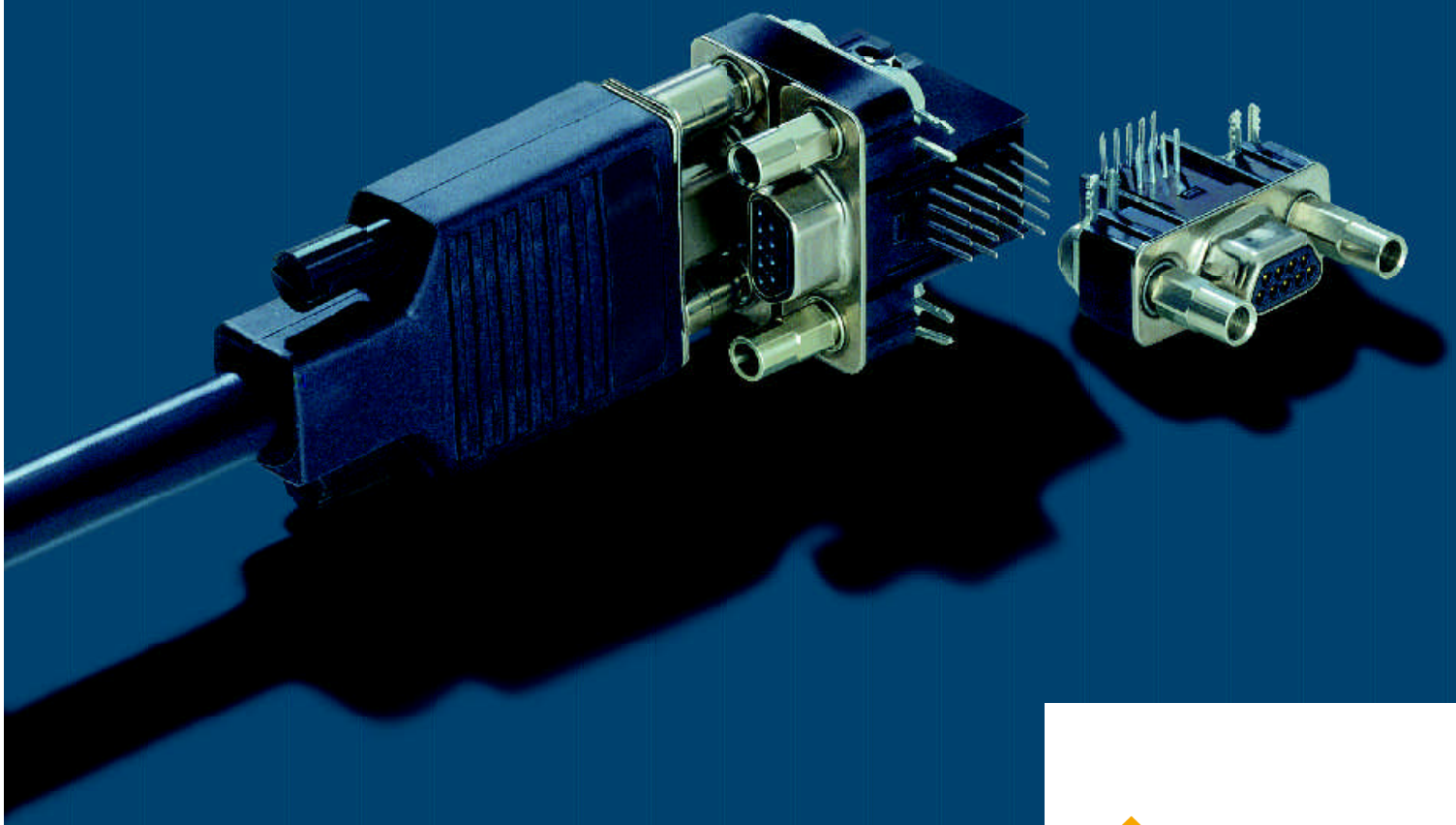
# Microminiature Connectors MDSM / RTG88



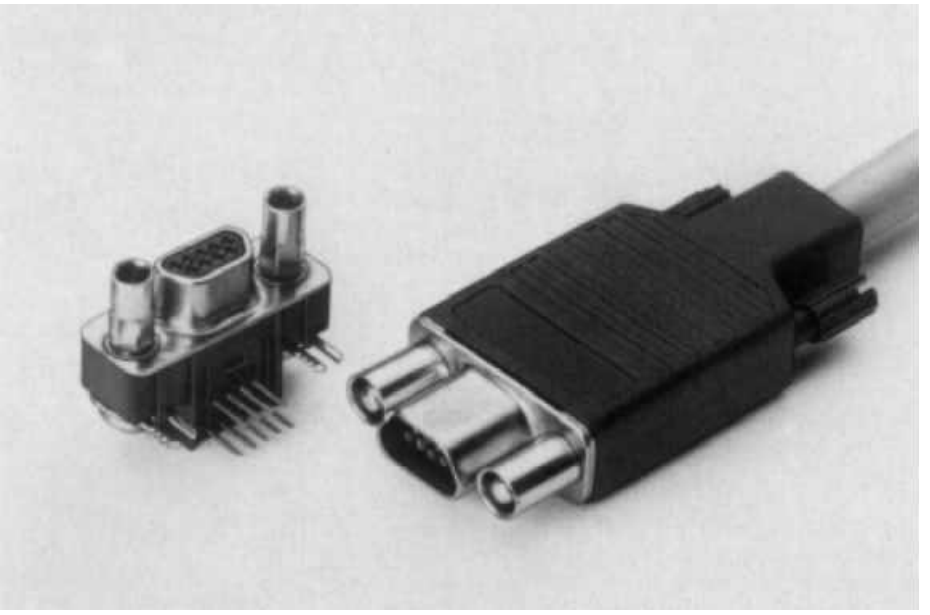
MY-13/0898

## Contents

**Shielded Connectors**

MICRO MDSM is the Cannon designation for a shielded interface connector in its Microminiature series. It is ideally suited for applications with specific requirements to shielding, e.g. components for telecommunications and computers.

The MDSM connector is suitable for modern solder methods, e.g. IR reflow and vapor phase soldering. It is available with crimp contacts (sockets only) as a cable connecting receptacle. Or with 90° solder pins as a pcb connector. The contacts are spaced at 1.27 mm, the solder pins at 1.27 x 2.54 mm. Different locking devices are available - see page 9.



**Technical Data**

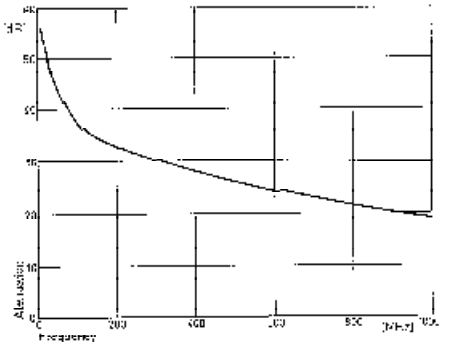
| | |
|---|---|
| Insulator | Thermoplast, UL94V-0 |
| Contact guiding plate | PA, high temperature resistant |
| Shell | Steel, tinned and nickel plated |
| Contacts | Copper alloy |
| Contact finish | Gold over PdNi |
| Contact termination area | Tin (SnPb) |
| Wire size | AWG 28 - 26 |
| Insulation dia. | 0.95 mm max |
| Contact spacing | 1.27 mm |
| Contact number | 9, 15, 25 |
| Temperature range acc. DIN IEC 68 Part 1 | -55 / 125°C |

**Electrical Data**

| | |
|---|---|
| Current rating | 2.5 A / 25°C |
| Test voltage | 350 Vrms |
| Contact resistance | 20 mΩ max (crimp version) |
| | 35 mΩ max (pcb version) |
| Insulation resistance | 5000 MΩ min |

**Shielding Effectiveness**

| Frequency MHz | Attenuation dB |
|---|---|
| 10 | 56 |
| 30 | 47 |
| 159 | 34 |
| 500 | 26 |
| 750 | 22 |
| 1000 | 19 |



**Shielded Connectors**

**Order Reference**

**MDSM - 9 P E - Z7 - VR - ***

**Series**

**Number of contacts**
9, 15, 25

**Contact type**
P - Pin
S - Socket (with crimp termination only)

**Termination method**
C - Crimp termination (contacts to be ordered separately)
E - Solder pin 90°, spacing 1,27 x 2,54 mm, with rivet nut and grounding tab (Pin connector only)

**Mounting method**
Z7 - Locking screw 1)
Z10 - Screw for wall thickness 1,5 mm 1)
Z11 - Screw, long, blank 2)
Z12 - Screw for wall thickness 1,0 mm 1)
Z24 - Pushpull Quick disconnect 2)
Z33 - Locking screw, short 1)
Z34 - Screw, short, for wall thickness 1,5 mm 1)
Z35 - Screw, short, for wall thickness 1,0 mm 1)
Z41 - Locking screw, Pushpull 1)
Z42 - Screw, Pushpull, for wall thickness 1,5 mm 1)
Z43 - Screw, Pushpull, for wall thickness 1,0 mm 1)

**Packaging**
VR - Tube packaging (not for termination method C)
VS1 - 100 pieces

**Modification**
Please consult factory

1) for pin connectors only
2) for socket connectors only (cable connecting receptacle)

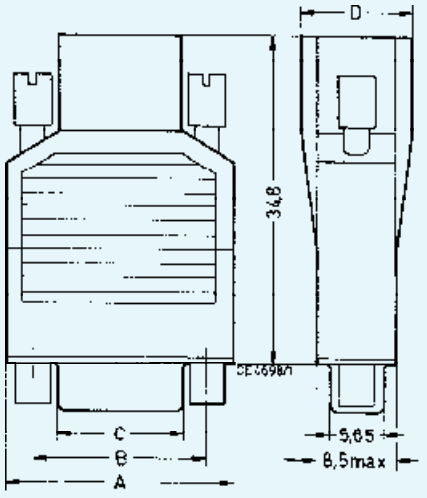
**Tube packaging (VR)**
A tube contains the following numbers of MDSM connectors:

| No. of contacts | No. of connectors |
|---|---|
| 9 | 25 |
| 15 | 22 |
| 25 | 17 |

**Ordering MDSM connectors**
Tube loaded connectors can only be supplied in the quantity per tube shown above or in multiples thereof. Other quantities cannot be supplied.This also applies when ordering VS1.

**Cable Connector**

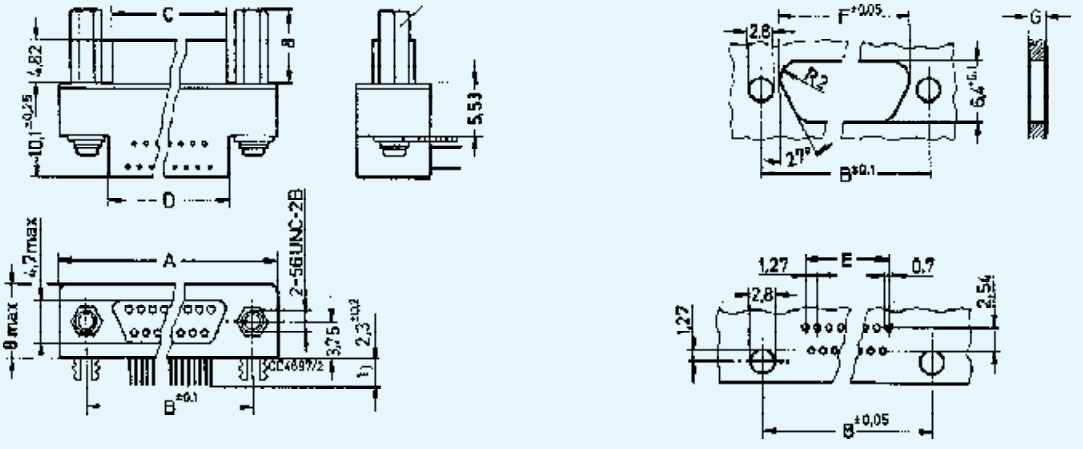
Socket contacts see page 8




| No of contacts | Designation | | Dimensions A max | B ± 0,1 | C ± 0,1 | D ± 0,2 |
|---|---|---|---|---|---|---|
| 9 | **MDSM-9SC-Z11-VS1** | **MDSM-9SC-Z24-VS1** | 19,9 | 14,35 | 9,45 | 8 |
| 15 | **MDSM-15SC-Z11-VS1** | **MDSM-15SC-Z24-VS1** | 23,7 | 18,16 | 13,25 | 8 |
| 25 | **MDSM-25SC-Z11-VS1** | **MDSM-25SC-Z24-VS1** | 30,05 | 24,5 | 19,6 | 8 |

**PCB Connector 90°**

with pin contacts



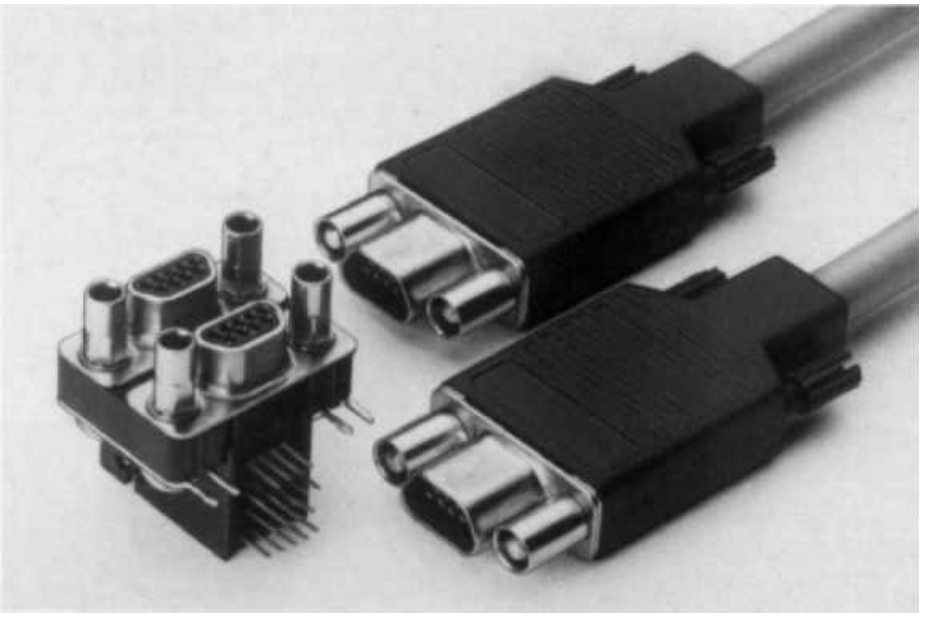

| No of contacts | Designation | Dimensions A max | B | C max | D max | E | F | G (Wallthickness) -Z7 | -Z10 | -Z12 |
|---|---|---|---|---|---|---|---|---|---|---|
| 9 | **MDSM-9PE-Z*-VR25** | 19,9 | 14,35 | 8,6 | 9,0 | 5,08 | 10,24 | 0,00 | 1,5 | 1,0 |
| 15 | **MDSM-15PE-Z*-VR22** | 23,7 | 18,16 | 12,4 | 12,8 | 8,89 | 14,00 | 0,00 | 1,5 | 1,0 |
| 25 | **MDSM-25PE-Z*-VR17** | 30,05 | 24,5 | 18,8 | 19,15 | 15,24 | 20,35 | 0,00 | 1,5 | 1,0 |

* Insert mounting method - see Order reference on this page

**Doubledecker**

This connector version offers higher packaging density. The MDSM Doubledecker provides twice the number of contacts in only 30% extra space.

Two Standard MDSM cable connectors with the corresponding number of contacts mate with the MDSM Doubledecker. The MDSM Doubledecker is available with pin contacts only.



**Technical Data**

| | |
|---|---|
| Insulator | Thermoplast, UL94V-0 |
| Contact guiding plate | PA, high temperature resistant |
| Shell | Steel, tinned and nickel plated |
| Contacts | Copper alloy |
| Contact finish | Gold over PdNi |
| Contact termination area | tinned (SnPb) |
| Contact spacing | 1.27 mm |
| Contact number | 18, 30 |
| Temperature range acc. DIN IEC 68 Part 1 | -55 / 125°C |

**Electrical Data**

| | |
|---|---|
| Current rating | 2.5 A / 25°C (row 1, 2) |
| | 1.8 A / 25°C (row 3, 4) |
| Test voltage | 350 Vrms |
| Contact resistance | 35 mΩ max (row 1, 2) |
| | 55 mΩ max. (row 3, 4) |
| Insulation resistance | 5000 MΩ min |

**Doubledecker**

**Order Reference**

**MDSM - 18 P E - Z7 - VR**

**Series**

**Number of contacts**
18, 30

**Contact type**
P - Pin

**Termination method**
E - Solder pin 90°, spacing 1,27 x 2,54 mm
with rivet nut and grounding tab

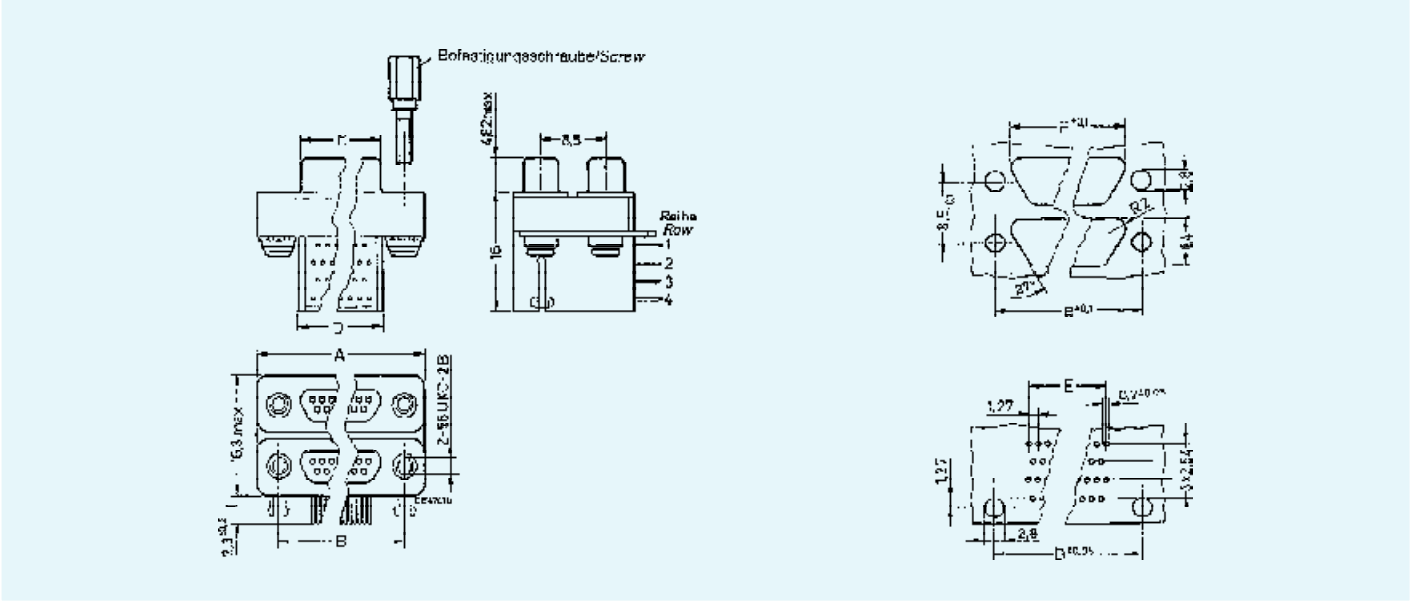
**Mounting method***
Z7 - Locking screw
Z10 - Screw for wall thickness 1,5 mm
Z12 - Screw for wall thickness 1,0 mm
* Additional mounting methods on page 9

**Packaging**
VR - Tube packaging (not for termination method C)

**Tube packaging (VR)**
A tube contains the following numbers of MDSM connectors:

| No. of contacts | No. of connectors |
|---|---|
| 18 | 25 |
| 30 | 22 |

**Ordering MDSM connectors**
Tube loaded connectors can only be supplied in the quantity per tube shown in the table or in multiples thereof. Other quantities cannot be supplied.




| No of contacts | Designation | Dimensions A max | B | C max | D max | E | F | G (Wall thickness) -Z7 | -Z10 | -Z12 |
|---|---|---|---|---|---|---|---|---|---|---|
| 18 | **MDSM-18PE-Z*-VR25** | 19,9 | 14,35 | 8,6 | 9,0 | 5,08 | 10,24 | 0,00 | 1,5 | 1,0 |
| 30 | **MDSM-30PE-Z*-VR22** | 23,7 | 18,16 | 12,4 | 12,8 | 8,89 | 14,00 | 0,00 | 1,5 | 1,0 |

* Insert mounting method - see Order reference on this page

**Signal Contacts**

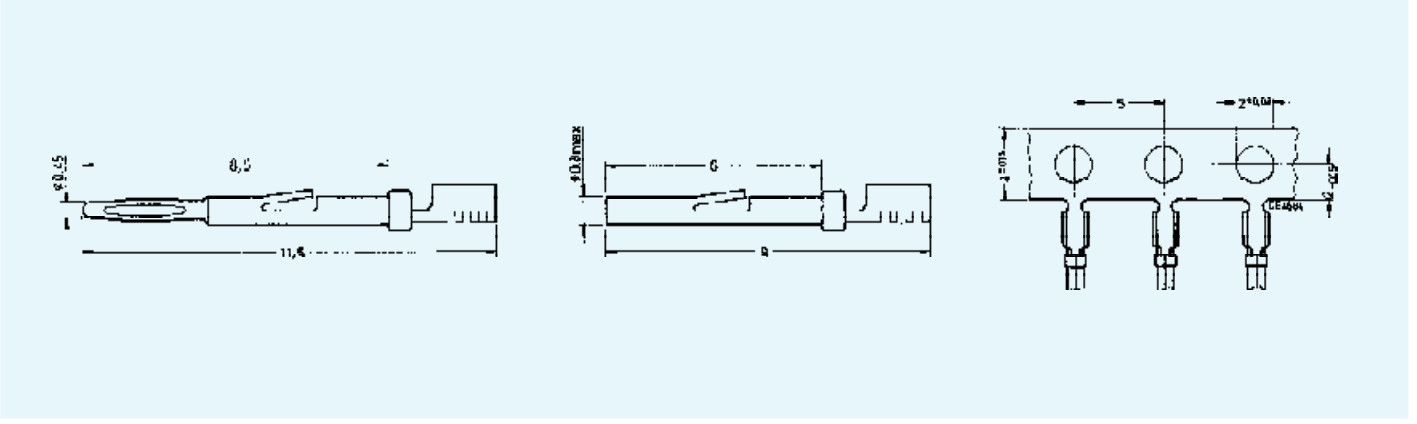
on reels / 1000 pieces (TS)

| | |
|---|---|
| **MDS-P-TS** | Pin contact |
| **MDS-S-TS** | Socket contact |

on reels / 10 000 pieces (RL)

| | |
|---|---|
| **MDS-P-RL** | Pin contact |
| **MDS-S-RL** | Socket contact |

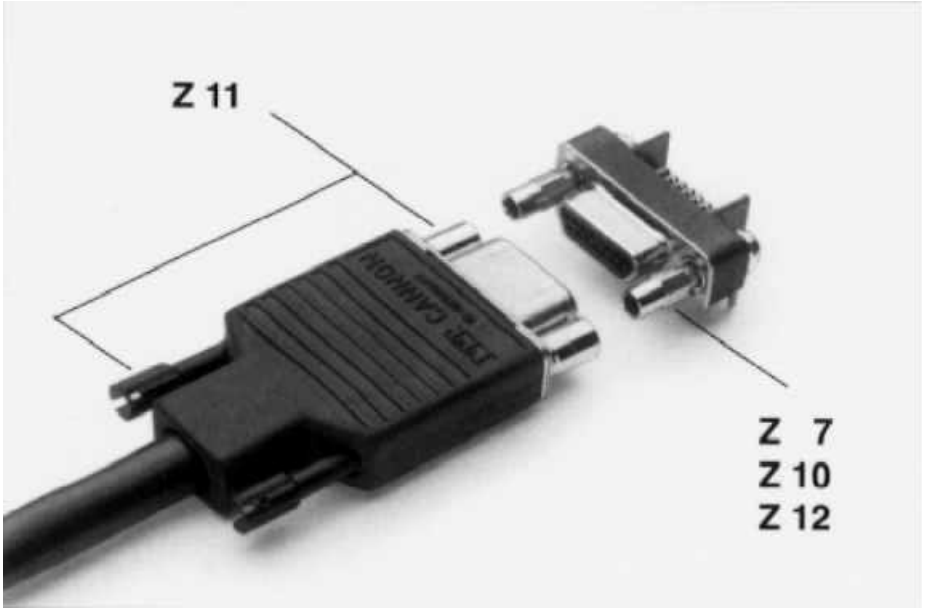
The contacts (1.2 µm PdNi with 0.1 µm Au over 0.5 µm Ni) are tin plated in the crimp area.
Wire size AWG 28 - 26 (0.09 - 0.14 mm²).



**Screw locking**

for cable connectors (socket side)
**Z11** Screw, long, blank

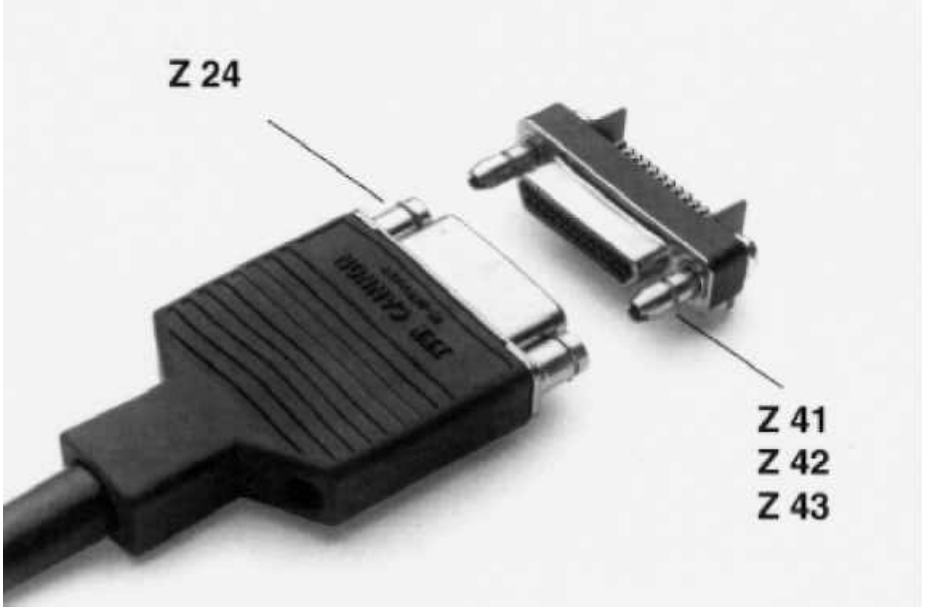
for pcb connectors (pin side)
**Z7** Locking screw
**Z10** Screw for wall thickness 1.5 mm
**Z12** Screw for wall thickness 1 mm
**Z33** Locking screw, short
**Z34** Screw, short, for wall thickness 1.5 mm
**Z35** Screw, short, for wall thickness 1 mm
**Z41** Locking pin
**Z42** Screw, universal, for wall thickness 1.5 mm
**Z43** Screw, universal, for wall thickness 1 mm




**Push Pull**

for cable connectors (socket side)
**Z24** Pushpull Quick disconnect

for pcb connectors (pin side)
**Z41** Locking pin
**Z42** Screw, Pushpull, for wall thickness 1.5 mm
**Z43** Screw, Pushpull, for wall thickness 1 mm



**with straight solder pins**

Due to customer requirements connectors MDSM-9PE-Z** with 90° termination are not suitable for all applications. There is great interest for a MDSM version with straight terminations. To fulfill market requirements the following connector versions and tools were developped:

- **MDSM-9PA-Z7/Z10**
- **MDSM-9PA-Z41/Z42**

with straight terminations and pcb locking.

**Typical Applications**
SSA band and disk drives, SSA distribution panels, bar code readers, mobile tele-communications and medical equipment.

**Locking of PC Board**
The mating and unmating forces are concentrated on to an integrated PCB locking, after the connector has been mounted on a pc board.

Please note:
The standard screw locking which is being used for MDSM-9PE-Z10 do **not** apply to MDSMA-9PA .

The MDSM-9PA screws require a shorter thread.

*MDSM-9PA Connector optionally with push-pull or screw locking*

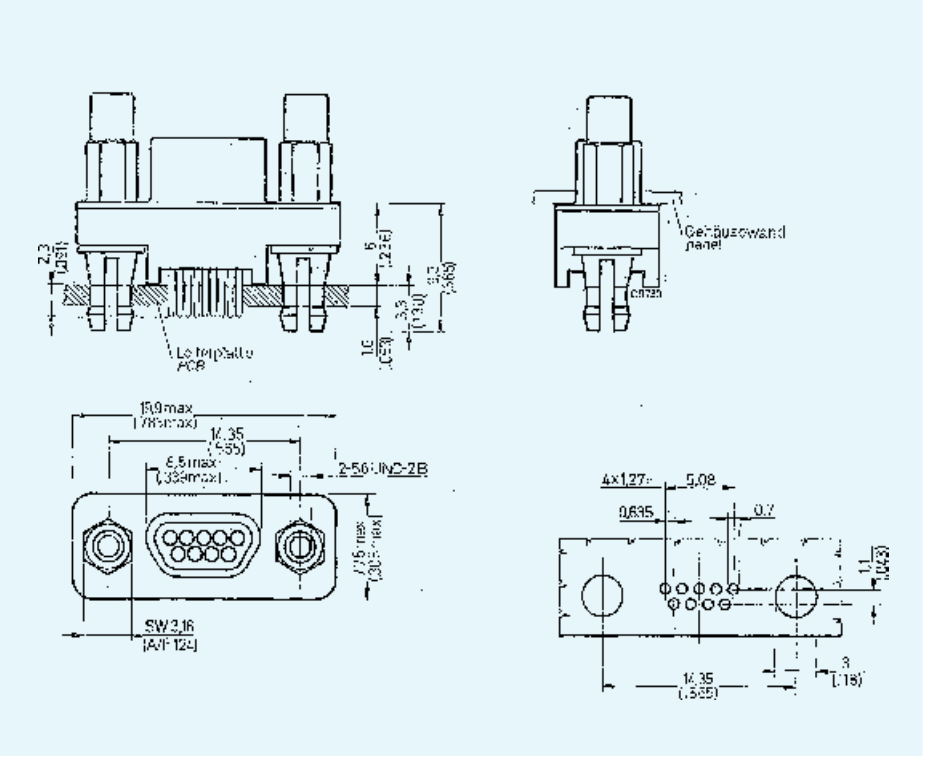
**Technical Data**

| | |
|---|---|
| Insulator | Thermoplast, UL 94V-0 |
| Shell | Steel, tinned and nickel plated |
| Contacts | Copper alloy |
| Contact finish | Gold over PdNi |
| Contact termination | tinned |
| Wire size | AWG 28 - 26 |
| Contact spacing | 1,27 mm |
| Contact number | 9 |
| Temperature range acc to DIN IEC 68 part 1 | -55 / 125°C |

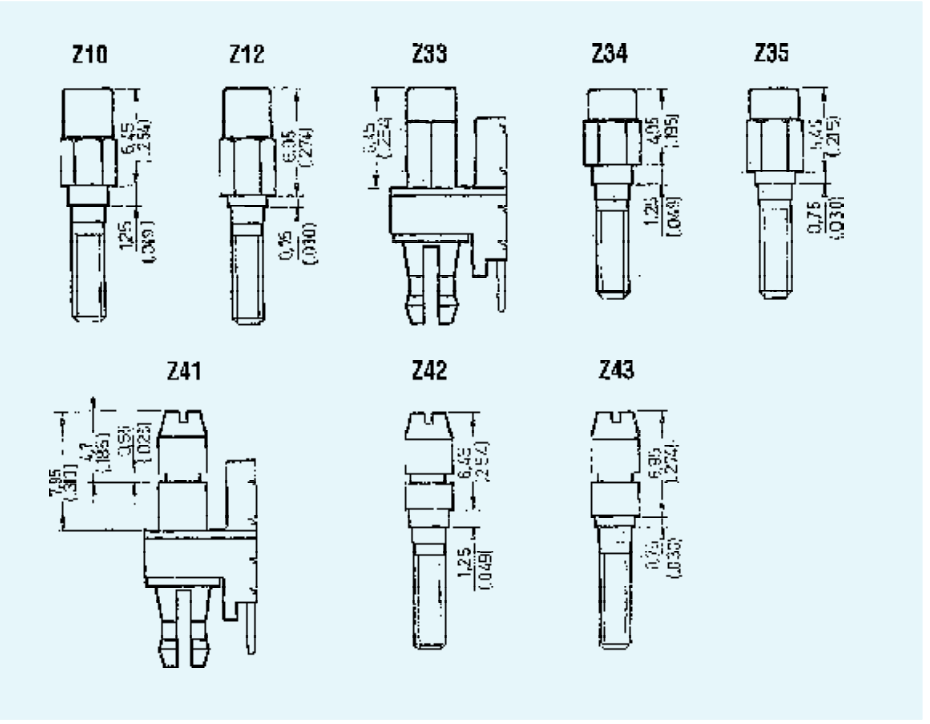
**Electrical Data**

| | |
|---|---|
| Current rating | 1,5 A / 55°C |
| Voltage rating | 350 Vrms |
| Contact resistance | 20 mΩ max |
| IInsulation resistance | 5000 MΩ |

**Dimensions**




**Mounting Methods**

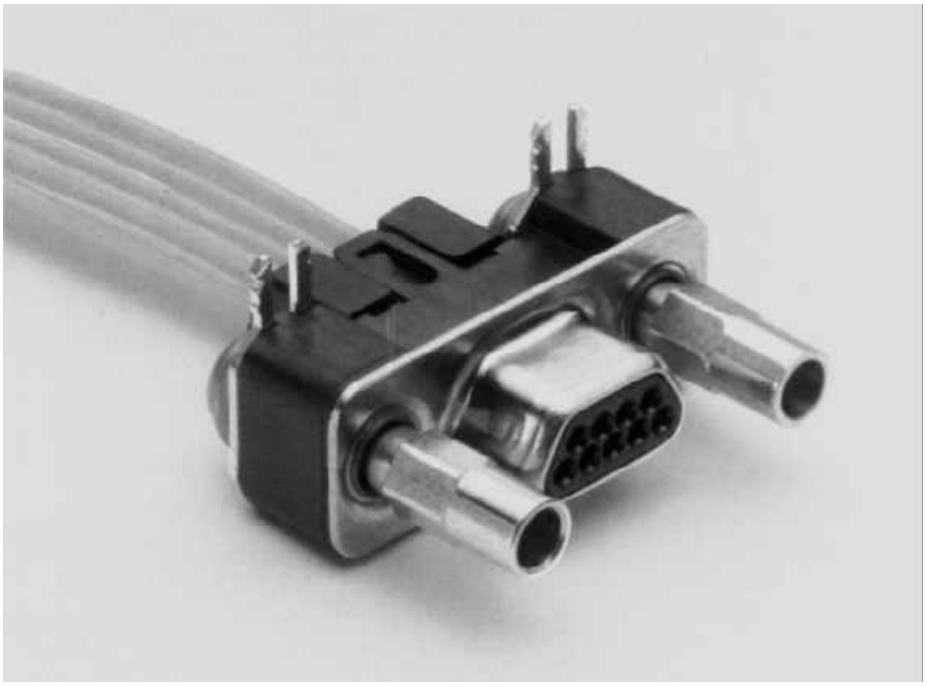


**with crimp contacts, for panel mounting**

The market shows great interest for a MDSM Inline receptacle with pin contacts for crimp termination. To fulfill this requirements the following connector versions and tools have been developped to accomodate pin contacts crimped to wire sizes AWG 28 - 26:

- **MDSM- 9PC-Z7/Z10-O- VS1**
- **MDSM-9PC-Z42-O-VS1**

**Contacts**
Contacts MDS-P-TS (1000 contacts / reel) or MDS-P-RL (10.000 contacts / reel) to be ordered separately.



*MDSM-9PC Connector with screw locking*

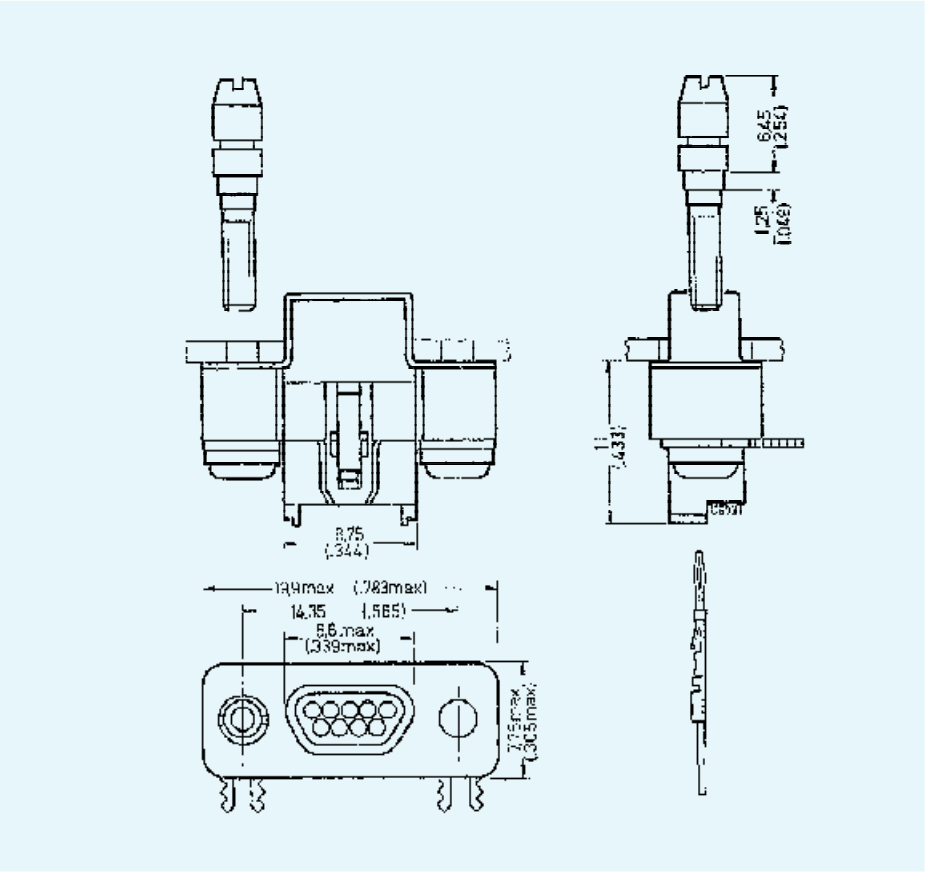
**Technical Data**

| | |
|---|---|
| Insulator | Thermoplast, UL 94V-0 |
| Shell | Steel, tinned and nickel plated |
| Contacts | Copper alloy |
| Contact finish | Gold over PdNi |
| Contact termination | tinned |
| Wire size | AWG 28 - 26 |
| Contact spacing | 1,27 mm |
| Contact number | 9 |
| Temperature range acc to DIN IEC 68 part 1 | -55 / 125°C |

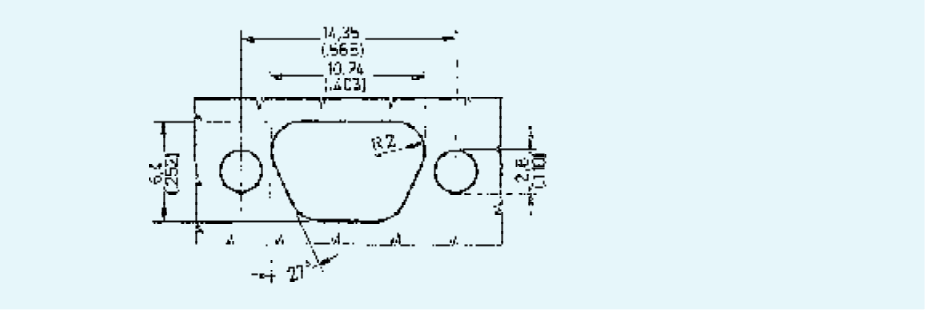
**Electrical Data**

| | |
|---|---|
| Current rating | 2,0 A / 55°C |
| Voltage rating | 350 Veff |
| Contact resistance | 20 mΩ max |
| Insulation resistance | 5000 MΩ |

**Dimensions**




**Panel Cutout**



**Stranded wire**

| | |
|---|---|
| Conductors | Copper, tinned<br>AWG 26 / 7 x 0,160 mm<br>AWG 28 / 7 x 0,127 mm |
| Insulation | PVC, PP or HDPE, Outer dia. max. 0,9 mm |
| Wall thickness | AWG 26: generally min. 0,140 mm<br>AWG 28: generally min. 0,152 mm<br><br>for all: min. permissible thickness at any position .127 mm |

**Cable**

| | |
|---|---|
| Shielding | Shielding braid, tinned copper, coverage min. 80% |
| Insulation | PVC |
| Wall thickness | 0.56 mm min. at any position*<br>0.76 mm min. at any position** |

Outer diameter

| Strands | ∅ mm max. |
|---|---|
| 9 | 5,7 |
| 15 | 6,7 |
| 25 | 7,9 |

| | |
|---|---|
| Temperature range | -40 / 80°C |
| Operating voltage | 300 Vrms |
| Test voltage | 1000 Vrms min. |
| Conductor resistance | 240 Ω / km |

* Cable with 9 wires or 5 twisted pairs
** Cable with more than 9 wires or more than 5 twisted pairs

**Tooling**

| | |
|---|---|
| Hand crimp tool (for reeled contacts) | **CCTR-MDS** |
| Semi-automatic stripper / crimper | **EPS 3500-MDS** |
| Insertion tool | **CT 120090-102** |
| Other tools | see assembly instruction |

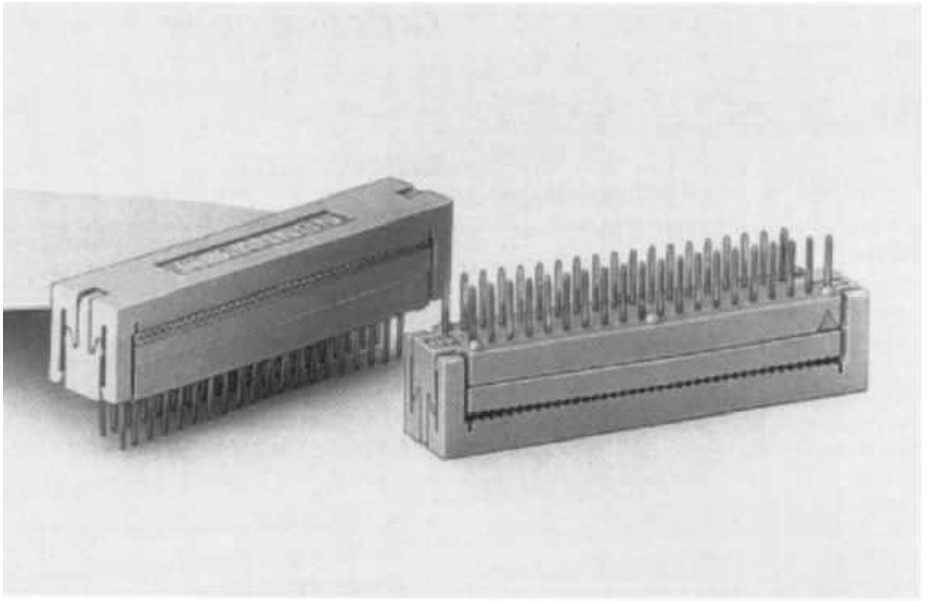
*+ Flachkabel für RTG88C ?*

**PCB Transition connector, double-row**

MICRO Speedy RTG88C from Cannon is a two-row pbc transition connector for IDC termination. The staggered contacts are spaced at 1.27 mm offering space savings of up to 60% compared to 2.54 mm pitch.

The upper connector part features a pre snap-in facility thus enabling simple and safe handling. An additional cable guidance ensures exact termination of ribbon cables. Suitable are ribbon cables with conductors size 0.057 $mm^2$ (AWG 30) spaced at 0.635 mm.

Together with connectors MDSM and series MSMC for surface mounting (spacing 1.27 mm), MICRO Speedy RTG88C offers an excellent inter-connection system for pcb/pcb and pcb/cable applications.



**Tools**

for termination of flat ribbon cables

| | |
|---|---|
| Hand press | CHP-420 |
| Pneumatic press | CPP-460 |
| Die plate | CT121086-3289 |

**Technical Data**

| | |
|---|---|
| Insulator | Polyester GF, grey, UL94V-0 |
| Contacts | Copper alloy |
| Contact finishes | Tin over nickel |
| Number of contacts | 20, 34, 40, 50 |
| Spacing of contacts | 1.27 / 2.54 mm |
| Termination method | IDC |
| Wire size | AWG 30 (0.06 $mm^2$) |
| Temperature range acc. to DIN IE 68 Part 1 | -55 / 125°C |

**Electrical Data**

| | |
|---|---|
| Current rating | 1 A / 25°C; 0.7 A / 70°C |
| Test voltage | 350 Vrms |
| Contact resistance | 20 mΩ max. |
| Insulation resistance | 5000 MΩ min. |

**Order Reference**

**RTG88 C 40 L L**

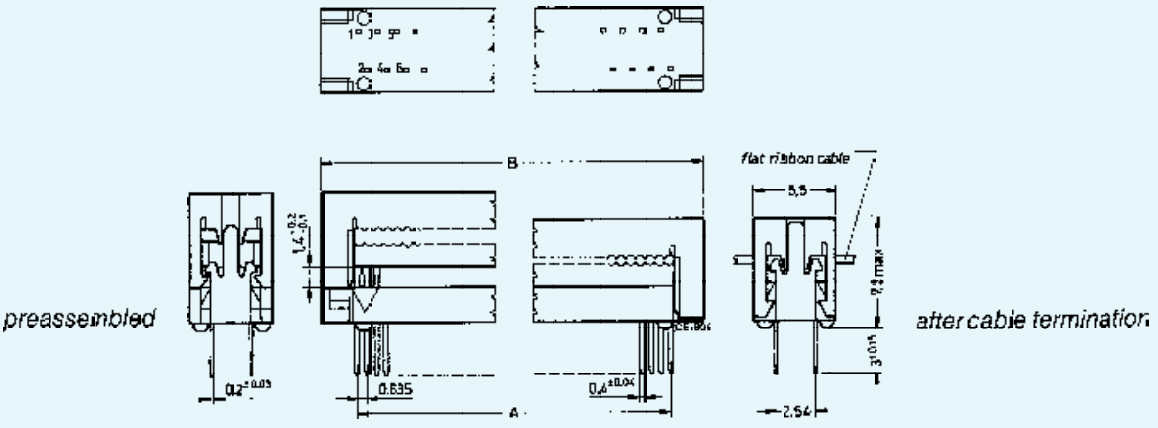
**Cannon series**

**Connector type**
C - PCB Transition connector, double-row

**Number of contacts**
20, 34, 50, 60

**Termination method / Size**
L - IDC / AWG 30

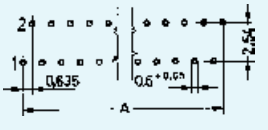
**Colour**
L - Grey




**Dimensions**

| No of contacts | Designation | Dimensions A | B max |
|---|---|---|---|
| 20 | **RTG88C20LL** | 12,065 | 16,5 |
| 34 | **RTG88C34LL** | 20,955 | 25,4 |
| 40 | **RTG88C40LL** | 24,765 | 29,2 |
| 50 | **RTG88C50LL** | 31,115 | 35,6 |

**PCB Hole Pattern**

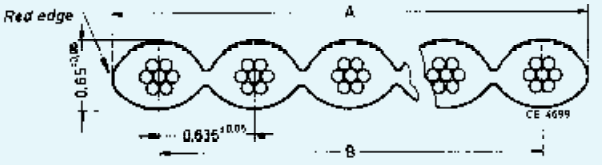


**Technical Data**

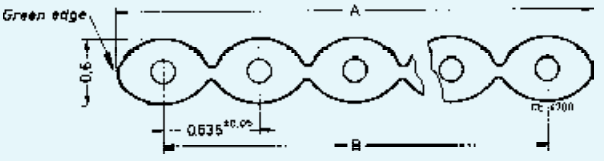
| **Stranded conductor** | |
|---|---|
| Temperature | 105°C |
| Voltage rating | 150 V |
| Insulation resistance | min. $10^{10}$ Ω |
| Insulation | PVC |
| Conductor | stranded, AWG 30 (7/38), tinned copper |
| Impedance | 75 Ω |
| Capacitance | 80 pf/m |
| Propagation delay | 4.5 ns/m |
| Crosstalk | NE 9.6% |
| | FE 2.8% |
| Spacing | 0.635 mm |

| **Solid conductor** | |
|---|---|
| Temperature | 150°C |
| Voltage rating | 150 V |
| Insulation resistance | min. $10^{10}$ Ω / 3 m |
| Insulation | Teflon FEP |
| Conductor | solid, AWG 30, silver plated copper |
| Impedance | 88 Ω |
| Capacitance | 49 pf/m |
| Propagation delay | 4.3 ns/m |
| Crosstalk | NE 8.1% |
| | FE 2.3% |
| Spacing | 0.635 mm |

Stranded conductor




Solid conductor




| No. of conductors | A | B |
|---|---|---|
| 12 | 7,62 ± 0,15 | 6,99 ± 0,15 |
| **20** | **12,70 ± 0,15** | **12,07 ± 0,15** |
| 26 | 16,51 ± 0,15 | 15,88 ± 0,15 |
| **34** | **21,59 ± 0,15** | **20,96 ± 0,15** |
| **40** | **25,40 ± 0,2** | **24,77 ± 0,2** |
| **50** | **31,75 ± 0,2** | **31,12 ± 0,2** |

# Product Safety Information

**THIS NOTE SHOULD BE READ IN CONJUNCTION WITH THE PRODUCT DATA SHEET/ CATALOGUE. FAILURE TO OBSERVE THE ADVICE IN THIS INFORMATION SHEET AND THE OPERATING CONDITIONS SPECIFIED IN THE PRODUCT DATA SHEET/CATALOGUE COULD RESULT IN HAZARDOUS SITUATIONS.**

**1. MATERIAL CONTENT AND PHYSICAL FORM**
Electrical connectors do not usually contain hazardous materials. They contain conducting and non-conducting materials and can be divided into two groups.

a) Printed circuit types and low cost audio types which employ all plastic insulators and casings.

b) Rugged, Fire Barrier and High Reliability types with metal casings and either natural rubber, synthetic rubber, plastic or glass insulating materials.

Contact materials vary with type of connector and also application and are usually manufactured from either copper, copper alloys, nickel, alumel, chromel or steel. In special applications, other alloys may be specified.

**2. FIRE CHARACTERISTICS AND ELECTRIC SHOCK HAZARD**
**There is no fire hazard when the connector is correctly wired and used within the specified parameters. Incorrect wiring or assembly of the connector or careless use of metal tools or conductive fluids, or transit damage to any of the component parts may cause electric shock or burns. Live circuits must not be broken by separating mated connectors as this may cause arcing, ionisation and burning.**
Heat dissipation is greater at maximum resistance in a circuit. Hot spots may occur when resistance is raised locally by damage, e.g. cracked or deformed contacts, broken strands of wire. Local overheating may also result from the use of the incorrect application tools or from poor quality soldering or slack screw terminals. Overheating may occur if the ratings in the Product Data Sheet/ Catalogue are exceeded and can cause breakdown of insulation and hence electric shock.
If heating is allowed to continue it intensifies by further increasing the local resistance through loss of temper of spring contacts, formation of oxide film on contacts and wires, and leakage currents through carbonisation of insulation and tracking paths. Fire can then result in the presence of combustible materials and this may release noxious fumes. Overheating may not be visually apparent. Burns may result from touching overheated components.

**3. HANDLING**
Care must be taken to avoid damage to any component parts of electrical connectors during installation and use. Although there are normally no sharp edges, care must be taken when handling certain components to avoid injury to fingers.
Electrical connectors may be damaged in transit to the customers, and damage may result in creation of hazards. Products should therefore be examined prior to installation/use and rejected if found to be damaged.

**4. DISPOSAL**
Incineration of certain materials may release noxious or even toxic fumes.

**5. APPLICATION**
Connectors with exposed contacts should not be selected for use on the current supply side of an electrical circuit, because an electric shock could result from touching exposed contacts on an unmated connector. Voltages in excess of 30 V ac or 42.5 V dc are potentially hazardous and care should be taken to ensure that such voltages can not be transmitted in any way to exposed metal parts of the connector body. The connector and wiring should be checked, before making live, to have no damage to metal parts or insulators, no solder blobs, loose strands, conducting lubricants, swarf, or any other undersired conducting particles. Insulation resistance should be checked to make certain that no low resistance joints or spurious conducting path are existing between contacts and exposed metal parts of the connector body. Further the contact resistance of the connectors should be measured within the electrical circuit in order to identify highresistances which result in excessive connector heating.

Always use the correct application tools as specified in the Data Sheet/Catalogue.

Do not permit untrained personnel to wire, assemble or tramper with connectors.

For operation voltage please see appropriate national regulations.

**IMPORTANT GENERAL INFORMATION.**

1. Air and creepage paths/Operating voltage.
The admissible operating voltages depend on the individual applications and the valid national and other applicable safety regulations.

For this reason the air and creepage path data are only reference values. Observe reduction of air and creepage paths due to PC board and/or harnessing.

2. Temperature
All information given are temperature limits. The operation temperature depends on the individual application.

3. Other important information
Cannon continuously endeavours to improve their products. Therefore, Cannon products may deviate from the description, technical data and shape as shown in this catalogue and data sheets.

4. Harnessing and Assembly Instructions
If applicable, our special harnessing and/or assembly instruction has to be adhered to. This is provided at request.

## Cannon Worldwide Facilities

### Austria

Afrikanergasse 3
1020 Vienna
FAX: (1) 2 16 09 48 PH: (1) 2 16 09 47

### Benelux

Residence Leopold
Genèvestreet 10
1140 Brussels, Belgium
FAX: (02) 7 26 92 01 PH: (02) 726 75 94

**NL**
FAX: 31.35.691.8796 PH: 31.35.691.6855

### China

No. 24, 2 Block
Taohuawu New District
Zhenjiang, Jiangsu
P.R.C.
FAX: 86 511 4428616 PH: 86 511 443 3399

### Denmark

Park Allé 287 A
2605 Brøndby
FAX: 43 43 58 58 PH: 43 45 52 88

### France

2, Ave Sablons Bouillants, B.P. 133
77109 Meaux
FAX: (1) 64 33 16 82 PH: (1) 60 24 51 51

### Germany

Postfach 1120, 71365 Weinstadt
Cannonstrasse 1, 71384 Weinstadt
FAX: (07151) 699 217 PH: (07151) 699-0

### Hong Kong

Unit 901 & 912, West Tower
Shun Tak Center
168-200 Connaught Road
Central
FAX: 852.2732.2919 PH: 852.2732.2720

### Italy

Via Panzeri 10
20123 Milano
FAX: (02) 8372036 PH: (02) 581801

### Japan

5362-1, 5-chome, Hibarigaoka
Zama-shi, Kanagawa 228
FAX: 0462-57-1680 PH: 0462-57-2010

### Korea

620, Changkang Bldg.
#22, Dohawa-dong, Mapo-ku
Seoul
FAX: (02) 717 7330 PH: (02) 702 7111

### Spain

Parque Empresarial San Fernando
#Edificio Italia 1ª Planta
28831 Madrid
FAX:(34) 91 656 15 83 PH:(34) 91 656 03 11

### Switzerland

Herzogenmühle 18
8304 Wallisellen
FAX: (01) 830-3104
PH: (01) 830-3888

### United Kingdom

Jays Close, Viables Estate
Basingstoke Hampshire RG22 4BA
FAX: (01256) 323356 PH: (01256) 311200

### United States

666 E. Dyer Road
Santa Ana, CA 92705-5612
FAX: 714.628.2142 PH: 714.557.4700

### INTERNET

**www.ittcannon.com**

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