Ordering number:EN3096

PNP/NPN Epitaxial Planar Silicon Transistors

2SA1709/2SC4489

High-Voltage Switching Applications

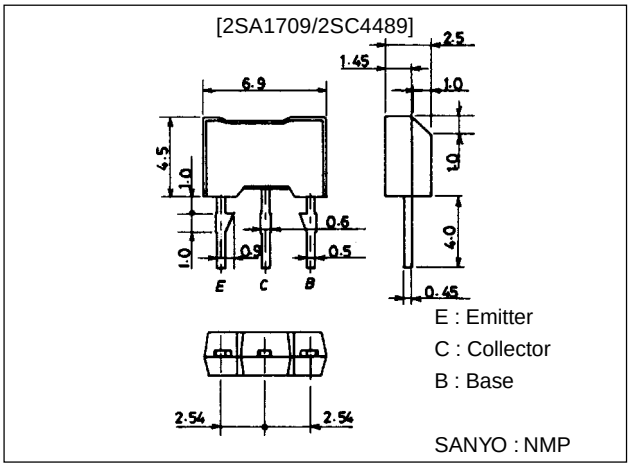
Features

- Adoption of FBET, MBIT processes.
- High breakdown voltage, large current capacity.
- Fast switching speed.

Package Dimensions

unit:mm

2064



( ) 2SA1709

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		1	W
Junction Temperature	Tj		150	˚C
Storage Temperature	Tstg		–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
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
Output Capacitance	C_{ob}	V_{CB}=(–)10V, f=1MHz		(25)16		pF

SANYO Electric Co.,Ltd. Semiconductor Bussiness Headquaters

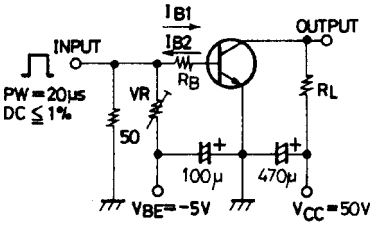
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

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

* : The 2SA1709/2SC4489 are classified by 100mA h_{FE} as follows :

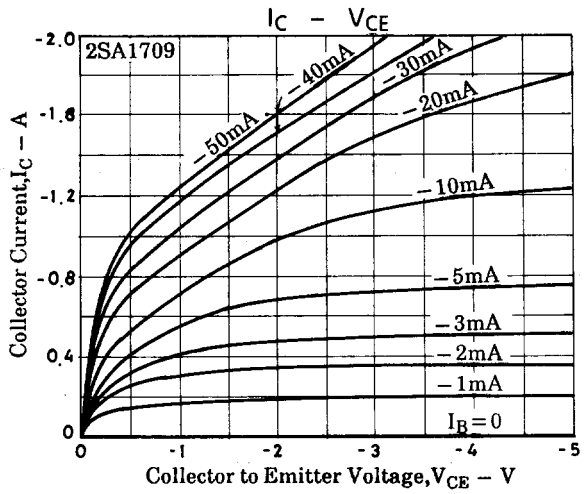
100 R 200	140 S 280	200 T 400

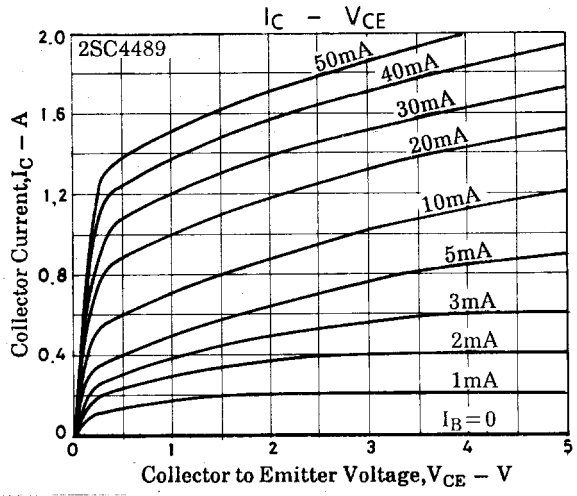
Switching Time Test Circuit

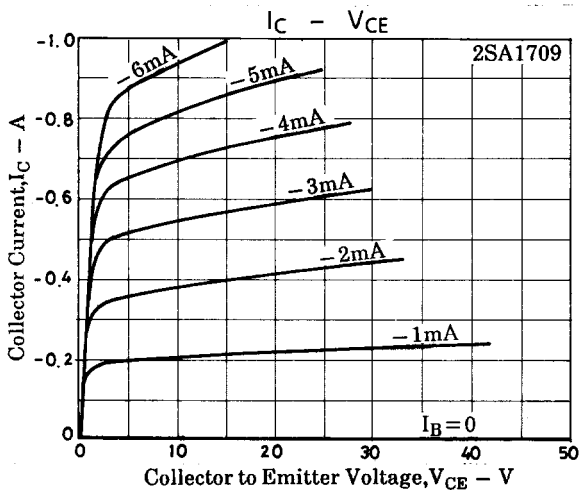


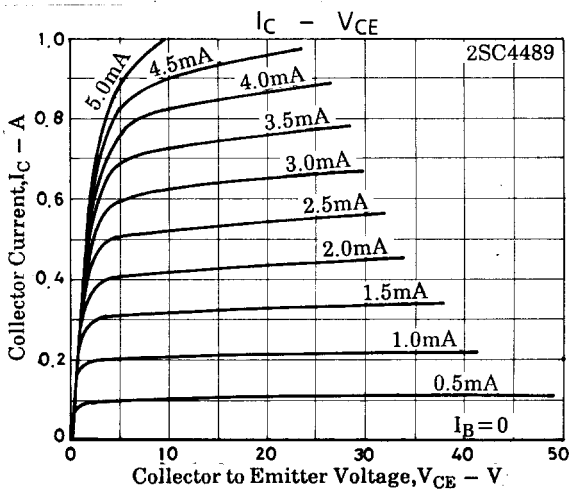
$10I_{B1} = -10I_{B2} = I_C = 0.7A$

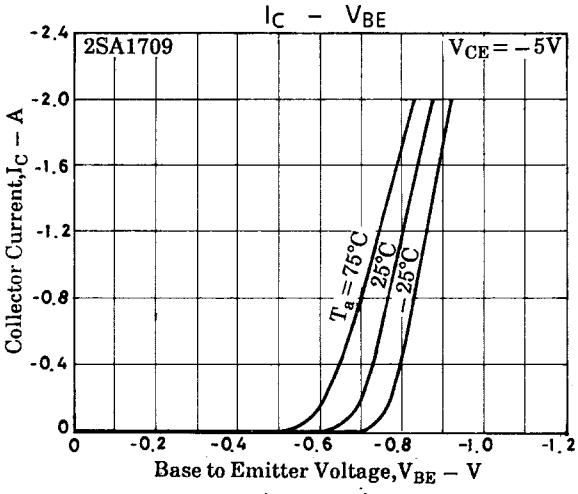
(For PNP, the polarity is reversed.)
Unit (resistance : Ω, capacitacne : F)

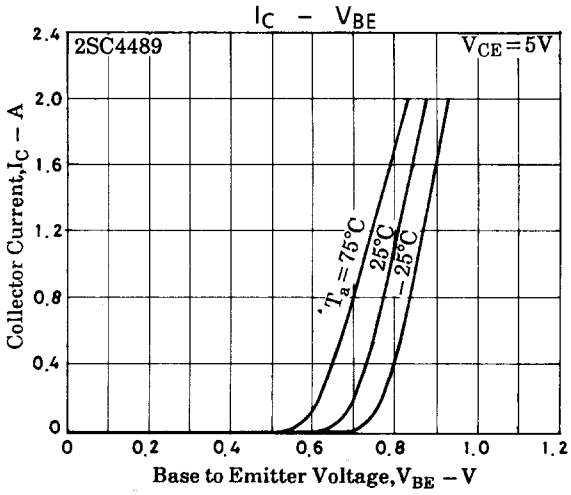


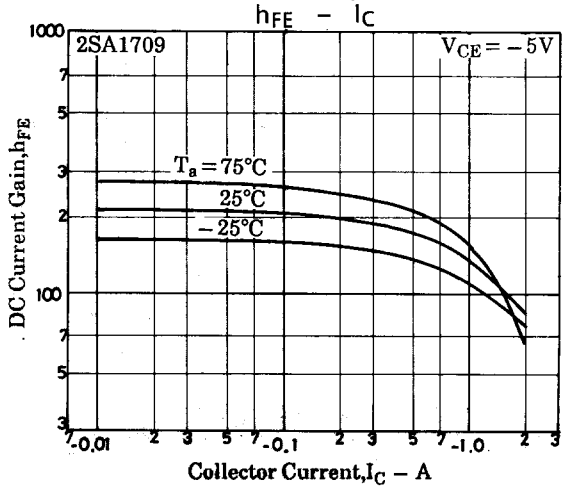


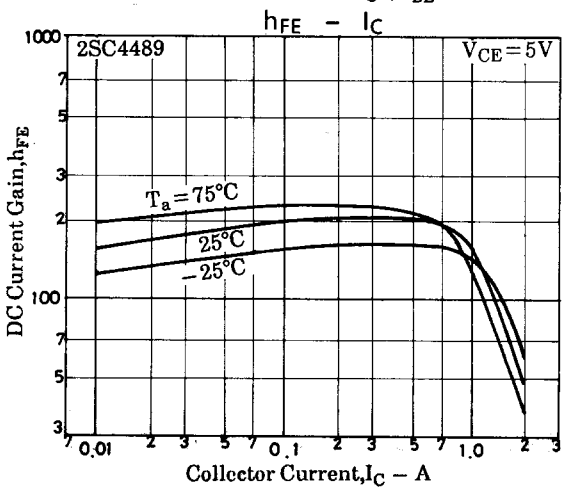


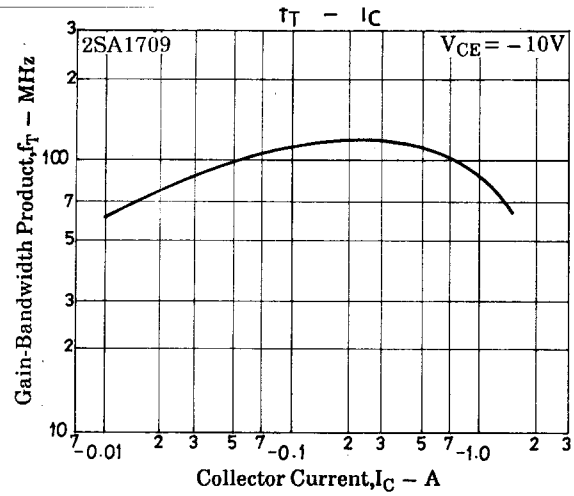


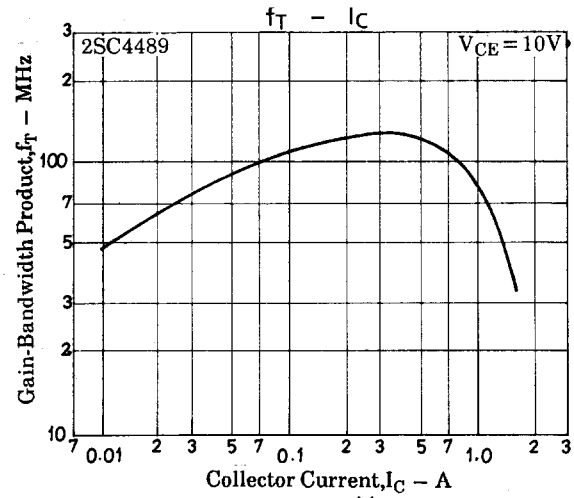

I_C – V_{BE}
2SA1709
V_{CE} = –5V
T_a = 75°C
25°C
–25°C
Collector Current, I_C – A
Base to Emitter Voltage, V_{BE} – V

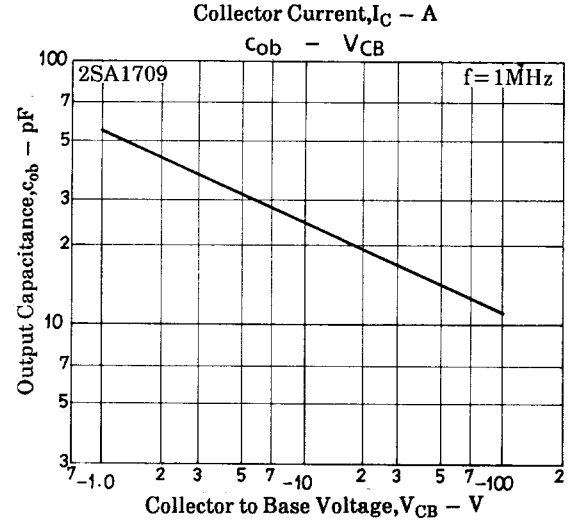

I_C – V_{BE}
2SC4489
V_{CE} = 5V
T_a = 75°C
25°C
–25°C
Collector Current, I_C – A
Base to Emitter Voltage, V_{BE} – V

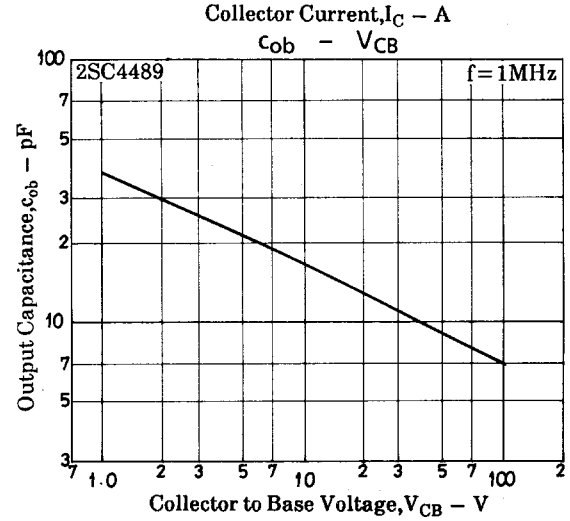

h_{FE} – I_C
2SA1709
V_{CE} = –5V
T_a = 75°C
25°C
–25°C
DC Current Gain, h_{FE}
Collector Current, I_C – A

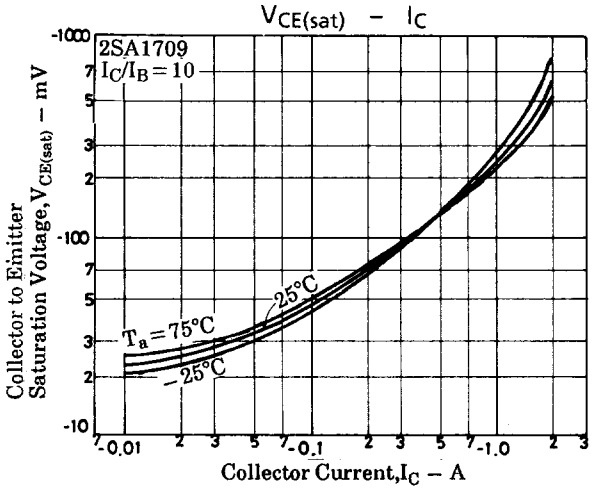

h_{FE} – I_C
2SC4489
V_{CE} = 5V
T_a = 75°C
25°C
–25°C
DC Current Gain, h_{FE}
Collector Current, I_C – A

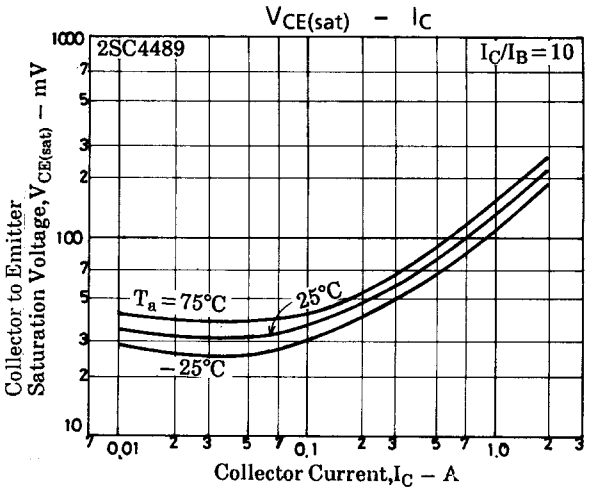

f_T – I_C
2SA1709
V_{CE} = –10V
Gain-Bandwidth Product, f_T – MHz
Collector Current, I_C – A

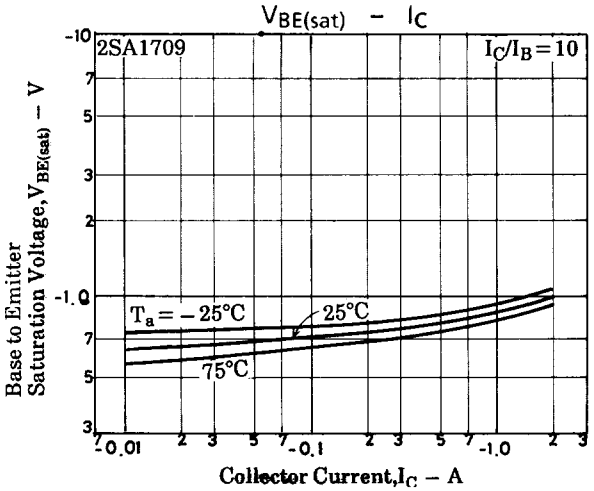

f_T – I_C
2SC4489
V_{CE} = 10V
Gain-Bandwidth Product, f_T – MHz
Collector Current, I_C – A

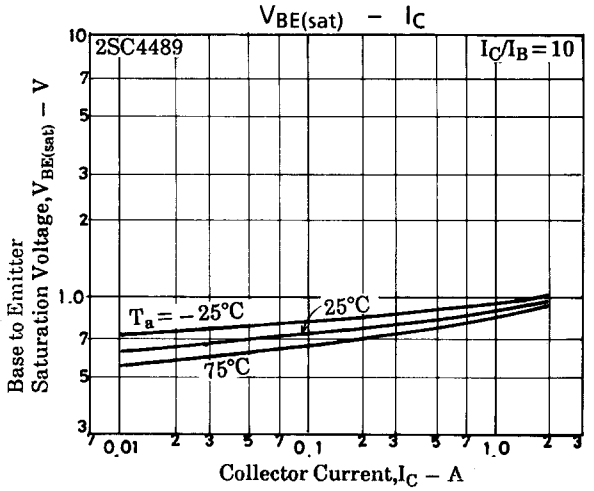

C_{ob} – V_{CB}
2SA1709
f = 1MHz
Output Capacitance, C_{ob} – pF
Collector to Base Voltage, V_{CB} – V

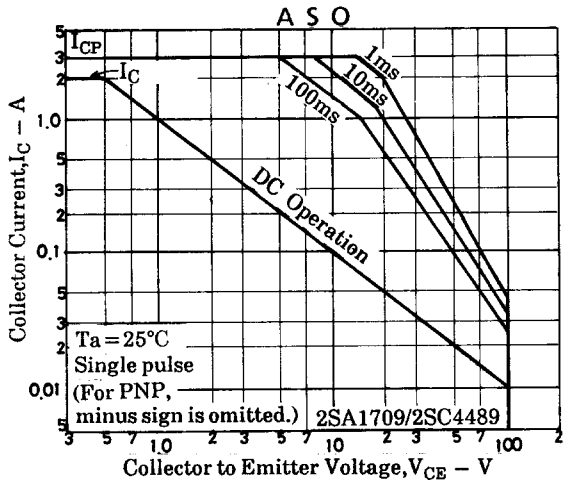

C_{ob} – V_{CB}
2SC4489
f = 1MHz
Output Capacitance, C_{ob} – pF
Collector to Base Voltage, V_{CB} – V

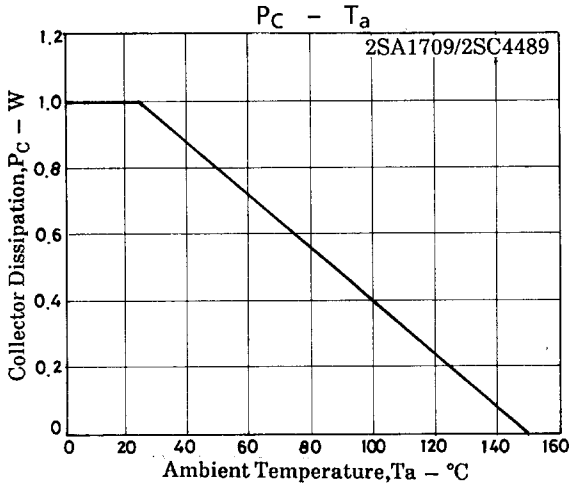

VCE(sat) – IC
2SA1709
IC/IB=10
Ta=75°C
25°C
–25°C
Collector to Emitter Saturation Voltage,VCE(sat) – mV
Collector Current,IC – A


VCE(sat) – IC
2SC4489
IC/IB=10
Ta=75°C
25°C
–25°C
Collector to Emitter Saturation Voltage,VCE(sat) – mV
Collector Current,IC – A


VBE(sat) – IC
2SA1709
IC/IB=10
Ta=–25°C
25°C
75°C
Base to Emitter Saturation Voltage,VBE(sat) – V
Collector Current,IC – A


VBE(sat) – IC
2SC4489
IC/IB=10
Ta=–25°C
25°C
75°C
Base to Emitter Saturation Voltage,VBE(sat) – V
Collector Current,IC – A


A S O
ICP
IC
1ms
10ms
100ms
DC Operation
Ta=25°C
Single pulse
(For PNP, minus sign is omitted.)
2SA1709/2SC4489
Collector Current,IC – A
Collector to Emitter Voltage,VCE – V


PC – Ta
2SA1709/2SC4489
Collector Dissipation,PC – W
Ambient Temperature,Ta – °C