

## NPN Silicon RF Transistor

- For modulators and amplifiers in TV and VCR tuners



**ESD: Electrostatic discharge sensitive device, observe handling precaution!**

Type	Marking	Ordering Code	Pin Configuration			Package
BF 771	RBs	Q62702-F1225	1 = B	2 = E	3 = C	SOT-23

### 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	$I_C$	80	mA
Base current	$I_B$	10	
Total power dissipation $T_S \leq 69\text{ °C}$	$P_{tot}$	580	mW
Junction temperature	$T_j$	150	°C
Ambient temperature	$T_A$	- 65 ... + 150	
Storage temperature	$T_{stg}$	- 65 ... + 150	

### Thermal Resistance

Junction - soldering point <sup>1)</sup>	$R_{thJS}$	$\leq 140$	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.	
<b>DC Characteristics</b>					
Collector-emitter breakdown voltage $I_C = 1 \text{ mA}, I_B = 0$	$V_{(BR)CEO}$	12	-	-	V
Collector-emitter cutoff current $V_{CE} = 20 \text{ V}, V_{BE} = 0$	$I_{CES}$	-	-	100	$\mu\text{A}$
Collector-base cutoff current $V_{CB} = 10 \text{ V}, I_E = 0$	$I_{CBO}$	-	-	100	nA
Emitter-base cutoff current $V_{EB} = 1 \text{ V}, I_C = 0$	$I_{EBO}$	-	-	1	$\mu\text{A}$
DC current gain $I_C = 30 \text{ mA}, V_{CE} = 8 \text{ V}$	$h_{FE}$	50	100	200	-

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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
<b>AC Characteristics</b>					
Transition frequency $I_C = 50 \text{ mA}$ , $V_{CE} = 8 \text{ V}$ , $f = 500 \text{ MHz}$	$f_T$	6	8	-	GHz
Collector-base capacitance $V_{CB} = 10 \text{ V}$ , $f = 1 \text{ MHz}$	$C_{cb}$	-	0.68	1	pF
Collector-emitter capacitance $V_{CE} = 10 \text{ V}$ , $f = 1 \text{ MHz}$	$C_{ce}$	-	0.24	-	
Emitter-base capacitance $V_{EB} = 0.5 \text{ V}$ , $f = 1 \text{ MHz}$	$C_{eb}$	-	1.8	-	
Noise figure $I_C = 10 \text{ mA}$ , $V_{CE} = 8 \text{ V}$ , $Z_S = Z_{\text{Sopt}}$ $f = 900 \text{ MHz}$ $f = 1.8 \text{ GHz}$	$F$	-	1.3 2.1	-	dB
Power gain <sup>2)</sup> $I_C = 30 \text{ mA}$ , $V_{CE} = 8 \text{ V}$ , $Z_S = Z_{\text{Sopt}}$ $Z_L = Z_{\text{Lopt}}$ $f = 900 \text{ MHz}$ $f = 1.8 \text{ GHz}$	$G_{\text{ma}}$	-	14.5 9	-	
Transducer gain $I_C = 30 \text{ mA}$ , $V_{CE} = 8 \text{ V}$ , $Z_S = Z_L = 50 \Omega$ $f = 900 \text{ MHz}$ $f = 1.8 \text{ GHz}$	$ S_{21e} ^2$	-	12.5 7	-	

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