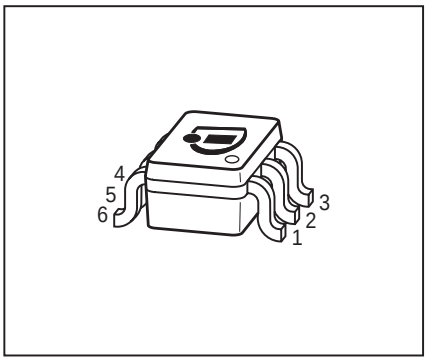
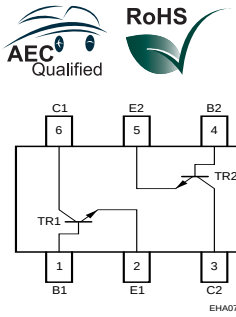
NPN Silicon RF Transistor*



- For low noise, high-gain broadband amplifiers at collector currents from 0.5 mA to 12 mA
- f_T = 8 GHz, F = 0.9 dB at 900 MHz
- Two (galvanic) internal isolated Transistors in one package
- For orientation in reel see package information below
- Pb-free (RoHS compliant) package [1)]
- Qualified according AEC Q101

* Short term description



ESD (**E**lectro**s**tatic **d**ischarge) sensitive device, observe handling precaution!

Type	Marking	Pin Configuration						Package
BFS481	RFs	1=B	2=E	3=C	4=B	5=E	6=C	SOT363

[1]Pb-containing package may be available upon special request

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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	20	mA
Base current	I_B	2	
Total power dissipation[1)] $T_S \leq 83$ °C	P_{tot}	175	mW
Junction temperature	T_j	150	°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}	≤ 380	K/W

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

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC Characteristics					
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_{EBO}	-	-	1	µA
DC current gain- I_C = 5 mA, V_{CE} = 8 V, pulse measured	h_{FE}	70	100	140	-

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

[2] For calculation of R_{thJA} please refer to Application Note Thermal Resistance

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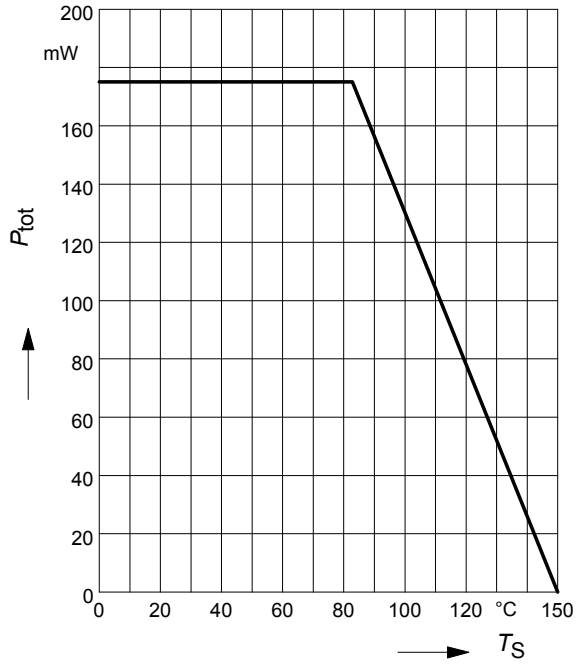
Electrical Characteristics at T_A = 25°C, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC Characteristics (verified by random sampling)					
Transition frequency I_C = 10 mA, V_{CE} = 8 V, f = 500 MHz	f_T	6	8	-	GHz
Collector-base capacitance V_{CB} = 10 V, f = 1 MHz, V_{BE} = 0 , emitter grounded	C_{cb}	-	0.23	0.4	pF
Collector emitter capacitance V_{CE} = 10 V, f = 1 MHz, V_{BE} = 0 , base grounded	C_{ce}	-	0.13	-	
Emitter-base capacitance V_{EB} = 0.5 V, f = 1 MHz, V_{CB} = 0 , collector grounded	C_{eb}	-	0.4	-	
Noise figure I_C = 2 mA, V_{CE} = 8 V, Z_S = Z_{Sopt}, f = 900 MHz I_C = 2 mA, V_{CE} = 8 V, Z_S = Z_{Sopt}, f = 1.8 GHz	F	 - -	 0.9 1.2	 - -	dB
Power gain, maximum stable[1)] I_C = 5 mA, V_{CE} = 8 V, Z_S = Z_{Sopt}, Z_L = Z_{Lopt} , f = 900 MHz	G_{ms}	-	20	-	dB
Power gain, maximum available[2)] I_C = 5 mA, V_{CE} = 8 V, Z_S = Z_{Sopt}, Z_L = Z_{Lopt} , f = 1.8 GHz	G_{ma}	-	15	-	dB
Transducer gain I_C = 5 mA, V_{CE} = 8 V, Z_S = Z_L = 50 Ω, f = 900 MHz I_C = 5 mA, V_{CE} = 8 V, Z_S = Z_L = 50 Ω, f = 1.8 MHz	$\lvert S_{21e}\rvert^2$	 - -	 16 11	 - -	dB

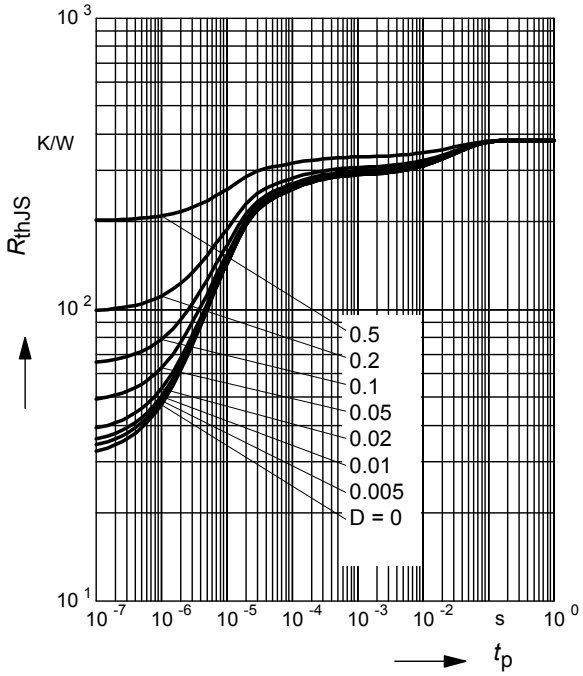
[1] $G_{ms} = |S_{21} / S_{12}|$

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

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

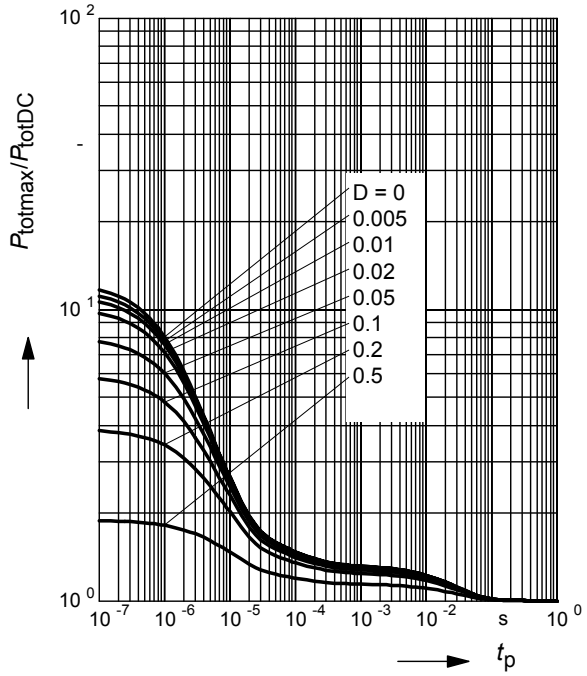


Permissible Pulse Load $R_{thJS} = f(t_p)$

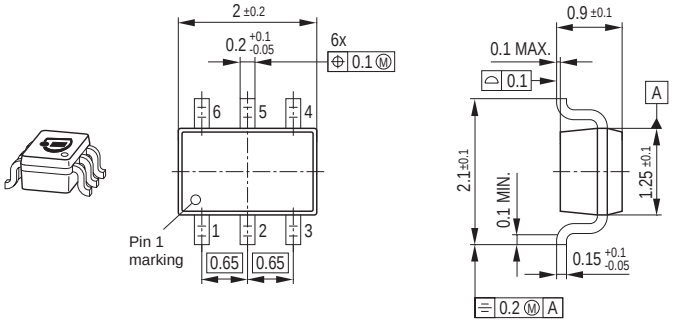


Permissible Pulse Load

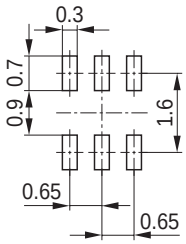
$P_{totmax}/P_{totDC} = f(t_p)$



Package Outline

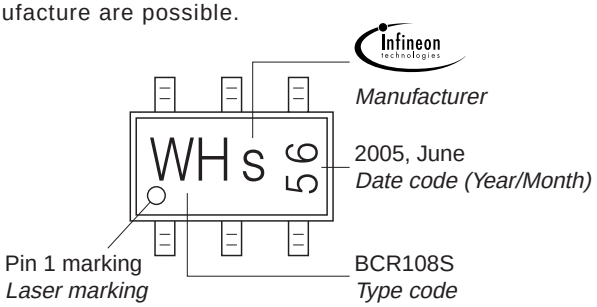


Foot Print



Marking Layout (Example)

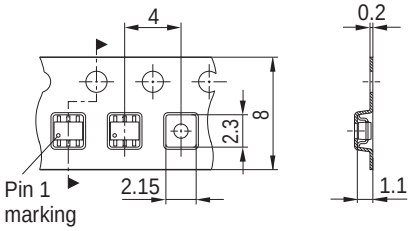
Small variations in positioning of
Date code, Type code and Manufacture are possible.



Standard Packing

Reel ø180 mm = 3.000 Pieces/Reel
Reel ø330 mm = 10.000 Pieces/Reel

For symmetric types no defined Pin 1 orientation in reel.



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