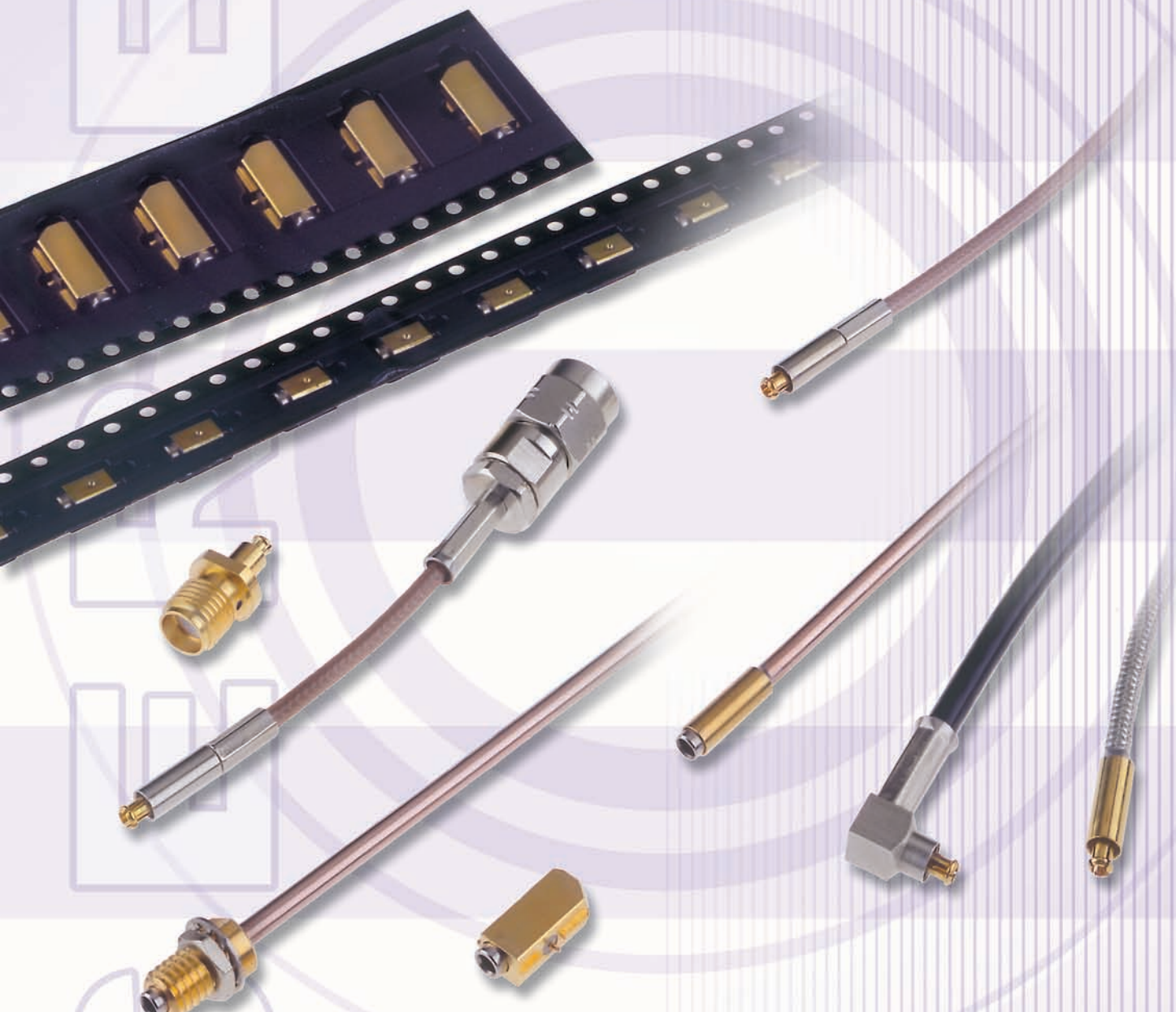
MC-CARD series

RI99-R299



RADIALL
The next conneXion

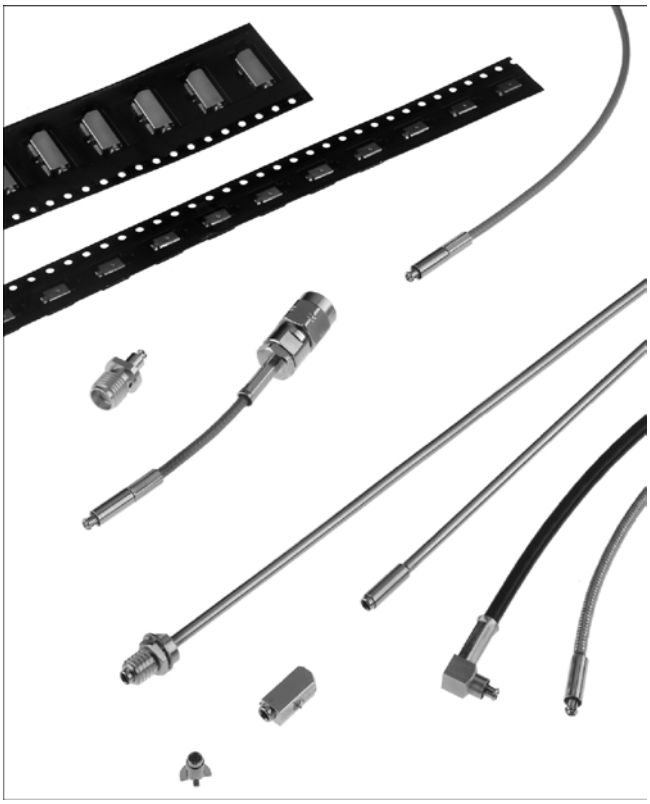
CONTENTS

INTRODUCTION

MC-Card series are microminiature, 50 Ω connectors that feature snap-on mating and a frequency range of DC - 8GHz. MC-Card series were designed by Radiall in the 90's. The success of the switching version quickly made the MC-Card an alternative to MMCX connectors in many wireless and telecom applications.
With similar performance than MMCX, featuring quick snap-on mating and unmating, MC-Card withstands a minimum of 5,000 mating cycles.

The Globally adopted switching connector version consists in a female edge card receptacle with an integrated switch for SMT assembly. It allows automatic switching between two RF signal paths.
This connector is mainly used on wireless PCMCIA-Card or GPS device to switch between the internal antenna and a higher-gain external antenna.

In addition to the standard MC-Card series, Radiall also offer MC-Card dia. 3 mm. Thank to this version, wireless equipments can be differentiated and protected against wrong antenna connection.



50 Ω	DC - 8 GHz

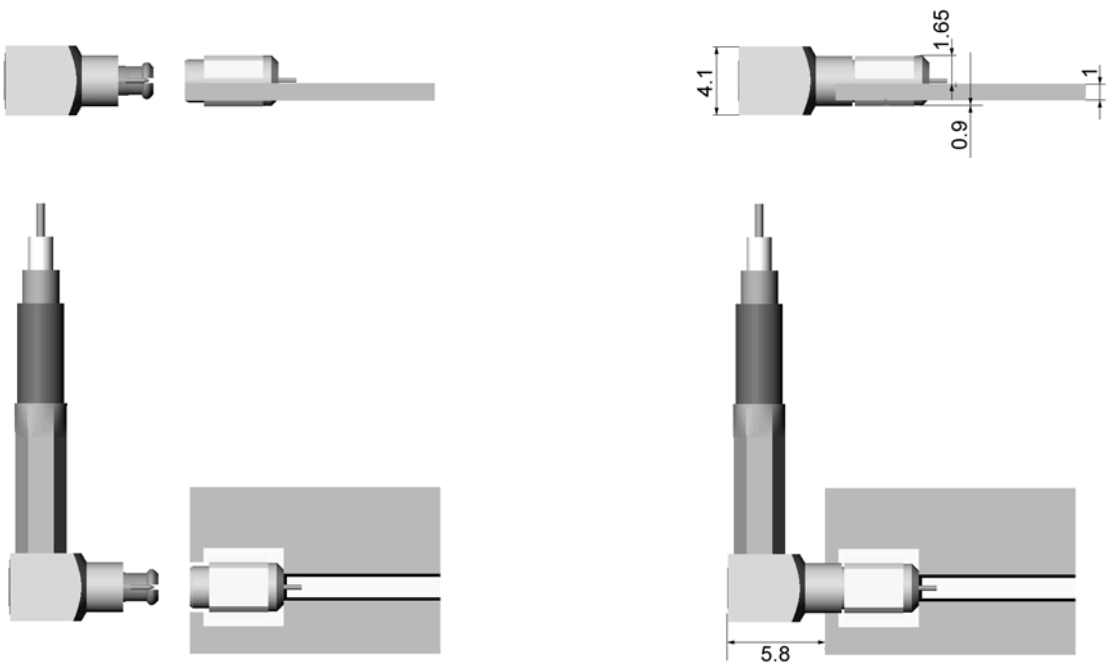
GENERAL

- Microminiature coaxial connectors
- Surface mount receptacles and switches
- 360° cable rotation
- Snap-on mating

APPLICATIONS

- Modems
  - PCMCIA and ISA card
  - WLAN
  - GPS
- Antennas connectors
  - PMR / TETRA

PROFILE



Unmated **Mated**

TEST / CHARACTERISTICS	VALUES / REMARKS

ELECTRICAL CHARACTERISTICS

Impedance	50 Ω				
Frequency range	DC - 8 GHz				
V.S.W.R. TYPICAL	1 GHz	2.5 GHz	4 GHz	6 GHz	8 GHz
• *Straight models*					
2/50 cable	1.07	1.15	1.16	1.17	1.25
• *Right angle models*					
2/50 cable	1.08	1.17	1.22	1.26	1.30
2.6/50 cable	1.05	1.08	1.10	1.13	1.12
Insertion loss					
• *straight connectors*	0.04	0.08	0.11	0.15	0.15
• *right angle connectors*	0.05	0.10	0.15	0.20	0.25
RF leakage (dB max)	- 65 dB max at 8 GHz				
Insulation resistance	5 000 MΩ min				
Contact resistance					
• *center contact*	1.5 mΩ				
• *outer contact*	0.2 mΩ				
Working voltage in VRMS					
• *at sea level (at 21000 m)*	170				
Dielectric withstanding voltage in VRMS					
• *at sea level*	500				
RF testing voltage sea level in VRMS	500				

MECHANICAL CHARACTERISTICS

Durability	5000 matings
Force to engage and disengage	6.2 N
Force to disengage	8.8 N
Cable retention force	
2/50 cable	58 N
2.6/50 cable	110 N
Center contact retention force	slide-on

ENVIRONMENTAL CHARACTERISTICS

Temperature range	
• *switches*	- 40° C + 110° C
• *others*	- 25° C + 125° C
Thermal cycling test	MIL STD 202, method 107, condition B,
High temperature endurance	MIL STD 202, method 108
Corrosion (salt spray)	MIL STD 202, method 101, condition B,
Vibration	MIL STD 202, method 204, condition B
Shock	MIL STD 202, method 213, condition G
Moisture resistance	MIL STD 202, method 106
Hermeticity	MIL STD 202, method 112, condition C Vacuum 10^{-6} Hgmm (Torr) Leakage rate 10^{-6} atm/cm^3/s
Barometric pressure	Pressure test: 3.5 bars; duration: 2 mn; Temperature: 15°C to 25 °C

TEST / CHARACTERISTICS	VALUES / REMARKS

MATERIALS

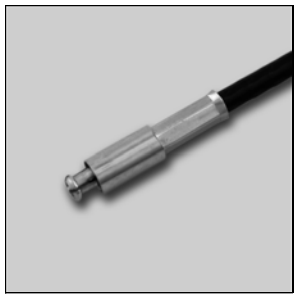
Bodies	Brass
Center contacts • *male* • *female*	 Brass Bronze or heat treated Berylium following QQ-C-530
Insulator • *cable connectors* • *switches*	 PTFE Polyether ethercetone 30% GF
Gasket	Silicon rubber

PLATINGS

Bodies • *cable connector* • *SMT receptacles* • *edge card receptacles* • *switches*	 Nickel or BBR* Gold Gold Gold
Center contacts	Gold

* BBR Bright Bronze Radiall

STRAIGHT PLUGS



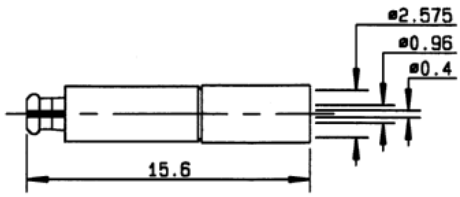


Fig. 1

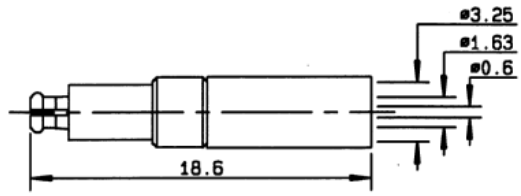
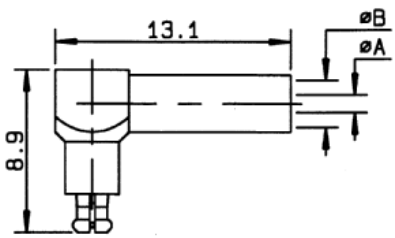


Fig. 2

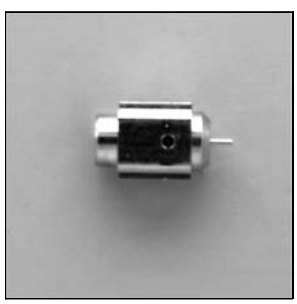
Cable group	Part number	Fig	Captive center contact	Assembly instructions	Finish	Note
2 / 50 / S	**R199 005 200**	1	no	M01	nickel	crimp type
2.6 / 50 / S	**R199 005 010**	2		M02		

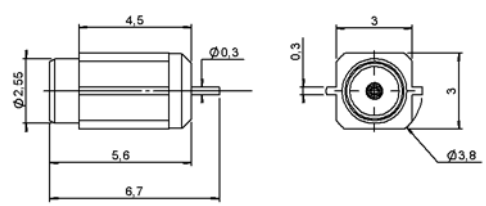
RIGHT ANGLE PLUGS



Cable group	Part number	Dimensions (mm)		Captive center contact	Assembly instructions	Finish	Note
		A	B				
2 / 50 / S	**R199 005 240**	2.57	0.96	yes	M03	nickel	crimp type
2.6 / 50 / S	**R199 005 250**	3.25	1.63				
2.6 / 50 / D	**R199 005 260**	3.5					

EDGE CARD SMT RECEPTACLES

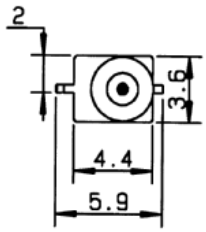


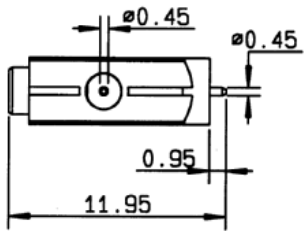


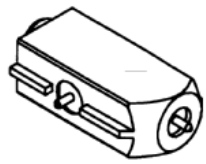
Part number	Captive center contact	Assembly instructions	PCB pattern	Finish	Packaging
R199 005 800W	yes	M04	P02	gold	unit
R199 005 800					400 p / reel
R199 005 801					1800 p / reel

Packaging 100 pieces

SMT SWITCHES



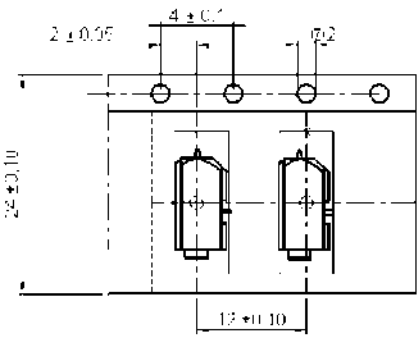




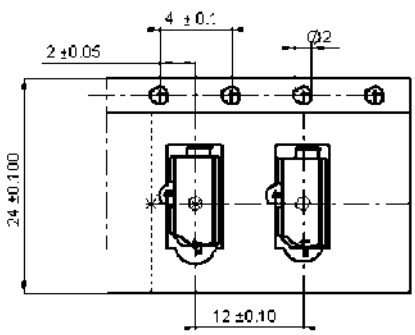
Part number	Captive center contact	Assembly instructions	PCB pattern	Finish	Packaging	Position*
R199 005 870	yes	M04	P01	Gold	500 p / reel	1
R199 005 880						2
R199 005 890						3
R199 005 890W					unit	

Electrical diagram on "M04"

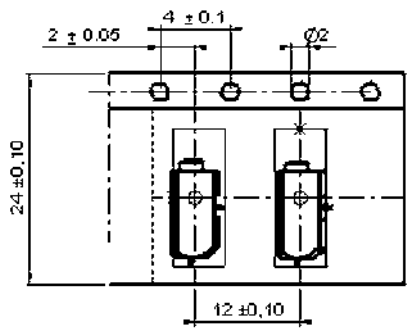
*** Position in the reel tape**



Position 1

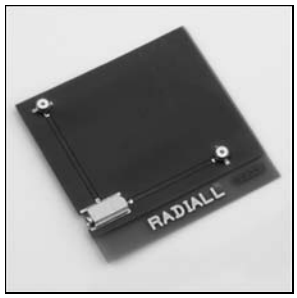


Position 2



Position 3

TEST BOARDS



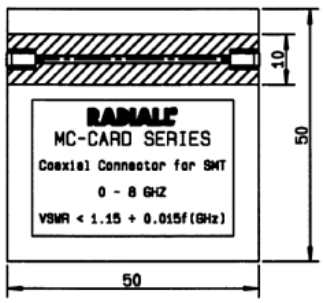


Fig. 1

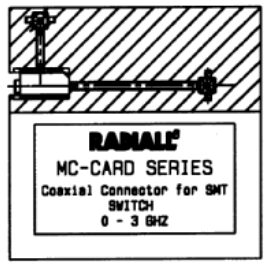


Fig. 2

Part number	Fig	Composition	Series
R199 005 940	1	2 x R199 005 800W (edge card)	MC CARD / MC CARD
R199 005 904	2	R199 005 890W (switch) + 2 x R209 408 002	switch MC CARD / MMS / MMS

BETWEEN SERIES ADAPTERS

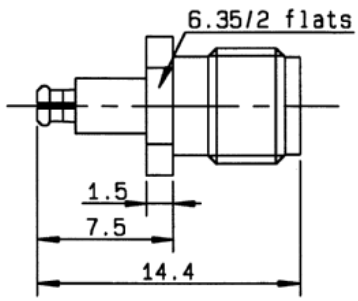


Fig. 1

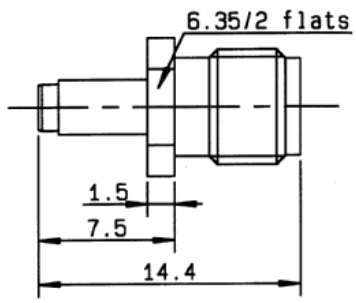


Fig. 2

Part number	Fig	Series	Body and finish
R191 366 071	1	SMA female / MC CARD male	passivated stainless steel
R191 366 091	2	SMA female / MC CARD female	

PIGTAILS

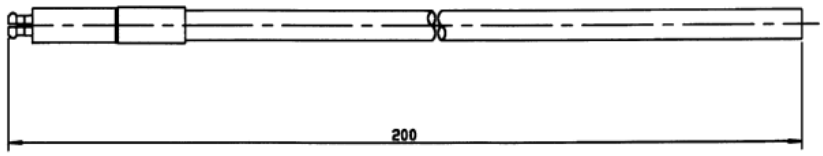


Fig. 1

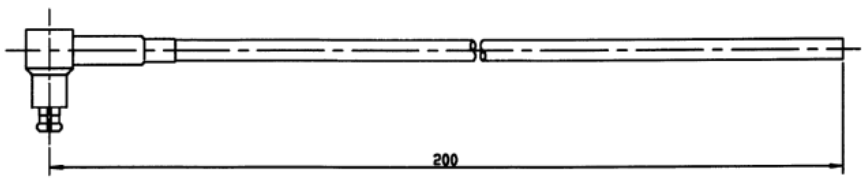
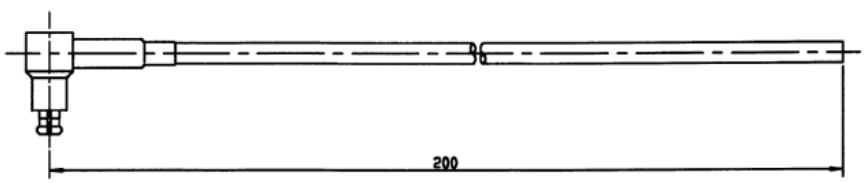


Fig. 2

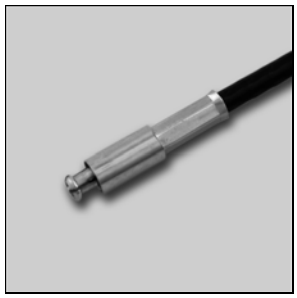
Cable group	Part number	Fig	Composition
2/50/S	**R285 055 021**	1	R199 005 200 / C291 145 060
	R285 055 221	2	R199 005 240 / C291 145 060
2.6/50/S	**R285 055 261**		R199 005 250 / C291 170 007

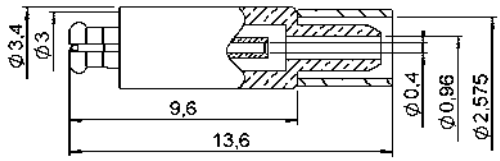
BETWEEN SERIES CABLE ASSEMBLY



Cable group	Part number	Composition	Series
2/50/S	**R285 330 010**	R199 005 200 + C291 145 + R124 069 120	MC CARD / SMA

STRAIGHT PLUG (3 mm dia.)





Cable group	Part number	Captive center contact	Assembly instructions	Finish	Note
2/50/S	**R299 790 020**	yes	M01	nickel	crimp type

RIGHT ANGLE PLUGS (3 mm dia.)

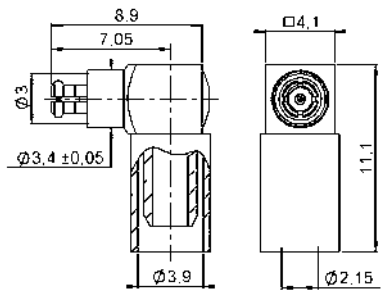


Fig. 1

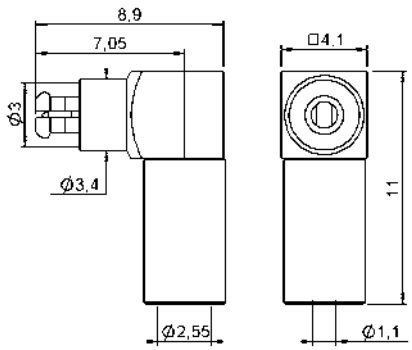
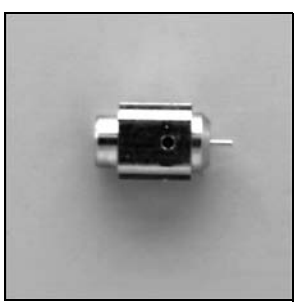
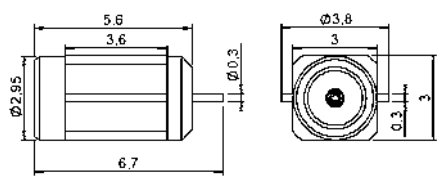


Fig. 2

Cable group	Part number	Fig.	Captive center contact	Assembly instructions	Finish	Note
2/50/S	**R299 792 107**	1	yes	M03	BBR	crimp type
3/50/S	**R299 792 000**	2			nickel	

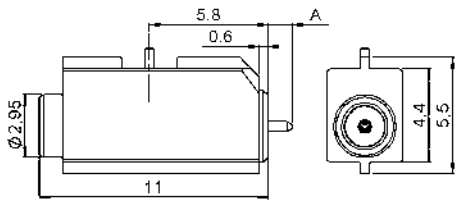
EDGE CARD SMT RECEPTACLES (3 mm dia.)





Part number	Captive center contact	Assembly instructions	PCB pattern	Finish	Packaging
R299 795 830	yes	M04	P02	gold	1800 p / reel

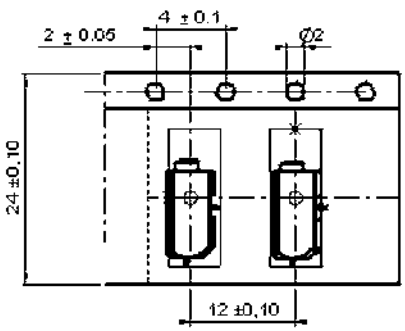
SMT SWITCHES (3 mm dia.)



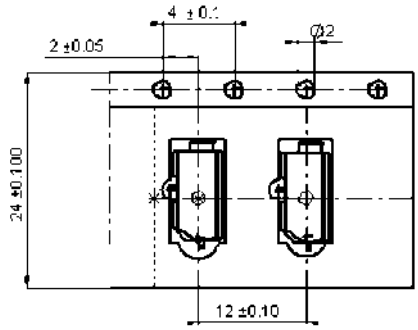
Part number	Dimension A (mm)	Captive center contact	Assembly instructions	PCB pattern	Finish	Packaging	Position*
R299 794 800	0.93	yes	M04	P01	gold	500 p / reel	1
R299 794 880	0.96						2

Electrical diagram on "M04"

*** Position in the reel tape**



Position 1



Position 2

PIGTAILS (or cable assemblies)

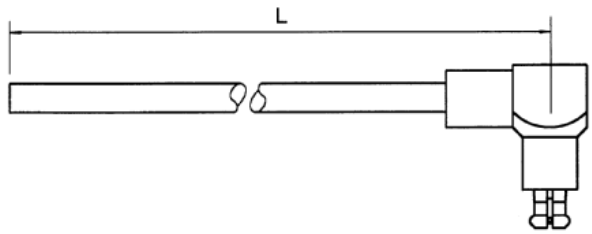
How to order

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

Example 1:

Pigtail featuring one right angle plug.

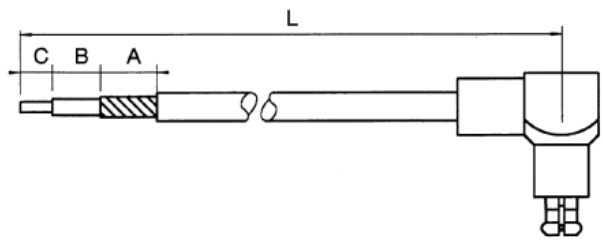
Connector / ***Cable*** / ***Length*** *(cm)*



Example 2:

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

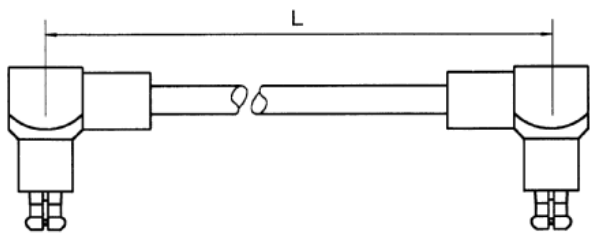
Connector / Cable / Length (cm)
A= (mm) B= (mm) C= (mm)



Example 3:

Cable assembly featuring two right angle plugs.

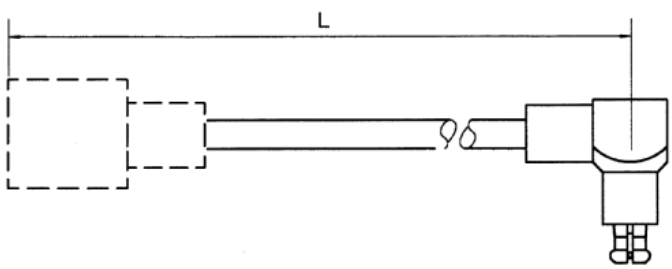
Connector / ***Cable*** / ***Connector*** / ***Length*** *(cm)*

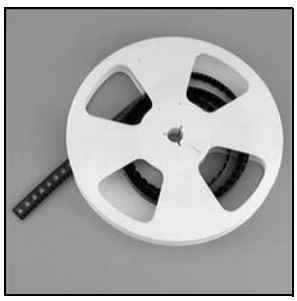


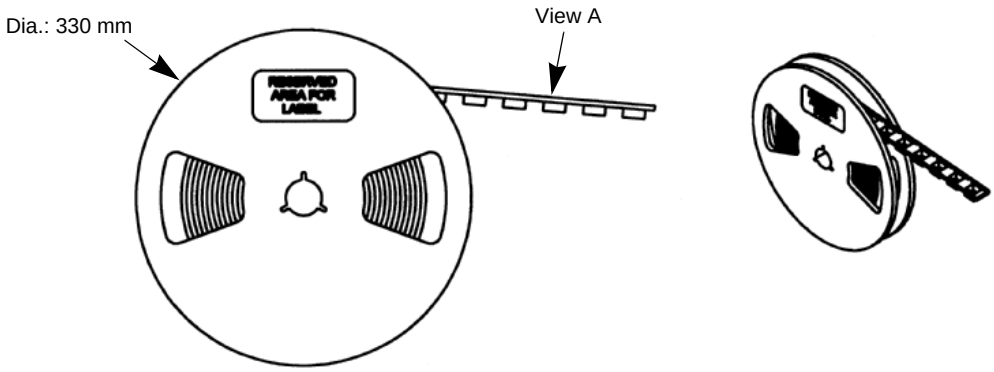
Example 4:

Cable assembly featuring one MC CARD right angle plug and any other connector compatible with cable.

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







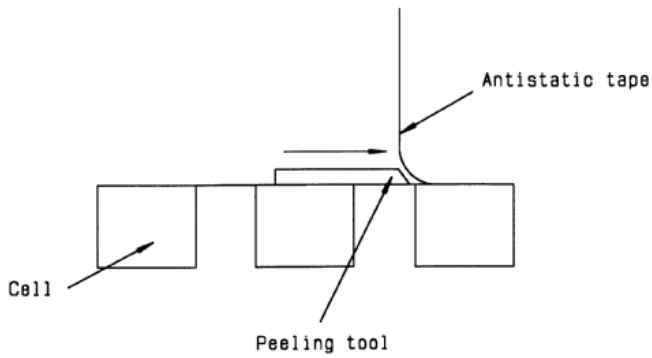
ACCORDING TO IEC 286-3 STANDARD

MATERIALS

Reel : polyester

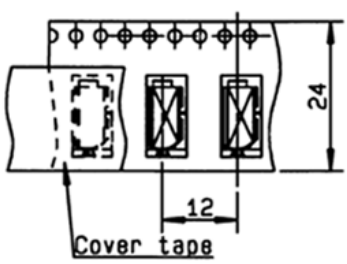
Carrier tape : antistatic PETG (polyester)

Cover tape : polyester

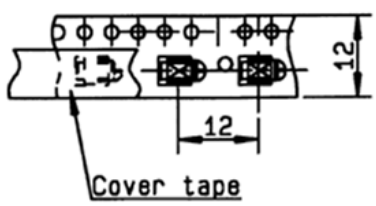


View A

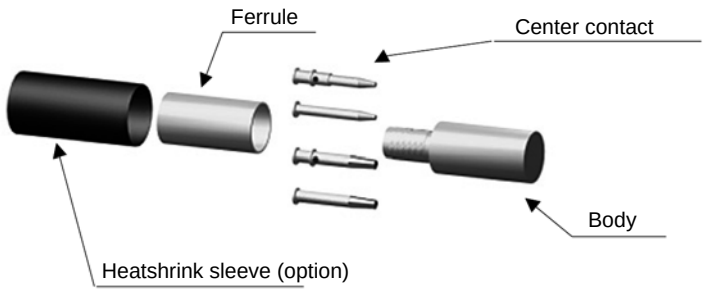
Part number
R199 005 890 **R299 794 800** **R299 794 880**



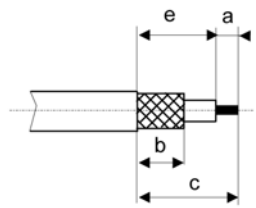
Part number
R199 005 800 **R199 005 801** **R299 795 830**



M 01



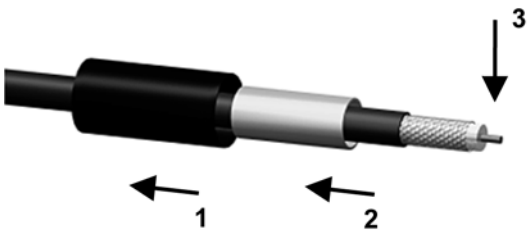
STRIPPING DIMENSIONS



Part Number	Stripping length (mm)				Center contact crimp tool MIL standard R282 281 000 (M22520/2-01) position 2 + positioner	Ferrule crimp tool		
	a	b	c	e		Hex. (mm).	MIL standard R282 293 000 (M22520/5-01) + dies	Dies included
R199 005 200	2.5	4.5	8.5	6	R282 967 040	2.67	R282 235 003 (M22520/5-03)	R282 211 000
R299 790 020	2	4	7.3	5.3				

1

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

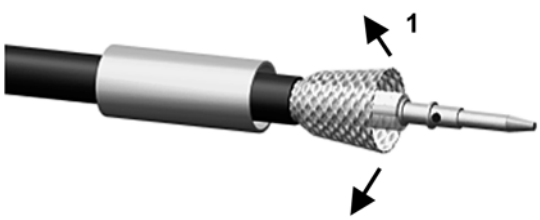


2

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

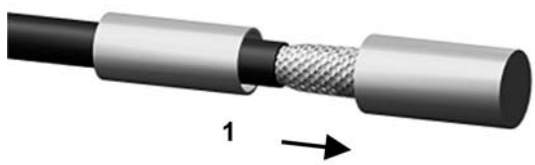
3

- Fan the braid.



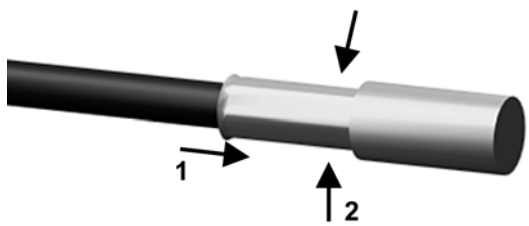
4

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



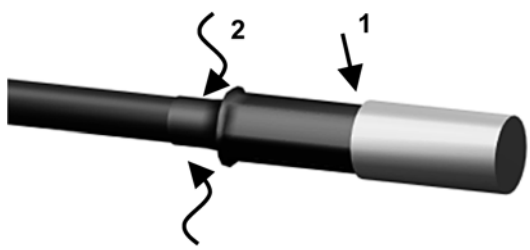
5

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

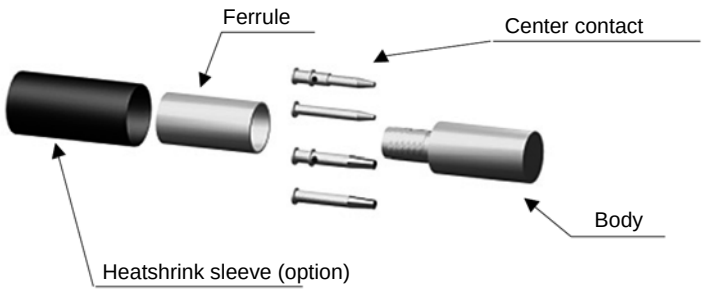


6

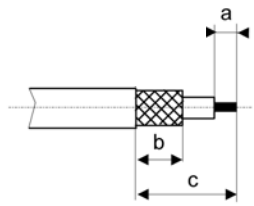
- Cut the excess of braid if necessary.
- Slide the sleeve over the ferrule and heatshrink it in place (Option).



M 02



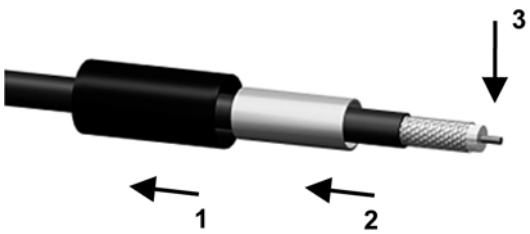
STRIPPING DIMENSIONS



Part Number	Stripping length (mm)			Hex. (mm)	Crimping tool
	a	b	c		
R199 005 010	2	6	8	3.25	R282 211 000

1

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

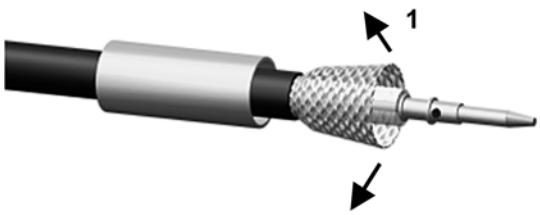


2

- Slide the centre contact on until it bottoms against the cable dielectric.
- Solder the centre contact.
- Clean solder area.

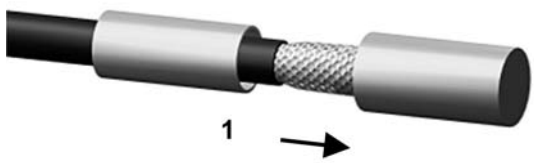
3

- Fan the braid.



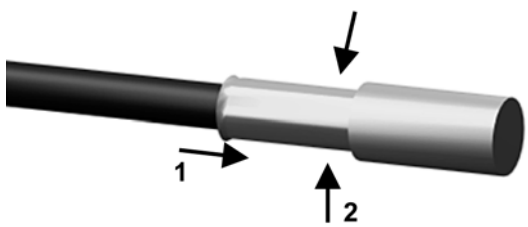
4

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



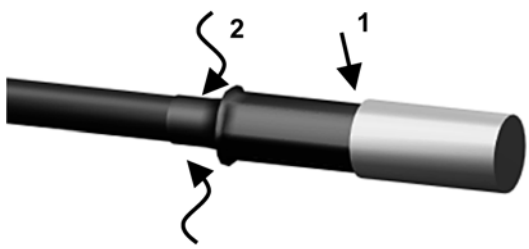
5

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

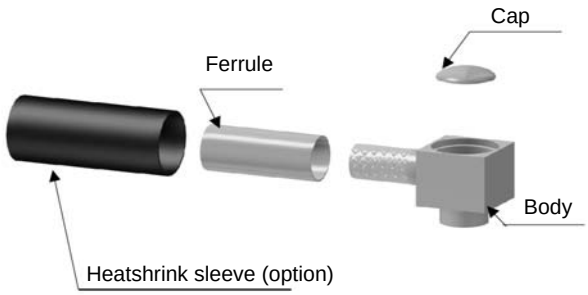


6

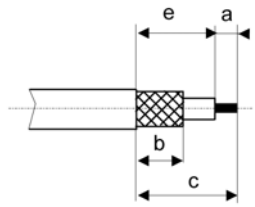
- Cut the excess of braid if necessary.
- Slide the sleeve over the ferrule and heatshrink it in place (Option).



M 03



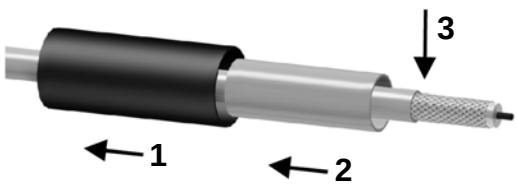
STRIPPING DIMENSIONS



Part Number	Stripping length (mm)				Hex. (mm)	Crimp tools	
	a	b	c	e		Dies included	MIL standard R282 293 000 (M22520/5-01) + dies
R199 005 240	2	6	8		2.67	R282 211 000	R282 235 003 (M22520/5-03)
R199 005 250					3.25		
R199 005 260					3.84	R282 271 000	R282 235 037 (M22520/5-37)
R299 792 000		5		6			
R299 792 107	1.7	6	8.1	6.4	3.25		R282 235 003 (M22520/5-03)

1

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

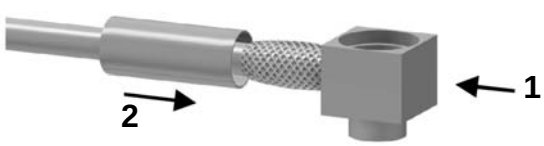


2

- Fan the braid.

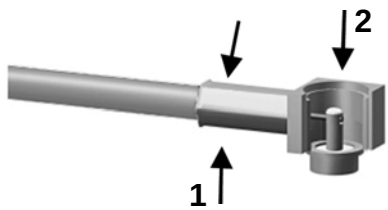
3

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



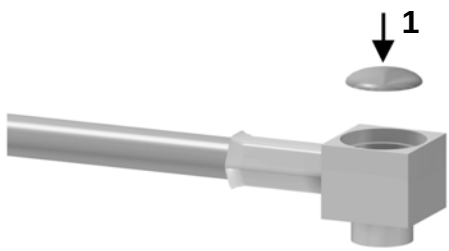
4

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



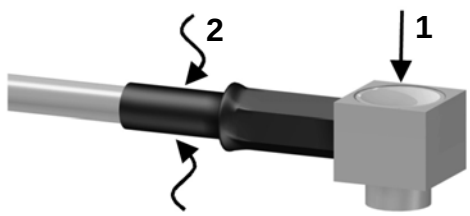
5

- Place the cap into the body.



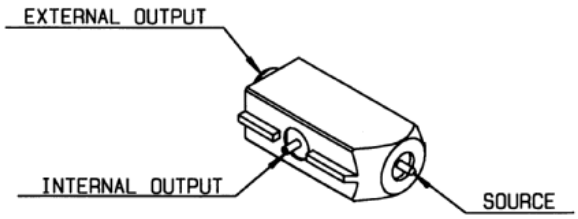
6

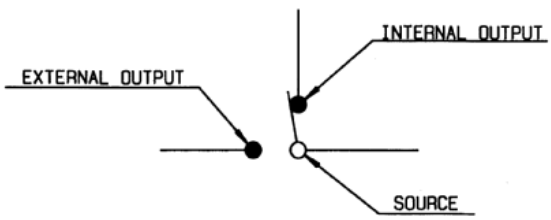
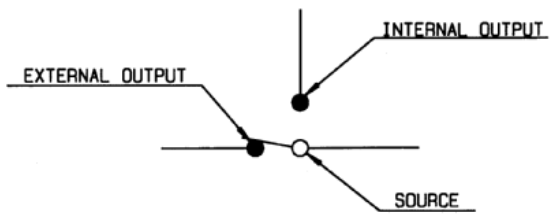
- Press on the cap flush or slightly below the surface of the body assembly.
- Slide the sleeve over the ferrule and heatshrink it in place (Option).



M 04

ELECTRICAL DIAGRAM

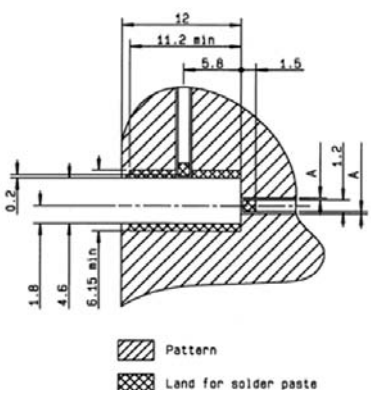


Part number	Step 1	Step 2
R199 005 890 **R199 005 890W** **R299 794 800** **R299 794 880**	 UNMATED CONNECTOR	 MATED WITH MC CARD PLUG

PCB PATTERN

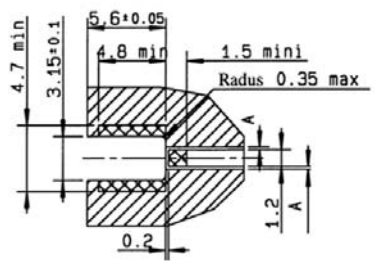
P01

Part number
R199 005 870 **R199 005 880** **R199 005 890** **R199 005 890W** **R299 794 800** **R299 794 880**



P02

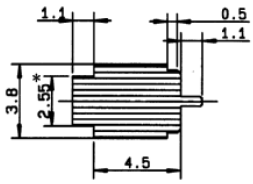
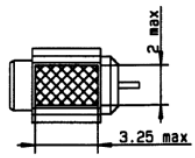
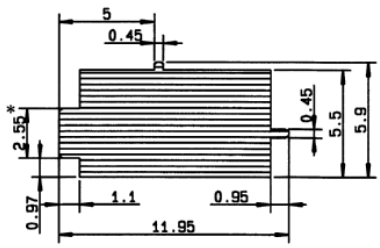
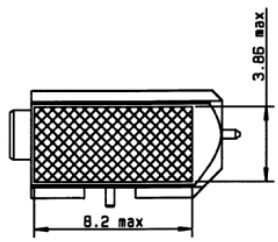
Part number
R199 005 800 **R199 005 800W** **R199 005 801** **R299 795 830**



PCB thickness (mm)	Coplanar line A (mm)
0.8	0.183
1.0	0.190
1.2	0.195
1.6	0.200

M 04

VIDEO SHADOW AND ASPIRATION AREA

Part number	Video shadow of receptacle	Aspiration area
R199 005 800 **R199 005 800W** **R199 005 801** **R299 795 830**		
R199 005 890W **R199 005 890** **R299 794 800** **R299 794 880**		

* 2.95 for: R299 795 830 - R299 794 800 - R299 794 880

SOLDER PROCEDURE

Part number			
R199 005 800 **R199 005 800W** **R199 005 801**	**R199 005 870** **R199 005 880** **R199 005 890**	**R199 005 890W** **R299 794 800**	**R299 794 830** **R299 794 880**

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.

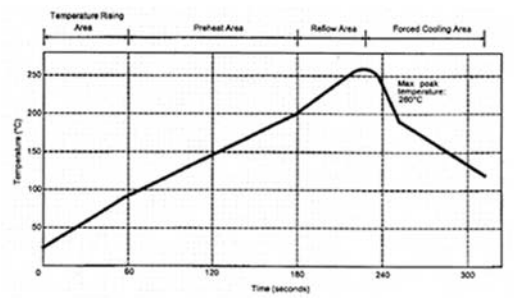
4

- 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