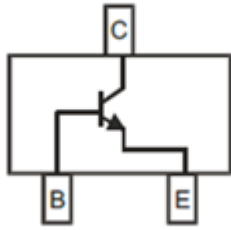


## NPN General Purpose Amplifier



**SOT-323**

### Features

- Epoxy meets UL-94 V-0 flammability rating and halogen free
- Moisture Sensitivity Level 1
- Part no. with suffix "Q" means AEC-Q101 qualified

### Applications

- General purpose switching and amplification

### Mechanical Data

- **Case:** SOT-323
- **Terminals:** Tin plated leads, solderable per J-STD-002 and JESD22-B102
- **Marking:**

|             |             |             |
|-------------|-------------|-------------|
| BC846AWQ=1A | BC847AWQ=1E | BC848AWQ=1J |
| BC846BWQ=1B | BC847BWQ=1F | BC848BWQ=1K |
|             | BC847CWQ=1G | BC848CWQ=1L |

### ■ Maximum Ratings (Ta=25°C unless otherwise noted)

| Item                                       | Symbol     | Unit | Conditions | Value                          |    |
|--|------------|------|------------|--------------------------------|----|
| Collector-Base Voltage                     | $V_{CBO}$  | V    |            | BC846AWQ、BC846BWQ              | 80 |
|  |            |      |            | BC847AWQ、BC847BWQ、<br>BC847CWQ | 50 |
|  |            |      |            | BC848AWQ、BC848BWQ、<br>BC848CWQ | 30 |
| Collector-Emitter Voltage                  | $V_{CEO}$  | V    |            | BC846AWQ、BC846BWQ              | 65 |
|  |            |      |            | BC847AWQ、BC847BWQ、<br>BC847CWQ | 45 |
|  |            |      |            | BC848AWQ、BC848BWQ、<br>BC848CWQ | 30 |
| Emitter-Base Voltage                       | $V_{EBO}$  | V    |            | 6                              |    |
| Collector Current -Continuous              | $I_C$      | A    |            | 0.1                            |    |
| Total Device Dissipation (*)               | $P_D$      | mW   |            | 200                            |    |
| Thermal Resistance Junction to Ambient (*) | $R_{thJA}$ | K/W  |            | 625                            |    |
| Junction Temperature                       | $T_j$      | °C   |            | -55 to +150                    |    |
| Storage Temperature                        | $T_{STG}$  | °C   |            | -55 to +150                    |    |

(\*) Device mounted on FR-4 PCB 1.0 x 1.0 x 0.06 inch.



# BC846AWQ THRU BC848CWQ

## ■ Electrical Characteristics (Ta=25°C unless otherwise noted)

| Item                                 | Symbol        | Unit | Conditions                          | Min | Max |                        |
|--------------------------------------|---------------|------|-------------------------------------|-----|-----|------------------------|
| Collector-base breakdown voltage     | $V_{(BR)CBO}$ | V    | BC846AWQ、BC846BWQ                   | 80  |     |                        |
|                                      |               |      | BC847AWQ、<br>BC847BWQ、BC847CWQ      |     |     | $I_C=10\mu A, I_E=0$   |
|                                      |               |      | BC848AWQ、<br>BC848BWQ、BC848CWQ      |     |     |                        |
| Collector-emitter breakdown voltage  | $V_{(BR)CEO}$ | V    | BC846AWQ、BC846BWQ                   | 65  |     |                        |
|                                      |               |      | BC847AWQ、<br>BC847BWQ、BC847CWQ      |     |     | $I_C=10mA, I_B=0$      |
|                                      |               |      | BC848AWQ、<br>BC848BWQ、BC848CWQ      |     |     |                        |
| Emitter-base breakdown voltage       | $V_{(BR)EBO}$ | V    | $I_E=10\mu A, I_C=0$                | 6   |     |                        |
| Collector cut-off current            | $I_{CBO}$     | nA   | BC846AWQ、BC846BWQ                   | 100 |     |                        |
|                                      |               |      | BC847AWQ、<br>BC847BWQ、BC847CWQ      |     |     | $V_{CB}=70V, I_E=0$    |
|                                      |               |      | BC848AWQ、<br>BC848BWQ、BC848CWQ      |     |     | $V_{CB}=50V, I_E=0$    |
| Collector cut-off current            | $I_{CEO}$     | nA   | BC846AWQ、BC846BWQ                   | 100 |     |                        |
|                                      |               |      | BC847AWQ、<br>BC847BWQ、BC847CWQ      |     |     | $V_{CE}=60V, I_B=0$    |
|                                      |               |      | BC848AWQ、<br>BC848BWQ、BC848CWQ      |     |     | $V_{CE}=45V, I_B=0$    |
| Emitter cut-off current              | $I_{EBO}$     | nA   | $V_{EB}=5V, I_C=0$                  |     | 100 |                        |
| DC current gain                      | $h_{FE}$      |      | BC846AWQ、<br>BC847AWQ、BC848AWQ      | 200 | 220 |                        |
|                                      |               |      | BC846BWQ、<br>BC847BWQ、BC848BWQ      |     |     | $V_{CE}=5.0V, I_C=2mA$ |
|                                      |               |      | BC847CWQ、BC848CWQ                   |     |     |                        |
| 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  | $V_{CE}=5V_{dc}, I_C=10mA, f=30MHz$ | 150 |     |                        |
| Collector output capacitance         | Cob           | pF   | $V_{CB}=10V, f=1MHz$                |     | 4.5 |                        |

## ■ Ordering Information (Example)

| PREFERRED P/N   | PACKING CODE | UNIT WEIGHT(g)       | MINIMUM PACKAGE(pcs) | INNER BOX QUANTITY(pcs) | OUTER CARTON QUANTITY(pcs) | DELIVERY MODE |
|---|--------------|----------------------|----------------------|-------------------------|----------------------------|---------------|
| BC846AWQ、BC846BWQ<br>BC847AWQ、BC847BWQ、BC847CWQ<br>BC848AWQ、BC848BWQ、BC848CWQ | F2           | Approximate<br>0.005 | 3000                 | 30000                   | 120000                     | 7" reel       |



# BC846AWQ THRU BC848CWQ

## ■ Characteristics (Typical)

Fig.1-Static Characteristic

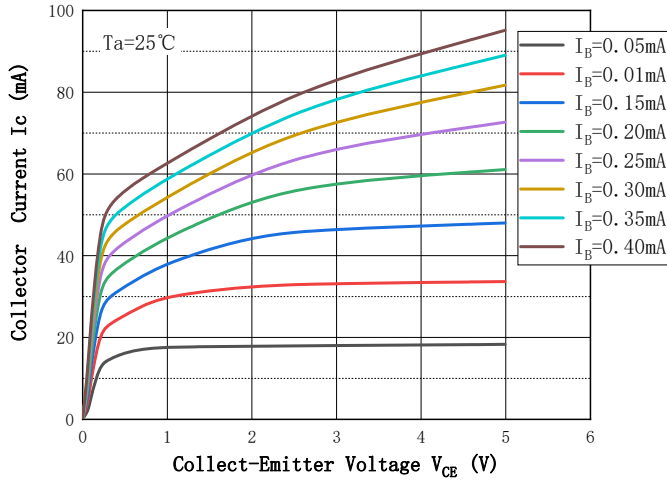


Fig.2 - DC Current Gian

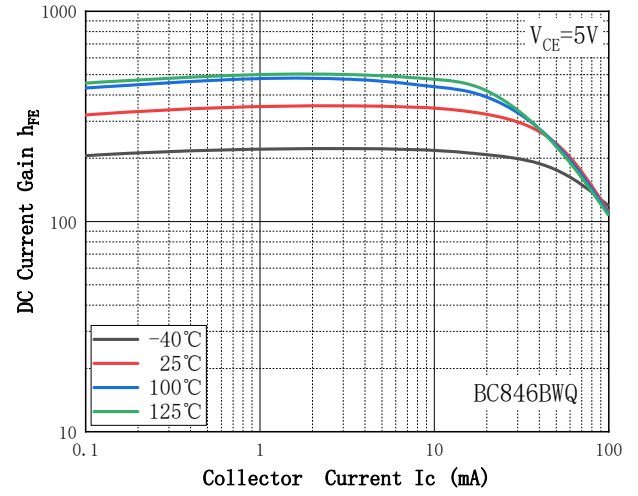


Fig.3 - Collect-Emittor Saturation Voltage

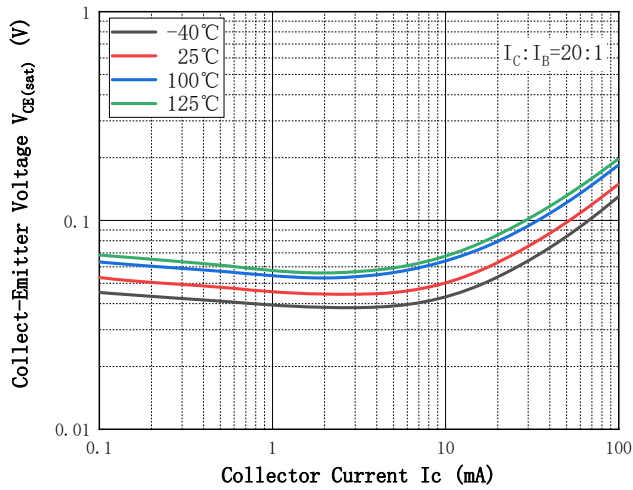


Fig.4 - Base-Emittor Voltage

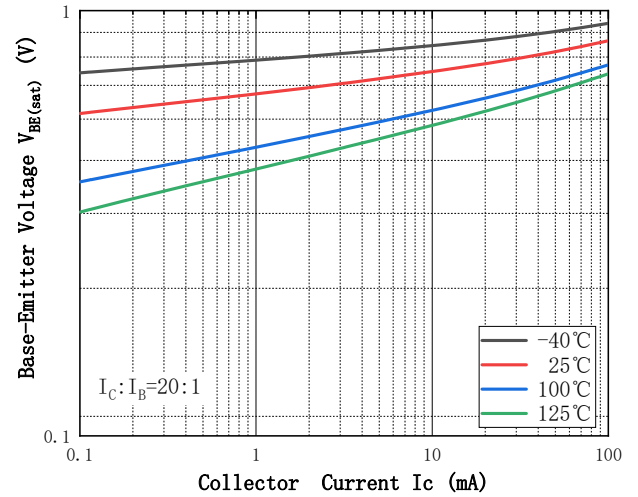


Fig.5 - Base-Emittor On Voltage

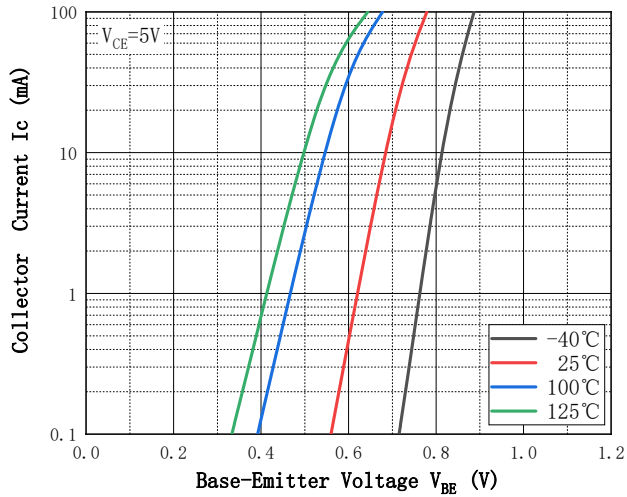
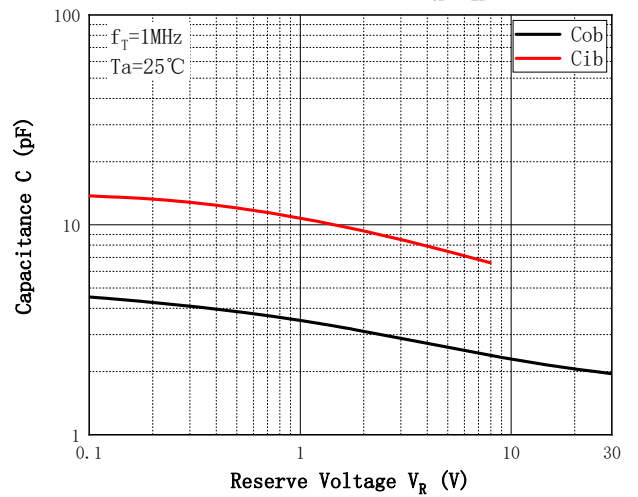


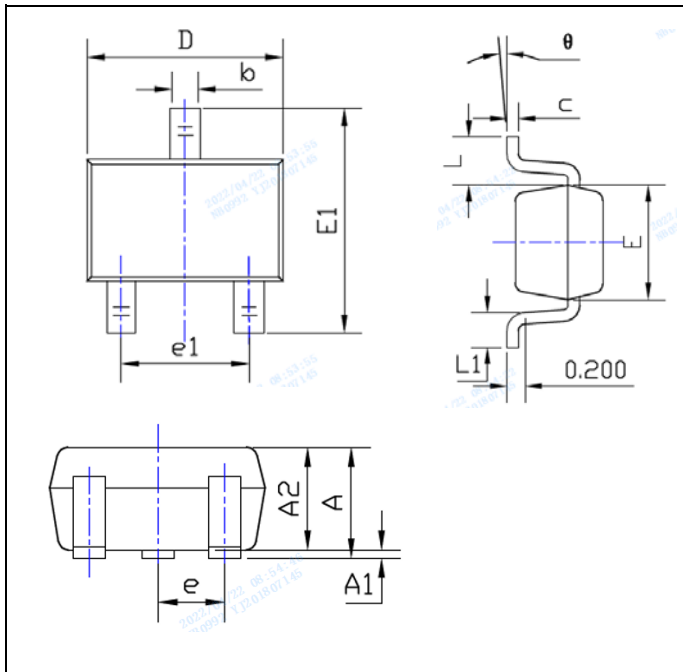
Fig.6 - Cob/Cib— $V_{ce}/V_{EB}$





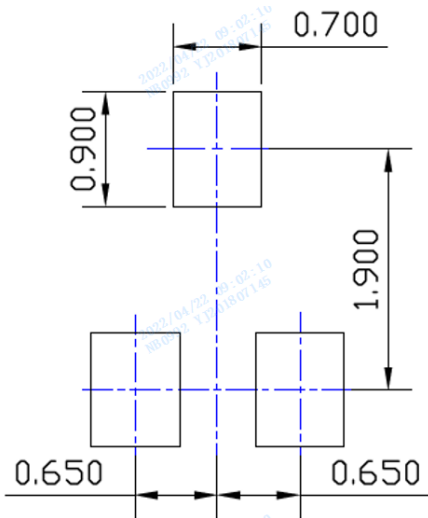
# BC846AWQ THRU BC848CWQ

## ■SOT-323 Package Outline Dimensions



| SYMBOL | DIMENSIONS |       |            |       |
|--------|------------|-------|------------|-------|
|        | INCHES     |       | Millimeter |       |
|        | MIN.       | MAX.  | MIN.       | MAX.  |
| A      | 0.035      | 0.043 | 0.900      | 1.100 |
| A1     | 0.000      | 0.004 | 0.000      | 0.100 |
| A2     | 0.035      | 0.039 | 0.900      | 1.000 |
| b      | 0.006      | 0.016 | 0.150      | 0.400 |
| c      | 0.004      | 0.010 | 0.100      | 0.250 |
| D      | 0.071      | 0.087 | 1.800      | 2.200 |
| E      | 0.045      | 0.053 | 1.150      | 1.350 |
| E1     | 0.085      | 0.096 | 2.150      | 2.450 |
| e      | 0.026TYP   |       | 0.650TYP   |       |
| e1     | 0.047      | 0.055 | 1.200      | 1.400 |
| L      | 0.021REF   |       | 0.525REF   |       |
| L1     | 0.010      | 0.018 | 0.260      | 0.460 |
| θ      | 0°         | 8°    | 0°         | 8°    |

## ■SOT-323 Suggested Pad Layout



Unit: mm



## BC846AWQ THRU BC848CWQ

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### Disclaimer

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