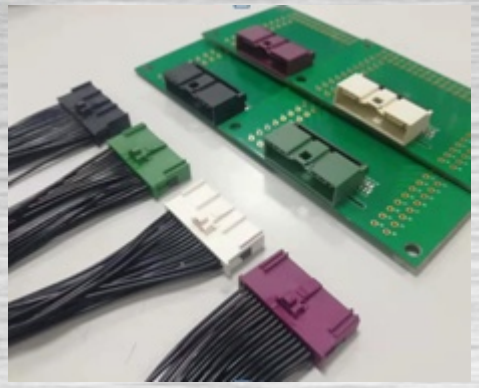
WireLock® Automotive WTB product

(*More reliability low mating force automotive grade connector system*)

Product Presentation

01/04/2021



Amphenol Information Communications and Commercial Products

FCi Basics

Amphenol ICC

Agenda

FCi Basics

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

Amphenol ICC

WireLock®
Value Proposition

FCi Basics

- The WireLock® Wire-To-Board connector's compact design addresses the growing demand for automotive components. The connector is double row offering four coding with four different colors.
- The connector has nominal current carrying capacity of 3A and cable wire gauge from 22AWG to 26AWG.
- The WireLock® is available in 10 to 40 positions (10,12,14…40) double row with right angle and horizontal configurations and through hole, SMT options.
- The connector can be applied in the automotive, industry and robotic. It can meet the requirements of USCAR-2 V2 or QC-T1067.1-2017.

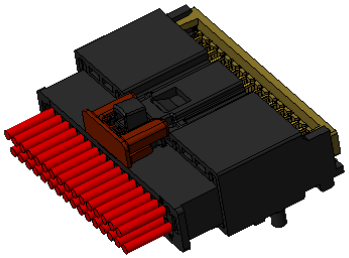
WireLock®
Value Proposition

FCi Basics

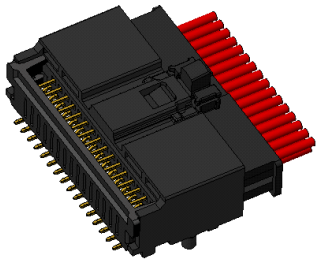
- **Header** *Housing with pins (Male connector)*
- **Receptacle** *Female housing with cable terminals*
- **Terminal** *CTW contact*
- **TPA** *Terminal position assurance*
- **CPA** *Connector Position assurance*

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

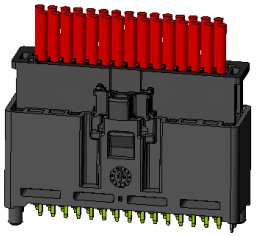
- **Horizontal** *Connection axis parallel to the board*
- **Vertical** *Connection axis perpendicular to the board*



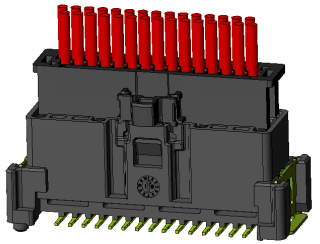
RA TH type



RA SMT type



VT TH type



VT SMT type

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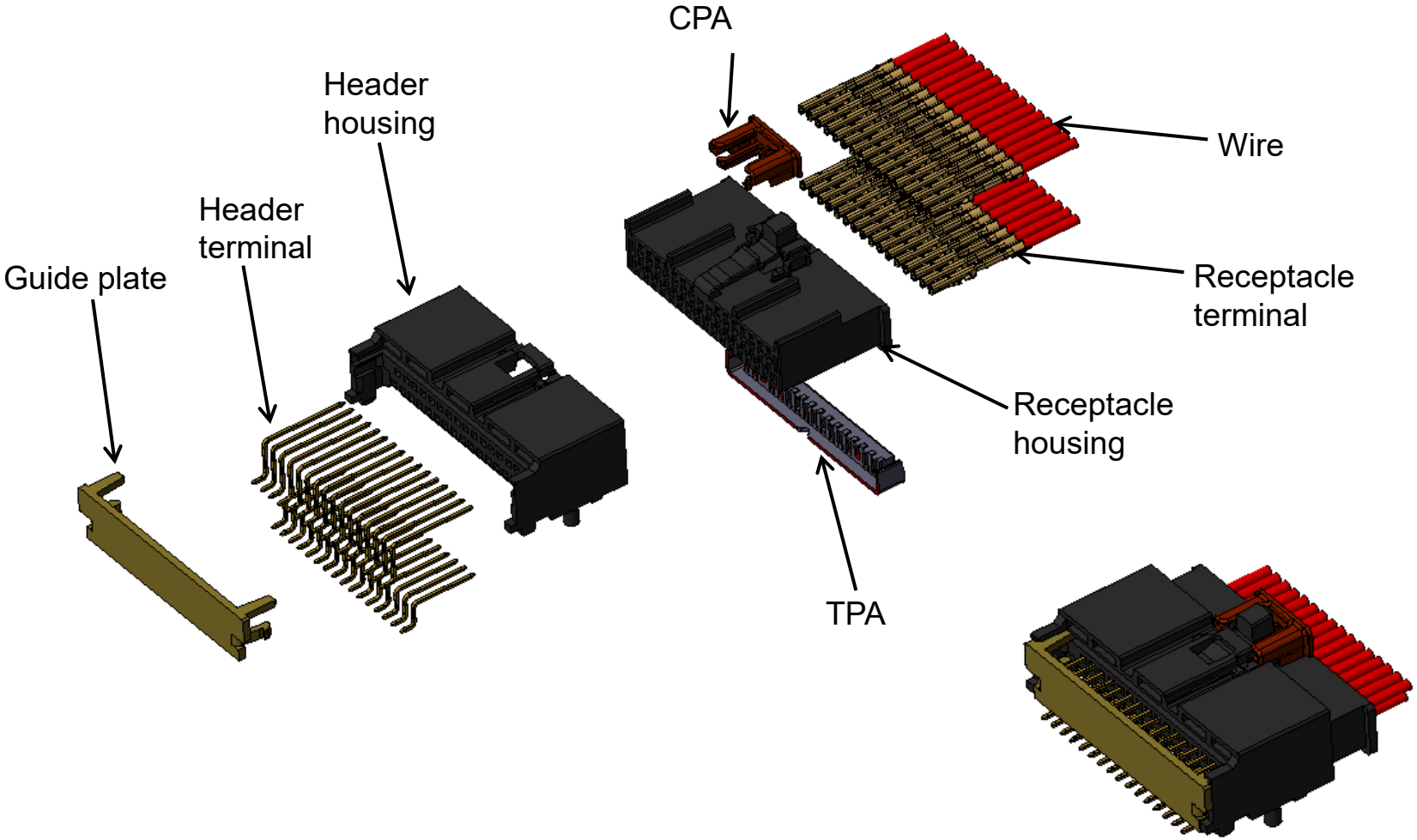
Product Overview Right Angle type

FCi Basics



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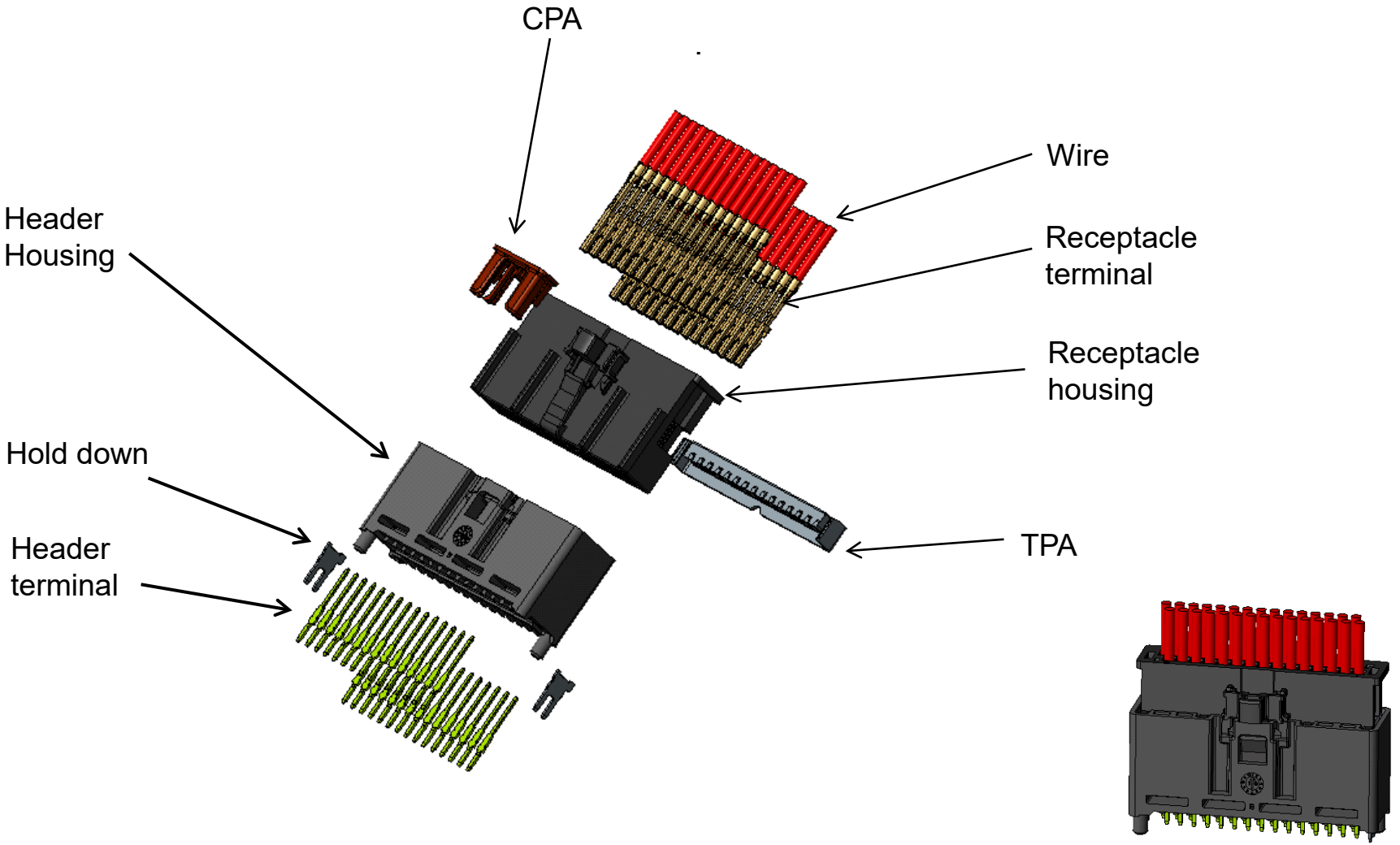
Product Overview Vertical type

FCi Basics



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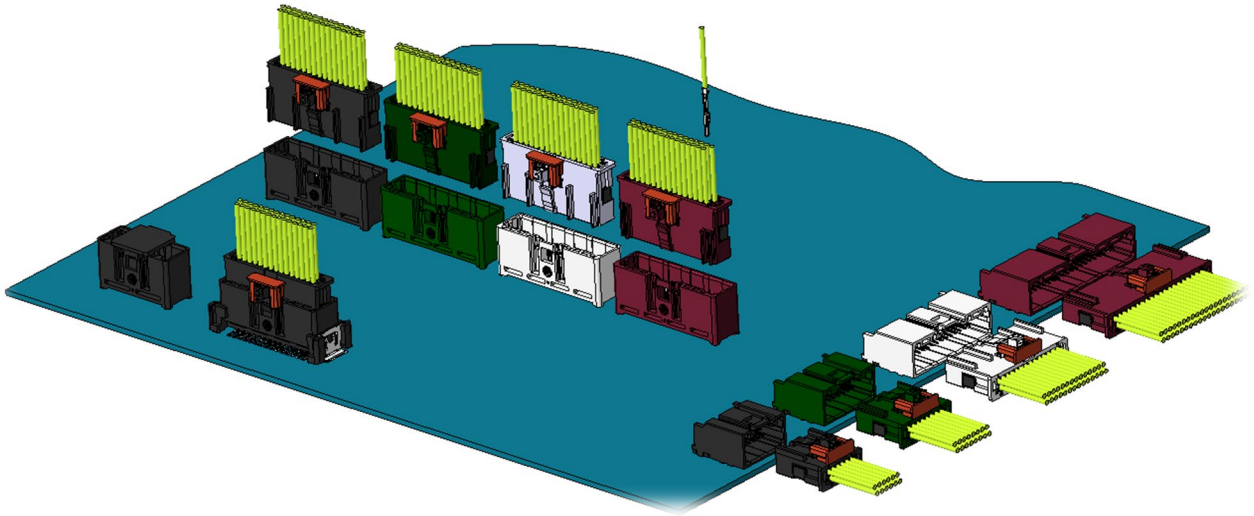
Family Configuration matrix

Board pitch	Board header Type	Wire to Board			Max Current (A)	Wire size	Plating options	Latch	CPA	TPA
		Pin position	Double Row	STG		AWG				
1,80 mm	Right Angle TH	10-40pin	✓	✓	3A	22/24/26AWG	Tin, Gold,	✓	✓	✓
	Right Angle SMT	10-40pin	✓	✓	3A	22/24/26AWG	Tin, Gold,	✓	✓	✓
	Vertical TH	10-40pin	✓	✓	3A	22/24/26AWG	Tin, Gold,	✓	✓	✓
	Vertical SMT	30pin	✓	✓	3A	22/24/26AWG	Tin, Gold,	✓	✓	✓



WireLock®
Product Specifications

FCi Basics

Specifications
- Pitch: 1.8mm.
- PCB Termination: 1.6mm, 2.0mm
- Configuration: SMT and TH types

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

Electrical Performances
- Low Level Contact Resistance:< 15mΩ
- Insulation Resistance: > 100MΩ
- Voltage Rating: 48V AC/DC
- Current Rating: 3A
- Dielectric Withstand Voltage:1000VAC
- Temperature Rise: +55°C max for 5.0A(32Pin)

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

Tool Information
- Hand Tool : 10159164-001LF
- Mini-applicator Crimping Tool: GS-20-0594

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

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WireLock®
Features & Benefits

FCi Basics

Features	Benefits
Reflow Tin plating process for terminal	Low mating and un-mating force
Current rating 3A 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

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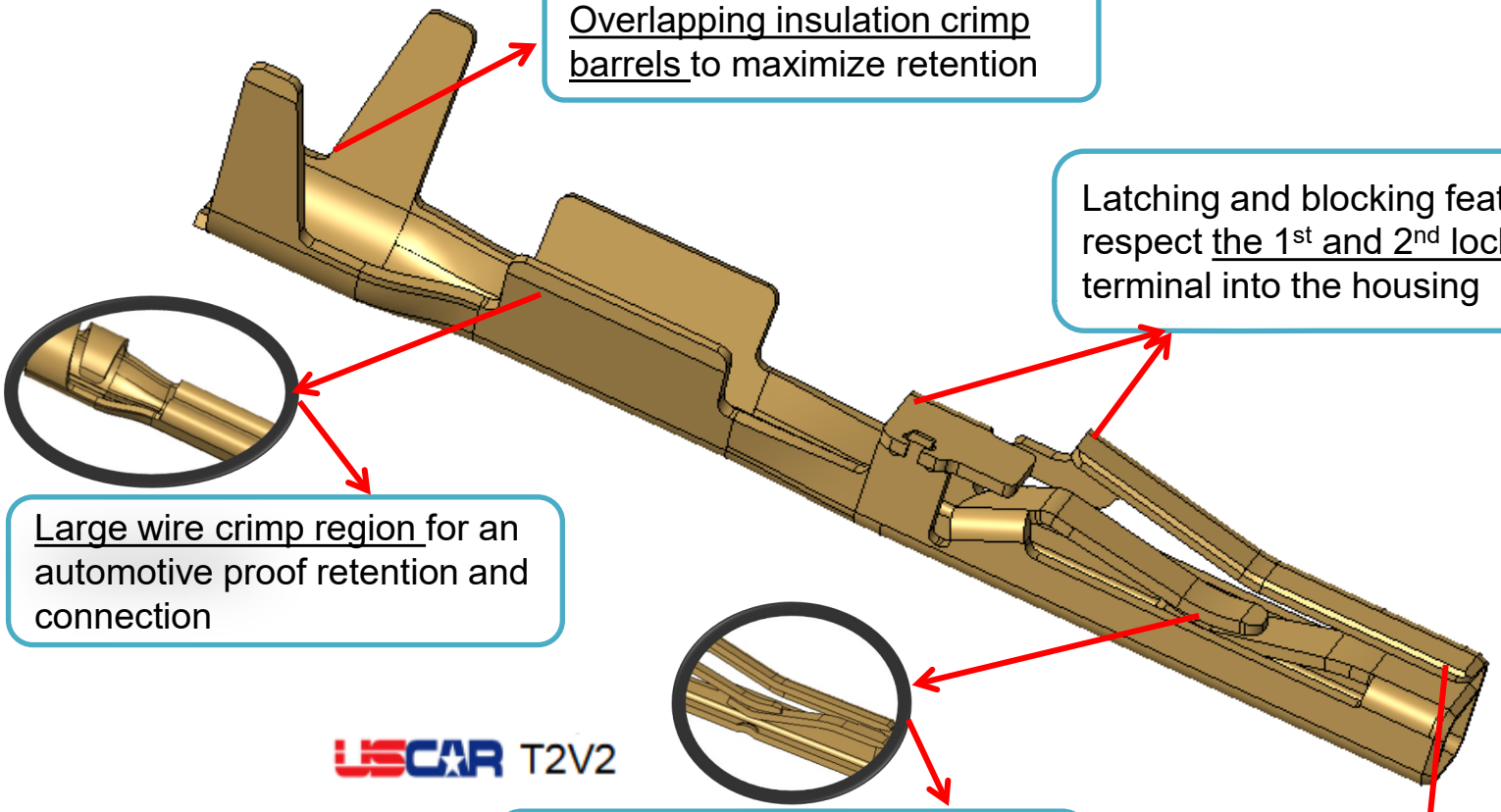
Terminal Features

FCi Basics



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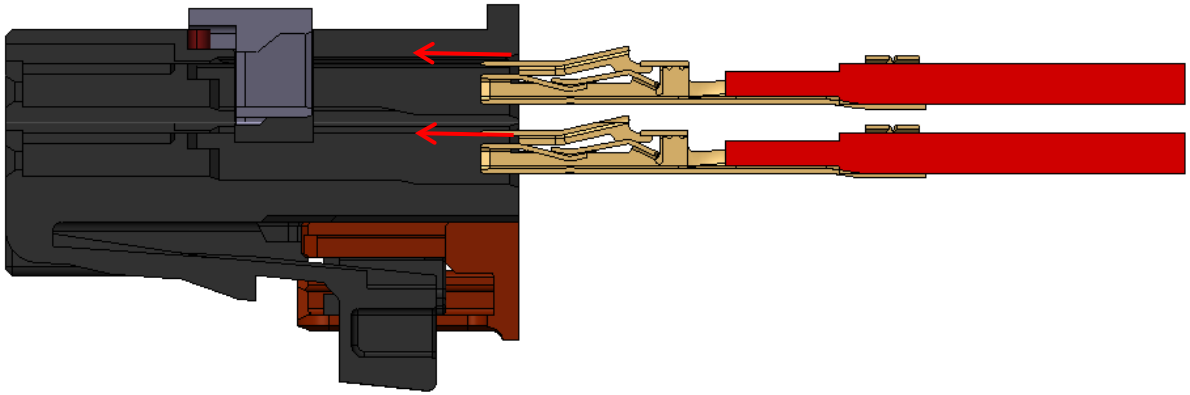
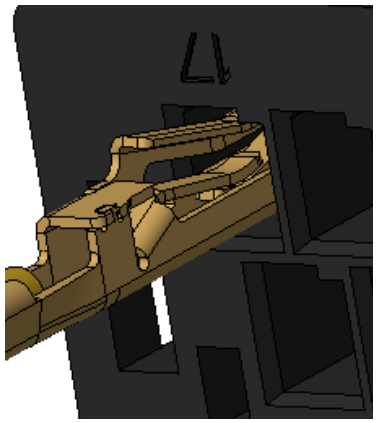
Rear loading terminal assembly

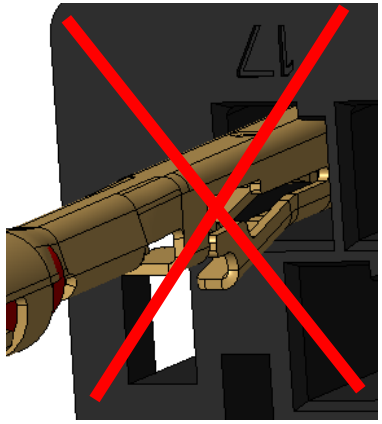
- Insert terminals into receptacle housing

Housing with open TPA



- Keying function of terminal prevents wrong insertion

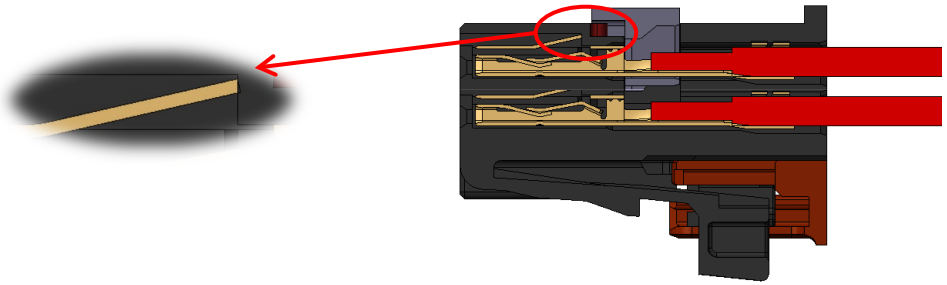


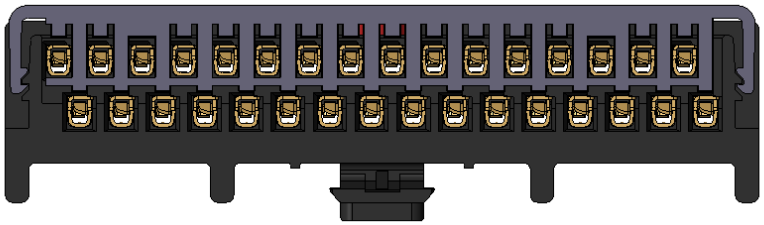


TPA functionality

❑Primary locking (to maintain before TPA)

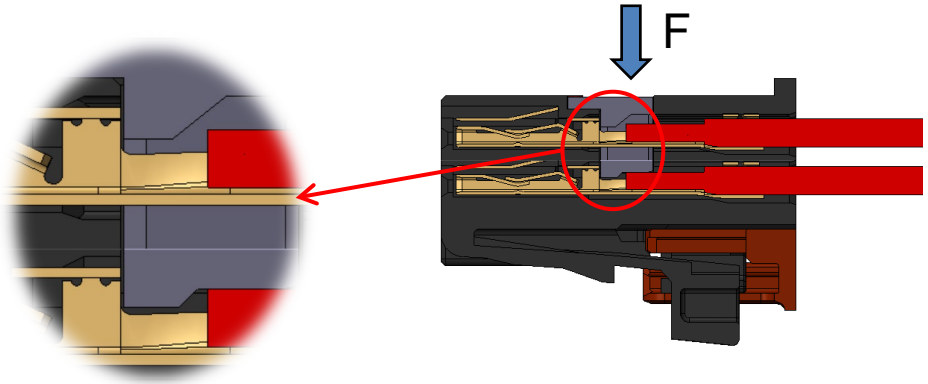
Housing with open TPA

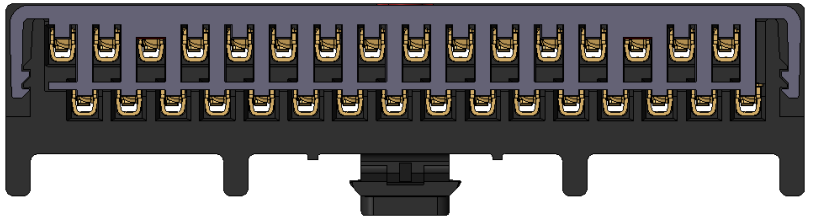




❑Secondary locking (to block)

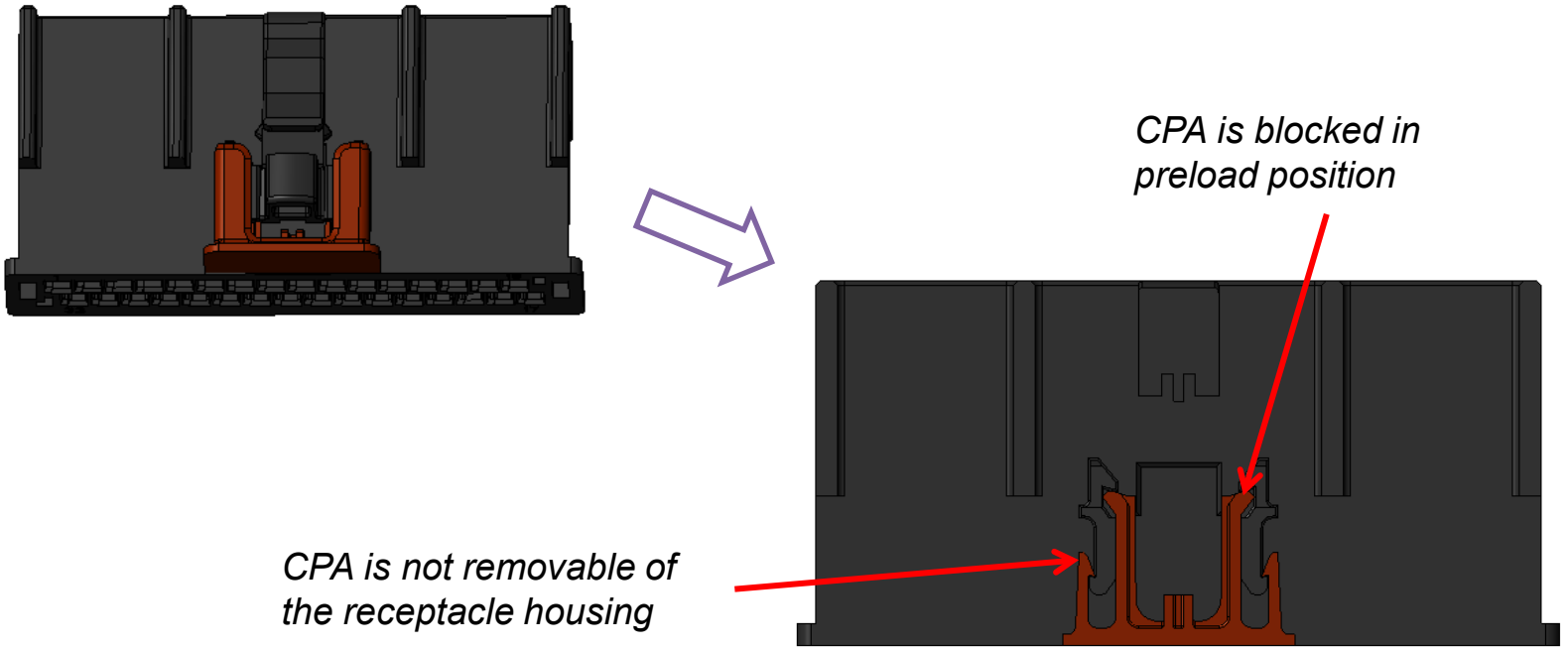
Housing with closed TPA





CPA functionality(optional)

- Pre-Insert CPA into the receptacle housing



- ***When receptacle is not mated, CPA could not be removed or pushed.***

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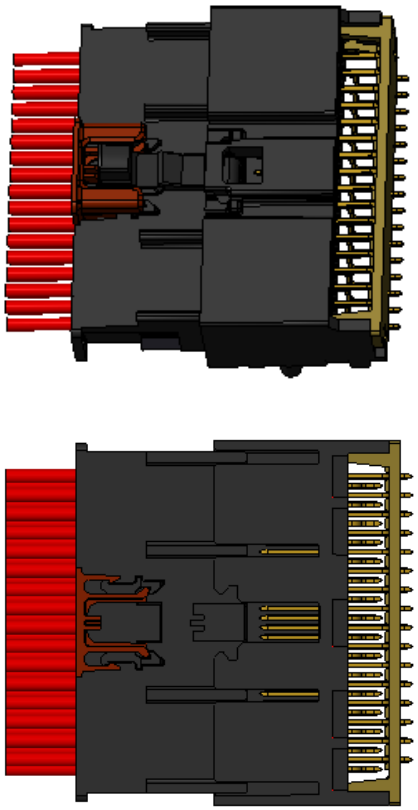
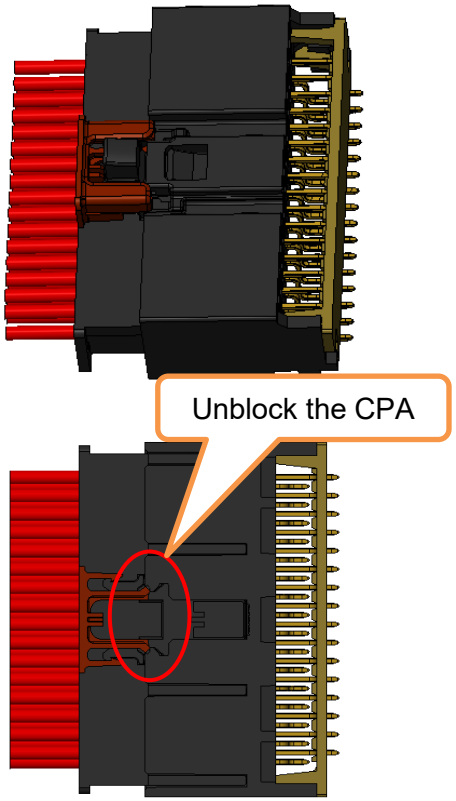
CPA Features

FCi Basics

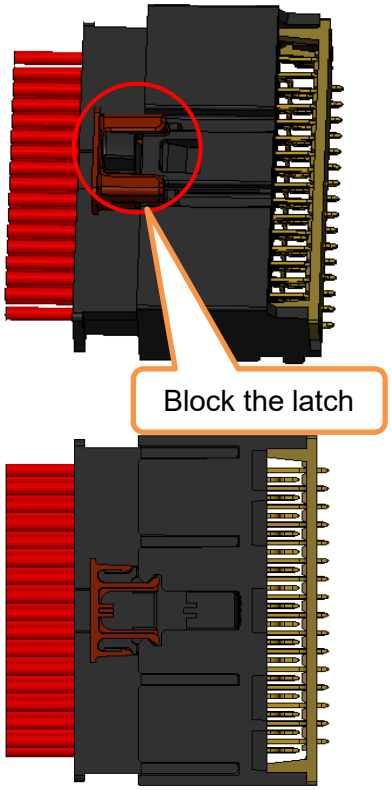
- CPA can be pushed only if the receptacle is mounted into the header at the final position



Insertion of the receptacle in the header



Header slope feature unblock the CPA from the receptacle



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

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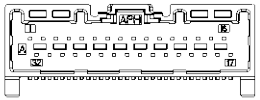
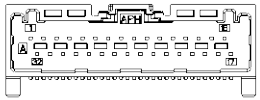
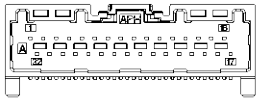
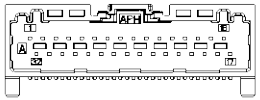
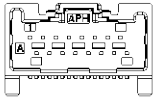
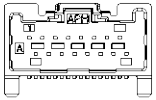
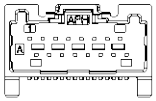
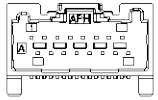
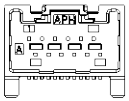
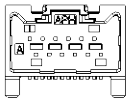
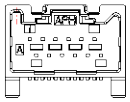
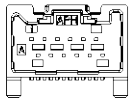
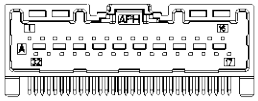
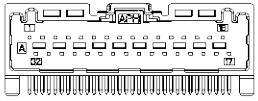
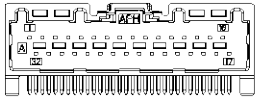
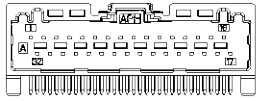
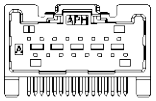
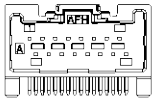
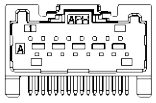
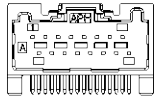
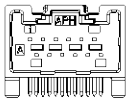
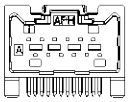
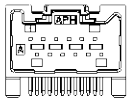
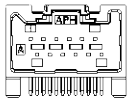
❑ Header----Prevent Error Insertion Structure: A code/B code/C code/D code and different color.

SMT header

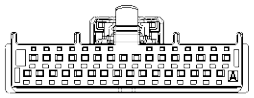
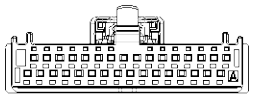
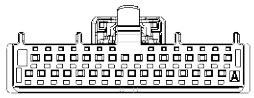
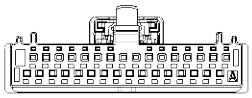
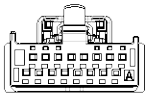
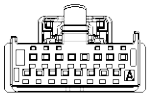
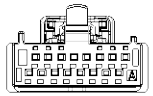
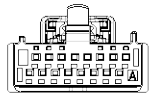
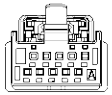
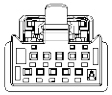
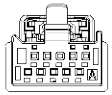
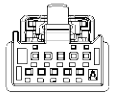
	A CODE / COLOR: BLACK	B CODE / COLOR: GREEN; COLOR CODE: RAL6002	C CODE / COLOR: WHITE; COLOR CODE: RAL9001	D CODE /COLOR: BORDEAUX; COLOR CODE: RAL4004
20 to 40 pos.				
14 to 18 pos.				
10 to 12 pos.				

TH header

	A CODE / COLOR: BLACK	B CODE / COLOR: GREEN; COLOR CODE: RAL6002	C CODE / COLOR: WHITE; COLOR CODE: RAL9001	D CODE /COLOR: BORDEAUX; COLOR CODE: RAL4004
20 to 40 pos.				
14 to 18 pos.				
10 to 12 pos.				

- Receptacle---- Prevent Error Insertion Structure : A code/B code/C code/D code and different color.

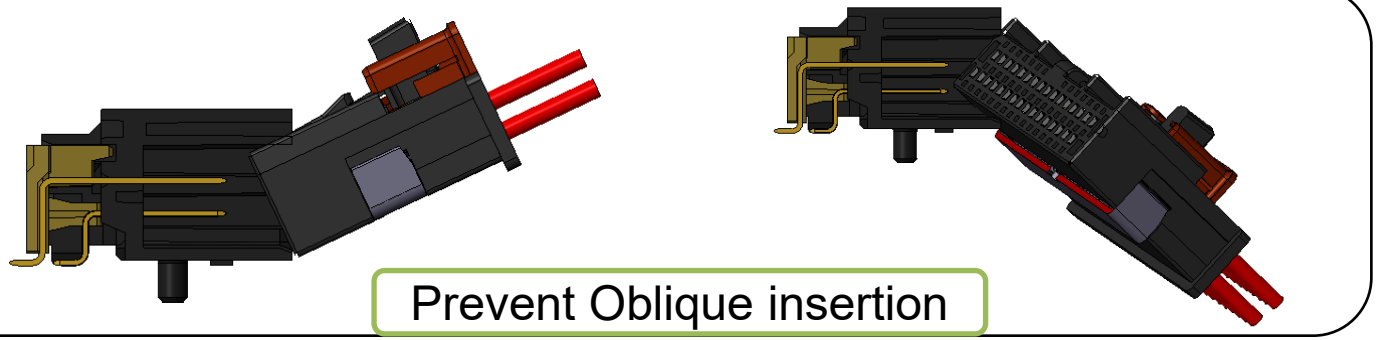
Receptacle

	A CODE / COLOR: BLACK	B CODE / COLOR: GREEN; COLOR CODE: RAL6002	C CODE / COLOR: WHITE; COLOR CODE: RAL9001	D CODE /COLOR: BORDEAUX; COLOR CODE: RAL4004
20 to 40 pos.				
14 to 18 pos.				
10 to 12 pos.				

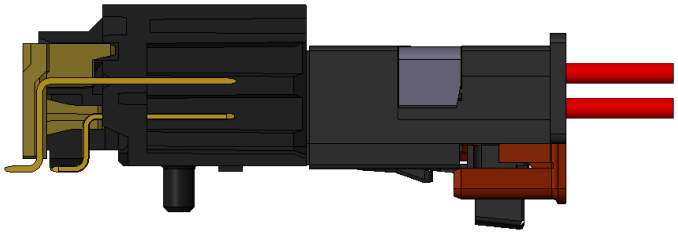
❖ ***When mating the receptacle with the wrong code header, it could not be inserted and different color for different code can be recognized easily.***

❑ 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.



Prevent Oblique insertion



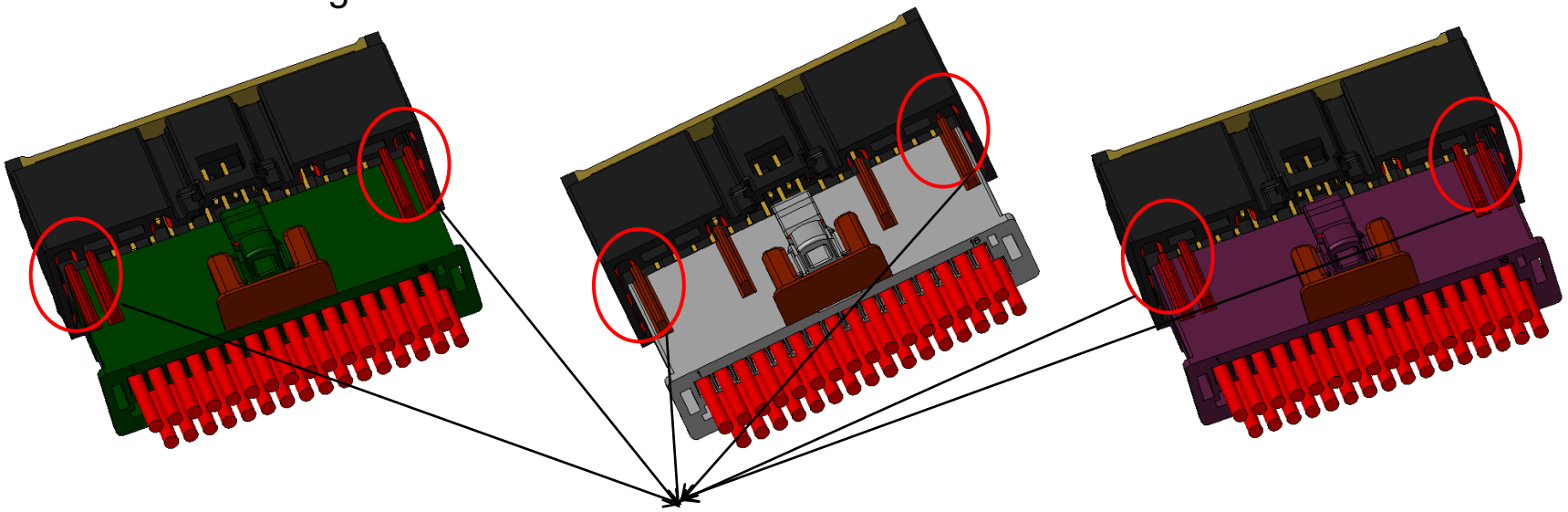
Prevent Reverse insertion

❑ 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.

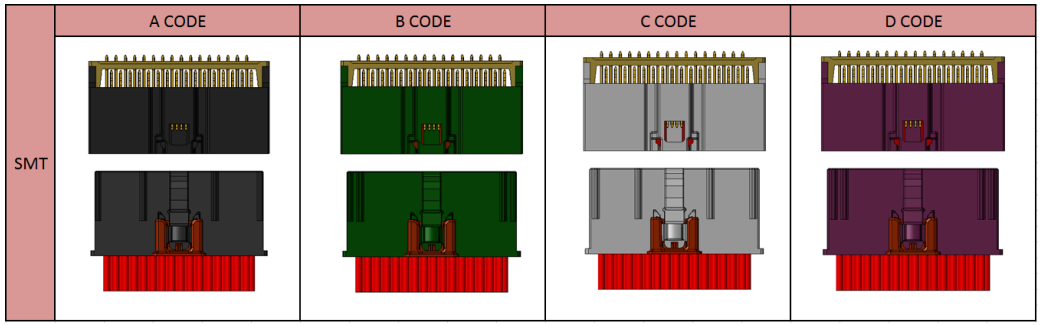
Prevent Error Insertion.

Situation as below figure:



Structure for preventing inserting into the plastic housing

Board header Right Angle SMT



9. PART NUMBER CODE: 10153117-X XX X X LF

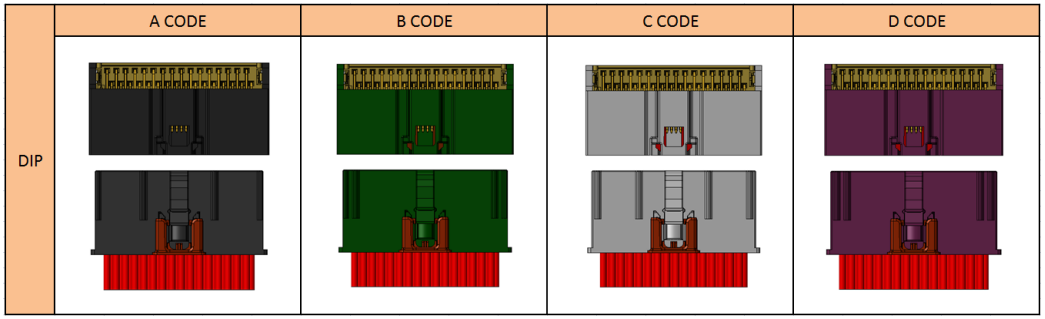
CONTACT MATERIAL&PLATING
0-MATERIAL: PHORSPHOR BRONZE
CONTACT AREA: REFLOW Tin 1~2.5um
SOLDER AREA: REFLOW Tin 1~2.5um
1-MATERIAL: BRASS
CONTACT AREA: REFLOW Tin 1~2.5um
SOLDER AREA: REFLOW Tin 1~2.5um
2-MATERIAL: PHORSPHOR BRONZE
CONTACT AREA: 0.15um Gold
SOLDER AREA: MATTE Tin 1~2.5um
3-MATERIAL: BRASS
CONTACT AREA: 0.15um Gold
SOLDER AREA: MATTE Tin 1~2.5um

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

RoHS COMPATABLE
CODE TYPE
A – A CODE
B – B CODE
C – C CODE
D – D CODE

PACKAGING
K – TAPE & REEL
T – TRAY PACKAGE

Board header Right Angle Through Hole



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

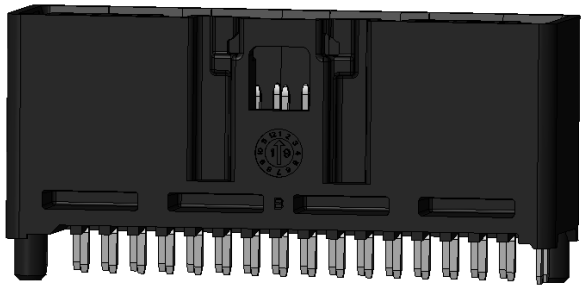
CONTACT MATERIAL&PLATING
0-MATERIAL: PHORSPHOR BRONZE
CONTACT AREA: REFLOW Tin 1~2.5um
SOLDER AREA: REFLOW Tin 1~2.5um
1-MATERIAL: BRASS
CONTACT AREA: REFLOW Tin 1~2.5um
SOLDER AREA: REFLOW Tin 1~2.5um
2-MATERIAL: PHORSPHOR BRONZE
CONTACT AREA: 0.15um Gold
SOLDER AREA: MATTE Tin 1~2.5um
3-MATERIAL: BRASS
CONTACT AREA: 0.15um Gold
SOLDER AREA: MATTE Tin 1~2.5um

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

RoHS COMPATABLE
CODE TYPE
A – A CODE
B – B CODE
C – C CODE
D – D CODE

PACKAGING
K – TAPE & REEL
T – TRAY PACKAGE

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

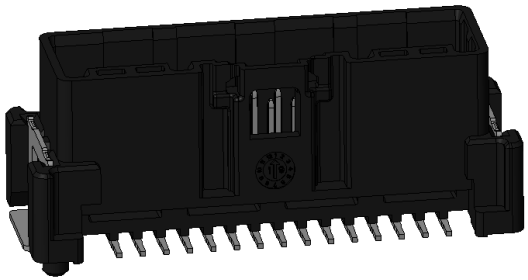
NUMBER OF POSITIONS
10 – 10 PINS
12 – 12 PINS
.....
40 – 40 PINS

RoHS COMPATABLE

CODE TYPE
A – A CODE
B – B CODE
C – C CODE
D – D CODE

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

Board header Vertical SMT



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

CONTACT PLATING:
0-CONTACT AREA: REFLOW TIN 1~2.5um
SOLDER AREA: REFLOW TIN 1~2.5um
1-CONTACT AREA: 0.15um GOLD
SOLDER AREA: REFLOW TIN 1~2.5um

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

PACKAGING :
K - TAPE & REEL
T - TRAY PACKAGE

CODE TYPE:
A - A CODE

RoHS COMPATIBLE

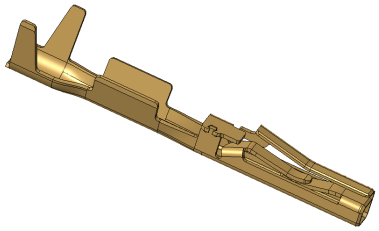
Cable side

Receptacle housing

PART NUMBER CODE: 10159549-1 XX X X LF

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

Receptacle Terminal



5. PART NUMBER: 10153126 – X Y Z LF

- X — CONTACT PLATING:
  - 0=Full Tin 1~2.5um Plated
  - 1=0.15um Gold on mating area
  - 2=0.375um Gold on mating area with lubrication
  - 3=0.75um Gold on mating area with lubrication
  - 4=Full Reflow Tin 1~2.5um Plated
- Y — TERMINAL TYPE :
  - C=TYPE A (MEET USCAR V1 LEVEL)
  - T=TYPE B (MEET USCAR V2 LEVEL)
- Z — WIRE SIZE RANGE:
  - 1=0.13 to 0.17mm²
  - 2=0.22 to 0.35mm²

Mini-applicator Crimping Tool: 10159164-001LF

- *See application spec GS-20-0594 …*

BMS (Battery Management System)

OBC (On Board Charge)

MCU (Micro Control Unit)

Gateway

Lighting

ADAS (Advanced Driving Assistance System)

RADAR

Robotics

Amphenol ICC

THANK YOU