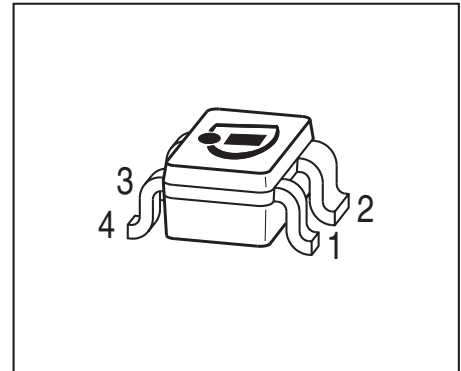


## High Performance Bipolar NPN RF Transistor

- 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

2010-04-06

**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

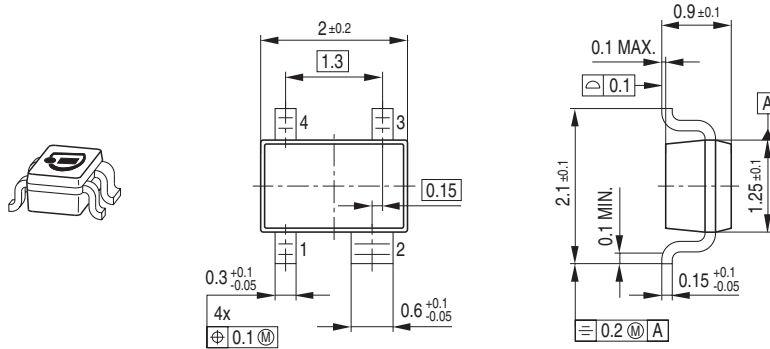
**Electrical Characteristics at  $T_A = 25^\circ\text{C}$ , unless otherwise specified**

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	-	

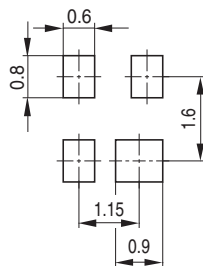
$$^1G_{ma} = |S_{21e} / S_{12e}| (k - (k^2 - 1)^{1/2})$$

<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

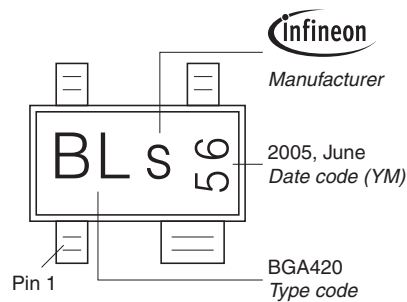
Package Outline



Foot Print

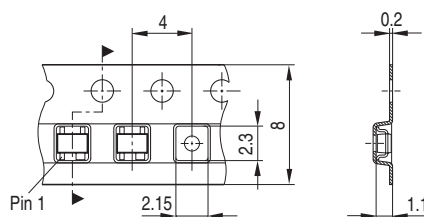


Marking Layout (Example)



Standard Packing

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



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