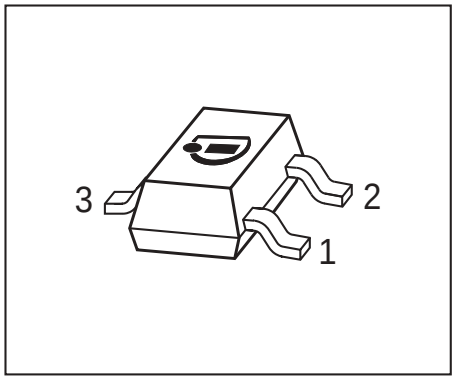
NPN Silicon RF Transistor*



- For broadband amplifiers up to 2 GHz and fast non-saturated switches at collector currents from 0.5 mA to 20 mA
- Complementary type: BFT91 (PNP)

* Short term description

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

Type	Marking	Pin Configuration			Package
BFR92P	GFs	1=B	2=E	3=C	SOT23

Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-emitter voltage	V_{CEO}	15	V
Collector-emitter voltage	V_{CES}	20	
Collector-base voltage	V_{CBO}	20	
Emitter-base voltage	V_{EBO}	2.5	
Collector current	I_C	45	mA
Base current	I_B	4	
Total power dissipation- $T_S \leq 48$ °C	P_{tot}	280	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[1)]	R_{thJS}	≤ 365	K/W

[1]For calculation of R_{thJA} please refer to Application Note 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	$V_{(BR)CEO}$	15	-	-	V
Collector-emitter cutoff current V_{CE} = 20 V, V_{BE} = 0	I_{CES}	-	-	10	µA
Collector-base cutoff current V_{CB} = 10 V, I_E = 0	I_{CBO}	-	-	100	nA
Emitter-base cutoff current V_{EB} = 2.5 V, I_C = 0	I_{EBO}	-	-	100	µA
DC current gain- I_C = 15 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 = 15 mA, V_{CE} = 8 V, f = 500 MHz	f_T	3.5	5	-	GHz
Collector-base capacitance V_{CB} = 10 V, f = 1 MHz, V_{BE} = 0 , emitter grounded	C_{cb}	-	0.39	0.55	pF
Collector emitter capacitance V_{CE} = 10 V, f = 1 MHz, V_{BE} = 0 , base grounded	C_{ce}	-	0.23	-	
Emitter-base capacitance V_{EB} = 0.5 V, f = 1 MHz, V_{CB} = 0 , collector grounded	C_{eb}	-	0.64	-	
Noise figure I_C = 2 mA, V_{CE} = 6 V, Z_S = Z_{Sopt}, f = 900 MHz I_C = 2 mA, V_{CE} = 6 V, Z_S = Z_{Sopt}, f = 1.8 GHz	F	 - -	 1.4 2	 - -	dB
Power gain, maximum available[1)] I_C = 15 mA, V_{CE} = 8 V, Z_S = Z_{Sopt}, Z_L = Z_{Lopt} , f = 900 MHz I_C = 15 mA, V_{CE} = 8 V, Z_S = Z_{Sopt}, Z_L = Z_{Lopt}, f = 1.8 GHz	G_{ma}	 - -	 16 10.5	 - -	
Transducer gain I_C = 15 mA, V_{CE} = 8 V, Z_S = Z_L = 50 Ω, f = 900 MHz I_C = 15 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] $G_{ma} = |S_{21e} / S_{12e}| (k-(k^2-1)^{1/2})$,

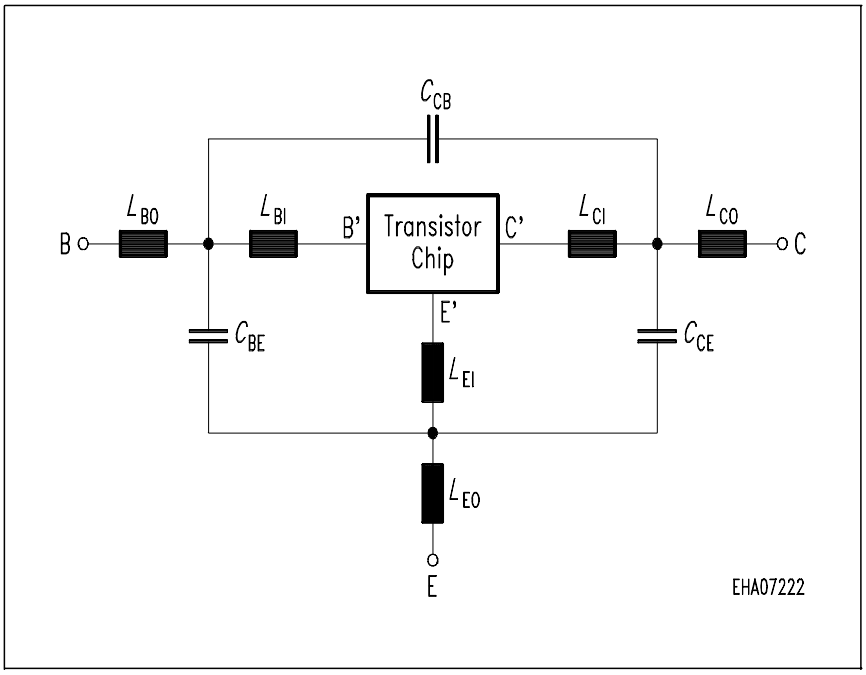
SPICE Parameter (Gummel-Poon Model, Berkley-SPICE 2G.6 Syntax):

Transitor Chip Data:

IS =	0.1213	fA	BF =	94.733	-	NF =	1.0947	-
VAF =	30	V	IKF =	0.46227	A	ISE =	129.55	fA
NE =	1.9052	-	BR =	10.729	-	NR =	0.8983	-
VAR =	14.599	V	IKR =	0.01	A	ISC =	0.75557	fA
NC =	1.371	-	RB =	14.998	Ω	IRB =	0.01652	mA
RBM =	7.8145	Ω	RE =	0.29088	-	RC =	0.13793	Ω
CJE =	10.416	fF	VJE =	0.70618	V	MJE =	0.34686	-
TF =	26.796	ps	XTF =	0.3817	-	VTF =	0.32861	V
ITF =	4.4601	mA	PTF =	0	deg	CJC =	946.47	fF
VJC =	0.84079	V	MJC =	0.4085	-	XCJC =	0.13464	-
TR =	1.2744	ns	CJS =	0	fF	VJS =	0.75	V
MJS =	0	-	XTB =	0	-	EG =	1.11	eV
XTI =	3	-	FC =	0.99545		TNOM	300	K

All parameters are ready to use, no scalling is necessary. Extracted on behalf of Infineon Technologies AG by: Institut für Mobil- und Satellitentechnik (IMST)

Package Equivalent Circuit:

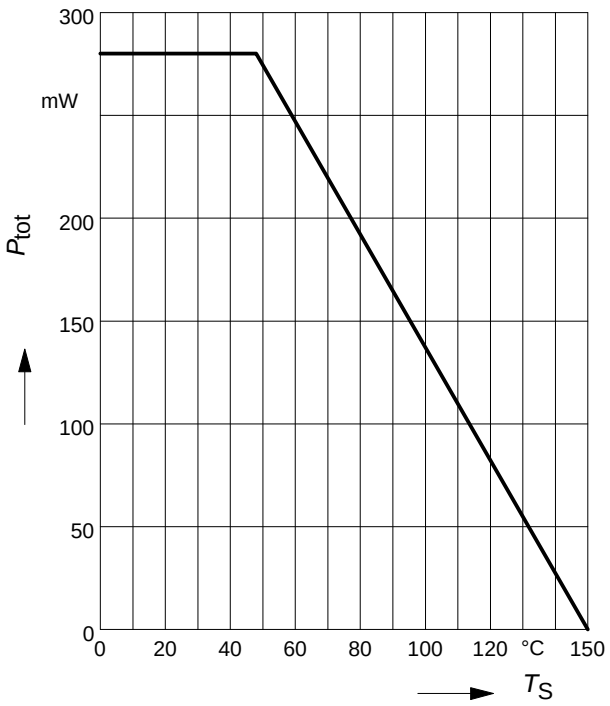


L_{BI} =	0.85	nH
L_{BO} =	0.51	nH
L_{EI} =	0.69	nH
L_{EO} =	0.61	nH
L_{CI} =	0	nH
L_{CO} =	0.49	nH
C_{BE} =	73	fF
C_{CB} =	84	fF
C_{CE} =	165	fF

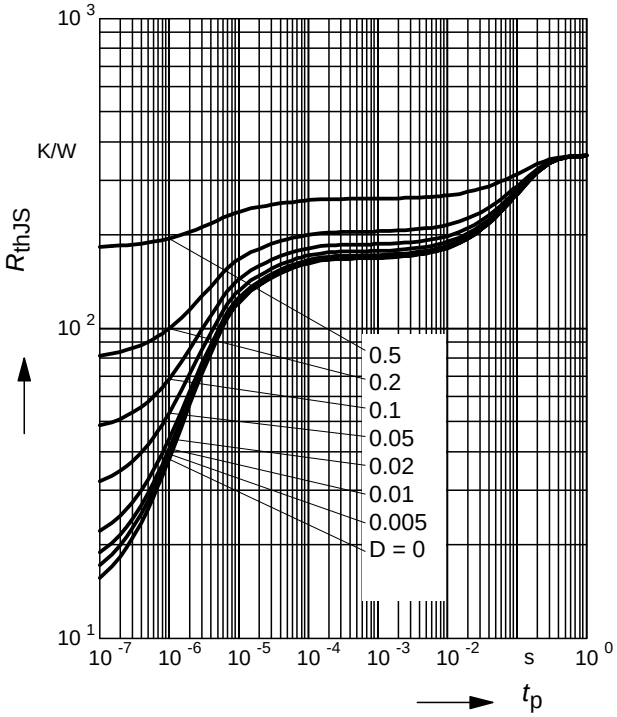
Valid up to 6GHz

For examples and ready to use parameters please contact your local Infineon Technologies distributor or sales office to obtain a Infineon Technologies CD-ROM or see Internet: http//www.infineon.com/silicondiscretes

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

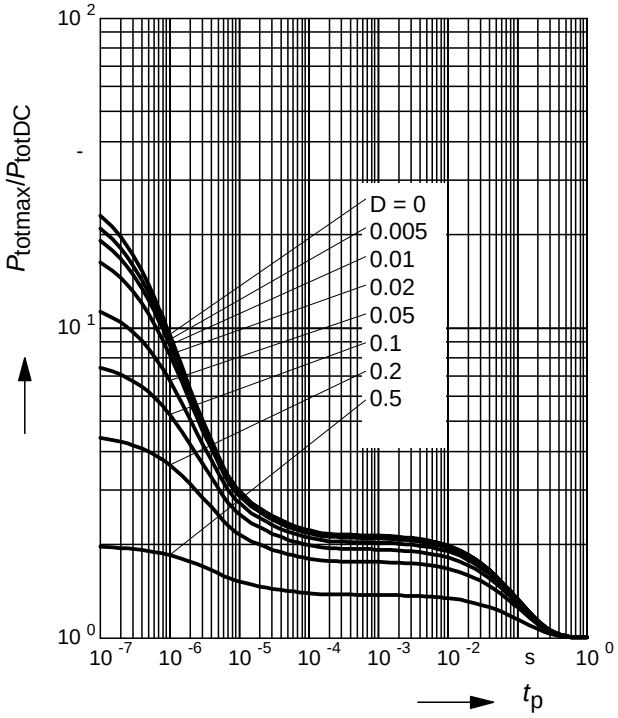


Permissible Pulse Load $R_{thJS} = f(t_p)$

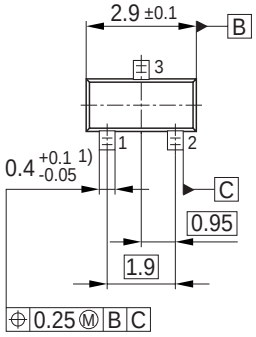


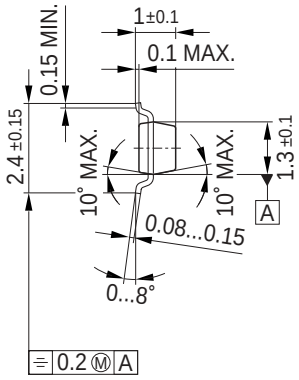
Permissible Pulse Load

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



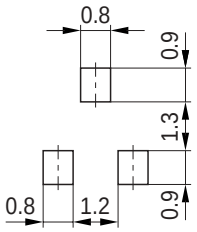
Package Outline



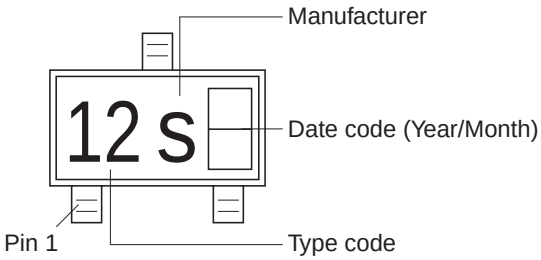


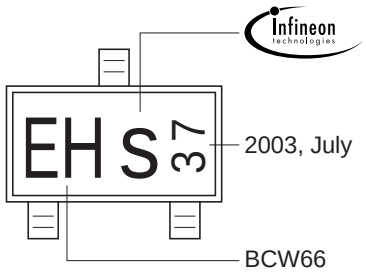
1) Lead width can be 0.6 max. in dambar area

Foot Print



Marking Layout

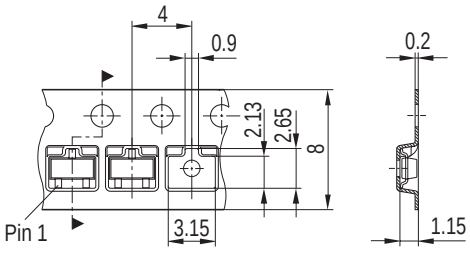




Example

Standard Packing

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



Published by Infineon Technologies AG,
St.-Martin-Strasse 53,
81669 München

Attention please!

The information herein is given to describe certain components and shall not be considered as a guarantee of characteristics.
Terms of delivery and rights to technical change reserved.
We hereby disclaim any and all warranties, including but not limited to warranties of non-infringement, regarding circuits, descriptions and charts stated herein.

Information

For further information on technology, delivery terms and conditions and prices please contact your nearest Infineon Technologies Office (www.Infineon.com).

Warnings

Due to technical requirements components may contain dangerous substances. For information on the types in question please contact your nearest Infineon Technologies Office.
Infineon Technologies Components may only be used in life-support devices or systems 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.