

KSB13005AR

SemiHow
Know-How for Semiconductor

KSB13005AR

High Voltage Switch Mode Application

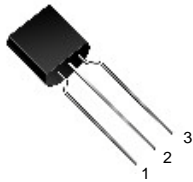
- High voltage, high speed power switching
- Suitable for switching regulator, inverters, motor controls

4 Amperes
NPN Silicon Power Transistor
2.8 Watts

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

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	4	A
Collector Current(Pulse)	I_{CP}	8	A
Base Current	I_B	2	A
Collector Dissipation($T_C=25^{\circ}\text{C}$)	P_C	2.8	W
Junction Temperature	T_J	150	$^{\circ}\text{C}$
Storage Temperature	T_{STG}	-65~150	$^{\circ}\text{C}$

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1. Emitter
2. Collector
3. Base



Electrical Characteristics ⁽¹⁾ $T_C=25^{\circ}\text{C}$ unless otherwise noted

CHARACTERISTICS	SYMBOL	Test Condition	Min	Typ.	Max	Unit
Collector-Emitter Sustaining Voltage	$V_{CEO(sus)}$	$I_C=10\text{mA}, I_B=0$	400			V
Emitter Cut-off Current	I_{EBO}	$V_{EB}=9\text{V}, I_C=0$			1	mA
DC Current Gain	h_{FE1} h_{FE2}	$V_{CE}=5\text{V}, I_C=1\text{A}$ $V_{CE}=5\text{V}, I_C=2\text{A}$	10 8		60 40	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=1\text{A}, I_B=0.2\text{A}$ $I_C=2\text{A}, I_B=0.5\text{A}$ $I_C=4\text{A}, I_B=1\text{A}$			0.5 0.6 1	V V V
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	$I_C=1\text{A}, I_B=0.2\text{A}$ $I_C=2\text{A}, I_B=0.5\text{A}$			1.2 1.6	V V
Output Capacitance	C_{ob}	$V_{CB}=10\text{V}, f=0.1\text{MHz}$		65		pF
Current Gain Bandwidth Product	f_T	$V_{CE}=10\text{V}, I_C=0.5\text{A}$	4			MHz
Turn on Time	t_{on}	$V_{CC}=125\text{V}, I_C=2\text{A}$			0.8	μs
Storage Time	t_{stg}	$I_{B1}=0.4\text{A}, I_{B2}=-0.4\text{A}$ $R_L=62.5\Omega$			4.0	μs
Fall Time	t_F	(Note 2)			0.9	μs

Notes ;

1. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$
2. Final Test Condition : UI9600, $V_{CC}=5\text{V}$, $I_C=0.5\text{A}$ (t_{stg} Class = A : 2.0~2.5, B : 2.5~3.0, C : 3.0~3.5)

hFE1 Classification	R	19 ~ 28	S AR 1 3 0 0 5 YWW Z	S	SemiHow Symbol
	O	26 ~ 35		YWW	Y; year code, WW; week code
	Y	33 ~ 40		Z	hFE1 Classification

Typical Characteristics

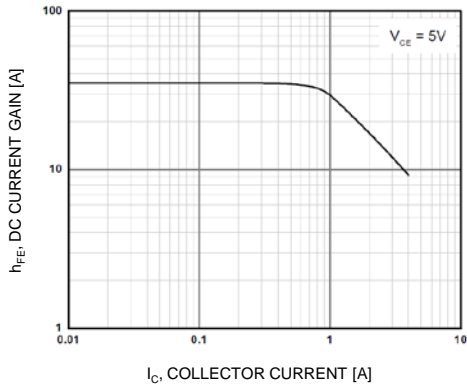


Figure 1. DC Current Gain

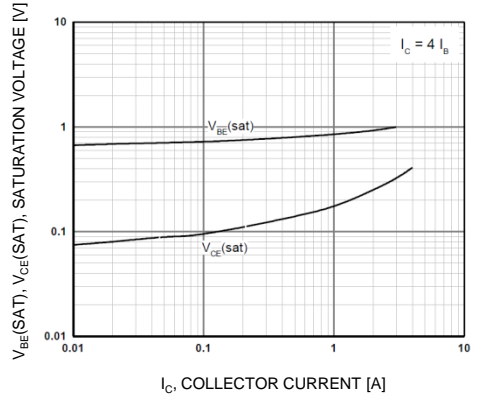


Figure 2. Base-Emitter Saturation Voltage
Collector-Emitter Saturation Voltage

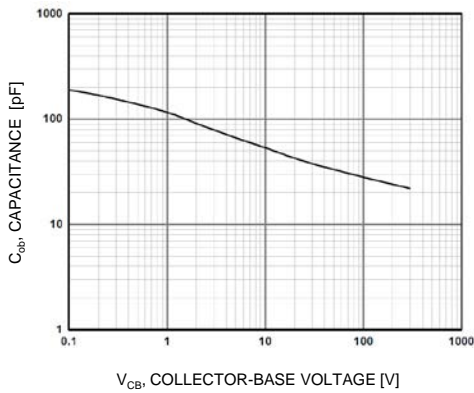


Figure 3. Collector Output Capacitance

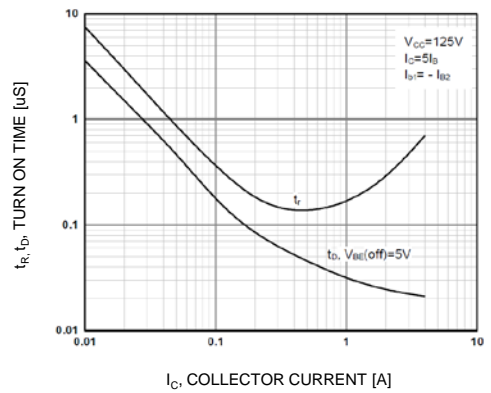


Figure 4. Turn On Time

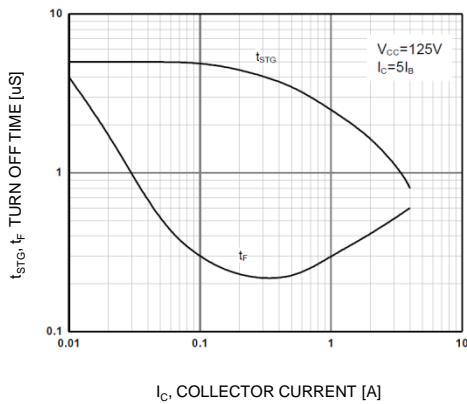


Figure 5. Turn Off Time

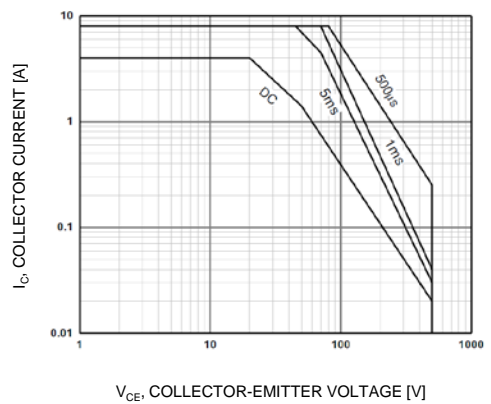


Figure 6. Safe Operating Area

Typical Characteristics

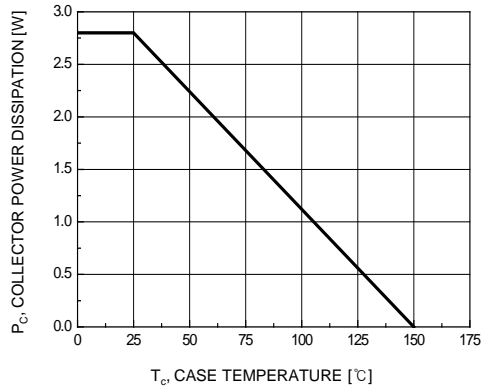
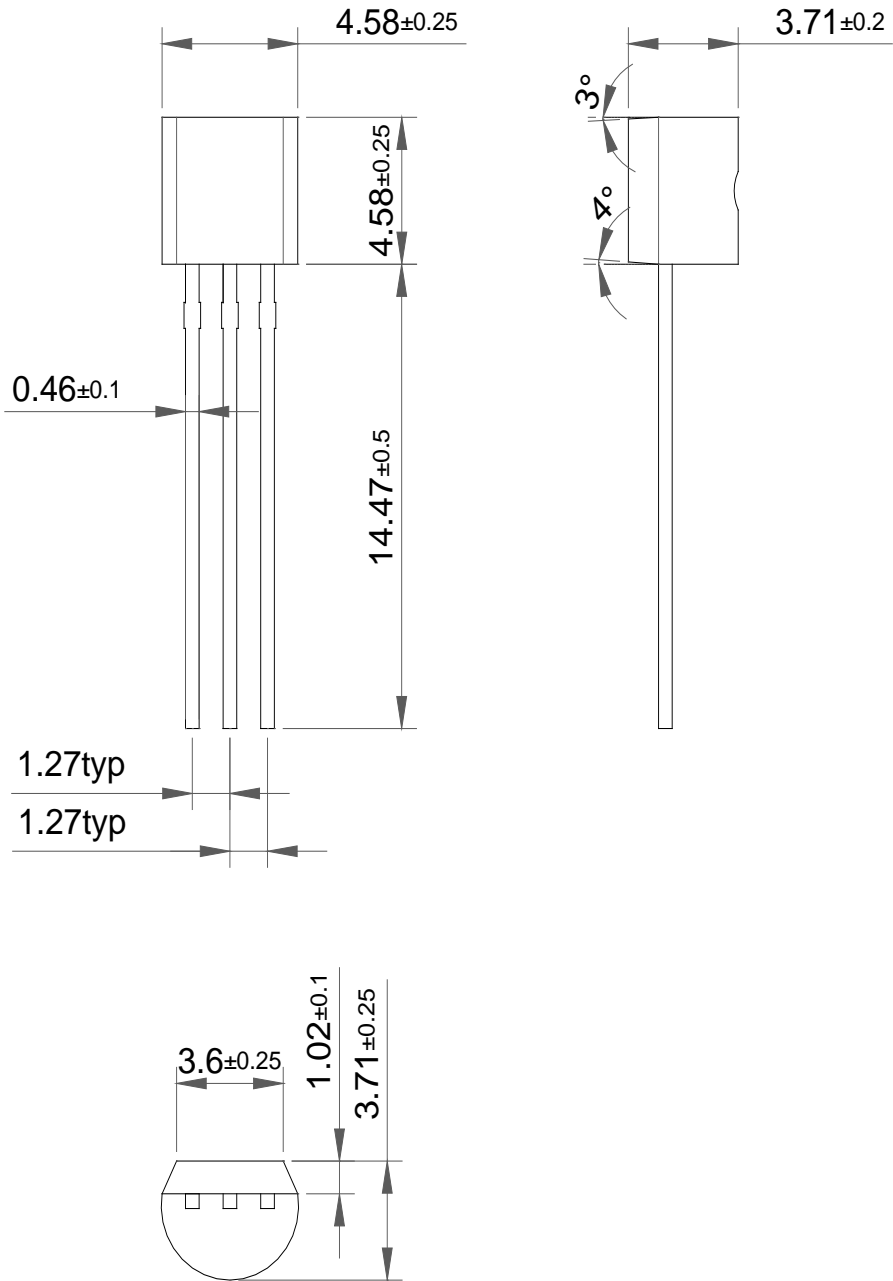


Figure 7. Power Derating

Package Dimension

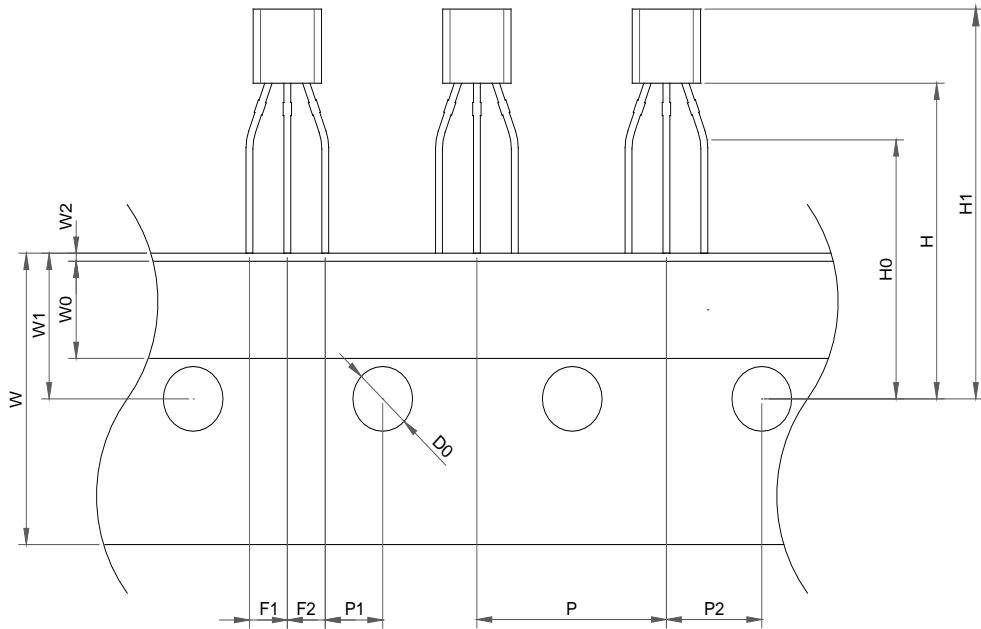
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Dimensions in Millimeters

Package Dimension

TO-92 TAPING



Item	Symbol	Dimension [mm]	
		Reference	Tolerance
Component pitch	P	12.7	±0.5
Side lead to center of feed hole	P1	3.85	±0.5
Center lead to center of feed hole	P2	6.35	±0.5
Lead pitch	F1,F2	2.5	+0.2/-0.1
Carrier Tape width	W	18.0	+1.0/-0.5
Adhesive tape width	W0	6.0	±0.5
Tape feed hole location	W1	9.0	±0.5
Adhesive tape position	W2	1.0 MAX	
Center of feed hole to bottom of component	H	19.5	±1
Center of feed hole to lead form	H0	16.0	±0.5
Component height	H1	27.0 max	
Tape feed hole diameter	D0	4.0	±0.2