

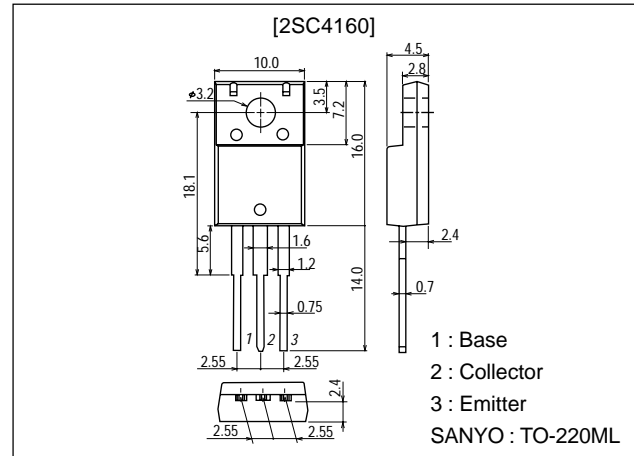
**2SC4160****400V/4A Switching Regulator Applications****Features**

- High breakdown voltage.
- High reliability.
- Fast switching speed ( $t_f=0.1\mu\text{s}$  typ).
- Wide ASO.
- Adoption of MBIT process.
- Micaless package facilitating mounting.

**Package Dimensions**

unit:mm

2041A

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

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	$V_{CB0}$		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)	$I_{CP}$	$PW \leq 300\mu\text{s}$ , duty cycle $\leq 10\%$	8	A
Base Current	$I_B$		1.5	A
Collector Dissipation	$P_C$		2	W
		$T_c=25^\circ\text{C}$	25	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	$I_{CB0}$	$V_{CB}=400\text{V}$ , $I_E=0$			10	$\mu\text{A}$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB}=5\text{V}$ , $I_C=0$			10	$\mu\text{A}$
DC Current Gain	$h_{FE1}^*$	$V_{CE}=5\text{V}$ , $I_C=0.4\text{mA}$	15		50	
	$h_{FE2}$	$V_{CE}=5\text{V}$ , $I_C=2\text{mA}$	10			
	$h_{FE3}$	$V_{CE}=5\text{V}$ , $I_C=10\text{mA}$	10			

\* : The  $h_{FE1}$  of the 2SC4160 is classified as follows.When specifying the  $h_{FE1}$  rank, specify two or more ranks in principle.

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Rank	L	M	N
$h_{FE}$	15 to 30	20 to 40	30 to 50

■ Any and all SANYO products described or contained herein do not have specifications that can handle applications that require extremely high levels of reliability, such as life-support systems, aircraft's control systems, or other applications whose failure can be reasonably expected to result in serious physical and/or material damage. Consult with your SANYO representative nearest you before using any SANYO products described or contained herein in such applications.

■ SANYO assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all SANYO products described or contained herein.

**SANYO Electric Co.,Ltd. Semiconductor Company**

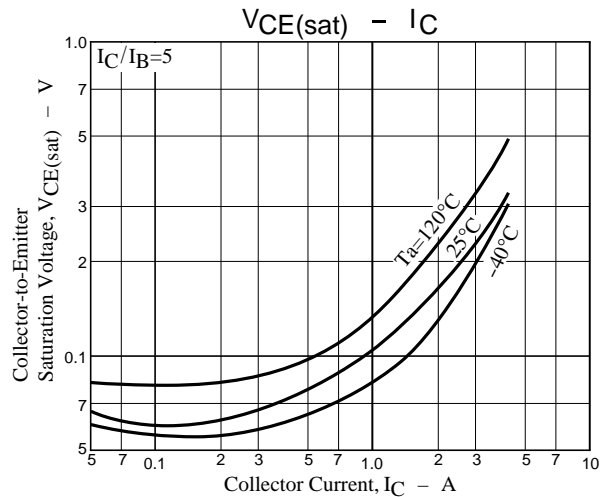
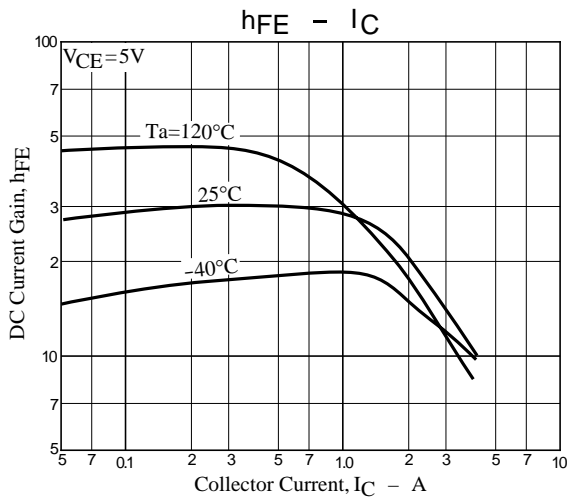
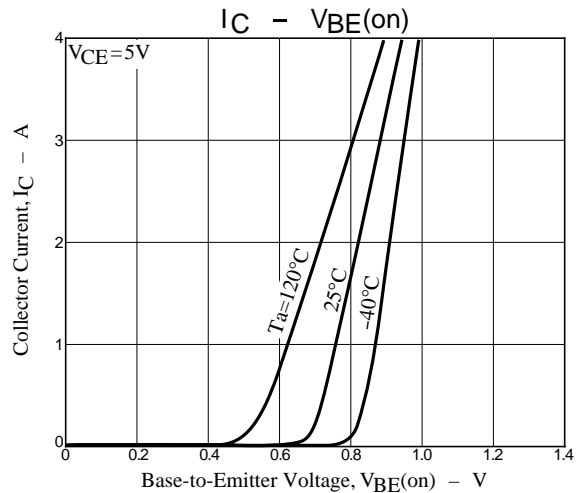
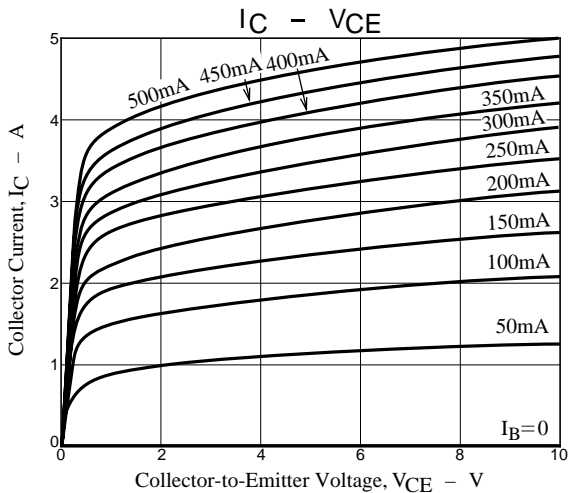
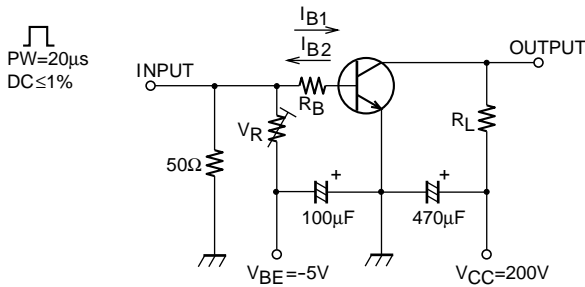
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Gain-Bandwidth Product	$f_T$	$V_{CE}=10V, I_C=0.4A$		20		MHz
Output Capacitance	$C_{ob}$	$V_{CB}=10V, f=1MHz$		50		pF
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=2A, I_B=0.4A$			0.8	V
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=2A, I_B=0.4A$			1.5	V
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	$V_{CEX(sus)}$	$I_C=2A, I_{B1}=0.2A, I_{B2}=-0.8A, L=1mH, \text{clamped}$	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



# 2SC4160

