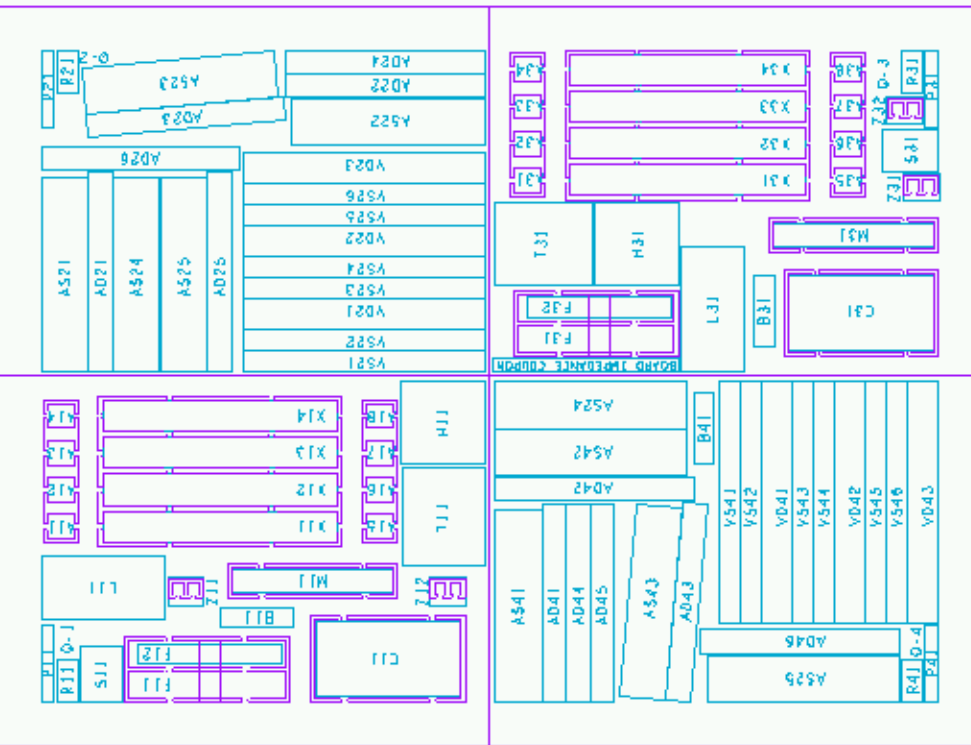
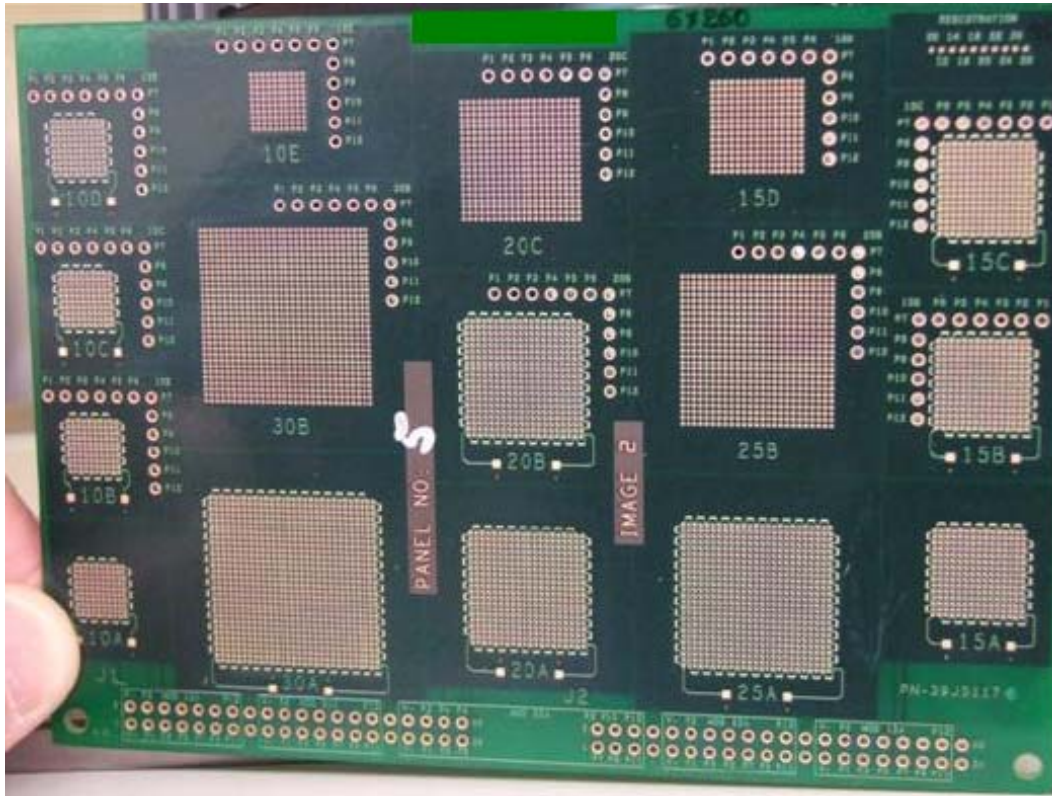


- **Phase 2 Tasks**
  1. **Develop evaluation plan and schedule**
  2. **Procure parts and test vehicles**
  3. **Assign teams to carry out completion of the testing in a standardized fashion**
  4. **Perform electrical and reliability testing on test vehicles.**
  
- **Test Vehicles Under Consideration So Far**
  - **Electrical:**
    - **IBM SMASPP2z**
  - **High Temp Reflow Compatibility, Test Vehicle Options:**
    - **Intel Materials Evaluation Board (MEB)**
    - **IBM HOP31 High Temp Reflow Laminate Assessment Test Vehicle**





- Intel Materials Evaluation Board (MEB) Laminate Evaluation Test Vehicle.
  - Flexible design
    - 8 Layer Thickness variable from 0.031” to 0.150”
      - » minimum 2.7mil cores, minimum 2 mil prepreg
    - 0.5, 1.0, 2.0 oz copper layers
    - Designed for 18”x24” panel (16.5x22.5” useable area)
  - Focus on material properties
    - Reliability coupons
    - Electrical, Mechanical, Thermal property coupons
    - Minimal fabrication capability (trace/space coupons)



- IBM “Hop31” Laminate Evaluation Test Vehicle
  - Versatile cross section...whatever required.
  - Minimum PTH pitch of 31 mils (0.8mm)
  - Specifically designed for assessment of higher reflow compatibility of laminate materials.
  - Design tweaks underway to easy finding internal delamination. To be completed by next week (2/16/07).
  - 4” x 5.5” ....many test vehicles / panel.

## Supplier Published Dk/Df Data

Material	Dk	Df
NanYa NPG-170TL	4.5 @ 1MHz 4.1 @ 1GHz	0.012 – 0.014 @ 1GHz
Hitachi BE-67G(J)	5.0 – 5.2 @ 1MHz 4.5 – 4.7 @ 1 GHz	0.009 – 0.11 @ 1GHz
Nelco 4000-7EF	4.1 @ 1 MHz 4.0 @ 1 GHz	0.014 – 0.015 @ 1GHz
Isola IS500	4.3 @ 2 GHz	0.012 @ 2GHz
TUC TU-742	4.6 @ 1MHz 4.3 @ 1GHz	0.013 – 0.014 @ 1GHz
MEW R1566W	5.2 @ 1MHz 4.8 @ 1GHz	0.010 @ 1GHz
ITEQ IT170G	4.5 – 4.6 @ 1MHz	0.009 – 0.010 @ 1MHz