



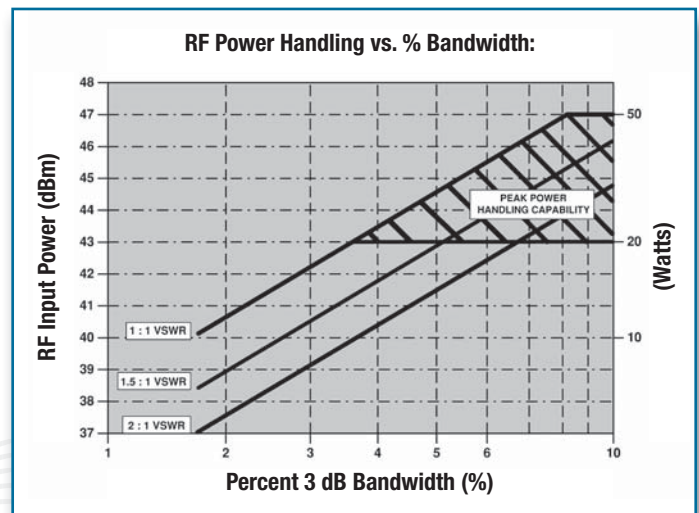
The **POWER-POLE®** Series of tunable filters provides improved RF performance with increased power handling capability and the lowest insertion loss for a given bandwidth. The product line includes several standard designs in various frequencies to support almost any application.

POWER-POLE® SERIES

Specifications:

Frequency Coverage (Multiple Bands):	30 to 400 MHz
Input/Output Impedance:	50Ω
In-band Input/Output VSWR:	1.5:1 typical
In-band RF Power Handling:	refer to chart below
Outband RF Power Handling:	Up to 20 Watt
In-band Second Order Intercept Point:	+100 dBm (input)
In-band Third Order Intercept Point:	+50 dBm (input)
Center Frequency Drift:	-80 PPM/°C
Tuning Control:	8 bit parallel
Tuning Speed:	15 μS*
DC Power Consumption (Static):	+5 VDC @ 400 mA to 1.5 A
Shape Factor (30 dB / 3 dB):	6 typical
Operating Temperature Range:	-40°C to +65°C
Size:	2.6 × 3.0 × 4.0 (in.) / 66.7 × 76.2 × 101.6 (mm.)
Weight:	18.7 oz. / 530.1 g. / .5 kg.
RF Connection:	SMA jack

* 15 μS typical for UHF band filters. Consult factory for details on other bands.



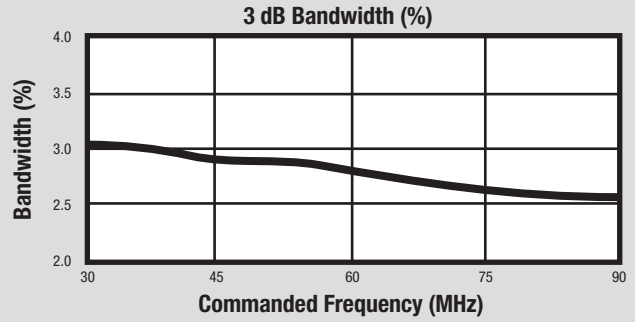
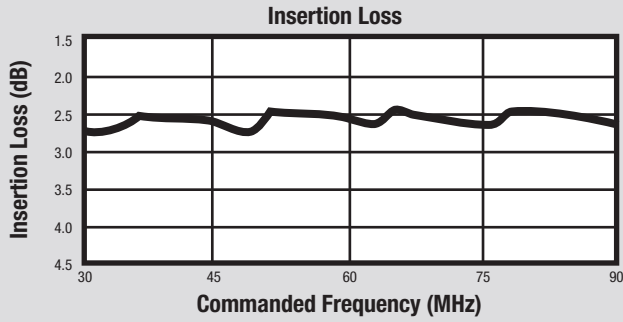
Important Application Notes:

- While changing RF center frequencies, RF input power must be reduced to < +20 dBm. These filters will not support “Hot RF Switching Conditions”. Please contact the factory in regards to custom features.
- Maximum strobe rate is 2 kHz; Actual rate is dependent upon frequency band.

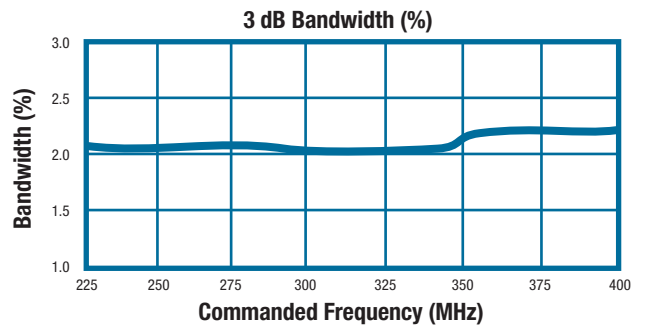
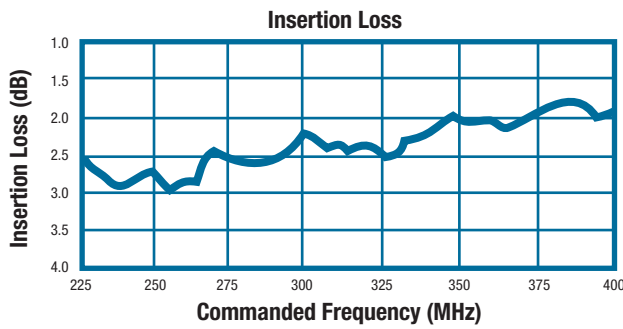
Tunable Bandpass Filters

The following plots illustrate approximate insertion loss and bandwidth trends across a given frequency band, and the differences between various bands:

POWER-30-90-3

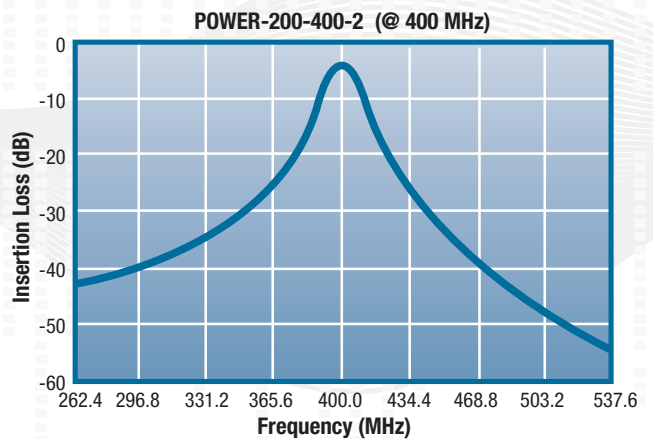
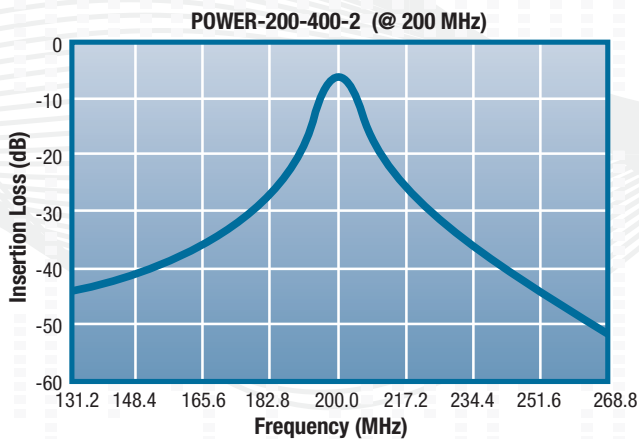
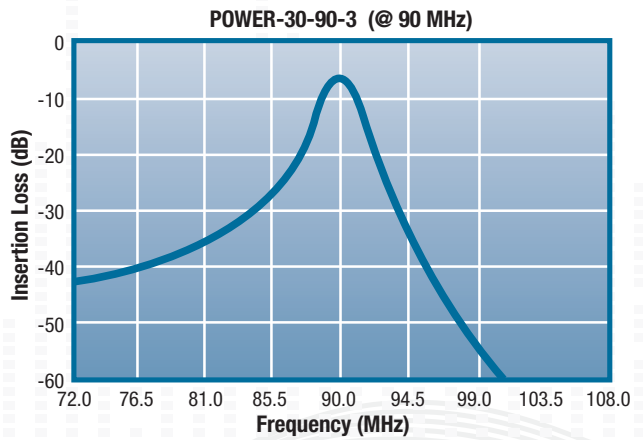
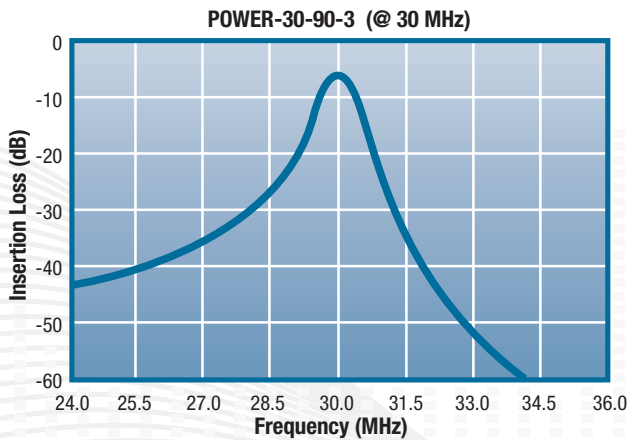


POWER-225-400-4



Performance:

The following plot illustrates approximate performance (not representative of all frequency ranges):



POWER-POLE® SERIES Selection Guide:

	Suffix	% Bandwidth (3 dB)	Insertion Loss	Strobe Rate (max.)	SHAPE FACTOR (30 dB)		
					Overall	Low Side	High Side
30 to 90 MHz	-1	8.4/9.5	0.8/1.2	900 Hz			
	-2	4.3/4.8	1.6/2.4		6.9/7.6	9.3/10.4	4.5/4.7
	-3	2.8/3.2	2.9/4.3		6.0/6.9	7.0/8.9	5.0/5.8
	-4	2.2/2.5	3.4/4.6				
	-5	1.8/1.9	4.4/5.8				
90 to 200 MHz	-1	8.6/9.2	0.8/1.2	2 KHz	6.0/6.5	7.5/8.3	4.6/4.7
	-2	4.2/4.8	1.2/2.3				
	-3	2.7/3.2	2.2/3.5				
	-4	2.2/2.5	3.3/5.0				
	-5	1.8/2.0	4.0/5.5				
200 to 400 MHz	-1			2 KHz			
	-2	4.2/4.8	1.3/2.2		5.6/6.1	6.4/7.0	4.8/5.3
	-3	2.7/3.1	1.7/3.5				
	-4	2.2/2.5	2.4/3.8				
	-5						
225 to 400 MHz	-1	8.2/9.1	0.6/0.9	2 KHz	5.8/6.0	7.0/7.3	4.6/4.7
	-2	4.2/4.8	1.0/2.2				
	-3	2.7/3.1	1.7/3.2				
	-4	2.1/2.5	2.3/3.8		5.7/6.3	6.1/7.0	5.3/5.7
	-5	1.8/2.0	2.5/4.2		5.9/6.2	6.4/6.2	5.4/5.8

This Selection Guide illustrates approximate performance for the **POWER-POLE®** Series: Table values are shown as average/maximum.

Pinout & Ratings:

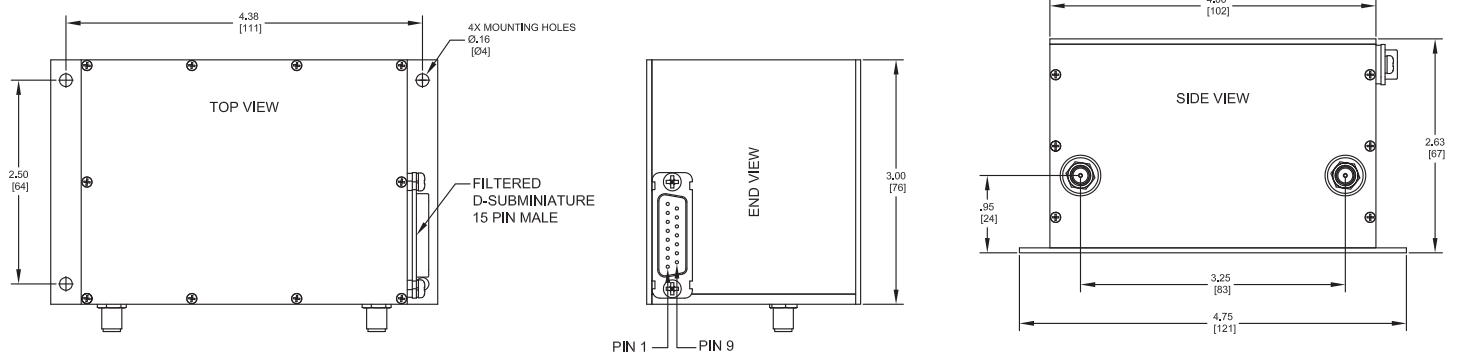
PARALLEL INTERFACE			
PIN #	Reference Designator	Description	Maximum Ratings
1	A2	Parallel Bit 2	-0.5 to (V _{CC} + 0.5) V
2	A3	Parallel Bit 3	
3	A4	Parallel Bit 4	
4	A5	Parallel Bit 5	
5	A6	Parallel Bit 6	
6	A7	Parallel Bit 7	
7, 9, 11, 12	GND	Digital/RF Ground	
8	V _{CC}	+5 V Power Supply Input ±10%	-0.5 to +6 V
10	N/C	No Connect (1)	—
13	STB	Strobe	-0.5 to (V _{CC} + 0.5) V
14	A0	Parallel Bit 0	
15	A1	Parallel Bit 1	

Note(s): 1 Leave pins disconnected for unit to function properly.

SERIAL INTERFACE			
PIN #	Reference Designator	Description	Maximum Ratings
1	SDO	Serial Data Out	0 to +6 VDC
2-6, 10	N/C	No Connect (1)	—
7, 9, 11, 12	GND	Digital/RF Ground	—
8	V _{CC}	+5 V Power Supply Input ±10%	-0.5 to +6 V
13	STB	Strobe	-0.5 to (V _{CC} + 0.5) V
14	SCLK	Serial Clock	
15	SDI	Serial Data In	

Note(s): 1 Leave pins disconnected for unit to function properly.

Mechanical Outline:



Tunable Bandpass Filters

POWER-POLE® Filters Product Number Guide:

Series	Frequency (MHz)	% Bandwidth 3 dBm	Connector Type	Options
POWER	30-90	1	SMA (Female)	B C
	90-200	2		
	200-400	3		
	225-400	4		
	225-400	5		

Available Options: B. Serial Interface

C. Custom Frequency Bands (Specify START and STOP frequencies in MHz.)

Note(s): Options may be limited to particular frequency bands and/or configurations. Consult factory for your application.

Example: Product # POWER-90-200-3-SMA

Interface & Control Options:

Frequency Tuning Address

There are 250 equally spaced tuning increments across each standard filter band, resulting in 251 tunewords from 00000000 to 11111010. The last 5 tunewords are reserved for housekeeping functions:

Tune Code	Result
00000000 thru 11111010	Lowest tuned frequency (251 total tune codes) Highest tuned frequency
11111011 thru 11111110	RF In/Out Isolation Filter Blanked
11111111	Power saver mode; all PIN diodes turned off

Calculating a Tune Address

The binary tuning word is determined by the following relationship:

$$\text{tuneword} = \left(\frac{F_{\text{desired}} - F_{\text{low}}}{F_{\text{high}} - F_{\text{low}}} \right) \times 250$$

Example: If you wish to tune to 322 MHz using a 225 to 400 MHz filter, the tuneword is:

$$\left(\frac{322 - 225}{400 - 225} \right) \times 250 = 138.57 \text{ (10001011 binary)}$$

Note: Round off to the nearest decimal integer.

Interface Options:

The filter comes standard with an 8 bit parallel interface, although a serial interface can be specified as an option.

DC Control Interface Characteristics:

Symbol	Parameter	Condition	Minimum	Maximum	Units
V _{IL}	Input Low Voltage	Control signals except A0-A7	0.0	0.2 V _{cc}	V
V _{IH}	Input High Voltage	Control signals except A0-A7	0.7 V _{cc}	V _{cc}	V
V _{IL1}	Input Low Voltage	A0-A7	0.0	0.15 V _{cc}	V
V _{IH1}	Input High Voltage	A0-A7	0.7 V _{cc}	V _{cc}	V

Switching Characteristics: (V_{cc} = +5 VDC, ± 10%; T = -40° to +85°C)

Symbol	Parameter	Minimum	Maximum	Units
t _S	Setup Time, A0-A7 to $\overline{\text{STB}}$	600		nS
t _H	Hold Time, A0-A7 from $\overline{\text{STB}}$	2.5		μS
t _{SH}	$\overline{\text{STB}}$ High Time	25		μS
t _W	$\overline{\text{STB}}$ Pulse Width	600		nS
t _{DW}	Strobe Dwell Time (from $\overline{\text{STB}}$ falling edge to next $\overline{\text{STB}}$ falling edge)	500		μS
t _{ACC}	Access Time from $\overline{\text{STB}}$ to f ₀		15*	μS

* 15 μs typical for UHF band filters. Consult factory for details on other bands.

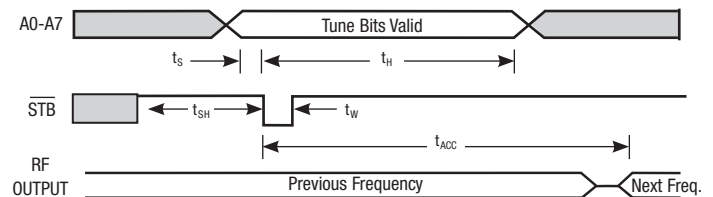


Figure 10

Strobe

The filter is tuned within 15 μs to the frequency designated by the tuneword existing on the eight control bit lines when the STB line is brought low. Once strobed, data existing on the tune control lines is ignored until strobed again. Maximum strobe rate is 2 kHz; Actual rate is dependent upon frequency band.

Temperature Effects

Over the -40°C to +65°C temperature range, filters will exhibit a negative temperature drift of less than 80 PPM/°C, or a total of less than ± 0.5% of the center frequency.