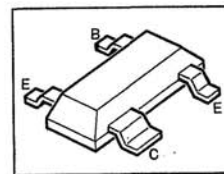


NPN Silicon RF Transistor

BFP 183

Preliminary Data

- For low-noise, high-gain broadband amplifiers at collector currents from 2 mA to 28 mA.
- $f_t = 8$  GHz
- $F = 1.2$  dB at 900 MHz



ESD: Electrostatic discharge sensitive device, observe handling precautions!

Type	Marking	Ordering code (tape and reel)	Package <sup>1)</sup>
BFP 183	RHs	Q 62702 - F1319	SOT-143

Maximum Ratings

Parameter	Symbol	Value	Unit
Collector-emitter voltage	$V_{CE0}$	12	V
Collector-emitter voltage, $V_{BE} = 0$	$V_{CES}$	20	
Collector-base voltage	$V_{CB0}$	20	
Emitter-base voltage	$V_{EB0}$	2	
Collector current	$I_C$	65	mA
Peak collector current, $f \geq 10$ MHz	$I_{CM}$	100	
Base current	$I_B$	5	
Peak base current, $f \geq 10$ MHz	$I_{BM}$	8	
Total power dissipation, $T_C \leq 62$ °C <sup>3)</sup>	$P_{tot}$	450	mW
Junction temperature	$T_J$	150	°C
Ambient temperature range	$T_A$	-65 ... +150	
Storage temperature range	$T_{stg}$	-65 ... +150	

Thermal Resistance

junction - ambient <sup>2)</sup>	$R_{thJA}$	$\leq 275$	K/W
junction - case <sup>3)</sup>	$R_{thJC}$	$\leq 195$	

- 1) For detailed information see chapter Package Outlines.
- 2) Package mounted on alumina 15 mm x 16.7 mm x 0.7 mm.
- 3) Case temperature  $T_C$  is measured on the collector lead at the soldering point to the pcb.

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Electrical Characteristics

at  $T_A = 25$  °C, unless otherwise specified.

DC characteristics

Parameter	Symbol	Values			Unit
		min	typ	max	
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, $I_C = 0$	$I_{EB0}$	-	-	1	µA
DC current gain $I_C = 5$ mA, $V_{CE} = 6$ V $I_C = 20$ mA, $V_{CE} = 8$ V	$h_{FE}$	50 50	90 110	250 -	-
Collector-emitter saturation voltage $I_C = 30$ mA, $I_B = 3$ mA	$V_{CEsat}$	-	0.1	0.4	V

AC characteristics

Parameter	Symbol	Values			Unit
		min	typ	max	
Transition frequency $I_C = 15$ mA, $V_{CE} = 8$ V, $f = 500$ MHz $I_C = 30$ mA, $V_{CE} = 8$ V, $f = 500$ MHz	$f_t$	-	7.8 8	-	GHz
Collector-base capacitance $V_{CB} = 10$ V, $V_{BE} = V_{be} = 0$ , $f = 1$ MHz	$C_{cb}$	-	0.32	-	pF
Collector-emitter capacitance $V_{CE} = 10$ V, $V_{BE} = V_{be} = 0$ , $f = 1$ MHz	$C_{ce}$	-	0.25	-	
Input capacitance $V_{EB} = 0.5$ V, $I_C = I_c = 0$ , $f = 1$ MHz	$C_{ibo}$	-	1.1	-	
Output capacitance $V_{CE} = 10$ V, $V_{BE} = V_{be} = 0$ , $f = 1$ MHz	$C_{obs}$	-	0.6	-	
Noise figure $I_C = 5$ mA, $V_{CE} = 6$ V, $f = 10$ MHz, $Z_S = 75$ Ω $I_C = 5$ mA, $V_{CE} = 6$ V, $f = 900$ MHz, $Z_S = Z_{Sopt}$ $I_C = 5$ mA, $V_{CE} = 6$ V, $f = 1.75$ GHz, $Z_S = Z_{Sopt}$	$F$	-	0.9 1.2 1.75	-	dB
Power gain $I_C = 30$ mA, $V_{CE} = 8$ V, $f = 900$ MHz, $Z_0 = 50$ Ω $I_C = 30$ mA, $V_{CE} = 8$ V, $f = 1.75$ GHz, $Z_0 = 50$ Ω	$G_{ma}^{1)}$	-	20 13.5	-	
Transducer gain $I_C = 30$ mA, $V_{CE} = 8$ V, $f = 2$ GHz, $Z_0 = 50$ Ω	$ S_{21e} ^2$	-	10	-	

$$1) G_{ma} = \left| \frac{S_{21e}}{S_{12e}} \right| (k - \sqrt{k^2 - 1})$$

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