

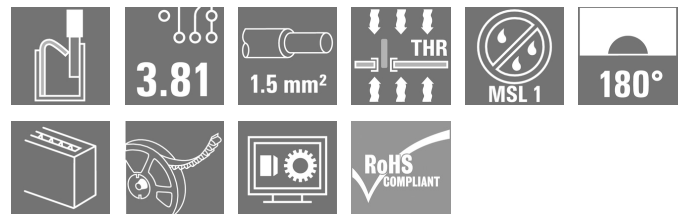
**LSF-SMT 3.81/04/180 3.5SN BK RL****Weidmüller Interface GmbH & Co. KG**

Klingenbergstraße 26

D-32758 Detmold

Germany

www.weidmueller.com

**Product image**

PCB terminal for fully automatic assembly in reflow soldering (SMT), with PUSH IN conductor connection system. Conductor inserted and slider operated in same direction (TOP). Packed in box or as tape on reel. Pin lengths optimised at 1.5 mm or 3.5 mm.

**General ordering data**

Version	Printed circuit board terminals, 3.81 mm, Number of poles: 4, 180°, Solder pin length (l): 3.5 mm, black, PUSH IN with actuator, Clamping range, max.: 1.5 mm², Tape
Order No.	<a href="#">1875590000</a>
Type	LSF-SMT 3.81/04/180 3.5SN BK RL
GTIN (EAN)	4032248465804
Qty.	175 pc(s).
Product data	IEC: 320 V / 17.5 A / 0.2 - 1.5 mm² UL: 300 V / 12 A / AWG 28 - AWG 14
Packaging	Tape

Creation date October 6, 2024 3:20:51 PM CEST

## LSF-SMT 3.81/04/180 3.5SN BK RL

Weidmüller Interface GmbH &amp; Co. KG

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## Technical data

## Dimensions and weights

Depth	7.8 mm	Depth (inches)	0.307 inch
Height	17.5 mm	Height (inches)	0.689 inch
Height of lowest version	14 mm	Width	15.63 mm
Width (inches)	0.615 inch	Net weight	4.274 g

## Temperatures

Continuous operating temp., max.	120 °C
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## System parameters

Product family	OMNIMATE Signal - series LSF	Wire connection method	PUSH IN with actuator
Mounting onto the PCB	THT/THR solder connection	Conductor outlet direction	180°
Pitch in mm (P)	3.81 mm	Pitch in inches (P)	0.15 "
Number of poles	4	Pin series quantity	1
Fitted by customer	No	Number of rows	1
Solder pin length (l)	3.5 mm	Solder pin length tolerance	+0.1 / -0.3 mm
Solder pin dimensions	0.35 x 0.8 mm	Solder pin dimensions = d tolerance	0 / -0.1 mm
Solder eyelet hole diameter (D)	1.1 mm	Solder eyelet hole diameter tolerance (D)	+ 0,1 mm
Number of solder pins per pole	2	Stripping length	8 mm
L1 in mm	11.43 mm	L1 in inches	0.45 "
Touch-safe protection acc. to DIN VDE 0470	IP 20	Touch-safe protection acc. to DIN VDE 57 106	Safe from finger touch
Protection degree	IP20	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	Cu-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.	

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## Technical data

w. wire end ferrule, DIN 46228 pt 1, max. 1.5 mm<sup>2</sup>

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>	
	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>	

Reference text 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.		

## LSF-SMT 3.81/04/180 3.5SN BK RL

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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 current (Use group B / UL 1059) 12 A

Wire cross-section, AWG, min. AWG 28

Reference to approval values Specifications are maximum values, details - see approval certificate.

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

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

Wire cross-section, AWG, max. AWG 14

## Packing

ESD Level packaging static dissipative

VPE length 330 mm

VPE height 35 mm

Tape width (W) 32 mm

Tape pocket height (A0) 8.05 mm

Tape pocket separation (P1) 20 mm

Tape pocket separation (F) 14.2 mm

Surface resistance  $R_s = 10^9 - 10^{12} \Omega$ Length Pick & Place Pad ( $L_{PPP}$ ) 8.5 mm

Packaging Tape

VPE width 330 mm

Tape depth (T2) 20 mm

Tape pocket depth (K0) 19.5 mm

Tape pocket width (B0) 15.93 mm

Tape hole separation (E) 1.75 mm

Tape reel diameter  $\varnothing$  (A) 330 mmWidth Pick & Place Pad ( $W_{PPP}$ ) 7.5 mmDiameter of the withdrawal surface ( $\varnothing D_{max}$ ) 9 mm

## Type tests

Test: Durability of markings

Standard

DIN EN 60512-1-1 / 01.03

Test

mark of origin, type identification, pitch, durability

Evaluation

available

Test

approval marking UL

Evaluation

on packaging label

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## Technical data

Test: Clampable cross section	Standard	DIN EN 60999-1 section 7 and 9.1 / 12.00, DIN EN 60947-1 section 8.2.4.5.1 / 12.02	
	Conductor type	Type of conductor and solid 0.14 mm <sup>2</sup> conductor cross-section	
		Type of conductor and stranded 0.14 mm <sup>2</sup> conductor cross-section	
		Type of conductor and solid 1.5 mm <sup>2</sup> conductor cross-section	
		Type of conductor and stranded 1.5 mm <sup>2</sup> conductor cross-section	
		Type of conductor and AWG 24/1 conductor cross-section	
		Type of conductor and AWG 24/19 conductor cross-section	
		Type of conductor and AWG 16/1 conductor cross-section	
		Type of conductor and AWG 16/19 conductor cross-section	
	Evaluation	passed	
Test for damage to and accidental loosening of conductors	Standard	DIN EN 60999-1 section 9.4 / 12.00	
	Requirement	0.2 kg	
	Conductor type	Type of conductor and AWG 24/1 conductor cross-section	
		Type of conductor and AWG 24/19 conductor cross-section	
	Evaluation	passed	
	Requirement	0.3 kg	
	Conductor type	Type of conductor and stranded 0.25 mm <sup>2</sup> conductor cross-section	
		Type of conductor and solid 0.5 mm <sup>2</sup> conductor cross-section	
	Evaluation	passed	
	Requirement	0.4 kg	
	Conductor type	Type of conductor and solid 1.5 mm <sup>2</sup> conductor cross-section	
		Type of conductor and stranded 1.5 mm <sup>2</sup> conductor cross-section	
		Type of conductor and AWG 16/1 conductor cross-section	
		Type of conductor and AWG 16/19 conductor cross-section	
	Evaluation	passed	

## LSF-SMT 3.81/04/180 3.5SN BK RL

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## Technical data

Pull-out test	Standard	DIN EN 60999-1 section 9.5 / 12.00
	Requirement	≥10 N
	Conductor type	Type of conductor and AWG 24/1 conductor cross-section
		Type of conductor and AWG 24/19 conductor cross-section
	Evaluation	passed
	Requirement	≥20 N
	Conductor type	Type of conductor and stranded 0.25 mm <sup>2</sup> conductor cross-section
		Type of conductor and H05V-U0.5 conductor cross-section
	Evaluation	passed
	Requirement	≥40 N
	Conductor type	Type of conductor and H07V-U1.5 conductor cross-section
		Type of conductor and H07V-K1.5 conductor cross-section
		Type of conductor and AWG 16/1 conductor cross-section
		Type of conductor and AWG 16/19 conductor cross-section
	Evaluation	passed

## Classifications

ETIM 6.0	EC002643	ETIM 7.0	EC002643
ETIM 8.0	EC002643	ETIM 9.0	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
ECLASS 12.0	27-46-01-01	ECLASS 13.0	27-46-01-01
ECLASS 14.0	27-46-01-01		

## Environmental Product Compliance

REACH SVHC	/
RoHS Compliance Status	Compliant without exemption

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[www.weidmueller.com](http://www.weidmueller.com)**Technical data****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>• Additional push button colours on request</li><li>• Operating force of slider max. 40 N</li><li>• Rated current related to rated cross-section &amp; min. No. of poles.</li><li>• Wire end ferrule with plastic collar to DIN 46228/4</li><li>• Wire end ferrule without plastic collar to DIN 46228/1</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>• Crimping shape "A" for wire end ferrules with PZ 6/5 crimping tool recommended.</li><li>• Long term storage of the product with average temperature of 50 °C and maximum humidity 70%, 36 months</li></ul>

**Approvals**

Approvals



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

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[www.weidmueller.com](http://www.weidmueller.com)**Technical data****Downloads**Approval/Certificate/Document of Con-  
formity[Declaration of the Manufacturer](#)

Engineering Data

[CAD data – STEP](#)

Product Change Notification

[Changeover to ESD bags for "Tape on Reel" products](#)[Umstellung auf ESD-Beutel bei „Tape on Reel“ Produkten](#)

Catalogues

[Catalogues in PDF-format](#)

Brochures

[FL DRIVES EN](#)[FL ANALO.SIGN.CONV. EN](#)[MB SMT EN](#)[FL DRIVES DE](#)[MB DEVICE MANUF. EN](#)[FL BUILDING SAFETY EN](#)[FL APPL LED LIGHTING EN](#)[FL INDUSTR.CONTROLS EN](#)[FL MACHINE SAFETY EN](#)[FL HEATING ELECTR EN](#)[FL APPL INVERTER EN](#)[FL BASE STATION EN](#)[FL ELEVATOR EN](#)[FL POWER SUPPLY EN](#)[FL 72H SAMPLE SER EN](#)[PO OMNIMATE EN](#)[PO OMNIMATE EN](#)

White paper surface mount technology

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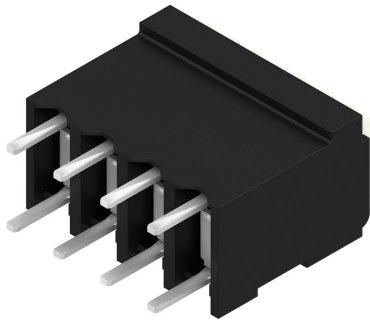
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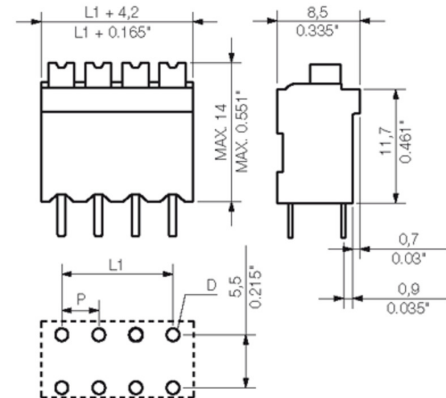
[www.weidmueller.com](http://www.weidmueller.com)

## Drawings

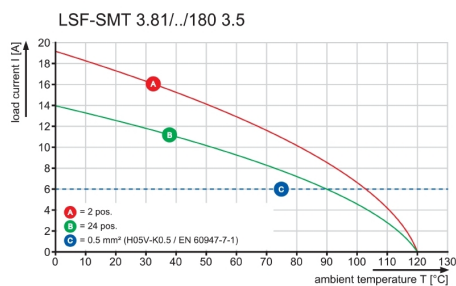
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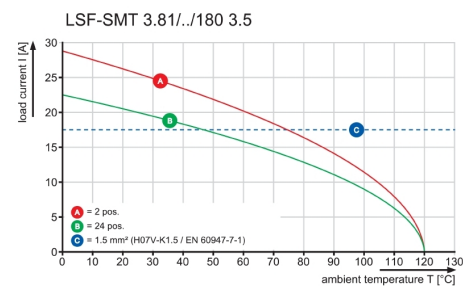
## Dimensional drawing



## Graph



## Graph



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[www.weidmueller.com](http://www.weidmueller.com)**Accessories****Slotted screwdriver**

Slotted screwdriver with rounded blade SD DIN 5265, ISO 2380/2, output to DIN 5264, ISO 2380/1. ChromTop tip, SoftFinish grip

**General ordering data**

Type	SDS 0.4X2.5X75	Version
Order No.	<a href="#">9009030000</a>	Screwdriver, Screwdriver
GTIN (EAN)	4032248266944	
Qty.	1 pc(s).	

**Slotted screwdriver**

VDE insulated slot-head screwdriver, SDI DIN 7437, ISO 2380/2, drive output acc. to DIN 5264, ISO 2380/1. SoftFinish grip

**General ordering data**

Type	SDIS 0.4X2.5X75	Version
Order No.	<a href="#">9008370000</a>	Screwdriver, Screwdriver
GTIN (EAN)	4032248056330	
Qty.	1 pc(s).	

## LSF-SMT 3.81/04/180 3.5SN BK RL

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## Drawings

## Dimensional drawing



## Dimensional drawing



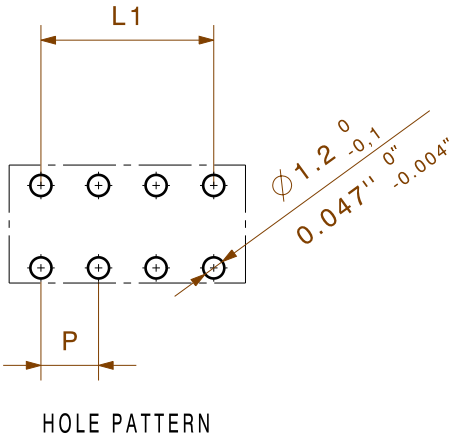
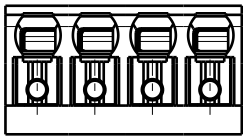
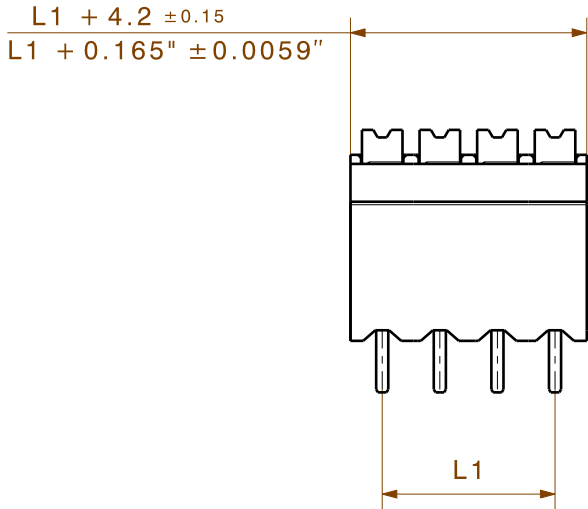
DIRECTION OF UNREELING →

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Dimensions without tolerances are no check dimensions

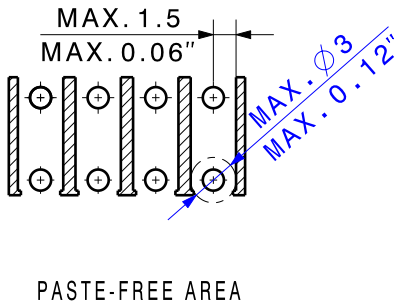
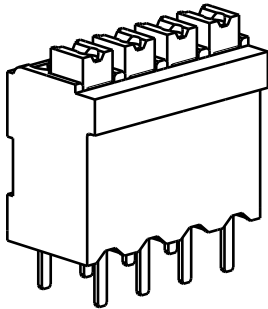
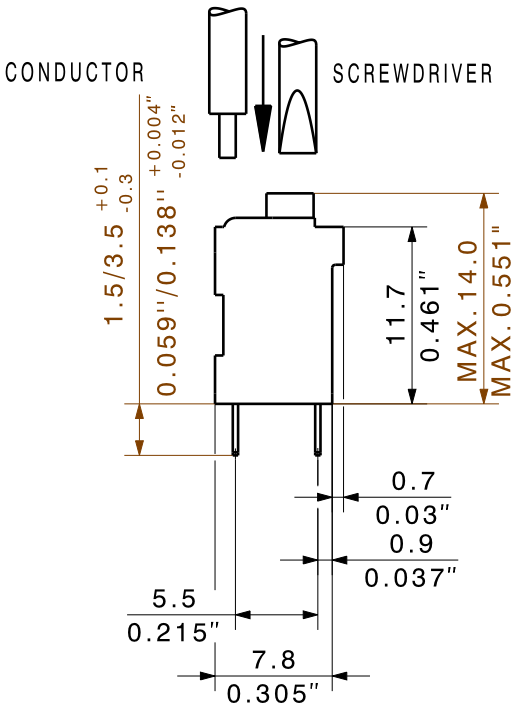
The English version is binding



P=3.81  
SHOWN: LSF-SMT 3.81/04/180

For the mounting on PCBs, it should be noted that the rated data relates only to the PCB components alone.  
The necessary creepage and clearance paths must be observed in the relevant equipment standards in accordance with IEC 664 / VDE 0110.  
The current-carrying capacity and pitch tolerance is to be determined according to DIN IEC 326 part 3.

Weidmüller PCB components are rated in accordance with the DIN EN 61984 standard, and are valid for its field of application.  
If the components are used in accordance with the intended purpose, the components will meet all requirements with respect to the occurring of electrical, mechanical, thermic and corrosive stress.



24	87,63	3,529
23	83,82	3,375
22	80,01	3,221
21	76,2	3,067
20	72,39	2,913
19	68,58	2,759
18	64,77	2,605
17	60,96	2,451
16	57,15	2,297
15	53,34	2,143
14	49,53	1,989
13	45,72	1,835
12	41,91	1,681
11	38,1	1,527
10	34,29	1,373
9	30,48	1,219
8	26,67	1,065
7	22,86	0,911
6	19,05	0,757
5	15,24	0,603
4	11,43	0,449
3	7,62	0,300
2	3,81	0,150
n	L1 [mm]	L1 [Inch]

DIN ISO 2768-m

98688/5  
23.10.17 HELIS\_MA

01

Modification

Date

Name

Drawn

22.06.2004

SEIDEL\_T

Responsible

KRUG\_M

Checked

01.11.2017

HELIS\_MA

Supersedes: .

Approved

HECKERT\_M

**Weidmüller**

**LSF-SMT .../.../180...TU**  
LEITERPLATTENKLEMME  
PCB TERMINAL

Product file: LSF-SMT

Cat.no.: .

**3 34084** **15**

Drawing no. Issue no.

Sheet 02 of 07 sheets

## Recommended wave soldering profiles

**Weidmüller Interface GmbH & Co. KG**  
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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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## 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.