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.
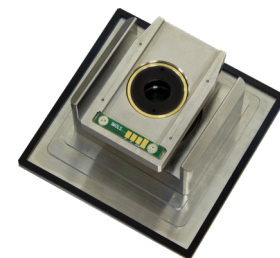
Automatic objective lens detection system

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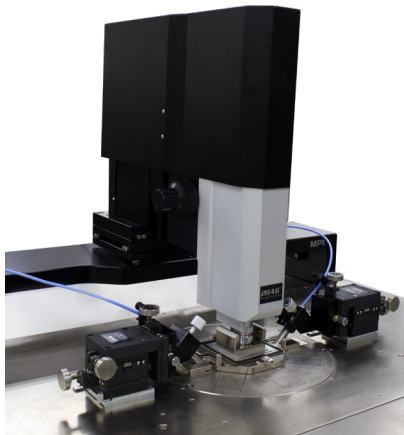
iMAG®-M – the digital microscope for MPI manual probe systems

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
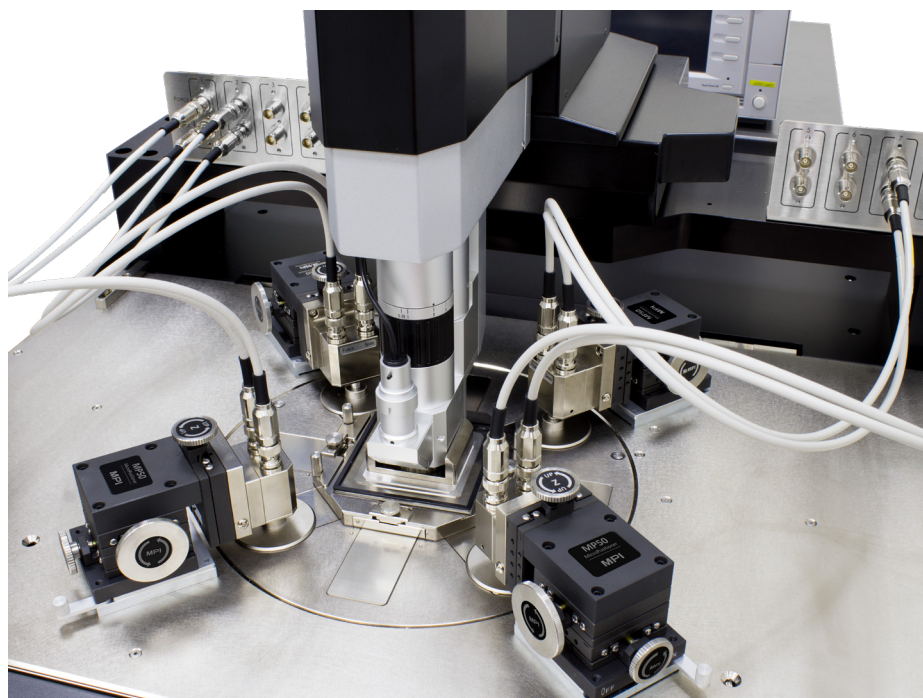
MPI TS2000-SE with AMZ12 microscope

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
Optical zoom range	0.58x - 7.0x	1.25x - 15.0x
WD	40.6 mm	46.2 mm
Optical resolving power	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. 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
FOV (H x V) w. MPI 1080	9.10 x 5.12 - 0.75 x 0.42 mm	4.22 x 2.38 - 0.35 x 0.20 mm
FOV (H x V) w. MOTICAM 1080	9.66 x 5.43 - 0.80 x 0.45 mm	4.48 x 2.52 - 0.37 x 0.21 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
LED coaxial illumination	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
Weight	Approx. 1000 g	

MPI SuperZoom SZ10

- 10x zoom single tube microscope
- Incredible 95 mm working distance for stress-free probe replacement and test heads/tuner integration
- 2.5 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
- Dedicated for all DC/CV, RF, mmW and load pull measurements

Optical zoom range	1.0x - 10.0x
WD	95 mm
Optical resolving power	8.8 - 2.5 µm
DOF	± 190.44 - ± 14.87 µm
N.A.	0.038 - 0.136
FOV (H x V) w. ST-HD2MP	5.44 x 3.09 - 0.54 x 0.31 mm
FOV (H x V) w. MPI 1080	5.28 x 2.97 - 0.53 x 0.30 mm
FOV (H x V) w. MOTICAM 1080	5.6 x 3.15 - 0.56 x 0.32 mm
FOV (H x V) w. SENTIO®	7.07 x 5.30 - 0.71 x 0.53 mm
LED coaxial illumination	5 W
Power supply	110 V / 220 V, 8 W, CE, manually dimmable
Dimensions (W x D x H)	46 x 85 x 300 mm
Weight	Approx. 940 g

MPI EyeZoom EZ10

- The unique microscope with ergonomically constructed trinocular eyepiece tube and 10x optical zoom
- Excellent optical resolving power down to 2µm
- 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. MPI 1080	6.21 x 3.49 - 0.62 x 0.35 mm
FOV (H x V) w. MOTICAM 1080	6.59 x 3.71 – 0.66 x 0.37 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
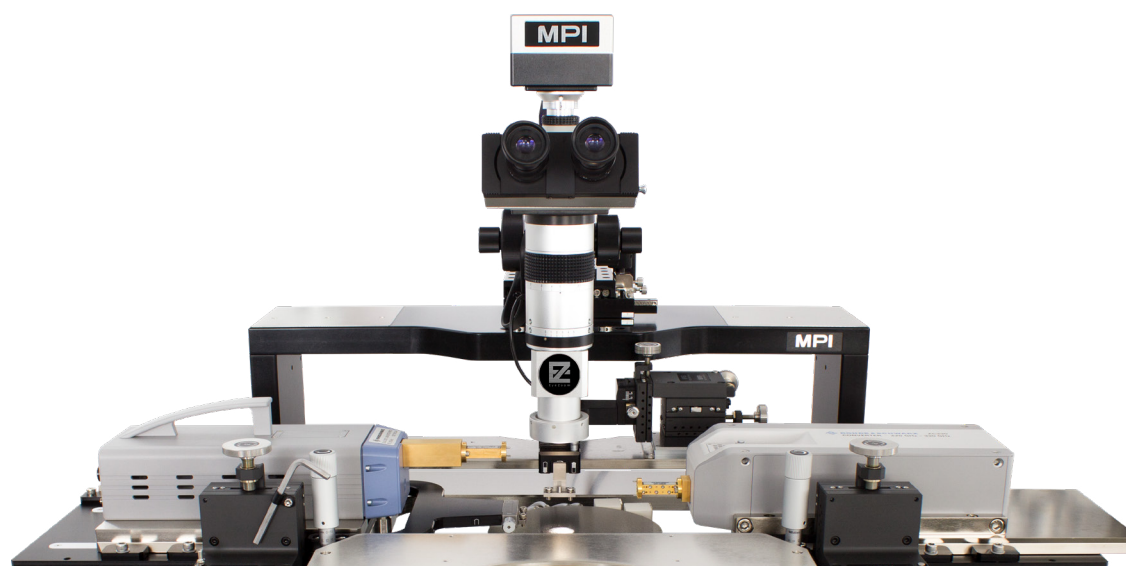
MPI TS150-THZ with EZ10 microscope

MPI Zoom Z10

- Single tube microscope with 10x zoom
- Excellent optical resolving power down to 2µm
- 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. MPI 1080	6.21 x 3.49 - 0.62 x 0.35 mm
FOV (H x V) w. MOTICAM 1080	6.59 x 3.71 – 0.66 x 0.37 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
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
- Image can be captured directly onto the built-in 8 GB USB flash drive card at 2 MP
- On Screen Display UI controlled by mouse
- Ideal for documentation on the MPI manual probe systems series
- Wireless mouse and HDMI cable are included
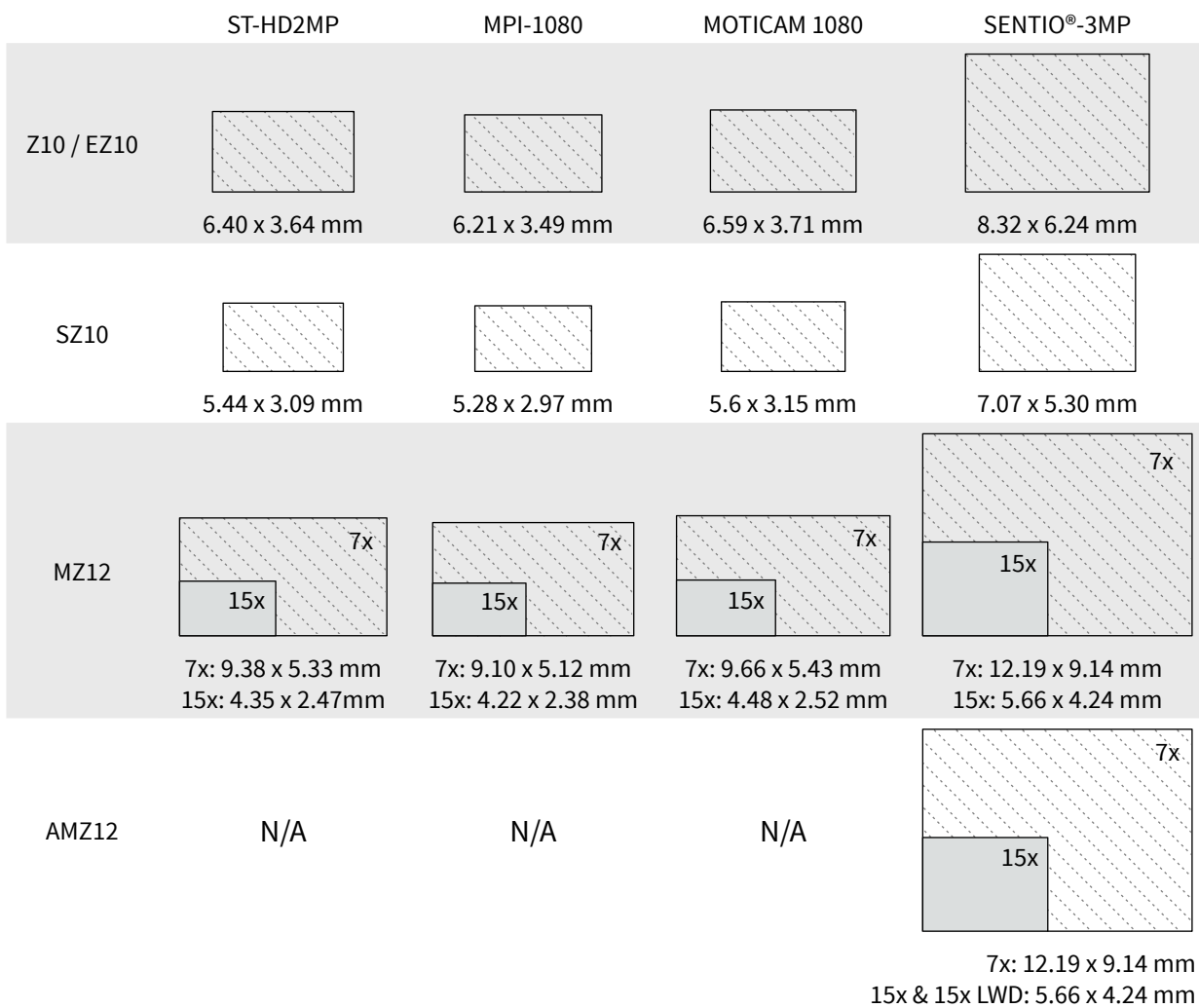
CAM-1080P
- 2 MP active resolution, 60 fps
- Versatile 1080 p HDMI camera
- No requirement of a computer for standard operation
- Image can be captured directly onto the included 16 GB micro SD card at 2 MP
- On Screen Display UI controlled by mouse
- Ideal for documentation on the MPI manual TS series
- USB 2.0 interface allows using the provided software: includes measurement, annotation and reporting tools
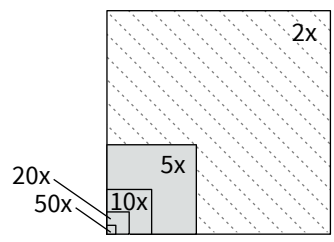- Wireless mouse and all necessary cables are included

Technical Specifications	ST-HD2MP	MPI CAM-1080	MPI CAM-1080P
Sensor type	CMOS	CMOS	CMOS
Sensor size	1/2.8 in	1/3 in	1/2.8 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	2.75 x 2.75 µm	2.8 x 2.8 µm
Live Display Mode (through HDMI)	1920 x 1080 (Full HD) @ 60 fps*		
Live Display Mode (through USB)	N/A	N/A	1920 x 1080 (Full HD) @ 30 fps
Memory card included	N/A	8 GB Flash drive	16 GB Micro SD card
Capture format (on SD-card)			
Still Image	N/A	1980 x 1080 (2.0 MP)	
Video	N/A	N/A	Full HD 1980 x 1080 (2.0 MP)
On-board software (over the mouse)	N/A	Still image capture, Freeze, Cross line, Gallery	Still image capture, Live image record, Zoom in & out, Magnifier, ROI, Mirror, Rotation, Split, Freeze, Cross line, Gallery
Extra software	N/A	N/A	Motic Image Plus 3.0 PC/OS
White balance	Automatic	Automatic, manual	
Remote control	Wired RC-HD133	Over the mouse (Bluetooth mouse included)	
Power supply	DC 12V AC Adapter, 110 / 220 V, CE	DC 12V AC Adapter, 110 / 220 V, CE, UL, PSE	DC 12V AC Adapter, 110 / 220 V, CE, FCC, UL, PSE
Dimension (W x D x H)	40 x 40x 51.1 mm	61 x 61 x 76 mm	80 x 88.8 x 61.8 mm
Weight	Approx. 120 g	Approx. 270 g	Approx. 275 g

Frames per second under optimal illumination conditions.

Maximal Field of View (FOV) Overview

	ST-HD2MP	MPI-1080	MOTICAM 1080	SENTIO®-3MP
Z10 / EZ10	6.40 x 3.64 mm	6.21 x 3.49 mm	6.59 x 3.71 mm	8.32 x 6.24 mm
SZ10	5.44 x 3.09 mm	5.28 x 2.97 mm	5.6 x 3.15 mm	7.07 x 5.30 mm
MZ12	7x: 9.38 x 5.33 mm 15x: 4.35 x 2.47mm	7x: 9.10 x 5.12 mm 15x: 4.22 x 2.38 mm	7x: 9.66 x 5.43 mm 15x: 4.48 x 2.52 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.

MPI Global Presence

Direct contact:
Asia region: ast-asia@mpi-corporation.com
EMEA region: ast-europe@mpi-corporation.com
America region: ast-americas@mpi-corporation.com

MPI global presence: for your local support, please find the right contact here:
www.mpi-corporation.com/ast/support/local-support-worldwide