Ordering number : EN2851A

SANYO Semiconductors

DATA SHEET

NPN Triple Diffused Planar Silicon Transistor

2SC4428 — 800V / 6A Switching Regulator Applications

Features

- High breakdown voltage, high reliability.
- High-speed switching (t_r : 0.1μs typ).
- Wide ASO.
- Adoption of MBIT process.
- Attachment workability is good by Mica-less package.

Specifications

Absolute Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		1100	V
Collector-to-Emitter Voltage	V_{CEO}		800	V
Emitter-to-Base Voltage	V_{EBO}		7	V
Collector Current	I_C		6	A
Collector Current (Pulse)	I_{CP}	PW≤300μs, duty cycle≤10%	20	A
Base Current	I_B		3	A
Collector Dissipation	P_C		3	W
		Tc=25°C	55	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}=800V, I_E=0A			10	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=5V, I_C=0A			10	μA
DC Current Gain	$h_{FE}1$	V_{CE}=5V, I_C=0.4A	10*		40*	
	$h_{FE}2$	V_{CE}=5V, I_C=2A	8			

Continued on next page.

* : The $h_{FE}1$ of the 2SC4428 is classified as follows. When specifying the $h_{FE}1$ rank, specify two ranks or more in principle.

Rank	K	L	M
h_{FE}	10 to 20	15 to 30	20 to 40

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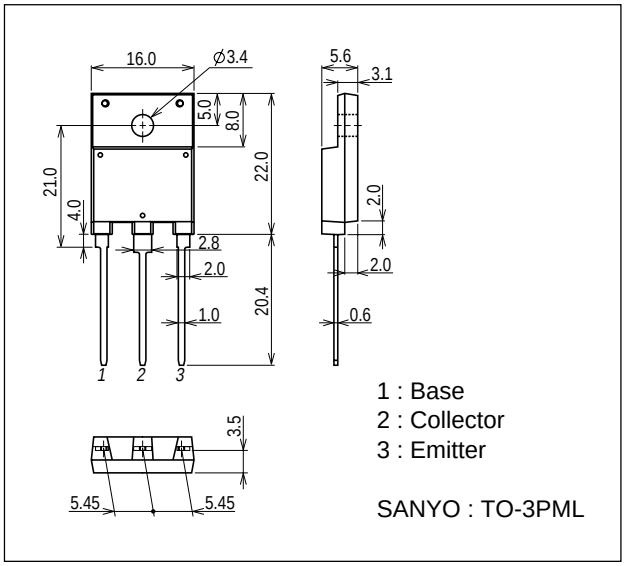
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Gain-Bandwidth Product	f_T	V_{CE}=10V, I_C=0.4A		15		MHz
Output Capacitance	Cob	V_{CB}=10V, f=1MHz		120		pF
Collector-to-Emitter Saturation Voltage	V_{CE}(sat)	I_C=3A, I_B=0.6A			2.0	V
Base-to-Emitter Saturation Voltage	V_{BE}(sat)	I_C=3A, I_B=0.6A			1.5	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=1mA, I_E=0A	1100			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=5mA, R_{BE}=∞	800			V
Emitter-to-Base Breakdown Voltage	$V_{(BR)EBO}$	I_E=1mA, I_C=0A	7			V
Collector-to-Emitter Sustain Voltage	V_{CEX}(sus)	I_C=3A, I_{B1}=0.6A, I_{B2}=−0.6A, L=1mH, Clamped	800			V
Turn-ON Time	t_{on}	V_{CC}=400V, I_{B1}=0.8A, I_{B2}=-1.6A, I_C=4A, R_L=100Ω			0.5	μs
Storage Time	t_{stg}	V_{CC}=400V, I_{B1}=0.8A, I_{B2}=-1.6A, I_C=4A, R_L=100Ω			3.0	μs
Fall Time	t_f	V_{CC}=400V, I_{B1}=0.8A, I_{B2}=-1.6A, I_C=4A, R_L=100Ω			0.3	μs

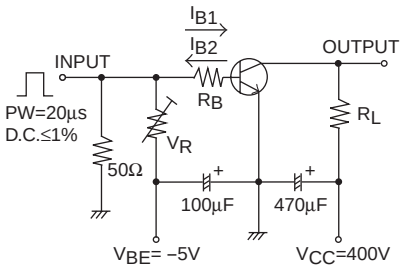
Package Dimensions

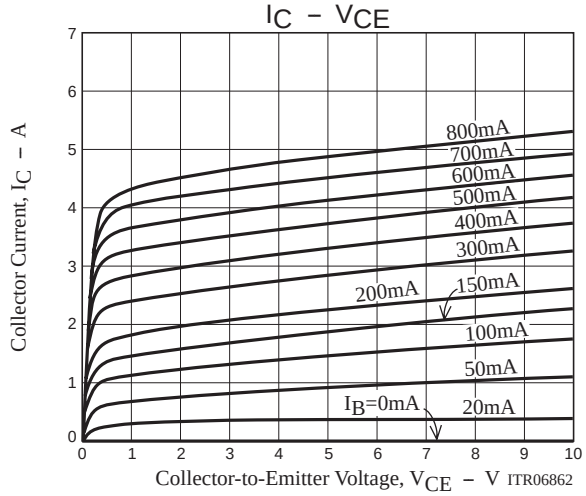
unit : mm

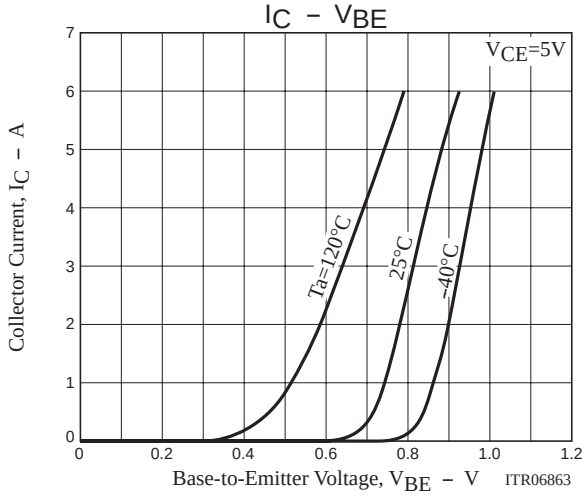
7502-002

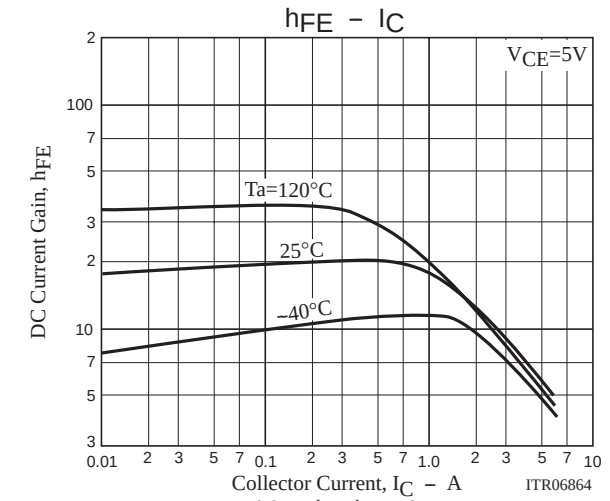


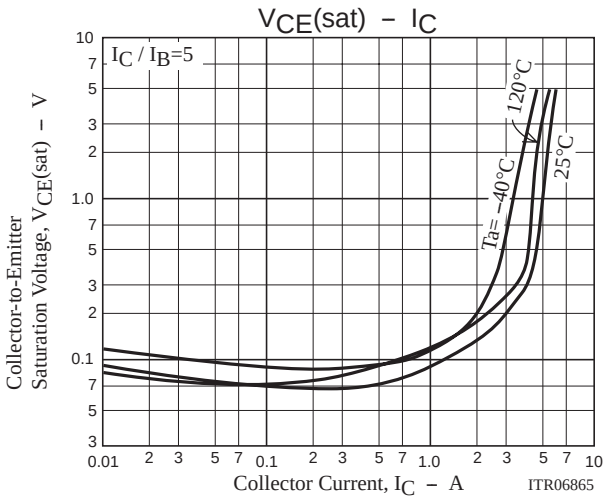
Switching Time Test Circuit

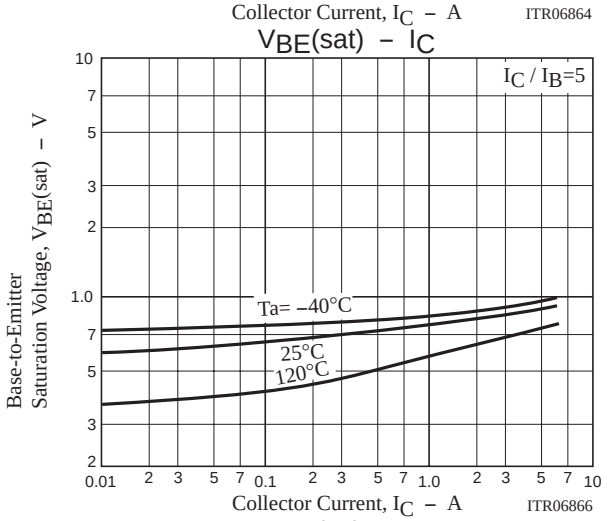


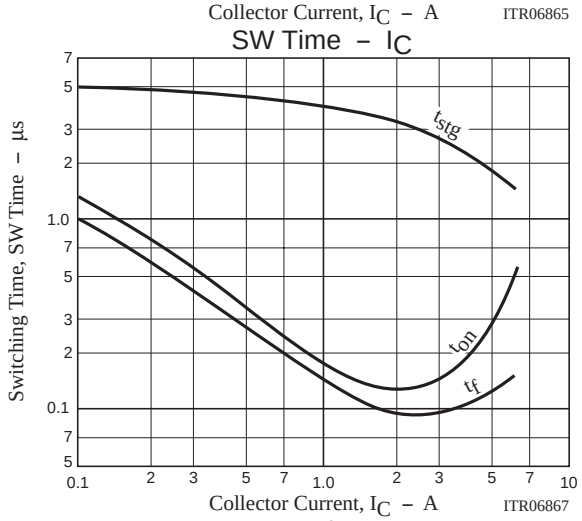


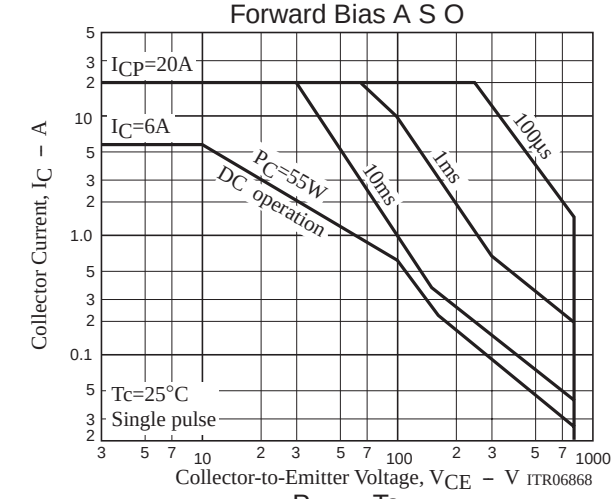


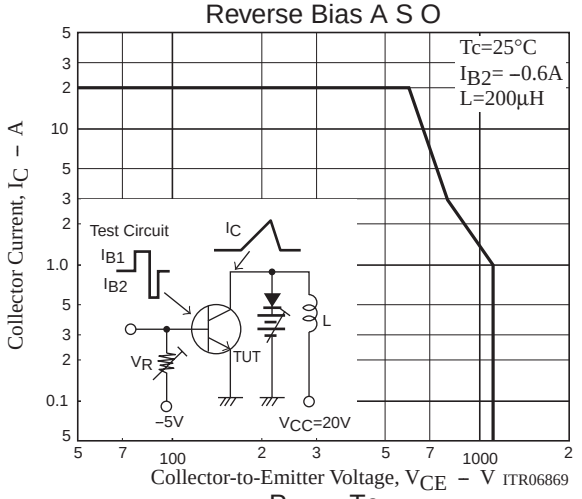

hFE – IC
VCE=5V
Ta=120°C
25°C
–40°C
DC Current Gain, hFE
Collector Current, IC – A
ITR06864

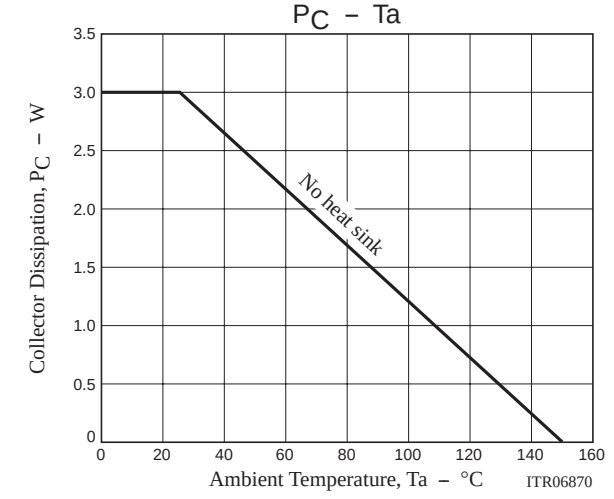

VCE(sat) – IC
IC / IB=5
120°C
25°C
Ta= –40°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – V
Collector Current, IC – A
ITR06865

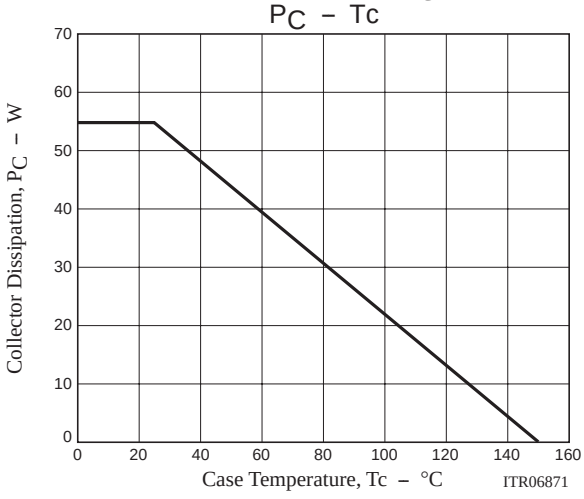

VBE(sat) – IC
IC / IB=5
Ta= –40°C
25°C
120°C
Base-to-Emitter Saturation Voltage, VBE(sat) – V
Collector Current, IC – A
ITR06866


SW Time – IC
tstg
ton
tf
Switching Time, SW Time – µs
Collector Current, IC – A
ITR06867


Forward Bias A S O
ICP=20A
IC=6A
PC=55W
DC operation
10ms
1ms
100µs
Tc=25°C
Single pulse
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
ITR06868


Reverse Bias A S O
Tc=25°C
IB2= –0.6A
L=200µH
Test Circuit
IB1
IB2
IC
L
VR
TUT
–5V
VCC=20V
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V
ITR06869


PC – Ta
No heat sink
Collector Dissipation, PC – W
Ambient Temperature, Ta – °C
ITR06870


PC – Tc
Collector Dissipation, PC – W
Case Temperature, Tc – °C
ITR06871