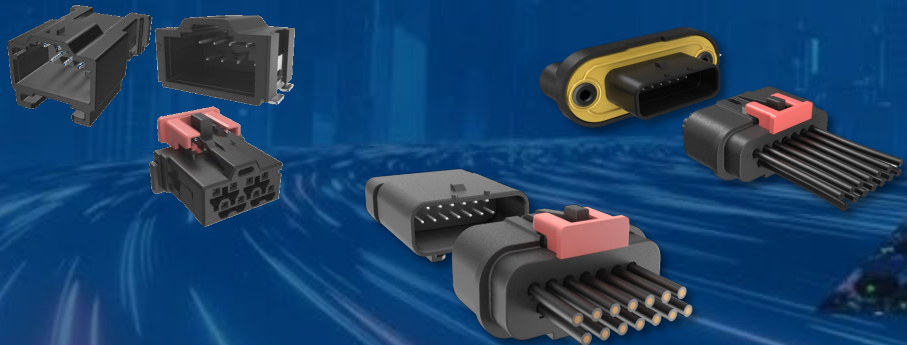


Amphenol

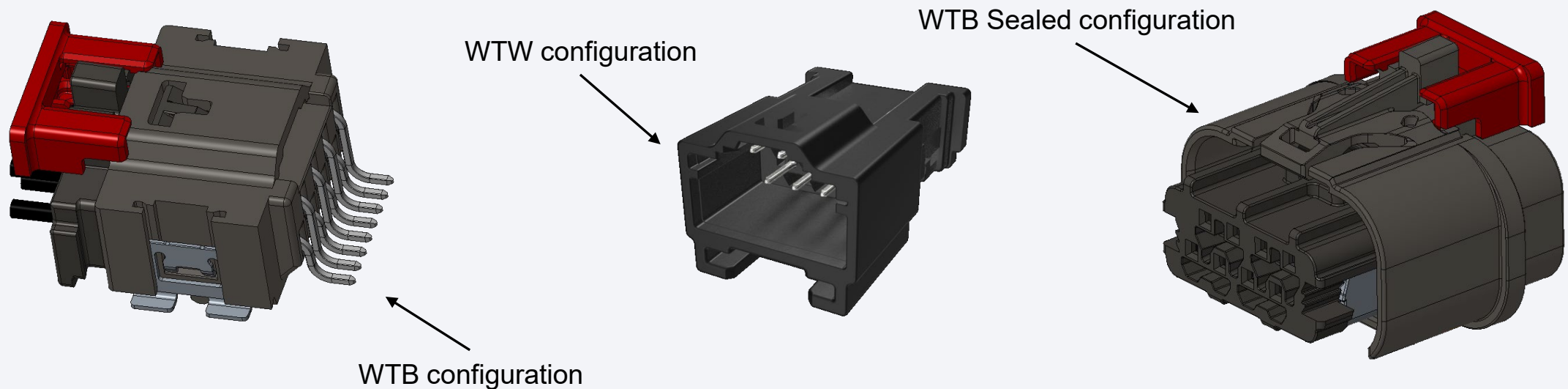
COMMUNICATIONS SOLUTIONS

MicroSpaceXS™ Product Presentation



FCi Basics

- The MicroSpaceXS™ Crimp-to-Wire's compact design addresses the growing demand for miniaturizing components. The connector is capable of reducing the PCB footprint by 50% due to the increase in signal density.
- The connector has nominal current carrying capacity of up to 4A and cable external diameter up to 1.4 mm.

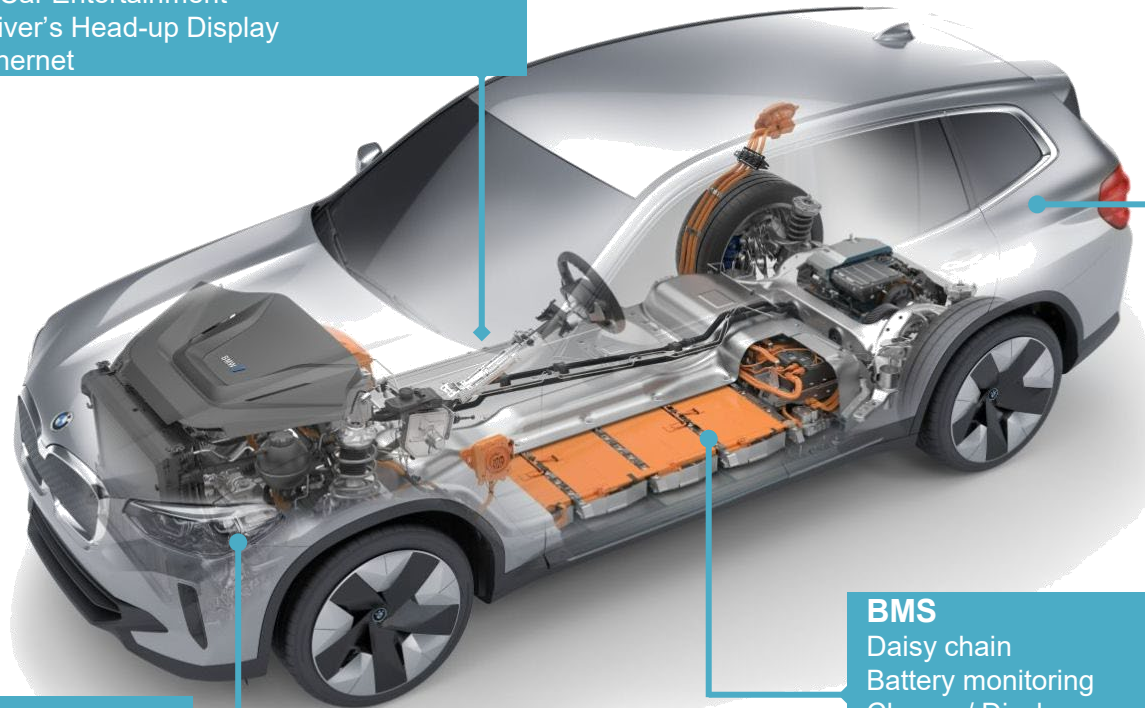


- The unique design of the MicroSpaceXS™ CtW makes this solution and contact pitch compatible with LV214 Severity-2 and USCAR-T2V2 for Tin plating and LV214 Severity-3 and USCAR-T4V2 for Gold plating. The right choice when high vibration endurance, primary latch, TPA, CPA, Poka Yoke, Kojiri safe are required with flexible configurations.

MicroSpaceXS™ Target Market Application



Infotainment
Navigation
In Car Entertainment
Driver's Head-up Display
Ethernet



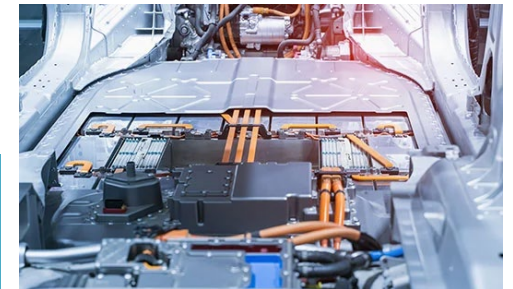
Camera System
Front Camera
Rear Camera

Surrounding Camera
Internal Camera



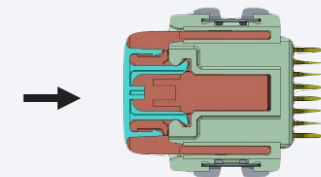
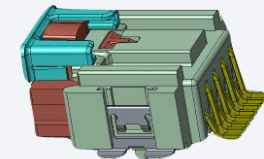
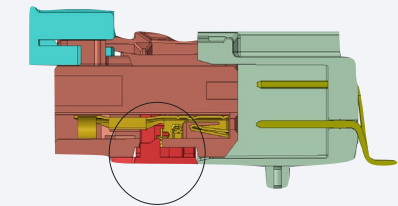
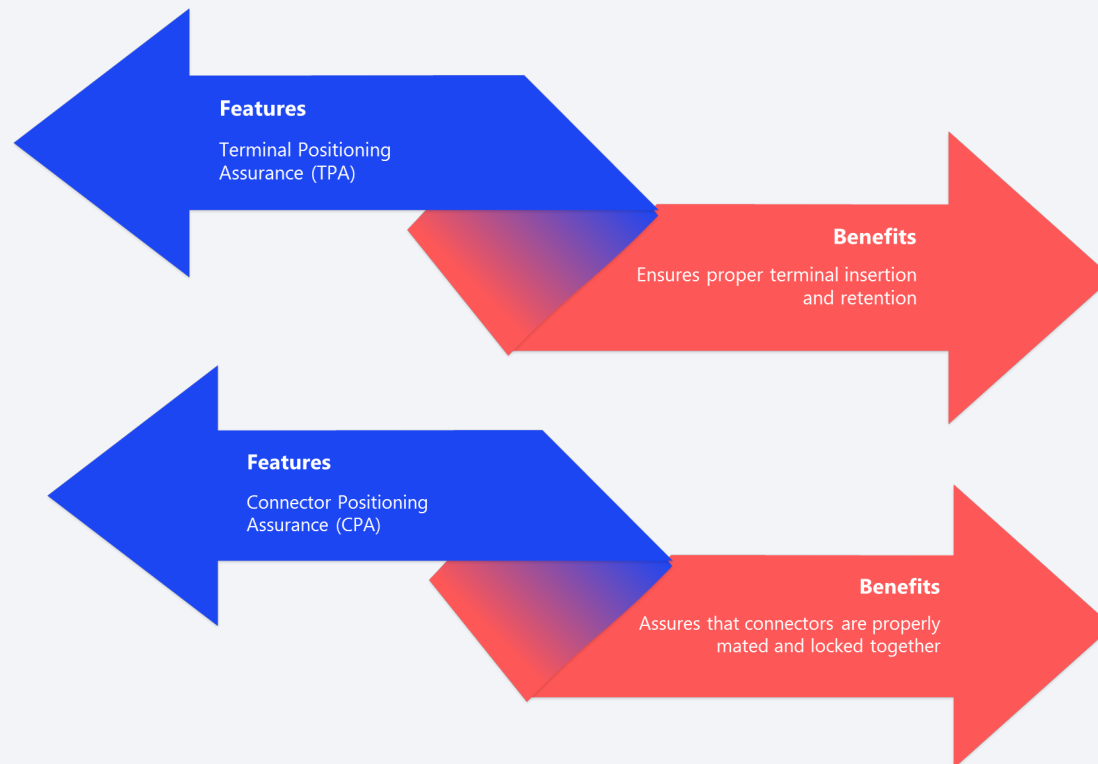
LED Lighting System
Front and Rear Head light
Internal Lights

BMS
Daisy chain
Battery monitoring
Charge / Discharge control



How MicrospaceXS™ is answering to technology trend

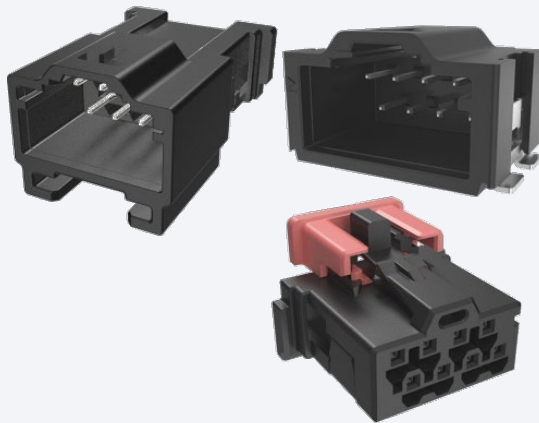
The evolving technology has imposed some new features like Terminal Positioning Assurance to ensure proper position and retention of the crimp terminal in the housing, or Connector Positioning Assurance to ensure the connectors are well mated in the final position and avoid accidental activation of the connector latching.



At the final position the CPA block the movement

MicroSpaceXS™ LV214 Up To Severity 3 **USCAR** T2V2 & T4V2

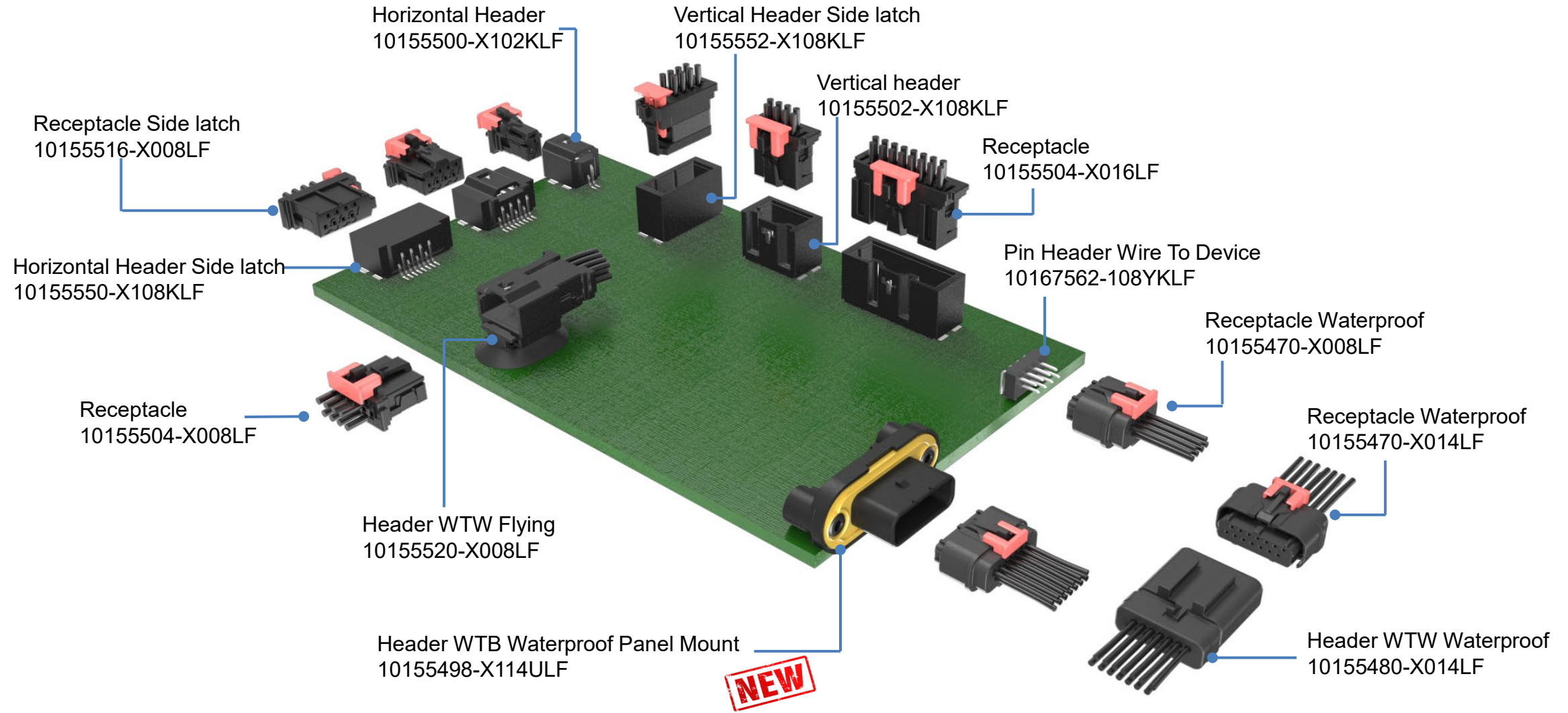
MicrospaceXS™ Unsealed



MixcrospaceXS™ Waterproof

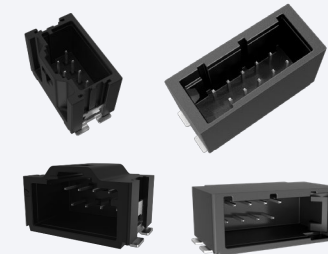


MicroSpaceXS™ Product Overview



Unsealed Family Configuration Matrix

Pitch	Header		Receptacle	Wire to Board	Max Current (A)	Wire size		Plating options	Top Latch	Side Latch	CPA	TPA
				STG*		AWG	OD (mm)					
1,27 mm	Vertical	10155502	10155504	✓	4	22-28	1.4	Tin, Gold	✓	✓	✓	✓
		10155512	10155514									
		10155552	10155516									
	Horizontal	10155500	10155504									
		10155510	10155514									
		10155550	10155516									



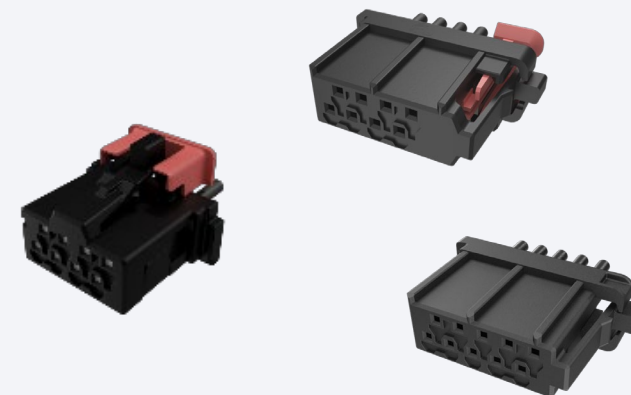
Pitch	Header		Receptacle	Wire to Wire	Max Current (A)	Wire size		Plating options	Top Latch	CPA	TPA	Connector clip (optional)
				STG*		AWG	OD (mm)					
1,27 mm	WTW Flying	10155520	10155504	✓	4	22-28	1.4	Tin, Gold	✓	✓	✓	✓



- Latch position: *Top and Side*
- 1,27 Staggered (positions): *2 to 16*
- Header soldering : *SMT*

*STG : staggered

MicrospaceXS™ is layout compatible with
Microspace™ design
for 3 to 16 positions



Product Specification MicrospaceXS™ unsealed

STANDARDS compatibility

- LV214 specification – up to severity 3 (See the product SPEC GS-12-1634)
- VW 75174 Slow motion bending test
- USCAR T2V2 for Tin plating and T4V2 for Gold plating
- VW 60330 crimp specification

MATERIALS

- Board Header Connector contact:
- Housing:
- Terminal for Crimping:

High Current Alloy
High temp. UL94V-0; Halogen Free
High Current Alloy

ELECTRICAL PERFORMANCES

- Low Level Contact Resistance:
- Insulation Resistance:
- Voltage Rating:
- Dielectric Withstand Voltage:
- Current Rating:

$< 30m\Omega$
 $> 100M\Omega$
12V - 48V (See the product SPEC GS-12-1634)
500VAC
4A at 80°C ambient
T° Rise : 30°C max

ENVIRONMENTAL

- Operating Temperature:
- Lead Free, Halogen Free

-40°C to +105°C for Sn
-40°C to +150°C for Au

TOOL INFORMATION

- Mini-applicator Crimping Tool:

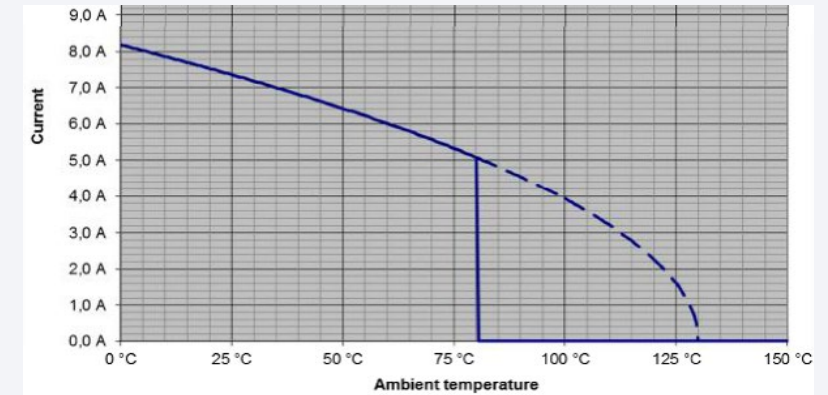
Amphenol Filec (see next slides)

MECHANICAL PERFORMANCE

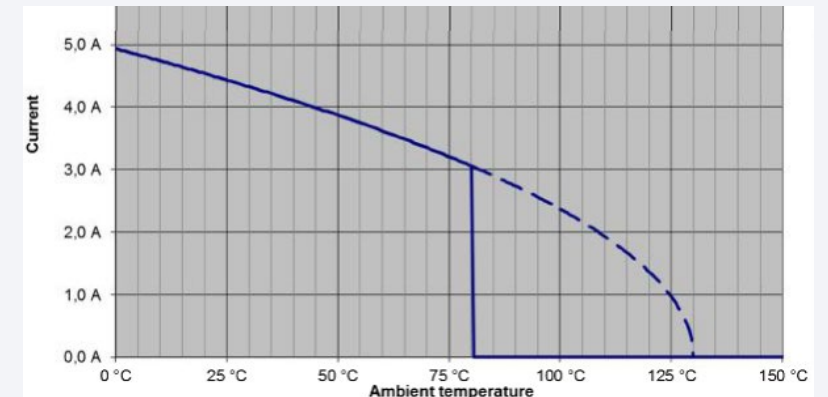
- Terminal Insertion Into Housing:
- Terminal Retention Into Housing:
- Durability:

$< 3N$
 $> 40N$
20 mating cycles for Sn;
100 mating cycles for Au
 $> 50N$ for 0.35 mm²
4N max

- Wire Pullout Force:
- Mating Force/Terminal

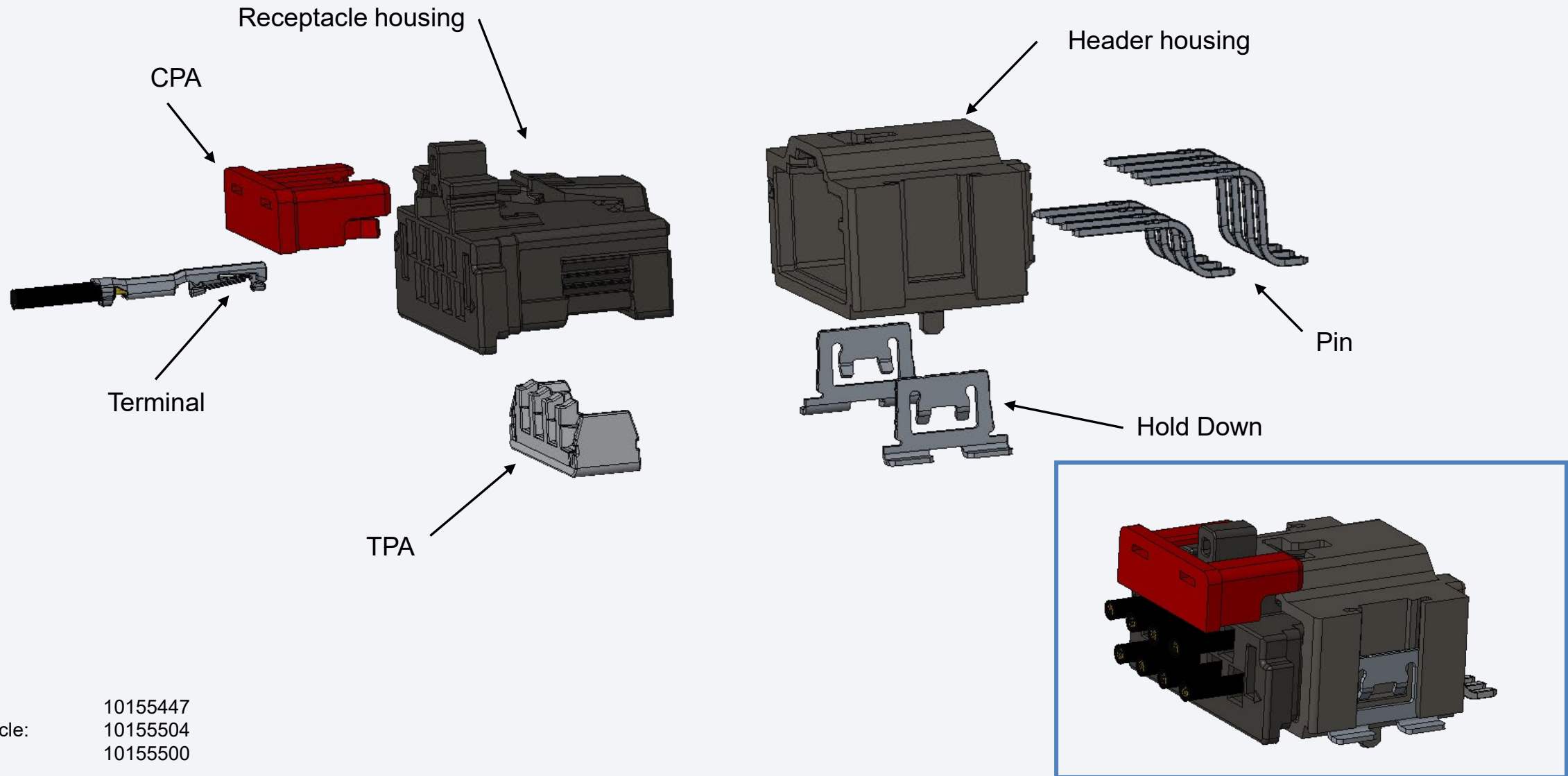


Derating according DIN EN 60512-5-2
Contact 10155447-111LF, AWG22 « free in air »



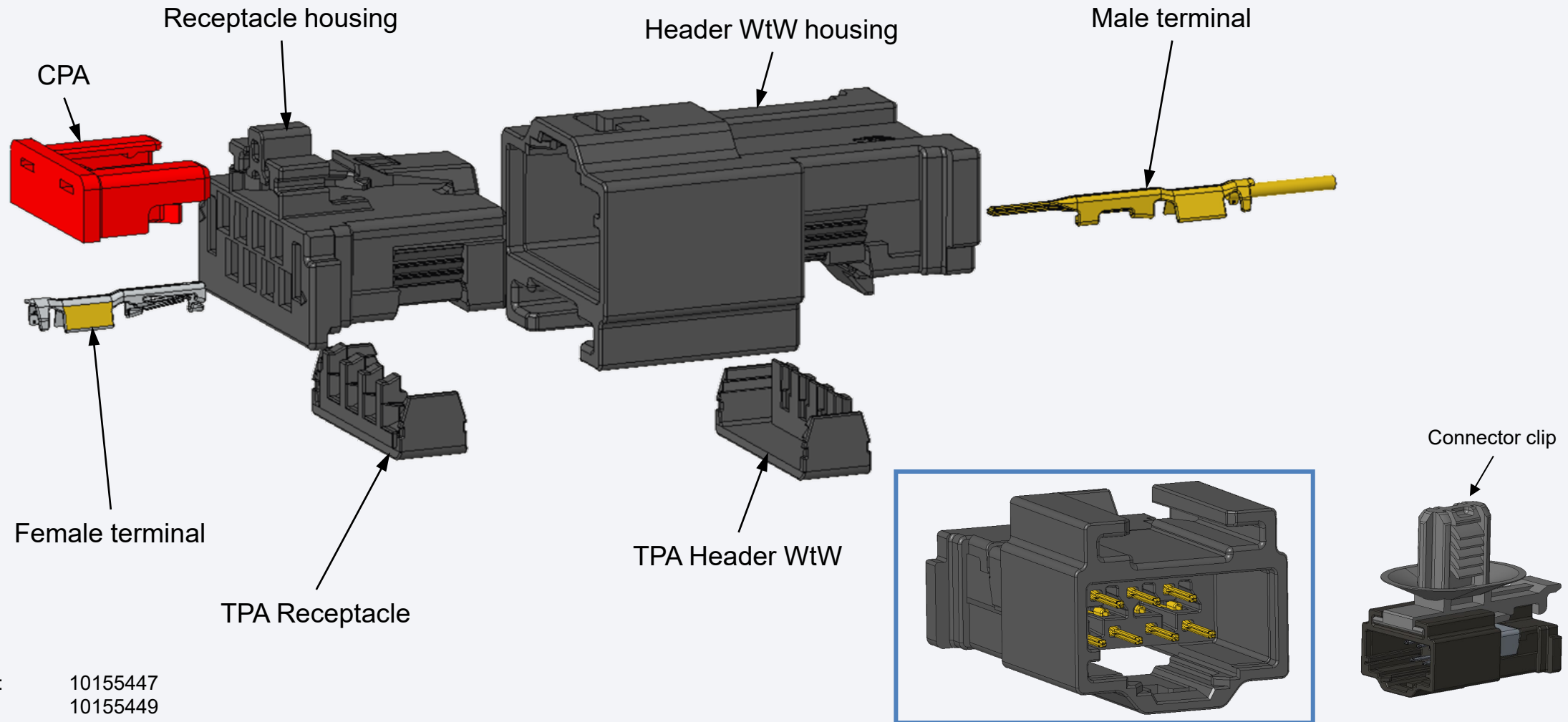
Derating according DIN EN 60512-5-2
Contact 10155447-111LF, AWG22 « derating in the housing »
8 pin connector 10155504-A008LF/10155500-A108LF

Overview MicrospaceXS™ WTB unsealed



CTW: 10155447
Receptacle: 10155504
Header: 10155500

Overview MicrospaceXS™ WTW unsealed



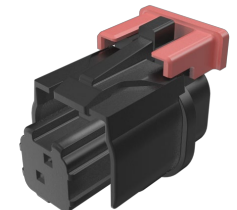
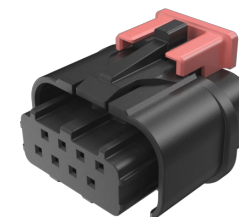
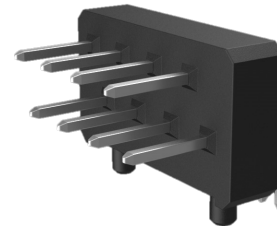
CTW female: 10155447
CTW male: 10155449
Receptacle: 10155504
Header: 10155520

Waterproof Family Configuration matrix

Pitch	Header	Receptacle	STG*	Max Current (A)	Wire size		Plating options	Latch	CPA	TPA
					AWG	OD (mm)				
1,27 mm	Wire To Wire Flying : 10155480	10155470	✓	3	22 - 28	1.4	Tin, Gold	✓	✓	✓
	Wire To Wire Panel Mount With insert : 10155493 Without insert : 10155490									
	Wire To Device : 10167562									
	Wire To Board Panel Mount With insert : 10155498 Without insert : 10155496									

- Latch position: *Top*
- Staggered (positions): *2 to 10*
- Wire to wire configuration: *Available // Design phase*

*STG : staggered



Product Specification MicrospaceXS™ Waterproof

STANDARDS compatibility

- USCAR T2V2 for Tin plating and T4V2 for Gold plating
- VW 60330 crimp specification
- IP68
- LV214 specification – up to severity 3 (*See the product SPEC GS-12-1634*)

MATERIALS

- Board Header Connector contact: *High Current Alloy*
- Housing: *High temp. UL94V-0; Halogen Free*
- Terminal for Crimping: *High Current Alloy*

ELECTRICAL PERFORMANCES

- Low Level Contact Resistance: *< 30mΩ*
- Insulation Resistance: *> 100MΩ*
- Voltage Rating: *12V - 48V (See the product SPEC GS-12-1634)*
- Dielectric Withstand Voltage: *500VAC*
- Current Rating: *3A at 80°C ambient
T° Rise : 30°C max*

ENVIRONMENTAL

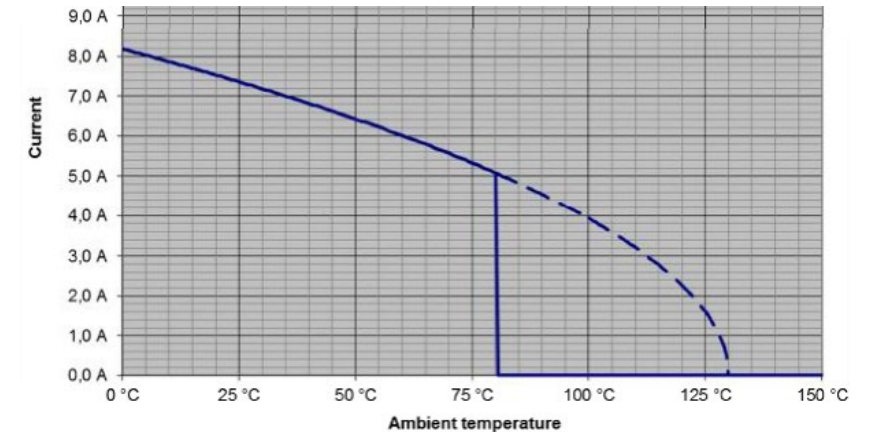
- Operating Temperature: *-40°C to +105°C for Sn
-40°C to +150°C for Au*
- Lead Free, Halogen Free

TOOL INFORMATION

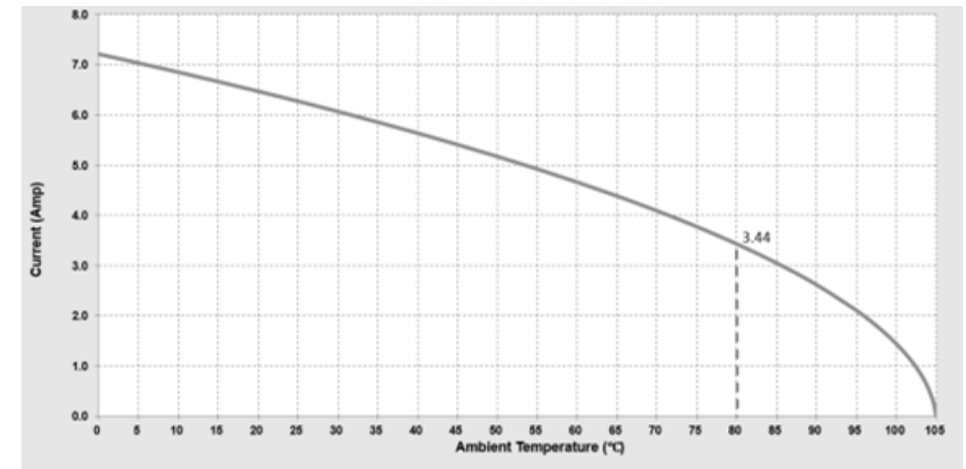
- Mini-applicator Crimping Tool: *Amphenol Filec (see next slides)*

MECHANICAL PERFORMANCE

- Terminal Insertion Into Housing: *< 10N*
- Terminal Retention Into Housing: *> 40N*
- Durability: *20 mating cycles for Sn;
100 mating cycles for Au*
- Wire Pullout Force: *> 50N for 0.35 mm²*
- Mating Force/Terminal: *4N max*

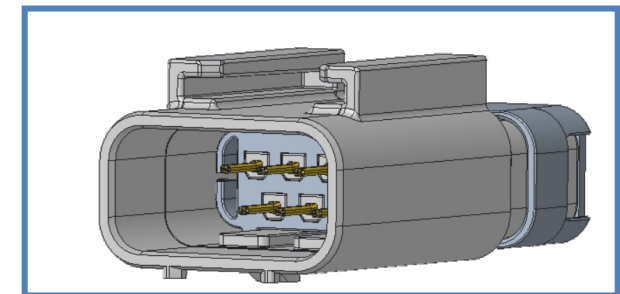
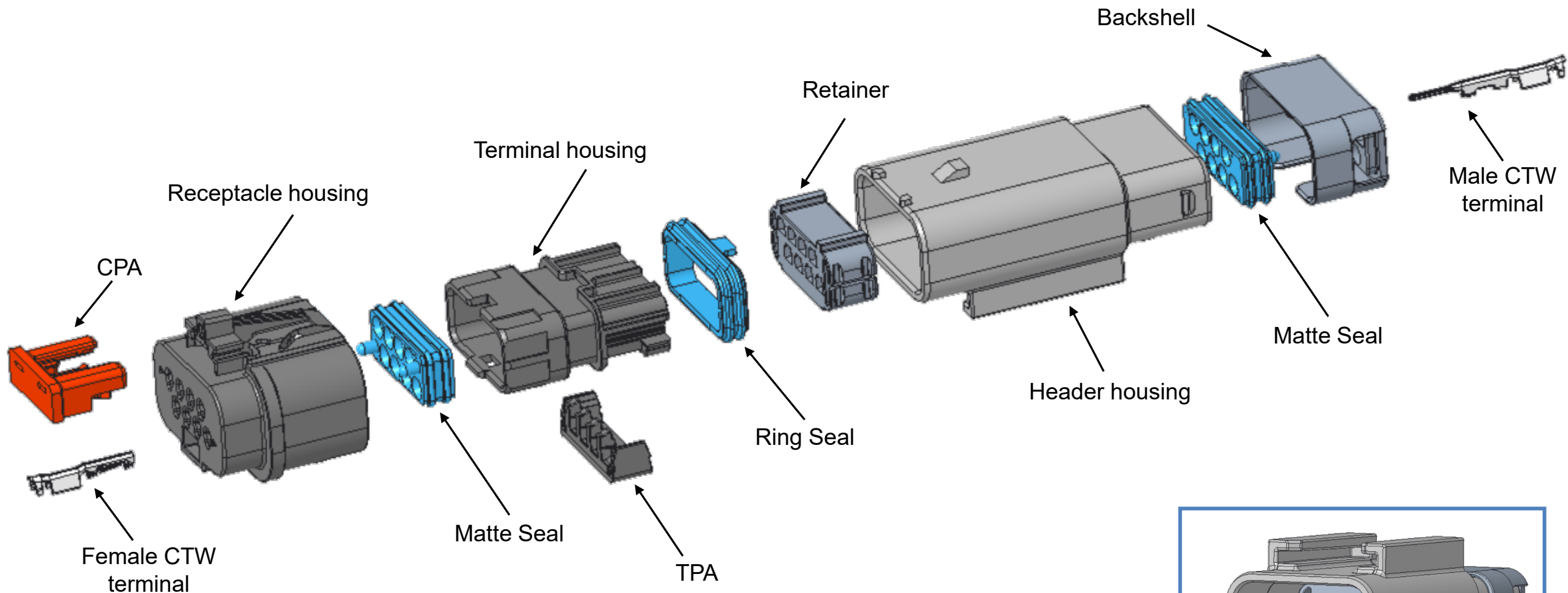


Derating according DIN EN 60512-5-2
Contact 10155447-111LF, AWG22 « free in air »

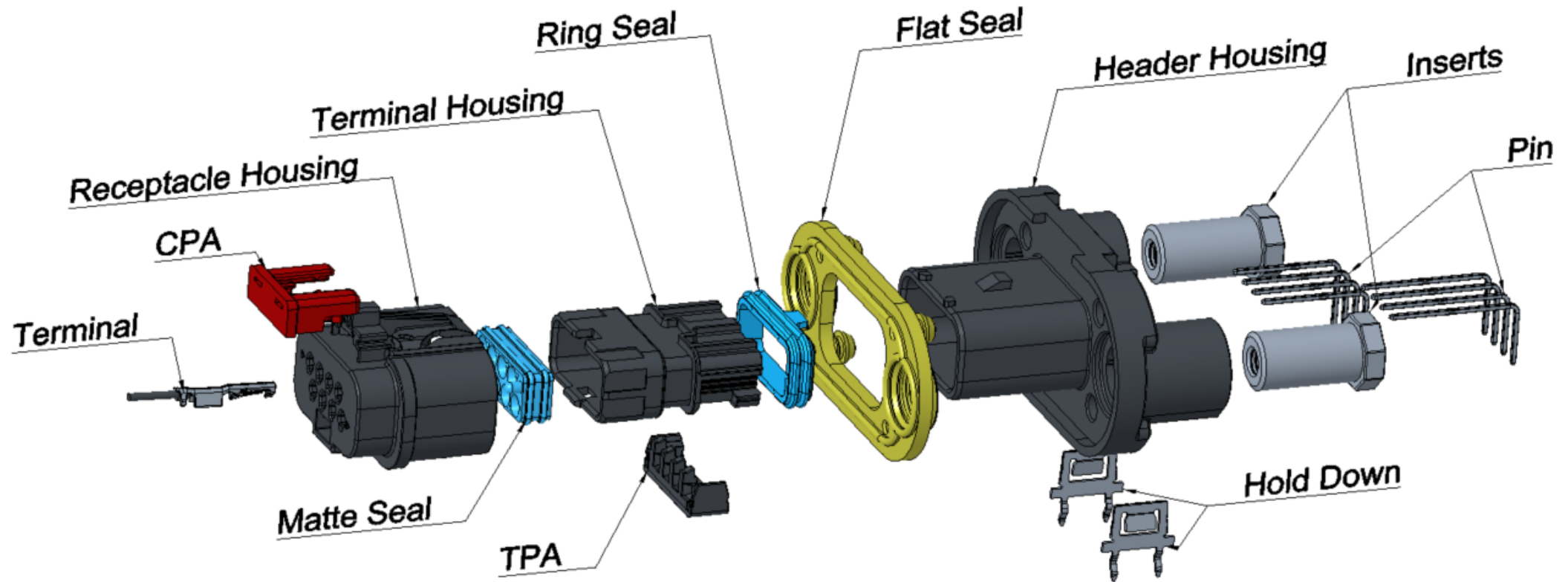


Derating according DIN EN 60512-5-2
Contact 10155449-111LF, AWG22 « derating in the housing »
8 pin connector 10155470-A008LF/10155490-A008LF»

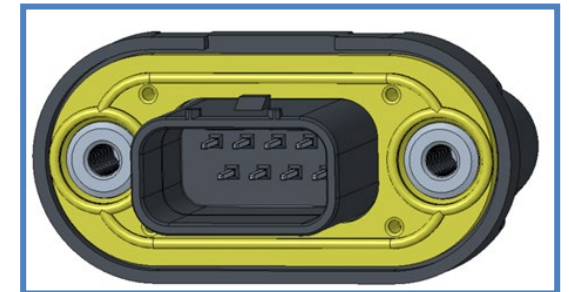
Overview MicrospaceXS™ WTW Waterproof



Overview MicrospaceXS™ WTB Waterproof

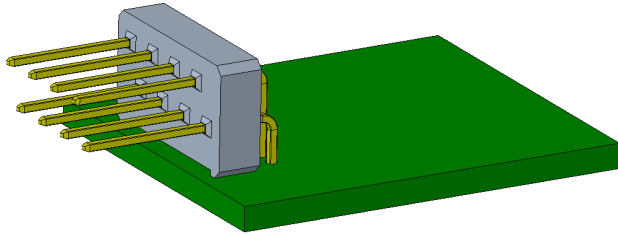


CTW female: 10155447
Receptacle: 10155470
Header: 10155498

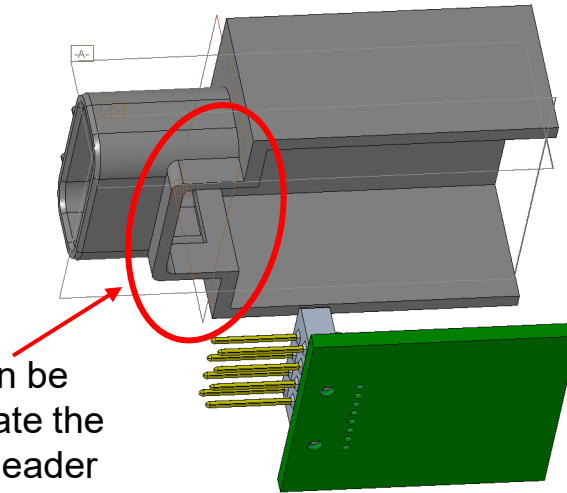


Wire To Device Pin Header

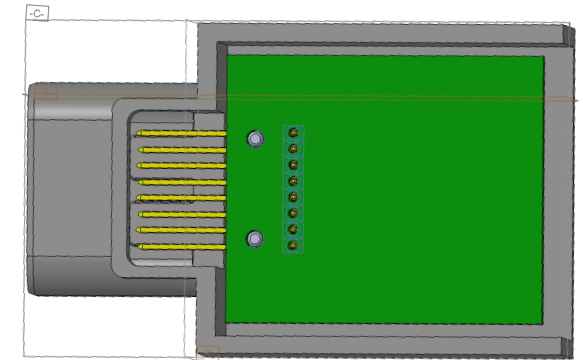
- Mounting option :



Pin header
soldered on a PCB

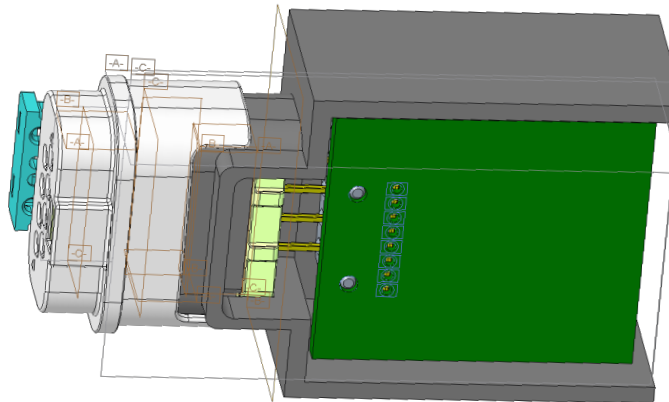


An extrusion can be
designed to facilitate the
assembly of the header
housing onto the PCB



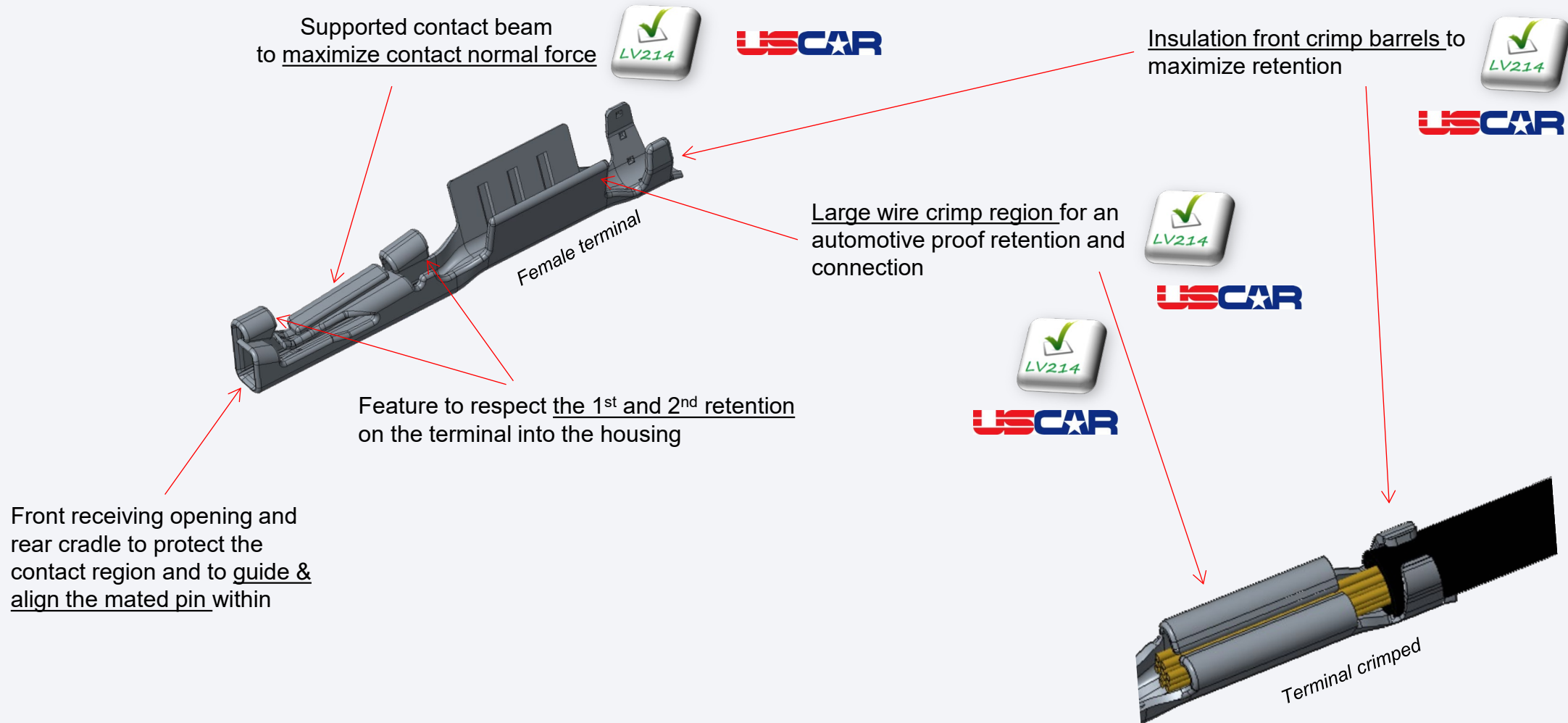
The header housing case has to be
closed from the bottom to assure
water tightness

Final assembly with
the receptacle



Receptacle: 10155470
Header: 10167562

MicrospaceXS™ female terminal features

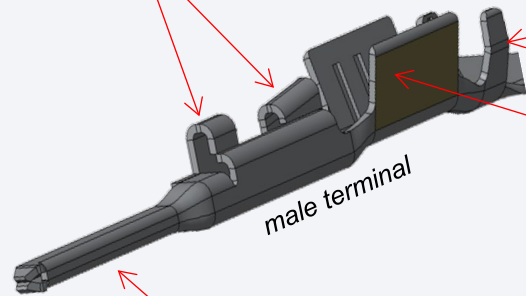


MicrospaceXS™ male terminal features

Feature to respect the 1st and 2nd retention on the terminal into the housing



USCAR



male terminal

Large wire crimp region for an automotive proof retention and connection

Insulation front crimp barrels to maximize retention



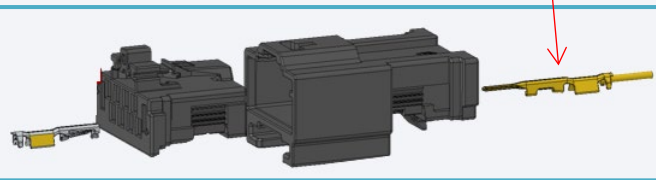
USCAR



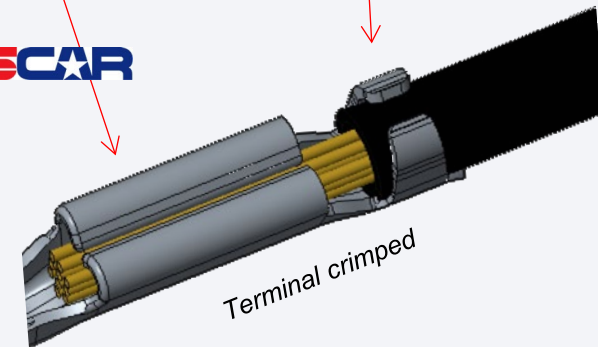
USCAR



CTW front pin to connect to the female terminal



USCAR



MicrospaceXS™ male pin high current terminal features

Feature to respect the 1st and 2nd retention on the terminal into the housing



USCAR

Insulation front crimp barrels to maximize retention



USCAR

Large wire crimp region for an automotive proof retention and connection

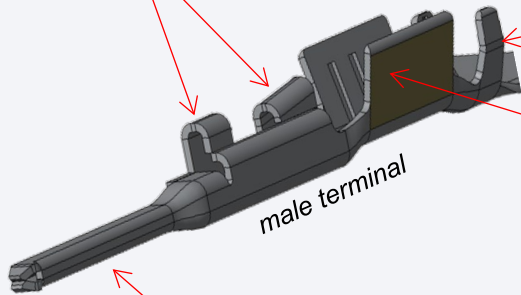


USCAR

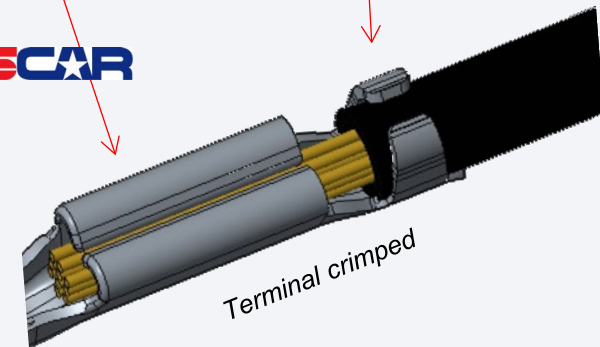
CTW front pin to connect to the female terminal



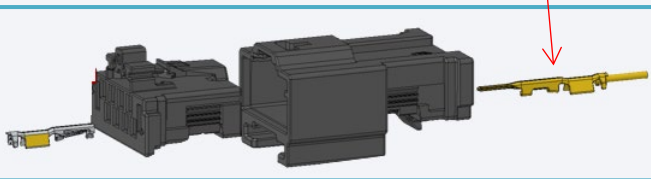
USCAR



male terminal

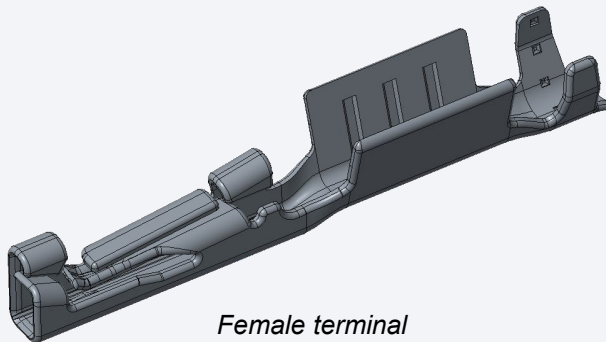


Terminal crimped

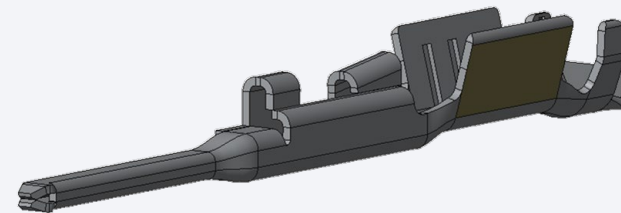


MicrospaceXS™ terminal performance

- Expected current
*2A ** (0.9mm OD wire – AWG28)
up to 6A (1.4mm OD wire – AWG22)*
- Material
High conductive copper alloy
- Designed to full-fill
*LV214 specification – severity 2
USCAR – T2V2
VW 75174 Slow motion bending test
VW 60330 crimp specification*



*Female terminal
10155447**



*Male terminal
10155449*
10168718**

***Current estimated, limitation depends on the wire type*

Mini-applicator Crimping Tool:

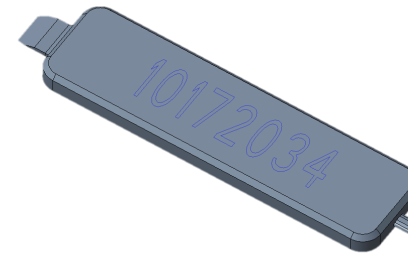
- *Crimping zone partnership design*
- *VW60330 compliance terminal crimping*
- *Provide mini applicator and crimping set*
- *List of compatible tools can be found in the application spec GS-20-0657*
- *Semi automatic crimping machine under development*



Handtool 10161117-00X

Extraction Tool :

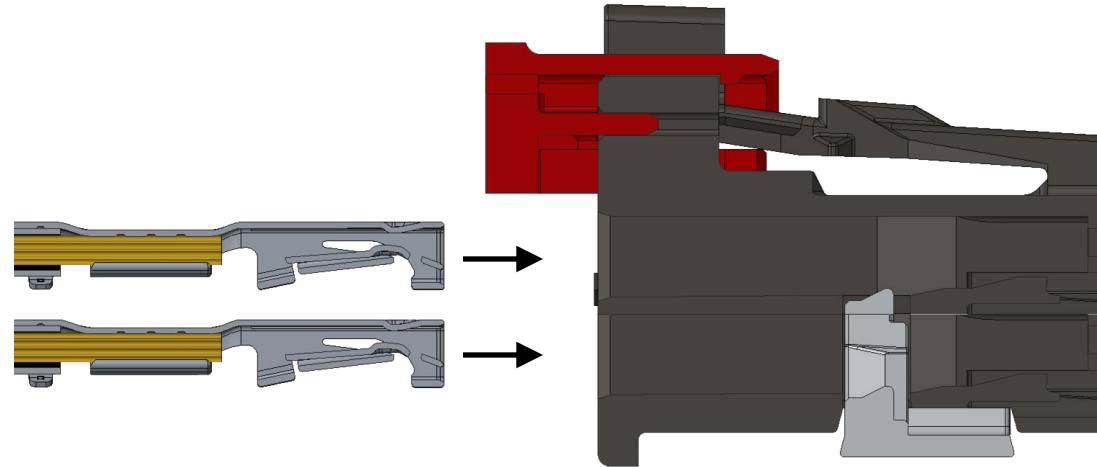
- *10172034-000LF : Application for CTW and TPA removal from receptacle.*
- *10173233-000LF : Application for Retainer Removal from Header Waterproof.*
- *Extraction procedure see spec GS-20-0657*



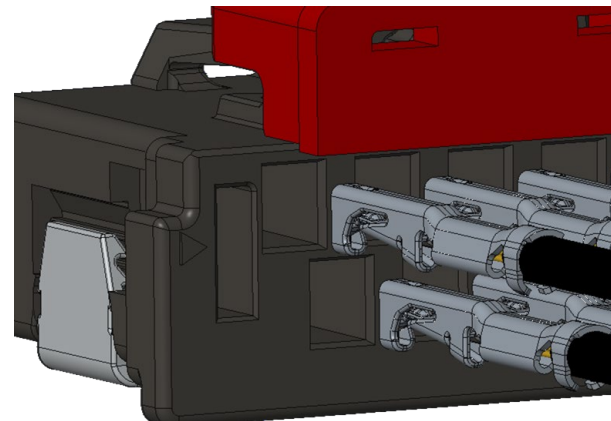
10173233-000LF

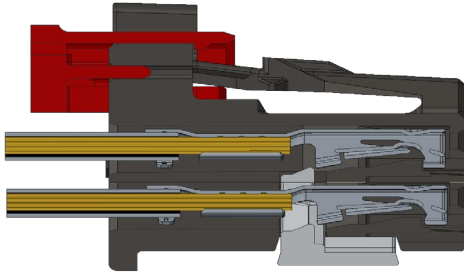
Insertion of terminal into receptacle housing

Housing with open TPA

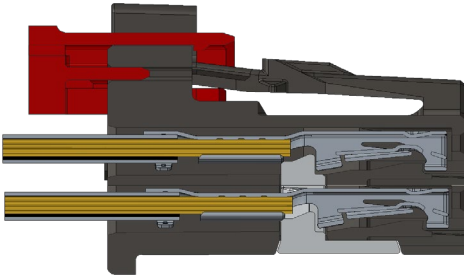
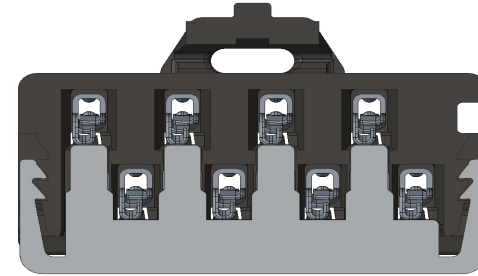


Keying function of terminal prevents wrong insertion

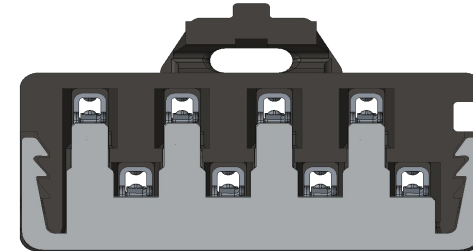




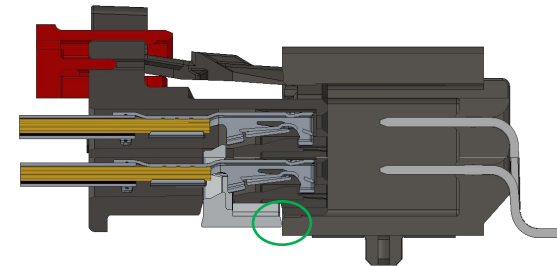
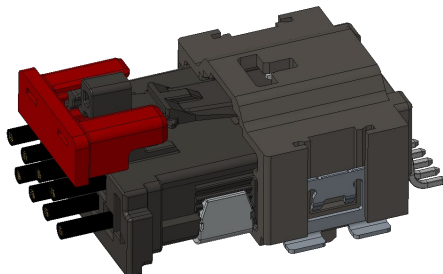
Housing with
open TPA



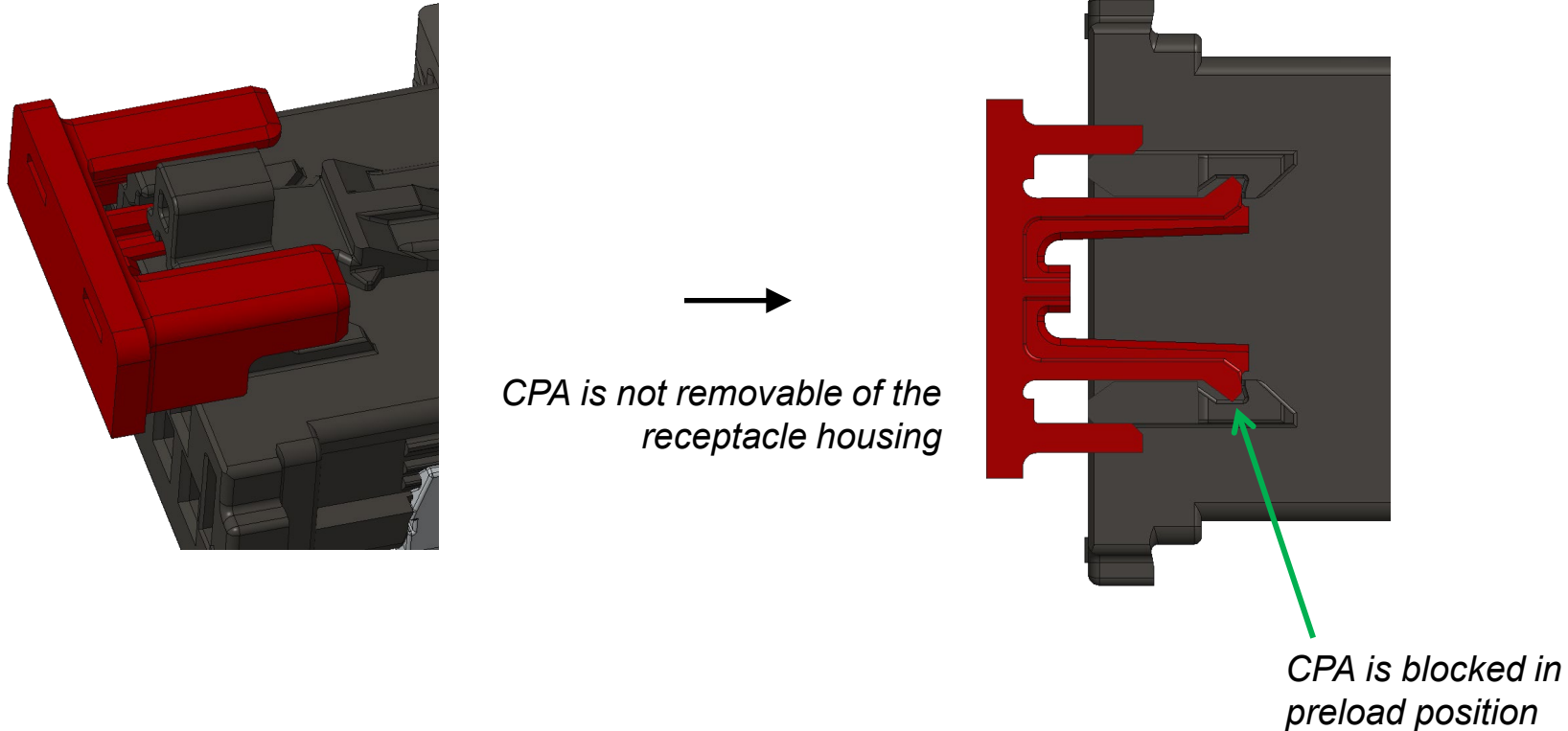
Housing with
closed TPA



When TPA is NOT at its final position it will be blocked against the interface of the header and make NO electrical contact.



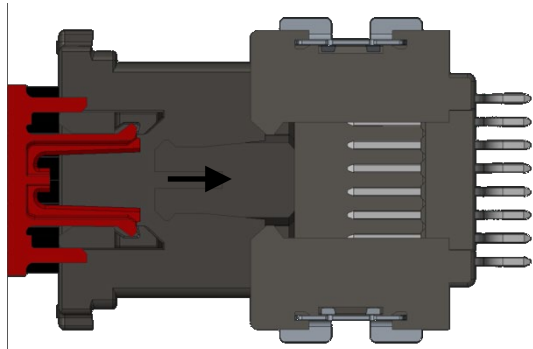
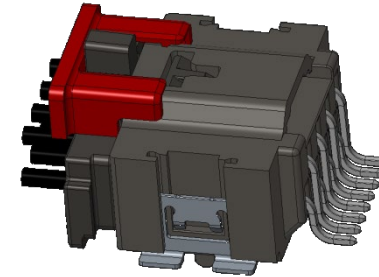
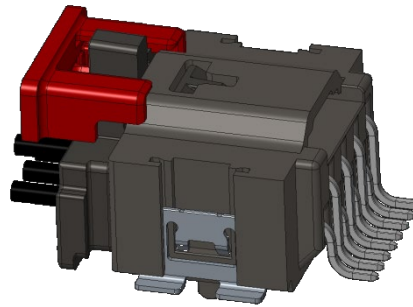
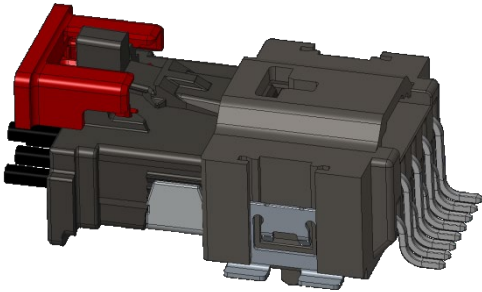
Insert CPA on the receptacle housing



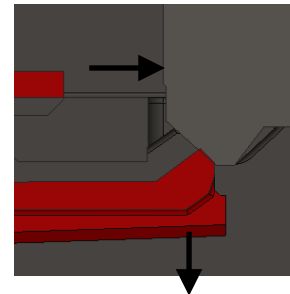
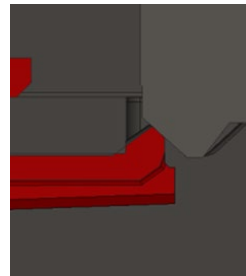
When receptacle is not unmatted, CPA could not be removed or actuated

Insert CPA on the receptacle housing

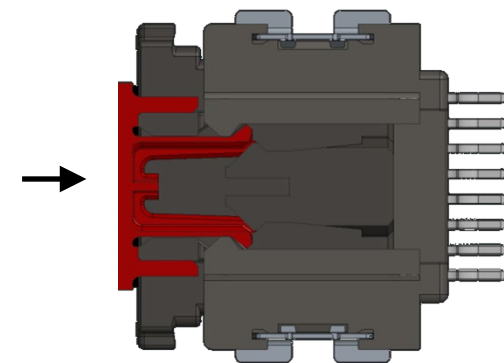
Header have to be not connected



Insertion of the receptacle housing in the header housing



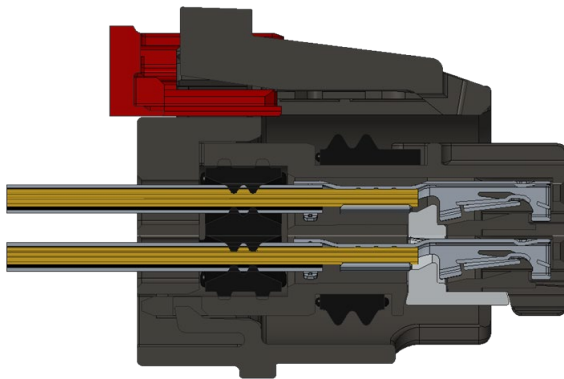
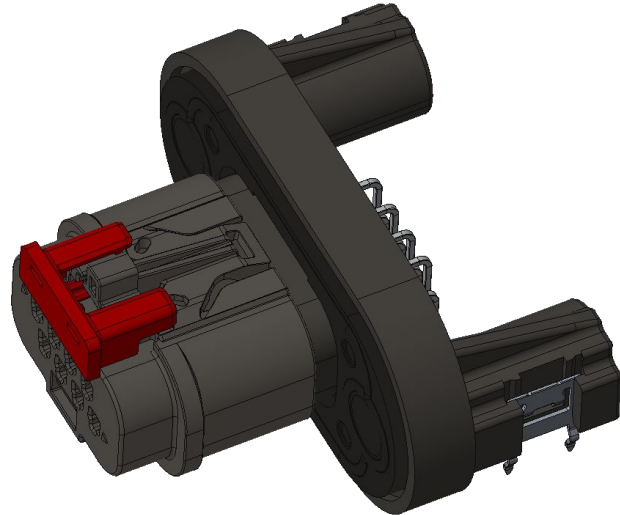
Header slope feature unblock the CPA from the receptacle



At the end position the CPA block the actuation of the latch

CPA can be actuated only if the receptacle is mounted into the header at the final position

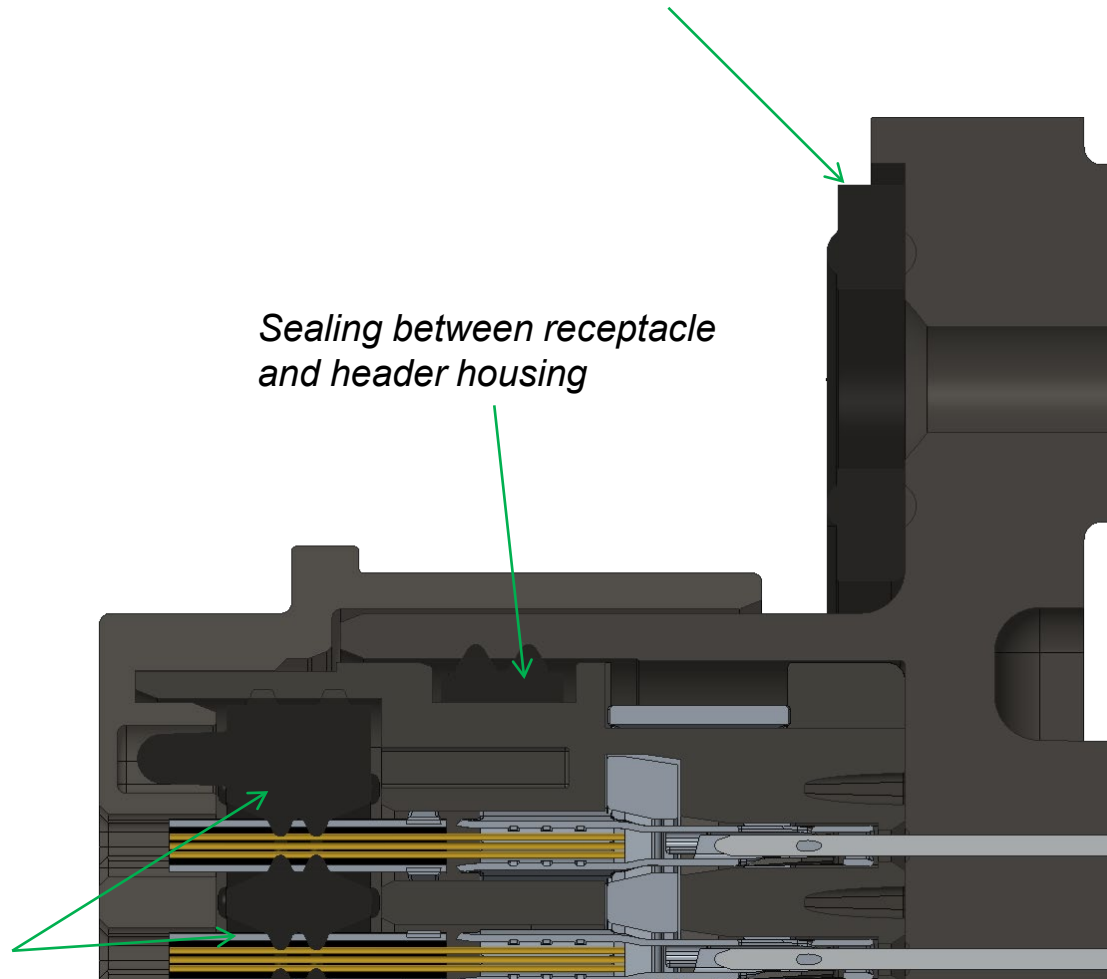
Connector completely seal (example)



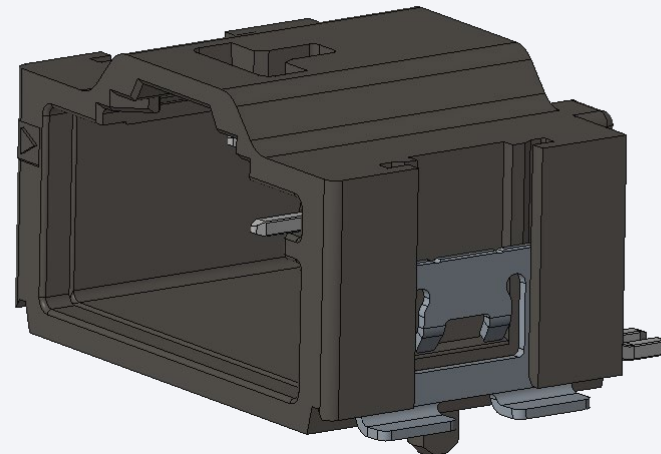
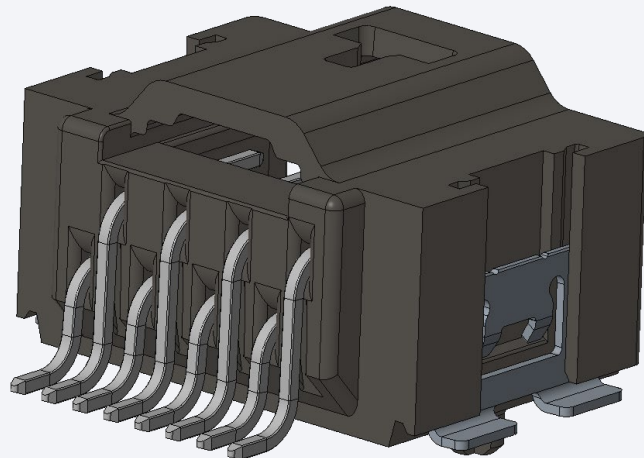
Sealing around terminals

Sealing between connector and panel

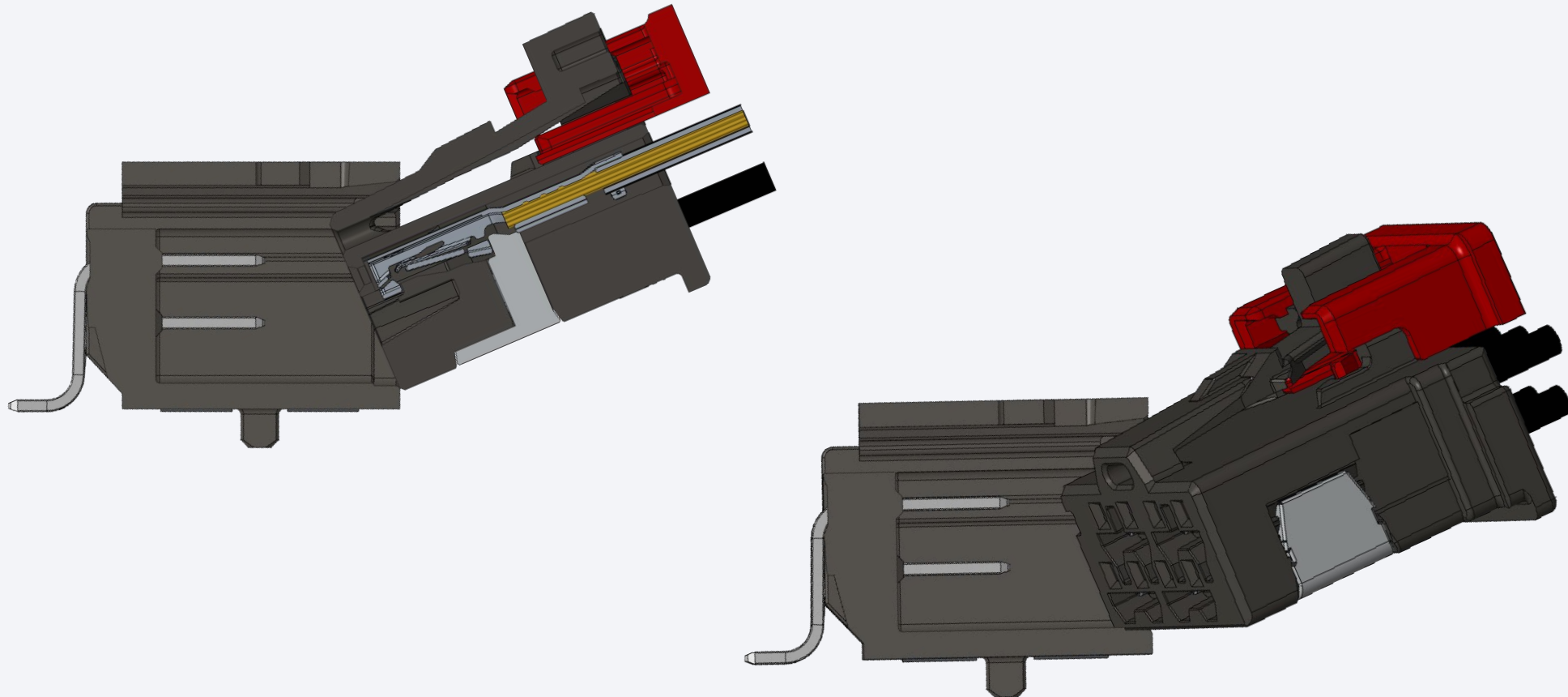
Sealing between receptacle and header housing



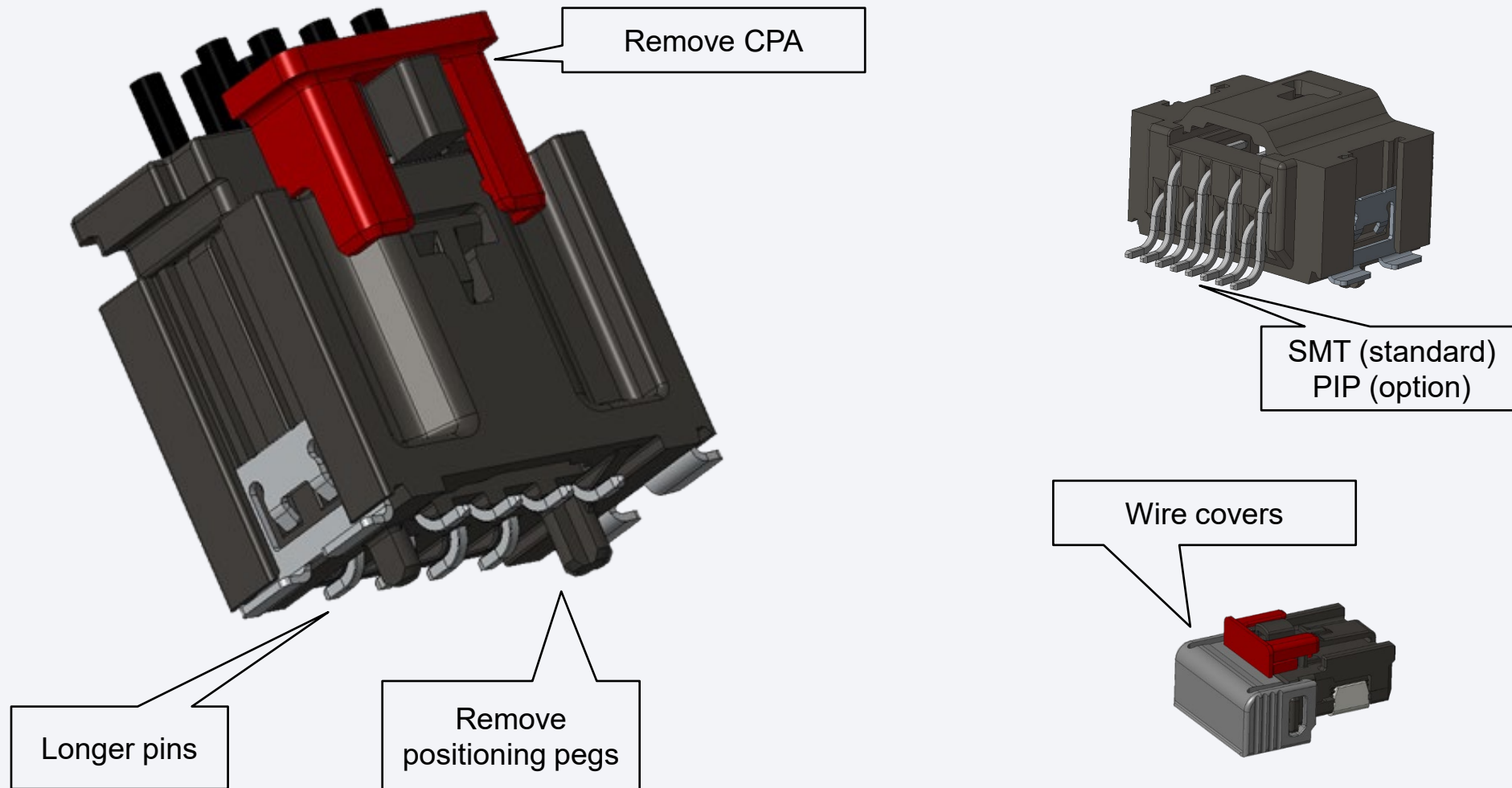
<u>Dimension</u>	<i>Square pin 0.47mm.</i>
<u>Base material</u>	<i>High conductive alloy</i>
<u>Finish</u>	<i>Sn, Au</i>



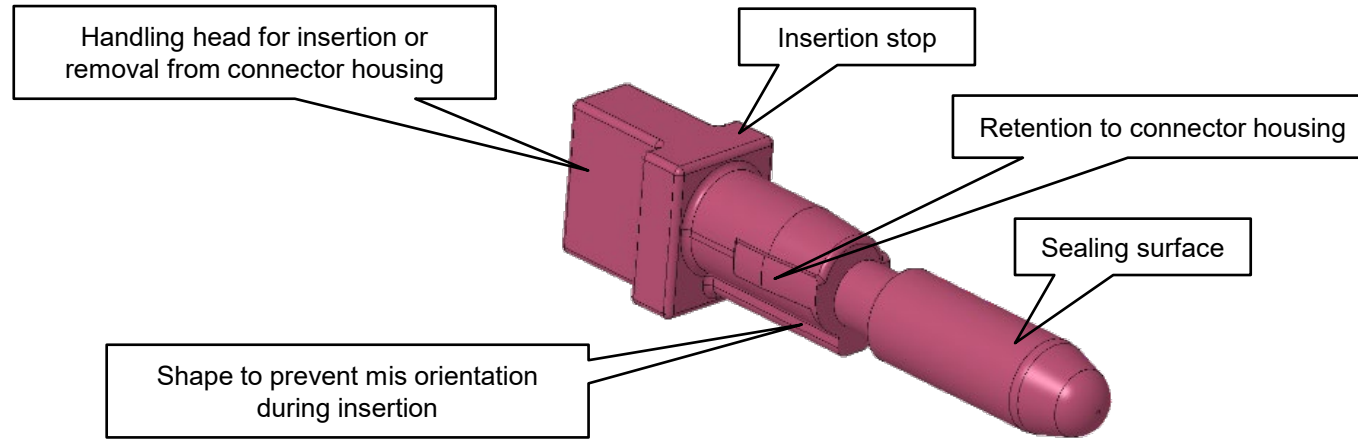
Concept 1.27mm pitch staggered 1 TPA



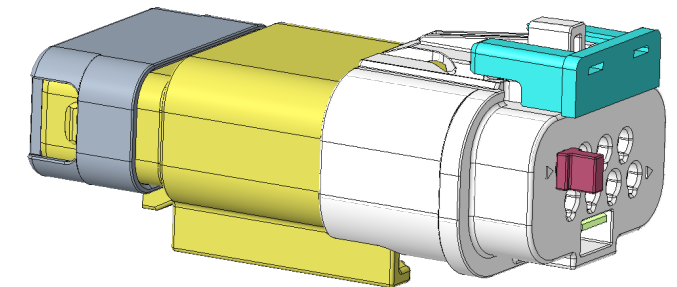
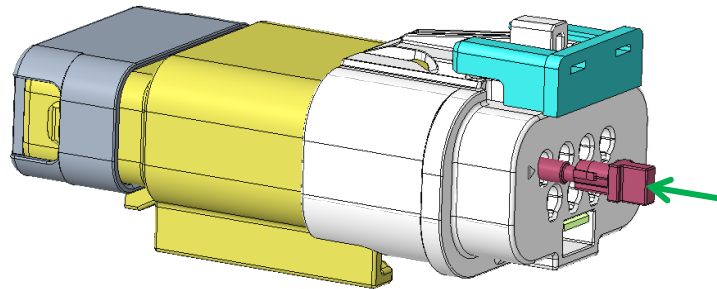
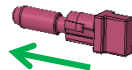
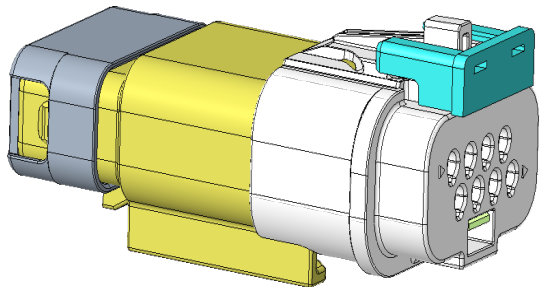
Example of possible Customized Solution:

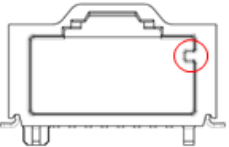
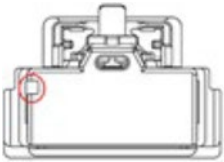

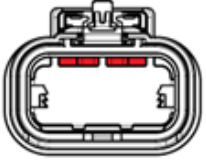
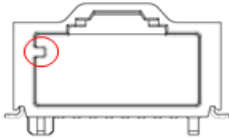
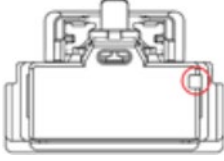

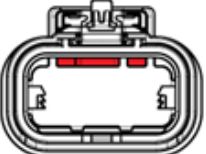
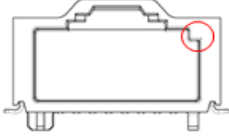
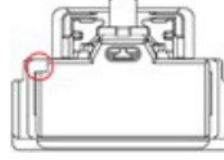

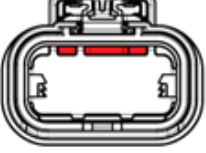


Example of possible Accessories Solution: MicroSpaceXS Sealed Sealing plug

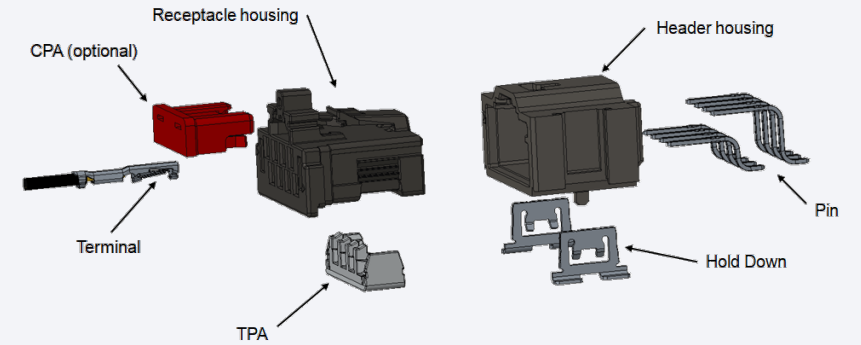
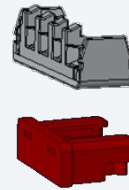






10155475-000LF



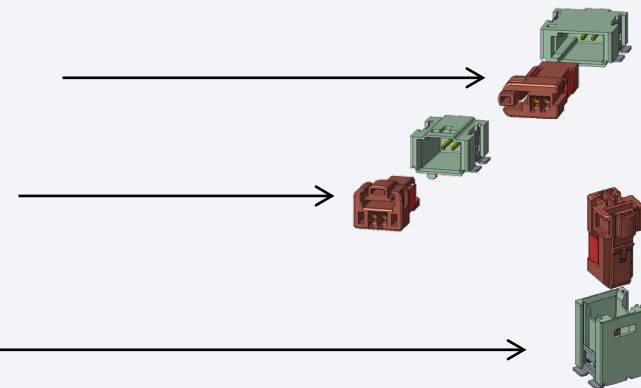
	MicroSpace XS		MicroSpace XS Waterproof	
Coding	Header	Receptacle	Header	Receptacle
A				
B				
C				

- **Header** *Housing with pins (Male connector)*
- **Receptacle** *Female housing*
- **Terminal** *CTW contact*
- **TPA** *Terminal Position Assurance*
- **CPA** *Connector Position Assurance*



- **StS** *Side to Side (contacts placed on side to side row)* 
- **StG** *Staggered (contacts placed on staggered row)* 
- **SR** *Simple row (contacts placed on 1 side to side row)* 
- **DR** *Double row (contacts placed on 2 side to side row)* 

- **SL** *Side Latch (latch between header and receptacle placed on the side of the connector)*
- **TL** *Top latch (latch between header and receptacle placed on the top of the connector)*
- **Horizontal** *Connection axis parallel to the board*
- **Vertical** *Connection axis perpendicular to the board*



Thank You

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COMMUNICATIONS SOLUTIONS

 **FCi Basics**