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Date:	Wed, October 16, 2002 10:42 am
Subject:	More results

Hi,
here are more results.
I calculated the first three resonant frequencies for the Z and Phi side bonds.
For the Z side they are:
1st frequency = 13 KHz the vibration is along a direction perpendicular to the plane where the wire lies.
2nd frequency = 35 KHz the vibration is on the plane where the wire lies.
3rd frequency = 40 Khz the vibration is along a direction perpendicular to the plane where the wire lies.

For the Phi side the frequencies are a bit higher being the bond shorter:
1st frequency = 18 KHz the vibration is along a direction perpendicular to the plane where the wire lies.
2nd frequency = 39 KHz the vibration is on the plane where the wire lies.
3rd frequency = 52 Khz the vibration is along a direction perpendicular to the plane where the wire lies.

To estimate the fatigue life for the 99% Al + 1% Si alloy an S-N diagram is needed. Basically this diagram reports the fatigue stress failure value vs. the number of cycles for a given material. I checked some web sites and called the company that manufactures this wire, but no luck so far. Fatigue characteristics are very specific to the material, because depend on the microscopic composition and how the alloy components are dispersed on the main material. I' ll keep looking, but even if I find something, I wouldn' t trust it very much because fatigue life depends also on mechanical defects of the wire or of the bond itself.
I hope this helps,

Stefano