



2SC3994

800V/25A Switching Regulator Applications

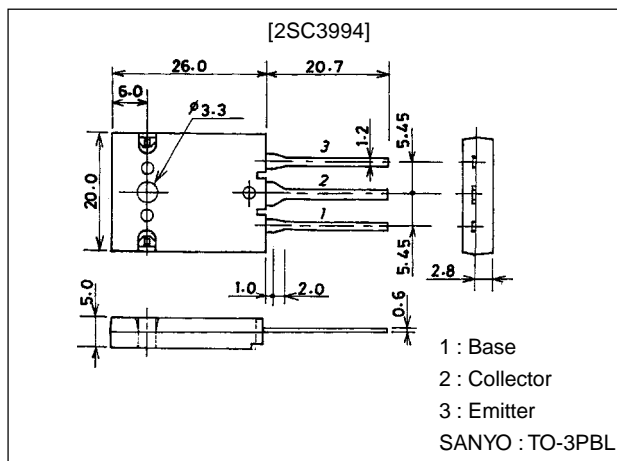
Features

- High breakdown voltage, high reliability.
- Fast switching speed ($t_f=0.1\mu s$ typ).
- Wide ASO.
- Adoption of MBIT process.

Package Dimensions

unit:mm

2048B



Specifications

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

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		1100	V
Collector-to-Emitter Voltage	V_{CEO}		800	V
Emitter-to-Base Voltage	V_{EBO}		7	V
Collector Current	I_C		25	A
Collector Current (Pulse)	I_{CP}	$PW \leq 300\mu s$, duty cycle $\leq 10\%$	60	A
Base Current	I_B		12	A
Collector Dissipation	P_C	$T_c = 25^\circ C$	300	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}	$V_{CB}=800V, I_E=0$			10	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB}=5V, I_C=0$			10	μA
DC Current Gain	h_{FE1}^*	$V_{CE}=5V, I_C=1.6A$	10		40	
	h_{FE2}	$V_{CE}=5V, I_C=8A$	8			
Gain-Bandwidth Product	f_T	$V_{CE}=10V, I_C=1.6A$		15		MHz
Output Capacitance	C_{ob}	$V_{CB}=10V, f=1MHz$		470		pF

* : The h_{FE1} of the 2SC3994 is classified as follows. When specifying the h_{FE1} rank, specify two ranks or more in principle.

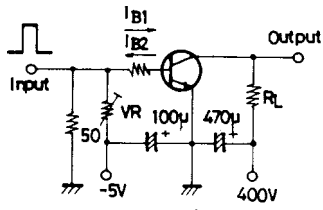
10	K	20	15	L	30	20	M	40
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2SC3994

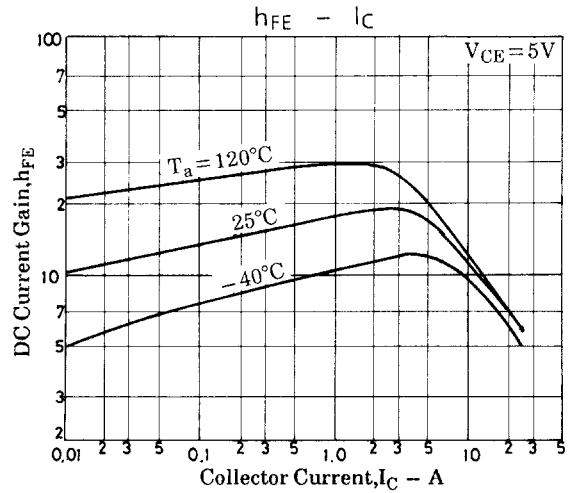
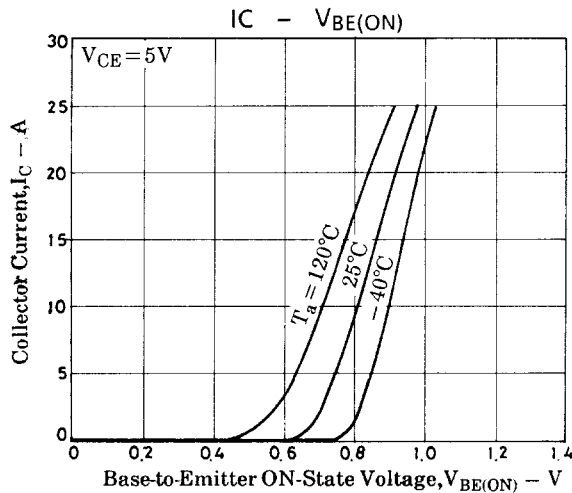
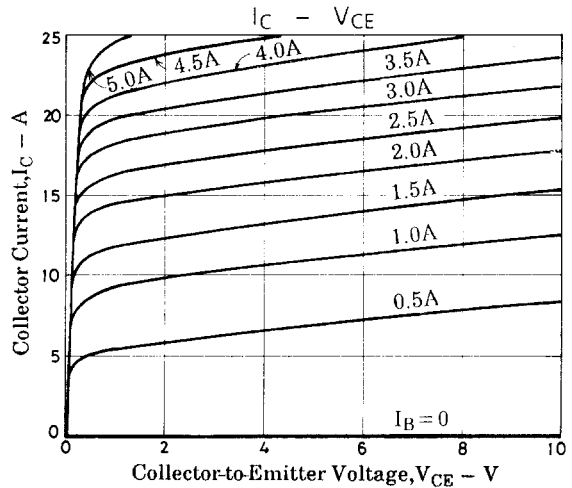
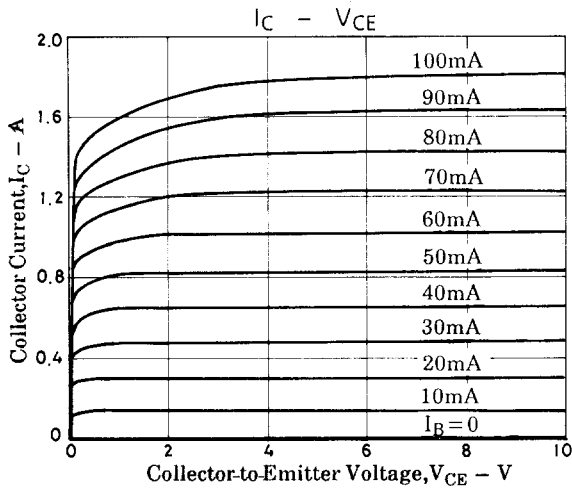
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=12A, I_B=2.4A$			2.0	V
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=12A, I_B=2.4A$			1.5	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=1mA, I_E=0$	1100			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=10mA, R_{BE}=\infty$	800			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E=1mA, I_C=0$	7			V
Collector-to-Emitter Sustain Voltage	$V_{CEX(sus)}$	$I_C=12A, I_{B1}=-I_{B2}=-2.4A, L=50\mu H, \text{clamped}$	800			V
Turn-ON Time	t_{on}	$V_{CC}=400V, 5I_{B1}=-2.5I_{B2}=I_C=20A, R_L=20\Omega$			0.5	μs
Storage Time	t_{stg}	$V_{CC}=400V, 5I_{B1}=-2.5I_{B2}=I_C=20A, R_L=20\Omega$			3.0	μs
Fall Time	t_f	$V_{CC}=400V, 5I_{B1}=-2.5I_{B2}=I_C=20A, R_L=20\Omega$			0.3	μs

Switching Time Test Circuit

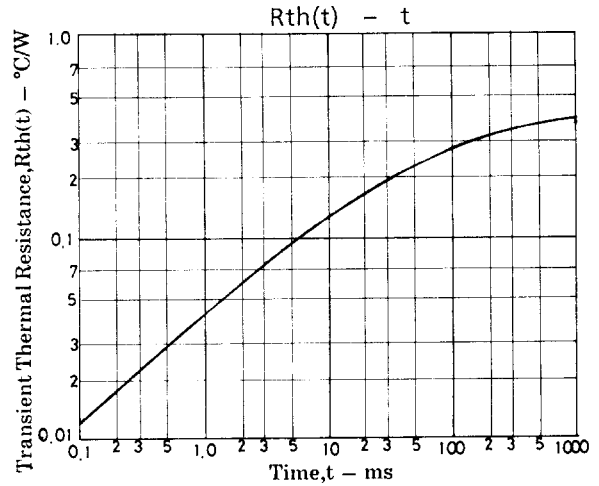
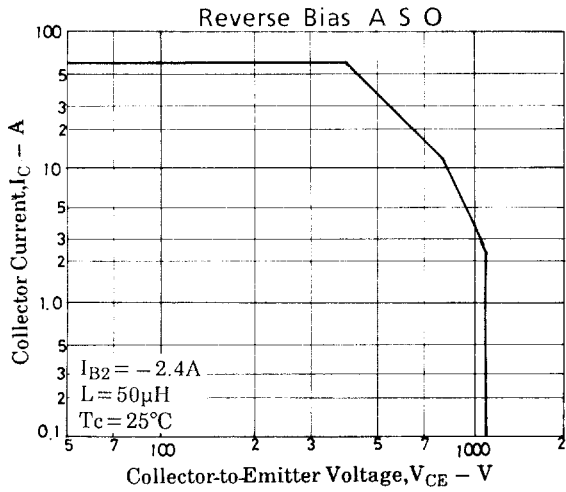
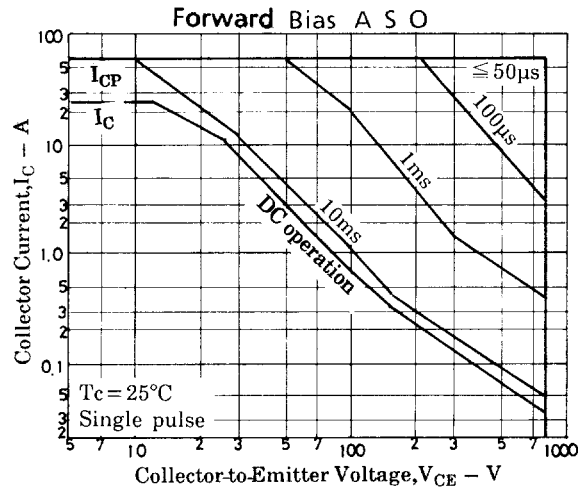
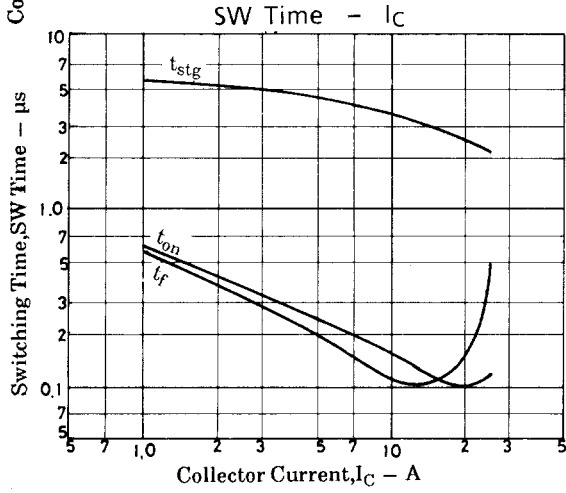
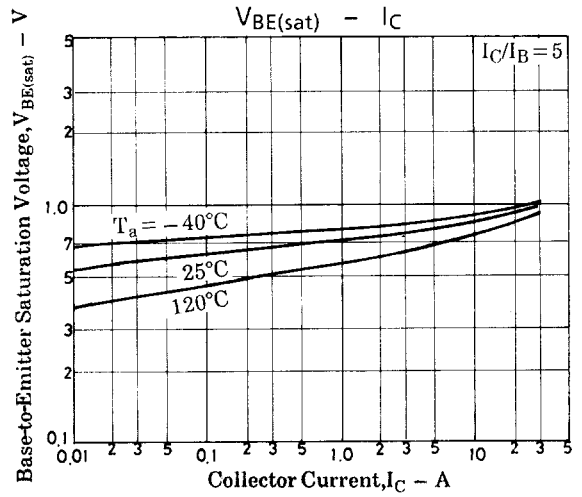
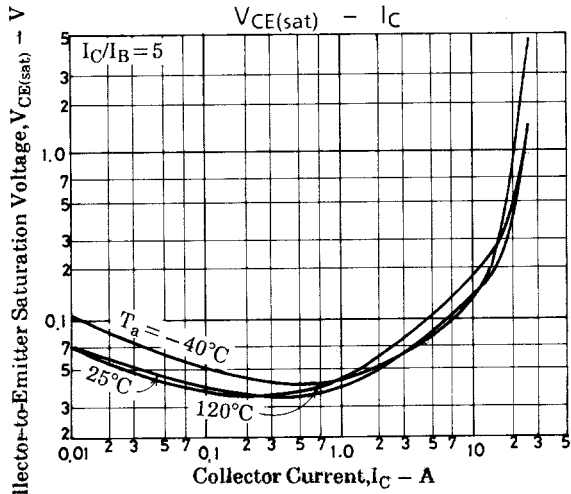


PW = 20 μs , Duty Cycle $\leq 1\%$

Unit (resistance : Ω , capacitance : F)



2SC3994



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