

# 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.

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]

## 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 10<sup>10</sup>Ω/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
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.

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

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UL FILE NO: E42769,  
 UL STYLE NO: 22170

INCH [MM]		
TOLERANCE - UNLESS NOTED		
.X	.XX	.XXX
[ INCH ] ±.1	±.05	±.010
[ ] = 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	MAY 29, 2018	MAY 29, 2018	MAY 29, 2018	MAY 29, 2018
DO NOT SCALE DRAWING	SCALE	TOLERANCES EXCEPT AS NOTED				
THIRD ANGLE PROJECTION	INTERPRET PER ASME Y14.5 - 2009	MAX SURFACE ROUGHNESS	TITLE: ROUND, SHIELDED / JACKETED, FLAT, CABLE, .050", HF659 CAGE NUMBER: D78-5100-2335-7 MODEL: HF659			
			REV. 1 OF 2 SHT 1 OF 2			

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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E	80157	AUG 01, 2018	JNC	BM
REVISED ELECTRICAL & ENVIRONMENTAL NOTES				
D	79295	MAY 29, 2018	JNC	BM
REVISED AND REDRAWN				
REV	ECO	ISSUE DATE AND DESCRIPTION	DRFT	CHKD
CHKD	C	CASTIGLIONE	MAY 29, 2018	MFG
CHKD	DATE	DATE	DATE	DATE
			B. MIZE	MAY 29, 2018

DESIGN REFERENCE	NEXT ASSEMBLY
DIVISION	DIVISION CODE
DO NOT SCALE DRAWING	EMSD
TOLERANCES EXCEPT AS NOTED	INCHES
THIRD ANGLE PROJECTION	.00 ±
INTERPRET PER ASME Y14.5 - 2009	.000 ±
MAX SURFACE ROUGHNESS	0 ±
MARKED ONLY	.00 ±
	200 ±

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<b>ROUND, SHIELDED / JACKETED, FLAT, CABLE, .050", HF659</b>				
CAGE NUMBER	SIZE	DRAWING NO.	REV.	
D		78-5100-2335-7	E	
MODEL		HF659	DET	YES <input type="checkbox"/> NO <input type="checkbox"/> SHT 2 OF 2

78-5100-2335-7 DRAWING NUMBER  
 Time 8/1/2018 -- UTC Offset (hrs) 6

## Данный компонент на территории Российской Федерации

### Вы можете приобрести в компании MosChip.

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

<http://moschip.ru/get-element>

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

### Офис по работе с юридическими лицами:

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