



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.

() : 2SB903

Specifications

Absolute Maximum Ratings at $T_a = 25^\circ C$

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
		$T_c=25^\circ C$	35	W
Junction Temperature	T_J		150	$^\circ C$
Storage Temperature	T_{stg}		-55 to +150	$^\circ C$

Electrical Characteristics at $T_a = 25^\circ C$

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_{FE1}	$V_{CE}=(-)2V, I_C=(-)1A$	70*		280*	
	h_{FE2}	$V_{CE}=(-)2V, I_C=(-)6A$	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 :

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

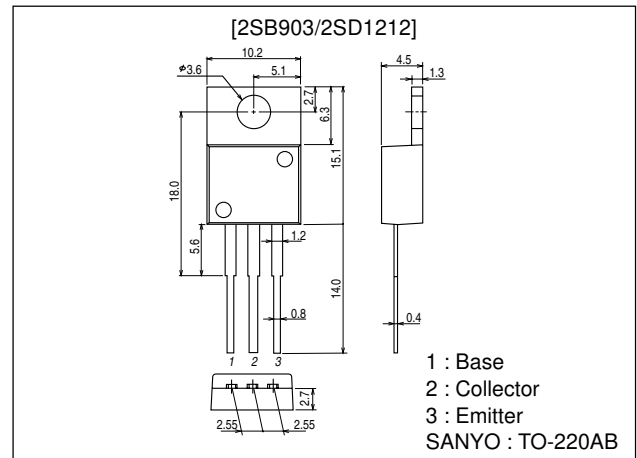
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Package Dimensions

unit:mm

2010C



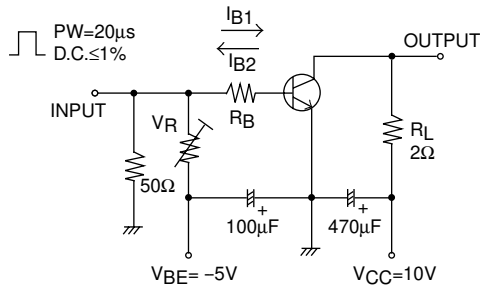
1 : Base
2 : Collector
3 : Emitter
SANYO : TO-220AB

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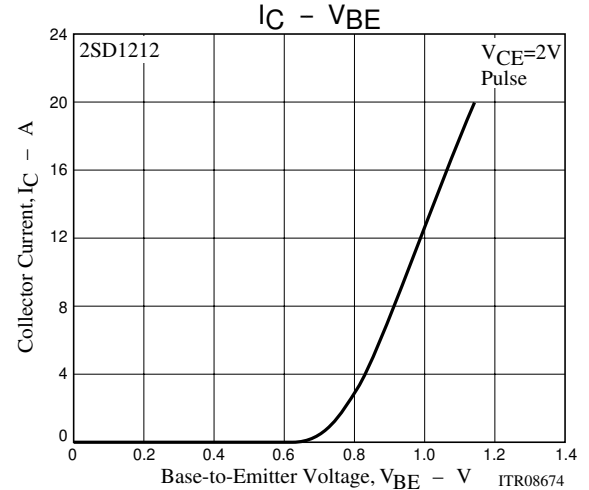
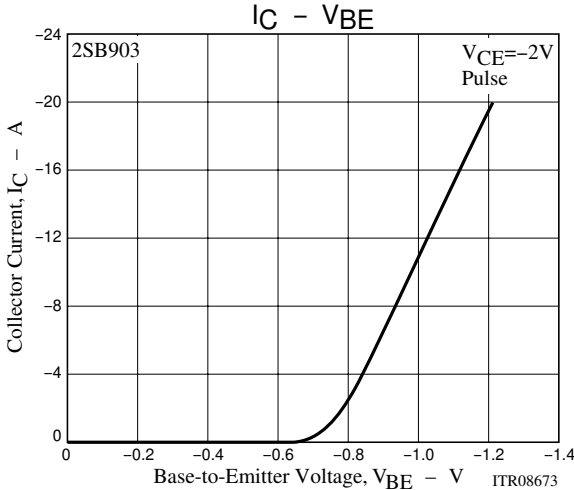
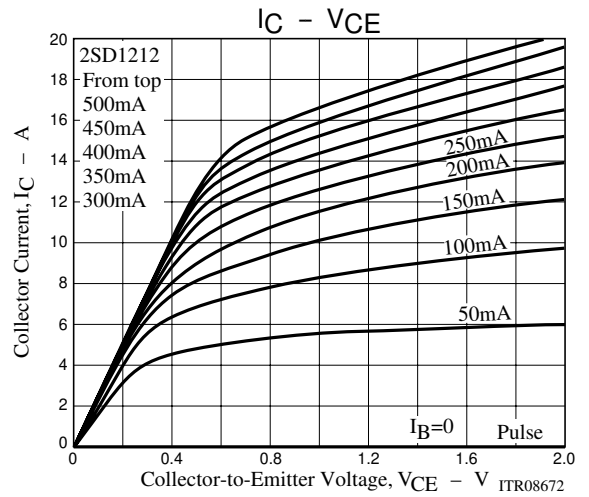
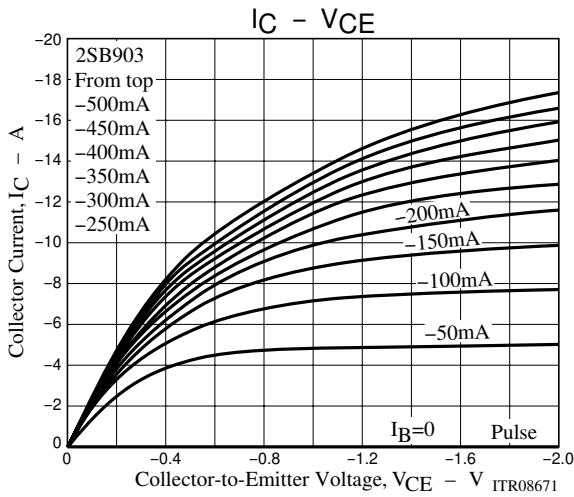
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=(-)5A, I_B=(-)0.25A$			(-0.5)	V
					0.4	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=(-)1mA, I_E=0$	(-)60			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=(-)1mA, R_{BE}=\infty$	(-)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

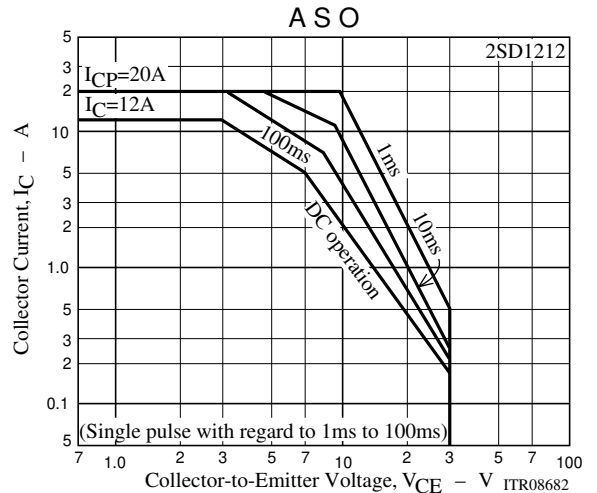
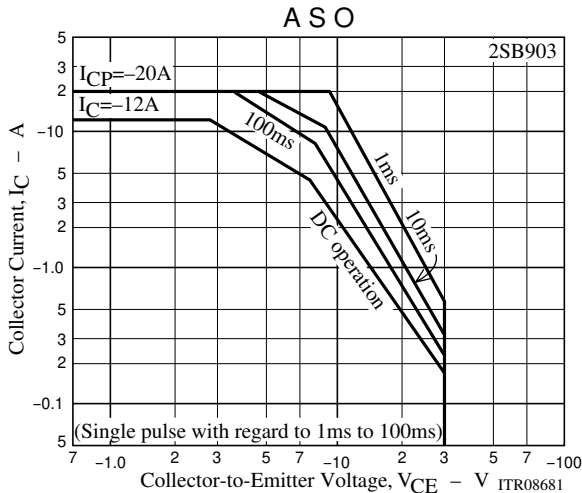
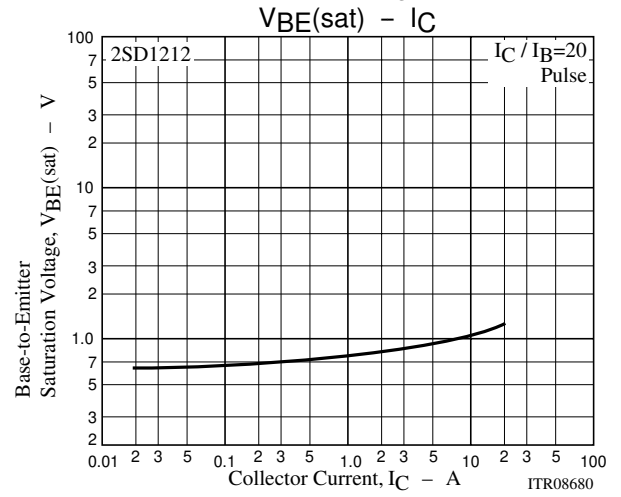
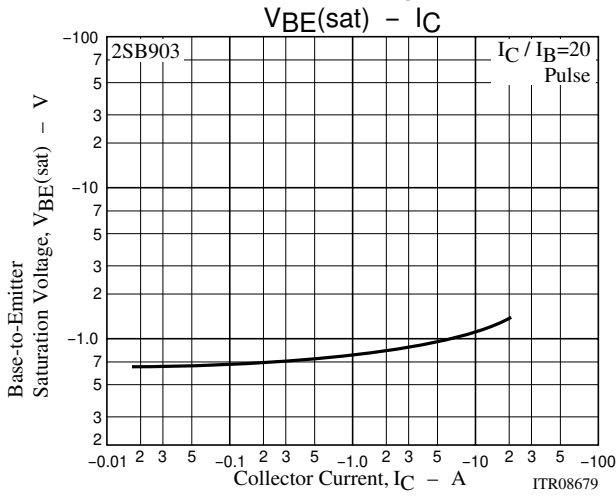
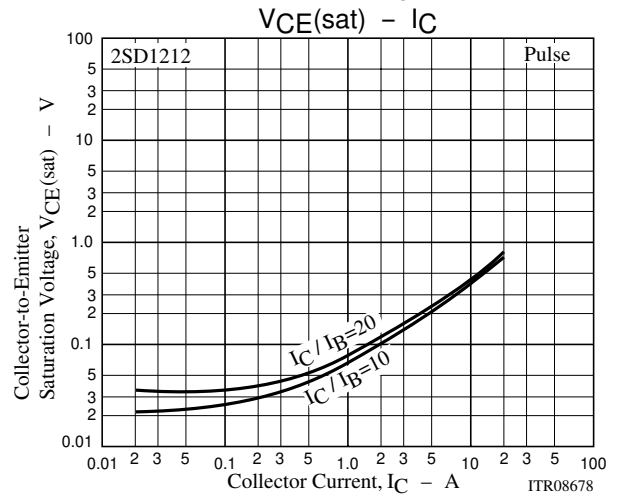
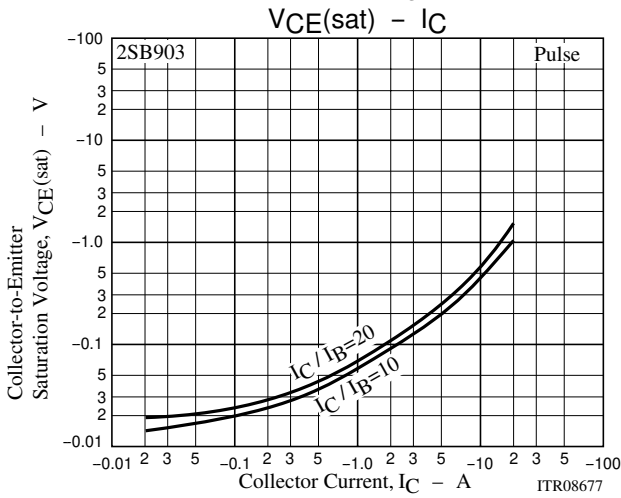
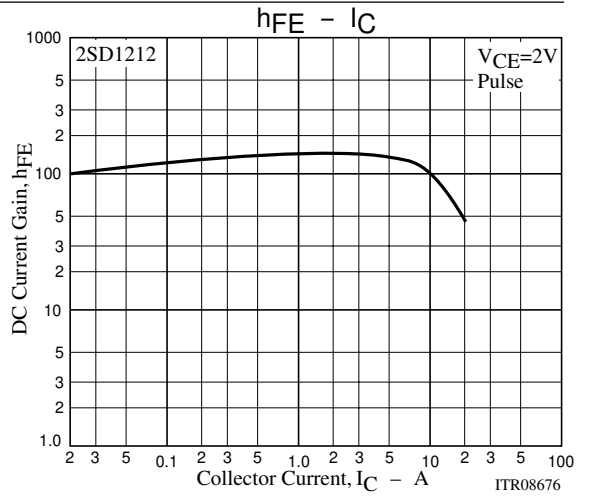
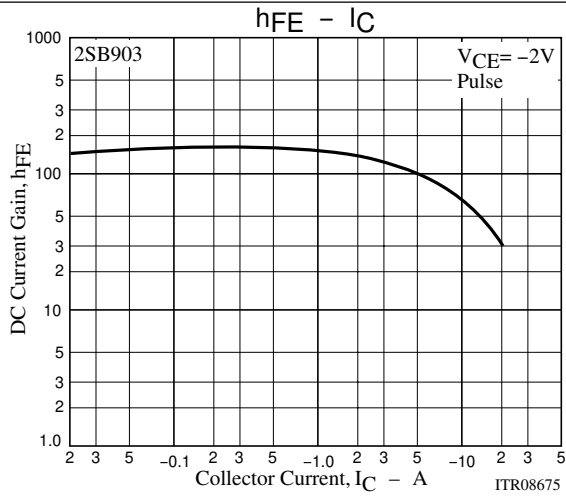
Switching Time Test Circuit



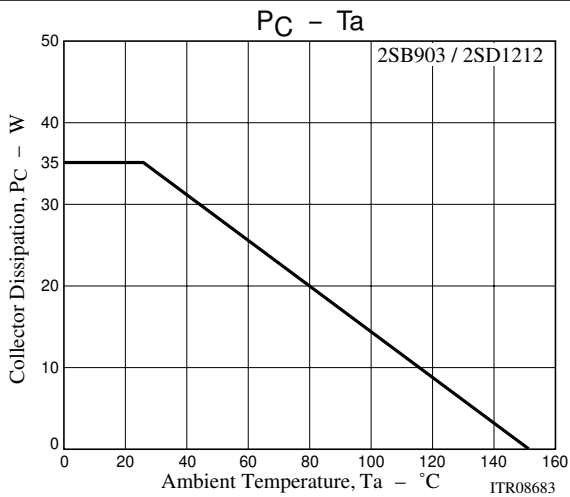
$I_C = 10I_{B1} = -10I_{B2} = 5A$
 (For PNP, the polarity is reversed.)



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