

Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from, Europe, America and south Asia, supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of "Quality Parts, Customers Priority, Honest Operation, and Considerate Service", our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip, ALPS, ROHM, Xilinx, Pulse, ON, Everlight and Freescale. Main products comprise IC, Modules, Potentiometer, IC Socket, Relay, Connector. Our parts cover such applications as commercial, industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China











eco mate® rm

Rugged Metal Shielded Connectors





We Are Amphenol

Global Interconnect Solution Supplier

For over 80 years Amphenol has enjoyed success as the interconnection technology provider of choice to industry leading companies around the world. Our organization works with leading manufacturers across a wide range of applications - including Energy Generation & Distribution, Transportation, Heavy Equipment, Factory Automation, Wireless Outdoor, Information Technology and Data Communications Equipment, Mobile Devices, Mobile Networks, Broadband Communication, Military and Commercial Aerospace, Industrial, Automotive and Chip Card Readers - enabling smarter, faster and better technologies to connect products to customer solutions.

Our engineers design innovative combinations of industry standard connectors and application specific shielding components to create assembly systems that set the standards for performance, reliability, and cost effectiveness. Our engineering, materials, and manufacturing organizations meet the high standards imposed by ISO 9001:2008 as well as many customer specific quality systems. Our performance has earned us ship to stock and world class performance awards from many major OEMs.

We are one of the largest interconnect solution suppliers in the world and supply a wide range of product solutions globally. The industrial market footprint of Amphenol covers more than 30 countries.





eco | mate® rm Rugged Metal Shielded Connectors

Table of Contents

We Are Amphenol	
Global Interconnect Solution Supplier	3
Connector Guide	
Introduction to eco mate®rm	6
Typical Applications	
Series Overview	
Connector Configurations	10
Insert Arrangements	
General Technical Characteristics	14
GuardSafe™ Locking Clips	
Connector Kits	
Connector Solutions	
1 POSITION 86A / 630V	179
1 POSITION 120A / 630V	183
1 POSITION 120A - 180A / 630V	187
1 POSITION 120A - 300A / 630V	191
3 POSITIONS 13A / 300V	21
3 POSITIONS 86A / 630V	197
4 POSITIONS 13A / 300V	
4 POSITIONS 23A / 350V	55
4 POSITIONS 45A / 500V	
4 POSITIONS MIX 13A & 5A / 350V	
4 POSITIONS MIX 23A &13A / 350V	
6 POSITIONS 5A, 7.5A/ 150V	71
8 POSITIONS 13A / 250V	
8 POSITIONS 13A / 300V	
8 POSITIONS 23A / 375V	
9 POSITIONS MIX 23A & 13A / 250V	
10 POSITIONS 5A, 7.5A / 150V	
12 POSITIONS 13A / 300V	
19 POSITIONS 5A, 7.5A / 150V	
19 POSITIONS 13A / 300V	
23 POSITIONS 13A / 300V	
26 POSITIONS 5A, 7.5A / 150V	
28 POSITIONS 13A / 300V	
32 POSITIONS 5A,7.5A / 150V	
48 POSITIONS 13A / 300V	175
Contacts	
Contact Overview	
Plating and Bulk Order Options	201
Stamped & Formed Crimped Contact Part Numbers	
PCB Contacts	
PCB Contacts Dimensions	
Machined Standard Crimp Contact Part Numbers	207

Table of Contents (con't)

Tooling	
Machined	212
Stamped & Formed	212
Contact Extraction Tool	212
Contact Extraction Tool Table	213
Contact Extraction Tool Instruction	214
Assembly Instructions	
Jam Nut Assembly and Installation Instructions	215
Flange Assembly and Installation Instructions	216
eco mate®rm Standard Product Straight Plug and Receptacle Cable Assembly	217
eco mate® rm Standard Product Straight Plug and Receptacle with End Cap	219
eco mate [®] rm Standard Product Right Angle Plug and Receptacle Cable Assembly	220
eco mate [®] rm with RADSOK [®] Straight Plug Cable Assembly	222
eco mate [®] rm with RADSOK [®] Straight Plug - Shell Size 12 Cable Assembly	223
eco mate®rm with RADSOK® 90° Plug Cable Assembly	224
Technical Data	
RADSOK® Product Overview	
RADSOK® Advantages and Custom Developed Solutions	
RADSOK® Series Rated Current and Working Voltage	228
RADSOK® Series Dynamic Overload Tests at Different Temperatures	
eco mate®rm Rated Current and Working Voltage	230
UL94 + UL1977 Industry Standards	231
IP Codes	232
Crimp Connection	233
Composition and Dimensions of Copper Wires	234
Reduction Values	235
Voltage Grading of Connectors	236
Creepage Distance	237
Appendix	222
Glossary of Terms	239 241
	/// 1

Introduction to eco|mate® rm

Quick Reliable Mating

Bayonet Coupling

With a quick twist of the bayonet coupling system, these connectors provide positive tactile feedback to insure confident mating. This feature also reduces time and labor during installation.

Economical and Flexible

Mixed Power & Signal Layouts

Power and signal contacts can be combined in a variety of inserts providing a highly flexible interconnect solution to reduce system complexity and minimize installation costs.

Waterproof

IP67

Ideal for temporary submersion, (acheiving IP67) where water and dust protection are needed.

Corrosion Resistant

Salt Spray Standard Nickel 48 Hours, Black or Green Zinc 96 Hours

Designed to withstand climate ingress and exposure to salt spray or a corrosive atmosphere while still maintaining mechanical and electrical functionality.

Wide Ranging Contact System

Flexible Contact Solutions

Our contact system offers the flexibility of using a wide variety of contact styles and wire gauges within various connectors, shell sizes and insert layouts, providing customers with a total solution.

eco|mate® rm

Rugged Metal Shielded Connectors

Typical Applications



Instrumentation Measurement



Robotics - Machine Tools



Building Automation & Control



Telecom -Data Infrastructure





Medical







Military



Automotive



Off Road - Mining - Railway



Electric Vehicles

eco|mate® rm Rugged Metal Shielded Connectors



Series Overview

The eco|mate® rm series is the connector of choice wherever there are demanding interconnect architectures. The multiway connectors are available in 7 shell sizes and 25 insert arrangements with a variety of wire gauge options. It is the high performance, cost effective solution of choice for our customers.

series includes two kinds The Standard Products and connectors: High Amperage. Standard Products are widely used, standardized connectors, while the High Amperage connectors are designed to endure large currents and high voltage. Typically used within hybrid electric vehicles, High Amperage connectors are available in single pole, high power arrangements featuring RADSOK® technology. RADSOK® products are offered exclusively by Amphenol. Custom developed solutions are available in both styles.

Our eco|mate®rm products are designed to be a competitive alternative to other industry standard products while maintaining the best possible mechanical and environmental quality on the market. Our eco|mate® rm products feature IP67 environmental sealing qualities, rugged

nickel plated aluminum outer shells and bayonet locking systems that require only a 1/3 turn. An audible locking "click" indicates proper installation.

The versatility of having three available contact styles allows for a broad variety of insert arrangements.

- Machined
- Stamped & Formed
- Power

The eco | mate® rm Standard Product is our standard rugged metal shielded circular connector series available in 7 shell sizes and multiple insert arrangements.

The high amperage eco|mate® rm with RADSOK® technology is our single pole power connector series ranging from 86A to 300A.

eco|mate®rm industrial grade circular connectors are manufactured to be intermateable with other industry standard connectors. All connectors are RoHS compliant. The eco|mate® rm Series meets the standards of UL1977. The file number is E339831.

High Performance Cost Effective Rugged Metal Shielded Connectors



eco | mate[®] rm Standard Products starting on page 21

eco | mate® rmStandard Products

- Suitable For Indoor and Outdoor Applications
- EMI/RMI Shielding Capability with Appropriate Backshell
- Operating Temperature: -40°C to +105°C
 Operating Temperature: -40°C to +125°C
 (for parts with a silicone seal, ending in 03)
- 500 Mating Cycles
- Contacts and Cord Grips Ordered Separately
- High-Density Contact Arrangements Available
- UL ECBT2 Certified



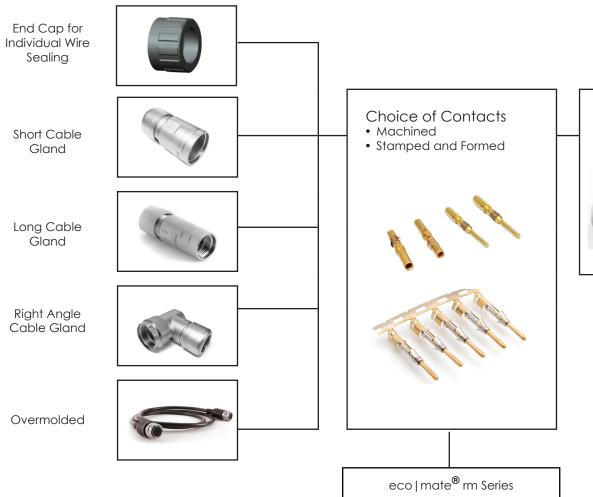
eco|mate® rm High Amperage Products starting on page 179

High Amperage eco | mate[®] rm with RADSOK® Technology

- Single Pole High Power Arrangements
- 3.6mm-10mm Contact Sizes
- Operating Temperature: -40°C to +125°C
- RoHS Compliant
- 4 Shell Sizes
- Operating Voltage: 630V
- Current Rating at 25°C: 86A-300A
- Flammability Rating: UL94-V0
- High Reliability
- Low Contact Engagement / Separation Forces
- Low Contact Resistance
- High Mating Cycle Durability

eco | mate® rm Rugged Metal Shielded Connectors

Connector Configurations



Custom Solutions Available For:

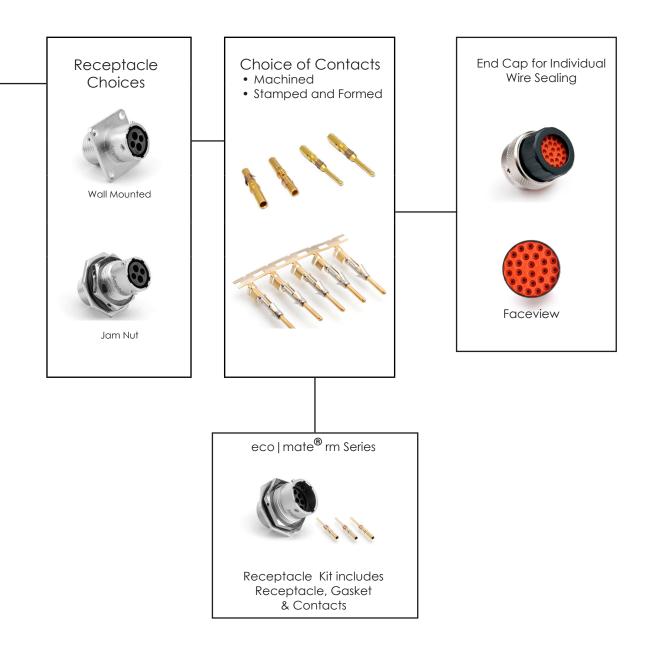
- Various Applications
- Extreme Environments
- Reducing the Number of Suppliers
- Molded Strain Relief
- Minimize Stress on Conductors
- 360 $^{\circ}$ Shielding Available
- Custom Logo
- Enhanced Sealing Properties

Contact the Factory to learn more



Plug

Connector Solutions: see page 19 for parts grouped by insert arrangement



eco|mate® rm

Rugged Metal Shielded Connectors

Insert Arrangements

	RTO				RTHP		
Shell Size	Contact :	#16 (Ø 1.6)	Mixed Pow	er & Signal	Contact 2.5mm	Contact #20 (Ø 1.0)	Single Pin Power RADSOK®
10	Contact : 13A	sitions #16 (Ø 1.6) 300V age 29	4 pos Contact # & #20 13A & 2 350V A see po	16 (Ø 1.6) (Ø 1.0) 20# 5A C/DC	Consult factory	6 positions Contact #20 (Ø 1.0) 5A, 7A(machined) 150V see page 71	Consult factory
12	3 positions Contact #16 (Ø 1.6) 13A 300V see page 21	8 positions Contact #16 (Ø 1.6) 13A 300V see page 79	Consult	factory	Consult factory	10 positions Contact #20 (Ø 1.0) 5A, 7.5A(machined) 150V see page 111	1 position Contact 3.6mm 86A 630V AC/DC see page 179
14	8 positions Contact #16 (Ø 1.6) 13A 300V AC/DC page 87	12 positions Contact #16 (Ø 1.6) 13A 300V see page 119	Consult factory 4 positions Contact 2.5mm #16 (Ø 1.6) 23A &13A 350V AC/DC see page 47	Consult factory	4 positions Contact 2.5mm 23A 350V AC/DC see page 55	19 positions Contact #20 (Ø 1.0) 5A, 7.5A(machined) 150V see page 127	1 position Contact 6mm 120A 630V AC/DC see page 183
16	Cor # 16 13A	ositions and the state of the s	4 positions Contact #8 (Ø 3.6) 45A 500V AC/DC see page 63	9 positions Contact 2.5mm & # 16 (Ø 1.6) 23A & 13A 350V AC/DC see page 103	Consult factory	26 positions Contact #20 (Ø 1.0) 5A, 7.5A(machined) 150V see page 151	1 position Contact 8mm 120A - 180A 630V AC/DC see page 187

		RTO			RTHP
Shell Size	Contact #16 (Ø 1.6)	Mixed Power & Signal	Contact 2.5mm	Contact #20 (Ø 1.0) or Contact 3.6mm	Single Pin Power RADSOK®
18	23 positions Contact #16 (Ø 1.6) 13A 300V see page 143	Consult factory	8 positions Contact 2.5mm 23A 375V AC/DC see page 95	32 positions Contact #20 (Ø 1.0) 5A, 7.5A 150V see page 167	Consult factory
20	28 positions Contact #16 (Ø 1.6) 13A 300V see page 159	Consult factory	Consult factory	3 positions Contact 3.6mm 86A 630V see page 197	1 position Contact 10mm 120A - 300A 630V see page 191
24	48 positions Contact #16 (Ø 1.6) 13A 300V see page 177	Consult factory	Consult factory	Consult factory	Consult factory

Insert Arrangements are Pin Faceview

eco|mate® rm

Rugged Metal Shielded Connectors

General Technical Characteristics





Materials

- **Zinc Alloy Shells**
- Metal Alloy Backshells and Cable Glands
- Aluminum Alloy, Nickel Plated **Coupling Ring**
- Stainless Steel Coupling Spring
- **Contacts Plating Options**

Gold Flash over Tin

Tin

Silver

5μ, 10μ, 15μ, 30μ

Gold Flash

Other platings on request

Insulation Resistance

5000 megohms minimum of 25° C

Insulation Inserts

Thermoplastic, UL94 V-0

Environmental

- **IP67**
- **Operating Temperature**

-40° to 105° C - Standard Products with NBR Seal

-40° to 125° C -Standard Products with Silicone Seal

-40° to 125° C -High Amperage Products with RADSOK® technology

- Flammability Rating UL94 V-0
- Salt Spray

Per MIL-STD-202 method 101

- -48 h (standard version)
- -96 h (black anodized coupling ring) Higher salt spray resistance (200/500h) upon request
- Sealina

In mated condition and in combination with sealed backshell

Fluid Resistance

Gas, oil, mineral oil, acid bath, basic bath





Electrical

In Accordance With

UL 1977: Certificate ECBT2 File number: E339831

More information

see "Technical Section" starting on page 228

Mechanical

Durability

RT Series : >500 mating cycles RTHP Series: >100 mating cycles

Vibration

10-2000 Hz, level of 20 G's

Thermal Shock

No cracking, chipping or leaking after 20 test cycles from -55°C to 125°C

Contact Resistance

#16 <6 m Ω #20 <15 m Ω eco|mate® rm with RADSOK® < 1m Ω

GuardSafe™ Locking Clips

Amphenol's **GuardSafe™ Locking Clips** are designed to complement the **eco|mate® rm** multi-way connector and **Amphenol PT\26482 Series** cylindrical metal bayonet coupling systems, and are suitable for many rough, harsh environmental applications. Featuring non-corrosive, plastic construction with clamshell functionality, they are resistant to brake and transmission fluid, oils, grease, salt, dirt and other contaminants. Compliant with new FM standards, the GuardSafe™ Locking Clip offers an extra layer of protection from an inadvertent uncoupling of the connector.



Cost Effective Safety Protection

GuardSafe™ Locking Clips render quick disconnections not "normally arching" by eliminating access to the coupling nut and requiring a tool for removal.

Easy to Use

User-friendly, easy to install and service.

Suitability

GuardSafe™ Locking Clips are suitable to be used with wiring methods in accordance with Class I, Division 2 wiring practices per the National Electric Code (NEC), ANSI,\NFPA 70, Article 501.4(B).

Installation:

Locate the clip over the connector coupling nut with the lanyard towards the plug adapter as shown. Close the safety clip.

Removal:

Locate a screwdriver on first latch as shown. Push down the latch then twist the screwdriver. Repeat actions for second latch.





Locking Clips are also Compatible with Amphenol PT\26482 Series Cylindrical Metal Bayonet Coupling Systems!

Go to <u>www.amphenol-sine.com</u>
for more information about the PT Series

eco mate [®] rm			
Part #			
108039110			
108039112			
108039114			
108039116			
108039118			
108039120			
108039122			
108039124			

Connector Kits

Q: Why are we offering "kits"?

A: Making "kits" available to our customers allows for reducing the number of part numbers necessary for any given project, whether for in-house production or field serviceable applications.

Amphenol's eco|mate® rm Rugged Metal Shielded Connector Kits offer mated multiway connector parts available in 6 shell sizes and 12 insert arrangements, with a variety of wire gauge options. eco|mate® rm industrial circular connectors are designed to be intermateable with other industry standard connectors. All connectors are RoHS compliant.



- Instrumentation Measurement
- Robotics
- Machine Tools
- Building Automation & Control
- Telecom Data Infrastructure
- Weldina
- Medical
- Aerospace
- Energy Power
- Military
- Automotive
- Off Road
- Mining
- Railway
- Electric Vehicles



Plug KitIncluding Connector, Backshell & Contacts



Square Flange Receptacle Kit Including Receptacle, Gasket & Contacts



Jam Nut
Receptacle Kit
Including Receptacle
& Contacts

eco|mate® rm Kits

- 6 shell sizes/12 insert configurations
- Insert arrangements from 4-32 contacts
- Operating voltage of 150V or 300V
- Current rating: 5A, 7.5A(machined) or 13A (signal contacts)
- Alternate keying positions available
- Plastic inserts with flammability rating of UL94-V0

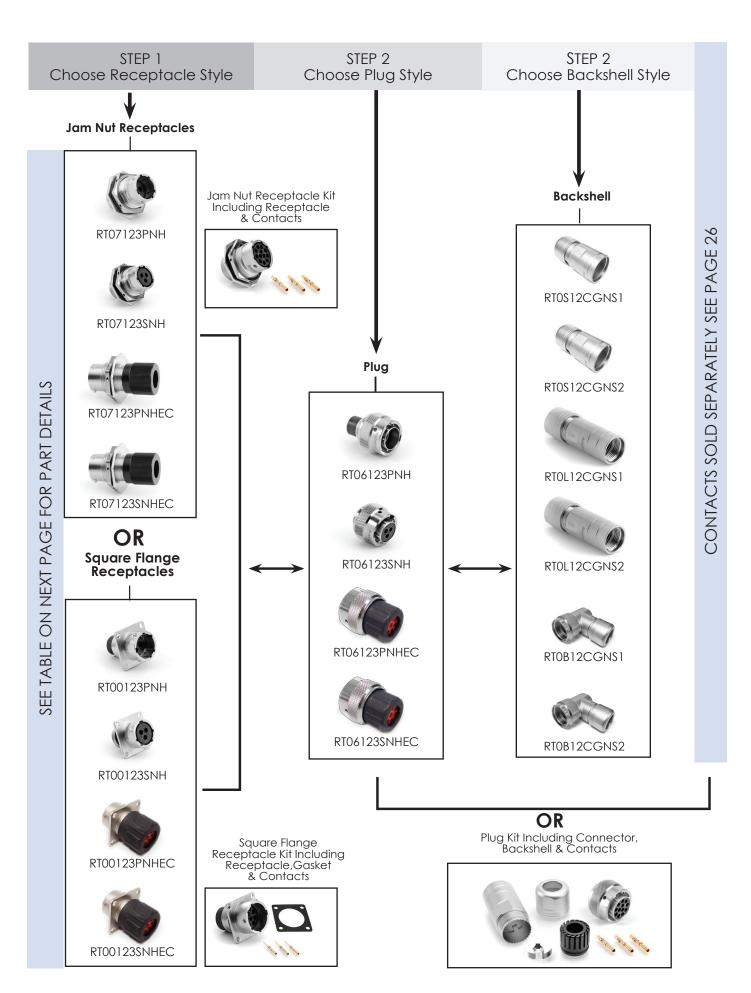




eco | mate® rm Rugged Metal Shielded Connectors

Connector Solutions

eco mate® rm Standard Products	
3 POSITIONS 13A / 300V	21
4 POSITIONS 13A / 300V	29
4 POSITIONS MIX 13A & 5A / 350V	37
4 POSITIONS MIX 23A &13A / 350V	47
4 POSITIONS 23A / 350V	
4 POSITIONS 45A / 500V	
6 POSITIONS 5A / 150V	71
8 POSITIONS 13A / 250V	79
8 POSITIONS 13A / 300V	
8 POSITIONS 23A / 375V	
9 POSITIONS MIX 23A & 13A / 250V	103
10 POSITIONS 5A, 7.5A/ 150V	111
12 POSITIONS 13A / 300V	119
19 POSITIONS 5A, 7.5A/ 150V	127
19 POSITIONS 13A / 300V	135
23 POSITIONS 13A / 300V	143
26 POSITIONS 5A, 7.5A / 150V	151
28 POSITIONS 13A / 300V	159
32 POSITIONS 5A, 7.5A / 150V	167
48 POSITIONS 13A / 300V	175
High Amperage eco mate® rm with RADSOK® Technology	
1 POSITION 86A / 630V	179
1 POSITION 120A / 630V	183
1 POSITION 120A - 180A / 630V	
1 POSITION 120A - 300A / 630V	191
2 DOSITIONIS 94 A 7 42017	107

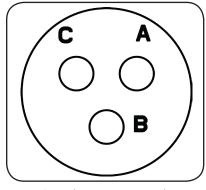


Sealing: IP67 Salt Spray: 48h

eco|mate® rm Standard Products

- Suitable For Indoor and Outdoor Applications
- EMI/RMI Shielding Capability with Appropriate Backshell
- Operating Temperature: -40°C to +105°C
- 500 Mating Cycles
- Contacts and Cord Grips Ordered Separately
- UL ECBT2 Certified*

An upgraded silicone seal is available for all connector parts. Please add "03" to the end of the part number when ordering. Operating Temperature: -40°C to +125°C. Not available in kits.



Insert Arrangement Pin (Male) Faceview

Connector Part Numbers

Part N	umber	Commonter Trum	Figure D	rawings
Male	Female	Connector Type	Male	Female
RT07123PNH	RT07123SNH	Jam Nut Receptacle	1,5	2,5
RT07123PNHEC	RT07123SNHEC	Jam Nut Receptacle with O-ring Seal and End Cap with Individual Rear Wire Seal**	3,5	4,5
RT07123PNHK	RT07123SNHK	Jam Nut Receptacle Kit	1,5	2,5
RT06123PNH	RT06123SNH	Plug	6	7
RT06123PNHEC	RT06123SNHEC	Plug with O-ring Seal and End Cap with Individual Rear Wire Seal**	8	9
RT06123PNHK	RT06123SNHK	Plug Kit	6	7
RT00123PNH	RT00123SNH	Square Flange Receptacle	10,14	11,14
RT00123PNHEC	RT00123SNHEC	Square Flange Receptacle with O-ring Seal and End Cap with Individual Rear Wire Seal**	12,14	13,14
RT00123PNHK	RT00123SNHK	Square Flange Receptacle Kit	10,14	11,14

Contacts supplied separately see page 26 **See page 23 for the real seal wire range

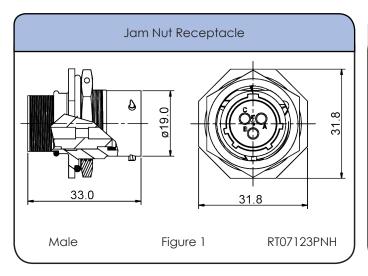
Backshells

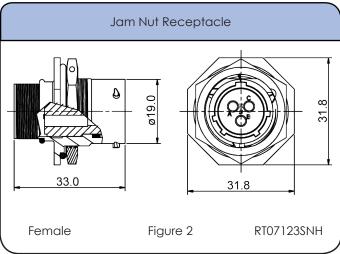
Part Number	Backshell Type	Cable Range (mm)	Figure Drawings	Shielding
RT0S12CGNS1	Short Cord Grip (straight)	6-10.5	15	✓
RT0S12CGNS2	Short Cord Grip (straight)	8.5-12.5	15	✓
RT0L12CGN\$1	Long Cord Grip (straight)	6-10.5	16	✓
RT0L12CGNS2	Long Cord Grip (straight)	8.5-12.5	16	✓
RT0B12CGNS1	Cord Grip (90°)	6-10.5	17	✓
RT0B12CGNS2	Cord Grip (90°)	8.0-12.5	17	✓

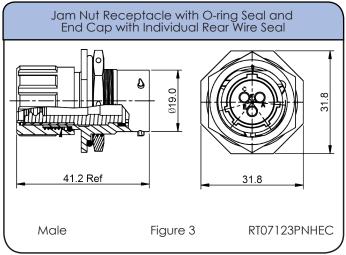
 $^{^*}$ Connector parts with part numbers ending in EC (with an end cap) were not available for submittal at the time of UL certification.

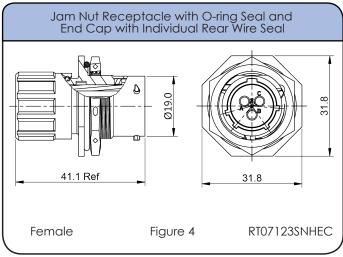
Sealing: IP67 Salt Spray: 48h

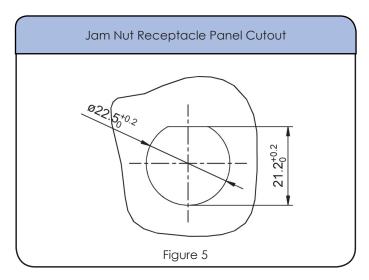
Dimensions Jam Nut Receptacle





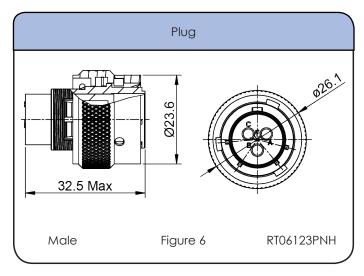


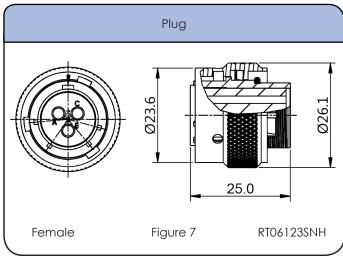


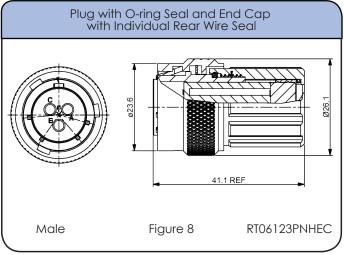


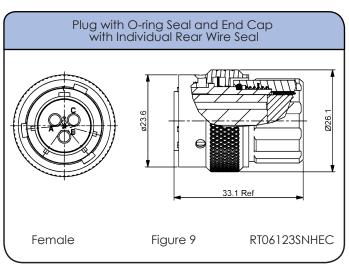
Sealing: IP67 Salt Spray: 48h

Dimensions Plug







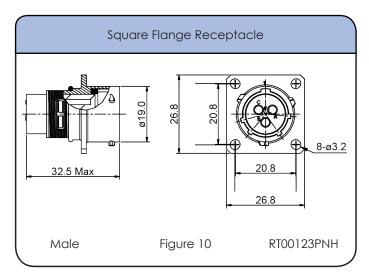


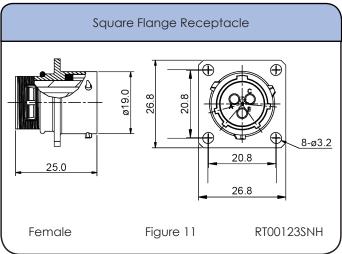
Individual Sealing Wire Range

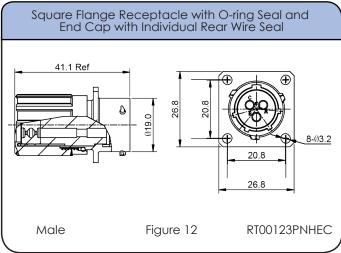
Contact Size	Insulation Overall Diameter (min-max)	Wire Range
16	16 Ø2.0mm - Ø3.2mm	

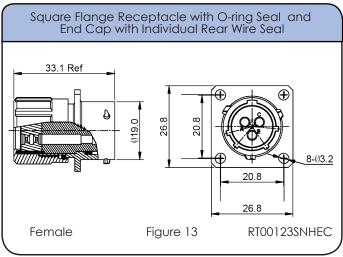
Sealing: IP67 Salt Spray: 48h

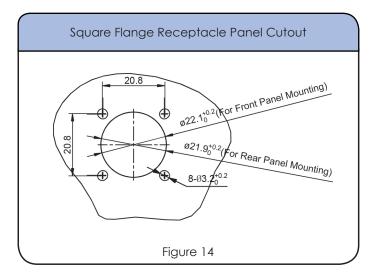
Dimensions Square Flange Receptacle





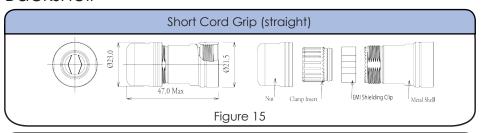


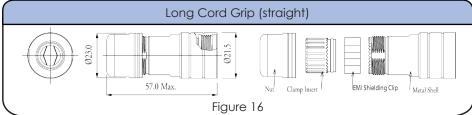


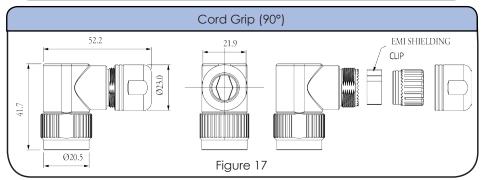


Sealing: IP67 Salt Spray: 48h

Dimensions Backshell







Accessories

RTFD12B









