



# 5 GHz Wideband NPN Chip – BFR91

Silicon NPN Planar RF Transistor in bare die form

Rev 1.1  
3/11/17

## Description

NPN transistor in unencapsulated chip form. It is primarily intended for use in RF wideband amplifiers, such as in aerial amplifiers, radar systems, oscilloscopes, spectrum analyzers, etc. The transistor features low intermodulation distortion and high power gain; due to its very high transition frequency, it also has excellent wideband properties and low noise up to high frequencies. PNP complement is BFT92.

## Ordering Information

The following part suffixes apply:

- No suffix - MIL-STD-750 /2072 Visual Inspection
- "H" - MIL-STD-750 /2072 Visual Inspection + MIL-PRF-38534 Class H LAT
- "K" - MIL-STD-750 /2072 Visual Inspection + MIL-PRF-38534 Class K LAT

LAT = Lot Acceptance Test.

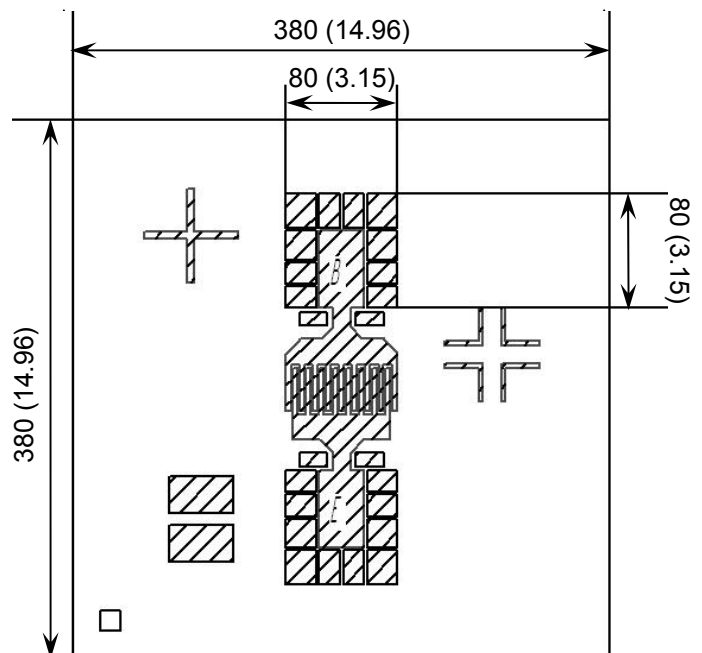
For further information on LAT process flows see below.

[www.siliconsupplies.com/quality/bare-die-lot-qualification](http://www.siliconsupplies.com/quality/bare-die-lot-qualification)

## Features:

- High Power Gain
- Low Noise
- Wide Transition Frequency

## Die Dimensions in $\mu\text{m}$ (mils)



B = BASE, E = EMITTER  
CHIP BACKSIDE IS COLLECTOR

## Supply Formats:

- Default – Die in Waffle Pack (400 per tray capacity)
- Sawn Wafer on Tape – By specific request
- Unsawn Wafer – By specific request
- With additional electrical selection – Specific request
- Sawn as pairs or adjacent pair pick – Specific request

## Mechanical Specification

Die Size (Unsawn)	380 x 380 14.96 x 14.96	$\mu\text{m}$ mils
Base & Emitter Bond Pad Size	80 x 80 3.15 x 3.15	$\mu\text{m}$ mils
Die Thickness	240 ( $\pm 20$ ) 9.45 ( $\pm 0.78$ )	$\mu\text{m}$ mils
Top Metal Composition	Au 1.5 $\mu\text{m}$	
Back Metal Composition	Au 0.35 $\mu\text{m}$	





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## Absolute Maximum Ratings $T_A = 25^\circ\text{C}$ unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN	MAX	UNIT
$V_{CBO}$	collector-base voltage	open emitter	-	20	V
$V_{CEO}$	collector-emitter voltage	open base	-	15	V
$V_{EBO}$	emitter-base voltage	open collector	-	2	V
$I_C$	DC collector current	-	-	50	mA
$P_{tot}$	total power dissipation	-	-	300	mW
$T_{stg}$	storage temperature	-	-65	150	$^\circ\text{C}$
$T_J$	junction temperature	-	-	175	$^\circ\text{C}$

## Electrical Characteristics $T_A = 25^\circ\text{C}$

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	SYMBOL
$I_{CBO}$	collector cut-off current	$I_E = 0 ; V_{CB} = 20\text{V}$	-	-	100	nA
$h_{FE}$	DC current gain	$I_C = 30\text{mA}; V_{CE} = 5\text{V}$	25	50	150	
$f_T$	transition frequency	$I_C = 30\text{mA}; V_{CE} = 5\text{V}; f = 300\text{ MHz}$	-	5	-	GHz
$G_P$	power gain	$I_C = 30\text{mA}; V_{CE} = 5\text{V}; f = 800\text{ MHz}$	-	13	-	dB
NF	noise figure	$I_C = 2\text{mA}; V_{CE} = 5\text{V}; f = 500\text{ MHz}$	-	1.9	-	dB

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