

## PNP SILICON POWER TRANSISTORS

...designed for use in power amplifier applications

### FEATURES:

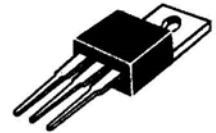
- \* Low Collector-Emitter Saturation Voltage  
 $V_{CE(sat)} = 0.4 \text{ V(Max) @ } I_C = 3.0\text{A}, I_B = 0.15\text{A}$
- \* DC Current Gain  
 $hFE = 70-240 @ I_C = 1.0\text{A}$
- \* High Speed Switching Time  
 $t_{stg} = 1.0 \text{ us (Typ.)}$

**PNP  
2SA1012**

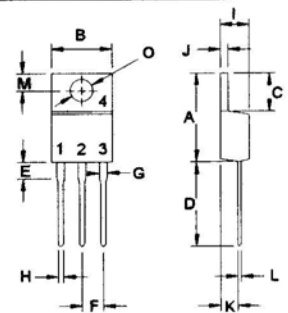
**5 AMPERE  
POWER  
TRANSISTORS  
50 VOLTS  
25 WATTS**

### 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	$I_C$	5	A
- Peak	$I_{CM}$	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**



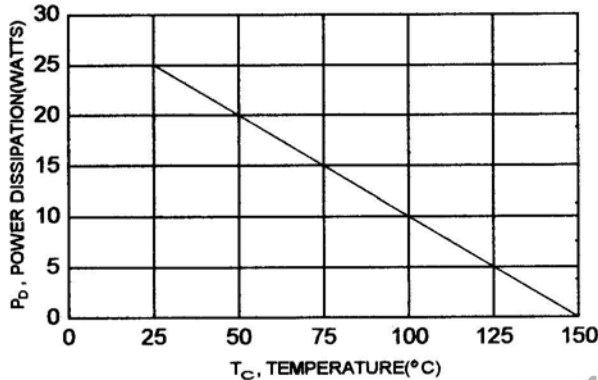
PIN 1.BASE  
2.COLLECTOR  
3.EMITTER  
4.COLLECTOR(CASE)

DIM	MILLIMETERS	
	MIN	MAX
A	14.68	16.00
B	9.78	10.42
C	5.02	6.60
D	13.00	14.62
E	3.10	4.19
F	2.41	2.67
G	1.10	1.67
H	0.69	1.01
I	3.21	4.98
J	1.14	1.40
K	2.20	3.30
L	0.28	0.61
M	2.48	3.00
O	3.50	4.00

### 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
----------------	--------	-----	-----	------

## 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
--	-------	----	--	-----

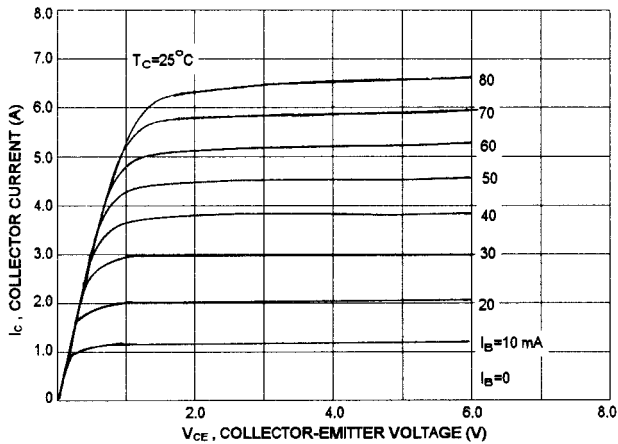
## SWITCHING CHARACTERISTICS

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

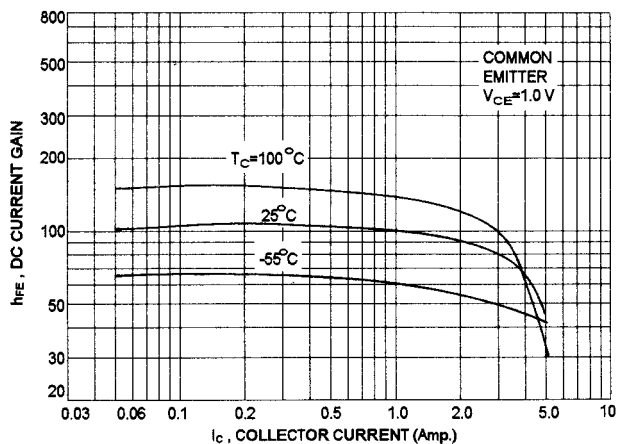
(1) Pulse Test: Pulse Width = 300  $\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ \*  $h_{FE(2)}$  Classification :

70	O	140	120	Y	240
----	---	-----	-----	---	-----

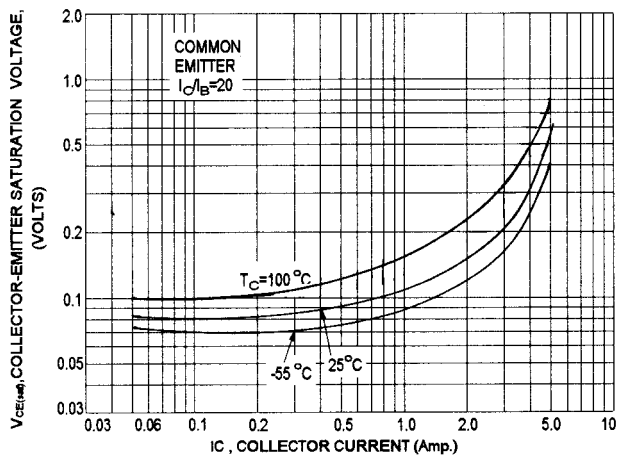
Ic - Vce



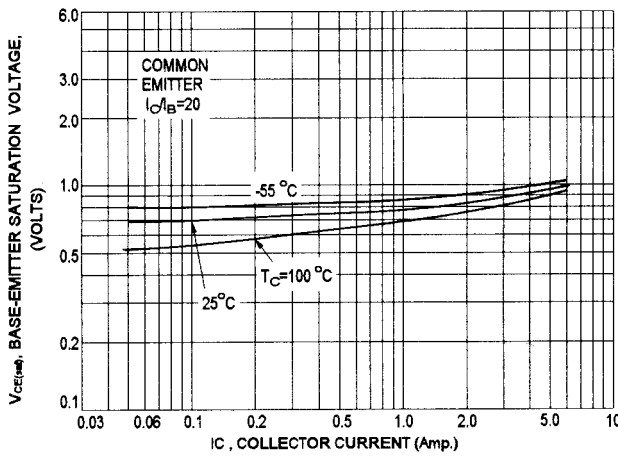
DC CURRENT GAIN



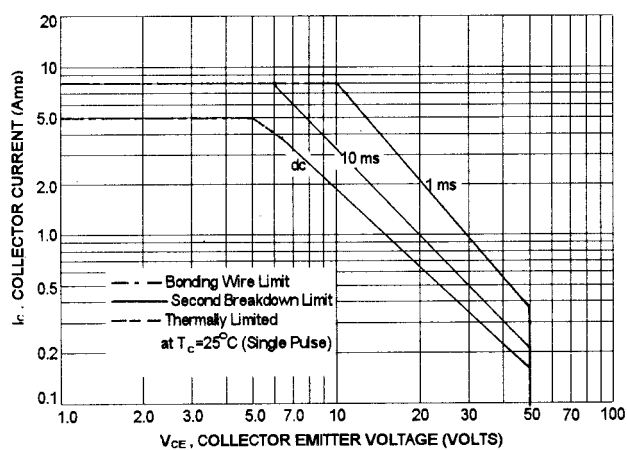
Vce(sat) - Ic



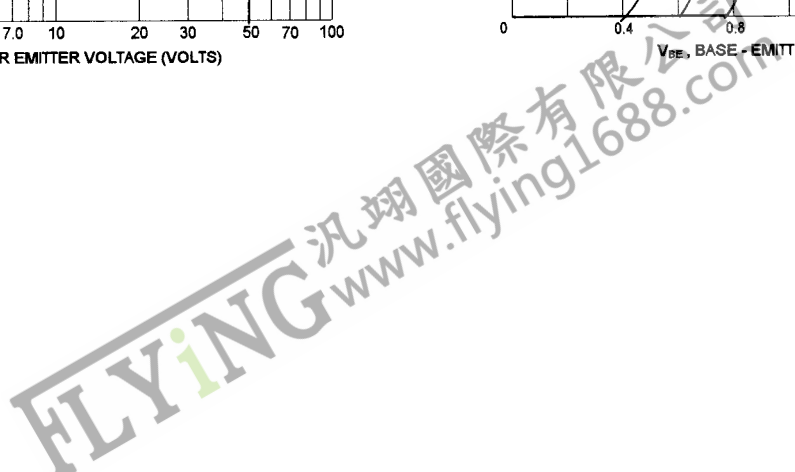
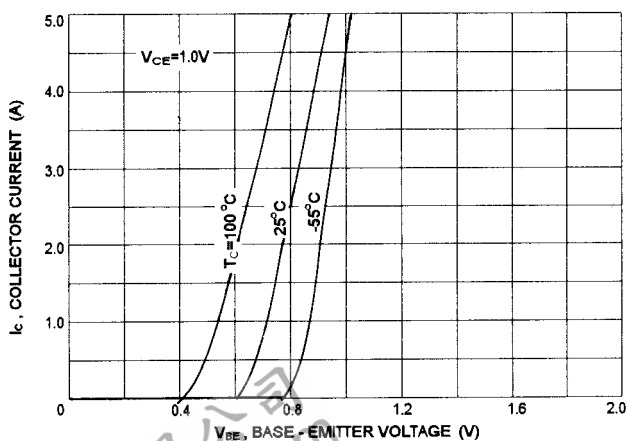
Vbe(sat) - Ic



ACTIVE-REGION SAFE OPERATING AREA



Ic - Vbe



## Notice

MOSPEC reserves the rights to make changes of the content herein the document anytime without notification. MOSPEC or anyone on its behalf, assumes no responsibility or liability for any errors or inaccuracies. Please refer to MOSPEC website for the last document.

MOSPEC disclaims any and all liability arising out of the application or use of any product including damages incidentally and consequentially incurred.

Application shown on the herein document are examples of standard use and operation. Customers are responsible for comprehending suitable use in particular applications. MOSPEC makes no representation or warranty that such application will be suitable for the specified use without further testing or modification.

The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by MOSPEC for any infringements of patents or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of MOSPEC or others.

These MOSPEC products are intended for usage in general electronic equipment. Please make sure to consult with MOSPEC before you use these MOSPEC products in equipment which require specialized quality and/or reliability, and in equipment which could have major impact to the welfare of human life ( atomic energy control, aeronautics , traffic control, combustion control, safety devices etc.)