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Joint Council on Aging Aircraft
Joint Group on Pollution Prevention



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Lead-Free Solder Project Meeting Minutes Tuesday, 2 March

Comments:

Attached please find the minutes for the March 2, 2004 Lead-Free Solder Working Group teleconference. Please further distribute as necessary.



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MEMORANDUM FOR RECORD

Subject: –Teleconference, Summary and Minutes – March 2, 2004

Next Teleconference: Tentatively scheduled for March 15, 2004, 11:00 EST.

Next Meeting:

1. Board building/kickoff at Boeing Irving; Tentatively week of March 18

Minutes:

Decisions arrived at by this meeting's participants → Recommendations for group-at-large.
Meeting led by Brian Greene, Project Integrator.

1. Opening: Brian Greene opened the meeting by welcoming everyone and thanking them for their participation.

2. Discussion:

- a. Mechanical Shock Test:** Previous discussions have brought about some initial consensus to consider the possibility of changing the mechanical shock spectrum. New information seems to support changing the spectrum. Originally, the proposed change was discussed because very few capabilities exist that can meet the lower end of the shock test. Mr. Kessel's contact with the Navy Warfare Center proved even more enlightening. The Navy's specification was for small boards that are used in the Tomahawk missile. Because the current boards are much larger the data will be less useful to the Navy. They are in favor of changing the shock spectrum also and suggested using MIL STD 810F, method 516.5, Functional Test for Ground Equipment. Tom Woodrow's concern is that the group agrees on a specific spectrum that can be defended if necessary. We can't afford to say we couldn't meet the test plan, but we did as good as we could. Mr. Greene sees two competing risks. The first risk is the risk of not meeting the profile that everyone agrees to. Risk 2 is the risk of using a profile that doesn't meet the needs of enough customers. The group agreed that one test would not satisfy everyone. A generic test profile that uses the MIL STD or the accepted industrial standard was suggested by Mr. Mark Stibitz. To ensure board failure, Mr. Reza Ghaffarian suggested shocking the boards in the perpendicular position 200 times and if it doesn't fail incrementally increase the G force until failure occurs. It was evident throughout the discussion that the group felt the Mechanical Shock Test needs to be rewritten. Mr. Greene asked for volunteers to rewrite the procedure. Mr. Ghaffarian agreed to rewrite the test with ACI input/review from Lee Whiteman. Mr. Woodrow brought up the question, do we want to test to the actual environment or test to board failure. Currently, the JTP shock procedure is to shock the board in the X axis (perpendicular to the ground) 500 times. This is how most CCAs are mounted in the



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aircraft. Should we be testing in the Z-axis (parallel to the ground) to induce more stress which in turn would cause more failures. This force vector change would change the test force from a shear force to a tension force. One comment was that we can't compare failures between the solders if we don't have failures. Mr. Greene asked the question if measurement of board displacement was necessary. BAE can measure displacement using calculations from a sinusoidal wave of the board deflection. The use of a strain gage would be a better measurement for comparison, but would probably cost extra dollars and increase the project scope for ACI. Mr. Whiteman will gather more information from BAE and pass the information to Mr. Greene.

b. Hybrid Components

Ms. Lety Campuzano-Contreras and Mr. Mark Stibitz are still in the process of working out the specifics as to how best to stake the hybrids.

c. Component Procurement

The latest component procurement status was briefed by Mr. Dave Hillman. The hybrids are in shipment as of 2 Mar 04. Soletron will be able to ship 100 more components by 12 Mar 04. The extra money saved on the board purchase will be used for the hybrid two stage tinning process.



Attachment 1: Action Item Status Action Items (from 03/02/2004 meeting)

LFS.04.02.XX

Date Due: 3/16/04
Responsibility: Reza Ghaffarian, Lee Whiteman
Required Action: Revise Mechanical Shock Test procedure
Comments:

LFS.04.02.XX

Date Due: 3/16/04
Responsibility: Mark Stibitz
Required Action: Send copies of MIL STD 810F graphs to Brian Greene
Comments:

LFS.04.02.XX

Date Due: 3/16/04
Responsibility: Lee Whiteman
Required Action: Confirm BAE's ability to measure board deflection and possibility of obtaining strain gage measurements. Pass information directly to Brian Greene.
Comments:

LFS.04.03.01

Date Due: 3/16/04
Responsibility: Lee Whiteman
Required Action: Confirm with BAE that they can meet MIL STD 810F. The two spectrums include Functional Test for Ground Equipment and Crash Hazard Test for Ground Equipment
Comments:

LFS.04.02.11

Date Due: 3/02/04
Responsibility: All Stakeholders
Required Action: Send any lessons learned regarding board assembly to Lety Campuzano-Contreras
Comments:

LFS.04.02.09

Date Due: 3/02/04
Responsibility: Lety Campuzano-Contreras
Required Action: Contact Mark Stibitz to confirm hybrid staking process
Comments:



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LFS.04.02.02

Date Due: 2/17/04

Responsibility: Dave Hillman

Required Action: Send one empty board and one fully assembled board to Lee Whiteman for setup and test purposes.

Comments: 02/17/2004: Mr. Hillman sent the board to Mr Whiteman the week of February 09. Mr. Whiteman will check shipping to see if the board has arrived.

LFS.04.02.08

Date Due: 2/24/04

Responsibility: Dave Hillman

Required Action: Make sure the appropriate Gerber files were provided to Lety for the IPC Electrochemical migration test coupons

Comments:

Open Action Items

LFS.04.02.01

Date Due: *Date Changed from 2/20/04 to 03/10/2004*

Responsibility: Brian Greene

Required Action: Distribute article on lead contamination written by John Paul Clech

Comments: This article will be presented at the upcoming APEX conference. Tom Woodrow will send a copy of the article to Brian Greene once the article has been presented. Brian will distribute the article to the rest of the group.

LFS.04.01.07

Date Due: 2/5/2004

Responsibility: Brian Greene

Required Action: Contact CALCE for support

Comments: 02/17/2004: Currently in progress

LFS.04.01.02

Date Due: 1/23/2004

Responsibility: Dave Hillman

Required Action: Determine additional cost associated with two tinning assemblies.

Comments: 02/17/2004 – In-progress



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Action Items Recommended for Closure on March 02, 2004

LFS.04.02.10

Date Due: 3/02/04 CLOSED

Responsibility: Brian Greene

Required Action: Contact Mark Stibitz to see if he can send a scrap hybrid to Lety Campuzano-Contreras for assembly testing

Comments:

LFS.04.02.06

Date Due: 2/24/04 CLOSED

Responsibility: ITB, Inc.

Required Action: Kurt Kessel to contact the author of the mechanical shock test procedure
Comments: In-Progress: Mr. Kurt Kessel found the original document from the Department of the Navy, Naval Air Warfare Center Weapons Division (COMNAVAIRWARCENWPNDIV), dated August 22, 2001, which provided the original profiles for mechanical shock and vibration testing, Currently Mr. Kessel is trying to contact Mr. John Nelson of COMNAVAIRWARCENWPNDIV to determine if Mr. Nelson was the original author of the mechanical shock test procedure write-up

LFS.04.02.07

Date Due: 2/24/04 CLOSED

Responsibility: ITB, Inc.

Required Action: Kurt Kessel to contact Mr. Mark Stibitz to bring resolution to the Hybrid placement and usage issue

Comments: In-Progress: Mr. Kessel drafted an email summarizing the discussion from the February 17, 2004 lead-free solder telecon; Comments from Mr. Stibitz on the proposed resolutions will be presented at the March 02, 2004 lead-free solder telecon.

LFS.04.01.08

Date Due: 2/5/2004 CLOSED

Responsibility: Dave Hillman

Required Action: Contact Practical on the on the wire bonding issue with regard to daisy chained components

Comments: **Closed:** Practical offered to bond from 12 to 14 and from 37 to 39. The group accepted the work around at the 02/09/2004 Small-Group Telecon.
ISSUE STILL OPEN: Mr. Hillman is still working to determine the date when the components will arrive at Rockwell Collins.