

FEATURES

- 700 - 2500 MHz Center Frequencies
- 2 Pole - 5 Pole Filters
- 4 Pole - 10 Pole Duplexers
- Low Loss Designs Available
- Extremely Stable Temperature Characteristics
- High Stability Against Shock and Vibration
- 50Ω Input/Output Impedance
- SMD and PIN Type Packaging
- Miniature Compact Design



APPLICATIONS

- Cellular Phones
- Cordless Phones
- Personal Communication Networks
- Spread Spectrum Systems
- Global Positioning Systems
- Satellite Receivers
- TCAS
- RF Data Systems
- RF Security Systems

DESCRIPTION

Toko dielectric resonator filters and duplexers are high "Q" filters constructed of a high dielectric constant ceramic material. The filters are formed by coupling the ceramic sections (poles). Toko designs are available in two through five poles. The selectivity of the filter will increase with additional poles, but at the expense of slightly higher insertion loss.

These filters are fixed tuned devices. The frequency of operation is determined by precision machined dimensions and the Toko manufacturing process provides excellent repeatability. Since it is a non-complex design with no moving parts these filters provide excellent mechanical stability and reliability. Their low loss and compact design make these filters ideally suited as the bandpass filters and antenna duplexers for high frequency RF communications equipment.

Toko filters are available in frequency ranges from 700 MHz to 2500 MHz. They provide an excellent alternative to cavity filters, SAW filters and helical filters. Toko has developed standard parts for all common communication systems.

STANDARD TOKO TYPES

TYPE	DESCRIPTION
4DFA	2 Pole Surface Mount Type
4DFB	3 Pole Surface Mount Type
6DFA	2 Pole Pin Type
6DFB	3 Pole Pin Type
6DFC	4 Pole Pin Type
6DFSC	4 Pole Pin Type
6DFSD	5 Pole Pin Type

TYPE	DESCRIPTION
6DPD	4 Pole Duplexer: 2 Pole RCV + 2 Pole Xmit
6DPF	6 Pole Duplexer: 3 Pole RCV + 3 Pole Xmit
6DPH	7 Pole Duplexer: 4 Pole RCV + 3 Pole Xmit
6DPK	9 Pole Duplexer: 5 Pole RCV + 4 Pole Xmit
6DPP	10 Pole Duplexer: 6 Pole RCV + 4 Pole Xmit

Dielectric Filters

Type 4DFA: SMD 2 Pole Designs

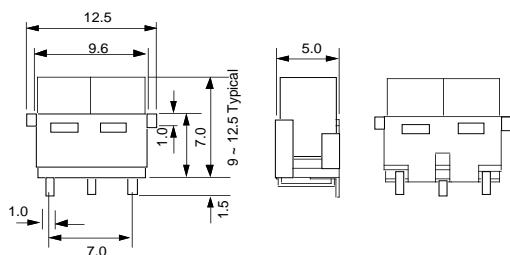
Part Number	Center Freq. (MHz)	Bandwidth (fo ± MHz)	I.L. (dB max.)	Ripple (dB max.)	VSWR in BW	Selectivity dB min. @ MHz	Application
4DFA-836E-10	836.5	± 12.5	2.0	1.0	2.0	18(fo ± 77.5)	Cellular-AMPS/TDMA/CDMA
4DFA-881E-10	881.5	± 12.5	2.0	1.0	2.0	18(fo ± 77.5)	Cellular-AMPS/TDMA/CDMA
4DFA-964E-10	964.0	± 12.5	2.0	1.0	2.0	18(fo ± 77.5)	Cellular-AMPS/TDMA/CDMA
4DFA-902E-10	902.5	± 12.5	2.5	1.0	2.0	18(fo ± 77.5)	Cellular-NMT/GSM
4DFA-947E-10	947.5	± 12.5	2.5	1.0	2.0	18(fo ± 77.5)	Cellular-NMT/GSM
4DFA-866A-10	866.0	± 2.0	3.0	1.0	2.0	30(fo ± 105)	CT2
4DFA-886A-10	886.0	± 1.0	3.0	1.0	2.0	22(fo ± 45)	Cordless Phone
4DFA-931A-10	931.0	± 1.0	3.0	1.0	2.0	22(fo ± 45)	Cordless Phone, Pager
4DFA-906A-10	906.5	± 1.0	6.0	0.5	2.0	10,25 (fo - 21, +19)	Cordless Phone
4DFA-926A-10	926.5	± 1.0	6.0	0.5	2.0	25,10 (fo - 19, +40)	Cordless Phone
4DFA-904A-10	904.0	± 1.0	3.8	0.5	2.0	21,30 (fo +21.5, +44)	Cordless Phone
4DFA-926A-11	926.5	± 1.0	3.8	0.5	2.0	21,30 (fo - 21.5, -44)	Cordless Phone
4DFA-915E-10	915.0	± 13.0	2.2	1.0	2.0	18(fo ± 77.5)	RF Data, Cordless,ISM
4DFA-1227B-10	1227.0	± 5.0	2.0	0.8	2.0	7,30(fo ± 35,140)	GPS
4DFA-1227B-11	1227.0	± 5.0	1.2: 0.7 typ	0.5	2.0	15,20(fo + 140,-140)	GPS
4DFA-1575B-10	1575.4	± 5.0	2.0: 1.4 typ	0.8	2.0	7,30(fo ± 35,140)	GPS
4DFA-1575B-12	1575.4	± 5.0	1.2: 0.7 typ	0.5	2.0	17,20(fo+140,-140)	GPS
4DFA-1575B-14	1575.4	± 5.0	2.5: 1.8 typ	0.8	2.0	17(fo ± 50)	GPS
4DFA-1890D-10	1890.0	± 10.0	2.0	1.0	2.0	20(fo ± 89)	DECT
4DFA-1903C-10	1903.0	± 8.0	2.7	1.0	2.0	15,27(fo ± 50,100)	PHP
4DFA-2442P-10	2442.0	± 40.0	2.5	1.0	2.0	15(fo ± 250)	RF Data, SST
4DFA-2450T-10	2450.0	± 50.0	2.0	1.0	2.0	22(fo - 280)	RF Data, ISM
4DFA-2500A-10	2500.0	± 2.0	3.0	1.0	2.0	18,25(fo ± 60,90)	RACS

Type 4DFB: SMD 3 Pole Designs

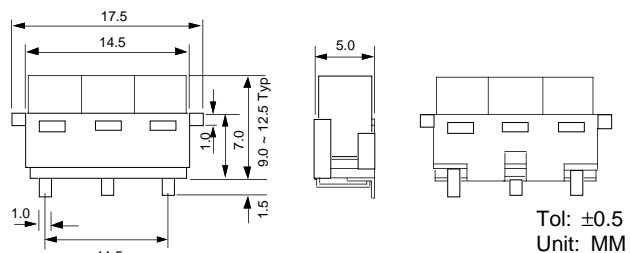
4DFB-815D-10	815.5	±10.0	2.5	0.8	2.0	15,35(fo ± 35,80)	SMR, Ardis
4DFB-860D-10	860.5	±10.0	2.5	0.8	2.0	15,35(fo ± 35,80)	SMR, Ardis
4DFB-836E-10	836.5	± 12.5	2.5	1.0	2.0	12(fo ± 32.5)	Cellular-AMPS/TDMA/CDMA
4DFB-881E-10	881.5	± 12.5	2.5	1.0	2.0	12(fo ± 32.5)	Cellular-AMPS/TDMA/CDMA
4DFB-886A-10	886.0	± 1.0	4.5	0.5	2.0	41(fo ± 45)	Cordless Phone
4DFB-931A-10	931.0	± 1.0	4.5	0.5	2.0	41(fo ± 45)	Cordless Phone, Pager
4DFB-899A-10	899.0	± 3.0	4.5	1.0	2.0	54,62(fo-100,+100)	Mobitex
4DFB-938A-10	938.0	± 3.0	4.5	1.0	2.0	16,48(fo-16,-74)	Mobitex
4DFB-914A-10	914.5	± 0.5	4.5	0.5	2.0	40(fo ± 45)	Cordless Phone
4DFB-959A-10	959.5	± 0.5	4.5	0.5	2.0	40(fo ± 45)	Cordless Phone
4DFB-915E-10	915.0	± 13.0	2.7	1.0	2.0	12(fo ± 32.5)	RF Data, Cordless,SST
4DFB-1030C-10	1030.0	± 7.5	3.2	1.0	1.6	20,50(fo ± 35,140)	TCAS
4DFB-1227D-10	1227.0	± 10.0	3.2	1.0	2.0	12,40(fo ± 35,140)	GPS
4DFB-1575D-10	1575.0	± 10.0	3.2	1.0	2.0	12,40(fo ± 35,140)	GPS
4DFB-1542G-10	1542.0	± 17.0	2.0	1.0	2.0	17(fo ± 84.5)	MCSS/INMARSAT
4DFB-1643G-10	1643.5	± 17.0	1.6	0.5	1.5	18,28(fo -67, +108)	MCSS/INMARSAT
4DFB-1747N-10	1747.5	± 35.0	2.0	1.2	2.0	12,40(fo ± 100,350)	PCN
4DFB-1842N-10	1842.5	± 35.0	2.0	1.2	2.0	24,38(fo ± 157,350)	PCN
4DFB-1890D-10	1890.0	±10.0	2.5	1.0	2.0	25,40(fo±89,210)	DECT
4DFB-2442P-10	2442.0	± 40.0	2.5	1.2	2.0	5,32(fo ± 80,250)	RF Data, ISM
4DFB-2450T-10	2450.0	± 50.0	2.2	1.2	2.0	28(fo-280)	RF Data, ISM

OUTLINE DIMENSIONS

4DFA Type



4DFB Type



Type 6DFA: 2 Pole Designs

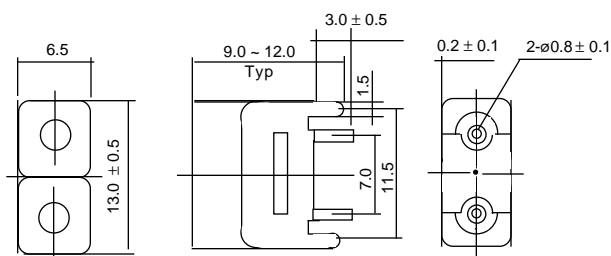
Part Number	Center Freq. (MHz)	Bandwidth (fo ± MHz)	Insertion Loss (dB max.)	Ripple in BW (dB max.)	VSWR in BW	Selectivity dB min. @ MHz	Application
6DFA-836E-10	836.5	± 12.5	1.8	0.8	2.0	20(fo ± 77.5)	Cellular—AMPS
6DFA-881E-10	881.5	± 12.5	1.8	0.8	2.0	20(fo ± 77.5)	Cellular—AMPS
6DFA-888G-10	888.5	± 16.5	2.5	1.2	2.2	20(fo ± 77.5)	Cellular—TACS
6DFA-933G-10	933.5	± 16.5	2.5	1.2	2.2	20(fo ± 77.5)	Cellular—TACS
6DFA-902E-10	902.5	± 12.5	1.8	0.8	2.0	20(fo ± 77.5)	Cellular—NMT/GSM
6DFA-947E-10	947.5	± 12.5	1.8	0.8	2.0	20(fo ± 77.5)	Cellular—NMT/GSM
6DFA-915E-10	915.0	± 13.0	1.8	0.8	2.0	20(fo ± 77.5)	Spread Spectrum
6DFA-866A-11	866.0	± 2.0	2.2	1.0	2.0	30(fo ± 75)	CT2
6DFA-886A-10	886.0	± 1.0	2.2	0.5	1.8	24(fo ± 45)	Cordless Phone
6DFA-931A-10	931.0	± 1.0	2.2	0.5	1.8	24(fo ± 45)	Cordless Phone
6DFA-914A-10	914.5	± 0.5	2.2	0.5	1.8	24(fo ± 45)	Cordless Phone
6DFA-959A-10	959.5	± 0.5	2.2	0.5	1.8	24(fo ± 45)	Cordless Phone
6DFA-1227B-10	1227.0	± 5.0	1.5	0.8	2.0	12,25(fo ± 50,140)	GPS
6DFA-1575B-10	1575.4	± 5.0	1.5	0.8	2.0	12,25(fo ± 50,140)	GPS
6DFA-1575B-11	1575.4	± 5.0	2.5	0.8	2.0	18(fo±50)	GPS

Type 6DFB: 3 Pole Designs

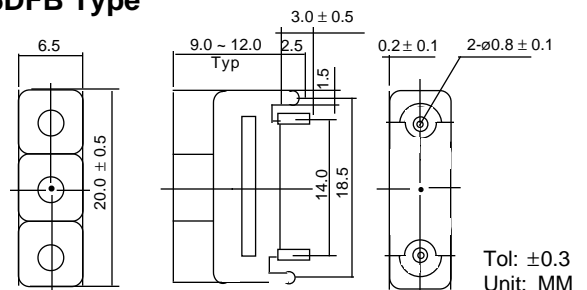
Part Number	Center Freq. (MHz)	Bandwidth (fo ± MHz)	Insertion Loss (dB max.)	Ripple in BW (dBmax.)	VSWR in BW	Selectivity dB min. @ MHz	Application
6DFB-836E-10	836.5	± 12.5	2.0	0.8	2.0	12(fo ± 32.5)	Cellular—AMPS
6DFB-881E-10	881.5	± 12.5	2.0	0.8	2.0	12(fo ± 32.5)	Cellular—AMPS
6DFB-888G-10	888.5	± 16.5	2.5	0.8	2.0	6(fo ± 28.5)	Cellular—TACS
6DFB-933G-10	933.5	± 16.5	2.5	0.8	2.0	6(fo ± 28.5)	Cellular—TACS
6DFB-902E-10	902.5	± 12.5	2.0	0.8	2.0	12(fo ± 32.5)	Cellular—NMT/GSM
6DFB-947E-10	947.5	± 12.5	2.0	0.8	2.0	12(fo ± 32.5)	Cellular—NMT/GSM
6DFB-915E-10	915.0	± 13.0	2.0	0.8	2.0	12(fo ± 32.5)	Spread Spectrum
6DFB-866A-10	866.0	± 2.0	4.5	1.0	2.0	20(fo ± 16)	CT2
6DFB-886A-10	886.0	± 1.0	4.0	0.5	2.0	45,50(fo -45, +45)	Cordless Phone
6DFB-908A-10	908.0	± 2.0	3.0	0.5	2.0	30 (fo ± 30)	Cordless Phone
6DFB-925A-10	925.0	± 1.0	3.5	0.5	2.0	20,35(fo ±20, ±34)	Cordless Phone
6DFB-931A-10	931.0	± 1.0	4.0	0.5	2.0	45,50(fo -45, +45)	Cordless Phone
6DFB-914A-10	914.5	± 0.5	4.0	0.5	2.0	45,50(fo -45, +45)	Cordless Phone
6DFB-959A-10	959.5	± 0.5	4.0	0.5	2.0	45,50(fo -45, +45)	Cordless Phone
6DFB-1575B-10	1575.4	± 5.0	3.0	1.0	2.0	18(fo ± 50)	GPS
6DFB-1544F-10	1544.5	± 14.5	3.0	1.0	2.0	30,20(fo +82, -64.5)	INMARSAT
6DFB-1643G-11	1643.5	± 17.0	3.0	1.0	2.0	23,37(fo -67, +108)	INMARSAT

OUTLINE DIMENSIONS

6DFA Type



6DFB Type



Tol: ±0.3
Unit: MM

Dielectric Filters

Type 6DFC: 4 Pole Designs

Part Number	Center Freq. (MHz)	Bandwidth (fo ± MHz)	Insertion Loss (dB max.)	Ripple in BW (dB max.)	VSWR in BW	Selectivity dB min. @ MHz	Application
6DFC-836E-10	836.5	± 12.5	2.7	1.0	2.0	23(fo ± 32.5)	Cellular—AMPS
6DFC-881E-10	881.5	± 12.5	2.7	1.0	2.0	23(fo ± 32.5)	Cellular—AMPS
6DFC-902E-10	902.5	± 12.5	2.7	1.0	2.0	23(fo ± 32.5)	Cellular—NMT/GSM
6DFC-947E-10	947.5	± 12.5	2.7	1.0	2.0	23(fo ± 32.5)	Cellular—NMT/GSM
6DFC-1030C-10	1030.0	± 7.5	3.0	1.0	2.0	40,60(fo ± 40,120)	TCAS
6DFC-1090C-10	1090.0	± 7.5	3.0	1.0	2.0	40,60(fo ± 40,120)	TCAS
6DFC-1553I-10	1553.25	± 23.25	3.0	1.0	2.0	25(fo ± 73.25)	Satellite
6DFC-1747O-10	1747.5	± 37.5	3.0	1.0	2.2	10,20(fo ± 57.5,80)	PCN
6DFC-1842O-11	1842.5	± 37.5	3.0	1.0	2.2	10,20(fo ± 57.5,80)	PCN

Type 6DFSC: 4 Pole Designs

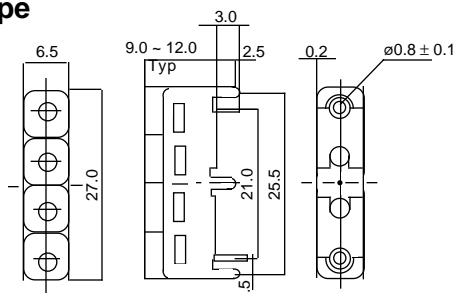
Part Number	Center Freq. (MHz)	Bandwidth (fo ± MHz)	Insertion Loss (dB max.)	Ripple in BW (dB max.)	VSWR in BW	Selectivity dB min. @ MHz	Application
6DFSC-836E-12T	836.5	± 12.5	2.5	0.9	1.7	43(869-894)	Cellular—AMPS

Type 6DFSD: 5 Pole Designs

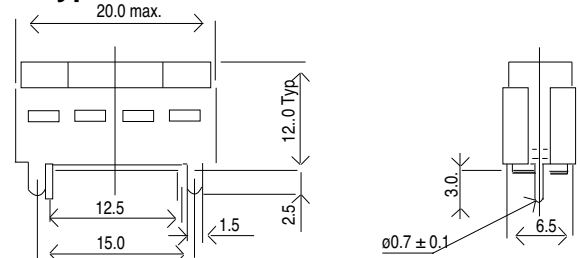
Part Number	Center Freq. (MHz)	Bandwidth (fo ± MHz)	Insertion Loss (dB max.)	Ripple in BW (dB max.)	VSWR in BW	Selectivity dB min. @ MHz	Application
6DFSD-881E-10	881.5	± 12.5	3.5	1.2	2.0	24(fo ± 32.5)	Cellular—AMPS
6DFSD-881E-12T	881.5	± 12.5	3.5	1.2	1.7	52(824-849)	Cellular—AMPS
6DFSD-902E-10	902.5	± 12.5	3.5	1.2	1.7	25(fo ± 32.5)	Cellular—NMT/GSM
6DFSD-947E-11	947.5	± 12.5	3.5	1.2	1.7	25(fo ± 32.5)	Cellular—NMT/GSM
6DFSD-947E-10T	947.5	± 12.5	3.5	1.5	1.7	53(890-915)	Cellular—NMT/GSM
6DFSD-1030C-10	1030.0	± 7.5	3.0	0.7	2.0	60(fo +60)	TCAS
6DFSD-1090C-10	1090.0	± 7.5	3.5	1.0	2.0	60(fo -60)	TCAS

OUTLINE DIMENSIONS

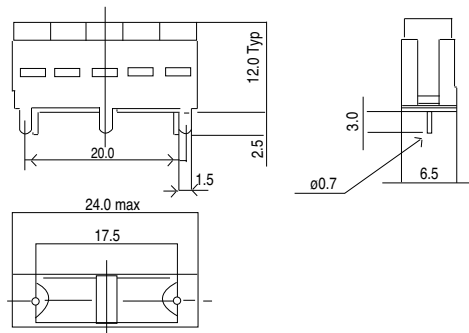
6DFC Type



6DFSC Type



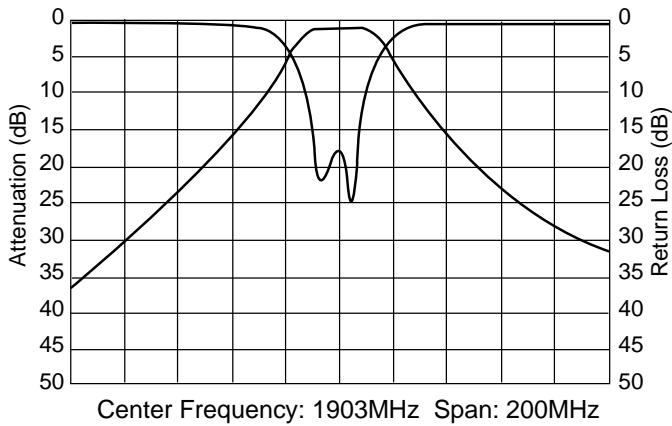
6DFSD Type



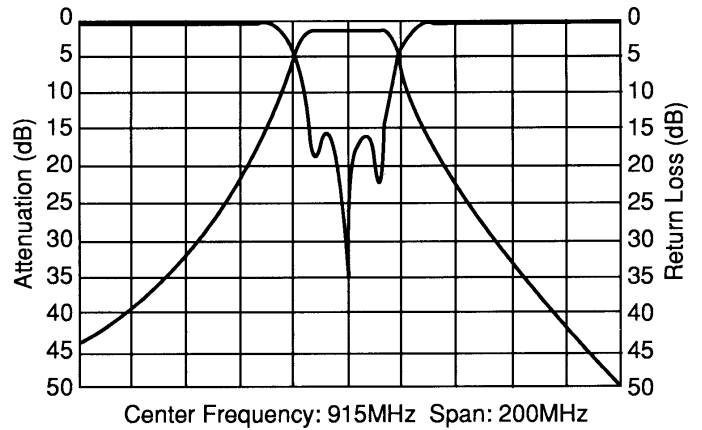
Tol: ±0.5
Unit: MM

TYPICAL RESPONSE CURVES

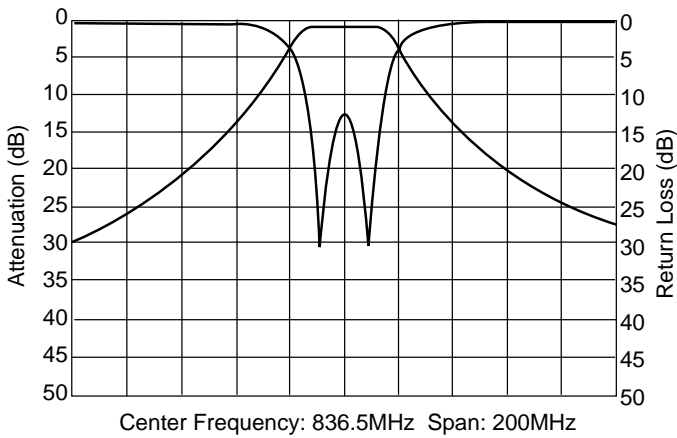
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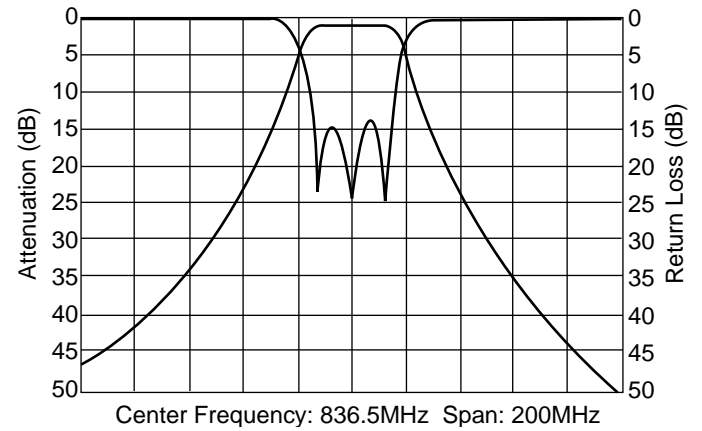
4DFB-915E-10



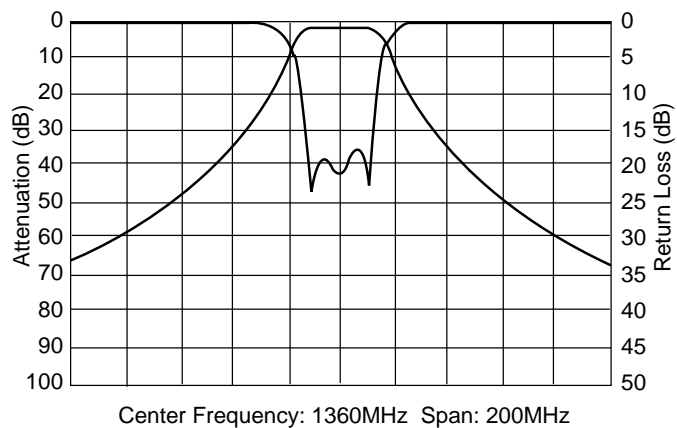
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6DFB-836E-10



6DFC1360D-10



6DFSD-902E-10

