Ordering number : ENN1727D

PNP / NPN Epitaxial Planar Silicon Transistors

2SB1123 / 2SD1623

High-Current Switching Applications

Applications

- Voltage regulators, relay drivers, lamp drivers, electrical equipment.

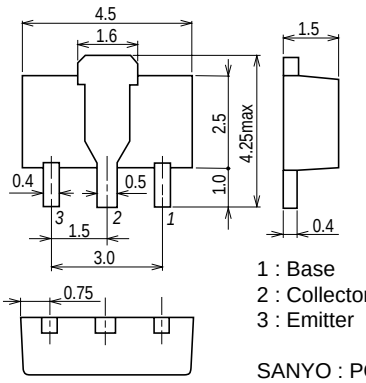
Features

- Adoption of FBET, MBIT processes.
- Low collector-to-emitter saturation voltage.
- Large current capacity and wide ASO.
- Fast switching speed.
- The ultraminiature package facilitates higher-density mounting, thus allows the applied hybrid IC's further miniaturization.

Package Dimensions

unit : mm
2038A

[2SB1123 / 2SD1623]



1 : Base
2 : Collector
3 : Emitter

SANYO : PCP

Specifications

( ) : 2SB1123

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		(-)60	V
Collector-to-Emitter Voltage	V_{CEO}		(-)50	V
Emitter-to-Base Voltage	V_{EBO}		(-)6	V
Collector Current	I_C		(-)2	A
Collector Current (Pulse)	I_{CP}		(-)4	A
Collector Dissipation	P_C		0.5	W
		Mounted on a ceramic board (250mm²×0.8mm)	1.3	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}=(-)50V, I_E=0			(-)100	nA
Emitter Cutoff Current	I_{EBO}	V_{EB}=(-)4V, I_C=0			(-)100	nA
DC Current Gain	$h_{FE}(1)$	V_{CE}=(-)2V, I_C=(-)100mA	100*		560*	
	$h_{FE}(2)$	V_{CE}=(-)2V, I_C=(-)1.5A	40			

* : The 2SB1123 / 2SD1623 are classified by 100mA h_{FE} as follows :

Rank	R	S	T	U
h_{FE}	100 to 200	140 to 280	200 to 400	280 to 560

Marking 2SB1123 : BF
2SD1623 : DF

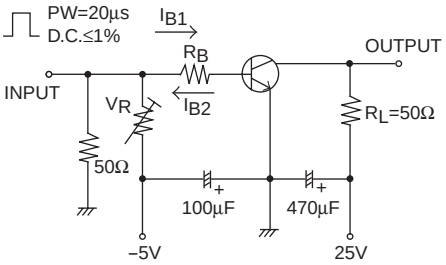
Continued on next page.

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

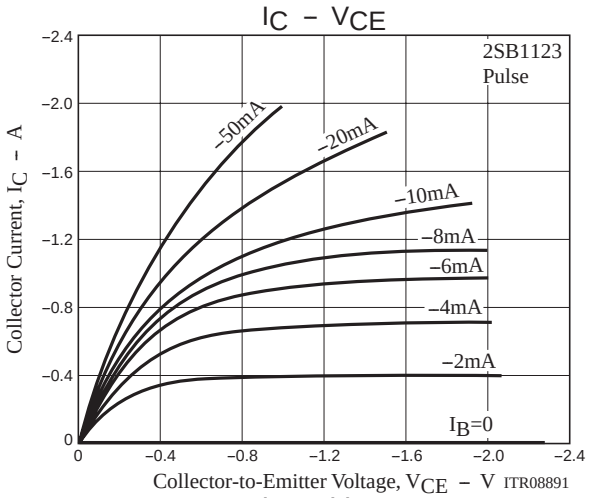
Continued from preceding page.

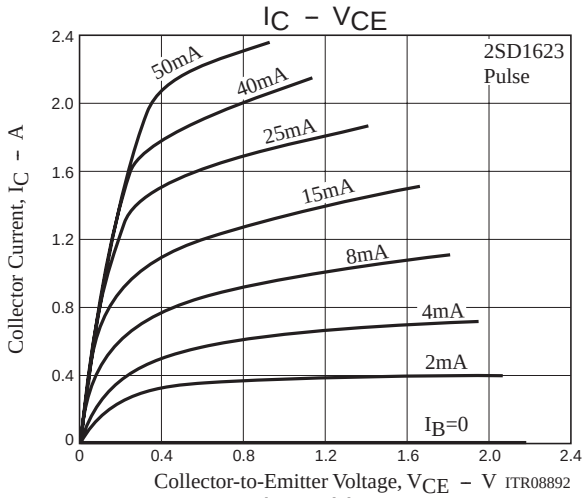
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Gain-Bandwidth Product	f_T	V_{CE}=(-)10V, I_C=(-)50mA		150		MHz
Output Capacitance	Cob	V_{CB}=(-)10V, f=1MHz		(22)12		pF
Collector-to-Emitter Saturation Voltage	V_{CE}(sat)	I_C=(-)1A, I_B=(-)50mA		(-0.3)0.15	(-0.7)0.4	V
Base-to-Emitter Saturation Voltage	V_{BE}(sat)	I_C=(-)1A, I_B=(-)50mA		(-)0.9	(-)1.2	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=(-)10μA, I_E=0	(-)60			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=(-)1mA, R_{BE}=∞	(-)50			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.		(60)60		ns
Storage Time	t_{stg}	See specified Test Circuit.		(450)550		ns
Fall Time	t_f	See specified Test Circuit.		(30)30		ns

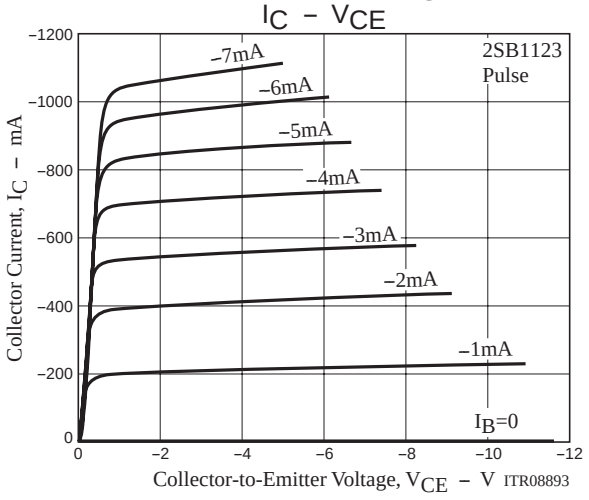
Switching Time Test Circuit

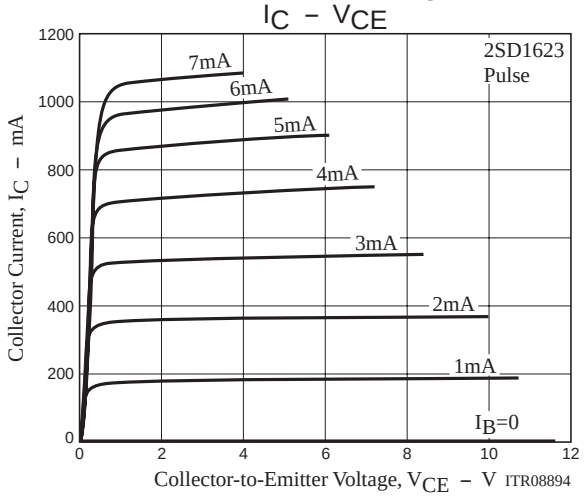


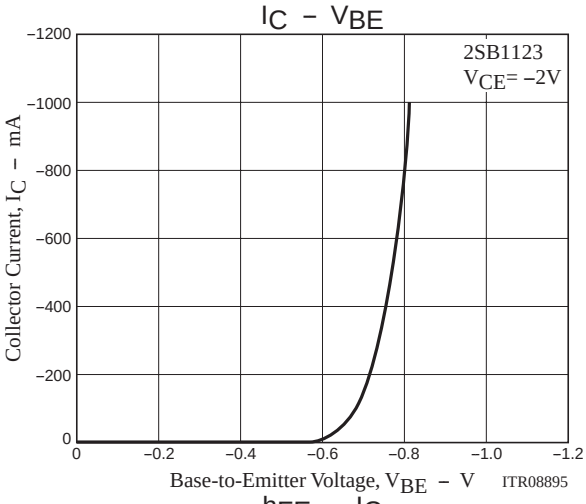
$10I_{B1}$= $-10I_{B2}$=I_C=500mA
(For PNP, the polarity is reversed)

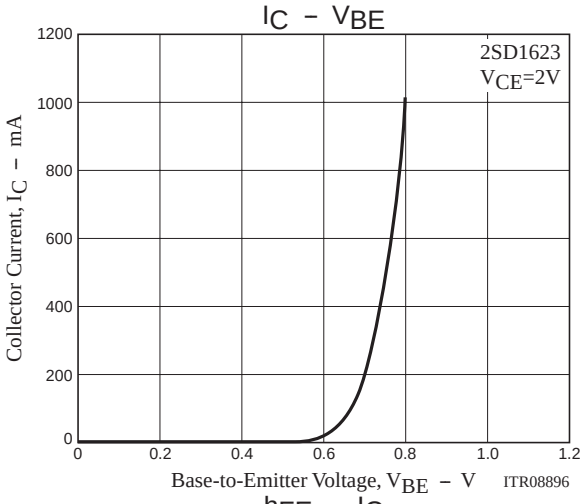


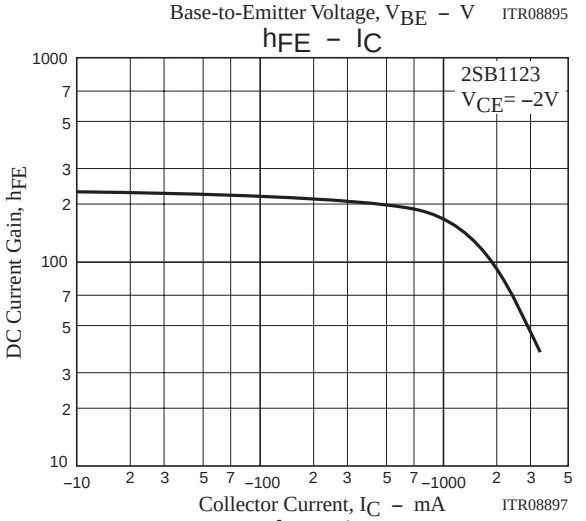


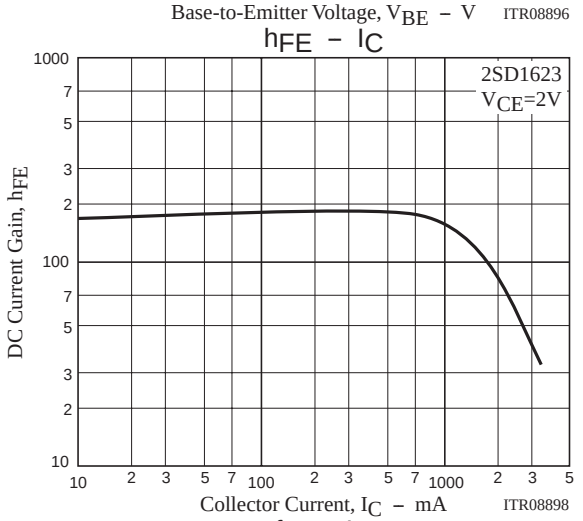


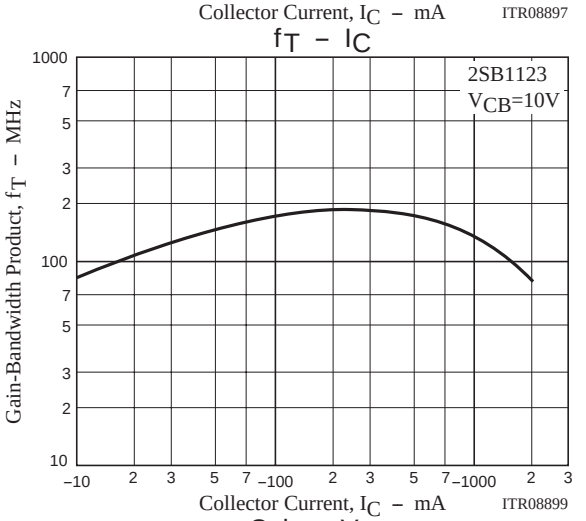


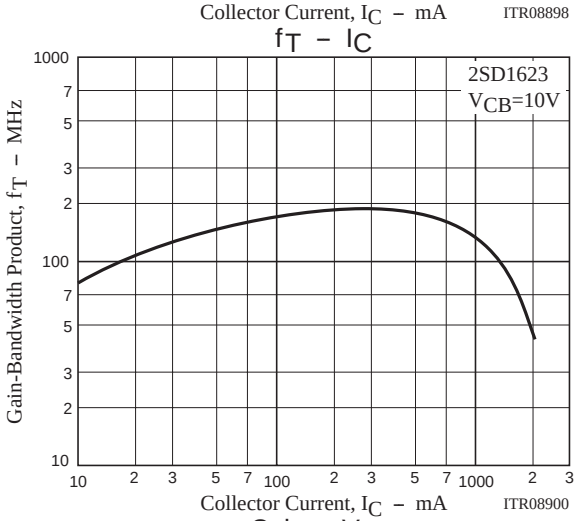

IC – VBE
2SB1123
VCE= –2V
Collector Current, IC – mA
Base-to-Emitter Voltage, VBE – V
ITR08895

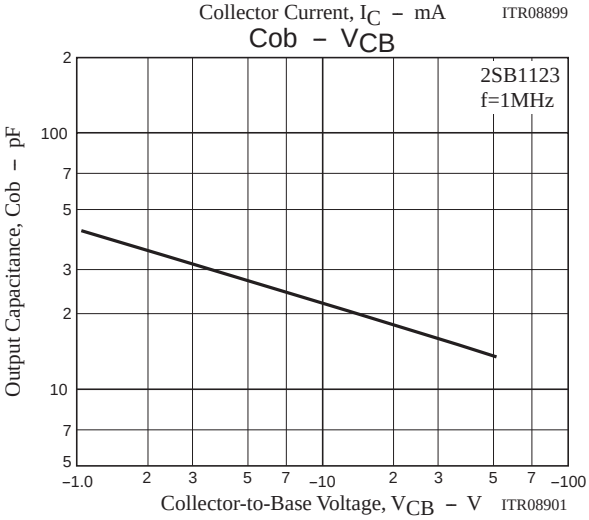

IC – VBE
2SD1623
VCE=2V
Collector Current, IC – mA
Base-to-Emitter Voltage, VBE – V
ITR08896

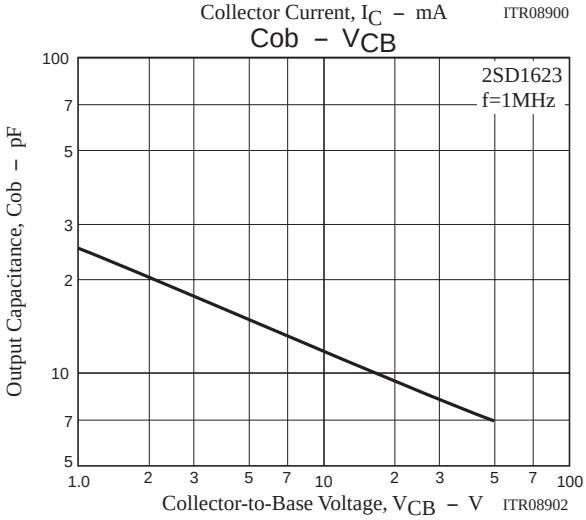

hFE – IC
2SB1123
VCE= –2V
DC Current Gain, hFE
Collector Current, IC – mA
ITR08897

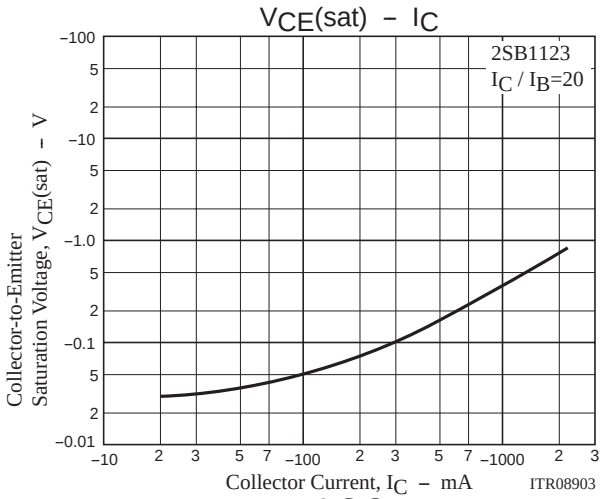

hFE – IC
2SD1623
VCE=2V
DC Current Gain, hFE
Collector Current, IC – mA
ITR08898

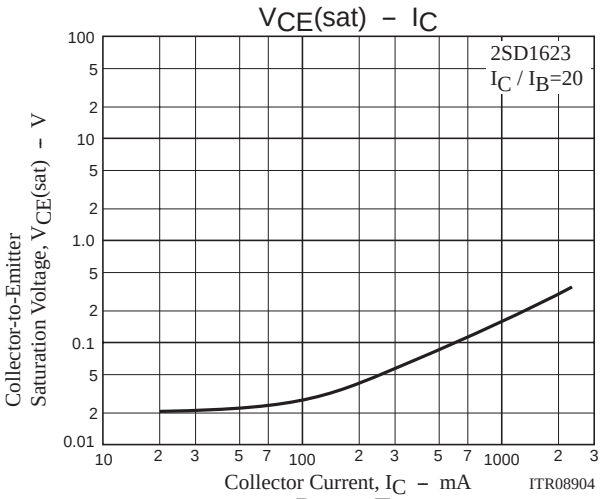

fT – IC
2SB1123
VCB=10V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – mA
ITR08899

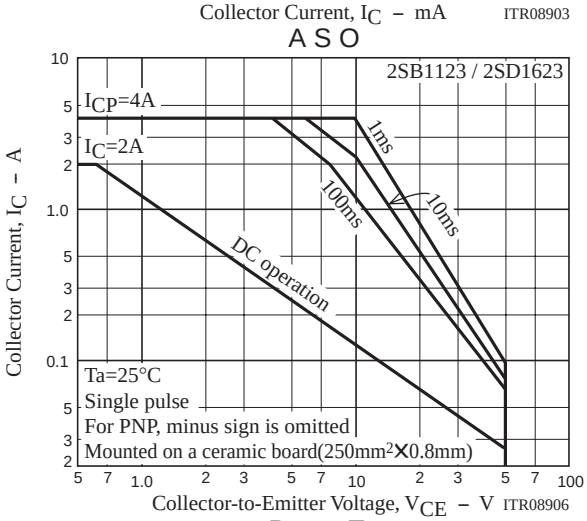

fT – IC
2SD1623
VCB=10V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – mA
ITR08900

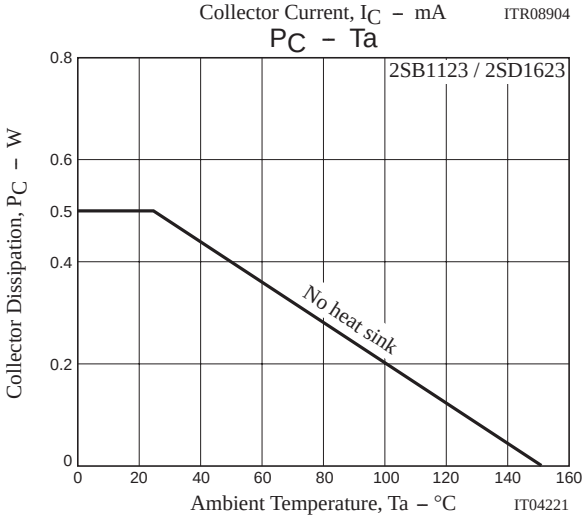

Cob – VCB
2SB1123
f=1MHz
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V
ITR08901

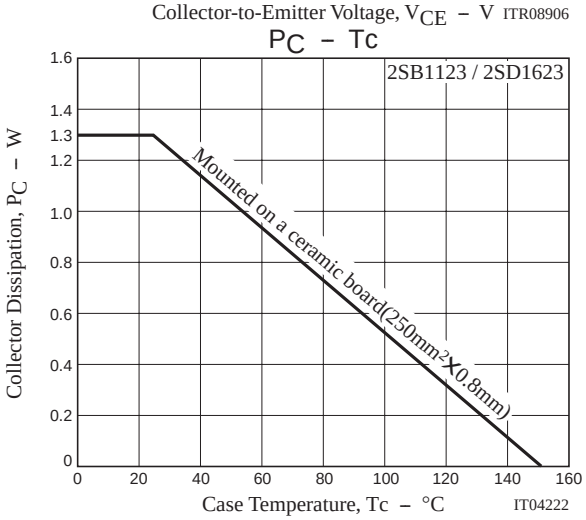

Cob – VCB
2SD1623
f=1MHz
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V
ITR08902


VCE(sat) – IC
2SB1123
IC / IB=20
Collector-to-Emitter Saturation Voltage, VCE(sat) – V
Collector Current, IC – mA
ITR08903


VCE(sat) – IC
2SD1623
IC / IB=20
Collector-to-Emitter Saturation Voltage, VCE(sat) – V
Collector Current, IC – mA
ITR08904


A S O
2SB1123 / 2SD1623
ICP=4A
IC=2A
1ms
10ms
100ms
DC operation
Ta=25°C
Single pulse
For PNP, minus sign is omitted
Mounted on a ceramic board(250mm²×0.8mm)
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
ITR08906


PC – Ta
2SB1123 / 2SD1623
No heat sink
Collector Dissipation, PC – W
Ambient Temperature, Ta – °C
IT04221


PC – Tc
2SB1123 / 2SD1623
Mounted on a ceramic board(250mm²×0.8mm)
Collector Dissipation, PC – W
Case Temperature, Tc – °C
IT04222