# Introduction

**Purpose**

**•To introduce Hirose's FH28 series of FPC/FFC connectors**

**Objectives**

**•To explain the features, benefits and applications for the FH28 Series**

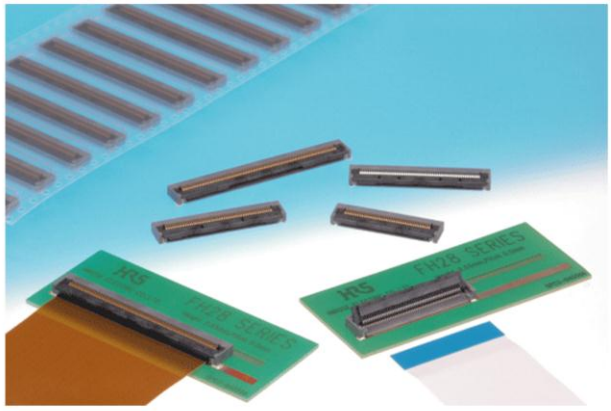
**Content**

**•pages**

Welcome to the Hirose product training module for the FH28 Series. This training module will include basic features, operation and some key points of this connector series.

# Hirose Electric

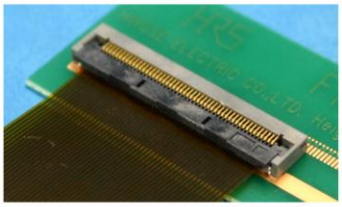
**FH28 Series -0.5 mm Pitch, FPC/FFC Connectors**

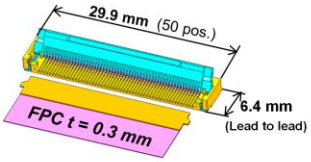



The FH28 series was designed as a ruggedized flex circuit connector for various applications including industrial and medical devices, test and measurement equipment and consumer electronics.

# FH28 Series

**-0.5 mm Pitch, FPC/FFC Connectors**



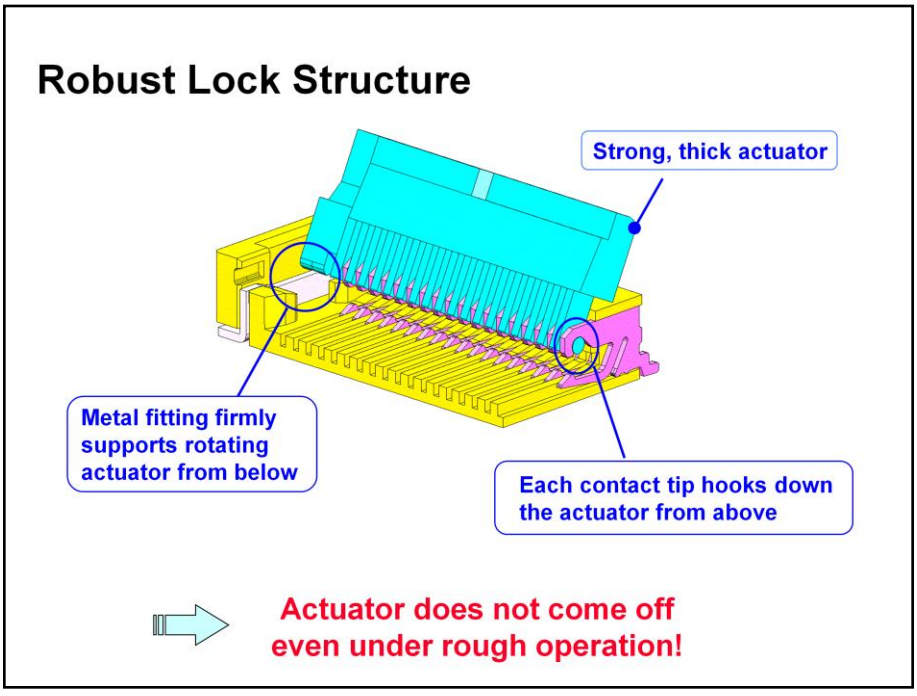



◆ **Features**

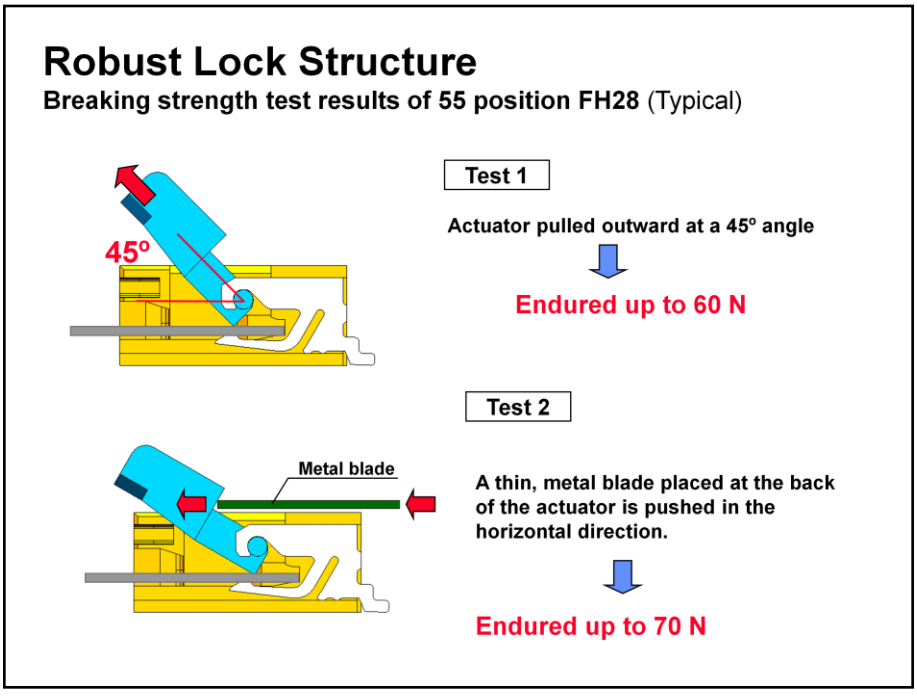
1. Rugged construction
2. Robust lock structure
3. FPC tabs allow high connection reliability
4. High FPC retention force
5. User-friendly
6. RoHS compliant, Halogen-free product*

*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.

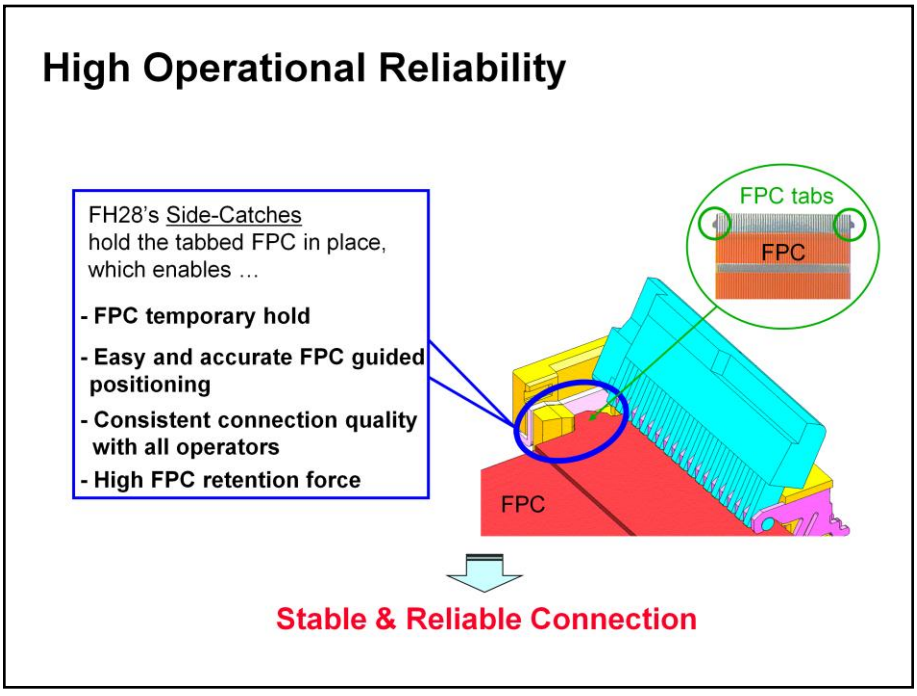
FH28 features include larger, rugged construction and a robust lock mechanism. FPC tabs allow for higher retention. The user friendly design allows quick and correct FPC/FFC positioning. The FH28 series is RoHS compliant and is halogen free.




A strong, Liquid Crystal Polymer (LCP) is used for both the actuator and housing. The actuator is held down by a hook at each contact point and is supported on each end with a metal fitting. The hooks serve to secure the actuator along its entire length and the fittings at each end of the connector act as bearing points.




The actuator can stand up to 60N of force when pulled at a 45 deg. angle and 70 N when pushed in a horizontal direction.



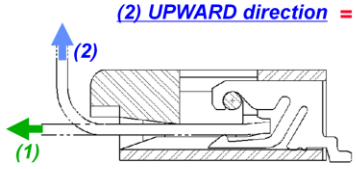

A key feature of the FH28 connector series is the "side catcher" design. The tab on FFC/FPC fits into the molded pockets of the FH28 connector allowing for correct positioning of the FPC/FFC within the connector. Once the actuator is locked down, the tabs act as a strain relief and increase retention force.

# High FPC Retention Force

**FPC retention force: FH28-50S**

**Test results with plain FPC (without tabs)**

*(2) UPWARD direction* = 10 N or more




*(1) HORIZONTAL direction*

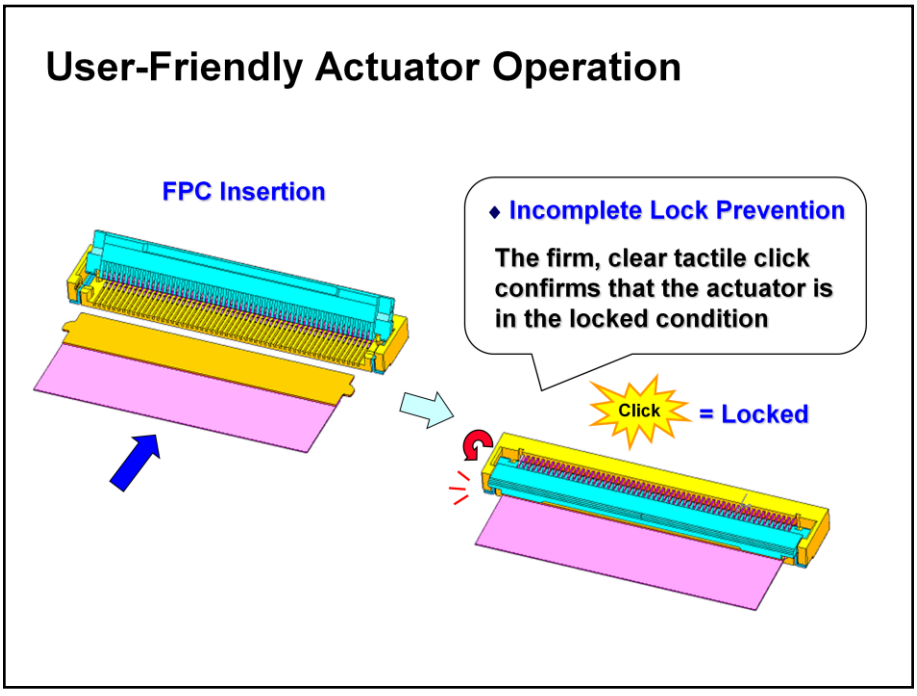
= 20 N or more

◆ Comparison between without tabs and with tabs in HORIZONTAL direction)

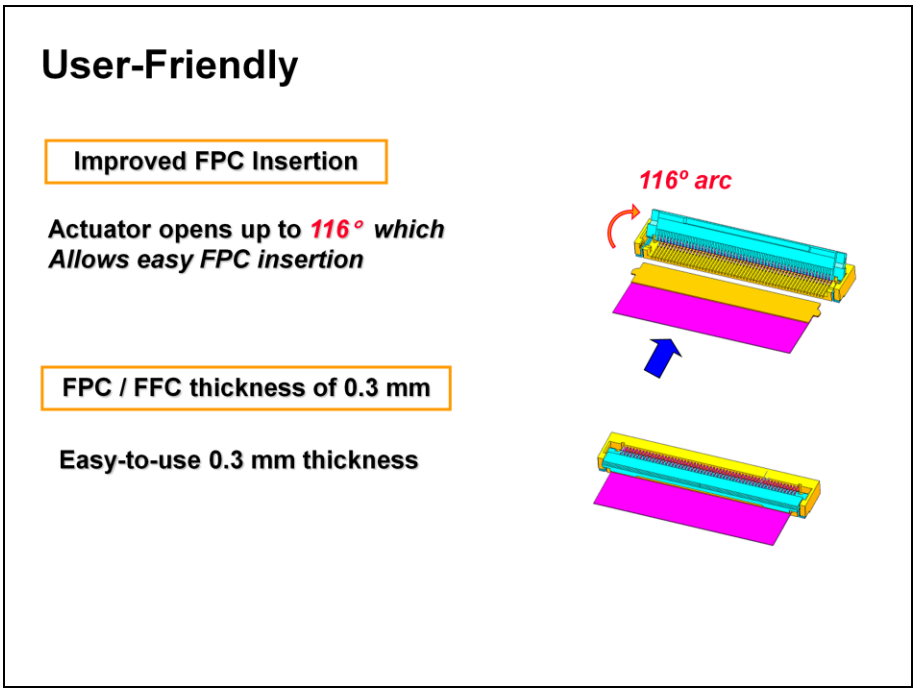
| | w/o tabs | with tabs |
|---|---|---|
| FH28-20S: | 8 N MIN. | 40 N MIN. |
| FH28-30S: | 12 N MIN. | 40 N MIN. |
| FH28-40S: | 16 N MIN. | 40 N MIN. |

Retention force is increased with FPC tabs!!

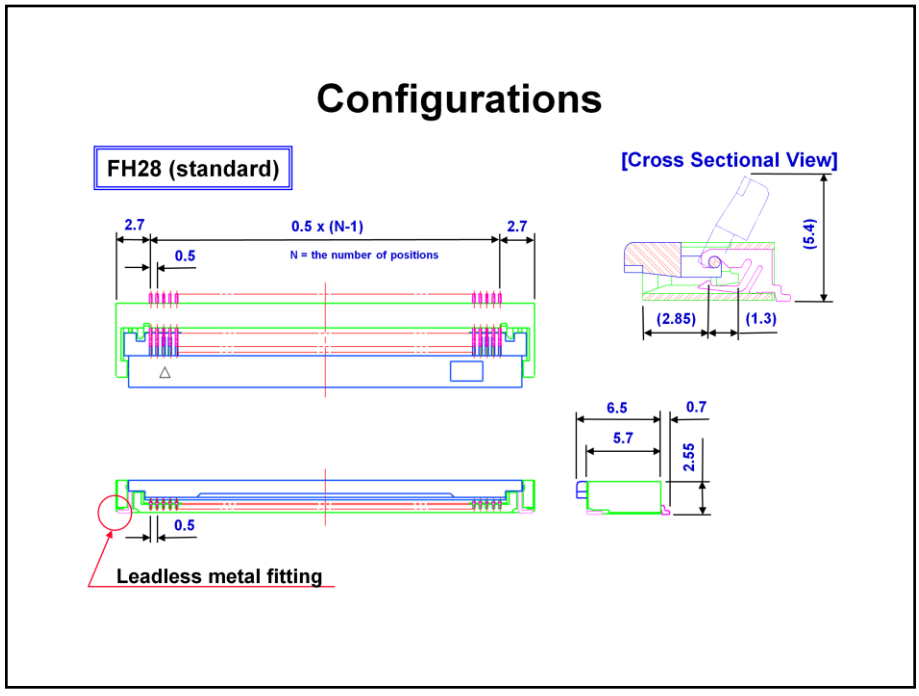
This slide shows the significant increase in the FPC/FFC retention force due to the tab design.




Once the FPC/FFC is correctly inserted, the actuator is rotated down. A tactile “click” confirms the assembly has been locked down and is completed.

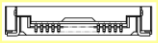
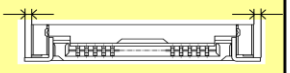
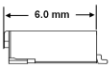



The generous 116 degree opening allows for easy access when inserting the FPC/FFC.




This slide shows critical dimensions of the FH28 connector series.

## FH28 Variations

| Series | FH28 | FH28E | FH28H |
|---|---|---|---|
| 1. Number of contacts | 40, 50, 55, and 60 | 20, 40, 50, 60, 68 | 80 pos. |
| 2. Metal fitting |  | Metal fitting is extended farther out from the housing edge to facilitate manual soldering and visual check.  | |
| 3. Actuator |  |   Same as Standard FH28 |   0.5 mm space saving |

The FH28 series has several variations and sizes available in the FH28 series. The FH28E and FH28H configurations have a metal fitting extending out from the edge of the connector.

The FH28H has a narrower actuator for space saving.

## Specifications & Remarks

- Material and Finish

| Component | Material | Finish & Remarks |
|---|---|---|
| Housing | LCP* | Gray / UL94V-0 |
| Actuator | LCP* | Black / UL94V-0 |
| Contacts | **Phosphor Bronze** | **Gold plate over Nickel underplating** |
| Metal fitting | Brass | **Tin plate over Nickel underplating** |

*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.

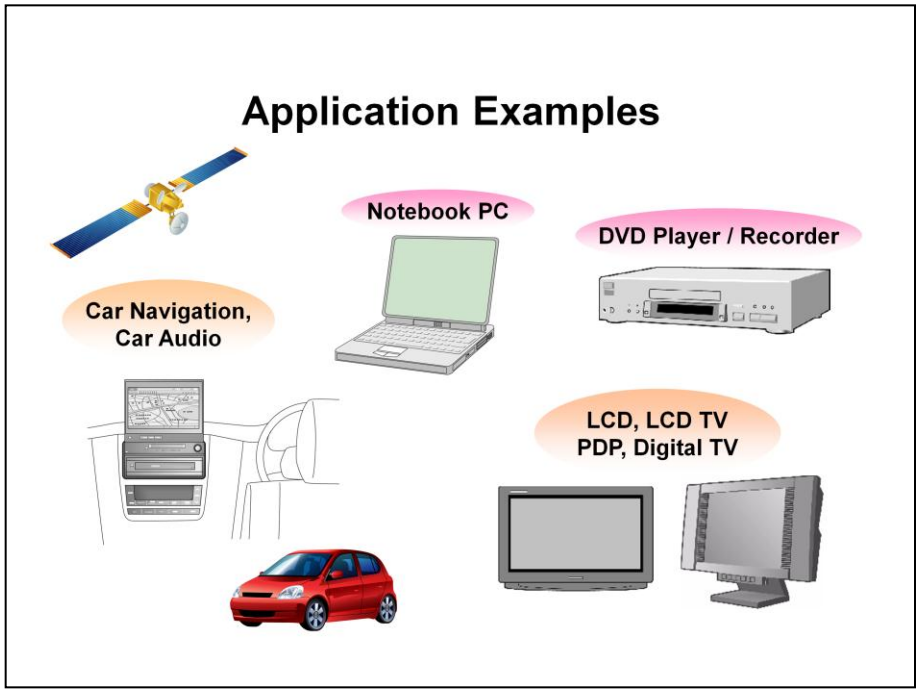
- Performance Characteristics

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

* includes FPC conductor resistance.

- Applicable FPC / FFC thickness required at mating area: 0.3 ± 0.05 mm

The max rated current of 0.5 Amp, shown here, is per pin, but when passing current through all of the contacts, reduce current to 70%. Also note that the LCP material used for the housing and actuator meets the conditions required for a halogen free product.




Applications for the FH28 series include consumer electronics, medical devices, GPS navigation, test and measurement devices, bar code readers, and industrial equipment.