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NOTES UNLESS OTHERWISE SPECIFIED:

1. THE FINISHED PRINTED WIRING BOARD SHALL MEET THE REQUIREMENTS OF IPC-A-600-X (LATEST REVISION).
2. THIS ARTWORK AND RELATED ARTWORK ARE COMPUTER GENERATED. CHANGES ARE TO BE PERFORMED ON THE ORIGINAL DATABASE.
3. THIS IS A REDUCED DIMENSION DRAWING. ADDITIONAL DIMENSIONS NEEDED TO DEFINE THE TRUE PROFILES OF THIS PART SHALL BE OBTAINED FROM THE MASTER CAD MODEL DATABASE NAMED 10398534_D.ZIP.
4. ALL DIMENSIONS ARE IN MILLIMETERS.
5. FABRICATE AND INSPECT PER IPC-6012, CLASS 2, TYPE 3.

6 MATERIAL: ISOLA 370HR 1 OZ / 1/2 OZ COPPER CLAD, DOUBLE SIDED, 0.127 mm THICK EPOXY/WOVEN GLASS LAMINATE
PER IPC-4101/L 126-0127-C1/CH

7 MATERIAL: ISOLA 370HR 0.0762 mm THICK EPOXY/WOVEN GLASS PREPEG PER IPC-4101/P 126-E1080 TW RE VC

8 MATERIAL: 1 OZ. COPPER FOIL PER IPC 4562/3 CU E3 1 S XS 3.

9 SURFACE FINISH TO BE ELECTROLESS NICKEL / IMMERSION GOLD (ENIG) PLATING PER IPC-6013. ALL PLATED HOLES AND CONDUCTIVE SURFACES SHALL BE PLATED WITH 0.0254 mm COPPER MINIMUM. ALL Ni/Au PLATED AREAS SHALL HAVE MINIMUM THICKNESS 0.00254 mm FOR Ni AND 0.051 μ m FOR Au.

10. ALL HOLES SPECIFIED IN THE DRILL CHART ARE FINISHED HOLE DIAMETERS. HOLE TOLERANCE +/- 0.051 mm FOR NON-PLATED HOLES AND +/- 0.076 mm FOR PLATED HOLES.

11. FABRICATION TOLERANCES: END PRODUCT TRACE WIDTHS AND LANDS SHALL NOT VARY MORE THAN THE SMALLER OF 0.051 mm OR 10% OF THE TRACE WIDTH FROM THE GERBER DATA.

12 SOLDER MASK: PHOTO-IMAGED LIQUID POLYMER, GREEN COLOR, ON BOTH SIDES OF BOARD, IN ACCORDANCE WITH IPC SM-840, TYPE B CLASS 2 OVER BARE COPPER.

13 SILKSCREEN: BOTH SIDES WITH WHITE NON-CONDUCTIVE EPOXY INK. LANDS AND EXPOSED PLATED AREAS TO BE FREE OF INK.

14. BOW AND TWIST: SHALL NOT EXCEED 0.75%.

15. ELECTRICAL TEST: CONTINUITY, SHORTS, AND OPEN TESTING ON ALL EXPOSED TERMINAL PADS USING IPC-D-356A NETLIST DATA AND A TWO-SIDED FLYING PROBE TESTER ON EACH PWB. DELIVER THE TEST DOCUMENTATION WITH THE FINISHED PWB. CONTINUITY TEST SHALL BE AT 10 OHMS MAX. SHORTS TEST SHALL BE PERFORMED AT 250V. MINIMUM ISOLATION OF 20M OHMS.

16 MARK IN LOCATION SHOWN WITH 1 mm MINIMUM HIGH CHARACTERS THE SERIAL NUMBER "NXXXXXX" (WHERE N IS A VENDOR DESIGNATION LETTER AND XXXXX IS A UNIQUE 5 DIGIT SERIAL NUMBER FOR EACH PART. THE VENDOR DESIGNATION AND THE STARTING SERIAL NUMBER SHALL BE IN ACCORDANCE WITH THE VALUES PROVIDED IN THE PURCHASE ORDER).

17 FILL HOLES INDICATED IN THE DRILL TABLE USING NON-CONDUCTIVE INK, ITEM 6, IN ACCORDANCE WITH IPC-4761.

REVISION HISTORY

REV	DESCRIPTION	CAT	DWN	ENGR	SEE JPL DATA MANAGEMENT SYSTEM FOR APPROVAL SIGNATURES AND DATES
A	----- INITIAL RELEASE -----	II	-	-	
B	CORRECTED R79 & R97. PREPARED FOR UNLIMITED RELEASE	II	D. PALMER	C. SHELTON	
C	CHANGED FROM CONCERTO TO DELFINO SUPPORT. ADDED DIFFERENTIAL CURRENT SENSE AND ENCODER OPTIONS.	II	D. PALMER	C. SHELTON	
D	CHANGED FORM FACTOR. ADDED MCU DIRECTLY TO BOARD. REMOVED ANALOG ENCODER. REMOVED 18-BIT ADC. UPDATED CONNECTORS. ADDED TEMPERATURE/HUMIDITY SENSOR AND 1-WIRE ID CONNECTOR. UPDATED CURRENT-SENSE COMPONENTS.	II	D. PALMER	C. SHELTON	

	AR	6			SAN-EI OR EQUIV. PHP-900 IR-10F	VIA HOLE FILL MATERIAL	IPC-4761	17
	AR	5			ETHONE 50-1000R CATALYST 9	INK, WHITE EPOXY	IPC-4781	13
	AR	4			PROBIMER 52 OR TAIYO PSR-4000	SOLDERMASK, LPI	IPC-SM-840 CL A	12
	AR	3			3 CU E3	COPPER FOIL, 1 OZ	IPC-4562	8
	AR	2			P 26-2116 TW RE VC	GLASS BASED EPOXY RESIN PREPEG, B-STAGE	IPC 4104/26	7
	AR	1			L 26 0400-C1/C1	GLASS BASED EPOXY RESIN CU CLAD 1 OZ / 1 OZ	IPC 4104/26	6
	-1	ITEM NO	REFDES	DAI	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	SPECIFICATION	MATERIAL OR NOTE
	QTY REQD							

PARTS LIST

		CONTRACT NO		JET PROPULSION LABORATORY			
		DWN	D PALMER	CALIFORNIA INSTITUTE OF TECHNOLOGY PASADENA, CA 91109			
		ENGR	C SHELTON				
		SEE JPL DATA MANAGEMENT SYSTEM FOR APPROVAL SIGNATURES AND DATES		TITLE PRINTED WIRING BOARD, M1 ACTUATOR DRIVER			
10398535	TMT			SIZE	DAI	DWG NO	REV
NEXT ASSEMBLY	USED ON			C	23835	10398534	D
APPLICATION				SCALE: 1/1		SHEET 1 OF 4	

REV 04/201

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DO NOT SCALE DRAWING
INTERPRET DIMENSIONING AND
TOLERANCING PER ASME Y14.5 2009
INTERPRET DWG PER ASME Y14.100

JPL C SH

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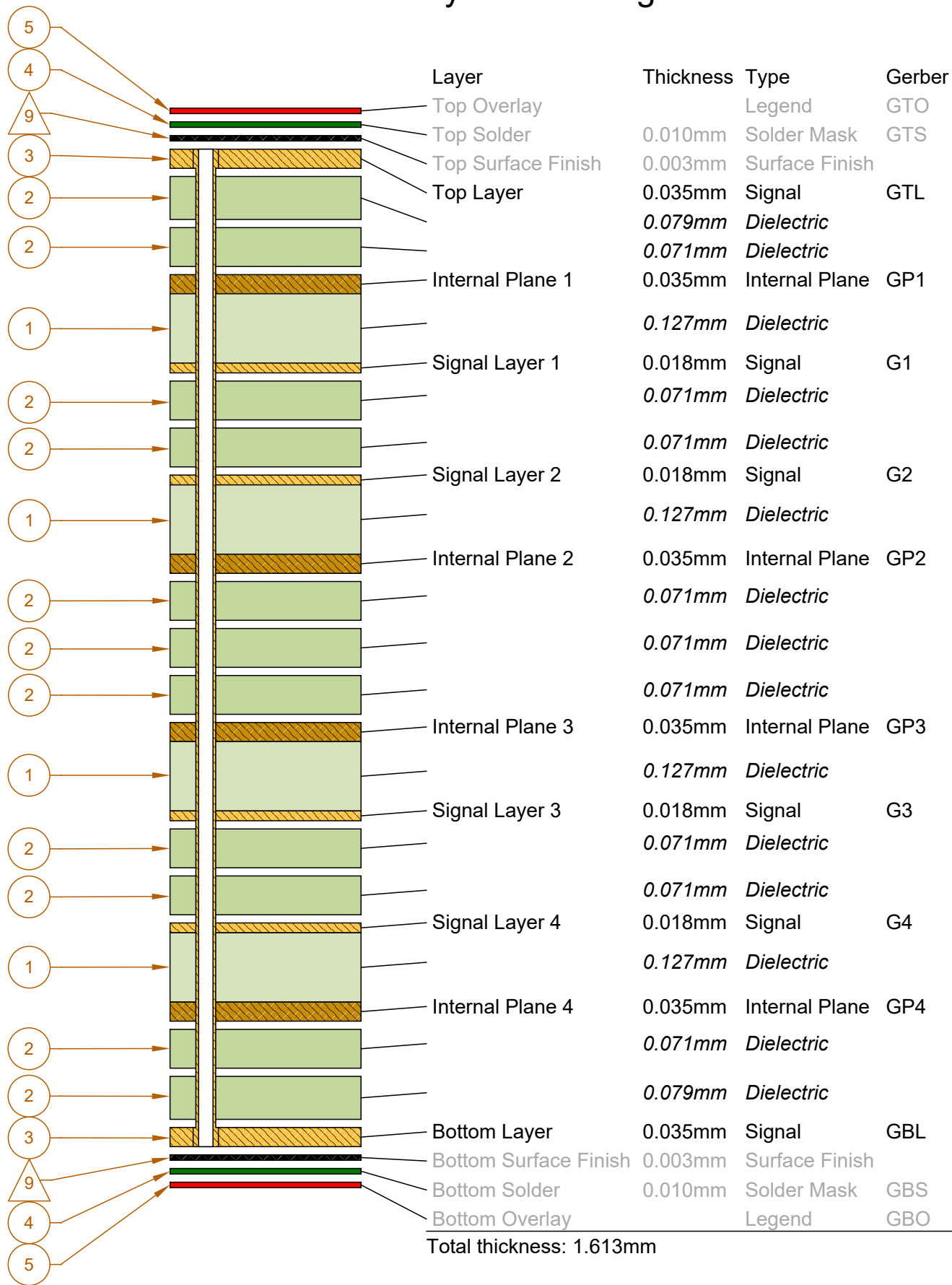
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D

D

Layer Stack Legend



C

C

B

B

A

A

4

3

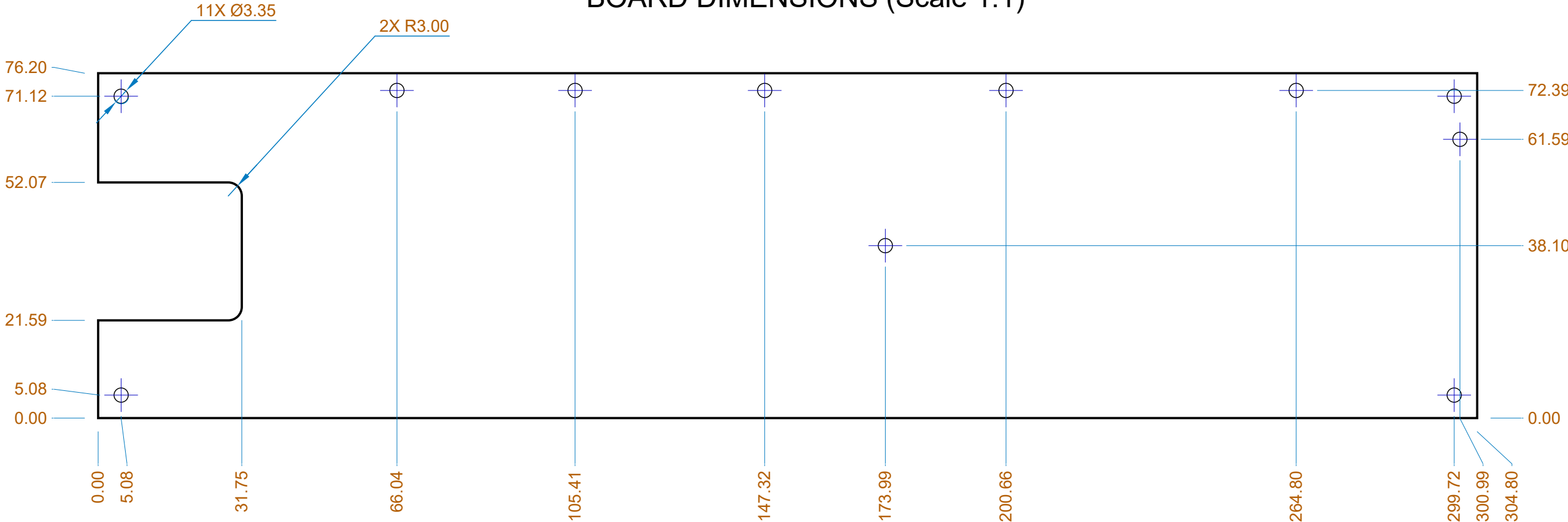
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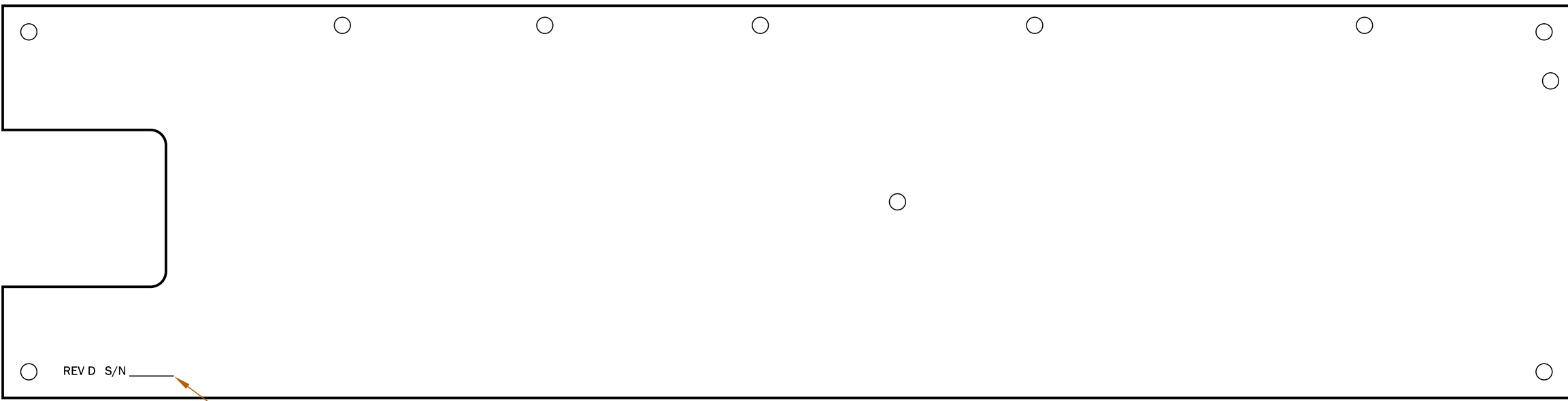
BOARD DIMENSIONS (Scale 1:1)



C

C

TOP VIEW (Scale 1:1)



B

B

A

A

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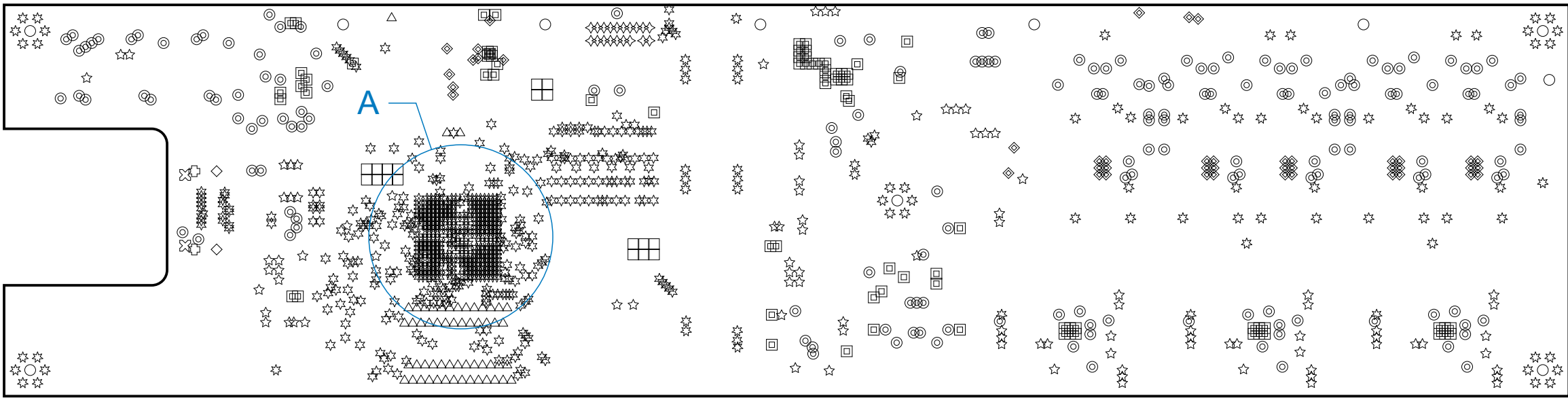
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DRILL DRAWING VIEW (SCALE 1:1)



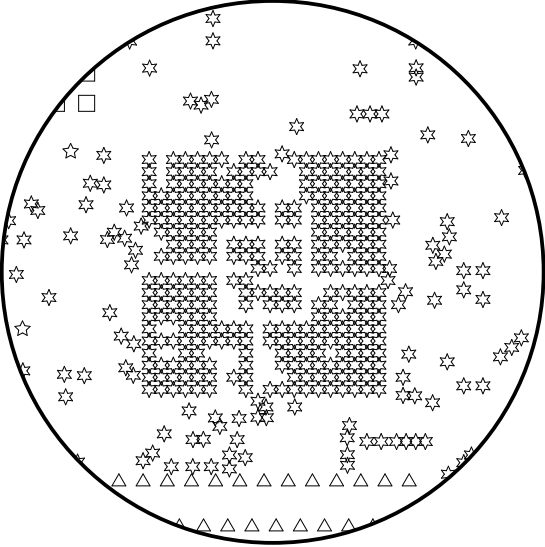
C

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DRILL TABLE

Symbol	Count	Hole Size	Plated	Note
☆	610	0.20mm	Plated	17
▣	80	0.25mm	Plated	
◆	44	0.30mm	Plated	
△	56	0.33mm	Plated	
◎	174	0.38mm	Plated	
☆	97	0.50mm	Plated	
⊠	2	0.64mm	Non-Plated	
◆	19	0.66mm	Plated	
☆	92	0.70mm	Plated	
▣	18	0.89mm	Plated	
⊠	2	1.45mm	Non-Plated	
◆	2	1.90mm	Non-Plated	
○	11	3.35mm	Non-Plated	
	1207 Total			

DETAIL A (Scale 2:1)



B

B

A

A