

**BCL-SMT 3.81/07/180 1.5SN BK BX****Weidmüller Interface GmbH & Co. KG**

Klingenbergstraße 26

D-32758 Detmold

Germany

[www.weidmueller.com](http://www.weidmueller.com)**Product image**

The inverted BCL-SMT socket block for the PCB offers three significant advantages:

- The BCL-SMT offers touch-safe security on the PCB which makes it ideal for live, current-carrying outputs.
- The BCL-SMT widens the range of applications with board-to-board connections between component assemblies.
- The BCL-SMT is reflow-compatible and can be seamlessly integrated into the automatic assembly and soldering process.

Two outlet directions give you a choice of position and thus more design flexibility.

- 180° standing
- 90° recumbent

Two housing variants are available for the BCL-SMT:

- Without flange
- With inverted solder flange ("LFI", with nut)
  - Fastened to PCB without additional screw
  - Fastened with screw to the SCZ FI

Weidmüller's 3.81-mm-pitch (0.15 inch) plug-in connectors are compatible with the layouts of customary connectors and offer space for labelling and coding.

**General ordering data**

|              |                                                                                                                                                                    |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Version      | PCB plug-in connector, female header, closed side, THT/THR solder connection, 3.81 mm, Number of poles: 7, 180°, Solder pin length (l): 1.5 mm, tinned, black, Box |
| Order No.    | <a href="#">1976570000</a>                                                                                                                                         |
| Type         | BCL-SMT 3.81/07/180 1.5SN BK BX                                                                                                                                    |
| GTIN (EAN)   | 4032248679034                                                                                                                                                      |
| Qty.         | 50 pc(s).                                                                                                                                                          |
| Product data | IEC: 320 V / 17.5 A<br>UL: 300 V / 10 A                                                                                                                            |
| Packaging    | Box                                                                                                                                                                |

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**Technical data****Dimensions and weights**

|            |        |
|------------|--------|
| Net weight | 3.12 g |
|------------|--------|

**System specifications**

| Product family                               | OMNIMATE Signal - series BC/SC 3.81 | Type of connection                         | Board connection |
|----------------------------------------------|-------------------------------------|--------------------------------------------|------------------|
| Mounting onto the PCB                        | THT/THR solder connection           | Pitch in mm (P)                            | 3.81 mm          |
| Pitch in inches (P)                          | 0.15 inch                           | Outgoing elbow                             | 180°             |
| Number of poles                              | 7                                   | Number of solder pins per pole             | 2                |
| Solder pin length (l)                        | 1.5 mm                              | Solder pin length tolerance                | 0 / -0,02 mm     |
| Solder pin dimensions                        | d = 0.8 mm                          | Solder pin dimensions = d tolerance        | +0,05 / -0,05 mm |
| Solder eyelet hole diameter (D)              | 1.2 mm                              | Solder eyelet hole diameter tolerance (D)  | + 0,1 mm         |
| Outside diameter of solder pad               | 1.9 mm                              | Template aperture diameter                 | 1.6 mm           |
| L1 in mm                                     | 22.86 mm                            | L1 in inches                               | 0.9 inch         |
| Number of rows                               | 1                                   | Pin series quantity                        | 1                |
| Touch-safe protection acc. to DIN VDE 57 106 | Safe from finger touch              | Touch-safe protection acc. to DIN VDE 0470 | IP 20            |
| Volume resistance                            | ≤5 mΩ                               | Can be coded                               | Yes              |
| Plugging force/pole, max.                    | 9.5 N                               | Pulling force/pole, max.                   | 6 N              |

**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                   |
| Contact surface                       | tinned                         | Layer structure of solder connection  | 1...3 µm Ni / 2...4 µm Sn matt |
| Layer structure of plug contact       | 1...3 µm Ni / 2...4 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. | -25 °C                         |
| Temperature range, installation, max. | 120 °C                         |                                       |                                |

**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)                             | 15.4 A                 | Rated current, min. number of poles (Tu=40°C)                         | 17.5 A           |
| Rated current, max. number of poles (Tu=40°C)                             | 13.8 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 76 A |

**Rated data acc. to CSA**

|                                   |       |                                   |      |
|-----------------------------------|-------|-----------------------------------|------|
| Rated voltage (Use group B / CSA) | 300 V | Rated voltage (Use group C / CSA) | 50 V |
| Rated current (Use group B / CSA) | 11 A  | Rated current (Use group C / CSA) | 11 A |

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|           |        |            |        |
|-----------|--------|------------|--------|
| Packaging | Box    | VPE length | 146 mm |
| VPE width | 116 mm | VPE height | 24 mm  |

**Classifications**

|             |             |             |             |
|-------------|-------------|-------------|-------------|
| ETIM 6.0    | EC002637    | ETIM 7.0    | EC002637    |
| ETIM 8.0    | EC002637    | ECLASS 9.0  | 27-44-04-02 |
| ECLASS 9.1  | 27-44-04-02 | ECLASS 10.0 | 27-44-04-02 |
| ECLASS 11.0 | 27-46-02-01 | ECLASS 12.0 | 27-46-02-01 |

**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 | <ul style="list-style-type: none"> <li>• Rated current related to rated cross-section &amp; min. No. of poles.</li> <li>• P on drawing = pitch</li> <li>• 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.</li> <li>• Long term storage of the product with average temperature of 50 °C and average humidity 70%, 36 months</li> </ul> |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**Approvals**

Approvals



|                         |            |
|-------------------------|------------|
| ROHS                    | Conform    |
| UL File Number Search   | UL Website |
| Certificate No. (cURus) | E60693     |

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|                                             |                                                 |
|---------------------------------------------|-------------------------------------------------|
| Approval/Certificate/Document of Conformity | <a href="#">Declaration of the Manufacturer</a> |
| Engineering Data                            | <a href="#">CAD data – STEP</a>                 |
| Engineering Data                            | <a href="#">EPLAN, WSCAD</a>                    |
| Catalogues                                  | <a href="#">Catalogues in PDF-format</a>        |
| Brochures                                   | <a href="#">FL DRIVES EN</a>                    |
|                                             | <a href="#">MB SMT EN</a>                       |
|                                             | <a href="#">FL DRIVES DE</a>                    |
|                                             | <a href="#">MB DEVICE MANUF. EN</a>             |
|                                             | <a href="#">FL BUILDING SAFETY EN</a>           |
|                                             | <a href="#">FL APPL LED LIGHTING EN</a>         |
|                                             | <a href="#">FL INDUSTR.CONTROLS EN</a>          |
|                                             | <a href="#">FL MACHINE SAFETY EN</a>            |
|                                             | <a href="#">FL HEATING ELECTR EN</a>            |
|                                             | <a href="#">FL APPL INVERTER EN</a>             |
|                                             | <a href="#">FL_BASE_STATION_EN</a>              |
|                                             | <a href="#">FL ELEVATOR EN</a>                  |
|                                             | <a href="#">FL POWER SUPPLY EN</a>              |
|                                             | <a href="#">FL 72H SAMPLE SER EN</a>            |
|                                             | <a href="#">PO OMNIMATE EN</a>                  |
|                                             | <a href="#">PO OMNIMATE EN</a>                  |
| White paper surface mount technology        | <a href="#">Download Whitepaper</a>             |

## BCL-SMT 3.81/07/180 1.5SN BK BX

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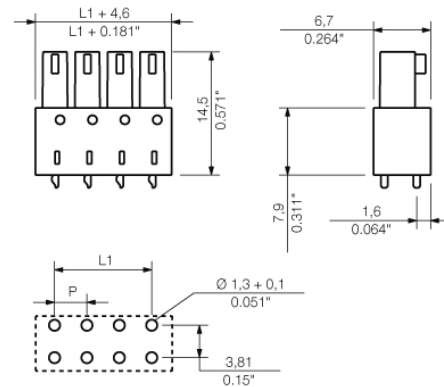
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## Drawings

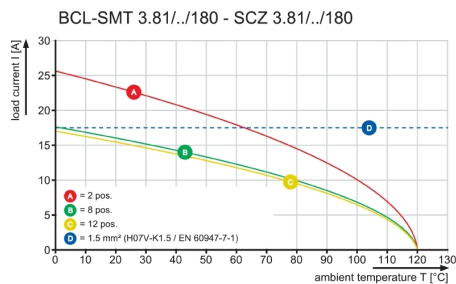
### Product image



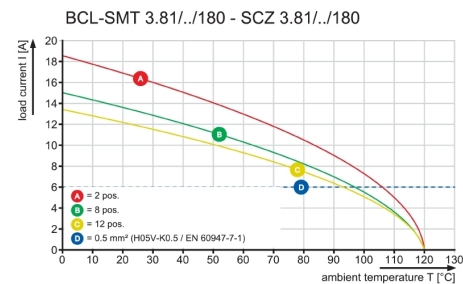
### Dimensional drawing



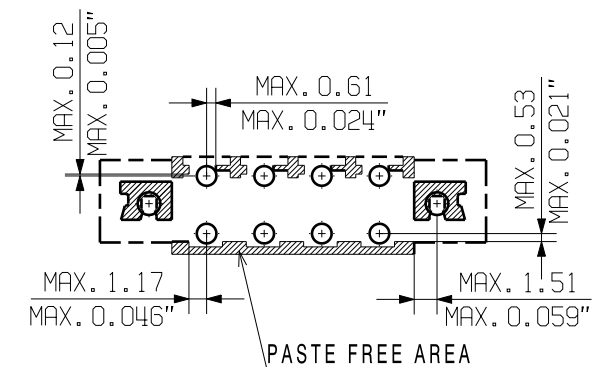
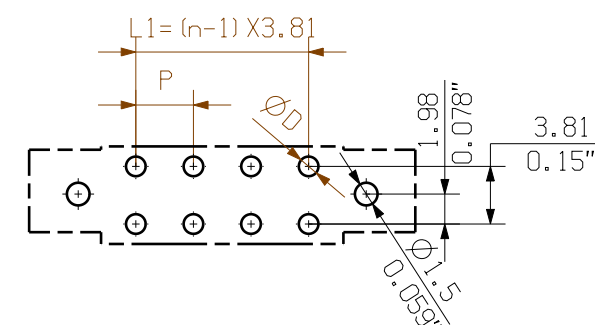
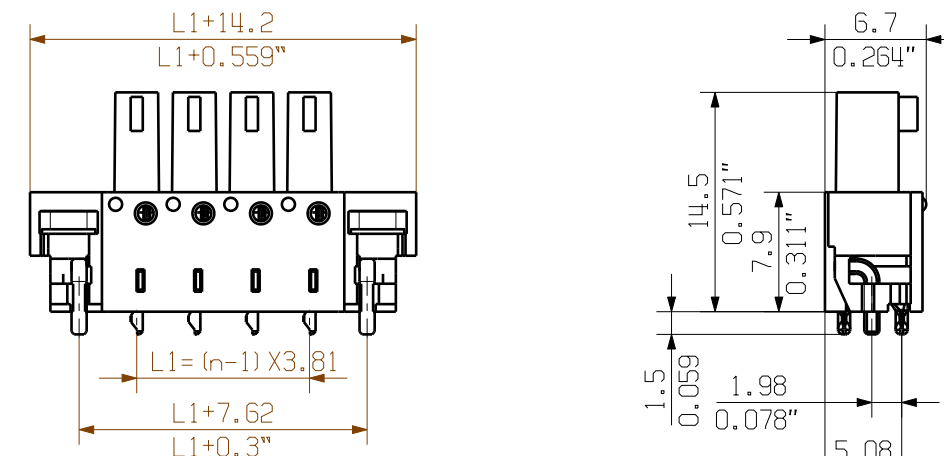
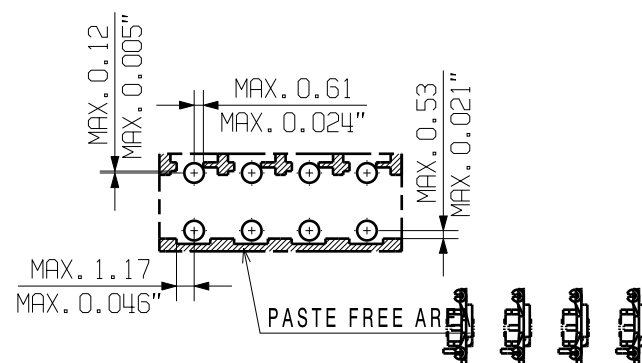
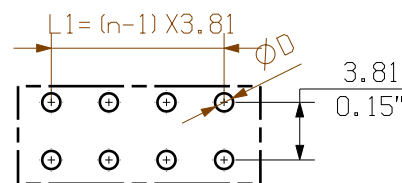
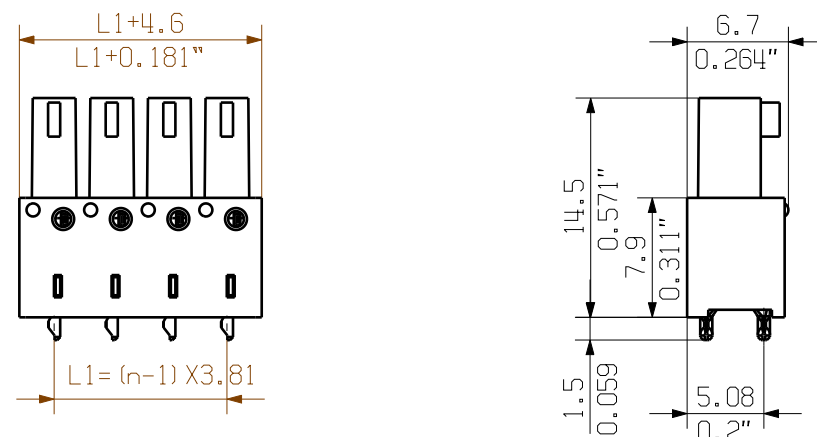
### Graph



### Graph



BCL-SMT 3.81/.../180LFI 1.5...



n=NO OF POLES  
P=PITCH

## KUNDENZEICHNUNG CUSTOMER DRAWING

For the mounting of PCBs, it should be noted that the rated data given in the catalogue relates only to the connection elements. The necessary creepage and clearance paths must be observed in connection with the respective applicant in accordance to VDE 0110. The current-carrying capacity and pitch tolerance is to be determined according to DIN IEC 326 part 3 very fine.

Weidmüller connectors are tested to the DIN VDE 0627 standard, and are valid for its field of application. Provided that the connectors are used to the intended purpose, all requirements with respect to the occurring of electrical, mechanical, thermic and corrosive stress will be satisfied.

|    |         |           |
|----|---------|-----------|
| 12 | 41.91   | 1.650     |
| 11 | 38.10   | 1.500     |
| 10 | 34.29   | 1.350     |
| 9  | 30.48   | 1.200     |
| 8  | 26.67   | 1.050     |
| 7  | 22.86   | 0.900     |
| 6  | 19.05   | 0.750     |
| 5  | 15.24   | 0.600     |
| 4  | 11.43   | 0.450     |
| 3  | 7.62    | 0.300     |
| 2  | 3.81    | 0.150     |
| n  | L1 [mm] | L1 [inch] |

|                                                                                       |             |                       |                                                                                                         |                                                                                                           |                                                                                                      |
|---------------------------------------------------------------------------------------|-------------|-----------------------|---------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
|                                                                                       |             |                       |                                                                                                         | CAT.NO.: .                                                                                                |                                                                                                      |
| 62605/5<br>28.08.12 SHI_S                                                             |             | 00                    | <b>Weidmüller</b>  |                                                                                                           | <b>C 40405</b>  |
| MODIFICATION                                                                          |             | DRAWING NO. ISSUE NO. |                                                                                                         |                                                                                                           |                                                                                                      |
|  |             | DATE                  | NAME                                                                                                    | <b>BCL-SMT 3.81/.../180...1.5...</b><br>LOETANSCHLUSS BUCHSENLEISTE<br>SOLDER CONNECTION SOCKET CONNECTOR |                                                                                                      |
|                                                                                       | DRAWN       | 19.02.2008            | SHI_S                                                                                                   |                                                                                                           |                                                                                                      |
|                                                                                       | RESPONSIBLE |                       | XU_S                                                                                                    |                                                                                                           |                                                                                                      |
|                                                                                       | CHECKED     | 29.08.2012            | ZHOU_N                                                                                                  |                                                                                                           |                                                                                                      |
| SCALE: 2/1                                                                            |             |                       |                                                                                                         | PRODUCT FILE: BCL-SMT 3.81 7084                                                                           |                                                                                                      |
| SUPERSEDES: .                                                                         |             |                       |                                                                                                         |                                                                                                           |                                                                                                      |
| SUPERSEDED BY: .                                                                      | APPROVED    |                       | XU_S                                                                                                    |                                                                                                           |                                                                                                      |

## Recommended wave soldering profiles

**Weidmüller Interface GmbH & Co. KG**  
Klingenbergstraße 16  
D-32758 Detmold  
Germany  
Fon: +49 5231 14-0  
Fax: +49 5231 14-292083  
[www.weidmueller.com](http://www.weidmueller.com)

### Single Wave:



### Double Wave:



### Wave soldering profiles

Wired connection elements should be processed in accordance with the DIN EN 61760-1 standard. We have included two recommendations for practical wave soldering profiles, with which Weidmüller PCB terminals and connectors are qualified.

When choosing a suitable profile for your application, the following factors also need to be considered:

- PCB thickness
- Proportion of Cu in the layers
- Single/double-sided assembly
- Product range
- Heating and cooling rates

The single and double wave profiles each indicate the recommended operating range, including the maximum soldering temperature of 260°C. In practice, the maximum soldering temperature is quite often well below the above maximum profile.

We reserve the right to make technical changes.

## Recommended reflow soldering profile

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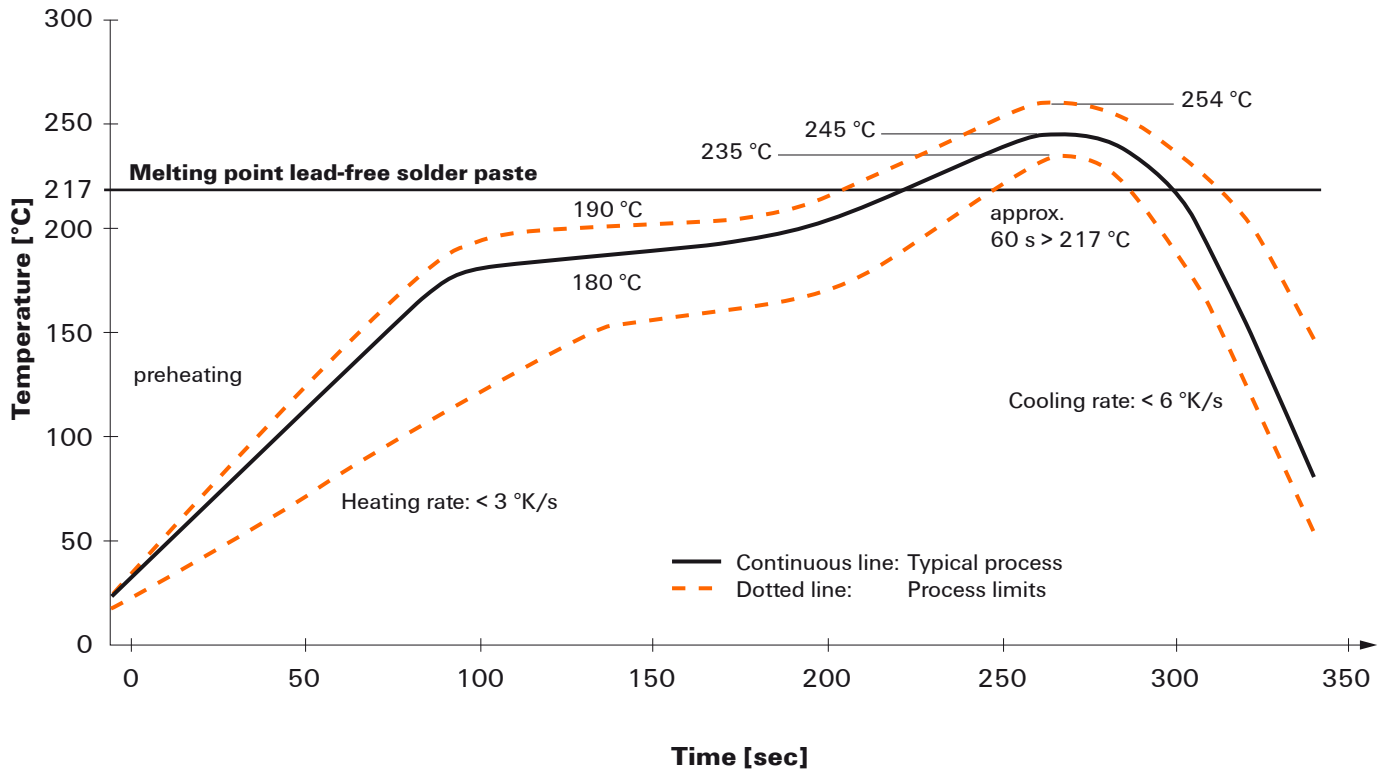
D-32758 Detmold

Germany

Fon: +49 5231 14-0

Fax: +49 5231 14-292083

www.weidmueller.com



## 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.