



## 500V/5A Switching Regulator Applications

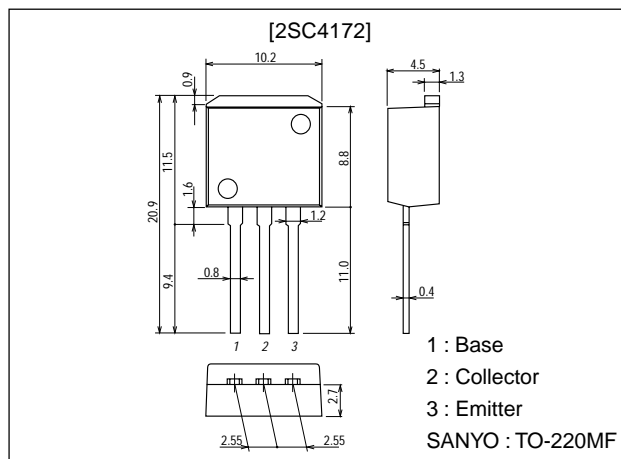
### Features

- High breakdown voltage ( $V_{CBO} \geq 800V$ ).
- Fast switching speed.
- Wide ASO.
- Suitable for sets whose height is restricted.

### Package Dimensions

unit:mm

2049C



### Specifications

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

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	$V_{CBO}$		800	V
Collector-to-Emitter Voltage	$V_{CEO}$		500	V
Emitter-to-Base Voltage	$V_{EBO}$		7	V
Collector Current	$I_C$		5	A
Collector Current (Pulse)	$I_{CP}$	$PW \leq 300\mu s$ , Duty Cycle $\leq 10\%$	10	A
Base Current	$I_B$		2	A
Collector Dissipation	$P_C$		1.65	W
		$T_c = 25^\circ C$	50	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	$I_{CBO}$	$V_{CB} = 500V$ , $I_E = 0$			10	$\mu A$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB} = 5V$ , $I_C = 0$			10	$\mu A$
DC Current Gain	$h_{FE1}$	$V_{CE} = 5V$ , $I_C = 0.6A$	15*		50*	
	$h_{FE2}$	$V_{CE} = 5V$ , $I_C = 3A$	8			

\* : The  $h_{FE1}$  of the 2SC4172 is classified as follows. When specifying the  $h_{FE1}$  rank, specify two ranks or more in principle.

15	L	30	20	M	40	30	N	50
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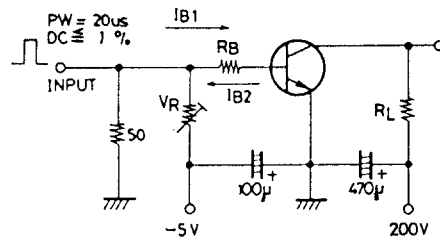
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

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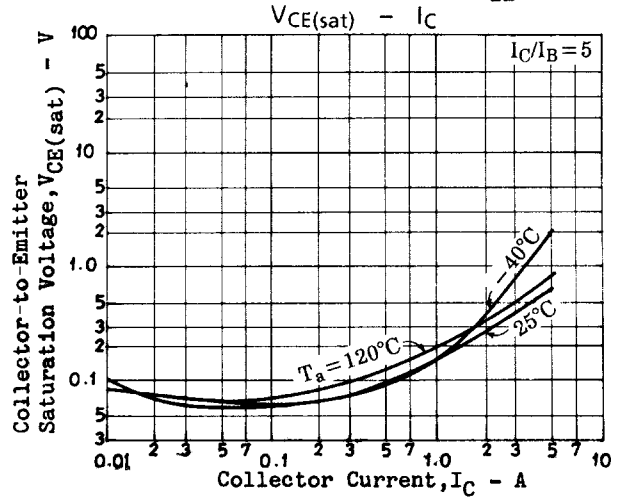
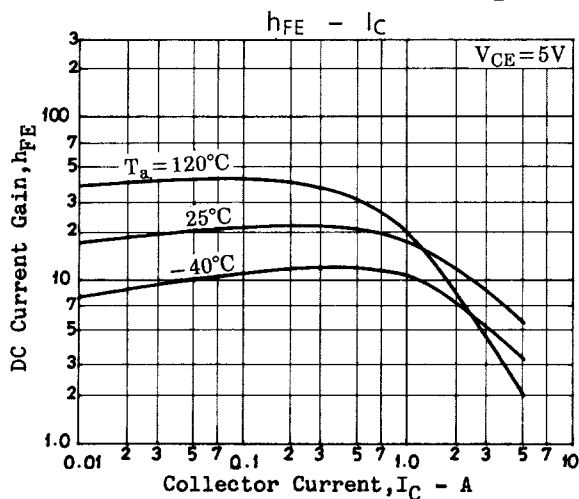
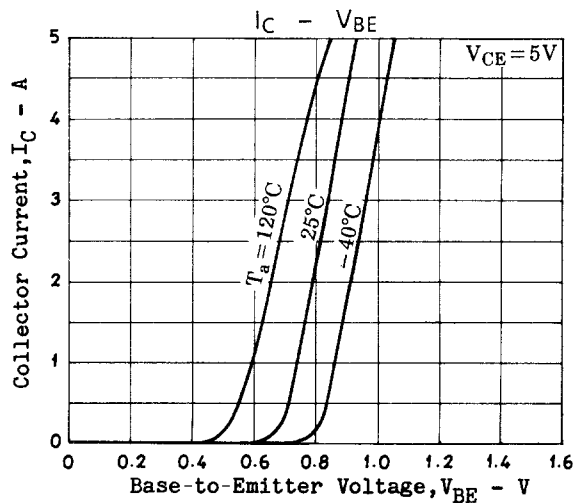
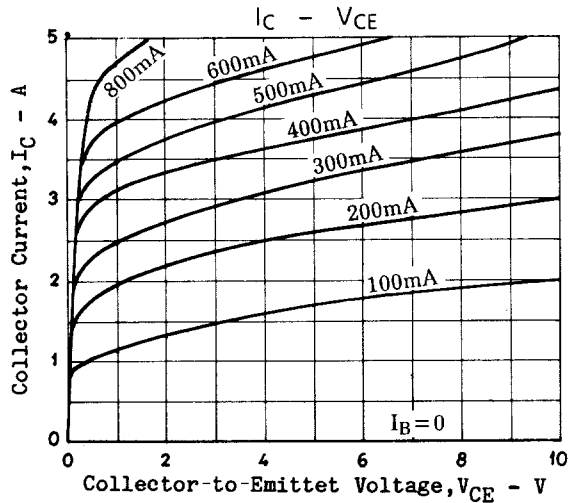
# 2SC4172

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=3A, I_B=0.6A$			1.0	V
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=3A, I_B=0.6A$			1.5	V
Gain-Bandwidth Product	$f_T$	$V_{CE}=10V, I_C=0.6A$		18		MHz
Output Capacitance	$C_{ob}$	$V_{CB}=10V, f=1MHz$		80		pF
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=1mA, I_E=0$	800			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=4mA, R_{BE}=\infty$	500			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E=1mA, I_C=0$	7			V
Collector-to-Emitter Sustain Voltage	$V_{CEO(sus)}$	$I_C=5A, I_B=1.0A, L=50\mu H$	500			V
	$V_{CEX(sus)1}$	$I_C=5A, I_{B1}=1.0A, L=200\mu H, I_{B2}=-1.0A, \text{Clamped}$	500			V
	$V_{CEX(sus)2}$	$I_C=1.2A, I_{B1}=0.24A, L=200\mu H, I_{B2}=-0.24A, \text{Clamped}$	550			V
Turn-ON Time	$t_{on}$	$I_C=4A, I_{B1}=0.8A, I_{B2}=-0.8A, R_L=50\Omega, V_{CC}=200V$			1.0	$\mu s$
Storage Time	$t_{stg}$	$I_C=4A, I_{B1}=0.8A, I_{B2}=-0.8A, R_L=50\Omega, V_{CC}=200V$			3.0	$\mu s$
Fall Time	$t_f$	$I_C=4A, I_{B1}=0.8A, I_{B2}=-0.8A, R_L=50\Omega, V_{CC}=200V$			1.0	$\mu s$

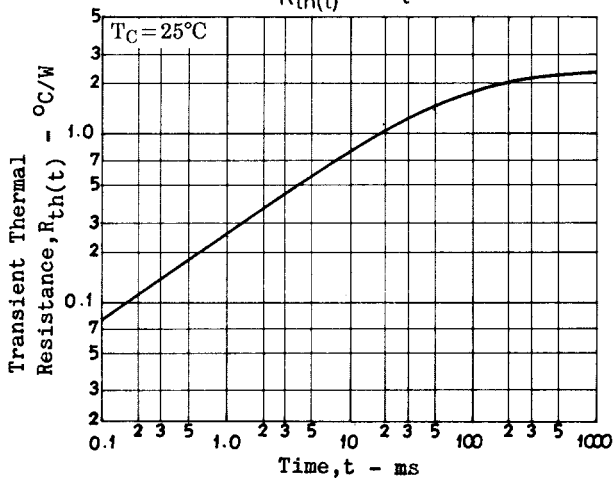
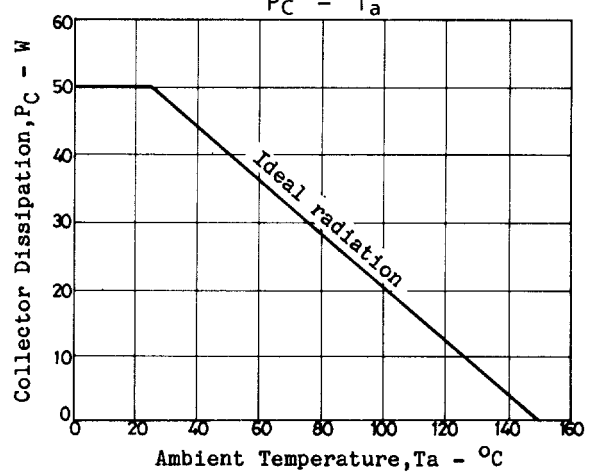
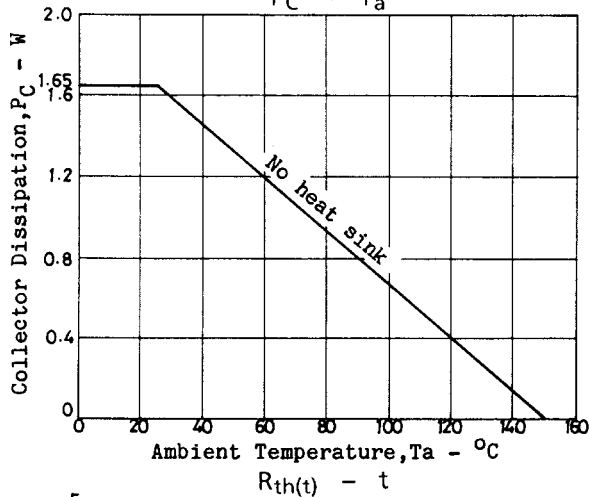
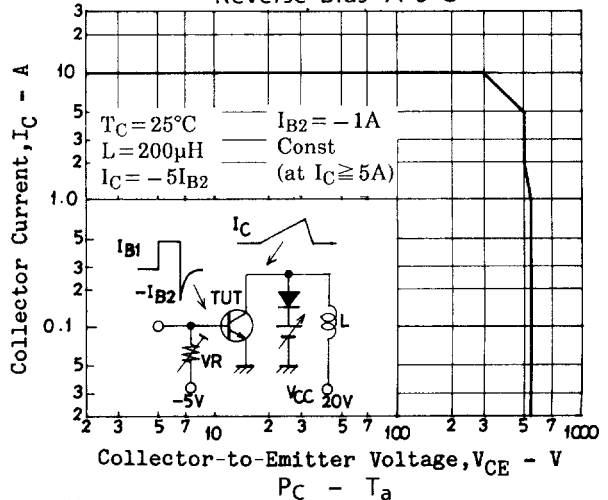
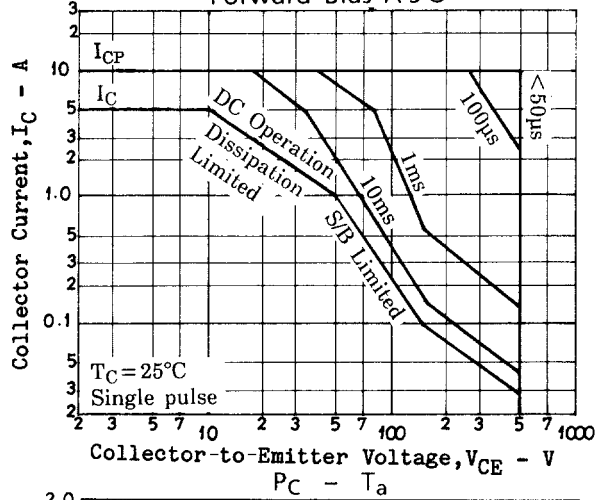
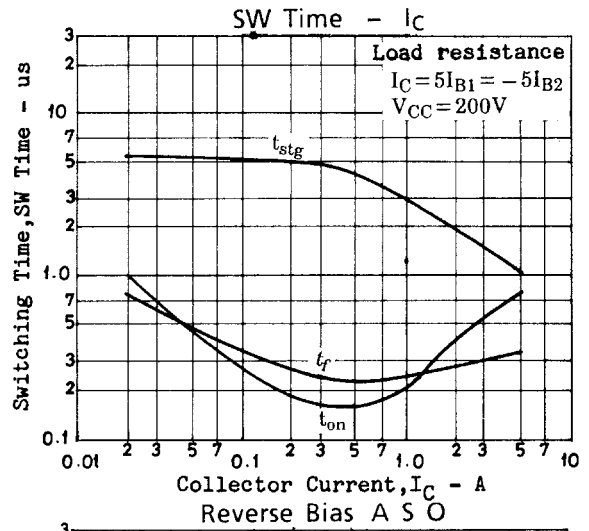
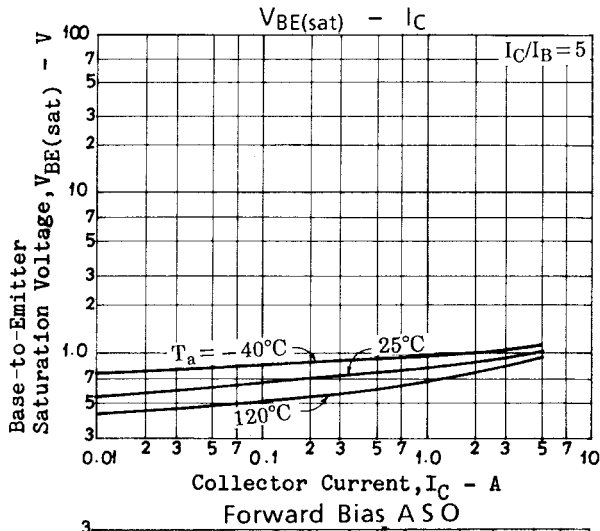
## Switching Time Test Circuit



Unit (resistance:  $\Omega$ , capacitance: F)



# 2SC4172



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