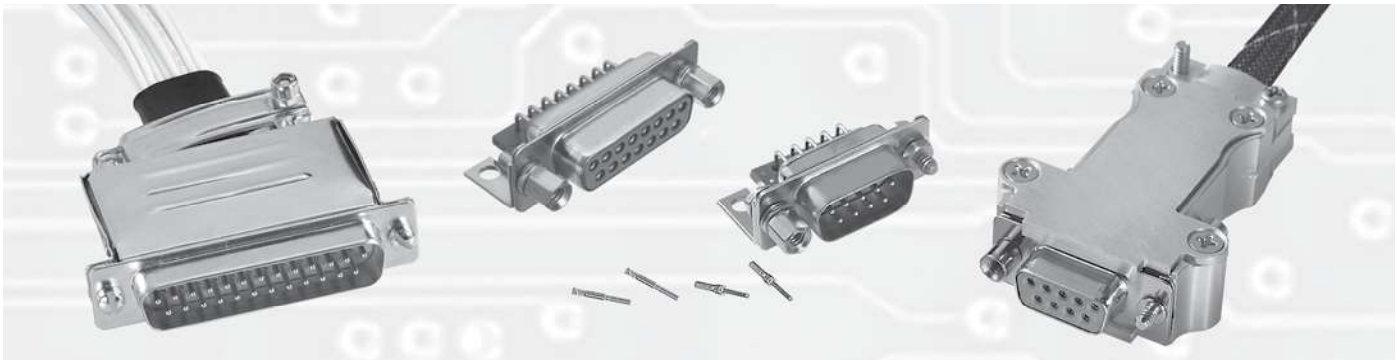
SND SERIES
MILITARY / SPACE FLIGHT QUALITY
STANDARD DENSITY FIXED OR REMOVABLE CONTACTS

High Performance D-sub



- High performance for use in harsh environments, including space flight.
- Size 20 fixed or removable contacts.
- Female closed entry contacts utilize the "PosiBand®" system. See page 1 for details. GSFC S-311-P-4/10 offers two contact engagement test options. Size 20 PosiBand contacts meet the higher 40 gram requirements per 4.2.2.b.
- Five connector variants include 9, 15, 25, 37, and 50 contacts.
- Terminations include cable or wire crimp and solder, straight and right angle PCB mount.
- Current ratings: signal level to 18 amperes. See temperature rise curves on page 2 for details.
- A wide variety of options and accessories.
- Applicable variants are qualified to GSFC and military specifications. See page 100 for details.

Conforming To Applicable Material, Dimensional and Performance Requirements:
- GSFC S-311-P4 & GSFC S-311-P10
- MIL-DTL-24308 Class M

Conforming To Outgassing Requirements:
- ASTM E-595 & NASA-RP-1124

TECHNICAL CHARACTERISTICS

MATERIALS AND FINISHES:

Connector Insert: Glass-filled DAP per ASTM-D-5948, Type SDG-F, UL 94V-0, ASTM E-595, NASA-RP-1124, green color.

Contacts: Precision machined copper alloy. 0.000050 inch [1.27 microns] gold over copper plate. Other finishes are available; see page 97.

Connector Housing (Shells): Brass with 0.000050 inch [1.27 microns] gold over copper plate.

Mounting Spacers and Brackets: Brass with 0.000050 inch [1.27 microns] gold over copper plate.

Push-On Fasteners: Phosphor bronze or beryllium copper with 0.000050 inch [1.27 microns] gold over copper plate.

Jackscrew Systems: Brass with 0.000050 inch [1.27 microns] gold over copper plate.

Cable Adapter (Hood): Brass with 0.000050 inch [1.27 microns] gold over copper plate; aluminum with electroless nickel plate. Other finishes available, contact Technical Sales.

MECHANICAL CHARACTERISTICS:

Contacts:

Size 20 Fixed: Male contact 0.040 inch [1.02 mm] mating diameter. Female contact - PosiBand closed entry design; *see page 1 for details.*

Size 20 Removable: Install contact to rear face of connector insert and remove from rear face of connector insert. Size 20 contact, male contact 0.040 inch [1.02 mm] mating diameter. Female contact - PosiBand closed entry design; *see page 1 for details. For removable size 20 contacts, see pages 81 & 82.*

continued on next page. . . .

DIMENSIONS ARE IN INCHES [MILLIMETERS].
ALL DIMENSIONS ARE SUBJECT TO CHANGE.

TECHNICAL CHARACTERISTICS, *continued*

continued from previous page. . . .

MECHANICAL CHARACTERISTICS, continued:

Contact Retention in Connector Insert: 9 lbs. [40 N].

Resistance to Solder Iron Heat: 650˚F [350˚C] for 10 seconds duration per IEC 60512-6, solder cup contacts.

Contact Terminations: Removable, closed barrel crimp - wire sizes 18 AWG [1.0 mm²] through 30 AWG [0.05 mm²].

Removable, closed barrel solder - wire size 20 AWG [0.5 mm²] maximum; *see page 82 for details.*

Fixed, solder cup - wire size 20 AWG [0.5 mm²] maximum; *see page 8 for details.*

Straight solder printed board mount - 0.028 inch [0.71 mm] termination diameter and 0.024 inch [0.61 mm] termination diameter.

Right angle (90º) printed board mount - 0.028 inch [0.71 mm] termination diameter for Inch System footprint, and 0.024 inch. [0.64 mm] termination diameter for European Metric footprint.

Straight printed circuit board mount, compliant press-fit, see page 10.

Connector Housing (Shells): Male connector housings may be dimpled for EMI/ESD ground paths.

Polarization: Trapezoidally-shaped connector housings and polarized jackscrews.

Mounting to Angle Brackets: Jackscrews and riveted fasteners with 0.120 inch [3.05 mm] clearance hole, and threaded riveted fasteners with 4-40 thread and polyester lock inserts.

Mounting to Printed Board: Rapid installation push-on fasteners and mounting posts.

Locking Systems: Jackscrews.

Mechanical Operations: 1,000 operations minimum per IEC 60512-5.

ELECTRICAL CHARACTERISTICS:

Contact Current Rating, Tested per UL 1977:

18 amperes, 2 contacts energized.
14 amperes, 6 contacts energized.
11 amperes, 15 contacts energized.
10 amperes, 25 contacts energized.
9 amperes, 50 contacts energized.

See temperature rise curves on page 2 for details.

Initial Contact Resistance: 0.004 ohms, maximum.

Proof Voltage: 1,000 V r.m.s.

Insulation Resistance: 5 G ohms.

Clearance and Creepage Distance: 0.039 inch [1.0 mm], minimum.

Working Voltage: 300 V r.m.s.

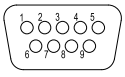
CLIMATIC CHARACTERISTICS:

Temperature Range: -55˚C to +125˚C.

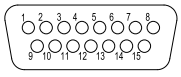
Damp Heat, Steady State: 21 days.

CONTACT VARIANTS

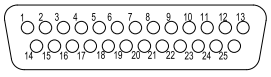
FACE VIEW OF MALE OR REAR VIEW OF FEMALE



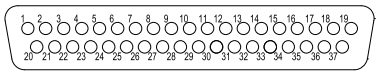
SND 9



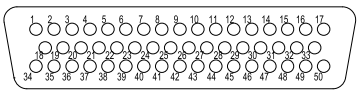
SND 15



SND 25



SND 37

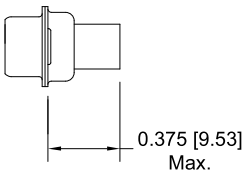


SND 50

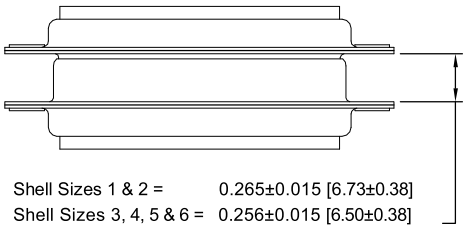
For information regarding **REMOVABLE CONTACTS,** see contact illustration drawings and charts on pages 79-87.

STANDARD CONNECTOR HOUSING (SHELLS) ASSEMBLY

CRIMP REMOVABLE

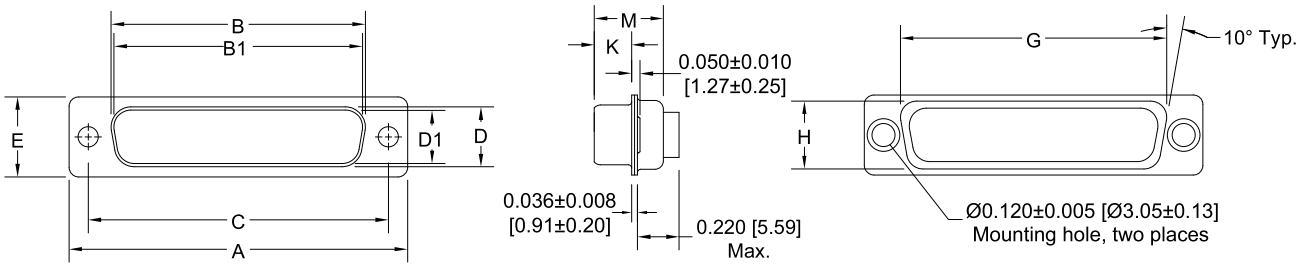


RECOMMENDED MATING DIMENSIONS

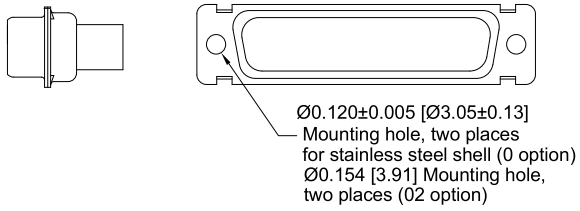


Shell Sizes 1 & 2 = 0.265±0.015 [6.73±0.38]
Shell Sizes 3, 4, 5 & 6 = 0.256±0.015 [6.50±0.38]

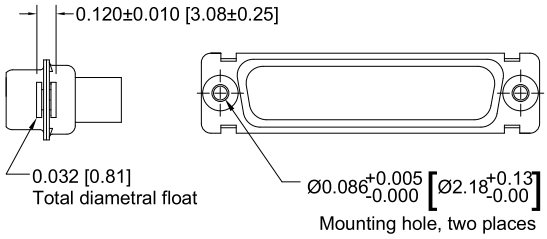
BOARD MOUNT



OPTIONAL CONNECTOR HOUSING ASSEMBLY (0. 02)



OPTIONAL CONNECTOR HOUSING ASSEMBLY WITH UNIVERSAL FLOAT MOUNTS (F)



CONNECTOR VARIANT SIZES	GENDER	A ±0.015 [0.38]	B ±0.005 [0.13]	B1 ±0.005 [0.13]	C ±0.005 [0.13]	D ±0.005 [0.13]	D1 ±0.005 [0.13]	E ±0.015 [0.38]	G ±0.010 [0.25]	H ±0.010 [0.25]	K ±0.005 [0.13]	M ±0.010 [0.25]
SND 9 *(SHELL SIZE 1)*	MALE	1.213 [30.81]		0.666 [16.92]	0.984 [24.99]		0.329 [8.36]	0.494 [12.55]	0.759 [19.28]	0.422 [10.72]	0.233 [5.92]	0.422 [10.72]
	FEMALE	1.213 [30.81]	0.643 [16.33]		0.984 [24.99]	0.311 [7.90]		0.494 [12.55]	0.759 [19.28]	0.422 [10.72]	0.243 [6.17]	0.429 [10.90]
SND 15 *(SHELL SIZE 2)*	MALE	1.541 [39.14]		0.994 [25.25]	1.312 [33.32]		0.329 [8.36]	0.494 [12.55]	1.083 [27.51]	0.422 [10.72]	0.233 [5.92]	0.422 [10.72]
	FEMALE	1.541 [39.14]	0.971 [24.66]		1.312 [33.32]	0.311 [7.90]		0.494 [12.55]	1.083 [27.51]	0.422 [10.72]	0.243 [6.17]	0.429 [10.90]
SND 25 *(SHELL SIZE 3)*	MALE	2.088 [53.04]		1.534 [38.96]	1.852 [47.04]		0.329 [8.36]	0.494 [12.55]	1.625 [41.28]	0.422 [10.72]	0.230 [5.84]	0.426 [10.82]
	FEMALE	2.088 [53.04]	1.511 [38.38]		1.852 [47.04]	0.311 [7.90]		0.494 [12.55]	1.625 [41.28]	0.422 [10.72]	0.243 [6.17]	0.429 [10.90]
SND 37 *(SHELL SIZE 4)*	MALE	2.729 [69.32]		2.182 [55.42]	2.500 [63.50]		0.329 [8.36]	0.494 [12.55]	2.272 [57.71]	0.422 [10.72]	0.230 [5.84]	0.426 [10.82]
	FEMALE	2.729 [69.32]	2.159 [54.84]		2.500 [63.50]	0.311 [7.90]		0.494 [12.55]	2.272 [57.71]	0.422 [10.72]	0.243 [6.17]	0.429 [10.90]
SND 50 *(SHELL SIZE 5)*	MALE	2.635 [66.93]		2.079 [52.81]	2.406 [61.11]		0.441 [11.20]	0.605 [15.37]	2.178 [55.32]	0.534 [13.56]	0.230 [5.84]	0.426 [10.82]
	FEMALE	2.635 [66.93]	2.064 [52.43]		2.406 [61.11]	0.423 [10.74]		0.605 [15.37]	2.178 [55.32]	0.534 [13.56]	0.243 [6.17]	0.429 [10.90]

DIMENSIONS ARE IN INCHES [MILLIMETERS].
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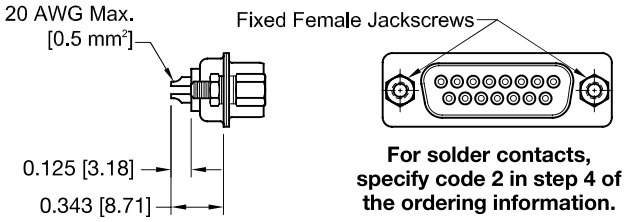
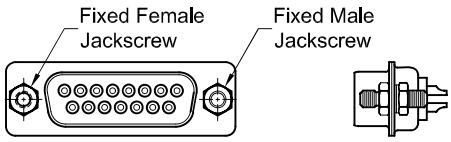
SOLDER CUP TERMINATION

CODE 2



For solder contacts, specify code 2 in step 4 of the ordering information.

TYPICAL PART NUMBER:
SND15M200T2G



Fixed male and female polarized jackscrews available. Specify Code T6 in step 7 of ordering information.

TYPICAL PART NUMBER:
SND15M200T6G

SND15S5R70T2G
(shown left)

SND25M10H0G
(shown middle)

SND9M000G with MC6020M contacts
(shown right)

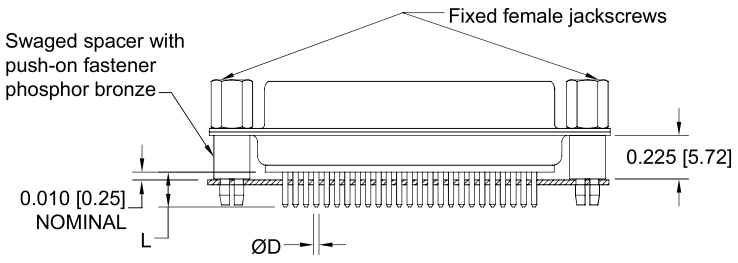
STRAIGHT SOLDER PRINTED BOARD MOUNT TERMINATION

CODE 3, 32 AND 36

*1 CODE NUMBER	L	ØD
3	0.170 [4.32]	0.028 [0.71]
32	0.375 [9.53]	0.028 [0.71]
36	0.236 [6.00]	0.024 [0.61]

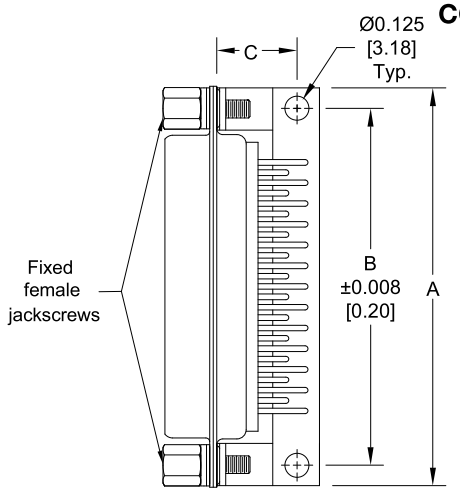
NOTE:

*1 Contact termination code as specified in Step 4 of ordering information.

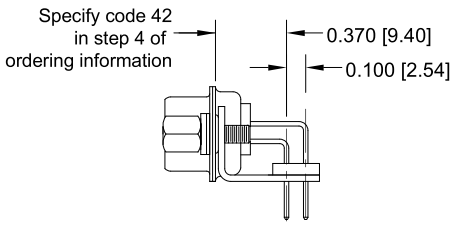


TYPICAL PART NUMBER:
SND25S3S60TG

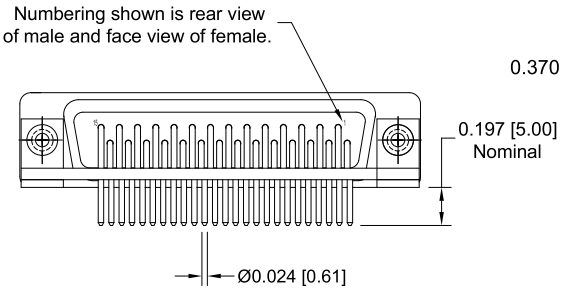
RIGHT ANGLE (90°) PRINTED BOARD MOUNT TERMINATION
CODE 42, 0.370 [9.40] CONTACT EXTENSION

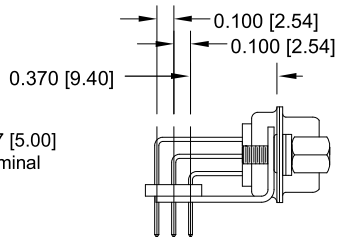


SND**42**** 0.370 [9.40] CONTACT EXTENSION			
PART NUMBER	A	B	C
SND9*42****	1.204 [30.58]	0.984 [24.99]	0.420 [10.67]
SND15*42****	1.532 [38.91]	1.312 [33.32]	0.420 [10.67]
SND25*42****	2.072 [52.63]	1.852 [47.04]	0.420 [10.67]
SND37*42****	2.720 [69.09]	2.500 [63.50]	0.420 [10.67]
SND50*42****	2.626 [66.70]	2.406 [61.11]	0.470 [11.94]



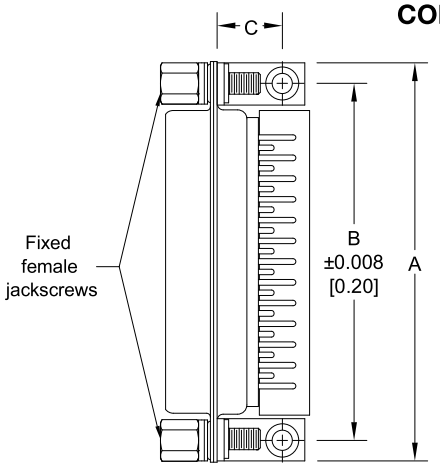
TYPICAL PART NUMBER:
SND25M42B30T2G



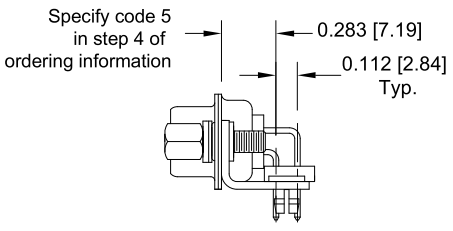


TYPICAL PART NUMBER:
SND50M42B30TG

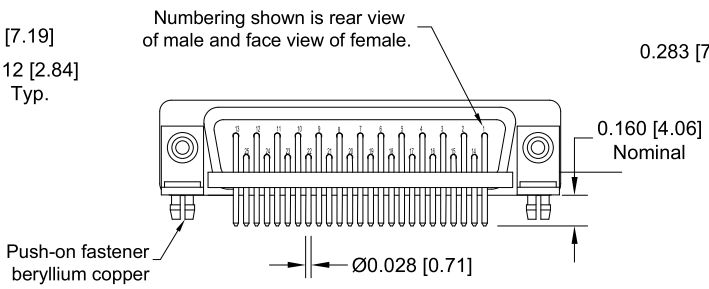
RIGHT ANGLE (90°) PRINTED BOARD MOUNT TERMINATION
CODE 5, 0.283 [7.19] CONTACT EXTENSION

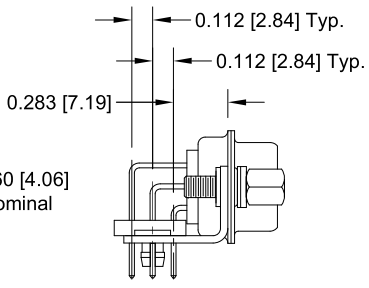


SND**5**** 0.283 [7.19] CONTACT EXTENSION			
PART NUMBER	A	B	C
SND9*5****	1.204 [30.58]	0.984 [24.99]	0.339 [8.61]
SND15*5****	1.532 [38.91]	1.312 [33.32]	0.339 [8.61]
SND25*5****	2.072 [52.63]	1.852 [47.04]	0.339 [8.61]
SND37*5****	2.720 [69.09]	2.500 [63.50]	0.339 [8.61]
SND50*5****	2.626 [66.70]	2.406 [61.11]	0.395 [10.03]



TYPICAL PART NUMBER:
SND25M5R7NT2G





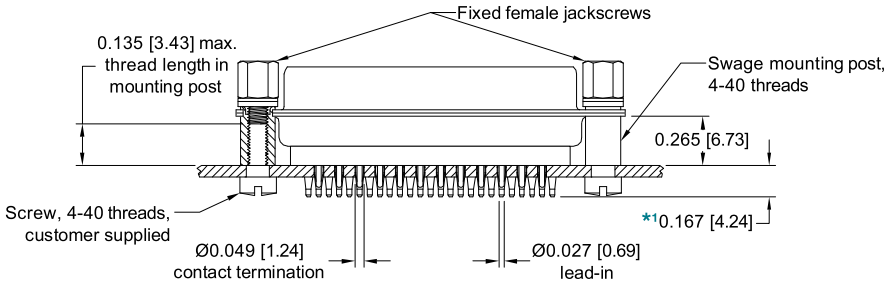
TYPICAL PART NUMBER:
SND50S5R7NTG

DIMENSIONS ARE IN INCHES [MILLIMETERS].
ALL DIMENSIONS ARE SUBJECT TO CHANGE.

STRAIGHT COMPLIANT PRESS-FIT TERMINATION

CODE 97

Positronic recommends the practice of using mounting hardware to secure connector to printed circuit board.



TYPICAL PART NUMBER: SND25S97000G

Detail of
Omega contacts

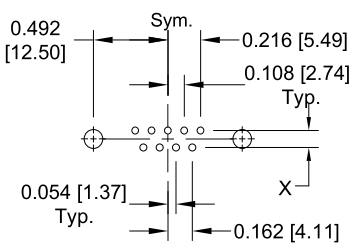
For straight compliant press-fit contacts, specify code 97 in step 4 of ordering information.

NOTE:

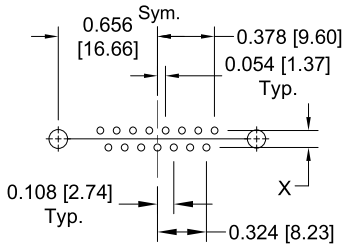
*1 The effective length of the compliant section may also be varied (longer or shorter) and can be selectively positioned and centered at several points along the contact termination length, permitting high or low profile mounting of the connector on printed boards.

RIGHT ANGLE (90°) AND STRAIGHT SOLDER PRINTED BOARD CONTACT HOLE PATTERN

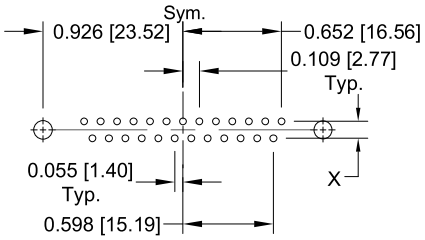
HOLE IDENTIFICATION SHOWN FOR MALE CONNECTOR; USE MIRROR IMAGE FOR FEMALE CONNECTOR.
MOUNT CONNECTOR WITH MATING FACE POSITIONED TO FOLLOW DIRECTION OF ARROWS.



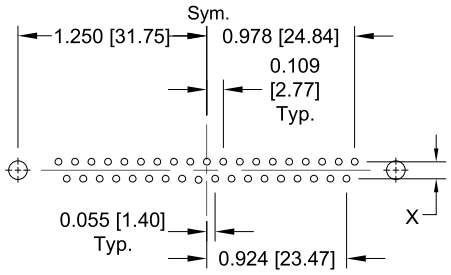
SND9



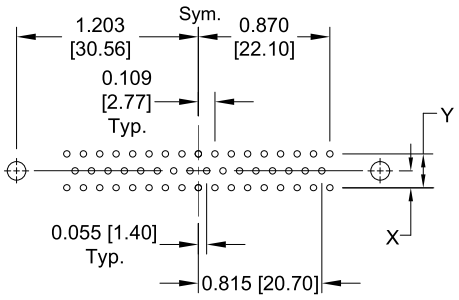
SND15



SND25



SND37



SND50

*1 CODE NUMBER	X	Y
3	0.112 [2.84]	0.224 [5.69]
5		
32		
36		
*2 42	0.100 [2.54]	0.200 [5.08]

NOTE:

*1 Contact termination code as specified in Step 4 of ordering information.

*2 Metric system, European contact hole pattern.

SUGGESTED PRINTED BOARD HOLE SIZES:

Suggest 0.039 [0.99] Ø hole for 0.024 [0.61] Ø contact termination positions.
Suggest 0.045 [1.14] Ø hole for 0.028 [0.71] Ø contact termination positions.
Suggest 0.123 ±0.003 [3.12 ±0.08] Ø hole for mounting connector with push-on fasteners.

DIMENSIONS ARE IN INCHES [MILLIMETERS].
ALL DIMENSIONS ARE SUBJECT TO CHANGE.

REMOVABLE CONTACT ORDERING ASSISTANCE CHART

SND SERIES
CRIMP AND SOLDER CONTACT TERMINATIONS

TYPE	PAGE NUMBER REFERENCE IN CATALOG	CONTACT SIZE	FEMALE PART NUMBER	MALE PART NUMBER	WIRE SIZE AWG [mm²]
CRIMP	see page 81 for additional information	20	FC6020M2	MC6020M	20 / 22 / 24 [0.5 / 0.3 / 0.25]
			FC6026M2	MC6026M	26 / 28 / 30 [0.12 / 0.0 8 / 0.05]
	see page 82 for additional information		FC6018M2	MC6018M	18 [1.0] max.
SOLDER	see page 82 for additional information	20	FS6020M2	MS6020M	20 [0.5] max.

NOTE: For ordering crimp contacts on reels, add "R" to part number, see page 79 for details.
Examples: FC6020M2R or MC6020MR

The PosiBand® contact system has many advantages over the legacy split tine design.

- ✗ **PosiBand** is more robust than split tine, which can be pried open in harsh environments, resulting in reduced normal force and degradation of electrical performance.
- ✗ **PosiBand** has greater surface area at the male and female contact interface, resulting in more consistent electrical performance.
- ✗ **PosiBand** has lower average insertion forces, resulting in greater ease in mating, especially in larger high density connectors. The average lower insertion force is accomplished while meeting or exceeding performance requirements.
- ✗ The **PosiBand's** main contact body does not require annealing of the crimp barrels, as does the split tine design. This eliminates concern of unintentionally heat-treating the mating end of the contact, which can cause electrical failure.
- ✗ **PosiBand** is qualified under **SAE AS39029** specification. **PosiBand** is also qualified under **GSFC S-311-P4** to the higher 40 gram contact engagement test requirement.

FC8022M2. Deconstructed contact shown for reference only.

For more information on PosiBand closed entry contacts, see page 1 & 2.

For information regarding **REMOVABLE CONTACTS,** see contact illustration drawings and charts on pages 79-87.

For information regarding CRIMP TOOLS & CRIMPING TOOL TECHNIQUES, see page 98.

ORDERING INFORMATION - CODE NUMBERING SYSTEM

Specify Complete Connector By Selecting An Option From Step 1 Through 8

STEP	1	2	3	4	5	6	7	8	—	9
EXAMPLE	SND	37	S	5	B3	0	T2	G		

STEP 1 - BASIC SERIES
SND series

STEP 2 - CONNECTOR VARIANTS
9, 15, 25, 37, 50

STEP 3 - CONNECTOR GENDER

M - Male
S - Female - PosiBand closed entry contacts, *see page 1 for more information.*

STEP 4 - CONTACT TERMINATION TYPE

0 - Contacts ordered separately, *see contact chart on page 12 for details.*
1 - Crimp, 20 AWG - 24 AWG [0.5 mm^2 - 0.25 mm^2].
12 - Crimp, 26 AWG - 30 AWG [0.12 mm^2 - 0.05 mm^2].
2 - Fixed, solder cup.
3 - Solder, straight printed board mount with 0.170 [4.32] tail length.
32 - Solder, straight printed board mount with 0.375 [9.52] tail length.
36 - Solder, straight printed board mount with 0.236 [5.99] tail length.
42 - Solder, metric system right angle (90˚) printed board mount with 0.370 [9.40] contact extension.
5 - Solder, right angle (90˚) printed board mount with 0.283 [7.19] contact extension.
97 - Straight printed circuit board mount, compliant press-fit

*1 STEP 5 - MOUNTING STYLE

0 - Mounting hole, 0.120[3.05] Ø.
*2 02 - Mounting hole, 0.154[3.91] Ø.
C5 - Swaged spacer, cul-de-sac style, 4-40 threads, 0.350 [8.89] length. For use with cable connectors only.
C7 - Bracket, mounting,right angle (90˚) metal, swaged to connector with cul-de-sac spacer and 4-40 threads with cross bar.
F - Float mounts, universal.
P - Threaded post, brass, length varies according to contact termination code. See page 91.
R2 - Bracket, mounting, right angle (90˚) metal, swaged to connector with 4-40 thread fixed female jackscrews with cross bar.
R6 - Bracket, mounting, right angle (90˚) metal, swaged to connector with 0.120 [3.05] Ø mounting hole with cross bar.
R7 - Bracket, mounting, right angle (90˚) metal, swaged to connector with 4-40 threads with cross bar.
R8 - Bracket, mounting, right angle (90˚) metal, swaged to connector with 4-40 locknut with cross bar.
S - Swaged spacer, 4-40 threads, length varies according to contact termination code. See page 90.
S2 - Swaged spacer, 4-40 threads, 0.125[3.18] length.
S5 - Swaged locknut, 4-40 threads.
S6 - Swaged spacer with push-on fastener, 4-40 threads, length varies according to contact termination code. See page 90.

*1 STEP 6 - CABLE ADAPTER (HOOD) AND PUSH-ON FASTENER

0 - None.
H - Cable adapter, top opening, brass.
AN - Cable adapter, lightweight aluminum, electroless nickel plate, *see page 93 for details.*
N - Push-on fastener for right angle (90˚) mounting brackets.

*1 STEP 7 - LOCKING AND POLARIZING SYSTEMS

0 - None.
T - Fixed female jackscrews.
T2 - Fixed female jackscrews.
T6 - Fixed male and female polarized jackscrews.
E - Rotating male jackscrews.
E2 - Rotating male screw locks.
E3 - Rotating male with internal hex for 3/32 hex drives.
E6 - Rotating male and female polarized jackscrews.

STEP 8 - CONNECTOR HOUSING (SHELLS) OPTIONS

G - Gold over copper plate.
D - Gold over copper plate and dimpled *(male connectors only).*

STEP 9 - SPECIAL OPTIONS

SEE APPENDIX ON PAGE 97.

NOTE:

*1 For additional information on accessories listed in Step 5, 6, and 7, see the Accessories section, pages 88-96.

*2 Code 02 mounting hole is only compatible with code 0 in steps 6 and 7.

For information regarding CRIMP TOOLS & CRIMPING TOOL TECHNIQUES, see page 98.

DIMENSIONS ARE IN INCHES [MILLIMETERS].
ALL DIMENSIONS ARE SUBJECT TO CHANGE.