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RoHS Compliant

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FLT Garnet — Low Temperature Dependence Faraday Rotator

Ideal for Uncooled Transceiver Free-Space Isolators or other Wide-band Passive Optical Components such as In-line Isolators, Circulators, Switches, Interleavers

Bismuth-doped rare-earth iron garnet thick films are the principal Faraday rotator materials for non-reciprocal devices in telecommunications and non-telecom applications. They have high specific rotations and are highly transparent in the near-infrared telecom band. Combined with the correct polarizing or birefringent elements, these Faraday rotators can be made into polarization-dependent and independent isolators as well as incorporated into many other non-reciprocal devices. Integrated Photonics' FLT Faraday rotator composition is optimized for **low temperature dependence** as is required for many uncooled and wide band applications.

Product Features

- Third-party certified RoHS compliant
- Excellent crystal quality for high isolation ≥ 40 dB
- Low insertion loss
 - ≤ 0.05 dB @ 1310 nm, ≤ 0.08 dB @ 1550 nm
- Low temperature dependence -0.04 - 0.045 deg/ $^{\circ}$ C
- Low wavelength dependence
- Anti-Reflection coating per customer requirements
 - Pinhole free; Reflectance $\leq 0.15\%$ per side
 - Highly durable against abrasion, humidity, high processing temperatures and other environmental factors
- Custom fabrication to customer's specification
 - A wide variety of wavelengths are available
 - Coatings available for air, epoxy, uncoated or in combinations

Properties	FLT Garnet
Temperature Coefficient; $d\theta/dT$ (deg/ $^{\circ}$ C)	-0.045 @ 1550 nm -0.04 @ 1310 nm
Wavelength Dispersion; $d\theta/d\lambda$ (deg/nm)	-0.058 @ 1550 nm -0.087 @ 1310 nm
Thermal Expansivity; α ($^{\circ}$ C $^{-1}$)	11.0×10^{-6}
Refractive Index; n	2.361 @ 1550 nm 2.374 @ 1310 nm
Curie Temperature; T_c ($^{\circ}$ C)	300
Specific Faraday Rotation; θ/t (deg/mm)	-96 @ 1550 nm -141 @ 1310 nm
Thickness for 45 degrees; t (μ m)	~ 470 @ 1550 nm ~ 320 @ 1310 nm
Saturating Field; H_s (Oersted)	< 800 for 11×11 mm < 650 for 2×2 mm < 550 for 1×1 mm

Ordering Information

Part numbers are given as **FLT-(Wavelength)-(Rotation Tolerance)-(AR Coating)-(Dimensions in mm)**

- Wavelength, λ (nm)—Typical wavelengths are 1310, 1480 and 1550 nm, but custom wavelengths are available by customer request. All Faraday rotations are 45 degrees at 22 $^{\circ}$ C and the center specification wavelength unless otherwise specified.
- Rotation Tolerance, $\pm\Delta\theta$ (degrees)—The Faraday rotation is given to a specific tolerance, typically ± 0.5 , ± 1.0 or ± 2.0 degrees.
- Anti-Reflection (AR) Coatings—Films may be coated to Air or Epoxy, Uncoated or to some custom specification. Ordering information must specify coatings for both sides such as AA-to Air both sides, EE-to Epoxy both sides, AE-One side to Air and one to Epoxy or UU-uncoated.
- Dimensions (mm)—The part number gives the square dimensions of the part in mm. Standard size is 11×11 mm.
 e. g. **FLT-1550-1.0-AA-11.0** would be a Faraday rotator for 1550 nm with 45.0 ± 1.0 degrees Faraday rotation, Anti-Reflection coated 2 sides to Air in the form of a square 11.0 mm on a side.