Ordering number:ENN2847

NPN Triple Diffused Planar Silicon Transistor

2SC4424

400V/16A Switching Regulator Applications

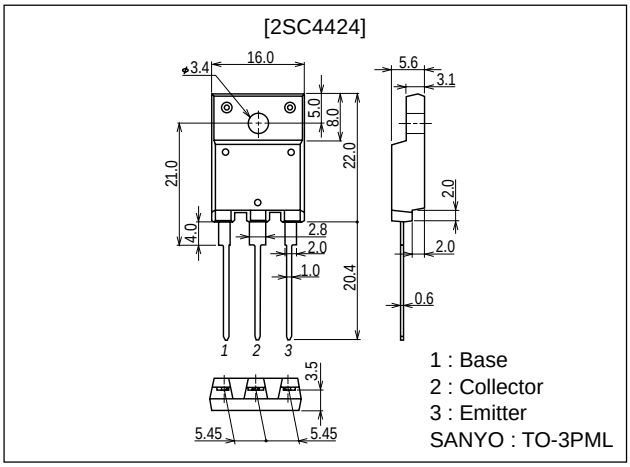
Features

- High breakdown voltage, high reliability.
- Fast switching speed (t_f : 0.1μs typ).
- Wide ASO.
- Adoption of MBIT process.
- Micaless package facilitating easy mounting.

Package Dimensions

unit:mm

2039D



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		16	A
Collector Current (Pulse)	I_{CP}	PW≤300μs, duty cycle≤10%	32	A
Base Current	I_B		6	A
Collector Dissipation	P_C		3	W
		Tc=25˚C	60	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

Continued on next page.

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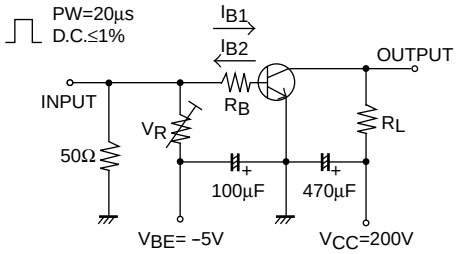
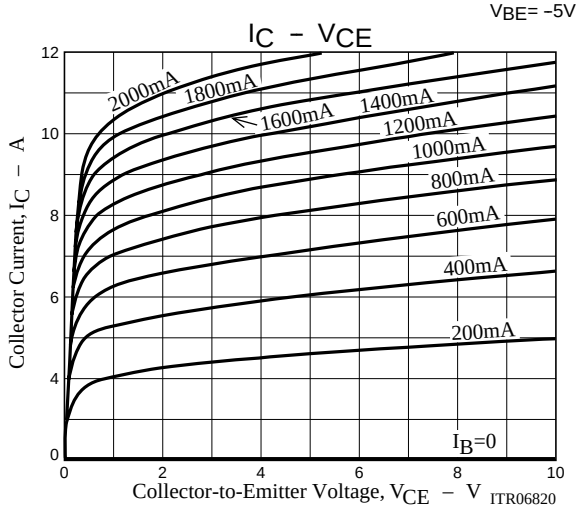
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
DC Current Gain	$h_{FE}1$*	V_{CE}=5V, I_C=2A	15		50	
	$h_{FE}2$	V_{CE}=5V, I_C=10A	10			
	$h_{FE}3$	V_{CE}=5V, I_C=10mA	10			
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C=10A, I_B=2A			0.8	V
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	I_C=10A, I_B=2A			1.5	V
Gain-Bandwidth Product	f_T	V_{CE}=10V, I_C=2A		20		MHz
Output Capacitance	C_{ob}	V_{CB}=10V, f=1MHz		230		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=8A, I_{B1}=0.8A, I_{B2}=–3.2A, L=200μH, Clamped	400			V
Turn-ON Time	t_{on}	I_C=12A, I_{B1}=2.4A, I_{B2}=–4.8A, R_L=16.6Ω, V_{CC}=200V			0.5	μs
Storage Time	t_{stg}	I_C=12A, I_{B1}=2.4A, I_{B2}=–4.8A, R_L=16.6Ω, V_{CC}=200V			2.5	μs
Fall Time	t_f	I_C=12A, I_{B1}=2.4A, I_{B2}=–4.8A, R_L=16.6Ω, V_{CC}=200V			0.3	μs

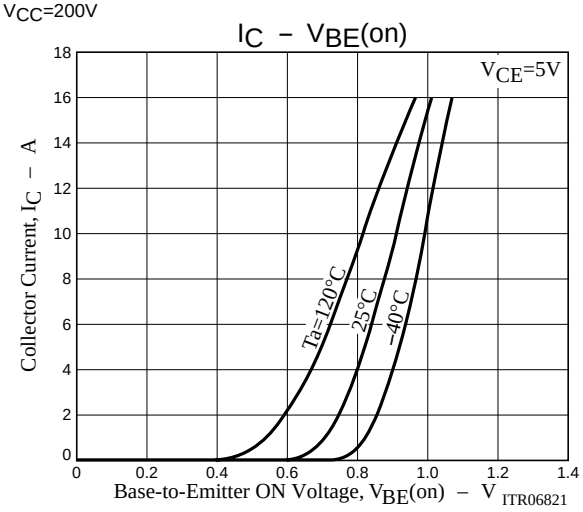
* : The $h_{FE}1$ of the 2SC4424 is classified as follows. When specifying the $h_{FE}1$ rank, specify two ranks or more in principle.

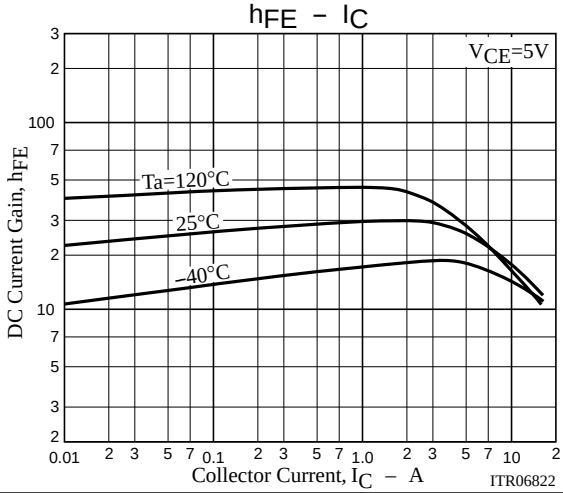
Rank	L	M	N
h_{FE}	15 to 30	20 to 40	30 to 50

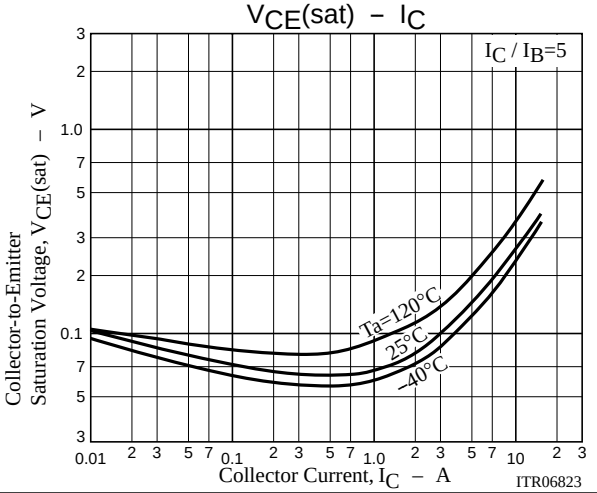
Switching Time Test Circuit



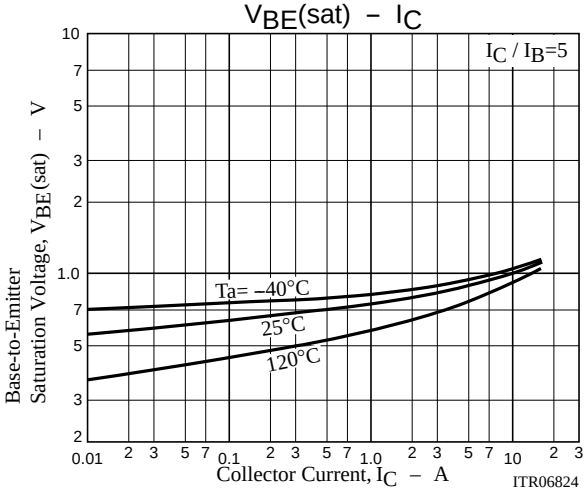




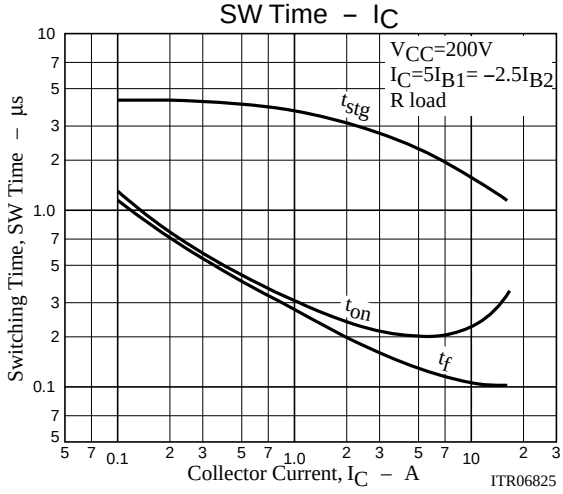




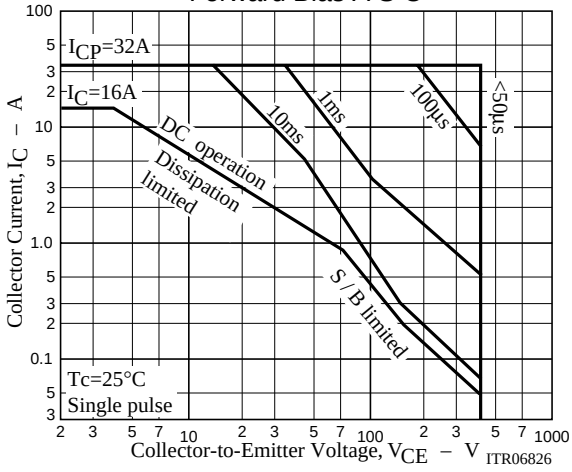
$V_{BE}(sat)$ – I_C



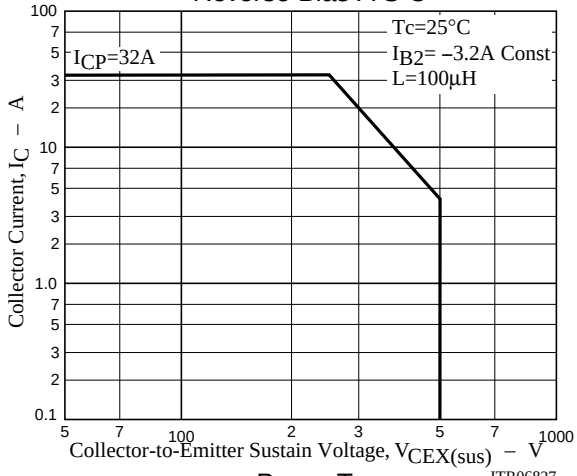
SW Time – I_C



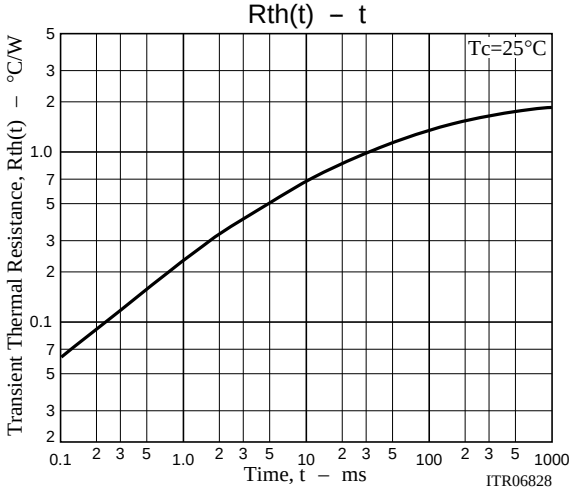
Forward Bias A S O



Reverse Bias A S O



Rth(t) – t



P_C – Ta