**PRODUCT SPECIFICATION**

Berk-Tek
A NEXANS COMPANY

| Part No: BERK-TEK6PATFTP (26AWG) | | | DESCRIPTION: GUARDmark-6, CAT6, Patch, FTP, XXRL | Drawn by | Approved |
|---|---|---|---|---|---|
| REV | ECN | Date | Revision | FJEA | |
| A | 910 | 031705 | 8.0 | HHEL | |

**PRELIMINARY SPECIFICATION ONLY PENDING FULL QUALIFICATION PER THE DESIGN CONTROL REQUIERMENTS OF ISO 9001:2000**

**1.0 Scope:** Berk-Tek GUARDmark-6 Category 6 patch cables are intended for use in applications needing up to 250MHz of bandwidth support. Applications supported by GUARDmark-6 Patch cable include but are not limited to: 10BASE-T, 100BASE-Tx, 1000BASE-T, FDDI, and 100Mbs ATM. GUARDmark-6 Patch is suggested for use as an interconnecting cable between field cross connect and patch panel or between an outlet and user machine.

These cables are listed as C(UL)US Type CM in accordance with NEC (NFPA 70) and National Building Code of Canada.

**2.0 Construction Details**

2.1 Primary - 26 AWG stranded, 7/34 tinned copper, 0.019" nominal diameter. Polyolefin Insulation, 0.008" nominal wall, 0.035" nominal diameter.

2.2 Twisted Pair - Two insulated conductors shall be twisted together with varying lays to reduce crosstalk.

2.3 Color Code: Wht/Blu // Blu, Wht/Org // Org, Wht/Grn // Grn, and Wht/Brn // Brn.

2.4 Core - the four pairs shall be cabled together around a central filler.

2.5 Core Binder - a 0.001" nominal thickness polyester binder tape shall enclose the core.

2.6 Shield - a 0.0025" nominal thickness aluminum/polyester tape, foil in, with a 26 AWG stranded (7/34) tin plated copper drain wire.

2.7 Jacket: Flame-retardant Polyvinyl Chloride, 0.227" nominal jacket diameter, 0.021 nominal wall thickness. See Chart on last page for jacket colors & Berk-Tek P/Ns.

**3.0 Electrical Details @ 20°C [F is the frequency in MHz]:**

3.1 Minimum Structural Return Loss and Return Loss (dB):

| Frequency Range (MHz) | 1 - 10 MHz | 10 - 20 MHz | 20 - 250 MHz |
|---|---|---|---|
| Structural Return Loss (dB) - Min. | 25 | 25 | 25 – 8.6 Log(F/20) |
| Return Loss (dB) - Min. | 20 – 5 Log(F) | 25 | 25 – 8.6 Log(F/20) |

| Frequency (MHz) | 1 | 4 | 10 | 16 | 20 | 31.25 | 62.5 | 100 | 250 |
|---|---|---|---|---|---|---|---|---|---|
| SRL (dB) min. | 25.0 | | | | | 23.3 | 20.7 | 19.0 | 15.6 |
| RL (dB) min. | 20.0 | 23.0 | 25.0 | | | 23.3 | 20.7 | 19.0 | 15.6 |

3.2 Maximum Attenuation (dB/100 m):

| Maximum Attenuation (dB/100 m) from 1 to 250 MHz | $\left(1.808\sqrt{F} + 0.017F + \frac{0.2}{\sqrt{F}}\right) * 1.5$ |
|---|---|

| Frequency (MHz) | 1 | 4 | 8 | 10 | 16 | 20 | 25 | 31.25 | 62.5 | 100 | 250 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Attenuation (dB/100 m) max. | 2.8 | 5.5 | 7.9 | 8.8 | 11.3 | 12.6 | 14.2 | 16.0 | 23.0 | 29.7 | 49.3 |

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3.3 Minimum Near-end Crosstalk (NEXT) and Power Sum Near End Crosstalk (PS-NEXT) loss of pair combination (dB):

| | |
|---|---|
| Minimum NEXT (dB) from .772 MHz to 250 MHz | 76 - 15 Log (F/0.772) |
| Minimum PS-NEXT (dB) from .772 MHz to 250 MHz | 74 - 15 Log (F/0.772) |

| Frequency (MHz) | 1 | 4 | 10 | 16 | 20 | 31.25 | 62.5 | 100 | 250 |
|---|---|---|---|---|---|---|---|---|---|
| NEXT (dB) min. | 74.3 | 65.3 | 59.3 | 56.3 | 54.8 | 51.9 | 47.4 | 44.3 | 38.3 |
| PS-NEXT (dB) min. | 72.3 | 63.3 | 57.3 | 54.3 | 52.8 | 49.9 | 45.4 | 42.3 | 36.3 |

3.4 Minimum Attenuation to Power Sum Crosstalk Ratio (PS-ACR) (dB at 100 m):

| | |
|---|---|
| Minimum PS-ACR(dB) from 1 MHz to 155 MHz | $\left[74 - 15 \text{ Log } (F/0.772)\right] - \left[\left[\ 1.808\sqrt{F} + 0.017F + \frac{0.2}{\sqrt{F}}\ \right]*1.5\right]$ |

| Frequency (MHz) | 1 | 4 | 10 | 16 | 20 | 31.25 | 62.5 | 100 | 155 |
|---|---|---|---|---|---|---|---|---|---|
| PS-ACR (dB) minimum @ 100 m | 69.5 | 57.7 | 48.5 | 43.0 | 40.2 | 33.9 | 22.3 | 12.6 | 1.7 |

3.5 Minimum Equal Level Far-end Crosstalk (ELFEXT) and Power Sum Equal Level Far-end Crosstalk (PS-ELFEXT) loss of any pair combination (dB at 100 m):

| | |
|---|---|
| Minimum ELFEXT (dB) from 1 MHz to 250 MHz | 70 - 20 Log (F/0.772) |
| Minimum PS-ELFEXT (dB) from 1 MHz to 250 MHz | 67 - 20 Log (F/0.772) |

| Frequency (MHz) | 1 | 4 | 10 | 16 | 20 | 31.25 | 62.5 | 100 | 250 |
|---|---|---|---|---|---|---|---|---|---|
| ELFEXT (dB) min. | 67.8 | 55.7 | 47.8 | 43.7 | 41.7 | 37.9 | 31.8 | 27.8 | 19.8 |
| PS-ELFEXT (dB) min. | 64.8 | 52.7 | 44.8 | 40.7 | 38.7 | 34.9 | 28.8 | 24.8 | 16.8 |

3.6 Minimum Longitudinal and Transverse Conversion Loss (LCL & TCL) (dB for 100 m):

| | | |
|---|---|---|
| Frequency Range (MHz) | 1 - 10 MHz | 10 - 250 MHz |
| Minimum LCL & TCL (dB) | 40 | 40 - 10 Log (F/10) |

| Frequency (MHz) | 1 | 4 | 10 | 16 | 20 | 31.25 | 62.5 | 100 | 250 |
|---|---|---|---|---|---|---|---|---|---|
| LCL & TCL (dB) minimum | 40.0 | 40.0 | 40.0 | 38.0 | 37.0 | 35.1 | 32.0 | 30.0 | 26.0 |

3.7 Minimum Equal Level Transverse Conversion Transverse Loss (EL TCTL) (dB for 100 m):

| | |
|---|---|
| Frequency Range (MHz) | 1 - 30 MHz |
| Minimum EL TCTL (dB) | 35 - 20 Log (F) |

| Frequency (MHz) | 1 | 4 | 10 | 16 | 20 | 30 |
|---|---|---|---|---|---|---|
| EL TCTL (dB) minimum | 35.0 | 23.0 | 15.0 | 10.9 | 9.0 | 5.5 |

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3.8 Maximum Propagation Delay (ns at 100 m):

| | |
|---|---|
| Maximum Propagation Delay from 4 to 250 MHz | $534 + \frac{36}{\sqrt{F}}$ |

| Frequency (MHz) | 4 | 10 | 16 | 20 | 25 | 31.25 | 62.5 | 100 | 250 |
|---|---|---|---|---|---|---|---|---|---|
| Propagation Delay (ns) maximum | 552 | 545 | 543 | 542 | 541 | 540 | 539 | 538 | 536 |

3.9 Maximum Mutual Capacitance: 5.6 nF/100 m at 1 kHz.
3.10 Maximum Capacitance Unbalance (Pair-to-Ground) at 1 kHz: 330 pF/100 m.
3.11 Maximum Conductor DC Resistance: 14.0 Ω/100 m.
3.12 DC Resistance Unbalance of a Pair: 5% maximum.
3.13 Time Delay Skew: 45-nsec/100 m maximum
3.14 Transfer Impedance: 45mΩ/m @ 10MHz.
3.15 Coupling Attenuation: 75 dB @ 30 MHz.

**4.0 Rating:**

C(UL)US listed NEC Type CM. Meets UL 444 and C22.2 No.214-02.
Maximum operating temperature 75°C.

**5.0 Legend:**

"BERK-TEK GUARDMARK-6 FTP 26 AWG STRANDED
CM 75C C(UL)US [date code] [sequential footage number] FT"

**6.0 Finished Cable Weight:**

23 pounds per 1,000 feet nominal.

**7.0 Mechanical Details:**

Minimum Bend Radius: 3.00"

**8.0 Product List:**

| COLOR | BT P/N | DESCRIPTION |
|---|---|---|
| GRAY | 10096091 | GUARDmark-6, CAT6, Patch, FTP, GRRL |