

.050" 28 AWG STRANDED, MASS TERMINATABLE, HALOGEN FREE PO/PO

HF659/XX XX XX

- BLANK = STANDARD  
SF = SPLICE FREE

NOTE:  
AVAILABLE IN STANDARD 275FT ROLLS. CONTACT 3M  
FOR AVAILABILITY OF ADDITIONAL CONDUCTOR COUNTS  
AND/OR CUSTOM ROLL LENGTHS.

2 PHYSICAL :

MARKING: STANDARD: NONE  
CONDUCTORS: 28 AWG, 7 X 36 AWG [7 X Ø.127] TINNED STRANDED COPPER  
SHIELDING: .001 [.03] THICK ALUMINUM/POLYESTER FILM FOIL AND 90%  
COVERAGE TINNED COPPER BRAID.

2 ELECTRICAL :

|                           | UNBALANCED               | BALANCED                 |
|---------------------------|--------------------------|--------------------------|
| CHARACTERISTIC IMPEDANCE: | 54Ω                      | 107Ω                     |
| CAPACITANCE:              | 28.7 pF/ft [ 84.2 pF/m ] | 14.4 pF/ft [ 47.2 pF/m ] |
| INDUCTANCE:               | .08μH/ft [ .27μH/m ]     | .16μH/ft [ .52μH/m ]     |
| PROPAGATION DELAY:        | 1.55 ns/ft [ 4.95 ns/m ] | 1.54 ns/ft [ 4.95 ns/m ] |
| VELOCITY OF PROPAGATION:  | 66%                      | 66%                      |

NOTE: UNBALANCED IS MEASURED BETWEEN GROUND-SIGNAL-GROUND CONDUCTORS.  
BALANCED IS MEASURED BETWEEN CONDUCTORS WITHIN A PAIR.  
"MEASURED VALUES ARE TYPICAL"

## 2 ENVIRONMENTAL :

FLAMMABILITY RATING: INTERNAL: HORIZONTAL FLAME PER UL758  
EXTERNAL: CABLE FLAME (VERTICAL) PER UL758

- o INSULATION.
- o ARE THE LOW
- o LOW TOXICITY
- o (-100-2-2006),
- o HTERS AND
- o ION DAMAGE TO
- o
- o EASY ROUTING.
- o HTERS PERMITS MASS
- o IDC CONNECTORS.
- o
- o ALLOWS FOR MASS
- o RS.
- o AVERAGE SHIELDING.
- o
- o R BRANCHING OR

|    |                                                                                                                                                                                                      |
|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. | REGULATORY INFORMATION:<br>VISIT <a href="http://3M.com/regs">3M.com/regs</a> OR CONTACT<br>YOUR 3M REPRESENTATIVE TO FIND<br>THE RoHS COMPLIANCE STATUS OF<br>THE 3M PART YOU ARE INTERESTED<br>IN. |
| 2  | IN THE EVENT OF CONFLICT<br>BETWEEN THIS DATA AND THAT<br>CONTAINED IN THE PRODUCT<br>SPECIFICATION, THE PRODUCT<br>SPECIFICATION TAKES PRECEDENT.                                                   |

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|                               |     |      |       |
|-------------------------------|-----|------|-------|
| INCH [ MM ]                   |     |      |       |
| TOLERANCE - UNLESS NOTED      |     |      |       |
|                               | .X  | .XX  | .XXX  |
| [ INCH ]                      | ±.1 | ±.05 | ±.010 |
| [ ] = DIM. FOR REFERENCE ONLY |     |      |       |

## 3M™ ROUND, SHIELDED/JACKETED, FLAT CABLE, HF659 SERIES

.050" 28 AWG STRANDED, MASS TERMINATABLE, HALOGEN FREE PO/PO

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|                                        |  |                            |  |                                    |  |                                                                                                                                                                                                                       |  |              |  |            |  |
|----------------------------------------|--|----------------------------|--|------------------------------------|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------|--|------------|--|
| E                                      |  | 80157                      |  | AUG 01, 2018                       |  | JNC                                                                                                                                                                                                                   |  | BM           |  |            |  |
| D                                      |  | 79295                      |  | MAY 29, 2018                       |  | JNC                                                                                                                                                                                                                   |  | BM           |  |            |  |
|                                        |  |                            |  | REVISED AND REDRAWN                |  |                                                                                                                                                                                                                       |  |              |  |            |  |
| REV                                    |  | ECO                        |  | ISSUE DATE AND DESCRIPTION         |  |                                                                                                                                                                                                                       |  | DRFT         |  | CHKD       |  |
| CRAFT                                  |  | STAGLIONE                  |  | DATE                               |  | MFG                                                                                                                                                                                                                   |  | DATE         |  |            |  |
| CHKD                                   |  |                            |  | DATE                               |  | APPROV                                                                                                                                                                                                                |  | DATE         |  |            |  |
|                                        |  |                            |  |                                    |  | B, MIZE                                                                                                                                                                                                               |  | MAY 29, 2018 |  |            |  |
| DIVISION                               |  | DIVISION CODE              |  | © 3M COPYRIGHT 2018                |  |                                                                                                                                                                                                                       |  |              |  |            |  |
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|                                        |  | TOLERANCES EXCEPT AS NOTED |  | TITLE                              |  | ROUND, SHIELDED / JACKETED, FLAT, CABLE, .050", HF659                                                                                                                                                                 |  |              |  |            |  |
| THIRD ANGLE PROJECTION                 |  | INCHES                     |  | CAGE NUMBER                        |  | SIZE                                                                                                                                                                                                                  |  | DRAWING NO.  |  | REV.       |  |
| INTERPRET PER ASME Y14.5 - 2009        |  | MILLIMETERS                |  | D                                  |  | 78-5100-2335-7                                                                                                                                                                                                        |  | E            |  |            |  |
| MAX SURFACE ROUGHNESS                  |  | INCHES                     |  | MODEL                              |  | HF659                                                                                                                                                                                                                 |  | DET. LISTS   |  | YES X NO   |  |
| ✓ <input type="checkbox"/> MARKED ONLY |  |                            |  |                                    |  |                                                                                                                                                                                                                       |  |              |  | SHT 2 OF 2 |  |