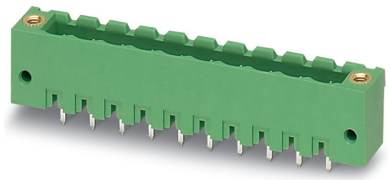
2020-08-05
Product version 06
Document revision 01

Data sheet

Order No.: 1777086

Type: MSTBV 2,5/ 3-GF-5,08

PCB headers



The figure shows a 10-position version of the product

1 Main features

- No. of pos. 3
- Nominal cross section 2.5 mm²
- Color green (6021)
- Pitch 5.08 mm
- Mounting type Wave soldering
- Nominal current 12 A
- Nominal voltage 320 V
- Connection direction 90 °
- Type of packaging packed in cardboard

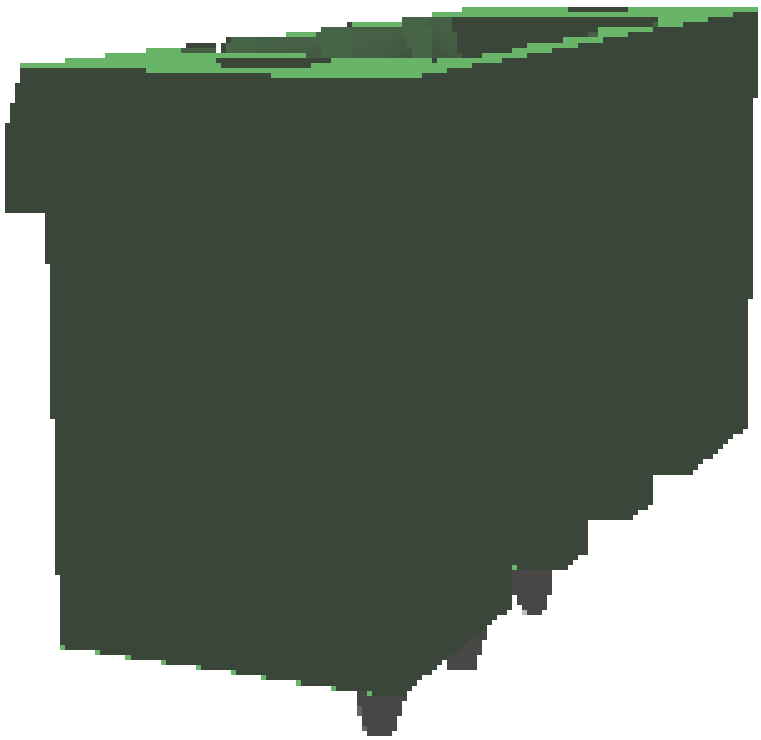
2 Your advantages

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

Make sure you always use the latest documentation.
It can be downloaded at: phoenixcontact.net/product/1777086

3 Table of contents

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



5 General Technical Data

5.1 item properties

Order No.	1777086
Type	MSTBV 2,5/ 3-GF-5,08
Plug-in system	CLASSIC COMBICON
Product type	PCB headers
Type of contact	Male connector
Range of articles	MSTBV 2,5/..-GF
Pitch	5.08 mm
Range of positions	2...24
Number of positions	3
Number of levels	1
Number of connections	3
Number of potentials	3
Mounting type	Wave soldering
Connection direction of the connector to the PCB	90 °
Pin layout	Linear pinning
Solder pins per potential	1
Type	Standard

6 Mounting

6.1 Flange fixing

Type of locking	Screw locking
Mounting flange	Threaded flange
Torque	0.3 Nm

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 (1.3 - 3 µm Ni), , Tin (3 - 5 µm Sn)
Soldering area surface	Nickel (1.3 - 3 µm Ni) , Tin (3 - 5 µm Sn)
Surface characteristics	Tin-plated

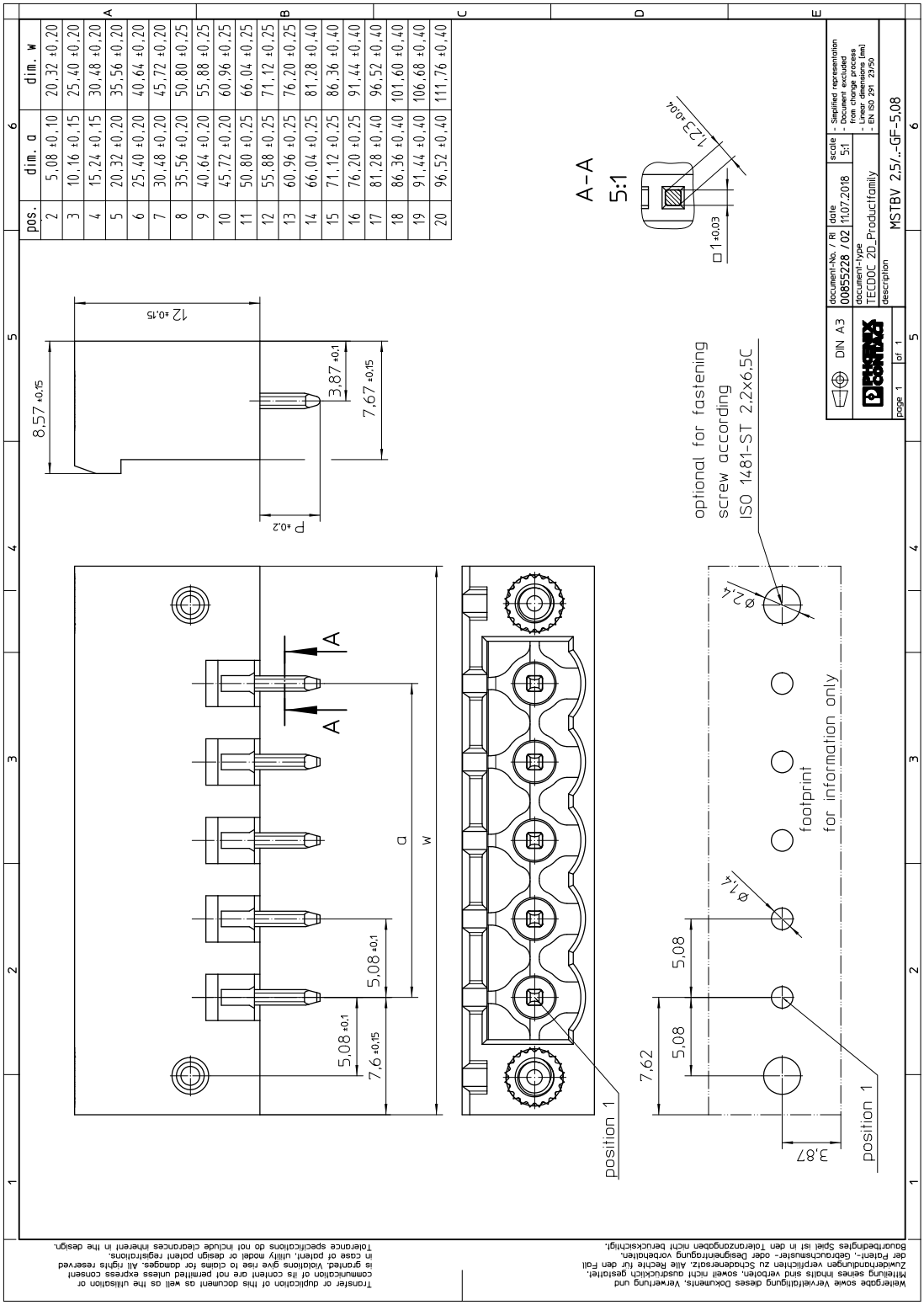
Insulating material data	Housing
Color	green (6021)
Insulating material	PBT
Insulating material group	IIIa
CTI according to IEC 60112	225
Flammability rating according to UL 94	V0

8 Dimensions

8.1 Dimensions for the product

Length	8.6 mm
Width	25.4 mm
Height (without solder pin)	12 mm
Total height	15.9 mm
Solder pin [P]	3.9 mm
Dimension a	10.16 mm

9 Series drawing



10 Application

11 Packaging information

Type of packaging	packed in cardboard
Pieces per package	250

11.1 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)

12 Mechanical tests

12.1 Visual examination

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

12.2 Dimensional test

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

12.3 Resistance of marking

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

12.4 Polarization and coding

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

12.5 Contact retention in insert

Contact retention in insert	Test passed
Specification	IEC 60512-15-1:2008-05
Test force per pos.	40 N

13 Insertion and withdrawal forces

Insertion and withdrawal force	Test passed
Specification	IEC 60512-13-2:2006-02
No. of cycles	25
Insertion strength per pos. approx.	8 N
Withdraw strength per pos. approx.	6 N

14 Electrical tests

14.1 Electrical data

Rated current / conductor cross section	12 A / 2.5 mm²
Rated insulation voltage (III/2)	320 V
Rated surge voltage (III/2)	4 kV
Contact resistance	2.5 mΩ
Degree of pollution	2

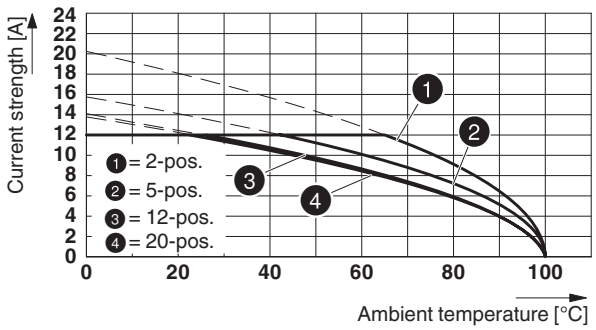
14.2 Air and creepage distances

Component	PCB headers		
Specification	IEC 60664-1:2007-04		
Mains type	unearthed mains		
Insulating material group	IIIa		
Comparative tracking index (IEC 60112:2003-01)	CTI 225		
Rated insulation voltage	250 V	320 V	400 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	3.2 mm	4 mm

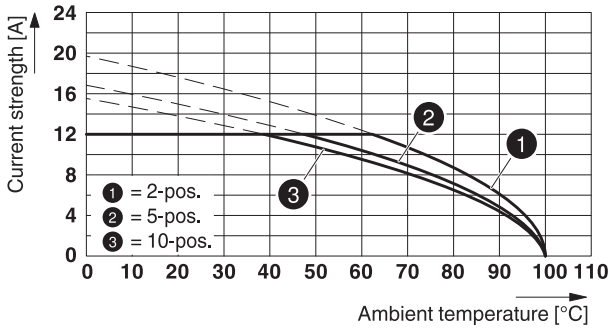
15 Current carrying capacity/derating curves

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 mm²

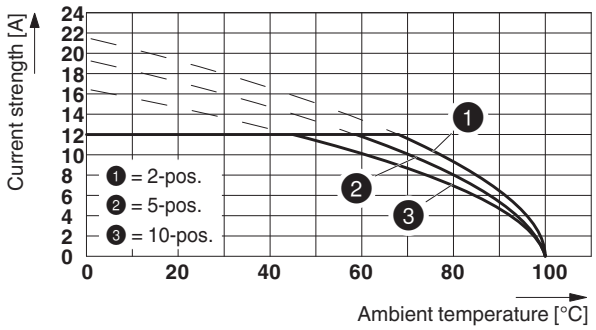
Type: MSTB 2,5/...-STF-5,08 with MSTBV 2,5/...-GF-5,08



Type: TVMSTB 2,5/...-STF-5,08 with MSTBV 2,5/...-GF-5,08

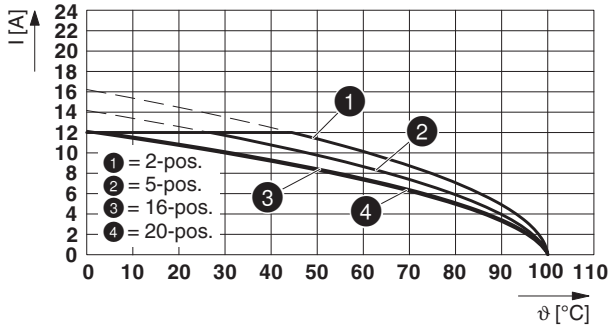


Type: TFKC 2,5/...-STF-5,08 with MSTBV 2,5/...-GF-5,08

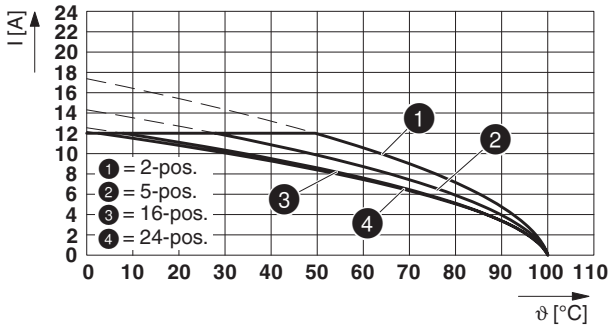


1777086 MSTBV 2,5/ 3-GF-5,08

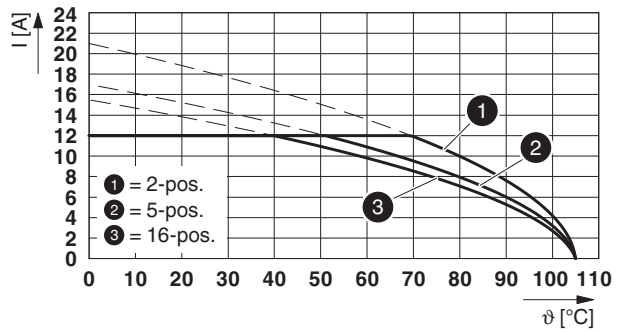
Type: MVSTB(R/W) 2,5/...-STF-5,08 with MSTBV 2,5/...-GF-5,08



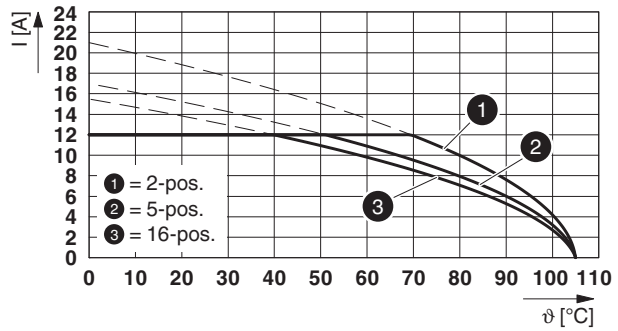
Type: SMSTB 2,5/...-STF-5,08 with MSTBV 2,5/...-GF-5,08



Type: FKCVR 2,5/...-STF-5,08 with MSTBV 2,5/...-GF-5,08

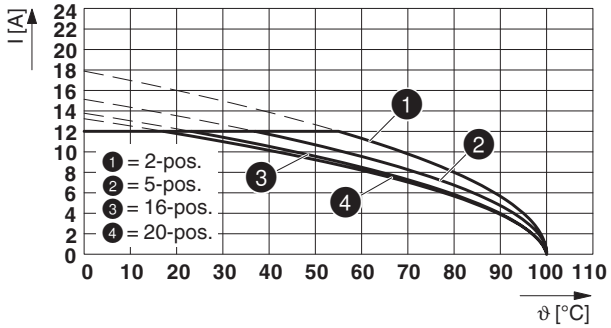


Type: FKCVW 2,5/...-STF-5,08 with MSTBV 2,5/...-GF-5,08



1777086 MSTBV 2,5/ 3-GF-5,08

Type: FRONT-MSTB 2,5/...-STF-5,08 with MSTBV 2,5/...-GF-5,08



15.1 Insulation resistance

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

15.2 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.

16 Approvals / Certificates

CSA	Voltage [V]	Current [A]	Cross section [AWG]	Cross section [mm²]
Usegroup B				
	300 V	12 A	-	-
Usegroup D				
	300 V	10 A	-	-

IECEE CB Scheme	Voltage [V]	Current [A]	Cross section [AWG]	Cross section [mm²]
	250 V	12 A	-	-

EAC				

VDE Zeichengenehmigung	Voltage [V]	Current [A]	Cross section [AWG]	Cross section [mm²]
	250 V	12 A	-	-

cULus Recognized	Voltage [V]	Current [A]	Cross section [AWG]	Cross section [mm²]
Usegroup B				
	300 V	12 A	-	-
Usegroup D				
	300 V	10 A	-	-

DNV GL				

RS				

17 Commercial Data

Order No.	1777086
Type	MSTBV 2,5/ 3-GF-5,08
Pieces per package	250
Net weight	2.5 g
GTIN	4017918039257
	Information that applies locally, see link on page 1
Country of origin	Information that applies locally, see link on page 1

18 corresponding plugs

Order No.	Type
1719105	TVMSTB 2,5/ 3-STF-5,08
1754801	FKCN 2,5/ 3-STF-5,08
1777811	FRONT-MSTB 2,5/ 3-STF-5,08
1777992	MSTB 2,5/ 3-STF-5,08
1805314	MSTBT 2,5/ 3-STF-5,08
1809747	MSTBC 2,5/ 3-STZF-5,08
1834916	MVSTBW 2,5/ 3-STF-5,08
1835106	MVSTBR 2,5/ 3-STF-5,08
1853117	TMSTBP 2,5/ 3-STF-5,08
1873210	FKC 2,5/ 3-STF-5,08
1873812	FKCVW 2,5/ 3-STF-5,08
1874112	FKCVR 2,5/ 3-STF-5,08
1883365	QC 1/ 3-STF-5,08
1902314	FKCT 2,5/ 3-STF-5,08
1962707	TFKC 2,5/ 3-STF-5,08
1971073	SMSTB 2,5/ 3-STF-5,08
1975273	FKCS 2,5/ 3-STF-5,08

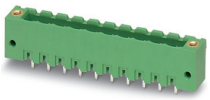
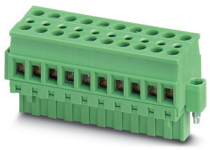
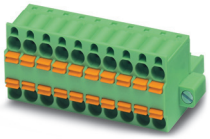
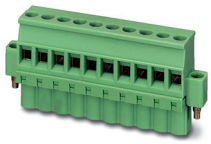
19 Accessories

Description	Order No.	**Type**
Coding section, inserted into the recess in the header or the inverted plug, red insulating material	1734401	CR-MSTB
	0804293	SK 5,08/3,8:FORTL.ZAHLEN
Keying cap, for forming sections, plugs onto header pin, green insulating material	1755477	MSTB-BL
	0805412	SK 5,08/3,8:UNBEDRUCKT
	0805085	SK 5,08/3,8:SO
Marker pen, for manual labeling of unprinted Zack strips, smear-proof and waterproof, line thickness 0.5 mm	1051993	B-STIFT
	1719105	TVMSTB 2,5/ 3-STF-5,08
	1754801	FKCN 2,5/ 3-STF-5,08
	1777811	FRONT-MSTB 2,5/ 3-STF-5,08
	1777992	MSTB 2,5/ 3-STF-5,08
	1805314	MSTBT 2,5/ 3-STF-5,08
	1809747	MSTBC 2,5/ 3-STZF-5,08
	1834916	MVSTBW 2,5/ 3-STF-5,08
	1835106	MVSTBR 2,5/ 3-STF-5,08

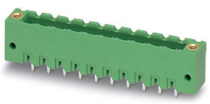
1777086 MSTBV 2,5/ 3-GF-5,08

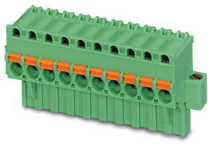
Description	Order No.	**Type**
	1853117	TMSTBP 2,5/ 3-STF-5,08
	1873210	FKC 2,5/ 3-STF-5,08
	1873812	FKCVW 2,5/ 3-STF-5,08
	1874112	FKCVR 2,5/ 3-STF-5,08
	1883365	QC 1/ 3-STF-5,08
	1902314	FKCT 2,5/ 3-STF-5,08
	1962707	TFKC 2,5/ 3-STF-5,08
	1971073	SMSTB 2,5/ 3-STF-5,08
	1975273	FKCS 2,5/ 3-STF-5,08

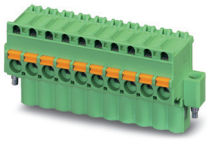
20 Combination tests

				
MSTBV 2,5/..-GF	**MSTB 2,5/..-STF**	**TVMSTB 2,5/..-STF**	**TFKC 2,5/..-STF**	**MVSTBW 2,5/..-STF**
IEC 61984	IEC 61984	IEC 61984	IEC 61984	IEC 61984
Mechanical tests (A)				
Insertion/withdrawal force per position	approx. 8 N / 6 N	approx. 8 N / 6 N	approx. 10 N / 9.5 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
Durability tests (B)				
Contact resistance R_1	2.5 mΩ	2.3 mΩ	2 mΩ	3.5 mΩ
Insertion/withdrawal cycles	25	25	25	25
Contact resistance R_2	2.6 mΩ	2.5 mΩ	2.2 mΩ	3.5 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	20	10	10	20
Tested conductor cross section	2.5 mm²	2.5 mm²	2.5 mm²	2.5 mm²
Test current	12 A	12 A DC	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^3 SO_2 on 300 dm^3/ 40 °C/1 cycle	0.2 dm^3 SO_2 on 300 dm^3/ 40 °C/1 cycle	0.2 dm^3 SO_2 on 300 dm^3/ 40 °C/1 cycle	0.2 dm^3 SO_2 on 300 dm^3/ 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
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 finger	Finger safety with IP20 test finger	Finger safety with IP20 test finger	Finger safety with IP20 test finger

1777086 MSTBV 2,5/ 3-GF-5,08







MSTBV 2,5/..-GF	SMSTB 2,5/..-STF	FKCVR 2,5/..-STF	FKCVW 2,5/..-STF	FRONT-MSTB 2,5/ ..-STF
IEC 61984	IEC 61984	IEC 61984	IEC 61984	IEC 61984
Mechanical tests (A)				
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
Durability tests (B)				
Contact resistance R_1	3.4 mΩ	2.2 mΩ	2.2 mΩ	2.4 mΩ
Insertion/withdrawal cycles	25	25	25	25
Contact resistance R_2	3.5 mΩ	2.3 mΩ	2.3 mΩ	2.6 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	16	16	20
Tested conductor cross section	2.5 mm²	2.5 mm²	2.5 mm²	2.5 mm²
Test current	12 A	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	105 °C/168 h	105 °C/168 h	100 °C/168 h
Test sequence 3: noxious gas storage (ISO 6988)	0.2 dm^3 SO_2 on 300 dm^3/ 40 °C/1 cycle	0.2 dm^3 SO_2 on 300 dm^3/ 40 °C/1 cycle	0.2 dm^3 SO_2 on 300 dm^3/ 40 °C/1 cycle	0.2 dm^3 SO_2 on 300 dm^3/ 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
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 finger	Finger safety with IP20 test finger	Finger safety with IP20 test finger	Finger safety with IP20 test finger