

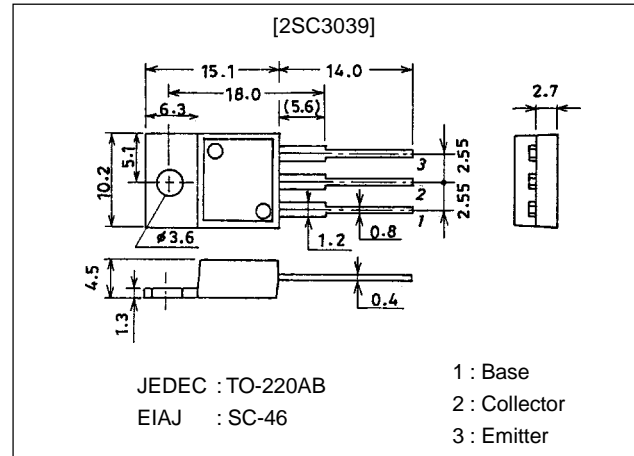
**400V/7A Switching Regulator Applications****Features**

- High breakdown voltage ( $V_{CBO} \geq 500V$ ).
- Fast switching speed.
- Wide ASO.

**Package Dimensions**

unit:mm

2010C

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

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	$V_{CBO}$		500	V
Collector-to-Emitter Voltage	$V_{CEO}$		400	V
Emitter-to-Base Voltage	$V_{EBO}$		7	V
Collector Current	$I_C$		7	A
Collector Current (Pulse)	$I_{CP}$	$PW \leq 300\mu s$ , Duty Cycle $\leq 10\%$	14	A
Base Current	$I_B$		3	A
Collector Dissipation	$P_C$		1.75	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	$I_{CBO}$	$V_{CB} = 400V$ , $I_E = 0$			10	$\mu A$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB} = 5V$ , $I_C = 0$			10	$\mu A$
DC Current Gain	$h_{FE1}$	$V_{CE} = 5V$ , $I_C = 0.8A$	15*		50*	
	$h_{FE2}$	$V_{CE} = 5V$ , $I_C = 4A$	8			
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C = 4A$ , $I_B = 0.8A$			1.0	V
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C = 4A$ , $I_B = 0.8A$			1.5	V

\* : The  $h_{FE1}$  of the 2SC3039 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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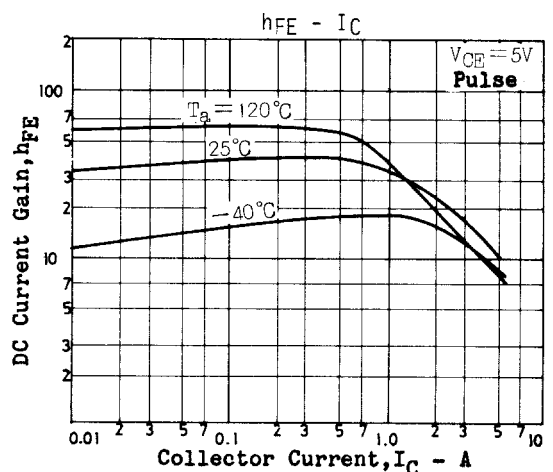
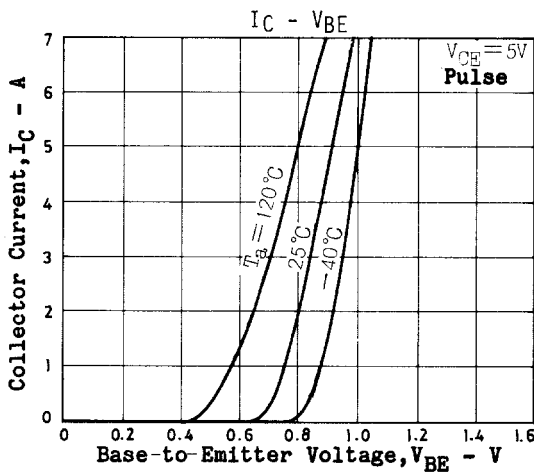
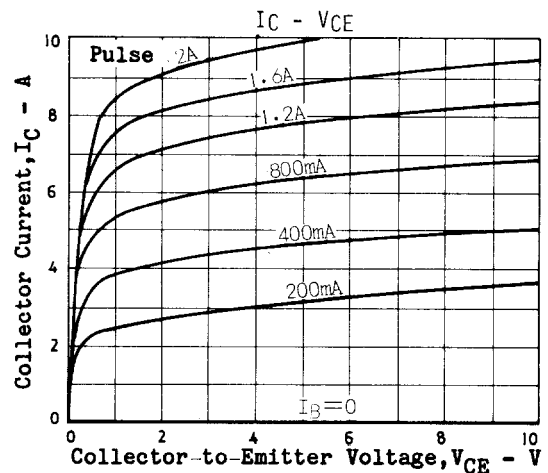
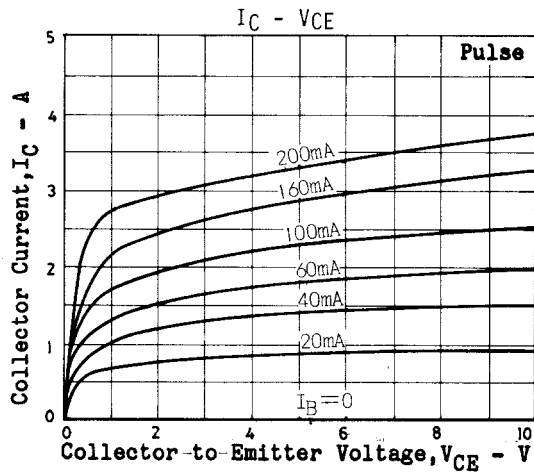
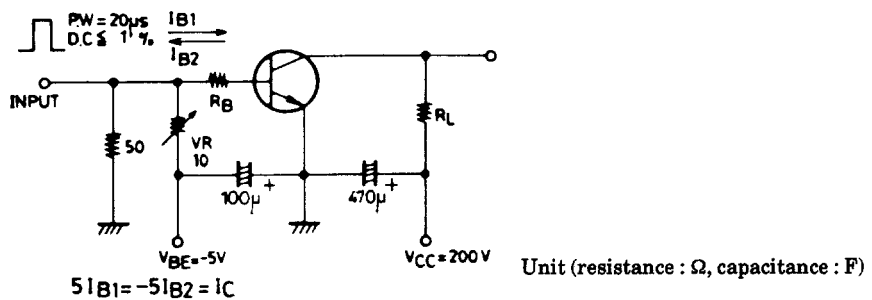
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# 2SC3039

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Gain-Bandwidth Product	$f_T$	$V_{CE}=10V, I_C=0.8A$		20		MHz
Output Capacitance	$C_{ob}$	$V_{CB}=10V, f=1MHz$		80		pF
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=1mA, I_E=0$	500			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=5mA, R_{BE}=\infty$	400			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E=1mA, I_C=0$	7			V
Collector-to-Emitter Sustain Voltage	$V_{CEO(sus)}$	$I_C=7A, I_B=1.4A, L=50\mu H$	400			V
Collector-to-Emitter Sustain Voltage	$V_{CEX(sus)1}$	$I_C=7A, I_{B1}=1.4A, L=200\mu H, I_{B2}=-1.4A, \text{clamped}$	400			V
	$V_{CEX(sus)2}$	$I_C=1.5A, I_{B1}=0.3A, L=200\mu H, I_{B2}=-0.3A, \text{clamped}$	450			V
Turn-ON Time	$t_{on}$	$I_C=5A, I_{B1}=1A, I_{B2}=-1A, R_L=40\Omega, V_{CC}=200V$			1.0	$\mu s$
Storage Time	$t_{stg}$	$I_C=5A, I_{B1}=1A, I_{B2}=-1A, R_L=40\Omega, V_{CC}=200V$			2.5	$\mu s$
Fall Time	$t_f$	$I_C=5A, I_{B1}=1A, I_{B2}=-1A, R_L=40\Omega, V_{CC}=200V$			1.0	$\mu s$

## Switching Time Test Circuit



# 2SC3039

