

# 3M™ SHIELDED CONTROLLED IMPEDANCE (SCI) CABLE ASSEMBLIES

2MM HARD METRIC (HM) 2X1, FOR TWIN-AX, COAX AND DUAL COAX CABLE ASSEMBLIES

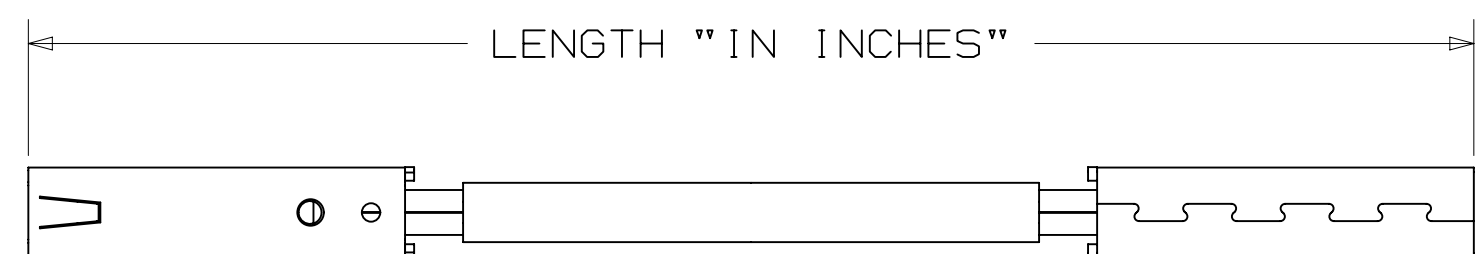
- \* HIGH DENSITY 2.0MM CENTER SPACING.
- \* MATES WITH THE FOLLOWING:
  - COMPACTPCI®
  - HSHM
  - FUTUREBUS®
  - 3M™ 2MM LATCH EJECT/HEADER 1552 SERIES
  - 2MM PIN STRIP HEADERS 1512 SERIES.
- \* ROBUST METAL GROUNDED CONNECTOR HOUSING PROVIDES IMPEDANCE CONTROL AND EMI SHIELD.
- \* AVAILABLE WITH HIGH PERFORMANCE COAXIAL OR TWINAXIAL CABLES.
- \* FOR HIGH SPEED DATA TRANSMISSION; PROVIDES UP TO 12 GHz PERFORMANCE (CONTACT 3M FOR ADDITIONAL DATA).
- \* LOW CROSS TALK, FULLY SHIELDED.
- \* AVAILABLE WITH OR WITHOUT EXTERNAL GROUND CLIPS.
- \* 64 POSITION CARRIER AVAILABLE, MULTIPLE SIZES OF LATCH EJECT CARRIER.
- \* CONTACT 3M FOR CUSTOM CONFIGURATIONS.

**6 ELECTRICAL PERFORMANCE:**  
 CURRENT RATING: 1A, ALL LINES  
 INSULATION RESISTANCE:  $5 \times 10^9$  OHMS  
 WITHSTANDING VOLTAGE: 500 V<sub>DC</sub> FOR 1 MINUTE  
 CHARACTERISTIC IMPEDANCE: 50 OHMS & 75 OHMS SINGLE ENDED, 85 OHMS & 100 OHMS DIFFERENTIAL  
 CABLE VOLTAGE RATING: 30V

**6 MECHANICAL:**  
 PITCH: 2.0 (.079), SIGNAL TO SIGNAL  
 MATING PIN: .5 (.0197) SQUARE  
 CONTACT MATE POINT: 2.4 (.094)  
 CONNECTOR INSERTION FORCE: 180 gms (.41 lbs), SIGNAL TO GROUND  
 CONNECTOR WITHDRAWL FORCE: 115 gms (.25 lbs), SIGNAL TO GROUND  
 DURABILITY (INSERTION/WITHDRAWL): 500 CYCLES

**6 ENVIRONMENTAL:**  
 -40°C TO +105°C

- NOTES
- CONNECTOR MATERIAL:  
 INSULATOR: THERMOPLASTIC, UL94V-0  
 CONTACT AND SHIELD: COPPER ALLOY.
  - CONTACT AND SHIELD PLATING:  
 100μ AVG. NICKEL UNDERPLATE  
 30μ AVG. GOLD ON WIPE AREA.
  - RECOMMENDED TO BE MATED TO SQUARE PIN RANGE:  
 .40 TO .64 (.0159 TO .0250)
  - CONNECTOR INSERTION FORCE:  
 180 GMS TYPICAL (.4 LBS)  
 SIGNAL TO GROUND,  
 .51 (.020) PIN.  
 CONNECTOR WITHDRAWL FORCE:  
 115 GMS TYPICAL (.25 LBS)  
 SIGNAL TO GROUND,  
 .51 (.020) PIN.
  - NOTE REMOVED.
  - IN THE EVENT OF CONFLICT BETWEEN THIS DATA AND THAT CONTAINED IN THE PRODUCT SPECIFICATION, THE PRODUCT SPECIFICATION TAKES PRECEDENT.
  - SCI CABLE ASSEMBLIES ARE INDIVIDUALLY PLACED OR REMOVED IN EACH POSITION OF THE CARRIERS SHOWN ON THIS TECH SHEET.
  - FOR DUAL COAX AND OFFSET COAX APPLICATIONS, ONLY CABLE TYPE 105 CAN BE USED.



LENGTH TOLERANCE IN INCHES:  
 4.0 TO 10.0" = ±.25  
 10 TO 36" = ±.50  
 36 TO 120" = ±1.0  
 120" & LONGER = ±2.0

## CABLE ASSEMBLY ORDERING INFORMATION-INDIVIDUAL LINES

98XXX-XXX-XXX.X-X

LEFT CONNECTOR TYPE/RIGHT CONNECTOR TYPE

COAX VERSION, CARRIER STYLE:  
 25 = WITH EDGE GROUND CLIP  
 27 = WITHOUT GROUND CLIP  
 29 = WITH FACE GROUND CLIP  
 41 = WITH LARGE EDGE GROUND CLIP  
 43 = WITH RAISED FACE GROUND CLIP

DUAL COAX VERSION, CARRIER STYLE: (SEE NOTE 8)  
 02 = WITH EDGE GROUND CLIP  
 04 = WITHOUT GROUND CLIP  
 08 = WITH FACE GROUND CLIP  
 09 = WITH LARGE EDGE GROUND CLIP  
 10 = WITH RAISED FACE GROUND CLIP

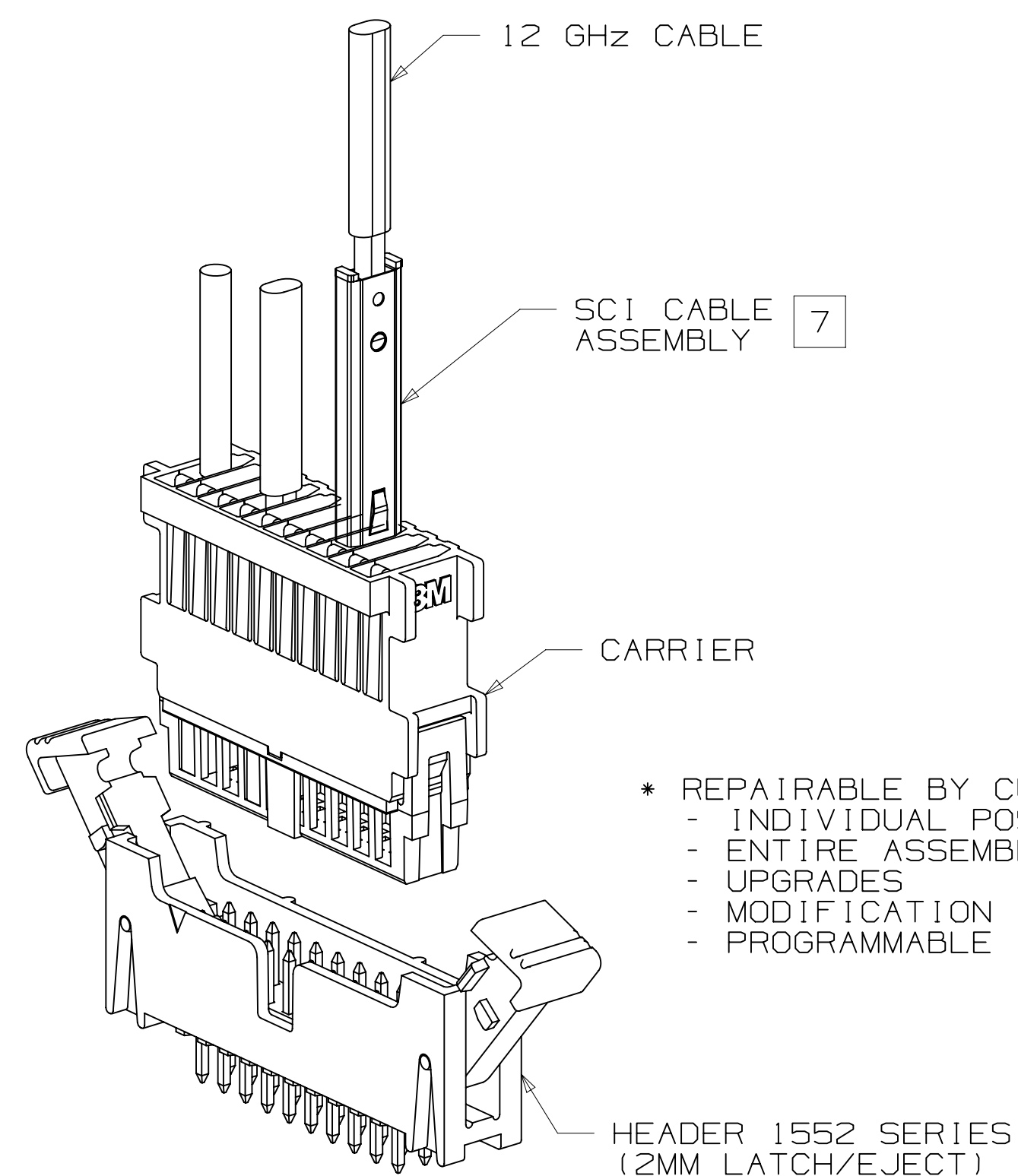
OFFSET COAX VERSION, CARRIER STYLE: (SEE NOTE 8)  
 32 = WITH EDGE GROUND CLIP

TWINAX VERSION, CARRIER STYLE:  
 26 = WITH EDGE GROUND CLIP  
 28 = WITHOUT GROUND CLIP  
 30 = WITH FACE GROUND CLIP  
 42 = WITH LARGE EDGE GROUND CLIP  
 44 = WITH RAISED FACE GROUND CLIP

HARNESSING  
 A = MULTIPLE ASS'S HARNESSSED  
 O = SINGLE ASS'Y ONLY

LENGTH (IN INCHES)

CABLE TYPE  
 027 = 50Ω COAX (26 AWG CONDUCTOR)  
 058 = 100Ω TWINAX (26 AWG CONDUCTOR)  
 105 = 50Ω COAX (28 AWG CONDUCTOR)  
 122 = 85Ω TWINAX (24.5 AWG CONDUCTOR)  
 123 = 75Ω COAX (30 AWG CONDUCTOR)



- \* REPAIRABLE BY CUSTOMER;
  - INDIVIDUAL POSITION
  - ENTIRE ASSEMBLY
  - UPGRADES
  - MODIFICATION
  - PROGRAMMABLE

3M™ ELECTRONIC SOLUTIONS DIVISION  
 INTERCONNECT SOLUTIONS  
<http://www.3m.com/interconnects/>

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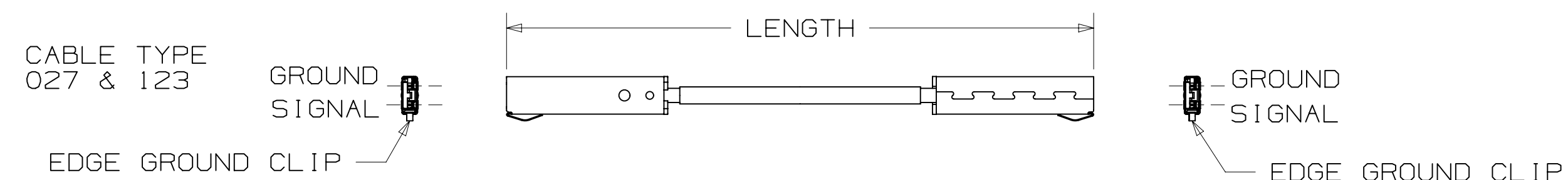
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		CASTIGLIONE	SEP 20, 2011	MFG			
CHKD	DATE	APPRV	DATE	DATE			
		R. SCHERER	SEP 20, 2011	SEP 20, 2011			
DIVISION		INTERCONNECT SOLUTIONS		ISD		3M Center St. Paul, MN 55144	
DO NOT SCALE DRAWING		TOLERANCES EXCEPT AS NOTED		INCHES		MILLIMETERS	
				.00 ± .01		0 ± .3	
				.000 ± .005		.00 ± .13	
				.0000 ±		.000 ±	
THIRD ANGLE PROJECTION		INTERPRET PER ASME Y14.5 - 1994		MILLIMETERS		MILLIMETERS	
				0 ±		0 ±	
MAX SURFACE ROUGHNESS		SURFACES		MARKED ONLY		ANGLES	
TITLE		2MM SCI HM 2X1, FOR TWINAX, COAX AND DUAL COAX, TS-2105		CAGE NUMBER		DRAWING NO.	
				D 78-5100-2105-4		REV. D	
MODEL		98XXXX		SHT		1 OF 6	

78-5100-2105-4

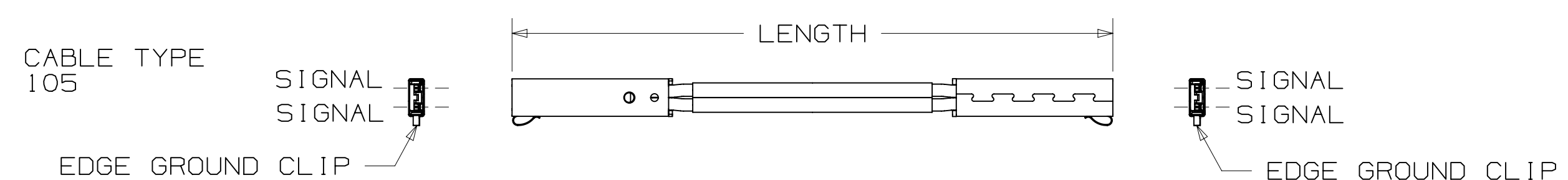
3M™ SHIELDED CONTROLLED IMPEDANCE (SCI) CABLE ASSEMBLIES  
2MM HARD METRIC (HM) 2X1, FOR TWIN-AX, COAX AND DUAL COAX CABLE ASSEMBLIES

NOTES  
1. FOR GROUNDING RECOMMENDATIONS, PLEASE CONTACT 3M TECHNICAL SUPPORT.

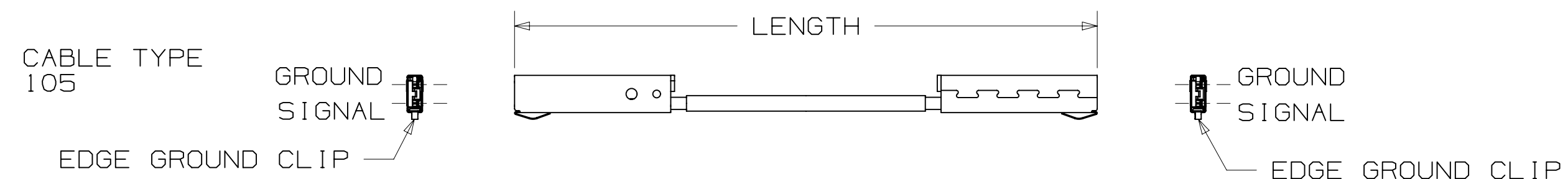
COAX CABLE ASSEMBLY W/EDGE GROUND CLIP, CONNECTOR TYPE #25



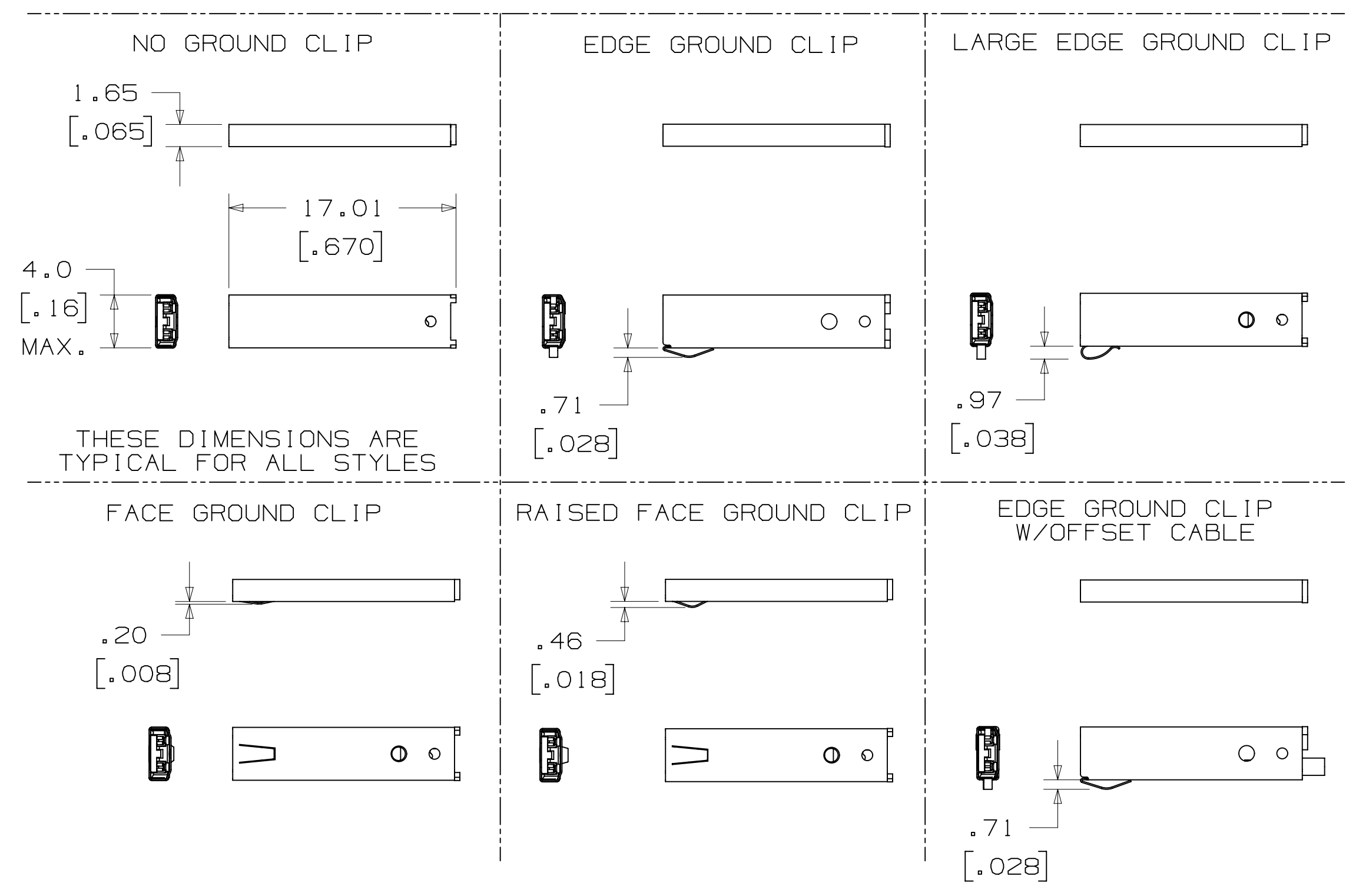
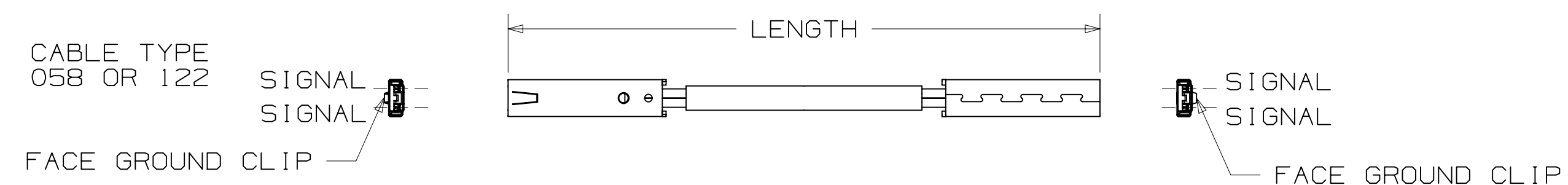
DUAL COAX CABLE ASSEMBLY W/EDGE GROUND CLIP, CONNECTOR TYPE #09



OFFSET COAX CABLE ASSEMBLY W/EDGE GROUND CLIP, CONNECTOR TYPE #32



TWINAX CABLE ASSEMBLY W/FACE GROUND CLIP, CONNECTOR TYPE #30



DESIGN REFERENCE	NEXT ASSEMBLY	REV	ECO	ISSUE DATE AND DESCRIPTION	DRFT	CHKD
				NOV 08, 2011	JNC	RS
CUST. CODES		DRW	DATE	ISSUE DATE AND DESCRIPTION	DATE	
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DIVISION		DIVISION CODE		DATE		
Interconnect Solutions		ISD		SEP 20, 2011		
DO NOT SCALE DRAWING	SCALE	TOLERANCES EXCEPT AS NOTED		DATE		
		INCHES		SEP 20, 2011		
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		.000 ± .005				
		.0000 ±				
THIRD ANGLE PROJECTION		MILLIMETERS				
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		.0 ± .3				
		.00 ± .13				
		.000 ±				
		ANGLES				
		MARKED ONLY				
CAGE NUMBER		SIZE	DRAWING NO.	REV.		
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MODEL		DET	LISTS	YES	NO	SHT 2 OF 6
96XXXX						

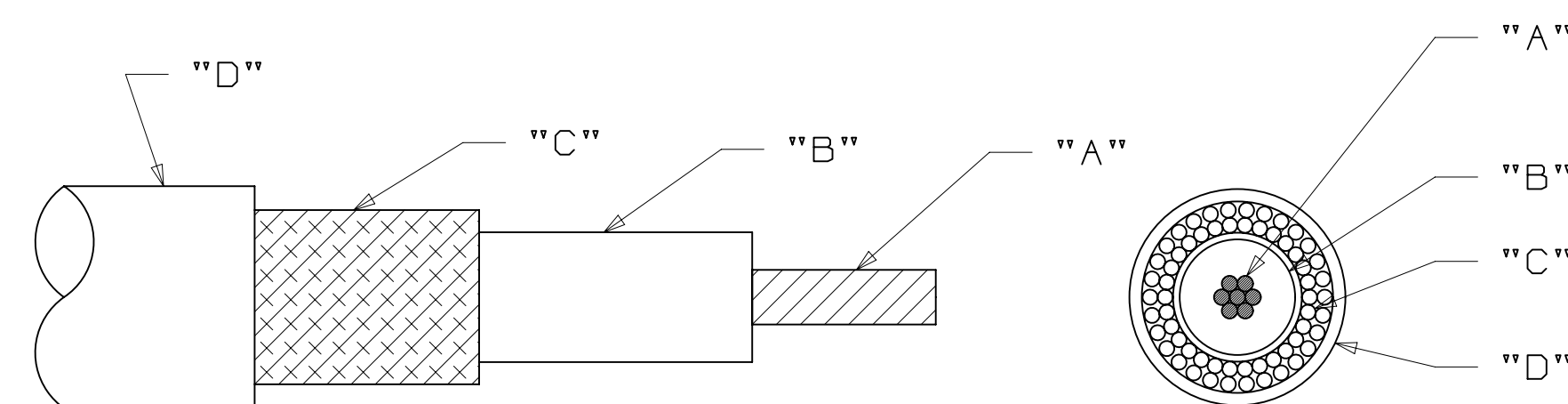
78-5100-2105-4  
DRAWING NUMBER

# 3M™ SHIELDED CONTROLLED IMPEDANCE (SCI) CABLE ASSEMBLIES

2MM HARD METRIC (HM) 2X1, FOR TWIN-AX, COAX AND DUAL COAX CABLE ASSEMBLIES

## COAXIAL CABLE

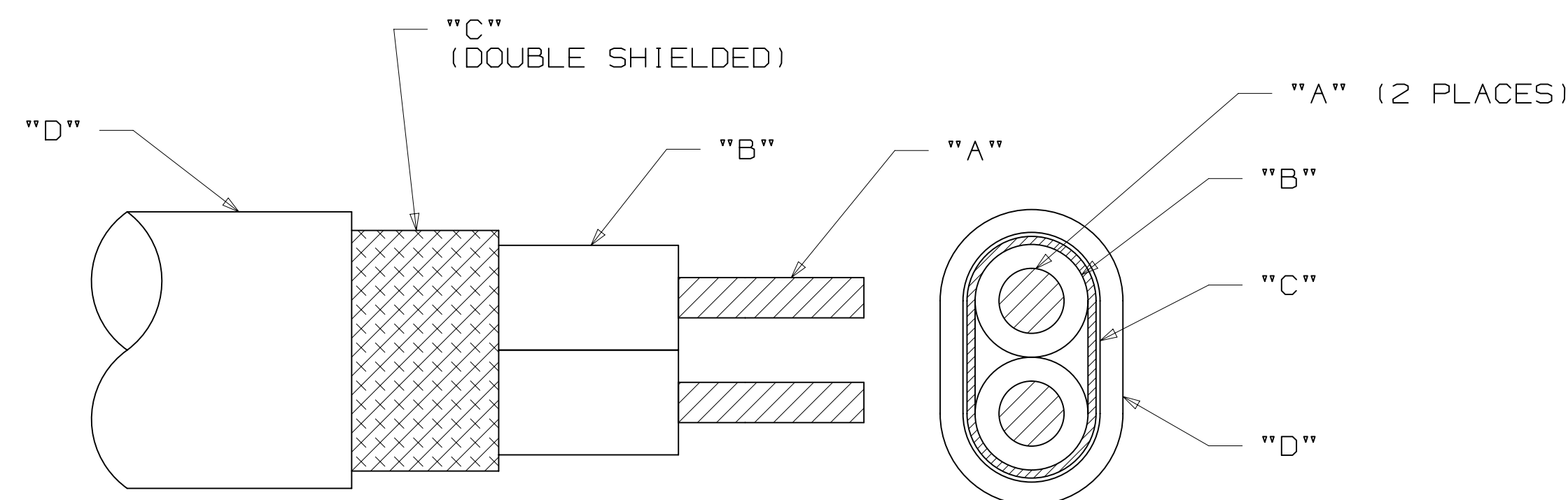
COAX PHYSICAL PROPERTIES (TYP)					
CABLE TYPE		"A" CENTER CONDUCTOR	"B" DIELECTRIC MATERIAL	"C" SHIELD	"D" JACKET
027 COAX BLUE	50 OHM	26 AWG SILVER PLATED COPPER (7/34) .48MM [ .019 ] OD	AIR / FEP	DUAL LAYER SILVER PLATED COPPER WIRE SERVED SHIELD	FEP 1.80MM [ .071 ] OD
105 COAX BLACK	50 OHM	28 AWG SILVER PLATED COPPER (19/40) .406MM [ .016 ] OD	FOAM / FEP	SILVER PLATED COPPER WIRE SERVED SHIELD	FEP 1.55MM [ .061 ] OD
123 COAX GRAY	75 OHM	30 AWG SILVER PLATED COPPER (7/38) .31MM [ .012 ] OD	AIR / PTFE	SILVER PLATED BRAID	FEP 1.88MM [ .074 ] OD



COAX ELECTRICAL PROPERTIES (TYP)				
CABLE TYPE		CAPACITANCE	PROPAGATION DELAY	ATTENUATION
027	#####	78.7 pF/m [ 24 pF/ft ] MAX.	3.8 nS/m [ 1.15 nS/ft ] NOM.	10m @ 650 MHz [ -8.23 dB ]
105	#####	87 pF/m [ 26.5 pF/ft ] MAX.	4.2 nS/m [ 1.28 nS/ft ] NOM.	3m @ 500 MHz [ -3 dB ]
123	#####	52 pF/m [ 16 pF/ft ] NOM.	4.0 nS/m [ 1.22 nS/ft ] NOM.	100m @ 300 MHz [ -14.5 dB ]

## TWINAXIAL CABLE

TWINAX PHYSICAL PROPERTIES (TYP)					
CABLE TYPE		"A" CENTER CONDUCTOR	"B" DIELECTRIC MATERIAL	"C" SHIELD	"D" JACKET
058 TWINAX BROWN	100 OHM	26 AWG SILVER PLATED COPPER (1) .406MM [ .016 ] OD	AIR / FEP	SILVER PLATED COPPER BRAID OVER ALUMINIZED MYLAR	FEP 1.68 X 2.62MM [ .066 X .103 ] OD
122 TWINAX BURGUNDY	85 OHM	24.5 AWG SOLID SPC .483MM [ .019 ] OD	AIR / PTFE	BRAID	FEP 1.73 X 2.67MM [ .068 X .105 ] OD



TWINAX ELECTRICAL PROPERTIES (TYP)				
CABLE TYPE		CAPACITANCE	PROPAGATION	ATTENUATION
058	100 OHM	39.4 pF/m [ 12 pF/ft ] MAX.	3.9 nS/m [ 1.18 nS/ft ] NOM.	10m @ 650 MHz [ -7.79 dB ]
122	85 OHM	45.9 pF/m [ 14 pF/ft ] MAX.	3.9 nS/m [ 1.18 nS/ft ] NOM.	CONTACT 3M TECHNICAL SUPPORT

D 36288 NOV 08, 2011 JNC RS

DESIGN REFERENCE	NEXT ASSEMBLY	REV	ECO	ISSUE DATE AND DESCRIPTION	DRFT	CHKD
				REVISED AND REDRAWN		
		DRFT		SEP 20, 2011		
		CHKD		SEP 20, 2011		
				APPV		
				R. SCHERER		
				DATE		
				SEP 20, 2011		

Interconnect Solutions  
DO NOT SCALE DRAWING

THIRD ANGLE PROJECTION

MAX SURFACE ROUGHNESS

MARKED ONLY

3M Center St. Paul, MN 55144

TITLE  
2MM SCI HM 2X1, FOR TWINAX, COAX AND DUAL COAX, TS-2105

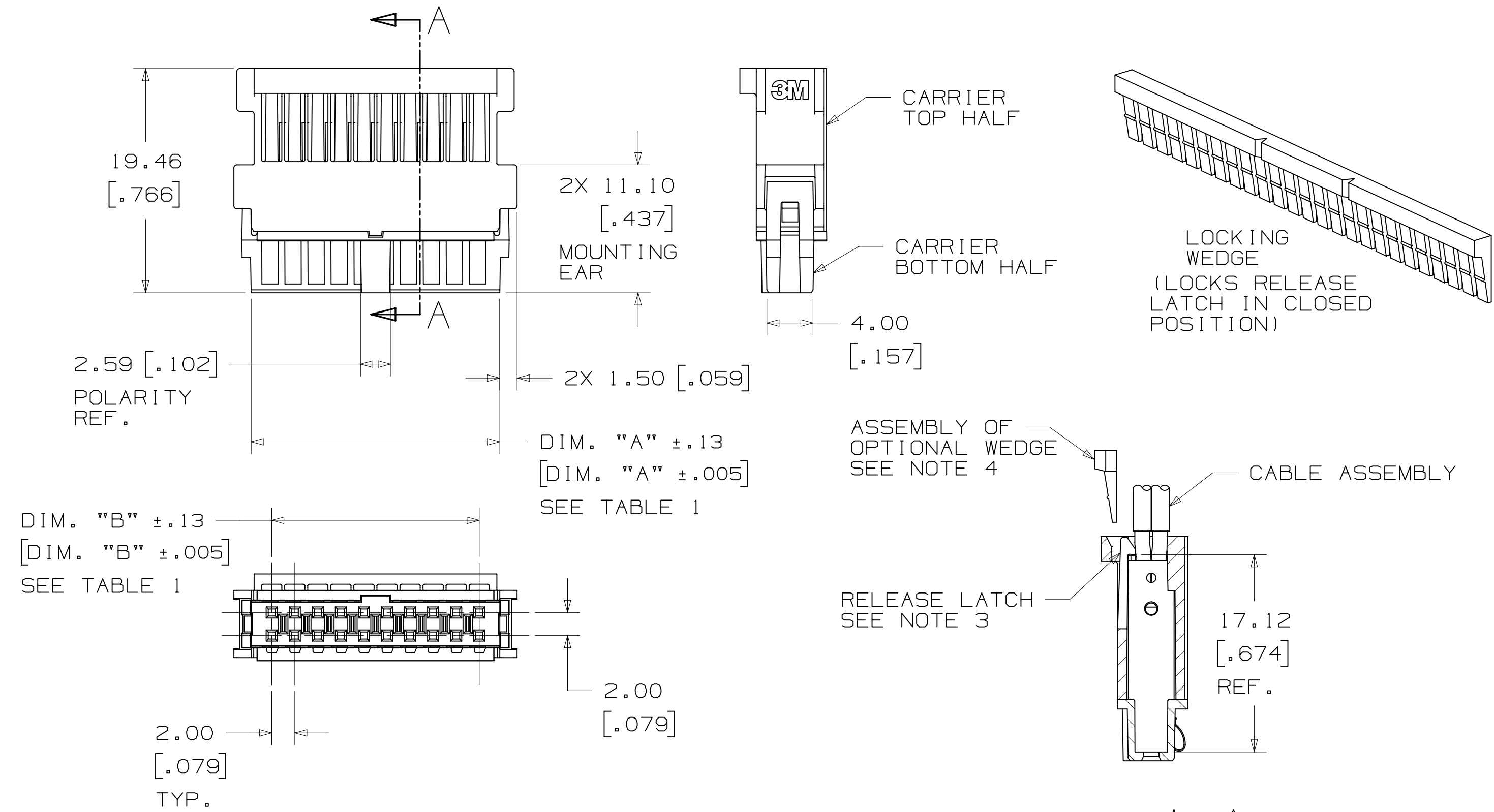
CAGE NUMBER D78-5100-2105-4

MODEL 96XXXX

REV. 3 OF 6

3M™ SHIELDED CONTROLLED IMPEDANCE (SCI) CABLE ASSEMBLIES  
 2MM HARD METRIC (HM) 2X1, FOR TWIN-AX, COAX AND DUAL COAX CABLE ASSEMBLIES

2MM SCI CARRIER DIMENSIONS AND STANDARD SIZES



DIM. "B" ±.13  
 [DIM. "B" ±.005]  
 SEE TABLE 1

DIM. "A" ±.13  
 [DIM. "A" ±.005]  
 SEE TABLE 1

TABLE 1: CARRIER POSITIONS

SCI POSITIONS	CONTACT QTY.	DIM. "A"	DIM. "B"
3	6	7.56 [.298]	4.00 [.157]
4	8	9.56 [.377]	6.00 [.236]
* 5	10	11.56 [.455]	8.00 [.315]
6	12	13.56 [.534]	10.00 [.394]
8	16	17.56 [.692]	14.00 [.551]
* 10	20	21.56 [.849]	18.00 [.709]
11	22	23.56 [.928]	20.00 [.787]
* 12	24	25.56 [1.006]	22.00 [.866]
13	26	27.56 [1.085]	24.00 [.945]
* 15	30	31.56 [1.243]	28.00 [1.102]
* 17	34	35.56 [1.400]	32.00 [1.260]
* 20	40	41.56 [1.636]	38.00 [1.496]
22	44	45.56 [1.794]	42.00 [1.654]
* 25	50	51.56 [2.030]	48.00 [1.890]

\* AVAILABLE NOW; CONTACT 3M SALES FOR OTHER POSITIONS

ORDERING INFORMATION: LATCH/EJECT HEADER AND CARRIER

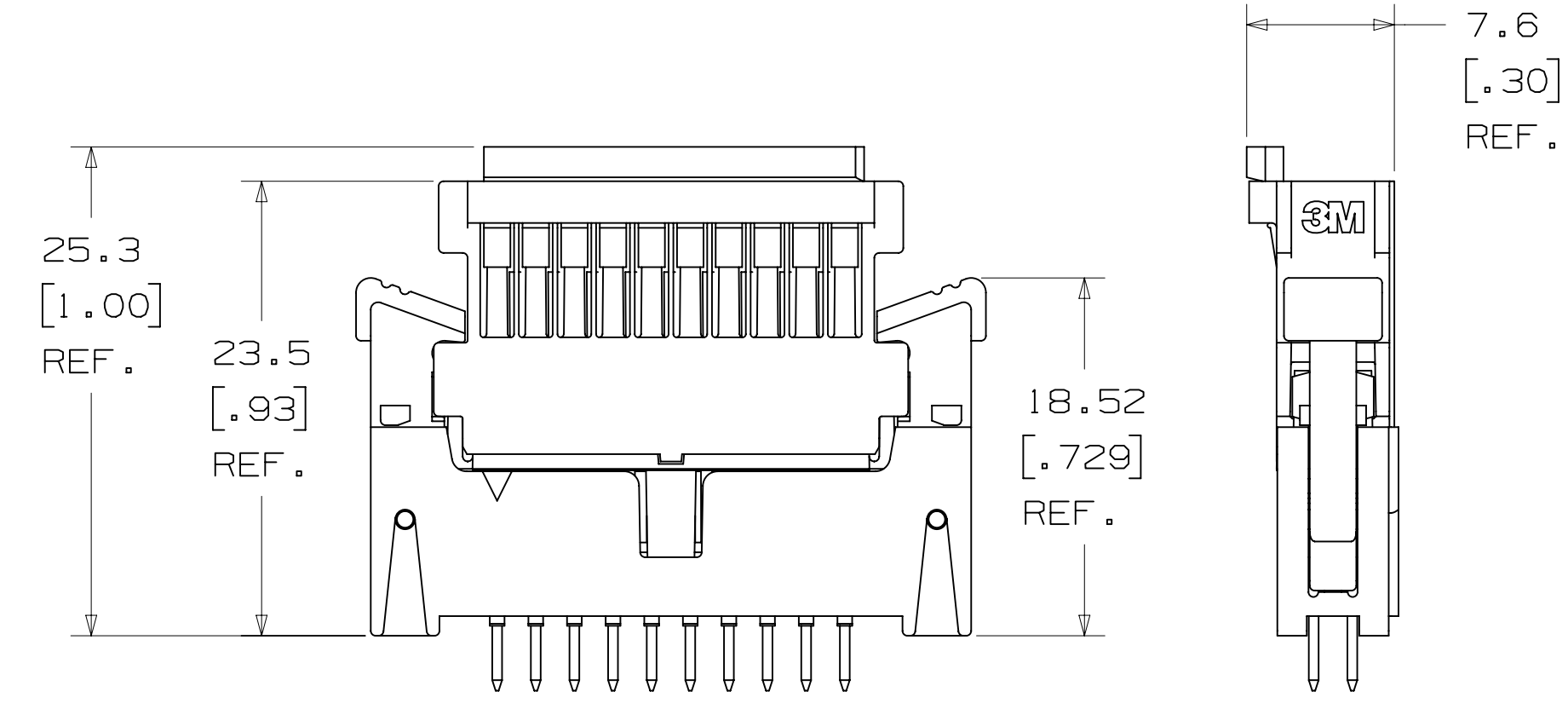
CARRIER: 93XX  
 CONTACT QTY. SEE TABLE 1

LOCKING WEDGE: 70-0100-1578-5  
 25 POSITION (CUT TO LENGTH)

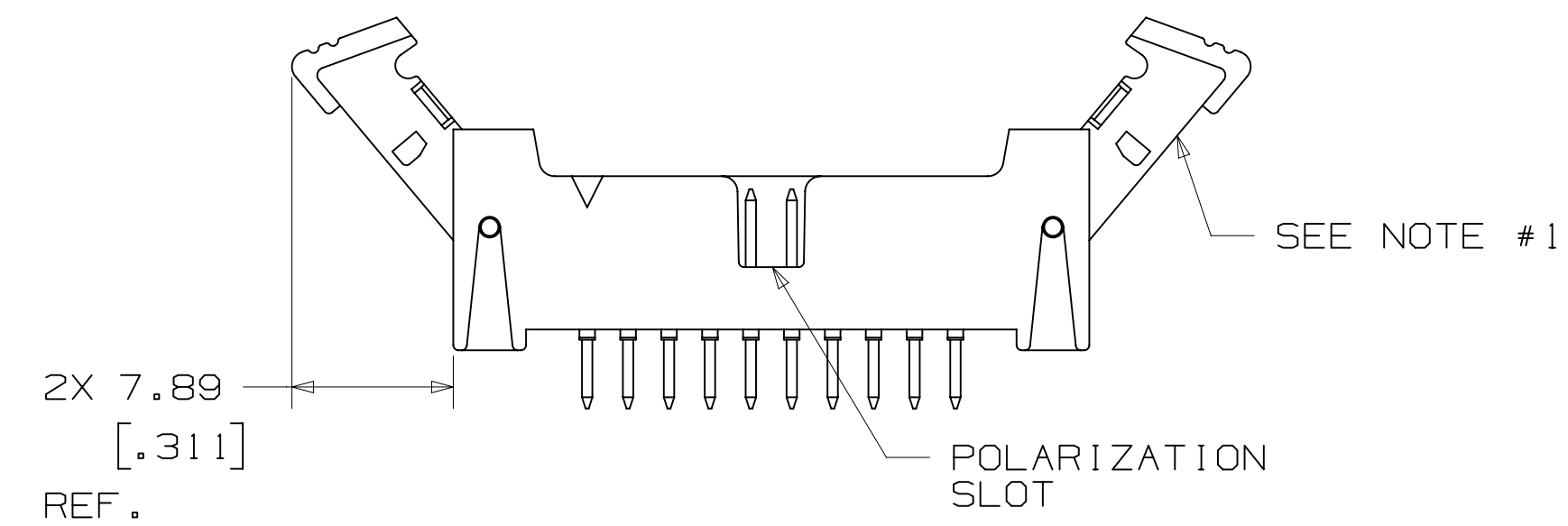
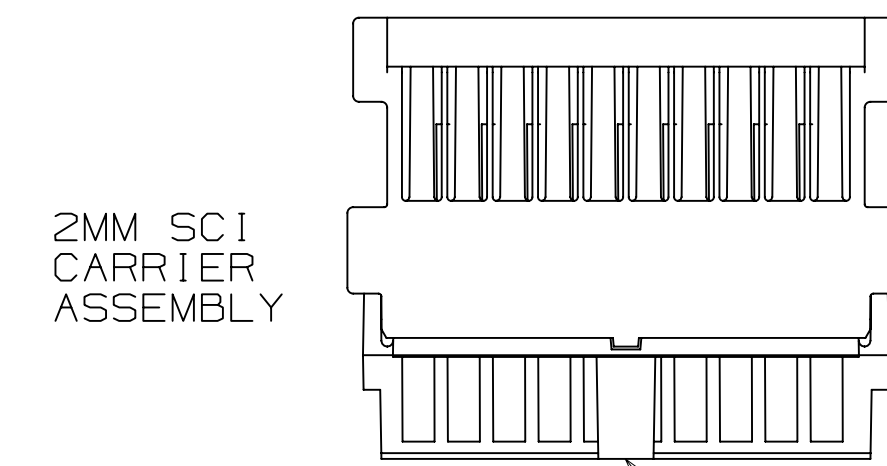
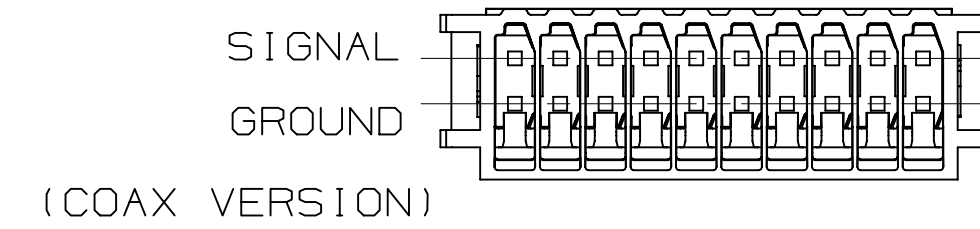
HEADER AND LATCH: 1552XX-X4XX  
 EJECTOR LATCH, SCI CARRIER

LATCH ONLY: 70-0100-3045-3  
 (SEE TS-2199 FOR FULL HEADER PART NUMBER)

- NOTES
- LATCH MUST BE PLACED IN APPROXIMATE POSITION SHOWN BEFORE INSERTING CARRIER.
  - COMPATIBLE 2MM LATCH/EJECT HEADER 1552XX-X4XX. MUST ORDER ABOVE PART NUMBER FOR PROPER LATCH SIZE (#4).
  - RELEASE LATCH CAN BE MOVED WITH FINGERNAIL TO ALLOW REPLACEMENT OF SCI CABLE LINE.
  - OPTIONAL LOCKING WEDGE PREVENTS SCI REMOVAL.



2MM SCI CARRIER MATES WITH 2MM LATCH/EJECT HEADER 1552XX-X4XX



2 COMPATIBLE 2MM LATCH/EJECT HEADER

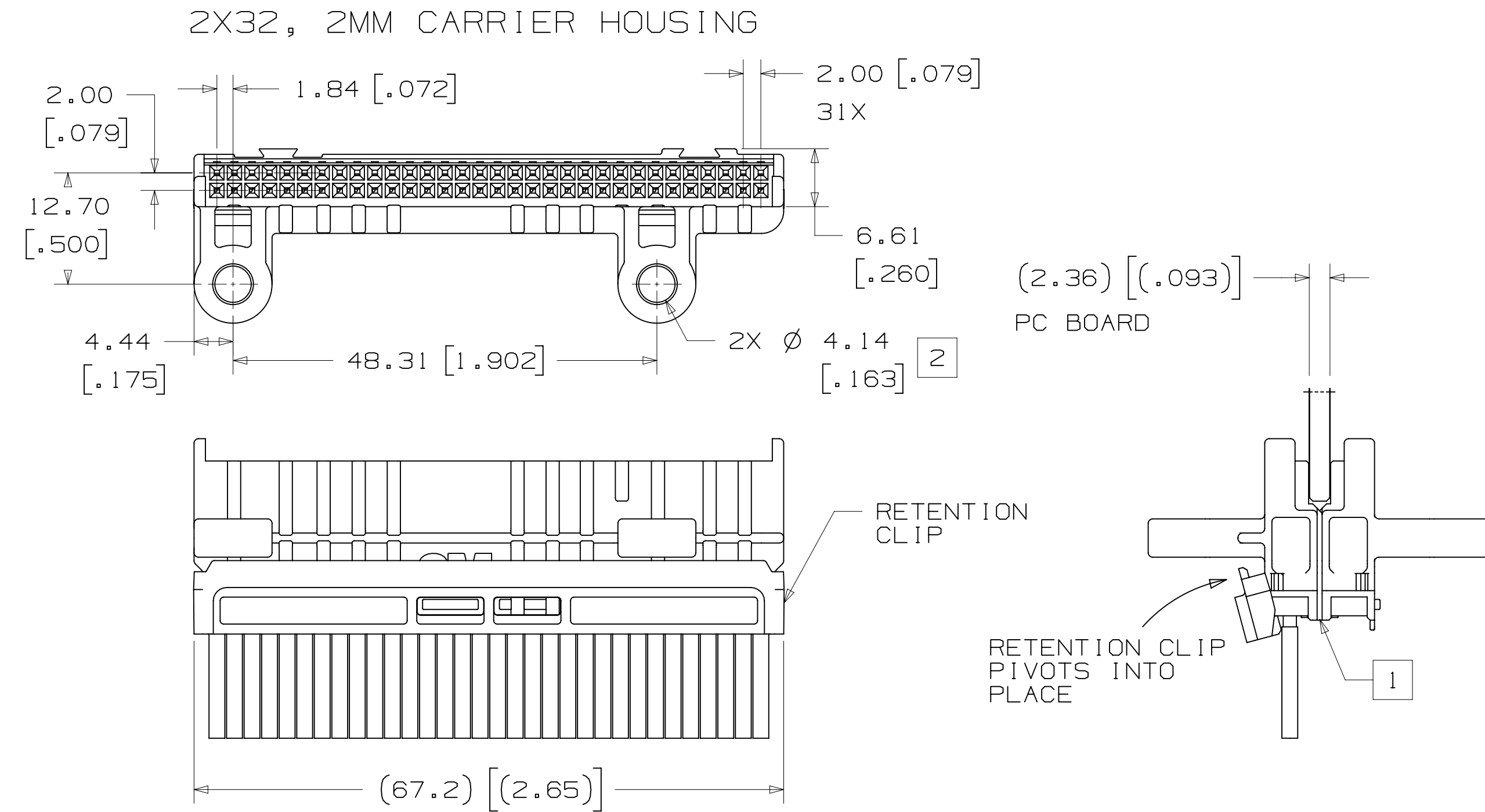
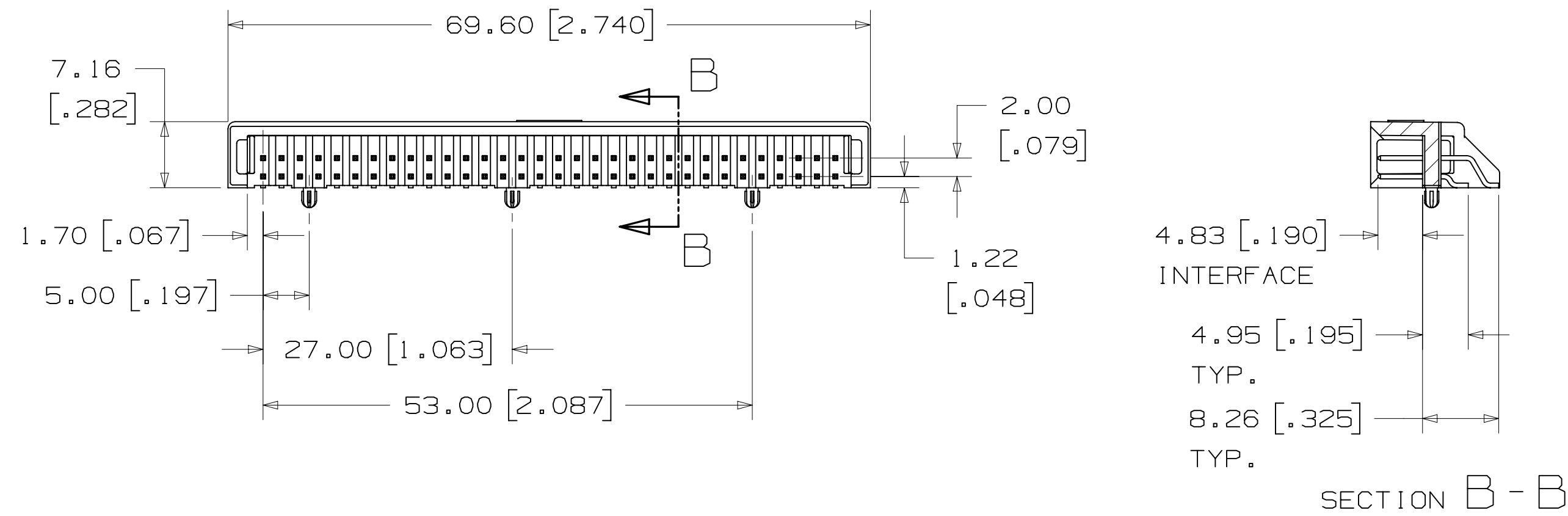
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				NOV 08, 2011	JNC	RS
DIVISION		DIVISION CODE		DATE		
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DO NOT SCALE DRAWING		TOLERANCES EXCEPT AS NOTED		DATE		
THIRD ANGLE PROJECTION		INCHES		DATE		
INTERPRET PER ASME Y14.5 - 1994		MILLIMETERS		DATE		
MAX SURFACE ROUGHNESS		ANGLES		DATE		
MARKED ONLY				DATE		
CAGE NUMBER		DRAWING NO.		REV.		
D 78-5100-2105-4		D		D		
MODEL		SHT		4 OF 6		
98XXX		SHT		4 OF 6		

78-5100-2105-4  
DRAWING NUMBER

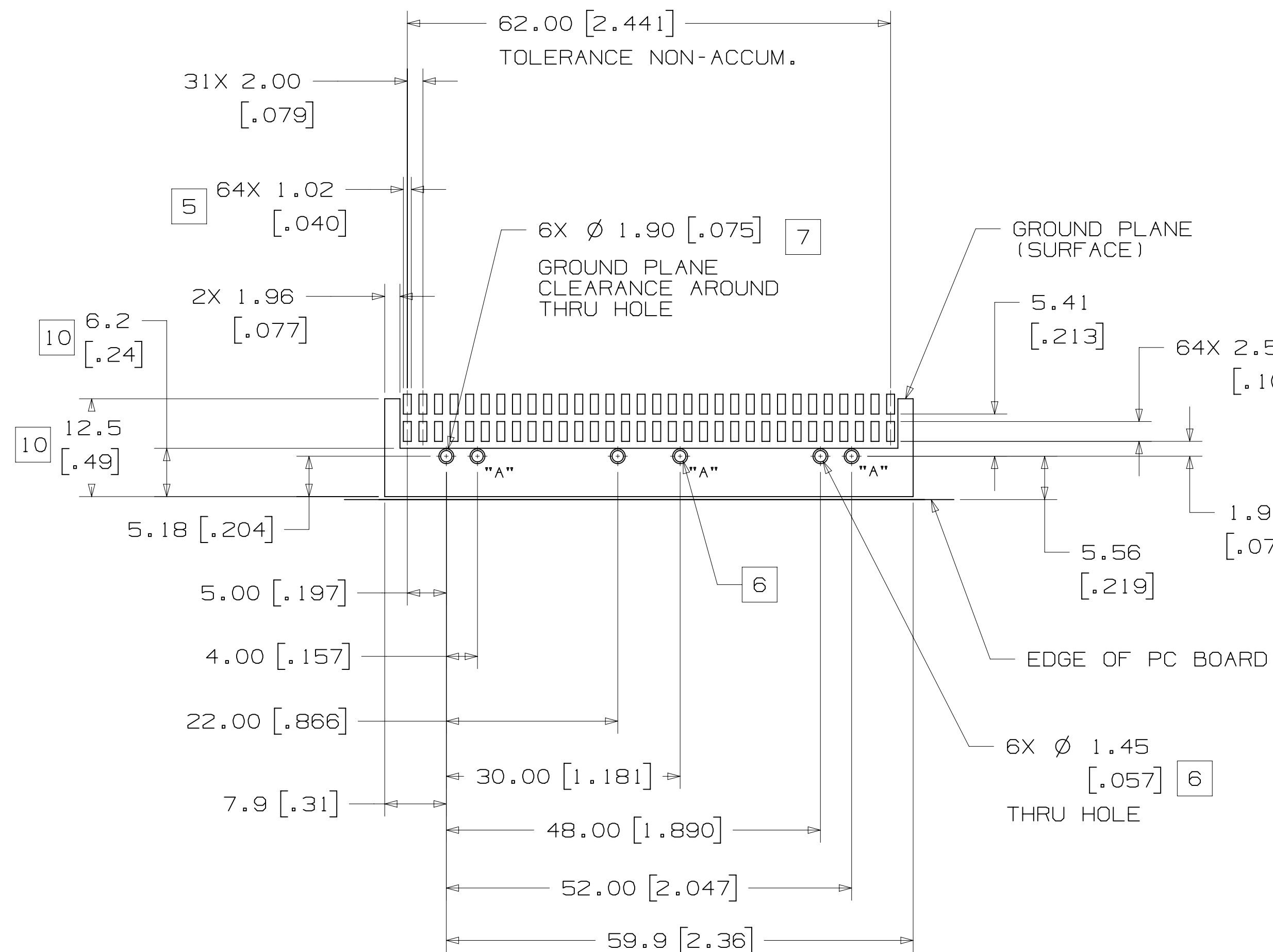
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2MM HARD METRIC (HM) 2X1, FOR TWIN-AX, COAX AND DUAL COAX CABLE ASSEMBLIES

2X32, 2MM SCI CARRIER AND SURFACE MOUNT (SMT) HEADER SYSTEM

2X32, 2MM SURFACE MOUNT 3 WALL HEADER  
(SEE BELOW FOR PCB LAYOUT GUIDELINES)



PCB LAYOUT GUIDELINES



ACCESSORIES ORDERING INFORMATION

9864-2X00

- C = 2X32, 2MM RETENTION CLIP ONLY
- D = 2X32, 2MM CARRIER HOUSING WITH RETENTION CLIP
- H = 2X32, SURFACE MOUNT HEADER

- NOTES
1. CARRIER DESIGNED TO LOCK TO OPTIONAL FACING CARRIER ON (2.362 [.093]) PC BOARD.
  2. MOUNTING HOLE SYSTEM DESIGNED TO PANEL MOUNT WITH CUSTOMER SUPPLIED SHOULDER SCREW.
  3. CARRIER POSITIONS CAN BE PARTIALLY LOADED WITH ANY SCI CABLE ASSEMBLY.
  4. PC BOARD TOLERANCE IS ±.08 [.003] UNLESS OTHERWISE NOTED.
  5. SOLDER PADS AND GROUND PLANE ARE TYPICAL ON TOP AND BOTTOM OF PC BOARD.
  6. HOLES MARKED WITH AN "A" ARE NOT REQUIRED ON SINGLE SIDE ETCHED PC BOARD.
  7. IN ORDER TO MAINTAIN THE CONNECTOR RELIABILITY, THE CUSTOMER SHOULD PLATE THE COAX/TWINAX EXTERNAL CLIP PC BOARD GROUND PLANE WITH 50µ MIN. NICKEL AND 30µ MIN. GOLD.
  8. FOR LESSER PERFORMANCE, A THINNER PLATING OF GOLD MAY BE USED. CUSTOMER MUST EVALUATE AND DETERMINE PERFORMANCE NEEDS AND APPROPRIATE PLATING THICKNESS.
  9. A STIFFENER MUST BE ADDED TO THE OPPOSITE SIDE OF THE BOARD FROM WHICH THE HEADER IS MOUNTED ON IN ORDER TO MAINTAIN BOARD STRAIGHTNESS FOR SINGLE SIDED APPLICATIONS.
  10. START OF GROUND PLANE(S).

DESIGN REFERENCE	NEXT ASSEMBLY	D 36288	NOV 08, 2011	JNC	RS
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CASTIGLIONE	SEP 20, 2011	MFG	DATE		
CHKD	DATE	APPR	DATE		
		R. SCHERER	SEP 20, 2011		
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DO NOT SCALE DRAWING	TOLERANCES EXCEPT AS NOTED	3M			
	INCHES	TITLE			
	.00 ± .01	2MM SCI HM 2X1, FOR TWINAX, COAX AND DUAL COAX, TS-2105			
	.000 ± .005	CAGE NUMBER			
	.0000 ±	D 78-5100-2105-4			
THIRD ANGLE PROJECTION	MILLIMETERS	REV.			
	0 ±	D			
INTERPRET PER ASME Y14.5 - 1994	.00 ± .3	MODEL			
	.00 ± .13	98XXXX			
MAX SURFACE ROUGHNESS	.000 ±	IESTS			
DTX SURFACES	ANGLES	YES X NO			
MARKED ONLY		SHT 5 OF 6			

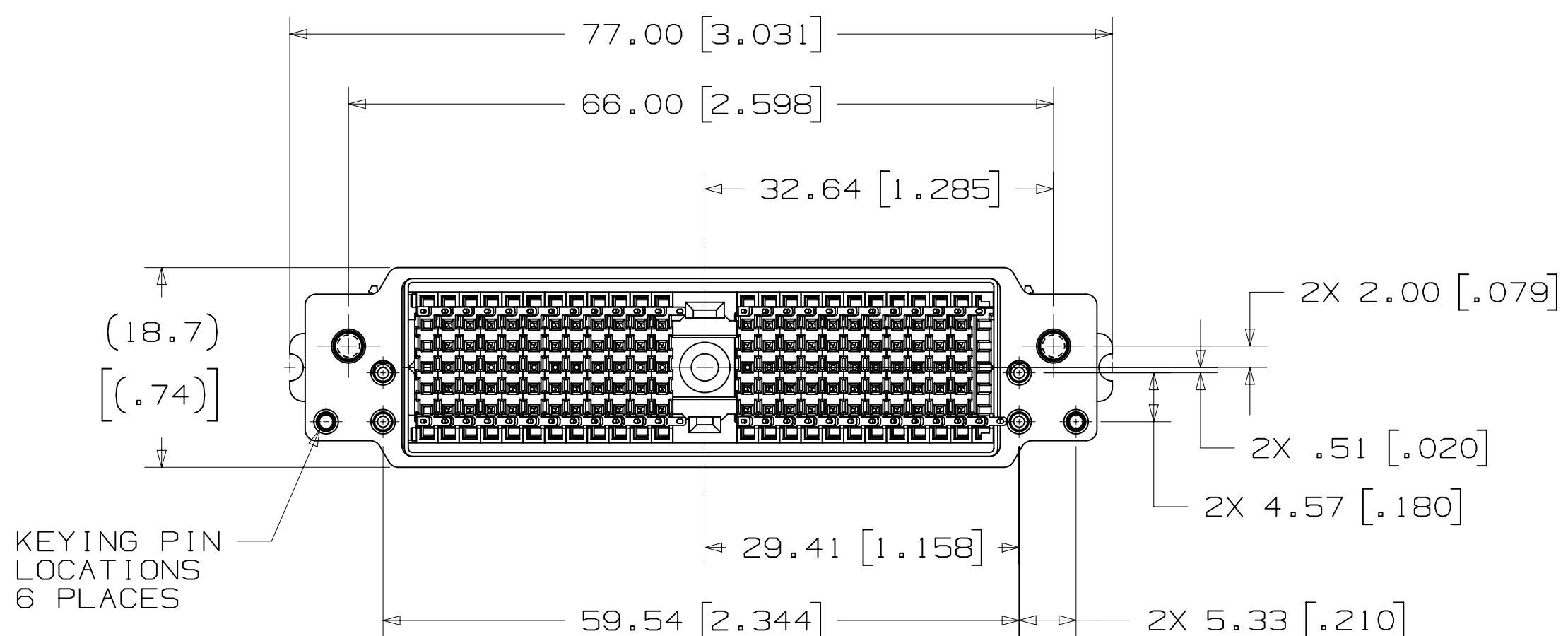
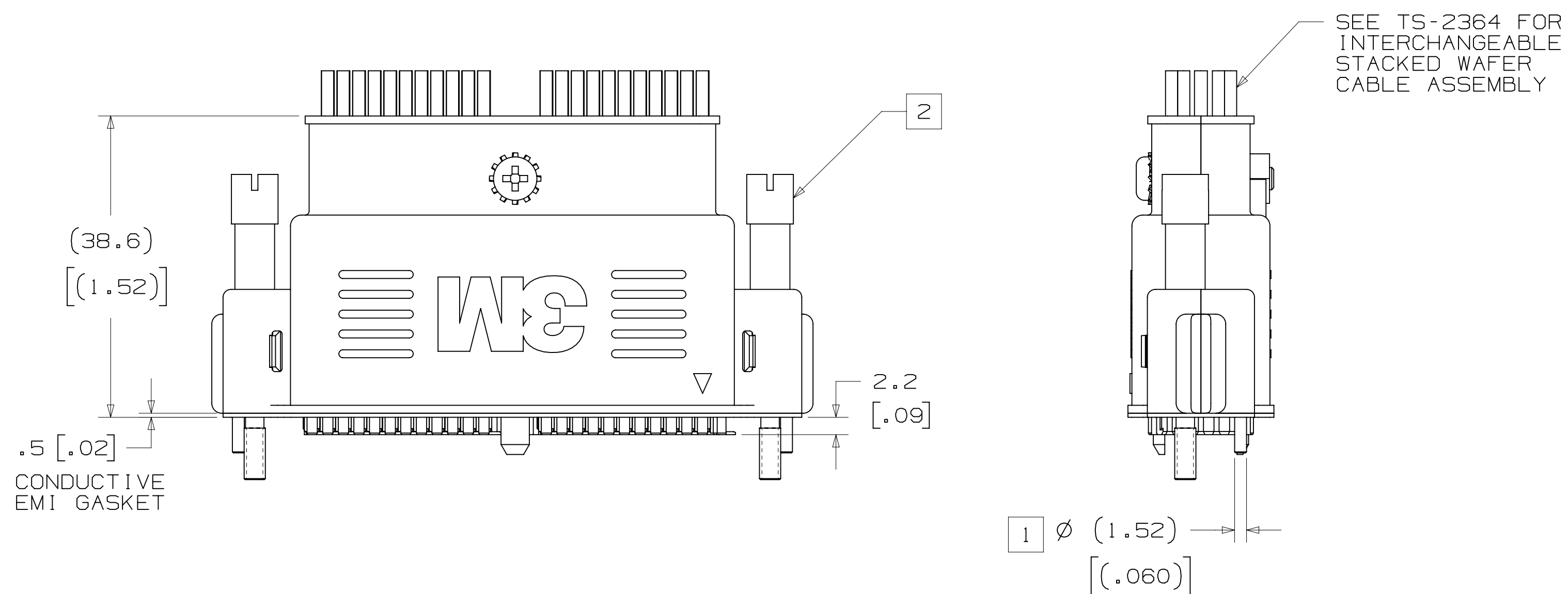
78-5100-2105-4

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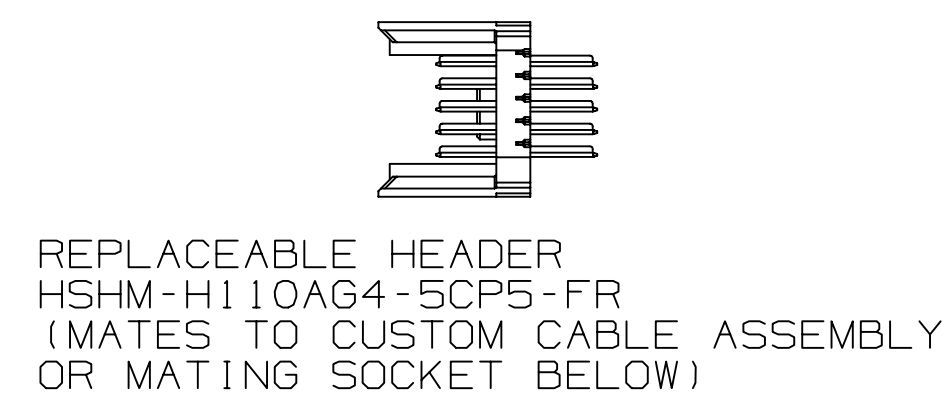
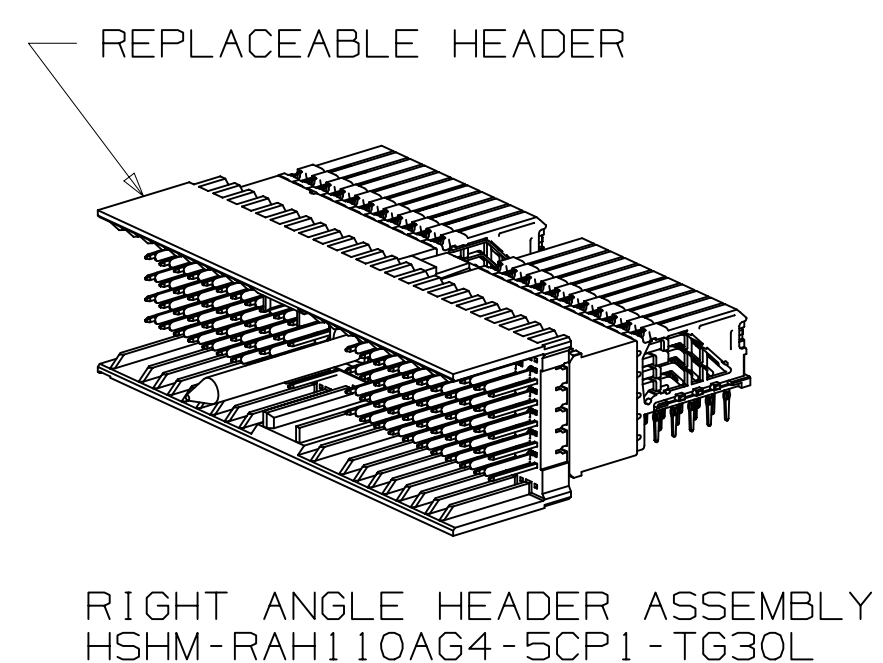
NOTES

- 1 2X KEYING PINS PER ASSEMBLY  
6 LOCATIONS FOR KEYING.
- 2 2X THUMBSCREWS, #4-40.

CUSTOM ASSEMBLY - HARD METRIC COMPATIBLE  
 HM, cPCI, HSHM & UHM STACKED WAFER HARNESS WITH SHELL, 110 POSITION  
 UPGRADES LEGACY HEADERS TO HIGH BANDWIDTH



HARNESS CONFIGURATION MATES WITH 5 ROW HSHM-H110A STYLE HEADER. (SEE TS-2073)  
 CONTACT 3M SALES FOR OTHER CONFIGURATIONS, SPECIFICATIONS AND ORDERING INFORMATION



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Interconnect Solutions	ISD	R. SCHERER	SEP 20, 2011	SEP 20, 2011		
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THIRD ANGLE PROJECTION	TOLERANCES EXCEPT AS NOTED	TITLE 2MM SCI HM 2X1, FOR TWINAX, COAX AND DUAL COAX, TS-2105				
INTERPRET PER ASME Y14.5 - 1994	INCHES	CAGE NUMBER D 78-5100-2105-4				
MAX SURFACE ROUGHNESS	MILLIMETERS	DRAWING NO. 78-5100-2105-4				
MARKED ONLY	ANGLES	REV. D				
		MODEL 98XXX				
		DET YES X NO				
		SHT 6 OF 6				

78-5100-2105-4