

# KSH13003A

**SemiHow**  
Know-How for Semiconductor

# KSH13003A

## High Voltage Switch Mode Applications


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

## Absolute Maximum Ratings TC=25°C unless otherwise noted

1.5 Amperes  
NPN Silicon Power Transistor  
30 Watts

CHARACTERISTICS	SYMBOL	RATING	UNIT
Collector-Base Voltage	$V_{CBO}$	700	V
Collector-Emitter Voltage	$V_{CEO}$	400	V
Emitter-Base Voltage	$V_{EBO}$	9	V
Collector Current(DC)	$I_C$	1.5	A
Collector Current(Pulse)	$I_{CP}$	3	A
Base Current	$I_B$	0.75	A
Collector Dissipation(Tc=25°C)	$P_C$	30	W
Junction Temperature	$T_J$	150	°C
Storage Temperature	$T_{STG}$	-65~150	°C

TO-220  
1. Base  
2. Collector  
3. Emitter



## Electrical Characteristics TC=25°C unless otherwise noted

CHARACTERISTICS	SYMBOL	Test Condition	Min	Typ.	Max	Unit
Collector-Base Breakdown Voltage	$V_{CBO}$	$I_C=500\mu A, I_E=0$	700			V
Collector-Emitter Breakdown Voltage	$V_{CEO}$	$I_C=5mA, I_B=0$	400			V
Emitter Cut-off Current	$I_{EBO}$	$V_{EB}=9V, I_C=0$			10	$\mu A$
*DC Current Gain	$h_{FE1}$ $h_{FE2}$	$V_{CE}=2V, I_C=0.5A$ $V_{CE}=2V, I_C=1A$	9 5		35	
*Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=0.5A, I_B=0.1A$ $I_C=1A, I_B=0.25A$ $I_C=1.5A, I_B=0.5A$			0.5 1.0 3.0	V
*Base-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=0.5A, I_B=0.1A$ $I_C=1A, I_B=0.25A$			1.0 1.2	V
Output Capacitance	$C_{ob}$	$V_{CB}=10V, f=0.1MHz$		21		pF
Current Gain Bandwidth Product	$f_T$	$V_{CE}=10V, I_C=0.1A$	4			MHz
Turn on Time	$t_{on}$	$V_{CC}=125V, I_C=1A$ $I_{B1}=0.2A, I_{B2}=-0.2A$ $R_L=125\Omega$			1.1	$\mu s$
Storage Time	$t_{stg}$				4.0	$\mu s$
Fall Time	$t_F$				0.7	$\mu s$

\* Pulse Test: Pulse Widths $\leq 300\mu s$ , Duty Cycles $\leq 2\%$

Note.

<b>hFE1 Classification</b>	R	9 ~ 16
	O	14 ~ 21
	Y	19 ~ 26
	G	25 ~ 35

Package Mark information.

<b>S</b> <b>YWW</b> <b>Z</b> <b>KSH13003A</b>	S	SemiHow Symbol
	YWW	Y; year code, WW; week code
	Z	hFE1 Classification

## Typical Characteristics

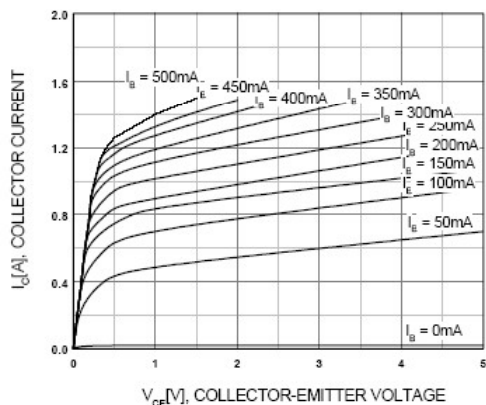


Figure 1. Static Characteristic

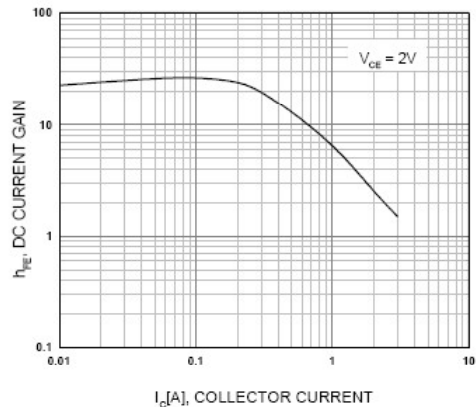


Figure 2. DC current Gain

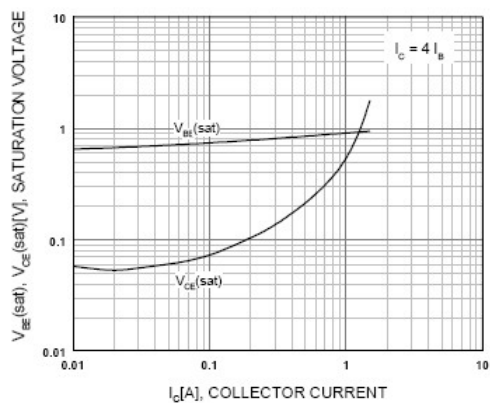


Figure 3. Base-Emitter Saturation Voltage  
Collector-Emitter Saturation Voltage

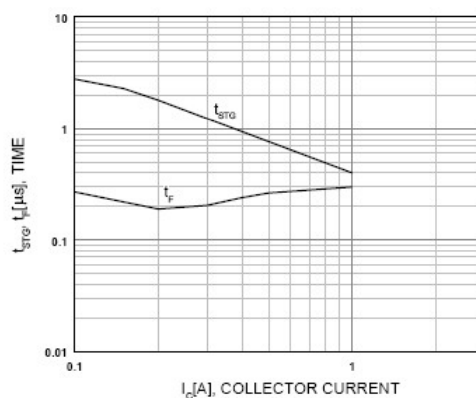


Figure 4. Switching Time

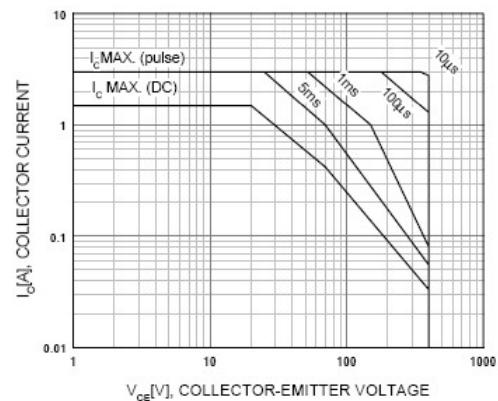


Figure 5. Safe Operating Area

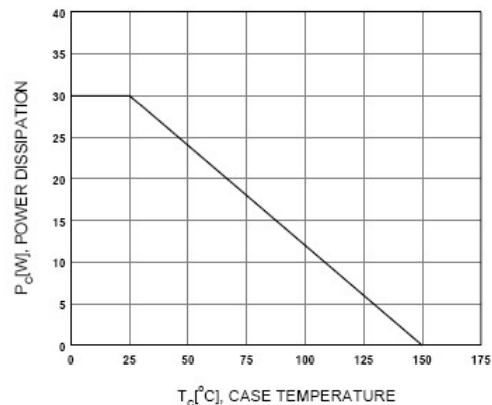
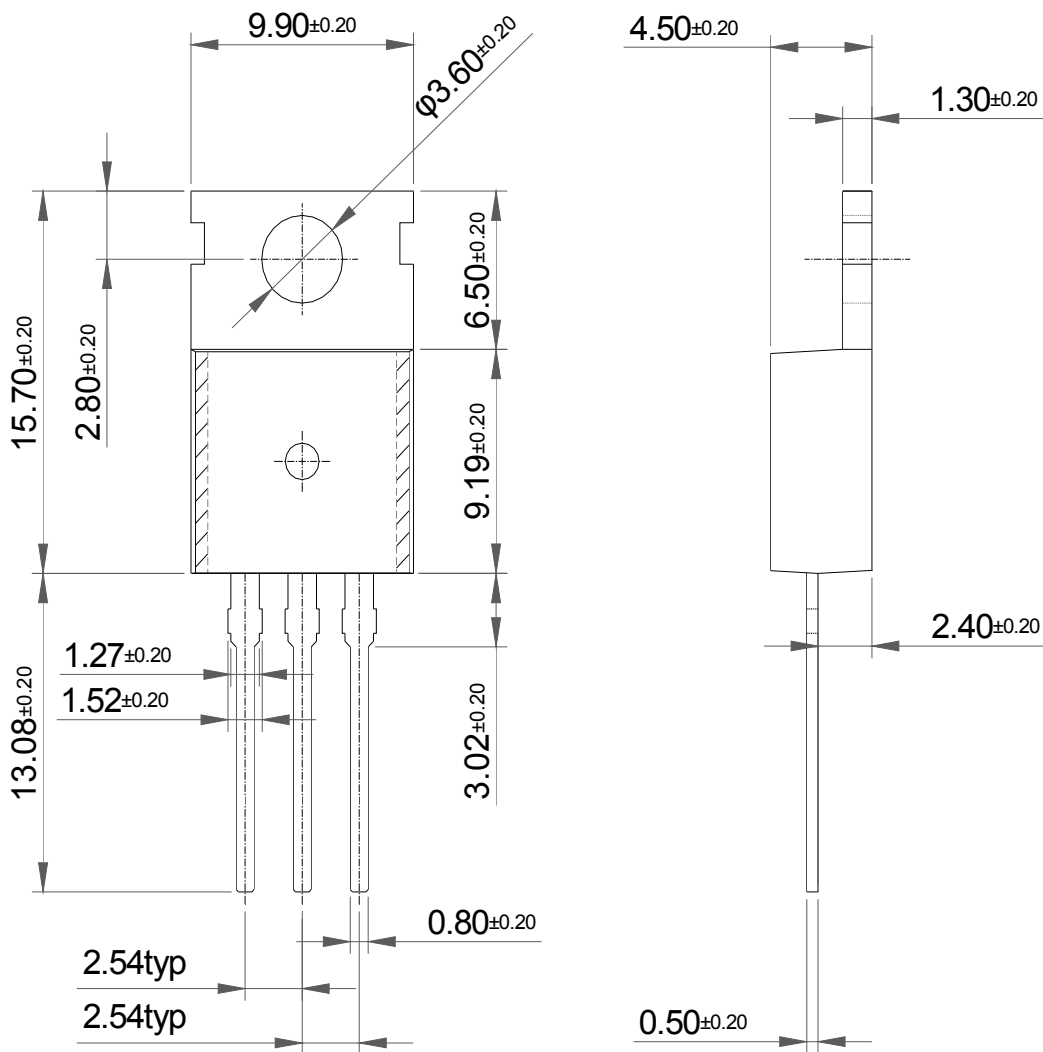


Figure 6. Power Derating

Package Dimension

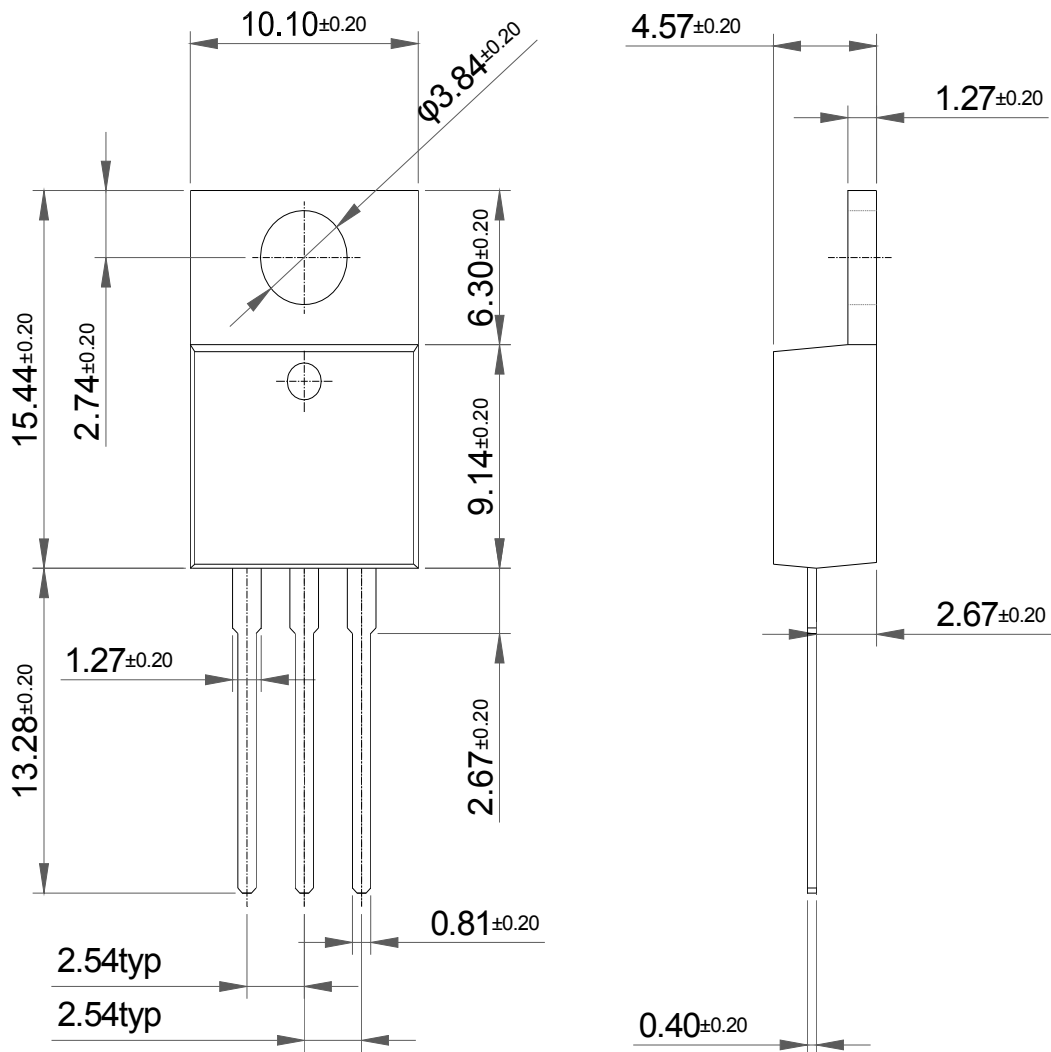
TO-220 (A)



Dimensions in Millimeters

Package Dimension

TO-220 (B)



Dimensions in Millimeters

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