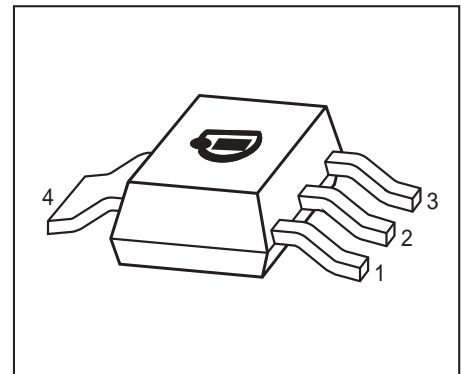


NPN Silicon RF Transistor*

- For low noise, high-gain amplifiers up to 2 GHz
- For linear broadband amplifiers
- $f_T = 8$ GHz, $F = 1$ dB at 900 MHz
- Pb-free (RoHS compliant) package¹⁾
- Qualified according AEC Q101



* Short term description



ESD (Electrostatic discharge) sensitive device, observe handling precaution!

Type	Marking	Pin Configuration						Package
BFG193	BFG193	1 = E	2 = B	3 = E	4 = C	-	-	SOT223

Maximum Ratings

Parameter	Symbol	Value	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 ²⁾ $T_S \leq 87^\circ\text{C}$	P_{tot}	600	mW
Junction temperature	T_j	150	°C
Ambient temperature	T_A	-55 ... 150	
Storage temperature	T_{stg}	-55 ... 150	

Thermal Resistance

Parameter	Symbol	Value	Unit
Junction - soldering point ³⁾	R_{thJS}	≤ 105	K/W

¹⁾Pb-containing package may be available upon special request

²⁾ T_S is measured on the collector lead at the soldering point to the pcb

³⁾For calculation of R_{thJA} please refer to Application Note Thermal Resistance

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

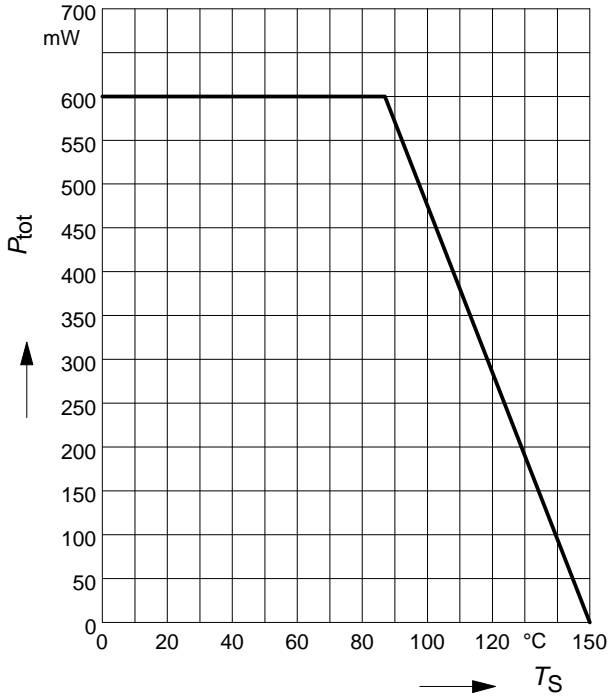
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC Characteristics					
Collector-emitter breakdown voltage $I_C = 1 \text{ mA}, I_B = 0$	$V_{(BR)CEO}$	12	-	-	V
Collector-emitter cutoff current $V_{CE} = 20 \text{ V}, V_{BE} = 0$	I_{CES}	-	-	100	μA
Collector-base cutoff current $V_{CB} = 10 \text{ V}, I_E = 0$	I_{CBO}	-	-	100	nA
Emitter-base cutoff current $V_{EB} = 1 \text{ V}, I_C = 0$	I_{EBO}	-	-	1	μA
DC current gain- $I_C = 30 \text{ mA}, V_{CE} = 8 \text{ V}, \text{ pulse measured}$	h_{FE}	70	100	140	-

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

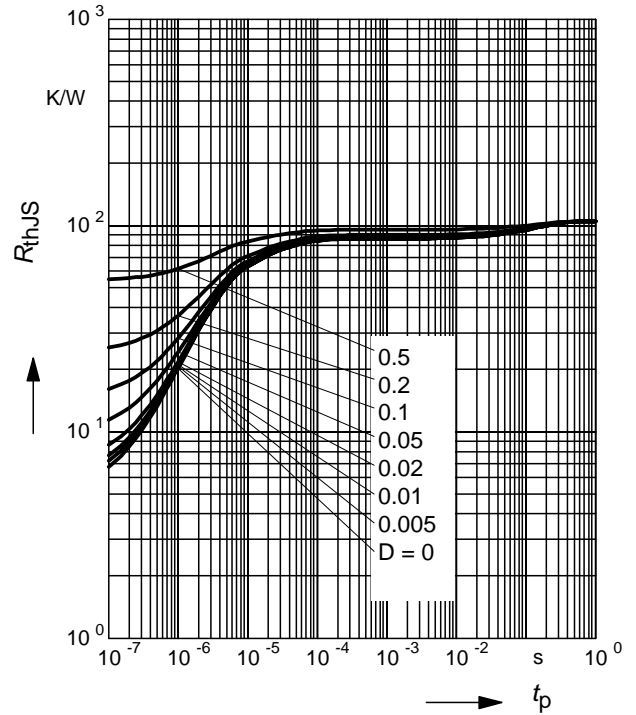
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC Characteristics (verified by random sampling)					
Transition frequency $I_C = 50 \text{ mA}$, $V_{CE} = 8 \text{ V}$, $f = 500 \text{ MHz}$	f_T	6	8	-	GHz
Collector-base capacitance $V_{CB} = 10 \text{ V}$, $f = 1 \text{ MHz}$, $V_{BE} = 0$, emitter grounded	C_{cb}	-	0.59	0.9	pF
Collector emitter capacitance $V_{CE} = 10 \text{ V}$, $f = 1 \text{ MHz}$, $V_{BE} = 0$, base grounded	C_{ce}	-	0.4	-	
Emitter-base capacitance $V_{EB} = 0.5 \text{ V}$, $f = 1 \text{ MHz}$, $V_{CB} = 0$, collector grounded	C_{eb}	-	2.5	-	
Noise figure $I_C = 10 \text{ mA}$, $V_{CE} = 8 \text{ V}$, $Z_S = Z_{Sopt}$, $f = 900 \text{ MHz}$ $I_C = 10 \text{ mA}$, $V_{CE} = 8 \text{ V}$, $Z_S = Z_{Sopt}$, $f = 1.8 \text{ GHz}$	F	-	1	-	dB
		-	1.6	-	
Power gain, maximum available ¹⁾ $I_C = 30 \text{ mA}$, $V_{CE} = 8 \text{ V}$, $Z_S = Z_{Sopt}$, $Z_L = Z_{Lopt}$, $f = 900 \text{ MHz}$ $I_C = 30 \text{ mA}$, $V_{CE} = 8 \text{ V}$, $Z_S = Z_{Sopt}$, $Z_L = Z_{Lopt}$, $f = 1.8 \text{ GHz}$	G_{ma}	-	16	-	
		-	10.5	-	
Transducer gain $I_C = 30 \text{ mA}$, $V_{CE} = 8 \text{ V}$, $Z_S = Z_L = 50\Omega$, $f = 900 \text{ MHz}$ $I_C = 30 \text{ mA}$, $V_{CE} = 8 \text{ V}$, $Z_S = Z_L = 50\Omega$, $f = 1.8 \text{ GHz}$	$ S_{21e} ^2$	-	13.5	-	dB
		-	8	-	

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

Total power dissipation $P_{tot} = f(T_S)$

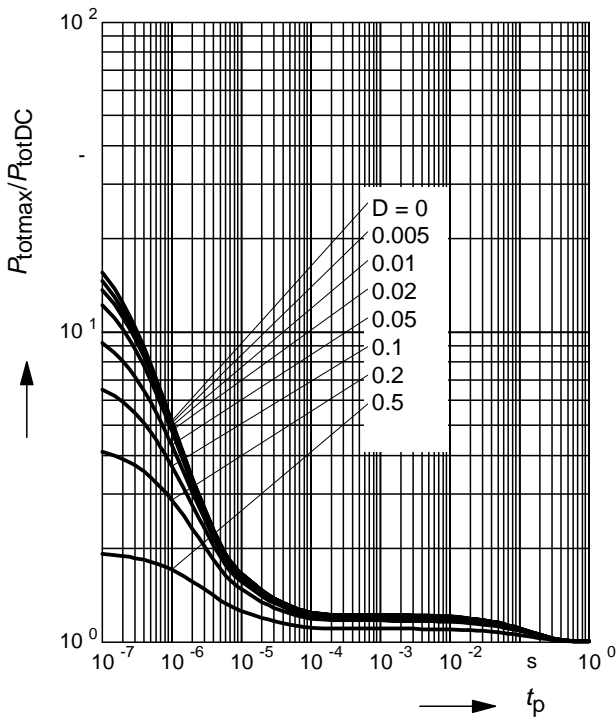


Permissible Pulse Load $R_{thJS} = f(t_p)$

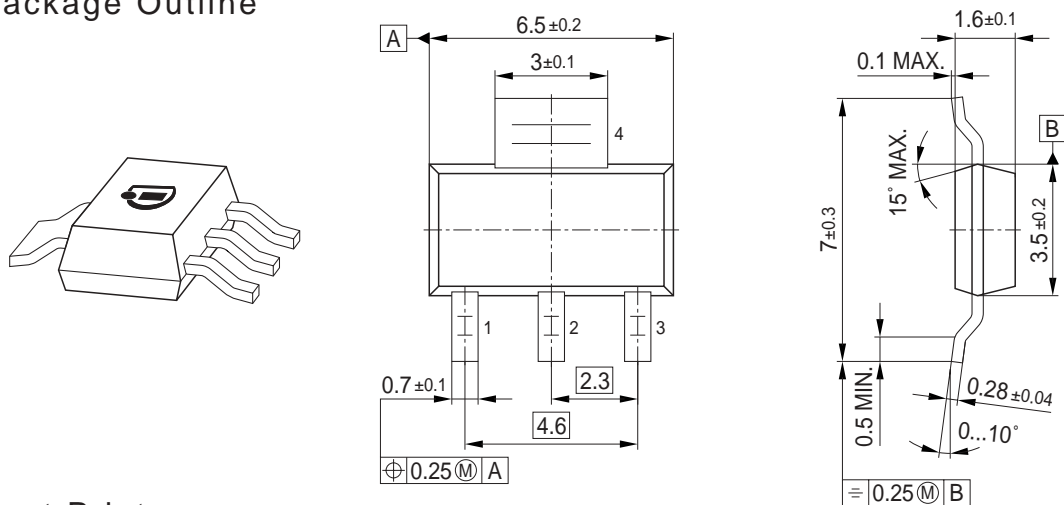


Permissible Pulse Load

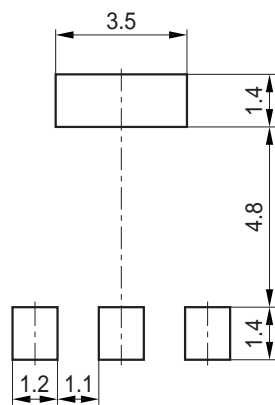
$P_{totmax}/P_{totDC} = f(t_p)$



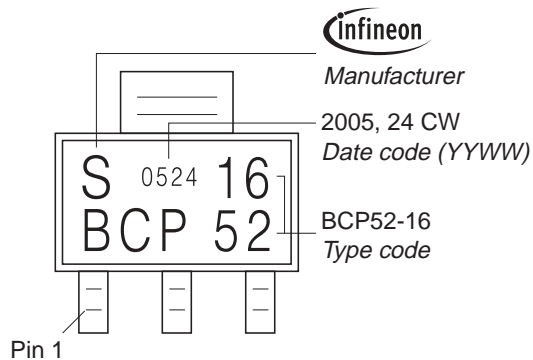
Package Outline



Foot Print

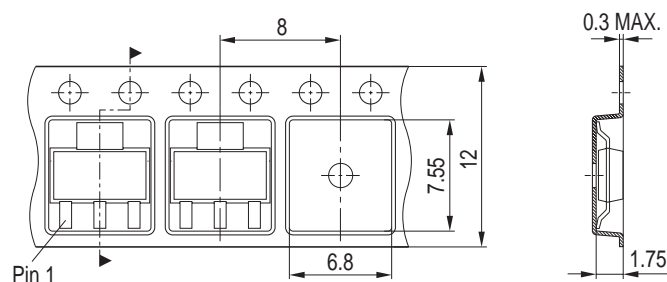


Marking Layout (Example)



Packing

Reel $\varnothing 180$ mm = 1.000 Pieces/Reel
 Reel $\varnothing 330$ mm = 4.000 Pieces/Reel



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