



500V/15A Switching Regulator Applications

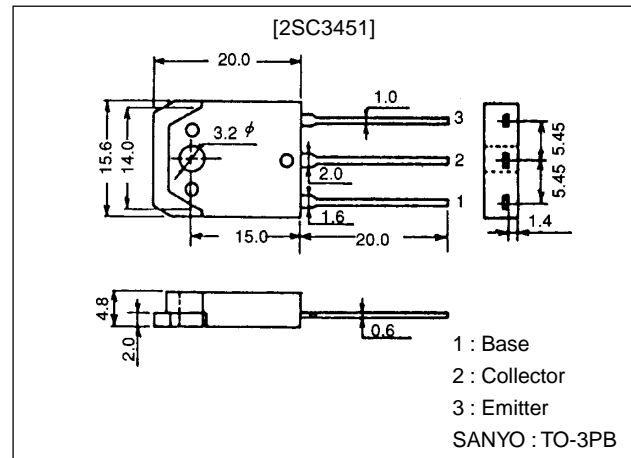
Features

- High breakdown voltage and high reliability.
- Fast switching speed (t_f : 0.1 μ s typ).
- Wide ASO.
- Adoption of MBIT process.

Package Dimensions

unit:mm

2022A



Specifications

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

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		800	V
Collector-to-Emitter Voltage	V_{CEO}		500	V
Emitter-to-Base Voltage	V_{EBO}		7	V
Collector Current	I_C		15	A
Collector Current (Pulse)	I_{CP}	$PW \leq 300\mu\text{s}$, Duty Cycle $\leq 10\%$	25	A
Base Current	I_B		4	A
Collector Dissipation	P_C	$T_c = 25^\circ\text{C}$	100	W
Junction Temperature	T_j		150	$^\circ\text{C}$
Storage Temperature	T_{stg}		-55 to +150	$^\circ\text{C}$

Electrical Characteristics at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	$V_{CB} = 500\text{V}$, $I_E = 0$			10	μA
Emitter Cutoff Current	I_{EBO}	$V_{EB} = 5\text{V}$, $I_C = 0$			10	μA
DC Current Gain	h_{FE1}	$V_{CE} = 5\text{V}$, $I_C = 1.2\text{A}$	15*		50*	
	h_{FE2}	$V_{CE} = 5\text{V}$, $I_C = 6\text{A}$	8			
Gain-Bandwidth Product	f_T	$V_{CE} = 10\text{V}$, $I_C = 1.2\text{A}$		18		MHz
Output Capacitance	C_{ob}	$V_{CB} = 10\text{V}$, $f = 1\text{MHz}$		160		pF

* : The h_{FE1} of the 2SC3451 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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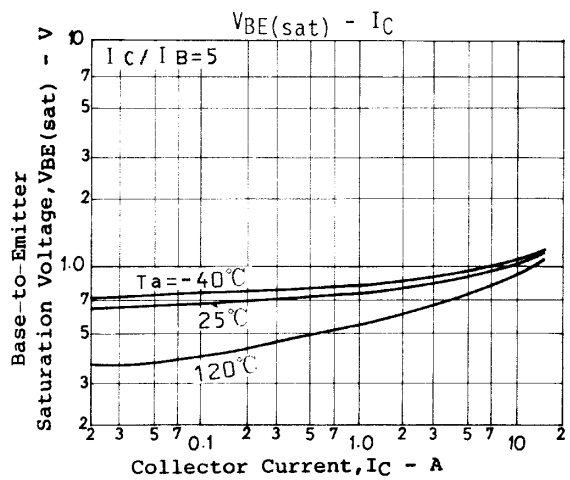
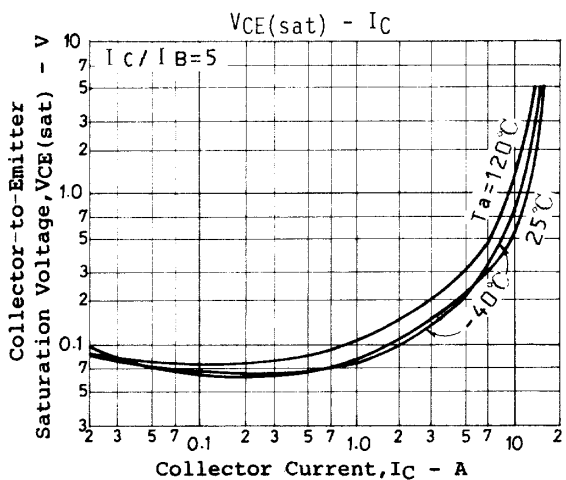
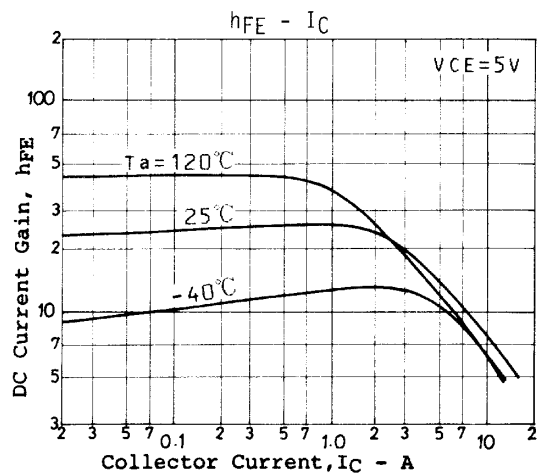
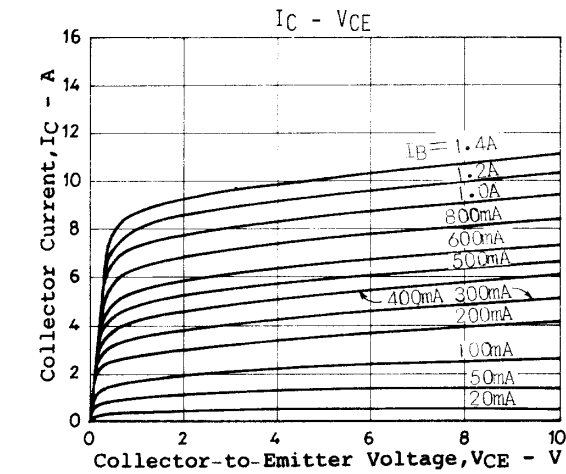
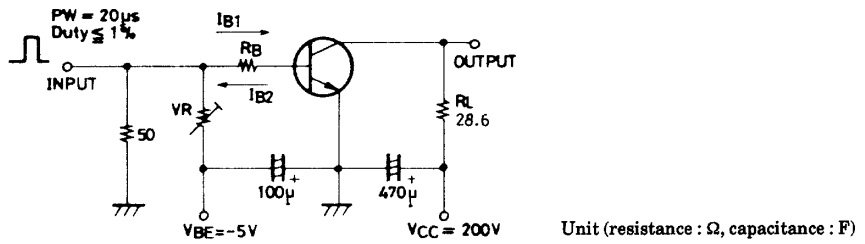
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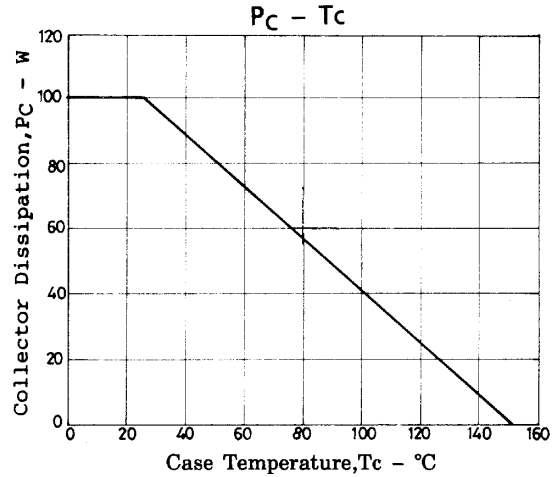
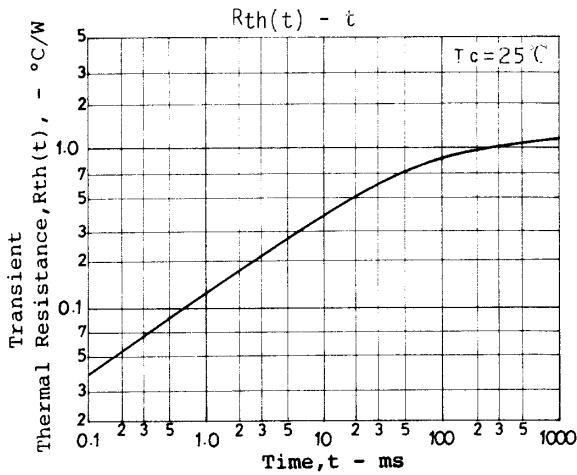
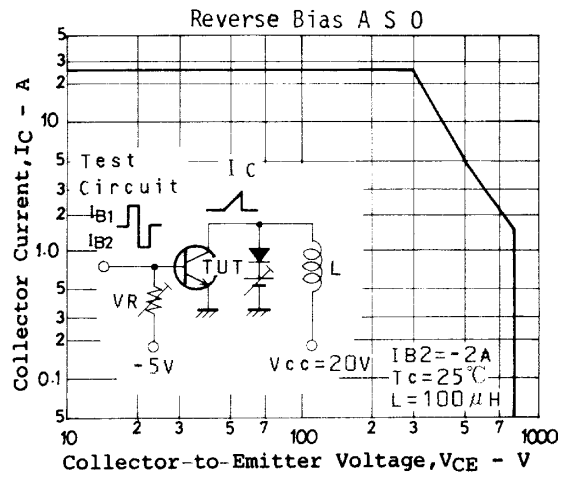
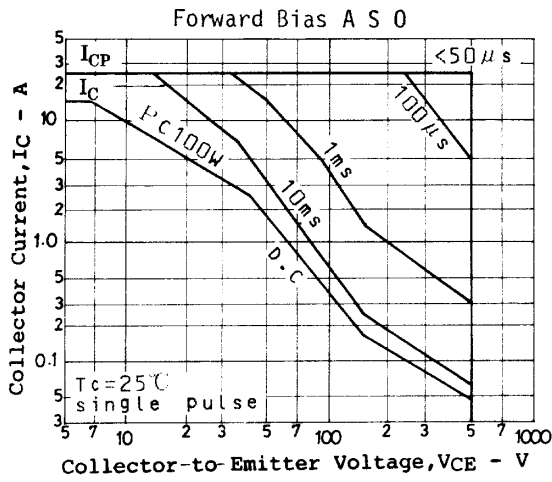
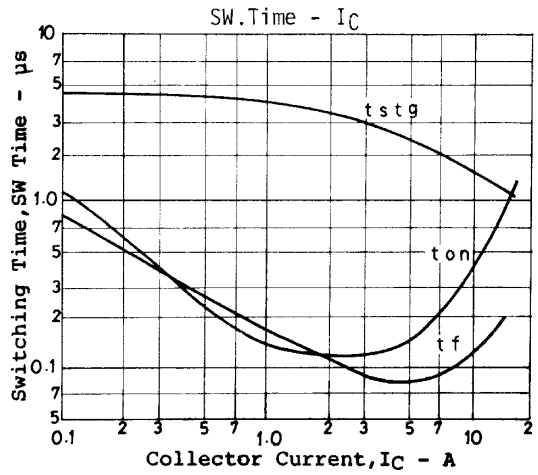
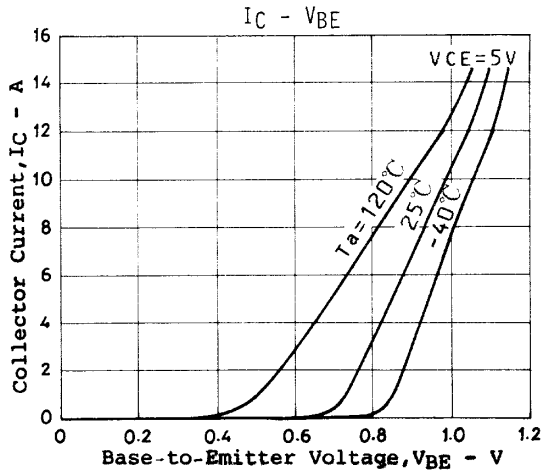
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=6A, I_B=1.2A$			1.0	V
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=6A, I_B=1.2A$			1.5	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=1mA, I_E=0$	800			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=5mA, R_{BE}=\infty$	500			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E=1mA, I_C=0$	7			V
Collector-to-Emitter Sustain Voltage	$V_{CEX(sus)}$	$I_C=5A, I_{B1}=-I_{B2}=2A, L=500\mu H, \text{clamped}$	500			V
Turn-ON Time	t_{on}	$V_{CC}=200V, 5I_{B1}=-2.5I_{B2}=I_C=7A, R_L=28.6\Omega$			0.5	μs
Storage Time	t_{stg}	$V_{CC}=200V, 5I_{B1}=-2.5I_{B2}=I_C=7A, R_L=28.6\Omega$			3.0	μs
Fall Time	t_f	$V_{CC}=200V, 5I_{B1}=-2.5I_{B2}=I_C=7A, R_L=28.6\Omega$			0.3	μs

Switching Time Test Circuit





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