

BIPOLARICS, INC.**Part Number BRF610****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.

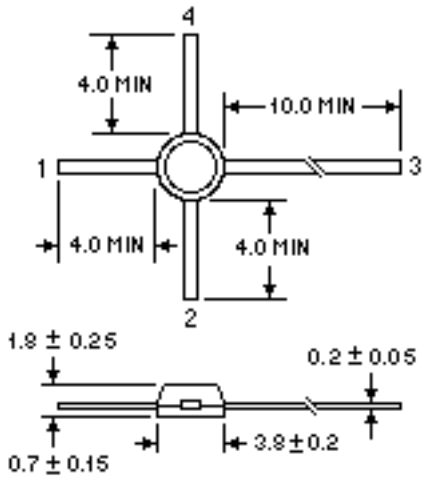
Absolute Maximum Ratings:

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	$^\circ\text{C}$

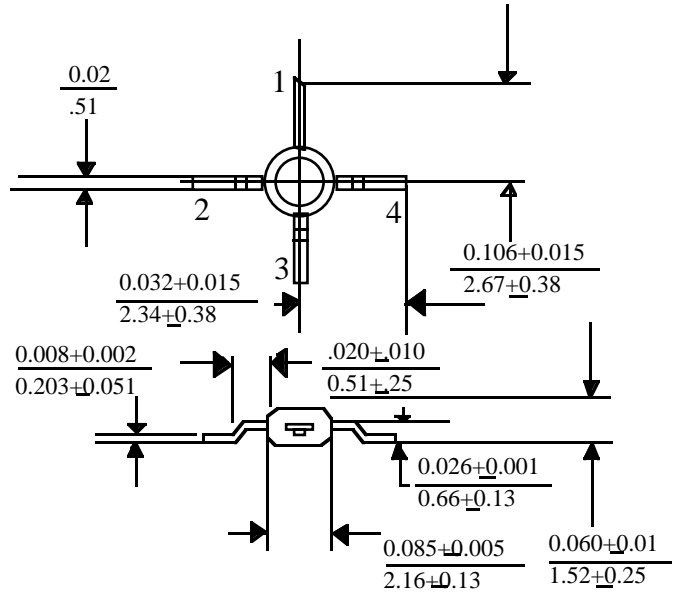
SYMBOL	PARAMETERS & CONDITIONS $V_{CE} = 8\text{V}, I_C = 10 \text{ mA}$ unless stated	UNIT	MIN.	TYP.	MAX.
f_t	Gain Bandwidth Product	GHz		12	
$ S_{21} ^2$	Insertion Power Gain: $f = 1.0 \text{ GHz}$ $f = 2.0 \text{ GHz}$			18.1 12.8	
P_{1dB}	Power output at 1dB compression: $f = 1.0 \text{ GHz}$	dBm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

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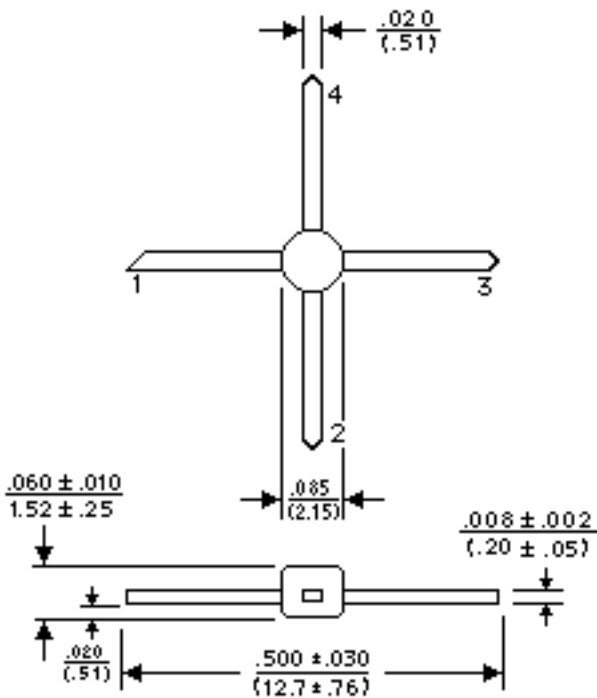
BRF61004
Package Style 04: 0.145" Plastic Macro-X



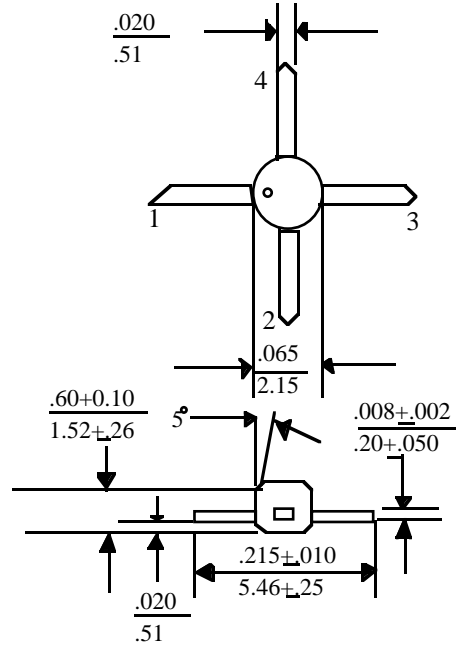
BRF61086
Package Style 86: 0.085" Plastic Micro-X,
Surface Mount



BRF61085
Package Style 85: 0.085" Plastic Micro-X



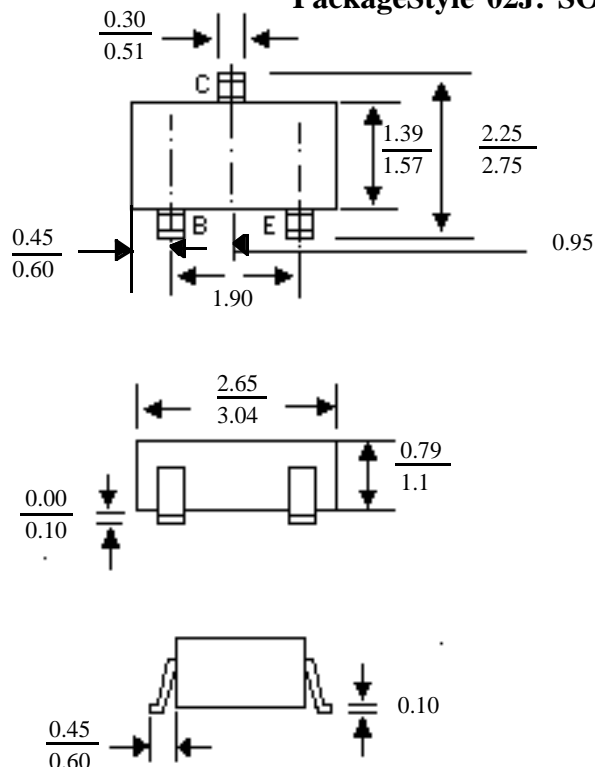
BRF61087
Package Style 87: 0.085" Plastic Micro-X,
Short Lead



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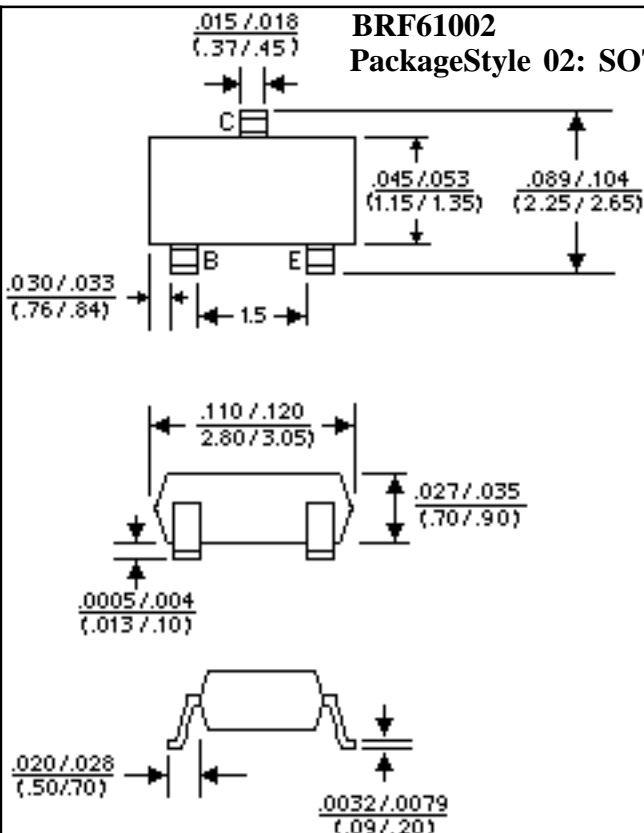
BRF61002J

PackageStyle 02J: SOT-23J



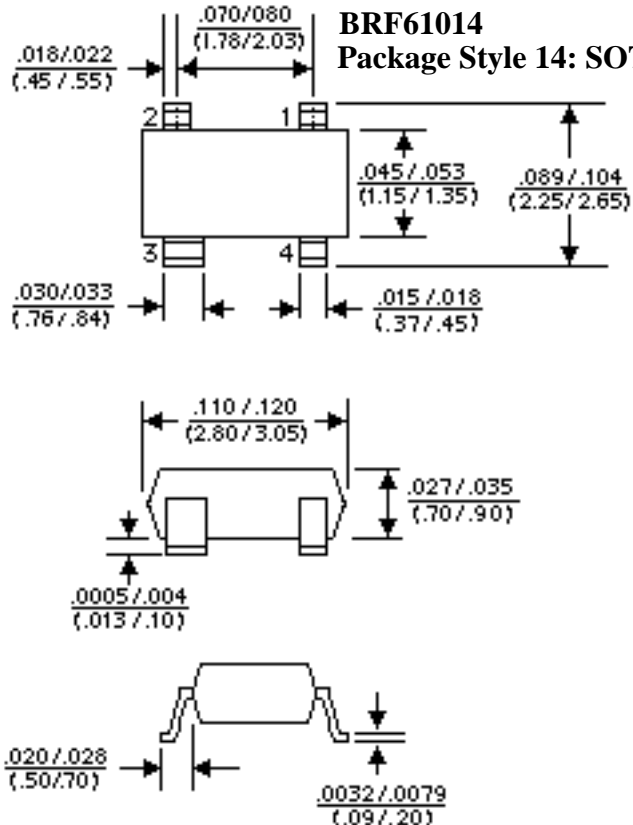
BRF61002

PackageStyle 02: SOT-23



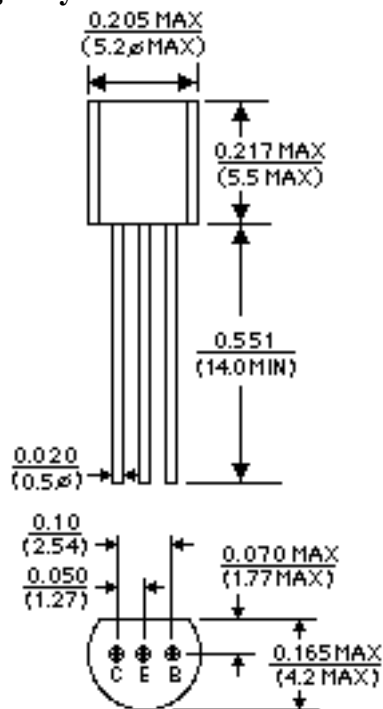
BRF61014

Package Style 14: SOT-143

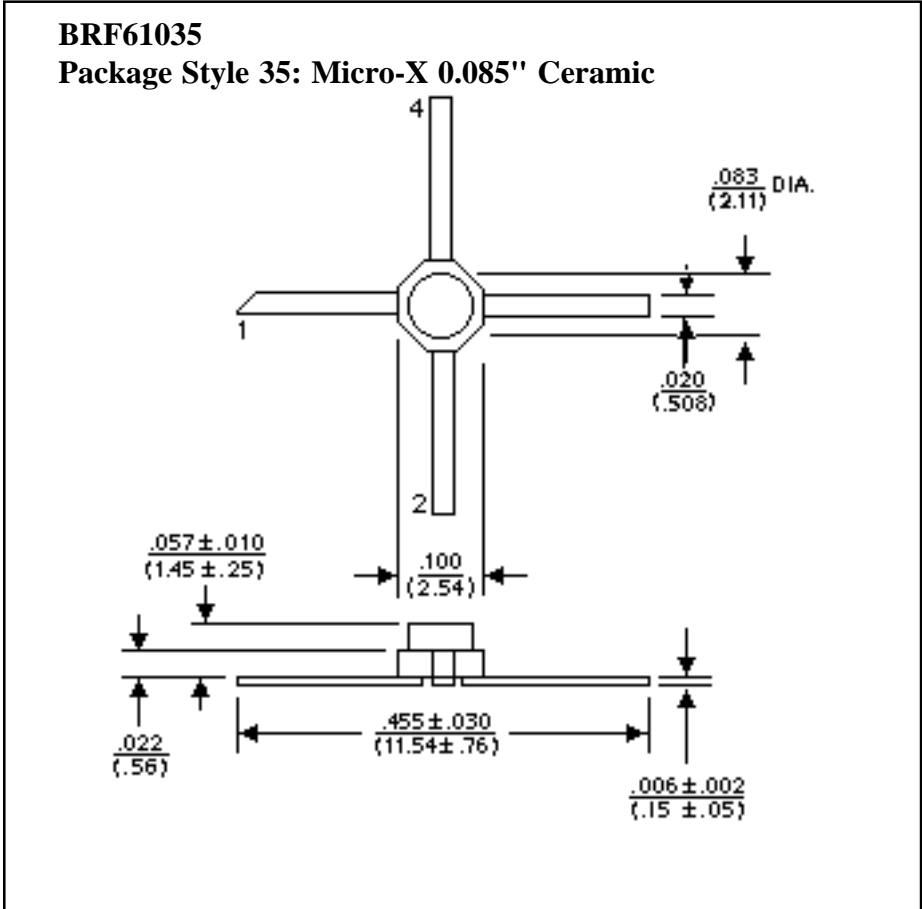


BRF61092

Package Style 92: TO-92



NPN LOW NOISE SILICON MICROWAVE TRANSISTOR



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 = $\pm .005$
mm .xx = $\pm .13$
3. All dimensions nominal; subject to change without notice