



## 400V/4A Switching Regulator Applications

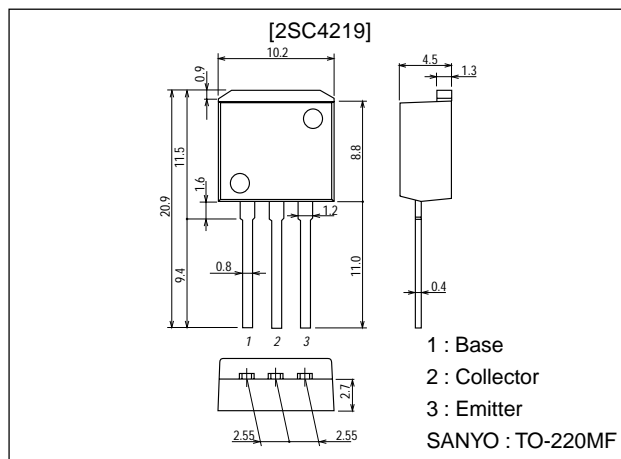
### Features

- High breakdown voltage, high reliability ( $V_{CEO} \geq 400V$ ).
- Fast switching speed ( $t_f = 0.1\mu s$  typ).
- Wide ASO.
- Adoption of MBIT process.
- Suitable for sets whose height is restricted.

### Package Dimensions

unit:mm

2049C



### 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	$I_C$		4	A
Collector Current (Pulse)	$I_{CP}$	$PW \leq 300\mu s$ , duty cycle $\leq 10\%$	8	A
Base Current	$I_B$		1.5	A
Collector Dissipation	$P_C$		1.65	W
		$T_c = 25^\circ C$	40	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	$\mu A$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB} = 5V$ , $I_C = 0$			10	$\mu A$
DC Current Gain	$h_{FE1}$	$V_{CE} = 5V$ , $I_C = 0.4A$	15		50	
	$h_{FE2}$	$V_{CE} = 5V$ , $I_C = 2A$	10			
	$h_{FE3}$	$V_{CE} = 5V$ , $I_C = 10mA$	10			

\* : The  $h_{FE1}$  of the 2SC4219 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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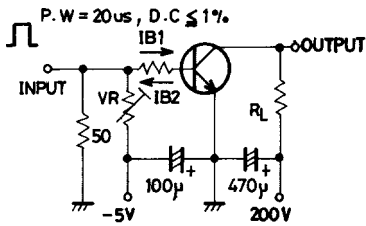
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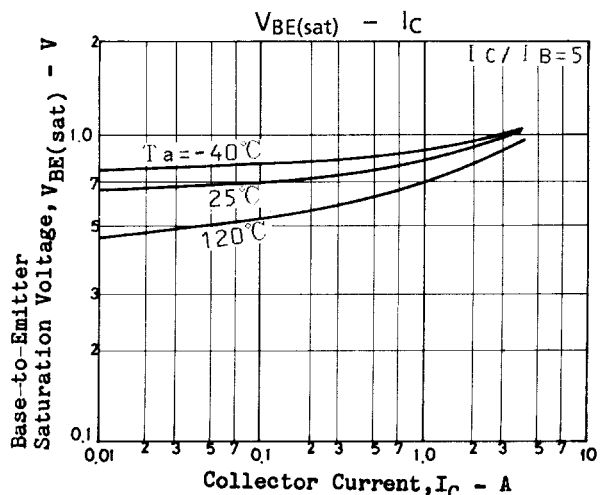
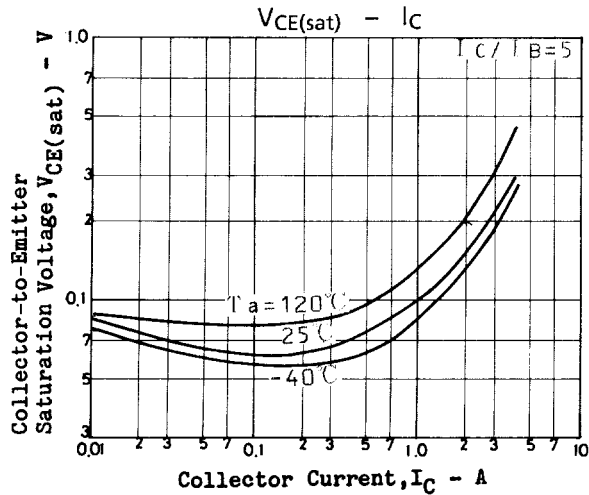
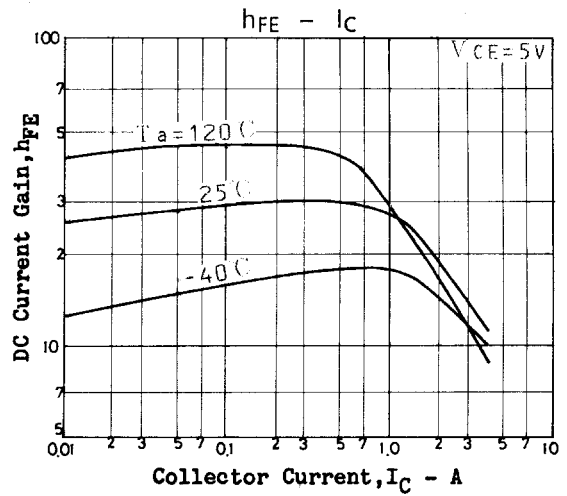
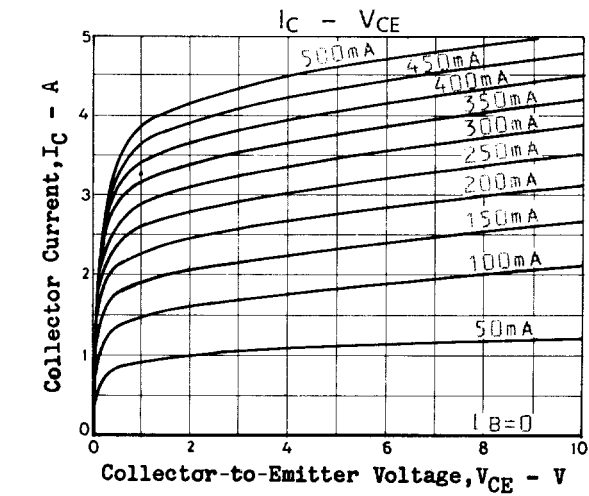
# 2SC4219

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=2A, I_B=0.4A$			0.8	V
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=2A, I_B=0.4A$			1.5	V
Gain-Bandwidth Product	$f_T$	$V_{CE}=10V, I_C=0.4A$		20		MHz
Output Capacitance	$C_{ob}$	$V_{CB}=10V, f=1MHz$		50		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	$V_{CEX(sus)}$	$I_C=2A, I_{B1}=0.2A, L=1mH, I_{B2}=-0.8A, \text{clamped}$	400			V
Turn-ON Time	$t_{on}$	$I_C=3A, I_{B1}=0.6A, I_{B2}=-1.2A, R_L=66.6\Omega, V_{CC}=200V$			0.5	$\mu s$
Storage Time	$t_{stg}$	$I_C=3A, I_{B1}=0.6A, I_{B2}=-1.2A, R_L=66.6\Omega, V_{CC}=200V$			2.5	$\mu s$
Fall Time	$t_f$	$I_C=3A, I_{B1}=0.6A, I_{B2}=-1.2A, R_L=66.6\Omega, V_{CC}=200V$			0.3	$\mu s$

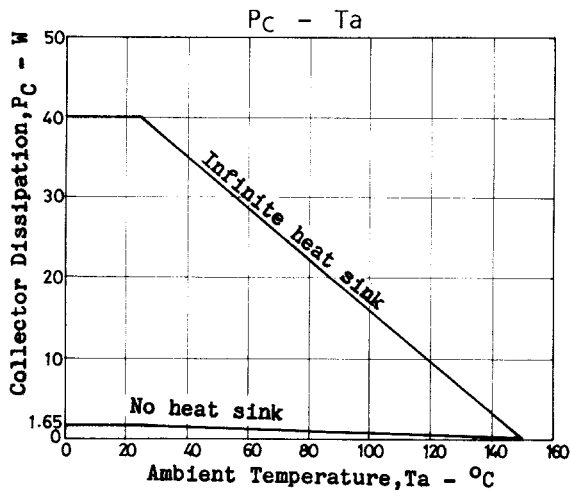
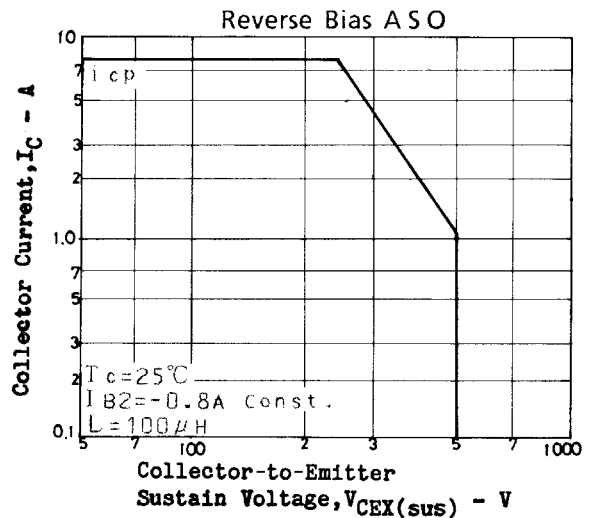
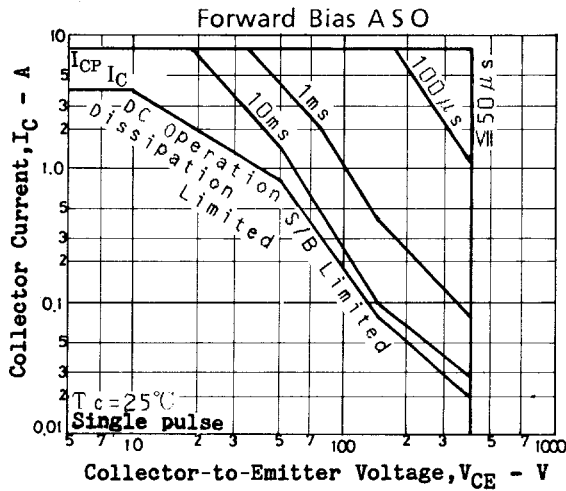
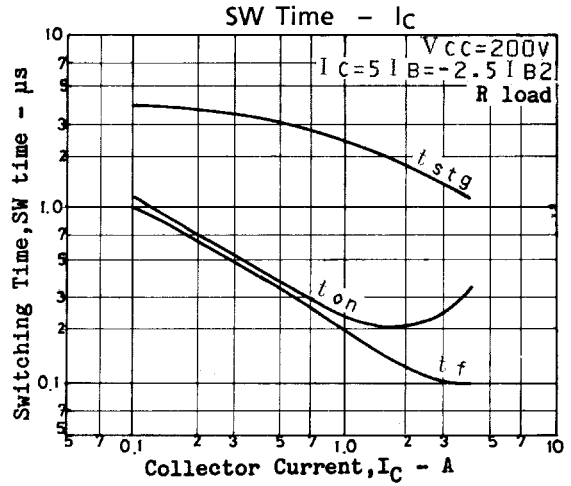
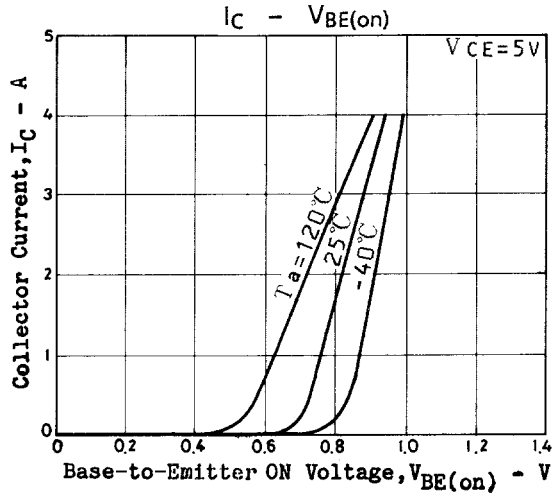
## Switching Time Test Circuit



Unit (resistance:  $\Omega$ , capacitance: F)



# 2SC4219



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