



# BAT54QB-Q

Schottky barrier diode

5 May 2021

Product data sheet

## 1. General description

Planar Schottky barrier diode encapsulated in an ultra small DFN1110D-3 (SOT8015, JEDEC MO340-BA) leadless Surface-Mounted Device (SMD) plastic package with side-wettable flanks.

## 2. Features and benefits

- Low forward voltage
- Low capacitance
- Leadless ultra small SMD plastic package
- Low package height of 0.5 mm
- Suitable for Automatic Optical Inspection (AOI) of solder joint
- Qualified according to AEC-Q101 and recommended for use in automotive applications

## 3. Applications

- Ultra high-speed switching
- Voltage clamping
- Protection circuits

## 4. Quick reference data

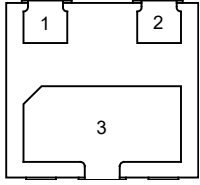
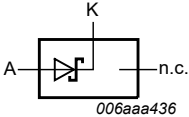
Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$V_R$	reverse voltage			-	-	30	V
$V_F$	forward voltage	$I_F = 100 \text{ mA}$ ; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	[1]	-	-	800	mV
$I_R$	reverse current	$V_R = 25 \text{ V}$ ; $T_{\text{amb}} = 25 \text{ }^\circ\text{C}$	[1]	-	-	2	$\mu\text{A}$

[1] Pulse test:  $t_p \leq 300 \text{ } \mu\text{s}$ ;  $\delta \leq 0.02$

## 5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	A	anode	 <p>DFN1110D-3 (SOT8015)</p>	
2	n.c.	not connected		
3	K	cathode		

## 6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
BAT54QB-Q	DFN1110D-3	plastic, leadless extremely thin small outline package with side-wettable flanks (SWF); 3 terminals; 0.65 mm pitch; 1.1 mm x 1 mm x 0.48 mm body	SOT8015

## 7. Marking

Table 4. Marking codes

Type number	Marking code
BAT54QB-Q	B7

## 8. Limiting values

**Table 5. Limiting values**

In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions		Min	Max	Unit
$V_R$	reverse voltage			-	30	V
$I_F$	forward current	$T_{amb} \leq 25\text{ °C}$		-	200	mA
$I_{FRM}$	repetitive peak forward current	$t_p \leq 1\text{ s}$ ; $\delta \leq 0.5$ ; $T_{amb} = 25\text{ °C}$		-	300	mA
$I_{FSM}$	non-repetitive peak forward current	square-wave pulse; $t_p \leq 10\text{ ms}$ ; $T_{j(\text{init})} = 25\text{ °C}$		-	600	mA
$P_{tot}$	total power dissipation	$T_{amb} \leq 25\text{ °C}$	[1]	-	400	mW
$T_j$	junction temperature			-	150	°C
$T_{amb}$	ambient temperature			-55	150	°C
$T_{stg}$	storage temperature			-65	150	°C

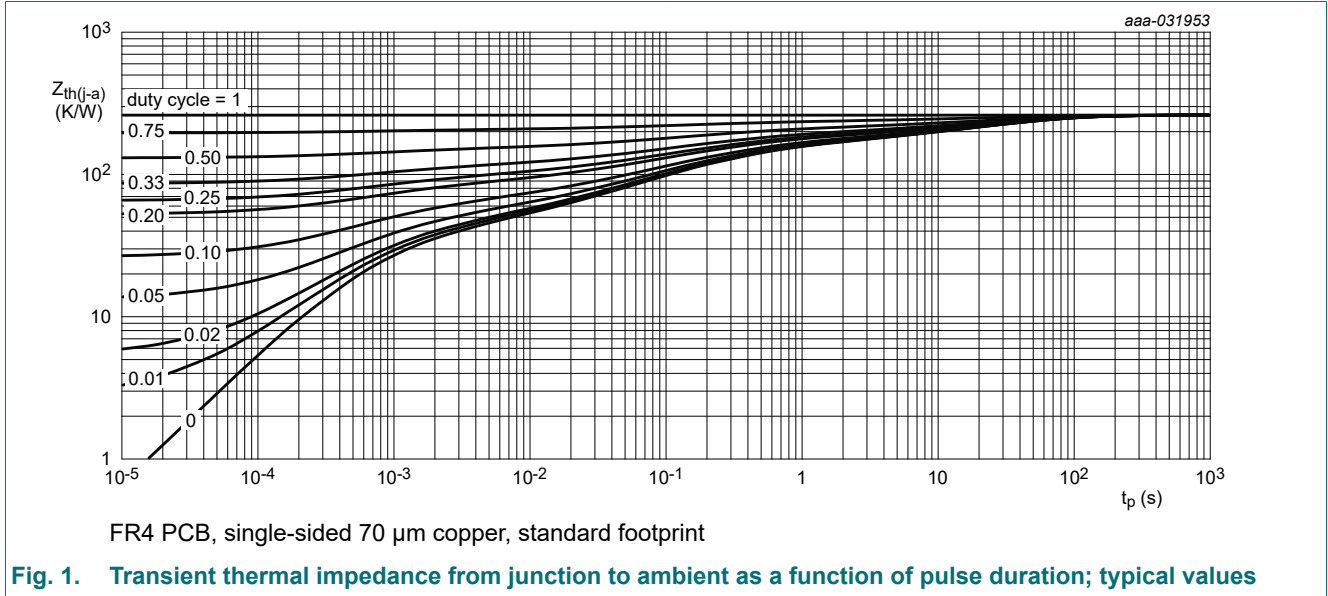
[1] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided 70  $\mu\text{m}$  copper, tin-plated and standard footprint.

## 9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1] [2]	-	-	305	K/W

- [1] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided 70  $\mu\text{m}$  copper, tin-plated and standard footprint.
- [2] For Schottky barrier diodes thermal runaway has to be considered, as in some applications the reverse power losses PR are a significant part of the total power losses.

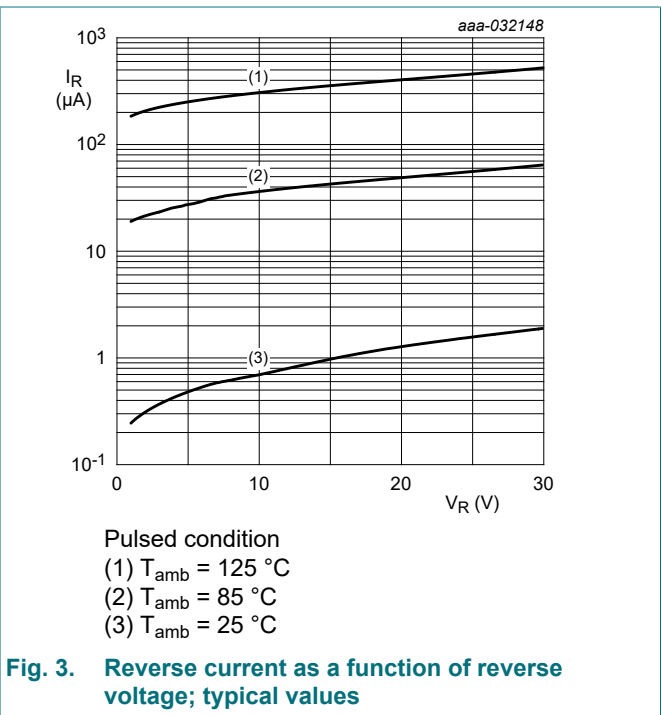
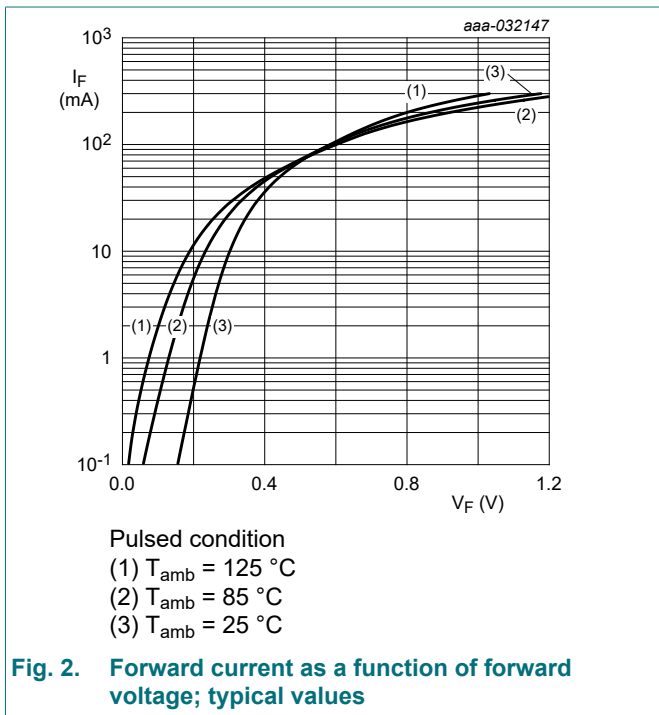


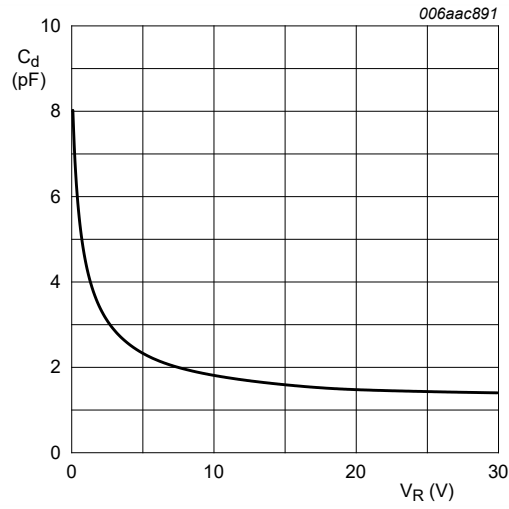
## 10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions	Min	Typ	Max	Unit	
V <sub>F</sub>	forward voltage	I <sub>F</sub> = 0.1 mA; T <sub>amb</sub> = 25 °C	[1]	-	-	240	mV
		I <sub>F</sub> = 1 mA; T <sub>amb</sub> = 25 °C	[1]	-	-	320	mV
		I <sub>F</sub> = 10 mA; T <sub>amb</sub> = 25 °C	[1]	-	-	400	mV
		I <sub>F</sub> = 30 mA; T <sub>amb</sub> = 25 °C	[1]	-	-	500	mV
		I <sub>F</sub> = 100 mA; T <sub>amb</sub> = 25 °C	[1]	-	-	800	mV
I <sub>R</sub>	reverse current	V <sub>R</sub> = 25 V; T <sub>amb</sub> = 25 °C	[1]	-	-	2	μA
C <sub>d</sub>	diode capacitance	V <sub>R</sub> = 1 V; f = 1 MHz; T <sub>amb</sub> = 25 °C	-	-	-	10	pF
t <sub>rr</sub>	reverse recovery time	I <sub>F</sub> = 10 mA; I <sub>R</sub> = 10 mA; R <sub>L</sub> = 100 Ω; I <sub>R(meas)</sub> = 1 mA; T <sub>amb</sub> = 25 °C	-	-	-	5	ns

[1] Pulse test: t<sub>p</sub> ≤ 300 μs; δ ≤ 0.02

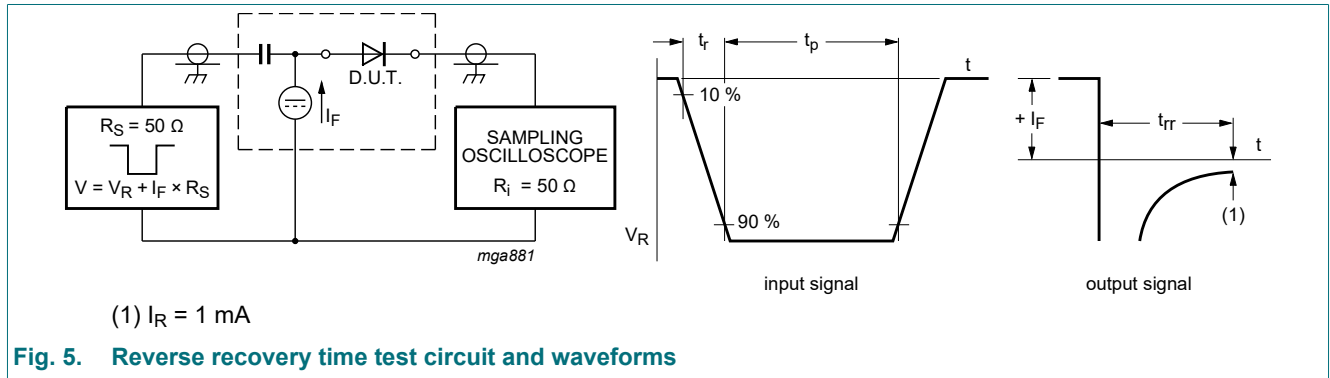




$T_{amb} = 25\text{ °C}$ ;  $f = 1\text{ MHz}$

**Fig. 4. Diode capacitance as a function of reverse voltage; typical values**

### 11. Test information



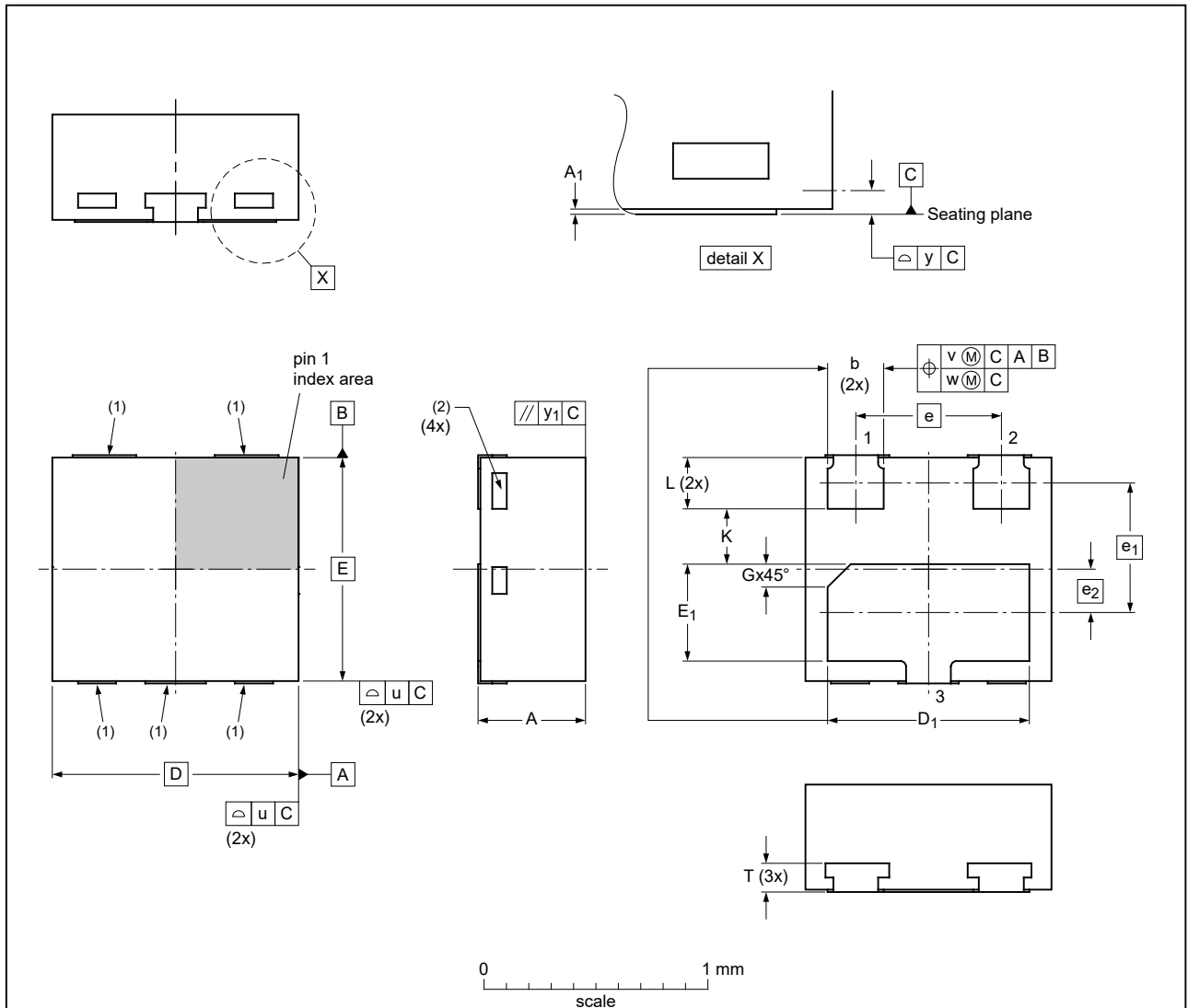
#### Quality information

This product has been qualified in accordance with the Automotive Electronics Council (AEC) standard Q101 - *Stress test qualification for discrete semiconductors*, and is suitable for use in automotive applications.

## 12. Package outline

DFN1110D-3: plastic, leadless extremely thin small outline package with side-wettable flanks (SWF); 3 terminals; 0.65 mm pitch; 1.1 mm x 1 mm x 0.48 mm body

SOT8015



Dimensions (mm are the original dimensions)

Unit	A	A <sub>1</sub>	b	D	D <sub>1</sub>	E	E <sub>1</sub>	e	e <sub>1</sub>	e <sub>2</sub>	G	K	L	T	u	v	w	y	y <sub>1</sub>
max	0.50	0.040	0.30		0.95		0.48						0.27	0.22					
nom	0.47	0.020	0.25	1.1	0.90	1	0.43	0.65	0.58	0.19	0.09		0.23	0.16	0.05	0.1	0.05	0.05	0.05
min	0.44	0.005	0.22		0.87		0.40				(ref)	0.2	0.20	0.10					

Note

- Side Wettable Flank, protrusion max. 0.02 mm.
  - Visible depend upon used manufacturing technology.
- Dimension A and T are including plating thickness.

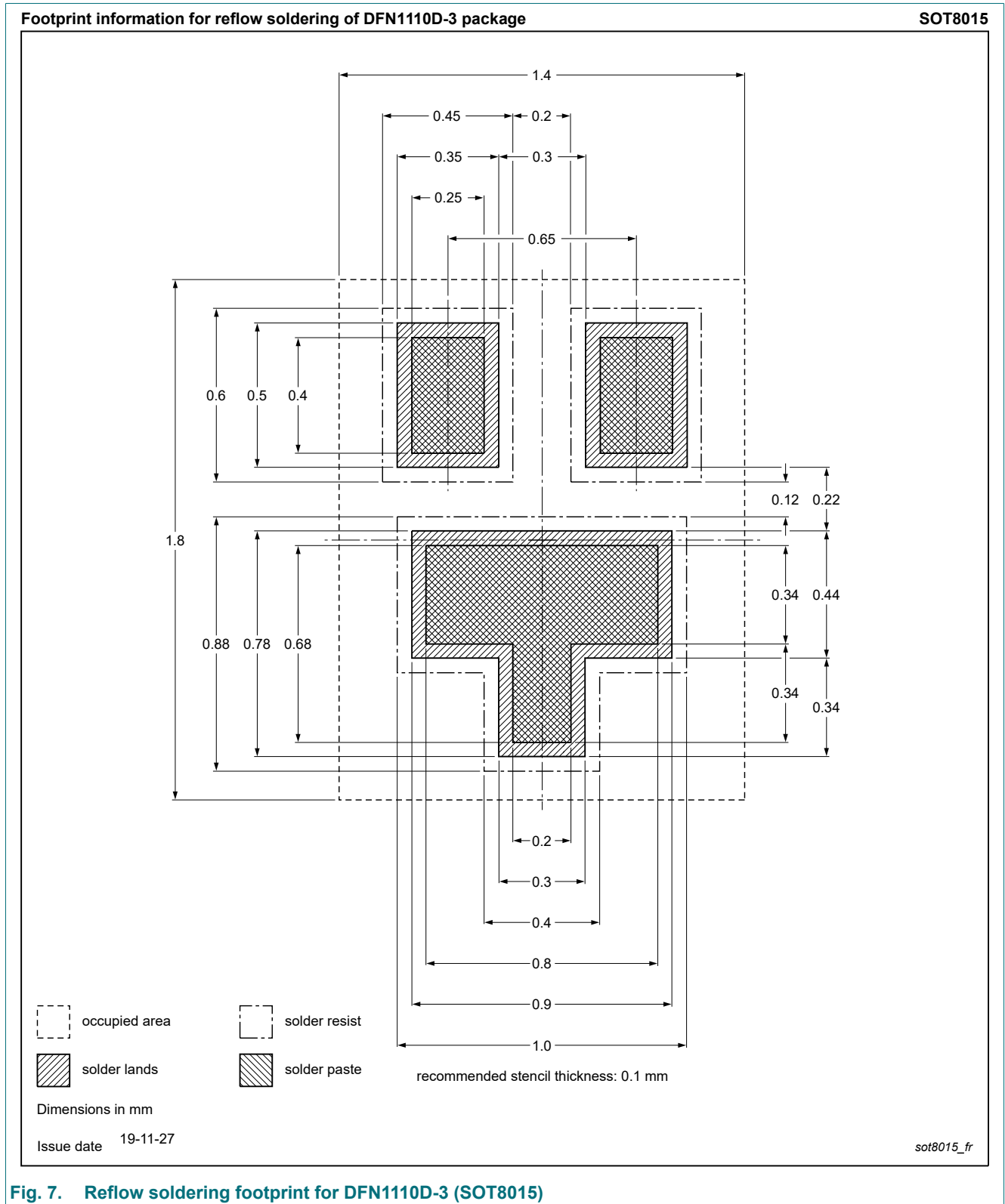
sot8015\_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOT8015		MO-340BA				19-12-02 19-12-04

Fig. 6. Package outline DFN1110D-3 (SOT8015)



### 13. Soldering



**Fig. 7. Reflow soldering footprint for DFN1110D-3 (SOT8015)**

## 14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
BAT54QB-Q v.2	20210505	Product data sheet	-	BAT54QB-Q v.1
Modifications:	• Features and benefits: added recommendation for automotive applications			
BAT54QB-Q v.1	20210331	Product data sheet	-	-

## 15. Legal information

### Data sheet status

Document status [1][2]	Product status [3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

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