

# BAR64-02V

## Low signal distortion, surface mount RF PIN diode



Order now



Technical documents



Simulation



Support

## Product description

This Infineon cost optimized RF PIN diode is designed for low distortion switches that require to hold off large RF voltages, and is best suited for frequencies as high as 6 GHz. Its nominal 50  $\mu\text{m}$  I-region width, combined with the typical 1.55  $\mu\text{s}$  carrier lifetime, result in a diode with low forward resistance and low distortion characteristics.



## Feature list

- Low signal distortion, charge carrier lifetime  $t_{rr} = 1.55 \mu\text{s}$  (typical)
- Ultra low capacitance  $C = 0.13 \text{ pF}$  (typical) at voltage  $V_R = 0$  and frequencies  $f \geq 1 \text{ GHz}$
- Low forward resistance  $R_F = 2.1 \Omega$  (typical) at forward current  $I_F = 10 \text{ mA}$  and frequency  $f = 100 \text{ MHz}$
- Low inductance  $L_s = 0.6 \text{ nH}$  (typical)
- Industry standard SC79 package (1.6 mm x 0.8 mm x 0.55 mm)
- Pb-free, RoHS compliant and halogen-free

## Product validation

Qualified for industrial applications according to the relevant tests of JEDEC47/20/22.

## Potential applications

Optimized for low bias current RF and high-speed interface switches and attenuators

- Wireless communication
- High speed data networks

## Device information



**Table 1** Part information

Product name / Ordering code	Package	Pin configuration	Marking	Pieces / Reel
BAR64-02V / BAR6402VH6327XTSA1	SC79	Single, with leads	0	3 k

**Attention:** ESD (Electrostatic discharge) sensitive device, observe handling precautions!

**Table of contents**

**Table of contents**

	<b>Product description</b> .....	1
	<b>Feature list</b> .....	1
	<b>Product validation</b> .....	1
	<b>Potential applications</b> .....	1
	<b>Device information</b> .....	1
	<b>Table of contents</b> .....	2
<b>1</b>	<b>Absolute maximum ratings</b> .....	2
<b>2</b>	<b>Electrical performance in test fixture</b> .....	3
2.1	DC characteristics .....	3
2.2	AC characteristics .....	4
<b>3</b>	<b>Thermal characteristics</b> .....	9
<b>4</b>	<b>Package information SC79</b> .....	11
	<b>Revision history</b> .....	12
	<b>Disclaimer</b> .....	13

**1 Absolute maximum ratings**

**Table 2 Absolute maximum ratings at  $T_A = 25\text{ °C}$ , unless otherwise specified**

Parameter	Symbol	Values		Unit	Note or test condition
		Min.	Max.		
Diode reverse voltage	$V_R$	–	150	V	
Forward current	$I_F$	–	100	mA	
Total power dissipation	$P_{TOT}$	–	250	mW	$T_S \leq 125\text{ °C}$ <sup>1)</sup>
Junction temperature	$T_J$	–	150	°C	
Operating temperature	$T_{OP}$	-55	125		
Storage temperature	$T_{STG}$	-55	150		

**Attention:** *Stresses above the maximum values listed here may cause permanent damage to the device. Exposure to absolute maximum rating conditions for extended periods may affect device reliability. Exceeding only one of these values may cause irreversible damage to the component.*

<sup>1</sup>  $T_S$  is the soldering point temperature.

**Electrical performance in test fixture**

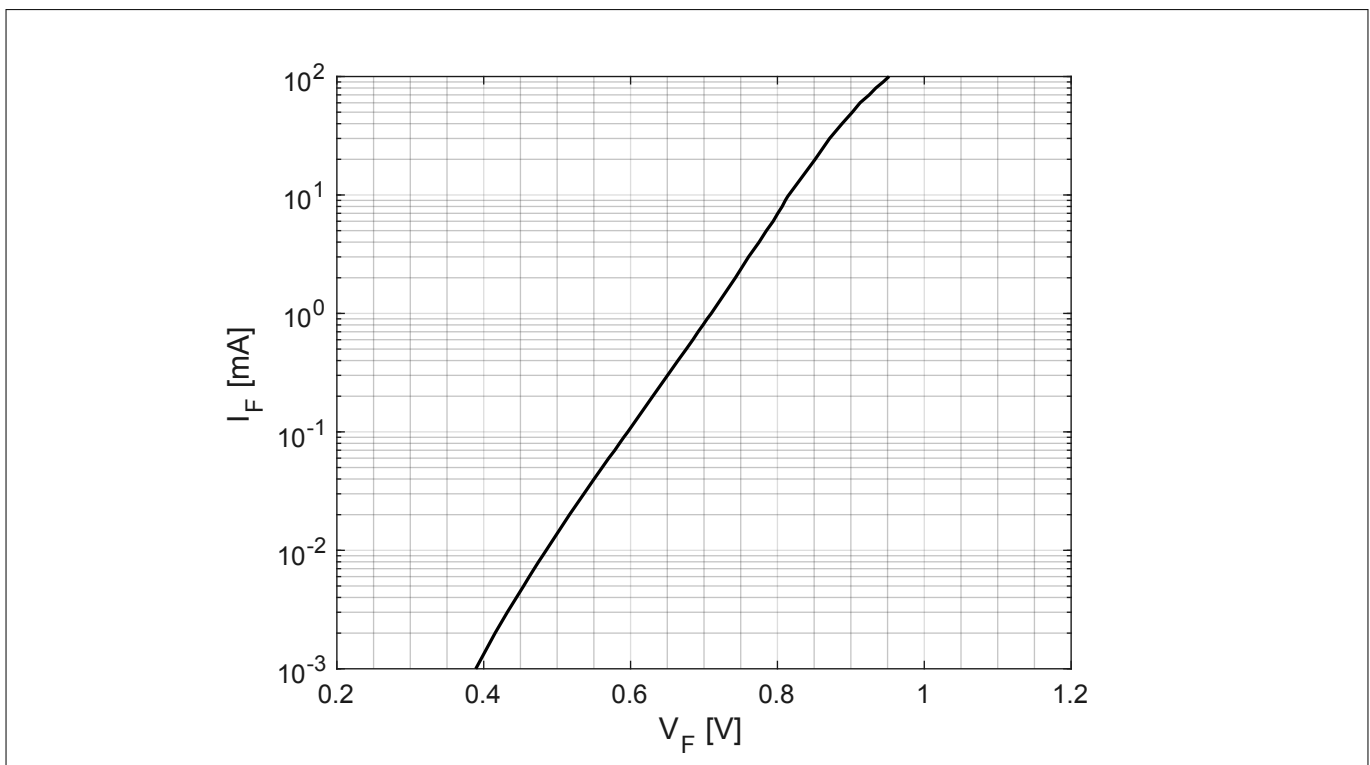
**2 Electrical performance in test fixture**

**2.1 DC characteristics**

At  $T_A = 25\text{ }^\circ\text{C}$ , unless otherwise specified

**Table 3 DC characteristics**

Parameter	Symbol	Values			Unit	Note or test condition
		Min.	Typ.	Max.		
Breakdown voltage	$V_{BR}$	150	–	–	V	$I_R = 5\text{ }\mu\text{A}$
Reverse current	$I_R$	–	–	20	nA	$V_R = 20\text{ V}$
Forward voltage	$V_F$	–	0.82	–	V	$I_F = 10\text{ mA}$
		–	0.9	–		$I_F = 50\text{ mA}$
		–	0.95	1.1		$I_F = 100\text{ mA}$
I-region width	$W_I$	–	50	–	$\mu\text{m}$	



**Figure 1 Forward current  $I_F$  vs. forward voltage  $V_F$**

**Electrical performance in test fixture**

**2.2 AC characteristics**

At  $T_A = 25\text{ °C}$ , unless otherwise specified

**Table 4 Key parameter**

Parameter	Symbol	Values			Unit	Note or test condition
		Min.	Typ.	Max.		
Capacitance	C	-	0.56	-	pF	$V_R = 0\text{ V}, f = 1\text{ MHz}$
		-	0.2	0.35		$V_R = 20\text{ V}, f = 1\text{ MHz}$
Forward resistance	$R_F$	-	10.1	20	$\Omega$	$I_F = 1\text{ mA}, f = 100\text{ MHz}$
		-	4.3	-		$I_F = 3\text{ mA}, f = 100\text{ MHz}$
		-	3.1	-		$I_F = 5\text{ mA}, f = 100\text{ MHz}$
		-	2.1	2.8		$I_F = 10\text{ mA}, f = 100\text{ MHz}$
		-	-	1.35		$I_F = 100\text{ mA}, f = 100\text{ MHz}$
Inductance	$L_S$	-	0.6	-	nH	
Charge carrier lifetime	$\tau_{rr}$	-	1550	-	ns	$I_F = 10\text{ mA}, I_R = 6\text{ mA}$ , measured at $I_R = 3\text{ mA}$ , $R_L = 100\ \Omega$

**Table 5 AC parameter at  $f = 1\text{ GHz}$**

Parameter	Symbol	Values			Unit	Note or test condition
		Min.	Typ.	Max.		
Capacitance	C	-	0.13	-	pF	$V_R = 0\text{ V}$
Reverse parallel resistance	$R_P$	-	3.9	-	k $\Omega$	$V_R = 0\text{ V}$
Forward resistance	$R_F$	-	9.6	-	$\Omega$	$I_F = 1\text{ mA}$
		-	4.3	-		$I_F = 3\text{ mA}$
		-	3.1	-		$I_F = 5\text{ mA}$
		-	2.2	-		$I_F = 10\text{ mA}$
Insertion loss	$I_L$	-	0.79	-	dB	$I_F = 1\text{ mA}$
		-	0.37	-		$I_F = 3\text{ mA}$
		-	0.28	-		$I_F = 5\text{ mA}$
		-	0.2	-		$I_F = 10\text{ mA}$
Isolation	$I_{SO}$	-	22.4	-		$V_R = 0\text{ V}$

**Table 6 AC parameter at  $f = 1.8\text{ GHz}$**

Parameter	Symbol	Values			Unit	Note or test condition
		Min.	Typ.	Max.		
Capacitance	C	-	0.12	-	pF	$V_R = 0\text{ V}$
Reverse parallel resistance	$R_P$	-	3.3	-	k $\Omega$	$V_R = 0\text{ V}$

**Electrical performance in test fixture**

**Table 6 AC parameter at  $f = 1.8$  GHz (continued)**

Parameter	Symbol	Values			Unit	Note or test condition
		Min.	Typ.	Max.		
Forward resistance	$R_F$	-	9.6	-	$\Omega$	$I_F = 1$ mA
		-	4.3	-		$I_F = 3$ mA
		-	3.2	-		$I_F = 5$ mA
		-	2.3	-		$I_F = 10$ mA
Insertion loss	$I_L$	-	0.8	-	dB	$I_F = 1$ mA
		-	0.39	-		$I_F = 3$ mA
		-	0.3	-		$I_F = 5$ mA
		-	0.23	-		$I_F = 10$ mA
Isolation	$I_{SO}$	-	17.7	-		$V_R = 0$ V

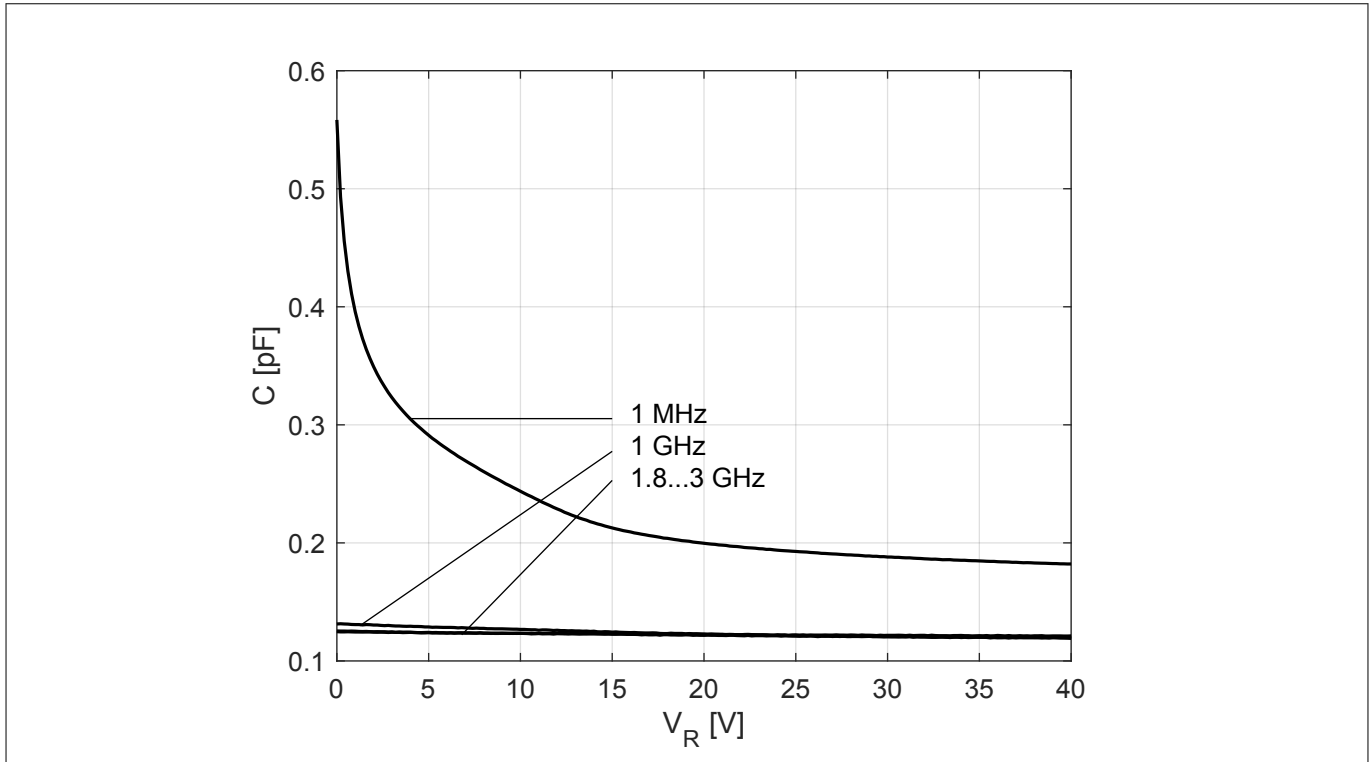
**Table 7 AC parameter at  $f = 2.5$  GHz**

Parameter	Symbol	Values			Unit	Note or test condition
		Min.	Typ.	Max.		
Capacitance	$C$	-	0.12	-	pF	$V_R = 0$ V
Reverse parallel resistance	$R_P$	-	3	-	k $\Omega$	$V_R = 0$ V
Forward resistance	$R_F$	-	9.7	-	$\Omega$	$I_F = 1$ mA
		-	4.4	-		$I_F = 3$ mA
		-	3.3	-		$I_F = 5$ mA
		-	2.4	-		$I_F = 10$ mA
Insertion loss	$I_L$	-	0.82	-	dB	$I_F = 1$ mA
		-	0.42	-		$I_F = 3$ mA
		-	0.33	-		$I_F = 5$ mA
		-	0.26	-		$I_F = 10$ mA
Isolation	$I_{SO}$	-	15.1	-		$V_R = 0$ V

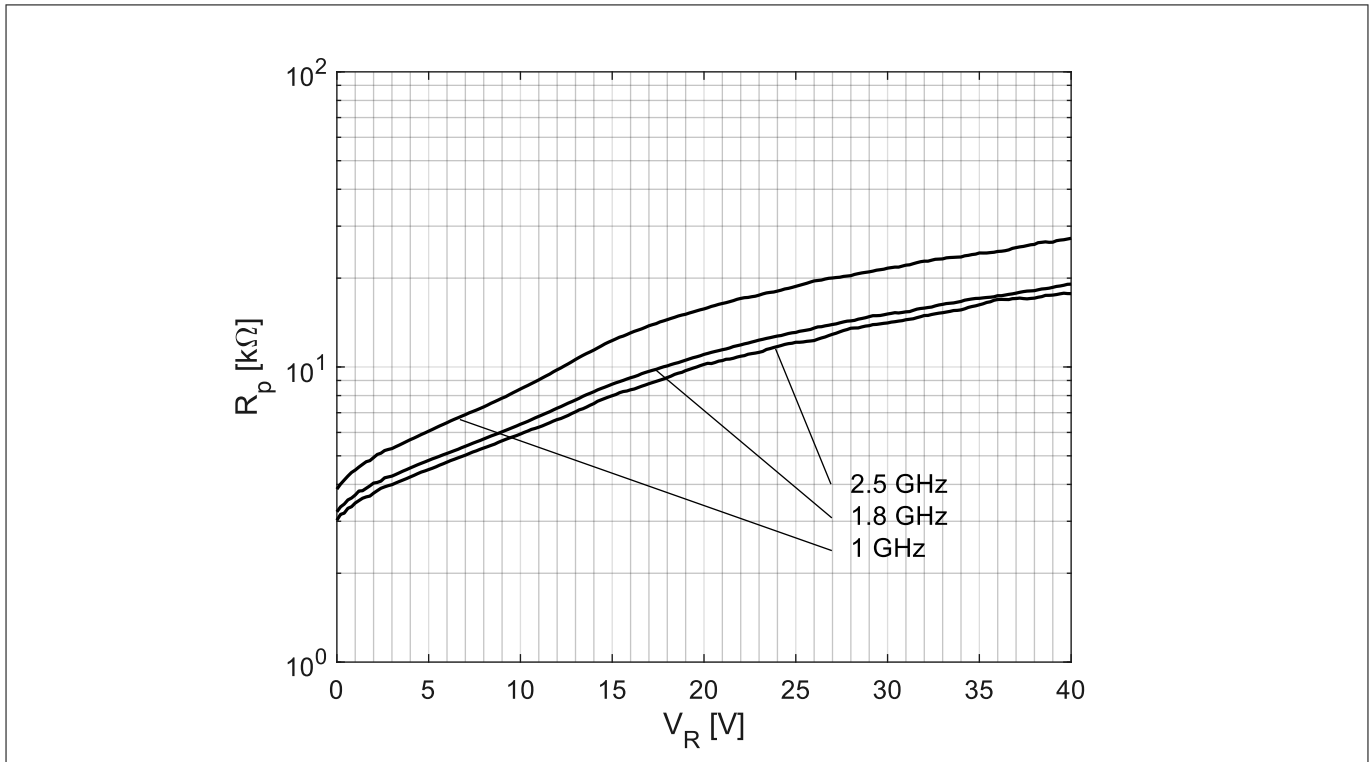
**Table 8 AC parameter at  $f = 5.5$  GHz**

Parameter	Symbol	Values			Unit	Note or test condition
		Min.	Typ.	Max.		
Insertion loss	$I_L$	-	1.03	-	dB	$I_F = 1$ mA
		-	0.64	-		$I_F = 3$ mA
		-	0.56	-		$I_F = 5$ mA
		-	0.49	-		$I_F = 10$ mA
Isolation	$I_{SO}$	-	7.7	-		$V_R = 0$ V

**Electrical performance in test fixture**

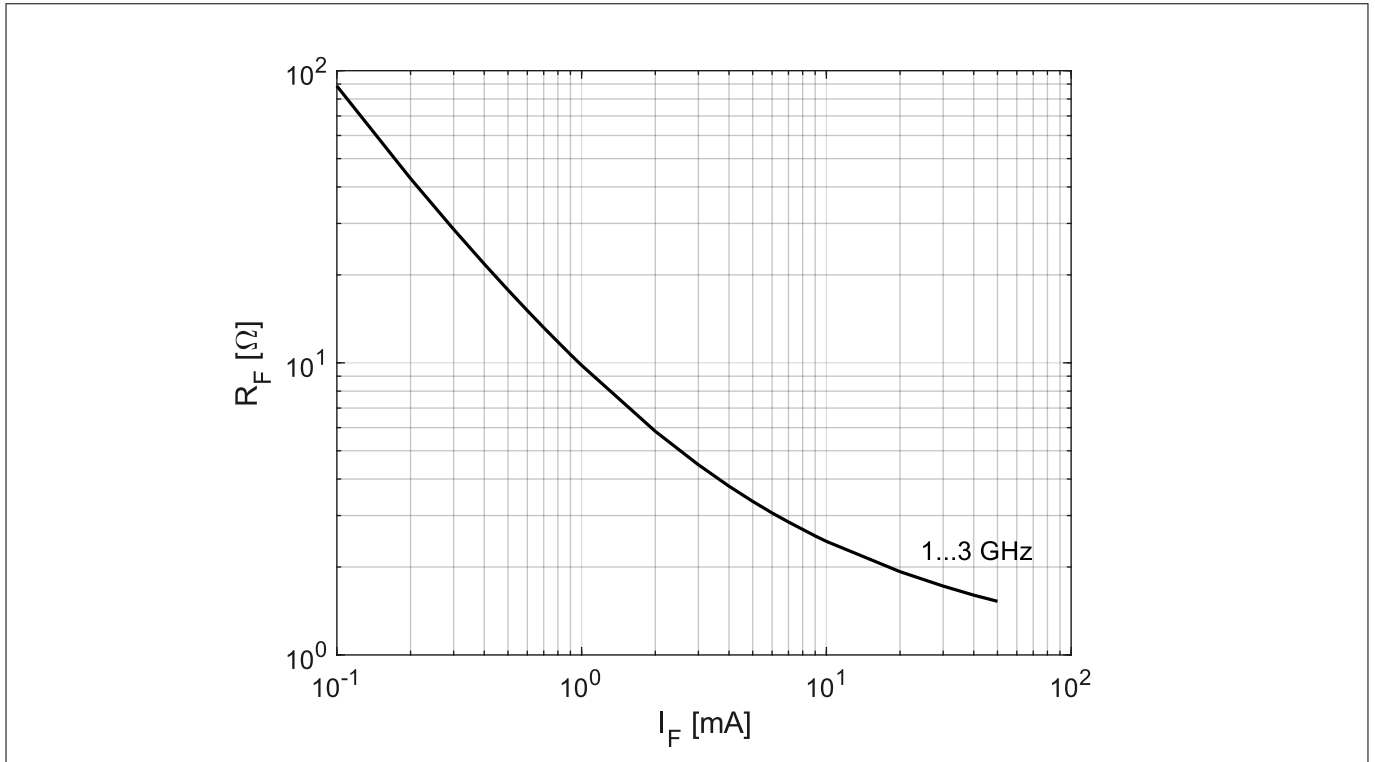


**Figure 2** Capacitance  $C$  vs. reverse voltage  $V_R$  at different frequencies

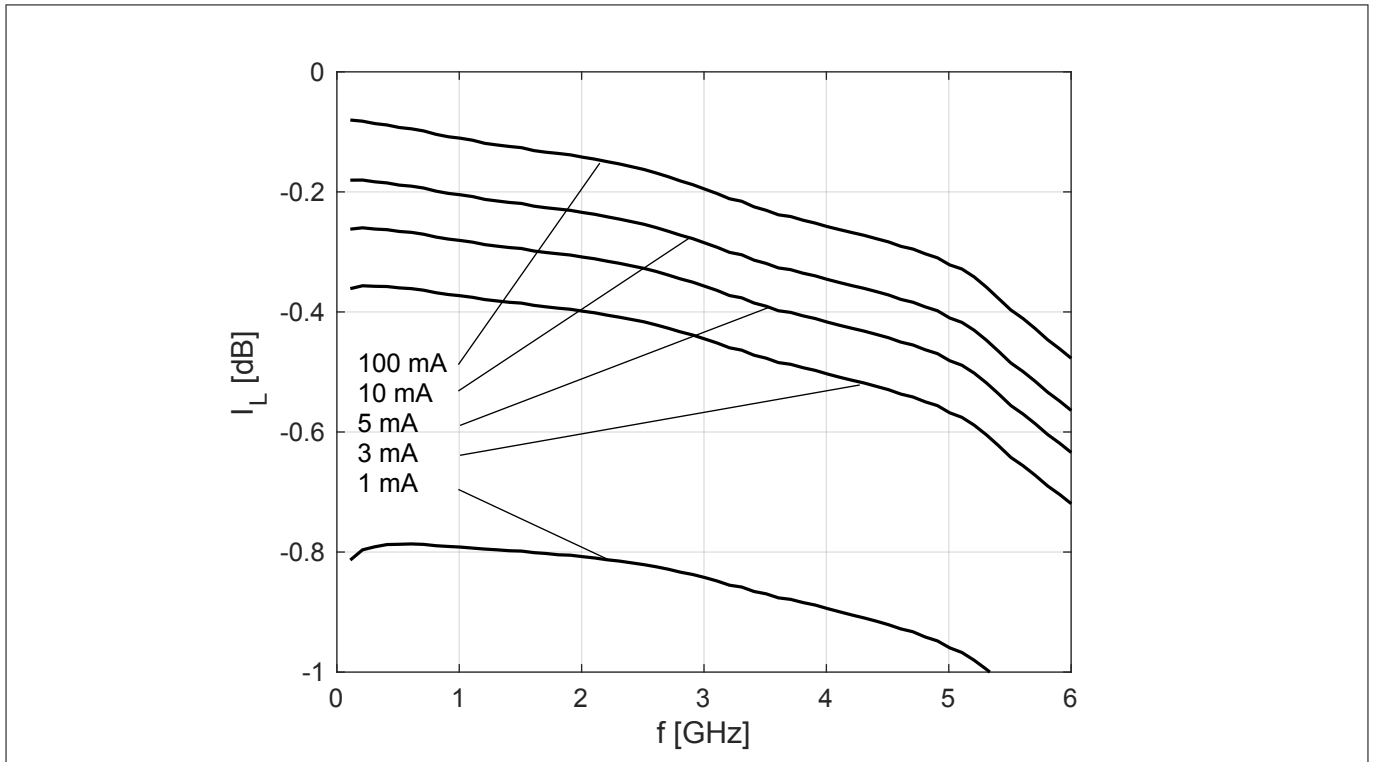


**Figure 3** Reverse parallel resistance  $R_p$  vs. reverse voltage  $V_R$  at different frequencies

**Electrical performance in test fixture**

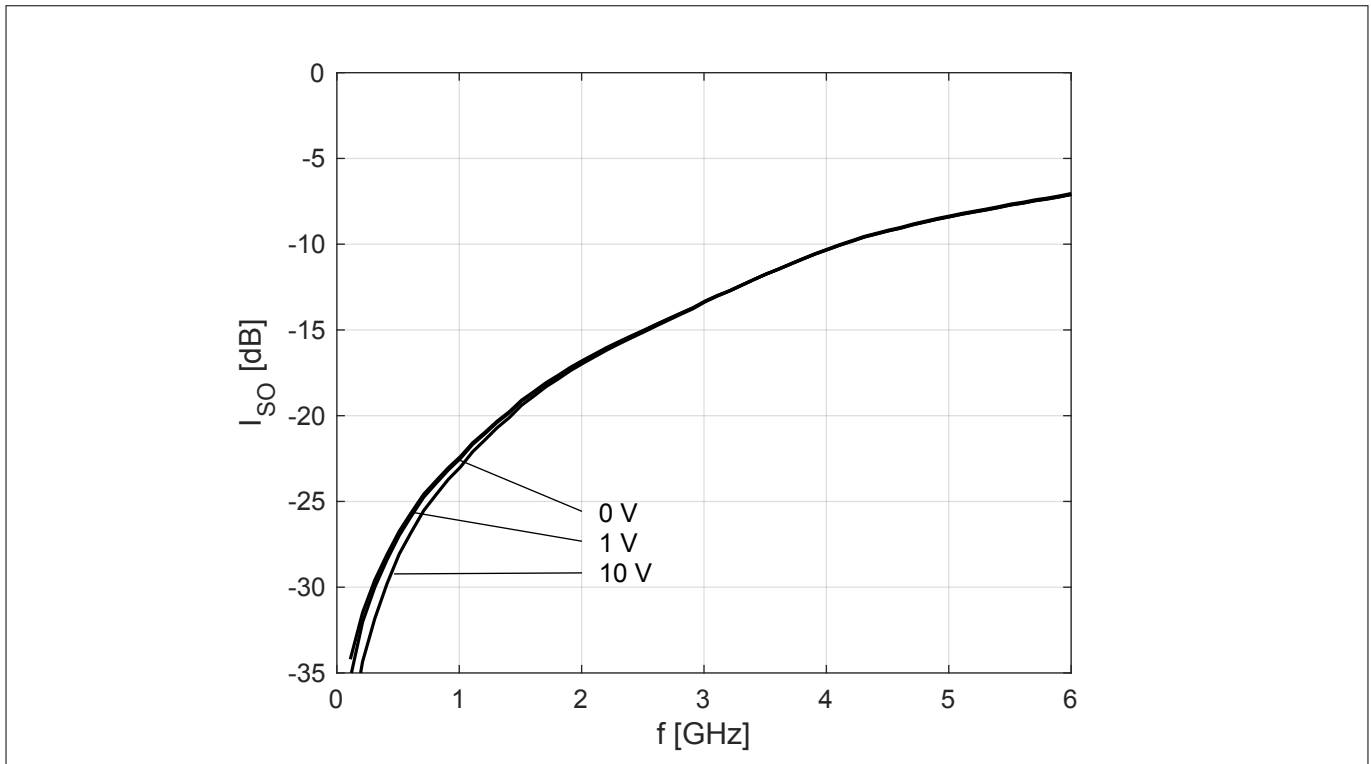


**Figure 4 Forward resistance  $R_F$  vs. forward current  $I_F$  at different frequencies**



**Figure 5 Insertion loss  $I_L$  vs. frequency  $f$  at different forward currents**

**Electrical performance in test fixture**



**Figure 6** Isolation  $I_{SO}$  vs. frequency  $f$  at different reverse voltages

*Note:* The curves shown in this chapter have been generated using typical devices but shall not be understood as a guarantee that all devices have identical characteristic curves.

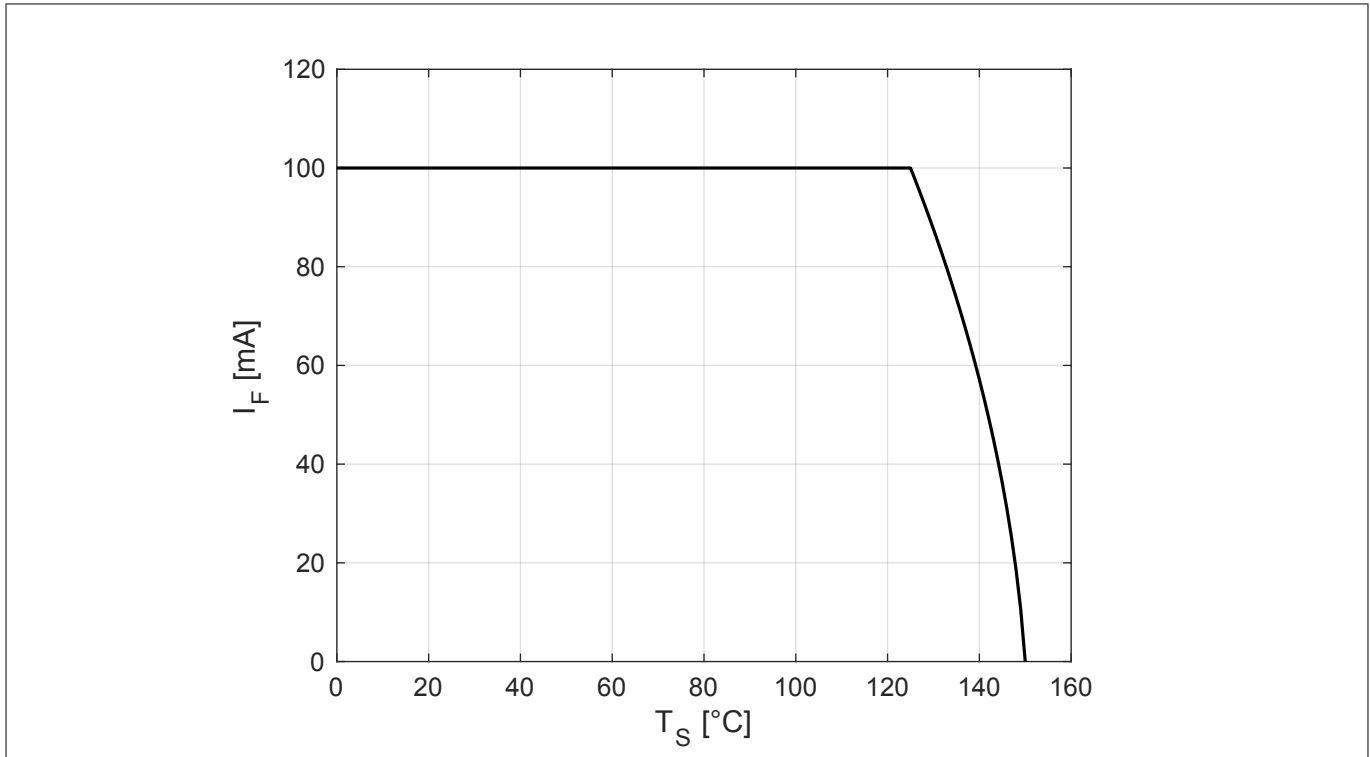


**Thermal characteristics**

**3 Thermal characteristics**

**Table 9 Thermal resistance**

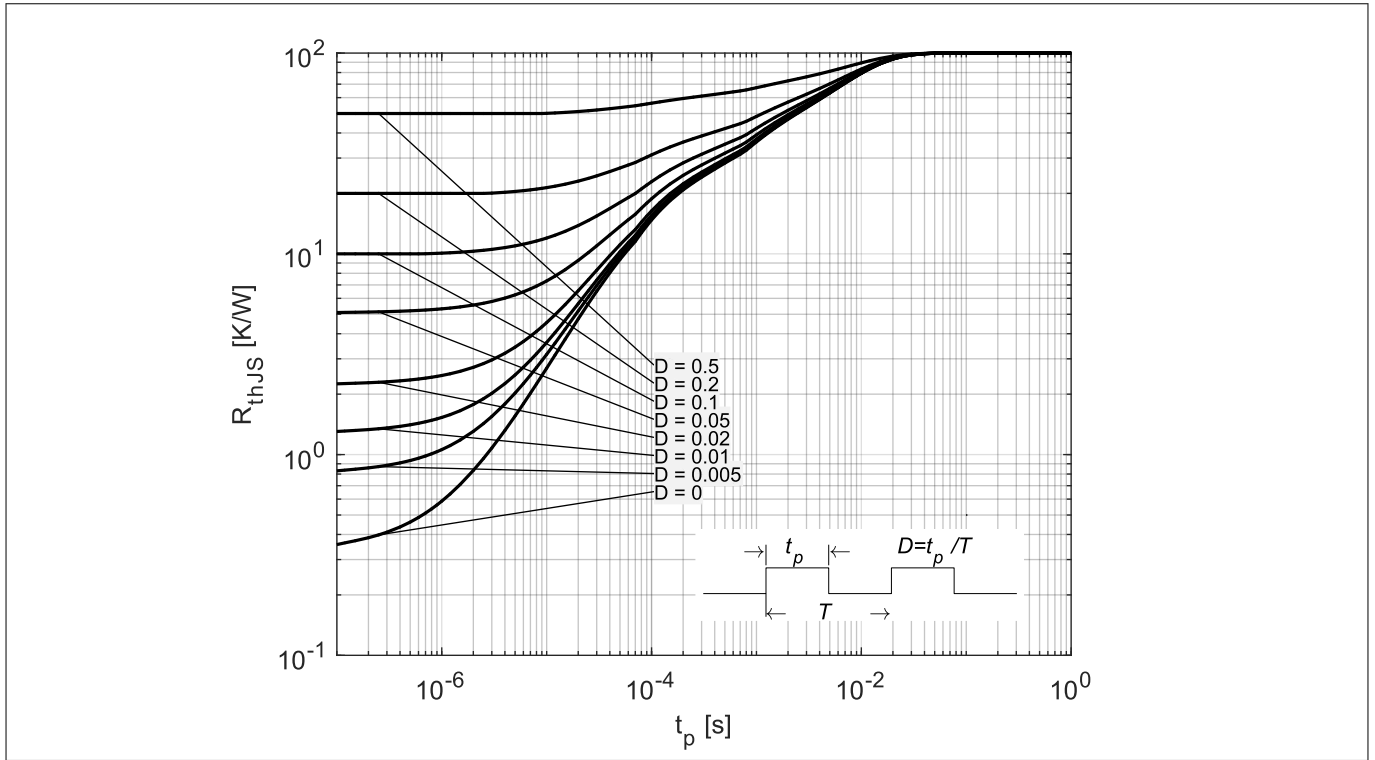
Parameter	Symbol	Values			Unit	Note or test condition
		Min.	Typ.	Max.		
Thermal resistance (junction - soldering point)	$R_{thJS}$	-	100	-	K/W	$T_S = 125\text{ °C}$ <sup>2)</sup>



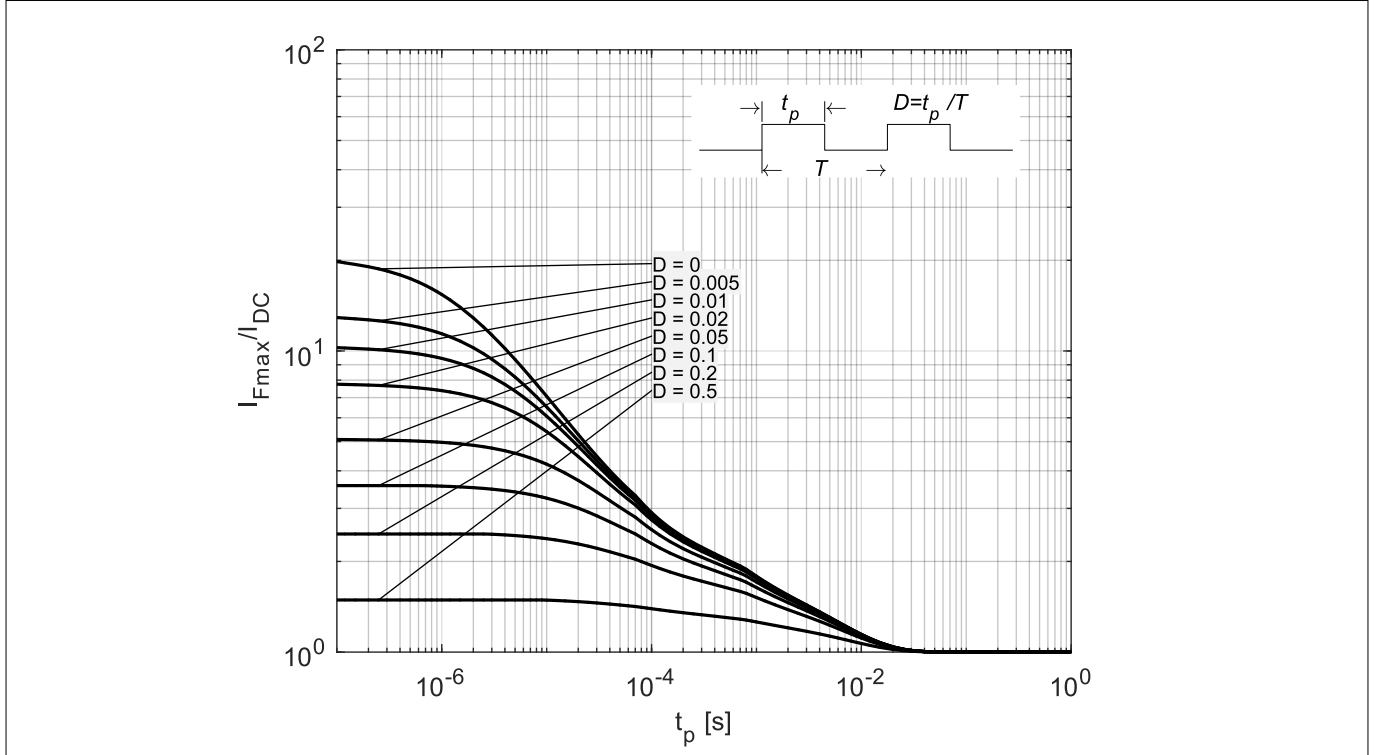
**Figure 7 Permissible forward current  $I_F$  in DC operation**

<sup>2</sup> For  $R_{thJS}$  in other conditions refer to the curves in this chapter.

**Thermal characteristics**



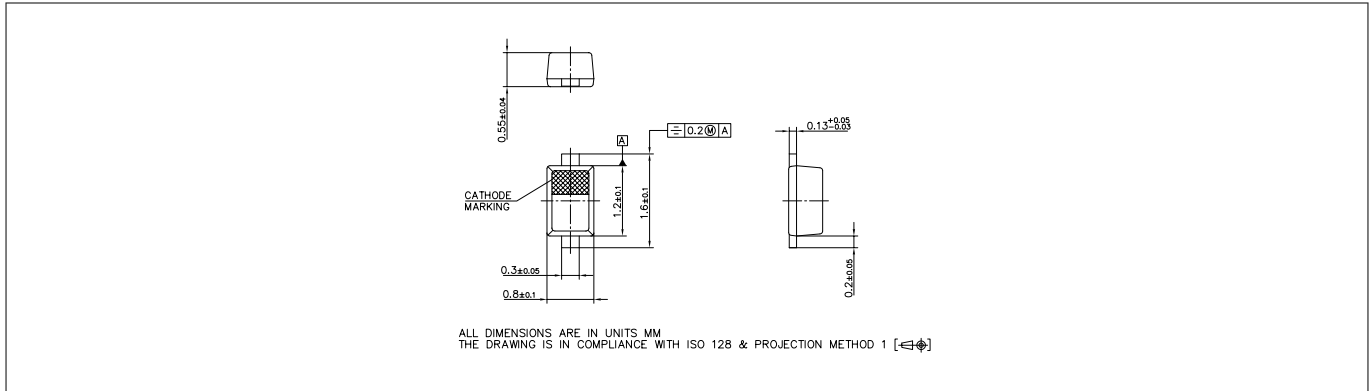
**Figure 8 Thermal resistance  $R_{thJS}$  in pulse operation**



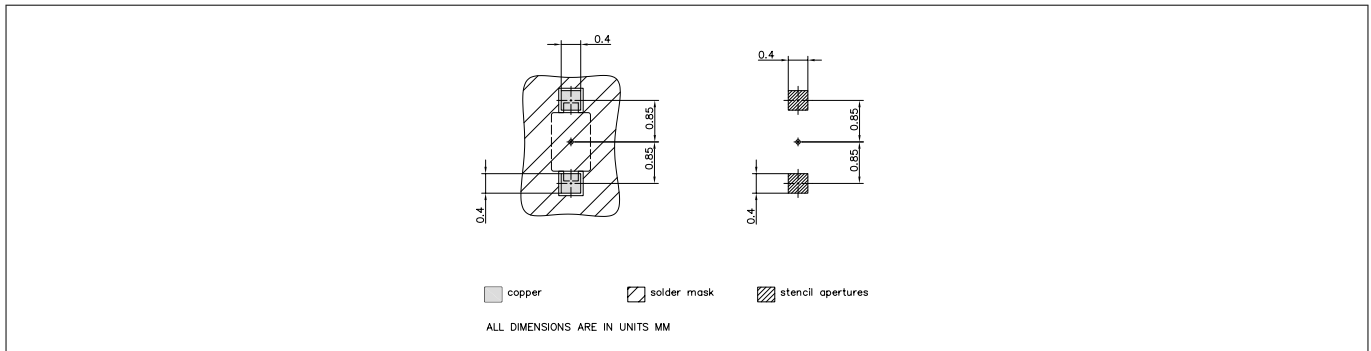
**Figure 9 Permissible forward current ratio  $I_{Fmax}/I_{DC}$  in pulse operation**

**Package information SC79**

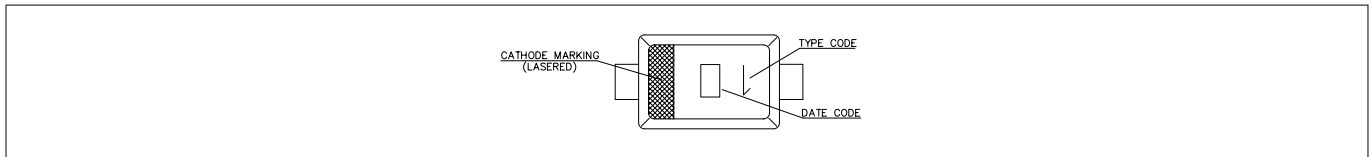
**4 Package information SC79**



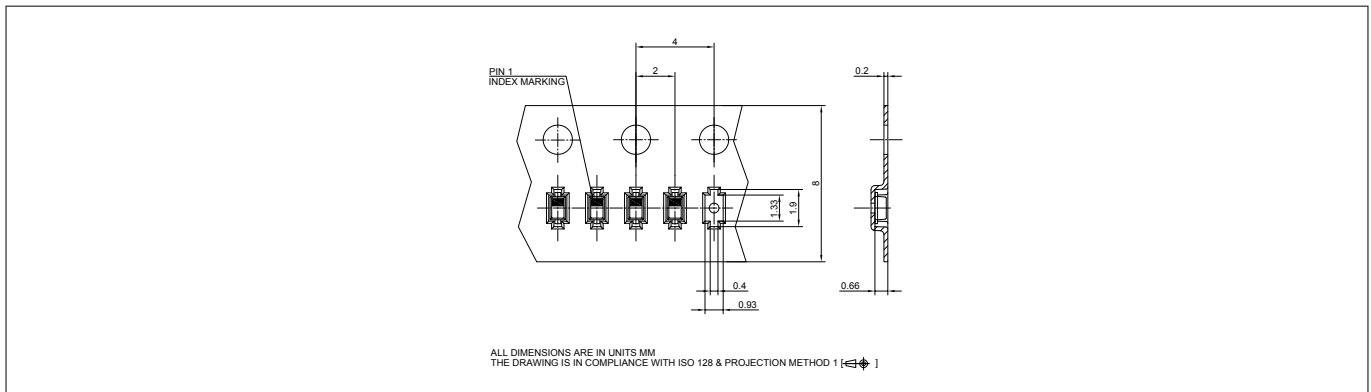
**Figure 10 Package outline**



**Figure 11 Foot print**



**Figure 12 Marking layout**



**Figure 13 Tape dimensions**

---

Revision history

## Revision history

Document version	Date of release	Description of changes
1.0	2018-09-07	<ul style="list-style-type: none"><li>• Change from series datasheet to individual one</li><li>• Initial release of datasheet</li><li>• Typical values and curves updated to the values of the production (No product or process change behind)</li><li>• Maximum/typical values added</li><li>• Typical curves/values removed</li></ul>
1.1	2019-01-21	Product description, feature list and potential application section reworked

## Trademarks

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

**Edition 2018-06-30**

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

**© 2019 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-pmi1535438451692**

## 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

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[Infineon:](#)

[BAR 64-02V H6327](#) [BAR 64-02V E6127](#) [BAR 64-02V E6327](#)