PWB FABRICATION NOTES (Rev. D, SPP_DPU EM FAB 12/19/13)
CALTECH/SPACE RADIATION LABORATORY

1. ALL SECTIONS AND SUBSECTIONS REFERRED TO IN THIS DOCUMENT ARE PER JPL SPECIFICATION D-8208 Rev. K

2. THIS DOCUMENT AND RELATED ARTWORK ARE COMPUTER GENERATED
CHANGES ARE TO BE PERFORMED ON THE ORIGINAL DATABASE ON FILE AT CALTECH

3. FABRICATE PRINTED WIRING BOARD PER JPL SPECIFICATION D-8208 SECTION 3.6
AND IAW IPC-6012, CLASS 3
FABRICATE RIGID-FLEX PER IPC-6013, CLASS 2

4. BOARD DETAILS:
   FAB DRAWING NAME: SPP_DPU_500101A
   NUMBER OF LAYERS: 8
   LAYER CONTRUCTION DRAWING NAME: LAYERSTACK_SPP_DPU_500101A_20140107.xls
   X-DIMENSION: 13.5cm (24.4cm to full extent of flex circuit)
   Y-DIMENSION: 12.7cm
   BOARD THICKNESS: 0.062” INCH +/- 0.005 INCH
   8 MIL TRACE AND 8 MIL SPACE MINIMUM ON ALL LAYERS*
   * 5 mil spacing for short distances at connector and device fanout
   BOARD INCLUDES 3 INTERNAL FLEXI-CIRCUIT LAYERS

5. MATERIALS:
   MATERIALS USED SHALL BE TRACEABLE TO THE MANUFACTURER'S LOT.
   CERTIFICATION SHALL BE SUPPLIED WITH ALL TEST DATA

   LAMINATE AND PRE-PREGS: POLYIMIDE IAW IPC-4101
   FINAL COPPER WEIGHT: EXTERNAL 1 OZ. INTERNAL 0.5 OZ.

6. SEPARATION BETWEEN ADJACENT CONDUCTOR LAYERS SHALL BE A MINIMUM OF 0.0035 INCHES AND CONSIST OF A MINIMUM TWO PLIES OF PRE-PREG

7. BOW AND TWIST SHALL NOT EXCEED 0.50%

8. ETCHBACK:
   NEGATIVE ETCHBACK SHALL BE PROHIBITTED
   POSITIVE ETCHBACK SHALL BE 0.0002-0.002 INCH; 0.0005 INCH IS PREFERRED
   PLASMA DESMEAR/ETCHBACK IS THE PREFERRED METHOD

9. ANNULAR RING:
   EXTERNAL ANNULAR RING SHALL BE AT LEAST 0.002 INCH
   INTERNAL ANNULAR RING SHALL BE AT LEAST 0.001 INCH

10. HOLES:
   HOLE SIZES AND PLATING SHALL BE PER DRILL TABLE
   HOLE SIZES APPLY AFTER PLATING AND FINAL CONDUCTOR FINISH
   HOLE SIZE TOLERANCE +/- 0.003 INCH
   COPPER PLATING IN HOLES SHALL BE 0.0015 INCH NOMINAL THICKNESS
   WITH NO READING LESS THAN 0.001 INCH

11. HOLE FILLING:
   COMPONENT MOUNTING THROUGH HOLES SHALL NOT BE FILLED
   PLATED VIA HOLES LESS THAN 0.012 INCH CAN BE SOLDER FILLED

UNLESS OTHERWISE SPECIFIED

12. SELECTIVE OUTER METALIZATION FINISH:
    HOT AIR SOLDER LEVEL (HASL) IAW IPC-6012, CLASS 3
    UNLESS OTHERWISE SPECIFIED

    A. FOR DURABLE GOLD (E.G. BETAPHASE EDGE CONNECTORS):
       ELECTROLYTIC NICKEL PER SAE-AMS-QQ-N290, CLASS 2, 200 MICROINCHES THICKNESS FOLLOWED BY ELECTROLYTIC GOLD PER ASTM B488-01, TYPE 1, MINIMUM 50 MICROINCHES THICK
    B. FOR GOLD WIREBOND PADS:
       ELECTROLYTIC NICKEL PER SAE-AMS-QQ-N290, CLASS 2, 150 MICROINCHES THICKNESS FOLLOWED BY ELECTROLYTIC GOLD PER ASTM B488-01, TYPE 3, CODE A, 75-100 MICROINCHES THICK. GOLD SHALL BE 99.97% MINIMUM PURITY
    C. FOR IMMERSION GOLD FINISH:
       ELECTROLESS NICKEL IMMERSION GOLD (ENIG) IAW IPC-4552
       ELECTROLESS NICKEL MINIMUM 3 MICROINCHES THICK FOLLOWED BY IMMERSION GOLD MINIMUM 0.05 MICROINCHES THICK

13. IONIC CONTAMINATION SHALL BE MEASURED ON ONE BOARD PER LOT AND SHALL NOT EXCEED 10 MICROGRAMS PER SQUARE INCH. TEST DOCUMENTATION SHALL BE DELIVERED WITH THE BOARD. THE BOARD USED FOR IONIC CONTAMINATION TESTING SHALL BE BAKED AT 125F FOR 20 MINUTES PRIOR TO APPLICATION OF SOLDERMASK

14. SOLDER MASK:
    LPI (GREEN) PER IPC-SM-840 TYPE H
    LAYERS: TOP AND BOTTOM LAYERS OVER BARE COPPER
    UNLESS OTHERWISE SPECIFIED
    COMPONENT PADS TO BE FREE FROM BLEEDING OR MISREGISTRATION
    LPI SOLDERMASK SHALL BE UV BUMPED PRIOR TO FINAL CURE
    DO NOT TENT VIAS

15. SILKSCREEN:
    MARKINGS ON BOTH SIDES SHALL BE MADE USING NON-CONDUCTIVE WHITE EPOXY INK

16. TEST COUPONS:
    REPRESENTATIVE TEST COUPONS SHALL BE MADE PER IPC-2221 AND IPC-6012 AND SHALL BE DELIVERED WITH THE FINISHED PWB

17. ELECTRICAL TESTING:
    CONTINUITY AND SHORTS TESTING SHALL BE PERFORMED ON EACH PWB AT 100%
    SHORTS TESTING SHALL BE AT A MINIMUM OF 200V DC
    TESTING DOCUMENTATION SHALL BE DELIVERED WITH THE FINISHED PWB

18. FLEX-CIRCUIT:
    FILLET AT FLEX TO RIGID TRANSITIONS WITH URALANE 5753
    FILLET SHOULD NOT EXTEND ONTO FLEX IN EXCESS OF 90 MIL