

DLP projector

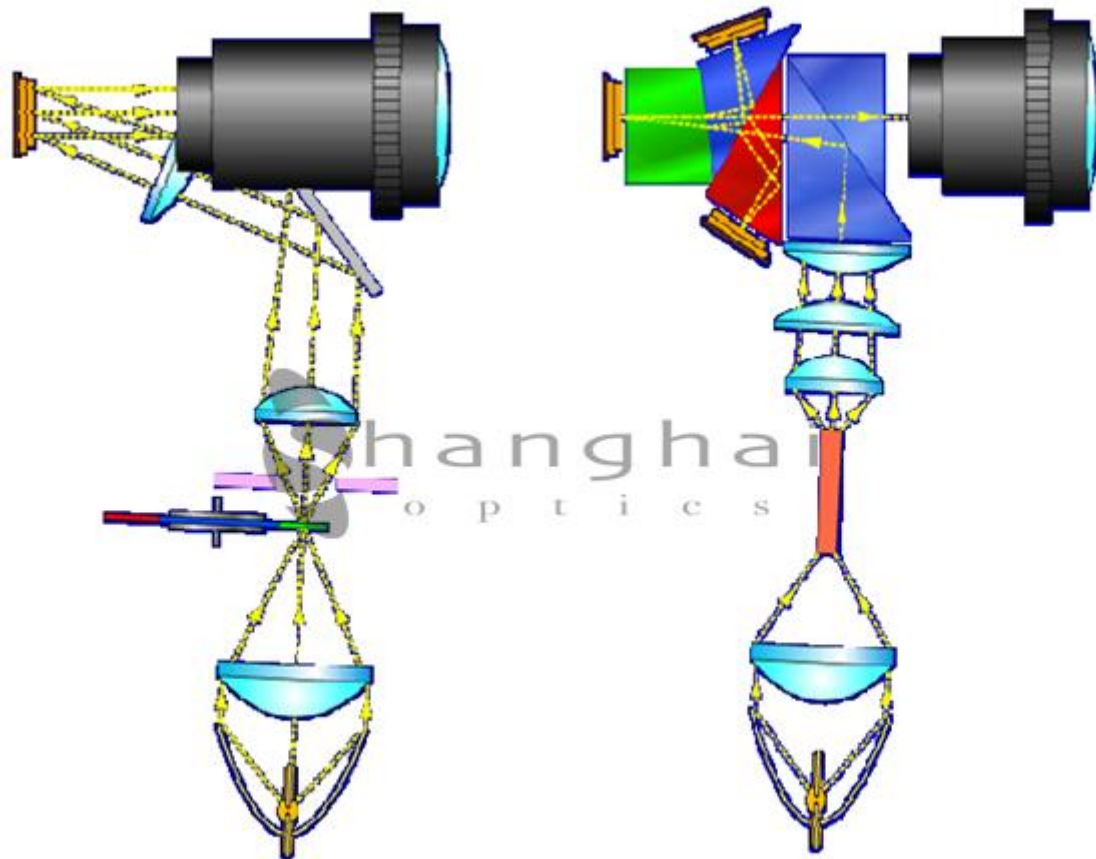
and

Lens design

Popular DLP products



Optical Configurations

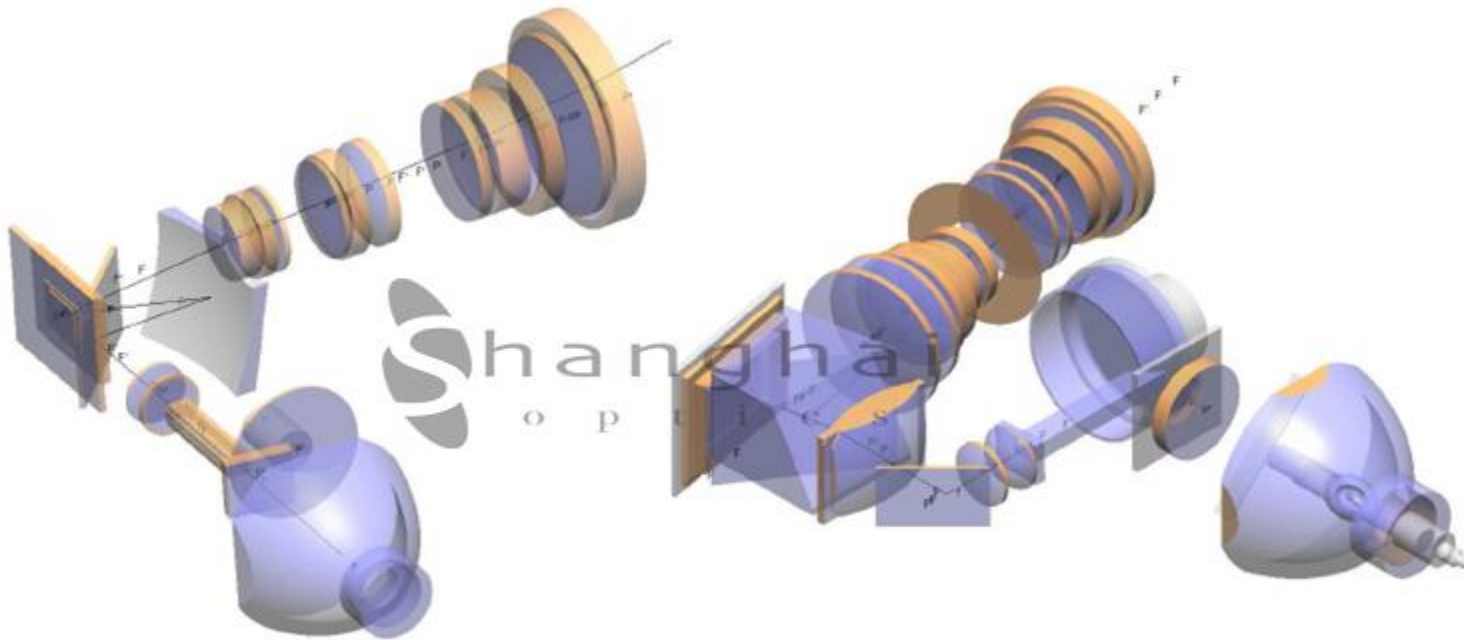


1 Chip DLP

3 Chip DLP

Optical Configurations

- TIR prism

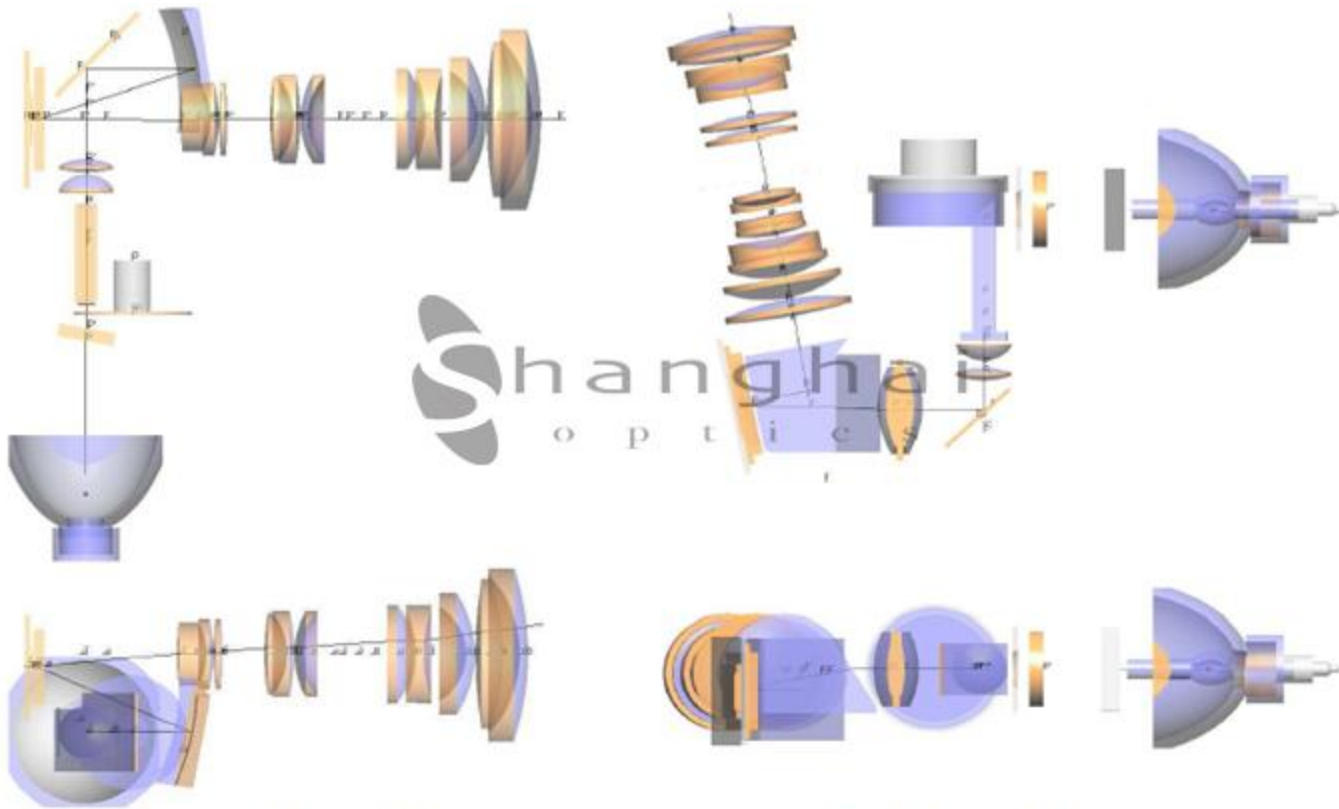


Non TIR Prism DLP

TIR Prism DLP

Optical Configurations

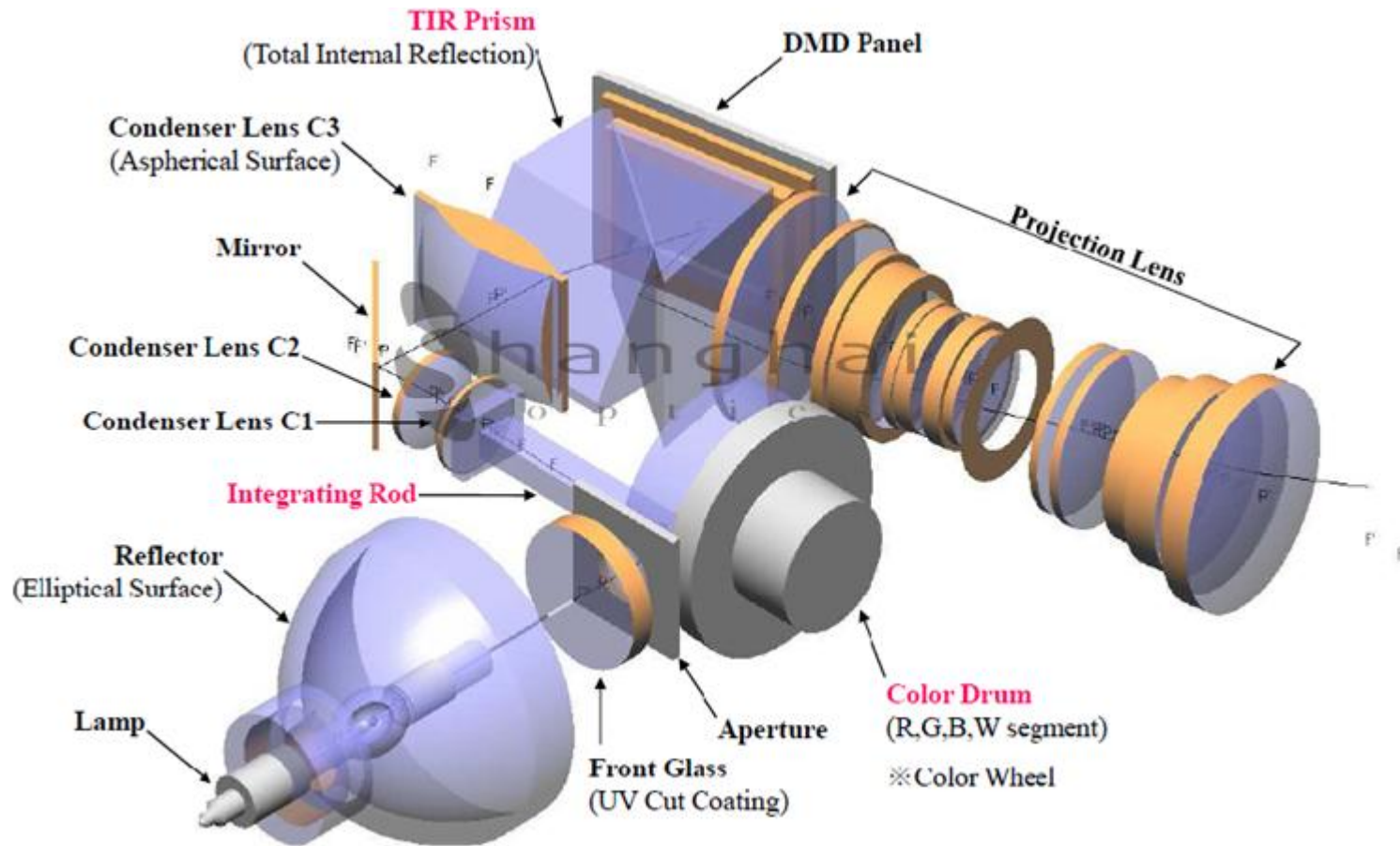
- TIR prism



Non TIR Prism DLP

TIR Prism DLP

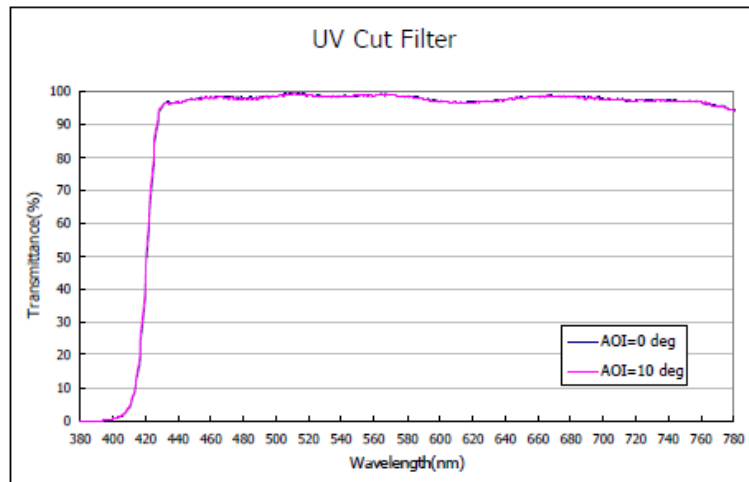
Optical Elements



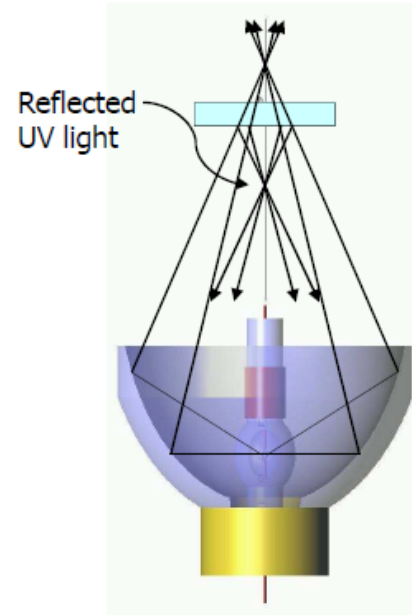
Optical Elements

UV Cut Filter

- UV causes heat for some parts . (Coating, Plastic, Bonding)
- On UV Cut Coating, Try not to make the reflected light be concentrated on one point of UV Lamp



Material: Borofloat + UV Coating

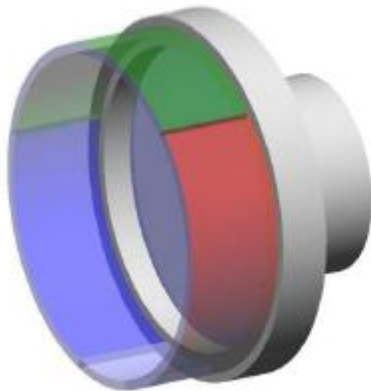


Optical Elements

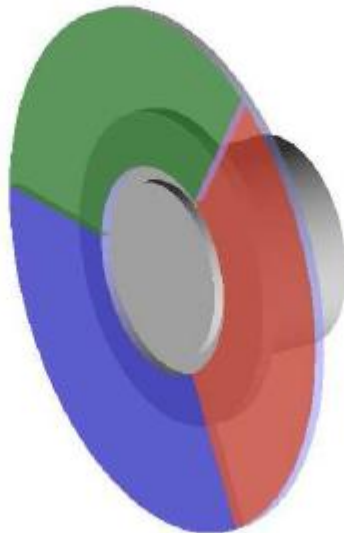
Color Drum & Wheel

Optical instrument filtering color by Color Filter assembled with Motor

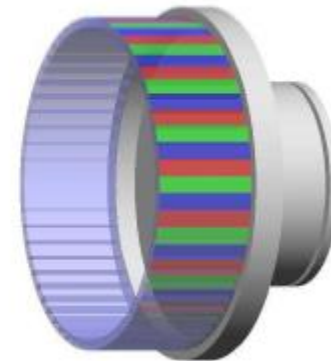
< Color Drum >



< Color Wheel >



< SCR Color Drum >



Optical Elements

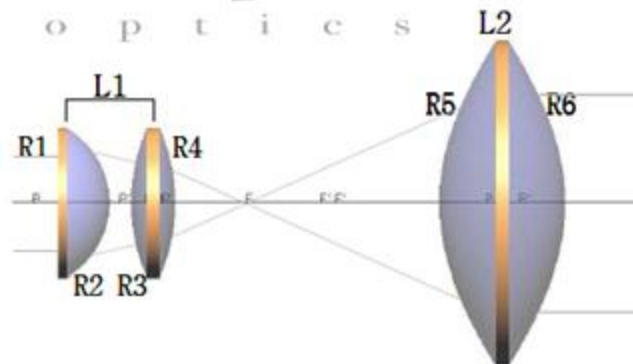
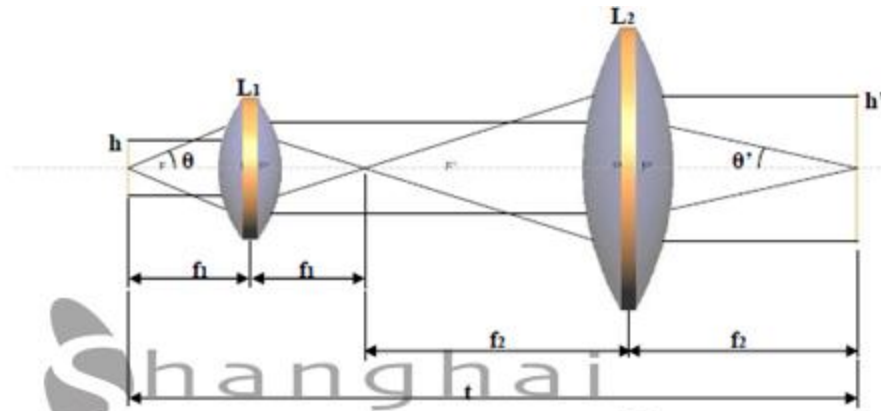
Illumination Lenses

It guides lights from Rod Integrator into valid dimensions of DMD

$$(m) = h' / h$$

$$= f_2 / f_1$$

$$(t) = 2 * (f_1 + f_2)$$



< JT30 >

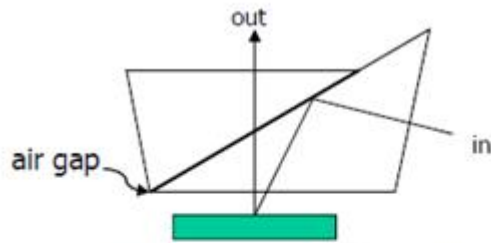
$f_1 = 9.53$, $f_2 = 22.79$

※ $m = 2.39$

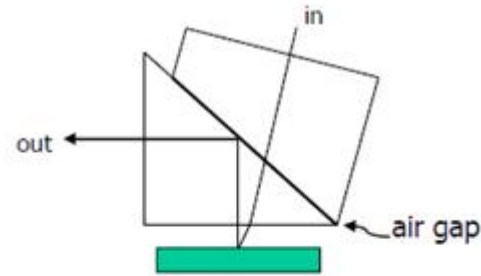
Optical Elements

(TIR Prism)

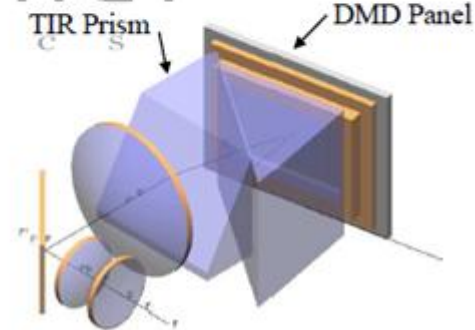
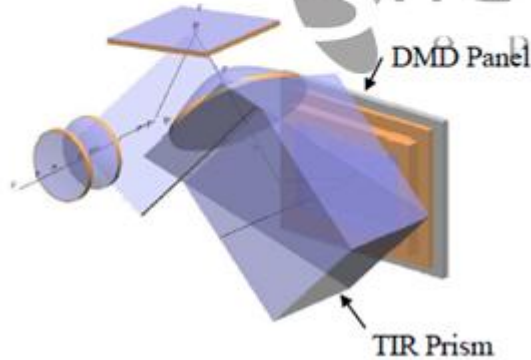
Using air gaps between two prism, it makes selective reflect of transmission



<in : reflect, out : transmission>



<in : transmission, out : Reflect >



SCR

● Operation

※SCR= Sequential Color Recapture

Scroll Lighting Whole RGB on DMD in timely sequence



Optical Elements

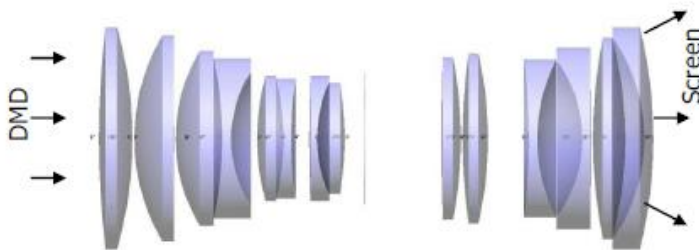
Projection Lens

It transmit Active Area of DMD on Screen

Fixed Focus Lens – Cannot control the zoom in Fixed distance

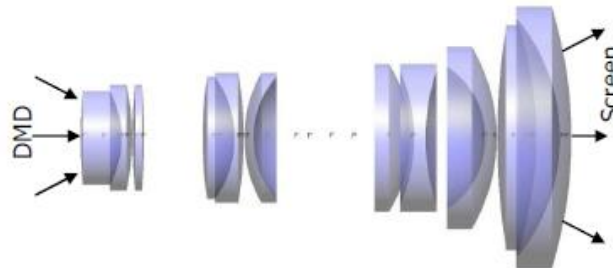
Variable Focus Lens (Zoom Lens) – Can control the screen size with zoom in Fixed distance

< Telecentric Type Zoom Lens >



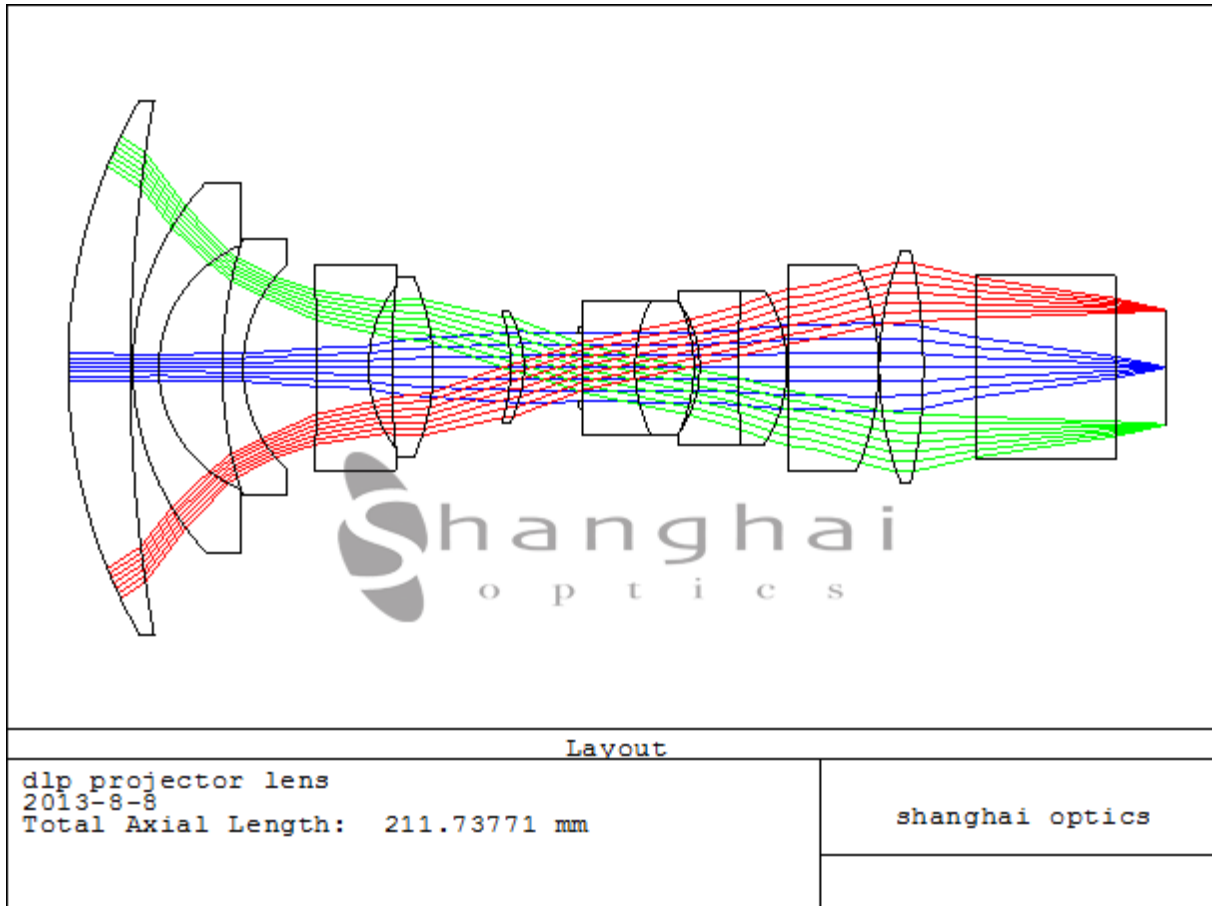
Used in DLP Engine with TRI Prism

< Converging Type Zoom Lens >

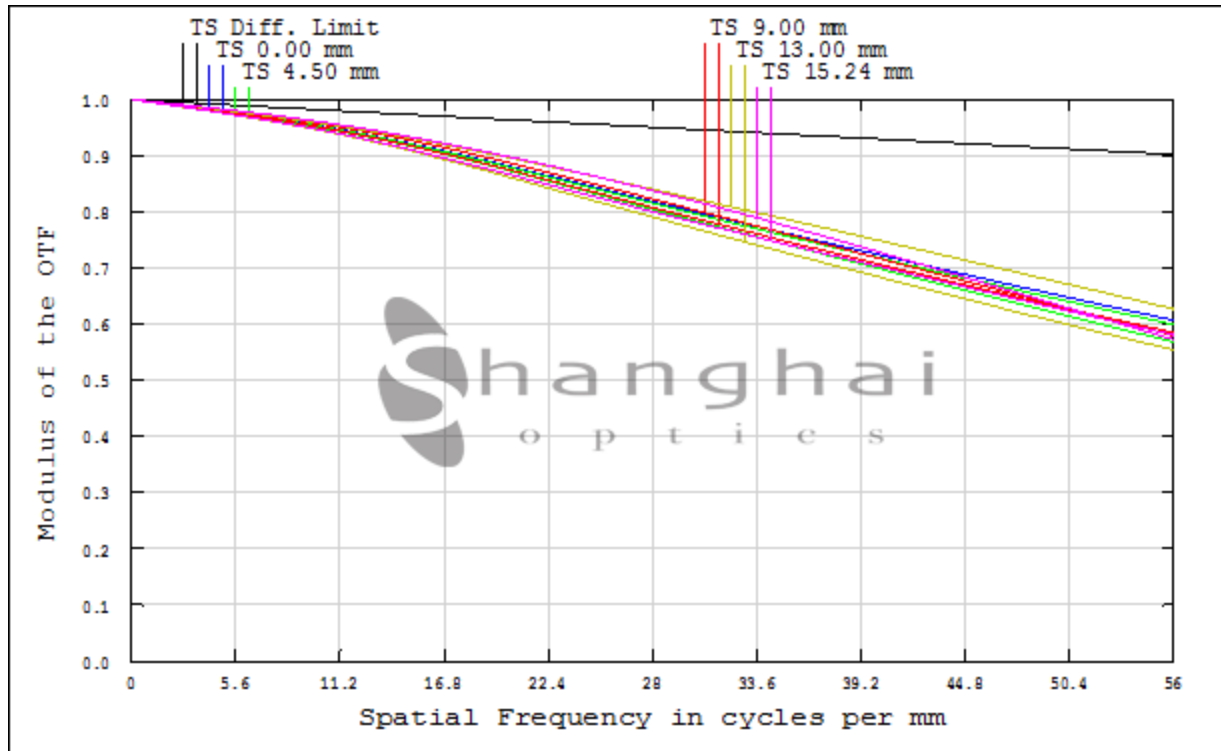


Used DLP Engine with Non-TIR Prism

Layout



MTF Analysis



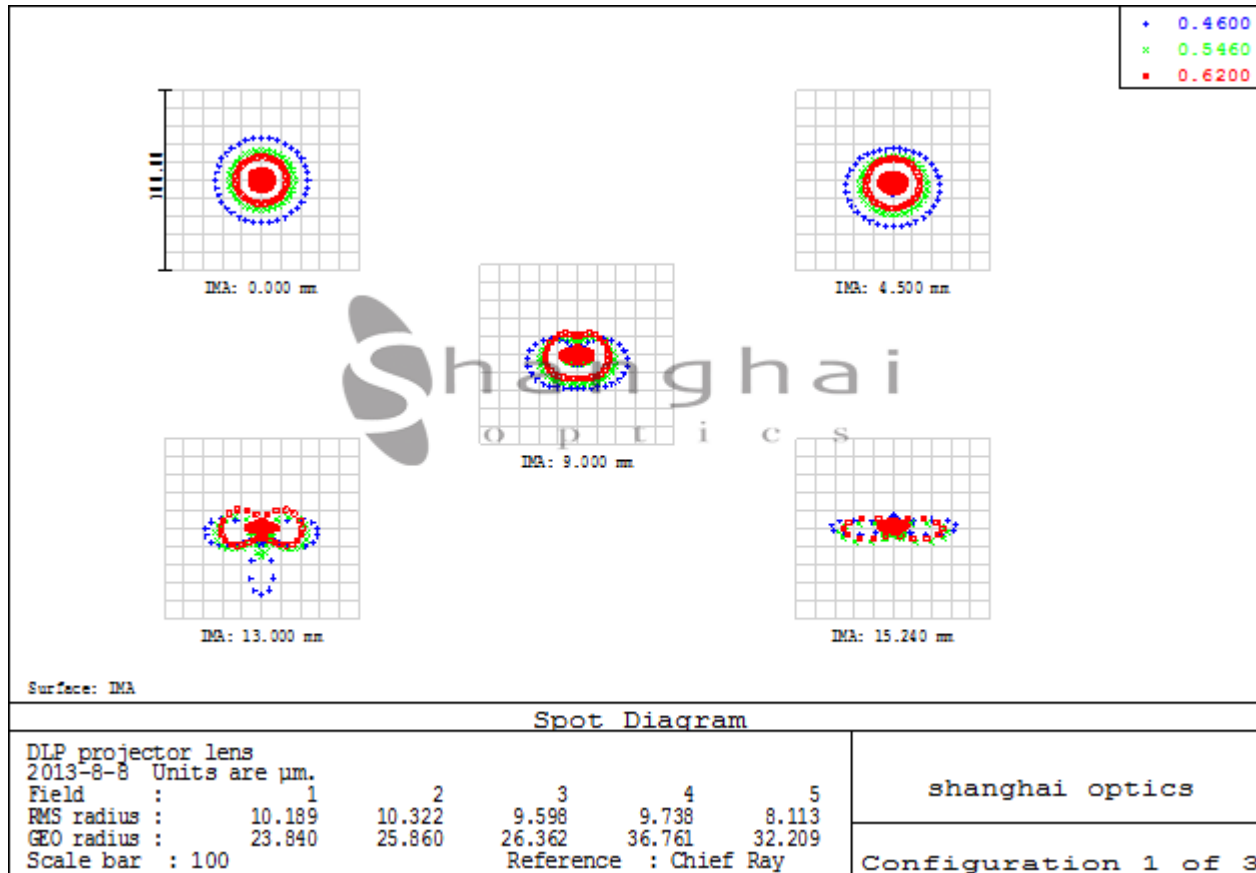
Polychromatic Diffraction MTF

DLP projector lens
2013-8-8
Data for 0.4600 to 0.6200 μm .
Surface: Image

shanghai optics

Configuration 1 of 3

Spot Diagram





THANKS