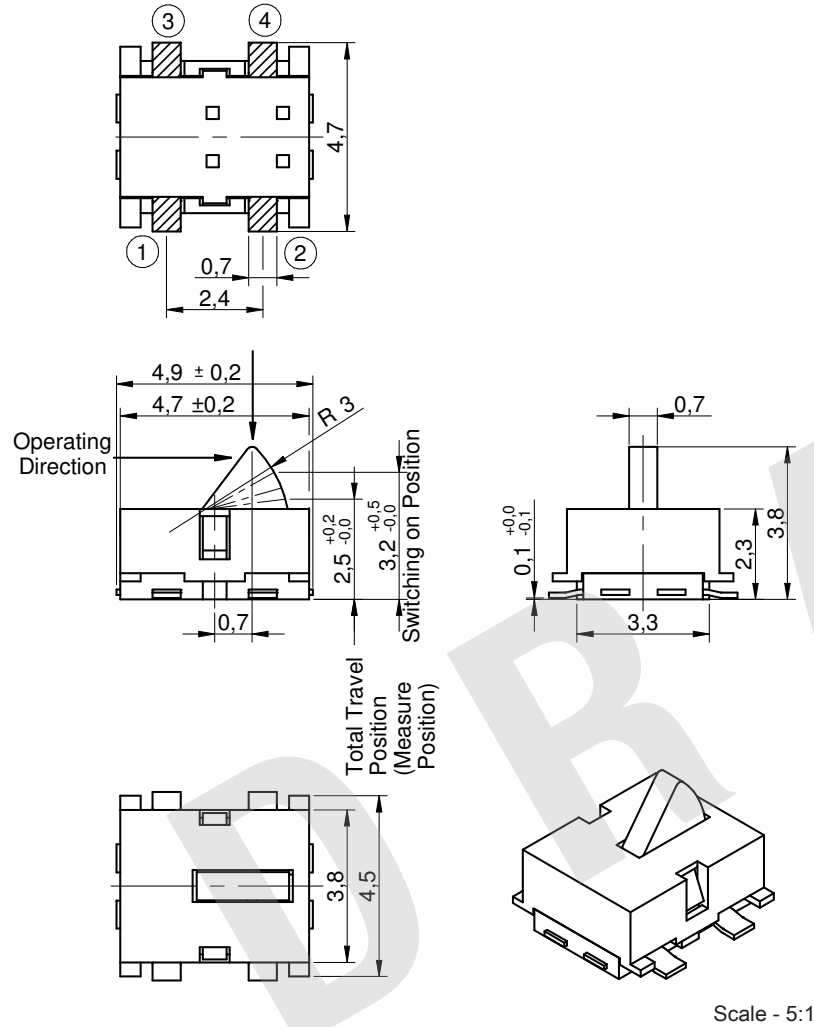
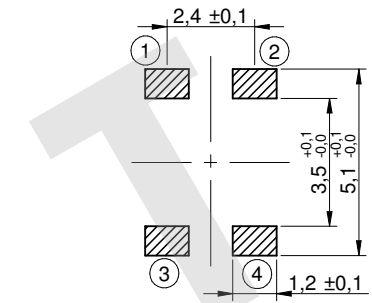


**Dimensions: [mm]**

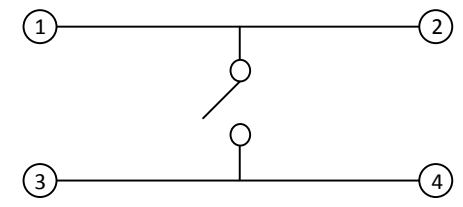


**Recommended Land Pattern: [mm]**



Scale - 5:1

**Schematic:**



Würth Elektronik eiSos GmbH & Co. KG EMC & Inductive Solutions  Max-Eyth-Str. 1 74638 Waldenburg Germany Tel. +49 (0) 79 42 945 - 0  www.we-online.com eiSos@we-online.com		CREATED DaSc	CHECKED ICH	GENERAL TOLERANCE DIN ISO 2768-1m	PROJECTION METHOD 
DESCRIPTION <b>4.7 x 3.8 mm SMD Detector Switch WS-DESV</b>				ORDER CODE <b>461011220101</b>	
		REVISION 001.001	STATUS Valid	DATE (YYYY-MM-DD) 2018-12-02	BUSINESS UNIT eiCan
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This electronic component has been designed and developed for usage in general electronic equipment only. This product is not authorized for use in equipment where a higher safety standard and reliability standard is especially required or where a failure of the product is reasonably expected to cause severe personal injury or death, unless the parties have executed an agreement specifically governing such use. Moreover Würth Elektronik eiSos GmbH & Co KG products are neither designed nor intended for use in areas such as military, aerospace, aviation, nuclear control, submarine, transportation (automotive control, train control, ship control), transportation signal, disaster prevention, medical, public information network etc. Würth Elektronik eiSos GmbH & Co KG must be informed about the intent of such usage before the design-in stage. In addition, sufficient reliability evaluation checks for safety must be performed on every electronic component which is used in electrical circuits that require high safety and reliability functions or performance.

## Material Properties:

Cover Material	PA46
Cover Flammability Rating	UL94 HB
Cover Color	Black
Actuator Material	LCP
Actuator Flammability Rating	UL94 V-0
Actuator Color	Black
Frame Material	LCP
Frame Flammability Rating	UL94 V-0
Frame Color	Black
Moveable Contact Material	Stainless Steel
Moveable Contact Plating	Silver
Terminal Material	Copper Alloy
Terminal Plating	Silver

## Electrical Properties:

Properties	Test conditions		Value	Unit	Tol.
Rated Current Switching		$I_R$	1	mA	
Rated Voltage Switching		$U_R$	5	V (DC)	
Contact Resistance Initial		R	500	mΩ	max.
Contact Resistance After Life Test		R	1	Ω	max.
Insulation Resistance	250 V (DC)	$R_{ISO}$	100	MΩ	min.
Withstanding Voltage	1 min		250	V (AC)	
Bounce			10	ms	max.

## Mechanical Properties:

Properties	Test conditions	Value	Unit	Tol.
Operation Force		60	g	max.
Electrical Life	1 mA/ 5 V (DC)	100000	Cycles	

Schematic	SPST-NO
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## General Information:

Operating Temperature	-40 °C up to +85 °C
Storage Temperature (in original packaging)	-40 °C up to +85 °C

## Packaging Properties:

Properties	Value
Packaging	Tape and Reel
Packaging Unit	Qty. 1500

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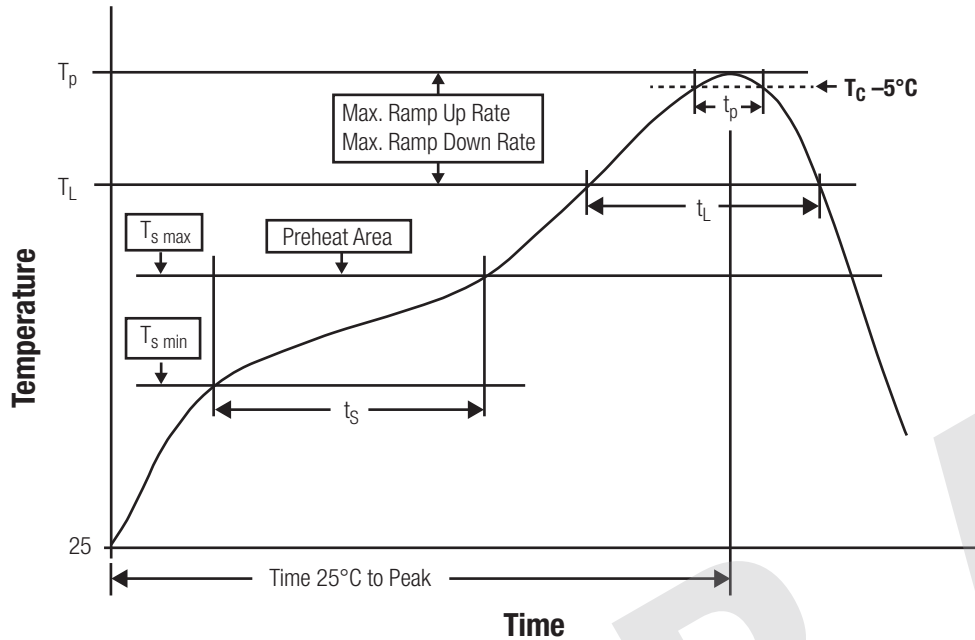
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### Classification Reflow Profile for SMT components:



### Classification Reflow Soldering Profile:

Profile Feature		Value
Preheat Temperature Min <sup>1)</sup>	$T_{s \text{ min}}$	150 °C
Preheat Temperature Max	$T_{s \text{ max}}$	200 °C
Preheat Time $t_s$ from $T_{s \text{ min}}$ to $T_{s \text{ max}}$	$t_s$	60 - 120 seconds
Ramp-up Rate ( $T_L$ to $T_p$ )		3 °C/ second max.
Liquidous Temperature	$T_L$	217 °C
Time $t_L$ maintained above $T_L$	$t_L$	60 - 150 seconds
Peak package body temperature	$T_p$	see table
Time within 5°C of actual peak tempereure	$t_p$	20 - 30 seconds
Ramp-down Rate ( $T_L$ to $T_p$ )		6 °C/ second max.
Time 25°C to peak temperature		8 minutes max.

<sup>1)</sup> refer to IPC/JEDEC J-STD-020D  
refer to IPC/ JEDEC J-STD-020E

### Package Classification Reflow Temperature:

Properties	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> 350-2000	Volume mm <sup>3</sup> >2000
PB-Free Assembly   Package Thickness < 1.6 mm <sup>1)</sup>	260 °C	260 °C	260 °C
PB-Free Assembly   Package Thickness 1.6 mm - 2.5 mm	260 °C	250 °C	245 °C
PB-Free Assembly   Package Thickness ≥ 2.5 mm	250 °C	245 °C	245 °C

<sup>1)</sup> refer to IPC/JEDEC J-STD-020D  
refer to IPC/ JEDEC J-STD-020E

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## Cautions and Warnings:

### The following conditions apply to all Detector Switches (hereinafter referred as to “switch” or “detector switch”) of Würth Elektronik eiSos GmbH & Co. KG:

#### General:

- This switch is designed and developed with the intention for use in general electronics equipment.
- Before incorporating the switch into any equipment in the field such as aerospace, aviation, nuclear control, submarine, transportation, (automotive control, train control, ship control), transportation signal, disaster prevention, medical, public information network etc. where higher safety and reliability are especially required or if there is possibility of direct damage or injury to human body, Würth Elektronik must be asked for a written approval.
- In addition, even switches in general electronic equipment, when used in electrical circuits that require high safety, reliability functions or performance, the sufficient reliability evaluation-check for the safety must be performed by the user before usage.
- The switch is designed and manufactured to be used within the datasheet specified values.
- Do not use the switch outside the datasheet specifications.
- Prevent any damage or scratches on the switch, especially on the actuator.
- Direct mechanical impact to the switch shall be prevented (e.g. overlapping of the PCB's).
- The responsibility for the applicability of the customer specific products and use in a particular customer design is always within the authority of the customer. All technical specification for standard products do also apply to customer specific products.

#### Product Specific:

##### Soldering:

- The solder profile must comply with the WE technical soldering specification; otherwise, the warranty will be void.
- For reflow soldering limitation of two times is recommended. Hand soldering max. 350°C for 3 sec max..
- Other soldering methods (e.g. vapor phase) are not verified and have to be validated by the customer on his own risk.

##### Cleaning and washing:

- Non-washable series are parts without ‘washable’ label in the catalog: The switch is not constructed for washing, so washing can cause malfunction afterwards.
- ‘Washable’ series are those with ‘washable’ label in the catalog: Cleaning agents that are used to clean the customer applications might damage or change the characteristics of the switch, body, pins and termination.
- Please do not submerge our washable products into water or cleaning agents or put them in locations exposed to water completely.
- Do not clean washable series immediately after soldering. The cleaning agent may be absorbed into the switch through respiration while the switch cools.
- When cleaning by hand (brushing), please do not use excessive force on our switch to avoid malfunction afterwards, otherwise relevant areas for the function of the switch might get deformed.

##### Potting and Coating:

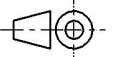

- If the switch is potted or coated in customer applications, the potting or coating material might shrink during and after hardening; thus the switch is exposed to the pressure of the potting material with the effect that the switch possibly might get damaged by this pressure with the outcome that the electrical as well as the mechanical characteristics are in danger of being affected. After the potting or coating material is cured, the switch needs to be checked if any malfunction or destructions on the switch has occurred.

##### Handling:

- Do not repeatedly operate the detector switch with excessive force. It may damage or deforms the contact of the detector switch which results in malfunction.
- Please set up the switch in such way that the actuator will operate in a straight vertical line. A decrease in the lifetime of the switch may result if the actuator is pressed off-center or from an angle.
- Please design the circuit with setting a delay time according to our defined bounce time.
- Do not stack the PCBs that have the switches mounted-on. The vertical pressure may cause damage to the detector switch.
- Please avoid using our detector switch in outdoor environment or environments with high density of chemical material or corrosive gas.
- For our detector switch, “total travel point” drawn in the drawing is the point to where we operate for testing and record related electrical parameter. Design the detector switch at the position at least reaching to “Switching On/OFF position” drawn in the drawing mechanically, however to “total travel position” is still recommended.
- Please operate our detector switches according to the ‘Operating Direction’ drawn from in the specification. Otherwise, it may cause malfunction and /or shorten the life of the detector switch. Design the right angle part with consideration of the wave soldering process so that the parts will not touch the soldering wave during the soldering process or protect the switch part with cover fixture. Melt of the detector switch might cause malfunction.

##### Operation and Storage conditions:

- -40°C ~ +85°C
- In case a switch requires particular handling precautions in addition to the general recommendations mentioned here before, these will appear on the product datasheet.
- The switch shall be used before the end of the period of 12 months based on the product date code; otherwise, 100% solderability cannot be warranted.

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## Important Notes

The following conditions apply to all goods within the product range of Würth Elektronik eiSos GmbH & Co. KG:

### 1. General Customer Responsibility

Some goods within the product range of Würth Elektronik eiSos GmbH & Co. KG contain statements regarding general suitability for certain application areas. These statements about suitability are based on our knowledge and experience of typical requirements concerning the areas, serve as general guidance and cannot be estimated as binding statements about the suitability for a customer application. The responsibility for the applicability and use in a particular customer design is always solely within the authority of the customer. Due to this fact it is up to the customer to evaluate, where appropriate to investigate and decide whether the device with the specific product characteristics described in the product specification is valid and suitable for the respective customer application or not.

### 2. Customer Responsibility related to Specific, in particular Safety-Relevant Applications

It has to be clearly pointed out that the possibility of a malfunction of electronic components or failure before the end of the usual lifetime cannot be completely eliminated in the current state of the art, even if the products are operated within the range of the specifications. In certain customer applications requiring a very high level of safety and especially in customer applications in which the malfunction or failure of an electronic component could endanger human life or health it must be ensured by most advanced technological aid of suitable design of the customer application that no injury or damage is caused to third parties in the event of malfunction or failure of an electronic component. Therefore, customer is cautioned to verify that data sheets are current before placing orders. The current data sheets can be downloaded at [www.we-online.com](http://www.we-online.com).

### 3. Best Care and Attention

Any product-specific notes, cautions and warnings must be strictly observed. Any disregard will result in the loss of warranty.

### 4. Customer Support for Product Specifications

Some products within the product range may contain substances which are subject to restrictions in certain jurisdictions in order to serve specific technical requirements. Necessary information is available on request. In this case the field sales engineer or the internal sales person in charge should be contacted who will be happy to support in this matter.

### 5. Product R&D

Due to constant product improvement product specifications may change from time to time. As a standard reporting procedure of the Product Change Notification (PCN) according to the JEDEC-Standard inform about minor and major changes. In case of further queries regarding the PCN, the field sales engineer or the internal sales person in charge should be contacted. The basic responsibility of the customer as per Section 1 and 2 remains unaffected.

## 6. Product Life Cycle

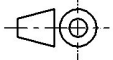

Due to technical progress and economical evaluation we also reserve the right to discontinue production and delivery of products. As a standard reporting procedure of the Product Termination Notification (PTN) according to the JEDEC-Standard we will inform at an early stage about inevitable product discontinuance. According to this we cannot guarantee that all products within our product range will always be available. Therefore it needs to be verified with the field sales engineer or the internal sales person in charge about the current product availability expectancy before or when the product for application design-in disposal is considered. The approach named above does not apply in the case of individual agreements deviating from the foregoing for customer-specific products.

## 7. Property Rights

All the rights for contractual products produced by Würth Elektronik eiSos GmbH & Co. KG on the basis of ideas, development contracts as well as models or templates that are subject to copyright, patent or commercial protection supplied to the customer will remain with Würth Elektronik eiSos GmbH & Co. KG. Würth Elektronik eiSos GmbH & Co. KG does not warrant or represent that any license, either expressed or implied, is granted under any patent right, copyright, mask work right, or other intellectual property right relating to any combination, application, or process in which Würth Elektronik eiSos GmbH & Co. KG components or services are used.

## 8. General Terms and Conditions

Unless otherwise agreed in individual contracts, all orders are subject to the current version of the "General Terms and Conditions of Würth Elektronik eiSos Group", last version available at [www.we-online.com](http://www.we-online.com).

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