

SL-SMT 3.50/20/135F 3.2SN BK BX**Weidmüller Interface GmbH & Co. KG**

Klingenbergstraße 26

D-32758 Detmold

Germany

www.weidmueller.com

Product image

Similar to illustration

High-temperature-resistant male header, 3.50 mm pitch.

- **Plugging direction parallel (90°), straight 180° or angled (135°) to PCB**
- **Housing variants: closed side (G), screw flange (F), solder flange (LF) or snap-on solder flange (RF)**
- **Optimised for the SMT process**
- **Pin length 3.2 mm universal for all soldering methods**
- **Pin length 1.5 mm optimised for reflow soldering methods**
- **Packed either in a box (BX) or tape-on-reel (RL)**
- **Male header can be coded**

**General ordering data**

Version	PCB plug-in connector, male header, Flange, THT/THR solder connection, 3.50 mm, Number of poles: 20, 135°, Solder pin length (l): 3.2 mm, tinned, black, Box
Order No.	1003700000
Type	SL-SMT 3.50/20/135F 3.2SN BK BX
GTIN (EAN)	4032248700325
Qty.	24 pc(s).
Product data	IEC: 320 V / 15 A UL: 300 V / 10 A
Packaging	Box

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Technical data

Dimensions and weights

Depth	13.2 mm	Depth (inches)	0.52 inch
Height	16.2 mm	Height (inches)	0.638 inch
Height of lowest version	13 mm	Net weight	7.3 g
Width	77 mm	Width (inches)	3.031 inch

System specifications

Product family	OMNIMATE Signal - series BL/SL 3.50			
Type of connection	Board connection			
Mounting onto the PCB	THT/THR solder connection			
Pitch in mm (P)	3.5 mm			
Pitch in inches (P)	0.138 inch			
Outgoing elbow	135°			
Number of poles	20			
Number of solder pins per pole	1			
Solder pin length (l)	3.2 mm			
Solder pin dimensions	d = 1.2 mm, Octagonal			
Solder eyelet hole diameter (D)	1.3 mm			
Solder eyelet hole diameter tolerance (D)+	0.1 mm			
Outside diameter of solder pad	2.3 mm			
Template aperture diameter	2.1 mm			
L1 in mm	66.5 mm			
L1 in inches	2.618 inch			
Number of rows	1			
Pin series quantity	1			
Volume resistance	≤5 mΩ			
Plugging force/pole, max.	10 N			
Pulling force/pole, max.	8 N			
Tightening torque	Torque type	Mounting screw, PCB		
	Usage information	Tightening torque	min.	0.1 Nm
			max.	0.15 Nm
		Recommended screw	Part number	PTSC KA 2.2X4.5 WN1412

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	CuSn
Contact surface	tinned	Layer structure of solder connection	2...4 µm Ni / 5...8 µm Sn glossy
Layer structure of plug contact	2...4 µm Ni / 5...8 µm Sn glossy	Storage temperature, min.	-40 °C
Storage temperature, max.	70 °C	Operating temperature, min.	-50 °C
Operating temperature, max.	100 °C	Temperature range, installation, min.	-30 °C
Temperature range, installation, max.	100 °C		

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Technical data**Rated data acc. to IEC**

tested acc. to standard

IEC 60664-1, IEC 61984

Rated current, max. number of poles
(Tu=20°C)

12 A

Rated current, max. number of poles
(Tu=40°C)

10 A

Rated voltage for surge voltage class /
pollution degree III/2

160 V

Rated impulse voltage for surge voltage
class/ pollution degree II/2

2.5 kV

Rated impulse voltage for surge voltage
class/ contamination degree III/3

2.5 kV

Rated current, min. number of poles
(Tu=20°C)

15 A

Rated current, min. number of poles
(Tu=40°C)

13 A

Rated voltage for surge voltage class /
pollution degree II/2

320 V

Rated voltage for surge voltage class /
pollution degree III/3

160 V

Rated impulse voltage for surge voltage
class/ pollution degree III/2

2.5 kV

Rated data acc. to CSA

Rated voltage (Use group B / CSA)

300 V

Rated current (Use group B / CSA)

10 A

Rated voltage (Use group D / CSA)

300 V

Rated current (Use group D / CSA)

10 A

Rated data acc. to UL 1059

Institute (UR)



Certificate No. (UR)

E60693

Rated voltage (Use group B / UL 1059)

300 V

Rated current (Use group B / UL 1059)

10 A

Rated voltage (Use group D / UL 1059)

300 V

Rated current (Use group D / UL 1059)

10 A

Reference to approval values

Specifications are
maximum values, details -
see approval certificate.**Packing**

Packaging

Box

VPE length

356 mm

VPE width

134 mm

VPE height

25 mm

Classifications

ETIM 6.0

EC002637

ETIM 7.0

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

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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	• Gold-plated contact surfaces on request • Rated current related to rated cross-section & min. No. of poles. • Diameter of solder eyelet $D = 1.4 \pm 0.1 \text{ mm}$ • Solder eyelet diameter $D = 1.5 \pm 0.1 \text{ mm}$, from 9 poles • 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. • Long term storage of the product with average temperature of 50 °C and average humidity 70%, 36 months

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

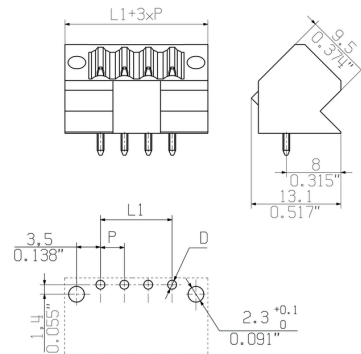
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Drawings

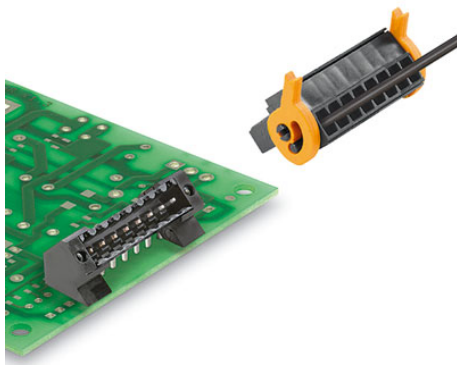
Dimensional drawing



LAYOUT FINISHED HOLES

Similar to illustration

Example of use



Rev.

Material data

System characteristic values		together with counterpart	BL 3.5
Pitch P		mm/inch	3.5/0.138
Number of rows			1
Dielectric strength (r.m.s withstand voltage)		kV	>2.2
Mechanical operating cycles		acc.to IEC512	25
Plug in force (max.)		N/Pole	10
Pull out force (max.)		N/Pole	10
Through resistance (typical)		m Ohm	4.5
Operating temperatur range		°C	-20..100
Degree of protection acc. to VDE 0106 (plugged/unplugged)			finger safe/back of hands
Degree of protection acc. to DIN EN 60529(plugged/unplugged)			IP20/IP10
Solder pin length L		mm/inch	3.2/0.126
PCB hole diameter D (wave soldering)		mm/inch	1.3+0.1/0.51+0.004
PCB hole diameter D (reflow soldering)		mm/inch	n.a.
Resistance to soldering heat acc. to DIN IEC 60512-6		°C/sec	-
Resistance to soldering heat acc. to EN 61760-1		°C/sec	290/30
Solderability classification acc. to EN 61760-1			class A
Solder connection type			Reflow
Solder pin diameter d (max.)		mm/inch	1.2/0.047

Application notes

IEC 664-1 / VDE0110 (4.97) rated data				
Rated cross section acc. to EN 60999	mm ²	n.a.		
Rated current @ 20°C ambient (together with)	A	16.8 (BL3.5)		
Rated current @ 40°C ambient (together with)	A	14.4 (BL3.5)		
Overvoltage category / Pollution degree		III/3	III/2	II/2
Rated voltage	V	160	160	250
Rated impulse voltage	kV	2.5	2.5	2.5

UL 1059 rated data

File No.: E60693

CSA C22.2 rated data

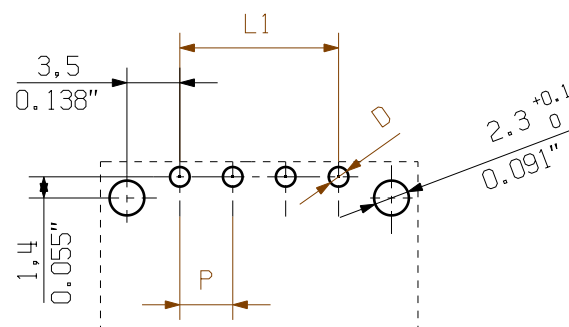
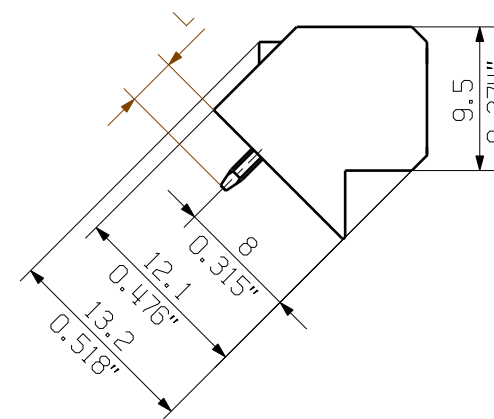
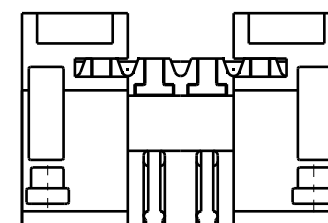

File No.: LR12400

Packaging

cardbox

Downloads

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LAYOUT FINISHED HOLES

24	80,50	3,169
23	77,00	3,031
22	73,50	2,894
21	70,00	2,756
20	66,50	2,618
19	63,00	2,480
18	59,50	2,343
17	56,00	2,205
16	52,50	2,067
15	49,00	1,929
14	45,50	1,791
13	42,00	1,654
12	38,50	1,516
11	35,00	1,378
10	31,50	1,240
9	28,00	1,102
8	24,50	0,965
7	21,00	0,827
6	17,50	0,689
5	14,00	0,551
4	10,50	0,413
3	7,00	0,276
2	3,50	0,138
n	L1 [mm]	L1 [Inch]

- 1) Without locking latches
- 2) Sum of ambient temperature and temperature rise
- 3) Recommendation for manual assembly
- 4) Recommendation for automatic assembly
- 5) Recommendation for wave soldering
- 6) Recommendation for reflow soldering
- 7) Referred to rated cross section and minimum pole number

n.a. = not applicable

Subject to technical changes

SHOWN: SL3.5/4/135F

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.

 METRIC TOLERANCES: X. = ±0.3 X.X = ±0.1 X.XX = ±0.05					CAT.NO.: . . .	
	39056/5 07.07.08 HELIS_MA	01	Weidmüller 		C 42538 DRAWING NO. ISSUE NO. SHEET 02 OF 03 SHEET	01
	MODIFICATION					
		DATE	NAME	SL SMT 3.5/.. /135F STIFBLEISTE PIN HEADER		
	DRAWN	04.07.2008	HELIS_MA			
	RESPONSIBLE		HERTEL_S			
	CHECKED	07.07.2008	HECKERT_M			
SCALE: 2/1	CHECKED	07.07.2008	HECKERT_M			
SUPERSEDES: .	APPROVED		HECKERT M	PRODUCT FILE: SL-SMT 3.5		
				7312		

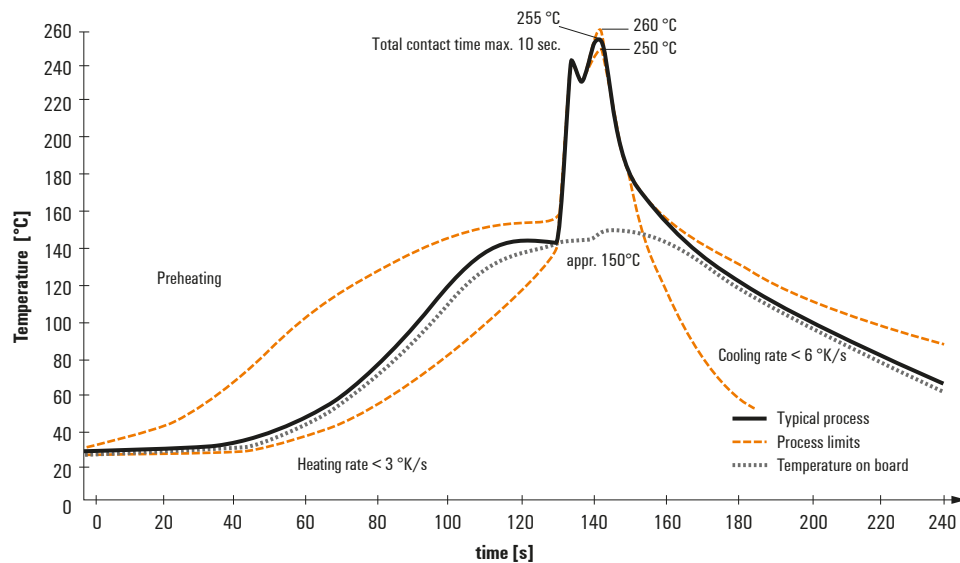
Recommended wave soldering profiles

Weidmüller Interface GmbH & Co. KG
Klingenbergstraße 16
D-32758 Detmold
Germany
Fon: +49 5231 14-0
Fax: +49 5231 14-292083
www.weidmueller.com

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

Weidmüller Interface GmbH & Co. KG

Klingenbergstraße 16

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.