



## 2SA2023/2SC5611

### 60V / 5A High-Speed Switching Applications

#### Applications

- Various inductance lamp drivers for electrical equipment.
- Inverters, converters (strobos, flash, fluorescent lamp lighting circuit).
- Power amplifier (high-power car stereo, motor control).
- High-speed switching (switching regulator, driver circuit).

#### Features

- Low collector-to-emitter saturation voltage.
- Excellent dependence of  $h_{FE}$  on current.
- High-speed switching.
- Micaless package facilitating mounting.

#### Specifications

Note \* ( ) : 2SA2023

**Absolute Maximum Ratings** at  $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	$V_{CB0}$		(-)80	V
Collector-to-Emitter Voltage	$V_{CEO}$		(-)60	V
Emitter-to-Base Voltage	$V_{EBO}$		(-)5	V
Collector Current	$I_C$		(-)5	A
Collector Current (Pulse)	$I_{CP}$		(-)7	A
Collector Dissipation	$P_C$		1.3	W
		$T_c=25^\circ\text{C}$	10	W
Junction Temperature	$T_j$		150	$^\circ\text{C}$
Storage Temperature	$T_{stg}$		-55 to +150	$^\circ\text{C}$

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

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	$I_{CBO}$	$V_{CB}=(-)40\text{V}, I_E=0$			(-)0.1	mA
Emitter Cutoff Current	$I_{EBO}$	$V_{EB}=(-)4\text{V}, I_C=0$			(-)0.1	mA
DC Current Gain	$h_{FE}$	$V_{CE}=(-)2\text{V}, I_C=(-)1\text{A}$	110		200	
Gain-Bandwidth Product	$f_T$	$V_{CE}=(-)5\text{V}, I_C=(-)1\text{A}$		100		MHz
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=(-)2.5\text{A}, I_B=(-)0.125\text{A}$			(-)0.4	V

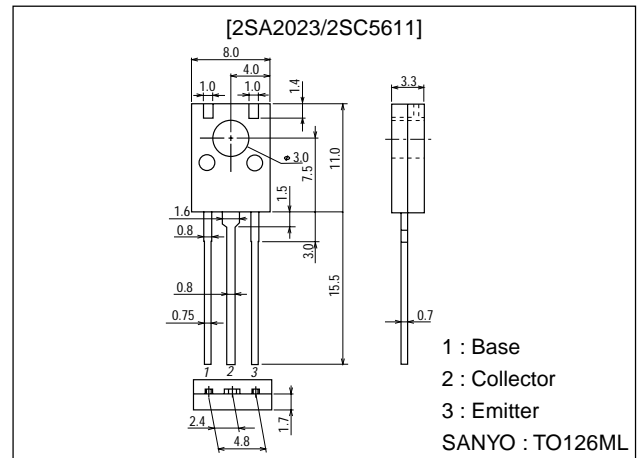
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#### Package Dimensions

unit:mm

2165



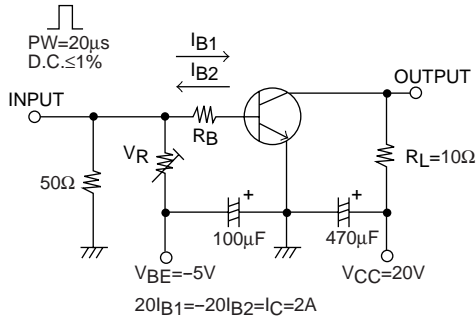
Note : The emitter and base are reversely assigned to those of our standard products encapsulated in the TO-126ML package.

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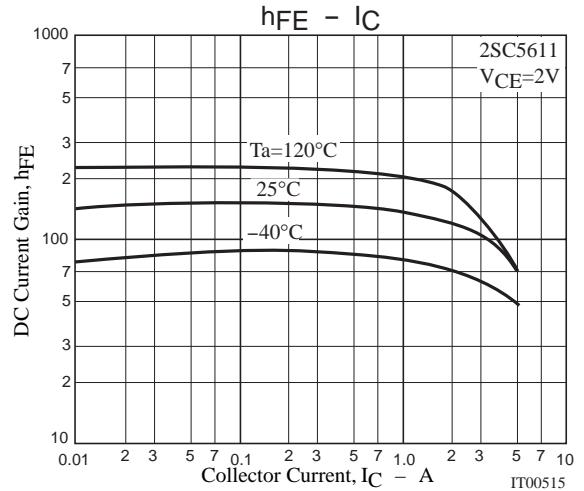
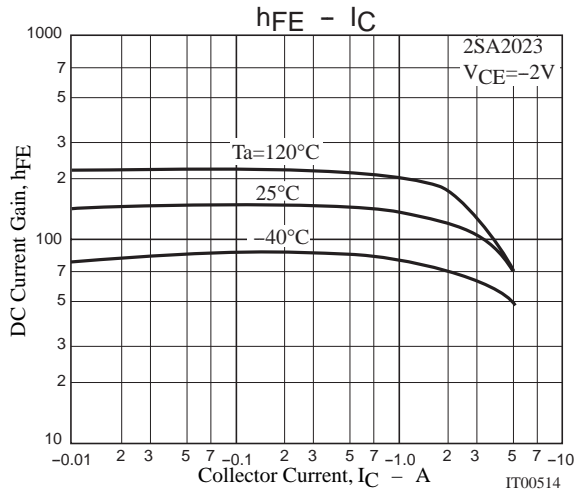
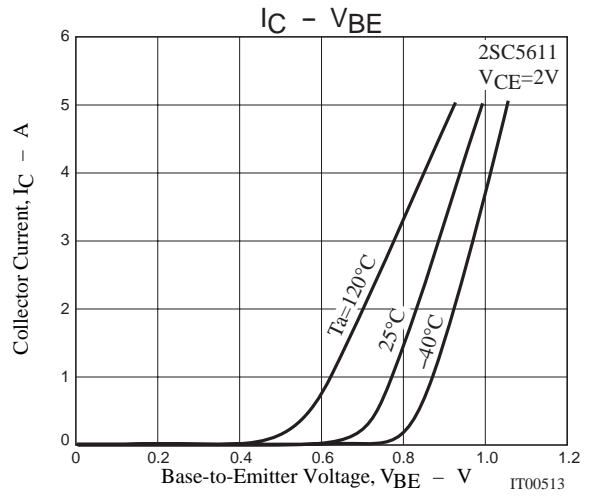
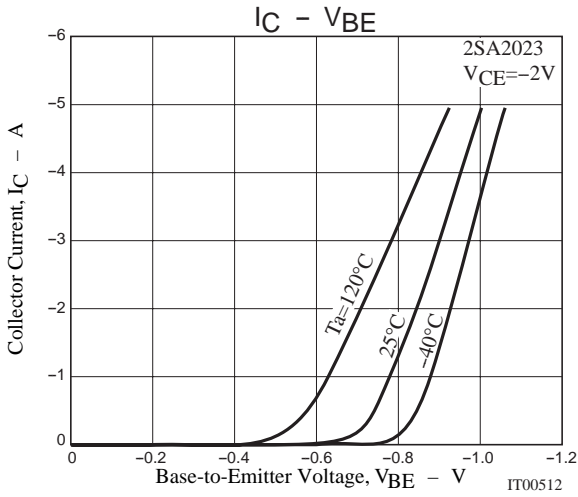
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=(-)1mA, I_E=0$	(-)80			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=(-)1mA, R_{BE}=\infty$	(-)60			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E=(-)1mA, I_C=0$	(-)5			V
Turn-ON Time	$t_{on}$	See specified Test Circuit		0.1		$\mu s$
Storage Time	$t_{stg}$	See specified Test Circuit		0.5		$\mu s$
Fall Time	$t_f$	See specified Test Circuit		0.1		$\mu s$

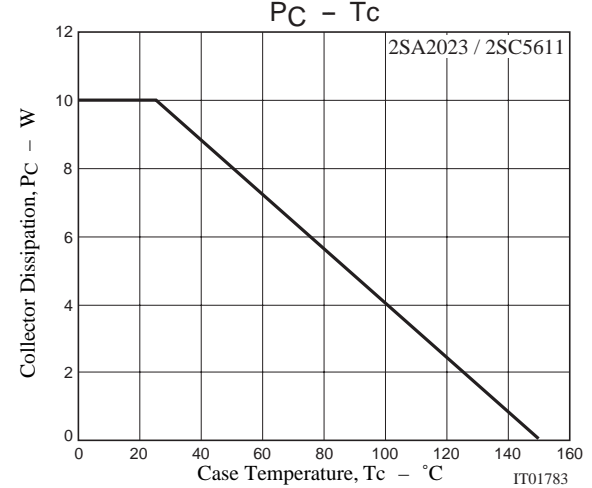
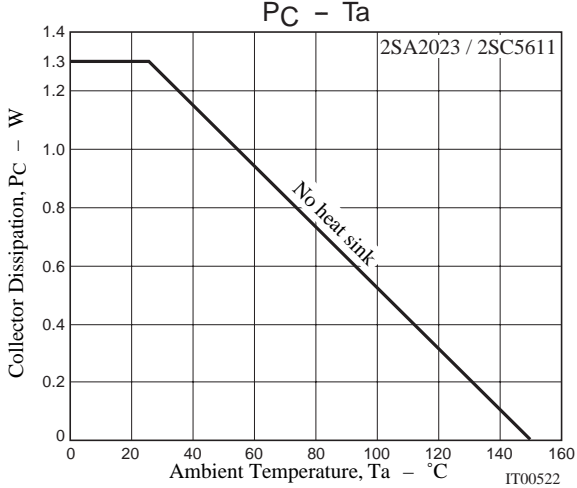
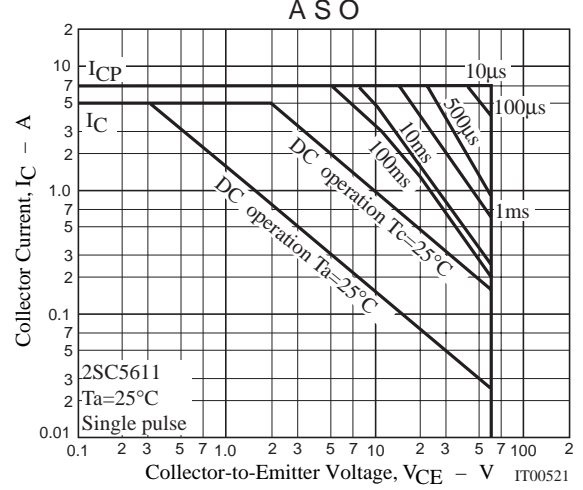
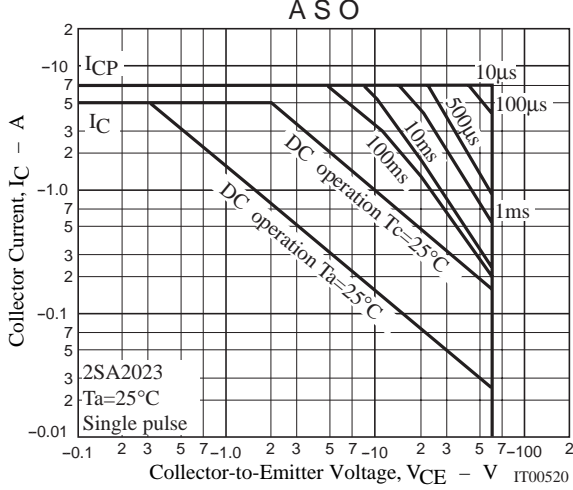
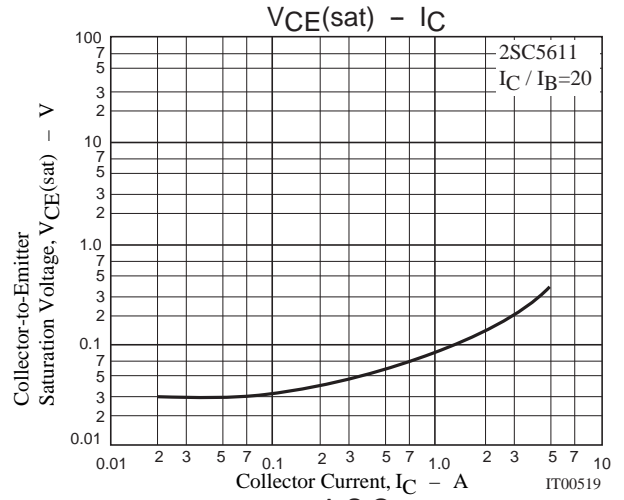
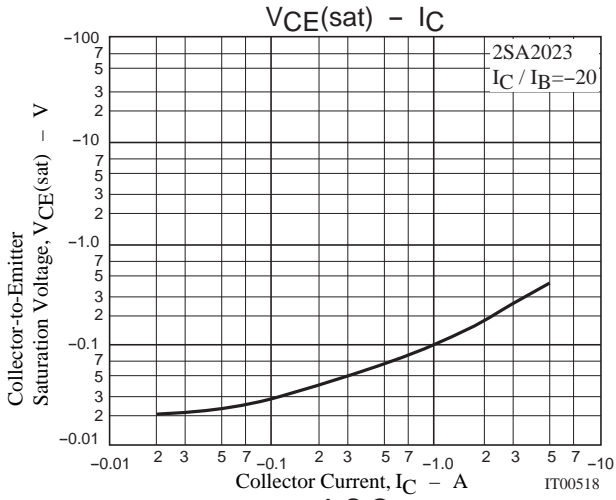
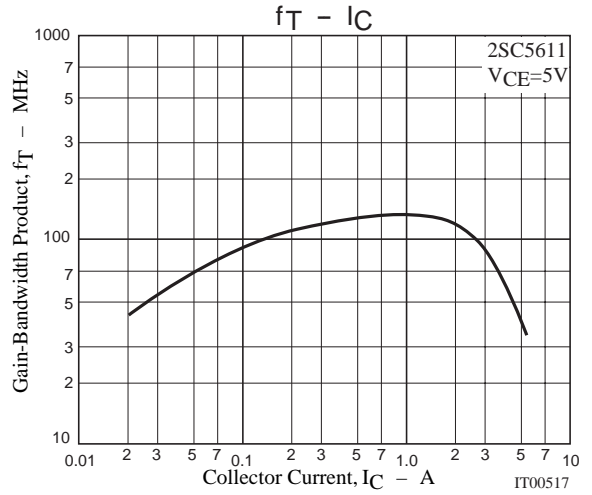
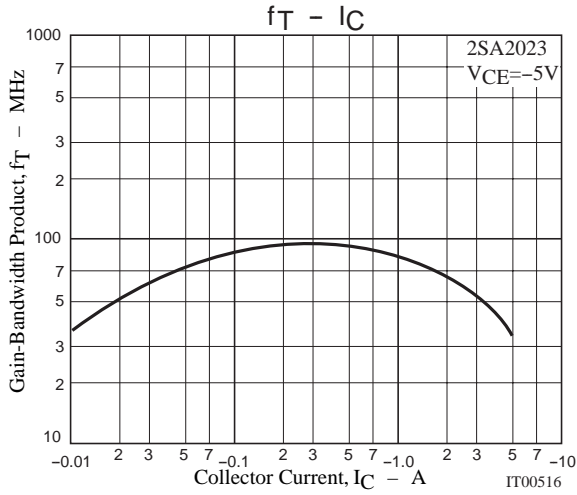
## Switching Time Test Circuit



(For PNP, the polarity is reversed.)



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