# KSA1013YBU Datasheet


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| | |
|---|---|
| DiGi Electronics Part Number | KSA1013YBU-DG |
| Manufacturer | onsemi |
| Manufacturer Product Number | KSA1013YBU |
| Description | TRANS PNP 160V 1A TO92-3 |
| Detailed Description | Bipolar (BJT) Transistor PNP 160 V 1 A 50MHz 900 m W Through Hole TO-92-3 |

Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

## Purchase and inquiry

| Manufacturer Product Number: | Manufacturer: |
| --- | --- |
| KSA1013YBU | onsemi |
| Series: | Product Status: |
| - | Active |
| Transistor Type: | Current - Collector (Ic) (Max): |
| PNP | 1 A |
| Voltage - Collector Emitter Breakdown (Max): | Vce Saturation (Max) @ Ib, Ic: |
| 160 V | 1.5V @ 50mA, 500mA |
| Current - Collector Cutoff (Max): | DC Current Gain (hFE) (Min) @ Ic, Vce: |
| 1µA (ICBO) | 60 @ 200mA, 5V |
| Power - Max: | Frequency - Transition: |
| 900 mW | 50MHz |
| Operating Temperature: | Mounting Type: |
| 150°C (TJ) | Through Hole |
| Package / Case: | Supplier Device Package: |
| TO-226-3, TO-92-3 Long Body | TO-92-3 |
| Base Product Number: | |
| KSA1013 | |

## Environmental & Export classification

| RoHS Status: | Moisture Sensitivity Level (MSL): |
| --- | --- |
| ROHS3 Compliant | Not Applicable |
| REACH Status: | ECCN: |
| REACH Unaffected | EAR99 |
| HTSUS: | |
| 8541.21.0095 | |

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**DATA SHEET**
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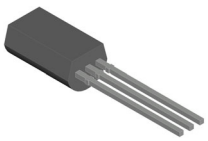
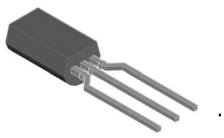
# PNP Epitaxial Silicon Transistor

# KSA1013



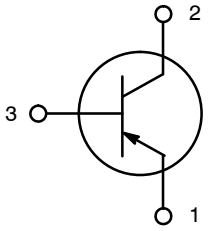
**TO−92 3**
**CASE 135AP**



**TO−92 3 LF**
**CASE 135AM**

### Features

- Color TV Audio Output
- Color TV Vertical Deflection Output




1. Emitter
2. Collector
3. Base

### ABSOLUTE MAXIMUM RATINGS

($T_A$ = 25°C unless otherwise noted.)

| Symbol | Parameter | Ratings | Unit |
|---|---|---|---|
| $V_{CBO}$ | Collector−Base Voltage | −160 | V |
| $V_{CEO}$ | Collector−Emitter Voltage | −160 | V |
| $V_{EBO}$ | Emitter−Base Voltage | −6 | V |
| $I_C$ | Collector Current | −1 | A |
| $I_B$ | Base Current | −0.5 | A |
| $T_J$ | 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.

### THERMAL CHARACTERISTICS (Note 1)

($T_A$ = 25°C unless otherwise noted.)

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $P_D$ | Power Dissipation | 900 | mW |
| | Derate Above $T_A$ = 25°C | 7.2 | mW/°C |
| $R_{\theta JA}$ | Thermal Resistance, Junction−to−Ambient | 139 | °C/W |

1. PCB size: FR−4, 76 mm × 114 mm × 1.57 mm (3.0 inch × 4.5 inch × 0.062 inch) with minimum land pattern size.

### MARKING DIAGRAM


A = Assembly Site
A1013 = Specific Device Code
Y = Year of Production
WW = Work Week

### ORDERING INFORMATION

| Device | Package | Shipping |
|---|---|---|
| KSA1013YBU | TO−92 3 (Pb−Free) | 6000 Units / Bulk |
| KSA1013YTA | TO−92 3 LF (Pb−Free) | 2000 Units / Ammo |

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

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| $I_{CBO}$ | Collector Cut−off Current | $V_{CB}$ = −150 V, $I_E$ = 0 | − | − | −1 | μA |
| $I_{EBO}$ | Emitter Cut−off Current | $V_{BE}$ = −6 V, $I_C$ = 0 | − | − | −1 | μA |
| $BV_{CEO}$ | Collector−Emitter Breakdown Voltage | $I_C$ = −10 mA, $I_B$ = 0 | −160 | − | − | V |
| $h_{FE}$ | DC Current Gain | $V_{CE}$ = −5 V, $I_C$ = −200 mA | 60 | − | 320 | |
| $V_{CE}$ (sat) | Collector−Emitter Saturation Voltage | $I_C$ = −500 mA, $I_B$ = −50 mA | − | − | −1.5 | V |
| $V_{BE}$ (on) | Base−Emitter On Voltage | $V_{CE}$ = −5 V, $I_C$ = −5 mA | −0.45 | − | −0.75 | V |
| $f_T$ | Current Gain Bandwidth Product | $V_{CE}$ = −5 V, $I_C$ = −200 mA | 15 | 50 | − | MHz |
| $C_{ob}$ | Output Capacitance | $V_{CB}$ = −10 V, $I_E$ = 0, f = 1 MHz | − | − | 35 | pF |

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.

### $h_{FE}$ Classification

| Classification | R | O | Y |
|---|---|---|---|
| $h_{FE}$ | 60 ~ 120 | 100 ~ 200 | 160 ~ 320 |

# KSA1013

## TYPICAL PERFORMANCE CHARACTERISTICS

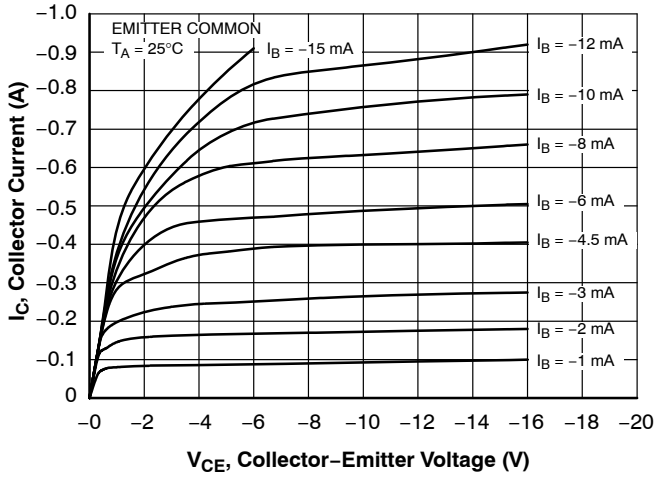



**Figure 1. Static Characteristic**

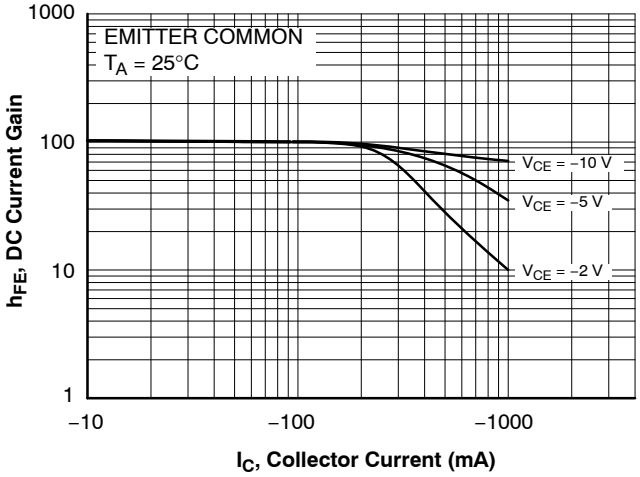



**Figure 2. DC Current Gain**

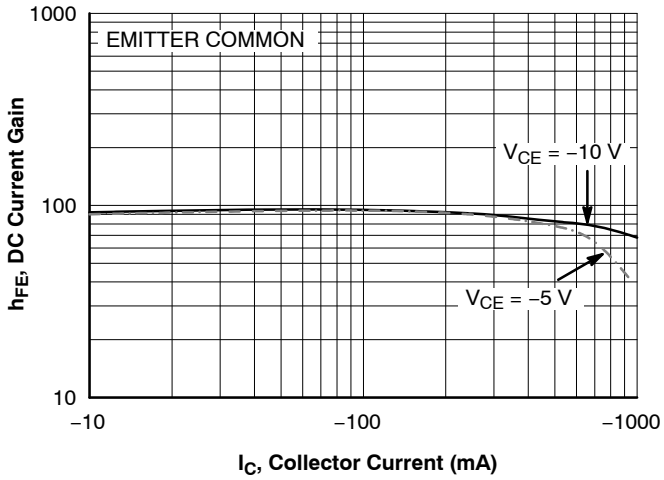



**Figure 3. DC Current Gain**

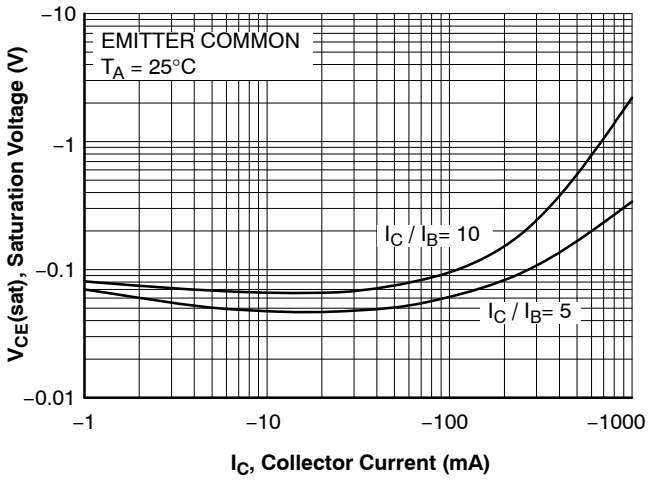



**Figure 4. Collector−Emitter Saturation Voltage**

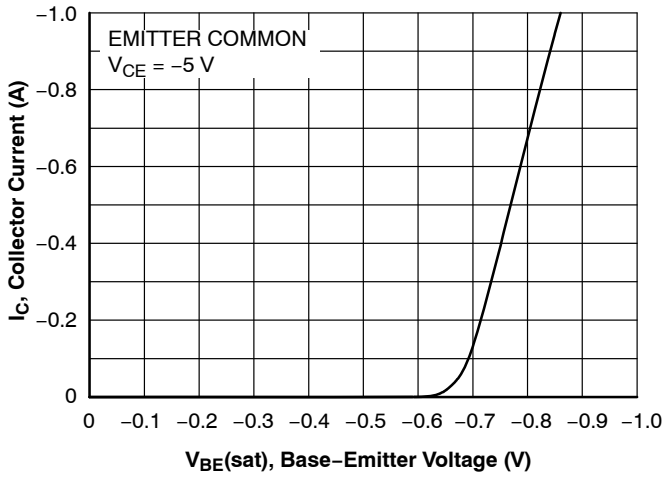



**Figure 5. Base−Emitter On Voltage**

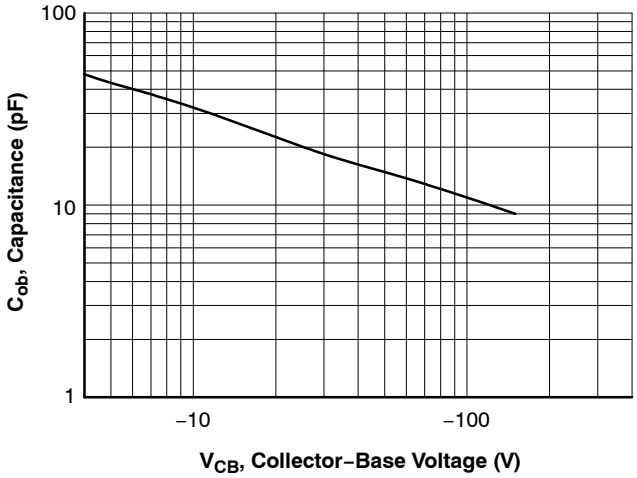



**Figure 6. Collector Output Capacitance**

## TYPICAL PERFORMANCE CHARACTERISTICS (CONTINUED)

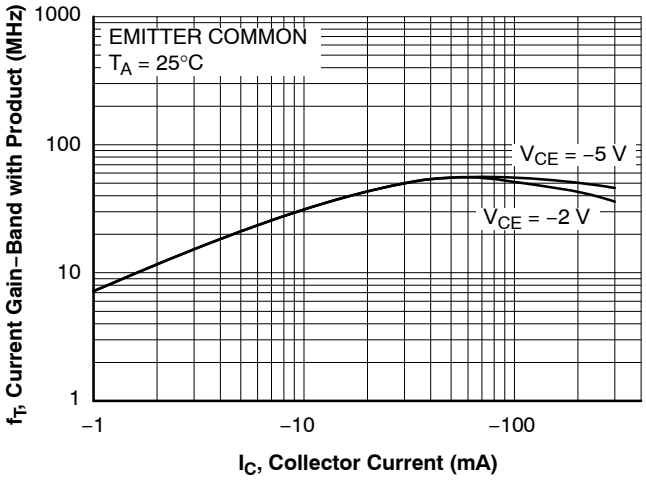



**Figure 7. Current Gain Bandwidth Product**

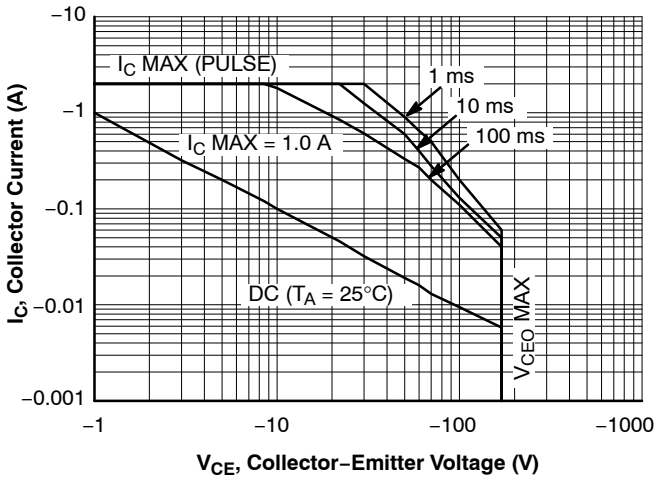



**Figure 8. Safe Operating Area**

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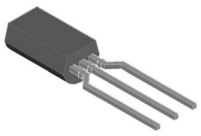
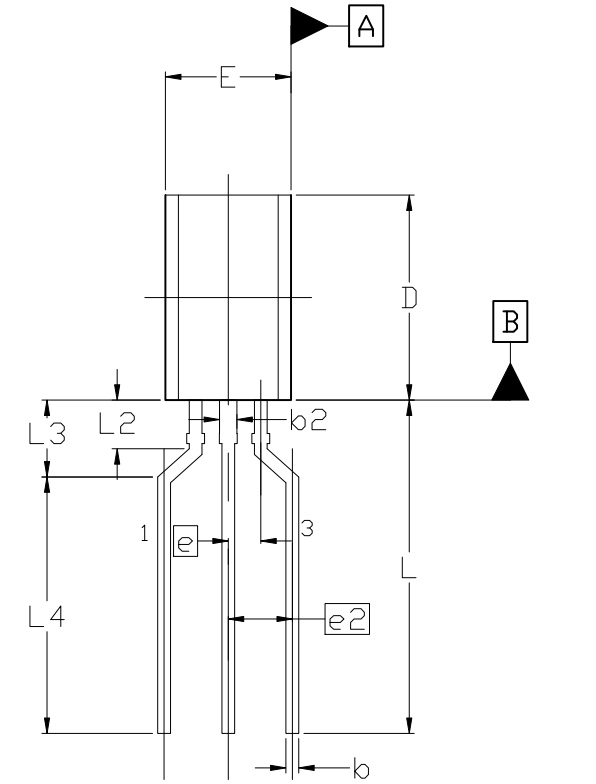
# MECHANICAL CASE OUTLINE
## PACKAGE DIMENSIONS

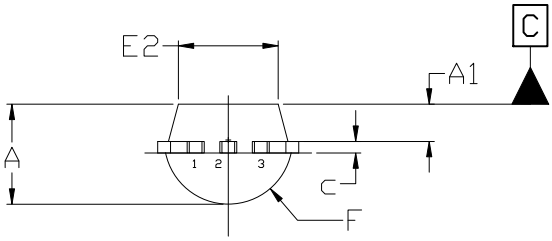


**TO−92 3 8.0x4.9 (LEADFORMED)**
CASE 135AM
ISSUE B

DATE 14 JAN 2021




TOP VIEW




END VIEW

NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2009.
2. CONTROLLING DIMENSION: MILLIMETERS
3. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, GATE REMAINS AND TIE BAR PROTRUSIONS.
4. DIMENSION b AND b2 DOES NOT INCLUDE DAMBAR PROTRUSION. DIMENSION b2 LOCATED ABOVE THE DAMBAR PORTION OF MIDDLE LEAD.

| | MILLIMETERS | | |
|---|---|---|---|
| DIM | MIN. | NOM. | MAX. |
| A | 3.70 | 3.90 | 4.10 |
| A1 | 1.25 | 1.45 | 1.65 |
| b | 0.35 | 0.50 | 0.60 |
| b2 | 0.62 | --- | 0.78 |
| c | 0.35 | 0.45 | 0.55 |
| D | 7.80 | 8.00 | 8.20 |
| E | 4.70 | 4.90 | 5.10 |
| E2 | 3.70 | 3.90 | 4.10 |
| e | 1.27 BSC | | |
| e2 | 2.50 BSC | | |
| F | 2.45 REF | | |
| L | 13.00 REF | | |
| L2 | 1.50 | --- | 1.90 |
| L3 | 2.60 | --- | 3.40 |
| L4 | 10.40 REF | | |

| | | | |
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| **DESCRIPTION:** | **TO−92 3 8.0X4.9 (LEADFORMED)** | | **PAGE 1 OF 1** |

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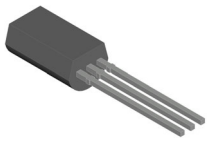
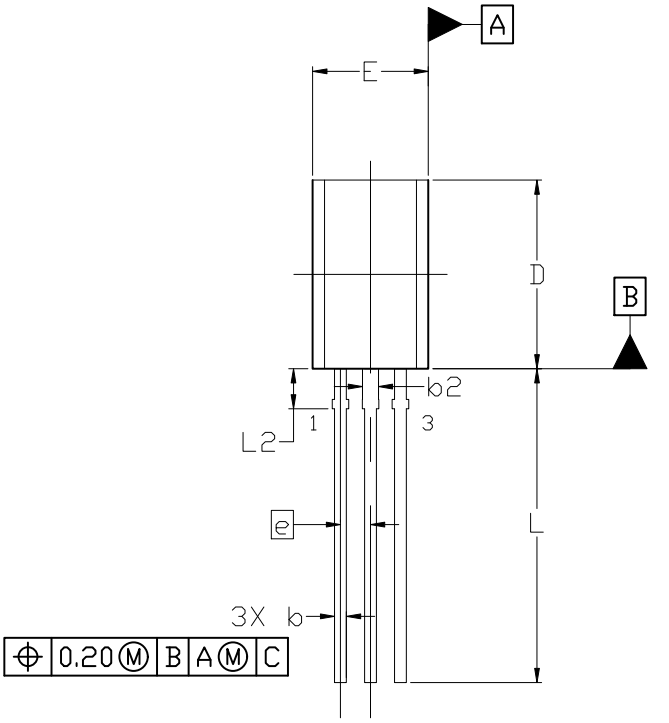
# MECHANICAL CASE OUTLINE
## PACKAGE DIMENSIONS



**TO−92 3 8.0x4.9**
CASE 135AP
ISSUE A

DATE 13 JAN 2021

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| E | 4.70 | 4.90 | 5.10 |
| E2 | 3.70 | 3.90 | 4.10 |
| e | 1.27 BSC | | |
| F | 2.45 REF | | |
| L | 13.30 | --- | 14.20 |
| L2 | 1.70 REF | | |

| | | | |
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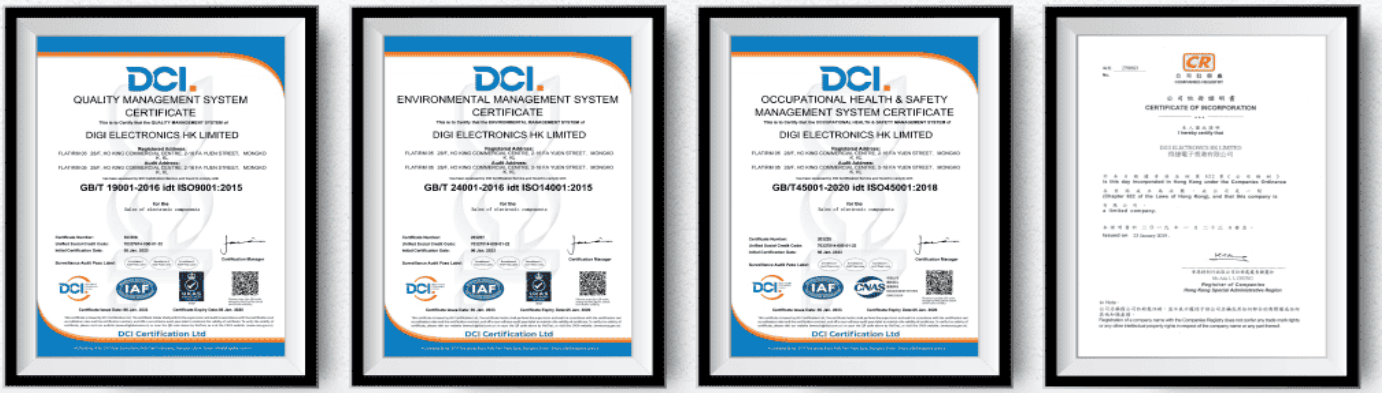



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