Ordering number : ENN6960

2SB1683 : PNP Epitaxial Planar Silicon Transistor
2SD2639 : NPN Triple Diffused Planar Silicon Transistor

2SB1683 / 2SD2639

140V / 12A, AF 60W Output Applications

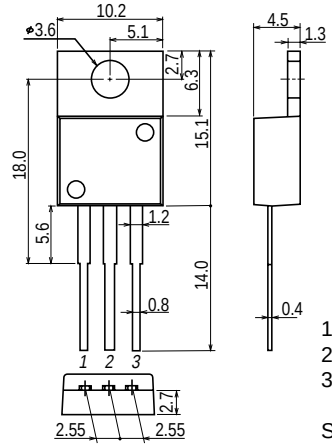
Features

- Wide ASO because of on-chip ballast resistance.
- Good dependence of f_T on current and good HF characteristic.

Package Dimensions

unit : mm
2010C

[2SB1683 / 2SD2639]



1 : Base
2 : Collector
3 : Emitter

SANYO : TO-220

Specifications

( ) : 2SB1683

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		(–)160	V
Collector-to-Emitter Voltage	V_{CEO}		(–)140	V
Emitter-to-Base Voltage	V_{EBO}		(–)6	V
Collector Current	I_C		(–)12	A
Collector Current (Pulse)	I_{CP}		(–)15	A
Collector Dissipation	P_C	Tc=25°C	80	W
Junction Temperature	Tj		150	°C
Storage Temperature	Tstg		–40 to +150	°C

Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	V_{CB}=(–)80V, I_E=0			(–)0.1	mA
Emitter Cutoff Current	I_{EBO}	V_{EB}=(–)4V, I_C=0			(–)0.1	mA

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

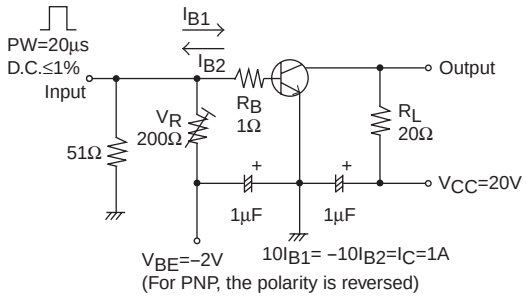
Continued from preceding page.

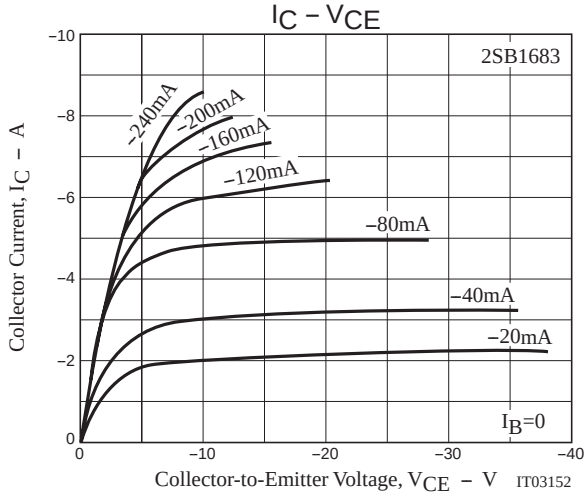
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
DC Current Gain	$h_{FE}1$	V_{CE}=(-)5V, I_C=(-)1A	60*		200*	
	$h_{FE}2$	V_{CE}=(-)5V, I_C=(-)6A	20			
Gain-Bandwidth Product	f_T	V_{CE}=(-)5V, I_C=(-)1A		15		MHz
Output Capacitance	Cob	V_{CB}=(-)10V, f=1MHz		(300)210		pF
Base-to-Emitter Saturation Voltage	V_{BE}	V_{CE}=(-)5V, I_C=(-)1A			1.5	V
Collector-to-Emitter Saturation Voltage	V_{CE}(sat)	I_C=(-)5A, I_B=(-)0.5A		(1.1)0.6	2.5	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=(-)5mA, I_E=0	(-)160			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=(-)5mA, R_{BE}=∞	(-)140			V
		I_C=(-)50mA, R_{BE}=∞	(-)140			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	I_E=(-)5mA, I_C=0	(-)6			V
Turn-ON Time	t_{on}	See specified test circuit.		(0.25)0.26		μs
Fall Time	t_f	See specified test circuit.		(0.53)0.68		μs
Storage Time	t_{stg}	See specified test circuit.		(1.61)6.88		μs

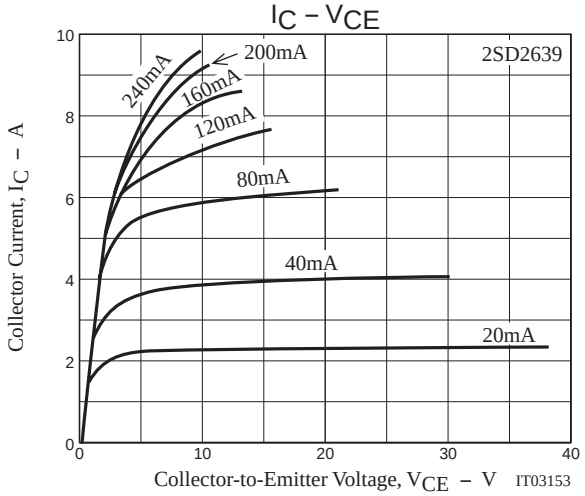
* : The 2SB1683 / 2SD2639 are classified by 1A h_{FE} as follows :

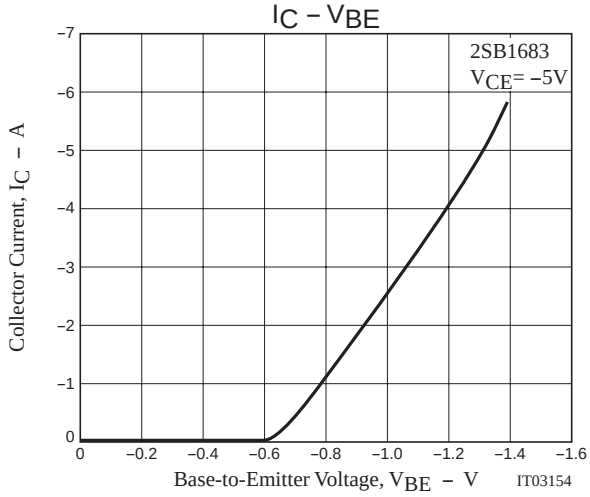
Rank	D	E
h_{FE}	60 to 120	100 to 200

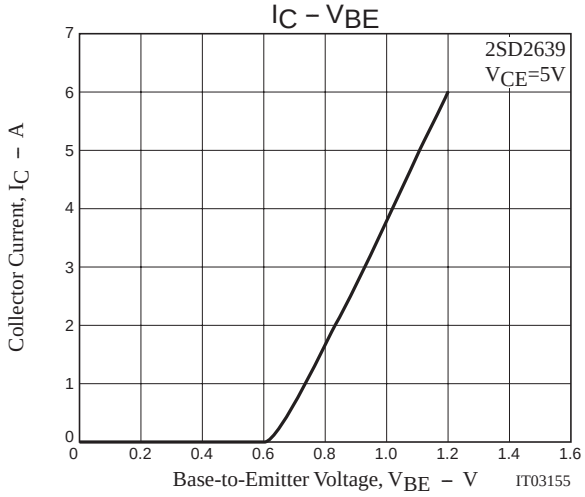
Switching Time Test Circuit

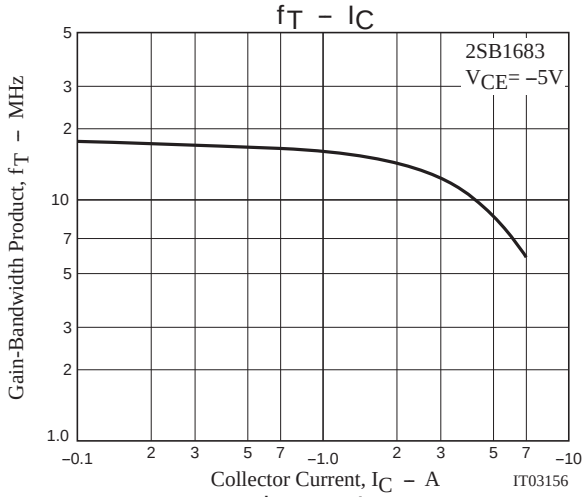


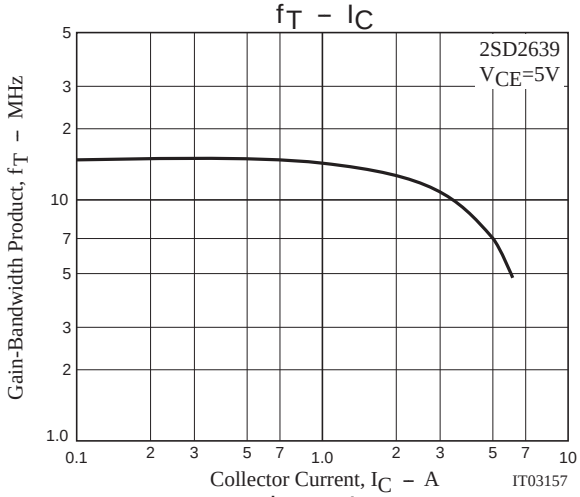


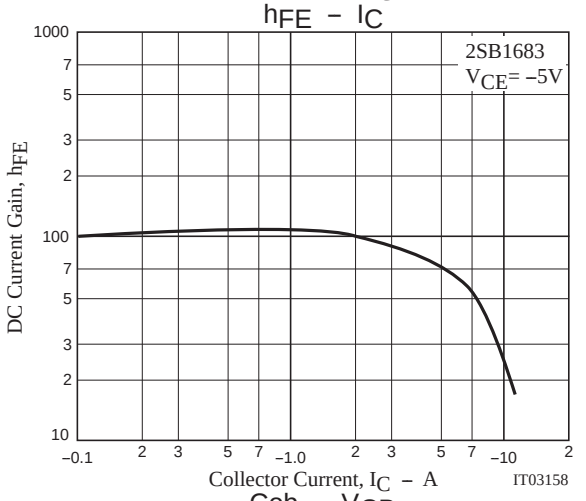


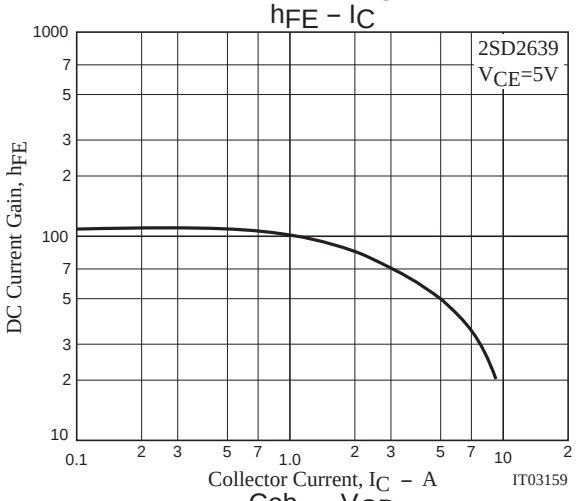


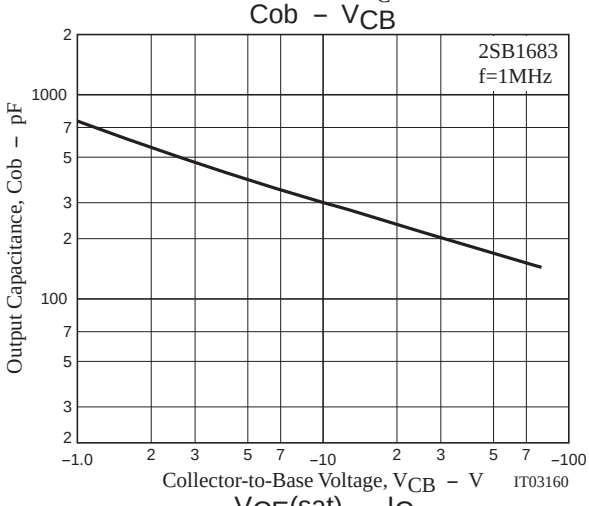


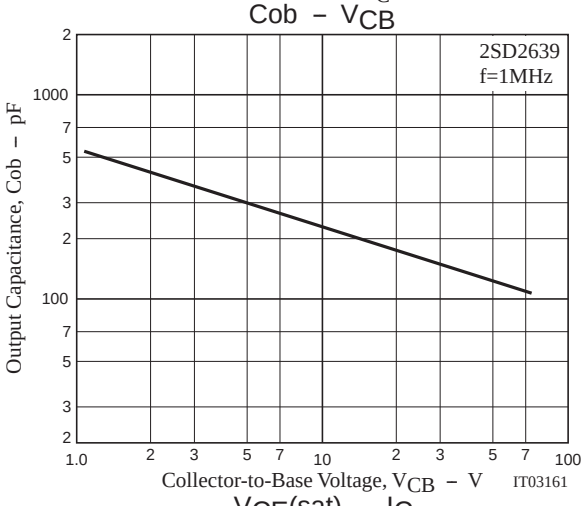

fT – IC
2SB1683
VCE= –5V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – A
IT03156

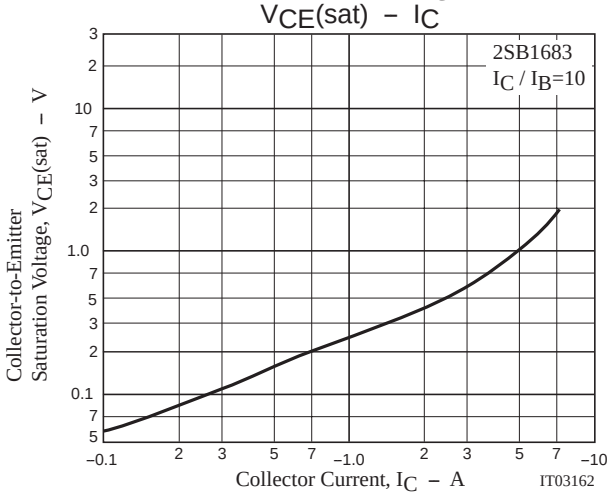

fT – IC
2SD2639
VCE=5V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – A
IT03157

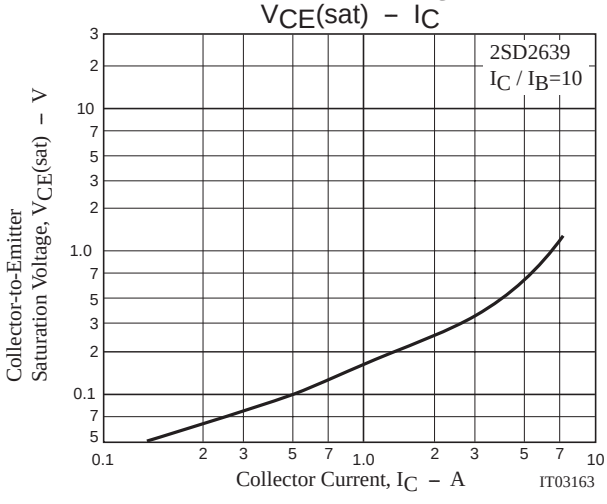

hFE – IC
2SB1683
VCE= –5V
DC Current Gain, hFE
Collector Current, IC – A
IT03158


hFE – IC
2SD2639
VCE=5V
DC Current Gain, hFE
Collector Current, IC – A
IT03159


Cob – VCB
2SB1683
f=1MHz
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V
IT03160


Cob – VCB
2SD2639
f=1MHz
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V
IT03161


VCE(sat) – IC
2SB1683
IC / IB=10
Collector-to-Emitter Saturation Voltage, VCE(sat) – V
Collector Current, IC – A
IT03162


VCE(sat) – IC
2SD2639
IC / IB=10
Collector-to-Emitter Saturation Voltage, VCE(sat) – V
Collector Current, IC – A
IT03163