$	50		V
Collector Cutoff Current ( $V_{CB} = 50\text{ V}$ , $I_E = 0$ )	$I_{CBO}$		10	$\mu\text{A}$
Emitter Cutoff Current ( $V_{EB} = 5.0\text{ V}$ , $I_C = 0$ )	$I_{EBO}$		10	$\mu\text{A}$

## ON CHARACTERISTICS (1)

DC Current Gain ( $I_c = 1.0\text{ A}$ , $V_{CE} = 1.0\text{ V}$ )* ( $I_c = 3.0\text{ A}$ , $V_{CE} = 1.0\text{ V}$ )	$h_{FE(2)}$ $h_{FE}$	70 30	240	
Collector-Emitter Saturation Voltage ( $I_c = 3.0\text{ A}$ , $I_B = 150\text{ mA}$ )	$V_{CE(sat)}$		0.4	V
Base-Emitter Saturation Voltage ( $I_c = 3.0\text{ A}$ , $I_B = 150\text{ mA}$ )	$V_{BE(sat)}$		1.2	V

## DYNAMIC CHARACTERISTICS

Current-Gain-Bandwidth Product ( $I_c = 1.0\text{ A}$ , $V_{CE} = 4.0\text{ V}$ , $f = 1.0\text{ MHz}$ )	$f_T$	10		MHz
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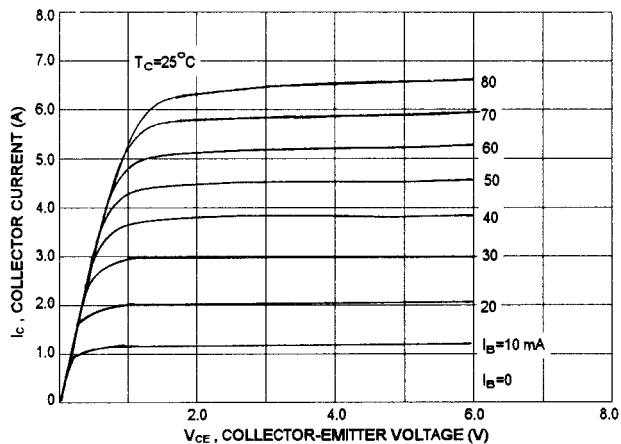
## SWITCHING CHARACTERISTICS

Turn-on Time	$V_{CC} = 30\text{ V}$ , $I_c = 3.0\text{ A}$ $I_{B1} = -I_{B2} = 150\text{ mA}$ $PW = 20\text{ us}$	$t_{on}$	0.2(typ)		$\mu\text{s}$
Storage Time		$t_s$	1.0(typ)		$\mu\text{s}$
Fall Time		$t_f$	0.2(typ)		$\mu\text{s}$

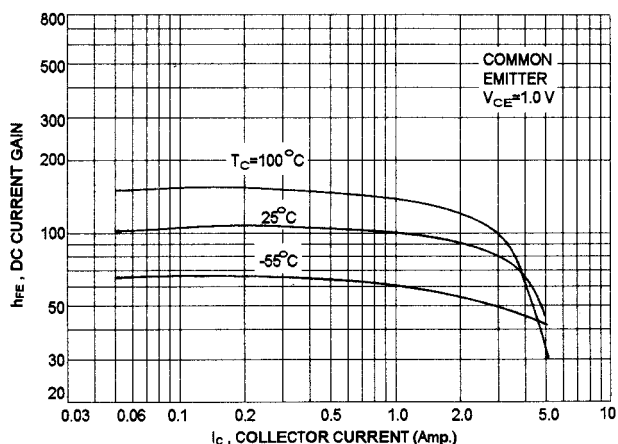
(1) Pulse Test: Pulse Width = 300  $\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ \*  $h_{FE(2)}$  Classification :

70	O	140	120	Y	240
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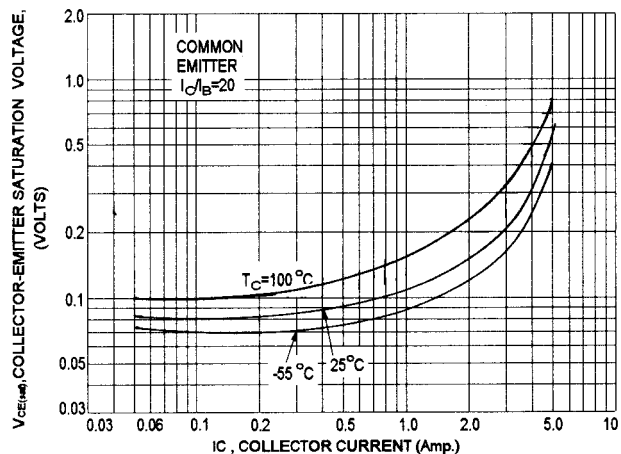
Ic - Vce



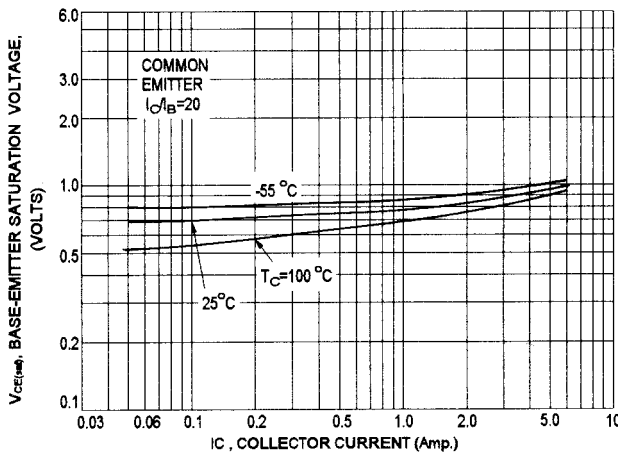
DC CURRENT GAIN



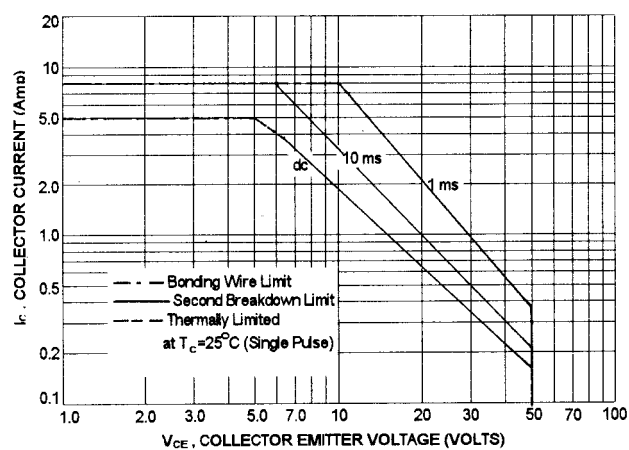
Vce(sat) - Ic



Vbe(sat) - Ic



ACTIVE-REGION SAFE OPERATING AREA



Ic - Vbe

