The Challenge

ITT has a long history of providing standard and custom MIL-DTL-38999 connectors which meet the most stringent military requirements. ITT's major military and commercial accounts recently approached us requesting that we take our proven high reliabilty designs and shrink them to decrease weight and size while maintaining the connectors robust environmental performance and high reliability. Along with these requests, ICS received substantial commentary from other markets including Medical, Industrial, and Space, requesting a similar, miniature circular product.

MKJ connector provides significant size and weight reduction while providing electrical and mechanical characteristics of larger connectors

Split tine contact design provides proven reliability in harsh environments

Connector uses size 23 contacts accepting #22 to #28 wire. Contact spacing is reduced to 0.076 inches providing a compact yet robust package.

Master key and 2 secondary keys allow multiple clocking positions

Pogo pin/pad technology. Touch pad contacts increase ease of cleanability, highly desireable in harsh environments.

Intergral band platform allows direct attachment of cable shield to connector.

Double start threads prevent thread damage and allow full connector mating in 1.5 turns. Durable design ideal for harsh shock and vibration environments.

Breakaway design incorporates a simple push/pull mating mechanism allowing quick connector disconnect.

The ITT Solution ...

ITT took on the challenge, driving innovation in mating capabilities and contacts to reduce size and weight while maintaining the high level of quality customers have come to expect from ITT over 90 years of engineering excellence. ITT collated a substantial amount of industry VOC from top tier military and commercial accounts. This feedback arrived from industry leading ICS customers, pioneering products in their fields including satellites & missiles, test and medical equipment, and tactical battlefield gear. Using this information and leveraging our historical product expertise, ITT engineered a product meeting our customers defined mix of Design, Functionality, and Flexibility. The result of this process represents our innovative new product line, Trinity. Offering three coupling methodologies {threaded, bayonet, and breakaway} and a highly engineered design, this innovative product reduces weight and size without sacrificing robust environmental performance or reliability. ITT ICS is proud to introduce our exciting new Trinity product line, engineered to the stringent quality standards for which ITT is world renown.

Technical overview

The Trinity MKJ family of mini circular connectors provides approximate electrical and mechanical characteristics of larger and heavier Military Standard Environmental connectors while reducing weight up to 71% and size up to 52%. All MKJ series connector's shells and jam nuts are available in high quality aluminum alloy or corrosion resistant steel per AMS-QQ-S 763. The MKJ series comes with rear accessory thread or integral band platform for direct attachment of cable shield and overmold. The MKJ series of connectors come with a variety of coupling mechanisms: threaded, breakaway, and bayonet. In addition, a Pogo Pin technology utilizing ITT's unique spring probe pin/touch pad contact system is available. The MKJ series receptacle comes with a variety of mounting options for both crimp and PCB contacts including in-line, jam nut, front mount, and square flange mount, and flange mount. The MKJ0, MKJ1, MKJ3, MKJ4, and MKJ5 feature a master key and 2 secondary keys for positive mating with 4 clocking positions available. The MKJ0 connector is ideal for everyday operations where size and weight are at a premium. The MJK1 connector uses a double start thread coupling with 1/1/2 turns for a full mate and is ideal for harsh shock and vibration environments. The MKJ3 connector can be fully mated in a 1/4 turn. The MKJ4 connector provides a quick push to mate / pull to unmate disconnect mechanism for fast breakaway connections. The MKJ5 connector utilizes a triple start thread and is fully mated in 1 turn, and is an ideal connector for harsh shock and vibration environments and offers an internal coupling ratchet mechanism along with an EMI grounding spring.

Product Features

- High contact density: size 23 contacts accommodate #22 - #28 wire and allowing 0.076 inch contact spacing
- Available with 3-85 rear release crimp or PCB contacts
- Master key with 2 secondary keys. 4 clocking positions available
- Significant weight and size reduction compared to traditional Mil Standard environmental connectors
- Available in jam nut, in-line, and square flange rear crimp receptacle versions. Jam nut and square flange PCB receptacle versions
- Rear accessory thread or integral band platform for direct attachment of cable shield or overmold
- Wire seal grommet for rear environmental sealing. Pin fluorosilicone interfacial seal provides interface sealing
- Available with double start threads allowing full mating in 1.5 turns
- Available with quick push/pull breakaway mechanism utilizing canted retention spring for quicker mating and demating
- Available with bayonet 1/4 turn locking mechanism
- Available with Pogo Pin technology utilizing ITT's unique spring probe pin/pad contact system

Applications

- Medical equipment: test and diagnostic
- Industrial equipment
- Commecial and militray aircraft electronics
- Unmanned aerial vehicles
- Missile systems
- Avionic systems
- Satellites
- Sensors
- Instrumentation
- Interconnections for helmets, weapons, battery packs, night vision goggles, aircraft headsets, etc.
- Navigation and Telemetry equipment
- Ruggedized computers and hand held communications equipment

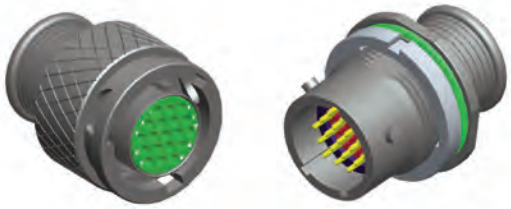
Dimensions shown in inches (mm)
Specifications and dimensions subject to change

MKJ Connector Styles

MKJ0

UNC Thread Coupling

MKJ3

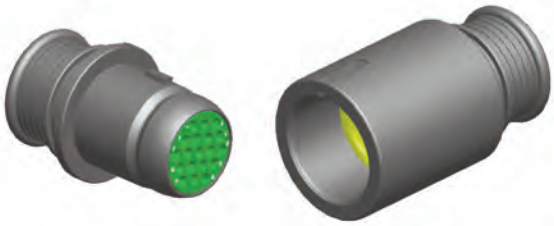


Bayonet Coupling

MKJ1

Double Start Thread Coupling

MKJ4



Breakaway Coupling

MKJ5

Triple Start Ratchet Locking

Multiple Styles for all applications!

Series MKJ Performance	
Contact size / Spacing	#23 / 0.076 inches (1.9 mm)
Contact Type	Solder Cup, Rear Crimp or PCB Mount
Wire Accomodation	#22 - #28 AWG
Current Rating	5 Amps Maximum
Voltage Rating	500 VAC RMS Sea Level
Insulation Resistance	5000 Megaohms Minimum
Operating Temperature	-55 degrees C to +150 degrees C
Contact Resistance	8 Milliohms Maximum
Vibration	20 g's in Accordance with MIL-STD-1344 Method 2005, Condition IV
Shock	300 g's (MKJ1) 50 g's (MKJ0 and MKJ4) in Accordance with MIL-STD-1344 Method 2004, Condition E
EMI Shielding Effectiveness	40dB Attenuation, 100 MHz to 1000 MHz
Coupling	Threaded, Quick Disconnect Pogo Pin
Coding	Master key and 2 secondary keys. 4 clocking positions available
Housing material	Aluminum and Stainless Steel
Layouts	31 layouts holding from 1 size 12 contact to 85 size 23 contacts
Usage	Medical, Military, Commercial, and Industrial
Receptacle Mounting	Jam Nut, Square Flange, In-line, PCB

Electrical specifications for the connector

The MKJ series of products uses size 23 pin and socket contacts with equivalent electrical performance of size 22 contacts. These smaller contacts accept #22 - #28 AWG wire and allow the contact spacing to be reduced down to 0.076 inches. The connector's Fortron dielectric insulating material can accommodate from 3 to 85 contacts in various shell sizes. This high density packaging, along with a reduced wall thickness and scoop, allows a dramatic decrease in size and weight of the MKJ connector while retaining the approximate mechanical and electrical characteristics of heavier and larger Military Standard Enviromental connectors. The connector is capable of operating between -55 degrees Celsius and +150 degrees Celsius and can be mated up to 2,000 cycles. Maximum electrical current is 5 Amps and maximum voltage at sea level is 500 VAC RMS.

Max. Voltage	Max. Current	Operating Temp	Durability
500 VAC RMS Sea Level	5 Amps Maximum	-55 degrees C to +150 degrees C	2,000 mated cycles

MKJ Product Line Talking Dog

MKJ1	C	2	F	9-19	P	N	**

MKJ1 — **SERIES**
- MKJ0 - Threaded Coupling, UN Thread
- MKJ1 - Threaded Coupling, Double Start ACME Thread
- MKJ3 - Bayonet Coupling
- MKJ4 - Breakaway/Quick Disconnect
- MKJ5 - Threaded Coupling, Triple start ACME Thread

C — **CLASS**
- A - Environmental Plug and Receptacle with Banding/Overmolding Platform
- B - Environmental Plug and Receptacle with Threaded Accessory Attachment
- C - Back- Potted Receptacle

2 — **SHELL STYLE**
- 1 - In-Line Receptacle
- 2 - Square Flange Receptacle
- 6 - Straight Plug
- 7 - Jam Nut Receptacle

F — **MATERIAL/PLATING**
- C - Aluminum/Anodize, Black
- F - Aluminum/Electroless Nickel
- W- Aluminum/OD Cad
- Z - Aluminum/Zinc Nickel, Black
- K - SS/Passivated
- Y - SS/Zinc Nickel, Black

9-19 — **SHELL SIZE/CONTACT ARRANGEMENT**

5-3	3 Size 23 Contacts	Series MKJ0, MKJ1, MKJ3, MKJ4
6-4	4 Size 23 Contacts	Series MKJ0, MKJ1, MKJ3, MKJ4
6-6	6 Size 23 Contacts	Series MKJ0, MKJ1, MKJ3, MKJ4
6-7	7 Size 23 Contacts	Series MKJ0, MKJ1, MKJ3, MKJ4
7-10	10 Size 23 Contacts	Series MKJ0, MKJ1, MKJ3, MKJ4
8-4	4 Size 23 Contacts	Series MKJ5
8-6	6 Size 23 Contacts	Series MKJ5
8-7	7 Size 23 Contacts	Series MKJ5
8-13	13 Size 23 Contacts	Series MKJ0, MKJ1, MKJ3, MKJ4
9-4	4 Size 16 Contacts	Series MKJ0, MKJ1, MKJ3, MKJ4
9-10	10 Size 23 Contacts	Series MKJ5
9-19	19 Size 23 Contacts	Series MKJ0, MKJ1, MKJ3, MKJ4
10-13	13 Size 23 Contacts	Series MKJ5
10-26	26 Size 23 Contacts	Series MKJ0, MKJ1, MKJ3, MKJ4
11-19	19 23 Contacts	Series MKJ5
12-26	26 Size 23 Contacts	Series MKJ5
12-37	37 Size 23 Contacts	Series MKJ0, MKJ1, MKJ3, MKJ4
13-37	37 Size 23 Contacts	Series MKJ1
14-55	55 Size 23 Contacts	Series MKJ0, MKJ3, MKJ4
15-37	37 Size 23 Contacts	Series MKJ5
15-55	55 Size 23 Contacts	Series MKJ0, MKJ3, MKJ4
16-55	55 Size 23 Contacts	Series MKJ1
17-85	85 Size 23 Contacts	Series MKJ1
18-55	55 Size 23 Contacts	Series MKJ5
19-85	85 Size 23 Contacts	Series MKJ5

P — **CONTACT STYLE**
- P - Pin, Crimp, Removable
- S - Socket, Crimp, Removable

- A - Pin, PC Tail, .0.062 Extension
- B - Pin, PC Tail, 0.109 Extension
- C - Socket, PC Tail, 0.062 Extension
- D - Socket, PC Tail, 0.109 Extension
- G - Pin, Pogo, Crimp, Removable
- O - Pad, Pogo, Crimp, Removable
- L - Pin, Solder Cup
- R - Socket, Solder Cup

N — **SHELL CLOCKING (POSITION)**

MKJ0 Series
- N - Normal
- X - Clocking Position X
- Y - Clocking Position Y
- Z - Clocking Position Z

MKJ1 Series
- A - Normal 150° 210°
- B - Clocking Position B 75° 210°
- C - Clocking Position C 95° 230°
- D - Clocking Position D 140° 275°

MKJ3 Series
- N - Normal 150° 210°
- X - Clocking Position X 75° 210°
- Y - Clocking Position Y 95° 230°
- Z - Clocking Position Z 140° 275°

MKJ4 Series

Omit for Single Key/Keyway
- A - Normal 150° 210°
- B - Clocking Position B 75° 210°
- C - Clocking Position C 95° 230°
- D - Clocking Position D 140° 275°

MKJ5 Series
- A - Normal 150° 210°
- B - Clocking Position B 75° 210°
- C - Clocking Position C 95° 230°
- D - Clocking Position D 140° 275°

****** — **MODIFICATION CODES**

F0 - Less Contacts ("F0" not printed on connector)
(No modification code required for standard product)
Consult Factor for other codes

Dimensions shown in inches (mm)
Specifications and dimensions subject to change