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

RoHS

ESD (**E**lectro**s**tatic **d**ischarge) 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 °C, unless otherwise specified

Parameter	Symbol	Value	Unit
Collector-emitter voltage	V_{CEO}		V
T_A = 25 °C		4.0	
T_A = – 55 °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[1)] $T_S \leq 89$ °C	P_{tot}	160	mW
Junction temperature	T_J	150	°C
Ambient temperature	T_A	-55 ... 150	
Storage temperature	T_{Stg}	-55 ... 150	

[1] T_S is measured on the emitter lead at the soldering point to the pcb

Thermal Resistance

Parameter	Symbol	Value	Unit
Junction - soldering point[1)]	R_{thJS}	≤ 380	K/W

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Electrical Characteristics at T_A = 25°C, unless otherwise specified

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

[1]For calculation of R_{thJA} please refer to Application Note Thermal Resistance

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Electrical Characteristics at T_A = 25°C, unless otherwise specified

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

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

[2] IP3 value depends on termination of all intermodulation frequency components.
Termination used for this measurement is 50 Ω from 0.1 MHz to 6 GHz

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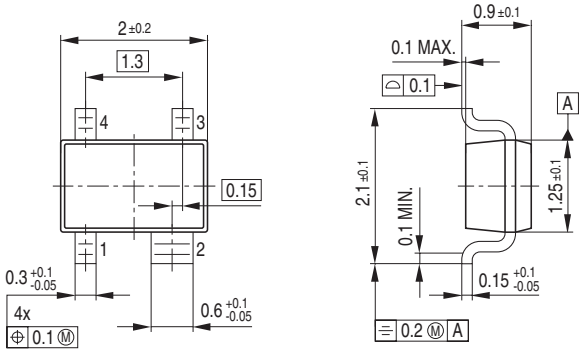
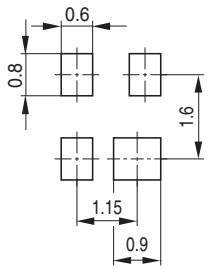
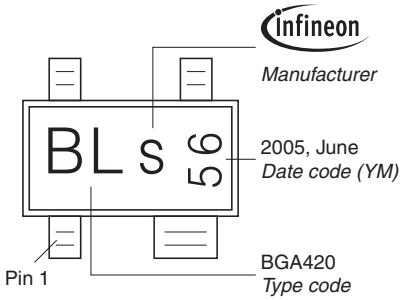
Package Outline



Foot Print

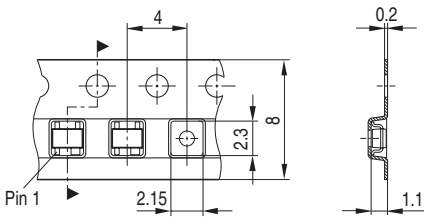


Marking Layout (Example)



Standard Packing

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



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