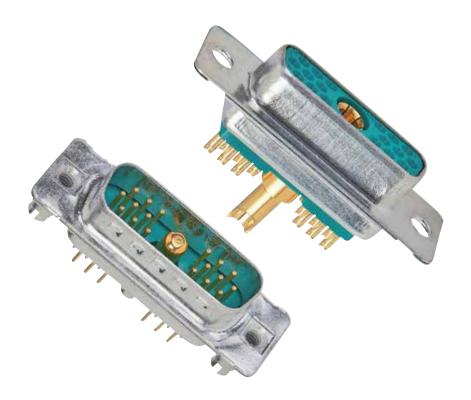
## Section 2

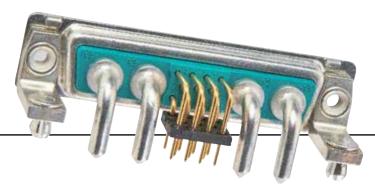
# COMBINATION D-SUB CONNECTORS\_

Combination D-SUB Connectors provide the ideal solution for applications to require power, signal and coaxial connections within one connector. This series of connectors achieves space saving on PCB's and I/O designs.

Within this product family are various pin out configurations possible. Almost endless selections can be created mixing power, signal and coaxial contacts.



Examples are coaxial contacts handling frequencies up to 2 GHz. Power contacts from 10 amp to 40 amp current handling. Signal contacts in various styles complete the product offering.



Industry standard terminations types, solder cup, PCB contacts in straight and angled pin configurations. Crimp types and wire wrap contacts.

#### Here are just a few Product characteristics:

- Space savings on the PCB
- Different wire terminations are possible in a single connector
- Cost savings mixed layout
- Insertable and removable coaxial, power, high voltage and signal contacts
- Precision machined contacts
- Various quality classes are available
- Wide product range

A wide range of standard pin configurations fully loaded with signal contacts are available. Specially configured contacts with power, coaxial and signal contacts can be constructed. Please use the Part Number Creator on page 2 | 2 and 2 | 3 or contact technical support at your closest CONEC office.



for standard version

#### PART NUMBER CREATOR

#### 3 003W3 S X X 6 1 A 1 0 X **Product Line** = Shell steel tin plated = Brass tin plated\* = Shell yellow chromated\* (not RoHS compliant) \*on request Shell size and design = 5W1, 2W2C = 3W3, 7W2, 11W1, 3W3C 3 = 5W5, 9W4, 13W3, 17W2, 21W1 = 8W8, 13W6, 17W5, 21WA4, 25W3, 27W2 = 24W7, 36W4, 43W2, 47W1 Empty positions ADD "0" = 003W3 = Plug connector = Socket connector Surface/Quality class for SIGNAL contacts = Quality class 3 = 50 mating cycles = Quality class 2 = 200 mating cycles\* R = Quality class 1 = 500 mating cycles C = Special application = > 500 mating cycles (on request)\* = Crimp and 3W3, 5W5, 8W8, 2W2C, 3W3C (no contacts are supplied with the connector) Χ \*on request **Termination only for SIGNAL contacts** = Crimp without contacts = Solder pin, angled, .370"/9.40 mm = Solder cup W\* = Solder pin, angled, .450" / 11.43 mm = 3W3, 5W5, 8W8, 2W2C, 3W3C Ν = Wire wrap, .500" / 12.7 mm Χ Р = Solder pin, angled, .540"/13.84 mm = Press fit R = Solder pin, straight, .220"/5.6 mm = please contact us = Solder pin, angled, .280"/7.19 mm Termination for HIGH POWER- or COAXIAL contacts Quality class 3/Quality class 1 Quality class 3/Quality class 1 Quality class 3/Quality class 1 C1 Solder/Crimp angled 10 A 59/55 = Solder pin, angled 15 A H2/88 = 3 Solder pins angled 75 $\Omega$ 73/56 = Solder pin, angled 20 A C2 = Solder/Crimp angled 20 A H3/89 = 3 Solder pins angled 75 $\Omega$ **C3** = Solder/Crimp angled 30 A 74/57 = Solder pin, angled 30 A H5/90 = 5 Solder pins angled 75 $\Omega$ = Solder/Crimp angled 40 A 75/58 = Solder pin, angled 40 A = Screw termination 20 A F2,61/F1,41 = Solder cup 10 A 77/60 = Solder pin, angled 40 A /P1 = press fit 30A F4,62/F3,42 = Solder cup 20 A 81 / 66 = Solder pin, angled 20 A /P2 = press fit 30A F6,63/F5,43 = Solder cup 30 A 82/67 = Solder pin, angled 30 A /P4 = press fit 30A F8,64/F7,44 = Solder cup 40 A 85/65 = Solder pin, angled 30 A = no high power, coax or crimp 68/48 = Solder pin, straight 20 A, D= .077"/1.95 mm 69/49 = Solder pin, straight 20 A, D= .102"/2.60 mm G7/76 = 3 Solder pins Straight 50 $\Omega$ contacts loaded G9/78 = 3 Solder pins angled 50 $\Omega$ Coaxial contacts with cable 70/50 = Solder pin, straight 20 A, D= .110"/2.85 mm H1/79 = 3 Solder pins angled 50 $\Omega$ termination must be ordered separately. 71 / 51 = Solder pin, straight 30 A, D= .130"/3.18 mm H4/80 = 5 Solder pins angled 50 $\Omega$ 72/52 = Solder pin, straight 40 A, D= .150"/3.75 mm G8/86 = 3 Solder pins Straight 75 $\Omega$ Mounting style = 4-40 UNC threaded rear spacer with PCB clip, PCB .126"/3.20 mm = M3 clip and threaded rear spacer with PCB clip, PCB .063"/1.60 mm = 4-40 UNC clip and threaded rear spacer with PCB clip, PCB .063"/1.60 mm A2 = M3 threaded insert F2 = M3 clip and threaded rear spacer with PCB clip, PCB .091"/2.30 mm A3 = 4-40 UNC threaded insert F3 A4 = M3 threaded rear spacer F4 = 4-40 UNC clip and threaded rear spacer with PCB clip, PCB .091"/2.30 mm **A5** = 4-40 UNC threaded rear spacer F5 = M3 clip and threaded rear spacer with PCB clip, PCB .126"/3.20 mm Α6 = 4-40 UNC clip and threaded rear spacer with PCB clip, PCB .126"/3.20 mm = Float fastening Α7 = Threaded rear spacer for M3 press fit G1 = Metal bracket, M3 threaded insert for .370"/9.40 mm A8 C1 C2 = Threaded rear spacer for 4-40 UNC press fit = Metal bracket, 4-40 UNC threaded insert for .370"/9.40 mm G2 = M3 threaded rear spacer with PCB clip, PCB .063"/1.60 mm G3 = Metal bracket, M3 threaded insert and clip for .370"/9.40 mm = 4-40 UNC threaded rear spacer with PCB clip, PCB .063"/1.60 mm G4 = Metal bracket, 4-40 UNC threaded insert and clip for .370"/9.40 mm C3 C4 C5 C6 D1 = M3 threaded rear spacer with PCB clip, PCB .091"/2.30 mm H1 = Metal bracket, M3 threaded lock for .370"/9.40 mm = 4-40 UNC threaded rear spacer with PCB clip, PCB .091"/2.30 mm H2 = Metal bracket, 4-40 UNC threaded lock for .370"/9.40 mm = M3 threaded rear spacer with PCB clip, PCB .126"/3.20 mm H3 = Metal bracket, M3 threaded lock and clip for .370"/9.40 mm = 4-40 UNC Threaded rear spacer with PCB clip, PCB .126"/3.20 mm H4 = Metal bracket, 4-40 UNC threaded lock and clip for .370"/9.40 mm = M3 clip and threaded rear spacer with PCB clip, PCB .063"/1.60 mm N1 = Metal bracket, M3 threaded insert for .280"/7.19 mm D2 = 4-40 UNC clip and threaded rear spacer with PCB clip, PCB .063"/1.60 mm N2 = Metal bracket, 4-40 UNC threaded insert for .280"/7.19 mm D3 = M3 clip and threaded rear spacer with PCB clip, PCB .091"/2.30 mm = Metal bracket, M3 threaded insert and clip for .280"/7.19 mm N3 D4 D5 = 4-40 UNC clip and threaded rear spacer clip, PCB .091"/2.30 mm = Metal bracket, 4-40 UNC threaded insert and clip for .280"/7.19 mm N4 = Metal bracket, M3 threaded lock for .280"/7.19 mm = M3 clip and threaded rear spacer with PCB clip, PCB .126"/3.20 mm D6 = 4-40 UNC clip and threaded rear spacer with PCB clip, PCB .126"/3.20 mm P2 = Metal bracket, 4-40 UNC threaded lock for .280"/7.19 mm E1 = M3 threaded rear spacer with PCB clip, PCB .063"/1.60 mm = Metal bracket, M3 threaded lock and clip for .280"/7.19 mm Р3 E2 = 4-40 UNC threaded rear spacer with PCB clip, PCB .063"/1.60 mm P4 = Metal bracket, 4-40 UNC threaded lock and clip for .280"/7.19 mm = M3 threaded rear spacer with PCB clip, PCB .091"/2.30 mm E3 W1 = Threaded rear spacer with M3 press in pin E4 = 4-40 UNC threaded rear spacer with PCB clip, PCB .091"/2.30 mm W2 = Threaded rear spacer with 4-40 UNC press in pin = M3 threaded rear spacer with PCB clip, PCB .126"/3.20 mm OX = Standard

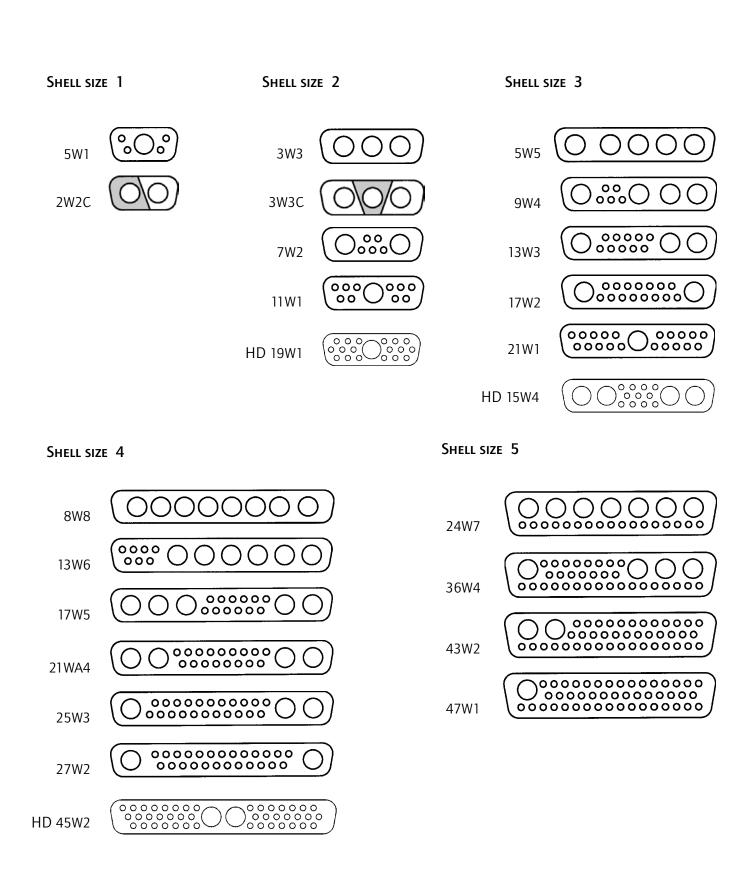
## TECHNICAL DATA

## Standard version

Materials	Connector with signal contacts	Coaxial contacts	High power contacts	High voltage contacts	
Insulator	PBTP, GV				
Green standard / black crimp	(UL94 V-0)				
Shell	steel tin plated				
	brass tin/stainless steel on request				
Contact plating		Gold plated over nickel			
Contact material		CU alloy			
		60 H			
Retaining clip			CU alloy		
Insulator		PTFE/PBTP/PI		PTFE	
mountoi		THE/IDIT/II		TIIL	
Mechanical and electrical characteristics					
Current rating	7,5A (UL) / 5A (CSA, VDE)				
Test voltage between 2 contacts	1000 V, 50Hz		1000 V, 50Hz		
contact and shell	1 min.		1 min.		
Resistance between mated contact	ts max. 8 mΩ	max. 2.7 mΩ	max. 1 mΩ	max. 2.7 mΩ	
Insulation resistance	≥5 GΩ	≥ 10 GΩ	≥ 5 GΩ	$\geq 2x10^7 M\Omega$	
Volume resistivity	10 <sup>16</sup> Ωcm				
B' L (' ' L	F0/4//				
Dielectric impedance	50KV/mm				
Characteristic impedance		50/75 Ω			
Characteristic impedance		30//3 22			
VSWR-value at according 1.	2GHz	≤1,2			
MIL-C-39012 1.	5GHz	≤1,3			
2.	0GHz	≤1,5			
Distanti sultan		7501/5011		2011	
Dielectric voltage		750V 50Hz		3.8kV	
Frequency range		0-2GHz			
Working voltage	250 V	250 V	250 V	max. 2.8kV	
Temperature range		-55°C to +125°C			
Incortion force new courts at	2.411	781	711	5N	
Insertion force per contact	3.4N	7N	7N	SIN	
Extraction force per contact	0.2N	7N	approx. 5N	approx. 2.5N	
Madina and a	A O	A Configuration 2 FOundary and a D. Configuration 2 2000 of the Late Configuration and the Configuration and t			
Mating cycles	A = Quality class 3 = 50 mating cy	A = Quality class 3 = 50 mating cycles, B = Quality class 2 = 200 mating cycles, C = Quality class 1 = 500 mating cycles			

Technical specifications are subject to change without notice.

#### PIN CONFIGURATION - MATING SIDE OF SOCKET CONNECTOR



Connectors 3W3, 5W5 and 8W8 with female insulators: Socket contacts are fingerprobe safe according to UL 1950 and CSA 22.2.950.

## **TECHNICAL INFORMATION**

#### SKIN EFFECT

Alternating currents do not uniformly occupy the entire cross section of the conductor, rather inductance effect in the conductor deflects the current towards the surface of the conductor, whereby this deflection increases with the frequency.

The resistive attenuation of a transmission line increases with the frequency as a result of this skin effect.

The skin depth (equivalent thickness of the layer in which current flows) can be determined using

$$\delta = \frac{1}{\sqrt{f \pi \sigma \mu_0 \mu_r}}$$

f = frequency

 $\sigma$  = conductivity of the conductor material

 $\sigma_{Aq} = 62 \times 10^6 \text{ S/m}$ 

 $\sigma_{Cu} = 58 \times 10^6 \text{ S/m}$ 

 $\mu_0 = 1,256 \ 10^6 \ Vs / Am$ 

 $\mu_r$  ... relative permeability constant for the employed material

#### **VSWR-VALUE**

The ratio between the value of the largest and the smallest voltages on a loss-free line is known as the ripple or voltage standing wave ratio s (where 1 m 1  $\infty$ ). The reciprocal value of the VSWR is known as the inverse voltage standing wave ratio m (where 0 m 1). (VSWR = Voltage standing ware ratio)

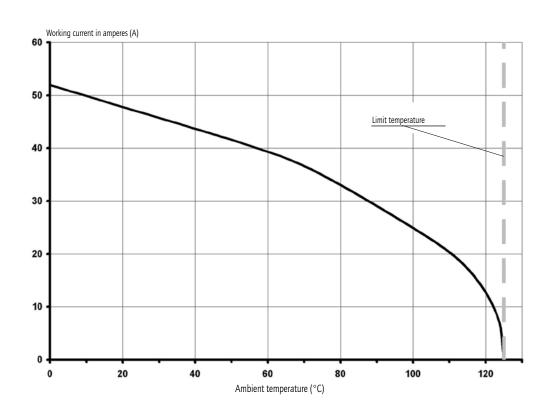
The value of is linked with the  $\rightarrow$  reflection coefficient r on s transmission line according to the equation

$$s = \frac{(1 + |r|)}{(1 - |r|)}$$

#### **DERATING CURVE**

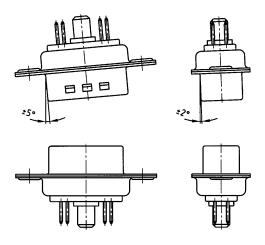
Measurement is according to DIN 41640 part 3 whereas all power contacts are connected in series.

For test procedure - product-no. 3008W8SXX99A has been equipped with 132C11049X and 3008W8PXX99AA10X with 131C11049X.

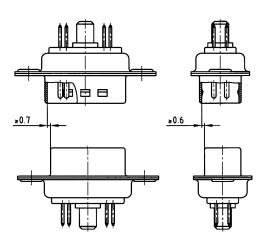


## MATING CONDITIONS

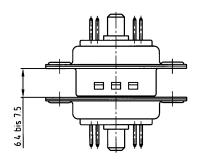
Float mount tolerance guide



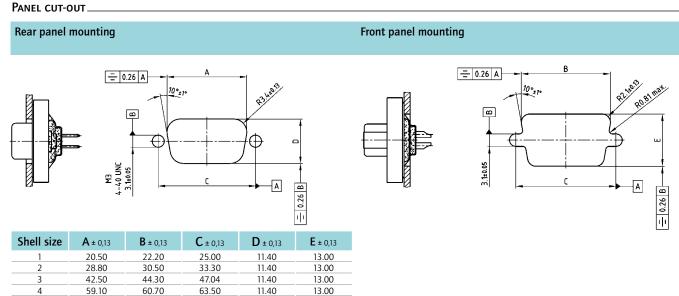
Rigid mount tolerance guide



Rigid mount vertical to tolerance guide







15.80

14.10

56.30

58.30

### **CRIMPING INSTRUCTIONS FOR COAX CONTACTS**

