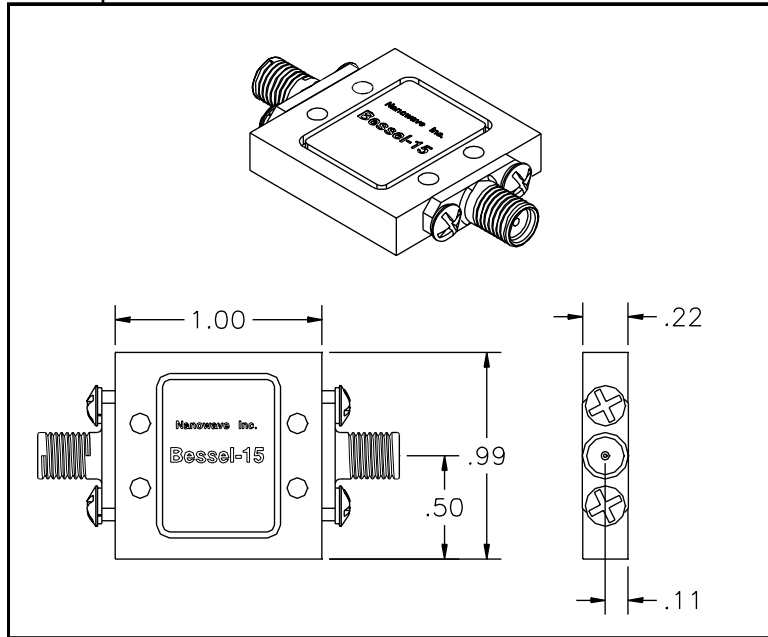




# STANDARD AND CUSTOMS BESSELS FILTERS

## Optical Communication Systems



### PRODUCT DESCRIPTION

- These high performance thin film filter products offer the optical subsystem engineers a variety of options to achieve enhanced system performance.
- They can be used in both transmit and receive chains to improve pulse shape and reduce jitter components due to high frequency deterministic and random noise. Because these products absorb rather than reflect energy, matching attenuators normally needed with reactive filters are unnecessary.
- Combined with low group delay or linear phase up to three times the 3dB lowpass filter cutoff frequency, these filters can make significant improvements to “eye diagrams” and BER performance.
- Delivery 6 weeks ARO for standard products. Custom designs also available.

### FEATURES

- Cutoff frequency from 1 to 40 GHz
- Linear phase and low reflection from dc to 3 X F3dB
- User can specify absorptive Bessel filters on Alumina or Aluminum Nitride substrate material
- User can specify bare substrate, connectorized hermetic package, SMT, or other custom package options
- User can specify 3, 5 or 7 section designs

### PACKAGING

- Standard SMA Package for Applications up to OC192
- Custom Coax and Other Package Options for Applications through OC768

### APPLICATIONS

- Pulse Shape Optimization in Optical Transmitter and Receiver Applications
- Improved System BER Performance
- System Noise Bandwidth Limiting Avionics Surveillance

**Nanowave Technologies Inc.**

**425 Horner Avenue, Etobicoke, Ontario M8W 4W3 Canada**

Tel: 416.252.5602 | Fax: 416.252.7077 | [www.nanowavetech.com](http://www.nanowavetech.com)

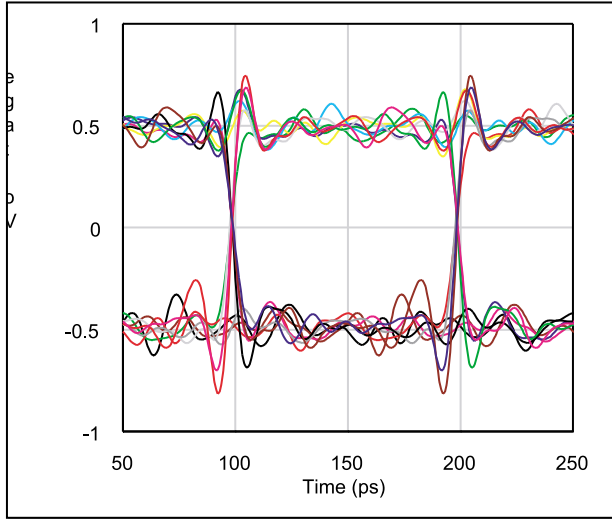


# PERFORMANCE SHEET

The example below shows the performance result of a noisy pseudorandom bit pattern being passed through 5 section Bessel filters with:

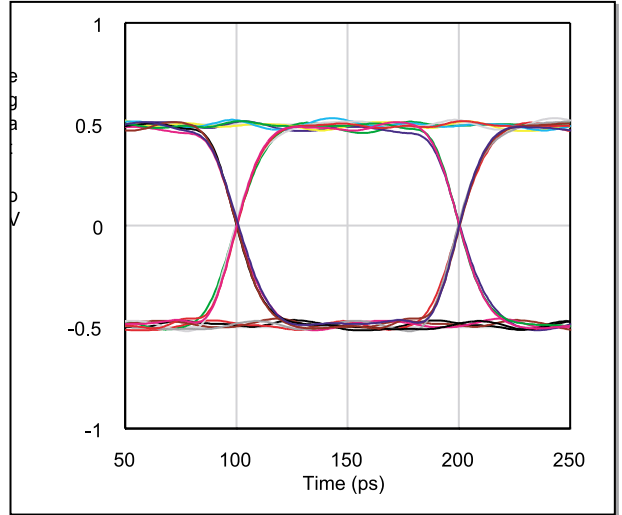
a) 15 GHz 3 dB cutoff, b) 10 GHz 3 dB cutoff, and c) 7.5 GHz 3 dB cutoff frequency.

Pseudorandom input signal  
with high frequency noise.



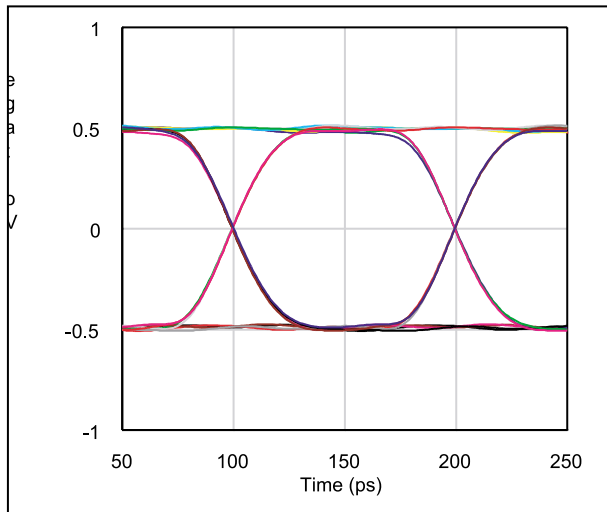
Rise Time (10%→90%) = 6ps

a) Through  $F_c = 15$  GHz Bessel Filter,



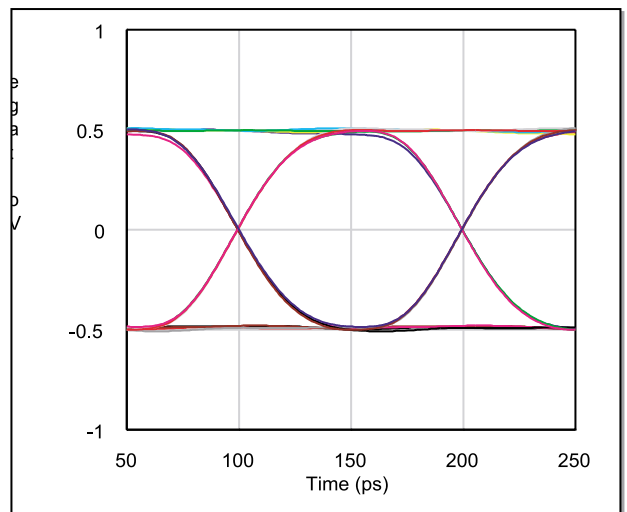
Rise Time (10%→90%) = 25ps

b) Through  $F_c = 10$  GHz Bessel Filter  
5 section



Rise Time (10%→90%) = 36ps

c) Through  $F_c = 7.5$  GHz Bessel Filter  
5 section



Rise Time (10%→90%) = 47ps

Specifications are subject to change without notification. Consult Nanowave Technologies, Inc. for specific applications/requirements.