

NPN LOW NOISE SILICON MICROWAVE TRANSISTOR

PRODUCT DATA SHEET

FEATURES:

- High Gain Bandwidth Product
 $f_t = 12 \text{ GHz typ @ } I_C = 10 \text{ mA}$
- Low Noise Figure
 1.6 dB typ at 1 GHz
 2.0 dB typ at 2 GHz
- High Gain
 $|S_{21}|^2 = 18.1 \text{ dB @ } 1 \text{ GHz}$
 $12.8 \text{ dB @ } 2 \text{ GHz}$
- Dice, Plastic, Hermetic and Surface Mount packages available

PERFORMANCE DATA:

- Electrical Characteristics ($T_A = 25^\circ\text{C}$)

DESCRIPTION AND APPLICATIONS:

Bipolarics' BRF610 is a high performance silicon bipolar transistor intended for use in low noise application at VHF, UHF and microwave frequencies. High performance low noise performance can be realized at 2 mA or less making the BRF610 an excellent choice for battery applications. From 10 mA to greater than 20 mA, f_t is nominally 10 GHz. Maximum recommended continuous current is 20 mA. A broad range of packages are offered including SOT-23, SOT-143, plastic and ceramic 0.085" Micro-X, 0.070" Stripline and unencapsulated dice.

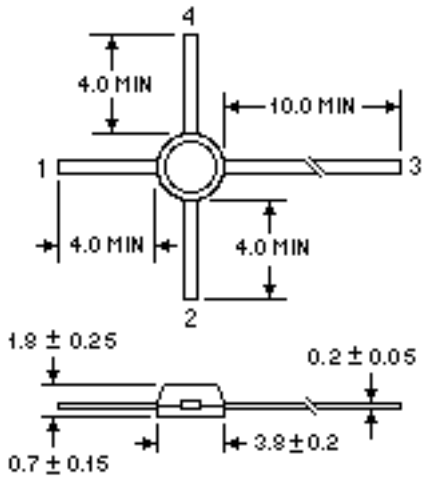
Absolute Maximum Ratings:

| SYMBOL | PARAMETERS | RATING | UNITS |
|----------------------|---------------------------|------------|------------------|
| V_{CBO} | Collector-Base Voltage | 9 | V |
| V_{CEO} | Collector-Emitter Voltage | 7 | V |
| V_{EBO} | Emitter-Base Voltage | 1.5 | V |
| $I_{C \text{ CONT}}$ | Collector Current | 20 | mA |
| T_J | Junction Temperature | 200 | $^\circ\text{C}$ |
| T_{STG} | Storage Temperature | -65 to 150 | $^\circ\text{C}$ |

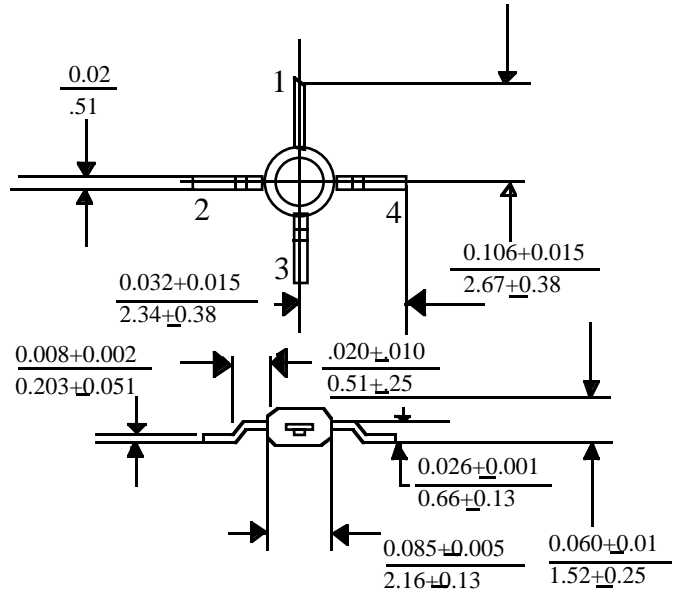
| SYMBOL | PARAMETERS & CONDITIONS $V_{CE} = 8V, I_C = 10 \text{ mA}$ unless stated | UNIT | MIN. | TYP. | MAX. |
|--------------|--|---------------|------|--------------|------|
| f_t | Gain Bandwidth Product | GHz | | 12 | |
| $ S_{21} ^2$ | Insertion Power Gain: $f = 1.0 \text{ GHz}$ $f = 2.0 \text{ GHz}$ | | | 18.1 12.8 | |
| P_{1dB} | Power output at 1dB compression: $f = 1.0 \text{ GHz}$ | dBm | | 12 | |
| G_{1dB} | Gain at 1dB compression: $f = 1.0 \text{ GHz}$ | dBm | | 15 | |
| NF | Noise Figure: $V_{CE} = 8V, I_C = 2mA$ $f = 1.0 \text{ GHz}$ $Z_S = 50\Omega$ | dB | | 1.6 | |
| h_{FE} | Forward Current Transfer Ratio: $V_{CE} = 8V, I_C = 10 \text{ mA}$ $f = 1\text{MHz}$ | | 50 | 100 | 250 |
| I_{CBO} | Collector Cutoff Current : $V_{CB} = 8V$ | μA | | | |
| I_{EBO} | Emitter Cutoff Current : $V_{EB} = 1V$ | μA | | | 1.0 |
| C_{CB} | Collector Base Capacitance: $V_{CB} = 8V$ $f = 1\text{MHz}$ | pF | | 0.11 | |

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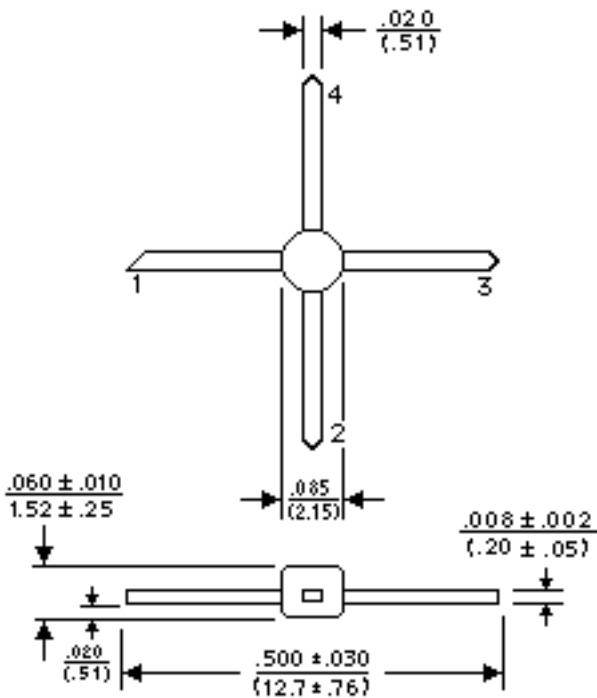
BRF61004
Package Style 04: 0.145" Plastic Macro-X



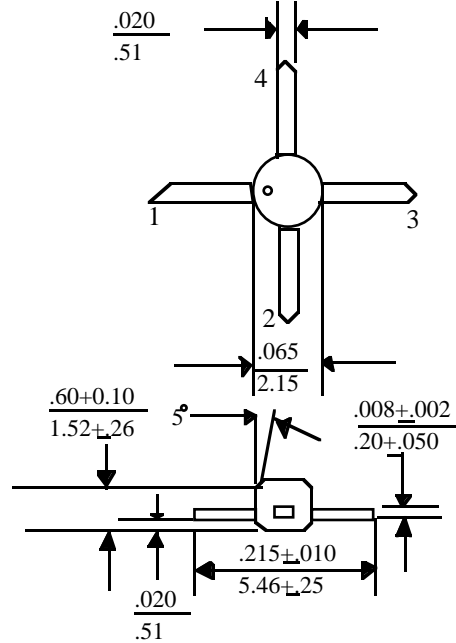
BRF61086
Package Style 86: 0.085" Plastic Micro-X,
Surface Mount



BRF61085
Package Style 85: 0.085" Plastic Micro-X



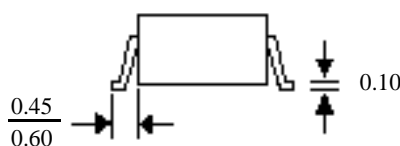
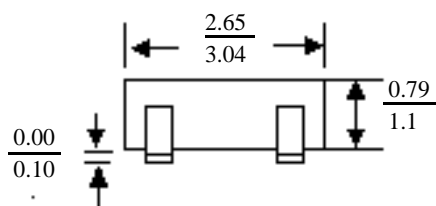
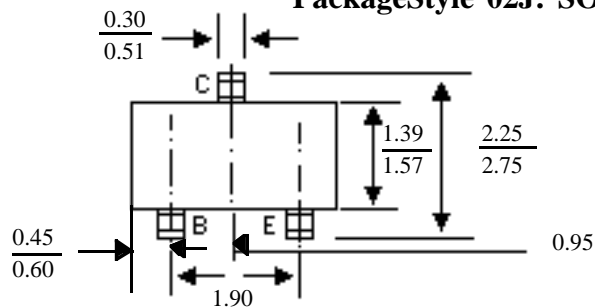
BRF61087
Package Style 87: 0.085" Plastic Micro-X,
Short Lead



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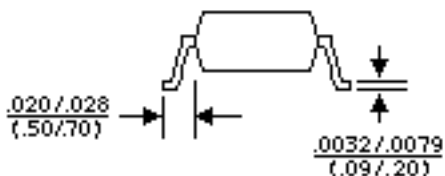
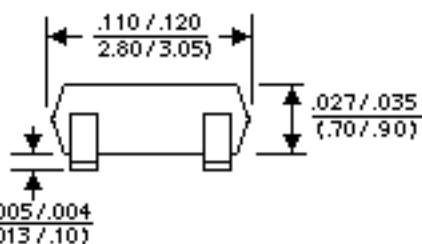
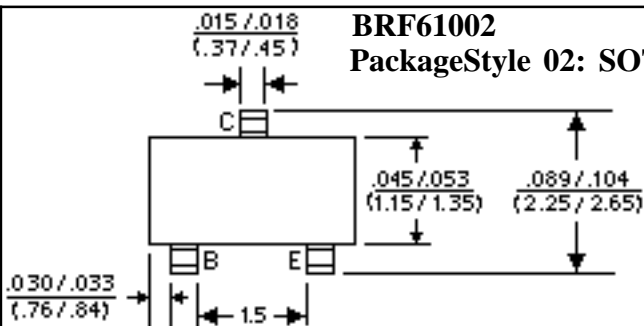
BRF61002J

PackageStyle 02J: SOT-23J



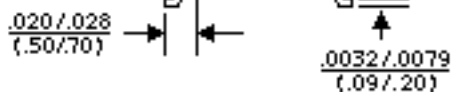
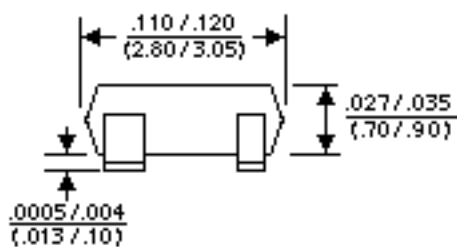
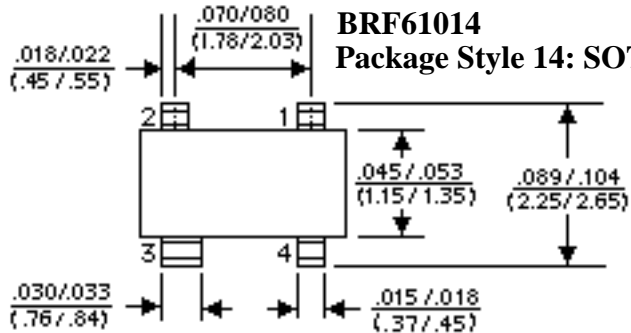
BRF61002

PackageStyle 02: SOT-23



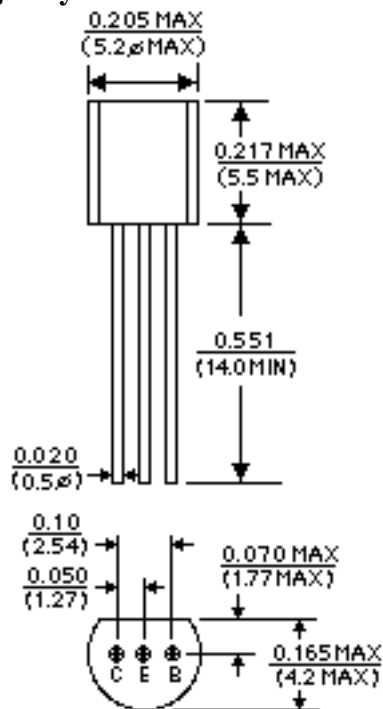
BRF61014

Package Style 14: SOT-143

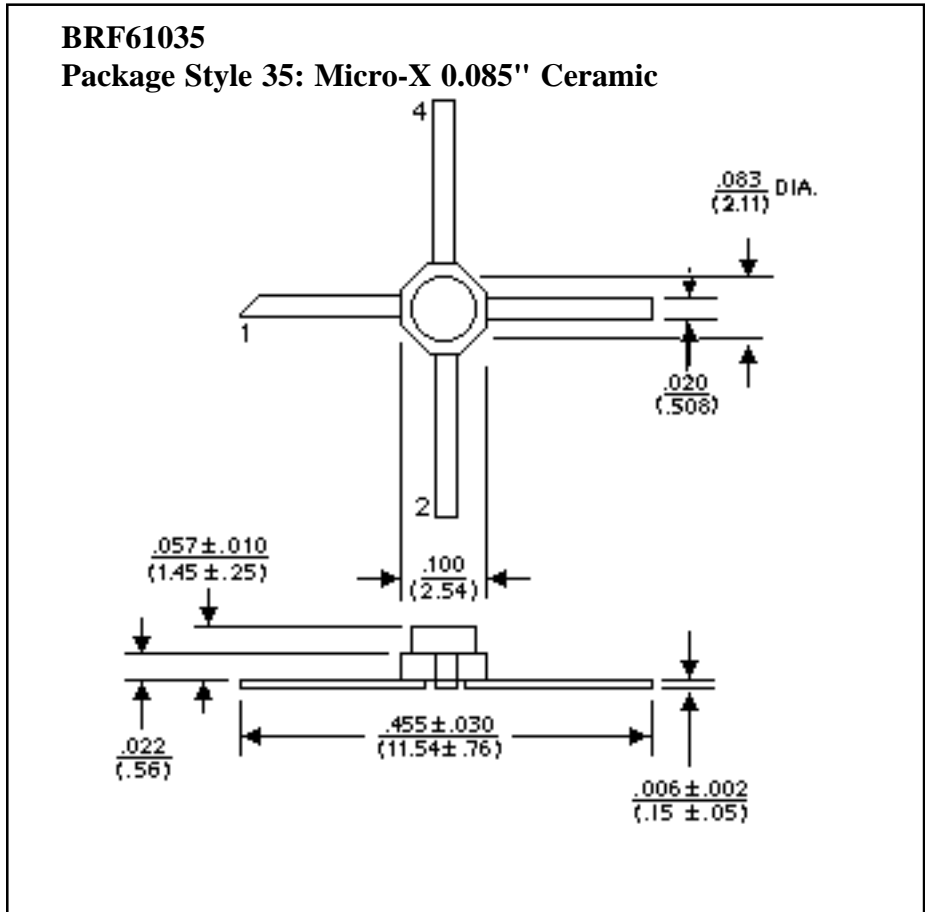


BRF61092

Package Style 92: TO-92



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| LEAD | 1 | 2 | 3 | 4 |
|----------------------------------|----------|----------|-----------|----------|
| Package Style 14, 85, 35 & 10 | Base | Emitter | Collector | Emitter |

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NOTES: (unless otherwise specified)

1. Dimensions are $\frac{\text{in}}{\text{mm}}$
2. Tolerances:
in .xxx = ± .005
mm .xx = ± .13
3. All dimensions nominal; subject to change without notice