Ordering number:EN2232B

NPN Triple Diffused Planar Silicon Transistor

2SC3988

500V/25A Switching Regulator Applications

Features

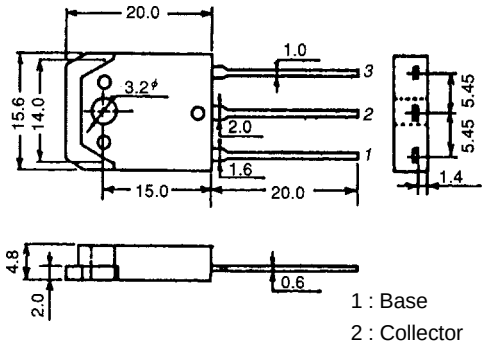
- High breakdown voltage, high reliability.
- Fast switching speed.
- Wide ASO.
- Adoption of MBIT process.

Package Dimensions

unit:mm

2022A

[2SC3988]



1 : Base
2 : Collector
3 : Emitter
SANYO : TO-3PB

Specifications

Absolute Maximum Ratings at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings	Unit
Collector-to-Base Voltage	V_{CBO}		800	V
Collector-to-Emitter Voltage	V_{CEO}		500	V
Emitter-to-Base Voltage	V_{EBO}		7	V
Collector Current	I_C		25	A
Collector Current (Pulse)	I_{CP}	Pulse PW≤300μs, duty cycle≤10%	40	A
Base Current	I_B		8	A
Collector Dissipation	P_C	Tc=25˚C	150	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}=500V, I_E=0			10	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=5V, I_C=0			10	μA
DC Current Gain	$h_{FE}1$	V_{CE}=5V, I_C=2.4A	15*		50*	
	$h_{FE}2$	V_{CE}=5V, I_C=12A	8			
Gain-Bandwidth Product	f_T	V_{CE}=10V, I_C=2.4A		18		MHz
Output Capacitance	C_{ob}	V_{CB}=10V, f=1MHz		260		pF

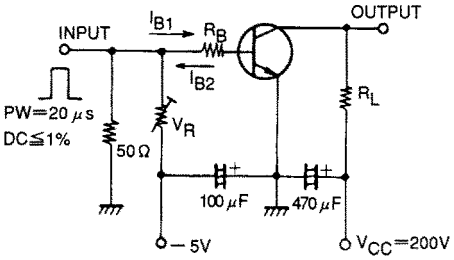
* : The 2SC3988 is classified by 2.4A h_{FE} as follows :

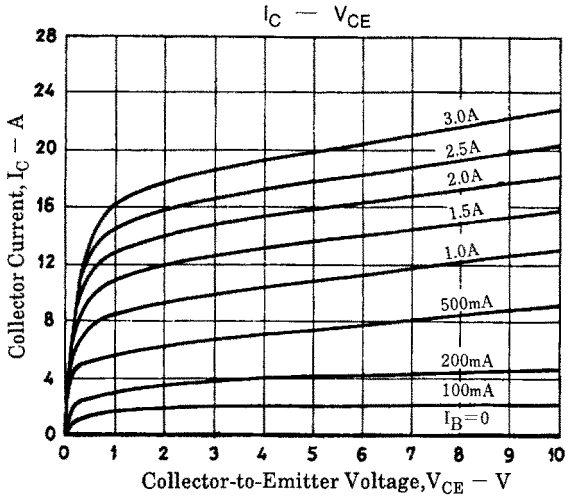
15	L	30	20	M	40	30	N	50

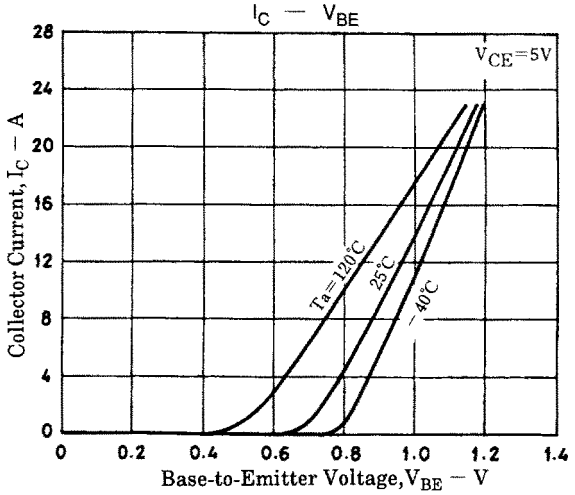
SANYO Electric Co.,Ltd. Semiconductor Bussiness Headquaters
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

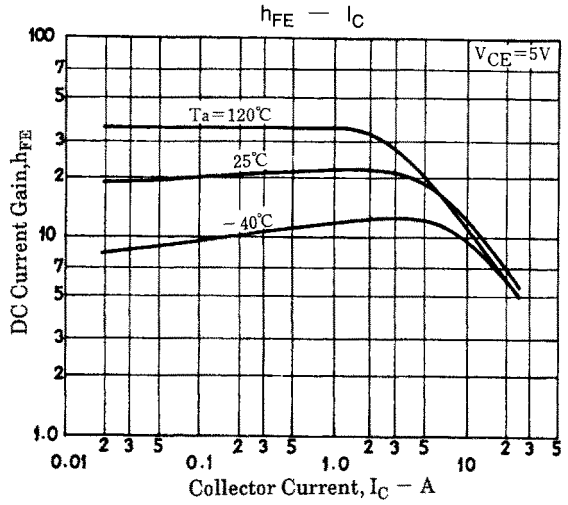
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C=12A, I_B=2.4A			1.0	V
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	I_C=12A, I_B=2.4A			1.5	V
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=1mA, I_E=0	800			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=5mA, R_{BE}=∞	500			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}=–I_{B2}=–2A, L=200μH, clamped	500			V
Turn-ON Time	t_{on}	V_{CC}=200V, 5I_{B1}=–2.5I_{B2}=I_C=14A, R_L=14.3Ω			0.5	μs
Storage Time	t_{stg}	V_{CC}=200V, 5I_{B1}=–2.5I_{B2}=I_C=14A, R_L=14.3Ω			3.0	μs
Fall Time	t_f	V_{CC}=200V, 5I_{B1}=–2.5I_{B2}=I_C=14A, R_L=14.3Ω			0.3	μs

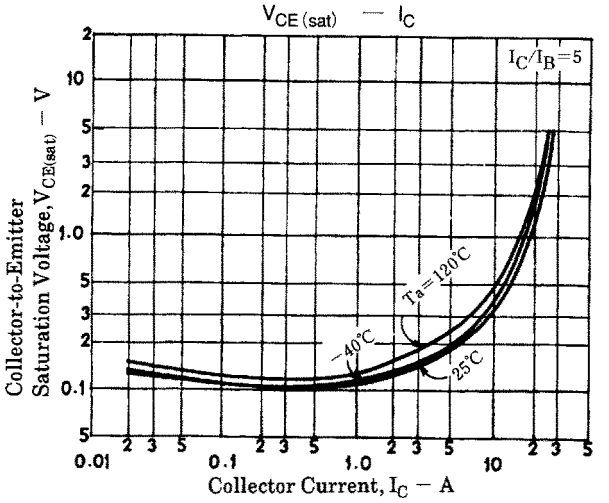
Switching Time Test Circuit



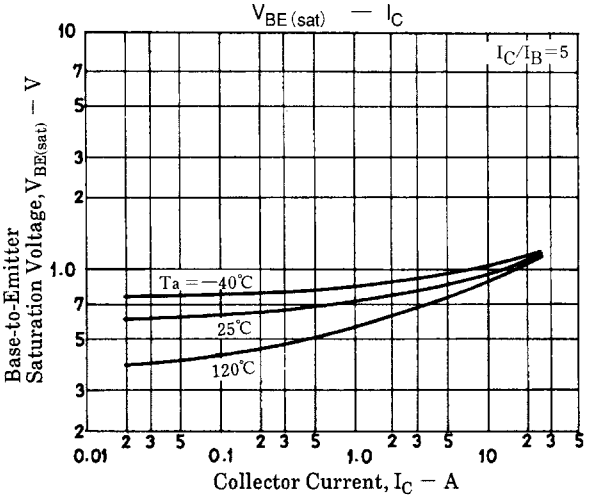




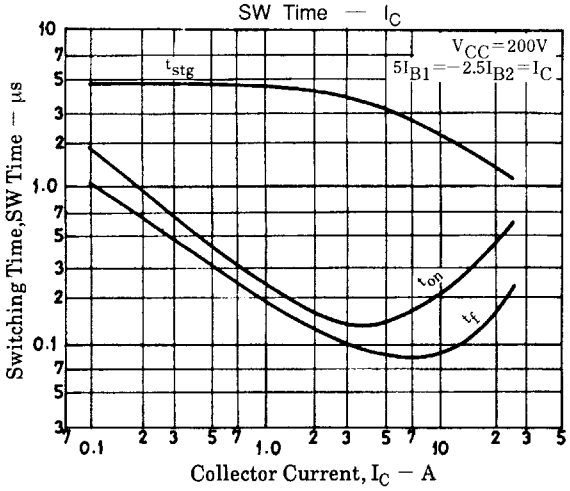




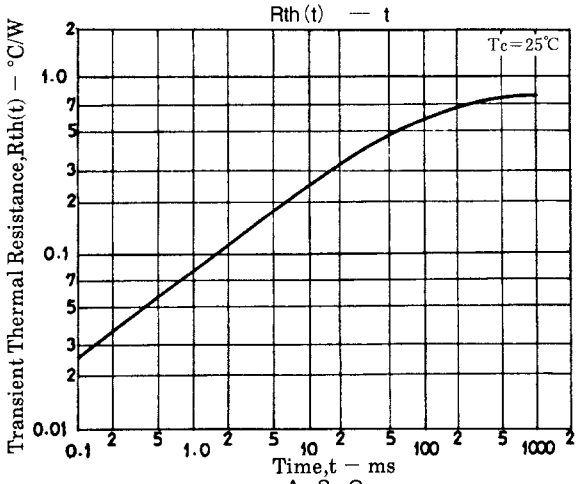
$V_{BE(sat)}$ — I_C



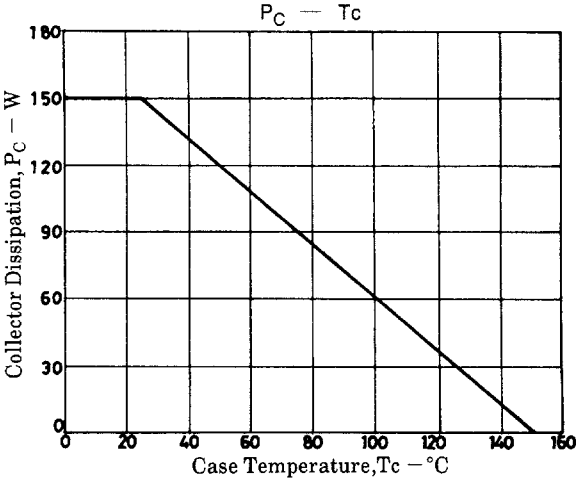
SW Time — I_C



Rth(t) — t



P_C — Tc



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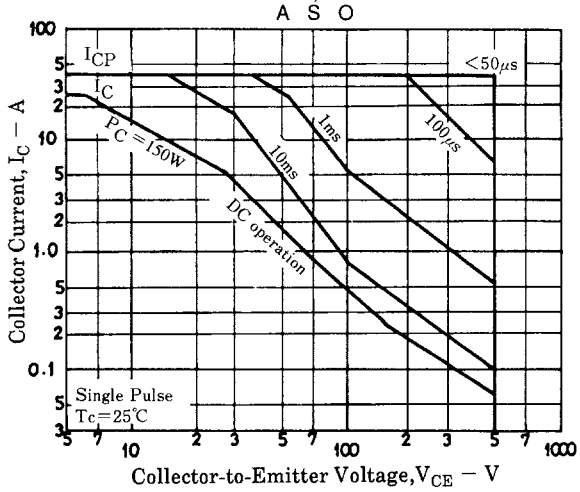

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