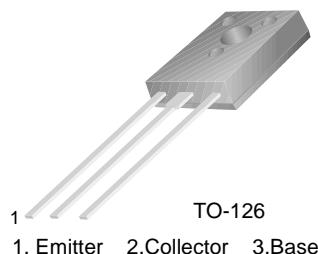


## High Speed High Voltage Switching Industrial Use

### NPN Epitaxial Silicon Transistor



#### Absolute Maximum Ratings $T_C=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Value	Units
$V_{CBO}$	Collector-Base Voltage	500	V
$V_{CEO}$	Collector-Emitter Voltage	400	V
$V_{EBO}$	Emitter-Base Voltage	7	V
$I_C$	Collector Current (DC)	0.5	A
$I_{CP}$	*Collector Current (Pulse)	1	A
$I_B$	Base Current (DC)	0.25	A
$P_C$	Collector Dissipation ( $T_a=25^\circ\text{C}$ )	1	W
$P_C$	Collector Dissipation ( $T_C=25^\circ\text{C}$ )	10	W
$T_J$	Junction Temperature	150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature	- 55 ~ 150	$^\circ\text{C}$

\*  $PW \leq 300\mu\text{s}$ , Duty Cycle  $\leq 10\%$

#### Electrical Characteristics $T_C=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Test Condition	Min.	Max.	Units
$V_{CEQ(sus)}$	Collector-Emitter Sustaining Voltage	$I_C = 0.3\text{A}$ , $I_{B1} = 0.06\text{A}$ , $L = 10\text{mH}$	400		V
$V_{CEX(sus)1}$	Collector-Emitter Sustaining Voltage	$I_C = 0.3\text{A}$ , $I_{B1} = -I_{B2} = 0.06\text{A}$ $V_{BE(off)} = -5\text{V}$ , $L = 10\text{mH}$ , Clamped	450		V
$V_{CEX(sus)2}$	Collector-Emitter Sustaining Voltage	$I_C = 0.6\text{A}$ , $I_{B1} = 0.2\text{A}$ , $I_{B2} = -0.06\text{A}$ $V_{BE(off)} = -5\text{V}$ , $L = 10\text{mH}$ , Clamped	400		V
$I_{CBO}$	Collector Cut-off Current	$V_{CB} = 400\text{V}$ , $I_E = 0$		10	$\mu\text{A}$
$I_{CER}$	Collector Cut-off Current	$V_{CE} = 400\text{V}$ , $R_{BE} = 51\Omega$ , $T_C = 125^\circ\text{C}$		1	mA
$I_{CEX1}$	Collector Cut-off Current	$V_{CE} = 400\text{V}$ , $R_{BE(off)} = -1.5\text{V}$		10	$\mu\text{A}$
$I_{CEX2}$	Collector Cut-off Current	$V_{CE} = 400\text{V}$ , $R_{BE(off)} = -1.5\text{V}$ @ $T_C = 125^\circ\text{C}$		1	mA
$I_{EBO}$	Emitter Cut-off Current	$V_{EB} = 5\text{V}$ , $I_C = 0$		10	$\mu\text{A}$
$h_{FE1}$ $h_{FE2}$	* DC Current Gain	$V_{CE} = 5\text{V}$ , $I_C = 0.05\text{A}$ $V_{CE} = 5\text{V}$ , $I_C = 0.3\text{A}$	20 10	80	
$V_{CE(sat)}$	* Collector-Emitter Saturation Voltage	$I_C = 0.3\text{A}$ , $I_B = 0.06\text{A}$		1	V
$V_{BE(sat)}$	* Base-Emitter Saturation Voltage	$I_C = 0.3\text{A}$ , $I_B = 0.06\text{A}$		2	V
$t_{ON}$	Turn ON Time	$V_{CC} = 150\text{V}$ , $I_C = 0.3\text{A}$		1	$\mu\text{s}$
$t_{STG}$	Storage Time	$I_{B1} = -I_{B2} = 0.06\text{A}$ , $R_L = 500\Omega$		2.5	$\mu\text{s}$
$t_F$	Fall Time	$PW = 50\mu\text{s}$ , Duty Cycle $\leq 2\%$		1	$\mu\text{s}$

\* Pulse Test:  $PW \leq 350\mu\text{s}$ , Duty Cycle  $\leq 2\%$  Pulsed

#### $h_{FE}$ Classification

Classification	R	O	Y
$h_{FE1}$	20 ~ 40	30 ~ 60	40 ~ 80

# Typical Characteristics

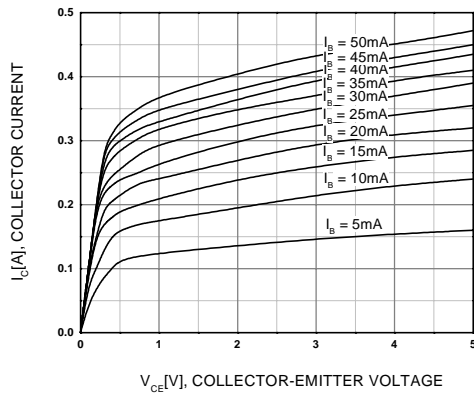


Figure 1. Static Characteristic

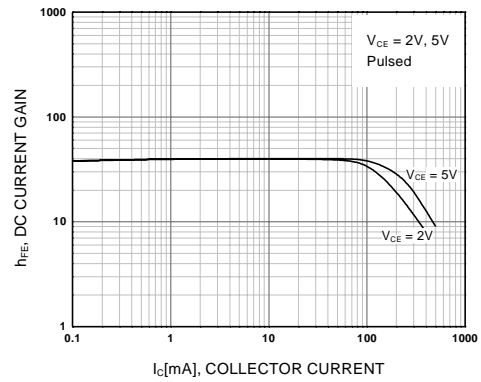


Figure 2. DC current Gain

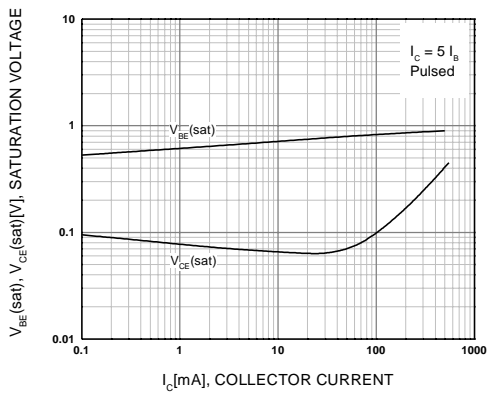


Figure 3. Base-Emitter Saturation Voltage  
Collector-Emitter Saturation Voltage

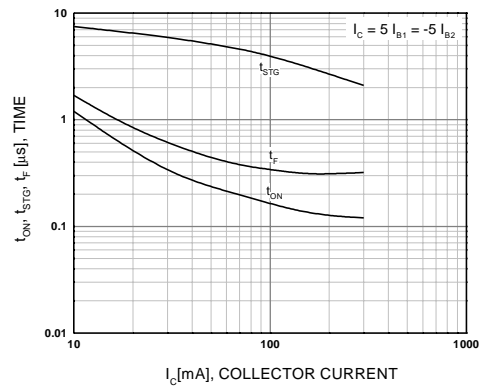


Figure 4. Switching Time

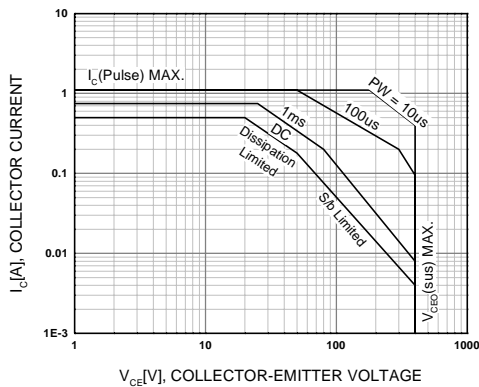


Figure 5. Safe Operating Area

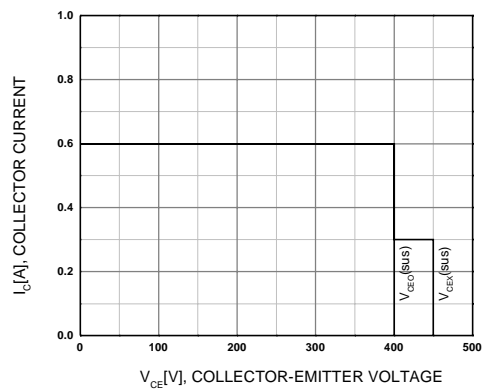


Figure 6. Reverse Bias Safe Operating Area

## Typical Characteristics (Continued)

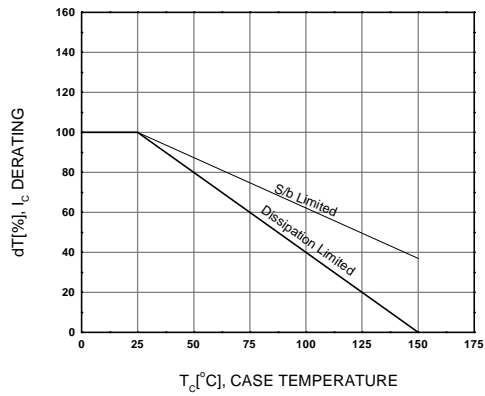


Figure 7. Derating Curve of Safe Operating Area

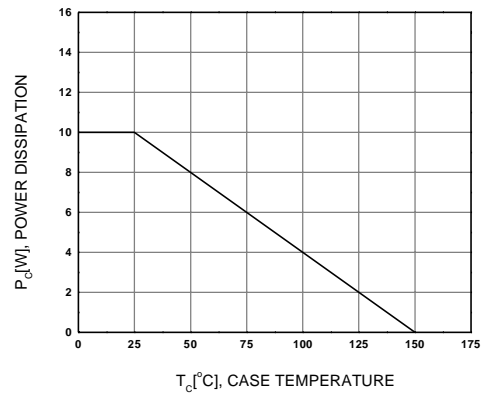


Figure 8. Power Derating

[illegible]

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