

# KSH5027A

**SemiHow**  
Know-How for Semiconductor

# KSH5027A

## High Voltage and High Reliability


- High Speed Switching
- Wide SOA

3 Amperes  
 NPN Silicon Power Transistor  
 50 Watts

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

CHARACTERISTICS	SYMBOL	RATING	UNIT
Collector-Base Voltage	$V_{CBO}$	1100	V
Collector-Emitter Voltage	$V_{CEO}$	800	V
Emitter-Base Voltage	$V_{EBO}$	7	V
Collector Current(DC)	$I_C$	3	A
Collector Current(Pulse)	$I_{CP}$	10	A
Base Current	$I_B$	1.5	A
Collector Dissipation( $T_C=25^\circ\text{C}$ )	$P_C$	50	W
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-55~150	$^\circ\text{C}$

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



### Electrical Characteristics <sup>(1)</sup> $T_C=25^\circ\text{C}$ unless otherwise noted

CHARACTERISTICS	SYMBOL	Test Condition	Min	Typ.	Max	Unit
Collector-Base Breakdown Voltage	$V_{CBO}$	$I_C=1\text{mA}, I_E=0$	1100			V
Collector-Emitter Breakdown Voltage	$V_{CEO}$	$I_C=5\text{mA}, I_B=0$	800			V
Emitter-Base Breakdown Voltage	$V_{EBO}$	$I_E=1\text{mA}, I_C=0$	7			V
Collector-Emitter Sustaining Voltage	$I_{CEX(sus)}$	$I_C=1.5\text{A}, I_{B1}=-I_{B2}=0.3\text{A}$ $L=2\text{mH}, \text{Clamped}$	800			V
Collector Cutoff Current	$I_{CBO}$	$V_{CB}=800\text{V}, I_E=0$			10	$\mu\text{A}$
Emitter Cutoff Current	$I_{EBO}$	$V_{EB}=5\text{V}, I_C=0$			10	$\mu\text{A}$
DC Current Gain	$h_{FE1}$ $h_{FE2}$	$V_{CE}=5\text{V}, I_C=0.2\text{A}$ $V_{CE}=5\text{V}, I_C=1\text{A}$	10 8		40	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=1.5\text{A}, I_B=0.3\text{A}$			2	V
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=1.5\text{A}, I_B=0.3\text{A}$			1.5	V
Output Capacitance	$C_{ob}$	$V_{CB}=10\text{V}, I_E=0, f=0.1\text{MHz}$		60		pF
Current Gain Bandwidth Product	$f_T$	$V_{CE}=10\text{V}, I_C=0.2\text{A}$		15		MHz
Turn on Time	$t_{on}$	$V_{CC}=400\text{V}, I_C=5\text{A}$ $I_{B1}=-2.5\text{A}, I_{B2}=2\text{A}$ $R_L=200\Omega$			0.5	$\mu\text{s}$
Storage Time	$t_{stg}$				3.0	$\mu\text{s}$
Fall Time	$t_f$	(Note 2)			0.3	$\mu\text{s}$

#### Notes ;

- Pulse Test: Pulse Widths $\leq 300\mu\text{s}$ , Duty Cycles $\leq 2\%$
- Final Test Condition : UI9600,  $V_{CC}=5\text{V}$ ,  $I_C=0.5\text{A}$  ( $t_{stg}$  Class = A : 3.0-4.0, B : 4.0-5.0, C : 5.0-6.0)

<b>hFE1 Classification</b>	R	15 ~ 30	<b>S</b> <b>YWW Z</b> <b>KSH5027A</b>	S	SemiHow Symbol
	O	20 ~ 40		YWW	Y; year code, WW; week code
				Z	hFE1 Classification

# Typical Characteristics

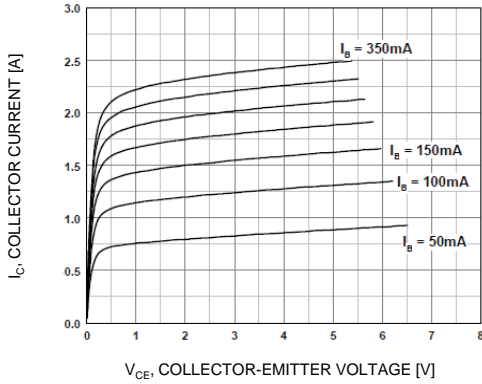


Figure 1. Static Characteristic

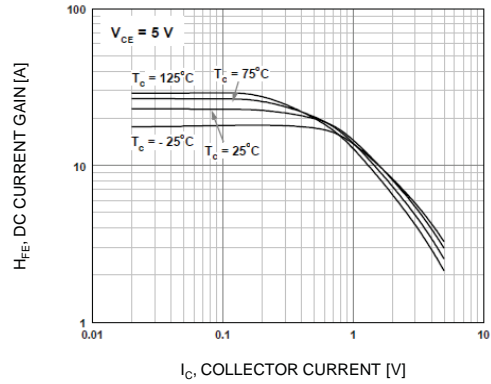


Figure 2. DC Current Gain

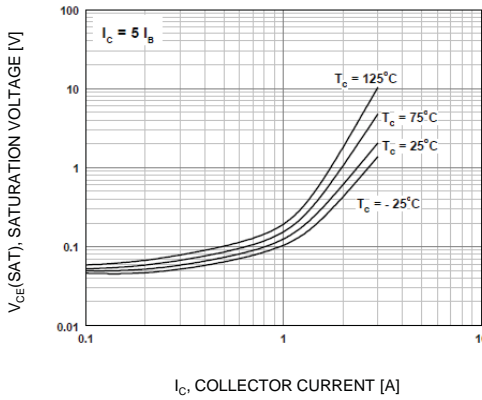


Figure 3. Collector-Emitter Saturation Voltage

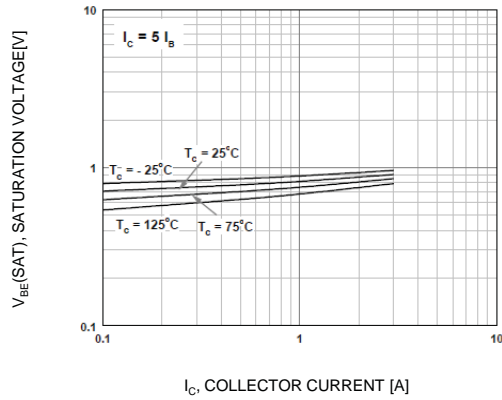


Figure 4. Base-Emitter Saturation Voltage

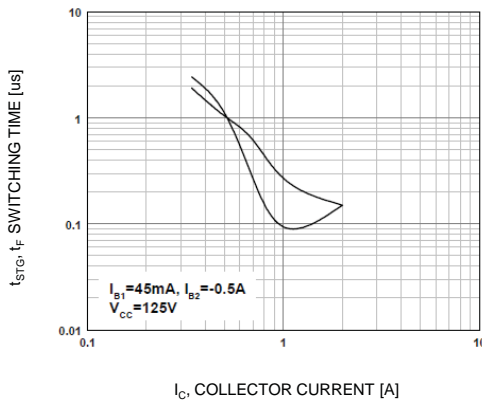


Figure 5. Resistive Load Switching Time

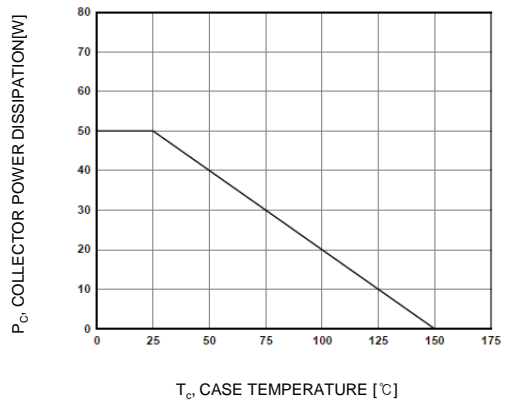


Figure 6. Power Derating

Typical Characteristics (Continued)

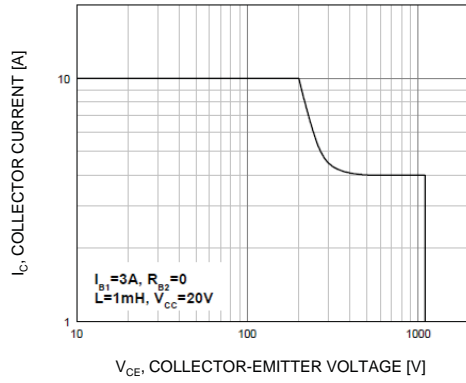


Figure 7. Reverse Biased Safe Operating Area

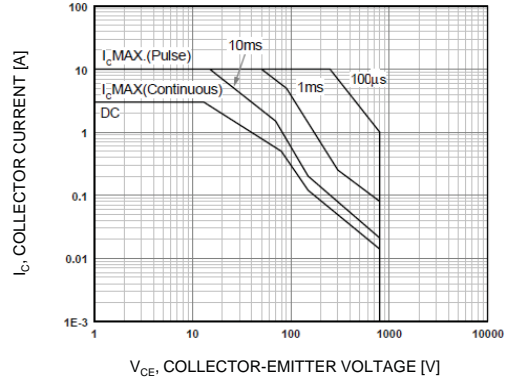
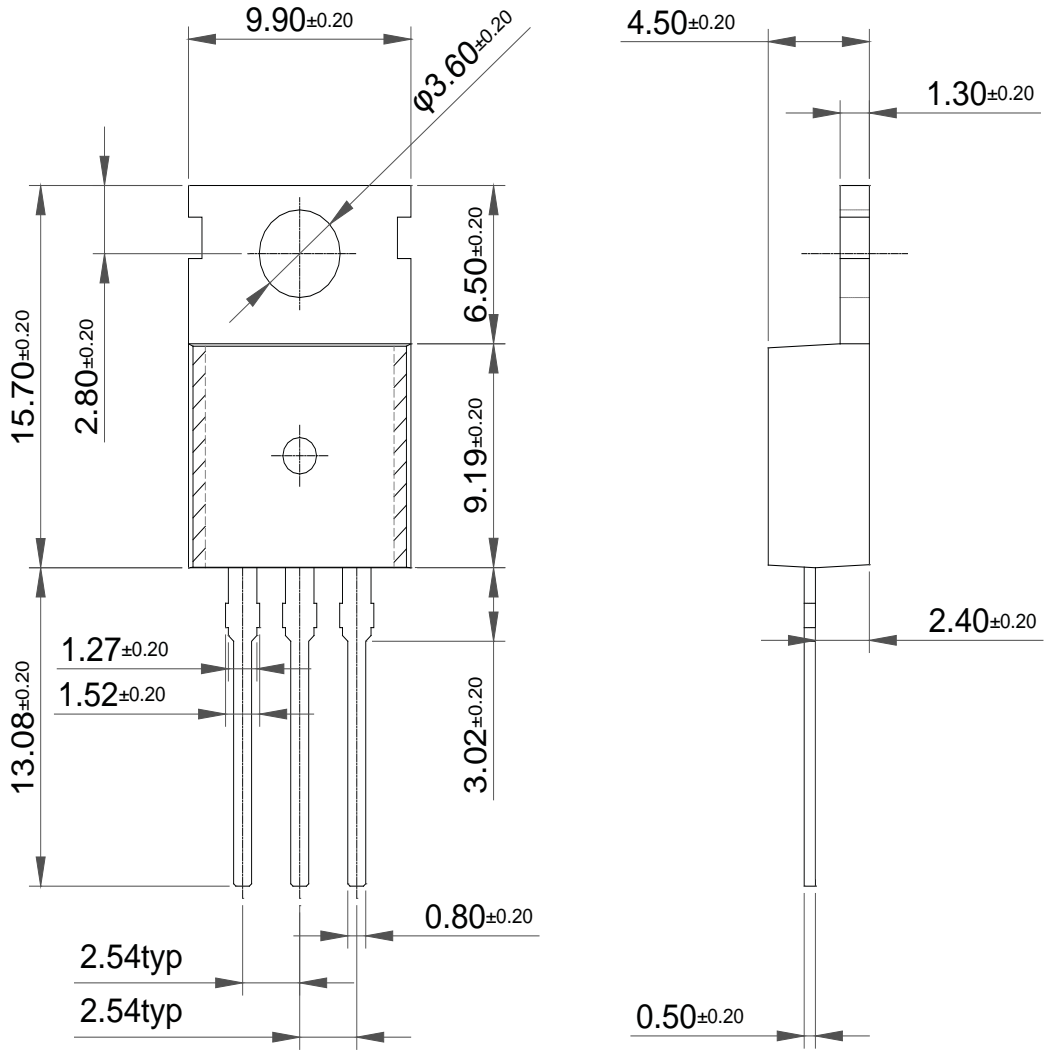


Figure 8. Forward Bias Safe Operating Area

Package Dimension

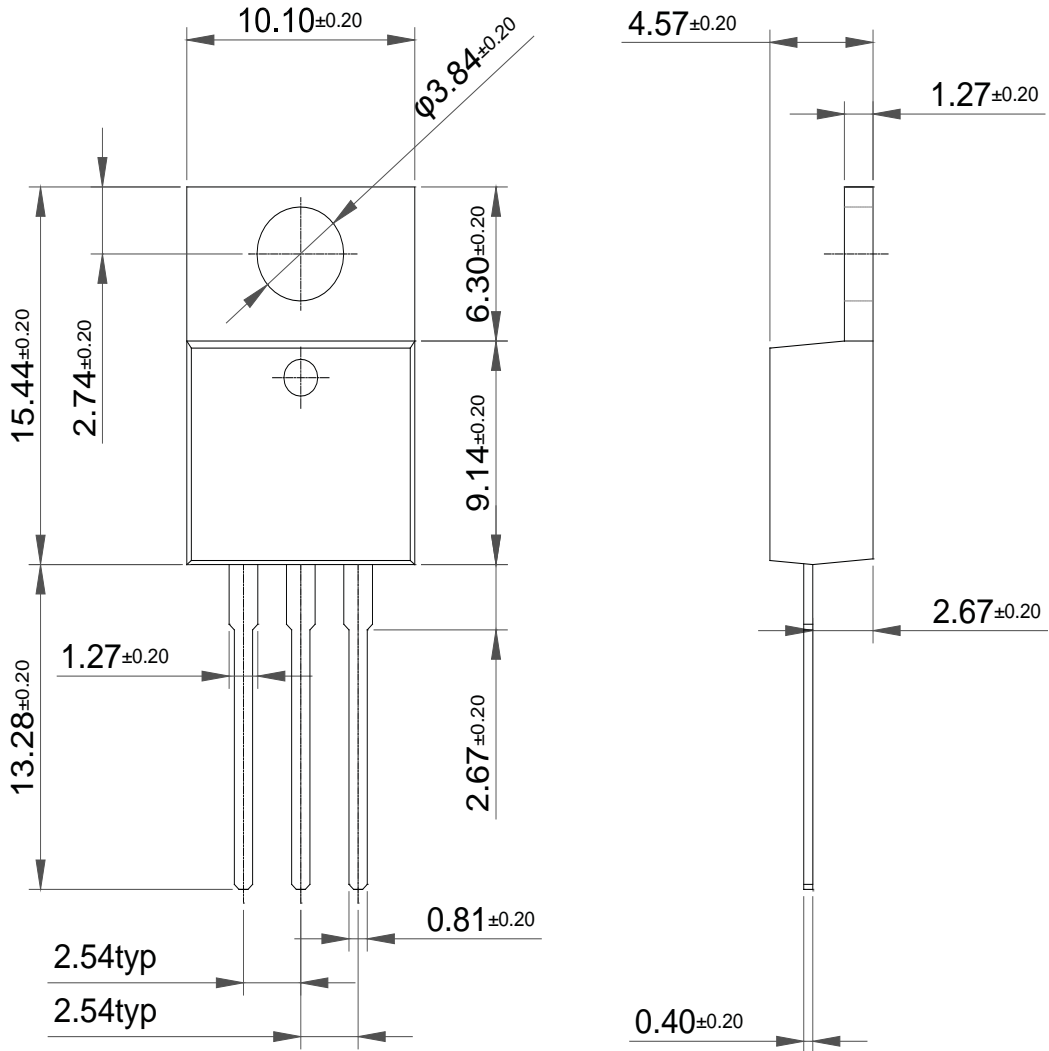
TO-220 (A)



Dimensions in Millimeters

Package Dimension

TO-220 (B)



Dimensions in Millimeters