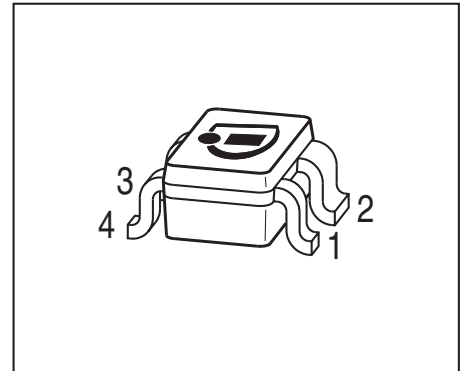


### High Performance Bipolar NPN RF Transistor

- High transducer gain of typ. 14 dB @ 25 mA, 6 GHz
- Low minimum noise figure of typ. 0.85 dB @ 6GHz
- High output compression of typ. 11 dBm @ 25 mA
- Pb-free (RoHS compliant) package
- For a wide range of non-automotive applications
  - 2nd and 3rd LNA stage and mixer stage in LNB
  - 5.8 GHz analog/digital cordless phone
  - Satellite radio SDARS
  - WLAN, WiMAX, UWB



**ESD (Electrostatic discharge) sensitive device, observe handling precaution!**

Type	Marking	Pin Configuration						Package
BF888	RYs	1=B	2=E	3=C	4=E	-	-	SOT343

**Maximum Ratings** at  $T_A = 25\text{ }^\circ\text{C}$ , unless otherwise specified

Parameter	Symbol	Value	Unit
Collector-emitter voltage	$V_{CEO}$		V
$T_A = 25\text{ }^\circ\text{C}$		4.0	
$T_A = -55\text{ }^\circ\text{C}$		3.5	
Collector-emitter voltage	$V_{CES}$	13	
Collector-base voltage	$V_{CBO}$	13	
Emitter-base voltage	$V_{EBO}$	1.2	
Collector current	$I_C$	30	mA
Base current	$I_B$	3	
Total power dissipation <sup>1)</sup>	$P_{tot}$	160	mW
$T_S \leq 89\text{ }^\circ\text{C}$			
Junction temperature	$T_J$	150	$^\circ\text{C}$
Ambient temperature	$T_A$	-55 ... 150	
Storage temperature	$T_{Std}$	-55 ... 150	

<sup>1)</sup>  $T_S$  is measured on the emitter lead at the soldering point to the pcb

### Thermal Resistance

Parameter	Symbol	Value	Unit
Junction - soldering point <sup>1)</sup>	$R_{thJS}$	$\leq 380$	K/W

**Electrical Characteristics** at  $T_A = 25^\circ\text{C}$ , unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>DC Characteristics</b>					
Collector-emitter breakdown voltage $I_C = 1\text{ mA}, I_B = 0$	$V_{(BR)CEO}$	4	4.7	-	V
Collector-emitter cutoff current $V_{CE} = 5\text{ V}, V_{BE} = 0$	$I_{CES}$	-	1	-	nA
Collector-base cutoff current $V_{CB} = 5\text{ V}, I_E = 0$	$I_{CBO}$	-	1	-	
Emitter-base cutoff current $V_{EB} = 0.5\text{ V}, I_C = 0$	$I_{EBO}$	-	10	-	
DC current gain $I_C = 25\text{ V}, V_{CE} = 3\text{ V}, \text{ pulse measured}$	$h_{FE}$	-	250	-	-

<sup>1</sup>For calculation of  $R_{thJA}$  please refer to Application Note Thermal Resistance

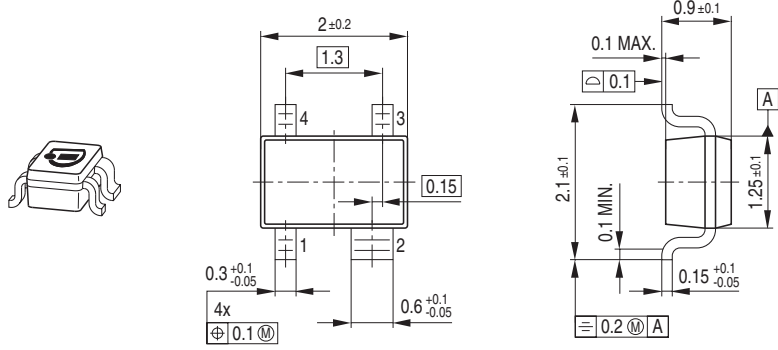
**Electrical Characteristics at  $T_A = 25^\circ\text{C}$ , unless otherwise specified**

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>AC Characteristics (verified by random sampling)</b>					
Transition frequency $I_C = 25\text{ mA}$ , $V_{CE} = 3\text{ V}$ , $f = 2\text{ GHz}$	$f_T$	-	47	-	GHz
Collector-base capacitance $V_{CB} = 3\text{ V}$ , $f = 1\text{ MHz}$ , $V_{BE} = 0$ , emitter grounded	$C_{cb}$	-	0.08	-	pF
Collector emitter capacitance $V_{CE} = 3\text{ V}$ , $f = 1\text{ MHz}$ , $V_{BE} = 0$ , base grounded	$C_{ce}$	-	0.35	-	
Emitter-base capacitance $V_{EB} = 0.5\text{ V}$ , $f = 1\text{ MHz}$ , $V_{CB} = 0$ , collector grounded	$C_{eb}$	-	0.45	-	
Noise figure $I_C = 8\text{ mA}$ , $V_{CE} = 3\text{ V}$ , $f = 1.8\text{ GHz}$ , $Z_S = Z_{Sopt}$ $I_C = 8\text{ mA}$ , $V_{CE} = 3\text{ V}$ , $f = 6\text{ GHz}$ , $Z_S = Z_{Sopt}$	$F$	-	0.5 0.85	-	dB
Power gain $I_C = 25\text{ mA}$ , $V_{CE} = 3\text{ V}$ , $Z_S = Z_{Sopt}$ , $Z_L = Z_{Lopt}$ , $f = 1.8\text{ GHz}$	$G_{ms}$	-	27	-	dB
Power gain, maximum available <sup>1)</sup> $I_C = 25\text{ mA}$ , $V_{CE} = 3\text{ V}$ , $Z_S = Z_{Sopt}$ , $Z_L = Z_{Lopt}$ , $f = 6\text{ GHz}$	$G_{ma}$	-	17	-	dB
Transducer gain $I_C = 25\text{ mA}$ , $V_{CE} = 3\text{ V}$ , $Z_S = Z_L = 50\ \Omega$ , $f = 1.8\text{ GHz}$ $f = 6\text{ GHz}$	$ S_{21e} ^2$	-	24.5 14	-	dB
Third order intercept point at output <sup>2)</sup> $V_{CE} = 3\text{ V}$ , $I_C = 25\text{ mA}$ , $f = 1.8\text{ GHz}$ , $Z_S = Z_L = 50\ \Omega$	$IP_3$	-	25	-	dBm
1dB Compression point $I_C = 25\text{ mA}$ , $V_{CE} = 3\text{ V}$ , $Z_S = Z_L = 50\ \Omega$ , $f = 1.8\text{ GHz}$	$P_{-1dB}$	-	11	-	

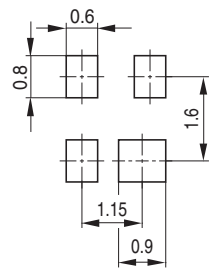
$$^1G_{ma} = |S_{21e} / S_{12e}| (k - (k^2 - 1)^{1/2})$$

<sup>2)</sup>IP3 value depends on termination of all intermodulation frequency components.  
Termination used for this measurement is 50  $\Omega$  from 0.1 MHz to 6 GHz

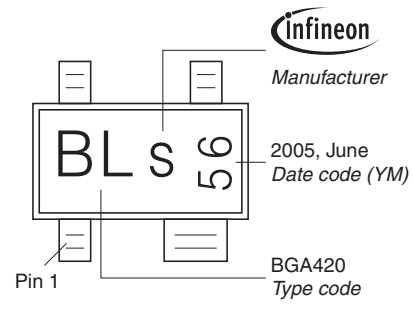
Package Outline



Foot Print

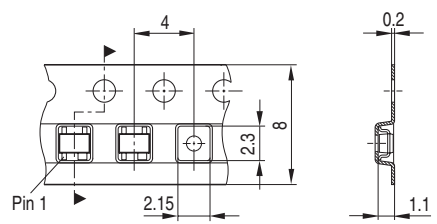


Marking Layout (Example)



Standard Packing

Reel ø180 mm = 3.000 Pieces/Reel  
 Reel ø330 mm = 10.000 Pieces/Reel



**Edition 2009-11-16**

**Published by  
Infineon Technologies AG  
81726 Munich, Germany**

**© 2009 Infineon Technologies AG  
All Rights Reserved.**

### **Legal Disclaimer**

The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics. With respect to any examples or hints given herein, any typical values stated herein and/or any information regarding the application of the device, Infineon Technologies hereby disclaims any and all warranties and liabilities of any kind, including without limitation, warranties of non-infringement of intellectual property rights of any third party.

### **Information**

For further information on technology, delivery terms and conditions and prices, please contact the nearest Infineon Technologies Office ([www.infineon.com](http://www.infineon.com)).

### **Warnings**

Due to technical requirements, components may contain dangerous substances. For information on the types in question, please contact the nearest Infineon Technologies Office.

Infineon Technologies components may be used in life-support devices or systems only with the express written approval of Infineon Technologies, if a failure of such components can reasonably be expected to cause the failure of that life-support device or system or to affect the safety or effectiveness of that device or system. Life support devices or systems are intended to be implanted in the human body or to support and/or maintain and sustain and/or protect human life. If they fail, it is reasonable to assume that the health of the user or other persons may be endangered.