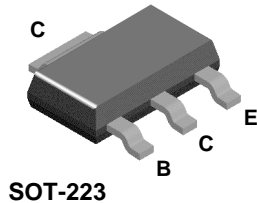


BCP54



NPN General Purpose Amplifier

This device is designed for general purpose medium power amplifiers and switching circuits requiring collector currents to 1.2 A. Sourced from Process 38.

Absolute Maximum Ratings* TA = 25°C unless otherwise noted

| Symbol | Parameter | Value | Units |
|----------------|--------------------------------------------------|-------------|-------|
| V_{CEO} | Collector-Emitter Voltage | 45 | V |
| V_{CBO} | Collector-Base Voltage | 45 | V |
| V_{EBO} | Emitter-Base Voltage | 5.0 | V |
| I_C | Collector Current - Continuous | 1.5 | A |
| T_J, T_{stg} | Operating and Storage Junction Temperature Range | -55 to +150 | °C |

*These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

NOTES:

- 1) These ratings are based on a maximum junction temperature of 150 degrees C.
- 2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

Thermal Characteristics TA = 25°C unless otherwise noted

| Symbol | Characteristic | Max | Units |
|-----------------|-----------------------------------------|-------|-------|
| | | BCP54 | |
| P_D | Total Device Dissipation | 1.5 | W |
| | Derate above 25°C | 12 | mW/°C |
| $R_{\theta JA}$ | Thermal Resistance, Junction to Ambient | 83.3 | °C/W |

NPN General Purpose Amplifier

(continued)

BCP54

Electrical Characteristics

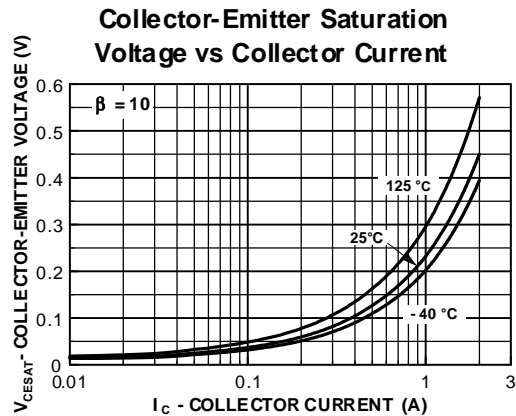
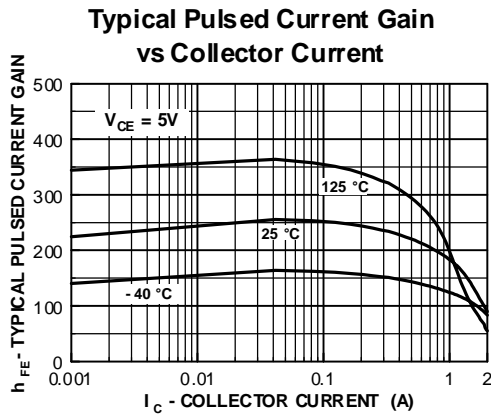
TA = 25°C unless otherwise noted

| Symbol | Parameter | Test Conditions | Min | Max | Units |
|----------------------------|-------------------------------------|-----------------------------------------------------------------------------------------------|-----|-----------|---------------------|
| OFF CHARACTERISTICS | | | | | |
| $V_{(BR)CEO}$ | Collector-Emitter Breakdown Voltage | $I_C = 10 \text{ mA}, I_B = 0$ | 45 | | V |
| $V_{(BR)CBO}$ | Collector-Base Breakdown Voltage | $I_C = 100 \text{ } \mu\text{A}, I_E = 0$ | 45 | | V |
| $V_{(BR)EBO}$ | Emitter-Base Breakdown Voltage | $I_E = 10 \text{ } \mu\text{A}, I_C = 0$ | 5.0 | | V |
| I_{CBO} | Collector-Cutoff Current | $V_{CB} = 30 \text{ V}, I_E = 0$ $V_{CB} = 30 \text{ V}, I_E = 0, T_A = 125^\circ\text{C}$ | | 100 10 | nA μA |
| I_{EBO} | Emitter-Cutoff Current | $V_{EB} = 5.0 \text{ V}, I_C = 0$ | | 10 | μA |

ON CHARACTERISTICS

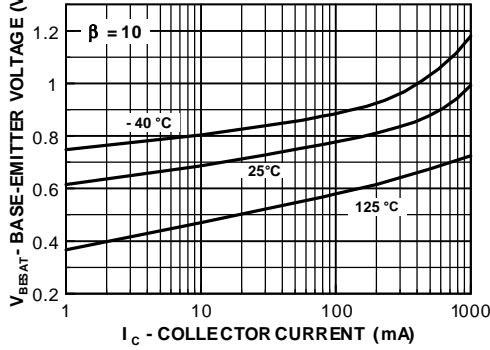
| | | | | | |
|---------------|--------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-----|---|
| h_{FE} | DC Current Gain | $I_C = 5.0 \text{ mA}, V_{CE} = 2.0 \text{ V}$ $I_C = 150 \text{ mA}, V_{CE} = 2.0 \text{ V}$ $I_C = 500 \text{ mA}, V_{CE} = 2.0 \text{ V}$ | 25 40 25 | 250 | |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage | $I_C = 500 \text{ mA}, I_B = 50 \text{ mA}$ | | 0.5 | V |
| $V_{BE(on)}$ | Base-Emitter On Voltage | $I_C = 500 \text{ mA}, V_{CE} = 2.0 \text{ V}$ | | 1.0 | V |

Typical Characteristics

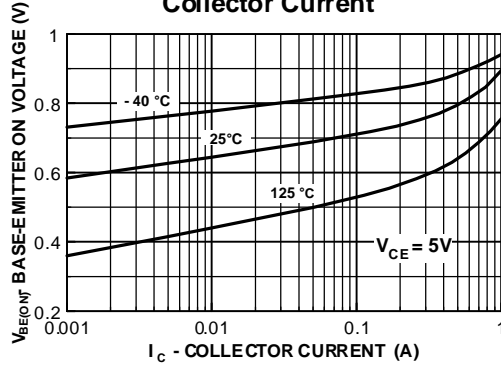


Typical Characteristics (continued)

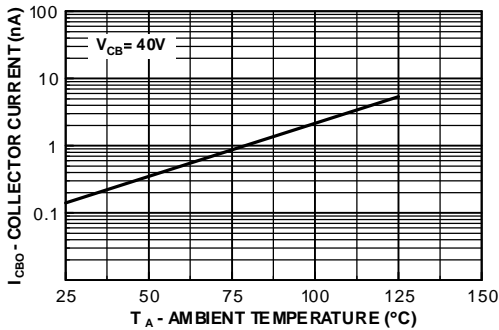
Base-Emitter Saturation Voltage vs Collector Current



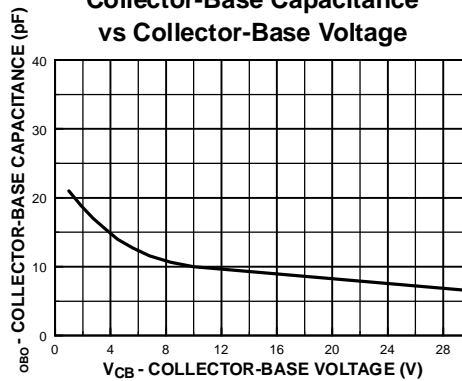
Base-Emitter ON Voltage vs Collector Current



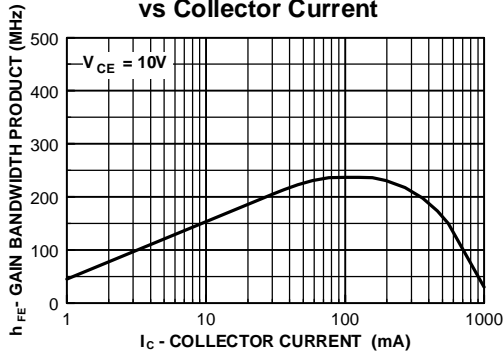
Collector-Cutoff Current vs Ambient Temperature



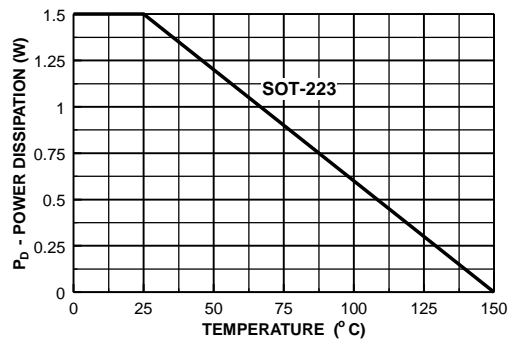
Collector-Base Capacitance vs Collector-Base Voltage



Gain Bandwidth Product vs Collector Current



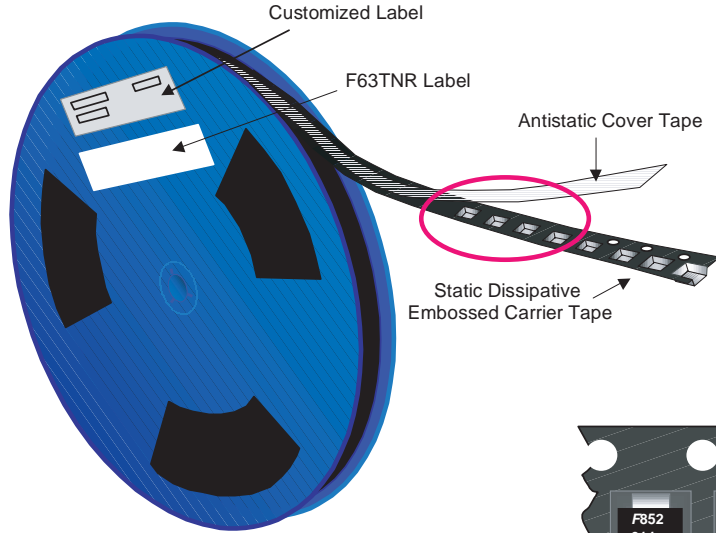
Power Dissipation vs Ambient Temperature



SOT-223 Tape and Reel Data

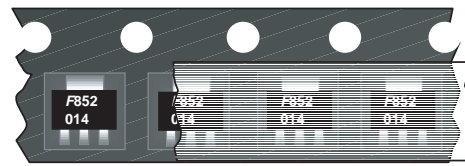


SOT-223 Packaging Configuration: Figure 1.0

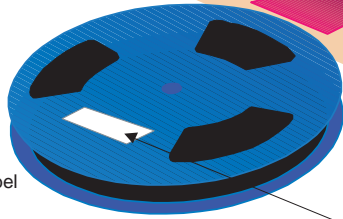
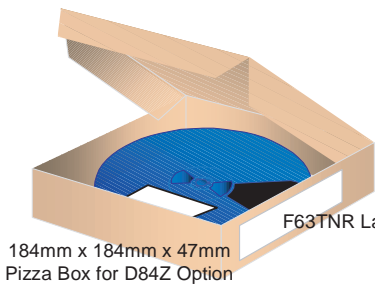
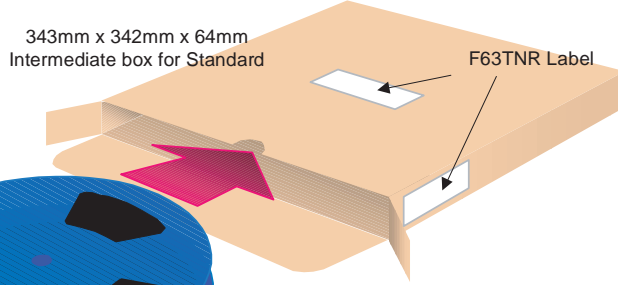


Packaging Description:
 SOT-223 parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 2,500 units per 13" or 330cm diameter reel. The reels are dark blue in color and is made of polystyrene plastic (anti-static coated). Other option comes in 500 units per 7" or 177cm diameter reel. This and some other options are further described in the Packaging Information table.
 These full reels are individually barcode labeled and placed inside a standard intermediate box (illustrated in figure 1.0) made of recyclable corrugated brown paper. One box contains two reels maximum. And these boxes are placed inside a barcode labeled shipping box which comes in different sizes depending on the number of parts shipped.

| SOT-223 Packaging Information | | |
|-------------------------------|-------------------------|------------|
| Packaging Option | Standard (no flow code) | D84Z |
| Packaging type | TNR | TNR |
| Qty per Reel/Tube/Bag | 2,500 | 500 |
| Reel Size | 13" Dia | 7" Dia |
| Box Dimension (mm) | 343x64x343 | 184x187x47 |
| Max qty per Box | 5,000 | 1,000 |
| Weight per unit (gm) | 0.1246 | 0.1246 |
| Weight per Reel (kg) | 0.7250 | 0.1532 |
| Note/Comments | | |



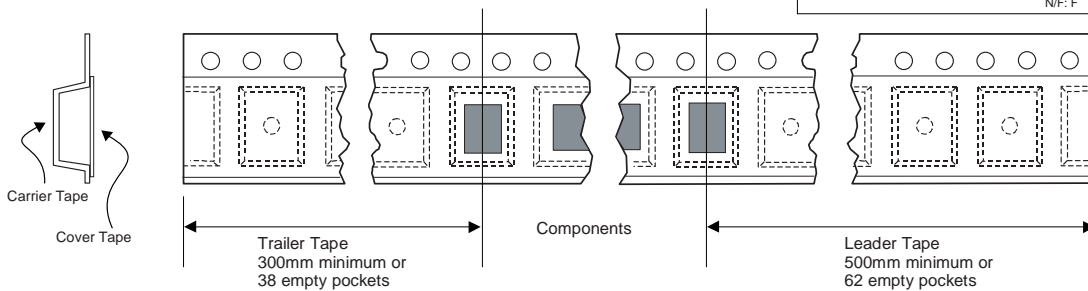
SOT-223 Unit Orientation



F63TNR Label sample

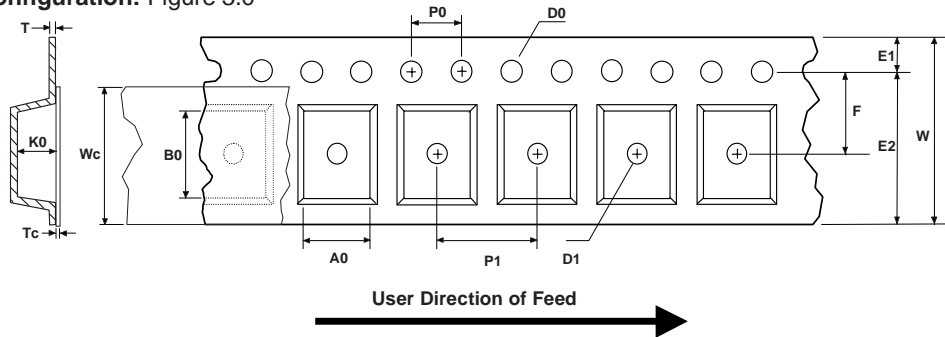
| | |
|------------------|-----------|
| LOT: CBVK741B019 | QTY: 3000 |
| FSID: PN2222A | SPEC: |
| D/C1: D9842 | QTY1: |
| D/C2: | QTY2: |
| SPEC REV: CPN: | N/F: F |
| | (F63TNR)3 |

SOT-223 Tape Leader and Trailer Configuration: Figure 2.0



SOT-223 Tape and Reel Data, continued

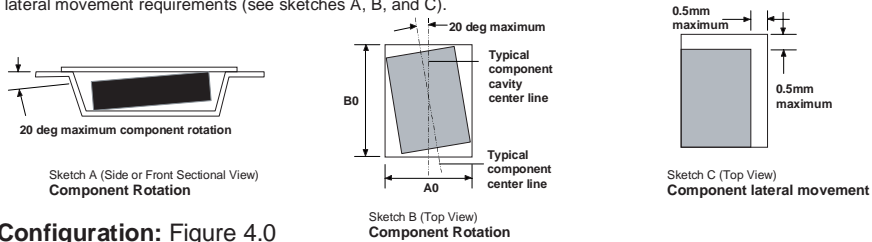
SOT-223 Embossed Carrier Tape Configuration: Figure 3.0



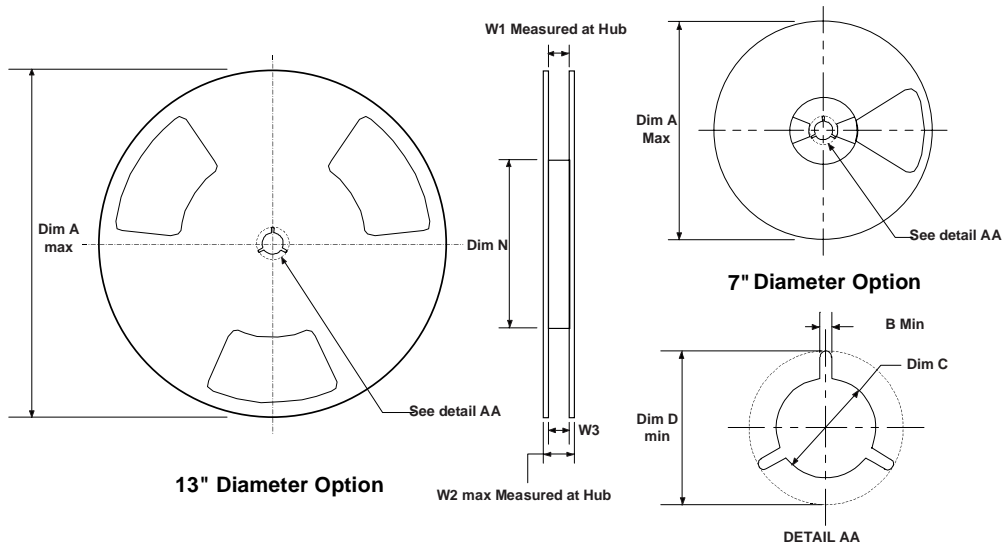
Dimensions are in millimeter

| Pkg type | A0 | B0 | W | D0 | D1 | E1 | E2 | F | P1 | P0 | K0 | T | Wc | Tc |
|-------------------|-----------------|-----------------|----------------|-----------------|-----------------|-----------------|--------------|-----------------|---------------|---------------|-----------------|------------------------|-----------------|-----------------|
| SOT-223 (12mm) | 6.83 +/-0.10 | 7.42 +/-0.10 | 12.0 +/-0.3 | 1.55 +/-0.05 | 1.50 +/-0.10 | 1.75 +/-0.10 | 10.25 min | 5.50 +/-0.05 | 8.0 +/-0.1 | 4.0 +/-0.1 | 1.88 +/-0.10 | 0.292 +/- 0.0130 | 9.5 +/-0.025 | 0.06 +/-0.02 |

Notes: A0, B0, and K0 dimensions are determined with respect to the EIA/Jedec RS-481 rotational and lateral movement requirements (see sketches A, B, and C).



SOT-223 Reel Configuration: Figure 4.0



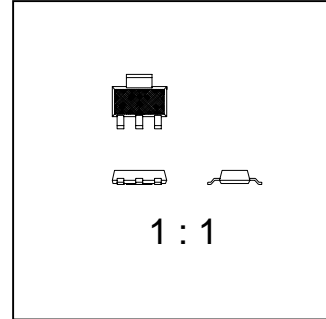
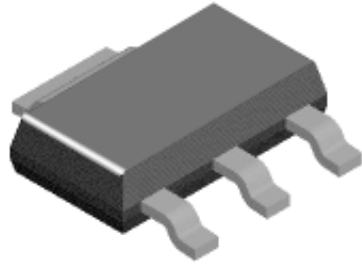
Dimensions are in inches and millimeters

| Tape Size | Reel Option | Dim A | Dim B | Dim C | Dim D | Dim N | Dim W1 | Dim W2 | Dim W3 (LSL-USL) |
|-----------|-------------|---------------|--------------|-----------------------------------|---------------|--------------|----------------------------------|---------------|------------------------------|
| 12mm | 7" Dia | 7.00 177.8 | 0.059 1.5 | 512 +0.020/-0.008 13 +0.5/-0.2 | 0.795 20.2 | 5.906 150 | 0.488 +0.078/-0.000 12.4 +2/0 | 0.724 18.4 | 0.469 - 0.606 11.9 - 15.4 |
| 12mm | 13" Dia | 13.00 330 | 0.059 1.5 | 512 +0.020/-0.008 13 +0.5/-0.2 | 0.795 20.2 | 7.00 178 | 0.488 +0.078/-0.000 12.4 +2/0 | 0.724 18.4 | 0.469 - 0.606 11.9 - 15.4 |

SOT-223 Package Dimensions

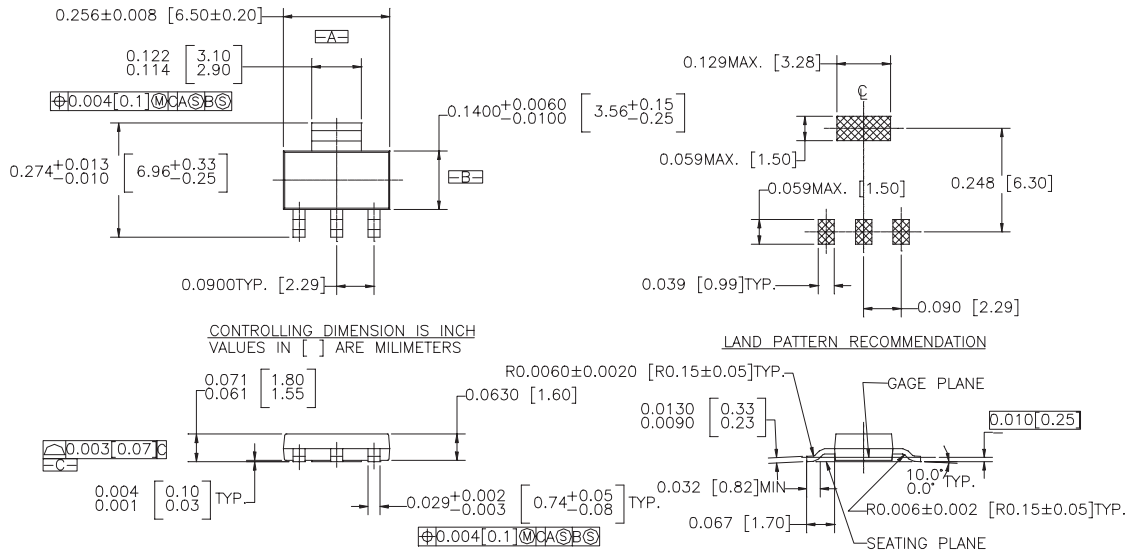


SOT-223 (FS PKG Code 47)



Scale 1:1 on letter size paper

Part Weight per unit (gram): 0.1246



- NOTES : UNLESS OTHERWISE SPECIFIED
- STANDARD LEAD FINISH TO BE 150 MICRONS/ 3.81 MICROMETERS MINIMUM TIN/LEAD (SOLDER) ON COPPER.
 - REFERENCE JEDEC REGISTRATION TO-261, VARIATION AA, ISSUE A, DATED JAN 1990

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