

**Y-LOCK**  
PULLFORCE



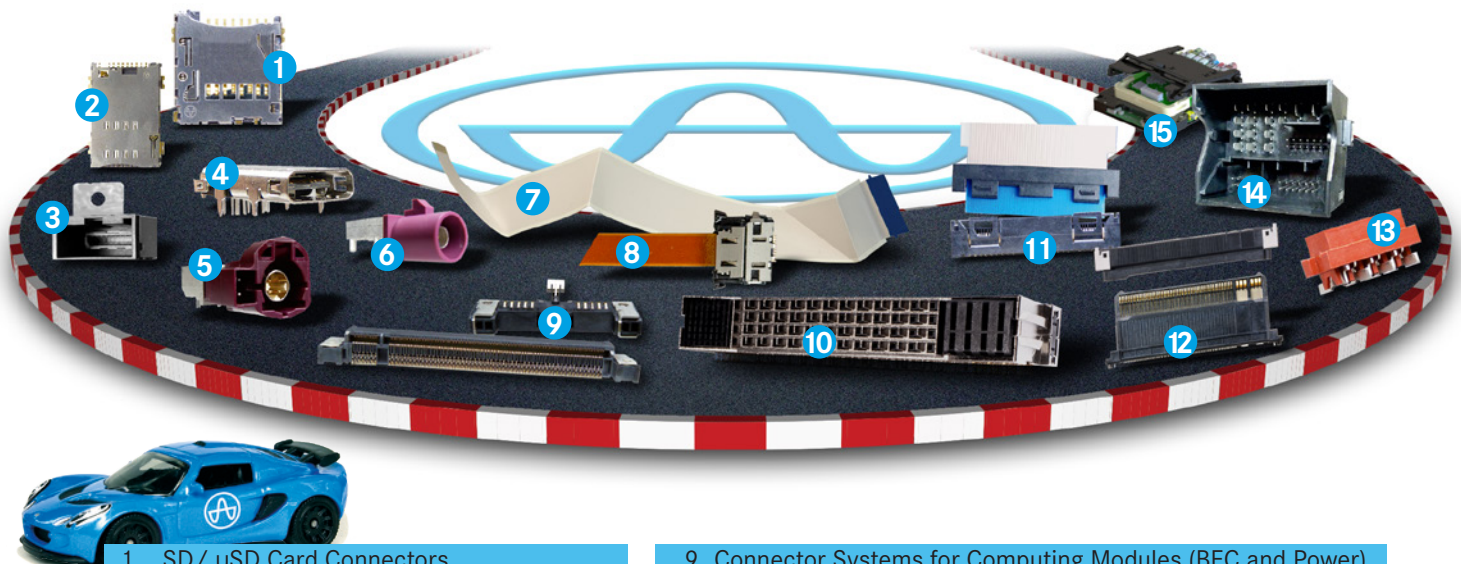
AUTOMOTIVE  
SOLUTIONS

# YAMAICHI ELECTRONICS AUTOMOTIVE PRODUCTS

Based on our wide product range Yamaichi Electronics offers many solutions which are dedicated to automotive applications. Products which have a reliable design and functionality especially for the rough environmental and mechanical conditions in automotive use.

The range of our products is going from non-ZIF connectors, like the Y-Lock connector system, to connectors which can also match High Speed requirements. Connectors for internal use are the BEC-series, means the 230 pin Board Edge connector family, or the Floating Board-to-Board series HF301. For I/O applications Yamaichi is not only able to supply a big choice of card connectors, but also standardised interfaces like Fakra/HSD connections, a complete USB range or HDMI solutions. The Y-Quad connector for Quadlock connection boxes belongs as well to the connector family. For all the different connector systems Yamaichi Electronics is able to develop and supply also the suitable test adapter for the production lines.

## YAMAICHI ELECTRONICS OFFERS THE FOLLOWING SOLUTIONS



1. SD/  $\mu$ SD Card Connectors

2. SIM/ $\mu$ SIM Card Connectors

3. HDMI Series

4. USB Series

5. HSD Connectors

6. FAKRA Connectors

7. Y-FFC - Flexible Flat Cables

8. High Speed FFC/FPC Series

9. Connector Systems for Computing Modules (BEC and Power)

10. Y-CCC - Car Computing Connector

11. Y-Lock Connector Series

12. High Speed Floating BtB Connectors

13. Wire-to-Board Series

14. Y-Quad Series

15. Module Test Adapters

## REFERENCE APPLICATIONS

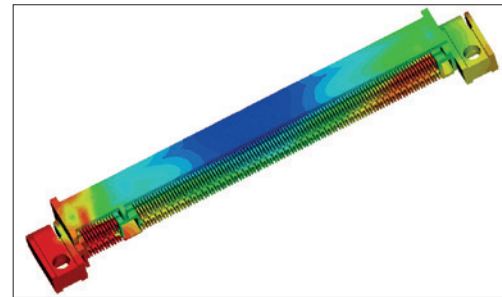
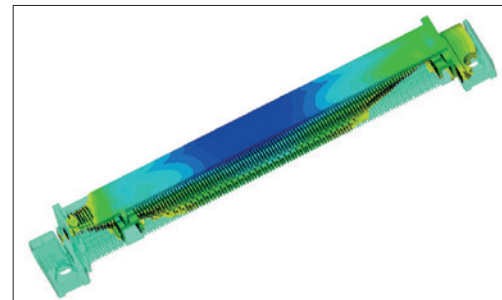
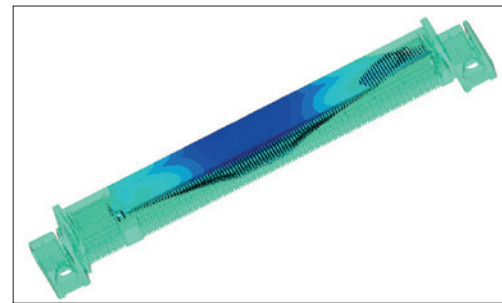
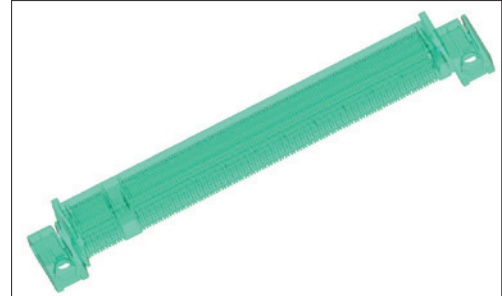
- Head units for infotainment systems
- Camera systems
- I/O connections for antenna, TV, radio, etc...
- Car computing
- Dashboard applications
- Navigation displays
- Connectivity module, e.g. USB Hub
- Electronic Control Units
- Cradle for mobile phones
- Radar/Lidar System

# EUROPEAN DESIGN CENTER

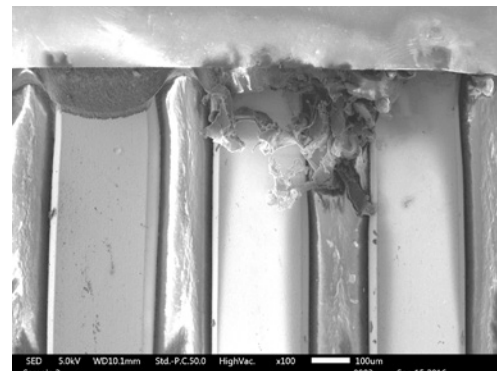
The European design center can offer any kind of customised connector solutions. The final design respects all customer specific requirements and objectives. The product can be optimised and designed for production locations around the world.

- About 100 engineers are working in the two design centers in Munich and Sousse (Tunisia)
- Approximately 400 designs are done per year
- In average 12 patents are applied per year
- Highest level of soft- and hardware is used, e.g.
  - 3D-CAD-construction software Solid Works
  - FEM-calculation software (Finite Element Method) Cosmos (non-linear force / strength calculation)
  - 3D-FEM-calculation software CST (high frequency/speed, thermal air and creep distances)
  - Solid Works stream simulation (for liquids)
  - Altium designer, PCB design software
  - Circuit simulation with SPICE (ADS)
  - Matlab (data analysis)
  - Moldflow 2011 (molding simulation)
  - High definition 3D prototype printer for plastic and metal parts
  - SEM (scanning electron microscope)
  - CT Scanner
  - Climatic Chamber
  - Shock and Vibration Chamber
  - Etc...

Molding Flow Simulation



- All products are qualified and tested in our own laboratories. The laboratories are well equipped and capable to execute the required tests.



# INTERNAL CONNECTORS – BOARD-TO-BOARD

## BOARD EDGE CONNECTOR SERIES WITH 230 PINS

The BEC series is available in two different versions: standard type and High Speed version with the capability to transmit up to 5Gbps and to support signals like USB3.0, HDMI, PCIe2.0 and Sata.

### FEATURES

- Connector ensures reliable contact in applications with vibrations due to the contact shape and form of insulator
- Improved mechanical stability due to enlarged SMT tabs
- Additional fixation of the module card in the connector ensures stable positioning over lifetime
- Improved EMI protection with additional ground connection
- Automatic assembly of module card is possible
- Mating area compatible with QSEVEN and MXM 1.0 standard cards
- RoHS2011/65/EU

### STANDARD BEC

BEC-0.5-230-59-\*F-R-EDC

- Capable for signals such as USB2.0, PCIe1.3

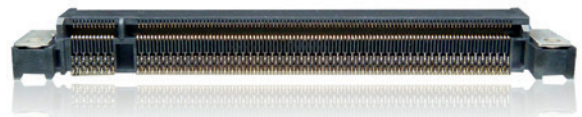


### HIGH SPEED BEC

BECHS-0.5-230-59-\*F-R-EDC

- Capable for signals such as USB3.0, HDMI, PCIe2.0, Sata

***HIGH SPEED***



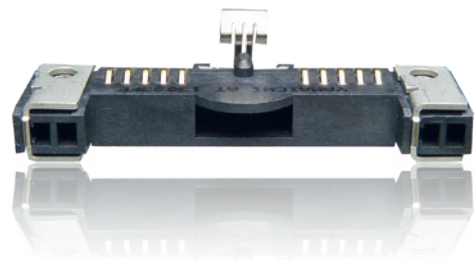
### POWER CONNECTOR

BECPOW-1.5-10-59-\*F-R-EDC

Optionally the power connector can be used together with the BEC/HS BEC. It supports the system with 10 pins. Each pin can transfer 1.5A. Another function is the fixing support of the module during mounting. The module is held down by a spring in the middle of the connector. This enables an easier module fixation by screws on the flanges.

### FEATURES

- Transferring power via 10 x 1.5A
- Supporting assembly of module by additional spring
- Mating height 5mm
- RoHS2011/65/EU



For all Versions: Plating Options (F=AU Flash Plating, B=15µinch AU Plating, A=30µinch AU plating)



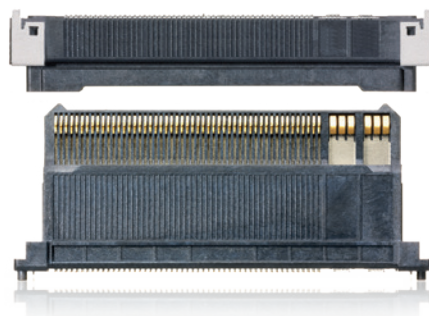
# FLOATING BOARD TO BOARD HIGH SPEED CONNECTOR

## HF301 SERIES ***HIGH SPEED***

This connector system is the perfect solution to connect two boards. The floating mechanism enables smooth functioning also during shock and vibrations.

### FEATURES

- Floating function between 0.5 and 1mm in X,Y,Z direction
- High speed transmission rate up to 5Gbps
- Stacking height up to 22mm
- Different pin counts and pitch available on request
- Power pins available on request
- First-Mate/Last-Break for ESD protection
- Poka-Yoke mating system
- RoHS2011/65/EU



## CAR COMPUTING CONNECTOR SYSTEM ***HIGH SPEED***

### Y-CCC SERIES

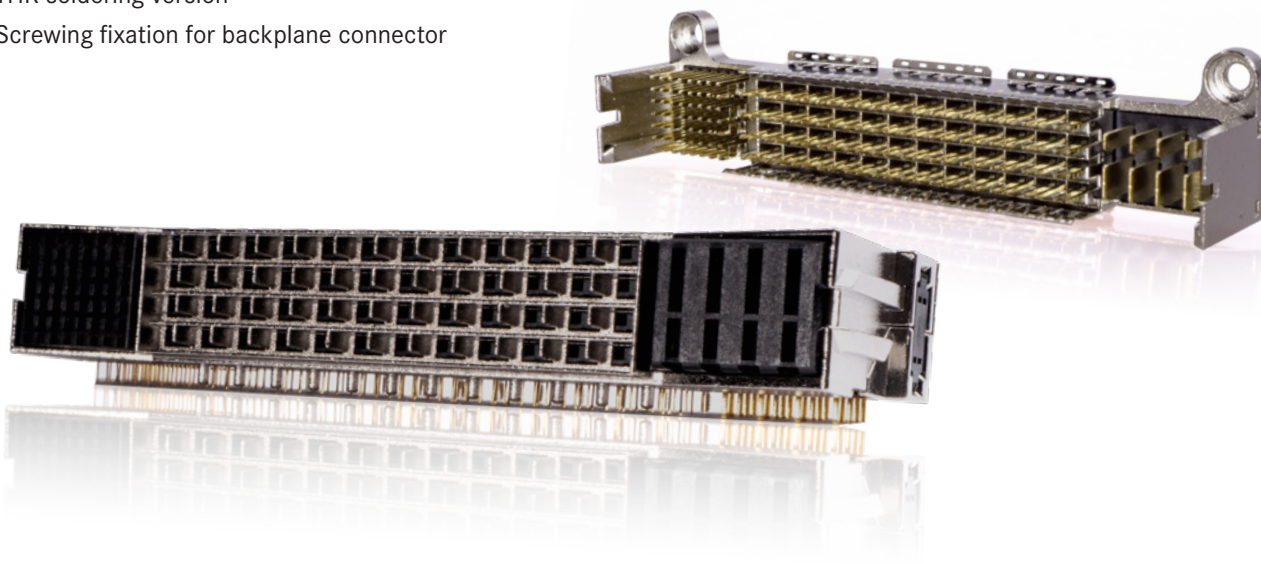
Yamaichi Electronics is creating the future for the connectivity of car computing systems with the new Y-CCC. This backplane connector system fulfills the high requirements of data, signal and power transmission combined with robustness and functionality. Contact us to get more details about the new Y-CCC system.

### FEATURES

- 56 Single ended contacts
- 48 Differential pairs for High speed transmission up to PCIe 4.0
- 8 Power pins up to 20A
- THR soldering version
- Screwing fixation for backplane connector



**Y-CCC**  
S E R I E S

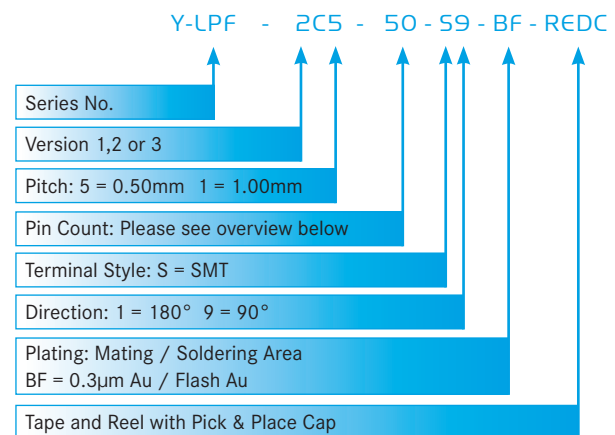


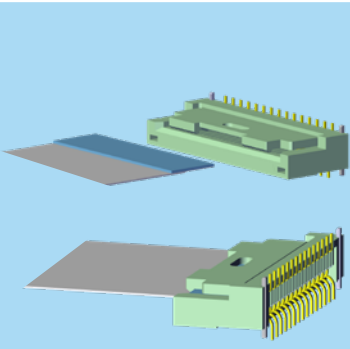
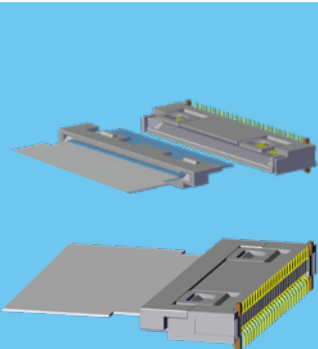
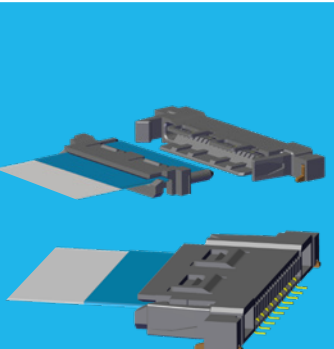
## Y-LPF SERIES

The Y-Lock connector family is combining a space saving and process securing design with smart and reliable technology. The connector system is designed for applications with tough requirements. Now available in three different versions, Y-Lock is able to fulfill a large spectrum of tasks in regard to mechanical, climatic and electrical specifications.

### SPECIAL FEATURES

- Non-ZIF Board-to-Cable system
- FFC has just to be pushed in one push lock and can be pulled out (pullforce) without any further action
- Quick and easy assembly
- Poka-Yoke system
- Pitches: 0.5 and 1.0mm
- 90° and 180° versions
- Various pin counts available
- Automatic assembly of FFC is possible
- Production site TS16949 certified
- RoHS2011/65/EU



Y-LOCK <sup>®</sup> PULLFORCE	Y-LOCK VERSION 1	Y-LOCK VERSION 2	Y-LOCK VERSION 3
Explanation	Locking function between the supporting tape on the FFC and the connector. Small hooks on the inner housing of the connector insulator ensure the locking function between the FFC and connector.	Additional stiffener is assembled mechanically on the FFC. Locking function between stiffener and connector. Poka-Yoke system prevents the FFC from being inserted in the wrong direction. The use of the stiffener is guiding the FFC during insertion.	Same as version 2 but with double locking function based on frontal and lateral hooks.
Version	1mm Pitch, 90° and 180°	0,5mm Pitch, 180°	1mm Pitch, 90°
Pin Count	12,14,16,18,20,22,24,26,28,30	18,50	20
			

# INTERNAL CONNECTORS – BOARD-TO-CABLE SOLUTIONS

## CABLES FFC AND FPC

Our different ZIF/Non-ZIF connectors are able to be used with standard FFC, High Speed FFC (Flexible Flat Cable) or YFLEX (High Speed FPC = Flexible Printed Circuit). The usage of the different cables is depending on the transfer rate.

Standard FFC can transfer up to 480Mbps, High Speed FFC's can transfer up to 3Gbps and YFLEX is able to transfer up to 20Gbps.

Connector Type	FFC/YFlex to be used with the different connector types		
	Standard FFC	High Speed FFC	YFLEX
Y-Lock Series	x		
HF601-**-02/12	x	x	
HF601-**-03		x	x
HF509-10-03			x
HF513-**-01/11		x	x

## YFLEX *HIGH SPEED*

### FEATURES

- Able to transmit high speed up to 20Gbps with low loss
- Effective to use at harshest temperature, humidity and EMI condition
- Customised depending on the layout and requirement
- Stable differential impedance of 100 Ohm (+/- 10%)
- Different structure compared to standard FPC by using LCP insulation and silver bumps for interconnection

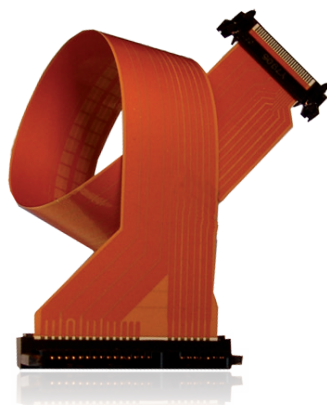
### PART NUMBER

YF \* - A\*\*\*\*\*

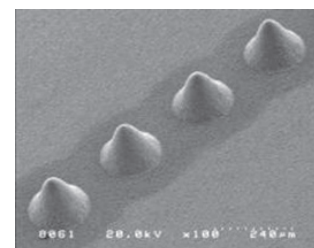
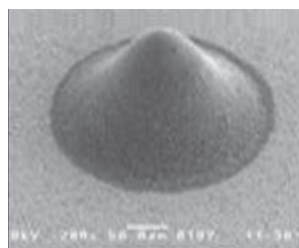
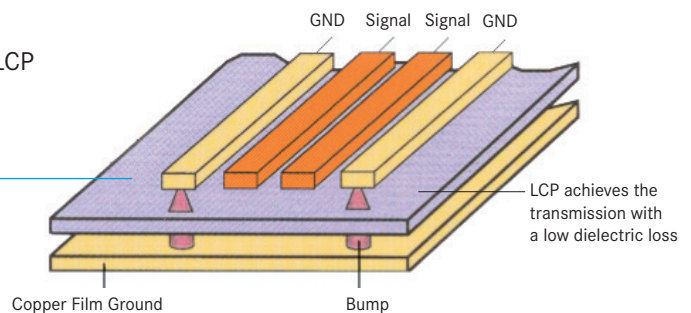
Series  
A = Single Layer  
B = Dual Layer

Design Number (internal only)

### STRUCTURE TO ACHIEVE HIGH SPEED TRANSMISSION



GND and copper film ground are connected with silver bumps which also protect from EMI







The Y-FFC Assembly Line in Frankfurt/Oder



In order to complete the product family of different FFC connectors Yamaichi Electronics offers FFC out of an own production line – Made in Germany.

The FFC are produced with latest state of the art production facilities and are fulfilling the requirements of Automotive standards.

Customised\* Pin Count, pitch, length, mating shape and foldings are available.



\*based on version MOQ might occur

Yamaichi Electronics offers a range of standard ZIF and non-ZIF connectors which are fulfilling special requirements, e.g. for high speed transmission. All connectors conform to RoH2011/65/EU

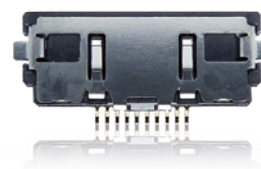
## HF509 NON-ZIF TYPE

This connector series is notable for its special space saving design with a height of only 2mm. The non-ZIF connector is providing a special side locking function.

### FEATURES

- Up to 5Gbps
- Pitch: 0.5mm
- Non-ZIF connector with side locking function
- 10 pins, 90°
- To be used with YFLEX cable and adapter
- Shielded version

HF509S - 10 - 03



## HF513 NON-ZIF TYPE

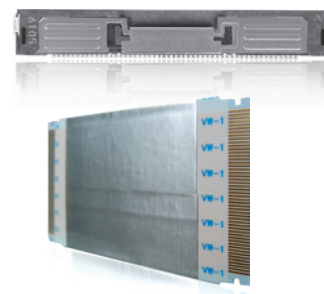
Direct mating type, the locking function ensures a reliable position of the cable with the connector. The HF513 series is available with or without shielding and ground contacts.

### FEATURES

- 30, 40 and 50 pins at 90° available, further versions on request
- Pitch: 0.5mm
- Up to 20Gbps data transfer rate (if used with YFLEX cable)
- Push-in locking
- With and without additional shielding pins

HF513 - \*\* - 0 \*

Series No.	↑
Pin Counts: 30, 40 and 50	↑
0 = No Additional GND Contact for Shielding 1 = Additional GND Contact for Shielding	↑



## HF601 ZIF TYPE

The HF601 ZIF series is a very smart connector family. It combines very small design with highly sophisticated technical features. The standard version is able to transmit up to 1Gbps, the high speed version up to 5Gbps. For an improved locking function the connector can be used with an FFC equipped with ears.

### FEATURES

- High speed function 1Gbps
- Pitch: 0.5mm
- Special types can transmit up to 5Gbps
- FFC with or without ears for additional locking
- Various pin counts in 90° and 180°

1) HF601 - 22 - 03

2) HF601 - \*\* - 02

Series No.	↑
Pin Counts: 10, 20, 30, 40, 45, 50 and 60	↑
02 = 90° Type	↑

3) HF601 - \*\* - 12

Series No.	↑
Pin Count: 30, 40, 45 and 50	↑
12 = 180° Type	↑



1) 22 Pin type (up to 5Gbps)



2) 90° Type (up to 1Gbps)



3) 180° Type (up to 1Gbps)

# BOARD-TO-BOARD / BOARD-TO-CABLE

## CRIMP/IDC CONNECTIONS

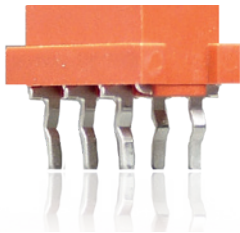
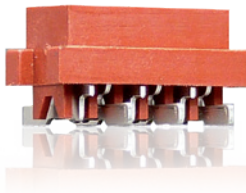
Also for single wires and flat cables, Yamaichi Electronics is able to supply standard connectors for Automotive use. Please see below a small selection of possible solutions. Further requests can be checked at any time.

## MATCHCON – M SERIES

This 1.27mm pitch series is known for the vibration resistance based on the special contact design. Additional positioning springs can absorb relative movements.

### FEATURES

- Series consists of Board-to-Board and Board-to-Cable connectors
- 1.27mm staggered center line
- Cable connection with help of IDC contacts
- 6–24 pins available
- With and without locking function
- RoHS2011/65/EU

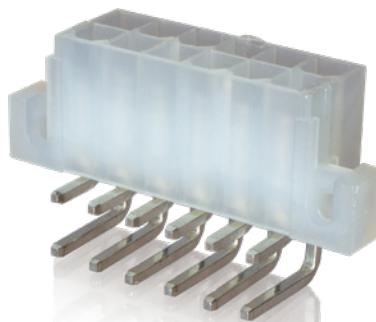
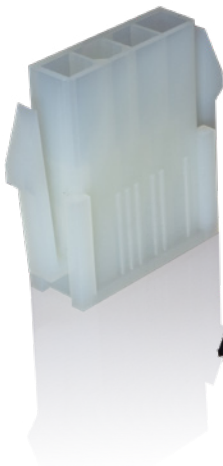


## BOARDFIT – P SERIES

The BoardFit series contains two versions, BoardFit3.0 with a pitch of 3mm and BoardFit4.2 with a pitch of 4.2mm. This series is especially used for power transmission, since per contact 5A (P3) or 9A (P4.2) can be transmitted.

### FEATURES

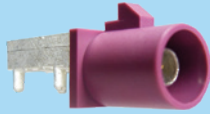
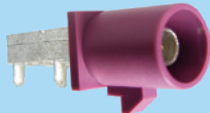
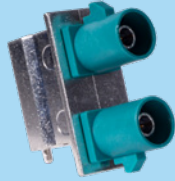
- BoardFit3.0, Pitch of 3mm, up to 5A per pin
- BoardFit4.2, Pitch of 4.2mm, up to 9A per pin
- Series consists of Board-to-Board and Board-to-Cable connectors
- Crimp connection for single wires on cable side
- 2–24pins available
- RoHS2011/65/EU





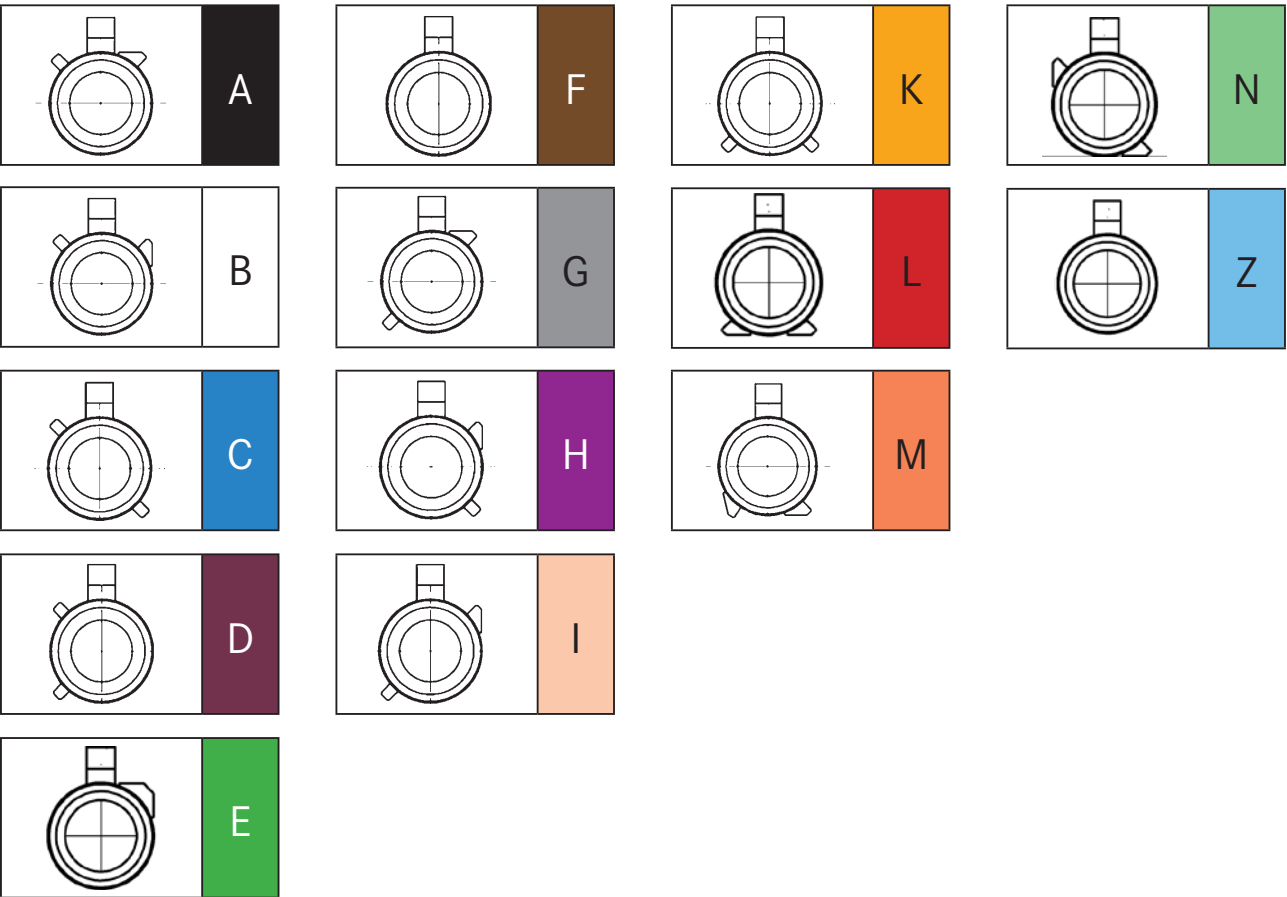
# INTERNAL I/O INTERFACES

## FAKRA CONNECTORS











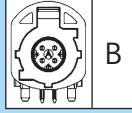


Version	Part Name	
PCB side, male connector, coding nose up	HF106P-0001-0X-VE	
PCB side, male connector, coding nose down	HF111P-0001-1X-VE	
PCB side, male connector, stacked version	HF110P-0001-XX-VE	

### COLOUR AND HOUSING CODING

X = available codings



## HSD CONNECTORS

Version	Part Name		Colour and housing coding
PCB side, male connector, with 4 power pins	HF112P-0001-0X-VE		 A  C
PCB side, male connector, with 2 power pins	HF108P-0001-0D-VE		 D
PCB side, male connector, w/o EMI ring	HF109P-0001-0X-VE		 B  E  F
PCB side, male connector, with EMI ring	HF107P-0001-0X-VE		 B  C  E

X = available codings

## Y-QUAD

Y-Quad is the connector series based on Quadlock connector systems. The improved design is ensuring a space saving and easy to assemble product. Further versions like a reflow solderable type, reduced number of pins, version with/without shielding or with/without PCB are available on request.

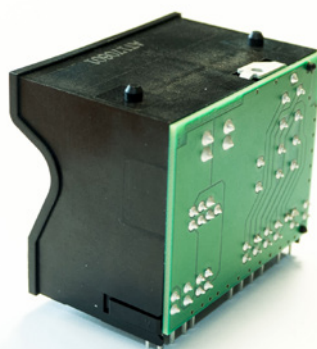
### FEATURES

- Space saving design in regards to connector size and PCB layout
- Other pin counts are available on request
- Wave soldering or Reflow soldering version (Pin&Paste)
- RoHS2011/65/EU

**Y-QUAD**  
AUTOMOTIVE I/O

Y-QL5 - 52 - THR9 - LL - P - EDC

Series No.	↑
Pin count	↑
Soldering version R=Pin&Paste, T=Wave	↑
Direction 1=180°, 9=90°	↑
Optional PCB, P=with PCB, 0=w/o PCB	↑

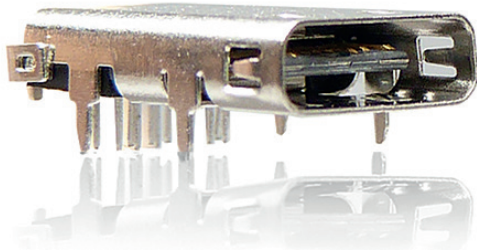


## AUTOMOTIVE END USER INTERFACES

The USB connector is one of the standard connections in the car. Especially the USB3.1 type C will be the future interface for applications like data or power transfer from customer devices to the car. Yamaichi Electronics is offering different versions which are verified based on Automotive specifications.

### USB3.1 TYPE C

USB-3.1 - C - ST9 - AL - TR



#### FEATURES

- USB Connector 3.1, Type C
- Up to 10Gbps transmission rate
- With power pins up to 1.8A
- RoHS2011/65/EU
- Different versions available

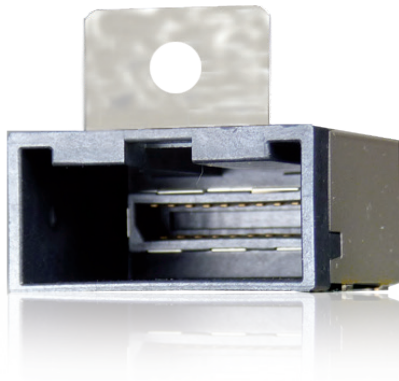
### HDMI TYPE E

The automotive type HDMI connector is supporting the HDMI application based on their latest specification.

PK5019 - 500X - OVE

Series No.

X=0 with Flange  
X=1 without Flange



#### FEATURES

- Locking tab for the cable connector and shell to prevent influences from moisture and dust
- According to 1.4b specification
- One contact row for easy soldering
- Four TH pins for robust fixation on the PCB
- RoHS2011/65/EU

## CABLE ASSEMBLIES

Yamaichi Electronics is also providing suitable cable assemblies for I/O connectors.



# CARD CONNECTORS

Based on customer requirements Yamaichi Electronics offers suitable card connectors for almost all card types, e.g. for Micro-SIM and SIM or MicroSD and SD. The design of the contacts ensures reliability under conditions of vibration and shock. All card connectors conform to RoHS2011/65/EU. This page shows a selection of card connectors out of our large portfolio.

## SD - FP5009-2903-0

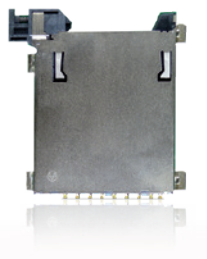


This SD card connector has a closed cover, card fly-out brakes and 2-point contact thus making it the perfect solution for automotive applications.

### FEATURES

- SD connector, especially for harsh environment
- Connector for both card types SD and MMC
- Card detector
- Soft lock with Push/Push mechanism
- Write protection switch
- EMI prevention with four grounding terminals
- Double spring coil

## SD - FP5009-4200-0(O3)

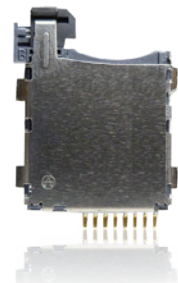


This SD card connector has a special one-push lock function. This means the locking system is working automatically after the insertion of the card. The design allows the highest reliability also under conditions of shock and vibrations.

### FEATURES

- Automatic locking function after insertion of SD card
- 2-point contact on all contact terminals to ensure dielectric discontinuity prevention which may be caused by vibration and impact
- Zero sliding contact @100G shock (X, Y, Z direction)
- Metal shell cover with 4 GNDs (solder tubes) to ensure EMI/ESD prevention performance

## MICROSD - PJ5008-4100-0-VE



This MicroSD card connector has a special one-push lock function. This means the locking system is working automatically after the insertion of the card. The design allows the highest reliability also under conditions of shock and vibrations.

### FEATURES

- Two-point contact on all contacts
- Inner spring coil ensures card position also under conditions of shock and vibrations
- Metal shell for EMI protection

## SIM - FM5006-2610-0



This SIM card connector convinces with its metal shielding, switch and an easy-to-use push-push mechanism.

### FEATURES

- Conforms to GSM11.11 standard for the European mobile phone system
- With switch
- Smooth extraction function by Push/Push mechanism

## SIM- FM5006-2340-0(VE)



This card connector has a push-lock function. The system is locking the card automatically after insertion. The design allows the highest reliability also under conditions of shock and vibrations.

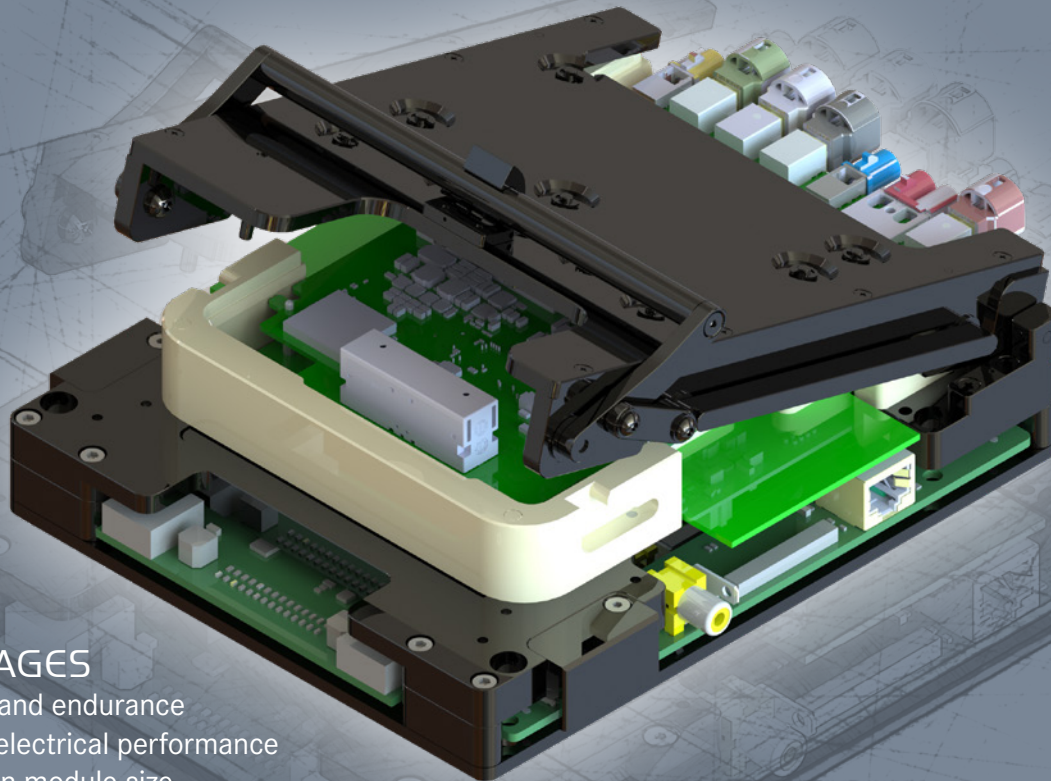
### FEATURES

- With switch
- With hard locking function

# MODULE TEST ADAPTER

With sophisticated and smart designs, Yamaichi Electronics provides adapter systems that perfectly meet the challenges of maintaining high-speed signal integrity by means of superior and reliable contact design.

Our products include vertical and horizontal test adapters for both burn-in and functional testing. Tailor-made solutions are also available.



## ADVANTAGES

- Reliability and endurance
- Very high electrical performance
- Flexibility in module size
- Volume test ready
- In-line volume test

Proven and reliable probe pin technology combined with high speed components provides a test system with very high electrical transmission properties. The combination of single module tests with one test system gives you the possibility to decrease the test time and costs per module.

## AUTOMOTIVE SOLUTIONS

Version October 2018

TECHNICAL DATA ARE SUBJECT TO ALTERATION WITHOUT PRIOR NOTICE

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