

MICROMINIATURE COAXIAL CONNECTORS

# SMP COM series



**RADIALL**   
The next conneXion

# COMPANY Profile

Founded in 1952 in France, Radiall started as a family owned company making coaxial plugs. Today, Radiall is an international and global manufacturer of interconnect components including **RF coaxial connectors and cable assemblies, antennas, fiber optic components, microwave components, and multipin connectors** for the Automotive, Civil Aviation, Defense, Industrial, Medical, Space and Telecommunications.



## QSE (Quality Safety Environment) POLICY

Radiall maintains a quality management system conforming to international standards, including for environmental protection. Our customers' recognition for the quality of our products and the sustainability of our company, demonstrates the efficiency of our quality system.



## CERTIFICATIONS

Certified ISO 9001 since 1994, Radiall has a pro-active policy in terms of conforming to international standards. Today, all Radiall sites are certified to **ISO 9001:2000** and some

dedicated activities are AS9100 or TS 16949. Our process approach gives us the tool for continuous improvement in all our activities.



A major step in our environment policy was the **ISO 14001** certification in 2001 of the Voreppe plant. Radiall complies with European directives such as **RoHS** for hazardous substance restrictions and **EuP** for environmentally friendly designs for energy-using products.

Some Radiall product lines are on **MIL, ESA/SCC** Qualified Product Lists.

Radiall is consequently proud to be recognized by leading industrial customers for the quality of its service and products.



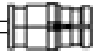
## A WORLDWIDE ENGINEERING & MANUFACTURING CAPABILITY

With expertise centers and manufacturing locations in 3 continents. Radiall offers its customers, through 12 industrial sites, the proximity they need to obtain the best quality of service and delivery performance. Our facilities feature state of the art equipment for the many technologies involved in the design, manufacturing and assembly of interconnect products. Manufacturing plants based in **China, India, Tunisia** and **Mexico** give the opportunity to offer Radiall quality at competitive prices.

Technical information and sales contacts are available on: [www.radiall.com](http://www.radiall.com)



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50  $\Omega$

DC - 12.4 GHz

### GENERAL

- Ultra miniature
- Allows axial and radial misalignments

### APPLICATIONS

- Board to board applications
- High density packaging
- Telecommunications

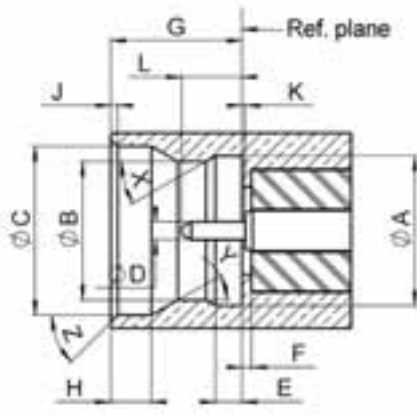
As the standard SMP, the SMP COM series offers 3 levels of retention provided by the male connectors :

- **full detent** for a maximum retention,
- **limited detent** for a medium retention,
- **smooth bore** for the lowest retention.

SMP COM is fully intermateable with the standard SMP and has been optimized up to 12.4 GHz meeting the telecommunication applications needs.

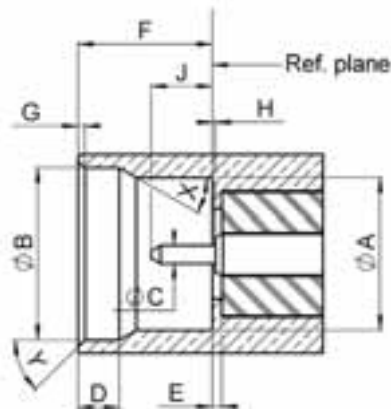


## MALE CONNECTOR (Full detent or Limited detent)



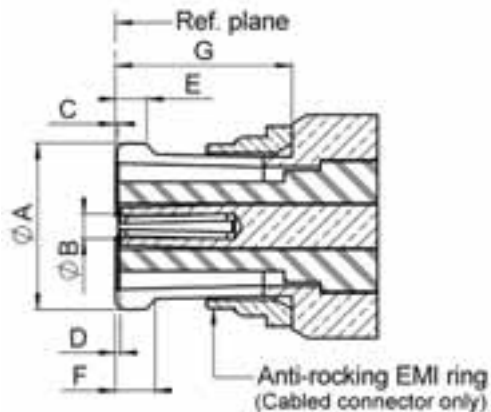
Dia A	3.18+/-0.02
Dia B (Full detent)	2.95+/-0.02
Dia B (Limited detent)	3.05+/-0.02
Dia C	3.59 +/- 0.02
Dia D	0.38+/-0.02
E	0.56+/-0.03
F	0.2+/-0.025
G (Full detent)	2.79+/-0.02
G (Limited detent)	2.77+/-0.02
H	0.86+/-0.02
J	0.15+/-0.05
K	0.07+/-0.07
L	1.27+/-0.12
X	30°+/-0.5°
Y	30°+/-0.5°
Z	45° nom

## MALE CONNECTOR (Smooth bore)



Dia A	3.18+/-0.02
Dia B	3.59+/-0.02
Dia C	0.38+/- 0.02
D	0.86+/-0.02
E	0.2+/-0.025
F	2.79+/-0.02
G	0.15+/-0.05
H	0.07+/-0.07
J	1.27+/-0.12
X	30°+/-0.5°
Y	45° nom

## FEMALE CONNECTOR



Dia A	3.275+/-0.025
Dia B	0.49+/-0.02
C	0.05+/- 0.05
D	0.05+/-0.05
E	0.59+/-0.02
F	0.76+/-0.1
G	3.4+/-0.03



TEST / CHARACTERISTICS	VALUES / REMARKS
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## GENERAL

Impedance	50 Ω								
Frequency range	DC - 6 GHz (optimized) DC - 12.4 GHz (working range)								
Typical V.S.W.R. <ul style="list-style-type: none"> <li>• <i>Straight styles</i></li> <li>• <i>Right angle styles</i></li> <li>• <i>Receptacles</i></li> </ul>	<table border="1"> <thead> <tr> <th>DC - 2.5 GHz</th> <th>2.5 - 6 GHz</th> </tr> </thead> <tbody> <tr> <td>1.10</td> <td>1.15</td> </tr> <tr> <td>1.15</td> <td>1.25</td> </tr> <tr> <td>1.06</td> <td>1.10</td> </tr> </tbody> </table>	DC - 2.5 GHz	2.5 - 6 GHz	1.10	1.15	1.15	1.25	1.06	1.10
DC - 2.5 GHz	2.5 - 6 GHz								
1.10	1.15								
1.15	1.25								
1.06	1.10								
Insertion loss (dB)	$0,12 \sqrt{F}$ (F in GHz)								
Insulation resistance (MΩ)	5000								
Voltage rating (VRMS)	750								
RF leakage	- 55 dB from 0 to 3 GHz - 40 dB from 3 to 6 GHz								

## ENVIRONMENTAL AND MECHANICAL CHARACTERISTICS

Operating temperature <ul style="list-style-type: none"> <li>• <i>Standard</i></li> <li>• <i>Semi-rigid</i></li> </ul>	-55°C / + 125°C -55°C / + 105°C		
	smooth bore	limited detent	full detent
Mechanical endurance (matings)	100		
Engagement and separation force (N)	9 max. - 2.2 min.	45 max. - 9 min.	68 max. - 22 min.
Radial misalignment Axial misalignment	± 0.25 mm 0, + 0.25 mm		
Moisture resistance	MIL - STD - 202 method 106		
Cable retention (N) <ul style="list-style-type: none"> <li>• <i>.085" semi-rigid</i></li> <li>• <i>2/50/S</i></li> <li>• <i>2.6/50/S</i></li> </ul>	200 35 58		
Contact captivation axial (N)	6.8		

## MATERIALS

Cable connectors	Beryllium copper or brass
Receptacles	Brass
In series adapters	Beryllium copper
Center contacts	Beryllium copper / brass
Insulators	PTFE / PEEK

## PLATING

Cable connectors	NPGR*
Receptacles	NPGR*
In series adapters	NPGR*
Center contacts	NPGR*

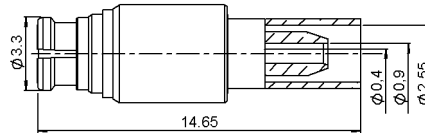
\* NPGR : Nickel Phosphorous Gold Radial

Standard packaging = 100 pieces. For unit packaging add «W» after the P/N

All dimensions are given in mm

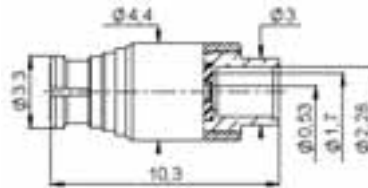


### STRAIGHT PLUG, FULL CRIMP TYPE FOR FLEXIBLE CABLE (female center contact)



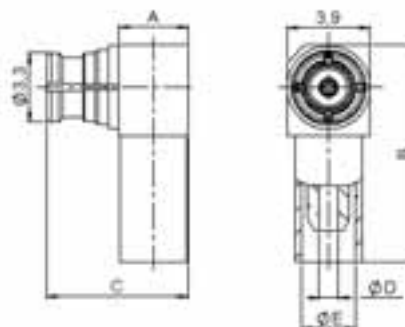
Cable group	Part number	Captive center contact	Assembly instructions
2/50/S	<b>R222 900 100</b>	yes	M01

### STRAIGHT PLUG, SOLDER TYPE (female center contact)

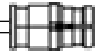


Cable group	Part number	Captive center contact	Assembly instructions
.085"	<b>R222 900 200</b>	no	M02

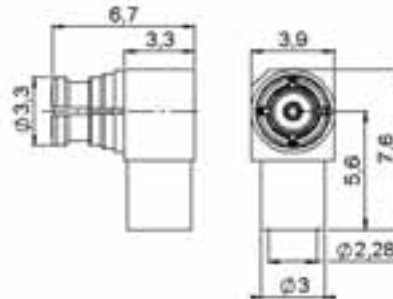
### RIGHT ANGLE PLUGS, CRIMP TYPE FOR FLEXIBLE CABLE (female center contact)



Cable group	Part number	Dimensions (mm)					Captive center contact	Assembly instructions
		A	B	C	D	E		
2/50/S	<b>R222 900 310</b>	3.3	10.3	6.7	0.9	2.55	yes	M03
2.6/50/S	<b>R222 900 320</b>	3.7	11.3	7.1	1.58	3.25		
2.6/50/D	<b>R222 900 330</b>		13.3	7.4		3.50		

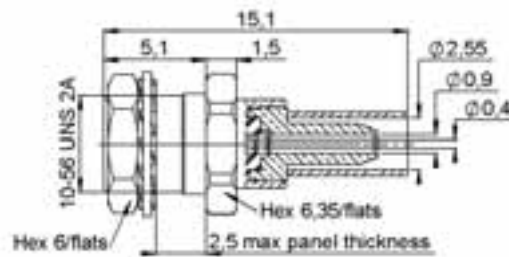


### RIGHT ANGLE PLUG, SOLDER TYPE (female center contact)



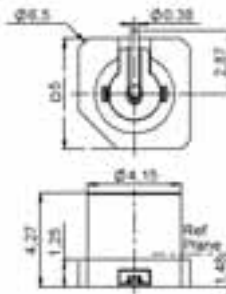
Cable group	Part number	Captive center contact	Assembly instructions
.085"	<b>R222 900 340</b>	yes	M04

### STRAIGHT BULKHEAD JACK, FULL CRIMP TYPE (male center contact)



Cable group	Part number	Retention	Captive center contact	Assembly instructions	Panel cut out
2/50/S	<b>R222 920 300</b>	Limited detent	yes	M01	P01

### STRAIGHT SMT RECEPTACLE (male center contact)

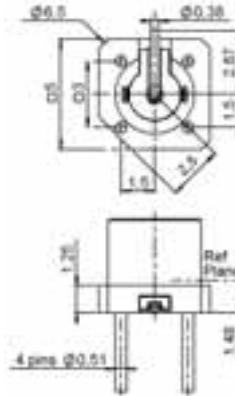
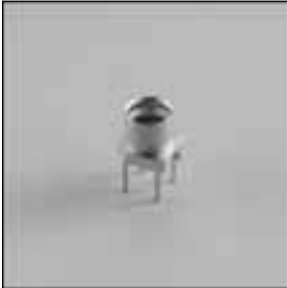


Part number	Retention	Captive center contact	Assembly instructions	Packaging
<b>R222 941 100</b>	Full detent	yes	M05	Tape & reel 500 pieces
<b>R222 941 300</b>	Limited detent			Tape & reel 1400 pieces
<b>R222 941 310</b>				Tape & reel 500 pieces
<b>R222 941 700</b>	Smooth bore			



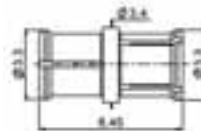


### STRAIGHT RECEPTACLES, PIN & PASTE MOUNT (male center contact)



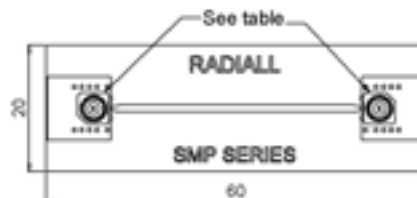
Part number	Retention	Captive center contact	Assembly instructions	Packaging
R222 940 100	Full detent	yes	M05	Tape & reel 500 pieces
R222 940 300	Limited detent			
R222 940 700	Smooth bore			

### IN SERIES ADAPTER (female to female center contact)

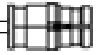


Part number	Finish	Packaging
R222 970 000	NPGR	100 pieces

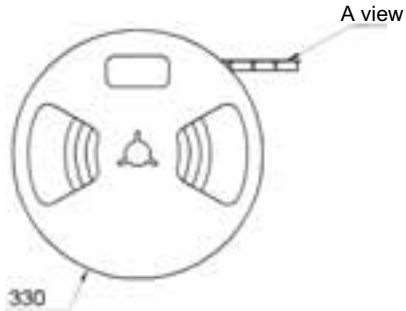
### MEASUREMENT PCB WITH SMT RECEPTACLE



Part number	Packaging	Connector
R222 995 320	Unit	2 x R222 941 300
R222 995 330		2 x R222 940 300

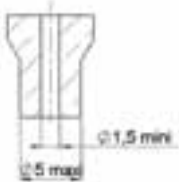


### PACKAGING

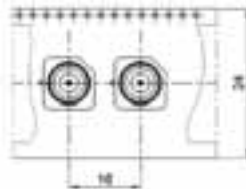


Part Number		Packaging
R222 940 100	R222 941 100	Tape & reel 500 pieces
R222 940 300	R222 941 300	
R222 940 700	R222 941 700	
R222 941 310		Tape & reel 1400 pieces

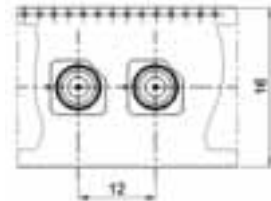
AIR SUNCTION



R222 940 100  
R222 940 300  
R222 940 700



R222 941 100  
R222 941 300  
R222 941 310  
R222 941 700



### PANEL DRILLING

P01






	MM		INCH	
	maxi	mini	maxi	mini
A	5,3	5,2	0,209	0,205

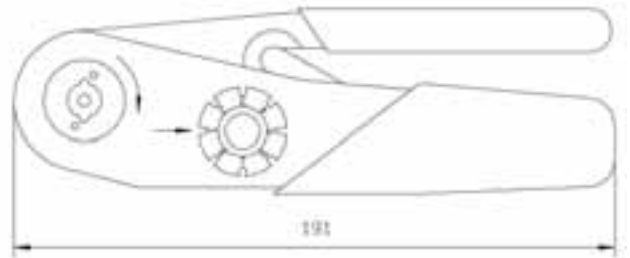


### CRIMP TOOL (dies included)



Part number	Cable group	Color of handles			
<b>R282 211 000</b>	1/50+75 - 2/50/S+75 - 2.6/50/S+75	Red	4.52 (.178)	3.25 (.128)	2.67 (.105)

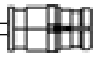
### CRIMP TOOL FOR CENTER CONTACT R282 281 000



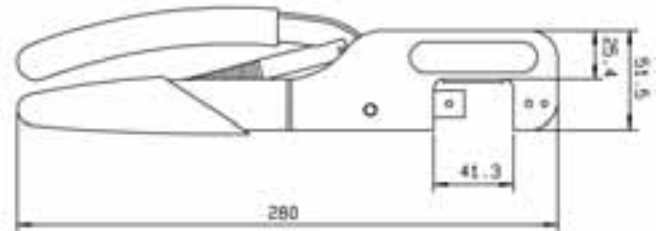
### LOCATOR TOOL FOR CENTER CONTACT CRIMP TOOL R282 281 000



Part number
<b>R282 967 090</b>
<b>R282 967 091</b>





**MIL CRIMP TOOL (M22520/5-01) R282 293 000** (dies not included)



### DIES

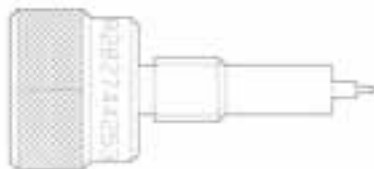


Part number	Cable group		
R282 235 003	2/50/S + D - 2.6/50 + 75/S	3.25 (.128)	2.67 (.105)

### LOCATOR TOOL



Locator tool



Locator tool for center contact

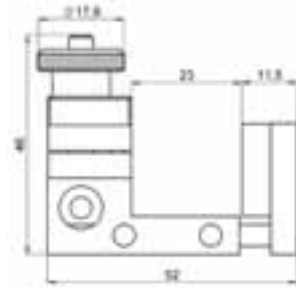


Solder gauge

Part number	Notes
R282 743 120	Locator tool for straight and right angle female
R282 744 253	Locator tool for center contact female
R282 862 050	Solder gauge thick 0.3 (.012)



## SOLDERING FIXTURE (JIG)



Cable group	Part number
.141"/.250"/.350"	<b>R282 740 030</b>

## POINTER GAUGE FOR SEMI-RIGID CABLE



Cable group	Part number	Stripping length setting
.085"	<b>R282 062 010</b>	1.3 (.051)
	<b>R282 063 000</b>	3.17 (.125)

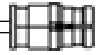
Specially designed for sharpening the end of the cable's center conductor, this sharpening tool-gauge is supplied with a removable blade whenever required. Please specify P/N **R282 056 000** when ordering the replacement blade. Including Hex key.

## STRIPPING TOOL FOR SEMI-RIGID CABLE

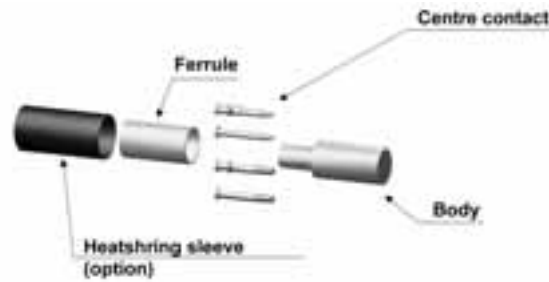


Cable group	Part number
.085"	<b>R282 051 000</b>

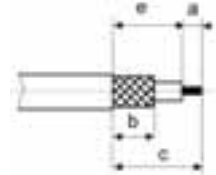
This easy to use tool removes the cable's outer conductor and dielectric leaving the center conductor stripped to the proper length. It is supplied with a removal blade which can be ordered separately whenever required. Please specify P/N **R285 055 000** when ordering the replacement blade. Including adjustment gauge and male hex key.



## M 01



STRIPPING DIMENSIONS



Part number	Stripping length (mm)				Hex	Ferrule crimp tool		Center contact crimp tool	
	a	b	c	e		MIL standard R282 293 000 + dies	Dies included	MIL standard R282 281 000 (M22520/2-01) position 2 + positioner	
<b>R222 900 100</b>	2.5	5	9	6.5	2.67	R282 235 003 (M22520/5-03)	R282 211 000	R282 967 091	
<b>R222 920 300</b>								R282 967 090	

- 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).



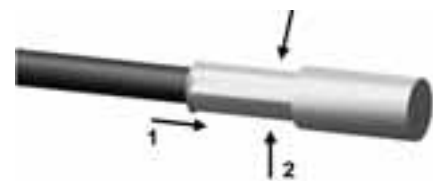
- 3**
- Fan the braid.



- 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).

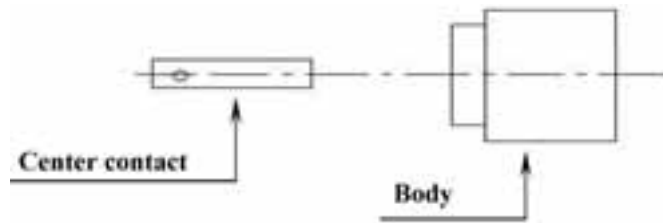


- 6**
- Cut the excess of braid if necessary.
  - Slide the sleeve over the ferrule and heatshrink it in place (Option).





## M 02



STRIPPING DIMENSIONS



We recommend a thermal preconditioning cable

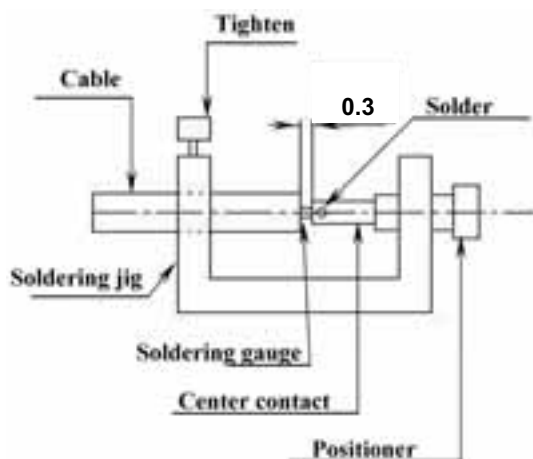
Part number	Stripping length a (mm)	Stripping tool	Pointer gauge	Soldering mounting	Positioner	Solder gauge thickness 012
<b>R222 900 200</b>	1.3	R282 051 000	R282 062 010	R282 740 030	R282 743 120 R282 744 253	R282 862 050

**1**

- Strip the dielectric of the cable .
- Trim the cable.
- Clean the cable.
- Iron temperature not exceed 250°C.

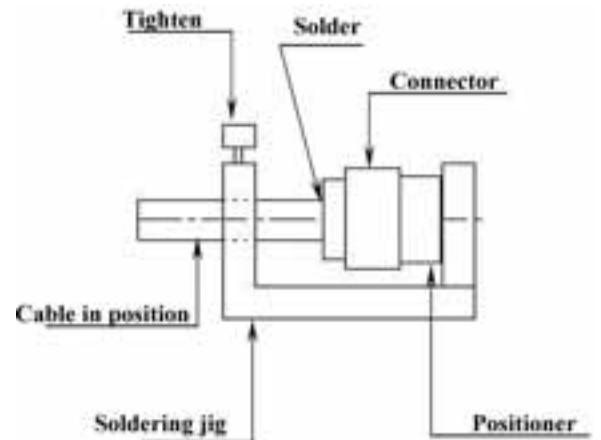
**2**

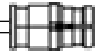
- Screw the positoner onto the soldering jig.
- Slide center contact into positoner.
- Insert solder gauge between contact and cable .
- Tighten and solder the contact.



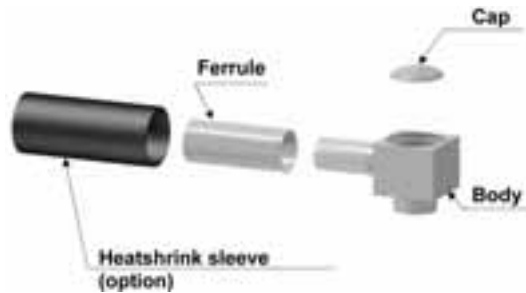
**3**

- After cooling remove cable assembly from the jig.
- Slide body into positoner.
- Slide cable into the connector until it bottoms against the positoner.
- Tighten.
- Solder the body onto the cable.
- After cooling remove cable assembly from the jig.

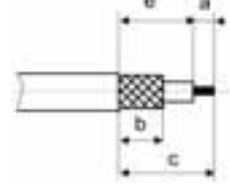




## M 03



STRIPPING DIMENSIONS



Part number	Stripping length (mm)					Ferrule crimp tool	
	a	b	c	e	Hex	MIL standard R282 293 000 + dies	Dies included
R222 900 310	1.3	5.0	7.8	6.5	2.67	R282 235 003 (M22520/5-03)	R282 211 000
R222 900 320	1.4		7.9		3.65		
R222 900 330	1.3		7.8		2.67		

- 1**
- Slide the heatshrink sleeve onto the cable (Option).
  - Slide the ferrule onto the cable.
  - Strip the cable.



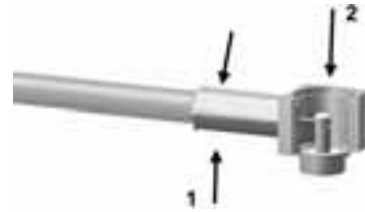
- 2**
- Fan the braid.



- 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.



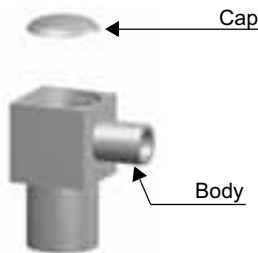
- 6**
- Press on the cap flush or slightly below the surface of the body assembly.
  - Slide the sleeve over the ferrule and heatshrink it in place (option).







## M 04



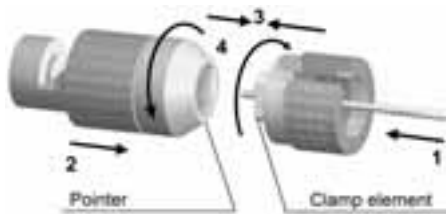
STRIPPING DIMENSIONS



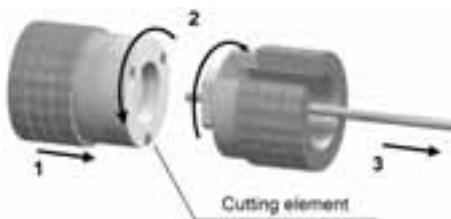
We recommend a cable thermal preconditioning before assembly

Part number	stripping length a (mm)	Stripping tool	Pointer gauge	Soldering mounting	Positioner
<b>R222 900 340</b>	3.17	R282 051 000	R282 063 000	R282 740 030	R282 743 120

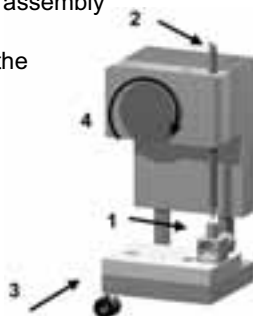
- 1**
- Insert the cable into the clamping element.
  - Present the pointer in front of the clamping element.
  - Push the cable until it stops, while holding the clamping element pushed on the hollow part of the pointer.
  - Turn the clamping part until the release of the pointer.



- 2**
- Present the cutting element in front of the cutting element.
  - Push and turn both elements, back part opposite to the front part.
  - Once they reach the stop, pull without revolving.



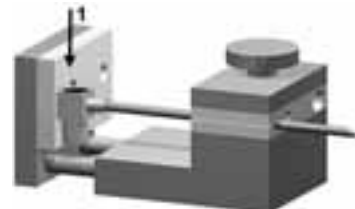
- 3**
- Insert the cable into the body.
  - Secure the positioner into the assembly jig.
  - Place the sub-assembly into the assembly jig.
  - Tighten.



- 4**
- Put three rings of solder around the cable.
  - Solder the body onto the cable

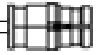


- 5**
- After cooling, remove the assembly from the jig.
  - Remove the positioner.
  - Solder the inner conductor.



- 6**
- Place the cap into the body.
  - Press on the cap flush or slightly below the surface of the body assembly.



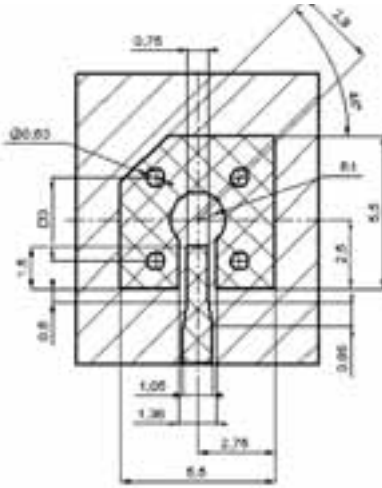


## M 05

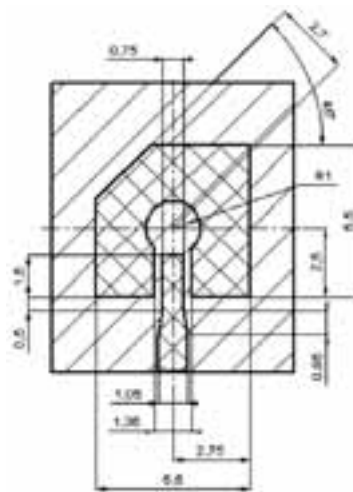
Part number		
R222 940 100 R222 940 300	R222 940 700 R222 941 100	R222 941 300 R222 941 310 R222 941 700

### SOLDERING PATTERN

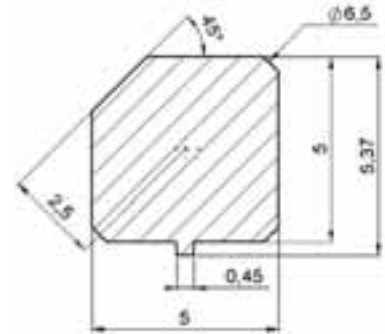
R222 940 100  
R222 940 300  
R222 940 700



R222 941 100  
R222 941 300  
R222 941 310  
R222 941 700



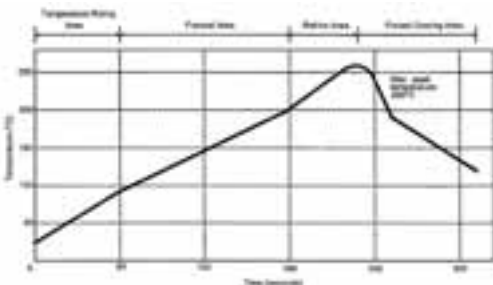
VIDEO SHADOW



### SOLDER PROCEDURE

- 1** - Deposition of 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 microns (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 recommended for the positioning of the component. Adhesive agents must not be used on the receptacle.
- 3** - Soldering by infra-red reflow. Below, please find the typical profile to use.
- 4** - Cleaning of printed circuit boards.
- 5** - Checking of solder joints and position of the component by visual inspection.

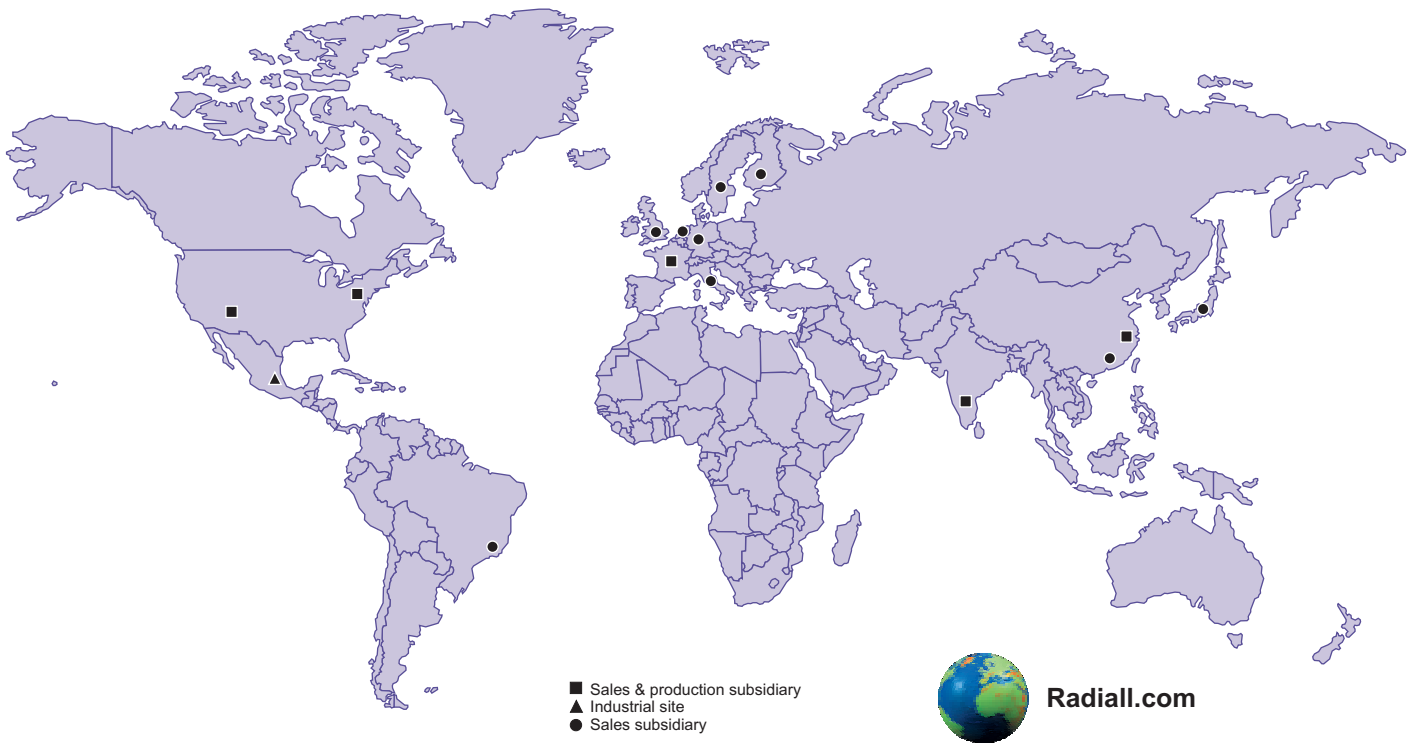
### TEMPERATURE PROFILE



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



Part numbers	Description	Page
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R222 941 300.....	Straight SMT receptacle limited detent (male center contact) reel 500 pc .....	8
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