



**BC847BW**  
**BC847CW**

## SMALL SIGNAL NPN TRANSISTORS

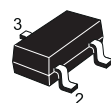
PRELIMINARY DATA

| Type    | Marking |
|---------|---------|
| BC847BW | 1FW     |
| BC847CW | 1GW     |

- SILICON EPITAXIAL PLANAR NPN TRANSISTORS
- MINIATURE SOT-323 PLASTIC PACKAGE FOR SURFACE MOUNTING CIRCUITS
- TAPE AND REEL PACKING
- BC847BW - THE PNP COMPLEMENTARY TYPE IS BC857BW

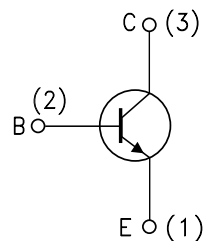
### APPLICATIONS

- WELL SUITABLE FOR PORTABLE EQUIPMENT
- SMALL LOAD SWITCH TRANSISTORS WITH HIGH GAIN AND LOW SATURATION VOLTAGE



**SOT-323**

### INTERNAL SCHEMATIC DIAGRAM



DS10130

### ABSOLUTE MAXIMUM RATINGS

| Symbol    | Parameter   | Value      | Unit               |
|-----------|---|------------|--------------------|
| $V_{CBO}$ | Collector-Base Voltage ( $I_E = 0$ )                    | 50         | V                  |
| $V_{CEO}$ | Collector-Emitter Voltage ( $I_B = 0$ )                 | 45         | V                  |
| $V_{EBO}$ | Emitter-Base Voltage ( $I_C = 0$ )                      | 6          | V                  |
| $I_C$     | Collector Current                                       | 100        | mA                 |
| $I_{CM}$  | Collector Peak Current                                  | 200        | mA                 |
| $P_{tot}$ | Total Dissipation at $T_C = 25\text{ }^{\circ}\text{C}$ | 200        | mW                 |
| $T_{stg}$ | Storage Temperature                                     | -65 to 150 | $^{\circ}\text{C}$ |
| $T_j$     | Max. Operating Junction Temperature                     | 150        | $^{\circ}\text{C}$ |

## BC847BW / BC847CW

### THERMAL DATA

|                        |                                     |     |     |      |
|------------------------|-------------------------------------|-----|-----|------|
| R <sub>thj-amb</sub> • | Thermal Resistance Junction-Ambient | Max | 625 | °C/W |
|------------------------|-------------------------------------|-----|-----|------|

• Device mounted on a PCB area of 1 cm<sup>2</sup>.

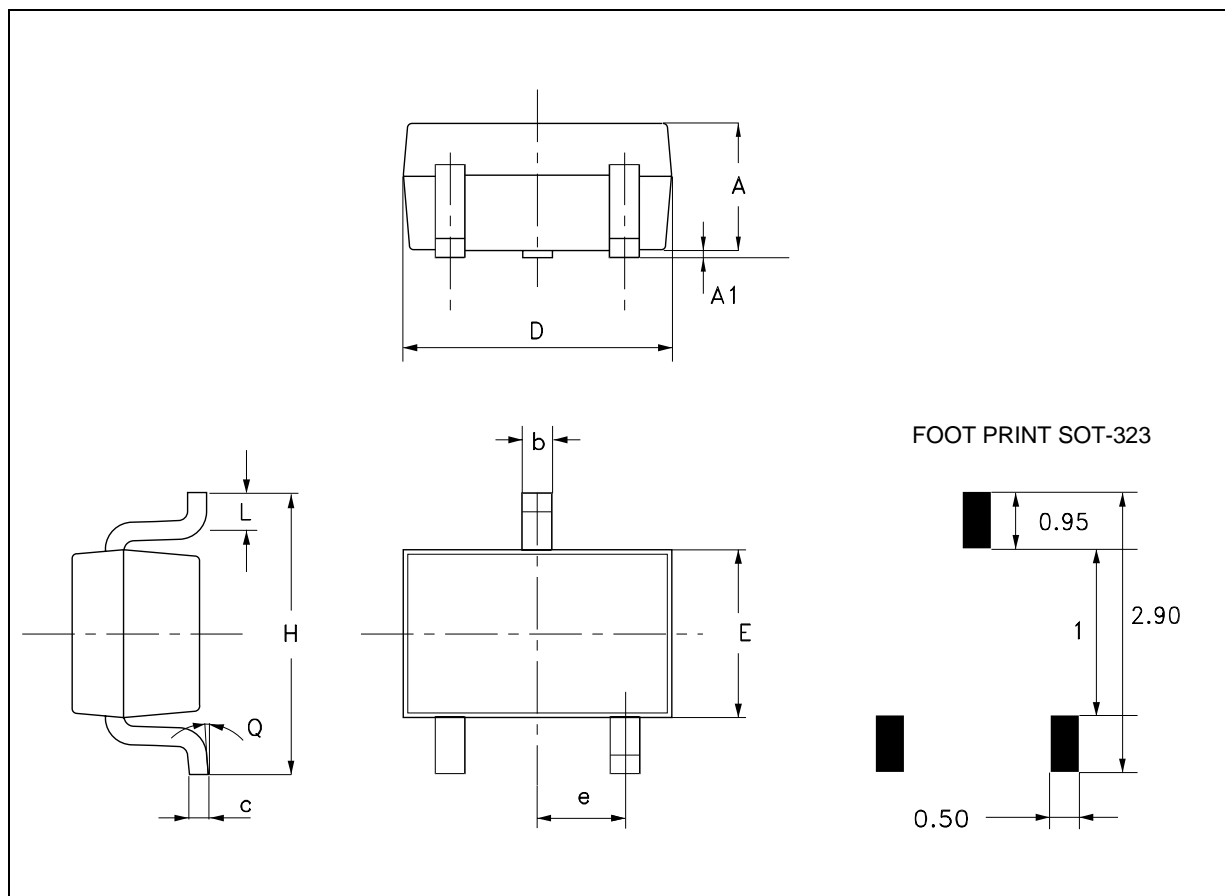
### ELECTRICAL CHARACTERISTICS (T<sub>case</sub> = 25 °C unless otherwise specified)

| Symbol                 | Parameter  | Test Conditions   | Min. | Typ.                     | Max.        | Unit     |
|------------------------|--|---|------|--------------------------|-------------|----------|
| I <sub>CBO</sub>       | Collector Cut-off Current (I <sub>E</sub> = 0)           | V <sub>CB</sub> = 30 V<br>V <sub>CB</sub> = 30 V      T <sub>C</sub> = 150 °C   |      |                          | 15<br>5     | nA<br>μA |
| I <sub>EBO</sub>       | Emitter Cut-off Current (I <sub>C</sub> = 0)             | V <sub>EB</sub> = 5 V   |      |                          | 100         | nA       |
| V <sub>(BR)CBO</sub>   | Collector-Base Breakdown Voltage (I <sub>E</sub> = 0)    | I <sub>C</sub> = 10 μA  | 50   |                          |             | V        |
| V <sub>(BR)CEO</sub> * | Collector-Emitter Breakdown Voltage (I <sub>B</sub> = 0) | I <sub>C</sub> = 2 mA   | 45   |                          |             | V        |
| V <sub>(BR)EBO</sub>   | Emitter-Base Breakdown Voltage (I <sub>C</sub> = 0)      | I <sub>E</sub> = 10 μA  | 6    |                          |             | V        |
| V <sub>CE(sat)</sub> * | Collector-Emitter Saturation Voltage                     | I <sub>C</sub> = 10 mA      I <sub>B</sub> = 0.5 mA<br>I <sub>C</sub> = 100 mA      I <sub>B</sub> = 5 mA   |      | 0.09<br>0.2              | 0.25<br>0.6 | V<br>V   |
| V <sub>BE(sat)</sub> * | Base-Emitter Saturation Voltage                          | I <sub>C</sub> = 10 mA      I <sub>B</sub> = 0.5 mA<br>I <sub>C</sub> = 100 mA      I <sub>B</sub> = 5 mA   |      | 0.7<br>0.9               |             | V<br>V   |
| V <sub>BE(on)</sub> *  | Base-Emitter On Voltage                                  | I <sub>C</sub> = 2 mA      V <sub>CE</sub> = 5 V<br>I <sub>C</sub> = 10 mA      V <sub>CE</sub> = 5 V   | 0.58 | 0.66                     | 0.7<br>0.77 | V<br>V   |
| h <sub>FE</sub> *      | DC Current Gain  | I <sub>C</sub> = 10 μA      V <sub>CE</sub> = 5 V<br>for <b>BC847BW</b><br>for <b>BC847CW</b><br>I <sub>C</sub> = 2 mA      V <sub>CE</sub> = 5 V<br>for <b>BC847BW</b><br>for <b>BC847CW</b> |      | 150<br>270<br>200<br>420 |             |          |
| f <sub>T</sub>         | Transition Frequency                                     | I <sub>C</sub> = 10 mA    V <sub>CE</sub> = 5 V    f = 100MHz   | 100  |                          |             | MHz      |
| C <sub>CBO</sub>       | Collector-Base Capacitance                               | I <sub>E</sub> = 0      V <sub>CB</sub> = 10 V    f = 1 MHz   |      | 2.5                      |             | pF       |
| NF                     | Noise Figure   | V <sub>CE</sub> = 5 V    I <sub>C</sub> = 0.2 mA    f = 1KHz<br>Δf = 200 Hz    R <sub>G</sub> = 2 KΩ  |      | 2                        | 10          | dB       |

\* Pulsed: Pulse duration = 300 μs, duty cycle ≤ 2 %

# SOT-323 MECHANICAL DATA

| DIM. | mm   |      |      | inch  |       |       |
|------|------|------|------|-------|-------|-------|
|      | MIN. | TYP. | MAX. | MIN.  | TYP.  | MAX.  |
| A    | 0.8  |      | 1.1  | 0.031 |       | 0.043 |
| A1   | 0    |      | 0.1  | 0     |       | 0.003 |
| b    | 0.25 |      | 0.4  | 0.009 |       | 0.015 |
| c    | 0.1  |      | 0.26 | 0.004 |       | 0.010 |
| D    | 1.8  | 2.0  | 2.2  | 0.070 | 0.078 | 0.086 |
| E    | 1.15 | 1.25 | 1.35 | 0.045 | 0.049 | 0.053 |
| e    |      | 0.65 |      |       | 0.025 |       |
| H    | 1.8  | 2.1  | 2.4  | 0.070 | 0.082 | 0.094 |
| L    | 0.1  | 0.2  | 0.3  | 0.004 | 0.007 | 0.011 |
| Q    | 0    |      | 10°  | 0     |       | 10°   |



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