Faraday Optical Isolators & Rotators

(FP)

- Available wavelength range: 400 nm to 1250 nm
- Peak isolation: >38 dB; >60 dB
- Transmission: >92% in HT modification
- Broadband and tunable models
- Thin-film polarizer modifications having higher laser-induced damage threshold of 5 J/cm^2 at 10 ns

Application:

- Seed Oscillator for Ultrafast Amplifiers
- Ultrafast Oscillator and Amplifier Pulse Selection
- Injection/Ejection of Pulses in Ultrafast Amplifier Systems OEM Integration
- Novel Ultrafast Fiber Laser Development
- Optical Feedback Elimination
- Amplifier Design



15AFI-1064C-TFP (1064 nm. 15 mm, TGG >38 dB, >5 J/cm^2)



6AFI-1064C (1064 nm, 6 mm, TGG >38 dB)



6AFIT-800C (710-880 nm, 6 mm, TGG >38 dB)

Faraday Optical Isolators

A Faraday isolator (FI) is a nonreciprocal optical device which transmits the linearly polarized light in one direction and deflects the backward beam. It usually consists of a Faraday rotator and two polarizers. The Faraday rotator is made of magneto-optical active material which is placed into the permanent magnet system (Nd-Fe-B).

Two types of the magneto-optical active materials are available: Terbium-doped glass, Terbium-Gallium-Garnet (TGG) crystals.

The isolator protects a laser source by attenuating the reflected and backscattered light by several orders of magnitude (10^4 to 10^6). It is also used when some devices have extreme sensitivity to optical feedback which can cause intensity instabilities, frequency pulling and other undesirable effects. A Faraday isolator is also indispensable in CPA (chirped-pulse amplification) laser layouts, where seed oscillator and its pump may get damaged easily by occasional back reflections.

Our company offers a variety of optical isolator models:

• Highly transparent single-stage isolators. Isolation 38-44 dB, wavelength from 400 to 1250 nm (fixed), clear aperture 2-15 mm. Transmission >90%.

• Broadband isolators. Isolation >38 dB. Center wavelength - 800 nm (other designs are also available on request). Bandwidth - 120 nm (>30 dB). Clear aperture is 2-12 mm. HT and SE modifications are also available.

• Tunable isolators. Peak isolation 38-42 dB. Central wavelength - 780 nm. Tuning range from 710 to 880 nm. Other wavelengths available upon request. Simple and convenient operation.

• Single stage isolators with side exit (SE). Isolation 38-44 dB, wavelength from 400 to 1250 nm (fixed), bandwidth - 30 nm. Clear aperture 2-12 mm.

• Double-stage isolators. Isolation >60 dB. Wavelength is 600 - 1150 nm (fixed). Bandwidth - 30 nm. Clear aperture 2 - 12 mm.



LASERS AND OPTICAL SYSTEMS



Please see reverse for typical models and their specifications

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Product overview



Central wavelength, nm	Clear aperture, mm ¹⁾	Part number	Rod material	Peak Isolation, dB ²⁾	Bandwidth (at >30 dB), nm	Tpeak, %	LxWxH (beam height), mm
1250	5	5AFR-1250C	TGG	35	±5	98	65x71x77 (42)
		5AFI-1250C				90	90x71x77 (42)
1030-1070, fixed	2	2AFR-1064C	TGG	35	±10 ±10	98	50x38x46 (26)
		2AFI-1064C				93	78x38x46 (26)
		4AFR-1064C				98	52x45x51 (28.5)
		4AFI-1064C				93	85x45x51 (28.5)
	6	6AFR-1064C		35	±10	98	55x48x54 (30)
		6AFI-1064C				93	92x48x54 (30)
	8	8AFR-1064C		35	±10	98	62x59x65 (35.5)
		8AFI-1064C				93	100x59x65 (35.5)
	10	10AFR-1064C		35	±10	98	65x66x72 (39)
		10AFI-1064C				93	110x66x72 (39)
	12	12AFR-1064C		35	±10	98	69x71x77 (41.5)
		12AFI-1064C				93	120x71x77 (41.5)
1030, broadband	2-12	(2-12)AFRB-1030C	TGG	35	980-1070	98	W H same as fixed 1+8 mm
		(2-12)AFIB-1030C				88	w, it suffic as fixed, ETO film
700-900, fixed	2	2AFR-800C, G	TGG (C) or Glass (G)	35	±10	98	50x38x46 (26)
		2AFI-800C, G				90	78x38x46 (26)
	4	4AFR-800C, G		35	±10	98	52x45x51 (28.5)
		4AFI-800C, G				90	85x45x51 (28.5)
	5	5AFR-800C, G		35	±10	98	52x48x54 (30)
		5AFI-800C, G				90	88x48x54 (30)
	8	8AFR-800C, G		35	±10	98	62x59x65 (35.5)
		8AFI-800C, G				90	100x59x65 (35.5)
	10	10AFR-800C, G		35	±10	98	65x66x72 (39)
		10AFI-800C, G				90	110x66x72 (39)
	12	12AFR-800C, G		35	±10	98	69x71x77 (41.5)
		12AFI-800C, G				90	120x71x77 (41.5)
	15	15AFR-800C, G		35	±10	98	71x81x84 (46)
		15AFI-800C, G				90	140x81x84 (46)
700-880, broadband	4-12	(4-12)AFRB-800C, G	TGG (C) or Glass (G)	35	±60	98	Will come on fixed it is a more
		(4-12)AFIB-800C, G				88	vv, n same as lixed, L+0 mm
710-880, tunable	4-12	(4-12)AFIT-800C, G	TGG (C) or Glass (G)	35	±10	88	W, H same as fixed, L+50 mm
633	4	4AFR-633C	TGG	35	±10	98	52x45x51 (28.5)
		4AFI-633C				85	85x45x51 (28.5)
	5	5AFR-633G	Glass	35	±10	98	52x48x54 (30)
		5AFI-633G				85	90x48x54 (30)
532	2	2AFR-532C	TGG	35	±10	97	30x38x46 (26)
		2AFI-532C				85	75x38x46 (26)
	5	5AFR-532C		35	±10	97	30x48x54 (30)
		5AFI-532C				85	90x48x54 (30)
	8 10	8AFR-532C		35	±10	97	42x59x65 (35.5)
		8AFI-532C				85	100x59x65 (35.5)
		10AFR-532C		35	±10	97	45x66x72 (39)
		10AFI-532C				85	110x66x72 (39)
400	4	4AFR-400C	TGG	35	±5	85	30x45x51 (28.5)
		4AFI-400C				75	60x45x51 (28.5)
	6	6AFR-400C		35	±5	85	30x48x54 (30)
		6AFI-400C				75	70x48x54 (30)
Polavization independent isolators							
1064 1.5 ³ PI35C ⁴ TGG 35 +5 90 120x48x52 (28)							
1064	1 5 ³⁾	PI35C35)	TGG	35	+5	90	80x32x32
1) typical apertures, other	r apertures are ava	ailable upon reauest:					CONCLASE

2) >60 dB double-stage optical isolators are available upon request;

3) input beam diameter at 1/e^2;

4) the PI35CF model with fiber-input is available;

5) small package.

- AFR in part number means Faraday rotator (supplied without polarizers), AFI means Faraday isolator (supplied with polarizers), PI means polarization-independent isolator (with polarizers);

- Damage threshold (typical): AFI isolators: 1 J/cm^2 at 10 ns; AFR rotators: 5 J/cm^2 at 10 ns; some isolator models are available in TFP version and 5 J/cm² at 10 ns DT, please enquire;

- Optical power: TGG rods have higher average power threshold than Glass rods (we recommend using TGG for beams with average power roughly >10 W/cm^2);

- Isolation ratio in case of a rotator shows achievable isolation ratio with the use of properly chosen external polarizers.

