**NPN Silicon RF Transistor***

- For low noise, high-gain amplifiers up to 2 GHz

- For linear broadband amplifiers

- f_T = 8 GHz, F = 1 dB at 900 MHz

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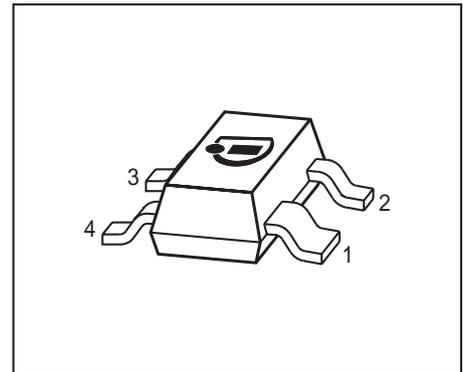
ESD (**E**lectro**s**tatic **d**ischarge) sensitive device, observe handling precaution!

Type	Marking	Pin Configuration						Package
BFP193	RCs	1 = C	2 = E	3 = B	4 = E	-	-	SOT143

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	80	mA
Base current	I_B	10	
Total power dissipation[1] $T_S \leq 72°C$	P_{tot}	580	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}	≤ 135	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 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	$V_{(BR)CEO}$	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} = 1 V, I_C = 0	I_{EBO}	-	-	1	µA
DC current gain- I_C = 30 mA, V_{CE} = 8 V, pulse measured	h_{FE}	70	100	140	-

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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 = 50 mA, V_{CE} = 8 V, f = 500 MHz	f_T	6	8	-	GHz
Collector-base capacitance V_{CB} = 10 V, f = 1 MHz, V_{BE} = 0 , emitter grounded	C_{cb}	-	0.59	0.9	pF
Collector emitter capacitance V_{CE} = 10 V, f = 1 MHz, V_{BE} = 0 , base grounded	C_{ce}	-	0.28	-	
Emitter-base capacitance V_{EB} = 0.5 V, f = 1 MHz, V_{CB} = 0 , collector grounded	C_{eb}	-	2.25	-	
Noise figure I_C = 10 mA, V_{CE} = 8 V, Z_S = Z_{Sopt} , f = 900 MHz	F	-	1	-	dB
I_C = 10 mA, V_{CE} = 8 V, Z_S = Z_{Sopt} , f = 1.8 GHz		-	1.6	-	
Power gain, maximum available[1)] I_C = 30 mA, V_{CE} = 8 V, Z_S = Z_{Sopt} , Z_L = Z_{Lopt} , f = 900 MHz	G_{ma}	-	18	-	
I_C = 30 mA, V_{CE} = 8 V, Z_S = Z_{Sopt} , Z_L = Z_{Lopt} , f = 1.8 GHz		-	12	-	
Transducer gain I_C = 30 mA, V_{CE} = 8 V, Z_S = Z_L = 50Ω , f = 900 MHz	$\|S_{21e}\|^2$	-	14.5	-	dB
I_C = 30 mA, V_{CE} = 8 V, Z_S = Z_L = 50Ω , f = 1.8 GHz		-	8.5	-	

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

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

Transitor Chip Data:

IS =	0.2738	fA	BF =	125	-	NF =	0.95341	-
VAF =	24	V	IKF =	0.26949	A	ISE =	10.627	fA
NE =	1.935	-	BR =	14.267	-	NR =	1.4289	-
VAR =	3.8742	V	IKR =	0.037925	A	ISC =	0.037409	fA
NC =	0.94371	-	RB =	1.8368	Ω	IRB =	0.91763	mA
RBM =	1	Ω	RE =	0.76534	-	RC =	0.11938	Ω
CJE =	1.1824	fF	VJE =	0.70276	V	MJE =	0.48654	-
TF =	18.828	ps	XTF =	0.69477	-	VTF =	0.8	V
ITF =	0.96893	mA	PTF =	0	deg	CJC =	935.03	fF
VJC =	1.1828	V	MJC =	0.30002	-	XCJC =	0.053563	-
TR =	1.0037	ns	CJS =	0	fF	VJS =	0.75	V
MJS =	0	-	NK =	0	-	EG =	1.11	eV
XTI =	3	-	FC =	0.72063		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:
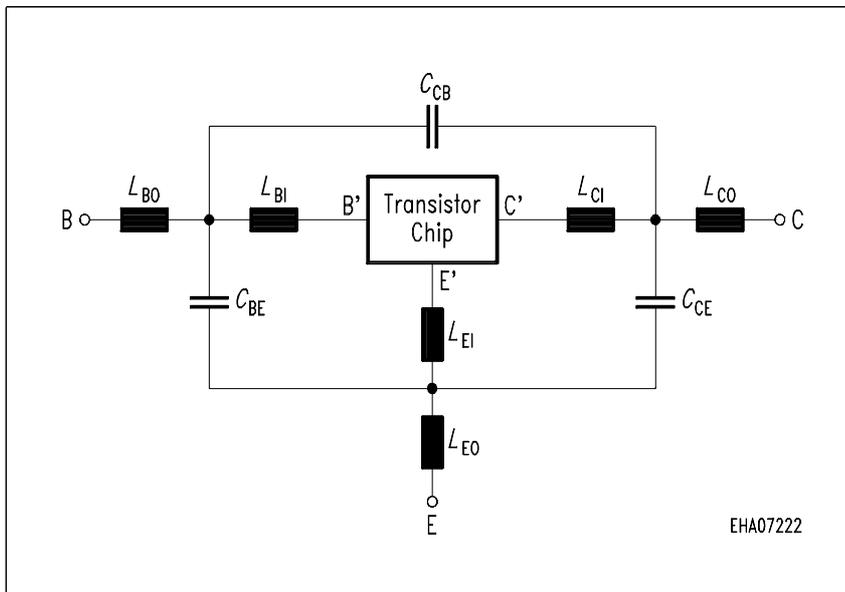
L_{BI} =	0.84	nH
L_{BO} =	0.65	nH
L_{EI} =	0.31	nH
L_{EO} =	0.14	nH
L_{CI} =	0.07	nH
L_{CO} =	0.42	nH
C_{BE} =	145	fF
C_{CB} =	19	fF
C_{CE} =	281	fF

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

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Total power dissipation $P_{tot} = f(T_S)$
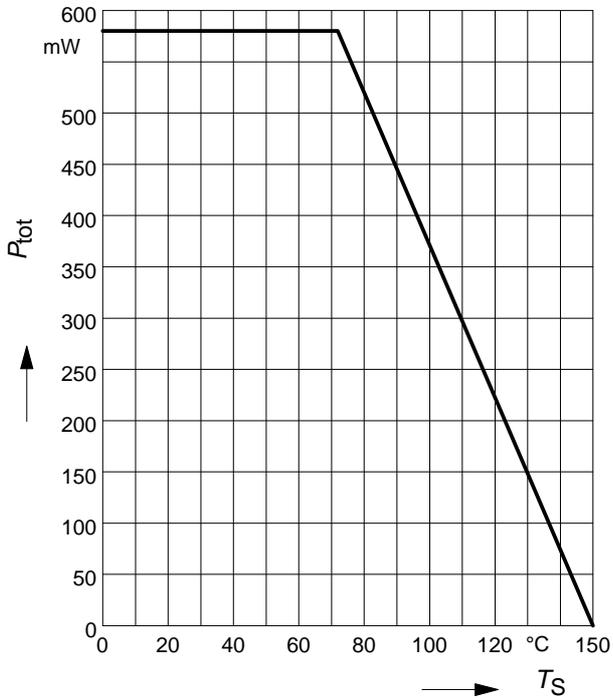
Permissible Pulse Load $R_{thJS} = f(t_p)$
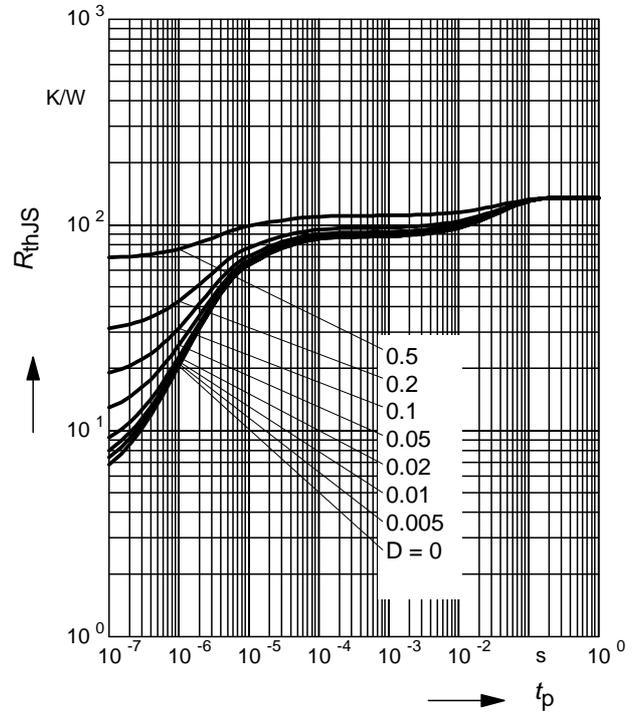
Permissible Pulse Load

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

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Package Outline

2.9 ±0.1 B
1.9

4   3
1   2

0.2

$0.8^{+0.1}_{-0.05}$

$0.4^{+0.1}_{-0.05}$

1.7

⊕ 0.25 Ⓜ B

0.15 MIN.

1 ±0.1

0.1 MAX.

2.4 ±0.15

10° MAX.   10° MAX.

$1.3 ±0.1$

0.08...0.15

0...8°

A

⌰ 0.2 Ⓜ A

Foot Print

0.8 1.2 0.8

0.9

1.1

1.2   0.8   0.9

0.8

Marking Layout

Manufacturer

12 s   Date code (Year/Month)

Pin 1   Type code

Infineon
technologies

RF s 56   2005, June

BFP181

Example
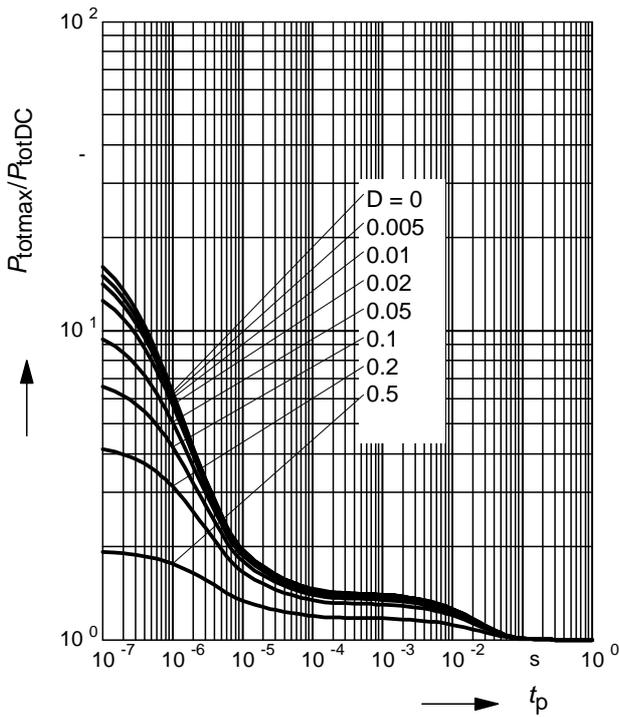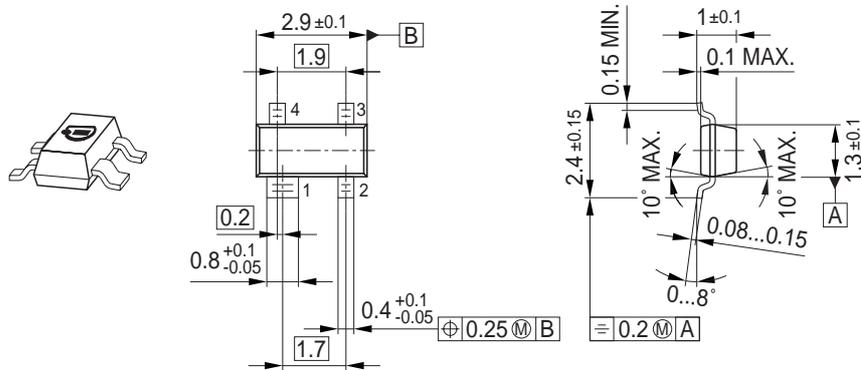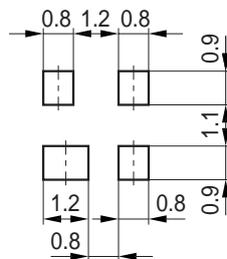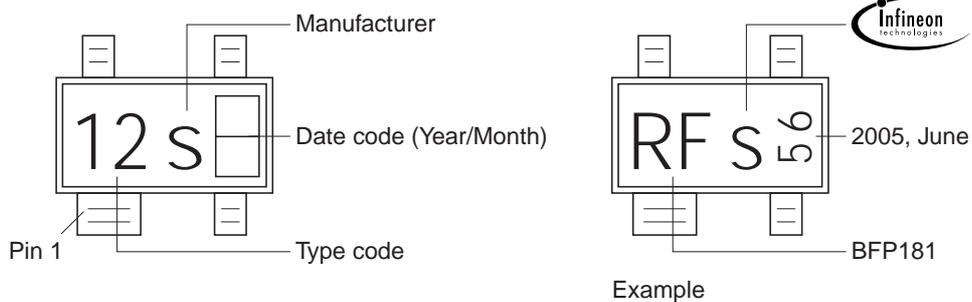
Standard Packing

Reel ø180 mm = 3.000 Pieces/Reel
Reel ø330 mm = 10.000 Pieces/Reel
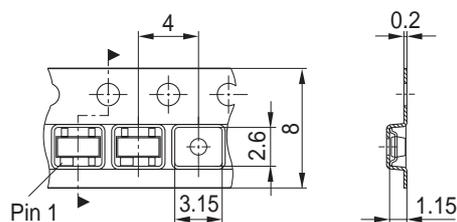
4

0.2

2.6   8

Pin 1   3.15   1.15

Attention please!

Information

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

Warnings

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