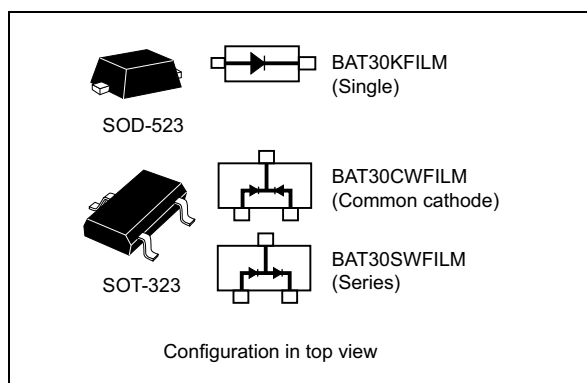


## Small signal Schottky diodes

Datasheet - production data



### Description

The BAT30 series uses 30 V Schottky barrier diodes encapsulated in SOD-523 or SOT-323 packages.

This device is specially suited for switching mode applications needing low forward voltage drop diodes.

### Features

- Very low conduction losses
- Negligible switching losses
- Low forward and reverse recovery times
- Extremely fast switching
- Surface mount device
- Low capacitance diode
- ECOPACK<sup>®</sup>2 and RoHS compliant component

Table 1. Device summary

| Symbol       | Value  |
|--------------|--------|
| $I_F$        | 300 mA |
| $V_{RRM}$    | 30 V   |
| $C$ (typ.)   | 14 pF  |
| $T_j$ (max.) | 150 °C |

# 1 Characteristics

**Table 2. Absolute ratings (limiting values at  $T_{amb} = 25\text{ °C}$ , unless otherwise specified)**

| Symbol      | Parameter                                    |                                       | Value       | Unit |
|-------------|----------------------------------------------|---------------------------------------|-------------|------|
| $V_{RRM}$   | Repetitive peak reverse voltage              |                                       | 30          | V    |
| $I_F$       | Continuous forward current                   |                                       | 300         | mA   |
| $I_{FSM}$   | Surge non repetitive forward current         | $t_p = 10\text{ ms}$ Sinusoidal       | 1           | A    |
| $I_{FRM}$   | Repetitive peak forward current, square wave | $T_A = 85\text{ °C}$ , $\delta = 0.1$ | 0.9         | A    |
| $P_D^{(1)}$ | Power dissipation                            | SOT-323                               | 225         | mW   |
|             |                                              | SOD-523                               | 200         |      |
| $T_{stg}$   | Storage temperature range                    |                                       | -65 to +150 | °C   |
| $T_J$       | Maximum operating junction temperature       |                                       | 150         | °C   |
| $T_L$       | Maximum soldering temperature                |                                       | 260         | °C   |

1. On epoxy printed circuit board with recommended pad layout

**Table 3. Thermal parameters**

| Symbol        | Parameter                          |         | Value | Unit |
|---------------|------------------------------------|---------|-------|------|
| $R_{th(j-a)}$ | Junction to ambient <sup>(1)</sup> | SOT-323 | 550   | °C/W |
|               |                                    | SOD-523 | 600   |      |

1. On epoxy printed circuit board with recommended pad layout

Table 4. Static electrical characteristics

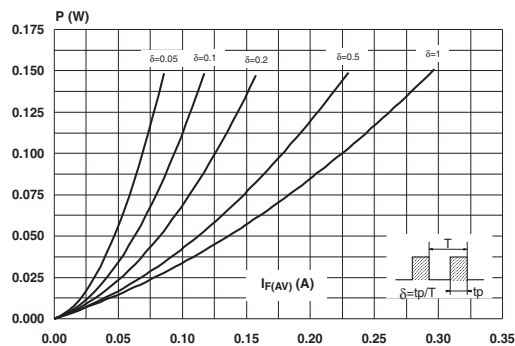
| Symbol      | Parameter               | Test conditions                    |                       | Min. | Typ. | Max. | Unit          |
|-------------|-------------------------|------------------------------------|-----------------------|------|------|------|---------------|
| $I_R^{(1)}$ | Reverse leakage current | $T_j = 25\text{ }^{\circ}\text{C}$ | $V_R = 5\text{ V}$    | -    |      | 0.5  | $\mu\text{A}$ |
|             |                         |                                    | $V_R = 10\text{ V}$   | -    |      | 1    |               |
|             |                         |                                    | $V_R = 25\text{ V}$   | -    | 0.65 | 3    |               |
|             |                         |                                    | $V_R = 30\text{ V}$   | -    |      | 5    |               |
|             |                         | $T_j = 70\text{ }^{\circ}\text{C}$ | $V_R = 10\text{ V}$   | -    | 7    | 20   |               |
|             |                         | $T_j = 85\text{ }^{\circ}\text{C}$ |                       | -    | 18   | 50   |               |
| $V_F^{(2)}$ | Forward voltage drop    | $T_j = 25\text{ }^{\circ}\text{C}$ | $I_F = 0.1\text{ mA}$ | -    |      | 240  | $\text{mV}$   |
|             |                         |                                    | $I_F = 1\text{ mA}$   | -    |      | 300  |               |
|             |                         |                                    | $I_F = 10\text{ mA}$  | -    |      | 375  |               |
|             |                         |                                    | $I_F = 30\text{ mA}$  | -    |      | 430  |               |
|             |                         |                                    | $I_F = 100\text{ mA}$ | -    |      | 500  |               |
|             |                         |                                    | $I_F = 200\text{ mA}$ | -    |      | 580  |               |
|             |                         |                                    | $I_F = 300\text{ mA}$ | -    | 530  |      |               |

1. Pulse test:  $t_p = 5\text{ ms}$ ,  $\delta < 2\%$ 2. Pulse test:  $t_p = 380\text{ }\mu\text{s}$ ,  $\delta < 2\%$ 

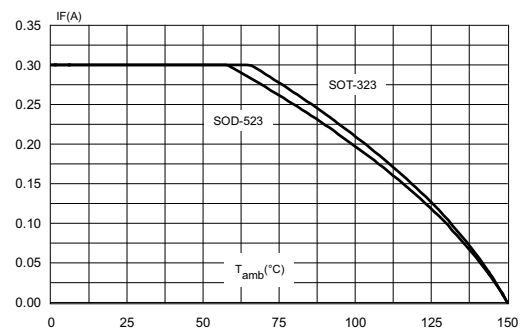
Table 5. Dynamic characteristics

| Symbol | Parameter         | Test conditions                          | Min. | Typ. | Max. | Unit        |
|--------|-------------------|------------------------------------------|------|------|------|-------------|
| C      | Diode capacitance | $V_R = 0\text{ V}$ , $F = 1\text{ MHz}$  | -    | 22   | -    | $\text{pF}$ |
|        |                   | $V_R = 1\text{ V}$ , $F = 1\text{ MHz}$  | -    | 14   | -    |             |
|        |                   | $V_R = 10\text{ V}$ , $F = 1\text{ MHz}$ | -    | 6    | -    |             |

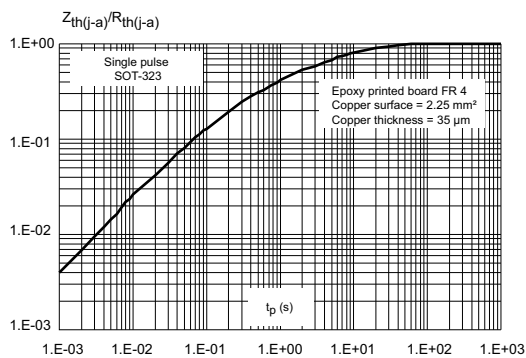
**Figure 1. Power dissipation versus average forward current**



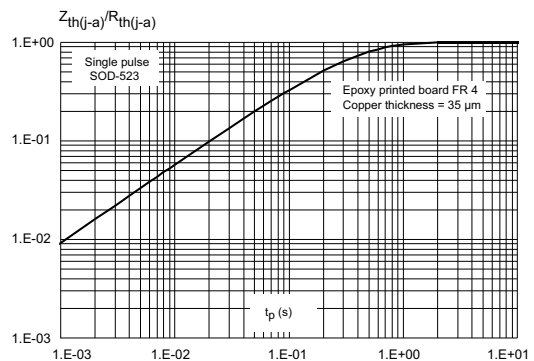
**Figure 2. Continuous forward current versus ambient temperature**



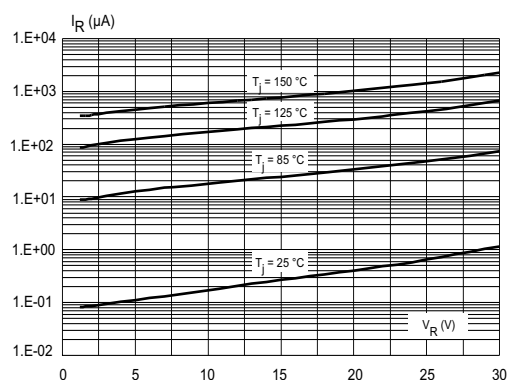
**Figure 3. Relative variation of thermal impedance junction to ambient versus pulse duration**



**Figure 4. Relative variation of thermal impedance junction to ambient versus pulse duration**



**Figure 5. Leakage current versus reverse applied voltage (typical values)**



**Figure 6. Relative variation of reverse leakage current versus junction temperature (typical values)**

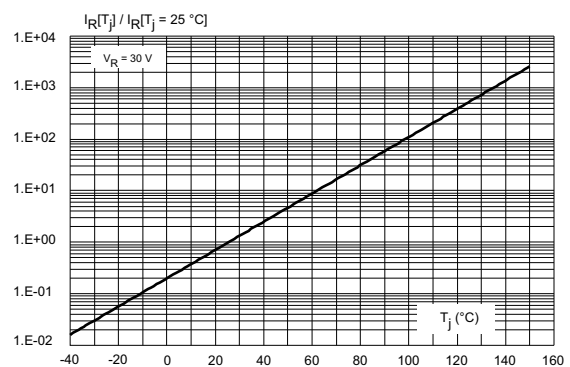


Figure 7. Junction capacitance versus reverse applied voltage (typical values)

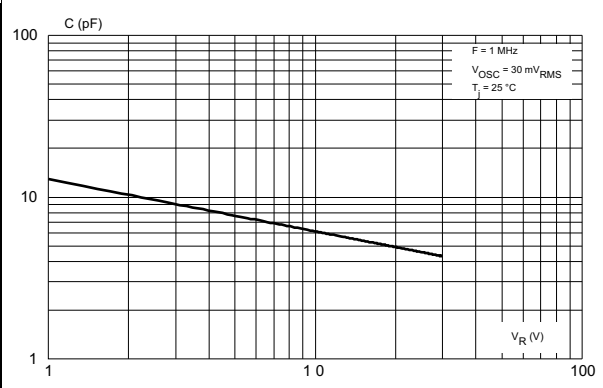


Figure 8. Forward voltage drop versus forward current (typical values)

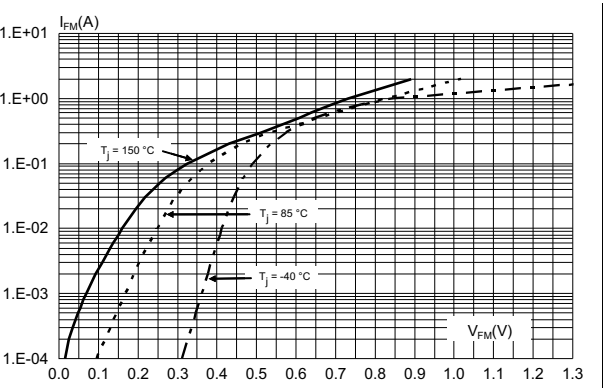
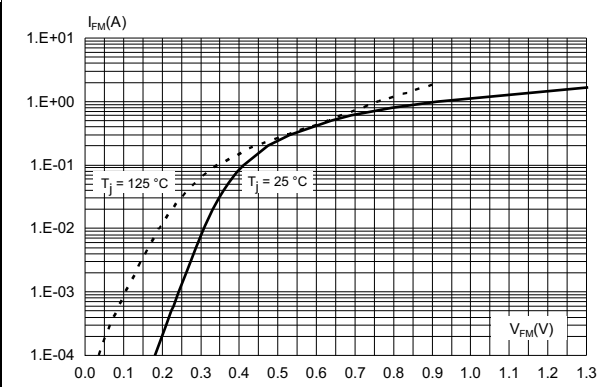


Figure 9. Forward voltage drop versus forward current (typical values)



## 2 Package information

- Epoxy meets UL94, V0
- Lead-free packages

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK<sup>®</sup> packages, depending on their level of environmental compliance. ECOPACK<sup>®</sup> specifications, grade definitions and product status are available at: [www.st.com](http://www.st.com). ECOPACK<sup>®</sup> is an ST trademark.

### 2.1 SOD-523 package information

Figure 10. SOD-523 package outline

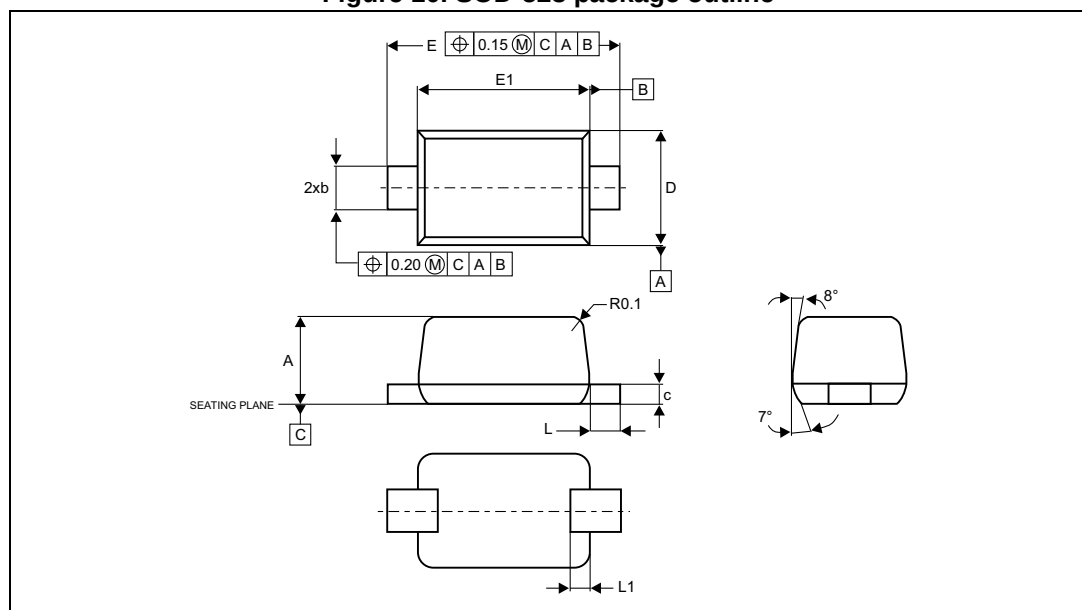
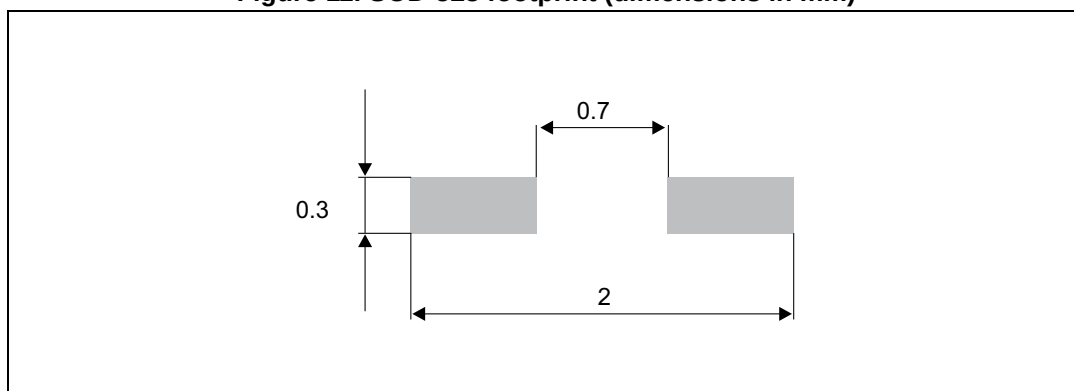


Table 6. SOD-523 package mechanical data

| Ref. | Dimensions  |      |      |                       |       |       |
|------|-------------|------|------|-----------------------|-------|-------|
|      | Millimeters |      |      | Inches <sup>(1)</sup> |       |       |
|      | Typ.        | Min. | Max. | Typ.                  | Min.  | Max.  |
| A    | 0.60        | 0.50 | 0.70 | 0.024                 | 0.020 | 0.028 |
| E    | 1.60        | 1.50 | 1.70 | 0.063                 | 0.059 | 0.067 |
| E1   | 1.20        | 1.10 | 1.30 | 0.047                 | 0.043 | 0.051 |
| D    | 0.80        | 0.70 | 0.90 | 0.031                 | 0.028 | 0.035 |
| b    | -           | 0.25 | 0.35 | -                     | 0.010 | 0.014 |
| c    | -           | 0.07 | 0.20 | -                     | 0.003 | 0.008 |
| L    | 0.20        | 0.15 | 0.25 | 0.008                 | 0.006 | 0.010 |
| L1   | -           | 0.05 | 0.20 | -                     | 0.002 | 0.008 |

1. Values in inches are converted from mm and rounded to 4 decimal digits.

Figure 11. SOD-523 footprint (dimensions in mm)



## 2.2 SOT-323 package information

Figure 12. SOT-323 package outline

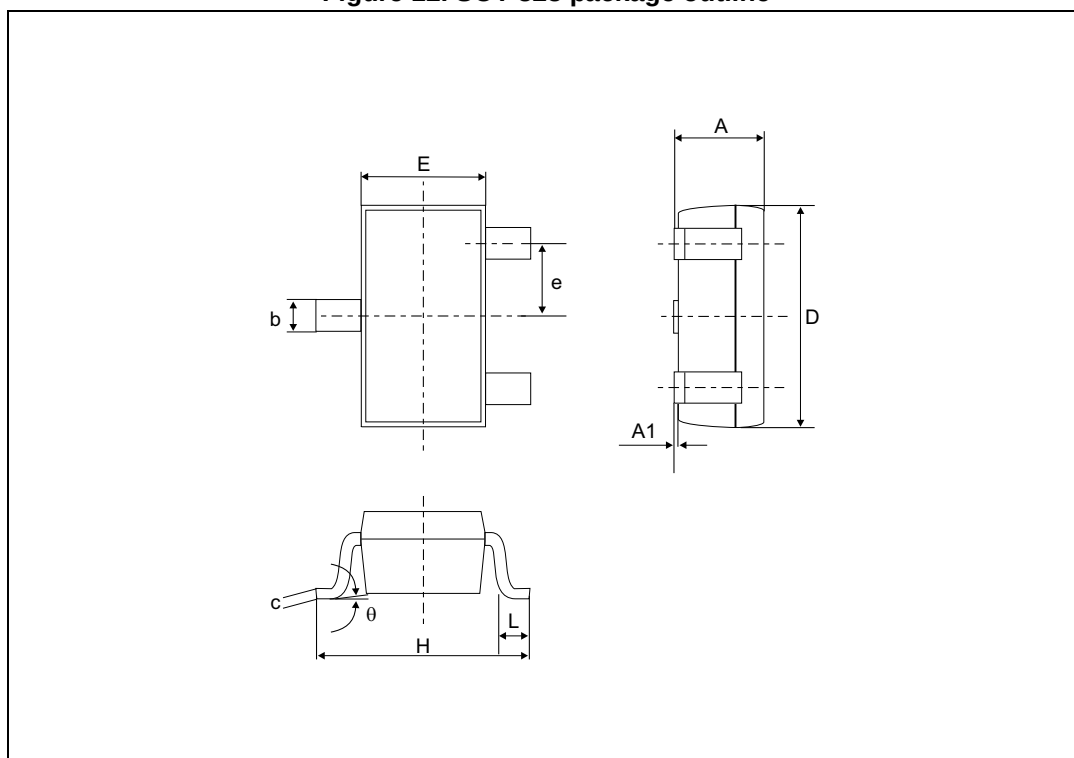
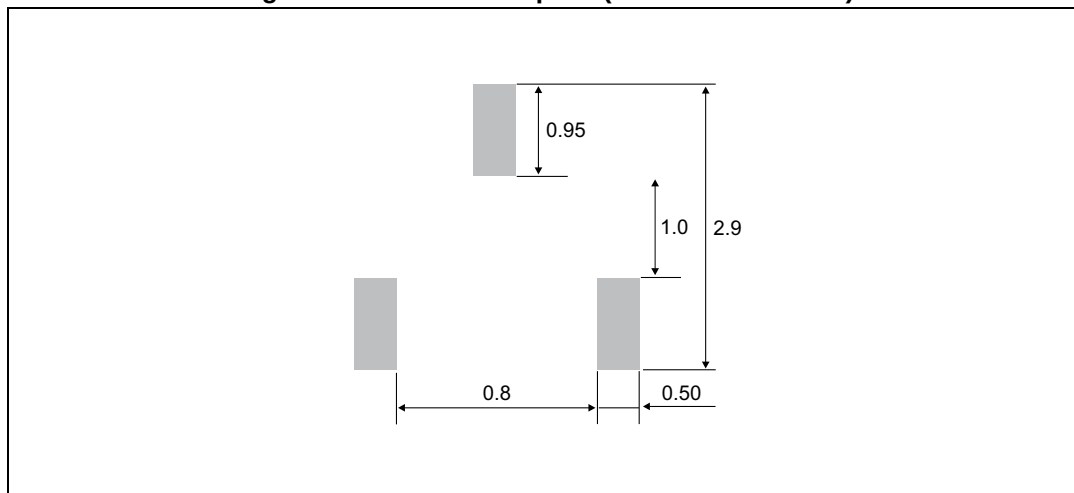


Table 7. SOT-323 package mechanical data

| Ref. | Dimensions  |      |      |                       |       |       |
|------|-------------|------|------|-----------------------|-------|-------|
|      | Millimeters |      |      | Inches <sup>(1)</sup> |       |       |
|      | Typ.        | Min. | Max. | Typ.                  | Min.  | Max.  |
| A    | -           | 0.8  | 1.1  | -                     | 0.031 | 0.043 |
| A1   | -           | 0.0  | 0.1  | -                     | 0.0   | 0.004 |
| b    | -           | 0.25 | 0.4  | -                     | 0.010 | 0.016 |
| c    | -           | 0.1  | 0.26 | -                     | 0.004 | 0.010 |
| D    | 2.0         | 1.8  | 2.2  | 0.079                 | 0.071 | 0.086 |
| E    | 1.25        | 1.15 | 1.35 | 0.049                 | 0.045 | 0.053 |
| e    | 0.65        | -    | -    | 0.026                 | -     | -     |
| H    | 2.1         | 1.8  | 2.4  | 0.083                 | 0.071 | 0.094 |
| L    | 0.2         | 0.1  | 0.3  | 0.008                 | 0.004 | 0.012 |
| q    | -           | 0    | 30°  | -                     | 0     | 30°   |

1. Values in inches are converted from mm and rounded to 4 decimal digits.

Figure 13. SOT-323 footprint (dimensions in mm)

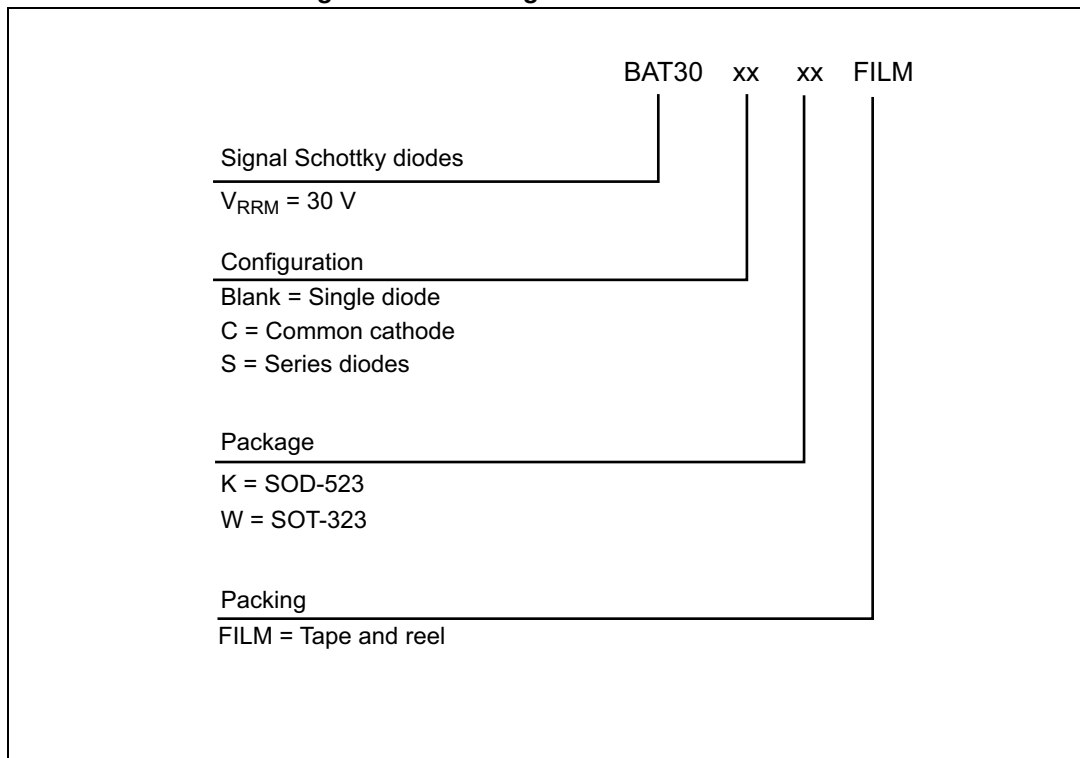


### 3 Ordering information

Table 8. Ordering information

| Order code  | Marking | Package                   | Weight  | Base qty. | Packing mode  |
|-------------|---------|---------------------------|---------|-----------|---------------|
| BAT30CWFILM | C30     | SOT-323<br>Common cathode | 6 mg    | 3000      | Tape and reel |
| BAT30KFILM  | 30      | SOD-523 Single            | 1.45 mg | 3000      | Tape and reel |
| BAT30SWFILM | S30     | SOT-323 Serial            | 6 mg    | 3000      | Tape and reel |

Figure 14. Ordering information scheme



## 4 Revision history

Table 9. Document revision history

| Date        | Revision | Changes                                                                                                                                                                                                                                                                       |
|-------------|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 24-Jul-2006 | 1        | First issue                                                                                                                                                                                                                                                                   |
| 08-Jul-2009 | 2        | Added SOD-923 package. Table 12 sorted on alphabetic sequence of order code. Updated ECOPACK statement.                                                                                                                                                                       |
| 13-Oct-2009 | 3        | Updated <a href="#">Table 6</a> quote "L1" from 0.10 to 0.05.                                                                                                                                                                                                                 |
| 01-Apr-2014 | 4        | Added Pin 1 anode marker to SOT-666 package graphics. Updated <a href="#">Table 2: Absolute ratings (limiting values at <math>T_{amb} = 25\text{ }^{\circ}\text{C}</math>, unless otherwise specified)</a> .                                                                  |
| 01-Apr-2015 | 5        | Package information updated and removed: SOD-323, SOD-923, SOT-23 and SOT666. Updated cover page.<br>Updated <a href="#">Table 2</a> and <a href="#">Table 3</a> .<br>Updated <a href="#">Figure 14</a> and <a href="#">Figure 3</a> .<br>Format updated to current standard. |

**IMPORTANT NOTICE – PLEASE READ CAREFULLY**

STMicroelectronics NV and its subsidiaries ("ST") reserve the right to make changes, corrections, enhancements, modifications, and improvements to ST products and/or to this document at any time without notice. Purchasers should obtain the latest relevant information on ST products before placing orders. ST products are sold pursuant to ST's terms and conditions of sale in place at the time of order acknowledgement.

Purchasers are solely responsible for the choice, selection, and use of ST products and ST assumes no liability for application assistance or the design of Purchasers' products.

No license, express or implied, to any intellectual property right is granted by ST herein.

Resale of ST products with provisions different from the information set forth herein shall void any warranty granted by ST for such product.

ST and the ST logo are trademarks of ST. All other product or service names are the property of their respective owners.

Information in this document supersedes and replaces information previously supplied in any prior versions of this document.

© 2015 STMicroelectronics – All rights reserved

Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Компания «Океан Электроники» является официальным дистрибьютором и эксклюзивным представителем в России одного из крупнейших производителей разъемов военного и аэрокосмического назначения «JONHON», а так же официальным дистрибьютором и эксклюзивным представителем в России производителя высокотехнологичных и надежных решений для передачи СВЧ сигналов «FORSTAR».



## JONHON

«JONHON» (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

«FORSTAR» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели,  
кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).



Телефон: 8 (812) 309-75-97 (многоканальный)

Факс: 8 (812) 320-03-32

Электронная почта: [ocean@oceanchips.ru](mailto:ocean@oceanchips.ru)

Web: <http://oceanchips.ru/>

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А