

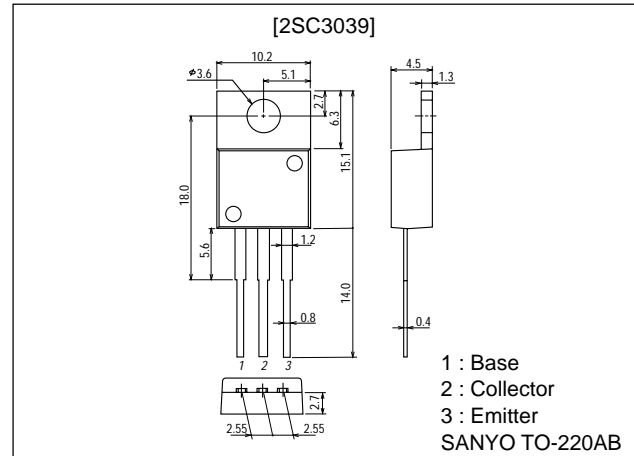
**2SC3039****400V/7A Switching Regulator Applications****Features**

- 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	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB} = 5V$, $I_C = 0$			10	μA
DC Current Gain	h_{FE1}	$V_{CE} = 5V$, $I_C = 0.8A$	15*		50*	
	h_{FE2}	$V_{CE} = 5V$, $I_C = 4A$	8			

Continued on next page.

* : The h_{FE1} of the 2SC3039 is classified as follows. When specifying the h_{FE1} rank, specify two ranks or more in principle.

Rank	L	M	N
h_{FE}	15 to 30	20 to 40	30 to 50

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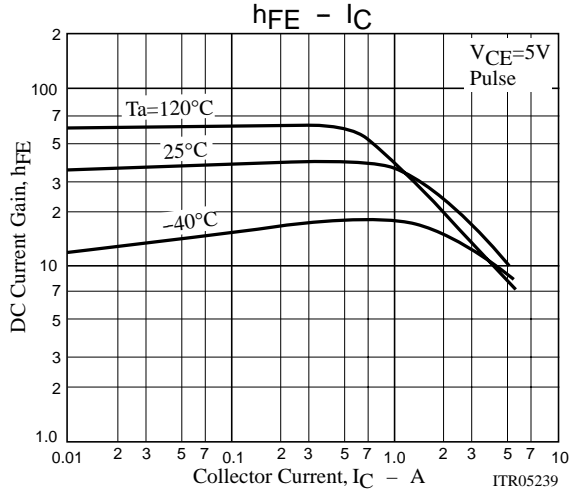
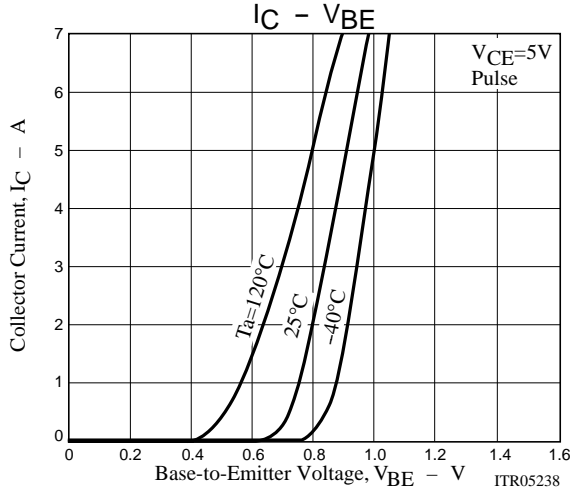
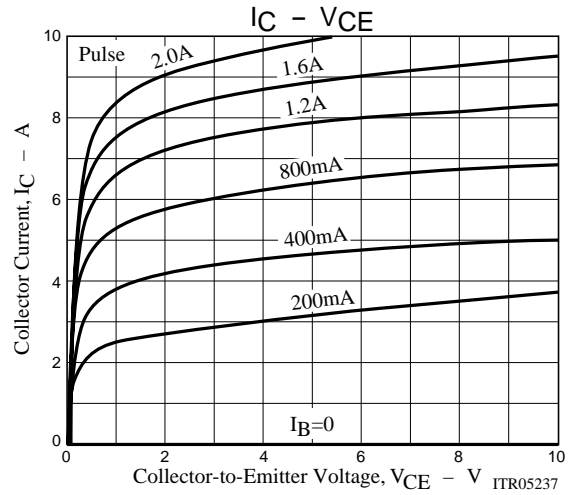
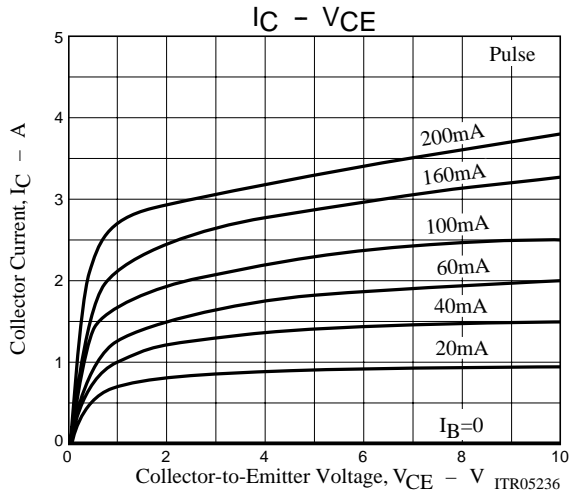
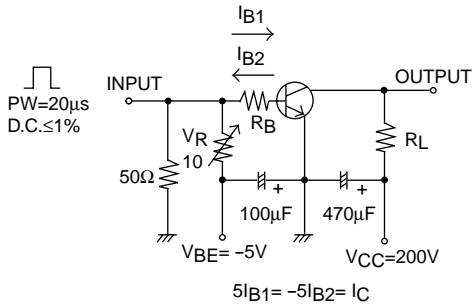
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

2SC3039

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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
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
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	μs
Storage Time	t_{stq}	$I_C=5A, I_{B1}=1A, I_{B2}=-1A, R_L=40\Omega, V_{CC}=200V$			2.5	μs
Fall Time	t_f	$I_C=5A, I_{B1}=1A, I_{B2}=-1A, R_L=40\Omega, V_{CC}=200V$			1.0	μs

Switching Time Test Circuit



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