



**AUTOMOTIVE
SOLUTIONS**



ABOUT YAMAICHI ELECTRONICS

WORLDWIDE SITES



ASIA HQ Tokyo Japan,
founded 1956
(Listed in the first section of the
Tokyo Stock Exchange)

Design Center: 1
Sales Office: 11
Manufacturing Site: 8 **20**

EMEA
HQ Munich Germany,
founded 1986

Design Center: 2
Sales Office: 5
Manufacturing Site: 1 **8**

AMERICAS
HQ San Jose CA. USA,
founded 1983

Design Center: 1
Sales Office: 1
Manufacturing Site: 1 **3**

MARKETS



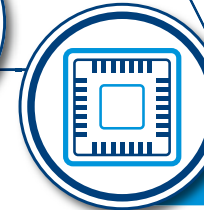
AUTOMOTIVE



INDUSTRY



**DATA
NETWORKING**



SEMICONDUCTOR



**MEASUREMENT &
TESTING**



MEDICAL

WORLDWIDE EMPLOYEES



GROUP 2,309 in production
325 in engineering **3,280**

EMEA 130 in production
110 in engineering **385**

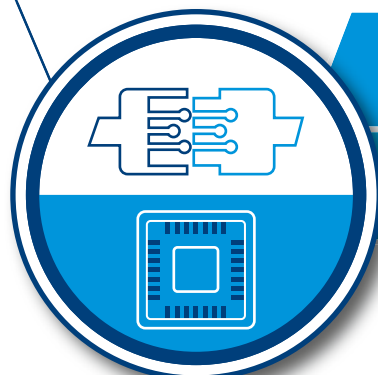
ANNUAL SALES



GROUP
333 Mio. Euro

EUROPE
104.8 Mio. Euro

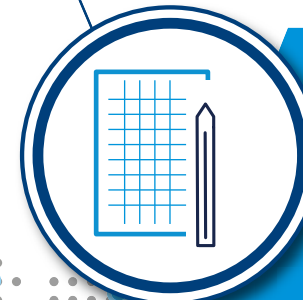
DIVISIONS



CONNECTOR SOLUTIONS
Standard & customised connectors,
cable assemblies

TEST SOLUTIONS
Test & burn-in sockets, test contactors,
module test adapters, PCB design

DESIGN CENTER



- Complex 3D CAD Construction
- Design FMEA
- Analysis using FEM
 - Structural Mechanics
 - Moldflow for Plastics
 - Thermal Simulation (Flow & Static)
 - Signal Integrity
- PCB Design
- Circuit Simulation
- High Resolution 3D Prototyping
 - Plastics (Photo Polymeric)
 - Metal (LMF Laser Metal Fusion)
- In-house Sample Construction

TEST LABORATORY



- High Voltage & High Current Testing
- High Frequency Measurements
- Soldering
- SEM (Scanning Electron Microscope)
- EDX (X-Ray spectroscopy)
- Computer Tomography / X-Ray
- X-Ray Fluorescence Spectrometer
- De-Rating

ENVIRONMENT

- Climatic & Temperature Chambers
- Mixed Gas (4 Gases) Testing
- Shock and Vibration Chamber
- Corrosion Tester
- IP Testing
- Bending-Rotation Tester

MANUFACTURING



In our production facility in Frankfurt (Oder) Germany, we manufacture connectors and cable assemblies as well as test contactors on 5,148 m².

Automotive Certified
Locations IATF16946



- Taiwan
- China
- Phillipines
- Mexico

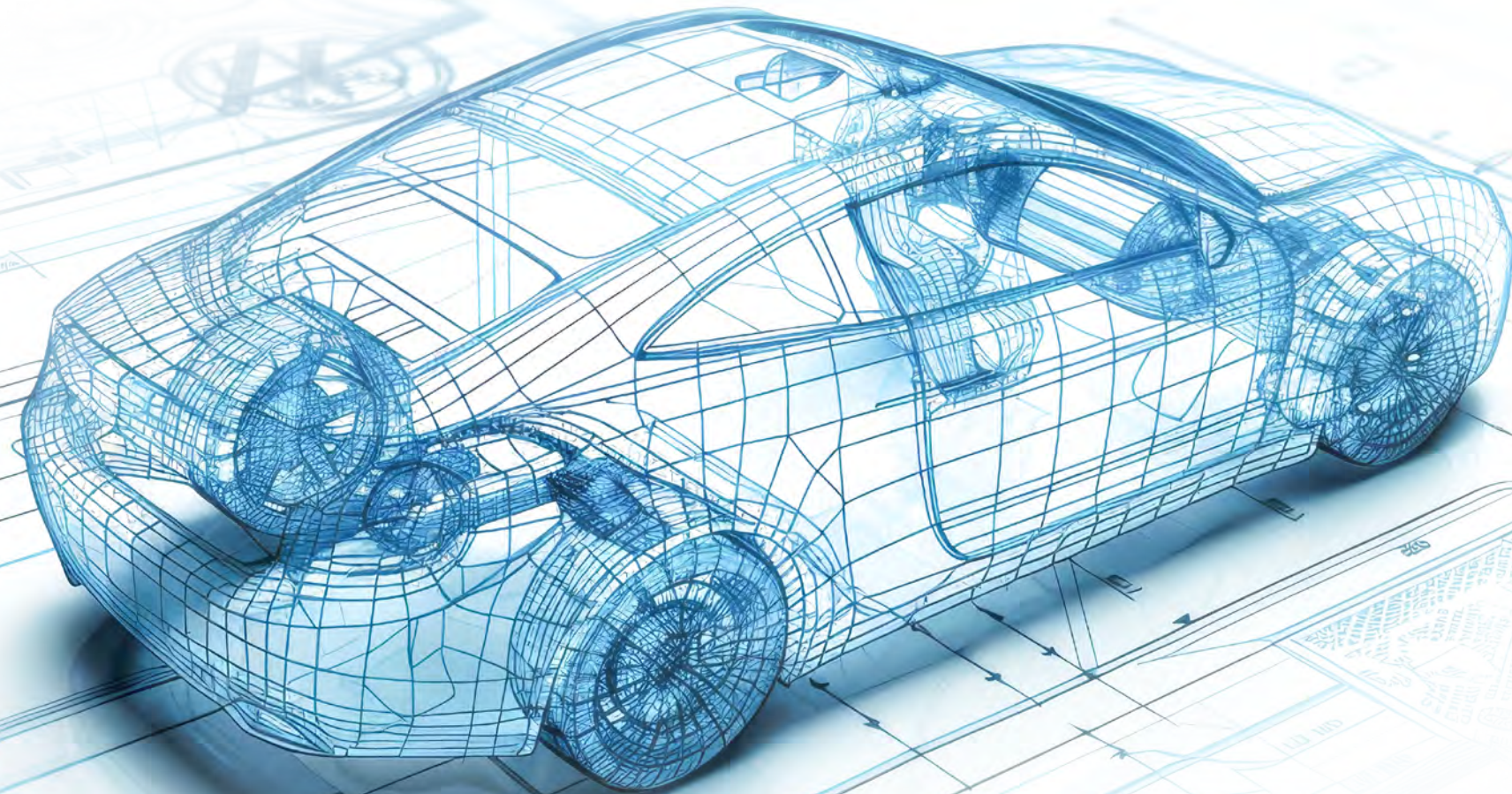
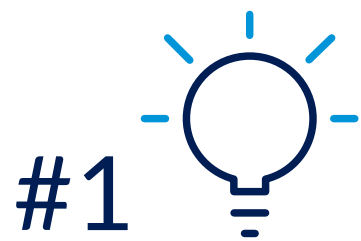




CUSTOMISED SOLUTIONS

From the initial idea to the series production of complex products - we take on the design and project management for the development of the perfect solution according to individual customer requirements.

All information on the advantages of customer-specific developments, our processes as well as a detailed decision-making aid „Customised solution or standard“.

IDEA / REQUIREMENT
(REQUEST)

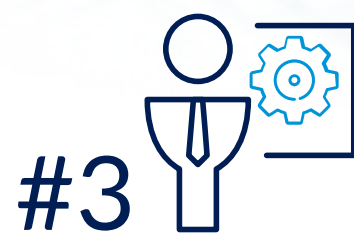
Right from the start our competent project team is at your side with advice and support. Together we establish the basis for a customised development and discuss important milestones such as:

1. Evaluation of initial customer requirements (specifications)
2. Building of a project team
3. Estimation of the project duration and important milestones
4. Usage of special project management software for Automotive projects

FEASIBILITY OR
PRODUCIBILITY
ANALYSIS

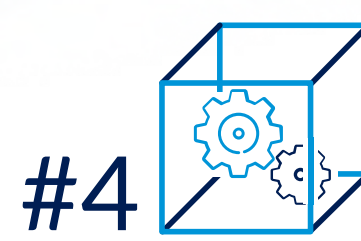
In a feasibility study, we develop the first rough concepts to match your requirements profile: specification and requirement sheets are important instruments in our development. In this step, you benefit from our service in relation to:

1. Checking the customer requirement for manufacturability and, if necessary, optimisation proposals
2. Creation of initial concepts in 3D

DETAILING /
DEVELOPMENT

In the detailed elaboration of the design, we regularly inform you about the development status, secure the development via design and process FMEA and jointly define test and inspection criteria.

1. Design Freeze
2. Simulations (FEM & Moldflow)
3. On request, realisation of first prototypes using 3D printing (plastic & metal)
4. All Automotive designs are done by an Automotive product design group

REALISATION /
TOOLS

During the entire tooling phase, we ensure that your product can be manufactured in the highest possible quality.

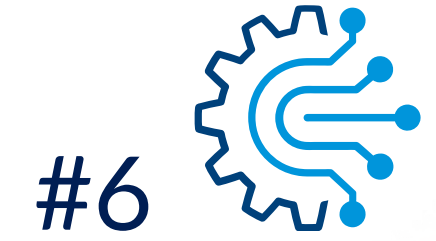
1. Design, commissioning, creation and approval of all necessary tools, such as injection moulding and punching tools as well as production-related equipment
2. Inspection and test planning as well as qualification of the application

QUALIFICATION /
TESTING

Based on the agreed test and inspection criteria, we perform environmental tests as well as dimensional and electrical tests for your product in our in-house test laboratories. Qualifications based on Automotive specifications like LV214 or USCAR are state of the art.

1. In-house test laboratory in Munich and Sousse
2. SEM (scanning electron microscope) and CT (computer tomography)
3. Vibration test and climate chamber
4. Testing and qualification based on relevant norms and standards

PRODUCTION



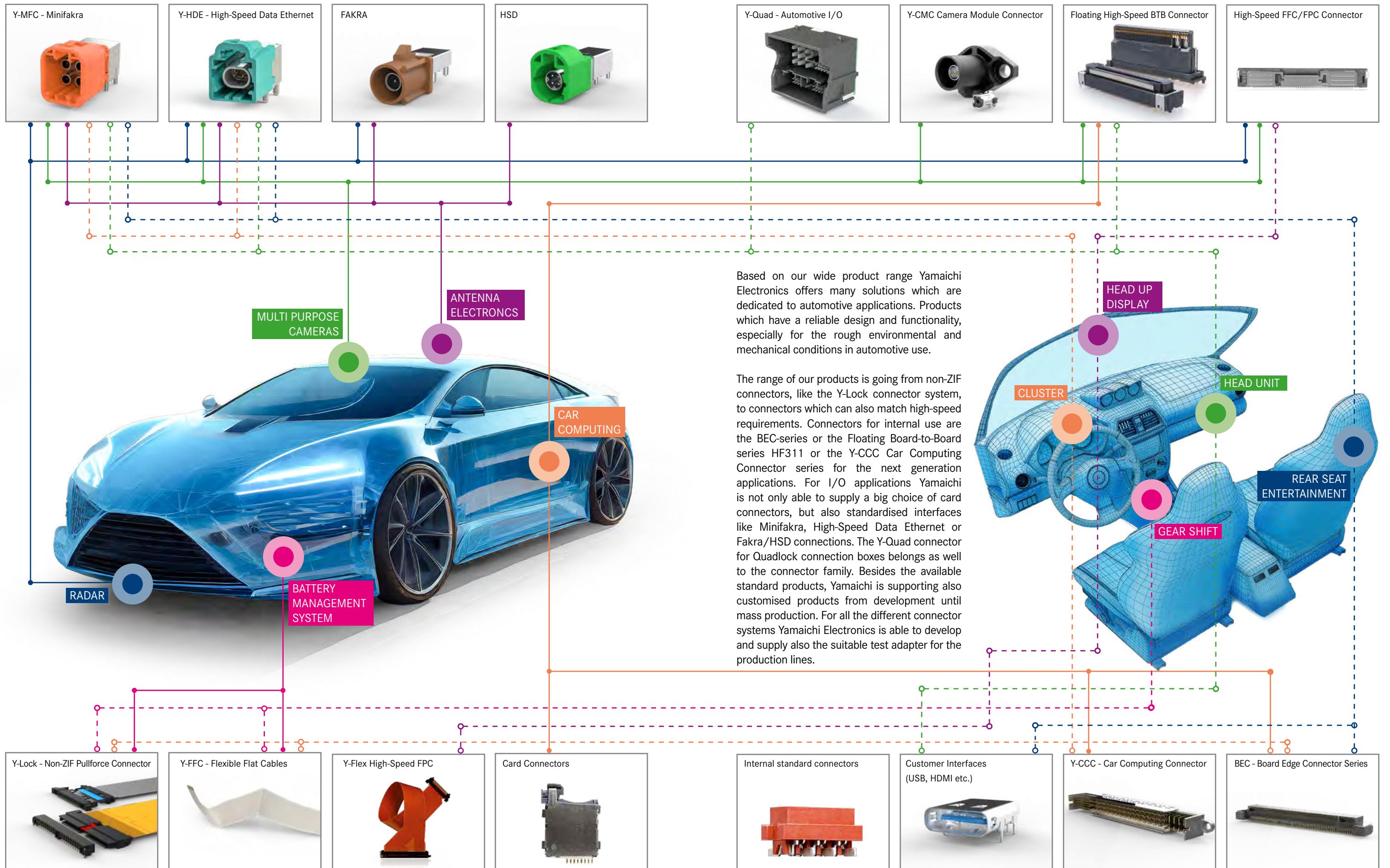
Production in IATF 16949-certified factories at fully automatic assembly lines.

Production Places

- Taiwan
- China
- Philippines
- Mexico



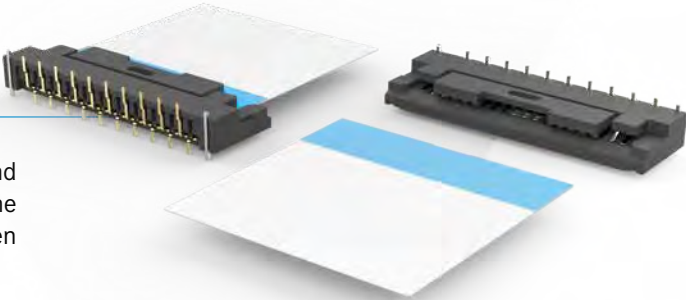
YAMAICHI ELECTRONICS AUTOMOTIVE PRODUCTS



The Y-Lock connector family is perfect for automotive applications like Infotainment systems, cell-contacting and battery systems, etc. It combines 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 four different versions, Y-Lock is able to fulfill a large spectrum of tasks regarding to mechanical, climatic and electrical specifications. It is qualified based on LV2 14 and can be used with FFC or FPC. An automatic assembly is possible. Yamaichi can offer the full assembly with connector, FFC and stiffener.

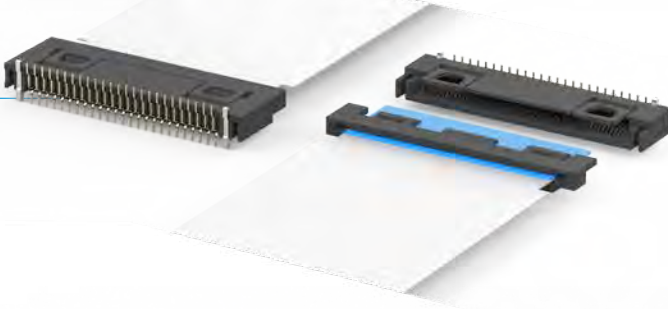
Y-LOCK VERSION 1

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.



Y-LOCK VERSION 2

An 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 guides the FFC during insertion.



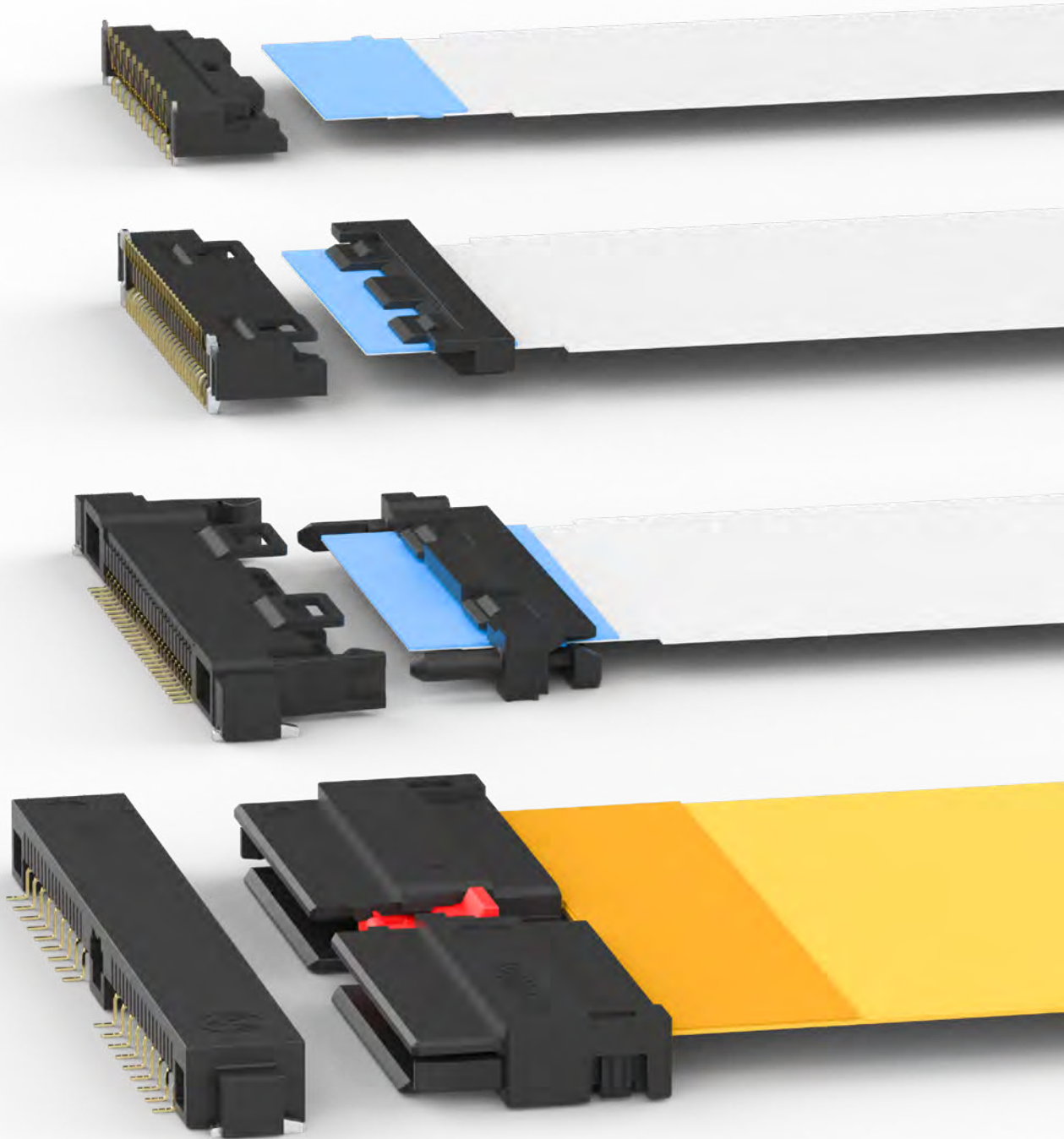
Y-LOCK VERSION 3

Version 3 combines the frontal locking hooks with two additional lateral hooks, which means the connection system has a double locking function. The guiding pins enable the system for blind mating function. The system is qualified based on LV 2 14 and designed for Battery management and cell contacting solutions.



Y-LOCK VERSION 4

The Y-Lock Version 4 is specially designed for cell contacting and battery management systems. It provides a double locking function with frontal and lateral locking. The CPA (Connector Position Assurance) can be used optional further locking feature. A special feature is the touch protection of the FFC/FPC contact pads. The design of the stiffener is also ensuring a Koshiri protection. The connector is offered as a Gold plated or a Tin plated version in order to offer a further cost-saving possibility.



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
- Qualified based on LV2 14
- Poka-Yoke system
- Several pitches for different versions available
- 90° and 180° versions
- Various pin counts available
- Automatic assembly of FFC/FPC is possible
- Further versions, pin counts available on request

Version	Version & Pin Count
Y-LOCK V1	1 mm pitch in 90° and 180° with 12, 14, 16, 18, 20, 22, 24, 26, 28, 30 pins 0,5 mm pitch in 90° and 180° with 30 pins
Y-LOCK V2	0.5 mm Pitch, 180° with 18 or 50 pins (MOQ may occur)
Y-LOCK V3	1 mm pitch, 90° with 20 pins or 2 mm pitch, 90° with 10 pins
Y-LOCK V4	90°, AU and TIN-Plating 1 mm pitch-28 pins, 2 mm pitch-18 pins 1,2 mm pitch-24 pins, 1,8 mm pitch-16 pins



FFC AND FPC CONNECTOR SERIES

Our different ZIF/Non-ZIF connectors can 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 depends on the transfer rate.

Standard FFC can transfer up to 480 Mbps, high-speed FFCs can transfer up to 3 Gbps and YFLEX is able to transfer up to 20 Gbps.

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



FLEXIBLE FLAT CABLE - Y-FFC

In order to complete the product family of different FFC connectors, Yamaichi Electronics offers FFC from its own production line – Made in Germany. The FFCs are produced with the 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.



ZIF- & NON-ZIF CONNECTOR SERIES

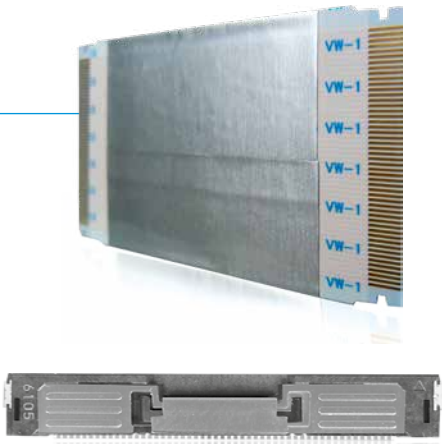
Yamaichi Electronics offers a range of standard ZIF and Non-ZIF connectors that fulfill special requirements, e.g. for high-speed transmission. All connectors conform to RoH2011/65/EU.

NON-ZIF TYPE HF513

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: 0.5 mm
- Up to 20 Gbps data transfer rate (if used with YFLEX cable)
- Push-in locking
- With and without additional shielding pins

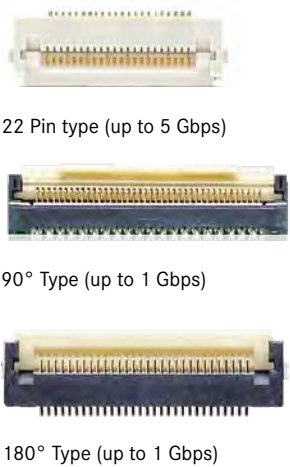


ZIF TYPE HF601

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

FEATURES

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

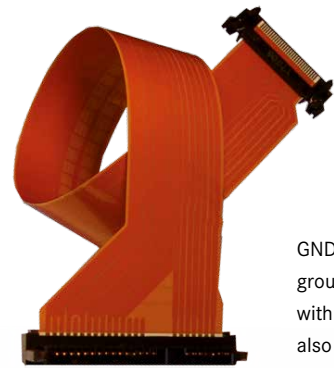




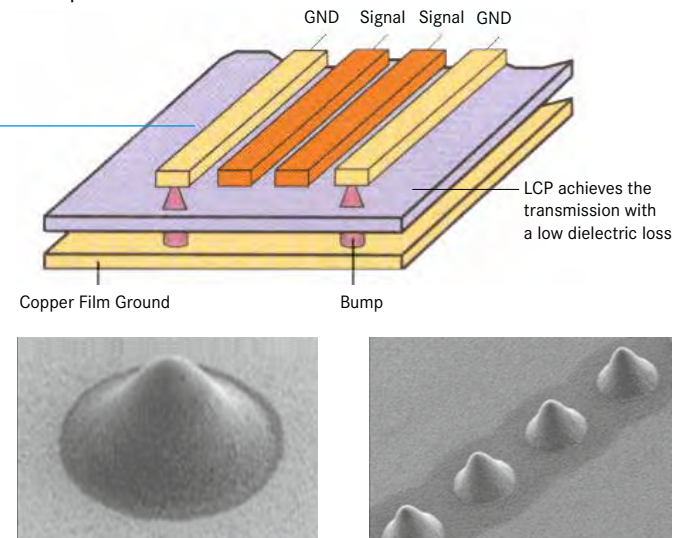
FLEXIBLE PRINTED CIRCUIT FPC - YFLEX

YFLEX is a special High-Speed FPC (Flexible Printed Circuit) that is able to transmit up to 112 Gbps with a differential Impedance of 100 Ohm. This high performance is given by different features, like LCP as base material, the contacting of different layers done by silver bumps and the special production process.

STRUCTURE TO ACHIEVE HIGH-SPEED TRANSMISSION



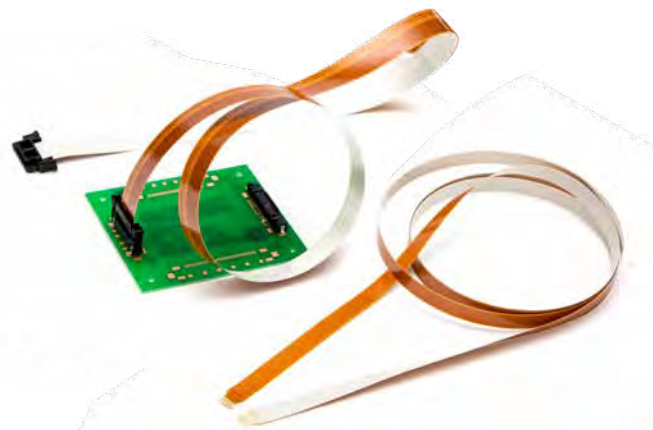
GND and copper film ground are connected with silver bumps which also protect from EMI

SINGLE-SIDED, LONG AND HIGHLY FLEXIBLE FPC *HIGH SPEED*

Single-sided, long and highly flexible FPC YFLEX consists of a copper layer, polyimide cover films and LCP as base material.

FEATURES

- Performance of High-Speed transmission as Gbps band with low loss
- Bending characteristics of 10 million times or more at $R = 5.0$ mm
- Manufacture lengths up to a maximum of 1,150 mm
- Accurate impedance matching is possible due to the coplanar structure
- Combination of YFLEX and our High-Speed connector series HF513, HF509, HF601 and HF507 possible

DOUBLE-SIDED HIGH-SPEED FPC *HIGH SPEED*

Double-sided FPC consists of two copper layers with top and bottom cover films.

FEATURES

- High-speed transmission up to 112 Gbps is possible with low loss
- FPC resistant to noise by using two conductor layers
- Precise impedance matching with microstrip structure
- Combination of YFLEX and our High-Speed connector series HF513, HF509, HF601 and HF507 available
- Manufacture lengths up to a maximum of 460 mm



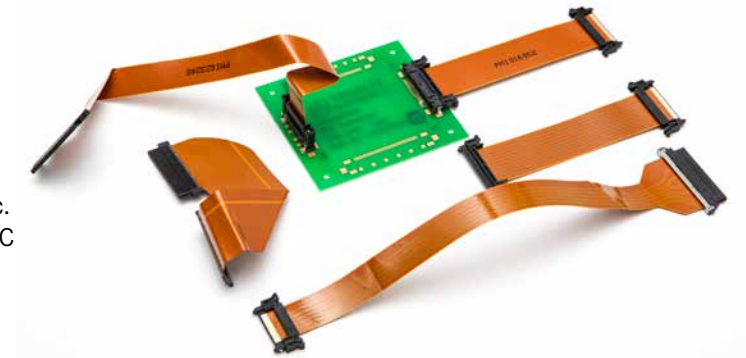
FLEXIBLE PRINTED CIRCUIT FPC - YFLEX

EMI PREVENTION FPC *HIGH SPEED*

EMI prevention FPC can be used in wiring areas with concerns about communication quality degradation due to noise in electronic devices. EMI prevention FPC performs excellent noise resistance.

FEATURES

- Supports transmission over 1 Gbps such as LVDS/eDP/MIPI
- Custom wiring design is possible such as impedance matching design, low loss, low crosstalk etc.
- Total quality assurance in combination with our FPC connector

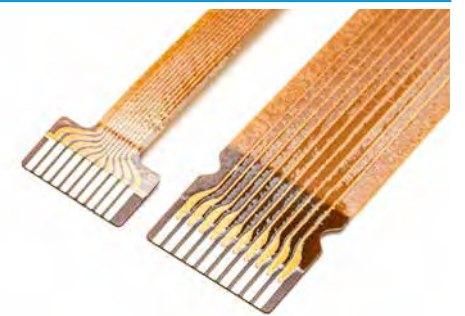


OIL RESISTANT FPC

Ideal for environments where cutting oil and other chemicals are sprayed. Use case: Internal wiring connection of products sprayed with industrial lubricating oil such as industrial equipment and processing equipment.

FEATURES

- Maintains conductivity even when immersed in alkali and sulfur oil for 100 hours
- High oil resistance suppresses wiring breakage due to sulfurization



ULTRA-THIN FPC

Providing extremely thin thickness of FPC.

FEATURES

- Total thickness: 39.5 μ m (single-sided wiring)
- Possibility of installation in extremely small spaces, curved surfaces and bends
- Component mounting on FPC possible





FLOATING BOARD TO BOARD CONNECTOR SERIES

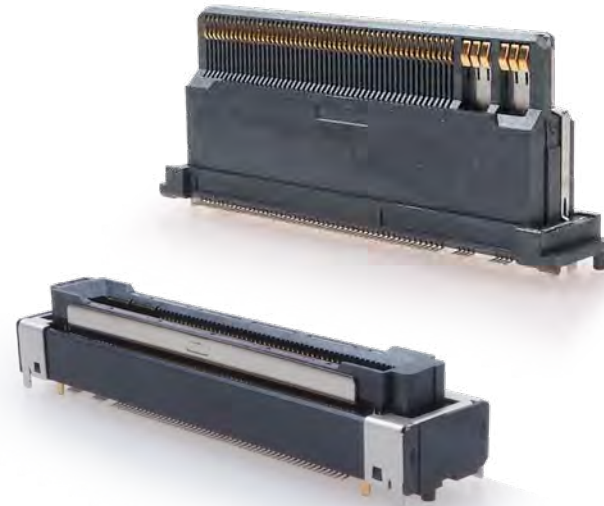
SERIES HF311

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 in X, Y, Z direction
- High-speed transmission rate up to 5 Gbps
- Stacking height up to 18 mm
- Different pin counts and pitches available on request
- Power pins up to 5 A
- First-Mate/Last-Break for ESD protection
- Poka-Yoke mating system



FURTHER FLOATING BOARD TO BOARD SOLUTIONS HIGH SPEED

Yamaichi offers customised Board to Board connector solution with the following features:

FEATURES

- 90°/180° Solution
- Mating height 10-30 mm
- Up to 160 signal pins
- Additional Power pins up to 5 A
- PCIe4.0 or 5.0 compliant
- Temperature range -55° to 125°C
- Floating range in X/Y/Z direction 0,5 mm



CAR COMPUTING CONNECTOR

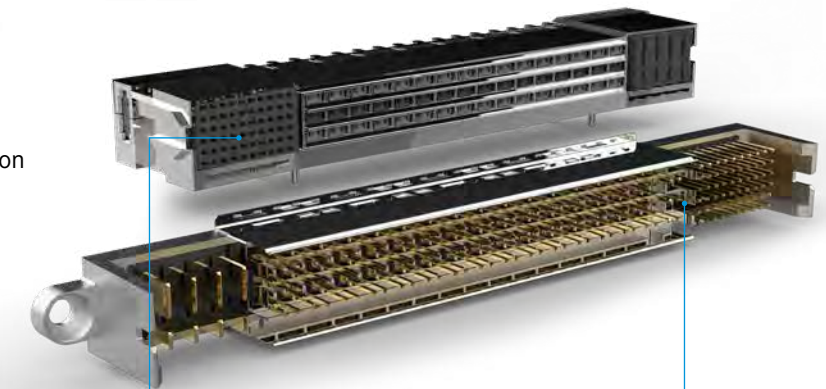
CAR COMPUTING CONNECTOR - Y-CCC

HIGH SPEED

Yamaichi Electronics is creating the future for the connectivity of car computing systems with its innovative Y-CCC. This backplane connector system fulfills the high requirements of data, signal and power transmission combined with robustness and functionality. Contact us for more details about the 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 20 A
- THR soldering version
- Screwing fixation for backplane connector

Module
connector
90°Backplane
connector
180°



BOARD EDGE CONNECTOR SERIES BEC

STANDARD & HIGH-SPEED BOARD EDGE CONNECTOR
WITH 230 PINS

HIGH SPEED

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



HIGH-SPEED BEC WITH 314 PINS

HIGH SPEED

FEATURES

- MXM3.1 / SMARC2.0
- High speed transmission 10 Gbps
- Connector ensures reliable contact with vibrations due to the nut and screwing structure with latch

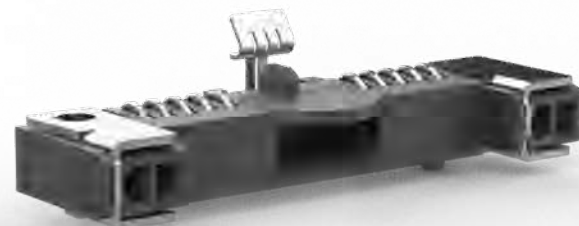


POWER CONNECTOR - BECPOW

Optionally the power connector can be used together with the BEC/HS BEC. It supports the system with 10 pins. Each pin can transfer 1.5 A. 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.

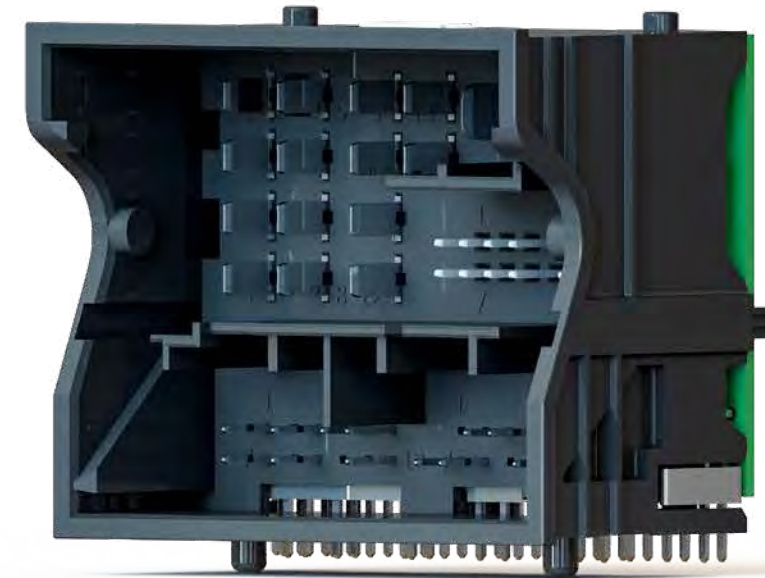
FEATURES

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



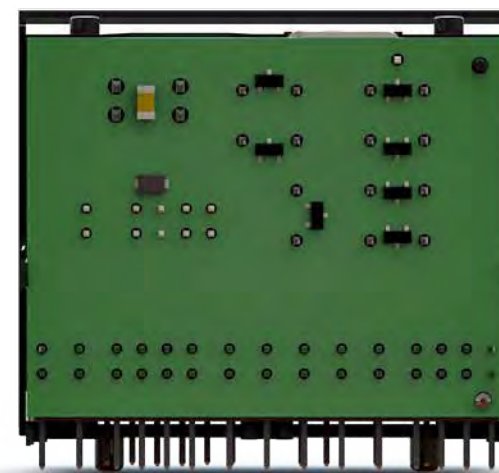
Y-QUAD CONNECTOR SERIES

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



FEATURES

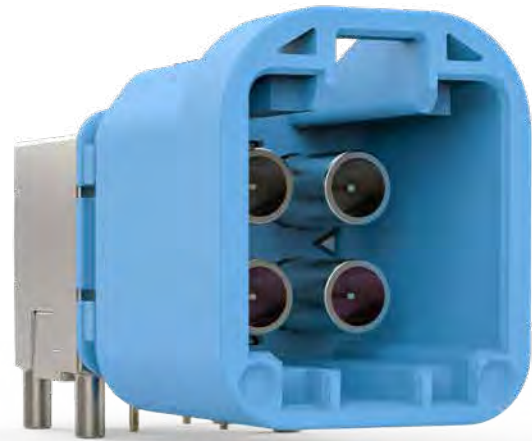
- Space-saving design in regards to connector size and PCB layout
- Other pin counts are available on request
- Wave soldering or reflow soldering version (Pin & Paste)
- PCB with assembled components possible



Yamachi is offering the backside PCB with components assembled on it, like capacitors, LED or resistors.



MINI-FAKRA - Y-MFC



The Y-MFC Mini-Fakra Series - High-speed data transmission in a space- and weight-saving design.

The Y-MFC series from Yamaichi Electronics meets the automotive industry's demand for a powerful and fast I/O interface that also offers potential for cost and weight savings. Especially the four-pole quad version of the mini coaxial connector convinces with a space advantage of up to 80% compared to the use of a standard Fakra connector. This means that many interfaces for the fast transmission of high data volumes are possible even in a small installation space.

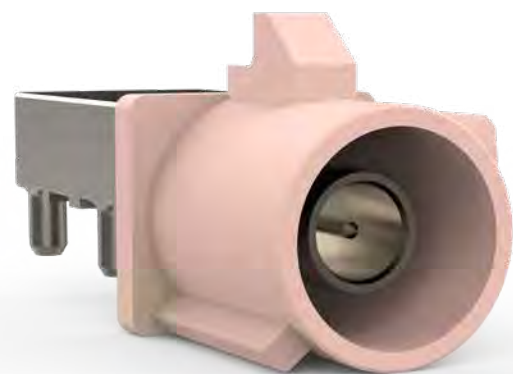
FEATURES

- Developed and tested for automotive applications
- High-speed performance
- Space- and weight-saving design
- Two different designs of the insulator available - thus perfect adaptation in the housing is possible
- Different colour and mechanical codings available
- The coding position can be supplied in standard 90° / 180° and 270° versions on customer request
- Further versions on request

CODINGS



FAKRA HF106, HF111



FAKRA connectors (FAKRA = FachKReis Automobil, a German automobile working group) are coaxial high-frequency connectors that meet the requirements of DIN20860 and USCAR 17 & 18. Their application lies in the transmission of a variety of signals, such as shortwave, mobile telephony, GPS or telematics signals. Thanks to standardization, each application is assigned a specific colour and mechanical code to ensure proper connections between the board and cable sides.



HIGH SPEED DATA ETHERNET - Y-HDE



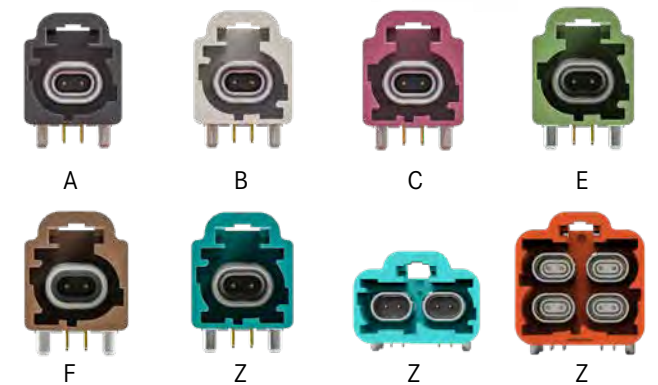
With the Y-HDE series, Yamaichi Electronics offers differential high-speed connectors that provide high-speed data transmission for the automotive sector in the smallest installation space.

With transmission rates up to 20 Gbps at 100 Ω differential impedance and tested based on LV214/USCAR, the Y-HDE is convincing in many high-speed applications.

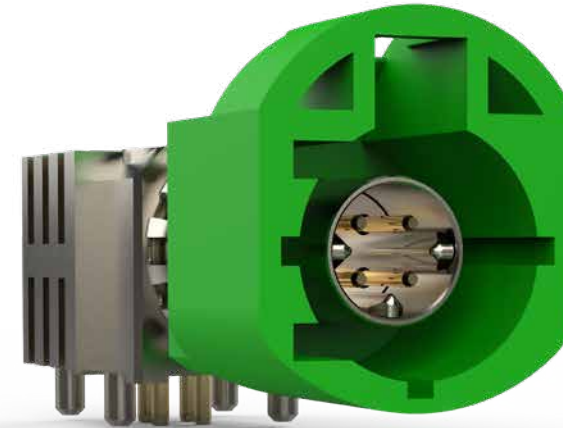
FEATURES

- Data transmission up to 20 Gbps
- Weight and space-saving design
- Single, double and quad version available in different codings

CODINGS



HSD HIGH SPEED DATA HF107, HF108, HF109, HF112



The HSD plug connector system is used for signals like USB or IEEE1394, for example. For the HSD interface, signal transmission via LVDS (Low Voltage Differential Signaling) is used. This decreases cross-talk between signals and interference from external signals to a minimum. The system is 100 Ω impedance controlled, so that signal transmission of the highest quality is achieved.

The series is available in several codings in the standard version, as a version with additional shielding spring and with different numbers of power pins.



CAMERA CONNECTOR SERIES Y-CMC



Cameras have become an indispensable standard in the automotive sector. With the Y-CMC series, Yamaichi Electronics offers a solution with PCB connectors and matching mating connectors. The Fakra mating face of the counter connector offers a standard interface, but other interfaces, such as Minifakra, are of course also possible.

CAMERA CONNECTOR - Y-CMC

FEATURES

- Plug side connector can be selected according to the application.
- Market smallest size(ø 3.5 mm) on both board and plug side
- Absorption of misalignment of mating part (mounting tolerance in X, Y, θ direction)
- High-speed transmission (Compatible with 4 GHz)
- Waterproof (IP6K9K)
- Easy procedure (only by screwing)
- Wire tension min. 100 N



FAKRA CAMERA CONNECTOR HF106P-60XX

FEATURES

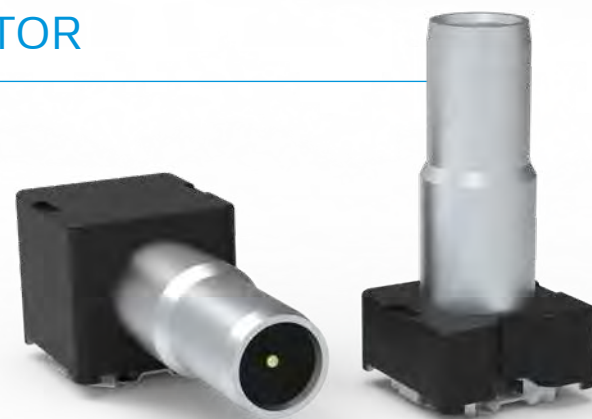
- Camera module connector based on Fakra standard
- w/o housing
- Straight version
- 50 Ohm Impedance
- DC to 6 GHz
- With or without EMI spring



SOLDERLESS CAMERA CONNECTOR

FEATURES

- Mounting per compression system
- Solderless assembly process
- 90° or 180° version
- Transmission standards based on USCAR
- Simulation results available



CARD CONNECTORS

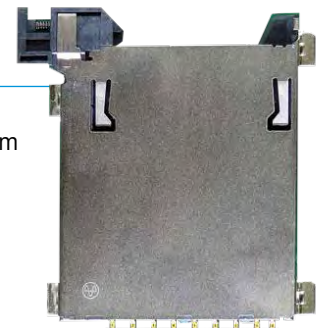
Based on customer requirements Yamaichi Electronics offers suitable card connectors for almost all card types, e.g. for Micro-SIM and SIM or MicroSD and SD. The design of the contacts ensures reliability under conditions of vibration and shock. All card connectors conform to. This page shows a selection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

SD - SERIES FPS

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 @100 G shock (X, Y, Z direction)
- Metal shell cover with 4 GNDs (solder tubes) to ensure EMI/ESD prevention performance



MICROSD - SERIES PJS

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 - SERIES FMS

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



MICRO SIM - SERIES FUS

FEATURES

- Reversed mount type
- One connector is usable for Nano- and Micro Sim tray
- Low profile design with 1,35 mm height
- Card mis insertion design





AUTOMOTIVE TEST ADAPTER

Sophisticated and customised design enables test systems for High-Speed signal tests for automotive computer-on-modules. Superior and reliable contact design ensures High-Speed signal integrity. Our product range includes vertical and horizontal test adapters.

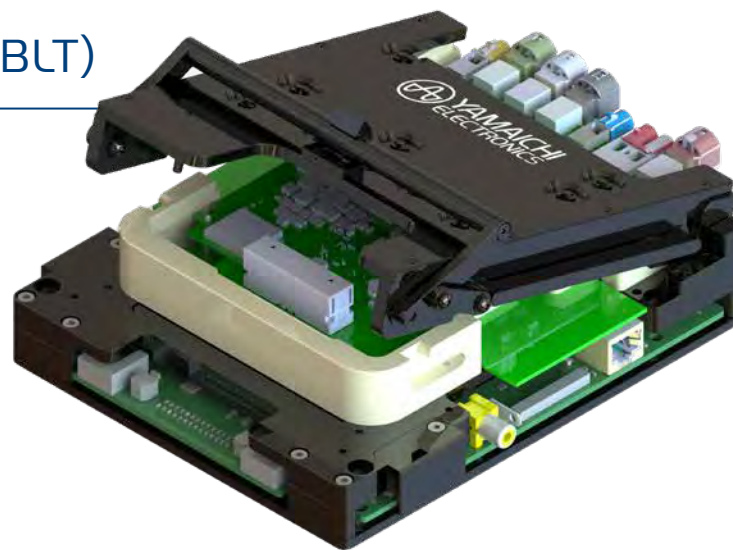
BOARD LEVEL TESTING (BLT)

FEATURES

- Fully customised for high-volume testing
- Stand-alone and integrable
- Fine-pitch contacting of test points

ADVANTAGES

- Compact test fixture and fully customised
- Developed for high-volume automotive testing of high integrated modules
- Short signal paths from DUT to test board



FLASHING SYSTEM

FEATURES

- In-line programming / flashing
- Stand-alone or integrable
- High volume flashing

ADVANTAGES

- Compact design
- Easy maintenance
- High-speed for faster throughput



SYSTEM LEVEL TEST (SLT)

FEATURES

- Scalable test system
- Reliable module testing
- In-line or stand-alone test system

ADVANTAGES

- Compact test fixture and fully customised
- Developed for high volume automotive testing of high integrated modules
- Short signal paths from DUT to test board



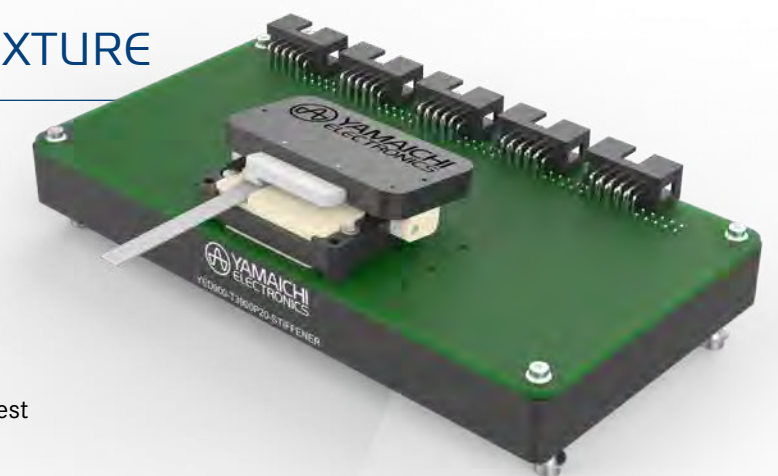
YED900 FPC / FFC TEST FIXTURE

FEATURES

- Reliable FPC / FFC testing
- Floating base for pin and flex foil protection
- Any shape of flex foil testable

ADVANTAGES

- Customised FPC / FFC test socket is used for any test purpose of flexible foils and attached application
- By using probe pins, the damage on the foil pad is minimised but ensures a proven contact technology
- Contacting the application from top or bottom



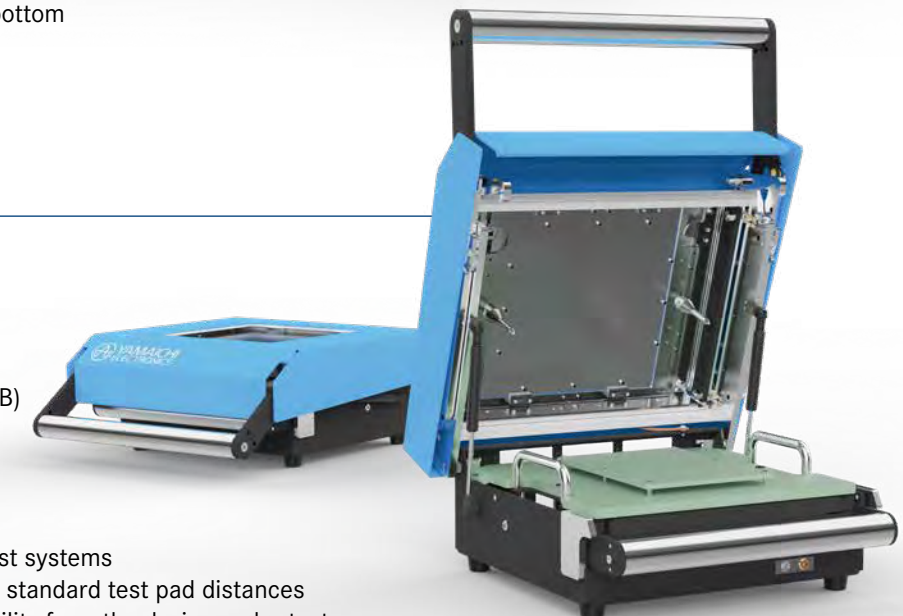
YETI TEST FIXTURE

FEATURES

- Cost Effective, robust and fully scalable
- User-friendly handling and maintenance
- Cassette and Test Application Board (TAB)

ADVANTAGES

- Universal: One test fixture for various test systems
- Scalable: for fine pitch from 0.25 mm to standard test pad distances
- Optimized: High signal quality and reliability from the device under test (DUT) to test system
- Individual: Test setup configuration either using cassette or test application board (TAB)





AUTOMOTIVE SOLUTIONS

YED-V1-2|4

TECHNICAL DATA ARE SUBJECT TO ALTERATION WITHOUT PRIOR NOTICE

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