BAT15-099R

Cross-over ring silicon RF Schottky diodes

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Product description

These Infineon RF Schottky diodes are silicon low barrier N-type devices with an integrated guard ring on-chip for over-voltage protection. Their low barrier height, low forward voltage and low junction capacitance make BAT15-099R a suitable choice for mixer functions in applications which frequencies are as high as 12 GHz.

Feature list

- Low inductance L_S = 2 nH (typical)
- Low capacitance C = 0.29 pF (typical)
- Industry standard SOT143 (2.9 mm x 2.4 mm x 1 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

For mixers in:

- Satellite systems
- Low noise blocks for Ku bands
- Security systems

Device information

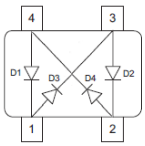

Table 1 Part information

Product name / Ordering code	Package	Pin configuration	Marking	Pieces / Reel
BAT15-099R / BAT15099RE6327HTSA1	SOT143	Cross-over ring	S6s	3 k

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

Table of contents

1 Absolute maximum ratings

Table 2 Absolute maximum ratings at T_A = 25 °C, unless otherwise specified

Parameter	Symbol	Values		Unit	Note or test condition
		Min.	Max.		
Diode reverse voltage	V_R	–	4	V	
Forward current	I_F	–	110	mA	
Total power dissipation	P_{TOT}	–	100	mW	$T_S \leq 67$ °C [1)]
Junction temperature	T_J	–	150	°C	
Operating temperature	T_{OP}	-55	150		
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.***

1 T_S is the soldering point temperature.

2 Electrical performance in test fixture

2.1 Electrical characteristics

Table 3 Electrical characteristics at T_A = 25 °C, unless otherwise specified

Parameter	Symbol	Values			Unit	Note or test condition
		Min.	Typ.	Max.		
Breakdown voltage	V_{BR}	4	–	–	V	I_R = 100 µA
Reverse current	I_R	–	–	5	µA	V_R = 1 V
Forward voltage	V_F	0.16	0.25	0.32	V	I_F = 1 mA
		0.25	0.35	0.41		I_F = 10 mA
Forward voltage matching	ΔV_F	–	–	20	mV	I_F = 10 mA [1)]
Differential forward resistance	R_F	–	5.8	–	Ω	I_F = 10 mA / 50 mA [2)]
Capacitance	C	–	0.29	0.5	pF	V_R = 0 V, f = 1 MHz
Inductance	L_S	–	2	–	nH	

1 ΔV_F is the difference between lowest and highest V_F in a multiple diode component.

2 $R_F = \frac{V_F(50\text{ mA}) - V_F(10\text{ mA})}{50\text{ mA} - 10\text{ mA}}$

2.2 Characteristic curves

At T_A = 25 °C, unless otherwise specified

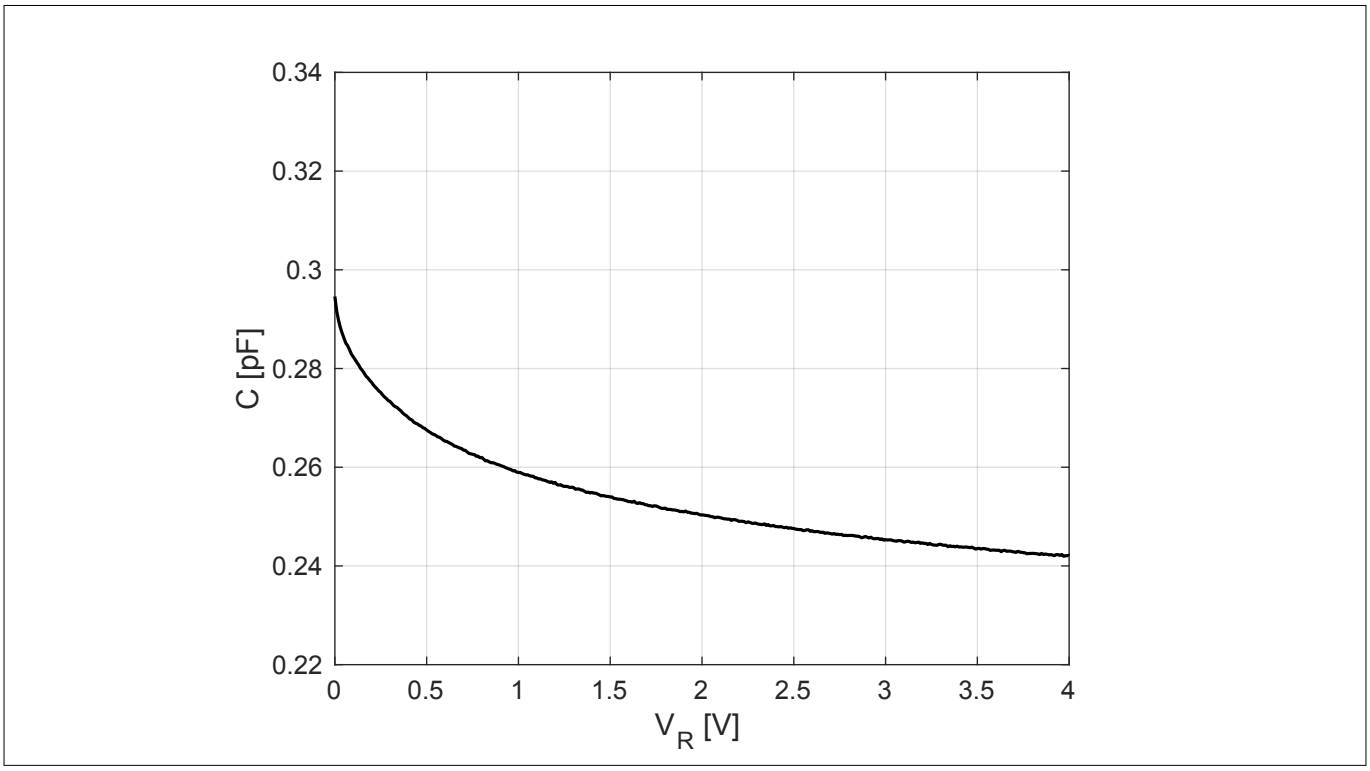

Figure 1 Diode capacitance *C* vs. reverse voltage V_R at frequency *f* = 1 MHz

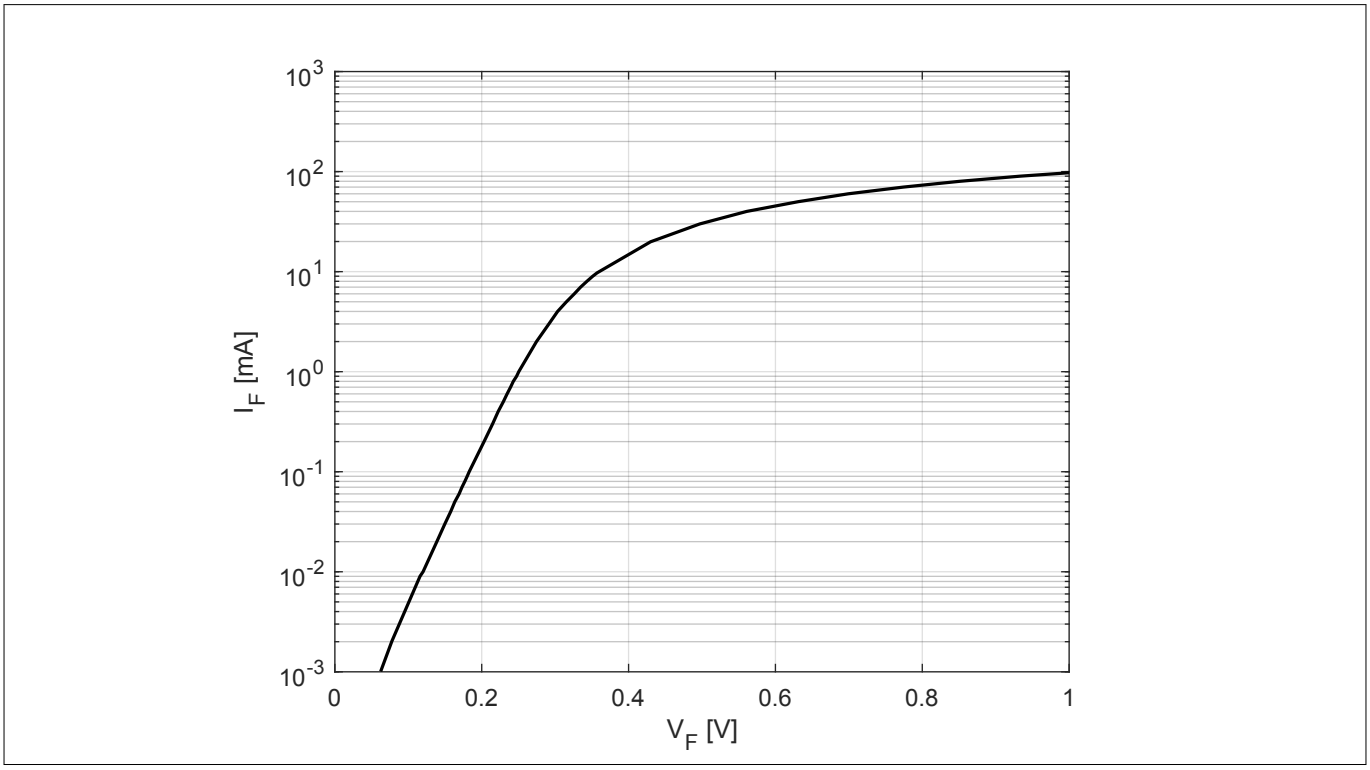

Figure 2 Forward current I_F vs. forward voltage V_F

Electrical performance in test fixture

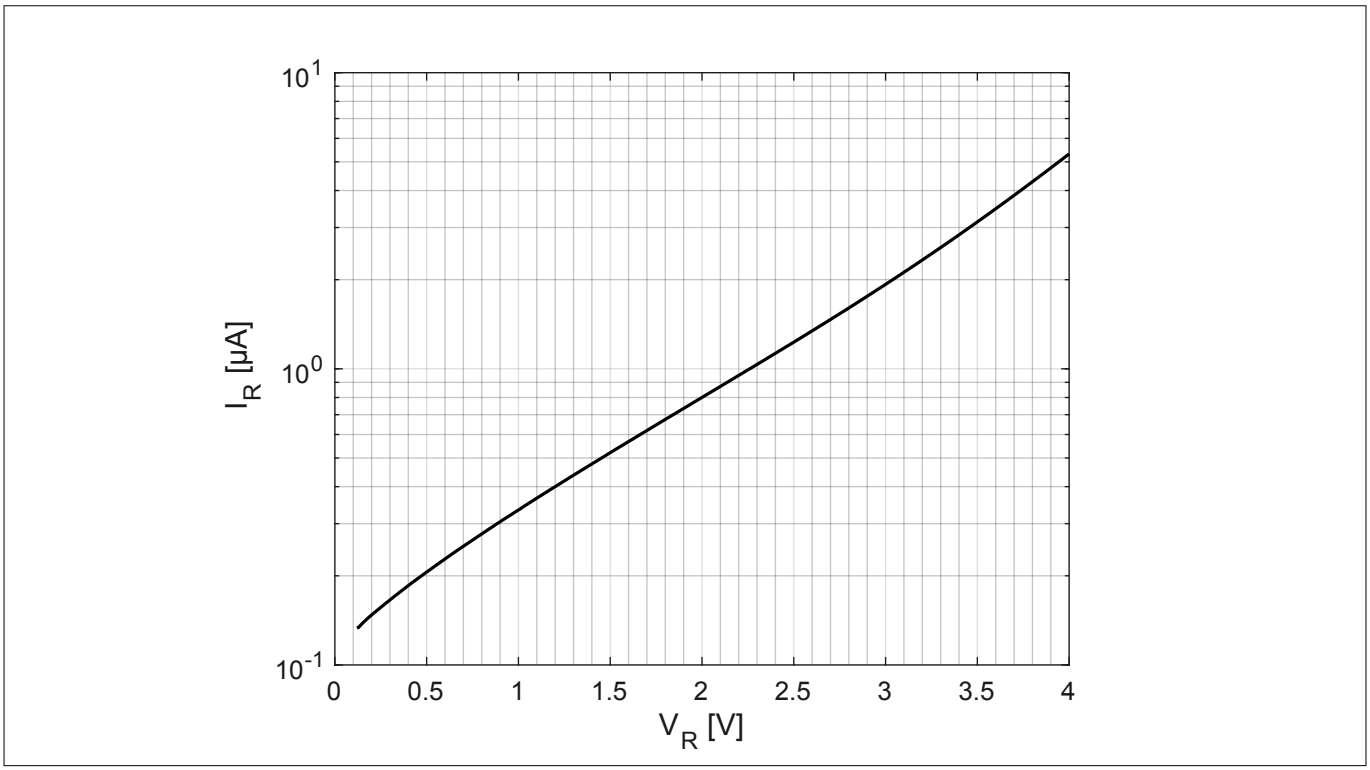

Figure 3 Reverse current I_R vs. reverse voltage V_R

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.

3 Thermal characteristics

Table 4 Thermal resistance

Parameter	Symbol	Values			Unit	Note or test condition
		Min.	Typ.	Max.		
Thermal resistance (junction - soldering point)	R_{thJS}	–	830	–	K/W	T_S = 67 °C [1)]

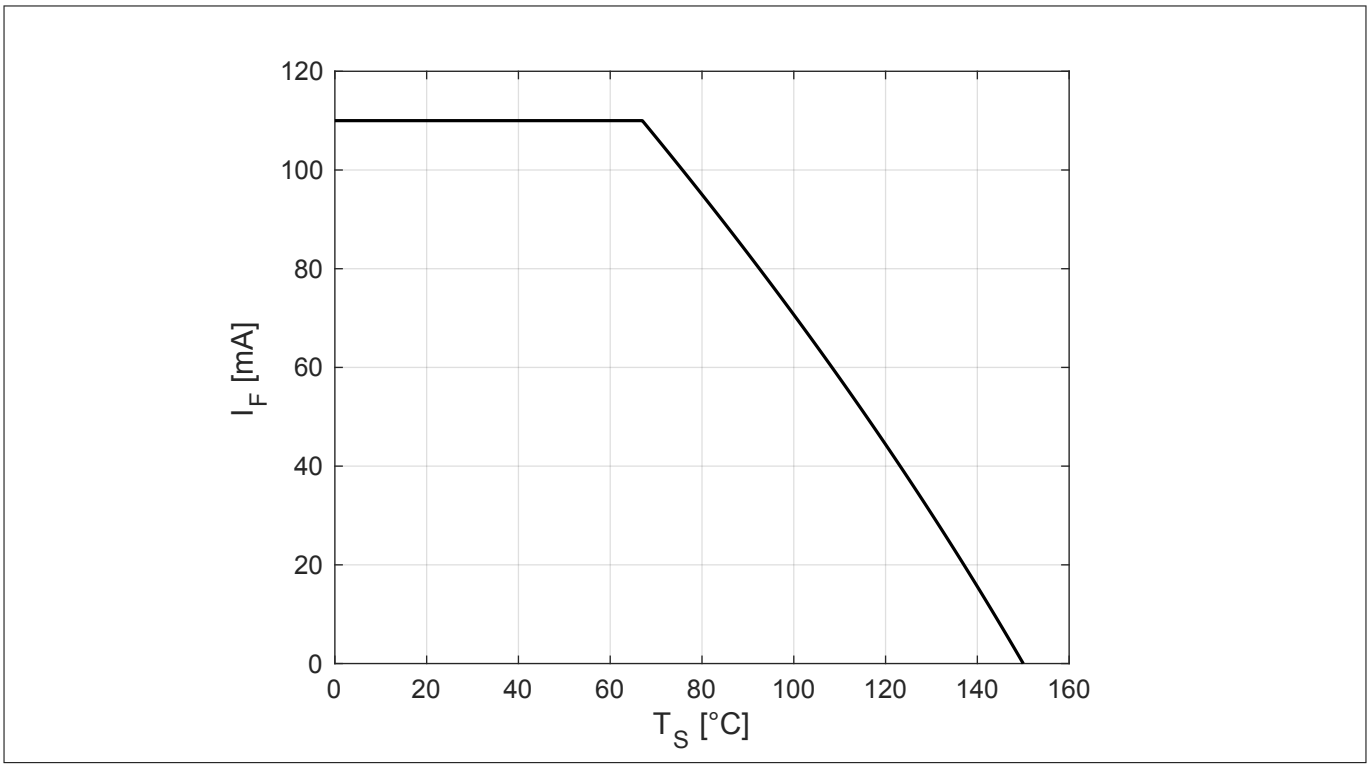

Figure 4 Permissible forward current I_F in DC operation

1 For R_{thJS} in other conditions refer to the curves in this chapter.

Thermal characteristics

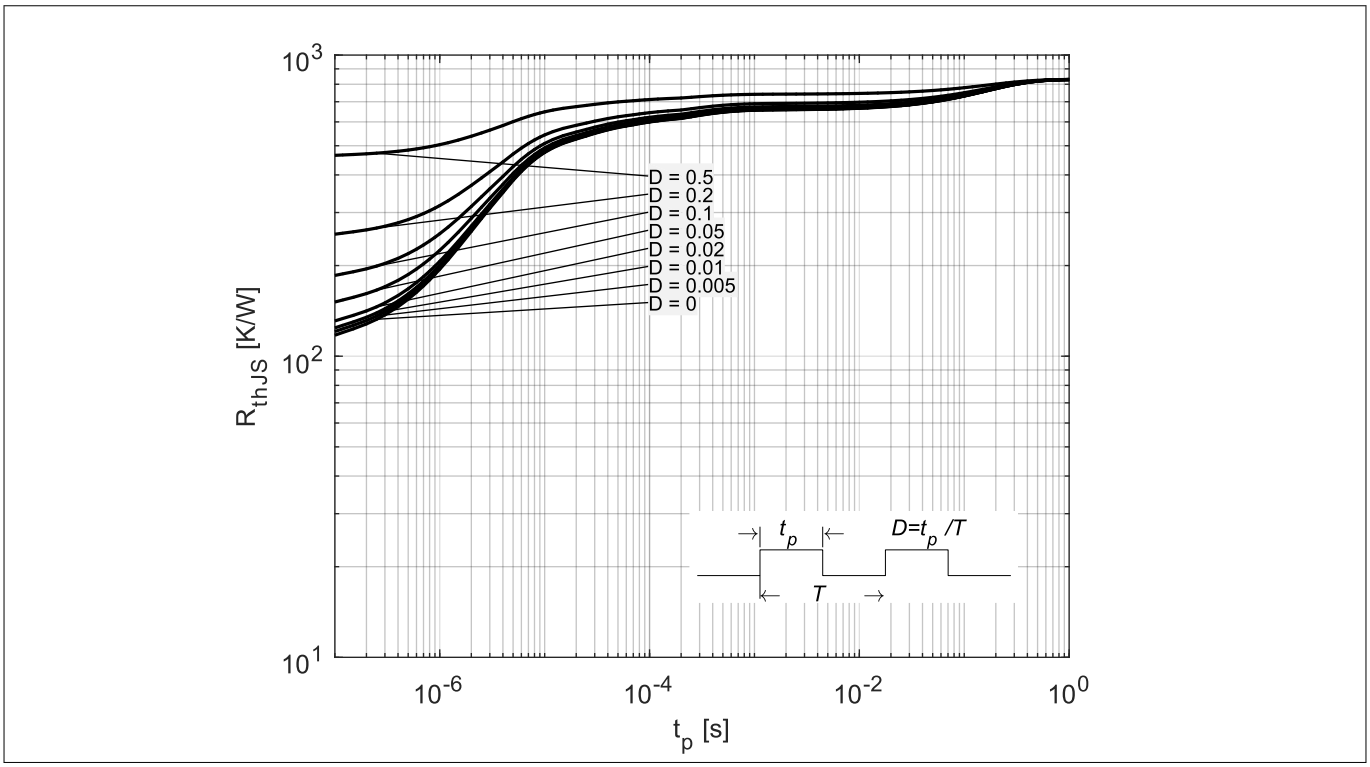

Figure 5 **Thermal resistance R_{thJS} in pulse operation**

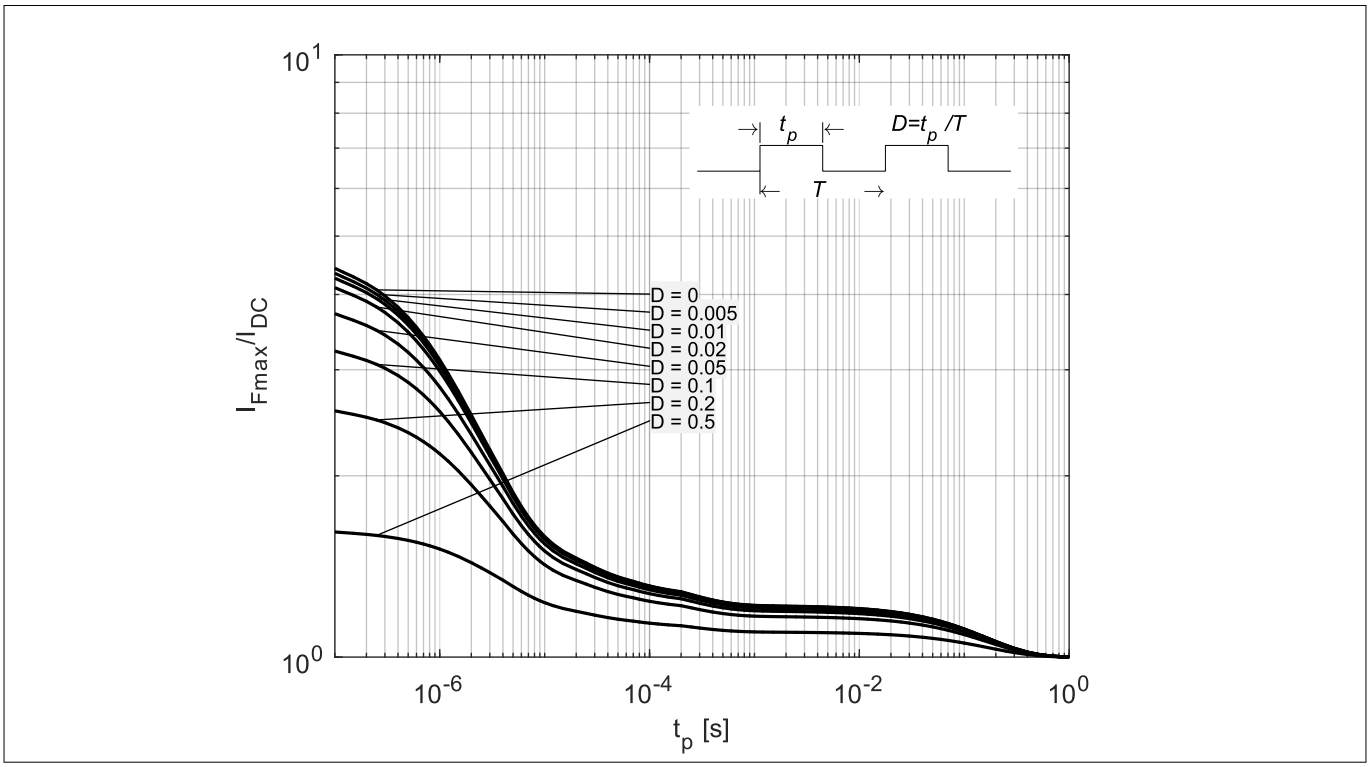

Figure 6 **Permissible forward current ratio I_{Fmax}/I_{DC} in pulse operation**

4 Package information SOT143

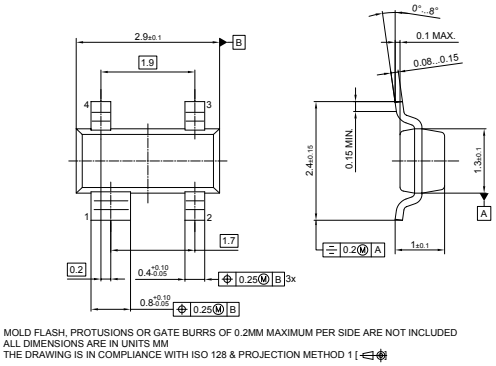

Figure 7 Package outline

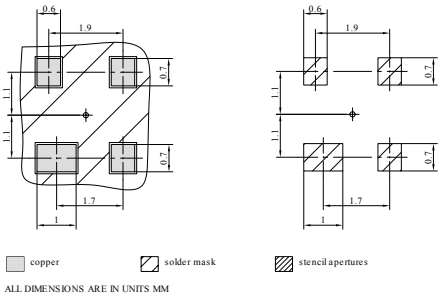

Figure 8 Foot print

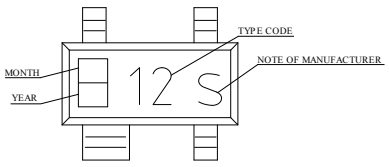

Figure 9 Marking layout example

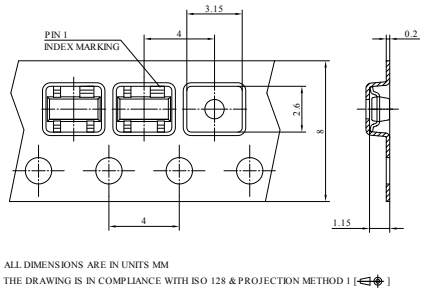

Figure 10 Tape dimensions

Revision history

Document version	Date of release	Description of changes
1.0	2018-09-07	• Change from series datasheet to individual one • Initial release of datasheet • Typical values and curves updated to the values of the production (No product or process change behind) • Typical values added • Typical curves removed

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