



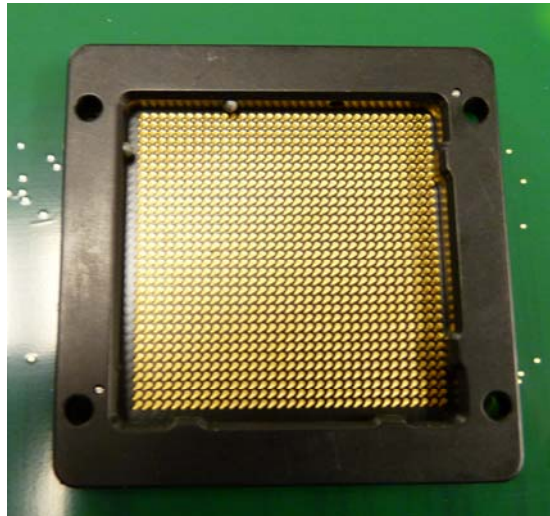
Cadence LGA ATC

Test Summary

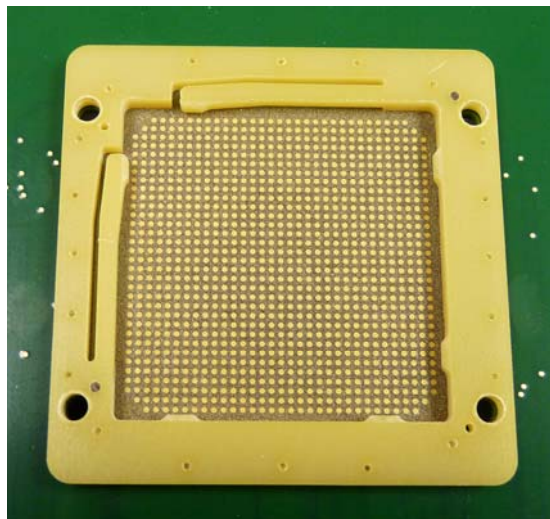
TR – 205047ATC

Nine (9) Cadence LGA test vehicle board assemblies were provided. Each board contains four (4) LGA socket positions. There are 77 testable nets per socket position; 308 total nets per board assembly.

Two (2) different LGA socket configurations were stressed. The first socket designation, "Black", is shown below:



The second socket designation, "Brown", is shown below:

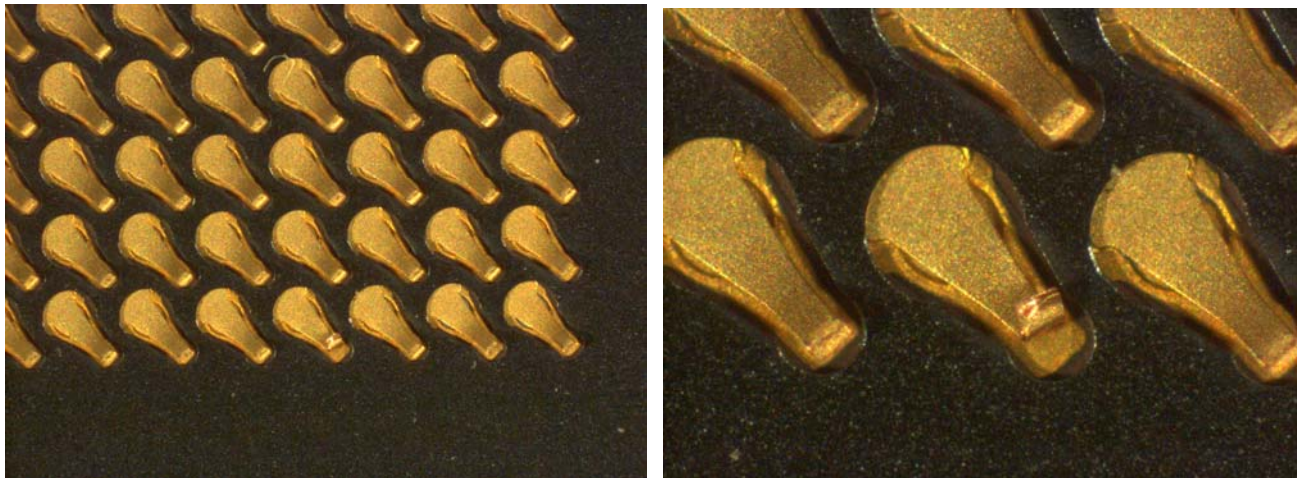


The following table summarizes the test board ID number along with the LGA socket type for each of the four positions:

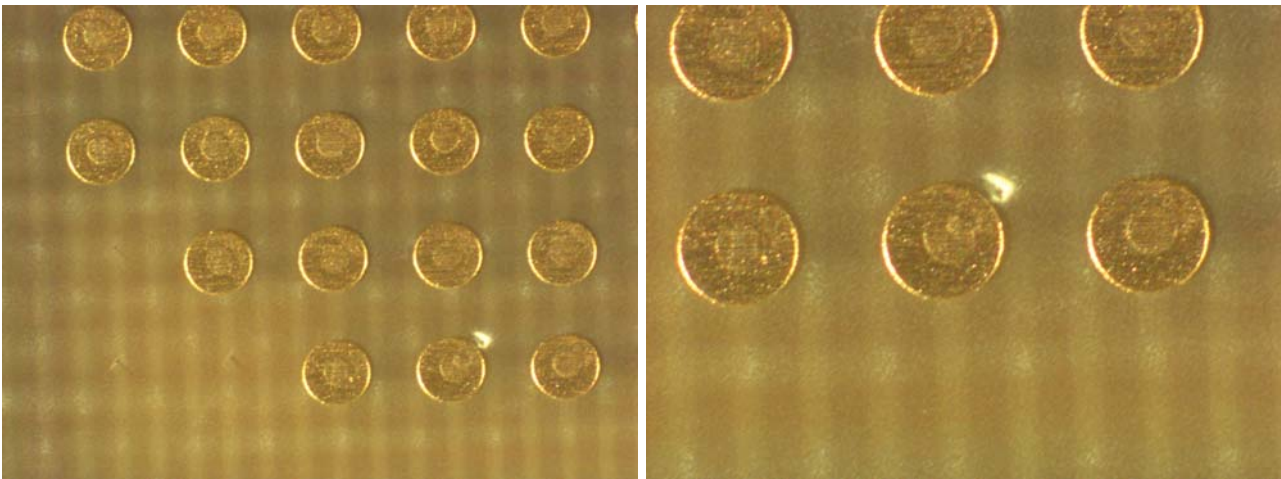
Card ID	Color of LGA Connector			
	U1	U2	U3	U4
28D122698	Black	Black	Black	Black
28D122699	Brown	Brown	Brown	Brown
28D122700	Black	Black	Black	Black
28D122703	Brown	Brown	Brown	Brown
28D122705	Black	Black	Black	Black
28D122706	Black	Black	Black	Black
28D122707	Brown	Brown	Brown	Brown
28D122708	Black	Black	Brown	Brown
28D122710	Brown	Brown	Brown	Brown

Time-zero continuity resistance measurements were taken on each test board. There was one (1) T0 open on LGA position 4 on test board 28D122706. After dismantling the socket assembly it was discovered that LGA pin AN04 was bent and made an indentation on the test board off of the contact land.

Here are photos taken on the back side of the LGA connector showing the bent AN04 pin:



Here are photos taken of the mating pad position on the test board:



Durability:

A durability study was done on test board 28D122708 whereby the screw clamping the LGA socket assembly together was loosened and tightened a total of five (5) times. This was done on all four module positions (two of each socket type). Continuity measurements were taken after each actuation.

Net: There were no fails.

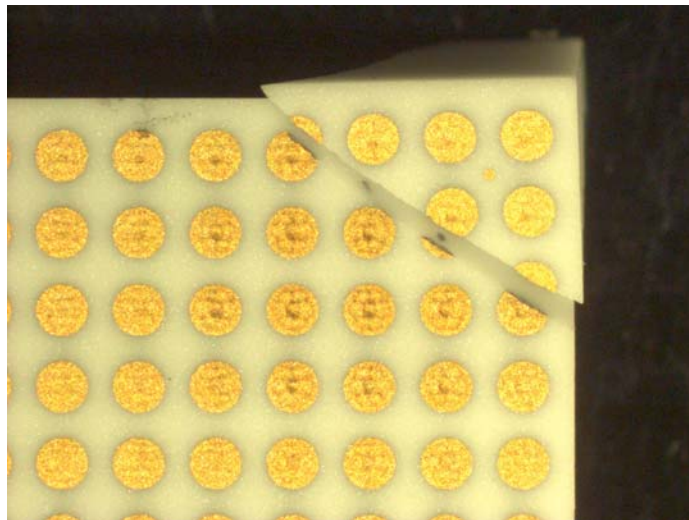
Ship Shock:

All test boards were subjected to 5 cycles of thermal ship shock (-40 to +60°C, 1 cycle / hour).

Continuity measurements were taken after ship shock.

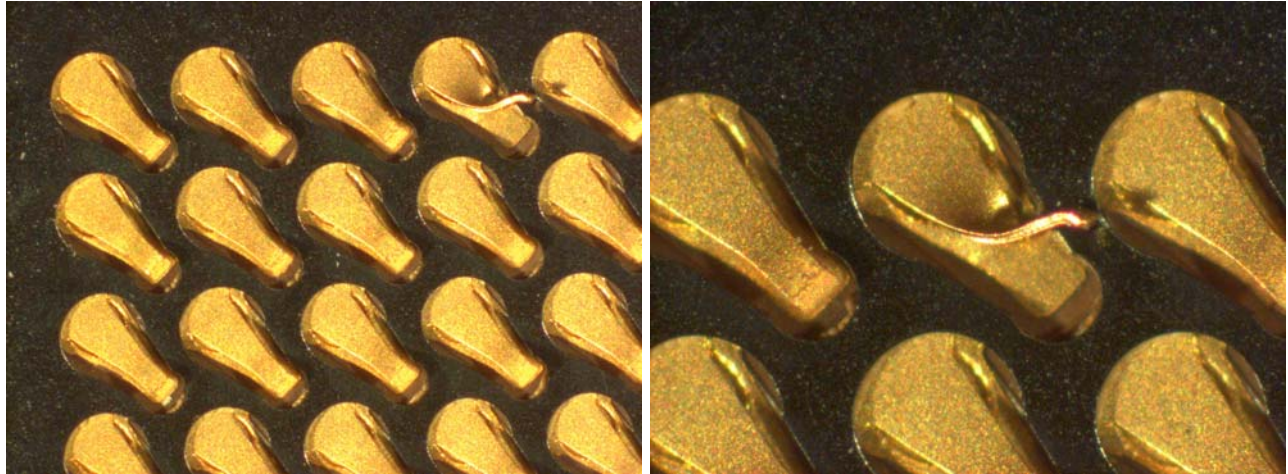
Two fails were noted: Position 4 on 28D122699 and Position 1 on 28D122706.

After dismantling the Position 4 socket assembly on 28D122699 it was discovered that the corner of the ceramic test module was cracked.

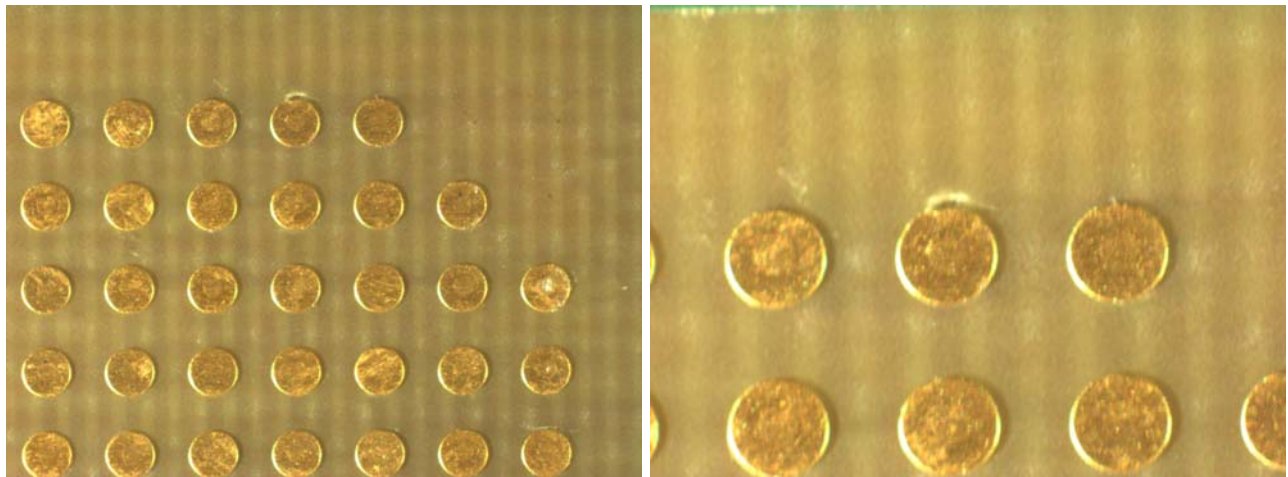


After dismantling the Position 1 socket assembly on 28D122706 it was discovered that LGA pin A30 was bent and made an indentation on the test board adjacent to the contact land.

Here are photos taken on the back side of the LGA connector showing the bent A30 pin:



Here are photos taken of the mating pad position on the test board:



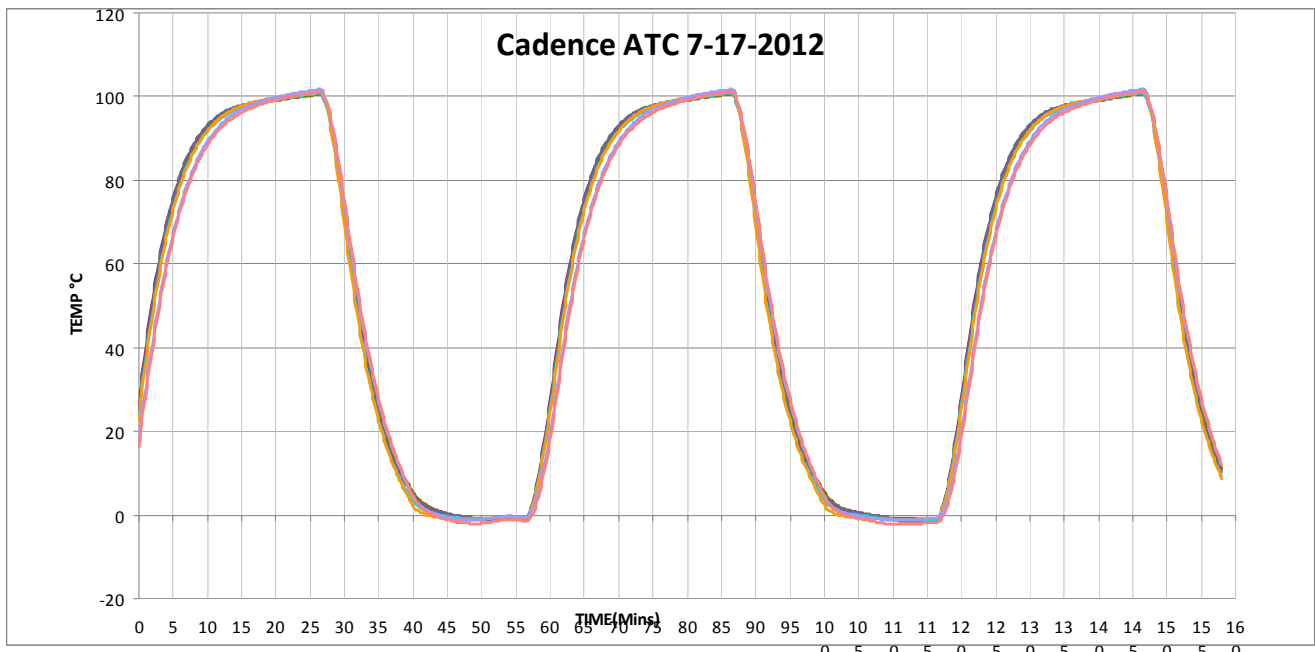
Following ship shock an additional spacer was added to all of the “Brown” LGA sockets. Two additional actuations were exercised on these positions with continuity measurements taken following each actuation.

Net: There were no additional fails.

Thermal Cycle (ATC):

All test boards were placed in a thermal cycle chamber profiled to the following conditions:

Delta T 0 to 100°C
 Cycle frequency 1.00 cycle / hour
 Dwell (low end) 18.2 minutes
 Dwell (high end) 16.1 minutes
 Min. temperature -2.3°C
 Max. temperature 101.8°C



The board assemblies were removed from the ATC chamber at defined intervals (100, 250, 500, 750 and 1000 cycles) for continuity measurement.

Net: There were no ATC stress fails.

Acknowledgements:

Principle Technician - Rick Wade

Change Summary:

Version	Date	Description
1.0	10-12-2012	Original