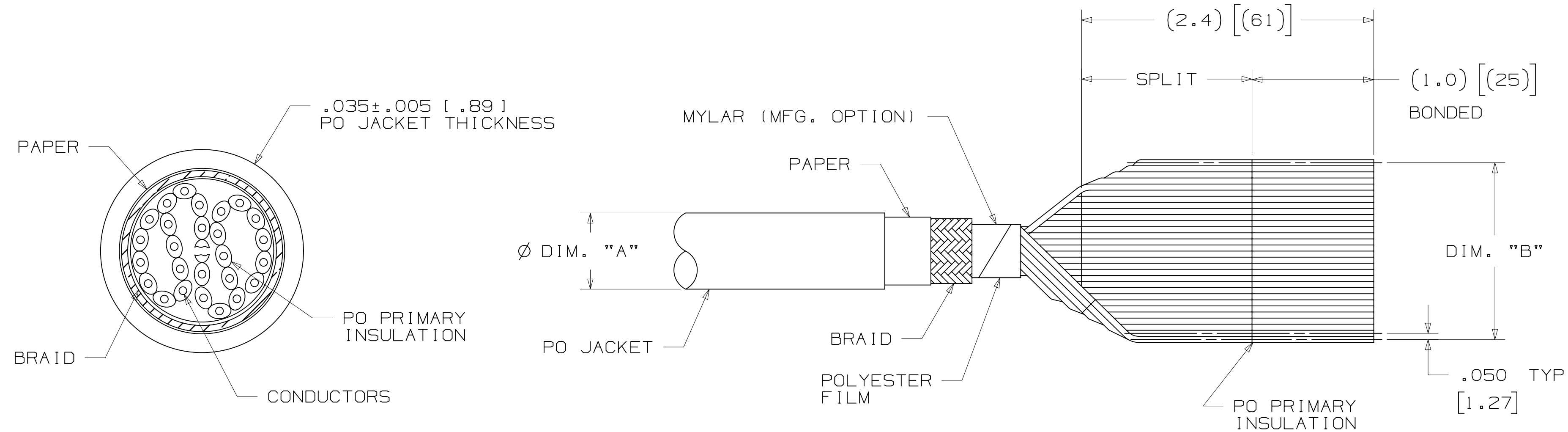


3M™ ROUND, SHIELDED/JACKETED, FLAT CABLE, HF659 SERIES
 .050" 28 AWG STRANDED, MASS TERMINATABLE, HALOGEN FREE PO/PO



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

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: 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 IMPEDANCE: UNBALANCED 54Ω BALANCED 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.

- * 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
- 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.
 - IN THE EVENT OF CONFLICT BETWEEN THIS DATA AND THAT CONTAINED IN THE PRODUCT SPECIFICATION, THE PRODUCT SPECIFICATION TAKES PRECEDENT.

TABLE 1			
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]

3M ELECTRONICS MATERIALS SOLUTIONS DIVISION
 INTERCONNECT SOLUTIONS
<http://www.3mconnectors.com>

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 FOR TECHNICAL, SALES OR ORDERING
 INFORMATION CALL 800-225-5373



UL FILE NO: E42769,
 UL STYLE NO: 22170

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

DESIGN REFERENCE	NEXT ASSEMBLY	REV	ECO	ISSUE DATE AND DESCRIPTION	DRFT	CHKD
				MAY 29, 2018	JNC	BM
DIVISION CODE			DIVISION CODE			
DO NOT SCALE DRAWING			EMSD			
THIRD ANGLE PROJECTION			TOLERANCES EXCEPT AS NOTED			
MAX SURFACE ROUGHNESS			INCHES			
LIT SURFACES			MILLIMETERS			
MARKED ONLY			0 ±			
			.00 ±			
			.000 ±			
			.0000 ±			
			0 ±			
			.00 ±			
			.000 ±			
			.000 ±			
			ANGLES			

REV	ECO	ISSUE DATE AND DESCRIPTION	DRFT	CHKD
		MAY 29, 2018	JNC	BM
REV	ECO	ISSUE DATE AND DESCRIPTION	DRFT	CHKD
		MAY 29, 2018	JNC	BM

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TITLE	ROUND, SHIELDED / JACKETED, FLAT CABLE, .050", HF659
CAGE NUMBER	D 78-5100-2335-7
SIZE	E
DRAWING NO.	78-5100-2335-7
REV.	E
MODEL	HF659
DEF	IS1S YES X NO
SHT	1 OF 2

78-5100-2335-7
 TIME 8/1/2018 11:54:00 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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THIRD ANGLE PROJECTION	INTERPRET PER ASME Y14.5 - 2009	MILLIMETERS	TITLE ROUND, SHIELDED / JACKETED, FLAT, CABLE, .050", HF659			
MAX SURFACE ROUGHNESS	MARKED SURFACES	INCHES	CAGE NUMBER D 78-5100-2335-7			
	MARKED ONLY	ANGLES	DRAWING NO. HF659			
			REV. E DET. YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> SHT 2 OF 2			

E REVISION
 78-5100-2335-7 DRAWING NUMBER
 B
 A
 Time 8/1/2018 11:53:10 AM UTC Offset (hrs) 6

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- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
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- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
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