



# RB521S30

200 mA low Vf MEGA Schottky barrier rectifier

8 October 2024

Product data sheet

## 1. General description

Planar Maximum Efficiency General Application (MEGA) Schottky barrier rectifier with an integrated guard ring for stress protection, encapsulated in a SOD523 (SC-79) ultra small and flat lead Surface-Mounted Device (SMD) plastic package.

## 2. Features and benefits

- Average forward current:  $I_{F(AV)} \leq 0.2 \text{ A}$
- Reverse voltage:  $V_R \leq 30 \text{ V}$
- Low reverse current:  $I_R \leq 30 \text{ }\mu\text{A}$
- Ultra small and flat lead SMD plastic package

## 3. Applications

- Low current rectification
- High efficiency DC-to-DC conversion
- Switch Mode Power Supply (SMPS)
- Reverse polarity protection
- Low power consumption applications



## 4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$I_R$	reverse current	$V_R = 10 \text{ V}$	-	2.5	30	$\mu\text{A}$
$V_R$	reverse voltage	$T_j = 25 \text{ }^\circ\text{C}$	-	-	30	V

## 5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	cathode[1]	 SC-79 (SOD523)	 sym001
2	A	anode		

[1] The marking bar indicates the cathode.

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
RB521S30	SC-79	plastic, surface-mounted package; 2 leads; 1.2 mm x 0.8 mm x 0.6 mm body	SOD523

7. Marking

Table 4. Marking codes

Type number	Marking code
RB521S30	ZB

8. Limiting values

Table 5. Limiting values

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

Symbol	Parameter	Conditions		Min	Max	Unit
V <sub>R</sub>	reverse voltage	T <sub>j</sub> = 25 °C		-	30	V
I <sub>F(AV)</sub>	average forward current	δ = 0.5; f = 20 kHz; square wave; T <sub>amb</sub> ≤ 120 °C	[1]	-	0.2	A
		δ = 0.5; f = 20 kHz; square wave; T <sub>sp</sub> ≤ 140 °C		-	0.2	A
I <sub>FSM</sub>	non-repetitive peak forward current	t <sub>p</sub> = 8.3 ms; half sine wave; JEDEC method; T <sub>j(init)</sub> = 25 °C	[2]	-	1	A
P <sub>tot</sub>	total power dissipation	T <sub>amb</sub> ≤ 25 °C	[3] [4]	-	275	mW
			[1] [4]	-	420	mW
			[5] [4]	-	500	mW
T <sub>j</sub>	junction temperature			-	150	°C
T <sub>amb</sub>	ambient temperature			-55	150	°C
T <sub>stg</sub>	storage temperature			-65	150	°C

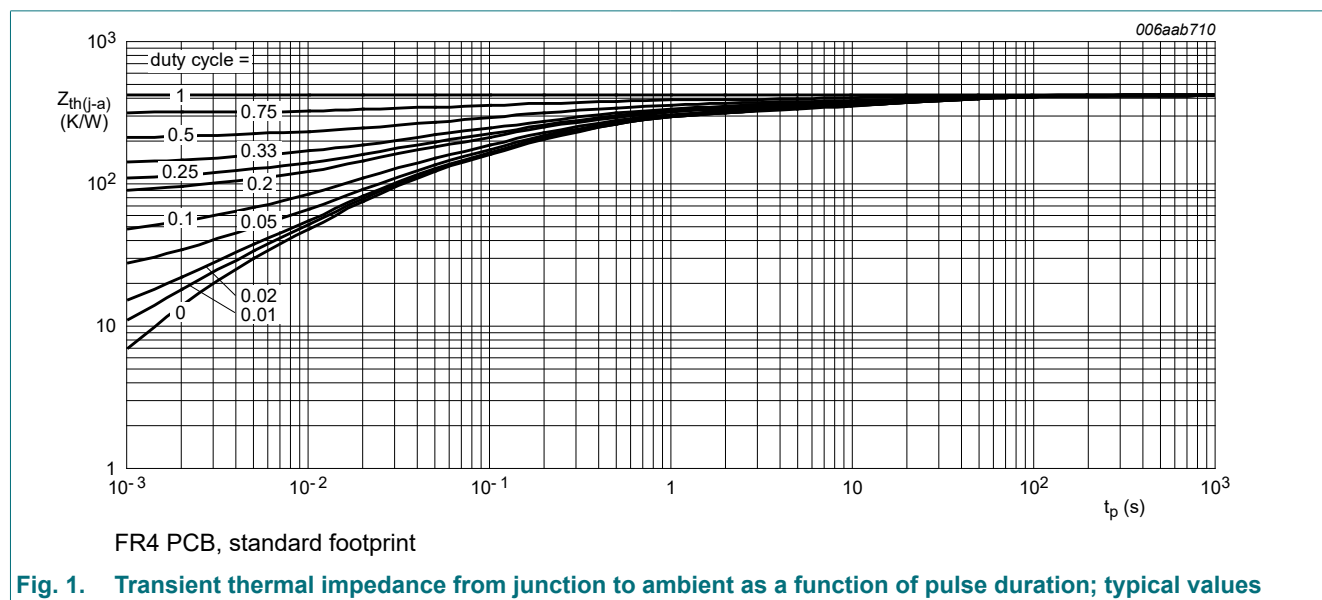
- [1] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm<sup>2</sup>.
- [2] T<sub>j</sub> = 25 °C Prior to surge
- [3] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.
- [4] Reflow soldering is the only recommended soldering method.
- [5] Device mounted on a ceramic PCB, Al<sub>2</sub>O<sub>3</sub>, standard footprint.

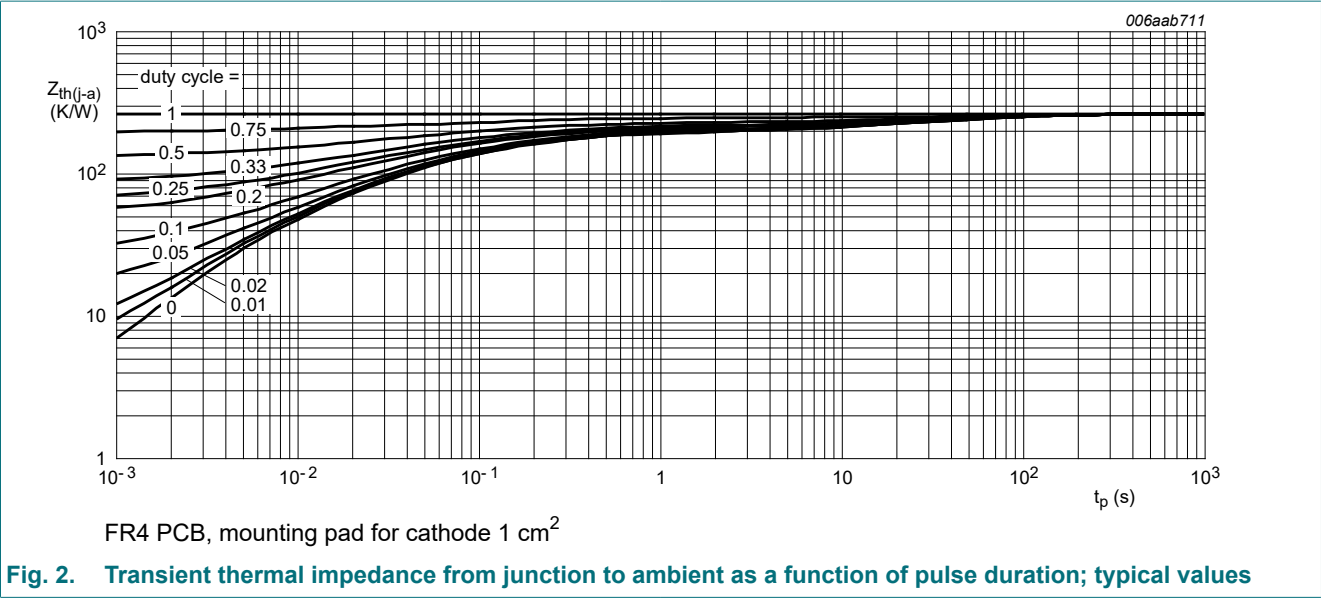
## 9. Thermal characteristics

### Table 6. Thermal characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
R <sub>th(j-a)</sub>	thermal resistance from junction to ambient	in free air	[1] [2] [3]	-	-	455	K/W
			[1] [4] [3]	-	-	300	K/W
			[1] [5] [3]	-	-	250	K/W
R <sub>th(j-sp)</sub>	thermal resistance from junction to solder point		[6]	-	-	90	K/W

- [1] For Schottky barrier diodes thermal runaway has to be considered, as in some applications the reverse power losses  $P_R$  are a significant part of the total power losses.
- [2] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.
- [3] Reflow soldering is the only recommended soldering method.
- [4] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for cathode 1 cm<sup>2</sup>.
- [5] Device mounted on a ceramic PCB, Al<sub>2</sub>O<sub>3</sub>, standard footprint.
- [6] Soldering point of cathode tab.





10. Characteristics

Table 7. Characteristics  
 $T_{amb} = 25\text{ }^{\circ}\text{C}$  unless otherwise specified.

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$V_F$	forward voltage	$I_F = 0.1\text{ mA}$	[1]	-	130	190	mV
		$I_F = 1\text{ mA}$	[1]	-	190	250	mV
		$I_F = 10\text{ mA}$	[1]	-	255	300	mV
		$I_F = 100\text{ mA}$	[1]	-	355	410	mV
		$I_F = 200\text{ mA}$	[1]	-	420	500	mV
$I_R$	reverse current	$V_R = 10\text{ V}$		-	2.5	30	$\mu\text{A}$
$C_d$	diode capacitance	$V_R = 1\text{ V}; f = 1\text{ MHz}$		-	20	25	pF

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

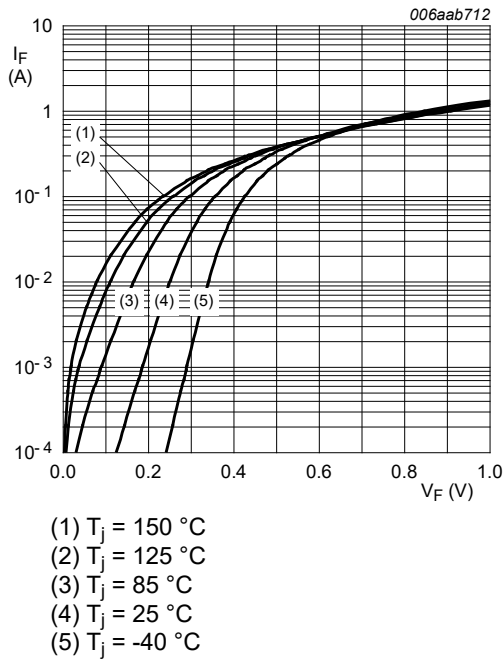


Fig. 3. Forward current as a function of forward voltage; typical values

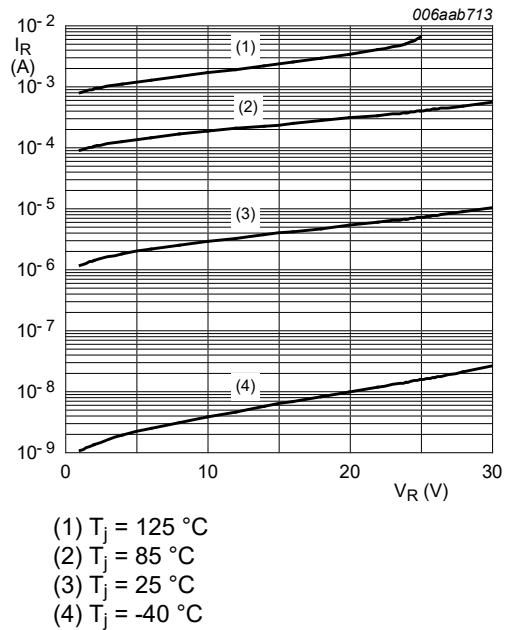


Fig. 4. Reverse current as a function of reverse voltage; typical values

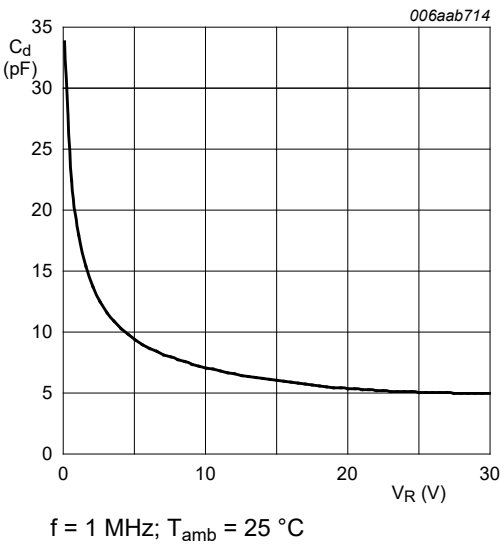


Fig. 5. Diode capacitance as a function of reverse voltage; typical values

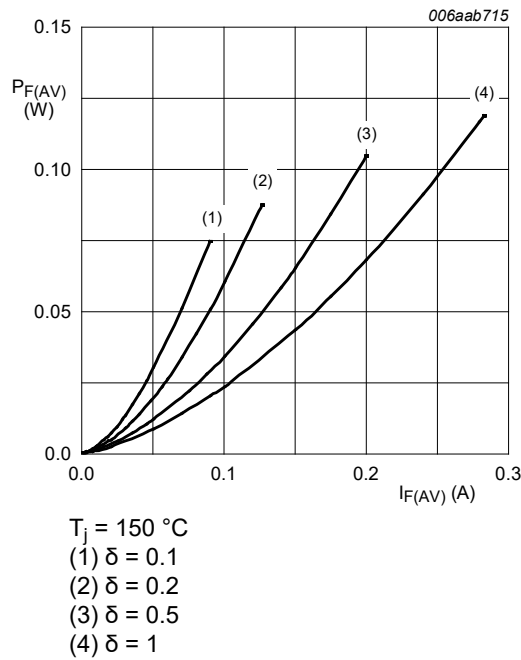


Fig. 6. Average forward power dissipation as a function of average forward current; typical values

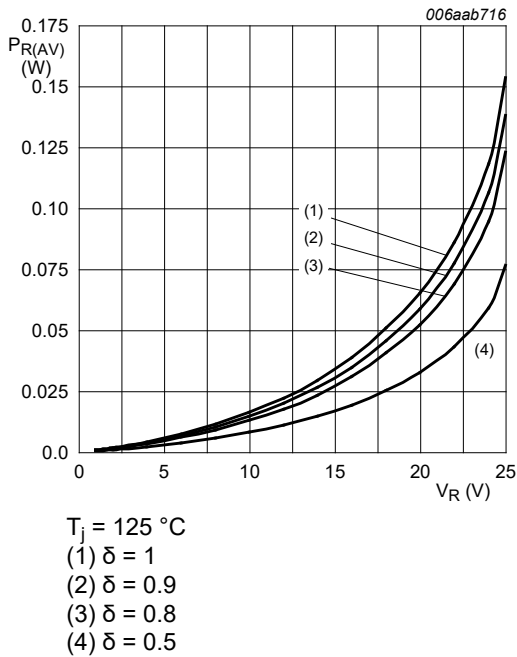


Fig. 7. Average reverse power dissipation as a function of reverse voltage; typical values

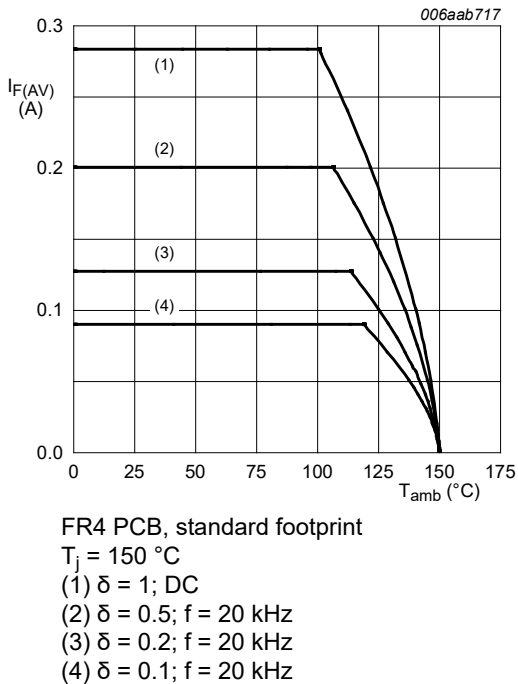


Fig. 8. Average forward current as a function of ambient temperature; typical values

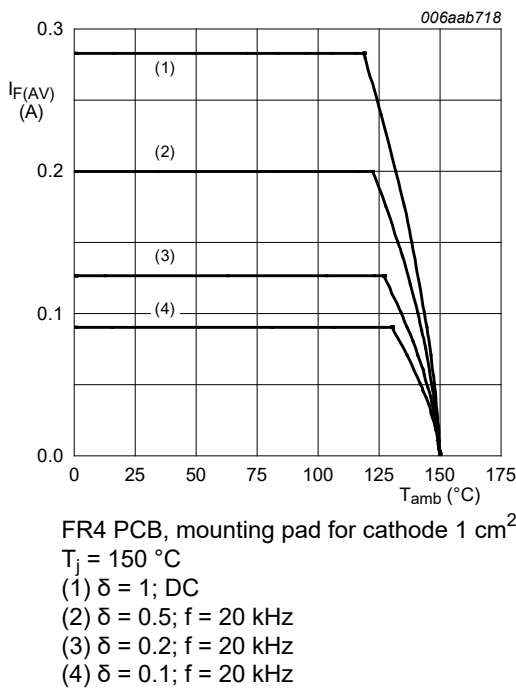


Fig. 9. Average forward current as a function of ambient temperature; typical values

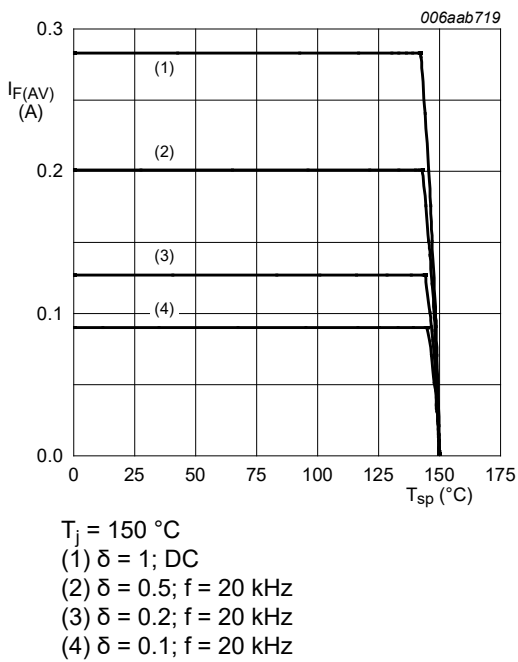


Fig. 10. Average forward current as a function of solder point temperature; typical values

11. Test information

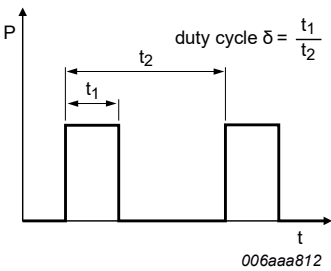


Fig. 11. Duty cycle definition

The current ratings for the typical waveforms are calculated according to the equations:

$I_{F(AV)} = I_M \times \delta$  with  $I_M$  defined as peak current

$I_{RMS} = I_{F(AV)}$  at DC

$I_{RMS} = I_M \times \sqrt{\delta}$  with  $I_{RMS}$  defined as RMS current

12. Package outline

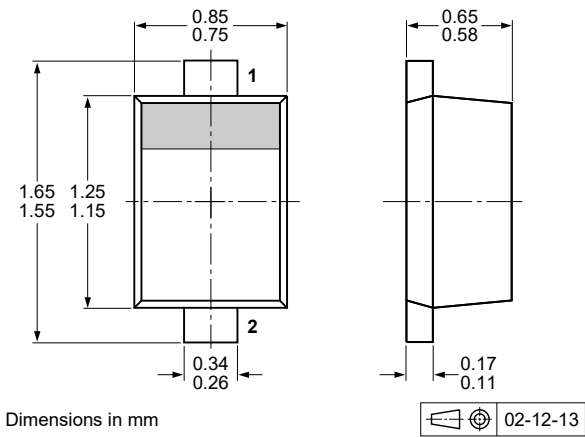


Fig. 12. Package outline SC-79 (SOD523)

13. Soldering

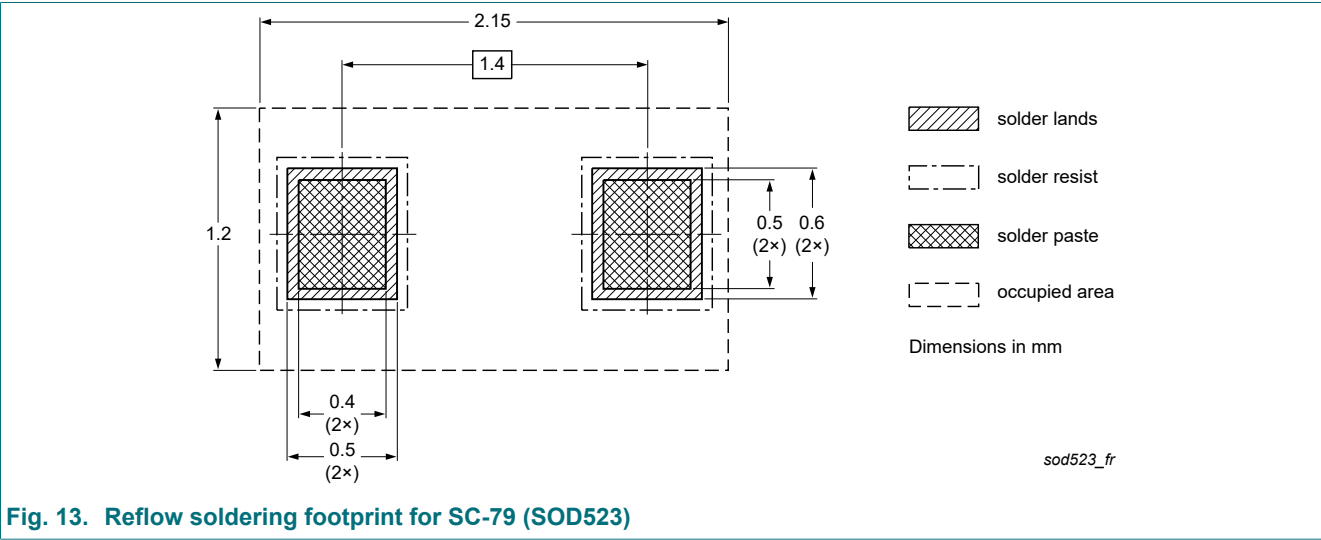


Fig. 13. Reflow soldering footprint for SC-79 (SOD523)



14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
RB521S30 v.3	20241008	Product data sheet	-	RB521S30 v.2
Modifications:	<ul style="list-style-type: none"><li>Product(s) changed to non-automotive qualification. Please refer to nexperia.com for automotive (-Q) product alternative(s).</li></ul>			
RB521S30 v.2	20210407	Product data sheet	-	RB521S30 v.1
RB521S30 v.1	20091006	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.

- [1] Please consult the most recently issued document before initiating or completing a design.
- [2] The term 'short data sheet' is explained in section "Definitions".
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