Micro Commercial Components

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# BC847PN

## PNP and NPN Small Signal Transistor 200mW

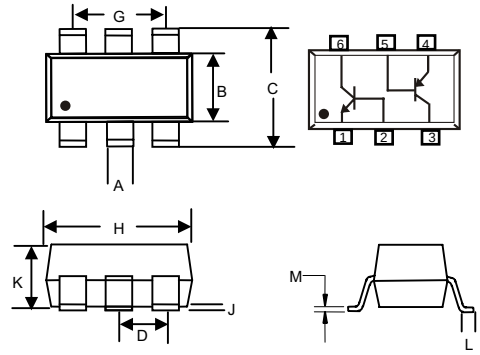
## Features

- Lead Free Finish/RoHS Compliant ("P" Suffix designates RoHS Compliant. See ordering information)
- Ideally Suited for Automatic Insertion
- Ultra-Small Surface Mount Package
- Epoxy meets UL 94 V-0 flammability rating
- Moisure Sensitivity Level 1
- Halogen free available upon request by adding suffix "-HF"

## Mechanical Data

- Case: SOT-363, Molded Plastic
- MAKING: 7P

SOT-363




| DIMENSIONS | | | | | |
|---|---|---|---|---|---|
| | INCHES | | MM | | |
| DIM | MIN | MAX | MIN | MAX | NOTE |
| A | .006 | .014 | 0.15 | 0.35 | |
| B | .045 | .053 | 1.15 | 1.35 | |
| C | .085 | .096 | 2.15 | 2.45 | |
| D | .026 | | 0.65Nominal | | |
| G | .047 | .055 | 1.20 | 1.40 | |
| H | .071 | .087 | 1.80 | 2.20 | |
| J | --- | .004 | --- | 0.10 | |
| K | .035 | .043 | 0.90 | 1.10 | |
| L | .010 | .018 | 0.26 | 0.46 | |
| M | .003 | .006 | 0.08 | 0.15 | |

### Maximum Ratings @ 25℃ Unless Otherwise Specified

| Symbol | Parameter | Value | Units |
|---|---|---|---|
| **OFF CHARACTERISTICS** | | | |
| $I_C$ | Collector Current | 100 | mAdc |
| $I_{CM}$ | Peak Collector Current | 200 | mAdc |
| $P_d$ | Power Dissipation @ $T_s$=50℃ | 200 | mW |
| $T_J$, $T_{STG}$ | Operating & Storage Temperature | -55~+150 | ℃ |

## CHARACTERISTICS of NPN Transistor (Tamb=25℃ unless otherwise specified)

| Parameter | Symbol | Test conditions | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|
| Collector-base breakdown voltage | $V_{(BR)CBO}$ | Ic=10μA,$I_E$=0 | 50 | | | V |
| Collector-emitter breakdown voltage | $V_{(BR)CEO}$ | Ic=10mA,$I_B$=0 | 45 | | | V |
| Emitter-base breakdown voltage | $V_{(BR)EBO}$ | $I_E$=1μA,$I_C$=0 | 6 | | | V |
| Collector cut-off current | $I_{CBO}$ | $V_{CB}$=30V,$I_E$=0 | | | 15 | nA |
| Emitter cut-off current | $I_{EBO}$ | $V_{EB}$=5V,$I_C$=0 | | | 100 | nA |
| DC current gain | $h_{FE1}$ | $V_{CE}$=5V,$I_C$=2mA | 200 | | 450 | |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C$=10mA,$I_B$=0.5mA | | | 0.25 | V |
| | $V_{CE(sat)}$ | $I_C$=100mA,$I_B$=5mA | | | 0.6 | V |
| Base-emitter saturation voltage | $V_{BE(sat)}$ | $I_C$=10mA,$I_B$=0.5mA | | 0.7 | | V |
| | $V_{BE(sat)}$ | $I_C$=100mA,$I_B$=5mA | | 0.9 | | V |
| Base-emitter voltage | $V_{BEon}$ | $V_{CE}$=5V,$I_C$=2mA | 0.58 | | 0.7 | V |
| | $V_{BEon}$ | $V_{CE}$=5V,$I_C$=10mA | | | 0.72 | V |
| Collector output capacitance | $C_{ob}$ | $V_{CB}$=10V,$I_E$=0,f=1MHz | | | 6.0 | pF |
| Transition frequency | $f_T$ | $V_{CE}$=5V,$I_C$=10mA,f=100MHz | 100 | | | MHz |
| Noise figure | NF | $V_{CE}$=5V,$I_c$=0.2mA, f=1kHZ,Rg=2KΩ,Δf=200Hz | | | 10 | dB |

## CHARACTERISTICS of PNP Transistor (Tamb=25℃ unless otherwise specified)

| Parameter | Symbol | Test conditions | MIN | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|
| Collector-base breakdown voltage | $V_{(BR)CBO}$ | Ic=-10μA,$I_E$=0 | -50 | | | V |
| Collector-emitter breakdown voltage | $V_{(BR)CEO}$ | Ic=-10mA,$I_B$=0 | -45 | | | V |
| Emitter-base breakdown voltage | $V_{(BR)EBO}$ | $I_E$=-1μA,$I_C$=0 | -5 | | | V |
| Collector cut-off current | $I_{CBO}$ | $V_{CB}$=-30V,$I_E$=0 | | | -15 | nA |
| Emitter cut-off current | $I_{EBO}$ | $V_{EB}$=-5V,$I_C$=0 | | | -100 | nA |
| DC current gain | $h_{FE1}$ | $V_{CE}$=-5V,$I_C$=-2mA | 220 | | 475 | |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C$=-10mA,$I_B$=-0.5mA | | | -0.3 | V |
| | $V_{CE(sat)}$ | $I_C$=-100mA,$I_B$=-5mA | | | -0.65 | V |
| Base-emitter saturation voltage | $V_{BE(sat)}$ | $I_C$=-10mA,$I_B$=-0.5mA | | -0.7 | | V |
| | $V_{BE(sat)}$ | $I_C$=-100mA,$I_B$=-5mA | | | -0.95 | V |
| Base-emitter voltage | $V_{BEon}$ | $V_{CE}$=-5V,$I_C$=-2mA | -0.6 | | -0.75 | V |
| | $V_{BEon}$ | $V_{CE}$=-5V,$I_C$=-10mA | | | -0.82 | V |
| Collector output capacitance | $C_{ob}$ | $V_{CB}$=-10V,$I_E$=0,f=1MHz | | | 4.5 | pF |
| Transition frequency | $f_T$ | $V_{CE}$=-5V,$I_C$=-10mA,f=100MHz | 100 | | | MHz |
| Noise figure | NF | $V_{CE}$=-5V,$I_c$=-0.2mA, f=1kHZ,Rg=2KΩ,Δf=200Hz | | | 10 | dB |

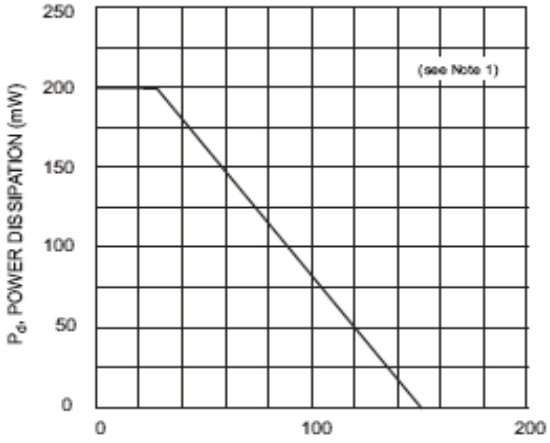



Fig. 1, Power Derating Curve (Total Device)

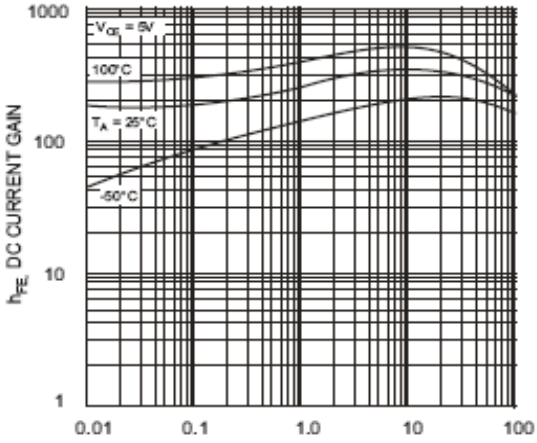



Fig. 2, DC Current Gain vs Collector Current (BC847B)

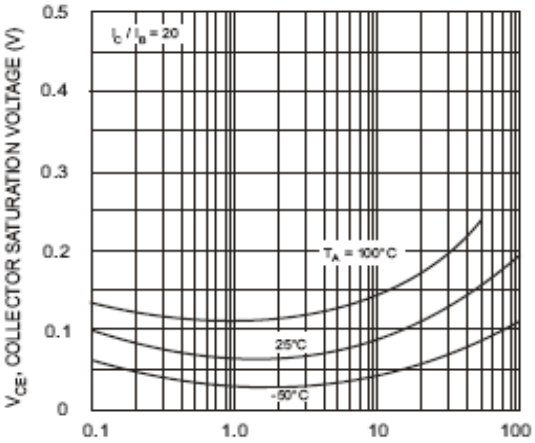



Fig. 3, Collector Saturation Voltage vs Collector Current (BC847B)

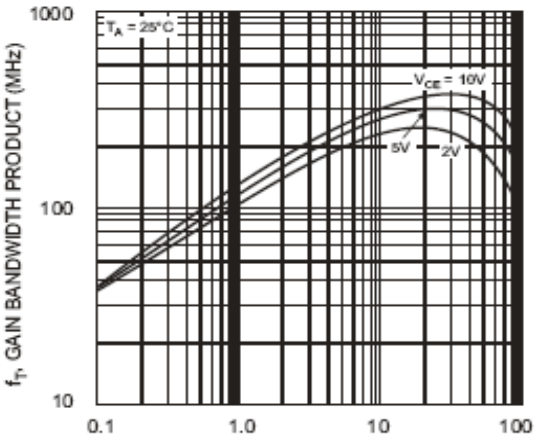



Fig. 4, Gain Bandwidth Product vs Collector Current (BC847B)

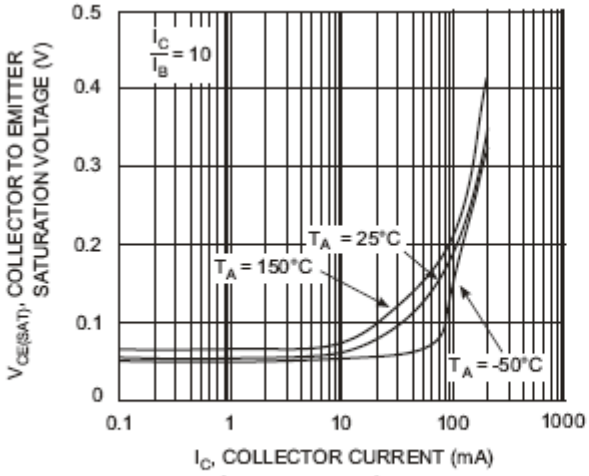



Fig. 5, Collector Emitter Saturation Voltage vs. Collector Current (BC857B)

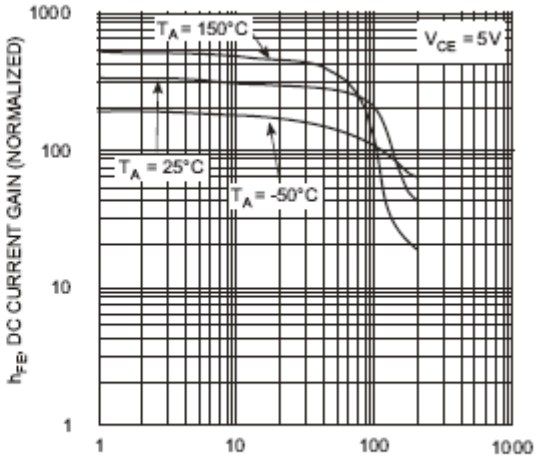



Fig. 6, DC Current Gain vs. Collector Current (BC857B)

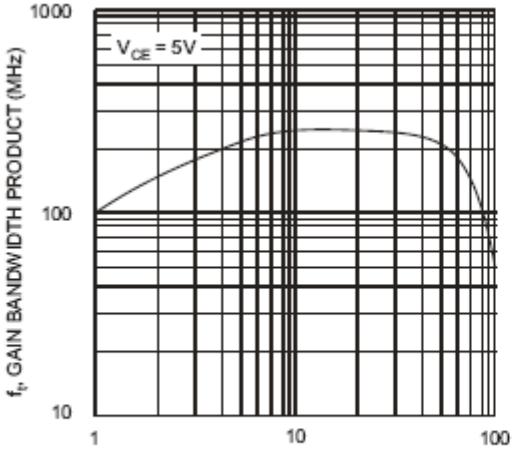



Fig. 7, Gain Bandwidth Product vs Collector Current (BC857B)

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## Ordering Information :

| Device | Packing |
|---|---|
| Part Number-TP | Tape&Reel;3Kpcs/Reel |

Note : Adding "-HF" suffix for halogen free, eg. Part Number-TP-HF

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|---|
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