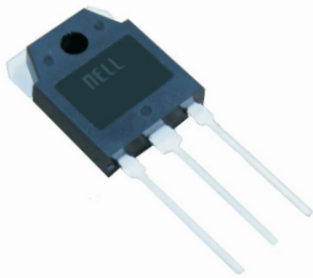


Silicon NPN triple diffusion planar transistor

25A/400V Switching Regulator Applications

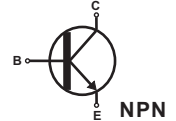
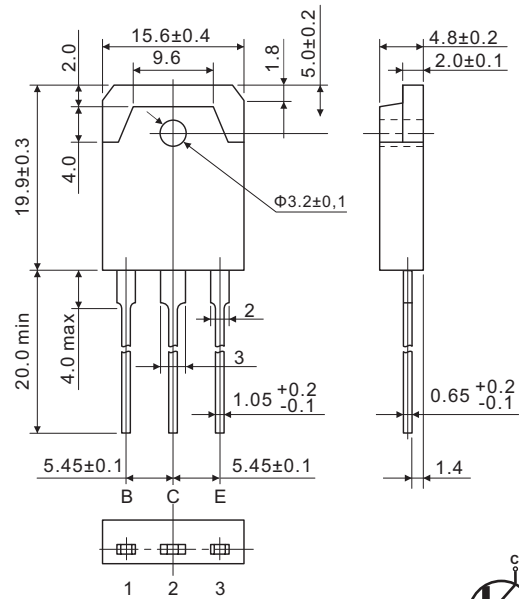

TO-3P(B)

FEATURES

- High-speed switching
- High breakdown voltage and high reliability
- Wide SOA (Safe Operation Area)
- TO-3P package which can be installed to the heat sink with one screw

APPLICATIONS

- Switching regulator
- High frequency inverters
- Ultrasonic generators
- General purpose power amplifiers



All dimensions in millimeters

ABSOLUTE MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

SYMBOL	PARAMETER		VALUE	UNIT
V _{CBO}	Collector to base voltage (I _E =0)		500	V
V _{CEO}	Collector to emitter voltage (I _B =0)		400	
V _{EBO}	Emitter to base voltage		7	
I _{CP}	Peak collector current (PW ≤ 300μs, duty cycle ≤ 10%)		40	A
I _C	Collector current		25	
I _B	Base current		8	
P _C	Collector power dissipation	T _C = 25°C	160	W
		T _A = 25°C	2.5	
T _j	Junction temperature		150	°C
T _{stg}	Storage temperature		-55 to 150	

THERMAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$)

SYMBOL	PARAMETER	Min.	Typ.	Max.	UNIT
$R_{th(j-c)}$	Thermal resistance, junction to case			0.70	V

ELECTRICAL CHARACTERISTICS (T_a = 25°C)

SYMBOL	PARAMETER	CONDITIONS		VALUE			UNIT
				MIN.	TYP.	MAX.	
I _{CBO}	Collector cutoff current	V _{CB} = 400V, I _E = 0				10	μA
I _{EBO}	Emitter cutoff current	V _{EB} = 5V, I _C = 0				10	
V _{CE(SUS)}	Collector to emitter sustaining voltage	I _C = 10A, L = 200μH, I _{B1} = 1A, I _{B2} = -4A		400			V
V _{CE(sat)}	Collector to emitter saturation voltage	I _C = 16A, I _B = 3.2A				0.8	V
V _{BE(sat)}	Base to emitter saturation voltage	I _C = 16A, I _B = 3.2A				1.5	
f _T	Transition frequency (Gain-Bandwidth product)	V _{CE} = 10V, I _C = 3.2A			20		MHz
C _{ob}	Output capacitance	V _{CB} = 10V, f= 1MHz			300		pF
V _{(BR)CBO}	Collector to base breakdown voltage	I _C = 1mA, I _E = 0		500			V
V _{(BR)CEO}	Collector to emitter breakdown voltage	I _C = 10mA, R _{BE} = ∞		400			
V _{(BR)EBO}	Emitter to base breakdown voltage	I _E = 1mA, I _C = 0		7			
t _{on}	Turn-on time	I _C = 20A, I _{B1} = 4.0A, I _{B2} = -8A V _{CC} = 200V, R _L = 10Ω				0.5	μs
t _{stg}	Storage time					2.5	
t _f	Fall time					0.3	
h _{FE1}	DC current gain	V _{CE} = 5V, I _C = 3.2A	Rank-L	15		30	
			Rank-M	20		40	
			Rank-N	30		50	
h _{FE2}		V _{CE} = 5V, I _C = 16A		10			
h _{FE3}		V _{CE} = 5V, I _C = 10mA		10			

ORDERING INFORMATION SCHEME

	2SC	4110	B	- M
Transistor series				
NPN Type				
Current & Voltage rating, I_C & V_{CEO}				
25A / 400V				
Package type				
B = TO-3PB				
DC current gain rank, h_{FE1}				
L = 15 ~ 30				
M = 20 ~ 40				
N = 30 ~ 50				

Switching time test circuit

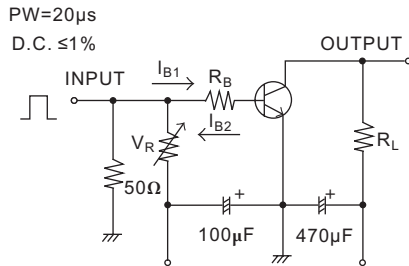


Fig.1 $I_C - V_{CE}$ characteristics

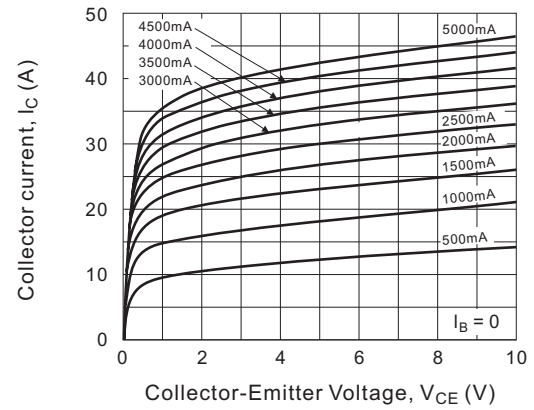


Fig.2 $I_C - V_{BE(on)}$ Temperature characteristics

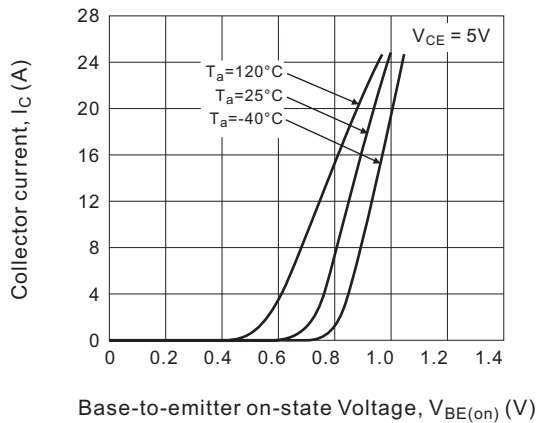


Fig.3 $h_{FE} - I_C$ characteristics

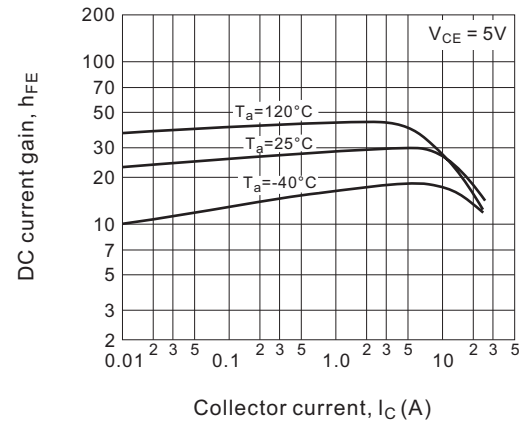


Fig.4 $V_{CE(sat)} - I_C$ characteristics

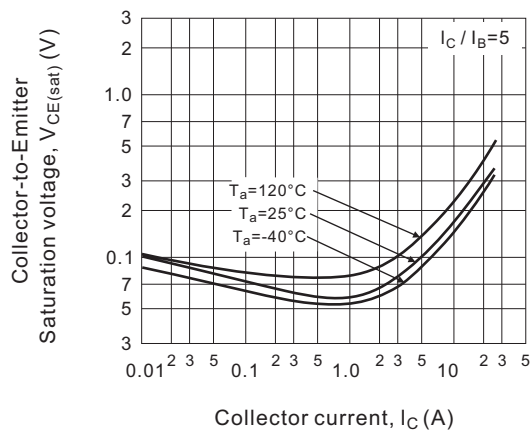


Fig.5 $V_{BE(sat)} - I_C$ Temperature characteristics

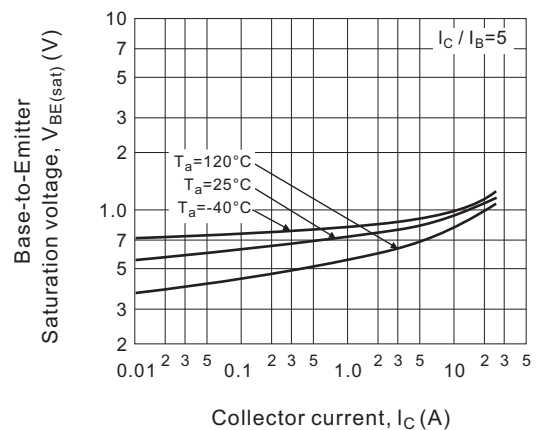


Fig.6 Switching time - I_C characteristics

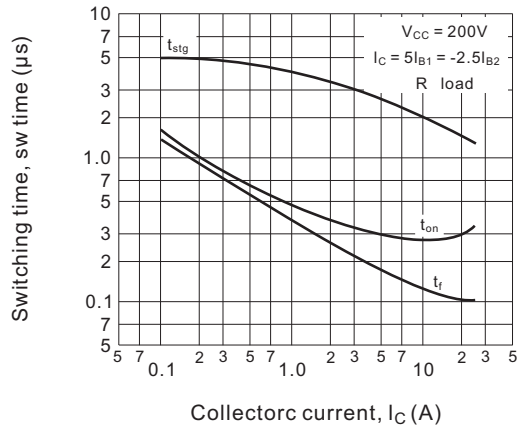


Fig.7 Forward bias SOA

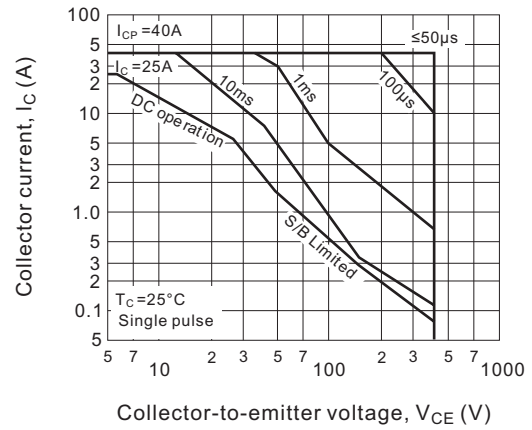


Fig.8 Reverse bias SOA

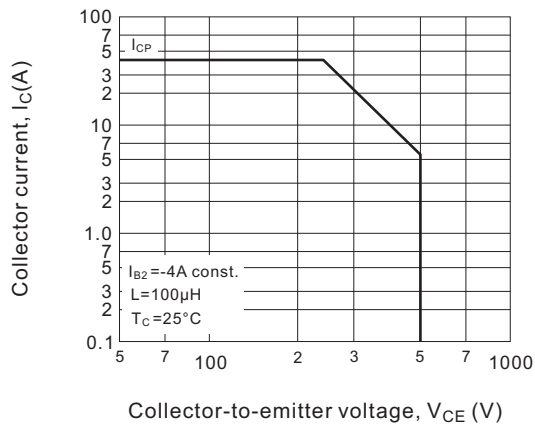


Fig.9 P_C - T_a derating

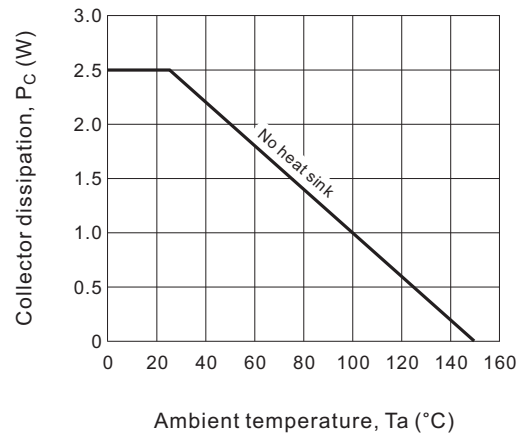


Fig.10 P_C - T_C derating

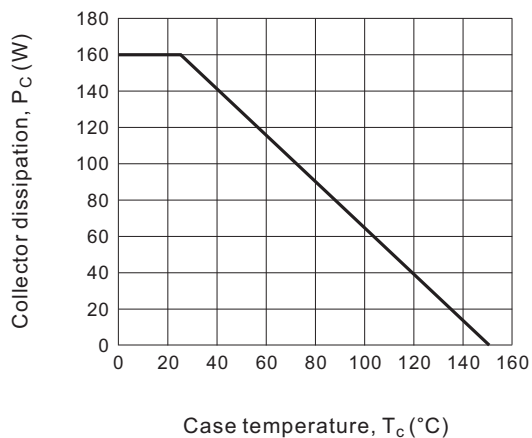


Fig.11 Thermal resistance

