



ON Semiconductor®

# ON Semiconductor DATA SHEET

NPN Triple Diffused Planar Silicon Transistor

## 2SC4110 — 400V/25A Switching Regulator Applications

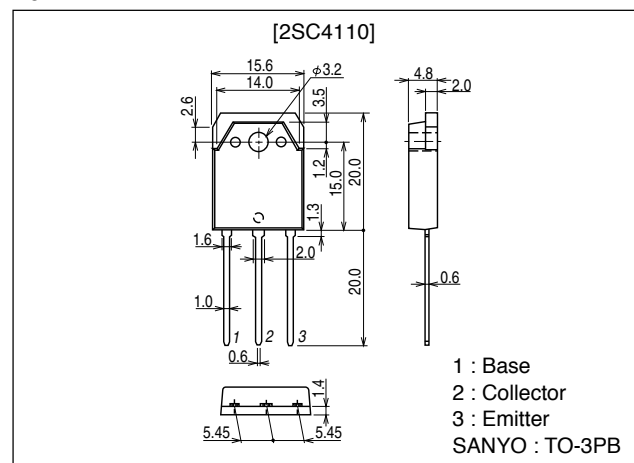
### Features

- High breakdown voltage and high reliability.
- Fast switching speed.
- 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	$V_{CB0}$		500	V
Collector-to-Emitter Voltage	$V_{CEO}$		400	V
Emitter-to-Base Voltage	$V_{EBO}$		7	V
Collector Current	$I_C$		25	A
Collector Current (Pulse)	$I_{CP}$	$PW \leq 300\mu\text{s}$ , duty cycle $\leq 10\%$	40	A
Base Current	$I_B$		8	A
Collector Dissipation	$P_C$		2.5	W
		$T_c = 25^\circ\text{C}$	160	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	$I_{CBO}$	$V_{CB} = 400\text{V}$ , $I_E = 0$			10	$\mu\text{A}$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB} = 5\text{V}$ , $I_C = 0$			10	$\mu\text{A}$

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# 2SC4110

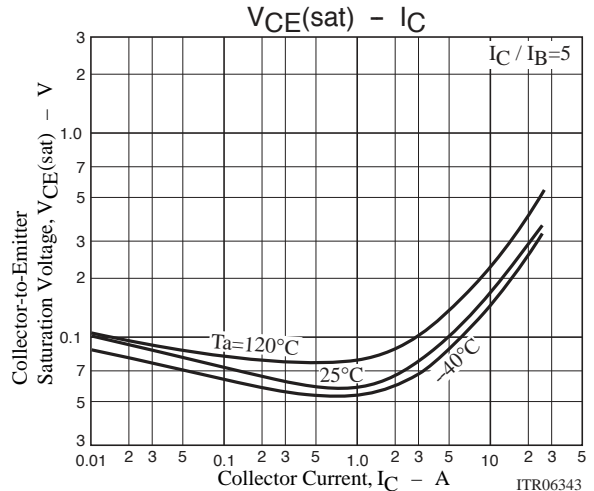
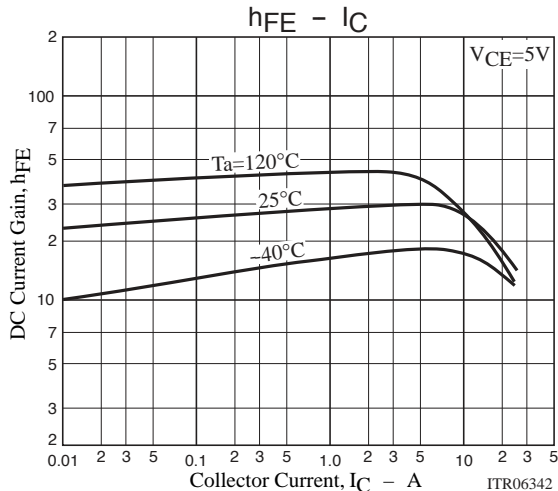
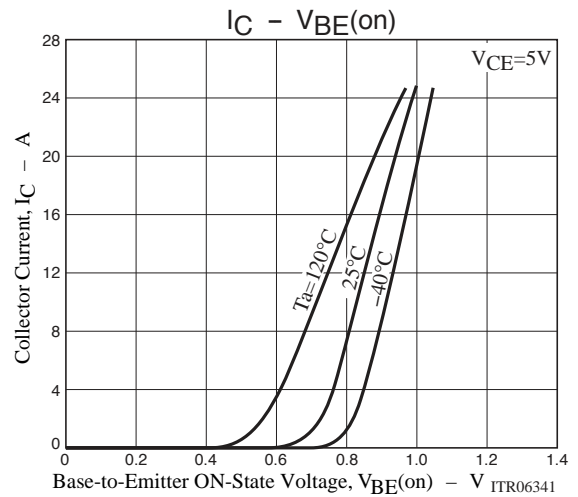
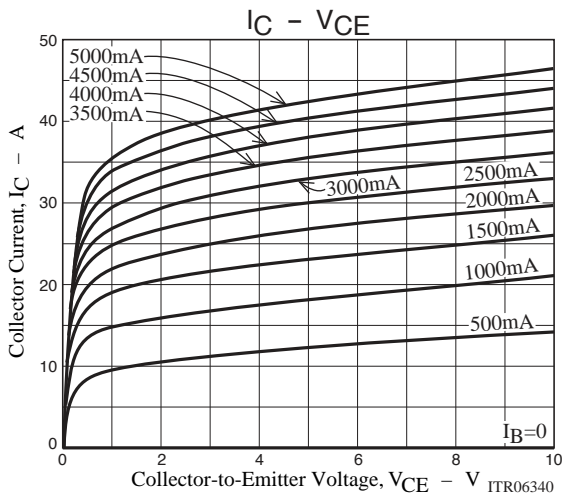
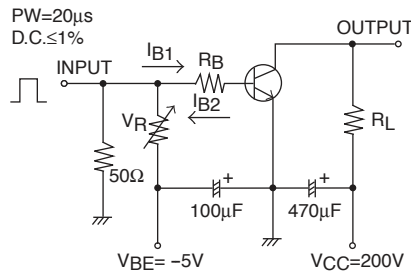
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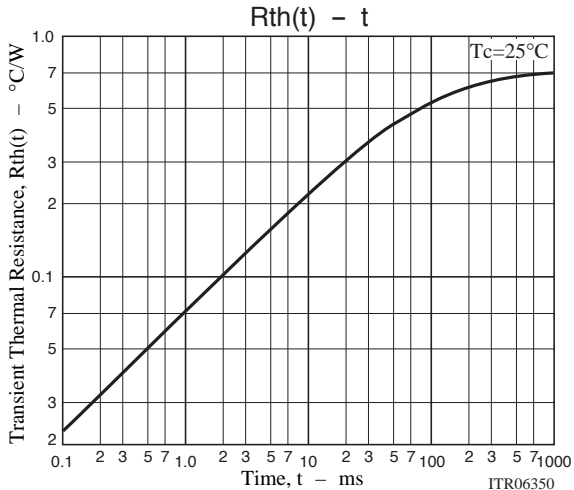
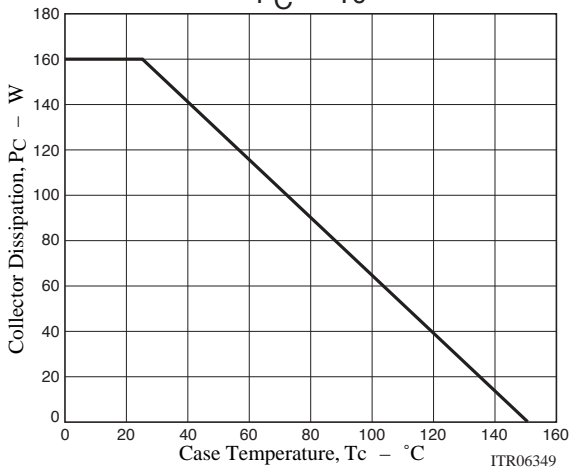
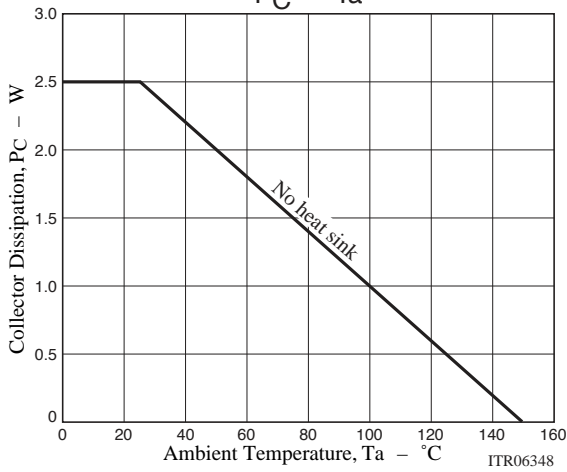
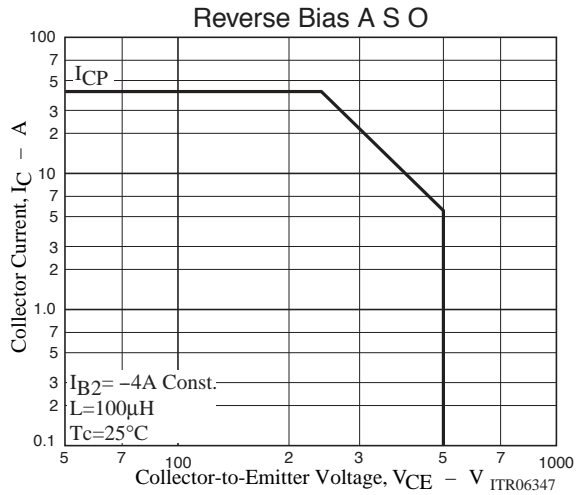
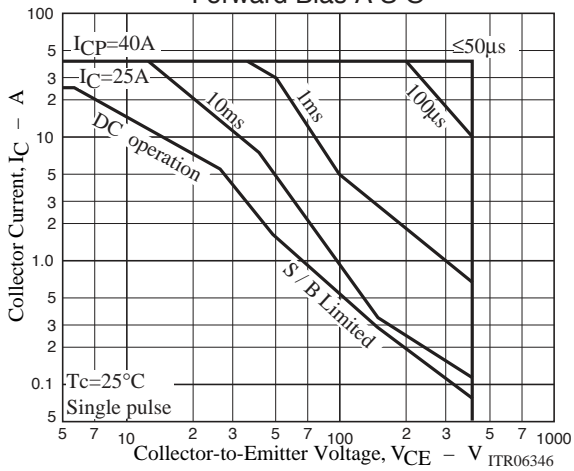
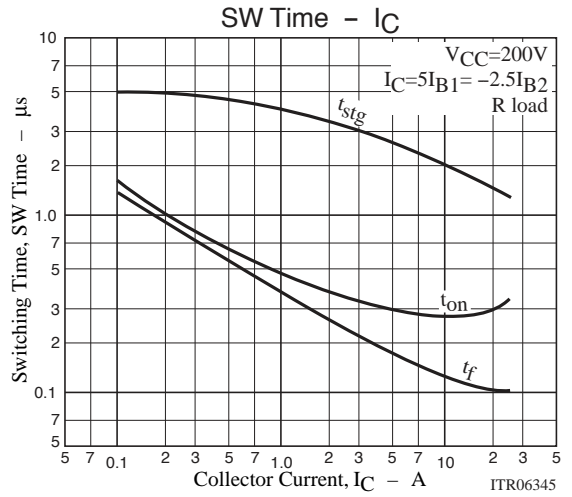
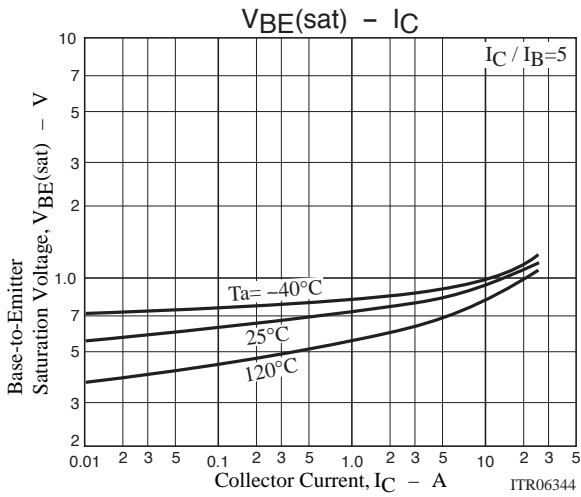
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
DC Current Gain	$h_{FE1}$	$V_{CE}=5V, I_C=3.2A$	15*		50*	
	$h_{FE2}$	$V_{CE}=5V, I_C=16A$	10			
	$h_{FE3}$	$V_{CE}=5V, I_C=10mA$	10			
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=16A, I_B=3.2A$			0.8	V
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=16A, I_B=3.2A$			1.5	V
Gain-Bandwidth Product	$f_T$	$V_{CE}=10V, I_C=3.2A$		20		MHz
Output Capacitance	$C_{ob}$	$V_{CB}=10V, f=1MHz$		300		pF
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	$I_C=1mA, I_E=0$	500			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	$I_C=10mA, R_{BE}=\infty$	400			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	$I_E=1mA, I_C=0$	7			V
Collector-to-Emitter Sustain Voltage	$V_{CEX(sus)}$	$I_C=10A, I_{B1}=1A, I_{B2}=-4A, L=200\mu H, \text{clamped}$	400			V
Turn-ON Time	$t_{on}$	$I_C=20A, I_{B1}=4A, I_{B2}=-8A, R_L=10\Omega, V_{CC}=200V$			0.5	$\mu s$
Storage Time	$t_{stg}$	$I_C=20A, I_{B1}=4A, I_{B2}=-8A, R_L=10\Omega, V_{CC}=200V$			2.5	$\mu s$
Fall Time	$t_f$	$I_C=20A, I_{B1}=4A, I_{B2}=-8A, R_L=10\Omega, V_{CC}=200V$			0.3	$\mu s$

\* : The  $h_{FE1}$  of the 2SC4110 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





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