

NPN SILICON POWER TRANSISTORS

2SD1047 transistor is designed for use in general purpose Power amplifier, application

FEATURES:

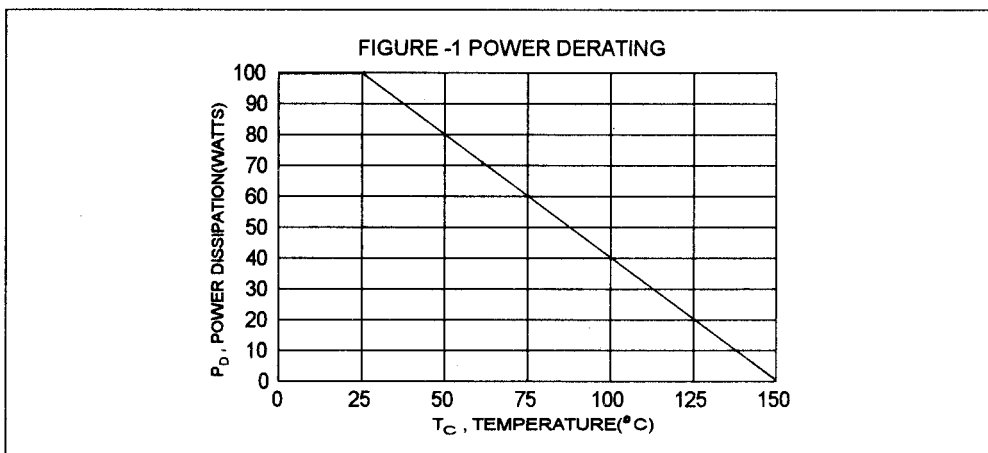
- * Collector-Emitter Voltage
 $V_{CEO} = 140V(\text{Min})$
- * DC Current Gain
 $hFE = 60-200 @ I_C = 1.0A$
- * Complement to 2SB817

MAXIMUM RATINGS

Characteristic	Symbol	2SD1047	Unit
Collector-Emitter Voltage	V_{CEO}	140	V
Collector-Base Voltage	V_{CBO}	160	V
Emitter-Base Voltage	V_{EBO}	6.0	V
Collector Current - Continuous - Peak	I_C I_{CM}	12 15	A
Total Power Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	100 0.8	W W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

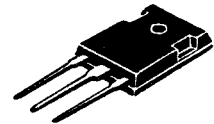
THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance Junction to Case	$R_{\theta jc}$	1.25	$^\circ\text{C}/\text{W}$

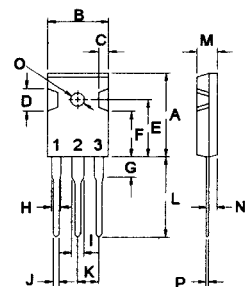


**NPN
2SD1047**

**12 AMPERE
POWER
TRANSISTORS
140 VOLTS
100 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

ELECTRICAL CHARACTERISTICS ($T_c = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
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OFF CHARACTERISTICS

Collector-Base Breakdown Voltage ($I_C = 5.0\text{ mA}$, $I_E = 0$)	$V_{(BR)CBO}$	160		V
Collector-Emitter Breakdown Voltage ($I_C = 5.0\text{ mA}$, $I_B = 0$)	$V_{(BR)CEO}$	140		V
Emitter-Base Voltage ($I_B = 5.0\text{ mA}$, $I_C = 0$)	$V_{(BR)EBO}$	6.0		V
Collector Cutoff Current ($V_{CB} = 80\text{ V}$, $I_E = 0$)	I_{CBO}		100	μA
Emitter Cutoff Current ($V_{EB} = 4.0\text{ V}$, $I_C = 0$)	I_{EBO}		100	μA

ON CHARACTERISTICS (1)

DC Current Gain ($I_C = 1.0\text{ A}$, $V_{CE} = 5.0\text{ V}$)* ($I_C = 6.0\text{ A}$, $V_{CE} = 5.0\text{ V}$)	$h_{FE(2)}$ h_{FE}	60 20	200	
Collector-Emitter Saturation Voltage ($I_C = 5.0\text{ A}$, $I_B = 0.5\text{ A}$)	$V_{CE(sat)}$		2.5	V
Base-Emitter On Voltage ($I_C = 1.0\text{ A}$, $V_{CE} = 5.0\text{ V}$)	$V_{BE(on)}$		1.5	V

SWITCHING CHARACTERISTICS

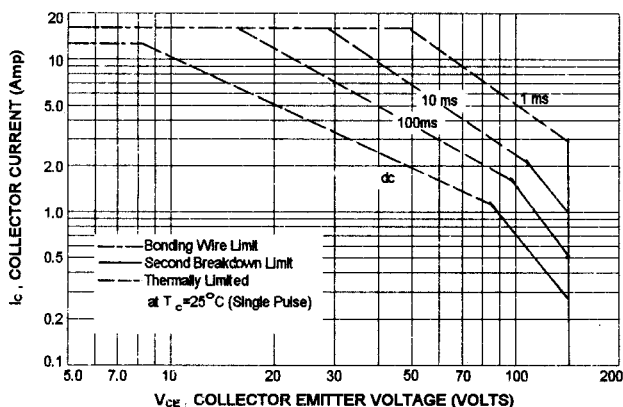
Turn-on Time	$V_{CC} = 20\text{ V}$, $I_C = 1.0\text{ A}$ $I_{B1} = -I_{B2} = 100\text{ mA}$ $PW = 20\mu\text{ s}$	t_{on}	0.3	μs
Storage Time		t_s	7.0	μs
Fall Time		t_f	0.7	μs

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

* h_{FE}(2) Classification:

60	D	120	100	E	200
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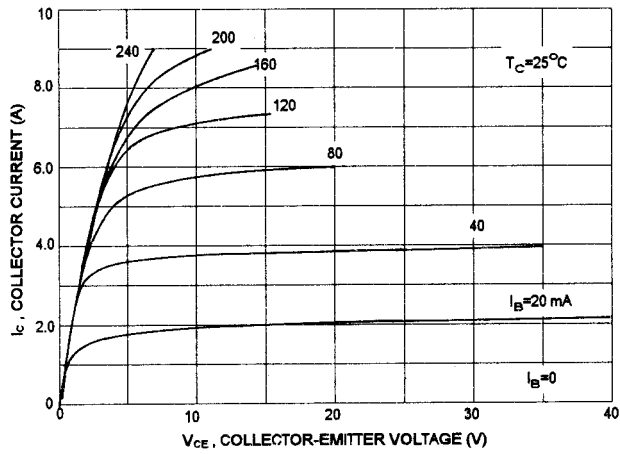
ACTIVE-REGION SAFE OPERATING AREA (SOA)



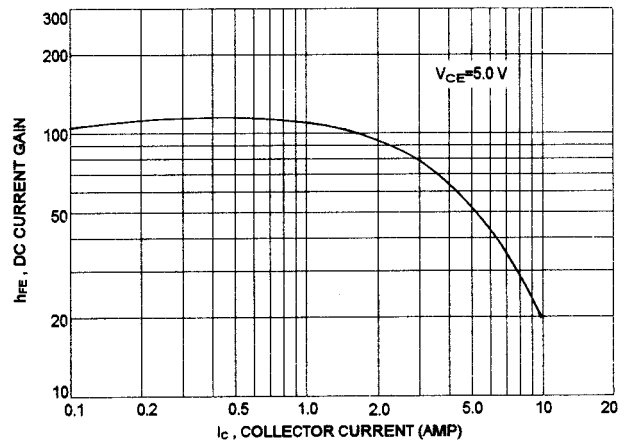
There are two limitation on the power handling ability of a transistor: average junction temperature and second breakdown safe operating area curves indicate I_C - V_{CE} limits of the transistor that must be observed for reliable operation i.e., the transistor must not be subjected to greater dissipation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

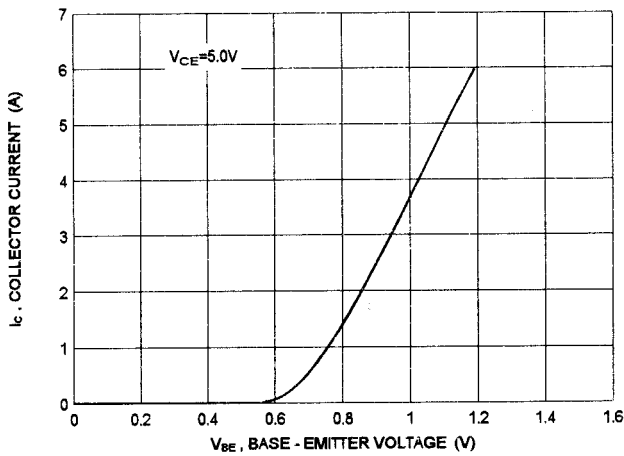
Ic - Vce



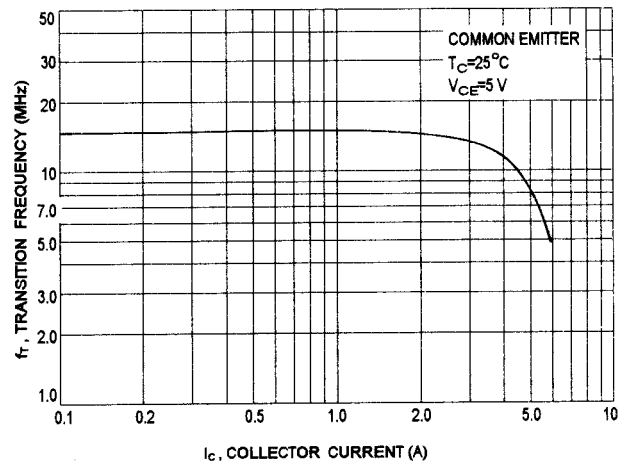
DC CURRENT GAIN



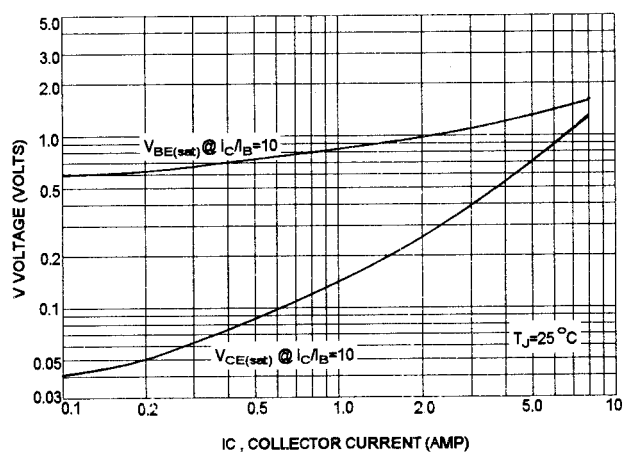
Ic - Vbe



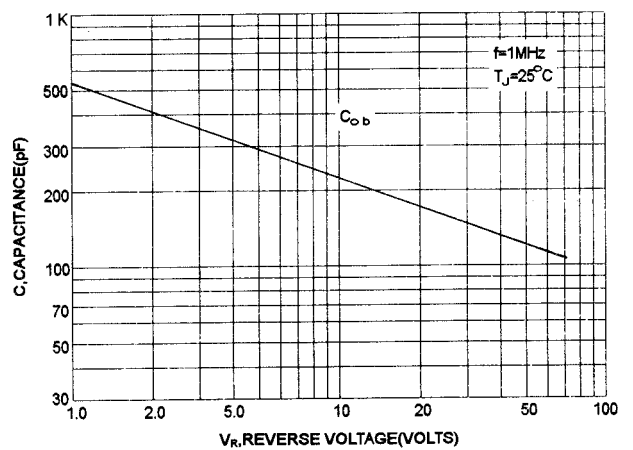
fT - Ic



"ON" VOLTAGES



CAPACITANCES



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