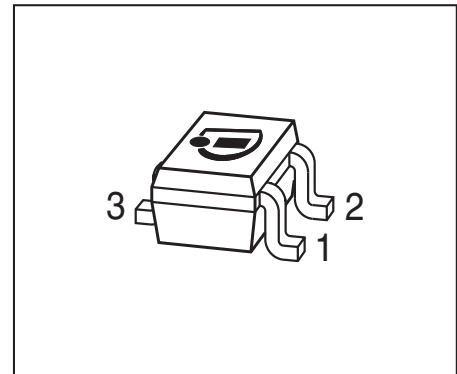


Low Noise Silicon Bipolar RF Transistor

- For low noise, high-gain broadband amplifiers at collector currents from 1 mA to 20 mA
- $f_T = 8 \text{ GHz}$, $NF_{\min} = 0.9 \text{ dB}$ at 900 MHz
- Pb-free (RoHS compliant) and halogen-free package with visible leads
- Qualification report according to AEC-Q101 available



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

Type	Marking	Pin Configuration			Package
BFR182W	RGs	1=B	2=E	3=C	SOT323

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

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	35	mA
Base current	I_B	4	
Total power dissipation ¹⁾ $T_S \leq 90 \text{ }^\circ\text{C}$	P_{tot}	250	mW
Junction temperature	T_J	150	$^\circ\text{C}$
Ambient temperature	T_A	-65 ... 150	
Storage temperature	T_{Stg}	-65 ... 150	

Thermal Resistance

Parameter	Symbol	Value	Unit
Junction - soldering point ²⁾	R_{thJS}	240	K/W

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

²⁾ For the definition of R_{thJS} please refer to Application Note AN077 (Thermal Resistance Calculation)

Electrical Characteristics at $T_A = 25\text{ °C}$, 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 $V_{CE} = 4\text{ V}$, $V_{BE} = 0$ $V_{CE} = 15\text{ V}$, $V_{BE} = 0\text{ V}$, $T_A = 85\text{ }^{\circ}\text{C}$ (verified by random sampling)	I_{CES}	- -	1 5	30 70	nA
Collector-base cutoff current $V_{CB} = 4\text{ V}$, $I_E = 0$	I_{CBO}	-	1	30	
Emitter-base cutoff current $V_{EB} = 1\text{ V}$, $I_C = 0$	I_{EBO}	-	-	50	
DC current gain $I_C = 10\text{ mA}$, $V_{CE} = 8\text{ V}$, pulse measured	h_{FE}	70	100	140	-

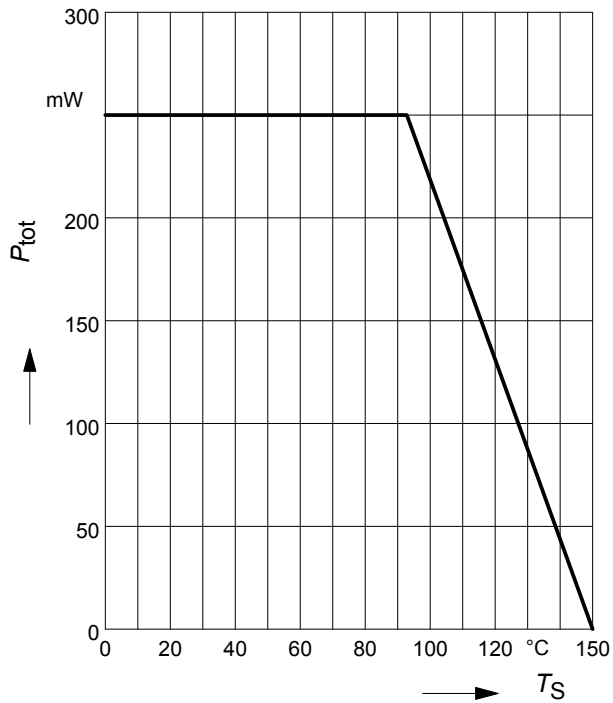
Electrical Characteristics at $T_A = 25\text{ }^{\circ}\text{C}$, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC Characteristics (verified by random sampling)					
Transition frequency $I_C = 15\text{ mA}$, $V_{CE} = 8\text{ V}$, $f = 500\text{ MHz}$	f_T	6	8	-	GHz
Collector-base capacitance $V_{CB} = 10\text{ V}$, $f = 1\text{ MHz}$, $V_{BE} = 0$, emitter grounded	C_{cb}	-	0.34	0.5	pF
Collector emitter capacitance $V_{CE} = 10\text{ V}$, $f = 1\text{ MHz}$, $V_{BE} = 0$, base grounded	C_{ce}	-	0.26	-	
Emitter-base capacitance $V_{EB} = 0.5\text{ V}$, $f = 1\text{ MHz}$, $V_{CB} = 0$, collector grounded	C_{eb}	-	0.8	-	
Minimum noise figure $I_C = 3\text{ mA}$, $V_{CE} = 8\text{ V}$, $Z_S = Z_{Sopt}$, $f = 900\text{ MHz}$ $I_C = 3\text{ mA}$, $V_{CE} = 8\text{ V}$, $Z_S = Z_{Sopt}$, $f = 1.8\text{ GHz}$	NF_{min}	- - -	0.9 1.3	- -	dB
Power gain, maximum stable ¹⁾ $I_C = 10\text{ mA}$, $V_{CE} = 8\text{ V}$, $Z_S = Z_{Sopt}$, $Z_L = Z_{Lopt}$, $f = 900\text{ MHz}$	G_{ms}	-	19	-	dB
Power gain, maximum available ²⁾ $I_C = 10\text{ mA}$, $V_{CE} = 8\text{ V}$, $Z_S = Z_{Sopt}$, $Z_L = Z_{Lopt}$, $f = 1.8\text{ GHz}$	G_{ma}	-	12.5	-	dB
Transducer gain $I_C = 10\text{ mA}$, $V_{CE} = 8\text{ V}$, $Z_S = Z_L = 50\text{ }\Omega$, $f = 900\text{ MHz}$ $I_C = 10\text{ mA}$, $V_{CE} = 8\text{ V}$, $Z_S = Z_L = 50\text{ }\Omega$, $f = 1.8\text{ GHz}$	$ S_{21e} ^2$	- - -	15.5 10	- -	dB

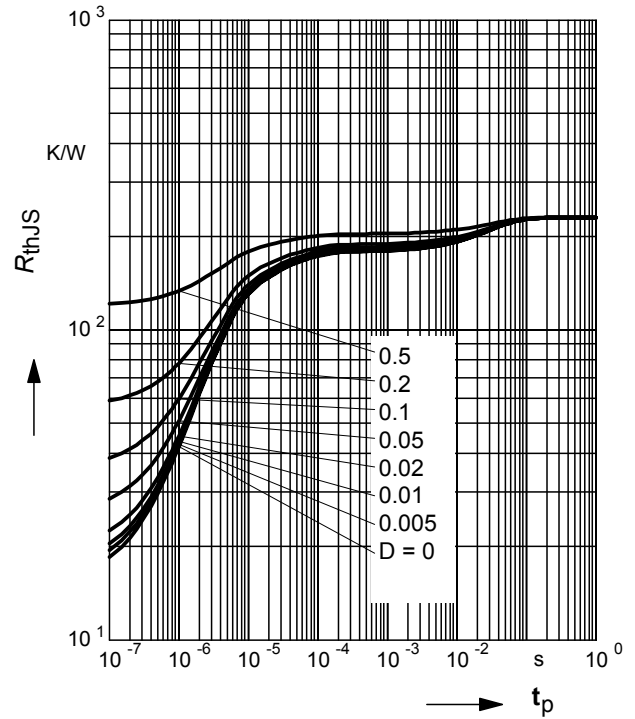
$$^1G_{ms} = |S_{21} / S_{12}|$$

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

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

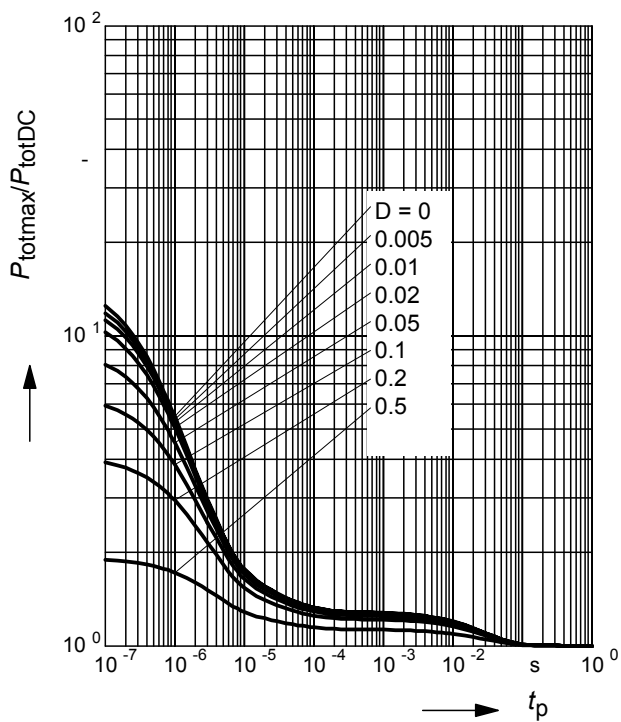


Permissible Pulse Load $R_{\text{thJS}} = f(t_p)$

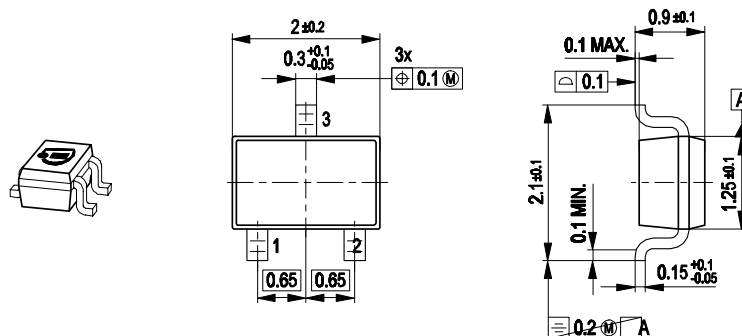


Permissible Pulse Load

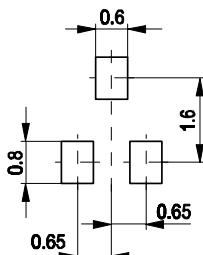
$P_{\text{totmax}}/P_{\text{totDC}} = f(t_p)$



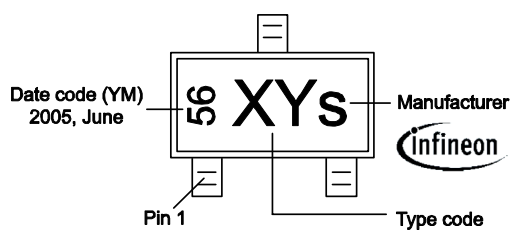
Package Outline



Foot Print

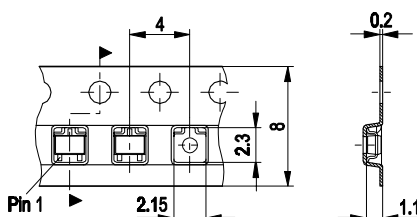


Marking Layout (Example)



Standard Packing

Reel $\varnothing 180$ mm = 3.000 Pieces/Reel
 Reel $\varnothing 330$ mm = 10.000 Pieces/Reel



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