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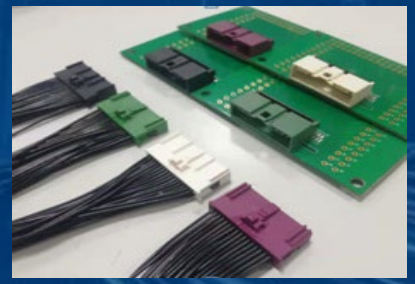
WireLock®
Product Presentation



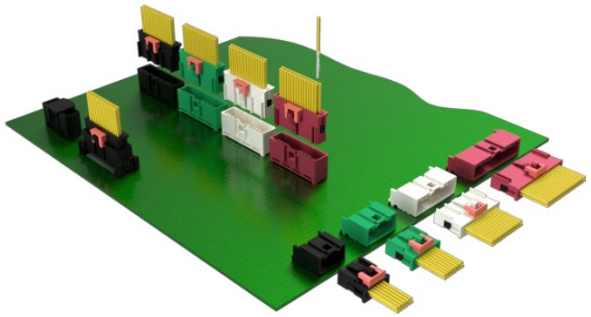
FCi Basics

Agenda: WireLock®

- Value Proposition
- Product Overview
- Product Specifications
- Features & Benefits
- Part Numbers
- Tooling information
- Target Application

WireLock® Value Proposition

- The WireLock® Wire-To-Board, Flex-To-Wire, Wire-To-Wire connector's **Compact Design** addresses the growing demand for space-saving automotive-grade connectors.
- This connector system is available in double row with **four Coding Types in Four Different Colors** and includes **Active Positive Latching**, **Terminal Positioning Assurance** and **Connector Positioning Assurance**.
- The connector has nominal current carrying capacity of **2A** (all contacts powered) and wire gauge from **22AWG to 26AWG**.
- WireLock® is available in 10 up to 40 positions with right angle and horizontal configurations and TH, SMT options.
- Meets the needs of **demanding applications like BMS in Automotive markets** and is compliant to **USCAR-2 or QC-T1067.1-2017, and LV 214 S2**



WireLock® Solution Overview

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Wire to Board

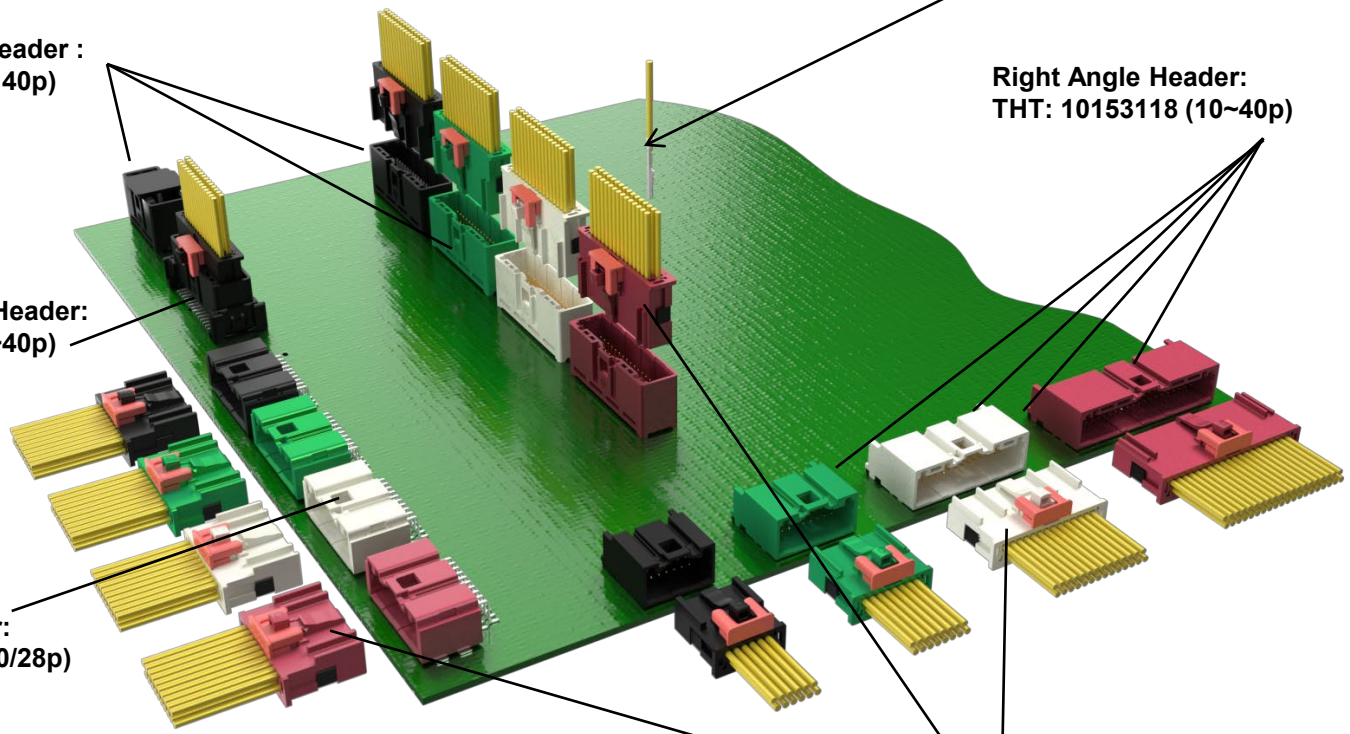
Crimping Contact:
10153126 (22AWG~26AWG), USCAR-2
10163003 (22AWG~26AWG), LV214 S2

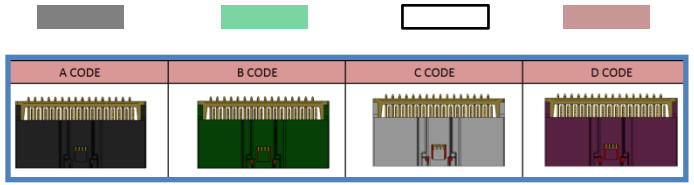
Vertical THT Header :
10158465 (10~ 40p)

Right Angle Header:
THT: 10153118 (10~40p)

Vertical SMT Header:
10158001 (10~40p)

RASMT Header:
10174399 (18/20/28p)





Cable Housing with CPA:
10159549 (10~ 40p)

Wire to Wire

Female Cable Housing:
10153123 (10~ 40p)
Female Crimping Contact:
10163003 (22AWG~26AWG)

Male Cable Housing:
10168908 (10~40p)
Male Crimping Contact:
10168906 (22AWG~26AWG)

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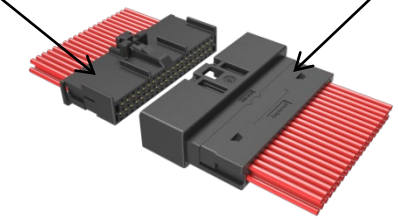
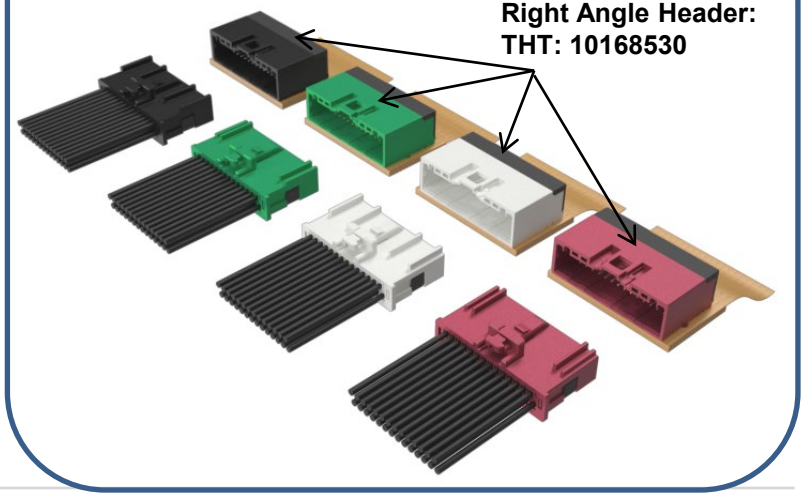


Flex to Wire

Right Angle Header:
THT: 10168530



WireLock® Product Family Matrix (1/2)

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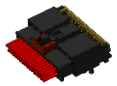
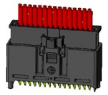
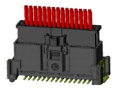
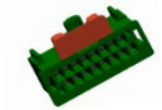
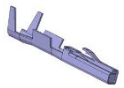
Image	Pitch	Description	Wire to Board			Max. Current (A)	Wire size	Plating	Auto Std.	Base number	Available Position
			Pin position	Double Row	STG		AWG				
	1.8mm	Right Angle TH (mount on PCB)	10-40p	✓	✓	2A	22/24/26AWG	Tin/Au	USCAR T2V2, LV214 S2	10153118	10/12/16/20/24/ 28/30/32/36p/40p
	1.8mm	Right Angle TH (mount on Flex)	10-40p	✓	✓	2A	22/24/26AWG	Tin/Au	USCAR T2V2, LV214 S2	10168530 (w/o standoff, with rear cover)	16/20/24/28/40p
	1.8mm	Vertical TH (mount on PCB)	10-40p	✓	✓	2A	22/24/26AWG	Tin/Au	USCAR T2V2, LV214 S2	10158465	10/16/20/30/32/36/40p
	1.8mm	Vertical SMT (mount on PCB)	10-30p	✓	✓	2A	22/24/26AWG	Tin	USCAR T2V2, LV214 S2	10158001	24/30p (Sample status)
	1.8mm	Cable Housing	10-40p	✓	✓	2A	22/24/26AWG	Tin	USCAR T2V2	10159549 (with CPA) 10153123 (w/o CPA)	10/12/16/18/ 20/24/28/30/32/36/40p
		Crimping Contact					22/24/26AWG	Tin/Au	USCAR T2V2	10153126	-4C1LF/5T1LF (tin, AWG 26) -4C2LF/5T2LF (tin, AWG 22/24) -3C2LF/3T2LF (Au, AWG 22/24)
	1.8mm	Cable Housing	10-40p	✓	✓	2A	22/24/26AWG	Tin	LV214 S2	10168373 (with CPA)	10/12/16/18/ 20/24/28/30/32/40p
		Crimping Contact					22/24/26AWG	Tin	LV214 S2	10163003	-002LF (AWG 22/24)

Remarks:
1. Others position change over lead time will be 6 weeks for FOT samples

WireLock® Product Family Matrix (2/2)

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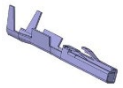
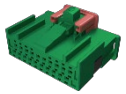
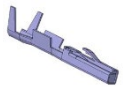
Image	Pitch	Description	Wire to Wire			Max. Current (A)	Wire size	Plating	Auto Std.	Base number	Available Position
			Pin position	Double Row	STG		AWG				
	1.8mm	Female Cable Housing	10-40p	✓	✓	2A	22/24/26AWG	Tin	USCAR T2V1	10153123 (w/o CPA)	10/12/16/ 20/24/28/30/32/40p
		Female Crimping Contact					22/24/26AWG	Tin	USCAR T2V1	10163003	-002LF (AWG 22/24)
	1.8mm	Male Cable Housing	10-40p	✓	✓	2A	22/24/26AWG	Tin	USCAR T2V1	10168908	40p
		Male Crimping Contact					22/24/26AWG	Tin	USCAR T2V1	10168906	-002LF (AWG 22/24)

Image	Pitch	Description	Wire to Board			Max. Current (A)	Wire size	Plating	Auto Std.	Base number	Available Position
			Pin position	Double Row	STG		AWG				
	1.8mm	Right Angle SMT (mount on PCB)	18,20,28	✓	✓	2A	22/24/26AWG	Tin/Au	USCAR T2V2	10174399	10174399: 18/20/28p
	1.8mm	Cable Housing	10-40p	✓	✓	2A	22/24/26AWG	Tin	USCAR T2V2	10174393 (with CPA)	10174393: 18/20/28p
		Crimping Contact					22/24/26AWG	Tin/Au	USCAR T2V1	10153126	-5C2LF (tin, AWG 22/24)

Remarks:

1. Others position change over lead time will be 6 weeks for FOT samples;

WireLock® Product Specifications

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Specifications

- Pitch: 1.8mm.
- PCB Termination: SMT or TH types
- Flex Termination: TH type
- Configuration: Double row, Right angle and Vertical in PCB

Materials

- Board Header Connector contact: Copper alloy
- Housing: High temp. UL94V-0
- Terminal for Crimping: Phosphor bronze Alloy(Tin plating)

Electrical Performances

- Low Level Contact Resistance:< 15mΩ
- Insulation Resistance: > 100MΩ
- Voltage Rating: 12V AC/DC
- Current Rating: 2A
- Dielectric Withstand Voltage:1000VAC

Environmental

- Operating Temperature: -40°C to +105°C

Tool Information

- Product Specification:
  GS-12-1535 (WtB - USCAR-2)
  GS-12-1780 (WtB - LV 214 S2)
  GS-12-1797 (WtW - USCAR-2)
  GS-12-1945 (WtB SMT header – USCAR-2)
- Package Specification:
  GS-14-2668 (header)
  GS-14-3129 (SMT header)
  GS-14-2679 (receptacle terminal)
- Hand Tool : 10176999-001HT
- Application spec.:
  GS-20-0594 (WtB)
  GS-20-0779 (WtW)

Mechanical Performance

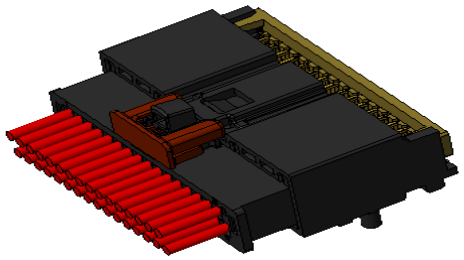
- Durability: 10 cycles (Tin/Au plating)
- Mating /Un-mating Force: 75N Max
- Terminal Insertion Force: <5N Max/pin
- Terminal Retention Force:
  20N Min (Before testing)
  40N Min (After testing)

WireLock® glossary

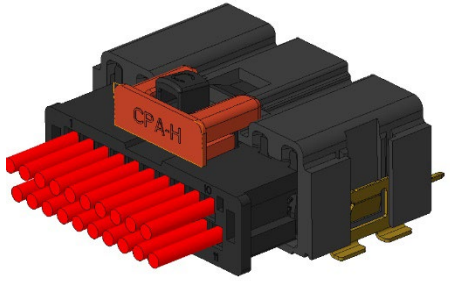
- **Header** *Housing with pins (Male connector)*
- **Receptacle** *Female housing with cable terminals*
- **Terminal** *CTW contact*
- **TPA** *Terminal position assurance*
- **CPA** *Connector Position assurance*

- **STG** *Staggered (contacts placed on staggered row)*

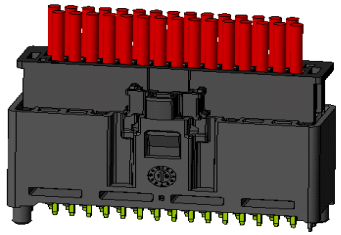
- **Horizontal** *Connection axis parallel to the board*
- **Vertical** *Connection axis perpendicular to the board*



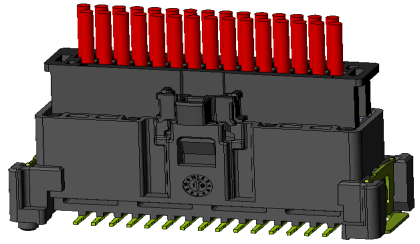
RA TH type



RA SMT type

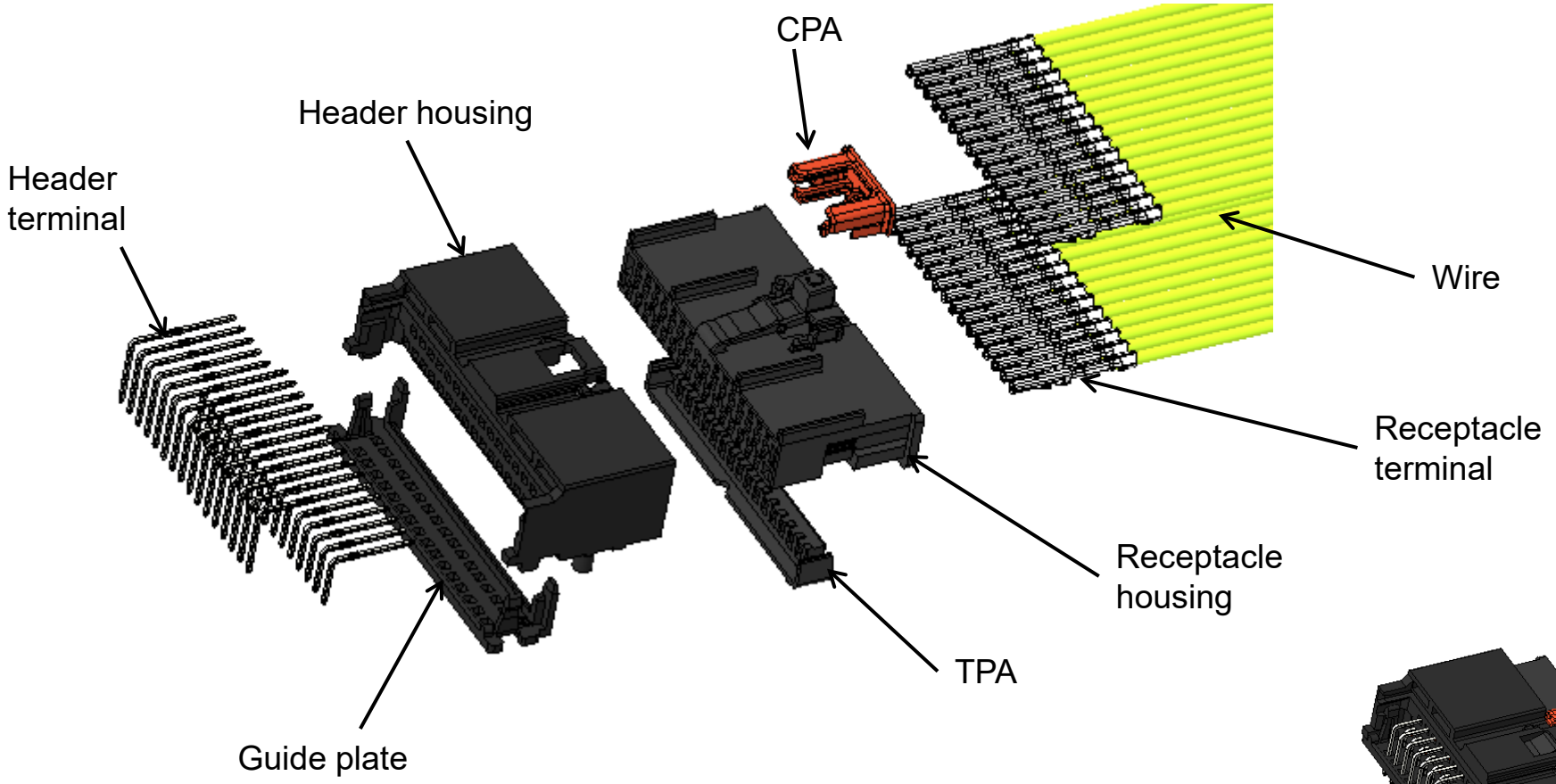


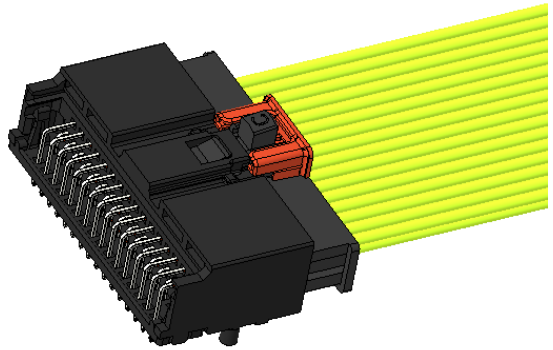
VT TH type



VT SMT type

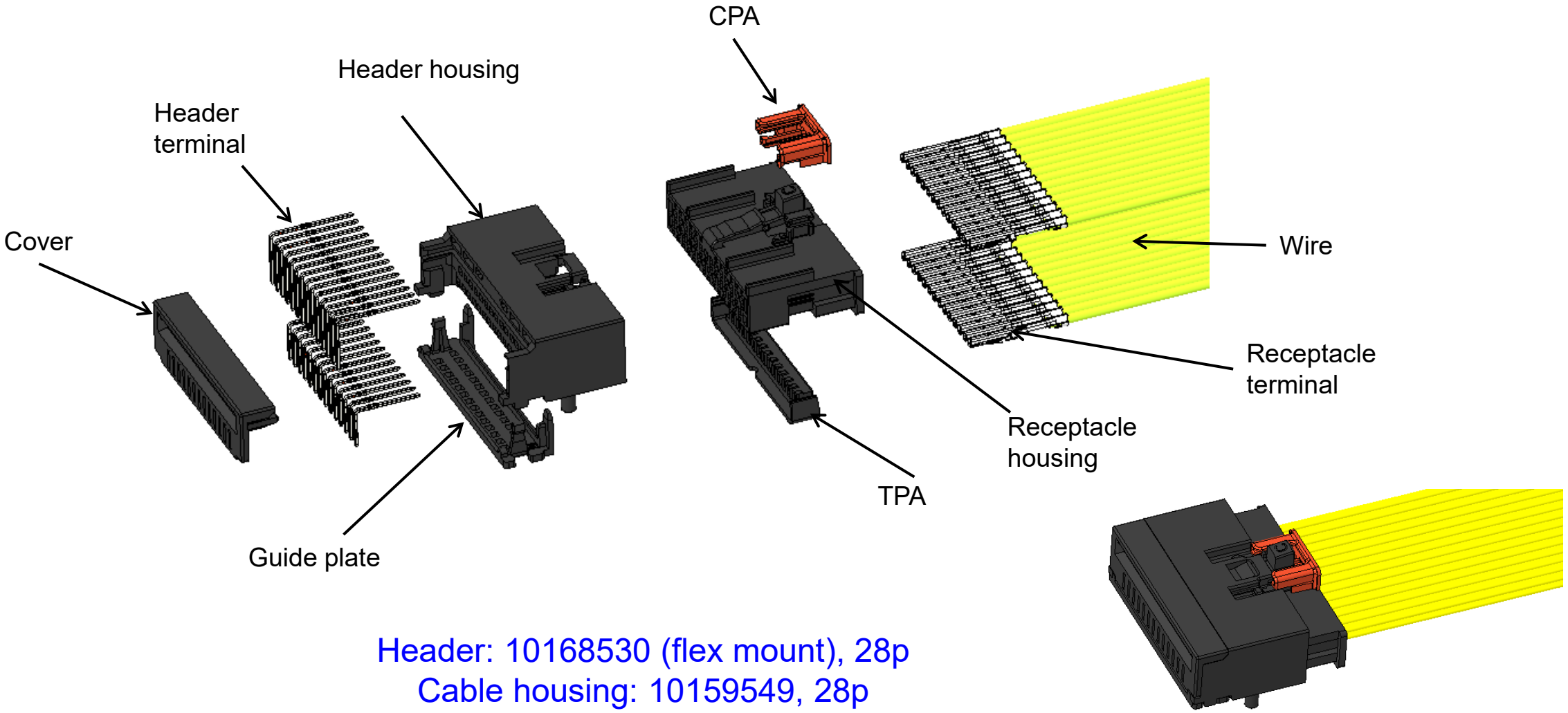
WireLock® Product Overview Right Angle type (THT)





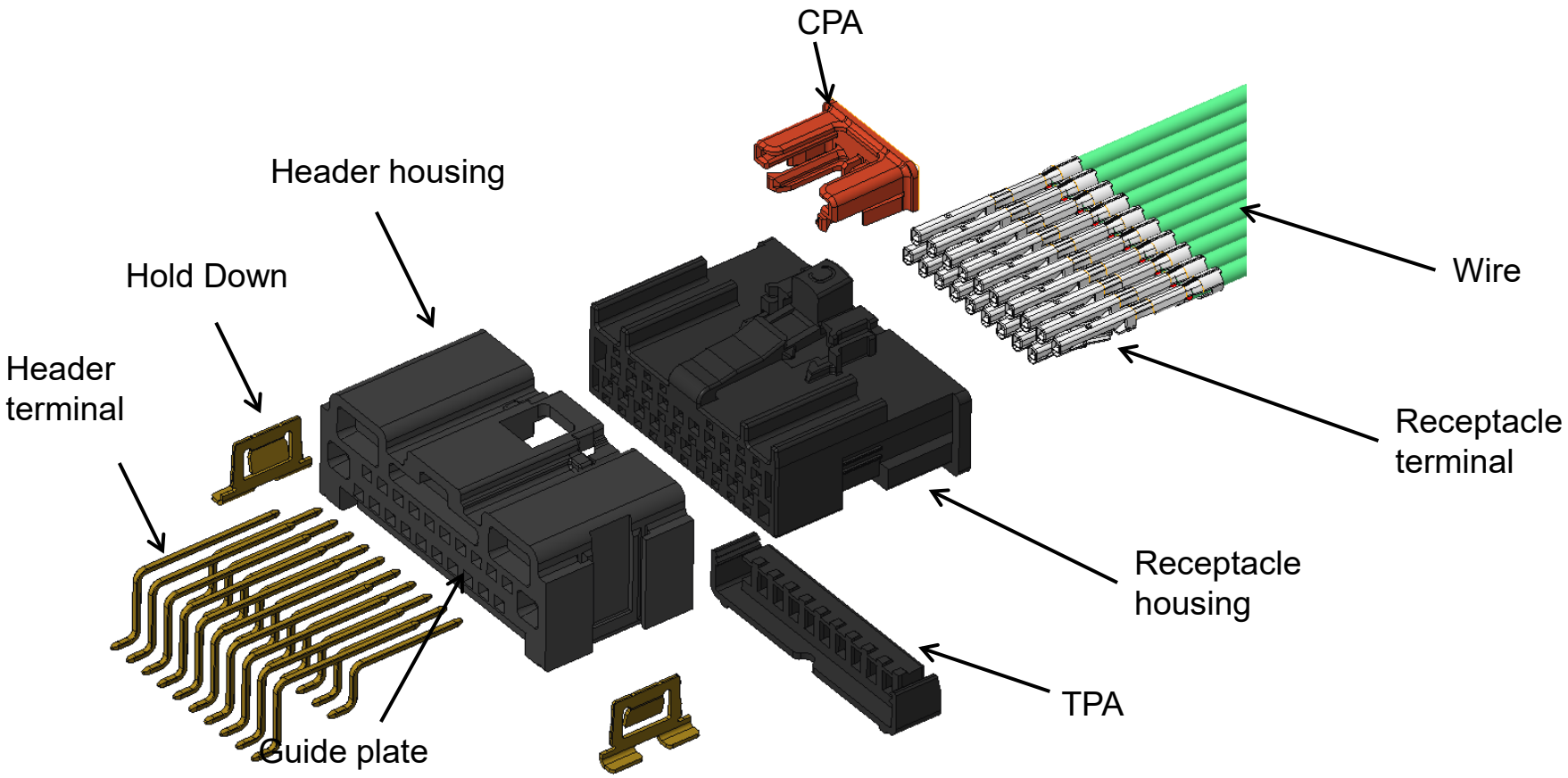
Header: 10153118 (PCB mount), 32p
Cable housing: 10159549, 32p

WireLock® Product Overview Right Angle type (THT)



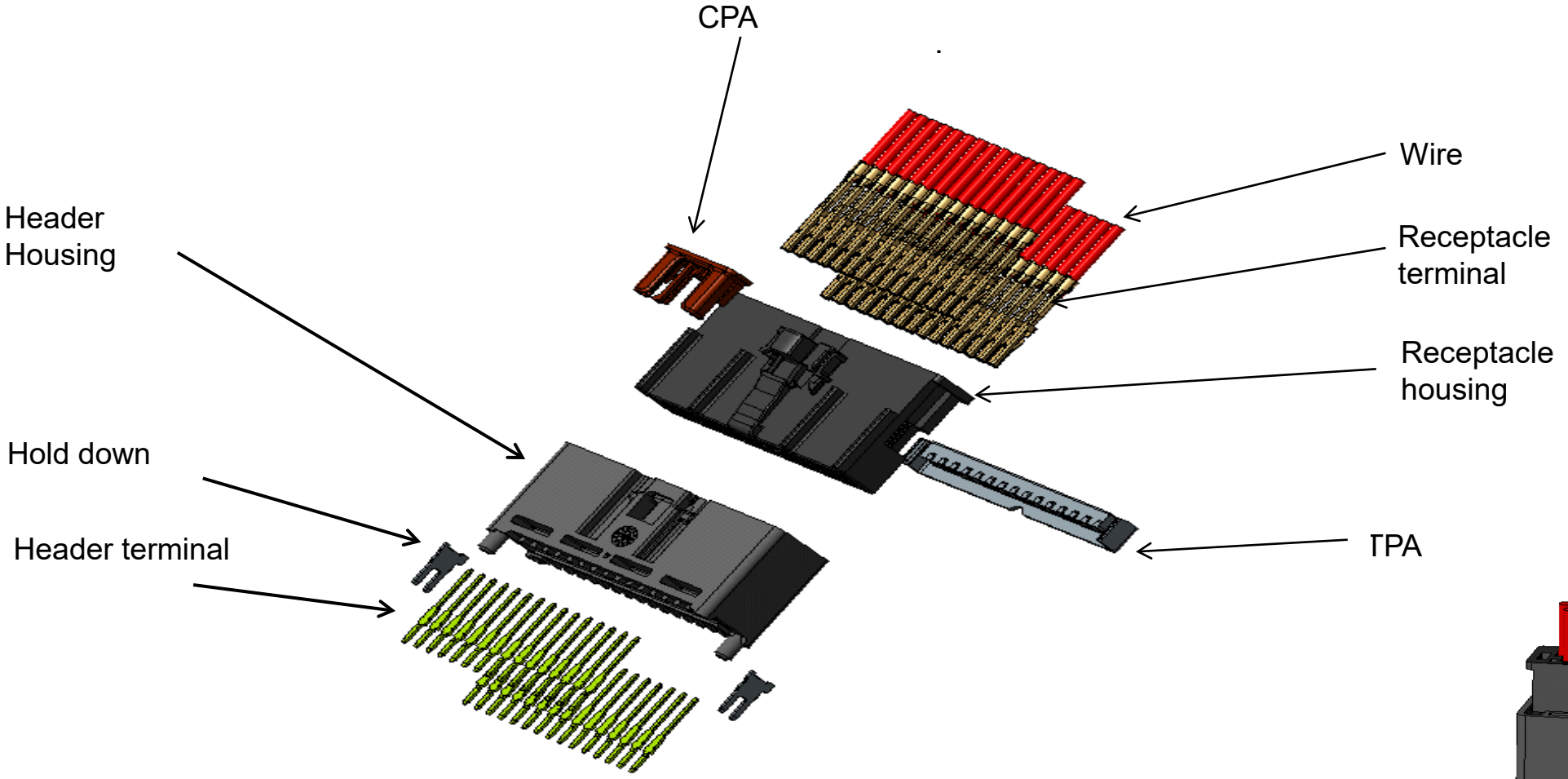
Header: 10168530 (flex mount), 28p
Cable housing: 10159549, 28p

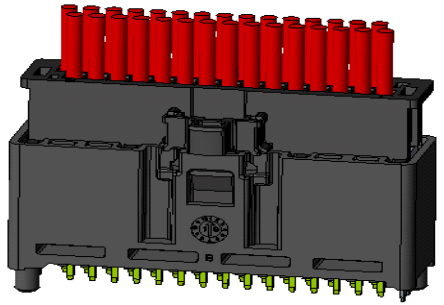
WireLock® Product Overview Right Angle type (SMT)



Header: 10174399 (PCB mount), 20p
Cable housing: 10174393, 20p

WireLock® Product Overview Vertical type (THT)



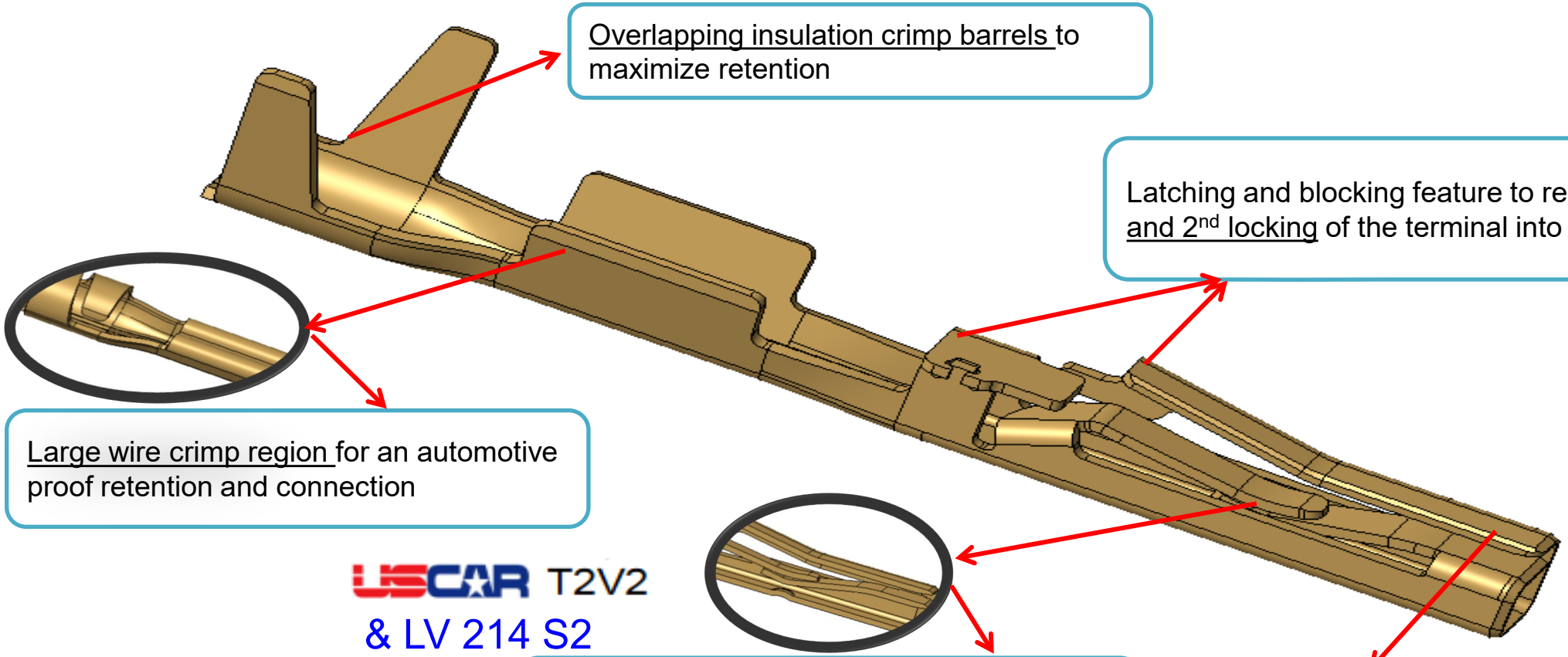


Header: 10158465 (PCB mount), 30p
Cable housing: 10159549, 30p

WireLock® Features and Benefits

Features	Benefits
Reflow Tin plating process for terminal	Low mating and un-mating force
Current rating 2A with each contact	Meet higher power Amps performance
Terminal position assurance (TPA)	Ensures proper terminal insertion position and retention
Connector positioning assurance(CPA)	Ensures that connectors are properly mated and locked together
Four different coding with four different colors	Visual and mechanical mismatching prevention system

WireLock® Terminal Features



WireLock® Terminal Insertion Features

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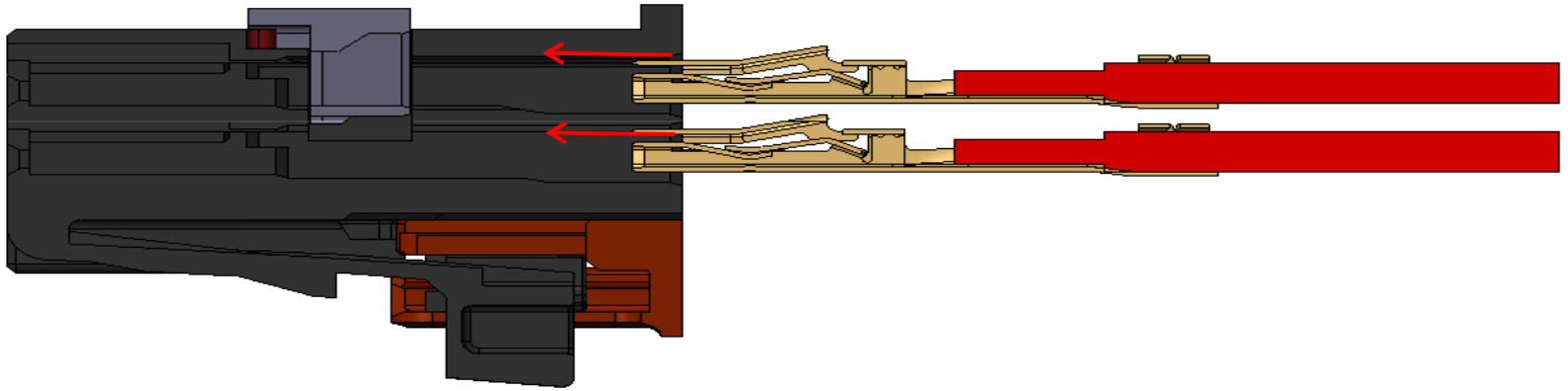
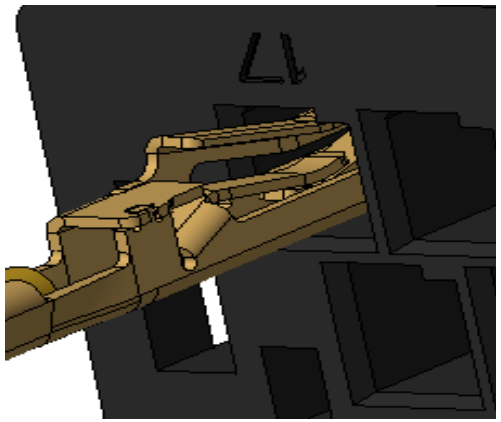
Rear loading terminal assembly

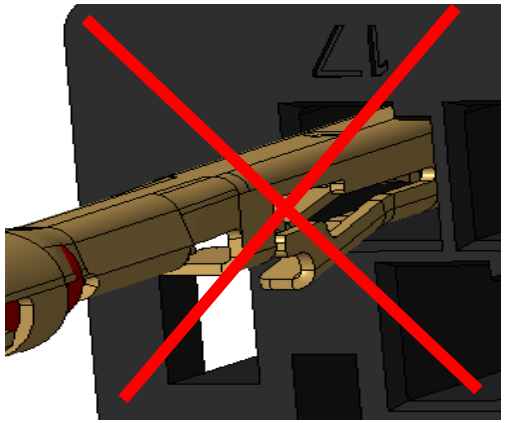
- Insert terminals into receptacle housing

Housing with open TPA



- Keying function of terminal prevents wrong insertion



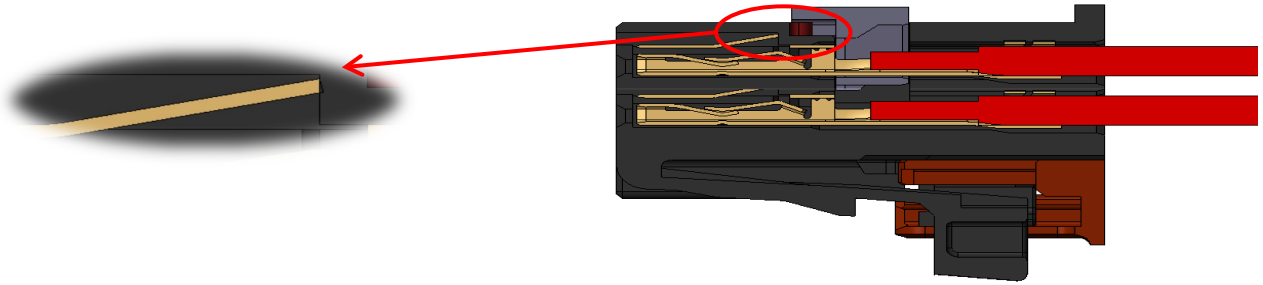


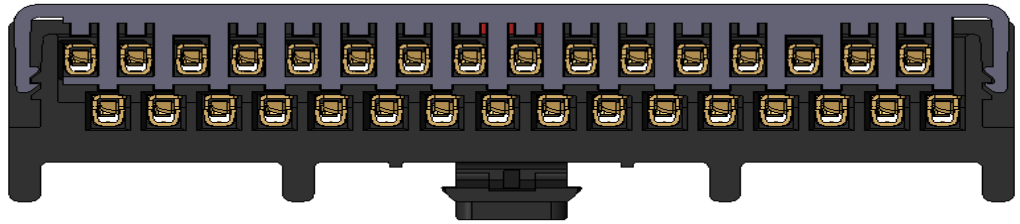
WireLock® TPA Features

TPA functionality

❑Primary locking (to maintain before TPA)

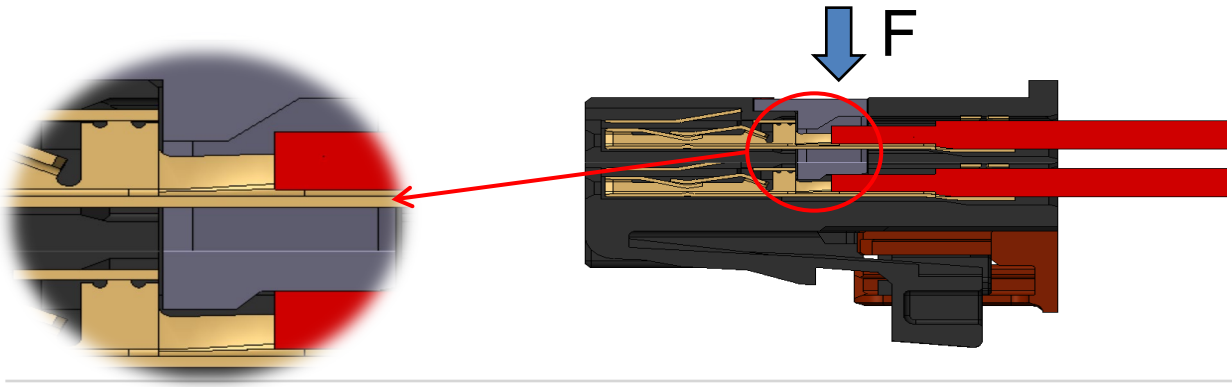
Housing with open TPA

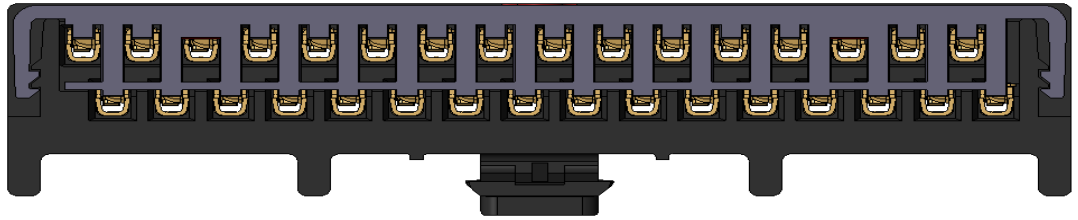




❑Secondary locking (to block)

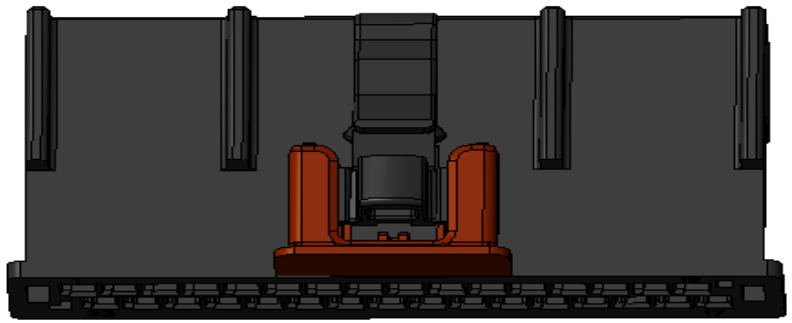
Housing with closed TPA





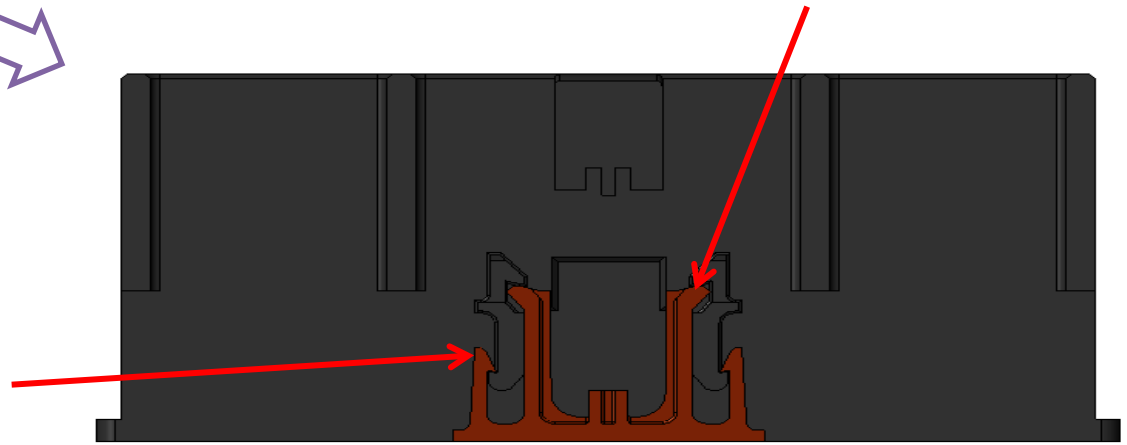
WireLock® CPA Features

- Pre-Insert CPA into the receptacle housing



CPA is not removable of the receptacle housing

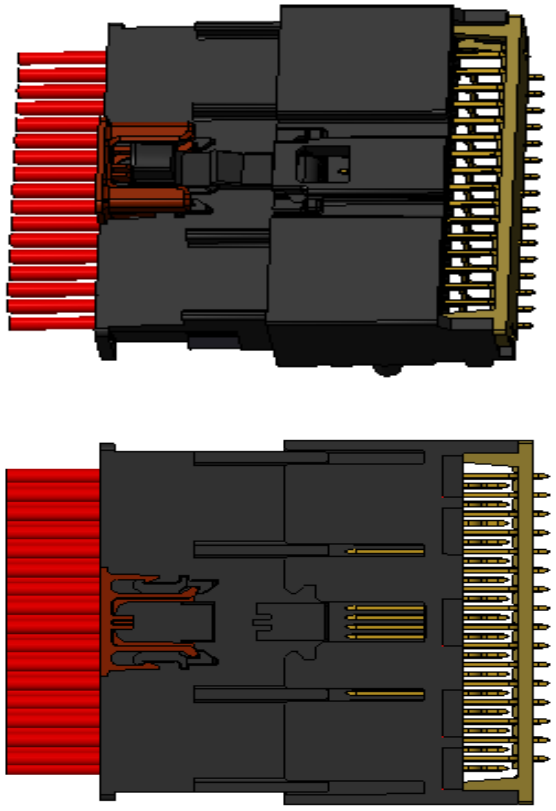
CPA is blocked in preload position



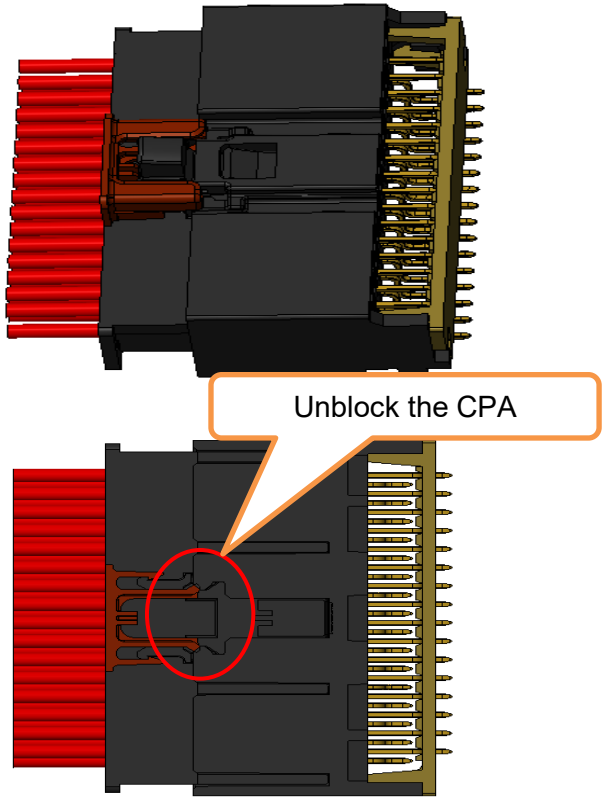
❖ ***When receptacle is not mated, the CPA cannot be removed or pushed.***

WireLock® CPA Features

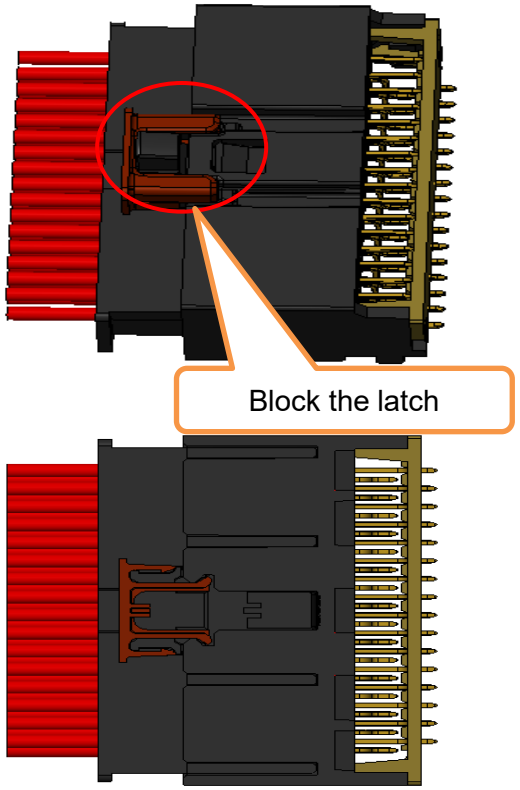
❑CPA can be pushed only if the receptacle is mounted into the header at the final position



Insertion of the receptacle in the header



Header slope feature unblock the CPA from the receptacle



At the final position the CPA blocks the movement of the latch

WireLock® Coding and Color Features

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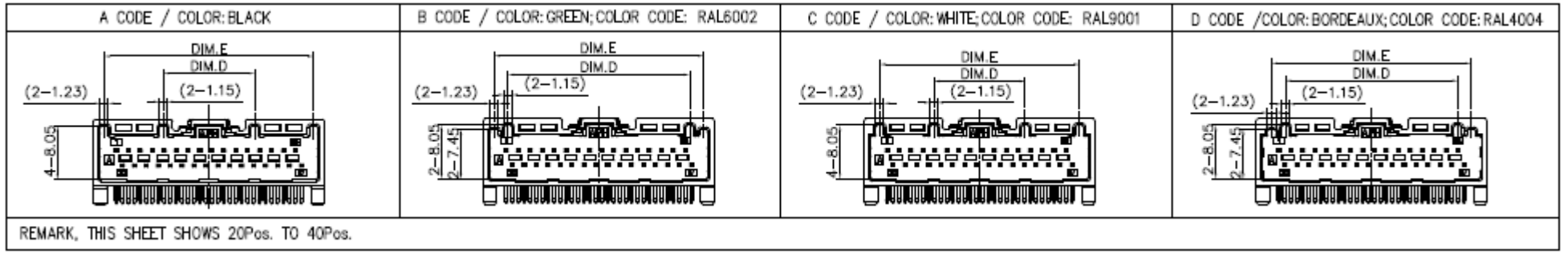
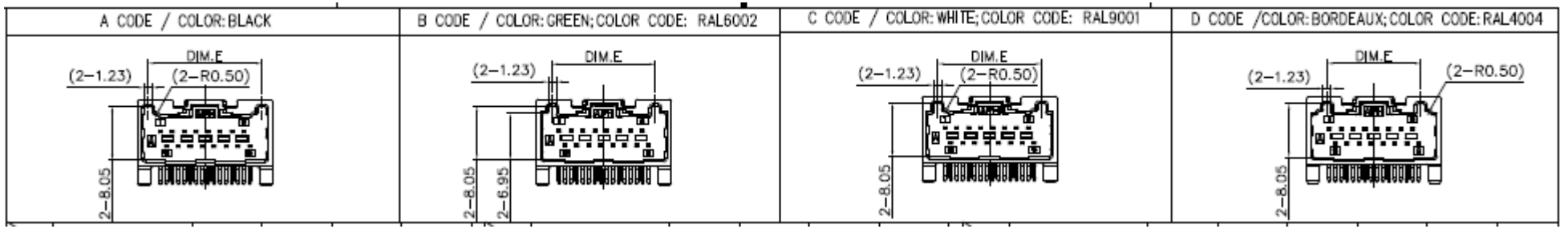
❑ Header----Prevent Error Insertion Structure: A / B / C / D coding in 4 different colors

TH header

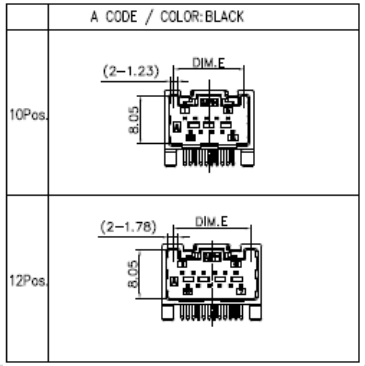
20 to 40 pos.



14 to 18 pos.



10 to 12 pos.



WireLock® Coding and Color Features

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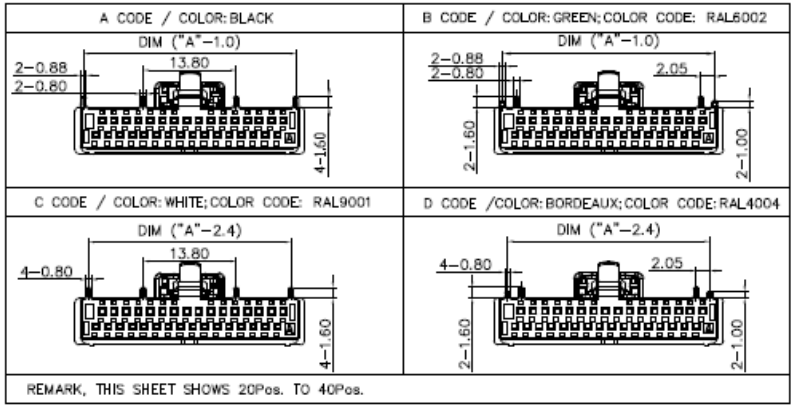
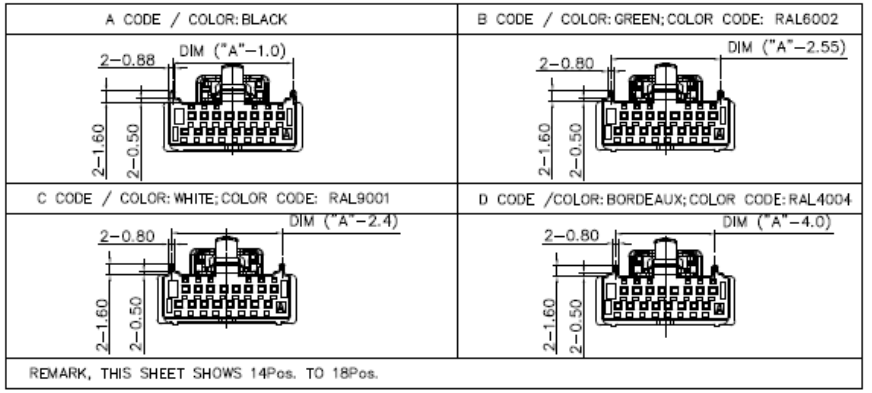
❑ Receptacle---- Prevent Error Insertion Structure: A / B / C / D coding in 4 different colors

Receptacle

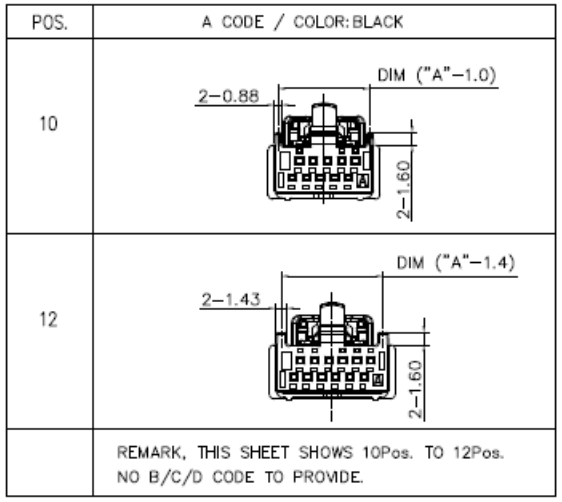
20 to 40 pos.



14 to 18 pos.



10 to 12 pos.

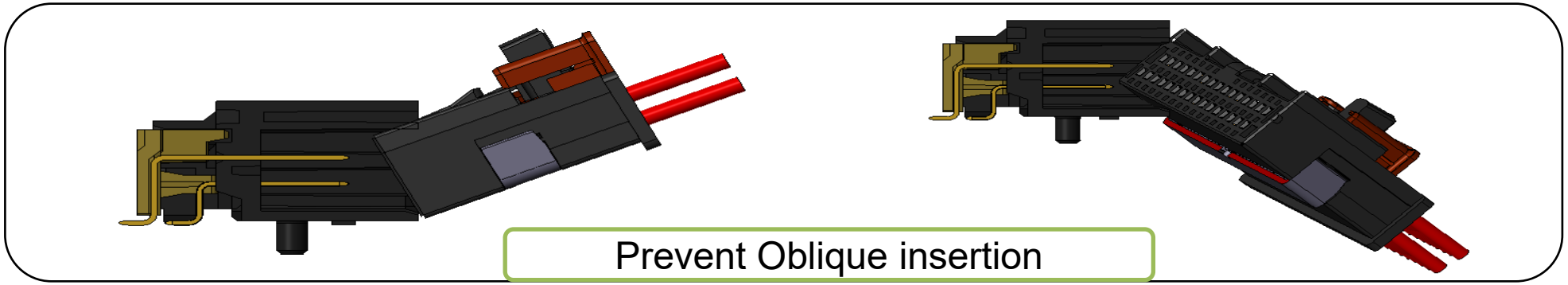


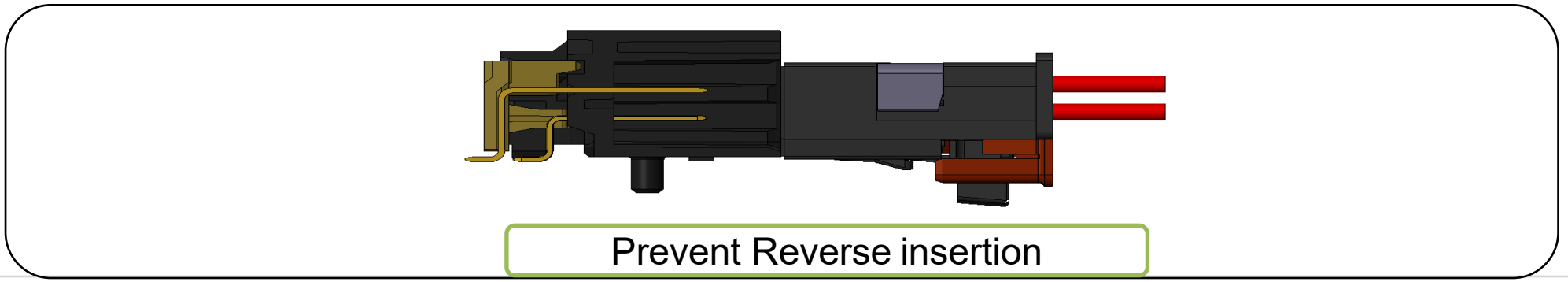
❖***When mating a receptacle with the wrong coded header, it cannot be inserted. Different codings can be recognized with help of the matching colors.***

WireLock® Coding and Color Features

❑ Error insertion for oblique insertion and reverse insertion (180°):
when mating in below situation:

❖mating A code receptacle with A code header ;
❖mating B code receptacle with B code header;
❖mating C code receptacle with C code header;
❖mating D code receptacle with D code header.





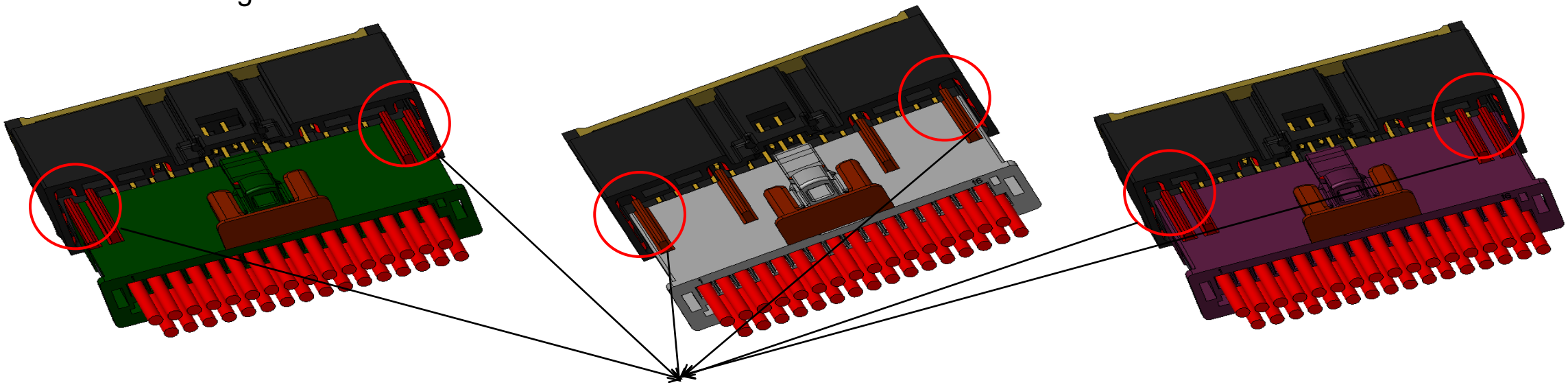
WireLock® Coding and Color Features

Amphenol
COMMUNICATIONS SOLUTIONS

❑ Error insertion for mistake code type:
when mating in below situation:
❖mating A code receptacle with B/C/D code header ;
❖mating B code receptacle with A/C/D code header;
❖mating C code receptacle with A/B/D code header;
❖mating D code receptacle with A/B/C code header.

Prevent Error Insertion.

Situation as below figure:

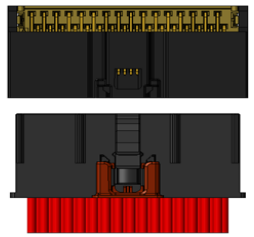
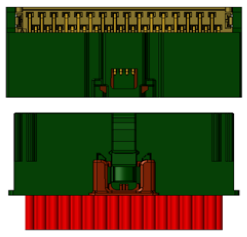
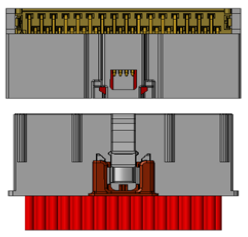
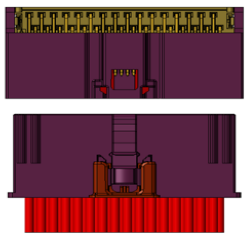


Structure for preventing inserting into the plastic housing

WireLock® Part Numbers - WtB

Amphenol
COMMUNICATIONS SOLUTIONS

Board header Right Angle Through Hole (PCB mount)

	A CODE	B CODE	C CODE	D CODE
DIP				

10. PART NUMBER CODE: 10153118-Y XX X X LF

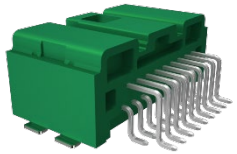
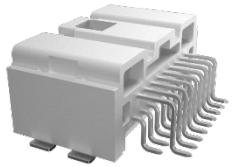
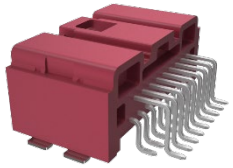
CONTACT MATERIAL&PLATING
0-MATERIAL: PHORSPHOR BRONZE
CONTACT AREA: REFLOW Tin 1~2.5um
SOLDER AREA: REFLOW Tin 1~2.5um
1-MATERIAL: BRASS
CONTACT AREA: REFLOW Tin 1~2.5um
SOLDER AREA: REFLOW Tin 1~2.5um
△J 5-MATERIAL: BRASS
CONTACT AREA: 0.76um Gold
SOLDER AREA: MATTE Tin 1~2.5um

RoHS COMPATABLE
FOR CUSTOMER CODE △J
CODE TYPE
A - A CODE
B - B CODE
C - C CODE
D - D CODE
PACKAGING
K - TAPE & REEL
T - TRAY PACKAGE
NUMBER OF POSITIONS
10 - 10 PINS
12 - 12 PINS
.....
40 - 40 PINS

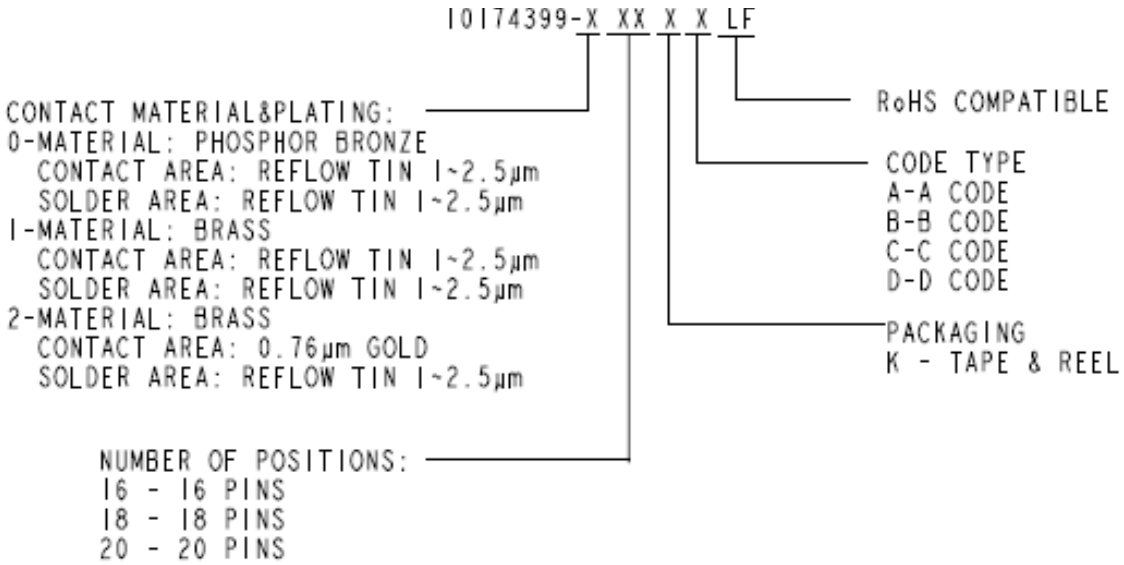
WireLock® Part Numbers - WtB

Amphenol
COMMUNICATIONS SOLUTIONS

Board header Right Angle SMT (PCB mount)

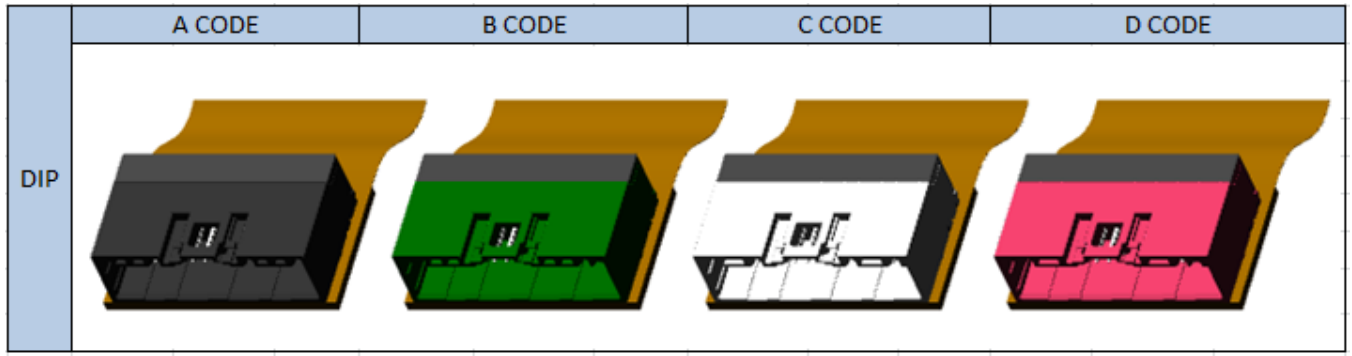
	A Code	B Code	C code	D code
SMT				

Remarks: 18/20/28p tooled up



WireLock® Part numbers - WtB

Board header Right Angle Through Hole (flex mount)



9. PART NUMBER CODE: 10168530-Y XX X X LF

△C

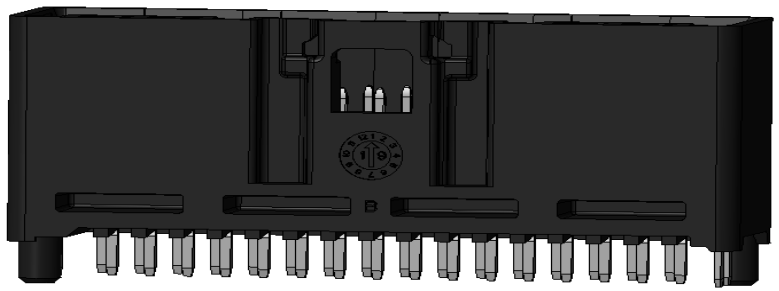
CONTACT MATERIAL&PLATING
0-MATERIAL: PHORSPHOR BRONZE
CONTACT AREA: REFLOW Tin 1~2.5um
SOLDER AREA: REFLOW Tin 1~2.5um
1-MATERIAL: BRASS
CONTACT AREA: REFLOW Tin 1~2.5um
SOLDER AREA: REFLOW Tin 1~2.5um
5-MATERIAL: BRASS
CONTACT AREA: 0.76um Gold
SOLDER AREA: MATTE Tin 1~2.5um

RoHS COMPATABLE
CODE TYPE
A - A CODE
B - B CODE
C - C CODE
D - D CODE
PACKAGING
K - TAPE & REEL
T - TRAY PACKAGE
NUMBER OF POSITIONS
10 - 10 PINS
12 - 12 PINS
14 - 14 PINS
.....
40 - 40 PINS

Remarks:
1. P/N refers only to connectors only

WireLock® Part Numbers - WtB

Board header Vertical Through Hole



9. PART NUMBER CODE: 10158465-Y XX Z X LF

CONTACT MATERIAL&PLATING
0-MATERIAL: PHORSPHOR BRONZE
REFLOW Tin 1~2.5um PLATED OVER ALL
1-MATERIAL: BRASS
REFLOW Tin 1~2.5um PLATED OVER ALL
E 2-MATERIAL: PHORSPHOR BRONZE
CONTACT AREA: 0.75um Gold
SOLDER AREA: MATTE Tin 1~2.5um

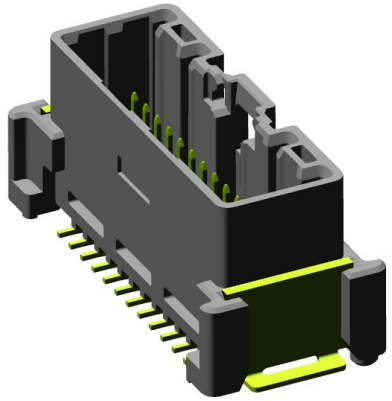
NUMBER OF POSITIONS
10 - 10 PINS
12 - 12 PINS
.....
40 - 40 PINS

PACKAGING
K - TAPE & REEL WITH CAP
M - TAPE & REEL WITHOUT CAP

CODE TYPE
A - A CODE
B - B CODE
C - C CODE
D - D CODE

RoHS COMPATABLE

Board header Vertical SMT



9 - PART NUMBER CODE : 10158001-X XX X X LF

CONTACT PLATING:
0-REFLOW TIN 1~2.5um PLATED ALL OVER

1-CONTACT AREA: 0.15um GOLD
SOLDER AREA: MATTE TIN 1~2.5um

NUMBER OF POSITIONS :
10 - 10 PINS
12 - 12 PINS
.....
40 - 40 PINS
(SEE TABLE ON SHEET 1)

PACKAGING :
K - TAPE & REEL
T - TRAY PACKAGE

CODE TYPE:
A - A CODE

RoHS COMPATIBLE

WireLock® Part Numbers - WtB

USCAR-2

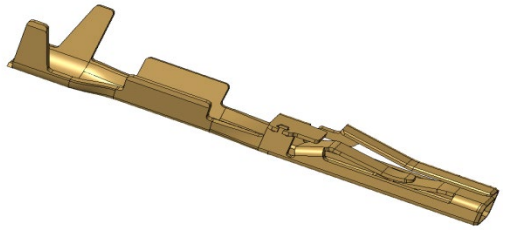
Cable side

Cable housing

3 – PART NUMBER CODE: 10159549-1 XX X X LF

- LF – RoHS COMPATABLE
- X – FOR CUSTOMER CODE
- X – CODE OPTION + COLOR
  - A – A CODE
  - B – B CODE
  - C – C CODE
  - D – D CODE
- X – PACKAGING
  - K – TRAY PACKAGE
  - T – PE BAG PACKAGE
- XX – NUMBER OF POSITIONS
  - 20 – 20 PINS
  - 22 – 22 PINS
  - .....
  - 40 – 40 PINS

Cable Terminal



8. PART NUMBER: 10153126 – X Y Z LF

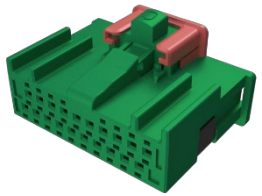
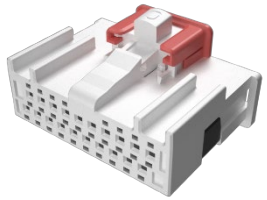
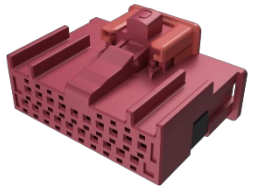
- LF – FOR CUSTOMER CODE
- Z – WIRE SIZE RANGE:
  - 1=0.13 to 0.17mm²
  - 2=0.22 to 0.35mm²
- Y – TERMINAL TYPE :
  - C=TYPE A (USCAR V1)
  - T=TYPE B (USCAR V2)
  - S=TYPE C (USCAR V1)
- X – CONTACT PLATING:
  - ⚠3=0.76um Gold on mating area
  - 4=Full Reflow Tin 1~2.5um Plated Cu underplated.
  - 5=Full Reflow Tin 1~2.5um Plated Ni under plated

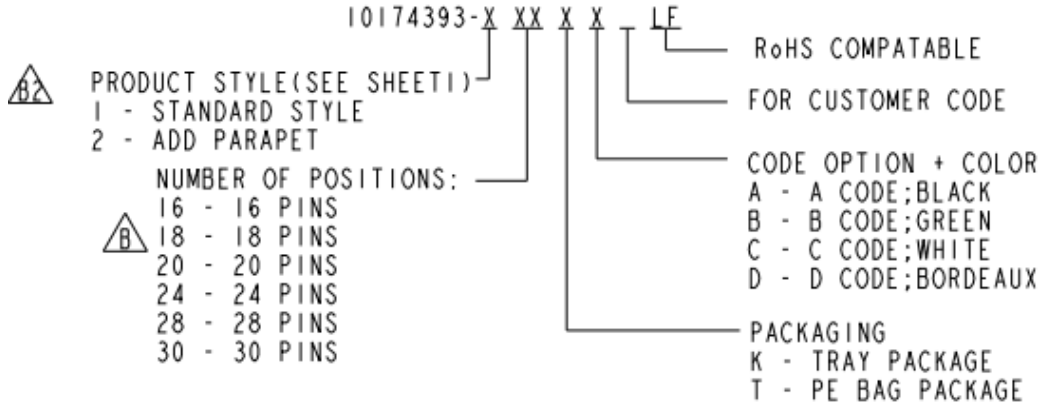
WireLock® Part Numbers - WtB

Cable side

Cable housing

USCAR-2

	A Code	B Code	C code	D code
SMT				



Remarks: 18/20/28p tooled up

WireLock® Part Numbers - WtB

LV214 S2

Cable side

Cable housing

PART NUMBER CODE: 10168373–1 XX X X LF

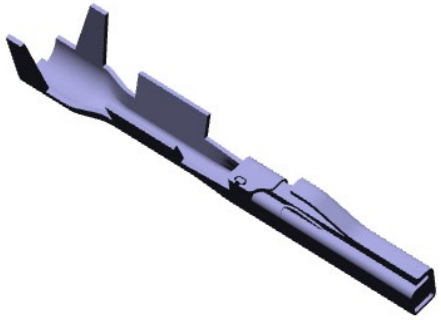
NUMBER OF POSITIONS
20 – 20 PINS
22 – 22 PINS
.....
40 – 40 PINS

RoHS COMPATABLE

CODE OPTION + COLOR
A – A CODE
B – B CODE
C – C CODE
D – D CODE

PACKAGING
K – TRAY PACKAGE
T – PE BAG PACKAGE

Cable Terminal



5. PART NUMBER: 10163003 – 0 0 X LF

CONTACT PLATING:
0=2.5~5um Hot–Dip Pure Tin

WIRE SIZE RANGE:
1=0.13 to 0.17mm²
2=0.22 to 0.35mm²

RESERVE NUMBER

WireLock® Part Numbers - WtW

USCAR-2

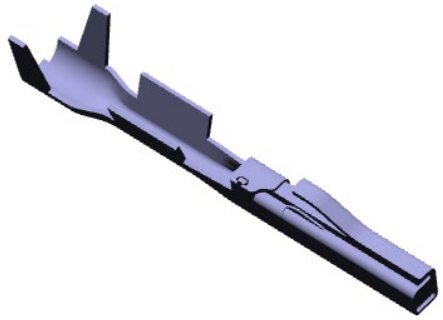
One Cable side

Female Cable housing

5 – PART NUMBER CODE: 10153123–0 XX X X LF

- 0: WITHOUT CPA
- NUMBER OF POSITIONS
  - 20 – 20 PINS
  - 22 – 22 PINS
  - .....
  - 40 – 40 PINS
- CODE OPTION + COLOR
  - A – A CODE
  - B – B CODE
  - C – C CODE
  - D – D CODE
- FOR CUSTMORE CODE
- RoHS COMPATABLE
- PACKAGING
  - K – TRAY PACKAGE
  - T – PE BAG PACKAGE

Female Cable Terminal



5. PART NUMBER: 10163003 – 0 0 X LF

- CONTACT PLATING:
  0=2.5~5um Hot–Dip Pure Tin
- RESERVE NUMBER
- WIRE SIZE RANGE:
  1=0.13 to 0.17mm²
  2=0.22 to 0.35mm²

WireLock® Part Numbers - WtW

USCAR-2

One Cable side

Male Cable housing

PART NUMBER CODE: 10168908–Y XX X X LF

- Y — 0 – STANDARD
- XX — NUMBER OF POSITIONS
  - 10 – 10 PINS
  - 12 – 12 PINS
  - .....
  - 40 – 40 PINS
- X — PACKAGING
  - K – TRAY PACKAGE
  - T – PE BAG PACKAGE
- X — CODE TYPE
  - A – A CODE
  - B – B CODE
  - C – C CODE
  - D – D CODE
- LF — RoHS COMPATABLE

Male Cable Terminal

PART NUMBER: 10168906 - X 0 X LF

- X — PLATING OPTION:
  - 0 → 1~2.5um REFLOW TIN PLATED ON 1.25um Min. NICKLE OVER ALL
- X — WIRE SIZE RANGE
  - 1 → 0.13~0.17mm²
  - 2 → 0.22~0.35mm²

WireLock® Tooling Information

Amphenol
COMMUNICATIONS SOLUTIONS

Crimping Tool:
10176999-001HT
(Female & male cable terminal)

- *See application spec GS-20-0594 …*

WireLock® Target Application

BMS (Battery Management System)

OBC (On Board Charge)

MCU (Micro Control Unit)

Gateway

Lighting

ADAS (Advanced Driving Assistance System)

RADAR

Robotics

Thank You

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COMMUNICATIONS SOLUTIONS

FCi Basics