NPN Triple Diffused Planar Silicon Transistor

2SC3042

400V/12A Switching Regulator Applications

Features

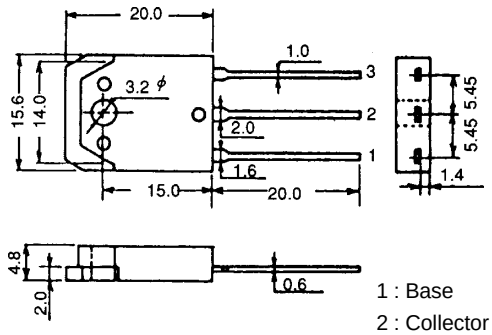
- High breakdown voltage (V_{CBO}≥500V).
- Fast switching speed.
- Wide ASO.

Package Dimensions

unit:mm

2022A

[2SC3042]



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}		500	V
Collector-to-Emitter Voltage	V_{CEO}		400	V
Emitter-to-Base Voltage	V_{EBO}		7	V
Collector Current	I_C		12	A
Collector Current (Pulse)	I_{CP}	PW≤300μs, Duty Cycle≤10%	25	A
Base Current	I_B		4	A
Collector Dissipation	P_C		2.5	W
		Tc=25˚C	100	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
DC Current Gain	$h_{FE}1$	V_{CE}=5V, I_C=1.6A	15*		50*	
	$h_{FE}2$	V_{CE}=5V, I_C=8A	8			
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C=8A, I_B=1.6A			1.0	V
Base-to-Emitter Saturation Voltage	$V_{BE(sat)}$	I_C=8A, I_B=1.6A			1.5	V

* : The $h_{FE}1$ of the 2SC3042 is classified as follows. When specifying the $h_{FE}1$ rank, specify two ranks or more in principle.

15	L	30	20	M	40	30	N	50

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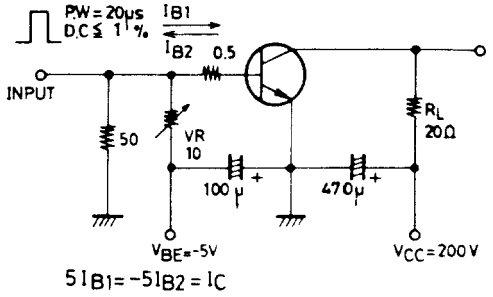
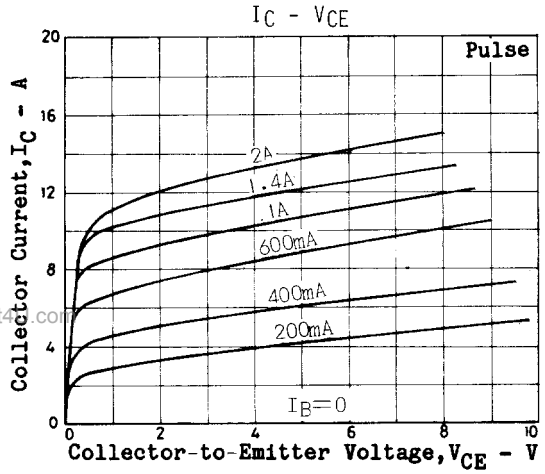
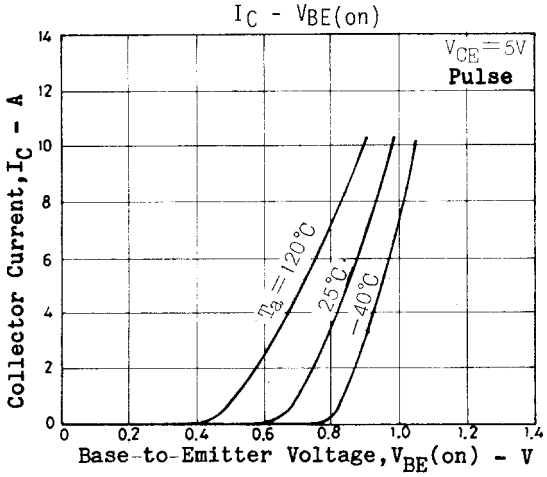
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Gain-Bandwidth Product	f_T	V_{CE}=10V, I_C=1.6A		20		MHz
Output Capacitance	C_{ob}	V_{CB}=10V, f=1MHz		160		pF
Collector-to-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C=1mA, I_E=0	500			V
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C=10mA, 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	$V_{CEO(sus)}$	I_C=12A, I_B=2.4A, L=50μH	400			V
Collector-to-Emitter Sustain Voltage	$V_{CEX(sus)1}$	I_C=12A, I_{B1}=2.4A, L=200μH, I_{B2}=–2.4A, clamped	400			V
	$V_{CEX(sus)2}$	I_C=3A, I_{B1}=0.6A, L=200μH, I_{B2}=–0.6A, clamped	450			V
Turn-ON Time	t_{on}	I_C=10A, I_{B1}=2A, I_{B2}=–2A, R_L=20Ω, V_{CC}=200V			1.0	μs
Storage Time	t_{stg}	I_C=10A, I_{B1}=2A, I_{B2}=–2A, R_L=20Ω, V_{CC}=200V			2.5	μs
Fall Time	t_f	I_C=10A, I_{B1}=2A, I_{B2}=–2A, R_L=20Ω, V_{CC}=200V			1.0	μs

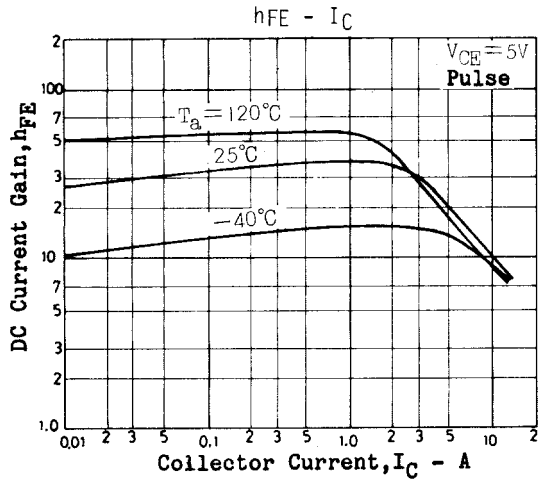
Switching Time Test Circuit

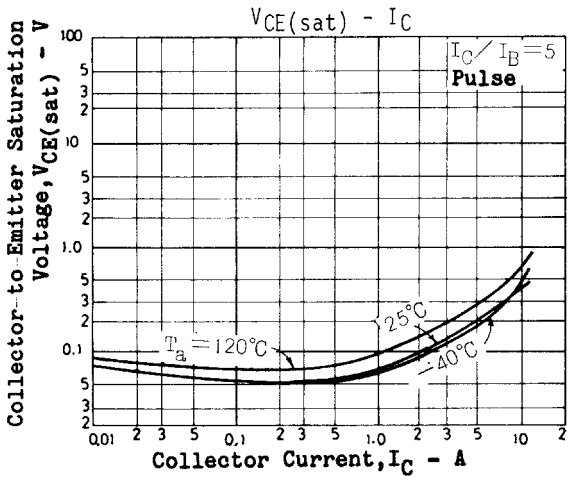


Unit (resistance : Ω, capacitance : F)

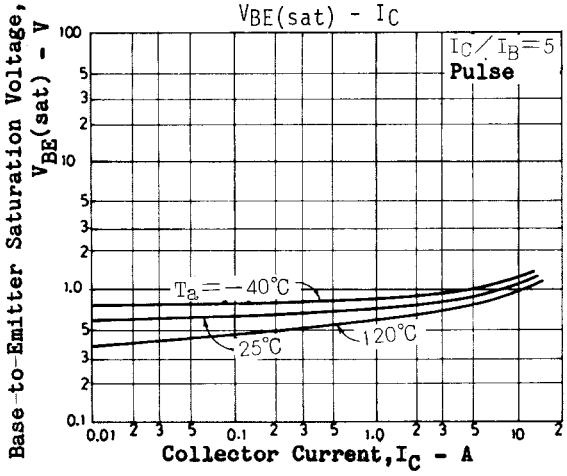




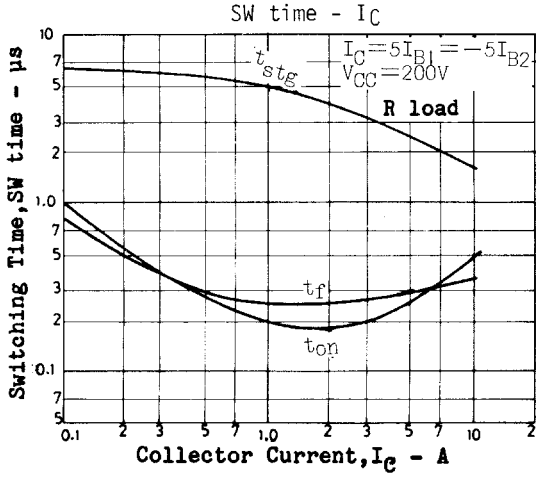




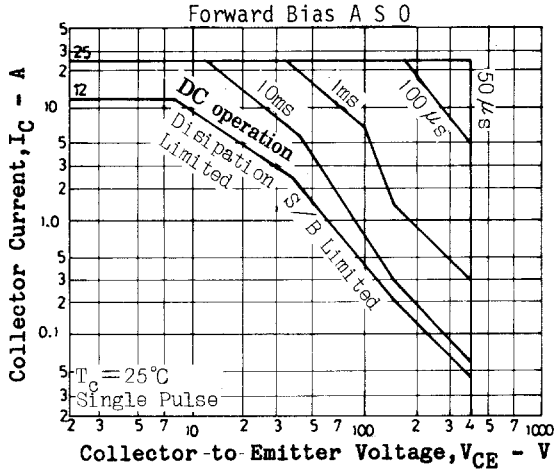
$V_{BE(sat)}$ - I_C



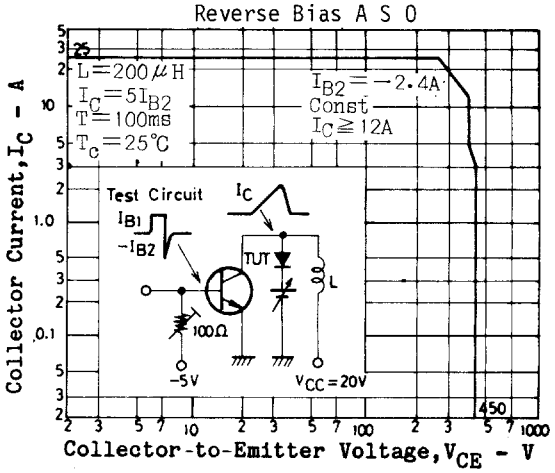
SW time - I_C



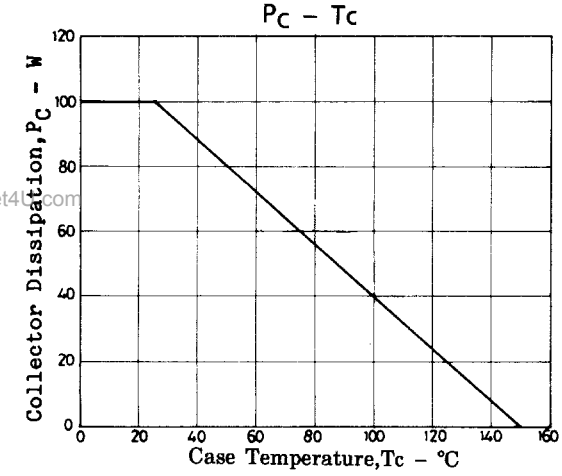
Forward Bias A S O



Reverse Bias A S O



P_C - Tc



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