



# 2SB922 / 2SD1238

## Large Current Switching Applications

### Applications

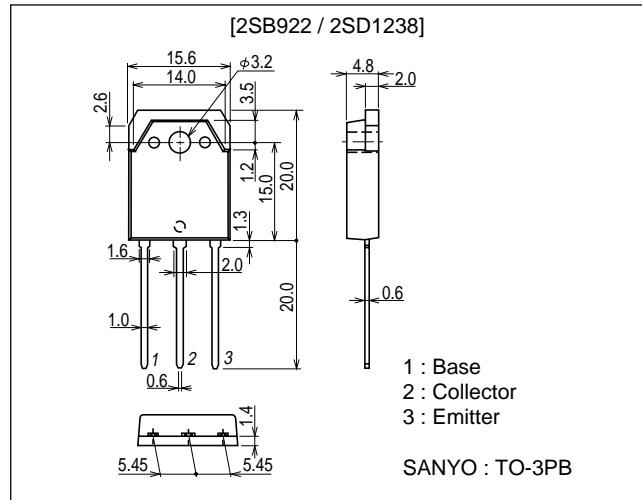
- Large current switching of relay drivers, high-speed inverters, converters.

### Features

- Low collector-to-emitter saturation voltage :  $V_{CE(sat)} = -0.5V$  (PNP),  $0.4V$  (NPN) max.
- Wide ASO and highly resistant to breakdown.

### Package Dimensions

unit : mm  
2022A



### Specifications

( ) : 2SB922

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

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	$V_{CB0}$		(-)120	V
Collector-to-Emitter Voltage	$V_{CE0}$		(-)80	V
Emitter-to-Base Voltage	$V_{EB0}$		(-)6	V
Collector Current	$I_C$		(-)12	A
Collector Current (Pulse)	$I_{CP}$		(-)20	A
Collector Dissipation	$P_C$	$T_c = 25^\circ C$	80	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	$I_{CBO}$	$V_{CB} = (-)80V, I_E = 0$			(-)0.1	mA
Emitter Cutoff Current	$I_{EBO}$	$V_{EB} = (-)4V, I_C = 0$			(-)0.1	mA

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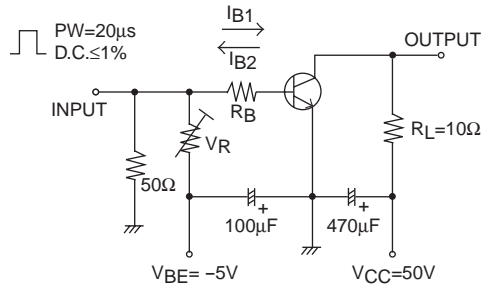
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
DC Current Gain	$h_{FE1}$	$V_{CE}=(-)2V, I_C=(-)1A$	70*		280*	
	$h_{FE2}$	$V_{CE}=(-)2V, I_C=(-)6A$	30			
Gain-Bandwidth Product	$f_T$	$V_{CE}=(-)5V, I_C=(-)1A$		20		MHz
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=(-)6A, I_B=(-)0.6A$			$(-0.5)0.4$	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=(-)1mA, I_E=0$	$(-)120$			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=(-)1mA, R_{BE}=\infty$	$(-)80$			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.		0.2		$\mu s$
Storage Time	$t_{stg}$	See specified test circuit.		$(0.7)1.7$		$\mu s$
Fall Time	$t_f$	See specified test circuit.		$(0.1)0.2$		$\mu s$

\*The 2SB922 / 2SD1238 are graded as follows by  $h_{FE}$  at 1A :

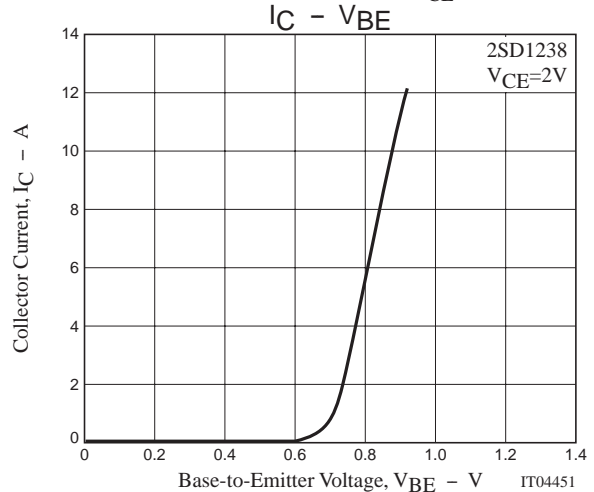
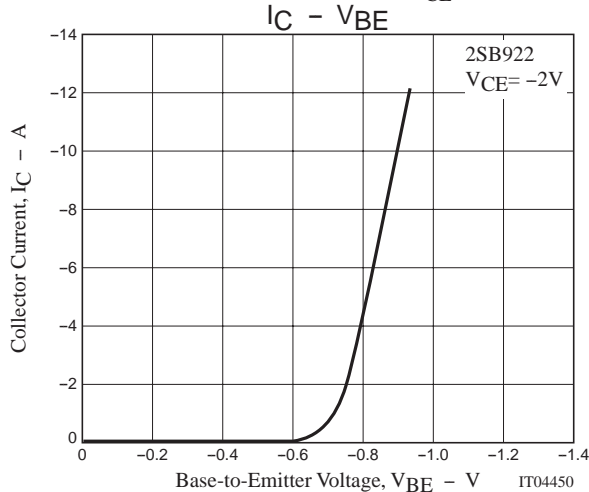
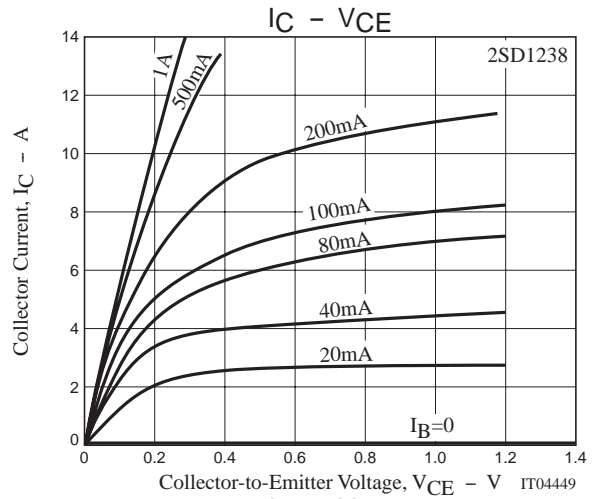
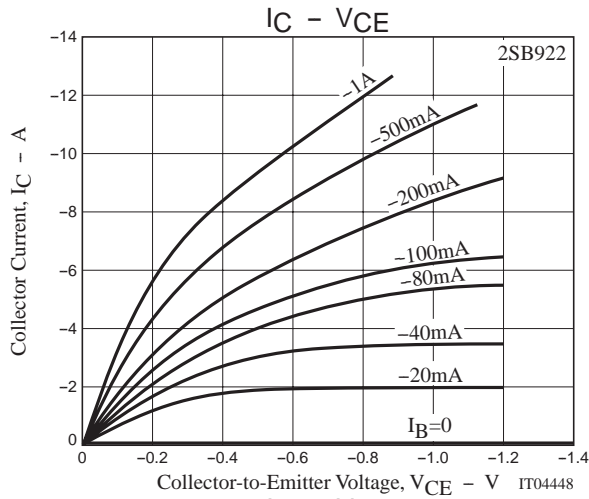
Rank	Q	R	S
$h_{FE}$	70 to 140	100 to 200	140 to 280

### Swicthing Time Test Circuit

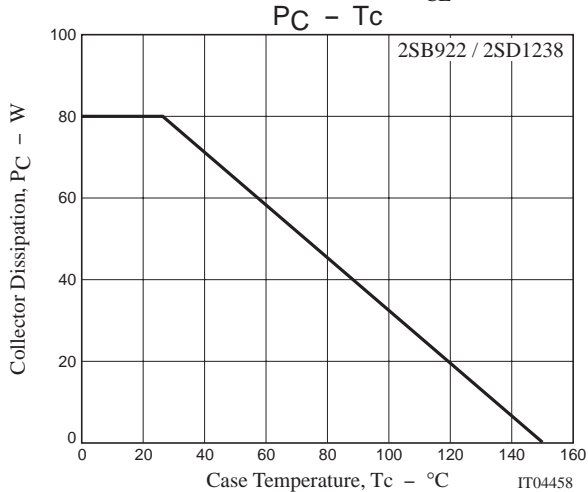
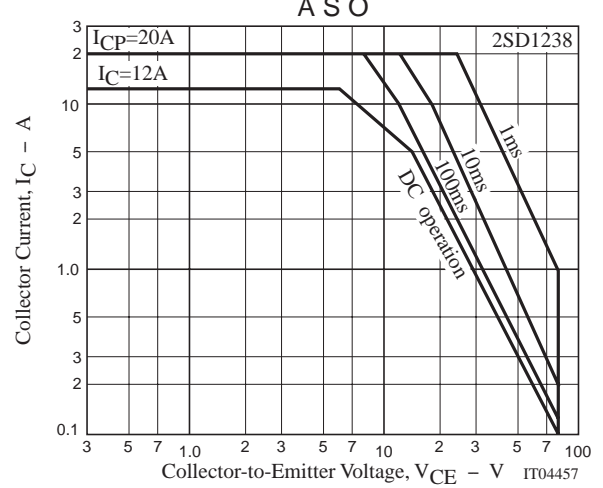
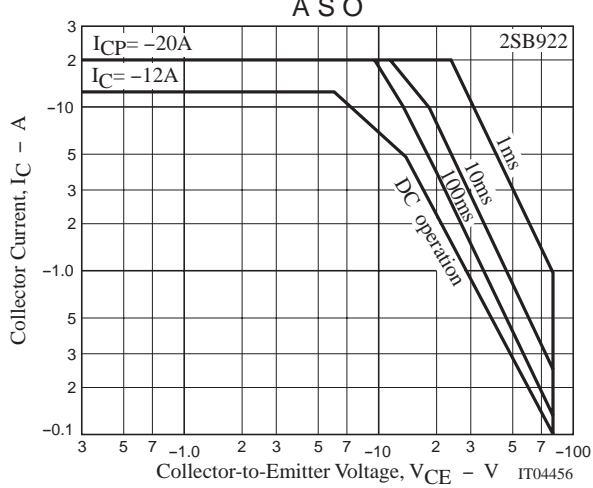
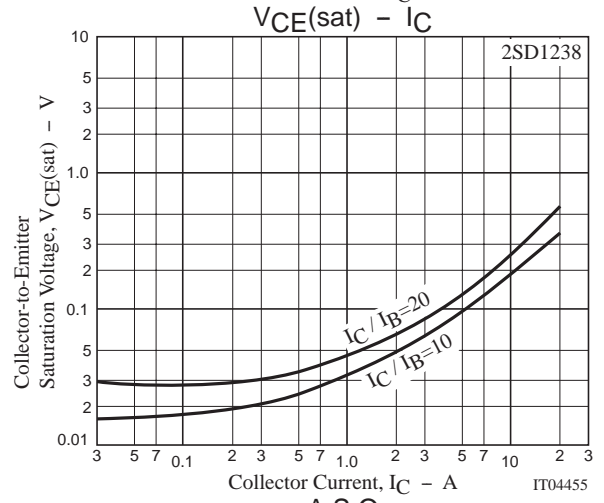
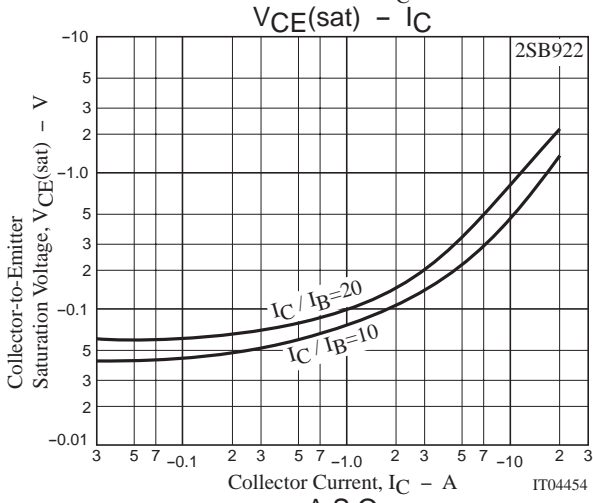
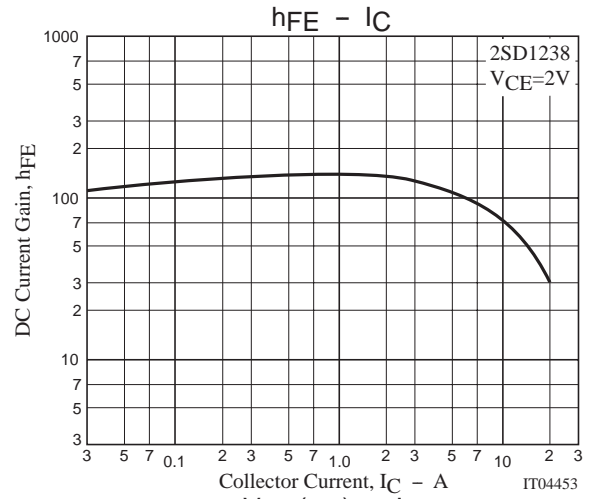
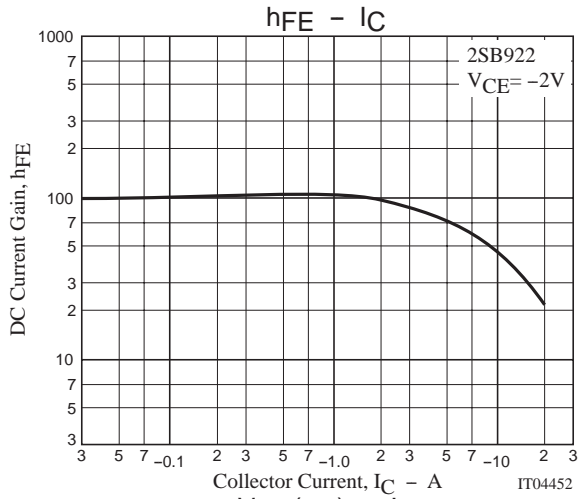


$$I_C = 10I_{B1} = -10I_{B2} = 5A$$

For PNP, the polarity is reversed.



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