

EO E-field Micro-Ring Sensor

Partow E-field Micro-Ring (MR) sensor products uses electro-optic micro-ring resonators made from lithium niobate thin films for sensing of electric fields. The sensors can achieve very high spatial resolution and can operated form near DC frequencies up to 2.5 GHz. The sensor is made from all dielectric materials. Hence it does not perturb measurand electric field. Also, since fiber optic cables are used these sensors are immune to electromagnetic interference and can be used in highly noisy environment. The readout system is based on a tunable laser and a detector. The sensor consists of the sensor element which is in a cylindrical housing and one fiber which is connected to a laser source and one or two additional fibers that will connect to detectors. The interrogation system includes the laser source and detector(s) and control circuits. The sensor operates at an eye safe wavelength of 1550nm. The sensor produces a voltage proportional to measurand electric field. An oscilloscope, digitizer board, lock in amplifier or spectrum analyzer instrument need to be connected to system output to measure the electric field.



Features

- Based on thin film lithium niobate
- Electro-optic micro-ring resonator
- DC frequency up to 1 GHz frequencies
- All dielectric materials
- Immune from electromagnetic interference
- High spatial resolution

Microring resonator sensor element, P/N MR-2.5GHz-300-XX-B

MicroRing E-field sensor datasheet

Parameter	Value	Additional Information
Dynamic range	0.1V/m – 0.5 MV/m	
Sensitivity	100 mV/(m. Hz ^{0.5})	Down to 10mV/(m.Hz ^{0.5}) is possible
Response Gain	60 μV/(V/m)	Measured at low frequency using standard controller unit
Selectivity (Orthogonal components rejection)	>30 (dB)	
Optical insertion loss of the sensor	-12 (dB)	

Parameter	Value	Additional Information
<i>E-field direction XX</i>	<i>PP or PL</i>	<i>PP: E field Perpendicular to fiber PL: E field Parallel to fiber</i>
<i>-3dB sensor bandwidth</i>	<i>2.5 (GHz)</i>	
<i>Sensor spatial resolution</i>	<i>300(μm)</i>	
<i>Packaged sensor size</i>	<i>3(mm) x 25(mm)</i>	<i>Can be reduced down to 1mm</i>
<i>Fiber pigtail</i>	<i>1(m)</i>	
<i>Fiber type, Connector</i>	<i>PM, FC/APC</i>	

E-field sensor controller system P/N: L-1550-40-D-XX-B

Parameter	Value	Additional Information
<i>Laser Power</i>	<i>40 (mW)</i>	
<i>Operating Wavelength</i>	<i>1550 (nm)</i>	
Balanced detector bandwidth <i>XX</i>	<i>400: 50Hz-400MHz 2500: 1MHz-2.5GHz</i>	<i>Up to 40GHz bandwidth is possible</i>
<i>Typical Response gain</i>	<i>5 (μV/(V/m))</i>	<i>Measured at low frequency using standard controller unit</i>
<i>Rise time</i>	<i>0.25 (nsec)</i>	<i>Down to 6psec rise time is possible</i>
<i>Interrogator dimension</i>	<i>200x275x40(mm)</i>	<i>Down to 6psec rise time is possible</i>
<i>Interrogator dimension</i>	<i>1 (kg)</i>	
<i>Interrogator output</i>	<i>SMA-50 ohm</i>	
<i>Input power</i>	<i>110-220 volt, 2 A</i>	