

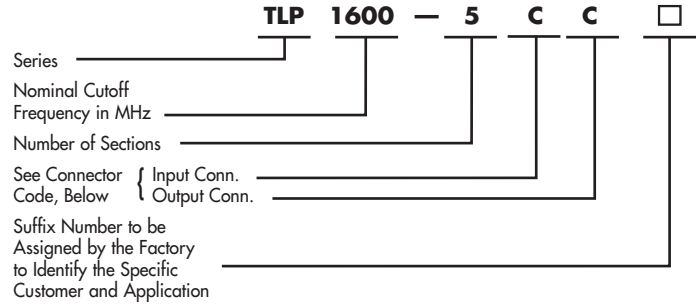
# TUBULAR LOWPASS FILTERS

■ 30 TO 2,750 MHz ■ 2 TO 12 SECTIONS

## DESCRIPTION

All Lowpass Series are typically of 0.1 db Chebyshev Design and are available with 2 thru 12 sections and practically any available RF connector (see pages 16, 17). Special designs are available on request.

The specifications for the example shown here are as follows: 1/2" diameter Lowpass Filter, VSWR cutoff frequency = 1600 MHz, 5 sections, TNC female conn.



**SERIES TLP**  
100 to 2,750 MHz  
1/2" diam.  
low cost  
small size

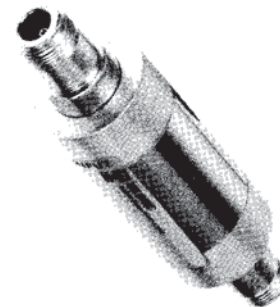
**SERIES TLA**  
50 to 1,500 MHz  
3/4" diam.  
intermediate loss  
size power

**SERIES TLC**  
30 to 1,000 MHz  
1 1/4" diam.  
low loss  
highest power

- \* A — BNC Jack
- \* B — BNC Plug
- C — TNC Jack
- D — TNC Plug
- E — N Jack
- F — N Plug
- S — SMA Jack
- T — SMA Plug
- X — Special

\* BNC Connectors not standard above 1000 MHz

**CONNECTOR CODE**



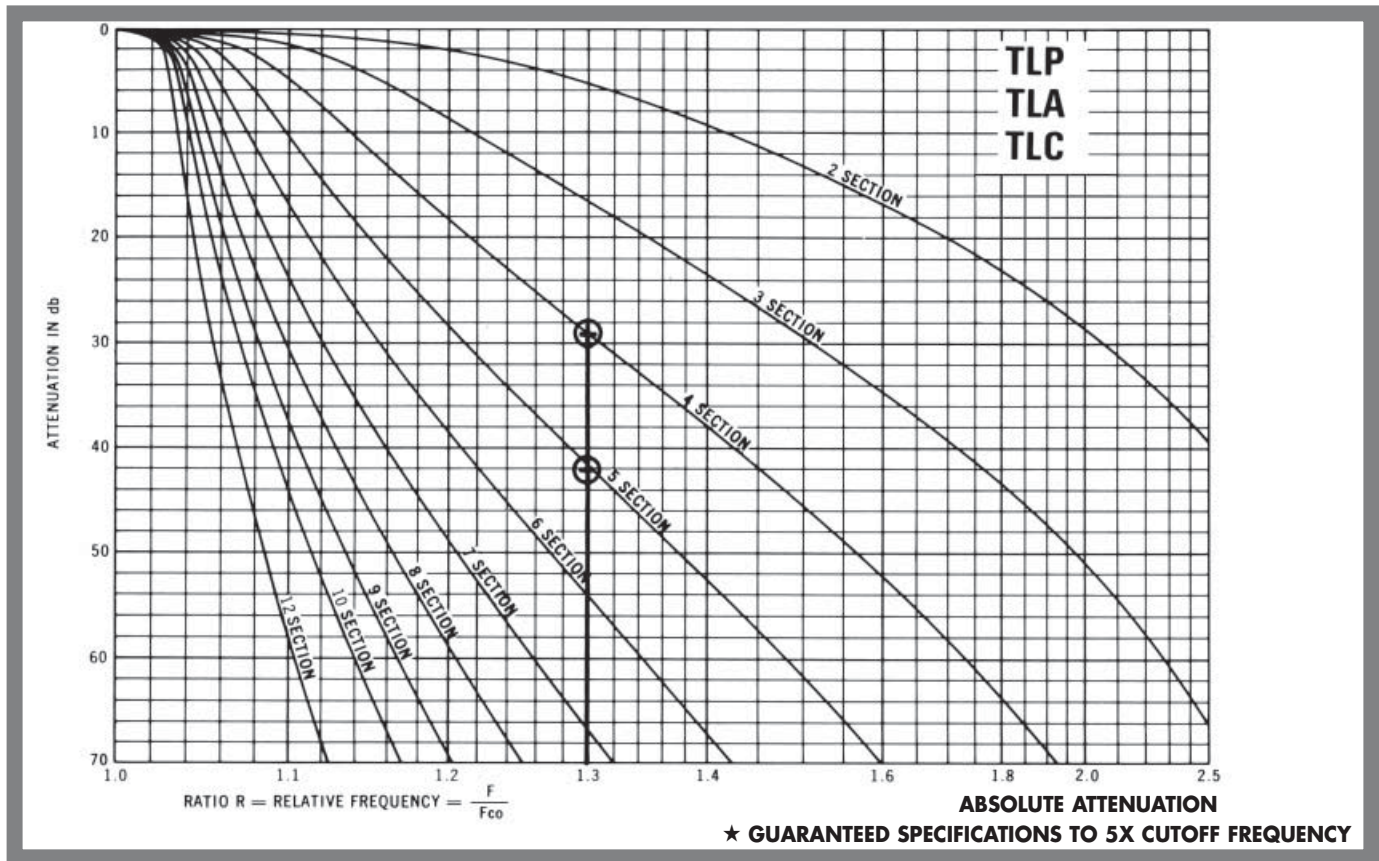
SPECIFICATIONS		TLP	TLA	TLC	
<b>ELECTRICAL SPECIFICATIONS</b>					
Cutoff Frequency Range	Normal Spec. Limit	100 MHz to 2750 MHz ( See Note 1 )	50 MHz to 1500 MHz ( See Note 1 )	30 MHz to 1000 MHz ( See Note 1 )	
	*Areas of Interest	As Low as 60 MHz	As Low as 40 MHz	As Low as 10 MHz	
Maximum Insertion Loss In Passband	Normal Spec. Limit	See Graph	See Graph	See Graph	
	*Areas of Interest	Submit Requirements	Submit Requirements	Submit Requirements	
Nominal Impedance (in and out)	Normal Spec. Limit	50 ohms	50 ohms	50 ohms	
	*Areas of Interest	50 to 100 ohms	50 to 100 ohms	50 to 100 ohms	
Maximum VSWR In Passband	Normal Spec. Limit	1.5:1	1.5:1	1.5:1	
	*Areas of Interest	As Low As 1.2:1	As Low As 1.2:1	As Low As 1.2:1	
Stop Band Attenuation	Normal Spec. Limit	See Page 11	See Page 11	See Page 11	
	*Areas of Interest	Submit Requirements	Submit Requirements	Submit Requirements	
Number of Sections	Normal Spec. Limit	2 to 8	2 to 8	3 to 6	
	*Areas of Interest	2 to 12	2 to 12	2 to 12	
Average Input Power (watts max. to 10,000 ft.)	Normal Spec. Limit	5	8	15	
	*Areas of Interest	Loss Constant 12 Loss Constant	Loss Constant 20 Loss Constant	Loss Constant 40 Loss Constant	
Input Peak Power (watts max. to 10,000 ft.)	Normal Spec. Limit	500	500	1000	
	*Areas of Interest	10,000	10,000	10,000	
<b>ENVIRONMENTAL SPECIFICATIONS</b>					
OPERATING	Shock	Normal Spec. Limit	30G	15G	15G
		*Areas of Interest	1000G	75G	75G
	Vibration	Normal Spec. Limit	10G	5G	5G
		*Areas of Interest	50G	30G	30G
	Humidity	Normal Spec. Limit	Up to 90%	Up to 90%	Up to 90%
		*Areas of Interest	To 100% with Condensation	To 100% with Condensation	To 100% with Condensation
Altitude	Normal Spec. Limit	Unlimited	Unlimited	Unlimited	
Temp. Range	Normal Spec. Limit	-20°C to +50°C	-20°C to +50°C	-20°C to +50°C	
	*Areas of Interest	-54°C to +125°C	-54°C to +125°C	-54°C to +125°C	
STORAGE	Shock	Normal Spec. Limit	30G	15G	15G
		*Areas of Interest	1000G	75G	75G
	Vibration	Normal Spec. Limit	10G	5G	5G
		*Areas of Interest	100G	30G	30G
	Temp. Range	Normal Spec. Limit	-54°C to +71°C	-54°C to +71°C	-54°C to +71°C
		*Areas of Interest	-62°C to +150°C	-62°C to +150°C	-62°C to +150°C
<b>MECHANICAL SPECIFICATIONS</b>					
Diameter		1/2 inch	3/4 inch	1 1/4 inch	
Approx. Weight		3/4 oz. per inch	3/4 oz. per inch	1 1/4 oz. per inch	

**NOTE 1:** See page 6 for standard tolerance on cutoff frequency. The normal specification passband is from 0.4 x cutoff frequency to cutoff. A wider specification passband can be supplied. Telonic will be happy to advise on all such special requirements.

\*Submit specific requirements

# TUBULAR LOWPASS FILTERS

# ATTENUATION CURVES



The curves above define the normal specification limits on attenuation for Telonic lowpass filters. The minimum attenuation level in db is shown as a function of the relative frequency.\*

Calculate relative frequency as ratio of frequency to be attenuated to frequency to be passed:  $R = \frac{'B' \text{ MHz}}{'A' \text{ MHz}}$

**For example:**

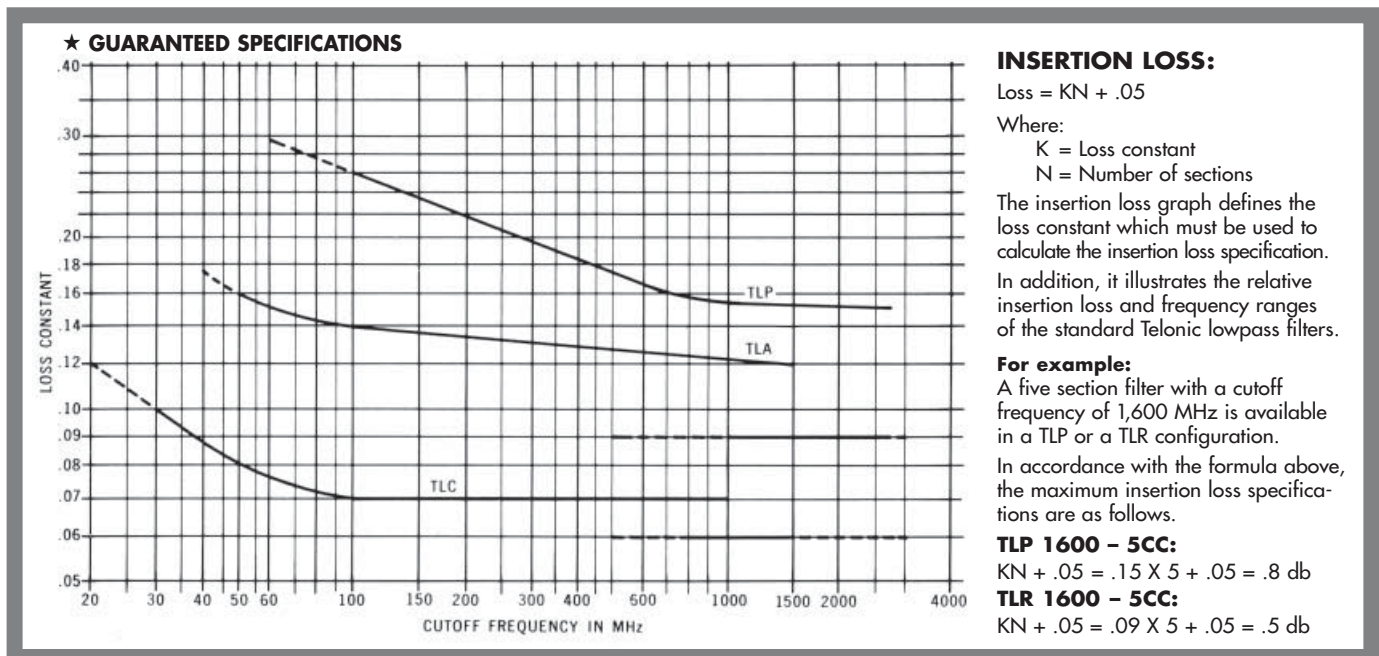
Requirements—

1. Min. cutoff frequency = 1,600 MHz.
2. 35 db min. attenuation at 2,080 MHz.

1,600 MHz is within the standard frequency ranges of two different lowpass types — TLP and TLR. 2,080 MHz is at a relative frequency of 1.3 with respect to 1600 MHz.  $\frac{2080}{1600} = 1.3$

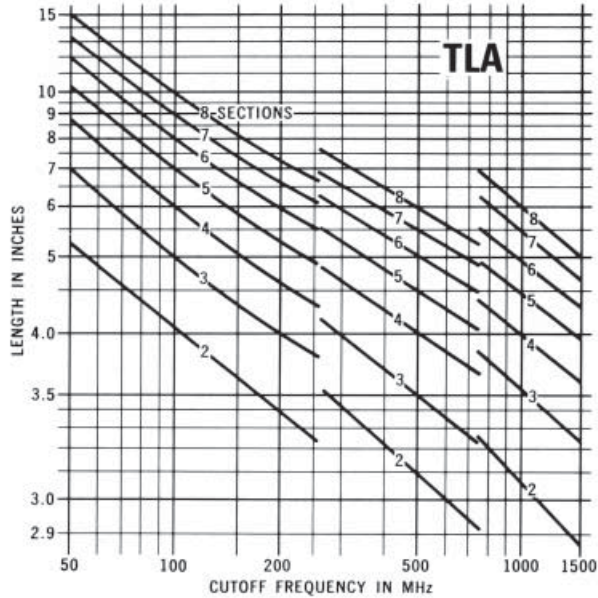
Reading from the 4-sec. curve (note ref. line) at a relative frequency of 1.3, we find that a four section TLP has a normal specification limit of 29 db and a five section TLP has a normal specification limit of 42 db. Therefore a TLP of five or more sections would be required to meet the 35 db attenuation specification.

# INSERTION LOSS CURVES



# LENGTH CURVES

# TUBULAR LOWPASS FILTERS



### LENGTH OF LOWPASS FILTERS:

The approximate length of any Telonic lowpass filter can be read directly from these graphs.

Select the graph which represents the correct series of filter. On the frequency scale, locate the proper value of cut-off frequency. Read straight up to the length-curve line which corresponds to the proper number of sections. Then, from the point where the cutoff frequency and section line cross, read horizontally to get the proper filter length, in inches.

### For example:

The approximate length of TLP 1600-5CC is 4.0 inches. Note example reading shown flagged on the TLP length curve.

All of the length information shown here is approximate. Exact length specifications must be quoted by the factory. In most cases a filter can be constructed shorter than the length shown here, but this may cause an increase in insertion loss. If a shorter unit or one with a specific length is needed, please submit all of your requirements — both electrical and mechanical. This will enable Telonic to quote the optimum design for your application.

