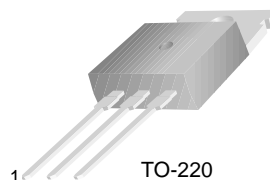


KSC2333

KSC2333

High Speed Switching Application

- Low Collector Saturation Voltage
- Specified of Reverse Biased SOA With Inductive Load



1.Base 2.Collector 3.Emitter

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)	2	A
I_{CP}	*Collector Current (Pulse)	4	A
I_B	Base Current (DC)	1	A
P_C	Collector Dissipation ($T_C=25^\circ\text{C}$)	15	W
T_J	Junction Temperature	150	$^\circ\text{C}$
T_{STG}	Storage Temperature	- 55 ~ 150	$^\circ\text{C}$

* $PW \leq 350\mu\text{s}$, Duty Cycle $\leq 10\%$

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

Symbol	Parameter	Test Condition	Min.	Max.	Units
$V_{CEO(sus)}$	Collector-Emitter Sustaining Voltage	$I_C = 0.5\text{A}$, $I_B = 0.1\text{A}$, $L = 1\text{mH}$	400		V
$V_{CEX(sus)1}$	Collector-Emitter Sustaining Voltage	$I_C = 0.5\text{A}$, $I_{B1} = -I_{B2} = 0.1\text{A}$ $T_C = 125^\circ\text{C}$, $L = 180\mu\text{H}$, clamped	450		V
$V_{CEX(sus)2}$	Collector-Emitter Sustaining Voltage	$I_C = 1\text{A}$, $I_{B1} = 0.2\text{A}$, $-I_{B2} = 0.2\text{A}$ $T_C = 125^\circ\text{C}$, $L = 180\mu\text{H}$, clamped	400		V
I_{CBO}	Collector Cut-off Current	$V_{CB} = 400\text{V}$, $I_E = 0$		10	μA
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	$V_{CE} = 400\text{V}$, $V_{BE(off)} = -5\text{V}$		10	μA
I_{CEX2}	Collector Cut-off Current	$V_{CE} = 400\text{V}$, $V_{BE(off)} = -5\text{V}$ @ $T_C = 125^\circ\text{C}$		1	mA
I_{EBO}	Emitter Cut-off Current	$V_{EB} = 5\text{V}$, $I_C = 0$		10	μA
h_{FE1} h_{FE2}	* DC Current Gain	$V_{CE} = 5\text{V}$, $I_C = 0.1\text{A}$ $V_{CE} = 5\text{V}$, $I_C = 0.5\text{A}$	20 10	80	
$V_{CE(sat)}$	* Collector-Emitter Saturation Voltage	$I_C = 0.5\text{A}$, $I_B = 0.1\text{A}$		1	V
$V_{BE(sat)}$	* Base-Emitter Saturation Voltage	$I_C = 0.5\text{A}$, $I_B = 0.1\text{A}$		1.2	V
t_{ON}	Turn ON Time	$V_{CC} = 150\text{V}$, $I_C = 0.5\text{A}$ $I_{B1} = -I_{B2} = 0.1\text{A}$ $R_L = 300\Omega$		1	μs
t_{STG}	Storage Time			2.5	μs
t_F	Fall Time			1	μs

* 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

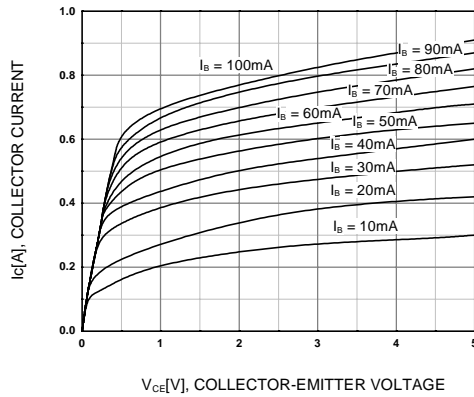


Figure 1. Static Characteristic

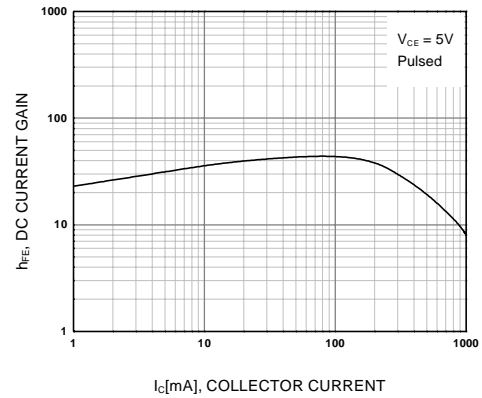


Figure 2. DC current Gain

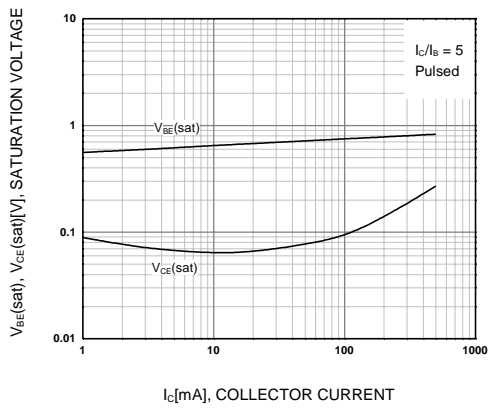


Figure 3. Collector-Emitter Saturation Voltage
Base-Emitter Saturation Voltage

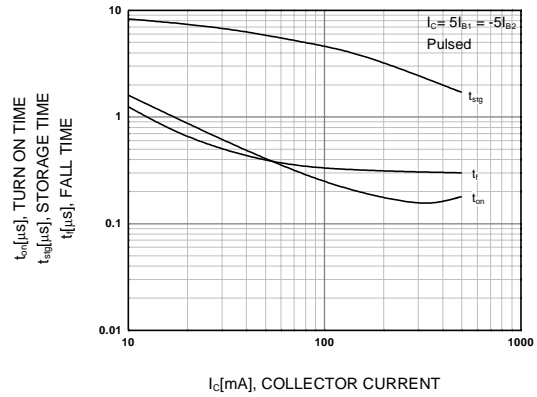


Figure 4. Turn On, Storage and Fall Time
vs Collector Current

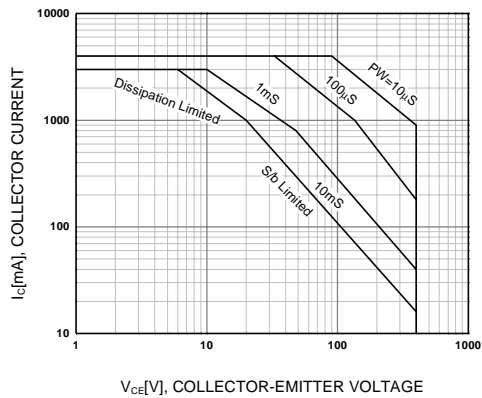


Figure 5. Forward Bias Safe Operating Area

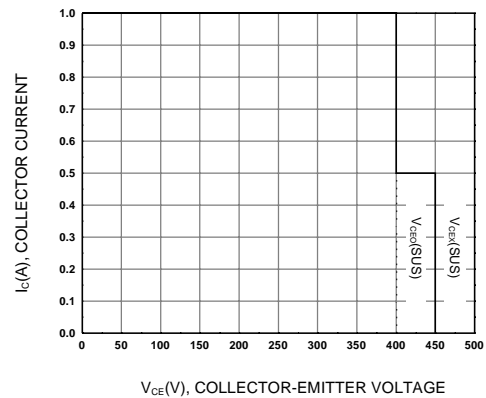


Figure 6. Reverse Bias Safe Operating Area

Typical characteristics (Continued)

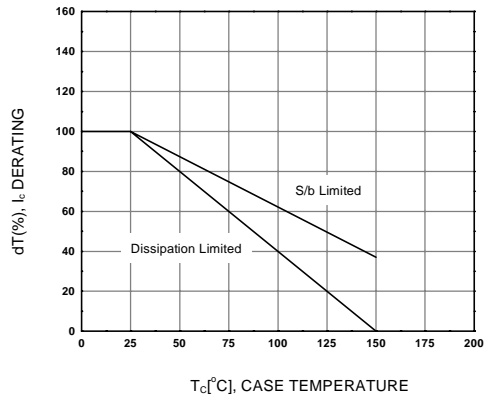


Figure 7. Derating Curve of Safe Operating Areas

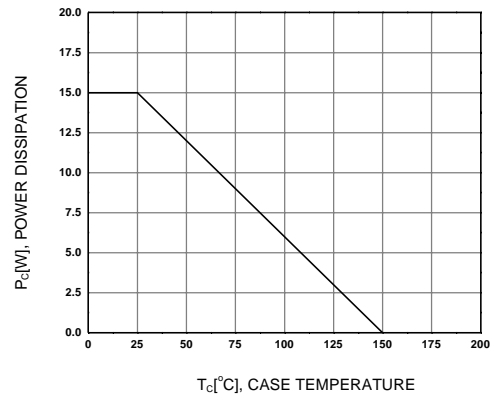
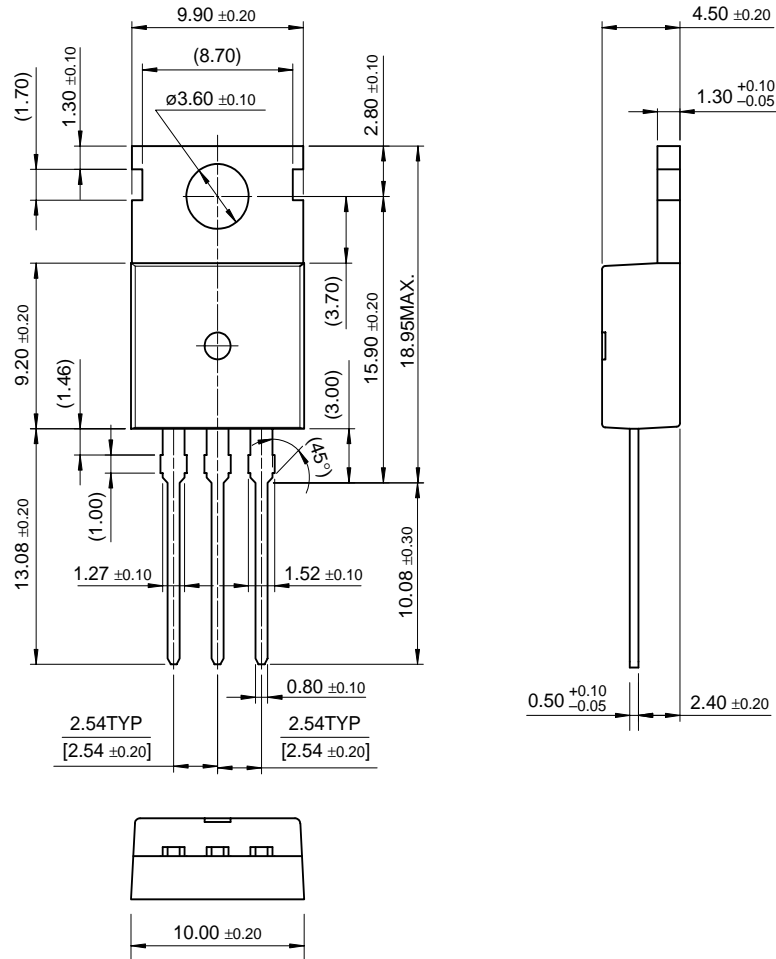


Figure 8. Power Derating

Package Dimensions

TO-220



Dimensions in Millimeters

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