



**BFS17N**

**NPN RF TRANSISTOR IN SOT23**

## Features

- 3.2GHz unity gain for RF switching applications
- **Totally Lead-Free & Fully RoHS compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP capable (Note 4)**

## Applications

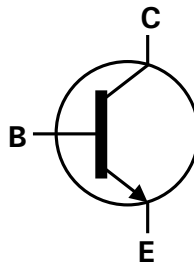
- RF switch

## Mechanical Data

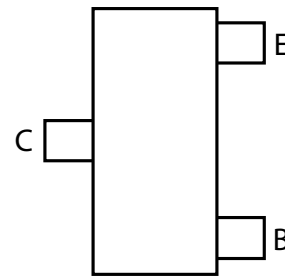
- Case: SOT23
- Case material: molded plastic. "Green" molding compound.
- UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 ③
- Weight: 0.008 grams (approximate)



Top View



Device symbol



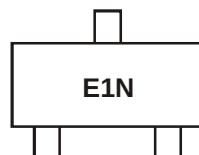
Top View  
Pin Out

## Ordering Information (Notes 4 & 5)

| Product    | Compliance | Marking | Reel size (inches) | Tape width (mm) | Quantity per reel |
|------------|------------|---------|--------------------|-----------------|-------------------|
| BFS17NTA   | AEC-Q101   | E1N     | 7                  | 8               | 3,000             |
| BFS17NQT A | Automotive | E1N     | 7                  | 8               | 3,000             |

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
  2. See <http://www.diodes.com> 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. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified.
  5. For packaging details, go to our website at <http://www.diodes.com>.

## Marking Information



E1N = Product type Marking Code

## Maximum Ratings (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic               | Symbol           | Value | Unit |
|------------------------------|------------------|-------|------|
| Collector-Base Voltage       | V <sub>CBO</sub> | 20    | V    |
| Collector-Emitter Voltage    | V <sub>CEO</sub> | 11    | V    |
| Emitter-Base Voltage         | V <sub>EBO</sub> | 3     | V    |
| Continuous Collector Current | I <sub>C</sub>   | 50    | mA   |

## Thermal Characteristics (@T<sub>A</sub> = +25°C, unless otherwise specified.)

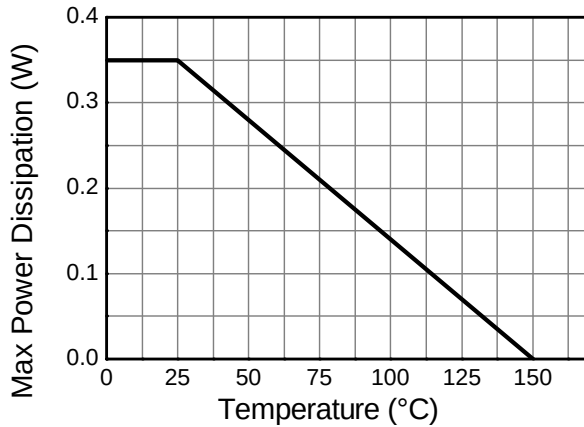
| Characteristic                          | Symbol                            | Value       | Unit |
|-----------------------------------------|-----------------------------------|-------------|------|
| Power Dissipation                       | P <sub>D</sub>                    | 310         | mW   |
|                                         |                                   | 350         |      |
| Thermal Resistance, Junction to Ambient | R <sub>θJA</sub>                  | 403         | °C/W |
|                                         |                                   | 357         |      |
| Thermal Resistance, Junction to Leads   | R <sub>θJL</sub>                  | 350         | °C/W |
| Operating and Storage Temperature Range | T <sub>J</sub> , T <sub>STG</sub> | -55 to +150 | °C   |

## ESD Ratings (Note 9)

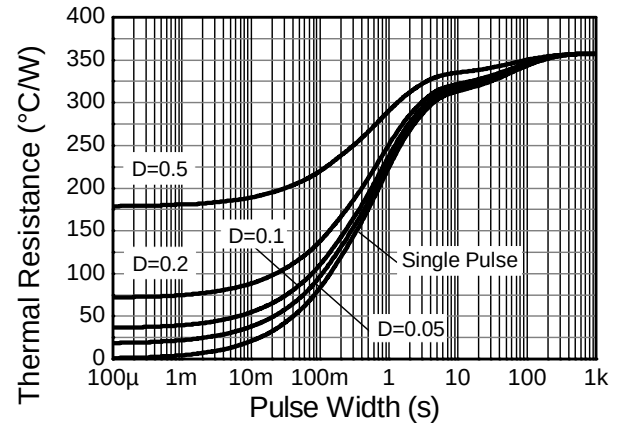
| Characteristic                             | Symbol  | Value | Unit | JEDEC Class |
|--------------------------------------------|---------|-------|------|-------------|
| Electrostatic Discharge - Human Body Model | ESD HBM | 2,000 | V    | 2           |
| Electrostatic Discharge - Machine Model    | ESD MM  | 100   | V    | A           |

- Notes:
6. For the device mounted on minimum recommended pad layout FR4 PCB with high coverage of single sided 1oz copper in still air condition;
  7. Same as Note 6, expect the device is mounted on 15mm X 15mm X 1.6mm FR4 PCB
  8. Thermal resistance from junction to solder-point (at the end of the leads).
  9. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

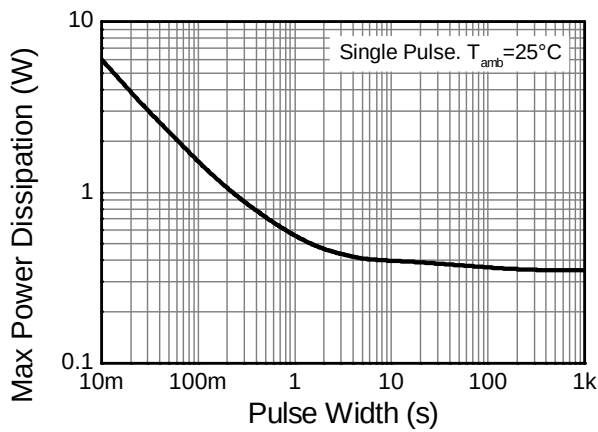
## Thermal Characteristics and Derating information



**Derating Curve**



**Transient Thermal Impedance**



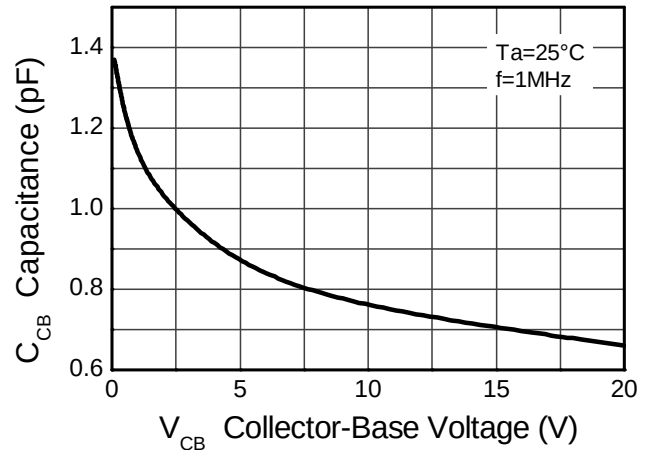
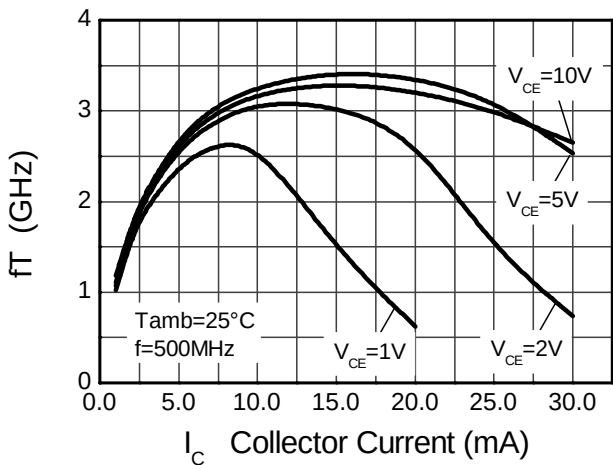
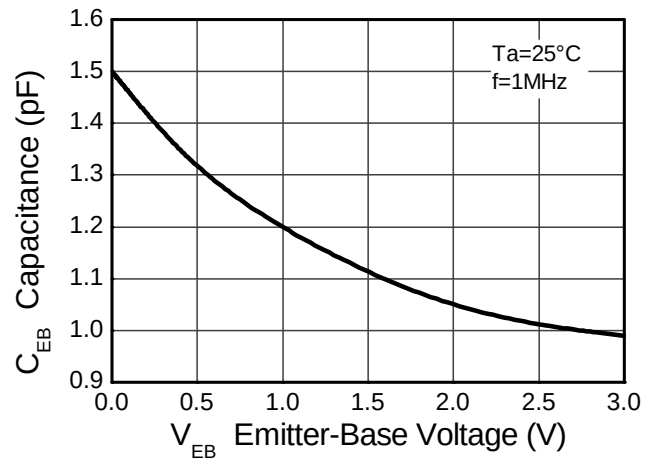
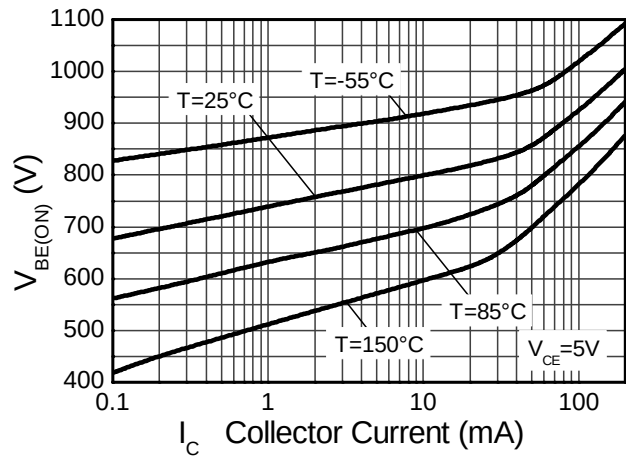
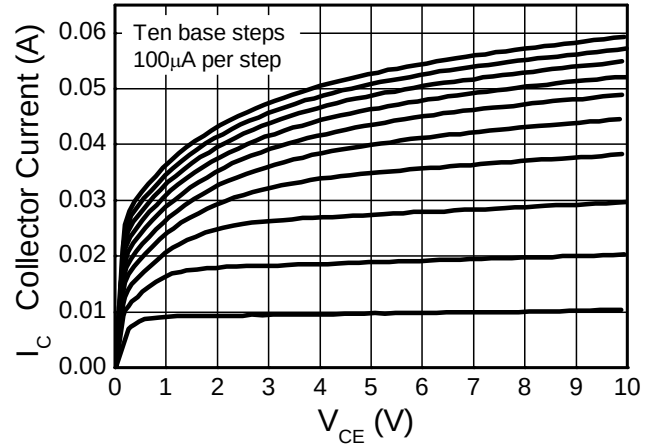
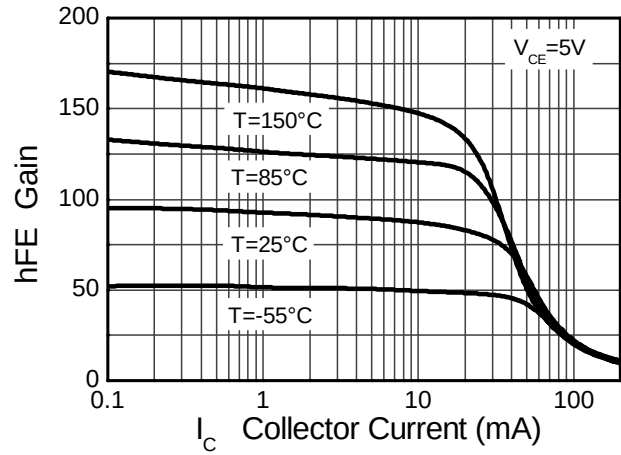
**Pulse Power Dissipation**

## Electrical Characteristics (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                                  | Symbol               | Min | Typ | Max | Unit | Test Condition                                             |
|-------------------------------------------------|----------------------|-----|-----|-----|------|------------------------------------------------------------|
| Collector-Base Breakdown Voltage                | BV <sub>CBO</sub>    | 20  | –   | –   | V    | I <sub>C</sub> = 10μA                                      |
| Collector-Emitter Breakdown Voltage (Note 10)   | BV <sub>CEO</sub>    | 11  | –   | –   | V    | I <sub>C</sub> = 1mA                                       |
| Emitter-Base Breakdown Voltage                  | BV <sub>EBO</sub>    | 3   | –   | –   | V    | I <sub>E</sub> = 10μA                                      |
| Collector Cutoff Current                        | I <sub>CBO</sub>     | –   | –   | 0.5 | μA   | V <sub>CB</sub> = 10V                                      |
| Emitter Cutoff Current                          | I <sub>EBO</sub>     | –   | –   | 0.5 | μA   | V <sub>EB</sub> = 2V                                       |
| Static Forward Current Transfer Ratio (Note 10) | h <sub>FE</sub>      | 56  | –   | 180 | –    | I <sub>C</sub> = 5mA, V <sub>CE</sub> = 10V                |
| Collector-Emitter Saturation Voltage (Note 10)  | V <sub>CE(sat)</sub> | –   | –   | 0.5 | V    | I <sub>C</sub> = 25mA, I <sub>B</sub> = 5mA                |
| Transition Frequency (Note 10)                  | f <sub>T</sub>       | 1.4 | 3.2 | –   | GHz  | I <sub>E</sub> = 25mA, V <sub>CE</sub> = 5V,<br>f = 500MHz |
| Collector Output Capacitance (Note 10)          | C <sub>ob</sub>      | –   | 0.8 | 1.5 | pF   | V <sub>CB</sub> = 10V, f = 1MHz                            |

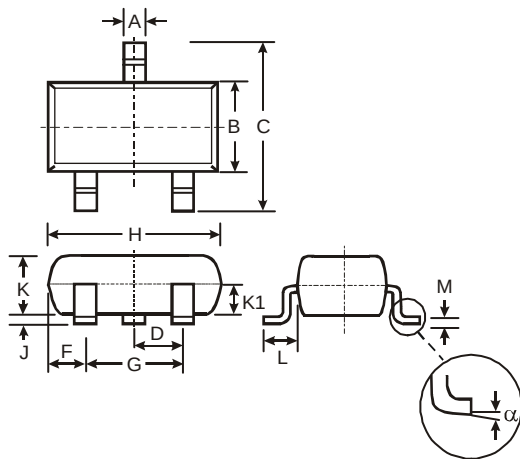
Notes: 10. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%

**Typical Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)



## Package Outline Dimensions

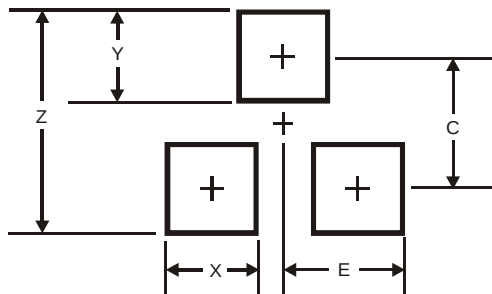
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



| SOT23                |       |      |       |
|----------------------|-------|------|-------|
| Dim                  | Min   | Max  | Typ   |
| A                    | 0.37  | 0.51 | 0.40  |
| B                    | 1.20  | 1.40 | 1.30  |
| C                    | 2.30  | 2.50 | 2.40  |
| D                    | 0.89  | 1.03 | 0.915 |
| F                    | 0.45  | 0.60 | 0.535 |
| G                    | 1.78  | 2.05 | 1.83  |
| H                    | 2.80  | 3.00 | 2.90  |
| J                    | 0.013 | 0.10 | 0.05  |
| K                    | 0.903 | 1.10 | 1.00  |
| K1                   | -     | -    | 0.400 |
| L                    | 0.45  | 0.61 | 0.55  |
| M                    | 0.085 | 0.18 | 0.11  |
| α                    | 0°    | 8°   | -     |
| All Dimensions in mm |       |      |       |

## Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



| Dimensions | Value (in mm) |
|------------|---------------|
| Z          | 2.9           |
| X          | 0.8           |
| Y          | 0.9           |
| C          | 2.0           |
| E          | 1.35          |

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