

ELECTRO- MECHANICAL COMPONENTS

2023



WÜRTH ELEKTRONIK MORE THAN YOU EXPECT

ELECTROMECHANICAL COMPONENTS FOR YOUR APPLICATION!



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Information in this publication is subject to change. The process of continually improving our product range leads to changes in content. For new designs please refer to the latest data sheets on www.we-online.com or contact our technical field staff.

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THE WÜRTH ELEKTRONIK

eiSos GROUP



THE WÜRTH ELEKTRONIK GROUP

Employees: 8,200*
Sales: 1.33 Bn. Euro*
 *2022

WÜRTH ELEKTRONIK eiSos GROUP



PRINTED CIRCUIT
BOARDS

INTELLIGENT
POWER AND
CONTROL SYSTEMS

Passive
Components



Power Modules &
Optoelectronics



Electromechanical
Components



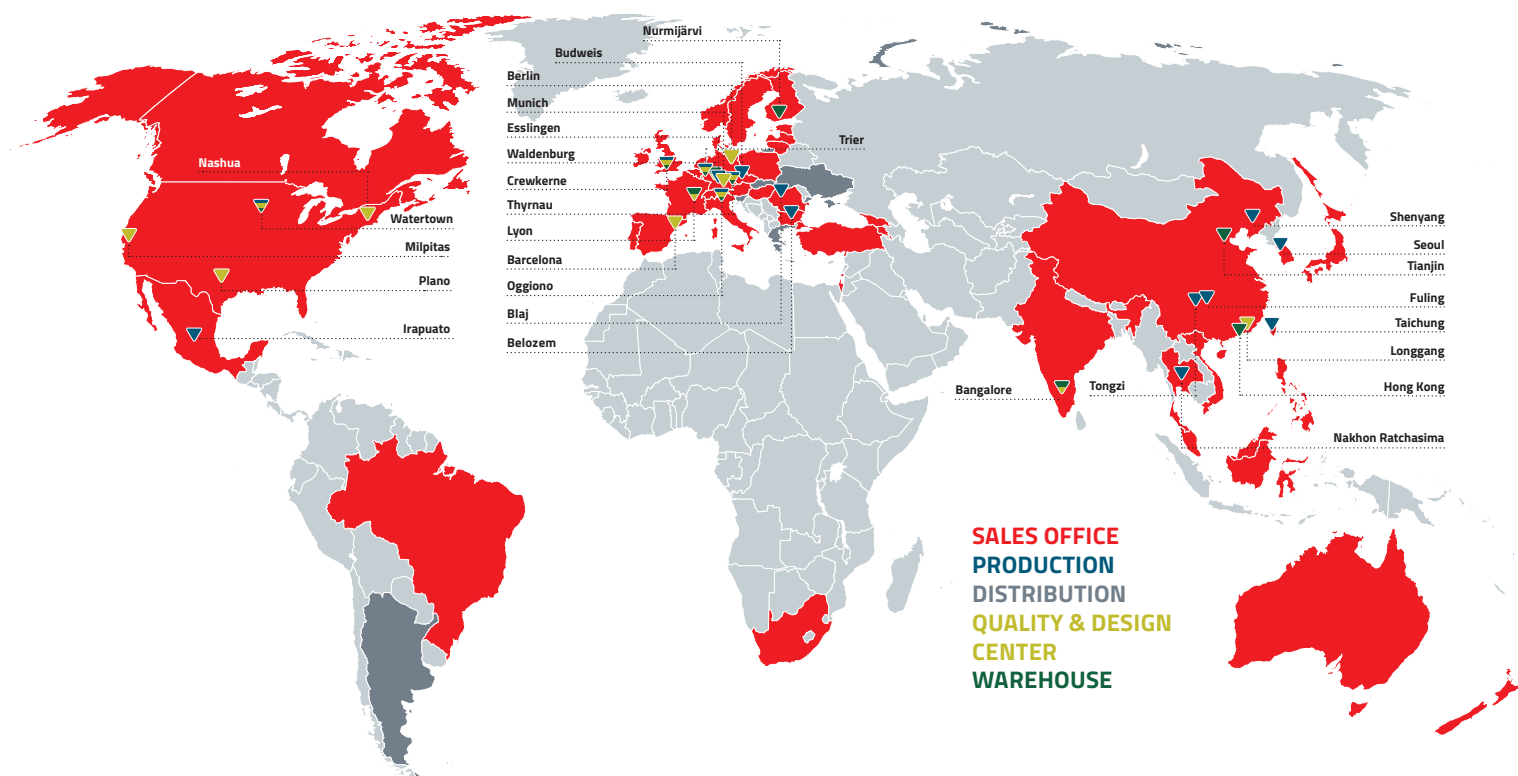
Automotive &
eMobility



Wireless Connectivity &
Sensors



GLOBALLY AVAILABLE. LOCALLY PRESENT.



MORE **THAN YOU EXPECT**



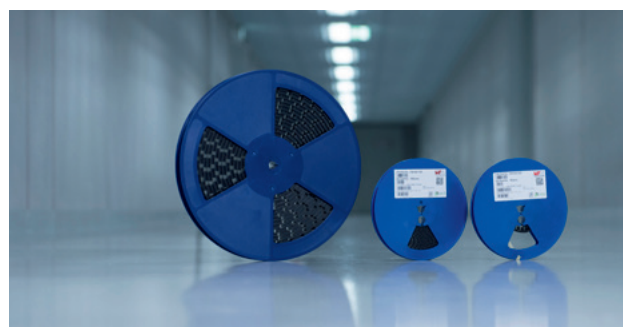
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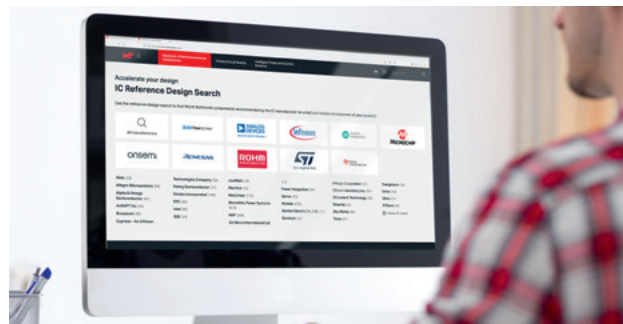
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**REFERENCE DESIGNS OF
LEADING IC MANUFACTURERS**

OUTSTANDING DESIGN SUPPORT

TRILOGY OF CONNECTORS 3rd EDITION

Basic Principles and Connector Design Explanations

Order Code:

English version:

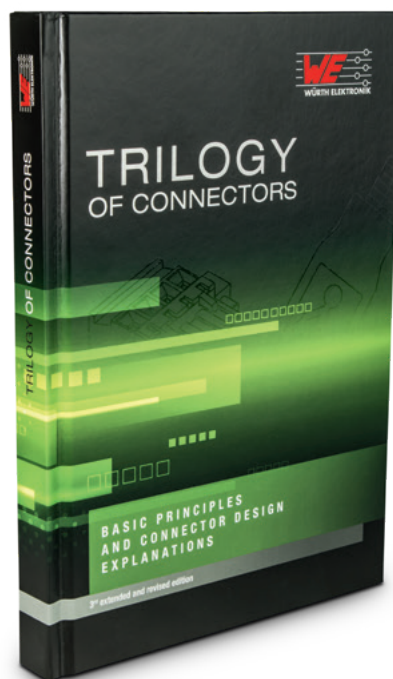
699 004

German version:

699 005

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ABC OF CAPACITORS

**Basic Principles, Characteristics
and Capacitor Types**

Order Code:

English version:

744 013

German version:

744 012



TRILOGY OF MAGNETICS

5th Edition:

**Design Guide for EMI Filter Design,
SMPS & RF Circuits**

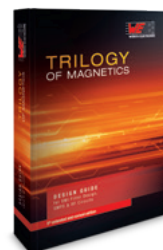
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TRILOGY OF WIRELESS POWER TRANSFER

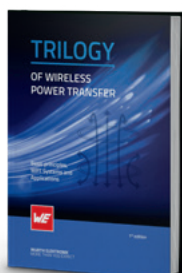
1st Edition:

**Basic Principles, WPT Systems
and Applications**

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English version:

744 018



ABC OF POWER MODULES

1st Edition:

**Functionality, Structure and
Handling of a Power Module**

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THE LT SPICE IV SIMULATOR

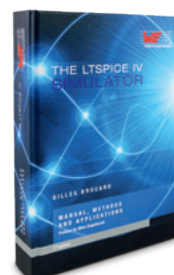
1st Edition:

Manual, Methods and Applications

Order Code:

German version:

744 011



APPLICATION NOTES

Find helpful and comprehensive application notes about DC/DC converters, interfaces, filter design and on how to use inductors, ferrites, wireless power transfer coils, shielding material, power modules, electromechanical components, capacitors and LEDs on www.we-online.com/appnotes



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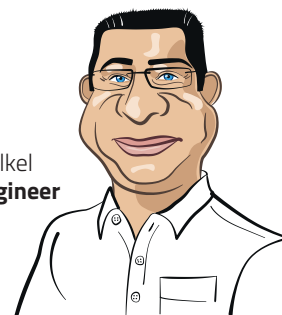


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Lorandt Fölkel
**Design Engineer
at heart**



or contact me directly:
askLorandt@we-online.com



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TOTAL QUALITY MANAGEMENT

Our environment is important to us!

As one of the leading manufacturers of electronic components world-wide, we are fully conscious of our responsibility for the environment and its protection.

Directives

We are thus pleased to confirm that all homogenous subcomponents manufactured by Würth Elektronik eiSos GmbH & Co. KG are in full compliance with the following directives:

- 2011/65/EU and 2002/95/EU of the European Parliament regarding the restriction of the use of defined hazardous substances in electrical and electronic devices (RoHS Directive)
- 2010/571/EU, which supersedes the Annex to Directive 2002/95/EG
- article 33, paragraph 1 of the European REACH regulation No. 1907/2006. All components and homogeneous subcomponents are tested according to the current version of the "list of candidates" of the substances of very high concern (SVHC) "Halogen free" according to JEDEC 709B & IEC 61249-2-21

The components count as compliant when they conform to the definitions of Directive 2011/65/EU and China RoHS ACPEIP (Administrative Measure on the Control of Pollution Caused by Electronic Information Products).

No ozone-depleting substances

We also confirm that we do not use ozone-depleting substances without CFCs (chlorofluorocarbons) as per the Montreal Protocol in our products.

This concerns halogenated organic compounds such as

- PCBs (polychlorinated biphenyls)
- PBDEs (polybrominated diphenyl ethers)
- PBBs (polybrominated biphenyls)
- PCN (polychlorinated naphthalene)
- Deca-BDE (decabromodiphenyl ether)

State-of-the-art Equipment

Four Quality Centers

- Germany (Waldenburg)
- France (Lyon)
- China (Shenzhen)
- USA (Watertown)

Measurement Lab

- Network/Spectrum/Impedance Analyzers
- RF Impedance/Material Analyzer
- LCR Bridges with High Current Capability
- Precision LCRs
- Modular Impulse Generators
- Varistor Testers
- Winding Testers
- ESD Testers
- Dielectric and Insulation Resistance Testers
- 1000 W Power Supply
- 300 W Electronic Loads

Environmental Lab

- Shock and Vibration
- Temperature Cycling
- Thermal Shock
- Combined Shock and Vibration with Temperature Cycling
- Steam Aging

Analysis Lab

- Microscopic Analysis
- Cross Sectioning and Polishing
- Terminal Strength
- Packaging MSL Level Testing
- Wetting Balance
- RoHS Reflow Profile
- Computer Tomography
- Hot Air Reflow
- Vapor Phase
- Wave Soldering
- XRF X-Ray
- Automatic Pick & Place



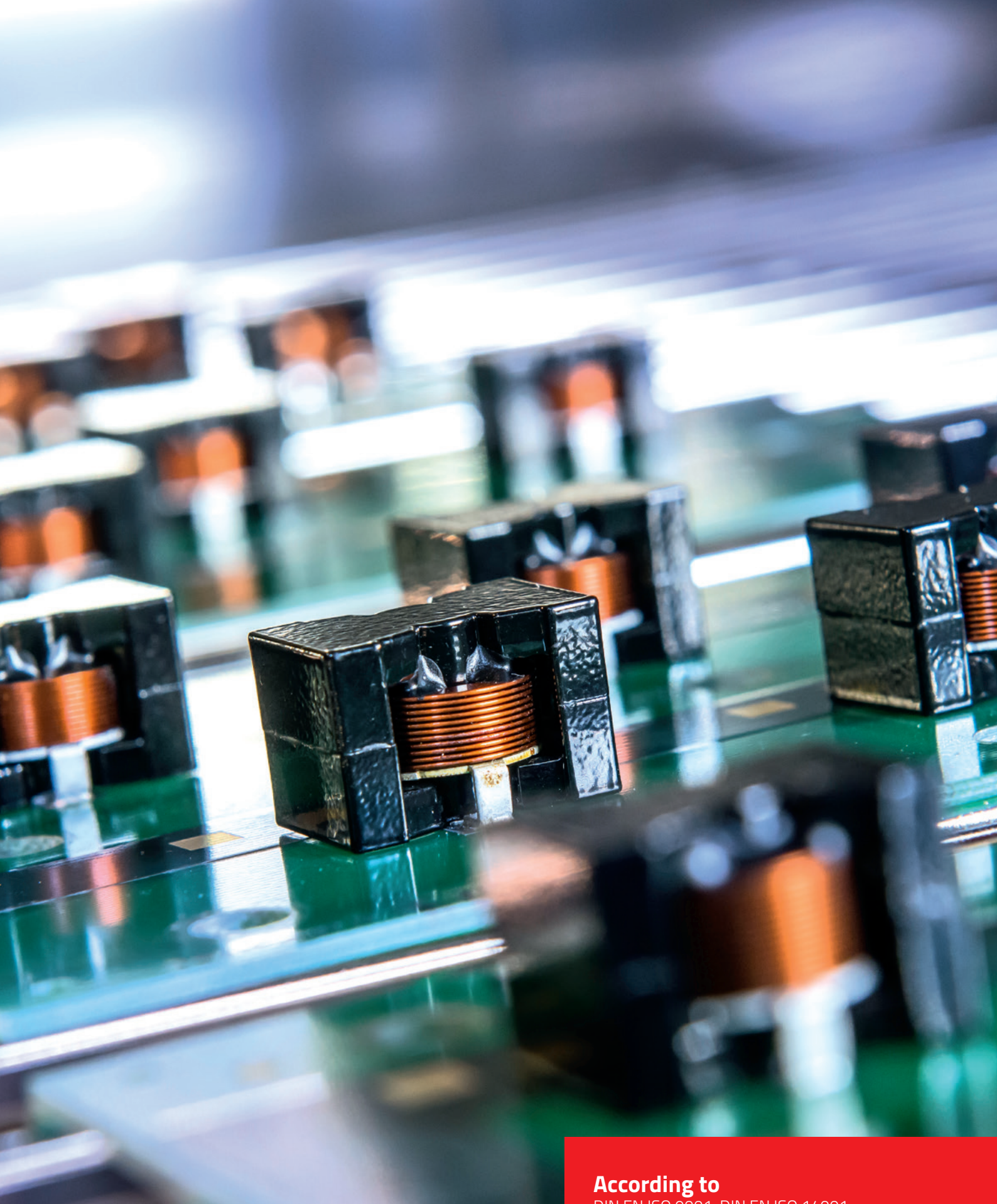
RoHS
COMPLIANT



REACH
COMPLIANT



HALOGEN
FREE



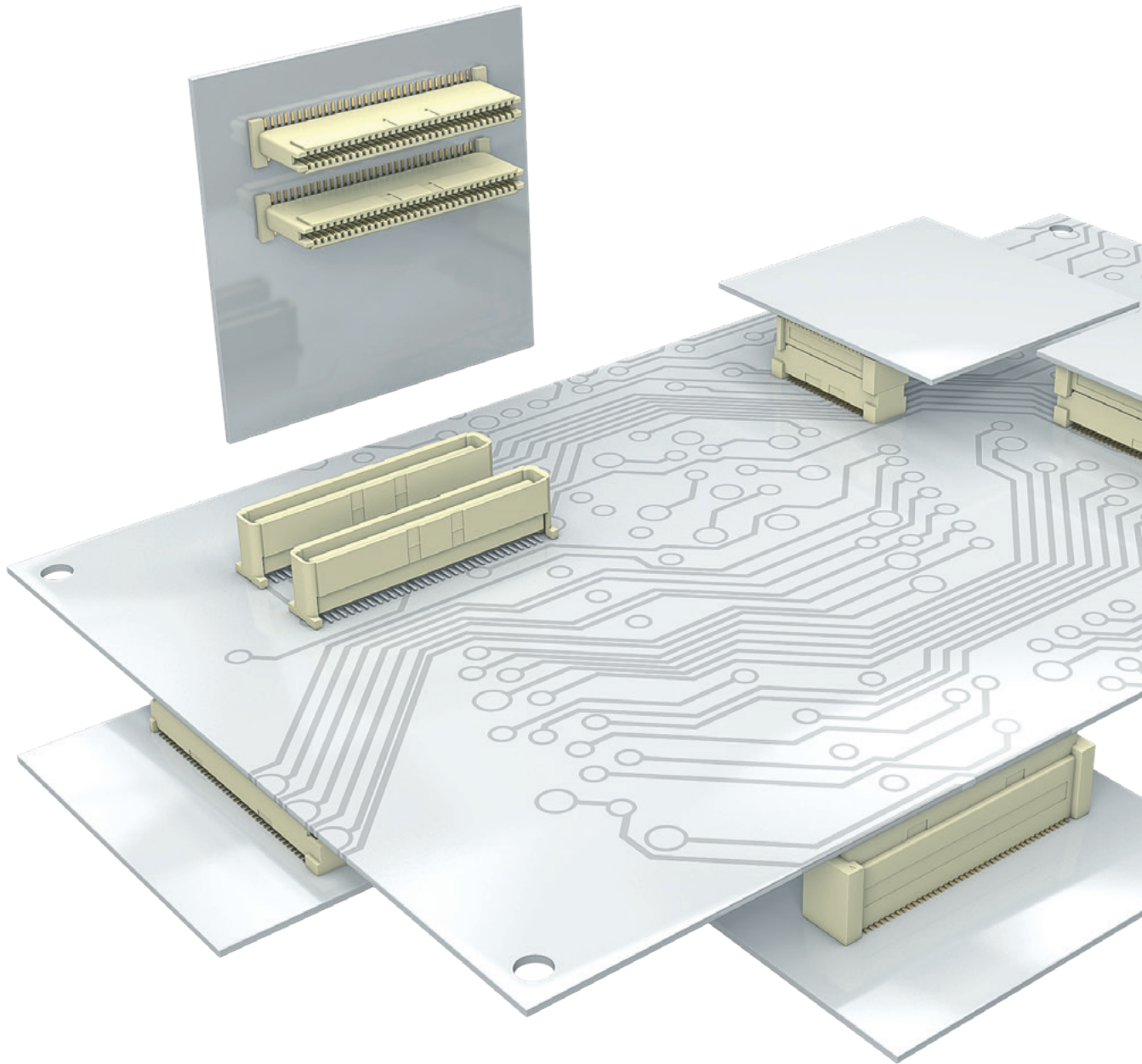
According to

DIN EN ISO 9001, DIN EN ISO 14001,
DIN EN ISO 50001

CONNECTORS

BOARD-TO-BOARD CONNECTORS

WR-BTB



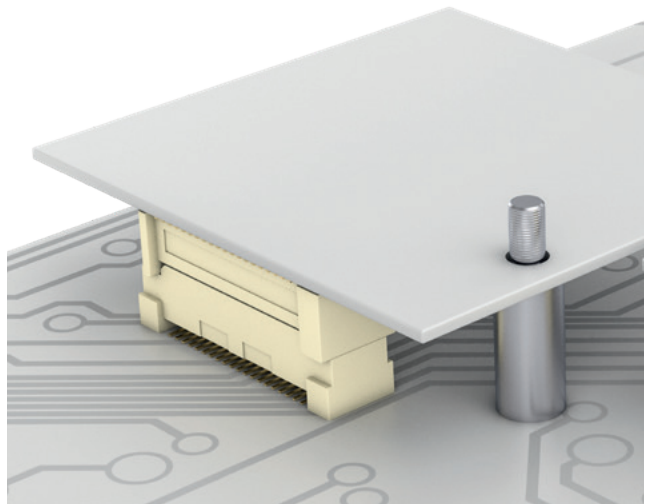
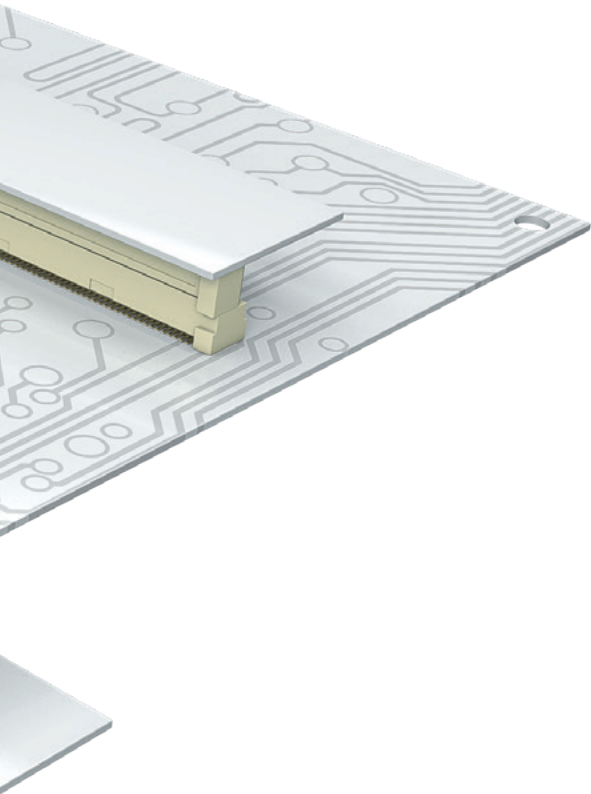
Features & Benefits

- 1.00 mm pitch standard for IEEE 1386 mezzanine connectors
- 0.80 mm pitch polarized to prevent reverse mating
- Transmits USB 2.0 differential signal with a data rate of 480 Mbps
- Up to six different height combinations by polarity
- Specially designed for fast and durable data transmission
- Strong and reliable mating interface

Available Products

- 0.80 mm pitch:
 - 40 pin – Stacking heights: 10 and 14 mm
 - 80 pin – Stacking heights: 5, 8, 9, 12, 13 and 16 mm
 - 100 pin – Stacking height: 10 mm
- 1.00 mm pitch:
 - 64 pin – Stacking heights: 7.75, 9.75, 11.75, 12.75 and 14.75 mm

Special Features



Perfectly matching SMT Spacers available

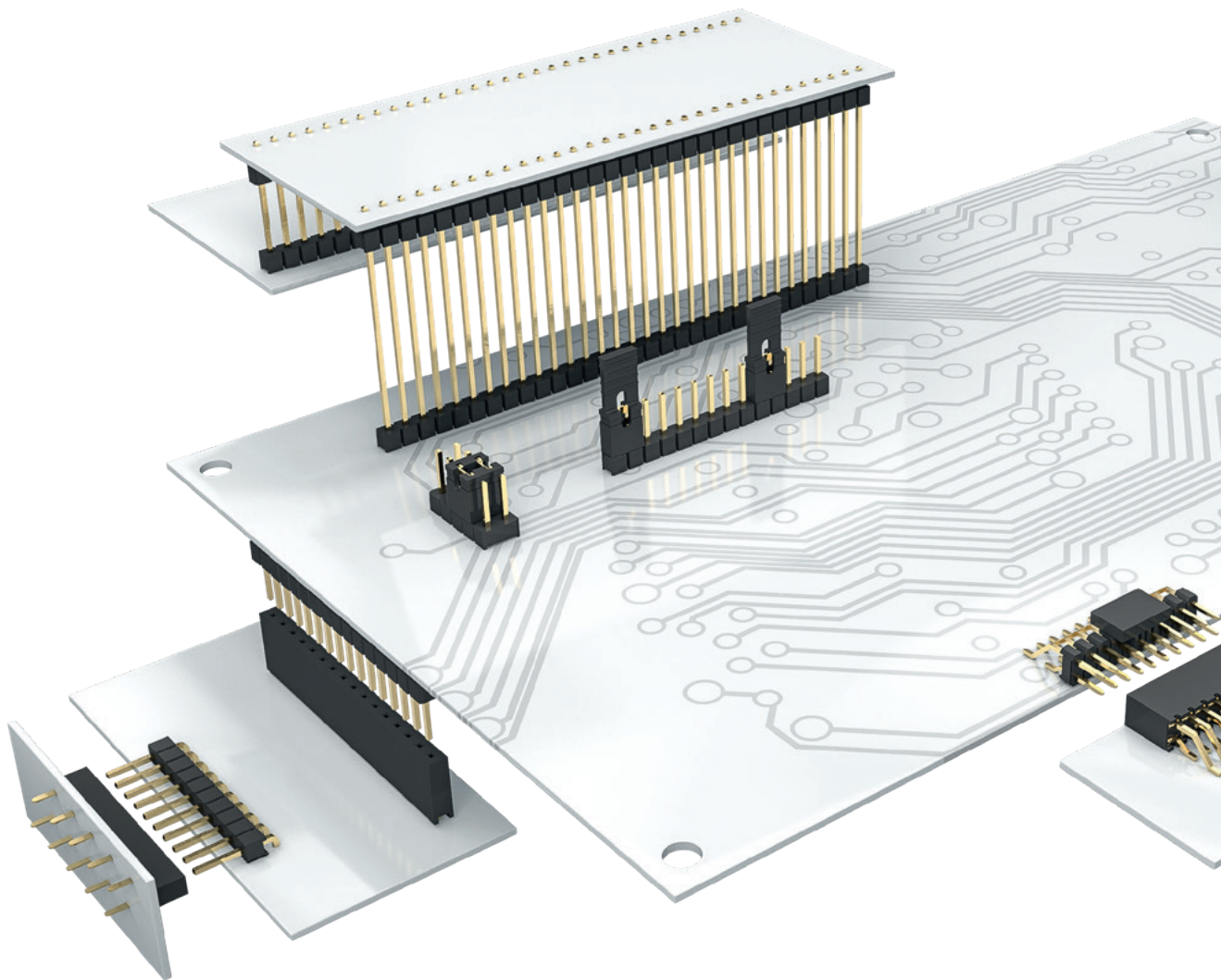


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CONNECTORS

PIN AND SOCKET HEADERS

WR-PHD

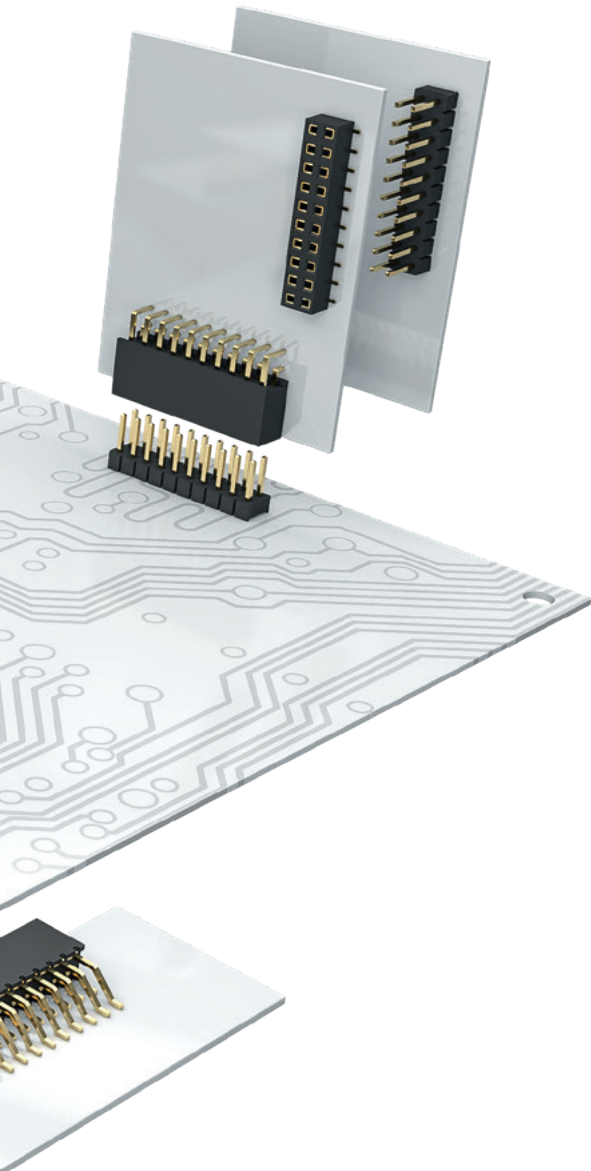


Features & Benefits

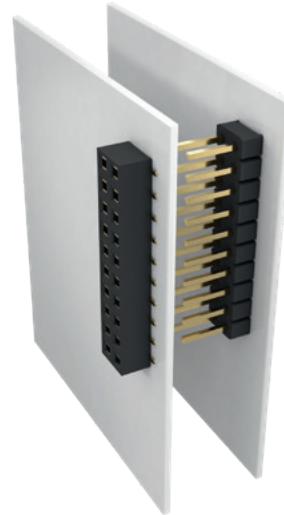
- Wide range of standard products
- SMT types in reel package with pick and place feature available
- Bottom entry types available in THT and SMT

Available Products

- Pitches: 2.54, 2.00 & 1.27 mm
- Straight & right angled types
- 1 or 2 rows
- THT & SMT
- Board stacker and jumper available



Special Features



Bottom Entry SMT type for very small Board-to-Board distances



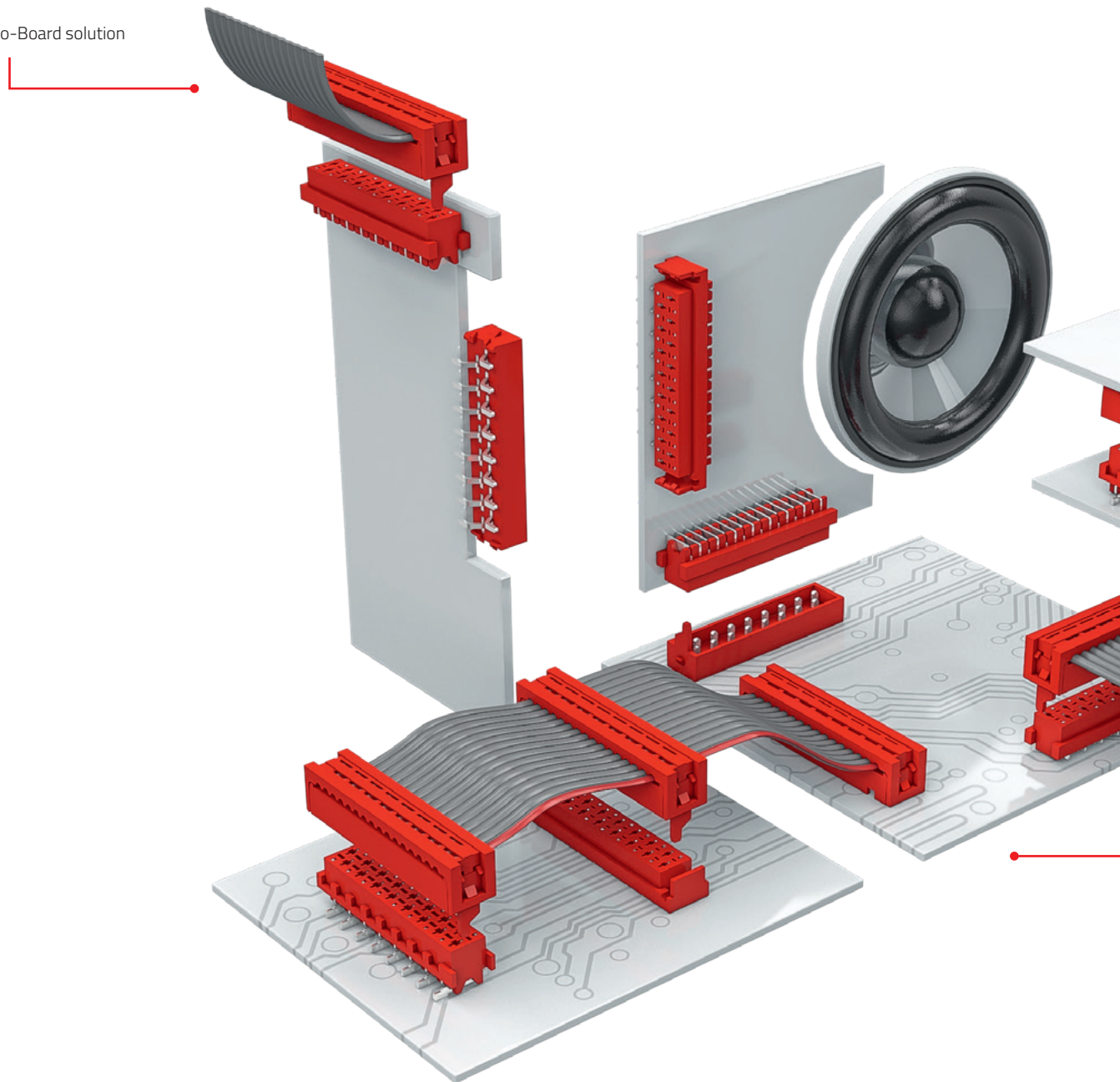
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CONNECTORS

MINI MODULE CONNECTORS

WR-MM

Wire-to-Board solution



Features & Benefits

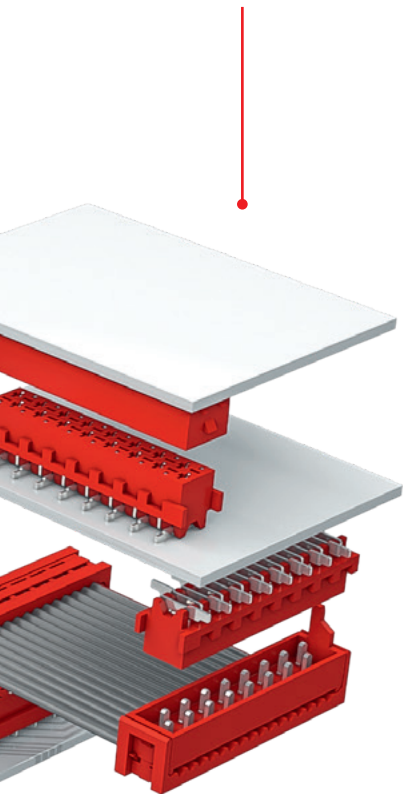
- Compact and low profile connectors: more compact than standard box headers
- Tin-plated design: lead-free and RoHS compliant
- Pitch: 2.54 mm / Pseudo-pitch: 1.27 mm
- For 1.27 mm flat-ribbon cable (AWG28)
- Reliable solution for Wire-to-Board and Board-to-Board applications
- IDC tools for easy cable assembling available

Available Products

- 4 to 26 pins
- SMT, THT, IDC
- Straight & right angled
- With or without coding
- With or without locking feature (for Wire-to-Board)



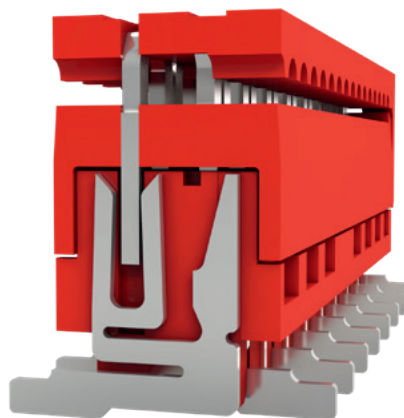
Board-to-Board solution



Wire-to-Board permanent solution



Special Features



The special fork design of the female socket absorbs relative movements caused by vibration. This prevents fretting corrosion and avoids micro-cuts.



With vibration-absorbing system



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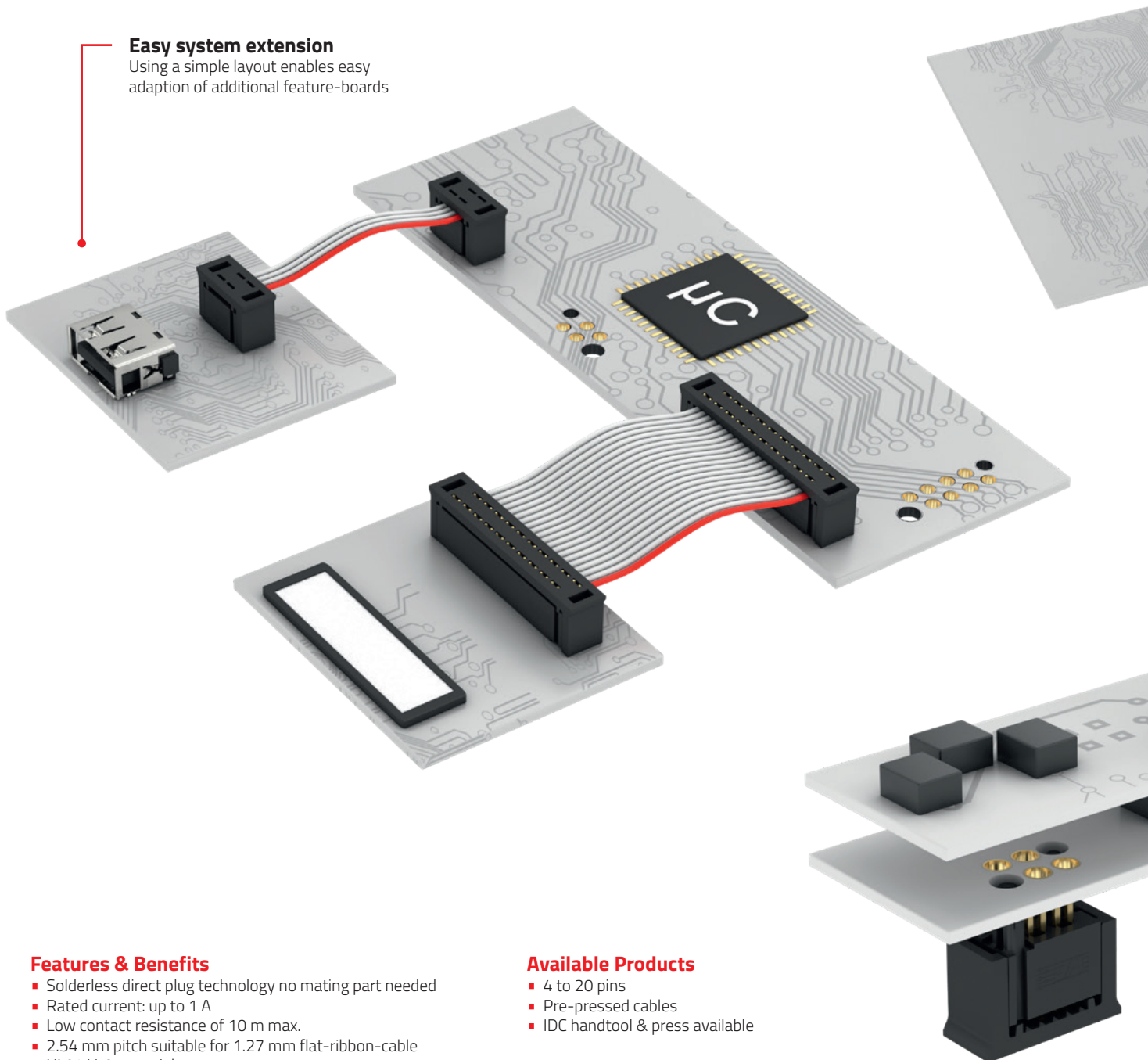
CONNECTORS

REDFIT IDC SKEDD

WR-WST

Easy system extension

Using a simple layout enables easy adaptation of additional feature-boards

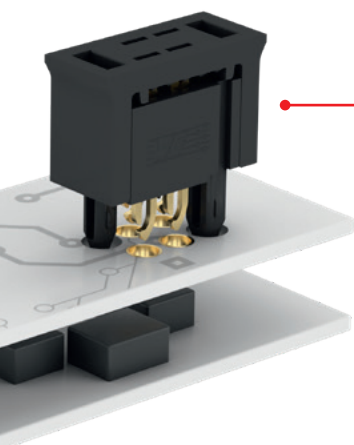
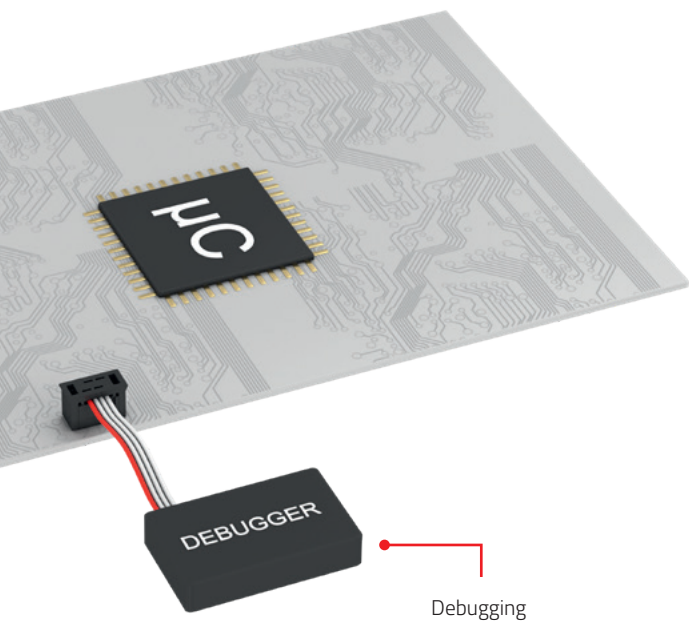


Features & Benefits

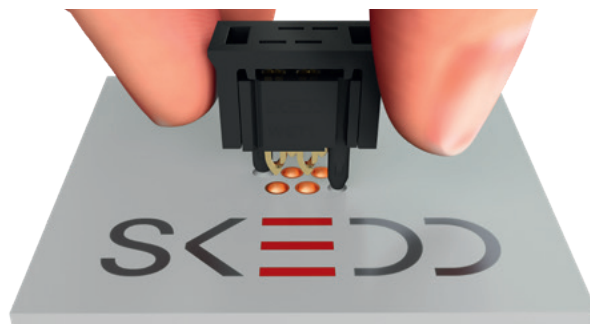
- Solderless direct plug technology no mating part needed
- Rated current: up to 1 A
- Low contact resistance of 10 m max.
- 2.54 mm pitch suitable for 1.27 mm flat-ribbon-cable
- UL94 V-0 material
- Working temperature: -25 °C to +105 °C
- Vibration resistant up to 10 g

Available Products

- 4 to 20 pins
- Pre-pressed cables
- IDC handtool & press available



Special Features

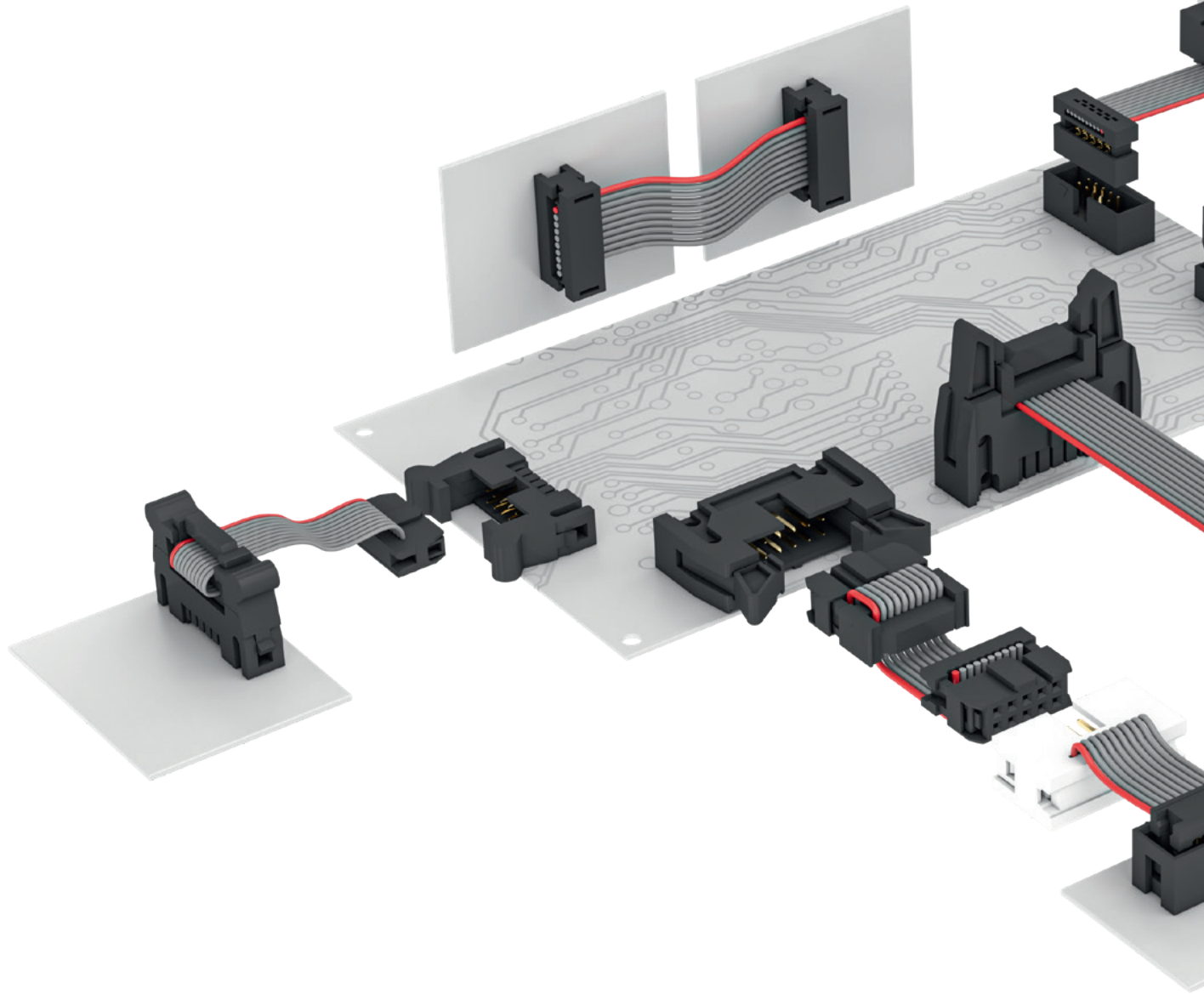


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CONNECTORS

BOX HEADER AND IDC CONNECTORS

WR-BHD

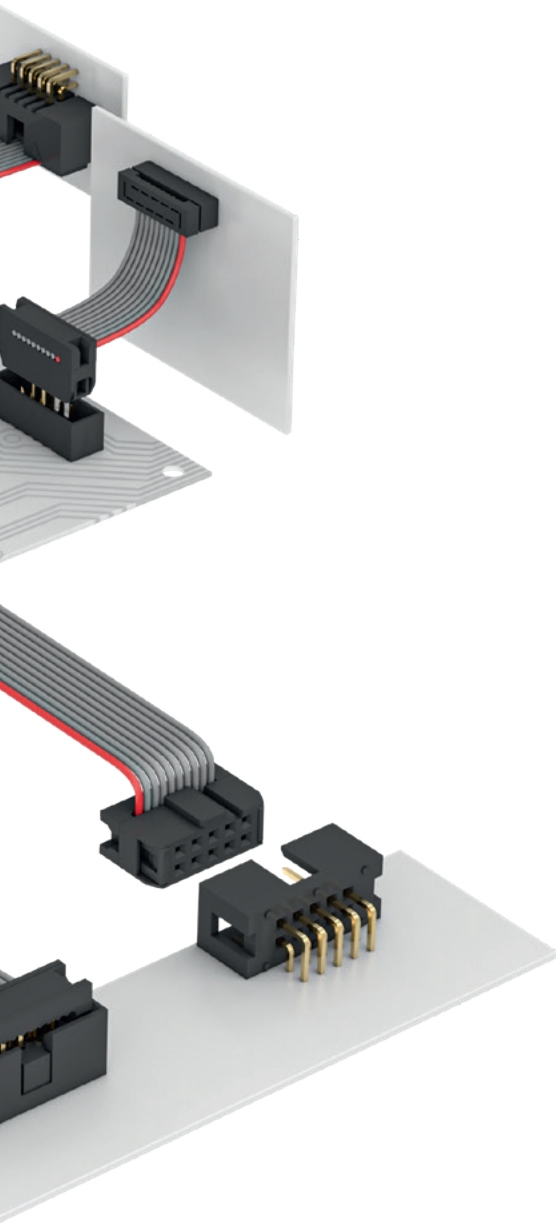


Features & Benefits

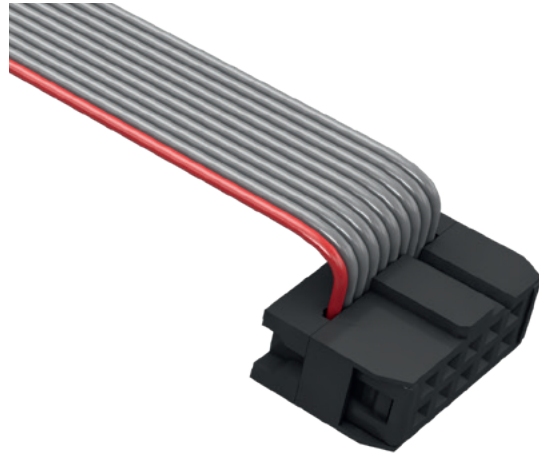
- Wide range of standard products
- Cost effective solution used in nearly all electronic equipment
- IDC Wire-to-Wire solution possible
- Flat ribbon cable available on reel for serial production and 1 meter precuts for prototyping

Available Products

- Pitches: 1.27, 2.00 & 2.54 mm
- Straight & right angled types
- Boxheaders with & without levers
- THT, SMT, IDC socket & IDC transition
- Strain relief at IDC connectors



Special Features



Flat ribbon cable in 0.635, 1.00 & 1.27 mm pitch available in various pin counts on reel.

For prototyping 1 meter precuts available.

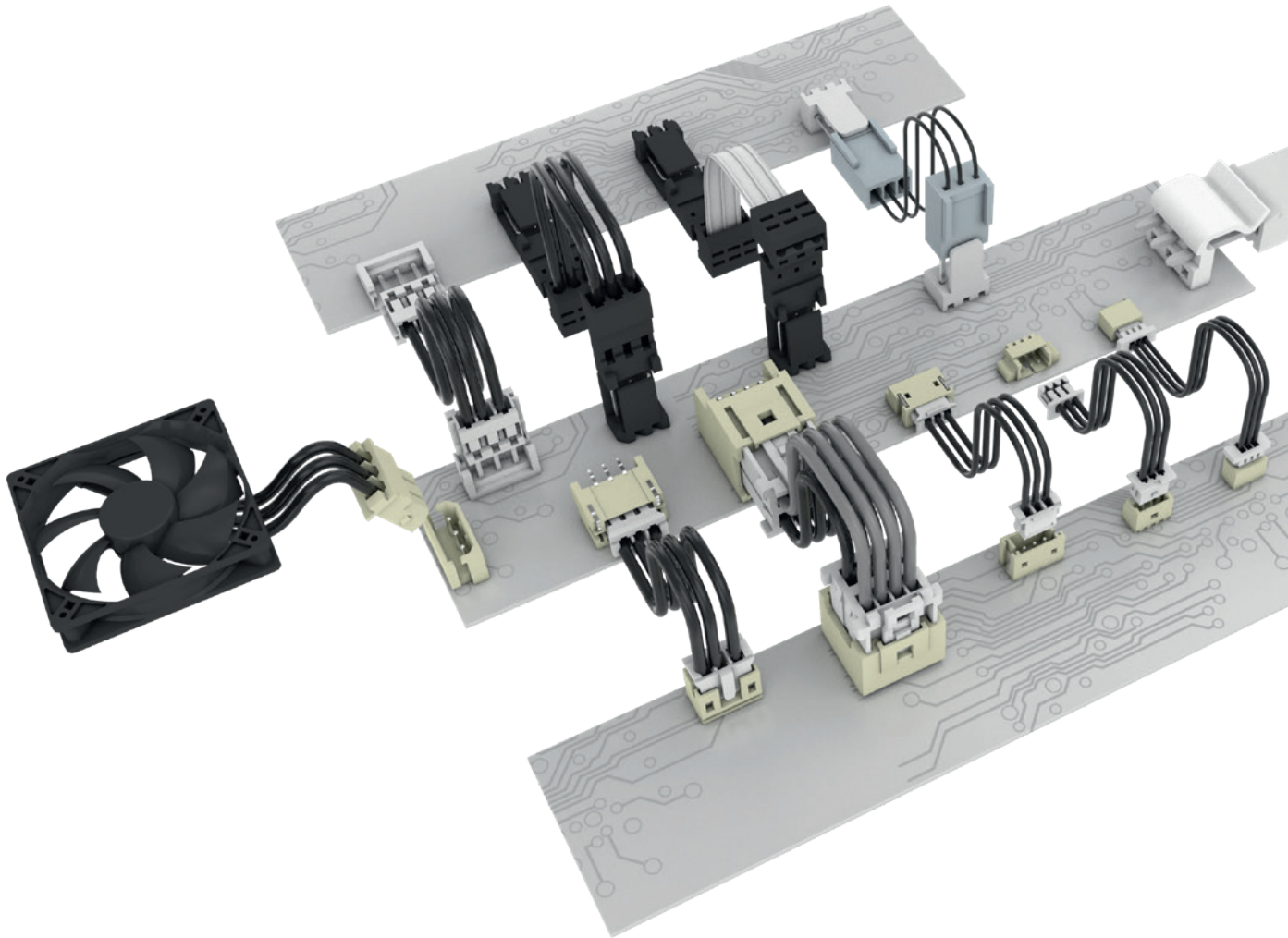


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CONNECTORS

WIRE-TO-BOARD CONNECTORS

WR-WTB



Features & Benefits

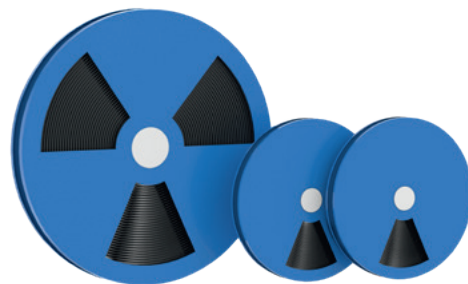
- Broad standard range of crimp type Wire-to-Board connectors
- Tin-plated design: lead-free and RoHS compliant
- Secure connection due to different locking features
- Reliable solution for Wire-to-Board and Board-to-Board applications

Available Products

- 3.96 mm down to 1.00 mm pitch
- Current rating up to 7 A
- Working voltage up to 250 VAC
- Pin counts from 2 to 10 for most series up to 40 for dedicated series
- SMT, THT, IDC & crimp (AWG32 to AWG18 – depending on connector size)
- Straight & right angled



Special Features



Small reels for prototyping using serial (semi-)automatic tool



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product selection:
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CONNECTORS

MINI POWER CONNECTOR 4.2 MM

WR-MPC4



Features & Benefits

- 4.20 mm pitch
- Current rating up to 9 A
- Working voltage up to 600 VAC
- Wire-to-Wire possible
- Coded system to prevent mismatching
- Highly secure positive locking system

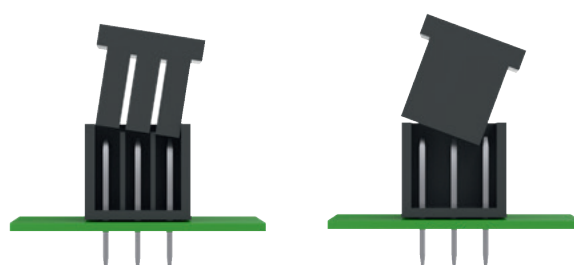
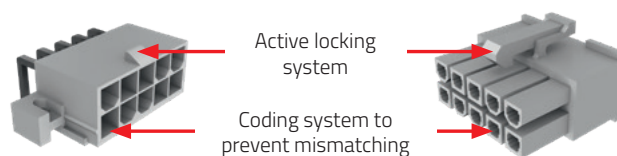
Available Products

- PCB and cable connectors
- 1 or 2 rows
- Vertical & horizontal
- PCB fixations: snap-in pegs, mounting flanges
- Polarity from 2 to 24
- THT and crimp types (AWG28 to AWG16)
- Glow wire compliant versions
- Panel mount ears

Variant Examples



Special Features



Scoop proof design

Accessories / Tooling



Pre-crimped cable, handtool and applicator for semi-automatic tools



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CONNECTORS

MICRO POWER CONNECTOR 3.0 MM

WR-MPC3



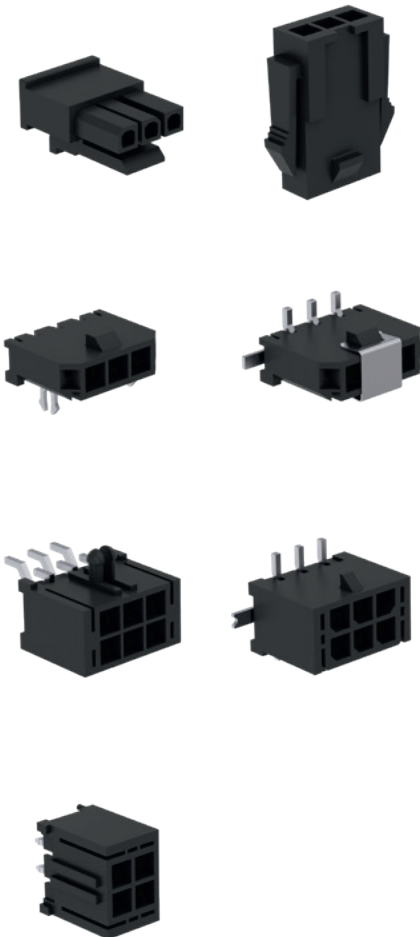
Features & Benefits

- 3.00 mm pitch
- Current rating up to 5 A
- Working voltage up to 250 VAC
- Wire-to-Wire possible
- Coded system to prevent mismatching
- Highly secure positive locking system

Available Products

- PCB and cable connectors
- 1 or 2 rows
- Vertical & horizontal
- PCB fixations: snap-in pegs, mounting flanges, solder tabs, metal retention clips
- Polarity from 2 to 24
- THT, SMT and Crimp types (AWG30 to AWG20)
- Low force contacts available
- Panel mount ears

Variant Examples

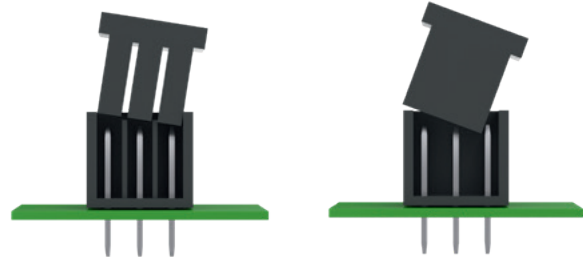


Special Features



Low Force Crimp Contact available!

Reduces insertion and disconnecting force especially for higher polarity.



Scoop proof design

Accessories / Tooling



Pre-crimped cable, handtool and applicator for semi-automatic tools

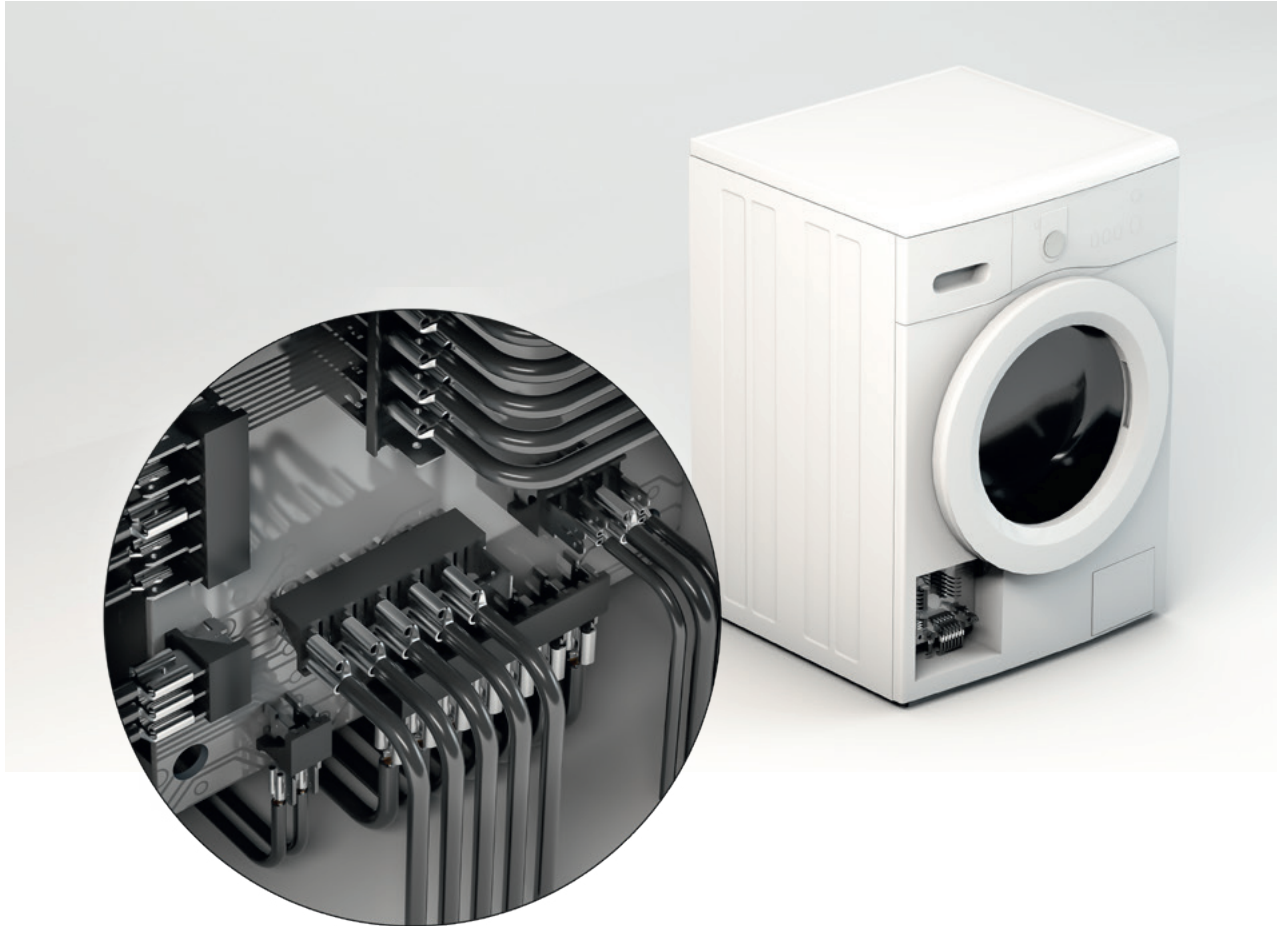


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CONNECTORS

FAST CONNECTION

WR-FAST



Features & Benefits

- 5.08 & 7.62 mm pitch
- Current rating up to 16 A
- Working voltage up to 300 V_{AC}
- Glow wire compliant according to IEC 60335-1
- cULus listed

Available Products

- Pin counts from 2 to 8 (WR-FAST)
- Single blades (WA-MTAB)
- THT mounted
- Straight & right angled
- Different blade designs following common market standards:
 - WR-FAST: 6.3 / 2.8 - 6.3 mm
 - WA-MTAB: 4.8 & 6.35 mm



MOUNTING TABS

WA-MTAB

Product Examples

WR-FAST: 6.3 / 2.8 – 6.3 mm



WA-MTAB



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CONNECTORS

ZIF, LIF & FLEXIBLE CABLES

WR-FPC & WR-FFC

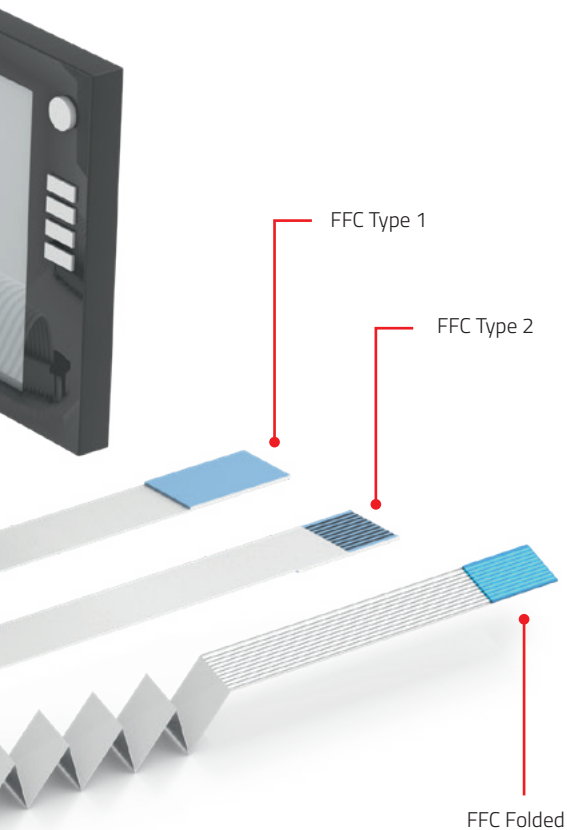


Features & Benefits

- Maximum cable retention even in small sizes
- Easy insertion system
- Optimized design offering good contact between mating parts
- Nickel under-plating preventing the tin-whisker phenomenon
- UL certified products
- Highly flexible FFCs – fold- and bendable
- Current rating of 0.5 A (0.5 mm pitch) and 1.0 A (1.0 mm pitch)

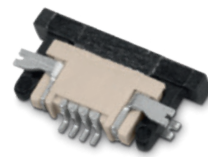
Available Products

- ZIF (Zero-Insertion-Force), LIF (Low-Insertion-Force) and FFC (Flat-Flexible-Cables)
- Straight, right angled & low profile
- Top, bottom, dual & back locking dual contact
- 0.5 and 1.0 mm pitch
- Pin counts: 4 to 30 (1 mm) & 6 to 50 (0.5 mm)
- FFC in 4 standard lengths (50, 100, 152 & 200 mm)
Folded FFC in 3 variable lengths
(120 – 200 mm / 165 – 350 mm / 280 – 500 mm)
- Custom length FFC on request (MOQ 5.000)



Special Features

Locking types of FPC connectors



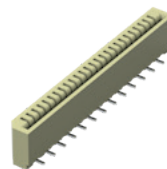
ZIF with slider



ZIF hinge type



ZIF with back locking
and dual contact



LIF connector
No locking – cable fixed
with contact force



Visit our online catalogue for detailed
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www.we-online.com/FPC-FFC

CONNECTORS

USB CONNECTORS

WR-COM



Type	USB 2.0	USB 3.0	USB 3.1
Type A			
Type B			
Mini			
Micro			
Type C			

Retrocompatible with USB 2.0

Retrocompatible with USB 2.0 & 3.0

Special Features

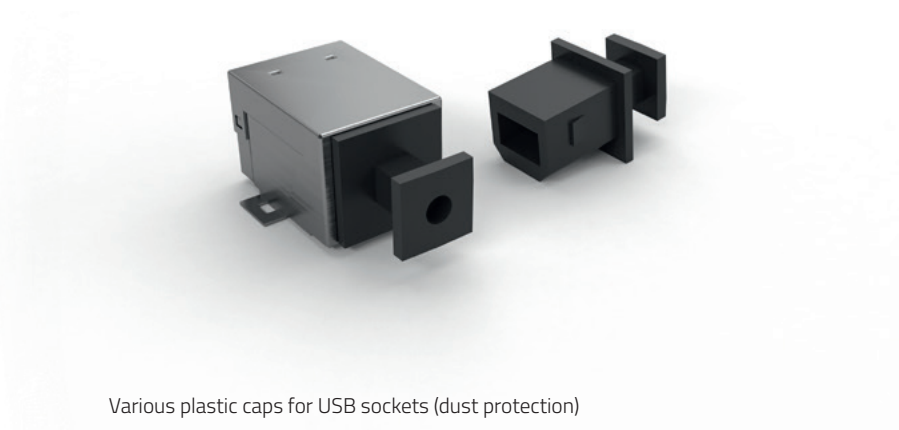


SMT spacer available to create USB 3.1 Type C locking feature (sideways or stacked locking)

Available Products

- USB 2.0 – Receptacle: Type A, B, C, Mini and Micro – Plug: Type A
- USB 3.0 – Receptacle: Type A, B and Micro – Plug: Type A
- USB 3.1 – Receptacle: Type A and Type C – Plug: Type C
- Pre-assembled test cables available
- Mounting: SMT, THR & THT
- Types: short types, with offset, high current, upright, vertical, horizontal

Accessories



Various plastic caps for USB sockets (dust protection)



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product selection:
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CONNECTORS

HDMI CONNECTORS

WR-HDMI



Features & Benefits

- Qualified and approved according to HDMI 1.4 version
- High data rate: up to 10.2 Gbps
- Different sizes in accordance with HDMI specification

Available Products



Type A



Type A
with M3 screw latch



Type C (Mini)



Type D (Micro)



Plastic caps
for protection available



Type D (Micro)
hybrid mount



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CONNECTORS

CARD CONNECTORS

WR-CRD



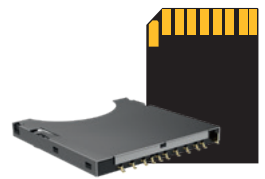
Nano Sim (4FF)



Micro SD



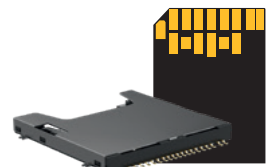
Micro Sim (3FF)



SD / SD 4.0 UHS-1



Mini Sim (2FF)



SD 4.0 UHS-2

Features & Benefits

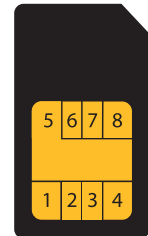
- Different card entrance style
 - Header, hinge, push & pull, push & push
- Card detection
 - Card detection switch
 - Pull-down card detection compatible (standard AN10911)
- Temperature range from -40 °C up to +85 °C
 - Suitable for environmental applications (SIM)
- Ultra-High-Speed interface compatible
 - UHS-1 (SD) and UHS-2 (SD 4.0)



Compact Flash

Pinout SIM & SD Cards

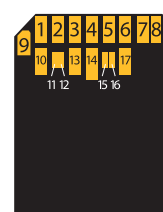
Pin Number	Signal Name	Description	Pinout			
			SIM 1	SIM 2	SIM 2 - CD1	SIM 2 - CD2
1	V _{CC}	V _{CC}	X	X	X	X
2	RESET	RESET	X	X	X	X
3	CLOCK	Clock	X	X	X	X
4	RFU	Reserved for Future Use		X	X	X
5	GND	Ground	X	X	X	X
6	V _{PP}	Programming Voltage	X	X	X	X
7	I/O	Serial Data	X	X	X	X
8	RFU	Reserved for Future Use		X	X	X
CD	Detection	Card Detection Switch			X	X
Common	Common	Ground for Card Detection Switch				X



Card type /
SIM card thickness

Mini SIM 0.76 mm +/-0.08
Micro SIM 0.76 mm +/-0.08
Nano SIM 0.66 mm +/-0.08

Signal Name	Description	Pinout (SD mode)				
		μSD-1	μSD-CD	SD	SD 4.0	
		UHS-1			UHS-1	UHS-2
DATA2	Data Line 2	1	1	9	9	
CD / DAT 3	Card Detection / Data Line 3	2	2	1	1	
CMD	Command / Answer	3	3	2	2	
Vss 1	Ground			3	3	
Vdd	Power Supply	4	4	4	4	
CLK	Clock	5	5	5	5	
Vss 2	Ground	6	6	6	6	
DAT0	Data Line 0	7	7	7	7	
DAT1	Data Line 1	8	8	8	8	
CD SW1	Card Detection Switch 1		9			
CD SW2	Card Detection Switch 2		10			
CD	Card Detection Switch			CD		
WP	Write Protection Switch			WP		
VSS3	Ground					10
D0+	Lane 0 Differential Data					11
D0-	Lane 0 Differential Data					12
VSS4	Ground					13
VDD2	Power Supply					14
D1+	Lane 1 Differential Data					15
D1-	Lane 1 Differential Data					16
VSS5	Ground					17



Visit our online catalogue for detailed
product selection:
www.we-online.com/CRD

CONNECTORS

MODULAR JACKS

WR-MJ



Features & Benefits

- Jack design in accordance to FCC regulation
 - mates all FCC plugs
- Compatible with standards IEEE 802.3u, 802.3z (8P8C – RJ45)*
- PoE compatible according to IEEE 802.3af, 802.3at (8P8C – RJ45)*
- Discret solution for Ethernet protocol (8P8C – RJ45)
 - Smaller footprint
 - High flexibility in PCB design
 - THR compatibility
 - Potentially better crosstalk performances

Available Products

- Up to Cat 6 products
- Straight, right angled, 45° & 47.5° types
- Shielded, half shielded, unshielded
- Shielded parts with and without EMI fingers
- Tab up or down
- SMT, THT & THR
- Multiport MJ and multitype configurations with USB
- Offset & low profile types
- Types with LED

** Subject to adequate combination with LAN transformer and DC/DC converter. Refer to Würth Elektronik eiSos passive components.*

xPxC Configuration



4P4C

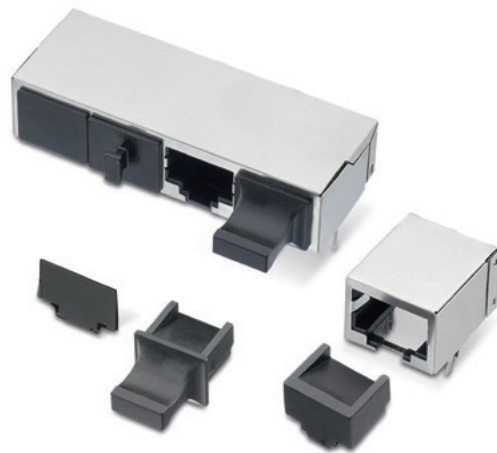


6P6C



8P8C

Special Features



Plastic caps for protection available for RJ45 and RJ11 Modular Jacks



Visit our online catalogue for detailed
product selection:
www.we-online.com/MJ

CONNECTORS

D-SUB CONNECTOR

WR-DSUB



Features & Benefits

- Well known standard since decades
- Secure connection with coded shell
- Fitting to industrial bus systems

Available Products

- Polarities:
 - 9, 15, 25 and 37 pins for standard version
 - 15, 26, 44 and 62 pins for high density versions
- Male and female
- Straight & right angled
- PCB and cable connectors with and without hex-screws
- Crimp contacts loose or reel type
- UNC and M3 screws available

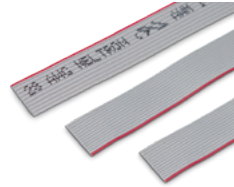
Accessories



Hoods (metalized & plastic)

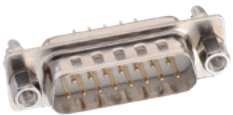


Protective plastic caps

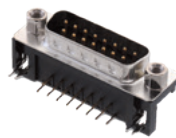


Flat ribbon cables for IDC types

PCB Connectors



Straight



Angled



XX
High density

Cable Connectors



IDC



Solder bucket



Terminal housing



Crimp contact

Tooling



Crimp handtool



IDC press



Visit our online catalogue for detailed
product selection:
www.we-online.com/DSUB

CONNECTORS

CIRCULAR CONNECTORS M12

WR-CIRCM12



Features & Benefits

- Adapted to work in harsh environments (moist, dust, vibration)
- Water & Dust Proof connectors: IP67 or IP68 rated
- Certified with UL 2238 (panel receptacles & field attachables)
Indicated for industrial applications: fieldbuses, sensor/actuator technologies, automation, ...

Available Products

- Circular connectors M12 Coding A Screw locking
- Polarities 4, 5 and 8
- Several typologies available : panel receptacles, field attachable & cable assemblies
- Male & female version for all connectors



Special Features



IP67 or IP68 compliant (depending on product type)

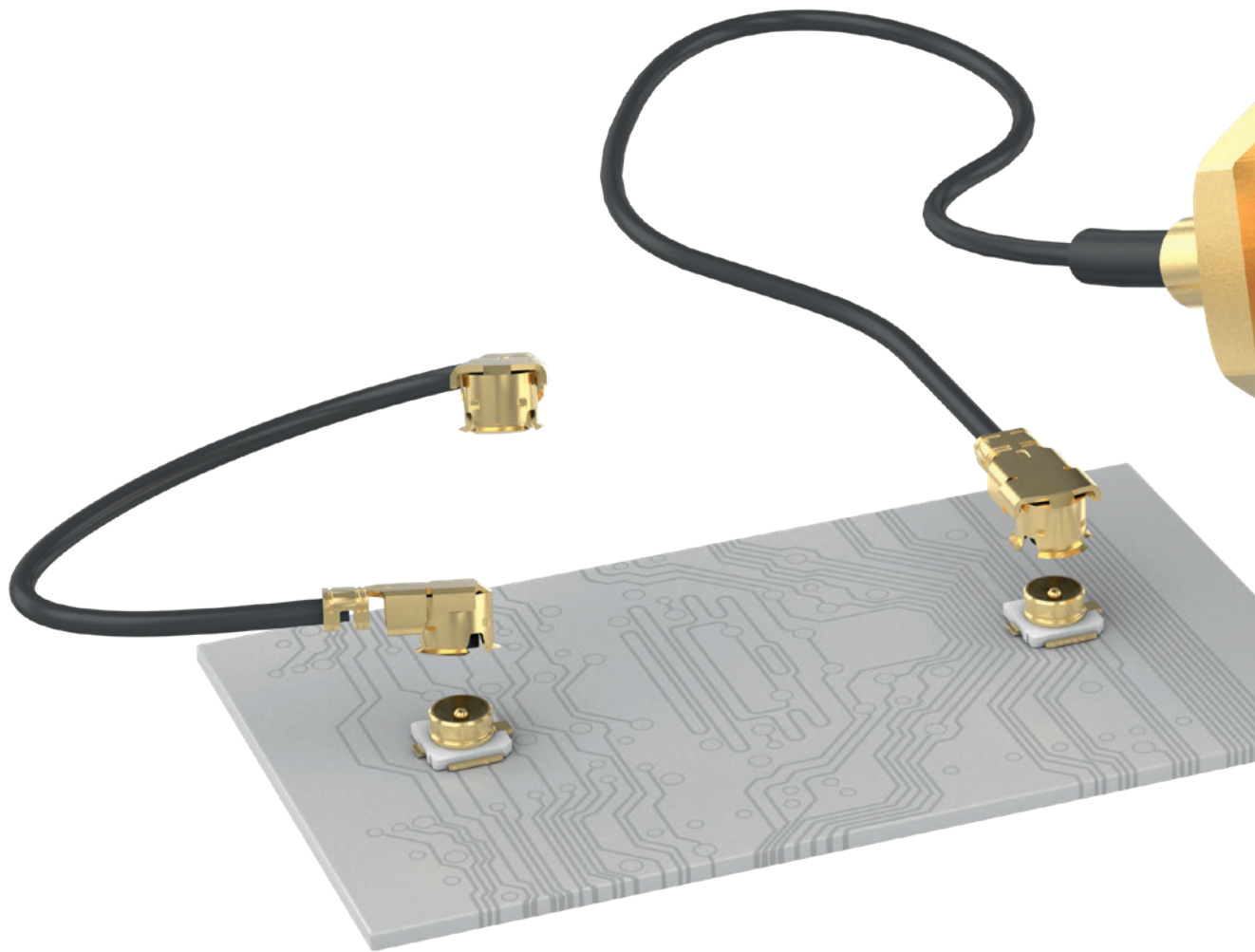


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product selection:
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CONNECTORS

ULTRA-MINIATURE RF COAXIAL CONNECTORS

WR-UMRF

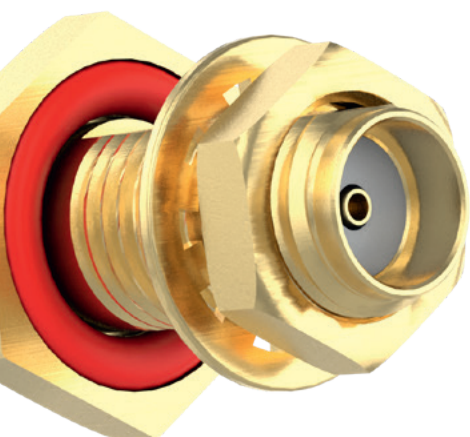


Features & Benefits

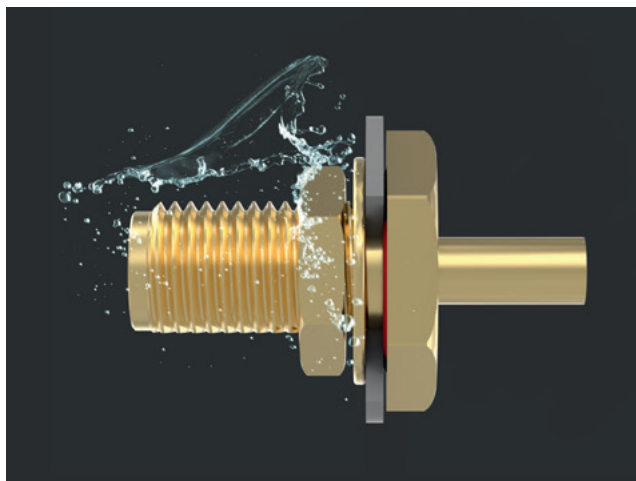
- Interface for DC to 6 GHz, 50 Ω
- Compact size and nominal mating height of 2.5 mm max.
- Snap-on mating for fast and convenient connection
- IP67 designed to protect panel from ingress of moisture and particle
- Cable diameters available: 1.13, 1.32 to 1.37 mm with both black and gray jacket

Available Products

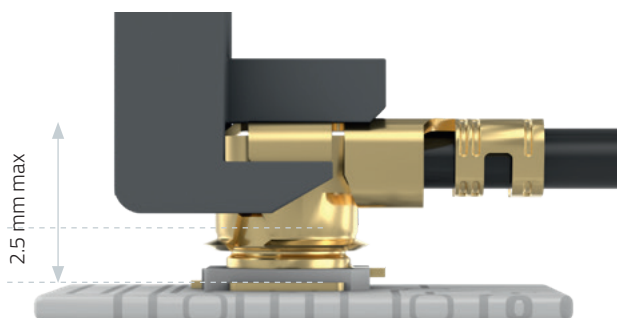
- Plug & Jack
- Cable Assemblies UMRF Plug to:
 - UMRF Plug
 - SMA & RPSMA Bulkhead Jack
 - IP67 SMA & RPSMA Bulkhead Jack



Special Features



IP67 panel protection



Slim mating height



Hand tool to assure mating / unmating safely

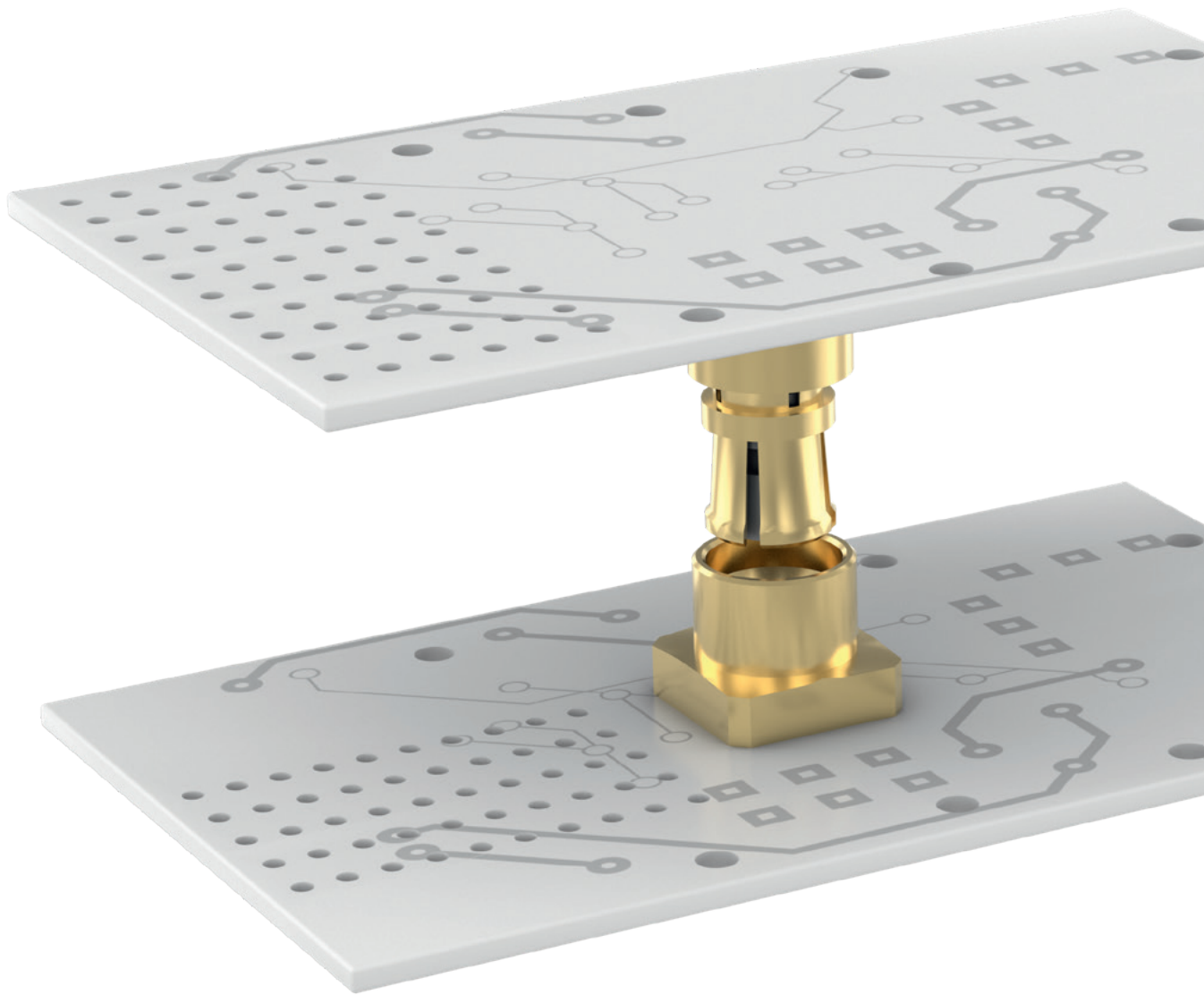


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product selection:
www.we-online.com/UMRF

CONNECTORS

SMP COAXIAL CONNECTORS

WR-SMP



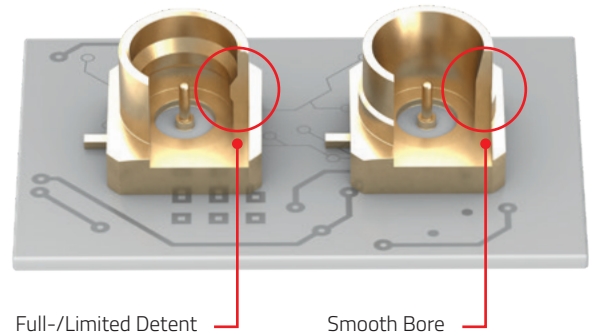
Features & Benefits

- Interface in accordance with MIL-STD-348
- Interface for DC to 18 GHz, 50 Ω
- Durability
 - Smooth Bore: 1000 cycles
 - Limited Detent: 500 cycles
 - Full Detent: 100 cycles

Available Products

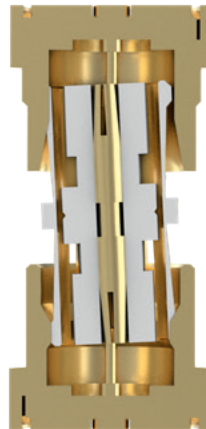
- Plug & Jack
- THT, SMT, THR & cable mount
- Straight, right angled, end launch

Special Features



Full Detent:
Limited Detent:
Smooth Bore:

Maximum retention for high vibration resistance
 Medium to low retention
 Lowest retention achieved with sliding contacts for modular systems and application



SMP connector is also designed for Board-to-Board application. Achieved by the so called bullet connector. The adaptor compensates axial and radial misalignments.



Visit our online catalogue for detailed product selection:
www.we-online.com/SMP

CONNECTORS

MMCX COAXIAL CONNECTORS

WR-MMCX



Features & Benefits

- Interface in accordance with IEC 61169-52
- Interface for DC to 6 GHz, 50 Ω
- Size reduction for limited space on the design
- Lock-snap-on coupling mechanism for fast and easy connection
- High durability up to 500 cycles minimum

Available Products

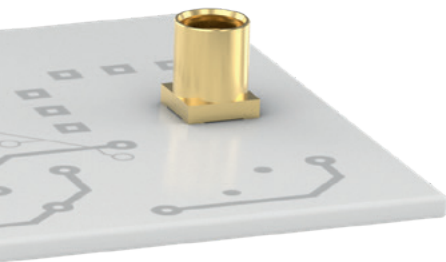
- Plug & Jack
- THT, SMT & Cable mount
- Straight, right angled, end launch, rear mounted bulkhead



Special Features



A snap ring ensures mechanical fixation.
The interface is appropriate for dense environment.

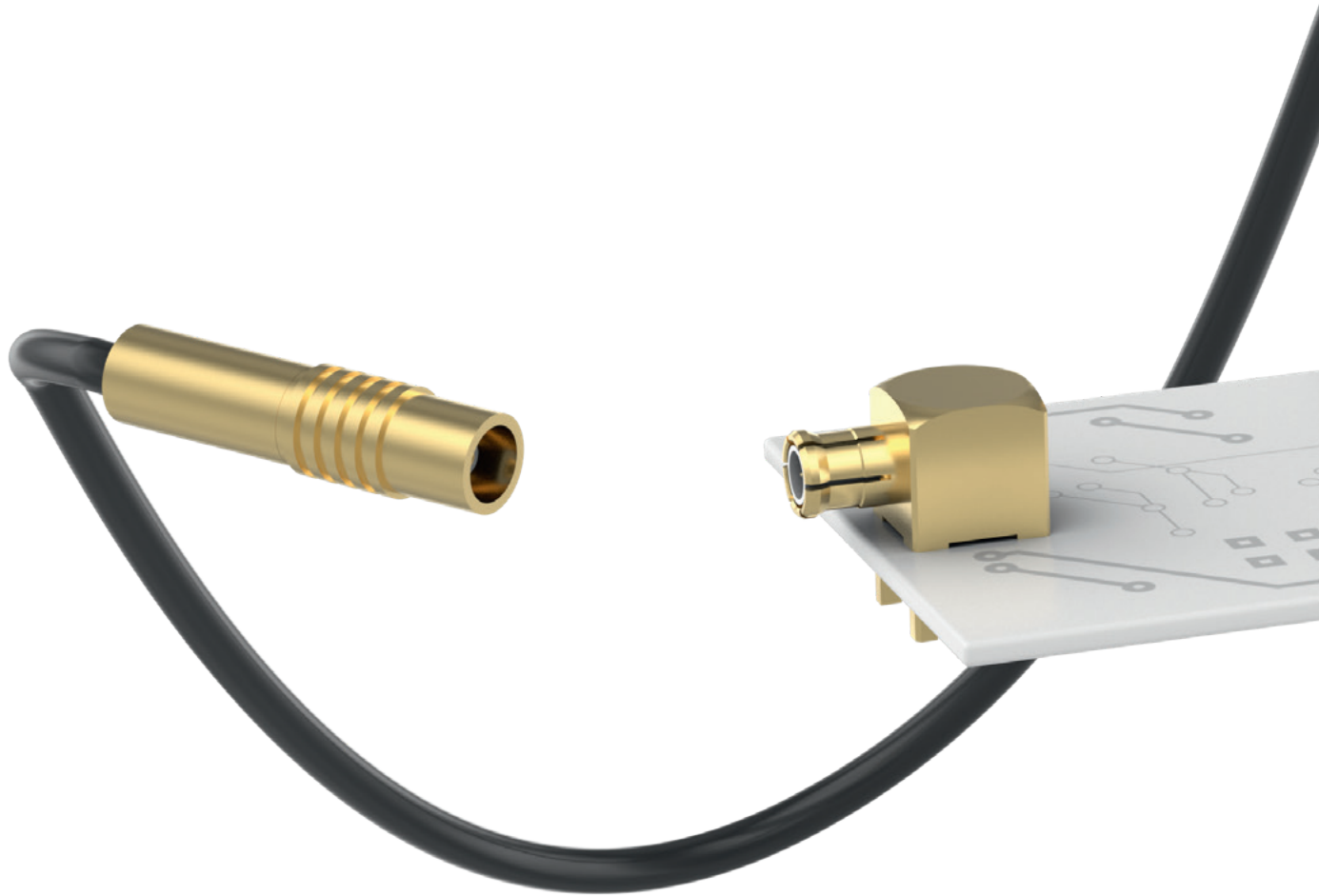


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www.we-online.com/MMCX

CONNECTORS

MCX COAXIAL CONNECTORS

WR-MCX



Features & Benefits

- Interface in accordance with IEC 61169-36
- Interface for DC to 6 GHz, 50 Ω
- Snap-on coupling mechanism for fast and easy connection
- High durability up to 500 cycles minimum

Available Products

- Plug & Jack
- THT, SMT & cable connector
- Straight, right angled, end launch, rear mounted bulkhead



Special Features



A snap ring ensures mechanical fixation.
User friendly interface for assembly engagement.

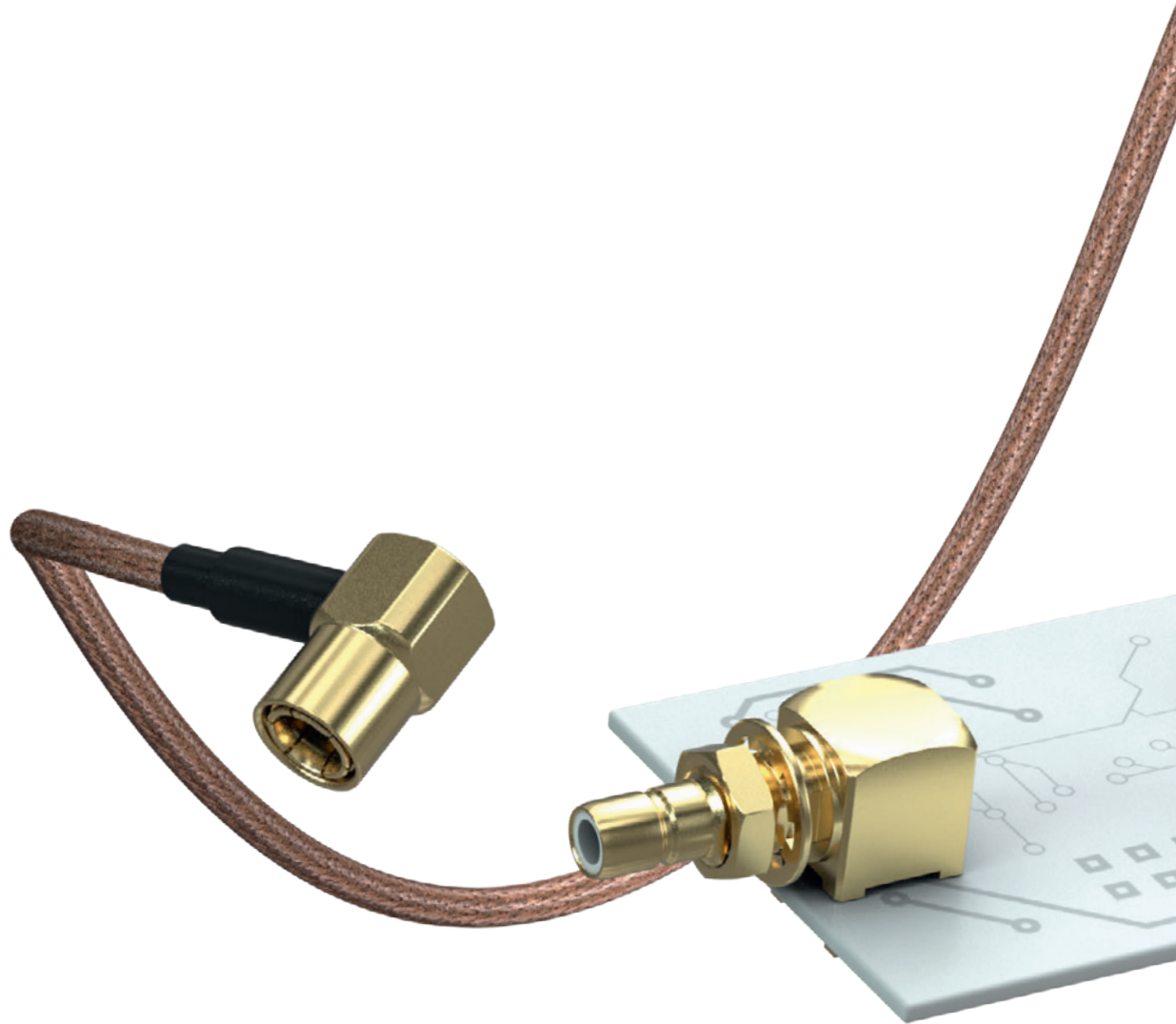


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CONNECTORS

SMB COAXIAL CONNECTORS

WR-SMB

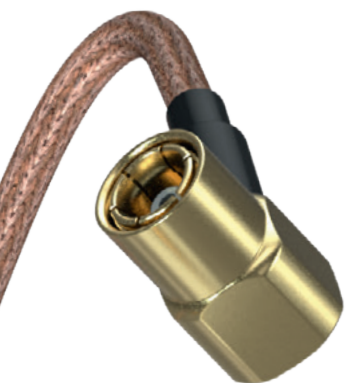


Features & Benefits

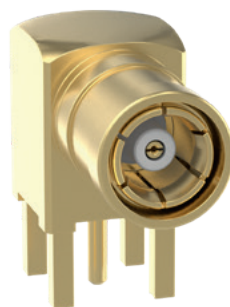
- Interface in accordance with MIL-STD-348
- Interface for DC to 4 GHz, 50 Ω
- Circuit miniaturization with wide range of configurations
- Snap-on coupling mechanism ideal for fast installation
- High durability up to 500 cycles minimum

Available Products

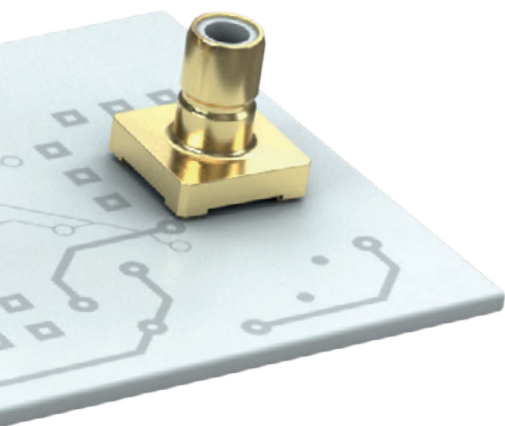
- Plug & Jack
- THT, SMT & cable mount
- Straight, right angled, end launch, rear mounted bulkhead



Special Features



Spring contacts are protected within connector body
Appropriate for environmental protection.

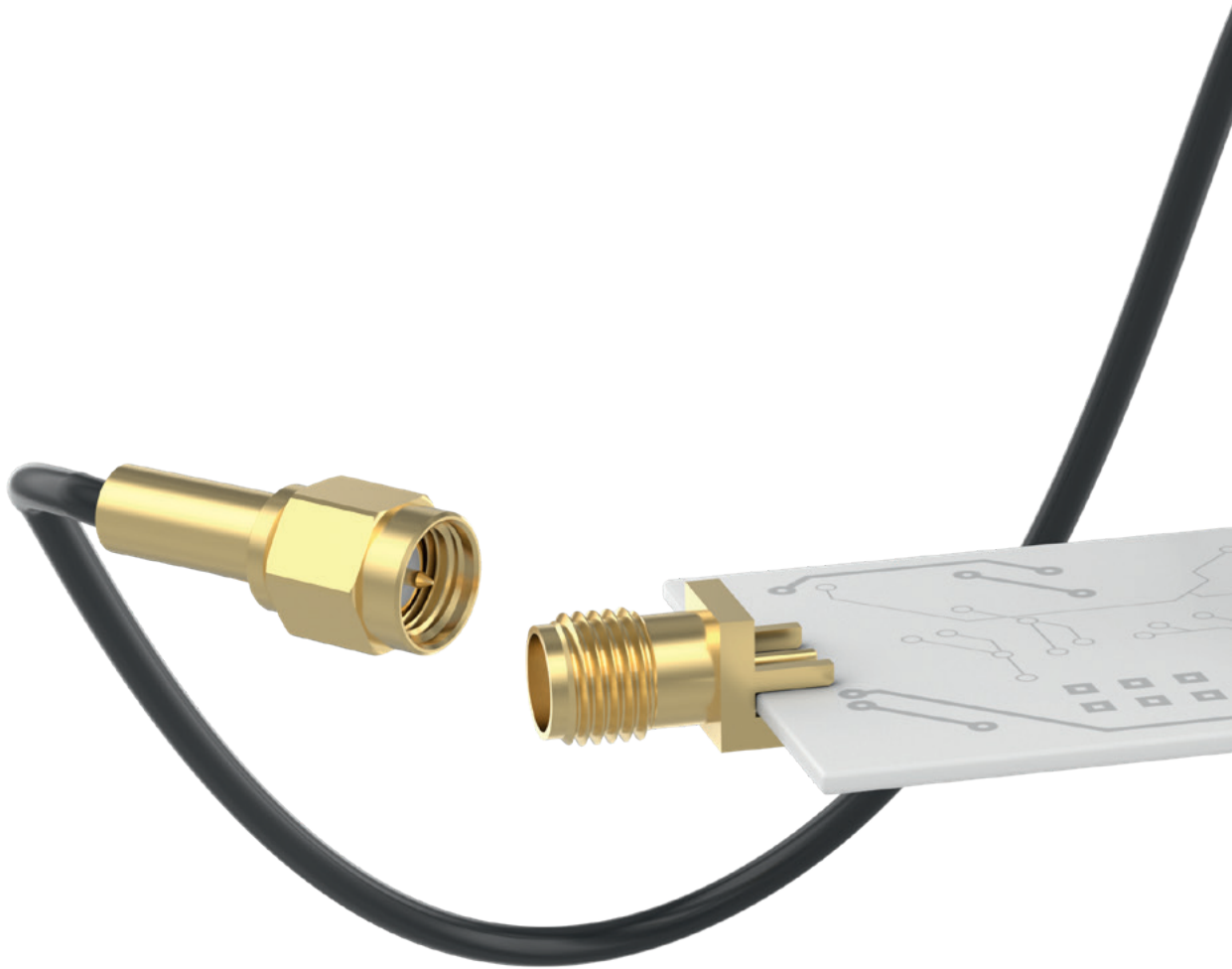


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www.we-online.com/SMB

CONNECTORS

SMA COAXIAL CONNECTORS

WR-SMA

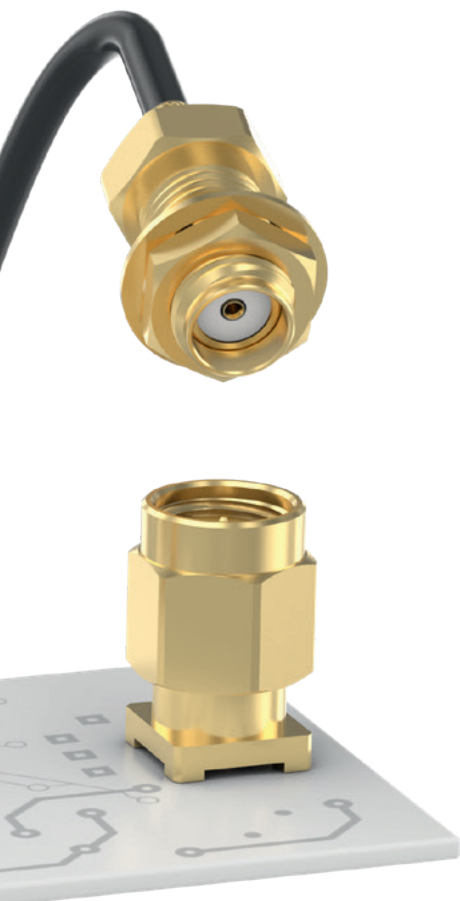


Features & Benefits

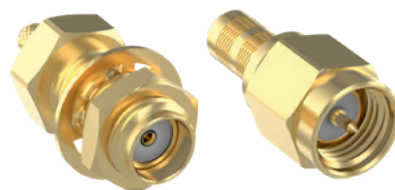
- Interface in accordance with MIL-STD-348
- Interface for DC to 18 GHz, 50 Ω
- High mechanical stability in intense vibration environment
- High axial force and torque
- Excellent electrical performance and high mating cycles up to 500 cycles minimum

Available Products

- Plug & Jack
- THT, SMT, THR, panel mount & cable connector
- Straight, right angled, end launch, rear mounted bulkhead
- IP67 Jack



Special Features



Coupling with thread design enables less force. Expend over a greater period of time.

Accessories



Red and black silicone caps for SMA Jack for protection purposes and torque wrench available.

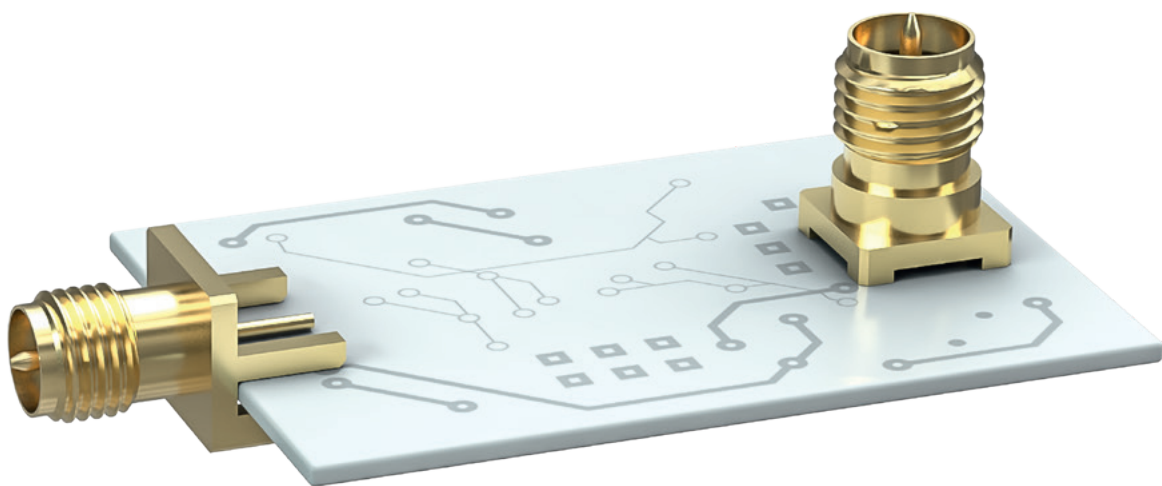


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www.we-online.com/SMA

CONNECTORS

REVERSE POLARITY SMA COAXIAL CONNECTORS

WR-RPSMA



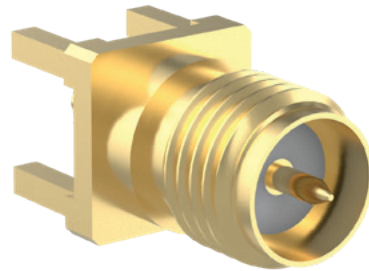
Features & Benefits

- Interface in accordance with MIL-STD-348
- Interface for DC to 18 GHz, 50 Ω
- High mechanical stability in intense vibration environment
- High axial force and torque
- Excellent electrical performance and high mating cycles up to 500 cycles minimum

Available Products

- THT & SMT mount
- Straight, right angled, end launch, rear mounted bulkhead
- IP67 Jack

Special Features



Reverse gender SMA interface. Appropriate for mistake proofing.

Accessories



Torque wrench available



Visit our online catalogue for detailed
product selection:
www.we-online.com/RPSMA

CONNECTORS

N TYPE COAXIAL CONNECTORS

WR-NTYPE



Features & Benefits

- Interface in accordance with MIL-STD-348
- Interface for DC to 11 GHz, 50 Ω
- Screw-on coupling
- Rugged structure for shock and outdoor application
- Cable connector entry option includes micro-coaxial cable types (1.13, 1.32, 1.37)

Available Products

- Plug & Jack
- THT, 4 Hole Flange & Cable Connector
- Straight, Right Angled, Rear mounted Bulkhead

Special Features



Knurl Coupling Nut



IP67 Panel Protection



Gold plated connector solder legs



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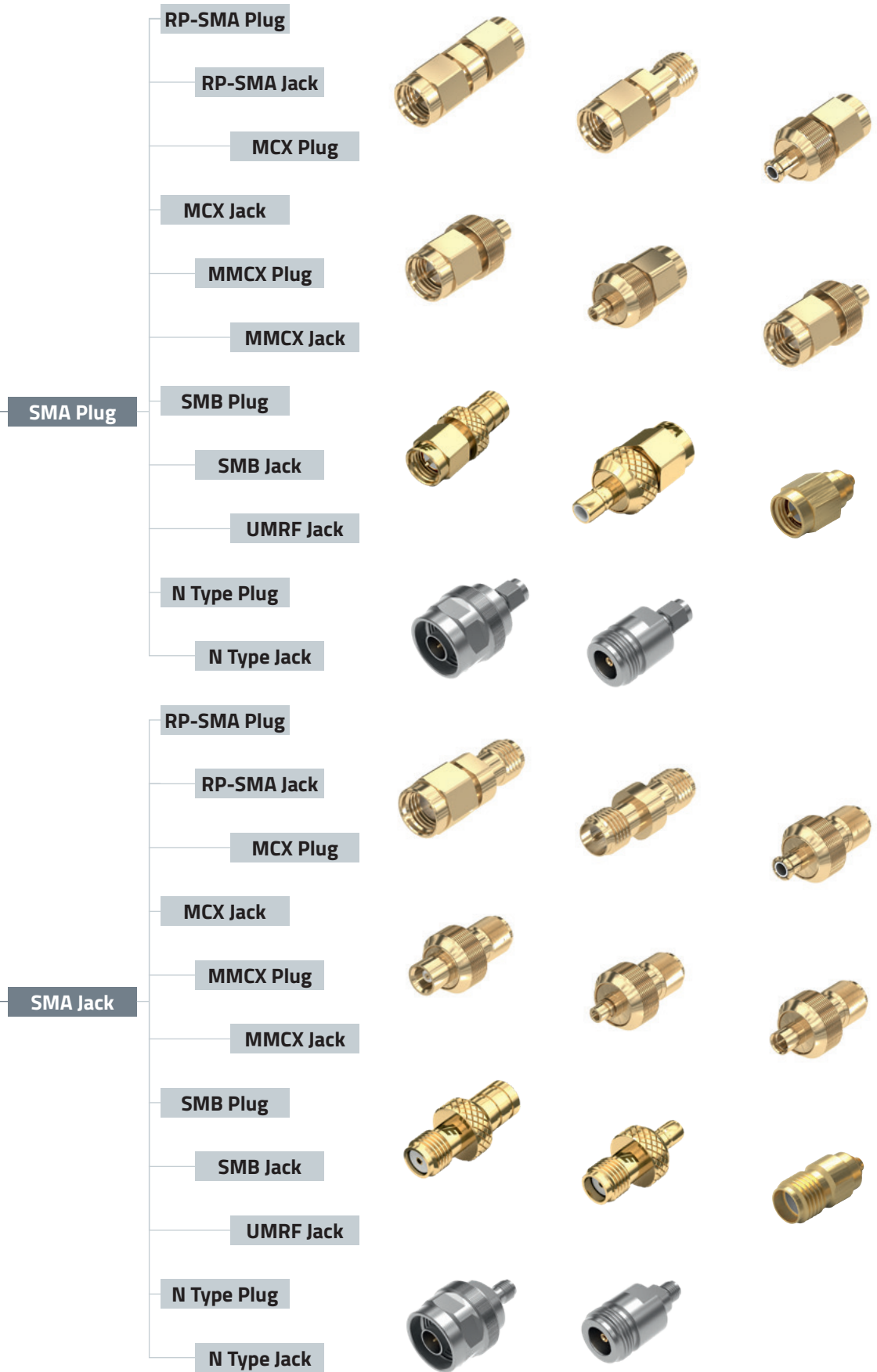
CONNECTORS

COAXIAL ADAPTORS

WR-ADPT



In-Between-Series

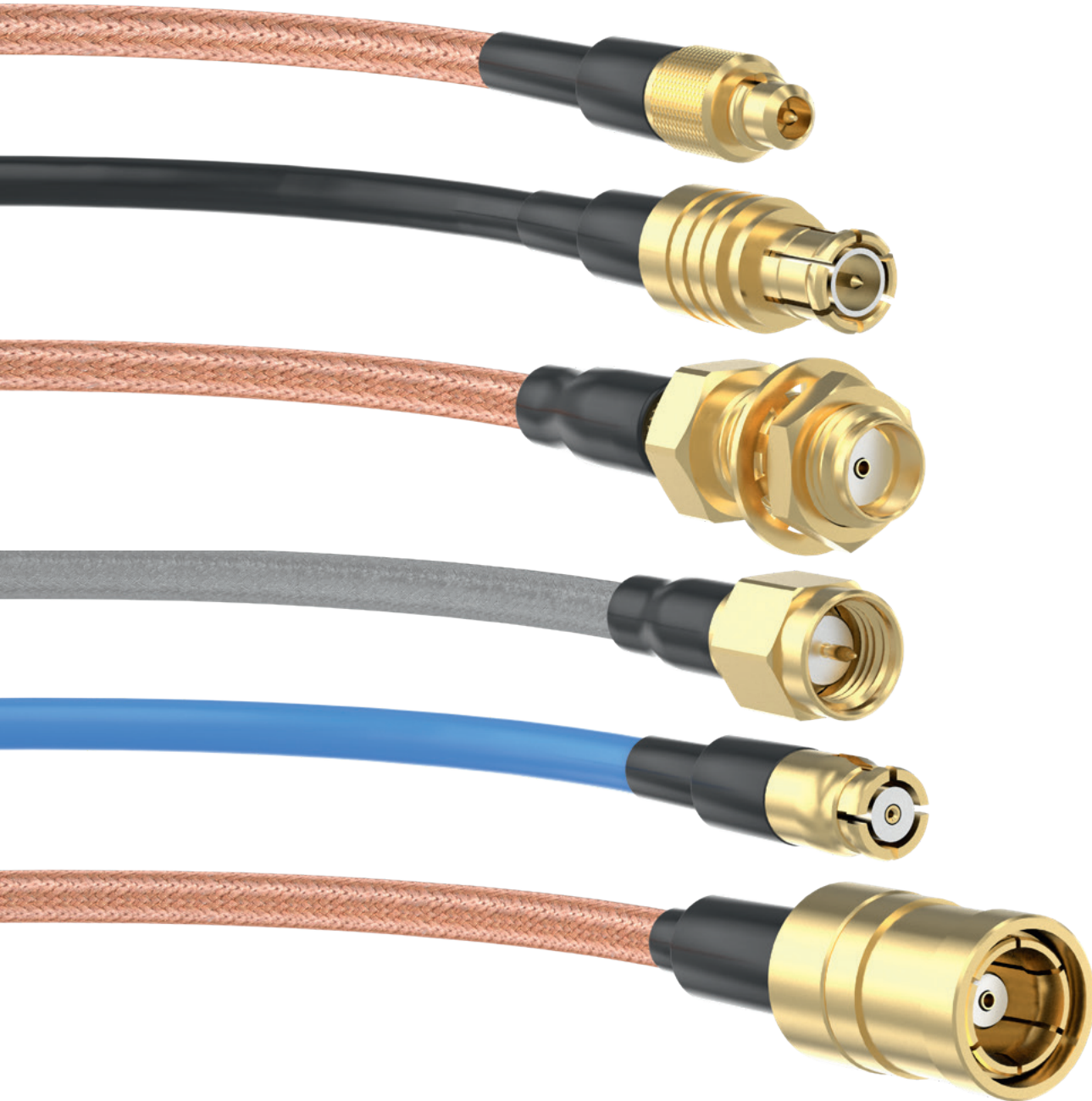


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www.we-online.com/ADPT

CONNECTORS

COAX CABLE ASSEMBLIES

WR-CXASY



Features & Benefits

- Pre-assembled cables between SMA, RPSMA, MCX, MMCX, SMB, SMP, N Type and UMRF
- Various types of standard flexible cables – Supporting frequency range up to 18 GHz
 - Flexible cables: RG58, RG174, RG178, RG142, RG316, RG316DB, Low Loss 195, .047", .085"
 - Hand formable cables: .141", .085"
- Customized cable assemblies with low MOQ upon customers specification possible

Typical Coaxial Cable Structure



Jacket:

Provide environmental protection for cable

Shielding:

Prevent and minimize RF leakage with braided wires or metal foil

Dielectric:

Main path for signal transmission
Insulating material that could separate cable center conductor and the shielding

Center Conductor:

Composed by multiple strands of twisted copper wire or a solid copper wire

Cable Styles

Cable Properties Overview

Suggested Frequency Range											
DC		1 GHz			3 GHz			6 GHz		18 GHz	
RG58 / RG174		RG178			RG142 / RG316 / RG316DB / Low Loss 195 / 1.13 / 1.32 / 1.37			RG405(.085") / RG402(.141") / .047"			
Nominal Outer Cable Diameter											
Thick											Thin
RG58 / RG142 / Low Loss 195	Hand formable 1.41"	RG316DB	RG174	Flexible .085"	Hand formable 0.85	RG178	Flexible .047"	1.37	1.32	1.13	
Minimum Bending Radius											
Low											High
1.13 / 1.32 / 1.37	Hand formable .085"	Flexible .047" / Hand formable .141"	RG178	RG316 / Low Loss 195 / Flexible .085	RG316DB	RG142	RG174	RG58			
Operating Temperature											
RG402(.141") / RG405(.085") / Flexible .047"											
RG178 / RG142 / RG316 / RG316DB											
1.13 / 1.32 / 1.37											
Low Loss 195											
RG58 / RG174											
				-65°C	-55°C	-40°C	-20°C	+80°C	+85°C	+90°C	-165°C



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CONNECTORS

DC POWER JACKS

WR-DC



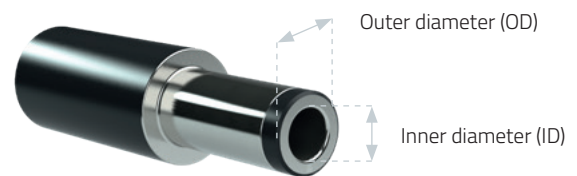
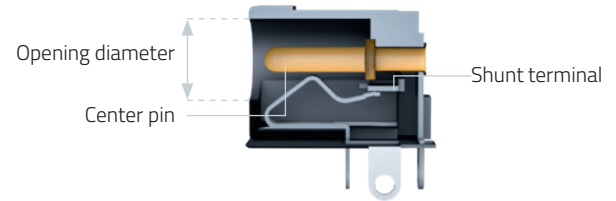
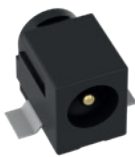
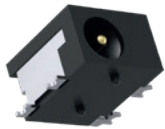
Features & Benefits

- Gold plated center pin
 - Beryllium-Copper contact spring for fatigue-free, durable clamping
 - Low contact resistance
 - 5000 mating cycles guaranteed
- Low profile options
 - Space saving on PCB
- High temperature plastics
 - UL94-V0 rating overall

Available Products

- SMT, THT
- Straight, right angled & offset types
- Various diameters to fit common market standards
- Shielded version available

Specification of Diameters

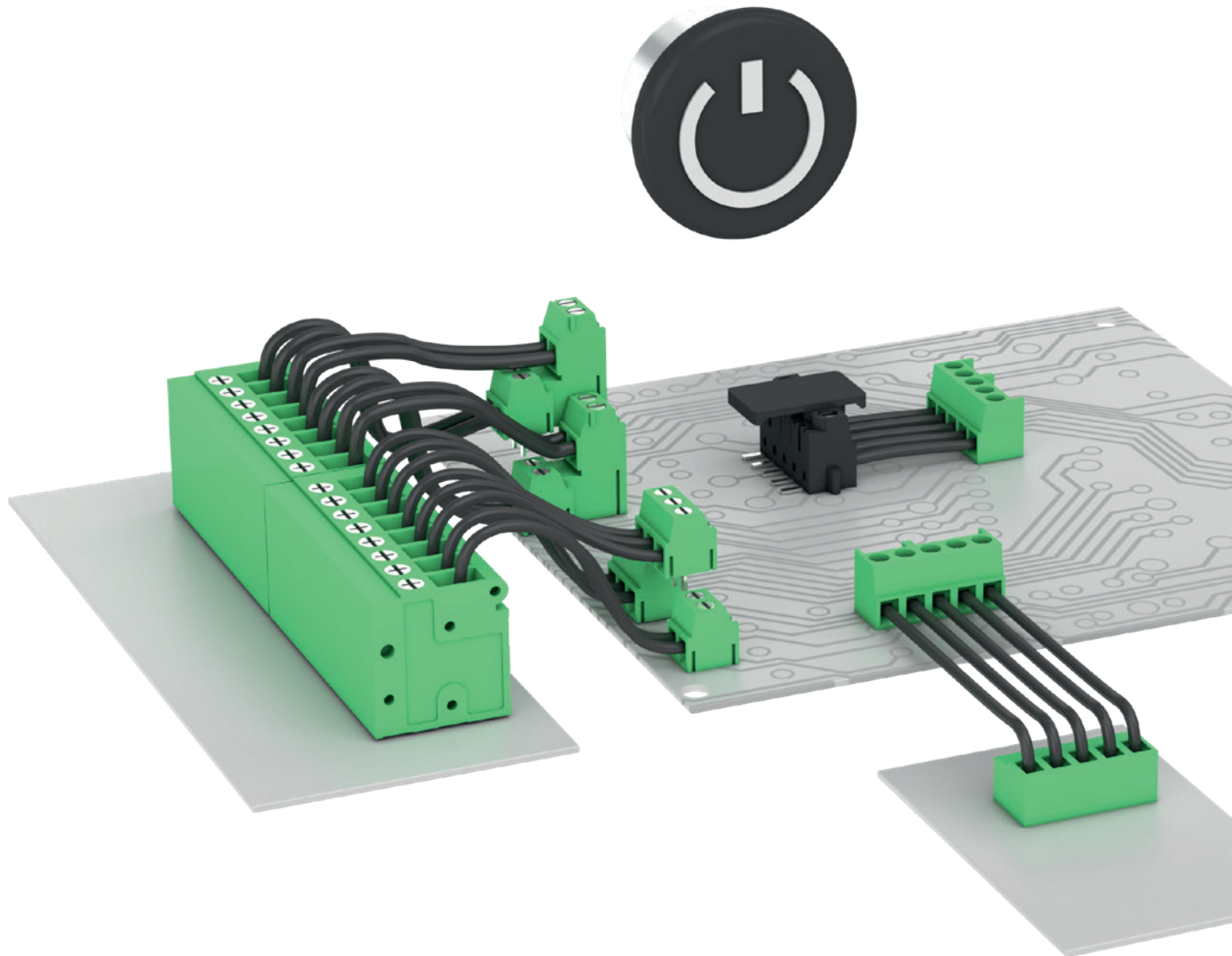


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CONNECTORS

TERMINAL BLOCKS – SCREW TYPES

WR-TBL



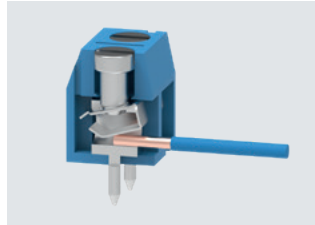
Features & Benefits

- Current rating up to 57 A
- Working voltage up to 750 VAC
- UL, cULus, VDE rated products

Available Products

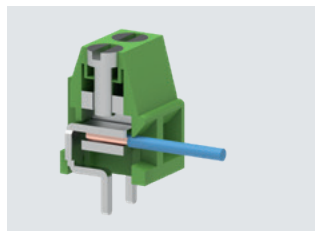
- 2 up to 12 pins
- THT & SMT
- Double & triple level versions
- Modular systems available
- Pitches: 2.54 mm up to 10.16 mm
- Horizontal, vertical & 45° cable entry
- Adhesive markers (numeric)

Types of Connection



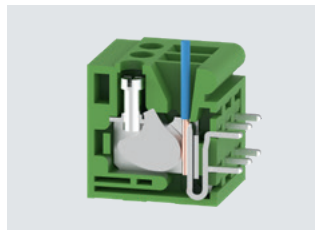
Wire Protector

- Cost effective
- Compact in size



Rising Cage Clamp

- High retention force
- Robust and secure



Excenter Clamp

- Front screw and cable connection
- High quality contact

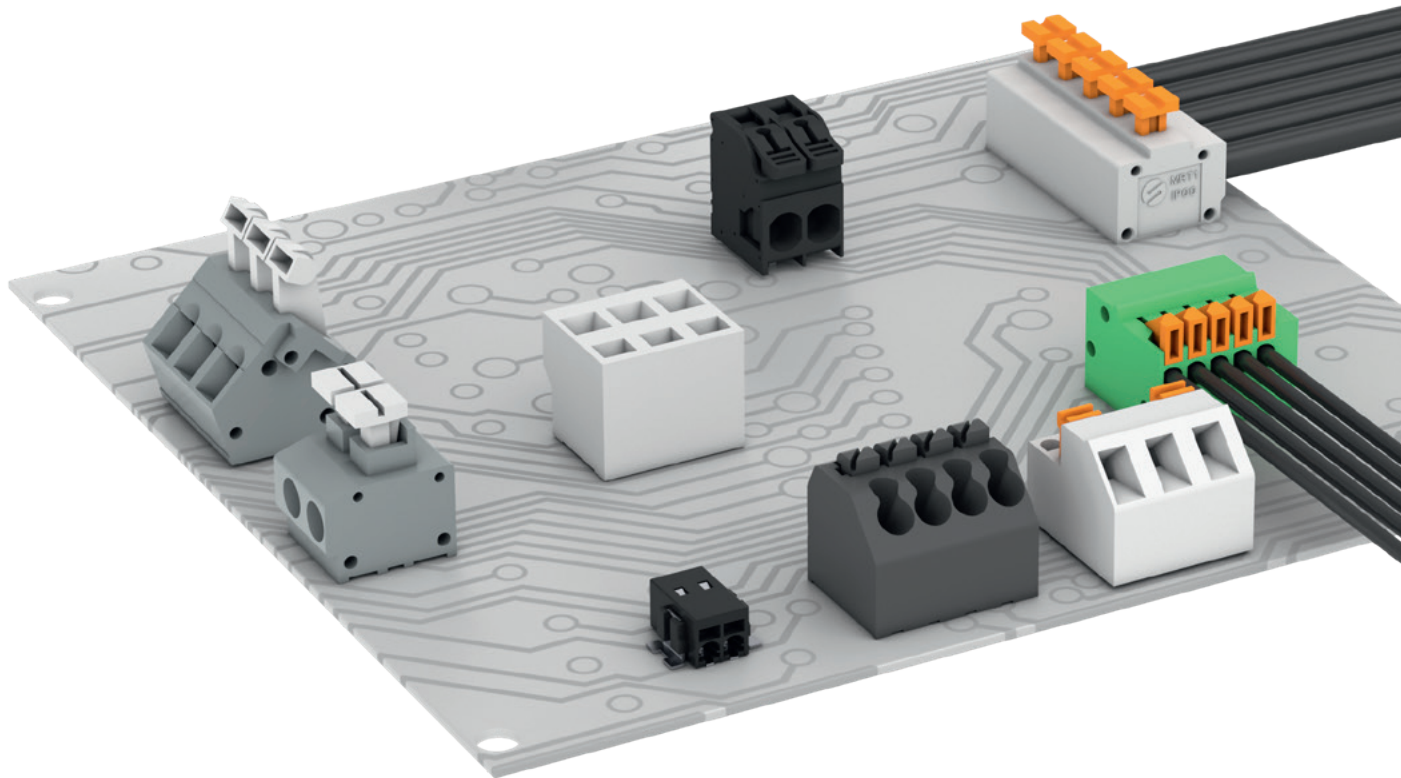


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CONNECTORS

TERMINAL BLOCKS – SCREWLESS TYPES

WR-TBL



Features & Benefits

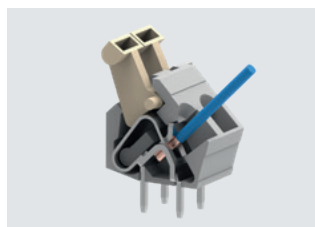
- Current rating up to 30 A
- Working voltage up to 750 VAC
- UL, cULus, VDE rated products
- Fast connection

Available Products

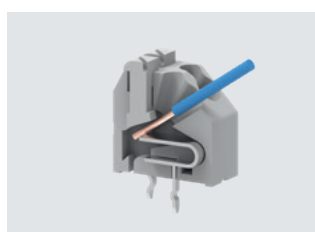
- 2 up to 24 pins
- Pitches: 2.50 mm up to 10.16 mm
- THT and SMT
- Horizontal, vertical & 45° cable entry



Types of Connection



**Screwless Spring
Clamp**



Screwless Push In

- Direct insertion with solid wire

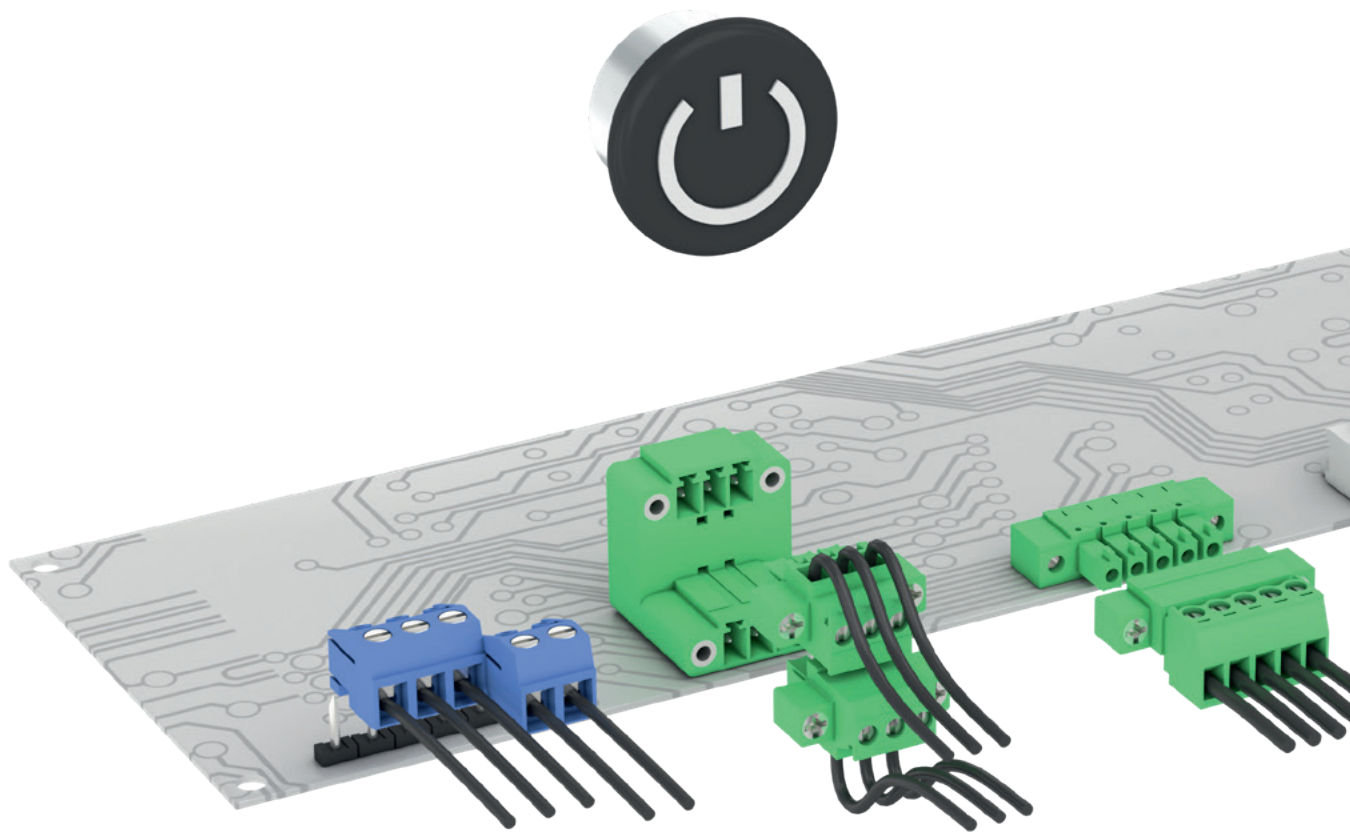


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CONNECTORS

TERMINAL BLOCKS – PLUGGABLE TYPES

WR-TBL

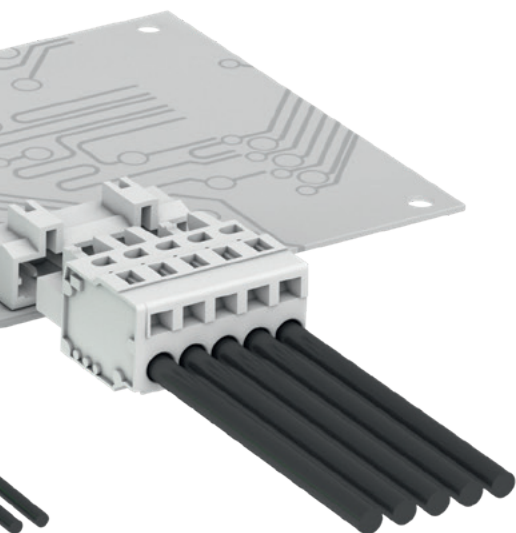


Features & Benefits

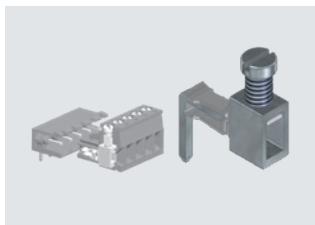
- Current rating up to 20 A
- Working voltage up to 750 V_{AC}
- UL, cULus, VDE rated products
- Fast connection

Available Products

- 2 up to 24 pins
- THT & THR
- Double level versions
- Reversed gender available (Wire-to-Board and Wire-to-Wire connections possible)
- Pitches: 2.50 mm up to 7.62 mm
- Horizontal & vertical cable entry
- Open and closed PCB header

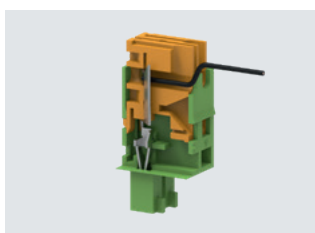


Types of Connection



Pluggable

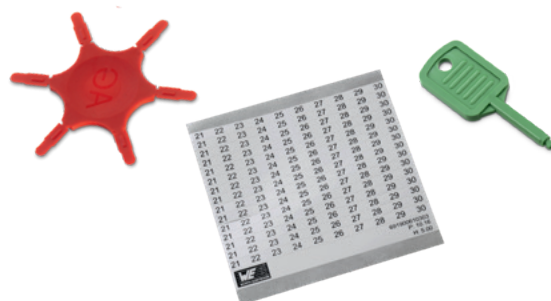
- Every monoblock connection technologies available
- Reversed gender
- Coding option



IDC Clamp

- Fast connection
- No cable stripping

Accessories



Coding keys, adhesive markers and removal key for dedicated series

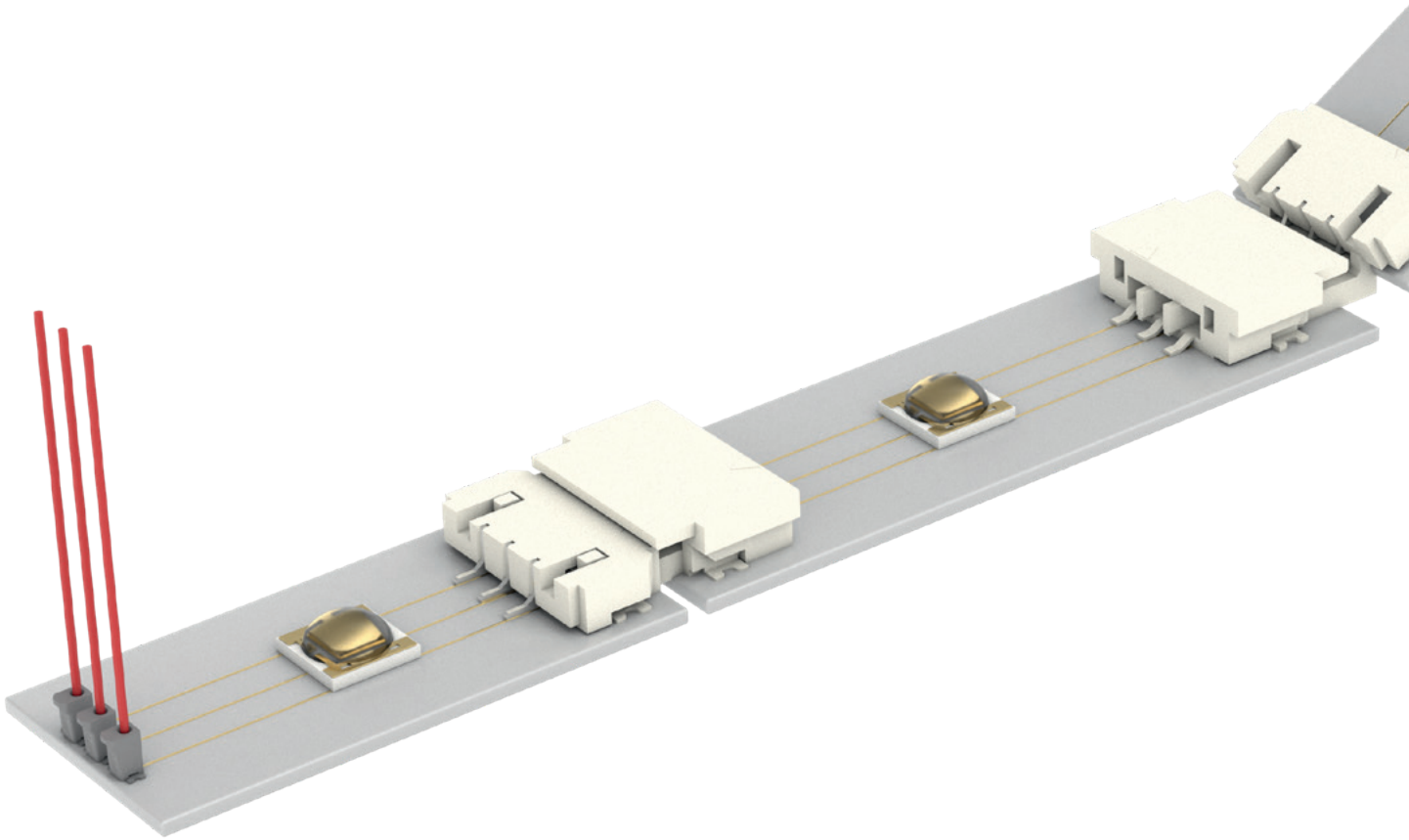


Visit our online catalogue for detailed
product selection:
www.we-online.com/TBL-PLUGGABLE

CONNECTORS

LED CONNECTORS

WR-LECO



Features & Benefits

- Space saving low profile design
- Lead-free and RoHS compatible
- White color preventing shading
- Current rating: up to 9 A

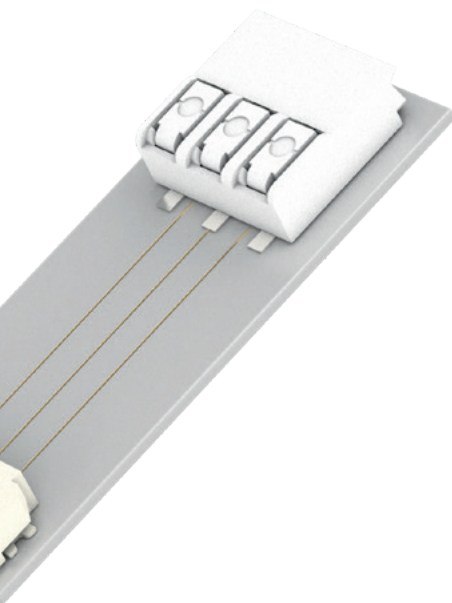
Available Products

Board-to-Board

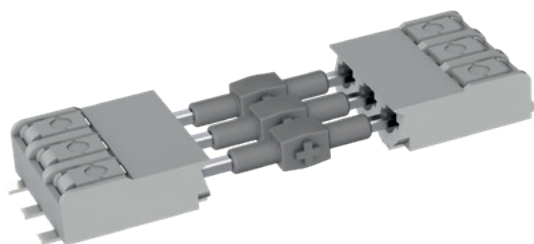
- Polarities 2, 3, 4 and 5
- Pitch: 1.5 & 2.54 mm
- Positioning peg
- Hermaphroditic connector
- SMT version

Wire-to-Board

- Polarities 1, 2 and 3
- Pitch: 4.0 mm



Special Features



Board-to-Board option for Wire-to-Board Series with accessory connector.

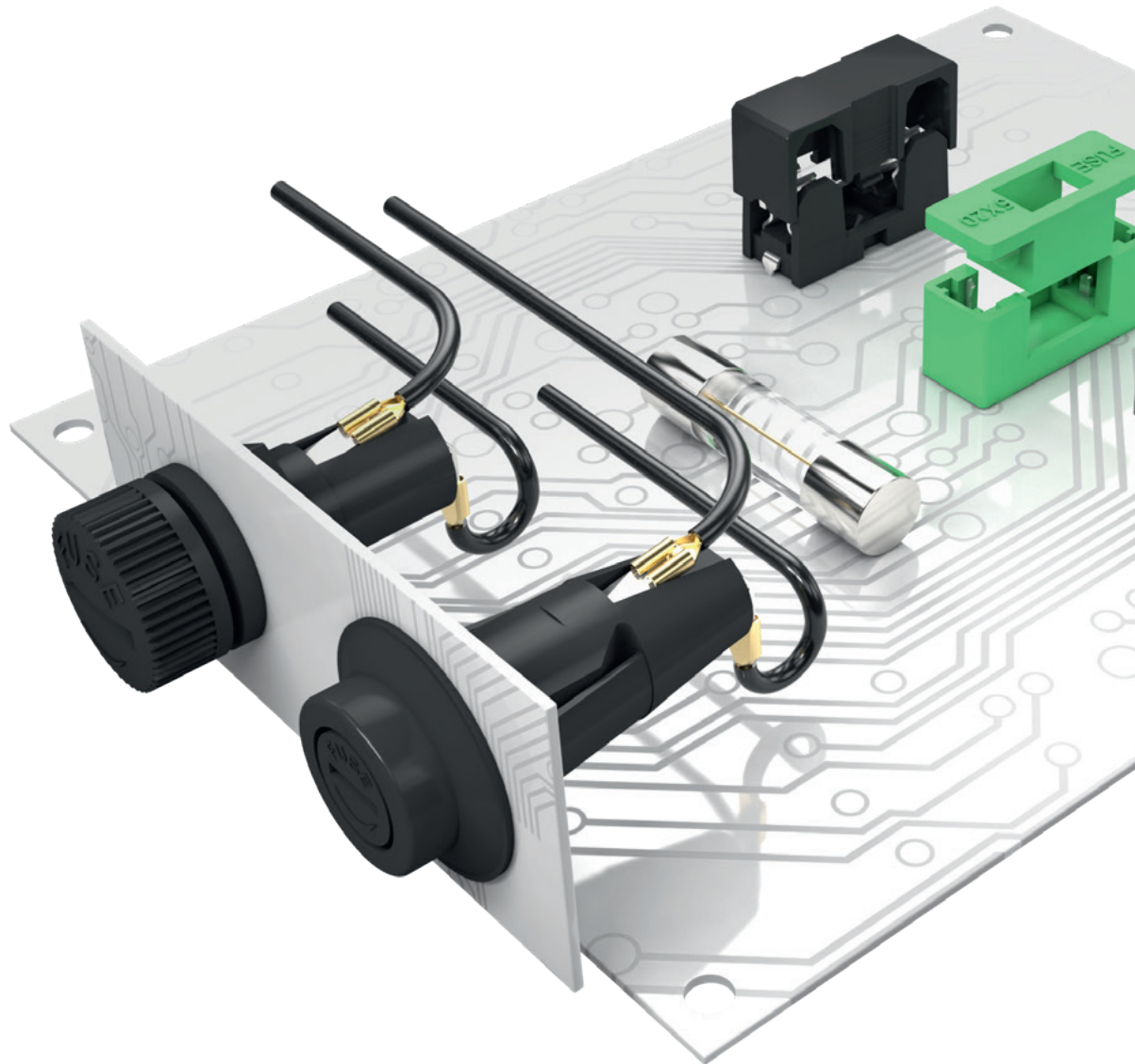


Visit our online catalogue for detailed
product selection:
www.we-online.com/LECO

CONNECTORS

FUSE HOLDERS

WR-FSH

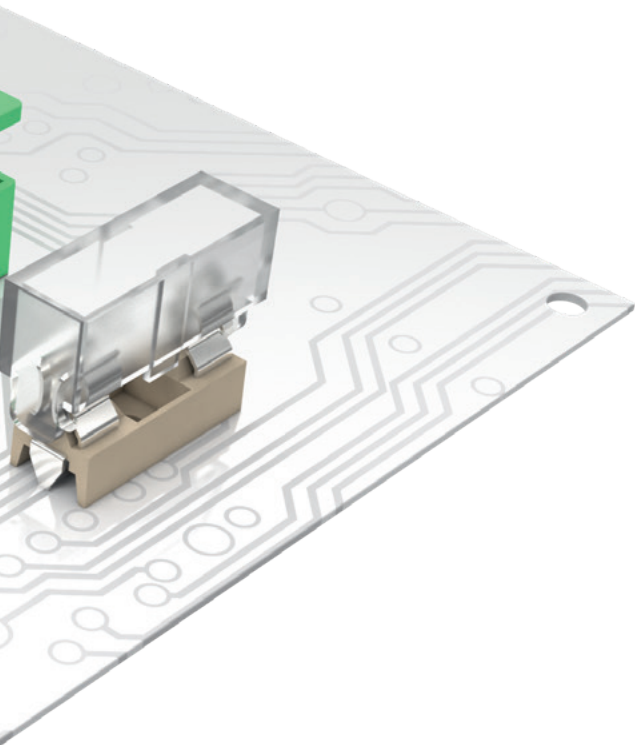


Features & Benefits

- In accordance with IEC 60127-6
- Some products Glow Wire tested according to IEC 60335-1 for home appliance applications
- Fitting 5x20 mm fuses

Available Products

- THT, SMT, THR & panel mount
- Clip covers
- Shock safe types

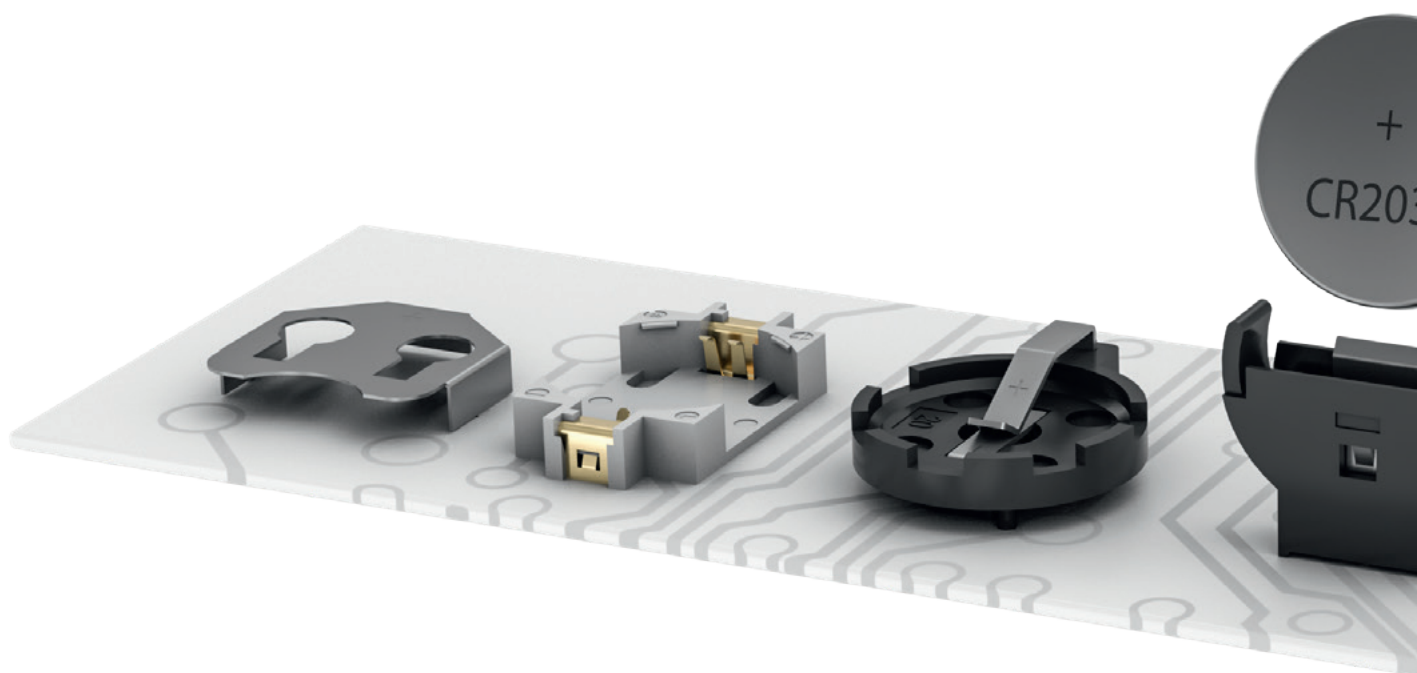


Visit our online catalogue for detailed
product selection:
www.we-online.com/FSH

CONNECTORS

BATTERY HOLDERS

WA-BCPH & WA-BCMC



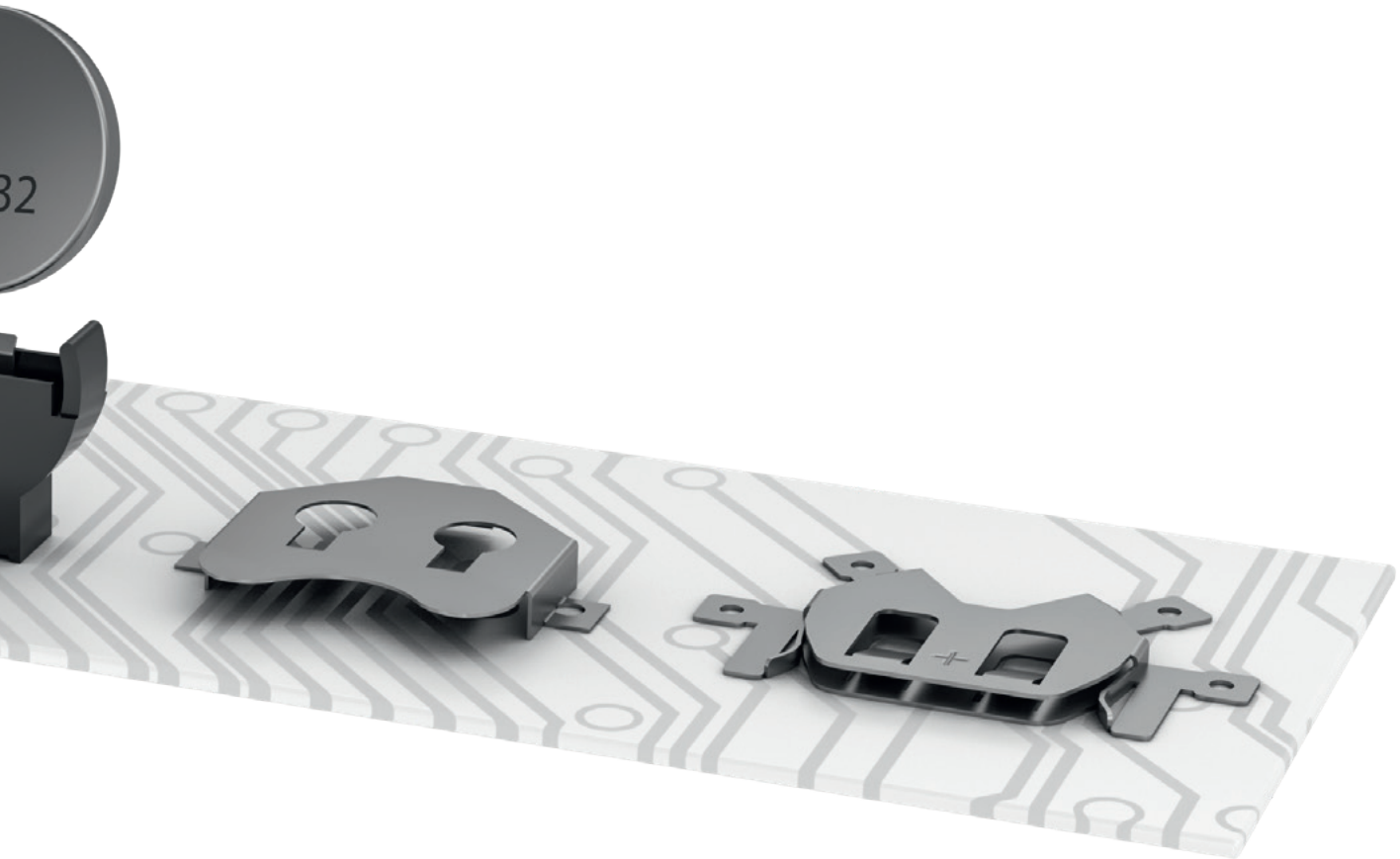
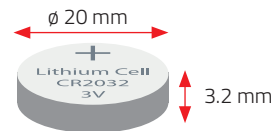
Features & Benefits

- SMT, THT
- Horizontal and vertical PCB mounting
- Metal or plastic body

Battery sizes:

2016 / 2020 / 2025 / 2032 / 2430 / 2450

Example: CR2032



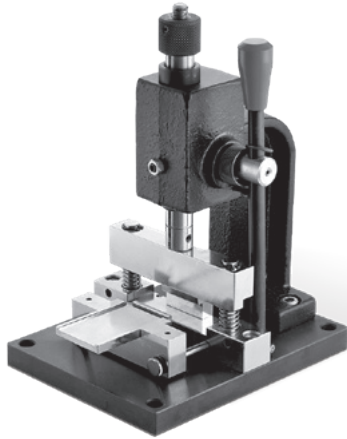
Visit our online catalogue for detailed
product selection:
www.we-online.com/BATTERY

CONNECTORS

TOOLS

IDC Press

for WR-MM



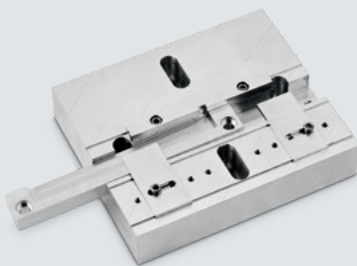
IDC Handpress

for WR-MM,
WR-BHD,
WR-DSUB,
WR-WST **REDFIT**



IDC Handpress Base Plate

for WR-MM, WR-BHD, WR-DSUB



IDC Press Adapter

for WR-MM, WR-BHD, WR-DSUB



Aluminium Die Set

for WR-WST IDC
use with IDC Handpress



Hand Pliers

for WR-WST **REDFIT** (IDC)
for WR-WST **REDFIT** (CRIMP)



Automatic Crimping Tool

for WR-WTB, WR-MPC3, WR-MPC4,
WR-DSUB



Hand Plier / Die Set

for WR-WTB, WR-MPC3, WR-MPC4,
WR-DSUB



Manual Crimping Tool

for WR-WTB



Manual Extraction Tool

for WR-MPC3, WR-MPC4



Manual Insulation Stripper



Hand Plier

for WR-TBL



SWITCHES

TACT SWITCHES

ON OFF ON OFF ON OFF ON OFF ON OFF ON OFF ON OFF
OFF ON OFF ON OFF ON OFF ON OFF ON OFF ON OFF ON
ON OFF ON OFF ON OFF ON OFF ON OFF ON OFF ON OFF
OFF ON OFF ON OFF ON OFF ON OFF ON OFF ON OFF ON
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© eiCan

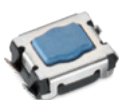
Tact Switches

The Tact Switches from Würth Elektronik are characterized by performance stability and long lifetime. All metal elements are corrosion resistant proven by a 48 hours salt spray test. Polyimide tape or silicone rubber protect the switch even in tough environments. The switch range includes various high quality solutions like dip, rotary, detector, micro, slide, rocker switches and encoder. Available from stock. Samples free of charge.

For further information, please visit: www.we-online.com/switch

#TIMETOSWITCH

- IP67
- Long lifetime
- High durability
- Corrosion resistant metal elements
- Full load life cycle test
- Tight tolerance due to automated production
- Various operation force and heights
- Travel from 0.15 mm to 1.5 mm
- IP series with corrosive resistant
- Corrosive Test according to IEC 60068-2-42
- Support vapor phase soldering



SMT Vertical



SMT Side Push



THT Vertical



THT Right Angled



IP67



Illuminated Solution



Long Travel

All Metal Parts



- 48 hours salt spray test
- Corrosion resistant

Plastics



- 5 times reflow resistant
- UL flammability approved

Snap Dome (Stainless Steel)

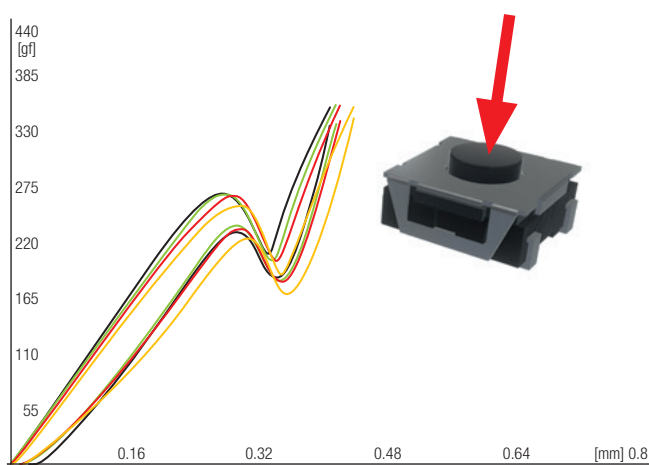


- High performance stability
- Full load life cycle tests
- Less friction

Polyimide Tape / Silicone Rubber



- Protection from environment
- Silicone rubber for tough environments



Characteristics

Automated production

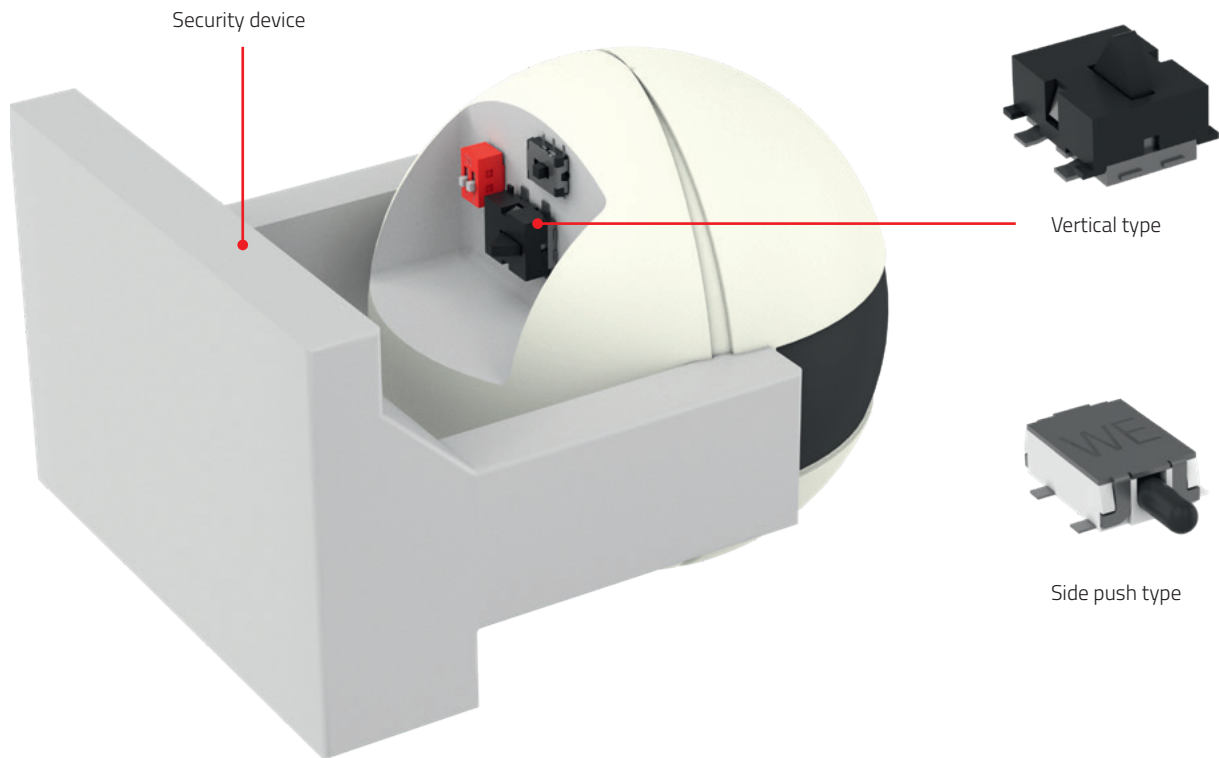
- Reduces the mechanical variation
- Stability of mechanical parameters
- Stable yield rate



Visit our online catalogue for detailed
product selection:
www.we-online.com/TACT-SWITCH

SWITCHES

DETECTOR SWITCHES



Tamper detection is the ability of a device to sense an active attack to the device and the threat of the attack should initiate an event (e.g. alarm, shutdown of the device).

Features & Benefits

- Full load life cycle test
- 48 h salt spray test
- Plastic material UL94 flammability approved
- 5 times reflow on SMT parts
- Low activation and return force
- Suitable for static use
- Application categories:
 - Detection / endstop
 - Power ON / OFF
 - Tamper detection (example above)
- Corrosive Test according to IEC 60068-2-42

Available Products

Detector Switches

- SPST – Normal open type
- SPST – Normal closed type
- Horizontal & vertical operation



MICRO SWITCHES

Vertical Push Types



Pin plunger



Lever



Roller lever

Horizontal Push Types



Pin plunger



Lever



Roller lever

	WE Detector Switch	WE Micro Switch
Application categories	Detection/endstop, Power ON/OFF, tamper detection	
Actual product size	Up to 5.7 x 4.0 mm	12.8 x 5.8 mm
Safety certificate	No	UL 61058-1
Circuit schematic	SPST (NO, NC)	SPDT
Terminal type	SMT	THT

Features & Benefits

- Trackable safety certification on UL/IEC 61058-1
- Full load life cycle test
- 48 h salt spray test
- Plastic material UL94 flammability approved
- Low activation and return force
- Suitable for static use

Available Products

Micro Switches

- Actuator type
- Roller type
- Lever type
- Horizontal & vertical operation



Visit our online catalogue for detailed product selection:
www.we-online.com/MICRO-SWITCH

SWITCHES

DIP SWITCHES



Features & Benefits

- Full load life cycle test
- 48 h salt spray test
- Plastic material UL94 flammability approved
- 5 times reflow on SMT parts
- Gold plating on contact and terminal
- Washable series support vapor phase soldering
- Corrosive test according to IEC 60068-2-42

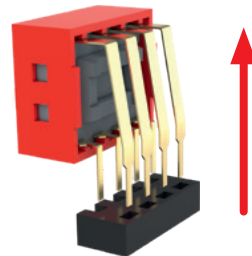
Available Products

- 1 to 12 poles
- 1.27 mm & 2.54 mm pitch
- THT & SMT
- Raise and flat actuator
- Washable products available

Box type



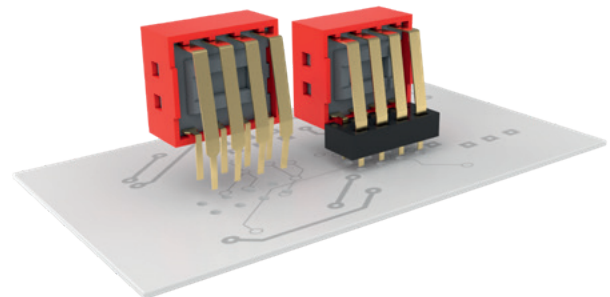
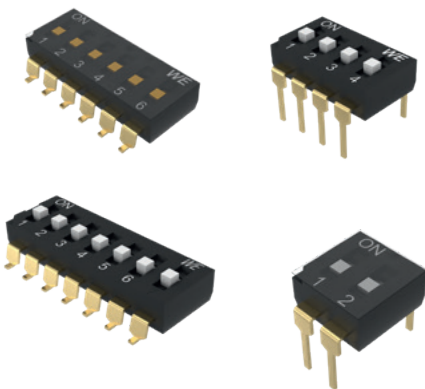
Special Features



Würth Elektronik utility patent in China, Germany, Hong Kong, South Korea and Taiwan:

- Black supporter to prevent deformation on the terminal
 - Easy manual placement on PCB
 - Saving of time and assembly costs

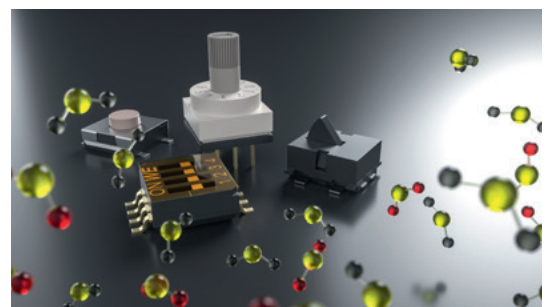
IC type



Half pitch



Placement example: Left without black supporter plastics; right with patented black supporter plastics



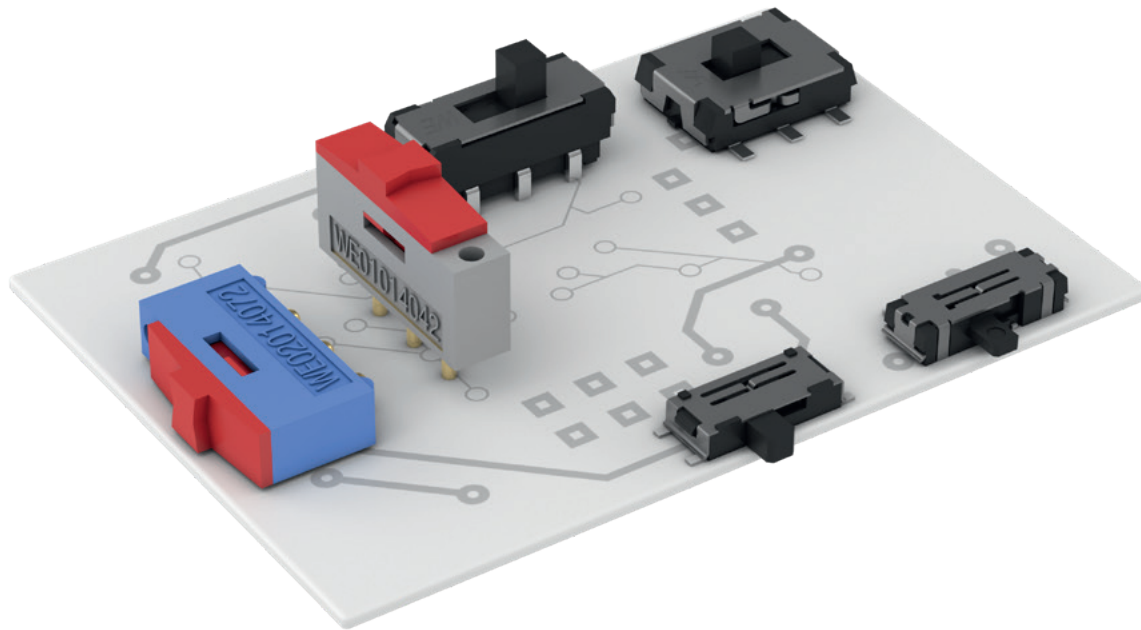
Corrosive Test according to IEC 60068-2-42



Visit our online catalogue for detailed product selection:
www.we-online.com/DIP-SWITCH

SWITCHES

SLIDE SWITCHES



Features & Benefits

- Full load life cycle test
- 48 h salt spray test
- Plastic material UL94 flammability approved
- 5 times reflow on SMT parts
- Non-shorting

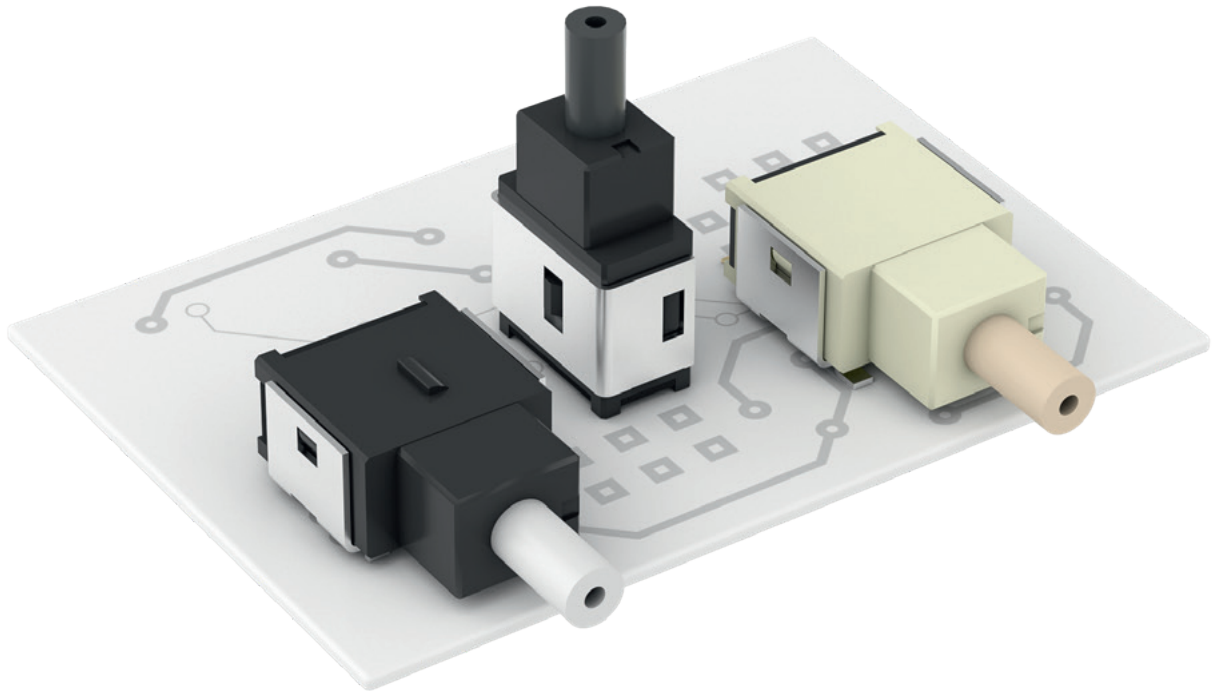
Available Products

Slide Switches

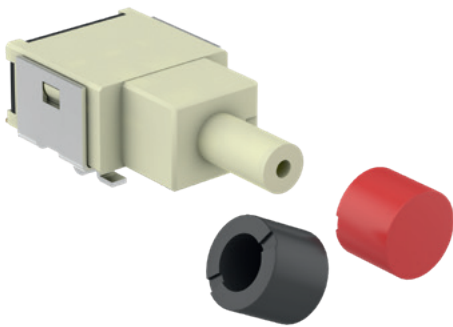
- THT & SMT
- DPDT & SPDT
- Same side / opposite side connection



PUSH BUTTON SWITCHES



Special Features



Plastic caps red & black for Push Button Switches



Special design of the push buttons' actuator tip (caved design) provides a perfect fix point for pen or other sharp tools while operation

Features & Benefits

- Full load life cycle test
- 48 h salt spray test
- Plastic material UL94 flammability approved
- 5 times reflow on SMT parts
- Non-shorting
- Self cleaning contact

Available Products

Push Button Switches

- THT & SMT
- SPDT
- Plastic caps available
- Horizontal and vertical



Visit our online catalogue for detailed
product selection:
www.we-online.com/PUSH-BUTTON

SWITCHES

ROTARY SWITCHES



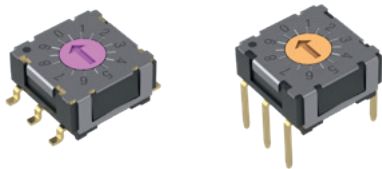
Features & Benefits

- Full load life cycle test
- 48 h salt spray test
- Plastic material UL94 flammability approved
- 5 times reflow on SMT parts
- Gold plating on contact and terminal
- Customized laser carving on request (MOQ: 5.000)
- Supports vapor phase soldering
- Corrosive test according to IEC 60068-2-42

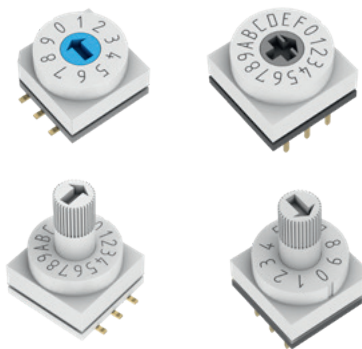
Available Products

- 10x10 and 7x7 mm size
- THT & SMT
- 10x10 mm right angled on pitch 2.54 & 5.08 mm
- Real and complement code
- IP67 (excl. 10x10 mm right angled types)

7x 7 mm SMT / THT IP67



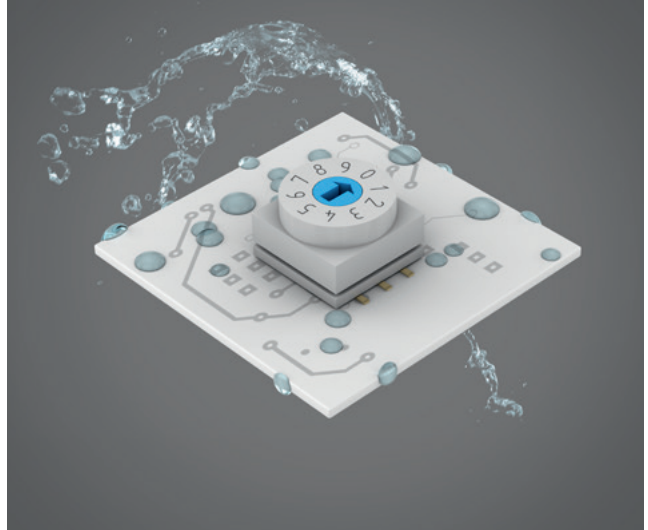
10 x 10 mm SMT / THT IP67



10 x 10 mm THT Right Angled Type



Special Features

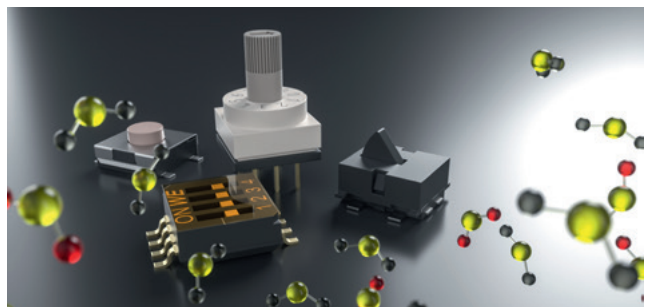


IP67

Accessories



- Segment wheel / spindle in various colors
- Delivery with accessory for THT products on request (MOQ: 5.000)



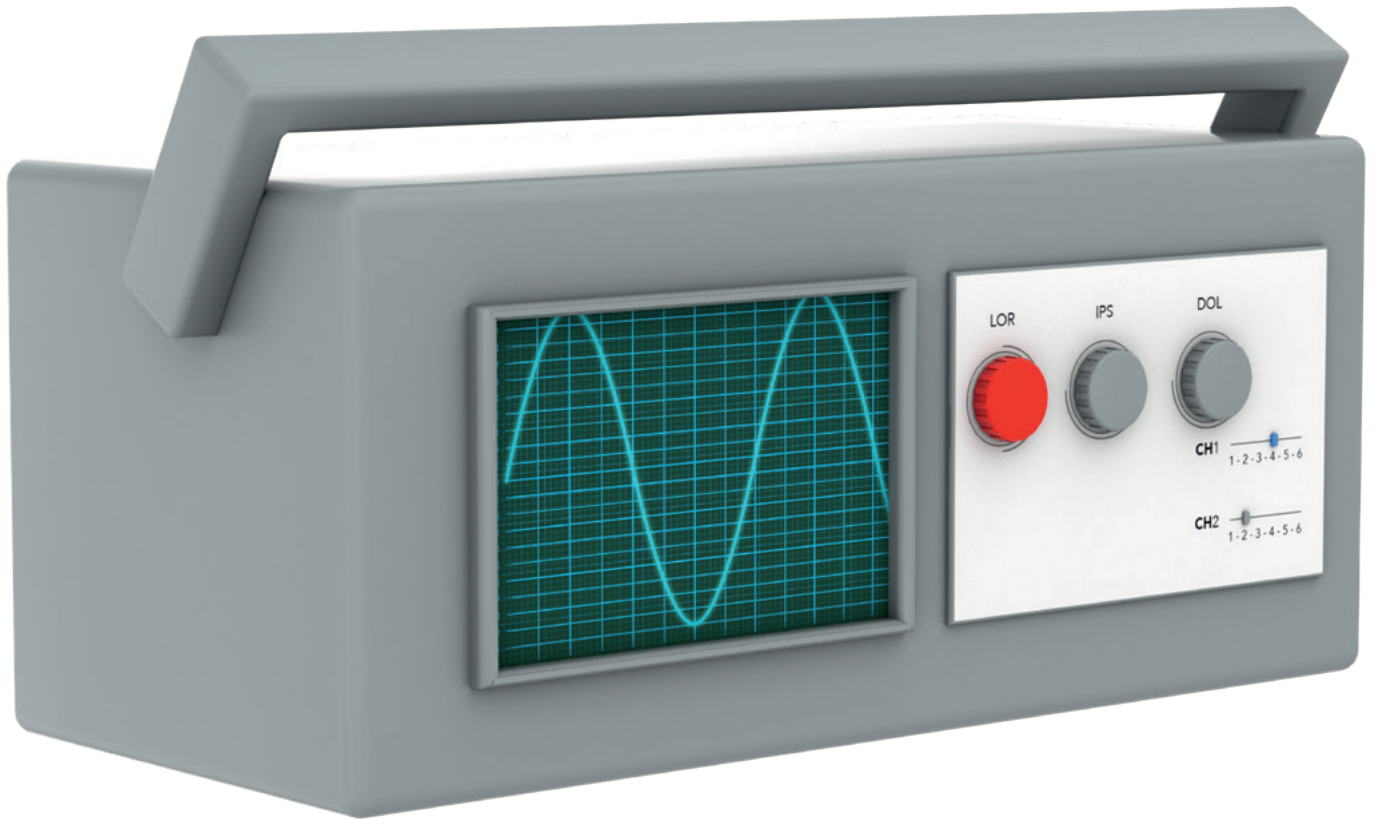
Corrosive Test according to IEC 60068-2-42



Visit our online catalogue for detailed
product selection:
www.we-online.com/ROTARY

SWITCHES

INCREMENTAL ENCODER SWITCHES



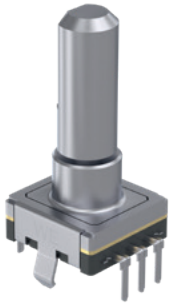
Mechanical encoders typically are used to sense human adjustment of the device in a clockwise or counter-clockwise direction triggering some action by the digital circuit.

Features & Benefits

- Full load life cycle test
- 48 h salt spray test
- Plastic material UL94 flammability approved
- Threaded bushing type with nut and washer included
- Without switching function on request (MOQ: 5.000)
- Without detent on request (MOQ: 5.000)

Available Products

- Different pulses
- 1:1 or 1:2 detent combination
- Different schematics available (A leads B or B leads A)
- With switching function
- Threaded / plain bushing and without bushing available



Plain Bushing



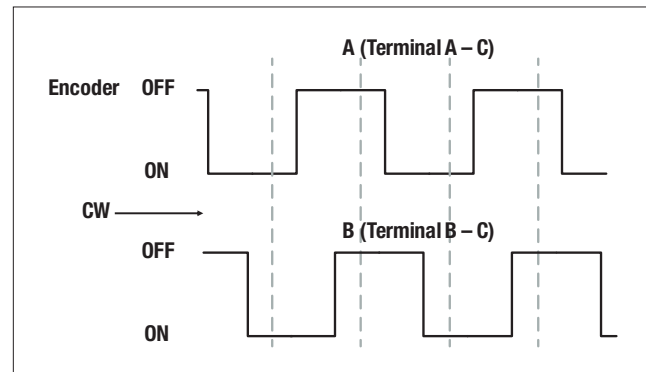
Without Bushing



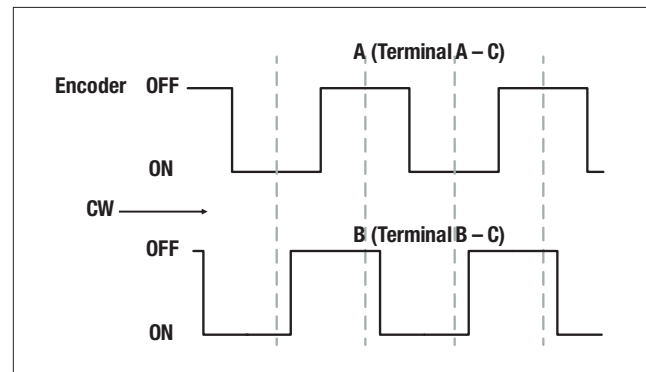
Threaded Bushing

Special Features

Available Schematics



A leads B



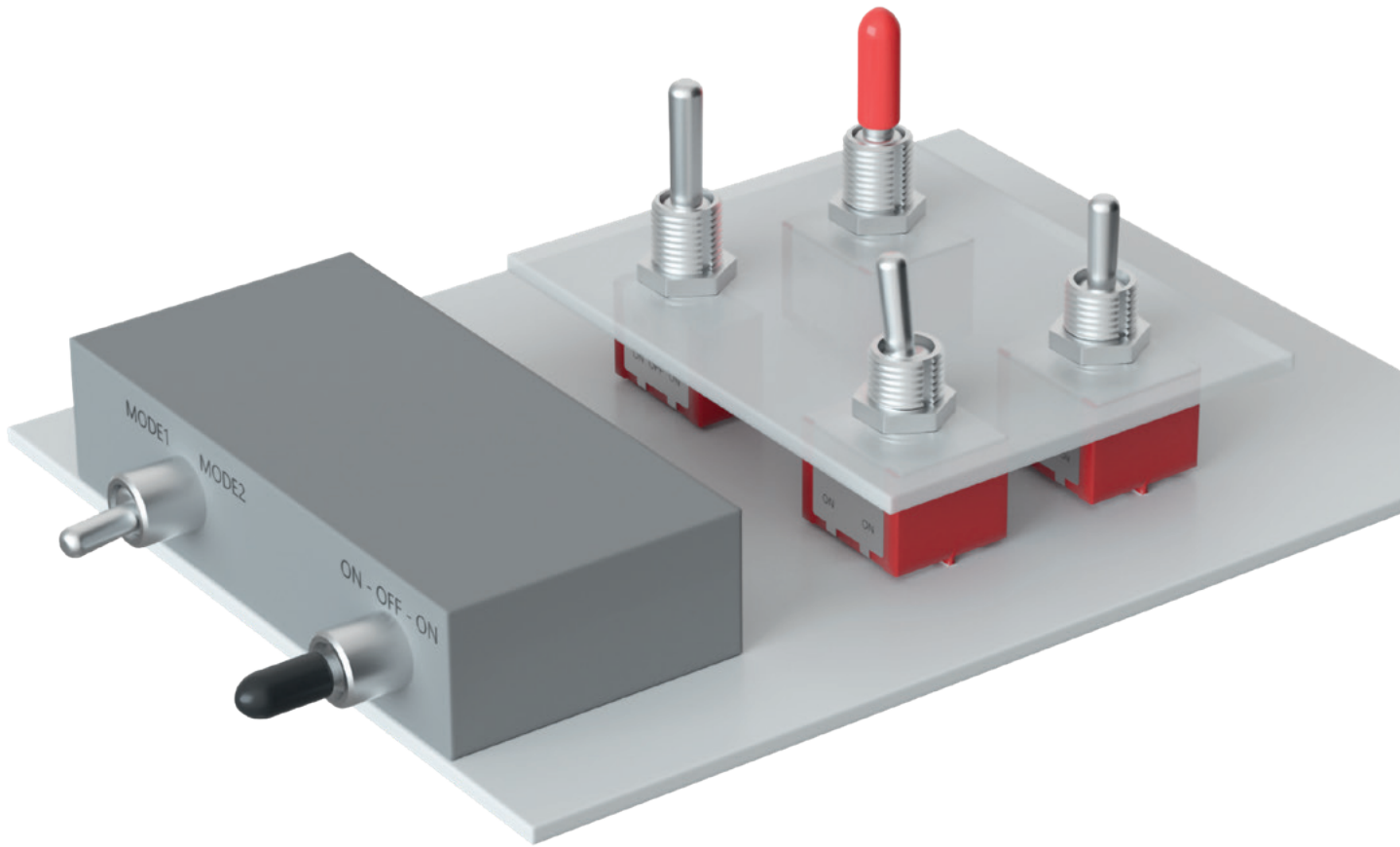
B leads A



Visit our online catalogue for detailed product selection:
www.we-online.com/Encoder

SWITCHES

TOGGLE SWITCHES



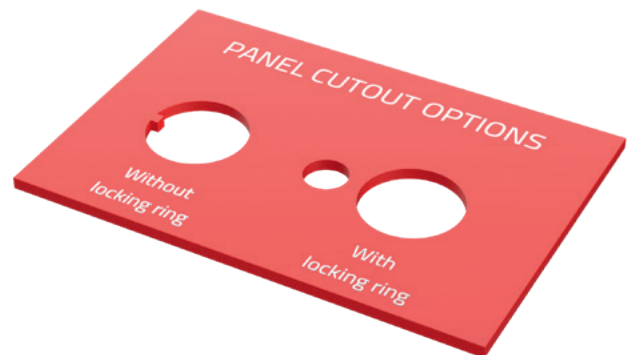
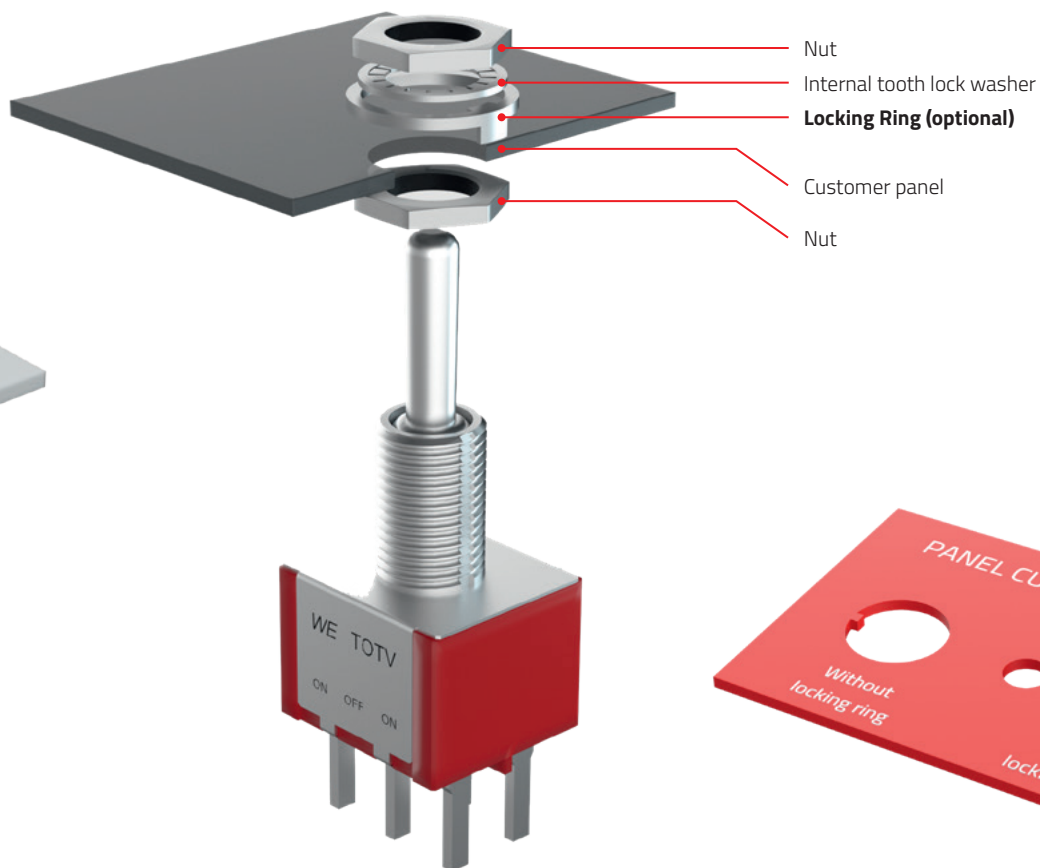
Features & Benefits

- Full load life cycle test
- 1 A, 30 VDC
- 48h salt spray test
- Plastic material UL94 flammability approved
- Threaded bushing with assembly accessories included
- ESD solutions for system level according to IEC 61000-4-2

Available Products

- Panel cut out Ø6.35 mm with keyway bushing
- Schematic SPDT/DPDT in ON-ON and ON-OFF-ON
- Opposite side connection
- Horizontal & vertical operation
- Assemble with standard cap (MOQ: 500 pcs)
- Standard caps available in red or black customized color on request (MOQ: 10.000 pcs)

**Special Features:
Assembly sequence**



Torque force up to 10 kgf-cm max

2 cut out design for different assembly sequence



Visit our online catalogue for detailed
product selection:
www.we-online.com/ToggleSwitch

SWITCHES

ROCKER SWITCHES



Features & Benefits

- Trackable safety certification on UL/IEC/CQC 61058-1
- DC rating listed
- 48 h salt spray test
- Glow Wire Test according to IEC 60695-2-11
- UV Test according to IEC 60068-2-5
- IP65 design
- Hot stamping technique on marking
- Customized marking on request (MOQ: 5.000)
- Compliances:



Available Products

- Rectangular types:
 - Panel cut-out: 19.2 x 12.9 mm / 0.187" quick connect terminal (SPST, DPST)
 - Panel cut-out: 30.2 x 22.2 mm / 0.25" quick connect terminal (DPST)
 - Panel cut-out: 27.6 x 13.8 mm / 0.25" quick connect terminal (SPST)
- Round types: Panel cut-out: \varnothing 20.2 mm
 - With 0.187" quick connect terminal (SPST, DPST)
 - With IP65 design (SPST)
 - Illuminated type available in 110 VAC and 220 VAC
- Protection cover for standard round types

ILLUMINATED



Ø20.2 mm



Ø20.2 mm

IP 65



Ø20.2 mm



27.6 x 13.8 mm



19.2 x 12.9 mm

NEW



30.2 x 22.2 mm

Special Features

No worries about aging of plastics!

WE provides UV test reports on Rocker Switches



Need a protection cover?



Visit our online catalogue for detailed
product selection:
www.we-online.com/Rocker

SWITCHES

ILLUMINATED SWITCHES



Features & Benefits

- Full load life cycle test
- Plastic material UL94 flammability approved
- 3 times reflow on SMT parts
- LED bin code limitation avoiding coloring variation

Available Products

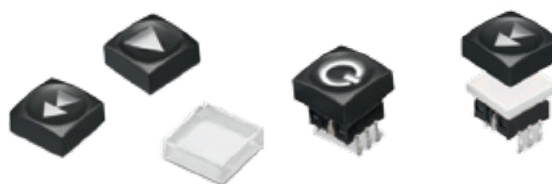
- SMT & THT
- Different LED color options

Special thanks to our customers Sydneyne Systems Pvt. Ltd and Weber Ultrasonics AG for allowing us using their application pictures to show Würth Elektronik product features

Special Features for the Caps

For WS-PBTL and WS-TATL

- 3 times coating on the caps (laser carving)
- Customized laser carving on standard caps (MOQ: 300)
- Customized pantone or RAL cap color coating (MOQ: 1.080)
- Assembled parts on request (MOQ: 1.080)
- New technology "laser etching" on transparent cap



Standard caps



Laser Carving



Laser Etching



Visit our online catalogue for detailed
product selection:
www.we-online.com/Illuminated

SWITCHES

MULTIFUNCTIONAL TEST TWEEZER



Adjustable rated current

Plug-in of dedicated connecting cable to multimeter. **Note: Use only connecting cable provided**

Buzzer

Battery (Type: 23AE 12 V)

Pass indicator

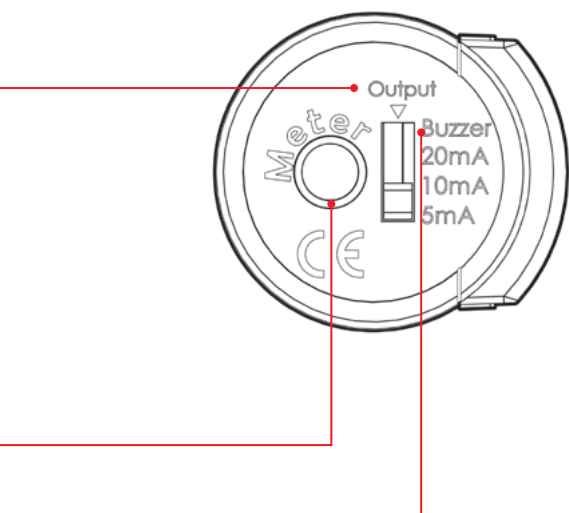
Tweezer handle
Red: Anode
Grey: Cathode

Test Terminal

Do not measure power loaded subjects!
Do not use in high-voltage systems.
Switch off power before testing!



Note: Sharp object!
Risk of injury, use carefully!

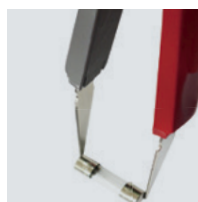


The Compact Testing Tweezer is specifically designed for quick and easy testing of small electronic components such as Switches, LEDs, Resistance, Fuses or conductivity test on PCB circuits. It can also be connected to a multimeter for resistance measurement.

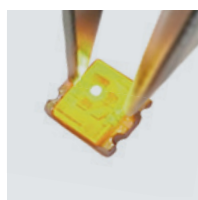
In addition to LED measurement, the adjustable current rating provides instant LED testing and demonstration.



PCB circuit conductivity test



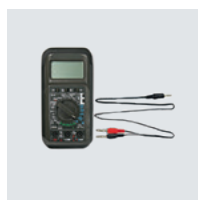
Fuse testing



LED light-up test



Measuring small electronic components



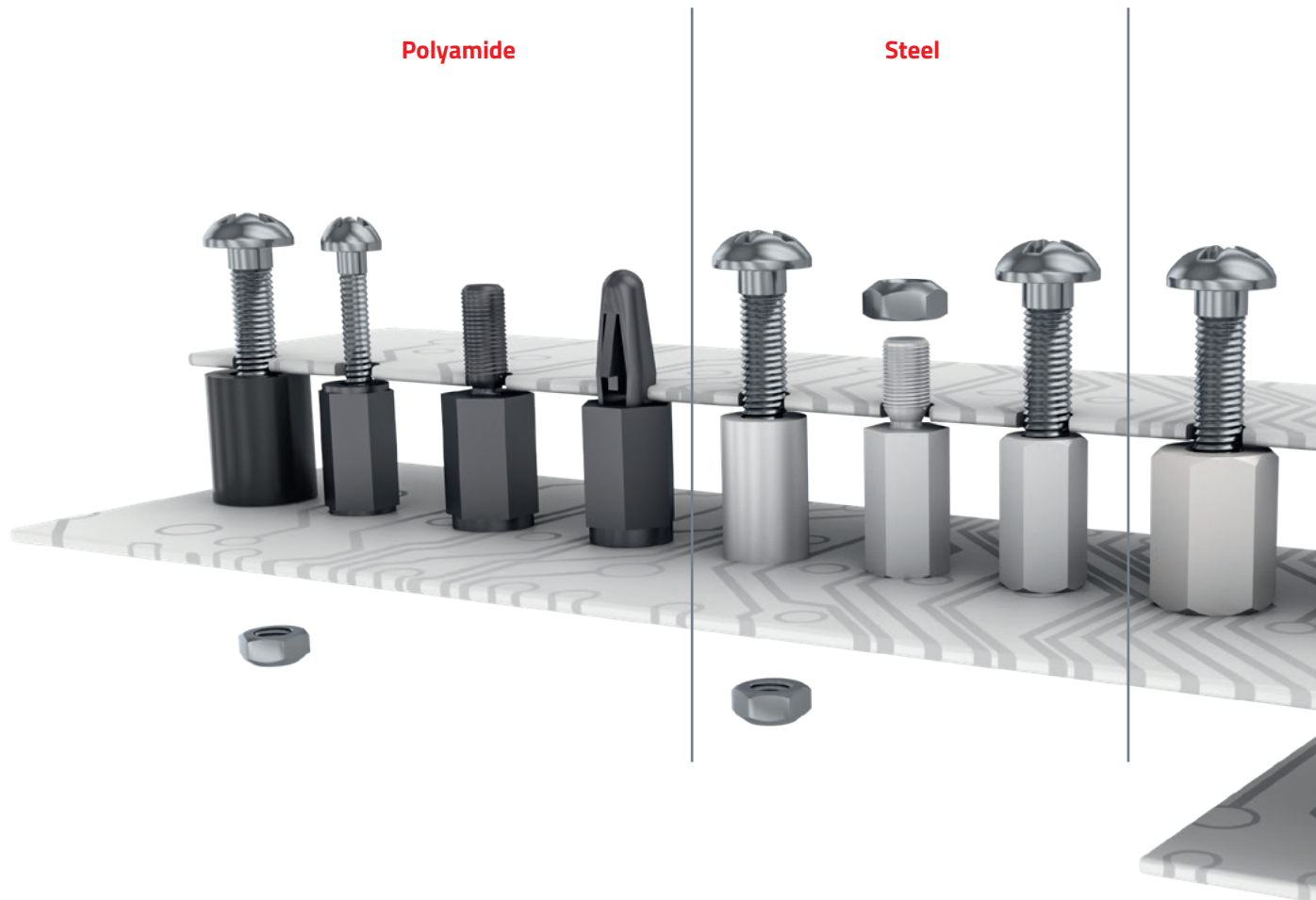
Multimeter connecting cable



Visit our online catalogue for detailed product selection:
www.we-online.com/TWEEZER

ASSEMBLY TECHNIQUE

SPACER STUDS & ROUND SPACERS



Features & Benefits

Large product range to find a solution for every application.

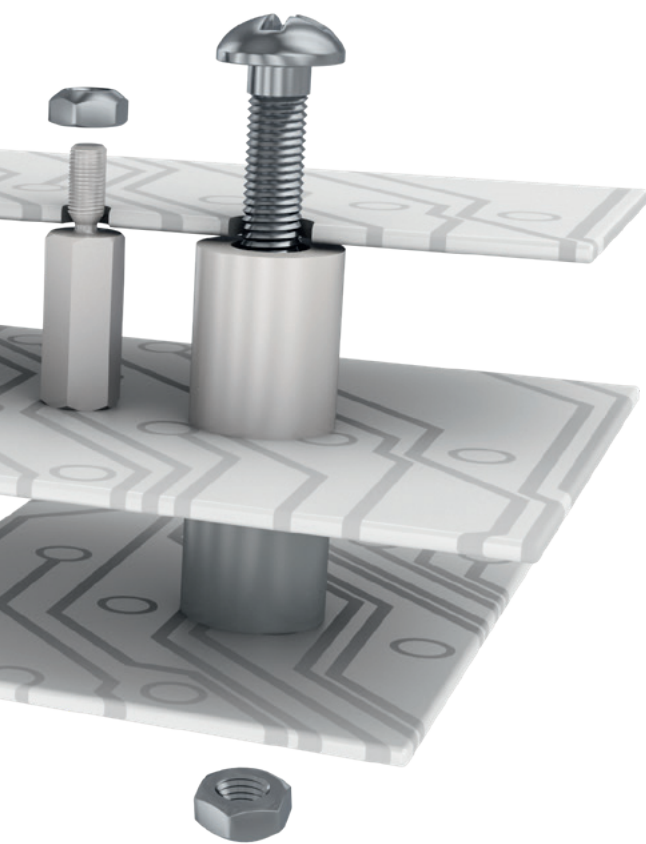
Different versions of:

- Thread and wrench sizes
- Length
- Material
- Types of mounting

Available Products

- Internal / internal thread
- Internal / external thread
- Snap-in
- Round spacers

Brass



Special Features



Polyamide

- Low weight
- Insulated connection



Steel, zinc plated

- High mechanical stability



Brass, nickel plated

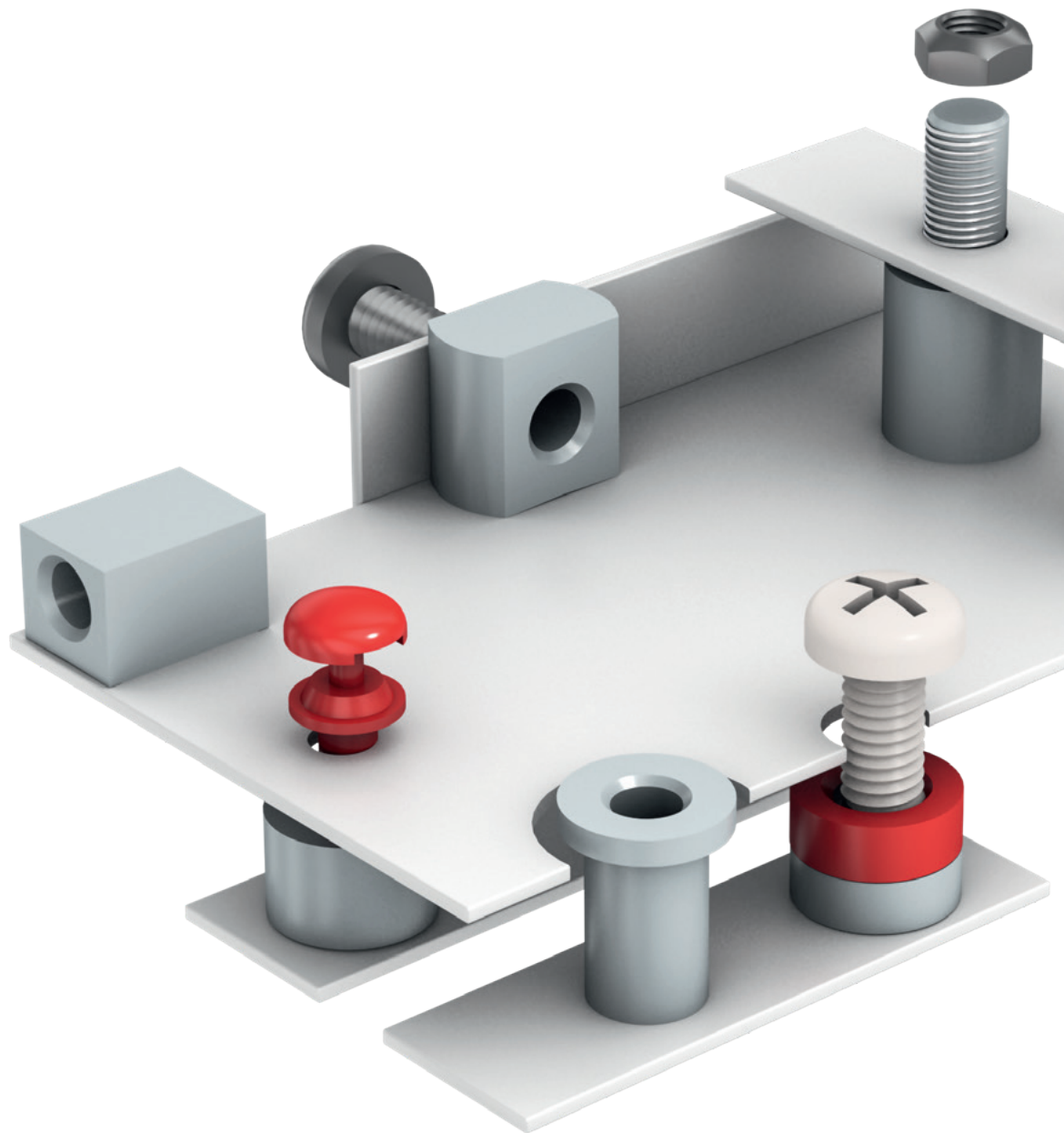
- Non magnetic
- Higher electrical and thermal conductivity



Visit our online catalogue for detailed
product selection:
www.we-online.com/SPACER-STUDS

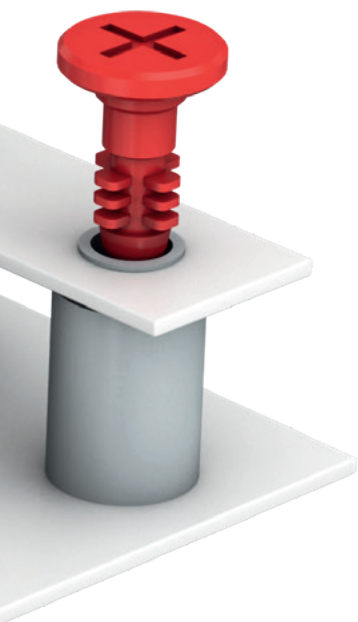
ASSEMBLY TECHNIQUE

SMT SPACERS

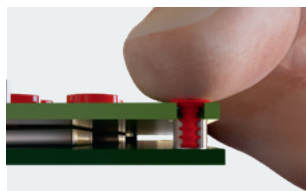


Features & Benefits

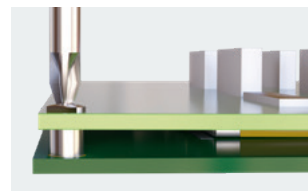
- Fast and precise process
- Instant removable polyimide foil
- Strong holding forces and torques
- Highest process reliability
- Customized length upon request (with MOQ)



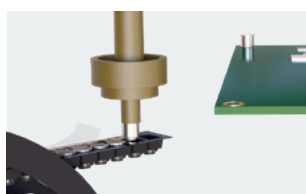
Special Features



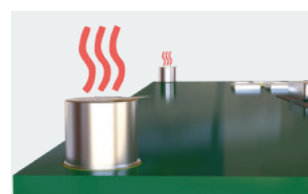
Screwless connections for fast mounting



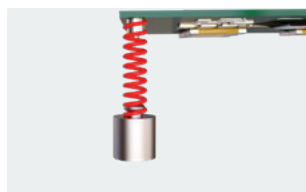
Robust screw connections for high mechanical load



Full automation for fast and very precise positioning on the PCB



Optimal solder pad geometry and specially developed plating for constant and reliable soldering results



High holding forces and torques for safe and strong mechanical connection



Tab on the polyimide foil for instant removal

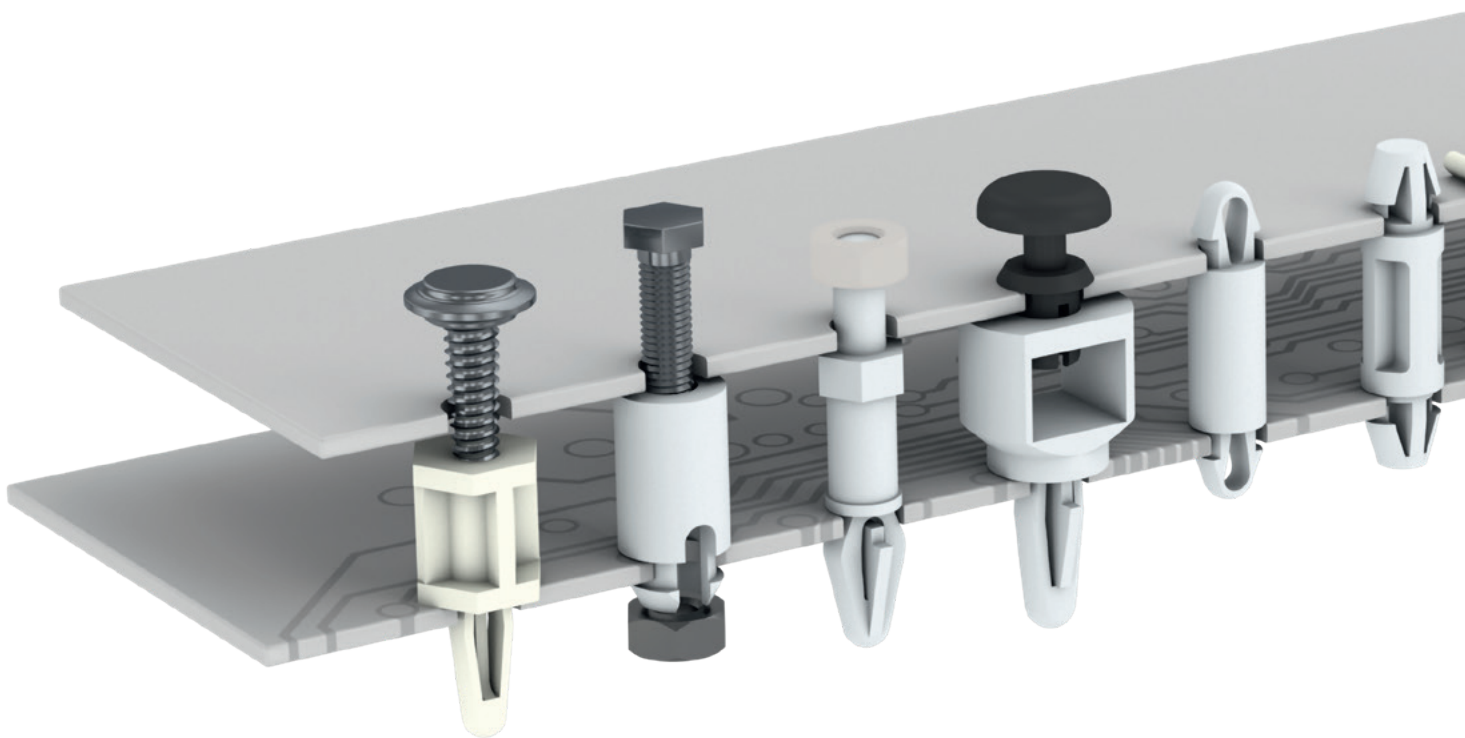
	Length	Thread size	Hole ϕ
Internal thread	1 to 16 mm	M1.6 to M5	
Through hole	1 to 16 mm		2.25 to 4.50 mm
External thread	5 to 15 mm	M3	
Reverse type	1 to 10 mm (using standard PCB 1.6 mm)	M3	3.20 mm
Right angled with pin or right angled block thread	XX	M2 to M3	3.30 mm
Accessories:	<ul style="list-style-type: none"> ■ Mounting button for M3 and snap rivet for fast and tool free mounting ■ Distance cap & fitting plastic screw (M3) (for spacers with 6 mm outer diameter, starting at 2.5 mm height) 		



Visit our online catalogue for detailed product selection:
www.we-online.com/SMT-SPACERS

ASSEMBLY TECHNIQUE

PLASTIC SPACERS



Features & Benefits

- Light and insulated connection
- Many different versions and mounting variations:
 - Snap-in
 - Self adhesive
 - Screw mount
 - Snap rivet mount

Available Products

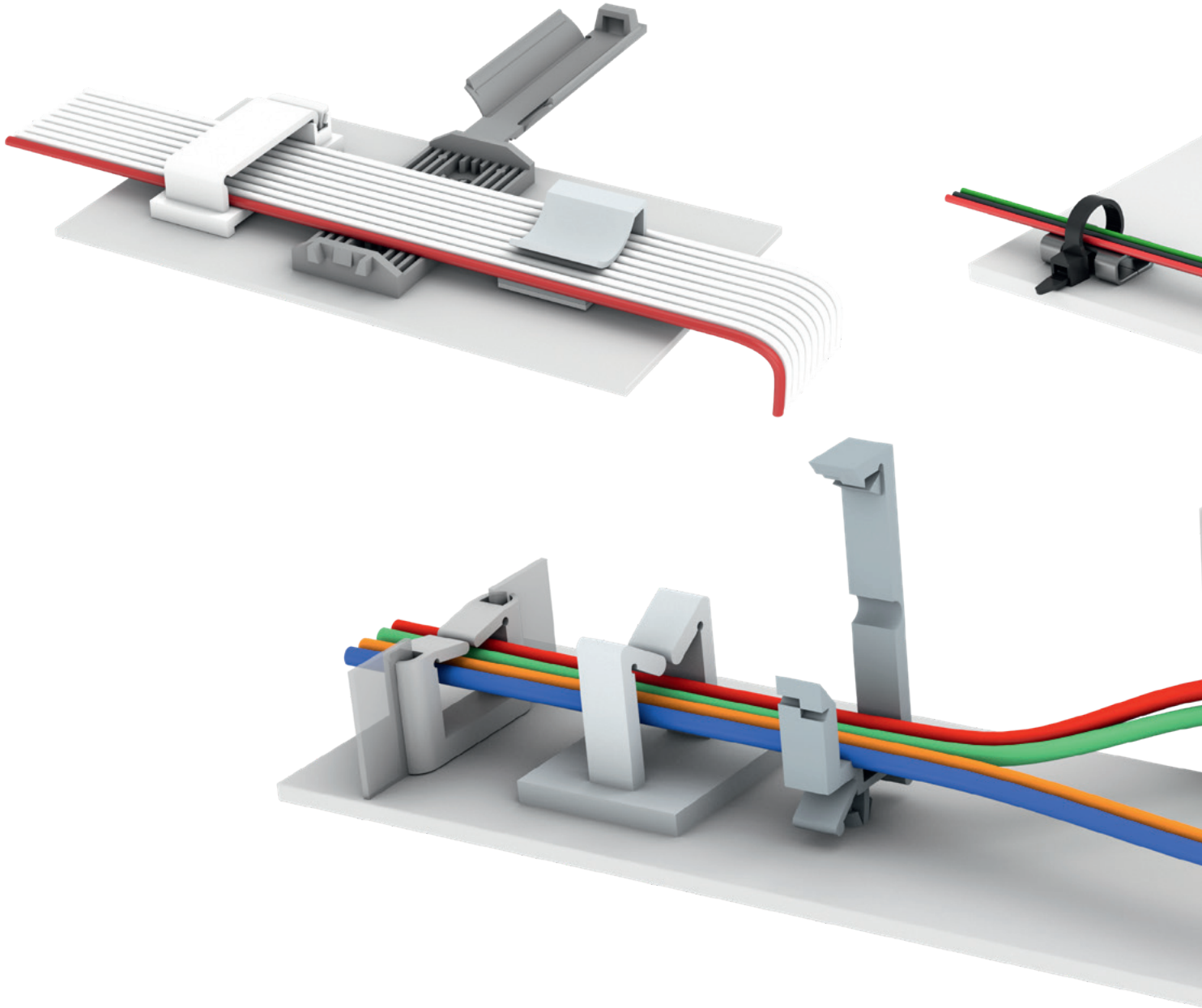
- Length 2 up to 80 mm
- For different hole diameters and panel thicknesses



103

ASSEMBLY TECHNIQUE

CABLE HOLDER & HEAT SHRINK TUBES



Features & Benefits

Cable Holder

- Many different ways to fix cables inside a housing or on a PCB
- single wire or ribbon flat cable

Heat Shrink Tubes

- Insulation and protection of cable, wire and current bar

Available Products

Cable Holder

- Cable clip, twister, holders to use with cable ties
- Mounting on PCB: SMT, snap-in, self-adhesive

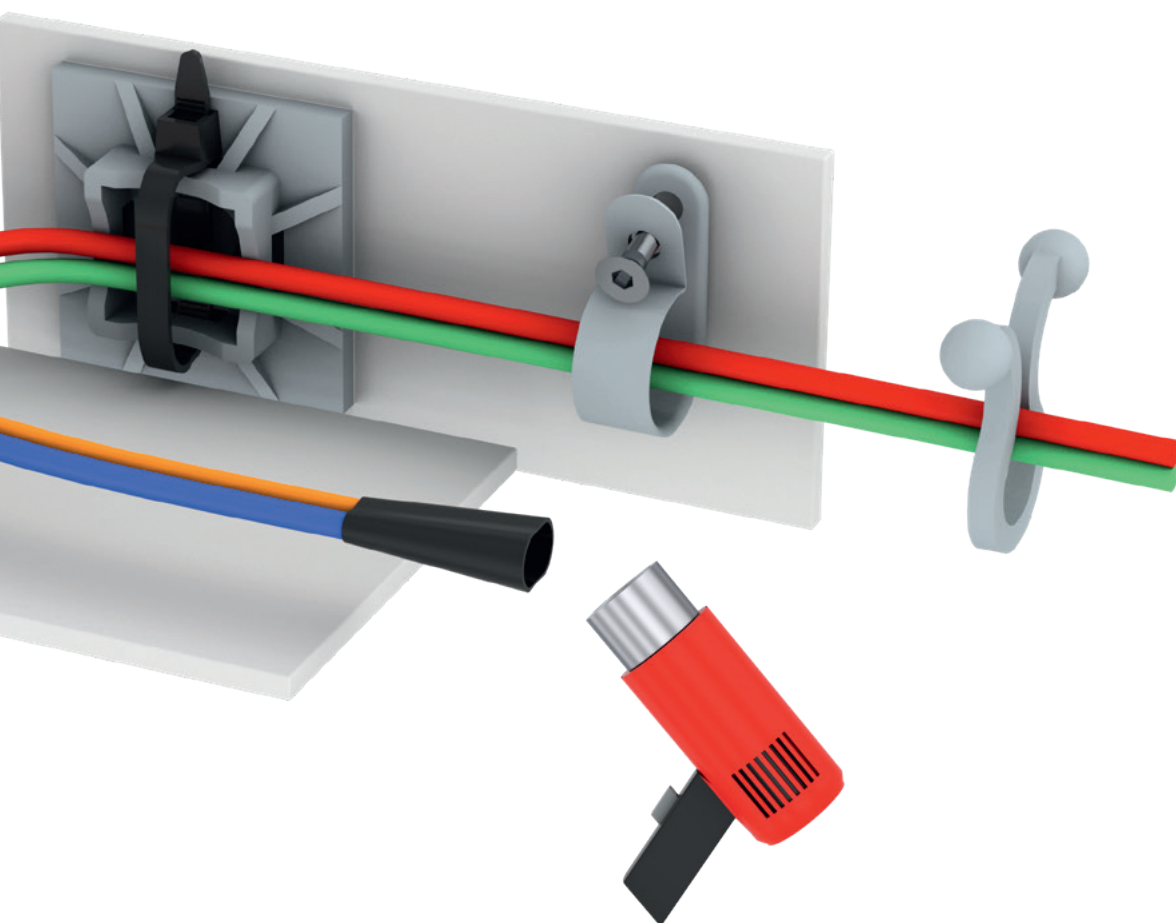
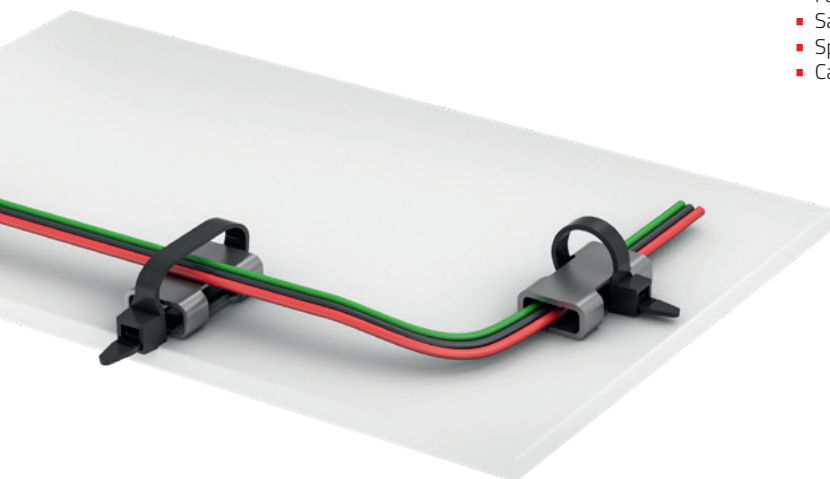
Heat Shrink Tubes

- Various diameters
- Shrinking rate 2:1 and 3:1
- Available on small and big reels

Special Features

SMT Cable Holder

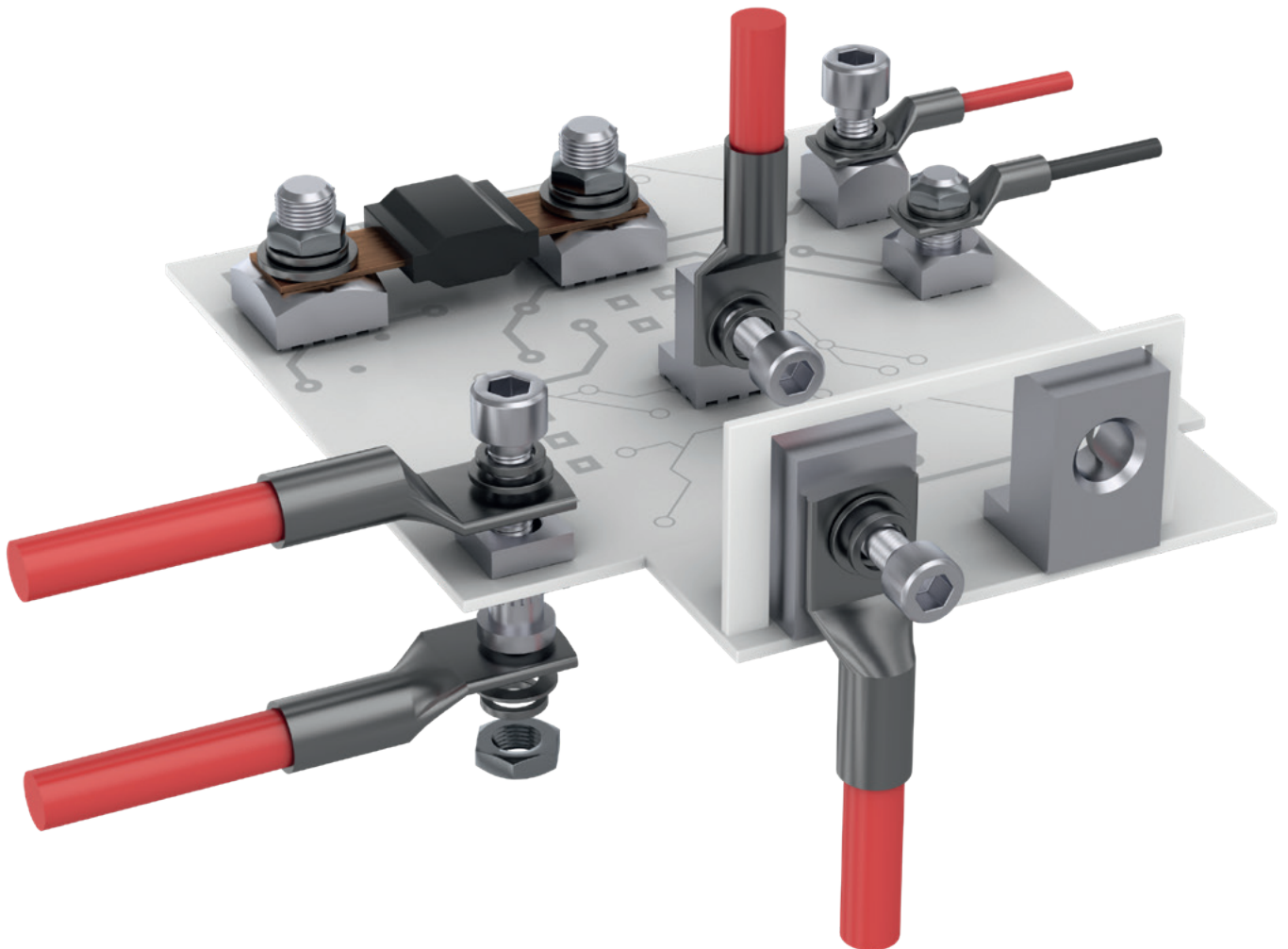
- Fast & precise positioning on the PCB
- Safe & strong mechanical connection
- Space saving
- Cable tie can be assembled in two directions



Visit our online catalogue for detailed
product selection:
www.we-online.com/CABLE-HOLDER

REDCUBE TERMINALS

PRESS-FIT WIRE-TO-BOARD

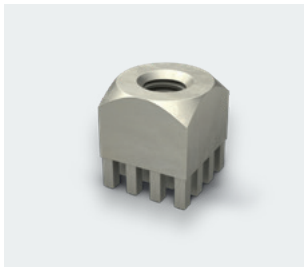


Features & Benefits

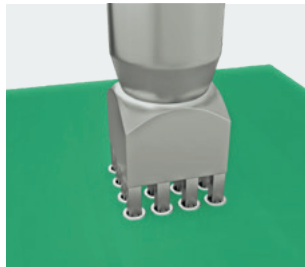
- Pressing the pins into the PCB, a high friction between pin and plated through-hole generates a homogeneous cold-welding between materials. Result is a gastight, strong mechanical connection with contact resistance less than 200 $\mu\Omega$.
- With the lowest Failure-In-Time value, **REDCUBE PRESS-FIT** is the most reliable technology on the PCB. The FIT value is up to 30 times better than that of a SMD solder joint.
- **REDCUBE PRESS-FIT** is suitable for two side mounting and allows very compact design of modules.
- Mounting of laminated fuses is also possible.

Available Products

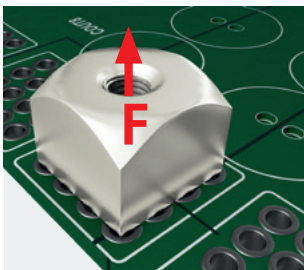
- WP-BUCF, WP-BUTR, WP-BUFU: Internal thread M2.5 to M10
- WP-SHFU: External thread M3 to M10
- WP-RAFU, WP-RATR: Right angled M3 to M10
- WP-RAFE: Right angled edge position M3
- WP-TGCF, WP-TGTR, WP-TPSE: Two-part M3 to M8; \varnothing 3.2 to 10.5 mm
- WA-CLUG: Cable lugs M3 up to M10, 1.5 mm² to 95 mm²
- Customized parts possible on request
- Rated current up to 500 A (+20 °C)



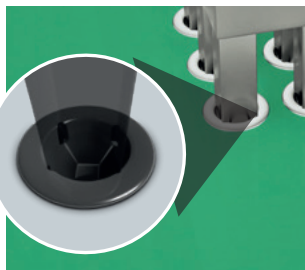
Ampacity up to 500 A



Simple & Quick Processing



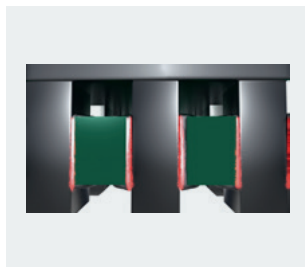
Extraction Force 10 kg/ Pin



Press-Fit Technology



Lowest Heat Development



Cold Welding between Materials

Applications

- High current Wire-to-Board & Board-to-Board connections
- Mounting of copper bars on PCBs
- Angled assembling of cable, PCB and housing
- Mounting of IGBT modules

Advantages

- Simple & quick processing
- No cold solder joints
- High process safety
- Low self heating

Characteristics

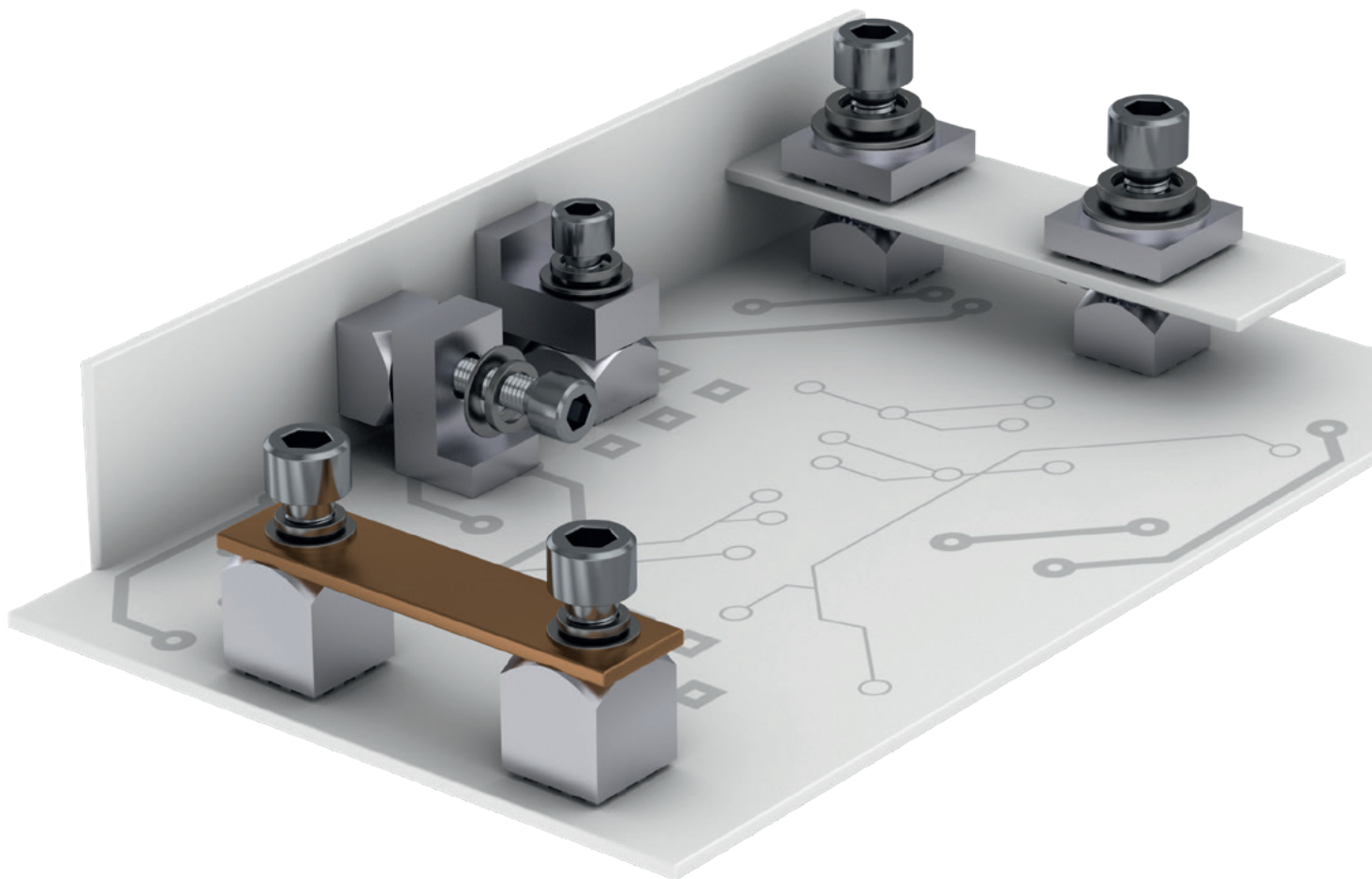
- Homogeneous material transition between pin and through-hole plating
- Contact resistance less than 200 $\mu\Omega$
- Gastight electrical and mechanical connection
- Extremely strong mechanical connection



Visit our online catalogue for detailed
product selection:
www.we-online.com/REDCUBE-PRESSFIT

REDCUBE TERMINALS

PRESS-FIT BOARD-TO-BOARD



Features & Benefits

- **REDCUBE PRESS-FIT** allows high current board-to-board solutions up to 500 A. For applications with current up to 85 A, REDCUBE Press-Fit can be combined with **REDCUBE SMT & THR** versions.
- Mounting of a bus bar for increasing the current-carrying capacity is also possible by using **REDCUBE PRESS-FIT**.
- **REDCUBE PRESS-FIT** can be used for a solid high current connection of relay contractor or IGBT. Horizontal or vertical mounting on the PCB is possible.

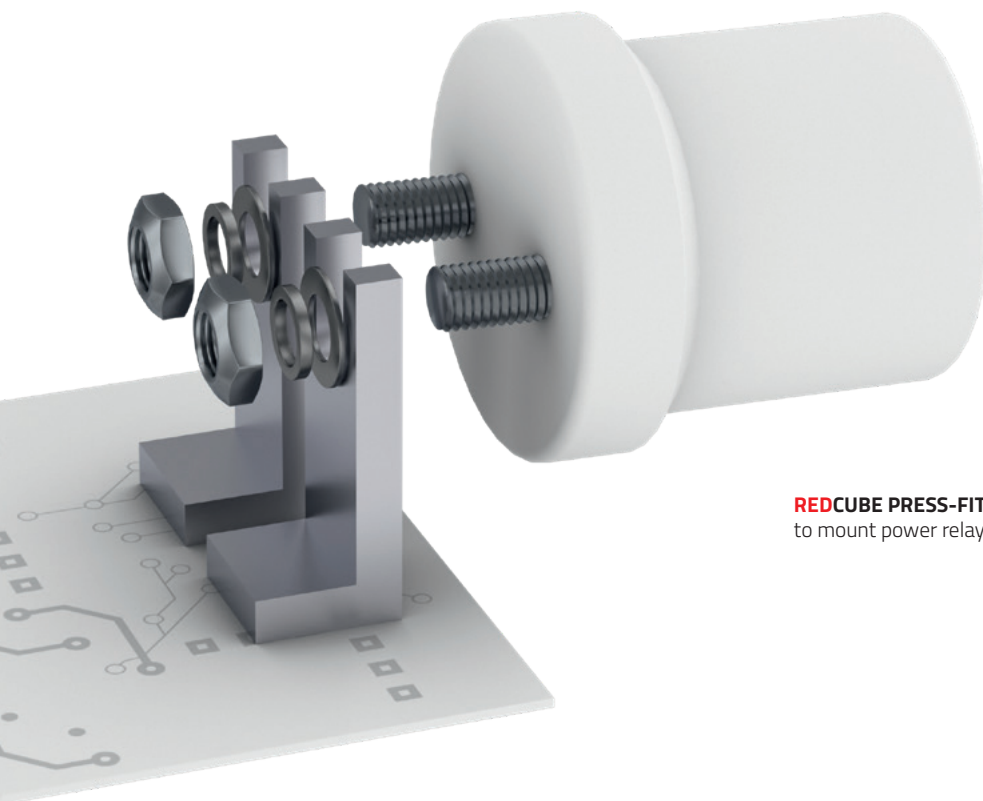
Available Products

- WP-BUCF, WP-BUTR, WP-BUFU: Internal thread M3 to M10
- WP-SHFU: External thread M3 to M10
- WP-RAFU, WP-RATR: Right angled M3 to M10
- WP-RAFU: Right angled U-Shape \varnothing 3.3
- WP-TGCF, WP-TGTR, WP-TPSE: Two-part M3 to M8; \varnothing 3.2 to 10.5 mm
- Customized parts possible on request
- Rated current up to 500 A (+20 °C)

Special Features



Two-part **REDCUBE PRESS-FIT** to mount IGBT



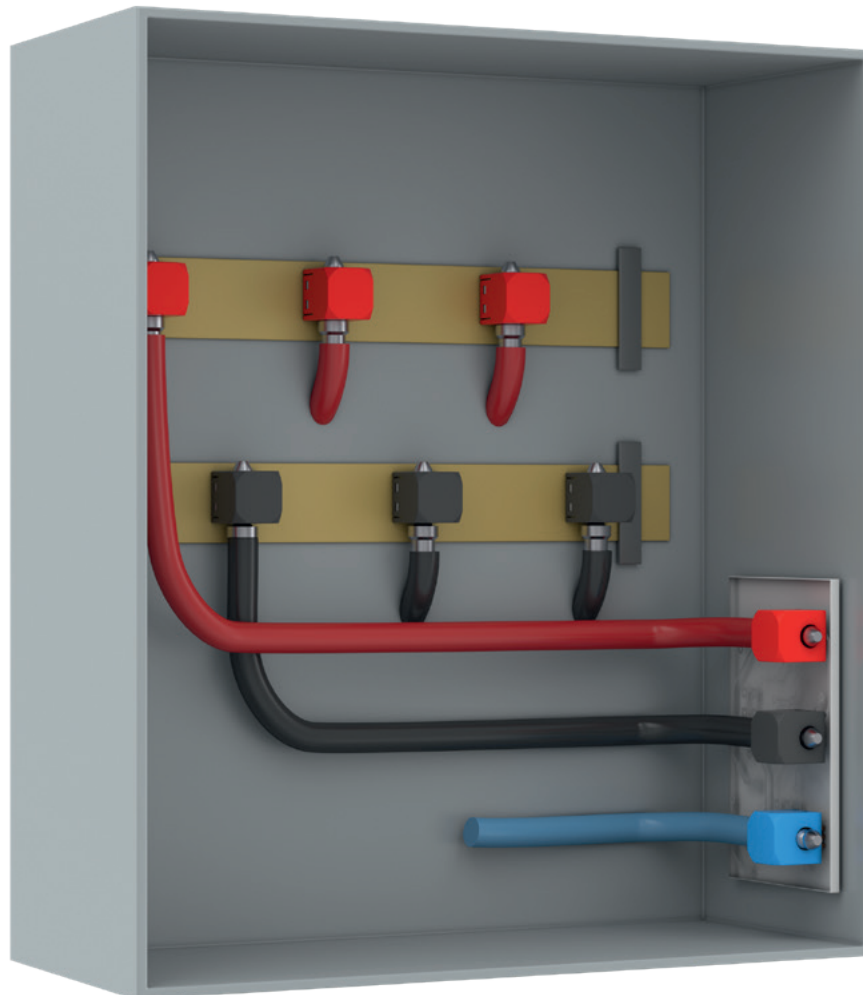
REDCUBE PRESS-FIT right angled with U-shape
to mount power relay



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product selection:
www.we-online.com/REDCUBE-PRESSFIT

REDCUBE TERMINALS

PLUG



Features & Benefits

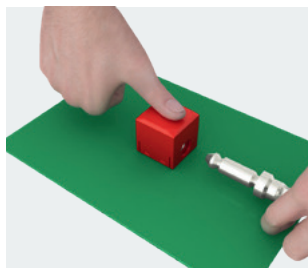
- The quick and easy pluggable solution **REDCUBE PLUG** offers all press-fit advantages. It is a multiple times pluggable solution for high current applications.
- Pushing on the top of the housing allows mating the corresponding cable connector. After actuating, the spring returns to its initial position and locks the cable connector automatically into the housing.
- A common hexagonal crimper is used to install the contact on the wire. This simple lug like crimp set the bond in place.

Available Products

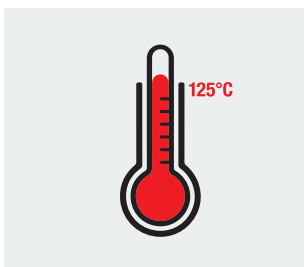
- WP-PLUG: Cable cross section 4, 6, 10 & 16 mm²
- Color: Red, black, blue
- Rated current: up to 120 A (+20 °C)



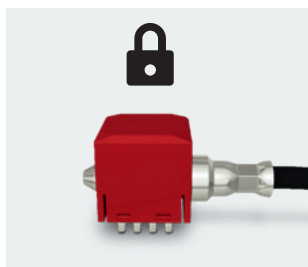
Ampacity up to 120 A



Plugging instead of Screwing



Heat Resistance up to +125 °C



Automated Locking Function



Cross Sections: 4, 6, 10 & 16 mm²



Crimp Connection

Applications

- High current and reversible Wire-to-Board connections
- Battery charger
- Multiple times pluggable solutions
- Mounting in very tight spaces
- Mounting areas with difficult access

Advantages

- Quick and easy assembling
- Tool-free and screwless mounting
- Multiple times pluggable
- Press-Fit advantages

Characteristics

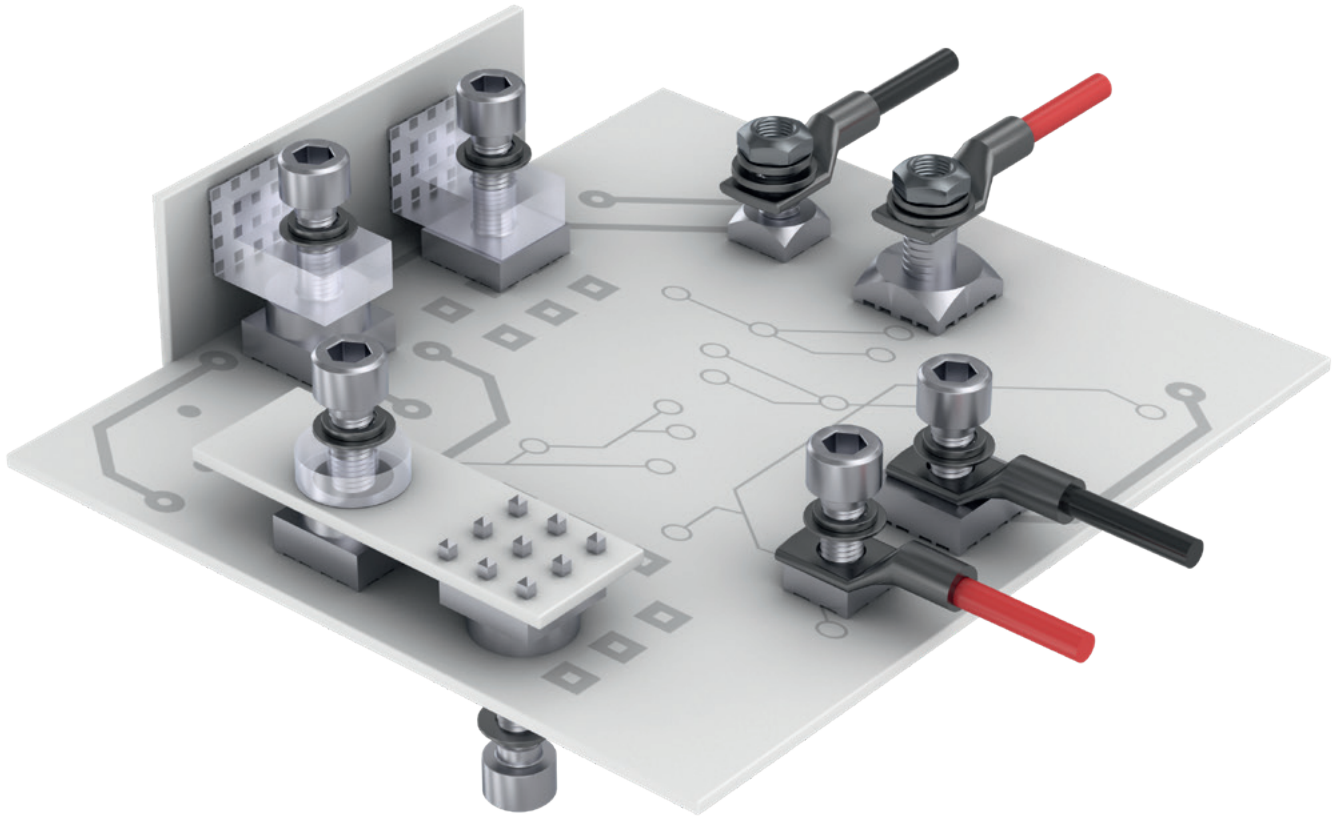
- Standard hexagonal crimping tools
- Gastight and strong crimp connection
- Special plating for optimal crimping results



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www.we-online.com/REDCUBE-PLUG

REDCUBE TERMINALS

THR



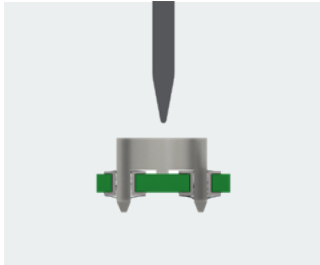
Features & Benefits

- **REDCUBE THR** combines the advantage of Through-Hole-Technology (high mechanical stability) with the time saving pick and place mounting and efficient reflow soldering.
- Drilling from solid material, **REDCUBE THR** guarantees high ampacity with much better torques compared to stamped contacts.
- **REDCUBE THR** shows the highest ampacity of full-automatically processed high-current components.

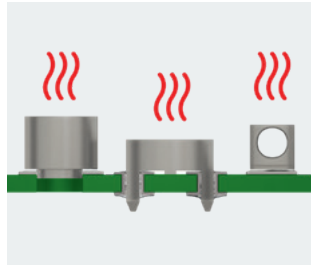
Available Products

- WP-THRB: Internal thread: M3 to M5
- WP-THRSH: External thread: M3 to M5
- WA-CLUG: Cable lugs M3 up to M10, 1.5 mm² to 95 mm²
- Rated current: up to 85 A
- Packaging: Bulk, tape & reel

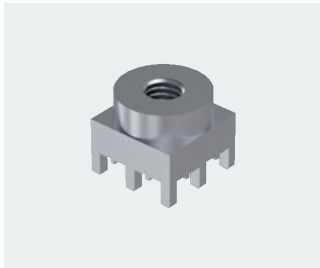
REDCUBE SMD and **THR** are the result of the growing demand in electronic market: high current technology in combination with fully automated, timesaving processing.



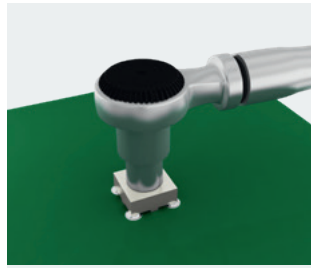
Pick & Place



Reflow Soldering



Ampacity up to 85 A



90° Board-to-Board

Applications

- High current Wire-to-Board and Board-to-Board connections
- Angled assembling of cable, PCB or housing

Advantages

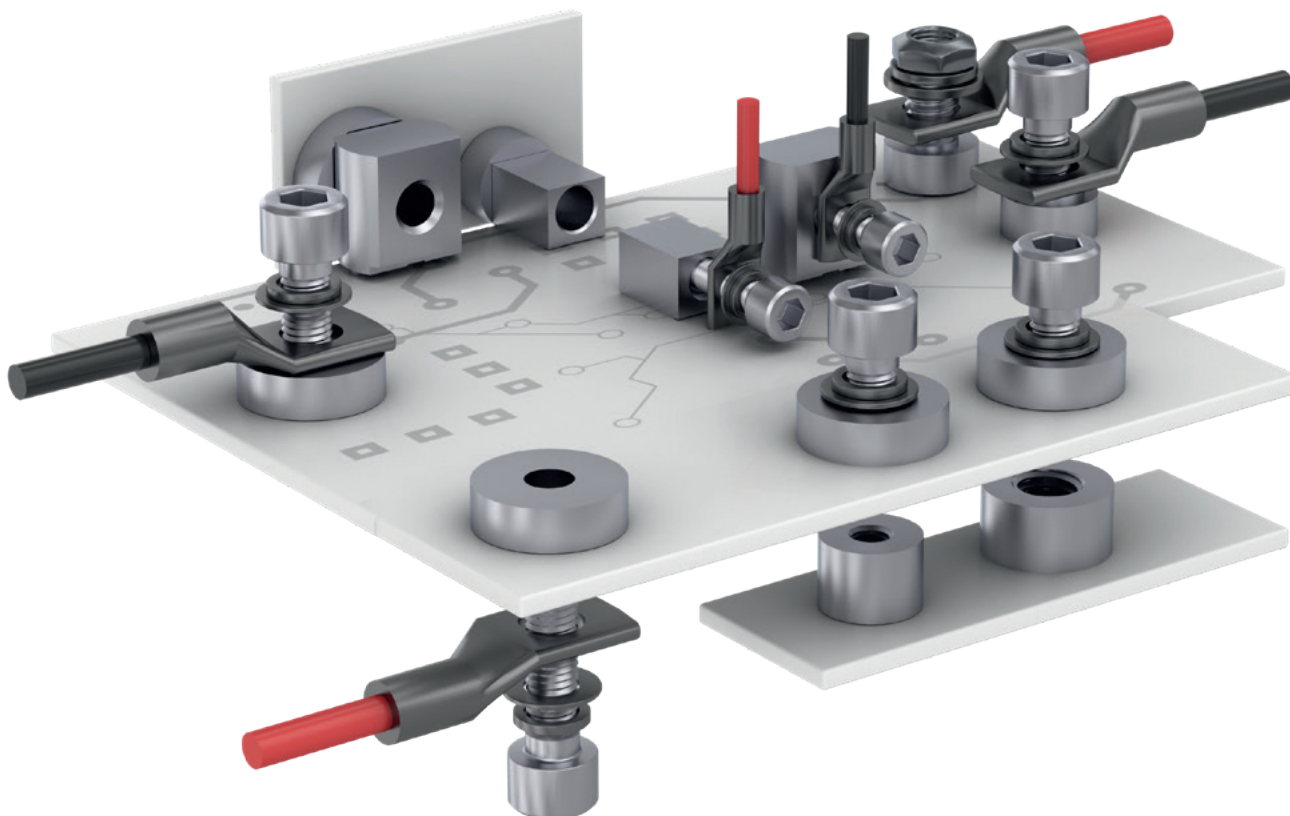
- Optimal current distribution in multilayer applications
- Fully automated reflow soldering
- High mechanical stability
- Low heat development
- Low profile
- Tape & Reel



Visit our online catalogue for detailed
product selection:
www.we-online.com/REDCUBE-THR

REDCUBE TERMINALS

SMT

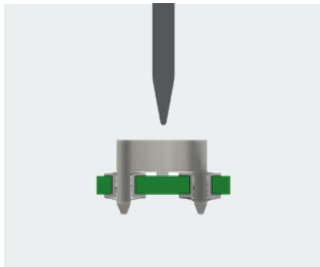


Features & Benefits

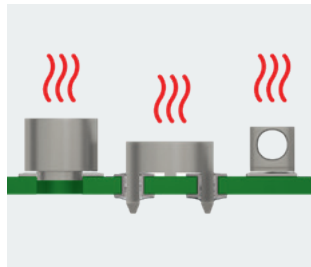
- **REDCUBE SMT** combines the advantages of a fully automated pick and place mounting in conjunction with high-current technology.
- A large connecting area of **REDCUBE SMT** achieves a low contact resistance and best holding forces.
- The small size of **REDCUBE SMT** allows a high packing density without critical heat development on the PCB.

Available Products

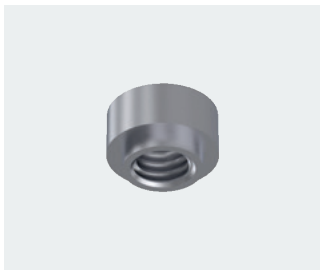
- WP-SMBU: Internal thread: M3 to M5
- WP-SMSH: External thread: M3 to M5
- WP-SMRT: Reverse type Board-to-Board: \varnothing 3.5 to 6.5 mm
- WP-SMRT: Reverse type Wire-to-Board: M3 to M6
- WP-SMRA: Right angled: M2, M3, \varnothing 3.3
- WA-CLUG: Cable lugs M3 M10, 1.5 mm² to 95 mm²
- Rated current: up to 85 A



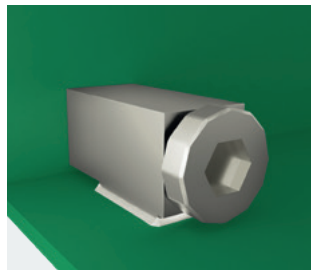
Pick & Place



Reflow Soldering



Ampacity up to 85 A



90° Board-to-Board

Applications

- High current Wire-to-Board and Board-to-Board connections
- Angled assembling of cable, PCB or housing
- Suitable for IMS circuit boards

Advantages

- Simple and fast automated assembly
- High packing density
- Efficient and timesaving soldering process
- Angled assembling of cable, PCB or housing
- Tape & Reel



Visit our online catalogue for detailed
product selection:
www.we-online.com/REDCUBE-SMT

DESIGN KITS

OVERVIEW



CONNECTORS OVERVIEW

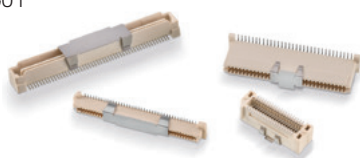
Order Code: 612 690

WR-DC

Order Code: 694 001

WR-BTB

Order Code: 658 001



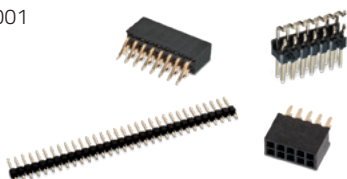
WR-WTB

Order Code: 645 001



WR-PHD

Order Code: 613 001



WR-MPC4

Order Code: 649 001



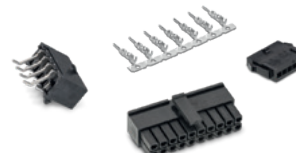
WR-MM

Order Code: 690 001



WR-MPC3

Order Code: 662 001



WR-BHD

Order Code: 612 001



WR-FAST

Order Code: 638 001



WR-FPC

Order Code: 687 001



WR-FSH

Order Code: 696 001



WR-MJ

Order Code: 615 001



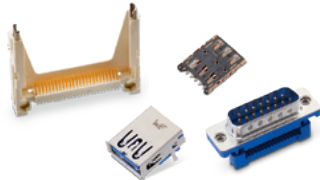
Assembly Overview

Order Code: 700 999



WR-COM

Order Code: 614 001



Tubular Cable Lugs

Order Code: 558 001



WR-SMA / WR-RPSMA

PCB Connector Order Code: 603 301
Cable Connector Order Code: 603 001



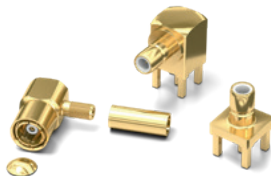
WA-SMST, SMSI, SMSE

Order Code: 977 990



WR-SMB

Order Code: 616 001



SWITCHES

Order Code: 499 001



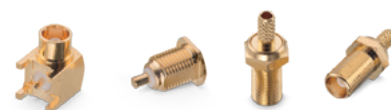
WR-SMP

Order Code: 601 001



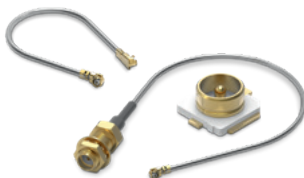
WR-MCX & WR-MMCX

MCX Connector Order Code: 606 001
MMCX Connector Order Code: 660 001



WR-UMRF

Order Code: 636 001



WR-NTYPE

Order Code: 604 001



REDCUBE Terminals

Order Code: 746 701



WR-TBL

Order Code: 691 001



GENERAL TERMS AND CONDITIONS OF THE WÜRTH ELEKTRONIK eiSos GROUP

As of: May 2018

1. Application

1.1 These General Terms and Conditions (hereinafter "**Conditions**") shall apply to all deliveries and services of Würth Elektronik eiSos GmbH & Co. KG, Würth Elektronik iBE GmbH and Erwin Büchele GmbH & Co. KG (hereinafter "**Würth Elektronik**") even if they are not referred to in subsequent contracts. Any terms and conditions of the customer that conflict with, supplement, or deviate from these Conditions shall not become part of the contract unless their application is expressly approved by Würth Elektronik in writing. These Conditions shall apply even if Würth Elektronik accepts a delivery or service from the customer without reservations whilst being aware of the customer's conflicting or deviating terms and conditions.

1.2 Agreements which supplement or deviate from these Conditions and which are made between the customer and Würth Elektronik for the performance of a contract must be set out in writing in the contract. This also applies to the cancellation of this requirement of the written form.

1.3 Any rights beyond these Conditions to which Würth Elektronik is entitled by law shall remain unaffected.

2. Offer and formation of contract

2.1 Offers from Würth Elektronik shall be subject to change and non-binding, unless they are expressly stated to be binding.

2.2 Pictures, drawings, information as to weight, measurement, performance and consumption as well as other descriptions of the goods in the documentation pertaining to the offer shall be approximations only, unless they are expressly stated to be binding. They do not constitute an agreement on, or guarantee of, the corresponding quality of the goods.

2.3 Würth Elektronik reserves all proprietary rights and copyrights in any offer documents. Such documents may not be made available to any third party.

2.4 Orders from the customer shall be binding. Würth Elektronik may accept orders by sending a written order confirmation, by making delivery or providing the services.

2.5 Executing orders according to the documents to be provided by the customer shall require written approval by Würth Elektronik.

2.6 Contracts that are concluded shall oblige the customer to accept and pay for the goods or services ordered.

3. Prices, payment, set-off

3.1 The agreed price shall always be decisive. Not included in the price shall, in particular, be the costs for packaging, freight, insurance, customs, public levies and VAT. Statutory VAT shall be stated separately in the invoice, at the statutory rate applicable on the day the invoice is issued.

3.2 For services that shall not be performed within a period of four months after the contract has been concluded Würth Elektronik shall be entitled to adjust the price in line with any increases in wages and in the cost of materials that may have occurred in the meantime. The same shall apply for services that are to be provided as part of continuous obligations. If Würth Elektronik has agreed with the customer that the prices shall depend on specific price factors, for example, raw material prices, changes in the price factors can lead to price adjustments, irrespective of the performance period.

3.3 Unless otherwise agreed, payment shall be made net within 30 days after the date of the invoice. Würth Elektronik shall, however, be entitled to make the execution of outstanding deliveries or the provision of services contingent upon pre-payment or the provision of security if no previous business relationship exists with the customer, deliveries are to be made abroad, the customer's registered office is abroad or if there are any other reasons that give Würth Elektronik reason to doubt that payment will be made promptly after delivery or provision of the services.

3.4 If after the contract has been entered into Würth Elektronik becomes aware of circumstances that could considerably reduce the customer's creditworthiness and which could endanger the payment of outstanding receivables of Würth Elektronik by the customer under the

individual contract, Würth Elektronik shall be entitled to refuse to continue to execute the contract until the customer makes payment or provides security for such. If the customer is in default of payment, all the receivables of Würth Elektronik that are outstanding with the customer shall become due immediately.

3.5 Payment shall be deemed made on the date on which Würth Elektronik can dispose of the amount owed. When paying by cheque, payment shall only be deemed made after the cheque has been cashed and Würth Elektronik can dispose of the amount. Discount charges and other cheque costs shall be borne by the customer. In the event of default of payment, the customer shall pay default interest at the rate of 9 percentage points above the base rate. The right to assert a further claim for damages is not excluded.

3.6 Würth Elektronik shall be entitled to credit payments made by the customer towards the customer's oldest debt first. If costs and interest have already accrued, Würth Elektronik shall be entitled to credit the payment towards the costs first, then towards interest, and finally towards the principal claim.

3.7 Counterclaims of the customer may only be set off or used to assert a right of retention by the customer if they have become final by virtue of a judgment or if they are undisputed. A right to retain may be asserted by the customer only if the customer's counterclaim is based on the same contractual relationship.

4. Deliveries

4.1 Delivery periods and dates shall only be binding for Würth Elektronik if Würth Elektronik explicitly states or confirms that they are binding. Agreed delivery periods shall be deemed met if the goods have been handed over to the person in charge of the transport at Würth Elektronik's registered office or at one of Würth Elektronik's warehouses before this period has expired or if Würth Elektronik has provided notification that they are ready for dispatch but have not left the registered office or warehouse because the customer has declared that it will not accept the goods.

4.2 If making the agreed deliveries or providing the services of Würth Elektronik requires the cooperation of the customer, the customer shall ensure that Würth Elektronik is provided with all the necessary and appropriate information and data within good time and that such is of the required quality. If programming is required, the customer shall provide Würth Elektronik with the necessary computer processing power, test data and data inputting capacities within good time and to a sufficient extent.

4.3 The delivery period shall not start before all the documents, information, approvals and permits that are to be provided by the customer have been provided in full and any technical issues have been clarified and any agreed down-payment has been received. As a prerequisite for compliance with the delivery period or the delivery date, the customer must perform its other obligations properly and in due time. Compliance with the agreed delivery deadlines and delivery dates is subject to the condition that Würth Elektronik is supplied by its own suppliers in due time and properly. Any changes or amendments that are subsequently agreed with Würth Elektronik may result in a reasonable extension of the agreed delivery dates.

4.4 Würth Elektronik shall be entitled to make reasonable part deliveries and provide partial services. Unless otherwise expressly agreed, deliveries and services ahead of schedule shall be allowed.

4.5 If the customer is in default of acceptance or violates other duties to cooperate, Würth Elektronik can claim compensation for the damage caused including any additional expenditure and storage costs. Any other claims remain unaffected. Würth Elektronik shall be entitled, after setting a reasonable subsequent deadline, to otherwise dispose of the goods and to supply the customer with new goods within a reasonable extended deadline.

5. Passing of risk/dispatch

5.1 The risk of accidental loss or accidental deterioration of the goods shall pass to the customer at the latest when the goods are handed over to the customer or, if it is agreed that the goods will be shipped, already with the handing over of the goods to the shipping company, freight carrier or to any other person instructed to carry out the dispatch. This

shall also apply to part deliveries or if it has been agreed that the dispatch is "freight paid" or free of charge. In the absence of written instructions from the customer, Würth Elektronik shall be entitled to choose the carrier and the itinerary at its own discretion and after a due assessment of the circumstances. At the request and expense of the customer, Würth Elektronik shall take out transport insurance to insure the goods against the risks specified by the customer.

5.2 If there is a delay in handing over or dispatch for reasons for which the customer is responsible, the risk shall pass to the customer on the day the goods are ready to be dispatched and Würth Elektronik informs the customer of such.

5.3 If Würth Elektronik chooses the type of dispatch, the dispatch route and/or the person to carry out the dispatch, Würth Elektronik shall only be liable for wilful misconduct or gross negligence resulting from this choice.

6. Retention of title

6.1 The goods supplied remain the property of Würth Elektronik until all receivables owed to Würth Elektronik by the customer as a result of the business relationship have been fully paid. If Würth Elektronik's obligations to be performed include delivering software, up until payment in full has been made of any receivables, the customer shall in any case only be granted a revocable usage right. These receivables also include claims under cheques and bills of exchange, as well as current-account claims. The customer shall be obliged to handle all goods to which title is retained, and as long as title is retained, with due care. In particular, the customer is obliged to sufficiently insure the goods at the customer's own expense against damage by fire, water, and theft at their replacement value. The customer hereby assigns to Würth Elektronik all claims for compensation arising from such insurance. Würth Elektronik hereby accepts the assignment. If an assignment is not allowed, the customer hereby irrevocably instructs its insurer to make payments, if any, only to Würth Elektronik. This does not affect any further claims of Würth Elektronik. Upon request, the customer must provide Würth Elektronik with evidence of the conclusion of the insurance policy.

6.2 The customer shall only be allowed to sell the goods which are subject to retention of title in the ordinary course of business. The customer shall not be entitled to pledge the goods which are subject to retention of title, to transfer them by way of security or to make any other dispositions which may jeopardize Würth Elektronik's ownership. In the event of attachments or other encroachments by third parties, the customer must notify Würth Elektronik without undue delay in textual form and provide all the information required, advise the third party of Würth Elektronik's property rights and assist with the measures taken by Würth Elektronik to protect the goods which are subject to retention of title. The customer shall bear any costs for which it is responsible and which are necessary for the removal of the encroachment and the recovery of the goods, if and to the extent that these costs cannot be obtained from the third party.

6.3 The customer hereby assigns to Würth Elektronik all receivables arising from the resale of the goods, including all ancillary rights, irrespective of whether the goods which are subject to retention of title are resold without or after further processing. Würth Elektronik hereby accepts this assignment. In the event that such assignment is not allowed, the customer hereby irrevocably instructs the third-party debtor to make payments, if any, only to Würth Elektronik. The customer has the authority, which may be revoked at any time, to collect the receivables assigned to Würth Elektronik as a trustee on behalf of Würth Elektronik. All amounts collected must be remitted to Würth Elektronik immediately. Würth Elektronik may revoke the customer's authority to collect receivables and its right to resell the goods if the customer fails to properly perform its payment obligations to Würth Elektronik, if the customer is in default of payment or stops payment, or if the creditworthiness or financial position of the customer deteriorates, he cease any other business activity essential for the contractual performance or if he becomes incapable for other reasons to fulfil the contractual duties. Any resale of these receivables is subject to prior approval by Würth Elektronik. The customer's authority to collect shall expire with the notification of the assignment to the third-party debtor. In the event of a revocation of the authority to collect, Würth Elektronik may request that the customer disclose all receivables assigned, as well as the respective debtors' names, provide all information necessary

for collection, provide the related documents and inform the debtors of the assignment.

6.4 In the event of default of payment on the part of the customer, Würth Elektronik shall be entitled to rescind the contract without prejudice to its other rights. The customer must immediately grant Würth Elektronik, or any third party commissioned by Würth Elektronik, access to the goods that are subject to retention of title, surrender such goods and inform Würth Elektronik where these goods are located. After a timely warning to such effect, Würth Elektronik may otherwise dispose of the goods that are subject to retention of title for the purpose of satisfying its due claims against the customer.

6.5 Any processing or alterations made by the customer to the goods which are subject to retention of title shall always be deemed made on behalf of Würth Elektronik. The customer's right to acquire ownership of the goods which are subject to retention of title continues to exist as a right to acquire ownership of the processed or altered item. If the goods are processed, combined or mixed with other goods that are not owned by Würth Elektronik, Würth Elektronik shall acquire a co-ownership interest in the new item that is equal to the ratio of the value of the goods supplied to the value of the other items processed at the time of processing. The customer shall store the new items on behalf of Würth Elektronik. In all other respects, the item created through processing or alteration shall be governed by the same provisions as the goods that are subject to retention of title.

6.6 If requested by the customer, Würth Elektronik shall be obliged to surrender the security interests to which Würth Elektronik is entitled to the extent that the realizable value of these security interests exceeds Würth Elektronik's receivables arising from the business relationship with the customer by more than 20% upon deduction of the mark-downs customary in the banking business. For valuation purposes, goods that are subject to retention of title shall be assessed on the basis of their invoice value and receivables shall be assessed on the basis of their nominal value.

6.7 In the event that goods are delivered to destinations with other legal systems in which the retention of title pursuant to clauses 6.1 to 6.6 above does not offer the same degree of protection as in the Federal Republic of Germany, the customer hereby grants Würth Elektronik the equivalent security interest. If the creation of this security interest requires further declarations or actions, the customer shall make these declarations and perform these actions. The customer shall assist with all measures required for, and conducive to, the validity and enforceability of such security interests.

7. Claims for quality defects and liability

7.1 Würth Elektronik shall manufacture its products according to the state of the art in technology applicable at time of entering into the contract. Any intended usage that goes beyond the customary usage of the products or that requires a quality that deviates from the norm, in particular, any usage that is relevant for safety purposes, for example, aerospace or automobile usage, must be agreed in advance in writing.

7.2 The customer's defect rights shall require that the customer has fulfilled its statutory obligations to inspect and give notice of defects (Sec. 377, 381 German Commercial Code (*HGB*)), in particular that the customer has checked the delivered goods upon receipt and notified Würth Elektronik without undue delay and in textual form upon receipt of the goods of any obvious defects and defects that could be identified during such inspection. The customer shall inform Würth Elektronik in writing of any hidden defects without undue delay after they have been discovered. The notification shall be deemed without undue delay if made within two weeks after delivery for obvious defects and defects that could be identified during a proper inspection or after discovery in the event of hidden defects; to meet the deadline, the dispatch of the notification or complaint shall suffice. If the customer fails to carry out a proper inspection and/or notification of the defects, Würth Elektronik shall not be liable for the defect. When reporting defects to Würth Elektronik, the customer must supply a detailed description of the defects in textual form.

7.3 Unless otherwise agreed, the customer shall initially deliver the goods at its own expense to Würth Elektronik so that the defects can be examined. The expenses that are required for the inspection and subsequent performance, in particular transportation, travel, labour and

GENERAL TERMS AND CONDITIONS OF THE WÜRTH ELEKTRONIK eiSos GROUP

As of: May 2018

material costs within the meaning of Sec. 439 (2 and 3) German Civil Code (*BGB*) shall only be borne by Würth Elektronik if it is determined during the inspection that a defect actually exists and provided these expenses are not increased due to the fact that the customer took the goods to a different location than the original delivery address. Personnel and material costs claimed by the customer in this connection shall be charged on the basis of net costs. The reimbursement of the costs for removal and installation in the context of supplementary performance regardless of fault is excluded. Equally excluded is the applicability of Sec. 445 a and 445 b German Civil Code (*BGB*).

7.4 If the goods are defective, Würth Elektronik shall be entitled - for the purposes of subsequent performance - to choose between remedying the defect or delivering goods that are free from defects.

7.5 If Würth Elektronik is not prepared or is not in a position to carry out subsequent performance after a reasonable deadline has expired, the customer can choose to rescind the agreement or reduce the purchase price. The same shall apply if the subsequent performance fails, if it is unacceptable to the customer or if a reasonable deadline is exceeded due to reasons for which Würth Elektronik is responsible.

7.6 The customer shall have no right to rescind the contract if the customer is unable to return the goods received and this is not due to the fact that it is impossible to return such due to their nature, if Würth Elektronik is responsible for such or if the defect did not become apparent until after the goods were processed or altered. The right to rescind the contract shall furthermore not exist if Würth Elektronik is not responsible for the defect and if instead of the received goods or services being returned by the customer, Würth Elektronik has to pay compensation for lost value.

7.7 Claims for defects shall not exist with respect to defects that are due to natural wear and tear, to improper handling by the customer or a third party, or to changes or repairs to the goods that have been carried out by the customer or a third party in an improper manner. The same shall apply to defects which can be attributed to the customer or which arise as a result of technical reasons other than the original defect. The customer shall, in particular, comply with the operational, storage and/or maintenance recommendations provided by Würth Elektronik or the manufacturer.

7.8 The customer's claim for reimbursement of expenses in place of damages in lieu of performance shall be excluded if and to the extent that such expenses would not have been made by a reasonable third party.

7.9 Würth Elektronik shall not be liable for damage for which it is not responsible, in particular, it shall not be liable for damage that is caused by improper usage or handling of the products. The customer is obliged to comply with the operational, storage and/or maintenance recommendations provided by Würth Elektronik or the manufacturer, to only make authorised changes, replace spare parts professionally and use the consumables that have the necessary specifications. Where applicable the customer shall, both before and also regularly after the deliveries have been made or the services have been provided by Würth Elektronik, perform backups to its computer systems at sufficiently regular intervals. Würth Elektronik shall assume no liability for damage which is caused by or can be attributed to a breach of the aforesaid obligations of the customer.

7.10 Würth Elektronik shall be liable without limitation for any damage resulting from breach of guarantee or from death, bodily injury, or damage to health. The same shall apply to wilful misconduct and gross negligence, to mandatory statutory liability for product defects (in particular under the German Product Liability Act (*ProdHaftG*) and to liability if defects were concealed with fraudulent intent. In cases of slight negligence, Würth Elektronik shall only be liable if material obligations are breached that result from the nature of the contract and the performance of which is of particular importance in order for the purpose of the contract to be achieved. If such obligations are breached, as well as in the event of default or if performance is impossible, Würth Elektronik's liability shall be limited to the damage which can typically be expected with such contract.

7.11 The limitation period for claims for defects of the customer shall be one year, unless the defective good has been used in its customary manner for a building and this has caused a defect to the building. The limitation period shall also apply to claims resulting from a tortious act that are based on a defect of the goods. The limitation period shall start with the delivery of the goods. This shall not affect the unlimited liability of Würth Elektronik for damage resulting from a breach of guarantee or from death, bodily injury or damage to health, for wilful misconduct and gross negligence, and product defects. If Würth Elektronik makes a statement with regard to a claim for defects asserted by the customer, this shall not be deemed as the start of negotiations with regard to the claim or the circumstances on which the claim is based, provided the claim for defects is fully rejected by Würth Elektronik.

8. Intellectual property and usage rights relating to software and other protected products, information and co-operation duties

8.1 Unless otherwise provided in the contract or by law, any rights relating to software or other protected products which are delivered to the customer or which are produced for the customer, in particular, copyrights, industrial property rights such as, patents, trademarks and registered designs, shall remain the property of Würth Elektronik or the individual proprietor of the rights. This shall also apply if the software or any other protected products are produced according to the specifications of or in co-operation with the customer.

8.2 If Würth Elektronik uses the customer's software, Würth Elektronik shall only use such software for the contractually agreed purpose. If Würth Elektronik requires the source codes for the software to make contractually agreed changes or remedy defects, the customer shall provide Würth Elektronik with such free of charge for use.

8.3 The customer shall only receive a simple right of use to the software and other protected products to such extent as is required for the purpose of the contract, unless otherwise provided in the contract, in particular, the applicable licencing terms of the software or an individual licence agreement, or by mandatory statutory law. With regard to software provided by Würth Elektronik, unless expressly permitted under the contract or by law, the customer shall in particular be forbidden from reproducing, distributing, disclosing, changing, translating, extending, making other modifications to and/or decompiling such.

8.4 For backup purposes, the customer may create the necessary backup copies of the software, provided the individual licence agreement does not contain provisions to the contrary. Sec. 69d (2) Germany Act on Copyright and Related Rights (*UrhG*) remains unaffected. Backup copies on moveable data carriers shall be marked as such and shall be endorsed with the copyright notice of the original data carrier.

8.5 In the event of unlawful use Würth Elektronik and/or third parties, in particular, the manufacturer of the software or other protected products, reserve the right to assert claims for compensation.

8.6 In the event that a third party alleges it has a claim which conflicts with the right of use granted to the customer, the customer shall inform Würth Elektronik without undue delay in text form. The notification shall also include information as to whether the customer has changed the software or the product or combined such with other software and whether this, from the customer's perspective, could justify the third party's claim. If so requested by Würth Elektronik, the customer shall allow Würth Elektronik to handle the defence against these claims and, to the extent permissible and possible, shall allow Würth Elektronik to represent the customer or shall conduct the defence itself as instructed by Würth Elektronik. Up until receiving notification as to whether Würth Elektronik will deal with the defence, the customer shall not acknowledge or enter into a settlement agreement regarding the alleged claims of the third party without the express approval of Würth Elektronik. If Würth Elektronik deals with the defence, this obligation shall continue to apply. In addition, the customer shall support Würth Elektronik in its defence, if this is required for an appropriate defence. In return, Würth Elektronik shall indemnify and hold the customer harmless against any necessary external costs and any third party compensation claims and claims for reimbursement of expenses resulting from the defence, provided these can be attributed to the fault of Würth Elektronik. In the event that Würth Elektronik does not deal with the defence, the customer shall be entitled to defend itself at its

own discretion. If existing third party claims cannot be attributed to the fault of Würth Elektronik, the customer shall not be entitled to assert claims against Würth Elektronik.

8.7 Notwithstanding Sec. 439 (1) German Civil Code (*BGB*), Würth Elektronik shall also be entitled with regard to title defects relating to software to attempt subsequent performance, if Würth Elektronik so chooses (cf. 7.4). In all other respects, the statutory provisions for warranty obligations for title defects with regard to software shall apply irrespective of whether Würth Elektronik is dealing with the defence against third party claims under clause 8.6 of these Conditions, however, with the following exceptions: (i) for the recovery of data, Würth Elektronik shall only be liable insofar as the loss of data would also have occurred if the customer had carried out the usual backups; (ii) clause 7.3 of these Conditions applies accordingly.

9. Product liability

9.1 The customer shall not modify the goods; in particular, the customer shall not modify or remove existing warnings relating to risks by improperly using the goods. If this duty is violated, the customer must inter partes indemnify and hold Würth Elektronik harmless from and against any product liability claims of third parties to the extent that the customer is responsible for the defect giving rise to liability.

9.2 If Würth Elektronik has to carry out a product recall or issue a product warning because of a product defect to the goods, the customer shall assist Würth Elektronik and take all measures ordered by Würth Elektronik, provided that these do not pose an unreasonable burden to the customer. The customer shall be obliged to bear the costs of the product recall or product warning, provided the customer is responsible for the product defect and the damage sustained. This does not affect any further claims of Würth Elektronik.

9.3 The customer shall inform Würth Elektronik without undue delay in textual form of any risks in the use of the goods and any possible product defects of which the customer becomes aware.

10. Force majeure

10.1 If Würth Elektronik is prevented by force majeure from performing its contractual obligations, in particular from delivering the goods, Würth Elektronik shall be released from its obligation to perform for the duration of the impediment and for a reasonable start-up period without being liable to the customer for damages. The same shall apply if the performance of its obligations by Würth Elektronik becomes unreasonably complicated or temporarily impossible because of unforeseeable circumstances for which Würth Elektronik is not responsible, in particular, because of industrial action, official acts, energy shortages, delivery problems on the part of suppliers, or major disruptions of operations.

10.2 Würth Elektronik shall have the right to rescind the contract if such an impediment continues for more than three months and if, as a result of such impediment, the performance of the contract is no longer of interest to Würth Elektronik. At the request of the customer, Würth Elektronik shall declare after the expiry of the aforesaid three-month period whether it intends to make use of its right to rescind the contract or whether it intends to deliver the goods within a reasonable period of time.

11. Confidentiality

The customer shall be obliged for an unlimited period of time to maintain the confidentiality of any and all information received through Würth Elektronik which is stated to be confidential or which due to other circumstances can be identified as a trade or business secret; the customer may neither record nor disclose or use any such information. The customer must ensure by means of suitable contractual agreements with its employees and those agents working on its behalf that such persons also refrain for an unlimited period of time from any use, disclosure and unauthorised recording of such trade and business secrets for their own purposes.

12. Final provisions

12.1 Any rights and obligations of the customer may only be assigned or transferred to a third party with the written consent of Würth Elektronik.

12.1 The legal relations between the customer and Würth Elektronik shall be governed by the laws of the Federal Republic of Germany, without regard to the United Nations Convention on Contracts for the International Sale of Goods (CISG).

12.3 Exclusive place of jurisdiction for all disputes arising from the business relationship between Würth Elektronik and the customer shall be the registered office of Würth Elektronik. Würth Elektronik may in addition sue the customer at the latter's registered office, as well as at any other permissible place of jurisdiction.

12.4 The place of performance for any and all obligations to be performed by the customer and by Würth Elektronik shall be the registered office of Würth Elektronik.

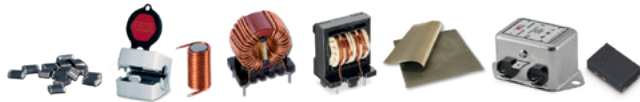
12.5 If a provision of this agreement is or becomes invalid or impracticable in whole or in part, or if this agreement is incomplete, this shall not affect the validity of the remaining provisions hereof. In lieu of the invalid or impracticable provision, such valid and impracticable provision shall be deemed agreed as comes closest to the purpose of the invalid or impracticable provision. In the event that this agreement is incomplete, such provision shall be deemed agreed as corresponds to what would have been agreed according to the purpose of this agreement if the contracting parties had considered the matter from the outset.

13. Environmental declaration

Würth Elektronik is committed to people and the environment. Therefore, we undertake to manufacture our products in a manner that conserves resources and to systematically realise any potential for saving energy in manufacturing processes and in transportation. We pay close attention to ecological alternatives as concerns the selection of sources of energy and raw materials and pursue a consistent policy of waste reduction and product recycling.

NOTES

ELECTRONIC & ELECTROMECHANICAL COMPONENTS



EMC Components



Power Magnetics



Signal & Communications



Quartz & Oscillators



Capacitors



Resistors



Automotive Standard Products



Optoelectronics



Power Modules



Wireless Connectivity & Sensors



Connectors



Fuseholders



Switches



Assembly Technique



REDCUBE Terminals

MORE THAN YOU EXPECT

Würth Elektronik eiSos differs from all other component manufacturers in several aspects:

- We guarantee all catalog products are available ex stock
- Samples free of charge
- Orders below MOQ
- Design kits with lifelong free refill
- Design Guide Trilogy of Magnetics, Trilogy of Connectors, Trilogy of Wireless Power Transfer, Abc of Capacitors, Abc of Power Modules & Application Handbook LTspice IV Simulator Design
- Seminars and webinars free of charge
- Reference designs of leading IC manufacturers
- Worldwide technical sales force and field application engineers on site