

## High Voltage Fast-Switching NPN Power Transistor

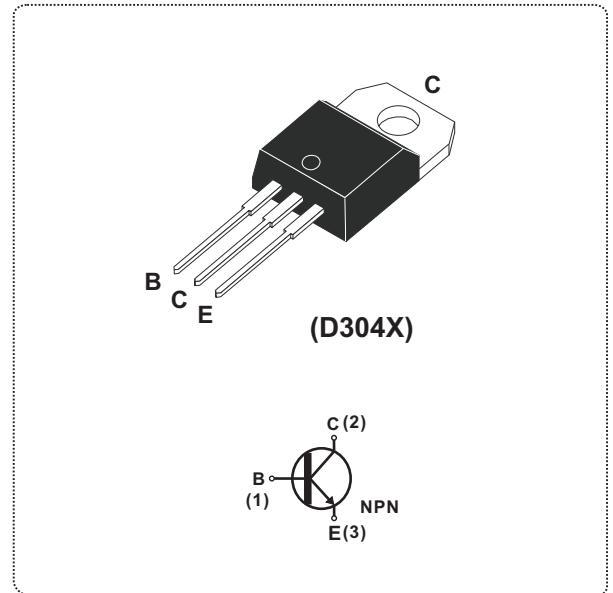
### 12A/400V/100W

**FEATURES**

- High-speed switching
- High breakdown voltage
- High current capability
- High reliability

**APPLICATIONS**

- Electronic ballasts, energy-saving light
- High frequency power transformer
- High frequency switching power supply
- Common power amplifier



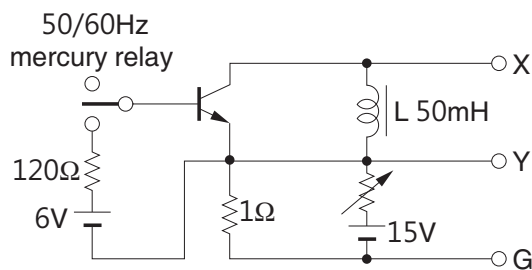
ABSOLUTE MAXIMUM RATINGS ( $T_C = 25^\circ\text{C}$ )			
SYMBOL	PARAMETER	VALUE	UNIT
$V_{CBO}$	Collector to base voltage ( $I_E=0$ )	450	V
$V_{CEO}$	Collector to emitter voltage ( $I_B=0$ )	400	
$V_{CES}$	Collector to emitter voltage ( $V_{BE}=0$ )	450	
$V_{EBO}$	Emitter to base voltage	9	
$I_C$	Collector current	12	A
$I_{CM}^*$	Peak Collector current	24	
$I_B$	Base current	6	
$I_{BM}^*$	Peak Base current	12	
$P_C$	Collector power dissipation	$T_C = 25^\circ\text{C}$ 100	W
$T_j$	Junction temperature	150	$^\circ\text{C}$
$T_{stg}$	Storage temperature	-55 to 150	

\*Pulse test: pulse width = 5.0ms, duty cycle < 10%

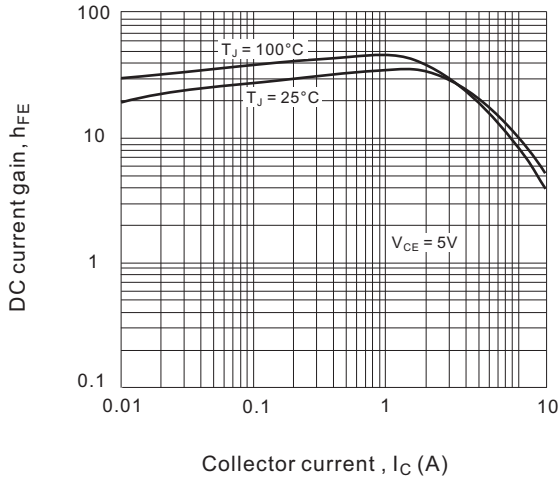
THERMAL CHARACTERISTICS ( $T_C = 25^\circ\text{C}$ )			
SYMBOL	PARAMETER	VALUE	UNIT
$R_{th(j-c)}$	Thermal resistance, junction to case	1.25	$^\circ\text{C}/\text{W}$

ELECTRICAL CHARACTERISTICS ( $T_C = 25^\circ\text{C}$ )					
SYMBOL	PARAMETER	CONDITIONS	MIN	MAX	UNIT
$I_{CBO}$	Collector cutoff current	$V_{CBO} = 450\text{V}, I_E = 0$		100	$\mu\text{A}$
$I_{CEO}$		$V_{CEO} = 400\text{V}, I_B = 0$		50	
$I_{EBO}$	Emitter cutoff current	$V_{EBO} = 9\text{V}, I_C = 0$		1.0	
$V_{(BR)CEO}$	Collector to emitter breakdown voltage	$I_C = 10\text{mA}, I_B = 0$	400		V
$V_{CEO(SUS)}^*$	Collector to emitter sustaining voltage	$I_C = 1\text{A}, L = 50\text{mH}$			
$V_{(BR)CBO}$	Collector to base breakdown voltage	$I_C = 1\text{mA}, I_E = 0$	450		
$V_{(BR)EBO}$	Emitter to base breakdown voltage	$I_E = 1\text{mA}, I_C = 0$	9		
$h_{FE}$	Forward current transfer ratio (DC current gain)	$V_{CE} = 5\text{V}, I_C = 5\text{A}$	8	40	
		$V_{CE} = 5\text{V}, I_C = 8\text{A}$	5		
$V_{CE(sat)}$	Collector to emitter saturation voltage	$I_C = 5\text{A}, I_B = 1\text{A}$		0.8	V
		$I_C = 8\text{A}, I_B = 1.6\text{A}$		2.2	
$V_{BE(sat)}$	Base to emitter saturation voltage	$I_C = 5\text{A}, I_B = 1\text{A}$		1.6	
$t_{on}$	Turn-on time	$V_{CC} = 24\text{V}, I_C = 5\text{A}$ $I_{B1} = -I_{B2} = 1\text{A}$		0.7	$\mu\text{S}$
$t_{stg}$	Storage time			3.0	
$t_f$	Fall time			0.7	
$f_T$	Trasistion frequency	$V_{CE} = 10\text{V}, I_C = 0.5\text{A}$ $f = 1.0\text{MHz}$	2.5		MHz

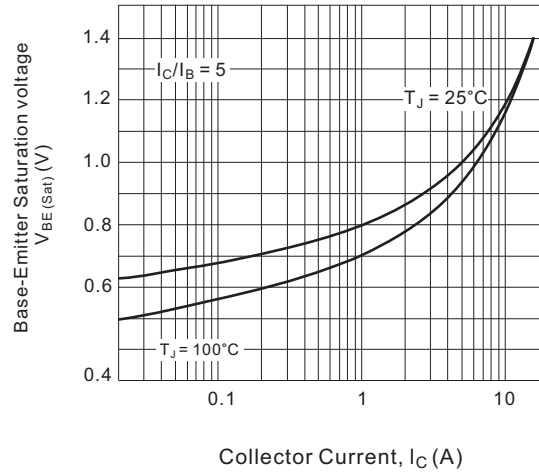
\* $V_{CEO(sus)}$  Test circuit



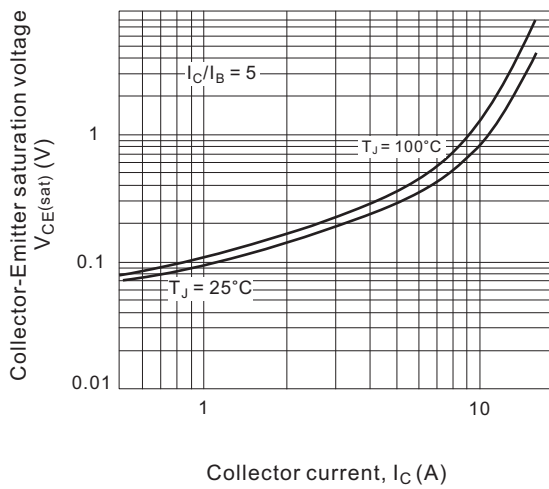
**Fig.1 DC Current gain**



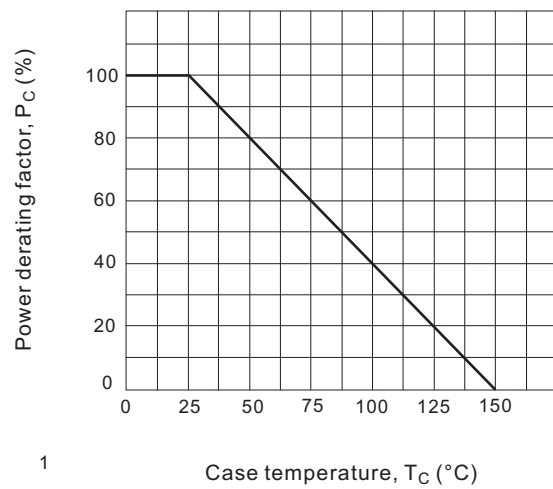
**Fig.2 Base - Emitter saturation voltage**



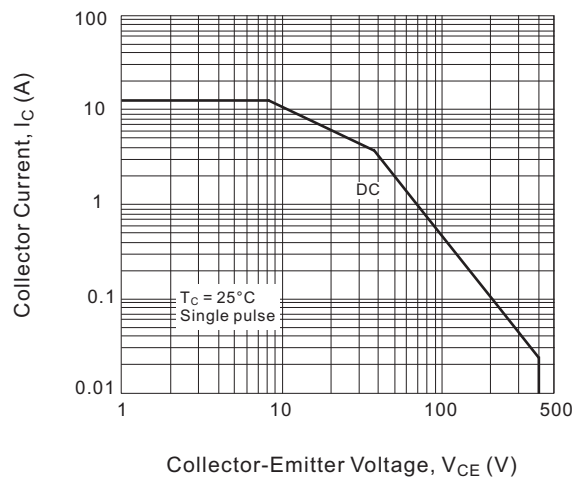
**Fig.3 Collector-Emitter saturation voltage**



**Fig.4 Power derating**



**Fig.5 Safe operating area (SOA)**



**Case Style**

