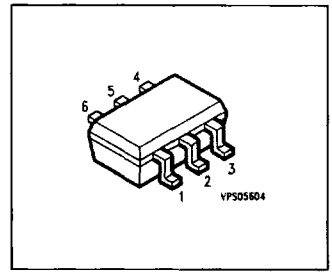
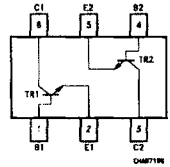
NPN Silicon RF Transistor

- For low-noise, high-gain broadband amplifier at collector currents from 0.5 to 12 mA
- f_T = 8 GHz
  F = 1.4 dB at 900 MHz
- Two (galvanic) internal isolated Transistors in one package





ESD: Electrostatic discharge sensitive device, observe handling precaution!

Type	Marking	Ordering Code	Pin Configuration			Package
BFS 481	RFs	Q62702-F1572	1/4 = B	2/5 = E	3/6 = C	SOT-363

data below is of a single transistor

Maximum Ratings

Parameter	Symbol	Values	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	20	mA
Base current	I_B	2	
Total power dissipation $T_S \leq 83$ °C	P_{tot}	175	mW
Junction temperature	T_j	150	°C
Ambient temperature	T_A	- 65 ... + 150	
Storage temperature	T_{stg}	- 65 ... + 150	

Thermal Resistance

Junction - soldering point [1]	R_{thJS}	≤ 380	K/W

1) T_S is measured on the collector lead at the soldering point to the pcb.

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 $I_C = 5$ mA, $V_{CE} = 8$ V	h_{FE}	50	100	200	-

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

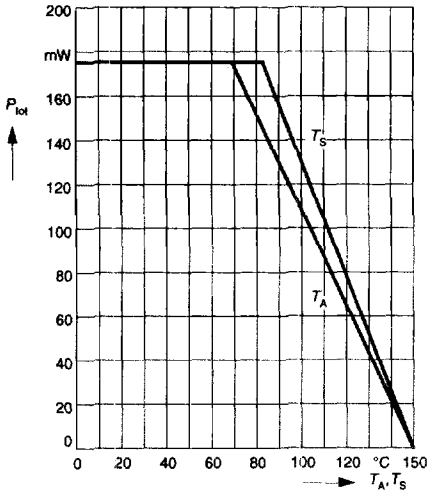
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC Characteristics					
Transition frequency I_C = 10 mA, V_{CE} = 8 V, f = 500 MHz	f_T	6	8	-	GHz
Collector-base capacitance V_{CB} = 10 V, f = 1 MHz	C_{cb}	-	0.24	0.4	pF
Collector-emitter capacitance V_{CE} = 10 V, f = 1 MHz	C_{ce}	-	0.11	-	
Emitter-base capacitance V_{EB} = 0.5 V, f = 1 MHz	C_{eb}	-	0.35	-	
Noise figure I_C = 2 mA, V_{CE} = 8 V, Z_S = Z_{Sopt} f = 900 MHz f = 1.8 GHz	F	- -	1.45 1.8	- -	dB
Power gain [1] I_C = 5 mA, V_{CE} = 8 V, f = 900 MHz Z_S = Z_{Sopt}, Z_L = Z_{Lopt}	G_{ms}	-	19	-	
Power gain [2] I_C = 5 mA, V_{CE} = 8 V, f = 1.8 GHz Z_S = Z_{Sopt}, Z_L = Z_{Lopt}	G_{ma}	-	14.5	-	
Transducer gain I_C = 5 mA, V_{CE} = 8 V, Z_S = Z_L = 50 Ω f = 900 MHz f = 1.8 GHz	$\lvert S_{21e}\rvert^2$	- -	15.5 10.5	- -	

1) $G_{ms} = |S_{21}/S_{12}|$

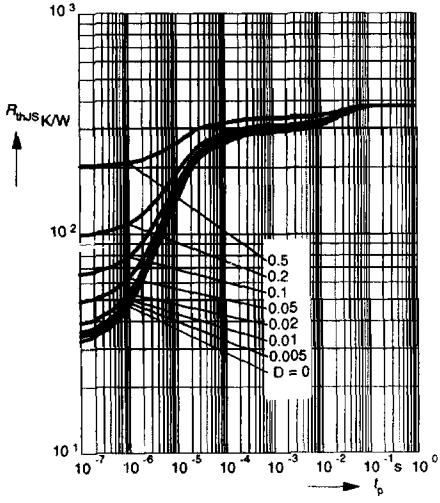
2) $G_{ma} = |S_{21}/S_{12}| \, (k-(k^2-1)^{1/2})$

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

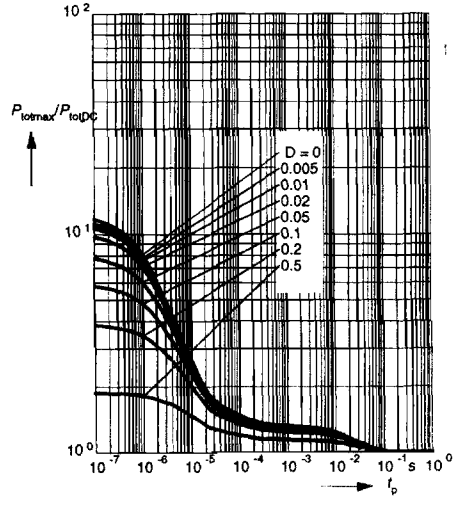
* Package mounted on epoxy



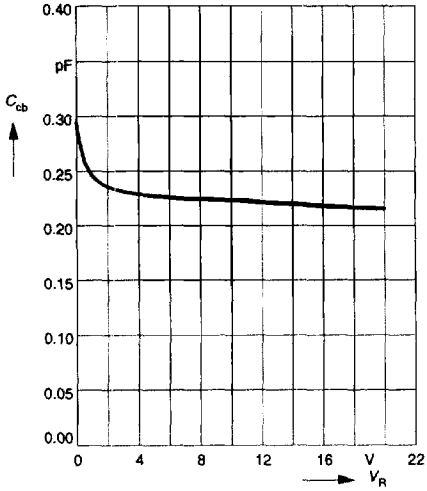
Permissible Pulse Load $R_{thJS} = f(t_p)$



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

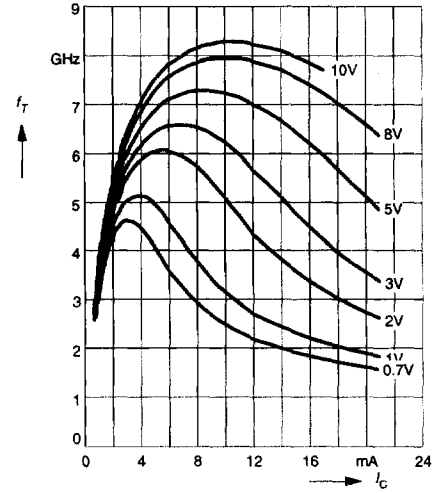


Collector-base capacitance $C_{cb} = f(V_{CB})$
$V_{BE} = v_{be} = 0$, $f = 1$MHz

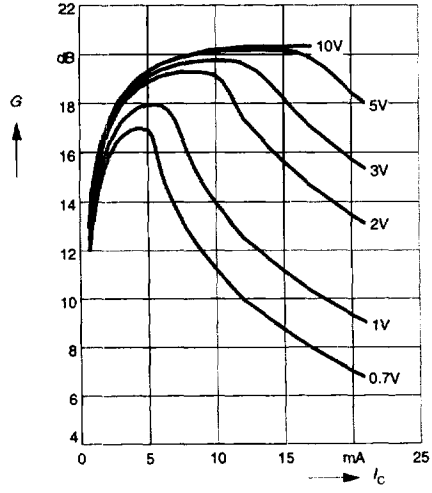


Transition frequency $f_T = f(I_C)$

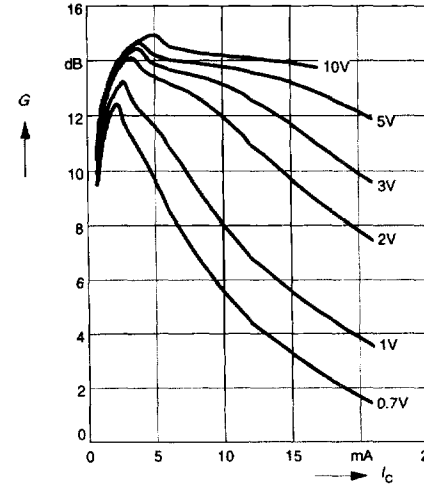
V_{CE} = Parameter



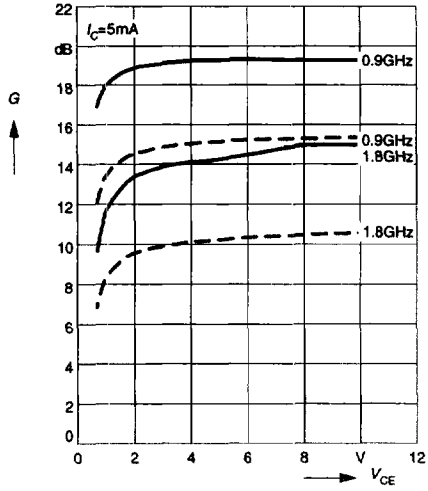
Power Gain G_{ma}, $G_{ms} = f(I_C)$
$f = 0.9$GHz
V_{CE} = Parameter



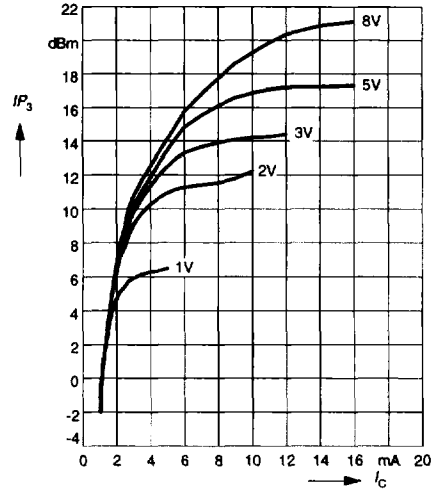
Power Gain G_{ma}, $G_{ms} = f(I_C)$
$f = 1.8$GHz
V_{CE} = Parameter



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

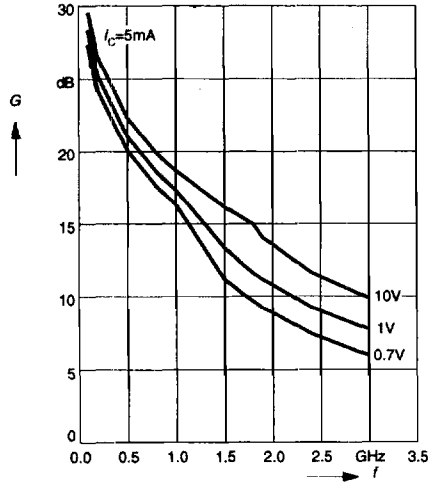


Intermodulation Intercept Point $IP_3 = f(I_C)$
(3rd order, Output, $Z_S = Z_L = 50\Omega$)
V_{CE} = Parameter, f = 900MHz



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

V_{CE} = Parameter



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

V_{CE} = Parameter