

OSCin/OSCin* Options

1. TCXO Mode
Terminate OSCin* if this is done
2. VCXO Mode
Connect VCXO and tie power supply to Vcc/2.
Drive and terminate differentially.
3. Differential Mode
Use 100 ohm or 2x51 ohm resistors for termination.
4. External Crystal Mode
Use back side of board. May have to bend leads of crystal to fit.
5. Use external signal source like LMK04000 evaluation board to drive OSCin/OSCin*
6. Special provisions on GND plane

Ftest/LD Pin Options

- Monitor the Ftest/LD pin
- Provisions for Analog Lock Detect
- Supply power for an op-amp for an active filter
- Allow the user to apply FSK modulation
- Monitor CPout Pin
- Monitor or Drive the Vtune pin

Loop Filter Options

1. Internal VCO
Do not use any bottom components for this.
2. External VCO with Passive Filter
Disconnecting Vtune isolates Vtune. Might not be necessary
3. External VCO with Active Filter
Use the components on the back.
Op AMP can be supplied with Ftest/LD pin or with VccAux voltage.
Use C1_LF and back side resistors for slow slew rate design.
3rd Pole is formed with C3_LF and resistor back to top of board.
4th Pole is already on top of board.
4. Monitor CPout through Ftest/LD
5. Monitor or Drive Vtune
Use test point or Ftest/LD SMA and back layer resistors.
Remove R3_LF or Tri-state charge pump to drive voltage.

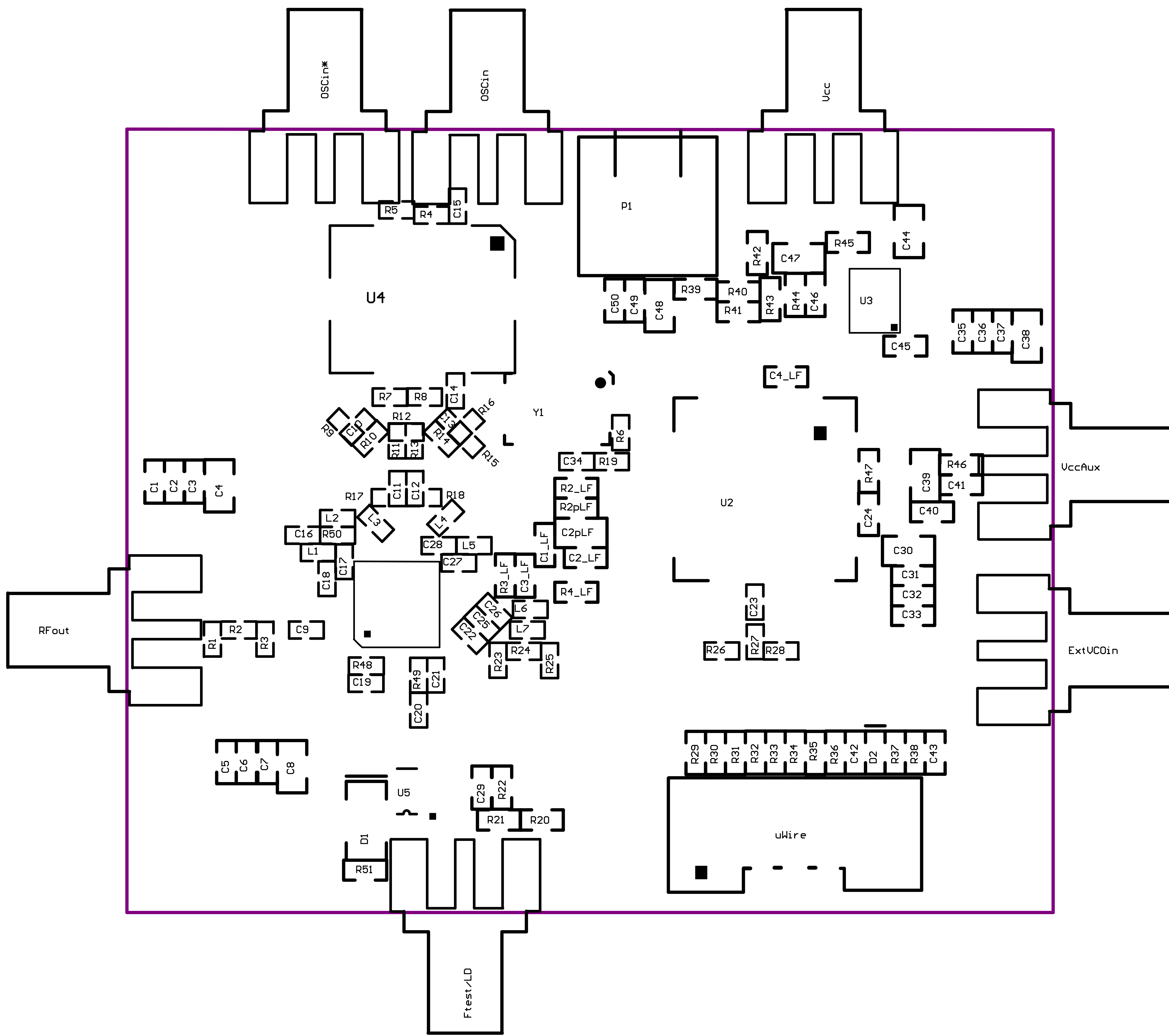
Pad and External VCO Options

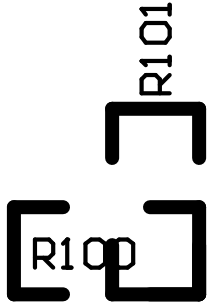
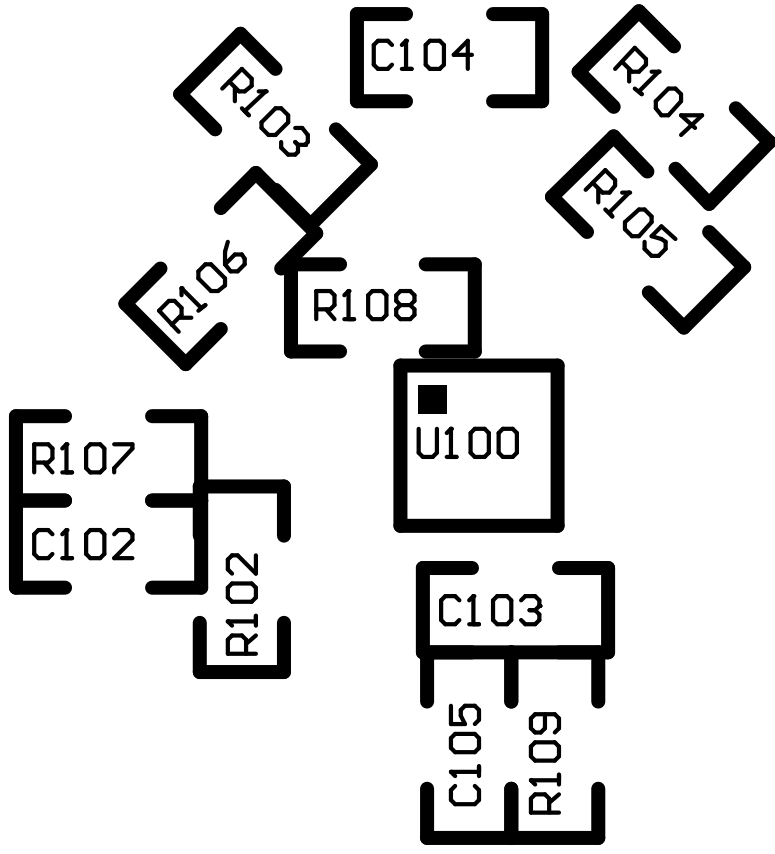
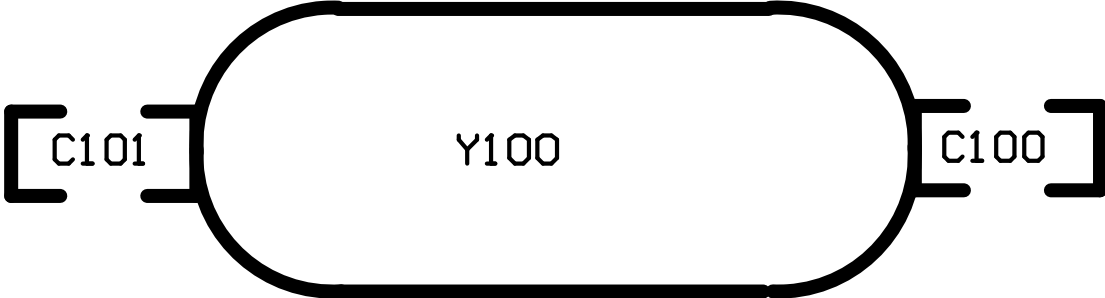
To use with a VCO, use 3 components to make a T-splitter and don't use the Pi-Pad. For sensitivity testing, put components in the Pi-Pad and zero out resistors in the T-Pad. Also, for fractional spurs outside the loop bandwidth with the external VCO option, there is some evidence that putting a resistive pad can improve fractional spurs outside the loop bandwidth.

VregRFout
Series resistance on VregRFout improves the noise floor when used in divided mode.

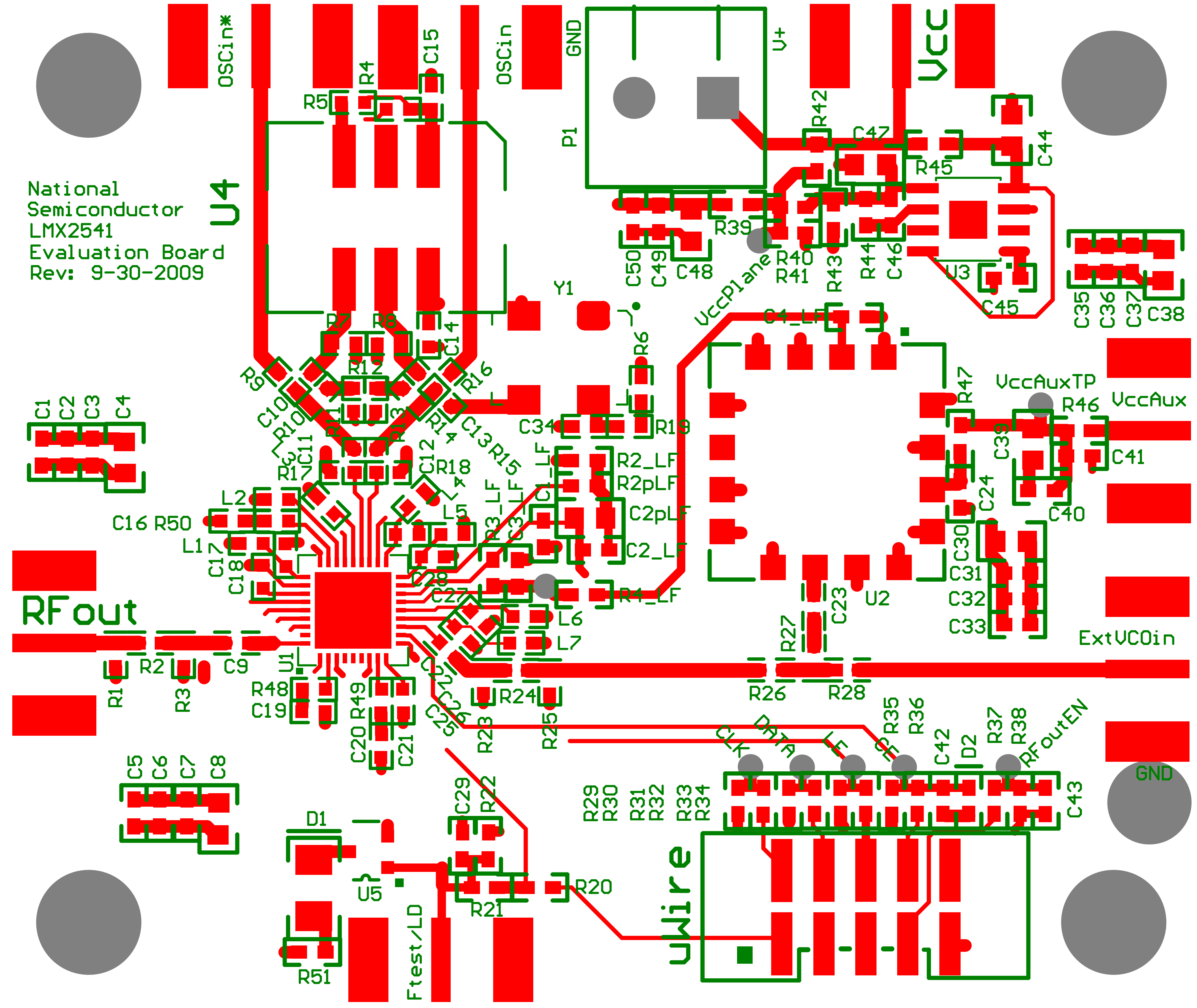
Additional Comments
- Any part with designator 100 or higher is on the bottom layer and not assembled by default.

Title		
Size	Number	Revision
C		
Date:	9/30/2009	Sheet of
File:	\\.\LMX2541.sch	Drawn By:





National
Semiconductor
LMX2541
Evaluation Board
Rev: 9-30-2009



U4

VCC

RFout

Uwire

GND

ExtVCOin

VccAux

VccAuxTP

OSCin

OSCin*

GND

V+

P1

Y1

VccPlane

CLK

DATA

LF

RF

RFoutEN

D2

R37

R38

C43

C44

C45

C46

C47

C48

C49

C50

R40

R41

R42

R43

R44

R45

R46

C1
C2
C3
C4

C16
R50

L1
L2

C17
C18

R1
R2
R3

C9
C19

R48
R49

C20
C21

C5
C6
C7
C8

D1

R51

Ftest/LD

R20

R21

R22

R23

R24

R25

R26

R27

R28

R9

C10

R10

R11

R12

R13

R14

R15

R16

R17

R18

R19

R2

R3

R4

R5

R6

R7

R8

R11

R12

R13

R14

R15

C11

C12

C13

C14

C15

C22

C23

C24

C25

C26

C27

C28

C29

C30

C31

C32

C33

C34

C35

C36

C37

C38

C39

C40

L3

L4

L5

L6

L7

L1

L2

L3

L4

L5

L6

L7

L1

L2

L3

L4

L5

L6

L7

L1

L2

L3

L4

L5

C1

C2

C3

C4

C5

C6

C7

C8

C9

C10

C11

C12

C13

C14

C15

C16

C17

C18

C19

C20

C21

C22

C23

C24

C25

C26

C27

C28

C29

C30

C31

C32

C33

C34

C35

C36

C37

C38

C39

C40

C41

C42

C43

C44

C45

C46

C47

C48

C49

C50

C1

C2

C3

C4

C5

C6

C7

C8

C9

C10

C11

C12

C13

C14

C15

C16

C17

C18

C19

C20

C21

C22

C23

C24

C25

C26

C27

C28

C29

C30

C31

C32

C33

C34

C35

C36

C37

C38

C39

C40

C41

C42

C43

C44

C45

C46

C47

C48

C49

C50

C1

C2

C3

C4

C5

C6

C7

C8

C9

C10

C11

C12

C13

C14

C15

C16

C17

C18

C19

C20

C21

C22

C23

C24

C25

C26

C27

C28

C29

C30

C31

C32

C33

C34

C35

C36

C37

C38

C39

C40

C41

C42

C43

C44

C45

C46

C47

C48

C49

C50

C1

C2

C3

C4

C5

C6

C7

C8

C9

C10

C11

C12

C13

C14

C15

C16

C17

C18

C19

C20

C21

C22

C23

C24

C25

C26

C27

C28

C29

C30

C31

C32

C33

C34

C35

C36

C37

C38

C39

C40

C41

C42

C43

C44

C45

C46

C47

C48

C49

C50

C1

C2

C3

C4

C5

C6

C7

C8

C9

C10

C11

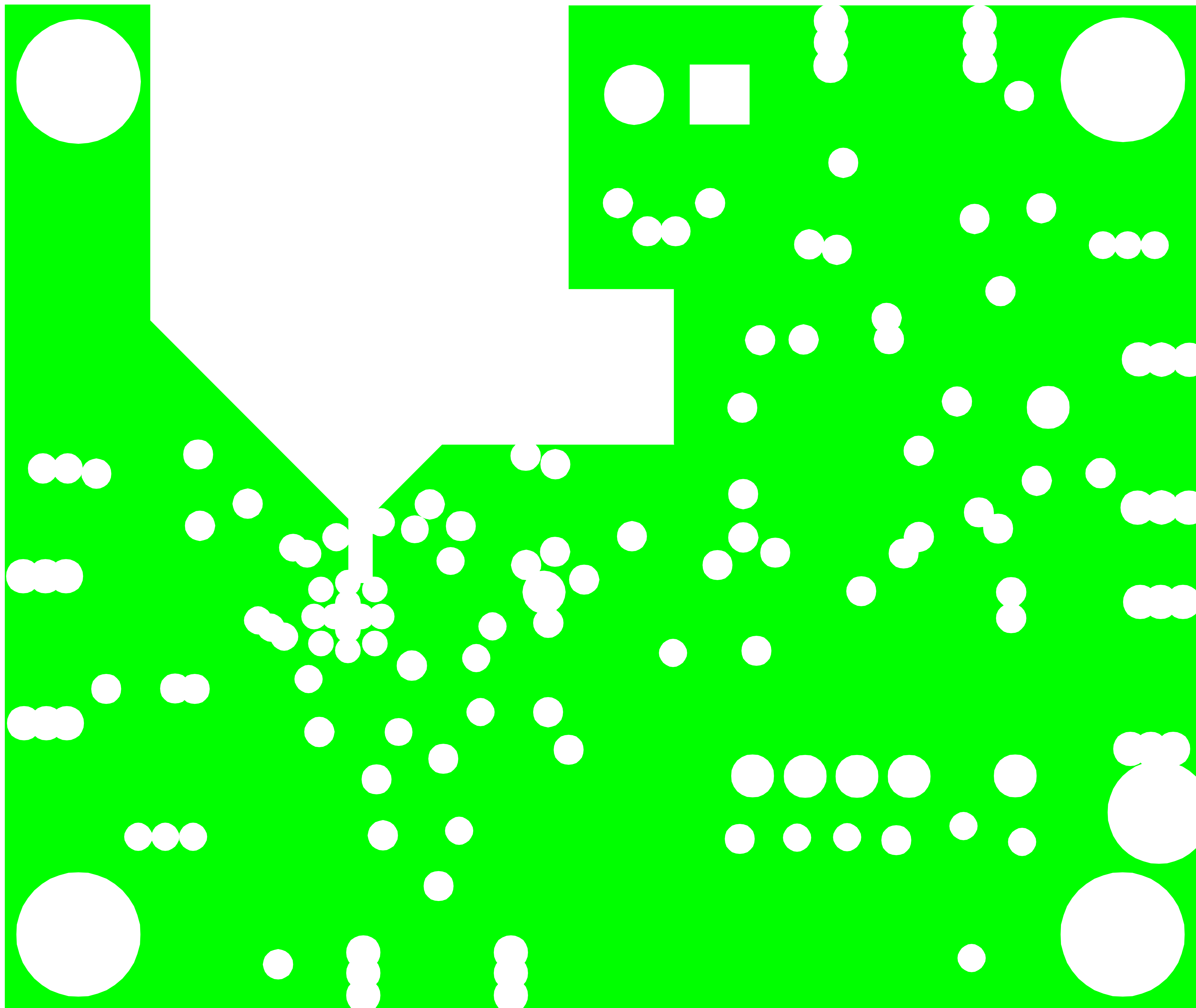
C12

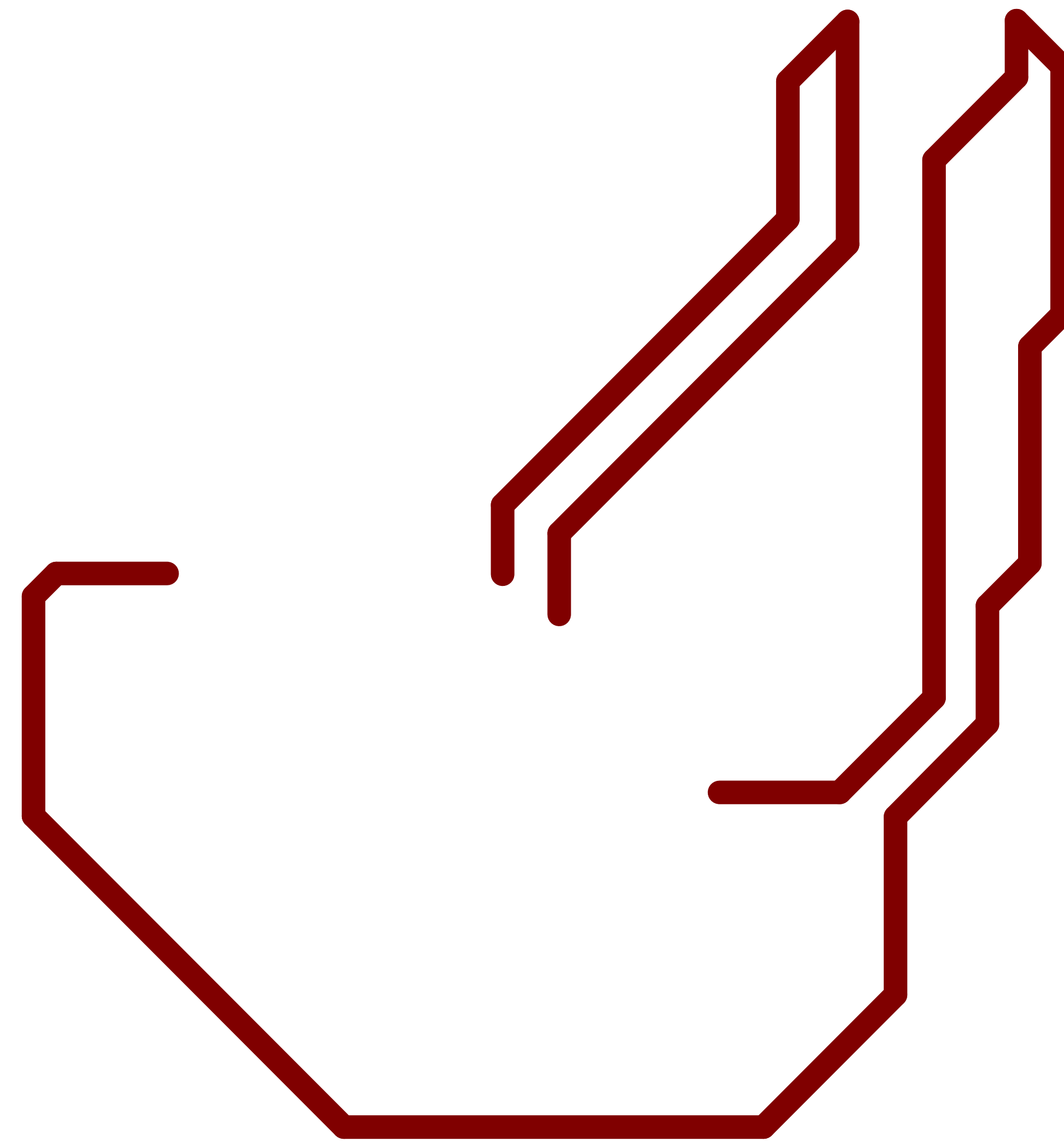
C13

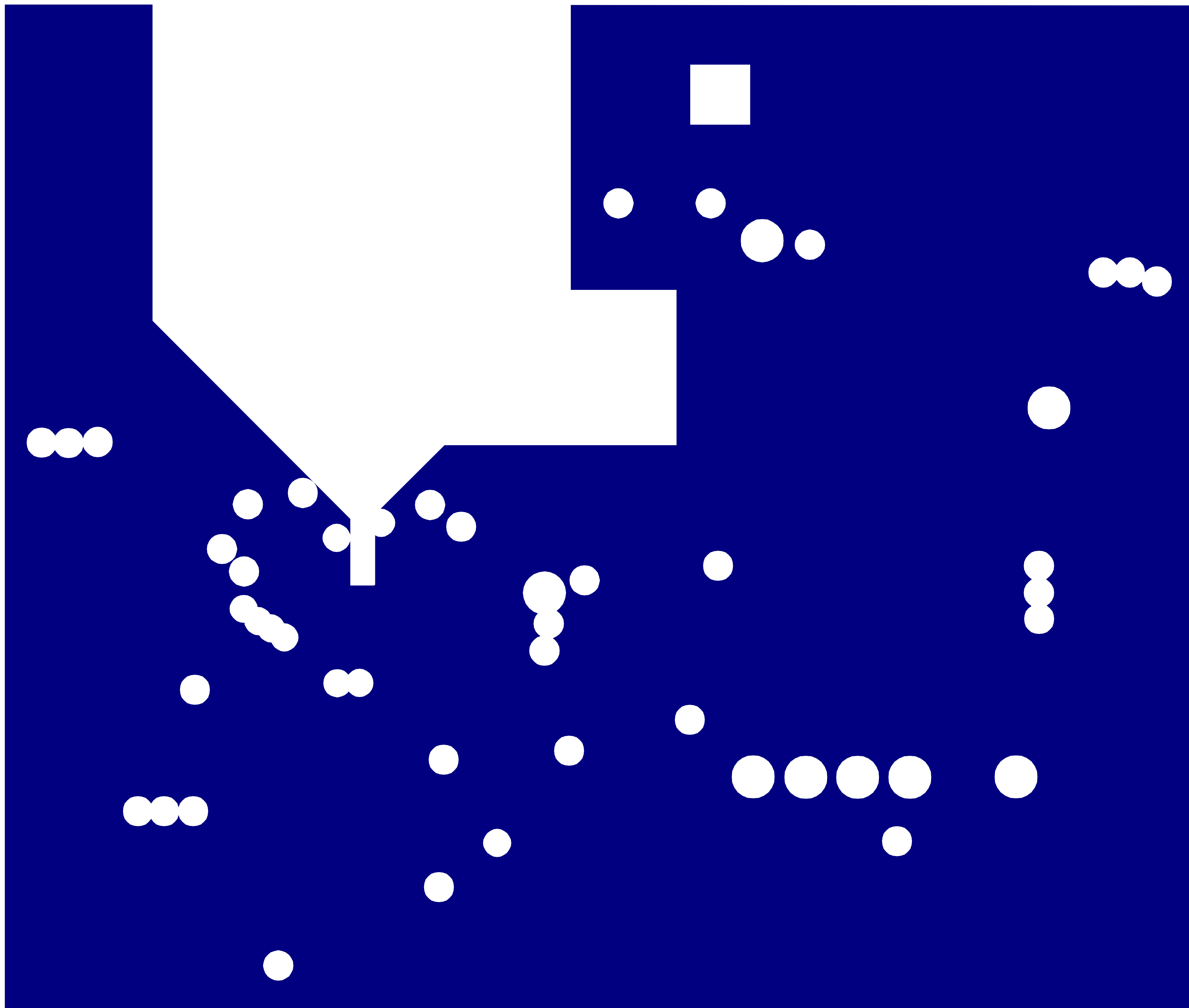
C14

C15

C16







Made in the USA
Copyright 2002 NSC
UL94V-0
251600406-002A

