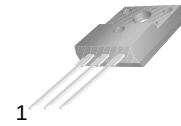


# PNP Epitaxial Silicon Transistor

## KSB1015



1. Base
2. Collector
3. Emitter

### Low Frequency Power Amplifier

- Low Collector Emitter Saturation Voltage
- This is a Pb-Free Device

TO-220 Fullpack, 3-Lead  
CASE 221AT

### MARKING DIAGRAM

B1015-  
Y  
AYWWZZ

B1015-Y = Specific Device Code  
A = Site Code  
YWW = Year WW  
ZZ = Assembly Lot Code

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

| Symbol    | Parameter                                                   | Ratings   | Unit             |
|-----------|-------------------------------------------------------------|-----------|------------------|
| $V_{CBO}$ | Collector-Base Voltage                                      | -60       | V                |
| $V_{CEO}$ | Collector-Emitter Voltage                                   | -60       | V                |
| $V_{EBO}$ | Emitter-Base Voltage                                        | -7        | V                |
| $I_C$     | Collector Current (DC)                                      | -3        | A                |
| $I_B$     | Base Current                                                | -0.5      | A                |
| $P_C$     | Collector Power Dissipation<br>( $T_C = 25^\circ\text{C}$ ) | 25        | W                |
| $T_J$     | Junction Temperature                                        | 150       | $^\circ\text{C}$ |
| $T_{STG}$ | Storage Temperature                                         | -55 ~ 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.

### ORDERING INFORMATION

| Device     | Package                        | Shipping             |
|------------|--------------------------------|----------------------|
| KSB1015YTU | TO-220-3 Fullpack<br>(Pb-Free) | 1000 Units /<br>Tube |

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

| Symbol                 | Parameter                            | Conditions                                                                                                    | Min      | Typ  | Max      | Unit          |
|------------------------|--------------------------------------|---------------------------------------------------------------------------------------------------------------|----------|------|----------|---------------|
| $BV_{CEO}$             | Collector-Emitter Breakdown Voltage  | $I_C = -50\text{ mA}$ , $I_B = 0$                                                                             | -60      | -    | -        | V             |
| $I_{CBO}$              | Collector Cut-off Current            | $V_{CB} = -60\text{ V}$ , $I_E = 0$                                                                           | -        | -    | -100     | $\mu\text{A}$ |
| $I_{EBO}$              | Emitter Cut-off Current              | $V_{BE} = -7\text{ V}$ , $I_C = 0$                                                                            | -        | -    | -100     | $\mu\text{A}$ |
| $h_{FE1}$<br>$h_{FE2}$ | DC Current Gain                      | $V_{CE} = -5\text{ V}$ , $I_C = -0.5\text{ A}$<br>$V_{CE} = -5\text{ V}$ , $I_C = -3\text{ A}$                | 60<br>20 | -    | 200<br>- |               |
| $V_{CE(sat)}$          | Collector-Emitter Saturation Voltage | $I_C = -3\text{ A}$ , $I_B = -0.3\text{ A}$                                                                   | -        | -0.5 | -1       | V             |
| $V_{BE(on)}$           | Base-Emitter ON Voltage              | $V_{CE} = -5\text{ V}$ , $I_C = -0.5\text{ A}$                                                                | -        | -0.7 | -1       | V             |
| $f_T$                  | Current Gain Bandwidth Product       | $V_{CE} = -5\text{ V}$ , $I_C = -0.5\text{ A}$                                                                | -        | 9    | -        | MHz           |
| $C_{ob}$               | Output Capacitance                   | $V_{CB} = -10\text{ V}$ , $f = 1\text{ MHz}$                                                                  | -        | 150  | -        | pF            |
| $t_{ON}$               | Turn ON Time                         | $V_{CC} = -30\text{ V}$ , $I_C = -1\text{ A}$ ,<br>$I_{B1} = -I_{B2} = -0.2\text{ A}$ ,<br>$R_L = 30\ \Omega$ | -        | 0.4  | -        | $\mu\text{s}$ |
| $t_{STG}$              | Storage Time                         |                                                                                                               | -        | 1.7  | -        | $\mu\text{s}$ |
| $t_F$                  | Fall Time                            |                                                                                                               | -        | 0.5  | -        | $\mu\text{s}$ |

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 | O        | Y         |
|----------------|----------|-----------|
| $h_{FE1}$      | 60 ~ 120 | 100 ~ 200 |

## TYPICAL CHARACTERISTICS

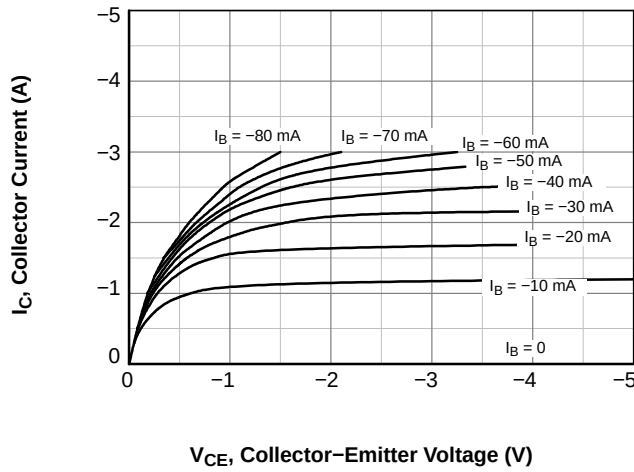


Figure 1. Static Characteristic

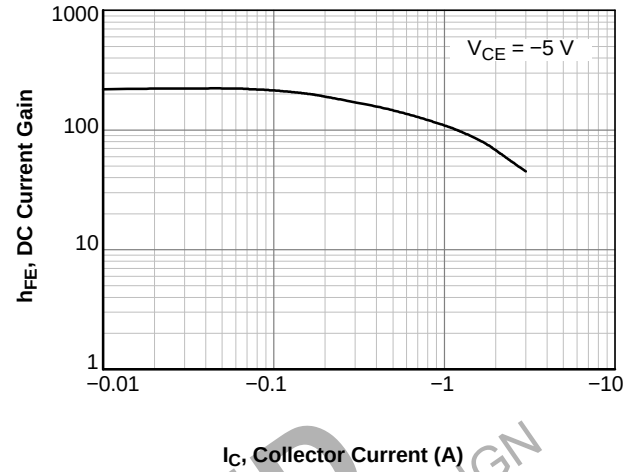


Figure 2. DC Current Gain

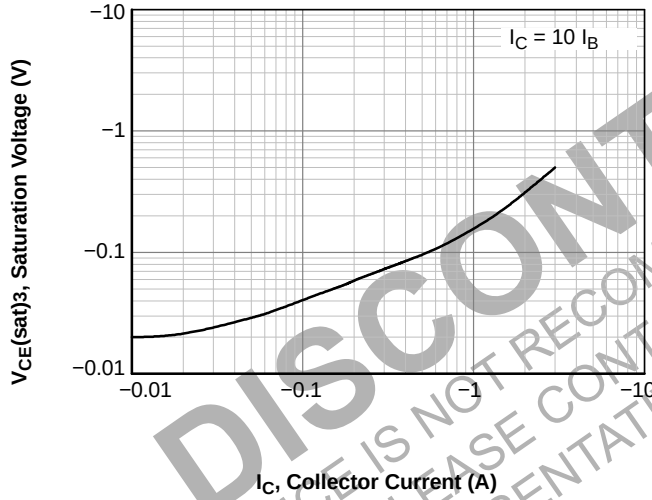


Figure 3. Collector-Emitter Saturation Voltage

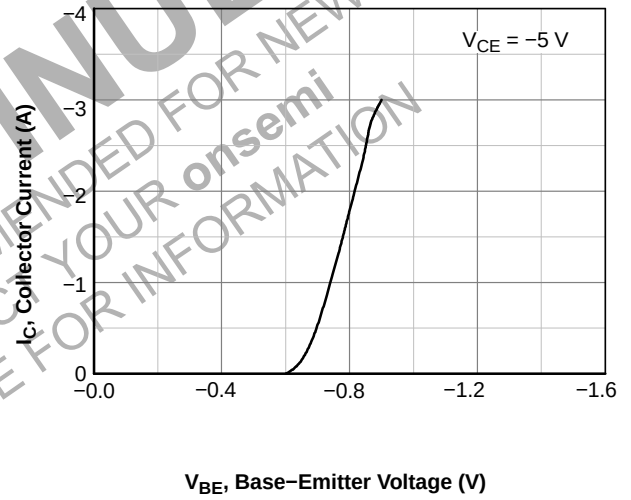


Figure 4. Base-Emitter On Voltage

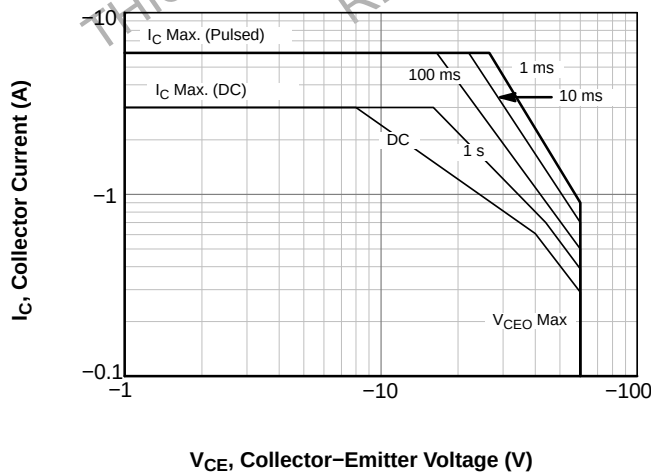


Figure 5. Safe Operating Areas

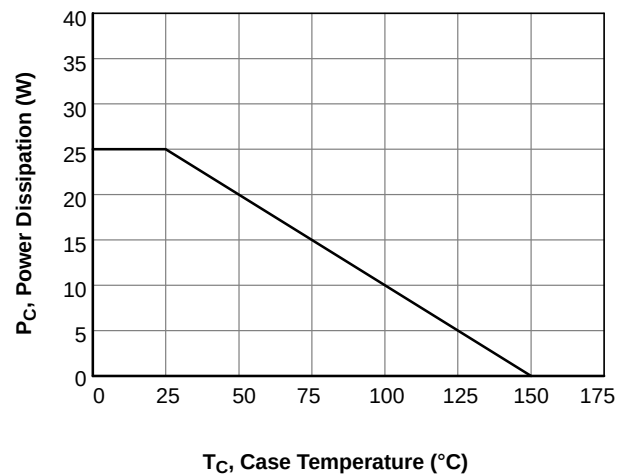
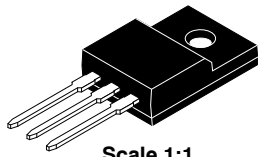


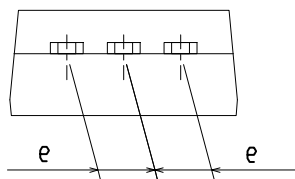
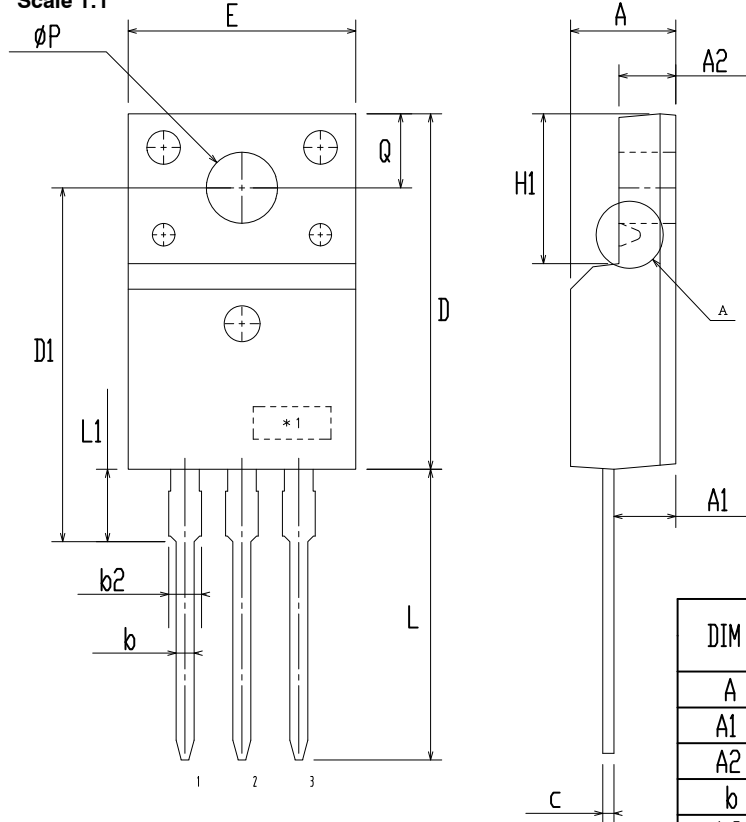
Figure 6. Power Derating

**TO-220 Fullpack, 3-Lead / TO-220F-3SG**  
**CASE 221AT**  
**ISSUE B**

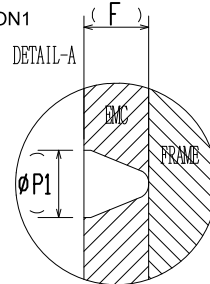
DATE 19 JAN 2021



Scale 1:1



OPTION1



| DIM  | MILLIMETERS |       |       |
|------|-------------|-------|-------|
|      | MIN         | NOM   | MAX   |
| A    | 4.50        | 4.70  | 4.90  |
| A1   | 2.56        | 2.76  | 2.96  |
| A2   | 2.34        | 2.54  | 2.74  |
| b    | 0.70        | 0.80  | 0.90  |
| b2   | ~           | ~     | 1.47  |
| c    | 0.45        | 0.50  | 0.60  |
| D    | 15.67       | 15.87 | 16.07 |
| D1   | 15.60       | 15.80 | 16.00 |
| E    | 9.96        | 10.16 | 10.36 |
| e    | 2.34        | 2.54  | 2.74  |
| F    | ~           | 0.84  | ~     |
| H1   | 6.48        | 6.68  | 6.88  |
| L    | 12.78       | 12.98 | 13.18 |
| L1   | 3.03        | 3.23  | 3.43  |
| Ø P  | 2.98        | 3.18  | 3.38  |
| Ø P1 | ~           | 1.00  | ~     |
| Q    | 3.20        | 3.30  | 3.40  |

**NOTES:**

A. DIMENSION AND TOLERANCE AS ASME Y14.5-2009

B. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH AND TIE BAR PROTRUCTIONS.

C. OPTION 1 - WITH SUPPORT PIN HOLE

OPTION 2 - NO SUPPORT PIN HOLE

|                         |                                              |                                                                                                                                                                                     |
|-------------------------|----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
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| <b>DESCRIPTION:</b>     | <b>TO-220 FULLPACK, 3-LEAD / TO-220F-3SG</b> | <b>PAGE 1 OF 1</b>                                                                                                                                                                  |

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