

SERIES JFD

FERRITE CIRCULATORS AND ISOLATORS



FEATURES:

- High isolation
- Low insertion loss
- Compact, lightweight

APPLICATIONS:

- Assemblies and subsystems
- Amplifiers and oscillators
- Duplexer in transceivers

DESCRIPTION

Millitech series JFD junction ferrite devices (circulators and isolators) cover the frequency range from 18 to 100 GHz. The circulator is a three-port, ferrite junction device which can be configured as an isolator by terminating one of the ports. The standard units are produced with an in-line tee configuration, which is suitable for compact circuit layout and efficient use of available space. The high isolation, low insertion loss and low VSWR (high return loss) typical of these ferrite devices make them ideal for use with frequency sources, amplifiers, and receivers.

The circulator is commonly used as a duplexer for combining, transmitting and receiving functions with adequate mutual isolation, and for injection-locked amplifiers. Port orientations for series JFD are straight in line or right angle. Triple junction units are also available.

Though narrower in bandwidth when compared to broadband (full waveguide band) Faraday-rotation isolators (series FBI) and wide band isolators (series WBI), the series JFD isolators are much smaller in size and lower in insertion loss. Millitech also offers series WBI wideband isolators that are similar in size and insertion loss.

ELECTRICAL SPECIFICATIONS

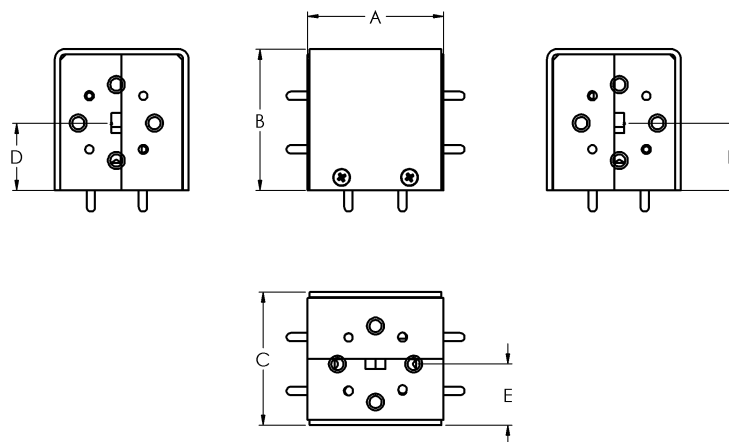
Model Number	JFD-42	JFD-28	JFD-22	JFD-19	JFD-15	JFD-12	JFD-10
Frequency Band and Range (GHz)	K 18-26.5	Ka 26.5-40	Q 33-50	U 40-60	V 50-75	E 60-90	W 75-100
Single Junction Units (Partial band/Fullband)							
Bandwidth (GHz) ^{†3} (max)	2.0/8.5 ^{†1}	2.0/13.5 ^{†1}	2.0	2.0	2.0	2.0	2.0
Isolation (dB) (min)	20/20	20/18	20	20	20	20	20
Insertion Loss (dB) (max)	0.3/0.4	0.5/0.6	0.5	0.6	0.7	0.8	0.8
VSWR (max)	1.2:1/1.3	1.2:1/1.4:1	1.2:1	1.3:1	1.3:1	1.3:1	1.3:1
Power Rating (Watts) (max) ^{†2}	10	10	8	7	6	5	5
Triple-Junction Circulators							
Isolation (dB) (min, ports 2 to 1 & 3 to 2)	---	35	35	35	35	35	35
Insertion Loss (dB) (max, ports 1 to 2 & 2 to 3)	---	0.8	1.0	1.2	1.4	1.6	1.8
VSWR (max)	---	1.2:1	1.2:1	1.2:1	1.3:1	1.3:1	1.3:1
Bandwidth (GHz) ^{†3} (max)	---	2.0	2.0	2.0	2.0	2.0	2.0 ^{*4}
Power Rating (Watts) (max) ^{†2}	---	10	8	7	6	5	5
Triple-Junction Isolators							
Isolation (dB) (min)	---	50	50	50	50	50	50
Insertion Loss (dB) (max)	---	1.2	1.3	1.6	1.9	2.2	2.5
VSWR (max)	---	1.2:1	1.2:1	1.2:1	1.3:1	1.3:1	1.3:1
Bandwidth (GHz) ^{†3} (max)	---	2.0	2.0	2.0	2.0	2.0	2.0 ^{*4}
Power Rating (Watts) (max) ^{†2}	---	10	8	7	6	5	5

*1 – Full waveguide bandwidth units available in K- and Ka- bands (WR-42 and WR-28 only). For broader bandwidth in other bands, please see series WBI or consult Millitech.

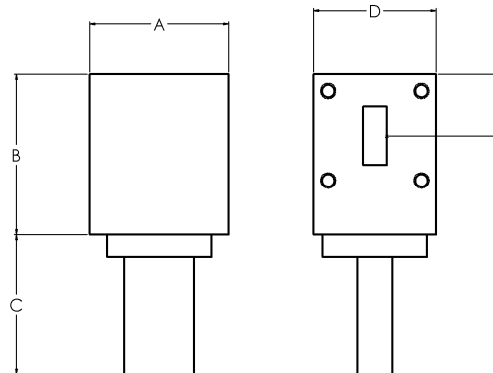
*2 – Load VSWR 3:1 or better.

*3 – Maximum bandwidth offered for the standard products. Please specify bandwidth requirement.

*4 – 1 GHz bandwidth for frequencies above 96 GHz.

OUTLINE DRAWINGS
Series JFD


Series JFD Fullband Isolator



MECHANICAL SPECIFICATIONS

Model Number	JFD-42	JFD-28	JFD-22	JFD-19	JFD-15	JFD-12	JFD-10
Finish	Aluminum with clear chromate			Brass with gold plating			
Single Junction Units							
A (in/mm)	1.20/30.48	1.19/30.23	1.19/30.23	1.19/30.23	1.00/25.40	1.00/25.40	1.00/25.40
B (in/mm) ^{*1}	1.44/36.58	1.39/35.31	1.39/35.31	1.39/35.31	1.04/26.42	1.04/26.42	1.04/26.42
C (in/mm)	0.97/24.64	1.28/32.51	1.28/32.51	1.28/32.51	0.99/25.15	0.99/25.15	0.99/25.15
D (in/mm) ^{*1}	0.94/23.88	0.78/19.81	0.78/19.81	0.78/19.81	0.50/12.70	0.50/12.70	0.50/12.70
E (in/mm)	0.48/12.19	0.62/15.75	0.62/15.75	0.62/15.75	0.45/11.43	0.46/11.68	0.47/11.94
Flange MIL.F-3922	/54-001*	/54-003*	/67B-006	/67B-007	/67B-008	/67B-009	/67B-010
Triple Junction Units ^{*2}							
A (in/mm)	---	1.50/38.10	1.50/38.10	1.50/38.10	1.10/27.94	1.10/27.94	1.10/27.94
B (in/mm)	---	1.25/31.75	1.25/31.75	1.25/31.75	1.14/28.96	1.14/28.96	1.14/28.96
C (in/mm)	---	1.21/30.73	1.21/30.73	1.21/30.73	0.98/24.89	0.98/24.89	0.98/24.89
D (in/mm)	---	0.64/16.26	0.64/16.26	0.64/16.26	0.58/14.73	0.58/14.73	0.58/14.73
E (in/mm)	---	0.60/15.24	0.60/15.24	0.60/15.24	0.49/12.45	0.49/12.45	0.49/12.45
Flange MIL.F-3922	/54-001*	/54-003*	/67B-006	/67B-007	/67B-008	/67B-009	/67B-010

* With # 4-40 threaded holes

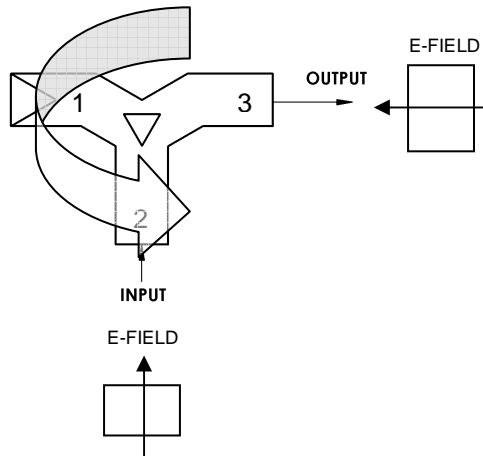
*1 – Circulators only. Add .04 in (1.016mm) for isolators

*2 – Circulators only. Add 0.5 in (12.7 mm) load to 'B' dimension for isolators.

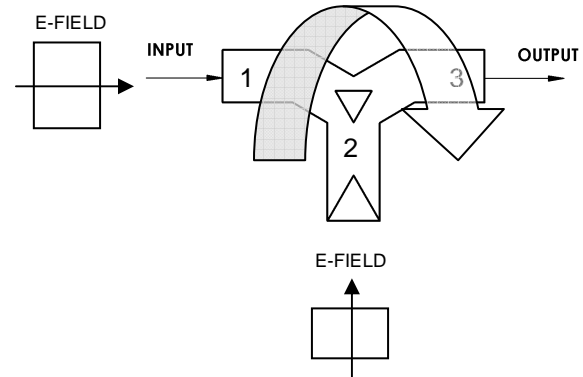
Port Configuration for Isolators/Circulators

(Not available on fullband units)

Port Orientation Option R



Port Orientation Option S


HOW TO ORDER
Specify Model Number*
JFD-XX-ABCDE
XX = Waveguide Band

WR – number (triple junction units not available in WR-42)

A = Flange Type

R – round (WR-28 through WR-10 partial band units only)

S – square (WR-42 single junction and WR-28 only)

B = Unit Type

I – isolators (triple junction units not available in WR-42)

C – circulator (triple junction units not available in WR-42)

C = Configuration

1 – single junction

3 – triple junction (not available in WR-42)

D = Port Orientation (isolators only)

S – straight in-line ports (standard)

R – at right angle to one another (single junction only), please specify port orientation. Not available on fullband units.

N – not applicable to circulators

E = Bandwidth

P – partial band (WR-42 through WR-10)

F – fullband (WR-42 and WR-28 only)

N – nonstandard (please specify)

***Please specify center frequency and required bandwidth when ordering.**