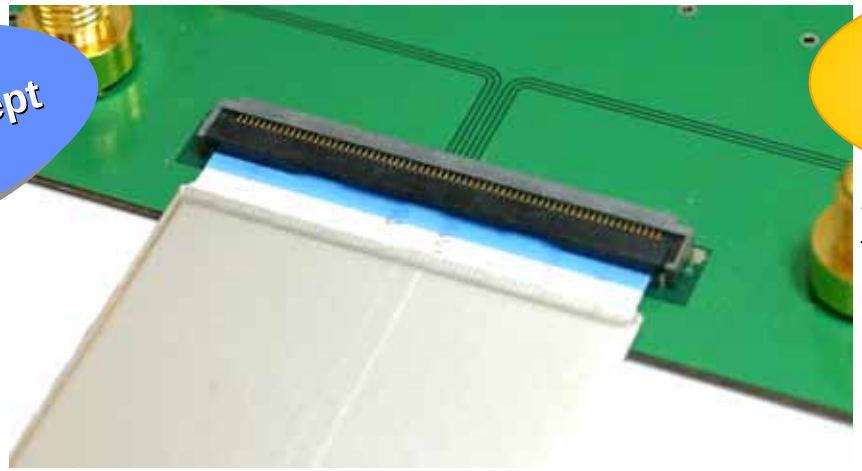
FH41 Series

0.5 mm Pitch, High Speed Transmission FFC Connector

Succeeds highly proven design concept of FH28 Series!!



Supports next gen. chip V-by-One® HS* by THine

*High speed serial interface technology for picture transmission

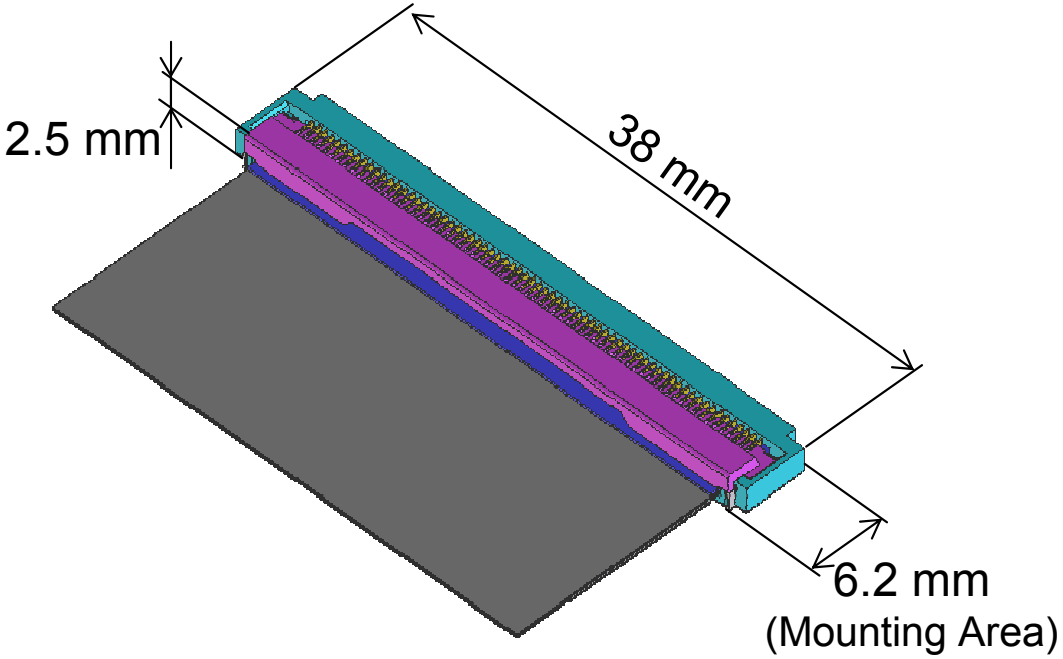
Features

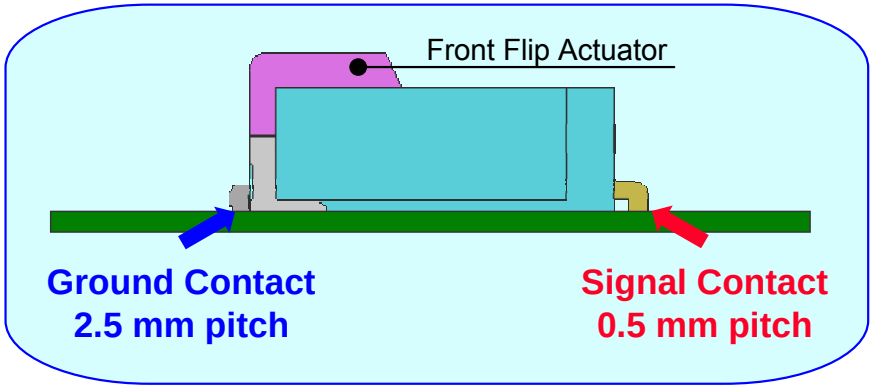
1. Accepts impedance matched shielded FFC with ground contacts
2. Differential impedance 100 Ω ± 10 % (1 Gbps+)
3. Firm & clear tactile click to confirm lock completion
4. Robust lock structure
5. FFC tabs allow high connection reliability
6. Utilizes same FFC as vertical FH48
7. Visible SMT leads for visual check
8. RoHS Compliant, Halogen-free Product*

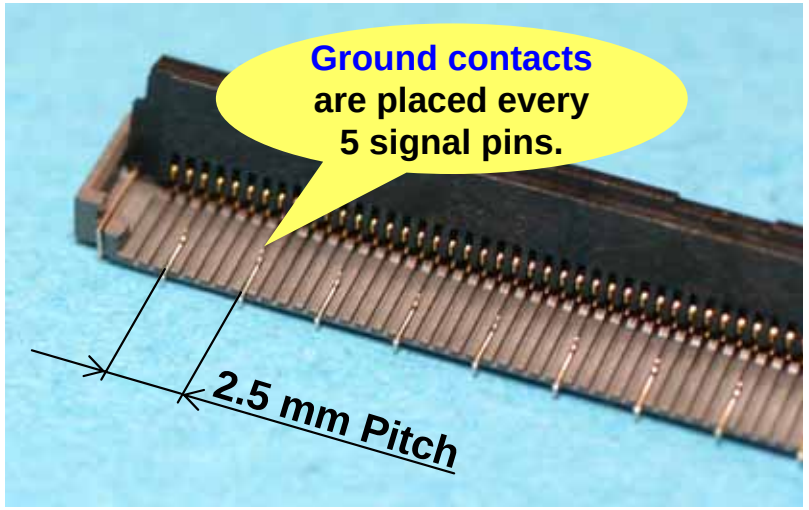
*This product satisfies halogen free requirements defined as 900 ppm maximum chlorine, 900 ppm maximum bromine, and 1500 ppm maximum total of chlorine and bromine.

Dimensions

Dimensions: 68 pos.







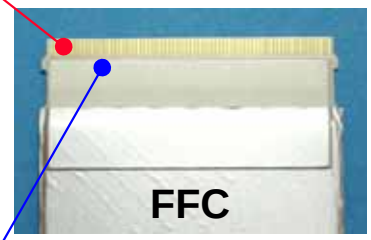
FFC:
t (Signal Contact Area) = 0.3 mm ± 0.05
t (Grounding Plate) = 0.5 mm ± 0.05
Bottom Contact

High Speed Transmission Capability

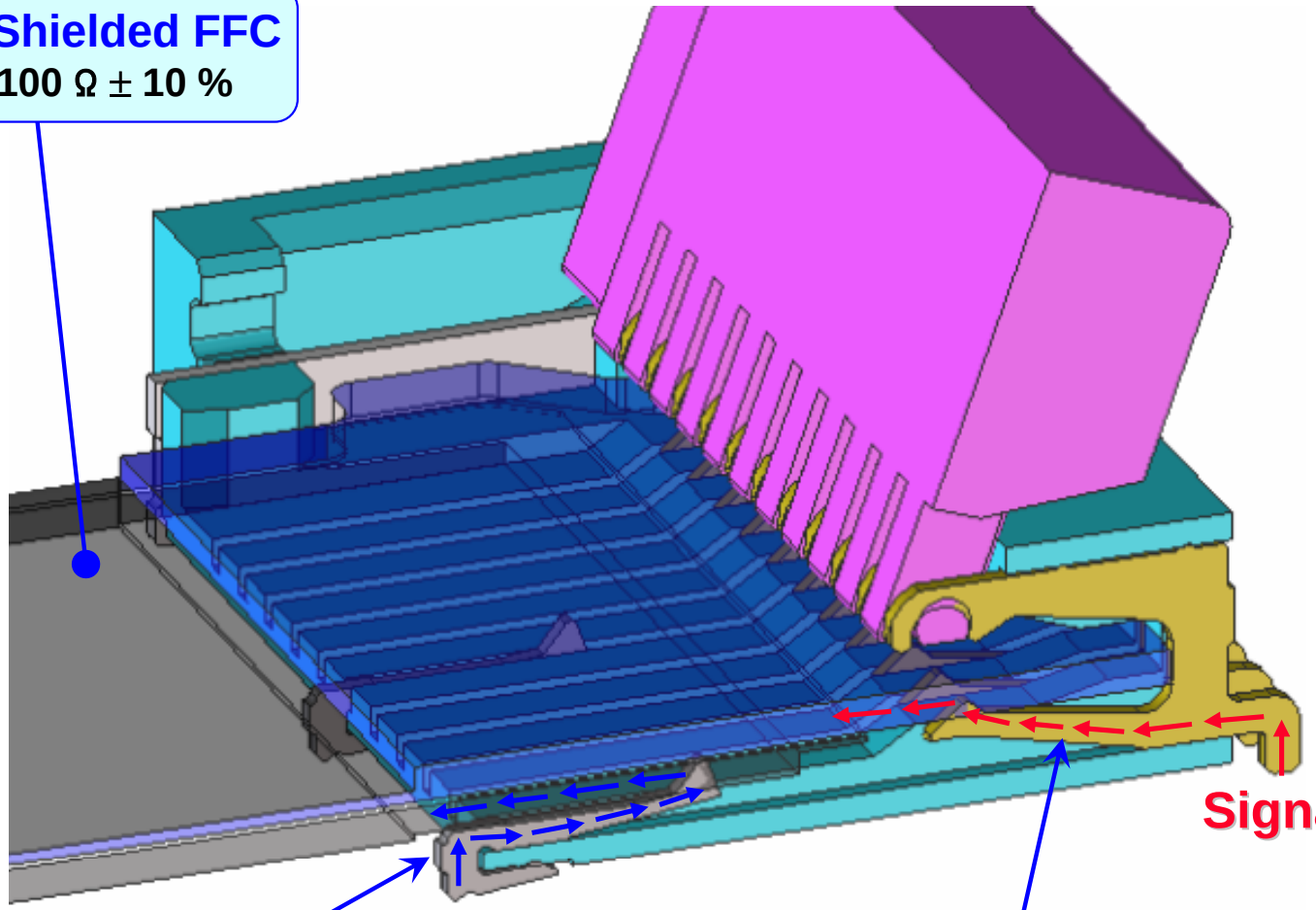
Impedance Matched Shielded FFC

◆ **Impedance Matched Shielded FFC**
Differential Impedance: 100 Ω ± 10 %

Contact area for signal



Contact area for grounding



◆ **Contacts Only for Grounding**
Connected to Shielded FFC for Impedance Matching

◆ **Impedance Controlled Contact Design**
Differential Impedance: 100 Ω ± 10 %

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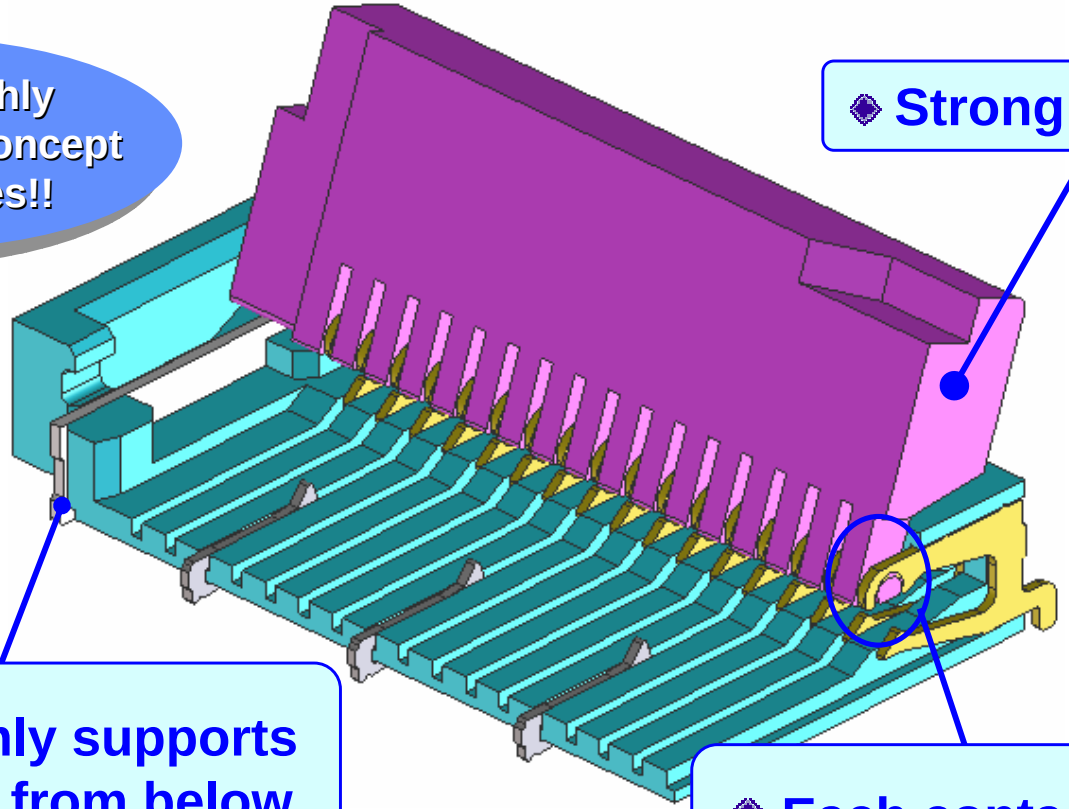
Robust Lock Structure

Succeeds highly proven design concept of FH28 Series!!



- Strong thick actuator
- Metal fitting firmly supports rotating actuator from below
- Each contact tip hooks down the actuator from above

Actuator does not come off, even under rough operation!

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High Operational Reliability

◆ Wide FFC Entry

110° wide actuator opening makes FFC insertion easier.

◆ Confirmed Locking

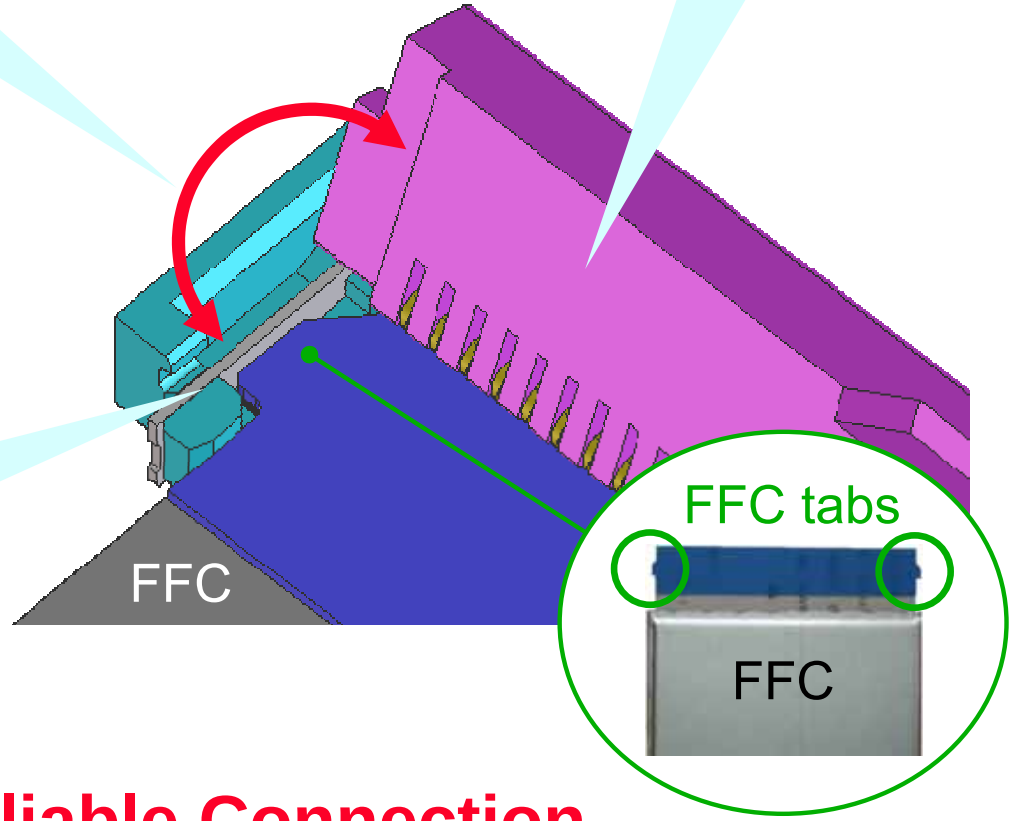
The firm & clear tactile click verifies lock completion

◆ Side-Catches hold the tabbed FFC in place, which enables…

- Stable FFC temporary holding
- Easy and accurate FFC guided positioning
- Consistent connection quality with all operators
- High FFC retention force

➡ **47 N**

(Horizontal direction, 68 pos.)



Stable & Reliable Connection

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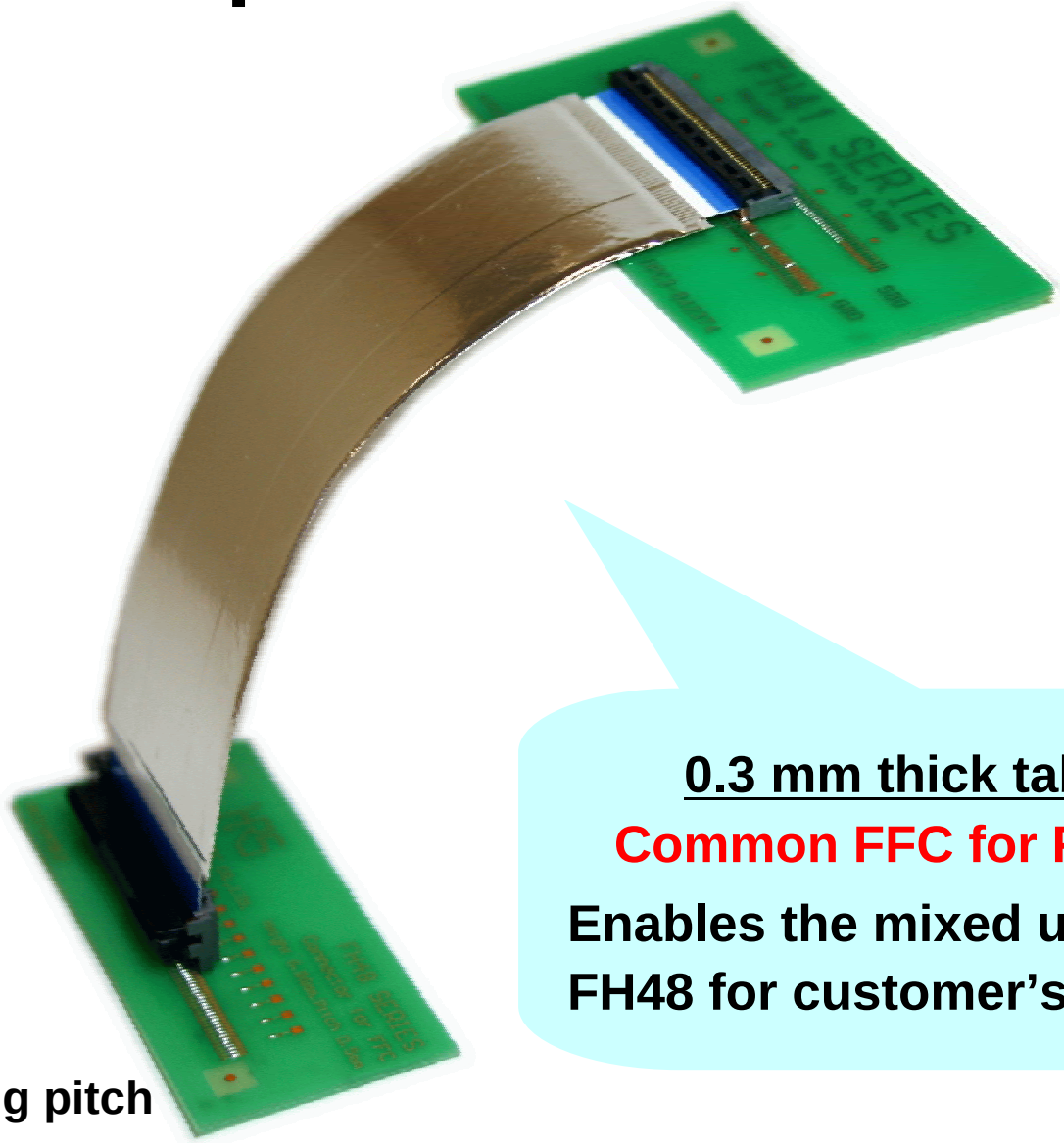
Compatible FFC with FH48



FH41

Horizontal type

0.5 mm pitch
2.5 mm grounding pitch
2.5 mm height

0.3 mm thick tabbed FFC

Common FFC for FH41 and FH48

Enables the mixed use of FH41 and FH48 for customer's convenience.

FH48

Vertical type

0.5 mm pitch
2.5 mm grounding pitch
6.18 mm height

***PCB layout is not compatible with FH48.**

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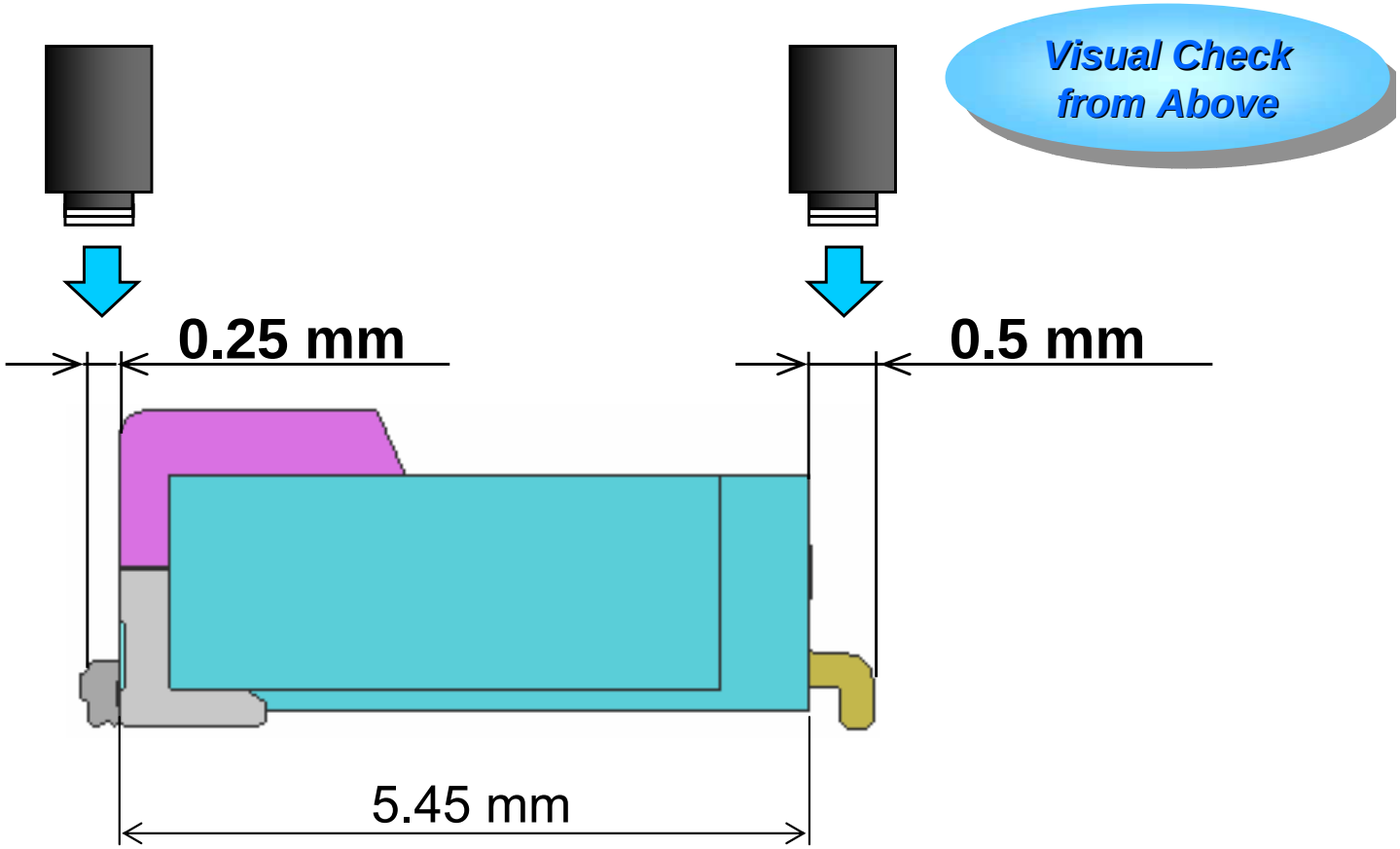
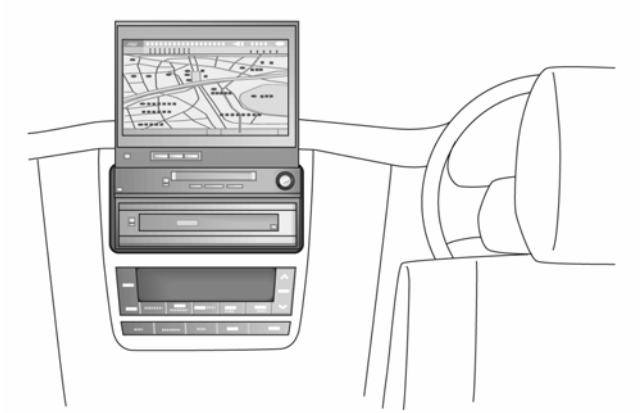
Visible SMT Lead for Visual Check

- The solder joints can be visually checked from above.

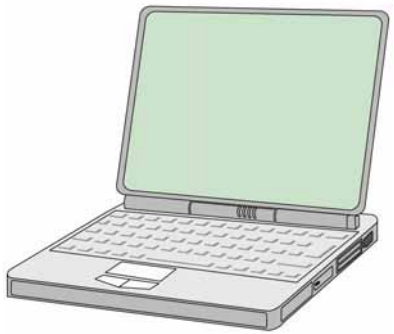


Application Examples

Car Navigation, Car audio



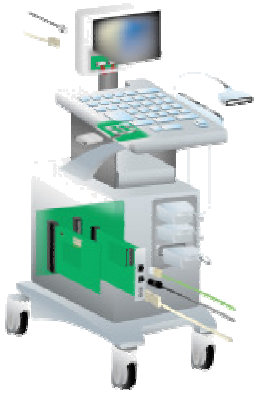
Notebook PC



LCD, LCD TV PDP, Digital TV

Game Machine

Medical Equipment



DVD Player / Recorder

PPC, MFP

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Specifications

- **Material and Finish**

Component	Material	Finish & Remarks
Housing	LCP*	Gray / UL94V-0
Actuator	LCP*	Black / UL94V-0
Signal Contacts	Phosphor Bronze	Contact area: Gold plated Others: Nickel plated
GND Contacts	Phosphor Bronze	Tin plated over Nickel under plating
Metal Fitting	Phosphor Bronze	Tin plated over Copper under plating

- **Performance Characteristics**

Contact Resistance**	100 mΩ MAX.
Withstanding Voltage	AC 150 V for 1 minute
Insulation Resistance	500 MΩ MIN. (DC 100 V)
Rated Current	0.5 A
Rated Voltage	AC / DC 50V

- **Applicable FFC thickness required at mating area: 0.3 ± 0.05 mm**
- **Varieties: 28, 30, 31, 40, 50 and 68 pos. (Sample availability: 21, 24 and 51 pos.)**
- **RoHS compliant, Halogen-free product** (Consult cable manufactures about halogen-free FFC.)

*NOTE: This product satisfies halogen free requirements defined as 900 ppm maximum chlorine, 900 ppm maximum bromine, and 1500 ppm maximum total of chlorine and bromine.

** includes FFC conductor resistance (L = 8 mm)

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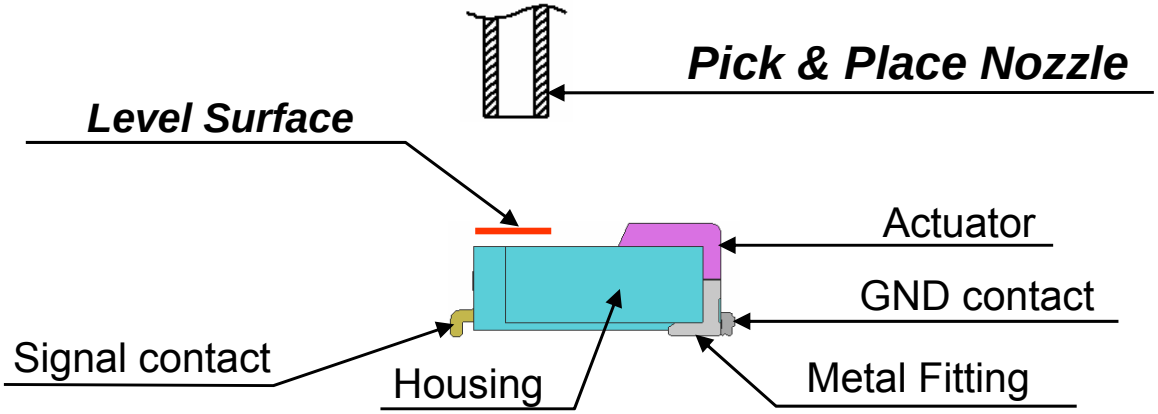
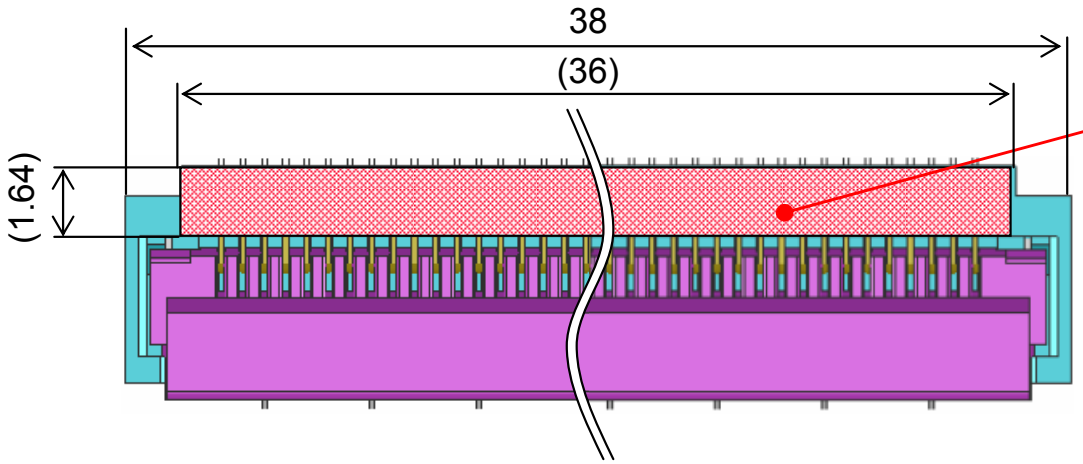
Automatic Mounting

♦ Recommended Vacuum Pick Up Area



Side view



Vacuum Pick Up Area

Top view

Core-outs are provided on the actuator, depending on the contact position.

Dimension Example: 68 positions, Weight: 0.57 grams

(All dimensions in millimeters)

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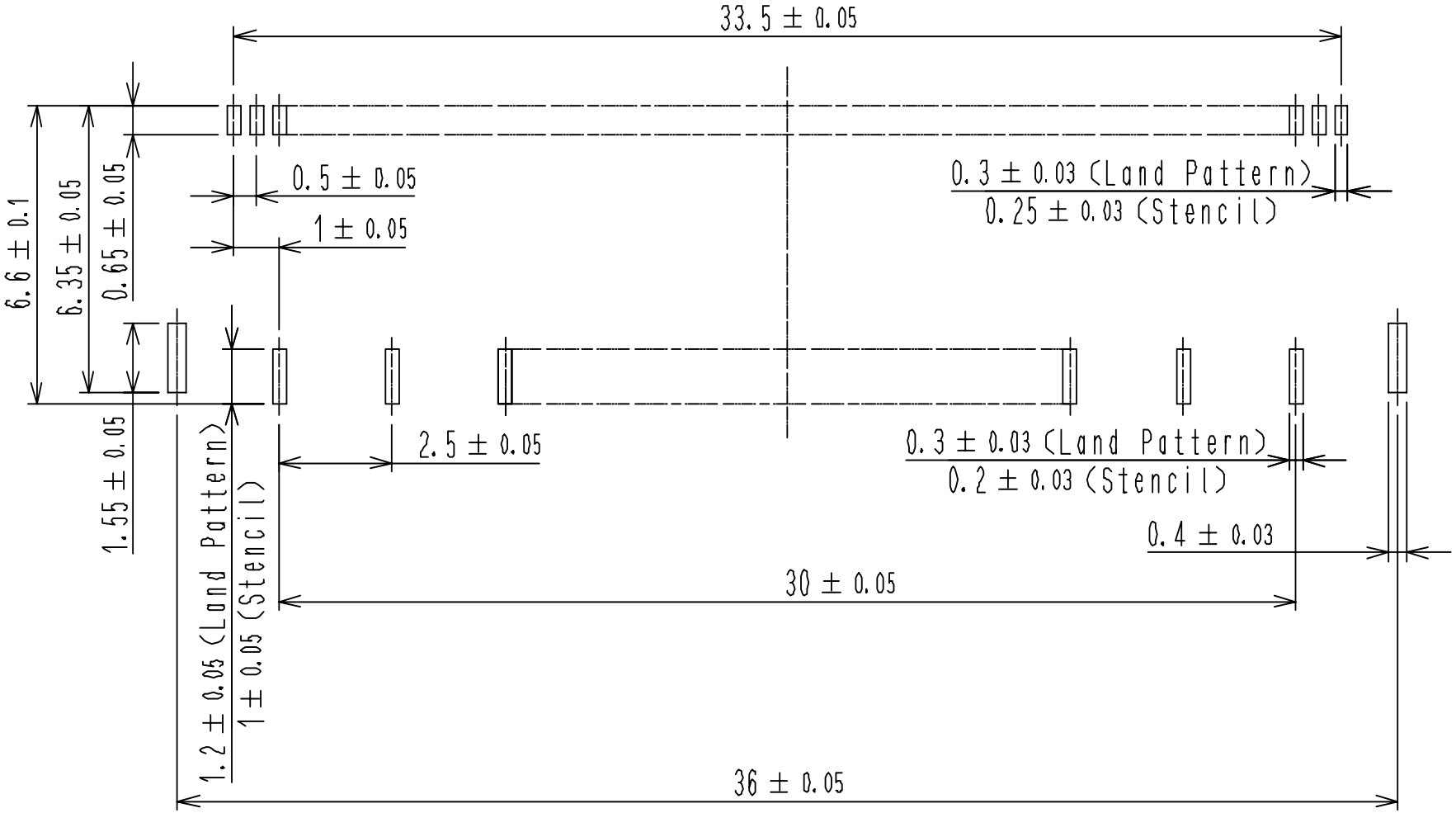
Recommended PCB Layout

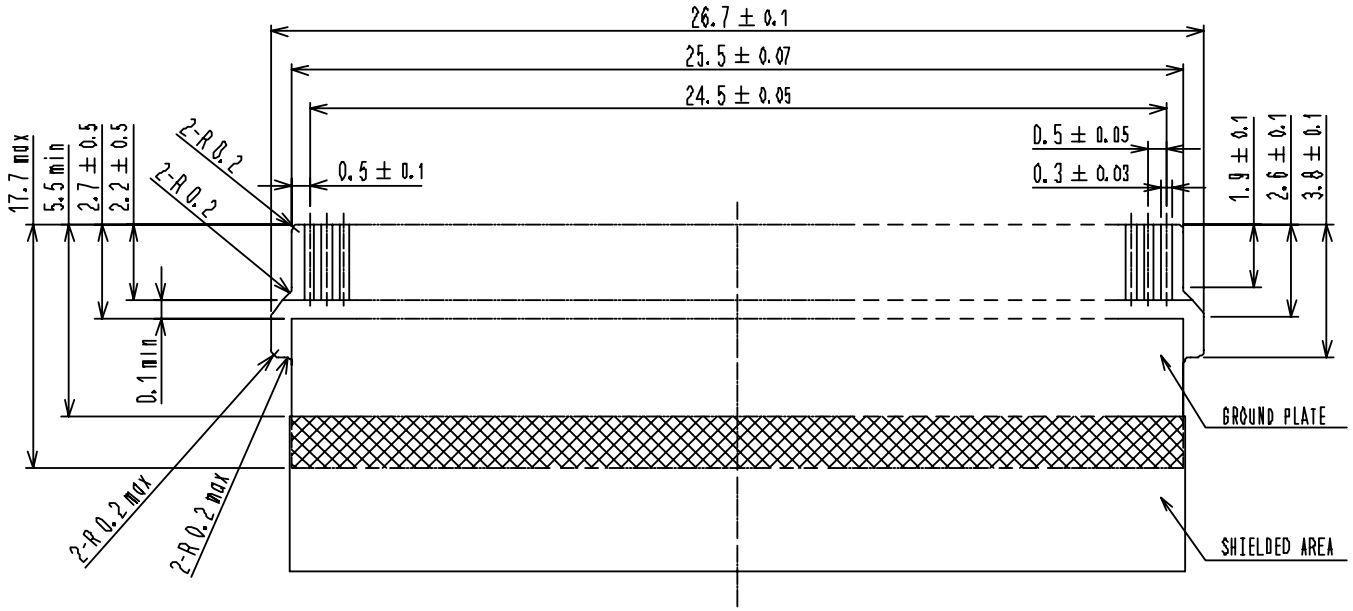
Dimension Example: 68 positions, Recommended stencil thickness: 0.1 mm

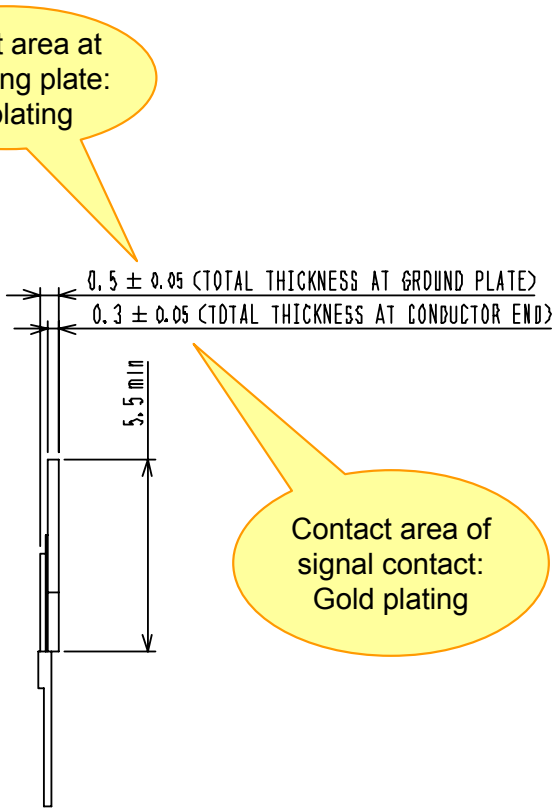


(All dimensions in millimeters)

Recommended FFC Layout

♦Dimension Example: 50 pos.



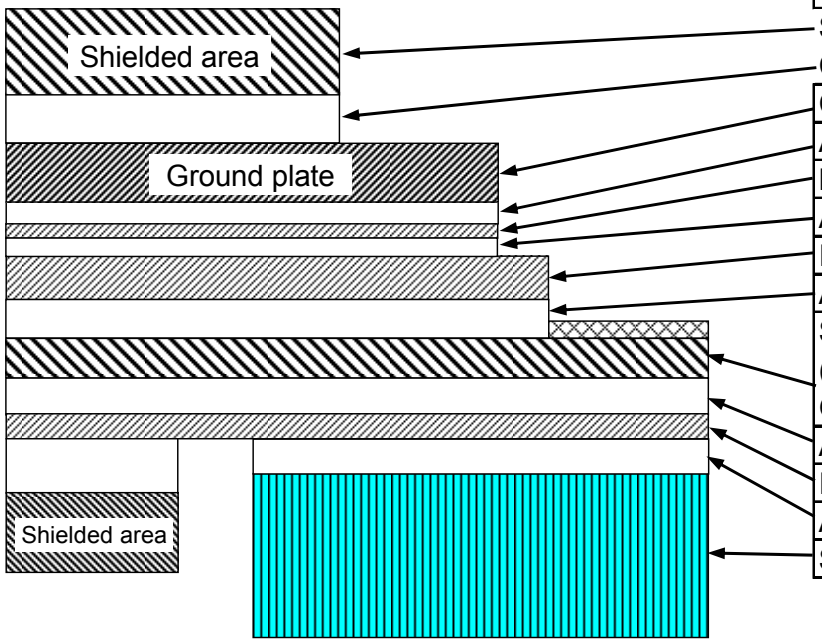


(All dimensions in millimeters)

FFC Material Configuration Examples

This specifies the recommended FFC configuration mating area.
The applicable FFC mating area thickness: Contact area for signal = 0.3 mm ± 0.05
Contact area for grounding = 0.5 mm ± 0.05

Single-sided



Layer	Material	Total Thickness at Ground Plate (µm)	Total Thickness at Conductor End (µm)
Shielding Material			
Conductive Adhesive	Polyester Type		
Copper Foil (Tin plating)		70	
Adhesive	Acrylic Type	24	
Base Film	Polyester Type	12	
Adhesive	Acrylic Type	24	
Insulator Layer	Polyester Type	25	
Adhesive	Polyester Type	35	
Soft Copper Foil (Nickel Under Plating / Gold Plating)		35	35
Adhesive	Polyester Type	35	35
Insulator Layer	Polyester Type	25	25
Adhesive	Polyester Type	30	30
Stiffener	Polyester Type	188	188
	Total	**503**	**313**

1. This configuration example is for reference.
2. Please consult FFC suppliers for configuration details.

High Speed Transmission Characteristics

- Differential Impedance
- Eye Diagram
- EMI Characteristics

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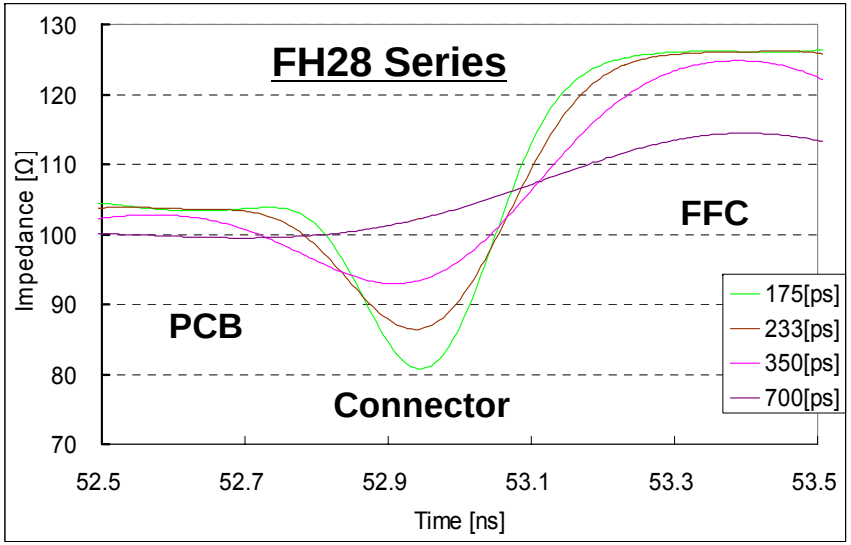
High Speed Transmission Characteristics
Differential Impedance

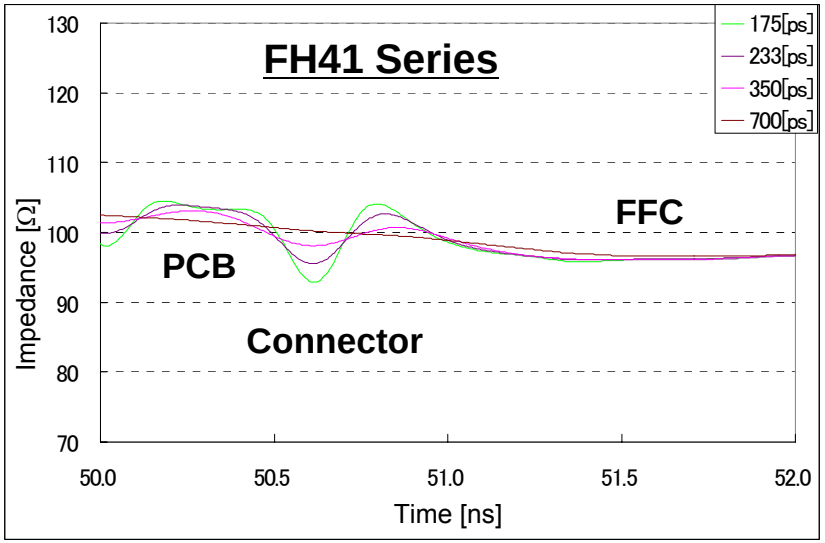
Input signal	Offset voltage: S+ 200 mV, S- 200 mV
	Rise time (Tr: 10 % - 90 %): 175 ps, 233 ps, 350 ps, 700 ps

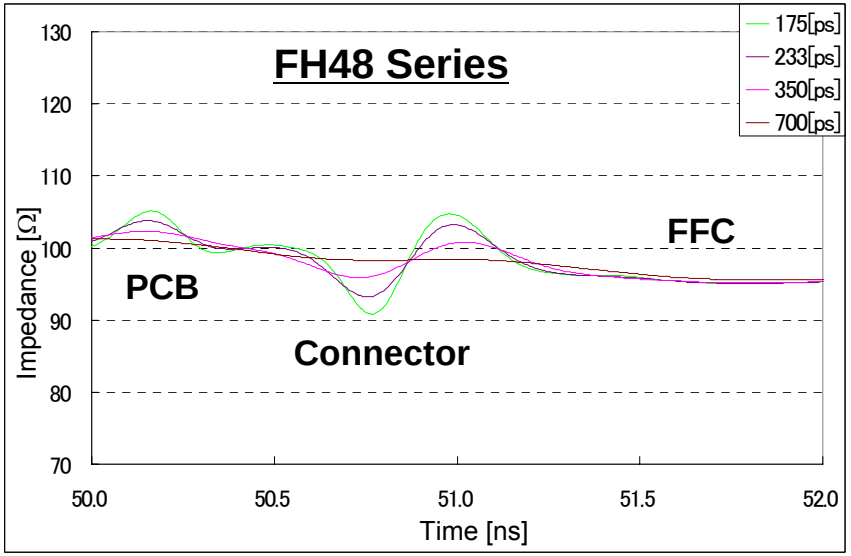
(Ω)

Tr	175 [ps]	233 [ps]	350 [ps]	700 [ps]
FH28-Normal FFC	81	86	93	99
FH41 HS FFC*	92.8	95.5	96.1	96.6
FH48 HS FFC*	90.8	93.3	95.2	95.6

*Manufactured by Hitachi Cable.







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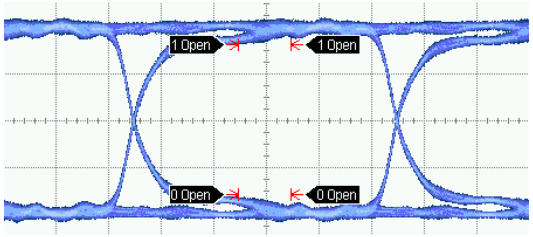
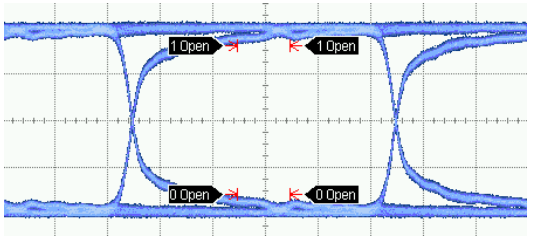
High Speed Transmission Characteristics
Eye Diagram -FH28 and FH41-

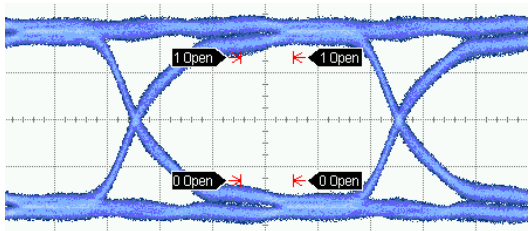
FH28 - Normal FFC (80 mm)

FH41- High Speed FFC (80 mm)

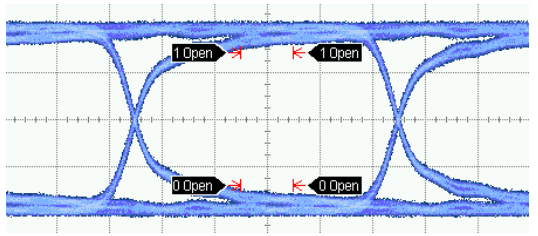


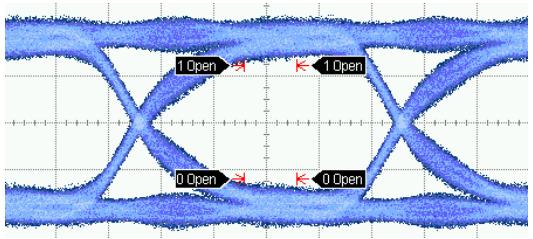
1 Gbps



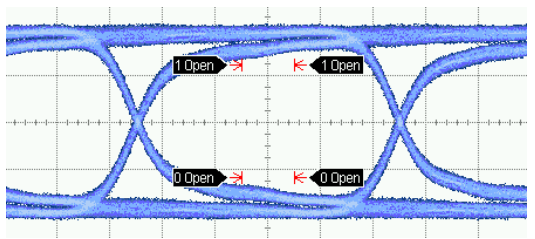


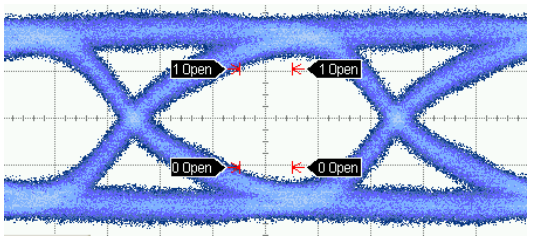
2 Gbps



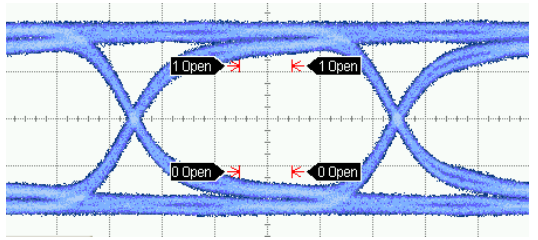


3 Gbps





4 Gbps



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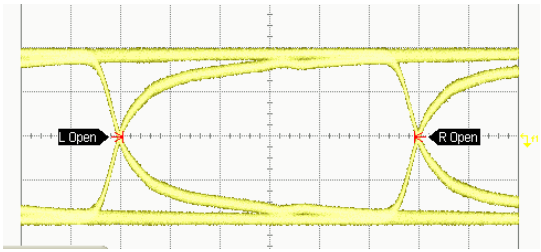
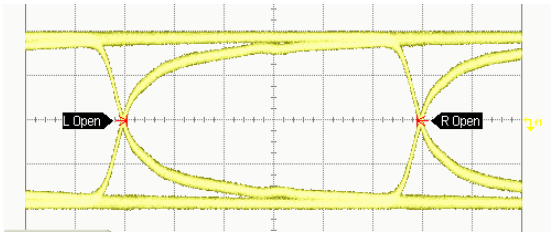
High Speed Transmission Characteristics
Eye Diagram -FH41 and FH48-

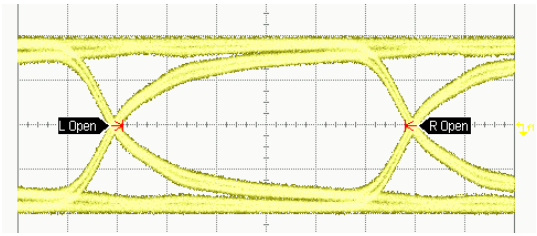
FH41 - High Speed FFC (500 mm)

FH48- High Speed FFC (500 mm)

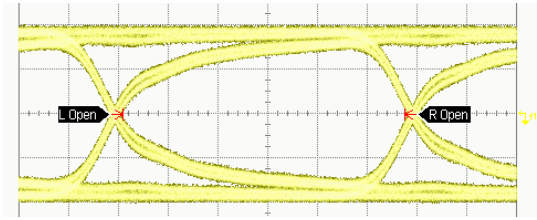


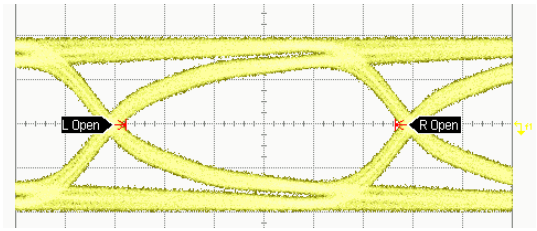
1 Gbps



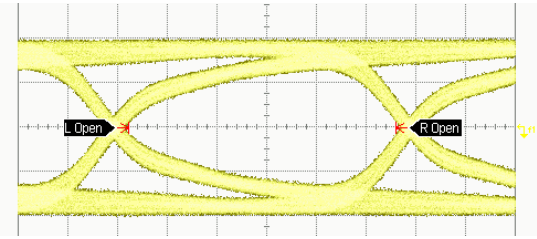


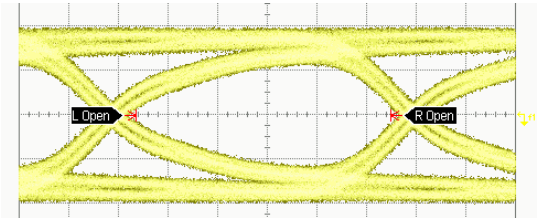
2 Gbps



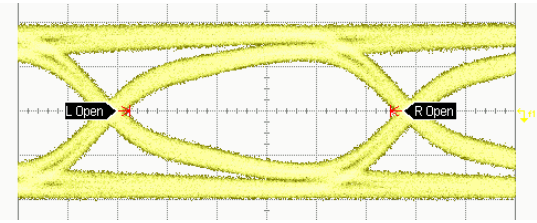


3 Gbps





3.75 Gbps



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EMI Characteristics
Magnetic Near-Field Measurement Method

FH28 - Normal FFC

Measured area

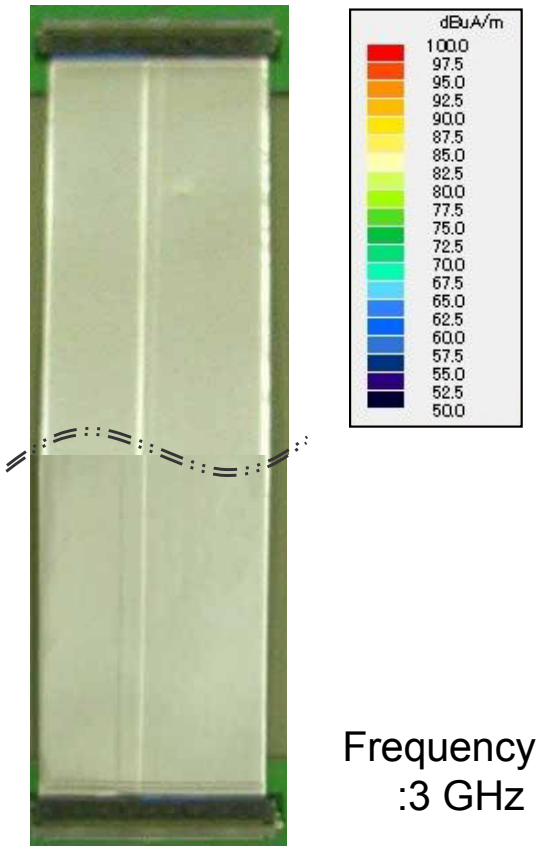
EMI Map

Drastic reduction of Noise

FH41 / FH48 – High Speed FFC

EMI Map

Measured area



Frequency :3 GHz