

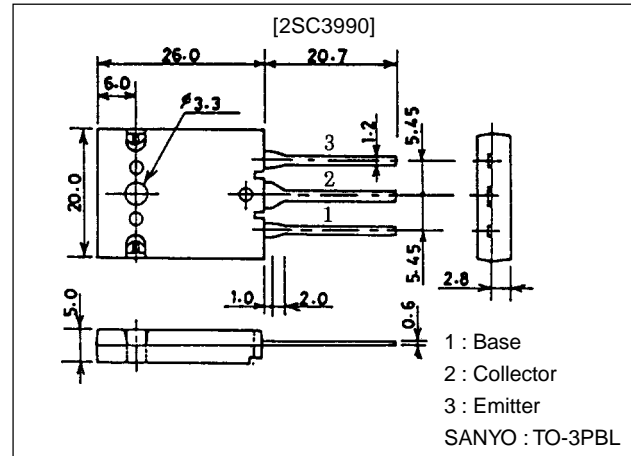
**2SC3990****500V/35A Switching Regulator Applications****Features**

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

**Package Dimensions**

unit:mm

2048B

**Specifications****Absolute Maximum Ratings at Ta = 25°C**

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	$V_{CB0}$		800	V
Collector-to-Emitter Voltage	$V_{CE0}$		500	V
Emitter-to-Base Voltage	$V_{EBO}$		7	V
Collector Current	$I_C$		35	A
Collector Current (Pulse)	$I_{CP}$	$PW \leq 300\mu s$ , duty cycle $\leq 10\%$	50	A
Base Current	$I_B$		12	A
Collector Dissipation	$P_C$	$T_c = 25^\circ C$	250	W
Junction Temperature	$T_j$		150	$^\circ C$
Storage Temperature	$T_{stg}$		-55 to +150	$^\circ C$

**Electrical Characteristics at Ta = 25°C**

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	$I_{CBO}$	$V_{CB} = 500V$ , $I_E = 0$			10	$\mu A$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB} = 5V$ , $I_C = 0$			10	$\mu A$
DC Current Gain	$h_{FE1}$	$V_{CE} = 5V$ , $I_C = 3.2A$	15*		50*	
	$h_{FE2}$	$V_{CE} = 5V$ , $I_C = 16A$	8			
Gain-Bandwidth Product	$f_T$	$V_{CE} = 10V$ , $I_C = 3.2A$		18		MHz
Output Capacitance	$C_{ob}$	$V_{CB} = 10V$ , $f = 1MHz$		400		pF

\* : The 2SC3990 is classified by 3.2A  $h_{FE}$  as follows :

15	L	30	20	M	40	30	N	50
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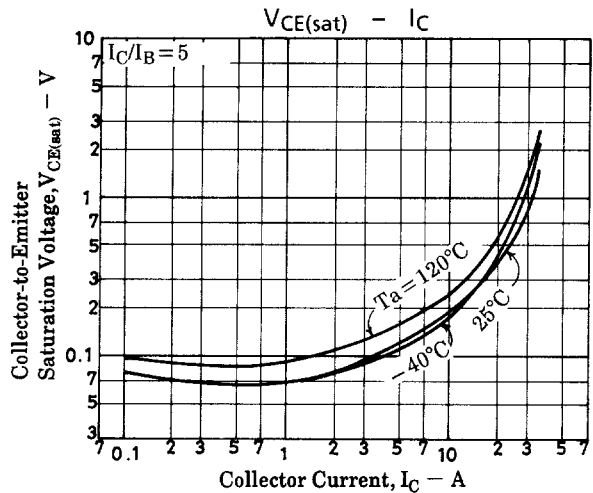
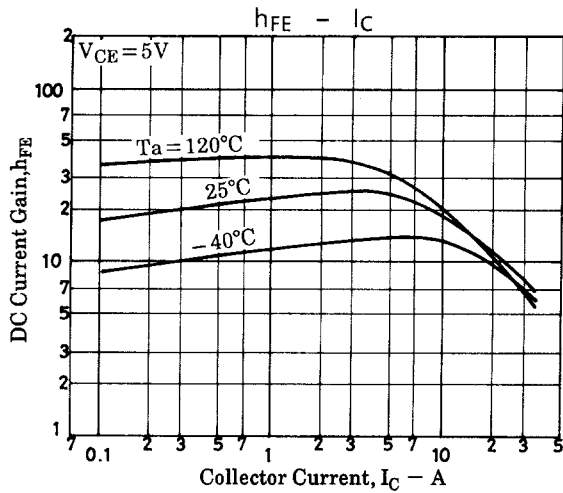
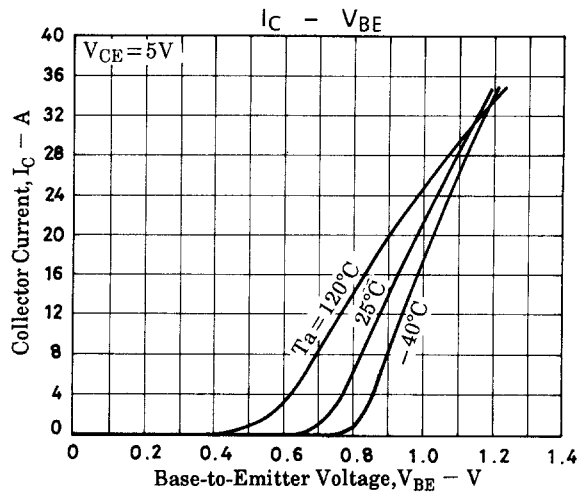
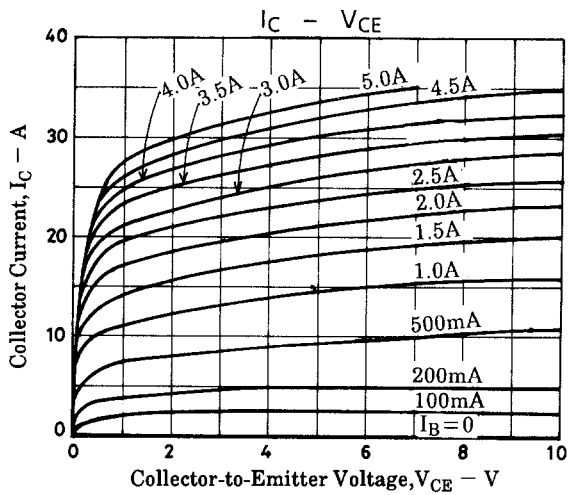
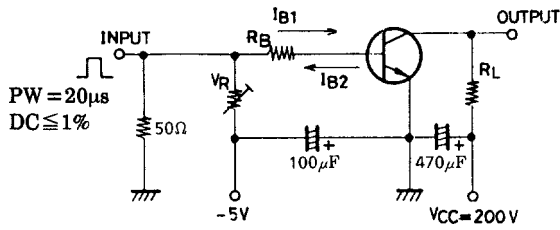
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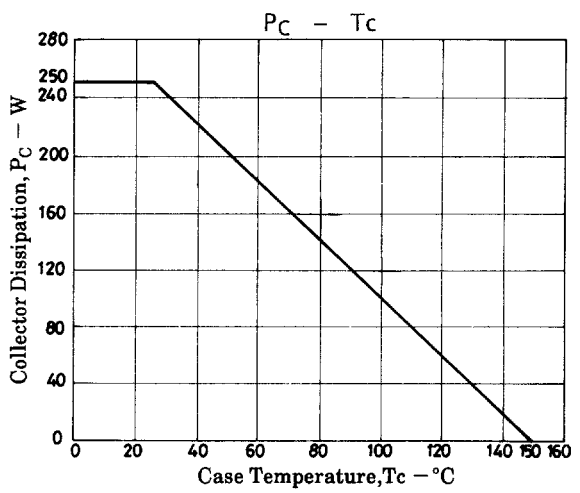
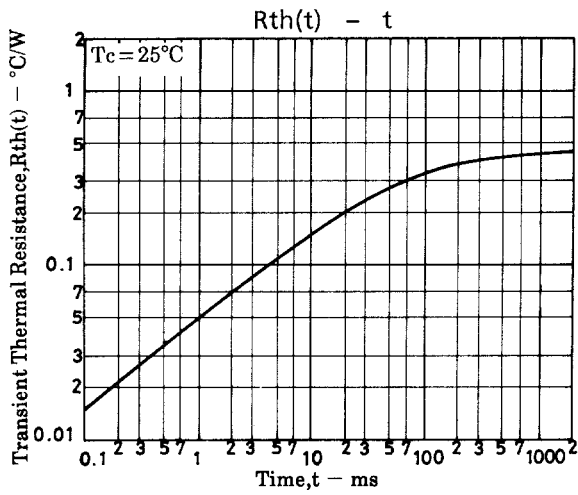
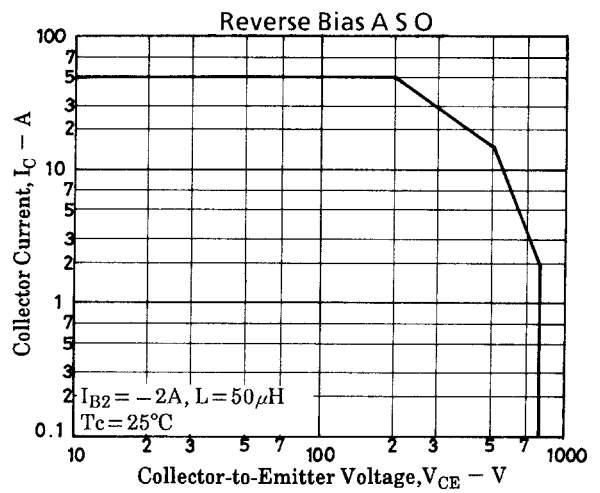
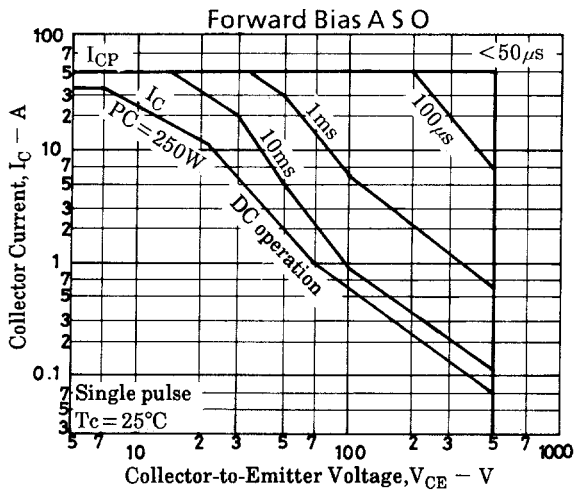
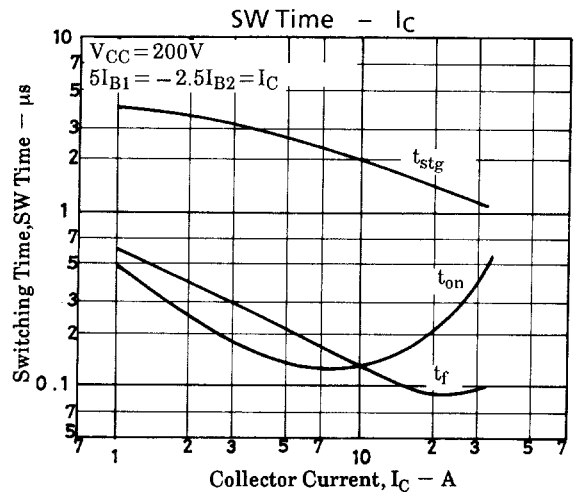
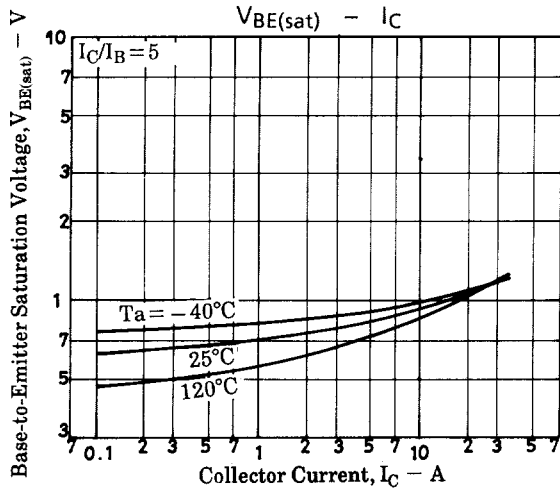
# 2SC3990

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=16A, I_B=3.2A$			1.0	V
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=16A, I_B=3.2A$			1.5	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=1mA, I_E=0$	800			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=10mA, R_{BE}=\infty$	500			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E=1mA, I_C=0$	7			V
Collector-to-Emitter Sustain Voltage	$V_{CEX(sus)}$	$I_C=15A, I_{B1}=-I_{B2}=-2A, L=200\mu H, \text{clamped}$	500			V
Turn-ON Time	$t_{on}$	$V_{CC}=200V, 5I_{B1}=-2.5I_{B2}=I_C=18A, R_L=11.1\Omega$			0.5	$\mu s$
Storage Time	$t_{stg}$	$V_{CC}=200V, 5I_{B1}=-2.5I_{B2}=I_C=18A, R_L=11.1\Omega$			3.0	$\mu s$
Fall Time	$t_f$	$V_{CC}=200V, 5I_{B1}=-2.5I_{B2}=I_C=18A, R_L=11.1\Omega$			0.3	$\mu s$

## Switching Time Test Circuit



# 2SC3990



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