Ordering number: EN2048A

SANYO

No.2048A

2SB1168/2SD1725

PNP/NPN Epitaxial Planar Silicon Transistors

100V/4A Switching Applications

Applications

. Relay drivers, high-speed inverters, converters

Features

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

( ): 2SB1168

Absolute Maximum Ratings at Ta=25°C

				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		(-)4	A
Collector Current (Pulse)	I_{CP}		(-)8	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

			min	typ	max	unit
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=(-)3A	40			
Gain-Bandwidth Product	f_T	V_{CE}=(-)10V, I_C=(-)0.5A		180		MHz
				(130)		MHz
Output Capacitance	C_{ob}	V_{CB}=(-)10V, f=1MHz		40		pF
				(65)		pF
C-E Saturation Voltage	$V_{CE(sat)}$	I_C=(-)2A, I_B=(-)0.2A		150	400	mV
				(-200)	(-500)	mV

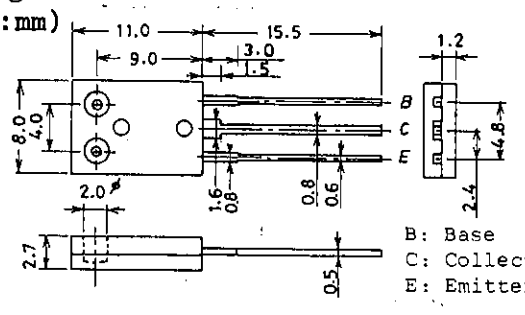
Continued on next page.

*: The 2SB1168/2SD1725 are classified by 0.5A h_{FE} as follows:

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

Package Dimensions 2043A

(unit: mm)



SANYO: TO126LP

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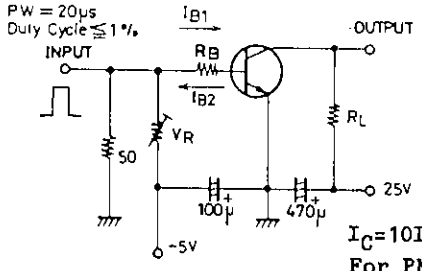
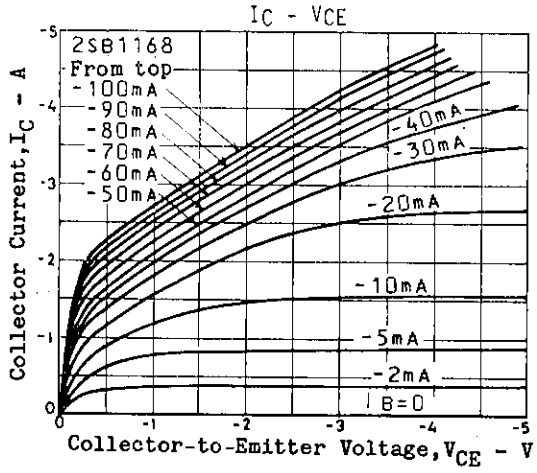
			min	typ	max	unit
B-E Saturation Voltage	$V_{BE(sat)}$	I_C=(-)2A, I_B=(-)0.2A		(-)0.9	(-)1.2	V
C-B Breakdown Voltage	$V_{(BR)CBO}$	I_C=(-)10μA, I_E=0	(-)120			V
C-E Breakdown Voltage	$V_{(BR)CEO}$	I_C=(-)1mA, R_{BE}=∞	(-)100			V
E-B Breakdown Voltage	$V_{(BR)EBO}$	I_E=(-)10μA, I_C=0	(-)6			V
Turn-on Time	t_{on}	See specified Test Circuit.		100		ns
				(100)		ns
Storage Time	tstg	"		900		ns
				(800)		ns
Fall Time	t_f	"		50		ns
				(50)		ns

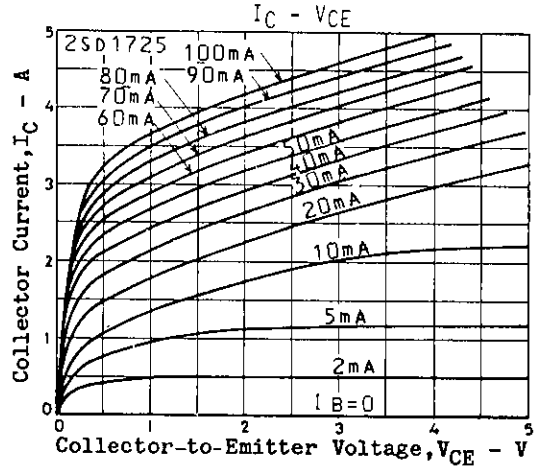
Switching Time Test Circuit

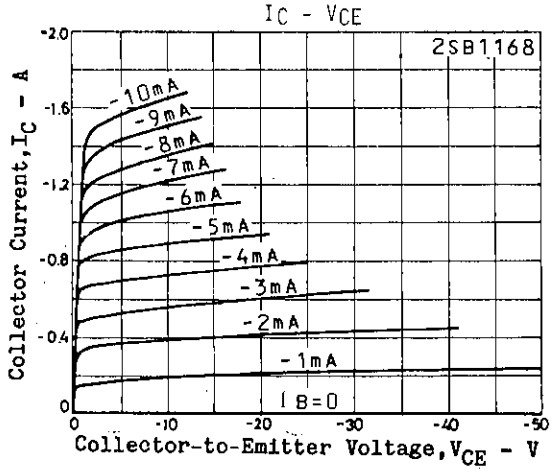


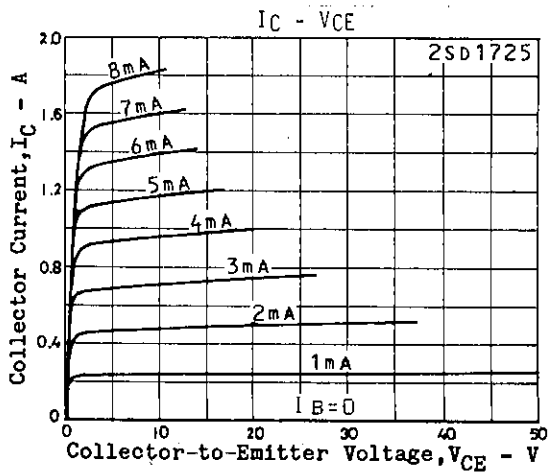
I_C=10I_B1=-10I_B2=2A
For PNP, the polarity is reversed.

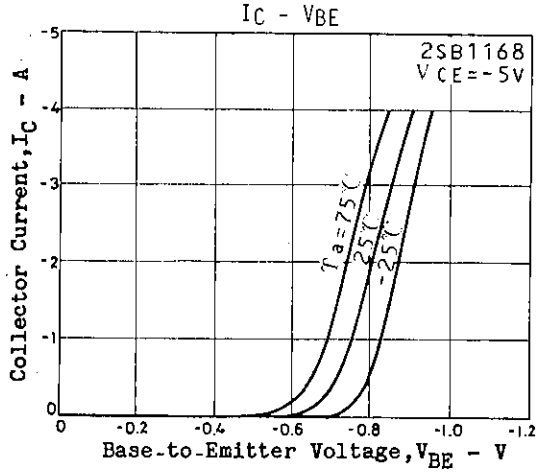
Unit (Resistance : Ω, Capacitance : F)

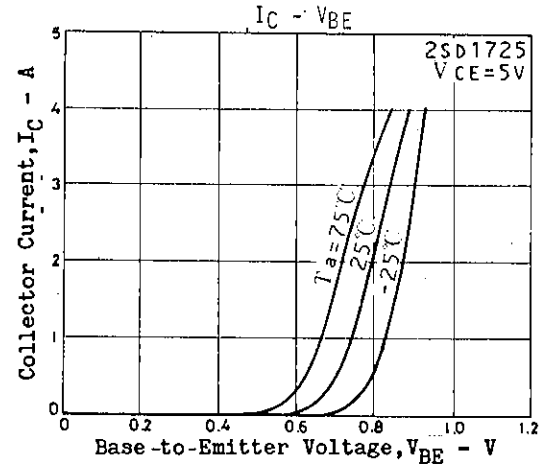


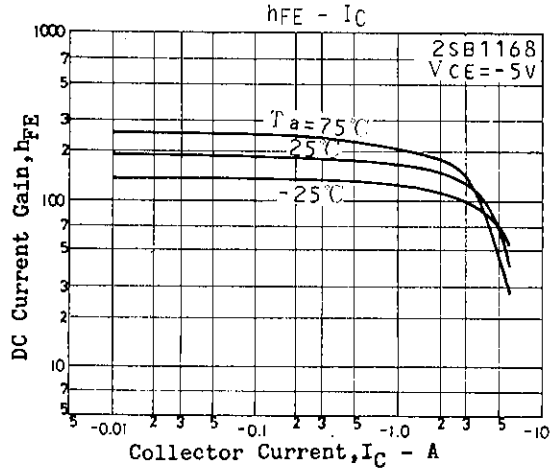


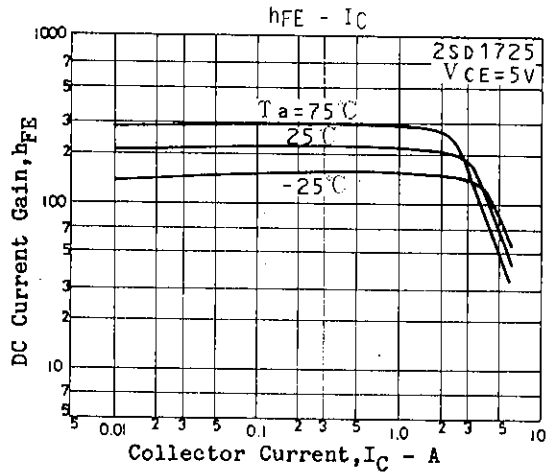


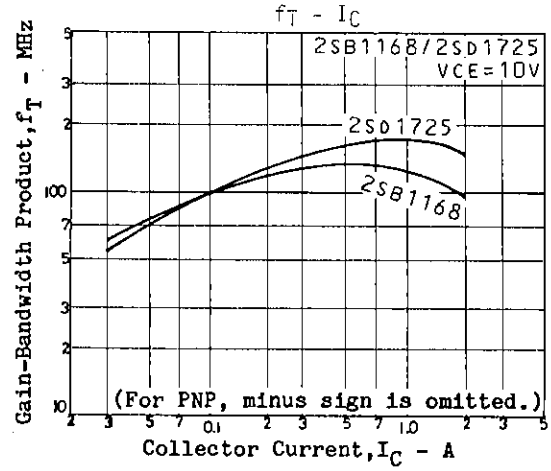


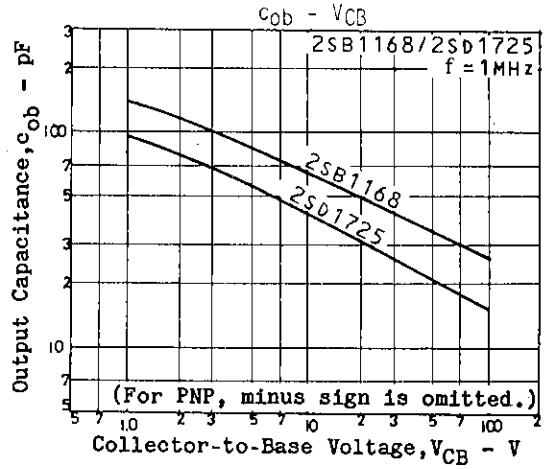

IC - VBE
2SB1168
VCE=-5V
Ta=75℃
25℃
-25℃
Collector Current, IC - A
Base-to-Emitter Voltage, VBE - V

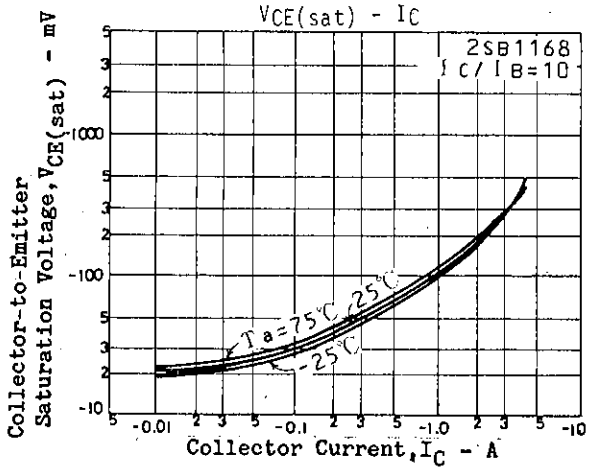

IC - VBE
2SD1725
VCE=5V
Ta=75℃
25℃
-25℃
Collector Current, IC - A
Base-to-Emitter Voltage, VBE - V

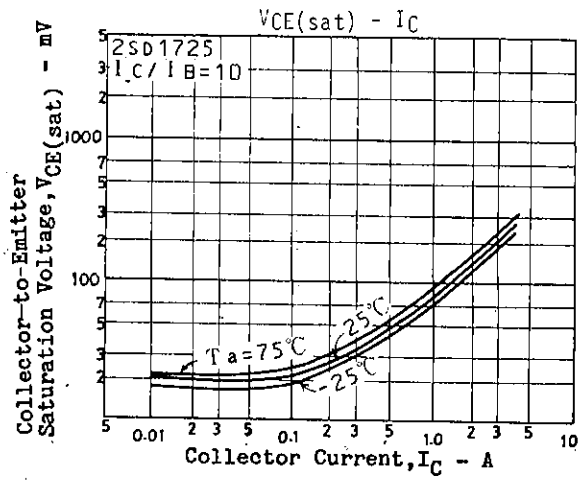

hFE - IC
2SB1168
VCE=-5V
Ta=75℃
25℃
-25℃
DC Current Gain, hFE
Collector Current, IC - A


hFE - IC
2SD1725
VCE=5V
Ta=75℃
25℃
-25℃
DC Current Gain, hFE
Collector Current, IC - A


fT - IC
2SB1168/2SD1725
VCE=10V
2SD1725
2SB1168
(For PNP, minus sign is omitted.)
Gain-Bandwidth Product, fT - MHz
Collector Current, IC - A


Cob - VCB
2SB1168/2SD1725
f=1MHz
2SB1168
2SD1725
(For PNP, minus sign is omitted.)
Output Capacitance, Cob - pF
Collector-to-Base Voltage, VCB - V


VCE(sat) - IC
2SB1168
IC/IB=10
Ta=75℃
25℃
-25℃
Collector-to-Emitter Saturation Voltage, VCE(sat) - mV
Collector Current, IC - A


VCE(sat) - IC
2SD1725
IC/IB=10
Ta=75℃
25℃
-25℃
Collector-to-Emitter Saturation Voltage, VCE(sat) - mV
Collector Current, IC - A