2SC3039



# 400V/7A Switching Regulator Applications

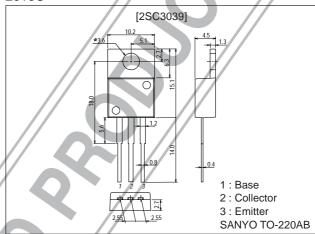
### **Features**

- · High breakdown voltage (V<sub>CBO</sub>≥500V).
- · Fast switching speed.
- · Wide ASO.

## Package Dimensions

unit:mm

2010C



### **Specifications**

Absolute Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V <sub>CBO</sub>		500	V
Collector-to-Emitter Voltage	VCEO		400	V
Emitter-to-Base Voltage	V <sub>EBO</sub>		7	V
Collector Current	l <sub>C</sub>		7	Α
Collector Current (Pulse)	I <sub>CP</sub> PW≤3	00μs, Duty Cycle≤10%	14	Α
Base Current	I <sub>B</sub>		3	Α
Collector Dissipation	Po		1.75	W
	P <sub>C</sub> 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	
raiallielei		Conditions	min	typ	max	Offic	
Collector Cutoff Current		ICBO	V <sub>CB</sub> =400V, I <sub>E</sub> =0			10	μA
Emitter Cutoff Current		IEBO	$V_{EB}=5V$ , $I_{C}=0$			10	μΑ
DC Current Gain	h <sub>FE</sub> 1	$V_{CE}$ =5V, $I_{C}$ =0.8A	15*		50*		
		h <sub>FE</sub> 2	V <sub>CE</sub> =5V, I <sub>C</sub> =4A	8			

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\*: The  $h_{FE}1$  of the 2SC3039 is classified as follows. When specifying the  $h_{FE}1$  rank, specify two ranks or more in principle.

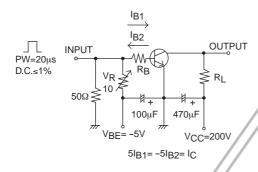
Rank	L	М	N
hFE	15 to 30	20 to 40	30 to 50

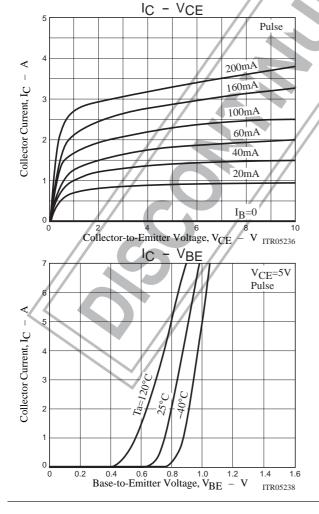
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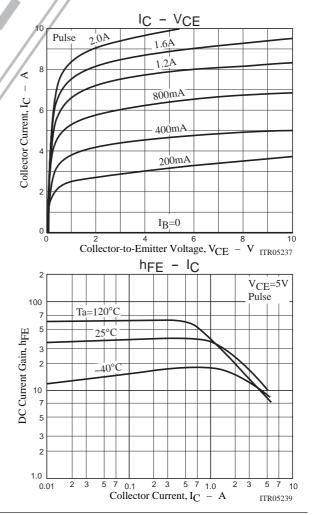
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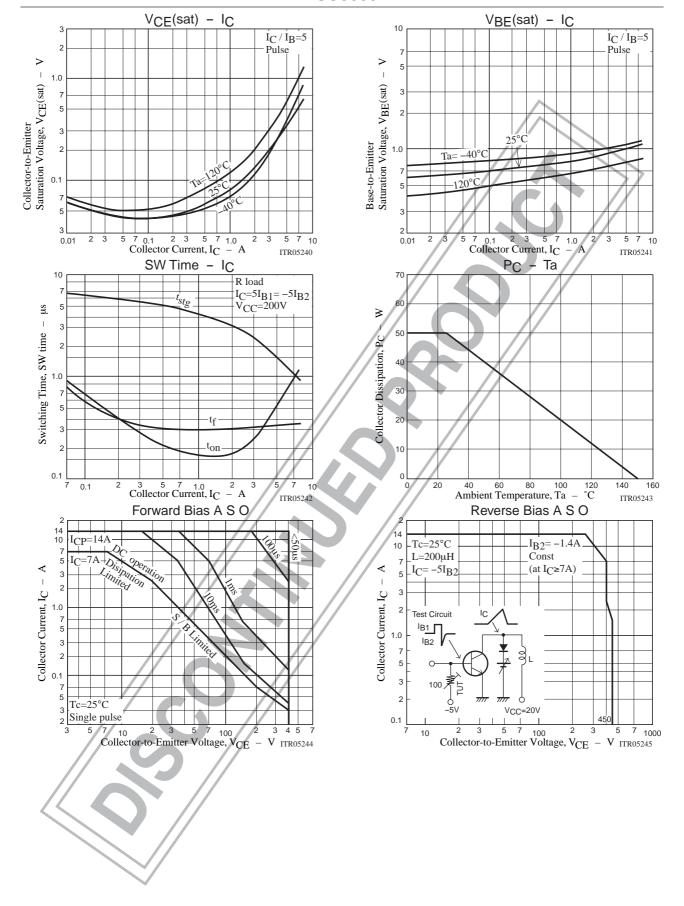
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	Offic
Collector-to-Emitter Saturation Voltage	V <sub>CE(sat)</sub>	I <sub>C</sub> =4A, I <sub>B</sub> =0.8A			1.0	V
Base-to-Emitter Saturation Voltage	V <sub>BE(sat)</sub>	I <sub>C</sub> =4A, I <sub>B</sub> =0.8A	4		1.5	V
Gain-Bandwidth Product	f <sub>T</sub>	V <sub>CE</sub> =10V, I <sub>C</sub> =0.8A		20		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	500			V
Collector-to-Emitter Breakdown Voltage	V(BR)CEO	I <sub>C</sub> =5mA, R <sub>BE</sub> =∞	400			V
Emitter-to-Base Breakdown Voltage	V(BR)EBO	I <sub>E</sub> =1mA, I <sub>C</sub> =0	7			V
Collector-to-Emitter Sustain Voltage	V <sub>CEO(sus)</sub>	I <sub>C</sub> =7A, I <sub>B</sub> =1.4A, L=50μH	400			<
Collector-to-Emitter Sustain Voltage	V <sub>CEX(sus)1</sub>	I <sub>C</sub> =7A, I <sub>B1</sub> =1.4A, L=200μH, I <sub>B2</sub> =-1.4A, clamped	400			V
	V <sub>CEX(sus)2</sub>	I <sub>C</sub> =1.5A, I <sub>B1</sub> =0.3A, L=200μH, I <sub>B2</sub> =-0.3A, clamped	450			V
Turn-ON Time	ton	I <sub>C</sub> =5A, I <sub>B1</sub> =1A, I <sub>B2</sub> =-1A, R <sub>L</sub> =40Ω, V <sub>CC</sub> =200V			1.0	μs
Storage Time	t <sub>stg</sub>	I <sub>C</sub> =5A, I <sub>B1</sub> =1A, I <sub>B2</sub> =-1A, R <sub>L</sub> =40Ω, V <sub>CC</sub> =200V			2.5	μs
Fall Time	t <sub>f</sub>	I <sub>C</sub> =5A, I <sub>B1</sub> =1A, I <sub>B2</sub> =-1A, R <sub>L</sub> =40Ω, V <sub>CC</sub> =200V			1.0	μs

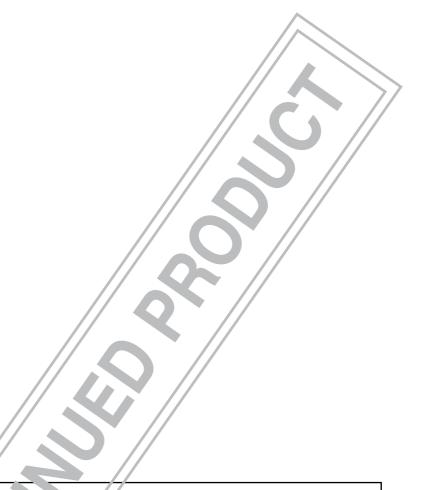
### Switching Time Test Circuit











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