

# F1A-PNMNM-4M

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FSJ1-50A SureFlex® Jumper with interface types N Male and N Male, 4 m



## Product Classification

|                       |                    |
|-----------------------|--------------------|
| <b>Product Type</b>   | SureFlex® standard |
| <b>Product Series</b> | FSJ1-50A           |

## General Specifications

|   |          |
|---|----------|
| <b>Body Style, Connector A</b>            | Straight |
| <b>Body Style, Connector B</b>            | Straight |
| <b>Interface, Connector A</b>             | N Male   |
| <b>Interface, Connector B</b>             | N Male   |
| <b>Specification Sheet Revision Level</b> | A        |

## Dimensions

|                     |                 |
|---------------------|-----------------|
| <b>Length</b>       | 4 m   13.123 ft |
| <b>Nominal Size</b> | 1/4 in          |

## VSWR/Return Loss

| Frequency Band | VSWR  | Return Loss (dB) |
|----------------|-------|------------------|
| 700–3000 MHz   | 1.222 | 20.01            |

## Jumper Assembly Sample Label

# F1A-PNMNM-4M



## Environmental Specifications

### Immersion Test Method

Meets IEC 60529:2001, IP68 in mated condition

## Included Products

- F1TNM-LS - Type N Male for 1/4 in foam and air coaxial cable, factory attached
- FSJ1-50A - FSJ1-50A, HELIAX® Superflexible Low Density Foam Coaxial Cable, corrugated copper, 1/4 in, black PE jacket

# F1TNM-LS

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Type N Male for 1/4 in foam and air coaxial cable, factory attached

## Product Classification

|                      |                                  |
|----------------------|----------------------------------|
| <b>Product Type</b>  | Wireless and radiating connector |
| <b>Product Brand</b> | HELIAX®   SureFlex®              |

## General Specifications

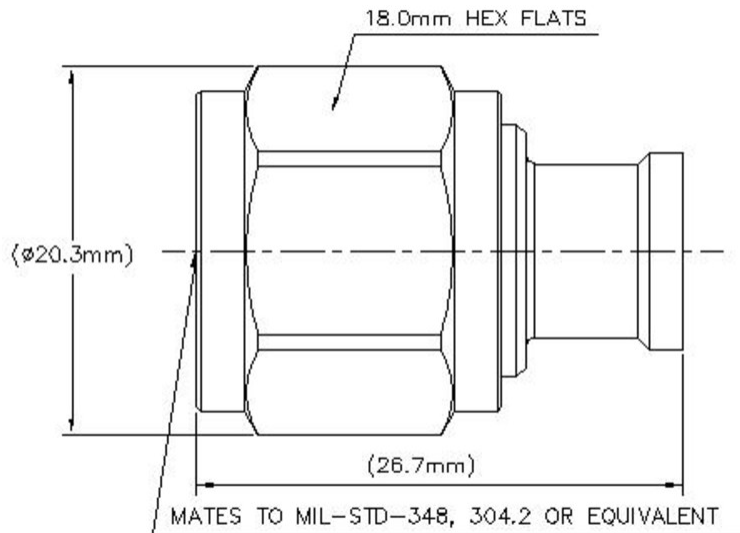
|  |          |
|--|----------|
| <b>Body Style</b>                      | Straight |
| <b>Inner Contact Attachment Method</b> | Solder   |
| <b>Inner Contact Plating</b>           | Silver   |
| <b>Interface</b>                       | N Male   |
| <b>Outer Contact Attachment Method</b> | Solder   |
| <b>Outer Contact Plating</b>           | Trimetal |
| <b>Pressurizable</b>                   | No       |

## Dimensions

|                     |                    |
|---------------------|--------------------|
| <b>Length</b>       | 26.67 mm   1.05 in |
| <b>Diameter</b>     | 20.32 mm   0.8 in  |
| <b>Nominal Size</b> | 1/4 in             |

# F1TNM-LS

## Outline Drawing



## Electrical Specifications

|   |                    |
|---|--------------------|
| <b>3rd Order IMD at Frequency</b>           | -110 dBm @ 910 MHz |
| <b>Insertion Loss, typical</b>              | 0.05 dB            |
| <b>Average Power at Frequency</b>           | 0.4 kW @ 900 MHz   |
| <b>Cable Impedance</b>                      | 50 ohm             |
| <b>Connector Impedance</b>                  | 50 ohm             |
| <b>dc Test Voltage</b>                      | 1600 V             |
| <b>Inner Contact Resistance, maximum</b>    | 1 mOhm             |
| <b>Insulation Resistance, minimum</b>       | 5000 MOhm          |
| <b>Operating Frequency Band</b>             | 0 – 6000 MHz       |
| <b>Outer Contact Resistance, maximum</b>    | 0.25 mOhm          |
| <b>Peak Power, maximum</b>                  | 6.4 kW             |
| <b>RF Operating Voltage, maximum (vrms)</b> | 565 V              |
| <b>Shielding Effectiveness</b>              | -110 dB            |

## VSWR/Return Loss

| <b>Frequency Band</b> | <b>VSWR</b> | <b>Return Loss (dB)</b> |
|-----------------------|-------------|-------------------------|
| <b>0–960 MHz</b>      | 1.036       | 35.05                   |

# F1TNM-LS

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|                      |       |       |
|----------------------|-------|-------|
| <b>1710–2200 MHz</b> | 1.046 | 32.96 |
| <b>2200–2700 MHz</b> | 1.065 | 30.04 |
| <b>2700–3000 MHz</b> | 1.065 | 30.04 |
| <b>3000–6000 MHz</b> | 1.152 | 23.02 |

## Mechanical Specifications

|  |                        |
|--|------------------------|
| <b>Connector Retention Tensile Force</b>   | 667.23 N   150 lbf     |
| <b>Connector Retention Torque</b>          | 1.1 N-m   9.736 in lb  |
| <b>Coupling Nut Proof Torque</b>           | 1.7 N-m   15.046 in lb |
| <b>Coupling Nut Proof Torque Method</b>    | IEC 61169-16:9.3.11    |
| <b>Coupling Nut Retention Force</b>        | 445 N   100.04 lbf     |
| <b>Coupling Nut Retention Force Method</b> | IEC 61169-15:9.3.11    |
| <b>Insertion Force</b>                     | 27.98 N   6.29 lbf     |
| <b>Insertion Force Method</b>              | IEC 61169-15:9.3.5     |
| <b>Interface Durability</b>                | 500 cycles             |
| <b>Interface Durability Method</b>         | IEC 61169-4:17         |
| <b>Mechanical Shock Test Method</b>        | IEC 60068-2-27         |

## Environmental Specifications

|   |                                       |
|---|---------------------------------------|
| <b>Operating Temperature</b>                      | -55 °C to +85 °C (-67 °F to +185 °F)  |
| <b>Storage Temperature</b>                        | -65 °C to +125 °C (-85 °F to +257 °F) |
| <b>Attenuation, Ambient Temperature</b>           | 20 °C   68 °F                         |
| <b>Average Power, Ambient Temperature</b>         | 40 °C   104 °F                        |
| <b>Average Power, Inner Conductor Temperature</b> | 100 °C   212 °F                       |
| <b>Corrosion Test Method</b>                      | IEC 60068-2-11                        |
| <b>Immersion Depth</b>                            | 1 m                                   |
| <b>Immersion Test Mating</b>                      | Mated                                 |
| <b>Immersion Test Method</b>                      | IEC 60529:2001, IP68                  |
| <b>Moisture Resistance Test Method</b>            | IEC 60068-2-3                         |
| <b>Thermal Shock Test Method</b>                  | IEC 60068-2-14                        |
| <b>Vibration Test Method</b>                      | IEC 60068-2-6                         |

## Packaging and Weights

# F1TNM-LS

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**Weight, net**

20.65 g | 0.046 lb

## Regulatory Compliance/Certifications

**Agency**

**Classification**

CHINA-ROHS

Below maximum concentration value

REACH-SVHC

Compliant as per SVHC revision on [www.commscope.com/ProductCompliance](http://www.commscope.com/ProductCompliance)

ROHS

Compliant



## \* Footnotes

**Insertion Loss, typical** 0.05√freq (GHz) (not applicable for elliptical waveguide)

**Immersion Depth** Immersion at specified depth for 24 hours

# FSJ1-50A

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FSJ1-50A, HELIAX® Superflexible Low Density Foam Coaxial Cable, corrugated copper, 1/4 in, black PE jacket

## Product Classification

|                       |                        |
|-----------------------|------------------------|
| <b>Product Type</b>   | Coaxial wireless cable |
| <b>Product Brand</b>  | HELIAX®   SureFlex®    |
| <b>Product Series</b> | FSJ1-50A   MLOC        |

## General Specifications

|                         |  |
|-------------------------|--|
| <b>Flexibility</b>      | Superflexible                                    |
| <b>Jacket Color</b>     | Black  |
| <b>Performance Note</b> | Attenuation values typical, guaranteed within 5% |

## Dimensions

|                                 |                     |
|---------------------------------|---------------------|
| <b>Diameter Over Dielectric</b> | 4.826 mm   0.19 in  |
| <b>Diameter Over Jacket</b>     | 7.366 mm   0.29 in  |
| <b>Inner Conductor OD</b>       | 1.905 mm   0.075 in |
| <b>Outer Conductor OD</b>       | 6.35 mm   0.25 in   |
| <b>Nominal Size</b>             | 1/4 in              |

## Electrical Specifications

|                                       |                                |
|---------------------------------------|--------------------------------|
| <b>Cable Impedance</b>                | 50 ohm ±1 ohm                  |
| <b>Capacitance</b>                    | 79.4 pF/m   24.201 pF/ft       |
| <b>dc Resistance, Inner Conductor</b> | 9.843 ohms/km   3 ohms/kft     |
| <b>dc Resistance, Outer Conductor</b> | 7.216 ohms/km   2.199 ohms/kft |
| <b>dc Test Voltage</b>                | 1600 V                         |
| <b>Inductance</b>                     | 0.2 µH/m   0.061 µH/ft         |
| <b>Insulation Resistance</b>          | 100000 MOhms-km                |

# FSJ1-50A

|  |               |
|--|---------------|
| <b>Jacket Spark Test Voltage (rms)</b> | 5000 V        |
| <b>Operating Frequency Band</b>        | 1 – 18000 MHz |
| <b>Peak Power</b>                      | 6.4 kW        |
| <b>Velocity</b>                        | 82 %          |

## VSWR/Return Loss

| <b>Frequency Band</b> | <b>VSWR</b> | <b>Return Loss (dB)</b> |
|-----------------------|-------------|-------------------------|
| <b>680–960 MHz</b>    | 1.201       | 20.8                    |
| <b>1700–2200 MHz</b>  | 1.201       | 20.8                    |
| <b>2200–2700 MHz</b>  | 1.433       | 15                      |

## Attenuation

| <b>Frequency (MHz)</b> | <b>Attenuation (dB/100 m)</b> | <b>Attenuation (dB/100 ft)</b> | <b>Average Power (kW)</b> |
|------------------------|-------------------------------|--------------------------------|---------------------------|
| <b>1.0</b>             | 0.577                         | 0.176                          | 6.4                       |
| <b>1.5</b>             | 0.707                         | 0.215                          | 6.4                       |
| <b>2.0</b>             | 0.816                         | 0.249                          | 6.4                       |
| <b>10.0</b>            | 1.833                         | 0.559                          | 3.99                      |
| <b>20.0</b>            | 2.6                           | 0.792                          | 2.81                      |
| <b>30.0</b>            | 3.192                         | 0.973                          | 2.29                      |
| <b>50.0</b>            | 4.136                         | 1.261                          | 1.77                      |
| <b>85.0</b>            | 5.419                         | 1.652                          | 1.35                      |
| <b>88.0</b>            | 5.516                         | 1.681                          | 1.33                      |
| <b>100.0</b>           | 5.889                         | 1.795                          | 1.24                      |
| <b>108.0</b>           | 6.125                         | 1.867                          | 1.19                      |
| <b>150.0</b>           | 7.25                          | 2.21                           | 1.01                      |
| <b>174.0</b>           | 7.825                         | 2.385                          | 0.93                      |
| <b>200.0</b>           | 8.408                         | 2.563                          | 0.87                      |
| <b>204.0</b>           | 8.495                         | 2.589                          | 0.86                      |
| <b>300.0</b>           | 10.373                        | 3.162                          | 0.71                      |
| <b>400.0</b>           | 12.051                        | 3.673                          | 0.61                      |
| <b>450.0</b>           | 12.817                        | 3.906                          | 0.57                      |
| <b>460.0</b>           | 12.965                        | 3.952                          | 0.56                      |
| <b>500.0</b>           | 13.545                        | 4.128                          | 0.54                      |
| <b>512.0</b>           | 13.715                        | 4.18                           | 0.53                      |
| <b>600.0</b>           | 14.909                        | 4.544                          | 0.49                      |



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|               |        |        |      |
|---------------|--------|--------|------|
| <b>700.0</b>  | 16.175 | 4.93   | 0.45 |
| <b>800.0</b>  | 17.362 | 5.292  | 0.42 |
| <b>824.0</b>  | 17.637 | 5.376  | 0.41 |
| <b>894.0</b>  | 18.42  | 5.614  | 0.4  |
| <b>960.0</b>  | 19.134 | 5.832  | 0.38 |
| <b>1000.0</b> | 19.556 | 5.96   | 0.37 |
| <b>1218.0</b> | 21.738 | 6.626  | 0.34 |
| <b>1250.0</b> | 22.044 | 6.719  | 0.33 |
| <b>1500.0</b> | 24.326 | 7.414  | 0.3  |
| <b>1700.0</b> | 26.038 | 7.936  | 0.28 |
| <b>1794.0</b> | 26.813 | 8.172  | 0.27 |
| <b>1800.0</b> | 26.862 | 8.187  | 0.27 |
| <b>2000.0</b> | 28.455 | 8.673  | 0.26 |
| <b>2100.0</b> | 29.227 | 8.908  | 0.25 |
| <b>2200.0</b> | 29.984 | 9.139  | 0.24 |
| <b>2300.0</b> | 30.727 | 9.365  | 0.24 |
| <b>2500.0</b> | 32.174 | 9.806  | 0.23 |
| <b>2700.0</b> | 33.576 | 10.233 | 0.22 |
| <b>3000.0</b> | 35.602 | 10.851 | 0.21 |
| <b>3400.0</b> | 38.183 | 11.638 | 0.19 |
| <b>3600.0</b> | 39.428 | 12.017 | 0.19 |
| <b>3700.0</b> | 40.041 | 12.204 | 0.18 |
| <b>3800.0</b> | 40.647 | 12.389 | 0.18 |
| <b>3900.0</b> | 41.247 | 12.571 | 0.18 |
| <b>4000.0</b> | 41.841 | 12.753 | 0.17 |
| <b>4100.0</b> | 42.429 | 12.932 | 0.17 |
| <b>4200.0</b> | 43.012 | 13.11  | 0.17 |
| <b>4300.0</b> | 43.59  | 13.286 | 0.17 |
| <b>4400.0</b> | 44.163 | 13.46  | 0.17 |
| <b>4500.0</b> | 44.73  | 13.633 | 0.16 |
| <b>4600.0</b> | 45.293 | 13.805 | 0.16 |
| <b>4700.0</b> | 45.852 | 13.975 | 0.16 |
| <b>4800.0</b> | 46.405 | 14.144 | 0.16 |
| <b>4900.0</b> | 46.955 | 14.311 | 0.16 |
| <b>5000.0</b> | 47.5   | 14.477 | 0.15 |

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|                |         |        |      |
|----------------|---------|--------|------|
| <b>6000.0</b>  | 52.747  | 16.077 | 0.14 |
| <b>8000.0</b>  | 62.37   | 19.01  | 0.12 |
| <b>8800.0</b>  | 65.974  | 20.108 | 0.11 |
| <b>10000.0</b> | 71.173  | 21.693 | 0.1  |
| <b>12000.0</b> | 79.393  | 24.198 | 0.09 |
| <b>14000.0</b> | 87.172  | 26.569 | 0.08 |
| <b>15800.0</b> | 93.872  | 28.611 | 0.08 |
| <b>16000.0</b> | 94.601  | 28.833 | 0.08 |
| <b>18000.0</b> | 101.745 | 31.01  | 0.07 |

## Material Specifications

|                                 |                           |
|---------------------------------|---------------------------|
| <b>Dielectric Material</b>      | Foam PE                   |
| <b>Jacket Material</b>          | PE                        |
| <b>Inner Conductor Material</b> | Copper-clad aluminum wire |
| <b>Outer Conductor Material</b> | Corrugated copper         |

## Mechanical Specifications

|  |                           |
|--|---------------------------|
| <b>Minimum Bend Radius, multiple Bends</b> | 25.4 mm   1 in            |
| <b>Minimum Bend Radius, single Bend</b>    | 25.4 mm   1 in            |
| <b>Number of Bends, minimum</b>            | 15                        |
| <b>Number of Bends, typical</b>            | 20                        |
| <b>Tensile Strength</b>                    | 68 kg   149.914 lb        |
| <b>Bending Moment</b>                      | 0.7 N-m   6.196 in lb     |
| <b>Flat Plate Crush Strength</b>           | 1.8 kg/mm   100.795 lb/in |

## Environmental Specifications

|   |                                      |
|---|--------------------------------------|
| <b>Installation temperature</b>                   | -40 °C to +60 °C (-40 °F to +140 °F) |
| <b>Operating Temperature</b>                      | -55 °C to +85 °C (-67 °F to +185 °F) |
| <b>Storage Temperature</b>                        | -70 °C to +85 °C (-94 °F to +185 °F) |
| <b>Attenuation, Ambient Temperature</b>           | 68 °F   20 °C                        |
| <b>Average Power, Ambient Temperature</b>         | 104 °F   40 °C                       |
| <b>Average Power, Inner Conductor Temperature</b> | 212 °F   100 °C                      |

## Packaging and Weights

# FSJ1-50A

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**Cable weight**

0.07 kg/m | 0.047 lb/ft

## Regulatory Compliance/Certifications

**Agency****Classification**

CHINA-ROHS

Above maximum concentration value

ISO 9001:2015

Designed, manufactured and/or distributed under this quality management system

ROHS

Compliant

UL/ETL Certification

Compliant

