IPOptica

Free Space Faraday Devices

Rotators & Isolators

VITG
BBTG
HPTG
HPTS
HPKT
HPTC
DSTG
NLYG

Product Reference

Rev. 03.2025

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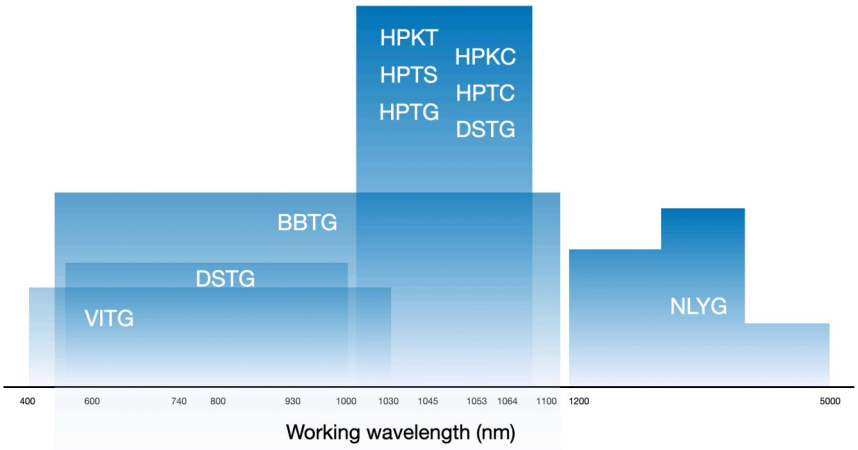
IPOptica
InPut Optica Technology, LLC.

Rotator & Isolator
Faraday Devices

IPOptica is always focusing on the future, to further develop technology and better satisfy broad applications, and always a better solution for most special demands of free space Rotators and Isolators by adjustable, broadband, and super large aperture available for most wavelength, at the same time with high performance and reliable. IPOptica's Faraday Devices have been designed to cover full wavelengths from 400 to 5000nm, while other wavelengths are available upon request.

IPOptica respect talents and their years experience from aesthetic combined engineering design, theoretical data simulations, precision machining, and quality control, and have been specifically designed to satisfy the demands of high power damage threshold, low absorption, low insertion loss and high isolation.



FEATURES

High damage threshold and low insertion loss for high power application

Low thermal lensing effect and thermal depolarization phenomena

Orthogonal or Brewster isolated beams available upon request

Tunable input polarization state

Large aperture up to 70mm for 1000nm range

Reliable quality and integrated design satisfy hostile operating environments

APPLICATIONS

Protection of Pulsed and CW lasers against optical feedback

Protection of seed sources by elimination of frequency instability

Isolate ASE generated by amplifiers

kW-level Isolator


kW-level Water Cooled Isolator

25mm~70mm Rotators


TFP Isolator


Dual Stage Isolator
Typically > 70dB


Vacuum Isolator


1200 ~ 5000nm
Isolator

Broadband Isolator

Custom Rotators


Mini isolators for
seed lasers

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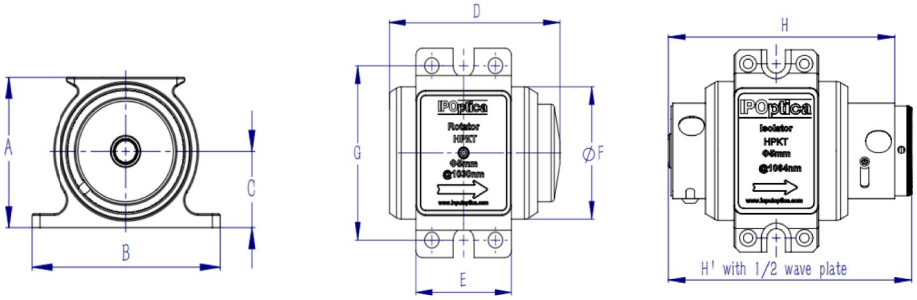
HPKT series is making superior Faraday Rotators & Isolators providing higher extinction at high incident power, an order of lower absorption and Thermo-optic Coefficient, making it a better solution for ultra-fast and high power applications with respect to HPTG series. HPKT series focusing on 1000-1100nm market demands with specified performance up to 600W and without damage over 2.6kW of average power testing.

The high quality of HPKT series relay on our talents' years experience from aesthetic combined engineering design, theoretical data simulations, precision machining, and quality control, and have been specifically designed to satisfy the demands of high power damage threshold, lower nonlinear refractive index, lower focal shift, lower thermo effect, lower absorption, lower insertion loss and higher isolation.

SPECIFICATIONS

MODEL	HPKT High Power 1030nm, 1045nm, 1053nm, 1064nm (1000-1100nm)
Clear Aperture D	3.5mm, 5mm, 8mm, 10mm, 12mm, 15mm, 20mm
Working Wavelength	1000 ~ 1090nm
Rotation (Peak)	45° ± 0.5°
Damage Threshold (@1064nm)	>7J/cm² @ 10ns >600mJ/cm² @ 8ps
Peak Isolation	>35dB (Isolator)
Transmission Rate, %	>98% (Rotator) >96% (Isolator)
Storage Temp Range	-40°C ~ 70°C
Tunable Temp Range	20°C ± 10°C / On request
Isolated Beam Pointing	<3 mrad

DIMENSIONS



	A(mm)	B(mm)	C(mm)	D(mm)	E(mm)	F(mm)	G(mm)	H(mm)	H'(mm)
3.5mm	43	60	22.2	40.5	25	38	45	59.9	63.8
5mm	43	60	22.2	52.5	30	38	50	71.9	75.7
8mm	54.4	72	27.6	57.5	30	49.4	60	82.9	86.7
10mm	71.3	90	36.2	72	40	64.2	70	110.2	115
12mm	71.3	90	36.2	72	40	64.2	70	110.2	115
15mm	79.2	100	39.2	101.4	50	72.2	76	144.2	148.3
20mm	79.2	100	39.2	118	50	72.2	76	175.2	182

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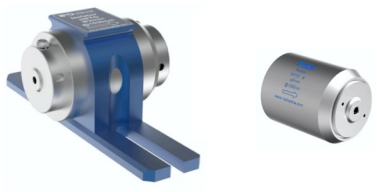


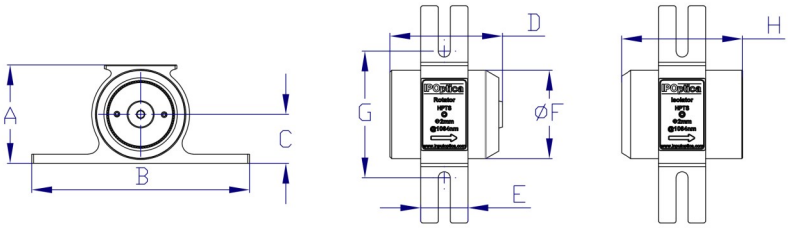
HPTS series of Faraday devices have been designed to meet high power and high energy laser (1000-1100nm) demands. Benefit from over 20% Verdet Constant higher and 30% less adsorption with respect with HPTG series, HPTS series is awarded low thermally induced birefringence and much cabinet dimensions contributing to laser design, especially for 1030nm seed source laser.

The high quality of HPTS series relay on our talents' years experience from aesthetic combined engineering design, theoretical data simulations, precision machining, and quality control, and have been specifically designed to satisfy the demands of high power damage threshold, low absorption, low insertion loss and high isolation.

SPECIFICATIONS

MODEL	HPTS High Power 1030nm, 1045nm, 1053nm, 1064nm (1000-1100nm)
Clear Aperture D	2mm
Working Wavelength	1000 ~ 1090nm
Rotation (Peak)	45° ± 0.5°
Damage Threshold (@1064nm)	10J/cm² @ 10ns (MAX 15J/cm² on request) 1J/cm² @ 8ps (MAX 1.5J/cm² on request)
Peak Isolation	>35dB (Isolator)
Transmission Rate, %	>98% (Rotator) >96% (Isolator)
Storage Temp Range	-40°C ~ 70°C
Tunable Temp Range	20°C ± 10°C / On request
Isolated Beam Pointing	<3 mrad

DIMENSIONS



	A(mm)	B(mm)	C(mm)	D(mm)	E(mm)	F(mm)	G(mm)	H(mm)
2mm	27.2	60	13.5	31	13	24.4	35	33.3

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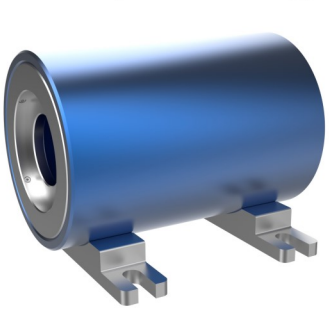


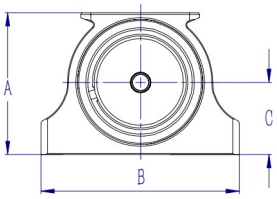
HPTG series Faraday Rotator & Isolator have been designed to provide the superior protection for solid state lasers and fiber lasers in 1000 - 1100nm range. The HPTG series support broad aperture range devices and tested up to 400W for CW power.

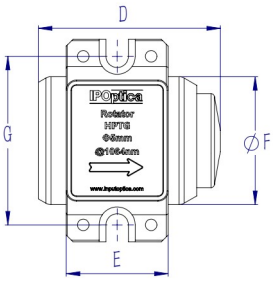
The high quality of HPTG series relay on our talents' years experience from aesthetic combined engineering design, theoretical data simulations, precision machining, and quality control, and have been specifically designed to satisfy the demands of high power damage threshold, low absorption, low insertion loss and high isolation.

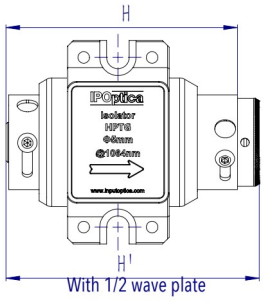
SPECIFICATIONS

MODEL	HPTG High Power 1030nm, 1045nm, 1053nm, 1064nm (1000-1100nm)	
Clear Aperture D	2mm, 2.5mm, 3.5mm, 4mm, 5mm, 6mm, 8mm	10mm/12mm, 15mm, 20mm, 25mm, 30mm, 35mm, 45mm, 60mm, 70mm
Working Wavelength	1000 ~ 1090nm	
Rotation (Peak)	45° ± 0.5°	45° ± 1°
Damage Threshold	10J/cm² @ 10ns (MAX 15J/cm² on request) 1J/cm² @ 8ps (MAX 1.5J/cm² on request)	
Peak Isolation @22°C	>35dB (Isolator)	
Transmission Rate, %	Rotator: >98% typically >99% Isolator: >96% typically >98%	
Storage Temp Range	-40°C ~ 70°C	-10°C ~ 60°C
Tunable Temp Range	20°C ± 10°C / On request	
Isolated Beam Pointing	<3 mrad	On request

DIMENSIONS







	A(mm)	B(mm)	C(mm)	D(mm)	E(mm)	F(mm)	G(mm)	H(mm)	H'(mm)
2mm	33	60	16.5	34	15	28.8	35	36.3	41.5
2.5mm	33	60	16.5	34	15	28.8	35	46.8	46.8
3.5mm	43	60	22.2	40.5	25	38	45	59.9	63.8
4mm	43	60	22.2	43	25	38	50	60.4	64.3
5mm	43	60	22.2	52.5	30	38	50	71.9	75.8
6mm	43	60	22.2	52.5	30	38	50	75.8	79.6
8mm	54.4	72	27.6	57.5	30	49.4	60	82.9	86.7
10/12mm	71.3	90	36.2	72	40	64.2	70	110.2	115
15mm	79.2	100	39.2	101.4	50	72.2	76	144.1	148.3
20mm	79.2	100	39.2	117.7	50	72.2	76	175.5	179.5
25mm	129	150	72	167	111	114	120	255.6	258.8
30mm	129	150	72	167	111	114	120	255.6	258.8
35mm	129	150	72	167	111	114	120	264.4	266.6
45mm	138	165	72	190.3	135	132	135	299.1	301.3
50~70mm	Up on request								

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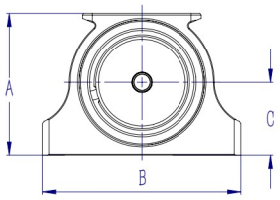
BBTG series products have been designed to minimum pulse broadening by unique short optical path length and low reflective indices. This results the great broadband wavelength protection to the ultra-short laser pulses at from 520nm to 1150nm.

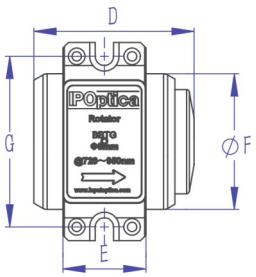
The high quality of BBTG line relay on our talents' years experience from aesthetic combined engineering design, theoretical data simulations, precision machining, and quality control, and have been specifically designed to satisfy the demands of high power damage threshold, low absorption, low insertion loss and high isolation.

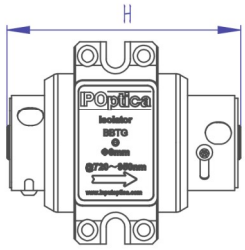
SPECIFICATIONS

MODEL	BBTG (Broadband)				
	532nm (520 ~ 590nm)	650nm (590 ~720nm)	808nm (720 ~ 950nm)		1053nm (950 ~ 1150nm)
Clear Aperture D	4mm		5mm	8mm, 12mm	5mm, 8mm, 12mm
Working Wavelength	520 ~ 590nm	590 ~720nm	720 ~ 950nm		950 ~ 1150nm
Rotation (Peak)	0° / 90° ± 1°				
Damage Threshold	3.4J/cm² @ 10ns 1J/cm² @ 10ns			5J/cm² @ 10ns 2kW/cm² CW	
Transmission Rate, %	>90% (Isolator)	>88% (Isolator)	>98% (Rotator) >93% (Isolator)		
Peak Isolation @22°C	>35dB (Isolator)				

DIMENSIONS







	Clear Aperture	A(mm)	B(mm)	C(mm)	D(mm)	E(mm)	F(mm)	G(mm)	H(mm)
532nm (520 ~ 590nm)	4mm	27.15	60	13.5	\	13	24.4	30	31.8
650nm (590 ~720nm)		27.15	60	13.5	\	13	24.4	30	37.8
808nm (720 ~ 950nm)	5mm	43	50	22.2	40.5	25	38	45	59.9
	8mm	43	60	22.2	52.5	30	38	50	81.4
	12mm	54.4	72	27.6	57.5	30	49.4	60	93.5
1053nm (950 ~ 1150nm)	5mm	43	60	22.2	52.5	30	38	50	71.9
	8mm	54.4	72	27.6	57.5	30	49.4	60	82.9
	12mm	71.3	90	36.2	72	40	64.2	70	111.2
Up to 50mm		Up on request							

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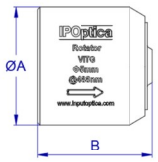
VITG series products have been designed to cover broad demands of wavelength from 400nm to 980nm, and always better performance, reliable, exquisite, and elegant.

The high quality of VITG series Faraday devices relay on our talents' years experience from aesthetic combined engineering design, theoretical data simulations, precision machining, and quality control. Therefore, the broadband, high transmission, and high power VITG products are always better satisfy various applications.

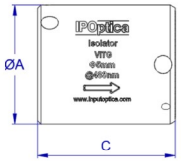
SPECIFICATIONS

MODEL	VITG 405nm, 488nm, 532nm, 561nm, 638nm, 670nm, 730nm, 780nm, 800nm, 850nm, 920nm, 980nm		
Working Wavelength	488nm (±10nm)	320 ~ 790nm (±10nm)	800 ~ 980nm (±10nm)
Clear Aperture D	2mm, 4mm, 5mm		2mm, 5mm
Rotation (Peak)	45° ± 0.5°		
Peak Isolation	>33dB (Isolator)		
Damage Threshold	>3J/cm² @ 10ns		
Transmission Rate, %	>92% (Rotator) >90% (Isolator)	>98% (Rotator) >93% (Isolator)	
Storage Temp Range	-10°C ~ 60°C		
Tunable Temp Range	20°C ± 10°C / On request		
Isolated Beam Pointing	<3 mrad		

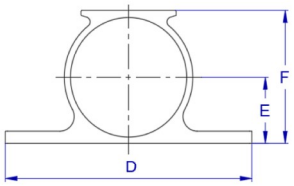
DIMENSIONS



Rotator



Isolator



MODEL	Clear Aperture	A(mm)	B(mm)	C(mm)	D(mm)	E(mm)	F(mm)	G(mm)	H(mm)	I(mm)
320 ~ 535nm	2mm	12	16.5	18.3	25	7	14.5	10	30	3.3
540 ~ 638nm		20	14.5	15.3	35	11.5	23	10	30	3.3
640 ~ 795nm		20	21.5	22.3	35	11.5	23	10	30	3.3
800 ~ 850nm		20	24.5	25.3	35	11.5	23	10	30	3.3
860 ~ 980nm		24.4	31.5	32.3	60	13.5	27.2	13	30	3.3
500 ~ 680nm	4mm	24.4	21.5	34.1	60	13.5	27.2	13	30	3.3
685 ~ 850nm		24.4	27.5	40.1	60	13.5	27.2	13	30	3.3
320 ~ 430nm	5mm	16.4	20.5	31.5	30	9.5	19.5	10	25	3.3
440 ~ 490nm		24.4	23.5	31	60	13.5	27.2	13	30	3.3
495 ~ 580nm		24.4	24.5	32	60	13.5	27.2	13	30	3.3
600 ~ 670nm		34.5	27	34.5	45	19.5	39	20	40	3.5
680 ~ 780nm		34.5	28.5	36	45	19.5	39	20	40	3.5
790 ~ 900nm		34.5	33.5	41	45	19.5	39	20	40	3.5
910 ~ 980nm		34.5	37.5	45	45	19.5	39	20	40	3.5

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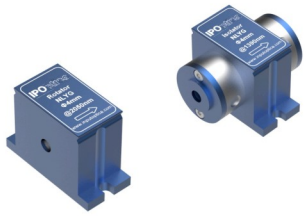


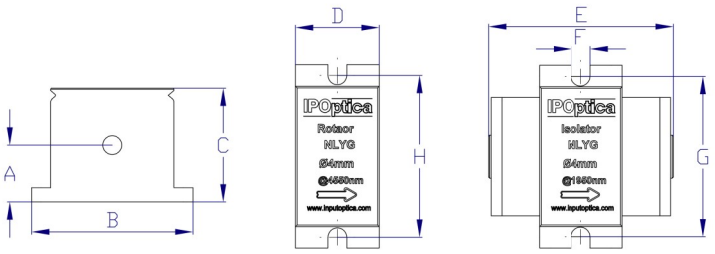
NLYG series products have been designed to satisfy various demands from 1200nm to 5000nm as QCLs, Ho and Tm Oscillators, etc. and always better performance, reliable, exquisite, and elegant.

The high quality of NLYG series Faraday devices relay on our talents' years experience from aesthetic combined engineering design, theoretical data simulations, precision machining, and quality control. Therefore, the broadband and high transmission NLYG products are always better satisfy various applications.

SPECIFICATIONS

MODEL	NLYG					
Working Wavelength	1310nm	1390nm	1550nm	1950nm (1900～2000nm)	2050nm (2000～2100nm)	4550nm (4500～4600nm)
Clear Aperture D	4.6mm					
Rotation (Peak)	45° ± 0.5°					
Damage Threshold	1J/cm² @ 10ns			5J/cm² @ 10ns		2.5W
Transmission Rate @22°C, %	>93% (Rotator) >92% (Isolator)			>95% (Rotator) >92% (Isolator)		>70% (Rotator)
Storage Temp Range	-10°C ~ 60°C					
Tunable Temp Range	20°C ± 10°C / On request					
Peak Isolation (Isolator)	>30dB					

DIMENSIONS



MODEL		A(mm)	B(mm)	C(mm)	D(mm)	E(mm)	F(mm)	G(mm)	H(mm)
1200 ~ 5000nm	Ø4.6	12	34	24	15.5	36.8	3.5	30.0	28.0

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Rotator & Isolator
Faraday Devices

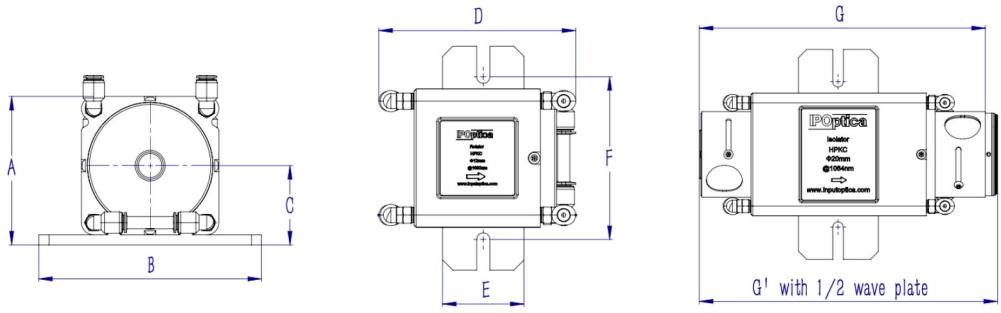
HPKC / HPTC series is making Water-Cooled Faraday Rotators & Isolators providing higher extinction at high incident power, an order of lower absorption and Thermo-optic Coefficient, making it a better solution for ultra-fast and high power applications with respect to HPKT / HPTG series.

HPKC / HPTC series focusing on 1000-1100nm high-end market demands, effectively avoids the reduction of isolation and transmission by the harmful disturbance of magnetic field from external ambient temperature or internal thermal absorption.

SPECIFICATIONS

MODEL	HPKC / HPTC High Power 1030nm, 1045nm, 1053nm, 1064nm (1000-1100nm)
Clear Aperture D	12mm, 15mm, 20mm
Working Wavelength	1000 ~ 1090nm
Rotation (Peak)	45° ± 1°
Peak Isolation	>35dB (Isolator)
Damage Threshold (@1064nm)	>7J/cm² @ 10ns >600mJ/cm² @ 8ps
Transmission Rate, %	>98% (Rotator) >96% (Isolator)
Storage Temp Range	-40°C ~ 70°C
Tunable Temp Range	20°C ± 10°C / On request
Isolated Beam Pointing	<3 mrad

DIMENSIONS



MODEL	A(mm)	B(mm)	C(mm)	D(mm)	E(mm)	F(mm)	G(mm)	G'(mm)
12mm	68.4	110	36.7	93.3	40	80	106.6	110.3
15mm	76.4	130	40.7	120.3	50	90	142.6	146.8
20mm	76.4	130	40.7	138.3	50	90	173.1	177.1

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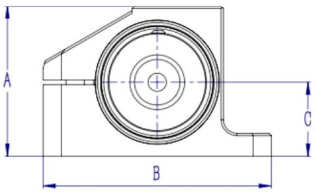
DSTG series is making superior Dual-Stage Faraday Isolators providing higher isolation over 60dB at high incident power for solid state lasers and fiber lasers in 500 - 1100nm range. The DSTG series support broad aperture range devices and tested up to 100W for CW power.

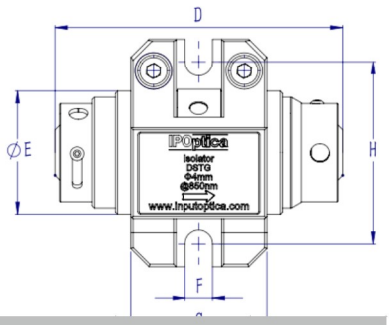
The high quality of DSTG series relay on our talents' years experience from aesthetic combined engineering design, theoretical data simulations, precision machining, and quality control, and have been specifically designed to satisfy the demands of high power damage threshold, low absorption, low insertion loss and high isolation.

SPECIFICATIONS

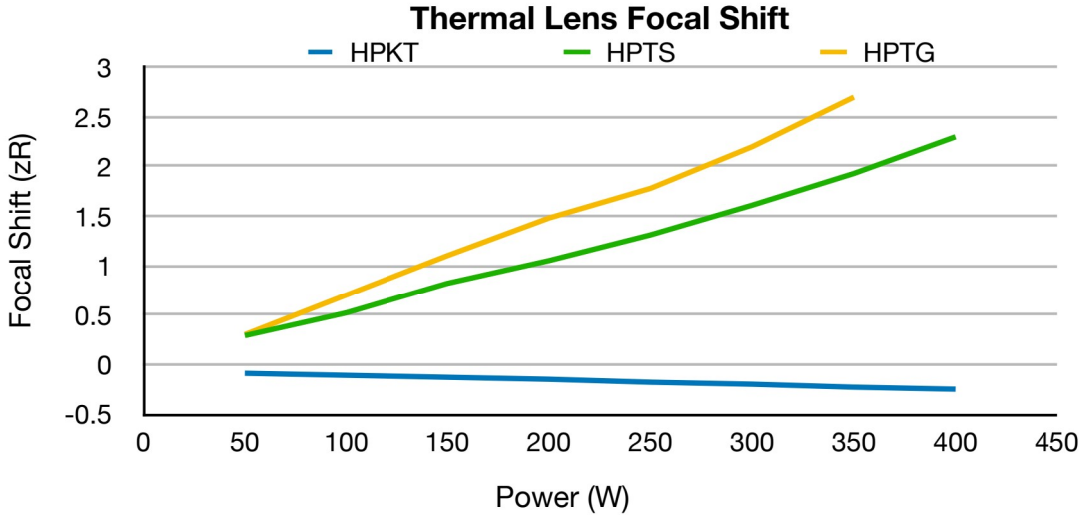
MODEL	DSTG				
Working Wavelength	**532nm**	**648nm**	**780nm**	**850nm**	**1064nm**
Clear Aperture D	4mm, 5mm				5mm
Peak Isolation	>60dB (Typically: > 68dB)				
Rotation (Peak)	90° ± 0.5°				
Damage Threshold (@1064nm)	>3J/cm² @ 10ns				>10J/cm² @ 10ns
Transmission Rate, %	>93% (Isolator)				
Storage Temp Range	-40°C ~ 70°C				
Tunable Temp Range	20°C ± 10°C / On request				
Isolated Beam Pointing	<5 mrad				

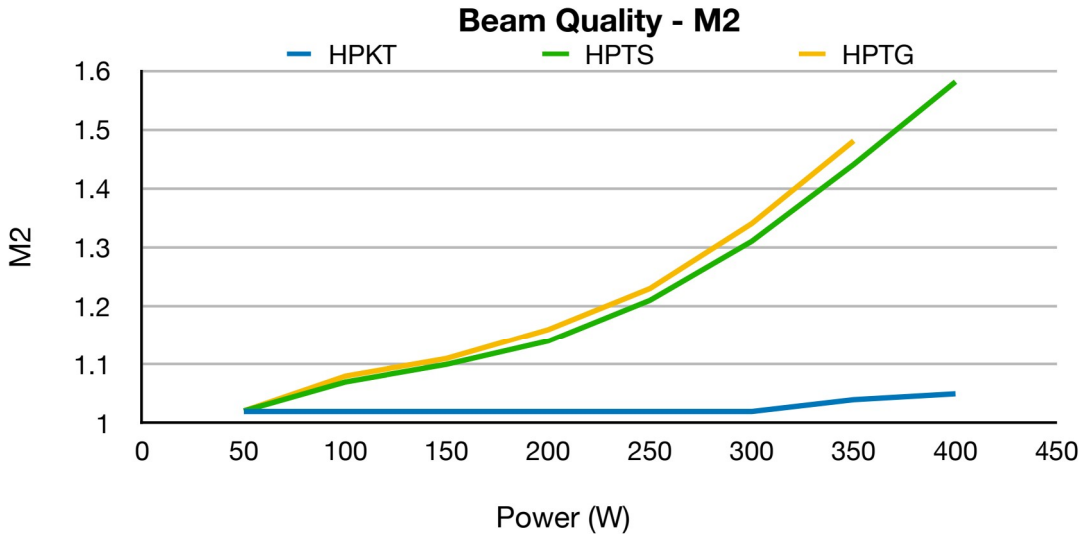
DIMENSIONS





MODEL	Clear Aperture	A(mm)	B(mm)	C(mm)	D(mm)	E(mm)	F(mm)	G(mm)	H(mm)
320 ~ 450nm	3mm	29	35	14.5	58.2	23.5	3.5	25	30
455 ~ 550nm		31.5	45	16	54.2	25.5	3.5	30	35
560 ~ 710nm		36	50	18	57.2	30	4.5	30	40
715 ~ 870nm		36	50	18	59.2	30	4.5	30	40
875 ~ 980nm		36	50	18	71.2	30	4.5	30	40
320 ~ 430nm	5mm	25.5	35	13	64	20	3.5	25	30
440 ~ 490nm		31.5	45	16	64	25.5	3.5	30	35
495 ~ 580nm		31.5	45	16	65	25.5	3.5	30	35
600 ~ 670nm		42	60	21	70	35.5	5.5	35	45
680 ~ 780nm		42	60	21	73	35.5	5.5	35	45
790 ~ 900nm		42	60	21	83	35.5	5.5	35	45
910 ~ 980nm		42	60	21	91	35.5	5.5	35	45
1010 ~ 1080nm		57.5	75	28.5	84	51	6.5	40	60





Composition	HPKT	HPTS	HPTG
Transparency Range	1000 — 1090nm		
Absorption @1064nm	~0.02% / cm	~0.12% / cm	~0.16% / cm
Thermo-optic Coefficient (dn/dT)	~1 x 10^{-6} / K	~10.3 x 10^{-6} / K	~17.9 x 10^{-6} / K
Nonlinear Refractive Index	~1 x $10^{-20}m^2$ / W	~15 x $10^{-20}m^2$ / W	~2 x $10^{-19}m^2$ / W
Thermal Conductivity (W/m•K)	1.67	5.7	7.4
Clean Aperture (mm)	3.5 ~ 12	2, 3.5	3.5 ~ 70