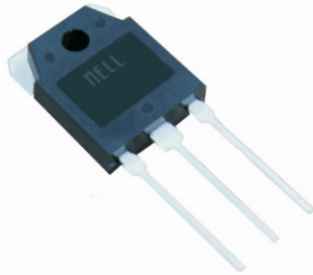


Silicon NPN triple diffusion planar transistor (High voltage switching transistor)

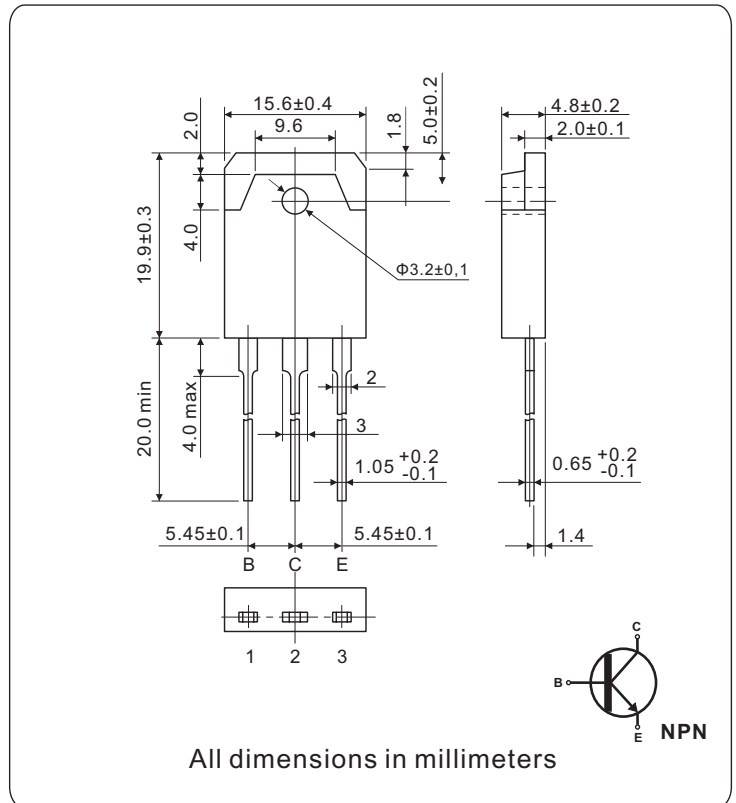
12A/400V/130W


TO-3P(B)
FEATURES

- High-speed switching
- High collector to base voltage V_{CBO}
- Satisfactory linearity of forward current transfer ratio h_{FE}
- TO-3P package which can be installed to the heat sink with one screw

APPLICATIONS

- Switching regulator and general purpose
- Ultrasonic generators
- High frequency inverters



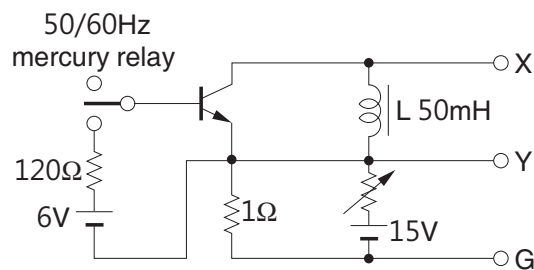
ABSOLUTE MAXIMUM RATINGS ($T_C = 25^\circ\text{C}$)			
SYMBOL	PARAMETER	VALUE	UNIT
V_{CBO}	Collector to base voltage	700	V
V_{CEO}	Collector to emitter voltage	400	
V_{EBO}	Emitter to base voltage	7	
I_C	Collector current (DC)	12	A
I_{CP}	Maximum peak collector current (pulse)	24	
I_B	Base current	6	
P_C	Collector power dissipation	$T_C = 25^\circ\text{C}$ 130	W
T_j	Junction temperature	150	°C
T_{stg}	Storage temperature	-55 to 150	

THERMAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$)			
SYMBOL	PARAMETER	VALUE	UNIT
$R_{th(j-c)}$	Thermal resistance, junction to case	1.55	°C/W

ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$) unless otherwise specified					
SYMBOL	PARAMETER	CONDITIONS	MIN	MAX	UNIT
I_{CBO}	Collector cutoff current	$V_{CBO} = 700\text{V}, I_E = 0$		1.0	mA
I_{EBO}	Emitter cutoff current	$V_{EBO} = 7\text{V}, I_C = 0$		1.0	
V_{CEO}	Collector to emitter voltage	$I_{CEO} = 10\text{mA}$	400		V
$V_{CEO(SUS)}^*$		$I_C = 1\text{A}, L = 50\text{mH}$			
V_{CBO}	Collector to base voltage	$I_{CBO} = 1\text{mA}$	700		
V_{EBO}	Emitter to base voltage	$I_{EBO} = 1\text{mA}$	7		
h_{FE}	Forward current transfer ratio (DC current gain)	$V_{CE} = 5\text{V}, I_C = 5\text{A}$	8	40	
		$V_{CE} = 5\text{V}, I_C = 8\text{A}$	6	30	
$V_{CE(sat)}$	Collector to emitter saturation voltage	$I_C = 5\text{A}, I_B = 1\text{A}$		1.0	V
		$I_C = 8\text{A}, I_B = 1.6\text{A}$		1.5	
$V_{BE(sat)}$	Base to emitter saturation voltage	$I_C = 5\text{A}, I_B = 1\text{A}$		1.2	
		$I_C = 8\text{A}, I_B = 1.6\text{A}$		1.6	
t_{on}	Turn-on time	$V_{CC} = 125\text{V}$ $I_C = 8\text{A}, I_{B1} = 1.6\text{A}, I_{B2} = -1.6\text{A}$ $R_L = 20\Omega, P_W = 20\mu\text{s}$, Duty $\leq 2\%$		1.1	μs
t_{stg}	Storage time			3	
t_f	Fall time			0.7	

*Pulse test: $P_W \leq 300\mu\text{s}$, duty cycle $\leq 2\%$

* $V_{CEO(SUS)}$ Test circuit



• Switching time test circuit

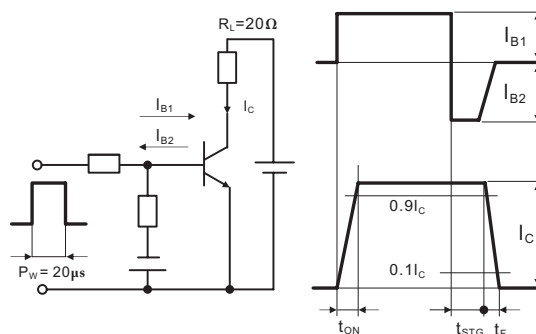


Fig.1 Dc current gain

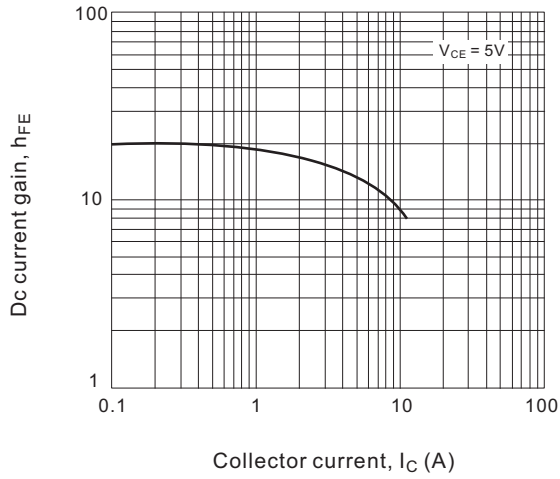


Fig.2 Base and collector saturation voltage

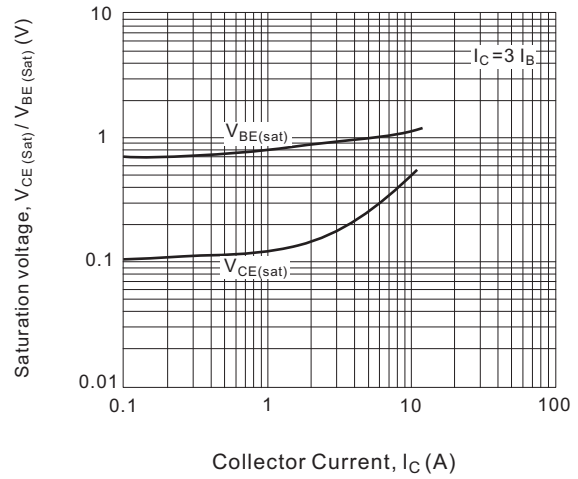


Fig.3 Collector output capacitance

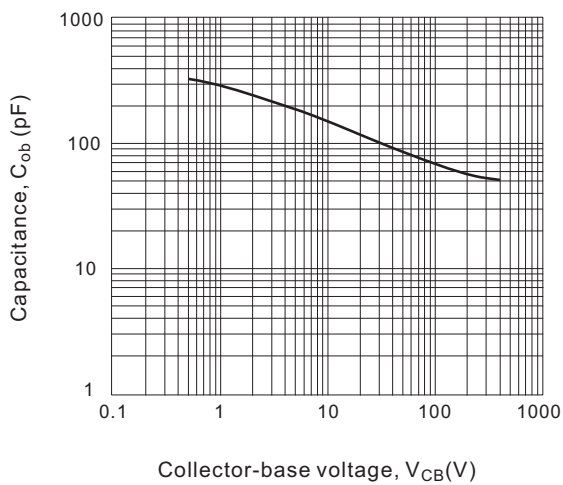


Fig.4 Turn-on time

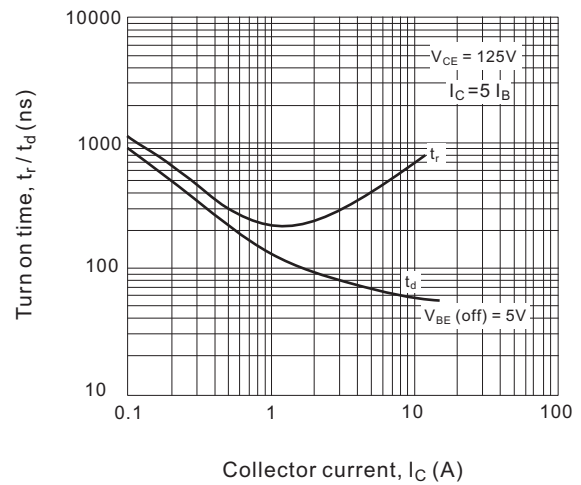


Fig.5 Turn off time

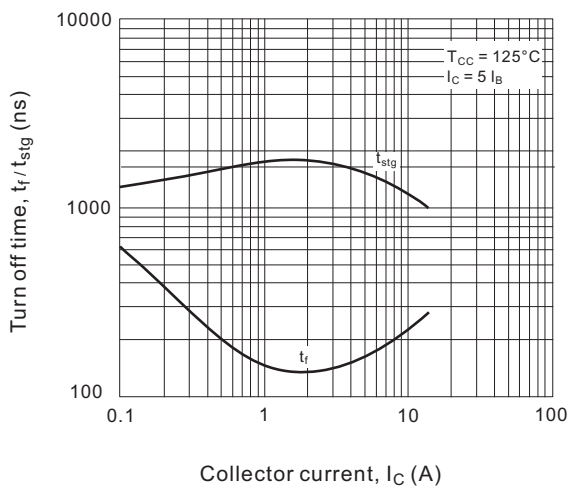


Fig.6 Forward bias safe operating area

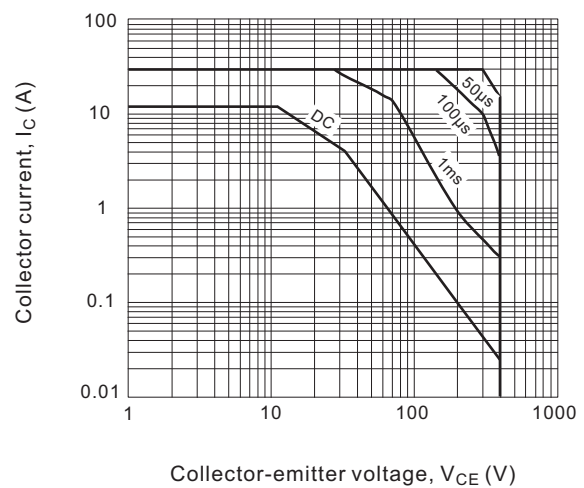


Fig.7 Reverse bias safe operating area

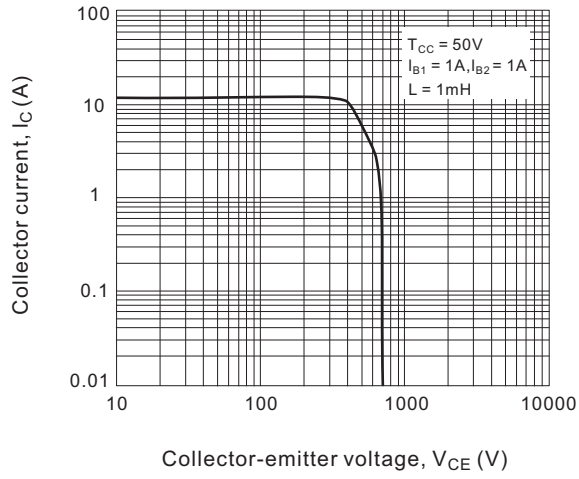


Fig.8 Power derating

