

# Data sheet

Order No.: 1769887

Type: SMSTBA 2,5/10-G

PCB header



## 1 Main features



- |                         |                     |                        |                     |
|-------------------------|---------------------|------------------------|---------------------|
| • No. of pos.           | 10                  | • Nominal current      | 12 A                |
| • Nominal cross section | 2.5 mm <sup>2</sup> | • Nominal voltage      | 320 V               |
| • Color                 | green (6021)        | • Connection direction | 45 °                |
| • Pitch                 | 5 mm                | • Type of packaging    | packed in cardboard |
| • Mounting type         | Wave soldering      |                        |                     |

## 2 Your advantages

- ✓ Maximum flexibility when it comes to device design – one header for connectors with different connection technologies
- ✓ Well-known mounting principle allows worldwide use
- ✓ Angled connection enables multi-row arrangement on the PCB



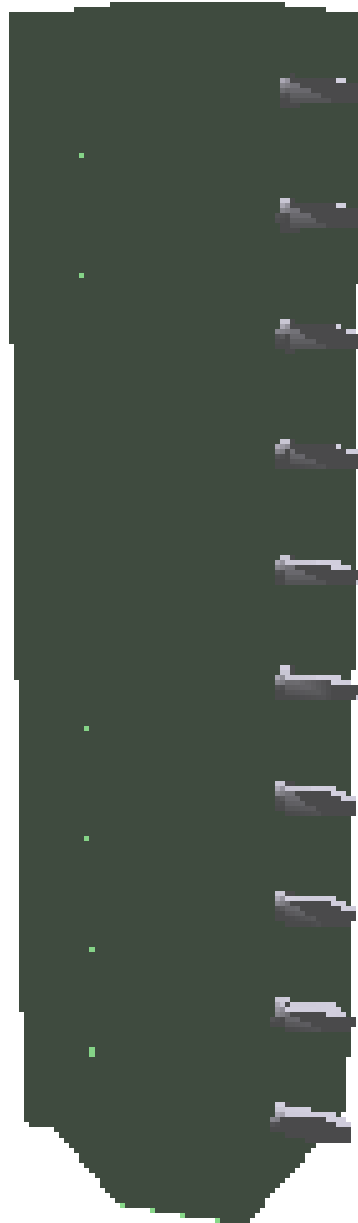
Make sure you always use the latest documentation.

It can be downloaded at: [phoenixcontact.net/product/1769887](https://phoenixcontact.net/product/1769887)

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4 3D model in PDF can be activated (Acrobat Reader only)



**1769887 SMSTBA 2,5/10-G****5 General Technical Data****5.1 item properties**

Order No.	1769887
Type	SMSTBA 2,5/10-G
Plug-in system	CLASSIC COMBICON
Product type	PCB header
Type of contact	Male connector
Range of articles	SMSTBA 2,5/..-G
Pitch	5 mm
Number of positions	10
Number of levels	1
Number of connections	10
Number of potentials	10
Mounting type	Wave soldering
Connection direction of the connector to the PCB	45 °
Pin layout	Linear pinning
Solder pins per potential	1
Type	Standard

**1769887 SMSTBA 2,5/10-G****6 Mounting****6.1 Flange mounting**

Type of locking	without
Mounting flange	without

**7 Material properties****7.1 Material of metal parts**

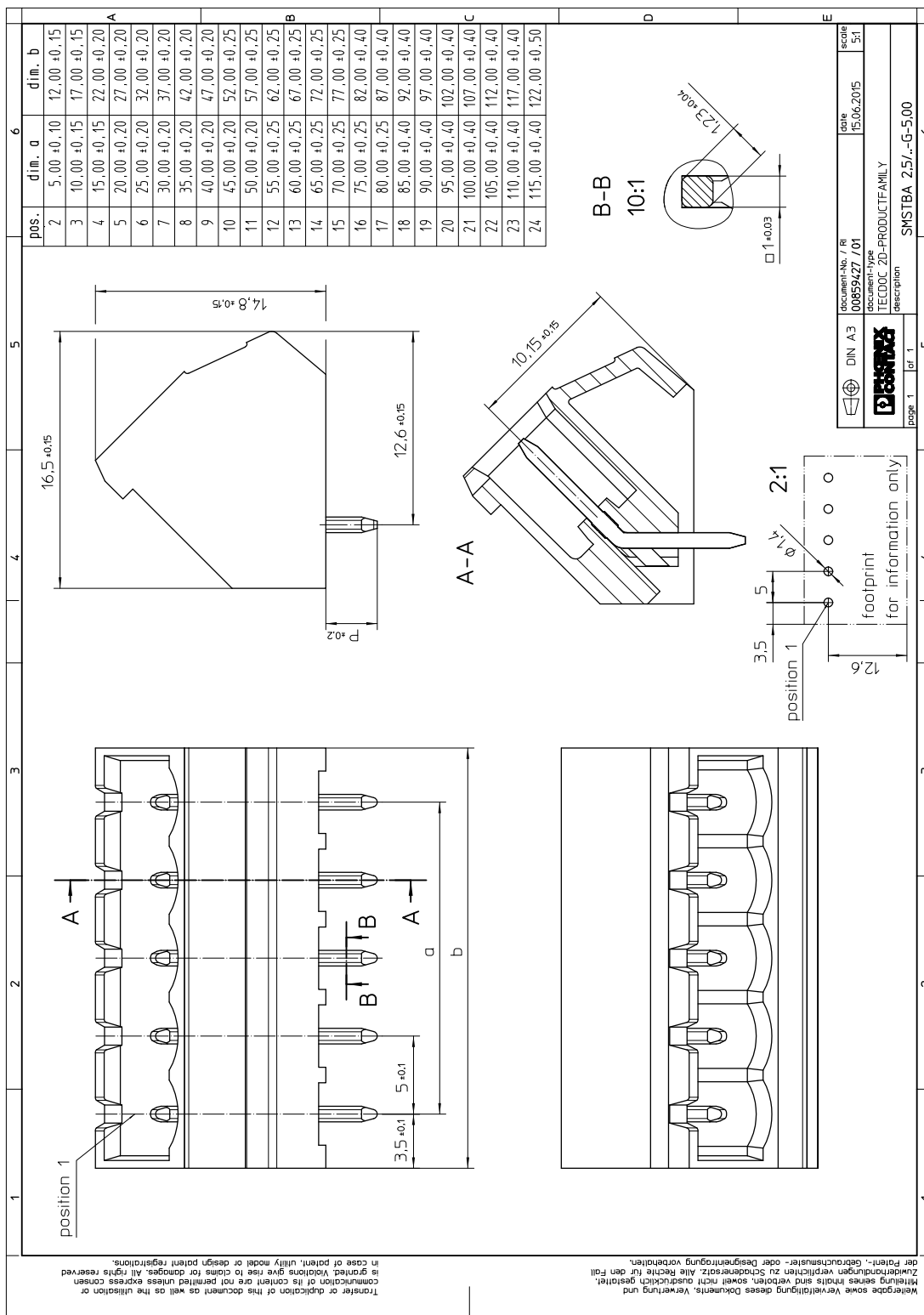
Note	WEEE/RoHS-compliant, whisker-free acc. to IEC 60068-2-82/JEDEC JESD 201
Contact material	Cu alloy
Surface contact area	Nickel (2 - 3 µm Ni) , Tin (5 - 7 µm Sn)
Soldering area surface	Nickel (2 - 3 µm Ni) , Tin (5 - 7 µm Sn)
Surface characteristics	Tin-plated
<b>Insulating material data</b>	<b>Housing</b>
Color	green (6021)
Insulating material	PA
Insulating material group	I
CTI according to IEC 60112	600
Flammability rating according to UL 94	V0
Glow wire flammability index GWFI according to EN 60695-2-12	850
Glow wire ignition temperature GWIT according to EN 60695-2-13	775
Temperature for the ball pressure test according to EN 60695-10-2	125 °C

**1769887 SMSTBA 2,5/10-G****8 Dimensions****8.1 Dimensions for the product**

Length	16.5 mm
Width	52 mm
Height (without solder pin)	14.8 mm
Total height	18.3 mm
Solder pin [P]	3.5 mm

1769887 SMSTBA 2,5/10-G

9 Series drawing



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**1769887 SMSTBA 2,5/10-G****10 Product notes****10.1 General information**

Notes on operation

In accordance with IEC 61984, COMBICON connectors have no switching power (COC). During designated use, they must not be plugged in or disconnected when carrying voltage or under load.

**11 Application****12 Packaging information**

Type of packaging	packed in cardboard
-------------------	---------------------

Pieces per package	50
--------------------	----

**12.1 Temperature limit values**

Ambient temperature (storage/transport)	-40 °C ... 70 °C
-----------------------------------------	------------------

Ambient temperature (assembly)	-5 °C ... 100 °C
--------------------------------	------------------

Ambient temperature (operation)	-40 °C ... 100 °C (dependent on the derating curve)
---------------------------------	-----------------------------------------------------

**1769887 SMSTBA 2,5/10-G****13 Mechanical tests****13.1 Visual examination**

Specification	IEC 61984:2008-10
Visual examination	Test passed
Specification	IEC 60512-1-1:2002-02

**13.2 Dimensional test**

Dimensional test	Test passed
Specification	IEC 60512-1-2:2002-02

**13.3 Resistance of marking**

Resistance of marking	Test passed
Specification	IEC 60068-2-70:1995-12

**13.4 Polarization and coding**

Polarization and coding	Test passed
Specification	IEC 60512-13-5:2006-02
Test force	20 N

**13.5 Contact retention in insert**

Contact holder in insert Requirements >20 N	Test passed
Specification	IEC 60512-15-1:2008-05

**1769887 SMSTBA 2,5/10-G****14 Insertion and withdrawal forces**

Insertion and withdrawal force	
Specification	Test passed
No. of cycles	25
Insertion strength per pos. approx.	11 N
Withdraw strength per pos. approx.	6 N

**1769887 SMSTBA 2,5/10-G****15 Electrical tests**

Rated current / conductor cross section	12 A / 2.5 mm <sup>2</sup>
Rated insulation voltage (III/2)	320 V
Rated surge voltage (III/2)	4 kV
Contact resistance	2.3 mΩ
Degree of pollution	2

**15.1 Air and creepage distances**

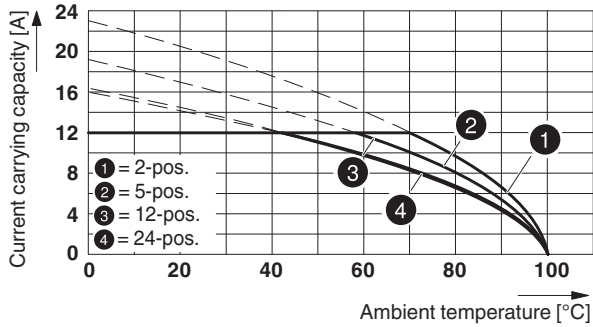
Component	PCB header		
Specification	IEC 60664-1:2007-04		
Mains type	unearthed mains		
Insulating material group	I		
Comparative tracking index (IEC 60112:2003-01)	CTI 600		
Rated insulation voltage	320 V	320 V	630 V
Rated surge voltage	4 kV	4 kV	4 kV
Degree of pollution	3	2	2
Overvoltage category	III	III	II
Minimum clearance case A (inhomogeneous field)	3 mm	3 mm	3 mm
Minimum value of the creepage path requirement in acc. with table	4 mm	1.6 mm	3.2 mm

1769887 SMSTBA 2,5/10-G

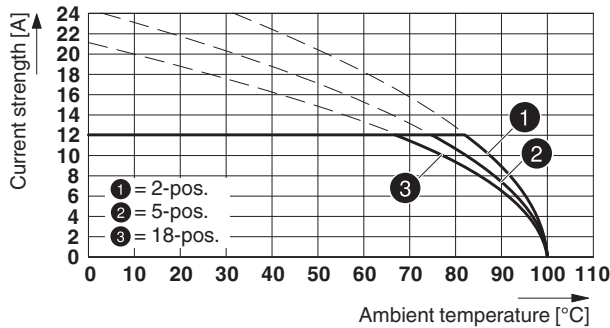
16 Current carrying capacity/derating curves

Specification	IEC 61984:2008-10
Note	Representation based on IEC 60512-5-2:2002-02
Note	For number of positions, see diagram
Reduction factor	0.8
Conductor cross section	2.5 mm <sup>2</sup>

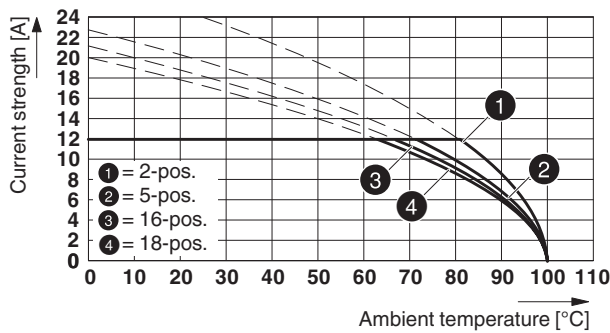
Type: SMSTB 2,5/...-ST with SMSTBA 2,5/...-G



Type: FKCS 2,5/...-ST with SMSTBA 2,5/...-G

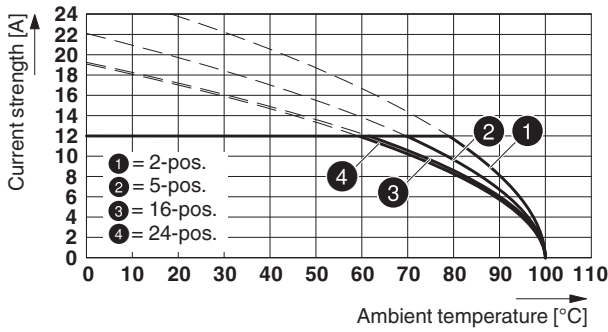


Type: MSTBT 2,5/...-ST with SMSTBA 2,5/...-G

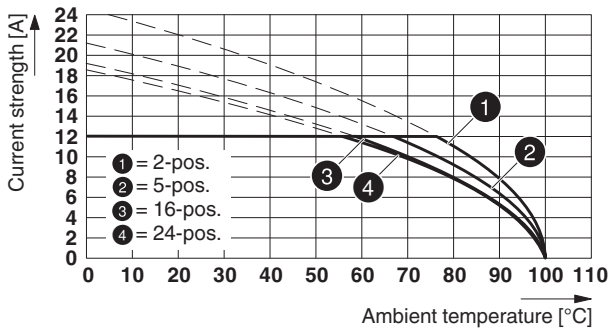


1769887 SMSTBA 2,5/10-G

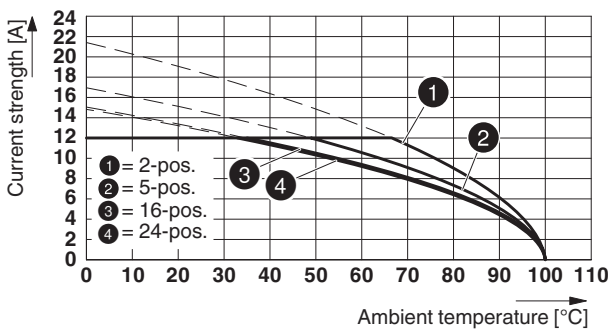
Type: MSTB 2,5/...-ST with SMSTBA 2,5/...-G



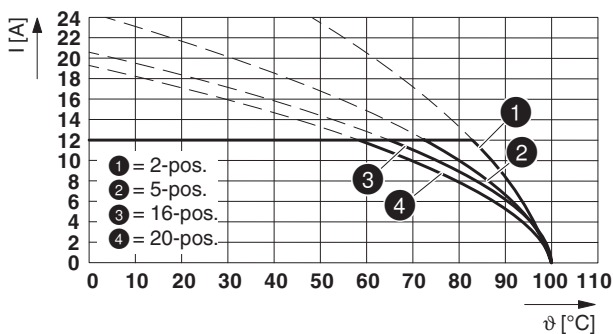
Type: FRONT-MSTB 2,5/..-ST with SMSTBA 2,5/...-G



Type: MVSTB(R/W) 2,5/...-ST with SMSTBA 2,5/...-G

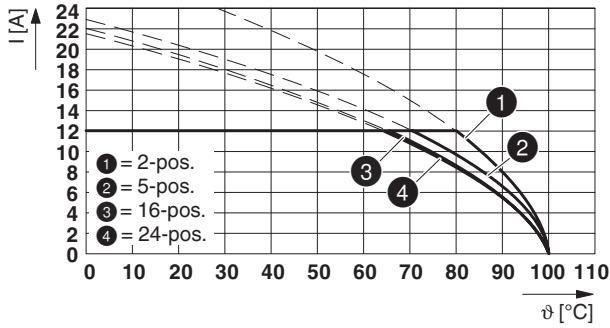


Type: FKCT 2,5/...-ST with SMSTBA 2,5/...-G

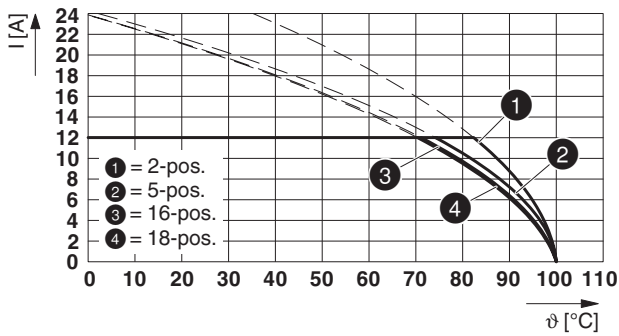


1769887 SMSTBA 2,5/10-G

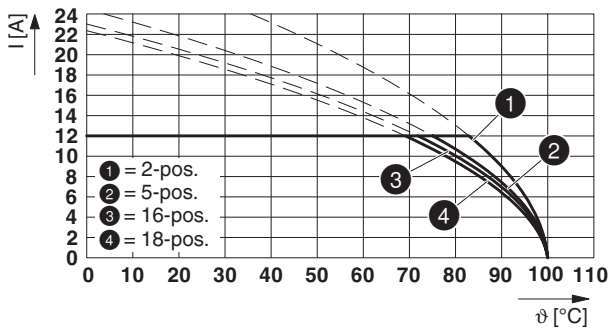
Type: MSTBP 2,5/...-ST with SMSTBA 2,5/...-G



Type: FKCN 2,5/...-ST with SMSTBA 2,5/...-G



Type: FKCV(W/R) 2,5/...-ST with SMSTBA 2,5/...-G



**1769887 SMSTBA 2,5/10-G****17 Environmental and durability tests****17.1 Vibration test**







Specification	IEC 60068-2-6:2007-12
Result	Test passed
Frequency	10 - 150 - 10 Hz
Sweep speed	1 octave/min
Amplitude	0.35 mm (10 - 60.1 Hz)
Acceleration	5 g (60.1 - 150 Hz)
Test duration per axis	2.5 h
Test directions	X-, Y- and Z-axis
Note	The connected conductor loops were guided to the test sample at a distance of approx. 10 cm.

**17.2 Insulation resistance**

Specification	IEC 60512-3-1:2002-02
Result	Test passed
Insulation resistance, neighboring positions	> 5 MΩ

## 1769887 SMSTBA 2,5/10-G

## 18 Approvals / Certificates

CSA 	Voltage [V]	Current [A]	Cross section [AWG]	Cross section [mm <sup>2</sup> ]
<b>Usegroup B</b>				
	300 V	15 A	-	-
<b>Usegroup D</b>				
	300 V	10 A	-	-
IECEE CB Scheme 	Voltage [V]	Current [A]	Cross section [AWG]	Cross section [mm <sup>2</sup> ]
	250 V	12 A	-	-
EAC 				
VDE Zeichengenehmigung 	Voltage [V]	Current [A]	Cross section [AWG]	Cross section [mm <sup>2</sup> ]
	250 V	12 A	-	-
cULus Recognized 	Voltage [V]	Current [A]	Cross section [AWG]	Cross section [mm <sup>2</sup> ]
<b>Usegroup B</b>				
	300 V	15 A	-	-
<b>Usegroup D</b>				
	300 V	10 A	-	-
VDE Zeichengenehmigung 	Voltage [V]	Current [A]	Cross section [AWG]	Cross section [mm <sup>2</sup> ]
	250 V	12 A	-	-

**1769887 SMSTBA 2,5/10-G****19 Commercial Data**

Order No.	1769887
Type	SMSTBA 2,5/10-G
Pieces per package	50
Net weight	5.915 g
GTIN	4017918035105
	Information that applies locally, see link on page 1
	Information that applies locally, see link on page 1

**20 corresponding plugs**

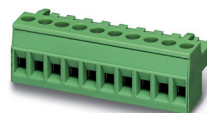
Order No.	Type
1713910	TVFKC 1,5/10-ST
1716001	TVFKCL 1,5/10-ST
1718041	QC 1,5/10-ST
1732823	FKCN 2,5/10-ST
1754601	MSTB 2,5/10-ST
1759004	MSTB 2,5/10-STZ
1765852	MSTBP 2,5/10-ST
1768833	SMSTB 2,5/10-ST
1779495	FRONT-MSTB 2,5/10-ST
1779916	MSTBT 2,5/10-ST
1792090	MVSTBR 2,5/10-ST
1792605	MVSTBW 2,5/10-ST
1909294	FKCT 2,5/10-ST
1909799	FKCVR 2,5/10-ST
1910115	FKCVW 2,5/10-ST
1910432	FKC 2,5/10-ST
1974818	FKCS 2,5/10-ST

**21 Accessories**

Description	Order No.	Type
Coding section, inserted into the recess in the header or the inverted plug, red insulating material	1734401	CR-MSTB
	0804183	SK 5/3,8:FORTL.ZAHLEN
Keying cap, for forming sections, plugs onto header pin, green insulating material	1755477	MSTB-BL

## 1769887 SMSTBA 2,5/10-G

## 22 Combination tests

**SMSTBA 2,5/10-G**

IEC 61984

**Mechanical tests (A)**

Insertion/withdrawal force per position

**SMSTB 2,5/10-ST**

IEC 61984

approx. 11 N / 6 N

**FKCS 2,5/10-ST**

IEC 61984

approx. 8 N / 6 N

**MSTBT 2,5/10-ST**

IEC 61984

approx. 8 N / 6 N

**MSTB 2,5/10-ST**

IEC 61984

approx. 8 N / 6 N

Polarization when inserted  
Requirement >20 N

Test passed

Test passed

Test passed

Test passed

Contact holder in insert  
Requirements >20 N

Test passed

Test passed

Test passed

Test passed

**Durability tests (B)**Contact resistance R<sub>1</sub> 1st level

2.3 mΩ

1.1 mΩ

1.3 mΩ

1.3 mΩ

Contact resistance R<sub>1</sub> 2nd level

Insertion/withdrawal cycles

25

25

25

25

Contact resistance R<sub>2</sub>

2.4 mΩ

1.2 mΩ

1.3 mΩ

1.4 mΩ

Rated impulse voltage at sea level  
Voltage waveform ≥ (1.2/50 μs)

4.8 kV

4.8 kV

4.8 kV

4.8 kV

Power-frequency withstand voltage  
Voltage waveform ≥ (50/60 Hz)

2.21 kV

2.21 kV

2.21 kV

2.21 kV

**Thermal tests (C)**

Tested number of positions

24

18

18

24

Tested conductor cross section

2.5 mm<sup>2</sup>2.5 mm<sup>2</sup>2.5 mm<sup>2</sup>2.5 mm<sup>2</sup>

Test current

12 A

12 A

12 A

Upper limiting temperature  
Requirements < 100°C

Test passed

Test passed

Test passed

Test passed

**Climatic tests (D)**

Test sequence 1: low temperature storage

-40 °C/2 h

-40 °C/2 h

-40 °C/2 h

-40 °C/2 h

Test sequence 2: heat storage

100 °C/168 h

100 °C/168 h

100 °C/168 h

100 °C/168 h

Test sequence 3: noxious gas storage  
(ISO 6988)0.2 dm<sup>3</sup> SO<sub>2</sub> on 300 dm<sup>3</sup>/  
40 °C/1 cycle0.2 dm<sup>3</sup> SO<sub>2</sub> on 300 dm<sup>3</sup>/  
40 °C/1 cycle0.2 dm<sup>3</sup> SO<sub>2</sub> on 300 dm<sup>3</sup>/  
40 °C/1 cycle0.2 dm<sup>3</sup> SO<sub>2</sub> on 300 dm<sup>3</sup>/  
40 °C/1 cycleRated impulse voltage at sea level  
Voltage waveform ≥ (1.2/50 μs)

4.8 kV

4.8 kV

4.8 kV

4.8 kV

Power-frequency withstand voltage  
Voltage waveform ≥ (50/60 Hz)

2.21 kV

2.21 kV

2.21 kV

2.21 kV

**Environmental and endurance tests (E)**

Specification

IEC 61984:2008-10

IEC 61984:2008-10

IEC 61984:2008-10

IEC 61984:2008-10

Degree of protection

Finger safety with IP20  
test fingerFinger safety with IP20  
test fingerFinger safety with IP20  
test fingerFinger safety with IP20  
test finger

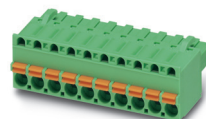
## 1769887 SMSTBA 2,5/10-G



SMSTBA 2,5/..-G

FRONT-MSTB 2,5/  
..-ST

MVSTBR 2,5/..-ST

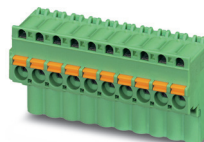
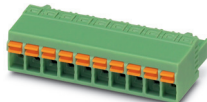


FKCT 2,5/..-ST



MSTBP 2,5/..-ST

IEC 61984	IEC 61984	IEC 61984	IEC 61984	IEC 61984
<b>Mechanical tests (A)</b>				
Insertion/withdrawal force per position	approx. 8 N / 6 N	approx. 8 N / 6 N	approx. 8 N / 6 N	approx. 8 N / 6 N
Polarization when inserted Requirement >20 N	Test passed	Test passed	Test passed	Test passed
Contact holder in insert Requirements >20 N	Test passed	Test passed	Test passed	Test passed
<b>Durability tests (B)</b>				
Contact resistance R <sub>1</sub> 1st level	1.6 mΩ	2.5 mΩ	1.1 mΩ	1.3 mΩ
Contact resistance R <sub>1</sub> 2nd level				
Insertion/withdrawal cycles	25	25	25	25
Contact resistance R <sub>2</sub>	1.6 mΩ	2.5 mΩ	1.2 mΩ	1.4 mΩ
Rated impulse voltage at sea level Voltage waveform ≥ (1.2/50 μs)	4.8 kV	4.8 kV	4.8 kV	4.8 kV
Power-frequency withstand voltage Voltage waveform ≥ (50/60 Hz)	2.21 kV	2.21 kV	2.21 kV	2.21 kV
<b>Thermal tests (C)</b>				
Tested number of positions	24	24	20	24
Tested conductor cross section	2.5 mm <sup>2</sup>	2.5 mm <sup>2</sup>	2.5 mm <sup>2</sup>	2.5 mm <sup>2</sup>
Test current	12 A	12 A	12 A	12 A
Upper limiting temperature Requirements < 100°C	Test passed	Test passed	Test passed	Test passed
<b>Climatic tests (D)</b>				
Test sequence 1: low temperature storage	-40 °C/2 h	-40 °C/2 h	-40 °C/2 h	-40 °C/2 h
Test sequence 2: heat storage	100 °C/168 h	100 °C/168 h	100 °C/168 h	100 °C/168 h
Test sequence 3: noxious gas storage (ISO 6988)	0.2 dm <sup>3</sup> SO <sub>2</sub> on 300 dm <sup>3</sup> / 40 °C/1 cycle	0.2 dm <sup>3</sup> SO <sub>2</sub> on 300 dm <sup>3</sup> / 40 °C/1 cycle	0.2 dm <sup>3</sup> SO <sub>2</sub> on 300 dm <sup>3</sup> / 40 °C/1 cycle	0.2 dm <sup>3</sup> SO <sub>2</sub> on 300 dm <sup>3</sup> / 40 °C/1 cycle
Rated impulse voltage at sea level Voltage waveform ≥ (1.2/50 μs)	4.8 kV	4.8 kV	4.8 kV	4.8 kV
Power-frequency withstand voltage Voltage waveform ≥ (50/60 Hz)	2.21 kV	2.21 kV	2.21 kV	2.21 kV
<b>Environmental and endurance tests (E)</b>				
Specification	IEC 61984:2008-10	IEC 61984:2008-10	IEC 61984:2008-10	IEC 61984:2008-10
Degree of protection	Finger safety with IP20 test finger	Finger safety with IP20 test finger	Finger safety with IP20 test finger	Finger safety with IP20 test finger

**1769887 SMSTBA 2,5/10-G****SMSTBA 2,5/10-G****FKCN 2,5/10-ST****FKCVW 2,5/10-ST**

IEC 61984

IEC 61984

IEC 61984

**Mechanical tests (A)**

Insertion/withdrawal force per position

approx. 8 N / 6 N

approx. 8 N / 6 N

Polarization when inserted  
Requirement >20 N

Test passed

Test passed

Contact holder in insert  
Requirements >20 N

Test passed

Test passed

**Durability tests (B)**Contact resistance R<sub>1</sub> 1st level

1 mΩ

1 mΩ

Contact resistance R<sub>1</sub> 2nd level

Insertion/withdrawal cycles

25

25

Contact resistance R<sub>2</sub>

1.1 mΩ

1.2 mΩ

Rated impulse voltage at sea level  
Voltage waveform ≥ (1.2/50 μs)

4.8 kV

4.8 kV

Power-frequency withstand voltage  
Voltage waveform ≥ (50/60 Hz)

2.21 kV

2.21 kV

**Thermal tests (C)**

Tested number of positions

18

18

Tested conductor cross section

2.5 mm<sup>2</sup>2.5 mm<sup>2</sup>

Test current

12 A

12 A

Upper limiting temperature  
Requirements < 100°C

Test passed

Test passed

**Climatic tests (D)**

Test sequence 1: low temperature storage

-40 °C/2 h

-40 °C/2 h

Test sequence 2: heat storage

100 °C/168 h

100 °C/168 h

Test sequence 3: noxious gas storage  
(ISO 6988)0.2 dm<sup>3</sup> SO<sub>2</sub> on 300 dm<sup>3</sup>/  
40 °C/1 cycle0.2 dm<sup>3</sup> SO<sub>2</sub> on 300 dm<sup>3</sup>/  
40 °C/1 cycleRated impulse voltage at sea level  
Voltage waveform ≥ (1.2/50 μs)

4.8 kV

4.8 kV

Power-frequency withstand voltage  
Voltage waveform ≥ (50/60 Hz)

2.21 kV

2.21 kV

**Environmental and endurance tests (E)**

Specification

IEC 61984:2008-10

IEC 61984:2008-10

Degree of protection

Finger safety with IP20  
test fingerFinger safety with IP20  
test finger