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DATA SHEET

NPN Triple Diffused Planar Silicon Transistor

2SC4110 — 400V/25A Switching Regulator Applications

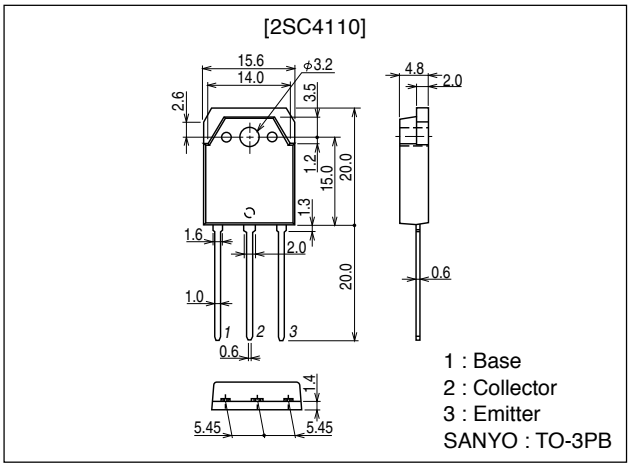
Features

- 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 Ta = 25˚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		25	A
Collector Current (Pulse)	I_{CP}	PW≤300μs, duty cycle≤10%	40	A
Base Current	I_B		8	A
Collector Dissipation	P_C		2.5	W
		Tc=25˚C	160	W
Junction Temperature	Tj		150	˚C
Storage Temperature	Tstg		–55 to +150	˚C

Electrical Characteristics at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector Cutoff Current	I_{CBO}	V_{CB}=400V, I_E=0			10	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=5V, I_C=0			10	μA

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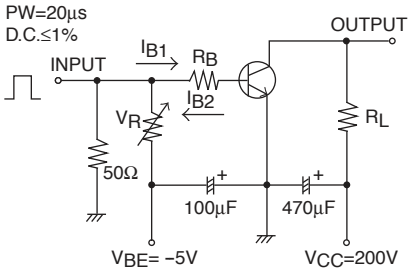
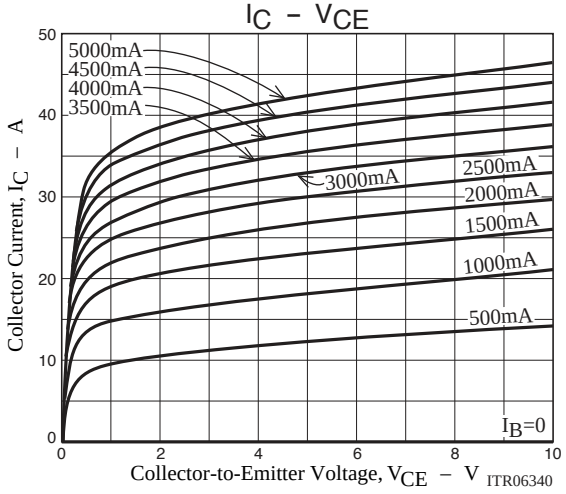
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
DC Current Gain	$h_{FE}1$	V_{CE}=5V, I_C=3.2A	15*		50*	
	$h_{FE}2$	V_{CE}=5V, I_C=16A	10			
	$h_{FE}3$	V_{CE}=5V, I_C=10mA	10			
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C=16A, I_B=3.2A			0.8	V
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	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}=∞	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=200μH, clamped	400			V
Turn-ON Time	t_{on}	I_C=20A, I_{B1}=4A, I_{B2}=–8A, R_L=10Ω, V_{CC}=200V			0.5	μs
Storage Time	t_{stg}	I_C=20A, I_{B1}=4A, I_{B2}=–8A, R_L=10Ω, V_{CC}=200V			2.5	μs
Fall Time	t_f	I_C=20A, I_{B1}=4A, I_{B2}=–8A, R_L=10Ω, V_{CC}=200V			0.3	μs

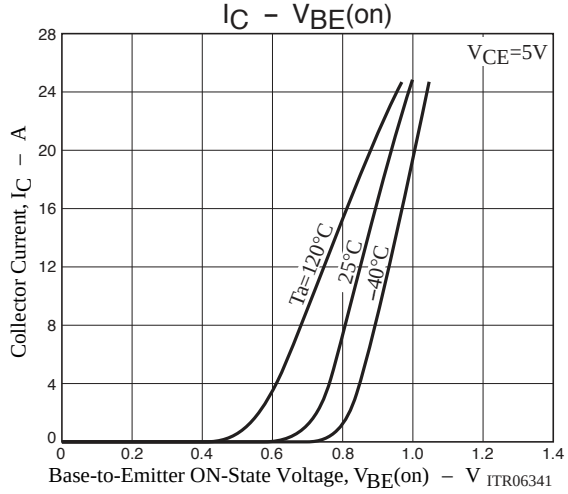
* : The $h_{FE}1$ of the 2SC4110 is classified as follows. When specifying the $h_{FE}1$ rank, specify two ranks or more in principle.

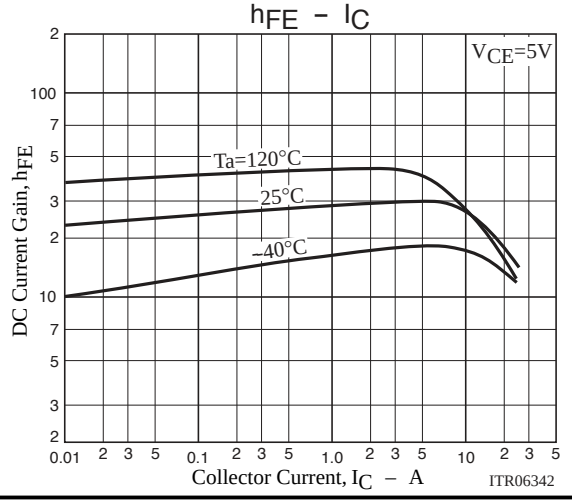
Rank	L	M	N
h_{FE}	15 to 30	20 to 40	30 to 50

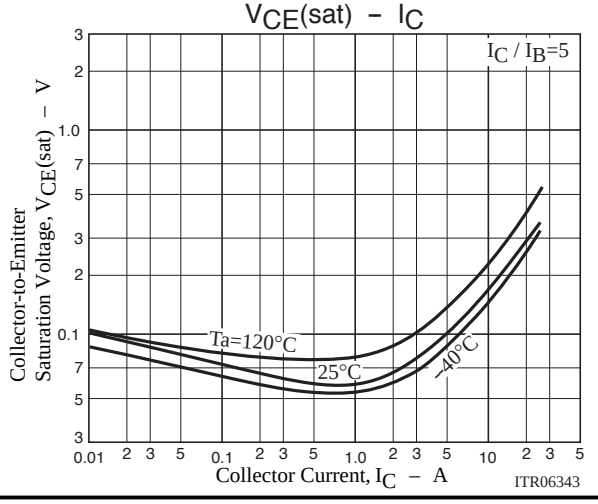
Switching Time Test Circuit

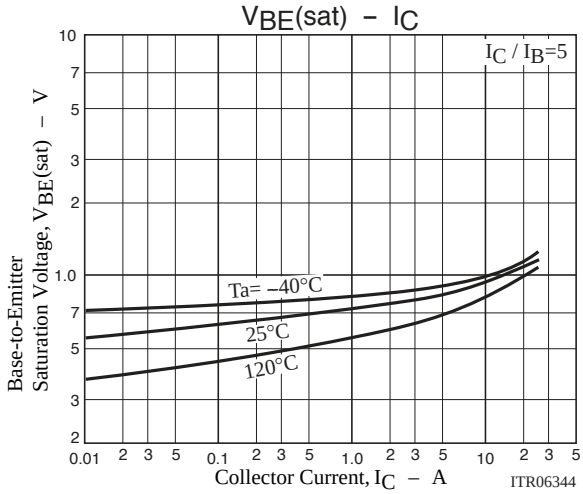


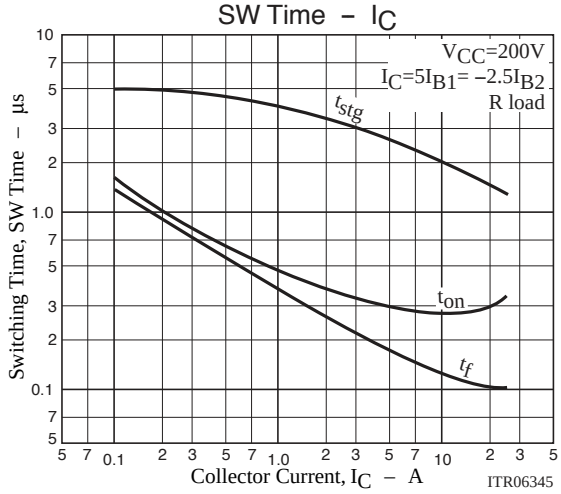


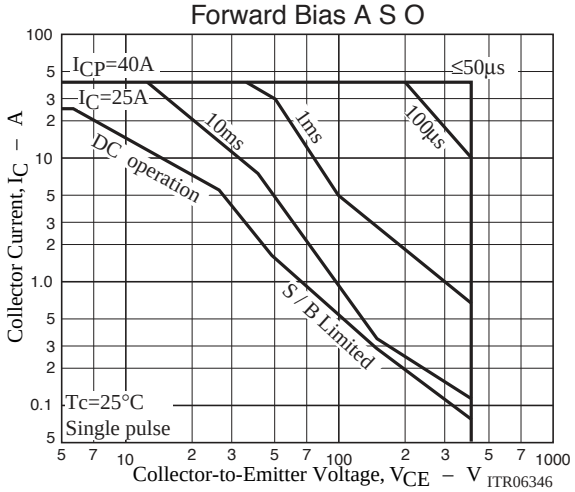


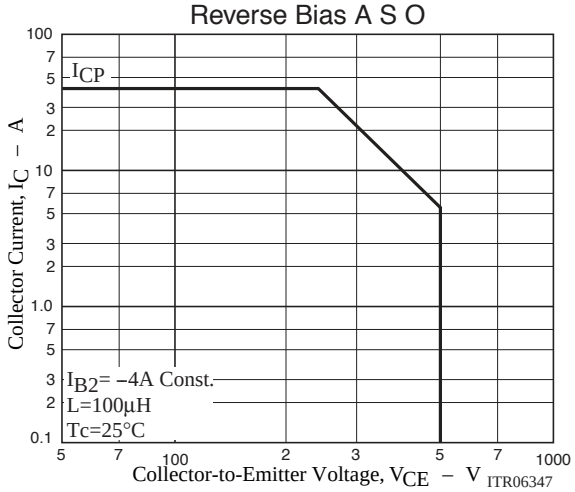


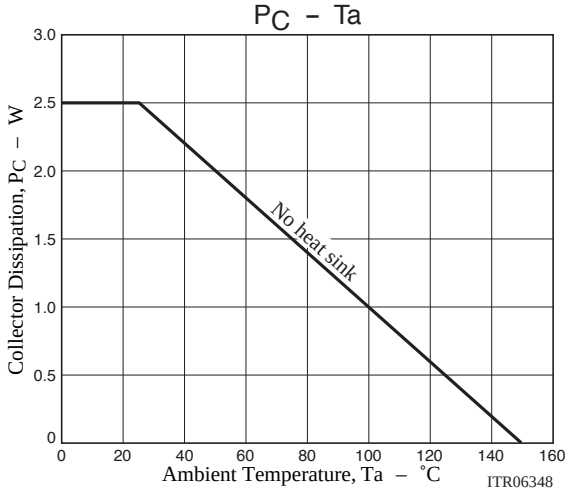


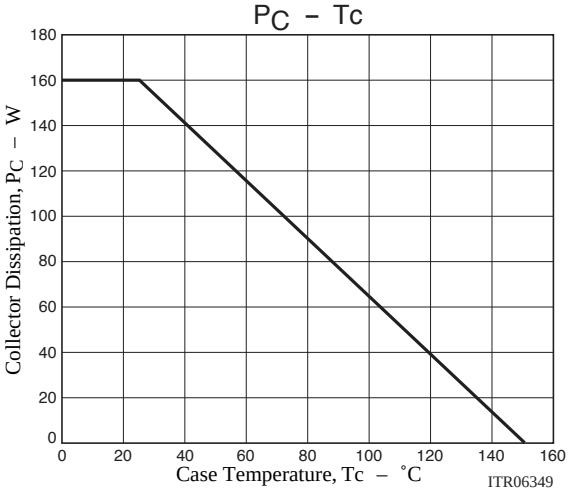

$V_{BE}(sat)$ – I_C
I_C / I_B=5
Ta= –40°C
25°C
120°C
Base-to-Emitter Saturation Voltage, $V_{BE}(sat)$ – V
Collector Current, I_C – A
ITR06344

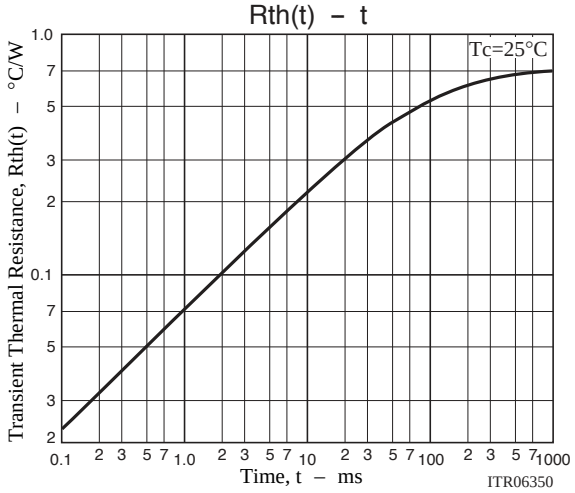

SW Time – I_C
V_{CC}=200V
I_C=5I_{B1}= –2.5I_{B2}
R load
t_{stg}
t_{on}
t_f
Switching Time, SW Time – µs
Collector Current, I_C – A
ITR06345


Forward Bias A S O
I_{CP}=40A
I_C=25A
≤50µs
10ms
1ms
100µs
DC operation
S / B Limited
Tc=25°C
Single pulse
Collector Current, I_C – A
Collector-to-Emitter Voltage, V_{CE} – V
ITR06346


Reverse Bias A S O
I_{CP}
I_{B2}= –4A Const.
L=100µH
Tc=25°C
Collector Current, I_C – A
Collector-to-Emitter Voltage, V_{CE} – V
ITR06347


P_C – Ta
No heat sink
Collector Dissipation, P_C – W
Ambient Temperature, Ta – °C
ITR06348


P_C – Tc
Collector Dissipation, P_C – W
Case Temperature, Tc – °C
ITR06349


Rth(t) – t
Tc=25°C
Transient Thermal Resistance, Rth(t) – °C/W
Time, t – ms
ITR06350

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