

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

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

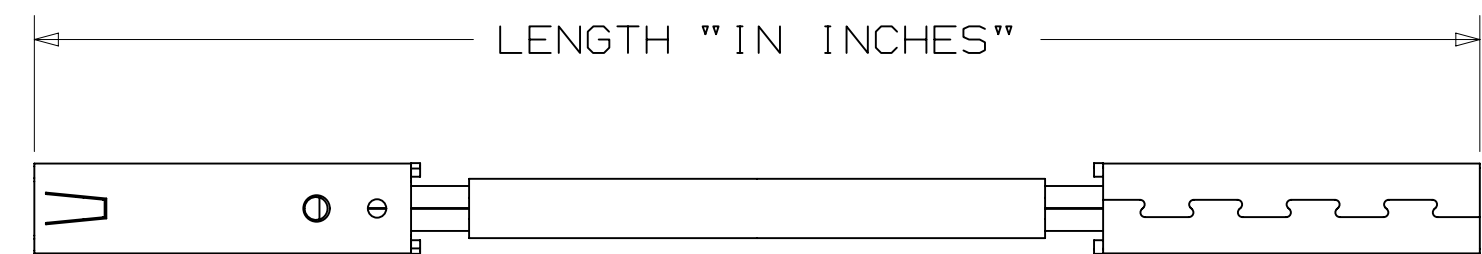
- \* HIGH DENSITY 2.0MM CENTER SPACING.
- \* MATES WITH THE FOLLOWING:
  - COMPACTPCI®
  - HSHM
  - FUTUREBUS®
  - 3M™ 2MM LATCH EJECT/HEADER 1552 SERIES
  - 2MM PIN STRIP HEADERS 1512 SERIES.
- \* ROBUST METAL GROUNDED CONNECTOR HOUSING PROVIDES IMPEDANCE CONTROL AND EMI SHIELD.
- \* AVAILABLE WITH 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

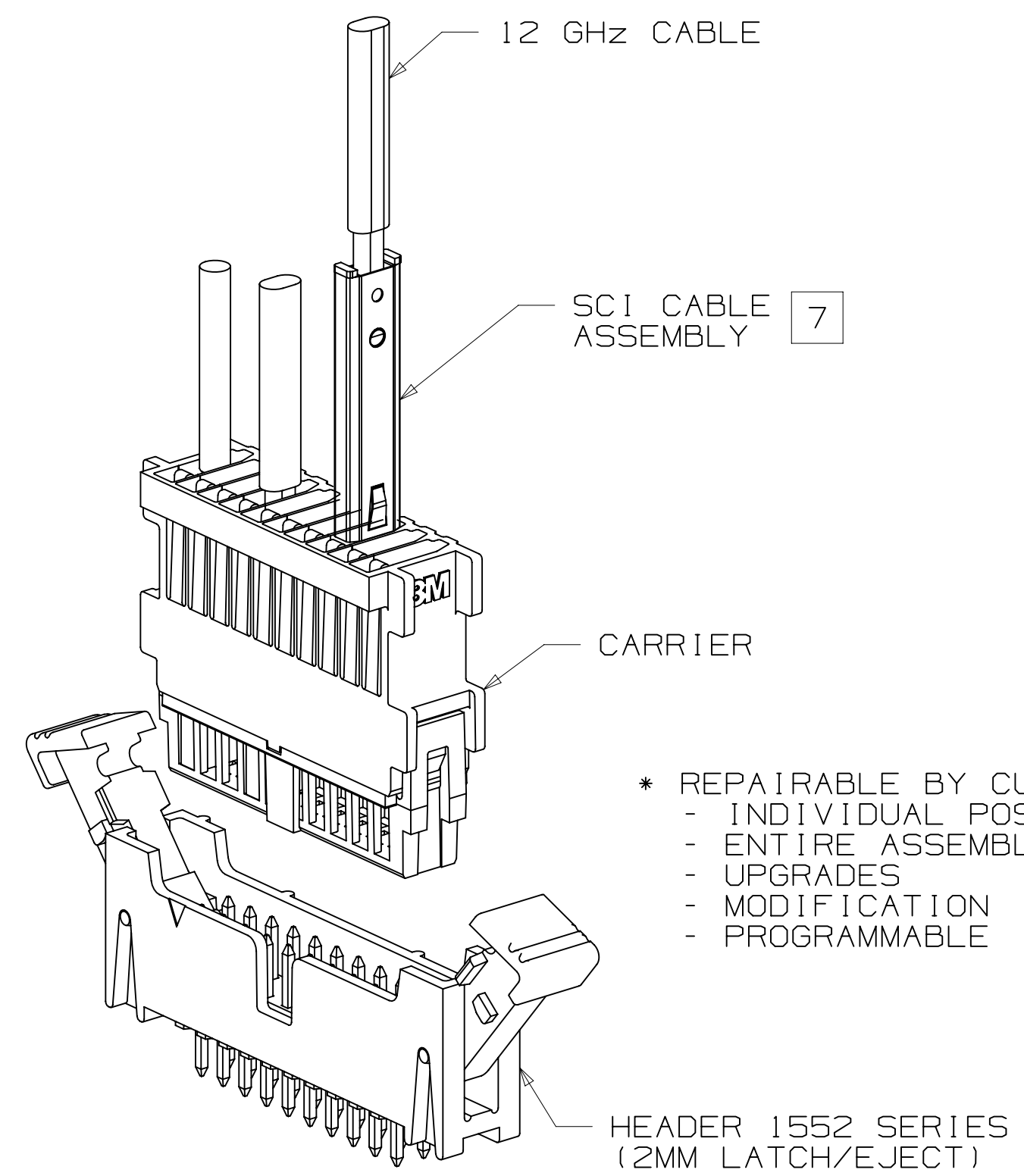
**6 MECHANICAL:**  
 PITCH: 2.0 (.079), SIGNAL TO SIGNAL  
 MATING PIN: .5 (.0197) SQUARE 3 4  
 CONTACT MATE POINT: 2.4 (.094)  
 CONNECTOR INSERTION FORCE: 180 gms (.41 lbs), SIGNAL TO GROUND  
 CONNECTOR WITHDRAWL FORCE: 115 gms (.25 lbs), SIGNAL TO GROUND  
 DURABILITY (INSERTION/WITHDRAWL): 500 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



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

## 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)

DESIGN REFERENCE		NEXT ASSEMBLY	D 36288		NOV 08, 2011	JNC	RS
REV	ECO	ISSUE DATE AND DESCRIPTION	DRFT	CHKD			
		CASTIGLIONE	SEP 20, 2011	MFG			
CHKD	DATE	APPR	DATE	DATE			
		R. SCHERER	SEP 20, 2011	SEP 20, 2011			
DIVISION		DIVISION CODE					
Interconnect Solutions		ISD					
DO NOT SCALE DRAWING	TOLERANCES EXCEPT AS NOTED						
INCHES							
.00 ± .01							
.000 ± .005							
.0000 ±							
THIRD ANGLE PROJECTION							
INTERPRET PER ASME Y14.5 - 1994							
MILLIMETERS							
0 ±							
.0 ± .3							
.00 ± .13							
.000 ±							
MARKED SURFACES ONLY							
ANGLES							
TITLE		2MM SCI HM 2X1, FOR TWINAX, COAX AND DUAL COAX, TS-2105					
CAGE NUMBER		DRAWING NO.		REV.			
D		78-5100-2105-4		D			
MODEL		98XXXX		SHT		1 OF 6	

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

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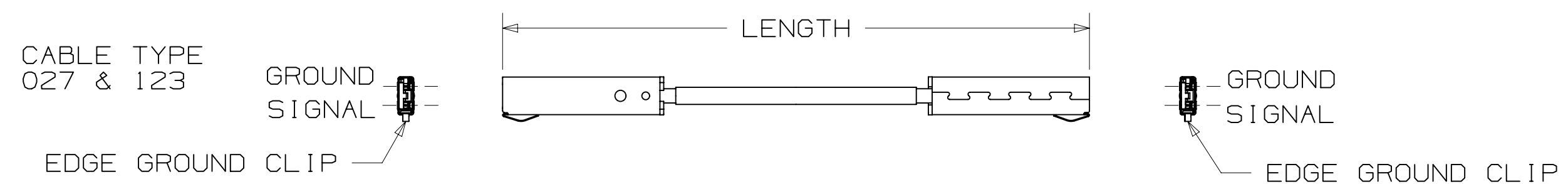
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78-5100-2105-4

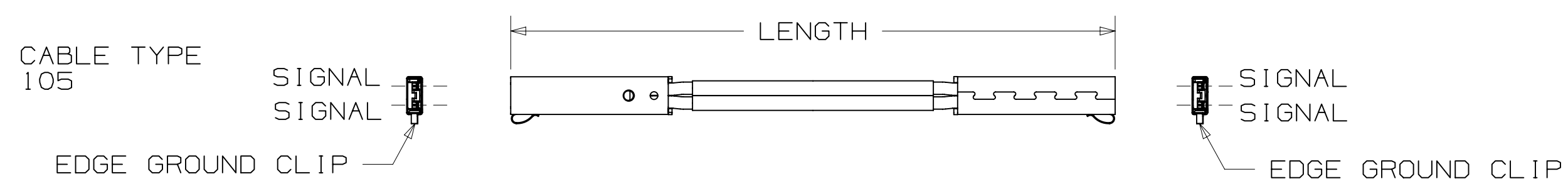
3M™ SHIELDED CONTROLLED IMPEDANCE (SCI) CABLE ASSEMBLIES  
 2MM HARD METRIC (HM) 2X1, FOR TWIN-AX, COAX AND DUAL COAX CABLE ASSEMBLIES

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

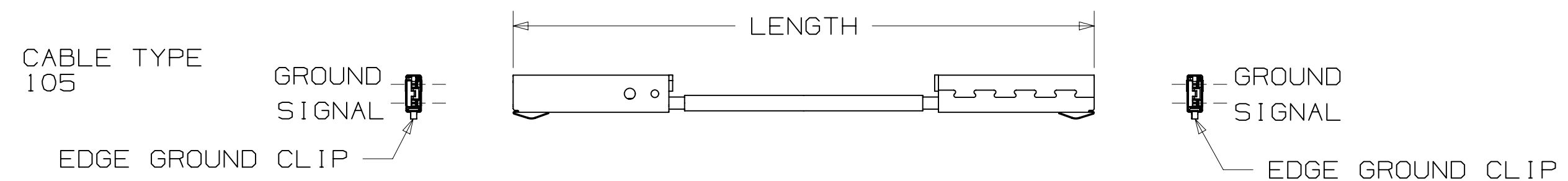
COAX CABLE ASSEMBLY W/EDGE GROUND CLIP, CONNECTOR TYPE #25



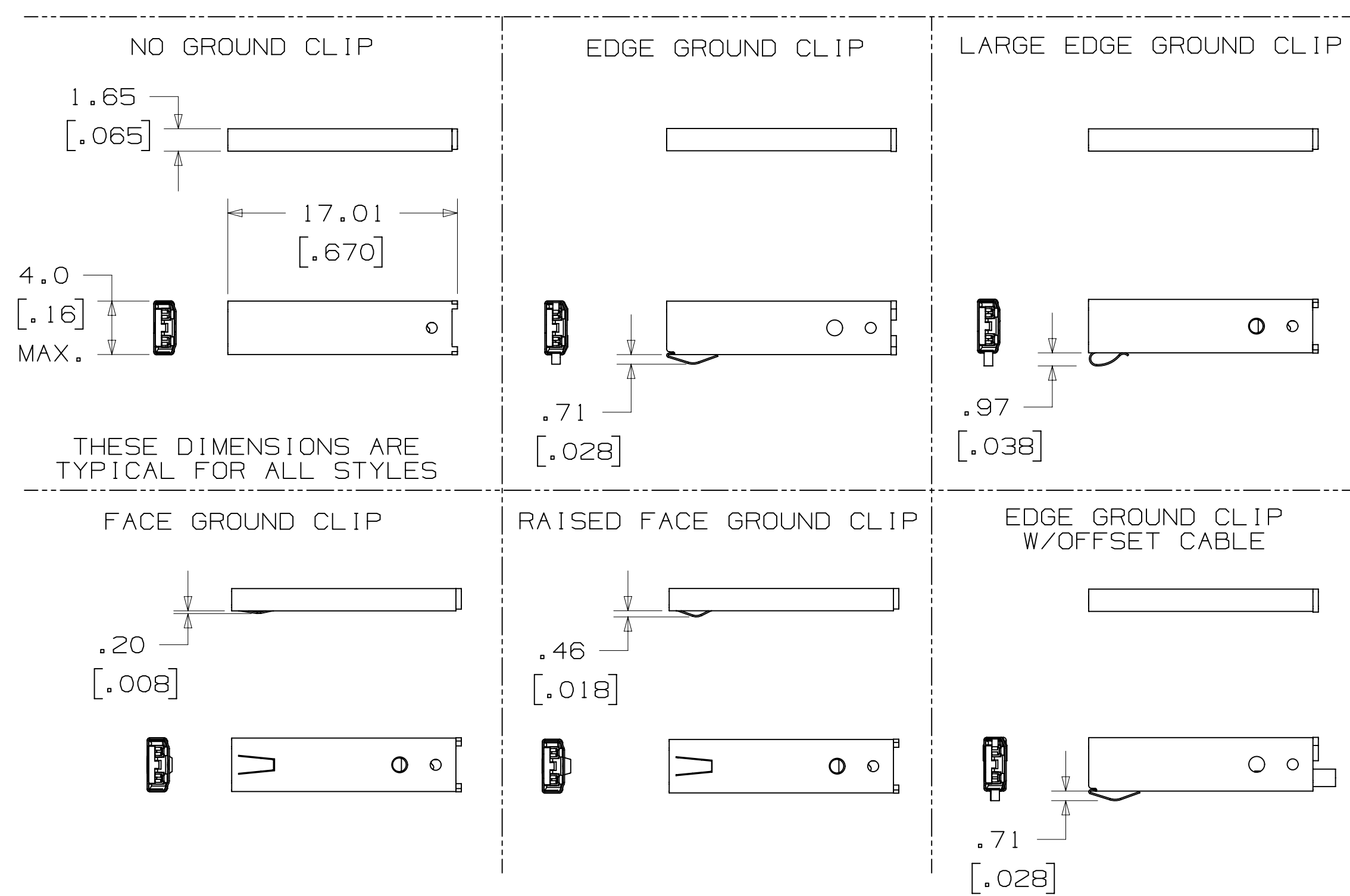
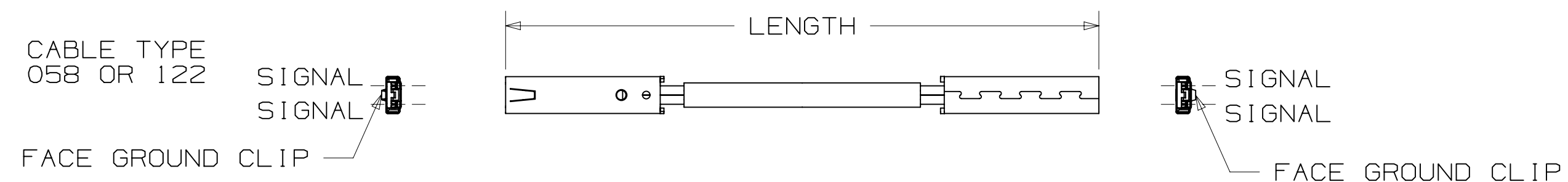
DUAL COAX CABLE ASSEMBLY W/EDGE GROUND CLIP, CONNECTOR TYPE #09



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



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



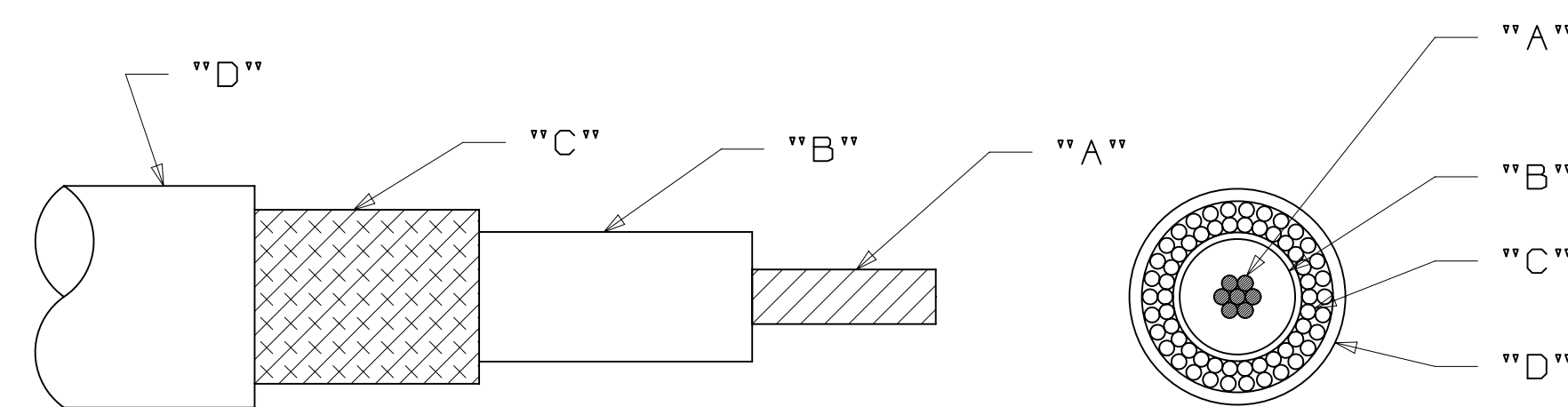
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D 36288		SEP 20, 2011		SEP 20, 2011		D
DIVISION		DIVISION CODE		DATE		
Interconnect Solutions		ISD		R. SCHERER		
DO NOT SCALE DRAWING	SCALE	TOLERANCES EXCEPT AS NOTED		3M		
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		.000 ± .005		3M Center St. Paul, MN 55144		
		.0000 ±		TITLE		
THIRD ANGLE PROJECTION		MILLIMETERS		2MM SCI HM 2X1, FOR TWINAX, COAX AND DUAL COAX, TS-2105		
		0		CAGE NUMBER		
INTERPRET PER ASME Y14.5 - 1994		.0 ± .3		D 78-5100-2105-4		
		.00 ± .13		DRAWING NO.		
MAX SURFACE ROUGHNESS		.000 ±		REV.		
UNFINISHED SURFACES		.000 ±		D		
MARKED ONLY		ANGLES		MODEL		
				96XXXX		
				SHT 2 OF 6		

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

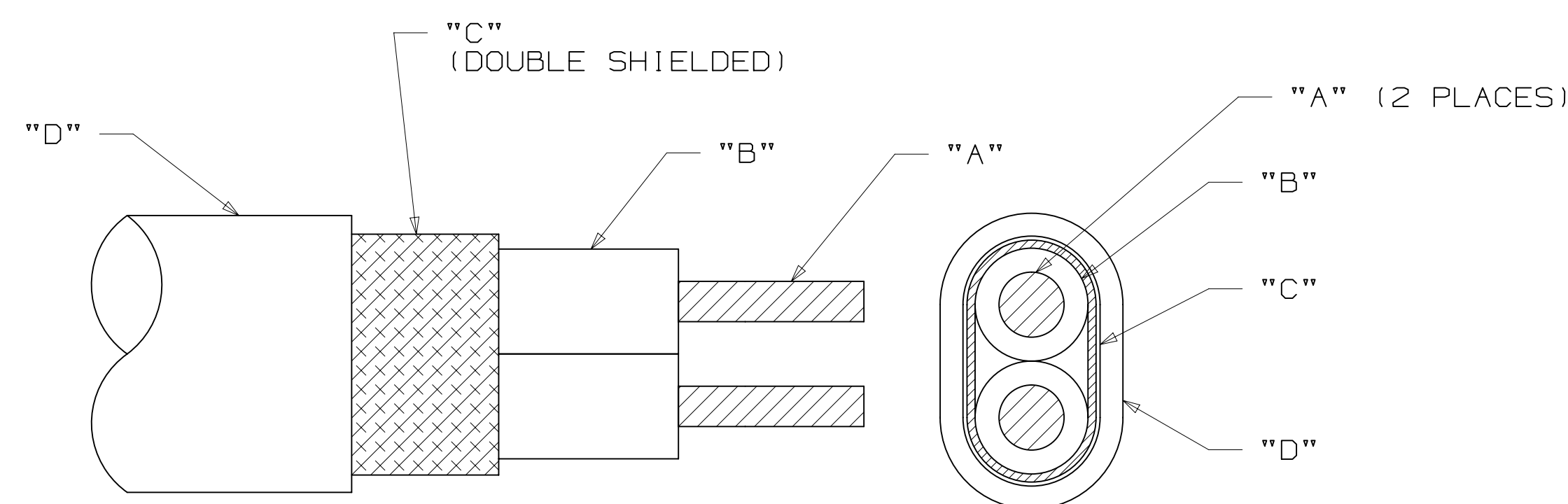
COAX PHYSICAL PROPERTIES (TYP)					
CABLE TYPE		"A" CENTER CONDUCTOR	"B" DIELECTRIC MATERIAL	"C" SHIELD	"D" JACKET
027 COAX BLUE	50 OHM	26 AWG SILVER PLATED COPPER (7/34) .48MM [ .019 ] OD	AIR / FEP	DUAL LAYER SILVER PLATED COPPER WIRE SERVED SHIELD	FEP 1.80MM [ .071 ] OD
105 COAX BLACK	50 OHM	28 AWG 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

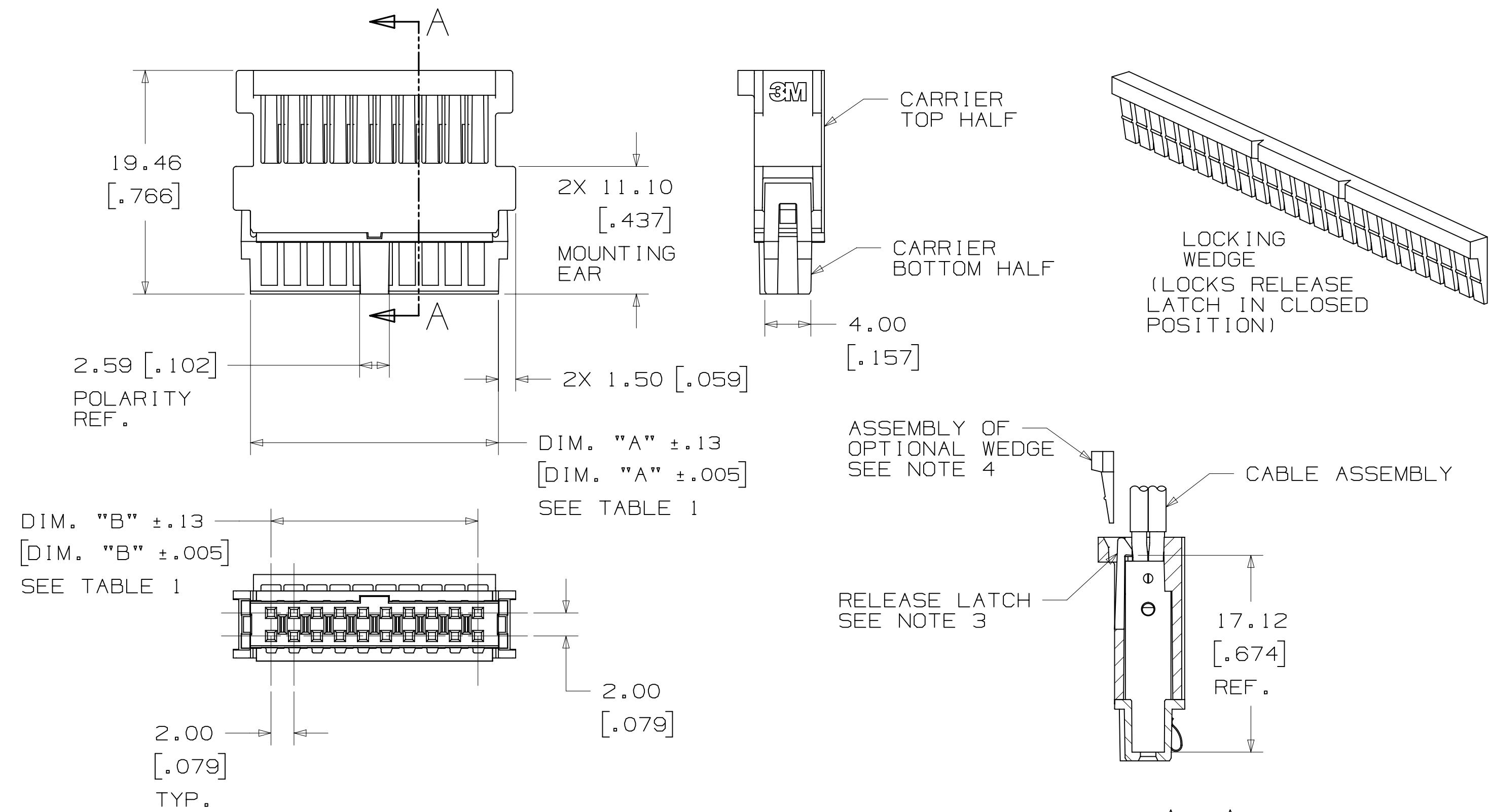


TWINAX ELECTRICAL PROPERTIES (TYP)				
CABLE TYPE		CAPACITANCE	PROPAGATION	ATTENUATION
058	100 OHM	39.4 pF/m [ 12 pF/ft ] MAX.	3.9 nS/m [ 1.18 nS/ft ] NOM.	10m @ 650 MHz [ -7.79 dB ]
122	85 OHM	45.9 pF/m [ 14 pF/ft ] MAX.	3.9 nS/m [ 1.18 nS/ft ] NOM.	CONTACT 3M TECHNICAL SUPPORT

DESIGN REFERENCE	NEXT ASSEMBLY	REV	ECO	ISSUE DATE AND DESCRIPTION	DRFT	CHKD
				NOV 08, 2011	JNC	RS
DISTRICT CODES		DRFT	CASTIGLIONE	DATE	DATE	DATE
		CHKD		SEP 20, 2011	APPV	SEP 20, 2011
DIVISION		DIVISION CODE		DATE		
Interconnect Solutions		ISD		R. SCHERER		
DO NOT SCALE DRAWING	SCALE	TOLERANCES EXCEPT AS NOTED				
		INCHES		© 3M COPYRIGHT 2011 This document and the information it contains are 3M property and may not be reproduced or further distributed without 3M permission, or used or disclosed other than for 3M authorized purposes. All rights reserved.		
		MILLIMETERS		TITLE 2MM SCI HM 2X1, FOR TWINAX, COAX AND DUAL COAX, TS-2105		
THIRD ANGLE PROJECTION		INTERPRET PER ASME Y14.5 - 1994		CAGE NUMBER D78-5100-2105-4		
MAX SURFACE ROUGHNESS		SURFACES		MODEL 96XXX		
		MARKED ONLY		REV. NUMBER D78-5100-2105-4 D		
		ANGLES		DET. YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> SHT 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 [0.298]	4.00 [0.157]
4	8	9.56 [0.377]	6.00 [0.236]
* 5	10	11.56 [0.455]	8.00 [0.315]
6	12	13.56 [0.534]	10.00 [0.394]
8	16	17.56 [0.692]	14.00 [0.551]
* 10	20	21.56 [0.849]	18.00 [0.709]
11	22	23.56 [0.928]	20.00 [0.787]
* 12	24	25.56 [1.006]	22.00 [0.866]
13	26	27.56 [1.085]	24.00 [0.945]
* 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

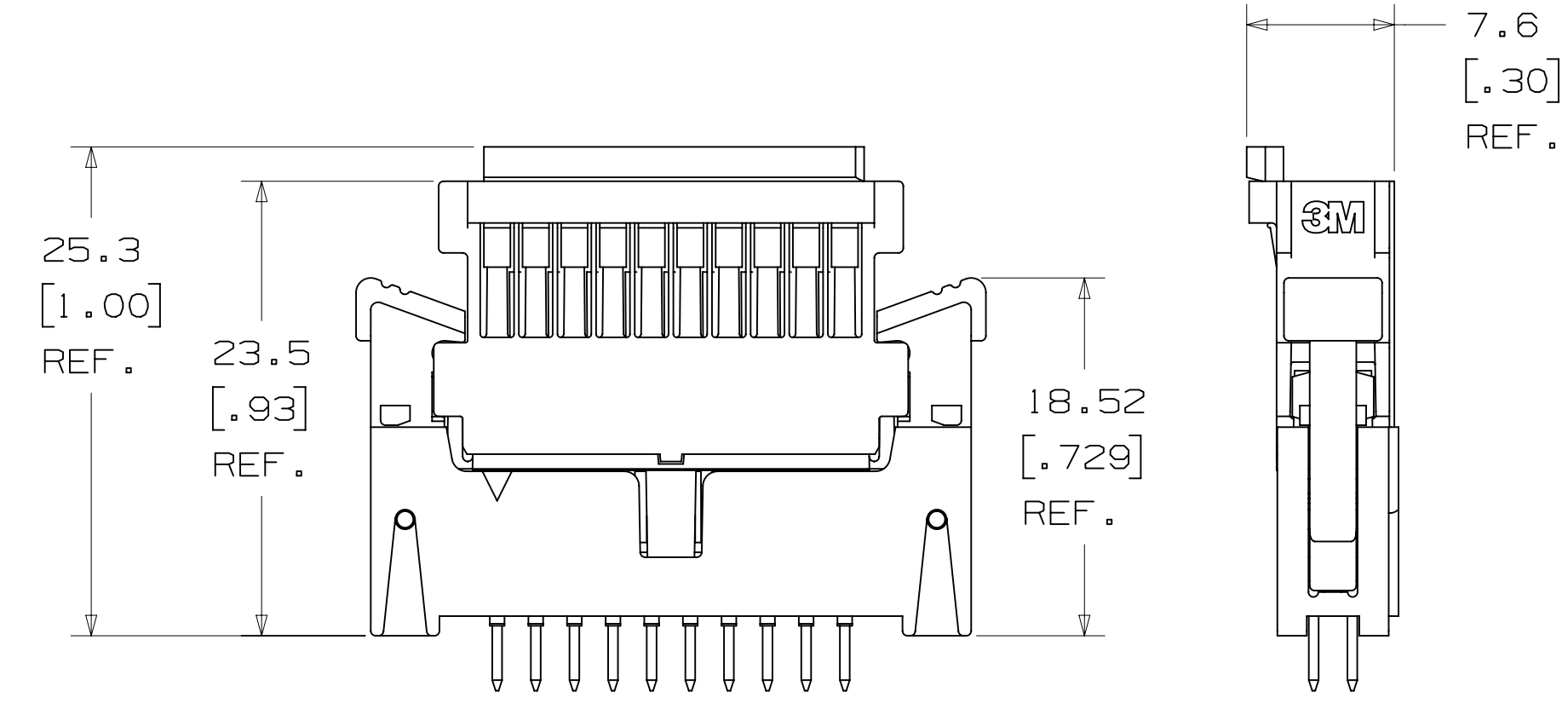
CARRIER: 93XX  
 CONTACT QTY. SEE TABLE 1

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

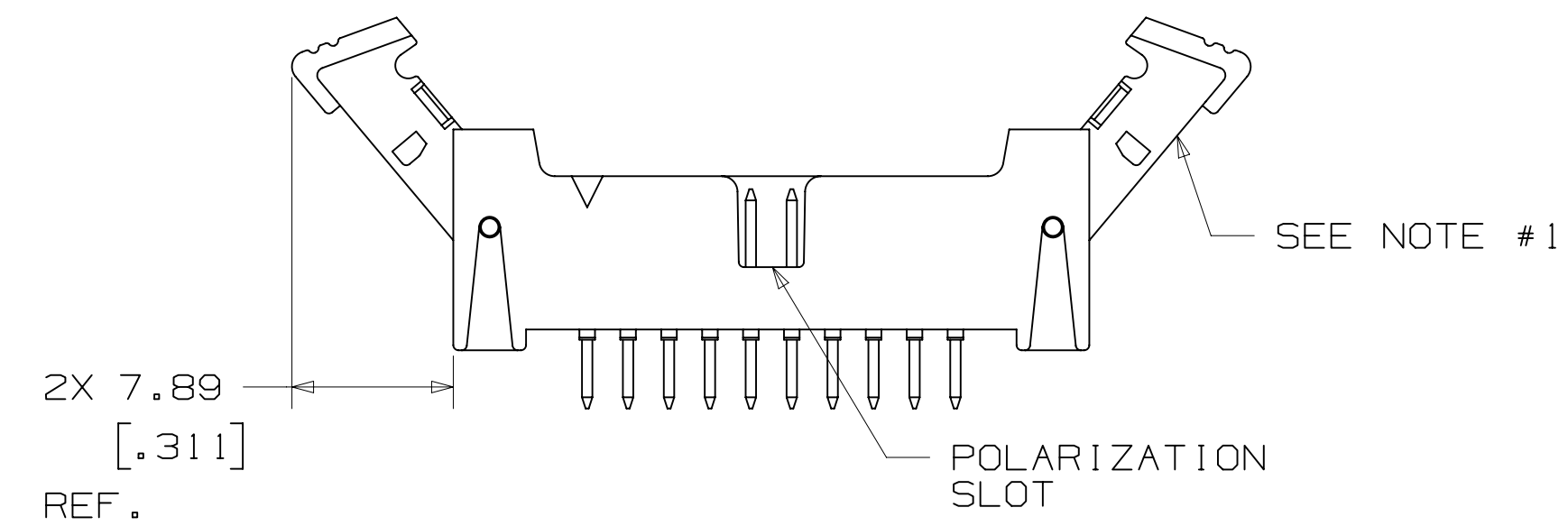
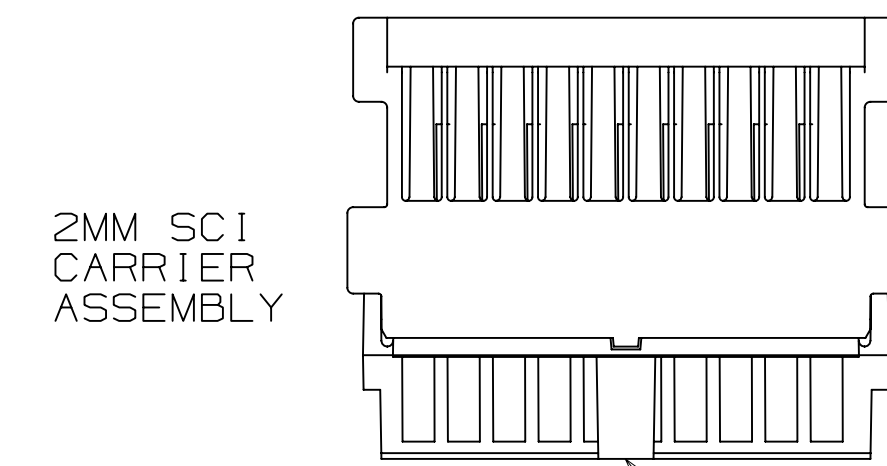
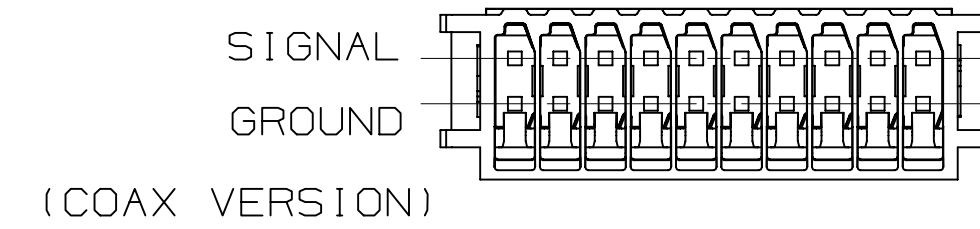
HEADER AND LATCH: 1552XX-X4XX  
 EJECTOR LATCH, SCI CARRIER

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

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



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



2 COMPATIBLE 2MM LATCH/EJECT HEADER

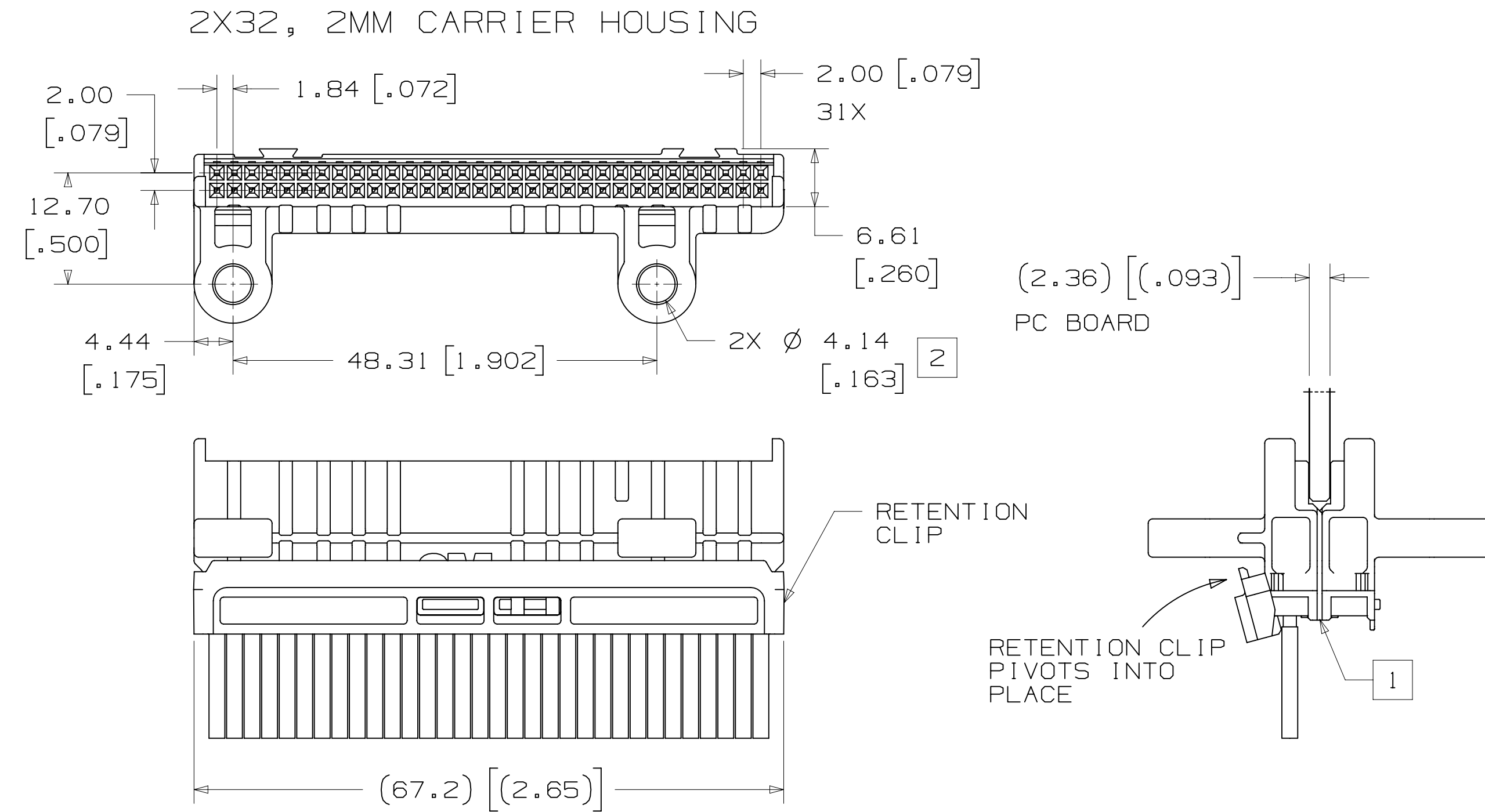
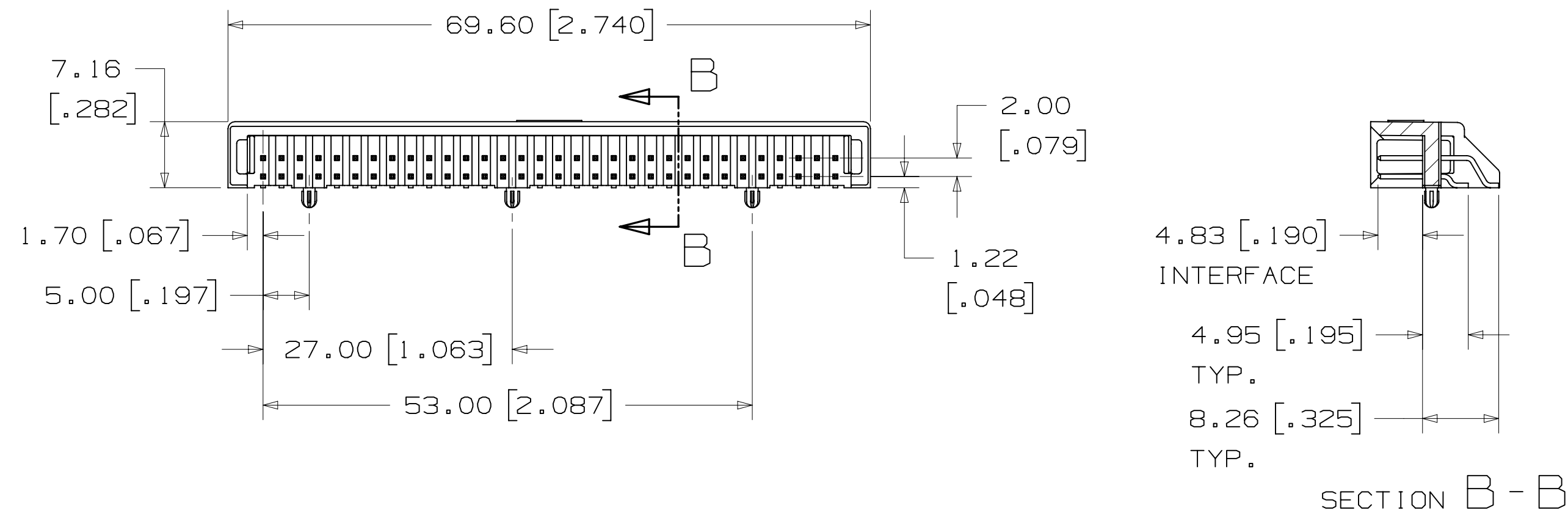
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				NOV 08, 2011	JNC	RS
DIVISION		DIVISION CODE		DATE		
Interconnect Solutions		ISD		SEP 20, 2011		
DO NOT SCALE DRAWING		TOLERANCES EXCEPT AS NOTED		DATE		
THIRD ANGLE PROJECTION		INCHES		DATE		
INTERPRET PER ASME Y14.5 - 1994		MILLIMETERS		DATE		
MAX SURFACE ROUGHNESS		ANGLES		DATE		
MARKED SURFACES		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

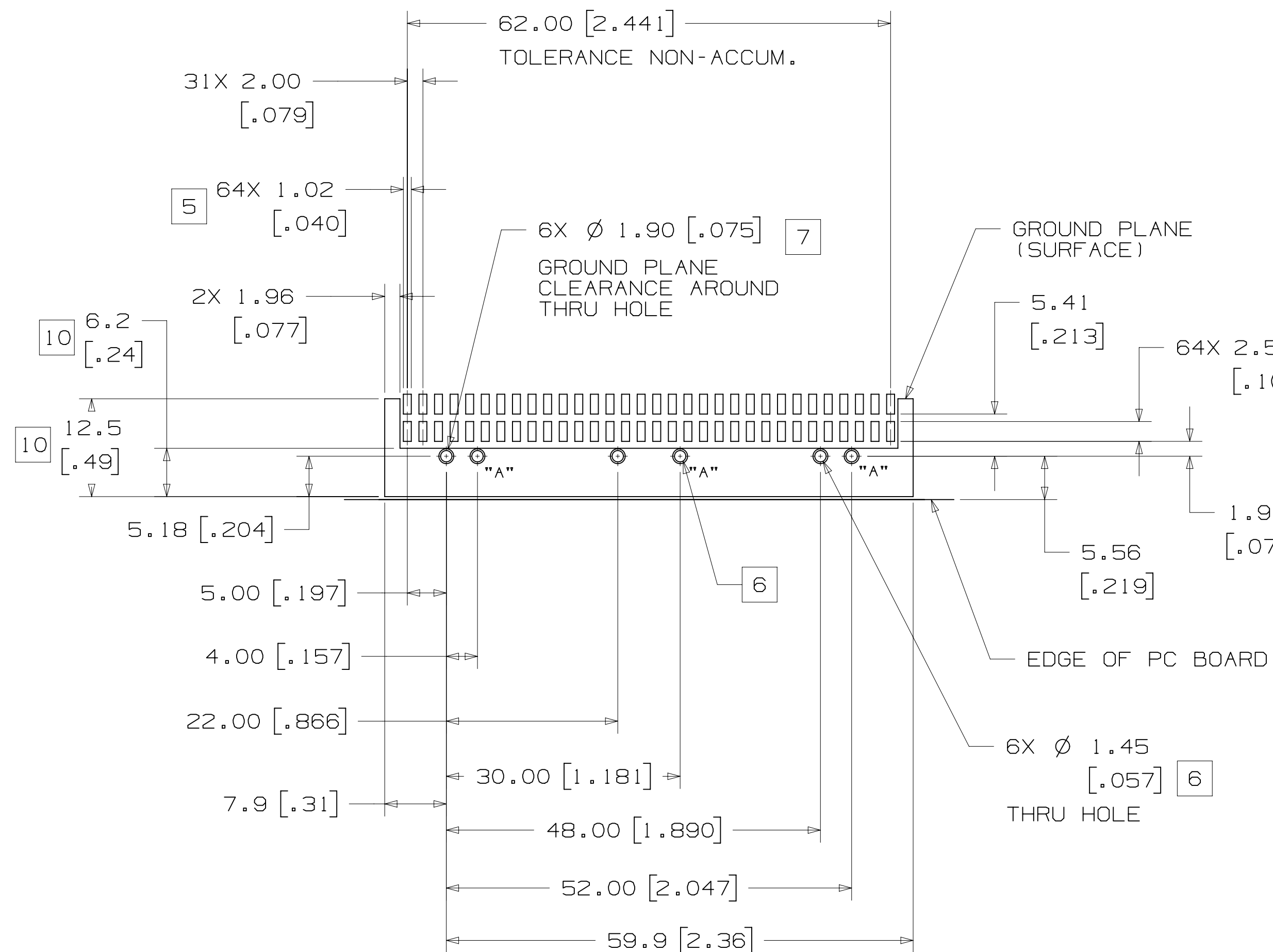
3M™ SHIELDED CONTROLLED IMPEDANCE (SCI) CABLE ASSEMBLIES  
 2MM HARD METRIC (HM) 2X1, FOR TWIN-AX, COAX AND DUAL COAX CABLE ASSEMBLIES

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

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



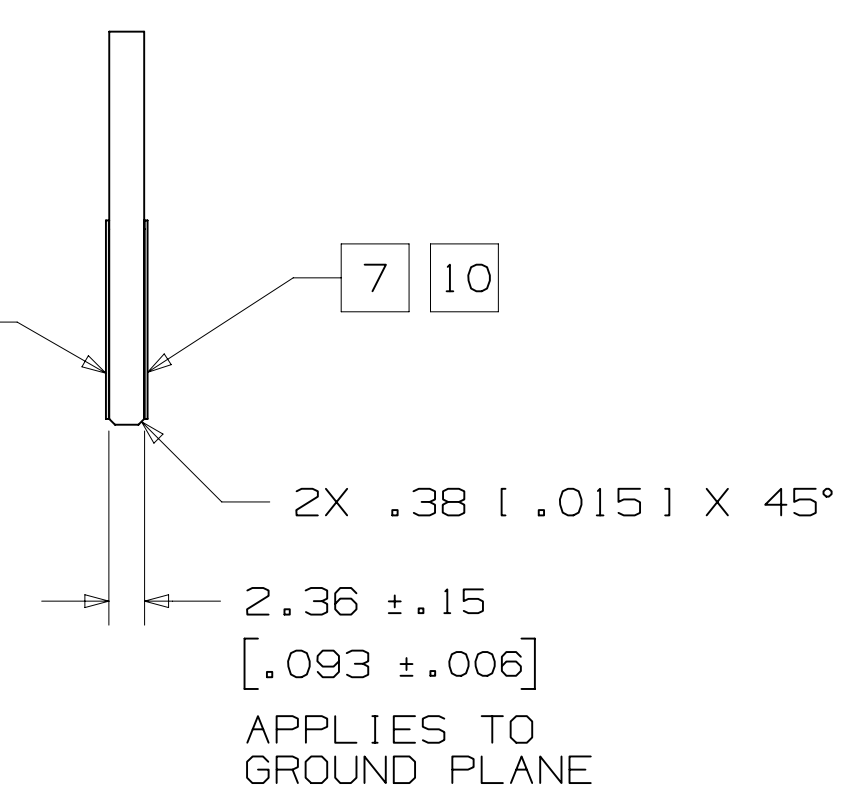
PCB LAYOUT GUIDELINES



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).

D	36288	NOV 08, 2011	JNC	RS
REV	ECO	ISSUE DATE AND DESCRIPTION	DRFT	CHKD
CHKD	CASTIGLIONE	SEP 20, 2011	DATE	DATE
APPR	R. SCHERER	DATE	DATE	DATE
DIVISION: Interconnect Solutions DIVISION CODE: ISD DO NOT SCALE DRAWING TOLERANCES EXCEPT AS NOTED INCHES: .00 ±.01, .000 ±.005, .0000 ± MILLIMETERS: 0 ±, .0 ±.3, .00 ±.13 INTERPRET PER ASME Y14.5 - 1994 MAX SURFACE ROUGHNESS: 1.6 µm (32 RMS) UNLESS OTHERWISE SPECIFIED MARKED SURFACES: MARKED ONLY ANGLE: 45° UNLESS OTHERWISE SPECIFIED				
TITLE: 2MM SCI HM 2X1, FOR TWINAX, COAX AND DUAL COAX, TS-2105 CAGE NUMBER: D78-5100-2105-4 MODEL: 98XXXX DET: [ ] YES [X] NO SHT 5 OF 6				

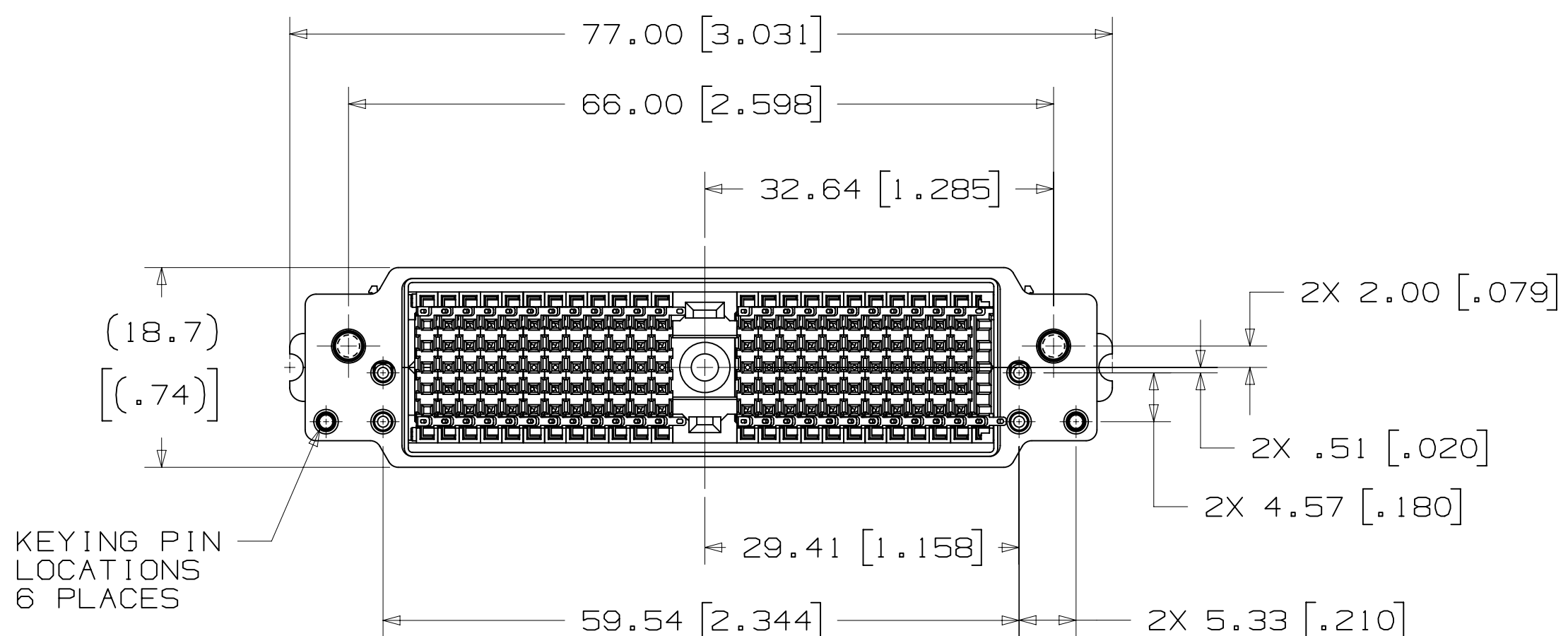
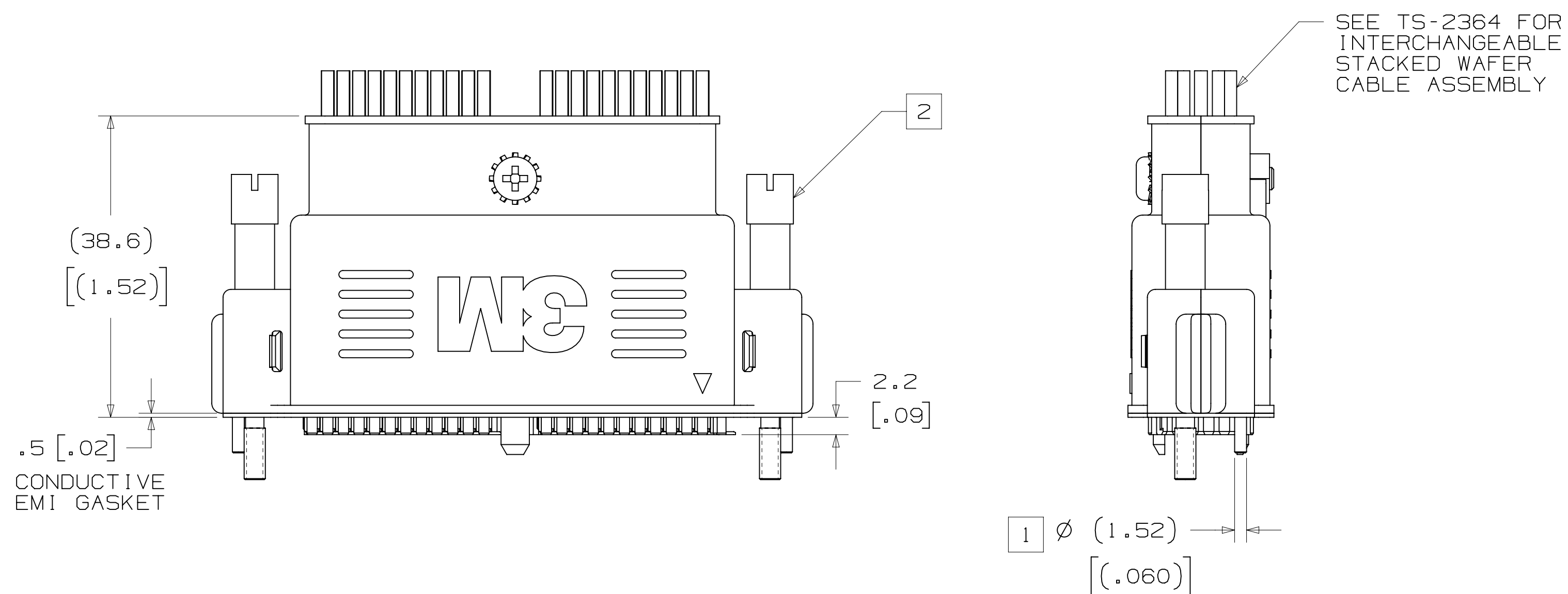
78-5100-2105-4  
DRAWING NUMBER

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

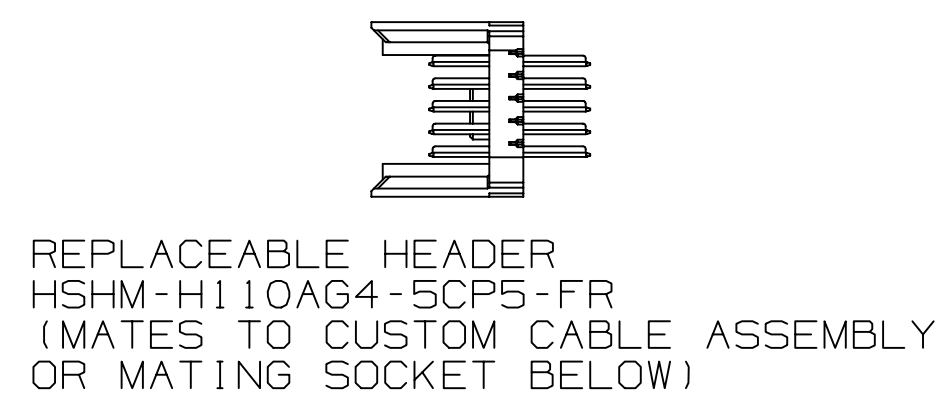
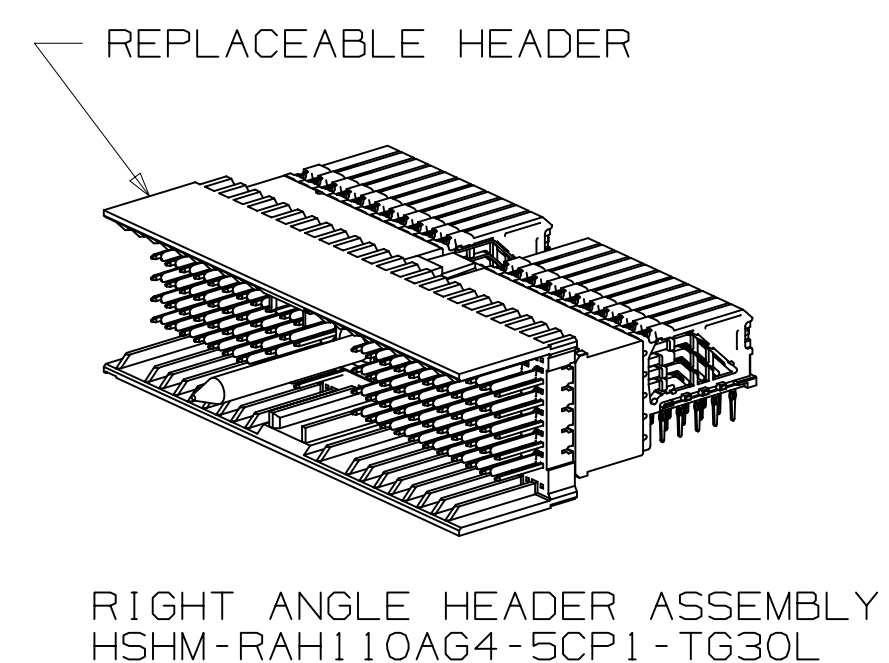
NOTES

- 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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DESIGN REFERENCE	NEXT ASSEMBLY	REV	ECO	ISSUE DATE AND DESCRIPTION	DRFT	CHKD
				NOV 08, 2011	JNC	RS
DISTRICT CODES		DRFT	CASTIGLIONE	DATE	MFG	DATE
		CHKD		SEP 20, 2011	R. SCHERER	SEP 20, 2011
DIVISION		DIVISION CODE				
Interconnect Solutions		ISD				
DO NOT SCALE DRAWING	SCALE	TOLERANCES EXCEPT AS NOTED				
		INCHES				
		.00 ± .01				
		.000 ± .005				
		.0000 ±				
		MILLIMETERS				
		0 ±				
		.0 ± .3				
		.00 ± .13				
		.000 ±				
		ANGLES				
		MARKED ONLY				
INTERPRET PER ASME Y14.5 - 1994		CAGE NUMBER				
		D 78-5100-2105-4				
		REV. D				
		MODEL 98XXXX				
		DET [ ] YES [X] NO [ ] SHT 6 OF 6				

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