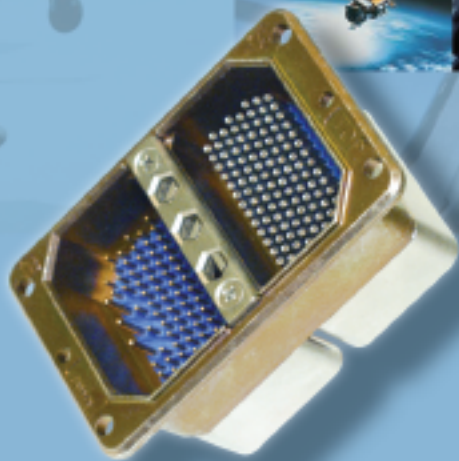
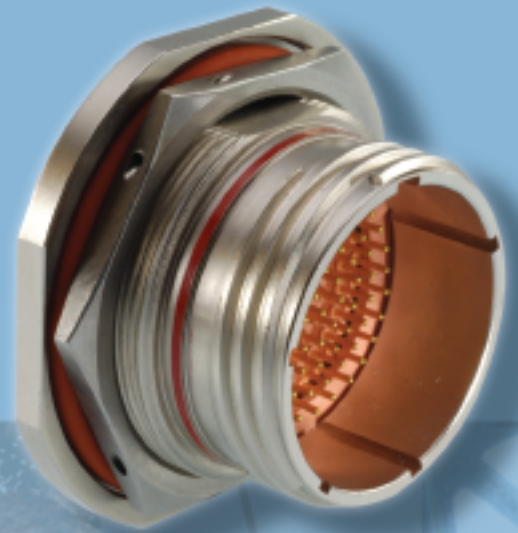




Electronic Components

Cannon Chip-on-Flex Filter Connectors

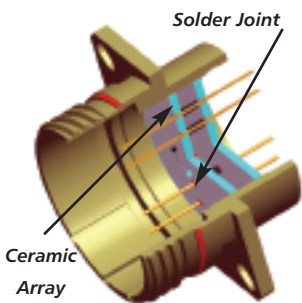


Engineered for life

Technology Update

With the increasing demand for lighter weight and more rugged filter connectors, ITT Electronic Components, has advanced the state of the art in filter technology with the new Cannon Chip-on-Flex (CoF) design.

Cannon's Chip-on-Flex filter connector technology provides a significant performance improvement in thermal shock and vibration to the ceramic planar array technology that is the current industry standard. The current planar array design utilizes a ceramic block capacitor with plated thru holes where feed thru contacts are inserted and soldered into place. Internal stresses associated with vibration, thermal expansion/contraction



**38999-Style
Current Planar Array Design**

can build at the solder joints and cause the ceramic material to crack resulting in a filter failure. As a consequence, costly thermal shock screening and burn in procedures are often used for quality assurance.

In the new Cannon Chip-on-Flex design, the internal thermal shock stresses have been virtually eliminated. The fragile ceramic planar array capacitor block has been

replaced by a flex circuit where individual chip capacitors are surface mounted on a pad adjacent to the feed thru contact.

The result is a very robust filter connector with superior mechanical performance and improved reliability.

New Design/Development Flexibility and Reduced Leadtimes

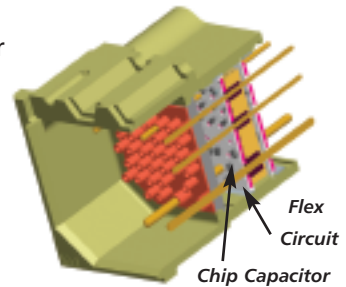
Cannon's Chip-on-Flex filter design offers the system designer new and complete flexibility in defining or changing individual circuit requirements without the need to retool the ceramic planar array. The Chip-on-Flex design utilizes readily available flex circuits and devices leading to reduced design / development cycle time and overall production delivery.

1. Virtually no limitations on the variation in capacitance/feed-thru/ground/diode choices that is readily available to the customer. The exact same flex circuit is used. Cannon installs the appropriate device in each location as selected by the customer.
2. EMP protection can be simply added by substituting a Zener diode in place of a chip capacitor.

Rugged Design plus up to 15% Savings in Weight

Cannon's new Chip-on-Flex filter connector has the additional benefit of being the lightest weight design. The 38999-Style Series III CoF offers up to a 15% savings in weight over the ceramic planar array equivalent.

The new Chip-on-Flex connector will protect critical circuits from electrical interference providing a "stray signal barrier" upstream and away from electronic devices without affecting system function and performance.



**ARINC 404 Type
New Chip-on-Flex Design**

The Chip-on-Flex filter connector provides all the same benefits of filter connector technologies.

1. Individual isolated pin filtering of high frequency noise, shunted to ground via the connector shell. The cut-in frequency of the filtering is selected by the user from the performance attenuation curves.
2. Built-in ground plane barrier in the connector insert. This eliminates EMI windows on the face of systems where connectors enter or exit boxes.
3. Filtering at the face of system boxes eliminating filtering on the PCB, freeing up board space, and maintaining EMI integrity of the system by not allowing unwanted signals to enter the box.

Applications

The CoF filter connectors are ideal for high reliability military, aerospace and industrial applications:

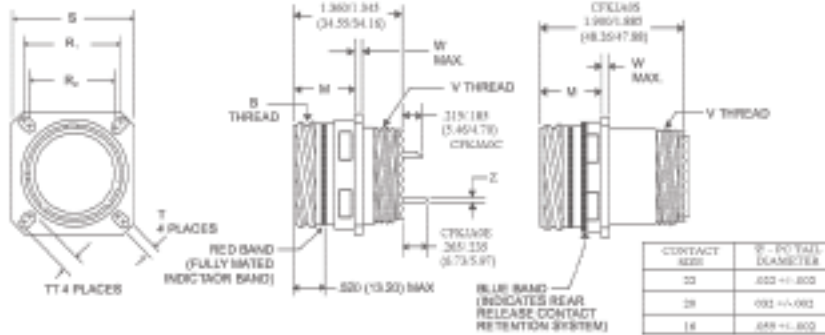
- Integrated Avionics Systems
- Communication and Navigation
- Displays and Instrumentation
- Data Processing Equipment
- Electronic Warfare Systems
- Radar and Sensors
- Weapons Controls and Targeting Systems
- Electronic Counter Measures
- Satellites and Space Systems



Well Mount Receptacle



CFKJA0

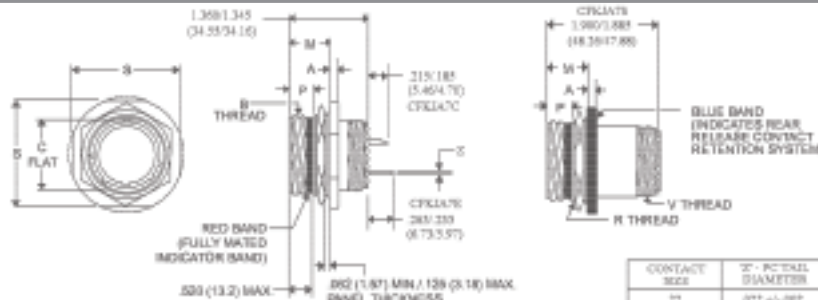


Shell Size	MS Shell Size Code	B Thread Class 2A (Plated)	M ±.000 (.000) -.005 (.130)	R ₁	R ₂	S ±.012 (.380)	T ±.004 (.190) -.002 (.060)	TT ±.004 (.180) -.002 (.050)	Metric V Thread (Plated)	W Max.
9	A	.8250-0.1P-0.3L-TS	.820 (20.60)	.718 (18.26)	.586 (15.09)	.830 (23.03)	-.126 (3.25)	.216 (5.49)	M12X1-8gB 100R	.090 (2.56)
11	B	.7500-0.1P-0.3L-TS	.820 (20.60)	.812 (20.62)	.719 (18.26)	1.031 (26.19)	-.126 (3.25)	.194 (4.93)	M15X1-8gB 100R	.090 (2.56)
13	C	.8750-0.1P-0.3L-TS	.820 (20.60)	.908 (23.01)	.812 (20.62)	1.126 (28.64)	-.126 (3.25)	.194 (4.93)	M18X1-8gB 100R	.090 (2.56)
15	D	1.0000-0.1P-0.3L-TS	.820 (20.60)	.968 (24.61)	.906 (23.01)	1.219 (30.96)	-.126 (3.25)	.173 (4.39)	M22X1-8gB 100R	.090 (2.56)
17	E	1.1875-0.1P-0.3L-TS	.820 (20.60)	1.082 (28.97)	.969 (24.61)	1.312 (33.32)	-.126 (3.25)	.194 (4.93)	M25X1-8gB 100R	.090 (2.56)
19	F	1.2500-0.1P-0.3L-TS	.820 (20.60)	1.158 (29.36)	1.082 (28.97)	1.430 (36.53)	-.126 (3.25)	.194 (4.93)	M28X1-8gB 100R	.090 (2.56)
21	G	1.3750-0.1P-0.3L-TS	.790 (20.07)	1.258 (31.75)	1.198 (30.38)	1.562 (39.67)	-.126 (3.25)	.194 (4.93)	M31X1-8gB 100R	.126 (3.20)
23	H	1.5000-0.1P-0.3L-TS	.790 (20.07)	1.375 (34.92)	1.293 (32.75)	1.680 (42.68)	-.154 (3.91)	.242 (6.15)	M36X1-8gB 100R	.126 (3.20)
25	J	1.6250-0.1P-0.3L-TS	.790 (20.07)	1.500 (38.10)	1.375 (34.92)	1.812 (46.02)	-.154 (3.91)	.242 (6.15)	M37X1-8gB 100R	.126 (3.20)

Jam Nut Receptacle

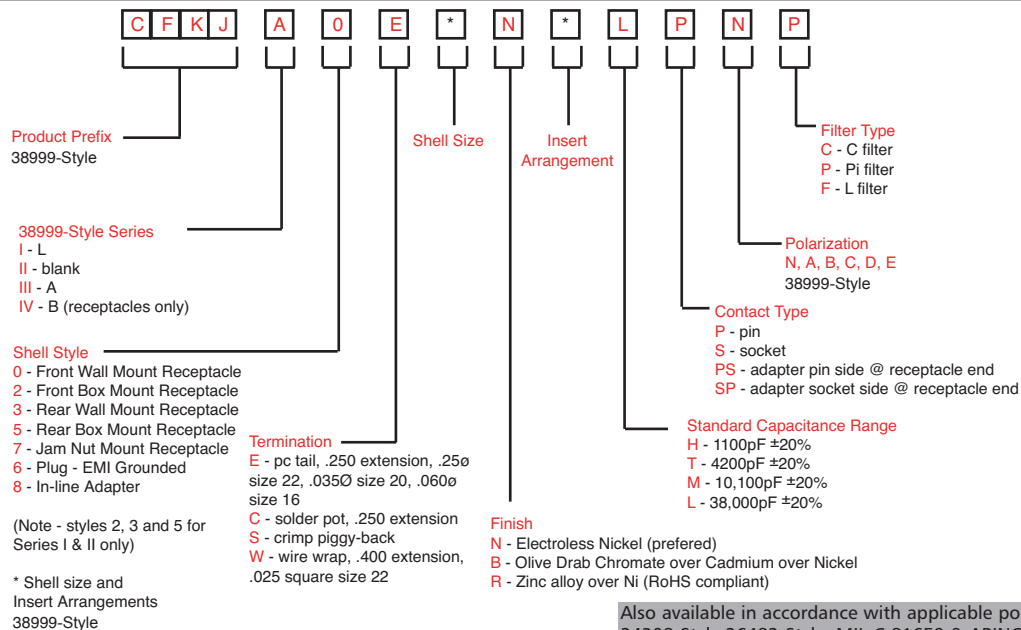


CFKJA7



Shell Size	MS Shell Size Code	A ±.018 (.258) -.005 (.130)	B Thread Class 2A (Plated)	C ±.004 (.190) -.018 (.260)	M ±.005 (.130) -.004 (.100)	P ±.016 (.410) -.004 (.100)	S ±.016 (.410)	Metric R Thread (Plated)	Metric V Thread (Plated)
9	A	.504 (2.64)	.8250-0.1P-0.3L-TS	.891 (18.80)	.871 (22.12)	.999 (14.10)	1.082 (28.97)	M17X1-8gB 100R	M12X1-8gB 100R
11	B	.504 (2.64)	.7500-0.1P-0.3L-TS	.751 (19.07)	.871 (22.12)	.999 (14.10)	1.290 (32.76)	M25X1-8gB 100R	M15X1-8gB 100R
13	C	.504 (2.64)	.8750-0.1P-0.3L-TS	.938 (23.82)	.878 (22.30)	.963 (14.30)	1.375 (34.92)	M25X1-8gB 100R	M18X1-8gB 100R
15	D	.504 (2.64)	1.0000-0.1P-0.3L-TS	1.062 (26.97)	.878 (22.30)	.963 (14.30)	1.500 (38.10)	M28X1-8gB 100R	M22X1-8gB 100R
17	E	.504 (2.64)	1.1875-0.1P-0.3L-TS	1.167 (30.15)	.878 (22.30)	.963 (14.30)	1.625 (41.26)	M32X1-8gB 100R	M25X1-8gB 100R
19	F	.506 (3.43)	1.2500-0.1P-0.3L-TS	1.312 (33.32)	.878 (22.30)	.963 (14.30)	1.812 (46.02)	M36X1-8gB 100R	M28X1-8gB 100R
21	G	.506 (3.43)	1.3750-0.1P-0.3L-TS	1.437 (36.50)	.878 (22.30)	.963 (14.30)	1.938 (49.23)	M36X1-8gB 100R	M31X1-8gB 100R
23	H	.506 (3.43)	1.5000-0.1P-0.3L-TS	1.562 (39.67)	.878 (22.30)	.963 (14.30)	2.062 (52.37)	M41X1-8gB 100R	M36X1-8gB 100R
25	J	.506 (3.43)	1.6250-0.1P-0.3L-TS	1.687 (42.68)	.878 (22.30)	.963 (14.30)	2.188 (55.38)	M44X1-8gB 100R	M37X1-8gB 100R
















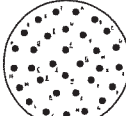
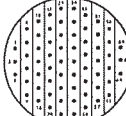
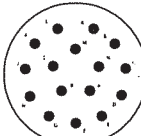
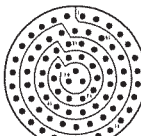
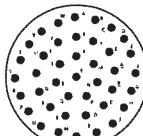
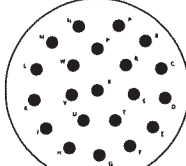
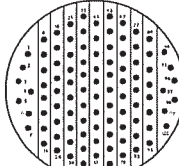
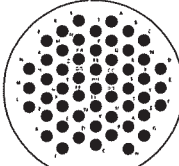
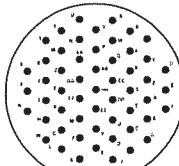
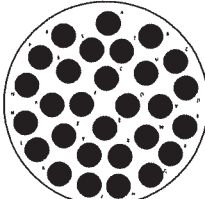
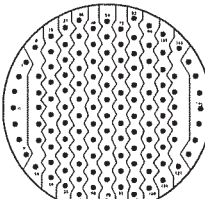
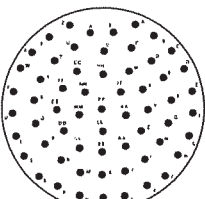
Ordering Information



Also available in accordance with applicable portions of 24308-Style, 26482-Style, MIL-C-81659 & ARINC 600

Contact Arrangements

Engaging view, pin insert

								
Series I, III & IV Series II No. of Contacts Service Ratings	9-35 8-35 6 #22D M	11-5 10-5 5 #20 I	11-98 10-98 6 #20 I	11-35 10-35 13 #22D M	13-8 12-8 8 #20 I	13-98 12-98 10 #20 I	13-35 12-35 22 #22D M	
								
Series I, III & IV Series II No. of Contacts Service Ratings	15-5 14-5 5 #16 II	15-18 14-18 18 #20 I	15-19 14-19 19 #20 I	15-35 14-35 37 #22D M	- 16-99 21 #20, 2 #16 I	17-8 16-8 8 #16 II	17-26 16-26 26 #20 I	17-35 16-35 55 #22D M
								
Series I, III & IV Series II No. of Contacts Service Ratings	19-32 18-32 32 #20 I	19-35 18-35 66 #22D M	21-16 20-16 16 #16 II	21-35 20-35 79 #22D M	21-41 20-41 41 #20 I			
								
Series I, III & IV Series II No. of Contacts Service Ratings	23-21 22-21 21 #16 II	23-35 22-35 100 #22D M	23-53 22-53 53 #20 I	23-55 22-55 55 #20 I				
								
Series I, III & IV Series II No. of Contacts Service Ratings	25-29 24-29 29 #16 I	25-35 24-35 128 #22D M	25-61 24-61 61 #20 I					

Please consult factory for availability of layouts not shown

Attenuation Curves

Cannon's Chip-on-Flex filter connectors are designed to be comparable to MIL-DTL-38999 Series III testing for thermal shock, random vibration, humidity and high altitude DMV. These connectors are ideal for high reliability military aerospace and industrial applications.

This new filter technology is available in almost all series of Cannon standard connectors:

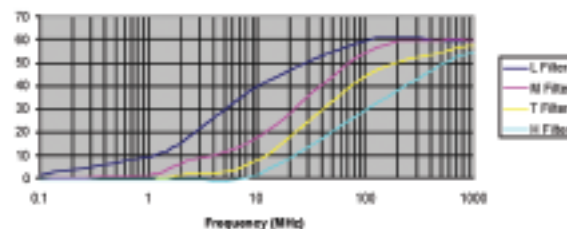
DESIGNED TO BE COMPARABLE TO THE FOLLOWING:

MIL-DTL-38999, Series I
MIL-DTL-38999, Series II
MIL-DTL-38999, Series III
MIL-DTL-38999, Series IV
MIL-C-26482, Series II
MIL-DTL-24308
MIL-C-81659 (ARINC 404)
ARINC 600

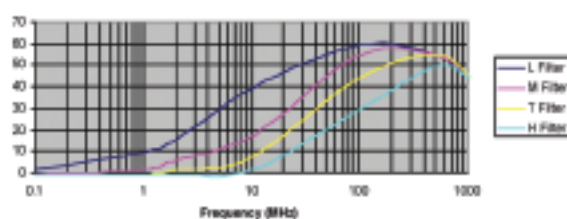
P/N LEAD-OFF

CFKJL
CFKJ
CFKJA
CFKJB
CFPV
CFD
CFDPX
CFBKA

CoF Pi-filter Attenuation



CoF C-filter Attenuation



38999-Style Filter Performance

Chip-on-Flex Filter Connectors are designed to be comparable to MIL-DTL-38999.

Test Description	Paragraph	Requirements
Insulation Resistance	4.5.9	Insulation resistance test is performed on unmated connectors per MIL-STD-1344, method 3003. The test voltage is 100 Vdc minimum. Standard quality conformance testing is done, where all contacts are measured to all other contacts and the shell at room temperature. The minimum requirement is 5,000 Megohms at room temperature and 1,000 Megohms at 125°C.
Dielectric Withstanding Voltage (DWV)	4.5.10	Dielectric Withstanding Voltage (DWV) is performed on unmated connectors per MIL-STD-1344, method 3001. Standard quality conformance testing is done, where all contacts are measured to all other contacts and the shell at room temperature. Leakage current shall not exceed 100 microamps at the shown minimum test voltages.
		Contact Size22 with 'M', 'T' & 'H' range filters22 with 'L' range filters20, 16 & 12
		Test Voltage500 Vdc300 Vdc500 Vdc
Contact Retention	4.5.19	After preloading to 3 pounds maximum, the force is applied at approximately 1 pound per second and maintained at full load for 5-10 seconds. There is no damage to contacts or inserts and filter attenuation minimum values are met after testing. Filter contacts are non-removable.
		Contact Size22201612
		Load in Pounds + / - 10%10152525
Vibration	4.5.22	Wired, mated connectors are vibrated by mounting filter receptacles on the vibration fixture by normal means. There are no pin-socket electrical discontinuities exceeding 1 microsecond with 100/500 milliamps of current flowing during vibration testing. There is no disengagement of mated connectors, evidence of cracking, breaking or loosening of parts. Filter attenuation minimum values are met after testing.
		Series I and IVa) MIL-STD-202, Method 204, Condition G (30g sine, 4 hrs in 3 axis) b) MIL-STD-1344, Method 2005, Condition VI, Letter J (Random, 8 hrs in 2 axis) c) MIL-STD-1344, Method 2005, 38999-Style Figure 25 (Random, 8 hrs in 2 axis, no weights)
		Series II MIL-STD-1344, M2005, Cond. VI, Ltr J (Random, 8 hrs in 2 axis)
		Series III a) MIL-STD-1344, Method 2005, Condition VI, Letter J (Random, 8 hrs in 2 axis at high temp) b) MIL-STD-1344, Method 2005, 38999-Style Figure 25 (Random, 8 hrs in 2 axis, no weights)
Mechanical Shock	4.5.23.1	Wired, mated connectors are subjected to 300g half sinusoidal shocks per MIL-STD-1344, method 2004, condition D. Filter receptacles are mounted on the shock fixture by normal means. There are no pin-socket electrical discontinuities exceeding 1 microsecond with 100/500 milliamps of current flowing during shock testing. There is no disengagement of mated connectors, evidence of cracking, breaking or loosening of parts. Filter attenuation minimum values are met after testing.
Thermal Shock	4.5.4	Unmated connectors are subjected to 25 cycles of temperature cycling per MIL-STD-1344, method 1003, condition A except temperature extremes are -65/-68°C and +122/125°C. There is no damage detrimental to the operation of the connectors. Filter attenuation minimum values are met after testing.
High Altitude DWV	4.5.10.2	Unmated connectors are tested per MIL-STD-1344, method 3001 at the test voltages below. Only the engaging face of receptacles are subjected to the high altitude (rear face is suitably protected). Leakage current shall not exceed 100 microamps at the shown minimum test voltages.
		Contact Size22 with 'M', 'T' & 'H' range filters22 with 'L' range filter20, 16 & 12
		50,000 feet400240400
		70,000 feet260150260
		100,000 feet200125200

Filter connector characteristics under Coupling Torque, Durability, Corrosion, Shell-to-shell Conductivity, Contact Resistance, Insert Retention, Temperature Exposure and Humidity testing are identical to those of non-filtered MIL specification versions. Standard Operating Parameters:

Maximum Operating Voltage – 200 Vdc or 120 Vac rms at 400 Hz

Contact current rating (dc)

15 amps size 16
7.5 amps size 20
5 amps size 22

Contact RF current rating – 11 milliamps rms



Connector Product Locations

With manufacturing facilities, sales representatives and distributors located worldwide, please visit our website at www.ittcannon.com for a complete listing and to find the office nearest you.

GERMANY

Cannonstrasse 1
Weinstadt, 71384
phone: 49.7151.699.0
fax: 49.7151.699.217

HONG KONG

Unit 901 & 912, West Tower
Shun Tak Center
168-200 Connaught Road
Central
phone: 852.2732.2720
fax: 852.2732.2919

ITALY

Via Pietro Panzeri 10
Milano, 20123
phone: 39.2.58180.1
fax: 39.2.8372036

UK

Jays Close, Viabes Estate
Basingstoke, RG22 4BA
phone: 44.1256.311200
fax: 44.1256.323356

USA

56 Technology Drive
Irvine, CA 92618
phone: 1.800.854.3028
fax: 1.714.628.2142

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Our facility is not currently certified by the DLA and this product is not covered by the QPL/QML.

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