

RoHS Compliant Product

A suffix of "-C" specifies halogen & lead-free

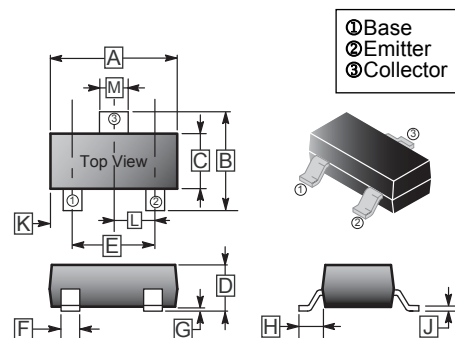
## FEATURES

- Ideally suited for automatic insertion
- For Switching and AF Amplifier Applications

## SOT-523

## MARKING

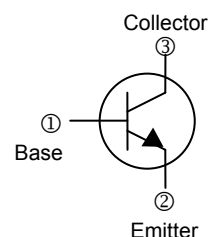
| Product | Marking Code |
|---------|--------------|
| BC847AT | 1E           |
| BC847BT | 1F           |
| BC847CT | 1G           |



## PACKAGE INFORMATION

| Package | MPQ | LeaderSize |
|---------|-----|------------|
| SOT-523 | 3K  | 7' inch    |

| REF. | Millimeter |      | REF. | Millimeter |       |
|------|------------|------|------|------------|-------|
|      | Min.       | Max. |      | Min.       | Max.  |
| A    | 1.5        | 1.7  | G    | -          | 0.1   |
| B    | 1.45       | 1.75 | H    | 0.55 REF.  |       |
| C    | 0.75       | 0.85 | J    | 0.1        | 0.2   |
| D    | 0.7        | 0.9  | K    | -          |       |
| E    | 0.9        | 1.1  | L    | 0.5 TYP.   |       |
| F    | 0.15       | 0.25 | M    | 0.25       | 0.325 |



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

| Parameter                      | Symbol         | Ratings        | Unit             |
|--------------------------------|----------------|----------------|------------------|
| Collector to Base Voltage      | $V_{CBO}$      | 50             | V                |
| Collector to Emitter Voltage   | $V_{CEO}$      | 45             | V                |
| Emitter to Base Voltage        | $V_{EBO}$      | 6              | V                |
| Collector Current - Continuous | $I_C$          | 0.1            | A                |
| Collector Power Dissipation    | $P_C$          | 150            | mW               |
| Junction, Storage Temperature  | $T_J, T_{STG}$ | 150, -55 ~ 150 | $^\circ\text{C}$ |

**ELECTRICAL CHARACTERISTICS** (  $T_A = 25^\circ\text{C}$  unless otherwise specified )

| Parameter                               | Symbol        | Min.     | Typ. | Max. | Unit | Test Conditions                                                  |                                                                                          |
|-----------------------------------------|---------------|----------|------|------|------|------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| Collector to Base Breakdown Voltage     | $V_{CBO}$     | 50       | -    | -    | V    | $I_C = 10 \mu\text{A}, I_E = 0$                                  |                                                                                          |
| Collector to Emitter Breakdown Voltage  | $V_{CEO}$     | 45       | -    | -    | V    | $I_C = 10 \text{mA}, I_B = 0$                                    |                                                                                          |
| Emitter to Base Breakdown Voltage       | $V_{EBO}$     | 6        | -    | -    | V    | $I_E = 1 \mu\text{A}, I_C = 0$                                   |                                                                                          |
| Collector Cutoff Current                | $I_{CBO}$     | -        | -    | 15   | nA   | $V_{CB} = 30 \text{V}$                                           |                                                                                          |
| Collector to Emitter Saturation Voltage | $V_{CE(sat)}$ | -        | -    | 0.25 | V    | $I_C = 10\text{mA}, I_B = 0.5 \text{mA}$                         |                                                                                          |
|                                         |               | -        | -    | 0.6  |      | $I_C = 100\text{mA}, I_B = 5 \text{mA}$                          |                                                                                          |
| Base to Emitter Saturation Voltage      | $V_{BE(sat)}$ | -        | 0.7  | -    | V    | $I_C = 10\text{mA}, I_B = 0.5 \text{mA}$                         |                                                                                          |
|                                         |               | -        | 0.9  | -    |      | $I_C = 100\text{mA}, I_B = 5 \text{mA}$                          |                                                                                          |
| Base to Emitter Voltage                 | $V_{BE(on)}$  | 580      | 660  | 700  | mV   | $V_{CE} = 5 \text{V}, I_C = 2 \text{mA}$                         |                                                                                          |
|                                         |               | -        | -    | 770  |      | $V_{CE} = 5 \text{V}, I_C = 10 \text{mA}$                        |                                                                                          |
| DC Current Gain                         | BC847AT       | $h_{FE}$ | 110  | -    | 220  | V <sub>CE</sub> = 5 V, I <sub>C</sub> = 2 mA                     |                                                                                          |
|                                         | BC847BT       |          | 200  | -    | 450  |                                                                  |                                                                                          |
|                                         | BC847CT       |          | 420  | -    | 800  |                                                                  |                                                                                          |
| Transition Frequency                    | $f_T$         | 100      | -    | -    | MHz  | $V_{CE} = 5 \text{V}, I_C = 10 \text{mA}$<br>$f = 100\text{MHz}$ |                                                                                          |
| Collector Output Capacitance            | $C_{Ob}$      | -        | -    | 4.5  | pF   | $V_{CB} = 10 \text{V}, f=1\text{MHz}$                            |                                                                                          |
| Noise Figure                            | BC847BT       | NF       | -    | -    | 10   | dB                                                               | $V_{CE}= 5\text{V}, \text{BW}= 200\text{HZ},$<br>$f= 1\text{KHz}, R_s= 2 \text{k}\Omega$ |
|                                         | BC847CT       |          | -    | -    | 4    |                                                                  |                                                                                          |

**CHARACTERISTIC CURVES**

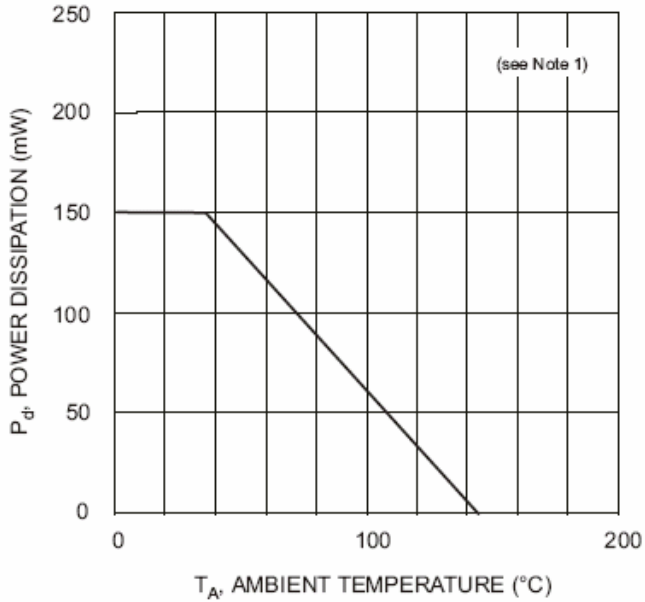


Fig. 1, Power Derating Curve

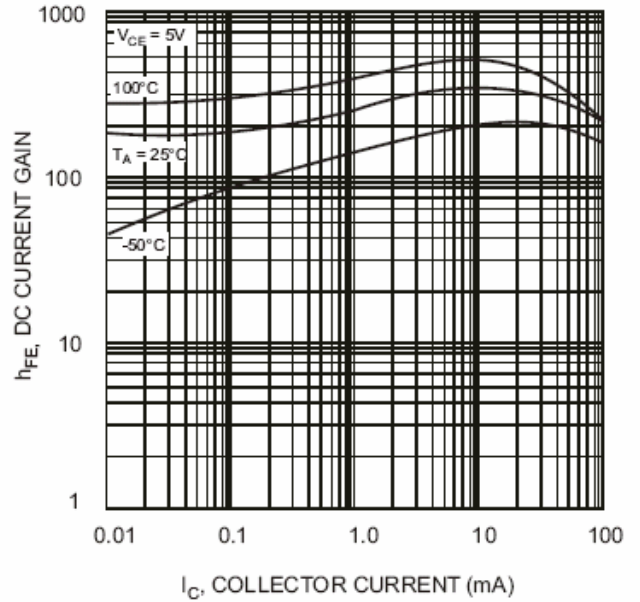


Fig. 2, DC Current Gain vs Collector Current

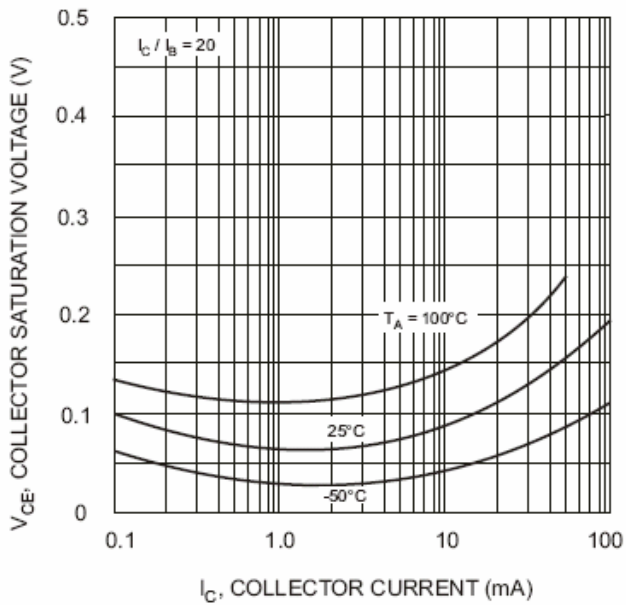


Fig. 3, Collector Saturation Voltage vs Collector Current

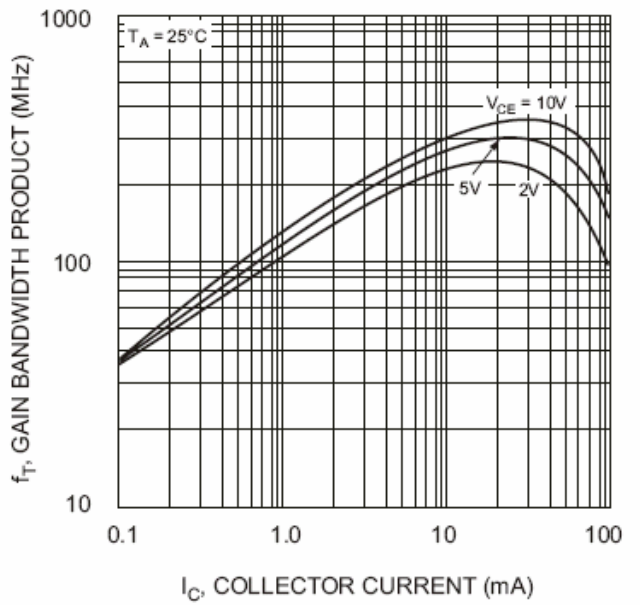


Fig. 4, Gain Bandwidth Product vs Collector Current