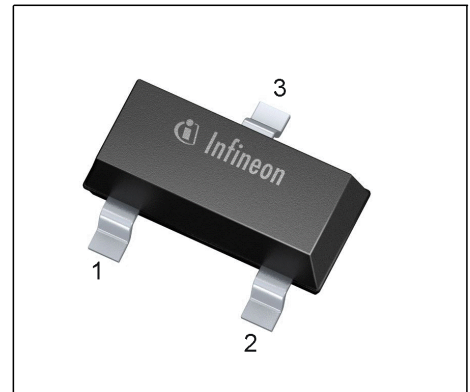


## Low Noise Silicon Bipolar RF Transistor

- For low distortion broadband amplifiers and oscillators up to 2GHz at collector currents from 0.5mA to 20 mA
- Pb-free (RoHS compliant) package
- Qualification report according to AEC-Q101 available



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

Type	Marking	Pin Configuration			Package
BFR35AP	GEs	1 = B	2 = E	3 = C	SOT23

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

Parameter	Symbol	Value	Unit
Collector-emitter voltage	$V_{CEO}$	15	V
Collector-emitter voltage	$V_{CES}$	20	
Collector-base voltage	$V_{CBO}$	20	
Emitter-base voltage	$V_{EBO}$	2.5	
Collector current	$I_C$	45	mA
Base current	$I_B$	4	
Total power dissipation <sup>1)</sup> $T_S \leq 93\text{ °C}$	$P_{tot}$	280	mW
Junction temperature	$T_J$	150	°C
Storage temperature	$T_{Stg}$	-55 ... 150	

### Thermal Resistance

Parameter	Symbol	Value	Unit
Junction - soldering point <sup>2)</sup>	$R_{thJS}$	205	K/W

<sup>1)</sup>  $T_S$  is measured on the collector lead at the soldering point to the pcb

<sup>2)</sup> For calculation of  $R_{thJS}$  please refer to Application Note AN077 (Thermal Resistance Calculation)

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

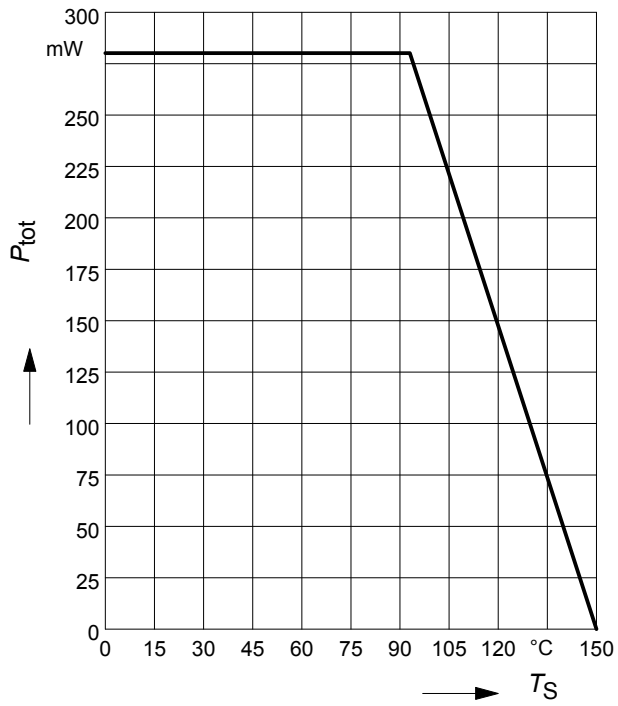
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
DC Characteristics					
Collector-emitter breakdown voltage $I_C = 1\text{ mA}$ , $I_B = 0$	$V_{(BR)CEO}$	15	-	-	V
Collector-emitter cutoff current $V_{CE} = 20\text{ V}$ , $V_{BE} = 0$	$I_{CES}$	-	-	10	$\mu\text{A}$
Collector-base cutoff current $V_{CB} = 10\text{ V}$ , $I_E = 0$	$I_{CBO}$	-	-	100	nA
Emitter-base cutoff current $V_{EB} = 2.5\text{ V}$ , $I_C = 0$	$I_{EBO}$	-	-	100	$\mu\text{A}$
DC current gain $I_C = 15\text{ mA}$ , $V_{CE} = 8\text{ V}$ , pulse measured	$h_{FE}$	70	100	140	-

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

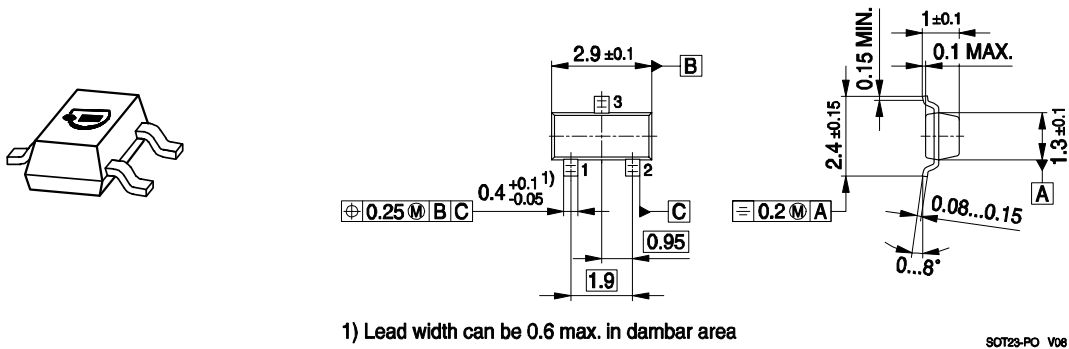
Parameter	Symbol	Values			Unit
		min.	typ.	max.	
AC Characteristics (verified by random sampling)					
Transition frequency $I_C = 15\text{ mA}$ , $V_{CE} = 8\text{ V}$ , $f = 500\text{ MHz}$	$f_T$	3.5	5	-	GHz
Collector-base capacitance $V_{CB} = 10\text{ V}$ , $f = 1\text{ MHz}$ , $V_{BE} = 0$ , emitter grounded	$C_{cb}$	-	0.39	0.55	pF
Collector emitter capacitance $V_{CE} = 10\text{ V}$ , $f = 1\text{ MHz}$ , $V_{BE} = 0$ , base grounded	$C_{ce}$	-	0.23	-	
Emitter-base capacitance $V_{EB} = 0.5\text{ V}$ , $f = 1\text{ MHz}$ , $V_{CB} = 0$ , collector grounded	$C_{eb}$	-	0.64	-	
Minimum noise figure $I_C = 2\text{ mA}$ , $V_{CE} = 6\text{ V}$ , $Z_S = Z_{Sopt}$ , $f = 900\text{ MHz}$ $f = 1.8\text{ GHz}$	$NF_{min}$	- -	1.4 2	- -	dB
Power gain, maximum available <sup>1)</sup> $I_C = 15\text{ mA}$ , $V_{CE} = 8\text{ V}$ , $Z_S = Z_{Sopt}$ , $Z_L = Z_{Lopt}$ , $f = 900\text{ MHz}$ $f = 1.8\text{ GHz}$	$G_{ma}$	- -	16 10.5	- -	
Transducer gain $I_C = 15\text{ mA}$ , $V_{CE} = 8\text{ V}$ , $Z_S = Z_L = 50\Omega$ , $f = 900\text{ MHz}$ $f = 1.8\text{ GHz}$	$ S_{21e} ^2$	- -	13 7.5	- -	dB

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

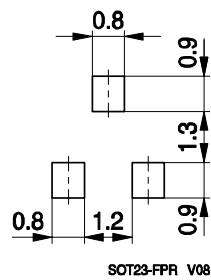
Total power dissipation  $P_{\text{tot}} = f(T_S)$



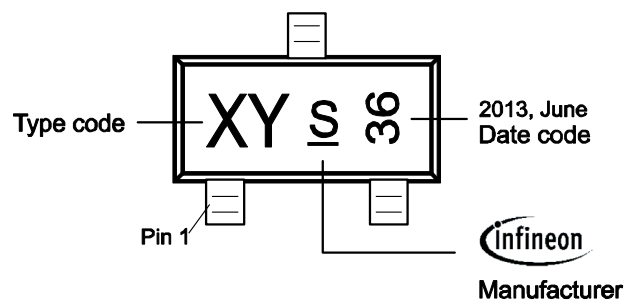
## Package Outline



## Foot Print

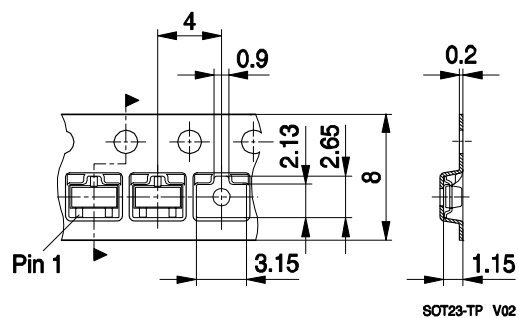


## Marking Layout



## Standard Packing

Reel o 180 mm: 3.000 Pieces / Reel  
 Reel o 330 mm = 10.000 Pieces / Reel



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