

# MRS™ Sensor Technology

High Precision Optical Sensor for Semiconductor Applications

MRS SENSOR

## Measure. Analyze. Improve.

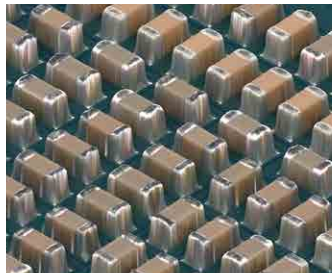
CyberOptics is a leading global developer and manufacturer of high precision sensing technology solutions. CyberOptics' 2D and 3D sensors are used in SMT, semiconductor and metrology markets to significantly improve yields and productivity.

## High Precision Accuracy with Multi-Reflection Suppression™ (MRS) Sensor Technology

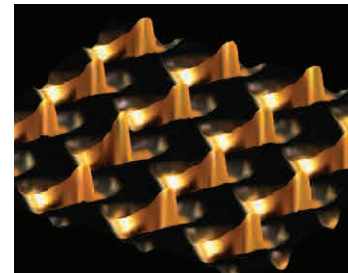
Proprietary MRS sensor technology, deemed best-in-class, enables metrology grade accuracy by inhibiting optical measurement distortions and reflections. CyberOptics' unique sensor architecture simultaneously captures and transmits multiple images in parallel while proprietary 3D fusing algorithms merge the images together. The result is ultra-high quality 3D images and high-speed inspection.



Solder Ball and Bump



SMT Packaging



CPU Socket

## Metrology-Grade Accuracy

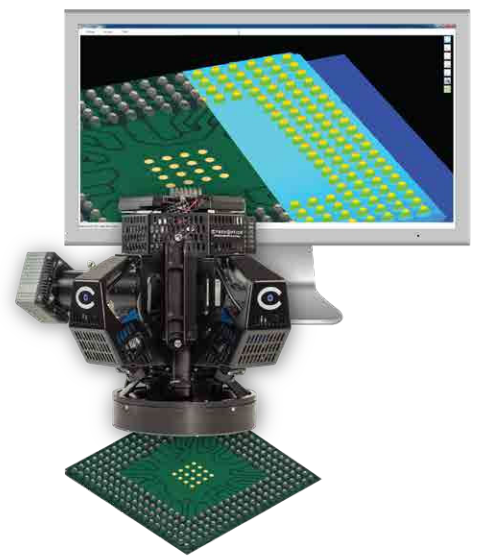
- Achieve metrology-grade accuracy with MRS-enabled technology.
- Attain repeatable and reproducible measurements for metrology, semiconductor, microelectronics and SMT applications.

## Fast, Superior Inspection Performance

- Achieve high speed, highly accurate, 3D and 2D metrology and inspection for critical packaging features.
- Significantly speeds attaining coordinate measurements vs. traditional methods.
- Reduce engineering resource time.

## Versatility for Mid-End and Advanced Packaging Applications

- Measure and inspect a wide range of applications including CPU sockets, solder balls and bumps, IC packaging and other mid-end and advanced packaging applications.



IC Package

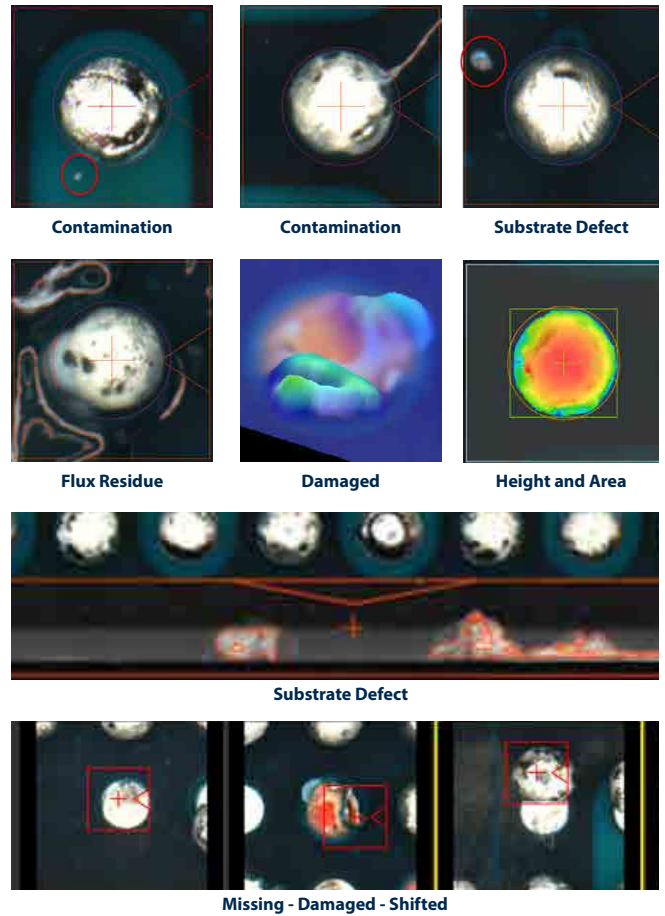
## Inspection Capabilities

CyberOptics has advanced the proprietary Multi-Reflection Suppression (MRS) sensor to an even finer resolution. The Ultra-High Resolution MRS sensor delivers superior inspection performance for socket metrology, advanced packaging, solder ball & bump, micro-electronic applications, and a variety of semiconductor applications where an even greater degree of accuracy and inspection reliability is critical.

The image resolution from the MRS Sensor enables 3D and 2D metrology and inspection for critical packaging features including:

- bump height and area
- coplanarity
- diameter and shape
- relative location
- contamination
- defects and variety of other measurements.

## Examples from CyberOptics AOI Software



Specifications	MRS Sensor (2D+3D) Two Models		Ultra High Resolution MRS Sensor (2D+3D)
Minimum Feature Diameter (µm)	130	180	110
FOV (mm)	26x26	36x36	21x21
Lateral Resolution (µm)	9.9	9.9	7
3D Sensor Height Resolution (µm)	0.2	0.3	0.2
Repeatability (µm) (3σ)	5	5	5
Accuracy (µm)	1	1	1
Height Measurement Range (mm)	2	3	2
3D Acquisition Time, typical (msec)	85	80	85
illumination	Integrated 2D Illumination		

**CYBEROPTICS®**

Contact CyberOptics today for more information

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