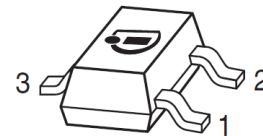


# BFS17P

## NPN Silicon RF Transistor

### Features

- Maximum collector-emitter voltage  $V_{CE0} = 15\text{ V}$
- Maximum collector current  $I_C = 25\text{ mA}$
- Noise figure  $NF = 3.5\text{ dB}$
- 3rd order output intercept point  $OIP_3 = 21.5\text{ dBm}$
- 1 dB output compression point  $P_{-1dB} = 10\text{ dBm}$
- Transition frequency  $f_T = 1.4\text{ GHz}$
- Maximum total power dissipation  $P_{tot} = 280\text{ mW}$
- Package: SOT23
- Pb-free (RoHS compliant) package



### Potential Applications

- For broadband amplifiers up to 1 GHz at collector currents from 1 mA to 20 mA
- For mixers and oscillators in sub-GHz applications

### Device Information

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

Type / Ordering code	Marking	Pin Configuration			Package
BFS17P / BFS17PE6327HTSA1	MCs	1=B	2=E	3=C	SOT23

## Table of contents

	<b>Features</b> .....	1
	<b>Potential Applications</b> .....	1
	<b>Device Information</b> .....	1
	<b>Table of contents</b> .....	2
<b>1</b>	<b>Maximum Ratings</b> .....	3
<b>2</b>	<b>Thermal Resistance</b> .....	3
<b>3</b>	<b>Electrical Characteristics</b> .....	4
<b>4</b>	<b>Typical characteristics diagrams</b> .....	5
<b>5</b>	<b>Package information</b> .....	9
5.1	SOT23 package .....	9
	<b>Revision History</b> .....	10
	<b>Trademarks</b> .....	11

**Maximum Ratings**

**1 Maximum Ratings**

**Table 1** Maximum Rating at  $T_A = 25\text{ °C}$ , unless otherwise specified

Parameter	Symbol	Values	Unit	Note or Test Condition
Collector-emitter voltage	$V_{CEO}$	15	V	–
Collector-base voltage	$V_{CBO}$	25		–
Emitter-base voltage	$V_{EBO}$	2.5		–
Collector current	$I_C$	25	mA	–
Peak collector current	$I_{CM}$	50		–
Total power dissipation <sup>1)</sup>	$P_{tot}$	280	mW	$T_S \leq 95\text{ °C}$
Junction temperature	$T_j$	150	°C	–
Ambient temperature	$T_A$	-65 ... 150		–
Storage temperature	$T_{Stg}$	-65 ... 150		–

**2 Thermal Resistance**

**Table 2** Thermal resistance

Parameter	Symbol	Values	Unit	Note or Test Condition
Junction - soldering point	$R_{thJS}$	$\leq 195$	K/W	–

Note: For calculation of  $R_{thJA}$  please refer to Application Note AN077 (Thermal Resistance Calculation)

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

**Electrical Characteristics**

**3 Electrical Characteristics**

**Table 3 DC Characteristics at  $T_A = 25^\circ\text{C}$ , unless otherwise specified**

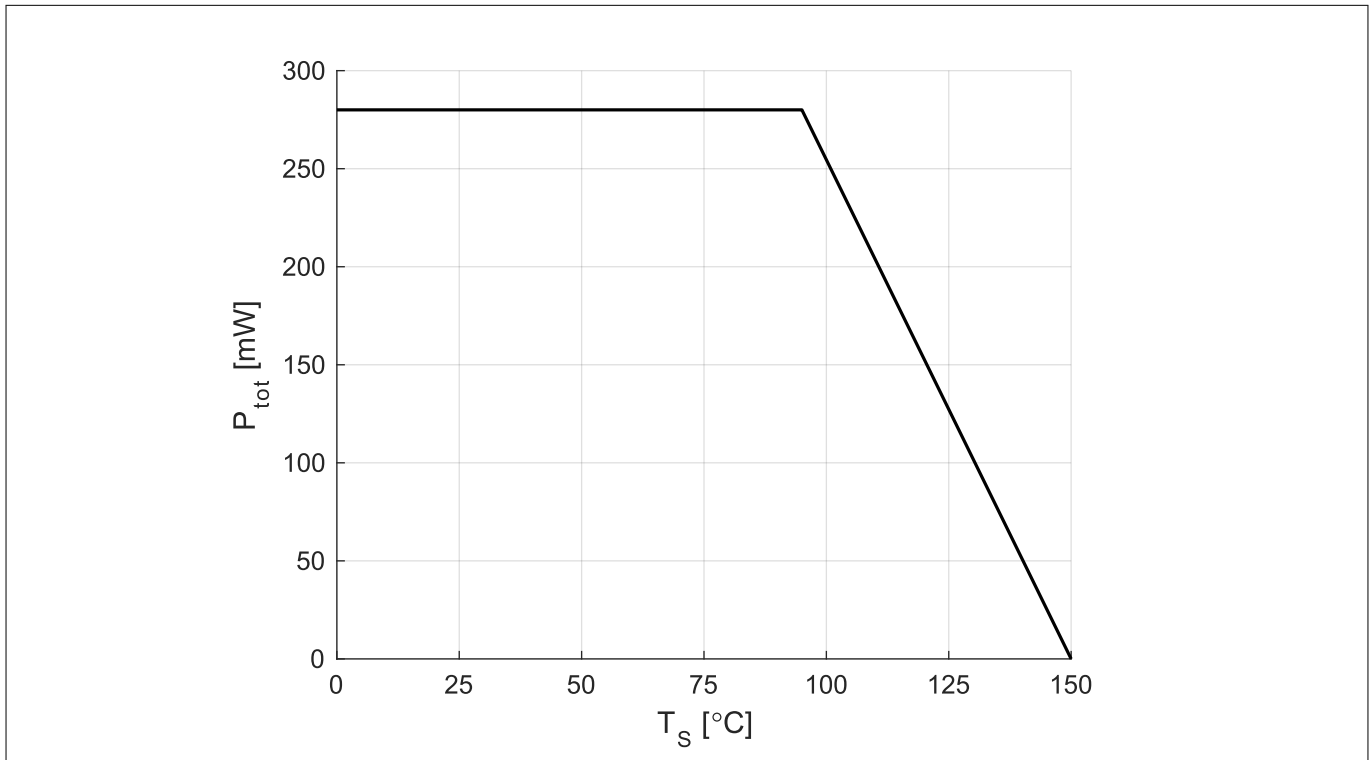
Parameter	Symbol	Values			Unit	Note or Test Condition
		Min.	Typ.	Max.		
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	15	–	–	V	$I_C = 1\text{ mA}, I_B = 0$
Collector-base cutoff current	$I_{CBO}$	–	–	0.05	$\mu\text{A}$	$V_{CB} = 10\text{ V}, I_E = 0$
		–	–	10		$V_{CB} = 25\text{ V}, I_E = 0$
Emitter-base cutoff current	$I_{EBO}$	–	–	100	$\mu\text{A}$	$V_{EB} = 2.5\text{ V}, I_C = 0$
DC current gain	$h_{FE}$	40	–	150	–	$I_C = 2\text{ mA}, V_{CE} = 1\text{ V}$ pulse measured
		20	70	–		$I_C = 25\text{ mA}, V_{CE} = 1\text{ V}$ pulse measured
Collector-emitter saturation voltage	$V_{CEsat}$	–	0.1	0.4	V	$I_C = 10\text{ mA}, I_B = 1\text{ mA}$

**Table 4 AC Characteristics at  $T_A = 25^\circ\text{C}$ , unless otherwise specified**

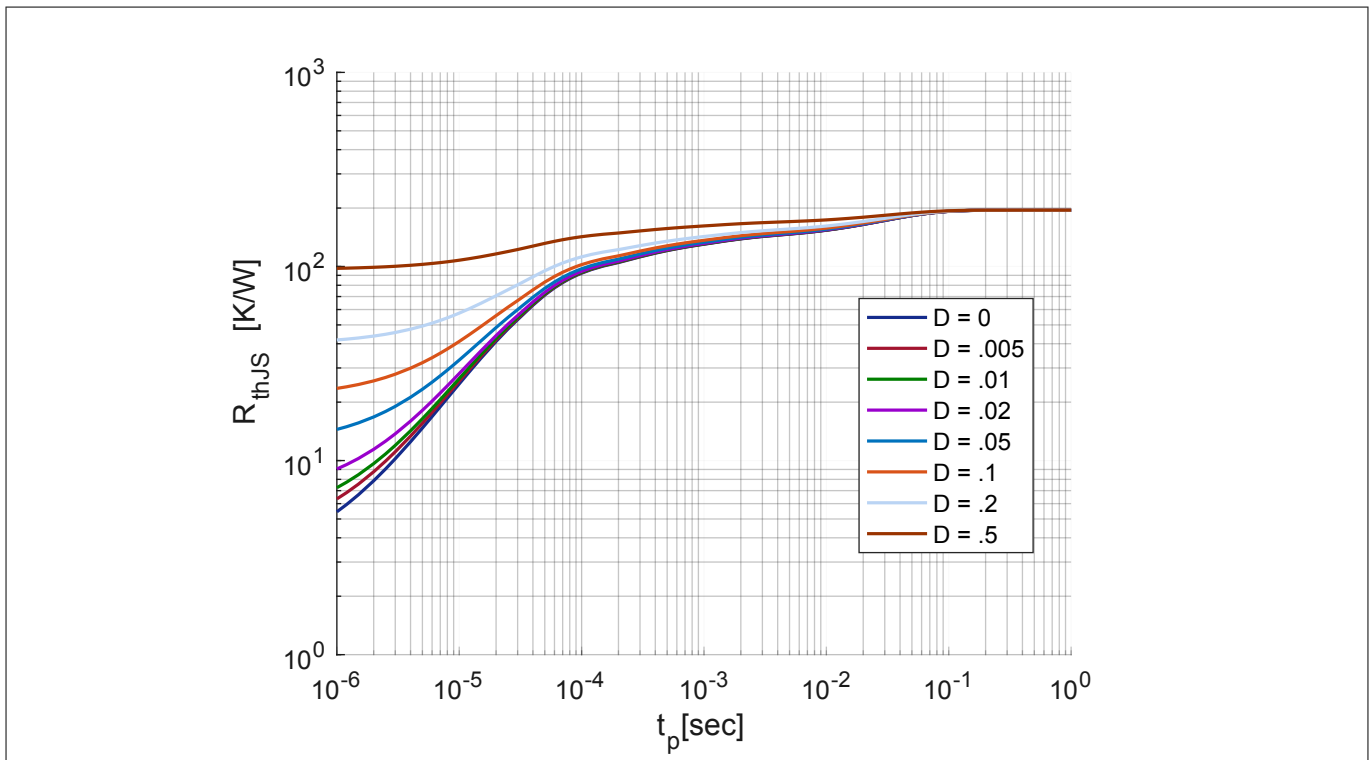
Parameter	Symbol	Values			Unit	Note or Test Condition
		Min.	Typ.	Max.		
Transition frequency	$f_T$	1	1.4	–	GHz	$I_C = 2\text{ mA}, V_{CE} = 5\text{ V},$ $f = 200\text{ MHz}$
		1.3	2.5	–		$I_C = 25\text{ mA}, V_{CE} = 5\text{ V},$ $f = 200\text{ MHz}$
Collector-base capacitance	$C_{cb}$	–	0.55	0.8	pF	$V_{CB} = 5\text{ V}, f = 1\text{ MHz},$ $V_{BE} = 0$ , emitter grounded
Collector emitter capacitance	$C_{ce}$	–	0.27		pF	$V_{CE} = 5\text{ V}, f = 1\text{ MHz},$ $V_{BE} = 0$ , base grounded
Emitter-base capacitance	$C_{eb}$	–	0.9	1.45	pF	$V_{EB} = 0.5\text{ V}, f = 1\text{ MHz},$ $V_{CB} = 0$ , collector grounded
Minimum noise figure	$NF_{min}$	–	3.5	5	dB	$I_C = 2\text{ mA}, V_{CE} = 5\text{ V},$ $Z_S = 50\Omega, f = 800\text{ MHz}$
Transducer gain	$ S_{21e} ^2$	–	13	–	dB	$I_C = 20\text{ mA}, V_{CE} = 5\text{ V},$ $Z_S = Z_L = 50\Omega, f = 500\text{ MHz}$
Third order intercept point at output	$OIP_3$	–	21.5	–	dBm	$V_{CE} = 5\text{ V}, I_C = 20\text{ mA},$ $f = 800\text{ MHz}, Z_S = Z_{Sopt},$ $Z_L = Z_{Lopt}$
1dB compression point	$P_{-1dB}$	–	10	–	dBm	$I_C = 20\text{ mA}, V_{CE} = 5\text{ V},$ $Z_S = Z_L = 50\Omega, f = 800\text{ MHz}$

Typical characteristics diagrams

**4 Typical characteristics diagrams**

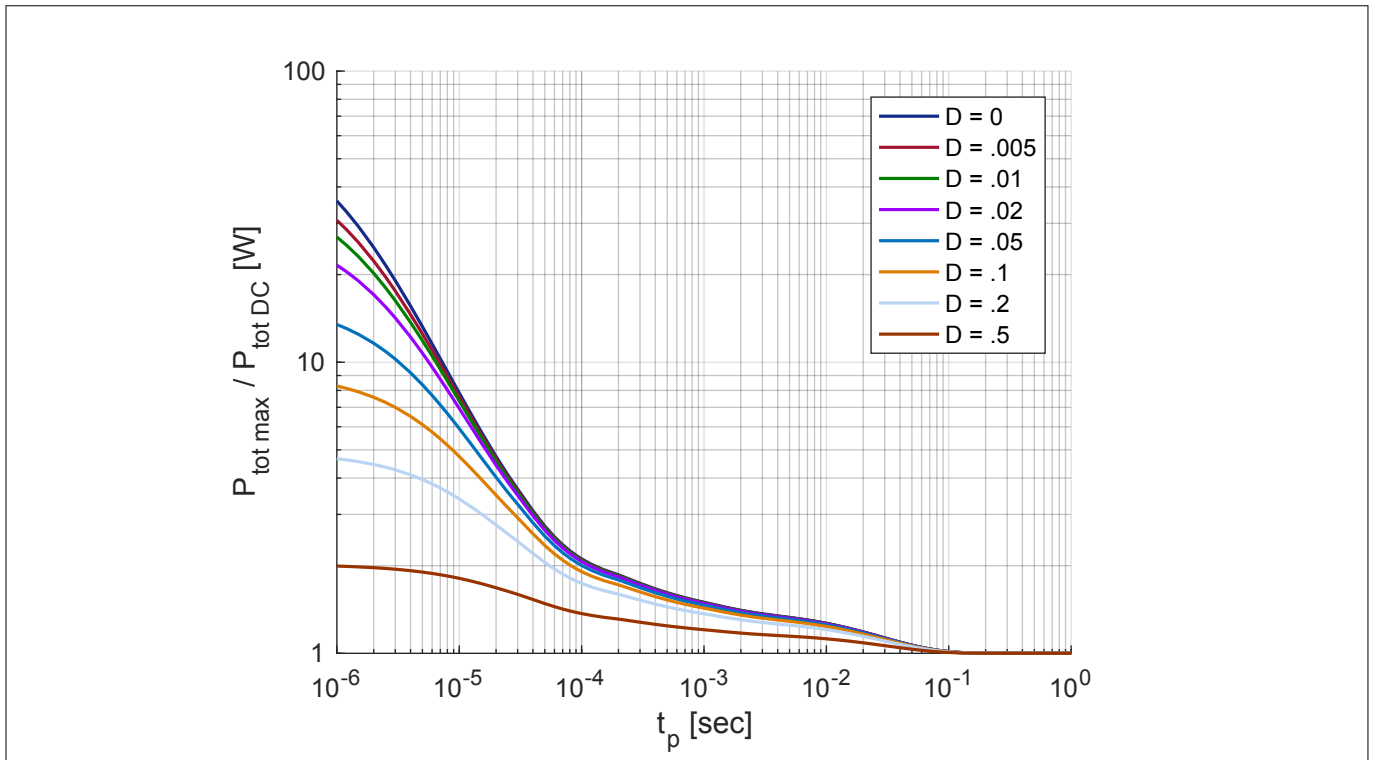


**Figure 1 Total Power Dissipation**

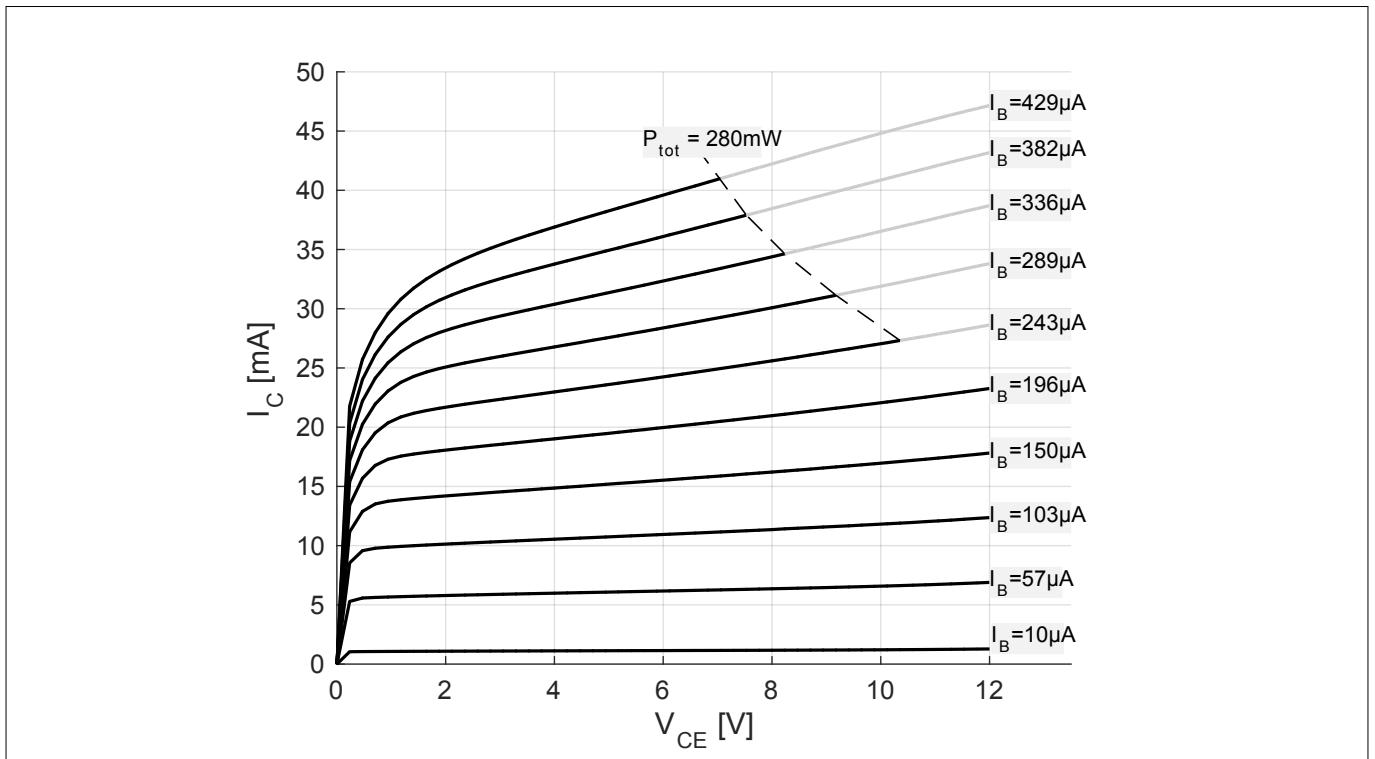


**Figure 2 Permissible Pulse Load  $R_{thJS} = f(t_p)$**

**Typical characteristics diagrams**

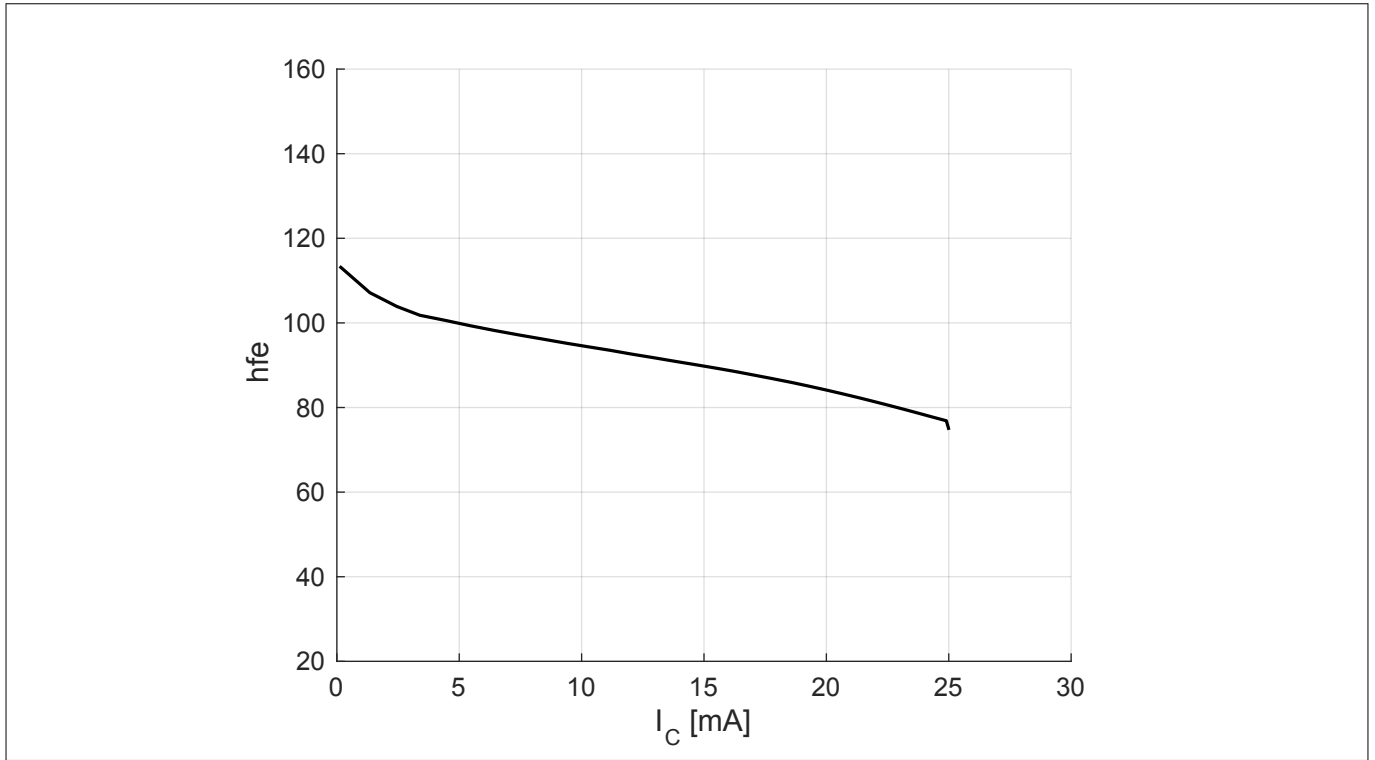


**Figure 3** Permissible Pulse Load  $P_{totmax} / P_{totDC} = f(t_p)$

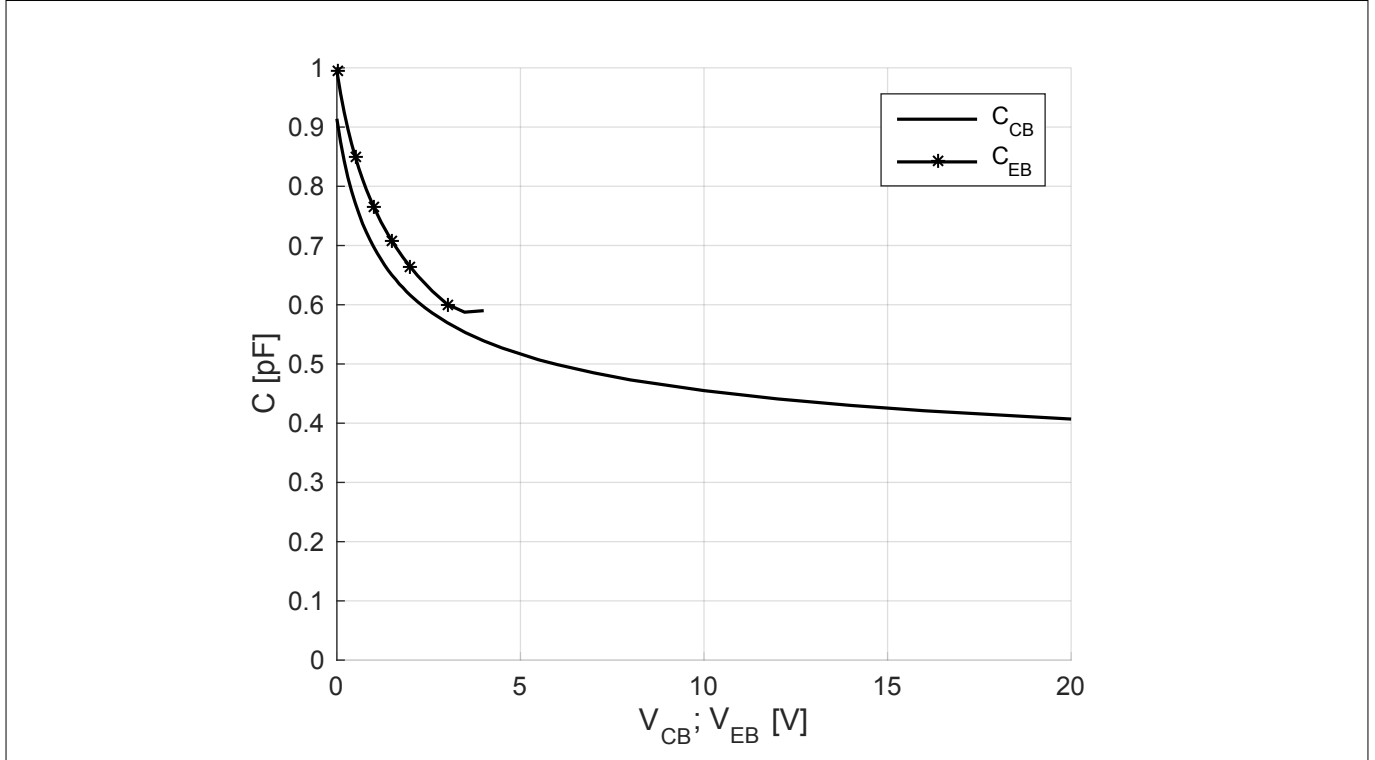


**Figure 4** Collector current  $I_C = f(V_{CE})$ ,  $I_B = \text{parameter}$

**Typical characteristics diagrams**

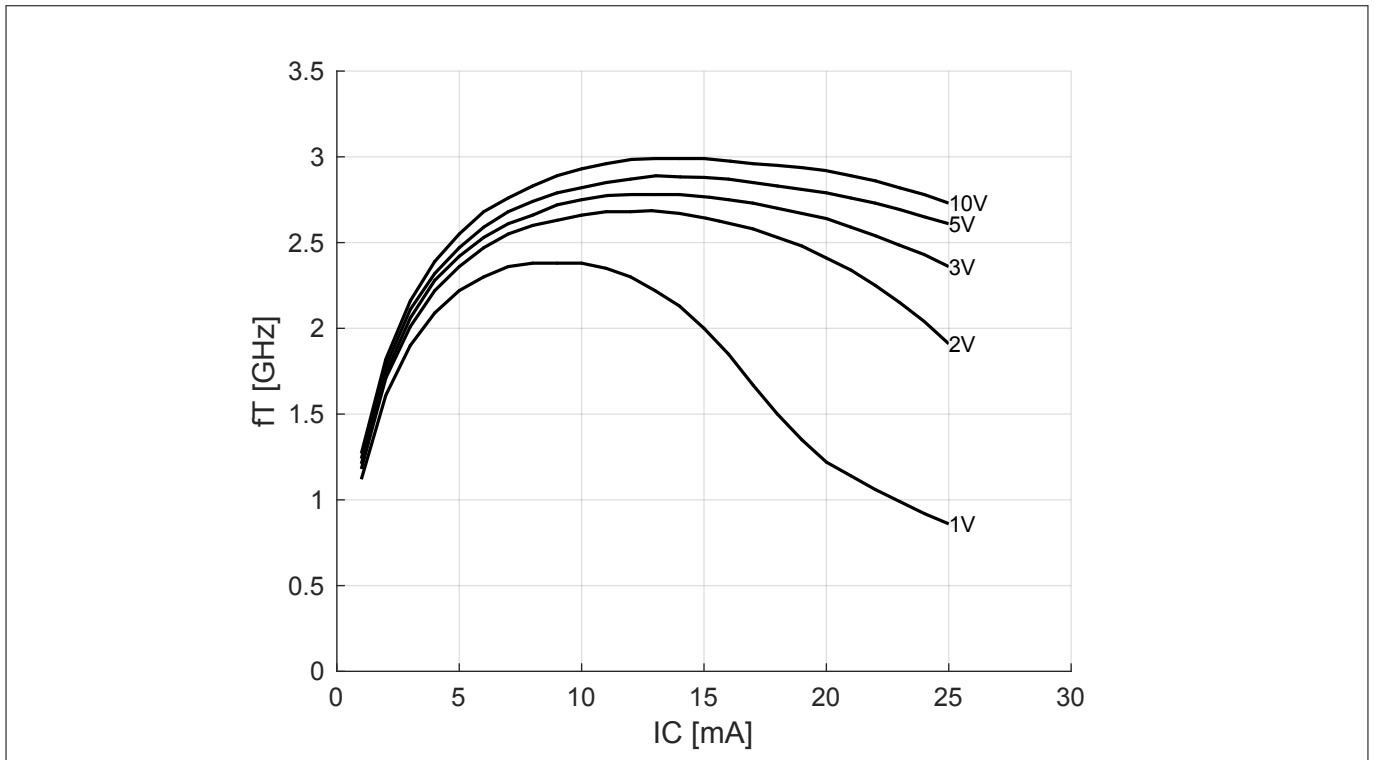


**Figure 5** Current gain  $h_{FE} = f(I_C)$ ,  $V_{CE} = 8\text{ V}$



**Figure 6** Collector-Base  $C_{CB} = f(V_{CB})$ ; Emitter-Base Capacitance  $C_{EB} = f(V_{EB})$

**Typical characteristics diagrams**



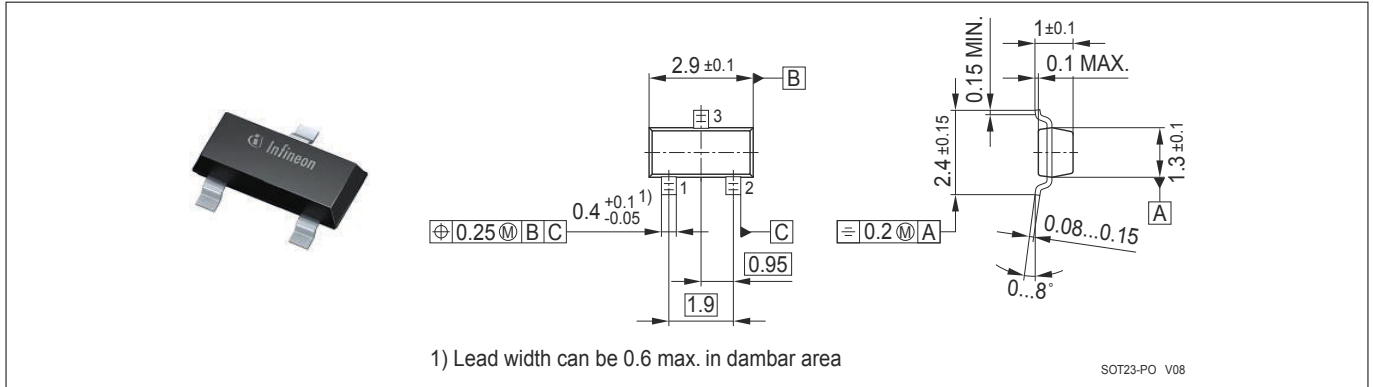
**Figure 7** Transition frequency  $f_T = f(I_C)$ ,  $V_{CE} = \text{parameter}$



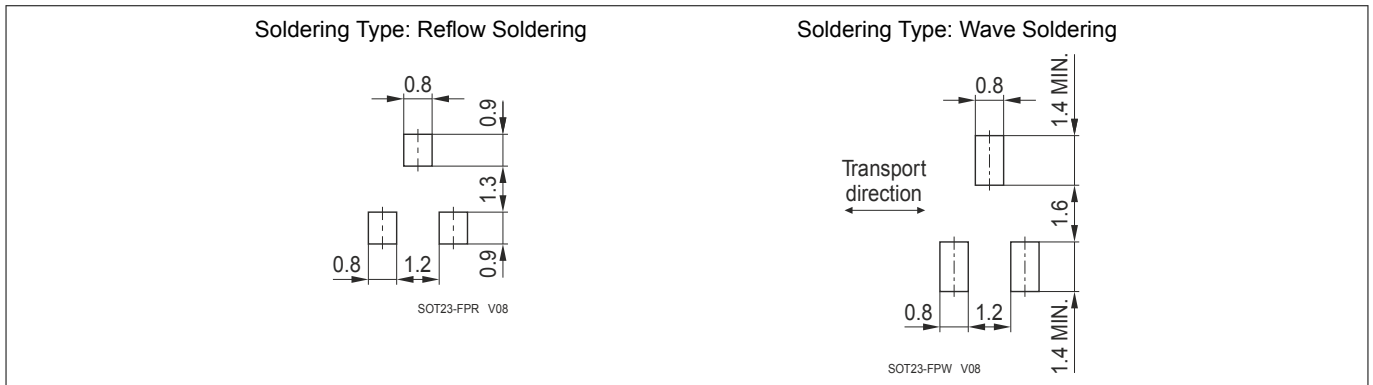
**Package information**

**5 Package information**

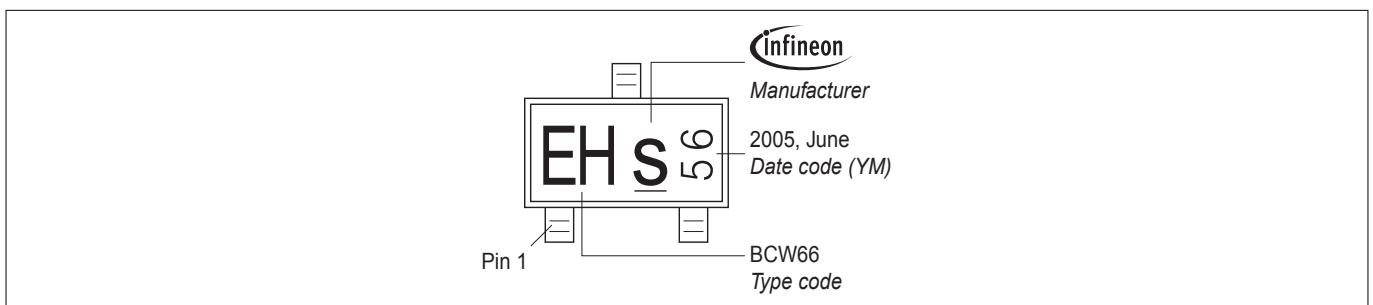
**5.1 SOT23 package**



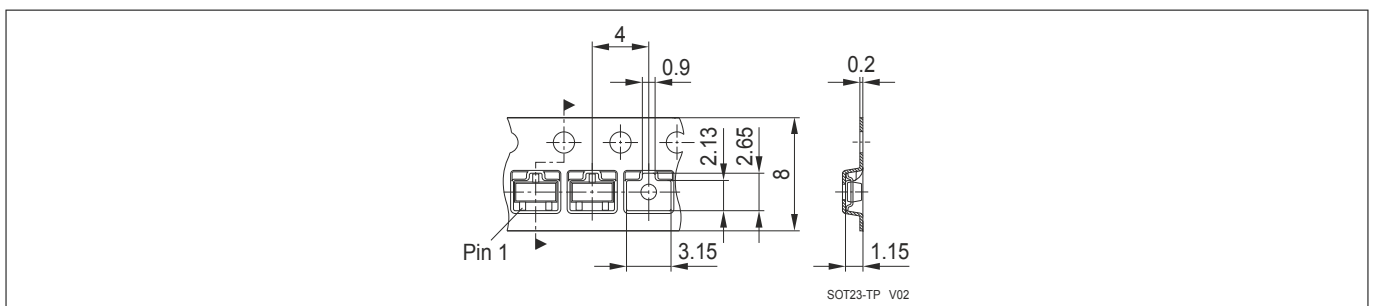
**Figure 8 SOT23 package outline**



**Figure 9 SOT23 foot print**



**Figure 10 SOT23 marking layout (example)**



**Figure 11 SOT23 tape and reel**

---

**Revision History**

**Revision History**

Major changes since previous revision

---

**Revision History**

<b>Reference</b>	<b>Description</b>
All pages	2017-06-01: Conversion to new document template
$R_{thJS}$	2017-06-01: Update of value

## Trademarks

All referenced product or service names and trademarks are the property of their respective owners.

**Edition 2017-06-01**

**Published by  
Infineon Technologies AG  
81726 Munich, Germany**

**© 2017 Infineon Technologies AG  
All Rights Reserved.**

**Do you have a question about any  
aspect of this document?  
Email: [erratum@infineon.com](mailto:erratum@infineon.com)**

**Document reference  
IFX-kwg1493983596879**

## IMPORTANT NOTICE

The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics ("Beschaffheitsgarantie").

With respect to any examples, hints or any typical values stated herein and/or any information regarding the application of the product, Infineon Technologies hereby disclaims any and all warranties and liabilities of any kind, including without limitation warranties of non-infringement of intellectual property rights of any third party.

In addition, any information given in this document is subject to customer's compliance with its obligations stated in this document and any applicable legal requirements, norms and standards concerning customer's products and any use of the product of Infineon Technologies in customer's applications.

The data contained in this document is exclusively intended for technically trained staff. It is the responsibility of customer's technical departments to evaluate the suitability of the product for the intended application and the completeness of the product information given in this document with respect to such application.

## WARNINGS

Due to technical requirements products may contain dangerous substances. For information on the types in question please contact your nearest Infineon Technologies office.

Except as otherwise explicitly approved by Infineon Technologies in a written document signed by authorized representatives of Infineon Technologies, Infineon Technologies' products may not be used in any applications where a failure of the product or any consequences of the use thereof can reasonably be expected to result in personal injury

## X-ON Electronics

Largest Supplier of Electrical and Electronic Components

*Click to view similar products for [RF Bipolar Transistors](#) category:*

*Click to view products by [Infineon](#) manufacturer:*

Other Similar products are found below :

[MAPRST0912-50](#) [MCH4016-TL-H](#) [MMBT5551-G](#) [MRF10120](#) [15GN01CA-TB-E](#) [PH1214-25M](#) [MAPRST0912-350](#) [MMBTH10-TP](#) [BFP640F H6327](#) [BFR 360F H6765](#) [MRF10031](#) [NSVF4009SG4T1G](#) [BFP 182R E7764](#) [BFP405H6740XTSA1](#) [MRF10350](#) [ASMA201](#) [BFR360FH6765XTSA1](#) [BFP410H6327XTSA1](#) [BFP620FH7764XTSA1](#) [BFP720ESDH6327XTSA1](#) [BFP720FH6327XTSA1](#) [BFR360L3E6765XTMA1](#) [BFP420H6433XTMA1](#) [BFP420H6740XTSA1](#) [BFP420H6801XTSA1](#) [MCH4015-TL-H](#) [BF888H6327XTSA1](#) [MMBT2222A-G](#) [BFP196WH6327XTSA1](#) [BFP405FH6327XTSA1](#) [BFP640ESDH6327XTSA1](#) [BFR193L3E6327XTMA1](#) [BFS483H6327XTSA1](#) [NSVF4020SG4T1G](#) [NSVF6003SB6T1G](#) [MRF10005](#) [BFP420FH6327XTSA1](#) [BFP740FESDH6327XTSA1](#) [BFR181E6327HTSA1](#) [BFR181WH6327XTSA1](#) [BFR182E6327HTSA1](#) [BFR193E6327HTSA1](#) [BFP181E7764HTSA1](#) [BFP183WH6327XTSA1](#) [BFP720H6327XTSA1](#) [BFR182WH6327XTSA1](#) [BFU590GX](#) [MAPR-000912-500S00](#) [BFR340FH6327XTSA1](#) [STGWT30HP65FB](#)