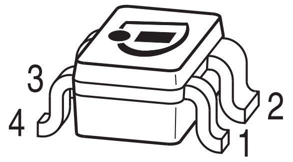
Low Noise Silicon Bipolar RF Transistor



- For low noise, low distortion broadband amplifiers in antenna and telecommunications systems up to 1.5 GHz at collector currents from 20 mA to 80 mA
- Power amplifier for DECT and PCN systems
- f_T = 7.5 GHz, NF_{min} = 1.3 dB at 900 MHz
- Pb-free (RoHS compliant) and halogen-free package with visible leads
- Qualification report according to AEC-Q101 available

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

Type	**Marking**	**Pin Configuration**						**Package**
BFP196W	RIs	1 = E	2 = C	3 = E	4 = B	-	-	SOT343

Maximum Ratings at T_A = 25 °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	150	mA
Base current	I_B	15	
Total power dissipation[1] $T_S \leq 69$°C	P_{tot}	700	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}	115	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 °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 = 50 mA, V_{CE} = 8 V, pulse measured	h_{FE}	70	100	140	-

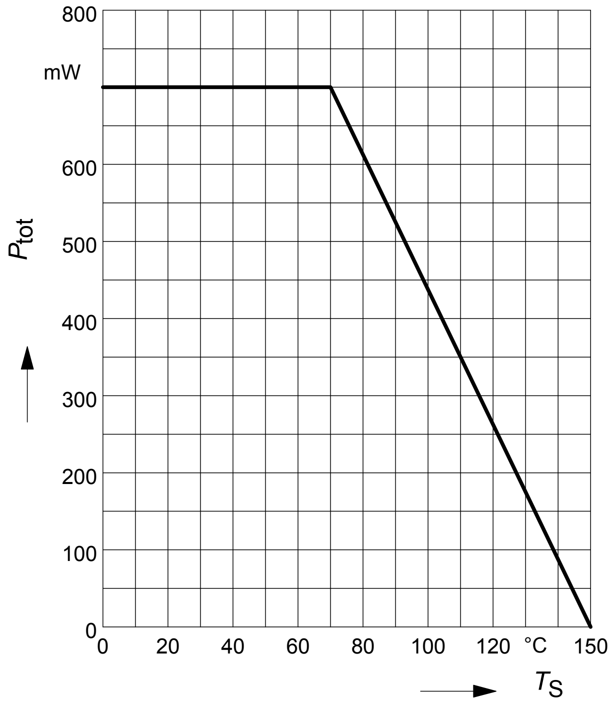
Electrical Characteristics at T_A = 25 °C, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC Characteristics (verified by random sampling)					
Transition frequency I_C = 70 mA, V_{CE} = 8 V, f = 500 MHz	f_T	5	7.5	-	GHz
Collector-base capacitance V_{CB} = 10 V, f = 1 MHz, V_{BE} = 0 , emitter grounded	C_{cb}	-	0.86	1.3	pF
Collector emitter capacitance V_{CE} = 10 V, f = 1 MHz, V_{BE} = 0 , base grounded	C_{ce}	-	0.4	-	
Emitter-base capacitance V_{EB} = 0.5 V, f = 1 MHz, V_{CB} = 0 , collector grounded	C_{eb}	-	3.9	-	
Minimum noise figure I_C = 20 mA, V_{CE} = 8 V, Z_S = Z_{Sopt} ,	NF_{min}				dB
f = 900 MHz		-	1.3	-	
f = 1.8 GHz		-	2.3	-	
Power gain, maximum available[1] I_C = 50 mA, V_{CE} = 8 V, Z_S = Z_{Sopt}, Z_L = Z_{Lopt},	G_{ma}				
f = 900 MHz		-	19	-	
f = 1.8 GHz		-	12.5	-	
Transducer gain I_C = 50 mA, V_{CE} = 8 V, Z_S = Z_L = 50Ω,	$\|S_{21e}\|^2$				dB
f = 900 MHz		-	13	-	
f = 1.8 GHz		-	7	-	
Third order intercept point at output[2] I_C = 50 mA, V_{CE} = 8 V, Z_S = Z_L = 50 Ω, f = 0.9 GHz	IP_3	-	32	-	dBm
1dB Compression point at output I_C = 50 mA, V_{CE} = 8 V, Z_S = Z_L = 50 Ω, f = 0.9 GHz	P_{-1dB}	-	19	-	

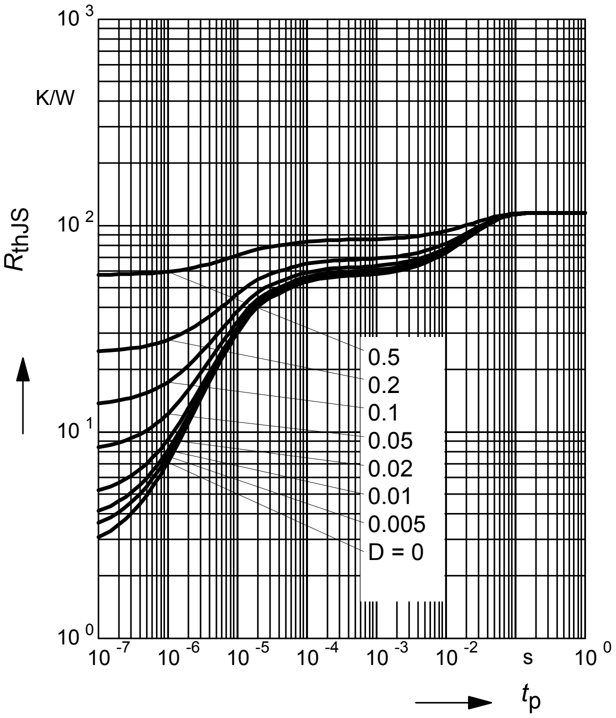
[1] $G_{ma} = |S_{21} / S_{12}| (k-(k^2-1)^{1/2})$

[2] IP3 value depends on termination of all intermodulation frequency components. Termination used for this measurement is 50Ω from 0.2 MHz to 12 GHz

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

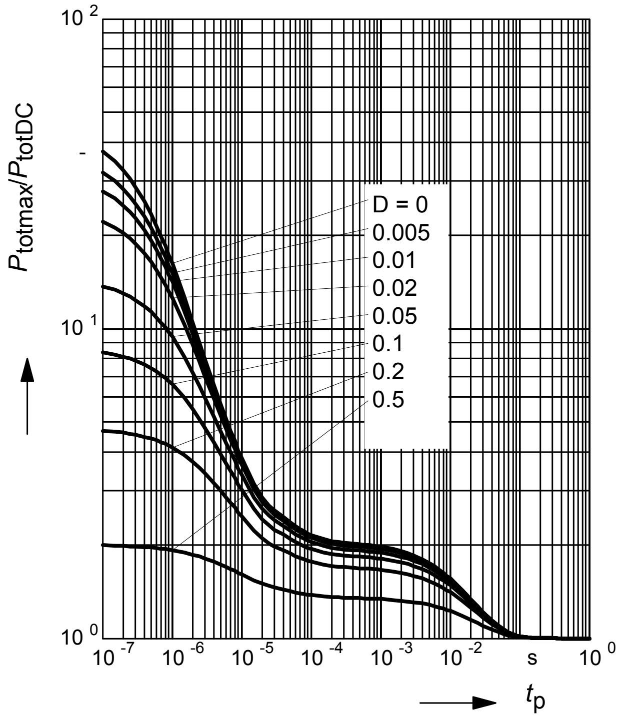


Permissible Pulse Load $R_{thJS} = f(t_p)$

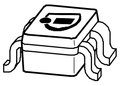


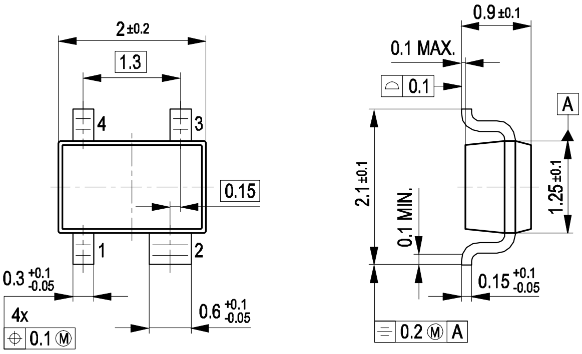
Permissible Pulse Load

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

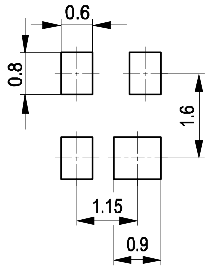


Package Outline

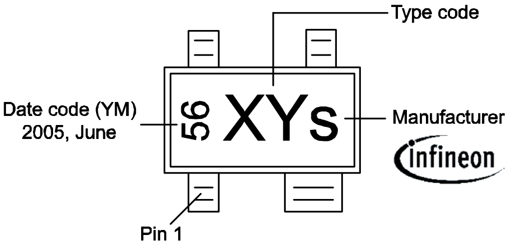




Foot Print

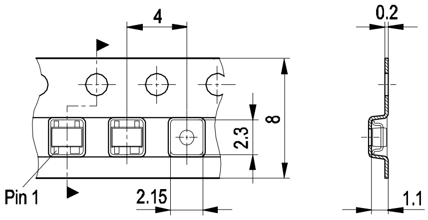


Marking Layout (Example)



Standard Packing

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



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