SemiHow
Know-How for Semiconductor

KSB13003E
KSU13003E / KSD13003E

NPN Silicon Power Transistor, VCBO= 700V, VCEO= 400V, IC= 1.5A

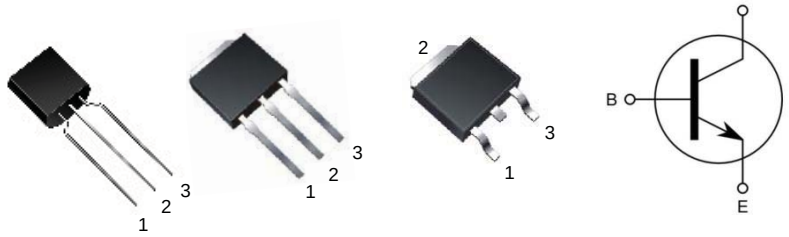
General Description

- High Voltage, High Speed Switching
- Suitable for Switching regulator, Inverters motor controls
- 150℃ Max. Operating temperature
- 8KV ESD proof at HBM (C=100㎊, R=1.5㏀)

Features

- VCBO = 700V
- VCEO = 400V
- VBEO = 9V
- IC = 1.5A

TO-92 **TO-251** **TO-252**



Ordering Information

Ordering number	Package	Pin Assignment			Packing
		1	2	3	
KSB13003E	TO-92	B	C	E	Ammo
KSB13003ER	TO-92	E	C	B	Ammo
KSU13003E	TO-251	B	C	E	Tube
KSU13003ER	TO-251	E	C	B	Tube
KSD13003E	TO-252	B	C	E	Reel
KSD13003ER	TO-252	E	C	B	Reel

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NPN Silicon Power Transistor, VCBO= 700V, VCEO= 400V, IC= 1.5A

Absolute Maximum Ratings TC=25℃ unless otherwise noted

CHARACTERISTICS	SYMBOL	RATING		UNIT
		TO-92	TO-251(2)	
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℃)	P_C	1.1	25	W
Junction Temperature	T_J	150		℃
Storage Temperature	T_{STG}	-65~150		℃

Electrical Characteristics TC=25℃ unless otherwise noted

CHARACTERISTICS	SYMBOL	Test Condition	Min	Typ.	Max	Unit
Collector-Base Breakdown Voltage	V_{CBO}	I_C=500μA, I_E=0	700			V
Collector-Emitter Breakdown Voltage	V_{CEO}	I_C=10mA, I_B=0	400			V
Emitter Cut-off Current	I_{EBO}	V_{EB}=9V,I_C=0			10	μA
*DC Current Gain	h_{FE1} h_{FE2}	V_{CE}=5V,I_C=0.2A V_{CE}=5V,I_C=1A	20 5		40	
*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 V V
*Base-Emitter Saturation Voltage	V_{BE}(sat)	I_C=0.5A,I_B=0.1A I_C=1A,I_B=0.25A			1.2 1.4	V 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}	Vcc=125V, Ic=2A I_{B1}=0.2A, I_{B2}= -0.2A R_L=125Ω			1.1	μs
Storage Time	t_{stg}				4.0	μs
Fall Time	t_F				0.7	μs

* Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%

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Typical Characteristics

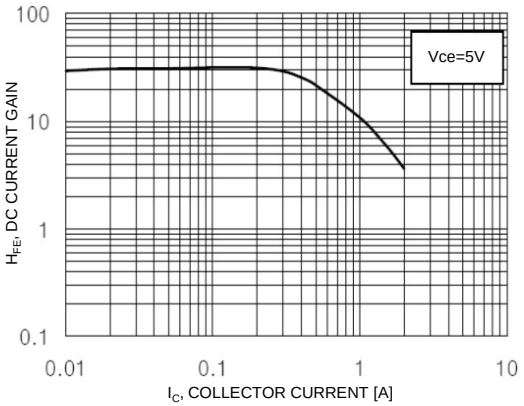


Figure 1. DC Current Gain

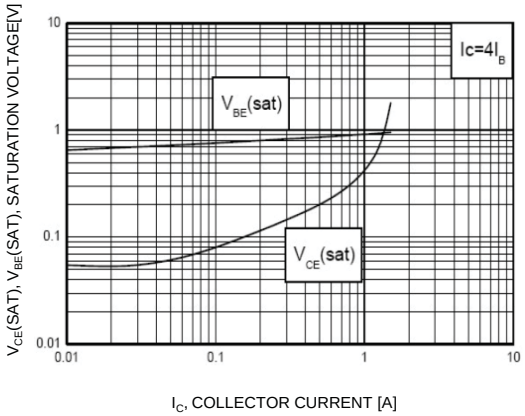


Figure 2. Base-Emitter Saturation Voltage Collector-Emitter Saturation Voltage

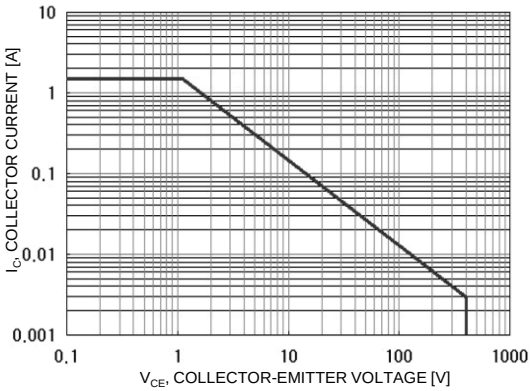


Figure 3. Safe Operating Area

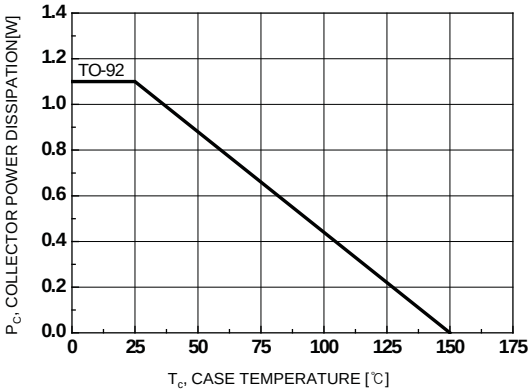


Figure 4. Power Derating

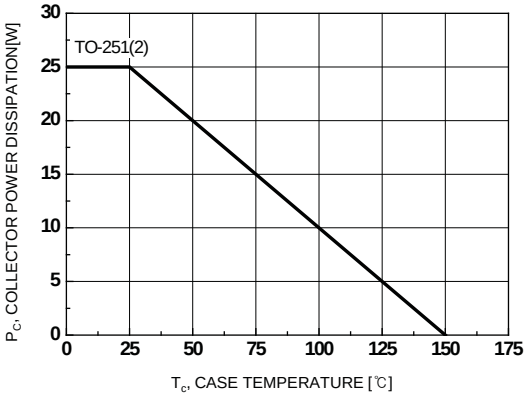
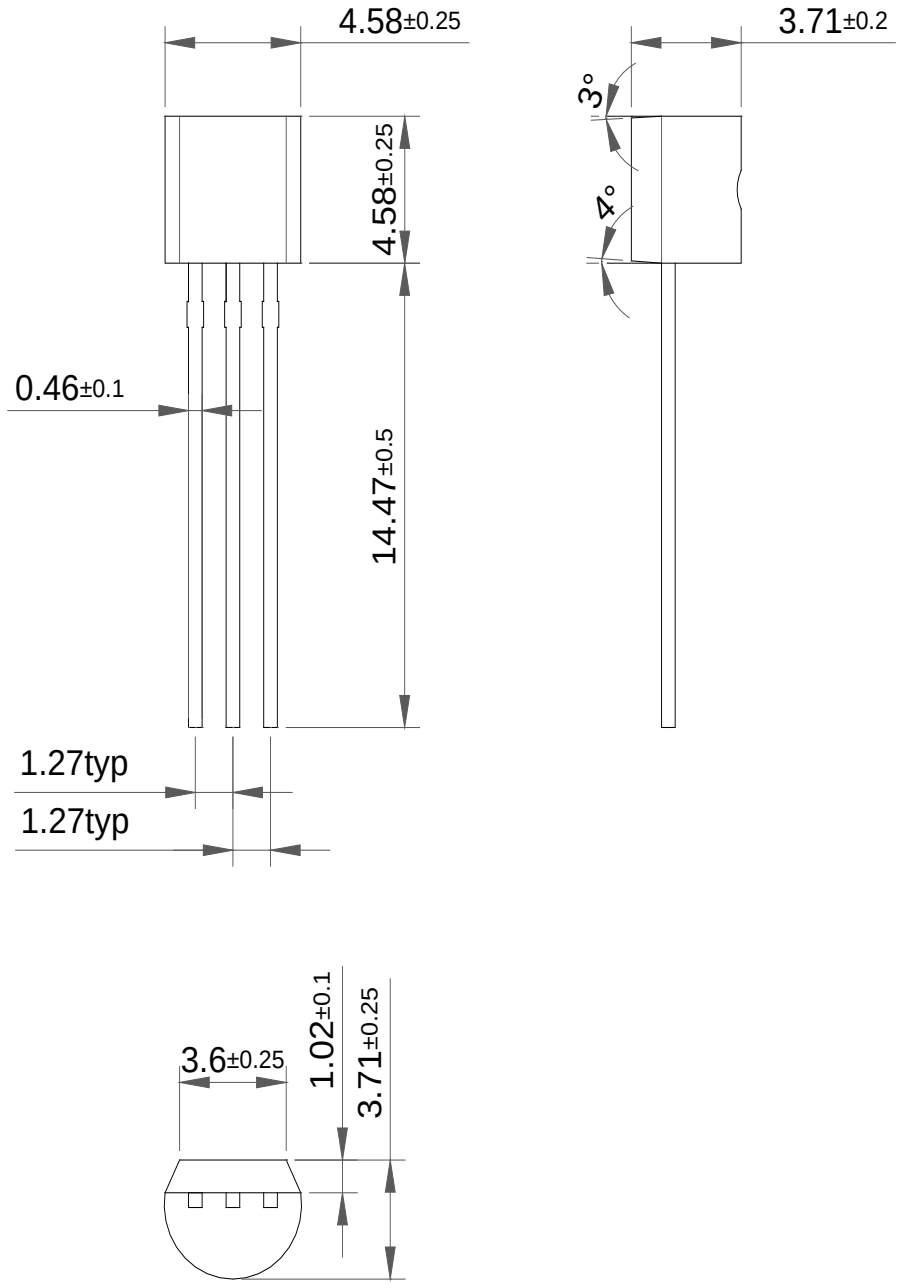


Figure 5. Power Derating

Package Dimension

TO-92

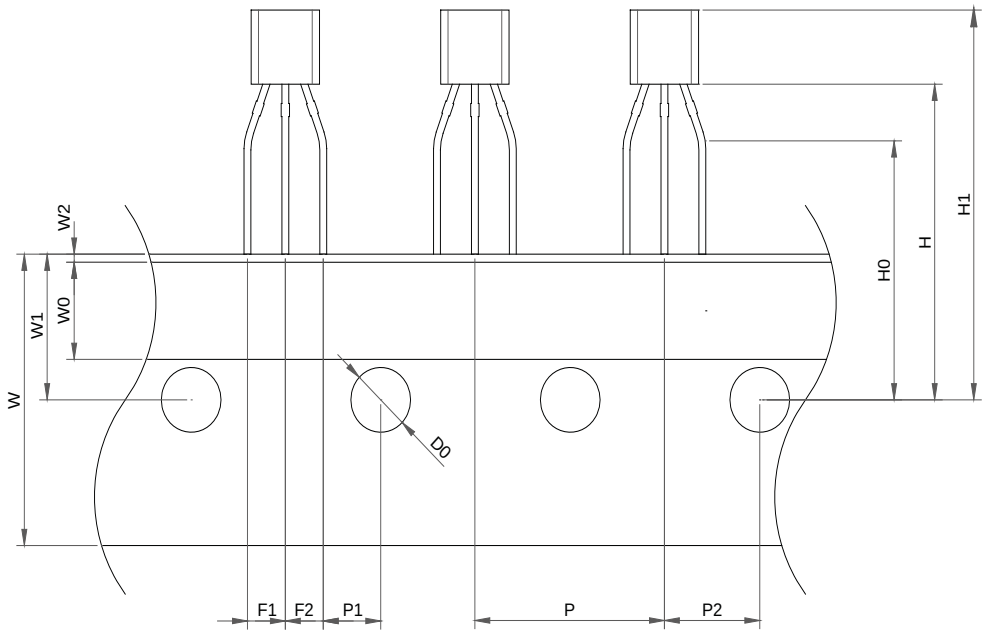


Dimensions in Millimeters

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Package Dimension

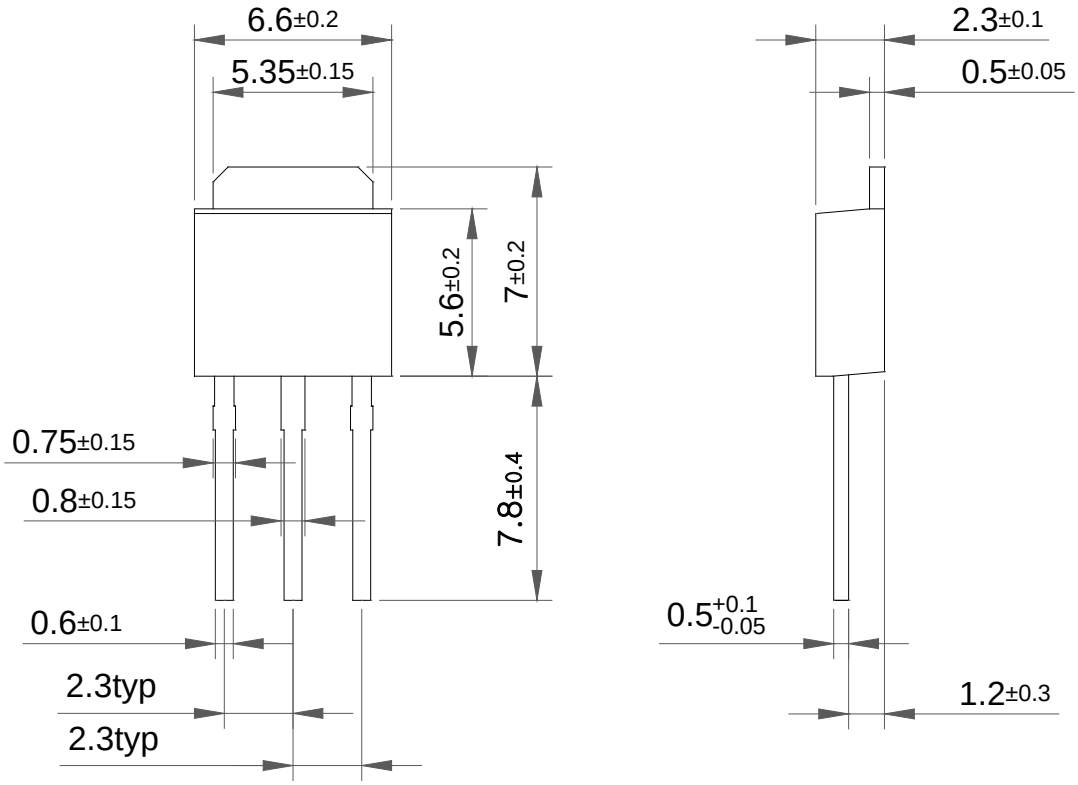
TO-92 TAPING



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	FI,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

Package Dimension

TO-251

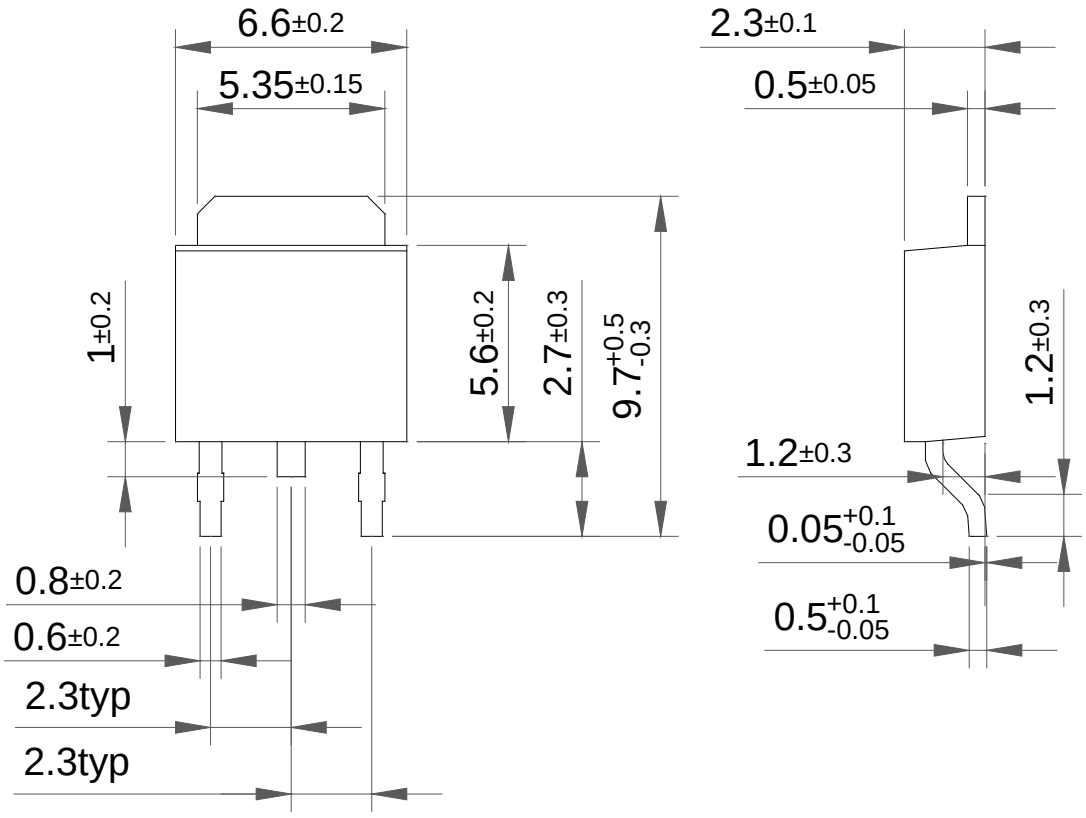


Dimensions in Millimeters

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Package Dimension

TO-252



Dimensions in Millimeters

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