

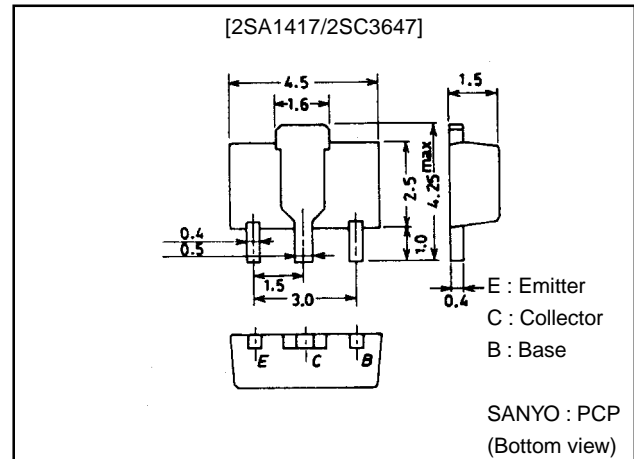
**2SA1417/2SC3647****SANYO****High-Voltage Switching Applications****Features**

- Adoption of FBET, MBIT processes.
- High breakdown voltage and large current capacity.
- Fast switching time.
- Very small size making it easy to provide high-density, small-sized hybrid ICs.

**Package Dimensions**

unit:mm

2038



() : 2SA1417

**Specifications****Absolute Maximum Ratings at Ta = 25°C**

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	$V_{CBO}$		(-120)	V
Collector-to-Emitter Voltage	$V_{CEO}$		(-100)	V
Emitter-to-Base Voltage	$V_{EBO}$		(-6)	V
Collector Current	$I_C$		(-2)	A
Collector Current (Pulse)	$I_{CP}$		(-3)	A
Collector Dissipation	$P_C$		500	mW
		Mounted on ceramic board (250 <sup>2</sup> ×0.8mm)	1.5	W
Junction Temperature	$T_j$		150	°C
Storage Temperature	$T_{stg}$		-55 to +150	°C

**Electrical Characteristics at Ta = 25°C**

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	$I_{CBO}$	$V_{CB}=(-100V, I_E=0$			(-100)	nA
Emitter Cutoff Current	$I_{EBO}$	$V_{EB}=(-4V, I_C=0$			(-100)	nA
DC Current Gain	$h_{FE}$	$V_{CE}=(-5V, I_C=(-100mA$	100*		400*	
Gain-Bandwidth Product	$f_T$	$V_{CE}=(-10V, I_C=(-100mA$		120		MHz
Output Capacitance	$C_{ob}$	$V_{CB}=(-10V, f=1MHz$		(25)		pF
				16		pF
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=(-1A, I_B=(-100mA$		(-0.22)	(-0.6)	V
				0.13	0.4	V
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=(-1A, I_B=(-100mA$		(-0.85)	(-1.2)	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=(-10\mu A, I_E=0$	(-120)			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=(-1mA, R_{BE}=\infty$	(-100)			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E=(-10\mu A, I_C=0$	(-6)			V
Turn-ON Time	$t_{on}$	See specified Test Circuit.		(80)		ns
				80		ns
Storage Time	$t_{stg}$	See specified Test Circuit.		(750)		ns
				1000		ns
Fall Time	$t_f$	See specified Test Circuit.		(40)		ns
				50		ns

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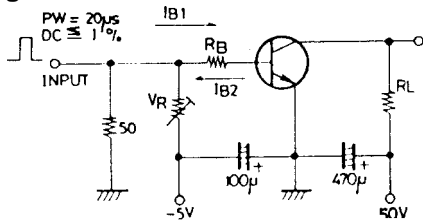
# 2SA1417/2SC3647

\* : The 2SA1417/2SC3647 are classified by 100mA  $h_{FE}$  as follows :

100	R	200	140	S	280	200	T	400
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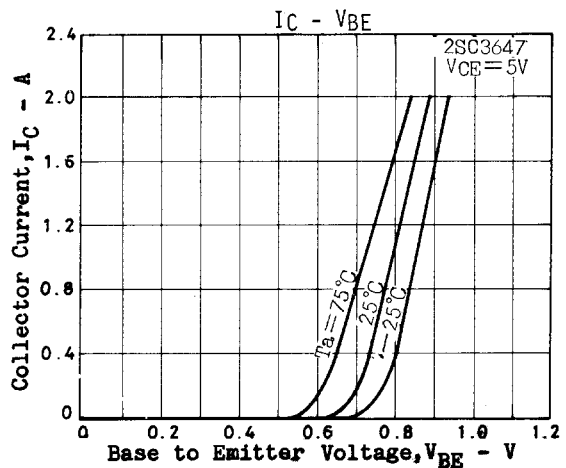
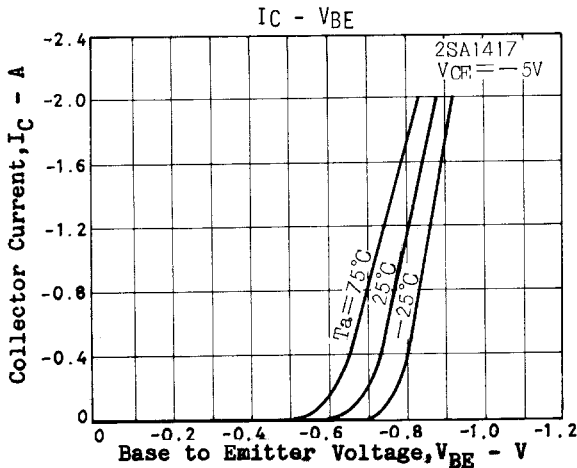
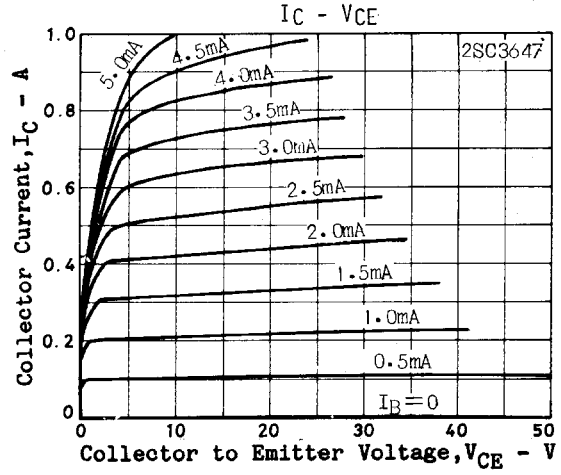
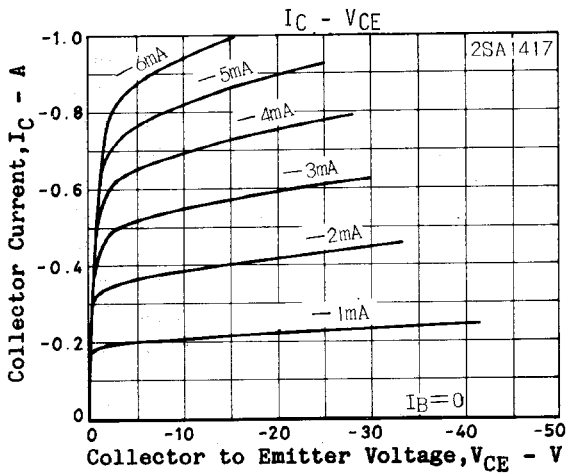
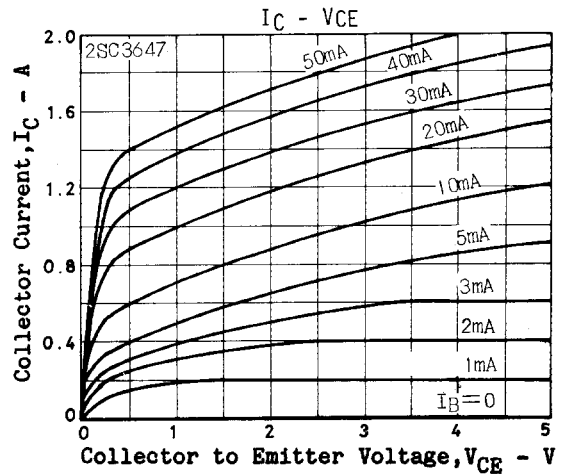
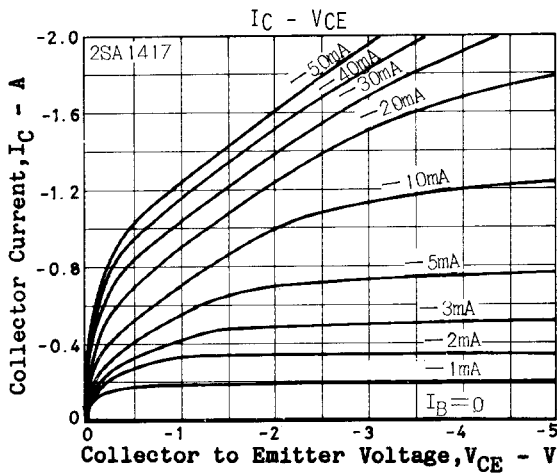
Marking 2SA1417 : AC  $h_{FE}$  rank : R, S, T  
 2SC3647 : CC

## Switching Time Test Circuit

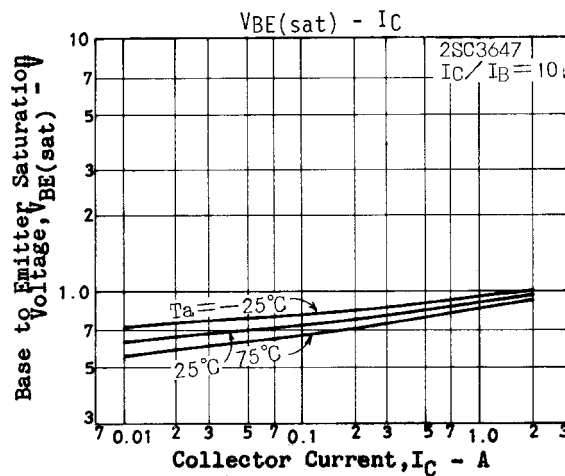
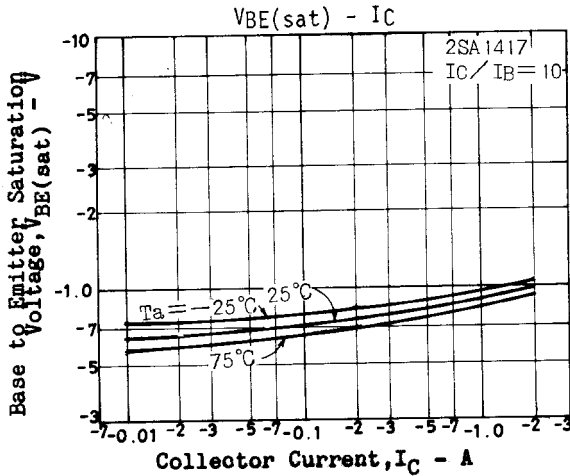
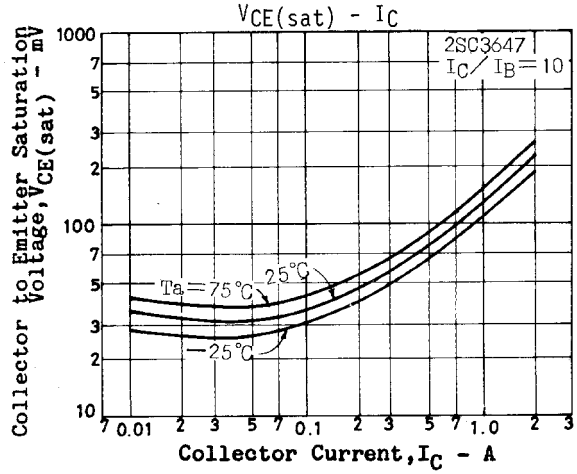
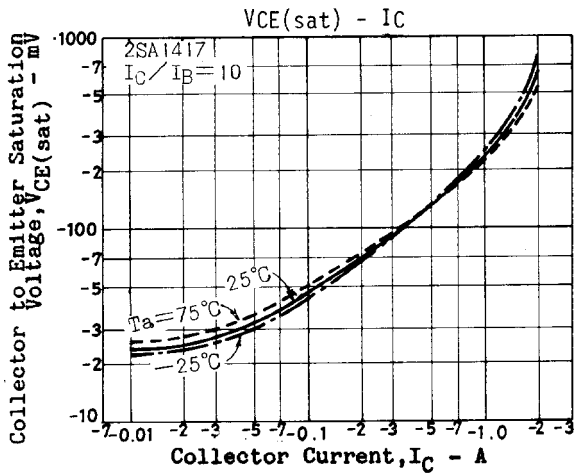
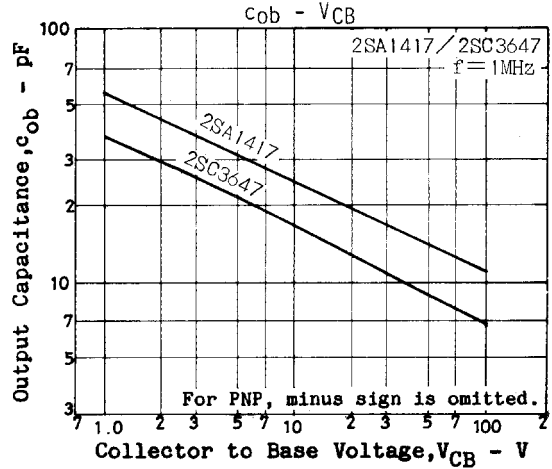
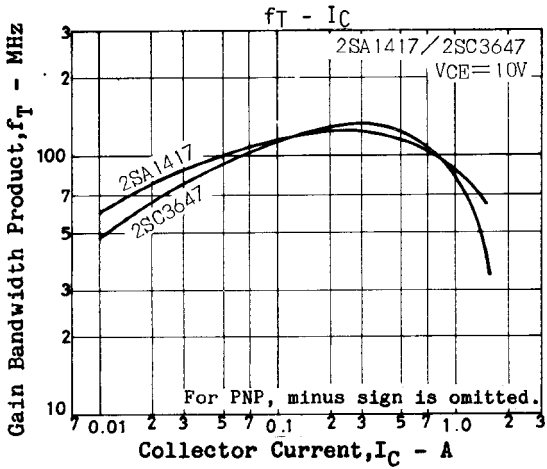
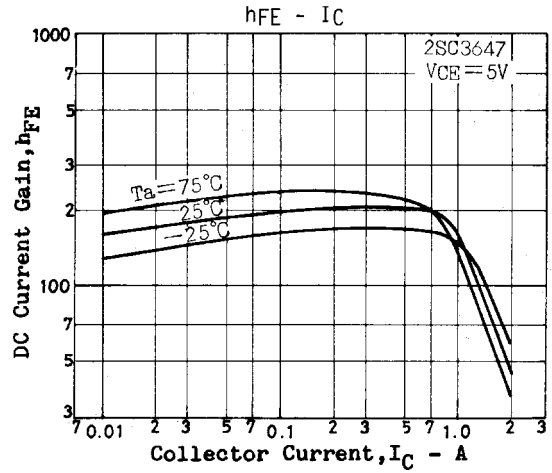
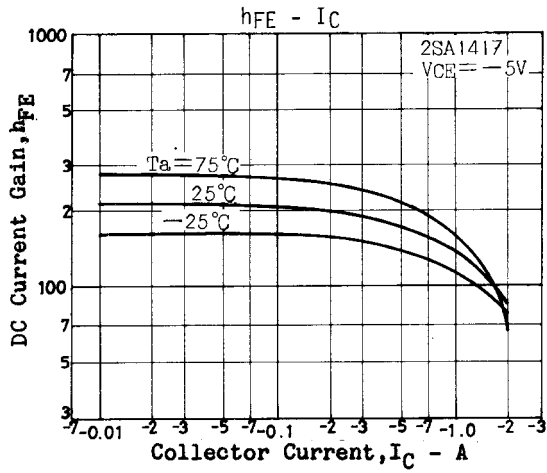


$$10I_{B1} = -10I_{B2} = I_C = 0.7A$$

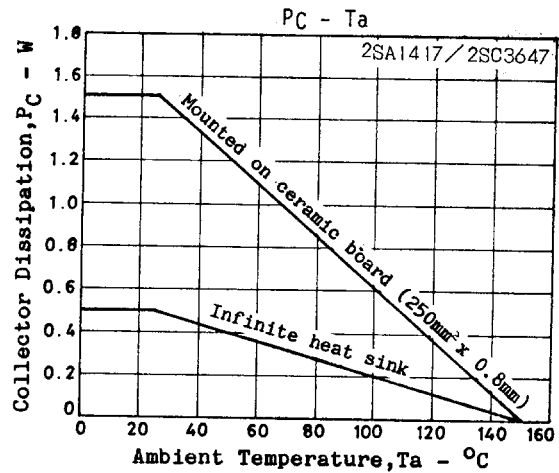
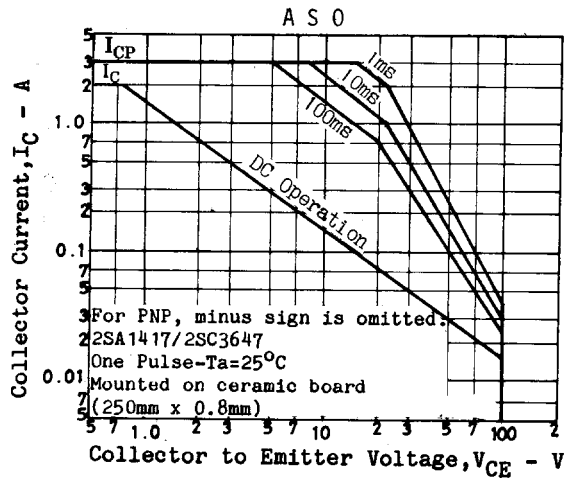
(For PNP, the polarity is reversed)  
 Unit (resistance :  $\Omega$ , capacitance : F)



# 2SA1417/2SC3647



## 2SA1417/2SC3647



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