RF Optic
Optical RF Solutions

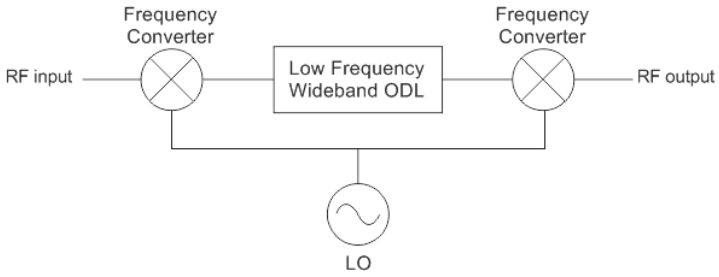
Optical Delay Line 40 GHz – DDS

Applications:	Key features:
Radar Calibration & Testing	Delays: 0.1-500 µsec (fixed or variable)
Signal & Phase Noise Processing	Frequency >40GHz (6GHz bandwidth frequency hopping)
Extension of radar range site	Number of progressive delay line 12
Clutter Canceller	Delay accuracy: <1%
BIT (built-in test)	Remote Control: RS-232 or Ethernet
EW Systems - Jammers	High Dynamic Range
Path Delay Simulation	No need for DCU up to 200 usec – save cost.
Phase noise measurements	Accurate amplitude control
	Excellent noise Figure
	Better Spectral purity
	Internal diagnostic capabilities
	Gain Control in the Tx and the Rx
	BIT indication in the optical and RF side

Key Parameters

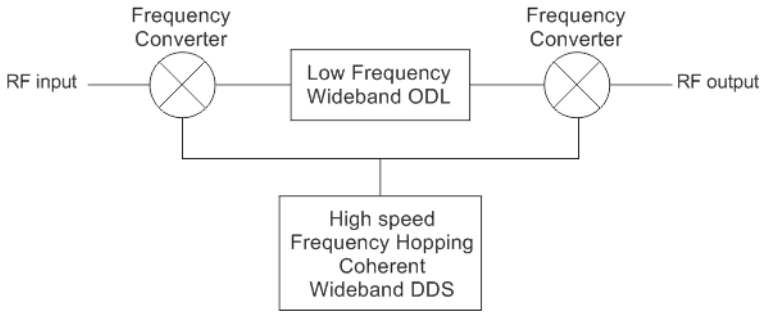
Parameters	Specifications	Notes
Frequency range	L,C,S,X, Ku, Ka	(0.1 to 40 GHz) in 7 frequency bands
Delay time	0.1-500	pre-fixed delay defined by customer up to 12 different delay lines
Delay accuracy [6]	≤1	Minimum accuracy of 25 ns
Delay repeatability	<0.01	at +/- 5 ℃variations
System RF gain	0±1dB	Fixed Gain with EDFA
Gain Flatness	±2.5dB	
Gain Control	0.5	Both Tx and Rx
Noise Figure at 6GHz [7	15	Can reach to 6 with built in LNA
1dB input Compression point	> 0	Can be changed by internal Tx attenuator
Spurious Free Dynamic Range	105	
VSWR	1:1.5	Both input and output

RFOptic's ODL frequency hopping is based **on unique patented technology** that is ideal for Radar systems. The RFoF element is based on RFOptic's programmable 6GHz RF over Fiber technology together with full **coherent DDS** which enables to cover any frequency up to 60 GHz with sliced bands of 6GHz.



In many cases the ODL system is used across a number of frequency bands either as a part of a test setup or where a number of frequency bands are used sequentially across a wide swath of the microwave spectrum. In such cases and where each signal is itself relatively a narrow band signal relative to the bandwidth of the ODL it is possible to work with a tunable synthesizer. In this approach a low frequency ODL can serve applications well into **the mm-Wave bands**. Such a system can produce a very cost effective alternative to a full wideband ODL.

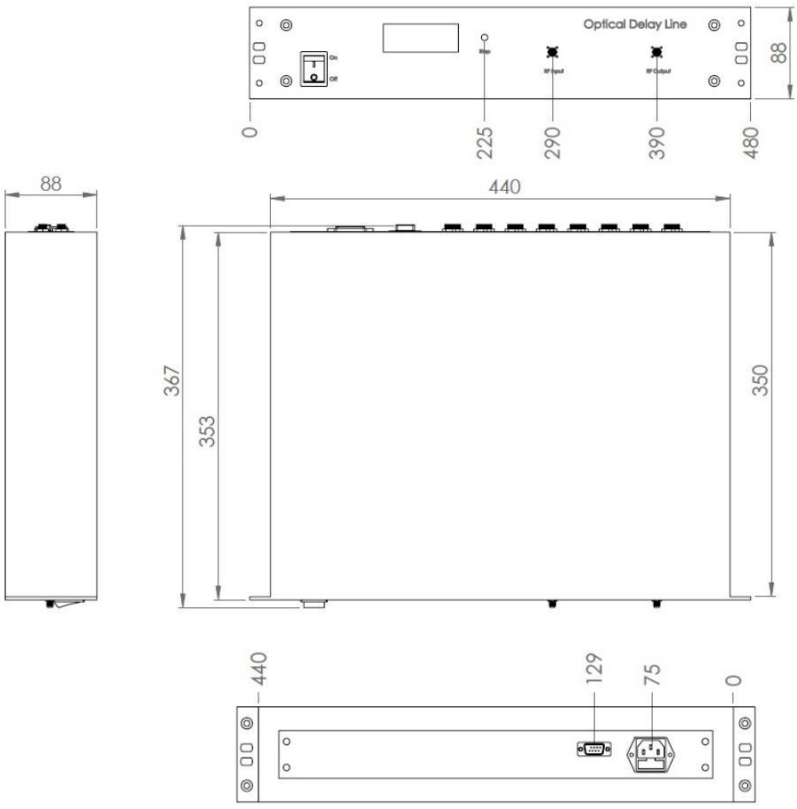
ODL applications typically require phase coherence and therefore prefer to use a wideband ODL to a frequency converted ODL. Using a patented **coherent DDS RF** Optic can offer a unique solution that is capable of providing ultrafast band switching and has a wide instantaneous bandwidth. In this approach the DDS would generate the relevant LO signals to fold any slice of the RF band into the ODL bandwidth and then regenerate the original signal frequency. The inherent coherency of the all DDS signals guarantees that as far as phase is concerned the ODL will function transparently as a full bandwidth system.



A single stabilized source creates the frequency which is changed by DDS. The frequency bands have overlap so any band can be covered. The solution is less expensive since almost no dispersion compensators are required. No need for any external amplifiers. A lot of flexibility in the gain, noise figure, p1dB etc. The solution is ideal for radar system which consumes relatively narrow bandwidth.

Mechanical Layout: 2U/3U Layout

Note: 3U is similar with 133 mm height.



Comment: An option for up to 8 ports rear panel for external delay line.