

## HIGH-POWER PNP SILICON POWER TRANSISTORS

...designed for use in general-purpose amplifier and switching application .

### FEATURES:

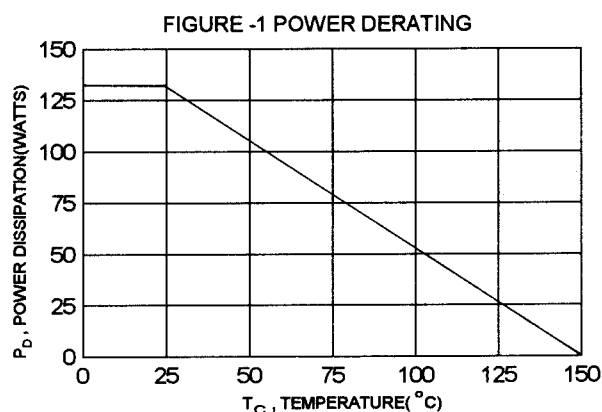
- \* Recommend for 105W High Fidelity Audio Frequency Amplifier Output stage
- \* Complementary to 2SC3519 & 2SC3519A

### MAXIMUM RATINGS

Characteristic	Symbol	2SA1386	2SA1386A	Unit
Collector-Emitter Voltage	$V_{CEO}$	160	180	V
Collector-Base Voltage	$V_{CBO}$	160	180	V
Emitter-Base Voltage	$V_{EBO}$	5.0		V
Collector Current - Continuous - Peak	$I_C$ $I_{CM}$	15 20		A
Base current	$I_B$	4.0		A
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	130 1.04		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	$R_{\theta jc}$	0.961	$^\circ\text{C/W}$

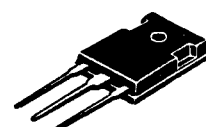


PNP

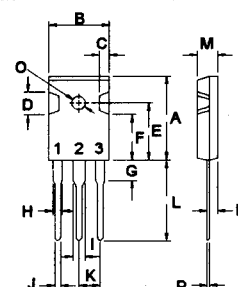
**2SA1386**  
**2SA1386A**

**15 AMPERE**  
**POWER**  
**TRANSISTOR**

**160 -180 VOLTS**  
**130 WATTS**



**TO-247(3P)**



PIN 1.BASE  
2.COLLECTOR  
3.EMITTER

DIM	MILLIMETERS	
	MIN	MAX
A	20.63	22.38
B	15.38	16.20
C	1.90	2.70
D	5.10	6.10
E	14.81	15.22
F	11.72	12.84
G	4.20	4.50
H	1.82	2.46
I	2.92	3.23
J	0.89	1.53
K	5.26	5.66
L	18.50	21.50
M	4.68	5.36
N	2.40	2.80
O	3.25	3.65
P	0.55	0.70

**TO-247(3P)**

**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 ( $I_C = 25\text{ mA}$ , $I_B = 0$ ) 2SA1386 2SA1386A	$V_{(BR)CEO}$	160 180		V
Collector Cutoff Current ( $V_{CB} = 160\text{ V}$ , $I_E = 0$ ) ( $V_{CB} = 180\text{ V}$ , $I_E = 0$ ) 2SA1386 2SA1386A	$I_{CBO}$		100 100	$\mu\text{A}$
Emitter Cutoff Current ( $V_{EB} = 5.0\text{ V}$ , $I_C = 0$ )	$I_{EBO}$		100	$\mu\text{A}$

**ON CHARACTERISTICS (1)**

DC Current Gain ( $I_C = 5.0\text{ A}$ , $V_{CE} = 4.0\text{ V}$ )	$h_{FE}$	50		
Collector-Emitter Saturation Voltage ( $I_C = 5.0\text{ A}$ , $I_B = 500\text{ mA}$ )	$V_{CE(sat)}$		2.0	V

**DYNAMIC CHARACTERISTICS**

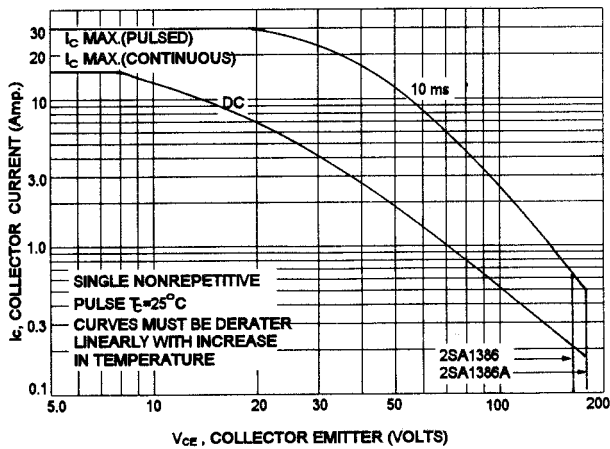
Current-Gain-Bandwidth Product ( $I_C = 2.0\text{ A}$ , $V_{CE} = 12\text{ V}$ , $f = 1.0\text{ MHz}$ )	$f_T$	10		MHz
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**SWITCHING CHARACTERISTICS**

Turn-on Time	$V_{CC} = 40\text{ V}$ , $I_C = 10\text{ A}$ $I_{B1} = -I_{B2} = 1.0\text{ A}$ $R_L = 4\text{ ohm}$	$t_{on}$	0.30(typ)		$\mu\text{s}$
Storage Time		$t_s$	0.75(typ)		$\mu\text{s}$
Fall Time		$t_f$	0.25(typ)		$\mu\text{s}$

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

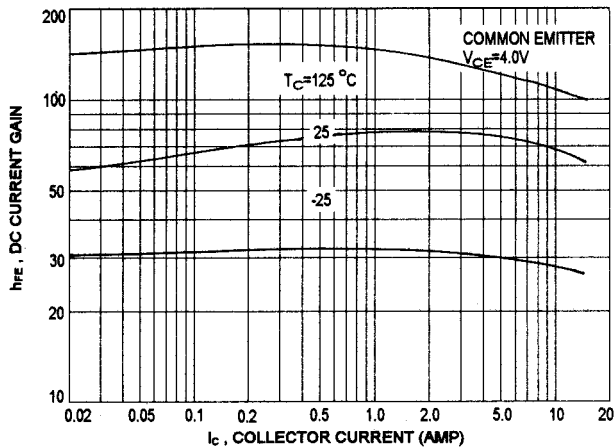
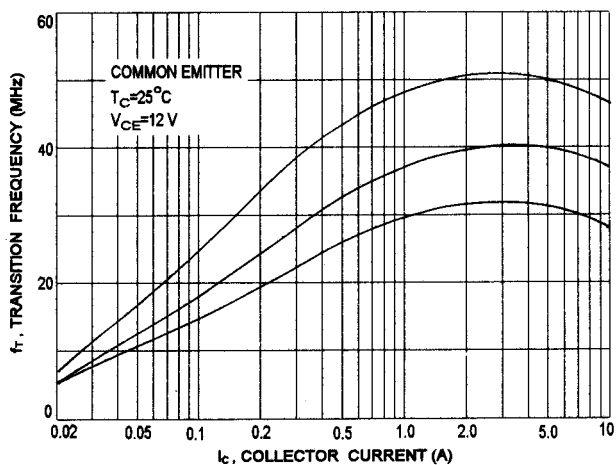
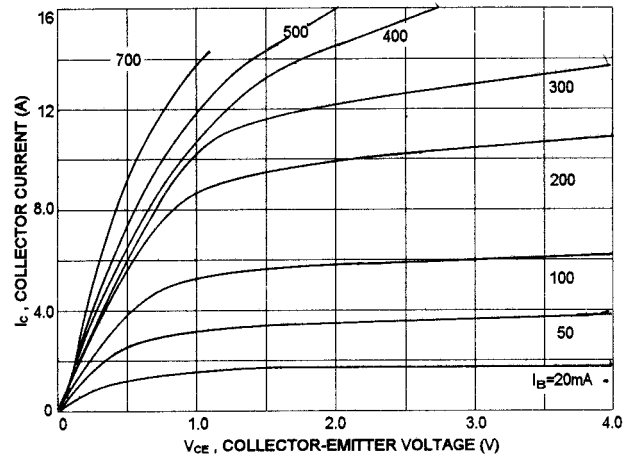
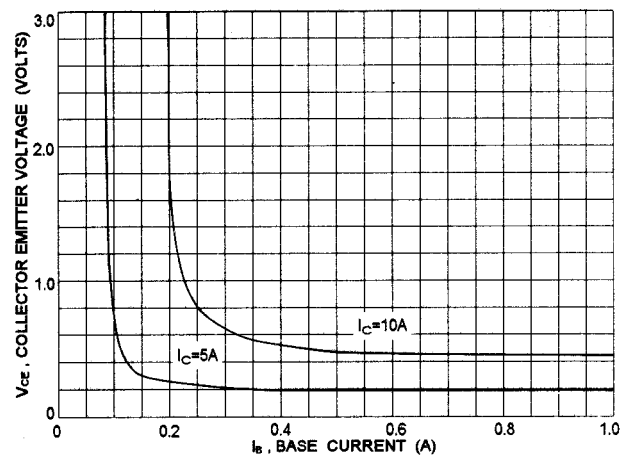
## ACTIVE REGION SAFE OPERATING AREA (SOA)



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 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.

## DC CURRENT GAIN

 $f_T$  -  $I_C$  $I_C$  -  $V_{CE}$  $V_{CE(sat)}$  -  $I_B$ 

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