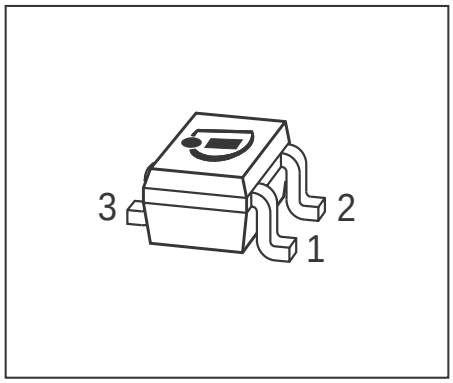
NPN Silicon RF Transistor



- For low distortion amplifiers and oscillators up to 2 GHz at collector currents from 5 mA to 30 mA
- Pb-free (RoHS compliant) package
- Qualified according AEC Q101

AEC Qualified RoHS

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

Type	Marking	Pin Configuration			Package
BFR93AW	R2s	1=B	2=E	3=C	SOT323

Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-emitter voltage	V_{CEO}	12	V
Collector-emitter voltage	V_{CES}	20	
Collector-base voltage	V_{CBO}	20	
Emitter-base voltage	V_{EBO}	2	
Collector current	I_C	90	mA
Base current	I_B	9	
Total power dissipation[1)] $T_S \leq 104$ °C	P_{tot}	300	mW
Junction temperature	T_J	150	°C
Ambient temperature	T_A	-65 ... 150	
Storage temperature	T_{Stg}	-65 ... 150	

Thermal Resistance

Parameter	Symbol	Value	Unit
Junction - soldering point[2)]	R_{thJS}	≤ 155	K/W

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

[2] For calculation of R_{thJA} please refer to Application Note AN077 Thermal Resistance

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

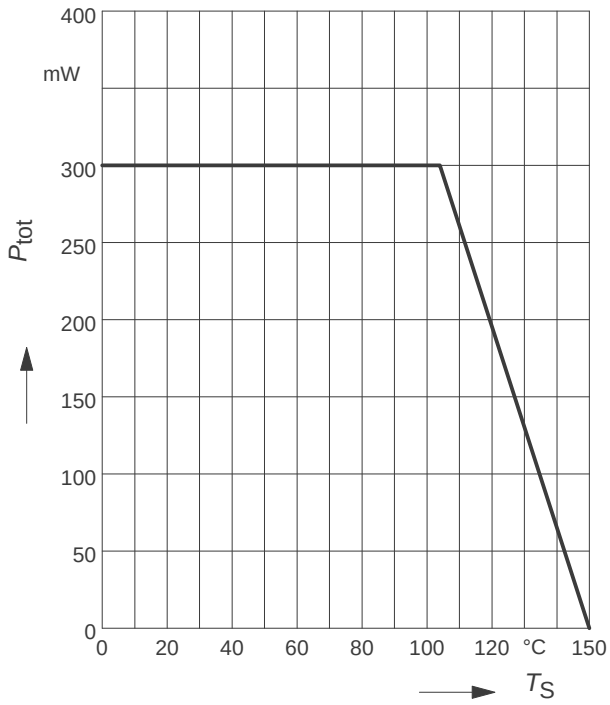
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC Characteristics					
Collector-emitter breakdown voltage I_C = 1 mA, I_B = 0	$V_{(BR)CEO}$	12	-	-	V
Collector-emitter cutoff current V_{CE} = 20 V, V_{BE} = 0	I_{CES}	-	-	100	µA
Collector-base cutoff current V_{CB} = 10 V, I_E = 0	I_{CBO}	-	-	100	nA
Emitter-base cutoff current V_{EB} = 2 V, I_C = 0	I_{EBO}	-	-	10	µA
DC current gain- I_C = 30 mA, V_{CE} = 8 V, pulse measured	h_{FE}	70	100	140	-

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

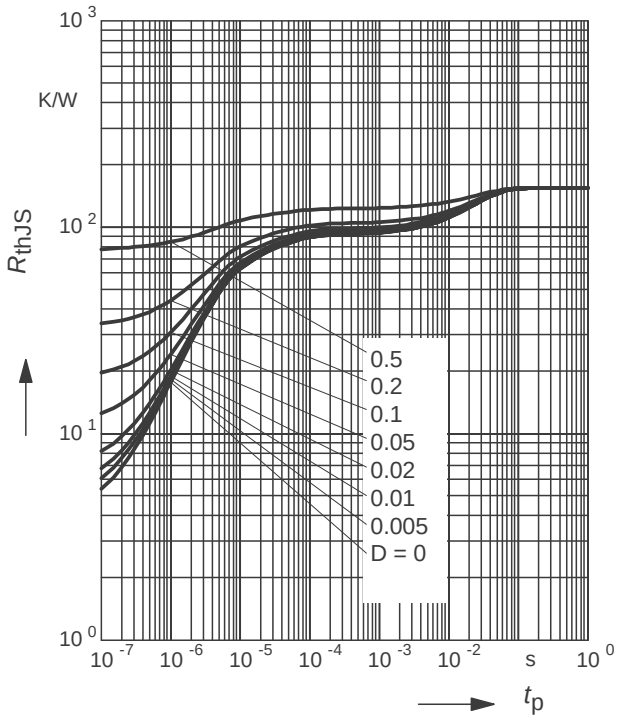
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC Characteristics (verified by random sampling)					
Transition frequency I_C = 30 mA, V_{CE} = 8 V, f = 500 MHz	f_T	4.5	6	-	GHz
Collector-base capacitance V_{CB} = 10 V, f = 1 MHz, V_{BE} = 0 , emitter grounded	C_{cb}	-	0.58	0.8	pF
Collector emitter capacitance V_{CE} = 10 V, f = 1 MHz, V_{BE} = 0 , base grounded	C_{ce}	-	0.3	-	
Emitter-base capacitance V_{EB} = 0.5 V, f = 1 MHz, V_{CB} = 0 , collector grounded	C_{eb}	-	1.9	-	
Minimum noise figure I_C = 5 mA, V_{CE} = 8 V, Z_S = Z_{Sopt}, f = 900 MHz I_C = 5 mA, V_{CE} = 8 V, Z_S = Z_{Sopt}, f = 1.8 GHz	NF_{min}	 - -	 1.5 2.6	 - -	dB
Power gain, maximum available[1)] I_C = 30 mA, V_{CE} = 8 V, Z_S = Z_{Sopt}, Z_L = Z_{Lopt} , f = 900 MHz I_C = 30 mA, V_{CE} = 8 V, Z_S = Z_{Sopt}, Z_L = Z_{Lopt}, f = 1.8 GHz	G_{ma}	 - -	 15.5 10.5	 - -	
Transducer gain I_C = 30 mA, V_{CE} = 8 V, Z_S = Z_L = 50 Ω, f = 900 MHz I_C = 30 mA, V_{CE} = 8 V, Z_S = Z_L = 50 Ω, f = 1.8 MHz	$\lvert S_{21e}\rvert^2$	 - -	 13 7.5	 - -	dB

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

Total power dissipation $P_{tot} = f(T_S)$

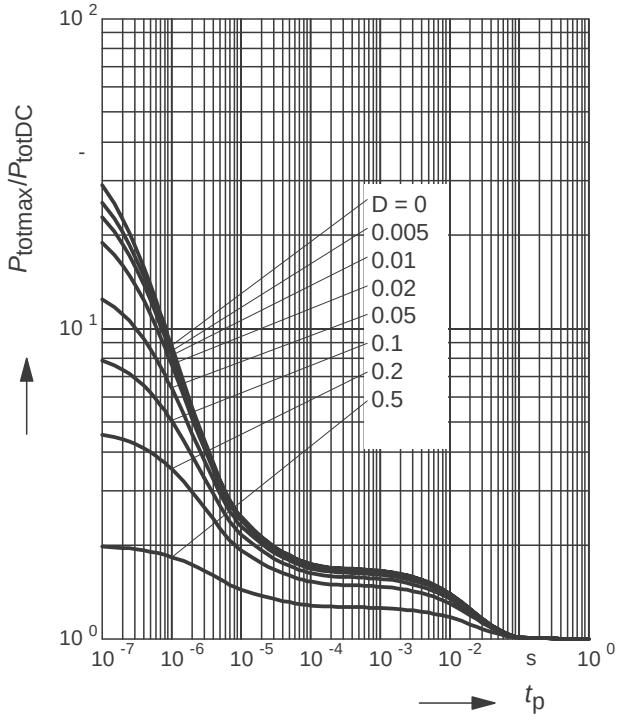


Permissible Pulse Load $R_{thJS} = f(t_p)$



Permissible Pulse Load

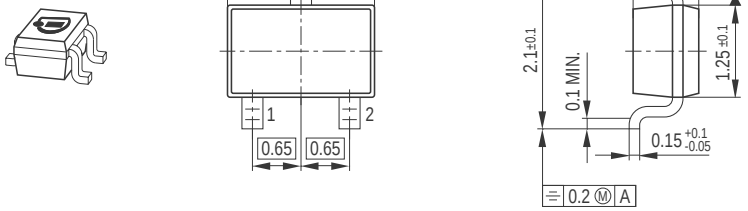
$P_{totmax}/P_{totDC} = f(t_p)$



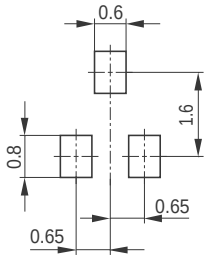
SPICE Parameter

For the SPICE Gummel Poon (GP) model as well as for the 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.

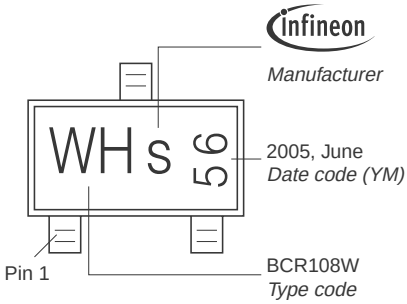
Package Outline



Foot Print

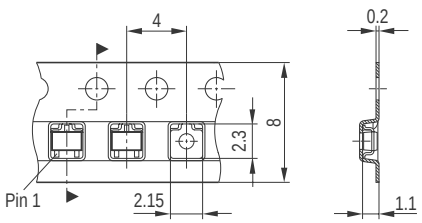


Marking Layout (Example)



Standard Packing

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



Datasheet Revision History: 9 August 2010

This datasheet replaces the revision from 26 April 2007.
The product itself has not been changed and the device characteristics remain unchanged. Only the product description and information available in the datasheet has been expanded and updated.

Previous Revision 26 April 2007	
Page	**Subject (changes since last revision)**
1	Datasheet has final status
2,3	Bias conditions for I_{EBO} and f_T corrected
4	SPICE model parameters removed from the datasheet, respective link to the internet site added

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