Ordering number:680F

PNP Epitaxial Planar Silicon Transistors
NPN Triple Diffused Planar Silicon Transistors

2SB817/2SD1047

140V/12A AF 60W Output Applications

Features

- Capable of being mounted easily because of one-point fixing type plastic molded package (Inter-changeable with TO-3).
- Wide ASO because of on-chip ballast resistance.
- Good depenedence of f_T on current and excellent high frequency responce.

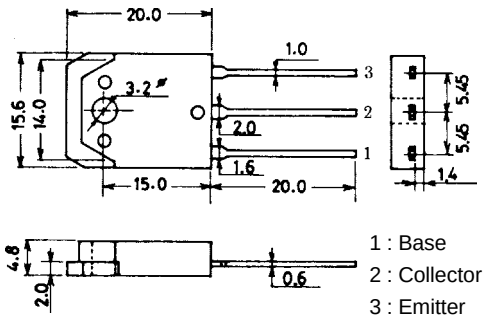
The descriptions in parentheses are for the 2SB817 only : other descriptions than those in parentheses are common to the 2SB817 and 2SD1047.

Package Dimensions

unit:mm

2022A

[2SB817/2SD1047]



SANYO : TO-3PB

Specifications

Absolute Maximum Ratings at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		(–)160	V
Collector-to-Emitter Voltage	V_{CEO}		(–)140	V
Emitter-to-Base Voltage	V_{EBO}		(–)6	V
Collector Current	I_C		(–)12	A
Collector Current (Pulse)	I_{CP}		(–)15	A
Collector Dissipation	P_C	Tc=25˚C	100	W
Junction Temperature	Tj		150	˚C
Storage Temperature	Tstg		–40 to +150	˚C

Electrical Characteristics at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	V_{CB}=(–)80V, I_E=0			(–)0.1	mA
Emitter Cutoff Current	I_{EBO}	V_{EB}=(–)4V, I_C=0			(–)0.1	mA
DC Current Gain	$h_{FE}1$	V_{CE}=(–)5V, I_C=(–)1A	60*		200*	
	$h_{FE}2$	V_{CE}=(–)5V, I_C=(–)6A	20			
Gain-Bandwidth Product	f_T	V_{CE}=(–)5V, I_C=(–)1A		15		MHz
Output Capacitance	C_{ob}	V_{CB}=(–)10V, f=1MHz		(300)		pF
				210		pF

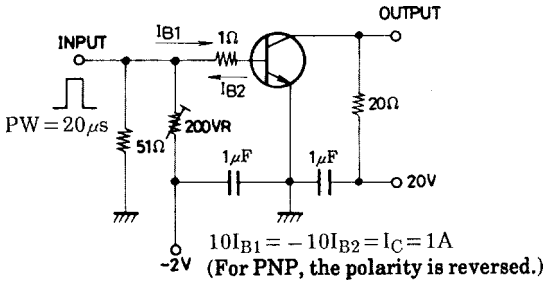
* : The 2SB817/2SD1047 are classified by 1A h_{FE} as follows :

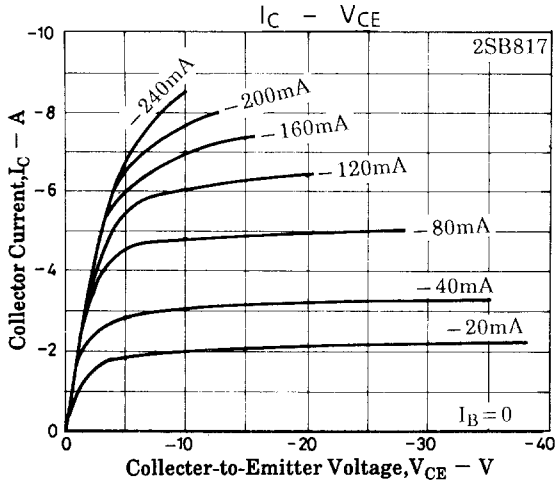
60 D 120	100 E 200

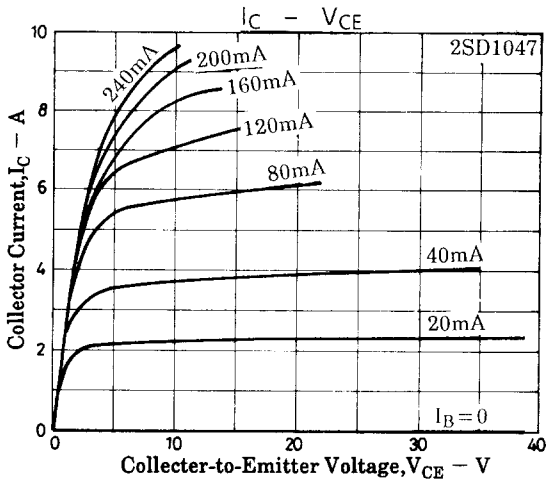
SANYO Electric Co.,Ltd. Semiconductor Bussiness Headquaters
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

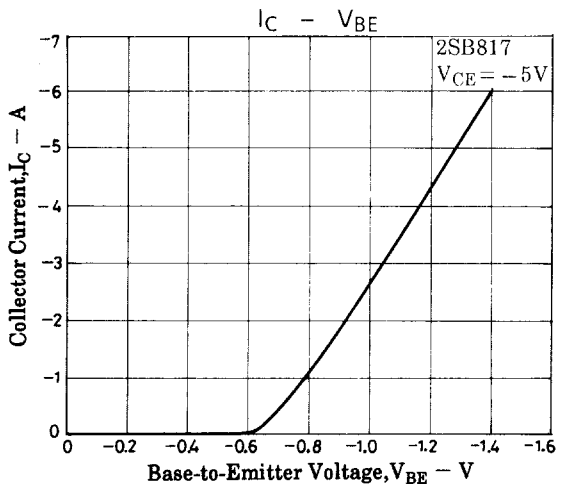
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Base-to-Emitter Voltage	V_{BE}	V_{CE}=(–)5V, I_C=(–)1A			1.5	V
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C=(–)5A, I_B=(–)0.5A		0.6	2.5	V
				(1.1)		V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=(–)5mA, I_E=0	(–)160			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=(–)5mA, R_{BE}=∞	(–)140			V
		I_C=(–)50mA, R_{BE}=∞	(–)140			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	I_E=(–)5mA, I_C=0	(–)6			V
Turn-ON Time	t_{on}	See specified Test Circuit		(0.25)		μs
				0.26		μs
Fall Time	t_f	See specified Test Circuit		(0.53)		μs
				0.68		μs
Storage Time	t_{stg}	See specified Test Circuit		(1.61)		μs
				6.88		μs

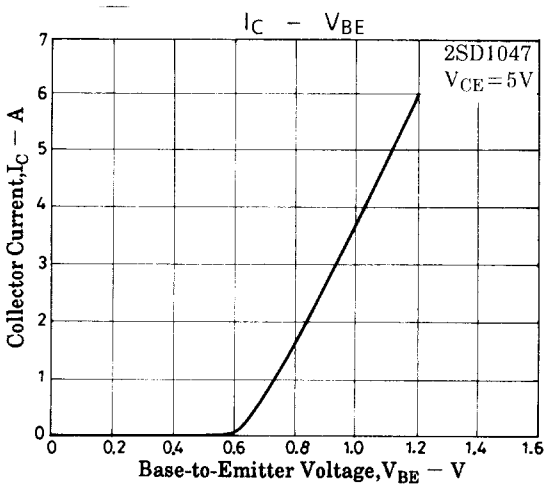
Switching Time Test Circuit

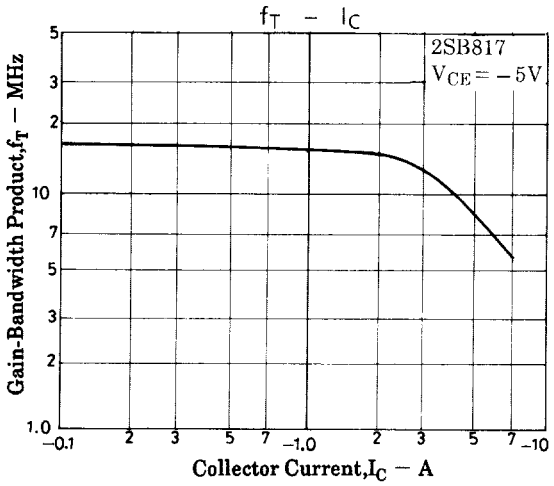


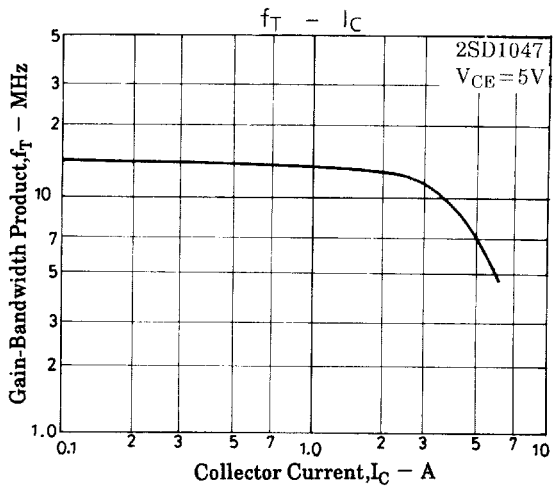


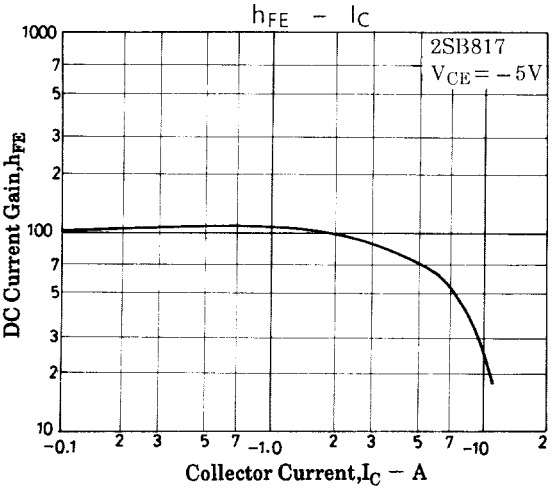


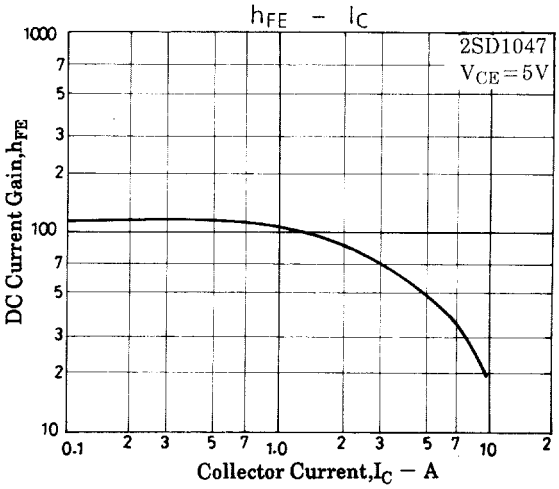


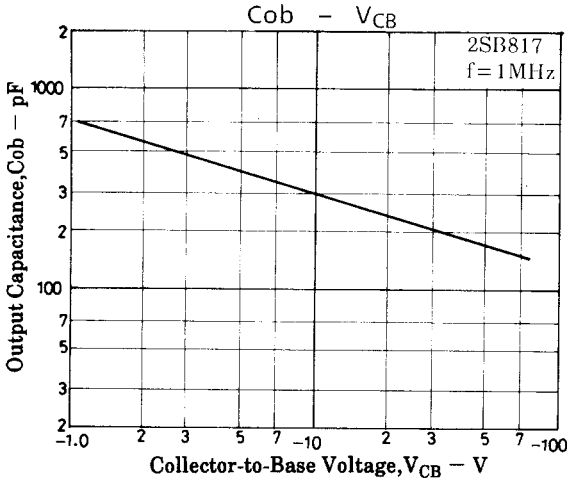


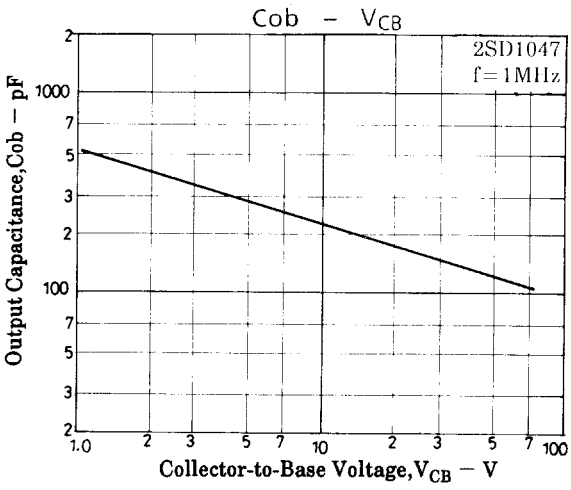

f_T – I_C
2SB817
V_{CE} = –5V
Gain-Bandwidth Product,f_T – MHz
Collector Current,I_C – A

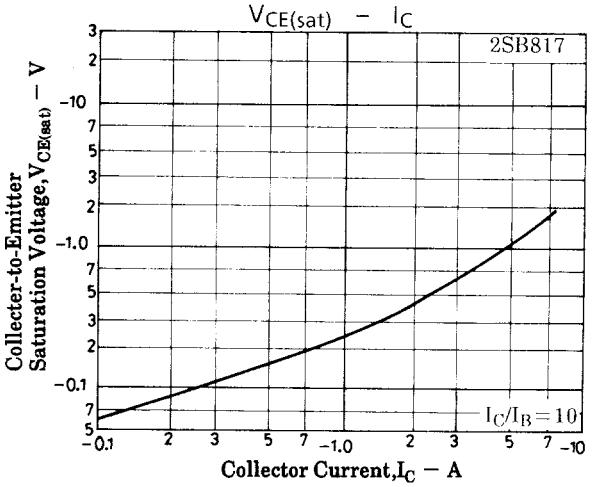

f_T – I_C
2SD1047
V_{CE} = 5V
Gain-Bandwidth Product,f_T – MHz
Collector Current,I_C – A

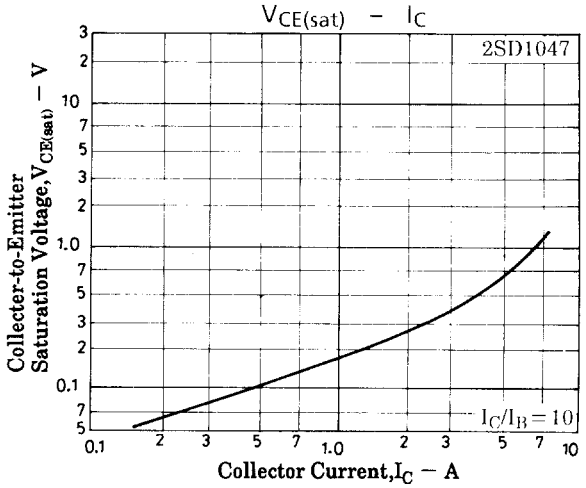

h_{FE} – I_C
2SB817
V_{CE} = –5V
DC Current Gain,h_{FE}
Collector Current,I_C – A

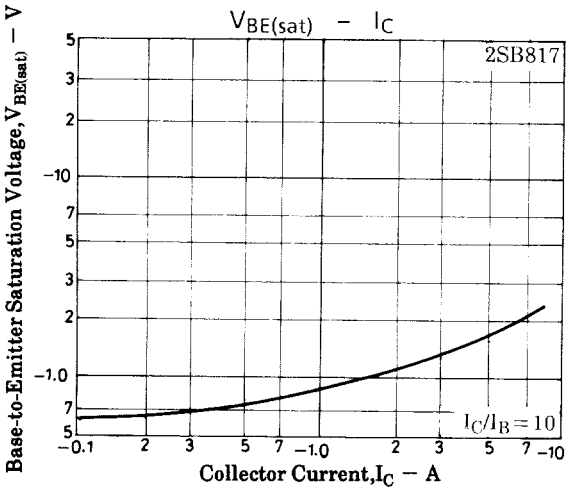

h_{FE} – I_C
2SD1047
V_{CE} = 5V
DC Current Gain,h_{FE}
Collector Current,I_C – A

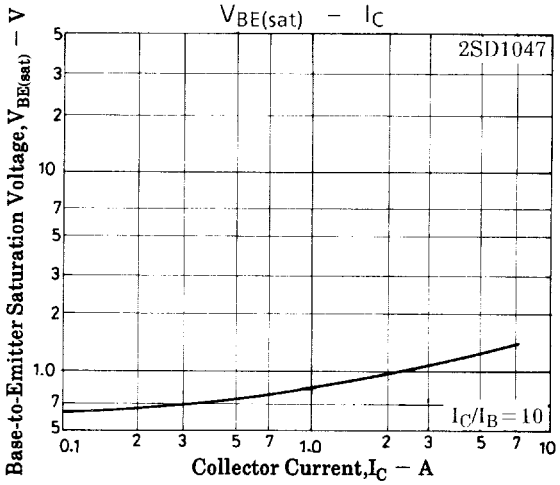

Cob – V_{CB}
2SB817
f = 1MHz
Output Capacitance,Cob – pF
Collector-to-Base Voltage,V_{CB} – V

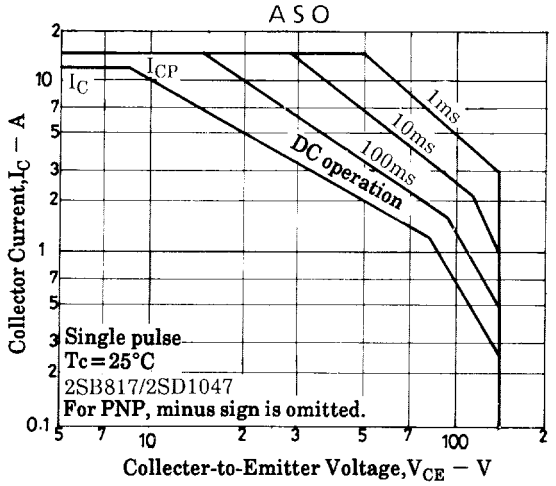

Cob – V_{CB}
2SD1047
f = 1MHz
Output Capacitance,Cob – pF
Collector-to-Base Voltage,V_{CB} – V

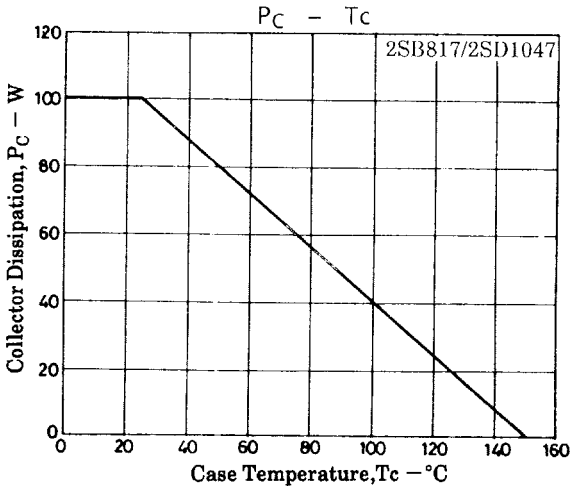

$V_{CE(sat)}$ – I_C
2SB817
I_C/I_B = 10
Collecter-to-Emitter Saturation Voltage,$V_{CE(sat)}$ – V
Collector Current,I_C – A


$V_{CE(sat)}$ – I_C
2SD1047
I_C/I_B = 10
Collecter-to-Emitter Saturation Voltage,$V_{CE(sat)}$ – V
Collector Current,I_C – A









MOSPEC

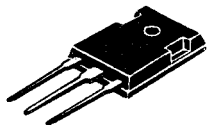
PNP SILICON POWER TRANSISTORS

PNP
2SB817

2SB817 transistor is designed for use in general purpose power amplifier,application

FEATURES:
* Collector-Emitter Voltage
  V_{CEO}= 140V(Min)
* DC Current Gain
  hFE= 60-200@I_C= 1.0A
* Complement to 2SD1047

12 AMPERE
POWER
TRANASISTORS
140 VOLTS
100 WATTS



TO-247(3P)

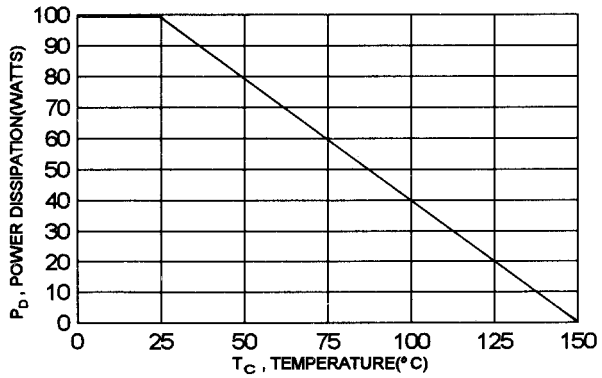
MAXIMUM RATINGS

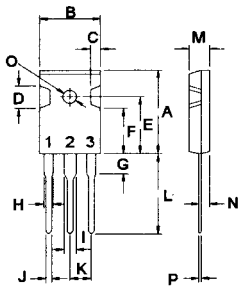
Characteristic	Symbol	2SB817	Unit
Coliector-Emitter Voltage	V_{CEO}	140	V
Collector-Base Voltage	V_{CBO}	160	V
Emitter-Base Voltage	V_{EBO}	6.0	V
Collector Current - Continuous - Peak	I_C I_{CM}	12 15	A
Total Power Dissipation @T_C = 25°C Derate above 25°C	P_D	100 0.8	W W/°C
Operating and Storage Junction Temperature Range	T_J , T_{STG}	-55 to +150	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance Junction to Case	Rθjc	1.25	°C/W

FIGURE -1 POWER DERATING





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°C unless otherwise noted)

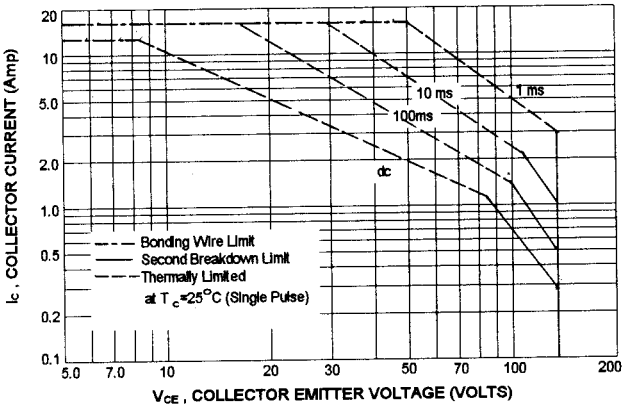
Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Base Breakdown Voltage (I_C= 5.0 mA, I_E= 0)	$V_{(BR)CBO}$	160		V
Collector-Emitter Breakdown Voltage (I_C= 5.0 mA, I_B= 0)	$V_{(BR)CEO}$	140		V
Emitter-Base Voltage (I_B= 5.0 mA, I_C= 0)	$V_{(BR)EBO}$	6.0		V
Collector Cutoff Current (V_{CB}= 80 V, I_E= 0)	I_{CBO}		100	uA
Emitter Cutoff Current (V_{EB}= 4.0 V, I_C= 0)	I_{EBO}		100	uA
ON CHARACTERISTICS (1)				
DC Current Gain (I_C= 1.0 A, V_{CE}= 5.0 V)* (I_C= 6.0 A, V_{CE}= 5.0 V)	hFE(2) hFE	60 20	200	
Collector-Emitter Saturation Voltage (I_C= 5.0 A, I_B= 0.5 A)	$V_{CE(sat)}$		2.5	V
Base-Emitter On Voltage (I_C= 1.0 A, V_{CE}= 5.0 V)	$V_{BE(on)}$		1.5	V
SWITCHING CHARATERISTICS				
Turn-on Time	V_{CC}= 20V, I_C= 1.0A I_{B1}= -I_{B2}= 100mA PW= 20μs	ton	0.3	us
Storage Time		ts	7.0	us
Fall Time		tf	0.7	us

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

* hHF(2) Classification:

60 D 120	100 E 200

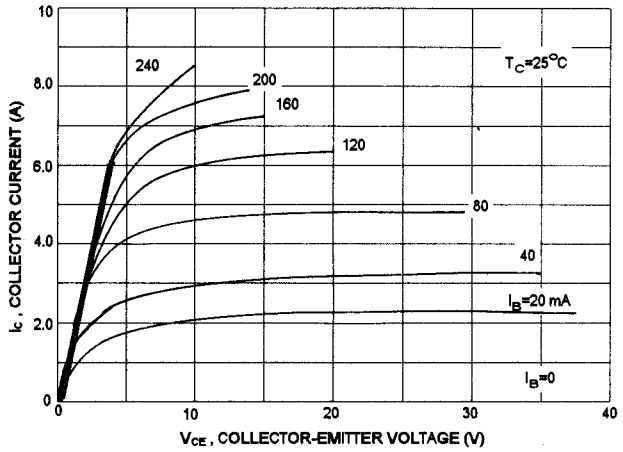
ACTIVE-REGION SAFE OPERATING AREA (SOA)



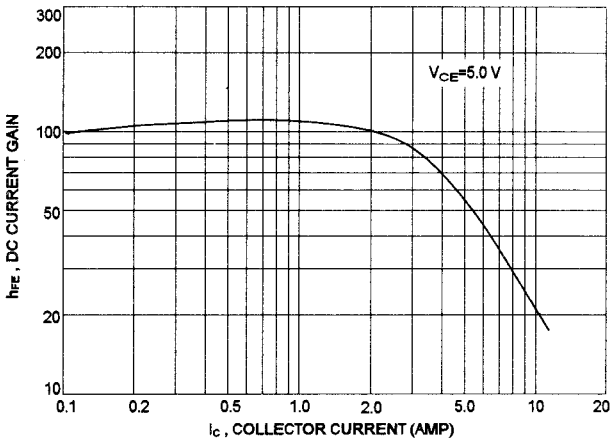
There are two limitation on the power handling ability of a transistor:average junction temperature and second breakdown safe operating area curves indicate I_C-V_{CE} limits of the transistor that must be observed for reliable operation i.e., the transistor must not be subjected to greater dissipation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

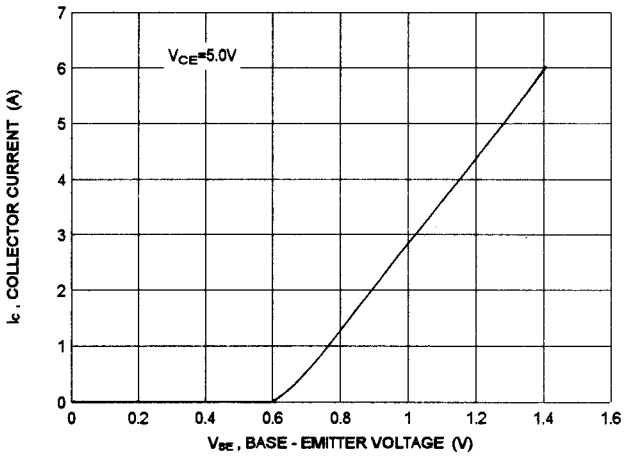
Ic - Vce



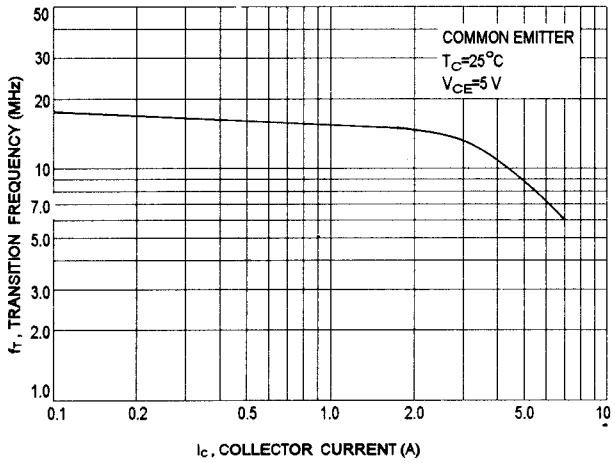
DC CURRENT GAIN



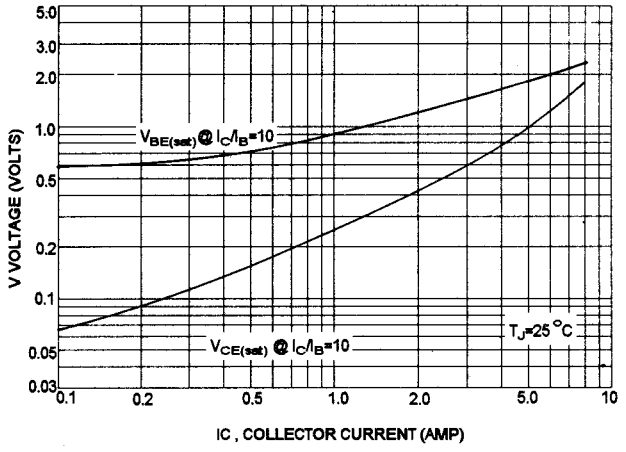
Ic - Vbe



f_T - Ic



"ON" VOLTAGES



CAPACITANCES