Ordering number:ENN990C

PNP/NPN Epitaxial Planar Silicon Transistors

2SB903/2SD1212

30V/12A High-Speed Switching Applications

Applications

· Suitable for relay drivers, high-speed inverters, converters, and other general large-current switching applications.

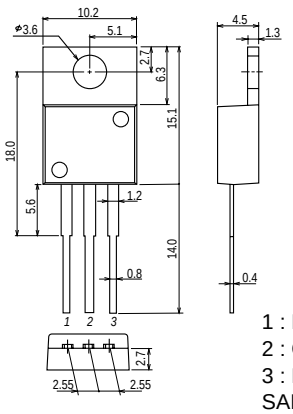
Features

· Low collector-to-emitter saturation voltage : $V_{CE(sat)}$=(–)0.5V (PNP), 0.4V (NPN) max.
· Large current capacity.

Package Dimensions

unit:mm

2010C



( ) : 2SB903

Specifications

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}		(–)30	V
Emitter-to-Base Voltage	V_{EBO}		(–)6	V
Collector Current	I_C		(–)12	A
Collector Current (Pulse)	I_{CP}		(–)20	A
Collector Dissipation	P_C		1.75	W
		Tc=25˚C	35	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}=(–)40V, I_E=0			(–)0.1	mA
Emitter Cutoff Current	I_{EBO}	V_{EB}=(–)4V, I_C=0			(–)0.1	mA
DC Current Gain	$h_{FE}1$	V_{CE}=(–)2V, I_C=(–)1A	70*		280*	
	$h_{FE}2$	V_{CE}=(–)2V, I_C=(–)6A	30			
Gain-Bandwidth Product	f_T	V_{CE}=(–)5V, I_C=(–)1A		120		MHz

* : The 2SB903/2SD1212 are graded as follows by h_{FE} at 1A :

Continued on next page.

Rank	Q	R	S
h_{FE}	70 to 140	100 to 200	140 to 280

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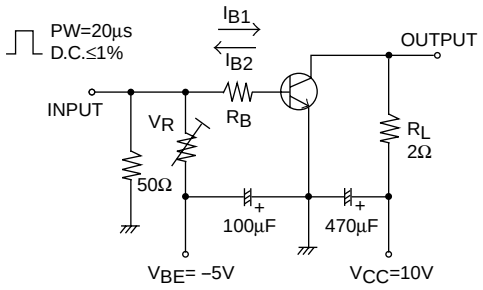
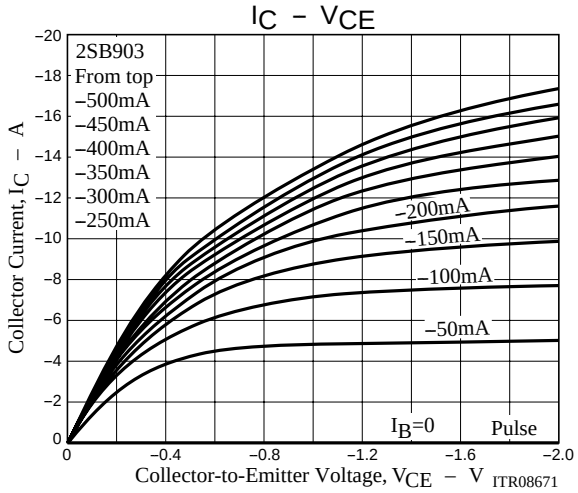
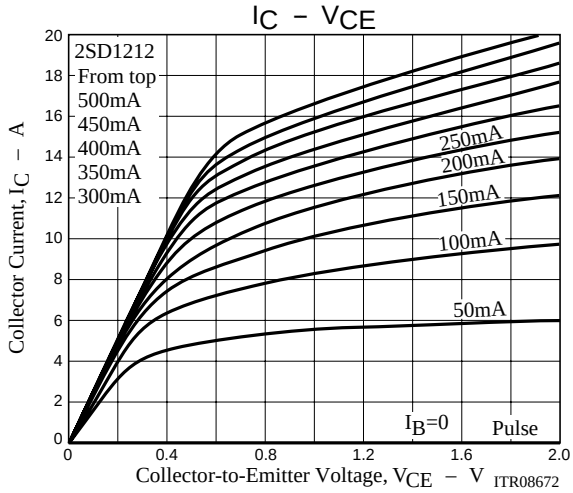
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C=(–)5A, I_B=(–)0.25A			(–0.5)	V
					0.4	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=(–)1mA, I_E=0	(–)60			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=(–)1mA, R_{BE}=∞	(–)30			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	I_E=(–)1mA, I_C=0	(–)6			V
Turn-ON Time	t_{on}	See specified Test Circuit		(0.1)		µs
				0.2		µs
Storage Time	t_{stg}	See specified Test Circuit		(0.3)		µs
				0.5		µs
Fall Time	t_f	See specified Test Circuit		0.03		µs

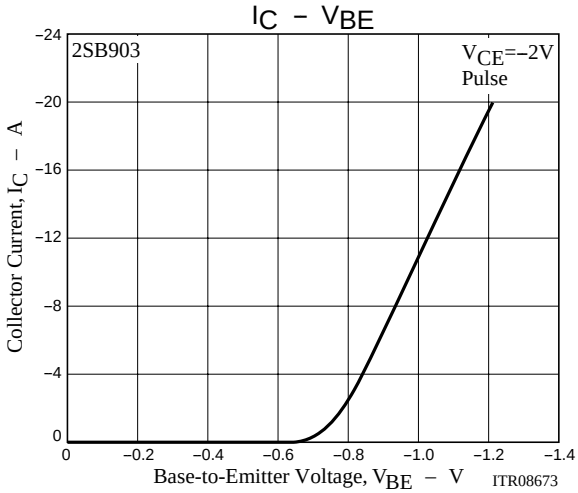
Switching Time Test Circuit

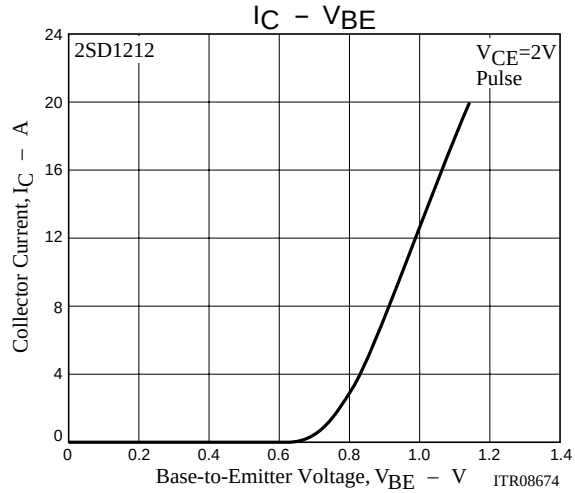


I_C=10I_{B1}= −10I_{B2}=5A
(For PNP, the polarity is reversed.)

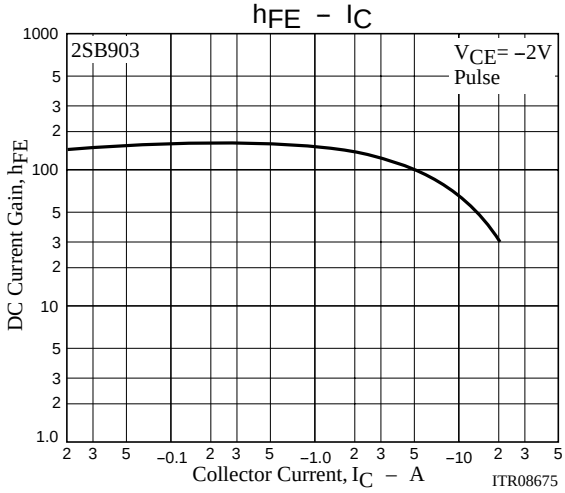


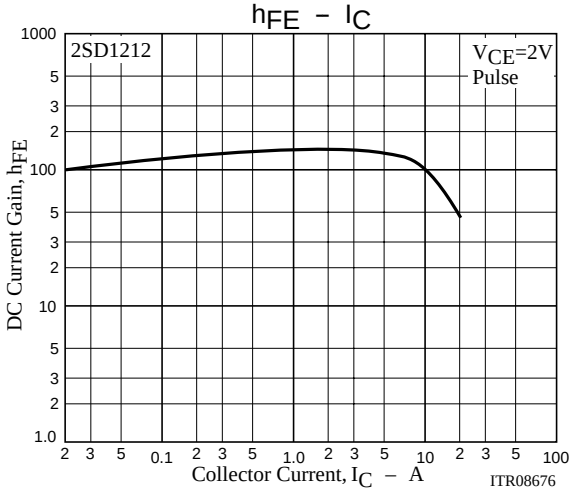




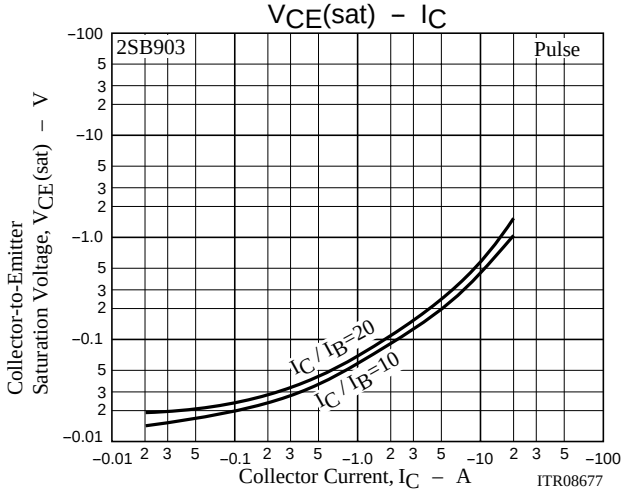


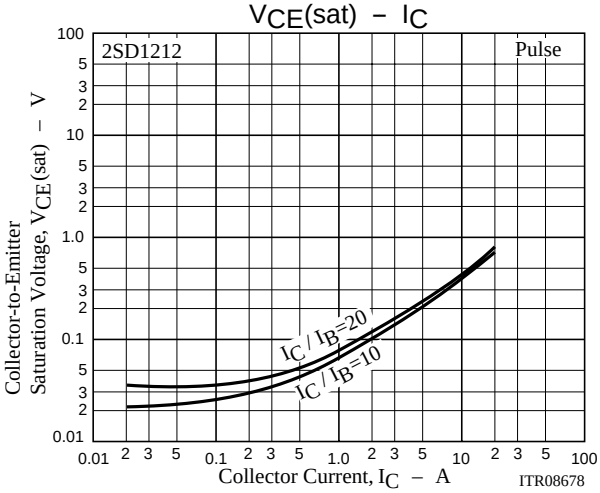
h_{FE} – I_C



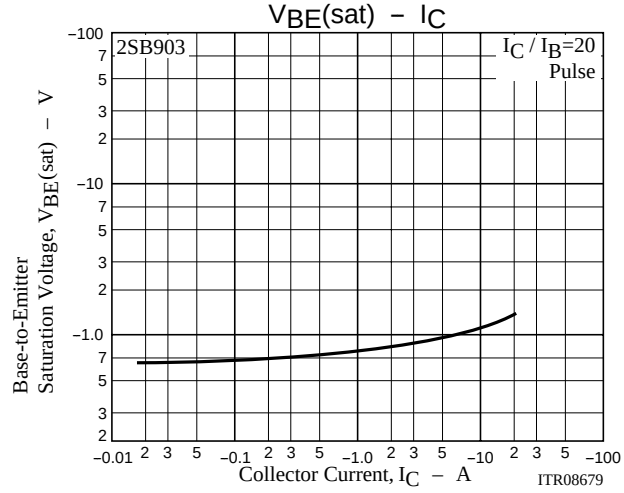


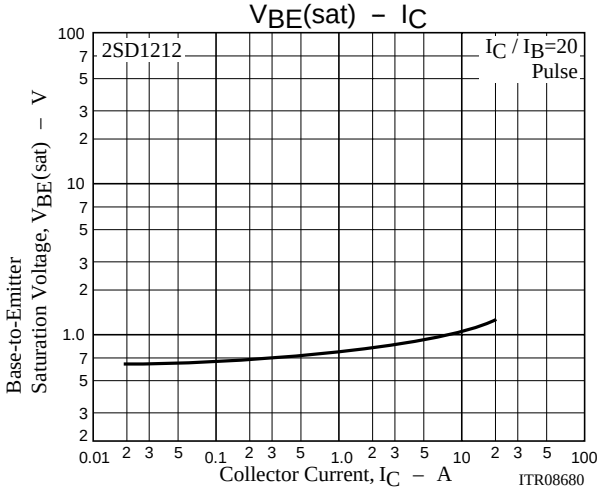
$V_{CE}(sat)$ – I_C





$V_{BE}(sat)$ – I_C





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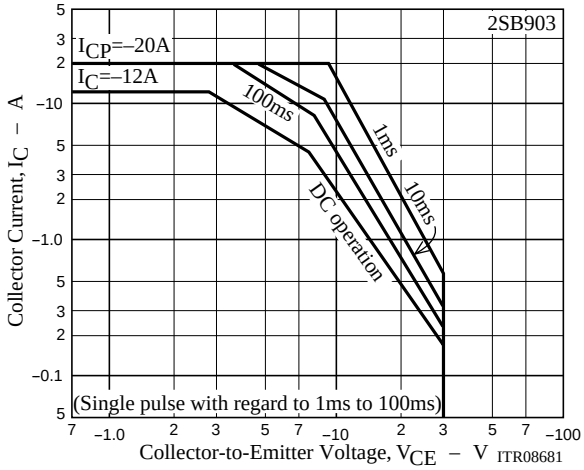

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