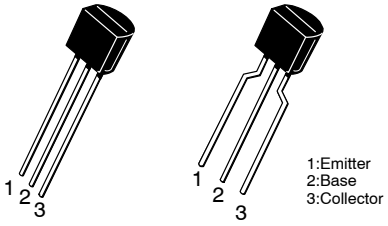
# NPN Epitaxial Silicon Darlington Transistor

# KSP13




**TO−92 3**
**CASE 135AN**

**TO−92 3 LF**
**CASE 135AR**

### Features

- Collector−Emitter Voltage: $V_{CES}$=30 V
- Collector Power Dissipation: $P_C$ (max)=625 mW
- These are Pb−Free Devices

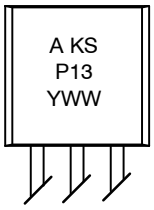
### ABSOLUTE MAXIMUM RATINGS

($T_A$ = 25°C unless otherwise noted)

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $V_{CBO}$ | Collector−Base Voltage | 30 | V |
| $V_{CES}$ | Collector−Emitter Voltage | 30 | V |
| $V_{EBO}$ | Emitter−Base Voltage | 10 | V |
| $I_C$ | Collector Current | 500 | mA |
| PC | Collector Power Dissipation | 625 | mW |
| $T_J$ | Junction Temperature | 150 | °C |
| $T_{STG}$ | Storage Temperature | −55 to 150 | °C |

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

### MARKING DIAGRAM




A = Assembly Code
KSP13 = Device Code
Y = Year
WW = Work Week

### ELECTRICAL CHARACTERISTICS ($T_C$ = 25°C unless otherwise noted.)

| Symbol | Parameter | Test Condition | Min | Max | Unit |
|---|---|---|---|---|---|
| $BV_{CES}$ | Collector−Emitter Breakdown Voltage | $I_C$ = 100 μA, $I_B$ = 0 | 30 | − | V |
| $I_{CBO}$ | Collector Cut−off Current | $V_{CB}$ = 30 V, $I_E$ = 0 | − | 100 | nA |
| $I_{EBO}$ | Emitter Cut−off Current | $V_{EB}$ = 10 V, $I_C$ = 0 | − | 100 | nA |
| $h_{FE}$ | DC Current Gain (Note 1) | $V_{CE}$ = 5 V, $I_C$ = 10 mA | 5k | − | |
| | | $V_{CE}$ = 5 V, $I_C$ = 100 mA | 10k | − | |
| $V_{CE}$(sat) | Collector−Emitter Saturation Voltage | $I_C$ = 100 mA, $I_B$ = 0.1 mA | − | 1.5 | V |
| $V_{BE}$(on) | Base−Emitter On Voltage | $V_{CE}$ = 5 V, $I_C$ = 100 mA | − | 2.0 | V |
| $f_T$ | Current Gain Bandwidth Product | $V_{CE}$ = 5 V, $I_C$ = 10 mA<br>f = 100 MHz | 125 | − | MHz |

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

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

### ORDERING INFORMATION

| Device | Package | Shipping |
|---|---|---|
| KSP13BU | TO−92 3<br>(Pb−Free) | 10000 /<br>Bulk Bag |
| KSP13TA | TO−92 3 LF<br>(Pb−Free) | 2000 /<br>Fan−Fold |

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## TYPICAL CHARACTERISTICS

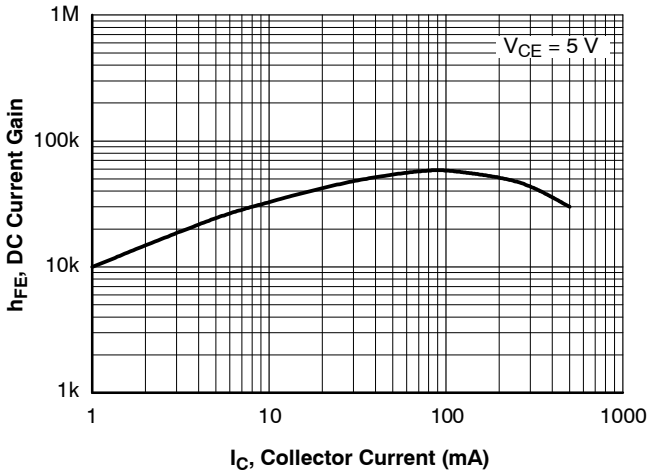



**Figure 1. DC Current Gain**

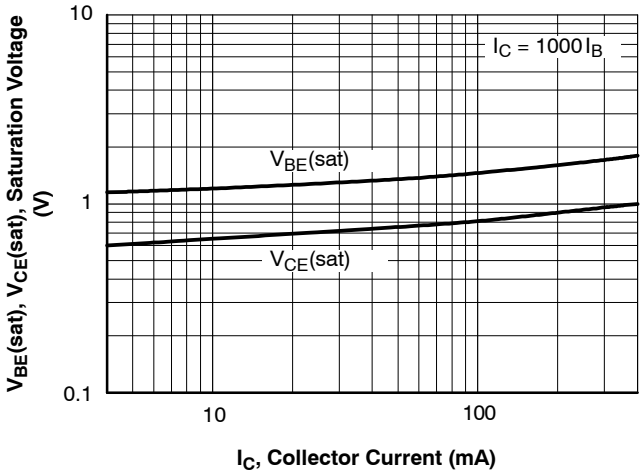



**Figure 2. Base−Emitter Saturation Voltage Collector−Emitter Saturation Voltage**

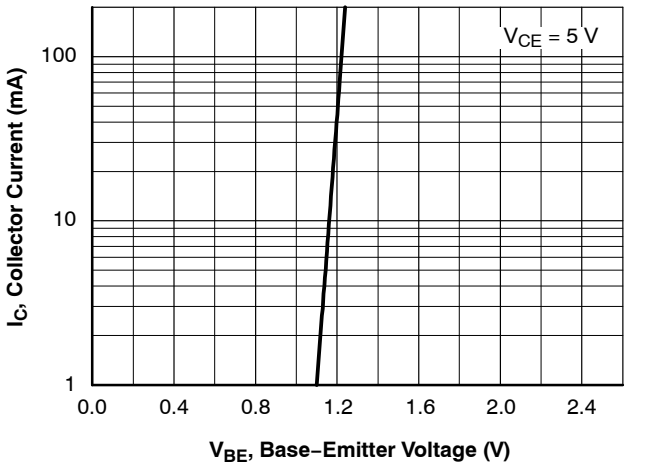



**Figure 3. Base−Emitter On Voltage**

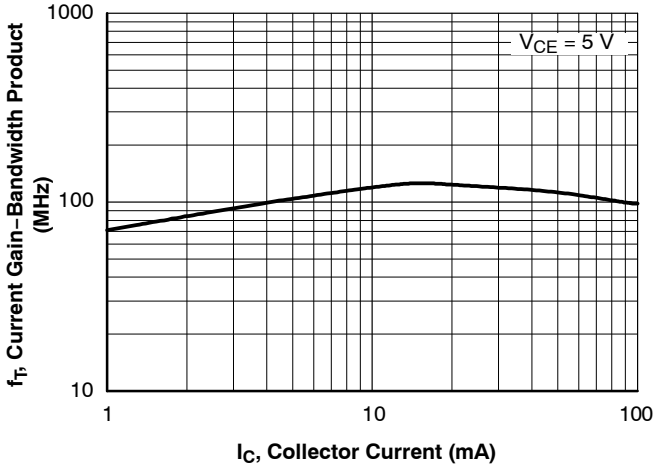
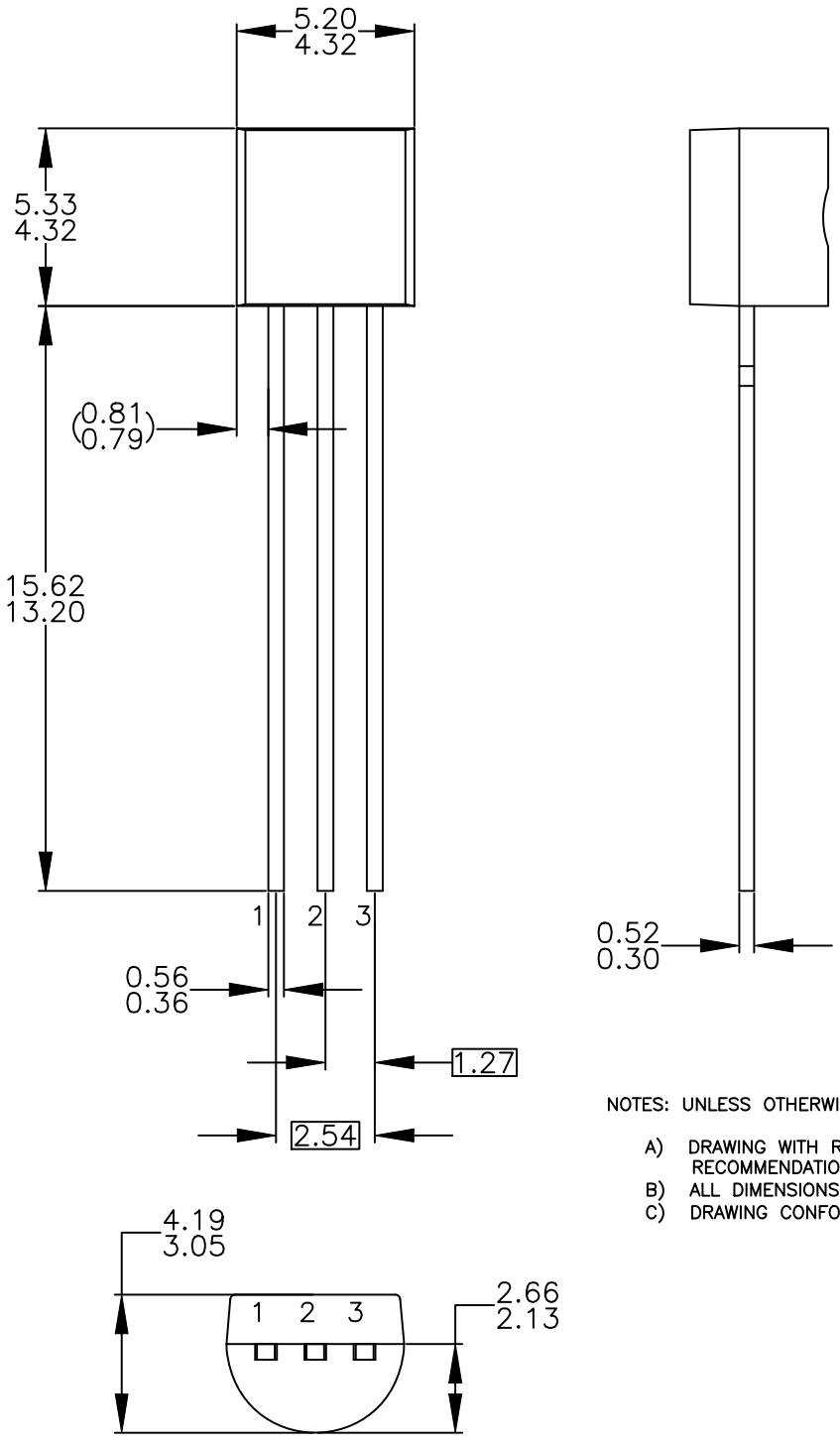



**Figure 4. Current Gain Bandwidth Product**

**TO−92 3 4.825x4.76**
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DATE 31 JUL 2016




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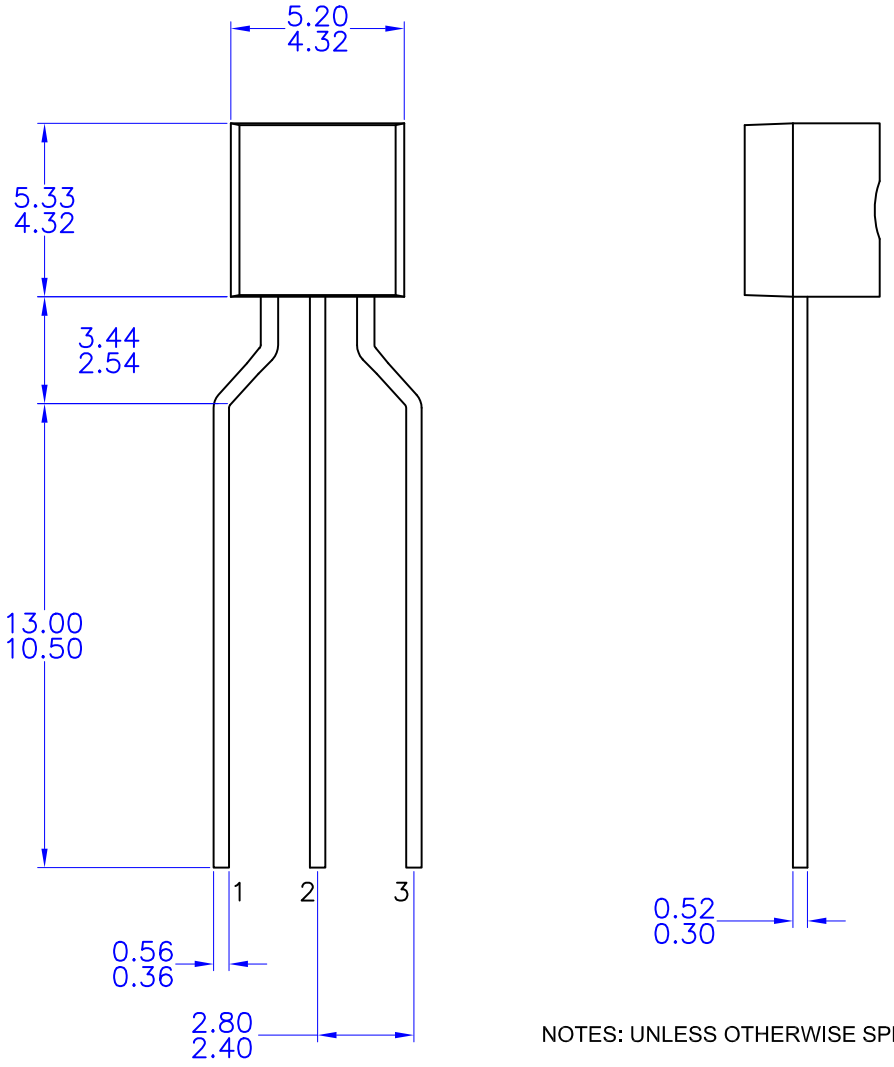
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B) ALL DIMENSIONS ARE IN MILLIMETERS.
C) DRAWING CONFORMS TO ASME Y14.5M−2009.

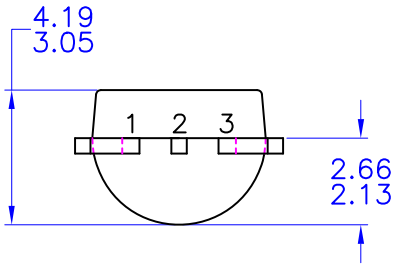
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