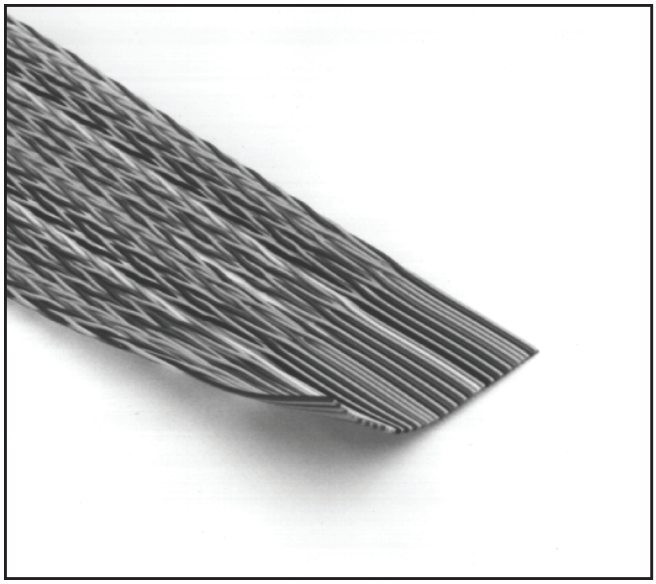
# 3M™ Twisted Pair Flat Cable

.050" 28 AWG Stranded, Mass Terminatable Pair, PVC 1700 Series



- Wires are color-coded for easy identification
- Twist and flat repeat has variable length option
- Can be mass terminated to a broad line of IDC connectors
- Provides reduced crosstalk in balanced drive applications
- 28 AWG stranded wire provides flexibility and extended product life
- 10 color repeat
- See Regulatory Information Appendix (RIA for chemical compliance information (RIA E1 & C1 apply)

Date Modified: May 4, 2009



## Physical

| | |
|---|---|
| **Insulation:** | |
| Material: | Polyvinyl Chloride (PVC) |
| Color: | 10 Color Repeat with Tan Common |
| **Marking:** | |
| Standard: | None |
| Canadian Option: | AWM 20462 105C 300V VW1 3M NU C AWM IA 80C 150V FT1 EU <50V |
| **Conductors:** | 28 AWG, 7 × 36 AWG [ 7 × ⌀ 0.127 ] Tinned Stranded Copper |

## Electrical

| | | |
|---|---|---|
| **Voltage Rating:** | USA: 300V Canada: 150V EU: <50V | |
| **Insulation Resistance:** | > 1 × $10^9$ Ω/10 ft. [ 3 m ] | |
| **Characteristic Impedance:** | **Unbalanced** 101 Ω | **Balanced** 122 Ω |
| **Capacitance:** | 15.9 pF/ft [ 52.2 pF/m ] | 13.3 pF/ft [ 43.6 pF/m ] |
| **Inductance:** | 0.16 µH/ft [ 0.53 µH/m ] | 0.20 µH/ft [ 0.66 µH/m ] |
| **Propagation Delay:** | 1.61 ns/ft [ 5.28 ns/m ] | 1.63 ns/ft [ 5.35 ns/m ] |
| **Velocity of Propagation:** | 63% | 62% |

Note: Unbalanced is measured between ground-signal-ground conductors. Balanced is measured between conductors within a pair.

## Environmental

| | | |
|---|---|---|
| **Temperature Rating:** | USA: -20°C to +105°C | Canada: -20°C to +80°C |
| **Flammability Rating:** | USA: VW-1 | Canada: FT1 |

UL File No.: E42769, Style No: 20462



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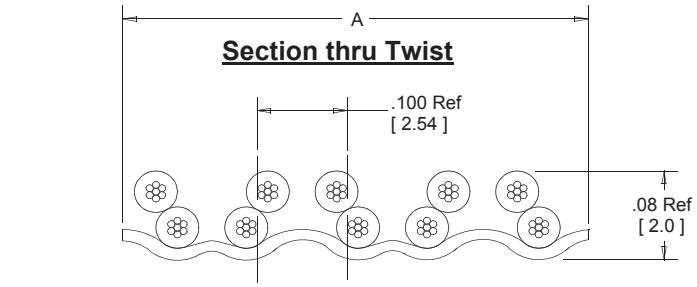
# 3M™ Twisted Pair Flat Cable

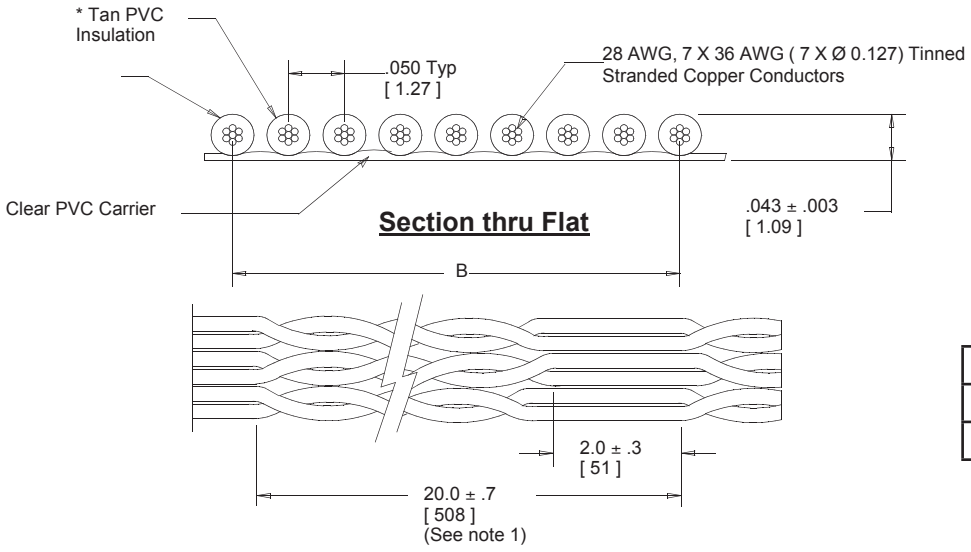
.050" 28 AWG Stranded, Mass Terminatable Pair, PVC — 1700 Series

c RU (OPTIONAL)

| Number of Conductors | 3M Part Number | Dimension A | Dimension B |
|---|---|---|---|
| 10 (5 pair) | 1700/10 | 0.50 [ 12.7 ] | 0.450 ± .010 [ 11.43 ] |
| 14 (7 pair) | 1700/14 | 0.70 [ 17.8 ] | 0.650 ± .010 [ 16.51 ] |
| 16 (8 pair) | 1700/16 | 0.80 [ 20.3 ] | 0.750 ± .015 [ 19.05 ] |
| 20 (10 pair) | 1700/20 | 1.00 [ 25.4 ] | 0.950 ± .015 [ 24.13 ] |
| 26 (13 pair) | 1700/26 | 1.30 [ 33.0 ] | 1.250 ± .015 [ 31.75 ] |
| 34 (17 pair) | 1700/34 | 1.70 [ 43.2 ] | 1.650 ± .020 [ 41.91 ] |
| 36 (18 pair) | 1700/36 | 1.80 [ 45.7 ] | 1.750 ± .020 [ 44.45 ] |
| 40 (20 pair) | 1700/40 | 2.00 [ 50.8 ] | 1.950 ± .020 [ 49.53 ] |
| 50 (25 pair) | 1700/50 | 2.50 [ 63.5 ] | 2.450 ± .020 [ 62.23 ] |
| 60 (30 pair) | 1700/60 | 3.00 [ 76.2 ] | 2.950 ± .020 [ 74.93 ] |
| 64 (32 pair) | 1700/64 | 3.20 [ 81.3 ] | 3.150 ± .020 [ 80.01 ] |

Note: Contact 3M for availability of additional conductor counts.







**Variable Flat-Repeat Length Suffix Table**
Alternative Twist and Flat Repeats

| Suffix | Repeat (in.) | Flat (in.) |
|---|---|---|
| Blank (Standard) | 20.0 | 2.0 |
| TO | 22.0 | 4.0 |
| TB | 7.5 | 1.0 |
| TD | 43.0 | 3.0 |
| BP | 9.0 | 1.5 |
| BA | 10.5 | 2.0 |
| BW | 34.0 | 2.0 |

* 10 Color Repeat
Brown/Tan
Red /Tan
Orange /Tan
Yellow /Tan
Green /Tan
Blue /Tan
Violet /Tan
Gray /Tan
White /Tan
Black /Tan

Inch
[mm]

| Tolerance Unless Noted | | | |
|---|---|---|---|
| | .0 | .00 | .000 |
| Inch | ±.1 | ±.01 | ±.005 |

[ ] Dimensions for Reference Only

## Ordering Information

**1700/XX XX XX**

- 1700/XX: Number of Conductors (See Table)
- XX: Blank = Standard; Variable Flat-Repeat Length (See Variable Flat-Repeat Length Suffix Table)
- XX: Blank = Standard; SF = Splice Free
- Blank = Standard; C = Canadian Certified Version

Note:
1. The twist-flat repeat can be specified from 8.5 inches (16.5 cm) to 48 inches (1.219 m), and the flat can be specified as anything over 1 inch (2.54 cm)
2. Available in standard 100 ft and 300 ft rolls, please specifiy when ordering. Contact 3M for availability of custom roll lengths or other special requirements.



3M
Interconnect Solutions
http://www.3M.com/interconnects/

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For technical, sales or ordering information call
800-225-5373

# Regulatory Information Appendix

## 3M Electronic Solutions Division/Interconnect

## EUROPE

## Appendix E1: European Union RoHS

Directive 2002/95/EC, Restriction of the Use of Certain Hazardous Substances in Electrical & Electronic Equipment, as amended by EU Commission Decision 2005/618/EC.

**This product is RoHS Compliant 2005/95/EC.**

"RoHS Compliant 2005/95/EC" means that the product or part ("Product") does not contain any of the substances in excess of the maximum concentration values in EU Directive 2002/95/EC, as amended by Commission Decision 2005/618/EC, unless the substance is in an application that is exempt under EU RoHS. Unless otherwise stated by 3M in writing, this information represents 3M's best knowledge and belief based upon information provided by third party suppliers to 3M.

In the event any product is proven not to conform with 3M's Regulatory Information Appendix, then 3M's entire liability and Buyer's exclusive remedy will be in accordance with the Warranty stated below.

## Appendix E2: European Union RoHS

Directive 2002/95/EC, Restriction of the Use of Certain Hazardous Substances in Electrical & Electronic Equipment, as amended by EU Commission Decision 2005/618/EC.

**This product contains lead in the compliant pin area in excess of the maximum concentration value allowed but is compliant by exemption under EU Commission Decision 2005/747/EC.**

"RoHS Compliant 2005/95/EC" means that the product or part ("Product") does not contain any of the substances in excess of the maximum concentration values in EU Directive 2002/95/EC, as amended by Commission Decision 2005/618/EC, unless the substance is in an application that is exempt under EU RoHS. Unless otherwise stated by 3M in writing, this information represents 3M's best knowledge and belief based upon information provided by third party suppliers to 3M.

In the event any product is proven not to conform with 3M's Regulatory Information Appendix, then 3M's entire liability and Buyer's exclusive remedy will be in accordance with the Warranty stated below.

## Appendix E3: European Union RoHS

Directive 2002/95/EC, Restriction of the Use of Certain Hazardous Substances in Electrical & Electronic Equipment as amended by Commission Decision 2005/618/EC.

**This product contains lead in the solder tail area in excess of the maximum concentration value allowed**.

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In the event any product is proven not to conform with 3M's Regulatory Information Appendix, then 3M's entire liability and Buyer's exclusive remedy will be in accordance with the Warranty stated below.

## Appendix E4: European Union RoHS

Directive 2002/95/EC, Restriction of the Use of Certain Hazardous Substances in Electrical & Electronic Equipment, as amended by EU Commission Decision 2005/618/EC, as amended by EU Commission Decision 2005/717/EC, as amended by EU Court of Justice Decision 2008/C 116/04

**This product contains decaBDE in the insulating material in excess of the maximum concentration allowed for finished products subject to EU RoHS that are placed on the EU market after June 30, 2008.**

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In the event any product is proven not to conform with 3M's Regulatory Information Appendix, then 3M's entire liability and Buyer's exclusive remedy will be in accordance with the Warranty stated below.

## Appendix E5: European Union RoHS

Directive 2002/95/EC, Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment, as amended by EU Commission Decision 2005/618/EC.

**This product contains lead in excess of the maximum concentration value allowed but is compliant by exemption under Item 6 of the Annex to the Directive.**

"RoHS Compliant 2005/95/EC" means that the product or part ("Product") does not contain any of the substances in excess of the maximum concentration values in EU Directive 2002/95/EC, as amended by Commission Decision 2005/618/EC, unless the substance is in an application that is exempt under EU RoHS. Unless otherwise stated by 3M in writing, this information represents 3M's best knowledge and belief based upon information provided by third party suppliers to 3M.

In the event any product is proven not to conform with 3M's Regulatory Information Appendix, then 3M's entire liability and Buyer's exclusive remedy will be in accordance with the Warranty stated below.

# CHINA

## Appendix C1: China RoHS

Electronic Industry Standard of the People's Republic of China, SJ/T11363-2006, Requirements for Concentration Limits for Certain Hazardous Substances in Electronic Information Products.
This symbol, per Marking for the Control of Pollution Caused by Electronic Information Products, SJ/T11364-2006, means that the product or part **does not** contain any of the following substances in excess of the following maximum concentration values in any homogeneous material: (a) 0.1% (by weight) for lead, mercury, hexavalent chromium, polybrominated biphenyls or polybrominated diphenyl ethers (excluding decaBDE); or (b) 0.01% (by weight) for cadmium. Unless otherwise stated by 3M in writing, this information represents 3M's best knowledge and belief based upon information provided by third party suppliers to 3M.

In the event any product is proven not to conform with 3M's Regulatory Information Appendix, then 3M's entire liability and Buyer's exclusive remedy will be in accordance with the Warranty stated below.

## Appendix C2: China RoHS

Electronic Industry Standard of the People's Republic of China, SJ/T11363-2006, Requirements for Concentration Limits for Certain Hazardous Substances in Electronic Information Products.
This symbol, per Marking for the Control of Pollution Caused by Electronic Information Products, SJ/T11364-2006, means that the product or part **does** contain a substance, as detailed in the chart below, in excess of the following maximum concentration values in any homogeneous material: (a) 0.1% (by weight) for lead, mercury, hexavalent chromium, polybrominated biphenyls or polybrominated diphenyl ethers (excluding decaBDE); or (b) 0.01% (by weight) for cadmium. Unless otherwise stated by 3M in writing, this information represents 3M's best knowledge and belief based upon information provided by third party suppliers to 3M.

The numerical reference in the symbol above should not be construed as a representation regarding the product's life or an extension of a product warranty. The product warranty is stated below. In the event any product is proven not to conform with 3M's Regulatory Information Appendix, then 3M's entire liability and Buyer's exclusive remedy will be in accordance with the product Warranty stated below.

产品中有毒有害物质或元素的名称及含量 Name and Content of Hazardous Substances or Elements

| 部件名称 (Part or Component Name) | 有毒有害物质或元素 (Hazardous Substances or Elements) | | | | | |
|---|---|---|---|---|---|---|
| | 铅(Pb) | 汞 (Hg) | 镉 (Cd) | 六价铬 (Cr(VI)) | 多溴联苯 (PBB) | 多溴二苯醚 (PBDE) |
| 端子镀层(contact plating) | × | ○ | ○ | ○ | ○ | ○ |

○：表示该有毒有害物质在该部件所有均质材料中的含量均在SJ/T11363-2006 标准规定的限量要求以下。(Indicates that this hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in SJ/T11363-2006.)
×：表示该有毒有害物质至少在该部件的某一均质材料中的含量超出SJ/T11363-2006 标准规定的限量要求。(Indicates that this hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement in SJ/T11363-2006.)

# Appendix C3: China RoHS

Electronic Industry Standard of the People's Republic of China, SJ/T11363-2006, Requirements for Concentration Limits for Certain Hazardous Substances in Electronic Information Products.

This symbol, per Marking for the Control of Pollution Caused by Electronic Information Products, SJ/T11364-2006, means that the product or part **does** contain a substance, as detailed in the chart below, in excess of the following maximum concentration values in any homogeneous material: (a) 0.1% (by weight) for lead, mercury, hexavalent chromium, polybrominated biphenyls or polybrominated diphenyl ethers (excluding decaBDE); or (b) 0.01% (by weight) for cadmium. Unless otherwise stated by 3M in writing, this information represents 3M's best knowledge and belief based upon information provided by third party suppliers to 3M.

The numerical reference in the symbol above should not be construed as a representation regarding the product's life or an extension of a product warranty. The product warranty is stated below. In the event any product is proven not to conform with 3M's Regulatory Information Appendix, then 3M's entire liability and Buyer's exclusive remedy will be in accordance with the product Warranty stated below.

产品中有毒有害物质或元素的名称及含量 Name and Content of Hazardous Substances or Elements

| 部件名称 (Part or Component Name) | 有毒有害物质或元素 (Hazardous Substances or Elements) | | | | | |
|---|---|---|---|---|---|---|
| | 铅(Pb) | 汞 (Hg) | 镉 (Cd) | 六价铬 (Cr(VI)) | 多溴联苯 (PBB) | 多溴二苯醚 (PBDE) |
| 合金(Metal alloy) | × | ○ | ○ | ○ | ○ | ○ |
| | | | | | | |

○：表示该有毒有害物质在该部件所有均质材料中的含量均在SJ/T11363-2006 标准规定的限量要求以下。(Indicates that this hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in SJ/T11363-2006.)
×：表示该有毒有害物质至少在该部件的某一均质材料中的含量超出SJ/T11363-2006 标准规定的限量要求。(Indicates that this hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement in SJ/T11363-2006.)

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This product will be free from defects in material and manufacture for a period of one (1) year from the time of purchase. **3M MAKES NO OTHER WARRANTIES INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.** If this product is defective within the warranty period stated above, your exclusive remedy shall be, at 3M's option, to replace or repair the 3M product or refund the purchase price of the 3M product. **Except where prohibited by law, 3M will not be liable for any indirect, special, incidental or consequential loss or damage arising from this 3M product, regardless of the legal theory asserted.**

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- Подбор аналогов;
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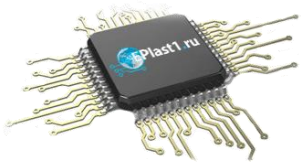


**Как с нами связаться**

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