MOSPEC

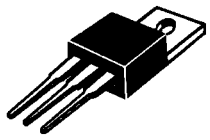
NPN SILICON POWER TRANSISTORS

...designed for the output stage of 15W to 25W AF power amplifier

NPN
2SD313

FEATURES:
* Low Collector-Emitter Saturation Voltage
  $V_{CE(sat)}$= 1.0V(Max) @I_C=2.0A,I_B=0.2A
* DC Current Gain
  hFE= 40-320@I_C= 1.0A
* Complementary to PNP 2SB507

3 AMPERE
POWER
TRANASISTORS
60 VOLTS
30 WATTS



TO-220

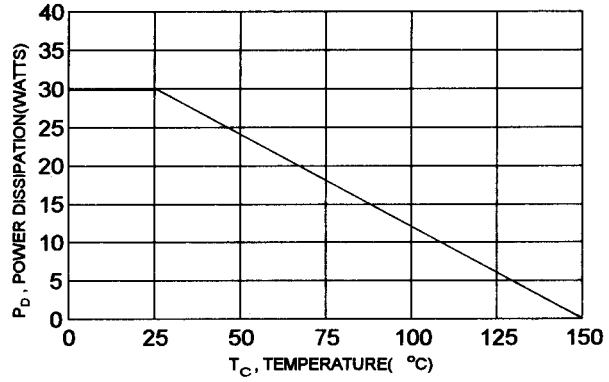
MAXIMUM RATINGS

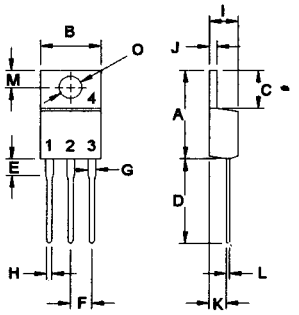
Characteristic	Symbol	2SD313	Unit
Collector-Emitter Voltage	V_{CEO}	60	V
Collector-Base Voltage	V_{CBO}	60	V
Emitter-Base Voltage	V_{EBO}	5.0	V
Collector Current - Continuous - Peak	I_C I_{CM}	3.0 8.0	A
Base current	I_B	1.0	A
Total Power Dissipation @T_C = 25°C Derate above 25°C	P_D	30 0.24	W W/°C
Operating and Storage Junction Temperature Range	T_J , T_{STG}	-55 to +150	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance Junction to Case	Rθjc	4.16	°C/W

FIGURE -1 POWER DERATING





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

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

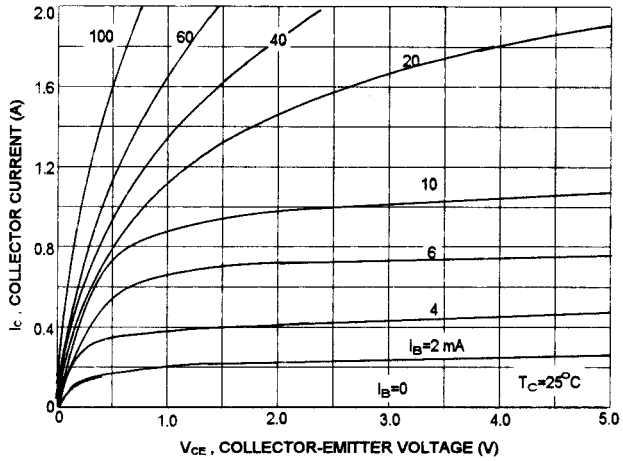
Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Voltage (I_C= 10 mA, I_B= 0)	V_{CEO}	60		V
Collector Cutoff Current (V_{CB}= 20 V, I_E= 0)	I_{CBO}		100	uA
Collector Cutoff Current (V_{CE}= 60 V, I_B= 0)	I_{CEO}		5.0	mA
Emitter Cutoff Current (V_{EB}=4.0 V, I_C= 0)	I_{EBO}		1.0	mA
ON CHARACTERISTICS (1)				
DC Current Gain (I_C= 1.0 A, V_{CE}= 2.0 V) * (I_C= 0.1 A, V_{CE}= 2.0 V)	hFE(2) hFE	40 40	320	
Collector-Emitter Saturation Voltage (I_C= 2.0 A, I_B= 200 mA)	$V_{CE(sat)}$		1.0	V
Base-Emitter On Voltage (I_C= 1.0 A, V_{CE}=2.0 V)	$V_{BE(on)}$		1.5	V
DYNAMIC CHARACTERISTICS				
Current-Gain-Bandwidth Product (I_C = 0.5 A, V_{CE} = 5.0 V, f = 1.0 MHz)	f_T	5.0		MHz

(1) Pulse Test: Pulse Width =300 μs,Duty Cycle ≦ 2.0%

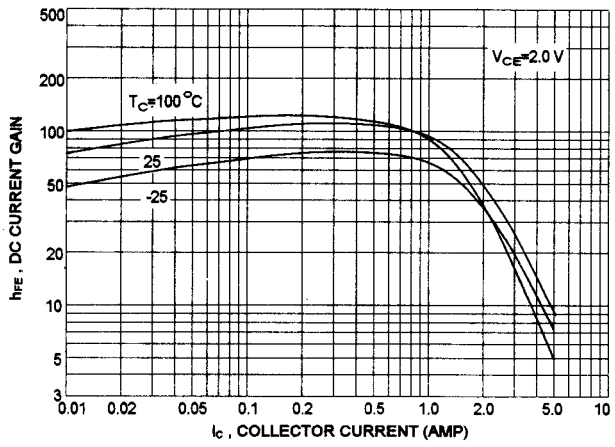
* hFE(2) Classification :

40	C	80	60	D	120	100	E	200	160	F	320

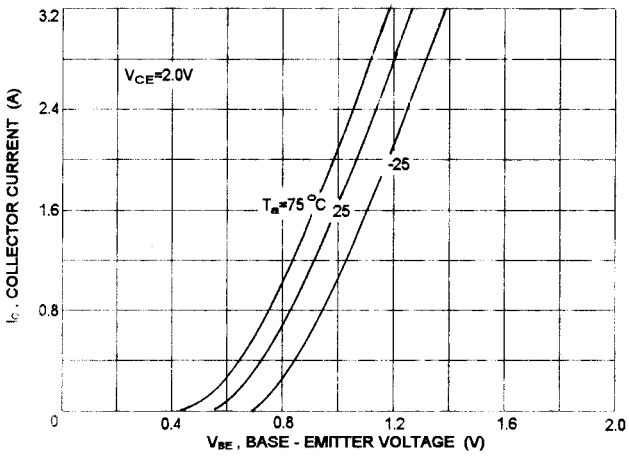
Ic - Vce



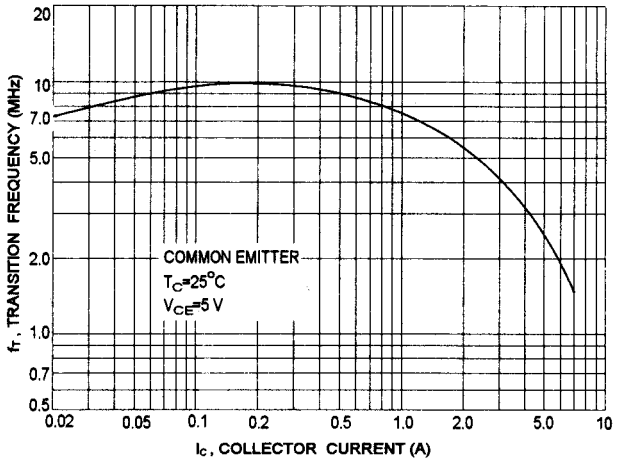
DC CURRENT GAIN



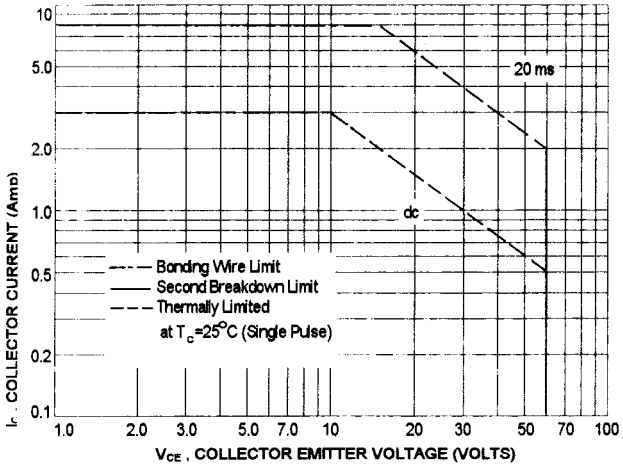
Ic - Vbe



f_T - Ic



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 °C;T_C is variable depending on conditions. second breakdown pulse limits are valid for duty cycles to 10% provided $T_{J(PK)}$≤150°C,At high case temperatures, thermal limita - tion will reduce the power that can be handled to values less than the limitations imposed by second breakdown.