



# 2SB920L/2SD1236L

## 80V/5A Switching Applications

### Applications

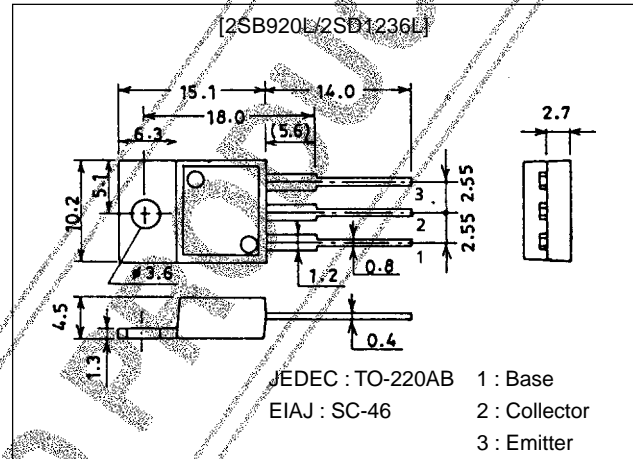
- Relay drivers, high-speed inverters, converters, and other general high-current switching applications.

### Features

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

### Package Dimensions

unit:mm  
2010C



( ) : 2SB920L

### Specifications

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

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	$V_{CBO}$		(-)90	V
Collector-to-Emitter Voltage	$V_{CEO}$		(-)80	V
Emitter-to-Base Voltage	$V_{EBO}$		(-)6	V
Collector Current	$I_C$		(-)5	A
Collector Current (Pulse)	$I_{CP}$		(-)9	A
Collector Dissipation	$P_C$	$T_C = 25^\circ C$	1.75	W
Junction Temperature	$T_J$		30	W
Storage Temperature	$T_{stg}$		150	$^\circ C$
			-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
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	$V_{CE(sat)}$	$I_C = (-)3A, I_B = (-)0.3A$			0.4	V
					(-)0.5	V

\* : The 2SB920L/2SD1236L are classified by  $1A h_{FE}$  as follows :

70	Q	140	100	R	200	140	S	280
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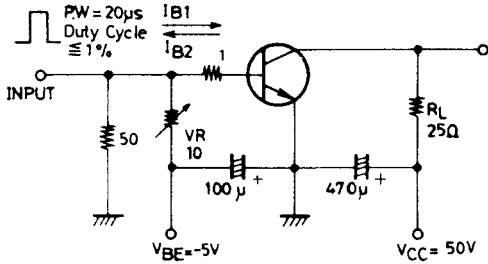
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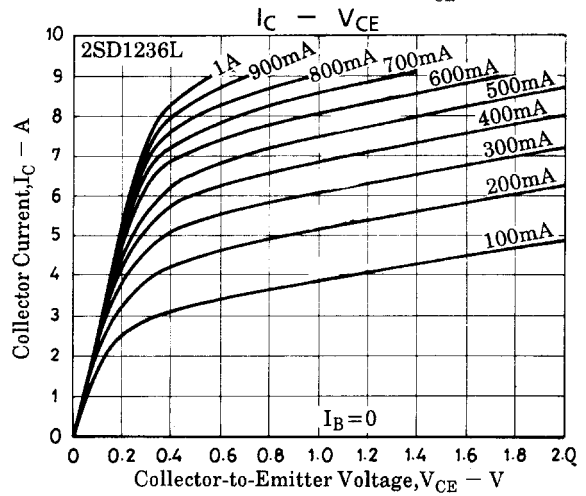
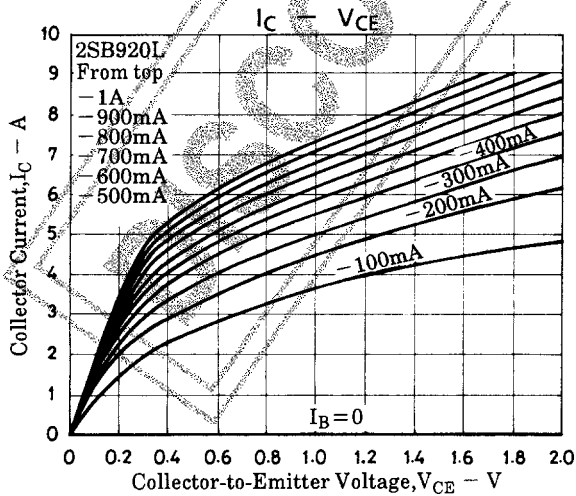
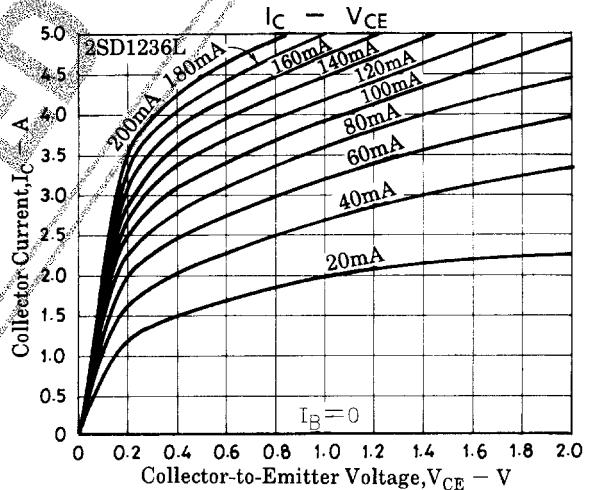
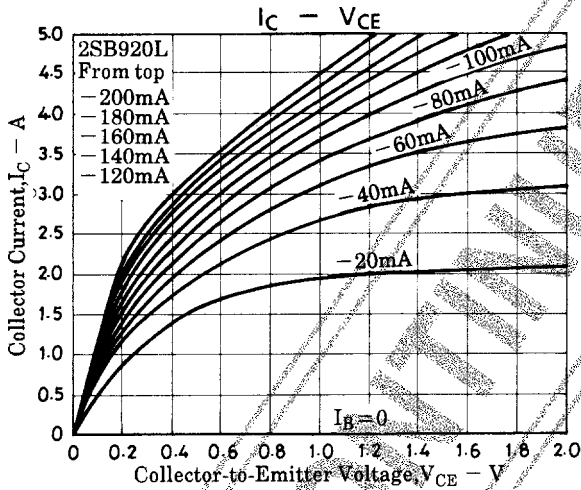
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C = (-)1mA, I_E = 0$	(-90)			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C = (-)1mA, R_{BE} = \infty$	(-80)			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E = (-)1mA, I_C = 0$	(-6)			V
Turn-ON Time	$t_{on}$	See specified Test Circuit		(0.2)		$\mu s$
Storage Time	$t_{stg}$	See specified Test Circuit		0.1		$\mu s$
				(0.7)		$\mu s$
Fall Time	$t_f$	See specified Test Circuit		1.2		$\mu s$
				(0.2)		$\mu s$
				0.4		$\mu s$

### Switching Time Test Circuit

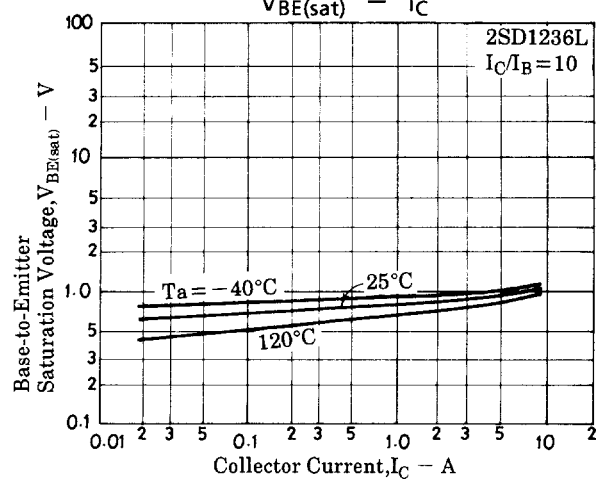
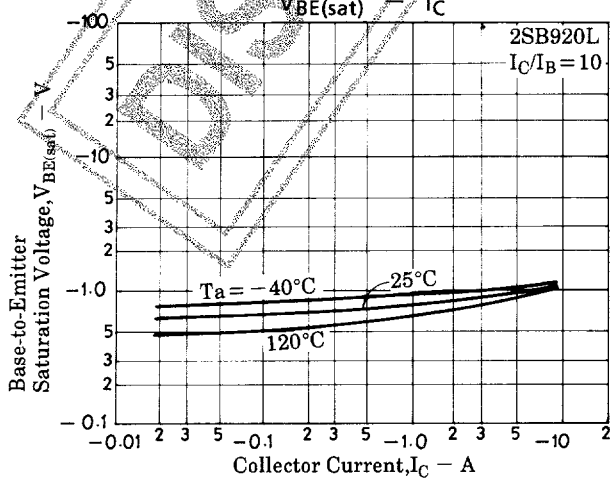
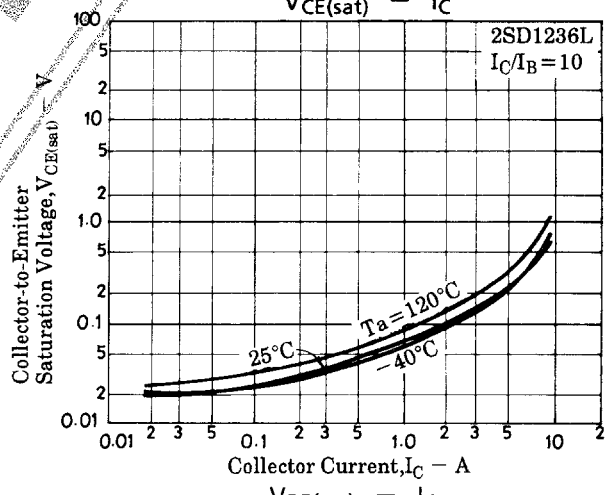
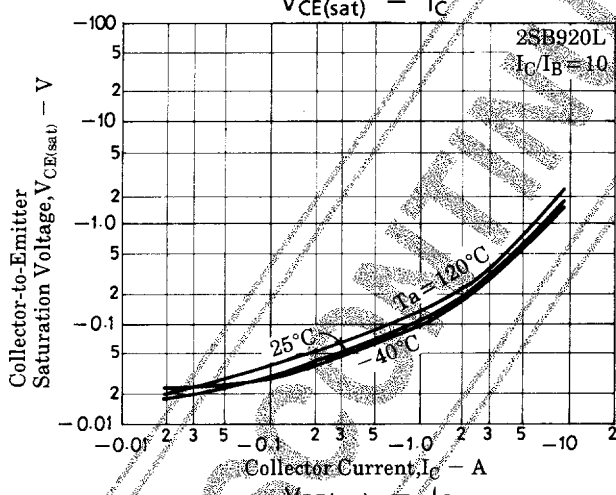
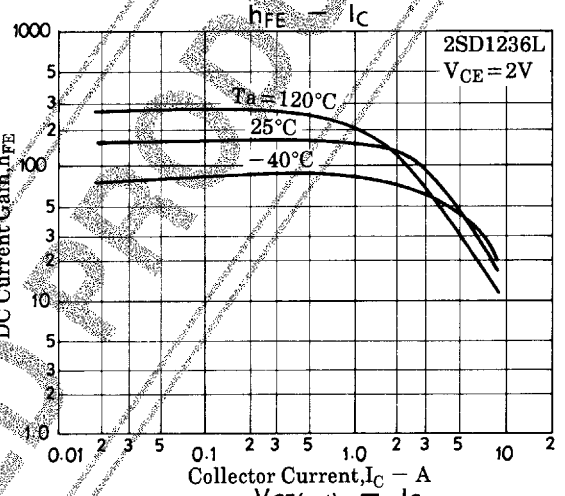
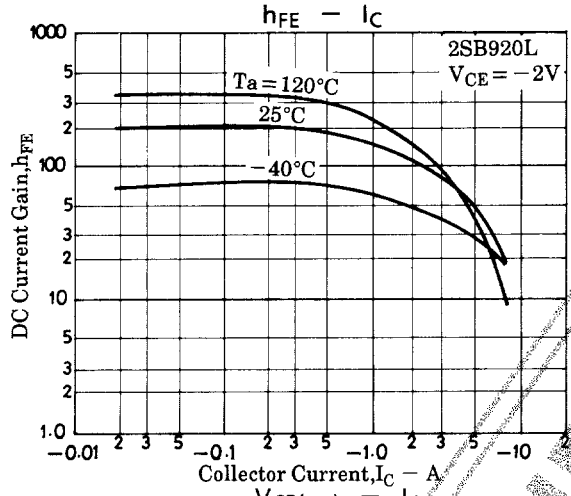
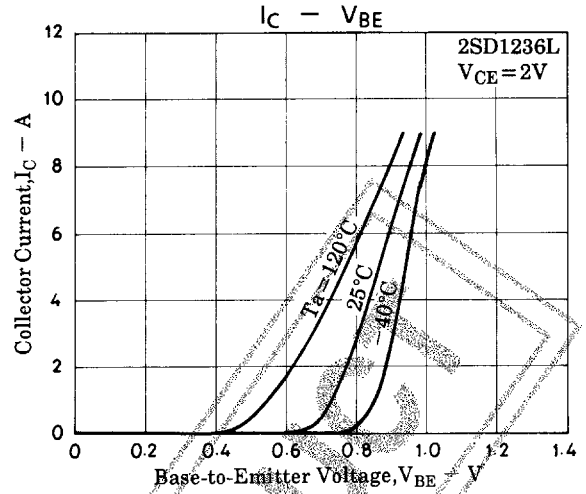
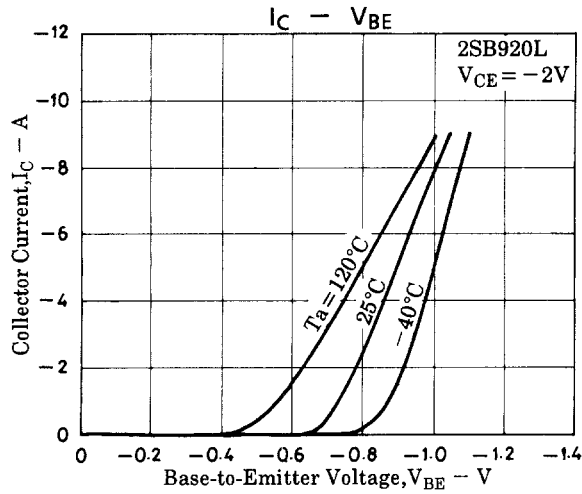


(For PNP, the polarity is reversed.)

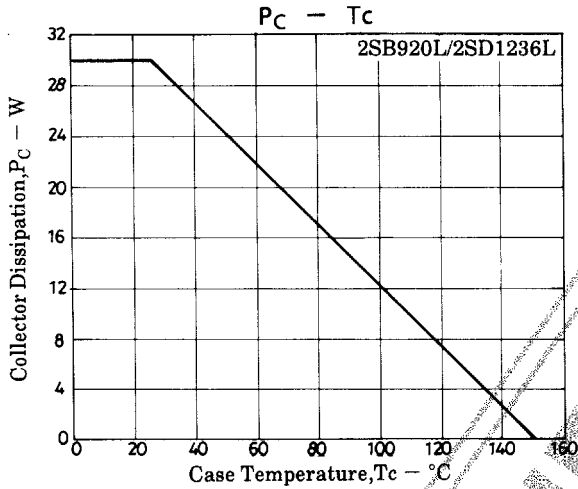
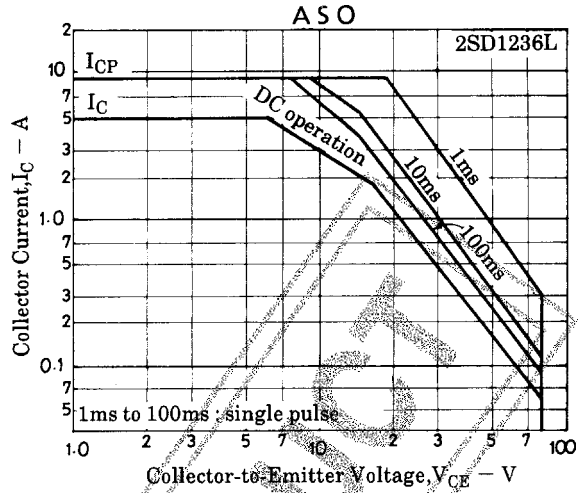
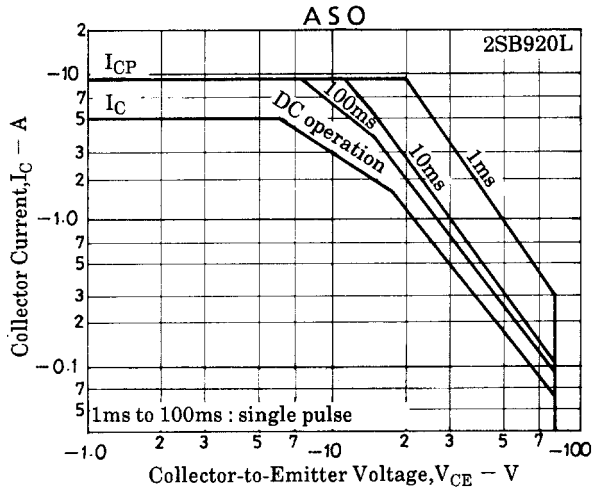
$10I_{B1} = -10I_{B2} = I_C = 2A$   
Unit ( resistance :  $\Omega$ , capacitance : F)



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