

## LSF-SMD 3.50/05/90 SN BK RL

Weidmüller Interface GmbH &amp; Co. KG

Klingenbergstraße 26

D-32758 Detmold

Germany

www.weidmueller.com

## Product image



Similar to illustration

**The innovative quick connector - simple, safe and economical:**

PCB terminals with spring connection and direct PUSH IN technology. A milestone in connection technology.

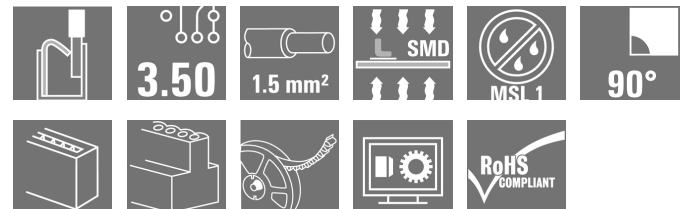
Amazingly simple and simply amazing in practice:

- Connect and easily detach solid wires or wires with wire-end ferrules without using tools
- Processed automatically in the reflow or vapour phase
- Potentials and clamping points marked clearly by coloured push buttons

World-class design-in and processing phases, and suitable for a vast range of applications.

**PCB terminal for fully automatic assembly using reflow soldering (SMD), with PUSH IN wire connections. Conductor insertion and slider operation from the same direction (TOP).**

- **Solid & flexible conductors with wire-end ferrules need only to be inserted and they are ready.**
- **When connecting stranded wires without wire-end ferrules the actuating element is used to open the terminal point**
- **Intuitive handling – since the wire-entry area and handling area are clearly separated.**
- **Packaged in tape-on-reel**
- **Conductor outlet direction 90°**

**General ordering data**

|              |                                                                                                                        |
|--------------|------------------------------------------------------------------------------------------------------------------------|
| Version      | Printed circuit board terminals, 3.50 mm, Number of poles: 5, 90°, black, PUSH IN, Clamping range, max.: 1.5 mm², Tape |
| Order No.    | <a href="#">1473520000</a>                                                                                             |
| Type         | LSF-SMD 3.50/05/90 SN BK RL                                                                                            |
| GTIN (EAN)   | 4050118279979                                                                                                          |
| Qty.         | 320 pc(s).                                                                                                             |
| Product data | IEC: 320 V / 17.5 A / 0.2 - 1.5 mm²<br>UL: 300 V / 12 A / AWG 28 - AWG 14                                              |
| Packaging    | Tape                                                                                                                   |

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## Technical data

## Dimensions and weights

|                          |          |                 |            |
|--------------------------|----------|-----------------|------------|
| Depth                    | 14.75 mm | Depth (inches)  | 0.581 inch |
| Height                   | 9.65 mm  | Height (inches) | 0.38 inch  |
| Height of lowest version | 9.65 mm  | Net weight      | 3.98 g     |
| Width                    | 18.2 mm  | Width (inches)  | 0.717 inch |

## Temperatures

|                                  |        |
|----------------------------------|--------|
| Continuous operating temp., max. | 120 °C |
|----------------------------------|--------|

## System parameters

|                                            |                              |                                              |                        |
|--------------------------------------------|------------------------------|----------------------------------------------|------------------------|
| Product family                             | OMNIMATE Signal - series LSF | Wire connection method                       | PUSH IN                |
| Mounting onto the PCB                      | SMD solder connection        | Conductor outlet direction                   | 90°                    |
| Pitch in mm (P)                            | 3.5 mm                       | Pitch in inches (P)                          | 0.138 inch             |
| Number of poles                            | 5                            | Pin series quantity                          | 1                      |
| Fitted by customer                         | No                           | Coplanarity:                                 | 100 µm                 |
| Number of solder pins per pole             | 2                            | Stripping length                             | 8 mm                   |
| L1 in mm                                   | 14 mm                        | L1 in inches                                 | 0.552 inch             |
| Touch-safe protection acc. to DIN VDE 0470 | IP 20                        | Touch-safe protection acc. to DIN VDE 57 106 | Safe from finger touch |
| Volume resistance                          | 1.60 mΩ                      |                                              |                        |

## Material data

|                                       |                  |                                       |              |
|---------------------------------------|------------------|---------------------------------------|--------------|
| Insulating material                   | LCP GF           | Colour                                | black        |
| Colour chart (similar)                | RAL 9011         | Insulating material group             | IIIa         |
| Comparative Tracking Index (CTI)      | ≥ 175            | Moisture Level (MSL)                  | 1            |
| UL 94 flammability rating             | V-0              | Contact material                      | Copper alloy |
| Layer structure of solder connection  | 4...6 µm Sn matt | Storage temperature, min.             | -40 °C       |
| Storage temperature, max.             | 70 °C            | Operating temperature, min.           | -50 °C       |
| Operating temperature, max.           | 120 °C           | Temperature range, installation, min. | -30 °C       |
| Temperature range, installation, max. | 120 °C           |                                       |              |

## Conductors suitable for connection

|                                                                      |                      |
|----------------------------------------------------------------------|----------------------|
| Clamping range, min.                                                 | 0.13 mm <sup>2</sup> |
| Clamping range, max.                                                 | 1.5 mm <sup>2</sup>  |
| Wire connection cross section AWG, min.                              | AWG 28               |
| Wire connection cross section AWG, max.                              | AWG 14               |
| Solid, min. H05(07) V-U                                              | 0.2 mm <sup>2</sup>  |
| Solid, max. H05(07) V-U                                              | 1.5 mm <sup>2</sup>  |
| Flexible, min. H05(07) V-K                                           | 0.2 mm <sup>2</sup>  |
| Flexible, max. H05(07) V-K                                           | 1.5 mm <sup>2</sup>  |
| w. plastic collar ferrule, DIN 46228 pt 4, 0.25 mm <sup>2</sup> min. |                      |
| w. plastic collar ferrule, DIN 46228 pt 4, 0.75 mm <sup>2</sup> max. |                      |
| w. wire end ferrule, DIN 46228 pt 1, 0.25 mm <sup>2</sup> min.       |                      |
| w. wire end ferrule, DIN 46228 pt 1, 1.5 mm <sup>2</sup> max.        |                      |

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|                     |                                                                                                                                                                       |                              |                               |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------------------------------|
| Clampable conductor | Cross-section for conductor connection                                                                                                                                | Type                         | fine-wired                    |
|                     |                                                                                                                                                                       | nominal                      | 0.25 mm <sup>2</sup>          |
|                     | wire end ferrule                                                                                                                                                      | Stripping length             | nominal 10 mm                 |
|                     |                                                                                                                                                                       | Recommended wire-end ferrule | <a href="#">H0.25/12 HBL</a>  |
|                     | Cross-section for conductor connection                                                                                                                                | Type                         | fine-wired                    |
|                     |                                                                                                                                                                       | nominal                      | 0.34 mm <sup>2</sup>          |
|                     | wire end ferrule                                                                                                                                                      | Stripping length             | nominal 10 mm                 |
|                     |                                                                                                                                                                       | Recommended wire-end ferrule | <a href="#">H0.34/12 TK</a>   |
|                     | Cross-section for conductor connection                                                                                                                                | Type                         | fine-wired                    |
|                     |                                                                                                                                                                       | nominal                      | 0.5 mm <sup>2</sup>           |
|                     | wire end ferrule                                                                                                                                                      | Stripping length             | nominal 10 mm                 |
|                     |                                                                                                                                                                       | Recommended wire-end ferrule | <a href="#">H0.5/14 OR</a>    |
| Reference text      | Cross-section for conductor connection                                                                                                                                | Type                         | fine-wired                    |
|                     |                                                                                                                                                                       | nominal                      | 0.75 mm <sup>2</sup>          |
|                     | wire end ferrule                                                                                                                                                      | Stripping length             | nominal 10 mm                 |
|                     |                                                                                                                                                                       | Recommended wire-end ferrule | <a href="#">H0.75/14T HBL</a> |
|                     | Cross-section for conductor connection                                                                                                                                | Type                         | fine-wired                    |
|                     |                                                                                                                                                                       | nominal                      | 1.5 mm <sup>2</sup>           |
|                     | wire end ferrule                                                                                                                                                      | Stripping length             | nominal 7 mm                  |
|                     |                                                                                                                                                                       | Recommended wire-end ferrule | <a href="#">H1.5/7</a>        |
|                     | Length of ferrules is to be chosen depending on the product and the rated voltage. The outside diameter of the plastic collar should not be larger than the pitch (P) |                              |                               |

## Rated data acc. to IEC

|                                                                           |                        |                                                                       |                  |
|---------------------------------------------------------------------------|------------------------|-----------------------------------------------------------------------|------------------|
| tested acc. to standard                                                   | IEC 60664-1, IEC 61984 | Rated current, min. number of poles (Tu=20°C)                         | 17.5 A           |
| Rated current, max. number of poles (Tu=20°C)                             | 16 A                   | Rated current, min. number of poles (Tu=40°C)                         | 17.5 A           |
| Rated current, max. number of poles (Tu=40°C)                             | 14 A                   | Rated voltage for surge voltage class / pollution degree II/2         | 320 V            |
| Rated voltage for surge voltage class / pollution degree III/2            | 160 V                  | Rated voltage for surge voltage class / pollution degree III/3        | 160 V            |
| Rated impulse voltage for surge voltage class/ pollution degree II/2      | 2.5 kV                 | Rated impulse voltage for surge voltage class/ pollution degree III/2 | 2.5 kV           |
| Rated impulse voltage for surge voltage class/ contamination degree III/3 | 2.5 kV                 | Short-time withstand current resistance                               | 3 x 1s with 80 A |

## Rated data acc. to CSA

|                                   |                                                                                     |                                   |                |
|-----------------------------------|-------------------------------------------------------------------------------------|-----------------------------------|----------------|
| Institute (CSA)                   |  | Certificate No. (CSA)             | 200039-1664286 |
| Rated voltage (Use group B / CSA) | 300 V                                                                               | Rated voltage (Use group D / CSA) | 300 V          |
| Rated current (Use group B / CSA) | 10 A                                                                                | Rated current (Use group D / CSA) | 10 A           |
| Wire cross-section, AWG, min.     | AWG 28                                                                              | Wire cross-section, AWG, max.     | AWG 14         |
| Reference to approval values      | Specifications are maximum values, details - see approval certificate.              |                                   |                |

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## Technical data

## Rated data acc. to UL 1059

Institute (cURus)



Certificate No. (cURus)

E60693

Rated voltage (Use group B / UL 1059) 300 V

Rated voltage (Use group D / UL 1059) 300 V

Rated current (Use group B / UL 1059) 12 A

Rated current (Use group D / UL 1059) 10 A

Wire cross-section, AWG, min. AWG 28

Wire cross-section, AWG, max. AWG 14

Reference to approval values

Specifications are maximum values, details - see approval certificate.

## Packing

|                          |         |                             |                               |
|--------------------------|---------|-----------------------------|-------------------------------|
| Packaging                | Tape    | VPE length                  | 60 mm                         |
| VPE width                | 330 mm  | VPE height                  | 330 mm                        |
| Tape depth (T2)          | 10.9 mm | Tape width (W)              | 56 mm                         |
| Tape pocket depth (K0)   | 10.4 mm | Tape pocket height (A0)     | 15.1 mm                       |
| Tape pocket width (B0)   | 43.5 mm | Tape pocket separation (P1) | 20 mm                         |
| Tape hole separation (E) | 1.75 mm | Tape pocket separation (F)  | 26.2 mm                       |
| Tape reel diameter Ø (A) | 330 mm  | Surface resistance          | $R_s = 10^9 - 10^{12} \Omega$ |

## Classifications

|             |             |             |             |
|-------------|-------------|-------------|-------------|
| ETIM 6.0    | EC002643    | ETIM 7.0    | EC002643    |
| ECLASS 9.0  | 27-44-04-01 | ECLASS 9.1  | 27-44-04-01 |
| ECLASS 10.0 | 27-44-04-01 | ECLASS 11.0 | 27-46-01-01 |

## Important note

IPC conformity

Conformity: The products are developed, manufactured and delivered according international recognized standards and norms and comply with the assured properties in the data sheet resp. fulfill decorative properties in accordance with IPC-A-610 "Class 2". Further claims on the products can be evaluated on request.

Notes

- Additional push button colours on request
- Operating force of slider max. 40 N
- Rated current related to rated cross-section & min. No. of poles.
- Wire end ferrule with plastic collar to DIN 46228/4
- Wire end ferrule without plastic collar to DIN 46228/1
- P on drawing = pitch
- Rated data refer only to the component itself. Clearance and creepage distances to other components are to be designed in accordance with the relevant application standards.
- Crimping shape "A" for wire end ferrules with PZ 6/5 crimping tool recommended.
- Long term storage of the product with average temperature of 50 °C and average humidity 70%, 36 months

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## Technical data

## Approvals

Approvals



ROHS Conform

UL File Number Search E60693

## Downloads

Approval/Certificate/Document of  
Conformity [Declaration of the Manufacturer](#)Engineering Data [STEP](#)Engineering Data [EPLAN, WSCAD](#)

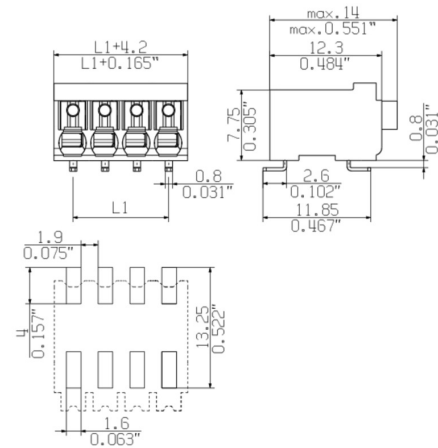
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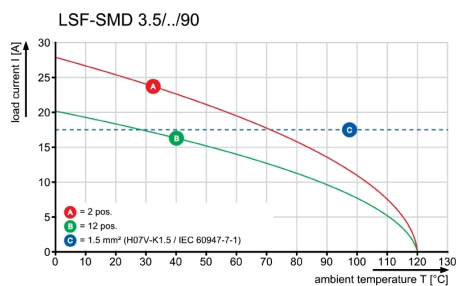
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# Drawings

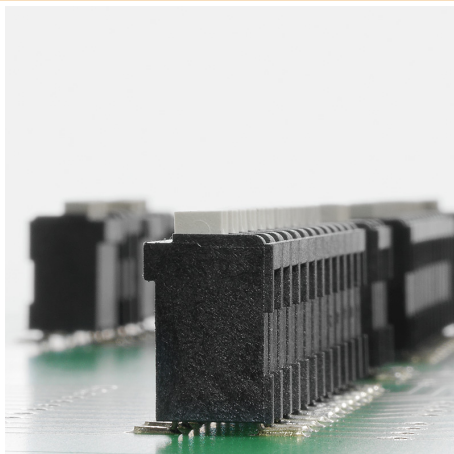
## Dimensional drawing



## Graph

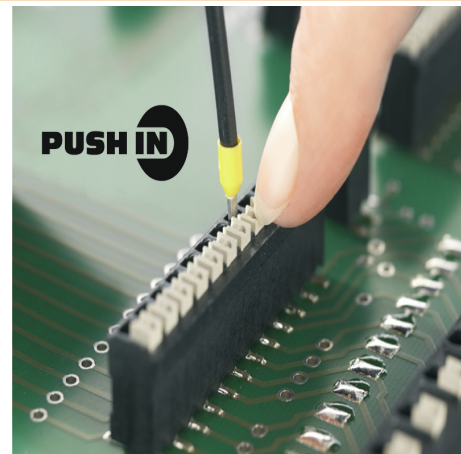


## Product benefits



Stable solder connection

## Product benefits



PUSH IN wire connection

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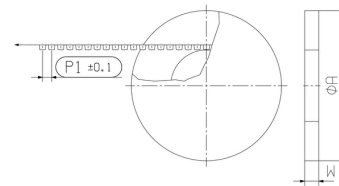
## Drawings

### Product benefits

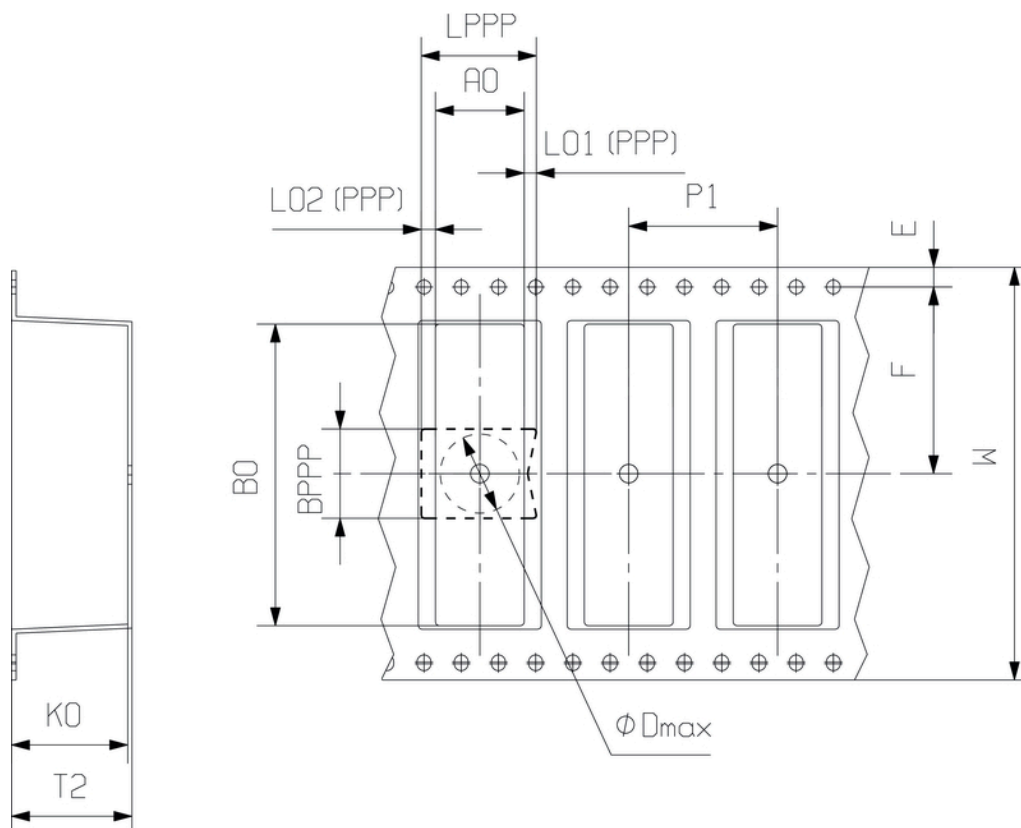


Packaged in tape-on-reel

### Dimensional drawing

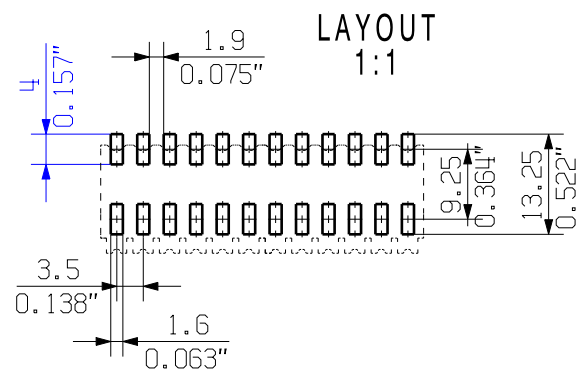
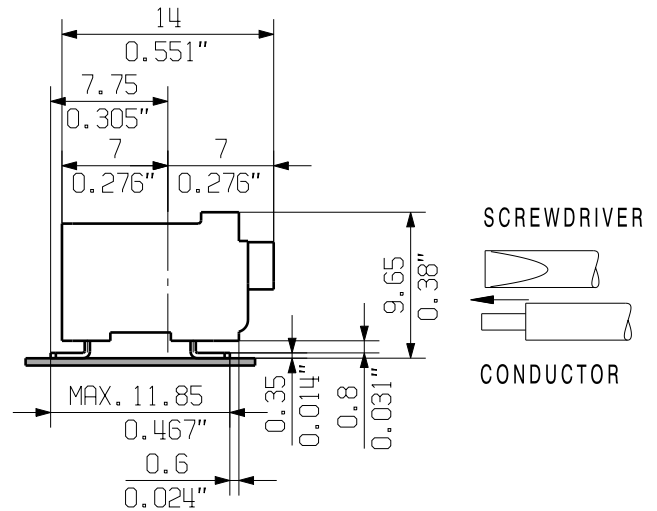


### Dimensional drawing



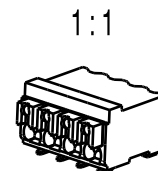
DIRECTION OF UNREELING →

DIE DEUTSCHE VERSION IST VERBINDLICH  
THE GERMAN VERSION IS BINDING



SHOWN: LSF-SMD 3.50/04/90

|    |            |              |
|----|------------|--------------|
| 12 | 38,5       | 1,516        |
| 11 | 35,0       | 1,378        |
| 10 | 31,5       | 1,240        |
| 9  | 28,0       | 1,102        |
| 8  | 24,5       | 0,965        |
| 7  | 21,0       | 0,827        |
| 6  | 17,5       | 0,689        |
| 5  | 14,0       | 0,551        |
| 4  | 10,5       | 0,413        |
| 3  | 7,0        | 0,276        |
| 2  | 3,5        | 0,138        |
| n  | L1<br>[mm] | L1<br>[Inch] |





## Recommended reflow soldering profile

**Weidmüller Interface GmbH & Co. KG**

Klingenbergstraße 16

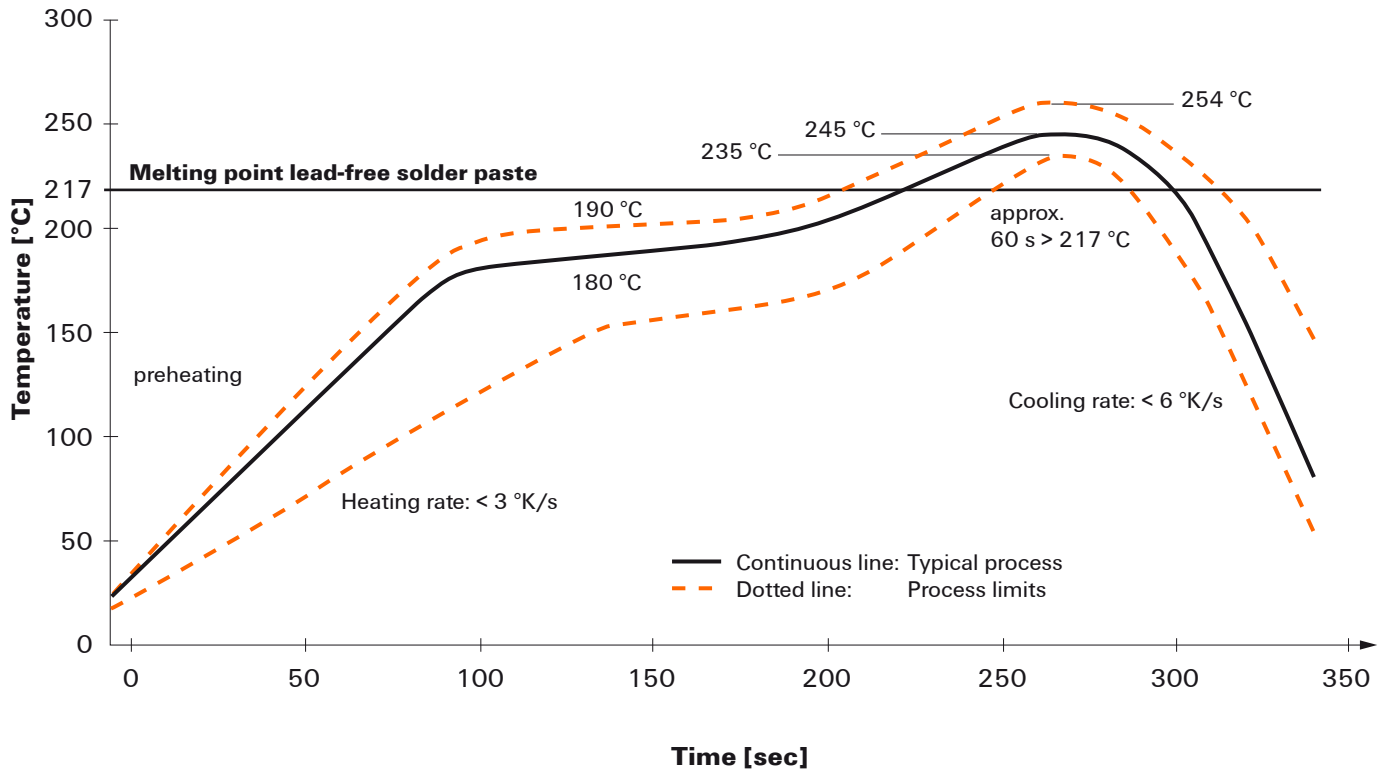
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## Reflow soldering profile

The perfect soldering profile for SMT Surface Mount Technology is one the most exiting question in SMT production. But there are more than one correct answer: The diagram of temperature-on-time is related to processing features of solder paste and to maximum load of components.

We have to consider the following parameters:

- Time for pre heating
- Maximum temperature
- Time above melting point
- Time for cooling
- Maximum heating rate
- Maximum cooling rate

We recommend a typical solder profile with associated process limits. With preheating components and board are prepared smoothly for the solder phase. Heating rate is typically  $\leq +3\text{K/s}$ . In parallel the solder paste is 'activated'. The time above melting point of 217°C the paste gets liquid and components and boards begin to connect. The maximum temperature of 245°C to 254°C should stay between 10 and 40 seconds. In the cooling phase at  $\geq -6\text{K/s}$  solder is cured. Board and components cool down while avoiding cold cracks.