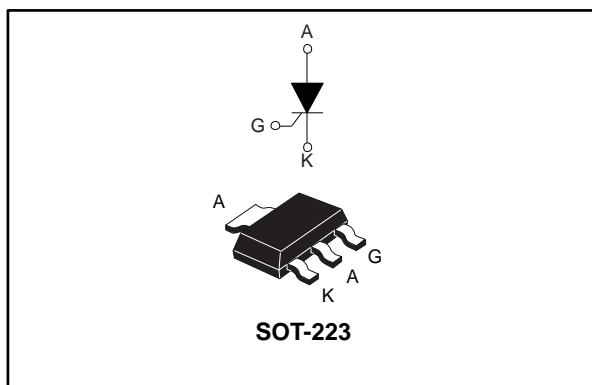


## Sensitive 0.8 A SCR thyristor

Datasheet - production data



### Description

Thanks to highly sensitive triggering levels, the 0.8 A P0111MN SCR thyristor is suitable for all applications where available gate current is limited. This device offers a high blocking voltage of 600 V, ideal for applications like interrupters circuits.

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
$V_{DRM}/V_{RRM}$	600	V
$I_{GT}$	0.004 to 0.025	mA
$T_j \text{ max.}$	125	°C

### Features

- $I_{T(RMS)}$  0.8 A
- 125 °C max  $T_j$
- Low 0.004 to 0.025 mA gate current
- 600 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)		0.5		
$I_{TSM}$	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		$T_j = 125\text{ °C}$	600	V
$I_{GM}$	Peak gate current	$t_p = 20\text{ }\mu\text{s}$	$T_j = 125\text{ °C}$	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	
$I_{GT}$	$V_D = 12\text{ V}, R_L = 140\text{ }\Omega$	Min. - Max.	0.004 to 0.025	mA	
$V_{GT}$					Max.
$V_{GD}$	$V_D = V_{DRM}, R_L = 3.3\text{ k}\Omega, R_{GK} = 1000\text{ }\Omega$	$T_j = 125\text{ °C}$	Min.	0.1	V
$V_{RG}$	$I_{RG} = 10\text{ }\mu\text{A}$		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.	80	V/ $\mu$ s

**Table 4: Static characteristics**

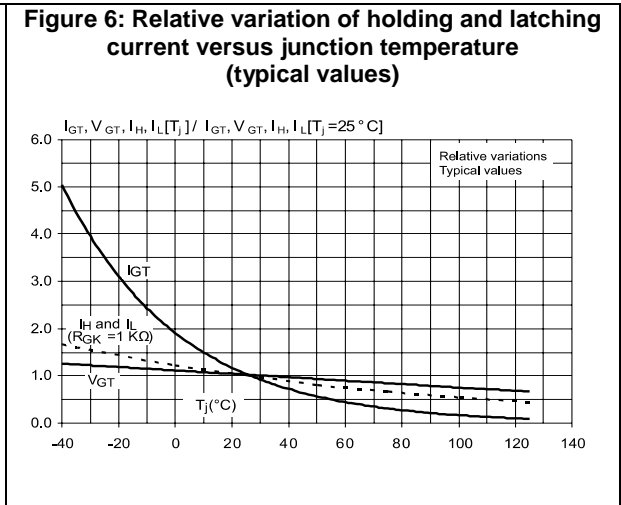
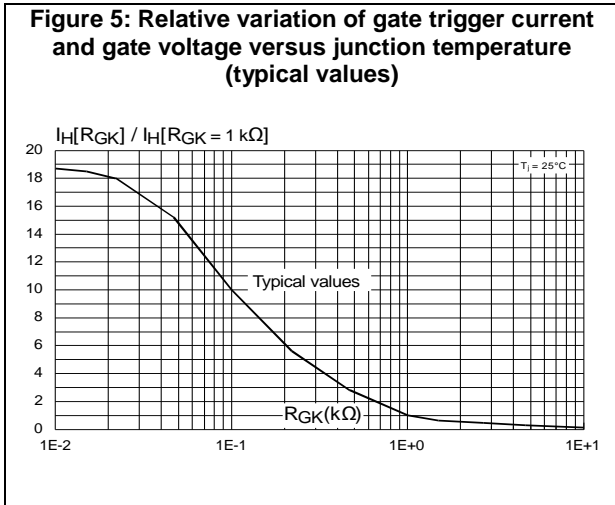
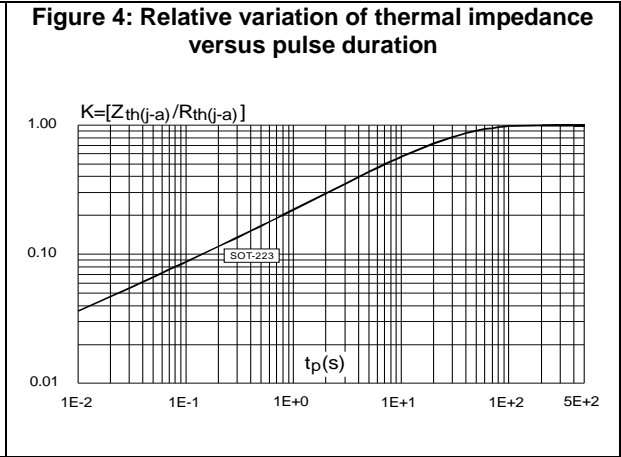
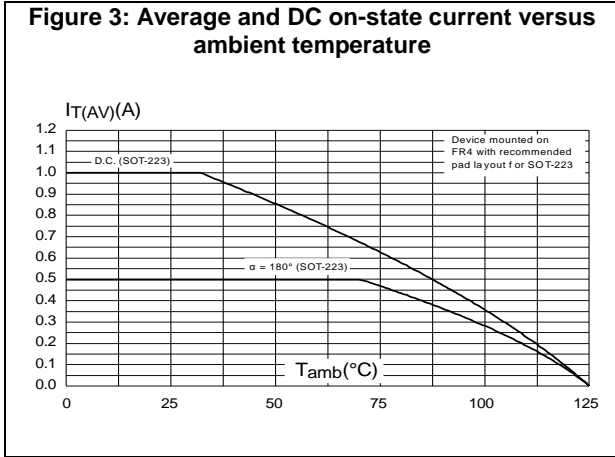
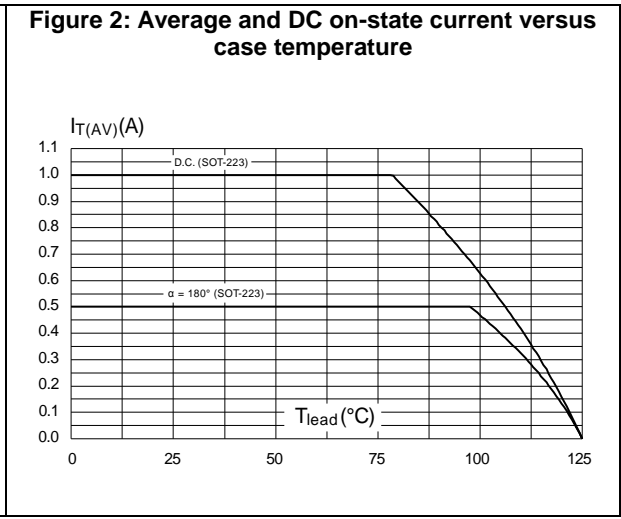
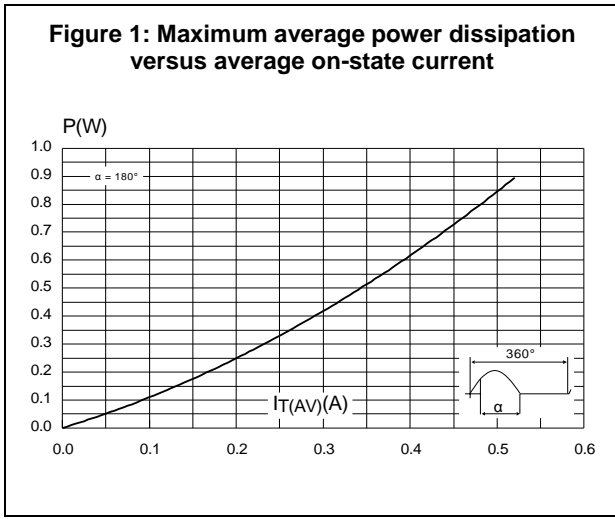
Symbol	Test conditions		Value	Unit		
$V_{TM}$	$I_{TM} = 1.6\text{ A}, t_p = 380\text{ }\mu\text{s}$	$T_j = 25\text{ °C}$	Max.	1.95	V	
$V_{TO}$	Threshold voltage		$T_j = 125\text{ °C}$	Max.		0.95
$R_D$	Dynamic resistance		$T_j = 125\text{ °C}$	Max.	600	m $\Omega$
$I_{DRM}/I_{RRM}$	$V_D = V_{DRM}, V_R = V_{RRM}, R_{GK} = 1000\text{ }\Omega$		$T_j = 25\text{ °C}$	Max.	10	$\mu\text{A}$
			$T_j = 125\text{ °C}$		100	

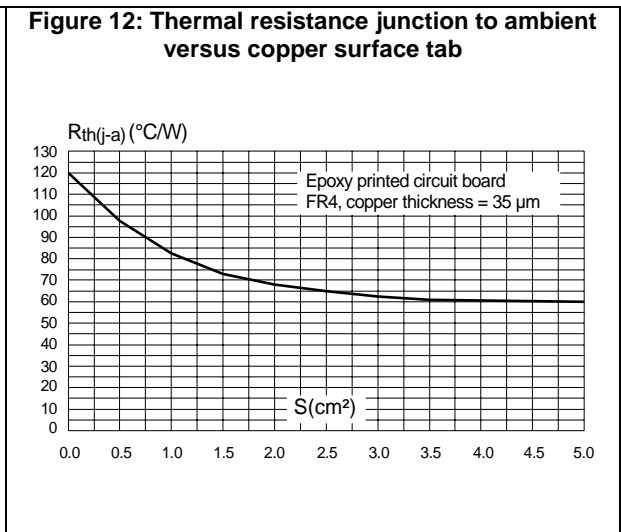
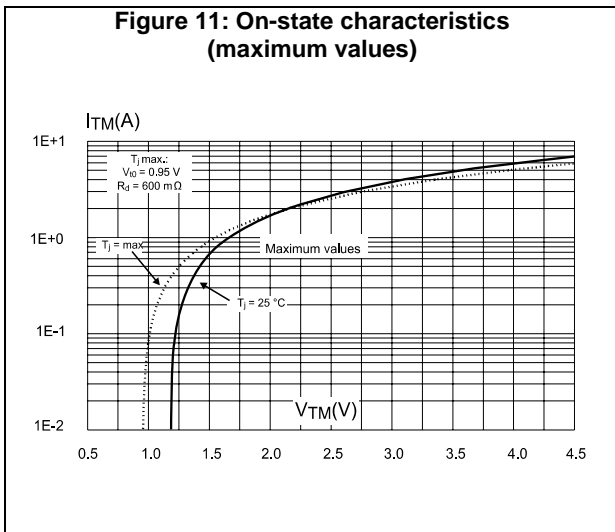
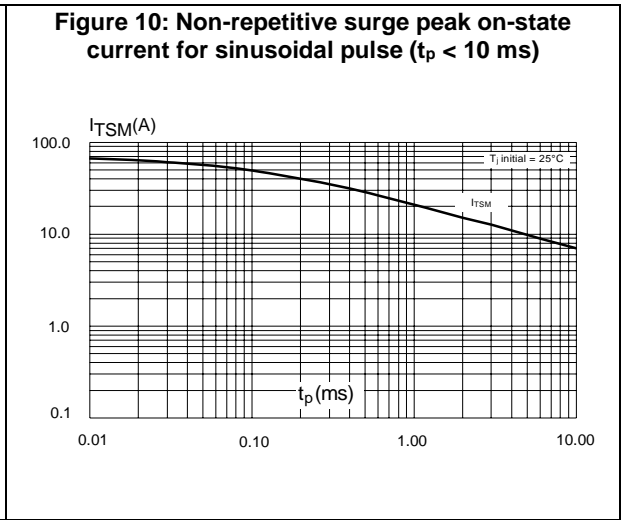
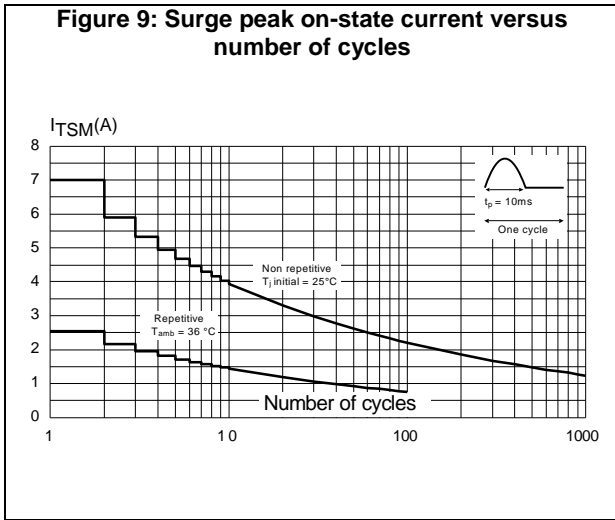
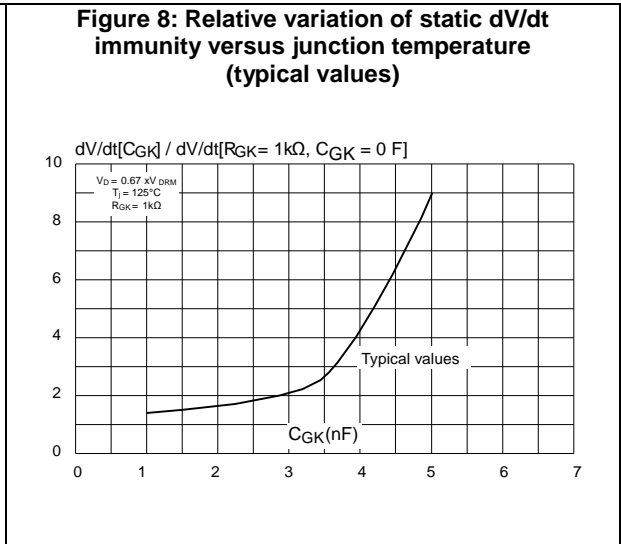
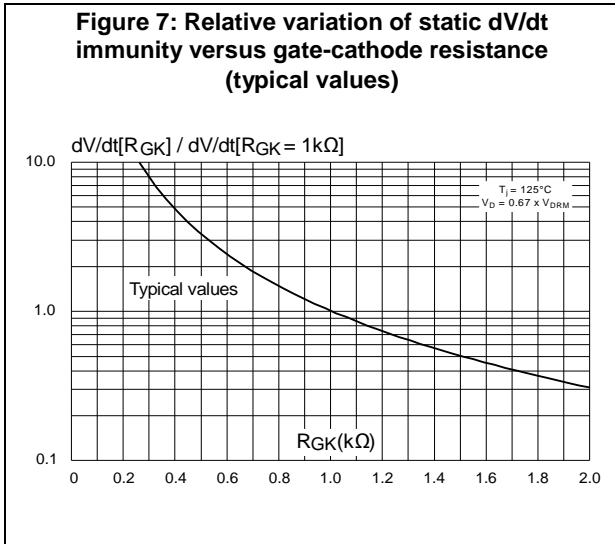
**Table 5: Thermal parameters**

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: <sup>(1)</sup>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

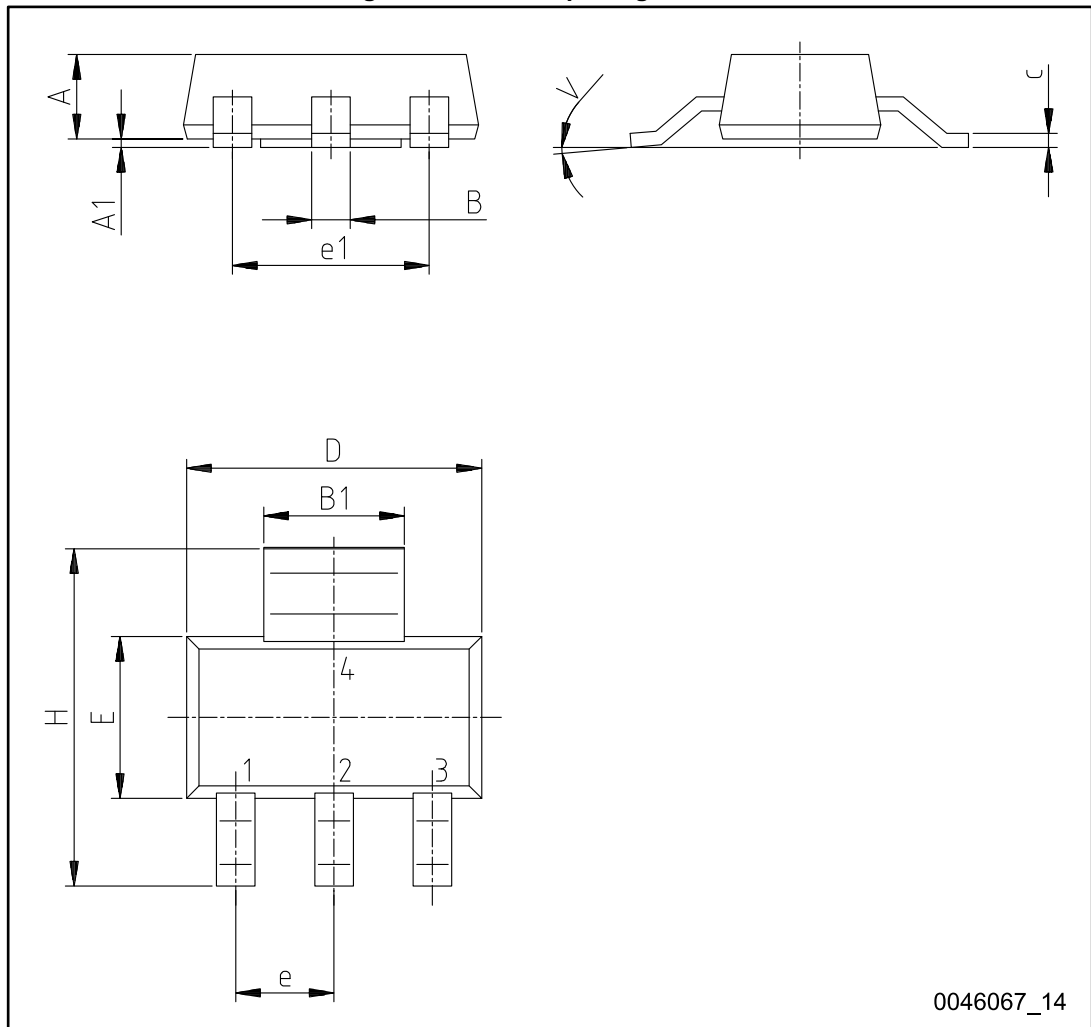


Table 6: SOT-223 package mechanical data

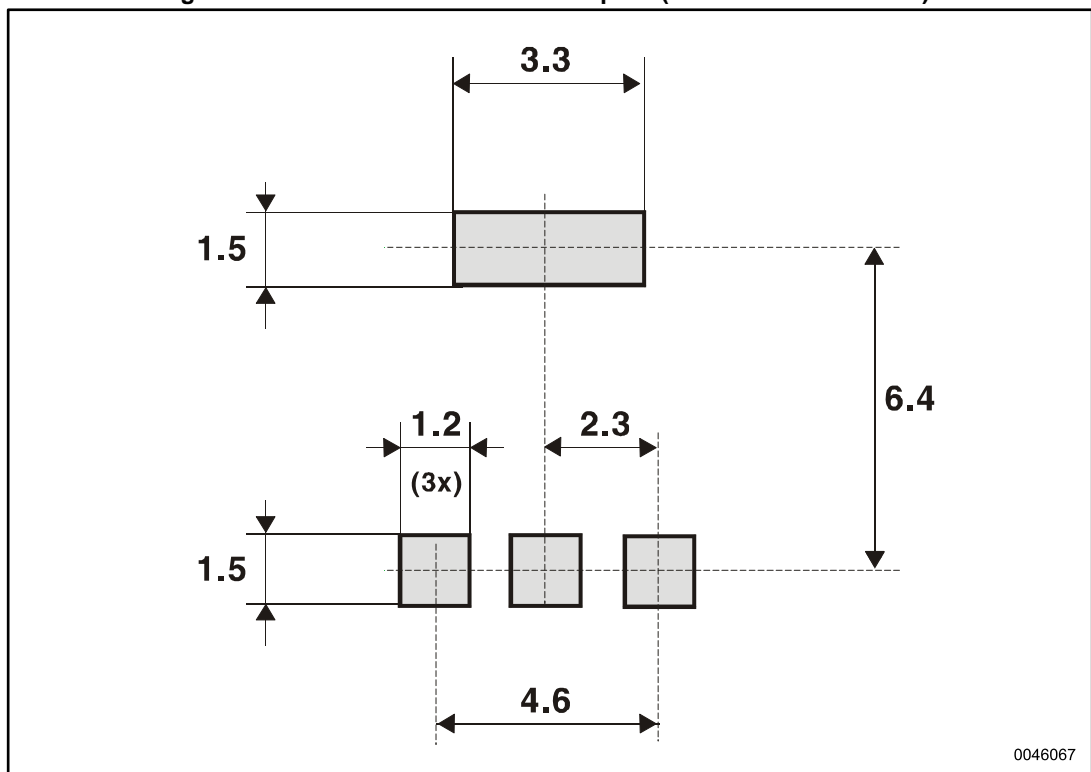
Dim.	Millimeters			Inches <sup>(1)</sup>		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A			1.8			0.0709
A1	0.02		0.1	0.0008		0.0039
B	0.6	0.7	0.85	0.0236	0.0276	0.0335
B1	2.9	3	3.15	0.1142	0.1181	0.1240
c	0.24	0.26	0.35	0.0094	0.0102	0.0138
D <sup>(2)</sup>	6.3	6.5	6.7	0.2480	0.2559	0.2638
e		2.3			0.0906	
e1		4.6			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

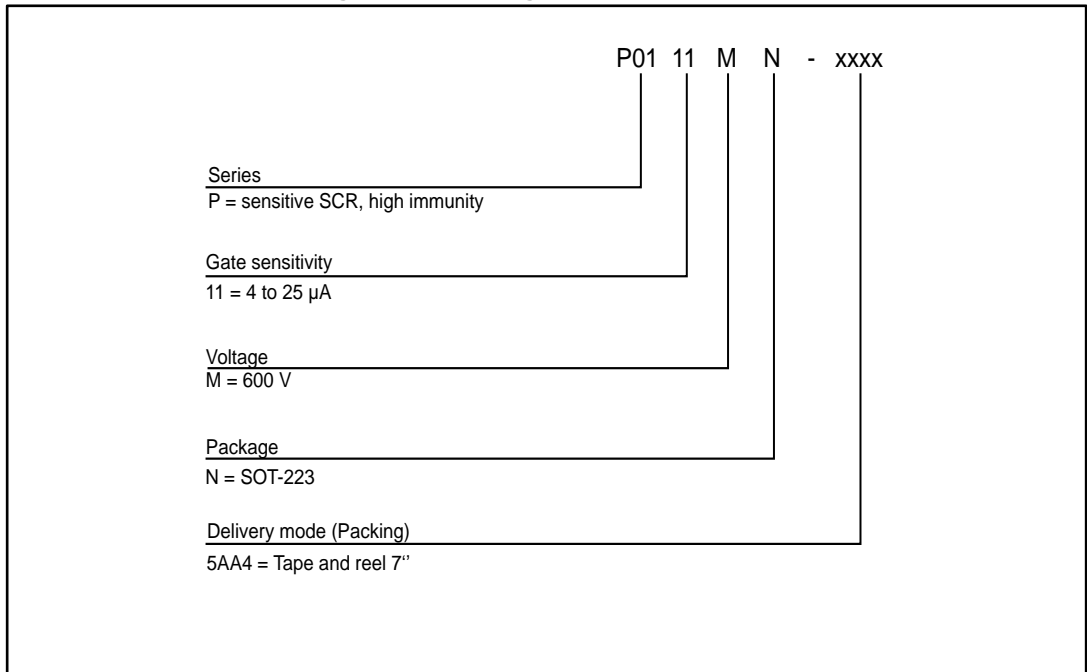


Table 7: Ordering information

Order code	Marking	Package	Weight	Base qty.	Delivery mode
P0111MN 5AA4	P1M	SOT-223	0.12 g	1000	Tape and reel 7"

### 4 Revision history

Table 8: Document revision history

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

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