2SC4172



# 500V/5A Switching Regulator Applications

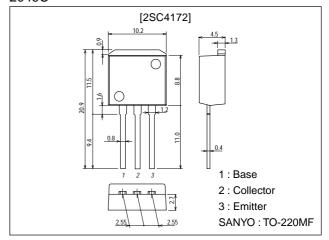
#### **Features**

- · High breakdown voltage (V<sub>CBO</sub>≥800V).
- · Fast switching speed.
- · Wide ASO.
- $\cdot$  Suitable for sets whose height is restricted.

# **Package Dimensions**

unit:mm

2049C



# **Specifications**

### Absolute Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V <sub>CBO</sub>		800	V
Collector-to-Emitter Voltage	V <sub>CEO</sub>		500	V
Emitter-to-Base Voltage	V <sub>EBO</sub>		7	V
Collector Current	IC		5	А
Collector Current (Pulse)	I <sub>CP</sub>	PW≤300μs, Duty Cycle≤10%	10	А
Base Current	I <sub>B</sub>		2	А
Collector Dissipation	PC		1.65	W
		Tc=25°C	50	W
Junction Temperature	Tj		150	°C
Storage Temperature	Tstg		-55 to +150	°C

#### Electrical Characteristics at Ta = 25°C

Parameter	Symbol	Conditions	Ratings			Unit
	Symbol		min	typ	max	Offic
Collector Cutoff Current	I <sub>CBO</sub>	V <sub>CB</sub> =500V, I <sub>E</sub> =0			10	μA
Emitter Cutoff Current	I <sub>EBO</sub>	V <sub>EB</sub> =5V, I <sub>C</sub> =0			10	μΑ
DC Current Gain	h <sub>FE</sub> 1	V <sub>CE</sub> =5V, I <sub>C</sub> =0.6A	15*		50*	
	h <sub>FE</sub> 2	V <sub>CE</sub> =5V, I <sub>C</sub> =3A	8			

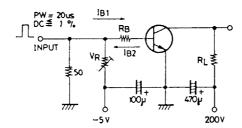
\*: The h<sub>FE</sub>1 of the 2SC4172 is classified as follows. When specifying the h<sub>FE</sub>1 rank, specify two ranks or more in principle.

15 L 30 20 M 40 30 N 50

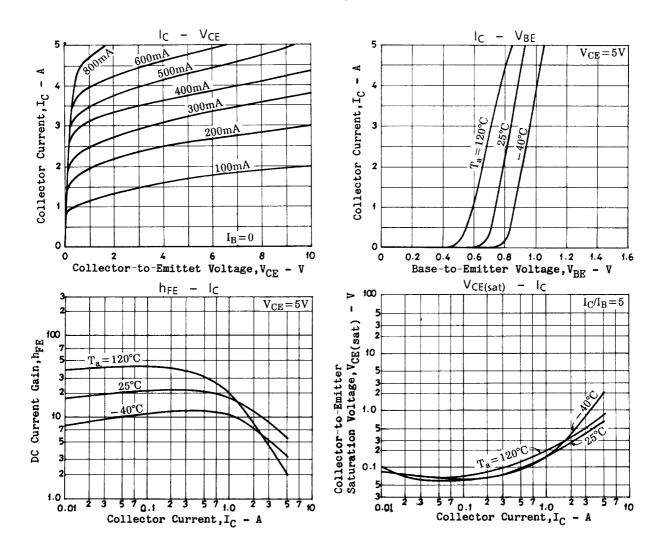
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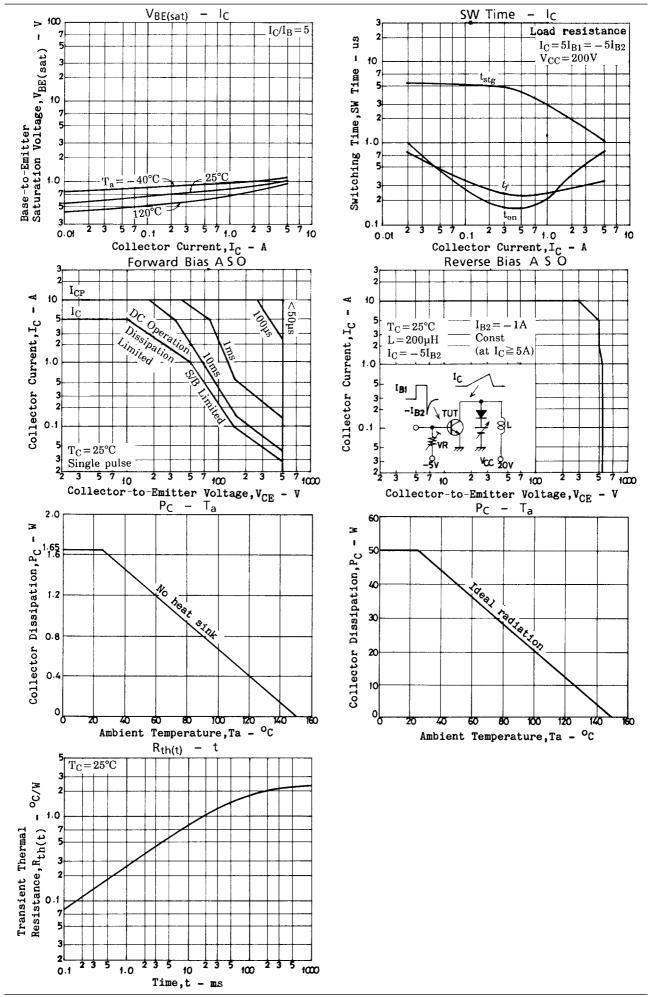
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	Uill
Collector-to-Emitter Saturation Voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> =3A, I <sub>B</sub> =0.6A			1.0	V
Base-to-Emitter Saturation Voltage	V <sub>BE(sat)</sub>	I <sub>C</sub> =3A, I <sub>B</sub> =0.6A			1.5	V
Gain-Bandwidth Product	fT	V <sub>CE</sub> =10V, I <sub>C</sub> =0.6A		18		MHz
Output Capacitance	C <sub>ob</sub>	V <sub>CB</sub> =10V, f=1MHz		80		pF
Collector-to-Base Breakdown Voltage	V(BR)CBO	I <sub>C</sub> =1mA, I <sub>E</sub> =0	800			V
Collector-to-Emitter Breakdown Voltage	V(BR)CEO	I <sub>C</sub> =4mA, R <sub>BE</sub> =∞	500			V
Emitter-to-Base Breakdown Voltage	V(BR)EBO	I <sub>E</sub> =1mA, I <sub>C</sub> =0	7			V
	V <sub>CEO(sus)</sub>	I <sub>C</sub> =5A, I <sub>B</sub> =1.0A, L=50μH	500			V
Collector-to-Emitter Sustain Voltage	V <sub>CEX(sus)</sub> 1	I <sub>C</sub> =5A, I <sub>B1</sub> =1.0A, L=200μH, I <sub>B2</sub> =-1.0A, Clamped	500			V
	V <sub>CEX(sus)</sub> <sup>2</sup>	I <sub>C</sub> =1.2A, I <sub>B1</sub> =0.24A, L=200μH, I <sub>B2</sub> =-0.24A, Clamped	550			V
Turn-ON Time	ton	I <sub>C</sub> =4A, I <sub>B1</sub> =0.8A, I <sub>B2</sub> =-0.8A, R <sub>L</sub> =50Ω, V <sub>CC</sub> =200V			1.0	μs
Storage Time	t <sub>stg</sub>	I <sub>C</sub> =4A, I <sub>B1</sub> =0.8A, I <sub>B2</sub> =-0.8A, R <sub>L</sub> =50Ω, V <sub>CC</sub> =200V			3.0	μs
Fall Time	t <sub>f</sub>	I <sub>C</sub> =4A, I <sub>B1</sub> =0.8A, I <sub>B2</sub> =-0.8A, R <sub>L</sub> =50Ω, V <sub>CC</sub> =200V			1.0	μs

## **Switching Time Test Circuit**



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





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