TR0636E-20033

IT3D(M)-300S-BGA (57)　Cross Sectioning
TEST REPORT

APPROVED	TY. ARAI
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PREPARED	TY.TAKADA

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HIROSE ELECTRIC CO., LTD.

[1] Objective

To evaluate SnCu intermetallic at BGA joints by cross sectioning initial state and post 3500 thermal cycle in accordance with IPC-9701.

[2] Specimens

No.	Product	Assembly	State	# of specimens
1	IT3D-300S-BGA (57)	Raw connector	Initial	1
2	IT3M-300S-BGA (57)	Virgin	Initial	1
3	IT3M-300S-BGA (57)	Reworked	Initial	1
4	IT3D-300S-BGA (57)	Virgin	Initial	1
5	IT3D-300S-BGA (57)	Reworked	Initial	1
6	IT3M-300S-BGA (57)	Virgin	Post 3500 cycles	1
7	IT3M-300S-BGA (57)	Reworked	Post 3500 cycles	1
8	IT3D-300S-BGA (57)	Virgin	Post 3500 cycles	1
9	IT3D-300S-BGA (57)	Reworked	Post 3500 cycles	1

Remarks

*Specimens are assembled as Fig.1.

*The test board design is based on IPC-9701 specification.

*Thickness of the PCB: 3.3mm

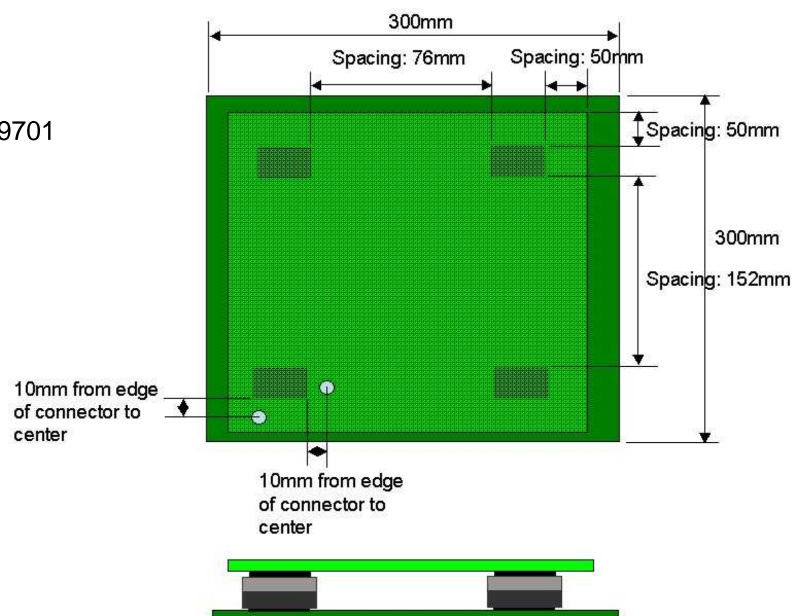


Fig.1

[3] Test Period

From: 2007-09-12

To : 2008-01-18

Cross Sectioning

1. Requirements

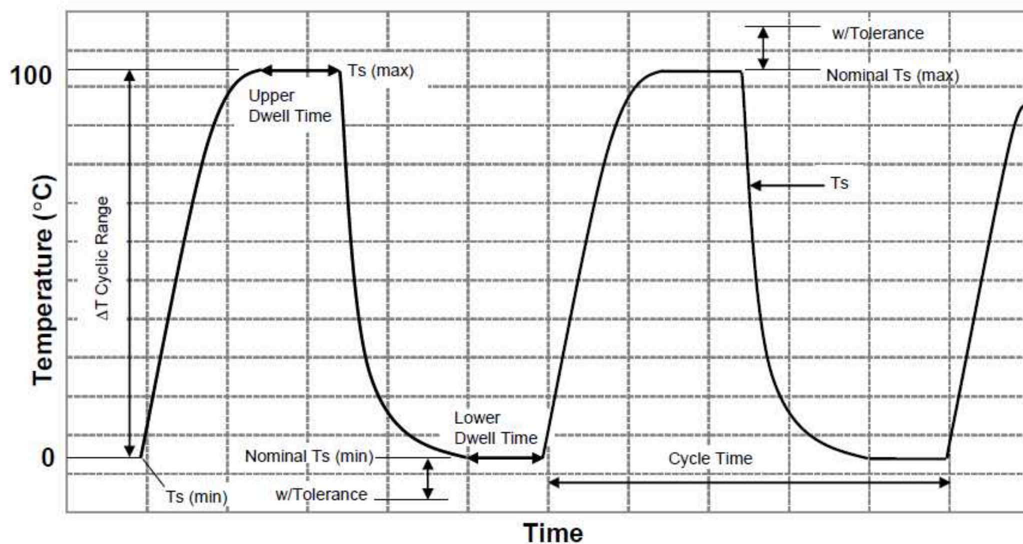
SnCu intermetallic is observed at 'the solder to connector pin interface' and 'the solder to pad interface'.

2. Conditions

2-1 Test condition

❑ Thermal cycle profile

- T_{max} = 100 °C (+10 / 0 °C)
- T_{min} = 0 °C (0 / -10°C)
- Ramp rate = Approximately 10 °C/min (10% to 90% of test temperature range)
- Dwell time = 5 to 10 min (Holding time of maximum and minimum temperature)

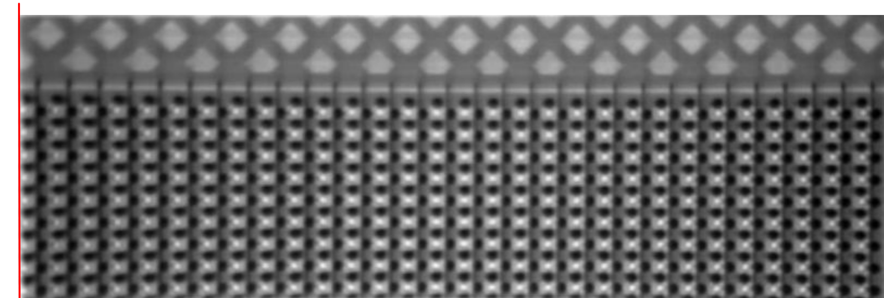


❑ Test cycle : 3500 cycles

2-2 Cross Sectioning Locations

1st Column of Solder Joints

Pin 1 Side



1st Row of Solder Joints

3. Results

Typical SnCu intermetallic was observed in all specimens.

Cross sections are shown in the attachment : TR060E_20033_CROSS_SECTIONING_Analysis

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Preliminary Analysis
Time-Zero

September 12, 2007

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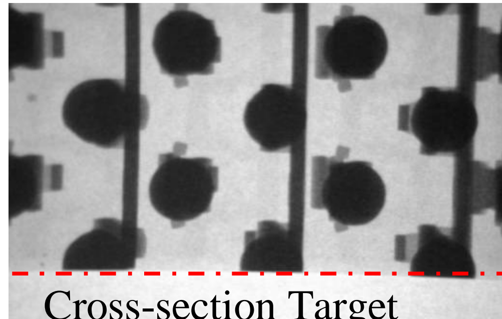
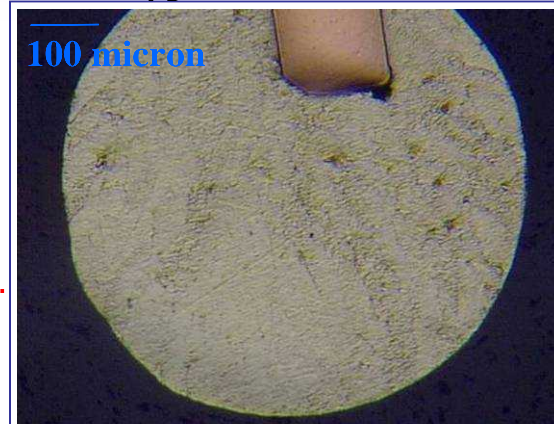
No.1 SnPb Raw Connector

X-Ray Image

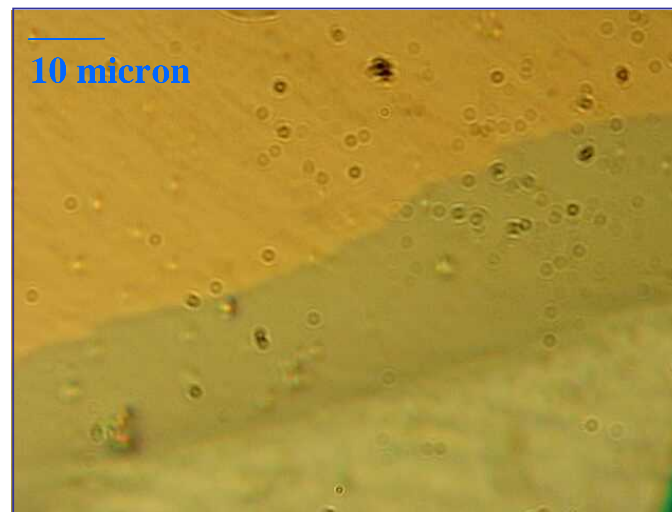


Cross-section Target

Typical Solder Joint

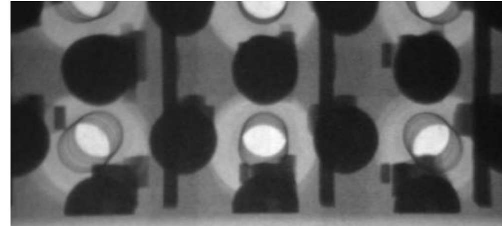


Pin



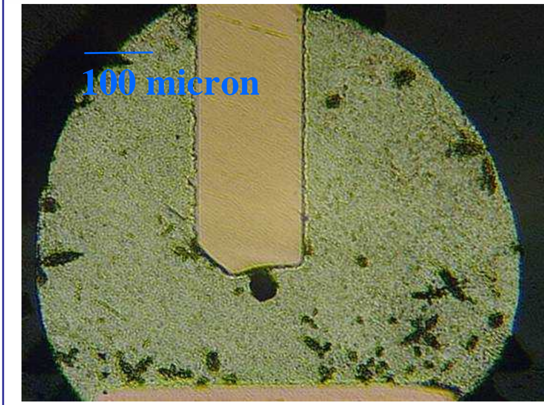
No.2 /IT3M-300S-BGA(57) / Virgin / Initial SnPb_MB_026 Conn-2

X-Ray Image

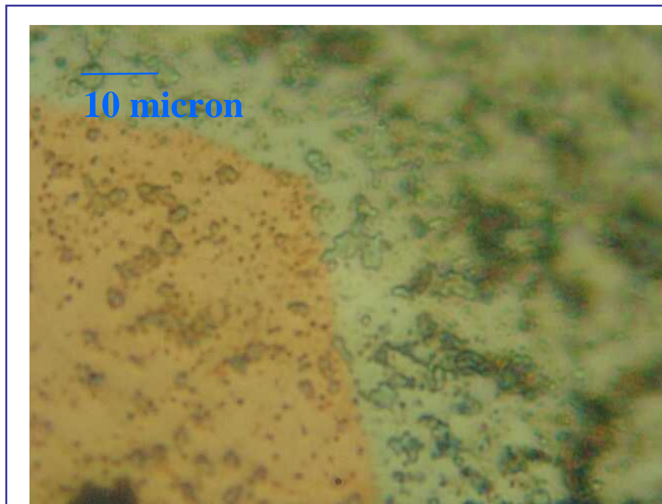


Cross-section Target

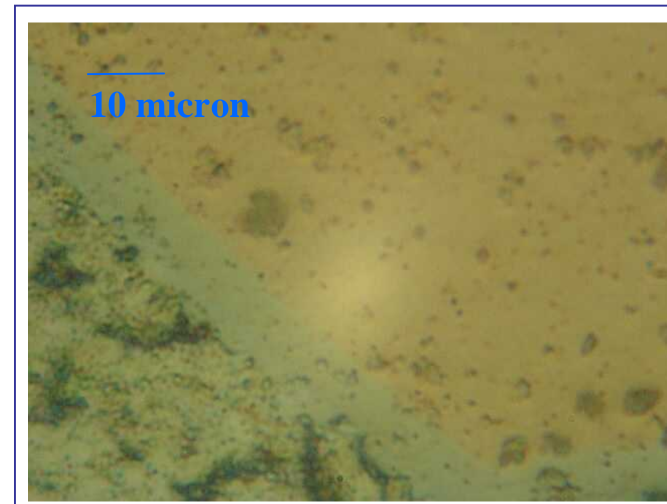
Typical Solder Joint



PCB

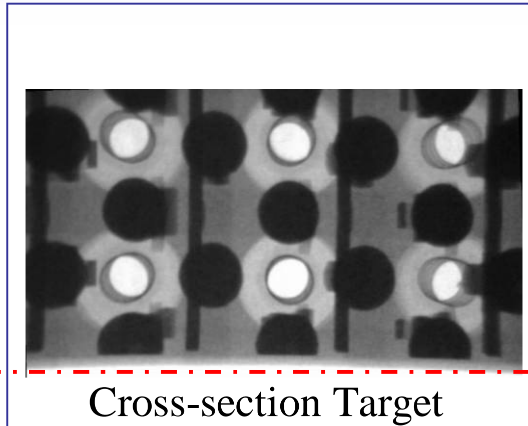


Pin



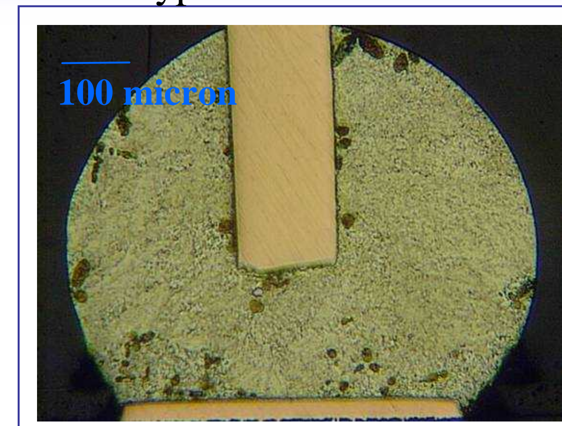
No.3 /IT3M-300S-BGA(57) / Reworked / Initial SnPb_MB_026 Conn-1

X-Ray Image

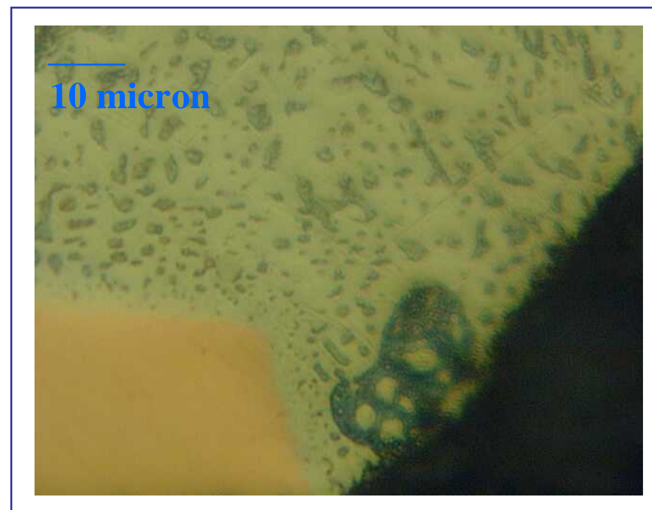


Cross-section Target

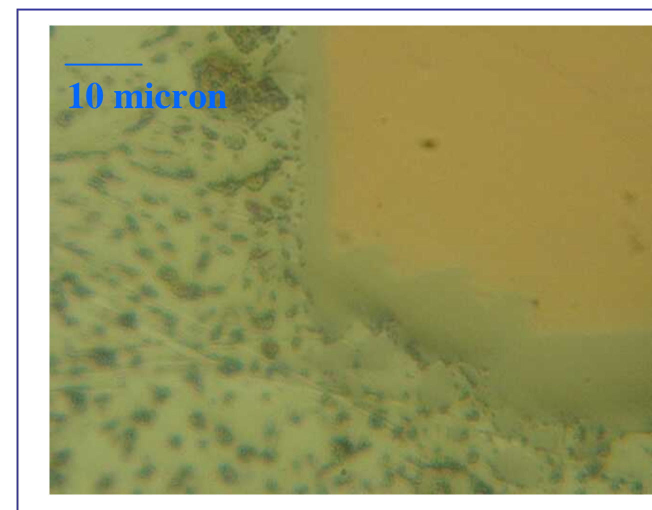
Typical Solder Joint



PCB

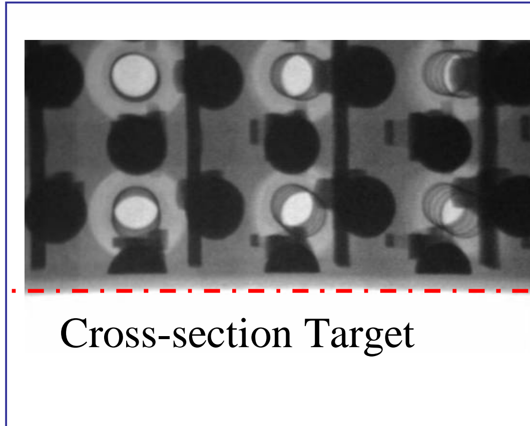


Pin



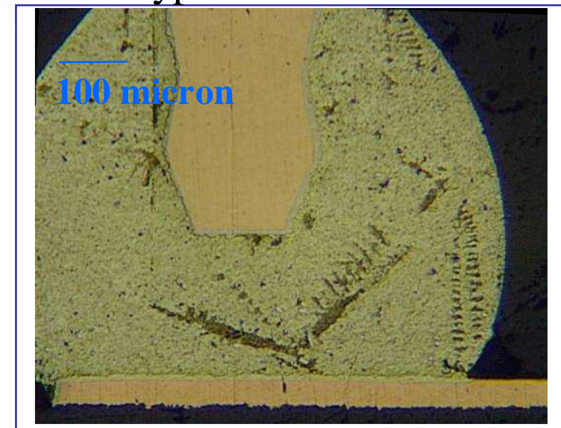
No.4 /IT3D-300S-BGA(57) / Virgin / Initial SnPb_DC_027 Conn-2

X-Ray Image

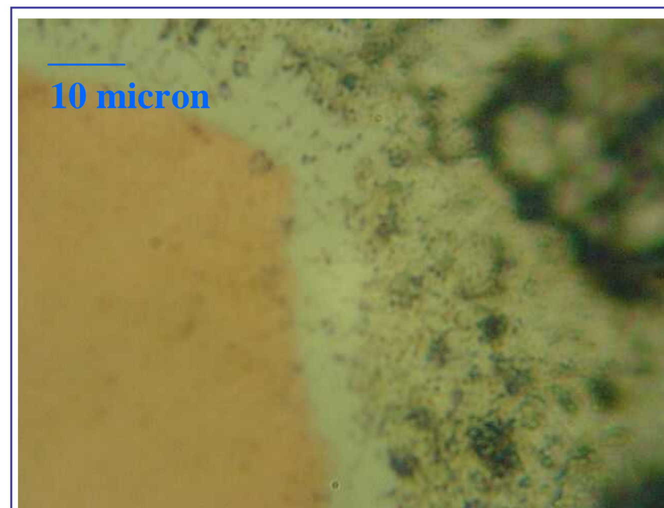


Cross-section Target

Typical Solder Joint



PCB



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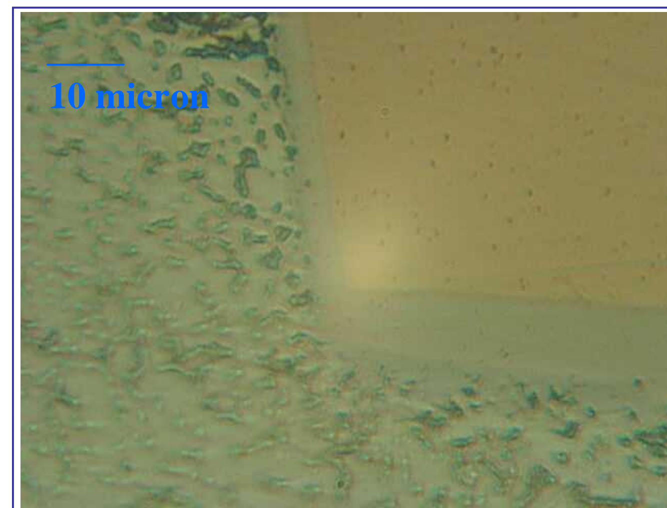
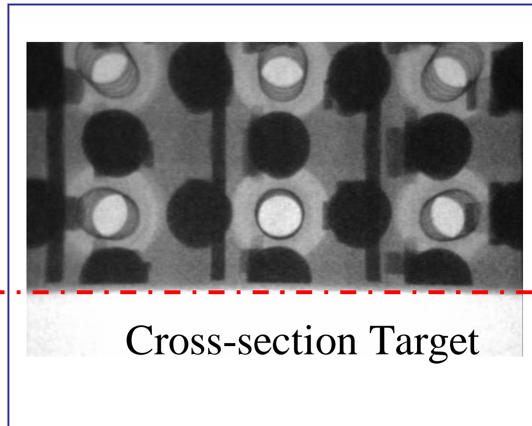
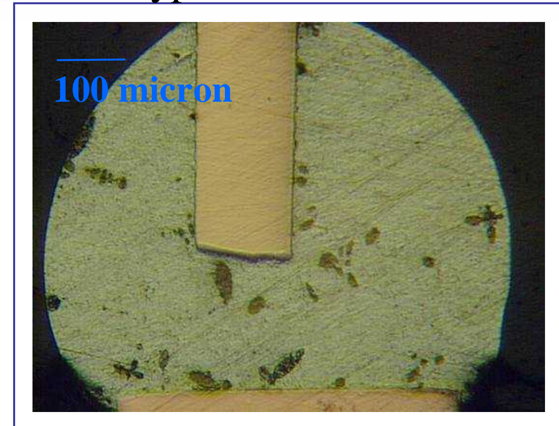


No.5 /IT3D-300S-BGA(57) / Reworked / Initial
SnPb_DC_027 Conn-1

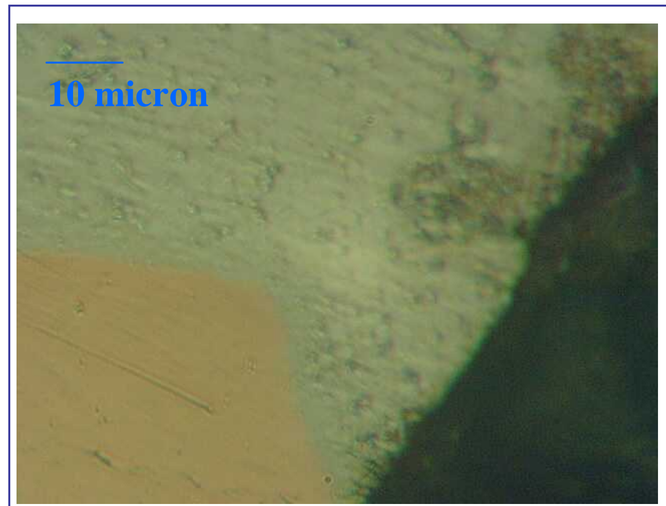
X-Ray Image



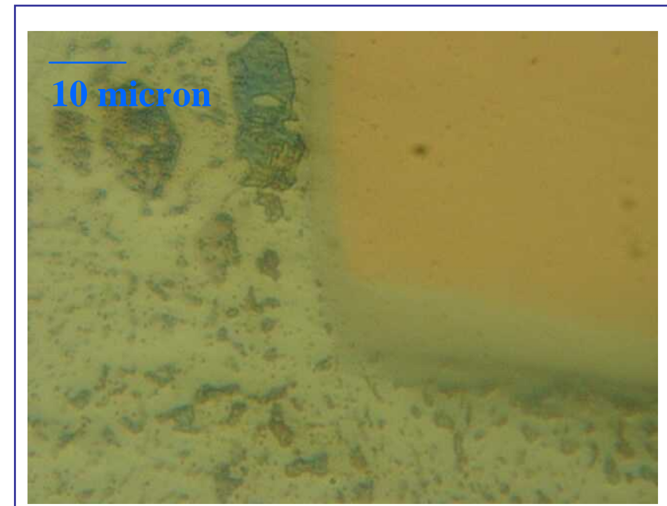
Typical Solder Joint



PCB



Pin



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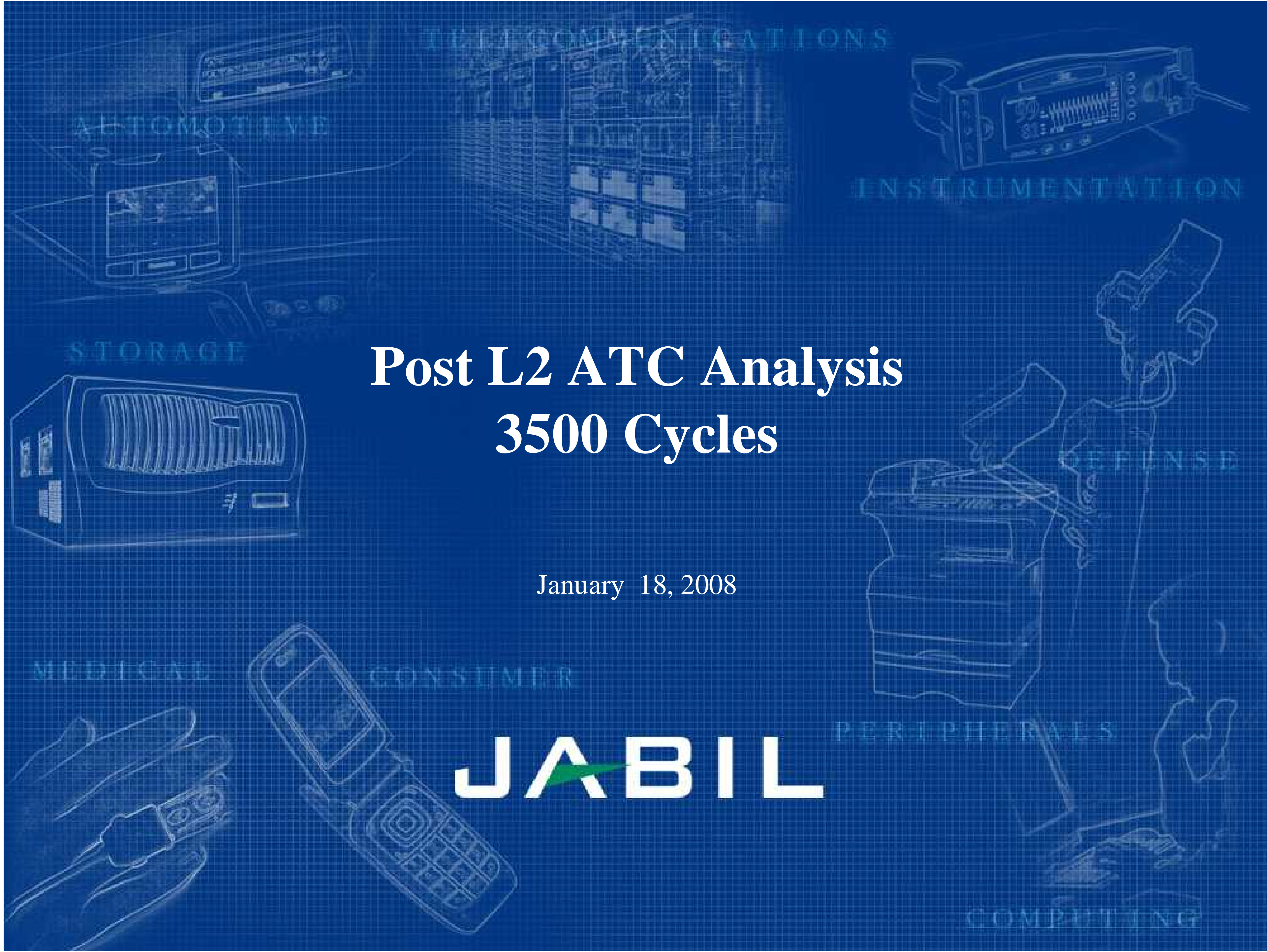
Post L2 ATC Analysis
3500 Cycles
January 18, 2008
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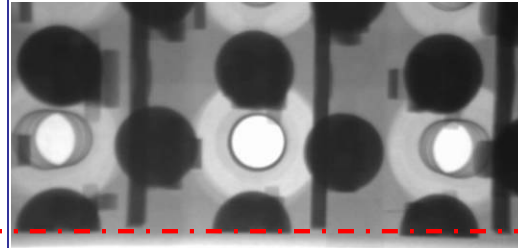
CONSUMER
INSTRUMENTATION
PERIPHERALS

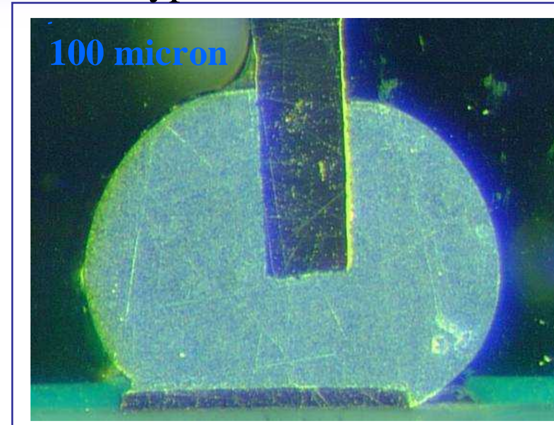
No.6 /IT3M-300S-BGA(57) / Virgin / Post 3500 cycles SnPb_MB_027 Conn-2

X-Ray Image

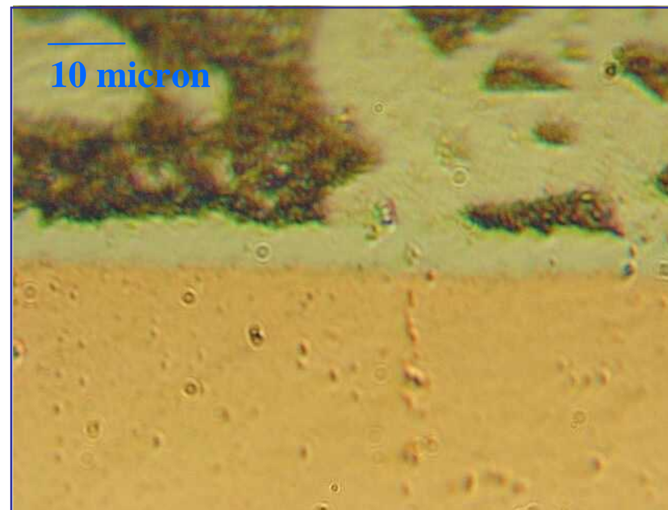


Cross-section Target

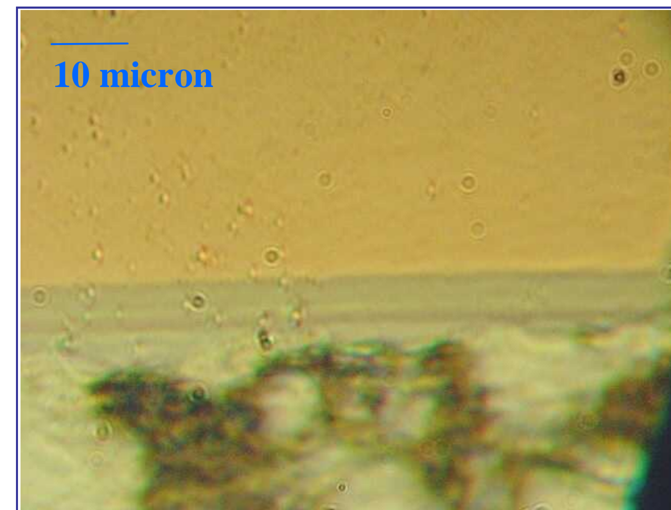
Typical Solder Joint



IMC - PCB

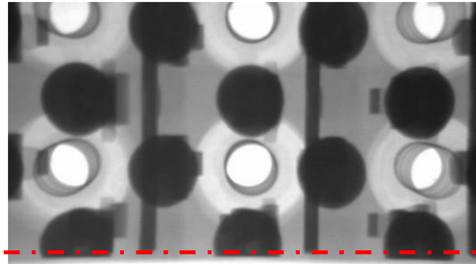


IMC - Pin



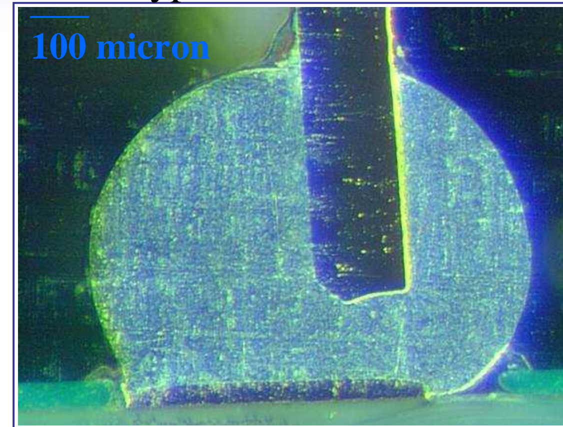
No.7 /IT3M-300S-BGA(57) / Reworked / Post 3500 cycles SnPb_MB_027 Conn-1

X-Ray Image

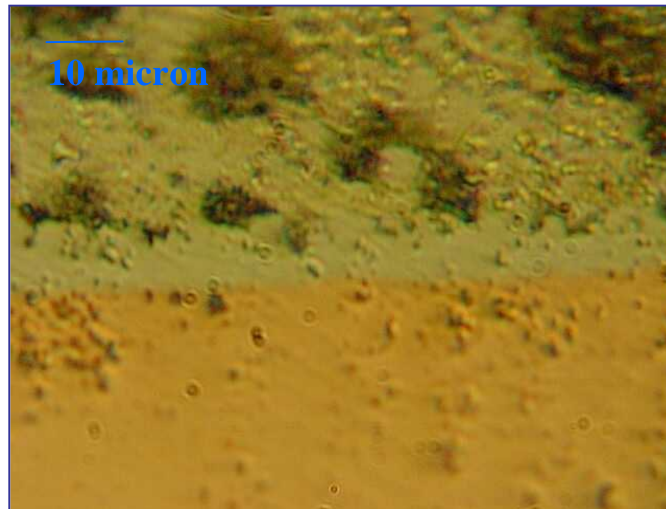


Cross-section Target

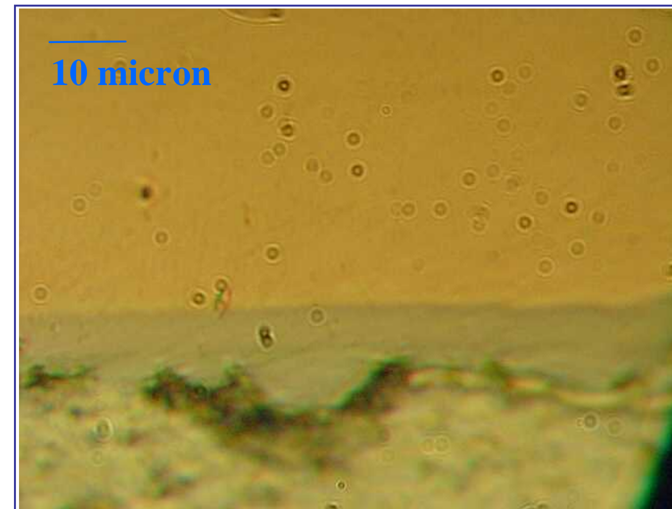
Typical Solder Joint



IMC - PCB



IMC - Pin



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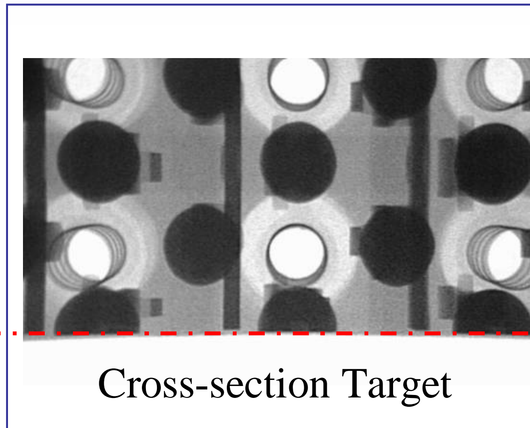
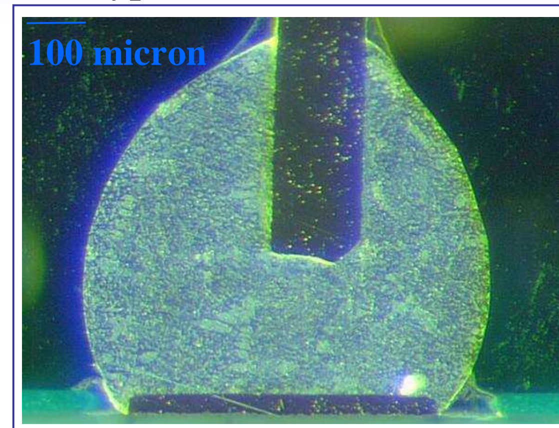
No.8 /IT3D-300S-BGA(57) / Virgin / Post 3500 cycles SnPb_DC_026 Conn-2

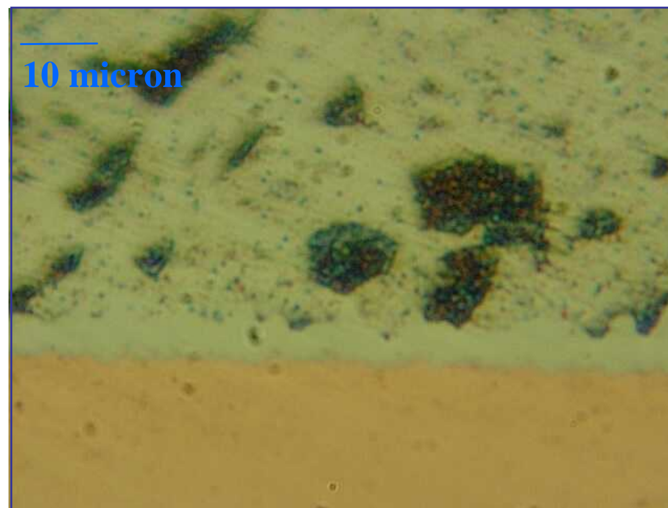
X-Ray Image



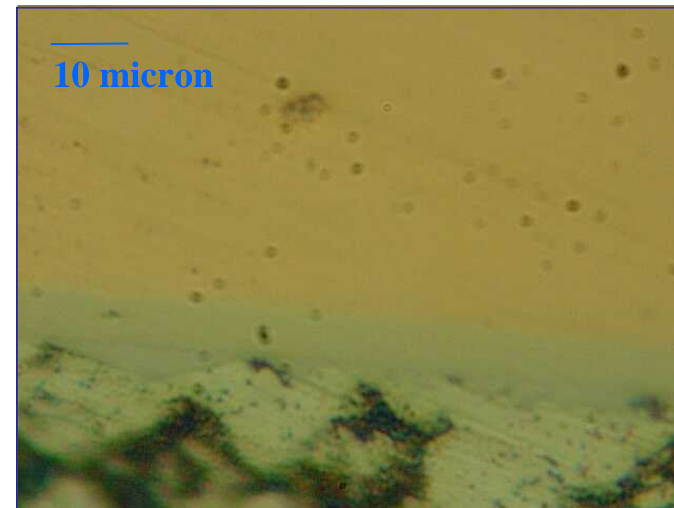
Typical Solder Joint



IMC - PCB

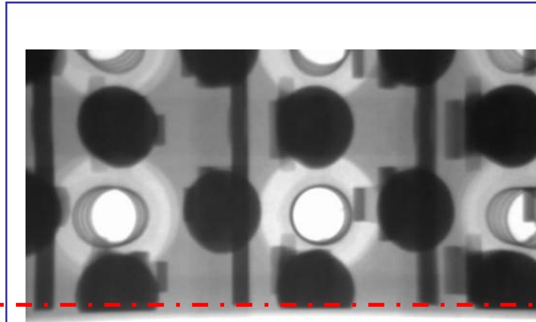


IMC - Pin



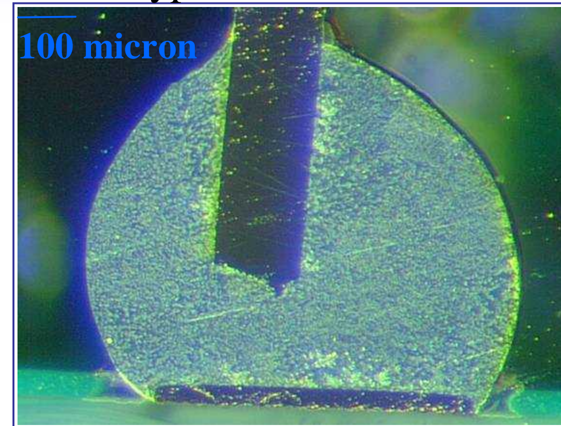
No.9 /IT3D-300S-BGA(57) / Reworked / Post 3500 cycles SnPb_DC_026 Conn-1

X-Ray Image

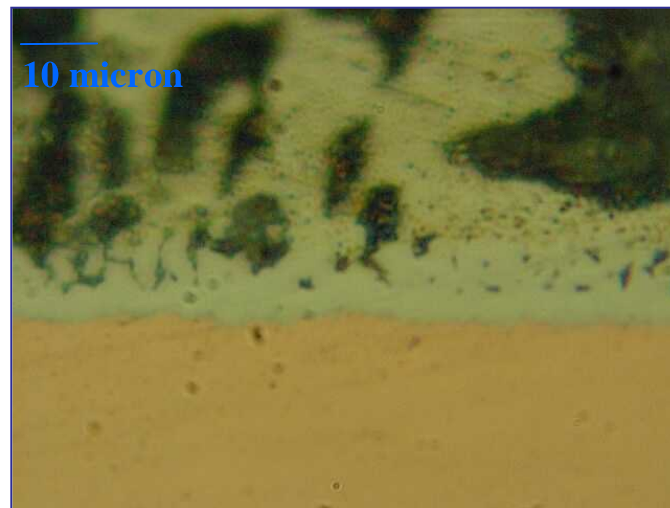


Cross-section Target

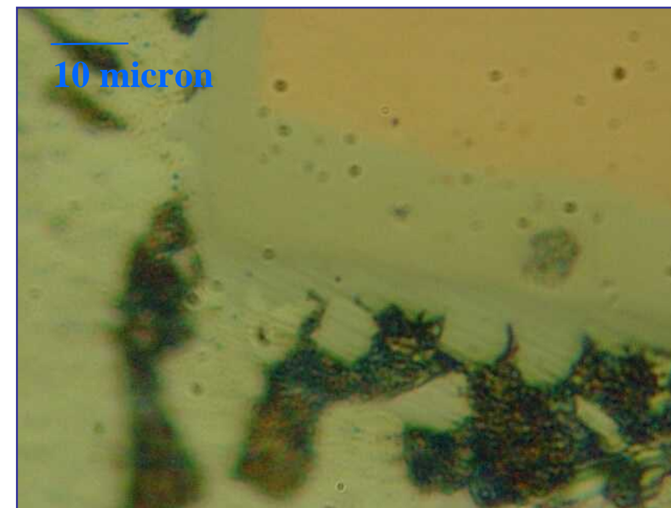
Typical Solder Joint



IMC - PCB



IMC - Pin



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