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AXON’, manufacturer of cables and interconnect solutions for advanced technologies, offers a complete range of Flat Cables and Assemblies:

- FFC-Flat Flexible Cables AXOJUMP®.
- Flat Cables with round pins AXOSTRIP®.
- Bulk Flat Flexible Cables FLEXLINK®.
- FDC-Flat Display Connections AXOLINK®.
- Flat Display Connections for High Speed (LVDS) and Ultra High Speed (UHS) transmission FDC 100®.

From standard Flat Cables to custom designed Assemblies, AXON’ harnesses a wealth of expertise to meet challenging customer requirements.
BULK FLAT FLEXIBLE CABLES

FFC - Flat Flexible Cables: AXOJUMP®

Designed for board-to-board interconnections, AXOJUMP® standard Flat Flexible Cables are made up of flat conductors insulated with Polyester or Polyimide tapes (from 0.30 mm to 1.25 mm pitch). AXON® has developed a wide range of custom designed Flat Flexible Cables incorporating folds, shields, notches, punching, slitting and marking. The termination of Flat Flexible Cables is made either:
- with ZIF (Zero Insertion Force) / LIF (Low Insertion Force) connectors: the cables are equipped with reinforcement tape to strengthen the ends,
- by soldering.

Flat Cables with round pins: AXOSTRIP®

AXOSTRIP® - Flat Cables with round pins can be soldered or inserted to achieve board-to-board interconnections.

Bulk Flat Flexible Cables: FLEXLINK®

FLEXLINK®-Bulk Flat Flexible Cables are made with flat conductors insulated with Polyester film. They are used for any application where space reduction and flexibility are the most important criteria. The termination of Flat Bulk Cables is made with crimped contacts.

FDC - Flat Display Connections: AXOLINK®

AXOLINK®-FDC-Flat Display Connections have been designed for board to display interconnections. They consist of AXOJUMP® standard Flat Flexible Cables and connectors such as: DF-9, DF-19, Fi-SE, Fi-X at one or both ends.

Flat Display Connections for High Speed (LVDS) and Ultra High Speed (UHS) transmission: FDC 100®

A special range called FDC 100® has also been developed for connecting full HD and ultra high definition displays with LVDS (Low Voltage Differential Signaling) and V-by-One® HS protocol. This assembly consists of a 21, 31, 41 or 51 way 0.50 mm pitch shielded flat cables, terminated with connectors compatible with the board-mount FI-R connectors. Cables are compatible with ZIF Molex and FH41 Hirose connectors.
Applications

AXON’ Flat Cables and Assemblies can be used in numerous application areas:

› Automotive industry
car radios, GPS systems, switch rotary connectors, headliners, door panels.

› Medical applications

› Consumer electronics
CD and DVD players, TV, LCD displays, hi-fi systems, satellite receivers and decoders.

› Telecommunications
telephones, fax machines.

› IT equipment
notebooks, scanners, printers.

› Household equipment
glass-ceramic cooking plates, refrigerators, dishwashers.

› Military electronics
missiles, weapon systems.

› Robotic applications

› Aeronautics
LCD displays, electronic devices.

Advantages

AXON’ Flat Cables and Assemblies offer many advantages:

- Extremely small dimensions:
  low profile - narrow width - fine pitch,

- Simple and fast installation:
  time saving - cost reduction,

- Compatible with ZIF/LIF connectors,

- Excellent flexibility and flex-life,
**Production**

AXOJUMP® Flat Flexible Cables are manufactured in AXON’s production sites in Europe and Asia, using state-of-the-art manufacturing equipment. AXON’s specialises in FFC manufacturing ranging from wire drawing, plating and rolling of conductors to insulation, final cutting and shielding.

**Conductor manufacturing**

AXON manufactures its own flat conductors. The main materials used are:

- Bare copper,
- Tin alloy plated copper,
- Gold plated copper.

AXON’s expertise in conductors allows for a wide range of flat cables with different levels of flexibility.

The modern manufacturing equipment allows perfect dimensional precision, electrical resistance control and production of long continuous lengths.

**Cable insulation**

AXON insulates the conductors with laminated Polyester or Polyimide tapes.

---

**Packaging**

Each container is marked with the following:

- AXON’CABLE.
- Reference of the product.
- Batch number.
- Quantity.

---

**Storage conditions**

- Pieces packaged in original packaging.
- Temperature: -20°C to 40°C.
- Relative humidity: 70 % max.
- Storage duration:
  - 1 year max. (tin plated conductors),
  - 3 years max. (gold plated conductors).
Quality assurance

AXON’ is accredited to:

› ISO 9001,
› ISO TS 16949,
› ISO 14001,
› EN 9100,
› OHSAS 18001,
› ISO 13485.

AXON’ s continuous improvement plan called “SOLON” is based on the EFQM model (European Foundation for Quality Management).

In addition to in-line controls throughout the manufacturing area, AXON’ applies “Statistical Process Control” methods (SPC) as well as standard problem solving and continuous improvement methods. TPM (Total Productive Maintenance) is applied in order to improve productivity.

AXON’ conforms to the latest RoHS European Directives and REACH regulation. Please consult our website for the latest information: www.axon-cable.com/Customer Area/ RoHS and EU directives.

In addition, AXON’ s products have been recorded in the IMDS database (International Material Data System) since 2003, in which the make-up of product is indicated.

Design, Research, Innovation and Development

At the company’s headquarters, as well as in each country where AXON’ has a subsidiary - Germany, Great Britain, USA, Latvia, Hungary, China, Mexico, India, Brazil - engineering teams provide local technical support.

The Research and Development Department located in France concentrates on the following areas:

Metal technologies
- Metal plating of the conductors,
- Drawing - Laminating - Annealing.

Plastics technology
- Insulation - Jacketing,
- Moulding - Overmoulding.

Electronics
- EMI/EMC,
- RF and high speed data.

Interconnection technology
- Soldering,
- Welding,
- Contact crimping
- Connectors.
Connection

Connection with connectors
AXON' flat cables are designed for LIF (Low Insertion Force) or ZIF (Zero Insertion Force) connectors from most connector manufacturers.

Connection with crimped contacts
1.27 and 2.54 mm pitch FFC's can be terminated with crimped contacts or provided ready for crimping.

Connection with soldering
Reflow soldering is suited for termination of flat cables to printed circuit boards. AXON' uses a semi-automatic hot bar soldering process to manufacture FFC/PCB connections. The two parts are assembled using a thermode.

Recommended PCB configuration
- Tin thickness on the soldering pads:
  5 to 8 µm for 0.5 and 0.8 mm pitch FFC.
  10 to 15 µm for 1.00 and 2.54 mm pitch FFC.
- Tinning material: tin-copper alloy.

The hot bar soldering process

Connection with connectors
AXON' offers flat cables for connectors with a locking system. Specially punched FFC's maximise stability. Used with a robust housing, it prevents warping.

AXON' punching process is camera-driven for a very high degree of precision.
AXON' can develop specific punched shapes as required.
Shielding expertise

AXON’ offers shielded flat cables with aluminium tape. The company is able to ground one or several conductors to the shield (same voltage level and EMI performance).

To characterize the shielding of flat or round cables, AXON’ uses the “Transfer Impedance ZT” parameters, expressed in ohms/m. As this notion depends on the type of product, rather than on the application, it is better suited to accurately characterize shielding performance than the alternative notion of “shielding efficiency”, given in dB. AXON’ is equipped with comprehensive test benches to characterize transfer impedance of round and flat cables as well as terminated harnesses.

Measurement of the shield resistance

Shielding efficiency is measured on a network analyser using the microstrip method.

The connection between the cable and the coaxial cable of the network analyser is made possible with an interface PCB which links the flat cable’s ZIF connectors to the coaxial connectors.

AXON’s standard shielded FFC’s are usually used for static applications. For dynamic applications, please contact us for more details.

Shielding efficiency

This graph shows the shielding efficiency of two different cables in terms of transfer impedance. The lower the transfer impedance (ZT) the more efficient the shielding.

![Graph showing shielding efficiency](image-url)
Flex-life

The flex-life of AXON® FFC’s depends on the choice of conductor/insulation tape combination.

To meet the different requirements of flex life in dynamic applications, AXON® offers a range of FFC’s to withstand an increasing number of flex cycles.

The sample is fitted between two plates. The bottom plate slides back and forth and the top one remains still. The cycle is repeated until the first conductor breaks.

The performance of our cables are defined in the datasheets in this brochure.
Gold plated Flat Flexible Cables

AXON’ offers flat cables with a fine gold coating over nickel on the stripped ends. Gold coating guarantees the absence of tin whiskers. **Whiskers are filaments or knots which can grow from metal such as tin after several months, with the risk of producing short circuits between fine pitch conductors.** AXON’ can offer stripped gold plated flat cables in different pitches compatible with a large range of gold contact connectors.

These gold plated cables have been designed for board-to-board interconnections in miniaturised electronic products, which require fine pitch flat cables. Gold Plated stripped ends are coated with:
- nickel, 0.3µm min.
- and gold, 0.05µm min.

The nickel coating is a barrier to avoid the migration of gold into the copper. It also improves the protection of the conductors against corrosion.

Thanks to a flexible manufacturing process, AXON’ can offer different thicknesses of nickel and gold plating depending on the application.

AXON’ gold plated cables successfully withstand salt spray testing.

Custom-designed Flat Flexible Cables

AXON’ is able to offer custom-designed Flat Flexible Cables such as:
- Ultraflex,
- 2.54 mm pitches,
- Hybrid pitches,
- Special reinforcement, (easy-to-insert, colour, …).
- 300V cables,
- Black cables,
- Printed line on the cable to help for connector assembly.
- Folds,
- Specific printing on the insulation,
- Adhesive tapes for fixation.
Designed for board-to-board interconnections in electronic systems, Axojump® Flat Flexible Cables (FFC) are made up of flat tin or gold plated copper conductors insulated with Polyester or Polyimide tapes. From 0.30 mm pitch for space saving to 1.25 mm, a large variety of pitches is available to suit your needs. In addition to the standard range, AXON® has developed custom designed flat flex cables incorporating folds, shields, notches, punching, slitting or marking. Flat Flexible Cables are compatible with ZIF and LIF connectors.
0.30 mm pitch Flat Flexible Cables

General characteristics

Temperature rating: up to 105°C.
Voltage rating: up to 30V AC.

Conductor

Pitch: 0.30 mm.
Width: 0.20 ± 0.015 mm.
Conductor thickness: 0.035 mm typical value.
Max. conductor resistance: 2800 (Ω/km) at 20°C.

Conductor plating

Gold: 0.3μm Ni (mini) / 0.05μm Au.

Insulation

Polyester insulation with flame retardant adhesive.
White colour.

General drawing

Connection scheme

With ZIF connectors

- Reinforcement tape: Polyester L code.
- Blue colour.
Processing forms

Type A
Reinforcements at both ends, on the same side.

Type D
Reinforcements at both ends, on opposing side.

Dimensions

<table>
<thead>
<tr>
<th>Pitch: P (mm)</th>
<th>0.30 ± 0.03</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of conductors: N</td>
<td>11 to 51</td>
</tr>
<tr>
<td>Span: E (mm)</td>
<td>(N-1)*0.30 ± 0.03</td>
</tr>
<tr>
<td>Width: W (mm) (on connection area)</td>
<td>(N+1)*0.30 ± 0.03</td>
</tr>
<tr>
<td>Margin: M (mm)</td>
<td>0.30 ± 0.05</td>
</tr>
<tr>
<td>Strip length: S1-S2 (mm)</td>
<td>4.00 ± 0.80</td>
</tr>
<tr>
<td>Reinforcement length: F1-F2 (mm)</td>
<td>8.00 ± 2.00</td>
</tr>
<tr>
<td>Insulated length: L (mm)</td>
<td>42 to 60 ± 2, 61 to 100 ± 3, 101 to 200 ± 4, 201 to 500 ± 5</td>
</tr>
<tr>
<td>Thickness at end of cable: T (mm)</td>
<td>0.20 ± 0.03</td>
</tr>
<tr>
<td>Cable thickness: th (mm)</td>
<td>0.12 (typical value)</td>
</tr>
</tbody>
</table>
### Electrical properties

<table>
<thead>
<tr>
<th>Testing conditions</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dielectric Test (V AC) - Min</td>
<td>In air, during 1 minute</td>
</tr>
<tr>
<td>Current rating (A) - Max</td>
<td>FFC at 23°C Allowable temperature rise : 40°C</td>
</tr>
<tr>
<td>Insulation resistance conductor to conductor</td>
<td>DC 3.0 V at 0.1mA</td>
</tr>
<tr>
<td>Continuity test</td>
<td>Passed</td>
</tr>
<tr>
<td>Impedance cond/cond balanced method (typical value)</td>
<td>FFC without shielding at 1MHz</td>
</tr>
<tr>
<td>Capacitance cond/cond balanced method (typical value)</td>
<td>FFC without shielding at 1kHz</td>
</tr>
</tbody>
</table>

### Other properties

<table>
<thead>
<tr>
<th>Testing conditions</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat resistance</td>
<td>113°C, 168 hours</td>
</tr>
<tr>
<td>Thermal shock</td>
<td>(-55°C x 30 min → 25°C x 5 min → 85°C x 30 min → 25°C x 5 min) x 25 cycles</td>
</tr>
<tr>
<td>Cold coiling</td>
<td>-40°C, 96 hours</td>
</tr>
<tr>
<td>Wear by abrasion</td>
<td>Test following EN3475-503 Weight: 500 g Speed: 60 cycles/min Abrasion tool: Ø = 0.50 mm</td>
</tr>
<tr>
<td>Flame resistance</td>
<td>UL 758</td>
</tr>
<tr>
<td>Folding</td>
<td>The specimen is folded manually at 180°</td>
</tr>
<tr>
<td>Moisture resistance</td>
<td>60°C, 95% RH, 96 hours</td>
</tr>
</tbody>
</table>

**Flex-life Number of cycles (typical values)**

- Speed 100 cycles /min Flex-life test is performed at 23°C.
- Radius 10 mm
- 500 000
Identification code

**FFC 0.30 A 25/0200 E 4.0-4.0-08.0-08.0 E A LL/AU**

**Option:**
- Plating on conductors
  - **AU:** gold plating

**Reinforcement type (F1 & F2):**
- **L:** Polyester reinforcement

**UL compliance:**
- **A:** No compliance

**Conductor thickness:**
- **E:** (35 microns)

**Reinforcement length F2** in mm
- (8 mm standard length)

**Reinforcement length F1** in mm
- (8 mm standard length)

**Strip length S2** in mm
- (4 mm standard length)

**Strip length S1** in mm
- (4 mm standard length)

**Insulation:**
- **E**

**Insulation length L** in mm

**Number of conductors:**
- **N**

**Processing form:**
- **A** or **D**

**Pitch P** in mm

**Flat Flexible Cable**
0.50, 1.00 and 1.25 mm pitch Flat Flexible Cables
100 micron conductors

General characteristics

Temperature rating: up to 105°C.
Voltage rating: up to 60V AC.

Conductor

<table>
<thead>
<tr>
<th>Pitch (mm)</th>
<th>Width (mm)</th>
<th>Max conductor resistance (Ω/km) at 20°C</th>
<th>Conductor thickness (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.50</td>
<td>0.30 ± 0.02</td>
<td>730</td>
<td>0.10 ± 0.015</td>
</tr>
<tr>
<td>1.00</td>
<td>0.70 ± 0.03</td>
<td>300</td>
<td>0.10 ± 0.015</td>
</tr>
<tr>
<td>1.25</td>
<td>0.80 ± 0.03</td>
<td>290</td>
<td>0.10 ± 0.015</td>
</tr>
</tbody>
</table>

Conductor plating

<table>
<thead>
<tr>
<th></th>
<th>2 µm mini</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tin (with silver)</td>
<td>2 µm mini</td>
</tr>
<tr>
<td>Gold</td>
<td>0.3µm Ni mini / 0.05µm Au</td>
</tr>
</tbody>
</table>

Insulation

Polyester insulation with flame retardant adhesive.
White colour.

Connection schemes

With ZIF connectors

Reinforcement tape: Polyester K code.
Blue colour.

Manual soldering

Code for the end: T.
F1 ; F2 = 2.50 mm.

Hot bar soldering

Reinforcement tape: Polyimide H code.
Natural colour (amber).
General drawing

Processing forms

Type A
Reinforcements at both ends, on the same side.

Type D
Reinforcements at both ends, on opposing side.

Dimensions

<table>
<thead>
<tr>
<th>Pitch: P (mm)</th>
<th>0.50 ± 0.05</th>
<th>1.00 ± 0.08</th>
<th>1.25 ± 0.10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of conductors: N</td>
<td>6 to 80</td>
<td>4 to 60</td>
<td>4 to 60</td>
</tr>
<tr>
<td>Span: E (mm)</td>
<td>(N-1)*0.50 ± 0.10</td>
<td>(N-1)*1.00 ± 0.15</td>
<td>(N-1)*1.25 ± 0.15</td>
</tr>
<tr>
<td>Width: W (mm)</td>
<td>(N+1)*0.50 ± 0.06</td>
<td>(N+1)*1.00 ± 0.10</td>
<td>(N+1)*1.25 ± 0.15</td>
</tr>
<tr>
<td>Margin: M (mm)</td>
<td>0.50 + 0.15/-0.096</td>
<td>1.00 ± 0.20</td>
<td>1.25 ± 0.20</td>
</tr>
<tr>
<td>Strip length: S1-S2 (mm)</td>
<td>2.00 to 10.0 ± 0.80 (standard value: 4 mm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reinforcement length: F1-F2 (mm)</td>
<td>6.00 to 20.0 ± 2.00 (standard value: 8 mm)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Insulated length: L (mm) | 20 to 60 ± 2
61 to 100 ± 3
101 to 200 ± 4 | 201 to 3999 ± 5
4000 to 5999 ± 10
6000 to 9999 ± 15 |
| Thickness at end of cable: T (mm) | 0.30 ± 0.05 (only for ZIF connectors) |
| Cable thickness: th (mm) | 0.25 typical |
### Electrical properties

<table>
<thead>
<tr>
<th>Testing conditions</th>
<th>Pitch</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dielectric Test (V AC) - Min</strong></td>
<td>0.50</td>
</tr>
<tr>
<td>In air, during 1 minute (MIL-STD-202 Method 301)</td>
<td>200</td>
</tr>
<tr>
<td><strong>Current rating (A) - Max</strong></td>
<td></td>
</tr>
<tr>
<td>FFC at 23°C Allowable temperature rise: 40°C</td>
<td></td>
</tr>
<tr>
<td><strong>Insulation resistance conductor to conductor (MΩ/m min)</strong></td>
<td></td>
</tr>
<tr>
<td>MIL-STD-202F Method 302 cond. B</td>
<td></td>
</tr>
<tr>
<td><strong>Continuity test</strong></td>
<td></td>
</tr>
<tr>
<td>DC 3.0 V at 0.1mA</td>
<td></td>
</tr>
<tr>
<td><strong>Impedance cond/cond balanced method (typical value)</strong></td>
<td>130Ω</td>
</tr>
<tr>
<td>FFC without shielding at 1MHz</td>
<td></td>
</tr>
<tr>
<td><strong>Capacitance cond/cond balanced method (typical value)</strong></td>
<td>62 pF/m</td>
</tr>
<tr>
<td>FFC without shielding at 1kHz</td>
<td></td>
</tr>
</tbody>
</table>

### Other properties

<table>
<thead>
<tr>
<th>Testing conditions</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Heat resistance</strong></td>
<td>136°C, 168 hours</td>
</tr>
<tr>
<td><strong>Thermal shock</strong></td>
<td>-55°C x 30 min → 25°C x 5 min → 85°C x 30 min → 25°C x 5 min</td>
</tr>
<tr>
<td><strong>Cold coil</strong></td>
<td>-40°C, 96 hours</td>
</tr>
<tr>
<td><strong>Wear by abrasion</strong></td>
<td>Test following EN3475-503</td>
</tr>
<tr>
<td><strong>Flame resistance</strong></td>
<td>UL 758</td>
</tr>
<tr>
<td><strong>Solderability (tin plated conductors)</strong></td>
<td>Immersion of the area which is intended for soldering into a tin bath at 250 ± 10°C During 30 seconds</td>
</tr>
<tr>
<td><strong>Folding</strong></td>
<td>The specimen shall be folded manually at 180°</td>
</tr>
<tr>
<td><strong>Moisture resistance</strong></td>
<td>60°C, 95% RH, 96 hours</td>
</tr>
<tr>
<td><strong>Flex-life (typical values)</strong></td>
<td>speed 100 cycles /min</td>
</tr>
</tbody>
</table>
UL compliance

With code A: the products are UL compliant.

With code B: the products are UL certified style 20706 and shipped with UL labels.

Temperature rating: 105°C; Voltage rating: 60V AC.

AXON’Cable UL file number: E45046.

Marking definition on the cable:

FFC with L> 30 mm and W> 9mm will have black printing on one side with the following text:


Special designs

Special designs available on request, such as specific shapes for connectors with locking systems.

<table>
<thead>
<tr>
<th>Pitch: P (mm)</th>
<th>0.50</th>
<th>0.50</th>
<th>0.50</th>
<th>0.50</th>
<th>1.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>FFC Drawing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Identification code

**FFC 1.00 A 25/0200 B 4.0-4.0-08.0-08.0 S A KK/AU**

### Options:
- Plating on conductors
  - tin plating
  - AU: gold plating

### Reinforcement type (F1 & F2):
- K: Polyester reinforcement
- H: Polyimide reinforcement
- T: Manual soldering

### UL compliance:
- A: Without UL marking
- B: UL certified 20706

### Conductor thickness: S
(100 microns)

### Reinforcement length F2 in mm
(8 mm standard length)

### Reinforcement length F1 in mm
(8 mm standard length)

### Strip length S2 in mm (4 mm standard length)

### Strip length S1 in mm (4 mm standard length)

### Insulation: B

### Insulation length L in mm

### Number of conductors: N

### Processing form: A or D

### Pitch P in mm

### Flat Flexible Cable

---

0.50, 1.00 and 1.25 mm pitch Flat Flexible Cables
100 micron conductors (continued)
0.50, 1.00 and 1.25 mm pitch Flat Flexible Cables
50 and 35 micron conductors

General characteristics

Temperature rating: up to 105°C.
Voltage rating: up to 60V AC.

Conductor

<table>
<thead>
<tr>
<th>Pitch (mm)</th>
<th>Width (mm)</th>
<th>Max Conductor Resistance (Ω/km) at 20°C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Flexible</td>
</tr>
<tr>
<td>0.50</td>
<td>0.30 ± 0.02</td>
<td>1460</td>
</tr>
<tr>
<td>1.00</td>
<td>0.70 ± 0.03</td>
<td>550</td>
</tr>
<tr>
<td>1.25</td>
<td>0.80 ± 0.03</td>
<td>540</td>
</tr>
<tr>
<td>Conductor thickness (typical value)</td>
<td></td>
<td>0.05 mm</td>
</tr>
</tbody>
</table>

Conductor plating

<table>
<thead>
<tr>
<th></th>
<th>2 µm min</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tin (with Silver)</td>
<td>2 µm min</td>
</tr>
<tr>
<td>Gold</td>
<td>0.3µm Ni min / 0.05µm Au</td>
</tr>
</tbody>
</table>

Insulation

Polyester insulation with flame retardant adhesive.
White colour.

Connection schemes

With ZIF connectors
Reinforcement tape: Polyester B code.
Blue colour.

Hot bar soldering
Reinforcement tape: Polymide H code.
Natural colour (amber).
### General drawing

![General drawing of flat cables](image)

### Processing forms

#### Type A

Reinforcements at both ends, on the same side.

#### Type D

Reinforcements at both ends, on opposing side.

### Dimensions

<table>
<thead>
<tr>
<th>Pitch: P (mm)</th>
<th>0.50 ± 0.05</th>
<th>1.00 ± 0.08</th>
<th>1.25 ± 0.10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of conductors: N</td>
<td>6 to 80</td>
<td>4 to 60</td>
<td>4 to 60</td>
</tr>
<tr>
<td>Span: E (mm)</td>
<td>(N-1)*0.50 ± 0.10</td>
<td>(N-1)*1.00 ± 0.15</td>
<td>(N-1)*1.25 ± 0.15</td>
</tr>
<tr>
<td>Width: W (mm)</td>
<td>(N+1)*0.50 ± 0.06</td>
<td>(N+1)*1.00 ± 0.10</td>
<td>(N+1)*1.25 ± 0.15</td>
</tr>
<tr>
<td>Margin: M (mm)</td>
<td>0.5 ±0.15/-0.096</td>
<td>1.00 ± 0.20</td>
<td>1.25 ± 0.20</td>
</tr>
<tr>
<td>Strip length: S1-S2 (mm)</td>
<td>2.00 to 10.0 ± 0.80 (standard value: 4 mm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reinforcement length: F1-F2 (mm)</td>
<td>6.00 to 20.0 ± 2.00 (standard value: 8 mm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insulated length: L (mm)</td>
<td>20 to 60 ± 2</td>
<td>201 to 3999 ± 5</td>
<td>4000 to 5999 ± 10</td>
</tr>
<tr>
<td></td>
<td>61 to 100 ± 3</td>
<td>4000 to 5999 ± 10</td>
<td>6000 to 9999 ± 15</td>
</tr>
<tr>
<td></td>
<td>101 to 200 ± 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thickness at end of cable: T (mm)</td>
<td>0.30 ± 0.05 (only for ZIF connectors)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cable thickness: th (mm)</td>
<td>Flexible: 0.14 / Extra flexible: 0.12 (typical value)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Electrical properties

<table>
<thead>
<tr>
<th>Testing conditions</th>
<th>Pitch</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dielectric Test (V AC) - Min</strong></td>
<td></td>
</tr>
<tr>
<td>In air, during 1 minute</td>
<td>200</td>
</tr>
<tr>
<td></td>
<td>400</td>
</tr>
<tr>
<td></td>
<td>500</td>
</tr>
<tr>
<td><strong>Current rating (A) - Max</strong></td>
<td></td>
</tr>
<tr>
<td>FFC at 23°C</td>
<td>0.40</td>
</tr>
<tr>
<td>Allowable temperature rise : 40°C</td>
<td>0.80</td>
</tr>
<tr>
<td></td>
<td>0.85</td>
</tr>
<tr>
<td><strong>Current rating (A) - Max</strong></td>
<td></td>
</tr>
<tr>
<td>Extra flexible conductor</td>
<td>0.35</td>
</tr>
<tr>
<td></td>
<td>0.80</td>
</tr>
<tr>
<td></td>
<td>0.80</td>
</tr>
<tr>
<td><strong>Insulation resistance conductor to conductor (MΩ m min)</strong></td>
<td></td>
</tr>
<tr>
<td>10 at DC 200V</td>
<td>Passed</td>
</tr>
<tr>
<td>10 at DC 400V</td>
<td>Passed</td>
</tr>
<tr>
<td>10 at DC 500V</td>
<td>Passed</td>
</tr>
<tr>
<td><strong>Continuity test</strong></td>
<td></td>
</tr>
<tr>
<td>DC 3.0 V at 0.1mA</td>
<td>Passed</td>
</tr>
<tr>
<td></td>
<td>Passed</td>
</tr>
<tr>
<td></td>
<td>Passed</td>
</tr>
<tr>
<td><strong>Impedance cond/cond balanced method (typical value)</strong></td>
<td></td>
</tr>
<tr>
<td>FFC without shielding at 1MHz</td>
<td>150 Ω</td>
</tr>
<tr>
<td></td>
<td>150 Ω</td>
</tr>
<tr>
<td></td>
<td>170 Ω</td>
</tr>
<tr>
<td><strong>Capacitance cond/cond balanced method (typical value)</strong></td>
<td></td>
</tr>
<tr>
<td>FFC without shielding at 1kHz</td>
<td>50 pF/m</td>
</tr>
<tr>
<td></td>
<td>40 pF/m</td>
</tr>
<tr>
<td></td>
<td>35 pF/m</td>
</tr>
</tbody>
</table>

### Other properties

<table>
<thead>
<tr>
<th>Testing conditions</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Heat resistance</strong></td>
<td></td>
</tr>
<tr>
<td>136°C, 168 hours</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Thermal shock</strong></td>
<td></td>
</tr>
<tr>
<td>(-55°C x 30 min → 25°C x 5 min → 85°C x 30 min → 25°C x 5 min) x 25 cycles</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cold cooling</strong></td>
<td></td>
</tr>
<tr>
<td>-40°C, 96 hours</td>
<td></td>
</tr>
<tr>
<td>The sample is initially wound on a mandrel of 3 mm</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Wear by abrasion</strong></td>
<td></td>
</tr>
<tr>
<td>Test following EN3475-503</td>
<td></td>
</tr>
<tr>
<td>Weight: 500 g</td>
<td></td>
</tr>
<tr>
<td>Speed: 60 cycles/min</td>
<td></td>
</tr>
<tr>
<td>Abrasion tool: Ø = 0.50 mm</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Flame resistance</strong></td>
<td></td>
</tr>
<tr>
<td>UL 758</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Solderability (tin plated conductors)</strong></td>
<td></td>
</tr>
<tr>
<td>Immersion of the area which is intended for soldering</td>
<td></td>
</tr>
<tr>
<td>into a tin bath at 250 ± 10°C during 30 seconds</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Folding</strong></td>
<td></td>
</tr>
<tr>
<td>The specimen shall be folded manually at 180°</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Moisture resistance</strong></td>
<td></td>
</tr>
<tr>
<td>60°C, 95% RH, 96 hours</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Flex-life</strong></td>
<td></td>
</tr>
<tr>
<td>Number of cycles (typical values)</td>
<td></td>
</tr>
<tr>
<td>Speed 100 cycles /min</td>
<td></td>
</tr>
<tr>
<td>Flex-life test is performed at 23°C.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Radius</strong></td>
<td></td>
</tr>
<tr>
<td>5 mm</td>
<td></td>
</tr>
<tr>
<td>10 mm</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Flexible</strong></td>
<td></td>
</tr>
<tr>
<td>20 000</td>
<td></td>
</tr>
<tr>
<td>2 500 000</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Extra flexible</strong></td>
<td></td>
</tr>
<tr>
<td>100 000</td>
<td></td>
</tr>
<tr>
<td>5 000 000</td>
<td></td>
</tr>
</tbody>
</table>
0.50, 1.00 and 1.25 mm pitch Flat Flexible Cables
50 and 35 micron conductors (continued)

UL compliance

With code A: the products are UL compliant.

With code B: the products are UL certified style 20706 and shipped with UL labels.

Temperature rating: 105°C; Voltage rating: 60V AC.

AXON’Cable UL file number: E45046.

Marking definition on the cable:

FFC with L> 30 mm and W> 9mm will have black printing on one side with the following text:


Special designs

Special designs available on request, such as specific shapes for connectors with locking systems.

<table>
<thead>
<tr>
<th>Pitch: P (mm)</th>
<th>0.50</th>
<th>0.50</th>
<th>0.50</th>
<th>0.50</th>
<th>1.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>FFC Drawing</td>
<td><img src="image" alt="FFC Drawing" /></td>
<td><img src="image" alt="FFC Drawing" /></td>
<td><img src="image" alt="FFC Drawing" /></td>
<td><img src="image" alt="FFC Drawing" /></td>
<td><img src="image" alt="FFC Drawing" /></td>
</tr>
</tbody>
</table>
## Identification code

<table>
<thead>
<tr>
<th>Code:</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FFC 1.00 A 25/0200 E 4.0-4.0-08.0-08.0 F A BB/AU</td>
<td>Identification code for the cable assembly</td>
</tr>
</tbody>
</table>

### Options:
- Plating on conductors:
  - Tin plating
  - Gold plating

### Reinforcement type (F1 & F2):
- Polyester reinforcement: B
- Polyimide reinforcement: H
- No tape (not for pitches 0.50/1.00 mm): -

### UL compliance:
- Without UL marking: A
- UL certified 20706: B

### Conductor thickness:
- Flexible (50 microns): F
- Extra flexible (35 microns): E

### Reinforcement length:
- F2: in mm (8 mm standard length)
- F1: in mm (8 mm standard length)

### Strip length:
- S2: in mm (4 mm standard length)
- S1: in mm (4 mm standard length)

### Insulation:
- E

### Insulation length:
- L: in mm

### Number of conductors:
- N

### Processing form:
- A or D

### Pitch:
- P: in mm

### Flat Flexible Cable
Shielded Flat Flexible Cables

General characteristics

Temperature rating: up to 80°C.
Voltage rating: up to 60 V AC.

Conductor

<table>
<thead>
<tr>
<th>Pitch (mm)</th>
<th>Width (mm)</th>
<th>Max Conductor Resistance (Ω/km) at 20°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.50</td>
<td>0.30 ± 0.02</td>
<td>1460</td>
</tr>
<tr>
<td>1.00</td>
<td>0.70 ± 0.03</td>
<td>550</td>
</tr>
</tbody>
</table>
Conductor thickness (Typical value) 0.05 mm

Conductor plating

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Tin (with Silver)</td>
<td>2 µm min</td>
</tr>
<tr>
<td>Gold</td>
<td>0.3µm Ni min / 0.05µm Au</td>
</tr>
</tbody>
</table>

Insulation

Polyester insulation with flame retardant adhesive.
White colour.

Shielding

Painted Shielding for 0.50 mm pitch FFC.
Aluminium tape with Polyester insulation for 1.00 mm pitch FFC.
Grey colour.

Connection scheme

With ZIF connectors

Polyester type B reinforcement tape.
Blue colour.
General drawing

Processing forms

Type A
Reinforcements at both ends, on the same side.

Type D
Reinforcements at both ends, on opposing side.

Dimensions

<table>
<thead>
<tr>
<th>Pitch: P (mm)</th>
<th>0.50 ± 0.05</th>
<th>1.00 ± 0.08</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of conductors: N</td>
<td>13 to 60</td>
<td>6 to 30</td>
</tr>
<tr>
<td>Span: E (mm)</td>
<td>(N-1)*0.50 ± 0.10</td>
<td>(N-1)*1.00 ± 0.15</td>
</tr>
<tr>
<td>Width: W (mm)</td>
<td>(N+1)*0.50 ± 0.10</td>
<td>(N+1)*1.00 ± 0.10</td>
</tr>
<tr>
<td>Margin: M (mm)</td>
<td>0.50 ±0.15/-0.096</td>
<td>1.00 ± 0.20</td>
</tr>
<tr>
<td>Strip length: S1-S2 (mm)</td>
<td>2.00 to 10.0 ± 0.80 (standard value: 4 mm)</td>
<td></td>
</tr>
<tr>
<td>Shielding position: D1-D2(mm)</td>
<td>4 ± 3</td>
<td></td>
</tr>
<tr>
<td>Reinforcement length: F1-F2 (mm)</td>
<td>6.00 to 20.0 ± 2.00 (standard value: 8 mm)</td>
<td></td>
</tr>
<tr>
<td>Insulated length: L (mm)</td>
<td>40 to 60 ± 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>61 to 100 ± 3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>101 to 200 ± 4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>201 to 1100 ± 5</td>
<td></td>
</tr>
<tr>
<td>Thickness at end of cable: T (mm)</td>
<td>0.30 ± 0.05</td>
<td></td>
</tr>
<tr>
<td>Cable thickness: th (mm)</td>
<td>0.25 (typical value)</td>
<td>0.28 (typical value)</td>
</tr>
</tbody>
</table>
**Electrical properties**

<table>
<thead>
<tr>
<th>Testing conditions</th>
<th>Pitch</th>
<th>0.50</th>
<th>1.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dielectric Test (V AC) - Min</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In air, during 1 minute (MIL-STD-202 Method 301)</td>
<td></td>
<td>200</td>
<td>400</td>
</tr>
<tr>
<td>Current rating (A) - Max FFC at 23°C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flexible conductor</td>
<td></td>
<td>0.50</td>
<td>1.00</td>
</tr>
<tr>
<td>Allowable temperature rise: 40°C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insulation resistance conductor (MΩ.m min)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continuity test</td>
<td></td>
<td>Passed</td>
<td>Passed</td>
</tr>
<tr>
<td>DC 3.0 V at 0.1mA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impedance cond/cond balanced method (typical value)</td>
<td></td>
<td>67 Ω</td>
<td>60 Ω</td>
</tr>
<tr>
<td>FFC without shielding at 1MHz</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impedance cond/shielding (typical value)</td>
<td></td>
<td>45 Ω</td>
<td>40 Ω</td>
</tr>
<tr>
<td>FFC with shielding at 1MHz</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capacitance cond/cond balanced method (typical value)</td>
<td></td>
<td>230 pF/m</td>
<td>220 pF/m</td>
</tr>
<tr>
<td>FFC without shielding at 1 KHz</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capacitance cond / shielding (typical value)</td>
<td></td>
<td>470 pF/m</td>
<td>500 pF/m</td>
</tr>
<tr>
<td>FFC with shielding at 1KHz</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Other properties**

<table>
<thead>
<tr>
<th>Testing conditions</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat resistance</td>
<td>Dielectric test Insulation resistance Passed Passed</td>
</tr>
<tr>
<td>113°C, 168 hours</td>
<td></td>
</tr>
<tr>
<td>Thermal shock</td>
<td>Dielectric test Insulation resistance Passed Passed</td>
</tr>
<tr>
<td>(-55°C x 30 min → 25°C x 5 min → 85°C x 30 min → 25°C x 5 min) x 25 cycles</td>
<td></td>
</tr>
<tr>
<td>Cold coiling</td>
<td>At room temperature: Visual inspection Dielectric test Insulation resistance Passed Passed</td>
</tr>
<tr>
<td>-40°C, 96 hours The sample is initially wound on a mandrel of 3 mm</td>
<td></td>
</tr>
<tr>
<td>Wear by Abrasion Test following EN3475-503</td>
<td>Dielectric test Insulation resistance: after 500 cycles Passed</td>
</tr>
<tr>
<td>Weight: 500 g Speed: 60 cycles/min Abrasion tool: Ø = 0.50 mm</td>
<td></td>
</tr>
<tr>
<td>Flame resistance</td>
<td>UL 758</td>
</tr>
<tr>
<td>UL 758</td>
<td>VW-1</td>
</tr>
<tr>
<td>Solderability (tin plated conductors)</td>
<td>No insulation separation Solder reflow below 1 mm Passed Passed</td>
</tr>
<tr>
<td>Immersion of the area which is intended for soldering into a tin bath at 250 ± 10°C During 30 seconds</td>
<td></td>
</tr>
<tr>
<td>Folding</td>
<td>Continuity after more than 20 times Passed</td>
</tr>
<tr>
<td>The specimen shall be folded manually at 180°</td>
<td></td>
</tr>
<tr>
<td>Moisture resistance</td>
<td>Dielectric test Insulation resistance Passed Passed</td>
</tr>
<tr>
<td>60°C, 95% RH, 96 hours</td>
<td></td>
</tr>
<tr>
<td>Flex-life Number of cycles (typical values)</td>
<td></td>
</tr>
<tr>
<td>Speed 100 cycles/min Flex-life test is performed at 23°C.</td>
<td></td>
</tr>
<tr>
<td>Radius 10 mm</td>
<td>100 000 cycles</td>
</tr>
</tbody>
</table>
UL compliance

With code A: the products are UL compliant.
With code B: the products are UL certified style 20624 and shipped with UL labels.

Temperature rating: 80°C; Voltage rating: 60V AC.

AXON’Cable UL file number: E45046.

Marking definition on the cable:

FFC with L > 30 mm and W > 9mm will have black printing on one side with the following text:

Identification code

<table>
<thead>
<tr>
<th>Identification code</th>
<th>Description</th>
</tr>
</thead>
</table>
| FFC 0.50 A 50 / 0200 C 4.0-4.0-08.0-08.0 F A BB/AU/G1-10 | Shielding:
S: Shielding without grounded  
G: Grounded shielding + n° of grounded conductor (max 4 and no adjacent conductors)

Options:
- Tin plating
- Gold plating

Reinforcement type (F1 & F2):
B: Polyester reinforcement

UL compliance:
A: Without UL marking  
B: UL certified 20624

Conductor thickness:
F: Flexible

Reinforcement length F2 in mm (8 mm standard length)

Reinforcement length F1 in mm (8 mm standard length)

Strip length S2 in mm (4 mm standard length)

Strip length S1 in mm (4 mm standard length)

Insulation:
B: (for pitch of 1mm) 
C: (for pitch of 0.5mm)

Insulation length L in mm

Number of conductors: N

Processing form: A or D

Pitch P in mm

Flat Flexible Cable
AXOSTRIP® is a flat cable with round pins which can be soldered or inserted to achieve board-to-board interconnections.

Advantages

- High flexibility,
- High resistance to vibration and bending: reliable connection joint,
- Lower production costs: wave-soldered with the other components onto the PCB in the same operation,
- Lower purchasing costs since no connectors are required for type C,
- Type B is dismountable, only one connector is needed,
- Preparation wire stripping and cutting to length is not required,
- ZIF interface if needed (when flat conductors on one end).

General characteristics

Conductor

Insulation

Polyester, Polyimide or Aramid.
Processing forms

**Type B**

Tin plated copper round conductors on one end with flat conductors on the other end.

**Type C**

Tin plated copper round conductors on both ends, straight on both sides.

**Dimensions**

<table>
<thead>
<tr>
<th>Pitch P (mm)</th>
<th>1.00</th>
<th>1.25/1.27</th>
<th>1.90</th>
<th>2.00</th>
<th>2.54</th>
<th>5.08</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. number of conductors</td>
<td>50</td>
<td>50</td>
<td>38</td>
<td>37</td>
<td>32</td>
<td>13</td>
</tr>
<tr>
<td>Insulated length (mm) L</td>
<td></td>
<td></td>
<td>15 to 999</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pin diameter (mm) Ø</td>
<td>0.32</td>
<td>0.32</td>
<td>0.40</td>
<td>0.40</td>
<td>0.51</td>
<td>0.51</td>
</tr>
<tr>
<td>Standard wire gauge (AWG)</td>
<td>28</td>
<td>28</td>
<td>26</td>
<td>26</td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>Flat conductor width (mm) C</td>
<td>0.7</td>
<td>0.8</td>
<td>1.3</td>
<td>1.3</td>
<td>1.5</td>
<td>1.5</td>
</tr>
<tr>
<td>Flat conductor thickness (mm)</td>
<td>0.115</td>
<td>0.10</td>
<td>0.10</td>
<td>0.10</td>
<td>0.12</td>
<td>0.12</td>
</tr>
<tr>
<td>Margin (mm) M</td>
<td>1.00</td>
<td>1.25/1.27</td>
<td>1.905</td>
<td>2.00</td>
<td>2.54</td>
<td>2.54</td>
</tr>
</tbody>
</table>

Other pitches and designs available on request.
Type of insulation tape

<table>
<thead>
<tr>
<th>Pitch P (mm)</th>
<th>1.00</th>
<th>1.25/1.27</th>
<th>1.90</th>
<th>2.00</th>
<th>2.54</th>
<th>5.08</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulation tape</td>
<td>Polyester 105°C</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Aramid 125°C</td>
<td></td>
<td>W</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Polyimide 125°C</td>
<td></td>
<td></td>
<td></td>
<td>Z</td>
<td></td>
</tr>
</tbody>
</table>

Electrical properties

<table>
<thead>
<tr>
<th>Pitch P (mm)</th>
<th>1.00</th>
<th>1.25/1.27</th>
<th>1.90</th>
<th>2.00</th>
<th>2.54</th>
<th>5.08</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. current rating at 20°C (A)</td>
<td>1</td>
<td>1.6</td>
<td>2.0</td>
<td>2.0</td>
<td>3.0</td>
<td>3.0</td>
</tr>
<tr>
<td>Max. voltage rating (VAC)</td>
<td>60</td>
<td>60</td>
<td>300</td>
<td>300</td>
<td>300</td>
<td>300</td>
</tr>
</tbody>
</table>

UL approval

UL certification on request.

Identification code

<table>
<thead>
<tr>
<th>RFC</th>
<th>2.54</th>
<th>B</th>
<th>10</th>
<th>/0100</th>
<th>H</th>
<th>4.0 - 3.5</th>
<th>-</th>
<th>08.0 - 00.0</th>
<th>S</th>
<th>A</th>
<th>L-</th>
</tr>
</thead>
</table>

Type of reinforcement:
- L: blue
- "": without reinforcement

Tape marking:
- A: Not marked

Conductor thickness
- Standard

Reinforcement length in mm
- Default F1=08.0 mm

Strip length in mm
- Type B default S1=4.0; S2=3.5
- Type C default S1=S2=3.5

Type of insulation tape
(see above table)

Insulated length (mm)

Number of conductors

Type of end
- B: round conductors on one end, flat conductors on the other end
- C: round conductors on both ends

Pitch

Round-to-flat Cable:
- AXOSTRIP®
Bulk Flat Flexible Cables

FLEXLINK® is a range of flat flexible cables supplied on the reel for any application where space reduction and flexibility are the most important criteria. They can be installed in printers and computers for consumer electronics, used for special machines or for board-to-board connections. Bulk flexible flat cables can also be used for the cabling of switch rotary connectors for airbag® modules. AXON’ offers standard as well as custom designed versions for switch rotary connectors.

Standard bulk Flat Cables FLEXLINK®

Advantages
- Very flexible cables,
- Space saving cabling,
- Compatible with most crimp contacts.

General characteristics
- Temperature rating:
  - Polyester insulation: -40°C to +105°C
  - Polyimide insulation: -90°C to +200°C
- Standard packaging:
  - 150 m for Polyester insulated flat cables,
  - 20 m for Polyimide insulated flat cables,
  - Bare copper or tin plated copper conductors,
  - Polarization on track 1 if required.

General drawing

Dimensions

<table>
<thead>
<tr>
<th>Conductor reference</th>
<th>S</th>
<th>M</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pitch P (mm)</td>
<td>1.27</td>
<td>2.54</td>
<td>2.54</td>
</tr>
<tr>
<td>Total width W (mm)</td>
<td>1.27 x (N+1)</td>
<td>2.54 x (N+1)</td>
<td>2.54 x (N+1)</td>
</tr>
<tr>
<td>Margin width M (mm)</td>
<td>1.27</td>
<td>2.54</td>
<td>2.54</td>
</tr>
<tr>
<td>Cable thickness T (mm) for Polyester version</td>
<td>0.28</td>
<td>0.28</td>
<td>0.28</td>
</tr>
<tr>
<td>Cable thickness T (mm) for Polyimide version</td>
<td>0.20</td>
<td>0.20</td>
<td>0.20</td>
</tr>
</tbody>
</table>
Electrical properties

### Conductor characteristics

<table>
<thead>
<tr>
<th></th>
<th>S</th>
<th>M</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current rating (A)</td>
<td>0.9 max.</td>
<td>3.0 max.</td>
<td></td>
</tr>
<tr>
<td>Voltage rating (V A.C.)</td>
<td>300 max.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insulation resistance conductor to conductor (MΩ m min)</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capacitance (typical value at 1KHz) Co (balanced, pF/m)</td>
<td>52</td>
<td>40</td>
<td>33</td>
</tr>
<tr>
<td>Capacitance (typical value at 1KHz) C0 (unbalanced, pF/m)</td>
<td>75</td>
<td>56</td>
<td>46</td>
</tr>
<tr>
<td>Impedance (typical value at 1KHz) Zb (balanced, Ω)</td>
<td>162</td>
<td>157</td>
<td>180</td>
</tr>
<tr>
<td>Impedance (typical value at 1KHz) Zo (unbalanced, Ω)</td>
<td>110</td>
<td>110</td>
<td>130</td>
</tr>
<tr>
<td>Resistance (Ω/km max) at 20°C</td>
<td>440</td>
<td>194</td>
<td>240</td>
</tr>
</tbody>
</table>

Special assemblies

**Flexlink® cable with crimped contacts**

Connector assemblies on request.

Identification code

**M 1 S P 55**

**NUMBER OF CONDUCTORS**
- For 1.27 pitch: 4 to 55
- For 2.54 pitch: 2 to 38

**CONDUCTOR MATERIAL**
- T = Tin plated
- U = Bare copper

**CONDUCTOR SIZE**
- For 1.27 pitch: S = 0.66 x 0.076
- For 2.54 pitch: L = 1.27 x 0.076
- M = 1.57 x 0.076

**PITCH**
- 1 = 1.27 mm
- 2 = 2.54 mm

**INSULATION MATERIAL**
- M = Polyester
- H = Polyimide (only available with bare copper conductors)
Custom-designed cables for switch rotary connectors

General characteristics

Conductor
Thickness: between 0.035 and 0.20 mm.
Width: between 0.80 and 10 mm.
Copper or tin plated copper.
Different conductor widths can be mixed in the same hybrid cable.

Insulation
Polyester insulation with flame retardant adhesive.

Processing forms

- Hotbar soldering
- Electrical welding
- Ultrasonic welding

Specific tests

- Flexion,
- Torsion,
- Dry heat or with humidity,
- Salt spray,
- Cassette rotation test (between -40°C/+90°C with or without humidity).

Don’t hesitate to contact us for specific requirements.
Flat Cable Assemblies

FDC-Flat Display Connections

AXOLINK®

FDC-Flat Display Connections are made from AXOJUMP® Flat Flexible Cables and industry standard display connectors such as DF-9, DF-19, FI-SE or FI-X.

Advantages

- Small dimensions: low profile, narrow width design.
- Low cost, high reliability,
- Excellent flexibility and flex-life.

General characteristics

- 0.50 mm, 1.00 mm and 1.25 mm pitches,
- Standard FFC, ZIF interface
- FDC with DF-9 cable assemblies are compliant with VESA (Video Electronics Standard Association) FPD-1 (Flat Panel Display Interface).

Product availability

<table>
<thead>
<tr>
<th>FFC type</th>
<th>DF-9**</th>
<th>DF-19*</th>
<th>FI-SE*</th>
<th>FI-X*</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.50 (mm)</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.00 (mm)</td>
<td></td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>1.25 (mm)</td>
<td></td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Number of conductors</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>x</td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>30</td>
<td></td>
<td>x</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>31</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>41</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
</tbody>
</table>

*Standard version is shielded for these connector types. Non shielded versions also available.
**Standard version is non-shielded (shielded version on request).

All versions can be supplied with custom folds.
Processing forms

DF9

Non-shielded version (FDC), Shielded version on request.

- AMF01
- BFM08
- AMM15
- CMZ22
- AMM02
- BMM09
- AFF16
- CFZ23
- AFF03
- BFF10
- BMF17
- CFZ24
- AMF04
- AMM11
- BMM18
- DMZ25
- BMM05
- AFF12
- BFF19
- DMZ26
- BFF06
- AMF13
- BMF20
- DFZ27
- BMF07
- AFM14
- CMZ21
- DFZ28

M: Header
F: Receptacle
<table>
<thead>
<tr>
<th>DF19</th>
<th>Non-shielded version (FDC), shielded version (FDB).</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMM29</td>
<td><img src="DF19_FDC_with_DF-19_Connector" alt="Image" /></td>
</tr>
<tr>
<td>FMZ31</td>
<td><img src="DF19_FDC_with_DF-19_Connector" alt="Image" /></td>
</tr>
<tr>
<td>EMM30</td>
<td><img src="DF19_FDC_with_DF-19_Connector" alt="Image" /></td>
</tr>
<tr>
<td>FMZ32</td>
<td><img src="DF19_FDC_with_DF-19_Connector" alt="Image" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FI-SE</th>
<th>Non-shielded version (FDC), shielded version (FDB).</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMM33</td>
<td><img src="FDC_with_DF-19_Connector" alt="Image" /></td>
</tr>
<tr>
<td>FMZ35</td>
<td><img src="FDC_with_DF-19_Connector" alt="Image" /></td>
</tr>
<tr>
<td>EMM34</td>
<td><img src="FDC_with_DF-19_Connector" alt="Image" /></td>
</tr>
<tr>
<td>FMZ36</td>
<td><img src="FDC_with_DF-19_Connector" alt="Image" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FI-X</th>
<th>Non-shielded version (FDC), shielded version (FDB).</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMM37</td>
<td><img src="41_Way_FDC_with_DF-9_Connector" alt="Image" /></td>
</tr>
<tr>
<td>FMZ39</td>
<td><img src="41_Way_FDC_with_DF-9_Connector" alt="Image" /></td>
</tr>
<tr>
<td>EMM38</td>
<td><img src="41_Way_FDC_with_DF-9_Connector" alt="Image" /></td>
</tr>
<tr>
<td>FMZ40</td>
<td><img src="41_Way_FDC_with_DF-9_Connector" alt="Image" /></td>
</tr>
</tbody>
</table>
Where there is a ZIF connector at one end, the standard number of ways for the ZIF will be 2 more than the DF-19/FI-SE/FI-X connector at the other end (for DF-9 versions the number of ways is equal for both connectors). If same number of ways (14, 20 or 30) is required for the ZIF on DF-19/FI-SE/FI-X versions, AXON’ can punch the ZIF end to ensure compatibility.

Off-the-shelf products

AXON’ keeps several standard lengths of Flat Flexible Cables in stock with 31 or 41 conductors for the different assembly types to assure a short delivery time. Immediately after receipt of your order, the termination process is started. Any connector configuration shown on the following pages is possible.
**Standard AXOLINK® assembly lengths**

- 76 mm  - 203 mm
- 102 mm  - 254 mm
- 152 mm

**Quick prototyping for electrical validation**

AXON® can provide small quantities of AXOLINK® prototypes for electrical validation. Dependent on the availability of cable, AXON® may propose the exact length required or a slightly different length to provide the quickest response.

**Special products**

AXON® can also provide special AXOLINK® products, in particular:

- special number of connectors
- special markings,
- any special length,
- moisture protection of the assembly,
- folded versions,
- ferrites on the assembly,
- shielding,
- shielding with grounding,
- gold plating: for DF-19/FI-SE and FI-X the gold plating available on the ZIF end.

**Processing forms**

**Connection schemes**

- **A**

- **B**

- **C**

- **D**

- **E**

- **F**

For “ZIF” ending of DF-19 / FI-SE / FI-X versions, connector ways = number of conductors + 2.
Flattened Flexible Cables and Flat Cable Assemblies

Identification code

<table>
<thead>
<tr>
<th>FDC</th>
<th>41 /</th>
<th>0100</th>
<th>A</th>
<th>M</th>
<th>M</th>
<th>02</th>
</tr>
</thead>
</table>

**Connection scheme**
1 through 40 as defined on the connection scheme.

**Connector type C2**
- M: MALE (Header) - DF-9 / DF-19 / FI-SE / FI-X
- F: FEMALE (Receptacle) - DF-9 only
- Z: ZIF

**Connector type C1**
- M: MALE (Header) - DF-9 / DF-19 / FI-SE / FI-X
- F: FEMALE (Receptacle) - DF-9 only

**Connection type**
- A: connector-connector - same face
- B: connector-connector - opposite face
- C: DF-9 to ZIF - same face
- D: DF-9 to ZIF - opposite face
- E: connector - connector (only for DF-19 / FI-SE / FI-X)
- F: connector - ZIF (only for DF-19 / FI-SE / FI-X)

**Length**
End to end length including connector (mm)
(minimum length : 52 mm)

**Number of conductors**
- 31 or 41 for DF-9
- 14, 20 or 30 for DF-19
- 20 for FI-SE
- 14, 20 or 30 for FI-X

**FDC = Non shielded version**
(DF-9, DF-19, FI-SE, FI-X connectors)

**FDB = Shielded version**
(DF-9, DF-19, FI-SE, FI-X connectors)

Any special version on request
FLAT CABLE ASSEMBLIES

Flat Display Connections for High Speed (LVDS) and Ultra High Speed (UHS) transmission: FDC 100®

FDC 100® is a 100 Ω shielded Flat Cable Assembly, designed for connecting HD and ultra high definition flat displays. The FDC 100® is the connection between the motherboard to the display on larger HD television displays (LCD LED, plasma and LCD monitors).

Advantages
- Connector with a simple connection system: no need to have an extra metal link between the PCB connector and the cable shield.
- Foldable to make installation easier.
- Small size.
- High flexibility.
- 100 Ω impedance.

General characteristics
- Made with a shielded flat cable only or a shielded flat cable connected with an innovative connector designed by AXON®.
- 21, 31, 41 and 51 way 0.50 mm pitch shielded flat cable with gold plated conductor ends, terminated with connectors compatible with the board-mount FI-R connectors.
- Compatible with ZIF Molex and FH41 Hirose connectors.

General drawing
FDC 100® - 0.50 mm pitch
Connector compatible with FI-R PCB mounted connector.

UHS cables are compatible with the V-by-One® HS protocol
FDC 100® with FI-R connectors

Dimensions

<table>
<thead>
<tr>
<th>Items</th>
<th>Materials and Finishes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>FFC</td>
</tr>
<tr>
<td>2</td>
<td>Connector – Housing</td>
</tr>
<tr>
<td>3</td>
<td>Connector – Cover</td>
</tr>
<tr>
<td>4</td>
<td>Clip</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Items Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of conductors N</td>
</tr>
<tr>
<td>Pitch P</td>
</tr>
<tr>
<td>Length L</td>
</tr>
<tr>
<td>Connector height H</td>
</tr>
<tr>
<td>Connector width G</td>
</tr>
</tbody>
</table>

Electrical properties for cable

<table>
<thead>
<tr>
<th>Properties</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact resistance</td>
<td>&lt; 40 milliohms max</td>
</tr>
<tr>
<td>Insulating resistance</td>
<td>10 Mohm.m min (200 VDC)</td>
</tr>
<tr>
<td>Dielectric withstanding voltage conductor to shield</td>
<td>200 VAC RMS (for 1 minute)</td>
</tr>
<tr>
<td>Operating voltage</td>
<td>30 VAC max.</td>
</tr>
<tr>
<td>Impedance</td>
<td>100 +/- 10 ohms</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>-40°C to +80°C</td>
</tr>
<tr>
<td>Humidity resistance</td>
<td>48H – 85°C / 95% humidity</td>
</tr>
<tr>
<td>Vibration resistance</td>
<td>OK (Acc 4g/ shock resistance 6g 10 ms)</td>
</tr>
<tr>
<td>Interconnection with FI-R connectors.</td>
<td>20 mating cycles: no change of electrical parameters.</td>
</tr>
</tbody>
</table>
Eye pattern FDC 100® UHS (for 700 mm length cables)

At 620 Mb/s (FI-R)

Without fold

With 10 folds on the cable

At 4 Gb/s (FI-R)

Without fold

With 10 folds on the cable
Eye pattern FDC 100® LVDS (for 500 mm length cables)

At 50 Mbit/s

At 500 Mbit/s

At 1000 Mbit/s
FDC 100® for ZIF connectors

Version for Molex 502231

Version for Hirose FH41

Electrical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulation resistance</td>
<td>10 Mohm.m min (200 VDC)</td>
</tr>
<tr>
<td>Impedance</td>
<td>100 +/- 10 ohms</td>
</tr>
<tr>
<td>Dielectric withstanding voltage</td>
<td>200 VAC RMS (for 1 minute)</td>
</tr>
<tr>
<td>Conduct to shield</td>
<td>200 VAC RMS (for 1 minute)</td>
</tr>
<tr>
<td>Operating voltage</td>
<td>30 VAC max</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>-40 °C to +80 °C</td>
</tr>
<tr>
<td>Humidity resistance</td>
<td>48H -85°C / 95% humidity</td>
</tr>
</tbody>
</table>

Pitch : P

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0.50</td>
<td>(N-1)*0.50 ± 0.05 mm</td>
<td>(N+1)*0.50 ± 0.07 mm</td>
<td>(N+5)*0.50 ± 0.15 mm</td>
<td>0.5 ± 0.08 mm</td>
<td>2.2 ± 0.5 mm</td>
<td>6 ± 2.0 mm</td>
<td>7 ± 1.5 mm</td>
<td>0.30 ± 0.05 mm</td>
<td>0.50 ± 0.05 mm</td>
<td>45 to 60 ± 2 mm</td>
</tr>
</tbody>
</table>
Special designs

<table>
<thead>
<tr>
<th>Pitch: P (mm)</th>
<th>0.50</th>
<th>0.50</th>
<th>0.50</th>
<th>0.50</th>
</tr>
</thead>
<tbody>
<tr>
<td>FFC Drawing</td>
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Identification code

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<th>FDC100</th>
<th>41</th>
<th>450</th>
<th>A</th>
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<tr>
<td>LVDS: -</td>
<td>UHS: V</td>
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<td>Fi-R/Fi-R connector: A</td>
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<td>ZIF Molex 502231: B</td>
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<td>Hirose FH41: C</td>
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<td>Length (mm)</td>
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Number of conductors

Fi-R: 21, 31, 41, 51
502231: 15, 24, 33
FH41: 28, 40, 50, 68

Flat Display Cable