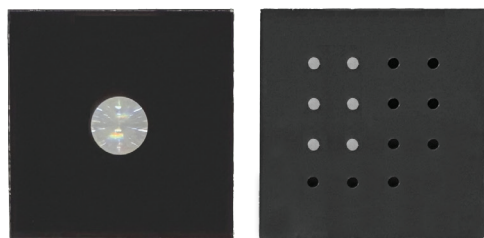


Visible Metalens Plates

MET Series Datasheet



Visible Metalens Plates

Moxtek® offers off-the-shelf metalens solutions for a wide range of optical applications. These flat-optic metalenses provide a compact and efficient alternative to traditional bulky, curved lenses. Utilizing Moxtek’s proprietary nanostructured “meta-atom” patterns, these metalenses are specifically engineered to modify the phase profile of incident light, enabling precise and efficient light redirection. Unlike conventional lenses that bend light through thick glass curvature, metalenses manipulate local phase shifts using advanced subwavelength nanostructures. This cutting-edge optical technology enables the development of innovative and next-generation devices.

Applications

- Imaging Systems
- Aberration Control
- Machine Vision
- Hyper- and Multi-spectral Cameras
- Medical/Dental Imaging
- LIDAR and Optical Sensing
- Augmented Reality (AR/VR)
- Emission Control for Micro-Displays
- Illumination and LED Lighting
- Laser Beam Shaping
- Optical Communications (telecom)
- Off-axis Beam Applications

Standard Product Options

Moxtek Part#	Design λ [nm]	Diam. [mm]	Focal length* [mm]	NA
MET00051	532	4	10	0.196
MET00043	532	4	2	0.707
MET00063	632	4	10	0.196
MET00055	632	4	2	0.707
MET00027 (Multiple parts on chip)	532	1	2.5	0.196
	532	1	0.5	0.707
	632	1	2.5	0.196
	632	1	0.5	0.707

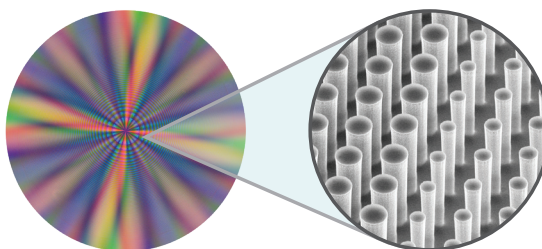
All parts above have protective Overcoat™ and absorptive aperture applied to metasurface.

*Focal length at design wavelength.

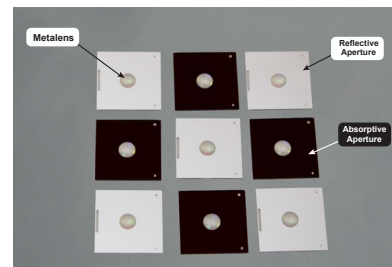
Other design λ 's are also included, but performance is not yet characterized for all lenses.

Features	Benefits
Moxtek® Nanofabrication Technology	High aspect ratio wafer-scale manufacturing
	High-volume production and advanced metrology
	Design, mastering and prototyping options
	Overcoat™, aperture and filter integration options
Nano-Imprint Lithography (NIL)	Reduced cost vs. DUV immersion lithography
	Accurate, precise, repeatable processing
	Meta-atom resolution limited only by Master
Inorganic	High heat resistance and high fluence tolerance

* See OPT-DATA-1010 for fabrication details.



Metalens Optical Micrograph & SEM Image



Reflective & Absorptive Aperture Examples

General Specifications

- Substrate Type:** Eagle XG Display Glass, 0.7±0.07 mm thick
- Index of Refraction:** 1.5198 (435.8 nm), 1.5078 (643.8 nm)
- Thermal Expansion:** 31.7 x 10⁻⁷/°C (0-300°C)
- Angular Field of View:** 20° ‡
- AR Coating:** Visible (broadband 420-670 nm), backside
- Maximum Temperature:** Under investigation (≥200°C, 1000 hrs)
- Sample Dimensions:** 20.0 ±0.2 mm (square)

Do not touch or clean the metalens surface, even with Moxtek protective Overcoat™. Dust with compressed N₂ or clean dry air.
 ‡ Minimal performance degradation in relative illumination & distortion for 1mm diameter, 2.5 mm focal length, 532 nm λ lens with narrow-band source. Some MTF degradation occurs, especially at high spatial frequency. See Tech Note: OPT-Tech-1018 for more information. Contact Moxtek for custom options.

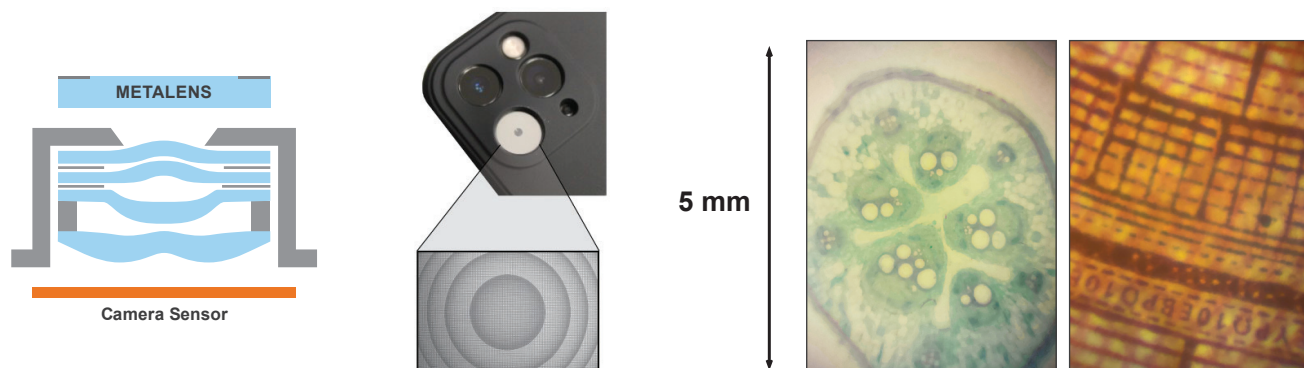


Preliminary Performance Specifications at Normal Incidence

Moxtek Part #	Lens #	Diam. [mm]	Focal length* [mm]	NA	AFE†	MTF (50 lp/mm)	Zero Order	Measurement Wavelength	Metrology Filter Bandwidth
MET00051		4	10	0.196	80.0%	0.70	12.5%	532 nm	1 nm
MET00043		4	2	0.707	50.0%	0.35	12.5%	532 nm	1 nm
MET00063		4	10	0.196	76.0%	0.65	8.0%	633 nm	3 nm
MET00055		4	2	0.707	53.0%	0.325	7.5%	633 nm	3 nm
MET00027 (Multiple parts on chip)	2b	1	2.5	0.196	70.0%	0.85	12.5%	532 nm	1 nm
	2a	1	0.5	0.707	47.5%	0.38	12.5%	532 nm	1 nm
	3b	1	2.5	0.196	60.0%	0.85	10.0%	633 nm	3 nm
	3a	1	0.5	0.707	46.0%	0.37	8.0%	633 nm	3 nm

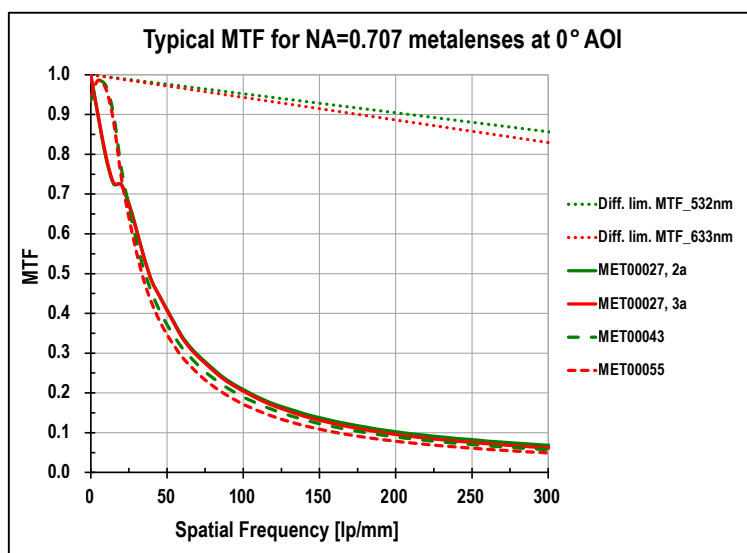
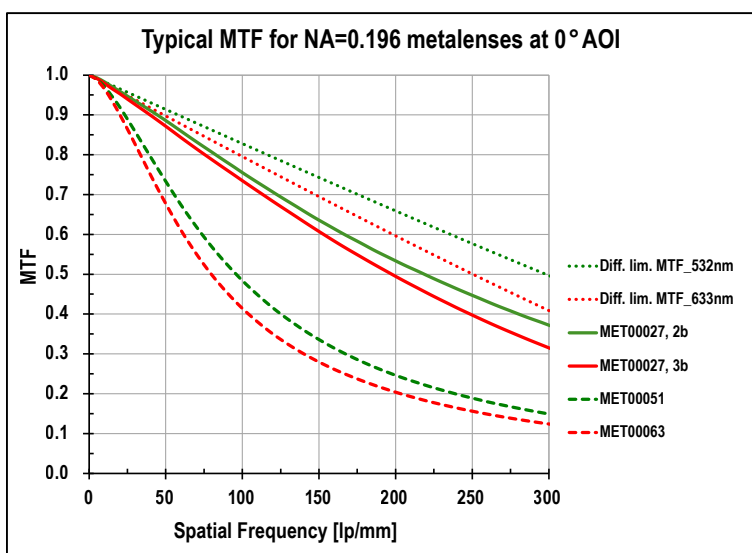
*Focal length at design wavelength. †AFE is characterized using internal method. Some lenses are still under evaluation.

See Tech Note: OPT-Tech-1018 or contact Moxtek for more information. Performance varies with source bandwidth, wavelength, and angle of incidence.



Metalens acting as a macro lens attachment to an iPhone 11 Pro telephoto camera system, with imaging results of a pumpkin stem and euro bill.

Example Optical Performance



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Performance data was taken from sample evaluations. Some part-to-part variation is expected.
For warranty and ordering information, please visit moxtek.com.

OPT-DATA-1014, Rev C
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