

# KSG13005AR

**SemiHow**  
Know-How for Semiconductor

# KSG13005AR

## Switch Mode series NPN silicon Power Transistor

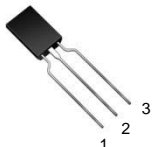
- High voltage, high speed power switching
- Suitable for switching regulator, inverters motor controls

3 Amperes  
NPN Silicon Power Transistor  
3.8 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)	$I_C$	3	A
Collector Current(Pulse)	$I_{CP}$	6	A
Base Current	$I_B$	1.5	A
Collector Dissipation( $T_C=25^\circ\text{C}$ )	$P_C$	3.8	W
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-65~150	$^\circ\text{C}$

TO-92L  
1. Emitter  
2. Collector  
3. Base



### Electrical Characteristics <sup>(1)</sup> $T_C=25^\circ\text{C}$ 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	$\mu\text{s}$
Storage Time	$t_{stg}$	$I_{B1}=0.4\text{A}, I_{B2}=-0.4\text{A}$ $R_L=62.5\Omega$			4.0	$\mu\text{s}$
Fall Time	$t_F$	(Note 2)			0.9	$\mu\text{s}$

**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)

<b>hFE1 Classification</b>	R	19 ~ 28	<b>S KSG</b> <b>13005AR</b> <b>YWW Z</b>	S	SemiHow Symbol
	O	26 ~ 35		YWW	Y; year code, WW; week code
	Y	33 ~ 40		Z	hFE1 Classification

# Typical Characteristics

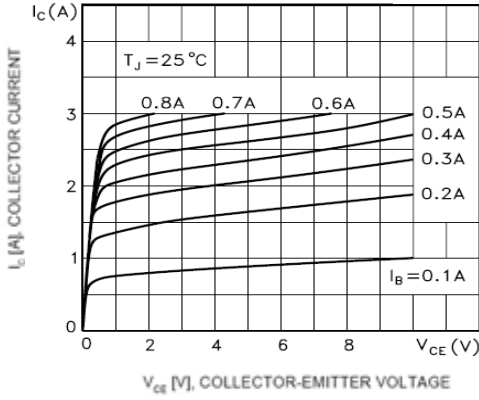


Figure 1. Static Characteristic

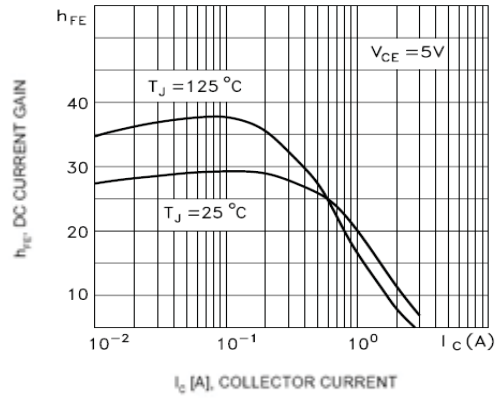


Figure 2. DC current Gain

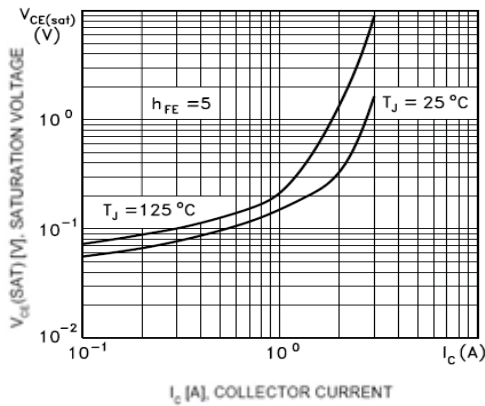


Figure 3. Collector-Emitter Saturation Voltage

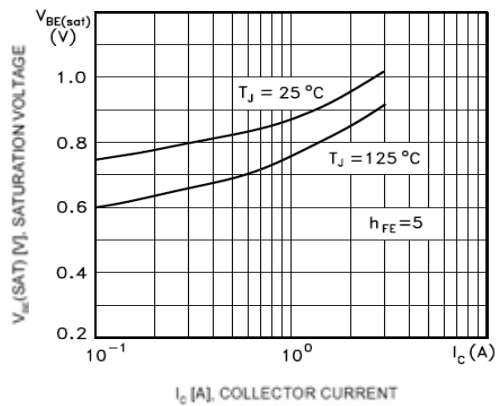


Figure 4. Base-Emitter Saturation Voltage

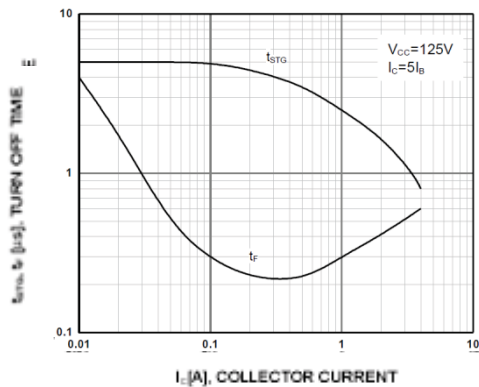


Figure 5. Turn Off Time

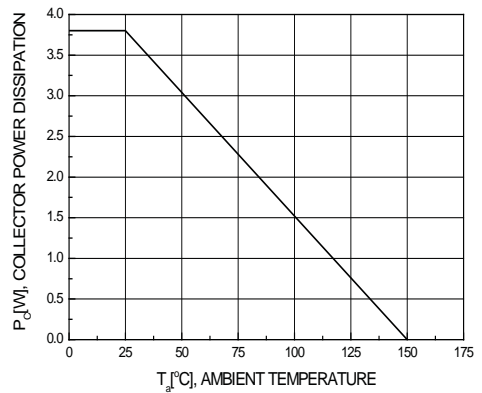
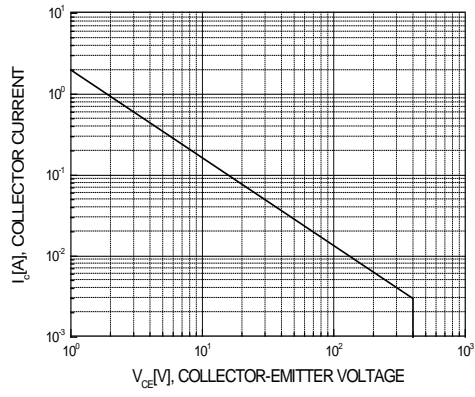
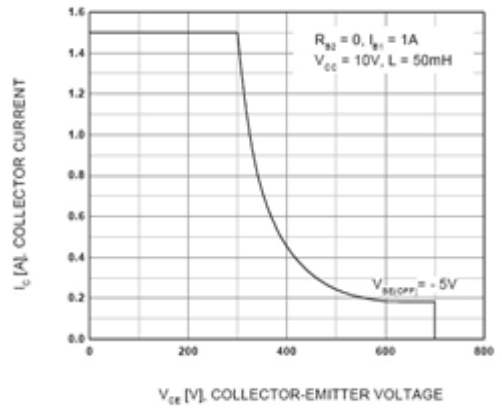


Figure 6. Power Derating

**Typical Characteristics (Continued)**



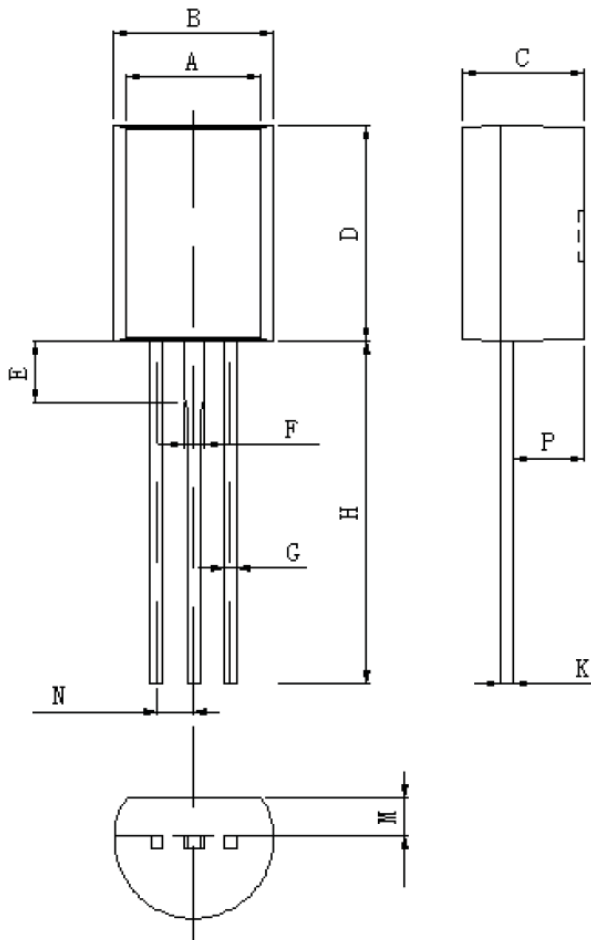
**Figure 7. Forward Bias Safe Operating Area**



**Figure 8. Reverse Bias Safe Operating Area**

## Package Dimensions

## TO-92L



DIM	MILLIMETERS
A	5.8 $\pm$ 0.2
B	6.3 $\pm$ 0.2
C	4.8 $\pm$ 0.2
D	8.6 $\pm$ 0.2
E	3.0 $\pm$ 0.2
F	1.0 $\pm$ 0.2
G	0.5 $\pm$ 0.1
H	13.0 $\pm$ 0.2
K	0.5 $\pm$ 0.1
M	1.5 $\pm$ 0.2
N	1.4 $\pm$ 0.2
P	2.9 $\pm$ 0.3

Dimensions in Millimeters