PNP Silicon RF Transistor
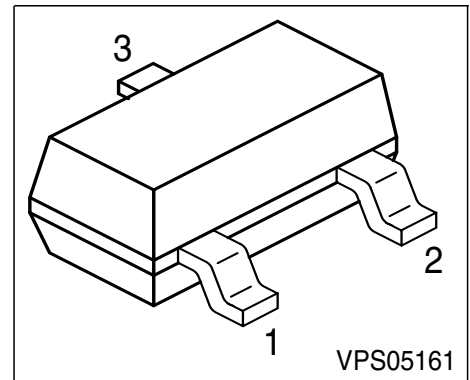
- For broadband amplifiers up to 2 GHz
  at collector currents up to 20 mA
- Complementary type: BFR 92P (NPN)

VPS05161

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

Type	Marking	Pin Configuration			Package
BFT 92	W1s	1 = B	2 = E	3 = C	SOT-23

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	
Collector current	I_C	25	mA
Base current	I_B	3	
Total power dissipation, $T_S \leq 78\ °C$ [1]	P_{tot}	200	mW
Junction temperature	T_j	150	°C
Ambient temperature	T_A	-65 ... 150	
Storage temperature	T_{stg}	-65 ... 150	

Thermal Resistance

Junction - soldering point	R_{thJS}	≤ 360	K/W

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

Oct-25-1999

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-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 = 15 mA, V_{CE} = 8 V	h_{FE}	15	50	-	-

Oct-25-1999

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	C_{cb}	-	0.54	0.8	pF
Collector-emitter capacitance V_{CE} = 10 V, f = 1 MHz	C_{ce}	-	0.25	-	
Emitter-base capacitance V_{EB} = 0.5 V, f = 1 MHz	C_{eb}	-	0.77	-	
Noise figure I_C = 2 mA, V_{CE} = 8 V, Z_S = Z_{Sopt} , f = 900 MHz f = 1.8 GHz	F	- -	2 3.2	- -	dB
Power gain, maximum available [F) I_C = 15 mA, V_{CE} = 8 V, Z_S = Z_{Sopt}, Z_L = Z_{Lopt} , f = 900 MHz f = 1.8 GHz	G_{ma}	- -	13.5 8	- -	
Transducer gain I_C = 15 mA, V_{CE} = 8 V, Z_S = Z_L = 50Ω , f = 900 MHz f = 1.8 GHz	$\lvert S_{21e}\rvert^2$	- -	11.5 6	- -	

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

Oct-25-1999

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

Transistor Chip Data

IS =	4.5354	fA	BF =	98.533	-	NF =	0.90551	-
VAF =	10.983	V	IKF =	0.016123	A	ISE =	12.196	fA
NE =	1.1172	-	BR =	10.297	-	NR =	1.2703	-
VAR =	47.577	V	IKR =	0.019729	A	ISC =	0.024709	fA
NC =	1.206	-	RB =	7.9562	Ω	IRB =	0.79584	mA
RBM =	1.5939	Ω	RE =	1.5119	Ω	RC =	0.66749	Ω
CJE =	1.7785	fF	VJE =	0.79082	V	MJE =	0.32167	-
TF =	32.171	ps	XTF =	0.30227	-	VTF =	0.21451	V
ITF =	0.013277	mA	PTF =	0	deg	CJC =	922.07	fF
VJC =	1.2	V	MJC =	0.3	-	XCJC =	0.3	-
TR =	2.0779	ns	CJS =	0	fF	VJS =	0.75	V
MJS =	0	-	XTB =	0	-	EG =	1.11	eV
XTI =	3	-	FC =	0.75167	-	TNOM	300	K

All parameters are ready to use, no scaling is necessary.
Extracted on behalf of SIEMENS Small Signal Semiconductors by:
Institut für Mobil-und Satellitentechnik (IMST)
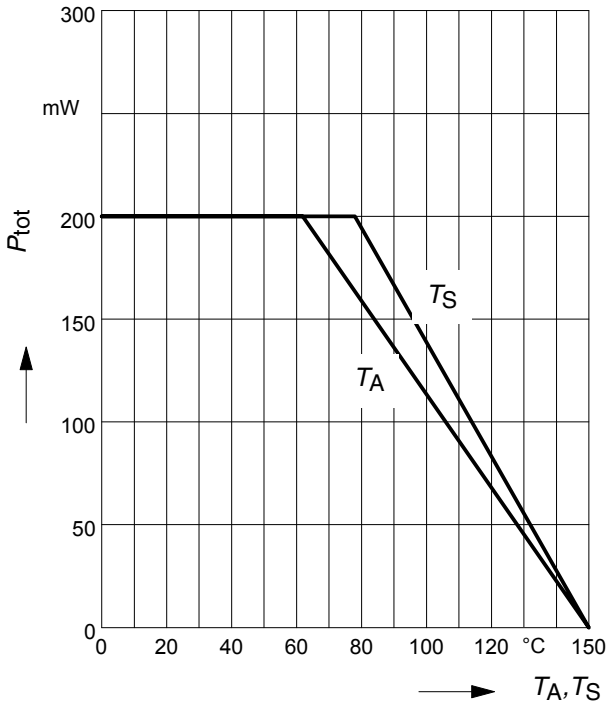© 1996 SIEMENS AG

Package Equivalent Circuit:

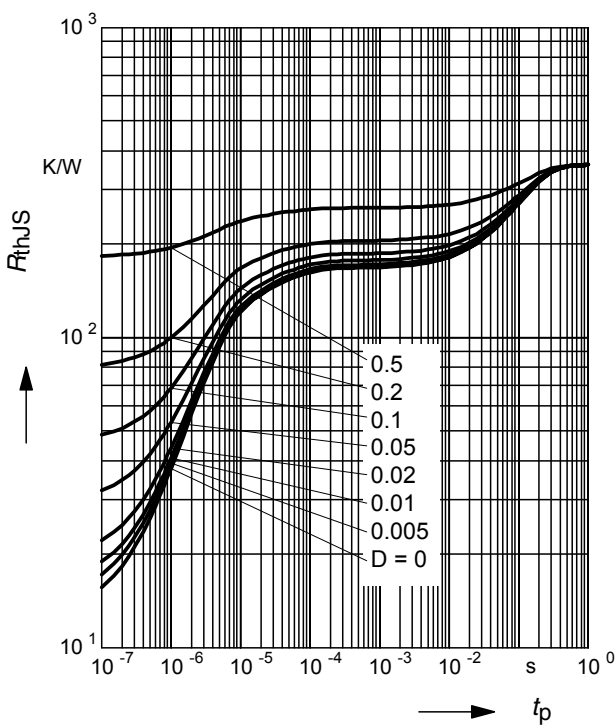|		
$L_{BI} =$	0.85	nH
$L_{BO} =$	0.51	
$L_{EI} =$	0.69	
$L_{EO} =$	0.61	
$L_{CI} =$	0	
$L_{CO} =$	0.49	
$C_{BE} =$	-	fF
$C_{CB} =$	84	
$C_{CE} =$	165	

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/products/discrete/index.htm

Oct-25-1999

Total power dissipation $P_{tot} = f(T_A{}^*, T_S)$
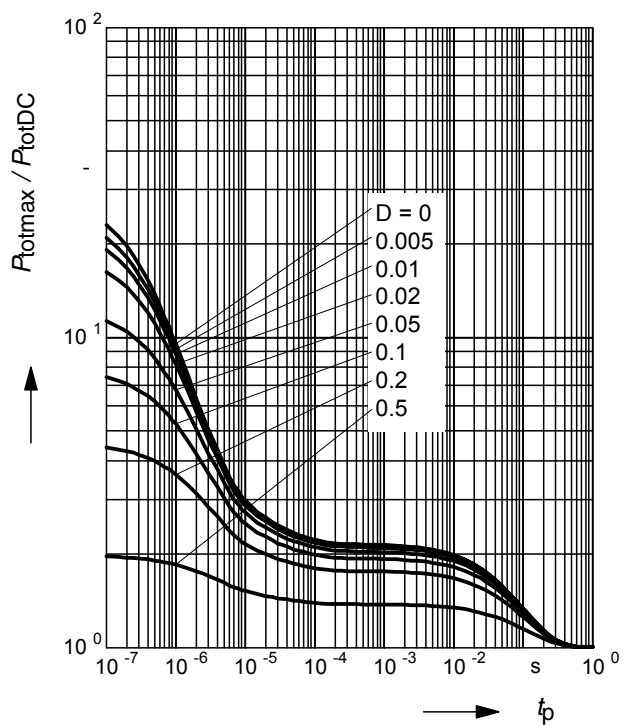
* Package mounted on epoxy

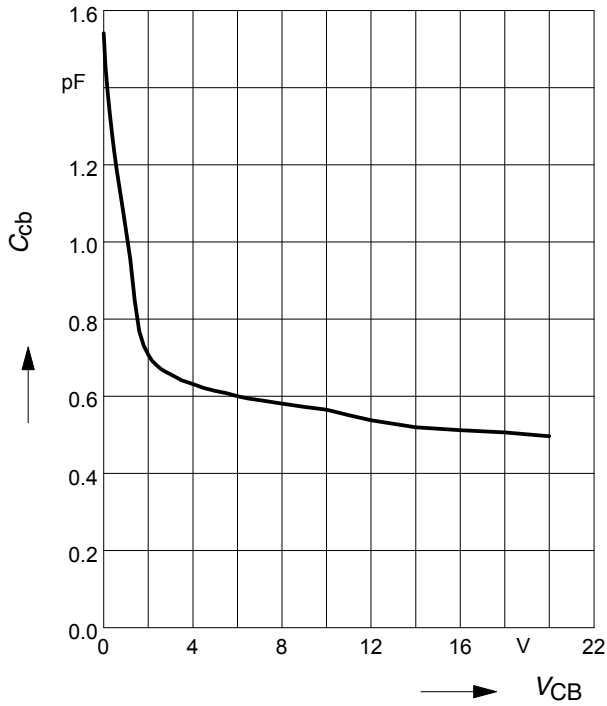

Permissible Pulse Load $R_{thJS} = f(t_p)$
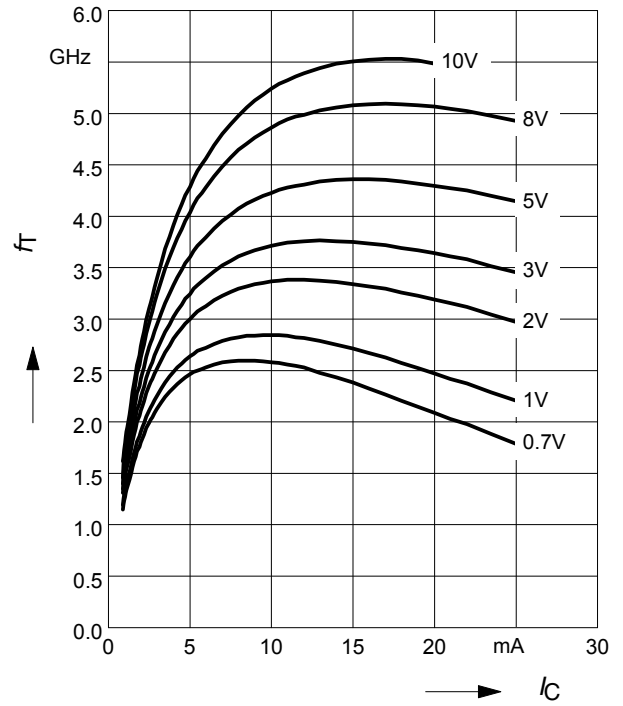

Permissible Pulse Load

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

Collector-base capacitance $C_{cb} = f(V_{CB})$
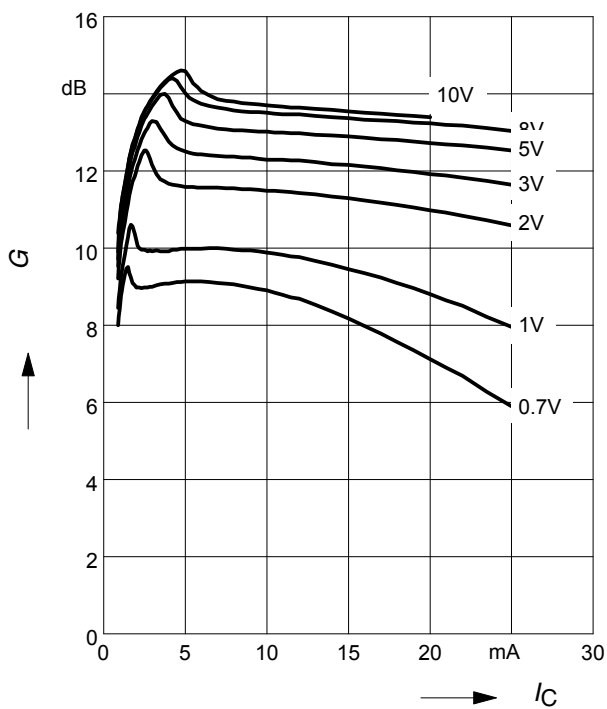
f = 1MHz

Transition frequency $f_T = f(I_C)$

V_{CE} = Parameter

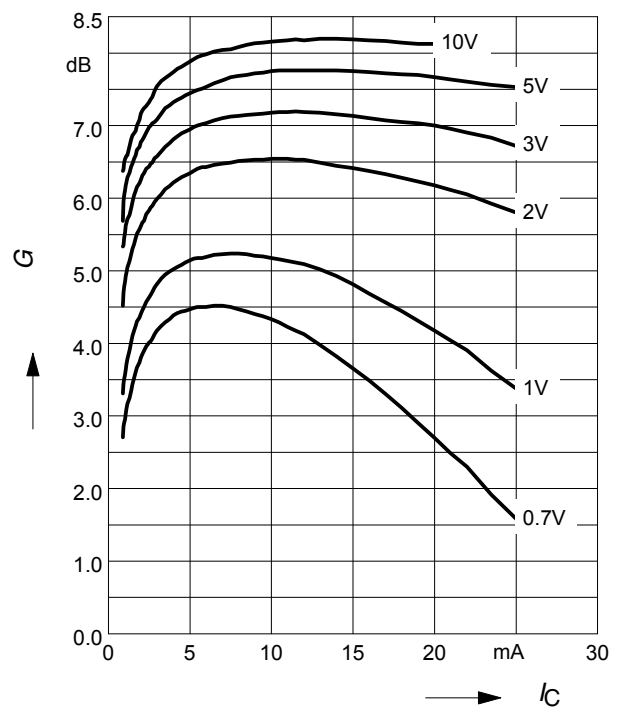
Power Gain G_{ma}, $G_{ms} = f(I_C)$

f = 0.9GHz

V_{CE} = Parameter

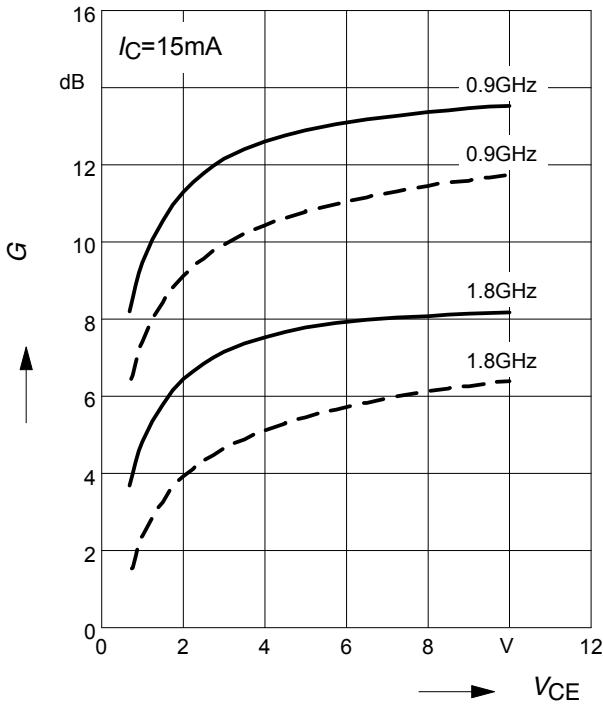
Power Gain G_{ma}, $G_{ms} = f(I_C)$

f = 1.8GHz

V_{CE} = Parameter

Oct-25-1999

Power Gain G_{ma}, $G_{ms} = f(V_{CE})$:_____
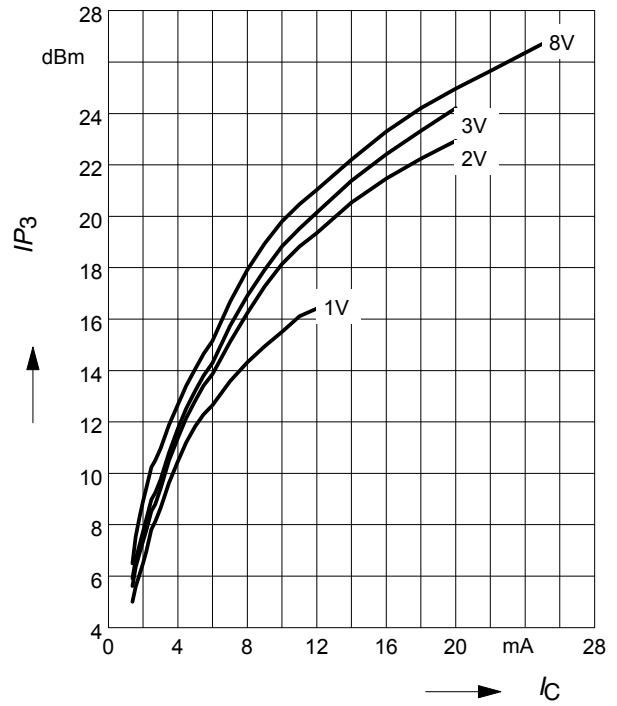
$|S_{21}|^2 = f(V_{CE})$:---------

f = Parameter

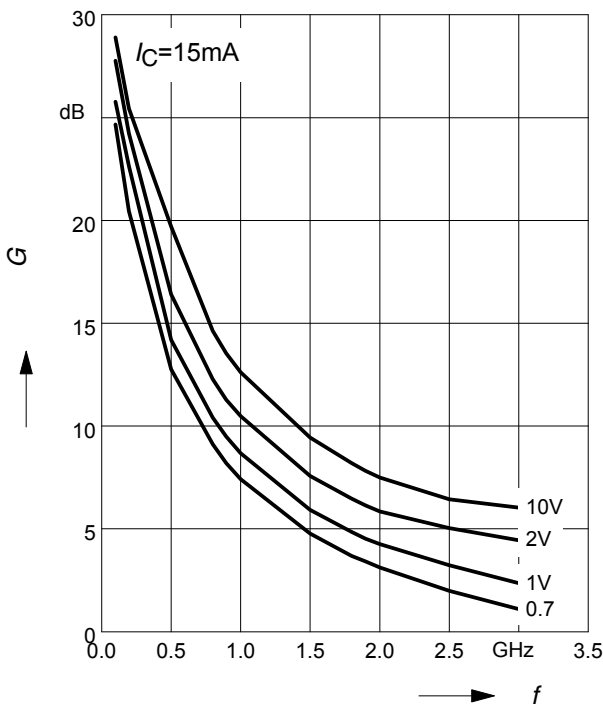**Intermodulation Intercept Point** $IP_3 = f(I_C)$

(3rd order, Output, $Z_S = Z_L = 50\Omega$)

V_{CE} = Parameter, f = 900MHz

Power Gain G_{ma}, $G_{ms} = f(f)$

V_{CE} = Parameter

Power Gain $|S_{21}|^2 = f(f)$

V_{CE} = Parameter

Oct-25-1999