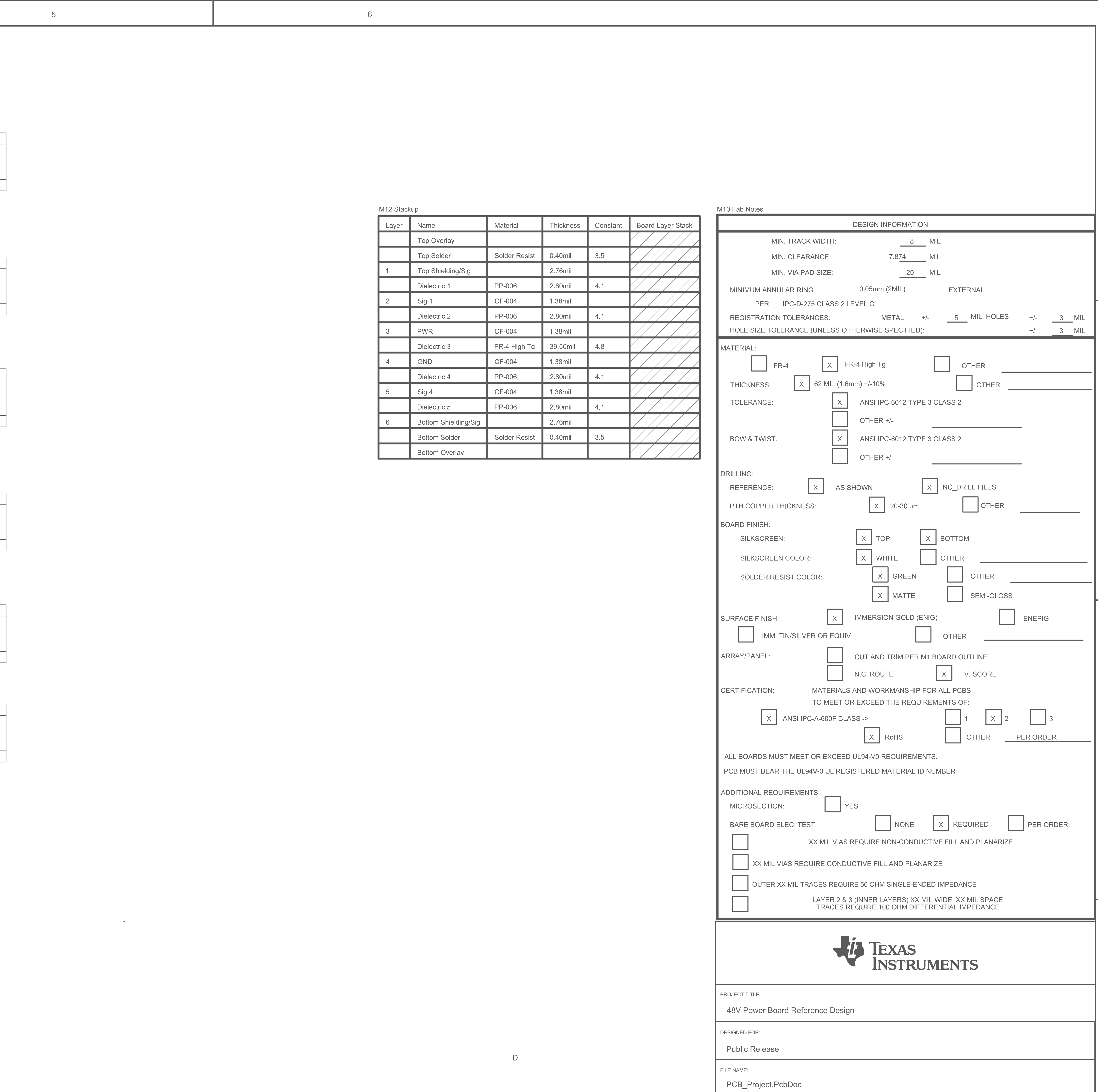




M10 Fab Notes

DESIGN INFORMATION

MIN. TRACK WIDTH: 8 MIL

MIN. CLEARANCE: 7.874 MIL

MIN. VIA PAD SIZE: 20 MIL

MINIMUM ANNULAR RING 0.05mm (2MIL) EXTERNAL

PER IPC-D-275 CLASS 2 LEVEL C

REGISTRATION TOLERANCES: METAL +/- 5 MIL, HOLES +/- 3 MIL

HOLE SIZE TOLERANCE (UNLESS OTHERWISE SPECIFIED): +/- 3 MIL

MATERIAL:

☐ FR-4

☒ FR-4 High Tg

☐ OTHER _____

THICKNESS: ☒ 62 MIL (1.6mm) +/-10% ☐ OTHER _____

TOLERANCE: ☒ ANSI IPC-6012 TYPE 3 CLASS 2

☐ OTHER +/- _____

BOW & TWIST: ☒ ANSI IPC-6012 TYPE 3 CLASS 2

☐ OTHER +/- _____

DRILLING:

REFERENCE: ☒ AS SHOWN

☒ NC_DRILL FILES

PTH COPPER THICKNESS: ☒ 20-30 um ☐ OTHER _____

BOARD FINISH:

SILKSCREEN:

☒ TOP

☒ BOTTOM

SILKSCREEN COLOR:

☒ WHITE

☐ OTHER _____

SOLDER RESIST COLOR:

☒ GREEN

☐ OTHER _____

☒ MATTE

☐ SEMI-GLOSS

SURFACE FINISH:

☒ IMMERSION GOLD (ENIG)

☐ ENEPIG

☐ IMM. TIN/SILVER OR EQUIV

☐ OTHER _____

ARRAY/PANEL:

☐ CUT AND TRIM PER M1 BOARD OUTLINE

☐ N.C. ROUTE

☒ V. SCORE

CERTIFICATION:

MATERIALS AND WORKMANSHIP FOR ALL PCBs

TO MEET OR EXCEED THE REQUIREMENTS OF:

☒ ANSI IPC-A-600F CLASS >

☐ 1

☒ 2

☐ 3

☒ RoHS

☐ OTHER

____ PER ORDER

ALL BOARDS MUST MEET OR EXCEED UL94-V0 REQUIREMENTS.

PCB MUST BEAR THE UL94V-0 UL REGISTERED MATERIAL ID NUMBER

ADDITIONAL REQUIREMENTS:

MICROSECTION: ☐ YES

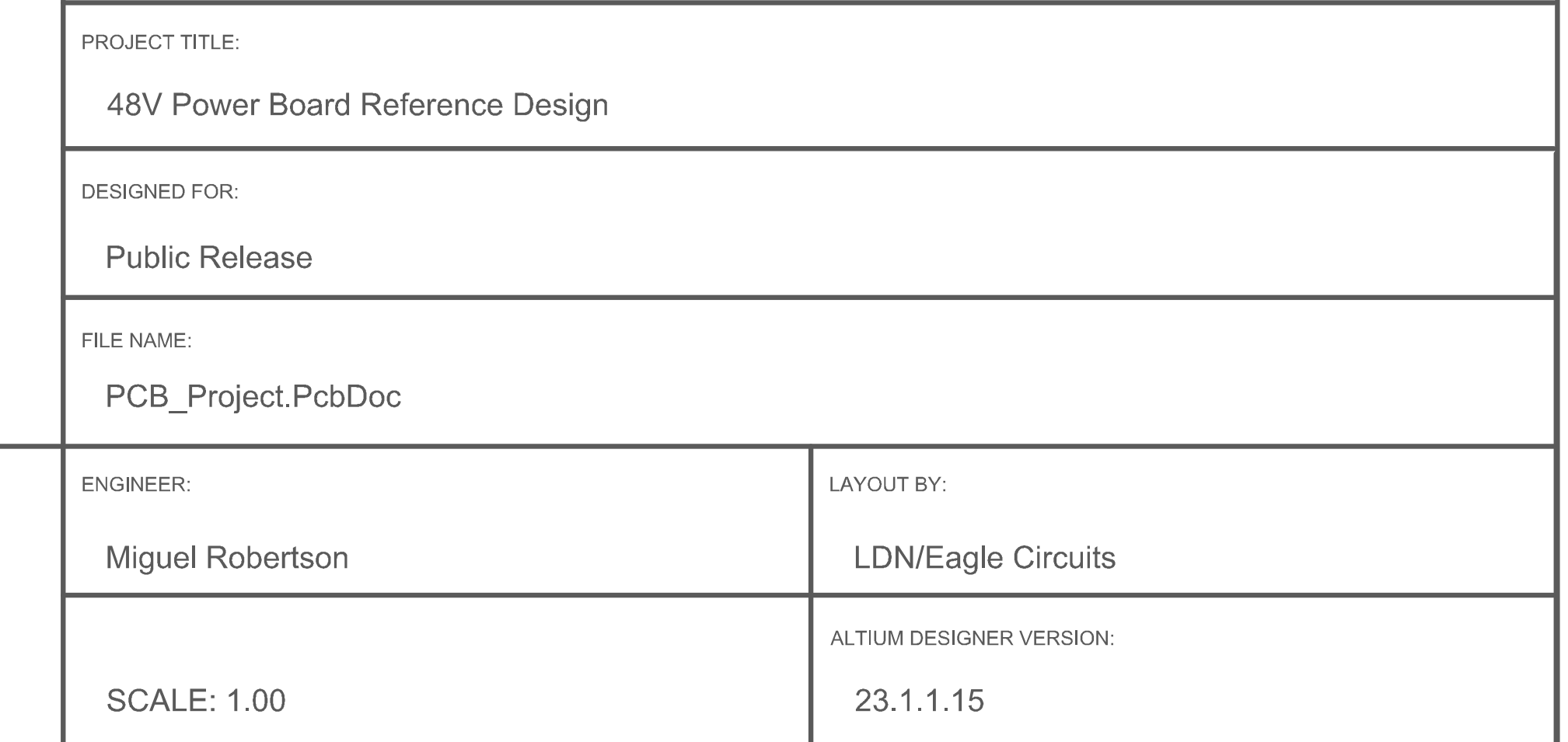
BARE BOARD ELEC. TEST: ☐ NONE ☒ REQUIRED ☐ PER ORDER

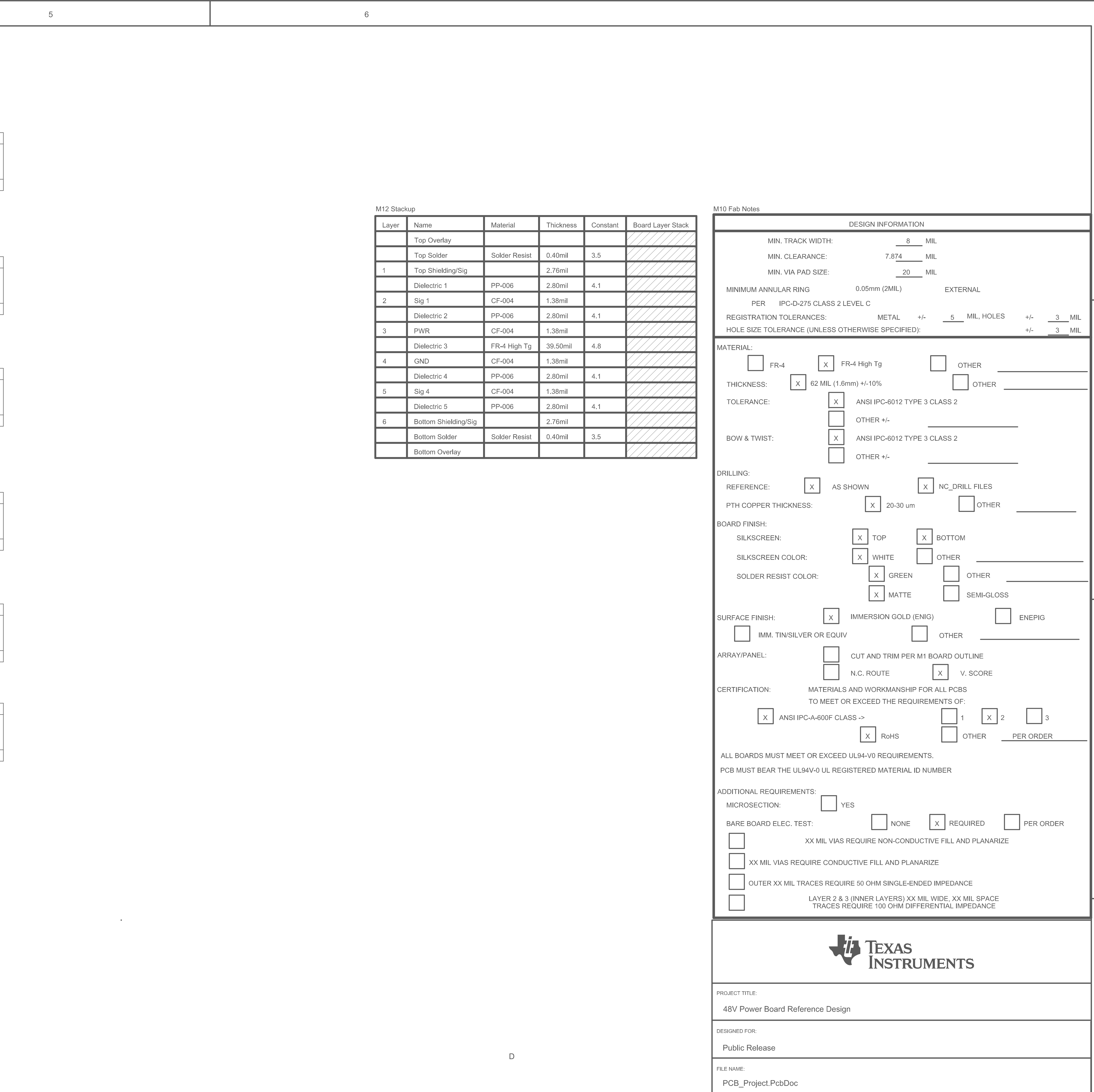
☐ XX MIL VIAS REQUIRE NON-CONDUCTIVE FILL AND PLANARIZE

☐ XX MIL VIAS REQUIRE CONDUCTIVE FILL AND PLANARIZE

☐ OUTER XX MIL TRACES REQUIRE 50 OHM SINGLE-ENDED IMPEDANCE

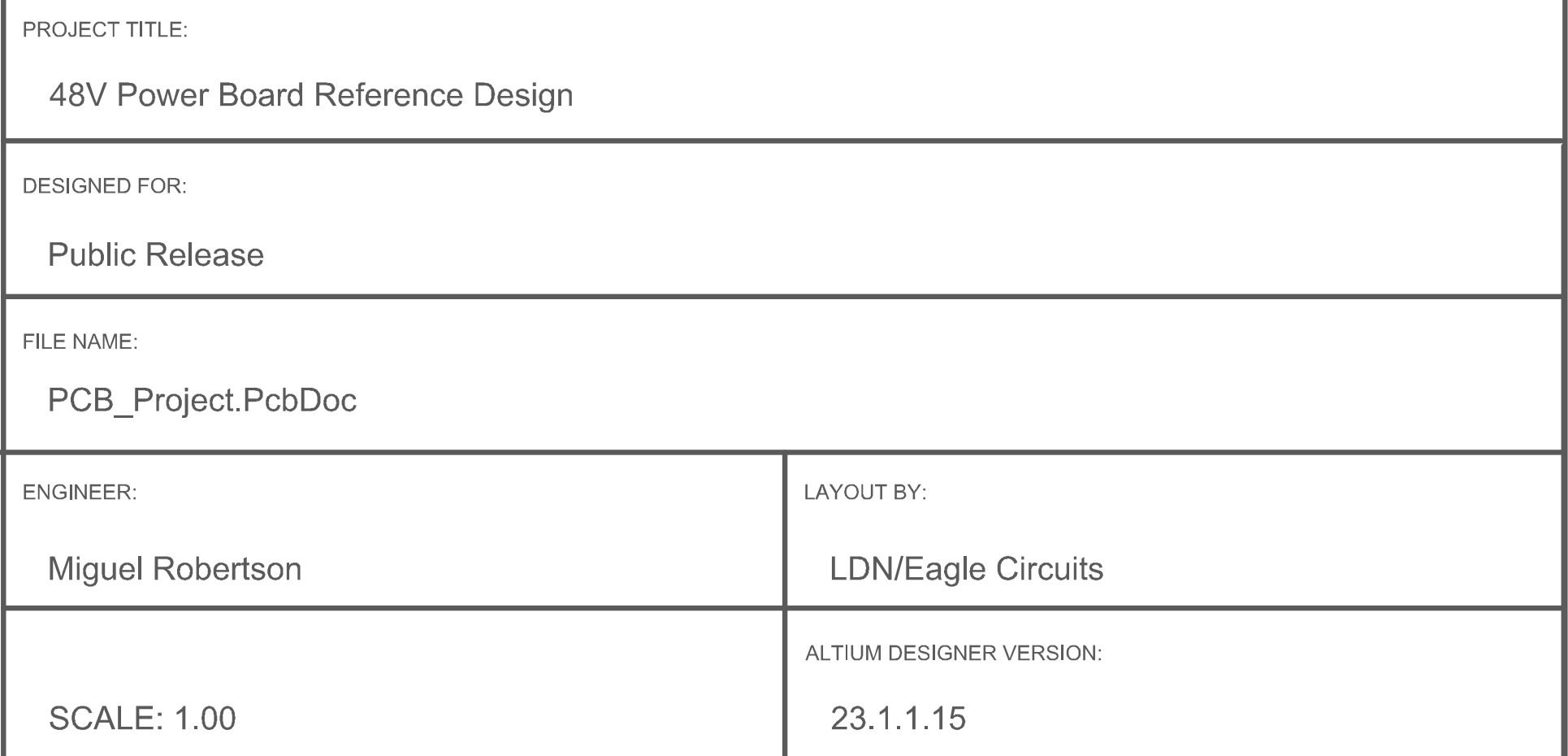
☐ LAYER 2 & 3 (INNER LAYERS) XX MIL WIDE, XX MIL SPACE TRACES REQUIRE 100 OHM DIFFERENTIAL IMPEDANCE





10 Feb Notes

DESIGN INFORMATION			
MIN. TRACK WIDTH:	8	MIL	
MIN. CLEARANCE:	7.874	MIL	
MIN. VIA PAD SIZE:	20	MIL	
MINIMUM ANNULAR RING	0.05mm (2MIL)	EXTERNAL	
PER IPC-D-275 CLASS 2 LEVEL C			
REGISTRATION TOLERANCES:	METAL +/-	6 MIL, HOLES +/-	3 MIL
HOLE SIZE TOLERANCE (UNLESS OTHERWISE SPECIFIED):		+/-	3 MIL
MATERIAL:			
☐ FR-4	☒ FR-4 High Tg	☐ OTHER	
THICKNESS:	☒ 62 MIL (1.6mm) +/-10%	☐ OTHER	
TOLERANCE:	☒ ANSI IPC-6012 TYPE 3 CLASS 2	☐ OTHER +/-	
BOW & TWIST:	☒ ANSI IPC-6012 TYPE 3 CLASS 2	☐ OTHER +/-	
DRILLING:			
REFERENCE:	☒ AS SHOWN	☐ NC_DRILL FILES	
PTH COPPER THICKNESS:	☒ 20-30 um	☐ OTHER	
BOARD FINISH:			
SILKSCREEN:	☒ TOP	☒ BOTTOM	
SILKSCREEN COLOR:	☒ WHITE	☐ OTHER	
SOLDER RESIST COLOR:	☒ GREEN	☐ OTHER	
	☒ MATTE	☐ SEMI-GLOSS	
SURFACE FINISH:			
☒ IMMERSION GOLD (ENIG)	☐ ENEPIG		
☐ IMM. TIN/SILVER OR EQUIV	☐ OTHER		
ARRAY/PANEL:			
☐ CUT AND TRIM PER M1 BOARD OUTLINE	☒ N.C. ROUTE	☒ V. SCORE	
CERTIFICATION:			
MATERIALS AND WORKMANSHIP FOR ALL PCBs TO MEET OR EXCEED THE REQUIREMENTS OF:			
☒ ANSI IPC-A-600F CLASS ->	☐ 1	☒ 2	☐ 3
☒ RoHS	☐ OTHER		PER ORDER
ALL BOARDS SHOULD MEET OR EXCEED UL94-V0 REQUIREMENTS.			
PCB SHOULD BEAR THE UL94V-0 UL REGISTERED MATERIAL ID NUMBER			
ADDITIONAL REQUIREMENTS:			
MICROSECTION:	☐ YES		
BARE BOARD ELEC. TEST:	☐ NONE	☒ REQUIRED	☐ PER ORDER
☐	XX MIL VIAS REQUIRE NON-CONDUCTIVE FILL AND PLANARIZE		
☐	XX MIL VIAS REQUIRE CONDUCTIVE FILL AND PLANARIZE		
☐	OUTER XX MIL TRACES REQUIRE 50 OHM SINGLE-ENDED IMPEDANCE		
☐	LAYER 2 & 3 (INNER LAYERS) XX MIL WIDE, XX MIL SPACE TRACES REQUIRE 100 OHM DIFFERENTIAL IMPEDANCE		



Texas Instruments (TI) and/or its licensors do not warrant the accuracy or completeness of this specification or any information contained therein. TI and/or its licensors do not warrant that this design will meet the specifications, will be suitable for your application or fit for any particular purpose, or will operate in an implementation. TI and/or its licensors do not warrant that the design is production worthy. You should completely validate and test your design implementation to confirm the system functionality for your application.	ENGINEER: Miguel Robertson	LAYOUT BY: LDN/Eagle Circuits
	SCALE: 1:00	ALTIUM DESIGNER VERSION: 23.1.1.15

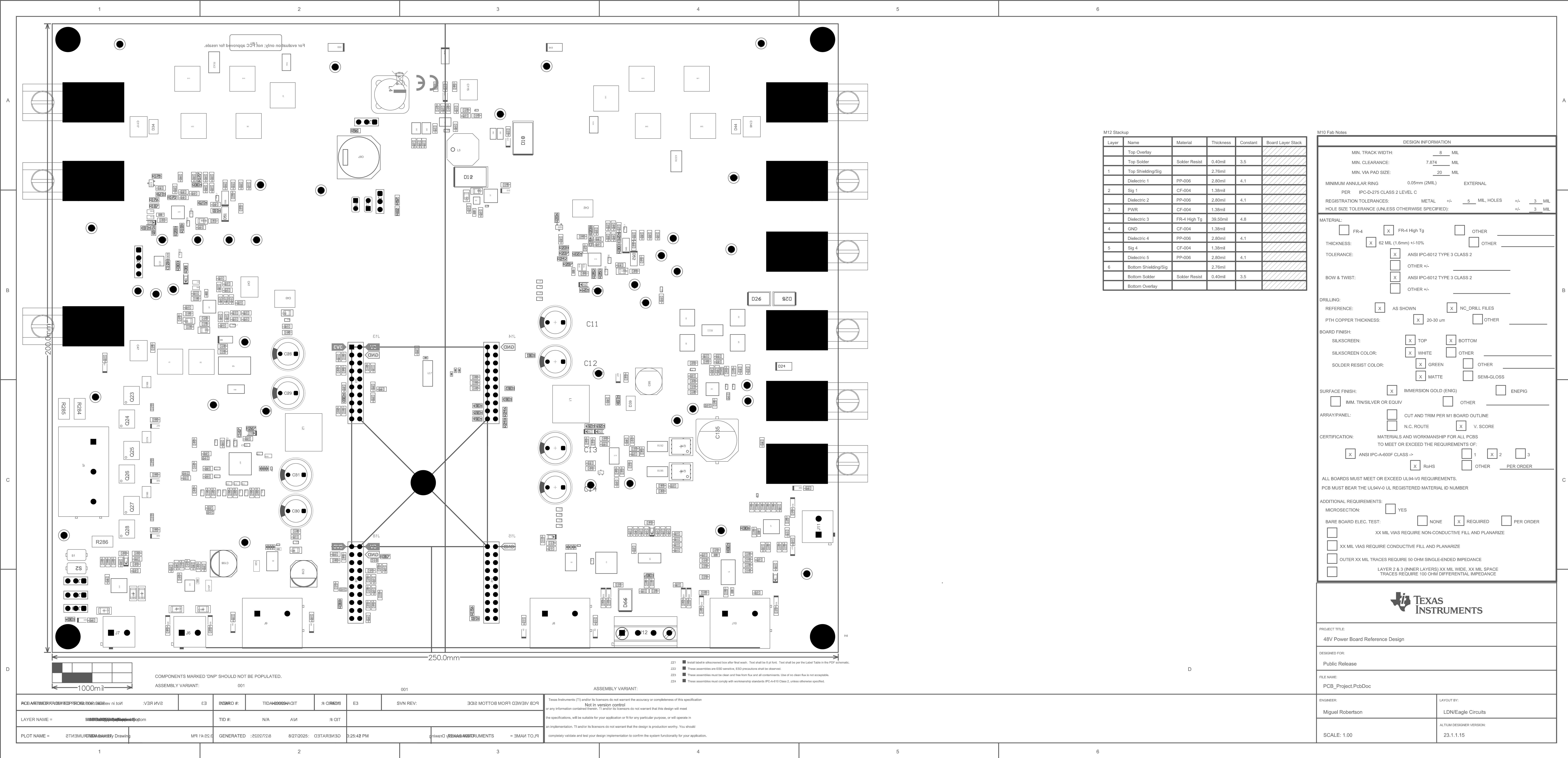
M10 Fab Notes

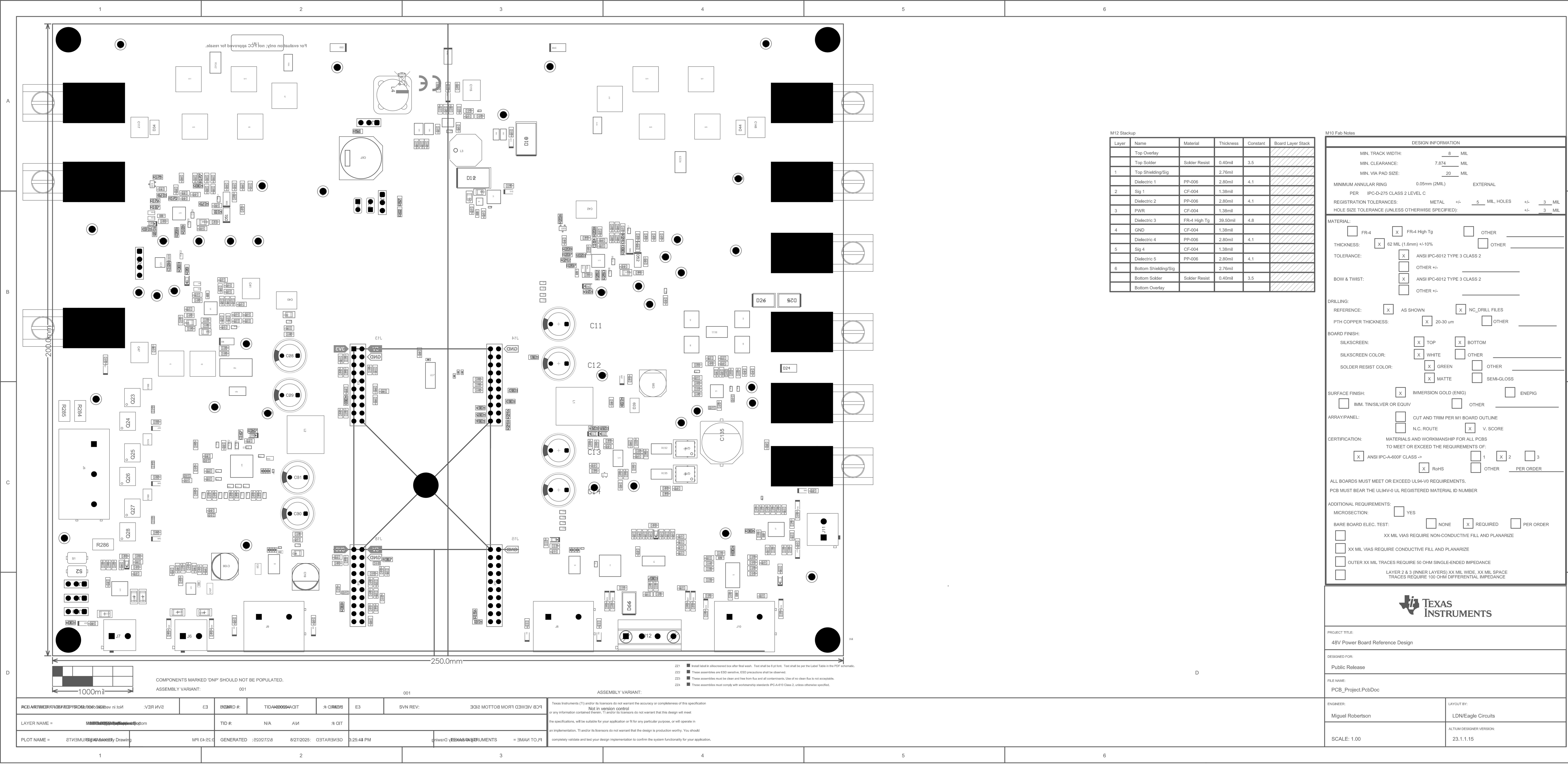
DESIGN INFORMATION			
MIN. TRACK WIDTH:	8	MIL	
MIN. CLEARANCE:	7.874	MIL	
MIN. VIA PAD SIZE:	20	MIL	
MINIMUM ANNULAR RING	0.05mm (2MIL)	EXTERNAL	
PER	IPC-D-275 CLASS 2 LEVEL C		
REGISTRATION TOLERANCES:	METAL	±/±	5 MIL HOLES ±/± 3 MIL
HOLE SIZE TOLERANCE (UNLESS OTHERWISE SPECIFIED):		±/±	3 MIL
MATERIAL:			
☐ FR-4	☒ FR-4 High Tg	☐ OTHER	
THICKNESS:	☒ 62 MIL (1.6mm) ±/±10%	☐ OTHER	
TOLERANCE:	☒ ANSI IPC-6012 TYPE 3 CLASS 2	☐ OTHER ±/±	
BOW & TWIST:	☒ ANSI IPC-6012 TYPE 3 CLASS 2	☐ OTHER ±/±	
DRILLING:			
REFERENCE:	☒ AS SHOWN	☒ NC_DRILL FILES	
PTH COPPER THICKNESS:	☒ 20-30 um	☐ OTHER	
BOARD FINISH:			
SILKSCREEN:	☒ TOP	☒ BOTTOM	
SILKSCREEN COLOR:	☒ WHITE	☐ OTHER	
SOLDER RESIST COLOR:	☒ GREEN	☐ OTHER	
	☒ MATTE	☐ SEMI-GLOSS	
SURFACE FINISH:	☒ IMMERSION GOLD (ENIG)	☐ ENENIG	
☐ IMM. TIN/SILVER OR EQUIV	☐ OTHER		
ARRAY/PANEL:			
☐	☐ CUT AND TRIM PER M1 BOARD OUTLINE	☒ V. SCORE	
☐	☐ N.C. ROUTE		
CERTIFICATION: MATERIALS AND WORKMANSHIP FOR ALL PCBs TO MEET OR EXCEED THE REQUIREMENTS OF:			
☒ ANSI IPC-A-600F CLASS ->	☐ 1	☒ 2	☐ 3
☐ RoHS	☐ OTHER		PER ORDER
ALL BOARDS MUST MEET OR EXCEED UL94-V0 REQUIREMENTS.			
PCB MUST BEAR THE UL94V-0 UL REGISTERED MATERIAL ID NUMBER			
ADDITIONAL REQUIREMENTS:			
MICROSECTION:	☐ YES		
BARE BOARD ELEC. TEST:	☐ NONE	☒ REQUIRED	☐ PER ORDER
☐	XX MIL VIAS REQUIRE NON-CONDUCTIVE FILL AND PLANARIZE		
☐	XX MIL VIAS REQUIRE CONDUCTIVE FILL AND PLANARIZE		
☐	OUTER XX MIL TRACES REQUIRE 50 OHM SINGLE-ENDED IMPEDANCE		
☐	LAYER 2 & 3 (INNER LAYERS) XX MIL WIDE, XX MIL SPACE TRACES REQUIRE 100 OHM DIFFERENTIAL IMPEDANCE		



TEXAS
INSTRUMENTS

ALTIUM DESIGNER VERSION
23.1.1.15





M12 Stackup					
Layer	Name	Material	Thickness	Constant	Board Layer Stack
	Top Overlay				
	Top Solder	Solder Resist	0.40mil	3.5	
1	Top Shielding/Sig		2.76mil		
	Dielectric 1	PP-006	2.80mil	4.1	
2	Sig 1	CF-004	1.38mil		
	Dielectric 2	PP-006	2.80mil	4.1	
3	PWR	CF-004	1.38mil		
	Dielectric 3	FR-4 High Tg	39.50mil	4.8	
4	GND	CF-004	1.38mil		
	Dielectric 4	PP-006	2.80mil	4.1	
5	Sig 4	CF-004	1.38mil		
	Dielectric 5	PP-006	2.80mil	4.1	
6	Bottom Shielding/Sig		2.76mil		
	Bottom Solder	Solder Resist	0.40mil	3.5	
	Bottom Overlay				

DESIGN INFORMATION

MIN. TRACK WIDTH:

8

MIL

MIN. CLEARANCE:

7.874

MIL

MIN. VIA PAD SIZE:

20

MIL

MINIMUM ANNULAR RING

0.05mm (2MIL)

EXTERNAL

PER

IPC-D-275 CLASS 2 LEVEL C

REGISTRATION TOLERANCES:

METAL

+/-

5

MIL

HOLES

+/-

3

MIL

HOLE SIZE TOLERANCE (UNLESS OTHERWISE SPECIFIED):

+/-

3

MIL

MATERIAL:

☐ FR-4

☒ FR-4 High Tg

☐ OTHER

THICKNESS:

☒ 62 MIL (1.6mm) +/-10%

☐ OTHER

TOLERANCE:

☒ ANSI IPC-6012 TYPE 3 CLASS 2

☐ OTHER +/-

BOW & TWIST:

☒ ANSI IPC-6012 TYPE 3 CLASS 2

☐ OTHER +/-

DRILLING:

REFERENCE:

☒ AS SHOWN

☒ NC_DRILL FILES

PTH COPPER THICKNESS:

☒ 20-30 um

☐ OTHER

BOARD FINISH:

SILKSCREEN:

☒ TOP

☒ BOTTOM

SILKSCREEN COLOR:

☒ WHITE

☐ OTHER

SOLDER RESIST COLOR:

☒ GREEN

☐ OTHER

☒ MATTE

☐ SEMI-GLOSS

SURFACE FINISH:

☒ IMMERSION GOLD (ENIG)

☐ ENEPIG

☐ IMM. TIN/SILVER OR EQUIV

☐ OTHER

ARRAY/PANEL:

☐ CUT AND TRIM PER M1 BOARD OUTLINE

☐ N.C. ROUTE

☒ V. SCORE

CERTIFICATION:

MATERIALS AND WORKMANSHIP FOR ALL PCBs

TO MEET OR EXCEED THE REQUIREMENTS OF:

☒ ANSI IPC-A-600F CLASS ->

☐ 1

☒ 2

☐ 3

☒ RoHS

☐ OTHER

PER ORDER

ALL BOARDS MUST MEET OR EXCEED UL94-V0 REQUIREMENTS.

PCB MUST BEAR THE UL94V-0 UL REGISTERED MATERIAL ID NUMBER

ADDITIONAL REQUIREMENTS:

MICROSECTION:

☐ YES

BARE BOARD ELEC. TEST:

☐ NONE

☒ REQUIRED

☐ PER ORDER

☐ XX MIL VIAS REQUIRE NON-CONDUCTIVE FILL AND PLANARIZE

☐ XX MIL VIAS REQUIRE CONDUCTIVE FILL AND PLANARIZE

☐ OUTER XX MIL TRACES REQUIRE 50 OHM SINGLE-ENDED IMPEDANCE

☐ LAYER 2 & 3 (INNER LAYERS) XX MIL WIDE, XX MIL SPACE

TRACES REQUIRE 100 OHM DIFFERENTIAL IMPEDANCE

TEXAS
INSTRUMENTS

PROJECT TITLE:

48V Power Board Reference Design

DESIGNED FOR:

Public Release

FILE NAME:

PCB_Project.PcbDoc

ENGINEER:

Miguel Robertson

LAYOUT BY:

LDN/Eagle Circuits

SCALE: 1.00

ALTUM DESIGNER VERSION:

23.1.1.15

- Z21

■ Metal label in ultrasonically cleaned box after final wash. Test shall be 5 g force. Test shall be per the Label Table in the PDF schematic.
- Z22

■ These assemblies are ESD sensitive. ESD precautions shall be observed.
- Z23

■ These assemblies must be clean and free from flux and all contaminants. Use of no clean flux is not acceptable.
- Z24

■ These assemblies must comply with workmanship standards IPC-A-610 Class 2, unless otherwise specified.

PCB REVIEWED FOR: 24M REV: E3

BOARD #: TID# N/A

SVN REV: 001

LAYER NAME =

PLOT NAME =

PCB VIEWED FROM BOTTOM SIDE

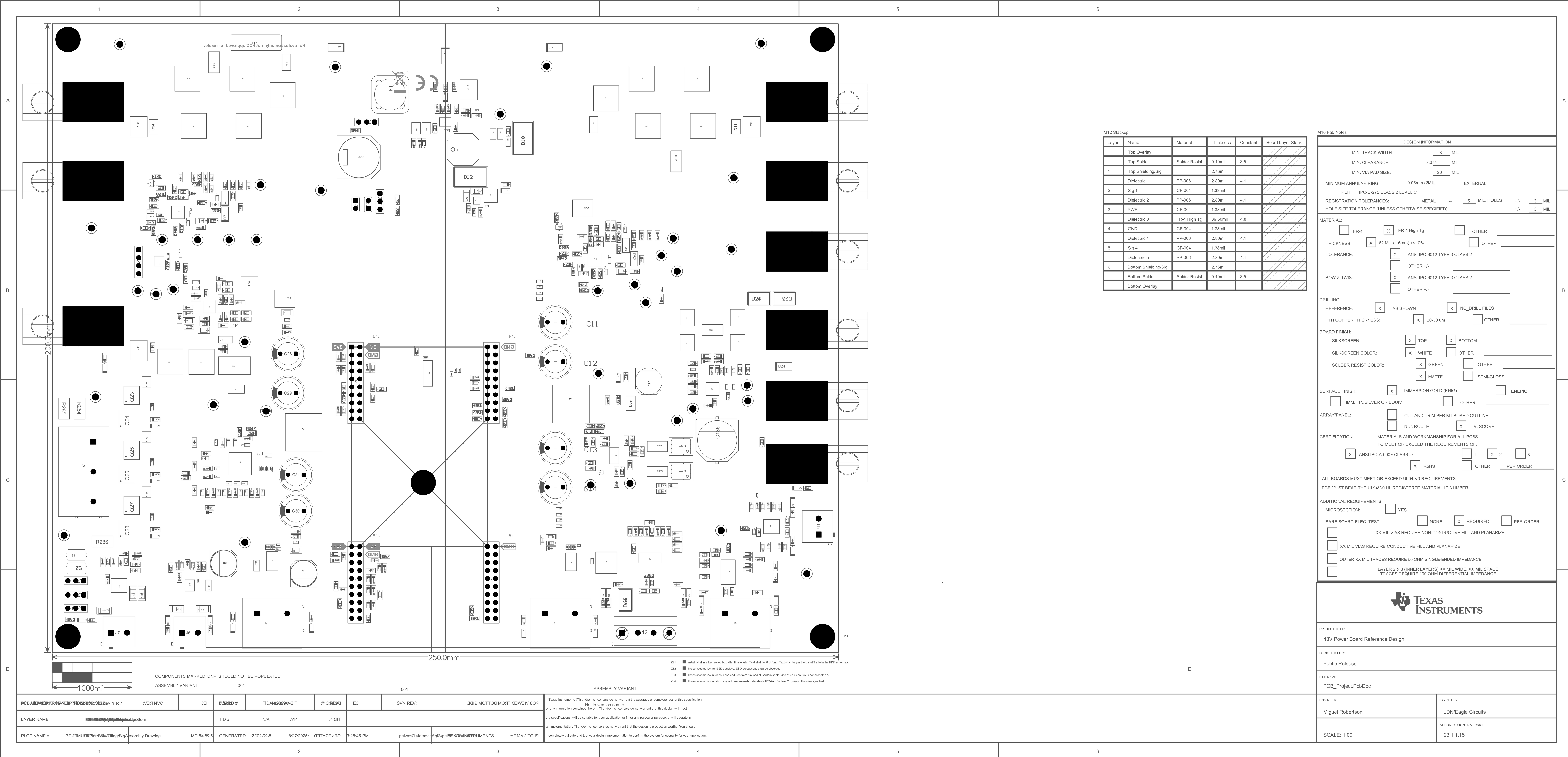
TID #: N/A

SVN REV: 001

GENERATED: 8/25/2025 3:25:48 PM

FILE NAME: PCB_Project.PcbDoc

Texas Instruments (TI) and/or its licensors do not warrant the accuracy or completeness of this specification. Not in version control. TI and/or its licensors do not warrant that this design will meet the specifications, will be suitable for your application or fit for any particular purpose, or will operate in an implementation. TI and/or its licensors do not warrant that the design is production worthy. You should completely validate and test your design implementation to confirm the system functionality for your application.



IMPORTANT NOTICE AND DISCLAIMER

TI PROVIDES TECHNICAL AND RELIABILITY DATA (INCLUDING DATASHEETS), DESIGN RESOURCES (INCLUDING REFERENCE DESIGNS), APPLICATION OR OTHER DESIGN ADVICE, WEB TOOLS, SAFETY INFORMATION, AND OTHER RESOURCES "AS IS" AND WITH ALL FAULTS, AND DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

These resources are intended for skilled developers designing with TI products. You are solely responsible for (1) selecting the appropriate TI products for your application, (2) designing, validating and testing your application, and (3) ensuring your application meets applicable standards, and any other safety, security, regulatory or other requirements.

These resources are subject to change without notice. TI grants you permission to use these resources only for development of an application that uses the TI products described in the resource. Other reproduction and display of these resources is prohibited. No license is granted to any other TI intellectual property right or to any third party intellectual property right. TI disclaims responsibility for, and you fully indemnify TI and its representatives against any claims, damages, costs, losses, and liabilities arising out of your use of these resources.

TI's products are provided subject to [TI's Terms of Sale](#), [TI's General Quality Guidelines](#), or other applicable terms available either on [ti.com](https://www.ti.com) or provided in conjunction with such TI products. TI's provision of these resources does not expand or otherwise alter TI's applicable warranties or warranty disclaimers for TI products. Unless TI explicitly designates a product as custom or customer-specified, TI products are standard, catalog, general purpose devices.

TI objects to and rejects any additional or different terms you may propose.

Copyright © 2025, Texas Instruments Incorporated

Last updated 10/2025