AUTOMOTIVE SOLUTIONS
YAMAICHI AUTOMOTIVE PRODUCTS

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

Yamaichi Electronics is one of the few suppliers who is able to offer very different connector products. The range of products is going from non-ZIF connectors, like the Y-Lock Connector system, to connectors which can also match High Speed requirements. Further 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 standardized interfaces like Fakra/HSD connections, a complete USB range or HDMI solutions. Furthermore the new Y-Quad connector for Quadlock connection boxes rounds up the I/O family. For all the different connector systems Yamaichi is able to develop and supply also the fitting test adapter for the production line.

YAMAICHI OFFERS THE FOLLOWING SOLUTIONS

- **I/O Connectors**
- **High Speed Connectors**
- **Floating B-t-B**
- **Module Test Adapters**
- **Custom Solutions**
- **Connector Systems for Computing Modules (BEC and Power)**
- **Non-ZIF with Locking Y-Lock®**
- **FAKRA & HSD**
- **Wire-to-Board**
- **High Speed Connectors and Cables**

REFERENCE APPLICATIONS

- Mobile navigation systems
- Head units for infotainment systems
- Camera systems
- SIM and Multimedia cards
- I/O connections for Antenna, TV, Radio, etc...
- Dashboard applications
- Navigation displays
- Connectivity module, e.g. USB Hub
- Electronic Control Units
- Cradle for mobile phones...
EUROPEAN DESIGN CENTER

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

- About 70 engineers are working in the two design centers in Munich and Sousse (Tunesia)
- 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-constructions software Solid Works
  - FEM-calculation software (Finite Elemente) 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 (date analysis)
  - Moldflow 2011 (molding simulation)
  - High definition 3D prototype printer
  - SEM (scanning electron microscope)
  - CT Scanner
  - Climatic Chamber
  - Shock and Vibration Chamber
  - Etc...

- All products are qualified and tested in our own laboratories. The laboraties are well equipped und capable to execute the required tests.
INTERNAL CONNECTORS - BOARD-TO-CABLE

Y-LOCK® PULLFORCE 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. Available now in two different generations the 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 (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 GEN1

Locking function between the supporting tape on the FFC and the connector. Small hooks on the inner housing of the connector insulator ensures the locking function between the FFC and connector.

Y-LOCK GEN2

Additional stiffener is assembled mechanically on the FFC. Locking function between stiffener and connector. Poka-Yoke system means it is not possible to insert the FFC in wrong direction. The use of the stiffener is guiding the FFC during insertion.

INTERNAL CONNECTORS - BOARD-TO-CABLE

Y-LOCK GEN1

Y-Lock GEN2

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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 RoH 2011/65/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. The shielding supports the EMI protection and ensures the transmission up to 5Gbps.

**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

### HF513 NON-ZIF TYPE

The new connector series is a very low profile connector with High speed transmission rates up to 10Gbps. It is a 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

### 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. The connector can be used with FFC with ears for an improved locking function.

**FEATURES**
- High speed function 1Gbps
- Pitch: 0.5mm
- Single types can transmit up to 5Gbps
- FFC with or without ears for additional locking
- Various pin counts in 90° and 180°
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 or YFlex (High Speed FPC). 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 10Gbps.

<table>
<thead>
<tr>
<th>Connector Type</th>
<th>FFC/FPC to be used with the following cable types</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Standard FFC</td>
</tr>
<tr>
<td>Y-Lock Series</td>
<td>x</td>
</tr>
<tr>
<td>HF601-**-02/12</td>
<td>x</td>
</tr>
<tr>
<td>HF601-**-03</td>
<td>x</td>
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<tr>
<td>HF509-10-03</td>
<td></td>
</tr>
<tr>
<td>HF513-**-01/11</td>
<td>x</td>
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</tbody>
</table>

**FEATURES**

- Available to transmit high speed up to 10Gbps with low loss
- Effective to use at harshest temperature, humidity and EMI condition
- Customized depending on the layout and requirement
- Stable differential impedance of 100 Ohm (+/- 10%)
INTERNAL CONNECTORS - BOARD-TO-CABLE SYSTEMS

CRIMP/IDC CONNECTIONS
Also for single wires and flat cables Yamaichi is able to supply standard connectors for Automotive use. Please see below a small choice 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
- 6-24pins 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 for power transmission used, 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 CONNECTORS - BOARD-TO-BOARD

BOARD EDGE CONNECTOR SERIES WITH 230 PINS

**BEC STANDARD**

**BEC-0.5-230-S9-*F-R-EDC**
- Normal speed type
- Capable for signals such as USB2.0, PCIe1.3

**SPECIAL FEATURES OF THE SERIES**
- 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

**POWER CONNECTOR**

**BECPOW-1.5-10-S9-*F-R-EDC**

The power connector can be used optionally 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 the mounting. The spring in the middle of the connector holds the module down, so that it is easier to fix with the screws on the flanges.

**FEATURES**
- Transferring power via 10 x 1.5A
- Supporting assembly of module by additional spring
- Mating height 5mm
- Production site TS16949 certified
- RoHS2011/65/EU

**HIGH SPEED BEC**

**BECHS-0.5-230-S9-*F-R-EDC**
- Based on special contact design this next generation of BEC is able to transfer data rates up to 5Gbps and is capable for signals such as USB3.0, HDMI, S-ATA or PCIe 2.0.
- 314 pin available on request

**SPECIAL FEATURES OF THE SERIES**
- 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

**FLOATING B-T-B HIGH SPEED**

**HF301**

This connector system is the best solution to connect two boards with each other. The floating mechanism is enabling it to work properly 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
- Available pin counts and pitches on request
- Power pins available on request
- First-Mate/Last-Break for ESD protection
- Poka-Yoke mating system
- RoHS2011/65/EU

SPECIFICATIONS AND DRAWINGS ARE SUBJECT TO ALTERATION WITHOUT PRIOR NOTICE - DIMENSIONS IN MILLIMETER
INPUT/OUTPUT CONNECTORS

Yamaichi developed this product range based on the high requirements of the automotive industry. This I/O connector series fulfills the automotive standard norms and can serve a broad range of applications due to its variety. The new HSD versions are designed for the need of fast data transmission. All connectors conform to RoHS 2011/65/EU.

FAKRA

**HF106P**

**FEATURES**
- Male PCB connector
- 10 different colour/housing codings available
- Primary and secondary locking
- According to ISO 20860-1 and -2 and USCAR 17 & 18
- Other versions/codings on request

HSD WITH EMI RING

**HF107P**

**FEATURES**
- Male PCB connector
- 3 different colour/housing codings available
- Primary and secondary locking
- Impedance controlled at 1000hm differential impedance
- Fully shielded
- Other versions/codings on request

HSD WITH 2 POWER PINS

**HF108P**

**FEATURES**
- Male PCB connector
- Impedance controlled at 1000hm differential impedance
- 2 additional power pins
- Fully shielded
- Other versions/codings on request

HSD STANDARD TYPE

**HF109P**

**FEATURES**
- Primary and secondary locking
- 1000hm Differential Impedance controlled
- Tape and reel packaging
INPUT/OUTPUT CONNECTORS

Y-QUAD

Y-QLS-52P-LL-THT9-P-EDC

Y-Quad is the new connector series based on Quadlock connector systems. The improved design is ensuring as 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
• 52 pin version, 90° TH version
• Space saving design in regards to connector size and PCB layout
• Other pin counts are available on request
• Reflow solderable version available on request
• RoHS2011/65/EU

USB

The USB connector is one of the standard connections in the Car. Yamaichi is offering different versions, which are verified based on Automotive specifications. All connectors conform to RoHS2011/65/EU

USB2.0 TYPE A

FEATURES
• USB Connector 2.0, Type A
• With power pins up to 2.5A

USB3.0 TYPE A

FEATURES
• USB Connector 3.0, Type A
• Up to 5Gbps transmission rate
• With power pins up to 1.8A

USB3.1 TYPE A

FEATURES
• USB Connector 3.1, Type A
• Up to 10Gbps transmission rate
• With power pins up to 1.8A

USB3.1 TYPE C

FEATURES
• USB Connector 3.1, Type C
• Up to 10Gbps transmission rate
• With power pins up to 1.8A

HDMI TYPE E

PKS019-5000-0VE

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

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
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. Most of the card connectors have a metal cover, card detection switch and easy handling functions, like mis-insertion prevention. 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 conditions
- Connector for both card types SD and MMC
- Card detector
- Smooth extraction function, Push-in/Push-out of card

**SD - FP5009-4200-0(03)**

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

**MICROSD - PJS008-4100-0-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 - FMS006-2610-0**

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

**MICROSIM - FUS006-3210-0**

This SIM card connector gives the possibility to be used with two different kind of trays. One for a micro SIM and one for a Nano SIM Card.

**FEATURES**

- Reversed mount type
- One Card connector usable with two different trays for Nano or Micro SIM Cards
- Super low profile 1.15mm height
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.