



## 2SB920 / 2SD1236

### 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.
- Large current capacity.

#### Specifications

( ) : 2SB920

**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	$I_C$		$(-5)$	A
Collector Current (Pulse)	$I_{CP}$		$(-9)$	A
Collector Dissipation	$P_C$		1.75	W
		$T_c = 25^\circ C$	30	W
Junction Temperature	$T_J$		150	$^\circ C$
Storage Temperature	$T_{stg}$		$-55$ to $+150$	$^\circ C$

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

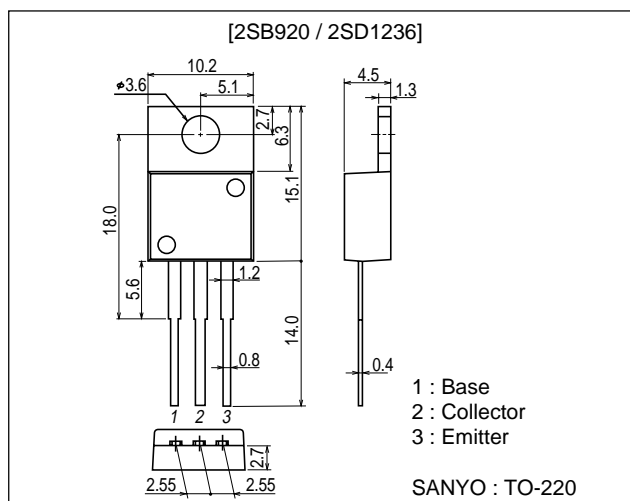
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	$I_{CB0}$	$V_{CB} = (-)80V, I_E = 0$			$(-0.1)$	mA
Emitter Cutoff Current	$I_{EB0}$	$V_{EB} = (-)4V, I_C = 0$			$(-0.1)$	mA

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#### Package Dimensions

unit : mm

2010C



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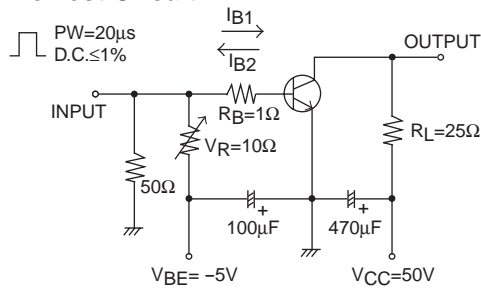
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
DC Current Gain	$h_{FE1}^*$	$V_{CE}=(-)2V, I_C=(-)1A$	70*		280*	
	$h_{FE2}$	$V_{CE}=(-)2V, I_C=(-)3A$	30			
Gain-Bandwidth Product	$f_T$	$V_{CE}=(-)5V, I_C=(-)1A$		20		MHz
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=(-)3A, I_B=(-)0.3A$			$(-0.5)0.4$	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.		$(0.2)0.1$		$\mu s$
Storage Time	$t_{stg}$	See specified test circuit.		$(0.7)1.2$		$\mu s$
Fall Time	$t_f$	See specified test circuit.		$(0.2)0.4$		$\mu s$

\*The 2SB920 / 2SD1236 are graded as follows by  $h_{FE}$  at 1A :

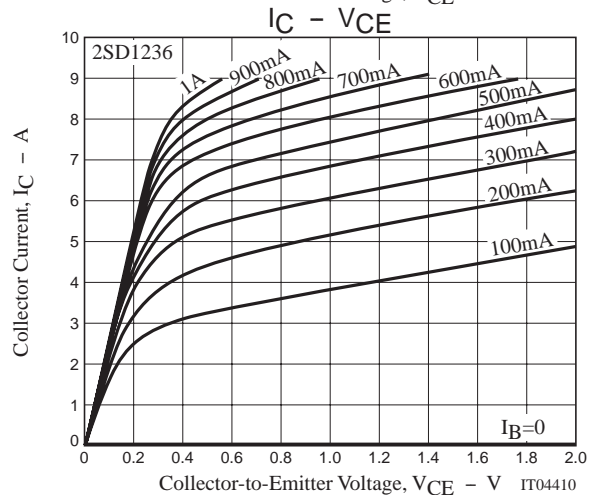
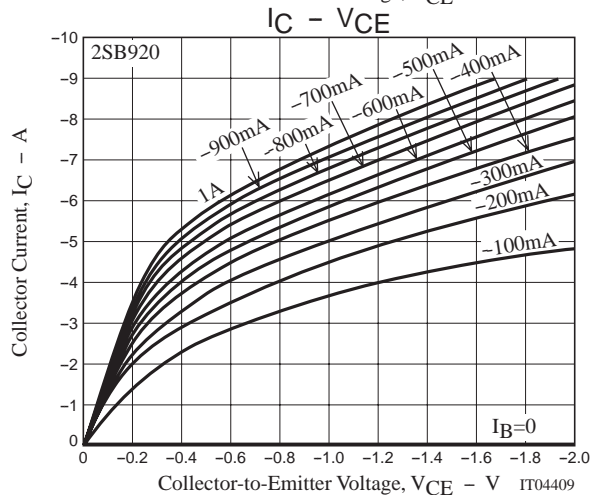
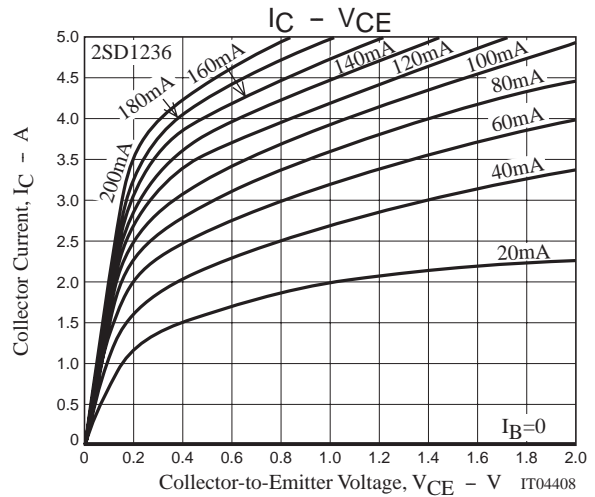
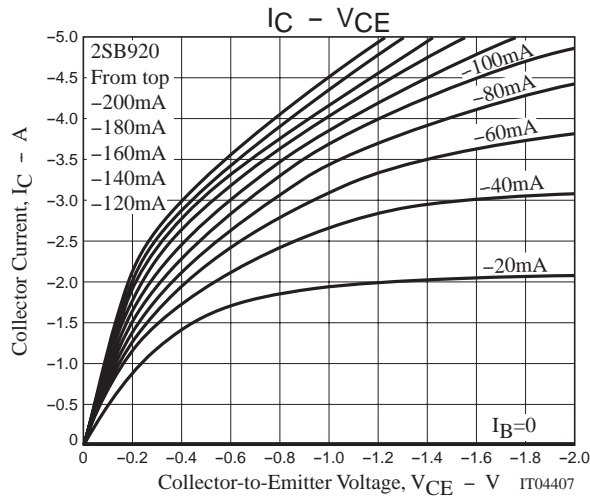
Rank	Q	R	S
$h_{FE}$	70 to 140	100 to 200	140 to 280

### Swicthing Time Test Circuit

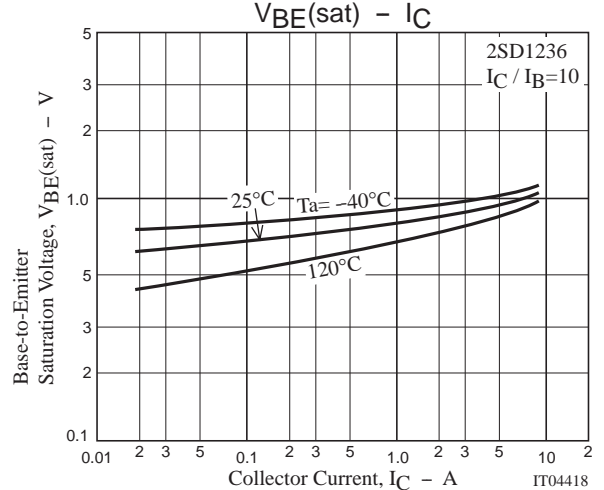
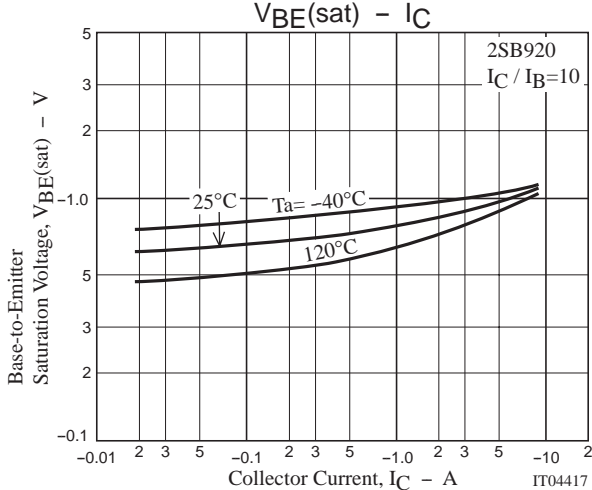
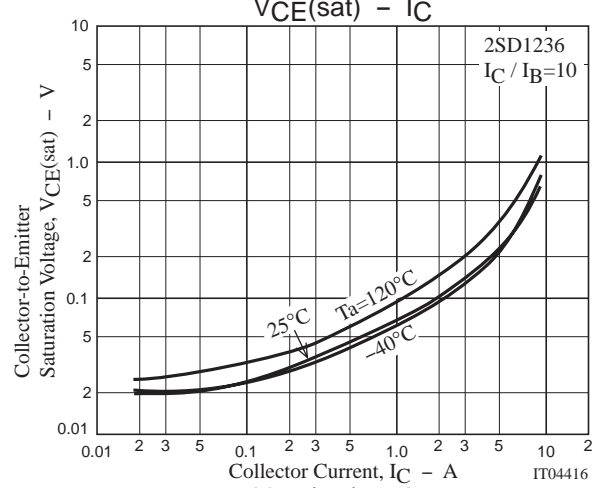
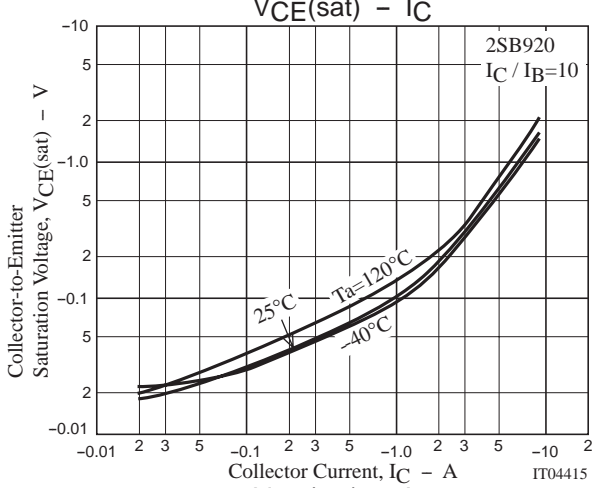
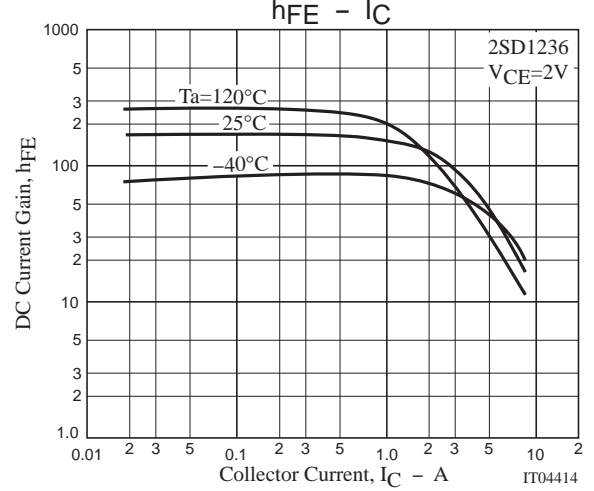
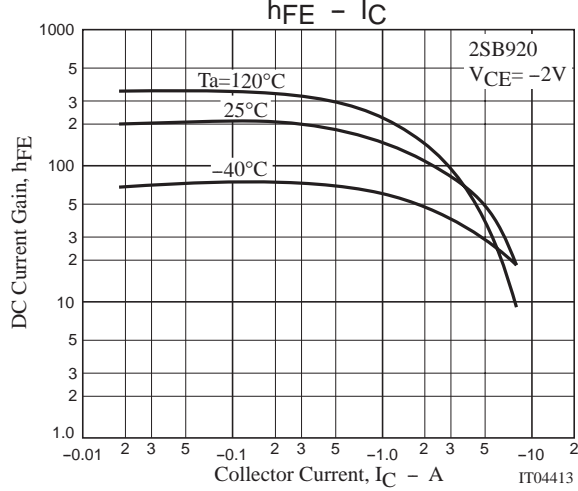
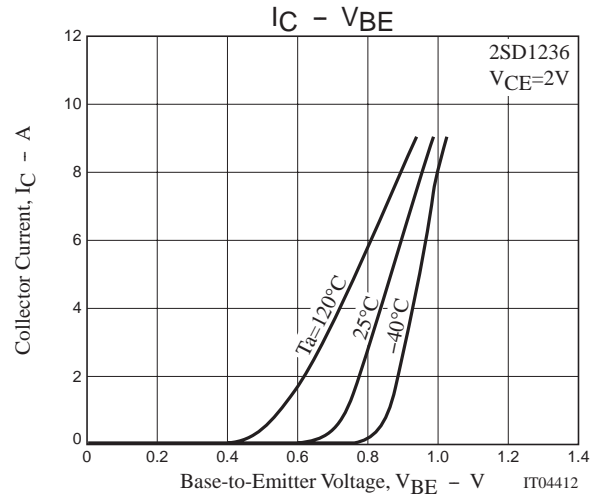
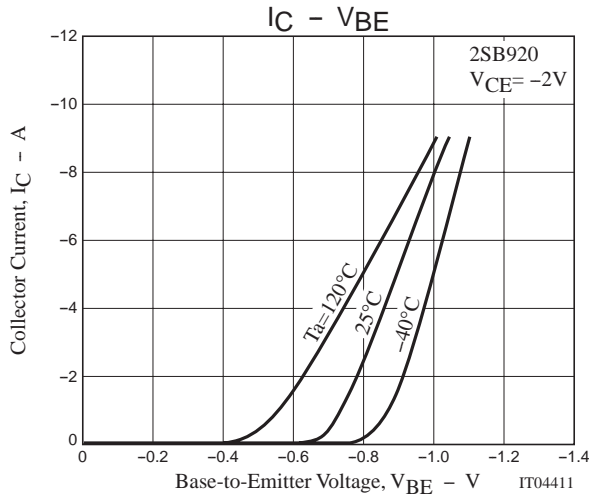


$$I_C = 10I_{B1} = -10I_{B2} = 2A$$

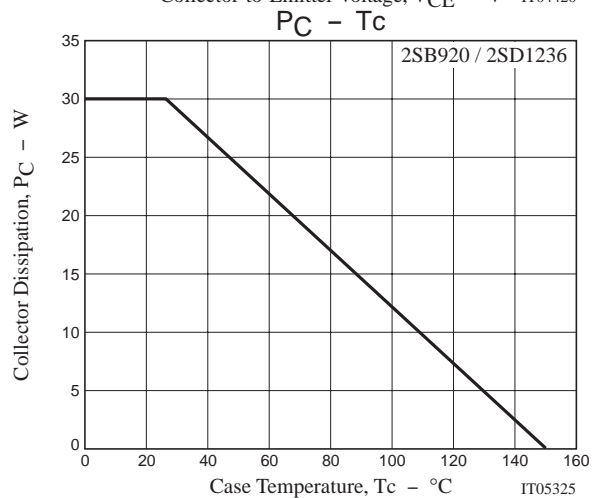
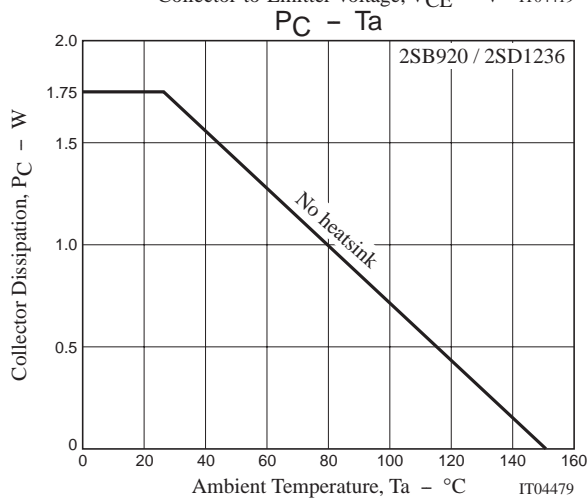
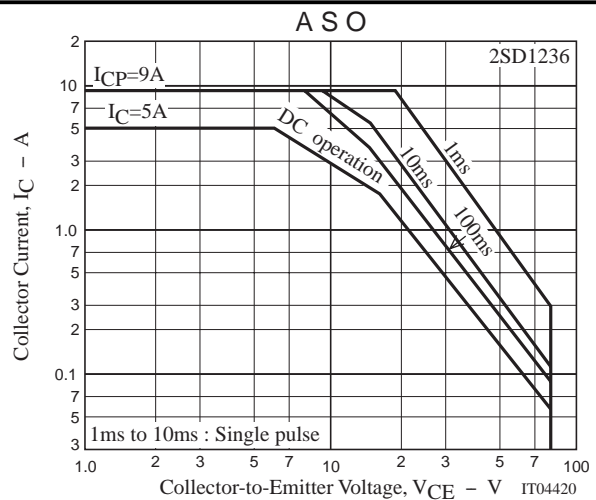
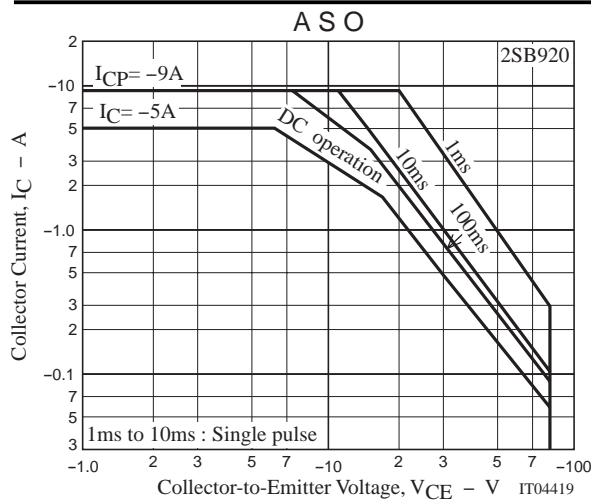
For PNP, the polarity is reversed.



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