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# Component Specification

## C05701

FLECTO Floating Connectors
0.5mm, 0.635mm, 0.8mm pitch
December 2023


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## 1. DESCRIPTION OF CONNECTOR SYSTEM

A range of board-to-board connectors that allows for at least 0.5mm misalignment when mating and when fully mated. The male connectors incorporate a contact design with added positional flexibility between the mating faces and the PCB terminations.

Three pitch options are available: 0.5mm, 0.635mm and 0.8mm:

- 0.5mm pitch: F10, F11 and F12 (signal only and signal/power connectors)
- 0.635mm pitch: F20 (signal only connectors)
- 0.8mm pitch: F30 (signal only connectors)

All connectors in the FLECTO range are Surface Mount and double row, supplied in Tape and Reel packaging (with pick and place aids). Signal-only connectors include locating pegs to help with alignment on the PCB, and SMT side tabs for additional peel strength and strain relief when soldered. Signal/Power connectors have throughboard terminations for the power contacts, which also assist with PCB alignment.

There are various mating height options across the ranges, ideal for a range of parallel board-to-board (mezzanine) layouts. The signal/power range also has a horizontal connector, for right-angle motherboard-to-daughterboard layouts. Various connector designs include polarization and shrouded contacts for additional assembly assistance.

## 2. RATINGS

### 2.1. Materials

| Component | Material |
|---|---|
| Contact Base Material | F10 / F11 series: Copper Alloy<br>F12 / F20 / F30 series: Phosphor Bronze |
| Contact Finish | Gold flash over Nickel |
| Termination Finish | F10 / F12 Male / F20 / F30 series: Gold flash over Nickel<br>F11 series Signal contacts: Gold flash over Nickel<br>Power contacts: 100% Tin over Nickel<br>F12 Female series: 100% Tin over Nickel |
| Housing | High Temperature LCP, UL94V-0 |
| SMT Side Tabs Base Material | Brass |
| SMT Side Tabs Finish | 100% Tin over Nickel |

### 2.2. Electrical Characteristics

#### 2.2.1. Current Rating

| Range | Current (max per contact) |
|---|---|
| F10 / F12 series | 0.4A |
| F11 series | Signal = 0.5A<br>Power = 3.0A |
| F20 / F30 series | 0.5A |

#### 2.2.2. Dielectric Withstanding Voltage (EIA-364-20, Method B)

| Range | DWV |
|---|---|
| F10 / F12 / F30 series | 250V AC/DC for 1 minute |
| F11 series | 150V AC/DC for 1 minute |
| F20 series | 200V AC/DC for 1 minute |

### 2.2.3. Contact Resistance (EIA-364-23)

| Range | Initial | After Conditioning |
|---|---|---|
| F10-100, F10-101 Female | 80mΩ max | Additional 10mΩ max. variation |
| F10 Male<br>F10-102 Female | 100mΩ max | |
| F12 Male/Female | | Additional 20mΩ max. variation |
| F11 Signal contacts | 70mΩ max | Additional 10mΩ max. variation |
| F11 Power contacts | 20mΩ max | |
| F20 Male/Female | 100mΩ max | |
| F30 Male/Female | | |

### 2.2.4. Insulation Resistance (EIA-364-21)

| Range | Insulation Resistance |
|---|---|
| F10 / F11 series | 100MΩ min. |
| F12 / F20 / F30 series | 500MΩ min. |

## 2.3. Environmental Characteristics

| Range | Operating Temperature |
|---|---|
| F10 / F12 / F20 / F30 series | -40°C to +105°C |
| F11 series | -55°C to +105°C |

| Range | Mechanical Vibration (EIA-364-28, Condition I) |
|---|---|
| F10 / F11 / F12 / F20 / F30 series | 10-55Hz, 1.52mm amplitude, duration 2 hours each axis |

| Range | Mechanical Shock (EIA-364-27, Condition A) |
|---|---|
| F10 / F11 / F12 / F20 / F30 series | Acceleration: 490m/s²(50g),<br>Duration: 11ms,<br>Sine half-wave,3 cycles, 3-axes, both directions (18 total) |

| Range | Thermal Shock (EIA-364-32) |
|---|---|
| F10 / F12 / F20 / F30 series | -40°C to +105°C, 10 cycles, 30 mins each extreme |
| F11 series | -55°C to +105°C, 10 cycles, 30 mins each extreme |

| Range | Temperature Life (EIA-364-17) |
|---|---|
| F10 / F11 / F12 series | +130°C for 1000 hours |
| F20 / F30 series | +105°C, 96 hours |

| Range | Humidity (EIA-364-31, Condition A) |
|---|---|
| F10 / F11 / F12 series | 90-95% RH at +60°C for 96 hours |
| F20 / F30 series | 90-95% RH at +40°C for 96 hours |

| Range | Salt Spray |
|---|---|
| F10 / F12 / F20 / F30 series | **EIA-364-26**<br>Tin plated parts - 8 hours<br>Gold plated parts - 48 hours<br>5±1% Salt solution |
| F11 series | **EN 60068-2-52** Test method 3:<br>Spray samples with 5% salt solution at 35°C for 2hrs<br>40°C at 93% RH for 22hrs<br>23°C at 50% RH for 3 days |

| Range | Solderability (EIA-364-52) |
|---|---|
| F10 / F11 / F12 / F20 / F30 series | 245±3°C for 3-5 seconds,<br>Solder coverage: 95% min. |

| Range | Resistance to Soldering Heat (EIA-364-56) |
|---|---|
| F10 / F11 / F12 / F20 / F30 series | Pre Heat: 150°C-200°C, 60-120s<br>Heat:217°C, 60-150s<br>Peak Temp: 260±5°C, 5-15s |

## 2.4. Mechanical Characteristics

### 2.4.1. Durability (EIA-364-09)

| Range | Durability (minimum no. of mating cycles) |
|---|---|
| F10 / F11 / F20 / F30 series | 100 |
| F12 series | 30 |

### 2.4.2. Mating Forces (per contact)

| Range | Initial Insertion Force (EIA-364-13) | Withdrawal Force (EIA-364-13C) |
|---|---|---|
| F10 / F11 / F12 / F30 series | 0.8N max. | 0.1N min. |
| F20 series | 0.5N max. | 0.05N min. |

### 2.4.3. Contact Retention (Per contact, EIA-364-29C)

| Range | Contact Retention |
|---|---|
| F10 / F11 / F12 / F20 / F30 series | 1.0N min. |

## 2.5. Signal Integrity

### 2.5.1. Differential Insertion Loss

| Range | Insertion Loss |
|---|---|
| F10 / F11 / F12 series | <1dB @ 4GHz |
| F20 series | <1dB @ 6GHz |
| F30 series | <1dB @ 2.5GHz |

### 2.5.2. Differential Return Loss

| Range | Return Loss |
|---|---|
| F10 / F11 / F12 series | >10dB @ 4GHz |
| F20 series | >10dB @ 6GHz |
| F30 series | >10dB @ 2.5GHz |

### 2.5.3. Impedance

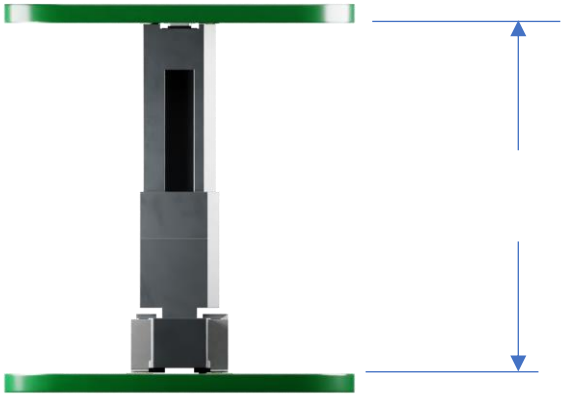
| Range | Impedance |
|---|---|
| F10 / F11 / F12 series | 100Ω |
| F20 series | |
| F30 series | |

### 2.5.4. Crosstalk

| Range | Near-End Crosstalk (NEXT) |
|---|---|
| F10 / F11 / F12 series | <-50dB @ 4GHz |
| F20 series | <-50dB @ 6GHz |
| F30 series | <-40dB @ 2.5GHz |

| Range | Far-End Crosstalk (NEXT) |
|---|---|
| F10 / F11 / F12 series | <-50dB @ 4GHz |
| F20 series | <-50dB @ 6GHz |
| F30 series | <-40dB @ 2.5GHz |

## APPENDIX 1 – MATING HEIGHTS/LENGTHS



**NOMINAL Board-to-Board mating height (parallel, mezzanine)**

### A1.1 – F10 Series (0.5mm pitch)

| Female | Male: F10-200XXX45R |
|---|---|
| F10-100XXX45R | 17.90mm |
| F10-101XXX45R | 24.90mm |
| F10-102XXX45R | 29.90mm |

### A1.2 – F11 Series (0.5mm pitch)

| Female | Male: F11-200XXX42R | Male: F11-201XXX42R |
|---|---|---|
| F11-100XXX42R | 15.00mm | 20.00mm |

### A1.3 – F12 Series (0.5mm pitch)

| Female | Male: F12-200XXX45R |
|---|---|
| F12-100XXX42R | 7.65mm |

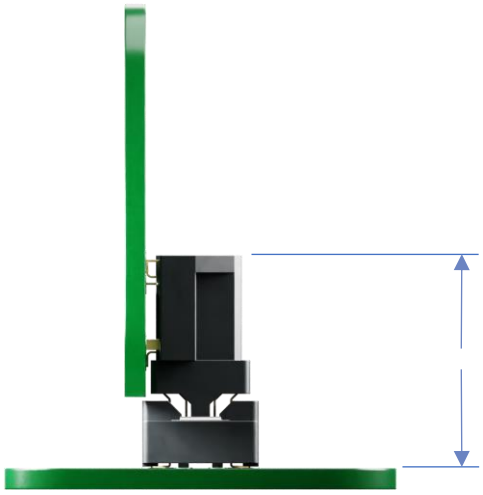
### A1.4 – F20 Series (0.635mm pitch)

| Female | Male: F20-200XXX45R |
|---|---|
| F20-100XXX45R | 5.98mm |
| F20-101XXX45R | 9.88mm |
| F20-102XXX45R | 14.88mm |

### A1.5 – F30 Series (0.8mm pitch)

| Female | Male: F30-200XXX45R | Male: F30-201XXX45R |
|---|---|---|
| F30-100XXX45R | 8.00mm | 11.75mm |
| F30-101XXX45R | 9.00mm | 12.75mm |
| F30-102XXX45R | 20.95mm | 24.70mm |

### A1.6 – F11 Series (0.5mm pitch)



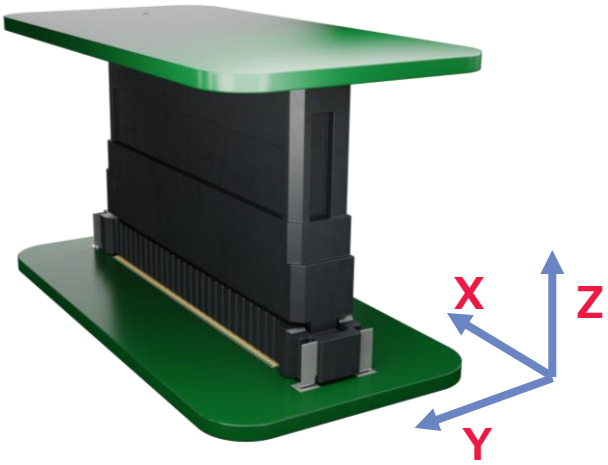
**NOMINAL Mating Length for Right angle connection**

| Female | Male: F11-200XXX42R | Male: F11-201XXX42R |
|---|---|---|
| F11-111XXX42R | 16.20mm | 21.20mm |

## APPENDIX 2 – CONNECTOR MISALIGNMENT

Misalignment Is controlled by the float availalbe In the male connector. Female connectors do not contain any float mechanism.

### A2.1 – Range of movement during mating and when mated




| Range | X Axis | Y Axis | Z Axis |
|---|---|---|---|
| F10 Series | ±0.5mm | ±0.5mm | ±0.5mm |
| F11 Series | ±0.6mm | ±0.6mm | ±0.5mm |
| F12 Series | ±0.5mm | ±0.5mm | ±0.5mm |
| F20 Series | ±0.7mm | ±0.7mm | ±0.5mm |
| F30-200XXX45R | ±0.5mm | ±0.5mm | ±0.5mm |
| F30-201XXX45R | ±0.8mm | ±0.8mm | ±0.5mm |

## APPENDIX 3 – CONNECTOR FEATURE IDENTIFICATION DIAGRAM