



Product: [2413F](#)

Category 6+ Enhanced Cable, 4 Pair, F/UTP, CMP

Product Description

Category 6+ Enhanced Premise Horizontal Cable (350MHz), 4 Pair, 23 AWG Solid Bare Copper Conductors, F/UTP - Foil Shielded, Plenum-CMP, Flamarrest® PVC-LS Jacket

Technical Specifications

Product Overview

| | |
|------------------------|--|
| Suitable Applications: | Premise Horizontal Cable, Ethernet 1000BASE-T, Ethernet 100BASE-TX, Ethernet 10BASE-T, Surveillance, PoE++, PoE+, PoE, Noisy Environments |
| Patent: | This product has one or more applicable patents. More information on patents can be found at https://www.belden.com/patents . |

Construction Details

Conductor

| Size | Stranding | Material | Number of Pairs |
|--------|-----------|------------------|-----------------|
| 23 AWG | Solid | BC - Bare Copper | 4 |

Insulation

| Material | Color Code |
|--------------------------------------|--|
| FEP - Fluorinated Ethylene Propylene | White/Blue Stripe & Blue, White/Orange Stripe & Orange, White/Green Stripe & Green, White/Brown Stripe & Brown |

Outer Shield

| Shield Type | Material | Coverage | Drainwire Type |
|-------------|-------------------------------------|----------|-------------------|
| Tape | Polyester + Bi-Laminate (Alum+Poly) | 100% | 24 AWG (Solid) TC |

Outer Jacket

| Separator | Material | Material Trade Name | Nom. Diameter | Ripcord |
|------------------------------------|--------------------------|---------------------|--------------------|---------|
| Center Member (Patented X-Spline®) | PVC - Polyvinyl Chloride | Flamarrest® | 0.285 in (7.24 mm) | No |

| | |
|-----------------------------------|--------------------|
| Overall Cable Diameter (Nominal): | 0.285 in (7.24 mm) |
|-----------------------------------|--------------------|

Electrical Characteristics

Electricals

| Max. Conductor DCR | Max. Capacitance Unbalance |
|-------------------------------|----------------------------|
| 93.8 Ohm/km (28.6 Ohm/1000ft) | 330 pF/100m |

Delay

| Frequency | Max. Delay | Max. Delay Skew | Nom. Velocity of Prop. |
|-----------|---------------|-----------------|------------------------|
| 100 MHz | 537.6 ns/100m | 45 ns/100m | 72% |

High Frequency

| Frequency [MHz] | Max. Insertion Loss (Attenuation) | Min. NEXT [dB] | Min. PSNEXT [dB] | Min. ACR [dB] | Min. PSACR [dB] | Min. ACRF (ELFEXT) [dB] | Min. PSACRF (PSELFEXT) [dB] | Min. RL (Return Loss) [dB] | Max./Min. Input Impedance (unFitted) [Ohm] | Max./Min. Fitted Impedance [Ohm] | Min. TCL [dB] | Min. ELTCTL [dB] |
|-----------------|-----------------------------------|----------------|------------------|---------------|-----------------|-------------------------|-----------------------------|----------------------------|--|----------------------------------|---------------|------------------|
| 0.772 | 1.8 dB/100m | 77.0 | 77.0 | 75.2 | 76.2 | 73.0 | 70.0 | 19.4 | 100 +/- 15 | 100 ± 15 | 40.0 | 37.2 |
| 1 | 2.0 dB/100m | 75.3 | 75.3 | 73.3 | 74.3 | 70.8 | 67.8 | 20.0 | 100 +/- 15 | 100 ± 15 | 40.0 | 35.0 |
| 4 | 3.7 dB/100m | 66.3 | 66.3 | 62.6 | 63.6 | 58.8 | 55.8 | 23.0 | 100 +/- 15 | 100 ± 15 | 40.0 | 23.0 |
| 8 | 5.2 dB/100m | 61.8 | 61.8 | 56.6 | 57.6 | 52.7 | 49.7 | 24.5 | 100 +/- 15 | 100 ± 15 | 40.0 | 16.9 |

| | | | | | | | | | | | | |
|-------|--------------|------|------|------|------|------|------|------|------------|----------|------|------|
| 10 | 5.8 dB/100m | 60.3 | 60.3 | 54.5 | 55.5 | 50.8 | 47.8 | 25.0 | 100 +/- 15 | 100 ± 15 | 40.0 | 15.0 |
| 16 | 7.4 dB/100m | 57.2 | 57.2 | 49.9 | 50.9 | 46.7 | 43.7 | 25.0 | 100 +/- 15 | 100 ± 15 | 38.0 | 10.9 |
| 20 | 8.3 dB/100m | 55.8 | 55.8 | 47.5 | 48.5 | 44.8 | 41.8 | 25.0 | 100 +/- 15 | 100 ± 15 | 37.0 | 9.0 |
| 25 | 9.3 dB/100m | 54.3 | 54.3 | 45.1 | 46.1 | 42.8 | 39.8 | 24.3 | 100 +/- 15 | 100 ± 15 | 36.0 | 7.0 |
| 31.25 | 10.4 dB/100m | 52.9 | 52.9 | 42.5 | 43.5 | 40.9 | 37.9 | 23.6 | 100 +/- 15 | 100 ± 15 | 35.1 | 5.1 |
| 62.5 | 15.0 dB/100m | 48.4 | 48.4 | 33.4 | 34.4 | 34.9 | 31.9 | 21.5 | 100 +/- 15 | 100 ± 15 | 32.0 | |
| 100 | 19.3 dB/100m | 45.3 | 45.3 | 26.0 | 27.0 | 30.8 | 27.8 | 20.1 | 100 +/- 15 | 100 ± 15 | 30.0 | |
| 155 | 24.6 dB/100m | 42.4 | 42.4 | 17.9 | 18.9 | 27.0 | 24.0 | 19.5 | 100 +/- 22 | 100 ± 15 | 28.1 | |
| 200 | 28.3 dB/100m | 40.8 | 40.8 | 12.5 | 13.5 | 24.8 | 21.8 | 18.7 | 100 +/- 22 | 100 ± 15 | 27.0 | |
| 250 | 32.1 dB/100m | 39.3 | 39.3 | 7.2 | 8.2 | 22.8 | 19.8 | 18.0 | 100 +/- 32 | 100 ± 15 | 26.0 | |
| 300 | 35.6 dB/100m | 38.1 | 36.1 | 2.5 | 1.5 | 21.3 | 18.3 | 17.5 | 100 +/- 32 | 100 ± 15 | 25.2 | |
| 350 | 38.9 dB/100m | 37.1 | 35.1 | | | 19.9 | 16.9 | 17.0 | 100 +/- 32 | 100 ± 15 | 24.6 | |
| 400 | 42.0 dB/100m | 36.3 | 34.3 | | | 18.8 | 15.8 | 16.6 | 100 +/- 32 | 100 ± 15 | 24.0 | |
| 450 | 45.0 dB/100m | 35.5 | 33.5 | | | 17.7 | 14.7 | 16.2 | 100 +/- 32 | 100 ± 15 | 23.5 | |
| 500 | 47.9 dB/100m | 34.8 | 32.8 | | | 16.8 | 13.8 | 15.9 | 100 +/- 32 | | 23.0 | |
| 550 | 50.6 dB/100m | 34.2 | 32.2 | | | 16.0 | 13.0 | 15.6 | 100 +/- 32 | | 22.6 | |

Voltage

| |
|--------------------------|
| UL Voltage Rating |
| 300 V (CMP) |

Mechanical Characteristics

Temperature

| UL Temperature | Operating | Installation | Storage |
|----------------|----------------|--------------|----------------|
| 75°C | -20°C To +75°C | 0°C To +50°C | -20°C To +75°C |

Bend Radius

| Stationary Min. | Installation Min. |
|-----------------|-------------------|
| 1.0 in (25 mm) | 2.25 in (57.2 mm) |

| | |
|--------------------|----------------|
| Max. Pull Tension: | 25 lbs (11 kg) |
| Bulk Cable Weight: | 44 lbs/1000ft |

Standards and Compliance

| | |
|---------------------------------------|---|
| Environmental Suitability: | Plenum, Indoor |
| Sustainability: | Product Lens™, Environmental Product Declaration (EPD) Available |
| Flammability / Reaction to Fire: | NFPA 262, UL 910 (Plenum), FT6, IEC 60332-1-2 |
| CPR Compliance: | CPR Euroclass: Eca; CPR UKCA Class: Eca |
| NEC / UL Compliance: | Article 800, CMP |
| CEC / C(UL) Compliance: | CMP |
| ICEA Compliance: | S-116-732 |
| IEEE Compliance: | IEEE 802.3bt Type 1, Type 2, Type 3, Type 4 |
| NEMA Compliance: | ANSI/NEMA WC-66 |
| Data Category: | Category 6 |
| TIA/EIA Compliance: | ANSI/TIA-568.2-D Category 6 |
| Third Party Performance Verification: | Category 6 |
| ISO/IEC Compliance: | ISO/IEC 11801-1, IEC 61156-5 |
| European Directive Compliance: | EU CE Mark, EU Directive 2015/863/EU (RoHS 2 amendment), REACH, EU Directive 2011/65/EU (RoHS 2), EU Directive 2012/19/EU (WEEE), REACH: 2020-01-16 |
| UK Regulation Compliance: | UKCA Mark |
| APAC Compliance: | China RoHS II (GB/T 26572-2011) |
| Non-Plenum Number: | 2412F |

Product Notes

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| Notes: | Electrical values are expected performance based on cable testing and representative performance within a typical Belden system. Values above 300 MHz are for Engineering Information Only. Shield is Bonded to Jacket Inner Wall for Electrical Stability. Print Includes Descending Footage Markings from Max. Put-Up Length to 0. |
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History

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| Update and Revision: | Revision Number: 0.531 Revision Date: 11-09-2022 |
|----------------------|--|

Part Numbers

Variants

| Item # | Color | Putup Type | Length | UPC |
|---------------|--------|-------------|----------|--------------|
| 2413F 0101000 | Black | Reel | 1,000 ft | 612825131601 |
| 2413F D15A500 | Blue | Reel-in-Box | 500 ft | 612825131519 |
| 2413F D151000 | Blue | Reel | 1,000 ft | 612825131526 |
| 2413F 0081000 | Gray | Reel | 1,000 ft | 612825131571 |
| 2413F 0051000 | Green | Reel | 1,000 ft | 612825131564 |
| 2413F 0031000 | Orange | Reel | 1,000 ft | 612825131540 |
| 2413F 0021000 | Red | Reel | 1,000 ft | 612825131533 |
| 2413F 009A500 | White | Reel-in-Box | 500 ft | 612825131588 |
| 2413F 0091000 | White | Reel | 1,000 ft | 612825131595 |
| 2413F 0041000 | Yellow | Reel | 1,000 ft | 612825131557 |

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