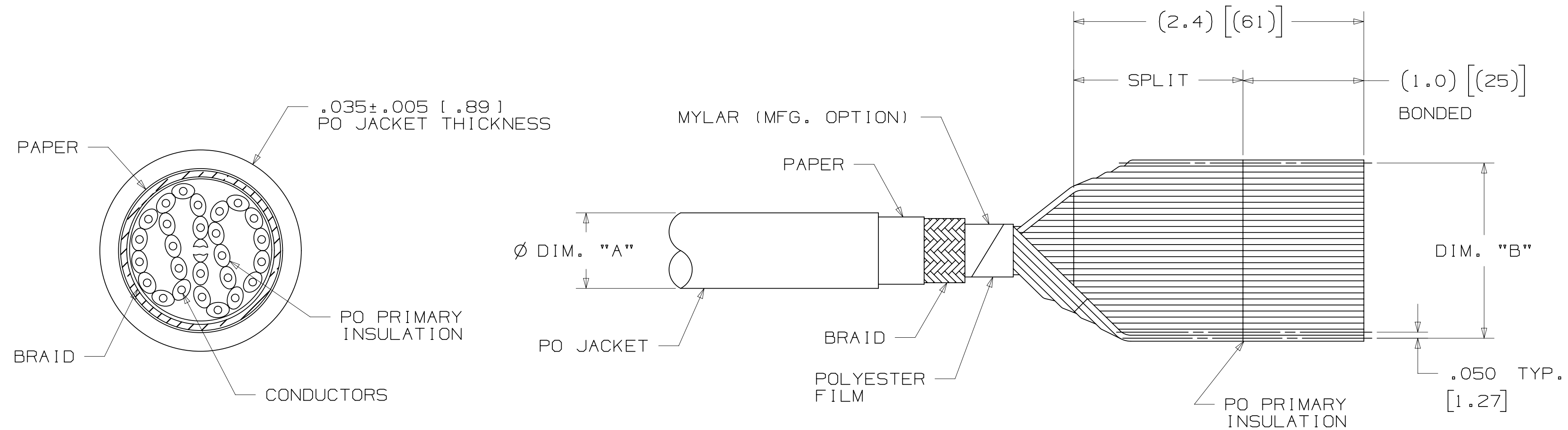


3M™ ROUND, SHIELDED/JACKETED, FLAT CABLE, HF659 SERIES

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



NOTE:
 1) BLUE MARKING ON ONE EDGE OF PRIMARY CABLE DESIGNATES WIRE #1.
 2) DIMENSION "B" PERTAINS TO BONDED AREA ONLY.

- * LOW SMOKE ZERO HALOGEN (LSZH) INSULATION. ADVANTAGES OF LSZH INSULATION ARE THE LOW SMOKE (IEC 61034-2-2005) AND LOW TOXICITY OF COMBUSTION GASES (NF X 70-100-2-2006), REDUCING THE RISK TO FIREFIGHTERS AND REDUCING THE SOOT AND CORROSION DAMAGE TO NEARBY EQUIPMENT.
- * ROUND CONSTRUCTION PERMITS MORE EASY ROUTING.
- * 28 AWG WIRE ON .050 INCH CENTERS PERMITS MASS TERMINATION TO BROAD LINE OF IDC CONNECTORS.
- * CONTINUOUS SPLIT/BOND REPEAT ALLOWS FOR MASS TERMINATIONS OF IDC CONNECTORS.
- * DUAL SHIELDING PROVIDES 35 db AVERAGE SHIELDING.
- * PRIMARY CABLE IS ZIPPABLE FOR BRANCHING OR DISCRETE TERMINATION.

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

ORDERING INFORMATION

HF659/XX XX XX

NUMBER OF CONDUCTORS (SEE TABLE 1)

BLANK = STANDARD
 SF = SPLICE FREE

BLANK = STANDARD
 SO = CONTINUOUSLY BONDED WIRE (NO SPLIT)

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

2 PHYSICAL :

JACKET MATERIAL: HALOGEN FREE POLYOLEFIN (PO)
 COLOR: DARK GRAY
 PRIMARY MATERIAL: HALOGEN FREE POLYOLEFIN (PO)
 COLOR: DARK GRAY

MARKING: NONE
 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 :

VOLTAGE RATING: USA 150V CANADIAN 150V EU: <50V
 INSULATION RESISTANCE: (PRIMARY CABLE) >1 X 10¹⁰Ω/10ft. [3m]

CHARACTERISTIC	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 :

TEMPERATURE RATING: -40°C TO +105°C (EIA-364-32G, METHOD A, TEST CONDITION 2)
 -15°C TO +75°C (UL TEMPERATURE RATING)

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

HALOGEN FREE IS DEFINED AS BOTH 1) NO HALOGEN COMPOUNDS THAT ARE INTENTIONALLY ADDED TO THE PRODUCT OR USED IN THE MANUFACTURING PROCESS FOR THE PRODUCT AND 2) ANY IMPURITIES PRESENT ARE LESS THAN 900ppm BROMINE, LESS THAN 900ppm CHLORINE AND/OR LESS THAN 1500ppm TOTAL BROMINE AND CHLORINE. THE LATTER ARE THE LEVELS SET FORTH IN CERTAIN INDUSTRY STANDARDS FOR PRINTED CIRCUIT BOARDS, SUCH AS THE INTERNATIONAL ELECTROTECHNICAL COMMISSION (IEC) 61249-2-21 STANDARDS. THIS INFORMATION REPRESENTS 3M'S KNOWLEDGE AND BELIEF WHICH MAY BE BASED IN WHOLE OR IN PART ON INFORMATION PROVIDED BY 3RD PARTY SUPPLIERS TO 3M.

NO. OF CONDUCTORS	3M PART NUMBER	DIM. "A"	DIM. "B"
09	HF659/09	.25 [6.4]	.40 [10.2]
10	HF659/10	.25 [6.4]	.45 [11.4]
14	HF659/14	.30 [7.6]	.65 [16.5]
15	HF659/15	.30 [7.6]	.70 [17.8]
16	HF659/16	.30 [7.6]	.75 [19.1]
20	HF659/20	.33 [8.4]	.95 [24.1]
24	HF659/24	.34 [8.6]	1.15 [29.2]
25	HF659/25	.34 [8.6]	1.20 [30.5]
26	HF659/26	.34 [8.6]	1.25 [31.8]
30	HF659/30	.37 [9.4]	1.45 [36.8]
34	HF659/34	.37 [9.4]	1.65 [41.9]
36	HF659/36	.41 [10.4]	1.75 [44.5]
37	HF659/37	.41 [10.4]	1.80 [45.7]
40	HF659/40	.41 [10.4]	1.95 [49.5]
50	HF659/50	.45 [11.4]	2.45 [62.2]
60	HF659/60	.48 [12.2]	2.95 [74.9]
64	HF659/64	.48 [12.2]	3.15 [80.0]

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 INTERCONNECT SOLUTIONS
<http://www.3Mconnectors.com>

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 INFORMATION CALL 800-225-5373



UL FILE NO: E42769,
 UL STYLE NO: 22170

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

DESIGN REFERENCE	NEXT ASSEMBLY	REV	ECO	ISSUE DATE AND DESCRIPTION	DRFT	CHKD
DIVISION	DIVISION CODE	DATE	DATE	DATE	DATE	DATE
	EMSD	MAY 29, 2018				
DO NOT SCALE DRAWING	SCALE	TOLERANCES EXCEPT AS NOTED				
THIRD ANGLE PROJECTION						
MAX SURFACE ROUGHNESS						

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TITLE: ROUND, SHIELDED / JACKETED, FLAT, CABLE, .050", HF659

CAGE NUMBER: D 78-5100-2335-7
 DRAWING NO. 78-5100-2335-7
 REV. E

MODEL: HF659
 DET: YES NO
 SHT 1 OF 2

78-5100-2335-7
 11/18/18
 Time 8/11/2018 11:52:14 AM
 UTC Offset (hrs) 6

8 7 6 5 4 3 2 1

3M™ ROUND, SHIELDED/JACKETED, FLAT CABLE, HF659 SERIES
 .050" 28 AWG STRANDED, MASS TERMINATABLE, HALOGEN FREE PO/PO

Regulatory: For regulatory information about this product, visit 3M.com/regs or contact your 3M representative.

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 1-800-225-5373
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DESIGN REFERENCE	NEXT ASSEMBLY	REV	ECO	ISSUE DATE AND DESCRIPTION	DRFT	CHKD
		D	79295	MAY 29, 2018 REVISED AND REDRAWN	JNC	BM
		E	80157	AUG 01, 2018 REVISED ELECTRICAL & ENVIRONMENTAL NOTES	JNC	BM
NAME CODES	DIVISION CODE	DRW	DATE	MFG	DATE	
	EMSD	CASTIGLIONE	MAY 29, 2018			
		CHKD	DATE	APPRV	DATE	
				B. MIZE	MAY 29, 2018	
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THIRD ANGLE PROJECTION	INCHES	MILLIMETERS	TITLE ROUND, SHIELDED / JACKETED, FLAT, CABLE, .050", HF659			
INTERPRET PER ASME Y14.5 - 2009	.00 ±	0 ±	CAGE NUMBER	SIZE	DRAWING NO.	REV.
MAX SURFACE ROUGHNESS	.000 ±	0 ±	D	78-5100-2335-7	E	
MARKED SURFACES	.000 ±	0 ±	MODEL	HF659	DET	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> SHT 2 OF 2
MARKED ONLY	ANGLES					

E REVISION
 78-5100-2335-7 DRAWING NUMBER
 B
 A
 Time 8/1/2018 11:53:11 AM UTC Offset (hrs) 6

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