Ordering number:2047A

PNP/NPN Epitaxial Planar Silicon Transistors

2SB1167/2SD1724

100V/3A Switching Applications

Features

· Relay drivers, high-speed inverters, converters.

Features

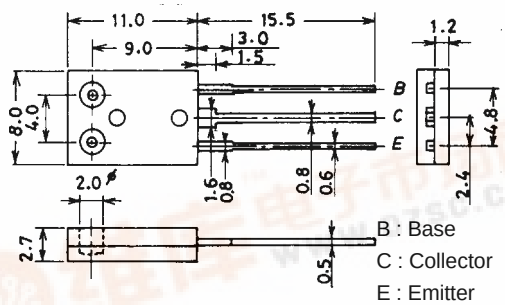
· Low collector-to-emitter saturation voltage.
· High f_T.
· Excellent linearity of h_{FE}.
· Fast switching time.

Package Dimensions

unit:mm

2043A

[2SB1167/2SD1724]



SANYO : TO-126LP

( ) : 2SB1167

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		(–)3	A
Collector Current (Pulse)	I_{CP}		(–)6	A
Collector Dissipation	P_C		1.2	W
		Tc=25˚C	20	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			(–)1	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=(–)4V, I_C=0			(–)1	μA
DC Current Gain	$h_{FE}1$	V_{CE}=(–)5V, I_C=(–)0.5A	70*		400*	
	$h_{FE}2$	V_{CE}=(–)5V, I_C=(–)2A	40			
Gain-Bandwidth Product	f_T	V_{CE}=(–)10V, I_C=(–)0.5A		(130)		MHz
				180		MHz
Output Capacitance	C_{ob}	V_{CB}=(–)10V, f=1MHz		25(40)		pF

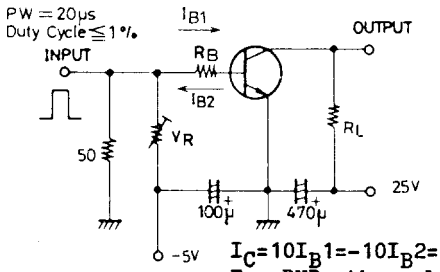
* : The 2SB1167/2SD1724 are classified by 0.5A h_{FE} as follows :

70	Q	140	100	R	200	140	S	280	200	T	400

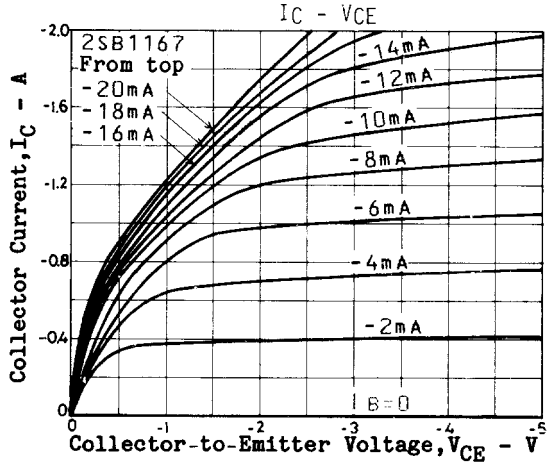
SANYO Electric Co.,Ltd. Semiconductor Bussiness Headquaters
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

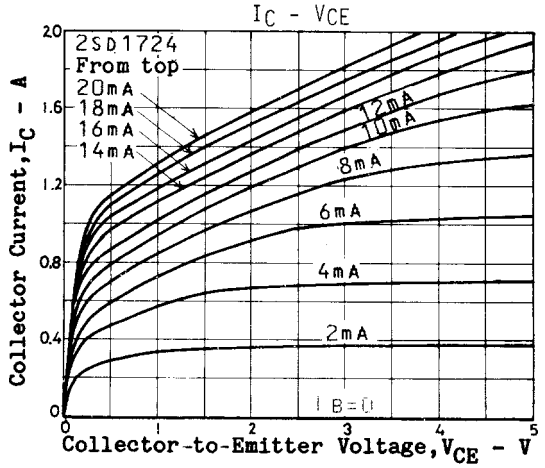
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C=(–)1.5A, I_B=(–)0.15A		(–200)	(–500)	mV
				150	400	mV
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	I_C=(–)1.5A, I_B=(–)0.15A		(–)0.9	(–)1.2	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	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	$V_{(BR)EBO}$	I_E=(–)10μA, I_C=0	(–)6			V
Turn-ON Time	t_{on}	See specified Test Circuit		(100)		ns
				100		ns
Storage Time	t_{stg}	See specified Test Circuit		900		ns
				(800)		ns
Fall Time	t_f	See specified Test Circuit		50(50)		ns

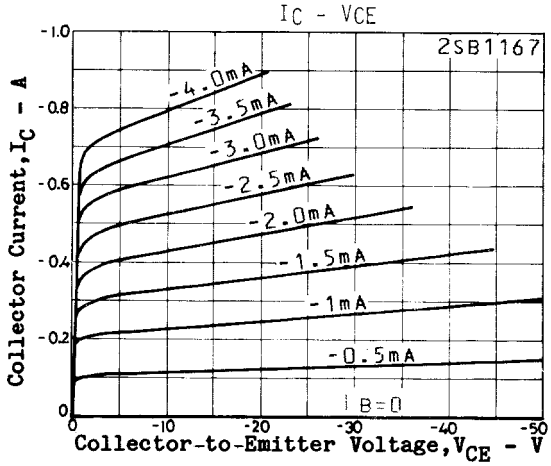
Switching Time Test Circuit

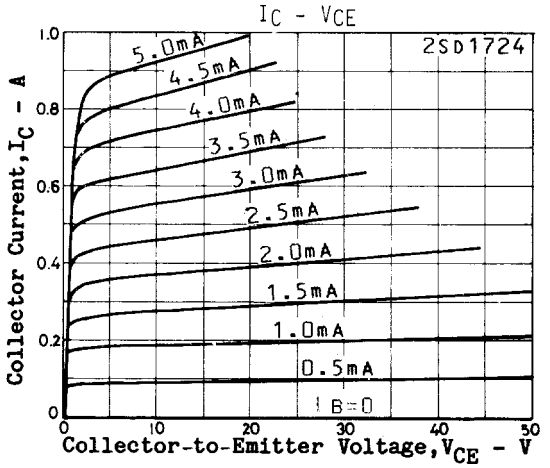


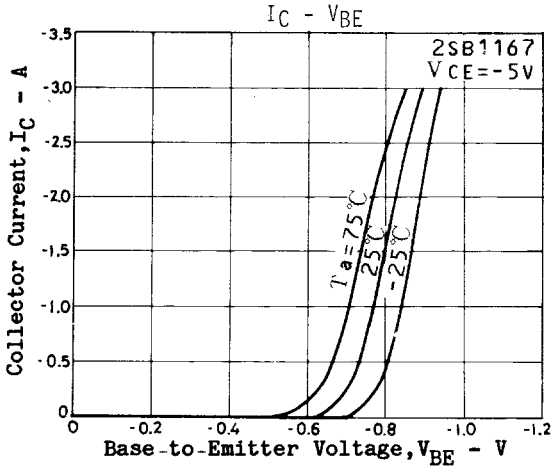
I_C=10I_B1=-10I_B2=1.5A
For PNP, the polarity is reversed.
Unit (resistance : Ω, capacitance : F)

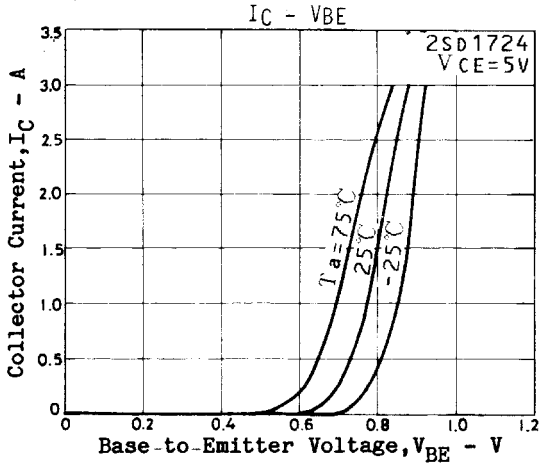


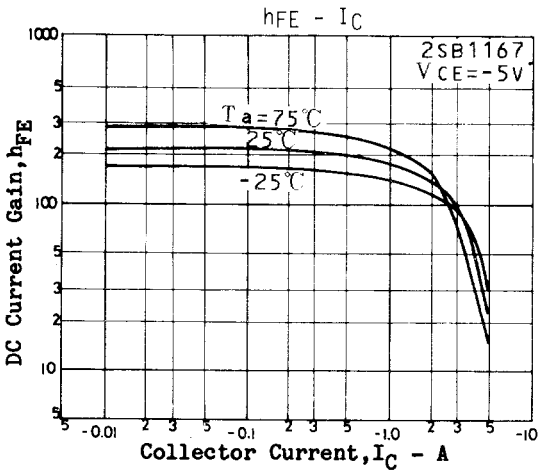


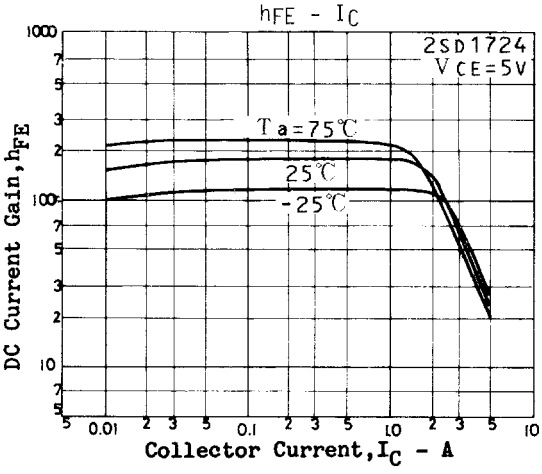


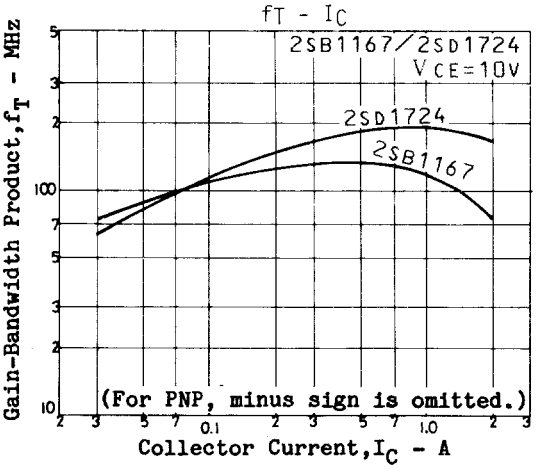


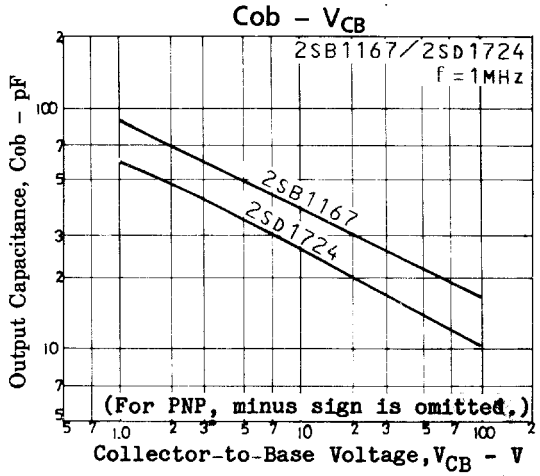

IC - VBE
2SB1167
VCE=-5V
Ta=75℃
25℃
-25℃
Collector Current, IC - A
Base-to-Emitter Voltage, VBE - V

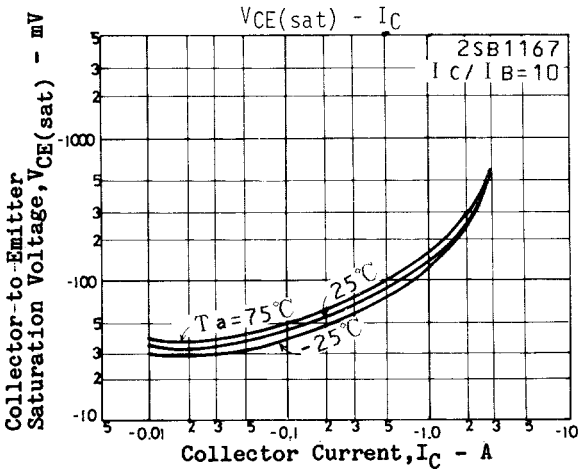

IC - VBE
2SD1724
VCE=5V
Ta=75℃
25℃
-25℃
Collector Current, IC - A
Base-to-Emitter Voltage, VBE - V

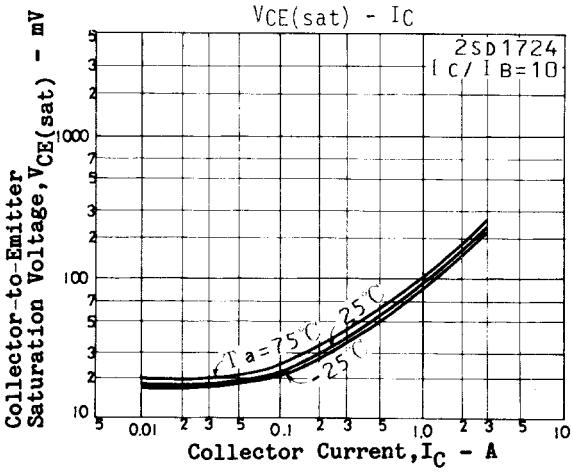

hFE - IC
2SB1167
VCE=-5V
Ta=75℃
25℃
-25℃
DC Current Gain, hFE
Collector Current, IC - A


hFE - IC
2SD1724
VCE=5V
Ta=75℃
25℃
-25℃
DC Current Gain, hFE
Collector Current, IC - A


fT - IC
2SB1167/2SD1724
VCE=10V
2SD1724
2SB1167
(For PNP, minus sign is omitted.)
Gain-Bandwidth Product, fT - MHz
Collector Current, IC - A


Cob - VCB
2SB1167/2SD1724
f=1MHz
2SB1167
2SD1724
(For PNP, minus sign is omitted.)
Output Capacitance, Cob - pF
Collector-to-Base Voltage, VCB - V


VCE(sat) - IC
2SB1167
IC/IB=10
Ta=75℃
25℃
-25℃
Collector-to-Emitter Saturation Voltage, VCE(sat) - mV
Collector Current, IC - A


VCE(sat) - IC
2SD1724
IC/IB=10
Ta=75℃
25℃
-25℃
Collector-to-Emitter Saturation Voltage, VCE(sat) - mV
Collector Current, IC - A