



# 2SA1419/2SC3649

## High-Voltage Switching Applications

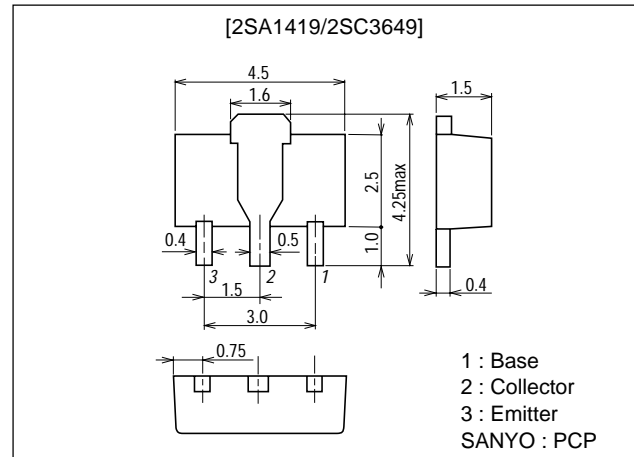
### Features

- Adoption of FBET, MBIT processes.
- High breakdown voltage and large current capacity.
- Ultrasmall size making it easy to provide high-density hybrid ICs.

### Package Dimensions

unit:mm

2038A



() : 2SA1419

### Specifications

**Absolute Maximum Ratings** at  $T_a = 25^\circ\text{C}$ 

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	$V_{CB0}$		(-)180	V
Collector-to-Emitter Voltage	$V_{CEO}$		(-)160	V
Emitter-to-Base Voltage	$V_{EBO}$		(-)6	V
Collector Current	$I_C$		(-)1.5	A
Collector Current (Pulse)	$I_{CP}$		(-)2.5	A
Collector Dissipation	$P_C$		500	mW
		Moutned on ceramic board (250mm <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  $T_a = 25^\circ\text{C}$ 

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	$I_{CBO}$	$V_{CB}=(-)120\text{V}, I_E=0$			(-)1	$\mu\text{A}$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB}=(-)4\text{V}, I_C=0$			(-)1	$\mu\text{A}$
DC Current Gain	$h_{FE1}$	$V_{CE}=(-)5\text{V}, I_C=(-)100\text{mA}$	100*		400*	
	$h_{FE2}$	$V_{CE}=(-)5\text{V}, I_C=(-)10\text{mA}$	80			

\* : The 2SA1419/2SC3649 are classified by 100mA  $h_{FE}$  as follows :

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Rank	R	S	T
$h_{FE}$	100 to 200	140 S 280	200 to 400

Marking 2SA1419 : AE  
2SC3649 : CE $h_{FE}$  rank : R, S, T

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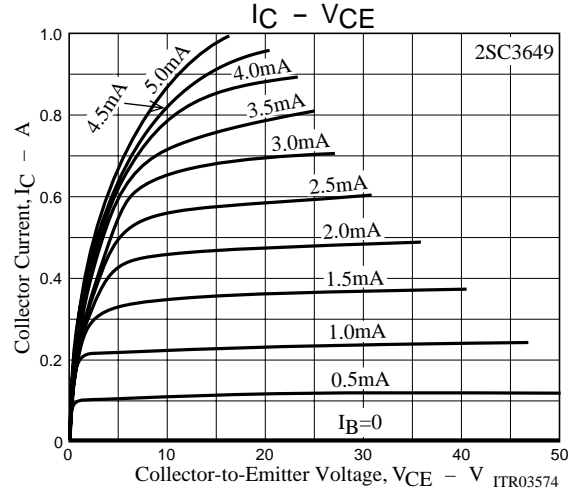
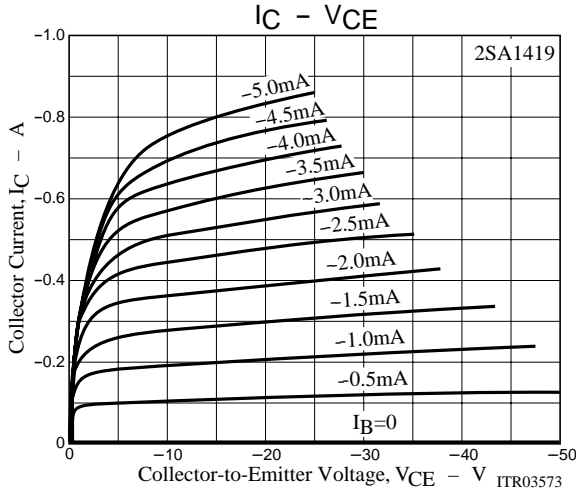
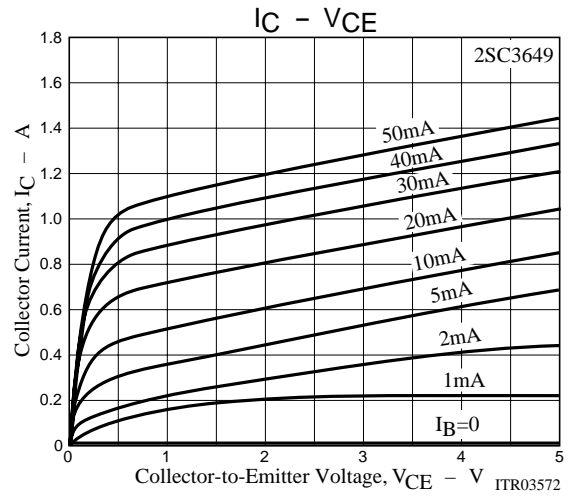
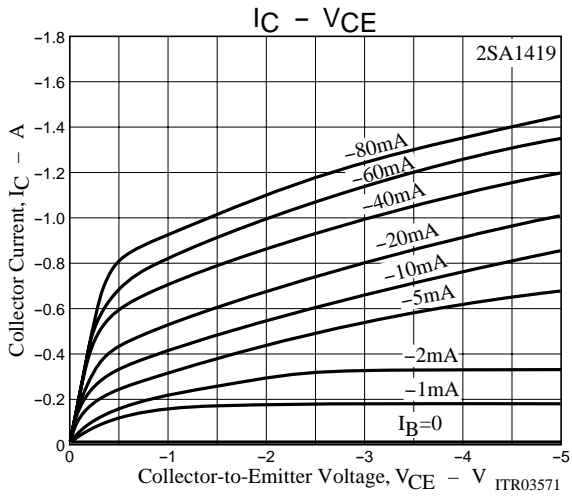
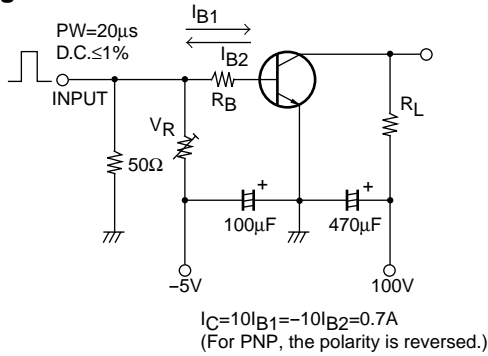
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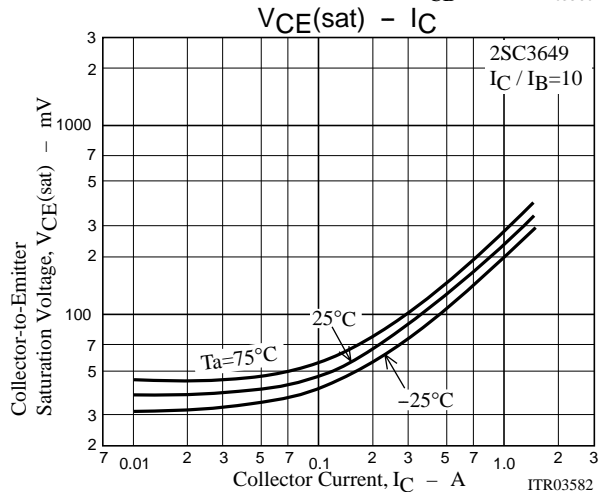
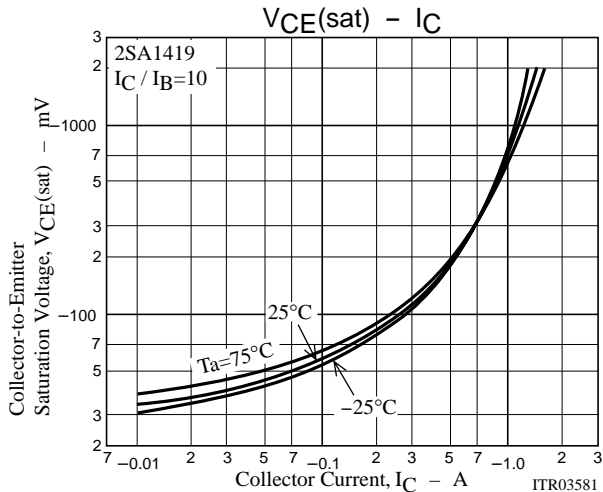
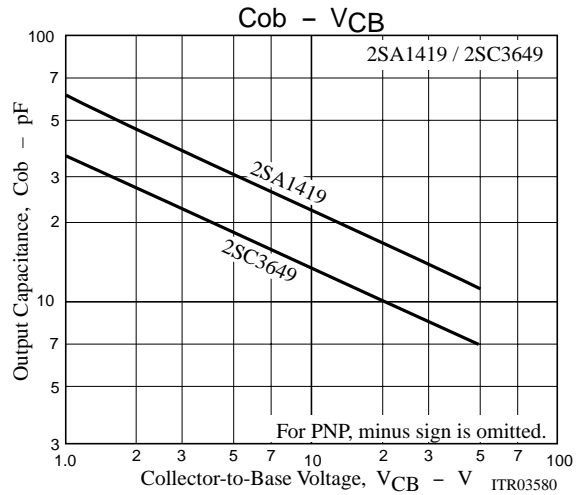
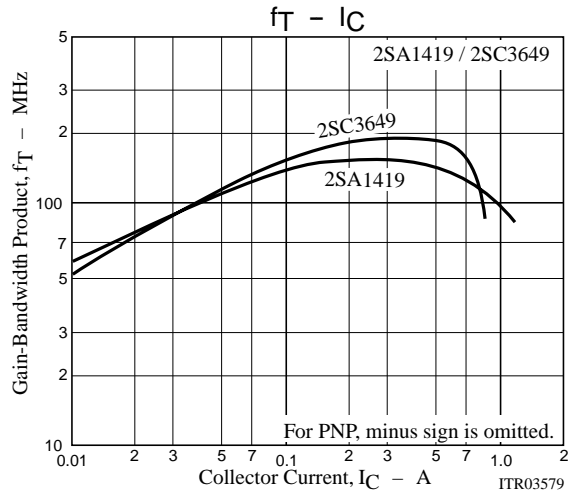
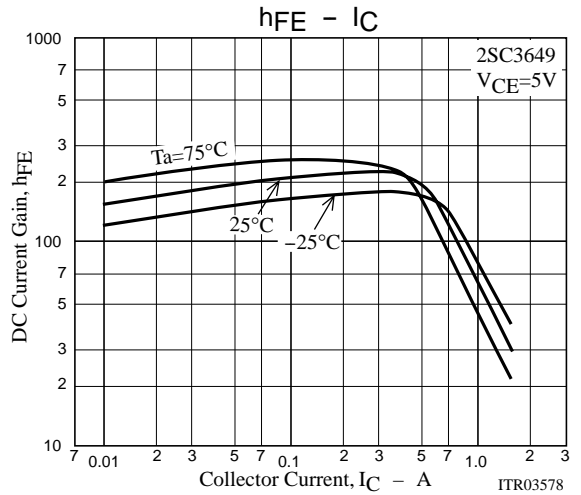
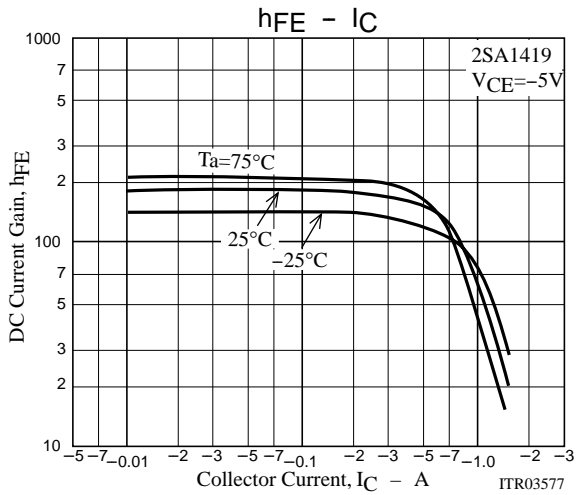
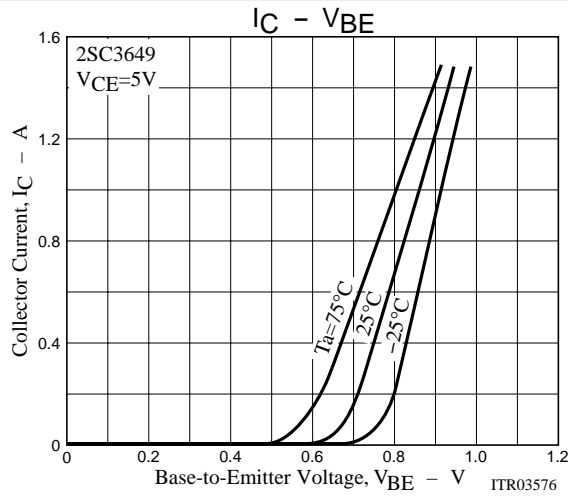
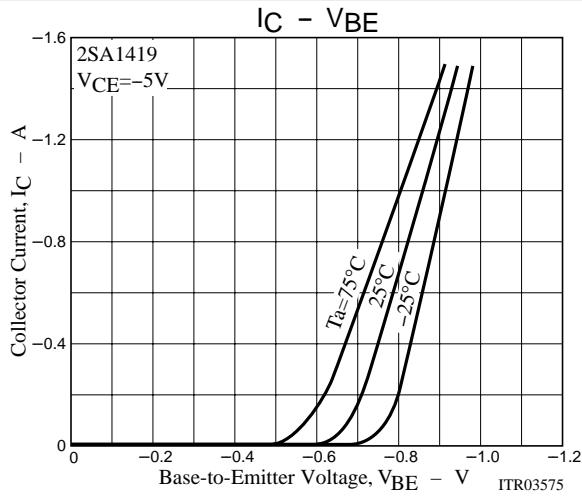
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Gain-Bandwidth Product	$f_T$	$V_{CE}=(-)10V, I_C=(-)50mA$		120		MHz
Output Capacitance	$C_{ob}$	$V_{CB}=(-)10V, f=1MHz$		(22)		pF
				14		pF
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=(-)500mA, I_B=(-)50mA$		(-200)	(-500)	mV
				130	450	mV
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=(-)500mA, I_B=(-)50mA$		(-0.85)	(-1.2)	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=(-)10\mu A, I_E=0$	(-180)			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=(-)1mA, R_{BE}=\infty$	(-160)			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.		(40)		ns
				40		ns
Storage Time	$t_{stg}$	See specified Test Circuit.		(0.7)		$\mu s$
				1.2		$\mu s$
Fall Time	$t_f$	See specified Test Circuit.		(40)		ns
				80		ns

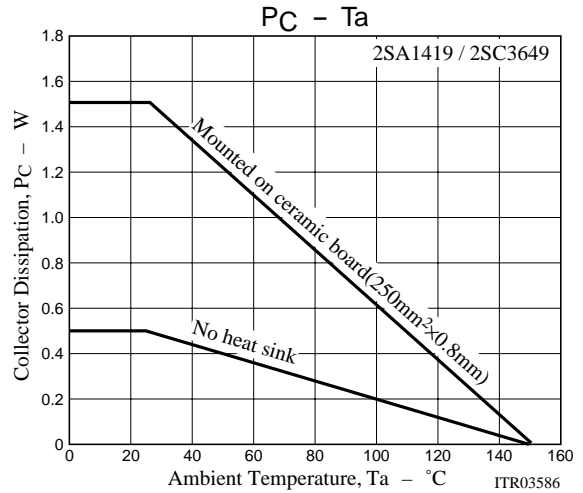
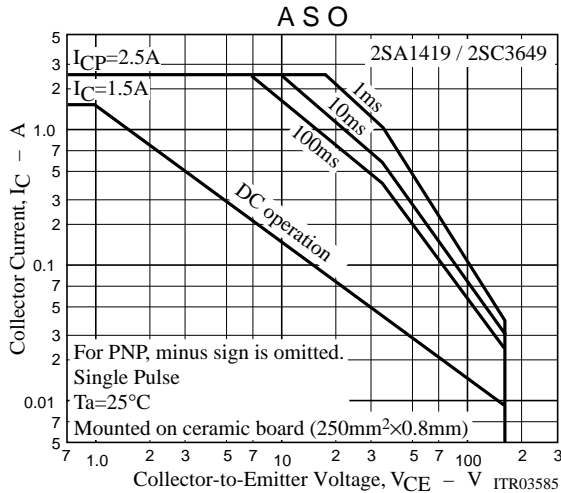
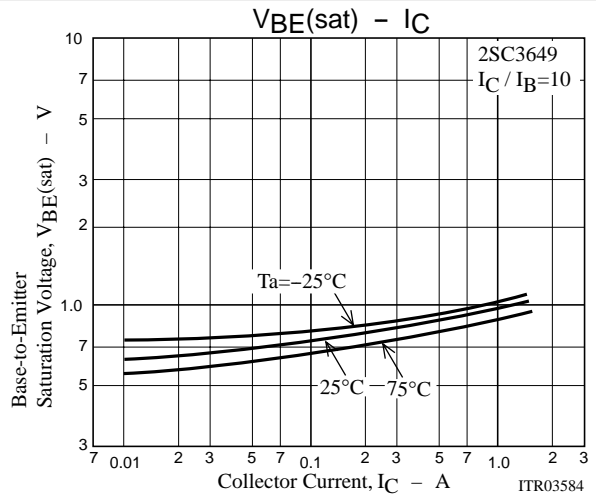
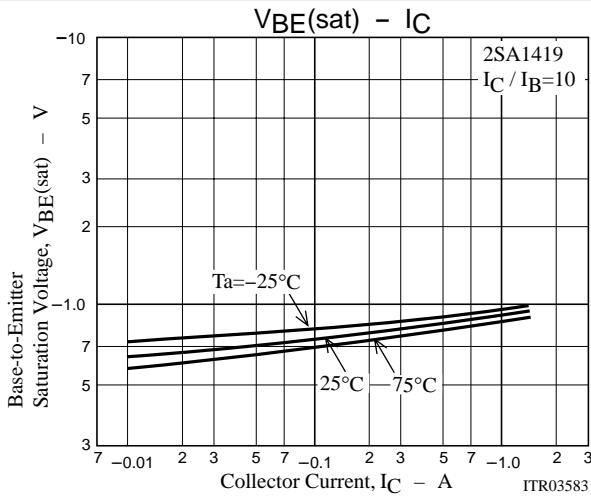
## Switching Time Test Circuit



# 2SA1419/2SC3649



## 2SA1419/2SC3649



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