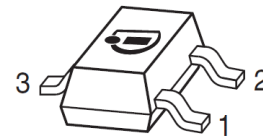


BFS17P

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

	Features	1
	Potential Applications	1
	Device Information	1
	Table of contents	2
1	Maximum Ratings	3
2	Thermal Resistance	3
3	Electrical Characteristics	4
4	Typical characteristics diagrams	5
5	Package information	9
5.1	SOT23 package	9
	Revision History	10
	Trademarks	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 ¹⁾	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}	≤ 195	K/W	–

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

¹ 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	μA	$V_{CB} = 10\text{ V}, I_E = 0$
		–	–	10		$V_{CB} = 25\text{ V}, I_E = 0$
Emitter-base cutoff current	I_{EBO}	–	–	100	μA	$V_{EB} = 2.5\text{ V}, I_C = 0$
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

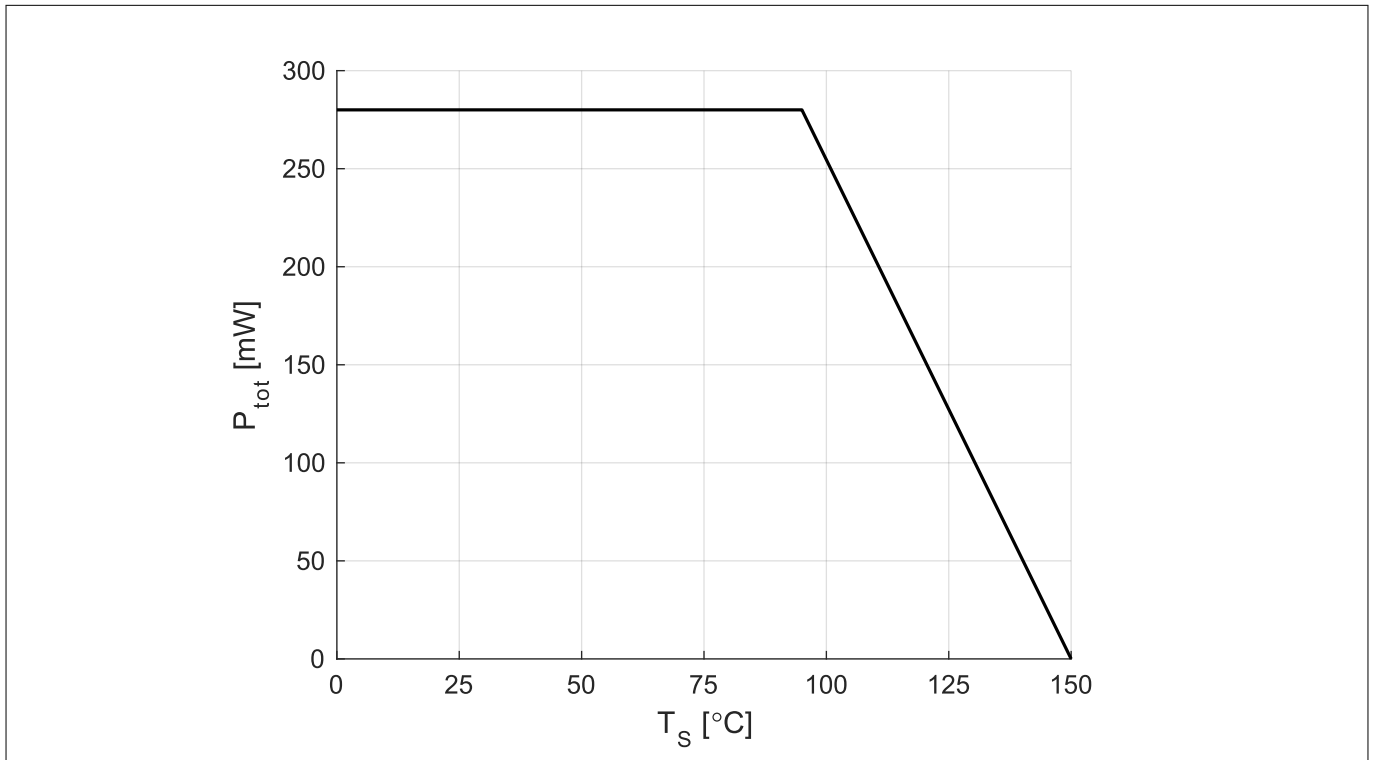


Figure 1 Total Power Dissipation

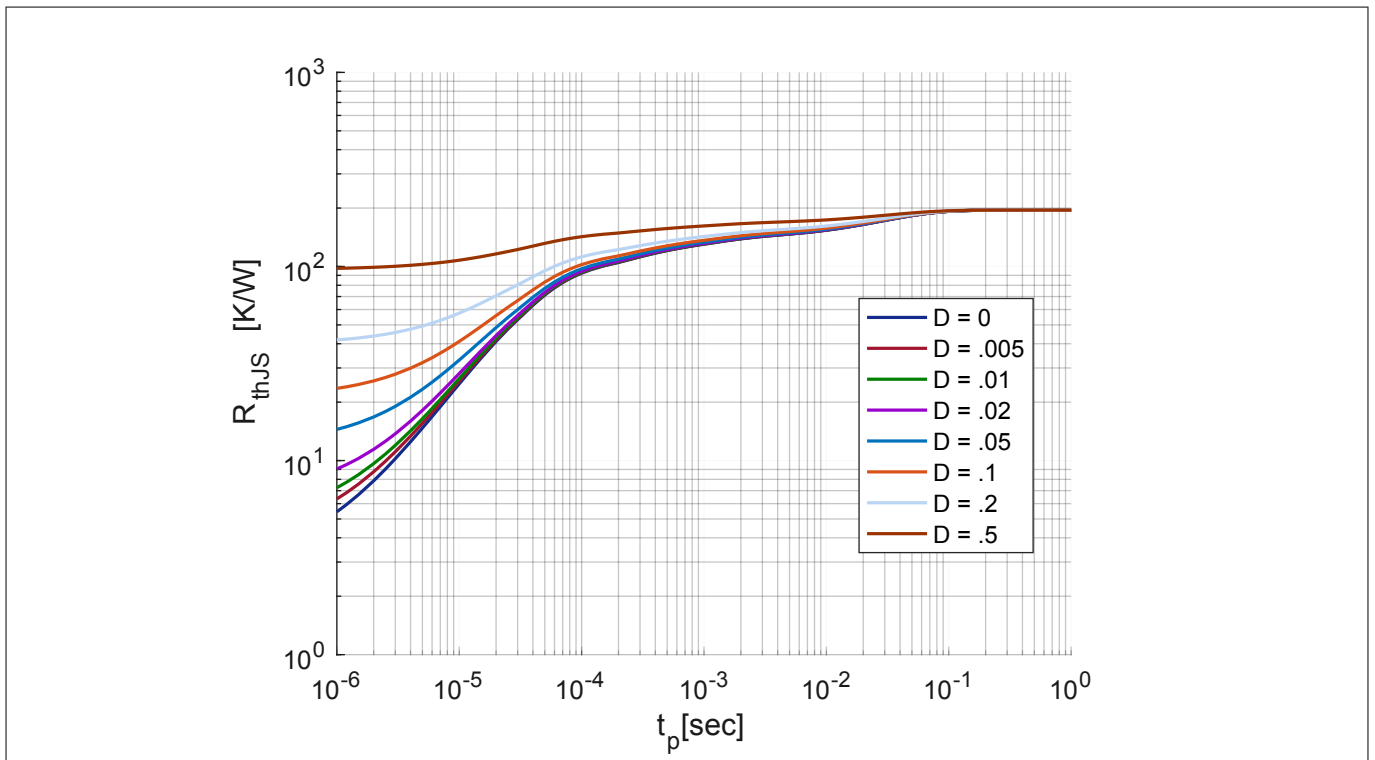


Figure 2 Permissible Pulse Load $R_{thJS} = f(t_p)$

Typical characteristics diagrams

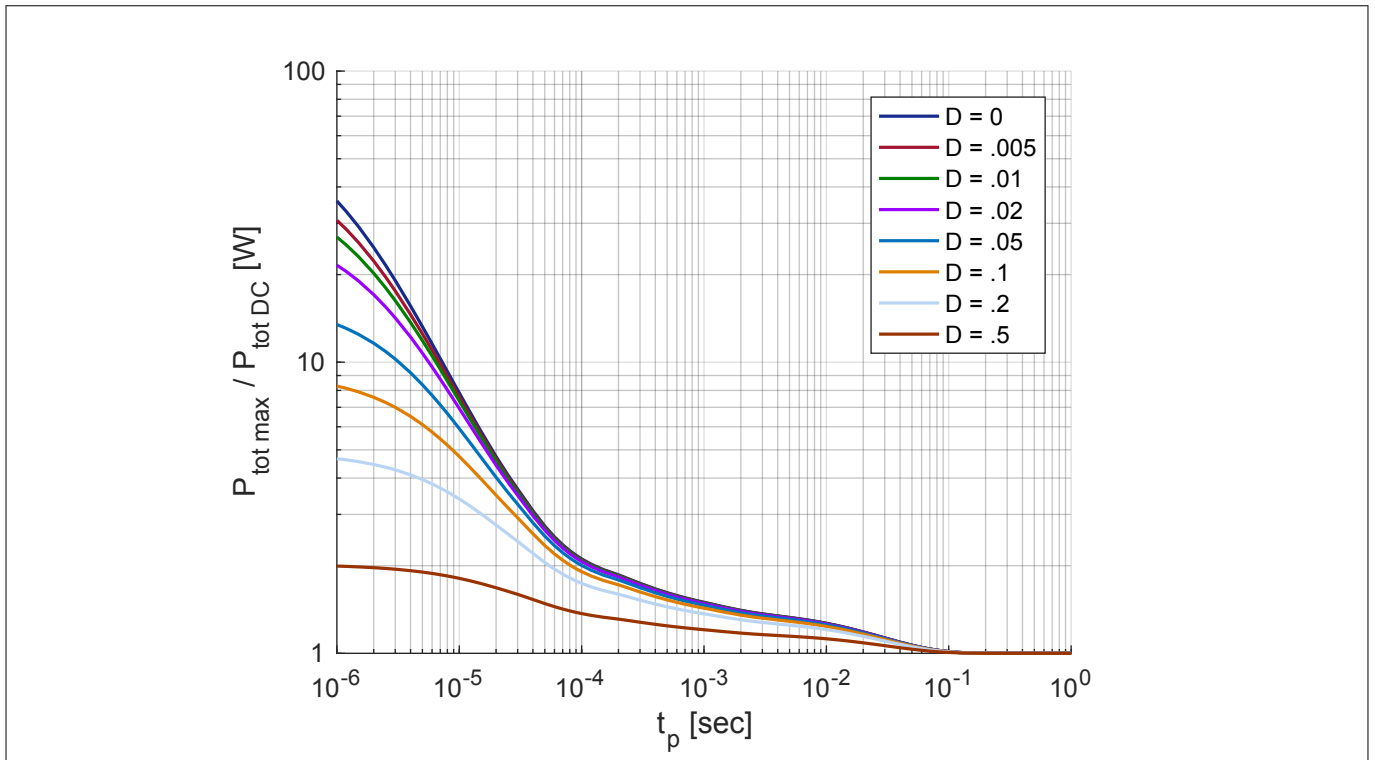


Figure 3 Permissible Pulse Load $P_{totmax} / P_{totDC} = f(t_p)$

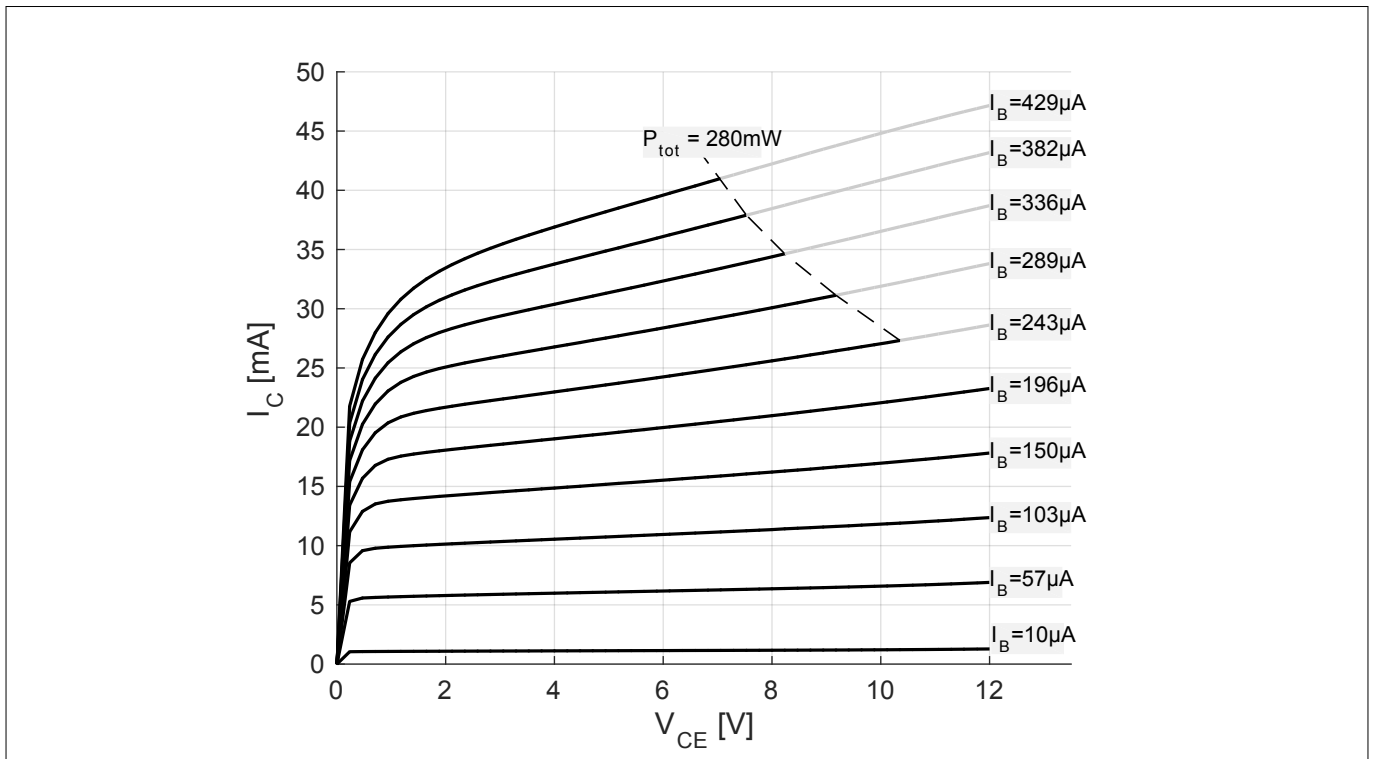


Figure 4 Collector current $I_C = f(V_{CE}), I_B = \text{parameter}$

Typical characteristics diagrams

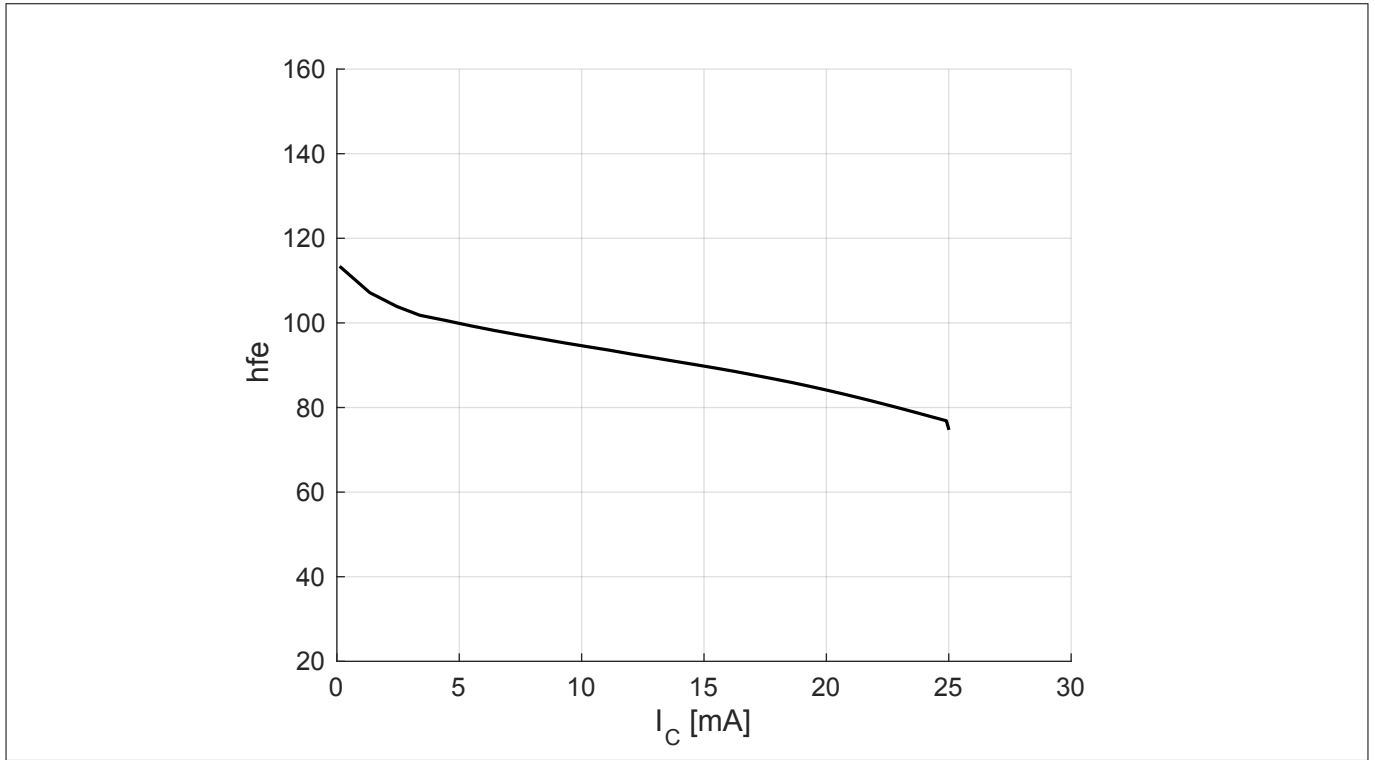


Figure 5 Current gain $h_{FE} = f(I_C)$, $V_{CE} = 8\text{ V}$

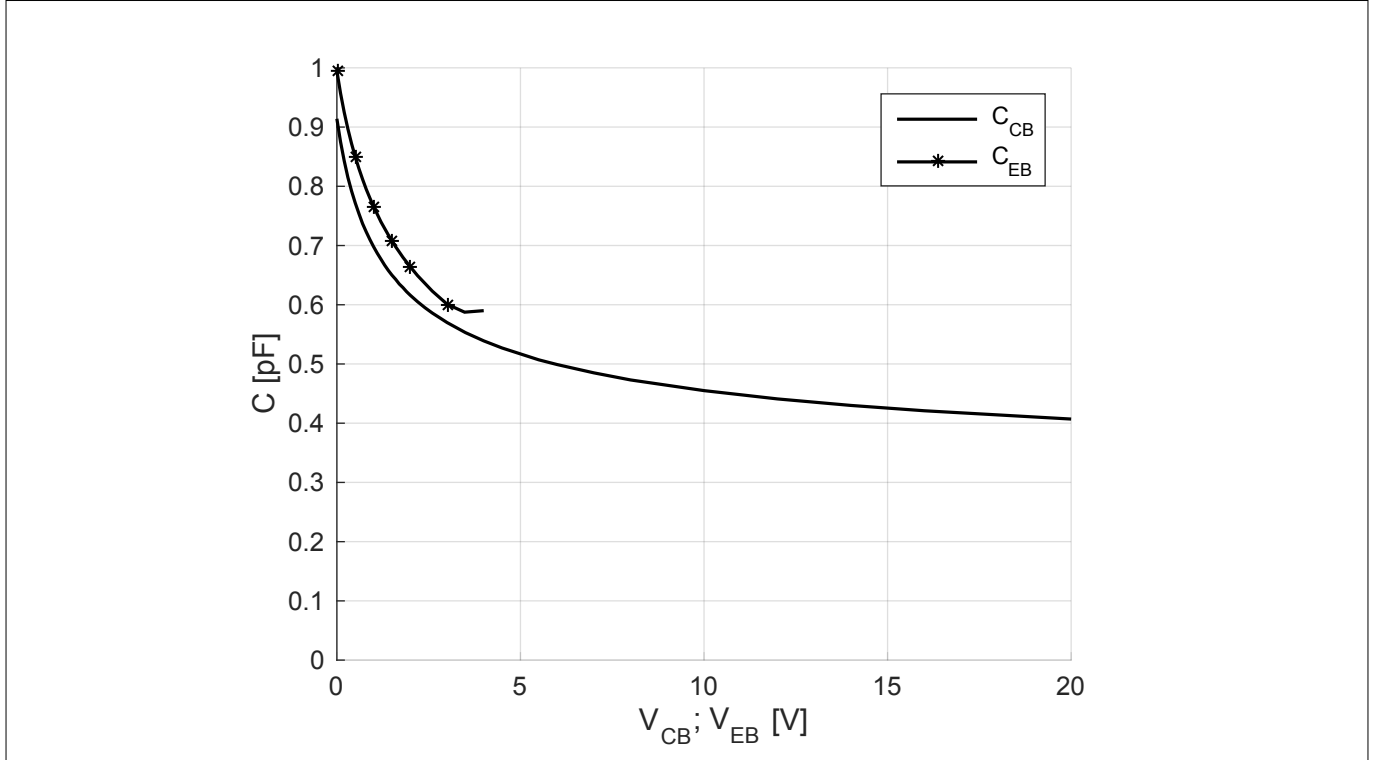


Figure 6 Collector-Base $C_{CB} = f(V_{CB})$; Emitter-Base Capacitance $C_{EB} = f(V_{EB})$

Typical characteristics diagrams

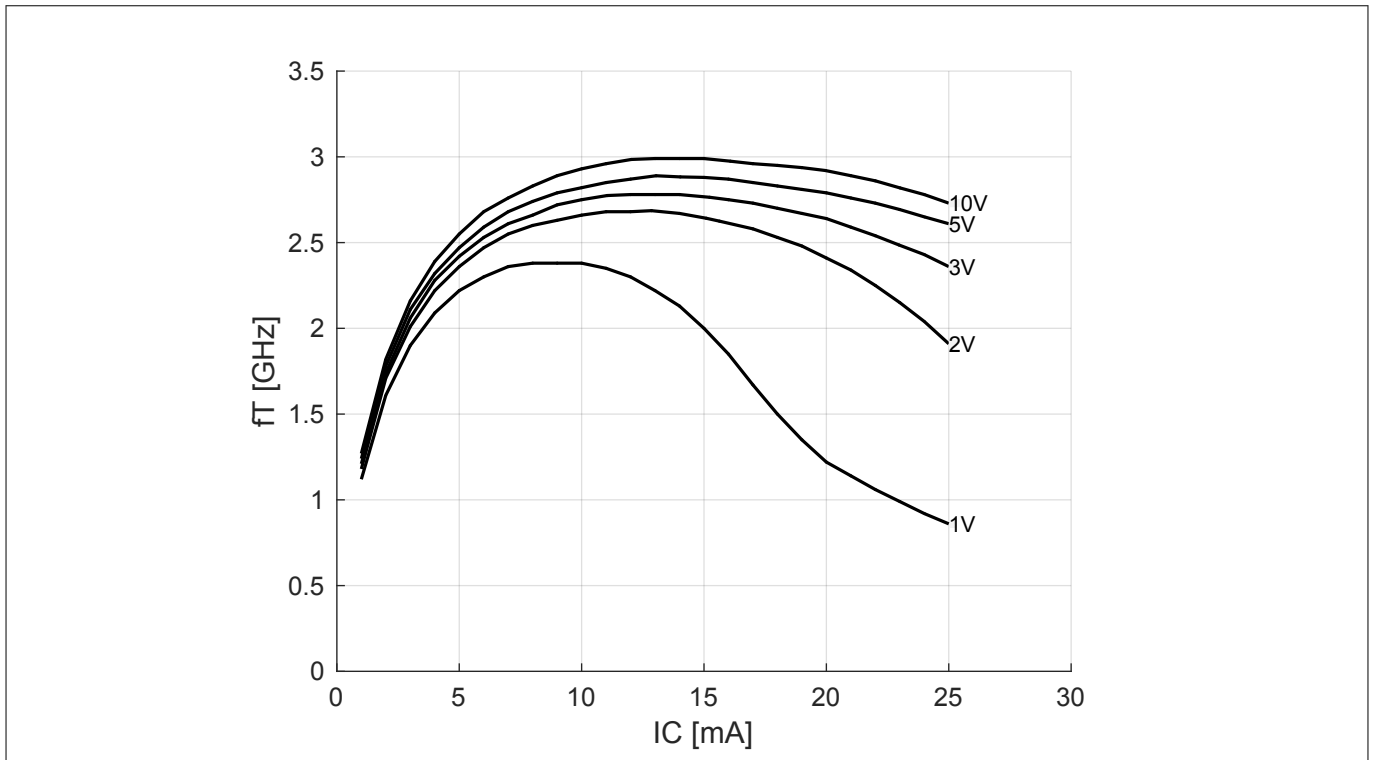


Figure 7 Transition frequency $f_T = f(I_C)$, $V_{CE} = \text{parameter}$

Package information

5 Package information

5.1 SOT23 package

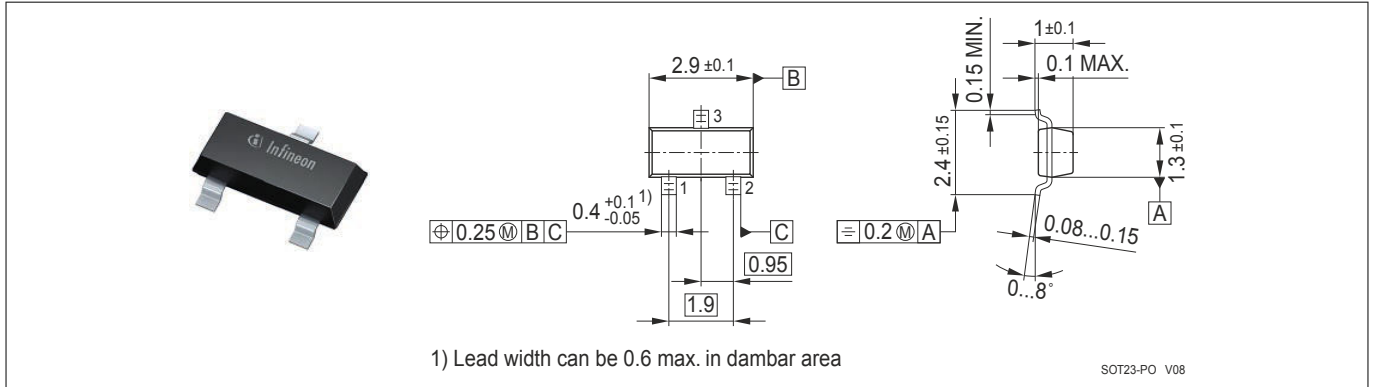


Figure 8 SOT23 package outline

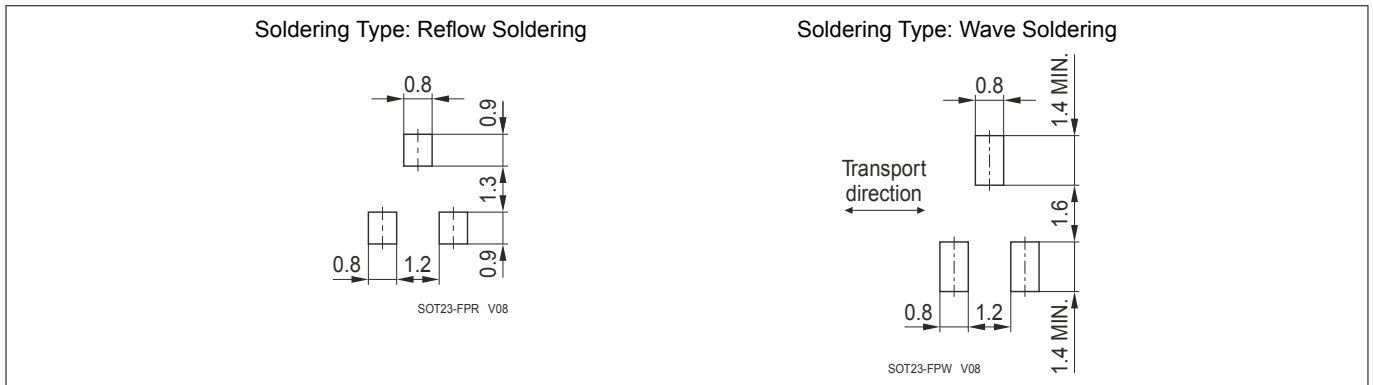


Figure 9 SOT23 foot print

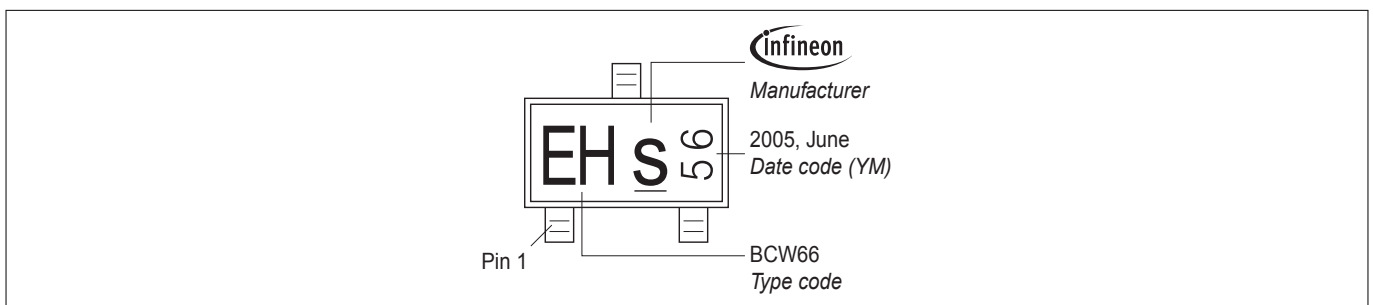


Figure 10 SOT23 marking layout (example)

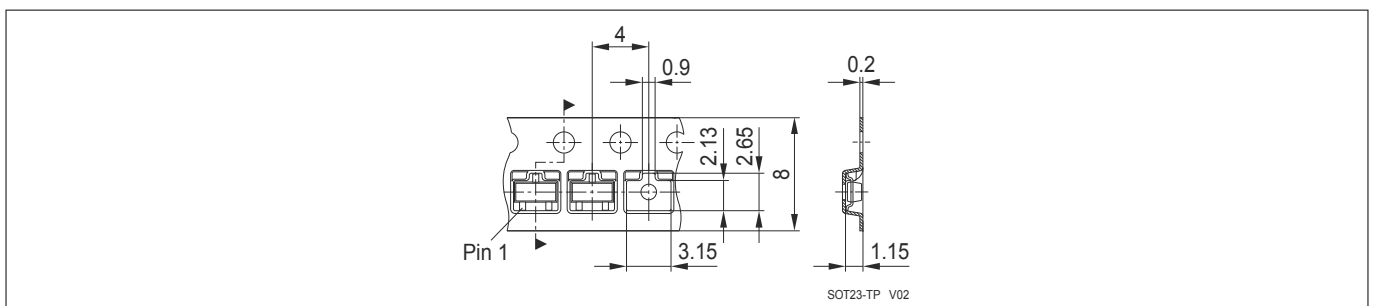


Figure 11 SOT23 tape and reel

Revision History

Revision History

Major changes since previous revision

Revision History

Reference	Description
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

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