

SMB380

Tri-axial acceleration sensor

Handling, soldering & mounting instructions

Bosch Sensortec




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SMB380 Handling, soldering & mounting instructions

| | |
|-----------------|---|
| Order code | 0 273 141 006 |
| Package type | QFN |
| Release version | 1.0 |
| Release date | 2007-07-23 |
| Notes | Specifications are subject to change without notice |

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Handling, soldering & mounting instructions for the SMB380

This document describes the conditions and parameters to be applied when handling, soldering and mounting the SMB380 to a PCB.

Important:

- In order to avoid any damages of the SMB380 and resultant loss of warranty please strictly keep with the instructions described within this document.
- It is also strongly recommended to study the SMB380 data sheet prior to handling the SMB380 sensor device.
- In case you have any questions, please do not hesitate to contact your nearest Bosch Sensortec representative for further advice.

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1 Package outline

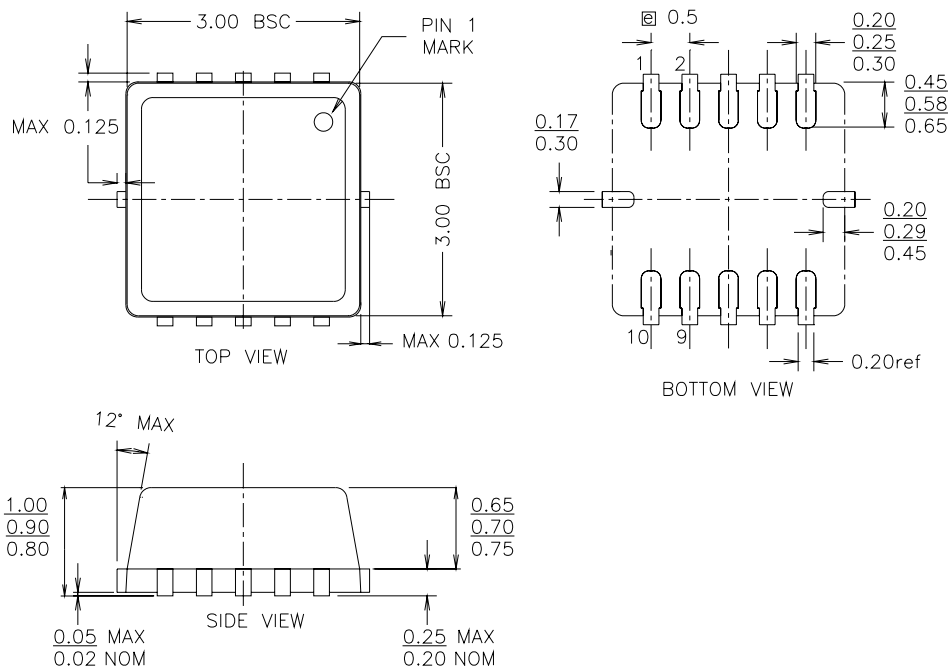
The SMB380 is packaged in a 3mm x 3mm x 0.9mm mold package following JEDEC MO-229.


Basic outline geometry is based on:

- Mold package footprint 3mm x 3mm (tolerance: $\pm 0.1\text{mm}$)
- Height 0.9mm
- No. of leads 10 (8 used for electrical connection)
 Remark: two additional metal features on front edges without electrical functionality
- Lead pitch 0.5mm

Please note: In addition to QFN package the SMB380 will be available in LGA package as well codenamed "BMA150". The QFN and LGA packages are 100% pin compatible.

Figure 1: Top, bottom and side views of the 3mm x 3mm x 0.9mm QFN package (dimensions in mm)



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2 Moisture sensitivity level (MSL)

The moisture sensitivity level classification of the SMB380 acceleration sensors has been made in accordance with the following JEDEC specifications:

- IPC/JEDEC J-STD-020C "Joint Industry Standard: Moisture/Reflow Sensitivity Classification for Non-hermetic Solid State Surface Mount Devices"
- IPC/JEDEC J-STD-033A "Joint Industry Standard: Handling, Packing, Shipping and Use of Moisture/Reflow Sensitive Surface Mount Devices".

The MSL of the SMB380 mass-production devices is 1.

3 RoHS compliancy

The SMB380 acceleration sensor meets the requirements of the EC restriction of hazardous substances (RoHS) directive, see also

"Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment".

The SMB380 acceleration sensor also fulfills the Pb-free soldering requirements of the above-mentioned IPC/JEDEC standard, i.e. reflow soldering with a peak temperature up to 260°C.



4 Landing pattern recommendations

As for the design of the landing patterns, the following recommendations can be given:

Note: this information is valid for QFN (SMB380) as well as LGA packages (BMA150)

Figure 2: Landing patterns for the SMB380

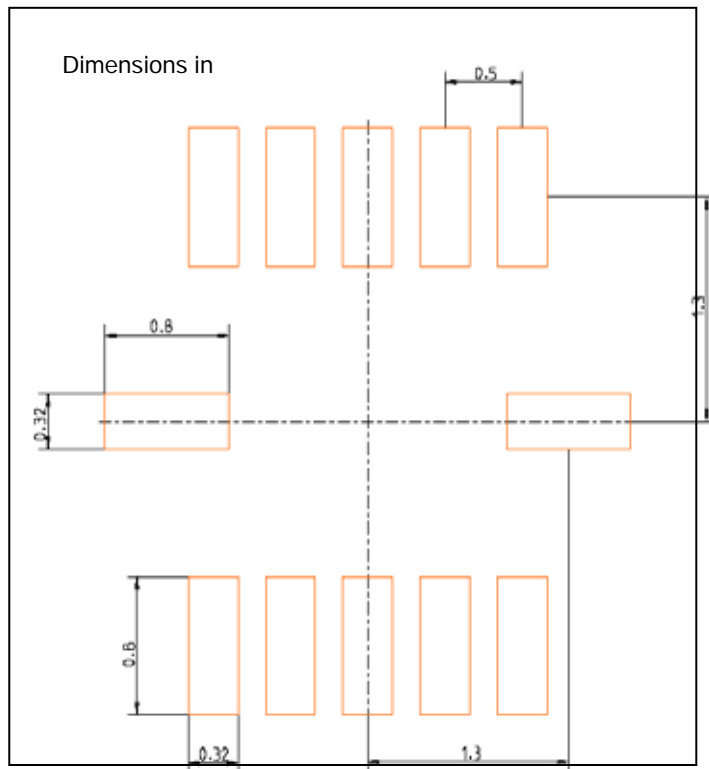
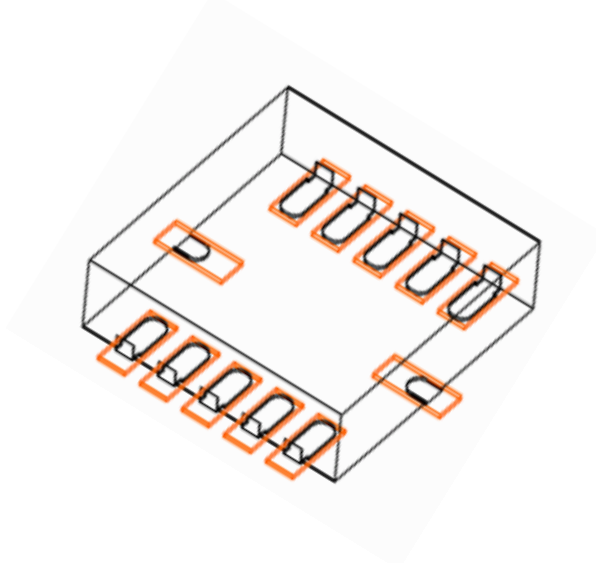



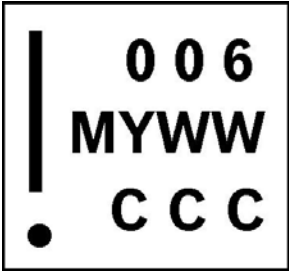
Figure 3: Perspective view of the SMB380 relative to the PCB landing pattern (red lines).



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5 Device marking

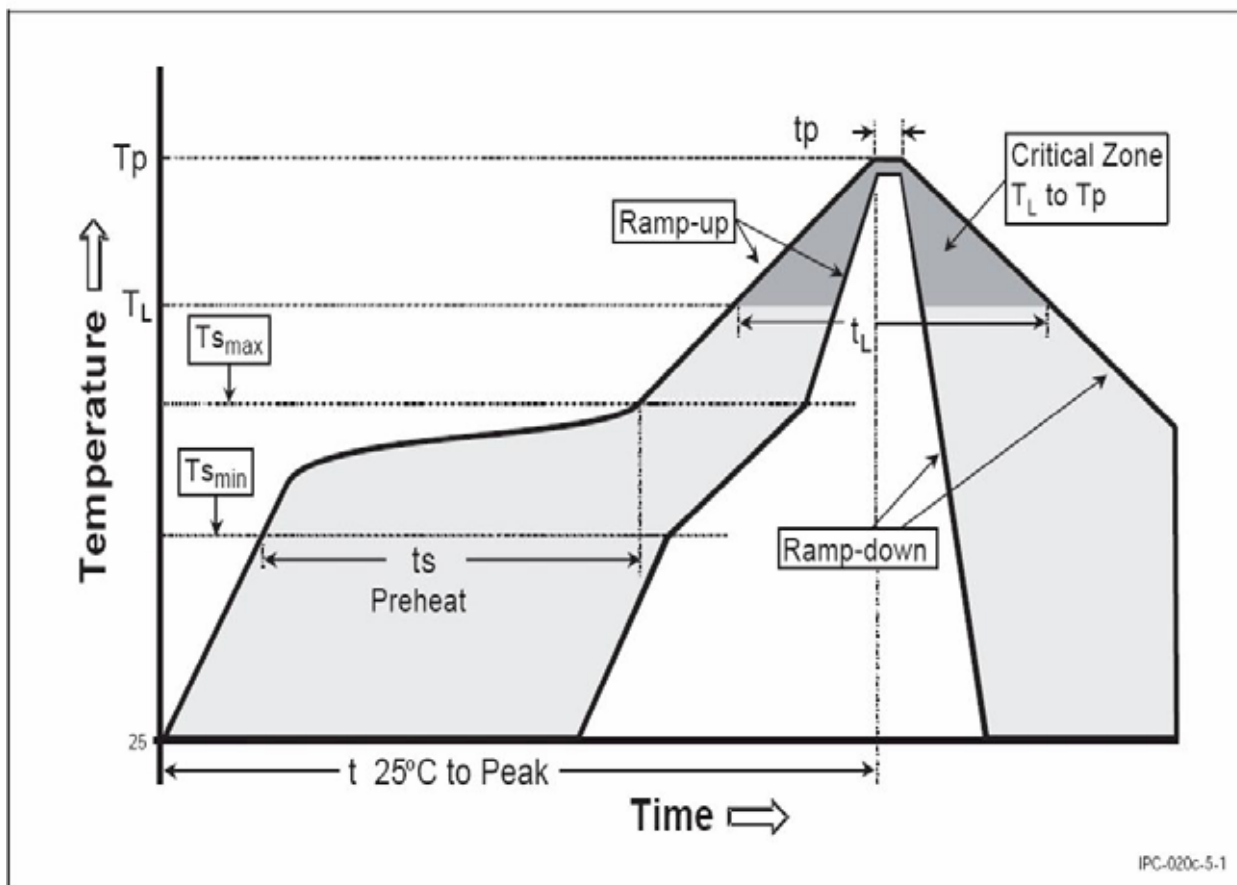
5.1 Mass production devices

| Labeling | Name | Symbol | Remark |
|---|------------------|--------|--|
|  | Product number | 0 0 6 | |
| | Sub-con ID | M | Coded alphanumerically |
| | Date code | YWW | Y: year, alpha-numerical 9=2009, A=2010, ... WW: Calendar week, numerical |
| | Lot counter | CCC | |
| | Pin 1 identifier | • | |

**6 Classification reflow profiles**

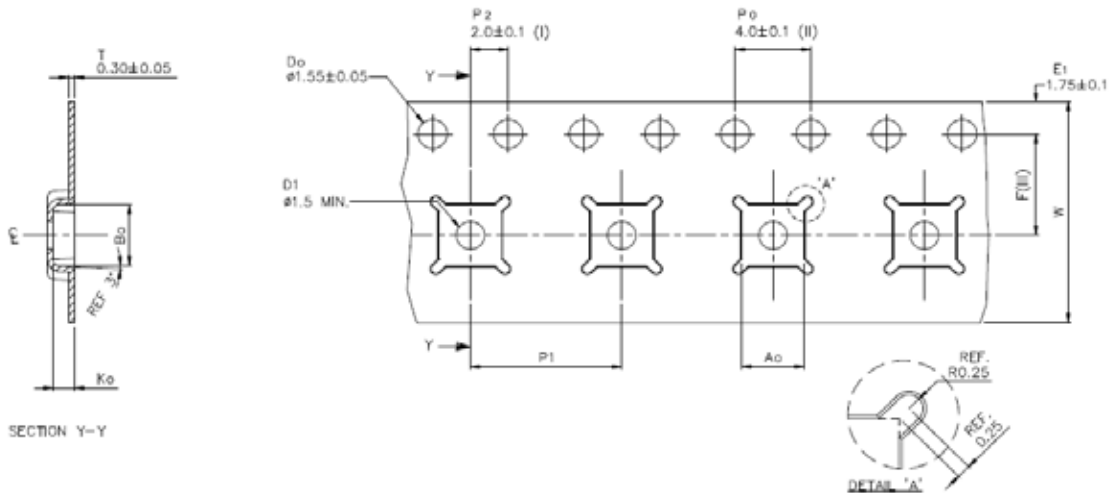
| Profile Feature | Pb-Free Assembly |
|---|------------------------------------|
| Average Ramp-Up Rate ($T_{s_{max}}$ to T_p) | 3° C/second max. |
| Preheat - Temperature Min ($T_{s_{min}}$) - Temperature Max ($T_{s_{max}}$) - Time ($t_{s_{min}}$ to $t_{s_{max}}$) | 150 °C 200 °C 60-180 seconds |
| Time maintained above: - Temperature (T_L) - Time (t_L) | 217 °C 60-150 seconds |
| Peak/Classification Temperature (T_p) | 260 °C |
| Time within 5 °C of actual Peak Temperature (t_p) | 20-40 seconds |
| Ramp-Down Rate | 6 °C/second max. |
| Time 25 °C to Peak Temperature | 8 minutes max. |

Note 1: All temperatures refer to topside of the package, measured on the package body surface.



7 Tape on reel

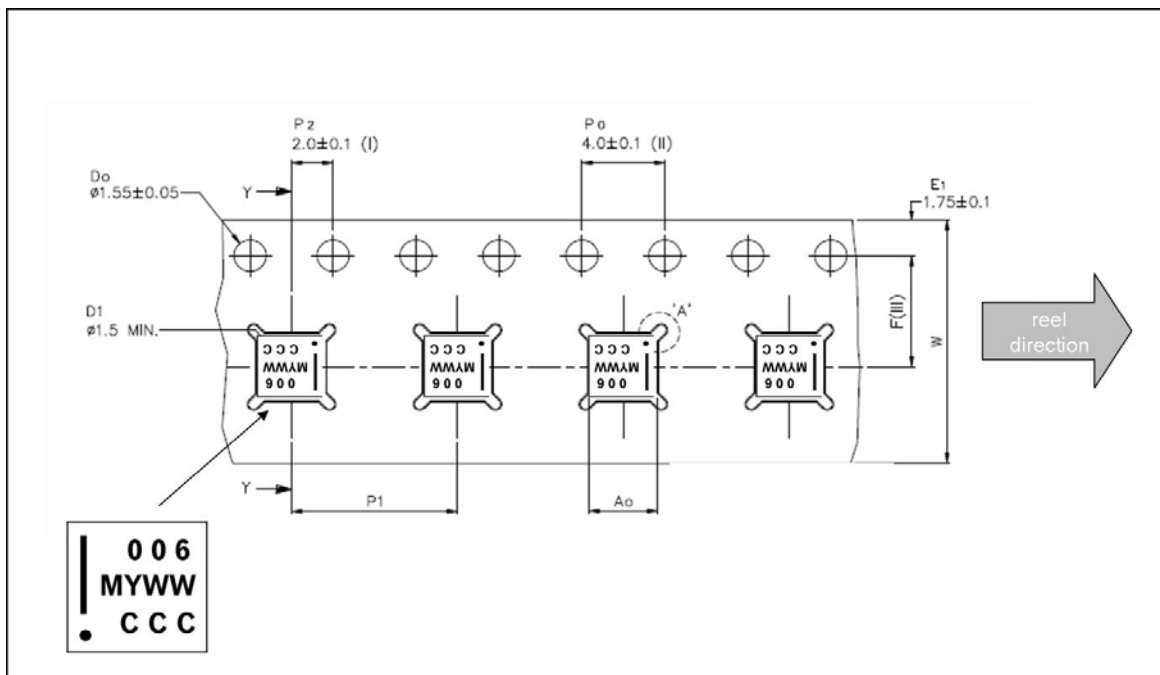
The following picture describes the dimensions of the tape used for shipping the SMB380 sensor device. The material of the tape is conductive polysterene (IV).




| | |
|----|---------------|
| Ao | 3.30 +/- 0.1 |
| Bo | 3.30 +/- 0.1 |
| Ko | 1.10 +/- 0.1 |
| F | 5.50 +/- 0.1 |
| P1 | 8.00 +/- 0.1 |
| W | 12.00 +/- 0.3 |

- (I) Measured from centreline of sprocket hole to centreline of pocket.
 - (II) Cumulative tolerance of 10 sprocket holes is ± 0.20 .
 - (III) Measured from centreline of sprocket hole to centreline of pocket.
 - (IV) Other material available.
- ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED.

The below figure shows the orientation of the SMB380 relative to the tape:



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8 Disclaimer

8.1 Product use

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The resale and/or use of products are at the purchaser's own risk and his own responsibility. The examination of fitness for the intended use is the sole responsibility of the Purchaser.

The purchaser shall indemnify Bosch Sensortec from all third party claims, including any claims for incidental, or consequential damages, arising from any product use not covered by the parameters of the respective valid product data sheet or not approved by Bosch Sensortec and reimburse Bosch Sensortec for all costs in connection with such claims.

The purchaser must monitor the market for the purchased products, particularly with regard to product safety and inform Bosch Sensortec without delay of all security relevant incidents.

8.2 Engineering samples

Engineering Samples are marked with an asterisk (*) or (e). Samples may vary from the valid technical specifications of the product series contained in this data sheet. They are therefore not intended or fit for resale to third parties or for use in end products. Their sole purpose is internal client testing. The testing of an engineering sample may in no way replace the testing of a product series. Bosch Sensortec assumes no liability for the use of engineering samples. By accepting the engineering samples, the Purchaser agrees to indemnify Bosch Sensortec from all claims arising from the use of engineering samples.