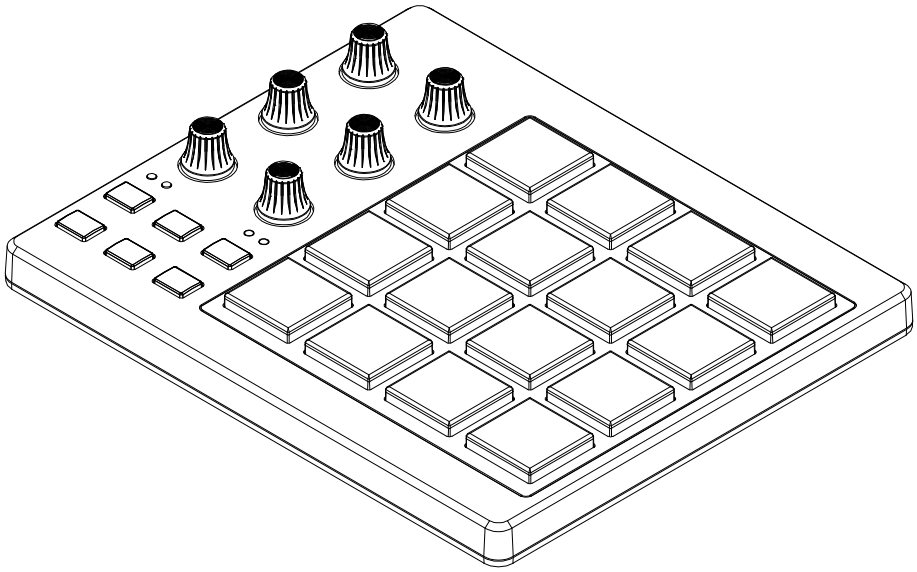
SERVICE MANUAL

MODEL: MPD218



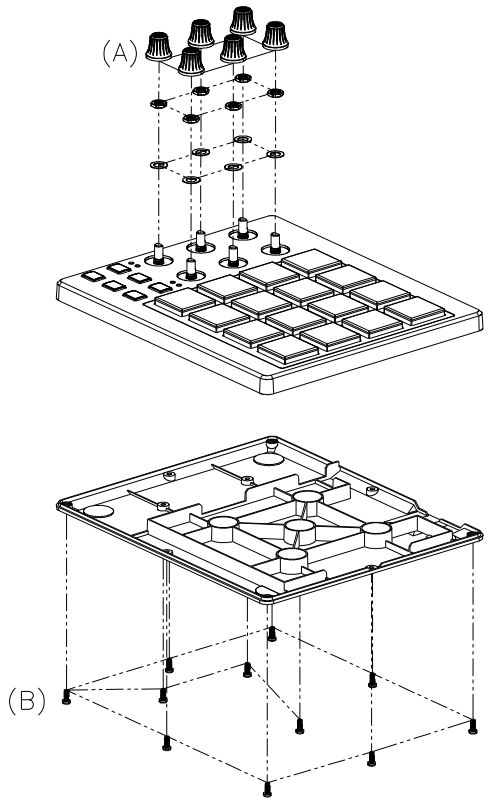
SPECIFICATIONS

Pads	**16** velocity- and pressure-sensitive pads, red-backlit **3** banks accessible via **Pad Bank** button
Knobs	**6** 360° assignable potentiometers **3** banks accessible via **Control Bank** button
Buttons	**6** buttons
Connections	**1** USB port **1** Kensington lock
Power	via USB connection
Dimensions (width x depth x height)	9.4" x 7.9" x 1.6" 23.9 cm x 20.1 cm x 4.1 cm
Weight	1.65 lbs. 0.75 kg

DISASSEMBLY PROCEDURES

1. DISASSEMBLE THE BOTTOM PANEL AND KNOB.

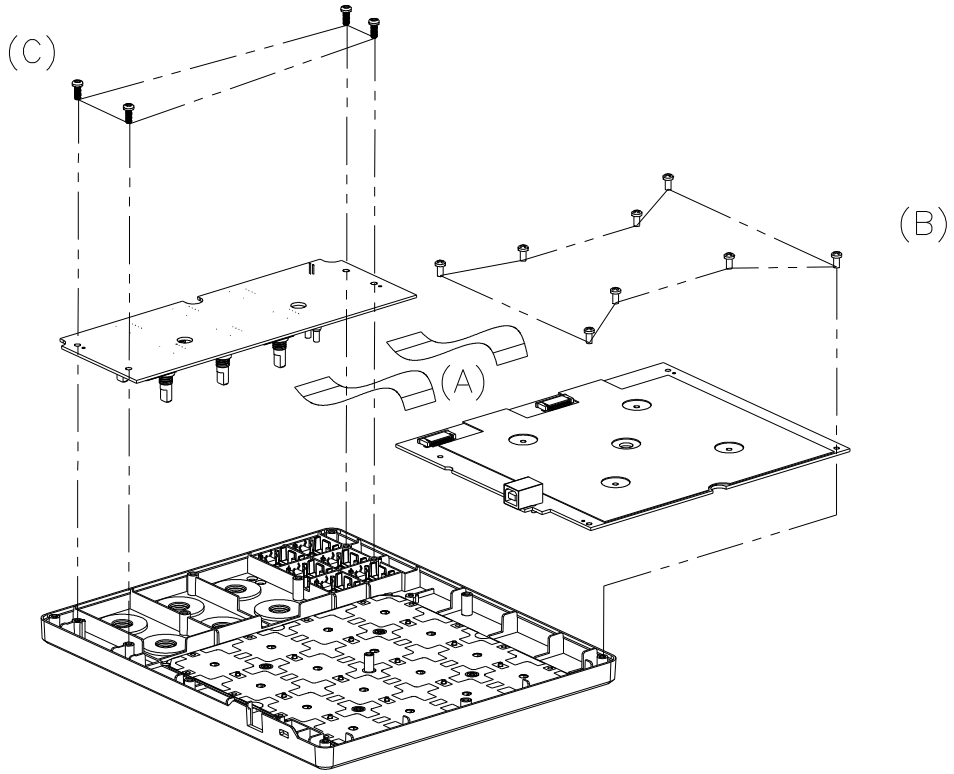
(A) REMOVE 6 KNOBS, 6 NUTS AND 6 WASHERS FROM THE TOP PANEL.
(B) REMOVE 11 SCREWS FROM THE BOTTOM PANEL.



(Fig1)

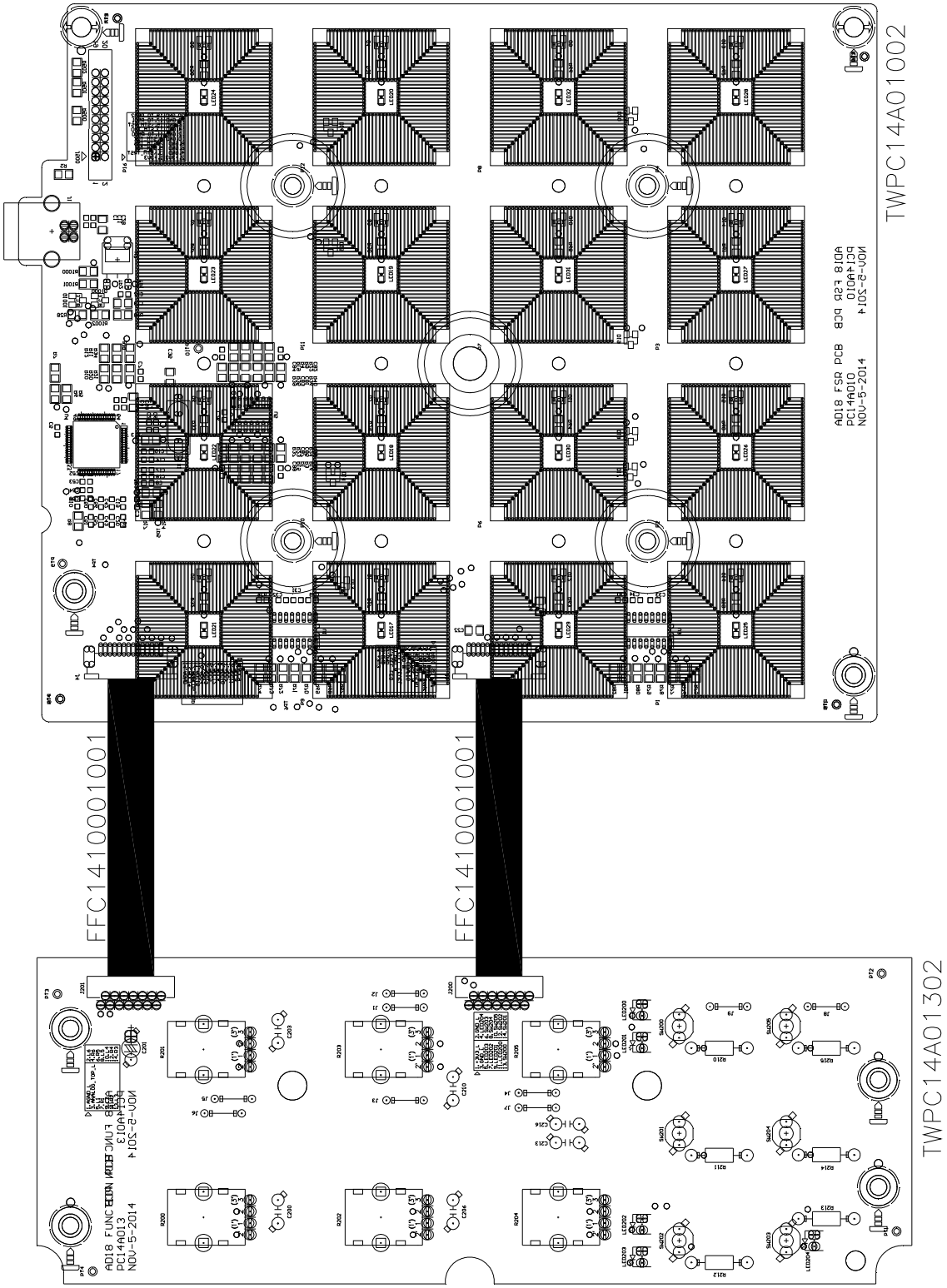
2. DISASSEMBLE THE FUNCTION PCB ASSEMBLY AND FSR PCB ASSEMBLY.

(A) UNPLUG 2 PCS FFC CABLE FROM THE FSR PCB ASSEMBLY AND FUNCTION PCB ASSEMBLY.
(B) REMOVE 8 SCREWS FROM THEFSR PCB ASSEMBLY.
(C) REMOVE 4 SCREWS FROM THE FUNTION PCB ASSEMBLY.

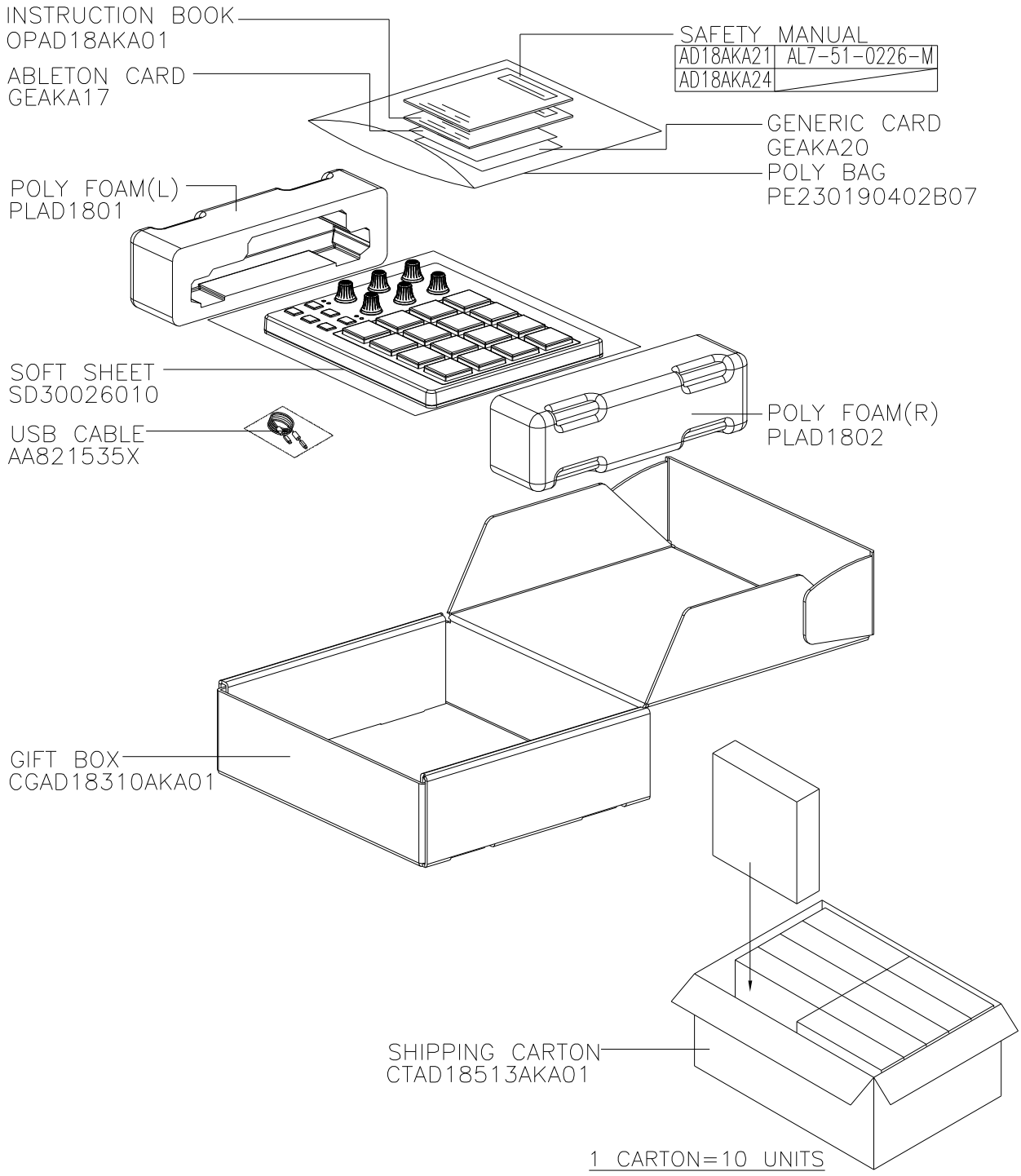


(Fig2)

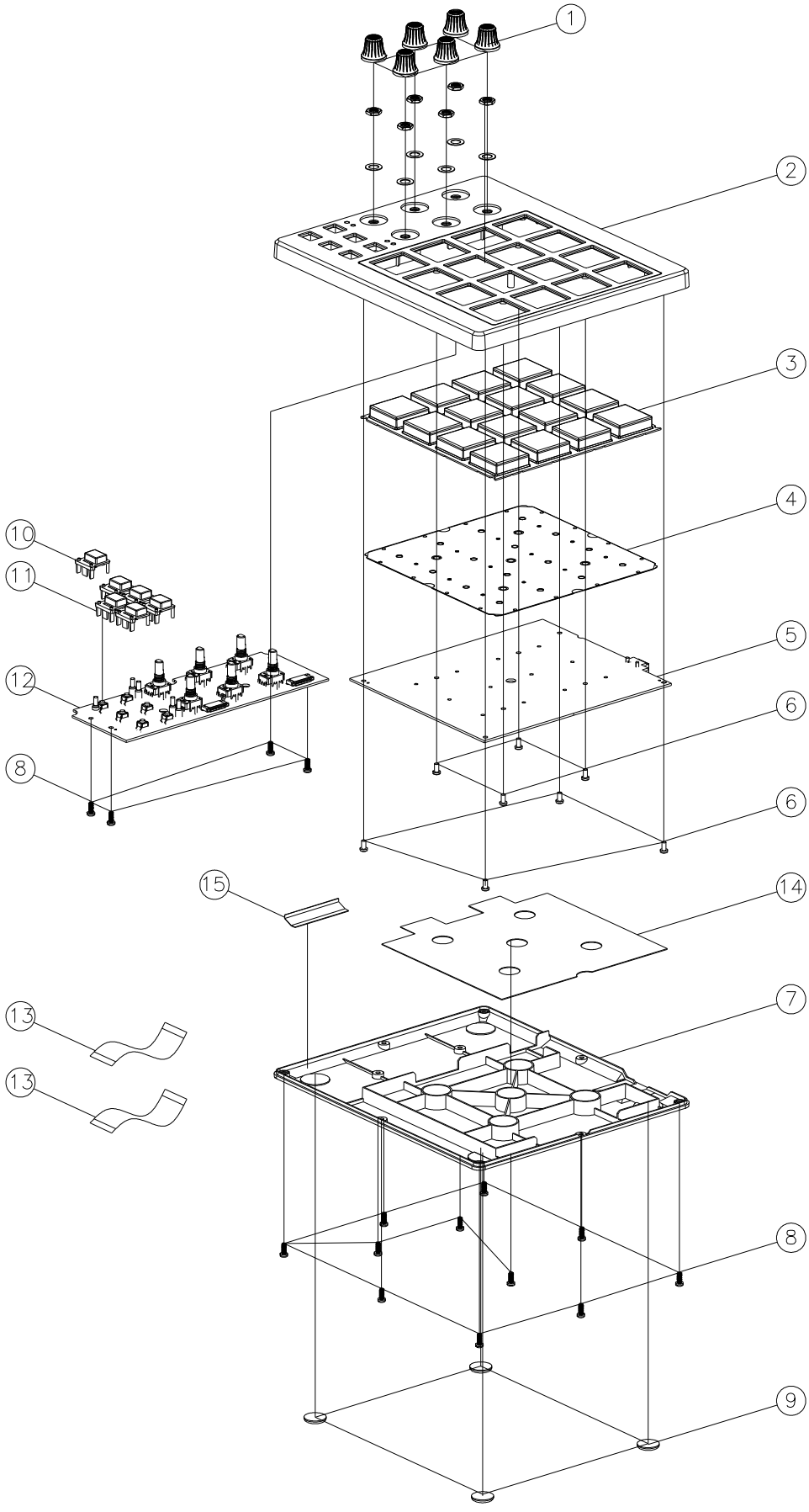
WIRING DIAGRAM
(US/AU)



PACKING DIAGRAM
(US/AU)



EXPLODE DIAGRAM
(US/AU)



EQUENCIAL NO EXPLODE DIAGRAM WILL BE MARKED ON REF.COLUMM OF BOM LIST

AD18AKA21 BOM

LEVEL	P/N	DESCRIPTION	QTY	REF
0	**AD18AKA21**	**AD18 USB5V USA**	**0**	
1	AA821535X	USB 2.0 Cable 1m A/B Type Black	1	
1	EVA1504476	EVA(50x15mm)	1	**15**
1	EVA1504479	EVA	1	**14**
1	FFC1410001001	FFC 14P Pitch:1.0mm Length:100mm	2	**13**
1	GEAKA17	Ableton Card	1	
1	LAC22AKA370	Serial Number Label	1	
1	LAC22AKA42	Sticker S/N Ableton	1	
1	LAC46AKA393	Istruction Label(IOS MODE)	1	
1	LAC57AKA398	Safety Label	1	
1	LAC62AKA369	Bar Code Label(CODE39)	0.1	
1	LAC62AKA371	Bar Code Label(GTIN14)	0.1	
1	LAC67YAH261	Label φ8mm Green	0.1	
1	OTFSR16KEY-AD33	FSR 16KEY	1	**4**
1	PAD18AKA21	Packing Assembly	1	
2	AL7-51-0226-M	Safety Manual	1	
2	CGAD18310AKA01	Gift Box	1	
2	CTAD18513AKA01	Shipping Carton	0.1	
2	GEAKA20	Generic Card	1	
2	OPAD18AKA01	Instruction Book	1	
2	PE230190402B07	Pe Bag	1	
2	PLAD1801	Poly Foam(Left)	1	
2	PLAD1802	Poly Foam(Right)	1	
2	SD30026010	Soft Sheet Bag	1	
1	PT15106125	Button(B;clear)	1	**10**
1	PT15106150	Knob	6	**1**
1	PT15106191	Button(Black)	5	**11**
1	PT153004401	Top Panel(Print/Paint)	1	**2**
2	PT1530044	Top Panel	1	
1	PT1530336	Bottom Panel	1	**7**
1	RU1110670	Rubber Foot	4	**9**
1	RU1510638	Rubber Knob	1	**3**
1	SC0308PBBI	Screw M3X8 PBB Tapping	15	**8**
1	SC2605PBBI	Screw M2.6x5 PBB Tapping	8	**6**
1	**TWPC14A01002**	**FSR PCB Assembly**	**1**	**5**
2	AL2-49-0070	Diode BAV70	8	D13~20
2	AL2-51-4403	Transistor 2N4403 PNP SOT-23	16	Q1~16
2	AL2-61-7223	IC NJU7223DL1-33 3.3V TO-252	1	U2
2	AL2-71-1324	IC LMV324 SOP-14	1	U5
2	AL4-08-0402	Con USB 4-Pin Female PC-MNT Horizontal	1	J1
2	CS102J5003NPO	CCAP SMD 1nF/50V 5% 0603 NPO	4	C31~34
2	CS103K5003X7R	CCAP SMD 0.01uF/50V 10% 0603 X7R	21	C8,15~20,42,43,50~57,82,84,86,88
2	CS104K5003X7R	CCAP SMD 0.1uF/50V 10% 0603 X7R	12	C1,3,4,5,7,10~12,26,29,30,58
2	CS106K0605X5R	CCAP SMD 10uF/6.3V 10% 0805 X5R	6	C9,13,14,22,35,36
2	CS180J5003NPO	CCAP SMD 18pF/50V 5% 0603 NPO	2	C2,6
2	CS561J5005NPO	CCAP SMD 560pF/50V 5% 0805 NPO	4	C81,83,85,87
2	FCN1T1001402	FCN DOWN Touch ZIF SMD Pitch=1.0mm 14P	2	J3,4
2	IC74HC595	Integrated Circuit	2	U1,3

2	ICYH103M13	IC(STM32F102RBT6+Program)TQFP-64	1	U4
3	ICSTM32F102RBT6	IC STM32F102RBT6 TQFP-64	1	(U4)
2	LDKPT-1608SURCK	Liquid-emitting Diode Red SMD 0603	16	LED17~32
		angle 120°		
2	PC14A010	FSR PCB 2Layer FR-4 187x156mm 1.6T	1	-
2	RS000008J05	RES 0Ω 5% SMD 0805	5	R2,14,17,18,28
2	RS001K08F05	RES 1K 1% SMD 0805	16	R67~82
2	RS002208F05	RES 22Ω 1% SMD 0805	2	R5,6
2	RS004710F03	RES 47Ω 1% SMD 0603	1	R26
2	RS006808F05	RES 68Ω 1% SMD 0805	16	R27,29~33,57~66
2	RS010008F05	RES 100Ω 1% SMD 0805	1	R34
2	RS010K08F05	RES 10K 1% SMD 0805	9	R8,11,15,16,19,22,500,501,502
2	RS01K508F05	RES 1.5K 1% SMD 0805	5	R1,3,4,7,9
2	RS022008F05	RES 220Ω 1% SMD 0805	5	R10,12,13,20,21
2	RS047008F05	RES 470Ω 1% SMD 0805	4	R37,38,39,40
2	RS06K808F05	RES 6.8K 1% SMD 0805	4	R23,24,35,36
2	XTM08000X6F1	Crystal 8MHZ 49US SMD Fundamental	1	X1
1	**TWPC14A01302**	**Function PCB Assembly**	**1**	
2	AL3-02-0035	LIQUID-EMITTING DIODE RED ASTIGMATISM	4	LED200~203
		DIP		
2	BALE42206-0A	LED Holder	4	(LED200~203)
2	BALED2X2	LED FIXED PLATE	1	(LED204)
2	CC10450T	C.CAP 0.1UF/50V	6	C200,203,206,210,213,216
2	EC10616TS	Capacitor Electrolytic 10uF/16V 4*5mm	1	C201
2	FCN2R1001401	FCN Dual Touch 90° Pitch:1.0mm 14P	2	J200,201
2	JW5206T	Jumping Wire	9	J1~9
2	LD-005HLV	Red LED	1	LED204
2	PC14A013	Main PCB 1Layer FR-1 1.6T 187x68mm	1	-
2	R10316	RES 10K 1/8W	6	R210~215
2	SWEVQ11L04M	Switch Tact 4.3mm 160g Horizontal DIP	6	SW200~205
2	VRR12302501	Potentiometer Rotary 12.5k 2B*2 25mm	6	R200~205

Manufacturing Testing of MPD218 using ADT1

15 October, 2014

This document is intended to describe the operation of the ADT1 Manufacturing Test application for the Production Testing of MPD218.

Terms

MPD218: A USB Pad Controller. Also known as AD18.

ADT1: A Manufacturing Test application that runs on Windows computers.

Hardware setup

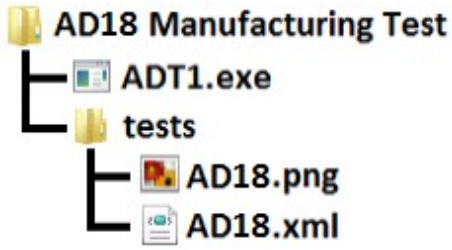
Connect MPD218 USB to Windows Computer running ADT1 Manufacturing Test application.

Software setup

The Manufacturing Test of AD18 requires the following files

- ADT1.exe: executable file (v.0.7.3 or later)
- AD18.png: image file
- AD18.xml: test file

These files should be arranged so that the product specific files (AD18.png and AD18.xml) are in a folder called “tests” that resides in the same folder as the ADT1 executable as below.



Running the Manufacturing Test Application

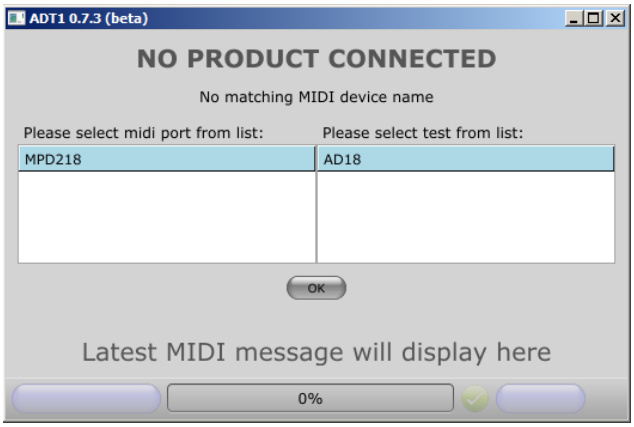
Port selection

Different language versions of different Operating Systems have different ways of identifying MIDI ports and audio hardware. For this reason, ADT1 allows the Tester to select these ports when the program is first run. Once a subtest has been successfully completed, it should no longer be necessary to select these ports even if a different unit is being tested.

The ports that need to be selected depend on the sub-tests that are being performed for that product. In addition to the main USB-MIDI port, the Manufacturing test for MPD218 requires that a port be selected for the MIDI loopback test.

Device/Test selection

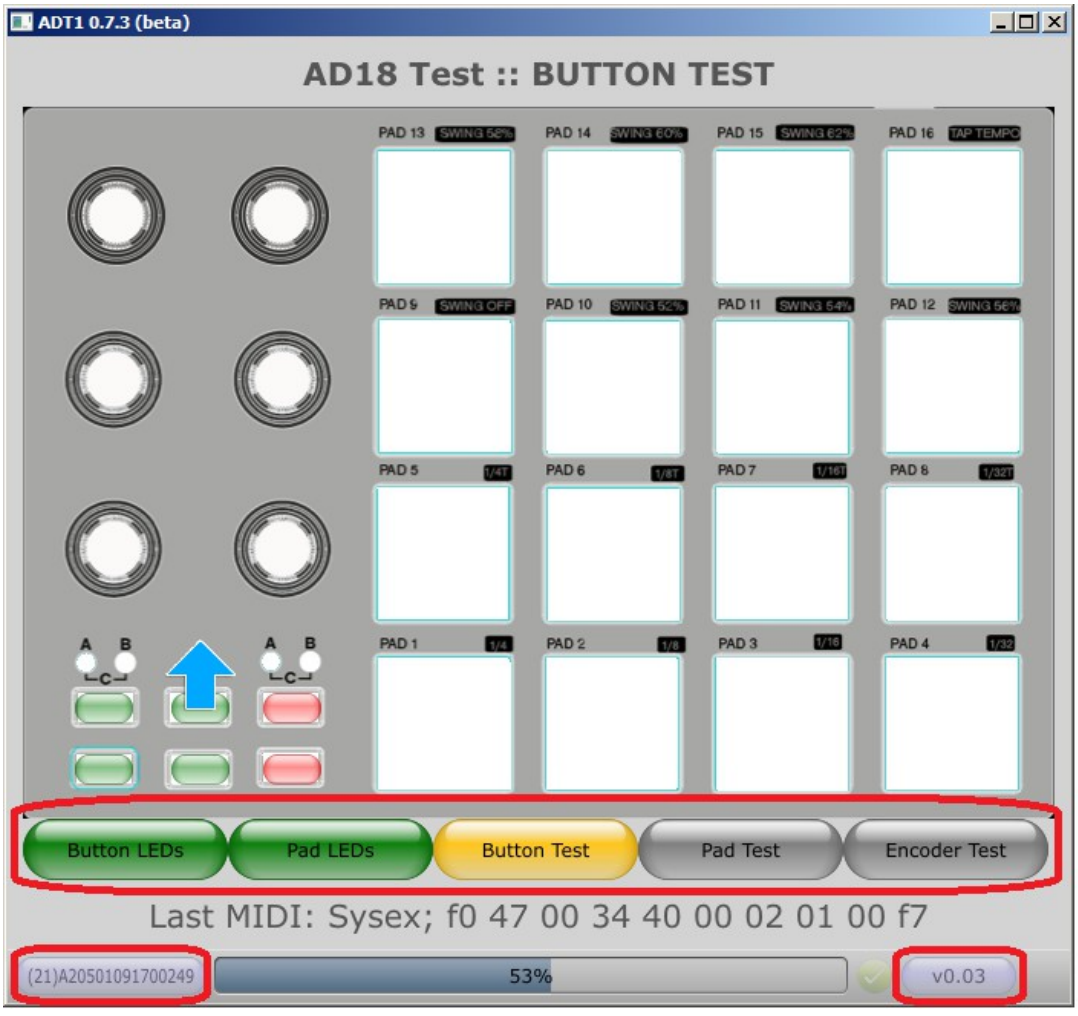
When the program starts on an English language version of Windows XP, the Tester should be presented with the following “Port/Test Chooser” window.



Select the correct port and test and click “OK”. This selection should only need to be done once when the program is first run.

User Interface

The Main Test screen has a representation of the Device Under Test.



Subtest buttons

At the bottom of the screen are some buttons that correspond to “sub-tests”. These might be tests of faders, LEDs, etc. The button will be

- grey if the subtest has not started
- yellow if the sub-test is in progress
- green if the test has subtest has completed successfully
- red if the subtest has failed.

Normally the order of the test will follow the order of the subtest buttons, but it is possible to change the order of the tests by clicking on the buttons. This can be useful if a test is accidentally failed.

When the the right-most subtest is completed, the Test Application will loop back to repeat any tests that have not completed successfully.

The option to write a Serial Number into the Device Under Test will not be offered until every subtest has been completed successfully (i.e. every subtest button is green).

Serial Number

When a test starts, the Serial Number of the MPD218 will be read and displayed in the bottom left corner.

The Serial Number will also be read from the MPD218 and displayed after Serialisation has completed.

Version Number

The version of the firmware will be displayed in the bottom right hand corner.

Indicators

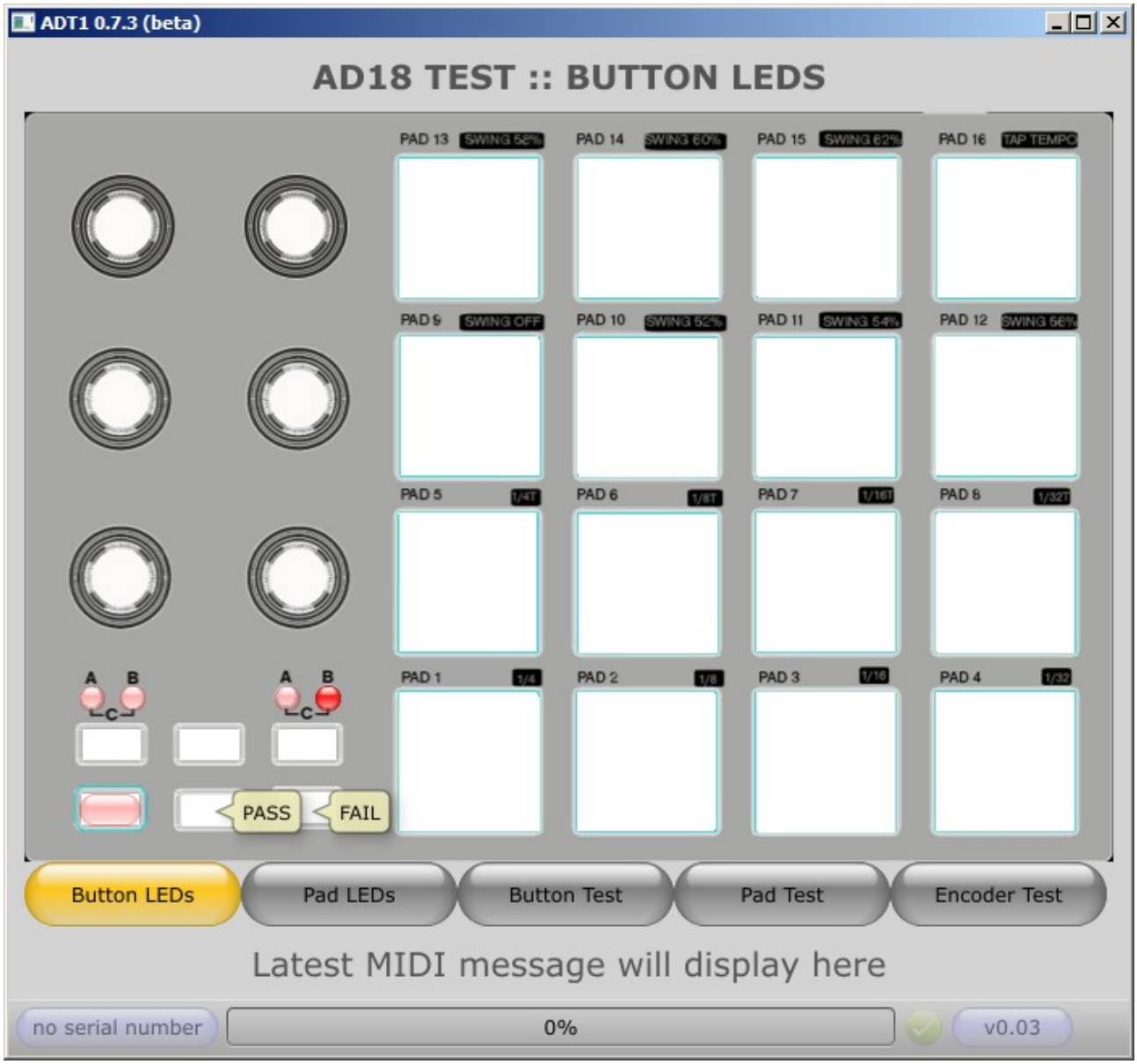
Wherever possible the ADT1 Manufacturing Test app will prompt the Tester. This might be to show which LEDs should be flashing, which buttons should be used to confirm the test result or which fader, knob, etc. has been tested.

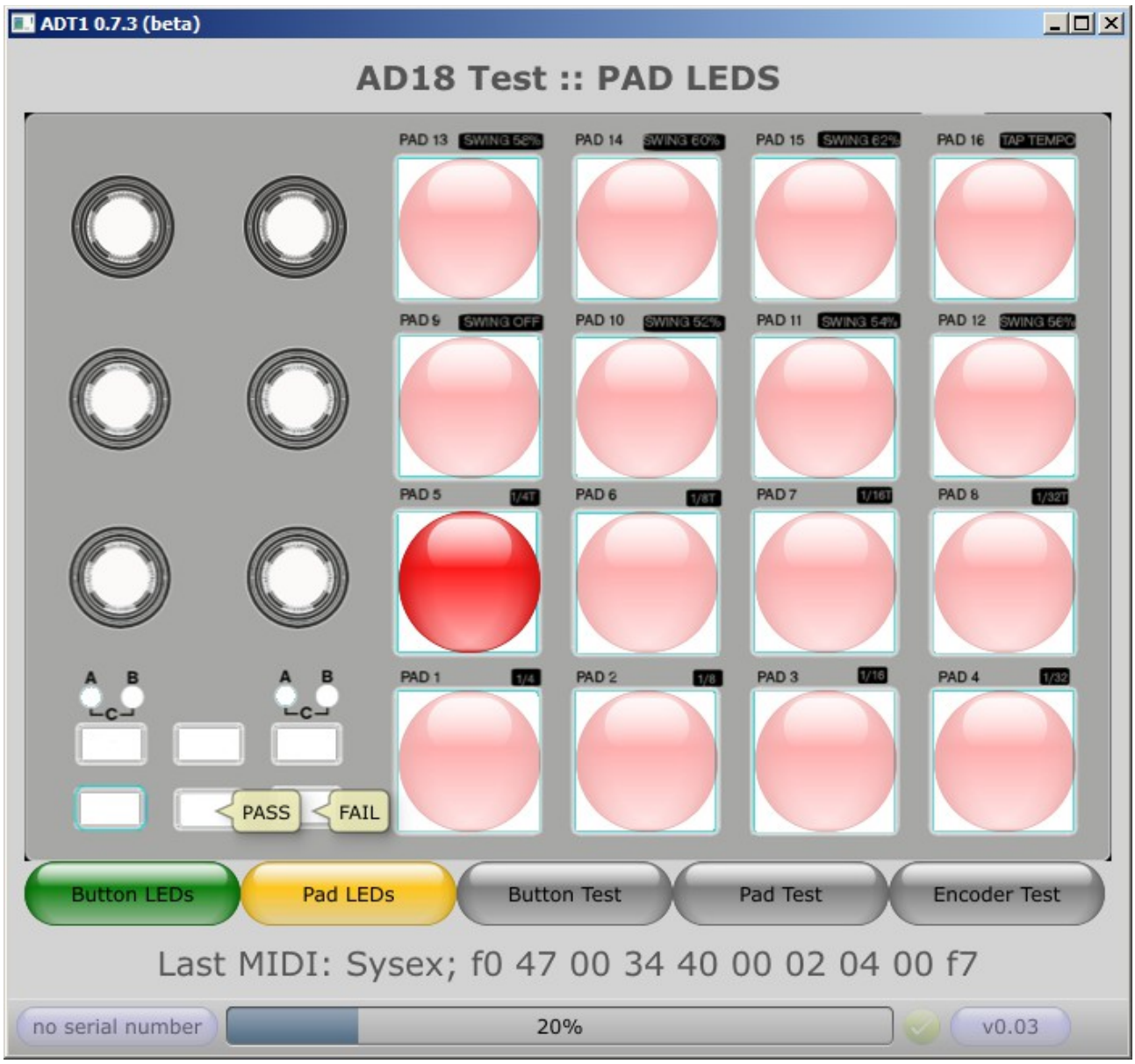
Tests

LED tests

There are two LED tests in the MPD218 Manufacturing Test.

- Button LEDs
- Pad LEDs





In each case, the ADT1 Manufacturing Test app will send a message to flash LEDs on the MPD218. The User interface will indicate which LEDs are flashing and what colour they should be. The Tester should indicate whether the test passed by pressing the UI controls indicated by the “bubble” messages.

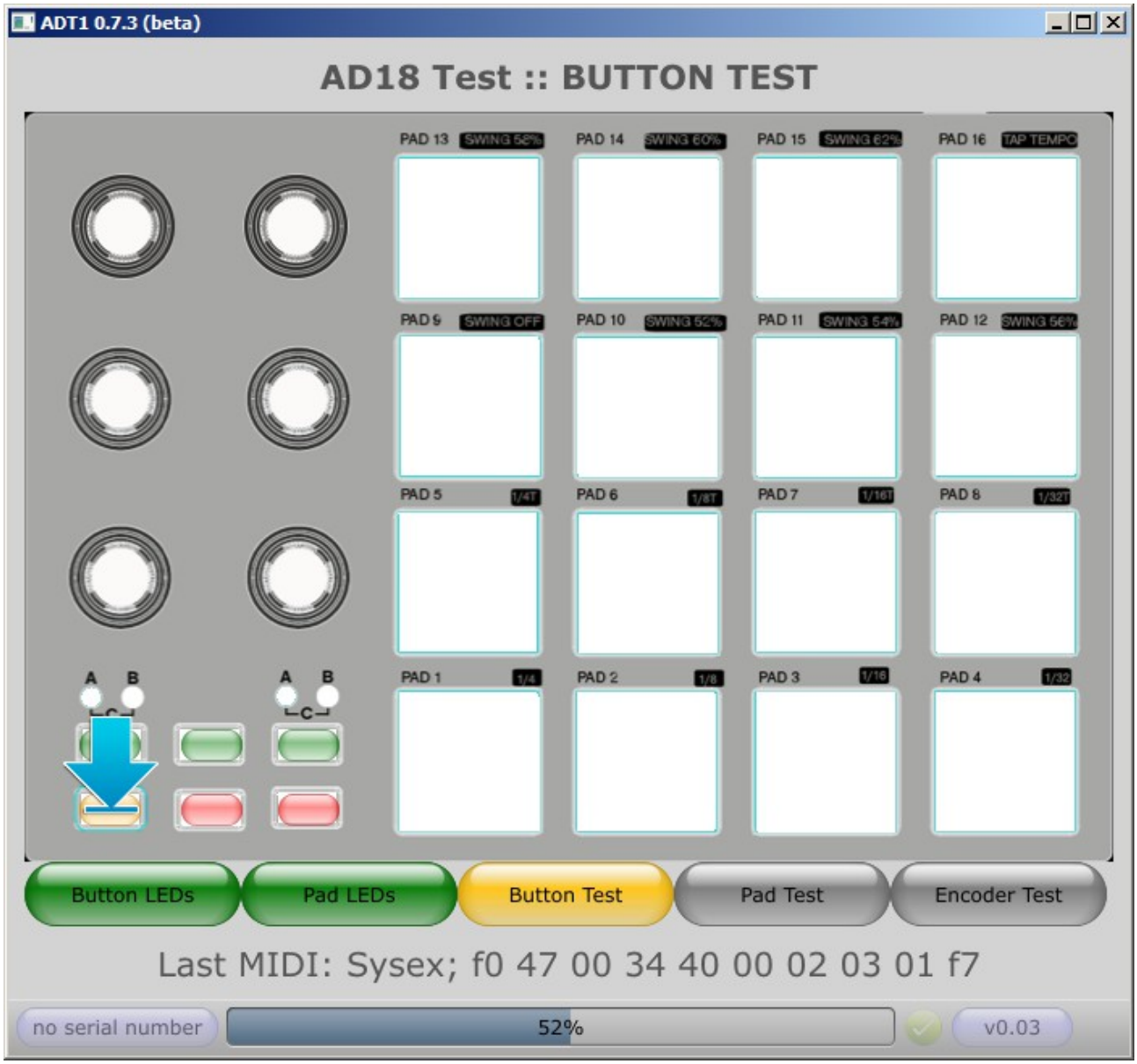
- Test Passed: press the control indicated by “PASS” bubble message.
- Test Failed: press the control indicated by “FAIL” bubble message.

The LED Test has two phases:

1. **Animated test** where the LEDs are lit one at a time. This is to check for shorts between LEDs.
2. **ALL_LEDS_ON test** where all the LEDs are lit. This is to help check for faulty LEDs.

Button Test

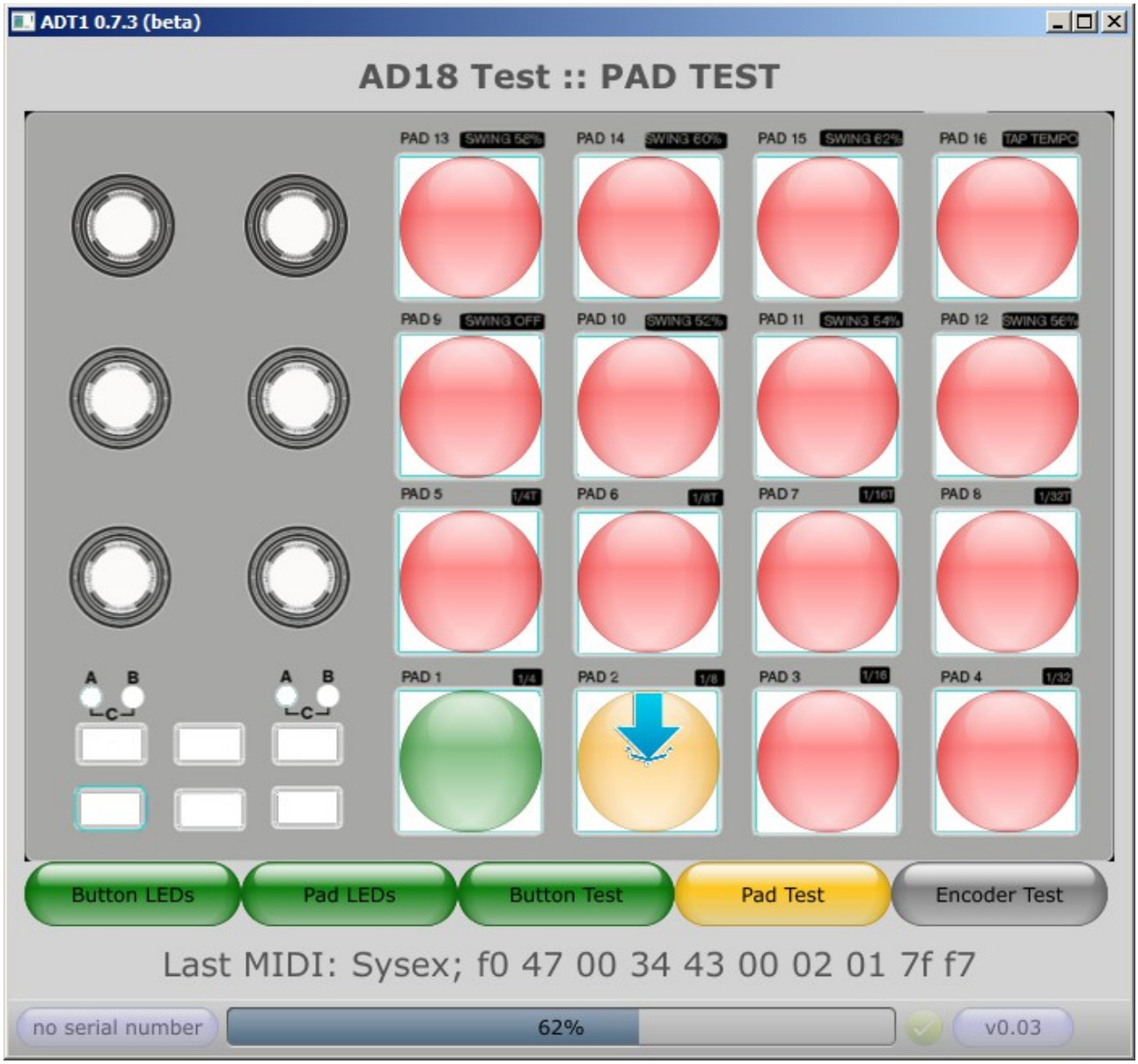
The ADT1 manufacturing Test application will indicate the buttons to be pressed. The Tester should individually press and release the indicated buttons.



When the ADT1 manufacturing Test application detects that the button has been pressed it will change the graphic symbol on the User Interface and, where possible, it will send a message to light the LED that is associated with the button on the MPD218.

The buttons can be pressed in any order, but if ADT1 detects two button events at exactly the same time it will assume that these buttons are shorted together and fail the test.

Pad test

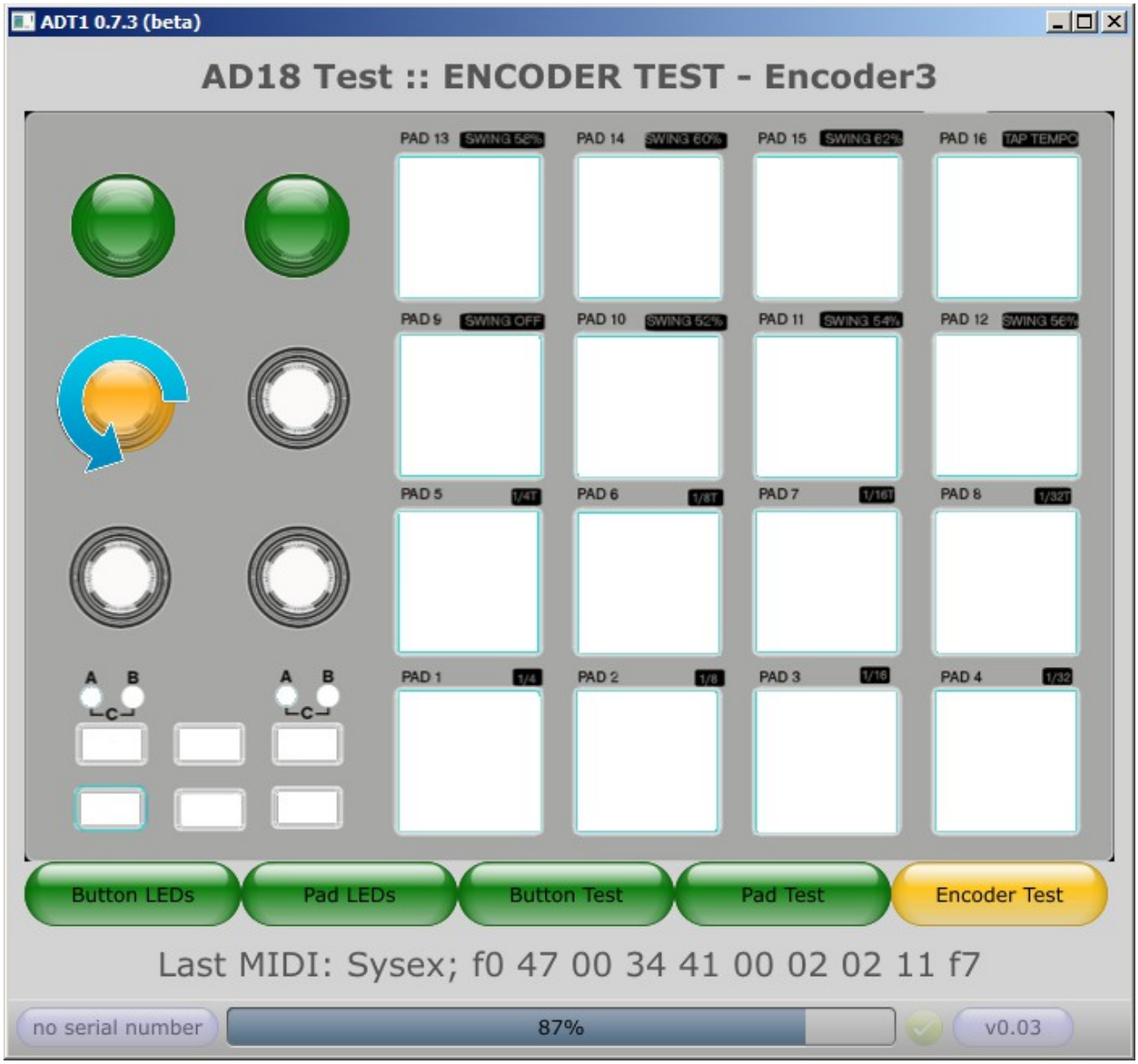


The Tester should firmly press the indicated pad. The test requires that a maximum pad pressure value is received by the ADT1 Manufacturing Test application.

When the ADT1 Manufacturing Test application detects light pressure it will change the graphic symbol on the User interface and send a message to the MPD218 to light the associated Pad LED.

When the ADT1 Manufacturing Test application detects maximum pad pressure, it will change the graphic symbol to green and send a message to the MPD218 to switch off the associated Pad LED.

Rotary Encoder test

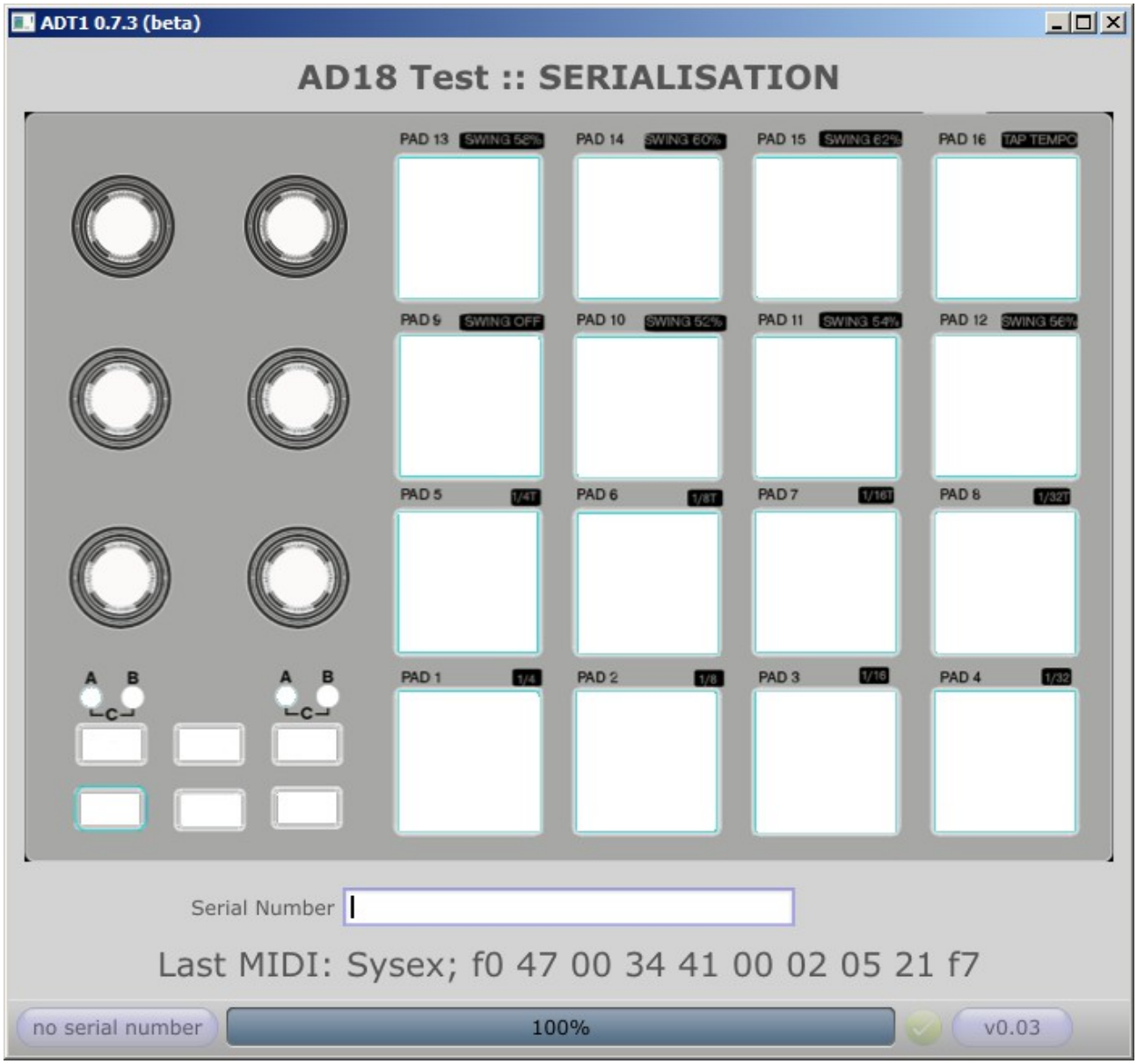


The Tester needs to turn the encoder first clockwise and the anti-clockwise as indicated by the ADT1 Manufacturing Test application.

When the ADT1 Manufacturing Test application detects clockwise rotation of the Rotary Encoder, it will change the graphic symbol on the User interface.

Serialisation

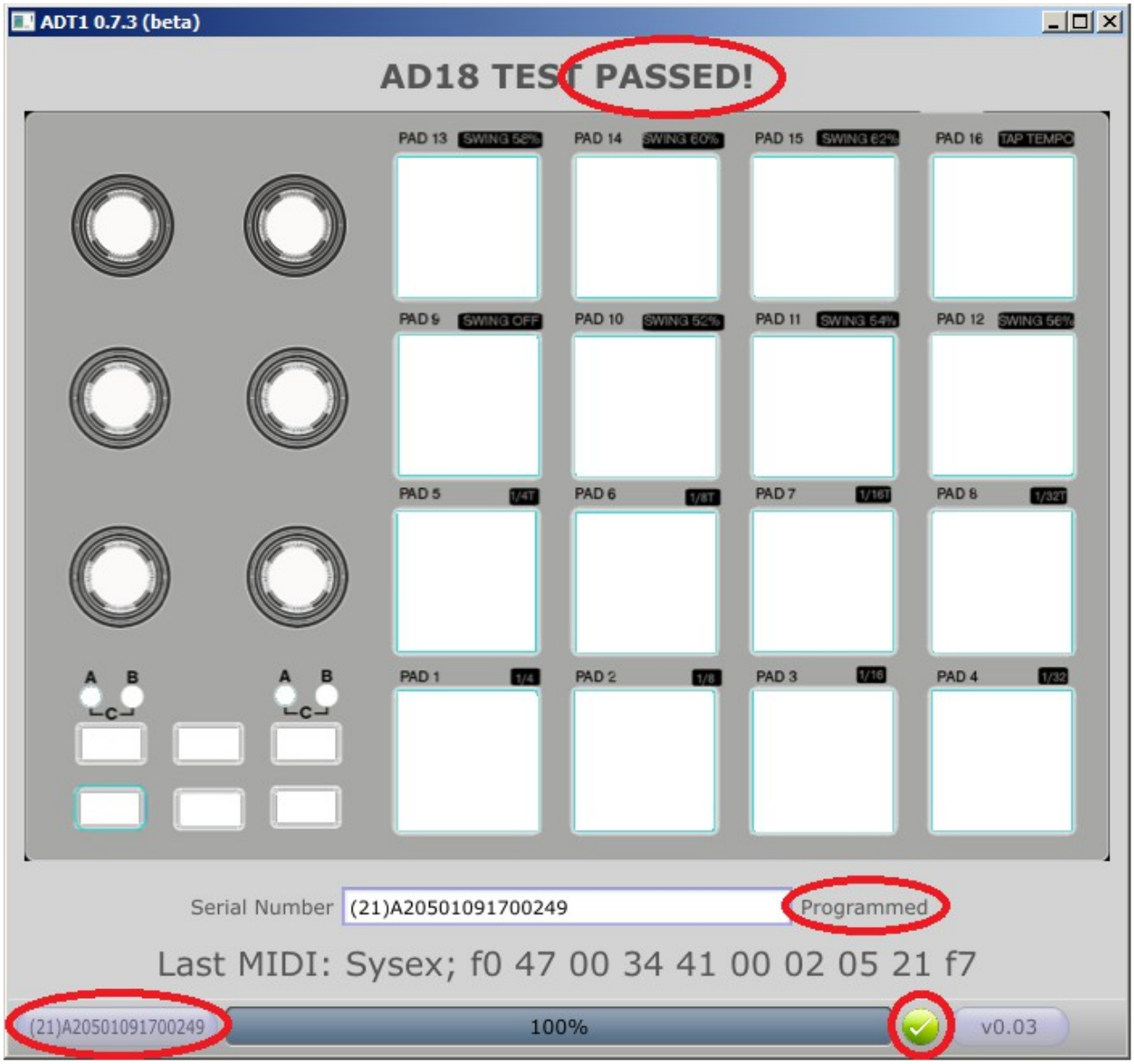
When all the subtest have been successfully completed, the subtest buttons on the User Interface will be removed and replaced with a text box. This text box should be used to program the Serial Number into the MPD218.



The Tester can type the Serial Number, followed by Carriage Return, but it is preferred that a USB Barcode Reader is used to scan the serial number barcode on the MPD218.

When the Serialisation has completed successfully, the display will update.

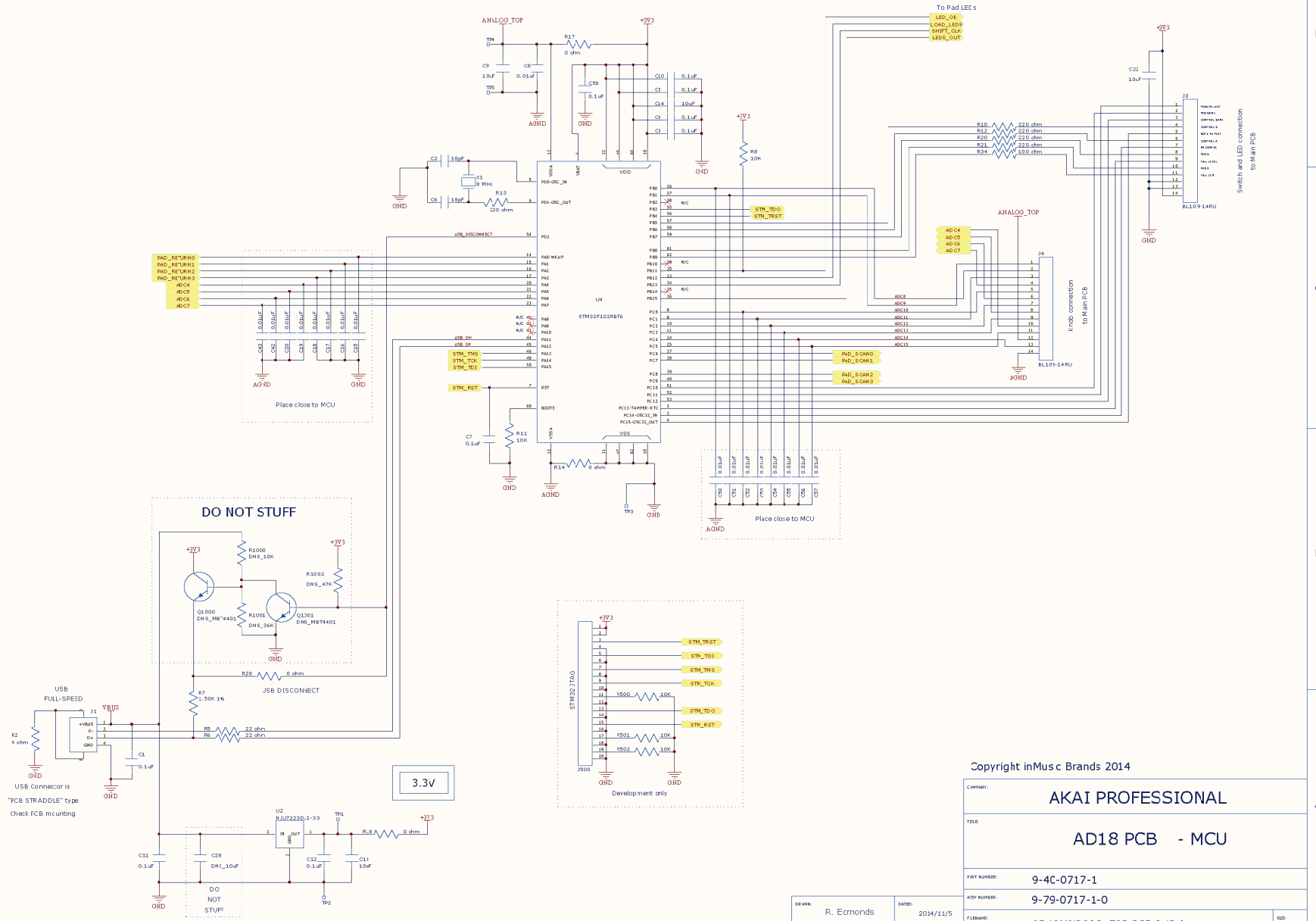
- The word “Programmed will appear next to the Serial Number box
- The new Serial Number will appear in the bottom left corner (this is important)
- A green tick will appear next to the Progress Bar
- The top line will say “PASSED”



Test Complete - Next MPD218

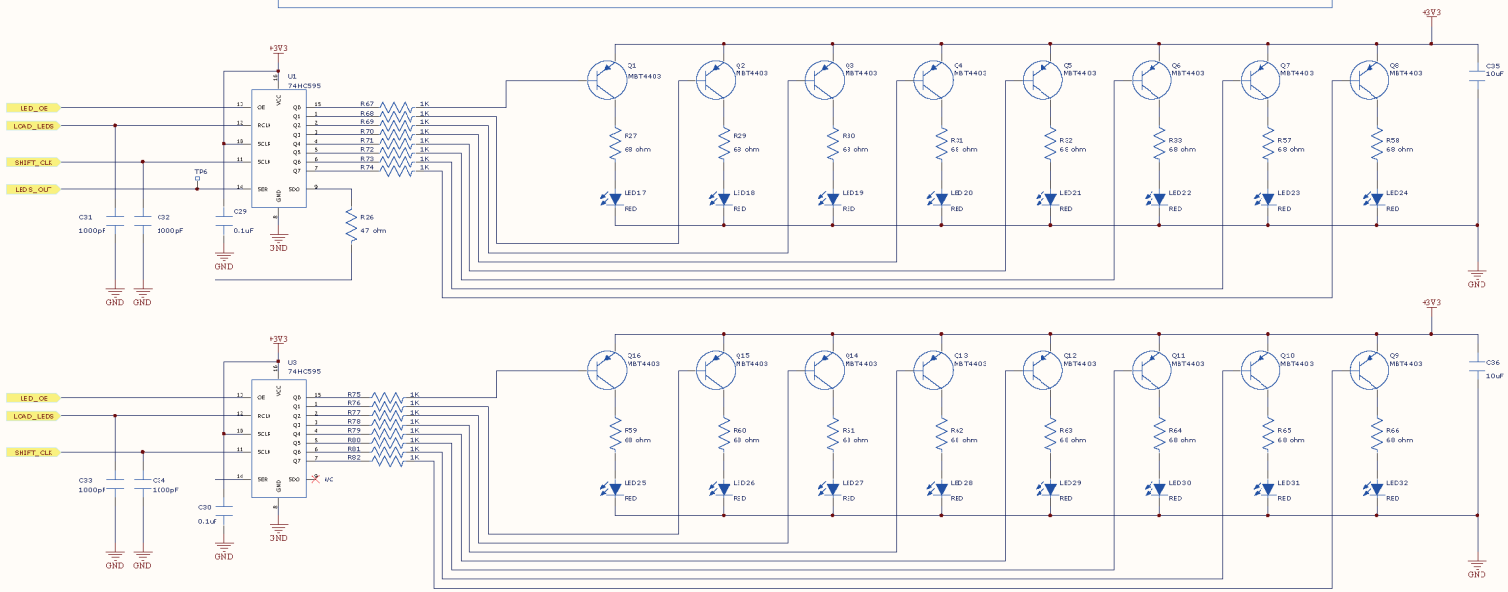
When a test of a MPD218 is complete, either successful or unsuccessful, it should be possible to just disconnect that MPD218 and connect the next one. It would not normally be necessary to reselect the ports as long as the corresponding test on the previous MPD218 were successful.

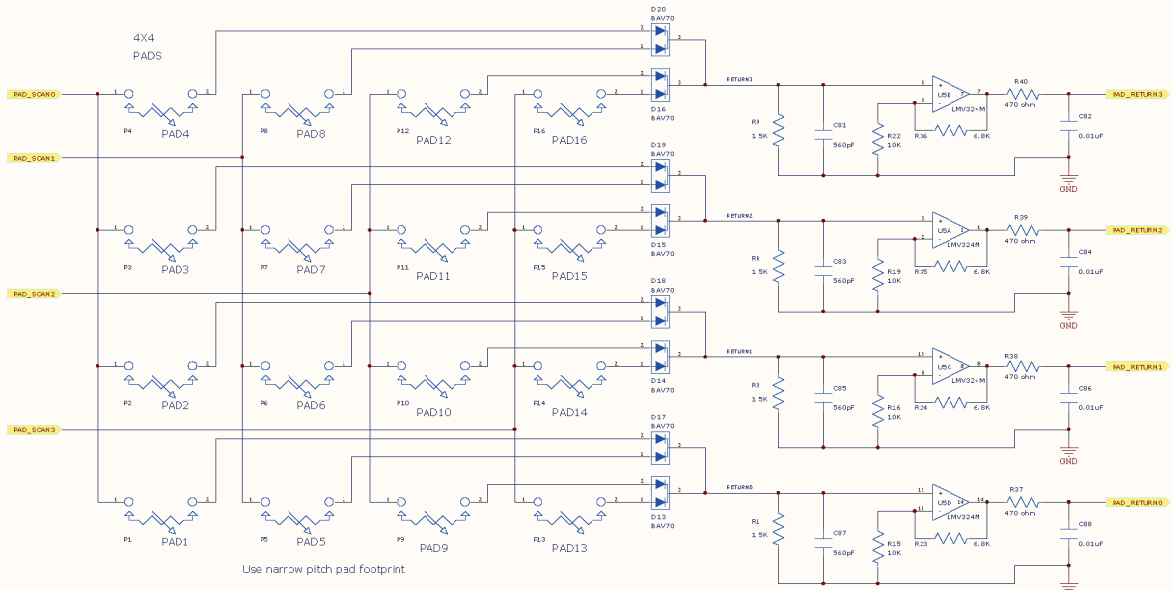
COMPONENTS ON THIS SHEET SHOULD BE ON FSR PCB



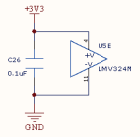
COMPANY:	AKAI PROFESSIONAL
TITLE:	AD18 PCB - MCU
PART NUMBER:	9-4C-0717-1
ASSY NUMBER:	9-79-0717-1-0
FILENAME:	AD18MN200C_FSR PCB.PrjPcb
SIZE:	C
SCALE:	
SHEET:	1 OF 2
DRAWN:	R. Ecmonds
DATE:	2014/11/5
RELEASED:	
DATE:	

COMPONENTS ON THIS SHEET SHOULD BE ON FSR PCB



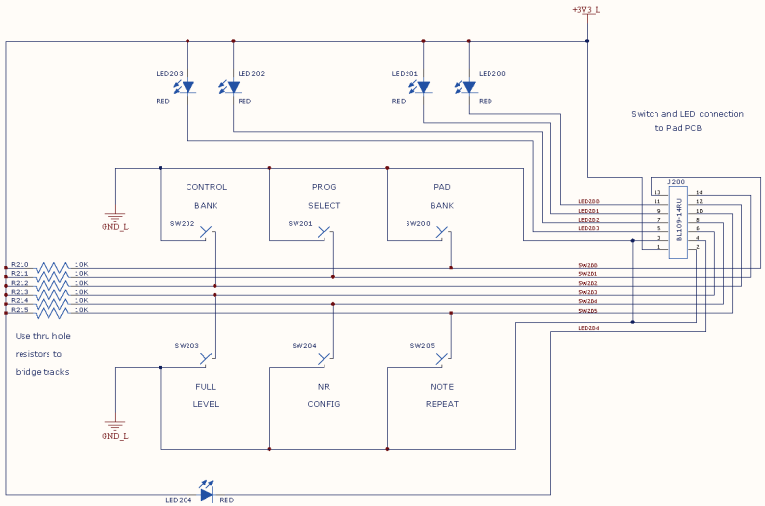


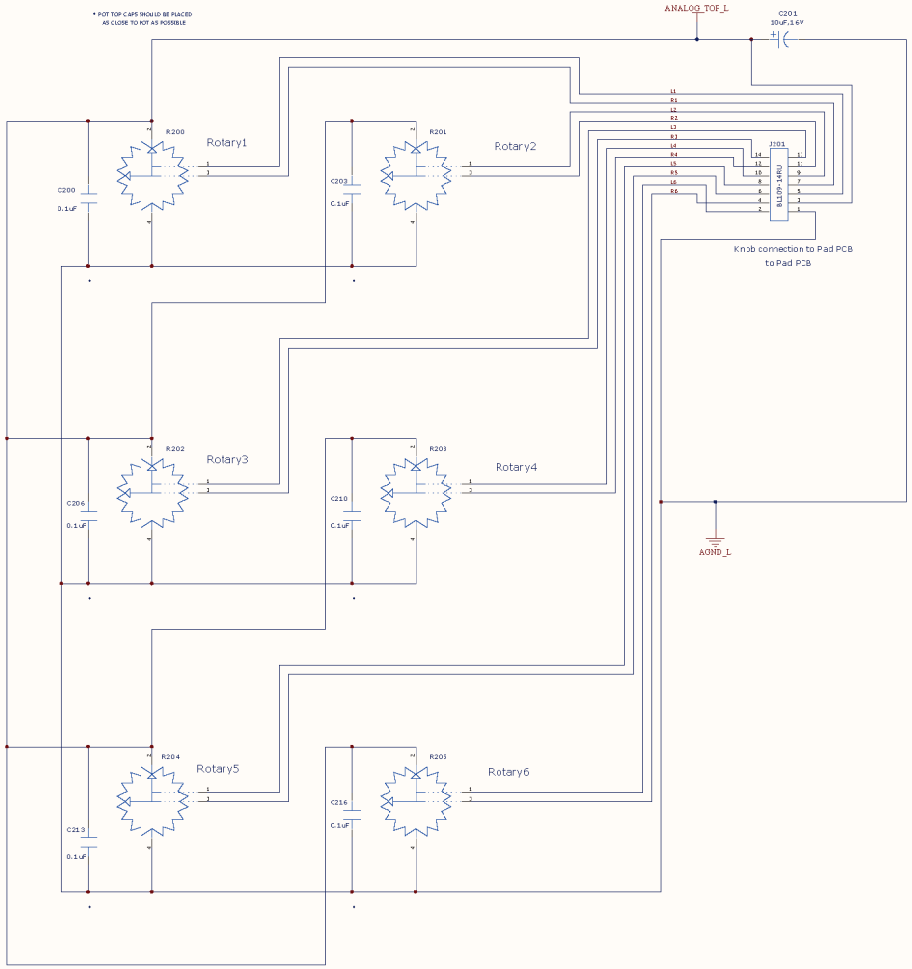
Use narrow pitch pad footprint



COMPANY:	AKAI PROFESSIONAL
TITLE:	AD18 PCB - PADS
PART NUMBER:	9-4C-0717-1
ASSY NUMBER:	9-79-0717-1-0
FILENAME:	AD18MN200C_FSR PCB.PrjPcb
SIZE:	C
SCALE:	
SHEET:	2 OF 2
DRAWN:	R. Ecmonds
DATED:	2014/11/5
RELEASED:	
DATED:	

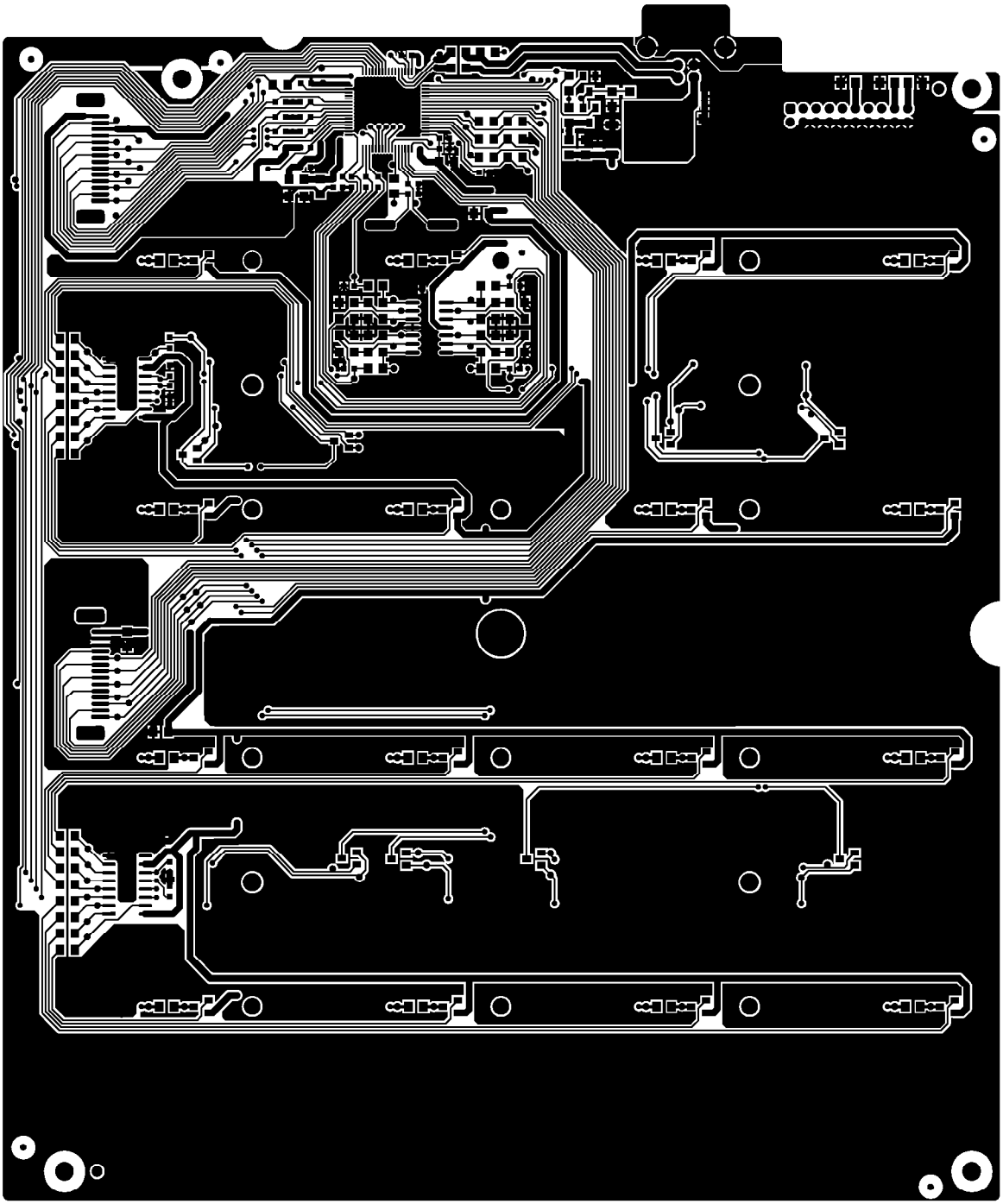
COMPONENTS ON THIS SHEET SHOULD BE ON MAIN PCB



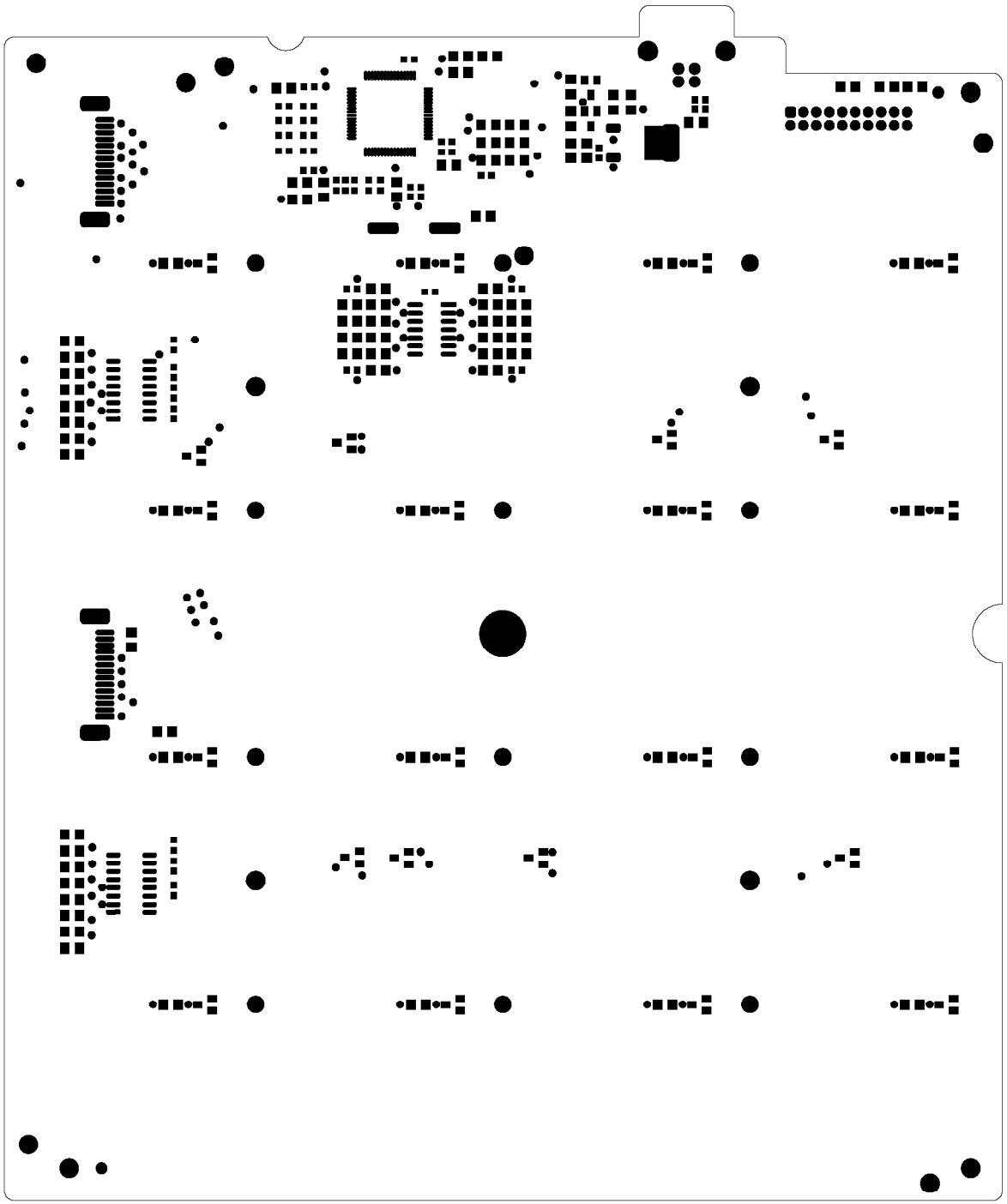


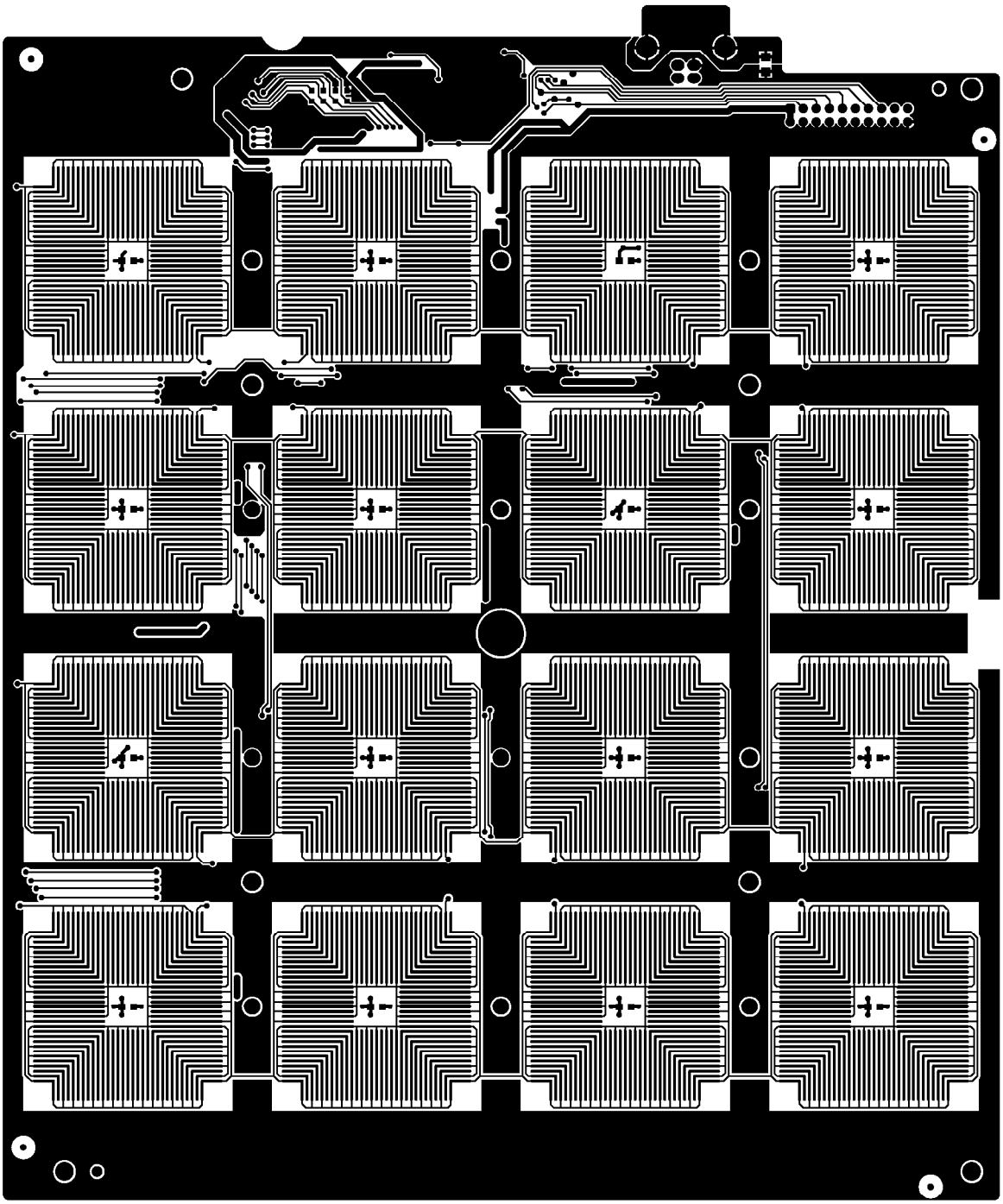
COMPANY:	AKAI PROFESSIONAL
TITLE:	AD18 PCB MAIN PCB
PART NUMBER:	9-4C-0717-1
ASSY NUMBER:	9-79-0717-1-0
FILENAME:	AD18MN200C_FUNCTION PCB.PrjPCB
SIZE:	C
SCALE:	
SHEET:	1 OF 1

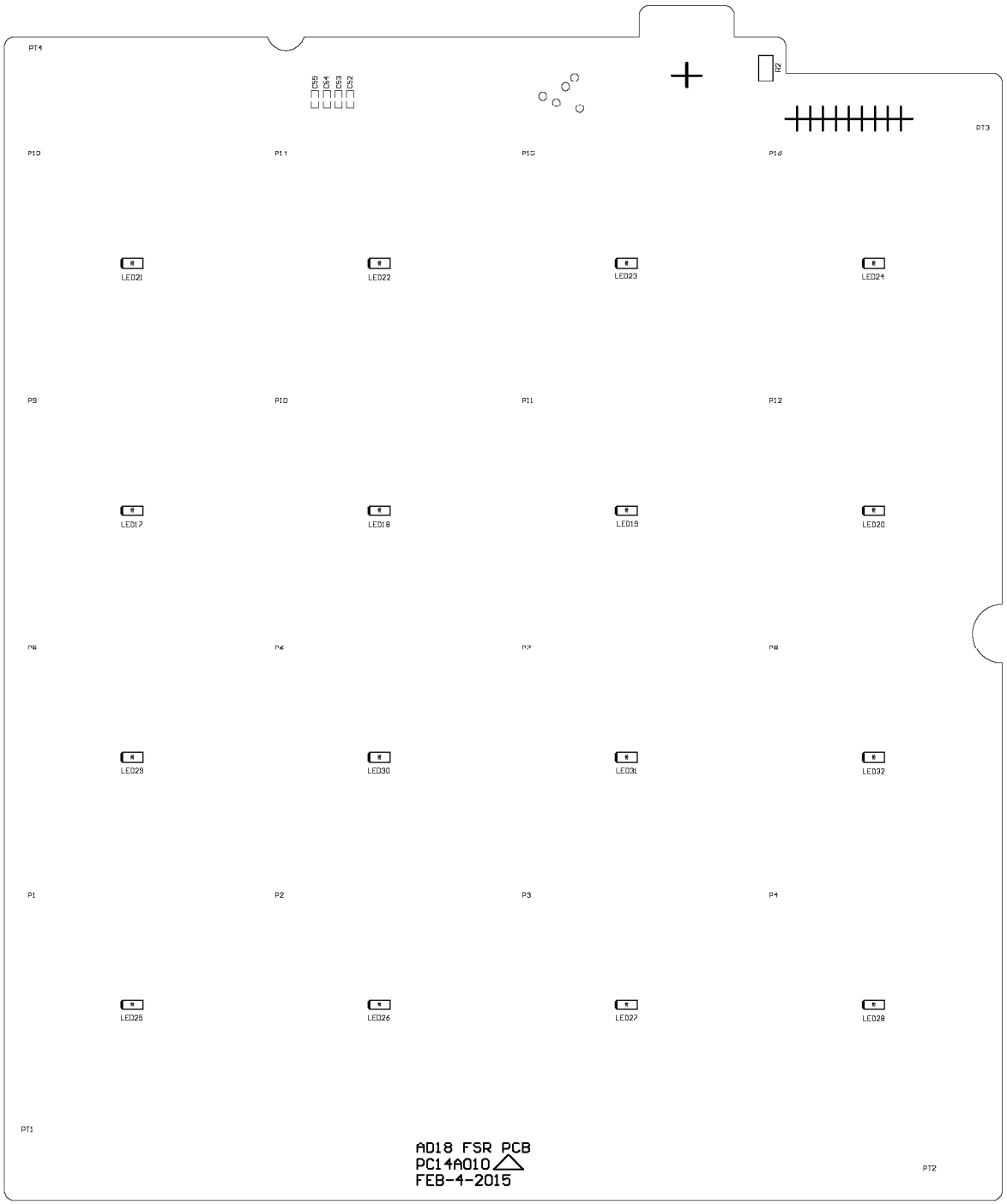
DRAWN:	R. Ecmonds	DATE:	2014/11/5
RELEASED:		DATE:	

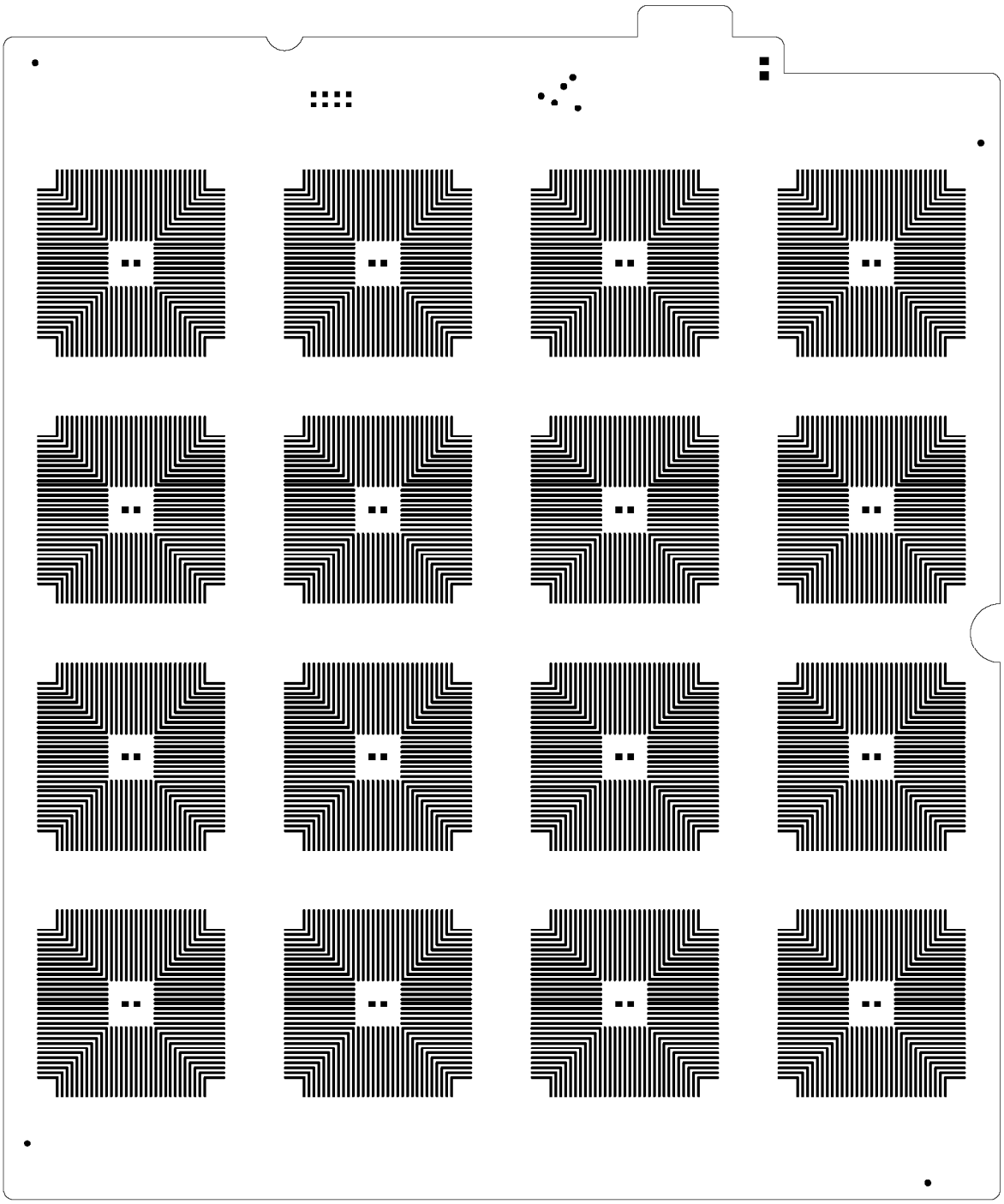


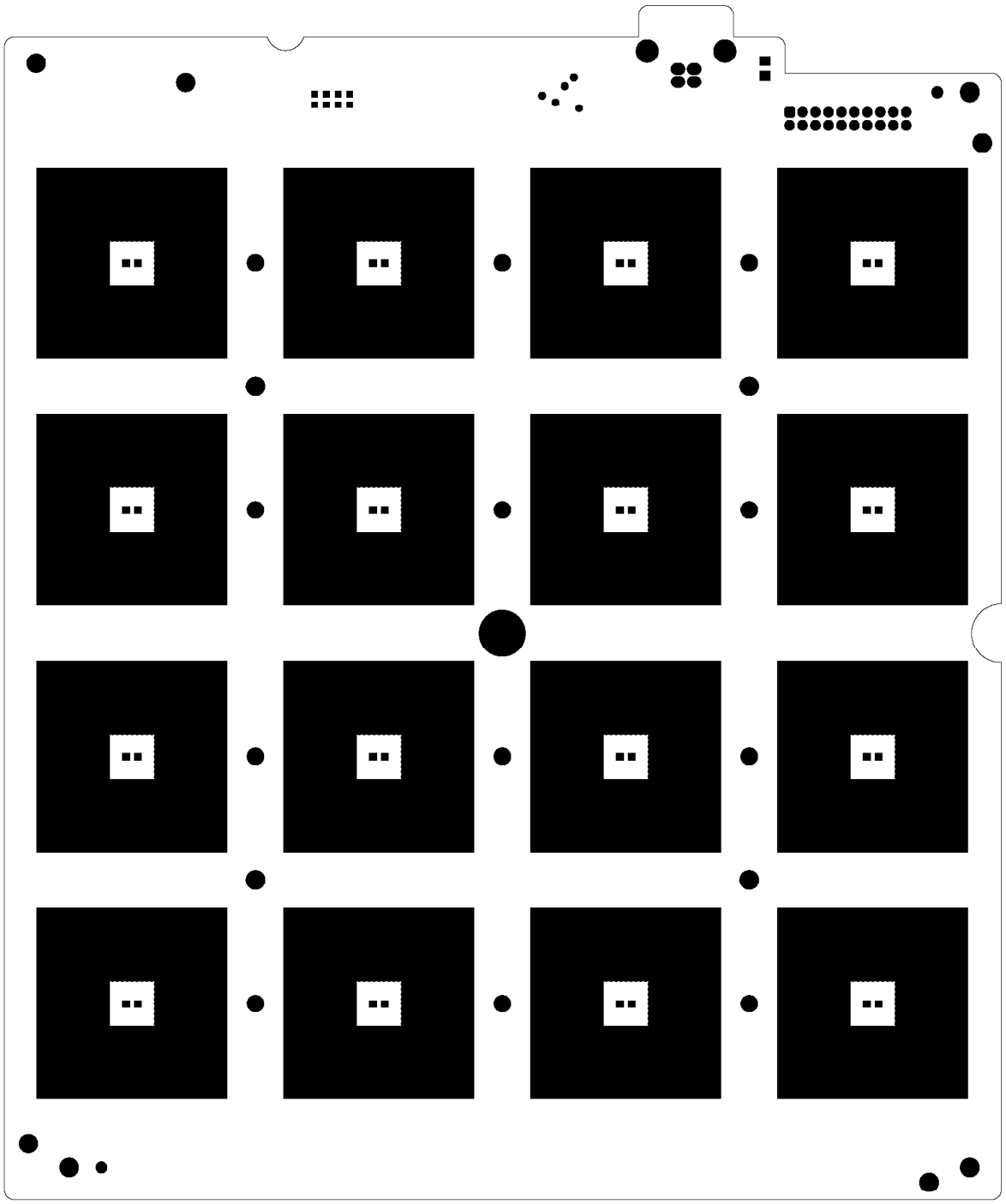
AD18 FSR PCB
PCI 4A010
FEB-4-2015

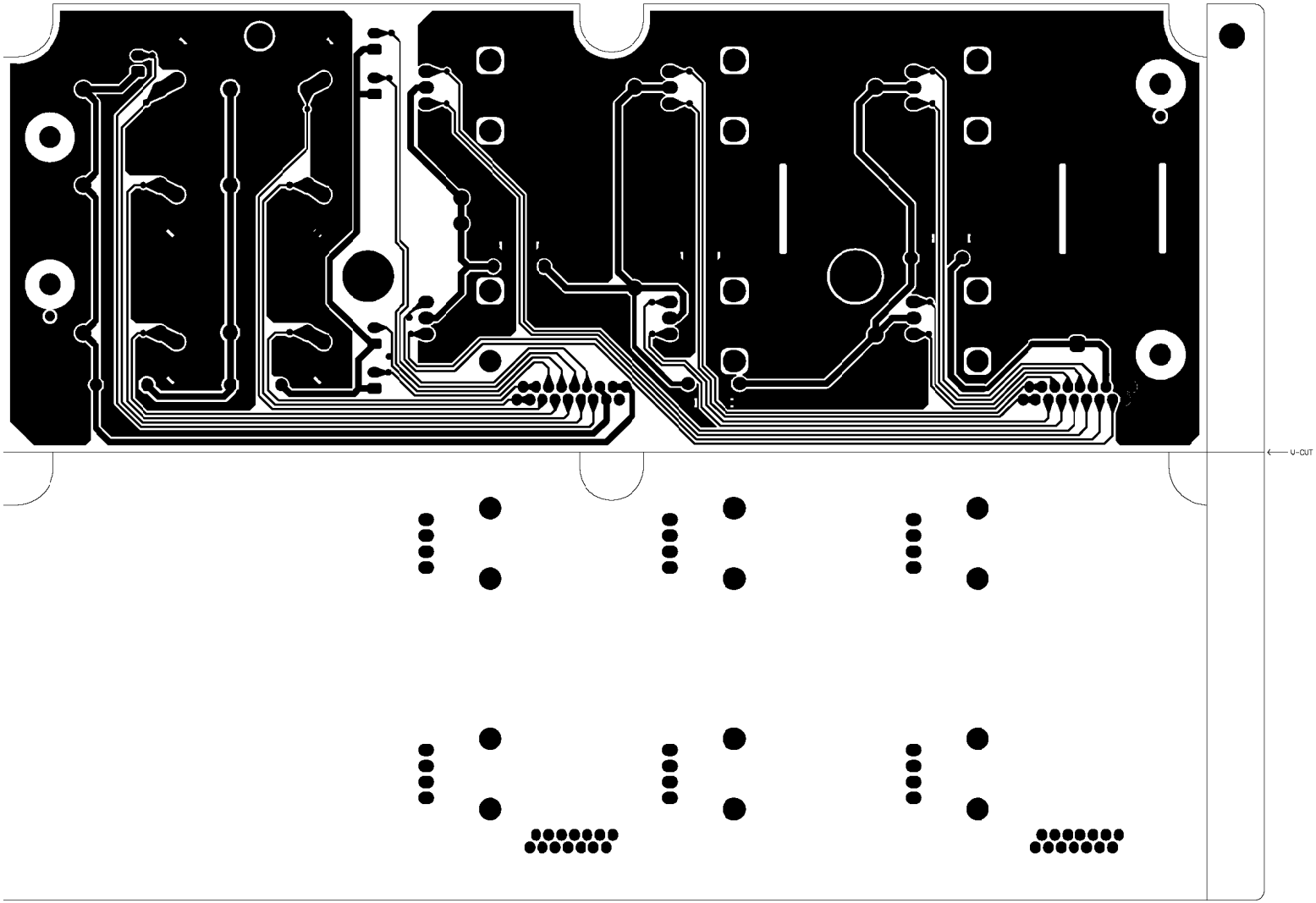




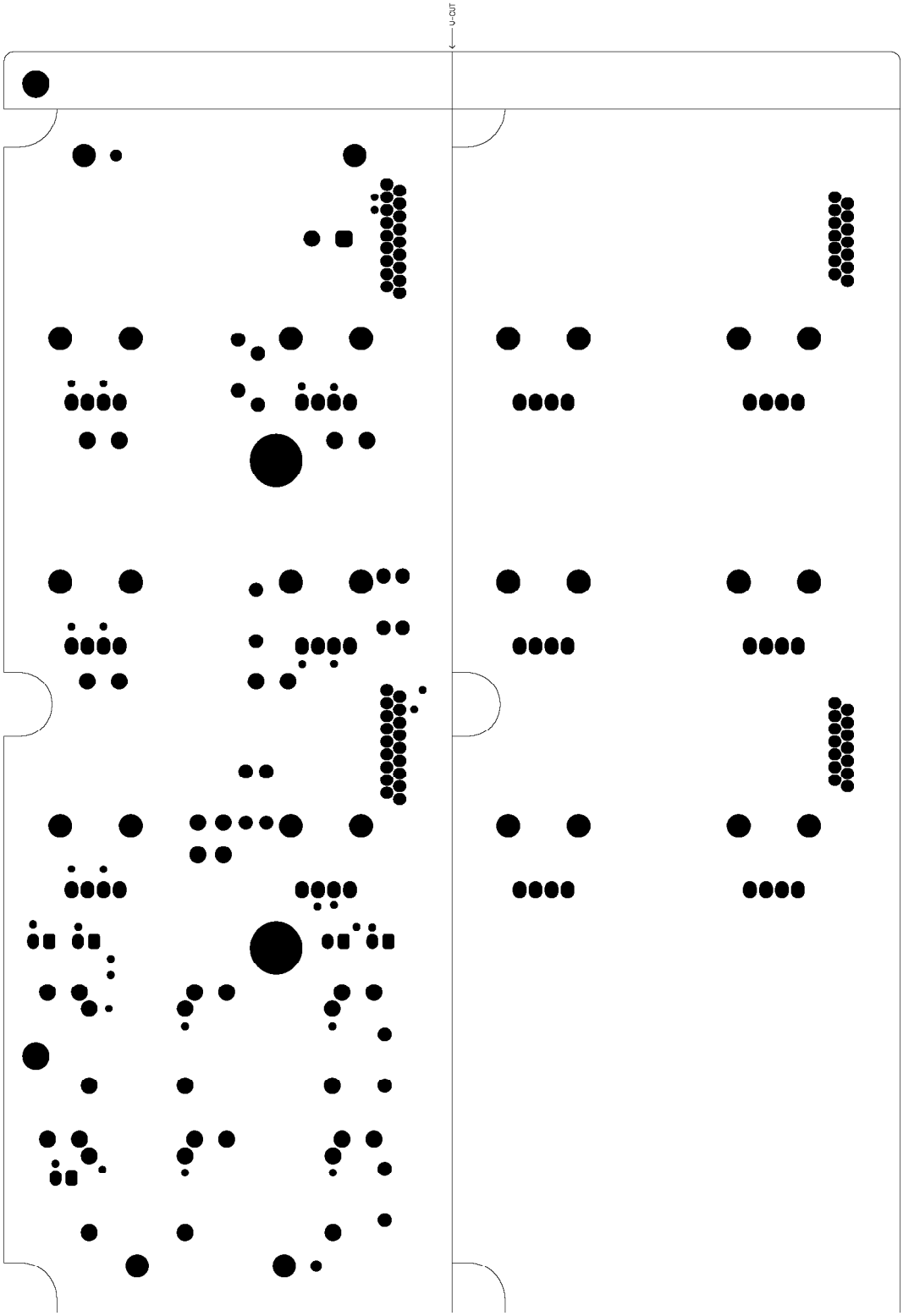

PT4
C55
C54
C53
C52
R2
PT3
P10
P11
P15
P16
LED21
LED22
LED23
LED24
P9
P10
P11
P12
LED17
LED18
LED19
LED20
P5
P6
P7
P8
LED29
LED30
LED31
LED32
P1
P2
P3
P4
LED25
LED26
LED27
LED28
PT1
AD18 FSR PCB
PC14A010
FEB-4-2015
PT2



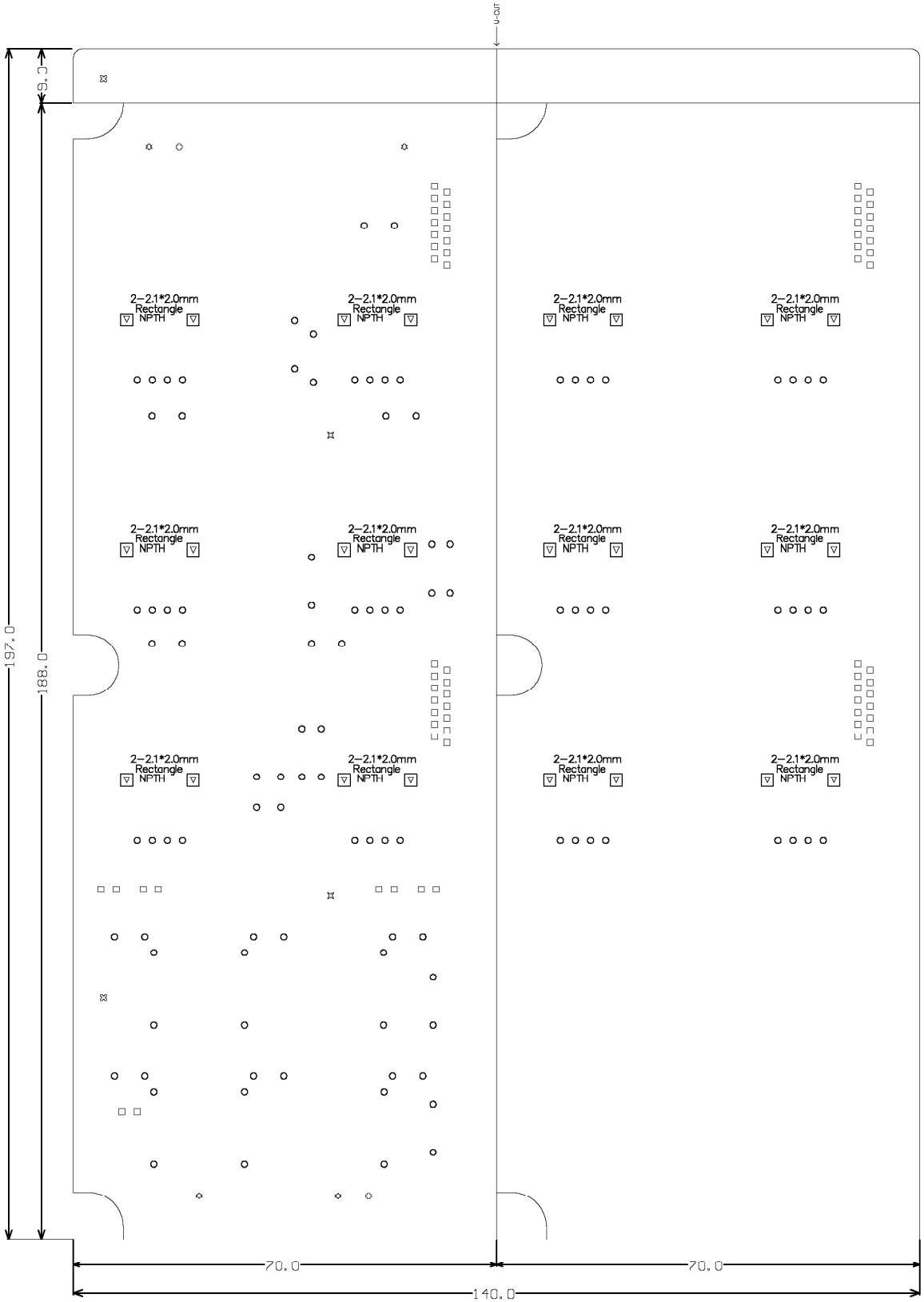



V-CUT

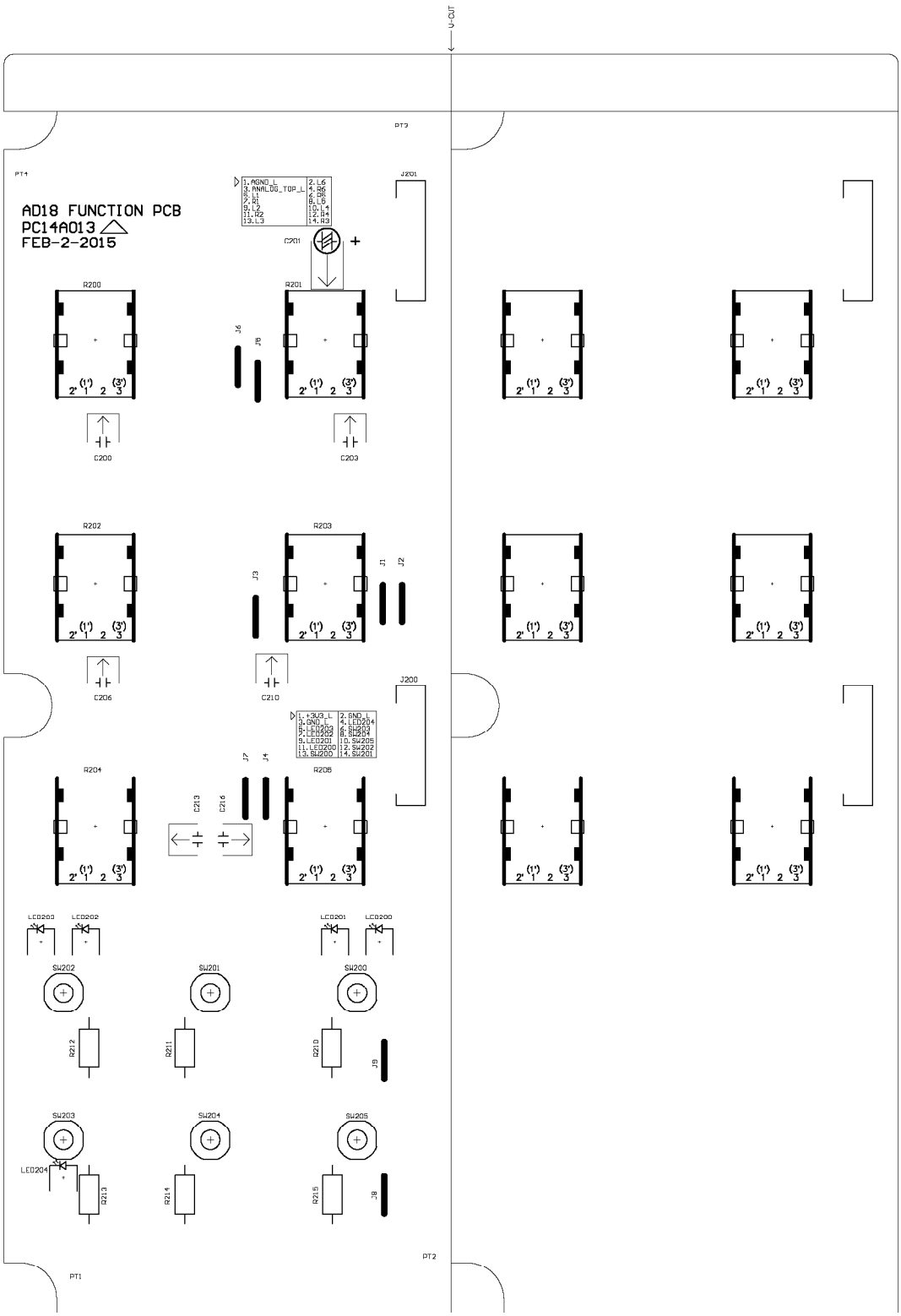
V-CUT
AD18 FUNCTION PCB
PCI4AD13
FEB-2-2015


V-CUT

洗板方式為 1PANEL(2PCS)（右側為併板示意圖）



Symbol	Hit Count	Finished Hole Size
□	66	0.8mm (31.496mil)
○	104	1mm (39.37mil)
○	2	1.6mm (62.992mil)
▽	24	2mm (78.74mil)
◇	4	3.4mm (133.858mil)
⊠	2	4mm (157.48mil)
⊠	2	8mm (314.961mil)
	204 Total	


V-CUT
PT3
PT4
AD18 FUNCTION PCB
PC14A013
FEB-2-2015
J201
C201
R200
R201
J6
J8
C200
C203
R202
R203
J3
J1
J2
C206
C210
J200
R204
R205
J7
J4
C213
C216
LED203
LED202
LED201
LED200
SW202
SW201
SW200
R212
R211
R210
J9
SW203
SW204
SW205
LED204
R213
R214
R215
J8
PT2
PT1