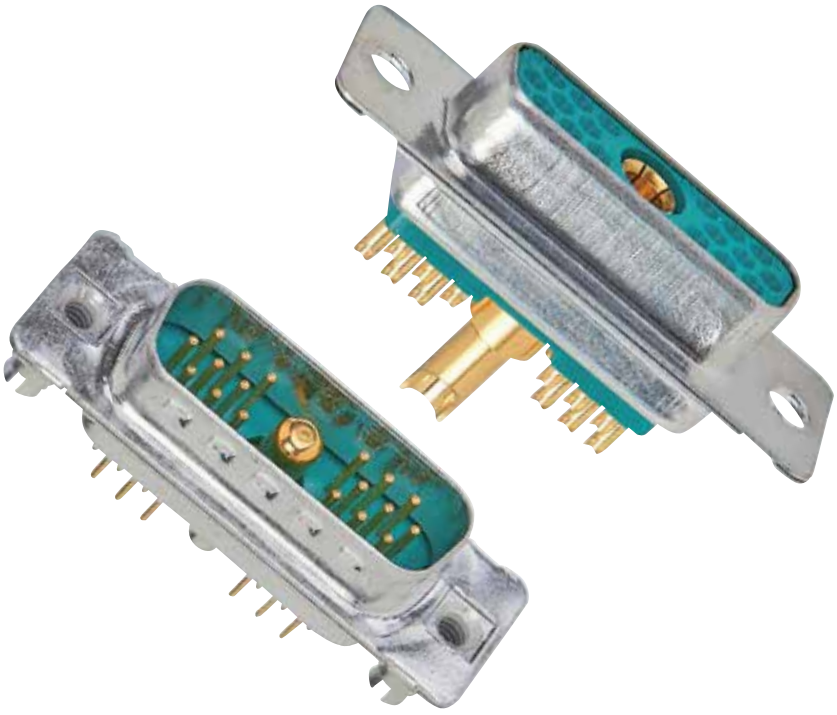
Section 2

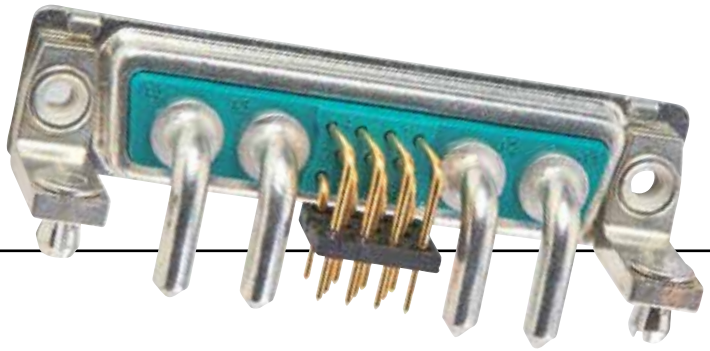
Combination D-SUB Connectors

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.

PART NUMBER CREATOR

for standard version

3	003W3	S	X	X	6	1	A	1	O	X

Product Line
3 = Shell steel tin plated
1 = Brass tin plated*
5 = Shell yellow chromated* (not RoHS compliant)
A = Stainless steel*
*on request

Shell size and design
1 = 5W1, 2W2C
2 = 3W3, 7W2, 11W1, 3W3C
3 = 5W5, 9W4, 13W3, 17W2, 21W1
4 = 8W8, 13W6, 17W5, 21WA4, 25W3, 27W2
5 = 24W7, 36W4, 43W2, 47W1
Empty positions ADD „0" = 003W3

Contact type
P = Plug connector
S = Socket connector

Surface/Quality class for SIGNAL contacts
A = Quality class 3 = 50 mating cycles
B = Quality class 2 = 200 mating cycles*
C = Quality class 1 = 500 mating cycles
J = Special application = > 500 mating cycles (on request)*
X = Crimp and 3W3, 5W5, 8W8, 2W2C, 3W3C (no contacts are supplied with the connector)
*on request

Termination only for SIGNAL contacts
K = Crimp without contacts
M = Solder cup
N = Wire wrap, .500"/12.7 mm
P = Press fit
R = Solder pin, straight, .220"/5.6 mm
T = Solder pin, angled, .280"/7.19 mm
U = Solder pin, angled, .370"/9.40 mm
W* = Solder pin, angled, .450"/11.43 mm
X = 3W3, 5W5, 8W8, 2W2C, 3W3C
Z* = Solder pin, angled, .540"/13.84 mm
* = please contact us

Termination for HIGH POWER- or COAXIAL contacts

Quality class 3/Quality class 1
C1 = Solder/Crimp angled 10 A
C2 = Solder/Crimp angled 20 A
C3 = Solder/Crimp angled 30 A
C4 = Solder/Crimp angled 40 A
F2,61/F1,41 = Solder cup 10 A
F4,62/F3,42 = Solder cup 20 A
F6,63/F5,43 = Solder cup 30 A
F8,64/F7,44 = Solder cup 40 A
68/48 = Solder pin, straight 20 A, D= .077"/1.95 mm
69/49 = Solder pin, straight 20 A, D= .102"/2.60 mm
70/50 = Solder pin, straight 20 A, D= .110"/2.85 mm
71/51 = Solder pin, straight 30 A, D= .130"/3.18 mm
72/52 = Solder pin, straight 40 A, D= .150"/3.75 mm

Quality class 3/Quality class 1
59/55 = Solder pin, angled 15 A
73/56 = Solder pin, angled 20 A
74/57 = Solder pin, angled 30 A
75/58 = Solder pin, angled 40 A
77/60 = Solder pin, angled 40 A
81/66 = Solder pin, angled 20 A
82/67 = Solder pin, angled 30 A
85/65 = Solder pin, angled 30 A
G7/76 = 3 Solder pins Straight 50 Ω
G9/78 = 3 Solder pins angled 50 Ω
H1/79 = 3 Solder pins angled 50 Ω
H4/80 = 5 Solder pins angled 50 Ω
G8/86 = 3 Solder pins Straight 75 Ω

Quality class 3/Quality class 1
H2/88 = 3 Solder pins angled 75 Ω
H3/89 = 3 Solder pins angled 75 Ω
H5/90 = 5 Solder pins angled 75 Ω
91 = Screw termination 20 A
/P1 = press fit 30A
/P2 = press fit 30A
/P4 = press fit 30A
99 = no high power, coax or crimp contacts loaded
Coaxial contacts with cable termination must be ordered separately.

Mounting style
A1 = Riveted
A2 = M3 threaded insert
A3 = 4-40 UNC threaded insert
A4 = M3 threaded rear spacer
A5 = 4-40 UNC threaded rear spacer
A6 = Float fastening
A7 = Threaded rear spacer for M3 press fit
A8 = Threaded rear spacer for 4-40 UNC press fit
C1 = M3 threaded rear spacer with PCB clip, PCB .063"/1.60 mm
C2 = 4-40 UNC threaded rear spacer with PCB clip, PCB .063"/1.60 mm
C3 = M3 threaded rear spacer with PCB clip, PCB .091"/2.30 mm
C4 = 4-40 UNC threaded rear spacer with PCB clip, PCB .091"/2.30 mm
C5 = M3 threaded rear spacer with PCB clip, PCB .126"/3.20 mm
C6 = 4-40 UNC Threaded rear spacer with PCB clip, PCB .126"/3.20 mm
D1 = M3 clip and threaded rear spacer with PCB clip, PCB .063"/1.60 mm
D2 = 4-40 UNC clip and threaded rear spacer with PCB clip, PCB .063"/1.60 mm
D3 = M3 clip and threaded rear spacer with PCB clip, PCB .091"/2.30 mm
D4 = 4-40 UNC clip and threaded rear spacer clip, PCB .091"/2.30 mm
D5 = 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
E1 = M3 threaded rear spacer with PCB clip, PCB .063"/1.60 mm
E2 = 4-40 UNC threaded rear spacer with PCB clip, PCB .063"/1.60 mm
E3 = M3 threaded rear spacer with PCB clip, PCB .091"/2.30 mm
E4 = 4-40 UNC threaded rear spacer with PCB clip, PCB .091"/2.30 mm
E5 = M3 threaded rear spacer with PCB clip, PCB .126"/3.20 mm
E6 = 4-40 UNC threaded rear spacer with PCB clip, PCB .126"/3.20 mm
F1 = M3 clip and threaded rear spacer with PCB clip, PCB .063"/1.60 mm
F2 = 4-40 UNC clip and threaded rear spacer with PCB clip, PCB .063"/1.60 mm
F3 = M3 clip and threaded rear spacer with PCB clip, PCB .091"/2.30 mm
F4 = 4-40 UNC clip and threaded rear spacer with PCB clip, PCB .091"/2.30 mm
F5 = M3 clip and threaded rear spacer with PCB clip, PCB .126"/3.20 mm
F6 = 4-40 UNC clip and threaded rear spacer with PCB clip, PCB .126"/3.20 mm
G1 = Metal bracket, M3 threaded insert for .370"/9.40 mm
G2 = Metal bracket, 4-40 UNC threaded insert for .370"/9.40 mm
G3 = Metal bracket, M3 threaded insert and clip for .370"/9.40 mm
G4 = Metal bracket, 4-40 UNC threaded insert and clip for .370"/9.40 mm
H1 = Metal bracket, M3 threaded lock for .370"/9.40 mm
H2 = Metal bracket, 4-40 UNC threaded lock for .370"/9.40 mm
H3 = Metal bracket, M3 threaded lock and clip for .370"/9.40 mm
H4 = Metal bracket, 4-40 UNC threaded lock and clip for .370"/9.40 mm
N1 = Metal bracket, M3 threaded insert for .280"/7.19 mm
N2 = Metal bracket, 4-40 UNC threaded insert for .280"/7.19 mm
N3 = Metal bracket, M3 threaded insert and clip for .280"/7.19 mm
N4 = Metal bracket, 4-40 UNC threaded insert and clip for .280"/7.19 mm
P1 = Metal bracket, M3 threaded lock for .280"/7.19 mm
P2 = Metal bracket, 4-40 UNC threaded lock for .280"/7.19 mm
P3 = Metal bracket, M3 threaded lock and clip for .280"/7.19 mm
P4 = Metal bracket, 4-40 UNC threaded lock and clip for .280"/7.19 mm
W1 = Threaded rear spacer with M3 press in pin
W2 = Threaded rear spacer with 4-40 UNC press in pin

OX = Standard

TECHNICAL DATA

Standard version

Materials	Connector with signal contacts	Coaxial contacts	High power contacts	High voltage contacts
Insulator Green standard / black crimp	PBTP, GV (UL94 V-0)			
Shell	steel tin plated brass tin / stainless steel on request			
Contact plating	Gold plated over nickel			
Contact material	CU alloy			
Retaining clip		CU alloy		
Insulator		PTFE/PBTP/PI		PTFE
Mechanical and electrical characteristics				
Current rating	7,5A (UL) / 5A (CSA, VDE)			
Test voltage between 2 contacts contact and shell	1000 V, 50Hz 1 min.		1000 V, 50Hz 1 min.	
Resistance between mated contacts	max. 8 mΩ	max. 2.7 mΩ	max. 1 mΩ	max. 2.7 mΩ
Insulation resistance	≥5 GΩ	≥ 10 GΩ	≥ 5 GΩ	≥ 2x10^7 MΩ
Volume resistivity	10^{16} Ωcm			
Dielectric impedance	50KV/mm			
Characteristic impedance		50/75 Ω		
VSWR-value at according MIL-C-39012 1.2GHz 1.5GHz 2.0GHz		≤1,2 ≤1,3 ≤1,5		
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			
Insertion force per contact	3.4N	7N	7N	5N
Extraction force per contact	0.2N	7N	approx. 5N	approx. 2.5N
Mating cycles	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

Shell size 1

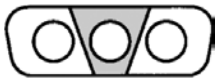
5W1

2W2C

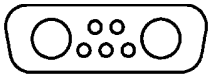
Shell size 2

3W3

3W3C

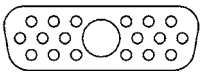


7W2



11W1

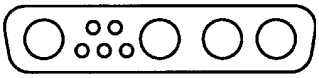
HD 19W1



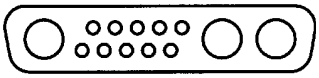
Shell size 3

5W5

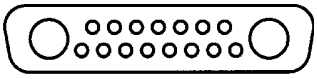
9W4



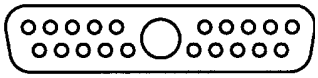
13W3



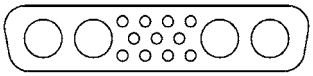
17W2



21W1



HD 15W4

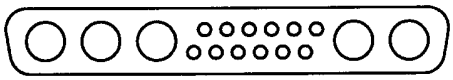


Shell size 4

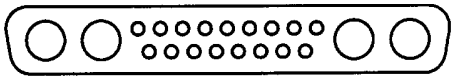
8W8

13W6

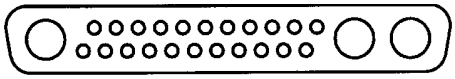
17W5



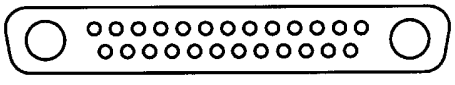
21WA4



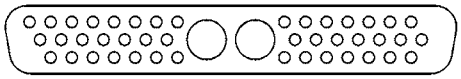
25W3



27W2

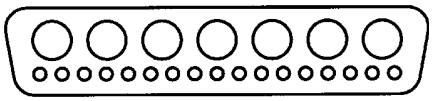


HD 45W2

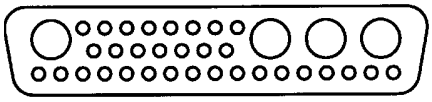


Shell size 5

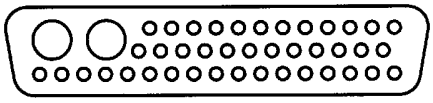
24W7



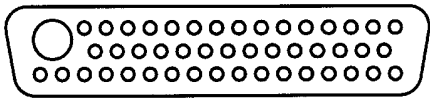
36W4



43W2



47W1



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
σ = conductivity of the conductor material
σ_{Ag} = 62 x 10^6 S/m
σ_{Cu} = 58 x 10^6 S/m
μ_0 = 1,256 10^6 Vs / Am
μ_r ... relative permeability constant for the employed material

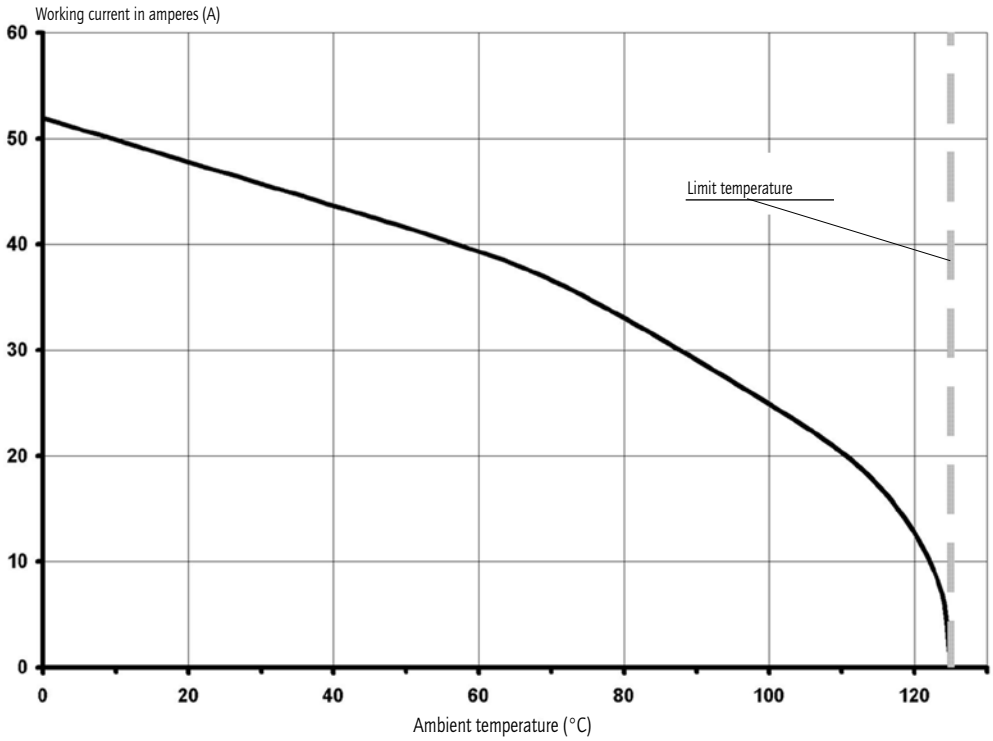
VSWR-VALUE

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 ∞). 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 → reflection coefficient r on s transmission line according to the equation

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

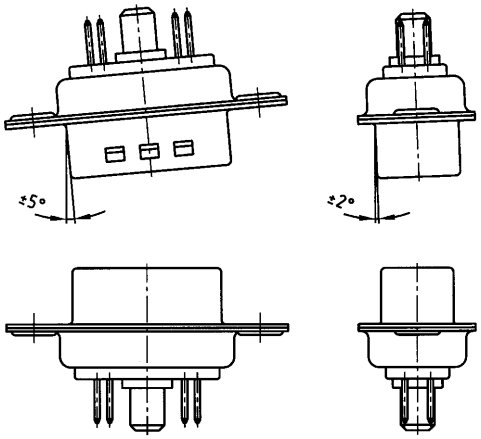
DERATING CURVE

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.

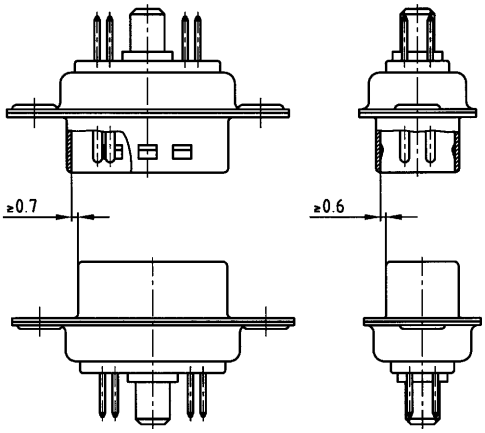


Mating conditions

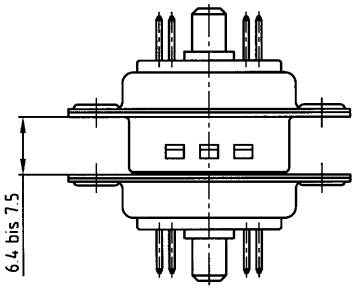
Float mount tolerance guide



Rigid mount tolerance guide

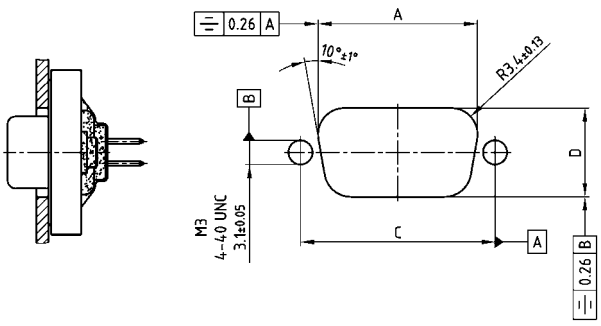


Rigid mount vertical to tolerance guide

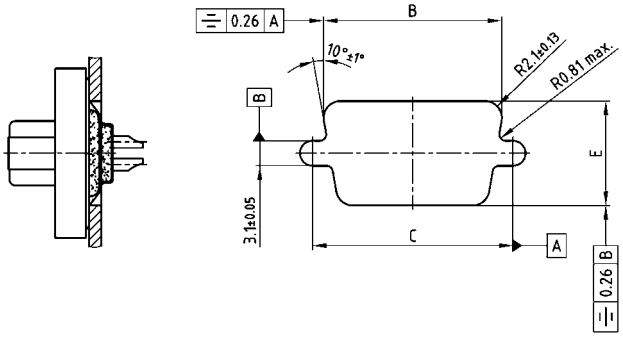


Panel cut-out

Rear panel mounting

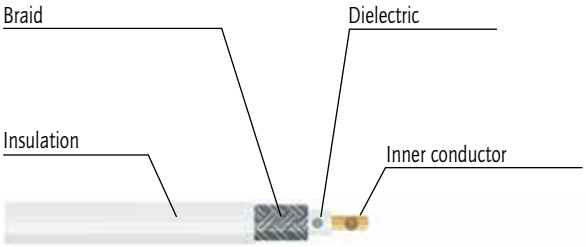


Front panel mounting



Shell size	A ± 0,13	B ± 0,13	C ± 0,13	D ± 0,13	E ± 0,13
1	20.50	22.20	25.00	11.40	13.00
2	28.80	30.50	33.30	11.40	13.00
3	42.50	44.30	47.04	11.40	13.00
4	59.10	60.70	63.50	11.40	13.00
5	56.30	58.30	61.10	14.10	15.80

Crimping instructions for coax contacts



Strip the wire
Using dimensions shown on the individual product drawings

Slide sleeve over coax cable

Crimp the inner contact on the inner conductor

Snap the inner contact into the outer contact

Slide braid over outer contact

Crimp the sleeve on to outer contact

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Amphenol:

3036W4SAR99E20X 3003W3PXX71E40X 3005W1PAT99N40X 3024W7SAR72E20X 3017W2PCT57N20X
3007W2SCR49E20X 3011W1PAM99A10X 3011W1SCM99A10X 5024W7SBR52E20X 3036W4SCU60L40X
3003W3SXX42A10X 302W2CSXX99A60X 3003W3SXX57N40X 3011W1PCM99A10X 3036W4PAR72E20X
3007W2PAR51C40X 3008W8SXX99G40X 3009W4PAM99A30X 3025W3SXK99A30X 3017W5PAR99A30X
303W3CPXX51C20X 3024W7PCR99C20X 3017W2PAM62A30X 3005W1SCU78G40X 3003W3SXX99G40X
321WA4PAR72E20X 3008W8PXX99G40X 3017W2SAR99A30X 3003W3SXX49F40X 3007W2SAM99A10X
302W2CSXX58G20X 3008W8PXX56N20X 3025W3PAU78H20X 3013W3SAR99A30X 3008W8PXX56N40X
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3017W2PCM42A30X 3005W1SCM99A10X 3003W3PXX42A10X 302W2CPXX58K30X 3024W7SAR99E20X
3036W4PCR51E20X 302W2CPXX51E40X 3008W8SXX75N40X 3009W4SCM41A10X 3013W6PXK99A10X
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3009W4PCU99G40X 303W3CPXX71E40X 3024W7PAU77G40X 5013W6PBM99A30X 3007W2SAT74N40X
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5013W6PCM99A30X 3024W7SCR99E20X 3008W8PXX72E40X 3013W6SAN99A10X 3024W7SAR72E40X
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