

SANYO

No.1022A

2SB904/2SD1213

PNP/NPN Epitaxial Planar Silicon Transistors

30V/20A High-Speed Switching Applications**Use**

- Large current switching of relay drivers, high-speed inverters, converters

Features

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

(): 2SB904

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

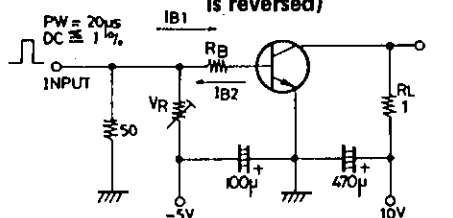
			unit
Collector-to-Base Voltage	V_{CBO}	(-)60	V
Collector-to-Emitter Voltage	V_{CEO}	(-)30	V
Emitter-to-Base Voltage	V_{EBO}	(-)6	V
Collector Current	I_C	(-)20	A
Collector Current (Pulse)	I_{CP}	(-)30	A
Collector Dissipation	P_C	2.5	W
	$T_c = 25^\circ C$	60	W
Junction Temperature	T_j	150	$^\circ C$
Storage Temperature	T_{stg}	-55 to +150	$^\circ C$

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

			min	typ	max	unit
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
Common emitter DC Current Gain	$h_{FE(1)}$	$V_{CE} = (-)2V, I_C = (-)1A$	70*		280*	
	$h_{FE(2)}$	$V_{CE} = (-)2V, I_C = (-)10A$	30			
Collector to Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = (-)8A, I_B = (-)0.4A$		(-0.25)	(-0.5)	V
				0.2	0.4	
Gain Band-width Product	f_T	$V_{CE} = (-)5V, I_C = (-)1A$		120		MHz
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		300		ns
Storage Time	t_{stg}	"		(300)600		ns
Fall Time	t_f	"		20		ns

*The 2SB904/2SD1213 are classified as follows according to h_{FE} at 1A.

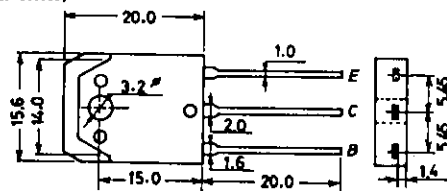
70	Q	140	100	R	200	140	S	280
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Switching Time Test Circuit (For PNP, the polarity is reversed)

$$20I_{B1} = -20I_{B2} = I_C = 10A$$

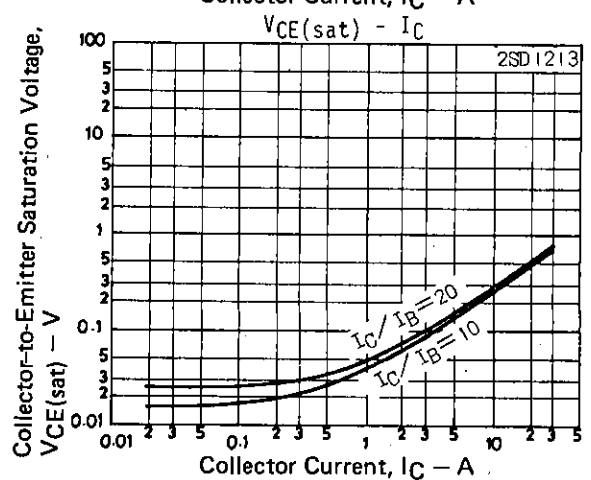
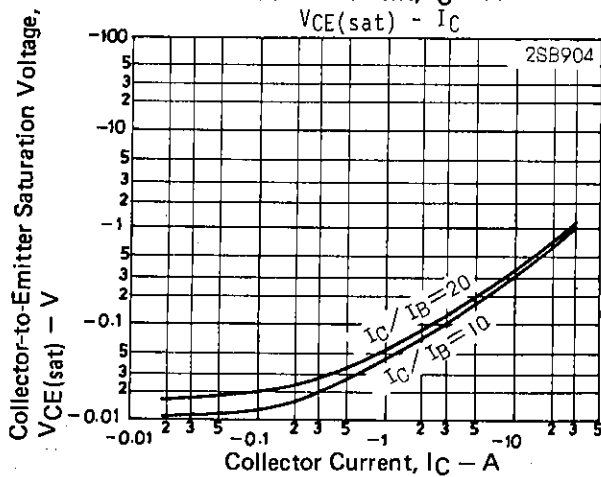
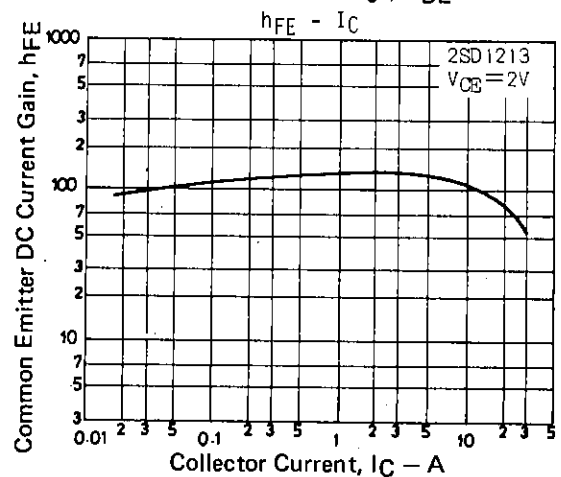
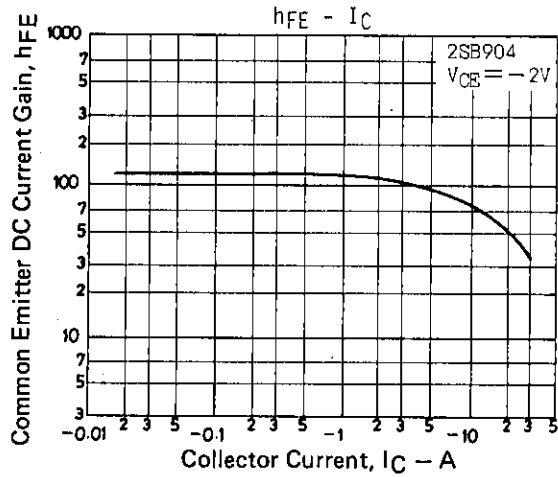
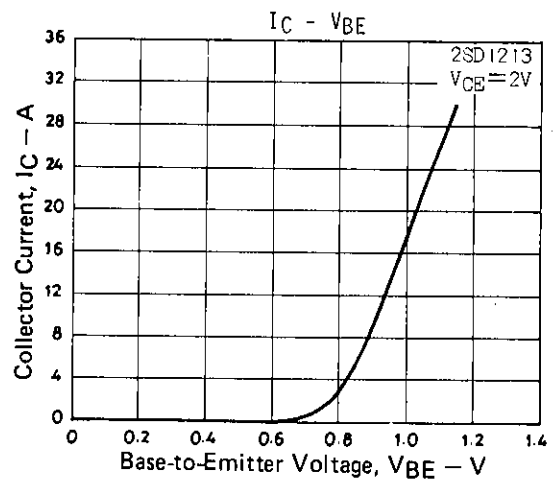
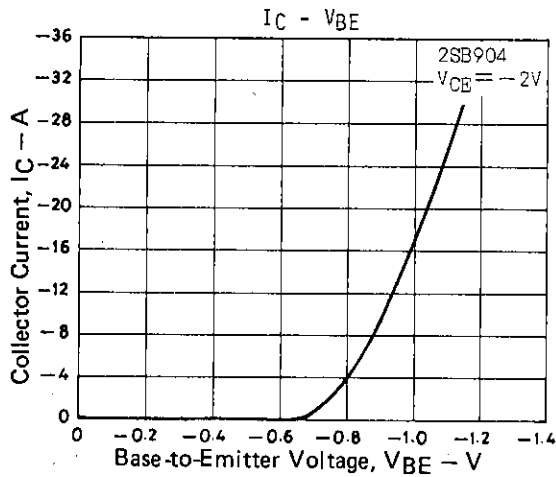
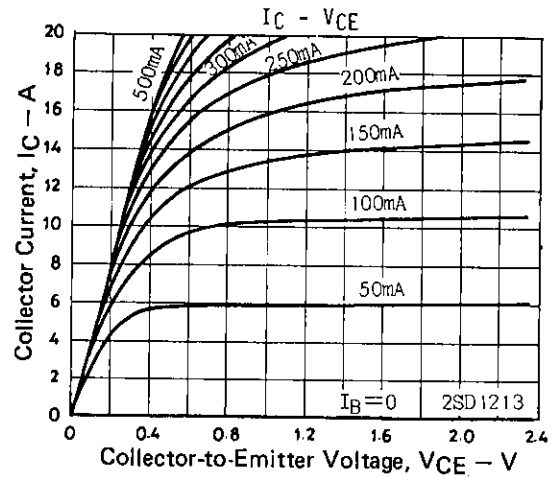
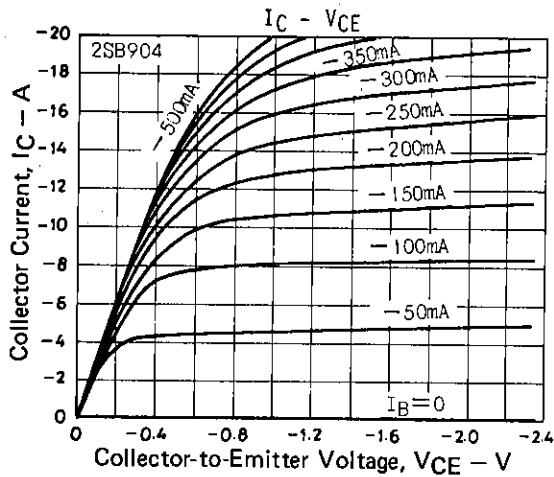
Unit (resistance: Ω , capacitance: F)**Package Dimensions 2022**

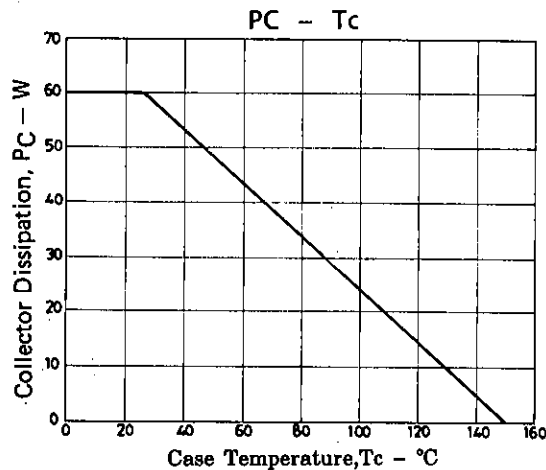
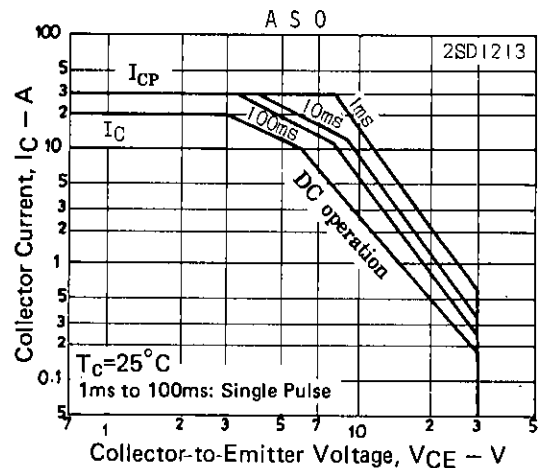
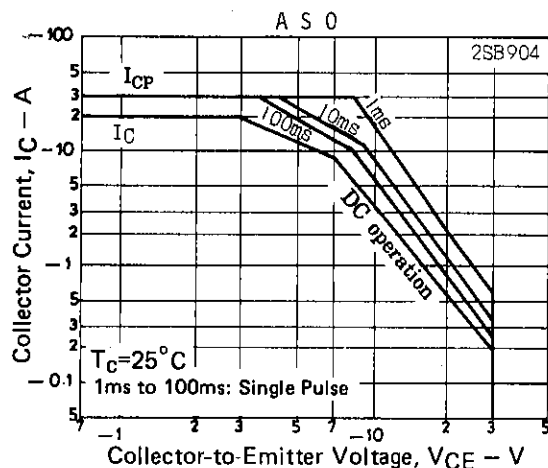
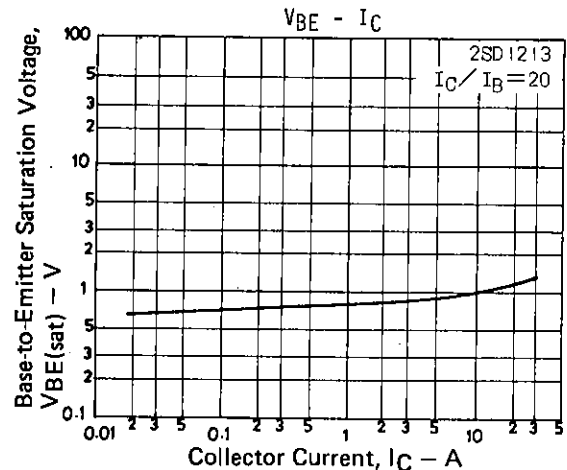
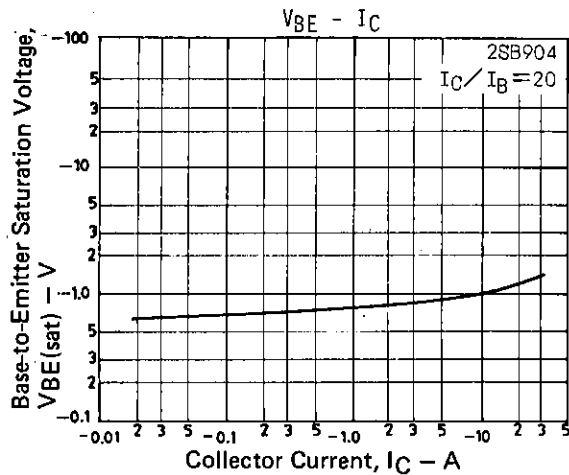
(unit: mm)



E: Emitter
C: Collector
B: Base
SANYO: TO3PB

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