

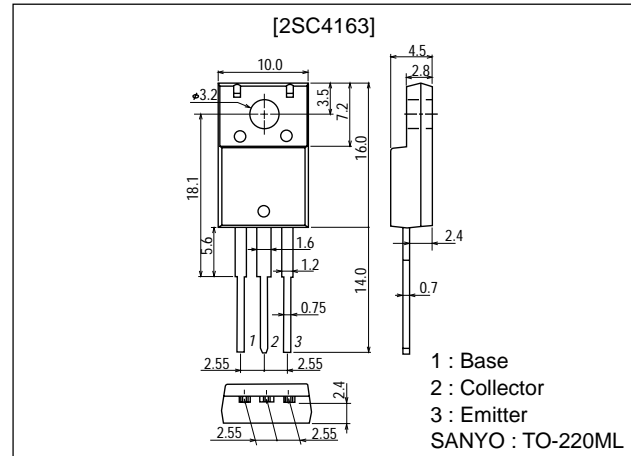
**2SC4163****400V/12A Switching Regulator Applications****Features**

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

**Package Dimensions**

unit:mm

2041A

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

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	$I_C$		12	A
Collector Current (Pulse)	$I_{CP}$	$PW \leq 300\mu s$ , duty cycle $\leq 10\%$	25	A
Base Current	$I_B$		4	A
Collector Dissipation	$P_C$		2	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	$\mu A$

Continued on next page.

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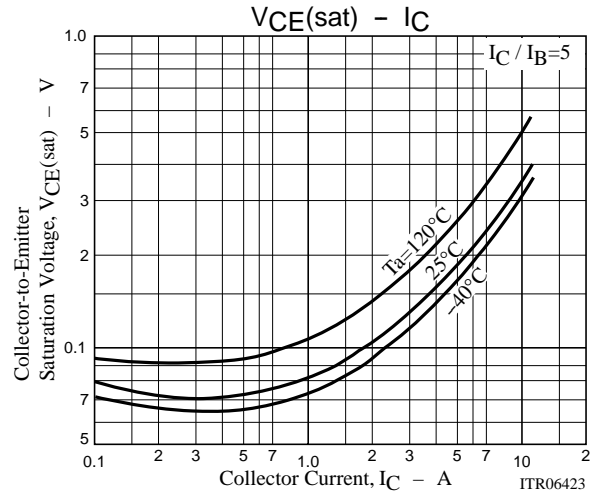
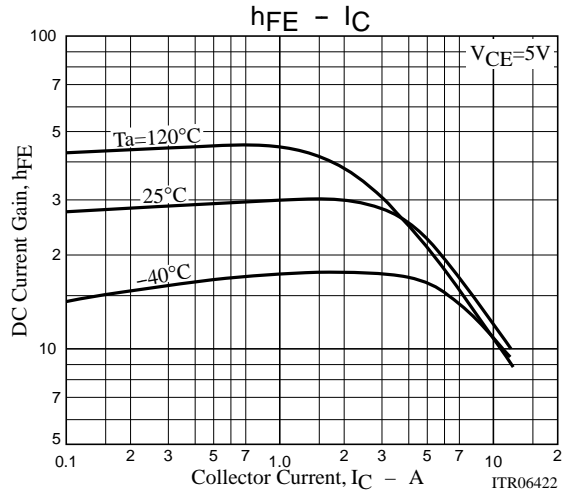
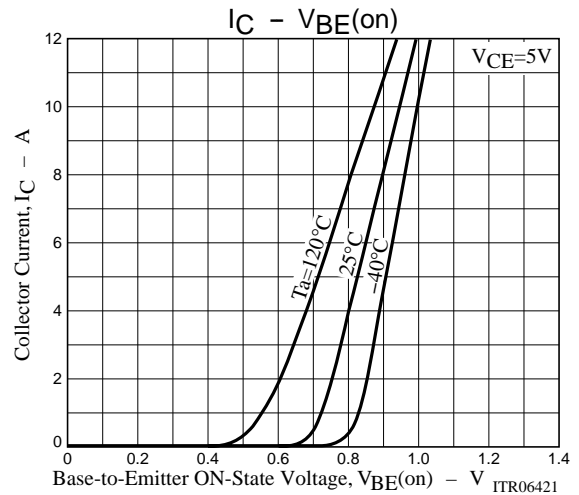
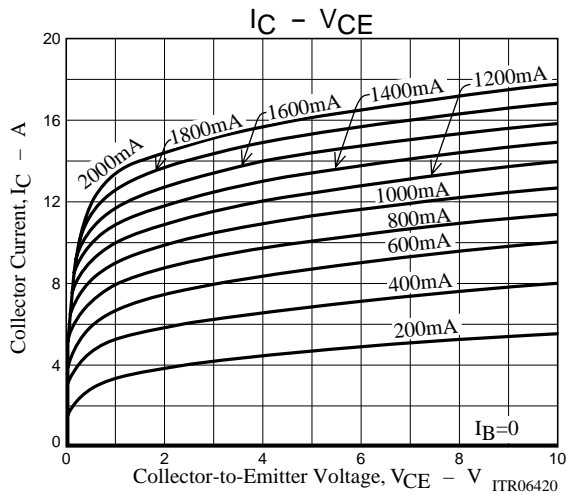
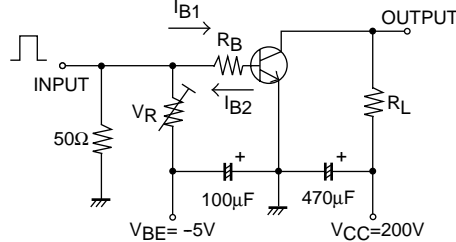
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
DC Current Gain	$h_{FE1}$	$V_{CE}=5V, I_C=1.6A$	15*		50*	
	$h_{FE2}$	$V_{CE}=5V, I_C=8A$	10			
	$h_{FE3}$	$V_{CE}=5V, I_C=10mA$	10			
Gain-Bandwidth Product	$f_T$	$V_{CE}=10V, I_C=1.6A$		20		MHz
Output Capacitance	$C_{ob}$	$V_{CB}=10V, f=1MHz$		160		pF
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=8A, I_B=1.6A$			0.8	V
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=8A, I_B=1.6A$			1.5	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=1mA, I_E=0$	500			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=10mA, R_{BE}=\infty$	400			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E=1mA, I_C=0$	7			V
Collector-to-Emitter Sustain Voltage	$V_{CEX(sus)}$	$I_C=6A, I_{B1}=0.6A, I_{B2}=-2.4A, L=500\mu H, \text{clamped}$	400			V
Turn-ON Time	$t_{on}$	$I_C=10A, I_{B1}=2A, I_{B2}=-4A, R_L=20\Omega, V_{CC}=200V$			0.5	$\mu s$
Storage Time	$t_{stg}$	$I_C=10A, I_{B1}=2A, I_{B2}=-4A, R_L=20\Omega, V_{CC}=200V$			2.5	$\mu s$
Fall Time	$t_f$	$I_C=10A, I_{B1}=2A, I_{B2}=-4A, R_L=20\Omega, V_{CC}=200V$			0.3	$\mu s$

\* : The  $h_{FE1}$  of the 2SC4163 is classified as follows. When specifying the  $h_{FE1}$  rank, specify two ranks or more in principle.

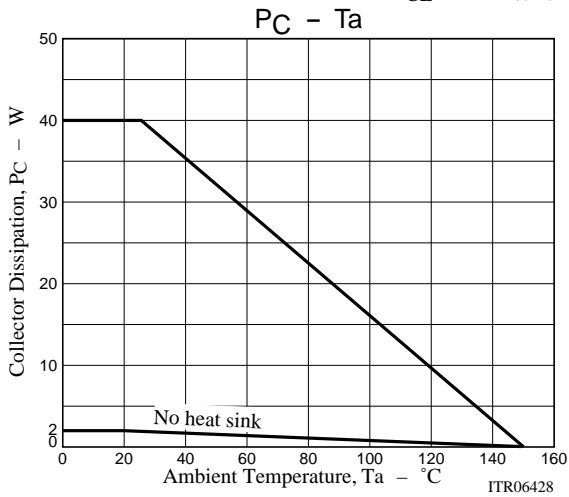
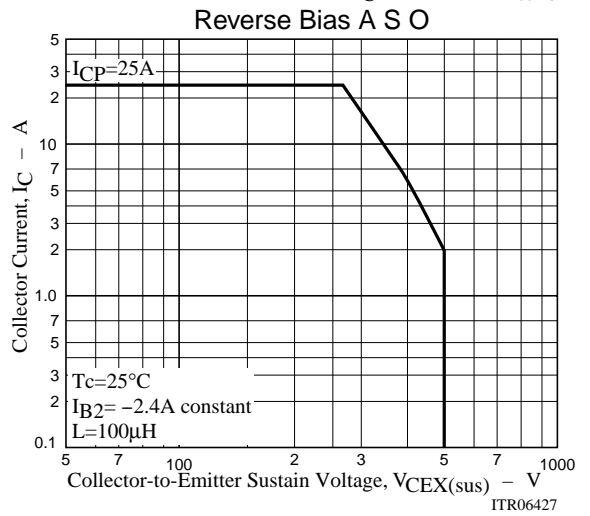
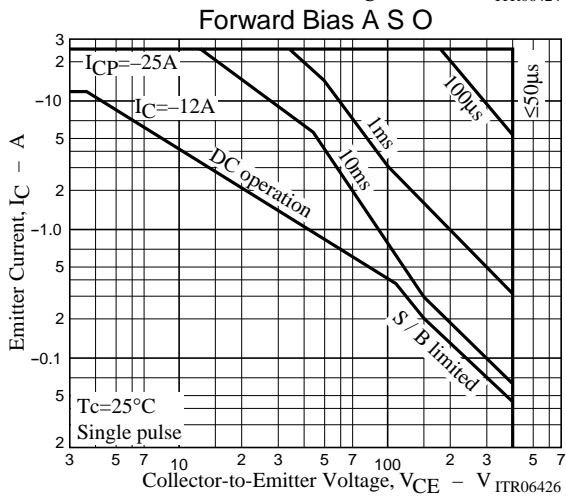
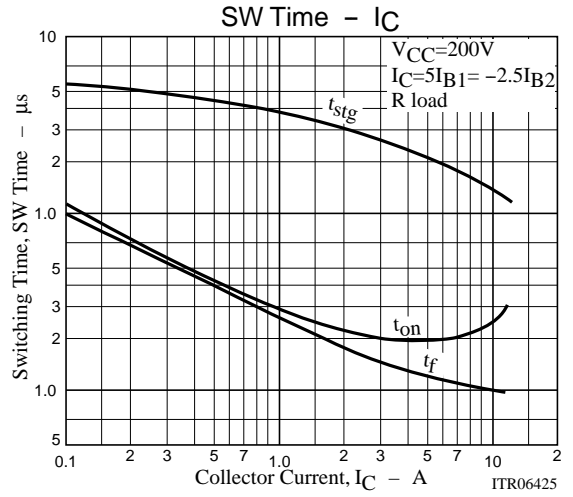
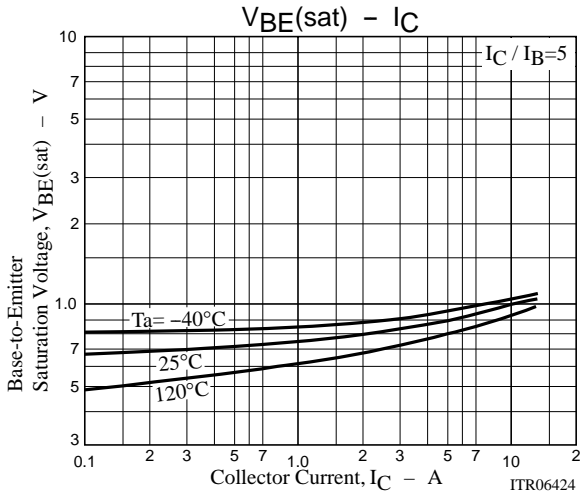
Rank	L	M	N
$h_{FE}$	15 to 30	20 to 40	30 to 50

## Switching Time Test Circuit

PW=20 $\mu s$ , duty factor  $\leq 1\%$



# 2SC4163



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