Military Filtered Connectors

An Innovative Technology of Frequency Filtering

ר.פ. אימיוניטי בע"מ
RF Immunity Ltd.

www.rfimmunity.co.il

Company Profile

YouR First Line Of Defense

Unwanted interferences at various frequencies that mix with signals are becoming a major problem to the electronics industry. EMI and RFI can result in havoc within electronic systems and lead to failure of complex and large projects.

Suppression components are vital to the task of tackling EMI and RFI. Such components ensure that all systems function properly.

One of the more practical and attractive low cost solutions is filtered connectors. They perfectly immunize systems against Radiated Emissions and Susceptibility and protect them against Fast Transients, ESD and Lightnings. These products are used more and more in Space, Aeronautical, Telecom, Ground Control Systems and Medical applications.

Filtered connectors offer the designer a solution that combines standard connectors with EMI/RFI suppression components. This combination saves space, offers design flexibility, reduces costs and allows easy retrofit and quick upgrade of existing systems.

RF Immunity Ltd. Military Filtered Connectors

A large diversity of connector sizes and types is available in various densities. All connectors meet the most stringent specifications of military standards: MIL-C-38999, MIL-C-26482, MIL-C-5015, MIL-C-83733, ARINC 404 and more.

Perfectly filtering Input/Output (I/O) interfaces of space-sensitive military systems demanding hermetic sealing, these filtered connectors are suitable for extreme environmental conditions. They can also include protective components to ensure transient resistance as well as fast HPM (High Power Microwave) pulse durability.
The entire assembly is integrated into a single package, where each contact pin has individual filter with specific type and level.
Together with other complying design considerations, the use of these filtered connectors enables modern platforms to meet the following reference standards: MIL-STD-461, MIL-STD-1275A, MIL-STD-704A, RTCA-DO160D.
Each filtering module is integrated into the connector, keeping the connector outer form and size unchanged and preserving system Form, Fit and Function (F^3).
Designed for airborne, marine and ground-controlled portable equipment, this line of products can be used in a broad frequency range of up to 20 GHz.

The Advantages of the Innovative Filtering Technology Offered by RF Immunity Ltd.

- **Easy retrofit and upgrade**
  Available system space is not to be concerned about, as our compact connectors are the same in dimensions as the corresponding unfiltered connectors, allowing for easy retrofit and upgrade.

- **Design flexibility**
  Our advanced design technologies enable the introduction of a complete selection of both electrical and mechanical solutions, while extensive knowledge allows us to offer design for and production of filtered versions of most connector types.

- **Reduced cost and lead times**
  With most standard contact arrangement designs, we can reduce the procurement costs and minimize the tooling expenses, down to zero. Moreover, we offer small quantities and prototypes.

- **Weight and space savings**
  As the filtering elements are placed within the connectors, functional PCB area is kept minimal, and up to 72% of weight is saved compared to the standard configuration of a connector and separate discreet filtering components.

- **Custom designs**
  We cater to various custom designs which call for specific filtering, transient protection, sealing, etc.

List of Contents

List of Contents

Our products are exceptional and outstanding in quality, miniaturization and in the ability to achieve perfection under extreme environmental conditions, making them ideal for a variety of military, industrial, commercial, and avionic applications. They are extremely suitable for signal filtering and protection assignments in communication, video, telecom and telephony applications, as well as within standard and high voltage AC and DC power supplies. Filtering components that meet current loads of 35 Amperes are available.

Quality Assurance

We are committed to the full satisfaction of our customers and to meeting their technical requirements.

Complying with the highest requirements of quality standards is our company mission, and a continuous improvement program is employed in all the enterprise levels.

All our products are subject to meticulous tightly-controlled test procedures carried out with top-quality tools - from component acceptance inspection, through process control to final examination of the complete products.

MIL-C-38999 Series I

These general purpose connectors are used for high density applications. They are available in shell sizes 9 through 25 with up to 128 contacts of size 22 and mixed contact arrangements.

The MIL-C-38999 family is offered in a variety of receptacle mounting configurations. These include square flange receptacles for wall and box mounting and jam nut receptacles.

Series I connectors are available in a broad range of shell materials and finishes.
Aluminum shells have finishes of bright cadmium, olive drab cadmium or electroless nickel. Olive drab cadmium finish is applied over a nickel under plate to create salt spray exposure durability.

These connectors can mate with non-filtered connectors and are drop-in replacements for non-filtered connectors.
Non-standard filter connector body sizes and shapes are available.

MIL-C-38999 Series II

These connectors are designed to be used mainly where the major requirements are low profile and light weight. Series II achieves up to 20% reduction in the mated length and 39% in the external diameter. The connector weight is reduced by approximately 40% compared to Series I. Thinner shell walls are used to meet customer requirements for reduction both in dimensions and in weight .

These connectors are offered with 22, 20, 16 and 12 size contacts, and shell sizes of 8 to 24. Receptacle mounting options include square flanges for wall and box mounting and a jam nut mount.

Series II connectors are available in a broad range of shell materials and finishes: Aluminum shells are finished with bright cadmium, olive drab cadmium or electroless nickel. Olive drab cadmium finish is applied over a nickel under plate to create salt spray exposure durability.

These connectors can mate with non-filtered connectors and are drop-in replacements for non-filtered connectors.
Non-standard filter connector body sizes and shapes and insert arrangements are available.

MIL-C-38999 Series III

Series III provides an improved threaded connector with a quick disconnect feature of a bayonet connector. In addition, Series III is designed to withstand extreme environmental conditions of e.g. vibration, shock, fluid, sand dust and salt, encountered mainly in modern aircraft wheel wells, engine compartments and wing tips.
Series III connectors also include a ratcheting self-locking device which eliminates the need for safety wiring.

These connectors are offered with 22, 20, 16, 12, 8 size contacts, and shell sizes of 9 through 25. Pin count up to 128 pins.These connectors are offered in square flange and jam nut mount receptacles.

Series III connectors are available in a broad range of shell materials and finishes.
Aluminum shells have finishes of olive drab, cadmium or electroless nickel.
Stainless steel shells are passivated and nickel deposit finished. Zinc cobalt finishes are also available.

We can offer filtered solutions for MIL-C-38999 III connectors which include Fiber-Optics, Coax & Twinax contacts.
These connectors can mate with non-filtered connectors and are drop-in replacements for non-filtered connectors.
Non-standard filter connector body sizes and shapes and insert arrangements are available.

Material & Finish

Shell - Aluminum alloy, Olive drab Cadmium plating.
Aluminum alloy, Electroless nickel plating.
Stainless steel, passivated.
Aluminum alloy, Zinc cobalt plating.

Contacts - Copper alloy , Gold plate.

Grommet & O-ring - Silicon based elastomer.

Contacts termination - PCB Tail, Gold plating.
PCB Tail, Tin plating.
Solder cup, Tin plating.

Insert - High grade Thermoplastic \ Thermoset \ Epoxy.

Content of Section

How To Order

C 1 W 23 F 35 P 1 N 10 PP28

FAMILY

- **C-** MIL-C-38999
- **B-** MIL-C-26482 Page 15
- **D-** MIL-C-83723 Page 22

SERIES

- **1-** Series I
- **2-** Series II
- **3-** Series III

SHELL STYLE

- **J-** Jum Nut receptacle
- **W-** Wall Mount receptacle
- **B-** Box Mount receptacle
- **X-** Rear Wall Mount receptacle
- **C-** Rear Box Mount receptacle

SHELL SIZE

Series I & III - 09-11-13-15-17-19-21-23-25
Series II - 08-10-12-14-16-18-20-22-24

MATERIAL & FINISH

- **F-** Aluminum Alloy, Electroless Nickel Plating
- **K -** Stainless Steel, Passivated, Corrosion resistant, without Firewall Capability
- **W -** Aluminum Alloy, Olive drab Cadmium Plating.
- **Z -** Aluminum Alloy, Zinc Cobalt Plating.

INSERT ARRANGEMENT

See Page 5

CONTACT STYLE

Regular: **P**-Pin
S-Socket

Hermetically Sealed: **R**-Pin
U-Socket

TERMINATION: See Page 6

- **1-** Solder Cup
- **2-** PCB (Tin Plated)
- **3-** PCB Long (Tin Plated)
- **4-** PCB (Gold plated)
- **5-** PCB Long (Gold Plated)

POLARIZATION:

Key Position See Page 7

WORKING VOLTAGE: See Page 28

01	6.3V	07	200V	14	800V	00 - For filters with diversified voltages
02	10V	08	250V	15	1000V	99 - For any configuration that incorporates transient protection
03	16V	09	300V	16	1500V	
04	25V	10	400V	17	2000V	
05	50V	11	500V			
06	100V	12	600V			

FILTER CODE AND\OR TRANSIENT PROTECTION CODE: see page 32

xxxx - In case where a custom protection is required (diversity of filter types and\or transient protection types) fill XXXX.
Contact sales for customizing.

Contact us for filter connectors not included in this catalog

Insert Arrangements Per MIL-STD-1560

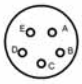
Numbering example	Series I & III	(Odd sizes only)	1198
	Series II	(Even sizes)	1098

Shell Size

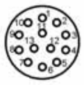
Insert Arrangement
6#20 (Contact quantity & Size)

0998/0898
3 #20

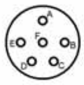
0935/0835
6 #22D



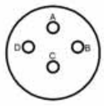
1105/1005
5 #20



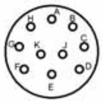
1135/1035
13 #22D



1198/1098
6 #20

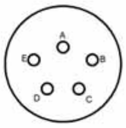


1304/1204
4 #16

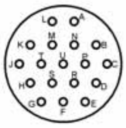


1398/1298
10 #20

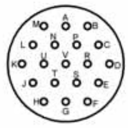
1335/1235
22 #22D



1505/1405
5 #16

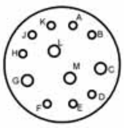


1518/1418
18 #20

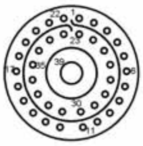


1519
19 #20

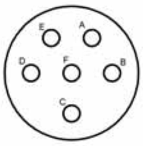
1535/1435
37 #22D



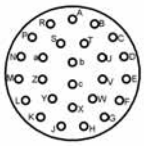
1597/1497
8 #20, 4 #16



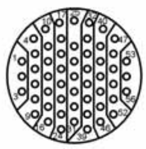
1702
38 #22D, 1 #8
Twinax



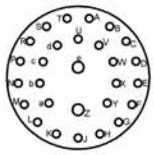
1706/1606
6 #12



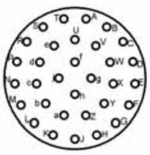
1726/1626
26 #20



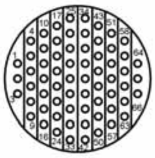
1735/1635
55 #22D



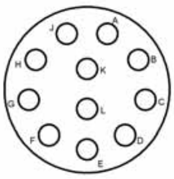
1928/1828
26 #20, 2 #16



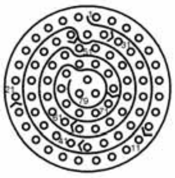
1932/1832
32 #20



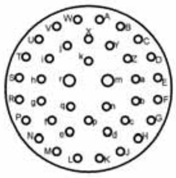
1935/1835
66 #22D



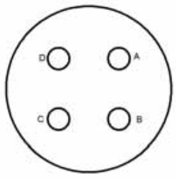
2111/2011
11 #12



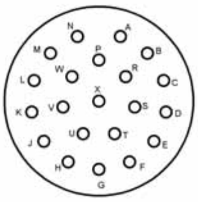
2135/2035
79 #22D



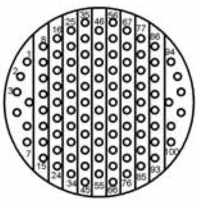
2139/2039
37 #20, 2 #16



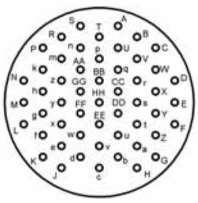
2175
4 #8 Twinax



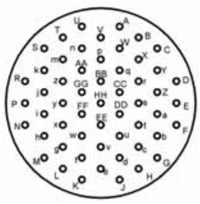
2321/2221
21 #16



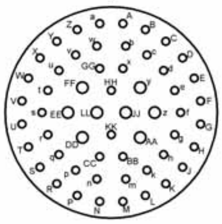
2335/2235
100 #22D



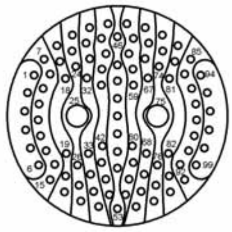
2353/2253
53 #20



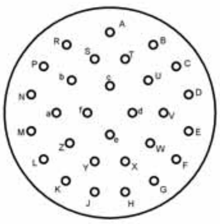
2355/2255
55 #20



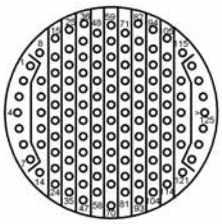
2504/2404
48 #20, 8 #16



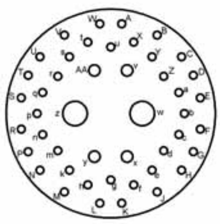
2507
97 #22D, 2 #8 Twinax



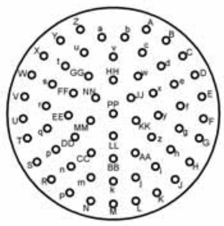
2529/2429
29 #16



2535/2435
128 #22D



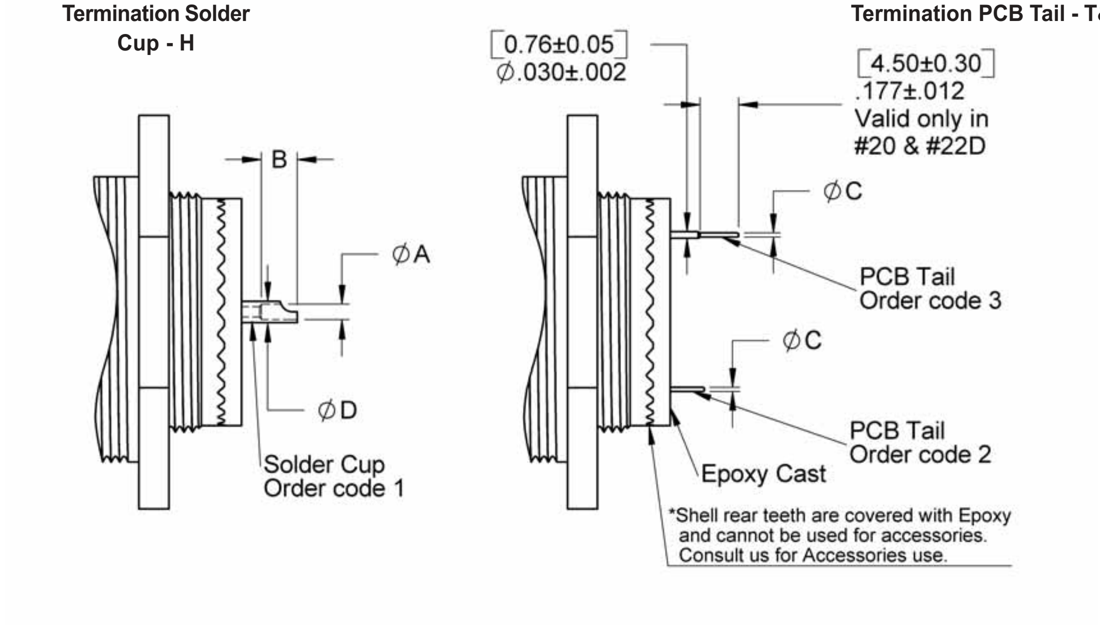
2546
40 #20, 4 #16, 2 #8 Coax



2561/2461
61 #20

* Mating face of Pin is Shown, Socket insert is opposite.

Termination Types



Termination Dimensions

* For Termination length refer to specific shell table in this catalog colums H, T, V.

Contact Size	#22	#20	#16	#12
Ø A ± .002 [±0.05]	.043 [1.10]	.043 [1.10]	.074 [1.90]	.114 [2.90]
B ± .012 [±0.30]	.126 [3.20]	.126 [3.20]	.149 [3.80]	4.20 [.165]
Ø C ±.002 [±0.05]	.002 [0.05]	.002 [0.05]	.046 [1.16]	2.06 [.081]
Ø D ± .002 [±0.05]	.059 [1.50]	.059 [1.50]	.100 [2.54]	3.60 [.141]

* Consult us regarding special termination lengths and sizes.

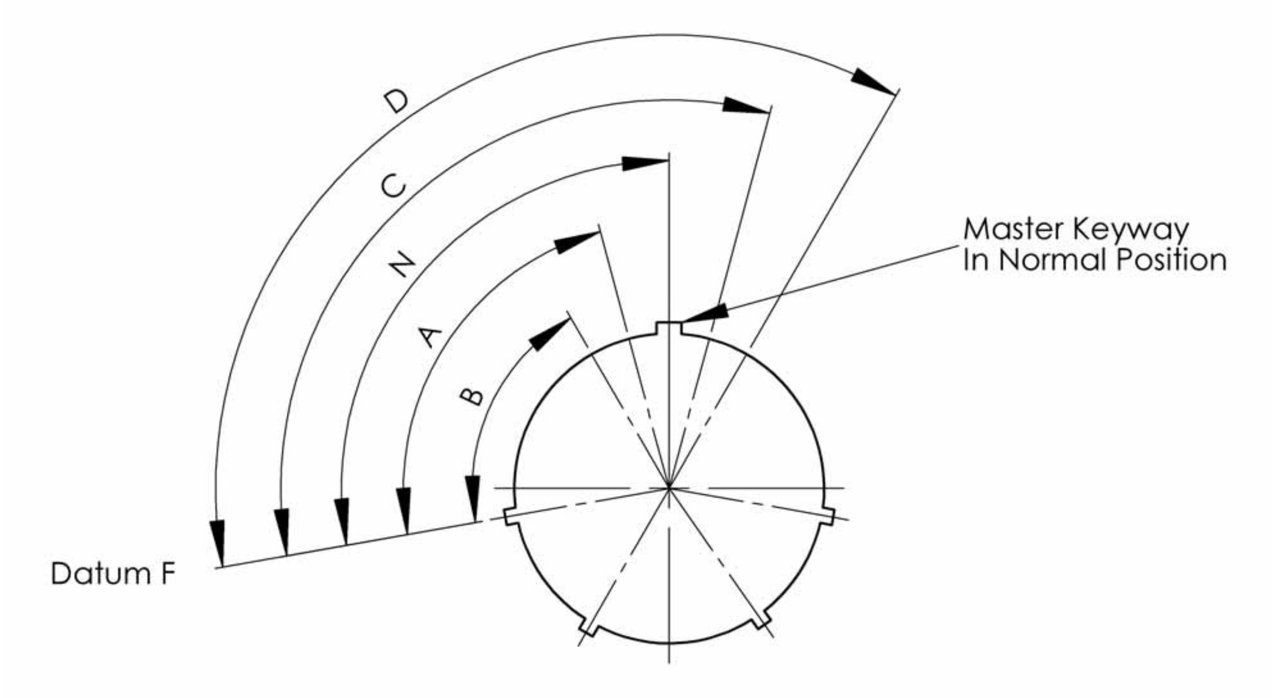
Environmental Conditions

Description	Values	Paragraph PER			
		ISO 2100	ISO 7137	MIL-STD-1334	MIL-STD- 202
Sealing**	<10^{-3} cm^3 / Sec at Δ P = 1atm				
Vibration (Random)	Up to 40g RMS 50-2000Hz	12		2005.1	201,204,215
Vibration (Sine)	Up to 15g PTP 10-2000Hz	12		2005.1	201,204,215
Shock	100g X 11msec		7	2004.1	213
Acceleration	40g	19			
Climatic					103,106
Temperature	-55ºC to +125ºC Operating & Storage				
Humidity	Up to 95% @ Storage Temperature range	18b		1002.2	
Altitude	Up to 70,000 ft	18a	4		
Salt Spray		22		1001.1	101
Sand & Dust		23	12		
Contact Endurance	More than 500 Mating cycles	16			

** For Hermetically sealed connector the sealing conditions are <10^{-5} cm^3 / Sec at Δ P = 1atm

* Dimensions are in Inches. Values in brackets are Millimeters equivalents.
* Dimensions subject to change without prior notice.

Key Position

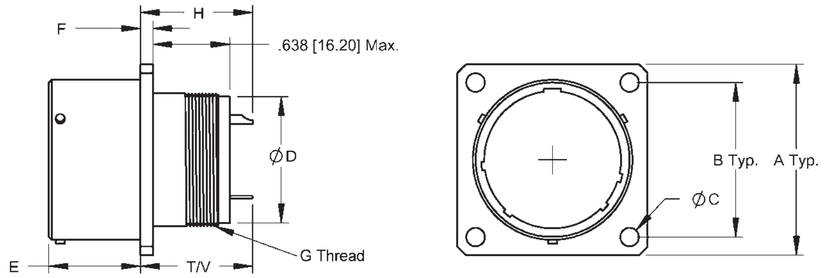


Mating face of Receptacle is shown in the figure (Plug is opposite).

Shell Size	Keying Positions				
	N	A	B	C	D
9	95	77	-	-	113
11	95	81	67	123	109
13	95	75	63	127	115
15	95	74	61	129	116
17	95	77	65	125	113
19	95	77	65	125	113
21	95	77	65	125	113
23	95	80	69	121	110
25	95	80	69	121	110

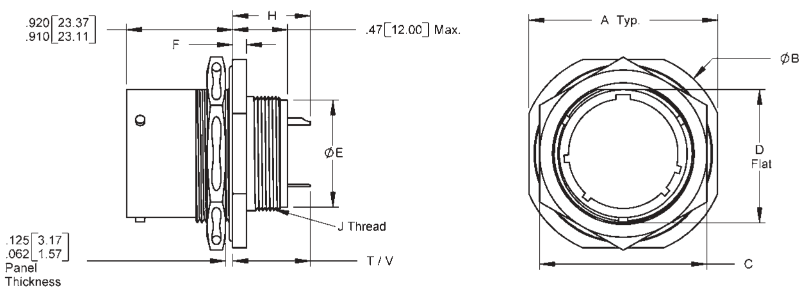
The master keyway is rotated to provide shell polarization the minor keys remain fixed.
Insert Arrangement does not rotate with the Keyway.

C1W Wall Mount Receptacle (MS27466 Compatible)



Shell Size	A Max	B ±.004 [±0.01]	Ø C +.010 [0.25] -.005 [0.13]	Ø D Max	E Max	F Max	G Thread	H Max		T ± .028 [±0.70]	V ± .028 [±0.70]
								#22, #20, #16	#12		
9	.958 [24.33]	.719 [18.26]	.128 [3.25]	.4375 [11.11]	.632 [16.05]	.100 [2.54]	.4375-28 UNEF	.874 [22.20]	.953 [24.20]	1.052 [26.71]	.953 [24.21]
11	1.051 [26.69]	.812 [20.62]	.128 [3.25]	.5625 [14.29]	.632 [16.05]	.100 [2.54]	.5625-24 UNEF	.874 [22.20]	.953 [24.20]	1.052 [26.71]	.953 [24.21]
13	1.145 [29.08]	.906 [23.01]	.128 [3.25]	.6875 [17.46]	.632 [16.05]	.100 [2.54]	.6875-24 UNEF	.874 [22.20]	.953 [24.20]	1.052 [26.71]	.953 [24.21]
15	1.239 [31.47]	.969 [24.61]	.128 [3.25]	.8125 [20.64]	.632 [16.05]	.100 [2.54]	.8125-20 UNEF	.874 [22.20]	.953 [24.20]	1.052 [26.71]	.953 [24.21]
17	1.332 [33.83]	1.062 [26.97]	.128 [3.25]	.9375 [23.81]	.632 [16.05]	.100 [2.54]	.9375-20 UNEF	.874 [22.20]	.953 [24.20]	1.052 [26.71]	.953 [24.21]
19	1.458 [37.03]	1.156 [29.36]	.128 [3.25]	1.0625 [26.99]	.632 [16.05]	.100 [2.54]	1.0625-18 UNEF	.874 [22.20]	.953 [24.20]	1.052 [26.71]	.953 [24.21]
21	1.582 [40.18]	1.250 [31.75]	.128 [3.25]	1.875 [30.16]	.602 [15.29]	.130 [3.30]	1.1875-18 UNEF	.906 [23.00]	.984 [25.00]	1.082 [27.48]	.983 [24.98]
23	1.708 [43.38]	1.375 [34.92]	.147 [3.73]	1.313 [33.34]	.602 [15.29]	.130 [3.30]	1.3125-18 UNEF	.906 [23.00]	.984 [25.00]	1.082 [27.48]	.983 [24.98]
25	1.832 [46.53]	1.500 [38.10]	.147 [3.73]	1.438 [36.51]	.602 [15.29]	.130 [3.30]	1.4375-18 UNEF	.906 [23.00]	.984 [25.00]	1.082 [27.48]	.983 [24.98]

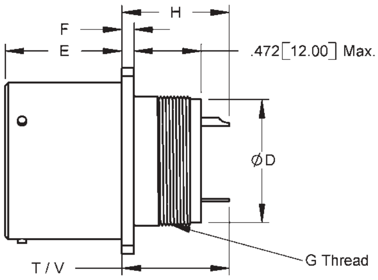
C1J Jam Nut Receptacle (MS27468 Compatible)

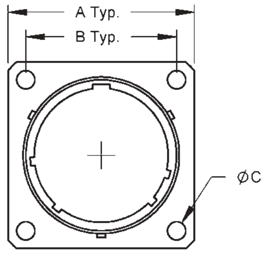


Shell Size	A Max	Ø B Max	C Max	D -.010 [-0.25]	Ø E Max	J Thread	F ± .010 [±0.25]	H Max		T ± .028 [±0.70]	V ± .028 [±0.70]
								#22, #20, #16	#12		
9	1.078 [27.38]	1.204 [30.58]	.892 [22.65]	.655 [16.64]	.4375 [11.11]	.4375-28 UNEF	.109 [2.77]	.591 [15.00]	.669 [17.00]	.768 [19.50]	.669 [17.00]
11	1.266 [32.15]	1.391 [35.33]	1.017 [25.83]	.755 [19.18]	.5625 [14.29]	.5625-24 UNEF	.109 [2.77]	.591 [15.00]	.669 [17.00]	.768 [19.50]	.669 [17.00]
13	1.391 [35.33]	1.516 [38.50]	1.205 [30.60]	.942 [23.93	.6875 [17.46]	.6875-24 UNEF	.109 [2.77]	.591 [15.00]	.669 [17.00]	.768 [19.50]	.669 [17.00]
15	1.516 [38.51]	1.641 [41.68]	1.329 [33.75]	1.066 [27.08]	.8125 [20.64]	.8125-20 UNEF	.109 [2.77]	.591 [15.00]	.669 [17.00]	.768 [19.50]	.669 [17.00]
17	1.641 [41.68]	1.766 [44.85]	1.455 [36.95]	1.191 [30.25]	.9375 [23.81]	.9375-20 UNEF	.109 [2.77]	.591 [15.00]	.669 [17.00]	.768 [19.50]	.669 [17.00]
19	1.828 [46.43]	1.954 [49.63]	1.579 [40.10]	1.316 [33.43]	1.0625 [26.99]	1.0625-18 UNEF	.140 [3.56]	.591 [15.00]	.669 [17.00]	.768 [19.50]	.669 [17.00]
21	1.954 [49.63]	2.078 [52.78]	1.705 [43.30]	1.441 [36.60]	1.875 [30.16]	1.1875-18 UNEF	.140 [3.56]	.621 [15.77]	.700 [17.78]	.798 [20.27]	.699 [17.76]
23	2.078 [52.78]	2.204 [55.98]	1.829 [46.45]	1.566 [39.78]	1.3125 [33.34]	1.3125-18 UNEF	.140 [3.56]	.621 [15.77]	.700 [17.78]	.798 [20.27]	.699 [17.76]
25	2.204 [55.98]	2.328 [59.13]	2.017 [51.23]	1.691 [42.95]	1.4375 [36.51]	1.4375-18 UNEF	.140 [3.56]	.621 [15.77]	.700 [17.78]	.798 [20.27]	.699 [17.76]

* Dimensions are in Inches. Values in brackets are Millimeters equivalents.
* Dimensions subject to change without prior notice.

C1X Rear Wall Mount Receptacle (MS27656 Compatible)

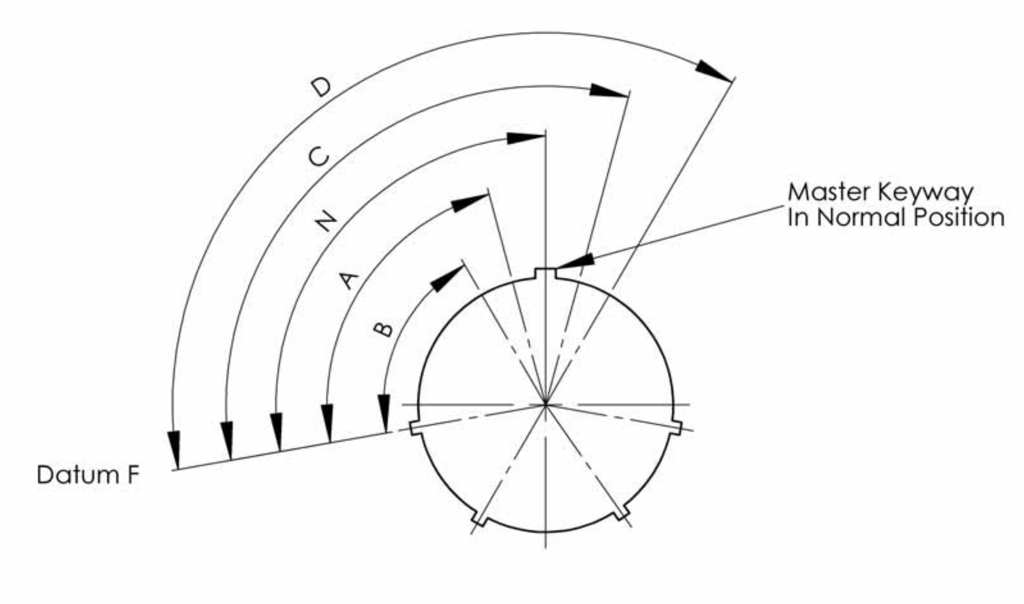




Shell Size	A Max	B ± .008 [±0.2]	Ø C ± .005 [±0.13]	Ø D Max	E Max	F +.015 [+0.38]	G Thread	H Max		T ± .028 [±0.70]	V ± .028 [±0.70]
								#22, #20, #16	#12		
9	.958 [24.33]	.719 [18.26]	.128 [3.25]	.4375 [11.11]	.820 [20.82]	.085 [2.16]	.4375-28 UNEF	.689 [17.50]	.768 [19.50]	.864 [21.94]	.766 [19.45]
11	1.051 [26.69]	.812 [20.62]	.128 [3.25]	.5625 [14.29]	.820 [20.82]	.085 [2.16]	.5625-24 UNEF	.689 [17.50]	.768 [19.50]	.864 [21.94]	.766 [19.45]
13	1.145 [29.08]	.906 [23.01]	.128 [3.25]	.6875 [17.46]	.820 [20.82]	.085 [2.16]	.6875-24 UNEF	.689 [17.50]	.768 [19.50]	.864 [21.94]	.766 [19.45]
15	1.239 [31.47]	.969 [24.61]	.128 [3.25]	.8125 [20.64]	.820 [20.82]	.085 [2.16]	.8125-20 UNEF	.689 [17.50]	.768 [19.50]	.864 [21.94]	.766 [19.45]
17	1.332 [33.83]	1.062 [26.97]	.128 [3.25]	.9375 [23.81]	.820 [20.82]	.085 [2.16]	.9375-20 UNEF	.689 [17.50]	.768 [19.50]	.864 [21.94]	.766 [19.45]
19	1.458 [37.03]	1.156 [29.36]	.128 [3.25]	1.0625 [26.99]	.820 [20.82]	.085 [2.16]	1.0625-18 UNEF	.689 [17.50]	.768 [19.50]	.864 [21.94]	.766 [19.45]
21	1.582 [40.18]	1.250 [31.75]	.128 [3.25]	1.875 [30.16]	.790 [20.06]	.115 [2.92]	1.1875-18 UNEF	.717 [18.20]	.796 [20.20]	.894 [22.70]	.796 [20.20]
23	1.708 [43.38]	1.375 [34.92]	.147 [3.73]	1.3125 [33.34]	.790 [20.06]	.115 [2.92]	1.3125-18 UNEF	.717 [18.20]	.796 [20.20]	.894 [22.70]	.796 [20.20]
25	1.832 [46.53]	1.500 [38.10]	.147 [3.73]	1.4375 [36.51]	.790 [20.06]	.115 [2.92]	1.4375-18 UNEF	.717 [18.20]	.796 [20.20]	.894 [22.70]	.796 [20.20]

* Dimensions are in Inches. Values in brackets are Millimeters equivalents.
* Dimensions subject to change without prior notice.

Key Position

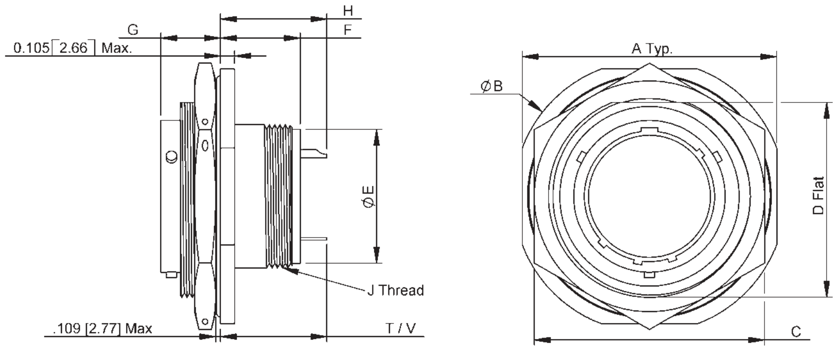


Mating face of receptacle is shown in the figure (Plug is opposite).

Shell Size	Keying Positions				
	N	A	B	C	D
8	100	82	-	-	118
10	100	86	72	128	114
12	100	80	68	132	120
14	100	79	66	134	121
16	100	82	70	130	118
18	100	82	70	130	118
20	100	82	70	130	118
22	100	85	74	126	115
24	100	85	74	126	115

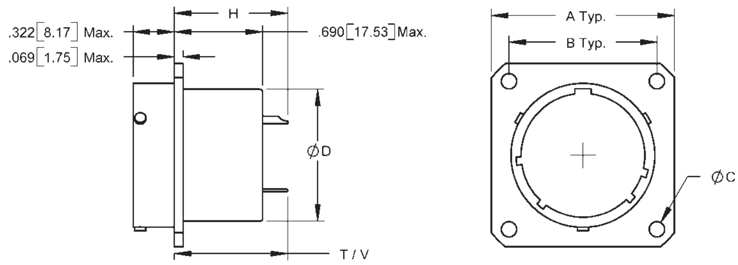
The master keyway is rotated to provide shell polarization the minor keys remain fixed.
Insert Arrangement does not rotate with the Keyway.

C2J Jam Nut Receptacle (MS27474 Compatible)



Shell Size	A Max	Ø B Max	C Max	D +.001[0.03] -.006[0.15]	Ø E Max	F Max	G Max	J Thread	H Max		T ± .028 [±0.70]	V ± .028 [±0.70]
									#22, #20, #16	#12		
8	1.266 [32.16]	1.391 [35.33]	1.079 [27.41]	.817 [20.75]	.4375 [11.11]	.573 [14.57]	.443 [11.25]	.4375-28 UNEF	.713 [18.10]	.791 [20.10]	.908 [23.07]	.810 [20.57]
10	1.389 [35.28]	1.515 [38.48]	1.206 [30.63]	.941 [23.90]	.5625 [14.29]	.573 [14.57]	.443 [11.25]	.5625-24 UNEF	.713 [18.10]	.791 [20.10]	.908 [23.07]	.810 [20.57]
12	1.515 [38.48]	1.641 [41.68]	1.329 [33.76]	1.065 [27.05]	.6875 [17.46]	.573 [14.57]	.443 [11.25]	.6875-24 UNEF	.713 [18.10]	.791 [20.10]	.908 [23.07]	.810 [20.57]
14	1.641 [41.68]	1.766 [44.86]	1.455 [36.96]	1.190 [30.23]	.8125 [20.64]	.573 [14.57]	.443 [11.25]	.8125-20 UNEF	.713 [18.10]	.791 [20.10]	.908 [23.07]	.810 [20.57]
16	1.795 [45.59]	1.954 [49.63]	1.579 [40.11]	1.320 [33.53]	.9375 [23.81]	.573 [14.57]	.443 [11.25]	.9375-20 UNEF	.713 [18.10]	.791 [20.10]	.908 [23.07]	.810 [20.57]
18	1.905 [48.39]	2.031 [51.59]	1.705 [43.31]	1.440 [36.58]	1.0625 [26.99]	.573 [14.57]	.443 [11.25]	1.0625-18 UNEF	.713 [18.10]	.791 [20.10]	.908 [23.07]	.810 [20.57]
20	2.031 [51.59]	2.157 [54.78]	1.829 [46.46]	1.565 [39.75]	1.1875 [30.16]	.548 [13.91]	.469 [11.91]	1.1875-18 UNEF	.685 [17.40]	.764 [19.40]	.882 [22.41]	.784 [19.91]
22	2.156 [54.74]	2.281 [57.94]	2.017 [51.23]	1.690 [42.93]	1.3125 [33.34]	.548 [13.91]	.469 [11.91]	1.3125-18 UNEF	.685 [17.40]	.764 [19.40]	.882 [22.41]	.784 [19.91]
24	2.279 [57.89]	2.405 [61.09]	2.142 [54.41]	1.815 [46.10]	1.4375 [36.51]	.548 [13.91]	.469 [11.91]	1.4375-18 UNEF	.685 [1740]	.764 [19.40]	.882 [22.41]	.784 [19.91]

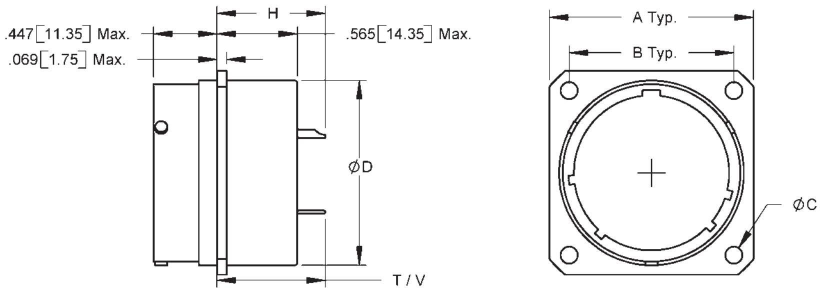
C2B Box Mount Receptacle (MS27499 Compatible)



Shell Size	A Max	B ±0.008 [± 0.2]	Ø C ±.008 [± 0.2]	Ø D ±.008 [± 0.2]	H Max		T ± .028 [±0.70]	V ± .028 [±0.70]
					#22, #20, #16	#12		
8	.827 [21.00]	.594 [15.09]	.120 [3.05]	.453 [11.51]	.827 [21.00]	.906 [23.00]	1.025 [26.03]	1.123 [28.53]
10	.953 [24.20]	.719 [18.26]	.120 [3.05]	.578 [14.69]	.827 [21.00]	.906 [23.00]	1.025 [26.03]	1.123 [28.53]
12	1.047 [26.60]	.812 [20.62]	.120 [3.05]	.703 [17.86]	.827 [21.00]	.906 [23.00]	1.025 [26.03]	1.123 [28.53]
14	1.141 [28.98]	.906 [23.01]	.120 [3.05]	.828 [21.04]	.827 [21.00]	.906 [23.00]	1.025 [26.03]	1.123 [28.53]
16	1.234 [31.34]	.969 [24.61]	.120 [3.05]	.953 [24.21]	.827 [21.00]	.906 [23.00]	1.025 [26.03]	1.123 [28.53]
18	1.327 [33.70]	1.062 [26.97]	.120 [3.05]	1.062 [26.98]	.827 [21.00]	.906 [23.00]	1.025 [26.03]	1.123 [28.53]
20	1.453 [36.90]	1.156 [29.36]	.120 [3.05]	1.188 [30.18]	.827 [21.00]	.906 [23.00]	1.025 [26.03]	1.123 [28.53]
22	1.578 [40.08]	1.250 [31.75]	.120 [3.05]	1.312 [33.33]	.827 [21.00]	.906 [23.00]	1.025 [26.03]	1.123 [28.53]
24	1.703 [43.26]	1.375 [34.93]	.147 [3.73]	1.438 [36.53]	.827 [21.00]	.906 [23.00]	1.025 [26.03]	1.123 [28.53]

* Dimensions are in Inches. Values in brackets are Millimeters equivalents.
* Dimensions subject to change without prior notice.

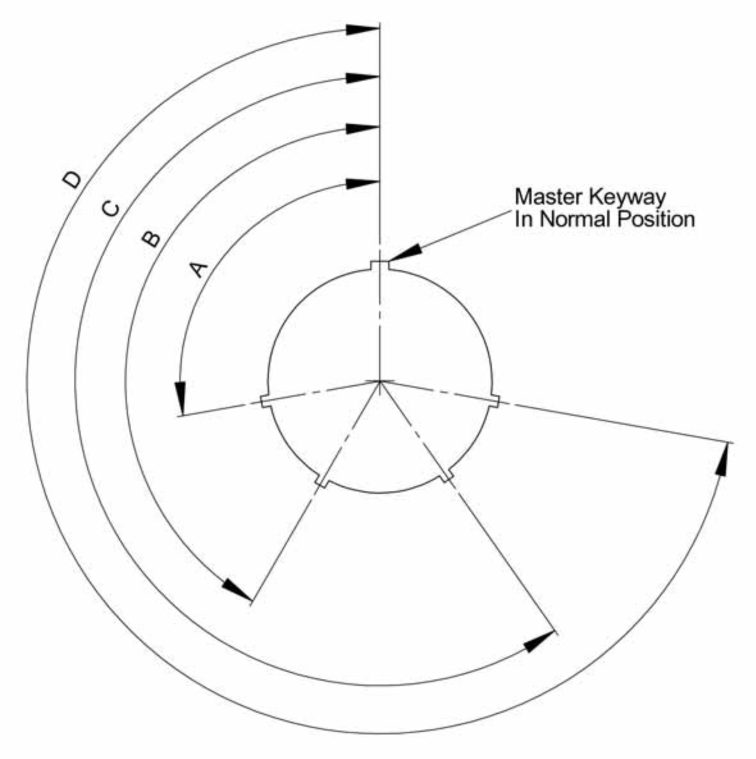
C2C Rear Box Mount Receptacle (MS27508 Compatible)



Shell Size	A Max	B ±0.008 [± 0.2]	Ø C ±.008 [± 0.2]	Ø D ±.008 [± 0.2]	H Max		T Max	V Max
					#22, #20, #16	#12		
8	.827 [21.00]	.594 [15.09]	.120 [3.05]	.547 [13.90]	.647 [16.44]	.785 [19.94]	.884 [22.46]	.786 [19.96]
10	.953 [24.20]	.719 [18.26]	.120 [3.05]	.672 [17.07]	.647 [16.44]	.785 [19.94]	.884 [22.46]	.786 [19.96]
12	1.047 [26.60]	.812 [20.62]	.120 [3.05]	.844 [21.44]	.647 [16.44]	.785 [19.94]	.884 [22.46]	.786 [19.96]
14	1.141 [28.98]	.906 [23.01]	.120 [3.05]	.969 [24.62]	.647 [16.44]	.785 [19.94]	.884 [22.46]	.786 [19.96]
16	1.234 [31.34]	.969 [24.61]	.120 [3.05]	1.094 [27.79]	.647 [16.44]	.785 [19.94]	.884 [22.46]	.786 [19.96]
18	1.327 [33.70]	1.062 [26.97]	.120 [3.05]	1.219 [30.97]	.647 [16.44]	.785 [19.94]	.884 [22.46]	.786 [19.96]
20	36.90 [1.453]	1.156 [29.36]	.120 [3.05]	1.344 [34.14]	.647 [16.44]	.785 [19.94]	.884 [22.46]	.786 [19.96]
22	1.578 [40.08]	1.250 [31.75]	.120 [3.05]	1.469 [37.32]	.647 [16.44]	.785 [19.94]	.884 [22.46]	.786 [19.96]
24	1.703 [43.26]	1.375 [34.93]	.147 [3.73]	1.594 [40.49]	.647 [16.44]	.785 [19.94]	.884 [22.46]	.786 [19.96]

* Dimensions are in Inches. Values in brackets are Millimeters equivalents.
* Dimensions subject to change without prior notice.

Key Position

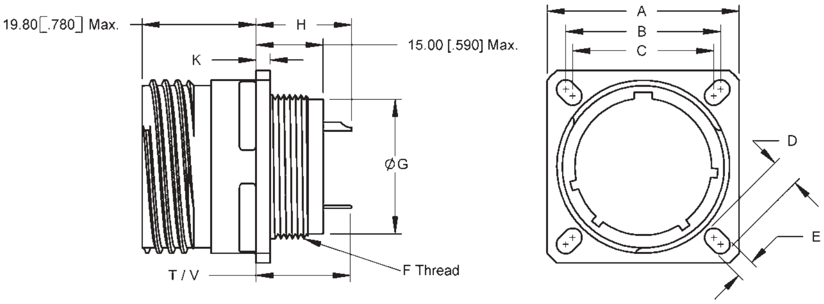


Mating face of receptacle is shown in the figure (Plug is opposite).

Size	Polarizing Positions	Key Locations			
		A	B	C	D
9	N	105	140	215	265
	A	102	132	248	320
	B	80	118	230	312
	C	35	140	205	275
	D	64	155	234	304
	E	91	131	197	240
11 to 15	N	95	141	208	236
	A	113	156	182	292
	B	90	145	195	252
	C	53	156	220	255
	D	119	146	176	298
	E	51	141	184	242
17 to 25	N	80	142	195	293
	A	135	170	200	310
	B	49	169	200	244
	C	66	140	200	257
	D	62	145	180	280
	E	79	153	190	272

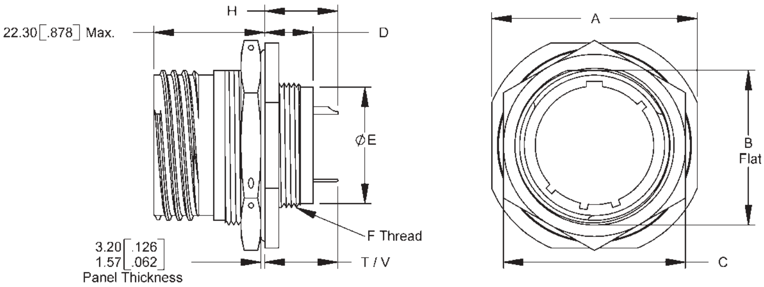
The master keyway is fixed, all minor keys are rotated to provide shell polarization.
Insert Arrangement does not rotate with the Keyway.

C3W Wall Mount Receptacle (D38999/20 Compatible)



Shell Size	A ±0.3 [± .012]	B ±0.26 [± .010]	C ±0.26 [± .010]	D ±0.2 [± .008]	E ±0.2 [± .008]	F Thread	Ø G Max	H Max #22, #20, #16	H Max #12	J Max	K Max	T ± .028 [±0.70]	V ± .028 [±0.70]
9	23.80 [.937]	18.26 [.719]	15.09 [.594]	5.49 [.216]	3.25 [.128]	M12x1.0-6g 0.100R	12.00 [.472]	18.50 [.728]	20.50 [.807]	20.83 [.820]	2.50 [.098]	23.00 [.905]	20.50 [.807]
11	26.20 [1.031]	20.62 [.812]	18.26 [.719]	4.93 [.194]	3.25 [.128]	M15x1.0-6g 0.100R	15.00 [.590]	18.50 [.728]	20.50 [.807]	20.83 [.820]	2.50 [.098]	23.00 [.905]	20.50 [.807]
13	28.60 [1.126]	23.01 [.906]	20.62 [.812]	4.93 [.194]	3.25 [.128]	M18x1.0-6g 0.100R	18.00 [.708]	18.50 [.728]	20.50 [.807]	20.83 [.820]	2.50 [.098]	23.00 [.905]	20.50 [.807]
15	31.00 [1.220]	24.61 [.969]	23.01 [.906]	4.39 [.172]	3.25 [.128]	M22x1.0-6g 0.100R	22.00 [.866]	18.50 [.728]	20.50 [.807]	20.83 [.820]	2.50 [.098]	23.00 [.905]	20.50 [.807]
17	33.30 [1.311]	26.97 [1.062]	24.61 [.969]	4.93 [.194]	3.25 [.128]	M25x1.0-6g 0.100R	25.00 [.984]	18.50 [.728]	20.50 [.807]	20.83 [.820]	2.50 [.098]	23.00 [.905]	20.50 [.807]
19	36.50 [1.437]	29.36 [1.156]	26.97 [1.062]	4.93 [.194]	3.25 [.128]	M28x1.0-6g 0.100R	28.00 [1.102]	18.50 [.728]	20.50 [.807]	20.83 [.820]	2.50 [.098]	23.00 [.905]	20.50 [.807]
21	39.70 [1.563]	31.75 [1.250]	29.36 [1.156]	4.93 [.194]	3.25 [.128]	M31x1.0-6g 0.100R	31.00 [1.220]	18.50 [.728]	20.50 [.807]	20.07 [.790]	3.20 [.126]	23.00 [.905]	20.50 [.807]
23	42.90 [1.689]	34.93 [1.375]	31.75 [1.250]	6.15 [.242]	3.91 [.154]	M34x1.0-6g 0.100R	34.00 [1.338]	18.50 [.728]	20.50 [.807]	20.07 [.790]	3.20 [.126]	23.00 [.905]	20.50 [.807]
25	46.00 [1.811]	38.10 [1.500]	34.93 [1.375]	6.15 [.242]	3.91 [.154]	M37x1.0-6g 0.100R	37.00 [1.457]	18.50 [.728]	20.50 [.807]	20.07 [.790]	3.20 [.126]	23.00 [.905]	20.50 [.807]

C3J Jam Nut Receptacle (D38999/24 Compatible)



Shell Size	A ±0.4 [± .016]	B ±0.1 [± .004]	C ±0.1 [± .004]	D Max	Ø E Max	F Thread	H Max #22, #20, #16	H Max #12	T ± .028 [±0.70]	V ± .028 [±0.70]
9	27.00 [1.063]	17.35 [.683]	17.35 [.683]	12.50 [.492]	12.00 [.472]	M12x1.0-6g 0.100R	16.00 [.630]	18.00 [.709]	20.30 [.799]	17.80 [.700]
11	31.80 [1.252]	20.55 [.809]	20.55 [.809]	12.50 [.492]	15.00 [.590]	M15x1.0-6g 0.100R	16.00 [.630]	18.00 [.709]	20.30 [.799]	17.80 [.700]
13	34.90 [1.374]	25.35 [1.002]	25.35 [1.002]	12.50 [.492]	18.00 [.708]	M18x1.0-6g 0.100R	16.00 [.630]	18.00 [.709]	20.30 [.799]	17.80 [.700]
15	38.10 [1.500]	28.45 [1.120]	28.45 [1.120]	12.50 [.492]	22.00 [.866]	M22x1.0-6g 0.100R	16.00 [.630]	18.00 [.709]	20.30 [.799]	17.80 [.700]
17	41.30 [1.626]	31.90 [1.256]	31.90 [1.256]	12.50 [.492]	25.00 [.984]	M25x1.0-6g 0.100R	16.00 [.630]	18.00 [.709]	20.30 [.799]	17.80 [.700]
19	46.00 [1.811]	34.90 [1.374]	34.90 [1.374]	12.50 [.492]	28.00 [1.102]	M28x1.0-6g 0.100R	16.00 [.630]	18.00 [.709]	20.30 [.799]	17.80 [.700]
21	49.20 [1.937]	37.90 [1.492]	37.90 [1.492]	12.50 [.492]	31.00 [1.220]	M31x1.0-6g 0.100R	16.00 [.630]	18.00 [.709]	21.10 [.829]	17.80 [.700]
23	52.40 [2.063]	41.15 [1.620]	41.15 [1.620]	12.50 [.492]	34.00 [1.338]	M34x1.0-6g 0.100R	16.00 [.630]	18.00 [.709]	21.10 [.829]	17.80 [.700]
25	55.60 [2.189]	44.35 [1.746]	44.35 [1.746]	12.50 [.492]	37.00 [1.457]	M37x1.0-6g 0.100R	16.00 [.630]	18.00 [.709]	21.10 [.829]	17.80 [.700]

* Dimensions are in Milimeters. Values in brackets are Inches equivalents.
* Dimensions subject to change without prior notice.

MIL-C-26482 Series II

These connectors are offered with 20, 16, 12 size contacts, and shell sizes of 8 through 24.

Square flange, jam nut single-hole mount receptacles are available.

The connectors are available with aluminum shells, electroless nickel and cadmium plated olive drab.
Passivated stainless steel shells are also available.

They can mate with non-filtered connectors and they are drop-in replacements for non-filtered connectors.
Non-standard filter connector body sizes and shapes and insert arrangements are available.

Material & Finish

Shell - Aluminum alloy, Olive drab Cadmium plating.
Aluminum alloy, Electroless nickel plating.
Stainless steel, passivated.

Contacts - Copper alloy , Gold plate.

Grommet & O-ring - Silicon based elastomer.

Contacts termination - PCB Tail, Gold plating.
PCB Tail, Tin plating.
Solder cup, Tin plating.

Insert - High grade Thermoplastic \ Thermoset \ Epoxy.

Content of Section

How To Order

B 2 F 14 K 05 P 1 N 06 CC30

FAMILY

- **C-** MIL-C-38999 Page 3
- **B-** MIL-C-26482
- **D-** MIL-C-83723 Page 22

SERIES

- **2-** Series II

SHELL STYLE

- **J-** Jum Nut receptacle
- **W-** Wall Mount receptacle
- **F-** Wall Mount Wide Flange receptacle

SHELL SIZE

Series II - 08-10-12-14-16-18-20-22-24

MATERIAL & FINISH

- **F-** Aluminum Alloy, Electroless Nickel Plating
- **K -** Stainless Steel, Passivated, Corrosion resistant, without Firewall Capability
- **W -** Aluminum Alloy, Olive drab Cadmium Plating.
- **Z -** Aluminum Alloy, Zinc Cobalt Plating.

INSERT ARRANGEMENT

See Page 17

CONTACT STYLE

Regular: **P**-Pin
S-Socket

Hermetically Sealed: **R**-Pin
U-Socket

TERMINATION: See Page 19

1-Solder Cup
2-PCB (Tin Plated)
3-PCB (Gold Plated)

POLARIZATION:

Key Position See Page 18

WORKING VOLTAGE: See Page 28

01	6.3V	07	200V	14	800V
02	10V	08	250V	15	1000V
03	16V	09	300V	16	1500V
04	25V	10	400V	17	2000V
05	50V	11	500V		
06	100V	12	600V		

00 - For filters with diversified voltages
99 - For any configuration that incorporates transient protection

FILTER CODE AND\OR TRANSIENT PROTECTION CODE: see page 32

xxxx - In case where a custom protection is required (diversity of filter types and\or transient protection types) fill XXXX.
Contact sales for customizing.

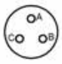
Contact us for filter connectors not included in this catalog

Insert Arrangements Per MIL-STD-1669

Numbering example 0833

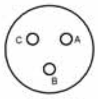
Shell Size

3#20 Insert Arrangement (Contact quantity & Size)


0833
3 #20


0898
3 #20


1006
6 #20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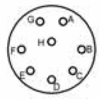
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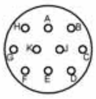
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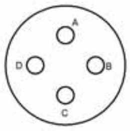
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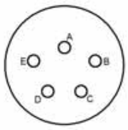
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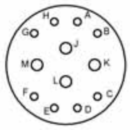
5 #16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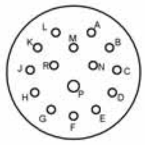
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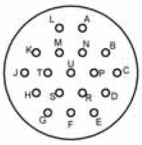
1 #16, 14 #20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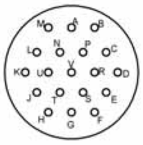
18 #20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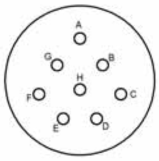
19 #20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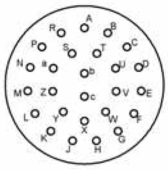
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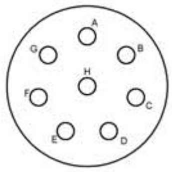
26 #20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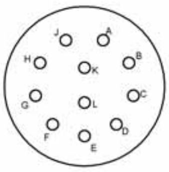
8 #12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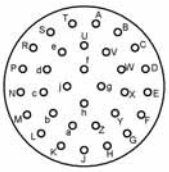
11 #16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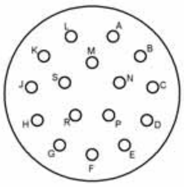
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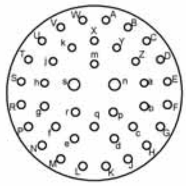
16 #16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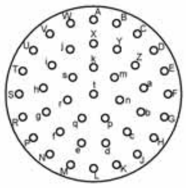
2 #16, 37 #20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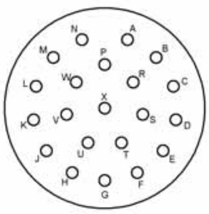
41 #20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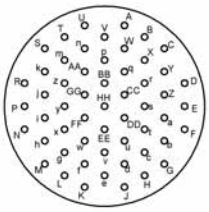
21 #16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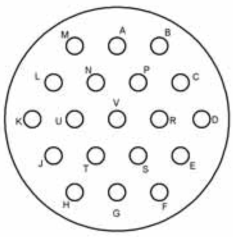
55 #20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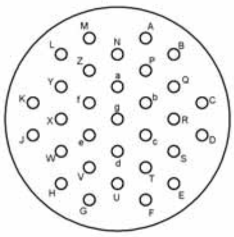
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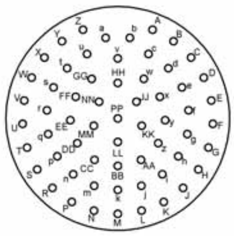
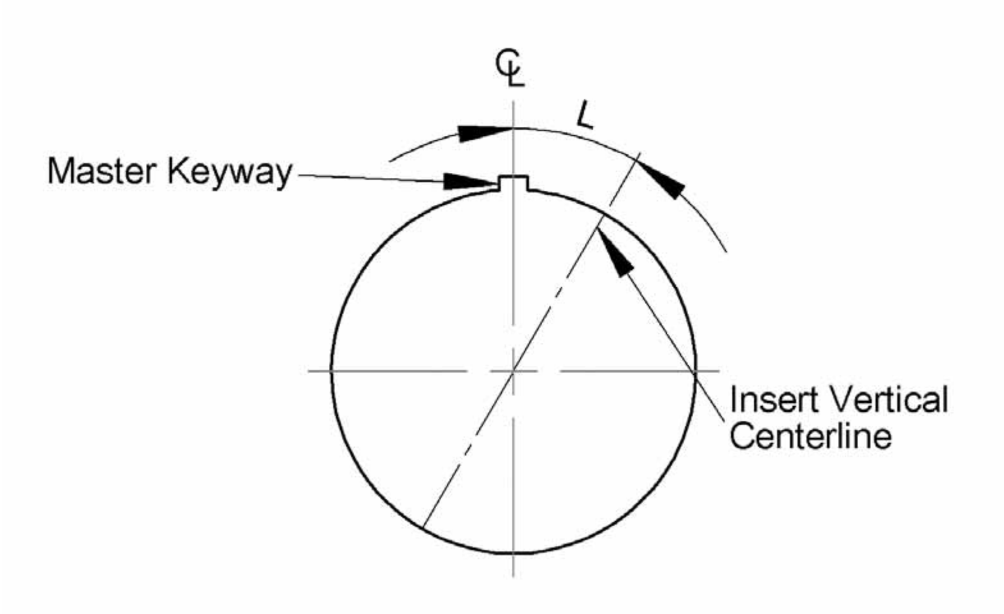
31 #16


2461
61 #20

*Mating face of Pin is Shown, Socket insert is opposite.

Key Position



1. In the Normal insert clocking position (position N) the insert centerline coincides with the centerline of the master keyway of the shell.

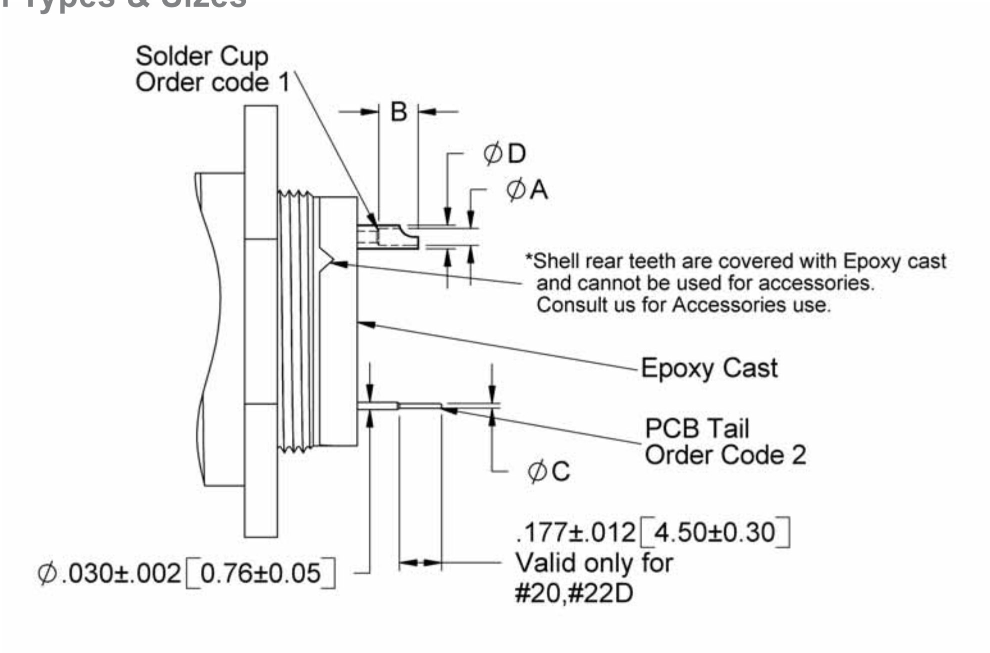
2. In the alternate insert clocking position (W,X,Y,Z) the pin Insert is rotated clockwise relative to the centerline of the master keyway as indicated in the figure and chart. The socket insert is rotated counter-clockwise.

3. Plugs have keys, receptacles have keyways.

Shell size & Insert Arrangement	L Degrees				
	N	W	X	Y	Z
8-33	0	90	-	-	-
8-98	0	-	-	-	-
10-6	0	90	-	-	-
12-3	0	-	-	180	-
12-8	0	90	112	203	292
12-10	0	60	155	270	295
14-4	0	45	-	-	-
14-5	0	40	92	184	273
14-12	0	43	90	-	-
14-15	0	17	110	155	234
14-18	0	15	90	180	270
14-19	0	30	165	315	-
16-8	0	54	152	180	331
16-26	0	60	-	275	338
18-8	0	180	-	-	-
18-11	0	62	119	241	340
18-32	0	85	138	222	265
20-16	0	238	318	333	347
20-39	0	63	144	252	333
20-41	0	45	126	225	-
22-21	0	16	135	175	349
22-55	0	30	142	226	314
24-19	0	30	165	315	-
24-31	0	90	225	255	-
24-61	0	90	180	270	324

The master key is rotated to provide polarization the minor keys remain fixed.
Insert Arrangement does not rotate with the Key/Keyway.

Termination Types & Sizes



Termination Dimensions

* For Extension Dimensions refer to specific shell table in this catalog colums H, T.

Contact Size	#22	#20	#16	#12
Ø A ± .002	.043	.043	.074	.114
[±0.05]	[1.10]	[1.10]	[1.90]	[2.90]
B ± .012	.126	.126	.149	4.20
[±0.30]	[3.20]	[3.20]	[3.80]	[.165]
Ø C ±.002	.002	.002	.046	2.06
[±0.05]	[0.05]	[0.05]	[1.16]	[.081]
Ø D ± .002	.059	.059	.100	3.60
[±0.05]	[1.50]	[1.50]	[2.54]	[.141]

* Consult us regarding special termination lengths and sizes.

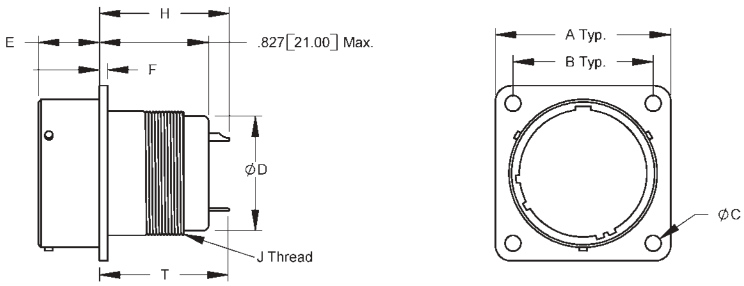
Environmental Conditions

Description	Values	Paragraph PER			
		ISO 2100	ISO 7137	MIL-STD-1334	MIL-STD- 202
Sealing**	<10^{-3} cm^3 / Sec at Δ P = 1atm				
Vibration (Random)	Up to 40g RMS 50-2000Hz	12		2005.1	201,204,215
Vibration (Sine)	Up to 15g PTP 10-2000Hz	12		2005.1	201,204,215
Shock	100g X 11msec		7	2004.1	213
Acceleration	40g	19			
Climatic					103,106
Temperature	-55ºC to +125ºC Operating & Storage				
Humidity	Up to 95% @ Storage Temperature range	18b		1002.2	
Altitude	Up to 70,000 ft	18a	4		
Salt Spray		22		1001.1	101
Sand & Dust		23	12		
Contact Endurance	More than 500 Mating cycles	16			

** For Hermetically sealed connector the sealing conditions are <10^{-5} cm^{-3} / Sec at Δ P = 1atm

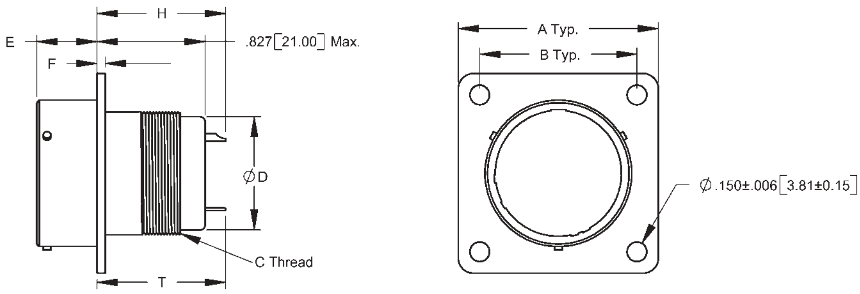
* Dimensions are in Inches. Values in brackets are Millimeters equivalents.
* Dimensions subject to change without prior notice.

B2W Wall Mount Receptacle (MS3470 Compatible)



Shell Size	A Max	B ±.005 [± .13]	Ø C ±0.006 [± .15]	Ø D Max	E Max	F ± .016 [±0.41]	J Thread	H Max		T ± .028 [±0.70]
								#22, #20, #16	#12	
8	.828 [21.04]	.594 [15.09]	.120 [3.04]	.500 [12.70]	.462 [11.73]	.062 [1.57]	1/2-20 UNF	.984 [25.00]	1.063 [27.00]	1.161 [29.50]
10	.954 [24.24]	.719 [18.26]	.120 [3.04]	.625 [15.88]	.462 [11.73]	.062 [1.57]	5/8-20 UNEF	.984 [25.00]	1.063 [27.00]	1.161 [29.50]
12	1.047 [26.60]	.812 [20.62]	.120 [3.04]	.750 [19.05]	.462 [11.73]	.062 [1.57]	3/4-20 UNEF	.984 [25.00]	1.063 [27.00]	1.161 [29.50]
14	1.141 [28.99]	.906 [23.01]	.120 [3.04]	.875 [22.22]	.462 [11.73]	.062 [1.57]	7/8-20 UNEF	.984 [25.00]	1.063 [27.00]	1.161 [29.50]
16	1.234 [31.35]	.969 [24.61]	.120 [3.04]	1.000 [25.40]	.462 [11.73]	.062 [1.57]	1-20 UNEF	.984 [25.00]	1.063 [27.00]	1.161 [29.50]
18	1.328 [33.74]	1.062 [26.97]	.120 [3.04]	1.063 [26.99]	.462 [11.73]	.062 [1.57]	1-1/16-18 UNEF	.984 [25.00]	1.063 [27.00]	1.161 [29.50]
20	1.453 [36.91]	1.156 [29.36]	.120 [3.04]	1.875 [30.16]	.587 [14.91]	.094 [2.39]	1-3/16-18 UNEF	.984 [25.00]	1.063 [27.00]	1.161 [29.50]
22	1.578 [40.09]	1.250 [31.75]	.120 [3.04]	1.3125 [33.34]	.587 [14.91]	.094 [2.39]	1-5/16-18 UNEF	.984 [25.00]	1.063 [27.00]	1.161 [29.50]
24	1.703 [43.26]	1.375 [34.93]	.147 [3.73]	1.4375 [36.51]	.587 [14.91]	.094 [2.39]	1-7/16-18 UNEF	.984 [25.00]	1.063 [27.00]	1.161 [29.50]

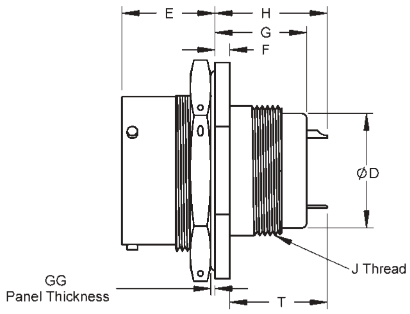
B2F Wall Mount Receptacle Wide Flange (MS3472 Compatible)

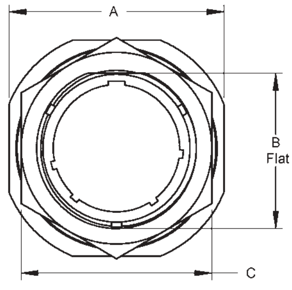


Shell Size	A Max	B ±.005 [± .13]	C Thread	Ø D Max	E Max	F ± .016 [±0.41]	H Max		T ± .028 [±0.70]
							#22, #20, #16	#12	
8	1.065 [27.06]	.734 [18.64]	1/2-20 UNF	.500 [12.70]	.493 [12.52]	.062 [1.57]	1.000 [25.40]	1.079 [27.40]	1.132 [28.75]
10	1.141 [28.99]	.812 [20.62]	5/8-20 UNEF	.625 [15.88]	.493 [12.52]	.062 [1.57]	1.000 [25.40]	1.079 [27.40]	1.132 [28.75]
12	1.266 [32.16]	.938 [23.83]	3/4-20 UNEF	.750 [19.05]	.493 [12.52]	.062 [1.57]	1.000 [25.40]	1.079 [27.40]	1.132 [28.75]
14	1.360 [34.55]	1.031 [26.19]	7/8-20 UNEF	.875 [22.22]	.493 [12.52]	.062 [1.57]	1.000 [25.40]	1.079 [27.40]	1.132 [28.75]
16	1.453 [36.91]	1.125 [28.58]	1-20 UNEF	1.000 [25.40]	.493 [12.52]	.062 [1.57]	1.000 [25.40]	1.079 [27.40]	1.132 [28.75]
18	1.532 [38.92]	1.203 [30.56]	1-1/16-18 UNEF	1.063 [26.99]	.493 [12.52]	.062 [1.57]	1.000 [25.40]	1.079 [27.40]	1.132 [28.75]
20	1.688 [42.88]	1.297 [32.94]	1-3/16-18 UNEF	1.875 [30.16]	.587 [14.91]	.094 [2.39]	1.000 [25.40]	1.079 [27.40]	1.037 [26.35]
22	1.766 [44.86]	1.375 [34.93]	1-5/16-18 UNEF	1.3125 [33.34]	.587 [14.91]	.094 [2.39]	1.000 [25.40]	1.079 [27.40]	1.037 [26.35]
24	1.891 [48.04]	1.500 [38.10]	1-7/16-18 UNEF	1.4375 [36.51]	.587 [14.91]	.094 [2.39]	1.000 [25.40]	1.079 [27.40]	1.000 [25.4]

* Dimensions are in Inches. Values in brackets are Millimeters equivalents.
* Dimensions subject to change without prior notice.

B2J Jam Nut Receptacle (MS3474 Compatible)





Shell Size	A Max	B ±0.13 [± .005]	C Max	Ø D Max	E	F	G Max	GG Max	J Thread	H Max #22, #20, #16	H Max #12	T ± .028 [±0.70]
8	.954 [24.24]	.525 [13.34]	.767 [19.49]	.500 [12.70]	.493 [12.52]	.062 [1.57]	.646 [16.40]	.187 [4.75]	1/2-20 UNF	.787 [20.00]	.886 [22.00]	.917 [23.30]
10	1.078 [27.39]	.650 [16.51]	.892 [22.66]	.625 [15.88]	.493 [12.52]	.062 [1.57]	.646 [16.40]	.187 [4.75]	5/8-20 UNEF	.787 [20.00]	.886 [22.00]	.917 [23.30]
12	1.266 [32.16]	.813 [20.65]	1.079 [27.41]	.750 [19.05]	.493 [12.52]	.062 [1.57]	.646 [16.40]	.187 [4.75]	3/4-20 UNEF	.787 [20.00]	.886 [22.00]	.917 [23.30]
14	1.391 [35.34]	.937 [23.80]	1.205 [30.61]	.875 [22.22]	.493 [12.52]	.062 [1.57]	.646 [16.40]	.187 [4.75]	7/8-20 UNEF	.787 [20.00]	.886 [22.00]	.917 [23.30]
16	1.516 [38.51]	1.061 [26.95]	1.329 [33.76]	1.000 [25.40]	.493 [12.52]	.062 [1.57]	.646 [16.40]	.187 [4.75]	1-20 UNEF	.787 [20.00]	.886 [22.00]	.917 [23.30]
18	1.641 [41.69]	1.186 [30.12]	1.455 [36.96]	1.063 [26.99]	.493 [12.52]	.062 [1.57]	.646 [16.40]	.187 [4.75]	1-1/16-18 UNEF	.787 [20.00]	.886 [22.00]	.917 [23.30]
20	1.828 [46.44]	1.311 [33.30]	1.579 [40.11]	1.875 [30.16]	.587 [14.91]	.094 [2.39]	.581 [14.75]	.250 [6.35]	1-3/16-18 UNEF	.724 [18.40]	.803 [20.40]	.852 [21.65]
22	1.954 [49.64]	1.436 [36.47]	1.705 [43.31]	1.3125 [33.34]	.587 [14.91]	.094 [2.39]	.581 [14.75]	.250 [6.35]	1-5/16-18 UNEF	.724 [18.40]	.803 [20.40]	.852 [21.65]
24	2.078 [52.79]	1.561 [39.65]	1.829 [46.46]	1.4375 [36.51]	.587 [14.91]	.094 [2.39]	.581 [14.75]	.219 [5.56]	1-7/16-18 UNEF	.724 [18.40]	.803 [20.40]	.852 [21.65]

* Dimensions are in Inches. Values in brackets are Millimeters equivalents.
* Dimensions subject to change without prior notice.

MIL-C-83723 Series III

The MIL-C-83723 Series III offers large diversity in one connector group.
The Series III group offers connectors with a bayonet coupling.

A wide selection of configurations includes square flange, jam nut and hermetically sealed receptacles for panel and box mount applications.

These connectors are offered with 2 to 61 contacts of size 20, 16 or 12, and with shell sizes of 8 through 24.

They are available with cadmium or nickel finished aluminum shells. Also available are shells of passivated stainless steel.

The connectors can mate with non-filtered connectors and are drop-in replacements for non-filtered connectors.
Non-standard filter connector body sizes and shapes and insert arrangements are available.

Material & Finish

Shell - Aluminum alloy, Olive drab Cadmium plating.
Aluminum alloy, Electroless nickel plating.
Stainless steel, passivated.

Contacts - Copper alloy , Gold plate.

Grommet & O-ring - Silicon based elastomer.

Contacts termination - PCB Tail, Gold plating.
PCB Tail, Tin plating.
Solder cup, Tin plating.

Insert - High grade Thermoplastic \ Thermoset \ Epoxy.

Content of Section

How To Order

D 3 J 24 W 61 P 1 N 99 YB54

FAMILY

- **C-** MIL-C-38999 Page 3
- **B-** MIL-C-26482 Page 15
- **D-** MIL-C-83723

SERIES

- **3-** Series III

SHELL STYLE

- **J-** Jum Nut receptacle
- **W-** Wall Mount receptacle

SHELL SIZE

Series II - 08-10-12-14-16-18-20-22-24

MATERIAL & FINISH

- **F-** Aluminum Alloy, Electroless Nickel Plating
- **K -** Stainless Steel, Passivated, Corrosion resistant, without Firewall Capability
- **W -** Aluminum Alloy, Olive drab Cadmium Plating.
- **Z -** Aluminum Alloy, Zinc Cobalt Plating.

INSERT ARRANGEMENT

See Page 24

CONTACT STYLE

Regular: **P**-Pin
S-Socket

Hermetically Sealed: **R**-Pin
U-Socket

TERMINATION: See Page 26

- **1**-Solder Cup
- **2**-PCB (Tin Plated)
- **3**-PCB (Gold Plated)

POLARIZATION:

Key Position See Page 25

WORKING VOLTAGE: See Page 28

01	6.3V	07	200V	14	800V
02	10V	08	250V	15	1000V
03	16V	09	300V	16	1500V
04	25V	10	400V	17	2000V
05	50V	11	500V		
06	100V	12	600V		

00 - For filters with diversified voltages
99 - For any configuration that incorporates transient protection

FILTER CODE AND\OR TRANSIENT PROTECTION CODE: see page 32

xxxx - In case where a custom protection is required (diversity of filter types and\or transient protection types) fill XXXX.
Contact sales for customizing.

Contact us for filter connectors not included in this catalog

www.rfimmunity.co.il
sales@rfimmunity.co.il

Insert Arrangements Per MIL-STD-1554

Numbering example 0802

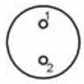
Shell Size

3#20

Insert Number
(Contact quantity & Size)


0803
3 #20

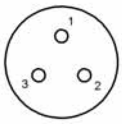

0898
3 #20

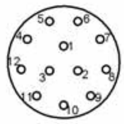

1002
2 #20

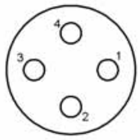

1005
5 #20

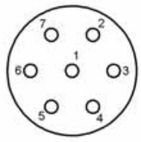

1006
6 #20

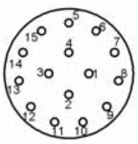

1020
2 #16


1203
3 #16


1212
12 #20


1404
4 #12


1407
7 #16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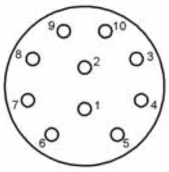
15 #20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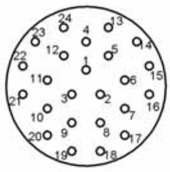
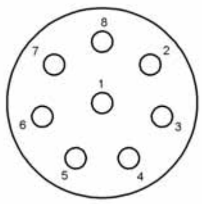
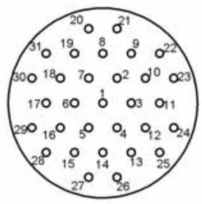
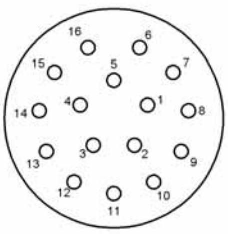
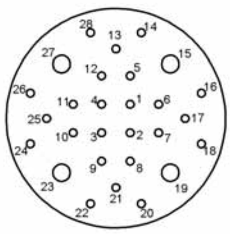
10 #16

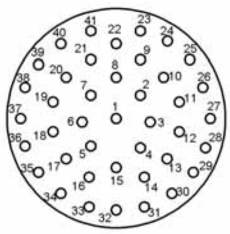

1624
20 #20

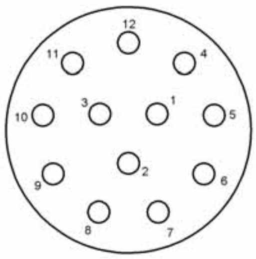

1808
8 #12

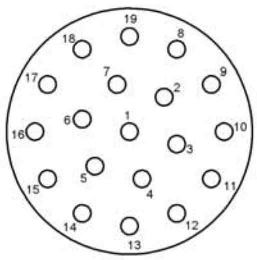

1831
31 #20

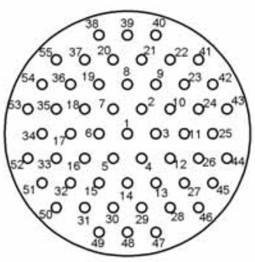

2016
16 #16

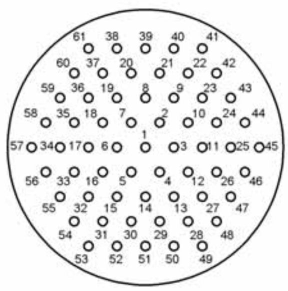

2028
24 #20, 4 #12


2041
41 #20


2212
12 #12

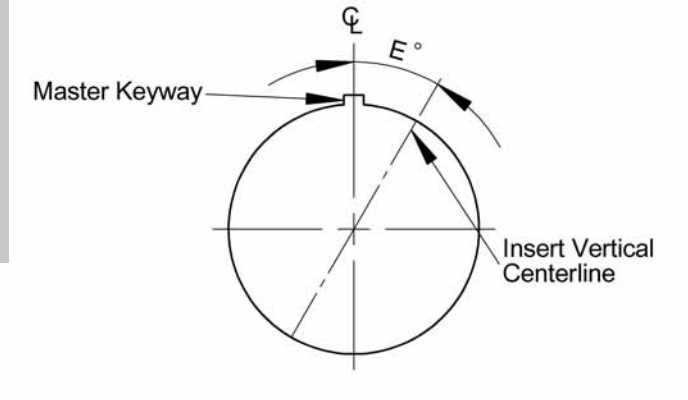

2219
19 #16

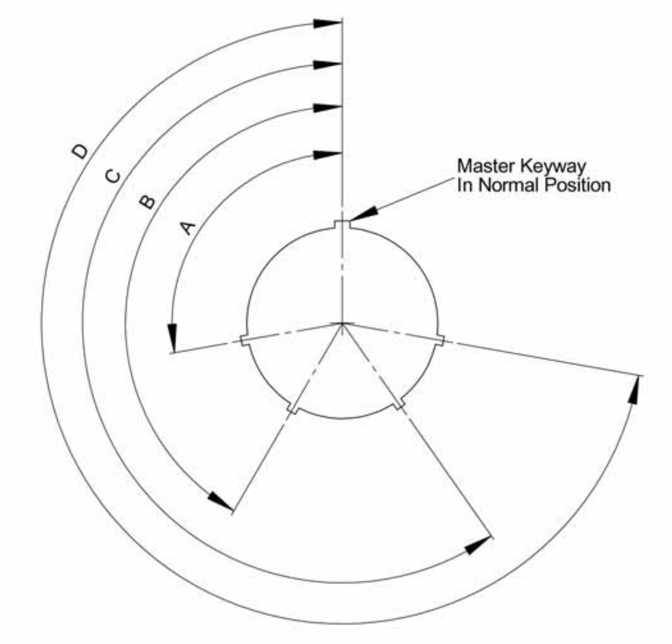

2255
55 #20


2461
61 #20

*Mating face of Pin is Shown, Socket insert is opposite.

Key Position





Insert Clocking Per MIL-STD-1554

Shell Size	Polarizing Position	A	B	C	D	Insert Position E
8,10	N	105	140	215	265	0
	1*	105	140	215	265	10
	2*	105	140	215	265	20
	3*	105	140	215	265	30
	4*	105	140	215	265	40
	5*	105	140	215	265	50
12 Thru 24	N	105	140	215	265	0
	1*	105	140	215	265	10
	2*	105	140	215	265	20
	3*	105	140	215	265	30
	4*	105	140	215	265	40
	5*	105	140	215	265	50

Keying Position Per MIL-STD-1554

Shell Size	Polarizing Position	A	B	C	D	Insert Position E
8 Thru 24	N	105	140	215	265	0
8 & 10	6	102	132	248	320	0
	7	80	118	230	312	0
	8	35	140	205	275	0
	9	64	155	234	304	0
10 Only	Y	25	115	220	270	0
12 Thru 24	6	18	149	192	259	0
	7	92	152	222	342	0
	8	84	152	204	334	0
	9	24	135	199	240	0
	Y	98	152	268	338	0

* Position 1 thru 5 inactive for new design, (Ref MIL-STD-1554).

1. In the “normal insert position” (position N) the insert centerline coincides with the centerline of the master keyway of the shell.

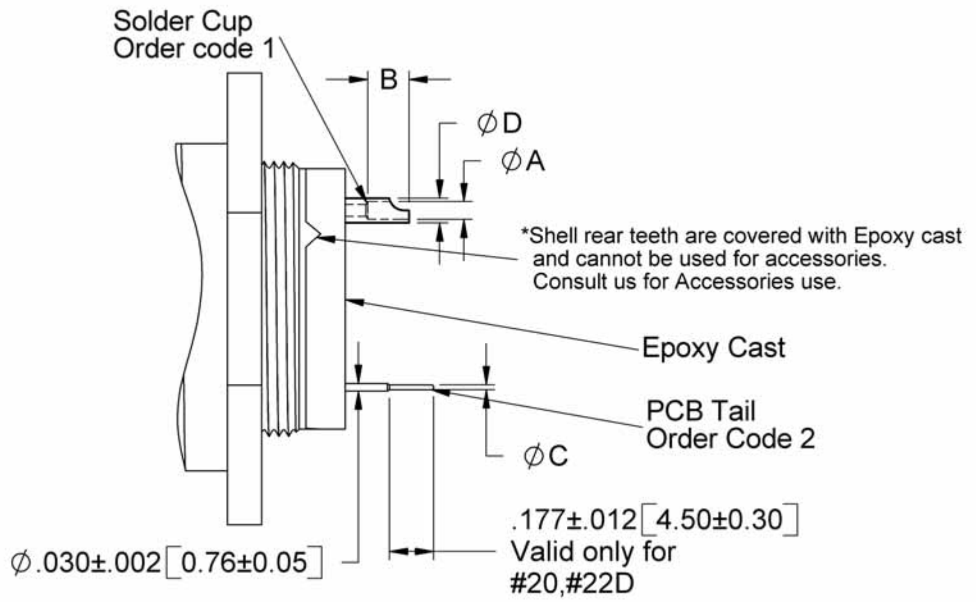
2. In the “alternate insert position” (1,2,3,4 & 5) the socket insert is rotated clockwise relative to the centerline of the master keyway as indicated in the figure and chart. The pin insert is rotated counter-clockwise.

3. Alternate polarizing positions 1,2,3,4 & 5 are for interchangeability use only. Not recommended for new design, per MIL-C-83723.

4. In the “alternate keying position” (positions 6, 7, 8, 9 & Y) the keyways are positioned as specified in the “Keying position” table with respect to the master keyway as shown in the drawing.

5. When the alternate keying position is used the insert clocking is always in the normal position.

Termination Types



Termination Dimensions

* For Extension Dimensions refer to specific shell table in this catalog coulums H, T.

Contact Size	#22	#20	#16	#12
Ø A ± .002 [±0.05]	.043 [1.10]	.043 [1.10]	.074 [1.90]	.114 [2.90]
B ± .012 [±0.30]	.126 [3.20]	.126 [3.20]	.149 [3.80]	4.20 [.165]
Ø C ±.002 [±0.05]	.002 [0.05]	.002 [0.05]	.046 [1.16]	2.06 [.081]
Ø D ± .002 [±0.05]	.059 [1.50]	.059 [1.50]	.100 [2.54]	3.60 [.141]

* Consult us regarding special termination lengths and sizes.

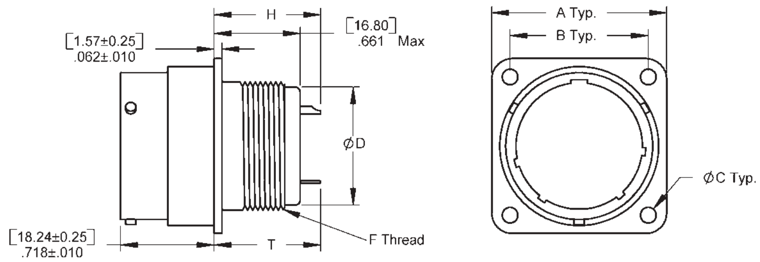
Environmental Conditions

		Paragraph PER			
Description	Values	ISO 2100	ISO 7137	MIL-STD-1334	MIL-STD- 202
Sealing**	$<10^{-3}$ cm^3 / Sec at Δ P = 1atm				
Vibration (Random)	Up to 40g RMS 50-2000Hz	12		2005.1	201,204,215
Vibration (Sine)	Up to 15g PTP 10-2000Hz	12		2005.1	201,204,215
Shock	100g X 11msec		7	2004.1	213
Acceleration	40g	19			
Climatic					103,106
Temperature	-55ºC to +125ºC Operating & Storage				
Humidity	Up to 95% @ Storage Temperature range	18b		1002.2	
Altitude	Up to 70,000 ft	18a	4		
Salt Spray		22		1001.1	101
Sand & Dust		23	12		
Contact Endurance	More than 500 Mating cycles	16			

** For Hermetically sealed connector the sealing conditions are $<10^{-5}$ cm^{-3} / Sec at Δ P = 1atm

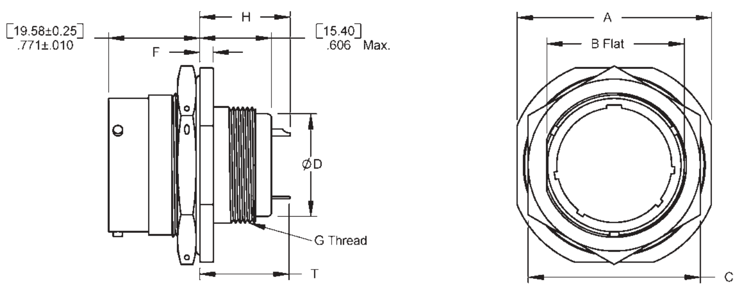
* Dimensions are in Inches. Values in brackets are Millimeters equivalents.
* Dimensions subject to change without prior notice.

D3W Wall Mount Receptacle (MS83723 71 & 72 Compatible)



Shell Size	A ±0.13 [± .005]	B ±0.13 [± .005]	Ø C ±0.13 [± .005]	Ø D Max	F Thread	H Max #22, #20, #16	H Max #12	T ± .028 [±0.70]
8	.812 [20.62]	.594 [15.09]	.120 [3.05]	.500 [12.70]	1/2-20 UNEF	20.30 [.799]	.878 [22.30]	.965 [24.51]
10	.937 [23.80]	.719 [18.26]	.120 [3.05]	.625 [15.86]	5/8-20 UNEF	20.30 [.799]	.878 [22.30]	.965 [24.51]
12	1.031 [26.19]	.812 [20.62]	.120 [3.05]	.750 [19.05]	3/4-20 UNEF	20.30 [.799]	.878 [22.30]	.965 [24.51]
14	28.58 [1.125]	.906 [23.01]	.120 [3.05]	.875 [22.23]	7/8-20 UNEF	20.30 [.799]	.878 [22.30]	.965 [24.51]
16	1.250 [31.75]	.969 [24.61]	.120 [3.05]	1.000 [25.40]	1-20 UNEF	20.30 [.799]	.878 [22.30]	.965 [24.51]
18	1.343 [34.11]	1.062 [26.97]	.120 [3.05]	1.063 [27.00]	1-1/16-18 UNEF	20.30 [.799]	.878 [22.30]	.965 [24.51]
20	1.437 [36.50]	1.156 [29.36]	.120 [3.05]	1.188 [30.16]	1-3/16-18 UNEF	20.30 [.799]	.878 [22.30]	.965 [24.51]
22	1.562 [39.67]	1.250 [31.75]	.120 [3.05]	1.313 [33.34]	1-5/16-18 UNEF	20.30 [.799]	.878 [22.30]	.965 [24.51]
24	1.703 [43.26]	1.375 [34.93]	.149 [3.78]	1.438 [36.51]	1-7/16-18 UNEF	20.30 [.799]	.878 [22.30]	.965 [24.51]

D3J Jam Nut Receptacle (MS83723 73 & 74 Compatible)



Shell Size	A Max	B Flat	C Max	Ø D Max	F	G Thread	H Max #22, #20, #16	H Max #12	T ± .028 [±0.70]
8	.596/.590 [15.14/14.99]	.979 [24.87]	.829 [21.06]	.500 [12.70]	.137/.097 [3.48/2.46]	1/2-20 UNEF	.744 [18.90]	.823 [20.90]	.912 [23.17]
10	.721/.715 [18.03/18.16]	1.104 [28.05]	.954 [24.24]	.625 [15.86]	.137/.097 [3.48/2.46]	5/8-20 UNEF	.744 [18.90]	.823 [20.90]	.912 [23.17]
12	.908/.902 [23.06/22.91]	1.291 [32.80]	1.142 [29.01]	.750 [19.05]	.137/.097 [3.48/2.46]	3/4-20 UNEF	.744 [18.90]	.823 [20.90]	.912 [23.17]
14	.971/.965 [24.66/24.51]	1.391 [35.34]	1.205 [30.61]	.875 [22.23]	.137/.097 [3.48/2.46]	7/8-20 UNEF	.744 [18.90]	.823 [20.90]	.912 [23.17]
16	1.096/1.090 [27.84/27.69]	1.516 [38.51]	1.329 [33.76]	1.000 [25.40]	.137/.097 [3.48/2.46]	1-20 UNEF	.744 [18.90]	.823 [20.90]	.912 [23.17]
18	1.220/1.214 [30.99/30.84]	1.641 [41.69]	1.455 [36.96]	1.063 [27.00]	.137/.097 [3.48/2.46]	1-1/16-18 UNEF	.744 [18.90]	.823 [20.90]	.912 [23.17]
20	1.345/1.339 [34.16/34.01]	1.766 [44.86]	1.579 [40.11]	1.188 [30.16]	.137/.097 [3.48/2.46]	1-3/16-18 UNEF	.744 [18.90]	.823 [20.90]	.912 [23.17]
22	1.470/1.464 [37.34/34.01]	1.954 [49.64]	1.705 [43.31]	1.313 [33.34]	.169/.128 [4.28/3.25]	1-5/16-18 UNEF	.744 [18.90]	.823 [20.90]	.912 [23.17]
24	1.595/1.589 [40.51/40.36]	2.079 [52.81]	1.829 [46.46]	1.438 [36.51]	.169/.128 [4.28/3.25]	1-7/16-18 UNEF	.744 [18.90]	.823 [20.90]	.912 [23.17]

* Dimensions are in Inches. Values in brackets are Millimeters equivalents.
* Dimensions subject to change without prior notice.

Electrical Characteristics Per Insert Arrangement

This section describes the correlation between the maximum capacitance, the filter rated operating voltage and the connector insert arrangement . It also deals with the applicability of the transient protection with each insert arrangement. The tables in the following pages (29-31) summarize this information.

These tables (pages 29-31) can be used in two ways:

- Once a connector family, shell style and an insert arrangement are selected, and using these tables, the capacitance limits and the operating voltage can be extracted, and the transient protection applicability can be determined, all in relation to the selected filter and connector types.
- Once the correct filter and/or transient protection are selected, and using these tables the complying insert arrangement can be determined to meet the design requirements.

Homogenous Rated Operating Voltage Codes

Code	01	02	03	04	05	06	07	08	09	10	11	12	14	15	16	17
WV [V_{DC}]	6.3	10	16	25	50	100	200	250	300	400	500	600	800	1k	1.5k	2k

Combined Rated Operating Voltage Codes

Code	
00	99
For filters with Diversified Working Voltages	For any configuration that incorporates Transient Protection

Note: Fill one of the above mentioned codes in the relevant sections of the filtered connector P/N.

Content of Section

Insert Arrangement VS. Working Voltage and Maximum Capacitance of the Filter

Transient Protection Applicability		MIL-C-38999/ I & III Insert Arrangement	Filter Type VS. Working Voltage and Maximum Capacitance				
0.1J	0.3J		C nF	C² nF	L nF	π nF	WV
Yes	No	09-35, 11-35, 13-35, 15-35, 17-02 (#20 contacts & #8 coax contact) , 17-35, 19-35, 21-35, 23-35, 25-07, 25-35 And Similar Insert Arrangements of MIL-C-38999/II	1µ	2µ	1µ	2µ	6.3V
			330	660	330	660	10V
			150	300	150	300	16V
			150	300	150	300	25V
			100	200	100	200	50V
			22	44	22	44	100V
			10	20	10	20	200V
			6.8	13.6	6.8	13.6	250V
							300V
							400V
							500V
							600V
							800V
							1KV
Yes	Yes	09-98, 11-05, 11-98, 13-98,15-18, 15-19, 15-97(#20 contacts), 17-02 (#8 PWR contact), 17-26, 19-28 (#20 contacts), 19-32, 21-39 (#20 contacts), 23-53, 23-55, 25-04, 25-46, 25-61 And Similar Insert Arrangements of MIL-C-38999/II	1µ	2µ	1µ	2µ	6.3V
			470	940	470	940	10V
			470	940	470	940	16V
			220	440	220	440	25V
			100	200	100	200	50V
			68	136	68	136	100V
			33	66	33	66	200V
			27	54	27	54	250V
			15	30	15	30	300V
			12	24	12	24	400V
			12	24	12	24	500V
			8.2	16.4	8.2	16.4	600V
			4.7	9.4	4.7	9.4	800V
			2.7	5.4	2.7	5.4	1KV
Yes	Yes	13-04, 15-05, 15-97 (#16 contacts), 17-06, 19-28, 21-11, 23-21, 25-29 And Similar Insert Arrangements of MIL-C-38999/II	10µ	20µ	10µ	20µ	6.3V
			4.7µ	9.4µ	4.7µ	9.4µ	10V
			2.2µ	4.4µ	2.2µ	4.4µ	16V
			1µ	2µ	1µ	2µ	25V
			470	940	470	940	50V
			180	360	180	360	100V
			100	200	100	200	200V
			68	136	68	136	250V
			47	94	47	94	300V
			27	54	27	54	400V
			33	66	33	66	500V
			18	36	18	36	600V
			10	20	10	20	800V
			6.8	13.6	6.8	13.6	1KV
			2.2	4.4	2.2	4.4	1.5KV
			1.5	3	1.5	3	2KV
Yes	Yes	21-75 And Similar Insert Arrangement of MIL-C-38999/II	10µ	20µ	10µ	20µ	6.3V
			4.7µ	9.4µ	4.7µ	9.4µ	10V
			2.2µ	4.4µ	2.2µ	4.4µ	16V
			1µ	2µ	1µ	2µ	25V
			1µ	2µ	1µ	2µ	50V
			330	660	330	660	100V
			180	360	180	360	200V
			120	240	120	240	250V
			82	164	82	164	300V
			68	136	68	136	400V
			68	136	68	136	500V
			39	78	39	78	600V
			27	54	27	54	800V
			18	36	18	36	1KV
			6.8	13.6	6.8	13.6	1.5KV
			6.8	13.6	6.8	13.6	2KV

Insert Arrangement VS. Working Voltage and Maximum Capacitance of the Filter

Transient Protection Applicability		MIL-C-26482/II Insert Arrangement	Filter Type VS. Working Voltage and Maximum Capacitance				
0.1J	0.3J		C	C²	L	π	WV
			nF	nF	nF	nF	
Yes	Yes	08-98, 08-33, 10-06, 12-08, 12-10, 14-12 (#20 contacts), 14-15 (#20 contacts), 14-18, 14-19, 16-26 18-32, 20-39(#20 contacts) 20-41,22-55, 24-61	1µ	2µ	1µ	2µ	6.3V
			470	940	470	940	10V
			470	940	470	940	16V
			220	440	220	440	25V
			100	200	100	200	50V
			68	136	68	136	100V
			33	66	33	66	200V
			27	54	27	54	250V
			15	30	15	30	300V
			12	24	12	24	400V
			12	24	12	24	500V
			8.2	16.4	8.2	16.4	600V
			4.7	9.7	4.7	9.7	800V
			2.7	5.4	2.7	5.4	1KV
Yes	Yes	12-03, 14-05, 14-12 (#16 contacts), 14-15 (#16 contacts), 16-08, 18-08 18-11, 20-16, 20-39 (#16 contacts), 22-21, 24-19,24-31	10µ	20µ	10µ	20µ	6.3V
			4.7µ	9.4µ	4.7µ	9.4µ	10V
			2.2µ	4.4µ	2.2µ	4.4µ	16V
			1µ	2µ	1µ	2µ	25V
			470	940	470	940	50V
			180	360	180	360	100V
			100	200	100	200	200V
			68	136	68	136	250V
			47	94	47	94	300V
			27	54	27	54	400V
			33	66	33	66	500V
			18	36	18	36	600V
			18	36	18	36	800V
			6.8	13.6	6.8	13.6	1KV
			2.2	4.4	2.2	4.4	1.5KV
			1.5	3	1.5	3	2KV
Yes	Yes	14-04	10µ	20µ	10µ	20µ	6.3V
			4.7µ	9.4µ	4.7µ	9.4µ	10V
			2.2µ	4.4µ	2.2µ	4.4µ	16V
			1µ	2µ	1µ	2µ	25V
			1µ	2µ	1µ	2µ	50V
			330	660	330	660	100V
			180	360	180	360	200V
			120	240	120	240	250V
			82	164	82	164	300V
			68	136	68	136	400V
			68	136	68	136	500V
			39	78	39	78	600V
			27	54	27	54	800V
			18	36	18	36	1KV
			6.8	13.6	6.8	13.6	1.5KV
			6.8	13.6	6.8	13.6	2KV

Insert Arrangement VS. Working Voltage and Maximum Capacitance of the Filter

Transient Protection Applicability		MIL-C-83723/III Insert Arrangement	Filter Type VS. Working Voltage and Maximum Capacitance				
0.1J	0.3J		C	C^2	L	π	WV
			nF	nF	nF	nF	
Yes	Yes	08-03, 08-98, 10-05, 10-06, 12-12, 14-15, 16-24, 18-31,20-28, 20-41, 22-55, 24-61	1μ	2μ	1μ	2μ	6.3V
			470	940	470	940	10V
			470	940	470	940	16V
			220	440	220	440	25V
			100	200	100	200	50V
			68	136	68	136	100V
			33	66	33	66	200V
			27	54	27	54	250V
			15	30	15	30	300V
			12	24	12	24	400V
			12	24	12	24	500V
			8.2	16.4	8.2	16.4	600V
			4.7	9.7	4.7	9.7	800V
			2.7	5.4	2.7	5.4	1KV
Yes	Yes	14-07, 16-10,18-08, 18-14, 20-16, 22-19	10μ	20μ	10μ	20μ	6.3V
			4.7μ	9.4μ	4.7μ	9.4μ	10V
			2.2μ	4.4μ	2.2μ	4.4μ	16V
			1μ	2μ	1μ	2μ	25V
			470	940	470	940	50V
			180	360	180	360	100V
			100	200	100	200	200V
			68	136	68	136	250V
			47	94	47	94	300V
			27	54	27	54	400V
			33	66	33	66	500V
			18	36	18	36	600V
			18	36	18	36	800V
			6.8	13.6	6.8	13.6	1KV
			2.2	4.4	2.2	4.4	1.5KV
			1.5	3	1.5	3	2KV
Yes	Yes	10-02, 10-20, 12-03, 14-04, 22-12	10μ	20μ	10μ	20μ	6.3V
			4.7μ	9.4μ	4.7μ	9.4μ	10V
			2.2μ	4.4μ	2.2μ	4.4μ	16V
			1μ	2μ	1μ	2μ	25V
			1μ	2μ	1μ	2μ	50V
			330	660	330	660	100V
			180	360	180	360	200V
			120	240	120	240	250V
			82	164	82	164	300V
			68	136	68	136	400V
			68	136	68	136	500V
			39	78	39	78	600V
			27	54	27	54	800V
			18	36	18	36	1KV
			6.8	13.6	6.8	13.6	1.5KV
			6.8	13.6	6.8	13.6	2KV

The unique technology of RF Immunity enables the integration of a variety of filter types and a diversity of transient protections, into a single filtered connector.

This section of the catalog presents the electrical characteristics of the available filters and transient protections and their Filter Codes. If you select identical filters, transient protections or a combination of these two for all contacts, fill in the Filter Code into the P/N.

The Filter Codes are applicable only when the same filter type is used for all the connector contacts.
If selected, a customized combination of filters and/or transient protections cannot be coded for the P/N by the customer. For such P/N replace the P/N filter code with XXXX and contact the sales department.

Five filter types (C, C², L, J and π) and two transient protection types (0.1J and 0.3J), and the combinations of all filter types with all transient protection types are characterized in this section. For explanations regarding the selection of the most appropriate filter, please refer to the Design Notes (page 71).

General electrical characteristics

Working Voltage (WV) [V_{DC}]	A variety of operating voltages can be selected, **from 6.3V_{DC} up to 2000V_{DC}**. Note that the operating voltage limits the capacitance of the filter. Both the filter capacitance and operating Voltage correlate to the selected insert arrangement of the connector. Refer to the Electrical Characteristics VS. Insert Arrangement section (page 28).				
Dielectric Withstanding Voltage (DWV)	WV<200V_{DC}		DWV - 250%		
	201 V_{DC} <WV<500 V_{DC}		DWV - 150%		
	WV>500 V_{DC}		DWV - 120%		
Insulation Resistance	25ºC		500ΩF		
	125ºC		50ΩF		
I [A]	#22 Contact	20# Contact	#16 Contact	#12 Contact	#8 Contact
	5	7.5	13	23	35

The structure of this section and the use of the following **Frequency Range VS. Filter Type and Page Number** table and of the **Content of Section**, enables the designer to quickly and easily select the correct filter, transient protection or the combination of both.

Frequency Range VS. Filter Type and Page Number

Frequency Range	Filter Cutoff Frequency	Page			
		C Filter (1) (2)	C² Filter (1) (2)	L&J Filter (1) (3)	π Filter (1)
VHF and UHF 300MHz ≤ f ≤ 3GHz	f_{co} ≥ 30MHz	33	38	43	48
HF 3MHz ≤ f ≤ 30MHz	f_{co} ≥ 3MHz	34	39	44	49
MF 300KHz ≤ f ≤ 3MHz	f_{co} ≥ 300KHz	35	40	45	50
LF 30KHz ≤ f ≤ 300KHz	f_{co} ≥ 30KHz	36	41	46	51
AUDIO f ≤ 30KHz	f_{co} < 30KHz	37	42	47	52

Note: For other filter topologies, e.g. Double L&J, Hi (Double π), T and Double T, contact the sales department.

(1) Refer to the Design Notes (page 71) for explanation regarding the differences between these filter topologies and for equivalent circuits.
(2) Both C and C² type Filters, have a C type filter topology . The C² type filter provides higher attenuation.
(3) J type filters have the same topology as L type filter. Refer to the illustrated description on page 75 for details related to the differences between the two.

Content of Section

C Filter

Audio	LF	MF	HF	VHF	UHF
$f \leq$ 30KHz	30KHz $\leq f \leq$ 300KHz	300KHz $\leq f \leq$ 3MHz	3MHz $\leq f \leq$ 30MHz	30MHz $\leq f \leq$ 300MHz	300MHz $\leq f \leq$ 3GHz

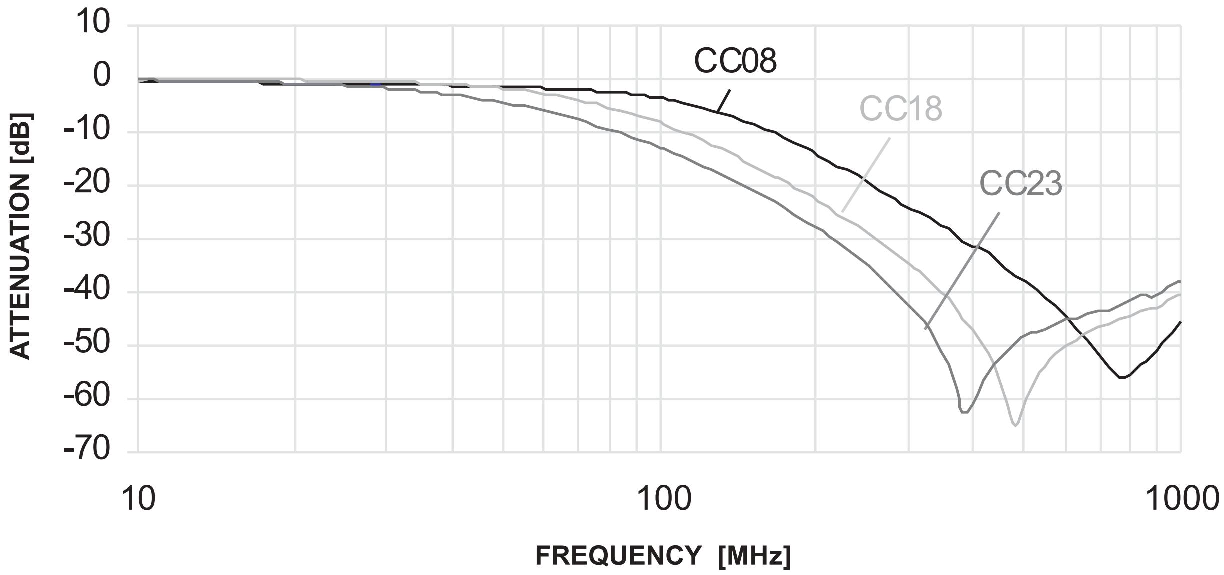
Typical cutoff frequency (-3dB) $f_{co} \geq$ 30MHz .

Minimum Attenuation

Filter Code	Typical Cap. [pF] (2)	f_{co} [MHz] Typical (3)	Min. Attenuation [dB] VS. Frequency [MHz] (1)								
			1	5	10	30	50	100	300	500	1000
CC08	47	92	0	0	0	0	0	0	19	32	37
CC18	120	62	0	0	0	0	0	2	27	54	30
CC23	180	40	0	0	0	0	1	7	37	43	29

(1) Measured in 50Ω system according to MIL-STD -220, no load.
(2) Capacitance tolerance: ±20%. For other capacitor values, contact the sales.
(3) For estimation of the filter cut off frequency in non-50Ω system please refer to the design notes.

Typical measured filter attenuation



Note: All filters characteristics subject to change without prior notice

C Filter

Audio	LF	MF	HF	VHF	UHF
$f \leq$ 30KHz	30KHz $\leq f \leq$ 300KHz	300KHz $\leq f \leq$ 3MHz	3MHz $\leq f \leq$ 30MHz	30MHz $\leq f \leq$ 300MHz	300MHz $\leq f \leq$ 3GHz

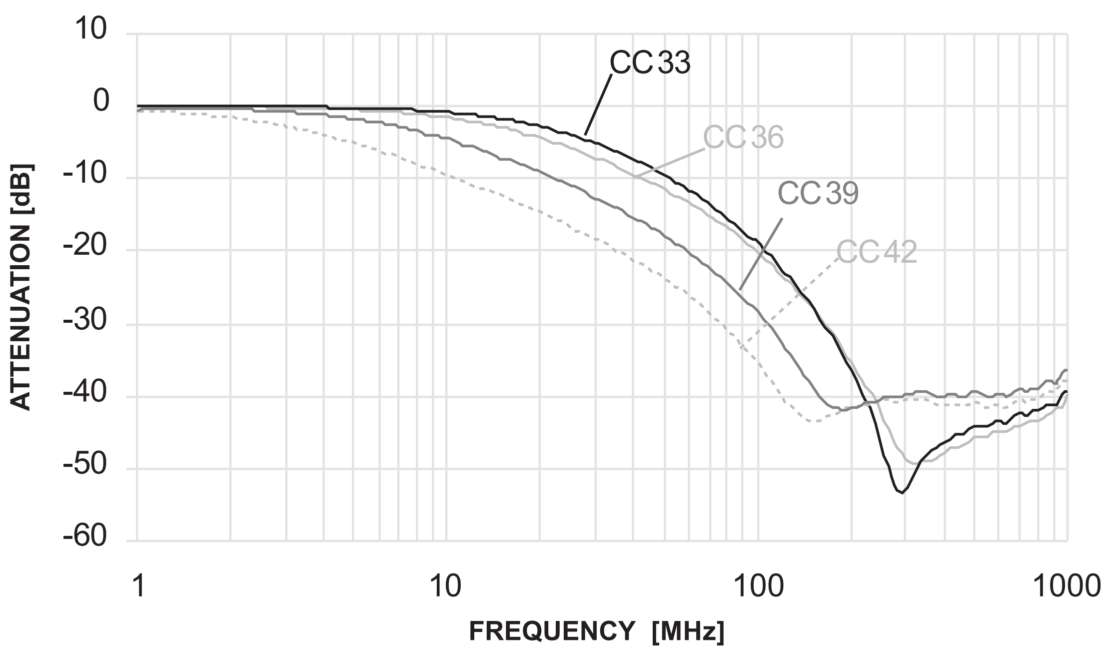
Typical cutoff frequency (-3dB) $f_{co} \geq$ 3MHz .

Minimum Attenuation

Filter Code	Typical Cap. [pF] (2)	f_{co} [MHz] Typical (3)	Min. Attenuation [dB] VS. Frequency [MHz] (1)								
			1	5	10	30	50	100	300	500	1000
CC33	330	20.00	0	0	0	2	6	13	44	37	28
CC36	470	15.20	0	0	0	4	8	14	43	40	31
CC39	1000	7.30	0	0	1	9	14	22	34	33	26
CC42	2200	3.19	0	2	6	15	20	30	34	34	28

(1) Measured in 50Ω system according to MIL-STD -220, no load.
(2) Capacitance tolerance: ±20%. For other capacitor values, contact the sales.
(3) For estimation of the filter cut off frequency in non-50Ω system please refer to the design notes.

Typical measured filter attenuation



Note: All filters characteristics subject to change without prior notice

C Filter

Audio	LF	MF	HF	VHF	UHF
$f \leq$ 30KHz	30KHz $\leq f \leq$ 300KHz	300KHz $\leq f \leq$ 3MHz	3MHz $\leq f \leq$ 30MHz	30MHz $\leq f \leq$ 300MHz	300MHz $\leq f \leq$ 3GHz

Typical cutoff frequency (-3dB) $f_{co} \geq$ 300KHz .

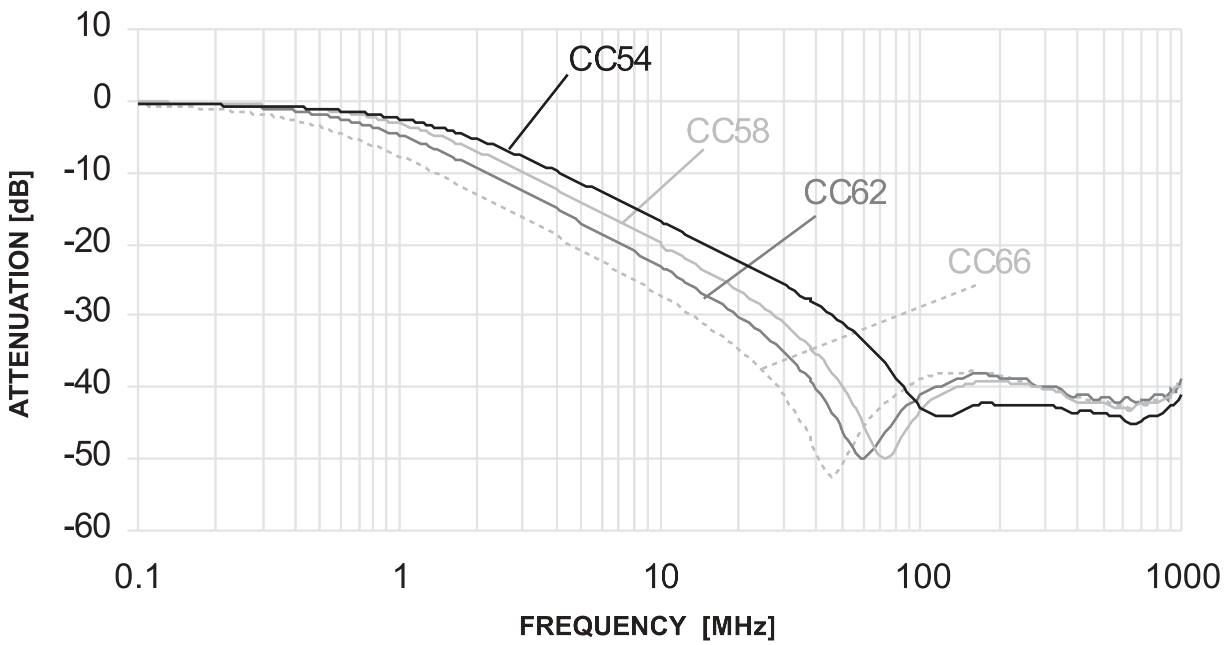
Minimum Attenuation

Filter Code	Typical Cap. [nF] (2)	f_{co} [MHz] Typical (3)	Min. Attenuation [dB] VS. Frequency [MHz] (1)								
			1	5	10	30	50	100	300	500	1000
CC54	4.7	1.180	0	9	13	22	28	37	37	37	33
CC58	6.8	0.925	0	11	16	27	35	37	34	36	30
CC62	10	0.695	2	15	20	32	43	36	35	36	30
CC66	15	0.420	5	18	23	37	46	32	33	34	28

(1) Measured in 50Ω system according to MIL-STD -220, no load.
(2) Capacitance tolerance: ±20%. For other capacitor values, contact the sales.
(3) For estimation of the filter cut off frequency in non-50Ω system please refer to the design notes.

C Filter

Typical measured filter attenuation



Note: All filters characteristics subject to change without prior notice

C Filter

Audio	LF	MF	HF	VHF	UHF
$f \leq$ 30KHz	30KHz $\leq f \leq$ 300KHz	300KHz $\leq f \leq$ 3MHz	3MHz $\leq f \leq$ 30MHz	30MHz $\leq f \leq$ 300MHz	300MHz $\leq f \leq$ 3GHz

Typical cutoff frequency (-3dB) $f_{co} \geq$ 30KHz .

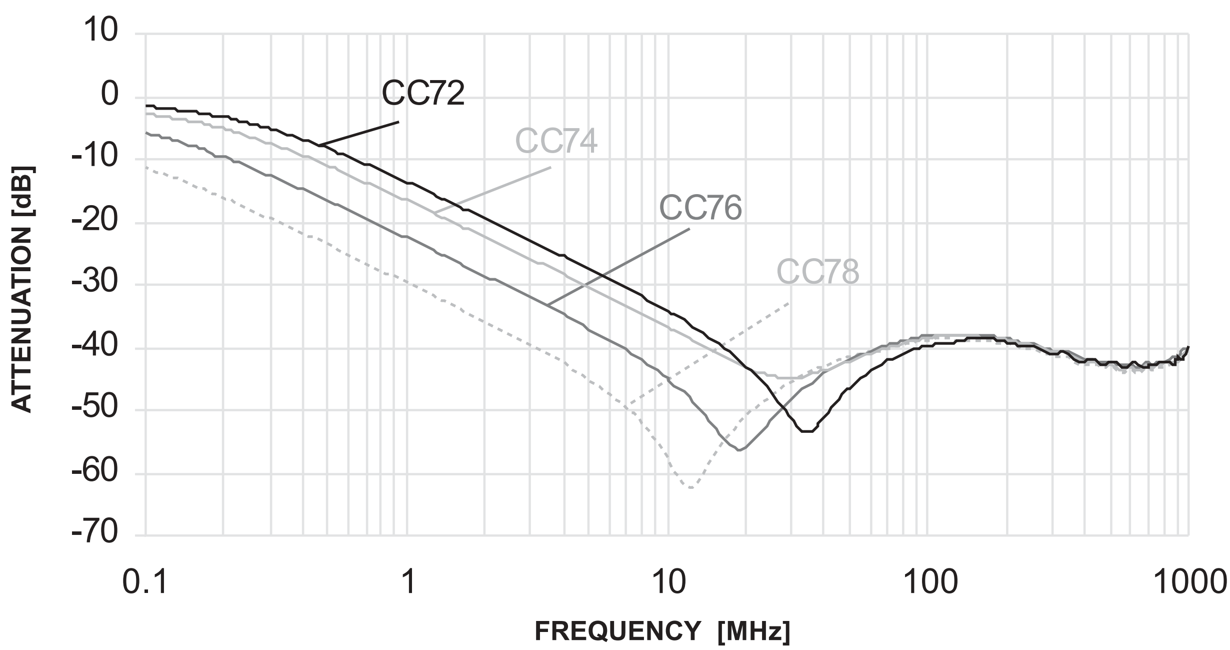
Minimum Attenuation

Filter Code	Typical Cap. [nF] (2)	f_{co} [KHz] Typical (3)	Min. Attenuation [dB] VS. Frequency [MHz] (1)								
			1	5	10	30	50	100	300	500	1000
CC72	33	182	11	25	31	48	43	34	36	37	32
CC74	47	109	14	28	33	40	38	32	34	36	31
CC76	100	63	20	34	40	43	38	33	35	37	32
CC78	220	30	27	42	53	41	38	33	35	36	31

(1) Measured in 50Ω system according to MIL-STD -220, no load.
(2) Capacitance tolerance: ±20%. For other capacitor values, contact the sales.
(3) For estimation of the filter cut off frequency in non-50Ω system please refer to the design notes.

C Filter

Typical measured filter attenuation



Note: All filters characteristics subject to change without prior notice

C Filter

Audio	LF	MF	HF	VHF	UHF
$f \leq$ 30KHz	30KHz $\leq f \leq$ 300KHz	300KHz $\leq f \leq$ 3MHz	3MHz $\leq f \leq$ 30MHz	30MHz $\leq f \leq$ 300MHz	300MHz $\leq f \leq$ 3GHz

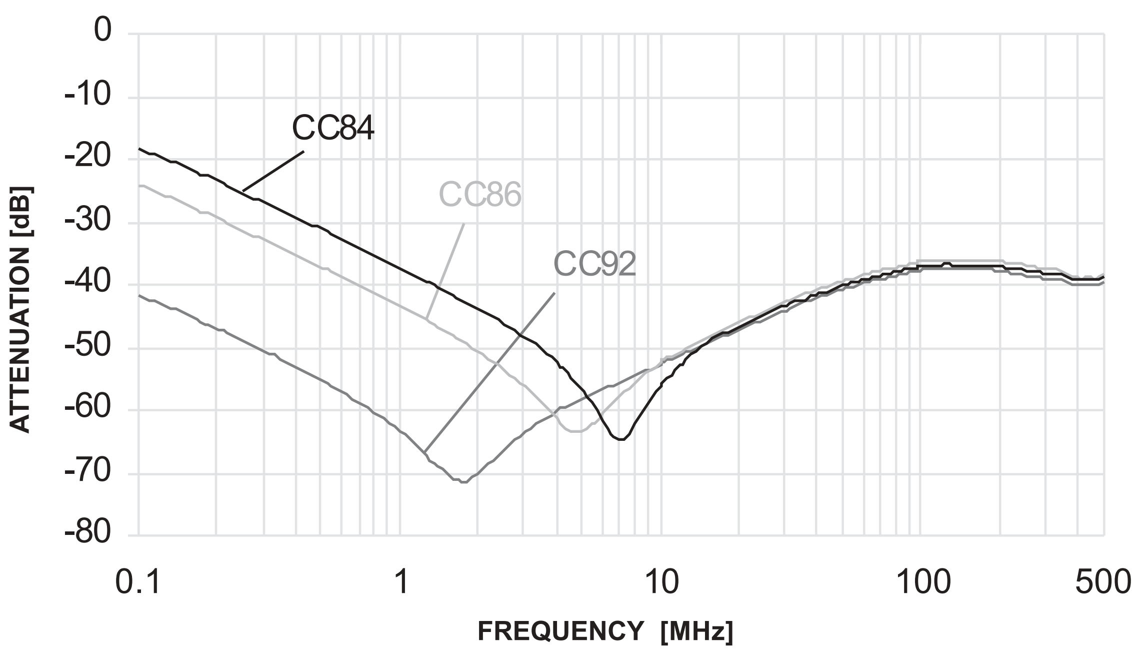
Typical cutoff frequency (-3dB) $f_{co} \leq$ 30KHz .

Minimum Attenuation

Filter Code	Typical Cap. [μF] (2)	f_{co} [KHz] Typical (3)	Min. Attenuation [dB] VS. Frequency [MHz] (1)							
			1	5	10	30	50	100	300	500
CC84	0.47	12.4	35	54	53	40	37	32	33	33
CC86	1	6.2	41	59	47	38	34	29	30	30
CC92	10	0.67	61	54	48	40	36	32	33	33

(1) Measured in 50Ω system according to MIL-STD -220, no load.
(2) Capacitance tolerance: ±20%. For other capacitor values, contact the sales.
(3) For estimation of the filter cut off frequency in non-50Ω system please refer to the design notes.

Typical measured filter attenuation



Note: All filters characteristics subject to change without prior notice

C² Filter

Audio	LF	MF	HF	VHF	UHF
$f \leq$ 30KHz	30KHz $\leq f \leq$ 300KHz	300KHz $\leq f \leq$ 3MHz	3MHz $\leq f \leq$ 30MHz	30MHz $\leq f \leq$ 300MHz	300MHz $\leq f \leq$ 3GHz

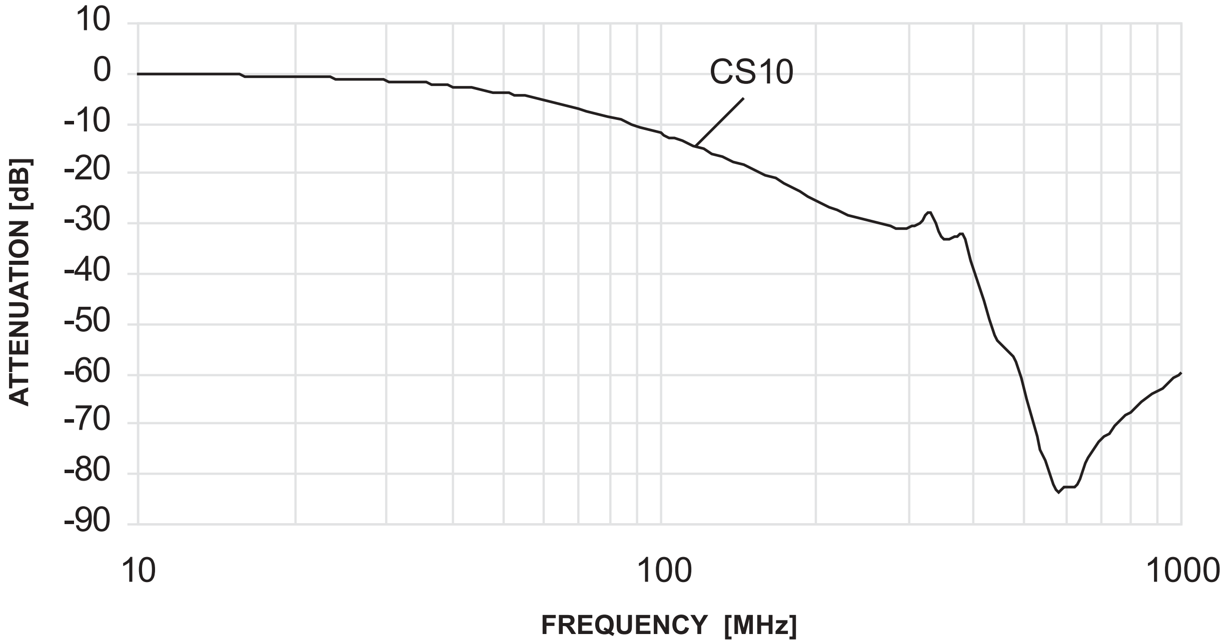
Typical cutoff frequency (-3dB) $f_{co} \geq$ 30MHz .

Minimum Attenuation

Filter Code	Typical Cap. [pF] (2)	f_{co} [MHz] Typical (3)	Min. Attenuation [dB] VS. Frequency [MHz] (1)								
			1	5	10	30	50	100	300	500	1000
CS10	164p	41.6	0	0	0	0	0	6	24	57	52

(1) Measured in 50Ω system according to MIL-STD -220, no load.
(2) Capacitance tolerance: ±20%. For other capacitor values, contact the sales.
(3) For estimation of the filter cut off frequency in non-50Ω system please refer to the design notes.

Typical measured filter attenuation



Note: All filters characteristics subject to change without prior notice

C² Filter

Audio	LF	MF	HF	VHF	UHF
$f \leq$ 30KHz	30KHz $\leq f \leq$ 300KHz	300KHz $\leq f \leq$ 3MHz	3MHz $\leq f \leq$ 30MHz	30MHz $\leq f \leq$ 300MHz	300MHz $\leq f \leq$ 3GHz

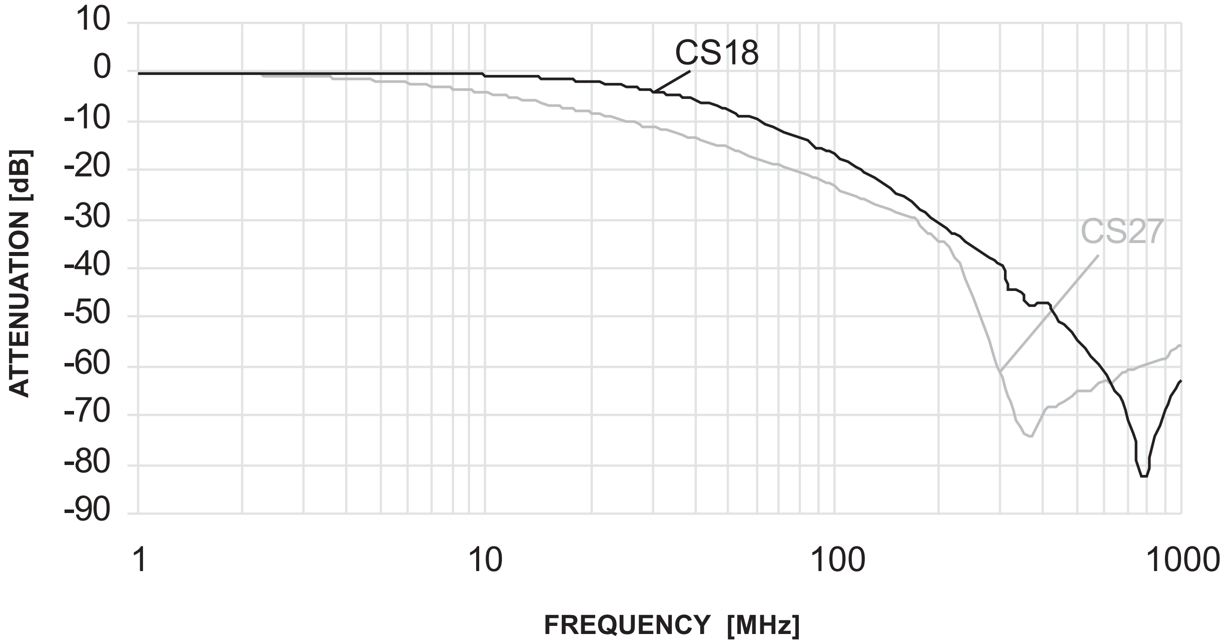
Typical cutoff frequency (-3dB) $f_{co} \geq$ 3MHz .

Minimum Attenuation

Filter Code	Typical Cap. [pF] (2)	f_{co} [MHz] Typical (3)	Min. Attenuation [dB] VS. Frequency [MHz] (1)								
			1	5	10	30	50	100	300	500	1000
CS18	267	24.8	0	0	0	0	4	11	34	45	57
CS23	660	9.35	0	0	0	7	12	18	62	57	50
CS27	940	7.35	0	0	1	7	12	17	56	57	50

(1) Measured in 50Ω system according to MIL-STD -220, no load.
(2) Capacitance tolerance: ±20%. For other capacitor values, contact the sales.
(3) For estimation of the filter cut off frequency in non-50Ω system please refer to the design notes.

Typical measured filter attenuation



Note: All filters characteristics subject to change without prior notice

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C² Filter

Audio	LF	MF	HF	VHF	UHF
$f \leq$ 30KHz	30KHz $\leq f \leq$ 300KHz	300KHz $\leq f \leq$ 3MHz	3MHz $\leq f \leq$ 30MHz	30MHz $\leq f \leq$ 300MHz	300MHz $\leq f \leq$ 3GHz

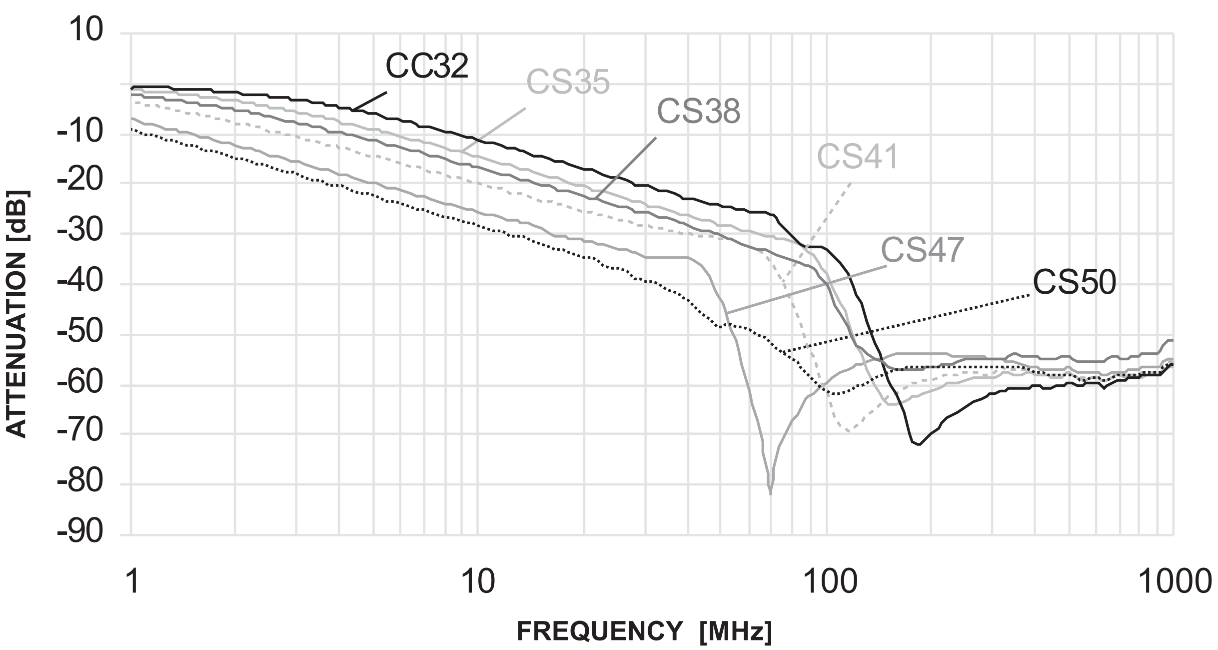
Typical cutoff frequency (-3dB) $f_{co} \geq$ 300KHz .

Minimum Attenuation

Filter Code	Typical Cap. [nF] (2)	f_{co} [MHz] Typical (3)	Min. Attenuation [dB] VS. Frequency [MHz] (1)								
			1	5	10	30	50	100	300	500	1000
CS32	2.4	2.77	0	3	7	16	21	25	56	53	49
CS35	3.6	1.8	0	7	11	20	24	32	51	50	50
CS38	5.7	1.23	0	9	13	22	27	33	48	47	43
CS41	7.8	0.79	1	12	16	24	27	55	51	52	50
CS47	13.6	0.450	5	17	22	30	39	53	49	51	49
CS50	19.7	0.330	7	20	25	34	44	55	50	51	49

(1) Measured in 50Ω system according to MIL-STD -220, no load.
(2) Capacitance tolerance: ±20%. For other capacitor values, contact the sales.
(3) For estimation of the filter cut off frequency in non-50Ω system please refer to the design notes.

Typical measured filter attenuation



Note: All filters characteristics subject to change without prior notice

C² Filter

Audio	LF	MF	HF	VHF	UHF
$f \leq$ 30KHz	30KHz $\leq f \leq$ 300KHz	300KHz $\leq f \leq$ 3MHz	3MHz $\leq f \leq$ 30MHz	30MHz $\leq f \leq$ 300MHz	300MHz $\leq f \leq$ 3GHz

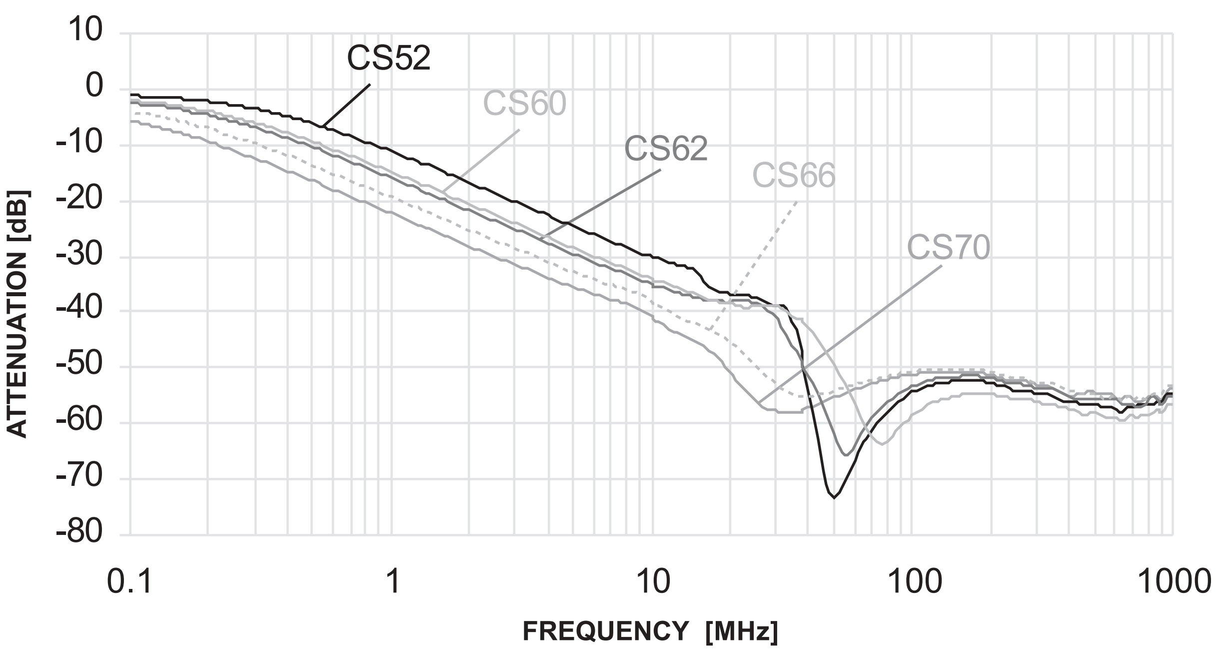
Typical cutoff frequency (-3dB) $f_{co} \geq$ 30KHz .

Minimum Attenuation

Filter Code	Typical Cap. [nF] (2)	f_{co} [KHz] Typical (3)	Min. Attenuation [dB] VS. Frequency [MHz] (1)								
			1	5	10	30	50	100	300	500	1000
CS52	25	256	9	22	27	35	60	49	49	51	49
CS60	39.8	142	12	26	31	36	45	53	50	52	50
CS62	43	125	13	27	31	37	56	48	48	49	48
CS66	66	98	17	30	34	49	51	45	47	49	48
CS70	94	94	20	33	37	50	50	45	47	48	46

(1) Measured in 50Ω system according to MIL-STD -220, no load.
(2) Capacitance tolerance: ±20%. For other capacitor values, contact the sales.
(3) For estimation of the filter cut off frequency in non-50Ω system please refer to the design notes.

Typical measured filter attenuation



Note: All filters characteristics subject to change without prior notice

C² Filter

Audio	LF	MF	HF	VHF	UHF
$f \leq$ 30KHz	30KHz $\leq f \leq$ 300KHz	300KHz $\leq f \leq$ 3MHz	3MHz $\leq f \leq$ 30MHz	30MHz $\leq f \leq$ 300MHz	300MHz $\leq f \leq$ 3GHz

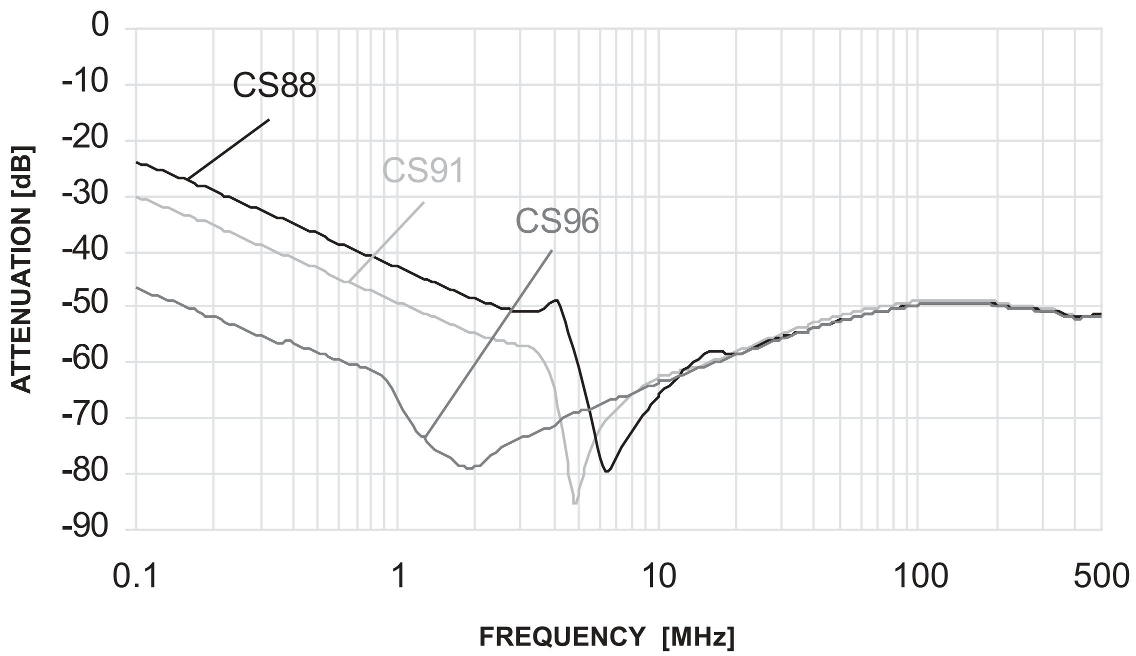
Typical cutoff frequency (-3dB) $f_{co} \leq$ 30KHz .

Minimum Attenuation

Filter Code	Typical Cap. [µF] (2)	f_{co} [KHz] Typical (3)	Min. Attenuation [dB] VS. Frequency [MHz] (1)							
			1	5	10	30	50	100	300	500
CS88	0.94	6.5	40	54	61	50	47	42	44	44
CS91	2	3.1	46	73	57	49	46	41	42	42
CS96	20	0.35	62	65	59	51	48	43	44	45

(1) Measured in 50Ω system according to MIL-STD -220, no load.
(2) Capacitance tolerance: ±20%. For other capacitor values, contact the sales.
(3) For estimation of the filter cut off frequency in non-50Ω system please refer to the design notes.

Typical measured filter attenuation



Note: All filters characteristics subject to change without prior notice

L&J Filter

Audio	LF	MF	HF	VHF	UHF
$f \leq$ 30KHz	30KHz $\leq f \leq$ 300KHz	300KHz $\leq f \leq$ 3MHz	3MHz $\leq f \leq$ 30MHz	30MHz $\leq f \leq$ 300MHz	300MHz $\leq f \leq$ 3GHz

Typical cutoff frequency (-3dB) $f_{co} \geq$ 30MHz .

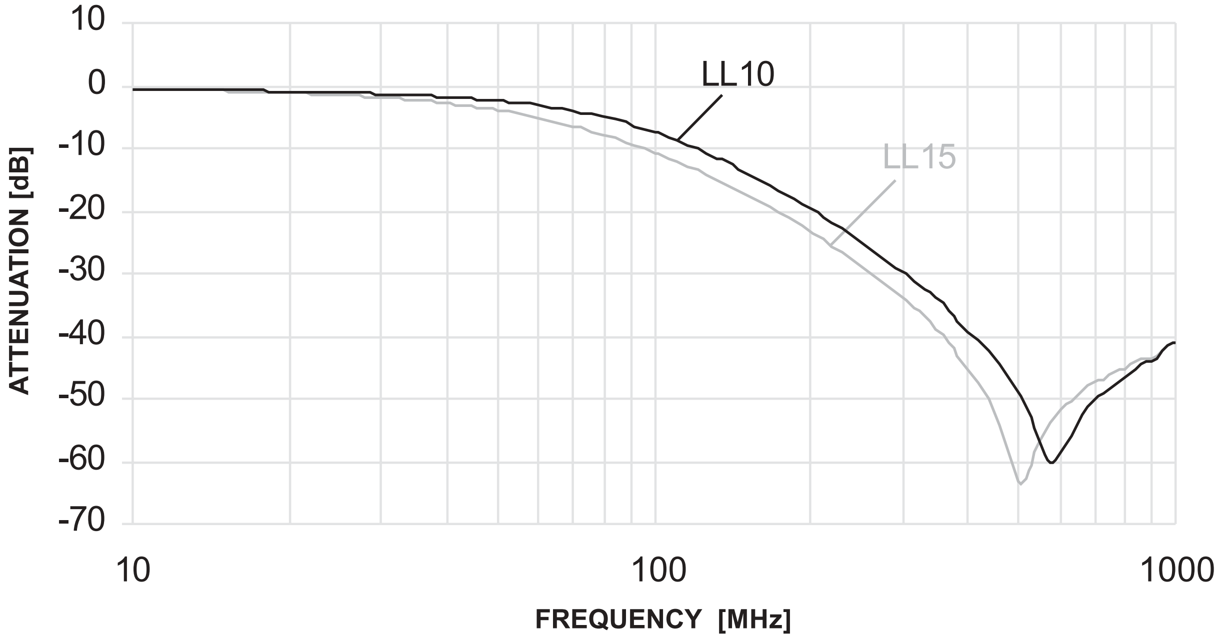
Minimum Attenuation

Filter Code (*)	Typical Cap. [pF] (2)	f_{co} [MHz] Typical (3)	Min. Attenuation [dB] VS. Frequency [MHz] (1)								
			1	5	10	30	50	100	300	500	1000
LL10	82	54.3	0	0	0	0	0	2	24	42	31
LL15	120	42.5	0	0	0	0	0	5	29	45	31

(*) For J filter replace LL with JJ

(1) Measured in 50Ω system according to MIL-STD -220, no load.
(2) Capacitance tolerance: ±20%. For other capacitor values, contact the sales.
(3) For estimation of the filter cut off frequency in non-50Ω system please refer to the design notes.

Typical measured filter attenuation



Note: All filters characteristics subject to change without prior notice

L&J Filter

Audio	LF	MF	HF	VHF	UHF
$f \leq$ 30KHz	30KHz $\leq f \leq$ 300KHz	300KHz $\leq f \leq$ 3MHz	3MHz $\leq f \leq$ 30MHz	30MHz $\leq f \leq$ 300MHz	300MHz $\leq f \leq$ 3GHz

Typical cutoff frequency (-3dB) $f_{co} \geq$ 3MHz .

Minimum Attenuation

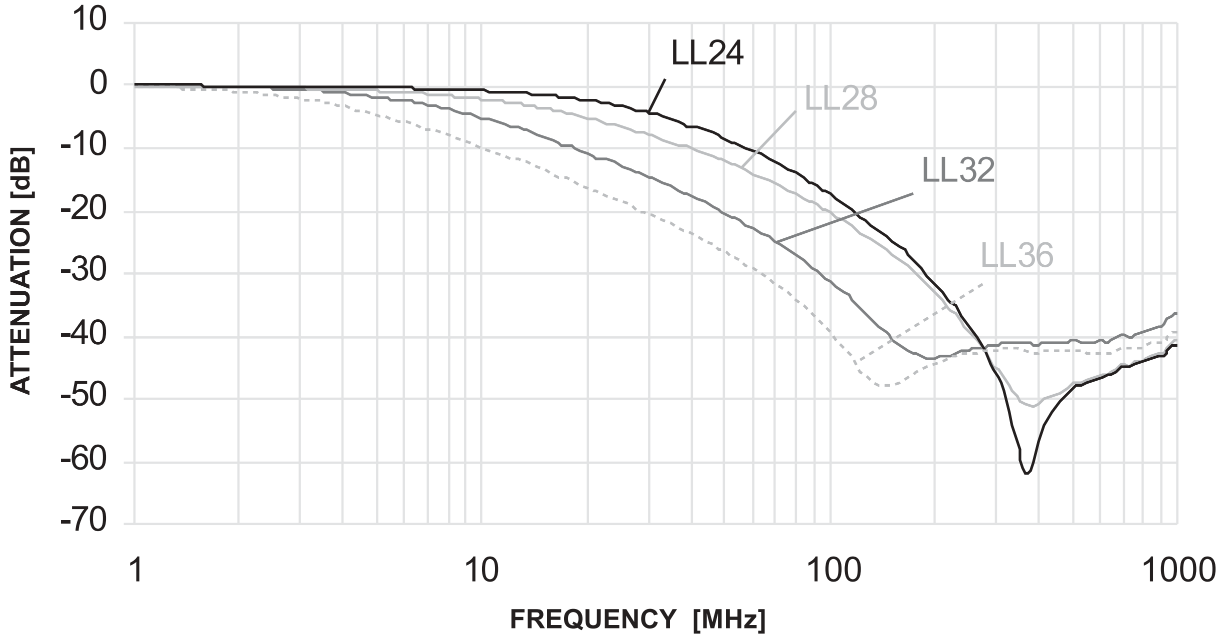
Filter Code (*)	Typical Cap. [pF] (2)	f_{co} [MHz] Typical (3)	Min. Attenuation [dB] VS. Frequency [MHz] (1)								
			1	5	10	30	50	100	300	500	1000
LL24	220	23.3	0	0	0	1	5	12	40	42	33
LL28	470	12.6	0	0	0	4	8	14	38	40	31
LL32	1000	6.85	0	0	1	11	17	25	36	35	28
LL36	1800	3.7	0	2	6	17	23	33	37	34	31

(*) For J filter replace LL with JJ

(1) Measured in 50Ω system according to MIL-STD -220, no load.
(2) Capacitance tolerance: ±20%. For other capacitor values, contact the sales.
(3) For estimation of the filter cut off frequency in non-50Ω system please refer to the design notes.

L&J Filter

Typical measured filter attenuation



Note: All filters characteristics subject to change without prior notice

L&J Filter

Audio	LF	MF	HF	VHF	UHF
$f \leq$ 30KHz	30KHz $\leq f \leq$ 300KHz	300KHz $\leq f \leq$ 3MHz	3MHz $\leq f \leq$ 30MHz	30MHz $\leq f \leq$ 300MHz	300MHz $\leq f \leq$ 3GHz

Typical cutoff frequency (-3dB) $f_{co} \geq$ 300KHz .

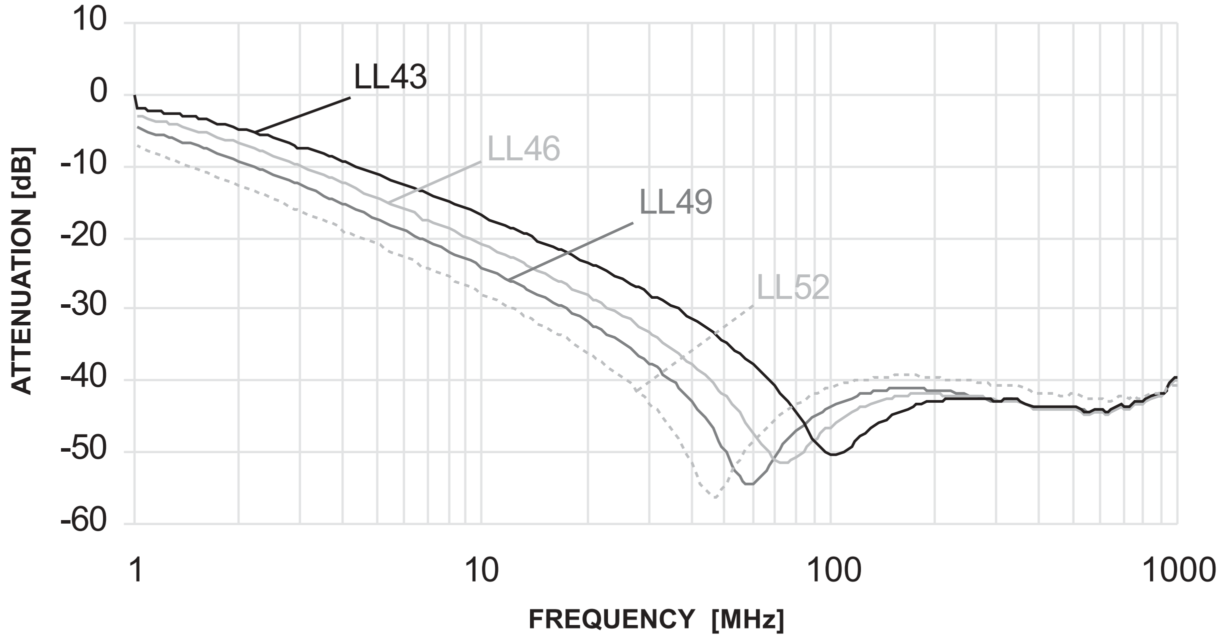
Minimum Attenuation

Filter Code (*)	Typical Cap. [nF] (2)	f_{co} [MHz] Typical (3)	Min. Attenuation [dB] VS. Frequency [MHz] (1)								
			1	5	10	30	50	100	300	500	1000
LL43	4.7	1.4	0	8	13	24	31	44	37	38	31
LL46	6.8	0.975	0	12	17	30	39	41	37	38	31
LL49	10	0.690	2	15	21	34	44	38	36	38	30
LL52	15	0.46	5	18	24	39	50	36	35	36	31

(*) For J filter replace LL with JJ

(1) Measured in 50Ω system according to MIL-STD -220, no load.
(2) Capacitance tolerance: ±20%. For other capacitor values, contact the sales.
(3) For estimation of the filter cut off frequency in non-50Ω system please refer to the design notes.

Typical measured filter attenuation



Note: All filters characteristics subject to change without prior notice

L&J Filter

Audio	LF	MF	HF	VHF	UHF
$f \leq$ 30KHz	30KHz $\leq f \leq$ 300KHz	300KHz $\leq f \leq$ 3MHz	3MHz $\leq f \leq$ 30MHz	30MHz $\leq f \leq$ 300MHz	300MHz $\leq f \leq$ 3GHz

Typical cutoff frequency (-3dB) $f_{co} \geq$ 30KHz .

Minimum Attenuation

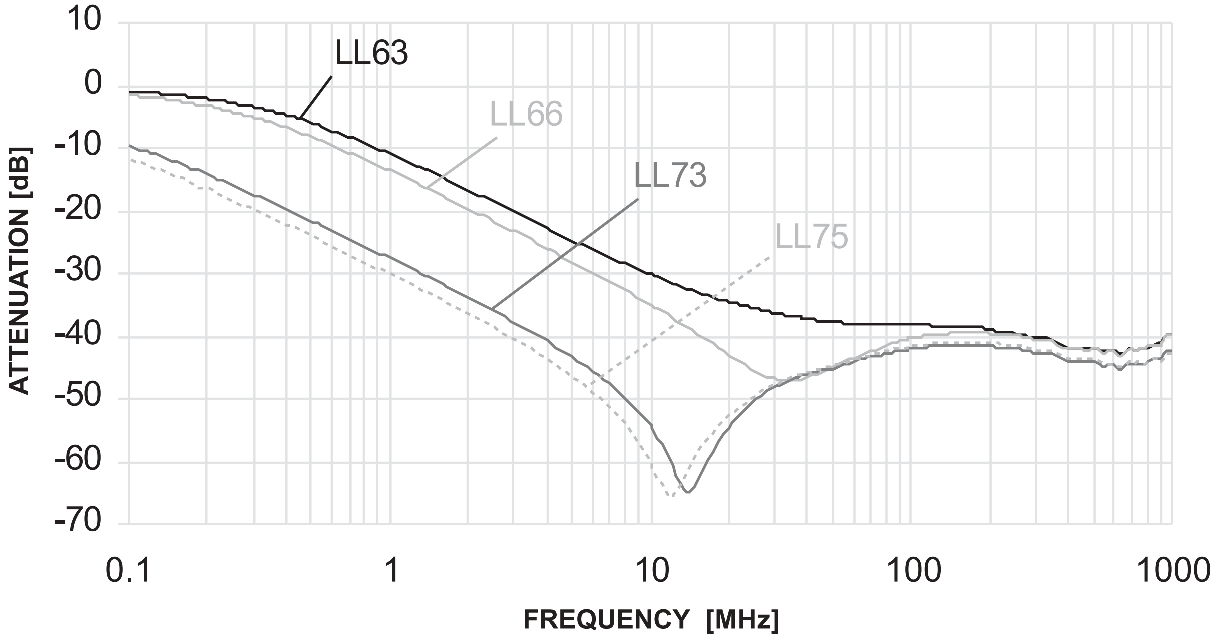
Filter Code (*)	Typical Cap. [nF] (2)	f_{co} [KHz] Typical (3)	Min. Attenuation [dB] VS. Frequency [MHz] (1)								
			1	5	10	30	50	100	300	500	1000
LL63	22	265	8	22	25	30	31	31	34	36	30
LL66	33	179	11	26	31	42	41	35	35	37	31
LL73	180	38	25	40	50	44	40	35	36	37	34
LL75	220	31	28	44	56	43	40	35	36	38	32

(*) For J filter replace LL with JJ

(1) Measured in 50Ω system according to MIL-STD -220, no load.
(2) Capacitance tolerance: ±20%. For other capacitor values, contact the sales.
(3) For estimation of the filter cut off frequency in non-50Ω system please refer to the design notes.

L&J Filter

Typical measured filter attenuation



Note: All filters characteristics subject to change without prior notice

L&J Filter

Audio	LF	MF	HF	VHF	UHF
$f \leq$ 30KHz	30KHz $\leq f \leq$ 300KHz	300KHz $\leq f \leq$ 3MHz	3MHz $\leq f \leq$ 30MHz	30MHz $\leq f \leq$ 300MHz	300MHz $\leq f \leq$ 3GHz

Typical cutoff frequency (-3dB) $f_{co} \leq$ 30KHz .

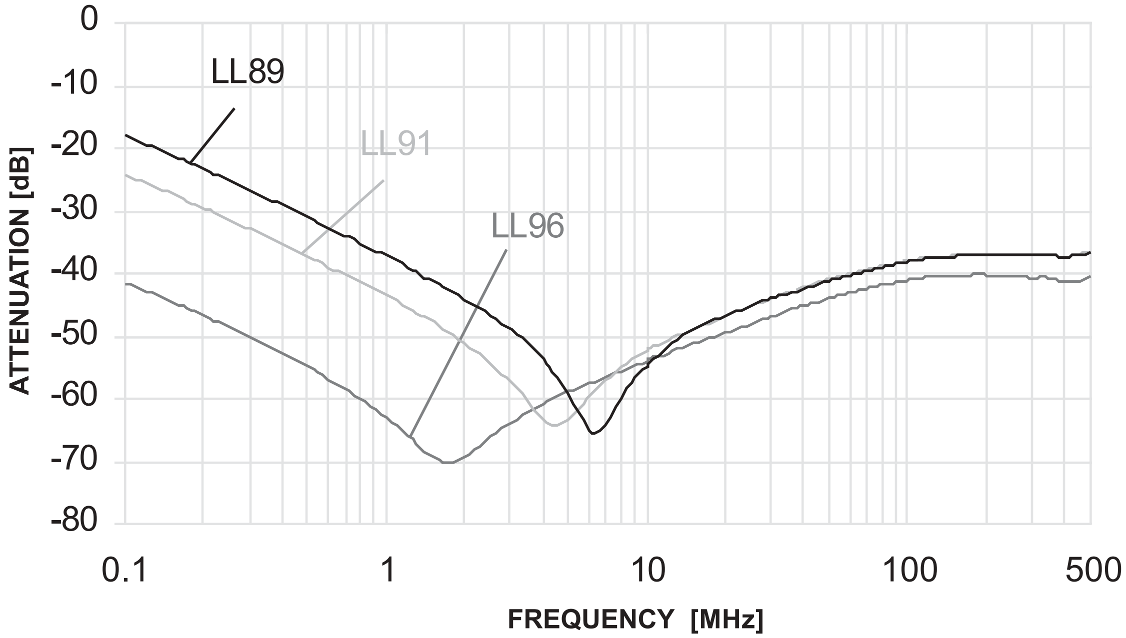
Minimum Attenuation

Filter Code (*)	Typical Cap. [μF] (2)	f_{co} [KHz] Typical (3)	Min. Attenuation [dB] VS. Frequency [MHz] (1)							
			1	5	10	30	50	100	300	500
LL89	0.47	11.5	35	55	51	40	38	33	32	31
LL91	1	6.2	41	60	40	40	37	32	31	31
LL96	10	0.68	60	55	49	42	39	34	34	33

(*) For J filter replace LL with JJ

(1) Measured in 50Ω system according to MIL-STD -220, no load.
(2) Capacitance tolerance: ±20%. For other capacitor values, contact the sales.
(3) For estimation of the filter cut off frequency in non-50Ω system please refer to the design notes.

Typical measured filter attenuation



Note: All filters characteristics subject to change without prior notice

π Filter

Audio	LF	MF	HF	VHF	UHF
$f \le$ 30KHz	30KHz $\le f \le$ 300KHz	300KHz $\le f \le$ 3MHz	3MHz $\le f \le$ 30MHz	30MHz $\le f \le$ 300MHz	300MHz $\le f \le$ 3GHz

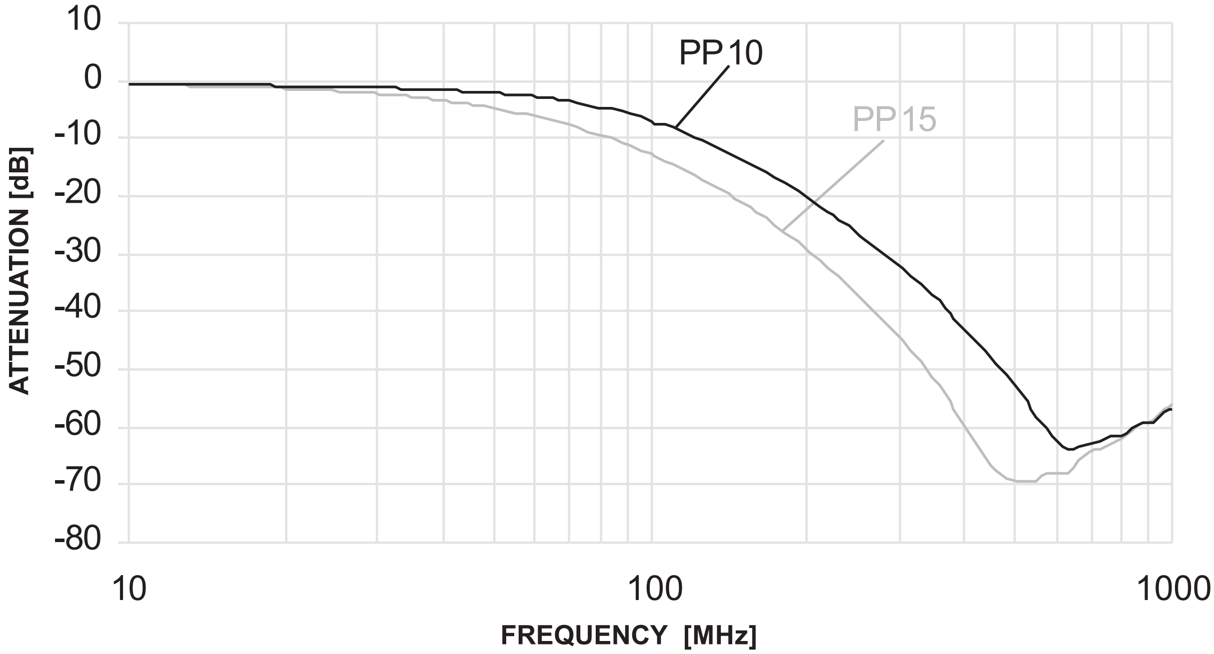
Typical cutoff frequency (-3dB) $f_{co} \ge$ 30MHz .

Minimum Attenuation

Filter Code	Typical Cap. [pF] (2)	f_{co} [MHz] Typical (3)	Min. Attenuation [dB] VS. Frequency [MHz] (1)								
			1	5	10	30	50	100	300	500	1000
PP10	94	62.7	0	0	0	0	0	1	26	46	52
PP15	164	36.2	0	0	0	0	1	7	39	62	51

(1) Measured in 50Ω system according to MIL-STD -220, no load.
(2) Capacitance tolerance: ±20%. For other capacitor values, contact the sales.
(3) For estimation of the filter cut off frequency in non-50Ω system please refer to the design notes.

Typical measured filter attenuation



Note: All filters characteristics subject to change without prior notice

π Filter

Audio	LF	MF	HF	VHF	UHF
$f \leq$ 30KHz	30KHz $\leq f \leq$ 300KHz	300KHz $\leq f \leq$ 3MHz	3MHz $\leq f \leq$ 30MHz	30MHz $\leq f \leq$ 300MHz	300MHz $\leq f \leq$ 3GHz

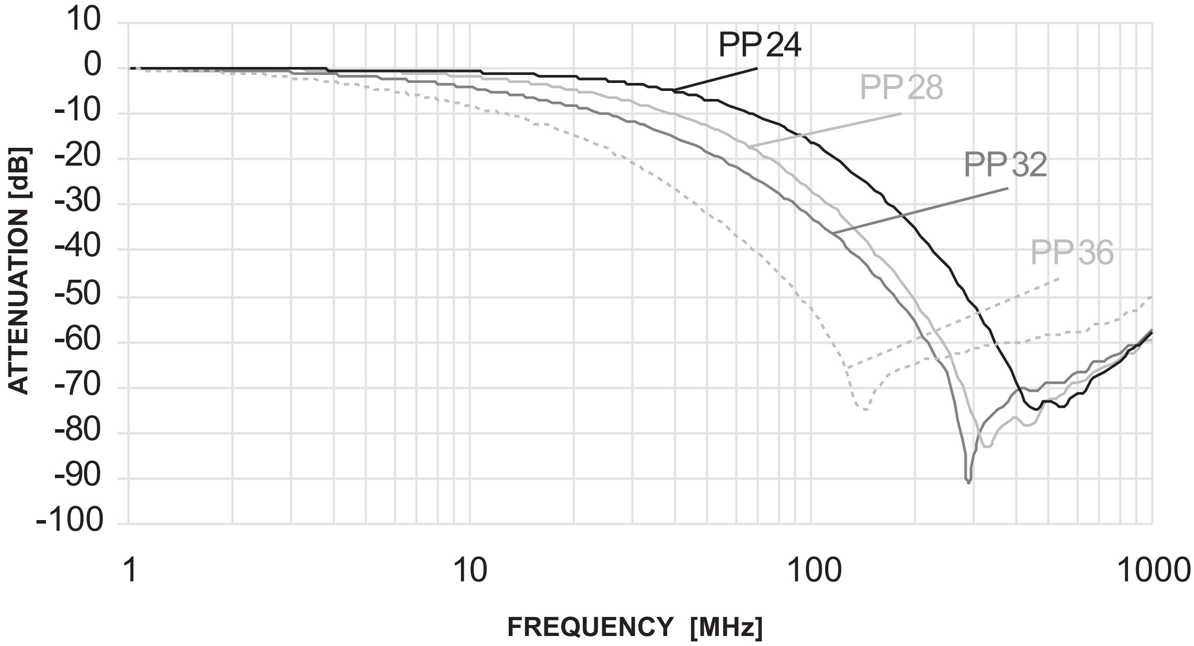
Typical cutoff frequency (-3dB) $f_{co} \geq$ 3MHz .

Minimum Attenuation

Filter Code	Typical Cap. [pF] (2)	f_{co} [MHz] Typical (3)	Min. Attenuation [dB] VS. Frequency [MHz] (1)								
			1	5	10	30	50	100	300	500	1000
PP24	240	28.1	0	0	0	0	3	10	45	63	50
PP28	440	14.5	0	0	0	4	9	20	67	65	54
PP32	940	7.7	0	0	1	8	15	27	66	60	46
PP36	2000	3.9	0	2	5	17	28	47	56	53	45

(1) Measured in 50Ω system according to MIL-STD -220, no load.
(2) Capacitance tolerance: ±20%. For other capacitor values, contact the sales.
(3) For estimation of the filter cut off frequency in non-50Ω system please refer to the design notes.

Typical measured filter attenuation



Note: All filters characteristics subject to change without prior notice

π Filter

Audio	LF	MF	HF	VHF	UHF
$f \leq$ 30KHz	30KHz $\leq f \leq$ 300KHz	300KHz $\leq f \leq$ 3MHz	3MHz $\leq f \leq$ 30MHz	30MHz $\leq f \leq$ 300MHz	300MHz $\leq f \leq$ 3GHz

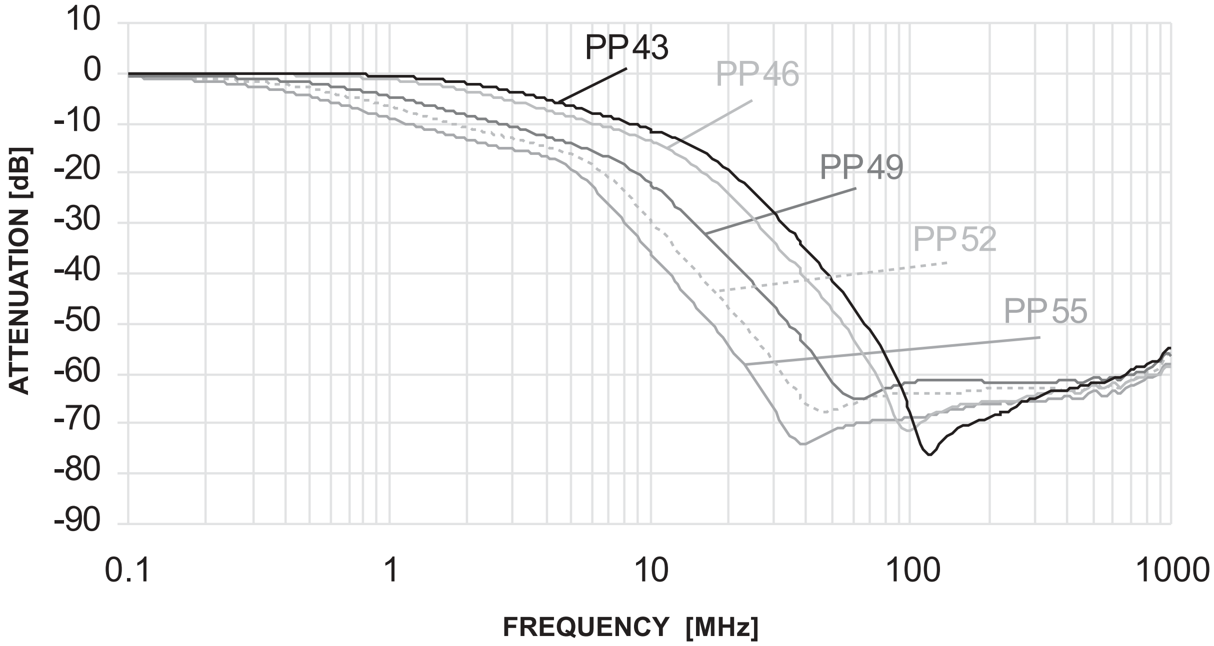
Typical cutoff frequency (-3dB) $f_{co} \geq$ 300KHz .

Minimum Attenuation

Filter Code	Typical Cap. [nF] (2)	f_{co} [MHz] Typical (3)	Min. Attenuation [dB] VS. Frequency [MHz] (1)								
			1	5	10	30	50	100	300	500	1000
PP43	3	2.5	0	4	7	23	35	58	57	54	47
PP46	4.4	1.74	0	6	10	30	44	55	58	55	52
PP49	9.4	0.677	2	11	18	43	57	55	56	55	49
PP52	13.6	0.470	4	14	25	54	62	57	57	56	48
PP55	20	0.325	6	16	32	62	66	60	58	57	49

(1) Measured in 50Ω system according to MIL-STD -220, no load.
(2) Capacitance tolerance: ±20%. For other capacitor values, contact the sales.
(3) For estimation of the filter cut off frequency in non-50Ω system please refer to the design notes.

Typical measured filter attenuation



Note: All filters characteristics subject to change without prior notice

π Filter

Audio	LF	MF	HF	VHF	UHF
$f \leq$ 30KHz	30KHz $\leq f \leq$ 300KHz	300KHz $\leq f \leq$ 3MHz	3MHz $\leq f \leq$ 30MHz	30MHz $\leq f \leq$ 300MHz	300MHz $\leq f \leq$ 3GHz

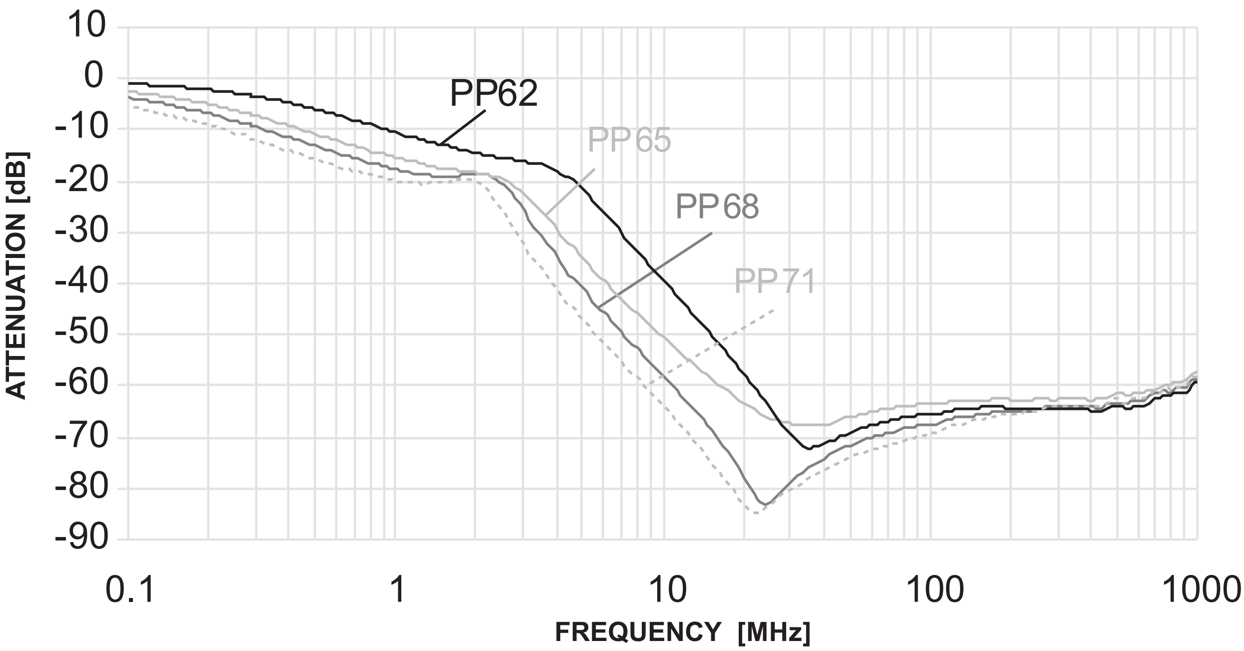
Typical cutoff frequency (-3dB) $f_{co} \geq$ 30KHz .

Minimum Attenuation

Filter Code	Typical Cap. [nF] (2)	f_{co} [KHz] Typical (3)	Min. Attenuation [dB] VS. Frequency [MHz] (1)								
			1	5	10	30	50	100	300	500	1000
PP62	24	265	8	19	36	63	64	59	59	58	54
PP65	44	118	13	31	45	59	60	57	57	56	52
PP68	66	99	15	38	54	73	68	62	58	57	53
PP71	94	75	17	45	60	72	68	63	58	57	53

(1) Measured in 50Ω system according to MIL-STD -220, no load.
(2) Capacitance tolerance: ±20%. For other capacitor values, contact the sales.
(3) For estimation of the filter cut off frequency in non-50Ω system please refer to the design notes.

Typical measured filter attenuation



Note: All filters characteristics subject to change without prior notice

π Filter

Audio	LF	MF	HF	VHF	UHF
$f \leq$ 30KHz	30KHz $\leq f \leq$ 300KHz	300KHz $\leq f \leq$ 3MHz	3MHz $\leq f \leq$ 30MHz	30MHz $\leq f \leq$ 300MHz	300MHz $\leq f \leq$ 3GHz

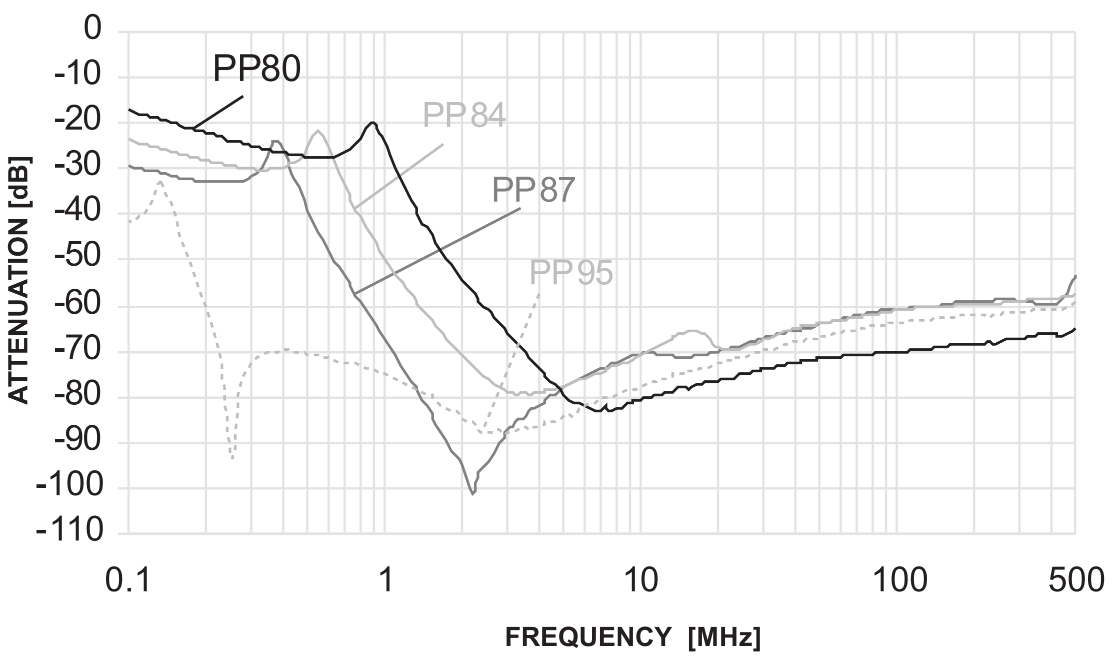
Typical cutoff frequency (-3dB) $f_{co} \leq$ 30KHz .

Minimum Attenuation

Filter Code	Typical Cap. [μF] (2)	f_{co} [KHz] Typical (3)	Min. Attenuation [dB] VS. Frequency [MHz] (1)							
			1	5	10	30	50	100	300	500
PP80	0.44	12	22	76	76	68	65	60	59	58
PP84	0.94	6.5	47	75	67	63	60	55	52	50
PP87	2	3.2	62	73	65	61	58	53	52	49
PP95	20	0.35	72	74	71	64	60	55	53	52

(1) Measured in 50Ω system according to MIL-STD -220, no load.
(2) Capacitance tolerance: ±20%. For other capacitor values, contact the sales.
(3) For estimation of the filter cut off frequency in non-50Ω system please refer to the design notes.

Typical measured filter attenuation



Note: All filters characteristics subject to change without prior notice

0.1J Bidirectional Transient Protection

Transient Protection Code	Working Voltage [VDC]	Maximum Breakdown Voltage [V]	Clamping Voltage [V]	Maximum Leakage Current [μA@VDC]	Transient Energy [J]	Maximum Capacitance [pF] (1)
ZA03	3.3	6.25	13.2	120	0.1	2175
ZA05	5.6	10.63	19.8	42	0.1	1650
ZA09	9.0	15.24	24.2	30	0.1	1125
ZA14	14	21.64	35.2	22.5	0.1	900
ZA18	18	28.75	46.2	12	0.1	525
ZA26	26	39.67	66	12	0.1	233
ZA30	30	47.15	73.7	12	0.1	188

(1) Measured at 0.5V $_{RMS}$ @1KHz

0.3J Bidirectional Transient Protection

Transient Protection Code	Working Voltage [VDC]	Maximum Breakdown Voltage [V]	Clamping Voltage [V]	Maximum Leakage Current [μA@VDC]	Transient Energy [J]	Maximum Capacitance [pF] (1)
ZC03	3.3	6.25	13.2	120	0.3	7500
ZC05	5.6	10.63	19.8	42	0.3	4500
ZC14	14	21.64	35.2	22.5	0.3	1350
ZC18	18	28.75	46.2	12	0.3	825
ZC26	26	39.67	66	12	0.3	375

(1) Measured at 0.5V $_{RMS}$ @1KHz

Note: For higher energy Transient Protection, contact the sales.

C Filter Combined with 0.1J Bidirectional Transient Protection

Filter Code Cap. [nF] (1)	C Filter and 0.1J Bidirectional Transient Protection Code. Typical Capacitance [nF]						
	Transient Protection Code. Capacitance [nF] (2)						
	ZA03 2.175	ZA05 1.65	ZA09 1.125	ZA14 0.9	ZA18 0.525	ZA26 0.233	ZA30 0.188
CC08 0.047							
CC12 0.1							
CC18 0.12							
CC23 0.18							
CC33 0.33							
CC36 0.47						YA01 0.703	YA02 0.658
CC39 1						YA03 1.233	YA04 1.188
CC42 2.2				YA05 3.1	YA06 2.725	YA07 2.433	YA08 2.388
CC45 3.9		YA9 5.55	YA10 5.025	YA11 4.8	YA12 4.425	YA13 4.133	YA14 4.088
CC54 4.7	YA15 6.875	YA16 6.35	YA17 5.825	YA18 5.6	YA19 5.225	YA20 4.933	YA21 4.888
CC58 6.8	YA22 8.975	YA23 8.45	YA24 7.925	YA25 7.7	YA26 7.325	YA27 7.033	YA28 6.988
CC62 10	YA29 12.175	YA30 11.65	YA31 11.125	YA32 10.9	YA33 10.525	YA34 10.233	YA35 10.188
CC66 15	YA36 17.175	YA37 16.65	YA38 16.125	YA39 15.9	YA40 15.525	YA41 15.233	YA42 15.188
CC72 33	YA43 35.175	YA44 34.65	YA45 34.125	YA46 33.9	YA47 33.525	YA48 33.233	YA49 33.188
CC74 47	YA50 49.175	YA51 48.65	YA52 48.125	YA53 47.9	YA54 47.525	YA55 47.233	YA56 47.188
CC76 100	YA57 102.175	YA58 101.65	YA59 101.125	YA60 100.9	YA61 100.525	YA62 100.233	YA63 100.188
CC78 220	YA64 222.175	YA65 221.65	YA66 221.125	YA67 220.9	YA68 220.525	YA69 220.233	YA70 220.188

(1) Refer to the attenuation on pages 33-37.
(2) Refer to the characteristics on page 53.

Example:

Assuming that a CC45 filter and a ZA14 transient protection are selected for all the connector contacts, the combined code can be extracted by finding the intersection of the CC45 row with the ZA14 column. The combined code is YA11. The typical capacitance of the combined filter is 4.8nF.

Refer to the design notes (page 71) for estimation of the cutoff frequency (f_{co}) of the combined filter.
If the estimated f_{co} is too low, select a filter with lower capacitance.

C^2 Filter Combined with 0.1J Bidirectional Transient Protection

Filter Code Cap. [nF] (1)	C^2 Filter and 0.1J Bidirectional Transient Protection Code. Typical Capacitance [nF]						
	Transient Protection Code. Capacitance [nF] (2)						
	ZA03 2.175	ZA05 1.65	ZA09 1.125	ZA14 0.9	ZA18 0.525	ZA26 0.233	ZA30 0.188
CS10 0.164							
CS18 0.267							
CS23 0.66						YB01 0.893	YB02 0.848
CS27 0.94						YB03 1.173	YB04 1.128
CS32 2.4			YB05 3.525	YB06 3.3	YB07 2.925	YB08 2.633	YB9 2.588
CS35 3.6		YB10 5.25	YB11 4.725	YB12 4.5	YB13 4.125	YB14 3.833	YB15 3.788
CS38 5.7	YB16 7.875	YB17 7.35	YB18 6.825	YB19 6.6	YB20 6.225	YB21 5.933	YB22 5.888
CS41 7.8	YB23 9.975	YB24 9.45	YB25 8.925	YB26 8.7	YB27 8.325	YB28 8.033	YB29 7.988
CS47 13.6	YB30 15.775	YB31 15.25	YB32 14.725	YB33 14.5	YB34 14.125	YB35 13.833	YB36 13.788
CS50 19.7	YB37 21.875	YB38 21.35	YB39 20.825	YB40 20.6	YB41 20.225	YB42 19.933	YB43 19.888
CS52 25	YB44 27.175	YB45 26.65	YB47 26.125	YB48 25.9	YB49 25.525	YB49 25.233	YB50 25.188
CS60 39.8	YB51 41.975	YB52 41.45	YB53 40.925	YB54 40.7	YB55 40.325	YB56 40.033	YB57 39.988
CS62 43	YB58 45.175	YB59 44.65	YB60 44.125	YB61 43.9	YB62 43.525	YB63 43.233	YB64 43.188
CS66 66	YB65 68.175	YB66 67.65	YB67 67.125	YB68 66.9	YB69 66.525	YB70 66.233	YB71 66.188
CS70 94	YB72 96.175	YB73 95.65	YB74 95.125	YB75 94.9	YB76 94.525	YB77 94.233	YB78 94.188

(1) Refer to the attenuation on pages 38-42.
(2) Refer to the characteristics on page 53.

Example:

Assuming that a CS38 filter and a ZA14 transient protection are selected for all the connector contacts, the combined code can be extracted by finding the intersection of the CS38 row with the ZA14 column. The combined code is YB19. The typical capacitance of the combined filter is 6.6nF.

Refer to the design notes (page 71) for estimation of the cutoff frequency (f_{co}) of the combined filter.
If the estimated f_{co} is too low, select a filter with lower capacitance.

L&J Filter Combined with 0.1J Bidirectional Transient Protection

Filter Code Cap. [nF] (1)	L&J Filter and 0.1J Bidirectional Transient Protection Code. Typical Capacitance [nF] (*)						
	Transient Protection Code. Capacitance [nF] (2)						
	ZA03 2.175	ZA05 1.65	ZA09 1.125	ZA14 0.9	ZA18 0.525	ZA26 0.233	ZA30 0.188
LL10 0.082							
LL15 0.12							
LL24 0.22							
LL28 0.47						YC01 0.703	YC02 0.658
LL32 1						YC03 1.233	YC04 1.188
LL36 1.8				YC05 2.7	YC06 2.325	YC07 2.033	YC08 1.988
LL43 4.7	YC09 6.875	YC10 6.35	YC11 5.825	YC12 5.6	YC13 5.225	YC14 4.933	YC15 4.888
LL46 6.8	YC16 8.975	YC17 8.45	YC18 7.925	YC19 7.7	YC20 7.325	YC21 7.033	YC22 6.988
LL49 10	YC23 12.175	YC24 11.65	YC25 11.125	YC26 10.9	YC27 10.525	YC28 10.233	YC29 10.188
LL52 15	YC30 17.175	YC31 16.65	YC32 16.125	YC33 15.9	YC34 15.525	YC35 15.233	YC36 15.188
LL63 22	YC37 24.175	YC38 23.65	YC39 23.125	YC40 22.9	YC41 22.525	YC42 22.233	YC43 22.188
LL66 33	YC44 35.175	YC45 34.65	YC46 34.125	YC47 33.9	YC48 33.525	YC49 33.233	YC50 33.188
LL73 180	YC51 182.175	YC52 181.65	YC53 181.125	YC54 180.9	YC55 180.525	YC56 180.233	YC57 180.188
LL75 220	YC58 222.175	YC59 221.65	YC60 221.125	YC61 220.9	YC62 220.525	YC63 220.233	YC64 220.188

(*) - For J filter replace YC with YD

(1) Refer to the attenuation on pages 43-47.
(2) Refer to the characteristics on page 53.

Example:

Assuming that a LL46 filter and a ZA14 transient protection are selected for all the connector contacts, the combined code can be extracted by finding the intersection of the LL46 row with the ZA14 column. The combined code is YC19. The typical capacitance of the combined filter is 7.7nF.

Refer to the design notes (page 71) for estimation of the cutoff frequency (f_{co}) of the combined filter. If the estimated f_{co} is too low, select a filter with lower capacitance.

π Filter Combined with 0.1J Bidirectional Transient Protection

Filter Code Cap. [nF] (1)	π Filter and 0.1J Bidirectional Transient Protection Code. Typical Capacitance [nF]						
	Transient Protection Code. Capacitance [nF] (2)						
	ZA03 2.175	ZA05 1.65	ZA09 1.125	ZA14 0.9	ZA18 0.525	ZA26 0.233	ZA30 0.188
PP10 0.094							
PP15 0.164							
PP24 0.24							
PP28 0.44							YE01 0.628
PP32 0.94						YE02 1.173	YE03 1.128
PP36 2				YE04 2.9	YE05 2.525	YE06 2.233	YE07 2.188
PP43 3			YE08 4.125	YE09 3.9	YE10 3.525	YE11 3.233	YE12 3.188
PP46 4.4	YE13 6.575	YE14 6.05	YE15 5.525	YE16 5.3	YE17 4.925	YE18 4.633	YE19 4.588
PP49 9.4	YE20 11.575	YE21 11.05	YE22 10.525	YE23 10.3	YE24 9.925	YE25 9.633	YE26 9.588
PP52 13.6	YE27 15.775	YE28 15.25	YE29 14.725	YE30 14.5	YE31 14.125	YE32 13.833	YE33 13.788
PP55 20	YE34 22.175	YE35 21.65	YE36 21.125	YE37 20.9	YE38 20.525	YE39 20.233	YE40 20.188
PP62 24	YE41 26.175	YE42 25.65	YE43 25.125	YE44 24.9	YE45 24.525	YE46 24.233	YE47 24.188
PP65 44	YE48 46.175	YE49 45.65	YE50 45.125	YE51 44.9	YE52 44.525	YE53 44.233	YE54 44.188
PP68 66	YE55 68.175	YE56 67.65	YE57 67.125	YE58 66.9	YE59 66.525	YE60 66.233	YE61 66.188
PP71 94	YE62 96.175	YE63 95.65	YE64 95.125	YE65 94.9	YE66 94.525	YE67 94.233	YE68 94.188
PP80 440	YE69 442.175	YE70 441.65	YE71 441.125	YE72 440.9	YE73 440.525	YE74 440.233	YE75 440.188

(1) Refer to the attenuation on pages 48-52.
(2) Refer to the characteristics on page 53.

Example:

Assuming that a PP46 filter and a ZA14 transient protection are selected for all the connector contacts, the combined code can be extracted by finding the intersection of the PP46 row with the ZA14 column. The combined code is YE16. The typical capacitance of the combined filter is 5.3nF.

Refer to the design notes (page 71) for estimation of the cutoff frequency (f_{co}) of the combined filter. If the estimated f_{co} is too low, select a filter with lower capacitance.

C Filter Combined with 0.3J Bidirectional Transient Protection

Filter Code Cap. [nF] (1)	C Filter and 0.3J Bidirectional Transient Protection Code. Typical Capacitance [nF]				
	Transient Protection Code. Capacitance [nF] (2)				
	ZC03 **7.5**	**ZC05** **4.5**	**ZC14** **1.35**	**ZC18** **0.825**	**ZC26** **0.375**
CC08 0.047					
CC12 0.1					
CC18 0.12					
CC23 0.18					
CC33 0.33					
CC36 0.47					
CC39 1					**YF01** 1.375
CC42 2.2				**YF02** 3.025	**YF03** 2.575
CC45 3.9			**YF04** 5.25	**YF05** 4.725	**YF06** 4.275
CC54 4.7			**YF07** 6.05	**YF08** 5.525	**YF09** 5.075
CC58 6.8			**YF10** 8.15	**YF11** 7.625	**YF12** 7.175
CC62 10		**YF13** 14.5	**YF14** 11.35	**YF15** 10.825	**YF16** 10.375
CC66 15	**YF17** 22.5	**YF18** 19.5	**YF19** 16.35	**YF20** 15.825	**YF21** 15.375
CC72 33	**YF22** 40.5	**YF23** 37.5	**YF24** 34.35	**YF25** 33.825	**YF26** 33.375
CC74 47	**YF27** 54.5	**YF28** 51.5	**YF29** 48.35	**YF30** 47.825	**YF31** 47.375
CC76 100	**YF32** 107.5	**YF33** 104.5	**YF34** 101.35	**YF35** 100.825	**YF36** 100.375
CC78 220	**YF37** 227.5	**YF38** 224.5	**YF39** 221.35	**YF40** 220.825	**YF41** 220.375

(1) Refer to the attenuation on pages 33-37.
(2) Refer to the characteristics on page 53.

Example:

Assuming that a CC72 filter and a ZC18 transient protection are selected for all the connector contacts, the combined code can be extracted by finding the intersection of the CC72 row with the ZC18 column. The combined code is YF25. The typical capacitance of the combined filter is 33.825nF.

Refer to the design notes (page 71) for estimation of the cutoff frequency (f_{co}) of the combined filter. If the estimated f_{co} is too low, select a filter with lower capacitance.

C² Filter Combined with 0.3J Bidirectional Transient Protection

Filter Code Cap. [nF] (1)	C² Filter and 0.3J Transient Protection Code. Typical Capacitance [nF]				
	Transient Protection Code. Capacitance [nF] (2)				
	ZC03 7.5	**ZC05** 4.5	**ZC14** 1.35	**ZC18** 0.825	**ZC26** 0.375
CS10 0.164					
CS18 0.267					
CS23 0.66					
CS27 0.94					**YG01** 1.315
CS32 2.4				**YG02** 3.225	**YG03** 2.775
CS35 3.6			**YG04** 4.95	**YG05** 4.425	**YG06** 3.975
CS38 5.7			**YG07** 7.05	**YG08** 6.525	**YG09** 6.075
CS41 7.8			**YG10** 9.15	**YG11** 8.625	**YG12** 8.175
CS47 13.6		**YG13** 18.1	**YG14** 14.95	**YG15** 14.425	**YG16** 13.975
CS50 19.7	**YG17** 27.2	**YG18** 24.2	**YG19** 21.05	**YG20** 20.525	**YG21** 20.075
CS52 25	**YG22** 32.5	**YG23** 29.5	**YG24** 26.35	**YG25** 25.825	**YG26** 25.375
CS60 39.8	**YG27** 47.3	**YG28** 44.3	**YG29** 41.15	**YG30** 40.625	**YG31** 40.175
CS62 43	**YG32** 50.5	**YG33** 47.5	**YG34** 44.35	**YG35** 43.825	**YG36** 43.375
CS66 66	**YG37** 73.5	**YG38** 70.5	**YG39** 67.35	**YG40** 66.825	**YG41** 66.375
CS70 94	**YG42** 101.5	**YG43** 98.5	**YG44** 95.35	**YG45** 94.825	**YG46** 94.375

(1) Refer to the attenuation on pages 38-42.
(2) Refer to the characteristics on page 53.

Example:

Assuming that a CS62 filter and a ZC18 transient protection are selected for all the connector contacts, the combined code can be extracted by finding the intersection of the CS62 row with the ZC18 column. The combined code is YG35. The typical capacitance of the combined filter is 43.825nF.

Refer to the design notes (page 71) for estimation of the cutoff frequency (f_{co}) of the combined filter.
If the estimated f_{co} is too low, select a filter with lower capacitance.

L&J Filter Combined with 0.3J Bidirectional Transient Protection

Filter Code Cap. [nF] (1)	L Filter and 0.3J Bidirectional Transient Protection Code. Typical Capacitance [nF] (*)				
	Transient Protection Code. Capacitance [nF] (2)				
	ZC03 7.5	ZC05 4.5	ZC14 1.35	ZC18 0.825	ZC26 0.375
LL10 0.082					
LL15 0.12					
LL24 0.22					
LL28 0.47					
LL32 1					YH01 1.375
LL36 1.8				YH02 2.625	YH03 2.175
LL43 4.7			YH04 6.05	YH05 5.525	YH06 5.075
LL46 6.8			YH07 8.15	YH08 7.625	YH09 7.175
LL49 10		YH10 14.5	YH11 11.35	YH12 10.825	YH13 10.375
LL52 15	YH14 22.5	YH15 19.5	YH16 16.35	YH17 15.825	YH18 15.375
LL63 22	YH19 29.5	YH20 26.5	YH21 23.35	YH22 22.825	YH23 22.375
LL66 33	YH24 40.5	YH25 37.5	YH26 34.35	YH27 33.825	YH28 33.375
LL73 180	YH29 187.5	YH30 184.5	YH31 181.35	YH32 180.825	YH33 180.375
LL75 220	YH34 227.5	YH35 224.5	YH36 221.35	YH37 220.825	YH38 220.375

(*) - For J filter replace YH with YJ

(1) Refer to the attenuation on pages 43-47.
(2) Refer to the characteristics on page 53.

Example:

Assuming that a LL63 filter and a ZC18 transient protection are selected for all the connector contacts, the combined code can be extracted by finding the intersection of the LL63 row with the ZC18 column. The combined code is YH22. The typical capacitance of the combined filter is 22.825nF.

Refer to the design notes (page 71) for estimation of the cutoff frequency (f_{co}) of the combined filter.
If the estimated f_{co} is too low, select a filter with lower capacitance.

π Filter Combined with 0.3J Bidirectional Transient Protection

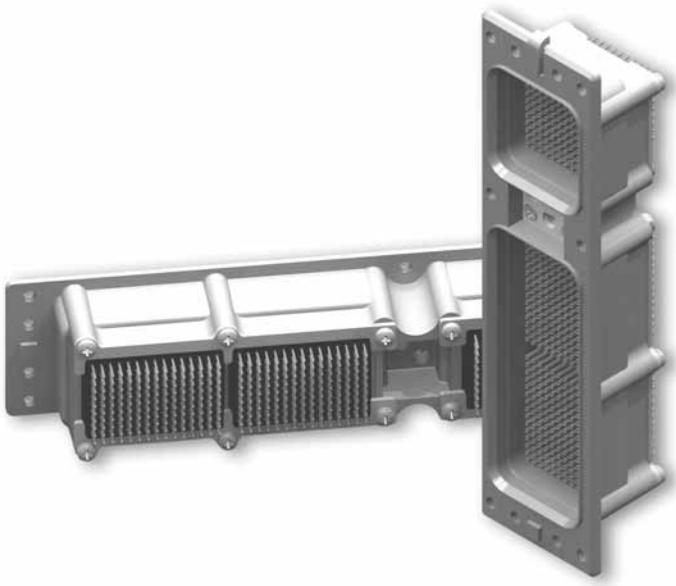
Filter Code Cap. [nF] (1)	π Filter and 0.3J Bidirectional Transient Protection Code. Typical Capacitance [nF]				
	Transient Protection Code. Capacitance [nF] (2)				
	ZC03 7.5	ZC05 4.5	ZC14 1.35	ZC18 0.825	ZC26 0.375
PP10 0.094					
PP15 0.164					
PP24 0.24					
PP28 0.44					
PP32 0.94					YJ01 1.315
PP36 2				YJ02 2.825	YJ03 2.375
PP43 3			YJ04 4.35	YJ05 3.825	YJ06 3.375
PP46 4.4			YJ07 5.75	YJ08 5.225	YJ09 4.775
PP49 9.4		YJ10 13.9	YJ11 10.75	YJ12 10.225	YJ13 9.775
PP52 13.6		YJ14 18.1	YJ15 14.95	YJ16 14.425	YJ17 13.975
PP55 20	YJ18 27.5	YJ19 24.5	YJ20 21.35	YJ21 20.825	YJ22 20.375
PP62 24	YJ23 31.5	YJ24 28.5	YJ25 25.35	YJ26 24.825	YJ27 24.375
PP65 44	YJ28 51.5	YJ29 48.5	YJ30 45.35	YJ31 44.825	YJ32 44.375
PP68 66	YJ33 73.5	YJ34 70.5	YJ35 67.35	YJ36 66.825	YJ37 66.375
PP71 94	YJ38 101.5	YJ39 98.5	YJ40 95.35	YJ41 94.825	YJ42 94.375
PP80 440	YJ43 447.5	YJ44 444.5	YJ45 441.35	YJ46 440.825	YJ47 440.375

(1) Refer to the attenuation on pages 48-52.
(2) Refer to the characteristics on page 53.

Example:

Assuming that a PP62 filter and a ZC18 transient protection are selected for all the connector contacts, the combined code can be extracted by finding the intersection of the PP62 row with the ZC18 column. The combined code is YJ26. The typical capacitance of the combined filter is 24.825nF.

Refer to the design notes (page 71) for estimation of the cutoff frequency (f_{co}) of the combined filter.
If the estimated f_{co} is too low, select a filter with lower capacitance.



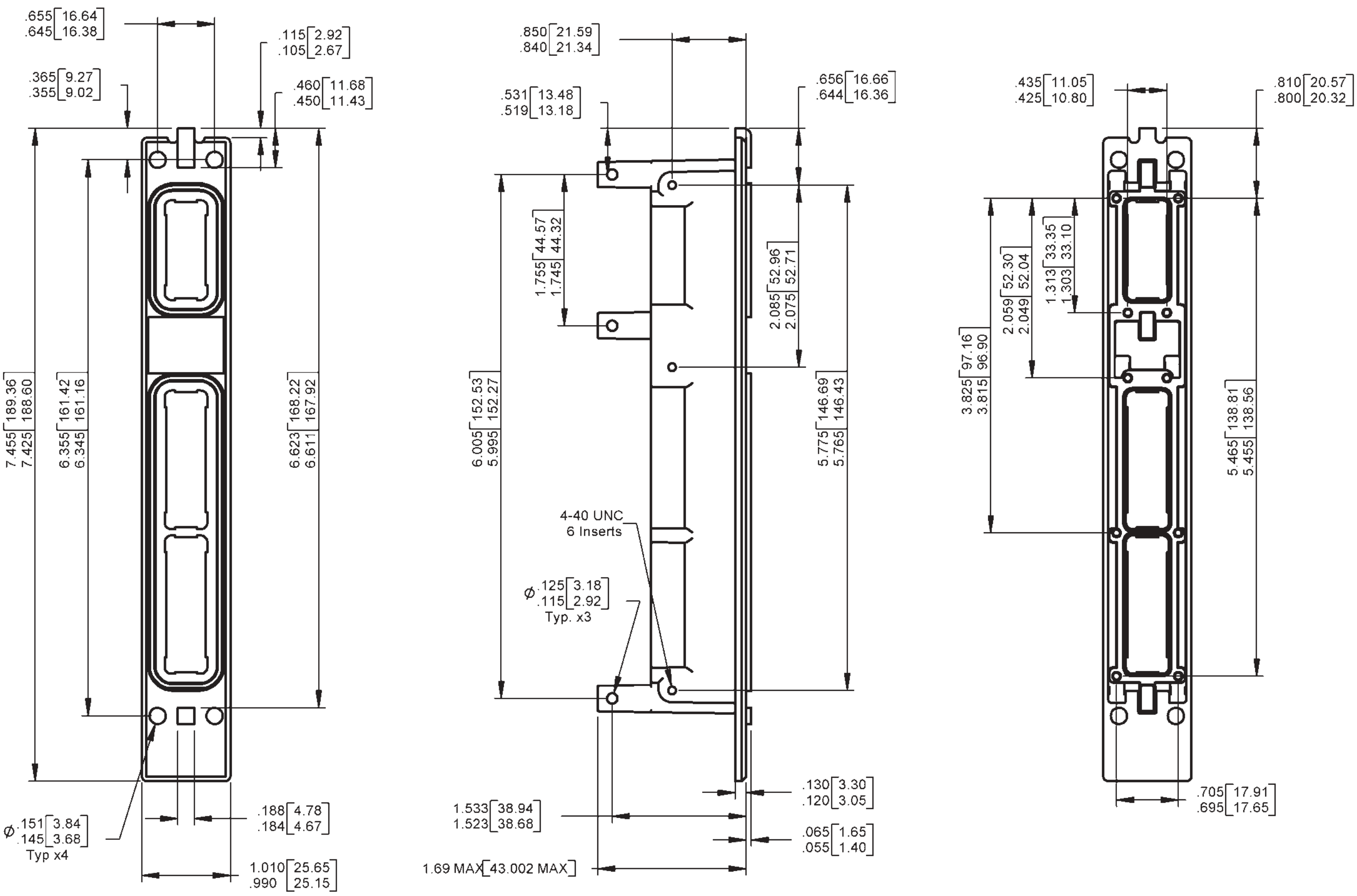
ARINC 600, Rack & Panel connector Series, feature low insertion force contacts.

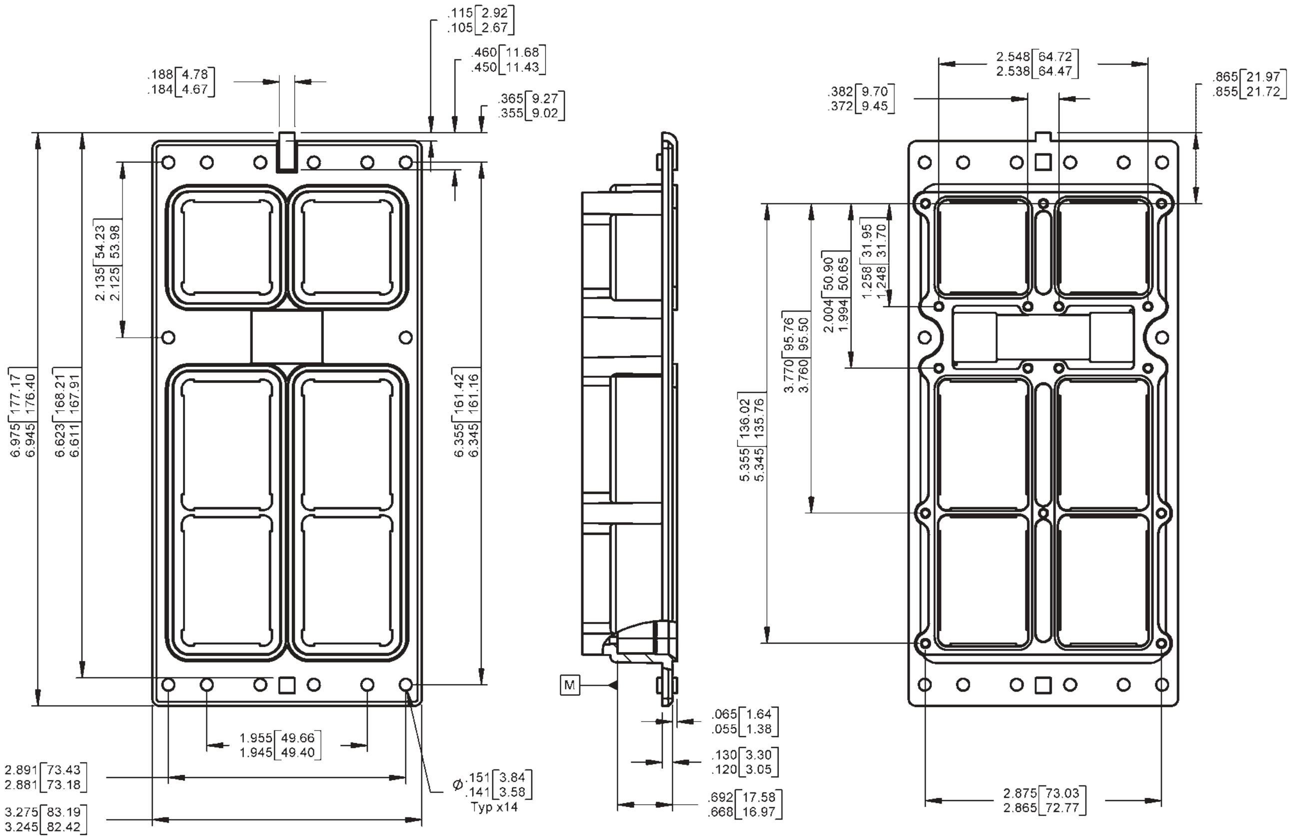
The ARINC 600 connectors are available both in environmental resistant and non- resistant versions.
The series uses contact sizes of #1, #8, #12, #16, #20, #22 and Coax sizes of (#1, #5, #8).

The connectors are available in 3 sizes: size 1 (low profile) and size 2 with 3 gangs only while size 3 comprises 6 gangs (the maximum number of contacts of # 22 is 800).

The ARINC 600 connectors are used mainly in Avionic applications.

Filters and protection components are built in as fixed and/or replaceable modules. A diversity of filters and protection types as well as power line filters can be applied to meet RTCA specification.

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.105 2.67
.460 11.68
.450 11.43
.188 4.78
.184 4.67
.365 9.27
.355 9.02
2.135 54.23
2.125 53.98
6.975 177.17
6.945 176.40
6.623 168.21
6.611 167.91
6.355 161.42
6.345 161.16
1.955 49.66
1.945 49.40
2.891 73.43
2.881 73.18
3.275 83.19
3.245 82.42
Ø .151 3.84
.141 3.58
Typ x14
M
.065 1.64
.055 1.38
.130 3.30
.120 3.05
.692 17.58
.668 16.97
2.548 64.72
2.538 64.47
.382 9.70
.372 9.45
.865 21.97
.855 21.72
5.355 136.02
5.345 135.76
3.770 95.76
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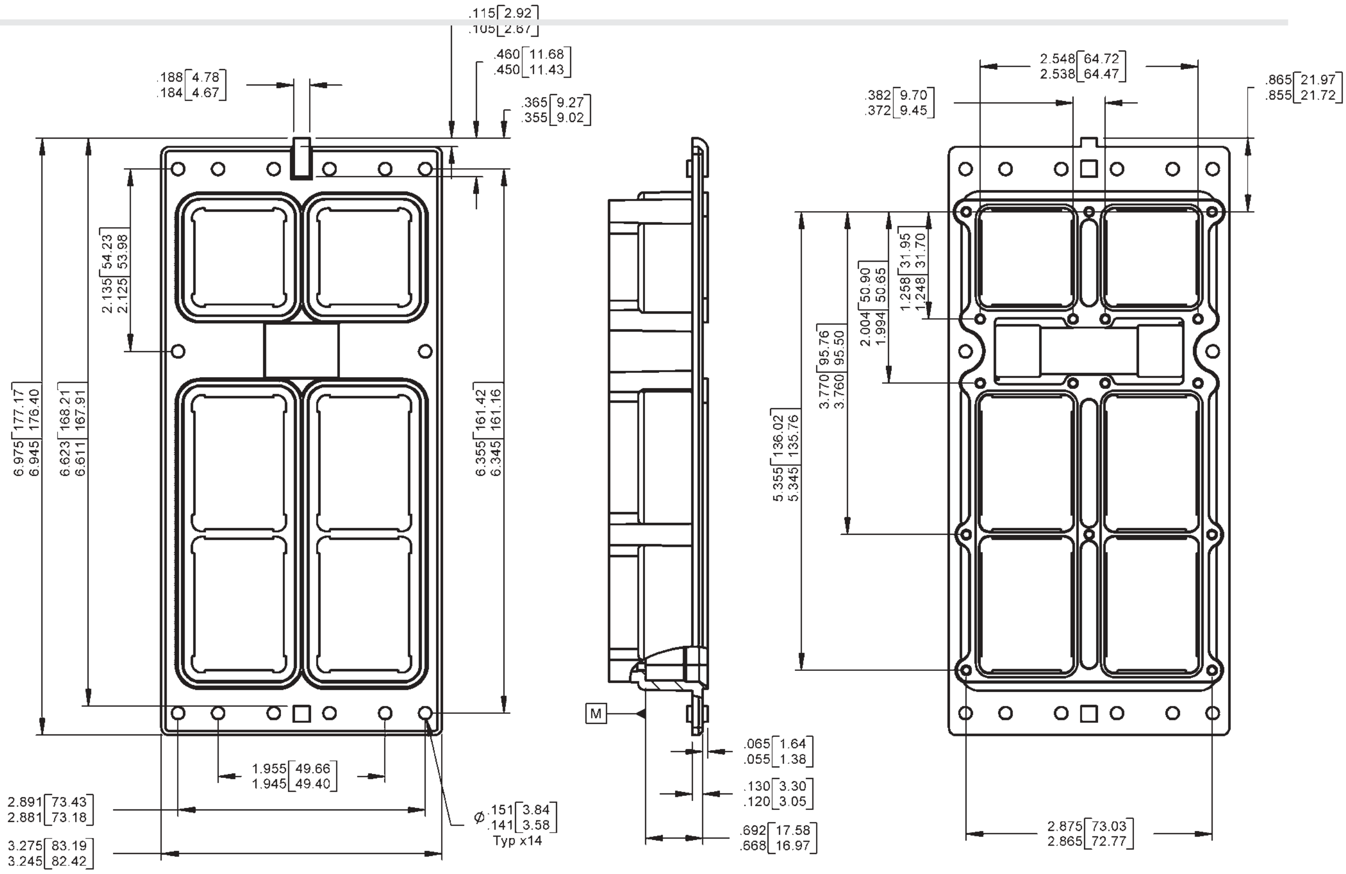
1.994 50.65
1.258 31.95
1.248 31.70
2.875 73.03
2.865 72.77


.115 2.92
.105 2.67
.460 11.68
.450 11.43
.188 4.78
.184 4.67
.365 9.27
.355 9.02
2.135 54.23
2.125 53.98
6.975 177.17
6.945 176.40
6.623 168.21
6.611 167.91
6.355 161.42
6.345 161.16
1.955 49.66
1.945 49.40
2.891 73.43
2.881 73.18
3.275 83.19
3.245 82.42
Ø .151 3.84
.141 3.58
Typ x14
M
.065 1.64
.055 1.38
.130 3.30
.120 3.05
.692 17.58
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.372 9.45
.865 21.97
.855 21.72
5.355 136.02
5.345 135.76
3.770 95.76
3.760 95.50
2.004 50.90
1.994 50.65
1.258 31.95
1.248 31.70
2.875 73.03
2.865 72.77

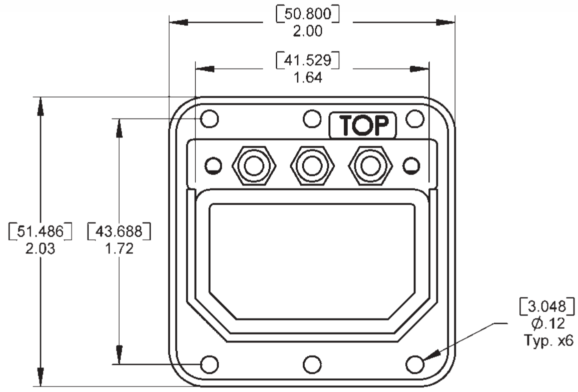
The ARINC 404 connectors are one piece shell miniature rack and panel connectors. They are available in one, two, three and four gang versions with ARINC 404 standard shells.

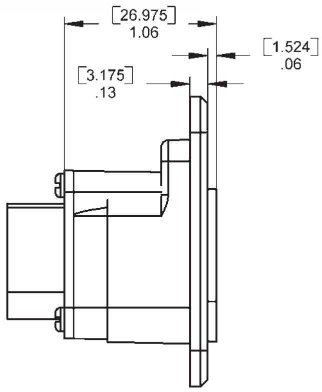
The shells are keystone shaped for polarization. The use of 3 hexagonal polarization posts provides up to 99 unique polarization positions.
The plug and receptacle connectors can include RFI fingers for better conductivity. Receptacle gangs are available.

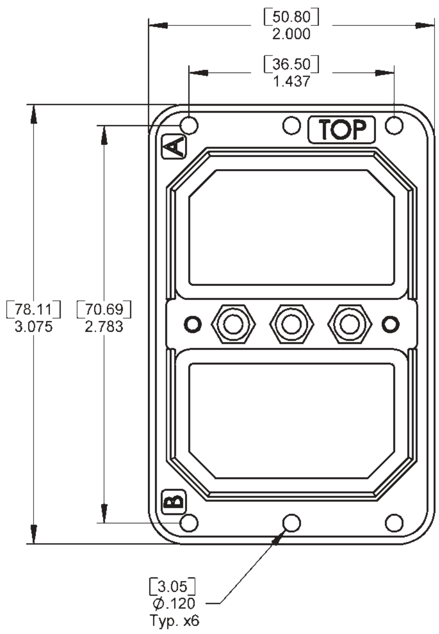
The series uses contact sizes of #4, #8, #12, #16, #20, #22, and Coax sizes (#5, #9, #11) Per MIL-C-81659

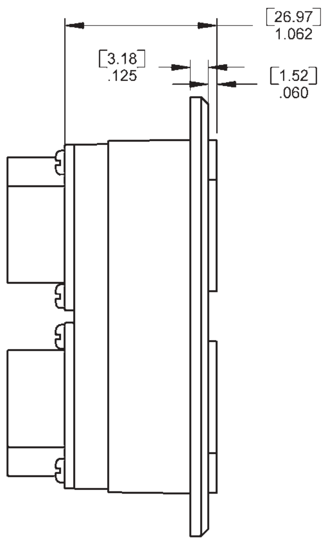
The ARINC 404 connectors are used mainly for Avionic applications.

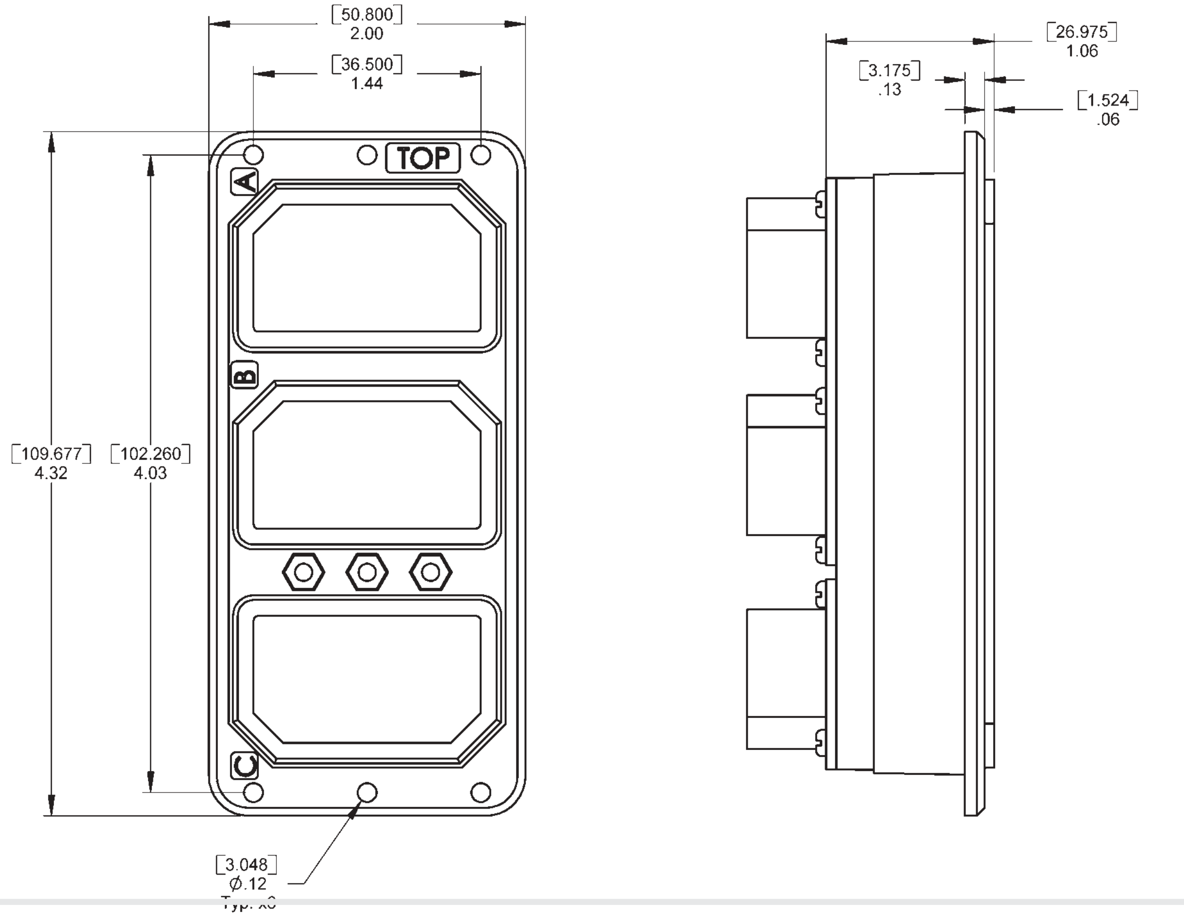
Filters and protection components are built in as fixed and/or replaceable modules. A diversity of filters and protection types as well as power line filters can be applied to meet RTCA specification.







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B
C
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4.32
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.13
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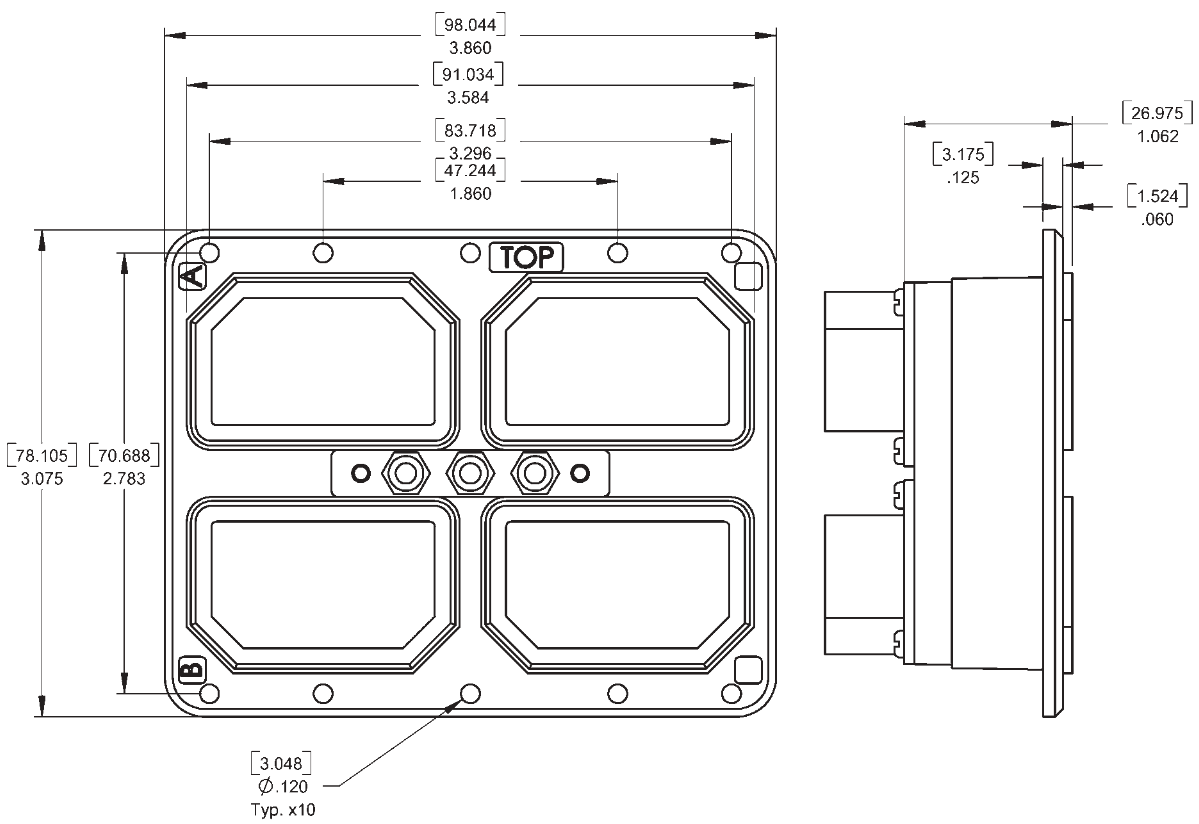
.06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3.860
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3.584
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1.860
TOP
A
B
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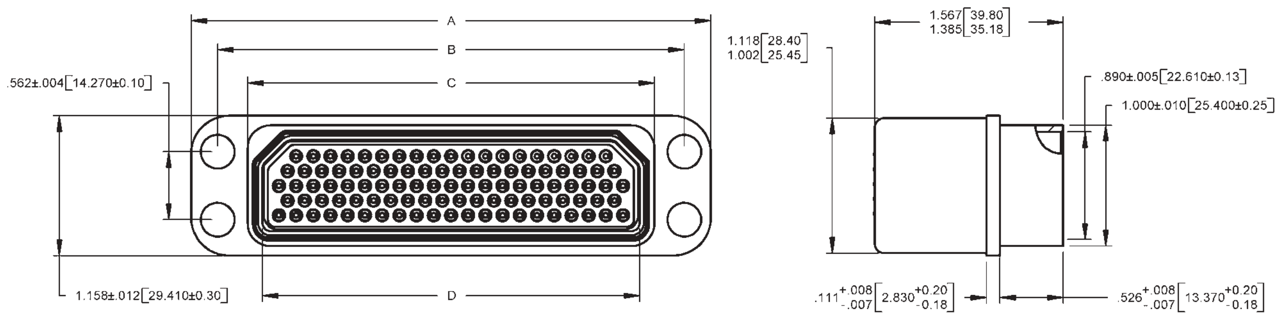
3.075
[70.688]
2.783
[3.048]
Ø.120
Typ. x10
[26.975]
1.062
[3.175]
.125
[1.524]
.060

The DPK series rectangular connectors feature high performance environment-resistant.

The DPK connectors have up to 185 contacts with sizes of #22D, #20, #16 & #12 per MIL-C-83733.

The DPK connectors are used mainly in avionic applications. Filters and transient protection components are built in as constant and/or replaceable modules.

A diversity of filter and transient protection types and of power line filters can be applied to meet the stringent requirements of MIL-STD-461 and RTCA DO160D.



Shell Size	A Max	B Max	C Max	Ø D ± 0.2 [± .008]
DPKA	.979 [24.87]	.596/.590 [15.14/14.99]	.829 [21.06]	.625 [15.88]
DPKB	1.104 [28.05]	.721/.715 [18.03/18.16]	.954 [24.24]	.750 [19.05]

AUDIO

RF Immunity Ltd. is a leading provider of filtered audio connectors for military tactical ground communication systems.

The filtered audio connectors are exactly identical to the standard audio connectors in material, finish, electrical characteristics and in their capability to withstand hostile environment conditions.
MIL-C-55116 compatible connectors with 5, 6 and 7 contacts are available in the same shell size.
Miniature Audio Connector VBA series with 7 and 10 contacts that meets the VG 95351 and VG 96934 standards is also available.
PCB and Solder Cup contact terminations are offered.

Filter diversity combined with transient protection are available in a standard connector shell.

Mil-C-5015

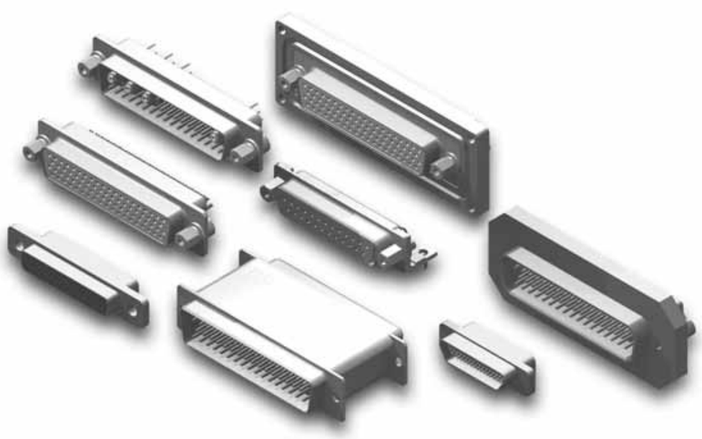
These connectors accommodate contact sizes of 0 to 16 and shell sizes of 8 to 40.
Multiple interlock systems ensure permanent insert retention.

Complete environmental sealing is achieved by individually sealing the connector inner components. The circular connector series includes a self-locking plug version.

These connectors are available with cadmium or nickel finished aluminum shells. Shells of passivated stainless steel are also available.

The connectors can mate with non-filtered connectors and are drop-in replacements for non-filtered connectors.
Non-standard filter connector body sizes and shapes and insert arrangements are available.

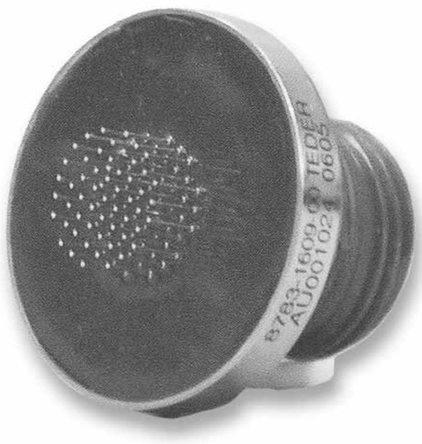
D-Type



The D-type filtered connector family features D-Sub STD density, High density, Combo and MDM connectors. We offer standard as well as custom design configurations in form of sealed or special shell design connectors for extreme environmental conditions.

The D-type product line also includes adapters in a variety of sizes and configurations. Our filtering solutions for these families are provided in form of C, L & PI section filters and can also contain transient protection all enclosed in the standard shell dimensions. Please refer to our D-Sub catalogue for more information.

A filtered connector for military applications, based on D38999/24 Jam Nut connector with a custom back shell. A power line filter and a signal line filter are enclosed in its housing with a high filter attenuation from 1kHz up to 1GHz



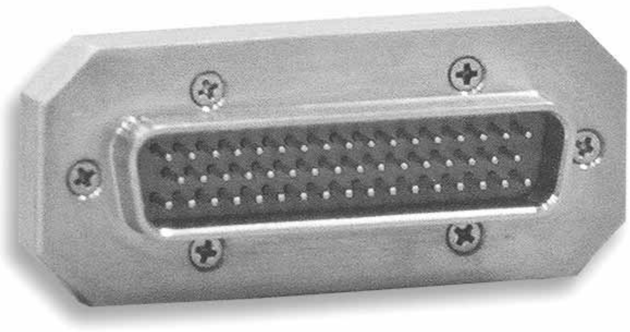
A filtered connector for ground mobile military applications based on D38999/24 Jam Nut connector with a custom low profile back shell (less than the standard connector depth). It contains 28V/12A power line filter, double L section filter with Fco=6kHz and a diversity of additional signal filters.

A filtered connector and an EMP protection for military applications with special back shell design.
A 28V/10A Per MIL-STD-1275 power line filter and an EMP protection built in a low profile connector with the same depth as the standard one.

Selected Projects

A 220V/5A /50-60Hz/ 1 phase power line filter for telecom and military applications, DM filters and CM filters. The filter has Fco= 1kHz combined with lightning transient protection (20 J Pulse energy). The filters are integrated in a D38999/24 Jam Nut connector with a special, extended back shell.

A custom design connector developed by R.F. Immunity with an EMI filter for use in military applications. It features easy and quick mating and disconnecting and contains PI filters for frequencies ranging from 10kHz to 1GHz.



A hermetically sealed filtered connector based on D-Type 50 pin cavity. It is designed to meet extreme environmental conditions. A PI section filter is enclosed within similar dimensions of a standard D-Type connector.

A hermetically sealed filter plate interface for armed mobile military applications. It contains a 20A power line and signal line feed through filters.

A 10A DC power line feed through filter for DC and/or Control lines, a PI filter operating at frequency range of up to 1GHz.

A 40A DC power line feed through filter for DC lines with operating voltage of up to 100V. It contains a double PI section filter operating at frequency range of up to 1GHz.

Selected Projects

Brief Introduction to EMC

The concern of designers to product electromagnetic compatibility issues has dramatically increased in the recent years. Many different standards have been developed and released, and all electrical and electronics engineers are aware of different compatibility tests. Unfortunately, there are still a lot of designers that encounter difficulties when dealing with EMC, either with understanding the issue, or in solving the related problems.

So, what is EMC?
ElectroMagnetic Compatibility (EMC) is defined as the ability of a device or system to satisfactorily function (without errors) in the target electromagnetic environmental conditions.
Nowadays, various EMC standards define the permissible electromagnetic interaction between every system and its immediate environment. All electronic systems must be compatible to all other systems in the affected environment, in terms of EMC. This system compatibility must be proven by tests to be certified by the applicable EMC standard.
All these developments had lead to the emergence of a new engineering branch - the EMC engineering.
EMC engineering use analytical methods, design practices, test procedures, and solution hardware and components both to enable the system to function without errors in its target electromagnetic environment, and to prevent it from inflicting errors to any adjacent system. It also enables the system to meet the EMC control specifications limits.

EMC deals with 3 major components:

- The source of interference (noisy system or power supply), also called EMI source.
- The victim of interference (sensitive circuitry), also called EMI victim
- The coupling path.

EMI (Electromagnetic Interference) is defined as the electromagnetic emissions discharged by a device or a system that interfere with the normal operation of other devices or systems.

Electromagnetic compatibility problems are generally solved by identifying at least two of the above mentioned components and eliminating one of them.

Potential sources of electromagnetic compatibility problems include radio transmitters, power lines, electronic circuits, lightnings, lamp dimmers, electric motors, arc welders, solar flares and just about everything that utilizes or creates electromagnetic energy. Potential receptors include radio receivers, electronic circuits, appliances, people, and just about everything that utilizes or can detect electromagnetic energy. The way this electromagnetic energy is transferred from a source to a receptor fall into one of the following four categories.

1. Conductance (electric current)
2. Inductive coupling (magnetic field)
3. Capacitive coupling (electric field)
4. Radiation (electromagnetic field)

The coupling paths are often comprised of a complex combination of these routes, making the path difficult to be identified, even when the source and/or receptor are known. There may be multiple coupling paths, and steps taken to attenuate one may enhance another.

- Conducted noise is coupled between components through interconnecting wires such as power supply and ground lines. Common impedance coupling is caused when currents from two or more circuits flow through the same impedance such as power supply and ground lines.
- Radiated electromagnetic field coupling can be handled in one of the following ways: in the near field, E and H field couplings are handled separately. In the far field, the coupling is handled as a plane wave coupling.
- Electric field coupling is caused by the voltage difference between conductors. The coupling mechanism can be modeled by a capacitor.
- Magnetic field coupling is caused by the current flow in conductors. The coupling mechanism can be modeled by a transformer.

The most common methods used for noise reduction include proper circuit design, shielding, grounding, **filtering**, isolation, separation and orientation, circuit impedance match control, cable design, and other noise cancellation techniques.

RF Immunity gained extensive experience in developing and producing filter and transient protection connectors. We have a variety of off the shelf connectors similar in size to standard connectors, and we have the capacity to develop custom made filtering products that are fully compatible with the customer specifications and enable the customer system to be approved by compatibility tests.

EMI Standards

The requirements for control of EMI characteristics of systems and equipment are defined by specifications and standards.
The specifications and standards define the permissible interaction between the electromagnetic environment on the one hand, and systems and equipment on the other hand. Different standards are applied in different countries. US, European, British, Australian, Japanese and many other standards are in use in the corresponding countries, but they all fall into 2 major groups of EMI standards:

1. Military.
2. Commercial/Industrial.

Each group is divided into sub-groups, each of which deals with different types of equipment and environment: avionic, ground, navy, communications, etc.
The standard tests relate to 1 or both of the following major categories: conducted and radiated.
These 2 categories deal with emission and susceptibility interferences; it is presented as CE - for conducted emission, RE - for radiated emission, CS - conducted susceptibility and RS - for radiated susceptibility. Each section deals with different level of interference as well as different frequency range.
Herein are the details of a few well-known standards:

- A variety of commercial and industrial standards are in use, and in general, they are applicable to certain types of equipment. Few of these standards are listed in the following table.

Equipment	Standard	Description	Test
Household Appliances, Electric Tools and similar Aparatus	EN 55014-1	EMC: Emission	CE, RE
	EN 55014-2	EMC: Immunity	CS, RS
Information Technology Equipment	EN 55022	Radio Disturbance Characteristics - Limits and Methods of Measurement	CE, RE
	EN 55024	Immunity Characteristics - Limits and Methods of Measurement	CS, RS
Testing and Measurement Techniques	EN 61000-4-2	Electrostatic Discharge Requirements	ESD
	EN 61000-4-3	Radiated, RF, Electromagnetic Field Immunity	RS
	EN 61000-4-4	Electrical Fast Transient/Burst Immunity Test	Transient
	EN 61000-4-5	Surge Immunity Tests	Lightning
	EN 61000-4-6	Immunity to Conducted Disturbances, Induced by RF Fields	CS

- EUROCAE ED-14D/RTCA-DO-160D
  ENVIROMENTAL CONDITIONS AND TEST PROCEDURES FOR AIRBORNE EQUIPMENT

EUROCAE ED-14D/RTCA-DO-160D ENVIROMENTAL CONDITIONS AND TEST PROCEDURES FOR AIRBORNE EQUIPMENT		
Section	**Change**	**Description**
17	-	Voltage Spikes
18	2	Audio Frequency Conducted Susceptibility Power Inputs
19	-	Induced Signal Susceptibility
20	1	Radio Frequency Susceptibility (Radiated and Conducted)
21	-	Emission of Radio Frequency Energy
22	3	Lightning Induced Transient Susceptibility
23	-	Lightning Direct Effects
25	-	Electrostatic Discharge

- MIL-STD-461
  DEPARTMENT OF DEFENSE INTERFACE STANDARD REQUIREMENTS FOR THE CONTROL OF ELECTROMAGNETIC INTERFERENCE CHARACTERISTICS OF SUBSYSTEMS AND EQUIPMENT

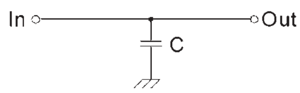
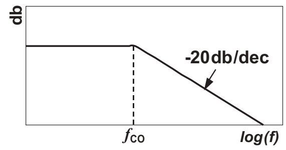
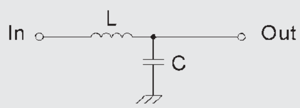
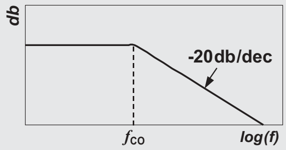
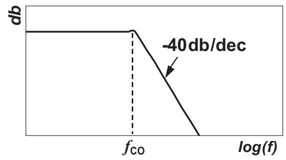
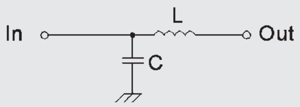
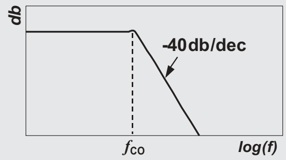
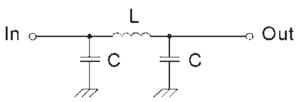
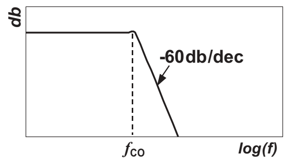
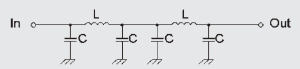
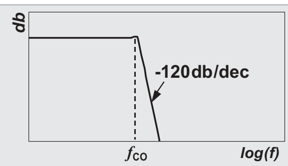
MIL-STD-461 DEPARTMENT OF DEFENSE INTERFACE STANDARD REQUIREMENTS FOR THE CONTROL OF ELECTROMAGNETIC INTERFERENCE CHARACTERISTICS OF SUBSYSTEMS AND EQUIPMENT								
MIL - STD - 461C			MIL - STD - 461D			MIL - STD - 461E		
TEST	DESCRIPTION	FREQ	TEST	DESCRIPTION	FREQ	TEST	DESCRIPTION	FREQ
CE01	Power / Signal Leads	30 Hz- 15 kHz	CE101	Power Leads	30 Hz- 10 kHz	CE101	Power Leads	30 Hz- 10 kHz
CE03	Power / Signal Leads	15 kHz- 50 MHz	CE102	Power Leads	10 kHz- 10 MHz	CE102	Power Leads	10 kHz- 10 MHz
CE06	Antenna Terminal	10 kHz- 26 GHz	CE106	Antenna Terminal	10 kHz- 40GHz	CE106	Antenna Terminal	10 kHz- 40GH
CE07	Power Leads	Spikes / Time Domain	N.A			N.A		
CS01	Power Leads	30 Hz- 50 kHz	CS101	Power Leads	30 Hz- 50 kHz	CS101	Power Leads	30 Hz- 150 kHz
CS02	Power Leads	50 kHz- 400 MHz						
CS03	Intermodulation	15 kHz- 10 GHz	CS103	Antenna Port- Intermodulation	15 kHz- 10 GHz	CS103	Antenna Port- Intermodulation	15 kHz- 10 GHz
CS04	Undesired Sig. Rejection	30 Hz- 20 GHz	CS104	Antenna Port-Rej. of Undesired Sig.	30 Hz - 20 GHz	CS104	Antenna Port-Rej. of Undesired Sig.	30 Hz - 20 GHz
CS05	Cross Modulation	30 Hz - 20 GHz	CS105	Antenna Port- Cross Mod.	30 Hz- 20 GHz	CS105	Antenna Port- Cross Mod.	30 Hz- 20 GHz
CS06	Spikes, Power Leads		N.A			N.A		
CS07	Squelch Ckts							
CS09	Structure Common Mode Current	60 Hz- 100 kHz	N.A			N.A		
CS10	Damped Sinusoidal Transients (Terminals)	10 kHz- 100 MHz	N.A			N.A		
CS11	Damped Sinusoidal Transients (Cables)	10 kHz- 100 MHz	N.A			N.A		
RE01	Magnetic Field	30 Hz- 50 kHz	RE101	Magnetic Field	30 Hz- 100 kHz	RE101	Magnetic Field	30 Hz- 100 kHz
RE02	Electric Field	14 kHz- 10 GHz	RE102	Electric Field	10 kHz- 18 GHz	RE102	Electric Field	10 kHz- 18 GHz
RE03	Spurious & Harmonic	10 kHz- 40 GHz	RE103	Antenna Spurious & Harmonics	10 kHz- 40 GHz	RE103	Antenna Spurious & Harmonics	10 kHz- 40 GHz
RS01	Magnetic Field, Equipment and Cables	30 Hz- 50 kHz	RS101	Magnetic Field	30 Hz- 100 kHz	RS101	Magnetic Field	30 Hz- 100 kHz
RS02	Magnetic Induction, Equipment and Cables	Power line & Spike	N.A			N.A		

MIL-STD-461 DEPARTMENT OF DEFENSE INTERFACE STANDARD REQUIREMENTS FOR THE CONTROL OF ELECTROMAGNETIC INTERFERENCE CHARACTERISTICS OF SUBSYSTEMS AND EQUIPMENT								
MIL - STD - 461C			MIL - STD - 461D			MIL - STD - 461E		
TEST	DESCRIPTION	FREQ	TEST	DESCRIPTION	FREQ	TEST	DESCRIPTION	FREQ
RS03	Electric Field, Equipment and Cables	14 kHz-40 GHz	RS103	Electric Field	10 kHz-40 GHz	RS103	Electric Field	2 MHz-40 GHz
RS05	Electromag. Pulse Field	Transients	RS105	Transient Electromag. Field	Transients	RS105	Transient Electromag. Field	Transients
N.A			CS109	Structure Current	60 Hz-100 kHz	CS109	Structure Current	60 Hz-100 kHz
N.A			CS114	Bulk Cable Injection	10 kHz-400 MHz	CS114	Bulk Cable Injection	10 kHz-200 MHz
N.A			CS115	Bulk Cable Injection	Impulse	CS115	Bulk Cable Injection	Impulse
N.A			CS116	Damp Sine Transients - Cables, and Power Leads	10 kHz-100 MHz	CS116	Damp Sine Transients - Cables, and Power Leads	10 kHz-100 MHz

Selecting filter Topology

Low pass passive filters are most commonly used to reduce EMI. There are several basic topologies of these filters - C and C², I, L, J, π, Double π (or Hi - Filter). Selecting the wrong filter topology may result in system oscillation and malfunction. Selecting the right filter topology is critical to significant EMI reduction and best system performance. The available RF Immunity filter topologies, performances and applications are described in the following table.

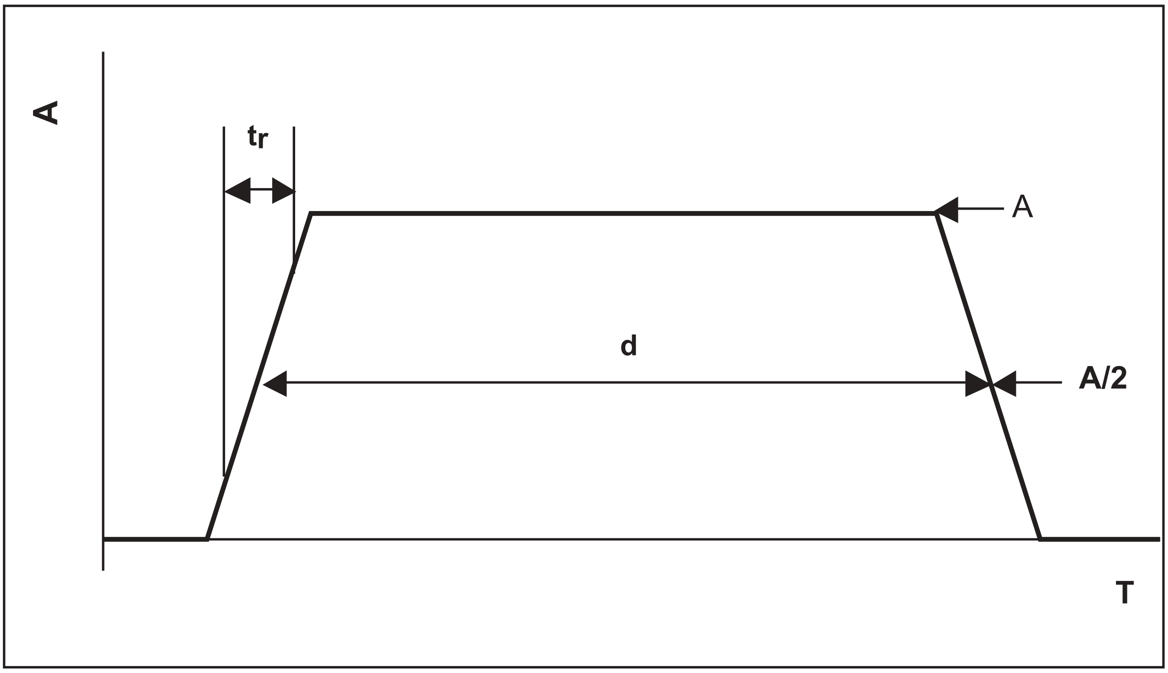
Note that an “in” label indicates connector front end and an “out” label indicates connector rear end.

Filter Topology Name	Filter Schem	Application	Theoretical f_{co} (Cut off Frequency)	Theoretical Insertion Loss
C And C²		• The best performance is achieved when used with high impedance load and source • Theoretical slope: -20 db/dec	$f_{co} = \dfrac{1}{\pi RC}$	
I		• The best performance achieved when used with low impedance load and source • Theoretical slope: -20 db/dec	$f_{co} = \dfrac{R}{\pi L}$	
L		• The best performance is achieved when used with high impedance load and low impedance source • Theoretical slope: -40 db/dec	$f_{co} = \dfrac{1}{\pi\sqrt{LC}}$	
J		• The best performance is achieved when used with low impedance load and high impedance source • Theoretical slope: -40 db/dec	$f_{co} = \dfrac{1}{\pi\sqrt{LC}}$	
Pi		• The best performance is achieved when used with high impedance load and source • Theoretical slope: -60 db/dec	$f_{co} = \dfrac{1}{\pi\sqrt{2LC}}$	
Hi		• The best performance is achieved when used with high impedance load and source • Theoretical slope: -120 db/dec	$f_{co} = \dfrac{1}{\pi\sqrt{2LC}}$	

Estimation of filter cut off frequency

Once the filter topology is selected, the filter Cut Off Frequency can be determined.
The filter cut off frequency is defined as the -3 db attenuation frequency . Attenuation -3 db means that half of the transmitted power is dissipated across the filter. The -3 db cut off frequency is considered to be the highest operation limit of the low pass filter range. The filter will attenuate dramatically all signals with frequency above the cut off frequency.
If the selected cut off frequency will be too low in comparison to the signal frequency and rise time, the filter will distort the signal shape . If it will be too high, undesired high frequency noise will be a part of the signal shape. Therefore the selection of the proper cut off frequency is crucial to the signal integrity.
To make the proper selection of the filter cut off frequency, the designer must estimate the spectrum of the signal.
The data pulse usually used in electronic systems is trapezoid in shape, with finite rise and fall times.

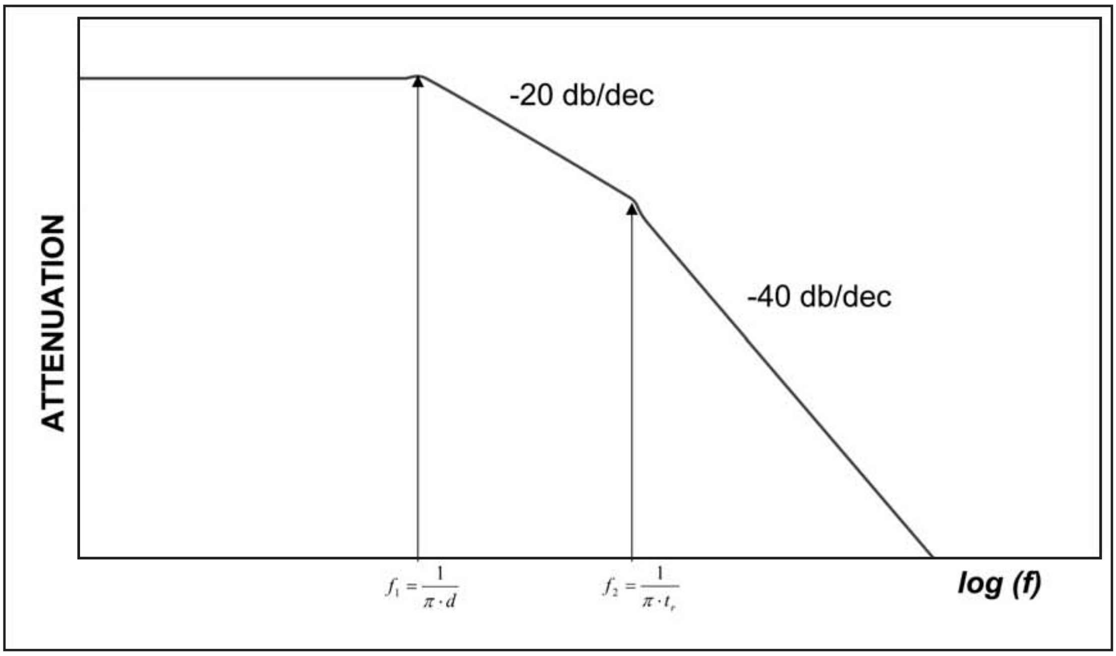
Single trapezoide



- ***A*** - the pulse amplitude
- ***d*** - the pulse duration; is the time interval in which the pulse value is higher than 50% of the amplitude
- ***t_r*** - the pulse rise time; is the required time for the signal to go from 10% to 90% of its amplitude.
  Analyzing the pulse using the Fourier method, the following frequency domain graph is obtained.

The graph can help designers in estimating the spectrum of trapezoidal pulses.

Spectrum of trapezoidal data pulse



f_1 - the first corner frequency ; f_2 - the second corner frequency

Please note, that the amplitude (dB) of the spectrum is different for a single data pulse and for a data pulse train, but the corner frequencies remain the same:

$$f_1 = \frac{1}{\pi \cdot d} \quad ; \quad f_2 = \frac{1}{\pi \cdot t_r}$$

The proper filter cut off frequency can be estimated by the following rule of thumb:

$$f_{co} = 10 \cdot f_2$$

where f_{co} is filter cut off frequency.

If an estimation of the cut off frequency is based on f_1 instead of f_2, and/or the coefficient is selected smaller than 10; the resulting filtered signal could be distorted.
However in many cases the designer uses devices with very fast rise and fall times (t_r & t_f) while the signal duration (d) is very long compared to the transition times. The t_r is not a critical factor in these cases. Slowing down the transition times (t_r & t_f) at those designs is possible and actually can be a very good idea. So the estimated cut off frequency of the filter can be detemined as follows:

$$f_{co} = (2 \div 3) \cdot f_2$$

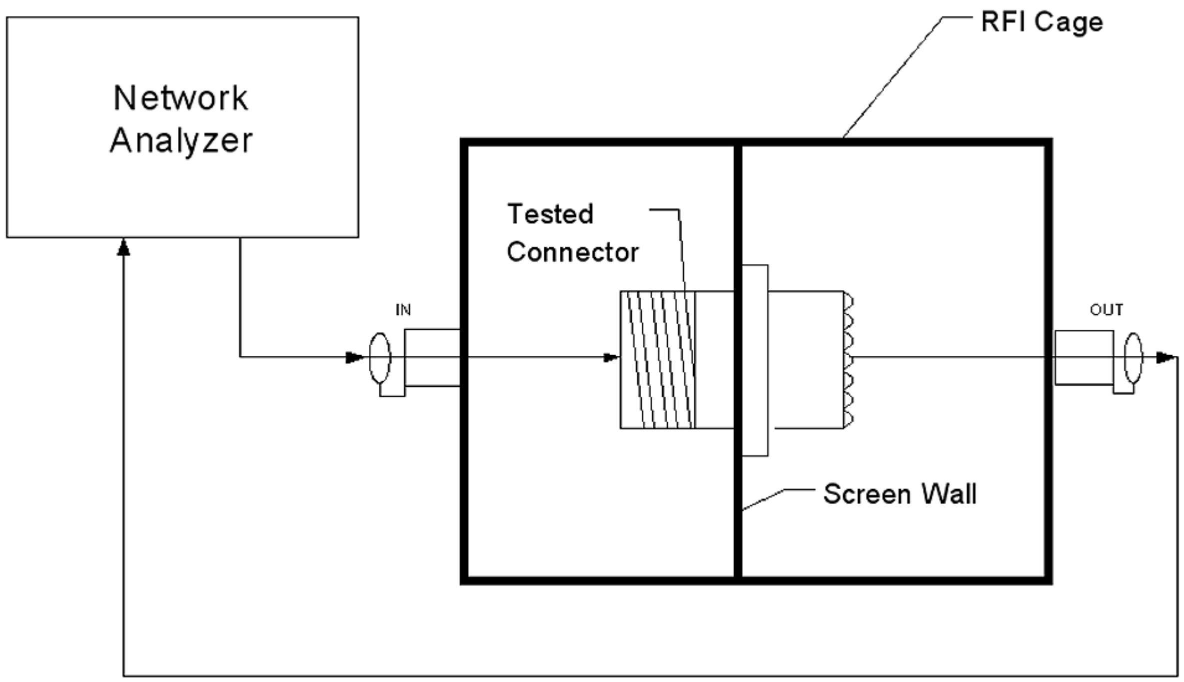
When using both the filter and the transient protection on the similar signal line, the approximation of the common cut off frequency can be calculated using the equation of the C Filter presented on page 75 and assigning the total capacitance of the filter and the transient protection to that equation.

$$f_{co} = \frac{1}{\pi R C_T} \quad ; \quad C_T = C_F + C_{TP}$$

C_T - Total Capacitance
C_F - Typical Capacitance of the Filter
C_{TP} - The Capacitance of Transient Protection

Measuring the Filter Performance

We measure filter performance in accordance with MIL-STD-220 with a 50Ω system and no load.
The test setup we use is as follows:



Filter Performance at non-50Ω System

Filter performance in non-50Ω system

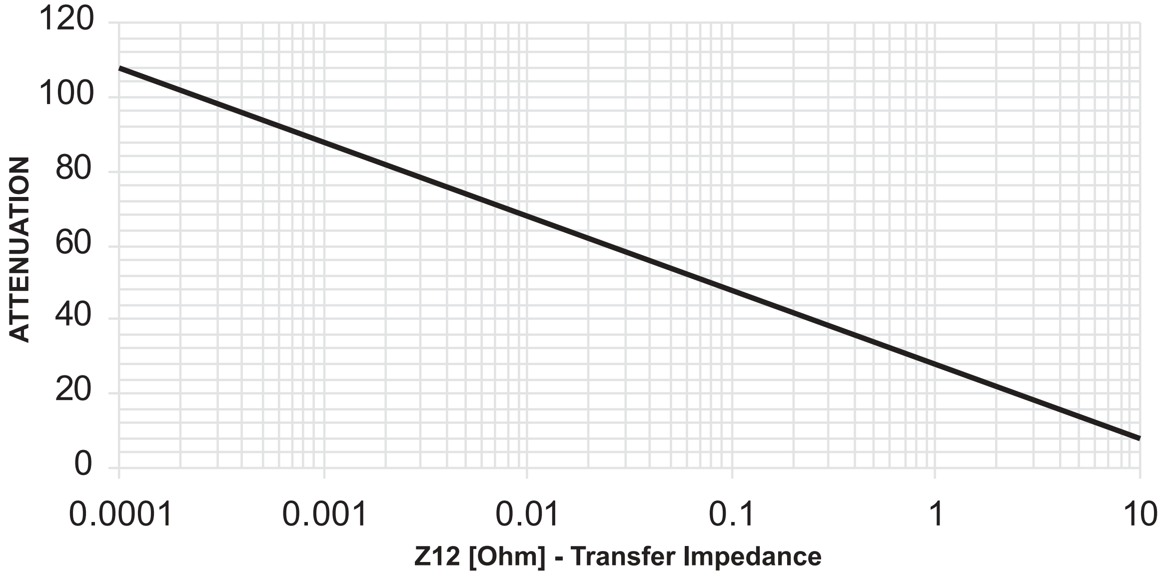
If your system is not 50Ω matched, you can use the following formula for predicting the filter performance when used with other sources and/or load impedances.

$$\text{Att. [db]} = \log_{10}\left[\, 1 + Z_S Z_L/(Z_{12}(Z_S + Z_L))\,\right]$$

Z_S - Source Impedance
Z_L - Load Impedance
Z_{12} - Transfer Impedance

The transfer impedance Z_{12} can be calculated using the following graph:

Attenuation VS. Transfer Impedance in 50Ω System



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Product Overview

D-Sub Filtered Connectors

Feed-Through Filters

COMPANY PRODUCT LINE:

> D-Sub Filtered Connectors
> Military Filtered Connectors
> Feed-Through Filters

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