EMI/EMP Filter Protection Connectors

For protection of sensitive circuits

Amphenol® EMI/EMP Protection Connectors offer the versatility of standard connectors with EMI/EMP protection for sensitive circuits. Internal housing of the EMI/EMP devices eliminates costly and bulky exterior discrete protection devices.

Virtually all major MIL-Spec circulars can be incorporated with filter devices:

- MIL-DTL-38999
- MIL-DTL-26482
- MIL-DTL-83723
- MIL-DTL-5015
- MIL-DTL-27599
- MIL-DTL-26500

Amphenol offers filter connectors that include:

- EMP protection using diodes
- EMP protection utilizing metal oxide varistors (MOV's)
- Filtered plug connectors
- Filtered hermetic connectors
- Filter connectors with ESD protection
- EMI & EMP Protected Connectors
- Combinations of filtering devices within one connector package

This catalog focuses on the cylindrical connector offerings from Amphenol with EMI/EMP filter transient protection. There are also many rectangular filter connectors that are offered by Amphenol which include:

- MIL-DTL-24308 D-Sub
- MIL-DTL-83513 Micro D
- ARINC 404/600
- DOD-83527 Rack and Panel
- MIL-DTL-83733 Rack and Panel

Rectangular filter interconnects are manufactured and supplied by Amphenol Canada.

Advantages of Filter Connectors:

- Reduction in overall weight and space with the elimination of external filter circuits
- Reduction of solder junctions
- Increase in reliability due to fewer connections
- Fragile filter elements protected from handling and environmental damage
- Pre-testing from factory and ready for installation

FTV

Subminiature Tri-Start, MIL-DTL-38999 Series III, Metal or Composite shells with Filter Protection.

FLJT

Subminiature LJT, MIL-DTL-38999 Series I with Filter Protection.

Filter AN Connector

MIL-DTL-5015 Type Connectors with Filter Protection.

See Catalog 12-120

FJT

Subminiature JT, MIL-DTL-38999 Series II with Filter Protection.

FCTV with Stand-off Flange

Filtered Tri-Start connectors with composite shells for attachment to printed circuit boards.

FPT

Miniature MIL-DTL-26482 Series I with Filter Protection.

See Catalog 12-120

Filter Contacts Combined with High Speed Contacts

Filter Connectors can incorporate high frequency coax, twinax, triax, quadrax and differential twinax contacts.

MOV Connectors

MOV's act as a variable resistor to efficiently dissipate energy. MOV can be packaged singularly or in combinations with other EMI

Header Assemblies

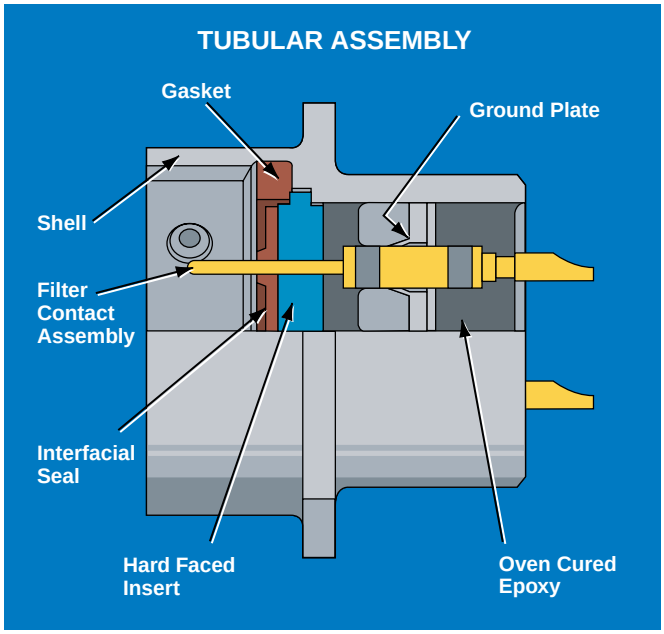
Allow for easy separation and easy termination of connectors when attaching to flex or printed circuit boards. Allow for electrical testing that would adversely affect sensitive diodes, MOV's or filter capacitors.

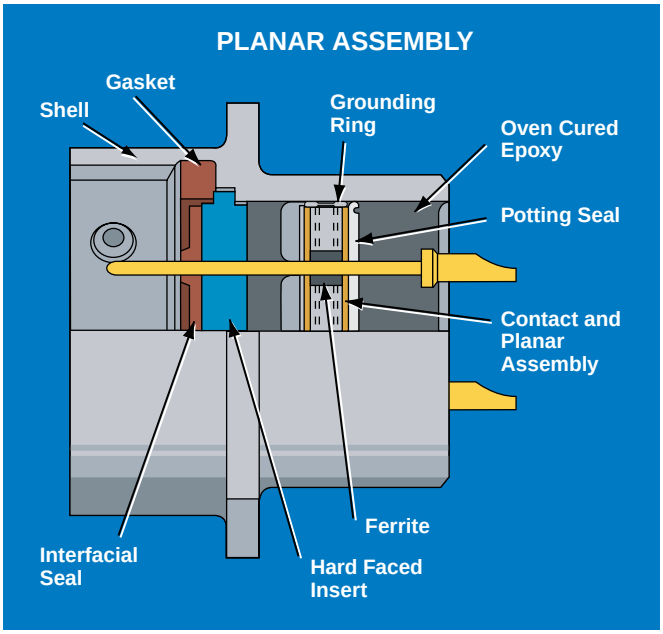
The Amphenol® EMI filter connector utilizes two manufacturing technologies to provide the user with the most cost effective performance across the frequency range. (For EMP performance data, see pages 172-175).

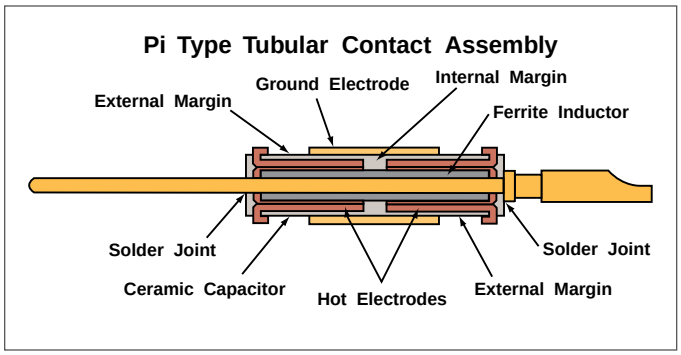
The tubular design offers over 40 years of proven field reliability. All filter contacts within the connector share a common ground plane, which is connected to the connector shell. The pin to pin isolation is 85 dB minimum at 100 MHz. The planar design joins pins to a multi-layered ceramic forming an array sub-assembly, with a peripheral ground which is connected to the connector shell via a ground spring. Pin to pin capacitance is less than 50 pf with a pin to pin isolation of 85 dB minimum at 100 MHz. Filter contacts for both designs contain either a pi passive element network comprised of a ferrite inductor and ceramic capacitor, or a single capacitor.

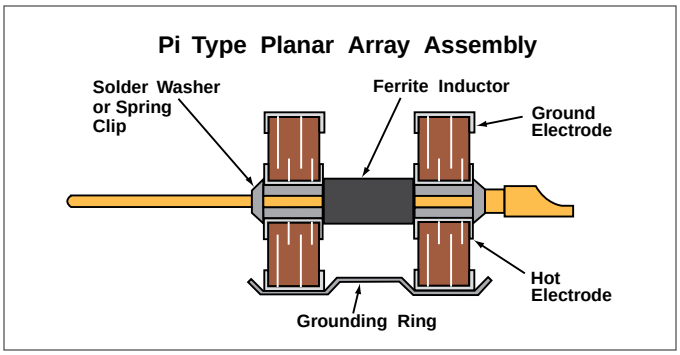
For planar designs other filter networks are available, ie. T Type, L-C Type, C-L Type and C Type. An encapsulant of oven-cured epoxy in the rear provides:

- Mechanical and thermal insulation of the ceramic elements – mechanical loading can be accomplished without capacitor damage. Pins can be bent 90° and straightened with no damage to the filter.
- Hermeticity (4.6×10^{-3} cc/sec) – prevents water from entering through the rear of the connector in high humidity environments. Amphenol recommends using metal protection caps during cleaning operations.









Amphenol provides a wide range of filtering solutions. You can select your options for your particular interference threats - VHF, UHF, HF or other filter ranges, then couple with a connector package of your choice. Or give Amphenol your custom shell design requirements for assistance in designing your unique filter solution.

EMI Filter connectors are intended for use in temperatures from –55°C to +125°C. Attenuation will change with feed-through current and temperature.*

To assure reliability, connectors may be subjected to an attenuation performance test verifying proper assembly and grounding of the filters. Attenuation data on filter performance is stated in reference to a 50 ohm impedance system in order to allow filter performance to be more easily translated into real world impedances. Those interested in determining the expected filter performance in an impedance system other than 50 ohms may refer to page 131 of this catalog or may contact Amphenol Aerospace for further assistance.

It is suggested that the user analyze his system requirements for EMI protection in the following areas:

- Working voltage (DC or AC and Frequency)
- Peak voltage
- Desired attenuation at a given frequency level
- Any special capacitance limitations

Definition of Filter Contacts:

MF-1	Medium Frequency 50 dB performance between 300 - 2999 KHz
HF-1	High Frequency 50 dB performance between 3 - 29 MHz
VHF-1	Very High Frequency 50 dB performance between 30 - 2999 MHz
UHF-1	Ultra High Frequency 50 dB performance between 300 - 2999 MHz

Filter contacts can be provided in most frequencies in contact sizes 22 or larger. Consult Amphenol Aerospace for availability.

Tubular connector designs will meet 3 amps RF current from –55°C through +125°C. Planar connector designs will meet 5 amps.

* More in-depth information on attenuation is available in:
L-1146, General Design Guideline for EMI Filters and/or TVS (Transient Voltage Suppression) Connectors.
Also for further information ask for:
L-1145, How to Specify Filter Connectors.

Planars, MOV's, Tubular and Diode Contacts

Planar Array Assembly

Capacitor and MOV Planars

Tubular Filters and Diode Contacts

Contact Options

- Coaxial, concentric twinax, triax and quadrax contacts can be included in arrangements of filtered contacts for signal or power circuits (See Amphenol catalog 12-130, High Frequency Contacts for Multi-Pin Connectors).
- Filter contacts with differing cut-off frequencies can be mixed in any given insert arrangement. (ratio 100:1 typical)
- Ground, insulated or filter contacts can be combined within the same connector to meet unique or changing frequency protection requirements.
- Thermocouple contacts
- Diodes for EMP

Methods of Wire Termination

- Solder cup - wire termination
- PCB termination (Pre-tinning is available)
- Solderless wrap
- Amphenol® UTS (Universal Termination System) allows crimp termination. It uses crimp insertable socket contacts on conductor wires. Sockets mate with filter pins within the connector body. (Socket type M39029/57). (For further contact information, see section, MIL-DTL-38999 Series I & II).
- Weld terminal for thermocouple contacts

Adapters

Filter adapters eliminate replacement of either existing mated pair. The adapter provides the circuit protection at the MF, VHF and UHF levels, and is an effective and economical method of introducing EMI/EMP protection to an installed system. Adapters are to be placed between mating faces. (See pages 171).

Printed Circuit Board Mount

Receptacle shell modifications that allow mounting directly to a PC board or flex header. Stand-off shells are available in different configurations. These offer improved reliability by eliminating external spacers and washers. (See pages 140, 141, 146, 147,160 and 163).

Hermetic

The hermetic filter connector, while only approximately 1/2 inch longer than standard series connectors, provides all the benefits of a hermetic connector, plus EMI protection for sensitive circuits. The filter assembly is protected by a fused glass insert within a unique steel housing. This design provides the capability to tolerate high level static pressure while maintaining a low level leakage rate. Consult Amphenol Aerospace for more information.

Composite

Composite shell filter connectors meet the MIL-DTL-38999, Series III dimensional length, and offer a light-weight, corrosion resistant, durable connector with the same high performance features as its metal counterpart. The composite filter connector utilizes planar technology to accommodate VHF-1 or better electrical performance characteristics. (See pages 138-141).

ESD Protection

Filter connectors with ESD (Electrostatic Discharge) protection are available. These MIL-DTL-38999 Series I and III connectors have an added feature of a Faraday Cage to shunt electrostatic discharge events to the conductive enclosure on which the connector is mounted.
(See page 203).

Filtered Plugs

Filtered Plugs are designed for applications where EMI protection is essential, but access to the receptacle is denied. Designed with the same components as a standard filter receptacle, the filtered plug offers the option of being mounted on the cable harness. It is a cost effective method of achieving EMI protection when length restrictions prohibit inclusion of an adapter to the system. Consult Amphenol Aerospace for availability.

Diode Connectors

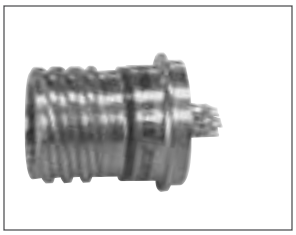
Diode Connectors offer versatility with transient protection for sensitive circuits, such as TTL lines. Diodes can stand alone or be combined with other filters. (Pages 174-175).

Shunting Assembly

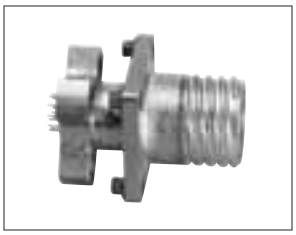
Amphenol's Energy Shunting Assembly is a simple, compact unit which provides lightning and electromagnetic pulse protection of systems in which many signal lines enter sensitive electronic equipment. (Page 176).

Cylindrical Filter Protection Connectors are offered in a wide range of styles, with custom designs for special applications.

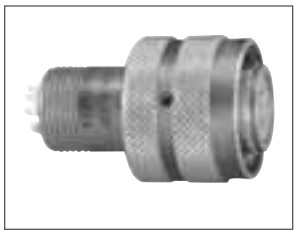
Filter Adapters can be attached to connectors to provide EMI/EMP protection.



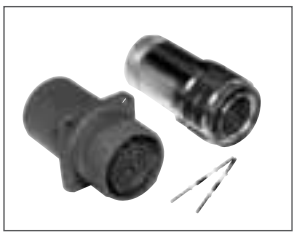
Hermetic filter connector



Composite shell stand-off Filter 38999 connector



Filtered plug

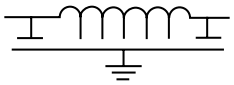


Diode Connectors

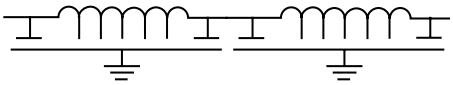
ESA - Energy Shunting Assembly

Amphenol® EMI Connectors are produced with several types of filters.
They are all low band pass filters with the following configurations:

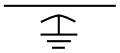
Pi -
Typical of the VHF, UHF and MF filter



Cascaded Pi -
Typical of the HF filter. It consists of two VHF Pi filters on a common pin and is available in tubular designs only.



Capacitor *-
Consists of a feed-through capacitor without any ferrite. It can be 50pf to 1µf and carry the MF, HF and VHF designation depending on its typical 50dB performance.



L-C *-
Typical of HF, VHF and UHF filter. Low source / high load impedance.

C-L *-
Typical of HF, VHF and UHF filter. High load impedance / low source.

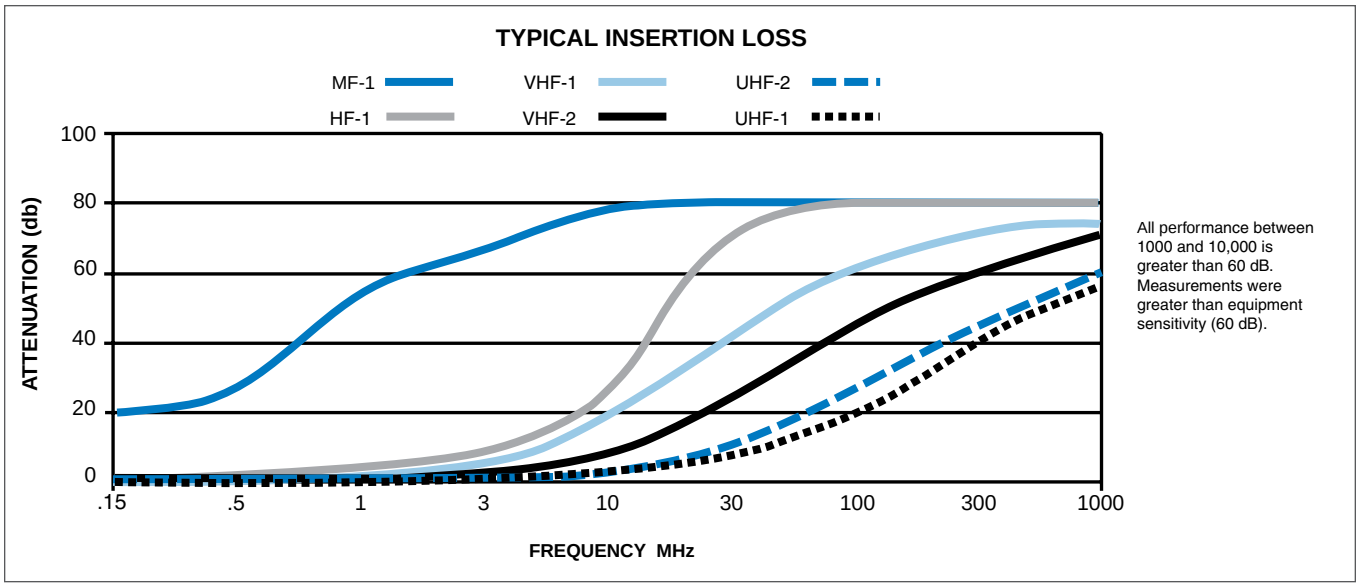
T *-
Typical of HF, VHF and UHF filter. Low source / low load impedance.

* Consult factory for attenuation performance values.

Parameters		Medium Frequency Filter✦	High Frequency Filter✦	Very High Frequency Filter		Ultra High Frequency Filter	
		MF-1 (Pi)	HF-1 (Cascaded Pi)	VHF-1 (Pi)	VHF-2† (Pi)	UHF-1† (Pi)	UHF-2† (Pi)
Minimum Attenuation (Test Points)*	150kHz	20dB	–	–	–	–	–
	15MHz	–	50dB	–	–	–	–
	50MHz	–	80dB	–	–	–	–
	100MHz	80dB	–	62dB	46dB	18dB	28dB
Maximum Working Voltage (User must specify DC or AC)††††	DC†††	50VDC	200VDC	200VDC	200VDC	200VDC	200VDC
Dielectric Withstanding Voltage Capability (for 5 sec. with 10 milliamperes max. charging current)✦✦		100 volts DC	500 volts DC	500 volts DC	500 volts DC	500 volts DC	500 volts DC
Maximum Feed-thru Current (DC and/or Audio Frequency R.M.S.)	Size 16 contacts	13.0 amps	13.0 amps	13.0 amps	13.0 amps	13.0 amps	13.0 amps
	Size 20 contacts	7.5 amps	7.5 amps	7.5 amps	7.5 amps	7.5 amps	7.5 amps
	Size 22 contacts	not available	not available	5.0 amps	5.0 amps	5.0 amps	5.0 amps
Maximum RF Current		3.0 amps	3.0 amps	3.0 amps	3.0 amps	3.0 amps	3.0 amps
Minimum Insulation Resistance		250 megohms	10 gigaohms	10 gigaohms	10 gigaohms	10 gigaohms	10 gigaohms
Typical Capacitance**		1.0 microfarad	16 nanofarads	7 nanofarads	2.5 nanofarads	375 picofarads	710 picofarads
Air Leakage††		4.6×10^{-3} cc/sec					
Operating Temperature Range		–55°C to +125°C					

* When tested at 25°C per MIL-STD-220.
** When measured at a frequency of 1 ±.1kHz and a voltage not exceeding 1.0 V.A.C.R.M.S. at +25°C.
† Consult Amphenol, Sidney, NY or your Amphenol representative for part number.
†† Lower leakage rates are available upon request.
††† Summation of the DC and low level AC super-imposed peak voltage.
†††† Consult Amphenol, Sidney, NY whenever AC voltage is present.
✦ Consult Amphenol, Sidney, NY or your Amphenol representative for availability.
✦✦ Higher DWV ratings are available upon request. Consult Amphenol, Sidney, NY.

Note: Below are typical capacitance values. Other capacitance values are available from 5pf to 400 NF in one capacitor element. Please consult factory for part numbers.



TYPICAL INSERTION LOSS (dB)
PER MIL-STD-220, 5 ADC, 25°C

Capacitance	1MHz	3MHz	10MHz	30MHz	100MHz	300MHz	1000MHz
375 pf UHF_1	0	0	1	8	16	–	–
750 pf UHF_2	0	0	3	10	19	–	–
2500 pf VHF_2	0	2	8	20	28	–	–
7000 pf VHF_1	5	9	17	23	40	–	–
16000 pf HF_1	6	14	20	24	80	–	–

Most filter attenuation curves and capacitance values are expressed at 25° C. However, temperature can affect the capacitance of a titanate filter element, affecting the insertion loss that the element will cause.
In order to assist the user in anticipating the effect of various temperatures, the following charts applicable to Amphenol® filter connectors utilizing MF-1, HF-1, VHF-1, VHF-2, UHF-1 and UHF-2 filters are provided. Please note that all insertion loss (attenuation) values given were measured with no load applied. The band designations refer to MIL-STD-2120.

MF-1*
Typical Capacitance = 1,000,000 pf Min. 800,000 pf Max. 1,600,000 pf
Type Pi

Temp.	Fco	1MHz	3MHz	10MHz	30MHz	100MHz	300MHz	1000MHz
–55°C	–	18	–	64	80	80	80	80
Room	7.94K	55	–	80	80	80	80	80
+125°C	–	22	–	70	80	80	80	80

VHF-2
Typical Capacitance = 2,500 pf Min. 1,900 pf Max. 4,000 pf
Band E, Type Pi

Temp.	Fco	1MHz	3MHz	10MHz	30MHz	100MHz	300MHz	1000MHz
–55°C	–	0	2	7	17	40	58	71
Room	3.3M	0	2	8	24	46	61	71
+125°C	–	0	3	10	26	46	63	69

HF-1*
Typical Capacitance = 16,000 pf Min. 9,800 pf Max. 24,000 pf
Type Cascaded Pi

Temp.	Fco	1MHz	3MHz	15MHz	50MHz	100MHz	300MHz	1000MHz
–55°C	–	2	6	24	62	80	80	80
Room	648K	3	9	50	80	80	80	80
+125°C	–	0	6	30	62	80	80	80

UHF-2
Typical Capacitance = 750 pf Min. 500 pf Max. 1,100 pf
Band C, Type Pi

Temp.	Fco	1MHz	3MHz	10MHz	30MHz	100MHz	300MHz	1000MHz
–55°C	–	0	0	3	9	25	46	61
Room	12.7M	0	0	3	10	28	46	61
+125°C	–	0	0	3	10	24	42	60

VHF-1
Typical Capacitance = 7,000 pf Min. 4,900 pf Max. 12,000 pf
Band G, Type Pi

Temp.	Fco	1MHz	3MHz	10MHz	30MHz	100MHz	300MHz	1000MHz
–55°C	–	1	2	8	21	44	61	65
Room	1.27M	1	6	18	42	62	72	75
+125°C	–	0	2	9	24	45	62	64

UHF-1
Typical Capacitance = 375 pf Min. 290 pf Max. 450 pf
Band B, Type Pi

Temp.	Fco	1MHz	3MHz	10MHz	30MHz	100MHz	300MHz	1000MHz
–55°C	–	0	0	1	6	21	43	58
Room	21.9M	0	0	1	8	18	42	56
+125°C	–	0	0	1	8	17	38	50

Note: F_{co} = Cut-off Frequency
* Consult Amphenol, Sidney, NY for availability.

Impedance Matching Formula
(your system to a 50 ohm system)

The following formula and example are offered in order to determine the expected filter performance in an impedance system other than 50 ohms.

With the attenuation expressed in 50 ohms and the transfer impedance curve shown in Figure 1 below, a designer can relate the expressed attenuation to the input and output impedance of his circuit.

Example:

(1) Noise is 40dB above specification level at 100 MHz
(2) Input and output impedance are 10 and 100 ohms respectively
(3) Amphenol® VHF 7000 pf filter has a 65 dB minimum attenuation at 100 MHz and +25°C

Formula (Taken from Figure 1):

1.4×10^{-2}= transfer impedance for 65 dB in a 50 ohm system

$$\text{Atten (dB)} = 20 \log_{10} \left[1 + \frac{Z_S Z_L}{Z_{12}(Z_S + Z_L)} \right]$$

Z_S = source impedance
Z_L = load impedance
Z_{12} = transfer impedance

Atten = filter performance in a system other than 50 ohms

$$\text{Atten (dB)} = 20 \log_{10} \left[1 + \frac{10(100)}{1.4 \times 10^{-2} (10 + 100)} \right]$$

Attenuation = 56.3dB

In this case, the 7000 pf VHF filter will give 56.3 dB which is 16.3dB below the desired reduction in noise (40dB) as stated in the above problem.

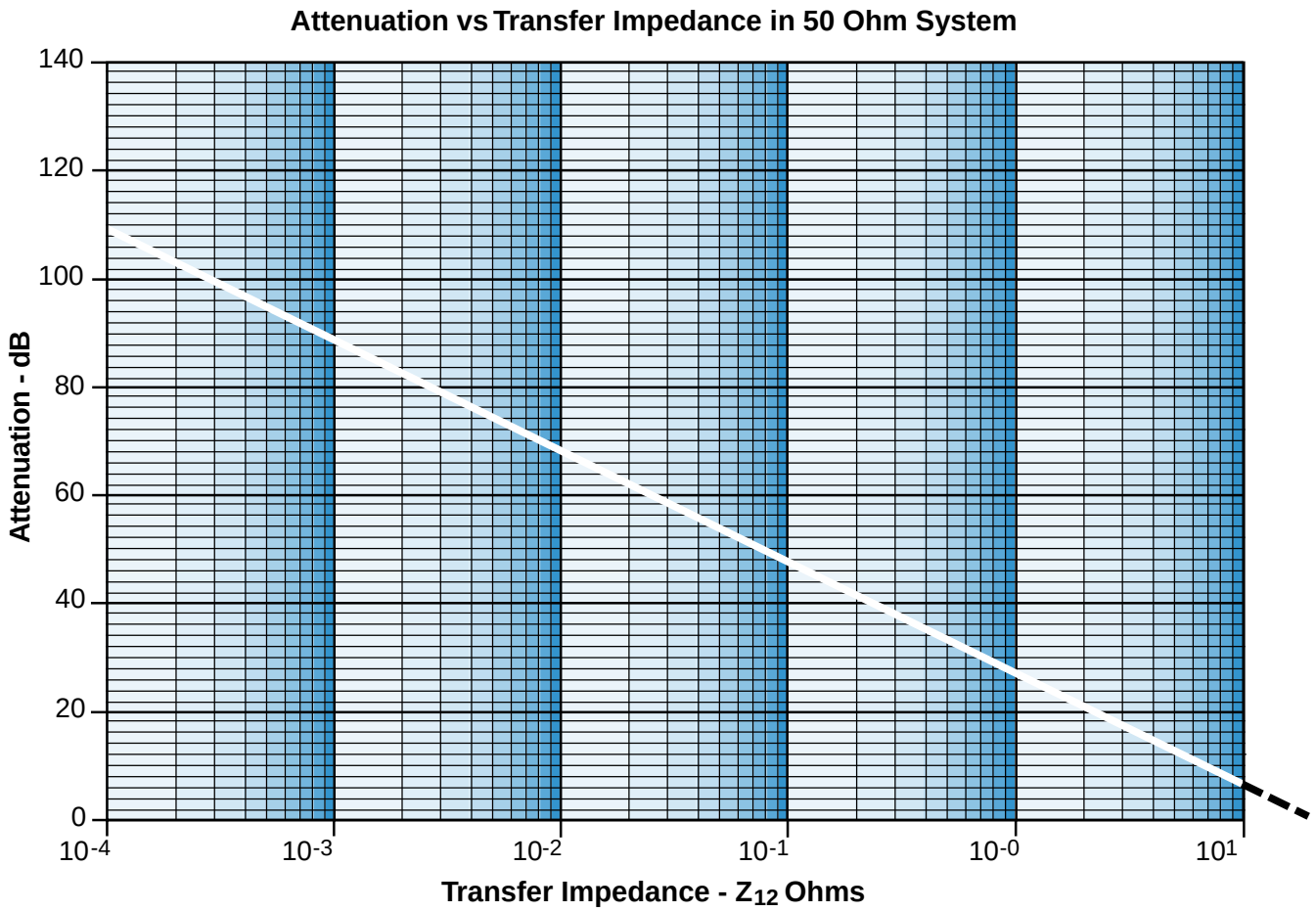


Figure 1

Acceptance Testing

All filter connectors undergo extensive acceptance testing to assure product quality. An outline of standard acceptance testing performed is as follows:

Mechanical Inspection

- Dimensional inspection of shells, keys, keyways and mounting surfaces by either in-process inspection of components or inspection of final assemblies.
- Visual inspection of contacts, inserts and seals, gaskets and surface finish of shells and hardware.

Electrical Tests

- Insulation resistance of filter contacts is checked 100% **at the working voltage and to the test limit** listed for each filter in the filter selection data table.
- Dielectric withstanding voltage is tested on 100% of filter contacts at the voltage listed in the filter selection data table.
- Capacitance is tested 100% at 1KHz.

Special Tests/Processes

In addition to the standard acceptance testing and processes, the following additional production testing and processing can be provided upon request:

- Attenuation testing (through 100 MHz)
- Leakage inspection
- Thermal cycling/shock
- Burn-in
- De-gassing

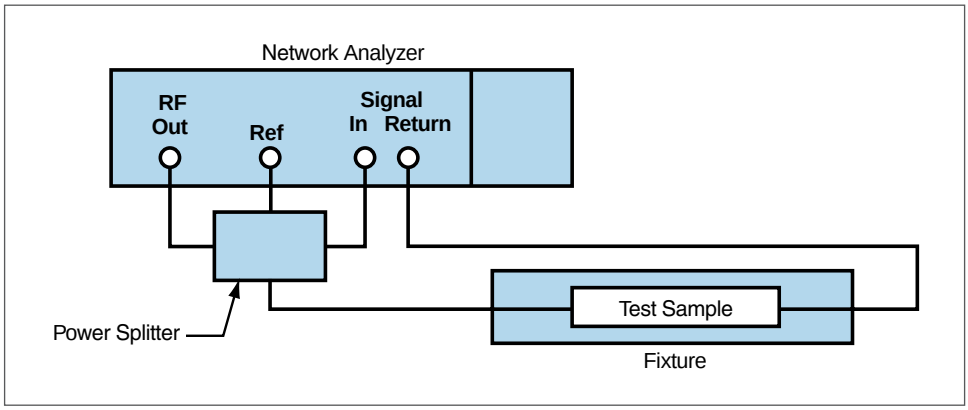
Consult Amphenol Aerospace for further information.

Qualifications

Amphenol® filter connectors have been qualified and are on periodic requalification to specification BSF-1 (available from your Amphenol representative). This is patterned after MIL-DTL-38999, modified to include mechanical and environmental testing and electrical parameters important to filter connector performance.

These acceptance tests, along with exhaustive in-process inspection and testing, give Amphenol® filter connectors their reputation for reliability.

ATTENUATION TEST CIRCUIT



There are multiple test stations located on the Amphenol production floor that support all in-process, final electric and qualification testing as necessary.

Amphenol Aerospace

Step 1.

Fill out the EMI Filter Connector Check list on page 134.

This check list page can be copied, filled out and sent to an Amphenol technical support person. Fax it to 607-563-5157 and a filter connector specialist will help you.

Step 2.

Choose the Contact and Attenuation Characteristics requirements on page 130 and 131

Step 3.

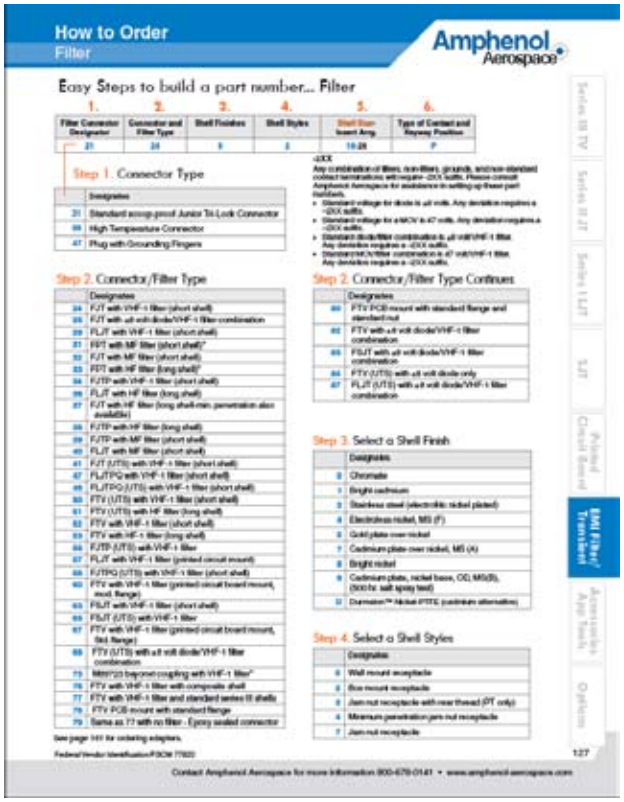
Choose the Shell Style that fits your application

Refer to each of the style sections in this catalog.

Filter Connector Type	Filter Connector Brief Description	Pages
FCTV	MIL-DTL-38999 Series III with Composite shell	137-141
FTV	MIL-DTL-38999 Series III with Metal shell (Aluminum)	142-147
FJT	MIL-DTL-38999, Series II	148-154
FLJT	MIL-DTL-38999 Series I	155-164
FSJT	Commercial 38999 type	165-168
FBL	MIL-DTL-38999, Series IV	169-170

Step 4.

See How to Order on page135



1. Fill out the EMI Filter Connector Check list

Date _____

Ref. Filter P/N _____ **Ref. Mil-Spec** _____

Filter Requirements:

Filter Type (Pi, C, LC, T, LL, other) _____

Capacitance (locations) _____

Capacitance (locations) _____

Capacitance (locations) _____

Ground Contacts (locations) _____

Insulated feed-thru (locations) _____

Frequency (MHz)	Insertion Loss (dB)
1	
3	
10	
30	
100	

Electrical Requirements:

Working Voltage (VDC or VAC and frequency) _____

Dielectric Withstand Voltage (VDC) _____

Modified Shell: (Flange moved, clinch nuts, heilicoils, stand offs, etc.) _____

Special Requirements: (AC voltage, spike voltage, attenuation testing, thermal cycling, burn-in, capacitor lot traceability, water immersion, etc.) _____

Contact Termination:

UTS (Crimp) _____

Solder Cup _____

Wire Wrap Flat dim. _____

Stickout dim. _____

PCB tail:

Diameter dim. _____

Stickout dim. _____

Pre-tin? _____

What is terminated to connector (ie. flex, rigid flex, PCB, etc.)? _____

Special Cleaning _____

(if so, recommend a protective cap with an environmental gasket)

Special Stamping: _____

Customer: _____

Program: _____

Forecast: _____

Requested by: _____

Comments: _____

Fax a completed copy to 607-563-5157

Amphenol Aerospace

Easy Steps to build a part number... Filter

1. Filter Connector Designator	2. Connector and Filter Type	3. Shell Finish	4. Shell Styles	5. Shell Size – Insert Arrg.	6. Type of Contact and Keyway Position
21	24	9	2	16-26	P

Step 1. Select a Connector Type

	Designates
21	Standard scoop-proof Junior Tri-Lock Connector
36	High Temperature Connector
47	Plug with Grounding Fingers

Step 2. Select a Connector/Filter Type

	Designates
20	FPT with VHF-1 filter (short shell)*
22	FPTE with VHF-1 filter (short shell)*
24	FJT with VHF-1 filter (short shell)
25	FJT with ±8 volt diode/VHF-1 filter combination
26	FAN with VHF-1 filter**
29	FLJT with VHF-1 filter (short shell)
31	FPT with MF-1 filter (short shell)*
32	FJT with MF-1 filter (short shell)
33	FPT with HF-1 filter (long shell)*
34	FJTP with VHF-1 filter (short shell)
36	FLJT with HF-1 filter (long shell)
37	FJT with HF-1 filter (long shell-min. penetration also available)
38	FJTP with HF-1 filter (long shell)
39	FJTP with MF-1 filter (short shell)
40	FLJT with MF-1 filter (short shell)
41	FJT (UTS) with VHF-1 filter (short shell)
46	FPT (UTS) with VHF-1 filter *
47	FLJTPQ with VHF-1 filter (short shell)
48	FLJTPQ (UTS) with VHF-1 filter (short shell)
50	FTV (UTS) with VHF-1 filter (short shell)
51	FTV (UTS) with HF-1 filter (long shell)
52	FTV with VHF-1 filter (short shell)
53	FTV with HF-1 filter (long shell)
56	FJTP (UTS) with VHF-1 filter
57	FLJT with VHF-1 filter (printed circuit mount)
58	FJTPQ (UTS) with VHF-1 filter (short shell)
60	FTV with VHF-1 filter (printed circuit board mount, mod. flange)
61	FBL with VHF-1 filter (short shell)
63	FSJT with VHF-1 filter (short shell)
64	FBL (UTS) with VHF-1 filter
65	FSJT (UTS) with VHF-1 filter
67	FTV with VHF-1 filter (printed circuit board mount, Std. flange)
68	FTV (UTS) with ±8 volt diode/VHF-1 filter combination

*See catalog 12-120 for more information

-2XX
Any combination of filters, non-filters, grounds, and non-standard contact terminations will require -2XX suffix. Please consult Amphenol Aerospace for assistance in setting up these part numbers.

- Standard voltage for diode is ±8 volts. Any deviation requires a –2XX suffix.
- Standard voltage for a MOV is 47 volts. Any deviation requires a –2XX suffix.
- Standard diode/filter combination is ±8 volt/VHF-1 filter. Any deviation requires a –2XX suffix.
- Standard MOV/filter combination is 47 volt/VHF-1 filter. Any deviation requires a –2XX suffix.

Step 2. Select Connector/Filter Type Continues

	Designates
73	M83723 bayonet coupling with VHF-1 filter*
76	FCTV with VHF-1 filter with composite shell
77	FTV with VHF-1 filter and standard series III shells
78	FCTV PCB mount with standard flange and VHF-1 filter
79	Same as 77 with no filter - Epoxy sealed
80	FTV PCB mount with standard flange, standard nut and VHF-1 filter
82	FTV with ±8 volt diode/VHF-1 filter combination
83	FSJT with ±8 volt diode/VHF-1 filter combination
84	FTV (UTS) with ±8 volt diode only
87	FLJT (UTS) with ±8 volt diode/VHF-1 filter combination

Step 3. Select a Shell Finish

	Designates
0	Chromate
1	Bright cadmium
2	Stainless steel (electrolitic nickel plated)
4	Electroless nickel, MS (F)
5	Gold plate over nickel
7	Cadmium plate over nickel, MS (A)
8	Bright nickel
9	Cadmium plate, nickel base, OD, MS(B), (500 hr. salt spray test)
D	Durmalon™ Nickel-PTFE (cadmium alternative)

Step 4. Select a Shell Styles

	Designates
0	Wall mount receptacle
2	Box mount receptacle
3	Jam nut receptacle with rear thread (PT only)
4	Minimum penetration jam nut receptacle
7	Jam nut receptacle

See page 171 for ordering adapters.
Federal Vendor Identification/FSCM 77820

Step 5. Select a Shell Size & Insert Arrangement

Shell Size	Designates
8 –24	Shell sizes available for FJT, Series I
9–25	Shell sizes available for FLJT, Series II and TV, Series III

For Shell Sizes & Insert Arrangements see charts on pages 4-7.
To view Insert Arrangement Illustrations see pages 8-14.

Shell Size & Insert Arrangements are together in one chart. First number represents Shell Size, second number is the Insert Arrangement.

Step 6. Select the type of Contact and Normal or Alternate Keying Positions

Shell Size	Designates
P	Pins in a normal rotation
S	Socket in a normal rotation

For alternate rotations go to the table below for suffix letter.

ALTERNATE ROTATION SUFFIX LETTERS

FJT, FLJT or FSJT			FTV or FCTV		
Alternate Position	Suffix Letter		Alternate Position	Suffix Letter	
	Pins	Sockets		Pins	Sockets
Normal	P	S	Normal	P	S
A	E	F	A	G	H
B	R	T	B	I	J
C	W	X	C	K	L
D	Y	Z	D	M	N
			E	R	T

See page 171 for ordering adapters; page 195 for ordering universal headers.

Record your part numbers here...

1. Filter Connector Designator	2. Connector and Filter Type	3. Shell Finish	4. Shell Styles	5. Shell Size – Insert Arrangements	6. Type of Contact and Keyway Position

The Amphenol® FTV Series III, demonstrates unsurpassed technical leadership. With added filter features, the high performance general duty threaded connector is designed to withstand the pressures of severe environment applications. The FCTV Series is the Composite Series III with filtering for EMI/EMP protection. It offers the same high performance as its metal counterpart, the FTV, but with a lightweight, corrosion resistance shell.

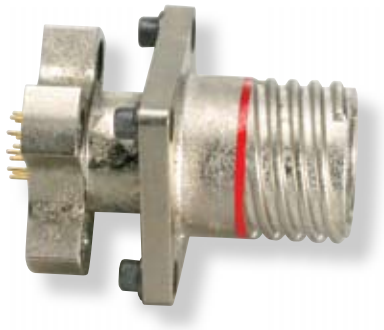
Intermateable with MIL-DTL-38999 Series III Connectors (See section Series III TV, MIL-DTL-38999) FTV & FCTV Composite

- Quick Mating - completely mates in a 360° turn of the coupling nut
- Lockwiring Eliminated - incorporates anti-decoupling device
- Contact Protection - 100% "scoop-proof"
- Improved Moisture Resistance - prevents electrolytic erosion of contacts
- Lightweight Composite Shell - 17% – 70% weight savings over metal
- Corrosion Resistant - available in standard MIL-DTL-38999 olive drab cadmium (175°C) and electroless nickel plating (200°C), both withstanding 2000 hours of salt spray exposure. The base material is able to withstand an indefinite exposure to salt spray.
- Durability - 1500 couplings minimum (in reference to connector couplings, not contacts)

FTV & FCTV Key/Keyway Positions

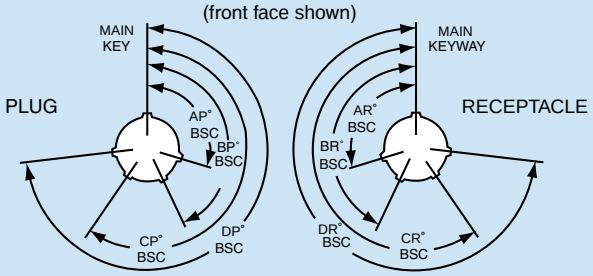
Shell Size	Key & Keyway arrangement identification letter	AR° or AP° BSC	BR° or BP° BSC	CR° or CP° BSC	DR° or DP° BSC
9	N	105	140	215	265
	A	102	132	248	320
	B	80	118	230	312
	C	35	140	205	275
	D	64	155	234	304
	E	91	131	197	240
11, 13, 15	N	95	141	208	236
	A	113	156	182	292
	B	90	145	195	252
	C	53	156	220	255
	D	119	146	176	298
	E	51	141	184	242
17 and 19	N	80	142	196	293
	A	135	170	200	310
	B	49	169	200	244
	C	66	140	200	257
	D	62	145	180	280
	E	79	153	197	272
21, 23, 25	N	80	142	196	293
	A	135	170	200	310
	B	49	169	200	244
	C	66	140	200	257
	D	62	145	180	280
	E	79	153	197	272

All angles are BSC
The insert arrangement does not rotate with main key/keyway.



FTV

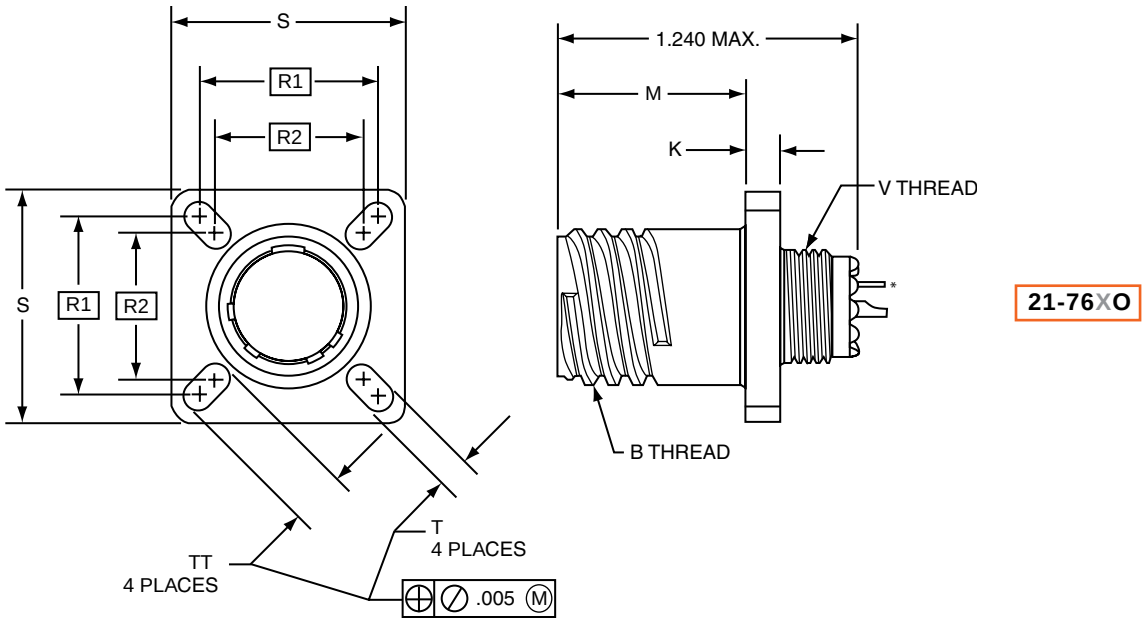
Composite FCTV Connector for PCB board mounting. Amphenol is currently the only supplier of one-piece composite PCB stand-off shells.



FCTV

PART # **To complete, see how to order page 135.**

Filter Connector Designator	Connect/ Filter Type	Shell Finish	Shell Style	Shell Size & Insert Arrg	Type of Contact/ Keyway Position
21	76	X	0	XX-XX	X



21-76XO

* Printed Circuit Tail available. Consult Amphenol Aerospace factory for Part Number.

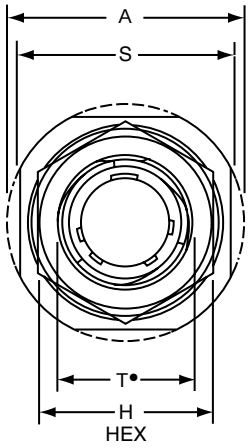
Shell Size	B Thread Class 2A 0.1P-0.3L-TS (Plated)	M +.000 –.005	K ±.0025	R¹ TP	R² TP	S +.011 –.010	T +.008 –.006	TT +.008 –.006	V Thread Metric (Plated)
9	.6250	.773	.1378	.719	.594	.938	.128	.216	M12X1-6g0.100R
11	.7500	.773	.1378	.812	.719	1.031	.128	.194	M15X1-6g0.100R
13	.8750	.773	.1378	.906	.812	1.125	.128	.194	M18X1-6g0.100R
15	1.0000	.773	.1378	.969	.906	1.219	.128	.173	M22X1-6g0.100R
17	1.1875	.773	.1378	1.062	.969	1.312	.128	.194	M25X1-6g0.100R
19	1.2500	.773	.1378	1.156	1.062	1.438	.128	.194	M28X1-6g0.100R
21	1.3750	.741	.1654	1.250	1.156	1.562	.128	.194	M31X1-6g0.100R
23	1.5000	.741	.1654	1.375	1.250	1.688	.154	.242	M34X1-6g0.100R
25	1.6250	.741	.1654	1.500	1.375	1.812	.154	.242	M37X1-6g0.100R

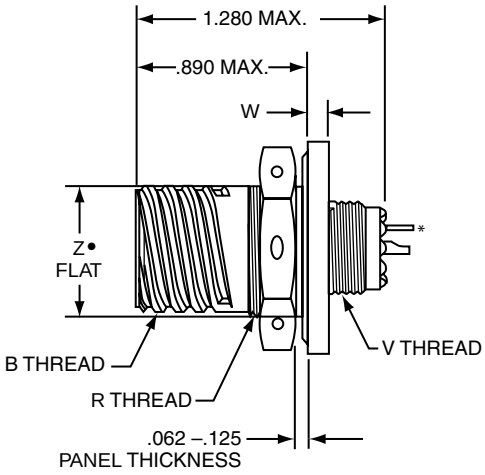
All dimensions for reference only.

Amphenol Aerospace

PART # To complete, see how to order page 135.

Filter Connector Designator	Connect/ Filter Type	Shell Finish	Shell Style	Shell Size & Insert Arrg	Type of Contact/ Keyway Position
21	76	X	7	XX-XX	X





21-76X7

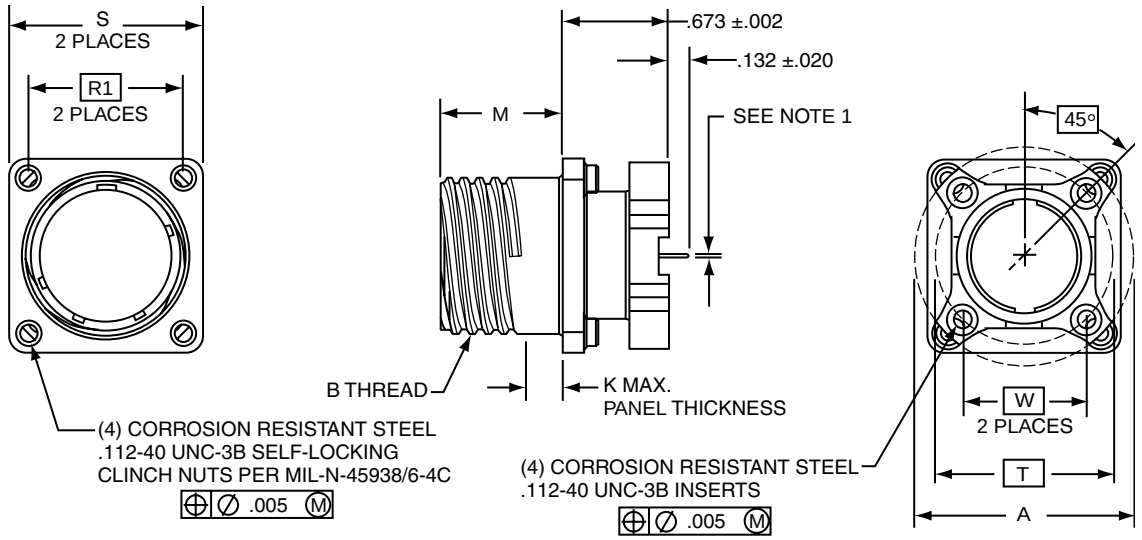
** Printed Circuit Tail available. Consult Amphenol Aerospace factory for Part Number.
• D shaped mounting hole dimensions

Shell Size	A Dia. ±.010	B Thread Class 2A 0.1P-0.3L-TS (Plated)	H Hex +.017 –.016	R Thread Metric (Plated)	S ±.015	T• +.010 –.000	V Thread Metric (Plated)	W +.035 –.004	Z• Flat +.000 –.010
9	1.188	.6250	.875	M17X1-6g0.100R	1.062	.697	M12X1-6g0.100R	.086	.669
11	1.375	.7500	1.000	M20X1-6g0.100R	1.250	.822	M15X1-6g0.100R	.086	.769
13	1.500	.8750	1.188	M25X1-6g0.100R	1.375	1.007	M18X1-6g0.100R	.086	.955
15	1.625	1.0000	1.312	M28X1-6g0.100R	1.500	1.134	M22X1-6g0.100R	.086	1.084
17	1.750	1.1875	1.438	M32X1-6g0.100R	1.625	1.259	M25X1-6g0.100R	.086	1.208
19	1.937	1.2500	1.562	M35X1-6g0.100R	1.812	1.384	M28X1-6g0.100R	.118	1.333
21	2.062	1.3750	1.688	M38X1-6g0.100R	1.938	1.507	M31X1-6g0.100R	.118	1.459
23	2.188	1.5000	1.812	M41X1-6g0.100R	2.062	1.634	M34X1-6g0.100R	.118	1.575
25	2.312	1.6250	2.000	M44X1-6g0.100R	2.188	1.759	M37X1-6g0.100R	.118	1.709

All dimensions for reference only.

PART # To complete, see how to order page 135.

Filter Connector Designator	Connect/ Filter Type	Shell Finish	Shell Style	Shell Size & Insert Arrg	Type of Contact/ Keyway Position
21	78	X	2	XX-XX	X



21-78X2

1. Standard tail for size 22 is .020 ±.001 dia.
   Standard tail for size 20 is .030 ±.001 dia.

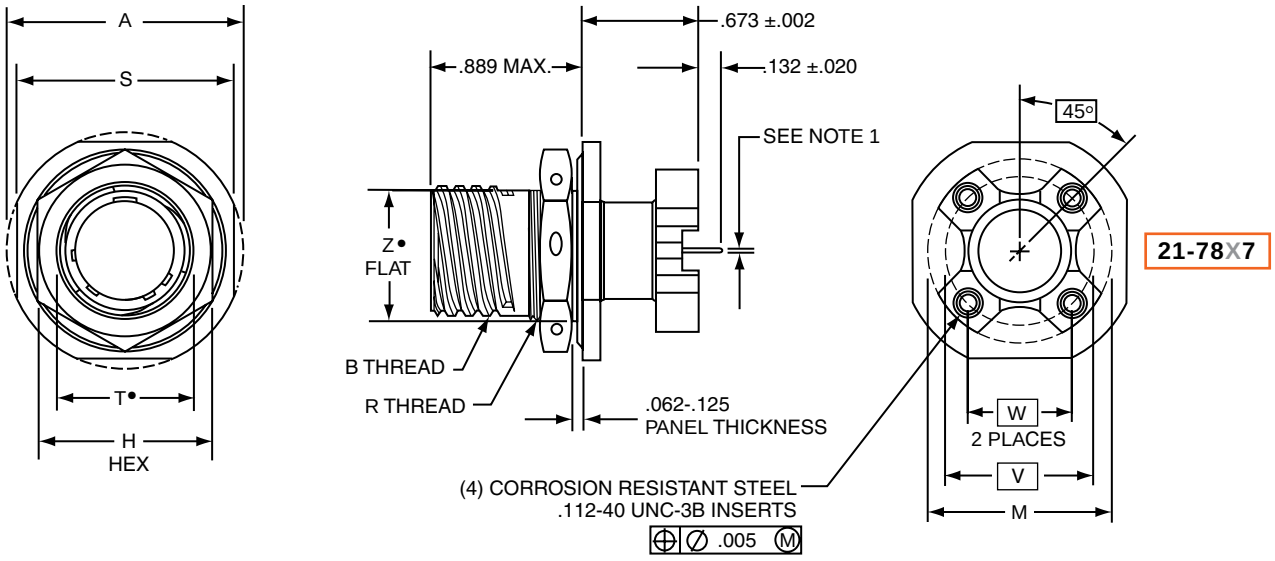
Shell Size	A Dia. ±.005	B Thread Class 2A 0.1P-0.3L-TS (Plated)	M +.003 –.003	K Max. Panel Thickness	R[1] TP	S +.011 –.010	PCB Mounting Dimensions	
							T Dia. TP	W TP
9	1.016	.6250	.770	.234	.719	.938	.752	.532
11	1.148	.7500	.770	.234	.812	1.031	.850	.601
13	1.250	.8750	.770	.234	.906	1.125	.994	.703
15	1.375	1.0000	.770	.234	.969	1.219	1.119	.791
17	1.500	1.1875	.770	.234	1.062	1.312	1.237	.875
19	1.625	1.2500	.770	.234	1.156	1.438	1.379	.975
21	1.750	1.3750	.738	.204	1.250	1.562	1.489	1.053
23	1.875	1.5000	.738	.204	1.375	1.688	1.619	1.145
25	2.000	1.6250	.738	.204	1.500	1.812	1.744	1.233

All dimensions for reference only.

(Printed circuit board mount)

PART # To complete, see how to order page 135.

Filter Connector Designator	Connect/ Filter Type	Shell Finish	Shell Style	Shell Size & Insert Arrg	Type of Contact/ Keyway Position
21	78	X	7	XX-XX	X



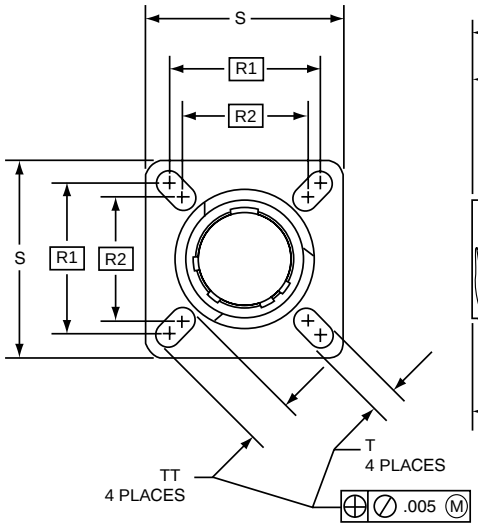
1. Standard tail for size 22 is .020±.001
   Standard tail for size 20 is .030±.001

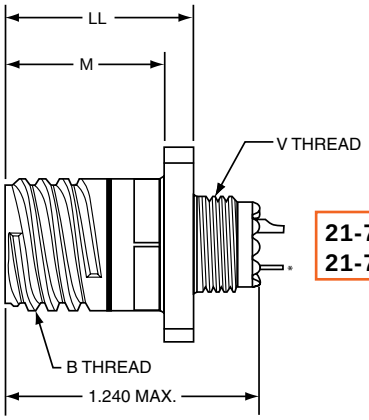
- "D" shaped mounting hole dimensions

Shell Size	A Dia. ±.005	B Thread Class 2A 0.1P-0.3L-TS (Plated)	H Hex +.017 –.016	M Dia. ±.005	R Thread Metric (Plated)	S +.011 –.010	T• Dia. +.010 –.000	PCB Mounting Dimensions W TP	PCB Mounting Dimensions V Dia. TP	Z• Flat +.000 –.010
9	1.188	.6250	.875	1.016	M17X1-6g0.100R	1.062	.697	.532	.752	.669
11	1.375	.7500	1.000	1.148	M20X1-6g0.100R	1.250	.822	.601	.850	.769
13	1.500	.8750	1.188	1.250	M25X1-6g0.100R	1.375	1.007	.703	.994	.955
15	1.625	1.0000	1.312	1.375	M28X1-6g0.100R	1.500	1.134	.791	1.119	1.084
17	1.750	1.1875	1.438	1.500	M32X1-6g0.100R	1.625	1.259	.875	1.237	1.208
19	1.937	1.2500	1.562	1.625	M35X1-6g0.100R	1.812	1.384	.975	1.379	1.333
21	2.062	1.3750	1.688	1.750	M38X1-6g0.100R	1.937	1.507	1.053	1.489	1.459
23	2.188	1.5000	1.812	1.875	M41X1-6g0.100R	2.062	1.634	1.145	1.619	1.575
25	2.312	1.6250	2.000	2.000	M44X1-6g0.100R	2.188	1.759	1.233	1.744	1.709

All dimensions for reference only.

PART #			
To complete, see how to order page 135.	Filter Connector Designator	21	21
	Connect/ Filter Type	77	79
	Shell Finish	X	X
	Shell Style	0	0
(Solder Cup)	Shell Size & Insert Arrg	XX-XX	XX-XX
* Mil Spec length	Type of Contact/ Keyway Position	X	X





21-77X0
21-79X0

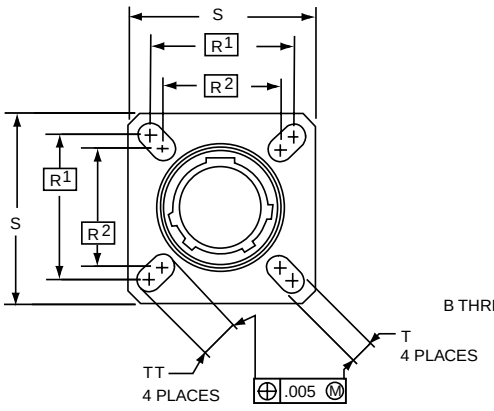
* Printed Circuit Tail available. Consult Amphenol Aerospace, Sidney, NY for Part Number.

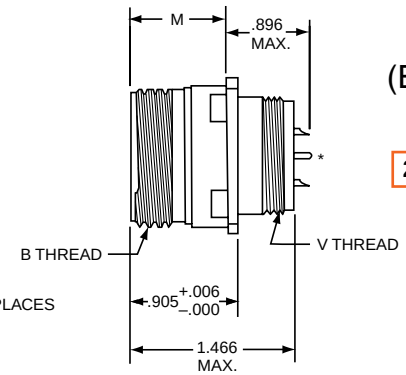
Shell Size	B Thread Class 2A 0.1P-0.3L-TS (Plated)	M +.000 –.005	LL +.006 –.000	R¹ TP	R² TP	S Max	T +.008 –.006	V Thread Metric (Plated)	TT +.008 –.006
9	.6250	.820	.905	.719	.594	.948	.128	M12X1-6g0.100R	.216
11	.7500	.820	.905	.812	.719	1.043	.128	M15X1-6g0.100R	.194
13	.8750	.820	.905	.906	.812	1.137	.128	M18X1-6g0.100R	.194
15	1.0000	.820	.905	.969	.906	1.232	.128	M22X1-6g0.100R	.173
17	1.1875	.820	.905	1.062	.969	1.323	.128	M25X1-6g0.100R	.194
19	1.2500	.820	.905	1.156	1.062	1.449	.128	M28X1-6g0.100R	.194
21	1.3750	.790	.905	1.250	1.156	1.575	.128	M31X1-6g0.100R	.194
23	1.5000	.790	.905	1.375	1.250	1.701	.154	M34X1-6g0.100R	.242
25	1.6250	.790	.905	1.500	1.375	1.823	.154	M37X1-6g0.100R	.242

All dimensions for reference only.

FTV – MIL-DTL-38999, Series III

Wall Mounting Receptacle (Extended length shell**) Aluminum





21-52X0

PART #		
To complete, see how to order page 135.	Filter Connector Designator	21
	Connect/ Filter Type	52
	Shell Finish	X
	Shell Style	0
	Shell Size & Insert Arrg	XX-XX
	Type of Contact/ Keyway Position	X

* Printed Circuit Tail available. Consult Amphenol Aerospace, Sidney, NY for Part Number.

Shell Size	B Thread Class 2A 0.1P-0.3L-TS (Plated)	M +.000 –.005	R¹ TP	R² TP	S ±.010	T +.008 –.006	V Thread Metric (Plated)	TT +.008 –.006
9	.6250	.820	.719	.594	.938	.128	M12X1-6g0.100R	.216
11	.7500	.820	.812	.719	1.031	.128	M15X1-6g0.100R	.194
13	.8750	.820	.906	.812	1.125	.128	M18X1-6g0.100R	.194
15	1.0000	.820	.969	.906	1.219	.128	M22X1-6g0.100R	.173
17	1.1875	.820	1.062	.969	1.312	.128	M25X1-6g0.100R	.194
19	1.2500	.820	1.156	1.062	1.438	.128	M28X1-6g0.100R	.194
21	1.3750	.790	1.250	1.156	1.562	.128	M31X1-6g0.100R	.194
23	1.5000	.790	1.375	1.250	1.688	.154	M34X1-6g0.100R	.242
25	1.6250	.790	1.500	1.375	1.812	.154	M37X1-6g0.100R	.242

**To accommodate higher voltage and/or higher capacitance applications

Plug movement required to clear FTV receptacles: .625 min.

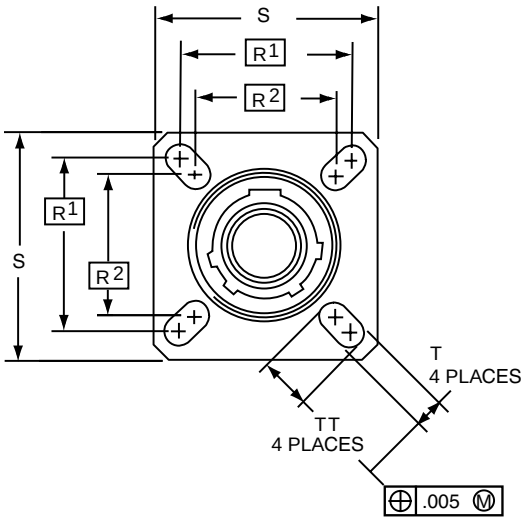
(UTS crimp)

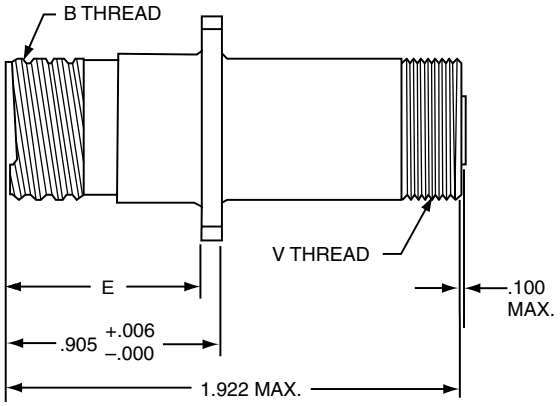
PART # To complete, see how to order page 135.

Filter Connector Designator	Connect/ Filter Type	Shell Finish	Shell Style	Shell Size & Insert Arrg	Type of Contact/ Keyway Position
21	50	X	0	XX-XX	X

UTS (Crimp) Contact SAE AS39029/57

21-50X0
UTS (Crimp) Contact
SAE AS39029/57





Shell Size	B Thread Class 2A 0.1P-0.3L-TS (Plated)	E +.000 –.005	R¹ TP	R² TP	S ±.010	T +.008 –.006	V Thread Metric (Plated)	TT +.008 –.006
9	.6250	.820	.719	.594	.938	.128	M15X1-6g0.100R	.216
11	.7500	.820	.812	.719	1.031	.128	M18X1-6g0.100R	.194
13	.8750	.820	.906	.812	1.125	.128	M22X1-6g0.100R	.194
15	1.0000	.820	.969	.906	1.219	.128	M25X1-6g0.100R	.173
17	1.1875	.820	1.062	.969	1.312	.128	M28X1-6g0.100R	.194
19	1.2500	.820	1.156	1.062	1.438	.128	M31X1-6g0.100R	.194
21	1.3750	.790	1.250	1.156	1.562	.128	M34X1-6g0.100R	.194
23	1.5000	.790	1.375	1.250	1.688	.154	M37X1-6g0.100R	.242
25	1.6250	.790	1.500	1.375	1.812	.154	M41X1-6g0.100R	.242

All dimensions for reference only.

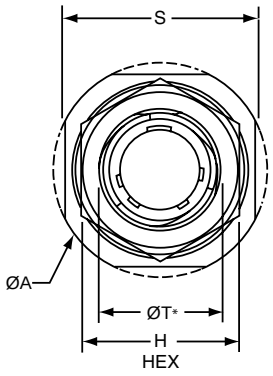
PART #

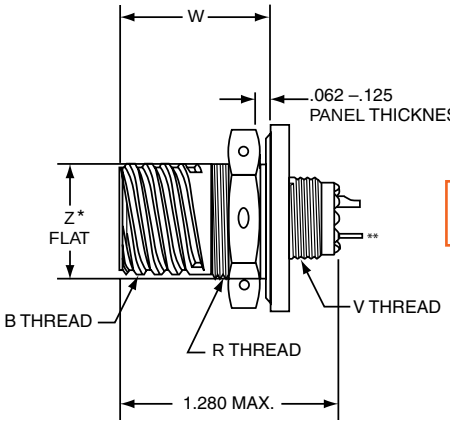
To complete, see how to order page 135.

(Solder Cup)

*** Mil Spec length**

Filter Connector Designator	21	21
Connect/ Filter Type	77	79
Shell Finish	X	X
Shell Style	7	7
Shell Size & Insert Arrg	XX-XX	XX-XX
Type of Contact/ Keyway Position	X	X





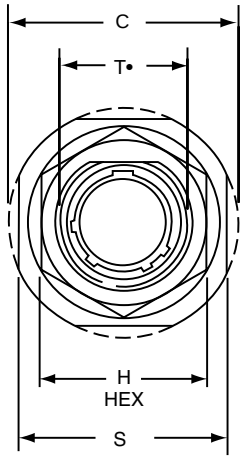
21-77X7
21-79X7

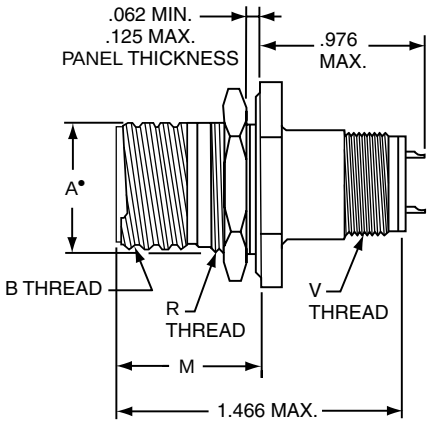
** Printed Circuit Tail available. Consult Amphenol Aerospace factory for P/N. * "D" shaped mounting hole dimensions

Shell Size	ØA• Max	B Thread Class 2A 0.1P-0.3L-TS (Plated)	H Hex +.017 –.016	R Thread Matric (Plated)	S ±.010	ØT* +.010 –.000	V Thread Metric (Plated)	W +.011 –.010	Z* Flat +.000 –.010
9	1.199	.6250	.875	M17X1-6g0.100R	1.062	.697	M12X1-6g0.100R	.871	.669
11	1.386	.7500	1.000	M20X1-6g0.100R	1.250	.822	M15X1-6g0.100R	.871	.769
13	1.511	.8750	1.188	M25X1-6g0.100R	1.375	1.007	M18X1-6g0.100R	.878	.955
15	1.636	1.0000	1.312	M28X1-6g0.100R	1.500	1.134	M22X1-6g0.100R	.878	1.084
17	1.761	1.1875	1.438	M32X1-6g0.100R	1.625	1.259	M25X1-6g0.100R	.878	1.208
19	1.949	1.2500	1.562	M35X1-6g0.100R	1.812	1.384	M28X1-6g0.100R	.878	1.333
21	2.073	1.3750	1.688	M38X1-6g0.100R	1.938	1.507	M31X1-6g0.100R	.878	1.459
23	2.199	1.5000	1.812	M41X1-6g0.100R	2.062	1.634	M34X1-6g0.100R	.878	1.575
25	2.323	1.6250	2.000	M44X1-6g0.100R	2.188	1.759	M37X1-6g0.100R	.878	1.709

FTV – MIL-DTL-38999, Series III

(Extended length shell**) Jam Nut Receptacle





21-52X7

PART #

To complete, see how to order page 135.

Filter Connector Designator	21
Connect/ Filter Type	52
Shell Finish	X
Shell Style	7
Shell Size & Insert Arrg	XX-XX
Type of Contact/ Keyway Position	X

• "D" shaped mounting hole dimensions Plug movement required to clear FTV receptacles: .625 min.

Shell Size	A• +.000 –.010	B Thread Class 2A 0.1P-0.3L-TS (Plated)	C Max	H Hex +.017 –.016	M +.011 –.010	R Thread (Plated)	S +.011 –.010	T• +.010 –.000	V Thread Metric (Plated)
9	.669	.6250	1.199	.875	.871	M17X1-6g0.100R	1.062	.697	M12X1-6g0.100R
11	.769	.7500	1.386	1.000	.871	M20X1-6g0.100R	1.250	.822	M15X1-6g0.100R
13	.955	.8750	1.511	1.188	.878	M25X1-6g0.100R	1.375	1.007	M18X1-6g0.100R
15	1.084	1.0000	1.636	1.312	.878	M28X1-6g0.100R	1.500	1.134	M22X1-6g0.100R
17	1.208	1.1875	1.761	1.438	.878	M32X1-6g0.100R	1.625	1.259	M25X1-6g0.100R
19	1.333	1.2500	1.949	1.562	.878	M35X1-6g0.100R	1.812	1.384	M28X1-6g0.100R
21	1.459	1.3750	2.073	1.688	.878	M38X1-6g0.100R	1.938	1.507	M31X1-6g0.100R
23	1.575	1.5000	2.199	1.812	.878	M41X1-6g0.100R	2.062	1.634	M34X1-6g0.100R
25	1.709	1.6250	2.323	2.000	.878	M44X1-6g0.100R	2.188	1.759	M37X1-6g0.100R

**To accommodate higher voltage and/or higher capacitance applications

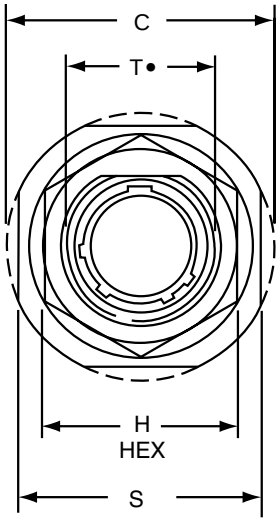
All dimensions for reference only.

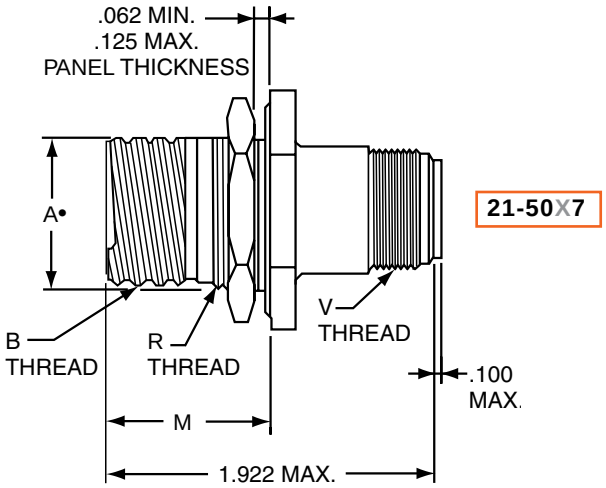
(UTS crimp)

PART # **To complete, see how to order page 135.**

Filter Connector Designator	Connect/ Filter Type	Shell Finish	Shell Style	Shell Size & Insert Arrg	Type of Contact/ Keyway Position
21	50	X	7	XX-XX	X

UTS (Crimp) Contact SAE AS39029/57





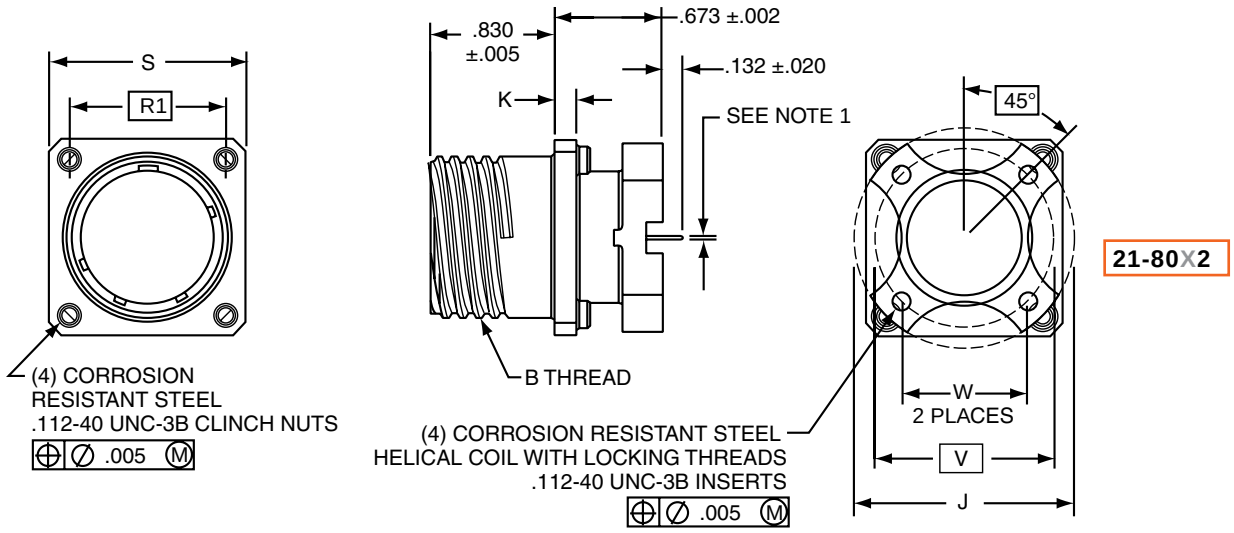
• "D" shaped mounting hole dimensions
Plug movement required to clear FTV receptacles: .625 min.

Shell Size	A• +.000 –.010	B Thread Class 2A 0.1P-0.3L-TS (Plated)	C Max	H Hex +.017 –.016	M ±.005	R Thread (Plated)	S +.011 –.010	T• +.010 –.000	V Thread Metric (Plated)
9	.669	.6250	1.199	.875	.871	M17X1-6g0.100R	1.062	.697	M15X1-6g0.100R
11	.769	.7500	1.386	1.000	.871	M20X1-6g0.100R	1.250	.822	M18X1-6g0.100R
13	.955	.8750	1.511	1.188	.878	M25X1-6g0.100R	1.375	1.007	M22X1-6g0.100R
15	1.084	1.0000	1.636	1.312	.878	M28X1-6g0.100R	1.500	1.134	M25X1-6g0.100R
17	1.208	1.1875	1.761	1.438	.878	M32X1-6g0.100R	1.625	1.259	M28X1-6g0.100R
19	1.333	1.2500	1.949	1.562	.878	M35X1-6g0.100R	1.812	1.384	M31X1-6g0.100R
21	1.459	1.3750	2.073	1.688	.878	M38X1-6g0.100R	1.938	1.507	M34X1-6g0.100R
23	1.575	1.5000	2.199	1.812	.878	M41X1-6g0.100R	2.062	1.634	M37X1-6g0.100R
25	1.709	1.6250	2.323	2.000	.878	M44X1-6g0.100R	2.188	1.759	M41X1-6g0.100R

All dimensions for reference only.

PART # **To complete, see how to order page 135.**

Filter Connector Designator	Connect/ Filter Type	Shell Finish	Shell Style	Shell Size & Insert Arrg	Type of Contact/ Keyway Position
21	80	X	2	XX-XX	X



1. Standard tail for size 22 is .020 ±.001.
   Standard tail for size 20 is 030 ±.001.

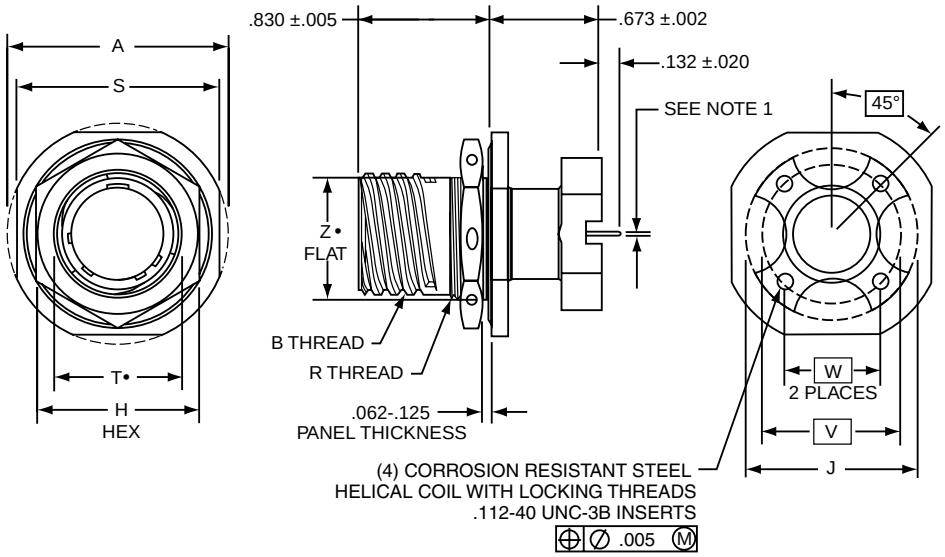
Shell Size	B Thread Class 2A 0.1P-0.3L-TS (Plated)	J Dia. ±.005	K ±.005	R[1] TP	S ±.010	PCB Mounting Dimensions W TP	PCB Mounting Dimensions V Dia. TP
9	.6250	1.016	.085	.719	.938	.532	.752
11	.7500	1.062	.085	.812	1.031	.601	.850
13	.8750	1.250	.085	.906	1.125	.703	.994
15	1.0000	1.375	.085	.969	1.219	.791	1.119
17	1.1875	1.500	.085	1.062	1.312	.875	1.237
19	1.2500	1.625	.085	1.156	1.438	.975	1.379
21	1.3750	1.750	.115	1.250	1.562	1.053	1.489
23	1.5000	1.875	.115	1.375	1.688	1.145	1.619
25	1.6250	2.000	.115	1.500	1.812	1.233	1.744

All dimensions for reference only.

(printed circuit board mount)

PART # To complete, see how to order page 135.

Filter Connector Designator	Connect/ Filter Type	Shell Finish	Shell Style	Shell Size & Insert Arrg	Type of Contact/ Keyway Position
21	80	X	7	XX-XX	X



21-80X7

1. Standard tail for size 22 is .020 ±.001.
   Standard tail for size 20 is .030 ±.001.

• "D" shaped mounting hole dimensions

Shell Size	A Dia. ±.010	B Thread Class 2A 0.1P-0.3L-TS (Plated)	H Hex +.017 –.016	J Dia. ±.005	R Thread Metric (Plated)	S ±.015	T• Dia. +.010 –.000	PCB Mounting Dimensions W TP	PCB Mounting Dimensions V Dia. TP	Z• Flat +.000 –.010
9	1.188	.6250	.875	1.016	M17X1-6g0.100R	1.062	.697	.532	.752	.669
11	1.375	.7500	1.000	1.062	M20X1-6g0.100R	1.250	.822	.601	.850	.769
13	1.500	.8750	1.188	1.250	M25X1-6g0.100R	1.375	1.007	.703	.994	.955
15	1.625	1.0000	1.312	1.375	M28X1-6g0.100R	1.500	1.134	.791	1.119	1.084
17	1.750	1.1875	1.438	1.500	M32X1-6g0.100R	1.625	1.259	.875	1.237	1.208
19	1.937	1.2500	1.562	1.625	M35X1-6g0.100R	1.812	1.384	.975	1.379	1.333
21	2.062	1.3750	1.688	1.750	M38X1-6g0.100R	1.937	1.507	1.053	1.489	1.459
23	2.188	1.5000	1.812	1.875	M41X1-6g0.100R	2.062	1.634	1.145	1.619	1.575
25	2.312	1.6250	2.000	2.000	M44X1-6g0.100R	2.188	1.759	1.233	1.744	1.709

All dimensions for reference only.

The Amphenol® FJT Series space and weight saving design, coupled with a filter, gives high reliability.

- Intermateable with MIL-DTL-38999/27599 Series II connectors (see section Series II JT)
- Quick positive coupling – 3 point bayonet locking
- Error-proof alternate positioning of shell keyways
- Higher reliability and greater durability with permanently encapsulated contacts
- Environmental resistant
- Aluminum shells with several finish options

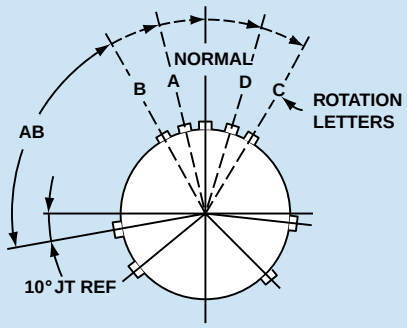
FJT

FJT Master Key/Keyway Rotation

Shell Size	AB Angle of Rotation (Degrees)				
	Normal	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

A plug with a given rotation letter will mate with a receptacle with the same rotation letter. The AB angle for a given connector is the same whether it contains pins or sockets. Inserts are not rotated in conjunction with the master key/keyway.

AB angles shown are viewed from the front face of the connector. A receptacle is shown at right. The angles for the plug are exactly the same, except the direction of rotation is opposite of that shown for the receptacle.



RELATIVE POSSIBLE POSITION OF ROTATED MASTER KEYWAY (front face of receptacle shown)

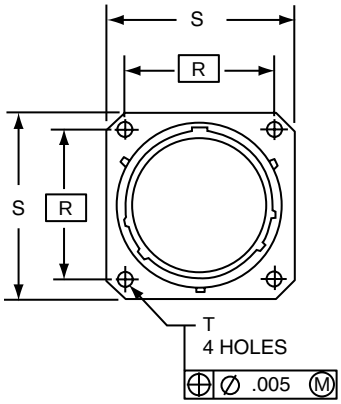
Amphenol Aerospace

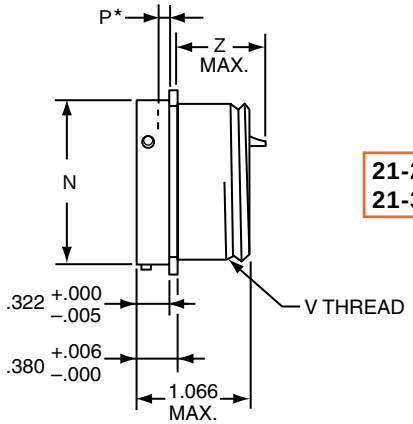
PART #

To complete, see how to order page 135.

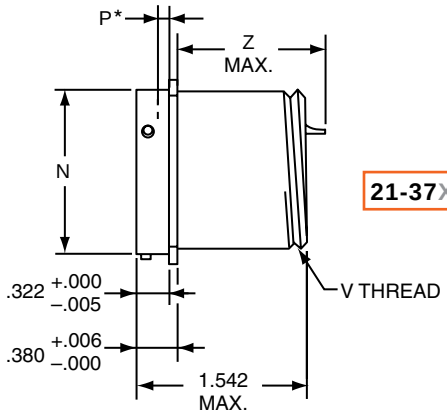
Filter Connector Designator	Connect/ Filter Type	Shell Finish	Shell Style	Shell Size & Insert Arrg	Type of Contact/ Keyway Position
21	24	X	0	XX-XX	X
21	32	X	0	XX-XX	X
21	37	X	0	XX-XX	X

(MS27334)





21-24X0 (MS27334)
21-32X0 (MS27334)



21-37X0 (MS27334)

Plug movement required to clear FJT receptacles: .281 min.
* Acceptable panel thickness for back panel mounting a standard receptacle.

Shell Size	N Dia +.001 –.005	P* Max.	R (TP)	S +.011 –.010	T Dia. ±.005	V Thread UNEF-2A (Plated)	SHORT SHELL VHF/UHF/MF Filters			LONG SHELL HF Filters	
							Size 20 Contact Z Max.	Size 16 or 16 & 20 Contacts Z Max.	Size 22 Contact Z Max.	Size 20 Contact Z Max.	Size 16 or 16 & 20 Contacts Z Max.
8	.473	.022	.594	.812	.120	.4375-28	.937	.952	.902	1.300	1.496
10	.590	.027	.719	.938	.120	.5625-24	.937	.952	.902	1.300	1.496
12	.750	.027	.812	1.031	.120	.6875-24	.937	.952	.902	1.300	1.496
14	.875	.027	.906	1.125	.120	.8125-20	.937	.952	.902	1.300	1.496
16	1.000	.027	.969	1.219	.120	.9375-20	.937	.952	.902	1.300	1.496
18	1.125	.027	1.062	1.312	.120	1.0625-18	.937	.952	.902	1.300	1.496
20	1.250	.054	1.156	1.438	.120	1.1875-18	.937	.952	.902	1.300	1.496
22	1.375	.054	1.250	1.562	.120	1.3125-18	.937	.952	.902	1.300	1.496
24	1.500	.054	1.375	1.688	.147	1.4375-18	.937	.952	.902	1.300	1.496

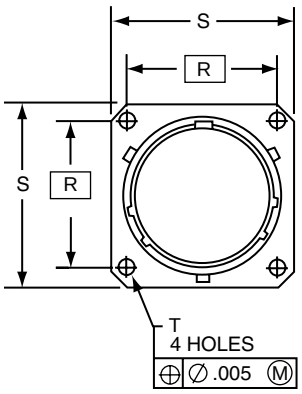
All dimensions for reference only.

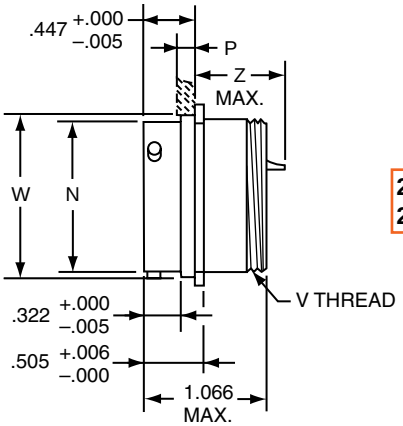
PART #

To complete, see how to order page 135.

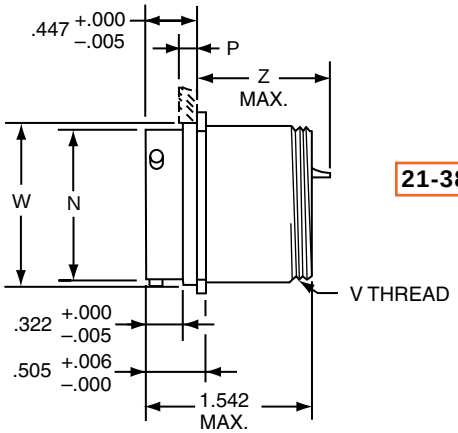
Filter Connector Designator	Connect/ Filter Type	Shell Finish	Shell Style	Shell Size & Insert Arrg	Type of Contact/ Keyway Position
21	34	X	0	XX-XX	X
21	39	X	0	XX-XX	X
21	38	X	0	XX-XX	X

(MS27497)





21-34X0 (MS27497)
21-39X0 (MS27497)



21-38X0 (MS27497)

Plug movement required to clear FJT receptacles: .281 min.

Shell Size	N Dia +.001 –.005	P Max. Panel Thickness	R (TP)	S +.011 –.010	T Dia. ±.005	V Thread UNEF-2A (Plated)	W Dia. +.001 –.005	SHORT SHELL VHF/UHF/MF Filters		LONG SHELL HF Filters	
								Size 16 or 16 & 20 Contacts Z Max.	Size 20 or 22 Contact Z Max.	Size 16 or 16 & 20 Contacts Z Max.	Size 20 Contact Z Max.
8	.473	.147	.594	.812	.120	.4375-28	.516	.900	.875	1.385	1.285
10	.590	.152	.719	.938	.120	.5625-24	.633	.900	.875	1.385	1.285
12	.750	.152	.812	1.031	.120	.6875-24	.802	.900	.875	1.385	1.285
14	.875	.152	.906	1.125	.120	.8125-20	.927	.900	.875	1.385	1.285
16	1.000	.152	.969	1.219	.120	.9375-20	1.052	.900	.875	1.385	1.285
18	1.125	.152	1.062	1.312	.120	1.0625-18	1.177	.900	.875	1.385	1.285
20	1.250	.179	1.156	1.438	.120	1.1875-18	1.302	.900	.875	1.385	1.285
22	1.375	.179	1.250	1.562	.120	1.3125-18	1.427	.900	.875	1.385	1.285
24	1.500	.179	1.375	1.688	.147	1.4375-18	1.552	.900	.875	1.385	1.285

All dimensions for reference only.

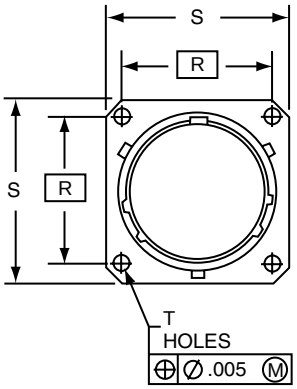
Amphenol Aerospace

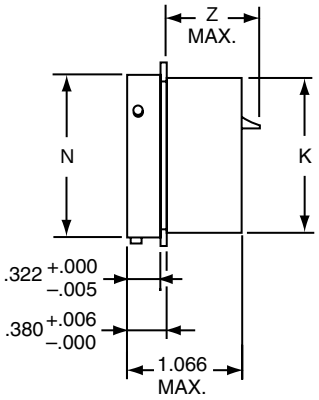
PART #

To complete, see how to order page 135.

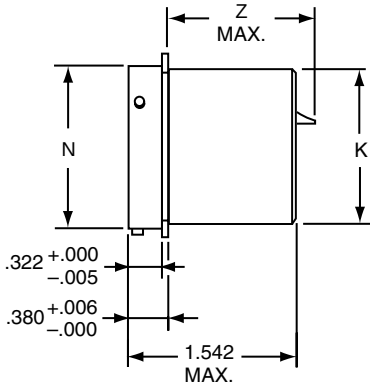
Filter Connector Designator	Connect/ Filter Type	Shell Finish	Shell Style	Shell Size & Insert Arrg	Type of Contact/ Keyway Position
21	24	X	2	XX-XX	X
21	32	X	2	XX-XX	X
21	37	X	2	XX-XX	X

(MS27335)





21-24X2 (MS27335)
21-32X2 (MS27335)



21-37X2 (MS27335)

Plug movement required to clear FJT receptacles: .281 min.

Shell Size	K Dia. +.000 −.007	N Dia +.001 −.005	R (TP)	S +.011 −.010	T Dia. ±.005	SHORT SHELL VHF/UHF/MF Filters			LONG SHELL HF Filters	
						Size 20 Contact Z Max.	Size 16 or 16 & 20 Contacts Z Max.	Size 22 Contact Z Max.	Size 20 Contact Z Max.	Size 16 or 16 & 20 Contacts Z Max.
8	.438	.473	.594	.812	.120	.937	.952	.902	1.300	1.496
10	.562	.590	.719	.938	.120	.937	.952	.902	1.300	1.496
12	.688	.750	.812	1.031	.120	.937	.952	.902	1.300	1.496
14	.812	.875	.906	1.125	.120	.937	.952	.902	1.300	1.496
16	.938	1.000	.969	1.219	.120	.937	.952	.902	1.300	1.496
18	1.062	1.125	1.062	1.312	.120	.937	.952	.902	1.300	1.496
20	1.188	1.250	1.156	1.438	.120	.937	.952	.902	1.300	1.496
22	1.312	1.375	1.250	1.562	.120	.937	.952	.902	1.300	1.496
24	1.438	1.500	1.375	1.688	.147	.937	.952	.902	1.300	1.496

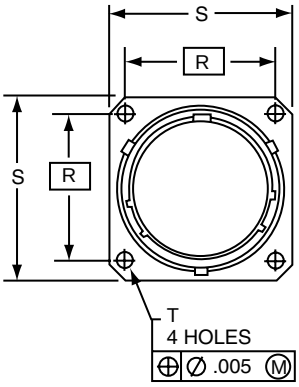
All dimensions for reference only.

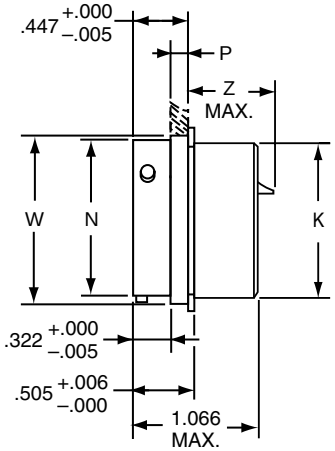
PART #

To complete, see how to order page 135.

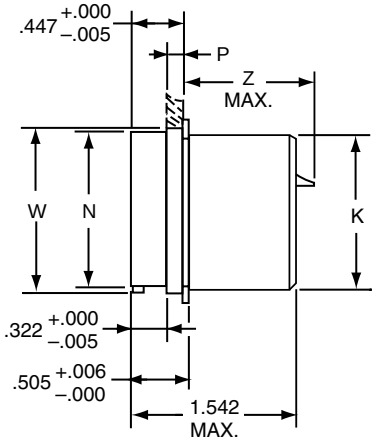
Filter Connector Designator	Connect/ Filter Type	Shell Finish	Shell Style	Shell Size & Insert Arrg	Type of Contact/ Keyway Position
21	34	X	2	XX-XX	X
21	39	X	2	XX-XX	X
21	38	X	2	XX-XX	X

(MS27508)





21-34X2 (MS27508)
21-39X2 (MS27508)



21-38X2 (MS27508)

Plug movement required to clear FJT receptacles: .281 min.

Shell Size	K Dia. +.000 –.007	N Dia +.001 –.005	P Max. Panel Thickness	R (TP)	S +.011 –.010	T Dia. ±.005	W Dia. +.001 –.005	SHORT SHELL VHF/UHF/MF Filters		LONG SHELL HF Filters	
								Size 16 or 16 & 20 Contacts Z Max.	Size 20 or 22 Contact Z Max.	Size 16 or 16 & 20 Contacts Z Max.	Size 20 Contact Z Max.
8	.438	.473	.147	.594	.812	.120	.516	.900	.875	1.385	1.285
10	.562	.590	.152	.719	.938	.120	.633	.900	.875	1.385	1.285
12	.688	.750	.152	.812	1.031	.120	.802	.900	.875	1.385	1.285
14	.812	.875	.152	.906	1.125	.120	.927	.900	.875	1.385	1.285
16	.938	1.000	.152	.969	1.219	.120	1.052	.900	.875	1.385	1.285
18	1.062	1.125	.152	1.062	1.312	.120	1.177	.900	.875	1.385	1.285
20	1.188	1.250	.179	1.156	1.438	.120	1.302	.900	.875	1.385	1.285
22	1.312	1.375	.179	1.250	1.562	.120	1.427	.900	.875	1.385	1.285
24	1.438	1.500	.179	1.375	1.688	.147	1.552	.900	.875	1.385	1.285

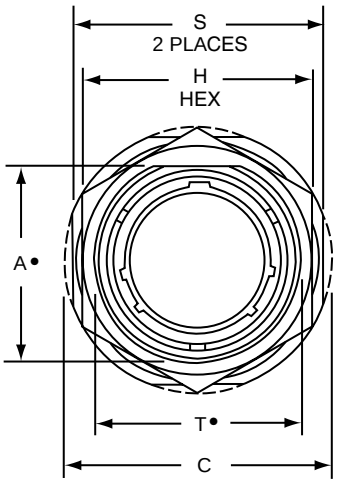
All dimensions for reference only.

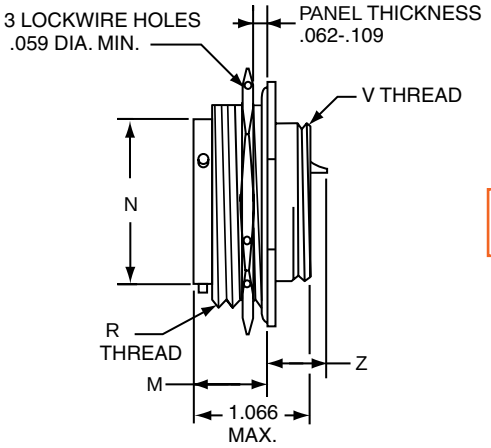
PART #

To complete, see how to order page 135.

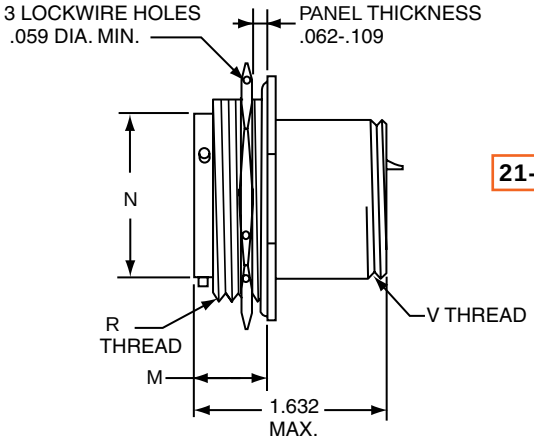
Filter Connector Designator	Connect/ Filter Type	Shell Finish	Shell Style	Shell Size & Insert Arrg	Type of Contact/ Keyway Position
21	24	X	7	XX-XX	X
21	32	X	7	XX-XX	X
21	37	X	7	XX-XX	X

(MS27337)





21-24X7 (MS27337)
21-32X7 (MS27337)



21-37X7 (MS27337)

• "D" shaped mounting hole dimensions
Plug movement required to clear FJT receptacles: .281 min.

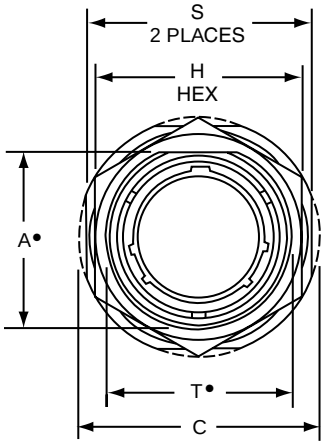
Shell Size	A• Flat +.000 –.010	C Dia. +.011 –.010	H Hex +.017 –.016	M ±.005	N Dia +.001 –.005	R Thread (Plated) Class -2A	S ±.010	T• Dia. +.010 –.000	V Thread UNEF-2A (Plated)	SHORT SHELL VHF/UHF/MF Filters			LONG SHELL HF Filters	
										Size 16 or 16 & 20 Contacts Z Max.	Size 20 Contact Z Max.	Size 22 Contact Z Max.	Size 16 or 16 & 20 Contacts Z Max.	Size 20 Contact Z Max.
8	.830	1.375	1.062	.438	.473	.8750-20UNEF	1.250	.884	.4375-28	.900	.884	.849	1.443	1.276
10	.955	1.500	1.188	.438	.590	1.0000-20UNEF	1.375	1.007	.5625-24	.900	.884	.849	1.443	1.276
12	1.084	1.625	1.312	.438	.750	1.1250-18UNEF	1.500	1.134	.6875-24	.900	.884	.849	1.443	1.276
14	1.208	1.750	1.438	.438	.875	1.2500-18UNEF	1.625	1.259	.8125-20	.900	.884	.849	1.443	1.276
16	1.333	1.938	1.562	.438	1.000	1.3750-18UNEF	1.781	1.384	.9375-20	.900	.884	.849	1.443	1.276
18	1.459	2.016	1.688	.438	1.125	1.5000-18UNEF	1.890	1.507	1.0625-18	.900	.884	.849	1.443	1.276
20	1.576	2.141	1.812	.464	1.250	1.6250-18UNEF	2.016	1.634	1.1875-18	.874	.858	.823	1.443	1.276
22	1.701	2.265	2.000	.464	1.375	1.7500-18UNS	2.140	1.759	1.3125-18	.874	.858	.823	1.417	1.250
24	1.826	2.390	2.125	.464	1.500	1.8750-16UN	2.265	1.884	1.4375-18	.874	.858	.823	1.417	1.250

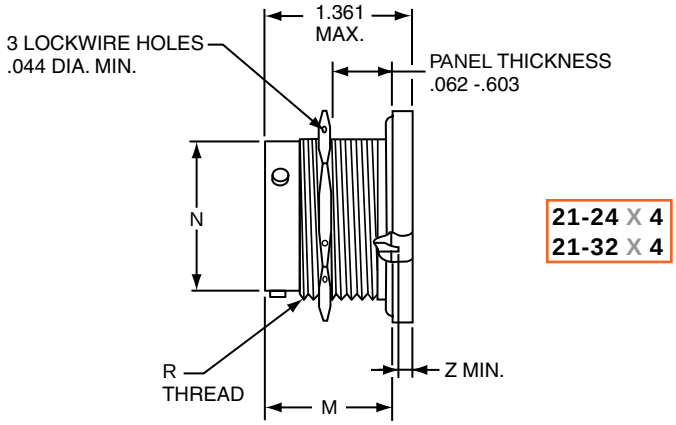
All dimensions for reference only.

PART #

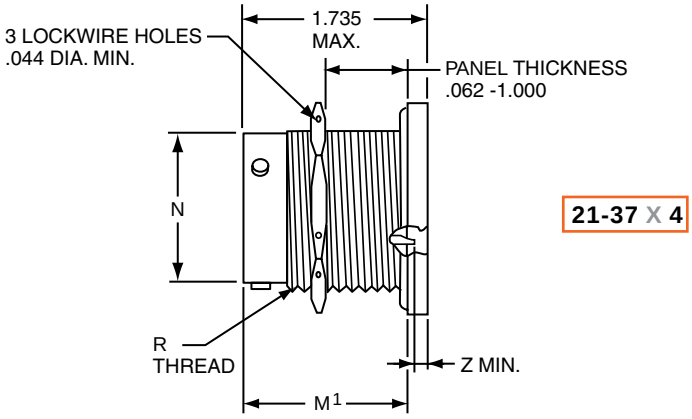
To complete, see how to order page 135.

Filter Connector Designator	Connect/ Filter Type	Shell Finish	Shell Style	Shell Size & Insert Arrg	Type of Contact/ Keyway Position
21	24	X	4	XX-XX	X
21	32	X	4	XX-XX	X
21	37	X	4	XX-XX	X





21-24 X 4
21-32 X 4



21-37 X 4

• "D" shaped mounting hole dimensions
Plug movement required to clear FJT receptacles: .281 min.

Shell Size	A• Flat +.000 –.010	C Dia. +.011 –.010	H Hex +.017 –.016	M ±.005	M1 ±.005	N Dia +.001 –.005	R Thread UNEF-2A (Plated)	S +.011 –.010	T• Dia. +.010 –.000	SHORT SHELL VHF/UHF/MF Filters			LONG SHELL HF Filters	
										Size 16 or 16 & 20 Contacts Z Max.	Size 20 Contact Z Max.	Size 22 Contact Z Max.	Size 16 or 16 & 20 Contacts Z Max.	Size 20 Contact Z Max.
8	.542	1.062	.750	1.220	1.594	.473	.5625-24	.938	.572	.000	.022	.057	.000	.000
10	.669	1.188	.875	1.220	1.594	.590	.6875-24	1.062	.697	.000	.022	.057	.000	.000
12	.830	1.375	1.062	1.220	1.594	.750	.8750-20	1.250	.844	.000	.022	.057	.000	.000
14	.955	1.500	1.188	1.220	1.594	.875	1.0000-20	1.375	1.007	.000	.022	.057	.000	.000
16	1.084	1.625	1.312	1.220	1.594	1.000	1.1250-18	1.500	1.134	.000	.022	.057	.000	.000
18	1.208	1.750	1.438	1.220	1.594	1.125	1.2500-18	1.625	1.259	.000	.022	.057	.000	.000
20	1.333	1.938	1.562	1.188	1.563	1.250	1.3750-18	1.812	1.384	.000	.022	.057	.000	.000
22	1.459	2.062	1.688	1.188	1.563	1.375	1.5000-18	1.938	1.507	.000	.022	.057	.000	.000
24	1.575	2.188	1.812	1.188	1.563	1.500	1.6250-18	2.062	1.634	.000	.022	.057	.000	.000

All dimensions for reference only.

Amphenol Aerospace

The Amphenol® FLJT Series offers all the design features of the FJT plus a 100% "scoop-proof" contact protection design.

- Intermountable with MIL-DTL-38999/27599 Series I connectors (see section Series I LJT)
- Contact Protection - shell design prevents contact damage
- Quick Positive Coupling – 3 point bayonet locking
- Higher reliability and greater durability with permanently encapsulated contacts
- Environmental Resistant
- Aluminum shells with several finish options
- Error-proof alternate positioning of shell keyways
- Corrosion Resistant - 500 hour salt spray olive drab cadmium over nickel plating, class T (aluminum), electroless nickel plating, class F (aluminum) or stainless steel shells

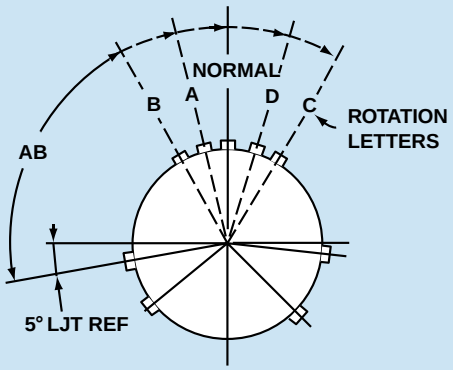
FLJT

FLJT Master Key/Keyway Rotation

Shell Size	AB Angle of Rotation (Degrees)				
	Normal	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

A plug with a given rotation letter will mate with a receptacle with the same rotation letter. The AB angle for a given connector is the same whether it contains pins or sockets. Inserts are not rotated in conjunction with the master key/keyway.

AB angles shown are viewed from the front face of the connector. A receptacle is shown at right. The angles for the plug are exactly the same, except the direction of rotation is opposite of that shown for the receptacle.

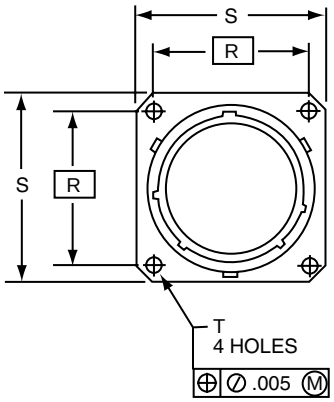


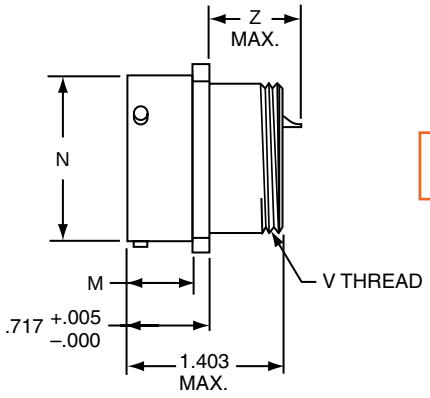
RELATIVE POSSIBLE POSITION OF ROTATED MASTER KEYWAY (front face of receptacle shown)

PART #

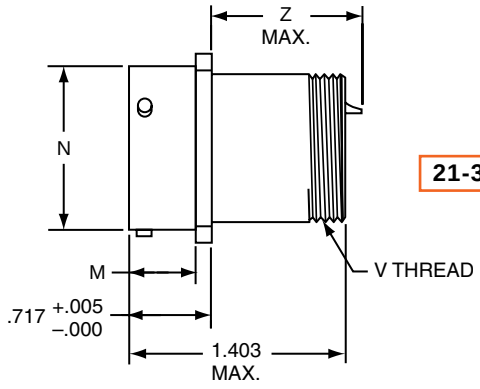
To complete, see how to order page 135.

Filter Connector Designator	Connect/ Filter Type	Shell Finish	Shell Style	Shell Size & Insert Arrg	Type of Contact/ Keyway Position
21	29	X	0	XX-XX	X
21	40	X	0	XX-XX	X
21	36	X	0	XX-XX	X





21-29X0
21-40X0



21-36X0

Plug movement required to clear FLJT receptacles: .625 min.

Shell Size	M +.000 –.006	N Dia. +.001 –.005	R (TP)	S +.011 –.010	T Dia. ±.005	V Thread UNEF-2A (Plated)	SHORT SHELL VHF/UHF/MF Filters			LONG SHELL HF Filters	
							Size 20 Contact Z Max.	Size 16 or 16 & 20 Contacts Z Max.	Size 22 Contact Z Max.	Size 20 Contact Z Max.	Size 16 or 16 & 20 Contacts Z Max.
9	.632	.572	.719	.938	.128	.4375-28	.865	.950	.820	1.324	1.394
11	.632	.700	.812	1.031	.128	.5625-24	.865	.950	.820	1.324	1.394
13	.632	.850	.906	1.125	.128	.6875-24	.865	.950	.820	1.324	1.394
15	.632	.975	.969	1.219	.128	.8125-20	.865	.950	.820	1.324	1.394
17	.632	1.100	1.062	1.312	.128	.9375-20	.865	.950	.820	1.324	1.394
19	.632	1.207	1.156	1.438	.128	1.0625-18	.865	.950	.820	1.324	1.394
21	.602	1.332	1.250	1.562	.128	1.1875-18	.865	.950	.820	1.324	1.394
23	.602	1.457	1.375	1.688	.147	1.3125-18	.865	.950	.820	1.324	1.394
25	.602	1.582	1.500	1.812	.147	1.4375-18	.865	.950	.820	1.324	1.394

All dimensions for reference only.

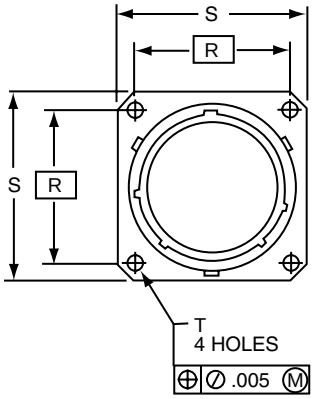
(back panel mounting, UTS crimp)

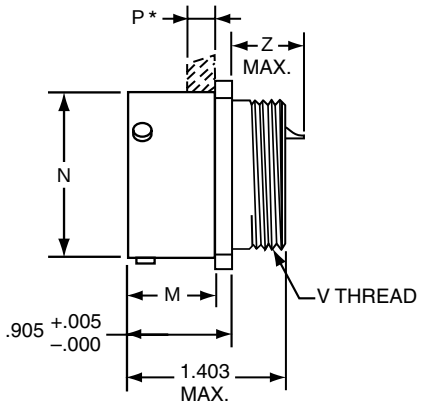
PART #

To complete, see how to order page 135.

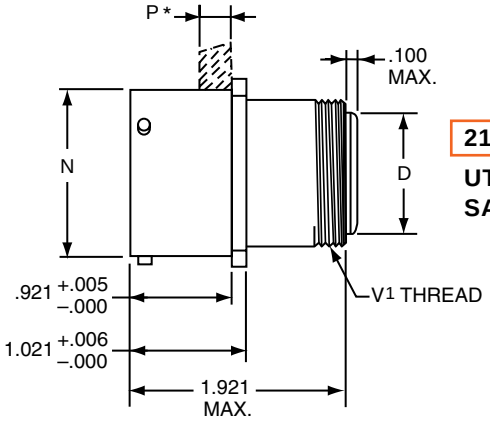
Filter Connector Designator	Connect/ Filter Type	Shell Finish	Shell Style	Shell Size & Insert Arrg	Type of Contact/ Keyway Position
21	47	X	0	XX-XX	X
21	48	X	0	XX-XX	X

UTS (Crimp) Contact SAE AS39029/57





21-47X0



21-48X0

UTS (Crimp) Contact SAE AS39029/57

Plug movement required to clear FLJT receptacles: .625 min.
* Acceptable panel thickness for back panel mounting a standard receptacle.

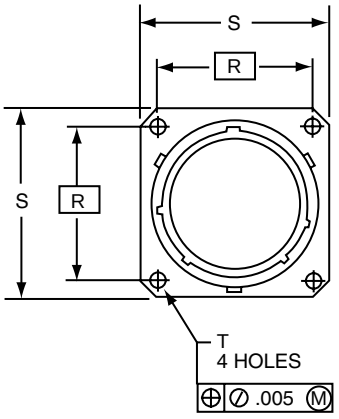
Shell Size	D Dia. ±.005	M +.000 –.006	N Dia. +.001 –.005	P Max. Panel Thickness	R (TP)	S +.011 –.010	T Dia. ±.005	V Thread UNEF-2A (Plated)	V1 Thread UNEF-2A (Plated)	SHORT SHELL VHF/UHF Filters		
										Size 20 Contact Z Max.	Size 16 or 16 & 20 Contacts Z Max.	Size 22 Contact Z Max.
9	.299	.820	.572	.234	.719	.938	.128	.4375-28	.5625-24	.672	.763	.632
11	.427	.820	.700	.234	.812	1.031	.128	.5625-24	.6875-24	.672	.763	.632
13	.541	.820	.850	.234	.906	1.125	.128	.6875-24	.8125-20	.672	.763	.632
15	.666	.820	.975	.234	.969	1.219	.128	.8125-20	.9375-20	.672	.763	.632
17	.791	.820	1.100	.234	1.062	1.312	.128	.9375-20	1.0625-18	.672	.763	.632
19	.897	.820	1.207	.234	1.156	1.438	.128	1.0625-18	1.1875-18	.672	.763	.632
21	1.022	.790	1.332	.204	1.250	1.562	.128	1.1875-18	1.3125-18	.672	.763	.632
23	1.147	.790	1.457	.204	1.375	1.688	.147	1.3125-18	1.4375-18	.672	.763	.632
25	1.272	.790	1.582	.193	1.500	1.812	.147	1.4375-18	1.5625-18	.672	.763	.632

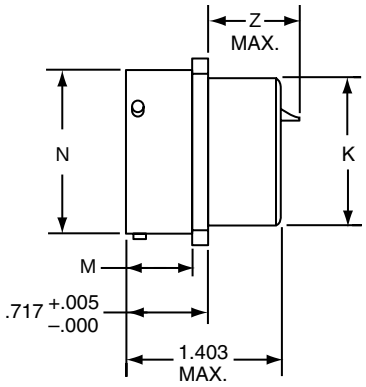
All dimensions for reference only.

PART #

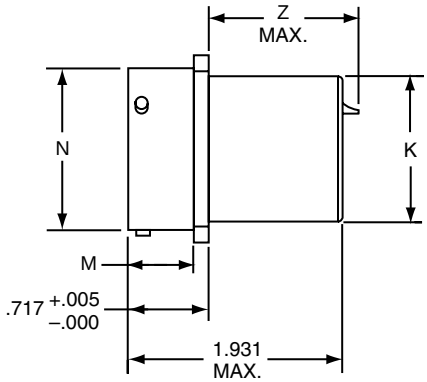
To complete, see how to order page 135.

Filter Connector Designator	Connect/ Filter Type	Shell Finish	Shell Style	Shell Size & Insert Arrg	Type of Contact/ Keyway Position
21	29	X	2	XX-XX	X
21	40	X	2	XX-XX	X
21	36	X	2	XX-XX	X





21-29X2
21-40X2



21-36X2

Plug movement required to clear FLJT receptacles: .625 min.

Shell Size	K Dia. +.001 –.006	M +.000 –.006	N Dia. +.001 –.005	R (TP)	S +.011 –.010	T Dia. ±.005	SHORT SHELL VHF/UHF/MF Filters			LONG SHELL HF Filters	
							Size 20 Contact Z Max.	Size 16 or 16 & 20 Contacts Z Max.	Size 22 Contact Z Max.	Size 20 Contact Z Max.	Size 16 or 16 & 20 Contacts Z Max.
9	.436	.632	.572	.719	.938	.128	.865	.950	.820	1.324	1.394
11	.560	.632	.700	.812	1.031	.128	.865	.950	.820	1.324	1.394
13	.686	.632	.850	.906	1.125	.128	.865	.950	.820	1.324	1.394
15	.810	.632	.975	.969	1.219	.128	.865	.950	.820	1.324	1.394
17	.936	.632	1.100	1.062	1.312	.128	.865	.950	.820	1.324	1.394
19	1.060	.632	1.207	1.156	1.438	.128	.865	.950	.820	1.324	1.394
21	1.186	.602	1.332	1.250	1.562	.128	.865	.950	.820	1.324	1.394
23	1.310	.602	1.457	1.375	1.688	.147	.865	.950	.820	1.324	1.394
25	1.436	.602	1.582	1.500	1.812	.147	.865	.950	.820	1.324	1.394

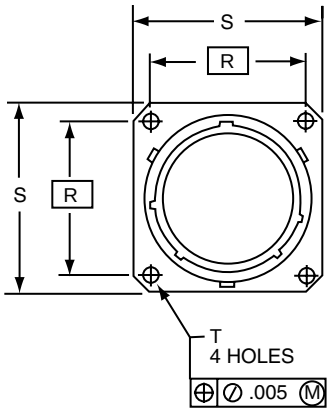
All dimensions for reference only.

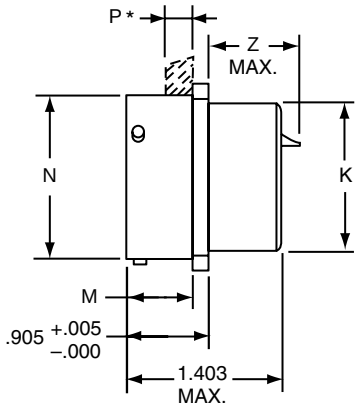
(back panel mounting, UTS crimp)

PART #
To complete, see how to order page 135.

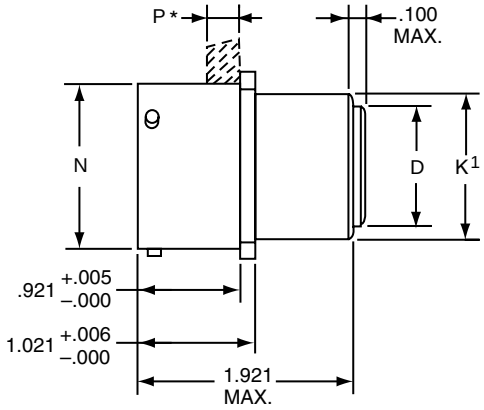
Filter Connector Designator	Connect/ Filter Type	Shell Finish	Shell Style	Shell Size & Insert Arrg	Type of Contact/ Keyway Position
21	47	X	2	XX-XX	X
21	48	X	2	XX-XX	X

UTS (Crimp) Contact SAE AS39029





21-47X2



21-48X2

UTS (Crimp) Contact SAE AS39029

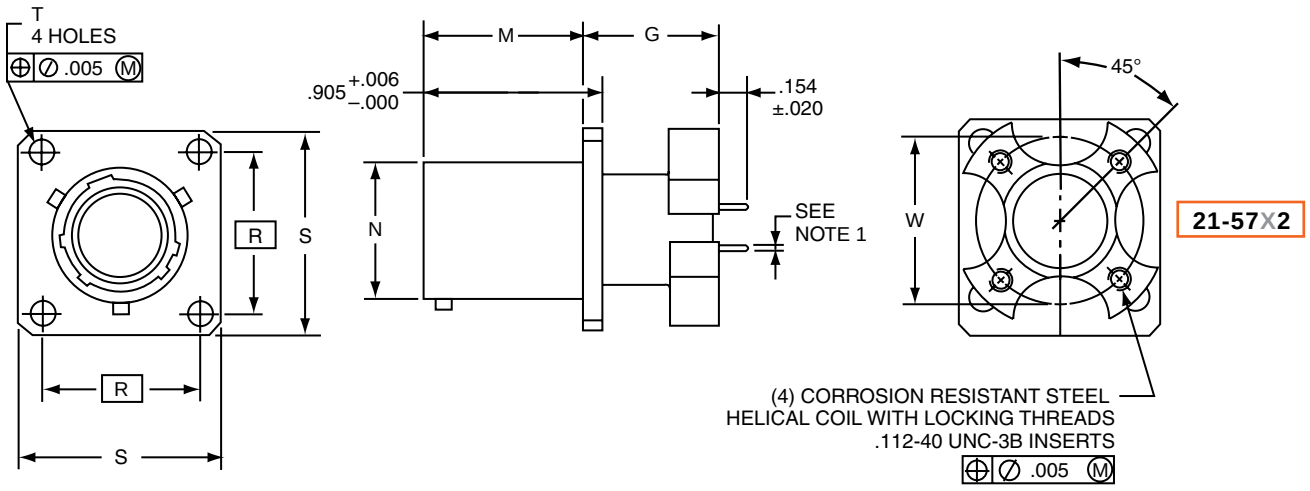
Plug movement required to clear FLJT receptacles: .625 min.
* Acceptable panel thickness for back panel mounting a standard receptacle.

Shell Size	D Dia. ±.005	K Dia. +.000 –.006	K¹ Dia. +.000 –.007	M +.000 –.006	N Dia. +.001 –.005	P Max. Panel Thickness	R (TP)	S +.011 –.010	T Dia. ±.005	SHORT SHELL VHF/UHF Filters		
										Size 20 Contact Z Max.	Size 16 or 16 & 20 Contacts Z Max.	Size 22 Contact Z Max.
9	.299	.437	.561	.820	.572	.234	.719	.938	.128	.672	.763	.632
11	.427	.562	.687	.820	.700	.234	.812	1.031	.128	.672	.763	.632
13	.541	.688	.811	.820	.850	.234	.906	1.125	.128	.672	.763	.632
15	.666	.812	.937	.820	.975	.234	.969	1.219	.128	.672	.763	.632
17	.791	.938	1.061	.820	1.100	.234	1.062	1.312	.128	.672	.763	.632
19	.897	1.062	1.187	.820	1.207	.234	1.156	1.438	.128	.672	.763	.632
21	1.022	1.188	1.312	.790	1.332	.204	1.250	1.562	.128	.672	.763	.632
23	1.147	1.312	1.437	.790	1.457	.204	1.375	1.688	.147	.672	.763	.632
25	1.272	1.438	1.562	.790	1.582	.193	1.500	1.812	.147	.672	.763	.632

All dimensions for reference only.

PART # **To complete, see how to order page 135.**

Filter Connector Designator	Connect/ Filter Type	Shell Finish	Shell Style	Shell Size & Insert Arrg	Type of Contact/ Keyway Position
21	57	X	2	XX-XX	X



1. Standard tail for size 22 is .020 ±.001 dia.
   Standard tail for size 20 is .030 ±.001 dia.

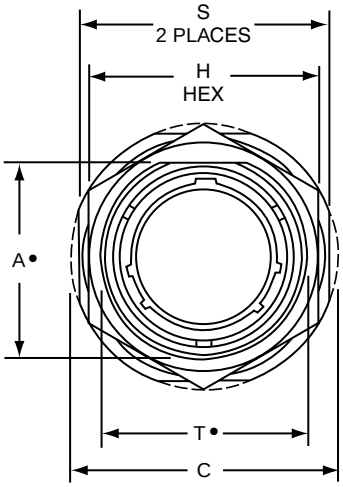
Plug movement required to clear FLJT receptacles: .625 min.

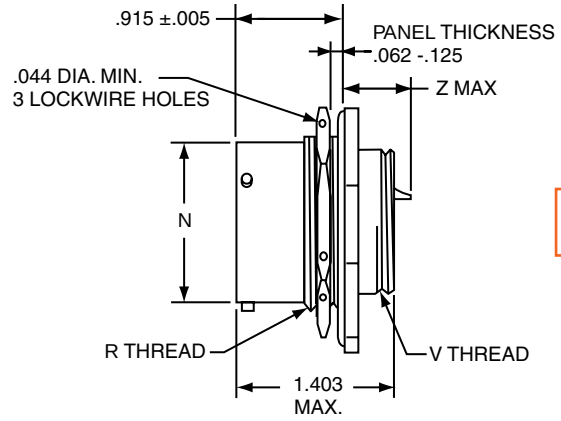
Shell Size	G +.006 –.005	M +.000 –.005	N Dia. +.001 –.005	R (TP)	S +.011 –.010	T Dia. +.004 –.003	W
11	.689	.820	.700	.812	1.031	.128	.850
13	.689	.820	.850	.906	1.125	.128	.994
15	.689	.820	.975	.969	1.219	.128	1.119
17	.689	.820	1.100	1.062	1.312	.128	1.237
19	.689	.820	1.207	1.156	1.438	.128	1.379
21	.689	.790	1.332	1.250	1.562	.128	1.489
23	.719	.790	1.457	1.375	1.688	.147	1.619
25	.719	.790	1.582	1.500	1.812	.147	1.744

All dimensions for reference only.

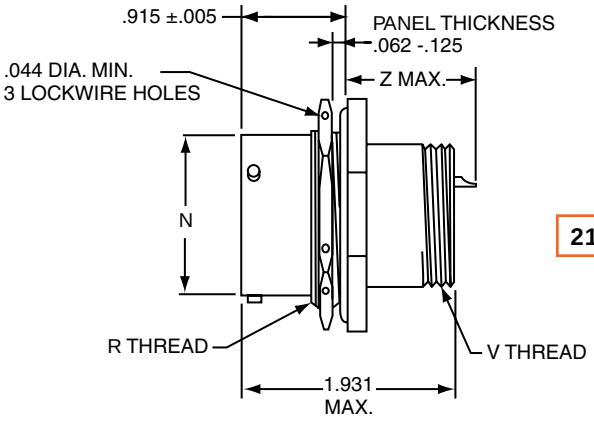
PART #
To complete, see how to order page 135.

Filter Connector Designator	Connect/ Filter Type	Shell Finish	Shell Style	Shell Size & Insert Arrg	Type of Contact/ Keyway Position
21	29	X	7	XX-XX	X
21	40	X	7	XX-XX	X
21	36	X	7	XX-XX	X





21-29X7
21-40X7



21-36X7

• "D" shaped mounting hole dimensions
Plug movement required to clear FLJT receptacles: .625 min.

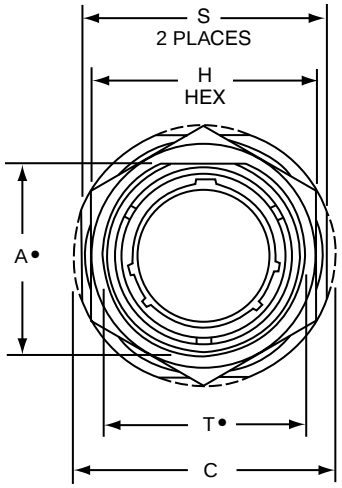
Shell Size	A• Flat +.000 –.010	C Dia. +.011 –.010	H Hex +.017 –.016	N Dia +.001 –.005	R Thread (Plated) Class -2A	S +.016 –.015	T• Dia. +.010 –.000	V Thread UNEF-2A (Plated)	SHORT SHELL VHF/UHF/MF Filters			LONG SHELL HF Filters	
									Size 20 Contact Z Max.	Size 16 or 16 & 20 Contacts Z Max.	Size 22 Contact Z Max.	Size 20 Contact Z Max.	Size 16 or 16 & 20 Contacts Z Max.
9	.669	1.188	.875	.572	.6875-24UNEF	1.062	.697	.4375-28	.667	.756	.616	1.228	1.201
11	.769	1.375	1.000	.700	.8125-20UNEF	1.250	.822	.5625-24	.667	.756	.616	1.228	1.201
13	.955	1.500	1.188	.850	1.0000-20UNEF	1.375	1.007	.6875-24	.667	.756	.616	1.228	1.201
15	1.084	1.625	1.312	.975	1.1250-18UNEF	1.500	1.134	.8125-20	.667	.756	.616	1.228	1.201
17	1.208	1.750	1.438	1.100	1.2500-18UNEF	1.625	1.259	.9375-20	.667	.756	.616	1.228	1.201
19	1.333	1.938	1.562	1.207	1.3750-18UNEF	1.812	1.384	1.0625-18	.667	.756	.616	1.228	1.201
21	1.459	2.062	1.688	1.332	1.5000-18UNEF	1.938	1.507	1.1875-18	.667	.756	.616	1.228	1.201
23	1.580	2.188	1.812	1.457	1.6250-18UNEF	2.062	1.634	1.3125-18	.667	.756	.616	1.228	1.201
25	1.709	2.312	2.000	1.582	1.7500-18UNS	2.188	1.759	1.4375-18	.667	.756	.616	1.228	1.201

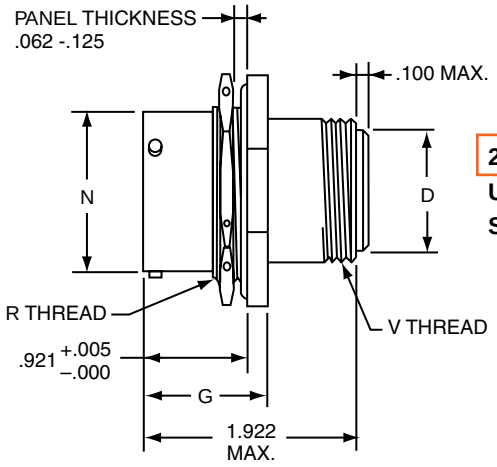
All dimensions for reference only.

PART # **To complete, see how to order page 135.**

Filter Connector Designator	Connect/ Filter Type	Shell Finish	Shell Style	Shell Size & Insert Arrg	Type of Contact/ Keyway Position
21	48	X	7	XX-XX	X

UTS (Crimp) Contact SAE AS39029/57





21-48X7
UTS (Crimp) Contact SAE AS39029/57

• "D" shaped mounting hole dimensions
Plug movement required to clear FLJT receptacles: .625 min.

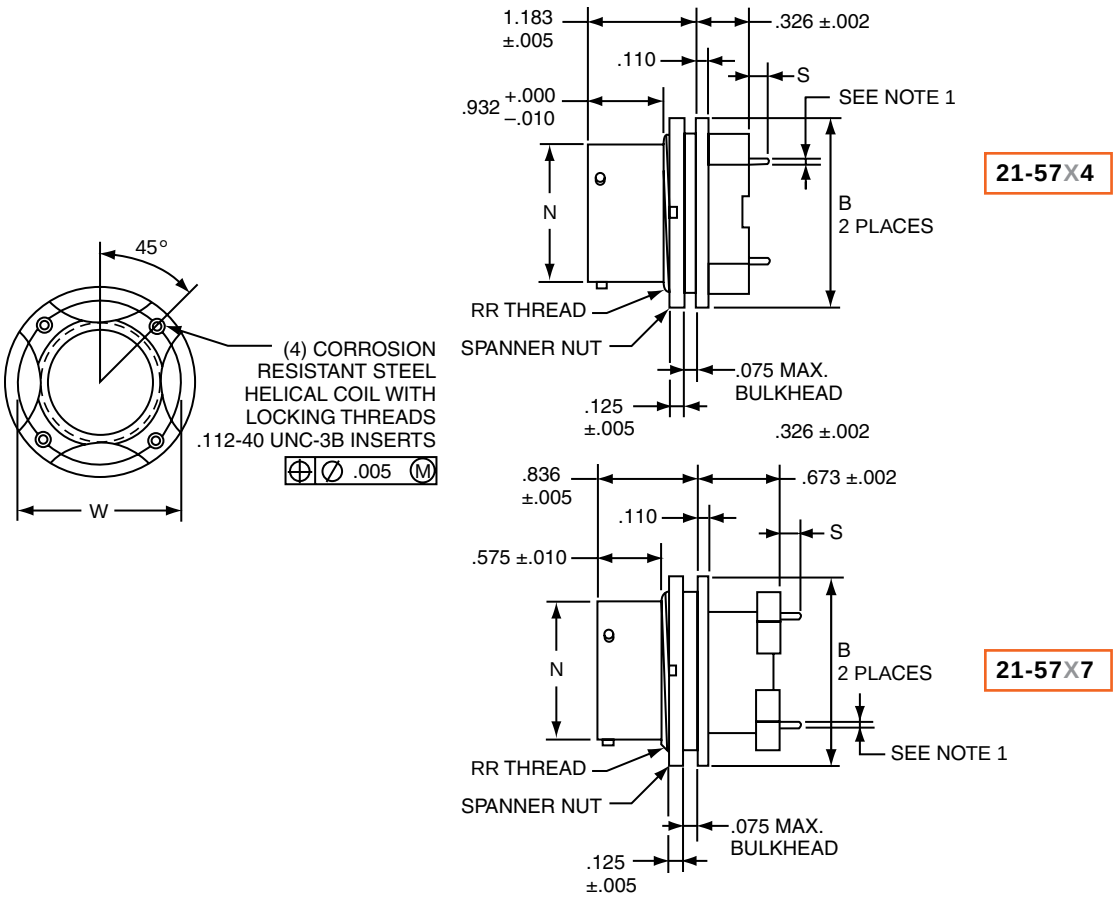
Shell Size	A• Flat +.000 −.010	C Dia. +.011 −.010	D Dia. ±.005	G +.006 −.005	H Hex +.017 −.016	N Dia +.001 −.005	R Thread (Plated) Class -2A	S +.016 −.015	T• Dia. +.010 −.000	V Thread UNEF-2A (Plated)
9	.669	1.188	.299	1.030	.875	.572	.6875-24UNEF	1.062	.697	.5625-24
11	.769	1.375	.427	1.030	1.000	.700	.8125-20UNEF	1.250	.822	.6875-24
13	.955	1.500	.541	1.030	1.188	.850	1.0000-20UNEF	1.375	1.007	.8125-20
15	1.084	1.625	.666	1.030	1.312	.975	1.1250-18UNEF	1.500	1.134	.9375-20
17	1.208	1.750	.791	1.030	1.438	1.100	1.2500-18UNEF	1.625	1.259	1.0625-18
19	1.333	1.938	.897	1.061	1.562	1.207	1.3750-18UNEF	1.812	1.384	1.1875-18
21	1.459	2.062	1.022	1.061	1.688	1.332	1.5000-18UNEF	1.938	1.507	1.3125-18
23	1.580	2.188	1.147	1.061	1.812	1.457	1.6250-18UNEF	2.062	1.634	1.4375-18
25	1.709	2.312	1.272	1.061	2.000	1.582	1.7500-18UNS	2.188	1.759	1.5625-18

All dimensions for reference only.

(printed circuit board mount)

PART #
To complete, see how to order page 135.

Filter Connector Designator	Connect/ Filter Type	Shell Finish	Shell Style	Shell Size & Insert Arrg	Type of Contact/ Keyway Position
21	57	X	4	XX-XX	X
21	57	X	7	XX-XX	X



1. Standard tail for size 22 is .020 ±.001 dia.
   Standard tail for size 20 is .030 ±.001 dia.

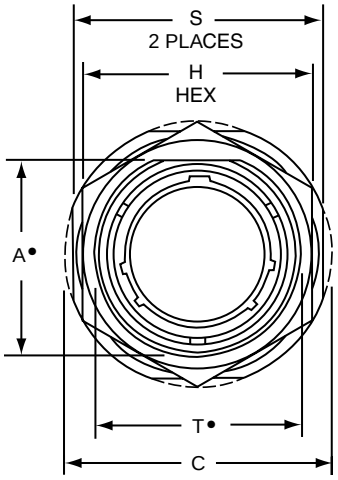
Plug movement required to clear FLJT receptacles: .625 min.

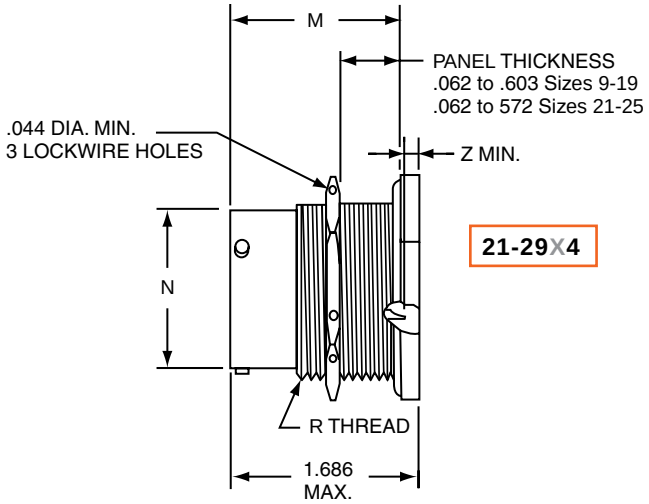
Shell Size	B Dia. ±.005	N Dia. +.001 –.005	S ±.020	W	RR Thread UNEF-2A
11	1.062	.700	.132	.850	.8125-20
13	1.250	.850	.132	.994	1.0000-20
15	1.375	.975	.132	1.119	1.1250-20
17	1.500	1.100	.132	1.237	1.2500-18
19	1.625	1.207	.132	1.379	1.3750-18
21	1.750	1.332	.132	1.489	1.5000-18
23	1.875	1.457	.132	1.619	1.6250-18
25	2.000	1.582	.132	1.744	1.7500-18

All dimensions for reference only.

PART # **To complete, see how to order page 135.**

Filter Connector Designator	Connect/ Filter Type	Shell Finish	Shell Style	Shell Size & Insert Arrg	Type of Contact/ Keyway Position
21	29	X	4	XX-XX	X





• "D" shaped mounting hole dimensions
Plug movement required to clear FLJT receptacles: .625 min.

Shell Size	A• Flat +.000 –.010	C Dia. +.011 –.010	H Hex +.017 –.016	M ±.005	N Dia +.001 –.005	R Thread (Plated) Class -2A	S +.016 –.015	T• Dia. +.010 –.000	SHORT SHELL VHF/UHF Filters			
									Size 16 Contact Z Max.	Size 16 or 16 & 20 Contacts Z Max.	Size 20 Contact Z Max.	Size 22 Contact Z Max.
9	.669	1.188	.875	1.557	.572	.6875-24UNEF	1.062	.697	.000	.000	.000	.000
11	.769	1.375	1.000	1.557	.700	.8125-20UNEF	1.250	.822	.000	.000	.000	.000
13	.955	1.500	1.188	1.557	.850	1.0000-20UNEF	1.375	1.007	.000	.000	.000	.000
15	1.084	1.625	1.312	1.557	.975	1.1250-18UNEF	1.500	1.134	.000	.000	.000	.000
17	1.208	1.750	1.438	1.557	1.100	1.2500-18UNEF	1.625	1.259	.000	.000	.000	.000
19	1.333	1.938	1.562	1.557	1.207	1.3750-18UNEF	1.812	1.384	.000	.000	.000	.000
21	1.459	2.062	1.688	1.525	1.332	1.5000-18UNEF	1.938	1.507	.000	.000	.000	.000
23	1.580	2.188	1.812	1.525	1.457	1.6250-18UNEF	2.062	1.634	.000	.000	.000	.000
25	1.709	2.312	2.000	1.525	1.582	1.7500-18UNS	2.188	1.759	.000	.000	.000	.000

All dimensions for reference only.

The Amphenol® FSJT Series combines the unique design features of the scoop-proof FLJT Series with the standard mounting dimensions of JT types.

- 100% scoop-proof design
- Standard mounting dimensions
- Compliance with European Specifications PAN6433-2, LN29729, VG96912
- Uses proven filter technology with available components from other series
- EMP protection versions available

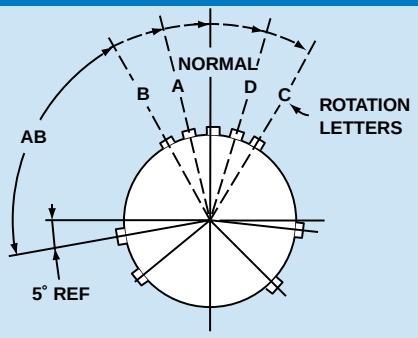
FSJT

FSJT Master Key/Keyway Rotation

Shell Size	AB Angle of Rotation (Degrees)				
	Normal	A	B	C	D
8	95	–	–	–	–
10	95	81	67	123	109
12	95	75	63	127	115
14	95	74	61	129	116
16	95	77	65	125	113
18	95	77	65	125	113
20	95	77	65	125	113
22	95	80	69	121	110
24	95	80	69	121	110

A plug with a given rotation letter will mate with a receptacle with the same rotation letter. The AB angle for a given connector is the same whether it contains pins or sockets. Inserts are not rotated in conjunction with the master key/keyway.

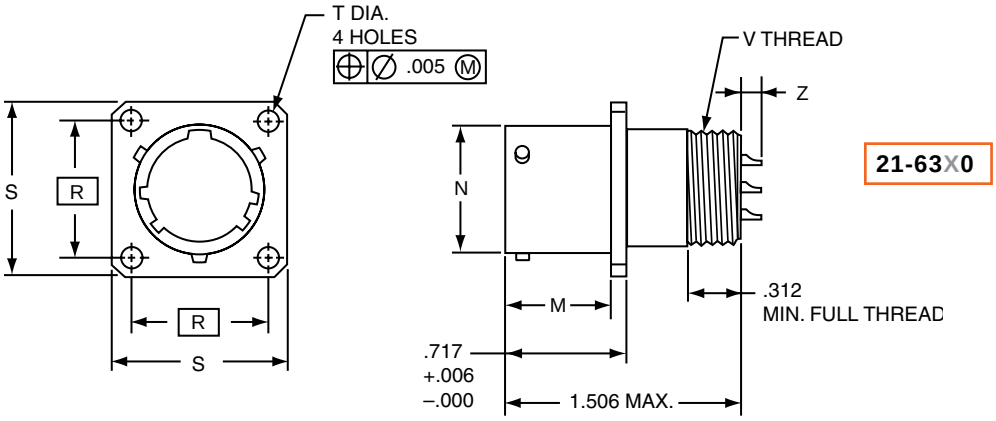
AB angles shown are viewed from the front face of the connector. A receptacle is shown at right. The angles for the plug are exactly the same, except the direction of rotation is opposite of that shown for the receptacle.



RELATIVE POSSIBLE POSITION
OF ROTATED MASTER KEYWAY
(front face of receptacle shown)

PART # **To complete, see how to order page 135.**

Filter Connector Designator	Connect/ Filter Type	Shell Finish	Shell Style	Shell Size & Insert Arrg	Type of Contact/ Keyway Position
21	63	X	0	XX-XX	X



Plug movement required to clear FSJT receptacles: .625 min.

Shell Size	M +.000 –.005	N Dia. +.001 –.005	R (TP)	S +.021 –.020	T Dia. +.004 –.003	V Thread UNEF-2A	Z Max. Size 20 Contact	Z Max. Size 16 or 16 & 20 Contacts	Z Max. Size 22 Contact
10	.632	.590	.719	.938	.120	.5625-24	.165	.265	.134
12	.632	.750	.812	1.031	.120	.6875-24	.165	.265	.134
14	.632	.875	.906	1.125	.120	.8125-20	.165	.265	.134
16	.632	1.000	.969	1.219	.120	.9375-20	.165	.265	.134
18	.632	1.125	1.062	1.312	.120	1.0625-18	.165	.265	.134
20	.602	1.250	1.156	1.438	.120	1.1875-18	.165	.265	.134
22	.602	1.375	1.250	1.562	.120	1.3125-18	.165	.265	.134
24	.602	1.500	1.375	1.688	.147	1.4375-18	.165	.265	.134

All dimensions for reference only.

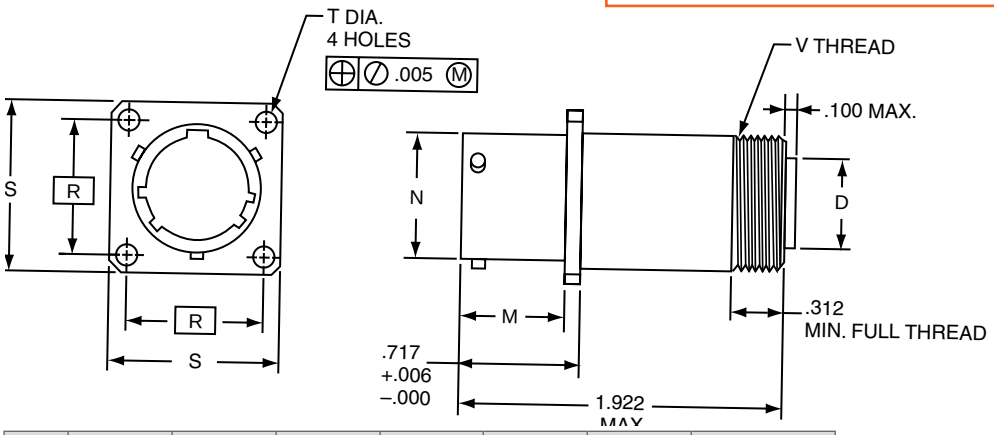
Amphenol Aerospace

Aluminum

PART #
To complete, see how to order page 135.

Filter Connector Designator	Connect/ Filter Type	Shell Finish	Shell Style	Shell Size & Insert Arrg	Type of Contact/ Keyway Position
21	65	X	0	XX-XX	X
21	63	X	2	XX-XX	X

UTS (Crimp) Contact SAE AS39029/57



21-65X0

UTS (Crimp) Contact SAE AS39029/57

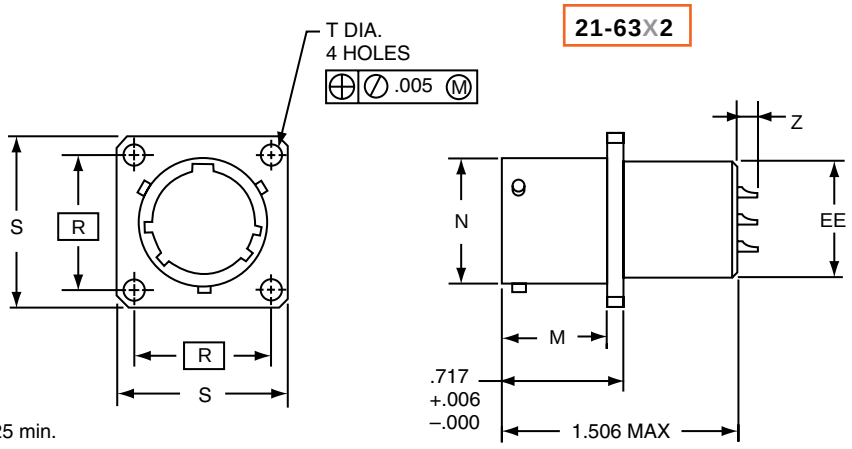
Shell Size	D Dia. ±.005	M +.000 –.005	N Dia. +.001 –.005	R (TP)	S +.021 –.020	T Dia. +.004 –.003	V Thread UNEF-2A
10	.427	.632	.590	.719	.938	.120	.6875-24
12	.541	.632	.750	.812	1.031	.120	.8125-20
14	.666	.632	.875	.906	1.125	.120	.9375-20
16	.791	.632	1.000	.969	1.219	.120	1.0625-18
18	.897	.632	1.125	1.062	1.312	.120	1.1875-18
20	1.022	.602	1.250	1.156	1.438	.120	1.3125-18
22	1.147	.602	1.375	1.250	1.562	.120	1.4375-18
24	1.272	.602	1.500	1.375	1.688	.147	1.5625-18

All dimensions for reference only.

Plug movement required to clear FSJT receptacles: .625 min.

FSJT
MIL-DTL-38999
Box Mounting Receptacle Aluminum

21-63X2



Plug movement required to clear FSJT receptacles: .625 min.

Shell Size	M +.000 –.005	N Dia. +.001 –.005	R (TP)	S +.021 –.020	T Dia. +.004 –.003	EE +.001 –.005	Z Max. Size 16 Contact	Z Max. Size 20 Contact	Z Max. Size 16 or 16 & 20 Contacts	Z Max. Size 22 Contact
10	.632	.590	.719	.938	.120	.562	.265	.165	.265	.134
12	.632	.750	.812	1.031	.120	.687	.265	.165	.265	.134
14	.632	.875	.906	1.125	.120	.812	.265	.165	.265	.134
16	.632	1.000	.969	1.219	.120	.937	.265	.165	.265	.134
18	.632	1.125	1.062	1.312	.120	1.062	.265	.165	.265	.134
20	.602	1.250	1.156	1.438	.120	1.187	.265	.165	.265	.134
22	.602	1.375	1.250	1.562	.120	1.312	.265	.165	.265	.134
24	.602	1.500	1.375	1.688	.147	1.437	.265	.165	.265	.134

All dimensions for reference only.

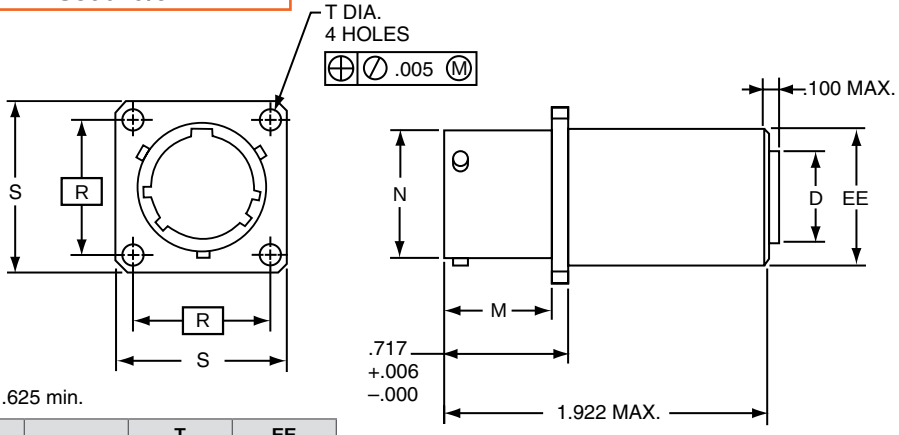
PART #
To complete, see how to order page 135.

Filter Connector Designator	Connect/ Filter Type	Shell Finish	Shell Style	Shell Size & Insert Arrg	Type of Contact/ Keyway Position
21	65	X	2	XX-XX	X
21	63	X	7	XX-XX	X

UTS (Crimp) Contact SAE AS39029/57

21-65X2

UTS (Crimp) Contact SAE AS39029/57

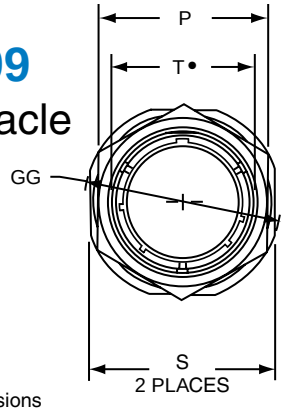


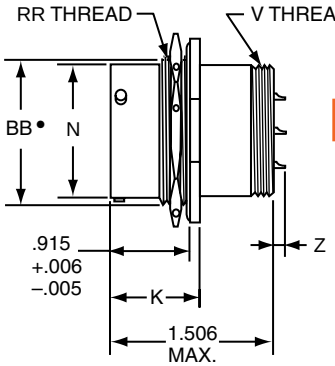
Plug movement required to clear FSJT receptacles: .625 min.

Shell Size	D Dia. ±.005	M +.000 –.005	N Dia. +.001 –.005	R (TP)	S +.021 –.020	T Dia. +.004 –.003	EE Dia. +.001 –.005
10	.427	.632	.590	.719	.938	.120	.687
12	.541	.632	.750	.812	1.031	.120	.811
14	.666	.632	.875	.906	1.125	.120	.937
16	.791	.632	1.000	.969	1.219	.120	1.061
18	.897	.632	1.125	1.062	1.312	.120	1.187
20	1.022	.602	1.250	1.156	1.438	.120	1.312
22	1.147	.602	1.375	1.250	1.562	.120	1.437
24	1.272	.602	1.500	1.375	1.688	.147	1.562

All dimensions for reference only.

FSJT
MIL-DTL-38999
Jam Nut Receptacle Aluminum





21-63X7

• "D" shaped mounting hole dimensions
Plug movement required to clear FSJT receptacles: .625 min.

Shell Size	K +.006 –.005	N Dia. +.001 –.005	P Hex	S ±.016	T• +.010 –.000	V Thread UNEF Class 2A	Z ±.020	BB• +.000 –.010	GG Max.	RR Thread UNEF Class 2A	SS +.001 –.016
10	1.024	.590	.875	1.062	.697	.5625-24	.150	.669	1.203	.6875-24	.680
12	1.024	.750	1.062	1.250	.884	.6875-24	.150	.830	1.391	.8750-20	.859
14	1.024	.875	1.188	1.375	1.007	.8125-20	.150	.955	1.515	1.0000-20	.984
16	1.024	1.000	1.312	1.500	1.134	.9375-20	.150	1.084	1.641	1.1250-18	1.108
18	1.055	1.125	1.438	1.625	1.259	1.0625-18	.150	1.208	1.766	1.2500-18	1.233
20	1.055	1.250	1.562	1.812	1.384	1.1875-18	.150	1.333	1.953	1.3750-18	1.358
22	1.055	1.375	1.688	1.938	1.507	1.3125-18	.150	1.459	2.078	1.5000-18	1.483
24	1.055	1.500	1.812	2.062	1.634	1.4375-18	.150	1.580	2.203	1.6250-18	1.610

All dimensions for reference only.

Amphenol Aerospace

Components designed to meet the severe mechanical and environmental requirements of MIL-DTL-38999 Series III are now available to Series IV users. Modifications of the connector are available with EMP protection, incorporating MOV's, diodes or a combination of both.

- Intermateable with MIL-DTL-38999 Series IV plugs
- Maintains all the features of standard MIL-DTL-38999 Series IV receptacles
- Scoop-proof pins provide contact protection
- Uses insert patterns from MIL-DTL-38999 Series III

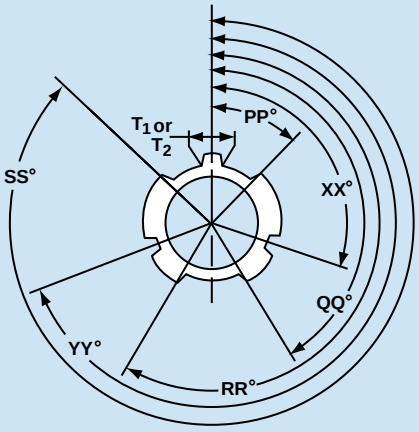
FBL

Polarity Dimensions

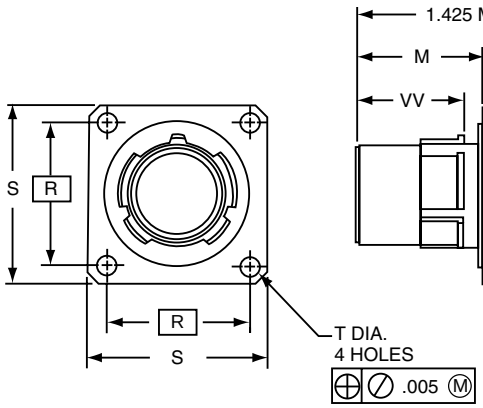
Key and Keyway Arrangement	XX°	YY°
N	110°	250°
A	100°	260°
B	90°	270°
C	80°	280°
D	70°	290°
K	120°	255°

FBL Master Key/Keyway Rotation

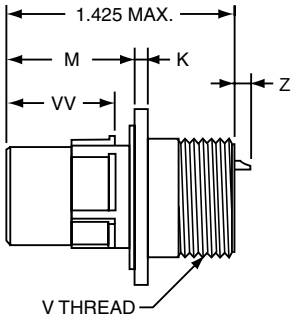
Shell Size	Receptacle Key Position				Main Key Receptacle/Basic	
	PP°	QQ°	RR°	SS°	Socket Contact T_1	Pin Contact T_2
11	44°28'	151°6'	208°54'	315°32'	.075	.109
13	44°25'	150°31'	209°29'	315°35'	.076	.112
15	44°33'	150°24'	209°36'	315°27'	.096	.132
17	44°36'	150°22'	209°38'	315°24'	.096	.134
19	44°33'	150°27'	209°33'	315°27'	.117	.154
21	44°34'	150°23'	209°37'	315°26'	.118	.155
23	44°34'	150°20'	209°40'	315°26'	.138	.176
25	44°42'	150°22'	209°48'	315°18'	.139	.177



RELATIVE POSSIBLE POSITION OF KEYWAYS (front face of receptacle shown)



BOX MOUNT
21-61X2XX-XXX



WALL MOUNT
21-61X0XX-XXX

Shell Size	K ±.010	M ±.020	R (TP)	S +.021 –.020	T Dia. +.004 –.003	V Thread (Plated) –.006	EE Dia. +.001 –.005	VV ±.003	Z Max. Size 16 Contact	Size 20 Contact	Size 16 or 16 & 20 Contacts	Size 22 Contact
11	.092	.791	.812	1.029	.128	M15X1-6g0.100R	.589	.672	.265	.165	.265	.134
13	.092	.791	.906	1.124	.128	M18X1-6g0.100R	.707	.672	.265	.165	.265	.134
15	.092	.791	.969	1.218	.128	M22X1-6g0.100R	.865	.672	.265	.165	.265	.134
17	.092	.791	1.062	1.313	.128	M25X1-6g0.100R	.983	.672	.265	.165	.265	.134
19	.092	.791	1.156	1.439	.128	M28X1-6g0.100R	1.101	.662	.265	.165	.265	.134
21	.124	.791	1.250	1.561	.128	M31X1-6g0.100R	1.219	.662	.265	.165	.265	.134
23	.124	.791	1.375	1.687	.147	M34X1-6g0.100R	1.337	.662	.265	.165	.265	.134
25	.124	.791	1.500	1.813	.147	M37X1-6g0.100R	1.455	.662	.265	.165	.265	.134

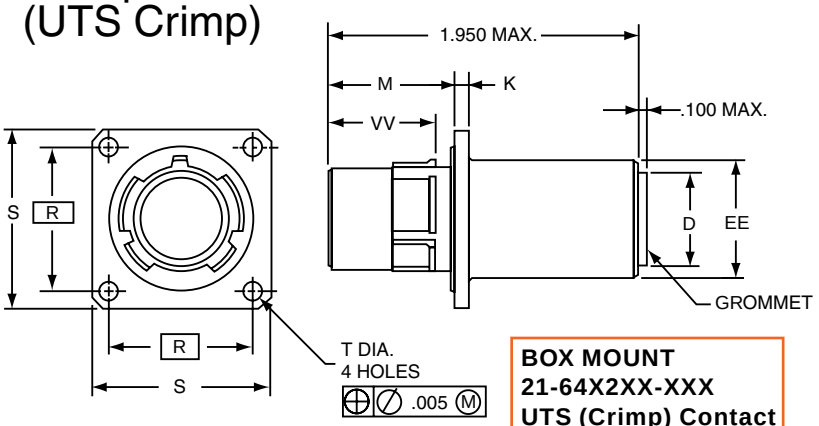
All dimensions for reference only.

FBL – MIL-DTL-38999

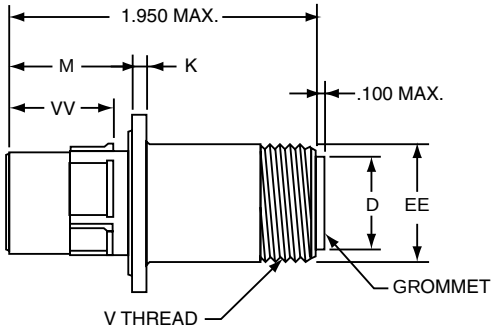
Box and Wall Mounting Receptacle (UTS Crimp)

PART # To complete, see how to order page 135.

Filter Connector Designator	Connect/ Filter Type	Shell Finish	Shell Style	Shell Size & Insert Arrg	Type of Contact/ Keyway Position
21	64	X	2	XX-XX	X



BOX MOUNT
21-64X2XX-XXX
UTS (Crimp) Contact
MIL-C-39029/57



WALL MOUNT
21-64X0XX-XXX
UTS (Crimp) Contact
MIL-C-39029/57

Shell Size	D Dia. ±.005	K ±.010	M ±.020	R (TP)	S +.021 –.020	T Dia. +.004 –.003	V Thread (Plated) –.006	EE Dia. +.001 –.005	VV ±.003
11	.427	.092	.791	.812	1.029	.128	M18X1-6g0.100R	.687	.672
13	.541	.092	.791	.906	1.124	.128	M22X1-6g0.100R	.811	.672
15	.666	.092	.791	.969	1.218	.128	M25X1-6g0.100R	.937	.672
17	.791	.092	,791	1.062	1.313	.128	M28X1-6g0.100R	1.061	.672
19	.897	.092	.791	1.156	1.439	.128	M31X1-6g0.100R	1.187	.662
21	1.022	.124	.791	1.250	1.561	.128	M34X1-6g0.100R	1.312	.662
23	1.147	.124	.791	1.375	1.687	.147	M37X1-6g0.100R	1.437	.662
25	1.272	.124	.791	1.500	1.813	.147	M41X1-6g0.100R	1.562	.662

Amphenol® Filter Adapters

Circuit Protection for Existing Applications

Amphenol Aerospace

Filter adapters present an effective and economical method of introducing EMI/EMP protection to an installed system. The adapter series of filter connectors from Amphenol are available to intermate with all the popular MIL-Specs.

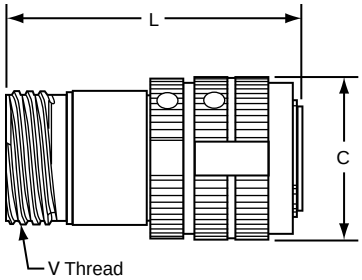
Features of the Amphenol Adapter include:

- Planar technology from the industry's leader in circulars
- Filter products
- MOV or diode capability for transient protection
- Wide range of tooled patterns
- Space qualified components

Installation of the adapter is quick and efficient, requiring no tools, fixtures or extended downtime. Simply unmate the existing cable harness from the receptacle; attach the coupling nut to the receptacle on the unit; then mate the cable harness to the receptacle side of the adapter. Several design alternatives are available that will help ensure that the adapter remains permanently attached to either the cable harness or the unit receptacle.

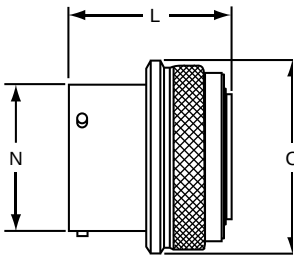
Adapters

FTV Adapter
21-900529-XXX



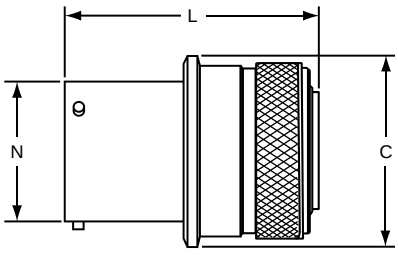
FTV Shell Size	C Dia. Ref.	V Thread 0.1P-0.3L-TS Class 2A	L Max.
9	.845	.6250	2.257
11	.950	.7500	2.257
13	1.121	.8750	2.257
15	1.249	1.0000	2.257
17	1.386	1.1875	2.257
19	1.493	1.2500	2.257
21	1.620	1.3750	2.257
23	1.737	1.5000	2.257
25	1.864	1.6250	2.257

FJT Adapter
21-900393-XXX



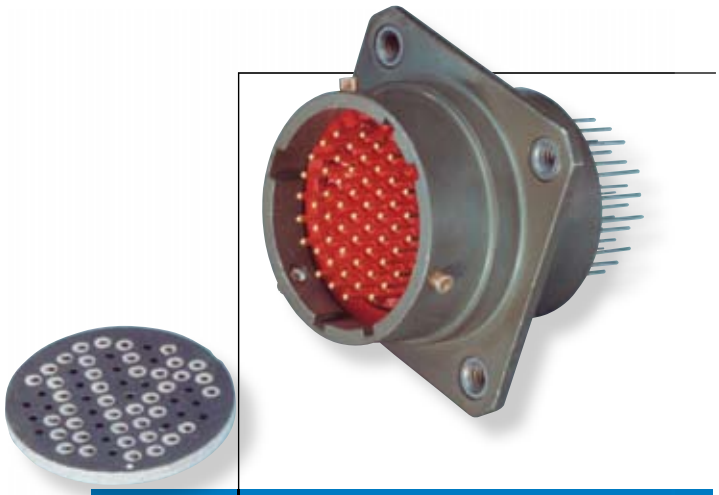
FJT Shell Size	C Dia. +.011 –.010	N Dia. +.001 –.005	L Max.
8	.847	.473	1.397
10	.969	.590	1.397
12	1.143	.750	1.397
14	1.255	.875	1.397
16	1.388	1.000	1.397
18	1.510	1.125	1.397
20	1.633	1.250	1.397
22	1.756	1.375	1.397
24	1.878	1.500	1.397

FLJT Adapter
21-900423-XXX



FLJT Shell Size	C Dia. +.011 –.010	N Dia. +.001 –.005	L Max.
9	.920	.572	2.038
11	1.045	.700	2.038
13	1.246	.850	2.038
15	1.371	.975	2.038
17	1.496	1.100	2.038
19	1.616	1.207	2.038
21	1.743	1.332	2.038
23	1.866	1.457	2.038
25	1.991	1.582	2.038

All dimensions for reference only.
Consult Amphenol, Sidney, NY for ordering information.



MOV

- **Filter connector size package**
- **Protection for 14, 31, 38 DC voltage circuits**
- **Radiation hardened**
- **No additional circuits required**
- **Low impedance**
- **Increased reliability**
- **Nanosecond response time**
- **Elimination of costly external suppression assemblies**

The Amphenol ® MOV Connector offers the versatility of a standard connector, with transient protection for sensitive circuits.Transients in electrical circuits caused by a sudden release of stored energy can originate within or outside of the circuit and may be repeatable or random.

Regardless of frequency or origin, transient caused failures generated by load switching, lightning, electrostatic discharge (ESD) and electromagnetic pulse (EMP) can destroy unprotected IC components.

Compatible with present filter connector assembly procedures, MOVs can be combined with existing filters. Internal housing of the MOV offers weight and space savings over other protection methods available today, and eliminates costly and bulky exterior suppression mechanisms in appropriate situations. MOVs are presently available in contact sizes 22, 20 and 16.

Transient protection can be provided in receptacle, plug or adapter configuration. These connectors are intermateable and intermountable with the following MIL-Specs:

- MIL-DTL-5015
- MIL-DTL-26482
- MIL-DTL-26500
- MIL-DTL-27599
- MIL-DTL-38999
- MIL-DTL-83723

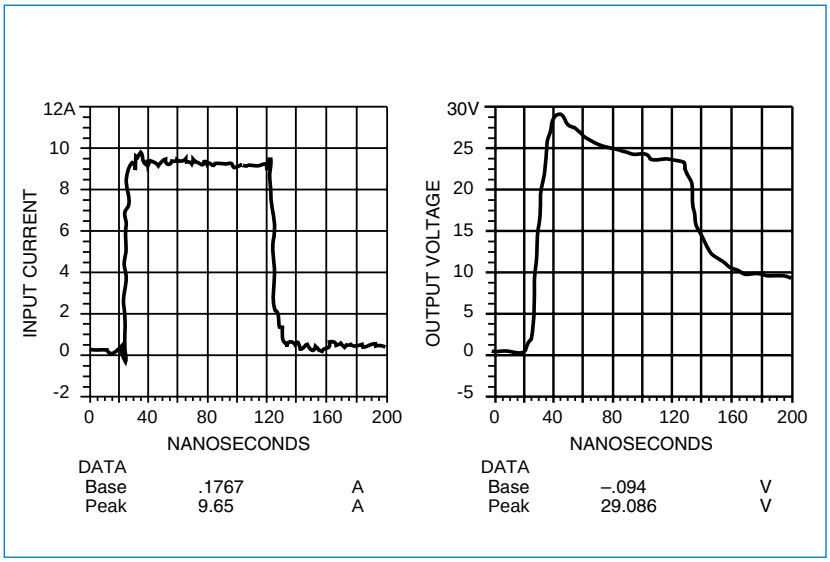
Amphenol Aerospace

M.O.V. PERFORMANCE CHARACTERISTICS

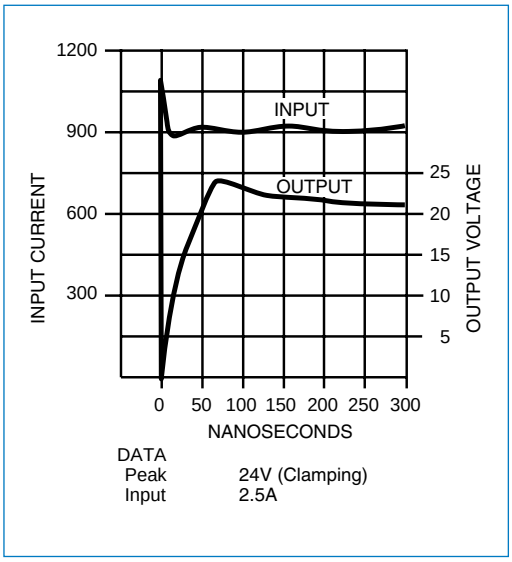
Designation	Contact Size	Maximum Rating (125°C)				Specifications (25°C)							Maximum Leakage Current at V_t (dc)		
		Continuous		Transient		Varistor Voltage at 1mA (DC)			Maximum Clamping Voltage V_c at Test Current Ip (8/20µS)		Capacitance at 1 MHz		I_L Max.	I_L Max.	V_t
		DC Voltage	RMS Voltage	Energy (10/1000µS)	Peak Current (8/20µS)						Picofarads		25°C	125°C	
		V_m Volts	V_m Volts	W_{tm} Joules	I_{tm} Amperes	Min. Volts	V_n (dc) Volts	Max. Volts	V_c Volts	I_p Amps	Min.	Max.	µA	µA	DC Volts
F14	22	**14**	10	1.5	250	18.5	**22**	25.5	42	10	800	2000	5	50	14
F31	22	**31**	25	1.5	250	35	**39**	48	85	5	400	1400	5	50	28
F38	22	**38**	30	1.5	250	42	**47**	58	100	5	200	1000	5	50	36
F45	22	**45**	35	1.5	250	53	**59**	68	100	5	200	850	5	50	45
F31	20	**31**	25	2	300	35	**39**	48	85	10	400	1400	5	50	28
F38	20	**38**	30	2	300	42	**47**	58	100	10	200	1000	5	50	36
F45	20	**45**	35	2	300	53	**59**	68	100	10	200	850	5	50	45
F38	16	**38**	30	3	350	42	**47**	58	100	20	200	1000	5	50	36
F45	16	**45**	35	3	350	53	**59**	68	100	20	200	850	5	50	45

NOTE: Continuous voltage ratings are based on 1000 hour reliability assurance tests at 125°C rated ambient terperature per MIL-STD-202 method 108. Contact Amphenol Sidney for options not listed in chart.

The following charts show the typical MOV response to an input pulse open circuit of 1000V and 10A peak square wave with a 5 nanosecond rise time in a 50 Ohm system.



The following chart shows response time and output voltage of a typical MOV with 1000V, 5 nanosecond, 2.5A input pulse mounted in an LJT 13–35P connector. Test was performed without load.



- **Clamping voltage as low as 11.9 volts**
- **Low capacitance – suitable for high frequency applications**
- **Unipolar or bipolar – using existing proven diode technology**
- **Protection for 5.8 to 60 VDC circuits**
- **No additional circuits required**
- **Low impedance – high frequency response**
- **Increased reliability**
- **Nanosecond response time**
- **Elimination of costly external suppression assemblies**
- **Screening to applicable requirements of MIL-S-19500TX/TXV available**
- **Keeps transients outside of the box**
- **Minimizes fast transient voltage overshoot**

The Amphenol® Diode Connector offers the versatility of a standard connector, with transient protection for sensitive circuits, such as TTL Lines.

Transients in electrical circuits caused by a sudden release of stored energy can originate within or outside of the circuit and may be repeatable or random.

Regardless of frequency or origin, transient caused failures generated by load switching, lightning, electrostatic discharge (ESD) and electromagnetic pulse (EMP) can destroy unprotected IC components.

Compatible with present filter connector assembly procedures, diodes can stand alone or can be combined in series with filters. Internal housing of the diode offers weight and space savings over other protection methods available today, and eliminates costly and bulky exterior suppression mechanisms in appropriate situations. Diodes are presently available in contact sizes 22 and 20.

Transient protection can be provided in receptacle, plug or adapter configurations. These connectors are intermateable and intermountable with the following MIL-Specs:

- MIL-DTL-5015
- MIL-DTL-26482
- MIL-DTL-26500
- MIL-DTL-27599
- MIL-DTL-38999
- MIL-DTL-83723

Diode

Diode Connector and Adapter

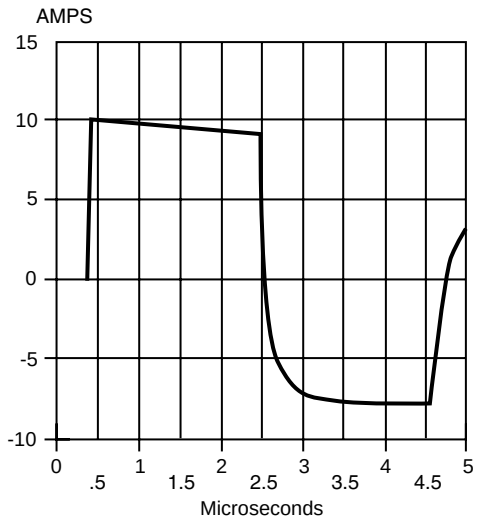
Close-up View of Diode Contact

STANDARD DIODE CONNECTOR CHARACTERISTICS AT 25°C

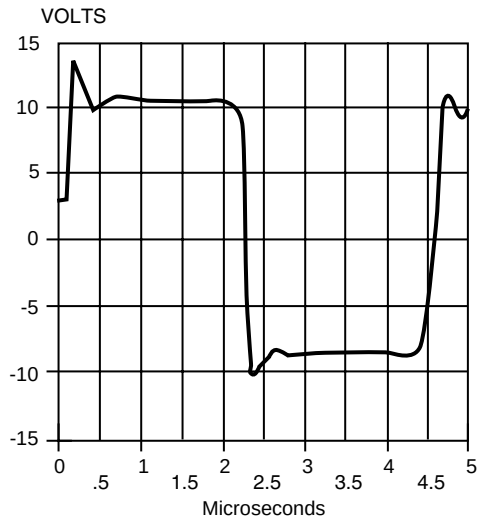
Stand-off Voltage † (VDC)	Max. Capacitance* (pf)	Breakdown Voltage at 1 mA (VDC)	Max. Clamping Voltage (8 x 20µ sec. pulse)	Leakage Current at Stand-off Voltage (µA)	Power Capability † 20µs Exp. Impulse (Peak) (Watts)
+ 5.8	1600	+ 6.45 to + 7.1**	+11.9	<100	1000
± 5.8	1000	± 6.45 to ± 7.1**	±11.9	<150	1000
± 7.0	750	± 7.3 to ± 9.3	±13.5	<10	1000
± 8.0	750	± 8.2 to ±10.6	±15.4	<5	1000
+ 8.0	1500	+ 8.5 to +10.6	+15.4	<5	1000
±10.0	500	±11.1 to ±12.3	±17.0	<1	1000
+10.0	1100	+11.1 to +12.3	+17.0	<1	1000
±15.0	500	±16.7 to ±18.5	±24.9	<1	1000
+15.0	750	+16.2 to +19.2	+24.9	<1	1000
–15.0	750	–16.2 to –19.2	–24.9	<1	1000
±17.0	500	±18.9 to ±23.0	±32.0	<1	1000
+17.1	600	+19.0 to +21.0	+27.7	<1	1000
±22.0	500	±25.7 to ±28.4	±38.0	<1	1000
±25.0	500	±27.8 to ±30.7	±40.5	<1	1000
+28.0	500	+30.5 to +35.7	+46.4	<1	1000
±33.3	500	+37.1 to +41.0	±53.9	<1	1000
+33.3	500	+37.1 to +41.0	+53.9	<1	1000
±40.0	500	±44.4 to ±49.1	±64.5	<1	1000
±45.0	500	±47.1 to ±58.1	±84.2	<1	1000
+57.8	500	+64.6 to +71.4	+95.2	<1	1000
±57.8	500	±64.6 to ±71.4	±95.2	<1	1000

Clamping Time -
Unipolar: Less than 1 nanosecond, 0V to breakdown
Bipolar: Less than 5 nanoseconds, 0V to breakdown
* Lower capacitance devices available; consult Amphenol, Sidney, NY.
** This device only measured at 10ma
† Higher power ratings also available

DIODE CONTACT PULSE TEST, ±5.8 DIODE



INPUT CURRENT ±10A
TO CONTACT



OUTPUT VOLTAGE +14V
TO -10V AFTER DIODE

The Amphenol ® Energy Shunting Assembly (ESA) is a simple, compact unit which provides lightning and electromagnetic pulse (EMP) protection of systems in which many signal lines enter sensitive electronic equipment. The efficient packaging of the ESA circumvents the concept of one protective device per line. It provides a surge arrestor which has the advantage of space saving and simplified assembly when compared to current protective devices which range from diodes to large spark gaps.

The current ESA design consists of two 53-pin contact, Mil-Standard, hermetic connectors assembled back to back, and encompassing a ground plate. A sealed chamber is formed within this thru-bulkhead unit, housing 53 in-line spark gaps. Introducing a controlled atmosphere enhances fast rise breakdown.

The ESA can be integrated with an EMI filter connector which can improve its performance. These two assemblies provide a method to help protect against lightning, EMP, EMI and TEMPEST effects.

ESA Energy Shunting Assembly

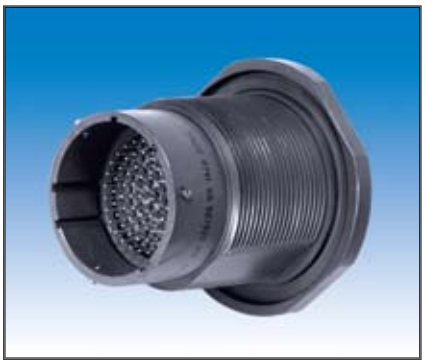
Performance Characteristics

1. DC breakdown voltage		230 Volts
2. Maximum rated surge discharge current (8 x 20 microsecond pulse)		5,000 Amperes per pin
3. Insulation resistance		10^{10} ohms minimum
4. Capacitance between each electrode and the ground plane		Less than 2 pf
5. Rate-of-rise breakdown voltage	Maximum Breakdown Voltage (Volts)	Rate of Rise (Volts/microsecond)
	600 800 1,500 2,000	10 1,000 10,000 1000,000
6. Surge breakdown unbalance (at 100 Volts/microseconds)		180 Volts
7. Surge life (500 Ampere – 10 x 1,000 microsecond)		400 Surges
8. Hold-over voltage		100 Volts
9. Arcing voltage		40 Volts
10. Glow to arc transition point		1 Ampere
11. Temperature range		–40°F to 150°F (233°K to 339°K)

Amphenol Aerospace

The Hermetic Filter Connector

While only approximately 1/2 inch longer than standard series connectors, the hermetic filter connector provides all the benefits of a hermetic connector, as well as EMI protection for sensitive circuits. The filter assembly is protected by a fused glass insert within a unique steel housing. This design accounts for the connector's capability intolerating high level static pressure, while maintaining a low level leakage rate. Applications include pressurized test equipment, environmental and toxic gas chambers, and moisture sealing on industrial equipment and missiles.



Hermetic Filter Connector

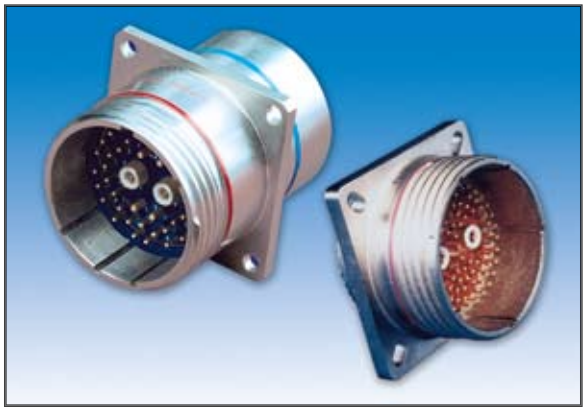
Filtered Plug

This connector is designed for applications where EMI protection is essential, but access to the receptacle is denied. The filtered plug presents an alternative for the electrical engineer. The filter plug is designed with the same components as a standard filter receptacle, but offers the option of being mounted on the cable harness. This device is a cost effective method of achieving EMI protection when length restrictions prohibit inclusion of an adapter to the system.

Filtered Plug

Filter Connectors can also incorporate high frequency coax, twinax, triax, quadrax and differential twinax contacts.

Amphenol MIL-DTL-38999 Series III connectors are the most commonly used connectors for incorporation of shielded contacts along with traditional crimp contacts. High performance shielded coaxial, twinax and triax contacts are available to fit various RG and special cables. They eliminate discontinuities or impedance variations due to movement of parts under axial load. Size 8 quadrax and differential twinax contacts provide high speed data transfers.



Filter Connectors with Coax Shielded Contacts

Filter Connectors with Flex Termination

Flex circuits are available for MIL-DTL-38999, MIL-DTL-5015 and MIL-DTL-26482 filter connectors. They are offered in flat or sculptured styles and provide flexibility in assembling to printed circuit boards. Through Amphenol's Advanced Circuit Technology division, these strong and rigid, yet highly flexible circuits eliminate the need to purchase and attach individual pins or connectors. Thus they promote system automation, reduce space requirements and lower installation costs. Sculptured® Flexible Circuits have built-interminations which eliminate the failure associated with crimped or soldered-on contacts, and geometrically fit the tight space requirements within a unit.

Flex Circuitry for Attachment to Printed Circuit Boards

MIL-DTL-38999 with Quadrax Contacts

For more information on these specials, consult Amphenol Aerospace and see our website at www.amphenol-aerospace.com.

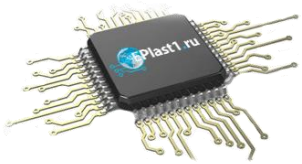
Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits,General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

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