



SANYO Semiconductors

# DATA SHEET

An ON Semiconductor Company

## 2SA1417 / 2SC3647 — PNP / NPN Epitaxial Planar Silicon Transistors

### 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 small-sized hybrid ICs.

#### Specifications ( ) : 2SA1417

##### Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V <sub>CB0</sub>		(-)120	V
Collector-to-Emitter Voltage	V <sub>CEO</sub>		(-)100	V
Emitter-to-Base Voltage	V <sub>EB0</sub>		(-)6	V
Collector Current	I <sub>C</sub>		(-)2	A
Collector Current (Pulse)	I <sub>CP</sub>		(-)3	A
Collector Dissipation	P <sub>C</sub>		500	mW
		Mounted on a ceramic board (250mm <sup>2</sup> X0.8mm)	1.5	W
Junction Temperature	T <sub>J</sub>		150	°C
Storage Temperature	T <sub>stg</sub>		-55 to +150	°C

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

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I <sub>CB0</sub>	V <sub>CB</sub> =(-)100V, I <sub>E</sub> =0A			(-)100	nA
Emitter Cutoff Current	I <sub>EB0</sub>	V <sub>EB</sub> =(-)4V, I <sub>C</sub> =0A			(-)100	nA
DC Current Gain	h <sub>FE</sub>	V <sub>CE</sub> =(-)5V, I <sub>C</sub> =(-)100mA	100*		400*	
Gain-Bandwidth Product	f <sub>T</sub>	V <sub>CE</sub> =(-)10V, I <sub>C</sub> =(-)100mA		120		MHz
Output Capacitance	C <sub>ob</sub>	V <sub>CB</sub> =(-)10V, f=1MHz		(25)16		pF
Collector-to-Emitter Saturation Voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> =(-)1A, I <sub>B</sub> =(-)100mA		(-0.22)0.13	(-0.6)0.4	V
Base-to-Emitter Saturation Voltage	V <sub>BE(sat)</sub>	I <sub>C</sub> =(-)1A, I <sub>B</sub> =(-)100mA		(-)0.85	(-)1.2	V

Continued on next page.

\* ; The 2SA1417 / 2SC3647 are classified by 100mA h<sub>FE</sub> as follows:

Rank	R	S	T
h <sub>FE</sub>	100 to 200	140 to 280	200 to 400

Marking 2SA1417: AC

2SC3647: CC

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**SANYO Semiconductor Co., Ltd.**

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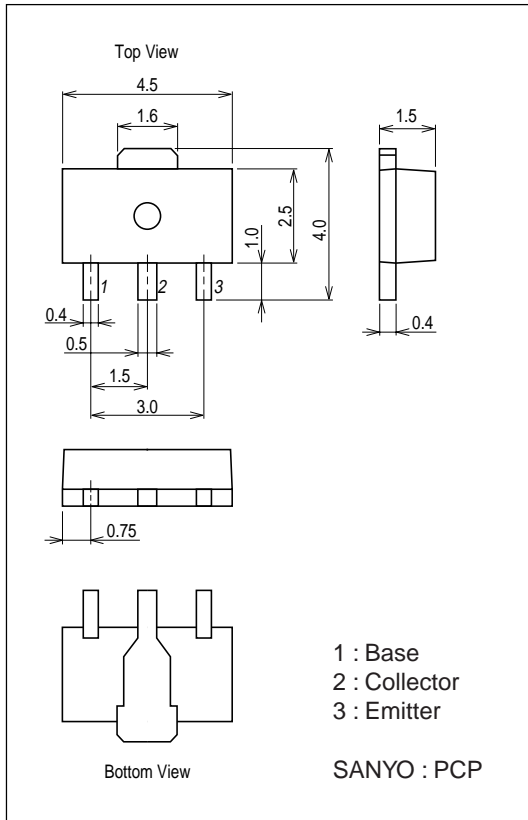
# 2SA1417 / 2SC3647

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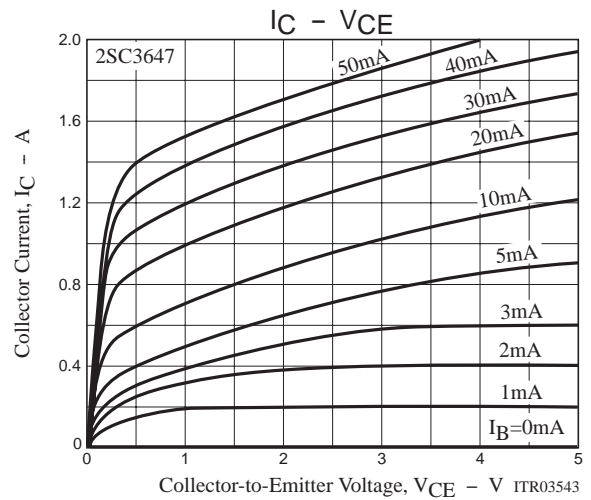
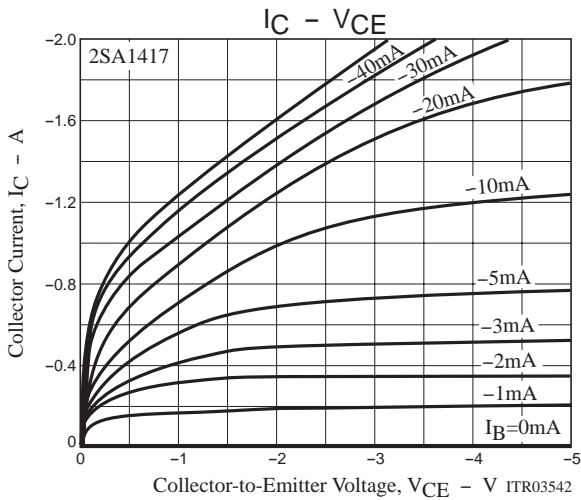
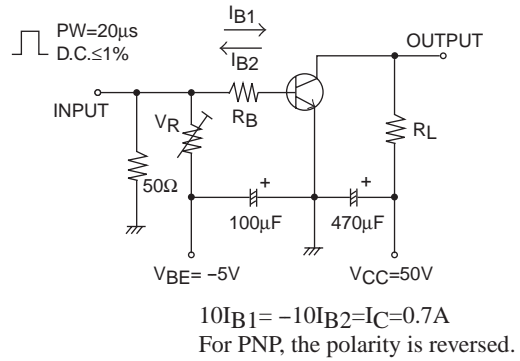
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = (-)10\mu A, I_E = 0A$	(-)120			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = (-)1mA, R_{BE} = \infty$	(-)100			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = (-)10\mu A, I_C = 0A$	(-)6			V
Turn-On Time	$t_{on}$	See specified Test Circuit.		(80)80		ns
Storage Time	$t_{stg}$	See specified Test Circuit.		(750)1000		ns
Fall Time	$t_f$	See specified Test Circuit.		(40)50		ns

## Package Dimensions

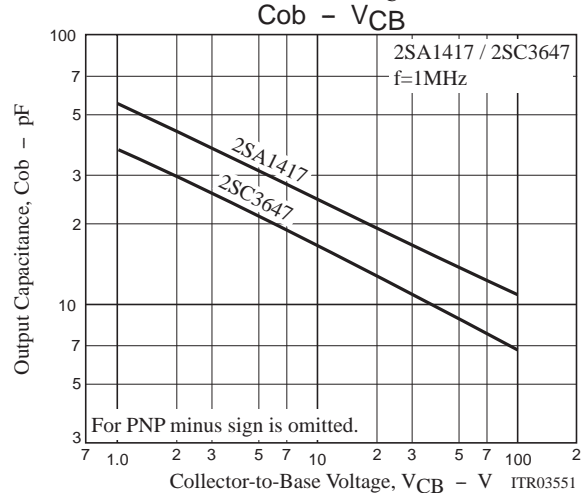
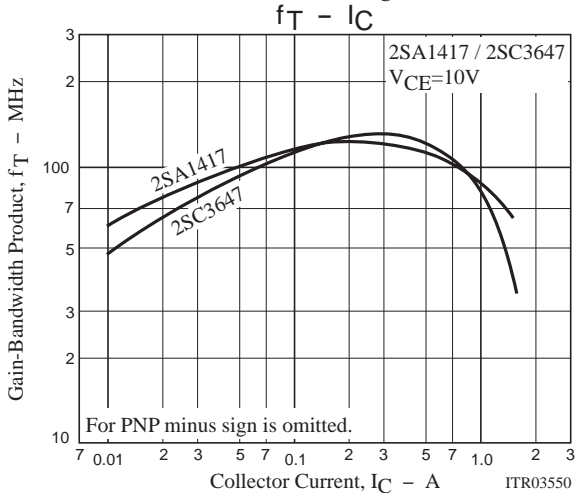
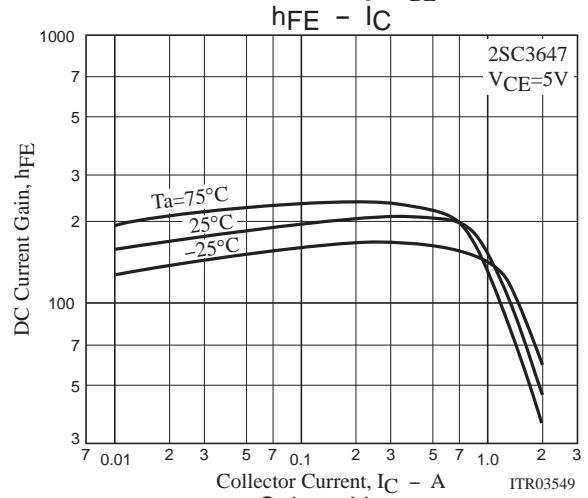
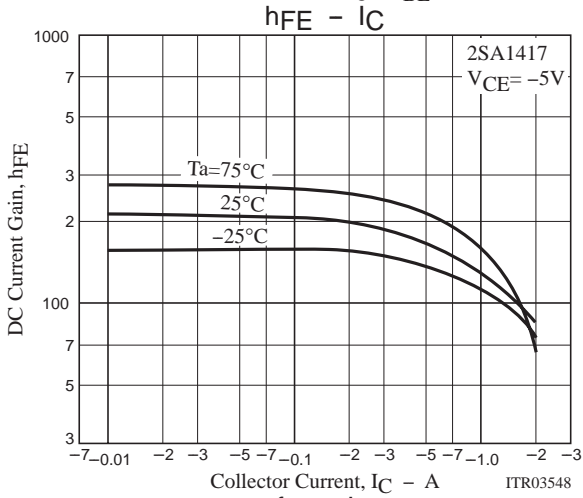
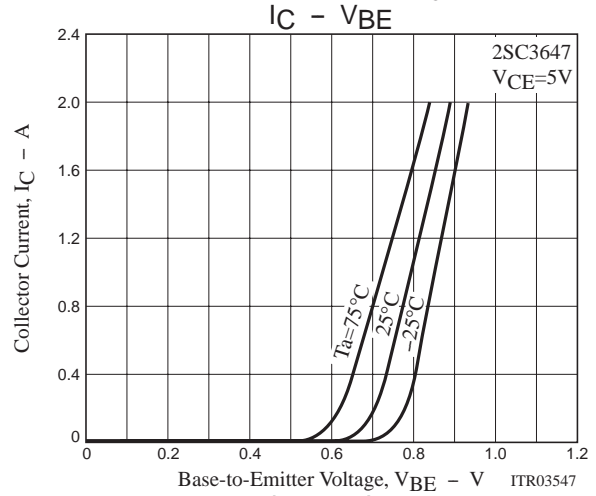
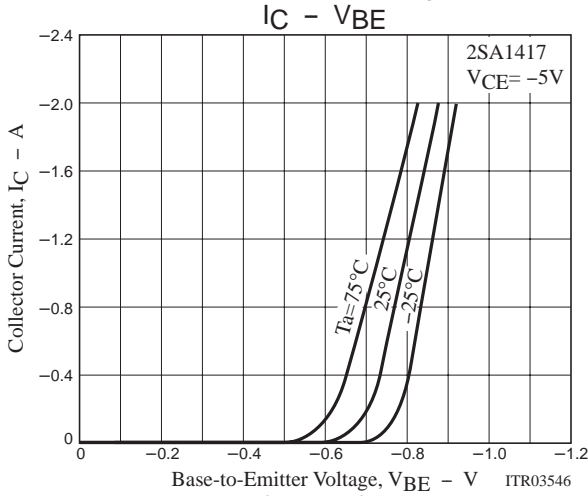
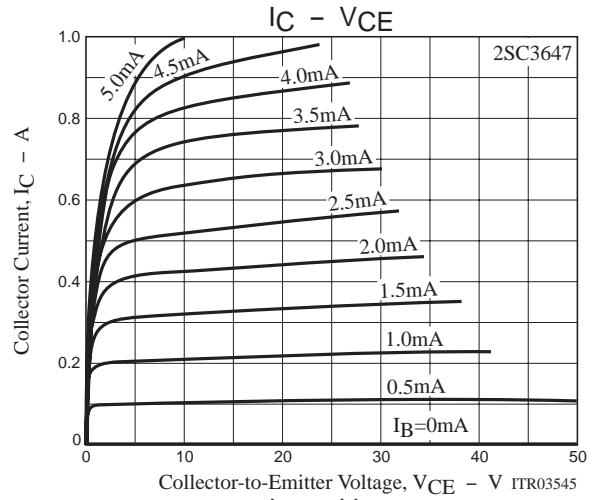
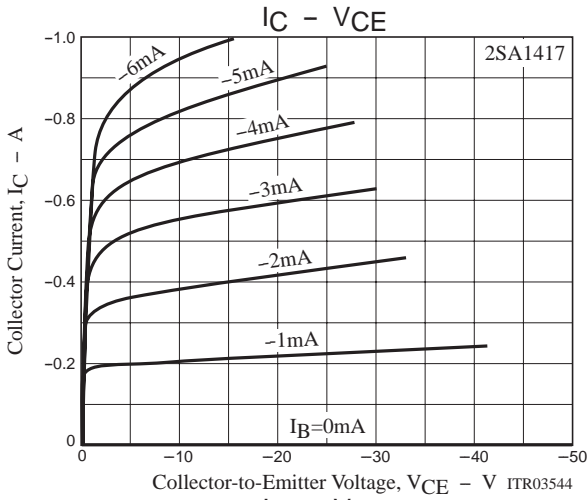
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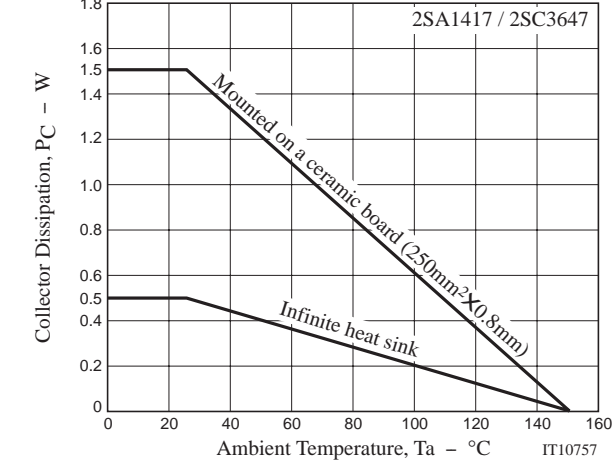
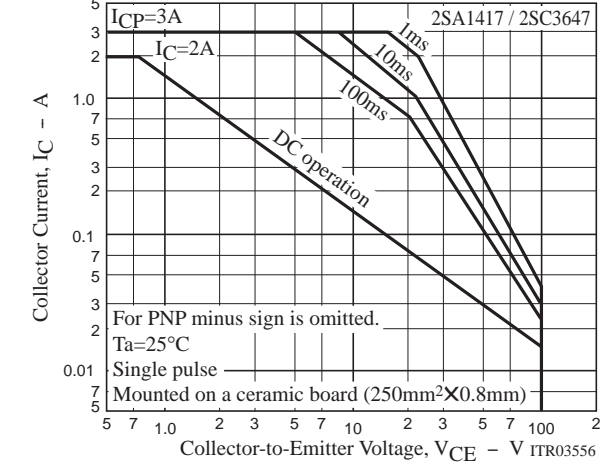
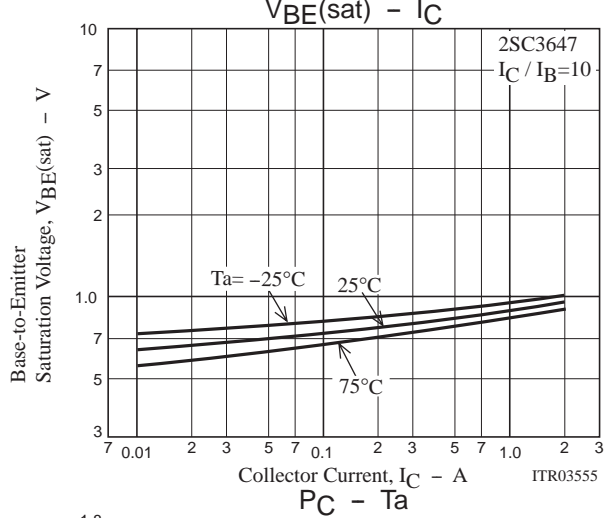
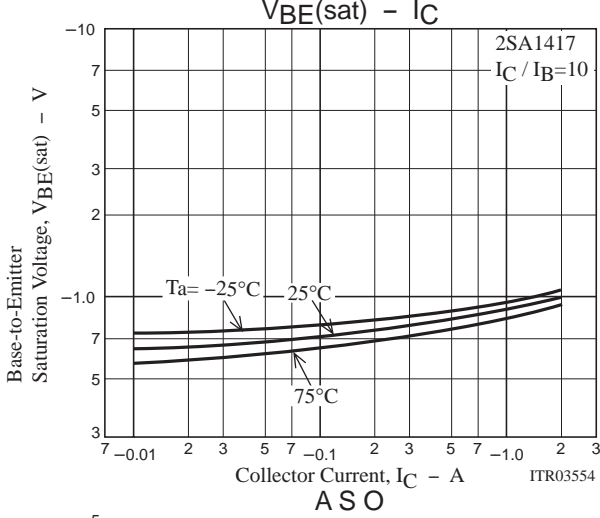
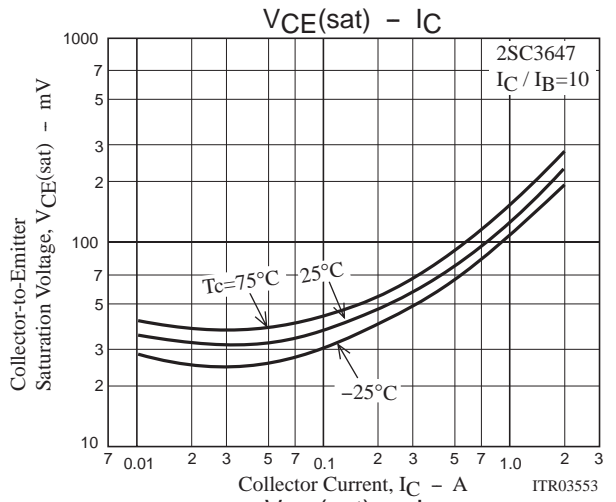
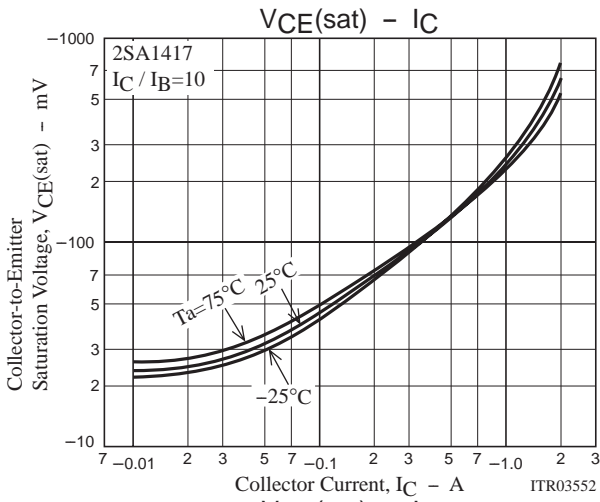
## Switching Time Test Circuit



2SA1417 / 2SC3647



# 2SA1417 / 2SC3647



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