

MPI Optical Solutions

MPI is working closely with leading optical suppliers to develop and optimize dedicated microscope solutions. This provides leading edge on-wafer observation and navigation. The selected optics are a perfect fit to the specific requirements of accurate probe placement on DC/CV, RF and mmW pads.

Single tube solution provides a large working distance at high magnification. Small form factors are ideal for RF, mmW and load-pull applications due to space restrictions inherent with the integration of test heads/tuners requiring shortest distance to DUT.

MPI is also offers state of the art high-power microscopes such as Motic PSM-1000 and Mitutoyo FS70 configured to address internal-node probing or Failure Analysis application requirements.

All optics include TV ports for being used with a number of 1080p HDMI cameras. Images are displayed on the monitor without additional computer requirements:

- Image can be captured directly onto the built-in mini SD card
- Remote control and/or direct camera buttons for various settings
- All required cables are included

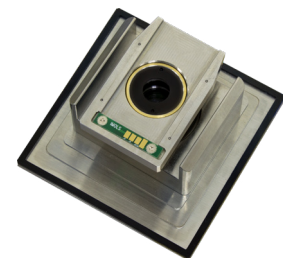
MPI iMAG® SERIES

MPI iMAG® Series are unique high resolution digital imaging systems, designed especially for MPI manual and automated probe systems by providing an unsurpassed color image quality and ultra-fast color frame rate video speed for an optimal and very convenient wafer navigation.

The dedicated optical design guarantees that one camera pixel is always smaller than the optical resolving power of the used objective lenses, so that the 40x zoom range is limited finally by the performance of the M Plan APO optics only.

The large 1.1 inch, 6.55 MP quadratic sensor delivers the maximum of optically possible field of view (FOV) without any edge shadow effects and by iMAG-II, one additional second 12MP camera offers maximum on optical resolution.

iMAG® Series microscopes are equipped with automated objective lens detection system, so that SENTIO® will recognize it automatically as soon is placed in. The software will memorize the corresponding objective data, and all automated features can be performed right away without the need of additional pixel-to-micrometer calibration. The operation of MPI Automated probe systems using iMAG® Series digital imaging systems are identified by intuitive, easy, safety and high productivity operation.



Automatic objective lens detection system

Main Features

| | iMAG-M | iMAG | iMAG Pro | iMAG-II | iMAG-II Pro |
|--------------------------|------------------------------|------|----------|-------------------|-------------|
| Max. video resolution | 6.55 MP color | | | 12 MP color | |
| Max. video speed | 20 fps real color frame rate | | | | |
| Max. picture resolution | 2560 x 2560 pixel | | | 4024 x 3036 pixel | |
| Max. lens Z drive range* | N/A | N/A | 4 mm | N/A | 4 mm |
| Automatic lens detection | N/A | | | Yes | |
| Lens compatibility | With any M Plan lenses | | | | |

*Depends on system's type and configuration

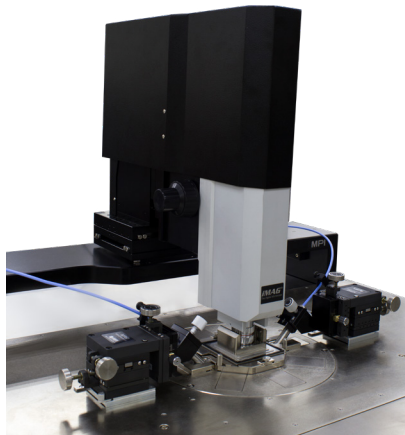
Optical Specification

| Objective Lens ⁽¹⁾ | Optical Resolution ⁽²⁾ [μm] | N.A. | Working Distance [mm] | Depth of Focus ⁽¹⁾ [± μm] | Max. FOV [μm] ⁽³⁾ | |
|-------------------------------|--|-------|-----------------------|--------------------------------------|------------------------------|------|
| | | | | | H | V |
| 2x | 5.0 | 0.055 | 34 | 90.91 | 9850 | 9850 |
| 5x LWD | 2.0 | 0.13 | 45 | 14.03 | 3940 | 3940 |
| 5x | 2.0 | 0.14 | 34 | 14.03 | 3940 | 3940 |
| 10x | 1.0 | 0.28 | 33.5 | 3.51 | 1970 | 1970 |
| 20x | 0.7 | 0.42 | 20 | 1.56 | 980 | 980 |

(1) 5x lens is part of standard delivery

(2) Optical resolution and focal depth based on reference wavelength of 550 nm. The optical resolution is identical over the entire FOV (!)

(3) Max. FOV is valid for all iMAG Series



iMAG®-M – the digital microscope for MPI manual probe systems



MPI iMAG® embedded within SENTIO® Software Suite

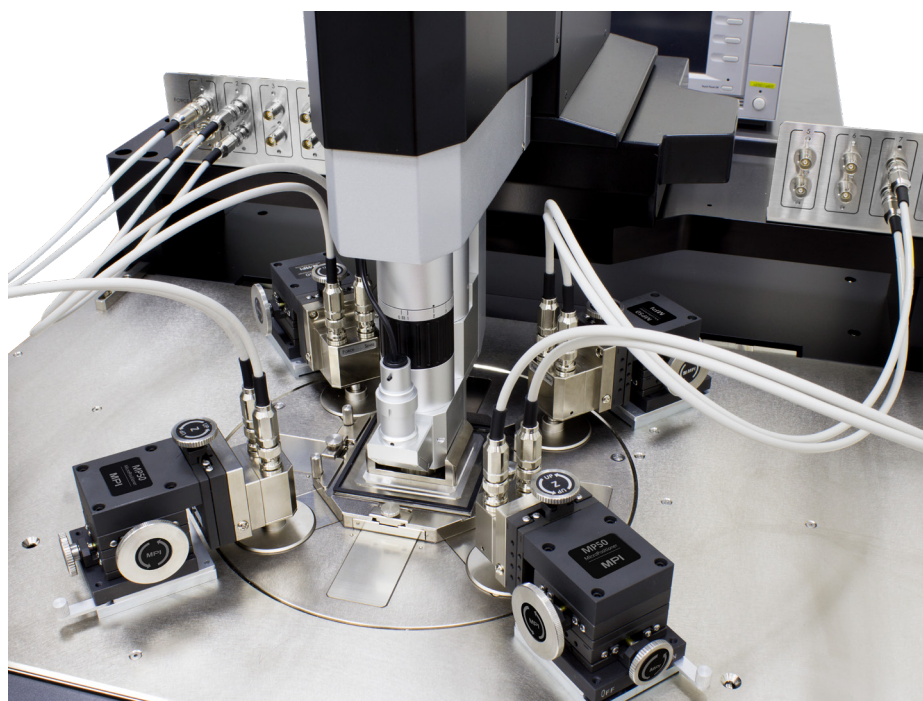
MPI Automated MegaZoom AMZ12

- The non-plus-mega, single tube microscope with 12x programmable zoom
- Unique combination of large field of view and extremely high magnification
- Max. 46.2 mm working distance for stress-free probe replacement, cable and different RF probe reconfiguration
- Up to 1.68 µm optical resolution for excellent small pads probing and accurate placement on calibration standards
- TV port – standard c-mount
- Dedicated for all DC/CV, RF, mmW and load pull measurements
- Ideally combined with MPI XYZ or just Z programmable microscope movements



| Objective Lens | 7x | 15x | 15x LWD* |
|--------------------------|--|-------------------|------------------------------|
| Optical zoom range | 0.58x - 7.0x (programmable) | | 1.25x - 15.0x (programmable) |
| WD | 40.6 mm | 46.2 mm | 101 mm |
| Resolution | 20.6 - 2.9 µm | | 11.18 - 1.68 µm |
| DOF | ± 1074.22 - ± 21.54 µm | | ±305.56 - ±6.88 µm |
| N.A. | 0.016 - 0.113 | | 0.03 - 0.2 |
| FOV (H x V) w. SENTIO® | 12.19 x 9.14 - 1.01 x 0.76 mm | | 5.66 x 4.24 - 0.47 x 0.35 mm |
| LED coaxial illumination | 5 W | | 5 W |
| Power supply | 110 V / 220 V, 8 W, CE, dimmable and On/Off programmable control | | |
| Dimensions (W x D x H) | 45 x 113 x 225 mm | 45 x 113 x 208 mm | 66 x 113 x 301 mm |
| Weight | Approx. 1200 g | Approx. 1200 g | Approx. 2900 g |

*OP-AMZ12LWD-XXX



MPI TS2000-SE with AMZ12 microscope

MPI MegaZoom MZ12

- The non-plus-mega, single tube microscope with 12x zoom
- Unique combination of large field of view and extremely high magnification
- Max. 46.2 mm working distance for stress-free probe replacement, cable and different RF probe reconfiguration
- Up to 1.68 μm optical resolution for excellent small pads probing and accurate placement on calibration standards
- TV port – standard c-mount
- 35 mm focus block with fine and fast movement, 90° tilting
- Dedicated for all DC/CV, RF, mmW and load pull measurements



| Objective Lens | 7x | 15x | 15x LWD* |
|--------------------------|---|-------------------------------------|-------------------------------------|
| Optical zoom range | 0.58x - 7.0x | 1.25x - 15.0x | 1.25x - 15.0x |
| WD | 40.6 mm | 46.2 mm | 101 mm |
| Optical resolving power | 20.6 - 2.9 μm | 11.18 - 1.68 μm | 11.18 - 1.68 μm |
| DOF | $\pm 1074.22 - \pm 21.54 \mu\text{m}$ | $\pm 305.56 - \pm 6.88 \mu\text{m}$ | $\pm 305.56 - \pm 6.88 \mu\text{m}$ |
| N.A. | 0.016 - 0.113 | 0.03 - 0.2 | 0.03 - 0.2 |
| FOV (H x V) w. ST-HD2MP | 9.38 x 5.33 - 0.78 x 0.44 mm | 4.35 x 2.47 mm - 0.36 x 0.21 mm | 4.35 x 2.47 mm - 0.36 x 0.21 mm |
| FOV (H x V) w. CAM-1080 | 12.41 x 6.98 - 1.03 x 0.58 mm | 5.76 x 3.24 - 0.48 x 0.27 mm | 5.76 x 3.24 - 0.48 x 0.27 mm |
| FOV (H x V) w. CAM-4000P | 13.24 x 7.45 - 1.10 x 0.62 mm | 6.14 x 3.46 - 0.51 x 0.29 mm | 6.14 x 3.46 - 0.51 x 0.29 mm |
| FOV (H x V) w. SENTIO® | 12.19 x 9.14 - 1.01 x 0.76 mm | 5.66 x 4.24 - 0.47 x 0.35 mm | 5.66 x 4.24 - 0.47 x 0.35 mm |
| LED coaxial illumination | 5 W | 5 W | 5 W |
| Power supply | 110 V / 220 V, 8 W, CE, manually dimmable and On/Off remote control | | |
| Dimensions (W x D x H) | 45 x 80 x 225 mm | 45 x 80 x 208 mm | 66 x 113 x 301 mm |
| Weight | Approx. 1000 g | Approx. 1000 g | Approx. 2900 g |

*OP-MZ12LWD-XXX

MPI SuperZoom SZ12

- 12x zoom single tube microscope
- Large 84 mm working distance for stress-free probe replacement and test heads/load-pull tuner integration
- 3.4 μm optical resolution for small pads probing and accurate placement on calibration standards
- TV port – standard c-mount
- 35 mm focus block with fine and fast movement, 90° tilting or linear Z, depends on the system's movement
- Standard coaxial LED illumination, ring illumination as option available (from MZ12)
- Dedicated for all DC/CV, RF, mmW and load pull measurements



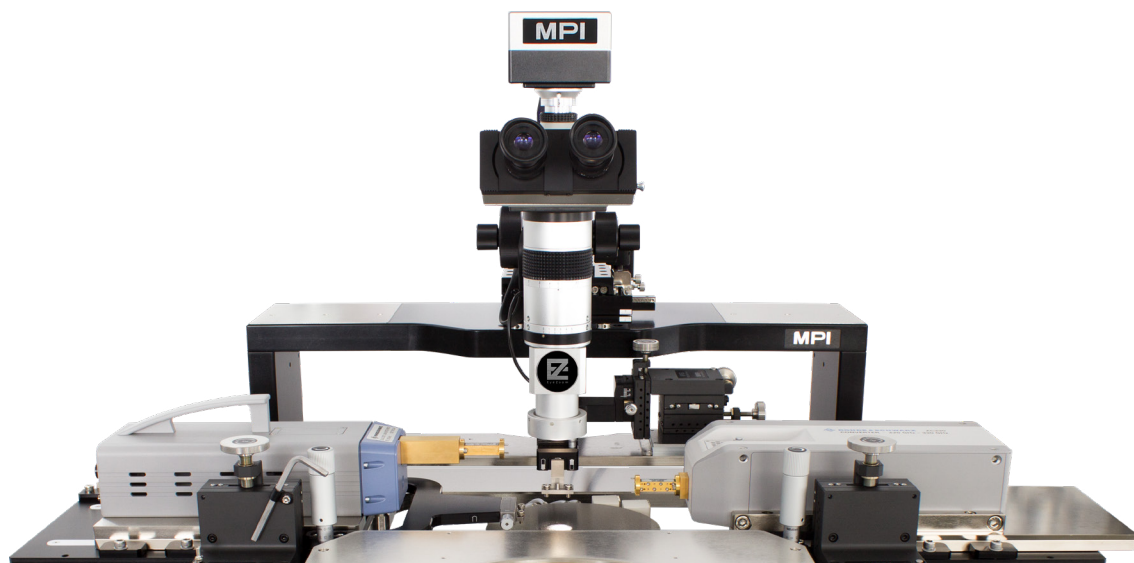
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| Optical zoom range | 0.83x - 10.0x |
| Objective/ Auxiliary lens* | 1x |
| WD | 86 mm |
| Optical resolving power | 16.78 - 3.36 μm |
| DOF | $\pm 688 - \pm 28 \mu\text{m}$ |
| N.A. | 0.02 - 0.1 |
| FOV (H x V) w. ST-HD2MP | 4.3 x 5.7 - 0.36 x 0.48 mm |
| FOV (H x V) w. CAM-1080 | 8.67 x 4.88 - 0.72 x 0.41 mm |
| FOV (H x V) w. CAM-4000P | 9.25 x 5.20 - 0.77 x 0.43 mm |
| TV port / C mount* | 1x |
| Illumination* | LED coaxial illumination, 1 W |
| Power supply* | 100 - 240 V, 1 W |
| Dimensions (W x D x H)* | 46 x 74.5 x 241 mm |
| Weight* | 890 g |

MPI EyeZoom EZ10

- The unique microscope with ergonomically constructed trinocular eyepiece tube and 10x optical zoom
- Excellent optical resolving power down to 2 μm
- 90 mm working distance for stress-free probe replacement, cable and different RF probe reconfiguration
- Optional ring-light illumination (in addition to the coaxial light) for outstanding visibility on different materials, such as calibration standards and different wafer pads
- Dedicated for all RF, mmW and load pull measurements



| | |
|----------------------------------|--|
| Trinocular head | Widefield trinocular tube, 20° optical observation angle |
| Eyepiece | WF 20x, incl. collapsible rubber eye-guards |
| Optical pass ratio | Eyepiece : Camera C-mount = 0% : 100% or 100% : 0% |
| Optical magnification (eyepiece) | 17x - 170x |
| IPD (inter-pupillary distance) | Adjustable range from 55 – 70 mm |
| Optical zoom range | 0.85x - 8.5x (10:1) |
| Aperture diaphragm | Adjustable field of depth and contrast, in 5 steps |
| WD | 90 mm |
| Optical resolving power | 2.0 μm |
| FOV (D) | 10.6 – 1.06 mm (20x eyepiece) |
| FOV (H x V) w. ST-HD2MP | 6.40 x 3.64 – 0.64 x 0.36 mm |
| FOV (H x V) w. CAM-1080 | 8.47 x 4.76 - 0.85 x 0.48 mm |
| FOV (H x V) w. CAM-4000P | 9.04 x 5.08 - 0.90 x 0.41 mm |
| FOV (H x V) w. SENTIO® | 8.32 x 6.24 - 0.83 x 0.62 mm |
| TV port (C-mount) | 1x |
| LED coaxial illumination | 5 W |
| LED ring illumination (option) | 24 pcs., 53 mm outer diameter |
| Power supply | 100 - 240 V, 7.2 W, CE |
| Dimensions (W x D x H) | 126 – 145 (eyepiece), 60 / 38 (tube / lens) x 195 x 305 mm |
| Weight | Approx. 2.5 kg |



MPI TS150-THZ with EZ10 microscope

MPI Zoom Z10

- Single tube microscope with 10x zoom
- Excellent optical resolving power down to 2 μm
- 90 mm working distance for stress-free probe replacement, cable and different RF probe reconfiguration
- Optional ring-light illumination (in addition to the coaxial light) for outstanding visibility on different materials, such as calibration standards and different wafer pads
- Dedicated for all RF, mmW and load pull measurements



| | |
|--------------------------------|--|
| Optical zoom range | 0.85x - 8.5x (10:1) |
| Aperture diaphragm | Adjustable field of depth and contrast, in 5 steps |
| WD | 90 mm |
| Optical resolving power | 2.0 μm |
| FOV (H x V) w. ST-HD2MP | 6.40 x 3.64 – 0.64 x 0.36 mm |
| FOV (H x V) w. CAM-1080 | 8.47 x 4.76 - 0.85 x 0.48 mm |
| FOV (H x V) w. CAM-4000P | 9.04 x 5.08 - 0.90 x 0.41 mm |
| FOV (H x V) w. SENTIO® | 8.32 x 6.24 - 0.83 x 0.62 mm |
| TV port (C-mount) | 1x |
| LED coaxial illumination | 5 W |
| LED ring illumination (option) | 24 pcs., 53 mm outer diameter |
| Power supply | 100 - 240 V, 7.2 W, CE |
| Dimensions (W x D x H) | 60 / 38 x 195 x 305 mm |
| Weight | Approx. 2.0 kg |

MPI Stereo Microscope ST45

- Entry level stereo microscope
- 25x eyepiece for max. magnification
- TV port – standard c-mount
- 50 mm focus block (for pivot or tilt mount)
- Dedicated for DC/CV measurements
- A TV port for higher magnification or other optics is recommended for RF measurements



| | |
|--------------------------|----------------------------------|
| Trinocular head | 45° inclined |
| Zoom objective lens | 0.67x - 4.5x (6.7:1) |
| Eyepiece | 25x |
| Auxiliary lens | 1.0x |
| Optical magnification | 16.8x - 112.5x |
| FOV (D) | 13.4 - 2.0 mm |
| FOV (H x V) w. CAM-1080 | 10.75 x 6.04 - 1.60 x 0.90 mm |
| FOV (H x V) w. CAM-4000P | 11.46 x 6.45 - 1.71 x 0.96 mm |
| WD | 100 mm |
| TV port (C-mount) | 1x |
| LED ring illumination | 60 pcs., external remote control |
| Power supply | 100 - 240 V, 7.2 W, CE |
| Dimensions (W x D x H) | 45 x 85.5 x 269 mm |
| Weight | Approx. 550 g |

Digital HDMI Cameras

ST-HD2MP

- Small form factor 1080p HDMI camera
- No requirement of a computer for standard operation
- 2 m HDMI cable included
- Wired control for white balance and other settings



CAM-1080

- 2 MP active resolution, 60p fps
- Versatile 1080p HDMI camera
- No requirement of a computer for standard operation
- The UI has functions: Still image capture, Recording, Freeze, Cross line, and Gallery
- Image can be captured directly onto the built-in 8 GB USB flash drive at 2 MP
- Video can be stored onto included 8 GB USB flash drive
- On Screen Display UI controlled by mouse
- Ideal for documentation on the MPI manual probe systems series
- Wireless mouse and HDMI cable are included



CAM-4000P

- 8 MP active resolution, 30 fps
- Versatile 4K HDMI camera
- No requirement of a computer for standard operation and measurement function
- The UI has functions: Measurement, Still image capture, Recording, Freeze, Cross line, and Gallery
- Image can be captured directly onto the included 16 GB micro SD card or self-prepare flash drive at 8 MP
- Video can be store onto included 16 GB micro SD card or self-prepare flash drive at 4K
- On Screen Display UI controlled by mouse
- Ideal for documentation on the MPI manual TS series
- USB 2.0 interface allows using the provided software: includes measurement, annotation and reporting tools
- Wireless mouse and all necessary cables are included



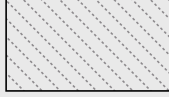
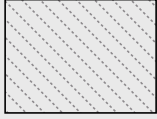
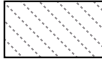
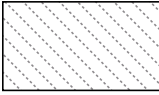
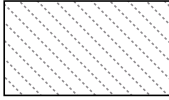
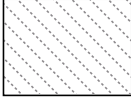
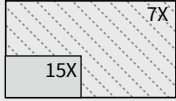
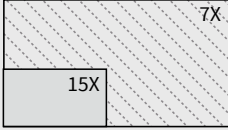
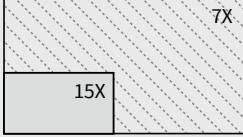
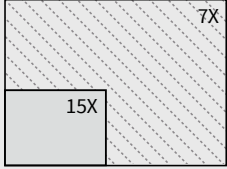
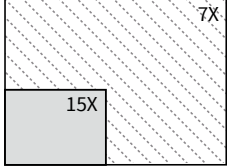


| Technical Specifications | ST-HD2MP | CAM-1080 | CAM-4000P |
|------------------------------------|---------------------------------|--|--|
| Sensor type | CMOS | CMOS | CMOS |
| Sensor size | 1/2.8 in | 1/2 in | 1/1.8 in |
| Resolution (total pixel) | 1936 x 1096 (2 MP) | 1920 x 1080 (2 MP) | 1920 x 1080 (2 MP) |
| Pixel size | 2.8 x 2.8 µm | 3.75 x 3.75 µm | 2.0 x 2.0 µm (UHD) 4.0 x 4.0 µm (FHD) |
| Live Display Mode (through HDMI) | 1920 x 1080 (Full HD) @ 60 fps* | 1920 x 1080 (Full HD) @ 60 fps* | 3840 x 2160 (Ultra HD) @ 30 fps 1920 x 1080 (Full HD) @ 30 fps |
| Live Display Mode (through USB) | N/A | N/A | 3840 x 2160 (Ultra HD) @ 20 fps |
| Memory card included | N/A | 32 GB Flash drive | 16GB SD card |
| Capture format - video | N/A | Full HD 1980 x 1080 (2.0 MP) | 4K(30fps@3840*2160) H264/H265 encoded MP4 file in SD Card |
| On-board software (over the mouse) | N/A | Still image capture, Freeze, Cross line, Gallery | Zoom, Mirror, Comparison, Freeze, Measure, Cross, Browser Function |

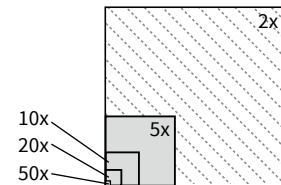
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|-----------------------|------------------------------------|------------------------------------|---|
| Extra software | N/A | N/A | MotiConnect for Android/iOS; Motic Images Plus 3.1 for Windows/Mac OS |
| White balance | Automatic | Automatic, manual | Automatic, manual |
| Remote control | Wired RC-HD133 | Yes, mouse control with screen UI | |
| Power supply | DC 12V AC Adapter, 110 / 220 V, CE | DC 12V AC Adapter, 110 / 220 V, CE | DC 12V AC Adapter, 110 / 220 V, CE |
| Dimension (W x D x H) | 40 x 40x 51.1 mm | 61 x 61 x 76 mm | 78 x 66 x 89 mm |
| Weight | Approx. 120 g | Approx. 270 g | Approx. 439 g |

*Frames per second under optimal illumination conditions.

Maximal Field of View (FOV) Overview

| | ST-HD2MP | CAM-1080 | CAM-4000P | SENTIO®-3MP |
|------------|---|---|--|---|
| Z10 / EZ10 |  6.40 x 3.64 mm |  8.47 x 4.76 mm |  9.04 x 5.08 mm |  8.32 x 6.24 mm |
| SZ12 |  5.44 x 3.09 mm |  8.67 x 4.88 mm |  9.25 x 5.20 mm |  7.07 x 5.30 mm |
| MZ12 |  7x: 9.38 x 5.33 mm 15x: 4.35 x 2.47mm |  7x: 12.41 x 6.98 mm 15x: 5.76 x 3.24 mm |  7x: 13.24 x 7.45 mm 15x: 6.14 x 3.46 mm |  7x: 12.19 x 9.14 mm 15x: 5.66 x 4.24 mm |
| AMZ12 | N/A | N/A | N/A |  7x: 12.19 x 9.14 mm 15x & 15x LWD: 5.66 x 4.24 mm |

| iMAG® | |
|-------|----------------|
| 2x | 9.85 x 9.85 mm |
| 5x | 3.94 x 3.94 mm |
| 10x | 1.97 x 1.97 mm |
| 20x | 0.98 x 0.98 mm |
| 50x | 0.39 x 0.39 mm |



See MPI Corporation's Terms and Conditions of Sale for more details.

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www.mpi-corporation.com/ast/support/local-support-worldwide

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MPI Global Presence

