



# General Information

## Allgemeine Informationen

In terms of their outside dimensions the shells of the high density D-Sub series are the same as for the well known standard D-Sub connectors, but the number of contacts has been considerably increased.

Due to the higher density of 15, 26, 44, 62 and 78 contacts, this series is ideally suited for the most modern applications in data transmission and telecommunications, as well as in measurement, regulation and control devices.

Protection against misalignment or bending of contacts is guaranteed by the use of a trapeze shaped metal shell. The tin plated shells also offer good shielding qualities and are mechanically stable. Because of their compact design and low mounting flange, these connectors can also be used without difficulty in the tried and tested 19"-modules.

These connectors are available in straight and right angled versions for p.c. boards. They can also be supplied for cable assemblies in solder or crimp version. The heat resistant plastics used in the production of the connectors meet UL94V-0 requirements.

*Die High Density D-Sub Serie verwendet von den Außenabmessungen die Gehäuse der bekannten Standard D-Sub Steckverbinder, jedoch hat sich die Anzahl der Kontakte wesentlich erhöht.*

*Durch die höhere Dichte von 15, 26, 44, 62 und 78 Kontakten eignet sich diese Serie hervorragend für modernste Anwendungen der Datentechnik, Telekommunikation sowie Mess-, Regel- und Steuerungstechnik.*

*Ein sicherer Verdrehenschutz ist durch das trapezförmige Metallgehäuse gewährleistet. Die verzinneten Gehäuse bieten gute Abschirmeigenschaften und sind mechanisch stabil. Aufgrund der kompakten Bauweise und des niedrigen Montageflansches sind diese Steckverbinder in den bewährten 19"-Einschüben problemlos einsetzbar.*

*Die Steckverbinder sind in gerader bzw. abgewinkelter Ausführung für Leiterplattenmontage sowie zur Kabelmontage in Löt- oder Crimptechnik lieferbar. Die verwendeten temperaturbeständigen Kunststoffe entsprechen den Anforderungen nach UL94V-0.*

# High Density D-Sub Connectors

## High Density D-Sub Steckverbinder

### Technical Data

#### Technische Daten

##### Mechanical Data

##### Mechanische Daten

Mechanical Data <i>Mechanische Daten</i>	
Shell <i>Gehäuse</i>	Steel, tin plated; pin shell with dimples <i>Stahl, verzinkt; Stiftgehäuse mit Kontaktnoppen</i>
Insulator <i>Isolierkörper</i>	Thermoplastic, glassfilled UL94V-0 <i>Thermoplast, glasfaserverstärkt UL94V-0</i>
Signal contacts <i>Signalkontakte</i>	Copper alloy, flash gold plated <i>Kupferlegierung, Oberfläche Hauchvergoldung</i>

##### Electrical Data

##### Elektrische Daten

Electrical Data <i>Elektrische Daten</i>	
Current rating <i>Maximale Stromstärke</i>	3 A
Contact resistance <i>Durchgangswiderstand</i>	≤ 15 mΩ
Insulation resistance <i>Isolationswiderstand</i>	≥ 3000 MΩ
Test voltage <i>Prüfspannung</i>	1000 V
Operating temperature <i>Betriebstemperatur</i>	-55 °C bis 105 °C (-67 °F to 221 °F)



# Ordering Code (High Density D-Sub Connectors)

## Bestellschlüssel (High Density D-Sub Steckverbinder)

CT W 09-15 S 5 - ...

High Density D-Sub series prefix  
**High Density D-Sub Serienbezeichnung**

### Mounting Type / Befestigungsarten

- Standard / *Standard*
- W** Float mounted / *Schwimmend* \*
- T** Clinch nut 4-40 UNC / *Einnietmutter 4-40 UNC* \*
- Z** Clinch nut M3 / *Einnietmutter M3* \*
- TS** Clinch nut 4-40 UNC, self locking / *Einnietmutter 4-40 UNC, selbstsichernd* \*
- ZS** Clinch nut M3, self locking / *Einnietmutter M3, selbstsichernd* \*

\* Not with contact design 5 / *nicht mit Kontaktvariante 5*

### No. of Contacts / Polzahlen

- 09-15** 15 contacts in shell size 1 (corresponds to 9 pin D-Sub standard connector shell)  
*15-polig in Gehäusegröße 1 (entspricht 9poligem D-Sub Standard Steckverbindergehäuse)*
- 15-26** 26 contacts in shell size 2 (corresponds to 15 pin D-Sub standard connector shell)  
*26-polig in Gehäusegröße 2 (entspricht 15poligem D-Sub Standard Steckverbindergehäuse)*
- 25-44** 44 contacts in shell size 3 (corresponds to 25 pin D-Sub standard connector shell)  
*44-polig in Gehäusegröße 3 (entspricht 25poligem D-Sub Standard Steckverbindergehäuse)*
- 37-62** 62 contacts in shell size 4 (corresponds to 37 pin D-Sub standard connector shell)  
*62-polig in Gehäusegröße 4 (entspricht 37poligem D-Sub Standard Steckverbindergehäuse)*
- 50-78** 78 contacts in shell size 5 (corresponds to 50 pin D-Sub standard connector shell)  
*78-polig in Gehäusegröße 5 (entspricht 50poligem D-Sub Standard Steckverbindergehäuse)*

### Contact Type / Kontaktart

- P** Pin / *Stift*
- S** Socket / *Buchse*

### Contact Design / Kontaktvariante

- Solder pot termination / *Löttopfanschluss*
- 1** Straight PCB termination / *Gerader Leiterplattenanschluss*
- 5** Right angled PCB termination / *Abgewinkelter Leiterplattenanschluss*

### Modifications / Modifikationen

For contact design 5 only! / *Nur für Kontaktvariante 5!*

- L228** See pages 12 and 13 (supplied with 4-40 UNC-2B clinch nut, plastic bracket and grounding bracket with snap-in)  
*Siehe Seiten 12 und 13 (mit Gewindeniet 4-40 UNC-2B, Kunststoffwinkel und Snap-In Massewinkel)*
- L229** See pages 12 and 13 (with M3 clinch nut, plastic bracket and grounding bracket with snap-in)  
*Siehe Seiten 12 und 13 (mit Gewindeniet M3, Kunststoffwinkel und Snap-In Massewinkel)*
- L222** See pages 12 and 13 (with 4-40 UNC-2B clinch nut, plastic bracket and grounding bracket with through hole)  
*Siehe Seiten 12 und 13 (mit Gewindeniet 4-40 UNC-2B, Kunststoffwinkel und Massewinkel mit Durchgangsloch)*

Further modifications are listed in our D-Sub miniature connector catalogue.  
**Weitere Modifikationen sind in unserem D-Sub Miniatur Steckverbinder Katalog aufgeführt.**

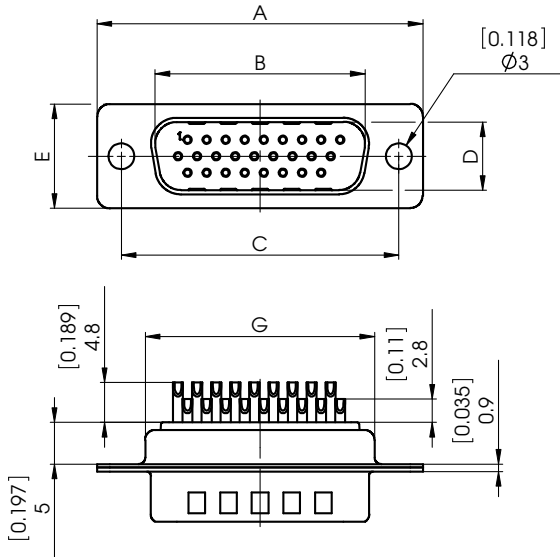


# Pin: Solder Pot Termination

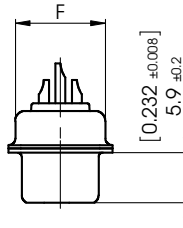
## Stift: Löttopfanschluss

### Dimensions

#### Abmessungen



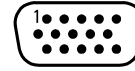
Stamped contacts  
(wire size:  
max. AWG 22)  
Gestanzte Kontakte  
(Drahtgröße:  
max. AWG 22)



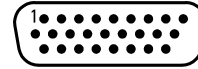
### Pin Connector, Front View

#### Stiftsteckverbinder, Frontansicht

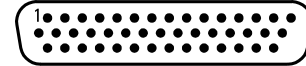
15 contacts  
15 Kontakte



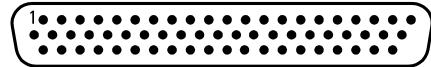
26 contacts  
26 Kontakte



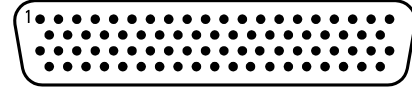
44 contacts  
44 Kontakte



62 contacts  
62 Kontakte



78 contacts  
78 Kontakte



### Dimensions

#### Abmessungen

Order Number <i>Bestellnummer</i>	Shell Size <i>Gehäusegröße</i>	Number of Contacts <i>Polzahl</i>	A ±0,4 (±0.016)	B +0,2 (+0.008)	C ±0,15 (±0.006)	D +0,2 (+0.008)	E ±0,4 (±0.016)	F ±0,3 (±0.012)	G ±0,3 (±0.012)
CT09-15P	1	15	30,8 (1.213)	16,9 (0.665)	25,0 (0.984)	8,2 (0.323)	12,5 (0.492)	10,8 (0.425)	19,3 (0.760)
CT15-26P	2	26	39,1 (1.539)	25,2 (0.992)	33,3 (1.311)	8,2 (0.323)	12,5 (0.492)	10,8 (0.425)	27,5 (1.083)
CT25-44P	3	44	53,0 (2.087)	38,9 (1.531)	47,04 (1.852)	8,2 (0.323)	12,5 (0.492)	10,8 (0.425)	41,3 (1.626)
CT37-62P	4	62	69,3 (2.728)	55,3 (2.177)	63,5 (2.500)	8,2 (0.323)	12,5 (0.492)	10,8 (0.425)	57,7 (2.272)
CT50-78P	5	78	66,9 (2.634)	52,8 (2.079)	61,1 (2.406)	11,0 (0.433)	15,4 (0.606)	13,7 (0.539)	55,3 (2.177)

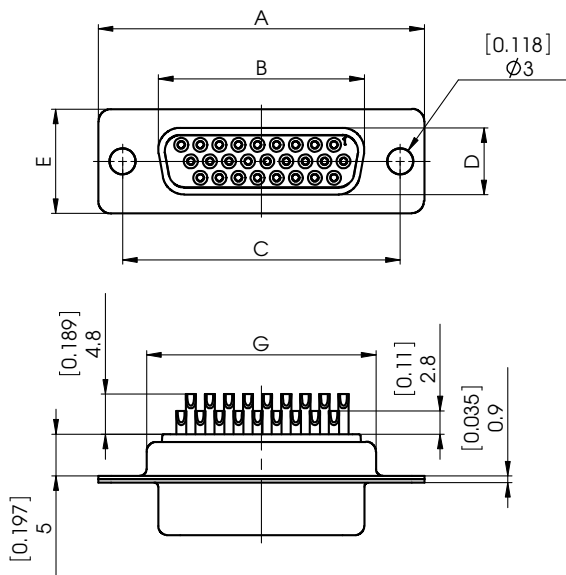


# Socket: Solder Pot Termination

## Buchse: Löttopfanschluss

### Dimensions

#### Abmessungen

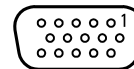


Stamped contacts  
(wire size:  
max. AWG 22)  
Gestanzte Kontakte  
(Drahtgröße:  
max. AWG 22)

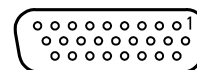
### Socket Connector, Front View

#### Buchsensteckverbinder, Frontansicht

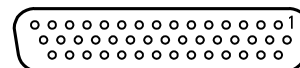
15 contacts  
15 Kontakte



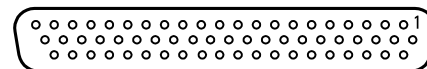
26 contacts  
26 Kontakte



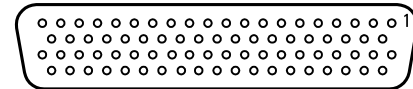
44 contacts  
44 Kontakte



62 contacts  
62 Kontakte



78 contacts  
78 Kontakte



### Dimensions

#### Abmessungen

Order Number <i>Bestellnummer</i>	Shell Size <i>Gehäusegröße</i>	Number of Contacts <i>Polzahl</i>	A ±0,4 (±0.016)	B -0,2 (-0.008)	C ±0,15 (±0.006)	D -0,2 (-0.008)	E ±0,4 (±0.016)	F ±0,3 (±0.012)	G ±0,3 (±0.012)
CT09-15S	1	15	30,8 (1.213)	16,4 (0.646)	25,0 (0.984)	8,0 (0.315)	12,5 (0.492)	10,8 (0.425)	19,3 (0.760)
CT15-26S	2	26	39,1 (1.539)	24,7 (0.972)	33,3 (1.311)	8,0 (0.315)	12,5 (0.492)	10,8 (0.425)	27,5 (1.083)
CT25-44S	3	44	53,0 (2.087)	38,5 (1.516)	47,04 (1.852)	8,0 (0.315)	12,5 (0.492)	10,8 (0.425)	41,3 (1.626)
CT37-62S	4	62	69,3 (2.728)	54,9 (2.161)	63,5 (2.500)	8,0 (0.315)	12,5 (0.492)	10,8 (0.425)	57,7 (2.272)
CT50-78S	5	78	66,9 (2.634)	52,5 (2.067)	61,1 (2.406)	10,8 (0.425)	15,4 (0.606)	13,7 (0.539)	55,3 (2.177)

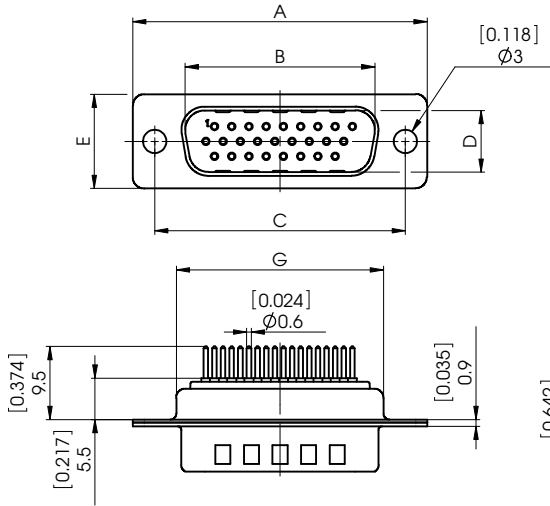


# Pin: Straight PCB Termination

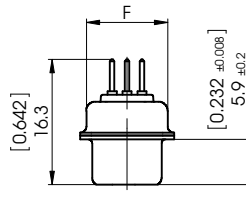
## Stift: Gerader Leiterplattenanschluss

### Dimensions

#### Abmessungen



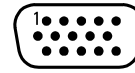
**Stamped contacts**  
**Gestanzte Kontakte**



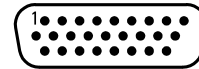
### Pin Connector, Front View

#### Stiftsteckverbinder, Frontansicht

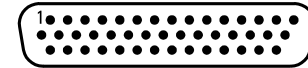
15 contacts  
15 Kontakte



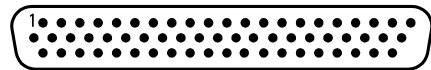
26 contacts  
26 Kontakte



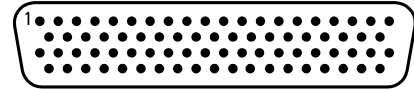
44 contacts  
44 Kontakte



62 contacts  
62 Kontakte



78 contacts  
78 Kontakte

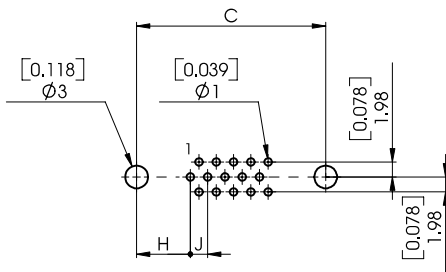


### PCB Hole Pattern (Mounting Side)

#### Leiterplattenlochbild (Bestückungsseite)

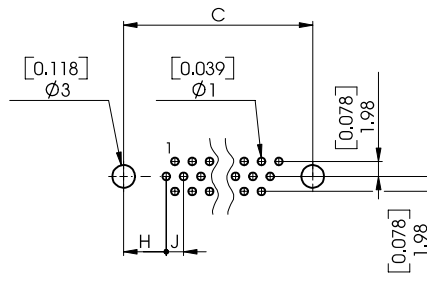
##### Hole Pattern 15 Contacts

##### Lochbild 15-polig



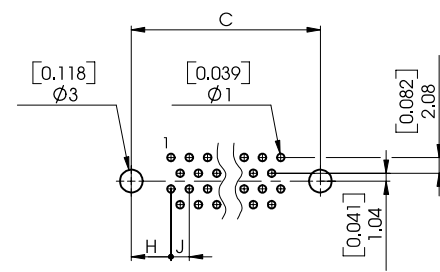
##### Hole Pattern 26, 44 and 62 Contacts

##### Lochbild 26-, 44- und 62-polig



##### Hole Pattern 78 Contacts

##### Lochbild 78-polig



### Dimensions

#### Abmessungen

Order Number <i>Bestellnummer</i>	Shell Size <i>Gehäusegröße</i>	Number of Contacts <i>Polzahl</i>	A ±0,4 (±0.016)	B +0,2 (+0.008)	C ±0,15 (±0.006)	D +0,2 (+0.008)	E ±0,4 (±0.016)	F ±0,3 (±0.012)	G ±0,3 (±0.012)	H	J
CT09-15P1	1	15	30,8 (1.213)	16,9 (0.665)	25,0 (0.984)	8,2 (0.323)	12,5 (0.492)	10,8 (0.425)	19,3 (0.760)	7,10 (0.280)	2,29 (0.090)
CT15-26P1	2	26	39,1 (1.539)	25,2 (0.992)	33,3 (1.311)	8,2 (0.323)	12,5 (0.492)	10,8 (0.425)	27,5 (1.083)	6,80 (0.268)	2,29 (0.090)
CT25-44P1	3	44	53,0 (2.087)	38,9 (1.531)	47,04 (1.852)	8,2 (0.323)	12,5 (0.492)	10,8 (0.425)	41,3 (1.626)	7,00 (0.276)	2,29 (0.090)
CT37-62P1	4	62	69,3 (2.728)	55,3 (2.177)	63,5 (2.500)	8,2 (0.323)	12,5 (0.492)	10,8 (0.425)	57,7 (2.272)	7,00 (0.276)	2,42 (0.095)
CT50-78P1	5	78	66,9 (2.634)	52,8 (2.079)	61,1 (2.406)	11,0 (0.433)	15,4 (0.606)	13,7 (0.539)	55,3 (2.177)	7,60 (0.299)	2,42 (0.095)

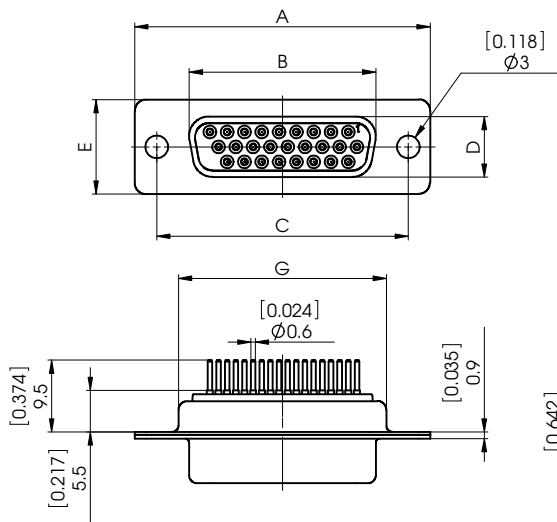


# Socket: Straight PCB Termination

## Buchse: Gerader Leiterplattenanschluss

### Dimensions

#### Abmessungen

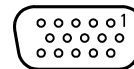


Stamped contacts  
Gestanzte Kontakte

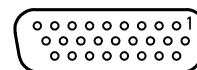
### Socket Connector, Front View

#### Buchsensteckverbinder, Frontansicht

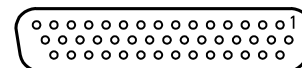
15 contacts  
15 Kontakte



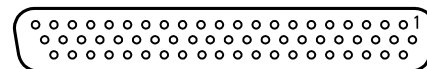
26 contacts  
26 Kontakte



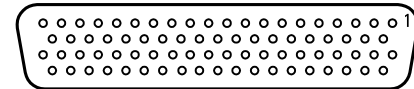
44 contacts  
44 Kontakte



62 contacts  
62 Kontakte



78 contacts  
78 Kontakte

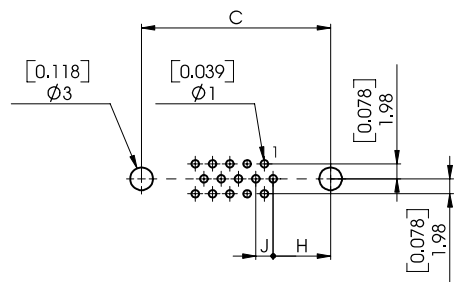


### PCB Hole Pattern (Mounting Side)

#### Leiterplattenlochbild (Bestückungsseite)

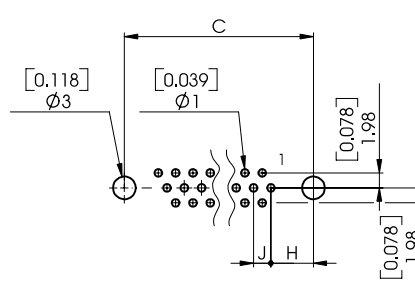
Hole Pattern 15 Contacts

Lochbild 15-polig



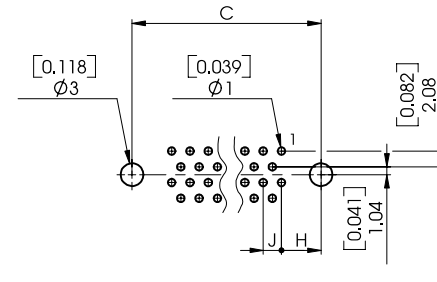
Hole Pattern 26, 44 and 62 Contacts

Lochbild 26-, 44- und 62-polig



Hole Pattern 78 Contacts

Lochbild 78-polig



### Dimensions

#### Abmessungen

Order Number Bestellnummer	Shell Size Gehäusegröße	Number of Contacts Polzahl	A	B	C	D	E	F	G	H	J
			$\pm 0,4$ ( $\pm 0.016$ )	$-0,2$ ( $-0.008$ )	$\pm 0,15$ ( $\pm 0.006$ )	$-0,2$ ( $-0.008$ )	$\pm 0,4$ ( $\pm 0.016$ )	$\pm 0,3$ ( $\pm 0.012$ )	$\pm 0,3$ ( $\pm 0.012$ )		
CT09-15S1	1	15	30,8 (1.213)	16,4 (0.646)	25,0 (0.984)	8,0 (0.315)	12,5 (0.492)	10,8 (0.425)	19,3 (0.760)	7,10 (0.280)	2,29 (0.090)
CT15-26S1	2	26	39,1 (1.539)	24,7 (0.972)	33,3 (1.311)	8,0 (0.315)	12,5 (0.492)	10,8 (0.425)	27,5 (1.083)	6,80 (0.268)	2,29 (0.090)
CT25-44S1	3	44	53,0 (2.087)	38,5 (1.516)	47,04 (1.852)	8,0 (0.315)	12,5 (0.492)	10,8 (0.425)	41,3 (1.626)	7,00 (0.276)	2,29 (0.090)
CT37-62S1	4	62	69,3 (2.728)	54,9 (2.161)	63,5 (2.500)	8,0 (0.315)	12,5 (0.492)	10,8 (0.425)	57,7 (2.272)	7,00 (0.276)	2,42 (0.095)
CT50-78S1	5	78	66,9 (2.634)	52,5 (2.067)	61,1 (2.406)	10,8 (0.425)	15,4 (0.606)	13,7 (0.539)	55,3 (2.177)	7,60 (0.299)	2,42 (0.095)

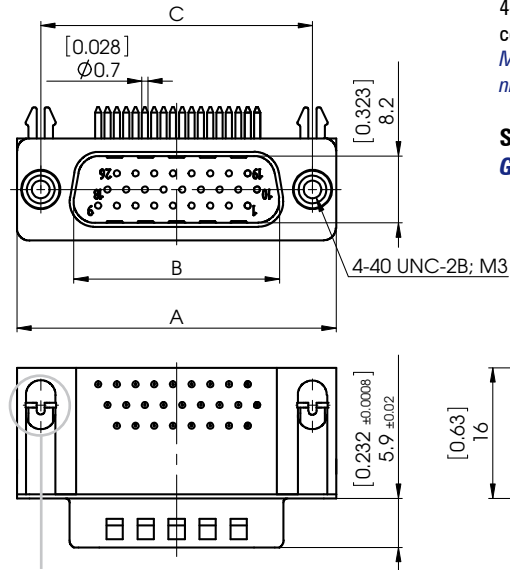


# Pin: Right Angled PCB Termination

## Stift: Abgewinkelter Leiterplattenanschluss

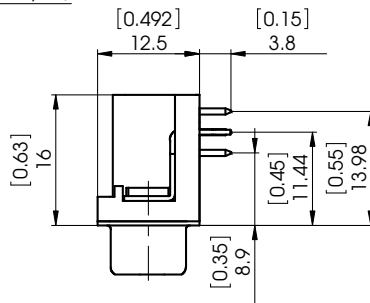
### Dimensions

#### Abmessungen



4-40 UNC-2B or M3 clinch nut on connector flange available.  
Mit 4-40 UNC-2B bzw. M3 Gewinde-niet im Steckerflansch lieferbar.

#### Stamped contacts Gestanzte Kontakte

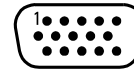


For snap-in or through hole  
Für Snap-in oder Durchgangsloch

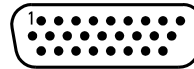
### Pin Connector, Front View

#### Stiftsteckverbinder, Frontansicht

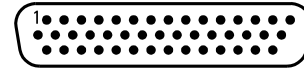
15 contacts  
15 Kontakte



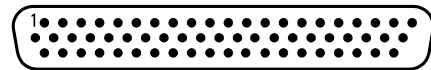
26 contacts  
26 Kontakte



44 contacts  
44 Kontakte



62 contacts  
62 Kontakte

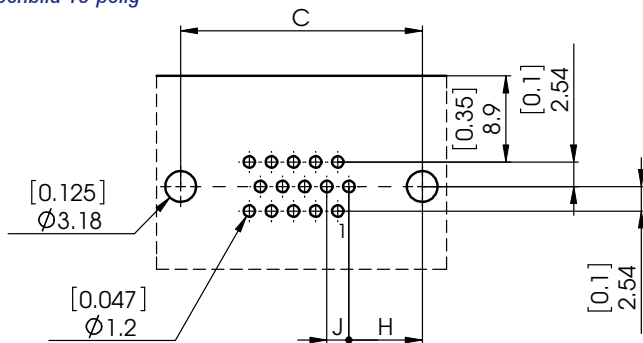


### PCB Hole Pattern (Mounting Side)

#### Leiterplattenlochbild (Bestückungsseite)

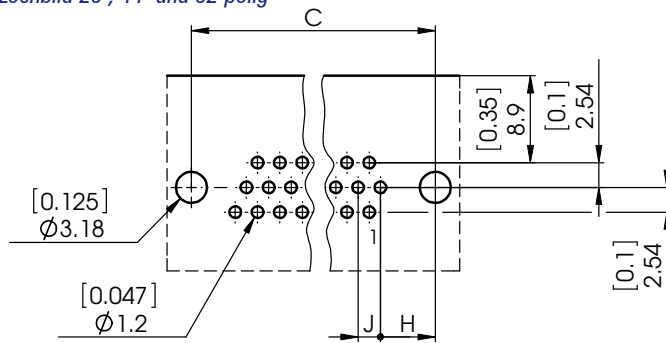
Hole Pattern 15 Contacts

Lochbild 15-polig



Hole Pattern 26, 44 and 62 Contacts

Lochbild 26-, 44- und 62-polig



### Dimensions

#### Abmessungen

Order Number Bestellnummer		Shell Size Gehäusegröße	Number of Contacts Polzahl	A	B	C	H	J				
Grounding Brackets with Snap-in Snap-in Massewinkel 4-40 UNC-2B	Grounding Brackets without Snap-in Massewinkel ohne Snap-in 4-40 UNC-2B											
CT09-15P5-L228	CT09-15P5-L229	CT09-15P5-L222	1	15	±0,4 (±0.016)	+0,2 (+0.008)	±0,15 (±0.006)	30,8 (1.213)	16,9 (0.665)	25,0 (0.984)	7,10 (0.280)	2,29 (0.090)
CT15-26P5-L228	CT15-26P5-L229	CT15-26P5-L222	2	26	±0,4 (±0.016)	+0,2 (+0.008)	±0,15 (±0.006)	39,1 (1.539)	25,2 (0.992)	33,3 (1.311)	6,80 (0.268)	2,29 (0.090)
CT25-44P5-L228	CT25-44P5-L229	CT25-44P5-L222	3	44	±0,4 (±0.016)	+0,2 (+0.008)	±0,15 (±0.006)	53,0 (2.087)	38,9 (1.531)	47,04 (1.852)	7,00 (0.276)	2,29 (0.090)
CT37-62P5-L228	CT37-62P5-L229	CT37-62P5-L222	4	62	±0,4 (±0.016)	+0,2 (+0.008)	±0,15 (±0.006)	69,3 (2.728)	55,3 (2.177)	63,5 (2.500)	7,00 (0.276)	2,42 (0.095)

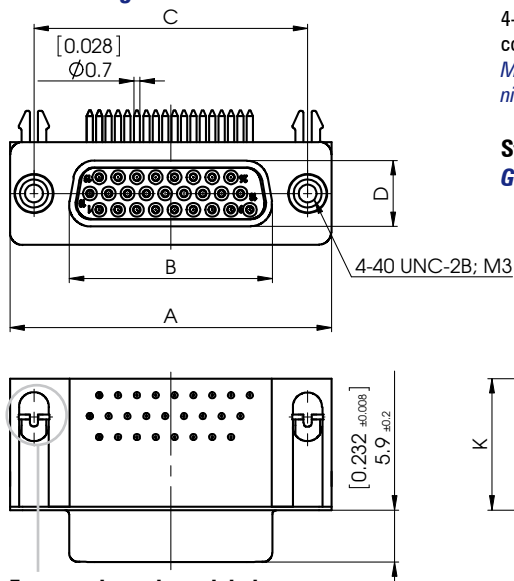


# Socket: Right Angled PCB Termination

## Buchse: Abgewinkelter Leiterplattenanschluss

### Dimensions

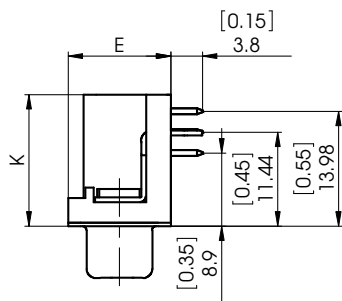
#### Abmessungen



For snap-in or through hole  
Für Snap-in oder Durchgangsloch

4-40 UNC-2B or M3 clinch nut on connector flange available.  
Mit 4-40 UNC-2B bzw. M3 Gewinde-nut im Steckerflansch lieferbar.

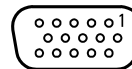
#### Stamped contacts Gestanzte Kontakte



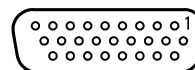
### Socket Connector, Front View

#### Buchsensteckverbinder, Frontansicht

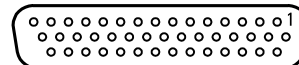
15 contacts  
15 Kontakte



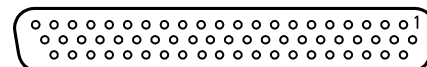
26 contacts  
26 Kontakte



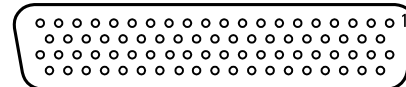
44 contacts  
44 Kontakte



62 contacts  
62 Kontakte



78 contacts  
78 Kontakte

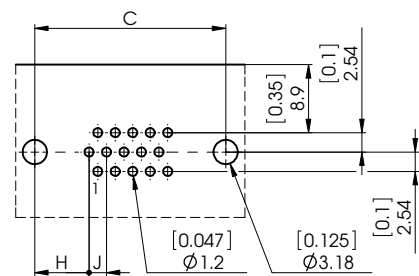


### PCB Hole Pattern (Mounting Side)

#### Leiterplattenlochbild (Bestückungsseite)

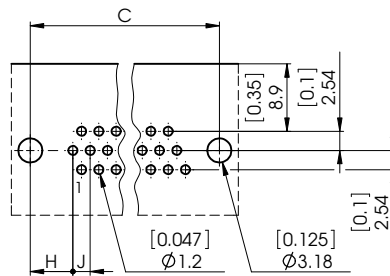
Hole Pattern 15 Contacts

Lochbild 15-polig



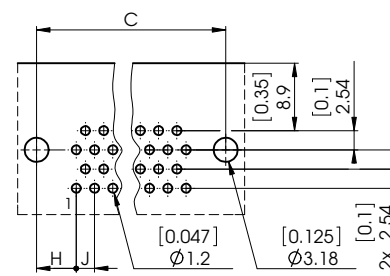
Hole Pattern 26, 44 and 62 Contacts

Lochbild 26-, 44- und 62-polig



Hole Pattern 78 Contacts

Lochbild 78-polig



### Dimensions

#### Abmessungen

Order Number Bestellnummer		Shell Size Gehäusegröße	Number of Contacts Polzahl	A	B	C	E	H	J	K	
Grounding Brackets with Snap-in Snap-in Massewinkel 4-40 UNC-2B M3		Grounding Brackets without Snap-in Massewinkel ohne Snap-in 4-40 UNC-2B		±0,4 (±0.016)	-0,2 (-0.008)	±0,15 (±0.006)	±0,4 (±0.016)				
CT09-15S5-L228	CT09-15S5-L229	CT09-15S5-L222	1	15	30,8 (1.213)	16,4 (0.646)	25,0 (0.984)	12,5 (0.492)	7,10 (0.280)	2,29 (0.090)	16,0 (0.630)
CT15-26S5-L228	CT15-26S5-L229	CT15-26S5-L222	2	26	39,1 (1.539)	24,7 (0.972)	33,3 (1.311)	12,5 (0.492)	6,80 (0.268)	2,29 (0.090)	16,0 (0.630)
CT25-44S5-L228	CT25-44S5-L229	CT25-44S5-L222	3	44	53,0 (2.087)	38,5 (1.516)	47,04 (1.852)	12,5 (0.492)	7,00 (0.276)	2,29 (0.090)	16,0 (0.630)
CT37-62S5-L228	CT37-62S5-L229	CT37-62S5-L222	4	62	69,3 (2.728)	54,9 (2.161)	63,5 (2.500)	12,5 (0.492)	7,00 (0.276)	2,42 (0.095)	16,0 (0.630)
CT50-78S5-L228	CT50-78S5-L229*	—	5	78	66,9 (2.634)	52,5 (2.067)	61,1 (2.406)	13,8 (0.543)	7,60 (0.299)	2,42 (0.095)	17,4 (0.685)

\* On request / auf Anfrage





# Panel Cut-out

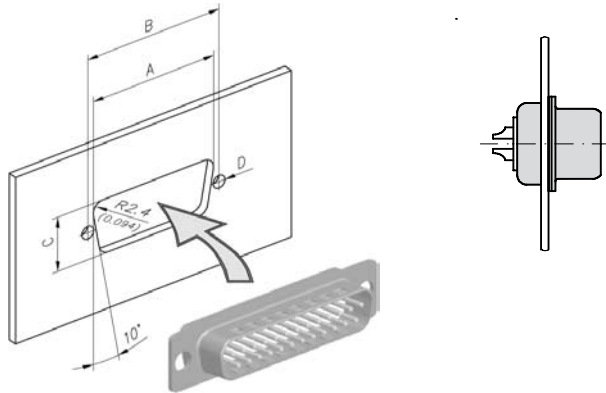
## Montageausschnitt

### Front Mounted

#### Frontseitig montiert

Standard, Front Mounted

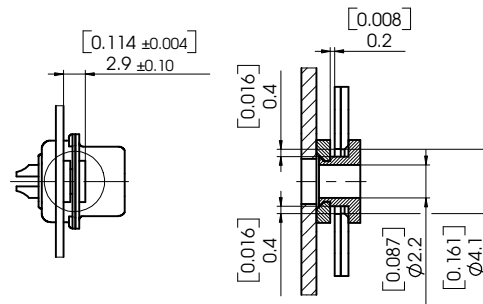
Standard, frontseitig montiert



Shell Size Gehäusegröße	A	B	C
1	±0,2 (±0.008) 22,2 (0.874)	±0,1 (±0.004) 25,0 (0.984)	±0,2 (±0.008) 12,3 (0.484)
2	30,5 (1.201)	33,3 (1.311)	12,3 (0.484)
3	44,3 (1.744)	47,0 (1.850)	12,3 (0.484)
4	60,7 (2.390)	63,5 (2.500)	12,3 (0.484)
5	58,3 (2.295)	61,1 (2.406)	15,1 (0.594)

Float, Front Mounted (Series FW)

Schwimmend, frontseitig montiert (Baureihe FW)



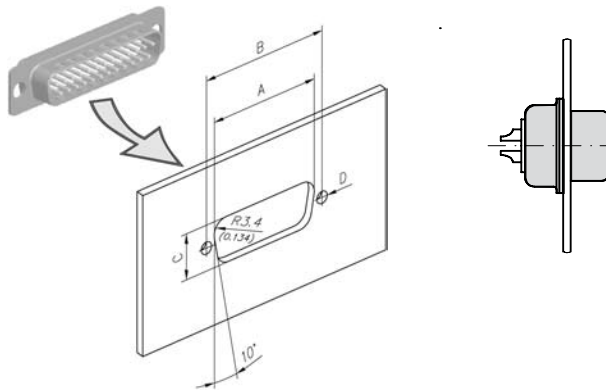
Shell Size Gehäusegröße	Mounting Befestigung	Ø D
1 - 5	Standard / <i>Standard</i>	±0,05 (±0.002) 3,1 (0.122)
1 - 5	Float mounted / <i>schwimmend</i>	2,2 (0.087)

### Rear Mounted

#### Rückseitig montiert

Standard, Rear Mounted

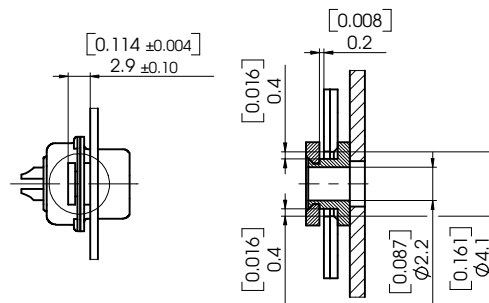
Standard, rückseitig montiert



Shell Size Gehäusegröße	A	B	C
1	±0,2 (±0.008) 20,5 (0.807)	±0,1 (±0.004) 25,0 (0.984)	±0,2 (±0.008) 11,4 (0.449)
2	28,8 (1.134)	33,3 (1.311)	11,4 (0.449)
3	42,5 (1.673)	47,0 (1.850)	11,4 (0.449)
4	59,1 (2.327)	63,5 (2.500)	11,4 (0.449)
5	56,3 (2.217)	61,1 (2.406)	14,1 (0.555)

Float, Rear Mounted (Series FW)

Schwimmend, rückseitig montiert (Baureihe FW)



Shell Size Gehäusegröße	Mounting Befestigung	Ø D
1 - 5	Standard / <i>Standard</i>	±0,05 (±0.002) 3,1 (0.122)
1 - 5	float mounted / <i>schwimmend</i>	2,2 (0.087)



The information for the panel cut-out is also valid for the crimp connectors (from page 15 onwards).  
Die Angaben zu den Montageausschnitten sind auch für die Crimpsteckverbinder (ab Seite 15) gültig.