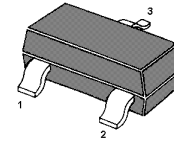


## NPN General-Purpose Transistors

### Features

- These transistors are subdivided into three groups -16, -25 and -40, according to their current gain.  
As complementary types the PNP transistors BC807A and BC808A are recommended.
- AEC-Q101 qualified
- High reliability
- Halogen and Antimony Free(HAF), RoHS compliant



1. Base 2. Emitter 3. Collector  
SOT-23 Plastic Package

### Applications

- General-purpose switching, AF driver and amplification

### Absolute Maximum Ratings ( $T_a = 25^\circ\text{C}$ )

| Parameter                 |                  | Symbol    | Value         | Unit             |
|---------------------------|------------------|-----------|---------------|------------------|
| Collector Base Voltage    | BC817A<br>BC818A | $V_{CBO}$ | 50<br>30      | V                |
| Collector Emitter Voltage | BC817A<br>BC818A | $V_{CEO}$ | 45<br>25      | V                |
| Emitter Base Voltage      |                  | $V_{EBO}$ | 5             | V                |
| Collector Current         |                  | $I_C$     | 500           | mA               |
| Power Dissipation         |                  | $P_{tot}$ | 300           | mW               |
| Junction Temperature      |                  | $T_j$     | 150           | $^\circ\text{C}$ |
| Storage Temperature Range |                  | $T_{stg}$ | - 55 to + 150 | $^\circ\text{C}$ |

### Thermal Characteristics

| Parameter                                                 | Symbol          | Max. | Unit               |
|-----------------------------------------------------------|-----------------|------|--------------------|
| Thermal Resistance from Junction to Ambient <sup>1)</sup> | $R_{\theta JA}$ | 417  | $^\circ\text{C/W}$ |

<sup>1)</sup> Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.

**Electrical Characteristics at  $T_a = 25^\circ\text{C}$** 

| Parameter                                                                                     | Symbol                                                 | Min.     | Typ. | Max. | Unit |
|-----------------------------------------------------------------------------------------------|--------------------------------------------------------|----------|------|------|------|
| DC Current Gain<br>at $V_{CE} = 1\text{ V}$ , $I_C = 100\text{ mA}$                           | Current Gain Group<br>-16A<br>-25A<br>-40A<br>$h_{FE}$ | 100      | -    | 250  | -    |
|                                                                                               |                                                        | 160      | -    | 400  | -    |
|                                                                                               |                                                        | 250      | -    | 600  | -    |
| at $V_{CE} = 1\text{ V}$ , $I_C = 500\text{ mA}$                                              |                                                        | 40       | -    | -    | -    |
| Collector Base Cutoff Current<br>at $V_{CB} = 20\text{ V}$                                    | $I_{CBO}$                                              | -        | -    | 100  | nA   |
| Emitter Base Cutoff Current<br>at $V_{EB} = 5\text{ V}$                                       | $I_{EBO}$                                              | -        | -    | 100  | nA   |
| Collector Base Breakdown Voltage<br>at $I_C = 10\text{ }\mu\text{A}$                          | BC817A<br>BC818A<br>$V_{(BR)CBO}$                      | 50<br>30 |      |      | V    |
| Collector Emitter Breakdown Voltage<br>at $I_C = 10\text{ mA}$                                | BC817A<br>BC818A<br>$V_{(BR)CEO}$                      | 45<br>25 |      |      | V    |
| Emitter Base Breakdown Voltage<br>at $I_E = 10\text{ }\mu\text{A}$                            | $V_{(BR)EBO}$                                          | 5        |      |      | V    |
| Collector Emitter Saturation Voltage<br>at $I_C = 500\text{ mA}$ , $I_B = 50\text{ mA}$       | $V_{CE(sat)}$                                          | -        | -    | 0.7  | V    |
| Base Emitter Voltage<br>at $I_C = 500\text{ mA}$ , $V_{CE} = 1\text{ V}$                      | $V_{BE(on)}$                                           | -        | -    | 1.2  | V    |
| Transition Frequency<br>at $V_{CE} = 5\text{ V}$ , $I_C = 10\text{ mA}$ , $f = 50\text{ MHz}$ | $f_T$                                                  | 100      | -    | -    | MHz  |
| Collector Base Capacitance<br>at $V_{CB} = 10\text{ V}$ , $f = 1\text{ MHz}$                  | $C_{ob}$                                               | -        | 5    | -    | pF   |

## Electrical Characteristics Curves

Fig. 1 Output Characteristics Curve

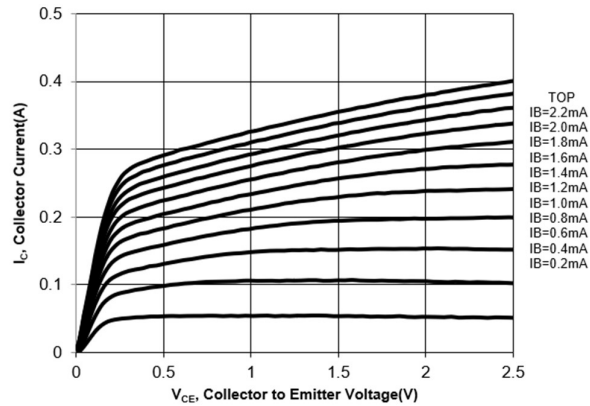


Fig. 2 Output Characteristics Curve

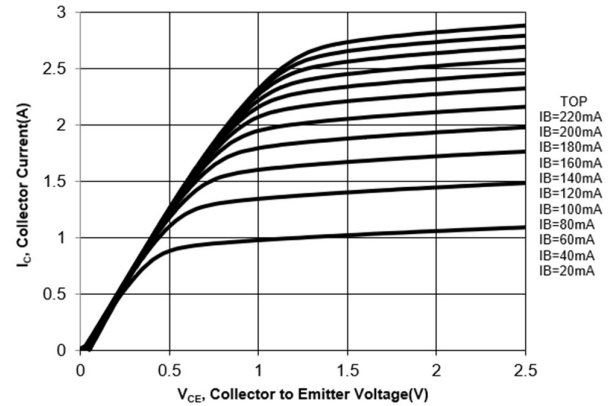
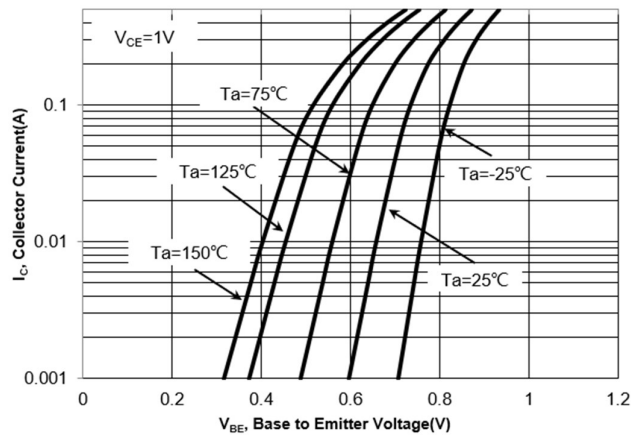
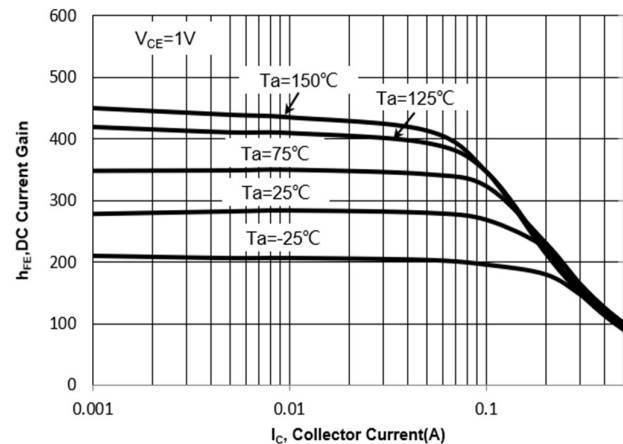
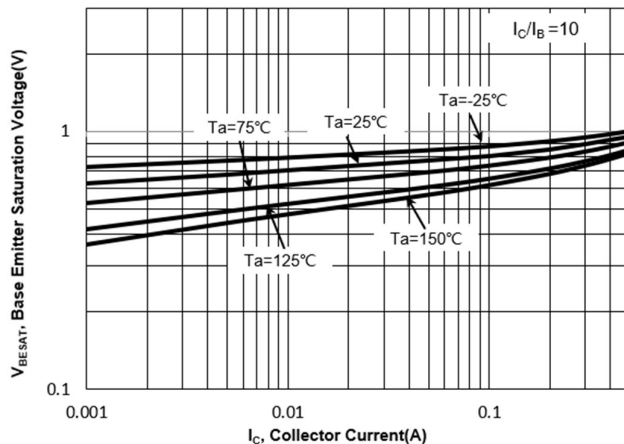
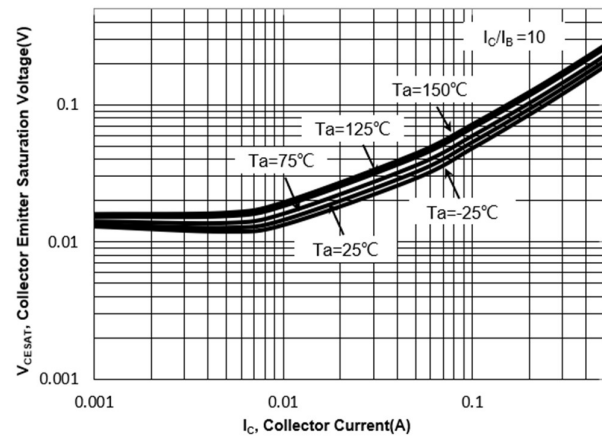


Fig. 3 Collector Current vs. Base to Emitter Voltage

Fig. 4  $h_{FE}$ , DC Current Gain vs. Collector CurrentFig. 5  $V_{BESAT}$  vs. Collector CurrentFig. 6  $V_{CESAT}$  vs. Collector Current

## Electrical Characteristics Curves

Fig. 7 Power Derating Curve

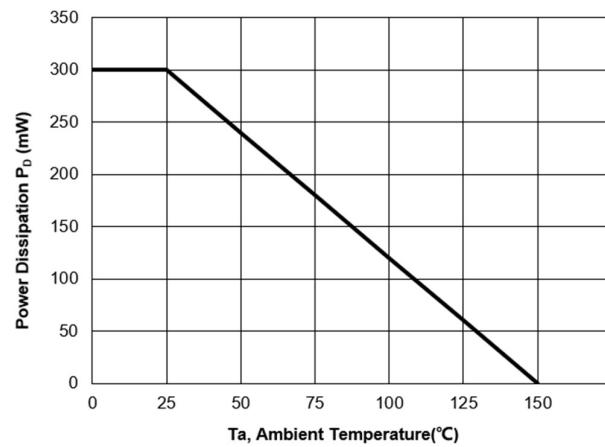
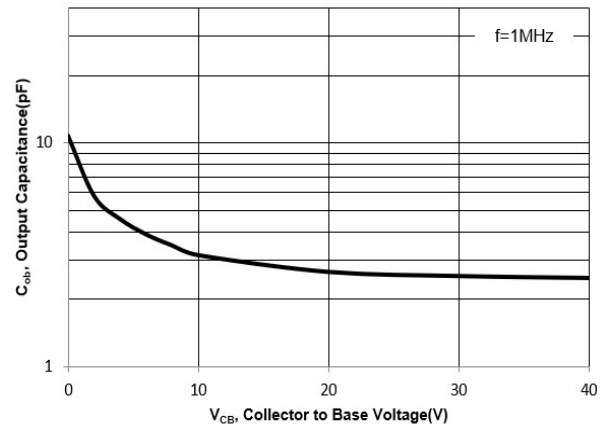
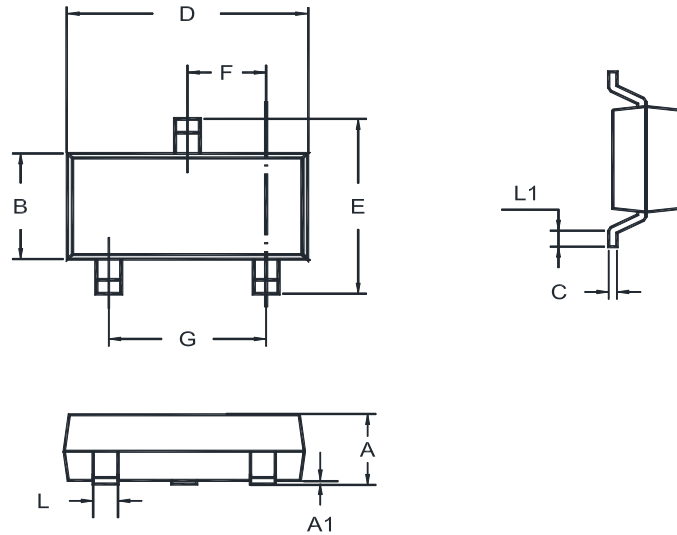


Fig. 8 Output Capacitance



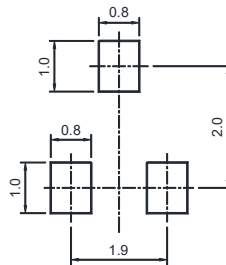
## Package Outline (Dimensions in mm)

## SOT-23



| Unit | A            | A1             | B            | C            | D            | E          | F            | G            | L            | L1         |
|------|--------------|----------------|--------------|--------------|--------------|------------|--------------|--------------|--------------|------------|
| mm   | 1.20<br>0.89 | 0.100<br>0.013 | 1.40<br>1.20 | 0.19<br>0.08 | 3.04<br>2.80 | 2.6<br>2.2 | 1.02<br>0.89 | 2.04<br>1.78 | 0.51<br>0.37 | 0.2<br>MIN |

## Recommended Soldering Footprint

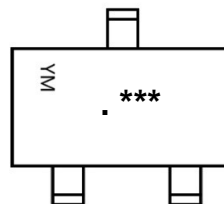


## Packing information

| Package | Tape Width (mm) | Pitch   |               | Reel Size |      | Per Reel Packing Quantity |
|---------|-----------------|---------|---------------|-----------|------|---------------------------|
|         |                 | mm      | inch          | mm        | inch |                           |
| SOT-23  | 8               | 4 ± 0.1 | 0.157 ± 0.004 | 178       | 7    | 3,000                     |

## Marking information

| Part No.              | Marking Code |
|-----------------------|--------------|
| BC817-16A & BC818-16A | 6CR          |
| BC817-25A & BC818-25A | 6CS          |
| BC817-40A & BC818-40A | 6CT          |



"•" = HAF (Halogen and Antimony Free)

"YM" = Date Code Marking

"Y" = Year

"M" = Month

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