

REV	DESCRIPTION	DATE	APPROVED

PROPRIETARY NOTICE: THIS DOCUMENT IS THE PROPERTY OF ALTERA CORPORATION. IT IS TO BE USED ONLY FOR THE PROJECT AND FOR THE BOARD FOR WHICH IT IS SPECIFICALLY DESIGNED. IT IS NOT TO BE REPRODUCED, COPIED, DISCLOSED OR USED FOR ANY OTHER PROJECT WITHOUT THE EXPRESS WRITTEN PERMISSION OF A DUTY AUTHORIZED REPRESENTATIVE OF ALTERA CORPORATION.

NOTES UNLESS OTHERWISE SPECIFIED:

- PCB VENDOR MUST NOTIFY ALTERA PCB CONTACT OF ANY DISCREPANCIES FOUND BETWEEN FABRICATION DATA AND FABRICATION DRAWING NOTES.
- THIS DRAWING IS VIEWED FROM THE PRIMARY OR TOP SIDE OF THE PCB.
- FABRICATION OF THIS PCB SHALL BE IN CONFORMANCE WITH THE FOLLOWING SPECIFICATIONS (UNLESS OTHERWISE SPECIFIED):
  - ALL MATERIALS USED MUST BE ROHS COMPLIANT.
  - BASE MATERIAL: FR4 GLASS EPOXY (ISOLA 370 HR), MIN. Tg OF 170 DEGREES C.
  - FLAME CLASS: UL 94V-0 & MUST MEET REQUIREMENTS OF UL796.
  - MANUFACTURER MUST BE UL RECOGNIZED TO PRODUCE THIS PRODUCT SUCH THAT IT MEETS 150 DEGREES CELSIUS MAXIMUM OPERATING TEMPERATURE (MOT).
  - THE FOLLOWING MUST BE MARKED OR ETCHED ON SECONDARY SIDE OF PCB IN AREA SHOWN:
    - DATE CODE
    - UL RECOGNIZED VENDOR ID, UL TYPE DESIGNATION AND/OR MARKINGS WHICH REFLECT THE SPECIFIED FLAME CLASS AND MAXIMUM OPERATING TEMPERATURE
- PCB VENDOR TO ENSURE ALL UNCONNECTED (NON-FUNCTIONAL) INTERNAL SIGNAL LAYER PADS AND VIAS ARE REMOVED.
- HOLE/SLOT PLATING - 0.001 MIN. AVERAGE / 0.0008 ABSOLUTE MIN. PLATING. HOLE/SLOT DIAMETERS ARE SPECIFIED AFTER PLATING (SEE HOLE SCHEDULE).
- A. SOLDERMASK VIA PLUG AND CAP/TENT FROM TOP SIDE.

15. AFTER REVIEWING FABRICATION DATA, PCB VENDOR MUST DISCUSS WHETHER COPPER MILLING IS NECESSARY TO ACHIEVE THE DESIRED BOARD PLATING COUNT WHEN DETERMINED NECESSARY. A SPACING OF 100 MILS FROM ANY OTHER COPPER FEATURE ON THE BOARD MUST BE MAINTAINED.

16. SMEAR REMOVAL SHALL NOT ETCHBACK GREATER THAN 0.001.

17. FINISHED CONDUCTOR WIDTH NOT TO BE REDUCED MORE THAN 20% OF MINIMUM WIDTH BOTH ARE MEASURED AT LINE TO PAD ENTRY. TEAR DROPPING OF TRACE TO PAD JUNCTION IS PERMITTED PROVIDED MINIMUM METAL-TO-METAL ARTWORK SPACINGS ARE NOT COMPROMISED.

18. INTERNAL ANNULAR RING 0.001 MINIMUM. EXTERNAL ANNULAR RING 0.002 MINIMUM. BOTH ARE MEASURED AT LINE TO PAD ENTRY. TEAR DROPPING OF TRACE TO PAD JUNCTION IS PERMITTED PROVIDED MINIMUM METAL-TO-METAL ARTWORK SPACINGS ARE NOT COMPROMISED.

19. MASK FINISH MUST BE PHOTO IMAGEABLE AND IN ACCORDANCE WITH IPC-SM-840C CLASS T. FINISH MUST BE GREEN AND GLOSSY. REGISTRATION TO BE WITHIN +/- 0.003 OF ITS RESPECTIVE OUTER CIRCUIT LAYERS. VENDOR MAY ADJUST SOLDERMASK WHERE SOLDERMASK PADS ARE THE SAME SIZE (10 MILS) TO PROVIDE UP EXPOSED AND NO CONFLICT IS PRODUCED WITH ANY STATED "VIA TENTING/PLUGGING" REQUIREMENTS.

20. PCB VENDOR TO ENSURE ALL VIAS ARE COMPLETELY FREE OF SOLDERMASK ON BOTTOM SIDE OF PCB.

21. FOLLOW UP SIZES WITH 150 MICROS INCHES MINIMUM ELECTROLESS NICKEL (Ni) FOLLOWED BY 500 MICROS INCHES THICKENING GOLD (Au).

22. REMOVE ALL SHARP EDGES AND BURS 0.003" MAXIMUM.

23. SILKSCREEN USING WHITE NONCONDUCTIVE INK NO INK TO APPEAR ON EXPOSED COPPER SUCH AS PLATED THROUGH HOLE PADS AND SURFACE MOUNT LANDS. INK ON SOLDER MASK COVERED PADS IS PERMISSIBLE. CLIPPING OF SILKSCREEN 0.008 MM FROM PADS IS PERMITTED.

24. CALCULATION IN ACCORDANCE WITH IPC-TM-650, METHOD 2.4.22. BOW AND TWIST MAY NOT EXCEED 0.7%

25. 100% CONTINUITY AND ISOLATION ELECTRICAL TESTING PER CURRENT IPC TEST REFERENCED IN IPC-6013.5 FILE NUMBER FOR NETLIST PROVIDED.

26. CONTROLLED IMPEDANCE TRACES ARE AS FOLLOWS:
 

- TOLERANCE ON ALL LINES, UNLESS OTHERWISE SPECIFIED +/- 10%.
- SINGLE ENDED TRACES (1.00425) LVR-1&12 TO BE 50 OHMS.
- EDGE COUPLED TRACES (1.004-.019 CENTERS), LVR 1 & 12 TO BE 100 OHMS.

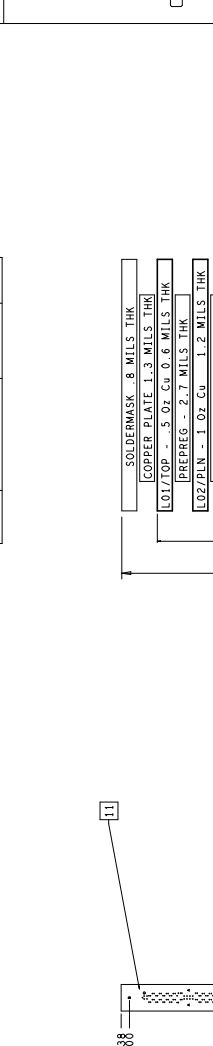
27. PCB VENDOR TO PROVIDE ONE TEST COUPLES AND ONE CROSS SECTION PER LOT WITH SHIPMENT.

28. PCB VENDOR TO PROVIDE 2 SOLDER SAMPLES WITH FIRST SHIPMENT.

29. DETAILS NOT SPECIFIED ARE AT MANUFACTURER'S OPTION, HOWEVER FINAL APPROVAL MUST BE OBTAINED.

DRILL CHART- TOP TO BOTTOM  
ALL UNITS ARE IN MILS

FIGURE	SIZE	PLATED	QTY
14-A	10.0	PLATED	149
	40.0	PLATED	4
	125.0	PLATED	2
	40.0	NON-PLATED	2



PRIMARY SIDE SHOWN

DETAIL A  
SCALE: NONE  
(CROSS SECTION)

REV	DESCRIPTION	DATE	APPROVED

PCB FABRICATION  
HSMC LOW COST  
LOOPBACK BOARD

SIZE: N/A  
CASE CODE: D  
RNG NO.: 140-0320604-C1  
CONTRACT NO.: XXXXXXX

SCALE: 1/1

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