TARGET X ASIC Test Board

Overview

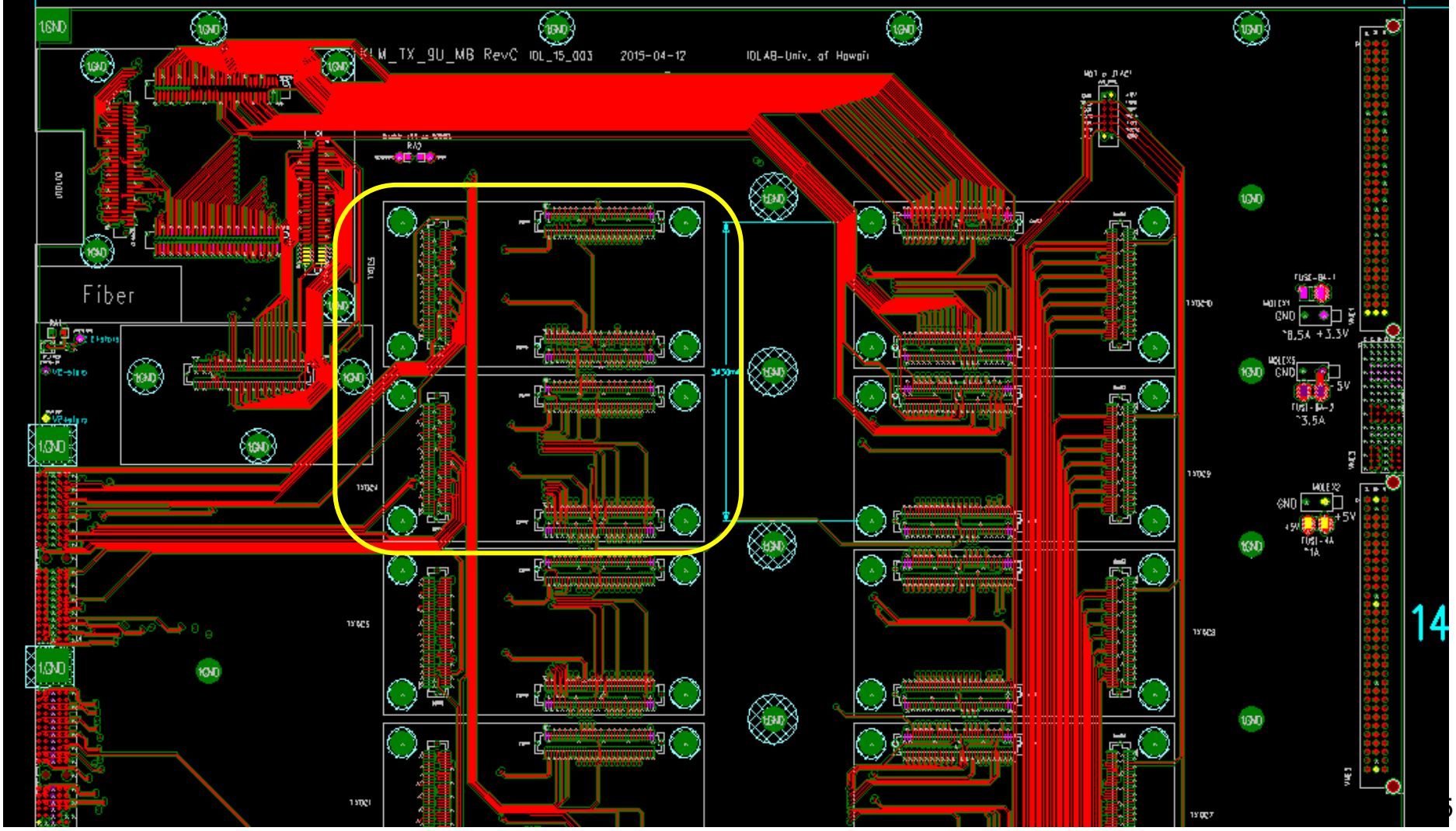
- Using clamshell to test and find the problematic TARGET X ASICs before assembly.
- Use the same KLM test bench setup
- avoid writing a new firmware

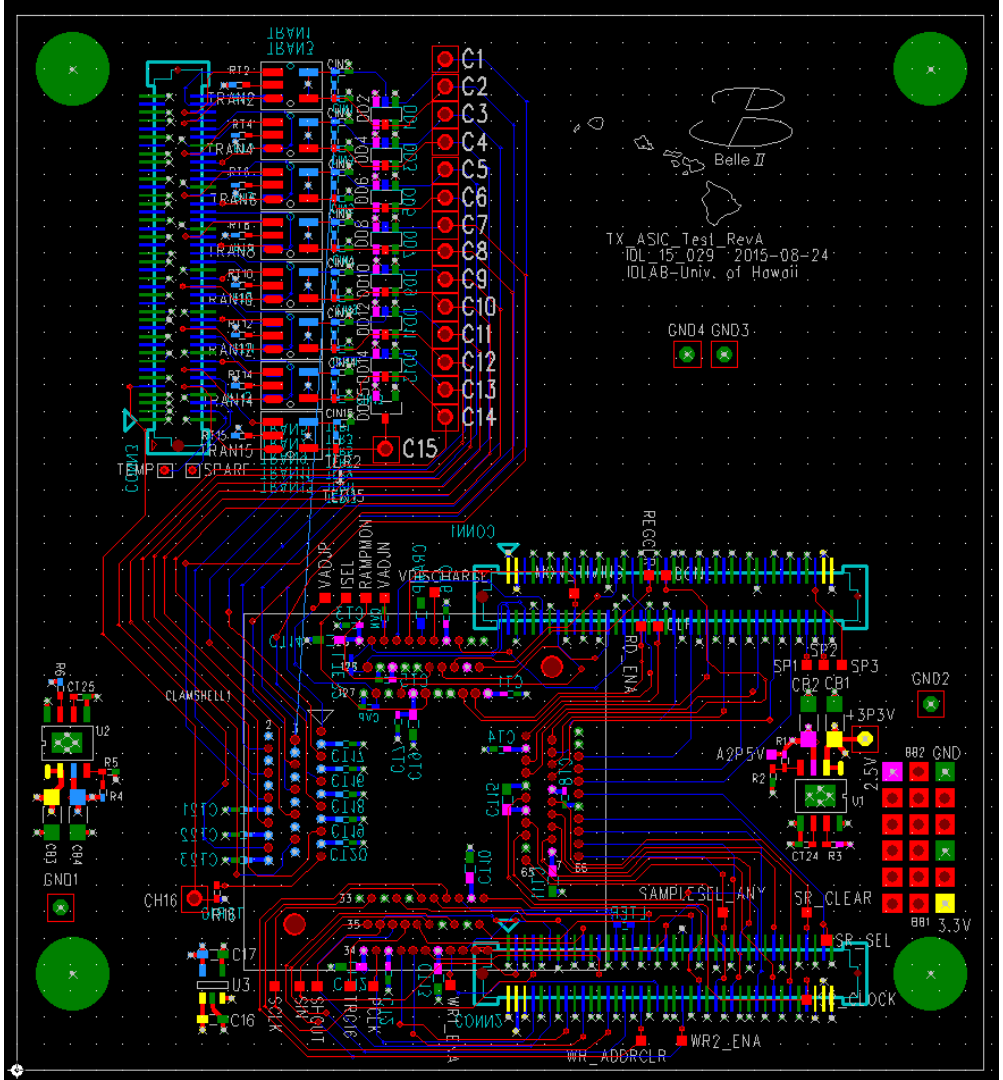
constraints

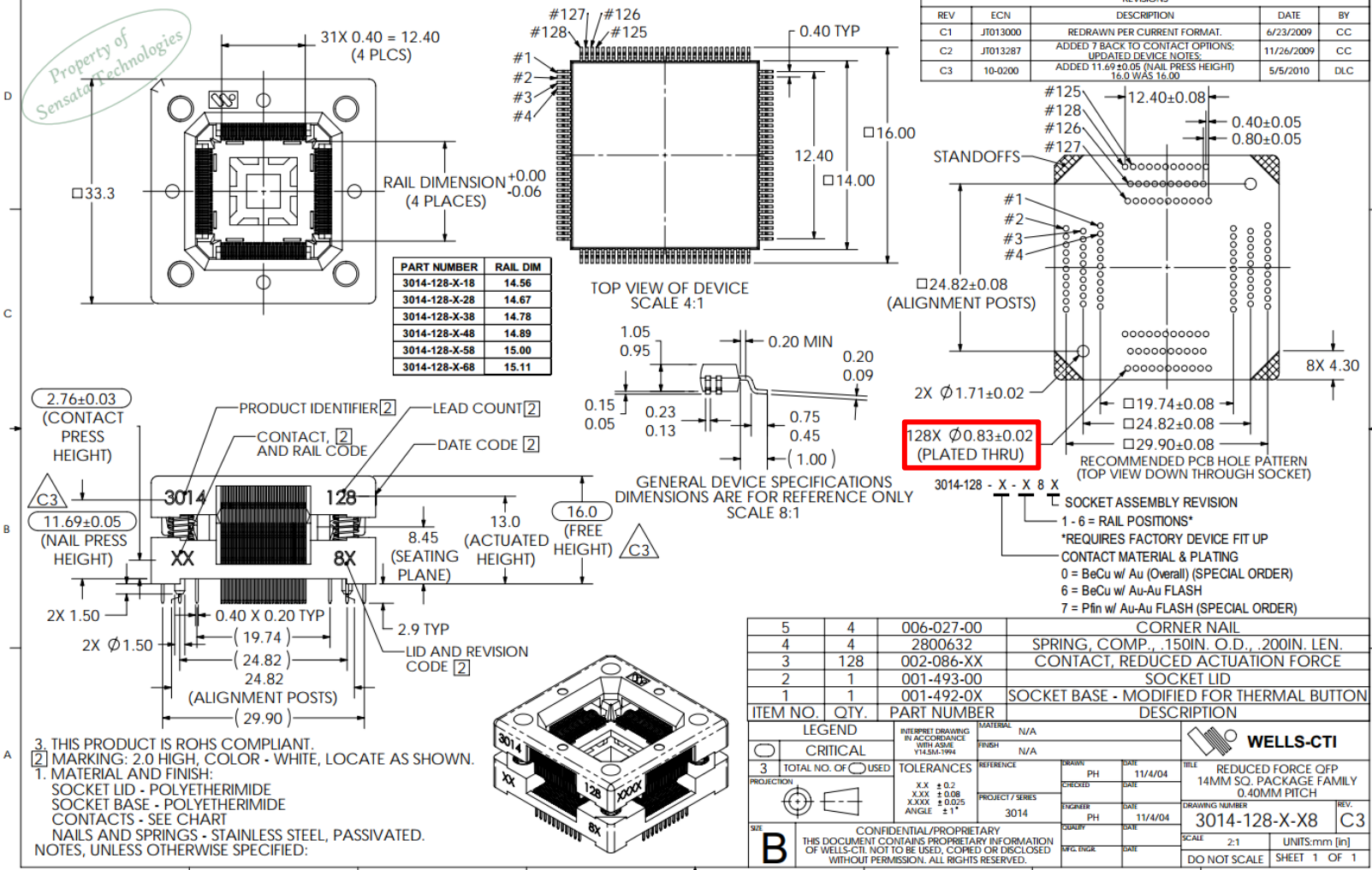
- A generic board for different ASICs will increase cost and we still have to make the interconnect board for each different ASIC.
- For TargetX, the easiest way would be replacing the ASIC on the Daughtercard with the clamshell, but the clamshell overlaps with the connectors…
- drill holes for the clamshell pins are very close, which limit the drill hole size.

solution

- using two TXDC slots on the MB will create just enough room for the clamshell and for routing.
- changes on the Daughtercard would be minimum.
- making the test pints bigger in case of signal injections on any of the 15 channels.


KLM_TX_9U_MB RevC IOL_15_003 2015-04-12 IOLAB-Univ. of Hawaii
Fiber
GND
+3.3V
+5V
3.5A
1A


Belle II
TX_ASIC_Test_RevA
IDL_15_029 2015-08-24
IDLAB-Univ. of Hawaii
GND4 GND3
GND2
GND1
+3P3V
2.5V
3.3V
SAMPLE_SEL_ANY
SR_CLEAR
SR_SEL
CLOCK
WR2_ENA
WR_ADDRCLR
CLAMSHELL1
CH16
TEMP
SPARE
VADJP
VADJN
RAMPMON
VBIASCHARGE
RD_ENA
SCK
SIN
SOUT



PART NUMBER	RAIL DIM
3014-128-X-18	14.56
3014-128-X-28	14.67
3014-128-X-38	14.78
3014-128-X-48	14.89
3014-128-X-58	15.00
3014-128-X-68	15.11

REVISIONS				
REV	ECN	DESCRIPTION	DATE	BY
C1	JT013000	REDRAWN PER CURRENT FORMAT.	6/23/2009	CC
C2	JT013287	ADDED 7 BACK TO CONTACT OPTIONS; UPDATED DEVICE NOTES;	11/26/2009	CC
C3	10-0200	ADDED 11.69±0.05 (NAIL PRESS HEIGHT) 16.0 WAS 16.00	5/5/2010	DLC

ITEM NO.	QTY.	PART NUMBER	DESCRIPTION
5	4	006-027-00	CORNER NAIL
4	4	2800632	SPRING, COMP., .150IN. O.D., .200IN. LEN.
3	128	002-086-XX	CONTACT, REDUCED ACTUATION FORCE
2	1	001-493-00	SOCKET LID
1	1	001-492-0X	SOCKET BASE - MODIFIED FOR THERMAL BUTTON

3. THIS PRODUCT IS ROHS COMPLIANT.
2 MARKING: 2.0 HIGH, COLOR - WHITE, LOCATE AS SHOWN.
1. MATERIAL AND FINISH:
SOCKET LID - POLYETHERIMIDE
SOCKET BASE - POLYETHERIMIDE
CONTACTS - SEE CHART
NAILS AND SPRINGS - STAINLESS STEEL, PASSIVATED.
NOTES, UNLESS OTHERWISE SPECIFIED:

LEGEND
CRITICAL
3 TOTAL NO. OF USED
PROJECTION

INTERPRET DRAWING IN ACCORDANCE WITH ASME Y14.5M-1994
TOLERANCES
X.X ±0.2
X.XX ±0.08
X.XXX ±0.025
ANGLE ±1°

MATERIAL N/A
FINISH N/A
REFERENCE
PROJECT / SERIES 3014

DRAWN	PH	11/4/04
CHECKED		
ENGINEER	PH	11/4/04
QUALITY		
MFG. ENGR.		

SIZE B

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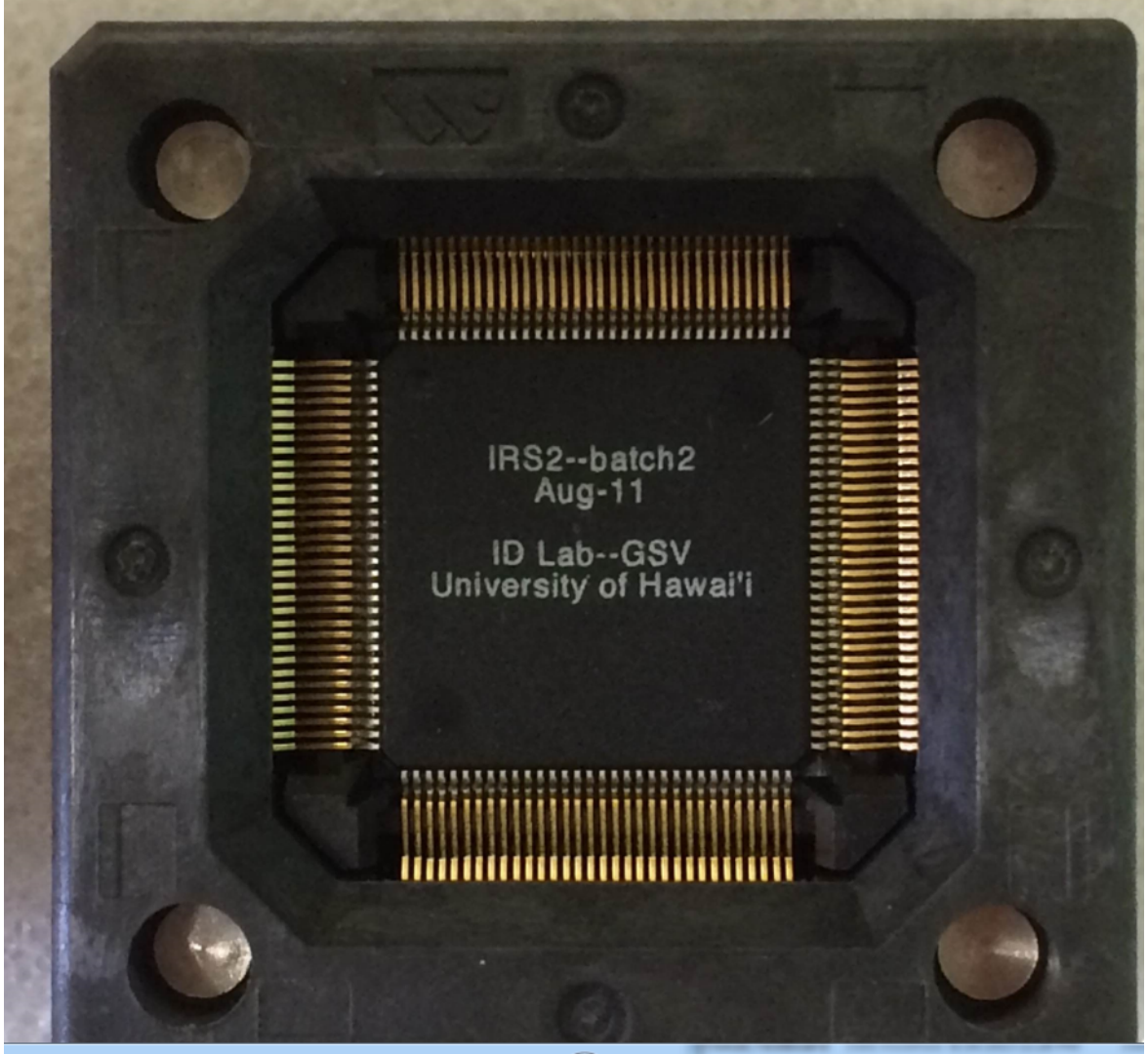
WELLS-CTI

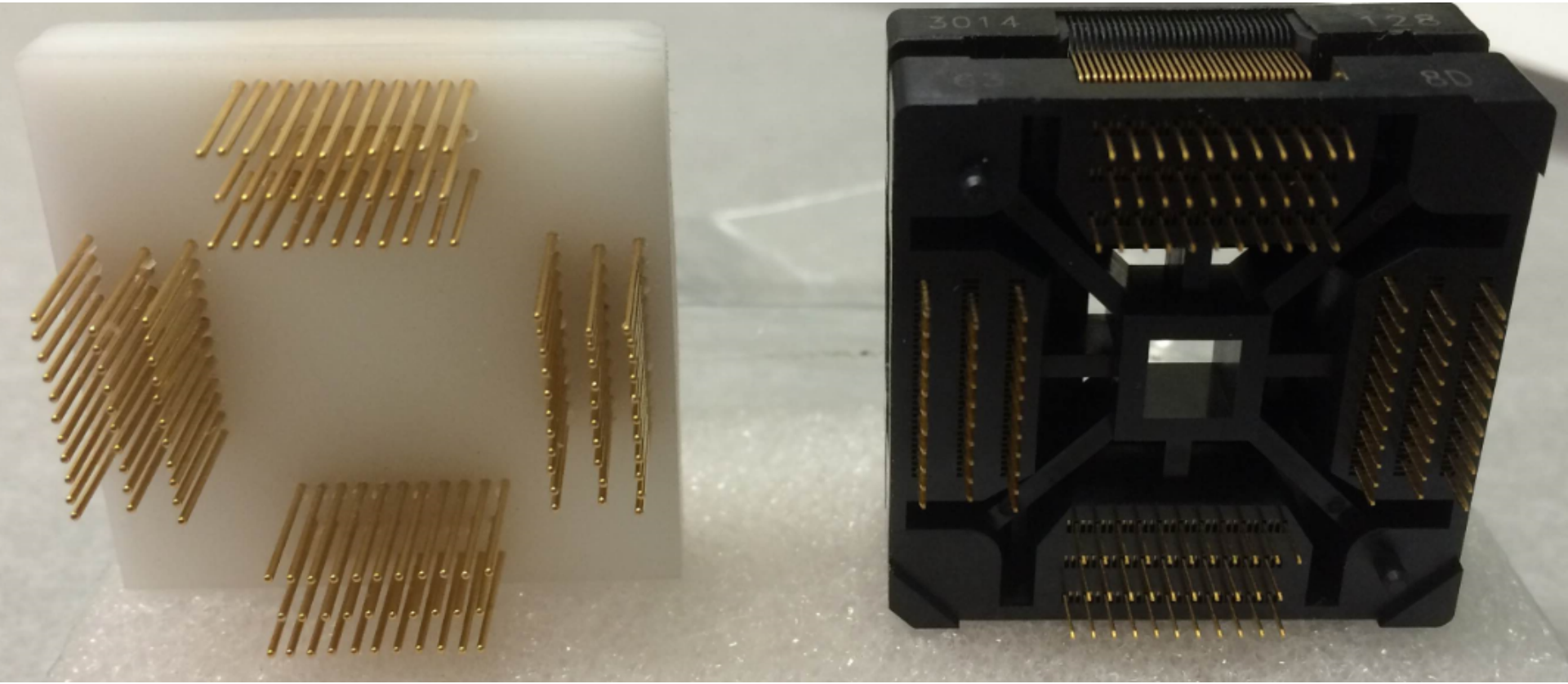
TITLE REDUCED FORCE QFP 14MM SQ. PACKAGE FAMILY 0.40MM PITCH

DRAWING NUMBER 3014-128-X-X8 REV. C3

SCALE 2:1 UNITS:mm [in]

DO NOT SCALE SHEET 1 OF 1

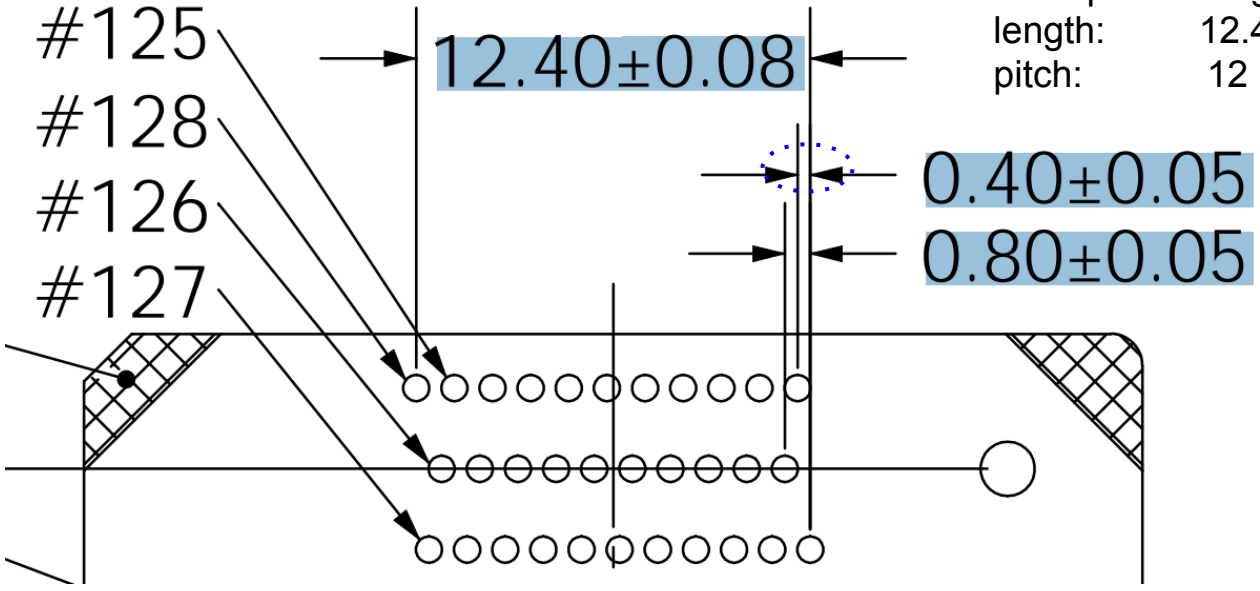

IRS2--batch2
Aug-11
ID Lab--GSV
University of Hawai'i


3014
128
BD

Clamshell dimension measured:

pin diameter: 0.42 mm

pin pitch: 1.2 mm



the top row: 10 gaps
length: 12.4 mm - 0.4 = 12 mm
pitch: 12 mm / 10 = 1.2 mm

The drill hole is 0.21 mm wider than the pin diameter.

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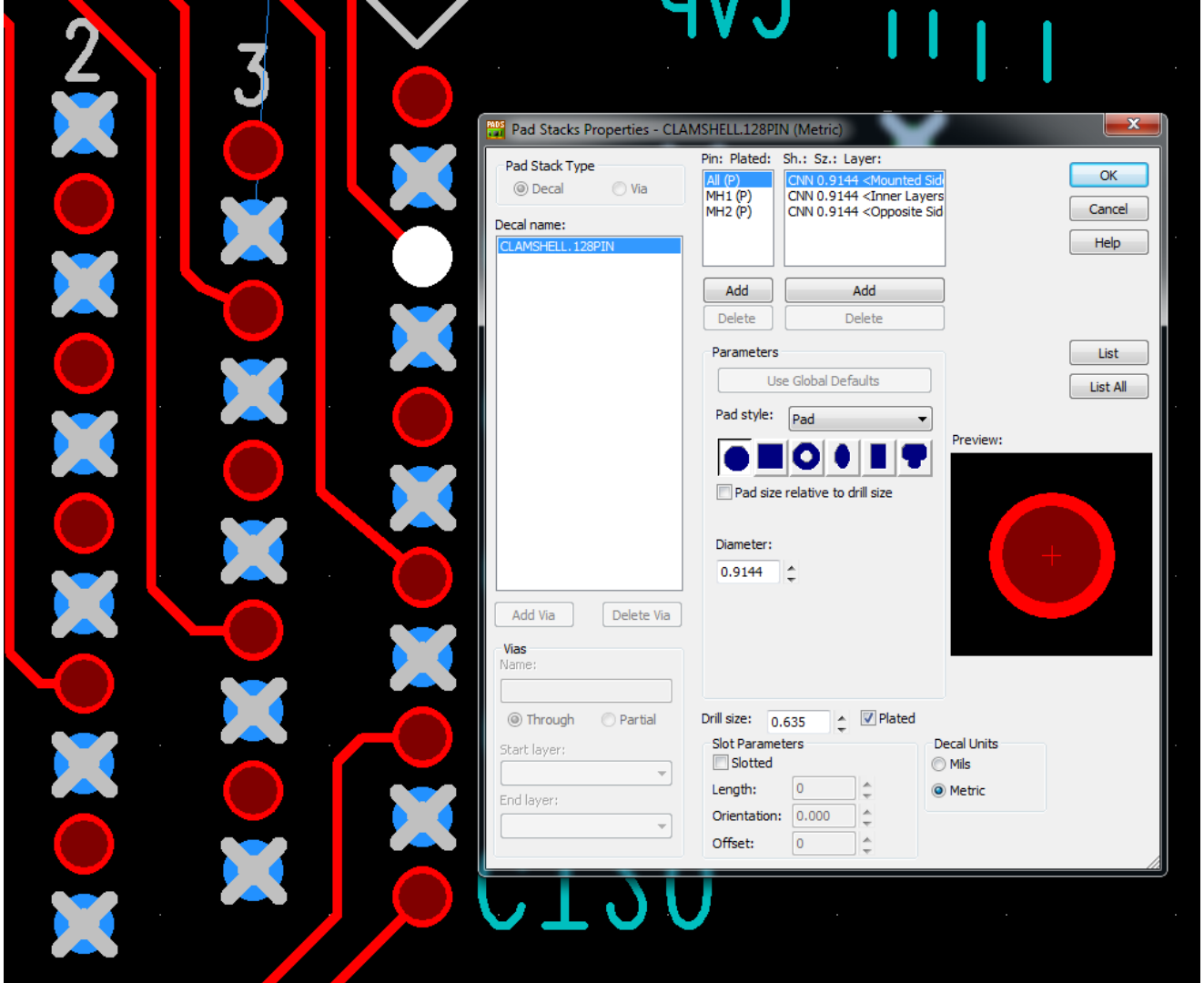
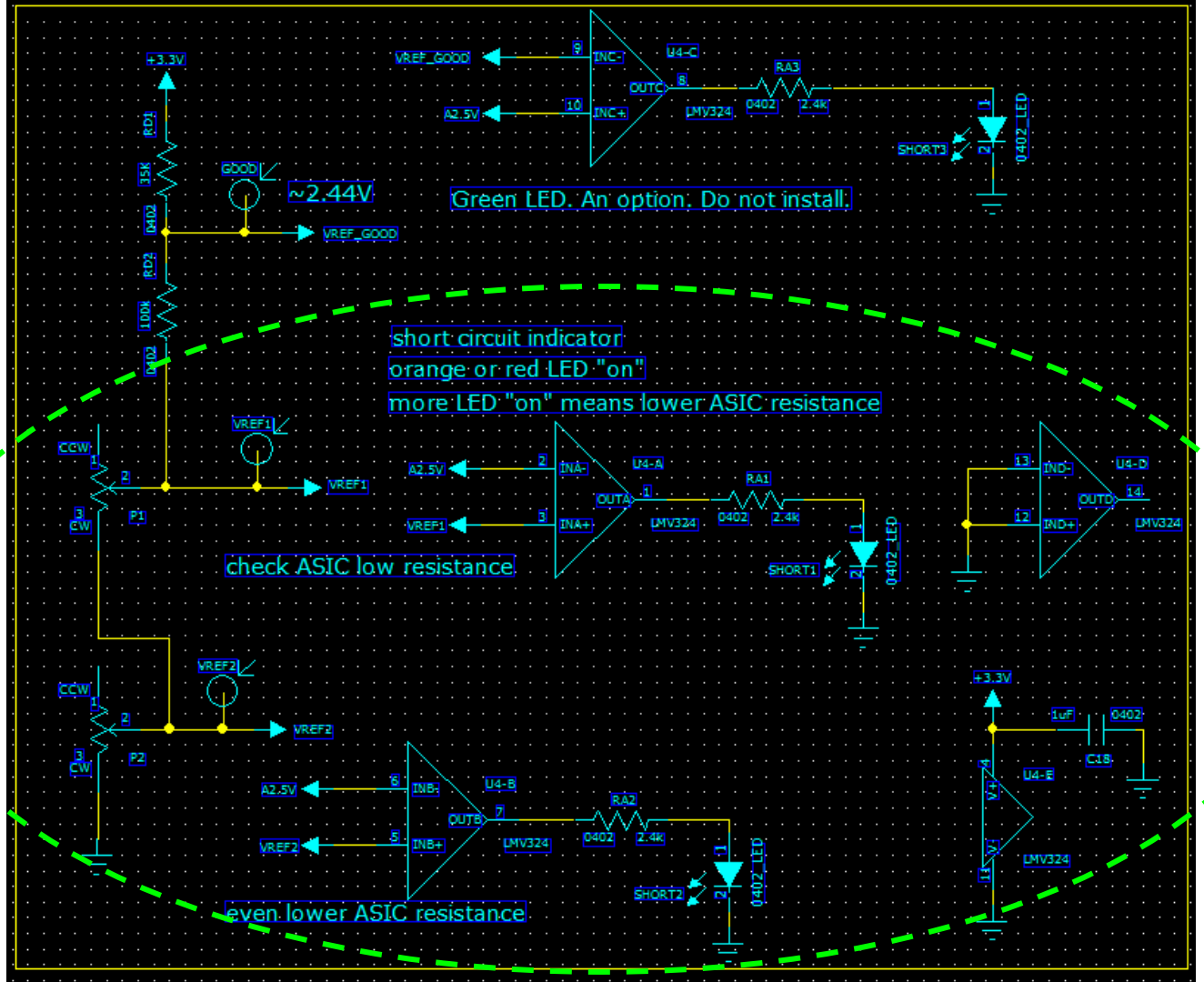
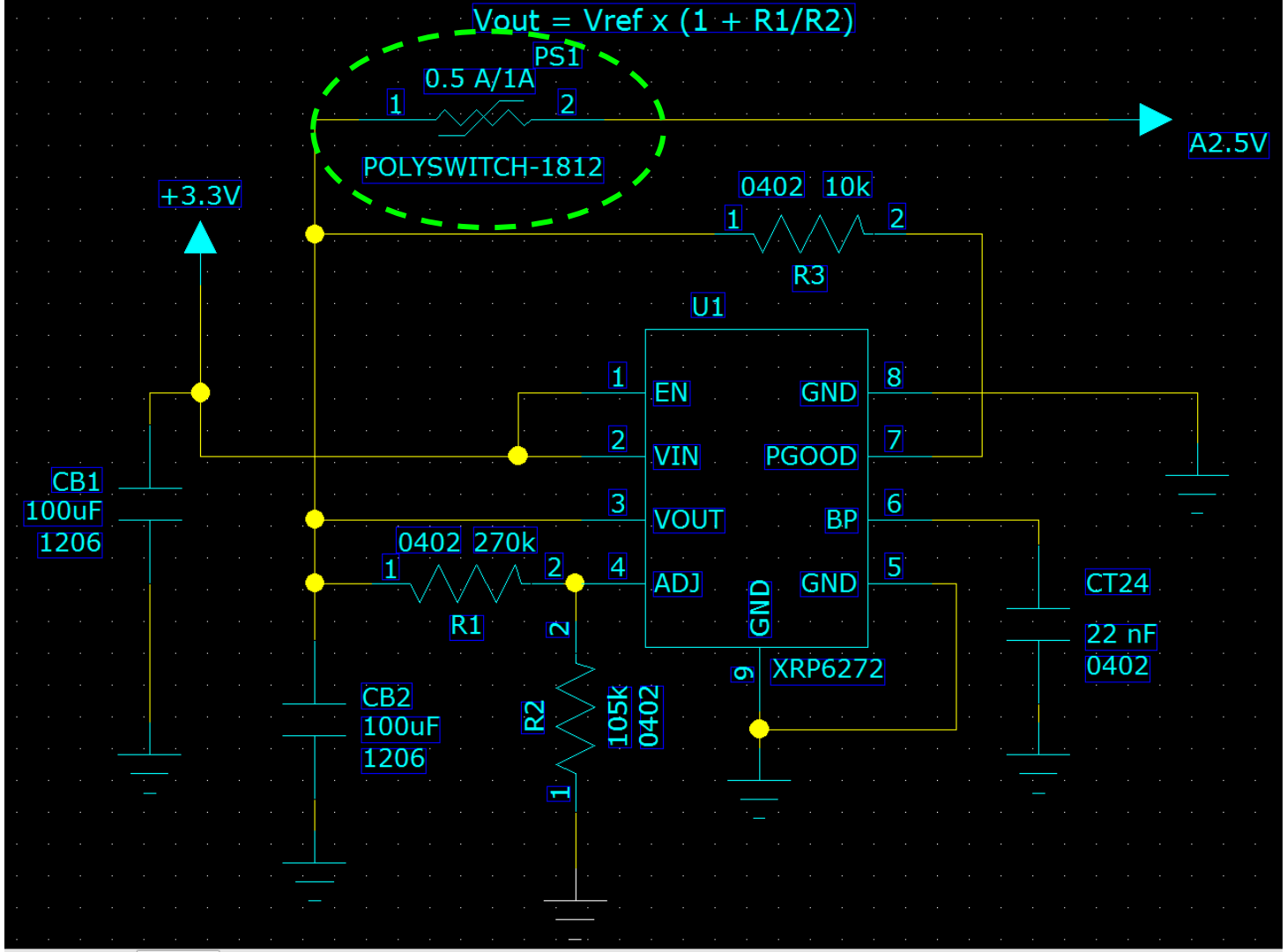
pad sizd: 0.9144 mm
drill size: 0.635 mm
annual ring: (0.9144-0.635)mm/2=0.1397mm (which is 5.5 mil)
The gap between two drill holes (outer ring edges): 0.2856 mm (~11 mil)

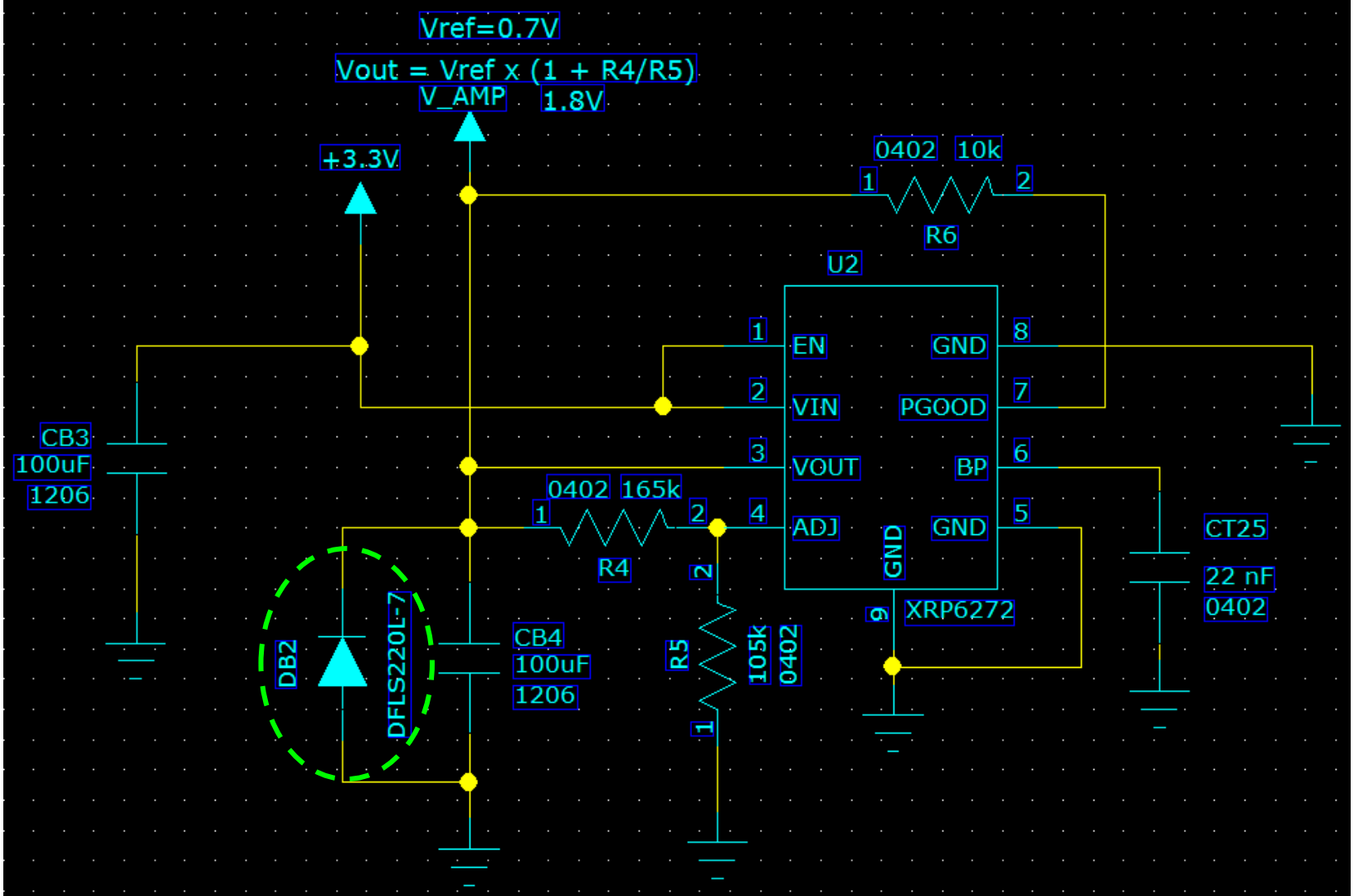


	datasheet recommend in mm (mil)	old value used in mm (mil)	new values used in mm (mil)	Final values used in mm (mil)
drill size	0.83 (32.7)	0.635 (25) Note: ~7.4 mil larger than pin	0.83 (32.7) ~15.1 mil larger than the pin	0.7 (27.56)
pad size	1.1094 (43.7)	0.9144 (36)	1.04 (40.9)	0.96 (37.8)
annular ring	0.1397 (5.5)	0.1397 (5.5)	0.105 (4.1)	0.13 (5.12)
gap between outer ring edges of two drill holes	0.0906 (3.5) Note: it probably won't work.	0.2856 (11) Note: could be reduced to 5 mils.	0.16 (6.3)	0.24 (9.45)

- Typically holes are .014" to .024" (360-590 um) larger than the maximum pin diameter. -- Chris
- Note: pitch=1.2 mm (47.24 mil)
- pin dimension: 0.4mmx0.2mm
  (diameter: ~0.447 mm or ~17.6 mil)
- for min cost, the annular ring should be 4 mils per side. We can do 3 mils for added cost. For min cost, you should have at least 5 mils between annular ring pads, but we might be able to go smaller than this for higher cost. --Terry
- We need 8-9 mils between the pads for mask dams that are sure to not get on the pads. --Terry


+3.3V
R1
35K
0402
R2
100K
0402
GOOD
~2.44V
VREF_GOOD
VREF_GOOD
A2.5V
U4-C
INC-
INC+
OUTC
LMV324
RA3
0402
2.4K
SHORT3
0402_LED
Green LED. An option. Do not install.
short circuit indicator
orange or red LED "on"
more LED "on" means lower ASIC resistance
VREF1
CCW
CW
P1
VREF1
A2.5V
VREF1
INA-
INA+
U4-A
OUTA
LMV324
RA1
0402
2.4K
SHORT1
0402_LED
check ASIC low resistance
U4-D
IND-
IND+
OUTD
LMV324
VREF2
CCW
CW
P2
VREF2
A2.5V
VREF2
INB-
INB+
U4-B
OUTB
LMV324
RA2
0402
2.4K
SHORT2
0402_LED
even lower ASIC resistance
+3.3V
1uF
0402
C18
U4-E
V+
V-
LMV324


Vout = Vref x (1 + R1/R2)
PS1
0.5 A/1A
1
2
POLYSWITCH-1812
A2.5V
+3.3V
0402 10k
1
2
R3
U1
1
EN
GND
8
2
VIN
PGOOD
7
3
VOUT
BP
6
4
ADJ
GND
5
GND
9
XRP6272
CB1
100uF
1206
0402 270k
1
2
R1
2
R2
105k
0402
1
CB2
100uF
1206
CT24
22 nF
0402


Vref=0.7V
Vout = Vref x (1 + R4/R5)
V_AMP
1.8V
+3.3V
0402
10k
R6
U2
EN
VIN
VOUT
ADJ
GND
PGOOD
BP
GND
XRP6272
CB3
100uF
1206
0402
165k
R4
CB4
100uF
1206
DB2
DFLS220L-7
R5
105k
0402
CT25
22 nF
0402