



SANYO Semiconductors

DATA SHEET

2SA1416 / 2SC3646 — PNP / NPN Epitaxial Planar Silicon Transistors

High-Voltage Switching Applications

Features

- Adoption of FBET, MBIT processes.
- High breakdown voltage and large current capacity.
- Fast switching speed.
- Ultrasmall size making it easy to provide high-density, small-sized hybrid IC's.

Specifications () : 2SA1416

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	VCBO		(-)120	V
Collector-to-Emitter Voltage	VCEO		(-)100	V
Emitter-to-Base Voltage	VEBO		(-)6	V
Collector Current	IC		(-)1	A
Collector Current (Pulse)	ICP		(-)2	A
Collector Dissipation	PC		500	mW
		Mounted on a ceramic board (250mm ² ×0.8mm)	1.3	W
Junction Temperature	Tj		150	°C
Storage Temperature	Tstg		-55 to +150	°C

Marking 2SA1416 : AB

2SC3646 : CB

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2SA1416 / 2SC3646

Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	$V_{CB}=(-)100V, I_E=0A$			(-) 100	nA
Emitter Cutoff Current	I_{EBO}	$V_{EB}=(-)4V, I_C=0A$			(-) 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}	$V_{CB}=(-)10V, f=1MHz$		(13)8.5		pF
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=(-)400mA, I_B=(-)40mA$		(-0.2)0.1	(-0.6)0.4	V
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=(-)400mA, I_B=(-)40mA$		(-) 0.85	(-) 1.2	V
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.		(700)850		ns
Fall Time	t_f	See specified Test Circuit.		(40)50		ns

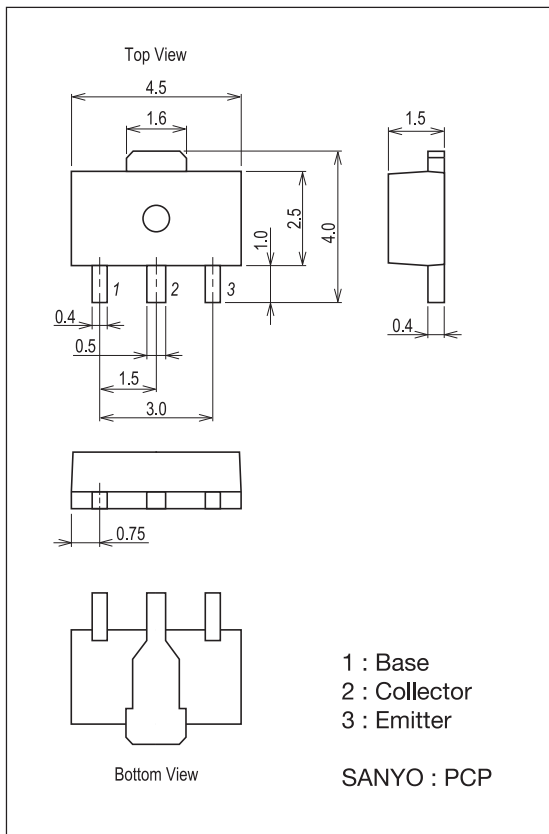
*: The 2SA1416 / 2SC3646 are classified by 100mA h_{FE} as follows:

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

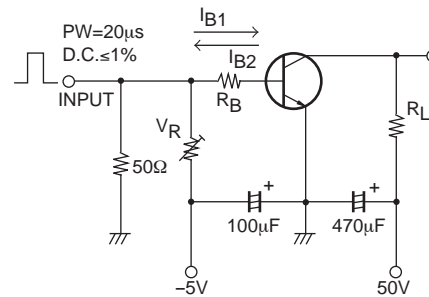
Package Dimensions

unit : mm (typ)

7007B-004

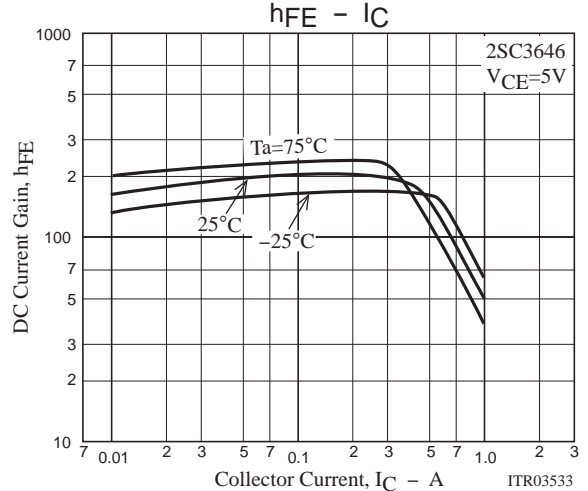
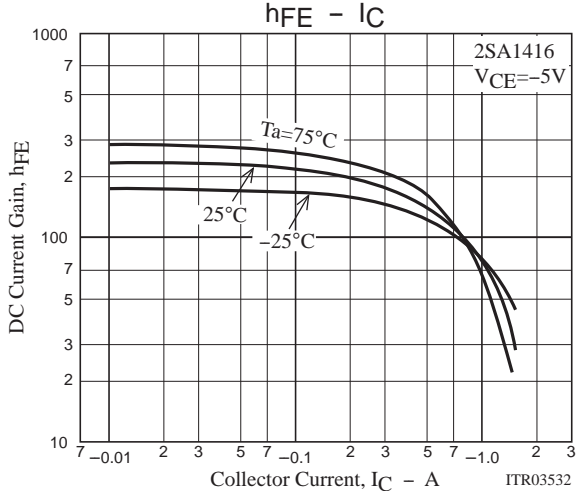
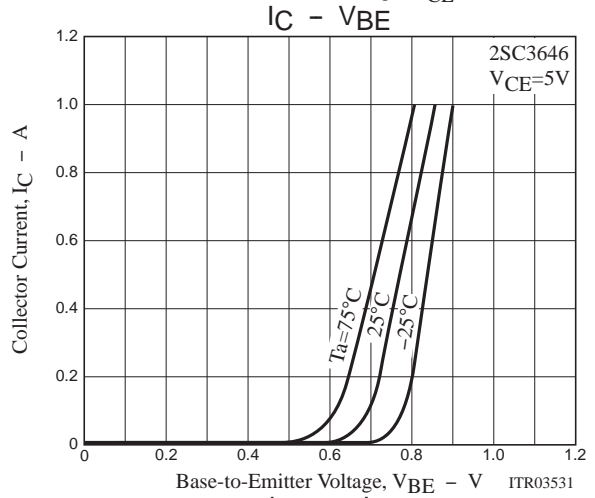
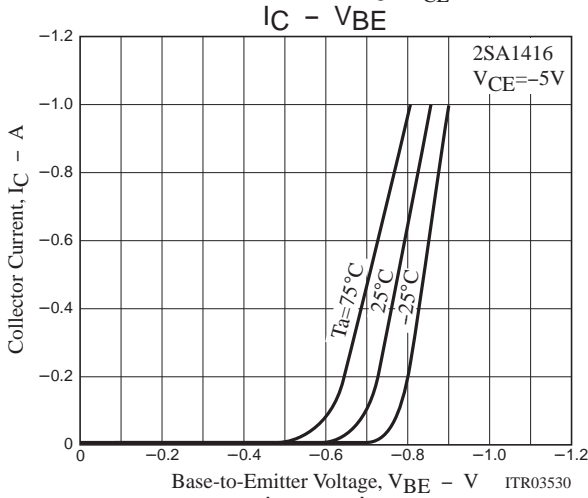
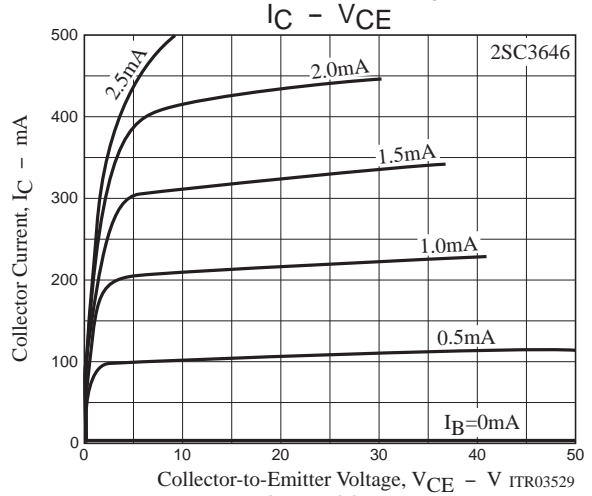
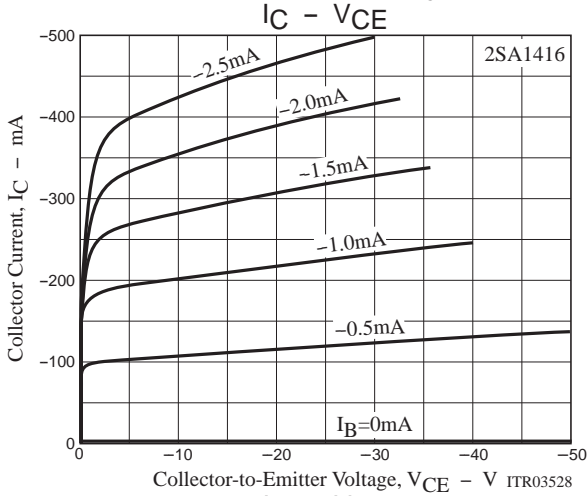
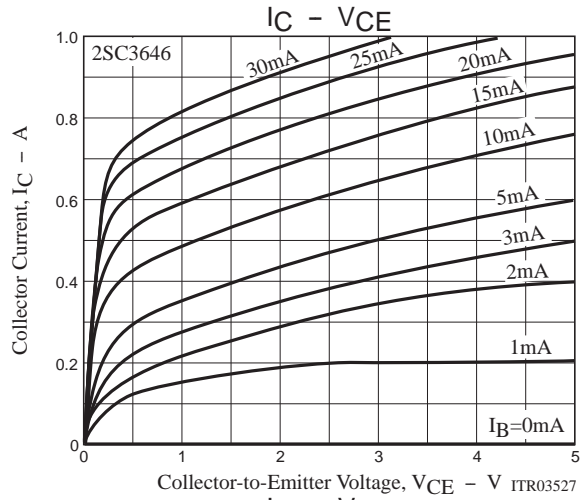
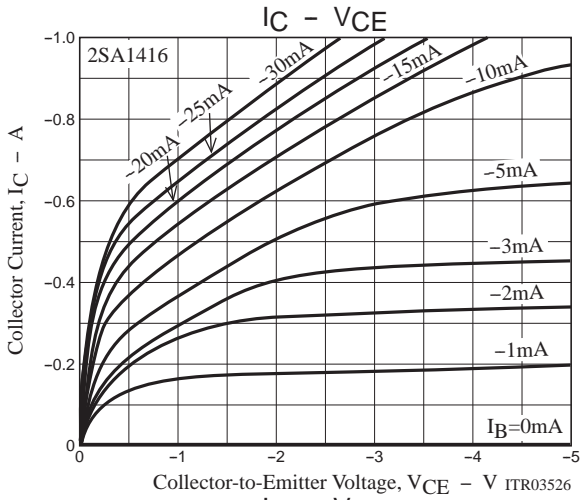


Switching Time Test Circuit

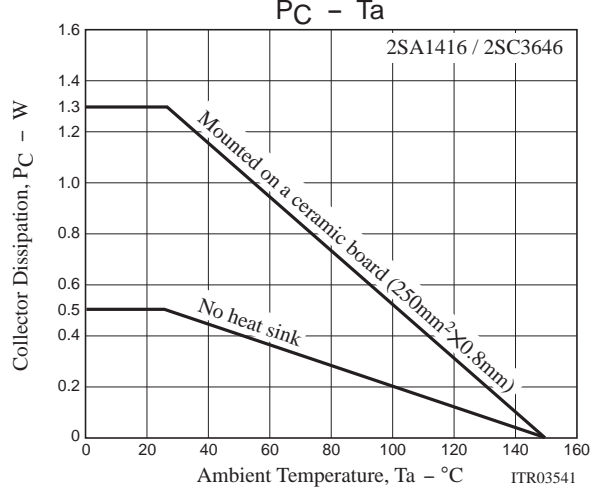
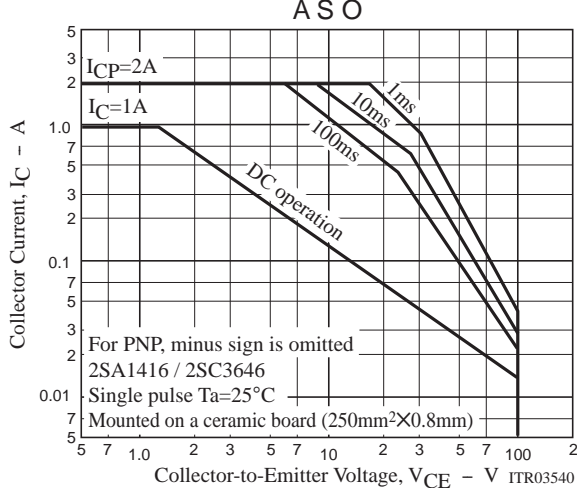
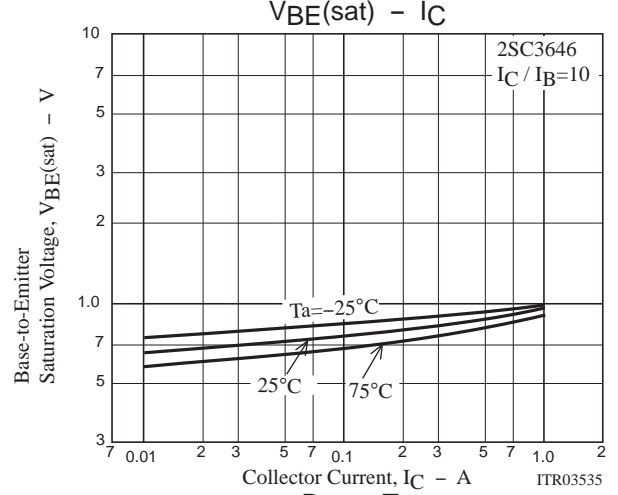
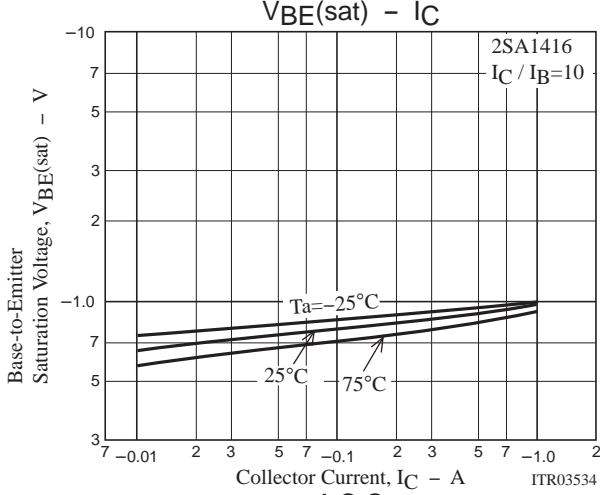
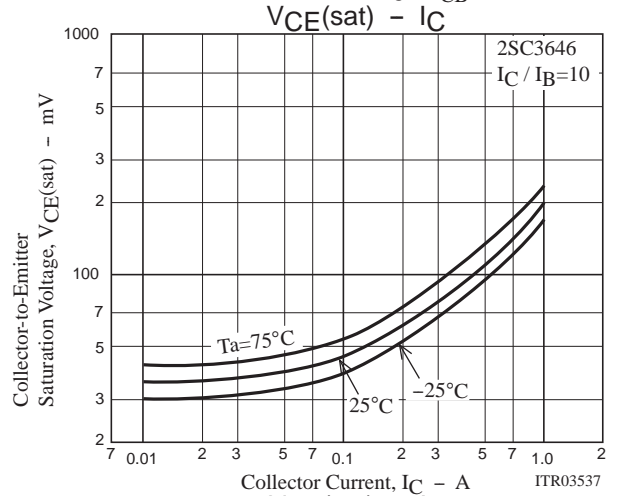
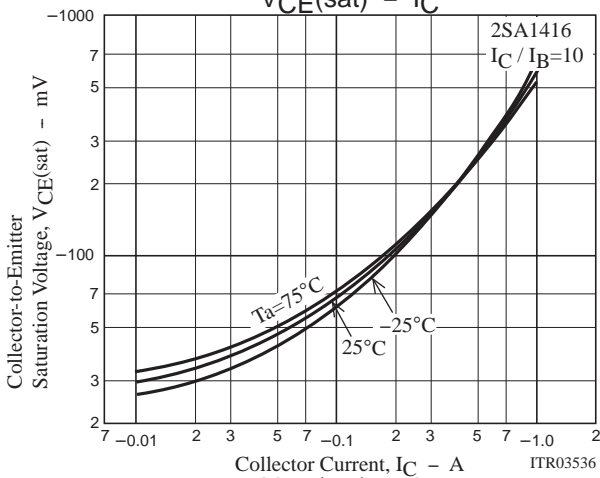
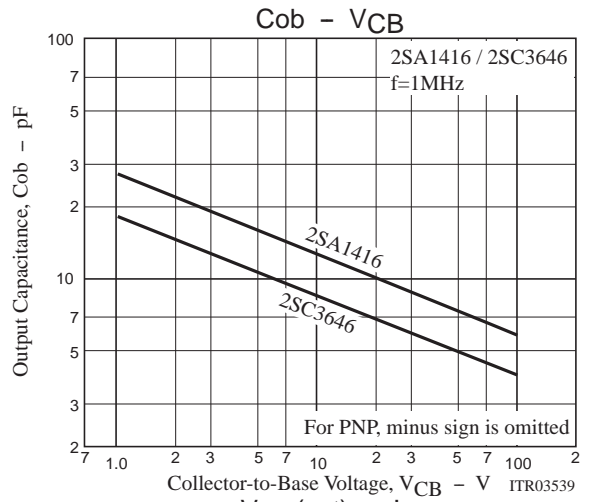
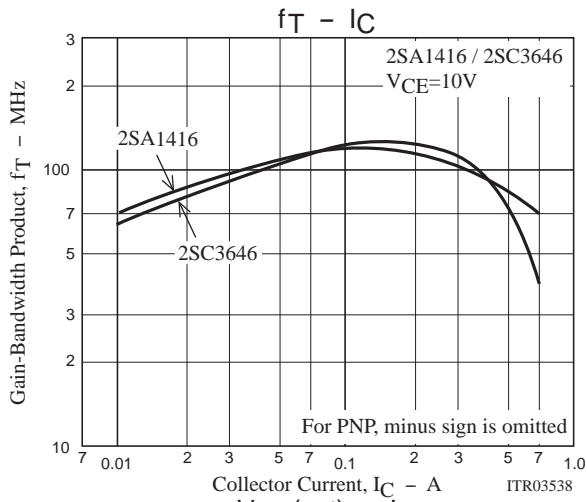


$I_C=10I_{B1}=-10I_{B2}=400mA$
(For PNP, the polarity is reversed)

2SA1416 / 2SC3646



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