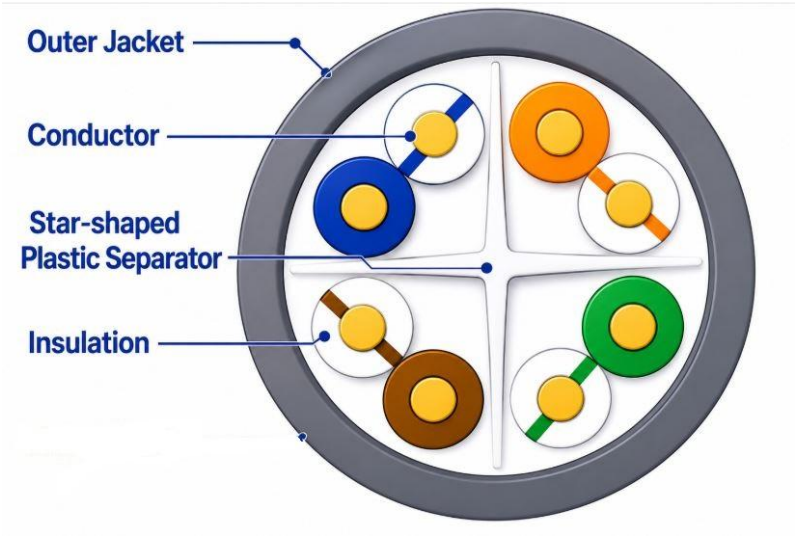
# TECHNICAL DATASHEET CAT 6 CABLE




Product code: **CAT 6 UTP CMX**

1. **General standard**

   **Comply standard UL 444 (**UL 444, Standard For Safety - Communications Cables type CMX, rated 75oC)- **Can it be checked/searched on the UL database website:** www.ul.com/database

   Designed and tested in accordance with ANSI/TIA-568.2-D, including Category 6 requirements specified in ANSI/TIA/EIA-568-B.2-1

   **- The certificate can be searched and verified on the UL website at the following address:**
   https://iq.ulprospector.com



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## 2. Detail technical Specification

| No | Description | Parameter |
|---|---|---|
| 1 | CAT6 UTP Cable Structure | Conductor<br>Insulation<br>Cross Filler / Center Spline<br>Outer Jacket<br>Outer Diameter**:** Typically ranges from 5.8 mm to 6.5 mm |
| 2 | Conductor | Made of high-purity solid bare copper conductor with a purity of ≥ 99.95%, annealed, smooth surface, circular cross-section, uniform quality, and free from any defects.<br>Conductor diameter: 0.57 mm ± 0.005 mm.<br>Number of conductors: 08 conductors twisted into 04 pairs, with each pair separated by a star-shaped plastic spline.<br>The conductors are continuously insulated with a homogeneous plastic layer and color-coded for identification |
| 3 | Outer Jacket | Made of plastic, free from cracks, and with uniform color throughout the entire cable length.<br>Jacket thickness: 0.6 mm ± 0.05 mm (thickness tolerance over the entire cable length shall not exceed ± 0.05 mm) |
| 4 | Color Code | • Pair 1: White - Blue, Blue;<br>• Pair 1: White - Blue, Blue;<br>• Pair 2: White - Orange, Orange;<br>• Pair 3: White - Green, Green;<br>• Pair 4: White - Brown, Brown.<br><br>Wherein, colored stripes are added for identification on conductors with white insulation. The other conductor in each pair shall have insulation color identical to the stripe color of the white-insulated conductor. Colored stripes on conductors with colored insulation may be present or absent |
| 5 | Breaking Tensile Strength | ≥ 110N |
| 6 | Bending radius | Minimum bending radius: 28 mm at low temperature of -20°C ± 1°C, without cracking of the outer jacket or insulation |



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| 7 | Direct Current Resistance | ≤ 9.38 Ω/100 m (for a single conductor measured at a temperature of 20°C). |
| 8 | DC resistance unbalance between two conductors of one pair, measured at a temperature of 20°C. | ≤ 3% |
| 9 | Mutual capacitance at 1 kHz of one conductor pair, measured at 20°C over a cable length of 100 m | ≤ 5,6nF/100m |
| 10 | Return Loss (RL) measured over a cable length of 100 m (worst pair) at a temperature of 20°C ± 3°C | At 1 MHz ≤ f < 10 MHz: RL ≥ 20 + 5log(f) [dB]<br>At 10 MHz ≤ f < 20 MHz: RL ≥ 25 [dB]<br>At 20 MHz ≤ f ≤ 250 MHz: RL ≥ 25 − 7log(f/20) [dB] |
| 11 | Near-End Crosstalk (NEXT) measured on a cable with a minimum length of 100 m within the frequency range from 0.772 MHz to 250 MHz | NEXT (dB) ≥ 44,3 – 15×lg(f/100) |
| 12 | Power Sum Near-End Crosstalk (PSNEXT) measured on a cable with a minimum length of 100 m within the frequency range from 0.772 MHz to 250 MHz | PSNEXT (dB) ≥ 42,3 – 15×lg(f/100) |
| 13 | Equal Level Far-End Crosstalk (ELFEXT) measured on a cable with a length of 100 m within the frequency range from 1 MHz to 250 MHz | ELFEXT (dB) ≥ 27,8 – 20×lg (f/100) |
| 14 | Power Sum Equal Level Far-End Crosstalk (PSELFEXT) measured on a cable with a minimum length of 100 m within the frequency range from 1 MHz to 250 MHz. | **PS ELFEXT (dB) ≥ 24.8 − 20 × log(f/100)**<br>Where **f** is the measurement frequency in MHz. |



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| 15 | Maximum propagation delay (D) within the frequency range from 1 MHz to 250 MHz, for a cable length of 100 m. | Shall comply with the following formula $D(ns/100m) \leq 534 + \frac{36}{\sqrt{f}}$ |
| 16 | Propagation delay skew measured at temperatures of 20°C, 40°C, and 60°C within the frequency range from 1 MHz to 250 MHz | ≤ 45 ns/100 m.<br>Wherein, the propagation delay skew between pairs measured at temperatures of 40°C and 60°C shall not exceed ±10 ns compared to the value measured at 20°C |
| 17 | Insertion Loss (IL) within the frequency range from 1 MHz to 250 MHz, measured at a temperature of 20°C ± 3°C for a cable length of 100 m | Shall comply with the following formula $IL_{100m}(dB/100m) \leq 1{,}808 \times \sqrt{f} + 0{,}017 \times f + \frac{0{,}2}{\sqrt{f}}$ |
| 18 | Characteristic Impedance | 100 Ω ± 15% within the frequency range from 1 MHz to 250 MHz |
| 19 | Dielectric Withstand Strength | **Withstand voltage:**<br>**AC:** 1.0 kV AC for 60 seconds.<br>**DC:** 1.5 kV DC for 60 seconds. |
| 20 | Operating temperature | from -10°C to +65°C |
| 21 | Flame Resistance | Flame retardancy complies with IEC 60332-1-2 |
| 22 | Service Life | ≥ 15 years |
| 23 | Cable Jacket Marking Information | Printed with indelible ink and marked longitudinally along the cable length (the identification markings shall be repeated continuously along the entire cable length at intervals not exceeding 1 m), including the following information:<br>• Manufacturer's name;<br>• Year of manufacture;<br>• Cable type;<br>• Cable standard;<br>• Meter marking. |



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| 24 | Cable Length Marking | All cable reels shall have continuous length markings at uniform intervals of 1 m, starting from "0 m" and printed continuously along the outer cable jacket throughout the entire cable length.<br><br>The length markings shall be clearly legible.<br><br>The tolerance of the length marking shall be ≤ 1%, and the actual cable length shall not be less than the marked length |
| 25 | Packaging and Standard Cable Length | Standard length: 305 m/reel (1000 ft/reel), packed in carton boxes to ensure protection against damage during transportation and handling, and to prevent cable twisting during installation and use. Both cable ends shall be sealed to prevent water ingress. Product labels shall be attached to the carton box and include the following information:<br><br>• Manufacturer's name and address;<br>• Cable type and cable length;<br>• Box serial number;<br>• Quality inspection date;<br>• Factory KSC inspection mark |
| 26 | Mechanical and Physical Test Requirements | |
| 26.1 | Breaking Tensile Strength and Elongation at Break Test for Conductors | **Test method:** according to ANSI/TIA-568.2-D.<br><br>**Requirement:** minimum breaking tensile strength of 110 N; average elongation at break E(%) ≥ 15%. |
| 26.2 | Breaking Tensile Strength and Elongation at Break Test for Conductor Insulation | **Test method:** according to ANSI/TIA-568.2-D.<br><br>**Requirement:** average breaking tensile strength ≥ 0.168 kgf/mm²; average elongation at break E(%) ≥ 300%. |
| 27 | Thermal Stability and Environmental Durability Test Requirements | |
| 27.1 | Insulation Shrinkage Test under Heating | **Test method:** according to ANSI/TIA-568.2-D.<br><br>**Requirement:** shrinkage shall not exceed 6% of the test specimen length. |
| 27.2 | Low Temperature Bending Test for Insulation | **Test method:** according to ANSI/TIA-568.2-D.<br><br>**Requirement:** the material shall be considered compliant if the insulation of the test sample shows no cracks when inspected by normal or corrected vision without magnification. |



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| 27.3 | Tensile Strength and Elongation at Break Test for Cable Jacket after Aging | **Test method:** according to ANSI/TIA-568.2-D.<br><br>**Requirement:** the jacket shall be considered compliant if the average breaking tensile strength is greater than or equal to 75% of the breaking tensile strength of the unaged cable jacket, and the average elongation at break is greater than or equal to 75% of the elongation at break of the unaged cable jacket |
| 27.4 | Measurement of conductor insulation uniformity | **Measurement method:** in accordance with ANSI/TIA-568.2-D.<br>**Requirement:** concentricity ≥ 90% |
| 28 | Cable Jacket Marking Information | Printed with indelible ink and marked longitudinally along the cable length (the identification markings shall be repeated continuously along the entire cable length at intervals not exceeding 1 m), including the following information:<br><br>• Manufacturer's name;<br>• Customer name;<br>• Cable type;<br>• Cable standard;<br>• Meter marking;<br>• Year of manufacture. |



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