

**SANYO**

No.2005A

**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 time.
- . Very small size making it easy to provide high-density, small-sized hybrid ICs.

( ): 2SA1416

Absolute Maximum Ratings at Ta=25°C		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>EBO</sub>	(-)6 V
Collector Current	I <sub>C</sub>	(-)1 A
Collector Current(Pulse)	I <sub>CP</sub>	(-)2 A
Collector Dissipation	P <sub>C</sub>	500 mW
	Mounted on ceramic board (250mm <sup>2</sup> x 0.8mm)	1.3 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		min	typ	max	unit
Collector Cutoff Current	I <sub>CBO</sub> V <sub>CB</sub> =(-)100V, I <sub>B</sub> =0			(-)100	nA
Emitter Cutoff Current	I <sub>EBO</sub> V <sub>EB</sub> =(-)4V, I <sub>C</sub> =0			(-)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		(13)		pF
			8.5		pF
C-E Saturation Voltage	V <sub>CE(sat)</sub> I <sub>C</sub> =(-)400mA, I <sub>B</sub> =(-)40mA		(-0.2)	(-0.6)	V
			0.1	0.4	V
B-E Saturation Voltage	V <sub>BE(sat)</sub> I <sub>C</sub> =(-)400mA, I <sub>B</sub> =(-)40mA		(-)0.85	(-)1.2	V
C-B Breakdown Voltage	V <sub>(BR)CBO</sub> I <sub>C</sub> =(-)10μA, I <sub>E</sub> =0		(-)120		V
C-E Breakdown Voltage	V <sub>(BR)CEO</sub> I <sub>C</sub> =(-)1mA, R <sub>BE</sub> =∞		(-)100		V
E-B Breakdown Voltage	V <sub>(BR)EBO</sub> I <sub>E</sub> =(-)10μA, I <sub>C</sub> =0		(-)6		V

\*: The 2SA1416/2SC3646 are classified by 100mA h<sub>FE</sub> as follows:

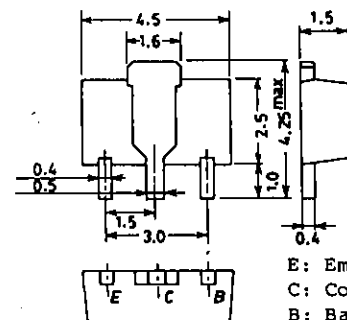
100 R	200	140 S	280	200 T	400
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Marking 2SA1416:AB  
2SC3646:CB

h<sub>FE</sub> rank : R, S, T**Package Dimensions 2038**

(unit:mm)



(Bottom View)

E: Emitter  
C: Collector  
B: Base

SANYO: PCP

**SANYO Electric Co., Ltd. Semiconductor Business Headquarters**

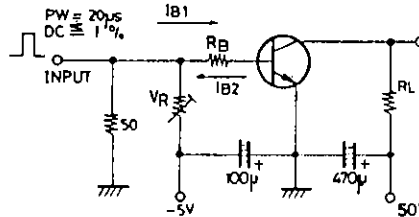
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110 JAPAN

2SA1416/2SC3646

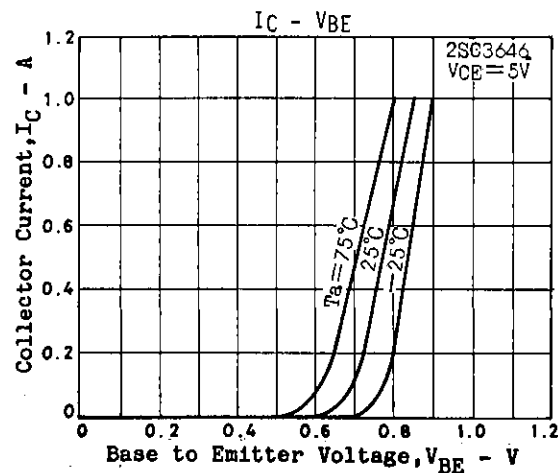
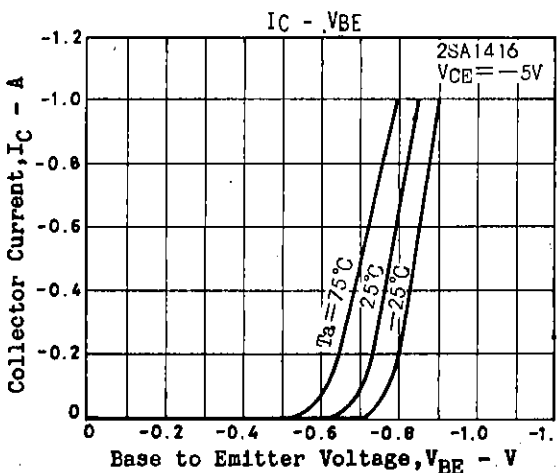
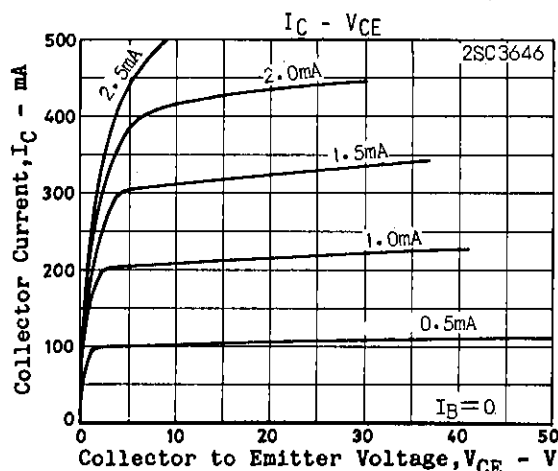
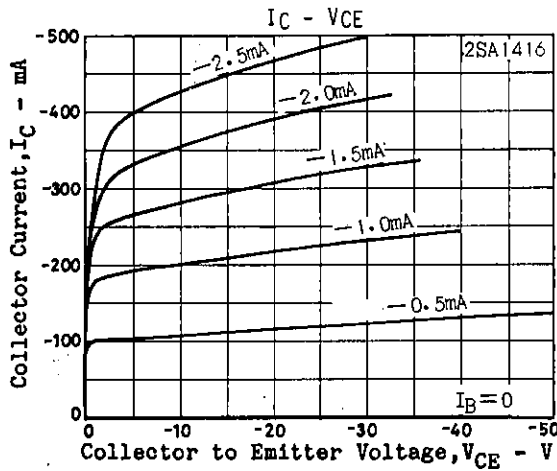
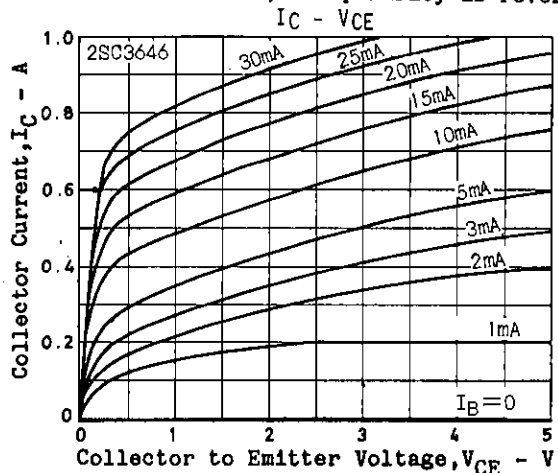
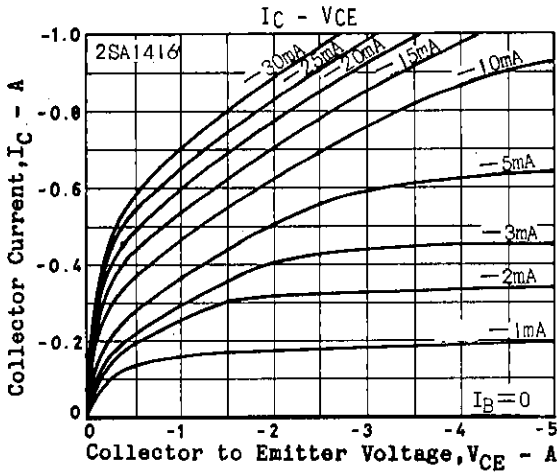
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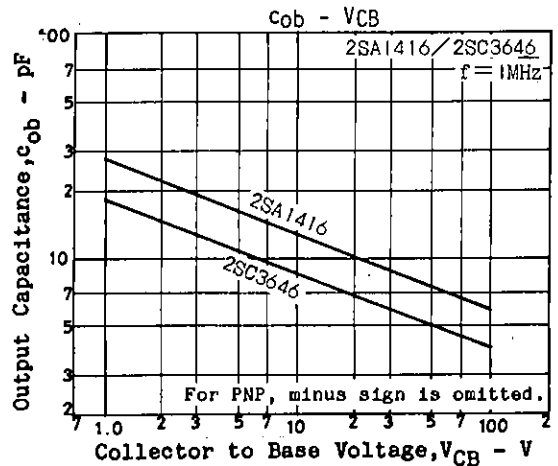
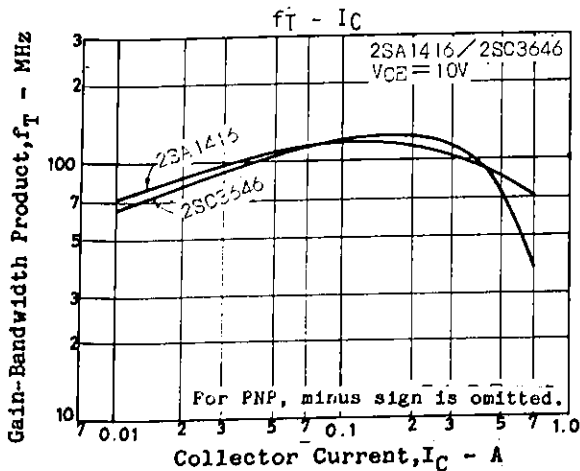
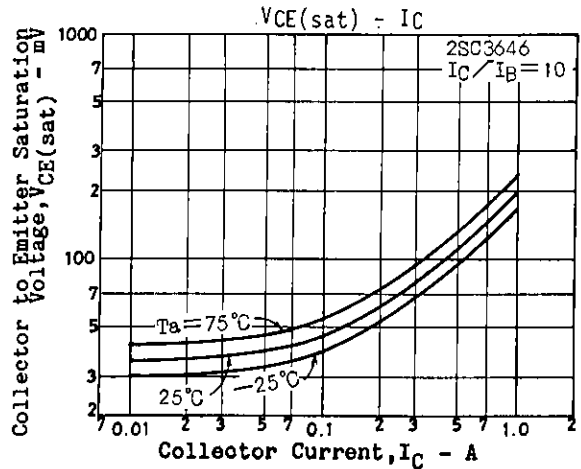
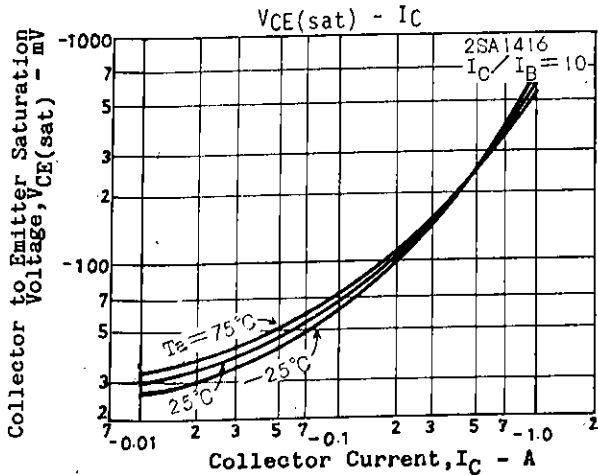
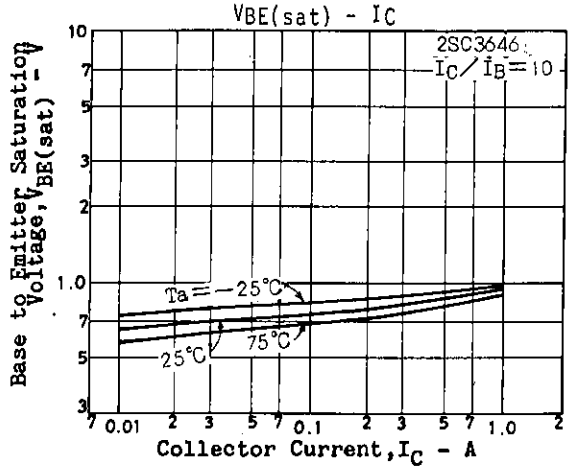
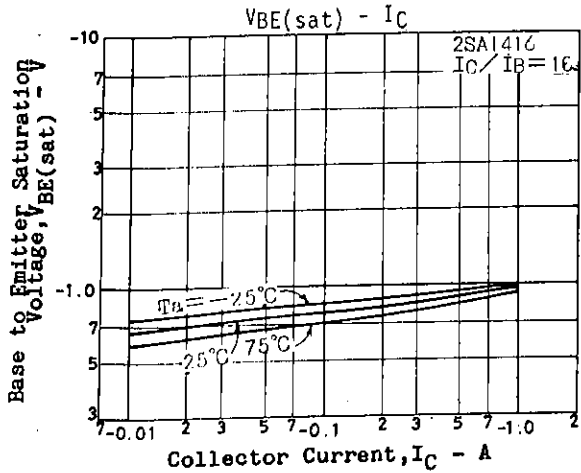
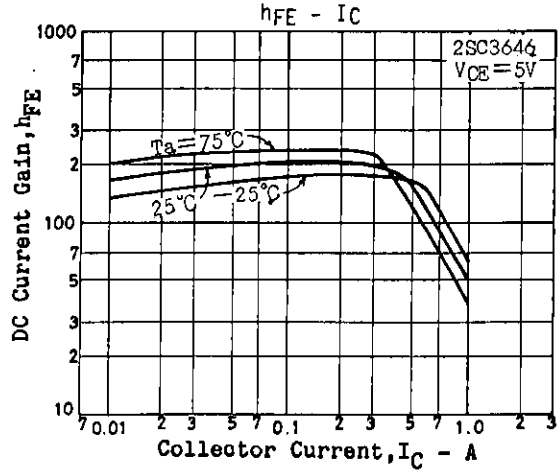
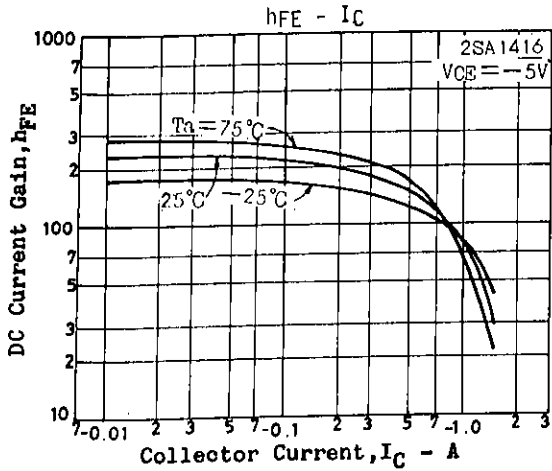
			min	typ	max	unit
Turn-ON Time	$t_{on}$	See specified Test Circuit.		(80)		ns
				80		ns
Storage Time	$t_{stg}$			(700)		ns
				850		ns
Fall Time	$t_f$			(40)		ns
				50		ns

Switching Time Test Circuit

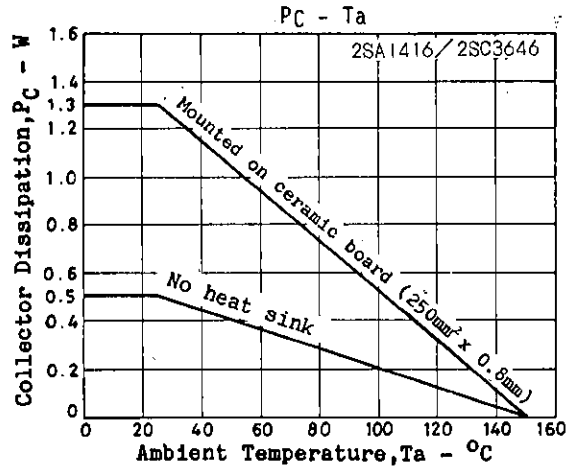
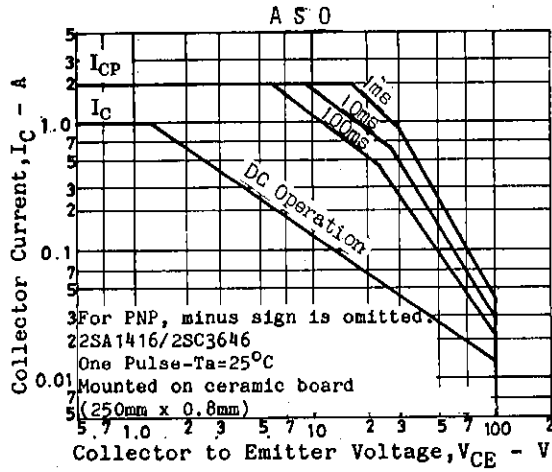


Unit (Resistance :  $\Omega$ , Capacitance : F)  
 $10I_{B1} = -10I_{B2} = I_C = 400mA$  (For PNP, the polarity is reversed.)





2SA1416/2SC3646



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