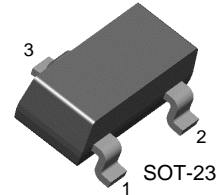


BC846- BC850

NPN Epitaxial Silicon Transistor

Features

- Switching and Amplifier Applications
- Suitable for automatic insertion in thick and thin-film circuits
- Low Noise: BC849, BC850
- Complement to BC856 ... BC860



1. Base 2. Emitter 3. Collector

Absolute Maximum Ratings* $T_a = 25^\circ\text{C}$ unless otherwise noted

| Symbol | Parameter | Value | Units |
|-----------|-----------------------------------|-----------|------------------|
| V_{CBO} | Collector-Base Voltage : BC846 | 80 | V |
| | : BC847/850 | 50 | V |
| | : BC848/849 | 30 | V |
| V_{CEO} | Collector-Emitter Voltage : BC846 | 65 | V |
| | : BC847/850 | 45 | V |
| | : BC848/849 | 30 | V |
| V_{EBO} | Emitter-Base Voltage : BC846/847 | 6 | V |
| | : BC848/849/850 | 5 | V |
| I_C | Collector Current (DC) | 100 | mA |
| P_C | Collector Power Dissipation | 310 | mW |
| T_J | Junction Temperature | 150 | $^\circ\text{C}$ |
| T_{STG} | Storage Temperature | -65 ~ 150 | $^\circ\text{C}$ |

* These ratings are limiting values above which the serviceability of any semiconductor device may be impaired.

Electrical Characteristics* $T_a = 25^\circ\text{C}$ unless otherwise noted

| Symbol | Parameter | Test Condition | Min. | Typ. | Max. | Units |
|----------------------|--------------------------------------|--|--|------|------|-------|
| I_{CBO} | Collector Cut-off Current | $V_{CB}=30\text{V}, I_E=0$ | | | 15 | nA |
| h_{FE} | DC Current Gain | $V_{CE}=5\text{V}, I_C=2\text{mA}$ | 110 | | 800 | |
| $V_{CE}(\text{sat})$ | Collector-Emitter Saturation Voltage | $I_C=10\text{mA}, I_B=0.5\text{mA}$ | | 90 | 250 | mV |
| | | $I_C=100\text{mA}, I_B=5\text{mA}$ | | 200 | 600 | mV |
| $V_{BE}(\text{sat})$ | Collector-Base Saturation Voltage | $I_C=10\text{mA}, I_B=0.5\text{mA}$ | | 700 | | mV |
| | | $I_C=100\text{mA}, I_B=5\text{mA}$ | | 900 | | mV |
| $V_{BE}(\text{on})$ | Base-Emitter On Voltage | $V_{CE}=5\text{V}, I_C=2\text{mA}$ | 580 | 660 | 700 | mV |
| | | $V_{CE}=5\text{V}, I_C=10\text{mA}$ | | | 720 | mV |
| f_T | Current Gain Bandwidth Product | $V_{CE}=5\text{V}, I_C=10\text{mA}, f=100\text{MHz}$ | | 300 | | MHz |
| C_{ob} | Output Capacitance | $V_{CB}=10\text{V}, I_E=0, f=1\text{MHz}$ | | 3.5 | 6 | pF |
| C_{ib} | Input Capacitance | $V_{EB}=0.5\text{V}, I_C=0, f=1\text{MHz}$ | | 9 | | pF |
| NF | Noise Figure | : BC846/847/848 | | 2 | 10 | dB |
| | | : BC849/850 | $V_{CE}=5\text{V}, I_C=200\mu\text{A}$ $R_G=2\text{K}\Omega, f=1\text{KHz}$ | 1.2 | 4 | dB |
| | : BC849 | $V_{CE}=5\text{V}, I_C=200\mu\text{A}$ | | 1.4 | 4 | dB |
| | : BC850 | $R_G=2\text{K}\Omega, f=30\sim 15000\text{Hz}$ | | 1.4 | 3 | dB |

* Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$

h_{FE} Classification

| Classification | A | B | C |
|-----------------|-----------|-----------|-----------|
| h _{FE} | 110 ~ 220 | 200 ~ 450 | 420 ~ 800 |

Ordering Information

| Device ^(note1) | Device Marking | Package | Packing Method | Qty(pcs) | Pin Difinitions |
|---------------------------|----------------|---------|----------------|----------|------------------------------|
| BC846AMTF | 8AA | SOT-23 | Tape & Reel | 3000 | 1.Base 2.Emitter 3.Collector |
| BC846BMTF | 8AB | SOT-23 | Tape & Reel | 3000 | 1.Base 2.Emitter 3.Collector |
| BC846CMTF | 8AC | SOT-23 | Tape & Reel | 3000 | 1.Base 2.Emitter 3.Collector |
| BC847AMTF | 8BA | SOT-23 | Tape & Reel | 3000 | 1.Base 2.Emitter 3.Collector |
| BC847BMTF | 8BB | SOT-23 | Tape & Reel | 3000 | 1.Base 2.Emitter 3.Collector |
| BC847CMTF | 8BC | SOT-23 | Tape & Reel | 3000 | 1.Base 2.Emitter 3.Collector |
| BC848AMTF | 8CA | SOT-23 | Tape & Reel | 3000 | 1.Base 2.Emitter 3.Collector |
| BC848BMTF | 8CB | SOT-23 | Tape & Reel | 3000 | 1.Base 2.Emitter 3.Collector |
| BC848CMTF | 8CC | SOT-23 | Tape & Reel | 3000 | 1.Base 2.Emitter 3.Collector |
| BC849AMTF | 8DA | SOT-23 | Tape & Reel | 3000 | 1.Base 2.Emitter 3.Collector |
| BC849BMTF | 8DB | SOT-23 | Tape & Reel | 3000 | 1.Base 2.Emitter 3.Collector |
| BC849CMTF | 8DC | SOT-23 | Tape & Reel | 3000 | 1.Base 2.Emitter 3.Collector |
| BC850AMTF | 8EA | SOT-23 | Tape & Reel | 3000 | 1.Base 2.Emitter 3.Collector |
| BC850BMTF | 8EB | SOT-23 | Tape & Reel | 3000 | 1.Base 2.Emitter 3.Collector |
| BC850CMTF | 8EC | SOT-23 | Tape & Reel | 3000 | 1.Base 2.Emitter 3.Collector |

Note1 : Affix "-A,-B,-C" means h_{FE} classification.

Affix "-M" means the matte type package.

Affix "-TF" means the tape & reel type packing.

Typical Performance Characteristics

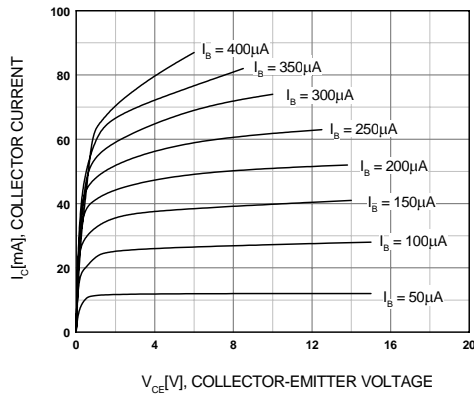


Figure 1. Static Characteristic

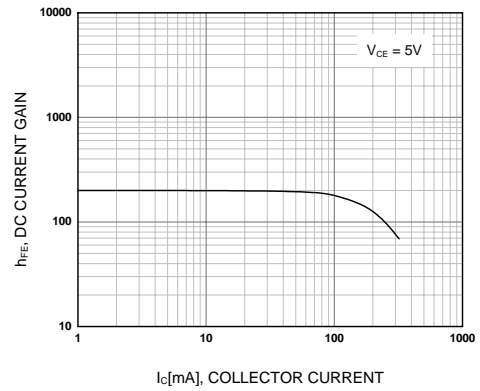


Figure 2. DC current Gain

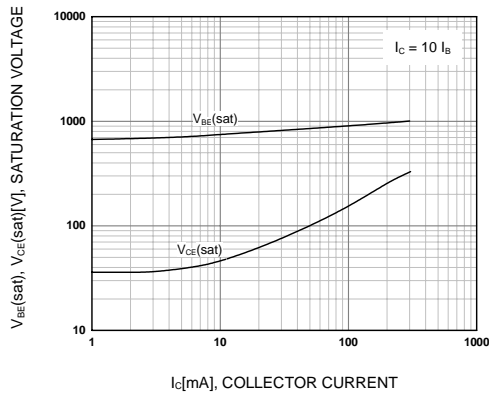


Figure 3. Base-Emitter Saturation Voltage
Collector-Emitter Saturation Voltage

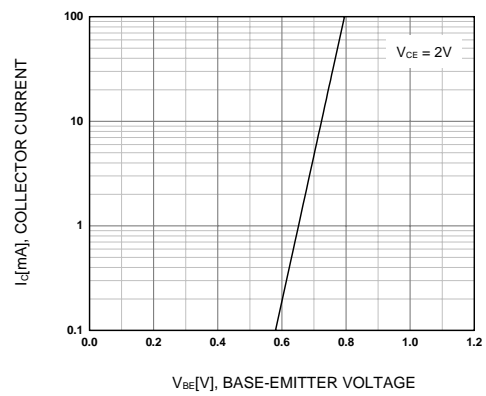


Figure 4. Base-Emitter On Voltage

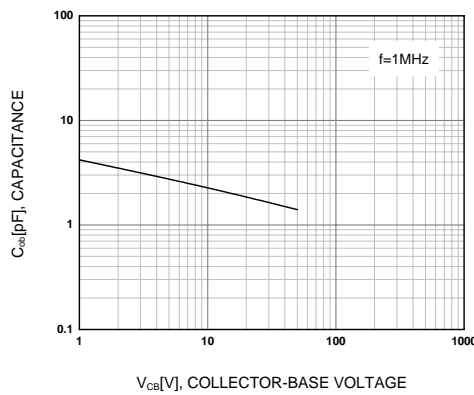


Figure 5. Collector Output Capacitance

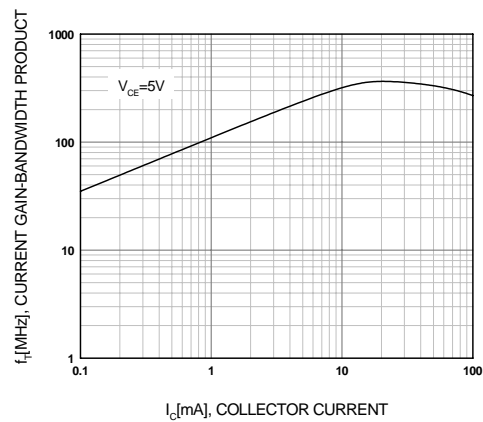
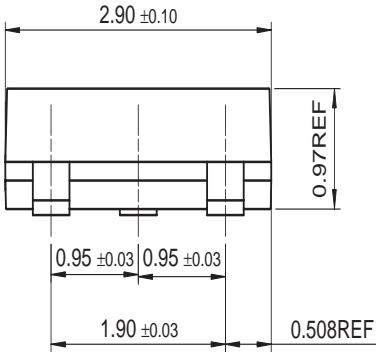
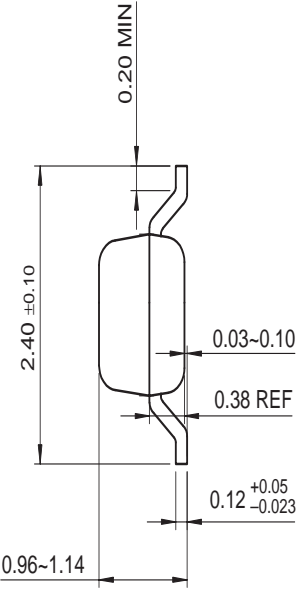
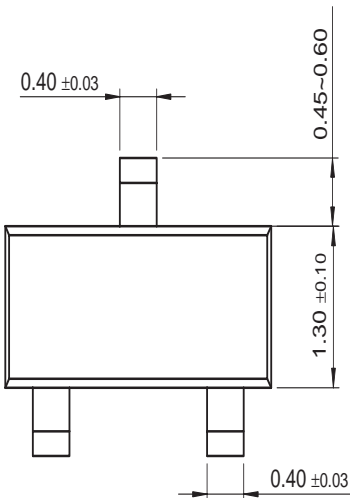


Figure 6. Current Gain Bandwidth Product

Mechanical Dimensions

SOT-23



Dimensions in Millimeters

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| | | | | |
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| Bottomless TM | GTO TM | OPTOLOGIC [®] | SPM TM | VCX TM |
| Build it Now TM | HiSeC TM | OPTOPLANAR TM | Stealth TM | Wire TM |
| CoolFET TM | I ² C TM | PACMAN TM | SuperFET TM | |
| CROSSVOLT TM | i-Lo TM | POP TM | SuperSOT TM -3 | |
| DOME TM | ImpliedDisconnect TM | Power247 TM | SuperSOT TM -6 | |
| EcoSPARK TM | IntelliMAX TM | PowerEdge TM | SuperSOT TM -8 | |
| E ² CMOS TM | ISOPLANAR TM | PowerSaver TM | SyncFET TM | |
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| FAST _r TM | MicroPak TM | QT Optoelectronics TM | TinyPWM TM | |
| FPS TM | MICROWIRE TM | Quiet Series TM | TinyPower TM | |
| FRFET TM | MSX TM | RapidConfigure TM | TinyLogic [®] | |
| | MSXPro TM | RapidConnect TM | TINYOPTO TM | |
| Across the board. Around the world. TM | | μSerDes TM | TruTranslation TM | |
| The Power Franchise [®] | | ScalarPump TM | UHC TM | |
| Programmable Active Droop TM | | | | |

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