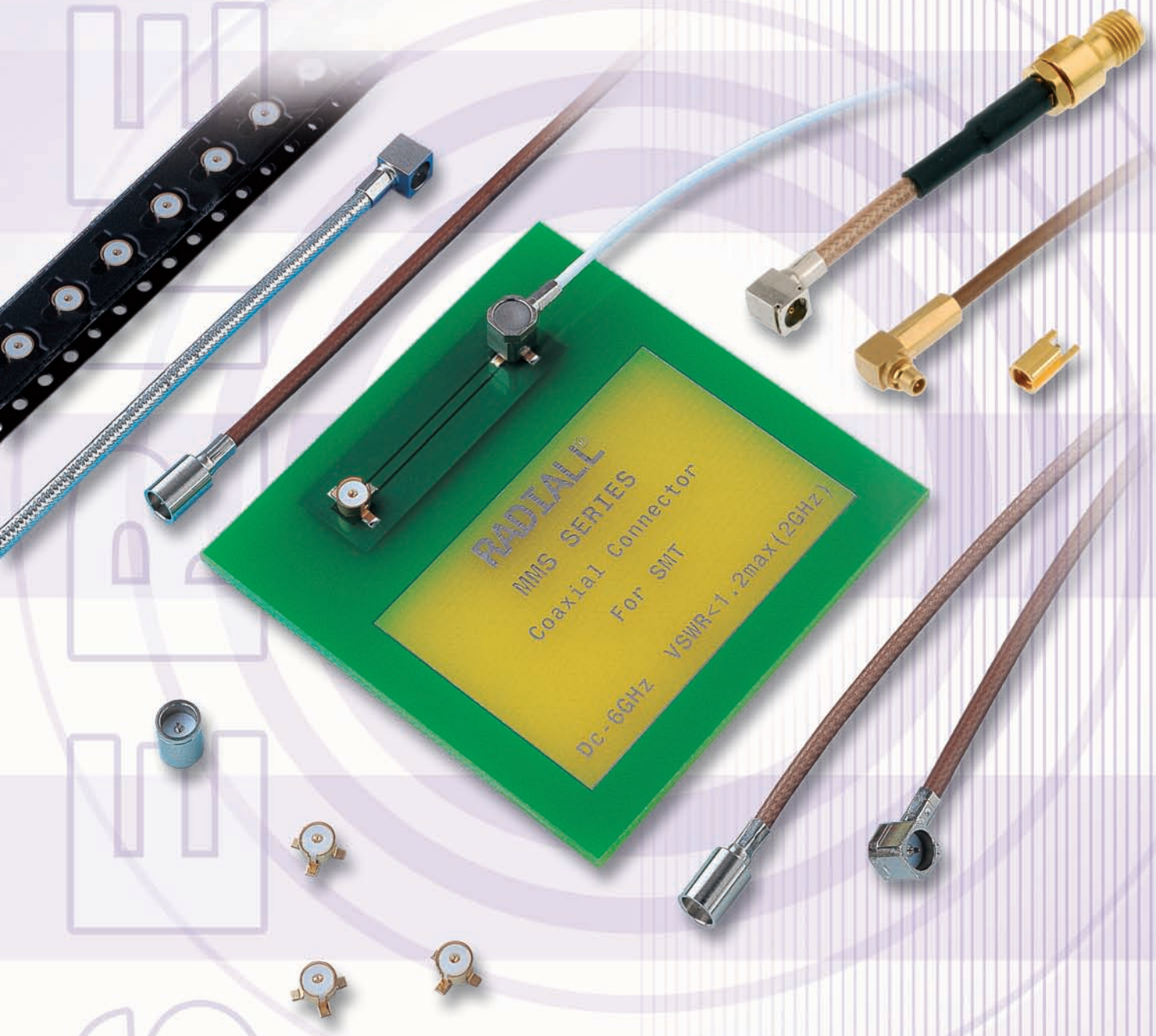
# MMS/MMT/MMCX series

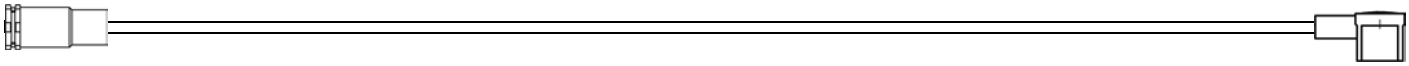
## R209 / R210 / R110



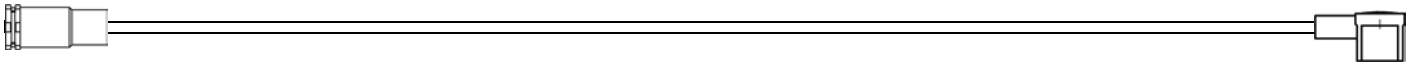



RADIALL
The next conneXion

# CONTENTS



# INTRODUCTION



RADIALL has designed a complete range of microminiature coaxial connectors, dedicated to **Surface Mount Technology (SMT)**.

Better than a simple SMT version of standard connector, **MMS** and **MMT** series were the first coaxial connectors fully designed for SMT applications.
Due to its optimized design, **MMS** and **MMT** range benefit from the following advantages:

- **Design adapted to automatic placement**

  The assymetric footprint of the **MMS** and **MMT** connectors allows video micro-positionning using the component's shadow to analyse its placement.

  **MMS** and **MMT** connectors stand on three pliable legs. This design guarantees the receptacle stability after the placement. It allows it to absorb by elastic bending of the legs, the pressure of the positioning and placement mechanism.

- **A geometry suited to automated picking**

  The plain upper surface of **MMS** and **MMT** receptacle facilitates vacuum picking of the component at the exit of the automated distribution system.

  The geometry allows the use of numerous pneumatic nozzles with various diameters.

- **Optimization of soldering procedure**

  **MMS** and **MMT** connectors materials used resist, without damage, the rapid elevation of temperature (to 270°C) during the short time of the solder reflow in an infra-red oven.

- **Packaging**

  The **MMS** and **MMT** connectors are packaged on tape and reels containing either 100, 500 or 3 000 receptacles.

  The unit cavity geometry is designed for a perfect presentation of the component. The bottom of the cavity is pierced. This hole facilitates the suction of the component, avoiding the adherance effect and allows the use of a through hole for a push rod.

- **360° cable rotation**

  The **MMS** and **MMT** snap-on mating system ensures a correct positive connection each time and all **MMS** and **MMT** connectors (plugs + receptacles) have a design which allows a 360° rotation of the pair when mated.

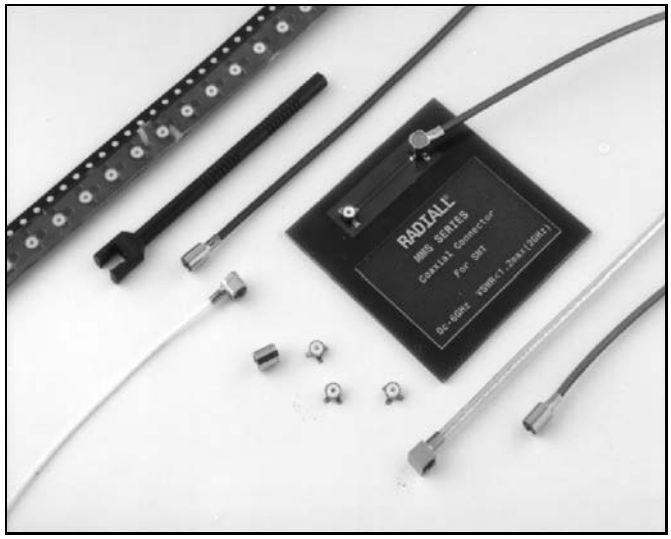
- **MMS vs MMT**

  **MMS** and **MMT** connectors are dedicated to similar application.

  Nevertheless the choice between these to standard will be driven by the following characteristics:

| | MMS | MMT | Comment |
|---|---|---|---|
| Durability (mating cycle) | 50 | 500 | It is the main difference between these two series. MMS is dedicated for application wich requires only few mating/unmating cycles. MMT provide stronger retention force while allowing more manipulation. |
| Frequency range | 50 Ohms DC-6 GHz<br>75 Ohms DC-1 GHz | 50 Ohms DC-8 GHz<br>75 Ohms DC-1 GHz | Both series are fully optimized for either wireless phone frequency range or mobile computing such as bluetooth, Wifi and Wimax. |
| Mated height | 5.2 mm | 6.8 mm | |

# GENERAL




| | MMS | MMT |
|---|---|---|
| 50 Ω | DC - 6 GHz | DC - 8 GHz |
| 75 Ω | DC - 1 GHz | DC - 1 GHz |

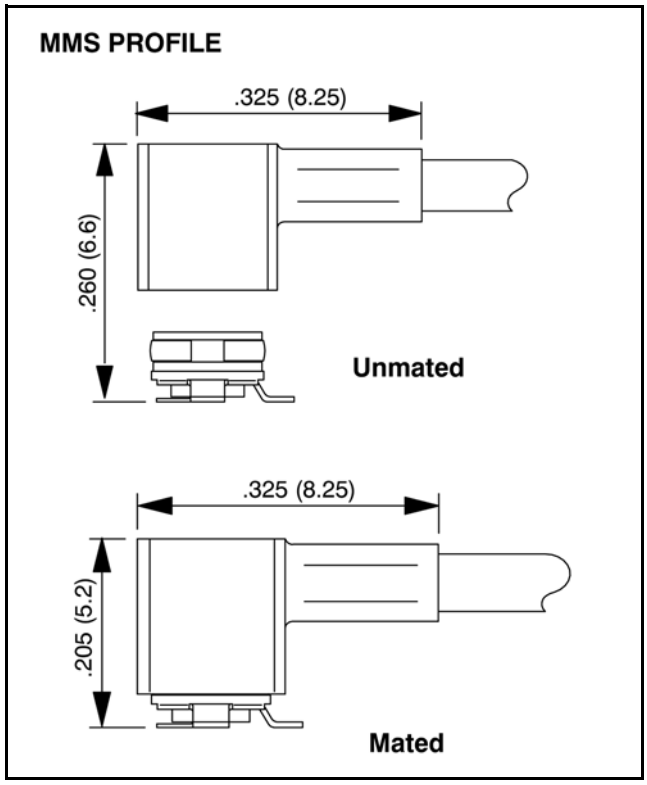
## GENERAL

- Low profile coaxial connectors
- Surface-mount receptacle (SMT)
- Fully compatible with automated pick and place machines
- Snap-on mating
- High RF performance
- 360° cable rotation

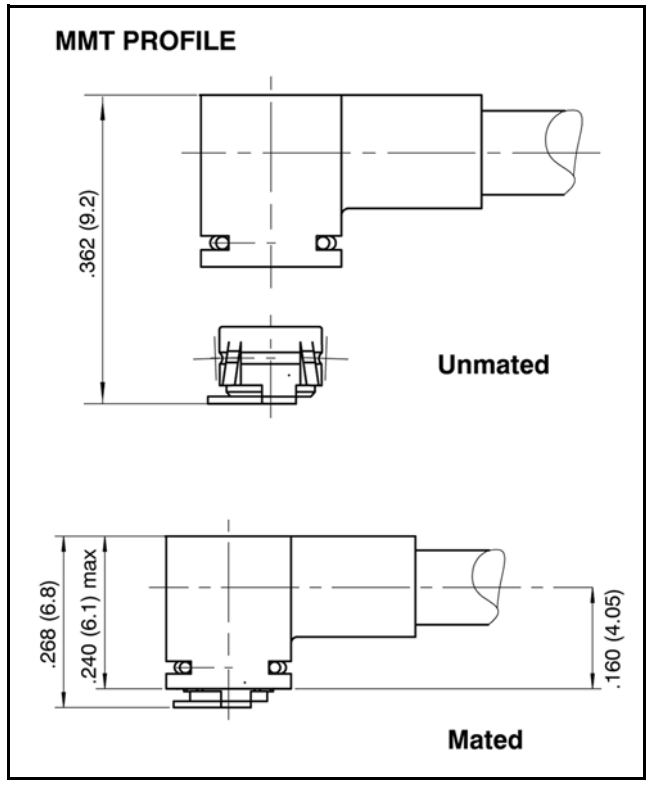
## APPLICATIONS

- Base stations and hand-sets for:
  - cellular telephones
  - cordless telephones
- Satellite reception terminals (GPS...)
- Instrumentation
- Wireless datacom networks
- Automated payment systems
- Videocommunications
- Other general electronics

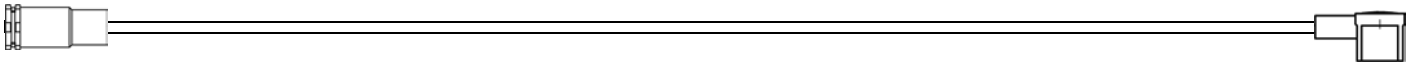
**MMS PROFILE**




**MMT PROFILE**



# CHARACTERISTICS MMS



| | TEST STANDARD | VALUES/REMARKS | |
|---|---|---|---|
| **ELECTRICAL CHARACTERISTICS** | | | |
| Impedance | | 50 Ω | 75 Ω |
| Frequency range | | DC-6 GHz | DC-1 GHz |
| Typical V.S.W.R. (mated pair) | IEC 1169–1 | 1.05 at 1 GHz<br>1.15 at 2.5 GHz<br>1.35 at 6 GHz | |
| Insertion loss | IEC 1169–1 | 0.2 dB at 2 GHz | |
| RF leakage (mated pair) | MIL STD 1344 method 3008 | -50 dB at 500 MHz<br>-45 dB at 1 GHz<br>-40 dB at 2 GHz | |
| Outer contact resistance | NF–C 93050 (I = 40 mA peak) | 5 MΩ max | |
| Center contact resistance | NF–C 93050 (I = 40 mA peak) | 15 MΩ max | |
| Insulation resistance | IEC 1169–1 | 500 MΩ min (under 250 V RMS) | |
| Working voltage | | 50 V RMS | |
| Testing voltage (V RMS) | IEC 1169–1 | Ø 1 mm: 250 ; Ø 2 mm: 500 | |
| Maximum admissible power | | 40 W at 1 GHz / 20°C / V.S.W.R. = 1 | |

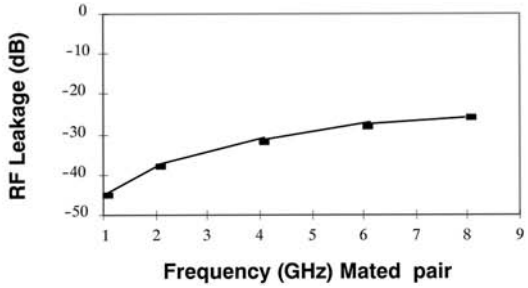
| | | |
|---|---|---|
| **MECHANICAL CHARACTERISTICS** | | |
| Durability | IEC 1169-1 | 50 matings |
| Force to engage | IEC 1169-1 | 7 N avg |
| Force to disengage | IEC 1169-1 | 5.5 N avg |
| Shocks (drop test) | IEC 68-2-27 | 50 g/11 ms ; 3 shocks/axis/way |
| Random vibrations | Général Motors spec. | Sine waves 5 to 1000 Hz<br>3 to 30g - 1 H/axis |
| Bumps (mechanical shocks) | IEC 68-2-29 | 25 g/6 ms 1000 bumps/axis/way |
| Cable retention force | IEC 1169-1 | Ø 1 mm: 20 N ; Ø 2 mm: 35 N |
| Solderability | IEC 68-2-54 | Passed |

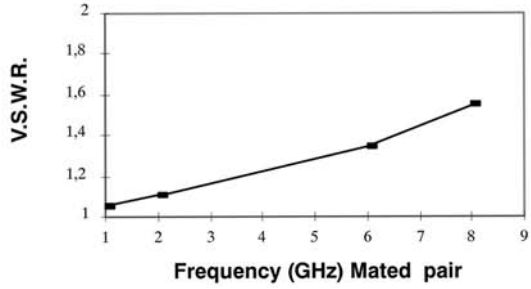
| | | |
|---|---|---|
| **ENVIRONMENTAL CHARACTERISTICS** | | |
| Temperature range | | -40°C / +90°C |
| Climatic cycles | GAM T 13 | 48 H at 70°C - 24 H at 40°C/93% -36 H at -25°C |

| | | |
|---|---|---|
| **MATERIALS** | | |
| Bodies plugs / in series adapters | | Die cast zinc / brass |
| Bodies receptacles | | Phosphor bronze |
| Center contact | male<br>female | Brass<br>Beryllium copper |
| Insulator | | PTFE |

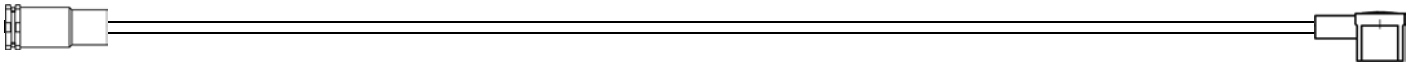
| | | |
|---|---|---|
| **PLATINGS** | | |
| Bodies plugs, in series adapters | | Nickel |
| Bodies receptacles | | Gold |
| Center contact | male<br>female | Nickel<br>Gold |

**POWER RATING** Example: P = 23 W at F= 1.8 GHz, T = 40°C, V.S.W.R. = 1.1



# CHARACTERISTICS MMT



| | TEST STANDARD | VALUES/REMARKS | |
|---|---|---|---|
| **ELECTRICAL CHARACTERISTICS** | | | |
| Impedance | | 50 Ω | 75 Ω |
| Frequency range | | DC – 8 GHz | DC – 1 GHz |
| Typical V.S.W.R. (mated pair) | IEC 1169–1 | 1.05 at 1 GHz<br>1.10 at 2.5 GHz<br>1.15 at 6 GHz | |
| Insertion loss | IEC 1169–1 | $\leq 0.2 \sqrt{F}$ (GHz) | |
| RF leakage (mated pair) | IEC 1726 | -42 dB at 500 MHz<br>-38 dB at 1 GHz<br>-30 dB at 3 GHz | |
| Outer contact resistance | IEC 1169-1 (I=40 mA eff.) | Initial : 2.5 mΩ max | Final : 12.5 mΩ max |
| Center contact resistance | IEC 1169-1 (I=40 mA eff.) | Initial : 5 mΩ max | Final : 15 mΩ max |
| Insulation resistance | IEC 1169-1 | ≥ 5000 MΩ under 500 Vcc | |
| Working voltage | | 170 V eff. | |
| Testing voltage | IEC 1169–1 | 500 V eff. | |
| **MECHANICAL CHARACTERISTICS** | | | |
| Durability | IEC 1169–1 | 500 matings | |
| Force to engage/disengage | IEC 1169–1 | Ins ≤ 18 N | Ext > 7 N |
| Shocks | IEC 68–2–27 | passed | |
| Vibrations | IEC 68–2–6 | passed | |
| Bumps | IEC 68–2–29 | passed | |
| Cable retention force | IEC 1169–1 | Ø 2 mm = 20 N - Ø 2.6 mm = 60 N | |
| Solderability | IEC 68–2–29 | passed | |
| **ENVIRONMENTAL CHARACTERISTICS** | | | |
| Temperature range | | 55°C / 100°C | |
| Damp heat | IEC 68-23 | passed | |
| Thermal shocks | IEC 68-2-14 / Test NA | passed | |

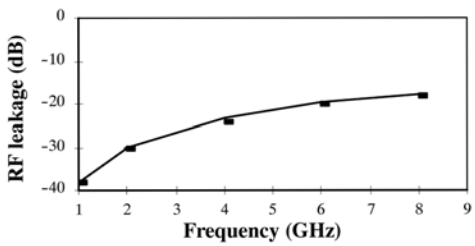
**MATERIALS**

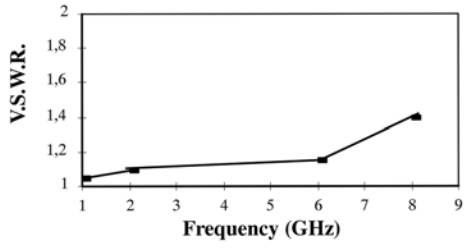
| | |
|---|---|
| Plugs body / in-series adaptor | Die cast zinc / brass |
| Receptacles body | CuSn9p |
| Plugs center contact | Cube2 |
| Receptacles center contact | Brass |
| Insulators | PTFE |

**PLATINGS**

| | |
|---|---|
| Plugs body / in-series adapter | Nickel / BBR* |
| Receptacles body | Gold |
| Plugs center contact | Gold |
| Receptacles center contact | Gold |

**POWER RATING** Example: P = 23 W at F= 1.8 GHz, T = 40°C, V.S.W.R. = 1.1

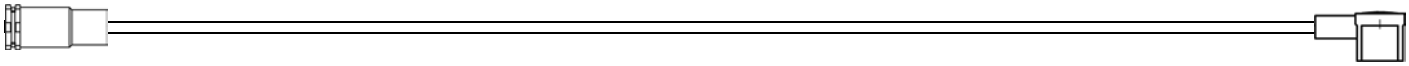



* BBR Bright Bronze Radiall

All dimensions are given in mm

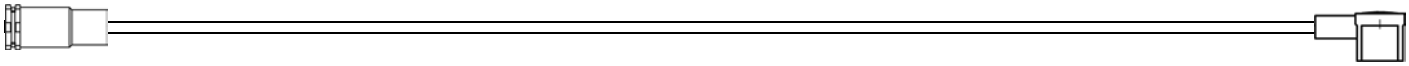
# CONNECTORS SUITABLE WITH PIGTAILS



| Series | Connector type | 1 / 50 / S | 2 / 50 / S | | | 2 / 50 / D | |
|---|---|---|---|---|---|---|---|
| | | Crimp | Crimp | Solder | Clamp | Crimp | Clamp |
| SSMB | STRAIGHT PLUG | | R203 073 000(020•) | | | | |
| | R/A PLUG | | R203 173 000(020•) | | | | |
| | BULKHEAD STRAIGHT JACK | | R203 313 000 | | | | |
| | BULKHEAD R/A JACK | | R203 373 000• | | | | |
| SSMC | STRAIGHT PLUG | R202 070 000 | R202 073 000• | | | | |
| | R/A PLUG | | R202 173 000• | | | | |
| MMS | STRAIGHT PLUG | | R209 080 000 | | | R209 081 000• | |
| | R/A PLUG | | R209 353 000 | | | R209 355 000 | |
| MMT | R/A PLUG | | R210 153 000 | | | R210 155 000 | |
| MCX | STRAIGHT PLUG | R113 070 000(020•) | R113 081 000(020) | | | R113 080 000• | |
| | R/A PLUG | | R113 181 000(020) | R113 161 000(020) | | | |
| | STRAIGHT JACK | | R113 236 000•(020) | | | | |
| | BULKHEAD STRAIGHT JACK | | R113 306 000(020•) | | | | |
| Coaxial terminals | STRAIGHT - 2 legs | R280 278 300 | R280 280 000(020) | R280 221 000(020•) | | | |
| | STRAIGHT - 4 legs | | R280 282 000 | | R280 281 000 | | |
| | R/A - 2 legs | | | R280 219 000(020•) | | | |
| | R/A - 4 legs | | R280 292 000 | | R280 291 000 | | |
| SMA | STRAIGHT PLUG | | R125 069 000/R124 069 120(123) | | | | R125 002 200• |
| | R/A PLUG | | R125 170 402• | | | | R125 163 200• |
| | STRAIGHT JACK | | R125 231 000•(001) | | | | |
| | FLANGE STRAIGHT JACK | | R125 270 000•/R124 271 120(123) | | | | |
| | TRUNC. FLANGE STRAIGHT JACK | | | | | R125 270 000•(001•) | |
| | BULKHEAD STRAIGHT JACK | | R124 310 020(023) | | | | |
| SMB | STRAIGHT PLUG | | R114 073 000 | | R114 003 000(020•) | | |
| | R/A PLUG | | R114 183 000(020•) | | R114 163 000(020•) | R114 174 000• | |
| | STRAIGHT JACK | | R114 237 000 | | R114 203 000 | | R114 304 000•(420•) |
| | BULKHEAD STRAIGHT JACK | | R114 311 000 | | R114 303 000 | | |
| SMC | STRAIGHT PLUG | | R112 073 000(020) | | R112 003 000(020•) | R112 073 000(020•) | R112 003 000(020•) |
| | R/A PLUG | | R112 183 000(020) | | R112 163 000 | R112 183 000(020) | R112 163 000 |
| | STRAIGHT JACK | | R112 237 000• | | R112 203 000(120•) | R112 237 000• | R112 203 000(120•) |
| | BULKHEAD STRAIGHT JACK | | R112 311 000• | | R112 303 000 | R112 311 000• | R112 303 000 |
| BMA | BULKHEAD PANEL SEAL STRAIGHT PLUG | | R128 082 001• | | | | |
| | FLOATING STRAIGHT JACK | | R128 232 001• | | | | |
| | FLOATING FLANGE STRAIGHT JACK | | R128 250 001 | | | | |
| Microclic | STRAIGHT PLUG | R205 070 000 | R205 071 000 | | | | |
| | R/A PLUG | | R205 181 000 | | | | |
| | STRAIGHT JACK | R205 240 000• | R205 241 000 | | | | |
| BNC | STRAIGHT PLUG | | | | R141 003 000 | | |
| | R/A PLUG | | | | R141 153 000 | | |
| | FLANGE STRAIGHT JACK | | R141 285 000• | | R141 253 000 | | |
| | BULKHEAD STRAIGHT JACK | | | | R141 323 000 | | R141 301 000• |
| mQ | STRAIGHT PLUG | | | | R225 003 000• | | |
| | FLANGE STRAIGHT JACK | | | | R225 253 000 | | |
| | BULKHEAD STRAIGHT JACK | | | | R225 303 000• | | |
| N | STRAIGHT PLUG | | R161 071 000 | | | | |
| | FLANGE STRAIGHT JACK | | R161 281 000 | | | R161 281 000 | |
| | BULKHEAD PANEL SEAL STRAIGHT JACK | | R161 309 000(200) | | | R161 309 000(200) | |

• Manufactured upon request. Please consult us.

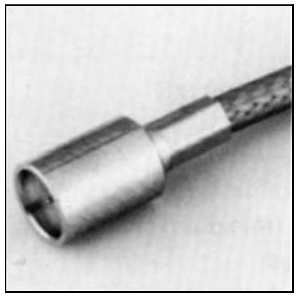
# CONNECTORS SUITABLE WITH PIGTAILS



| Series | Connector type | 2,6 / 50 / S | | | 2,6 / 50 / D | | |
|---|---|---|---|---|---|---|---|
| | | Crimp | Solder | Clamp | Crimp | | Clamp |
| SSMA | STRAIGHT PLUG | R121 072 000 | | | | | |
| | R/A PLUG | R121 172 000 | | | | | |
| | STRAIGHT JACK | R121 236 000 | | | | | |
| SSMB | STRAIGHT PLUG | R203 075 000 (020) | | | R203 076 030• | | |
| | R/A PLUG | R203 175 000 (020) | | | | | |
| | BULKHEAD STRAIGHT JACK | R203 315 000 | | | | | |
| SSMC | STRAIGHT PLUG | R202 075 000 | | | | | |
| | R/A PLUG | R202 175 000 | | | | | |
| SBMA | BULKHEAD STRAIGHT PLUG | | | | R108 084 001• | | |
| | FLOATNG FLANGE STRAIGHT JACK | | | | R108 264 001• | | |
| MMT | STRAIGHT PLUG | R210 087 000 | | | | | |
| | R/A PLUG | R210 157 000 | | | R210 158 000 | | |
| MCX | STRAIGHT PLUG | R113 082 000 (020) | | | R113 083 000(020) | | |
| | R/A PLUG | R113 182 000 (020) | | | R113 183 000(020) | | |
| | STRAIGHT JACK | R113 240 000 (020) | | | R113 241 000•(020•) | | |
| | BULKHEAD STRAIGHT JACK | R113 310 000 (020) | | | R113 311 000•(020•) | | |
| Coaxial terminals | STRAIGHT - 2 legs | R280 280 100 (120) | R280 222 000(020) | | R280 280 200• | | |
| | STRAIGHT - 4 legs | R280 284 000 | | R280 283 000 | R280 283 000 | | |
| | R/A - 2 legs | R280 294 308 | R280 222 200(020) | | | | |
| | R/A - 4 legs | R280 294 000 | | R280 293 000 | | | R280 293 000 |
| SMA | STRAIGHT PLUG | R125 072 000(001)/R124 071 120(123) | | | R125 072 008 | R124 072 220(223) | |
| | R/A PLUG | R125 172 000(001)/R124 172 120(123) | | | R125 174 000• | R124 174 120(123) | |
| | STRAIGHT JACK | R125 236 000(001)/R124 236 120(123) | | | R125 233 000•(001•) | R124 233 120(123) | |
| | FLANGE STRAIGHT JACK | R125 272 000(001)/R124 272 120(123) | | | | R124 274 120(123) | |
| | BULKHEAD PANEL SEAL STRAIGHT JACK | R125 303 000(001)/R124 312 120(123) | | | R125 304 000•(001•) | R124 313 120(123) | |
| SMB | STRAIGHT PLUG | R114 082 000(020) | | R114 005 000(120) | R114 083 000(020•) | | |
| | R/A PLUG | R114 187 000(020) | | R114 165 000 | R114 182 000 | | |
| | STRAIGHT JACK | R114 238 000(120) | | R114 205 000 | R114 244 420• | | |
| | BULKHEAD STRAIGHT JACK | R114 313 000(020) | | R114 305 000 | R114 315 000• | | |
| SMC | STRAIGHT PLUG | R112 082 000(120) | | R112 005 000(120) | R112 083 000• | | |
| | R/A PLUG | R112 187 000 | | R112 165 000 | R112 182 000 | | |
| | STRAIGHT JACK | R112 238 000(120) | R112 205 120 | R112 205 000 | | | |
| | BULKHEAD STRAIGHT JACK | R112 313 000 | | R112 305 000 | | | |
| BMA | BULKHEAD STRAIGHT PLUG | R128 083 000(001) | | | R128 084 827 | | |
| | BULKHEAD PANEL SEAL STRAIGHT PLUG | R128 085 000(001) | | | | | |
| | FLOATING STRAIGHT JACK | R128 233 000(001) | | | R128 234 827 | | |
| | FLOATING FLANGE STRAIGHT JACK | R128 263 000(001) | | | R128 264 827 | | |
| | BULKHEAD STRAIGHT JACK | R128 313 000(001) | | | | | |
| Microclic | STRAIGHT PLUG | R205 074 000 | | | | | |
| | STRAIGHT JACK | R205 244 000 | | | | | |
| BNC | STRAIGHT PLUG | R141 075 000 | | R141 004 000 | | | |
| | R/A PLUG | R141 175 000 | | R141 154 000 | | | |
| | FLANGE STRAIGHT JACK | R141 290 200 | | R141 254 000 | | | |
| | BULKHEAD STRAIGHT JACK | R141 306 000 | | R141 324 000 | | | |
| mQ | STRAIGHT PLUG | | | R225 004 000 | | | |
| | FLANGE STRAIGHT JACK | | | R225 254 000 | | | |
| | BULKHEAD STRAIGHT JACK | | | R225 304 000 | | | |
| N | STRAIGHT PLUG | R161 072 000 | | R161 004 000 | R161 072 000 | | R161 004 000 |
| | R/A PLUG | R161 181 000 | | | R161 181 300 | | |
| | FLANGE STRAIGHT JACK | R161 281 300 | | R161 252 000 | R161 281 300 | | R161 252 000 |
| | BULKHEAD PANEL SEAL STRAIGHT JACK | R161 311 200(300) | | R161 321 000<br>R161 322 000 | R161 311 200(300) | | R161 321 000<br>R161 322 000 |

ATTENTION: this guide is intended as an information and does not include all series P/N.

## STRAIGHT PLUGS CRIMP TYPE FOR FLEXIBLE CABLES



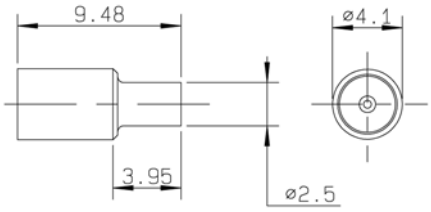



**Fig. 1**

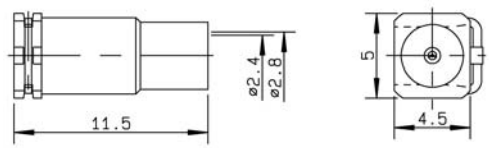



**Fig. 2**

| Series | Cable group | Part number | Fig | Imp. (Ω) | Dimensions (mm) | | Captive center contact | Finish |
|---|---|---|---|---|---|---|---|---|
| | | | | | A | B | | |
| MMS | 2 / 50 / S | **R209 080 000** | 1 | 50 | 2 | 0,6 | Yes | Nickel |
| | 2 / 50 / D | **R209 081 000•** | | | | 0,3 | | |
| | 2 / 75 / S | **R209 082 000•** | | | | 0,6 | | |
| MMT | 2.6 / 50 / S | **R210 087 000** | 2 | 50 | | | Yes | Nickel |

## RIGHT ANGLE PLUGS CRIMP TYPE FOR FLEXIBLE CABLES

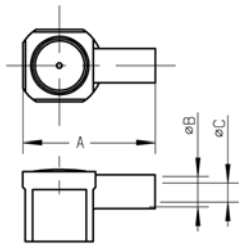



**Fig. 1**

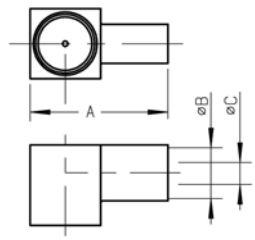



**Fig. 2**

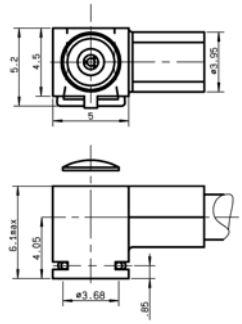
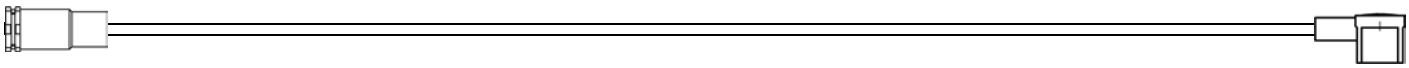


**Fig. 3**

| Series | Cable group | Part number | Fig. | Imp. (Ω) | Dimensions (mm) | | | Captive center contact | Finish |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | A | B | C | | |
| MMS | 1 / 50 / S | **R209 351 020** | 1 | 50 | 7,15 | 1,28 | 0,65 | yes | Nickel |
| | 2 / 50 / S | **R209 353 000** | | | 8,25 | 2 | 1,1 | | |
| | 2 / 50 / D | **R209 355 000** | 2 | | 8,06 | 2,25 | 1,4 | | |
| | 2 / 75 / S | **R209 353 000** | 1 | | 8,25 | 2 | 1,1 | | |
| MMT | 2 / 50+75 / S | **R210 153 000** | 3 | 50 | | | | yes | Nickel |
| | 2.6 / 50 / S | **R210 155 000** | | | | | | | |
| | 2.6 / 50 / S | **R210 157 000** | | | | | | | |
| | 2.6 / 50 / D | **R210 158 000** | | | | | | | |

• Upon request



## PIGTAILS

**Fig. 1**

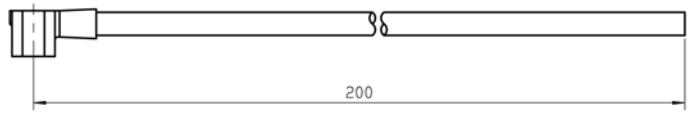
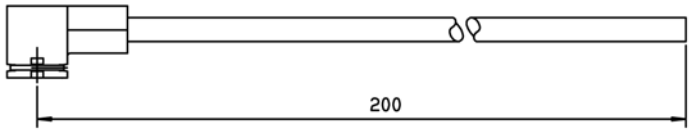



**Fig. 2**




| Series | Cable group | Part number | Fig | Composition |
|---|---|---|---|---|
| MMS | 1 / 50 / S | **R285 001 001** | 1 | R209 351 020 + C291 050 066 |
| | 2 / 50 / S | **R285 001 021** | | R209 353 000 + C291 145 007 |
| | 2 / 50 / D | **R285 001 031** | | R209 355 000+ C291 146 087 |
| | 2 / 75 / S | **R285 001 041** | | R209 353 000 + C291 305 000 |
| MMT | 2 / 50 / S | **R284 008 001** | 2 | R210 153 000 + C291 145 007 |
| | 2 / 50 / D | **R284 008 002** | | R210 155 000 + C291 146 087 |
| | 2.6 / 50 / S | **R284 008 004** | | R210 157 000 + C291 170 007 |
| | 2.6 / 50 / D | **R284 008 005** | | R210 158 000 + C291 185 067 |
| | 2 / 75 / S | **R284 008 003** | | R210 153 000 + C291 305 000 |

## CABLE ASSEMBLIES

**Fig. 1**

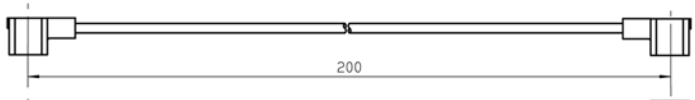



**Fig. 2**

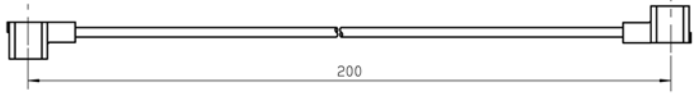



**Fig. 3**

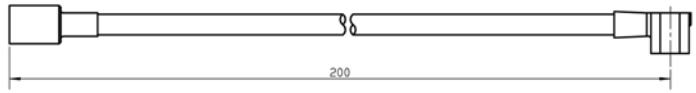



**Fig. 4**

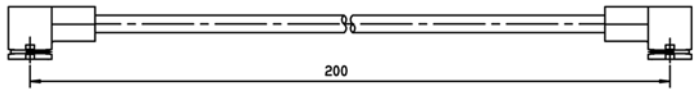
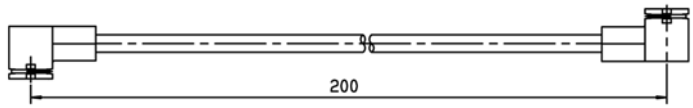



**Fig. 5**




| Series | Cable group | Part number | Fig | Composition |
|---|---|---|---|---|
| MMS | 1 / 50 / S | **R285 004 001** | 1 | R209 351 020 + C291 050 066 + R209 351 020 |
| | | **R285 005 001** | 2 | |
| | 2 / 50 / S | **R285 004 221** | 1 | R209 353 000 + C291 145 007 + R209 353 000 |
| | | **R285 005 221** | 2 | R209 353 000 + C291 145 060 + R209 353 000 |
| | | **R285 003 221** | 3 | R209 080 000 + C291 145 060 + R209 353 000 |
| MMT | 2 / 50 / S | **R285 011 221** | 4 | R210 153 000 + C291 145 007 + R210 153 000 |
| | | **R285 012 221** | 5 | R210 153 000 + C291 145 060 + R210 153 000 |

## BETWEEN SERIES CABLE ASSEMBLIES

**Fig. 1**

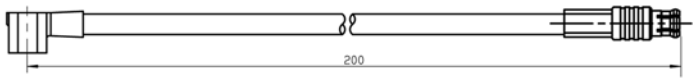



**Fig. 2**

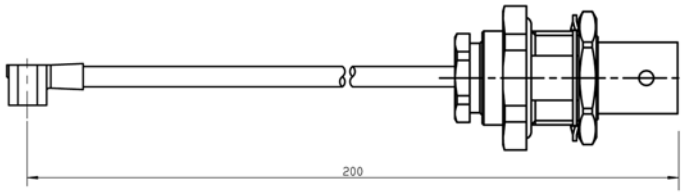



**Fig. 3**

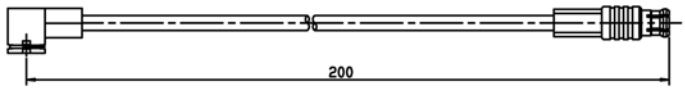
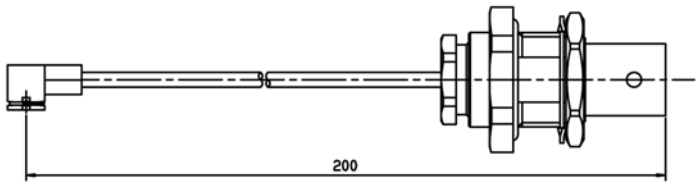



**Fig. 4**




| Series | Cable group | Part number | Fig | Composition | Note |
|---|---|---|---|---|---|
| MMS | 2 / 50 / S | **R285 017 221** | 1 | R209 353 000 + C291 145 007 + R113 081 020 | MCX |
| | | **R285 031 221** | 2 | R209 353 000 + C291 145 007 + R141 323 000 | BNC |
| MMT | 2 / 50 / S | **R285 017 331** | 3 | R210 153 000 + C291 145 060 + R113 081 020 | MCX |
| | | **R285 031 331** | 4 | R210 153 000 + C291 145 060 + R141 323 000 | BNC |

## SMT RECEPTACLES

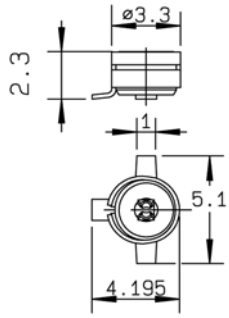



**Fig. 1**

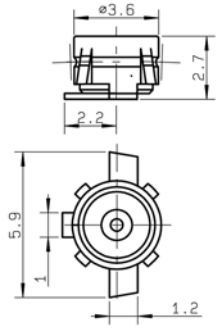
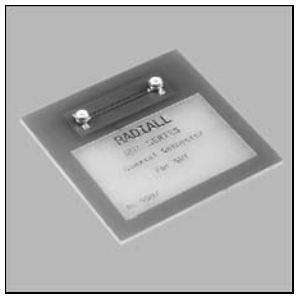



**Fig. 2**

| Series | Part number | Fig | Imp. (Ω) | Center contact finish | Finish | Packaging | Reel dimension A |
|---|---|---|---|---|---|---|---|
| MMS | **R209 408 012** | 1 | 50 | Gold | Gold | reel 100 pieces | 180 |
| | **R209 408 012W** | | | | | unit | - |
| | **R209 408 052** | | | | | reel 500 pieces | 180 |
| | **R209 408 302** | | | | | reel 3000 pieces | 330 |
| MMT | **R210 408 012** | 2 | 50 | Gold | Gold | reel 100 pieces | 180 |
| | **R210 408 052** | | | | | reel 500 pieces | 180 |
| | **R210 408 302** | | | | | reel 3000 pieces | 330 |

Packaging: see reel description on page 16
Soldering pattern and SMT procedure on page 18-19

## TEST BOARD



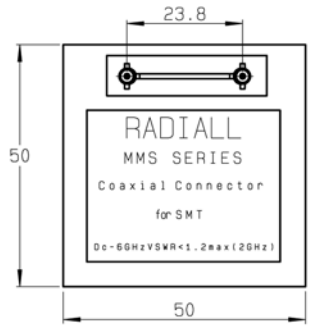



**Fig. 1**

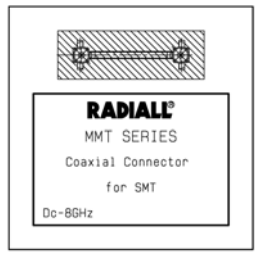



**Fig. 2**

| Series | Part number | Fig |
|---|---|---|
| MMS | **R209 900 500** | 1 |
| MMT | **R210 900 500** | 2 |

Connected to a network analyzer by 2 cable assemblies, this board allows to measure the V.S.W.R. of a complete link.

## BETWEEN SERIES ADAPTERS

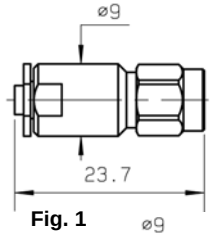



**Fig. 1**

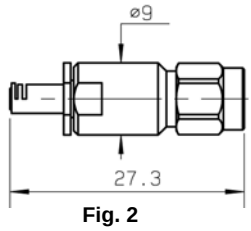



**Fig. 2**

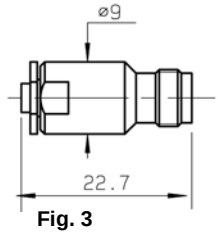



**Fig. 3**

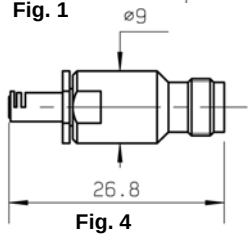



**Fig. 4**

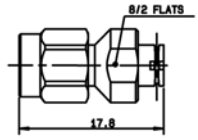



**Fig. 5**

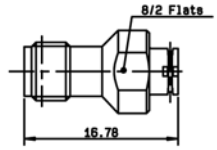
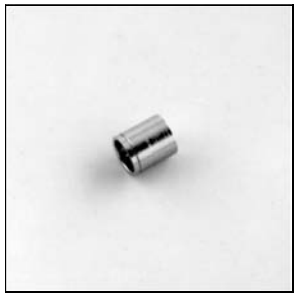



**Fig. 6**

| Series | Part number | Fig | Type | Finish |
|---|---|---|---|---|
| MMS | **R191 975 761** | 1 | MMS male / SMA male | passivated stainless steel |
| | **R191 975 771** | 2 | MMS female / SMA male | |
| | **R191 975 781** | 3 | MMS male / SMA female | |
| | **R191 975 791** | 4 | MMS female / SMA female | |
| MMT | **R191 392 027** | 5 | MMT female / SMA male | BBR |
| | **R191 394 027** | 6 | MMT female / SMA female | |

## IN SERIES ADAPTERS FOR PCB TO PCB LINK



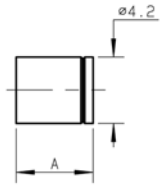



**Fig. 1**

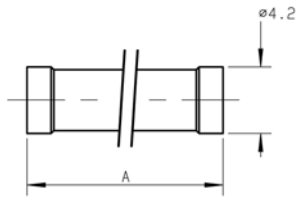



**Fig. 2**

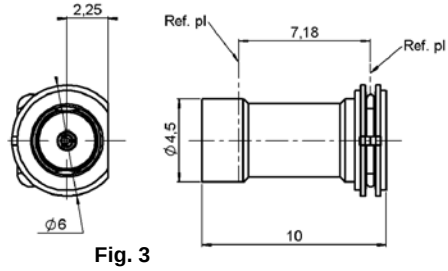
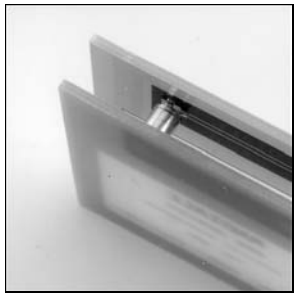


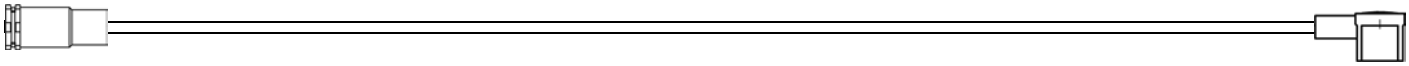

**Fig. 3**

| Series | Part number | Fig. | Dimension A (mm) | Finish | Packaging |
|---|---|---|---|---|---|
| MMS | **R209 307 000** | 1 | 4,9 | Nickel | 100 pcs |
| | **R209 703 030•** | 2 | 18,5 | | |
| MMT | **R210 703 507** | 3 | | BBR | 100 pcs |



To ease PCB linking, this adapter is designed to remain mated to one designated PCB. Therefore, the slit interface is slide-on, the other is snap-on. This adapter can also be developed upon request with other lengths, in order to adjust space between PCB (minimum distance: 6.4 mm). Please consult us.

• Upon request



## MEASUREMENT CABLE ASSEMBLIES

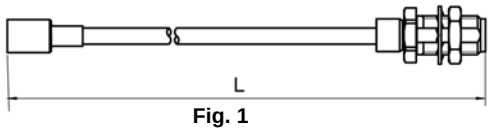



**Fig. 1**

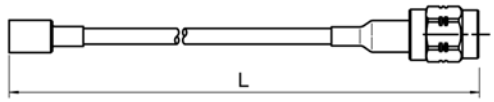



**Fig. 2**

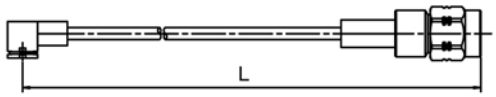



**Fig. 3**

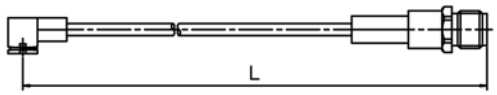
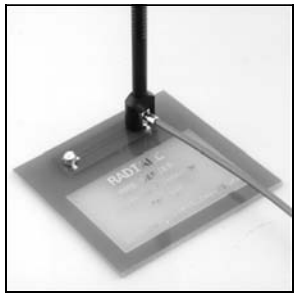


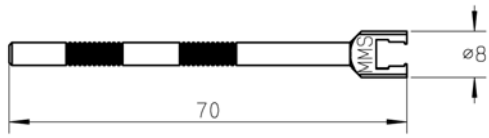

**Fig. 4**

| Series | Cable | Part number | Fig. | Composition | Length L (mm) |
|---|---|---|---|---|---|
| MMS (1) | 2 / 50 / S | **R285 023 021** | 1 | R209 080 500 + C291 145 007 + R124 310 020 | 200 |
| | | **R284 007 013** | 2 | R209 080 500 + C291 145 007 + R124 069 120 | |
| MMT | 2.6 / 50 / D | **R285 024 071** | 3 | R210 158 000 + C291 185 067 + R124 072 220 | 200 |
| | | **R285 024 271** | 4 | R210 158 000 + C291 185 067 + R124 233 120 | |
| | | **R284 310 061** | 3 | R210 158 000 + C291 185 067 + R124 072 220 | 60 |
| | | **R284 310 062** | 4 | R210 158 000 + C291 185 067 + R124 233 120 | |

(1) Both cable assemblies are equiped with a straight MMS plug with a sliding interface to allow 500 matings and a SMA connector.

## EXTRACTION TOOL



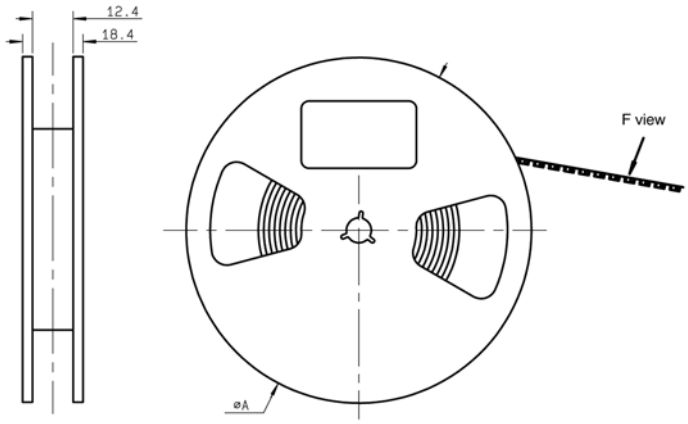


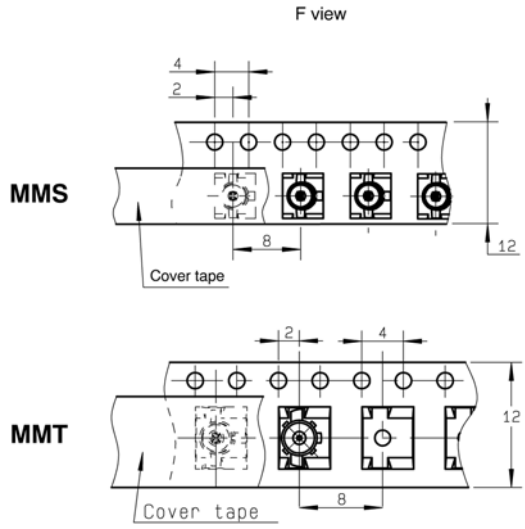

| Series | Part number |
|---|---|
| MMS | **R282 868 100** |
| MMT | **R282 868 030** |

Materials and finish : black anodized aluminium
The anodization allows the electric insulation and protects from the oxidization.

## ACCORDING TO IEC 286-3 STANDARD

MATERIALS
Reel : polyester
Carrier tape : antistatic PETG (polyester)
Cover tape : polyester

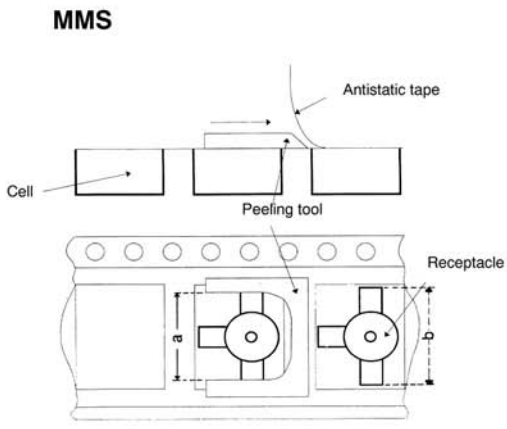


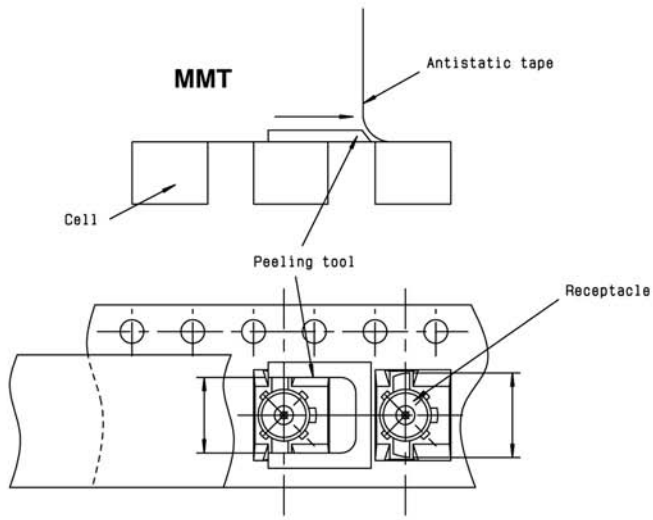



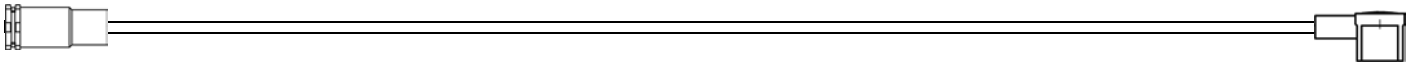

| Packaging | Dia. A |
|---|---|
| 100 & 500 | 180 |
| 3000 | 330 |

## PRECAUTION FOR USE

Automated pick and place machines use standard tooling to peel the antistatic film off. Sometimes the "a" dimension of this tool is shorter than the overall "b" width between the two legs of the receptacle. There is thus a risk for the two legs being deformed while they pass through the tool during the suction operation. The user must then widen the "a" dimension of the peeling tool.





## PIGTAILS (or cable assemblies)

**The right angle plugs are delivered as pigtails or cable assemblies.**
(Over 100.000 pieces, other assembling possibilities can be custom tailored upon request)

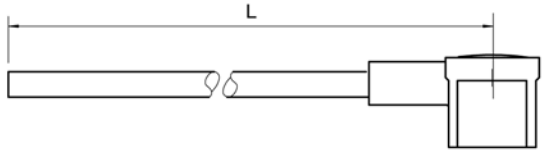
**How to order**

*Examples of composition (minimum length = 1.575 (4 cm) ± 2 %):*

**Example 1:**

*Pigtail featuring one right angle plug.*

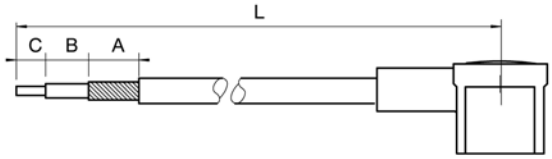
***Connector / Cable / Length*** *(cm)*




**Example 2:**

*Pigtail featuring one right angle plug with stripping option (stripping according to customers requirements with possibility of tin central conductor).*

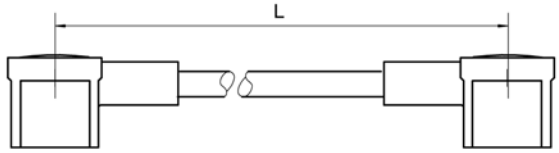
***Connector / Cable / Length*** *(cm) A= (mm) B= (mm) C= (mm)*




**Example 3:**

*Cable assembly featuring two right angle plugs*

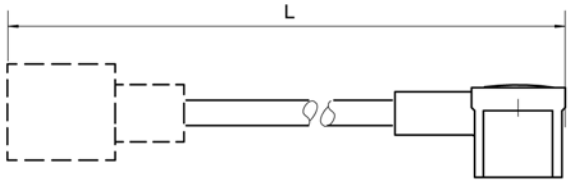
***Connector / Cable / Connector / Length*** *(cm)*




**Example 4:**

*Cable assembly featuring one MMS or MMT right angle plug and any other connector compatible with cable.*

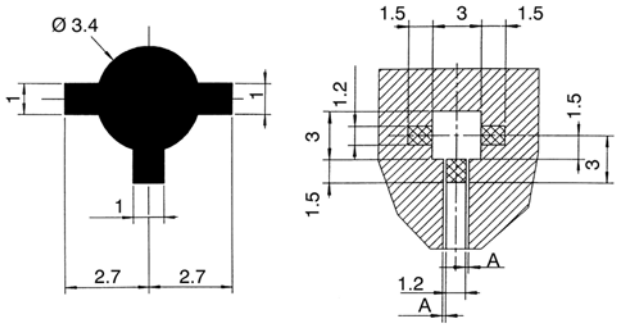
***Connector / Cable / R... ... ... (*) / Length*** *(cm)*



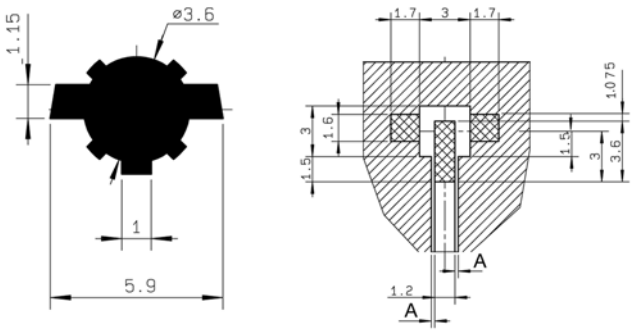
# VIDEO SHADOW AND SUCTION PROCEDURE

## VIDEO SHADOW AND SOLDERING PATTERN OF THE RECEPTACLE

**MMS**




**MMT**




Coplanar circuit on PCB
PCB material : glass epoxy composite (e r = 4.6)
Ground and signal are on the same side.

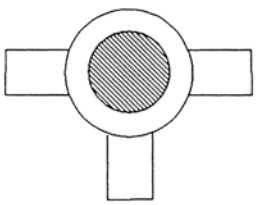
| PCB thickness (mm) | Coplanar line A (mm) |
|---|---|
| 0.8 | 0.183 |
| 1.0 | 0.190 |
| 1.2 | 0.195 |
| 1.6 | 0.2 |

Pattern
Land for solder paste

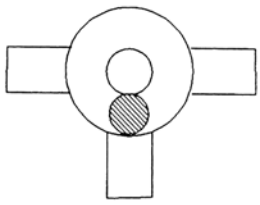
## SUCTION PROCEDURE FOR RECEPTACLE

**MMS**

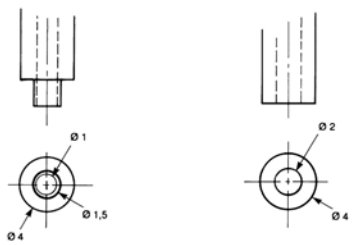
Ø OF NOZZLE > 1.2 mm
Suction with the central contact hole.



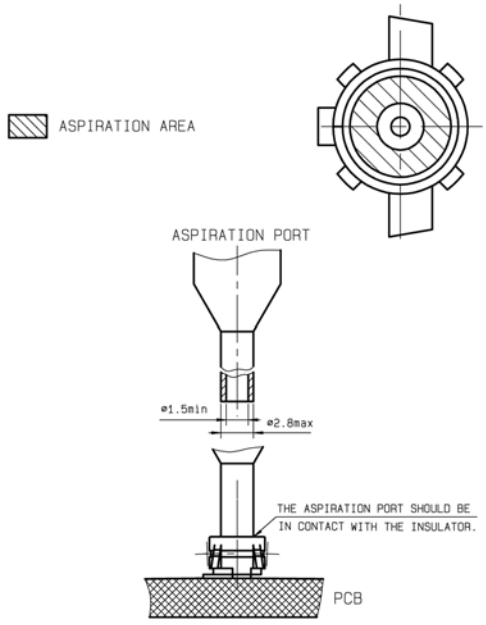
Ø OF NOZZLE < 1.2 mm
Suction with insulator.



**EXAMPLES OF PNEUMATIC NOZZLES**




**MMT**



# RADIALL RECOMMENDED SMT PROCEDURE

## SOLDER PROCEDURE

**1**

Deposit solder paste 'Sn Ag4 Cu0.5' on mounting zone by screen printing application. We recommend a low residue flux.
We advise a thickness of 150 micromm (5.850 microinch). Verify that the edges of the zone are clean.

**2**

Placement of the receptacle on the mounting zone with an automatic machine of 'pick and place' type.
Video camera is prefered to check the positioning of the component.
Adhesive agents are forbidden on the receptacle.

**3**

Soldering by infra-red reflow.

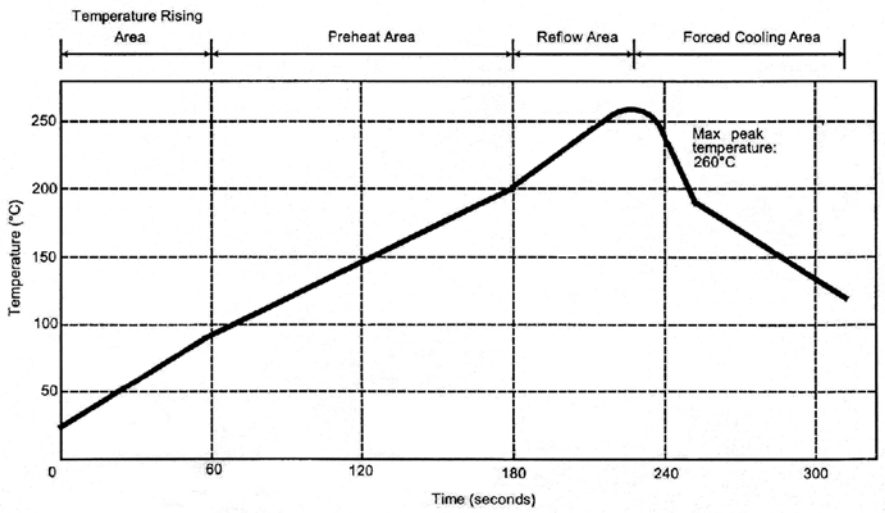
**4**

Cleaning of printed circuit boards.

**5**

Cheeking of solder joints and position of the component by visual inspection.

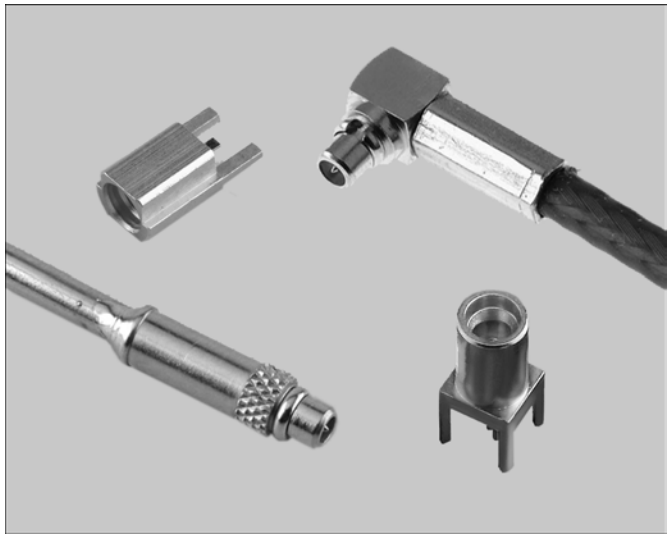
## TEMPERATURE PROFILE




| Parameter | Value | Unit |
|---|---|---|
| Temperature rising Area | 1 - 4 | °C/sec |
| Max Peak Temperature | 260 | °C |
| Max dwell time @260°C | 10 | sec |
| Min dwell time @235°C | 20 | sec |
| Max dwell time @235°C | 60 | sec |
| Temperature drop in cooling Area | -1 to -4 | °C/sec |
| Max dwell time above 100°C | 420 | sec |

# MMCX

## GENERAL



| 50 Ω | DC - 6 GHz |
|---|---|

### GENERAL

- Subminiature coaxial connectors
- Push-pull" snap-on mating
- Complies with specification CECC 22000

### APPLICATIONS

- Wireless LANs
- PCMCIA cards
- RF test ports
- Base stations

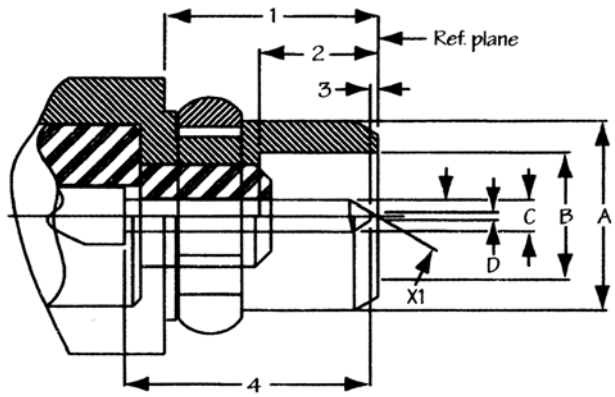
MMCX series from Radiall combine intermatability with CECC 22000 compliant supplier and high manufacturing quality.

MMCX series is especially dedicated to wire to PCB connection were low space above the PCB is available (less than 2.1 mm)

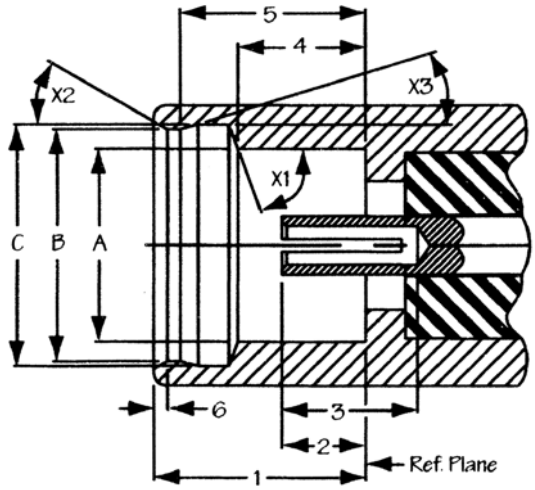
Due to Radiall manufacturing quality standard, our MMCX provide positive tactile feedback.

MMCX is adapted to high volume applications and Pick & Place manufacturing process.

## PLUG



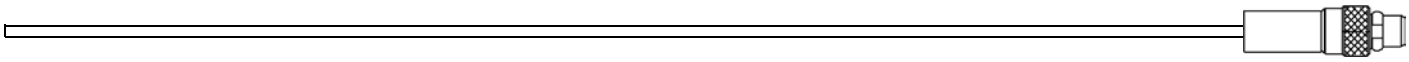

## JACK




| | mm | | inch | |
|---|---|---|---|---|
| | min. | max. | min. | max. |
| 1 | 2.70 | | .106 | |
| 2 | 1.45 | | .057 | |
| 3 | 0 | 0.25 | | .010 |
| 4 | | 3.15 | | .124 |
| A | 2.40 | | .095 | |
| B | 1.58 | 1.62 | .062 | .064 |
| C | 0.38 | 0.42 | .015 | .017 |
| D | | 0.20 | | .008 |
| X1 | 29° | 31° | | |
| | | | | |
| | | | | |
| | | | | |

| | mm | | inch | |
|---|---|---|---|---|
| | min. | max. | min. | max. |
| 1 | 2.60 | | .102 | |
| 2 | 0.90 | 1.20 | .035 | .047 |
| 3 | 1.40 | | .055 | |
| 4 | 1.57 | 1.63 | .062 | .064 |
| 5 | 2.30 | 2.34 | .091 | .092 |
| 6 | | 0.23 | | .009 |
| A | 2.41 | | .095 | |
| B | 2.88 | 2.90 | .113 | .114 |
| C | 3.00 | 3.04 | .118 | .120 |
| X1 | 68° | 72° | | |
| X2 | 28° | 32° | | |
| X3 | 13° | 17° | | |

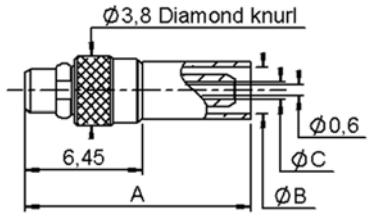
# CHARACTERISTICS



| | TEST STANDARD | VALUES/REMARKS |
|---|---|---|
| **ELECTRICAL CHARACTERISTICS** | | |
| Impedance | | 50 Ω |
| Frequency range | | DC–6 GHz |
| V.S.W.R. | CECC 22000 4.4.1 | Edge card SMT: 1.40 max<br>Cabled: 1.35 max |
| Dielectric withstanding voltage (at sea level) | CECC 22000 4.4.5 | 500 V RMS 50 Hz |
| Insulation resistance | CECC 22000 4.4.4 | 1000 MΩ min |
| **MECHANICAL CHARACTERISTICS** | | |
| Engagement force | CECC 22000 4.5.4 | 3.5 lbs max |
| Disengagement force | CECC 22000 4.5.4 | 1.4 lbs to 3.4 lbs max |
| Contact captivation | CECC 22000 4.5.2 | 2.3 lbs min |
| Durability (mating) | CECC 22000 4.7.1 | 500 cycles min |
| **ENVIRONMENTAL CHARACTERISTICS** | | |
| Temperature range | | –55°C / +155°C |
| Temperature shock | CECC 22000 4.6.7 | in conformance |
| Vibration | CECC 22000 4.6.3 | in conformance |
| **MATERIALS** | | |
| Bodies | | Brass |
| Center contact male<br>female | | Brass<br>Beryllium copper |
| Insulator | | PTFE |
| **PLATINGS** | | |
| Bodies | | Gold |
| Center contact male and female | | Gold |

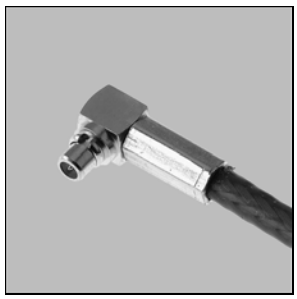
These characteristics are typical and may not apply to all connectors.

## STRAIGHT PLUGS FULL CRIMP TYPE FOR FLEXIBLE CABLE




| Cable group | Part number | Dimensions (mm) | | | Assembly instructions | Packaging |
|---|---|---|---|---|---|---|
| | | A | B | D | | |
| 2 / 50 / S | **R110 081 020** | 0.97 | 2.55 | 12.45 | M01 | 100 |
| 2.6 / 50 / S | **R110 083 120** | 1.61 | 2.95 | 13.35 | | |

## RIGHT ANGLE PLUGS



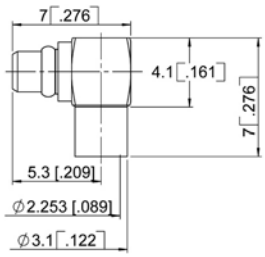



**Fig. 1**

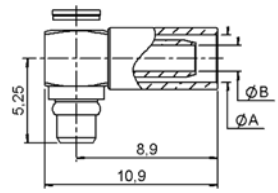



**Fig. 2**

| Cable group | Part number | Fig | Dimensions (mm) | | Assembly instructions | Packaging |
|---|---|---|---|---|---|---|
| | | | A | B | | |
| .085" | **R110 153 000** | 1 | | | M03 | 100 |
| 2 / 50 / S | **R110 170 100** | 2 | 0.97 | 2.55 | M02 | |
| 2.6 / 50 / S | **R110 172 100** | 2 | 1.61 | 2.95 | | |

## PCB EDGE CARD RECEPTACLES

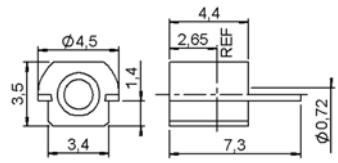



Fig. 1

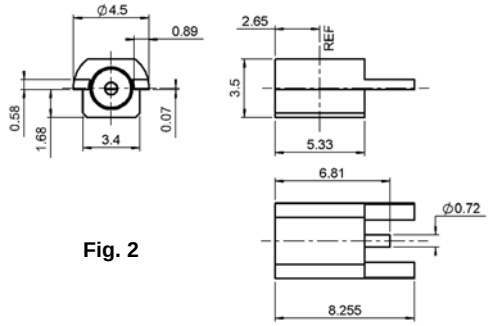
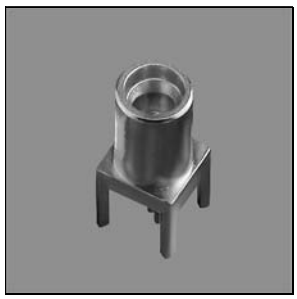



Fig. 2

| Part number | Fig | Gender | Packaging | Notes |
|---|---|---|---|---|
| **R110 422 100W** | 1 | jack | 1 | SMT |
| **R110 422 100** | 1 | | 100 | |
| **R110 422 830** | 1 | | reel of 1500 pcs | |
| **R110 422 200W** | 2 | | 1 | SMT/offset |
| **R110 422 200** | 2 | | 100 | |
| **R110 422 800** | 2 | | reel of 1500 | |

## STRAIGHT PCB RECEPTACLES



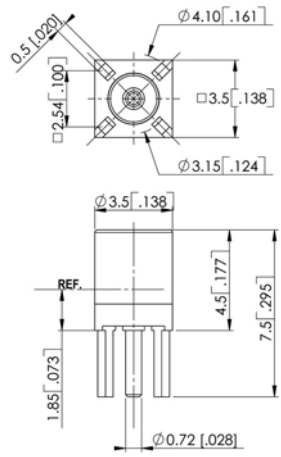



Fig. 1

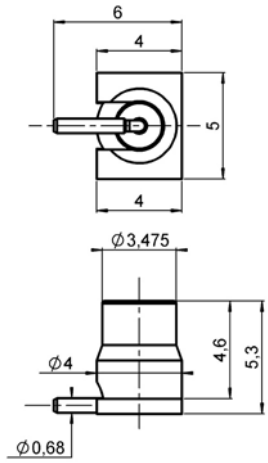


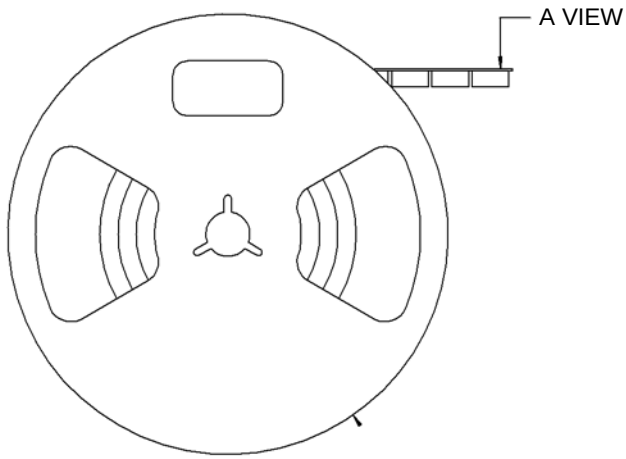

Fig. 2

| Part number | Fig | Gender | Panel drilling | Packaging | Notes |
|---|---|---|---|---|---|
| **R110 426 000** | 1 | jack | P01 | 100 | Tru-hole |
| **R110 427 820** | 2 | | | reel of 500 pcs | SMT |

# RECEPTACLE PACKAGING

## ACCORDING TO IEC 286-3 STANDARD

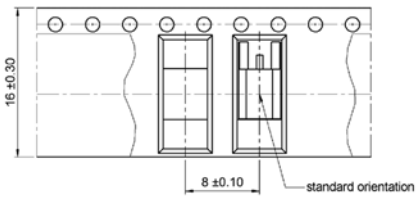
MATERIALS
Reel : polyester
Carrier tape : antistatic PETG (polyester)
Cover tape : polyester



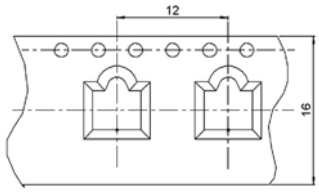

## PRECAUTION FOR USE

Automated pick and place machines use standard tooling to peel the antistatic film off. Sometimes the "a" dimension of this tool is shorter than the overall "b" width between the two legs of the receptacle. There is thus a risk for the two legs being deformed while they pass through the tool during the suction operation. The user must then widen the "a" dimension of the peeling tool.

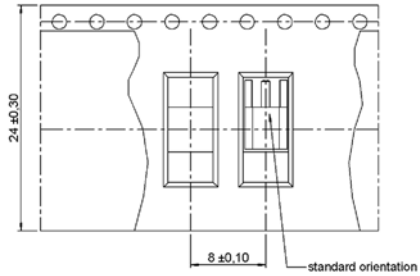
A VIEW




R110 422 200



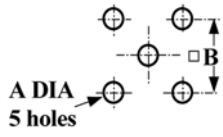

R110 427 820



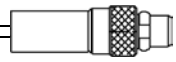

R110 422 100
R110 422 830

## PANEL DRILLING

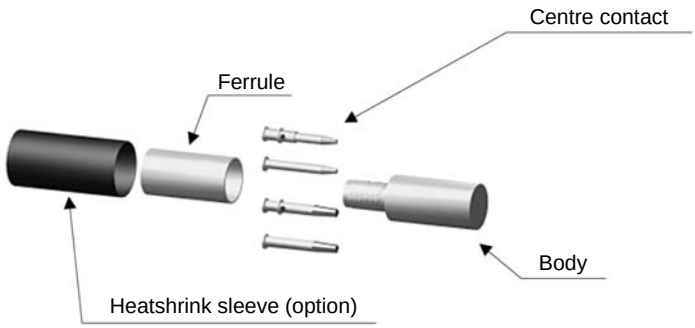
**P01**



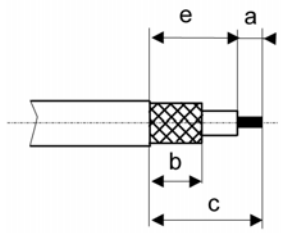

| | mm | | inch | |
|---|---|---|---|---|
| | max. | min. | max. | min. |
| A | 0.85 | 0.75 | .033 | .030 |
| B | 2.56 | 2.52 | .101 | .099 |



# M 01



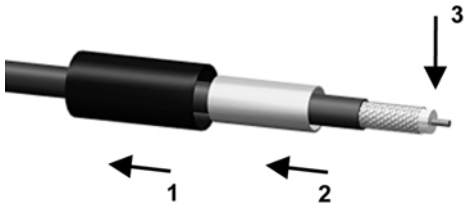

STRIPPING DIMENSIONS




| Part number | Stripping length (mm) | | | | Crimp tools | | Center contact crimp tool R282 281 000 (M22520/2-01) + positioner |
|---|---|---|---|---|---|---|---|
| | a | b | c | e | dies included | MIL standard R282 293 000 (M22520/5-01) + dies | |
| **R110 081 020** | 1.60 | 5.30 | 8.80 | 7.20 | R282 211 000 hex 2.67 | R282 235 003 (M22520/5-03) hex 2.67 | R282 967 070 2*4 pos 1 |
| **R110 083 120** | | | | | R282 271 000 hex 3.25 | R282 235 003 (M22520/5-03) hex 3.25 | R282 967 070 2*4 pos 3 |

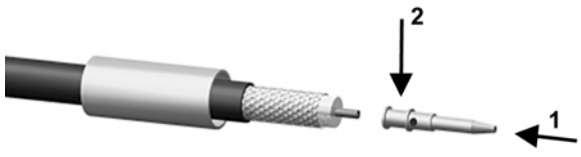
**1**

- Slide the heatshrink sleeve onto the cable (option).
- Slide the ferrule onto the cable.
- Strip the cable.



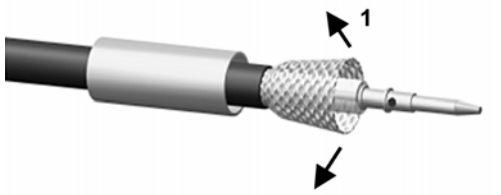

**2**

- Slide the centre contact on until it bottoms against the cable dielectric.
- Crimp the centre contact with crimping tool (see table).



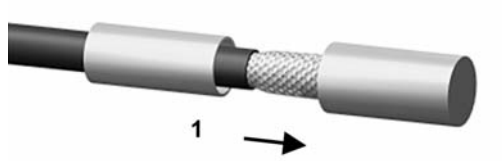

**3**

- Fan the braid.



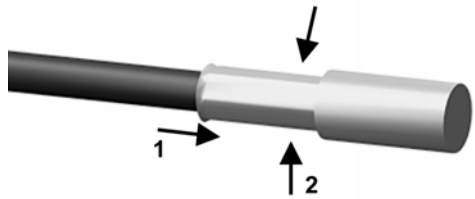

**4**

- Slide the cable into the body until it bottoms against insulator.



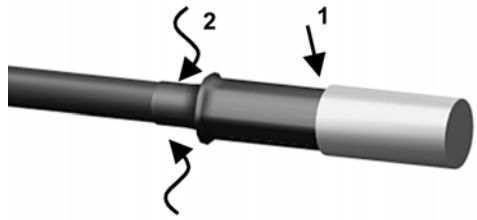

**5**

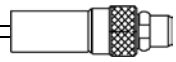
- Slide the ferrule over the braid.
- Crimp the ferrule with crimping tool (see table).



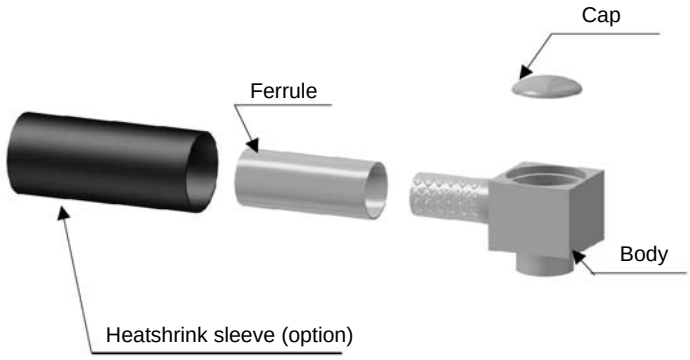

**6**

- Cut the excess of braid if necessary.
- Slide the sleeve over the ferrule and heatshrink it in place (option).

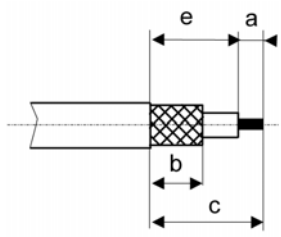




# M 02



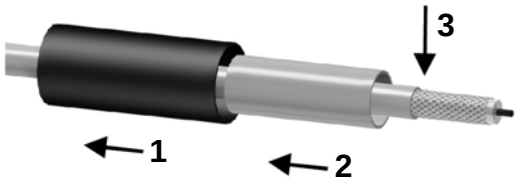

STRIPPING DIMENSIONS




| Part number | Stripping length (mm) | | | | Crimp tools | |
|---|---|---|---|---|---|---|
| | a | b | c | e | dies included | MIL standard R282 293 000 (M22520/5-01) + dies |
| **R110 170 100**<br>**R110 172 100** | 1.40 | 6.35 | 9.00 | 7.60 | R282 235 003 Hex 3.25 | R282 271 000 Hex 3.25 |

**1**

- Slide the heatshrink sleeve onto the cable (Option).
- Slide the ferrule onto the cable.
- Strip the cable.




**2**

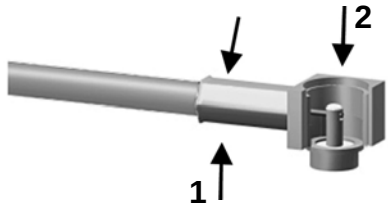
- Fan the braid.


**3**

- Push the connector body under the braid.
- Slide the ferrule over the braid.

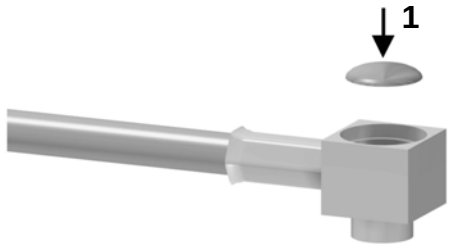

**4**

- Crimp the ferrule with crimping tool (see table).
- Solder the inner conductor.



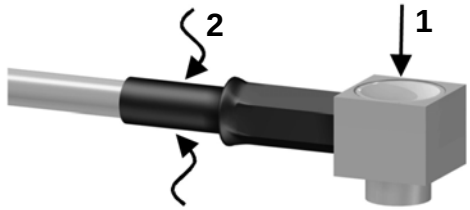

**5**

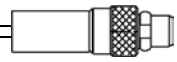
- Place the cap into the body.



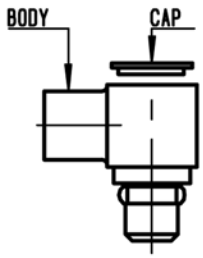

**6**

- Press on the cap flush or slightly below the surface of the body assembly.
- Slide the sleeve over the ferrule and heatshrink it in place (Option).

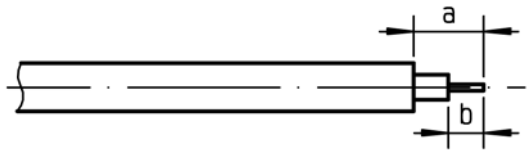




# M 03




STRIPPING DIMENSIONS




We recommend a thermal preconditionning cable

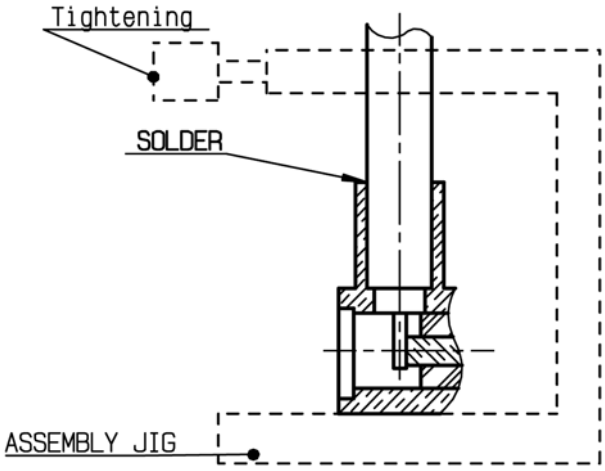
| Part Number | Stripping length (mm) | | Assembly jig |
|---|---|---|---|
| | A | B | |
| **R110 153 000** | 2.6 | 2 | R282 740 020 |

**1**

- Strip the cable.
- Clean the cable.
- Tin cable inner conductor.

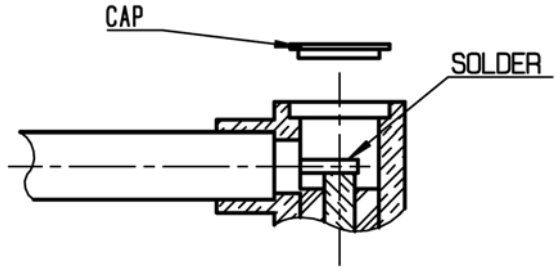
**2**

- Introduce the cable into the connector body until contact with the body shoulder, place the sub assembly into the assembly jig R282 740 020 and tighten it.
- Solder body on the cable and let assembly cool down before removing it from the jig.
- Clean soldering area.



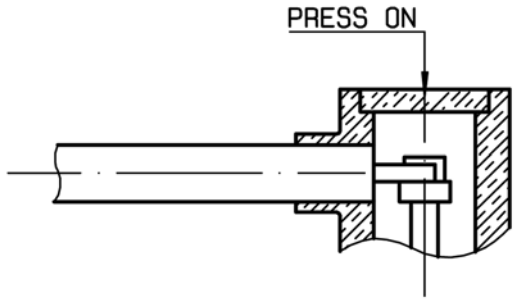

**3**

- Solder cable inner conductor into the centre contact.
- Clean soldering area.



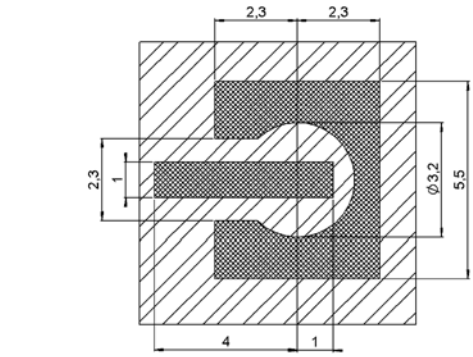

**4**

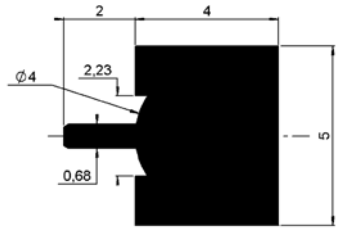
- Put the cap in its place.
- Press cap flush or slightly.
- Below surface or body assembly.



# VIDEO SHADOW AND SOLDERING PATTERN

R110 427 820

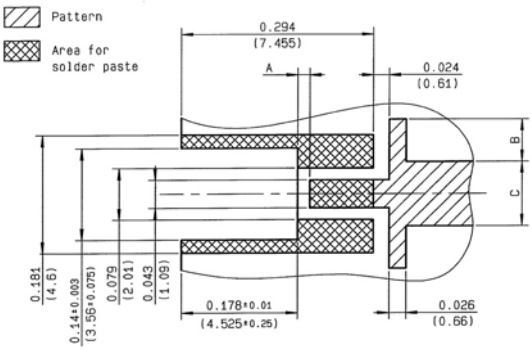


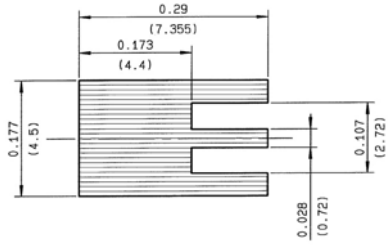




Ground + varnish

Lands for solder paste

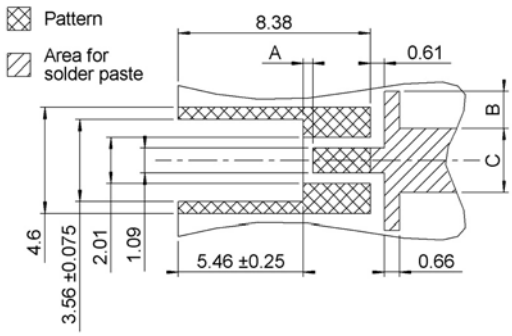
R110 422 100
R110 422 830

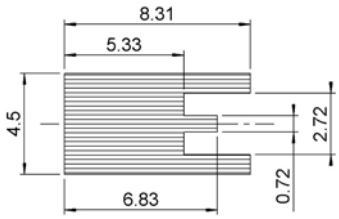



| PCB THICKNESS | A | B | C |
|---|---|---|---|
| 0.031 (0.79) | 0.039 (0.99) | - | 0.055 (1.4) |
| 0.039 (0.99) | 0.035 (0.89) | 0.012 (0.3) | 0.071 (1.8) |
| 0.063 (1.6) | 0.016 (0.41) | 0.063 (1.6) | 0.11 (2.79) |

R110 422 200
R110 422 800




| PCB THICKNESS | A | B | C |
|---|---|---|---|
| 0.79 | 0.99 | - | 1.4 |
| 0.99 | 0.89 | 0.3 | 1.8 |
| 1.6 | 0.41 | 1.6 | 2.79 |

# RADIALL RECOMMENDED SMT PROCEDURE

## SOLDER PROCEDURE

**1**

Deposit solder paste 'Sn Ag4 Cu0.5' on mounting zone by screen printing application. We recommend a low residue flux.
We advise a thickness of 150 micromm (5.850 microinch). Verify that the edges of the zone are clean.

**2**

Placement of the receptacle on the mounting zone with an automatic machine of 'pick and place' type.
Video camera is prefered to check the positioning of the component.
Adhesive agents are forbidden on the receptacle.

**3**

Soldering by infra-red reflow.

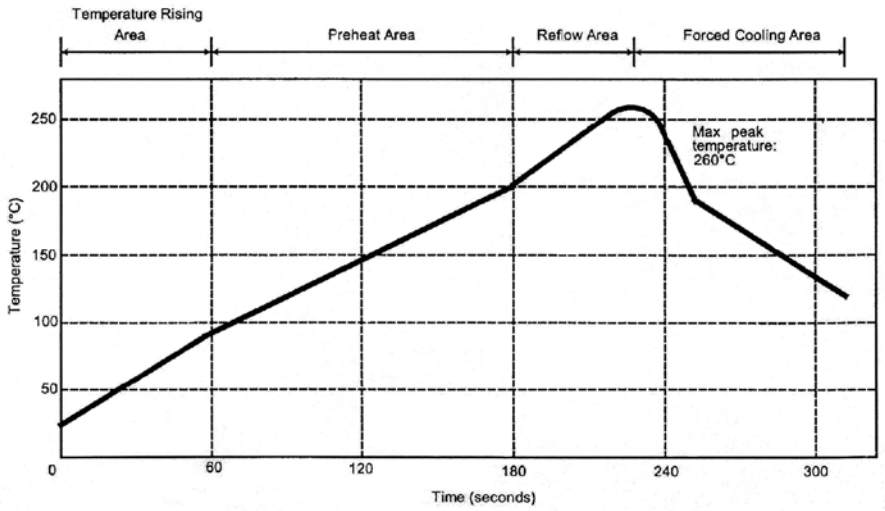
**4**

Cleaning of printed circuit boards.

**5**

Cheeking of solder joints and position of the component by visual inspection.

## TEMPERATURE PROFILE




| Parameter | Value | Unit |
|---|---|---|
| Temperature rising Area | 1 - 4 | °C/sec |
| Max Peak Temperature | 260 | °C |
| Max dwell time @260°C | 10 | sec |
| Min dwell time @235°C | 20 | sec |
| Max dwell time @235°C | 60 | sec |
| Temperature drop in cooling Area | -1 to -4 | °C/sec |
| Max dwell time above 100°C | 420 | sec |