

## HIGH-POWER NPN SILICON POWER TRANSISTORS

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

### FEATURES:

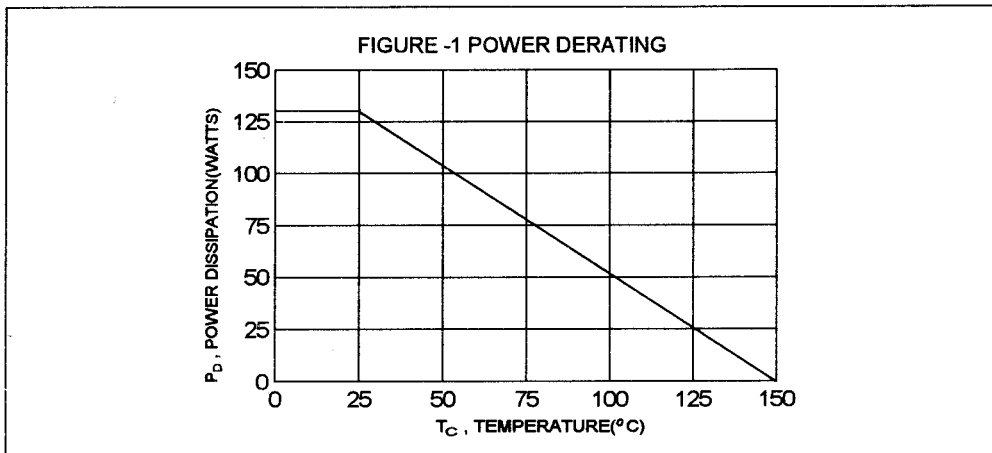
- \* Recommend for 105W High Fidelity Audio Frequency Amplifier Output stage
- \* Complementary to 2SA1386 & 2SA1386A

### MAXIMUM RATINGS

Characteristic	Symbol	2SC3519	2SC3519A	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 @ $T_C = 25^\circ C$ Derate above $25^\circ C$	$P_D$	130	1.04	W W/ $^\circ C$
Operating and Storage Junction Temperature Range	$T_J, T_{STG}$	-55 to +150		$^\circ C$

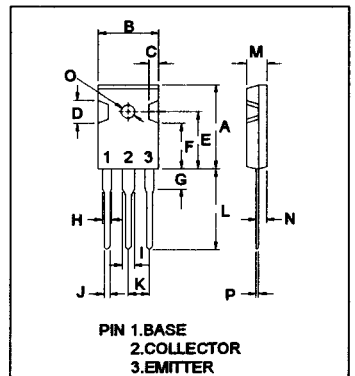
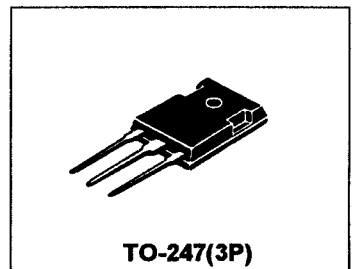
### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance Junction to Case	$R_{\theta jc}$	0.961	$^\circ C/W$



**NPN**  
**2SC3519**  
**2SC3519A**

**15 AMPERE**  
**SILICON POWER**  
**TRANSISTOR**  
**160 -180 VOLTS**  
**130 WATTS**



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

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 ( $I_C = 25\text{ mA}$ , $I_B = 0$ )	2SC3519 2SC3519A	$V_{(BR)CEO}$	160 180	V
Collector Cutoff Current ( $V_{CB} = 160\text{ V}$ , $I_E = 0$ ) ( $V_{CB} = 180\text{ V}$ , $I_E = 0$ )	2SC3519 2SC3519A	$I_{CBO}$	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

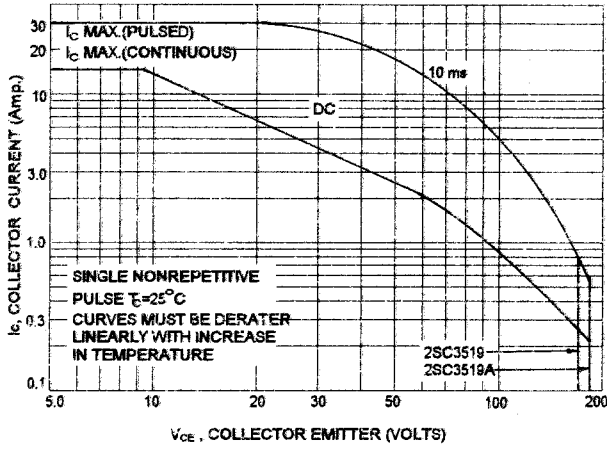
Current-Gain-Bandwidth Product ( $I_C = 2.0\text{ A}$ , $V_{CE} = 12\text{ V}$ , $f = 1.0\text{ MHz}$ )		$f_T$	10	MHz
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## SWITCHING CHARACTERISTICS

Turn-on Time	$V_{CC} = 40\text{ V}$ , $I_C = 10\text{ A}$ $I_{B1} = -I_{B2} = 1.0\text{ A}$ $R_L = 4\text{ ohm}$	$t_{on}$	0.20(typ)		$\mu\text{s}$
Storage Time		$t_s$	1.30(typ)		$\mu\text{s}$
Fall Time		$t_f$	0.45(typ)		$\mu\text{s}$

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

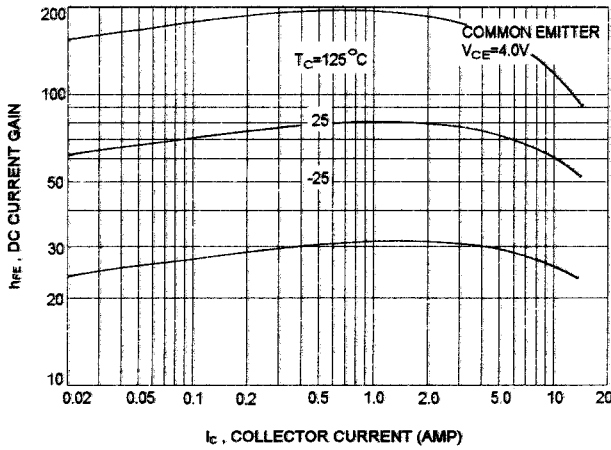
ACTIVE-REGION SAFE OPERATING AREA (SOA)



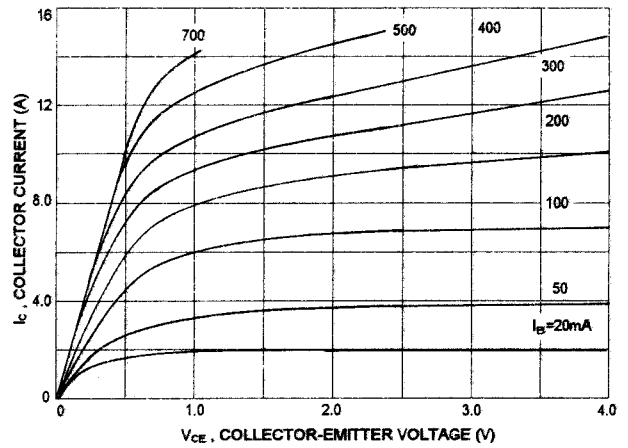
There are two limitation on the power handling ability of a transistor: average junction temperature and second breakdown safe operating area curves indicate  $I_C$ - $V_{CE}$  limits of the transistor that must be observed for reliable operation i.e., the transistor must not be subjected to greater dissipation than curves indicate.

The data of SOA curve 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.

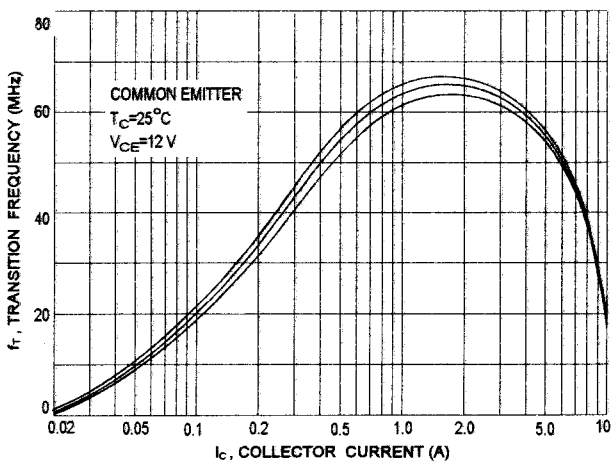
DC CURRENT GAIN



$I_C$  -  $V_{CE}$



$f_T$  -  $I_E$



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

