

# KSA1013RTA Datasheet

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|                              |                                                                          |
|------------------------------|--------------------------------------------------------------------------|
| DiGi Electronics Part Number | KSA1013RTA-DG                                                            |
| Manufacturer                 | <a href="#">onsemi</a>                                                   |
| Manufacturer Product Number  | KSA1013RTA                                                               |
| Description                  | TRANS PNP 160V 1A TO92-3                                                 |
| Detailed Description         | Bipolar (BJT) Transistor PNP 160 V 1 A 50MHz 900 mW Through Hole TO-92-3 |



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## Purchase and inquiry

Manufacturer Product Number:

KSA1013RTA

Series:

-

Transistor Type:

PNP

Voltage - Collector Emitter Breakdown (Max):

160 V

Current - Collector Cutoff (Max):

1 $\mu$ A (ICBO)

Power - Max:

900 mW

Operating Temperature:

150°C (TJ)

Package / Case:

TO-226-3, TO-92-3 Long Body (Formed Leads)

Base Product Number:

KSA1013

Manufacturer:

onsemi

Product Status:

Obsolete

Current - Collector (Ic) (Max):

1 A

Vce Saturation (Max) @ Ib, Ic:

1.5V @ 50mA, 500mA

DC Current Gain (hFE) (Min) @ Ic, Vce:

60 @ 200mA, 5V

Frequency - Transition:

50MHz

Mounting Type:

Through Hole

Supplier Device Package:

TO-92-3

## Environmental & Export classification

Moisture Sensitivity Level (MSL):

1 (Unlimited)

ECCN:

EAR99

REACH Status:

REACH Unaffected

HTSUS:

8541.21.0095



# PNP Epitaxial Silicon Transistor

## KSA1013

### Features

- Color TV Audio Output
- Color TV Vertical Deflection Output

### ABSOLUTE MAXIMUM RATINGS

( $T_A = 25^\circ\text{C}$  unless otherwise noted.)

| Symbol    | Parameter                 | Ratings     | Unit             |
|-----------|---------------------------|-------------|------------------|
| $V_{CB0}$ | 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         | $^\circ\text{C}$ |
| $T_{STG}$ | Storage Temperature       | -55 to +150 | $^\circ\text{C}$ |

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)

( $T_A = 25^\circ\text{C}$  unless otherwise noted.)

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

1. PCB size: FR-4, 76 mm  $\times$  114 mm  $\times$  1.57 mm (3.0 inch  $\times$  4.5 inch  $\times$  0.062 inch) with minimum land pattern size.

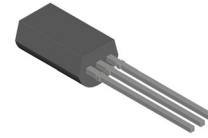
### ELECTRICAL CHARACTERISTICS ( $T_A = 25^\circ\text{C}$ unless otherwise noted.)

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

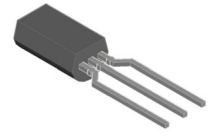
Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

### $h_{FE}$ Classification

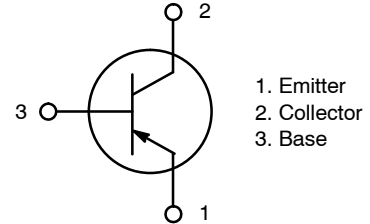
| Classification | R        | O         | Y         |
|----------------|----------|-----------|-----------|
| $h_{FE}$       | 60 ~ 120 | 100 ~ 200 | 160 ~ 320 |



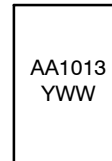
TO-92 3  
CASE 135AP



TO-92 3 LF  
CASE 135AM



### 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 |

# KSA1013

## TYPICAL PERFORMANCE CHARACTERISTICS

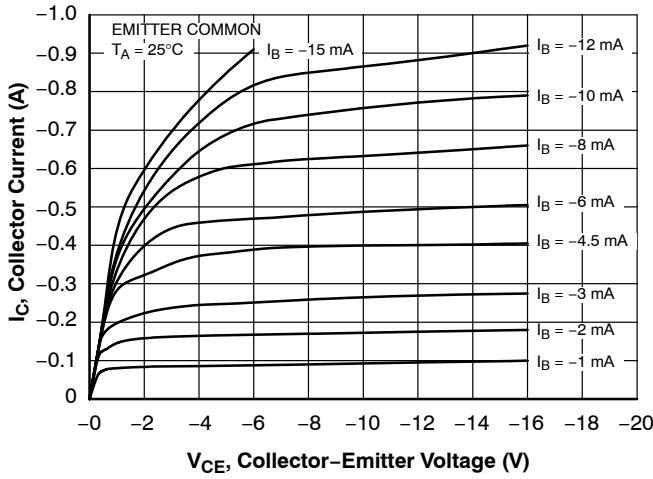


Figure 1. Static Characteristic

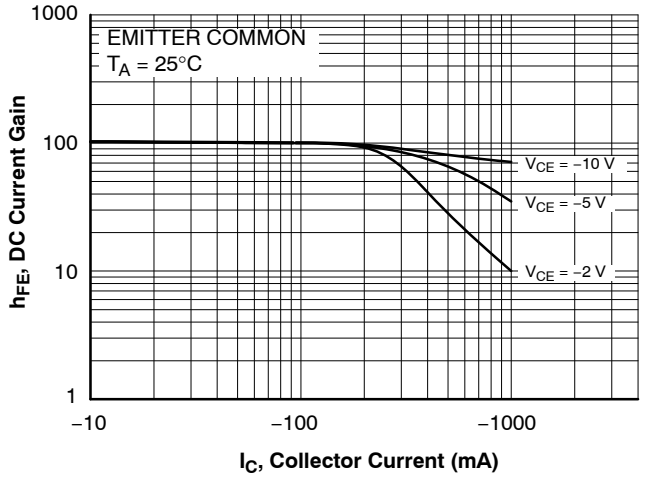


Figure 2. DC Current Gain

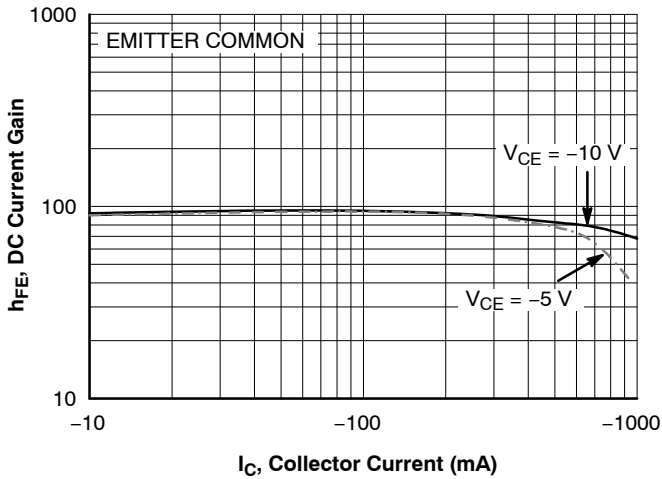


Figure 3. DC Current Gain

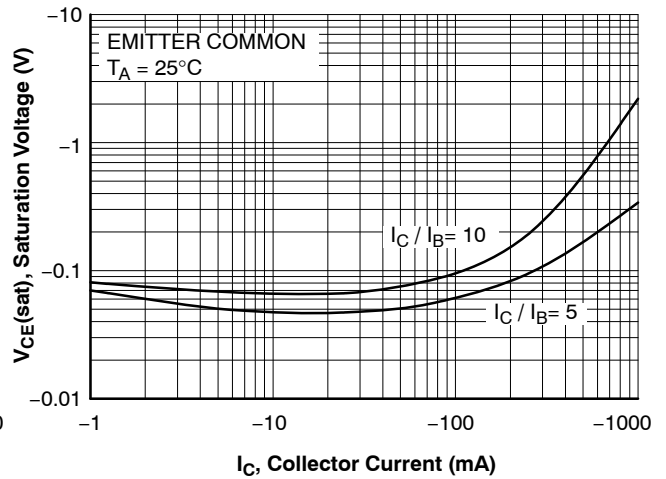


Figure 4. Collector-Emitter Saturation Voltage

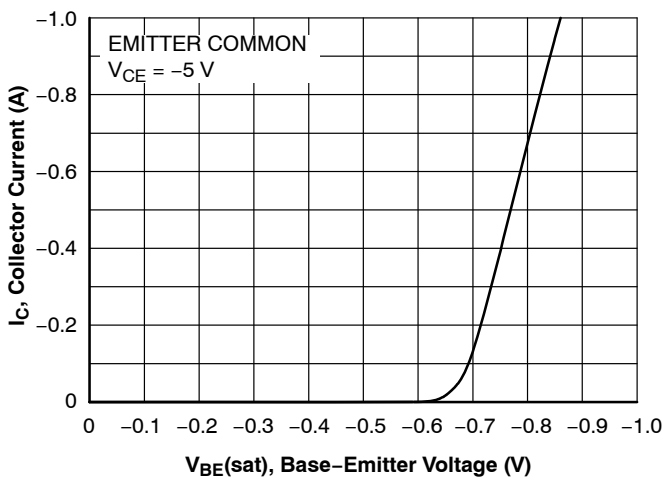


Figure 5. Base-Emitter On Voltage

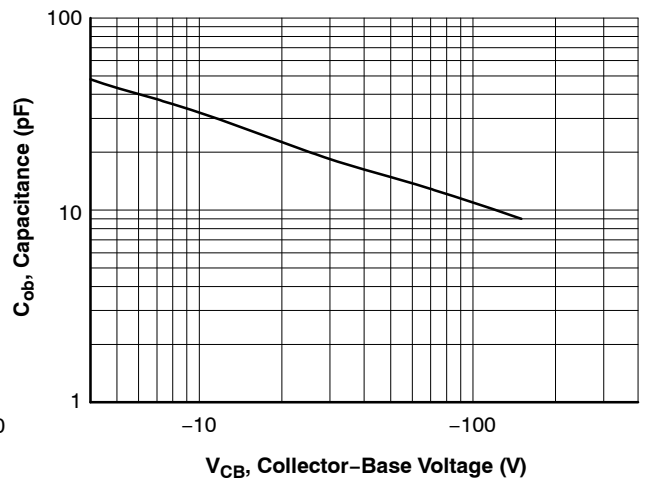


Figure 6. Collector Output Capacitance

# KSA1013

## TYPICAL PERFORMANCE CHARACTERISTICS (CONTINUED)

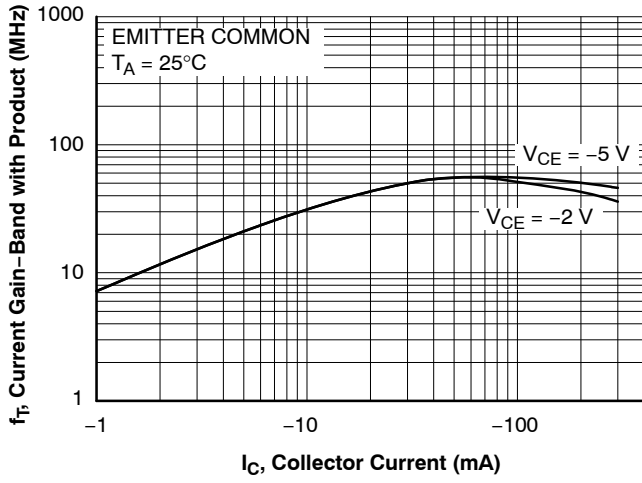


Figure 7. Current Gain Bandwidth Product

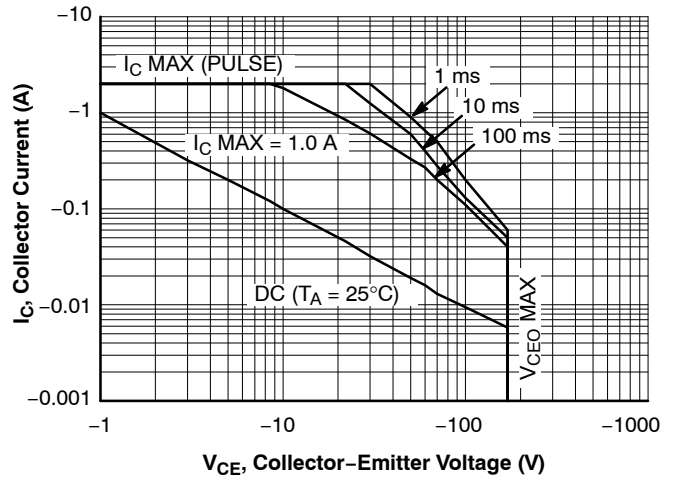
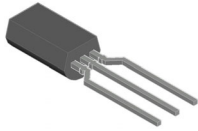
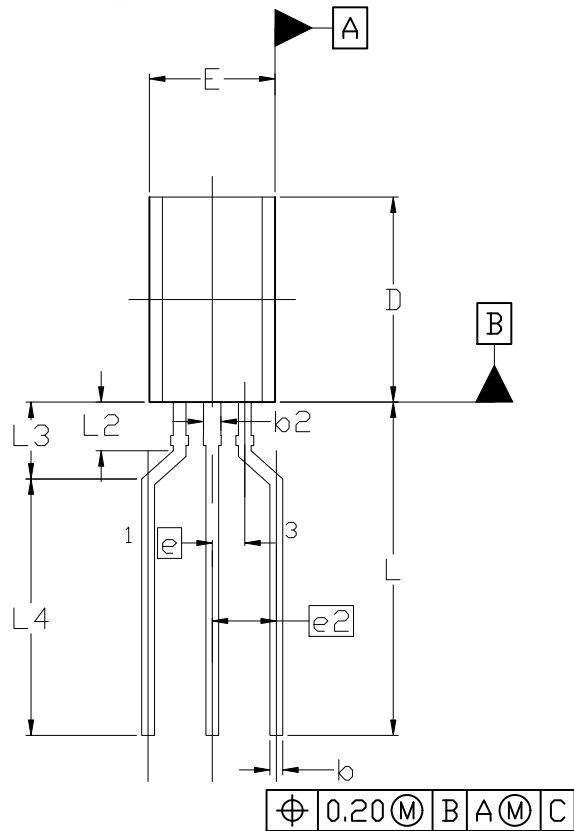


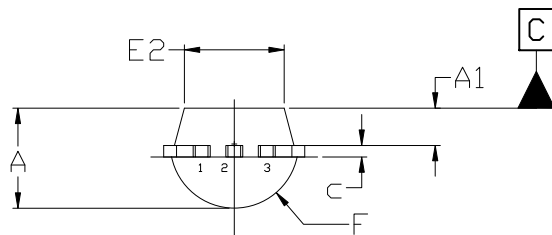
Figure 8. Safe Operating Area


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

DATE 14 JAN 2021



TOP VIEW



END VIEW

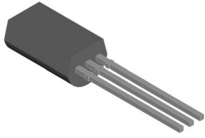
## NOTES:

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.

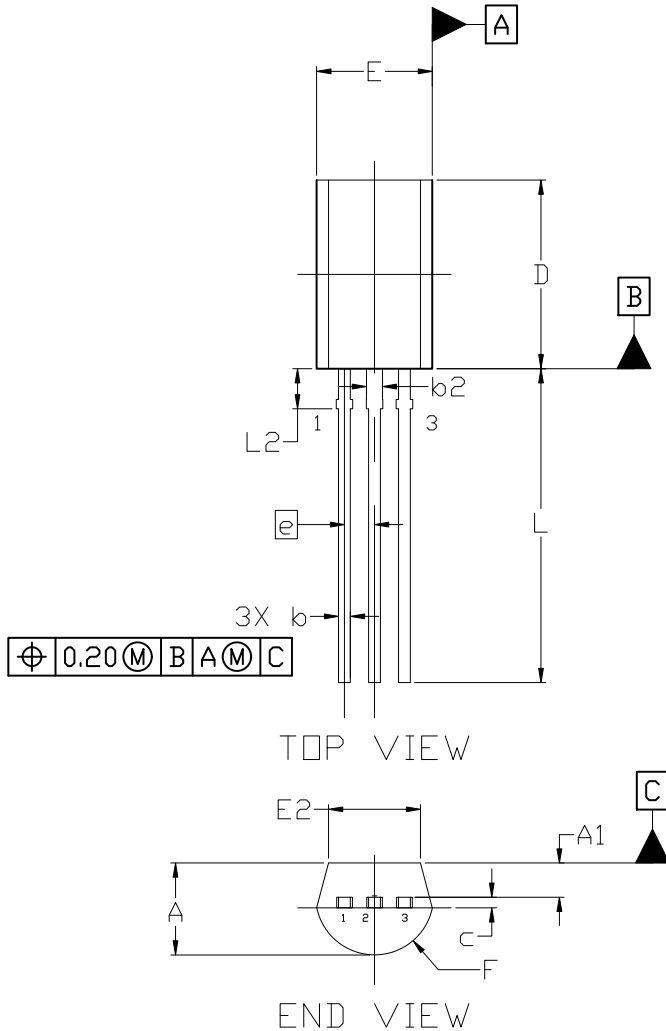
| DIM | MILLIMETERS |      |      |
|-----|-------------|------|------|
|     | MIN.        | NOM. | MAX. |
| A   | 3.70        | 3.90 | 4.10 |
| A1  | 1.25        | 1.45 | 1.65 |
| b   | 0.35        | 0.50 | 0.60 |
| b2  | 0.62        | ---  | 0.78 |
| c   | 0.35        | 0.45 | 0.55 |
| D   | 7.80        | 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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**TO-92 3 8.0x4.9**  
CASE 135AP  
ISSUE A

DATE 13 JAN 2021



## NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2009.
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3. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, GATE REMAINS AND TIE BAR PROTRUSIONS.
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| 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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