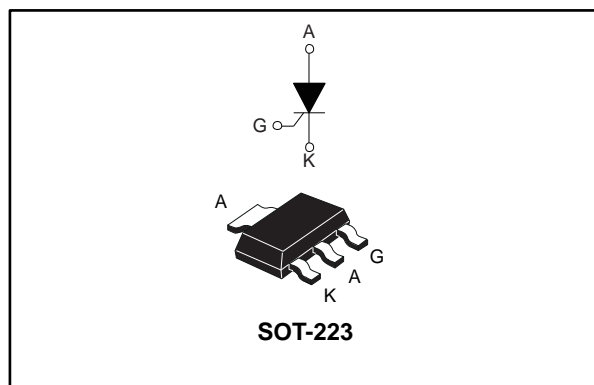


## Sensitive 0.8 A SCR thyristor

Datasheet - production data



### Description

Thanks to highly sensitive triggering levels, the 0.8 A P0102DN SCR thyristor is suitable for all applications where available gate current is limited. This device offers a high blocking voltage of 400 V, ideal for applications like interrupters circuits in 110 V mains regions.

The surface mount SOT-223 package allows compact, SMD based designs for automated manufacturing.

**Table 1: Device summary**

Symbol	Value	Unit
$I_{T(RMS)}$	0.8	A
$V_{DRM}/V_{RRM}$	400	V
$I_{GT}$	0.2	mA
$T_j \text{ max.}$	125	°C

### Features

- $I_{T(RMS)}$  0.8 A
- 125 °C max  $T_j$
- Low 0.2 mA gate current
- 400 V  $V_{DRM}/V_{RRM}$
- ECOPACK®2 compliant component

### Applications

- Proximity sensors
- Gate driver for large Thyristors
- Overvoltage crowbar protection
- Ground fault circuit interrupters
- Arc fault circuit interrupter
- Solid state relay pilot circuit
- Standby mode power supplies
- Residual current detector

# 1 Characteristics

**Table 2: Absolute maximum ratings (limiting values),  $T_j = 25\text{ °C}$  unless otherwise specified**

Symbol	Parameter		Value	Unit	
$I_{T(RMS)}$	RMS on-state current (180 ° conduction angle)		0.8	A	
$I_{T(AV)}$	Average on-state current (180 ° conduction angle)				
$I_{TSM}$	Non repetitive surge peak on-state current ( $T_j$ initial = 25 °C)		$t_p = 8.3\text{ ms}$	8	A
			$t_p = 10\text{ ms}$	7	
$I^2t$	$I^2t$ value for fusing		$t_p = 10\text{ ms}$	0.24	A <sup>2</sup> s
$di/dt$	Critical rate of rise of on-state current $I_G = 2 \times I_{GT}$ , $t_r \leq 100\text{ ns}$	$f = 60\text{ Hz}$	$T_j = 125\text{ °C}$	50	A/ $\mu$ s
$V_{DRM}/V_{RRM}$	Repetitive peak off-state voltage		$T_j = 125\text{ °C}$	400	V
$I_{GM}$	Peak gate current	$t_p = 20\text{ }\mu$ s	$T_j = 125\text{ °C}$	1	A
$P_{G(AV)}$	Average gate power dissipation		$T_j = 125\text{ °C}$	0.1	W
$T_{stg}$	Storage junction temperature range			-40 to +150	°C
$T_j$	Operating junction temperature			-40 to +125	°C

**Table 3: Electrical characteristics ( $T_j = 25\text{ °C}$  unless otherwise specified)**

Symbol	Test conditions		Value	Unit	
$I_{GT}$	$V_D = 12\text{ V}$ , $R_L = 140\text{ }\Omega$		Max.	200	$\mu$ A
$V_{GT}$			Max.	0.8	V
$V_{GD}$	$V_D = V_{DRM}$ , $R_L = 3.3\text{ k}\Omega$ , $R_{GK} = 1000\text{ }\Omega$	$T_j = 125\text{ °C}$	Min.	0.1	V
$V_{RG}$	$I_{RG} = 10\text{ }\mu$ A		Min.	8	V
$I_H$	$I_T = 50\text{ mA}$ , $R_{GK} = 1000\text{ }\Omega$		Max.	5	mA
$I_L$	$I_G = 1.2 \times I_{GT}$ , $R_{GK} = 1000\text{ }\Omega$		Max.	6	mA
$dV/dt$	$V_D = 67\% V_{DRM}$ , $R_{GK} = 1000\text{ }\Omega$	$T_j = 125\text{ °C}$	Min.	75	V/ $\mu$ s

**Table 4: Static characteristics**

Symbol	Test conditions		Value	Unit		
$V_{TM}$	$I_{TM} = 1.6\text{ A}$ , $t_p = 380\text{ }\mu$ s	$T_j = 25\text{ °C}$	Max.	1.95	V	
$V_{TO}$	Threshold voltage					
$R_D$	Dynamic resistance		$T_j = 125\text{ °C}$	Max.	600	m $\Omega$
$I_{DRM}/I_{RRM}$	$V_D = V_{DRM}$ ; $V_R = V_{RRM}$ , $R_{GK} = 1000\text{ }\Omega$		$T_j = 25\text{ °C}$	Max.	1	$\mu$ A
			$T_j = 125\text{ °C}$		100	

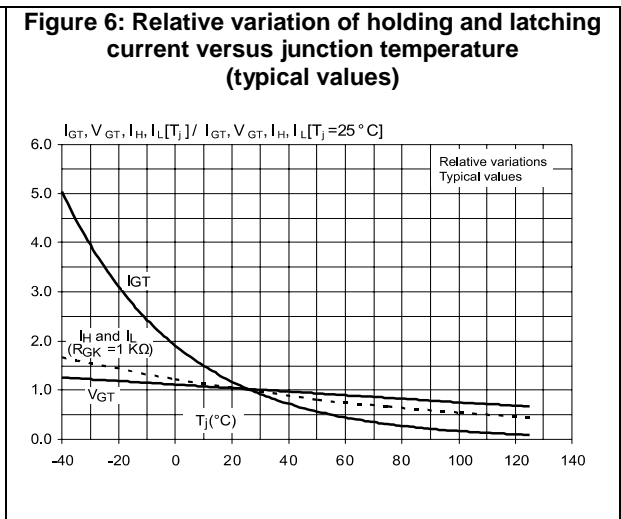
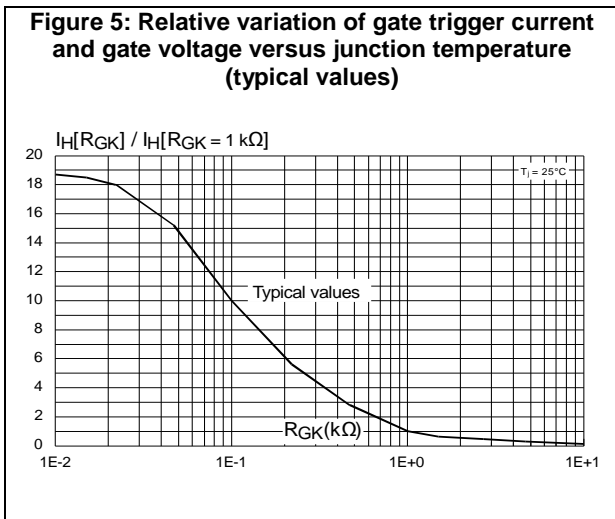
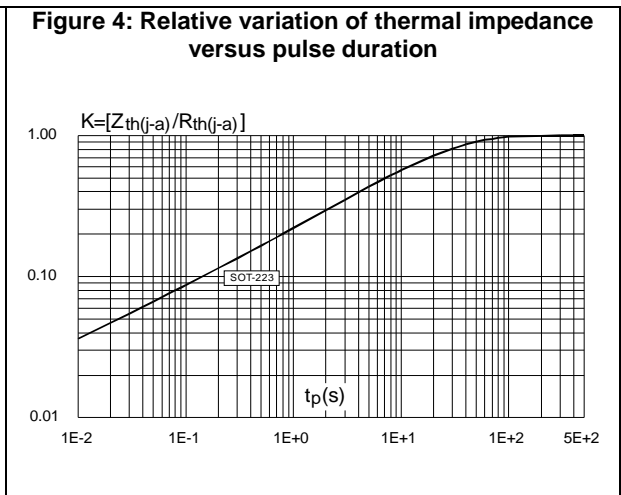
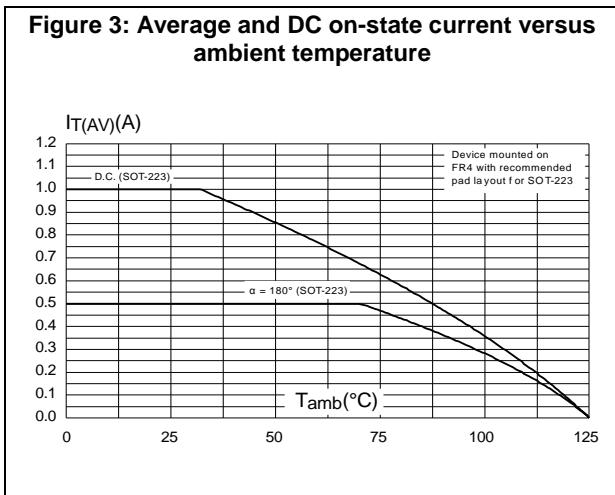
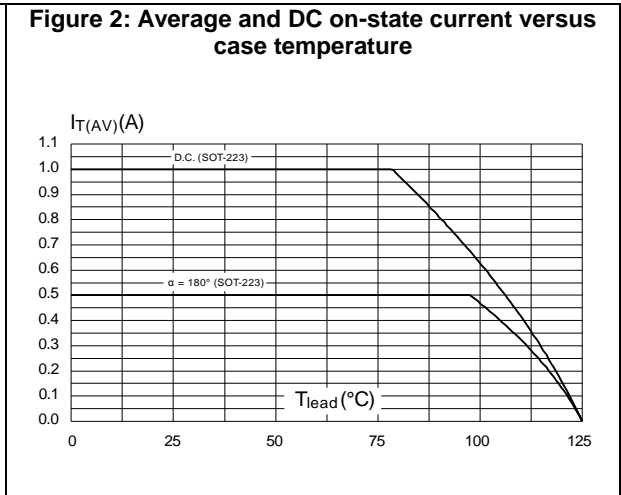
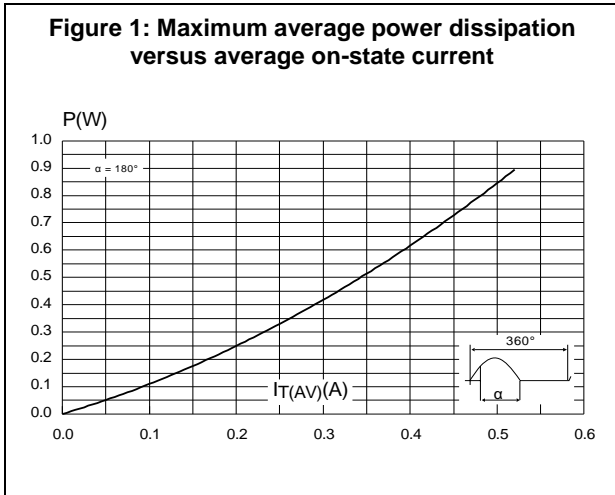
**Table 5: Thermal parameters**

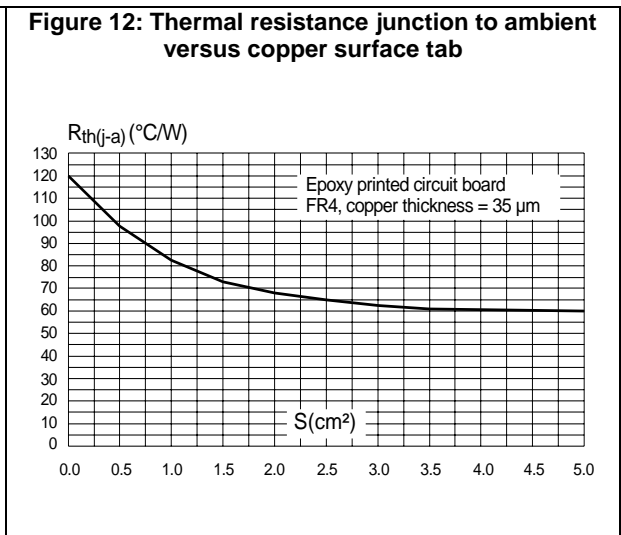
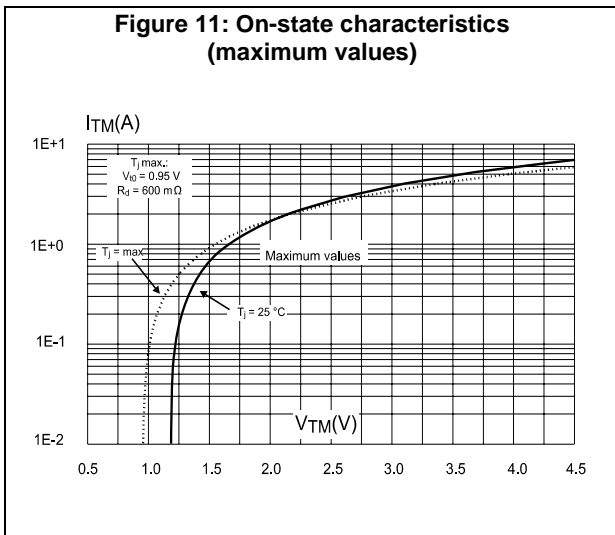
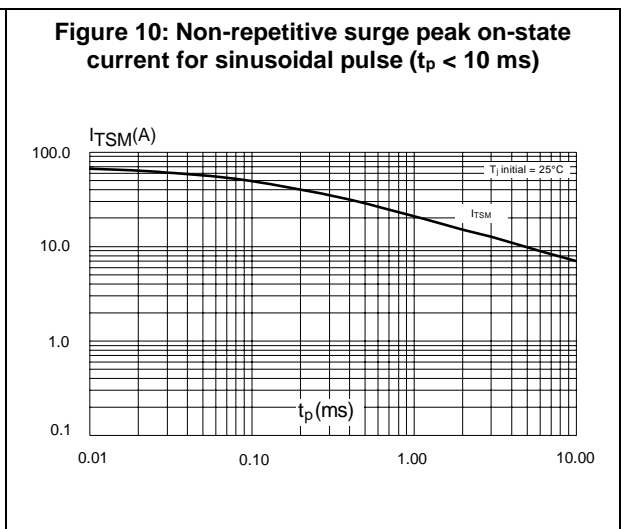
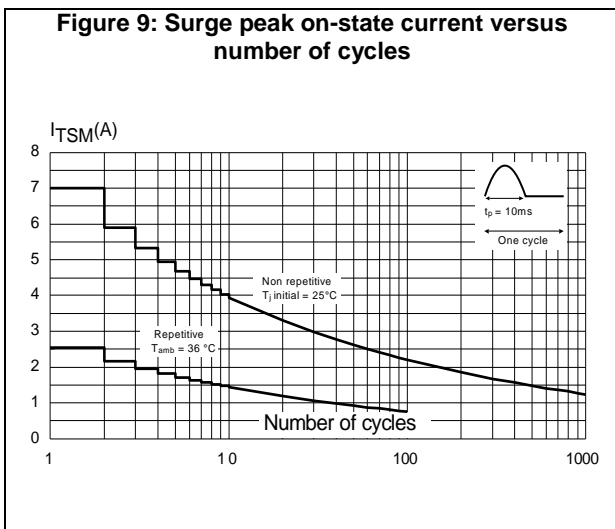
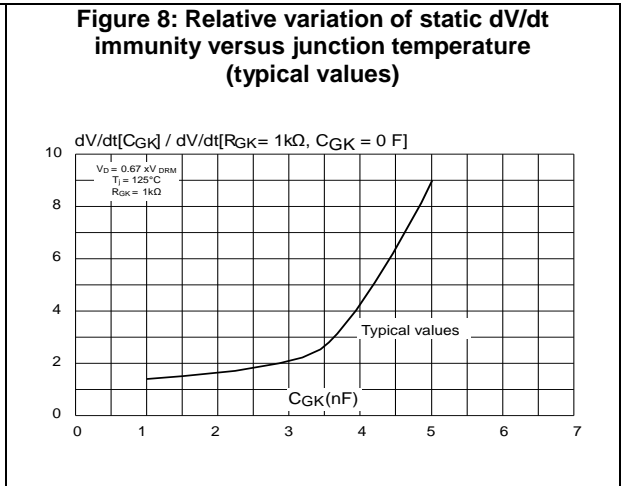
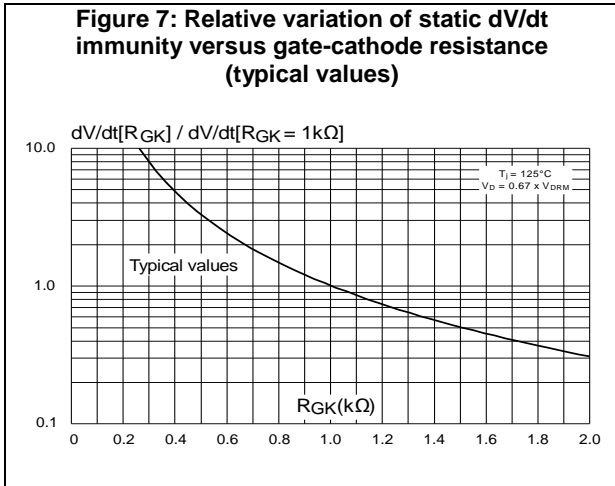
Symbol	Parameter		Value	Unit
$R_{th(j-t)}$	Junction to tab (DC)		30	
$R_{th(j-a)}$	Junction to ambient (DC)	$S^{(1)} = 5\text{ cm}^2$	60	°C/W

**Notes:**

(1)S = copper surface under tab.

# 1.1 Characteristics (curves)





## 2 Package information

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

- Lead-free package
- Halogen free molding resin
- Epoxy meets UL94, V0

### 2.1 SOT-223 package information

Figure 13: SOT-223 package outline

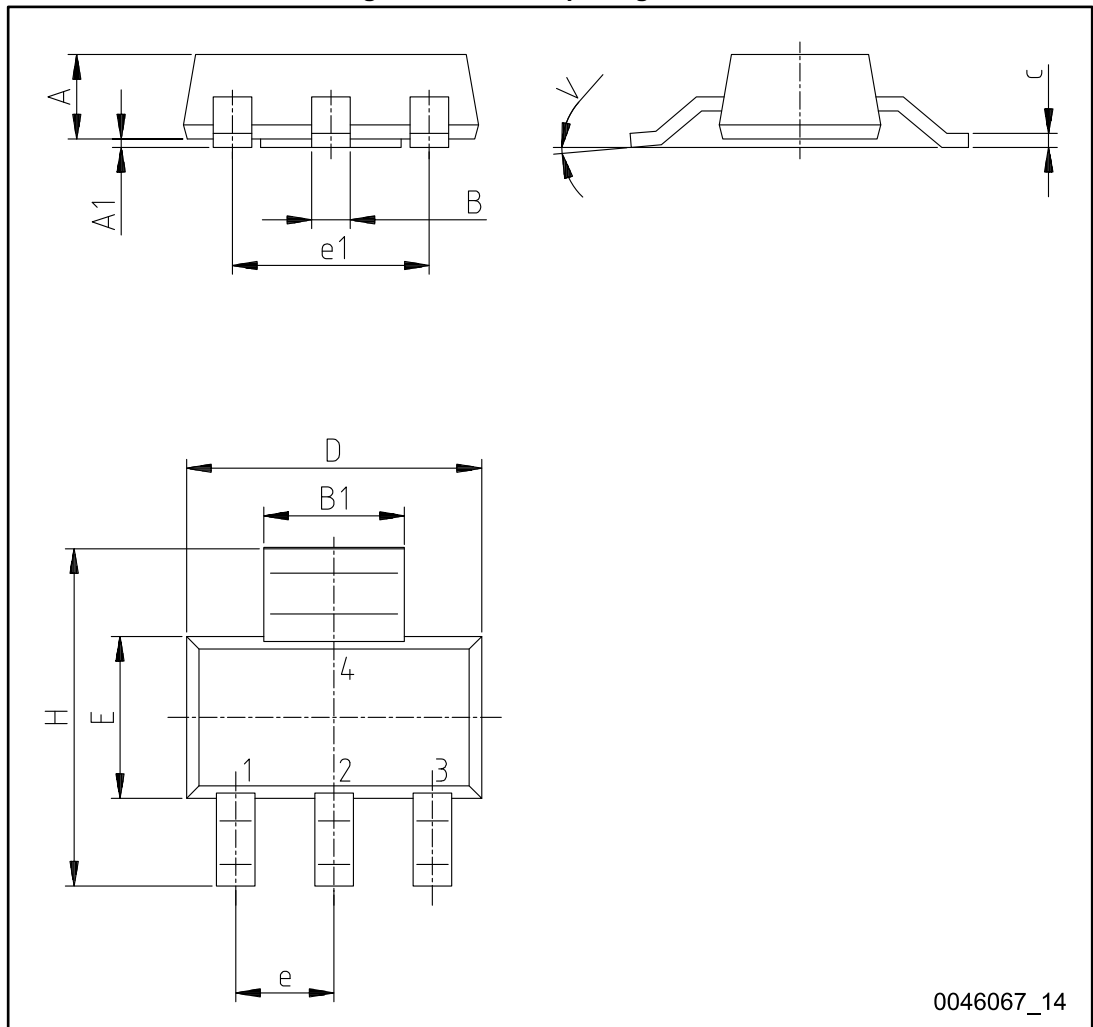


Table 6: SOT-223 package mechanical data

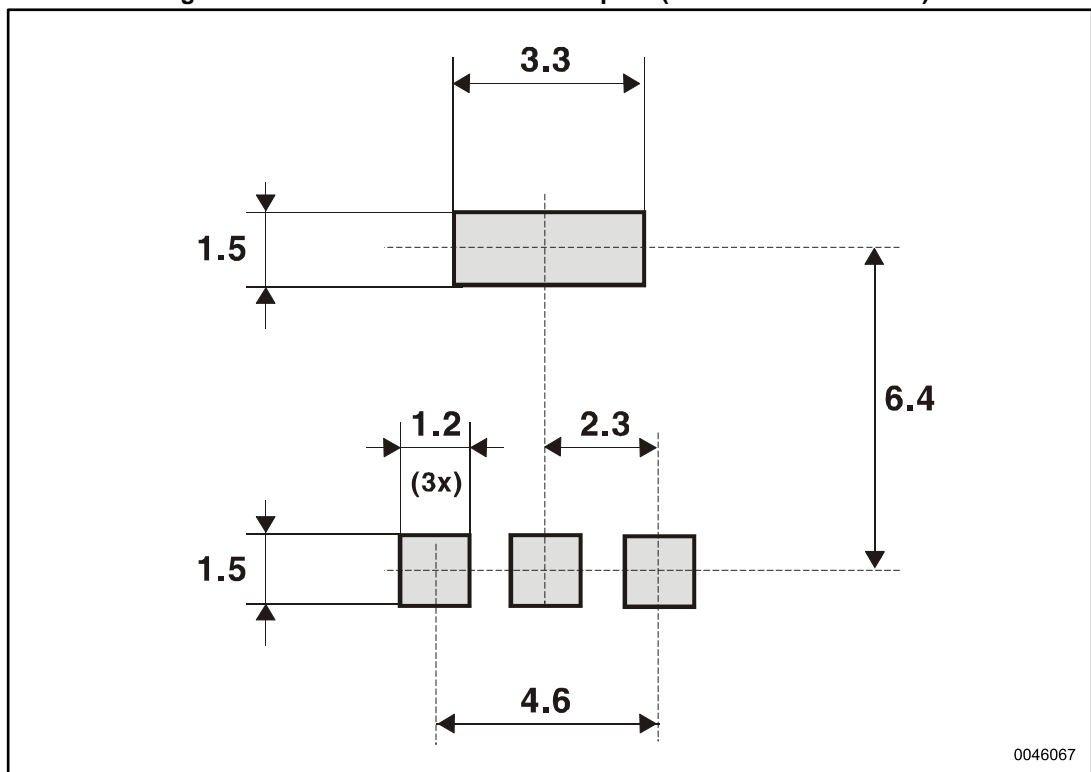
Dim.	Millimeters			Inches <sup>(1)</sup>		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A			1.8			0.0709
A1	0.02		0.1	0.0008		0.0039
B	0.6	0.7	0.85	0.0236	0.0276	0.0335
B1	2.9	3	3.15	0.1142	0.1181	0.1240
c	0.24	0.26	0.35	0.0094	0.0102	0.0138
D <sup>(2)</sup>	6.3	6.5	6.7	0.2480	0.2559	0.2638
e		2.3			0.0906	
e1		4.6			0.1811	
E	3.3	3.5	3.7	0.1299	0.1378	0.1457
H	6.7	7.0	7.3	0.2638	0.2756	0.2874
V			10°			10°

**Notes:**

<sup>(1)</sup>Inches dimensions given only for reference

<sup>(2)</sup>Does not include mold flash or protusions. Mold flash or protusions must not exceed 0.15 mm (0.006 inches)

Figure 14: SOT-223 recommended footprint (dimensions are in mm)



### 3 Ordering information

Figure 15: Ordering information scheme

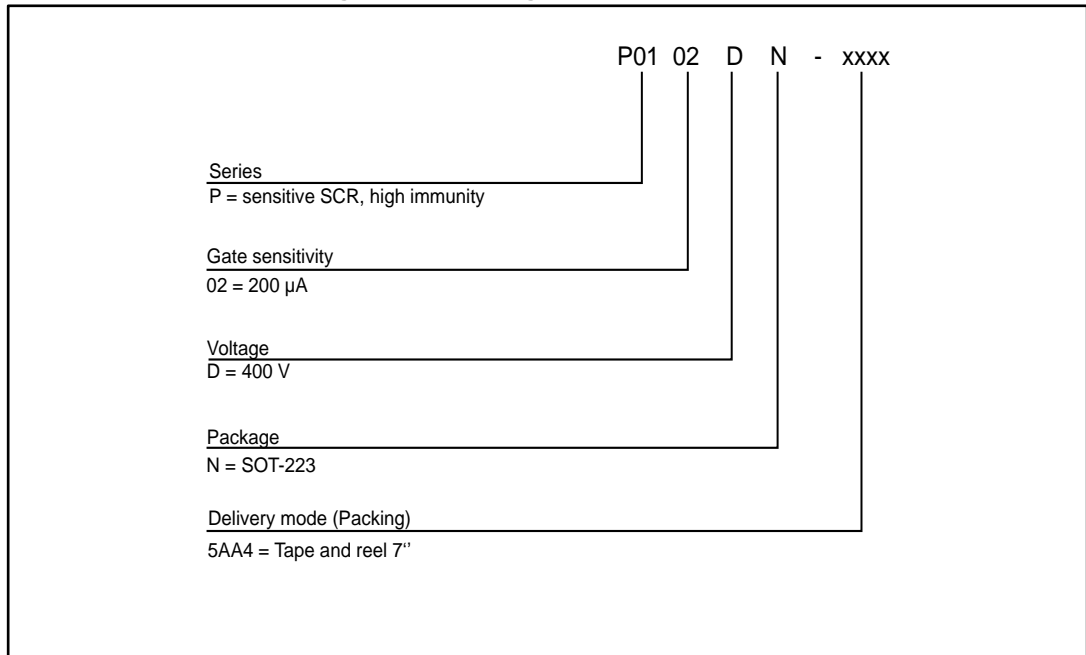


Table 7: Ordering information

Order code	Marking	Package	Weight	Base qty.	Delivery mode
P0102DN 5AA4	P2D	SOT-223	0.12 g	1000	Tape and reel 7''

### 4 Revision history

Table 8: Document revision history

Date	Revision	Changes
26-Oct-2017	1	Initial release.

**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.

© 2017 STMicroelectronics – All rights reserved



## X-ON Electronics

Largest Supplier of Electrical and Electronic Components

*Click to view similar products for [SCRs](#) category:*

*Click to view products by [STMicroelectronics](#) manufacturer:*

Other Similar products are found below :

[NTE5428](#) [T1500N16TOF VT](#) [T880N16TOF](#) [TT162N16KOF-A](#) [TT162N16KOF-K](#) [TT330N16AOF](#) [VS-22RIA20](#) [VS-2N685](#) [057219R](#)  
[T1190N16TOF VT](#) [T1220N22TOF VT](#) [T201N70TOH](#) [T700N22TOF](#) [T830N18TOF](#) [TT250N12KOF-K](#) [VS-110RKI40](#) [NTE5427](#) [NTE5442](#)  
[T2160N28TOF VT](#) [TT251N16KOF-K](#) [VS-22RIA100](#) [VS-16RIA40](#) [TD250N16KOF-A](#) [VS-ST110S16P0](#) [T930N36TOF VT](#) [T2160N24TOF](#)  
[VT](#) [T1190N18TOF VT](#) [T1590N28TOF VT](#) [2N1776A](#) [T590N14TOF](#) [NTE5375](#) [NTE5460](#) [NTE5481](#) [NTE5512](#) [NTE5514](#) [NTE5518](#)  
[NTE5519](#) [NTE5529](#) [NTE5553](#) [NTE5555](#) [NTE5557](#) [NTE5567](#) [NTE5570](#) [NTE5572](#) [NTE5574](#) [NTE5576](#) [NTE5578](#) [NTE5579](#) [NTE5589](#)  
[NTE5592](#)