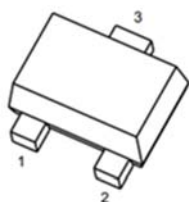
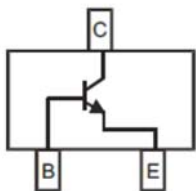


## BC846AM3 THRU BC848CM3

### NPN Transistor



1. Base  
2. Emitter  
3. Collector

**SOT-723**

#### Features

- Moisture sensitivity level 1
- Halogen free and
- Surface mount package ideally suited for automatic insertion

#### Application

- Signal amplification
- Switching circuit

#### Mechanical data

- **Package:** SOT-723
- **Terminals:** Tin plated leads, solderable per J-STD-002 and JESD22-B102

#### ■ Maximum Ratings ( $T_a=25^\circ\text{C}$ Unless otherwise specified)

| Item                      | Symbol    | Unit | Conditions |                            | Value |
|---------------------------|-----------|------|------------|----------------------------|-------|
| Device marking code       |           |      | BC846AM3   |                            | 1A    |
|                           |           |      | BC846BM3   |                            | 1B    |
|                           |           |      | BC847AM3   |                            | 1E    |
|                           |           |      | BC847BM3   |                            | 1F    |
|                           |           |      | BC847CM3   |                            | 1G    |
|                           |           |      | BC848AM3   |                            | 1J    |
|                           |           |      | BC848BM3   |                            | 1K    |
|                           |           |      | BC848CM3   |                            | 1L    |
| Collector-base voltage    | $V_{CBO}$ | V    | BC846      | $I_C=10\mu\text{A}, I_E=0$ | 80    |
|                           |           |      | BC847      |                            | 50    |
|                           |           |      | BC848      |                            | 30    |
| Collector-emitter voltage | $V_{CEO}$ | V    | BC846      | $I_C=10\text{mA}, I_B=0$   | 65    |
|                           |           |      | BC847      |                            | 45    |
|                           |           |      | BC848      |                            | 30    |

## BC846AM3 THRU BC848CM3

| Item                 | Symbol    | Unit | Conditions           | Value       |
|----------------------|-----------|------|----------------------|-------------|
| Emitter-base voltage | $V_{EBO}$ | V    | $I_E=10\mu A, I_C=0$ | 6           |
| Collector current    | $I_C$     | mA   |                      | 100         |
| Power dissipation    | $P_D$     | mW   |                      | 100         |
| Junction temperature | $T_J$     | °C   |                      | -55 to +150 |
| Storage temperature  | $T_{STG}$ | °C   |                      | -55 to +150 |

### ■ Electrical Characteristics ( $T_a=25^\circ\text{C}$ Unless otherwise specified)

| Item                                 | Symbol        | Unit    | Conditions                      | Min | Typ | Max |
|--------------------------------------|---------------|---------|---------------------------------|-----|-----|-----|
| Collector-base breakdown voltage     | $V_{(BR)CBO}$ | V       | BC846                           | 80  |     |     |
|                                      |               |         | BC847                           | 50  |     |     |
|                                      |               |         | BC848                           | 30  |     |     |
| Collector-emitter breakdown voltage  | $V_{(BR)CEO}$ | V       | BC846                           | 65  |     |     |
|                                      |               |         | BC847                           | 45  |     |     |
|                                      |               |         | BC848                           | 30  |     |     |
| Emitter-base breakdown voltage       | $V_{(BR)EBO}$ | V       | $I_E=10\mu A, I_C=0$            | 6   |     |     |
| Collector cut-off current            | $I_{CBO}$     | $\mu A$ | BC846                           |     |     | 0.1 |
|                                      |               |         | BC847                           |     |     | 0.1 |
|                                      |               |         | BC848                           |     |     | 0.1 |
| Emitter-base cutoff current          | $I_{EBO}$     | $\mu A$ | $V_{EB}=5V, I_C=0$              |     |     | 0.1 |
| DC current gain                      | $h_{FE}$      |         | BC846A,847A,848A                | 110 |     | 220 |
|                                      |               |         | BC846B,847B,848B                | 200 |     | 450 |
|                                      |               |         | BC847C,BC848C                   | 420 |     | 800 |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | V       | $I_C=100mA, I_B=5mA$            |     |     | 0.5 |
| Base-emitter saturation voltage      | $V_{BE(sat)}$ | V       | $I_C=100mA, I_B=5mA$            |     |     | 1.1 |
| Transition frequency                 | $f_T$         | MHz     | $V_{CE}=5V, I_C=10mA, f=100MHz$ | 100 |     |     |
| Collector-base output capacitance    | $C_{ob}$      | pF      | $V_{CB}=10V, f=1MHz$            |     |     | 4.5 |

## BC846AM3 THRU BC848CM3

### ■ Thermal Characteristics

| Parameter                               | Symbol                 | Unit                 | Value |
|-----------------------------------------|------------------------|----------------------|-------|
| Thermal resistance, junction-to-ambient | $R_{\theta J-A}^{(1)}$ | $^{\circ}\text{C/W}$ | 1250  |
| Thermal resistance, junction-to-case    | $R_{\theta J-C}^{(1)}$ | $^{\circ}\text{C/W}$ | 1000  |

#### Note:

(1) Thermal resistance from junction to ambient and from junction to case mounted on P.C.B. with 25.4mm\*25.4mm copper pad areas

### ■ Characteristics

Fig 1: Static Characteristics

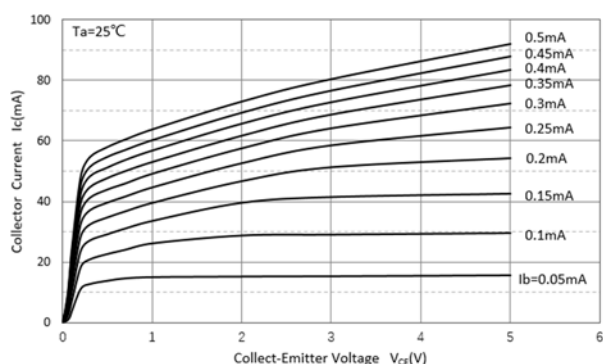


Fig 2: DC Current Gain Characteristics

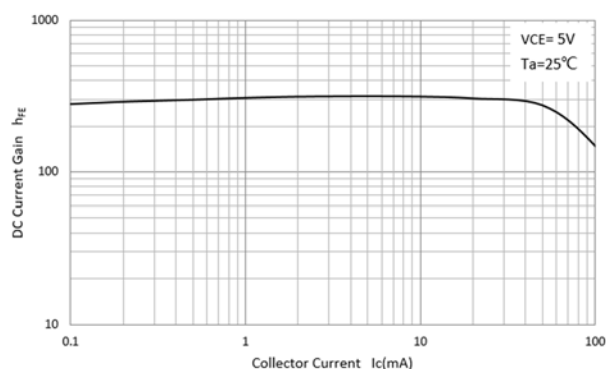


Fig 3: Collector-Emitter Saturation Voltage

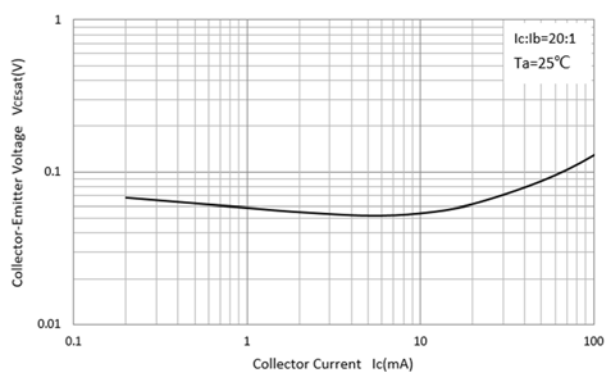
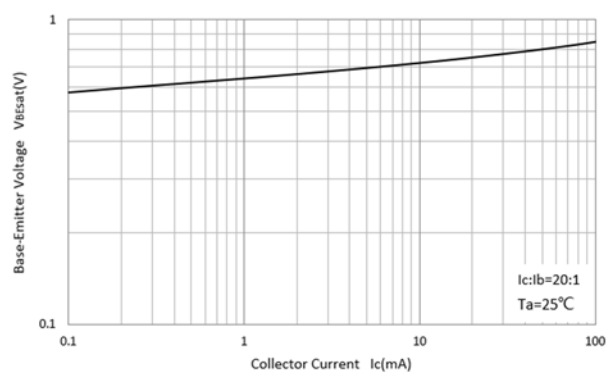
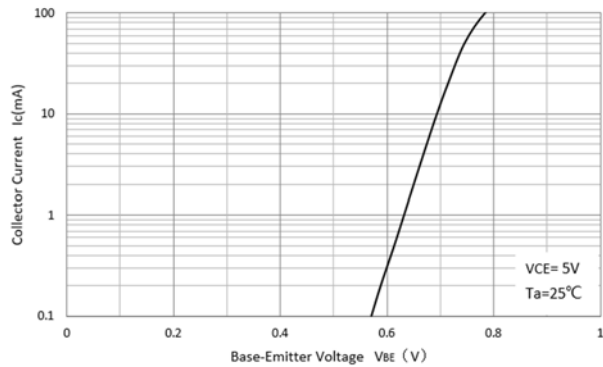


Fig 4: Base-Emitter Saturation Voltage

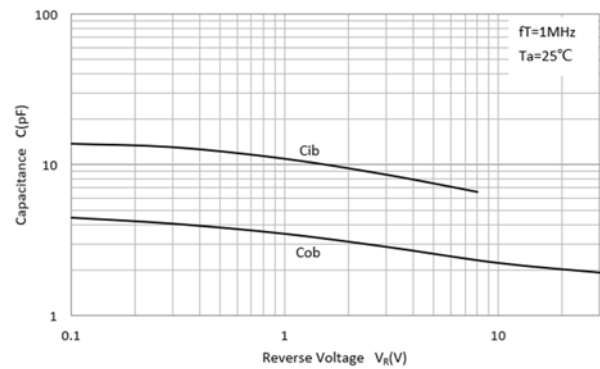


## BC846AM3 THRU BC848CM3

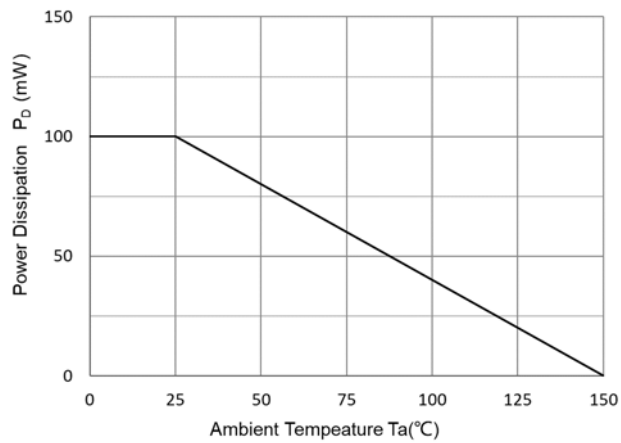
**Fig 5: Base-Emitter on Voltage**



**Fig 6: Cob/Cib- $V_{CB}/V_{EB}$**



**Fig 7:  $P_D$ - $T_a$  Curve**

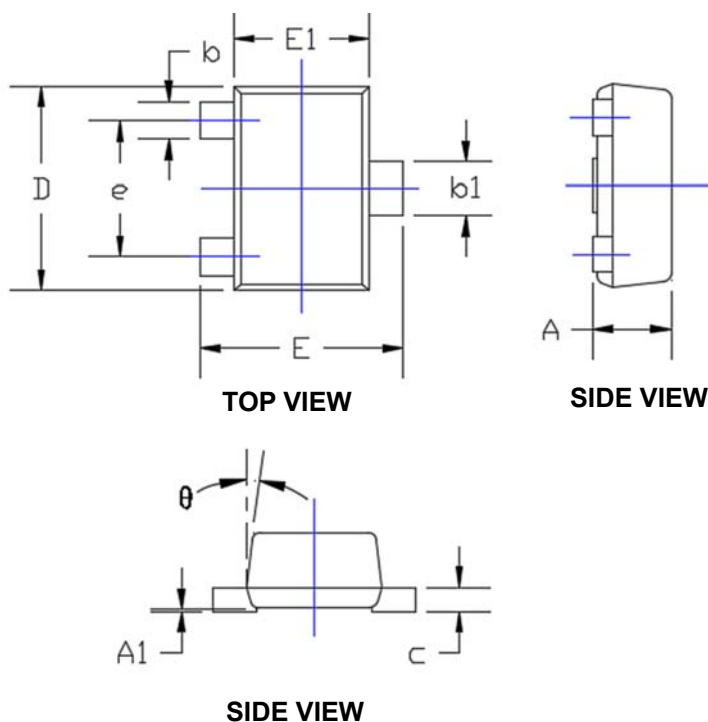


## BC846AM3 THRU BC848CM3

### ■ Ordering Information

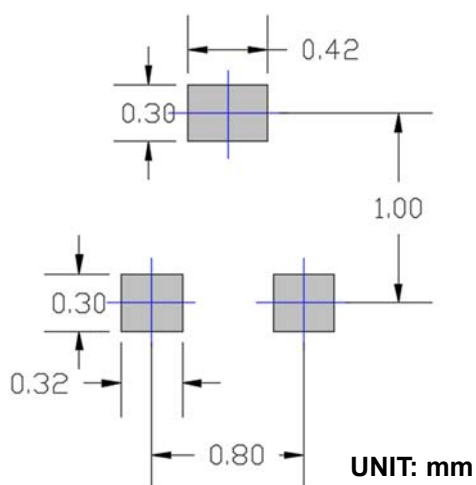
| Preferred P/N          | Packing code | Unit weight(g)     | Minimum package(pcs) | Inner box quantity(pcs) | Outer carton quantity(pcs) | Delivery mode |
|------------------------|--------------|--------------------|----------------------|-------------------------|----------------------------|---------------|
| BC846AM3 THRU BC848CM3 | F2           | Approximate 0.0013 | 8000                 | 80000                   | 320000                     | 7" reel       |

### ■ Outline Dimensions



| SYMBOL | DIMENSIONS |       |            |       |
|--------|------------|-------|------------|-------|
|        | INCHES     |       | Millimeter |       |
|        | MIN.       | MAX.  | MIN.       | MAX.  |
| A      | 0.017      | 0.022 | 0.430      | 0.550 |
| A1     | 0.000      | 0.002 | 0.000      | 0.050 |
| b      | 0.007      | 0.011 | 0.170      | 0.270 |
| b1     | 0.011      | 0.015 | 0.270      | 0.370 |
| c      | 0.003      | 0.008 | 0.080      | 0.200 |
| D      | 0.045      | 0.049 | 1.150      | 1.250 |
| E      | 0.045      | 0.049 | 1.150      | 1.250 |
| E1     | 0.030      | 0.033 | 0.750      | 0.850 |
| e      | 0.031TYP.  |       | 0.800TYP.  |       |
| θ      | 7°REF.     |       | 7°REF.     |       |

### ■ Suggested Pad Layout



## **BC846AM3 THRU BC848CM3**

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