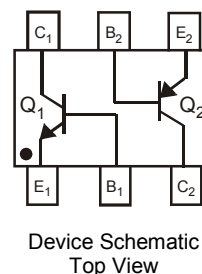
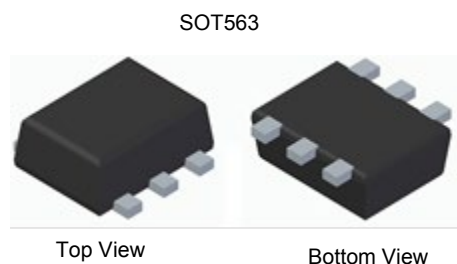


## Features

- Epitaxial Die Construction
- Two Internally Isolated NPN/PNP Transistors in One Package
- Ultra-Small Surface Mount Package
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen- and Antimony-Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](#) or your local Diodes representative. <https://www.diodes.com/quality/product-definitions/>**
- **An Automotive-Compliant Part Is Available Under Separate Datasheet ([BC847BVNQ](#))**

## Mechanical Data

- Surface Mount Package
- Weight: 0.003 grams (Approximate)
- Max Soldering Temperature +260°C for 30 secs as per JEDEC J-STD-020
- Case Material – Molded Plastic, UL Flammability Rating 94V-0
- Terminals: Finish – Matte Tin Plated Leads, Solderable
- per MIL-STD-202, Method 208 

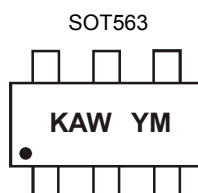


## Ordering Information (Note 4)

| Part Number | Compliance | Marking | Reel Size (inches) | Tape Width (mm) | Quantity per Reel |
|-------------|------------|---------|--------------------|-----------------|-------------------|
| BC847BVN-7  | Standard   | KAW     | 7                  | 8               | 3,000             |

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
  2. See <https://www.diodes.com/quality/lead-free/> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
  3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
  4. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

## Marking Information



KAW = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: H = 2020)  
 M = Month (ex: 9 = September)

### Date Code Key

| Year | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Code | H    | I    | J    | K    | L    | M    | N    | O    | P    | R    | S    | T    |

| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Code  | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | O   | N   | D   |

**Maximum Ratings: NPN, BC847B Type (Q<sub>1</sub>)** (@ T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                              | Symbol           | Value | Unit |
|---------------------------------------------|------------------|-------|------|
| Collector-Base Voltage                      | V <sub>CBO</sub> | 50    | V    |
| Collector-Emitter Voltage                   | V <sub>CEO</sub> | 45    | V    |
| Emitter-Base Voltage                        | V <sub>EBO</sub> | 6     | V    |
| Collector Current                           | I <sub>C</sub>   | 100   | mA   |
| Peak Pulse Collector Current (single pulse) | I <sub>CM</sub>  | 200   | mA   |
| Peak Pulse Emitter Current (single pulse)   | I <sub>EM</sub>  | 200   | mA   |

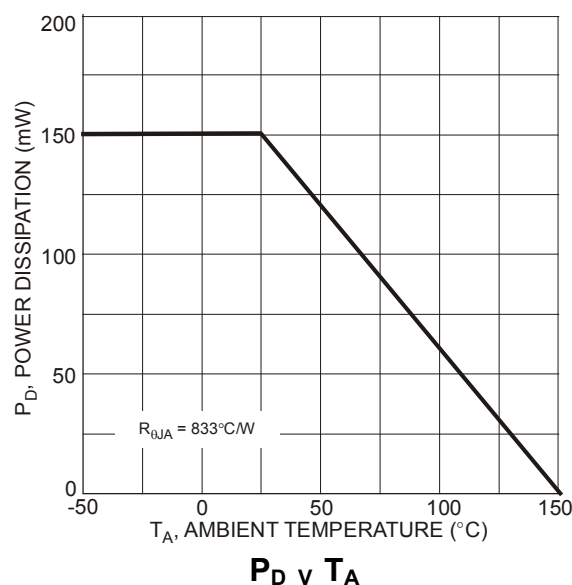
**Maximum Ratings: PNP, BC857B Type (Q<sub>2</sub>)** (@ T<sub>A</sub> = +25°C unless otherwise specified.)

| Characteristic                              | Symbol           | Value | Unit |
|---------------------------------------------|------------------|-------|------|
| Collector-Base Voltage                      | V <sub>CBO</sub> | -50   | V    |
| Collector-Emitter Voltage                   | V <sub>CEO</sub> | -45   | V    |
| Emitter-Base Voltage                        | V <sub>EBO</sub> | -6    | V    |
| Collector Current                           | I <sub>C</sub>   | -100  | mA   |
| Peak Pulse Collector Current (single pulse) | I <sub>CM</sub>  | -200  | mA   |
| Peak Pulse Emitter Current (single pulse)   | I <sub>EM</sub>  | -200  | mA   |

**Thermal Characteristics – Total Device** (@ T<sub>A</sub> = +25°C unless otherwise specified.)

| Characteristic                                   | Symbol                            | Value       | Unit |
|--------------------------------------------------|-----------------------------------|-------------|------|
| Power Dissipation (Note 5) Total Device          | P <sub>D</sub>                    | 150         | mW   |
| Thermal Resistance, Junction to Ambient (Note 5) | R <sub>θJA</sub>                  | 833         | °C/W |
| Operating and Storage Temperature Range          | T <sub>J</sub> , T <sub>STG</sub> | -55 to +150 | °C   |

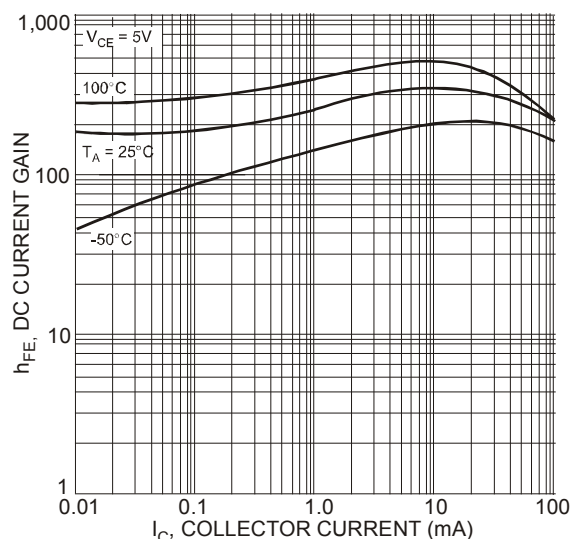
Note: 5. For a device surface mounted on minimum recommended pad layout FR-4 PCB with single sided 1oz copper, in still air conditions; the device is measured when operating in a steady-state condition.

**Thermal Characteristics – Total Device**


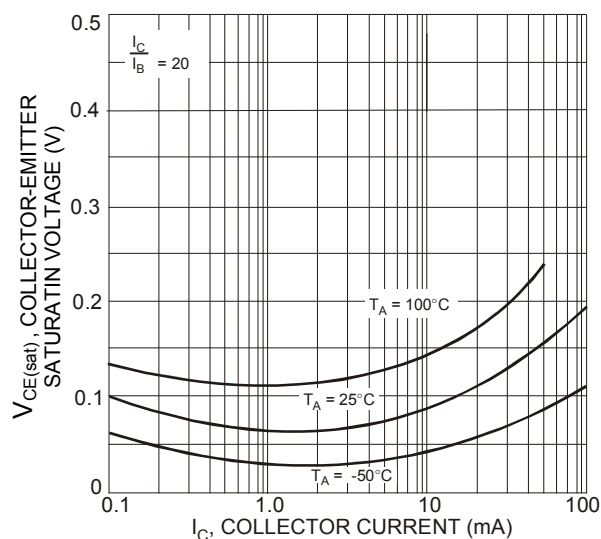
**Electrical Characteristics: NPN, BC847B Type (Q<sub>1</sub>)** (@ T<sub>A</sub> = +25°C unless otherwise specified.)

| Characteristic (Note 6)              | Symbol               | Min | Typ        | Max        | Unit     | Test Condition                                                                                  |
|--------------------------------------|----------------------|-----|------------|------------|----------|-------------------------------------------------------------------------------------------------|
| Collector-Base Breakdown Voltage     | BV <sub>CBO</sub>    | 50  | —          | —          | V        | I <sub>C</sub> = 100μA, I <sub>B</sub> = 0                                                      |
| Collector-Emitter Breakdown Voltage  | BV <sub>CEO</sub>    | 45  | —          | —          | V        | I <sub>C</sub> = 10mA, I <sub>B</sub> = 0                                                       |
| Emitter-Base Breakdown Voltage       | BV <sub>EBO</sub>    | 6   | —          | —          | V        | I <sub>E</sub> = 100μA, I <sub>C</sub> = 0                                                      |
| DC Current Gain                      | h <sub>FE</sub>      | 200 | 290        | 450        | —        | V <sub>CE</sub> = 5.0V, I <sub>C</sub> = 2.0mA                                                  |
| Collector-Emitter Saturation Voltage | V <sub>CE(sat)</sub> | —   | 90<br>200  | 250<br>600 | mV       | I <sub>C</sub> = 10mA, I <sub>B</sub> = 0.5mA<br>I <sub>C</sub> = 100mA, I <sub>B</sub> = 5.0mA |
| Base-Emitter Saturation Voltage      | V <sub>BE(sat)</sub> | —   | 700<br>900 | —          | mV       | I <sub>C</sub> = 10mA, I <sub>B</sub> = 0.5mA<br>I <sub>C</sub> = 100mA, I <sub>B</sub> = 5.0mA |
| Base-Emitter Voltage                 | V <sub>BE(on)</sub>  | 580 | 660        | 700<br>720 | mV       | V <sub>CE</sub> = 5.0V, I <sub>C</sub> = 2.0mA<br>V <sub>CE</sub> = 5.0V, I <sub>C</sub> = 10mA |
| Collector Cut Off Current            | I <sub>CBO</sub>     | —   | —          | 15<br>5.0  | nA<br>μA | V <sub>CB</sub> = 30V<br>V <sub>CB</sub> = 30V, T <sub>A</sub> = +150°C                         |
| Transition Frequency                 | f <sub>T</sub>       | 100 | 300        | —          | MHz      | V <sub>CE</sub> = 5.0V, I <sub>C</sub> = 10mA,<br>f = 100MHz                                    |
| Collector-Base Capacitance           | C <sub>cbo</sub>     | —   | 3.5        | 6.0        | pF       | V <sub>CB</sub> = 10V, f = 1.0MHz                                                               |

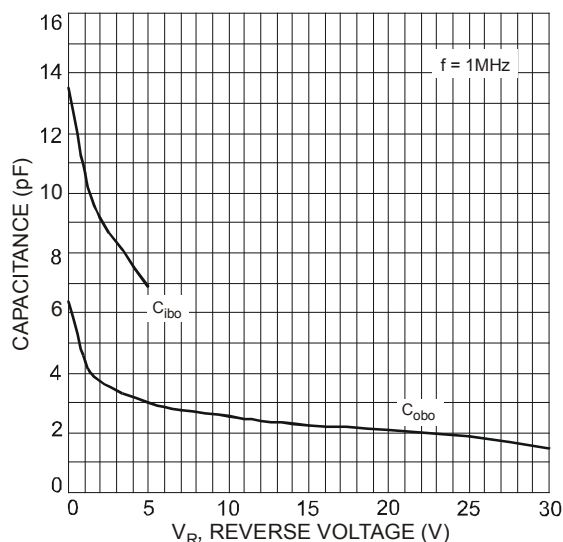
Note: 6. Short duration pulse test used to minimize self-heating effect.



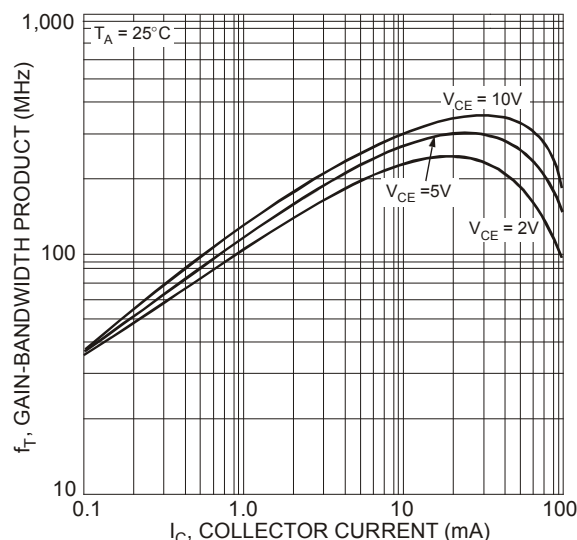
**h<sub>FE</sub> v I<sub>C</sub>**



**V<sub>CE(sat)</sub> v I<sub>C</sub>**



**C v V<sub>R</sub>**

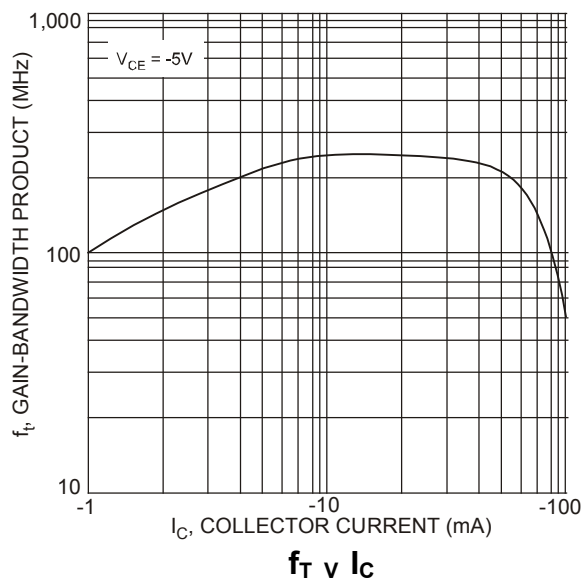
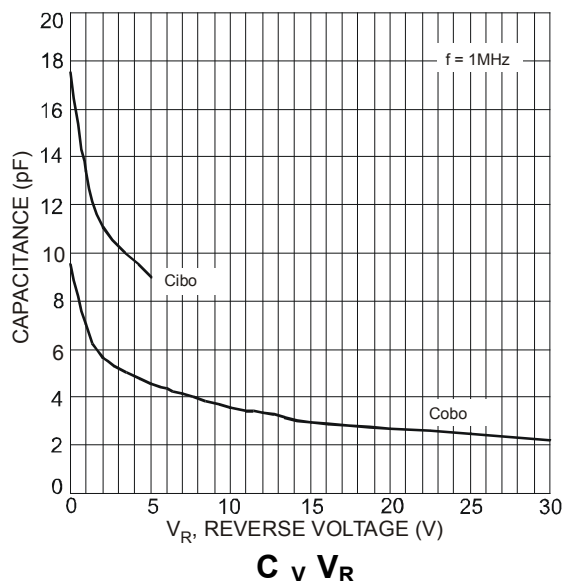
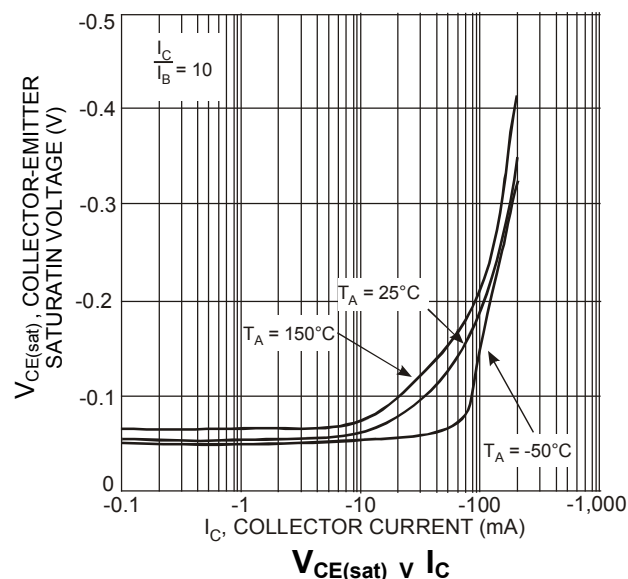
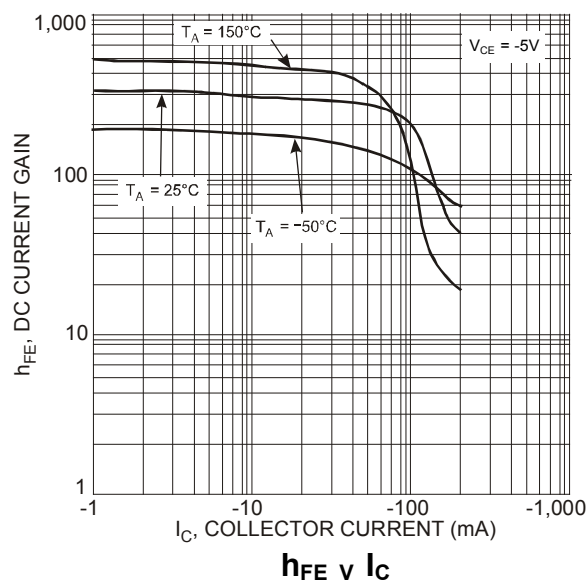


**f<sub>T</sub> v I<sub>C</sub>**

**Electrical Characteristics: PNP, BC857B Type (Q<sub>2</sub>)** (@T<sub>A</sub> = +25°C unless otherwise specified.)

| Characteristic (Note 7)              | Symbol               | Min  | Typ          | Max          | Unit     | Test Condition                                                                                      |
|--------------------------------------|----------------------|------|--------------|--------------|----------|-----------------------------------------------------------------------------------------------------|
| Collector-Base Breakdown Voltage     | BV <sub>CBO</sub>    | -50  | —            | —            | V        | I <sub>C</sub> = -100μA, I <sub>B</sub> = 0                                                         |
| Collector-Emitter Breakdown Voltage  | BV <sub>CEO</sub>    | -45  | —            | —            | V        | I <sub>C</sub> = -10mA, I <sub>B</sub> = 0                                                          |
| Emitter-Base Breakdown Voltage       | BV <sub>EBO</sub>    | -6   | —            | —            | V        | I <sub>E</sub> = -100μA, I <sub>C</sub> = 0                                                         |
| DC Current Gain                      | h <sub>FE</sub>      | 220  | 290          | 475          | —        | V <sub>CE</sub> = -5.0V, I <sub>C</sub> = -2.0mA                                                    |
| Collector-Emitter Saturation Voltage | V <sub>CE(sat)</sub> | —    | -75<br>-250  | -300<br>-650 | mV       | I <sub>C</sub> = -10mA, I <sub>B</sub> = -0.5mA<br>I <sub>C</sub> = -100mA, I <sub>B</sub> = -5.0mA |
| Base-Emitter Saturation Voltage      | V <sub>BE(sat)</sub> | —    | -700<br>-850 | —<br>-950    | mV       | I <sub>C</sub> = -10mA, I <sub>B</sub> = -0.5mA<br>I <sub>C</sub> = -100mA, I <sub>B</sub> = -5.0mA |
| Base-Emitter Voltage                 | V <sub>BE(on)</sub>  | -600 | -650         | -750<br>-820 | mV       | V <sub>CE</sub> = -5.0V, I <sub>C</sub> = -2.0mA<br>V <sub>CE</sub> = -5.0V, I <sub>C</sub> = -10mA |
| Collector Cut Off Current            | I <sub>CBO</sub>     | —    | —            | -15<br>-4.0  | nA<br>μA | V <sub>CB</sub> = -30V<br>V <sub>CB</sub> = -30V, T <sub>A</sub> = +150°C                           |
| Transition frequency                 | f <sub>T</sub>       | 100  | 200          | —            | MHz      | V <sub>CE</sub> = -5.0V, I <sub>C</sub> = -10mA,<br>f = 100MHz                                      |
| Collector-Base Capacitance           | C <sub>cbo</sub>     | —    | 3            | 4.5          | pF       | V <sub>CB</sub> = -10V, f = 1.0MHz                                                                  |

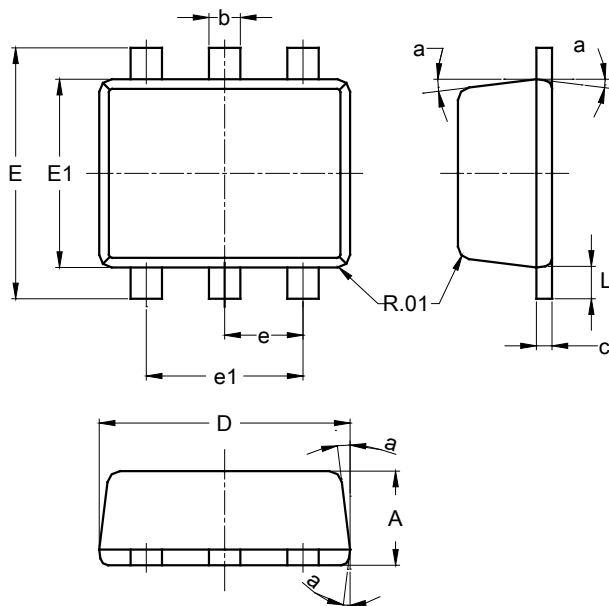
Note: 7. Short duration pulse test used to minimize self-heating effect.



## Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

**SOT563**

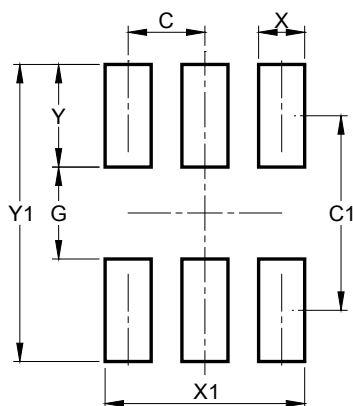


| SOT563               |      |      |      |
|----------------------|------|------|------|
| Dim                  | Min  | Max  | Typ  |
| A                    | 0.55 | 0.60 | 0.60 |
| b                    | 0.15 | 0.30 | 0.20 |
| c                    | 0.10 | 0.18 | 0.11 |
| D                    | 1.50 | 1.70 | 1.60 |
| E                    | 1.55 | 1.70 | 1.60 |
| E1                   | 1.10 | 1.25 | 1.20 |
| e                    | --   | --   | 0.50 |
| e1                   | 0.90 | 1.10 | 1.00 |
| L                    | 0.10 | 0.30 | 0.20 |
| a                    | 8°   | 9°   | 7°   |
| All Dimensions in mm |      |      |      |

## Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

**SOT563**



| Dimensions | Value (in mm) |
|------------|---------------|
| C          | 0.500         |
| C1         | 1.270         |
| G          | 0.600         |
| X          | 0.300         |
| X1         | 1.300         |
| Y          | 0.670         |
| Y1         | 1.940         |

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