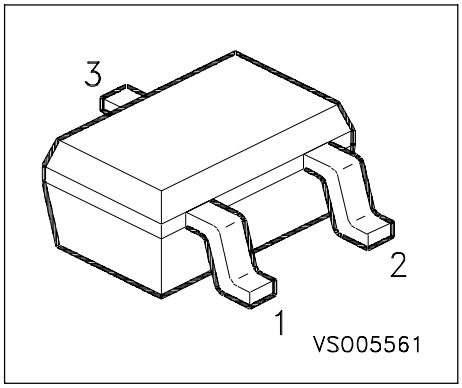
NPN Silicon RF Transistor

- For broadband amplifiers up to 1GHz at collector currents from 1mA to 20mA



Type	Marking	Ordering Code	Pin Configuration			Package
BFS 17W	MCs	Q62702-F1645	1 = B	2 = E	3 = C	SOT-323

Maximum Ratings of any single Transistor

Parameter	Symbol	Values	Unit
Collector-emitter voltage	V_{CEO}	15	V
Collector-base voltage	V_{CBO}	25	
Emitter-base voltage	V_{EBO}	2.5	
Collector current	I_C	25	mA
Peak collector current $f \geq 10$ MHz	I_{CM}	50	
Total power dissipation $T_S \leq 93$ °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			
Junction - soldering point 1)	R_{thJS}	≤ 205	K/W

1) Package mounted on aluminia 15 mm x 16,7 mm x 0,7 mm

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

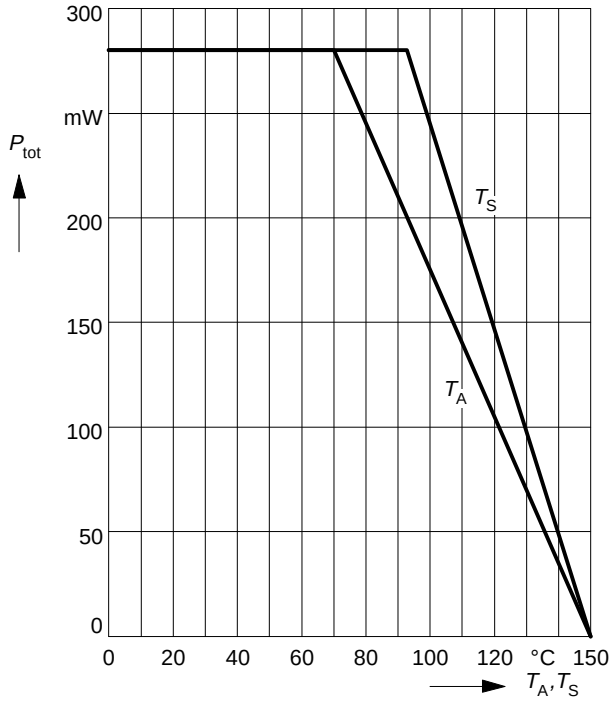
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC Characteristics of any single Transistor					
Collector-emitter breakdown voltage I_C = 1 mA, I_B = 0	$V_{(BR)CEO}$	15	-	-	V
Collector-base cutoff current V_{CB} = 10 V, I_E = 0 V_{CB} = 25 V, I_E = 0	I_{CBO}	- -	- -	0.05 10	µA
Emitter-base cutoff current V_{EB} = 2.5 V, I_C = 0	I_{EBO}	-	-	100	
DC current gain I_C = 2 mA, V_{CE} = 1 V I_C = 25 mA, V_{CE} = 1 V	h_{FE}	20 20	- 70	150 -	-
Collector-emitter saturation voltage I_C = 10 mA, I_B = 1 mA	V_{CEsat}	-	0.1	0.4	V

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

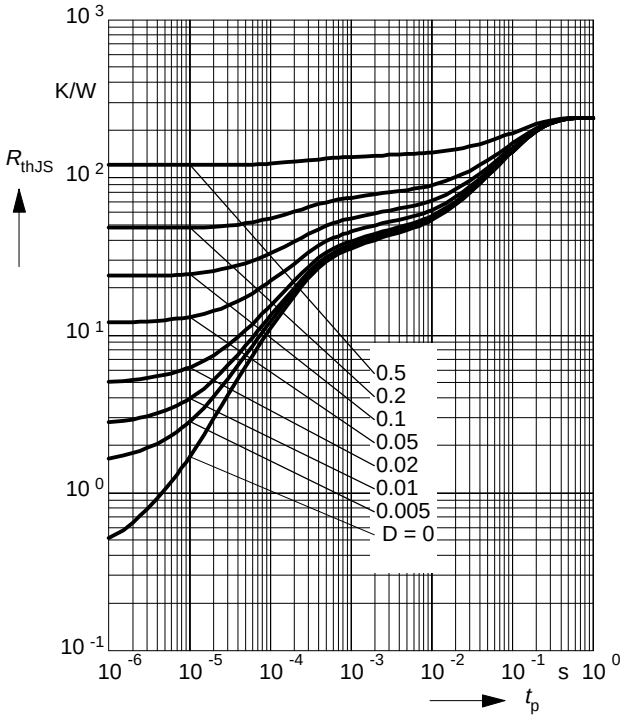
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC Characteristics of any single Transistor					
Transition frequency	f_T				GHz
I_C = 2 mA, V_{CE} = 5 V, f = 200 MHz		1	1.4	-	
I_C = 25 mA, V_{CE} = 5 V, f = 200 MHz		1.3	2.5	-	
Collector-base capacitance	C_{cb}				pF
V_{CB} = 5 V, V_{BE} = v_{be} = 0 , f = 1 MHz		-	0.6	0.8	
Collector-emitter capacitance	C_{ce}				
V_{CE} = 5 V, V_{BE} = v_{be} = 0 , f = 1 MHz		-	0.26	-	
Input capacitance	C_{ibo}				
V_{EB} = 0.5 V, I_C = 0 , f = 1 MHz		-	1.45	-	
Output capacitance	C_{obs}				
V_{CE} = 5 V, V_{BE} = v_{be} = 0 , f = 1 MHz		-	-	1.5	
Noise figure	F				dB
I_C = 2 mA, V_{CE} = 5 V, f = 800 MHz					
Z_S = 0 Ω		-	3.5	5	
Transducer gain	$\|S_{21e}\|^2$				
I_C = 20 mA, V_{CE} = 5 V, f = 500 MHz					
Z_S = 50 Ω		-	12.7	-	
Linear output voltage	V_{01}=V_{02}				mV
I_C = 14 mA, V_{CE} = 5 V, d_{im} = 60 dB					
f_1 = 806 MHz, f_2 = 810 MHz, Z_S =Z_L= 50 Ω		-	100	-	
Third order intercept point	IP_3				dBm
I_C = 200 mA, V_{CE} = 8 V, f = 900 MHz					
Z_S =Z_L= 50 Ω		-	23	-	

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

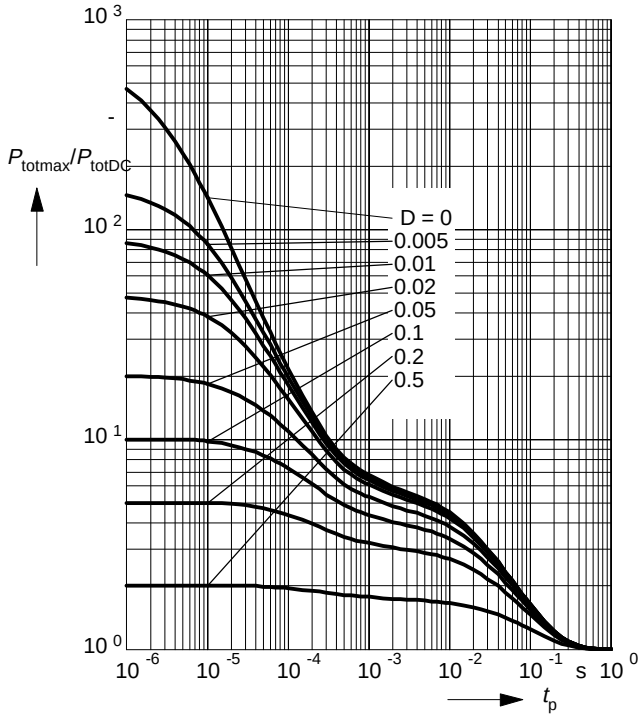
* Package mounted on epoxy



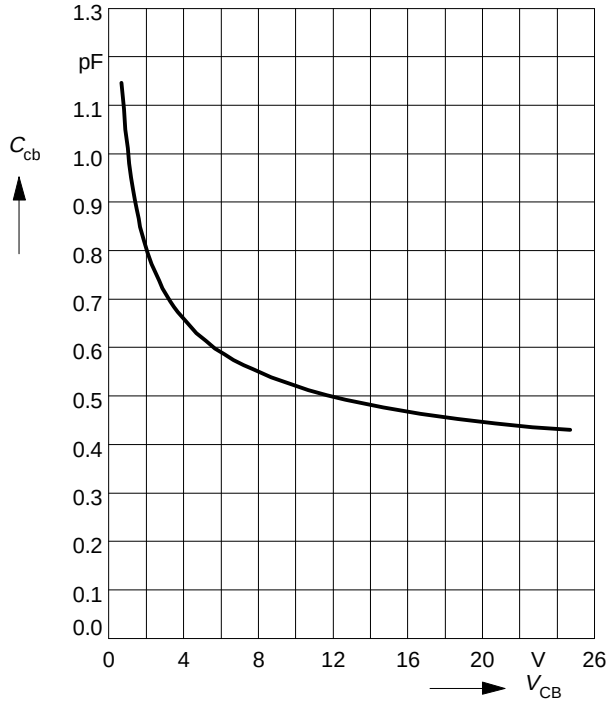
Permissible Pulse Load $R_{thJS} = f(t_p)$



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