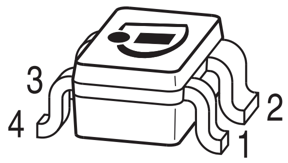
High Performance NPN Bipolar RF Transistor



- High performance low noise amplifier
- Low minimum noise figure of typ. 0.8 dB @ 1.8 GHz
- For a wide range of non automotive applications such as WLAN, WiMax, UWB, Bluetooth, GPS, SDARs, DAB, LNB, UMTS/LTE and ISM bands
- Easy to use standard package with visible leads
- Pb-free (RoHS compliant) package

RoHS

ESD (**E**lectro**s**tatic **d**ischarge) sensitive device, observe handling precaution!

Type	**Marking**	**Pin Configuration**						**Package**
BF776	R3s	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	50	mA
Base current	I_B	3	
Total power dissipation[1] $T_S \leq 90$°C	P_{tot}	200	mW
Junction temperature	T_J	150	°C
Ambient temperature	T_A	-55 ... 150	
Storage temperature	T_{Stg}	-55 ... 150	

Thermal Resistance

Parameter	**Symbol**	**Value**	**Unit**
Junction - soldering point[2]	R_{thJS}	$\leq$ 300	K/W

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

[2] 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.	
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 = 30 mA, V_{CE} = 3 V, pulse measured	h_{FE}	-	180	-	-

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 = 30 mA, V_{CE} = 3 V, f = 1 GHz	f_T	-	46	-	GHz
Collector-base capacitance V_{CB} = 3 V, f = 1 MHz, V_{BE} = 0 , emitter grounded	C_{cb}	-	0.09	-	pF
Collector emitter capacitance V_{CE} = 3 V, f = 1 MHz, V_{BE} = 0 , base grounded	C_{ce}	-	0.25	-	
Emitter-base capacitance V_{EB} = 0.5 V, f = 1 MHz, V_{CB} = 0 , collector grounded	C_{eb}	-	0.5	-	
Noise figure I_C = 5 mA, V_{CE} = 3 V, f = 1.8 GHz, $Z_S = Z_{Sopt}$ I_C = 5 mA, V_{CE} = 3 V, f = 6 GHz, $Z_S = Z_{Sopt}$	F	 - -	 0.8 1.3	 - -	dB
Power gain, maximum stable[1)] I_C = 30 mA, V_{CE} = 3 V, $Z_S = Z_{Sopt}$, $Z_L = Z_{Lopt}$, f = 1.8 GHz	G_{ms}	-	24	-	dB
Power gain, maximum available[1)] I_C = 30 mA, V_{CE} = 3 V, $Z_S = Z_{Sopt}$, $Z_L = Z_{Lopt}$, f = 6 GHz	G_{ma}	-	12.5	-	dB
Transducer gain I_C = 30 mA, V_{CE} = 3 V, $Z_S = Z_L$ = 50 Ω, f = 1.8 GHz f = 6 GHz	$\|S_{21e}\|^2$	 - -	 21.5 11	 - -	dB
Third order intercept point at output[2)] V_{CE} = 3 V, I_C = 30 mA, $Z_S=Z_L$=50 Ω, f = 1.8 GHz	IP_3	-	28	-	dBm
1dB Compression point at output I_C = 30 mA, V_{CE} = 3 V, $Z_S=Z_L$=50 Ω, f = 1.8 GHz	P_{-1dB}	-	13	-	

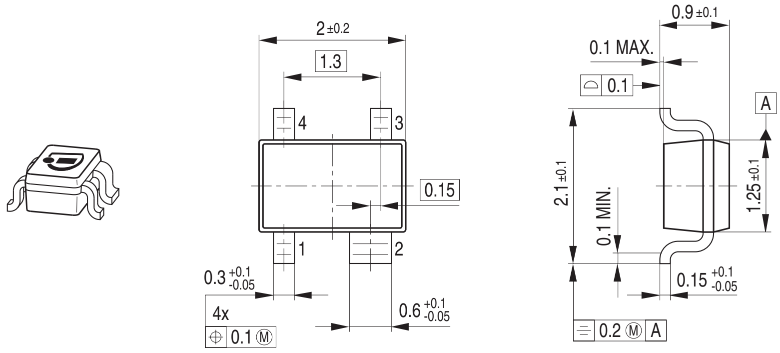
[1] $G_{ma} = |S_{21e} / S_{12e}| (k-(k^2-1)^{1/2})$, $G_{ms} = |S_{21e} / S_{12e}|$

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

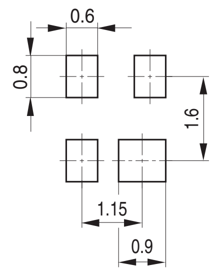
SPICE Parameter

For the SPICE model as well as for S-parameters (including noise parameters) please refer to our internet website www.infineon.com/rf.models.
Please consult our website and download the latest versions before actually starting your design.
The simulation data have been generated and verified using typical devices.
The BF776 SPICE model reflects the typical DC- and RF-performance with high accuracy.

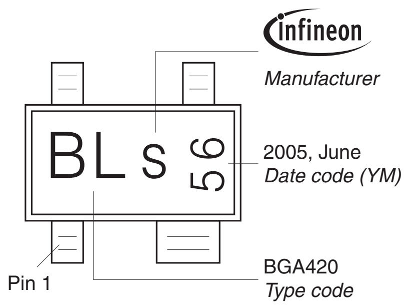
Package Outline



Foot Print

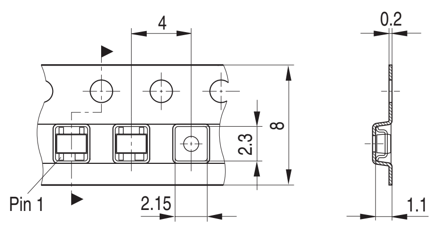


Marking Layout (Example)



Standard Packing

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



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