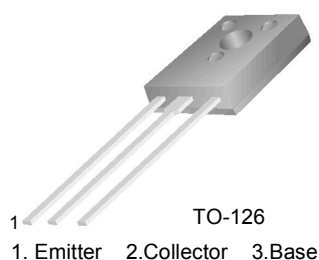


# KSE13003 NPN Silicon Transistor

## High Voltage Switch Mode Applications

- High Voltage Capability
- High Speed Switching
- Suitable for Switching Regulator and Motor Control



## Absolute Maximum Ratings\* T<sub>C</sub> = 25°C unless otherwise noted (notes\_1)

Symbol	Parameter	Value	Units
V <sub>CBO</sub>	Collector-Base Voltage	700	V
V <sub>CEO</sub>	Collector-Emitter Voltage	400	V
V <sub>EBO</sub>	Emitter-Base Voltage	9	V
I <sub>C</sub>	Collector Current (DC)	1.5	A
I <sub>CP</sub>	Collector Current (Pulse)	3	A
I <sub>B</sub>	Base Current	0.75	A
P <sub>C</sub>	Collector Dissipation (T <sub>C</sub> = 25°C)	20	W
T <sub>J</sub>	Junction Temperature	150	°C
T <sub>STG</sub>	Storage Temperature Range	-65 ~ 150	°C

\* These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

NOTES\_1:

1) These ratings are based on a maximum junction temperature of 150°C.

2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

## h<sub>FE</sub> Classification

Classification	H1	H2	H3
h <sub>FE</sub> *	9 ~ 16	14~ 21	19 ~ 26

\* Test on V<sub>CE</sub> = 2V, I<sub>C</sub> = 0.5A.

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

Symbol	Parameter	Conditions	Min.	Typ.	Max	Units
$BV_{CEO}$	Collector-Emitter Breakdown Voltage	$I_C = 5\text{mA}, I_B = 0$	400			V
$I_{EBO}$	Emitter Cut-off Current	$V_{EB} = 9\text{V}, I_C = 0$			10	$\mu\text{A}$
$h_{FE}$	*DC Current Gain	$V_{CE} = 2\text{V}, I_C = 0.5\text{A}$ $V_{CE} = 2\text{V}, I_C = 1\text{A}$	8 5		40	
$V_{CE(sat)}$	*Collector Emitter Saturation Voltage	$I_C = 0.5\text{A}, I_B = 0.1\text{A}$ $I_C = 1\text{A}, I_B = 0.25\text{A}$ $I_C = 1.5\text{A}, I_B = 0.5\text{A}$			0.5 1 3	V V V
$V_{BE(sat)}$	*Base Emitter Saturation Voltage	$I_C = 0.5\text{A}, I_B = 0.1\text{A}$ $I_C = 1\text{A}, I_B = 0.25\text{A}$			1 1.2	V V
$C_{ob}$	Output Capacitance	$V_{CB} = 10\text{V}, f = 0.1\text{MHz}$		21		pF
$f_T$	Current Gain Bandwidth Product	$V_{CE} = 10\text{V}, I_C = 0.1\text{A}$	4			MHz
$t_{ON}$	Turn On Time	$V_{CC} = 125\text{V}, I_C = 1\text{A}$			1.1	ms
$t_{STG}$	Storage Time	$I_{B1} = 0.2\text{A}, I_{B2} = -0.2\text{A}$ $R_L = 125\text{W}$			4.0	ms
$t_F$	Fall Time				0.7	ms

\* Pulse Test: Pulse Width=5ms, Duty Cycle $\leq$ 10%**Package Marking and Ordering Information**

Device Item (notes_2)	Device Marking	Package	Packing Method	Remarks
KSE13003H1ASTU	1 E13003	TO-126	TUBE	
KSE13003H2ASTU	2 E13003	TO-126	TUBE	
KSE13003H3ASTU	3 E13003	TO-126	TUBE	

Notes\_2 :

- 1) The Affix "-H1/-H2/-H3" means the  $h_{FE}$  classification.
- 2) The Suffix "-STU" means the TO126 short lead package and the Tube packing method, which can be on fairchildsemi website at <http://www.fairchildsemi.com>

### Typical Performance Characteristics

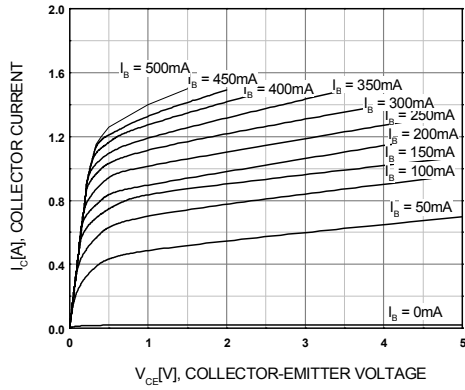


Figure 1. Static Characteristic

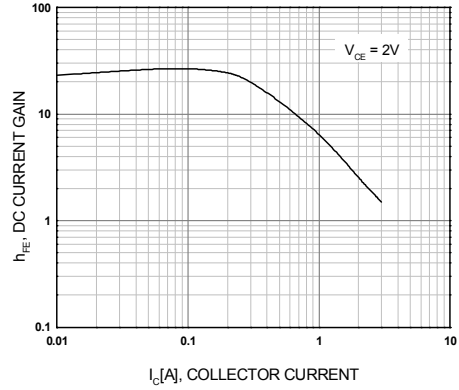


Figure 2. DC current Gain

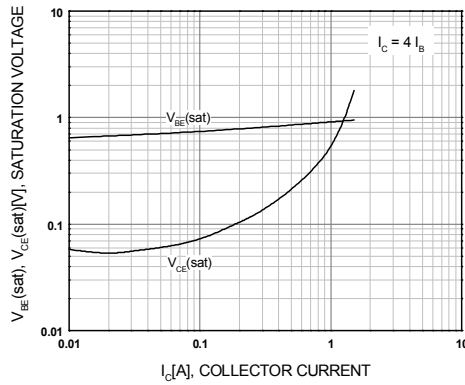


Figure 3. Base-Emitter Saturation Voltage  
Collector-Emitter Saturation Voltage

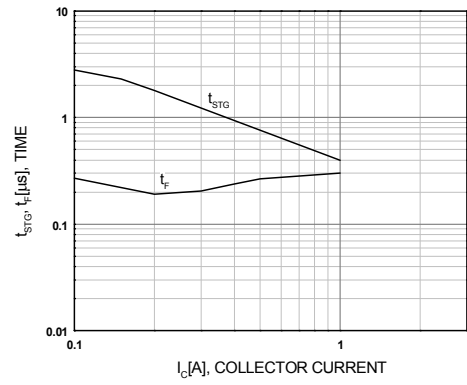


Figure 4. Switching Time

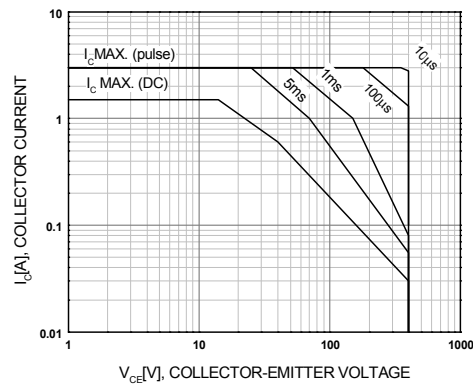


Figure 5. Safe Operating Area

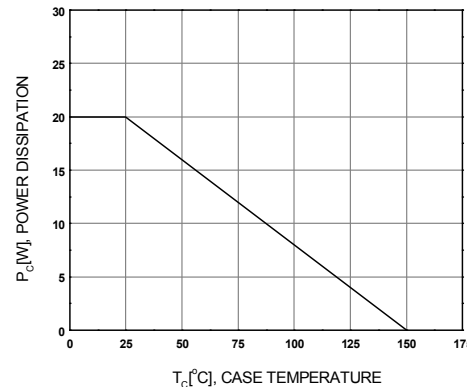







Figure 6. Power Derating



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