



## 2SB1511/2SD2285

### 30V/20A High-Current Switching Applications

#### Applications

- 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.
- Micaless package facilitating easy mounting.

( ) : 2SB1511

#### Specifications

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

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	$V_{CB0}$		(-)-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)	$I_{CP}$		(-)-40	A
Collector Dissipation	$P_C$		3.0	W
		$T_c = 25^\circ C$	40	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*	
	$h_{FE2}$	$V_{CE} = (-)2V, I_C = (-)10A$	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	V
Gain-Bandwidth Product	$f_T$	$V_{CE} = (-)5V, I_C = (-)1A$		120		MHz

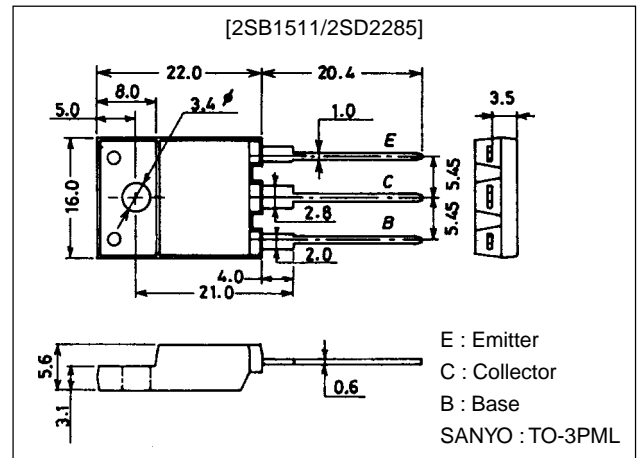
\* : The 2SB1511/2SD2285 are classified by  $1A h_{FE}$  as follows :

70	Q	140	100	R	200	140	S	280
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#### Package Dimensions

unit:mm

2039A



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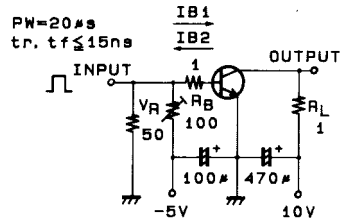
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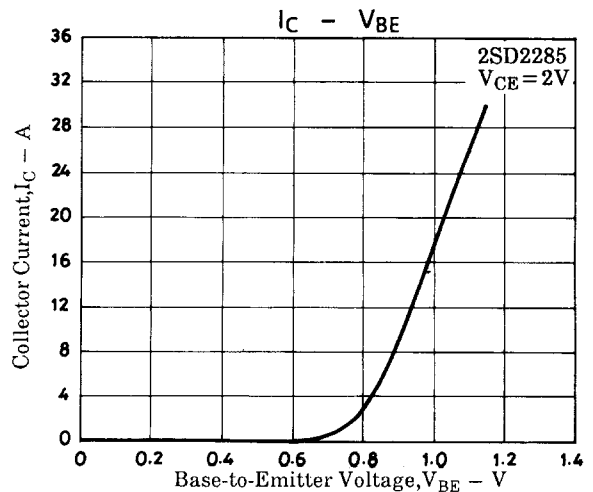
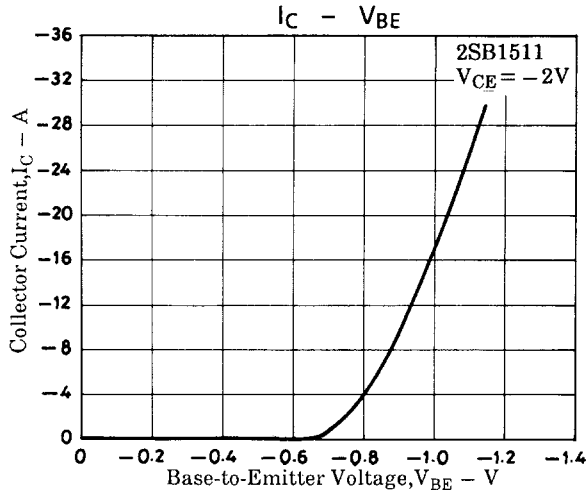
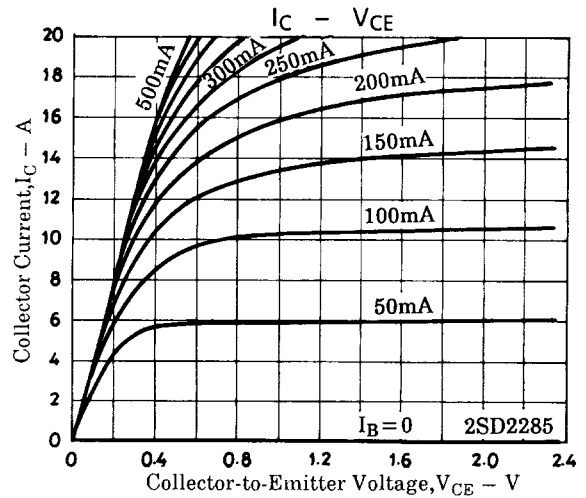
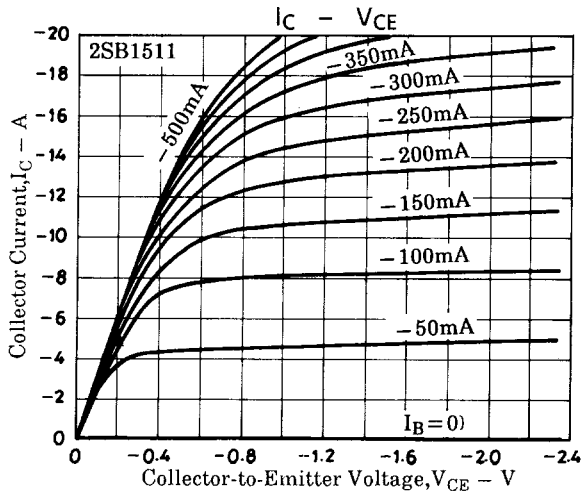
# 2SB1511/2SD2285

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
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	$t_{stg}$	See specified test circuit.		(300)		ns
				600		ns
Fall Time	$t_f$	See specified test circuit.		20		ns

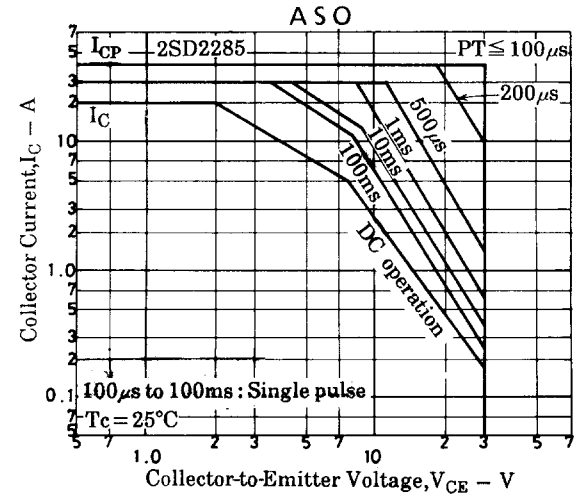
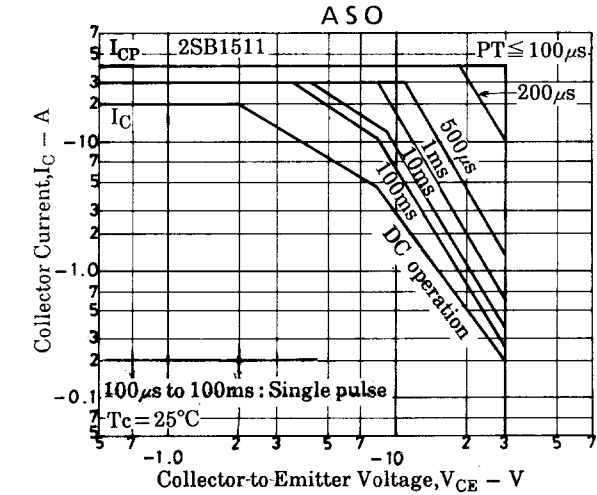
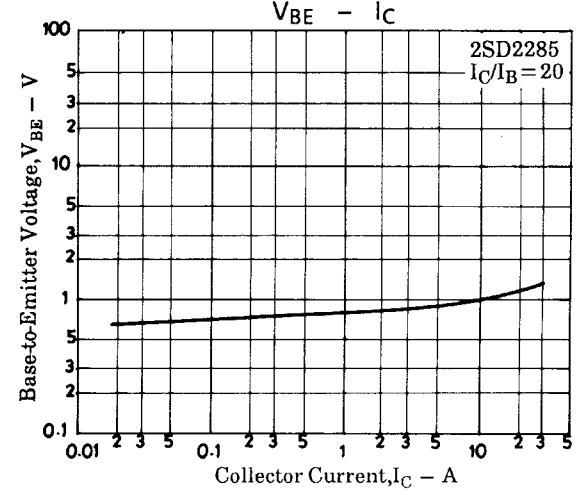
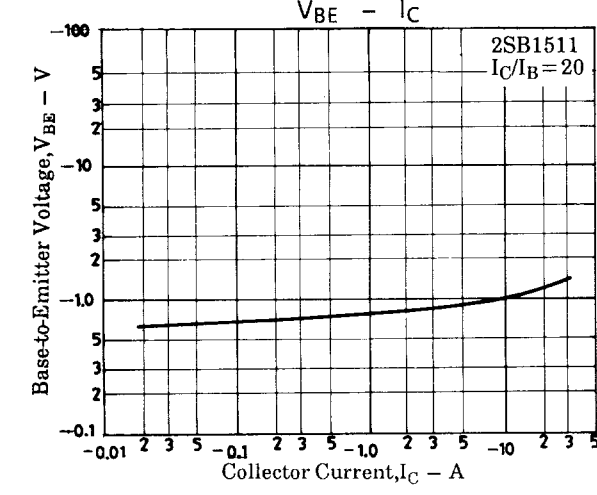
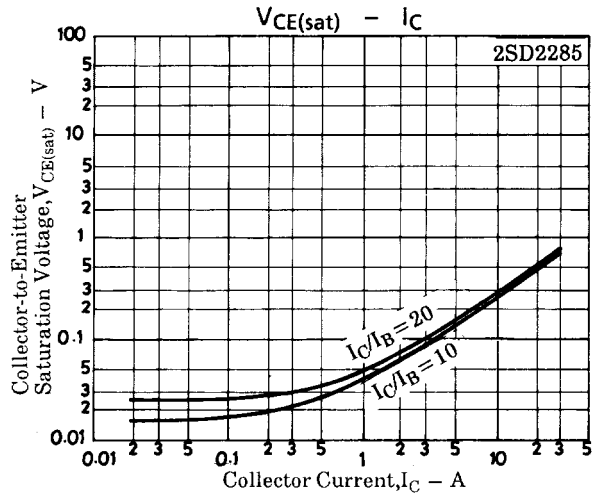
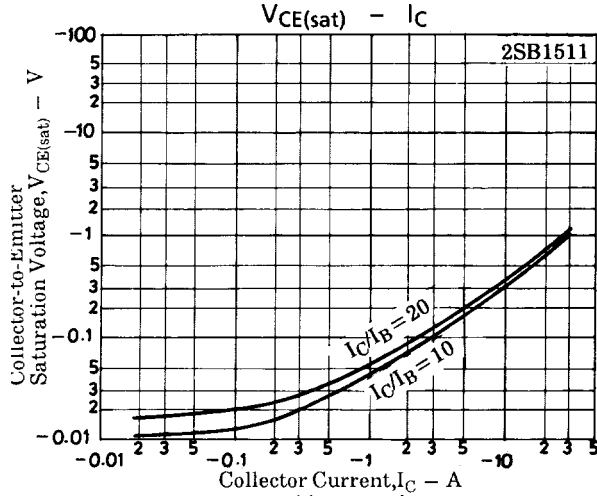
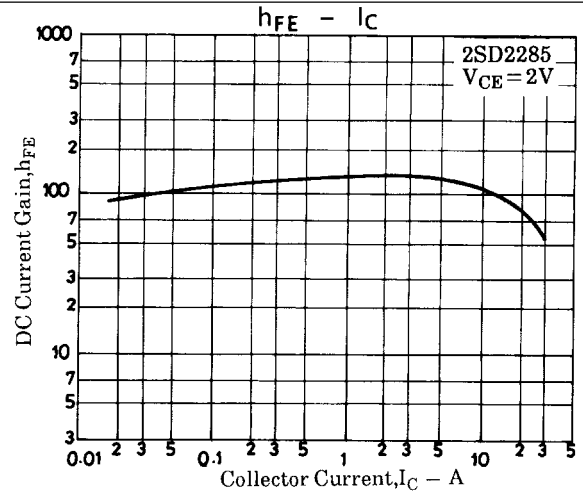
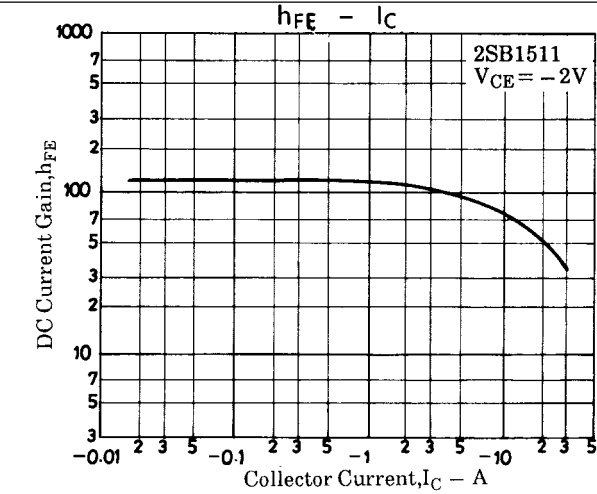
## Switching Time Test Circuit



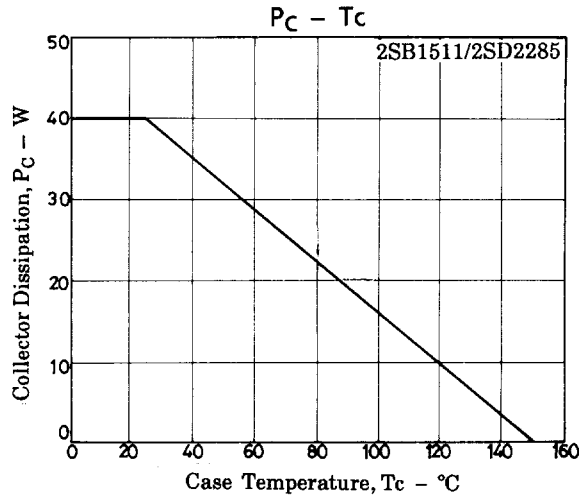
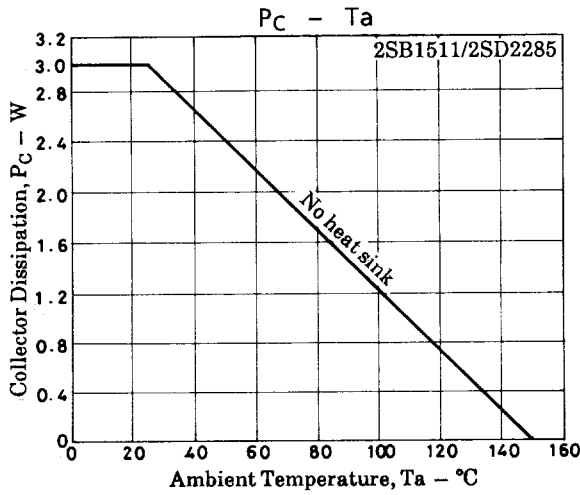
$20I_{B1} = -20I_{B2} = I_C = 10A$   
 (For PNP, the polarity is reversed.)  
 Unit (resistance :  $\Omega$ , capacitance : F)



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