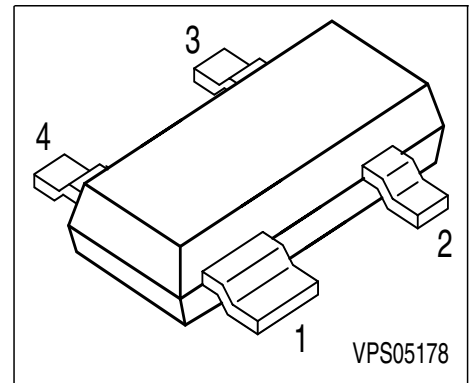


PNP Silicon RF Transistor

- For low distortion broadband amplifier in antenna and telecommunications systems up to 1.5 GHz at collector currents from 20 mA to 80 mA



ESD: Electrostatic discharge sensitive device, observe handling precaution!

Type	Marking	Pin Configuration				Package
BFP 194	RKs	1 = C	2 = E	3 = B	4 = E	SOT-143

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}	3	
Collector current	I_C	100	mA
Base current	I_B	10	
Total power dissipation, $T_S \leq 77 \text{ }^\circ\text{C}$ 1)	P_{tot}	700	mW
Junction temperature	T_j	150	$^\circ\text{C}$
Ambient temperature	T_A	-65 ... 150	
Storage temperature	T_{stg}	-65 ... 150	

Thermal Resistance

Junction - soldering point	R_{thJS}	≤ 105	K/W
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1) T_S is measured on the collector lead at the soldering point to the pcb

Electrical Characteristics at $T_A = 25^\circ\text{C}$, unless otherwise specified.

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC Characteristics					
Collector-emitter breakdown voltage $I_C = 1\text{ mA}, I_B = 0$	$V_{(BR)CEO}$	15	-	-	V
Collector-base cutoff current $V_{CB} = 10\text{ V}, I_E = 0$	I_{CBO}	-	-	100	nA
Emitter-base cutoff current $V_{EB} = 2\text{ V}, I_C = 0$	I_{EBO}	-	-	1	μA
DC current gain $I_C = 70\text{ mA}, V_{CE} = 8\text{ V}$	h_{FE}	15	50	-	-

Electrical Characteristics at $T_A = 25^\circ\text{C}$, unless otherwise specified.

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC characteristics (verified by random sampling)					
Transition frequency $I_C = 70\text{ mA}$, $V_{CE} = 8\text{ V}$, $f = 500\text{ MHz}$	f_T	3.5	5	-	GHz
Collector-base capacitance $V_{CB} = 10\text{ V}$, $f = 1\text{ MHz}$	C_{cb}	-	1.4	2	pF
Collector-emitter capacitance $V_{CE} = 10\text{ V}$, $f = 1\text{ MHz}$	C_{ce}	-	0.3	-	
Emitter-base capacitance $V_{EB} = 0.5\text{ V}$, $f = 1\text{ MHz}$	C_{eb}	-	4.4	-	
Noise figure $I_C = 20\text{ mA}$, $V_{CE} = 8\text{ V}$, $Z_S = Z_{\text{Sopt}}$, $f = 900\text{ MHz}$ $f = 1.8\text{ GHz}$	F	-	2.8 4.7	-	dB
Power gain, maximum available ^{F)} $I_C = 70\text{ mA}$, $V_{CE} = 8\text{ V}$, $Z_S = Z_{\text{Sopt}}$, $Z_L = Z_{\text{Lopt}}$, $f = 900\text{ MHz}$ $f = 1.8\text{ GHz}$	G_{ma}	-	12 7	-	
Transducer gain $I_C = 70\text{ mA}$, $V_{CE} = 8\text{ V}$, $Z_S = Z_L = 50\Omega$, $f = 900\text{ MHz}$ $f = 1.8\text{ GHz}$	$ S_{21e} ^2$	-	9 3	-	

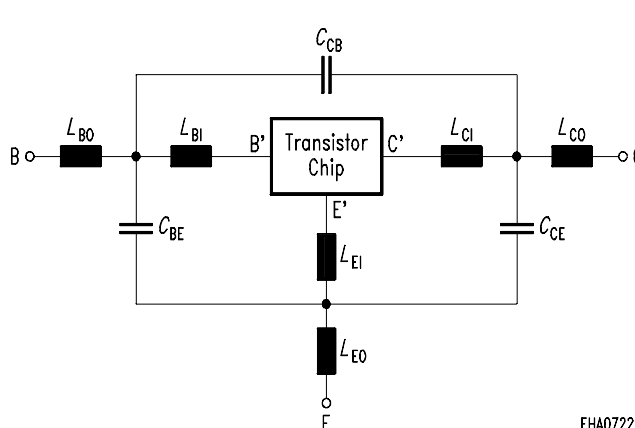
SPICE Parameters (Gummel-Poon Model, Berkley-SPICE 2G.6 Syntax) :

Transistor Chip Data

IS =	4.574	fA	BF =	111.78	-	NF =	0.66503	-
VAF =	9.1007	V	IKF =	0.84785	A	ISE =	21.629	fA
NE =	0.841	-	BR =	92.296	-	NR =	0.43618	-
VAR =	1.7871	V	IKR =	0.012843	A	ISC =	0.0078447	fA
NC =	1.6	-	RB =	0.75304	Ω	IRB =	0.061674	mA
RBM =	4.1356	Ω	RE =	0.15908		RC =	0.10833	Ω
CJE =	17.699	fF	VJE =	0.84843	V	MJE =	0.48212	-
TF =	53.11	ps	XTF =	0.65766	-	VTF =	0.10323	V
ITF =	0.010453	mA	PTF =	0	deg	CJC =	3585.6	fF
VJC =	0.71631	V	MJC =	0.40003	-	XCJC =	0.063742	-
TR =	0.97481	ns	CJS =	0	fF	VJS =	0.75	V
MJS =	0	-	XTB =	0	-	EG =	1.11	eV
XTI =	3		FC =	0.90755	-	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:



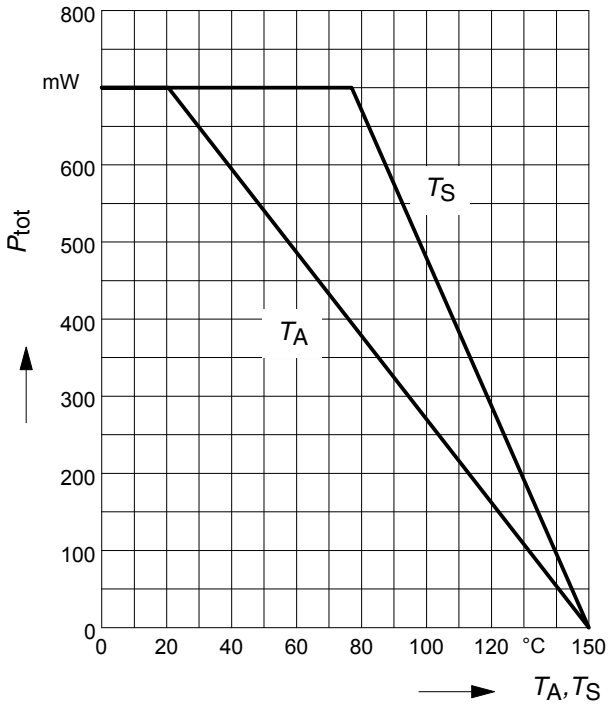
$L_{BI} =$	0.84	nH
$L_{BO} =$	0.65	
$L_{EI} =$	0.31	
$L_{EO} =$	0.14	
$L_{CI} =$	0.07	
$L_{CO} =$	0.42	
$C_{BE} =$	145	fF
$C_{CB} =$	19	
$C_{CE} =$	281	

Valid up to 6GHz

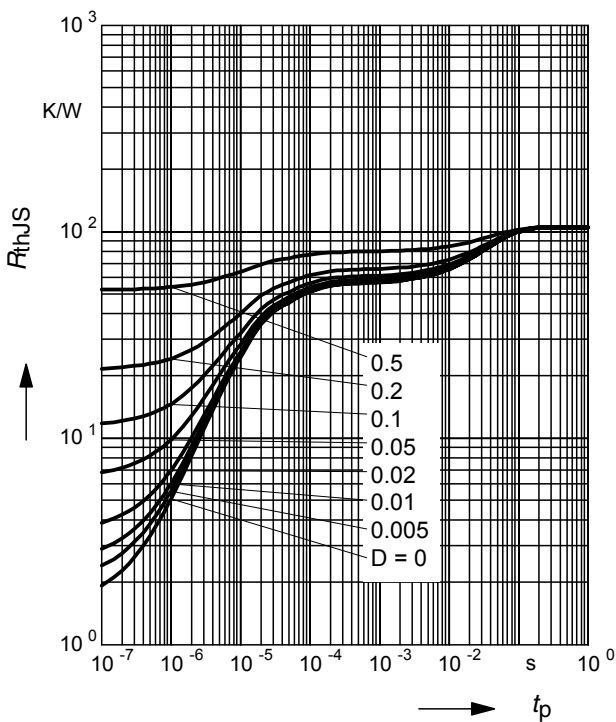
For examples and ready to use parameters please contact your local Infineon Technologies distributor or salesoffice to obtain a Infineon Technologies CD-ROM or see Internet: <http://www.infineon.com/products/discrete/index.htm>

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

* Package mounted on epoxy

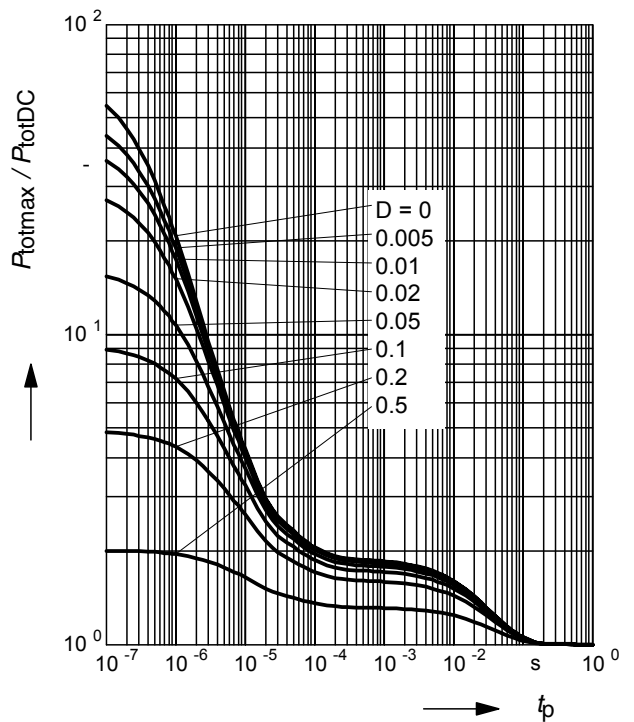


Permissible Pulse Load $R_{thJS} = f(t_p)$



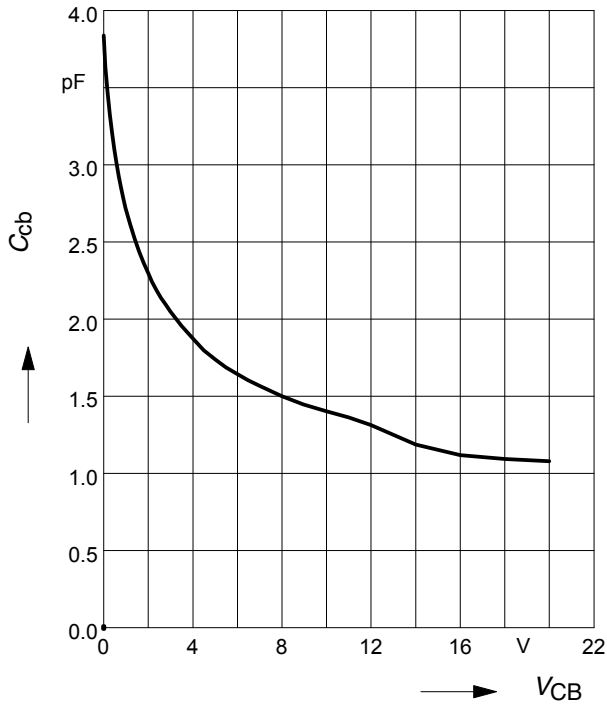
Permissible Pulse Load

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



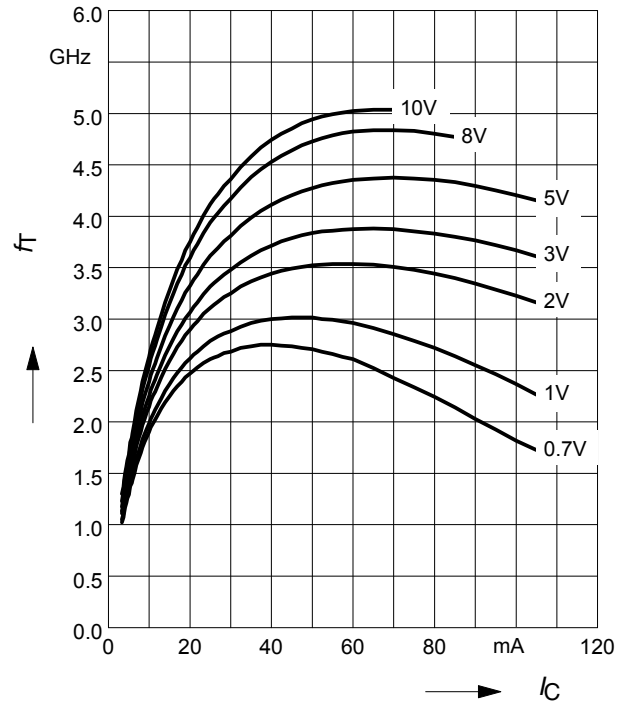
Collector-base capacitance $C_{cb} = f(V_{CB})$

$f = 1\text{MHz}$



Transition frequency $f_T = f(I_C)$

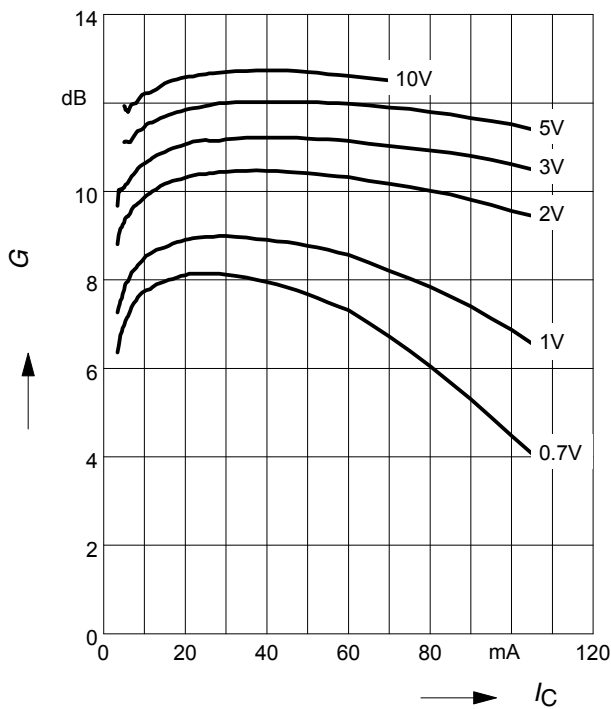
$V_{CE} = \text{Parameter}$



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

$f = 0.9\text{GHz}$

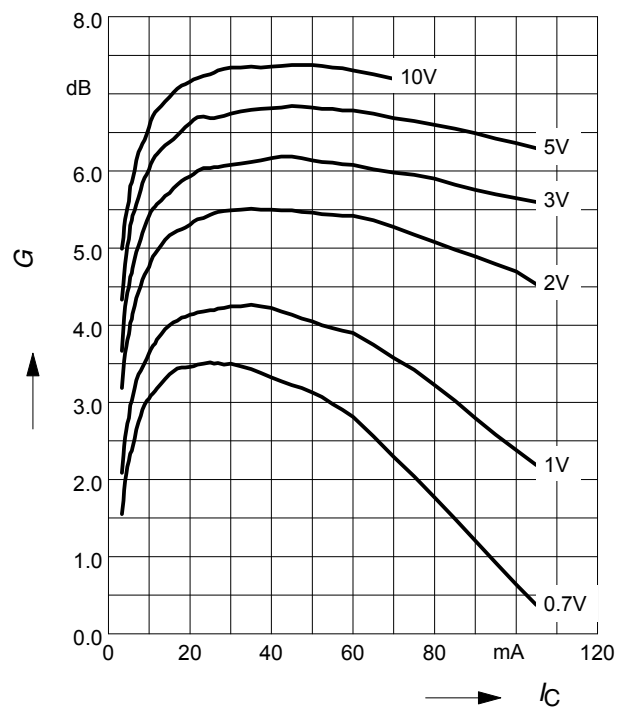
$V_{CE} = \text{Parameter}$



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

$f = 1.8\text{GHz}$

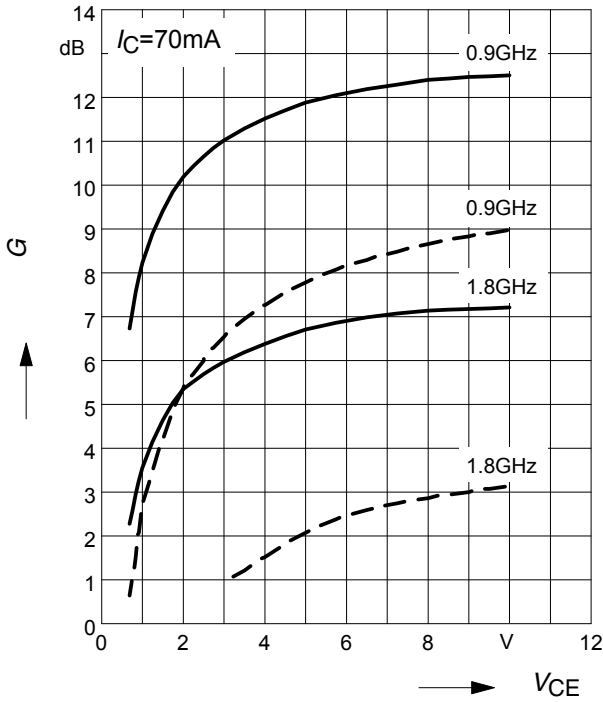
$V_{CE} = \text{Parameter}$



Power Gain $G_{ma}, G_{ms} = f(V_{CE})$: _____

$|S_{21}|^2 = f(V_{CE})$:-----

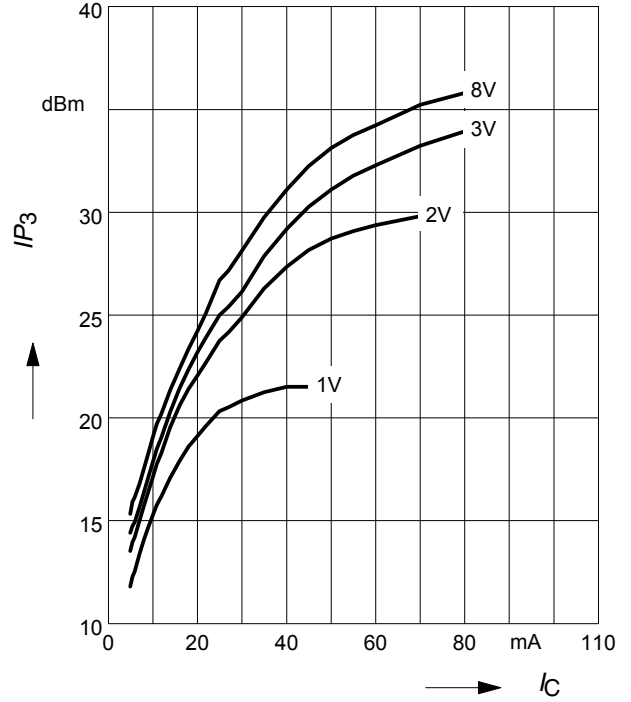
$f =$ Parameter



Intermodulation Intercept Point $IP_3 = f(I_C)$

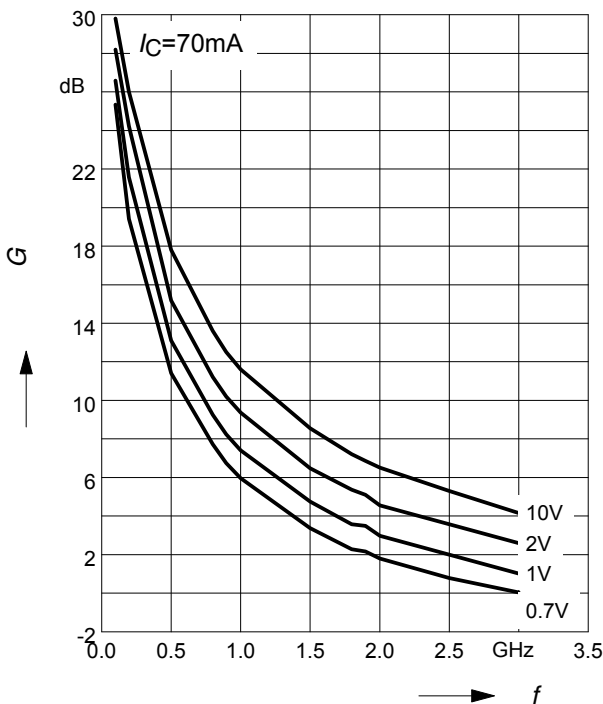
(3rd order, Output, $Z_S = Z_L = 50\Omega$)

$V_{CE} =$ Parameter, $f = 900\text{MHz}$



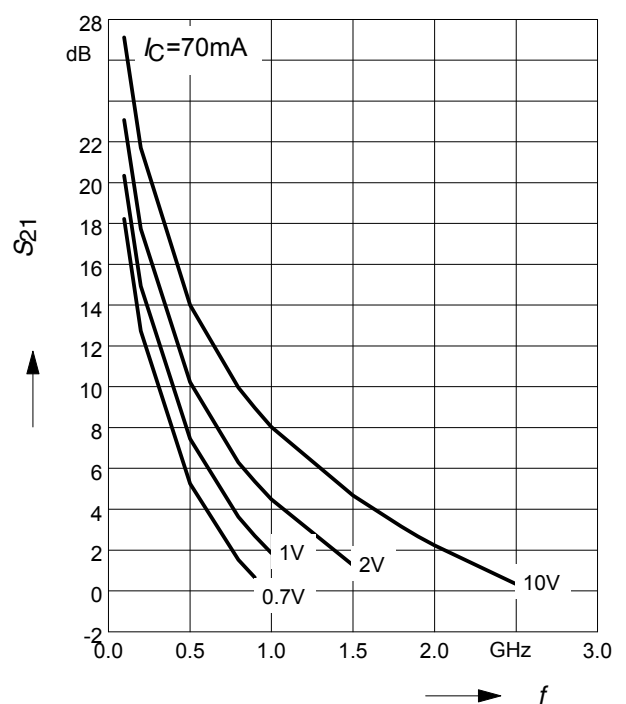
Power Gain $G_{ma}, G_{ms} = f(f)$

$V_{CE} =$ Parameter



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

$V_{CE} =$ Parameter





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