



March 2016

# KSH122 / KSH122I

## NPN Silicon Darlington Transistor

### Features

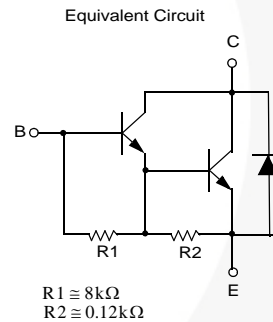
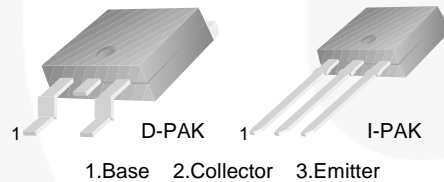
- D-PAK for Surface Mount Applications
- High DC Current Gain
- Built-in Damper Diode at E-C
- Lead Formed for Surface Mount Applications (No Suffix)
- Straight Lead (I-PAK, “ - I ” Suffix)
- Electrically Similar to Popular TIP122
- Complement to KSH127

### Applications

- Switching Regulators
- Converters
- Power Amplifiers

### Description

Designed for general-purpose power and switching, such as output or driver stages in applications.



### Ordering Information

Part Number	Top Mark	Package	Packing Method
KSH122TF	KSH122	TO-252 3L (DPAK)	Tape and Reel
KSH122TM	KSH122	TO-252 3L (DPAK)	Tape and Reel
KSH122ITU	KSH122-I	TO-251 3L (IPAK)	Rail

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## Absolute Maximum Ratings

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at  $T_C = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Value	Unit
$V_{CBO}$	Collector-Base Voltage	100	V
$V_{CEO}$	Collector-Emitter Voltage	100	V
$V_{EBO}$	Emitter-Base Voltage	5	V
$I_C$	Collector Current (DC)	8	A
$I_{CP}$	Collector Current (Pulse)	16	A
$I_B$	Base Current	120	mA
$P_C$	Collector Dissipation ( $T_C=25^\circ\text{C}$ )	20.00	W
	Collector Dissipation ( $T_A=25^\circ\text{C}$ )	1.75	
$T_J$	Junction Temperature	150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature	- 65 to 150	$^\circ\text{C}$

## Electrical Characteristics

Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$V_{CEO(sus)}$	Collector-Emitter Sustaining Voltage <sup>(1)</sup>	$I_C = 30\text{ mA}, I_B = 0$	100			V
$I_{CEO}$	Collector Cut-Off Current	$V_{CE} = 50\text{ V}, I_B = 0$			10	$\mu\text{A}$
$I_{CBO}$	Collector Cut-Off Current	$V_{CB} = 100\text{ V}, I_E = 0$			10	$\mu\text{A}$
$I_{EBO}$	Emitter Cut-Off Current	$V_{EB} = 5\text{ V}, I_C = 0$			2	mA
$h_{FE}$	DC Current Gain <sup>(1)</sup>	$V_{CE} = 4\text{ V}, I_C = 4\text{ A}$	1000		12000	
		$V_{CE} = 4\text{ V}, I_C = 8\text{ A}$	100			
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage <sup>(1)</sup>	$I_C = 4\text{ A}, I_B = 16\text{ mA}$			2	V
		$I_C = 8\text{ A}, I_B = 80\text{ mA}$			4	
$V_{BE(sat)}$	Base-Emitter Saturation Voltage <sup>(1)</sup>	$I_C = 8\text{ A}, I_B = 80\text{ mA}$			4.5	V
$V_{BE(on)}$	Base-Emitter On Voltage <sup>(1)</sup>	$V_{CE} = 4\text{ V}, I_C = 4\text{ A}$			2.8	V
$C_{ob}$	Output Capacitance	$V_{CB} = 10\text{ V}, I_E = 0, f = 0.1\text{ MHz}$			200	pF

### Note:

1. Pulse test:  $p_w \leq 300\ \mu\text{s}$ , duty cycle  $\leq 2\%$ .

## Typical Performance Characteristics

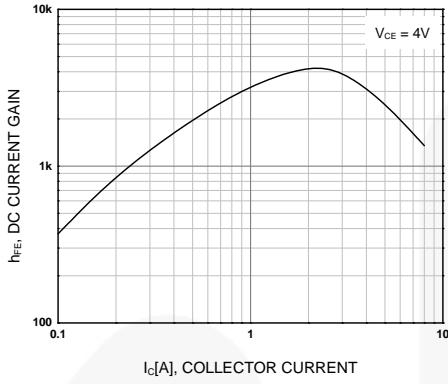


Figure 1. DC Current Gain

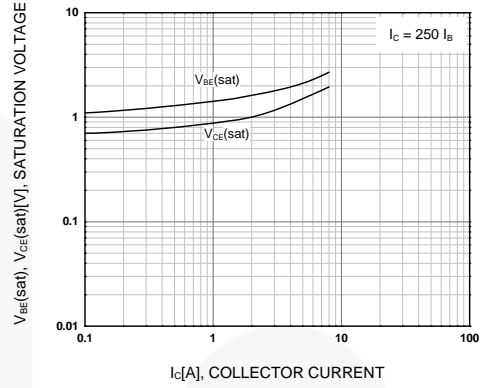


Figure 2. Base-Emitter Saturation Voltage  
Collector-Emitter Saturation Voltage

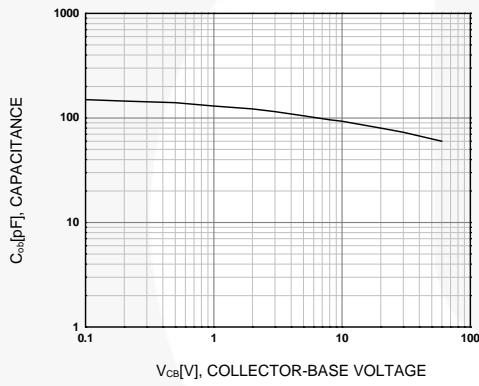


Figure 3. Collector Output Capacitance

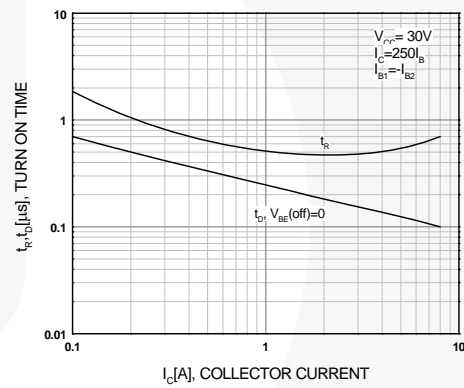


Figure 4. Turn-On Time

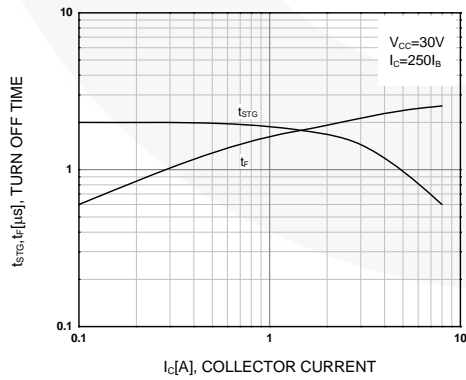


Figure 5. Turn-Off Time

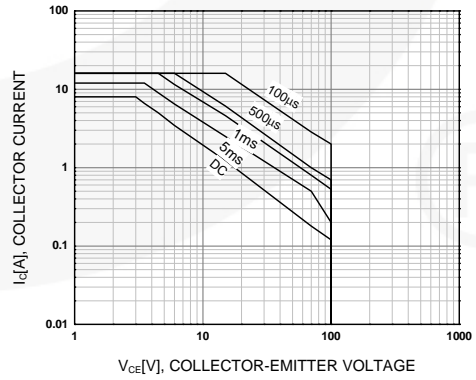


Figure 6. Safe Operating Area

Typical Performance Characteristics (Continued)

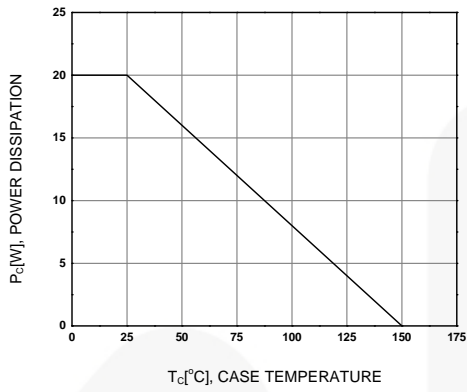
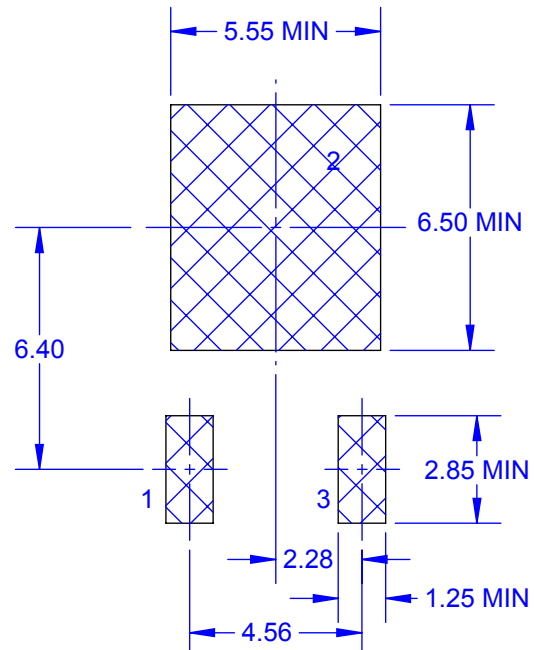
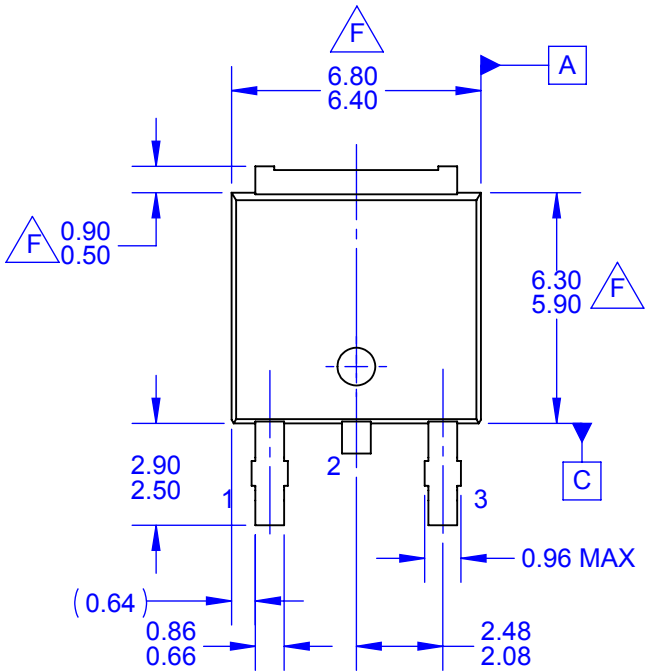
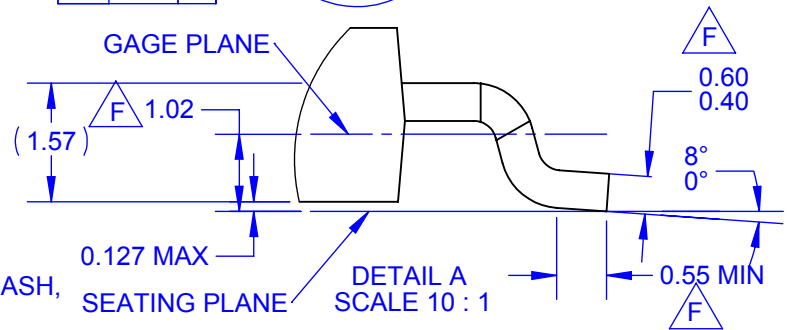
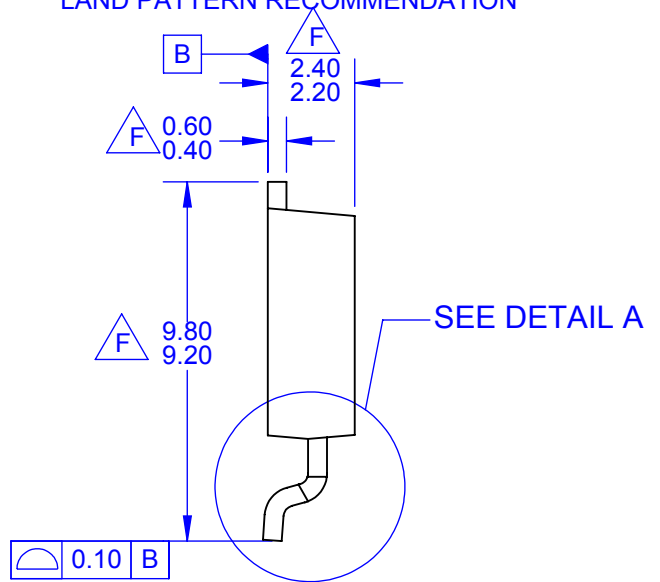
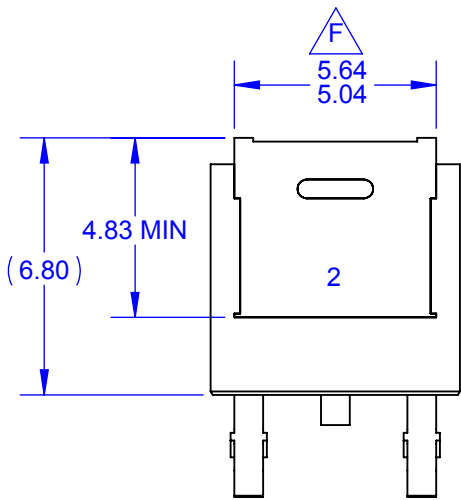


Figure 7. Power Derating



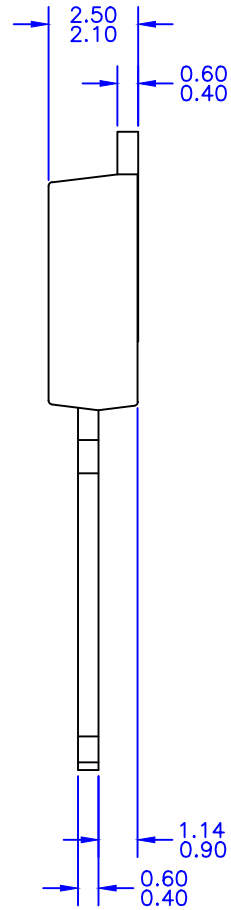
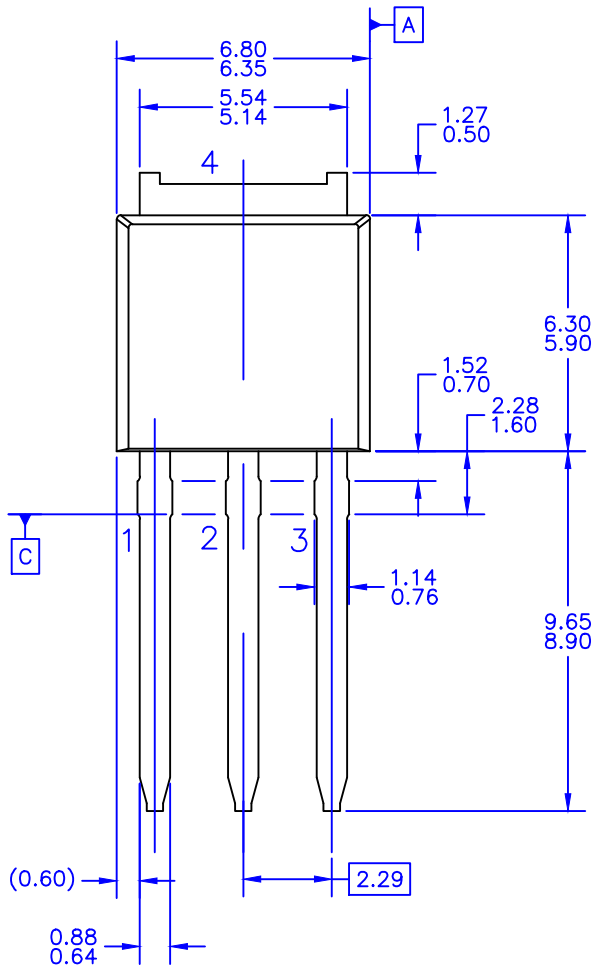


LAND PATTERN RECOMMENDATION

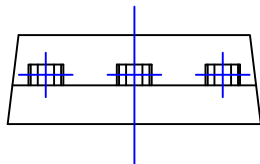


NOTES: UNLESS OTHERWISE SPECIFIED

- A) NOT COMPLIANT TO JEDEC TO-252 VARIATION AB
- B) ALL DIMENSION ARE IN MILLIMETER
- C) DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR EXTRUSIONS
- D) LAD PATTERN PER IPC7351A ATANDARD TO228P991X239-3N
- E) DRAWING FILE NAME: MKT-TO252D03REV3.
- F) DOES NOT COMPLY JEDEC STANDARD VALUE.
- G) FAIRCHILD SEMICONDUCTOR.



$\varnothing$  0.25 (M) A (M) C  
 3 PLCS



NOTES: UNLESS OTHERWISE SPECIFIED

- A) ALL DIMENSIONS ARE IN MILLIMETERS.
- B) THIS PACKAGE CONFORMS TO JEDEC, TO-251, ISSUE C, VARIATION AA, DATED SEP 1988.
- C) DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994.
- D) DRAWING NUMBER AND REVISION: MKT-TO251A03REV2





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