



400V/16A Switching Regulator Applications

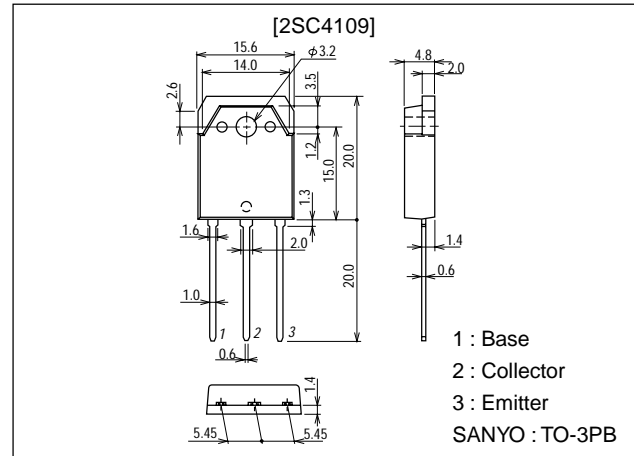
Features

- High breakdown voltage and high reliability.
- Fast switching speed.
- Wide ASO.
- Adoption of MBIT process.

Package Dimensions

unit:mm

2022A



Specifications

Absolute Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CB0}		500	V
Collector-to-Emitter Voltage	V_{CE0}		400	V
Emitter-to-Base Voltage	V_{EB0}		7	V
Collector Current	I_C		16	A
Collector Current (Pulse)	I_{CP}	PW≤300μs, duty cycle≤10%	32	A
Base Current	I_B		6	A
Collector Dissipation	P_C		2.5	W
		$T_c=25^\circ\text{C}$	140	W
Junction Temperature	T_j		150	°C
Storage Temperature	T_{stg}		-55 to +150	°C

Electrical Characteristics at Ta = 25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	$V_{CB}=400\text{V}, I_E=0$			10	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB}=5\text{V}, I_C=0$			10	μA
DC Current Gain	h_{FE1}	$V_{CE}=5\text{V}, I_C=2\text{A}$	15*		50*	
	h_{FE2}	$V_{CE}=5\text{V}, I_C=10\text{A}$	10			
	h_{FE3}	$V_{CE}=5\text{V}, I_C=10\text{mA}$	10			

* : The h_{FE1} of the 2SC4109 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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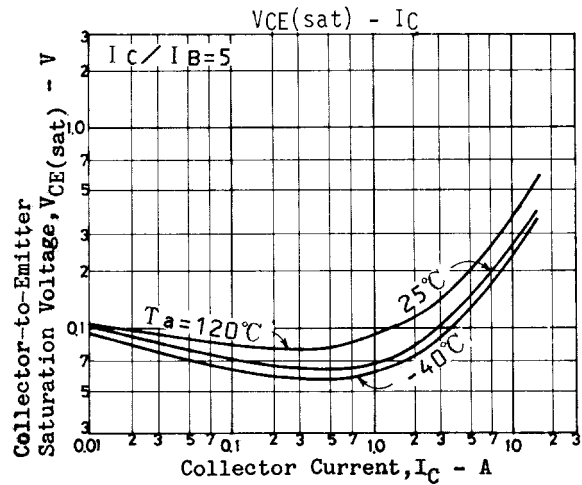
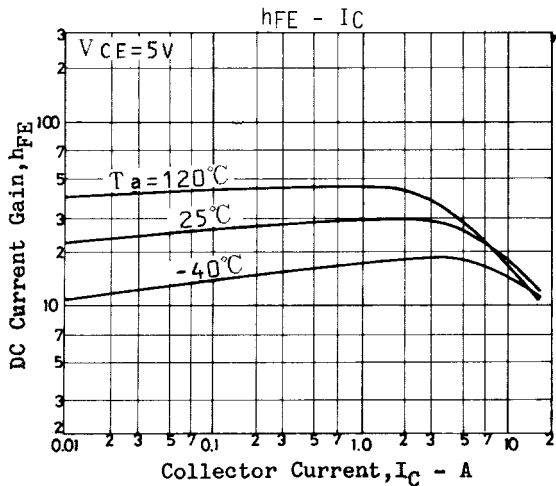
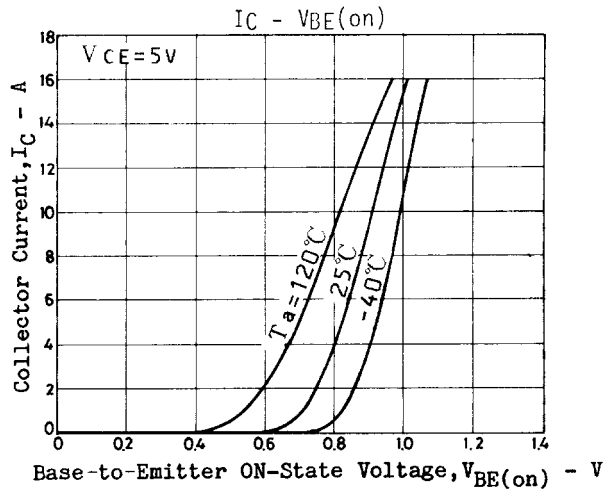
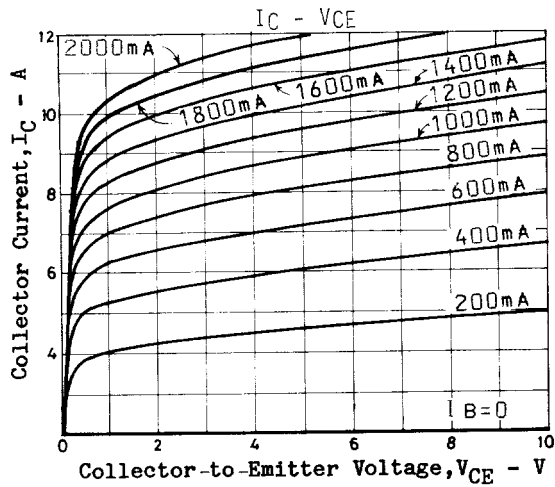
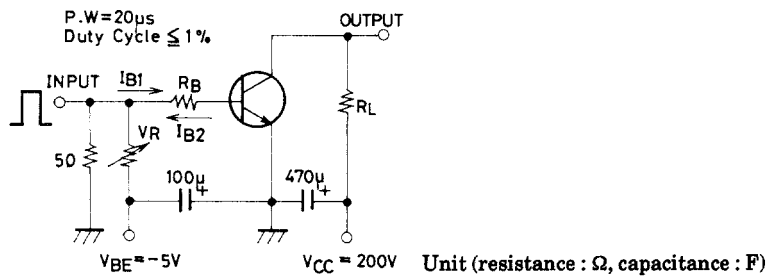
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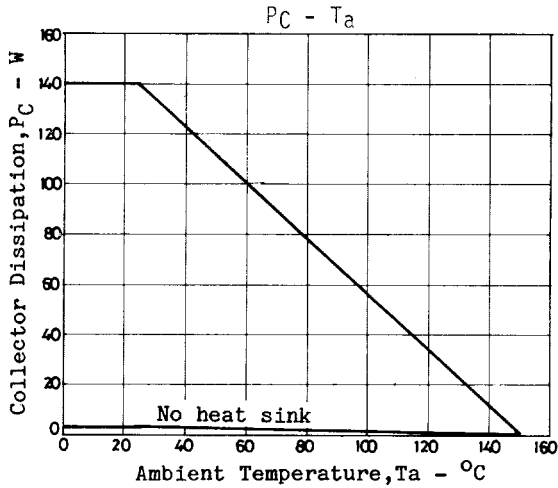
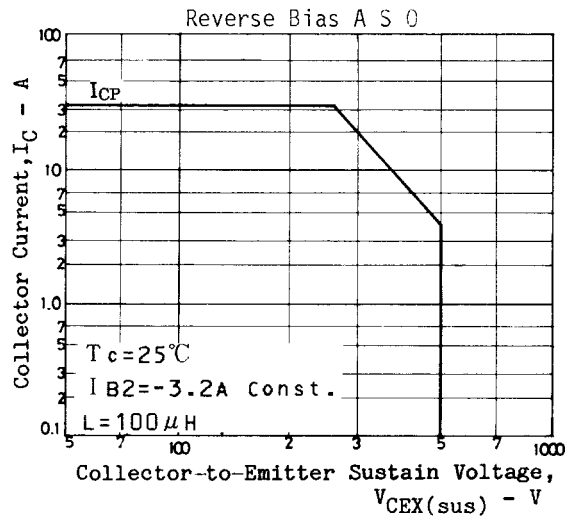
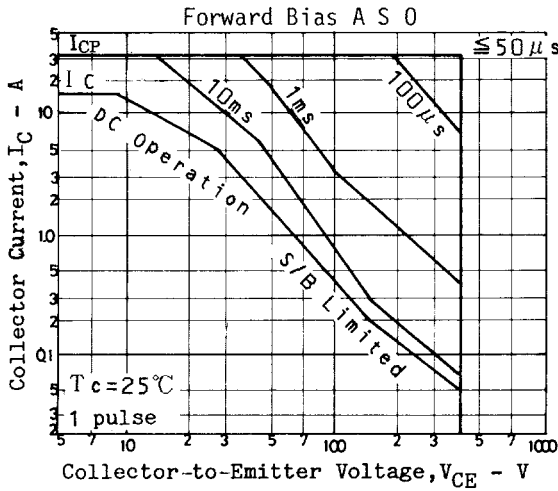
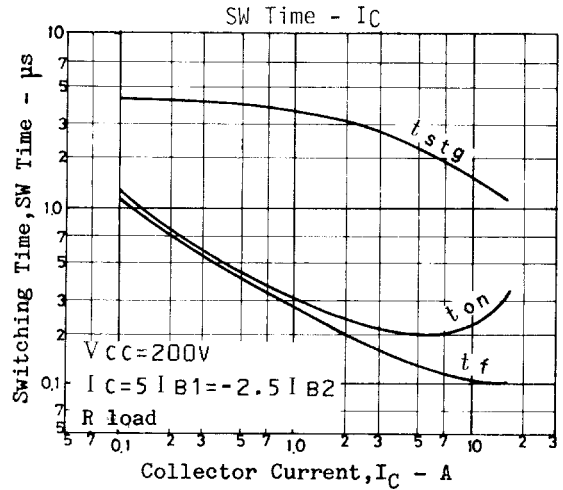
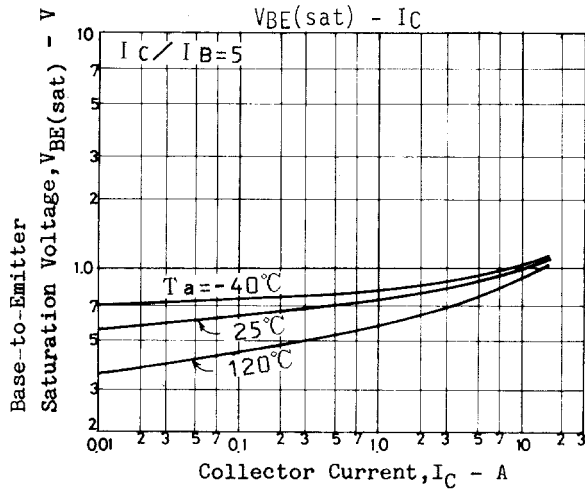
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=10A, I_B=2A$			0.8	V
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=10A, I_B=2A$			1.5	V
Gain-Bandwidth Product	f_T	$V_{CE}=10V, I_C=2A$		20		MHz
Output Capacitance	C_{ob}	$V_{CB}=10V, f=1MHz$		230		pF
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=1mA, I_E=0$	500			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=10mA, R_{BE}=\infty$	400			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E=1mA, I_C=0$	7			V
Collector-to-Emitter Sustain Voltage	$V_{CEX(sus)}$	$I_C=8A, I_{B1}=0.8A, I_{B2}=-3.2A, L=200\mu H, \text{clamped}$	400			V
Turn-ON Time	t_{on}	$I_C=12A, I_{B1}=2.4A, I_{B2}=-4.8A, R_L=16.6\Omega, V_{CC}=200V$			0.5	μs
Storage Time	t_{stg}	$I_C=12A, I_{B1}=2.4A, I_{B2}=-4.8A, R_L=16.6\Omega, V_{CC}=200V$			2.5	μs
Fall Time	t_f	$I_C=12A, I_{B1}=2.4A, I_{B2}=-4.8A, R_L=16.6\Omega, V_{CC}=200V$			0.3	μs

Switching Time Test Circuit



2SC4109



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