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MSX1200E/L/D X Ray Inspection System

High resolution micro-focus system, by new developed X ray generator.

Easy and safety operation system, by the original radiation prevention cabinet.

Best inspection system for after reworking of the BGA, and other electronic parts.

Easy maintenance system, by unit exchange of the X ray generator.

The angle of the image is changed to 0 to 60 degrees of Front and Back.

The angle of the image is changed to 0 to 30 degrees of left and right.

The manipulator enable viewpoint for 360 degrees.

The more clear image is obtained in D type, it is used digital I.I detector.

Abstract

MSX1200 is high resolution X rays inspection system of a 5 micron focus. It can be inspection of a detailed sample by sharp image.

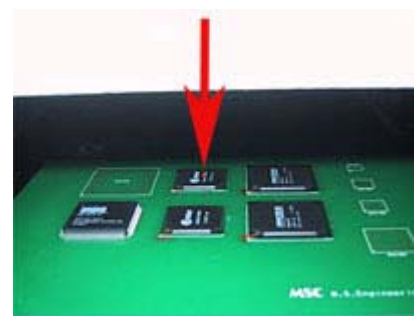
The life of the generator is guaranteed of 5000 hours. and the life time is managed by the counter in the system.

The XY table can be controlled by the motor, and position of X ray is displayed by laser pointer. The point can be monitor through the window of the door. Normally, the life of the x ray tube will be 10000 hours or more.

The irradiation angle of X Rays is changed to 0 to 60 degrees (model L type), and also left and right angle 0 to 30 degrees (model I/d tyoe), the angle of the XY table is fixation then.

The lamp of top of the system is blinking when the x ray generator is operating. All function of X ray are preserved by the interlock, It is immediately stopped when the door has opened at the system is operating.

The manipulator is a tool convenient for x ray fluoroscopy of small parts. it is rotated 360 degrees, and also it can be operated together irradiation angle change.



Laser Beam



The window of the door



MSX1200E/L/D X Ray Inspection System

Information of the X Ray

The X ray is an electromagnetic wave with short wave-length, it can pass through between an atom and atoms. The wavelength of visible is about several microns, but the x ray is about $\frac{1}{1000}$ and a penetration is in inverse proportion to the density. Generally, It is managed by the rule of the Government. It is because, the x ray gives a physiologically effect to a live-body.

MSX1000HR is managed of the radiation less than 1 micro Sv/ Hours / cm. It is lower than the color television, the CRT of the color television is always emitting the several micro Sv/H of radiation. and also there is same levels of radiation in the atmosphere always.

The radiation of MSX1000 is controlled by the very safety level. It is very safety zone.

Furthermore, MSX1000 is used of the X ray in the sealed box. and it is with sufficient interlock function.

Test Sample Images by MSX1200E/L/D

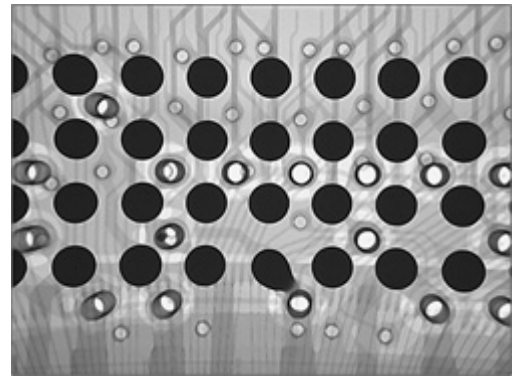
The image on the right is the BGA 33x, and also the image of 140x.

X Ray generator can be adjust of the voltage of 90 KV maximum. The penetration power will become strong if

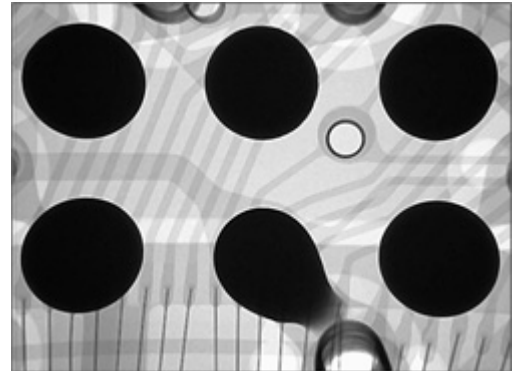
the voltage is high. And the current can be adjust of 40 micron-A maximum. the image will become bright if the current is large.

The X ray tube is by air cooling type, it will be operating continually. When unnecessary, the switch should be turn off for X ray generator, It will prolong of the life of the system.

The image on the monitor of MSX1200 obtained about 12--220 x from the original. Therefore, when an image over from the screen, it checks by moving of the XY table. The XY table is controlled by the switch on the body, and it can be programmable control. And if the image needed is obtained, the image data should be saved in the file, then the data can be adjust of the quality of the image by the function of the system.



55KV/ 22micro A/ 33x



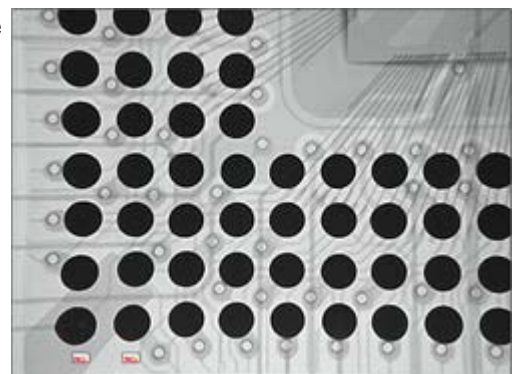
55KV/ 22micro A/140x

The image on the right is the BGA of 0 angle, and also the image of 60 degrees swings are added.

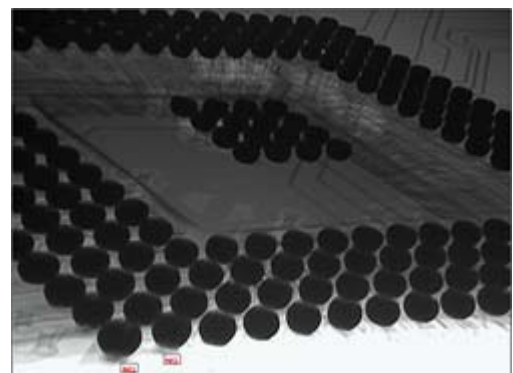
For the degree of angle os inclination, a top is 0, the next is 60 degrees. (MSX1200D is 0 to 50 degrees maximum).

In this case, it was able to see a solder ball open error,thus changed an angle and re-check.

The X ray tube is IXR-M316A, it is guaranteed of 5000 hours. And X ray I.I tube is E5877JCA1-2N/NU fo model E and E5877JCA1-2N/ND fo model L, and model D is used of E5877KXH2-P1K/2DC by Toshiba, They are guaranteed of 10000 hours. It will be the exchange for every unit, when those exchange is required. It means that maintenance is easy.



55KV 22 micron A/0-angle/40x



57KV 22 micro A -60 degrees

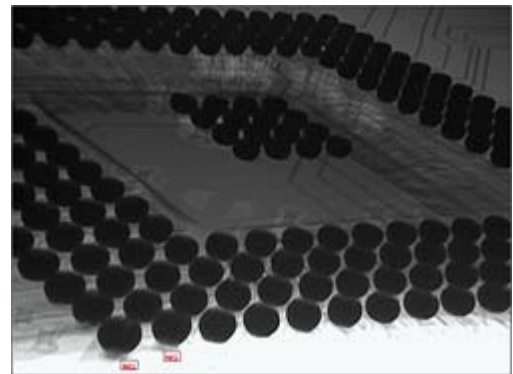
The image on the right is the BGA of 0 angle, and also the image of 60 degrees swings are added. For the degree of angle or inclination, a top is 0, the next is 60 degrees. (MSX1200D is 0 to 50 degrees maximum).

In this case, it was able to see a solder ball open error, thus changed an angle and re-check.

The X ray tube is IXR-M316A, it is guaranteed of 5000 hours. And X ray I.I tube is E5877JCA1-2N/NU for model E and E5877JCA1-2N/ND for model L, and model D is used of E5877KXH2-P1K/2DC by Toshiba, They are guaranteed of 10000 hours. It will be the exchange for every unit, when those exchange is required. It means that maintenance is easy.

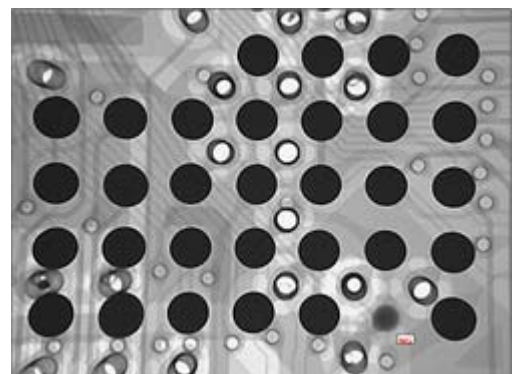


55KV 22 micron A/0-angle/40x



57KV 22 micro A -60 degrees

The image on the right is the BGA of 0 angle, In this case, it was able to see a solder ball missing error, thus changed an angle to 50 degrees and re-check.



55KV 22 micron A/0-angle/33x



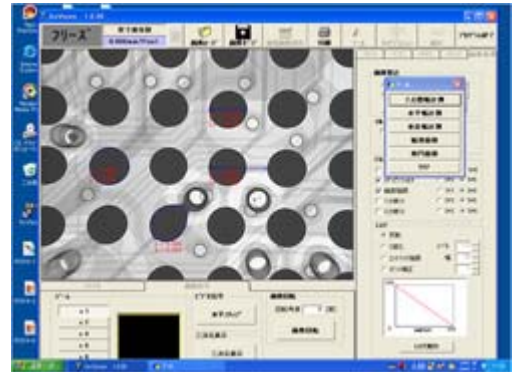
55KV 22 micro A -50 degrees

The image on the right is size of the BGA checking, the upper image is by auto checking,



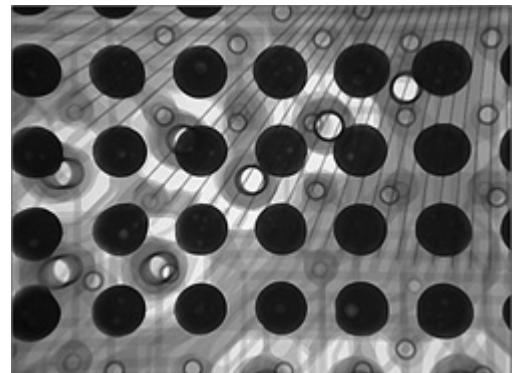
55KV 22 micron A/0-angle/53x

and lower image is by manual checking.



55KV 22 micro A /0-angle 53x

The image on the right is void image of the BGA.



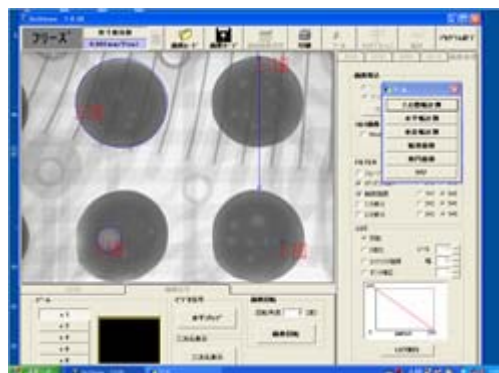
52KV 22 micron A/0-angle/78x

It is able to measured and automatically judgment, if setup the ratio of void beforehand.



52KV 22 micro A /0-angle/78x

It can be measured of the void, more precisely, if the image was more magnification.



60KV 22 micron A/0-angle/140x

The wire frame measurement also possible as below picture.



50KV 22 micro A /0-angle/78x

It can be measured of the coating void, as the right picture.



62KV 22 micron A/0-angle/53x

The hole gap is also measuring.



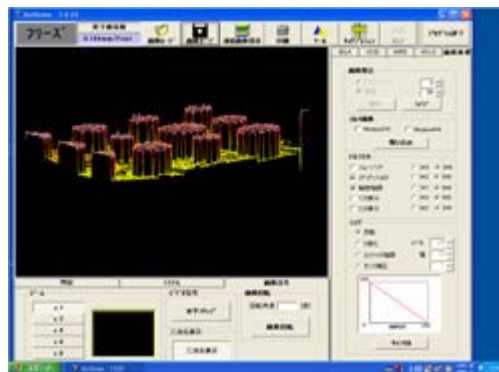
45KV 22 micro A /0-angle/23x

It can display 4 screens on 1 screen.



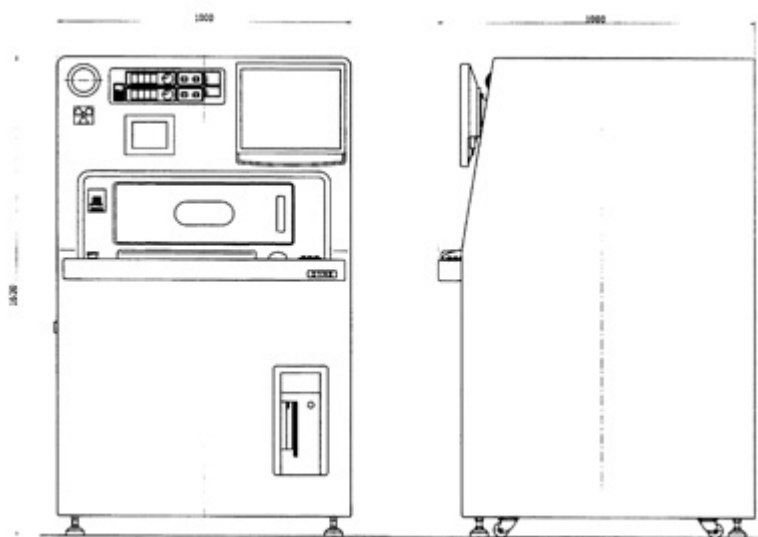
4-Display

MSX1200L/D can be displayed of 3 dimension image, it is by changed a seeing through angle by the front-back and left-right.



3D display

Dimensions



MSX1200E/L/D (1000x1630x1080mm)

MSX1200E/L/D (1000W x 1630H x 1080D mm)

Specifications

Items	Specifications		
	MSX1200E	MSX1200L	MSX1200D
Board Size	350x400mm max		
XY Table Stroke	200Yx200Xmm		
XY Table Control	Motor Controlled by touch panel		
XY Table Size	350W x 460D mm		
Position marker	Red marker by laser beam		
X Ray Source Voltage	90 KV max		
X Ray Tube Current	40 micro A		
Focus Size	5 micron m		
X Ray Tube	Enclosed Penetrated Type TOSHIBA IXR-M316A		
Cooling	Air cooling Closed		
Image Angle	0	F/B:0-60 R/L:0-30	F/B:0-50 R/L:0-30
X Ray Radiation	Less than 1 μ Sv/H		
X Ray Protection	X Ray protected special Cabinet		
Camera	1/2inch CCD 400K pixels in NTSC		CCD2/3 inch 1500K pixels
Image Magnification	12-110X(880x GXvision)	12-220X(1760x by GX- vision)	
Detector (I.I)	4inch E5881JCA1-2N/NU	E5877JCA1- 2N/ND	E5877KXH2- P1K/2DC
TOSHIBA	4 inch	4 and 2 inch selectable	4 and 2 inch selectable
PC	out put image 20mm Desk Top Type		
CPU	Celeron 430 1.8Ghz		
Memory	512MHB		
Storage Unit	HDD 1600GB DVD		
OS	Windows XP SP2		
LCD	17 inch LCD 1280 x 1024		
Image Controller	Quality Control for Averaging, Integrating. Enhancement Processing		
GX Vision	Contrast & Brightness Control Area arithmetic for oval, circle,BGA and void. 4-view/16 view display		
Management	V-Fluoroscopy	Black/white reversal, 3D display	

	GX-Vision	GX-Dvision
Image	Distance along wire frame / Gap of two round shapes	
Processing	Distance: between 2 points at X and Y.	
Measurement	Ellipse area, Polygonal area, BGA area, Void area	
Power	AC230V 1KVA	
Body Size	1000Wx1630Hx1080Dmm	
Weight	500Kg approx.	

The specification are subject to change without notice.

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M.S.Engineering Co.,Ltd.

2-17-11, Shinyokohama Kohoku-ku Yokohama-shi, Kanagawa-ken 222-0033 Japan. Phone:

+81-45-472-6441 / Fax: +81-45-472-6432

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