



microwave

# X-Microwave ADMV1013 / ADMV1014 Reference Design Kits (RDks)

XM-RDK-201 / XM-RDK-202

User Manual

For support contact: [sales@quanticxmw.com](mailto:sales@quanticxmw.com)

+1.512.355.7115



This product uses semiconductors that can be damaged by electrostatic discharge (ESD).  
When handling, care must be taken so that the devices are not damaged.

- Wear ground foot or wrist straps and use a grounded anti-static mat to cover your work surface
- Always discharge yourself by touching a grounded bare metal surface before picking up the plate

# Change Log

Date	Impacted PN	Change (Reason)	By
June 8, 2020	XM-RDK-201	Replace XM-B913-0809D, ADI ADMV1013, [PCB 1301] with With XM-B9U5-0909D, ADI ADMV1013, [PCB 1528] (0809 PCB size to 0909 PCB size for more common differential LO port spacing)	Luther
June 8, 2020	XM-RDK-202	Replace XM-B914-0809D, ADI ADMV1014, [PCB 1299] With XM-B9U7-0909D, ADI ADMV1014, [PCB 1526] (0809 PCB size to 0909 PCB size for more common differential LO port spacing)	Luther
June 8, 2020	XM-RDK-201 XM-RDK-202	Replace XM-B912-0509D, Mini-Circuits QCH-63, [PCB 1300] With XM-C373-0509D, Mini-Circuits QCH-63, [PCB 1300] (Coupler layout is reconfigurable for high side or low side using an an external load, such as XM-A354-0204D in the kit)	
June 8, 2020	XM-RDK-201 XM-RDK-202	Swap XM-A1B2-0204D, Mini-Circuits LFCN-3000+, [PCB 30] With XM-A1B8-0204D, Mini-Circuits LFCN-6000+, [PCB 30] Both are and will continue to be included in the kit, but 6 GHz LPF will be used as IF filters on the built assembly. (Updated antialiasing filters from 3 GHz to 6 GHz)	Luther

The background of the slide is composed of several overlapping, semi-transparent fragments of a printed circuit board (PCB) layout. These fragments are arranged in a stepped, staircase-like pattern, with some pieces appearing in the top right and others in the bottom left. The fragments show various components, traces, and vias, representing different sections of the overall board design.

# ADMV1013 Upconverter

XM-RDK-201

## ADMV1013 Upconverter

# XM-RDK-201 Signal Chain

### (1) Reference Oscillator

OSC, XM-A7T7-0404D, Connor-Winfield TB522-100.0M, [PCB 750], F=100M TCXO

### (2) PLL with Integrated VCO

PLL-VCO, XM-A5Y9-0409D, ADI ADF5356 [PCB 382], F=53.125M – 13.6G

### (3) Planar Filter

Band Pass Filter, XM-A2C3-0604D, DLI B056RC4S, [PCB 81], CF=6G BW=4.6G

### (4) Amplifier

Amplifier, XM-C598-0404D, ADI HMC451LC3, [PCB 1073], F=5G-20G -4dB +19dB -7dB

### (5) Transmission Line / Placeholder

0204 Transmission Line, XM-A2M5-0204D, [PCB 58], F=DC-50 GHz

### (6) IF Upconverter

IF Upconverter, XM-B9U5-0909D, ADI ADMV1013, [PCB 1528], F=24GHz – 44GHz

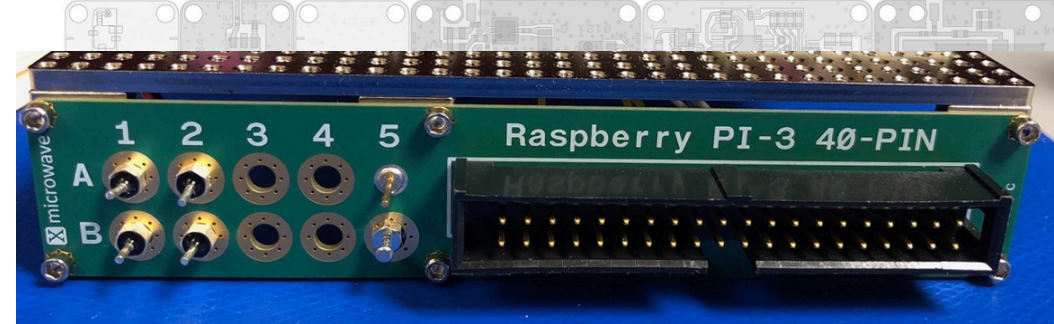
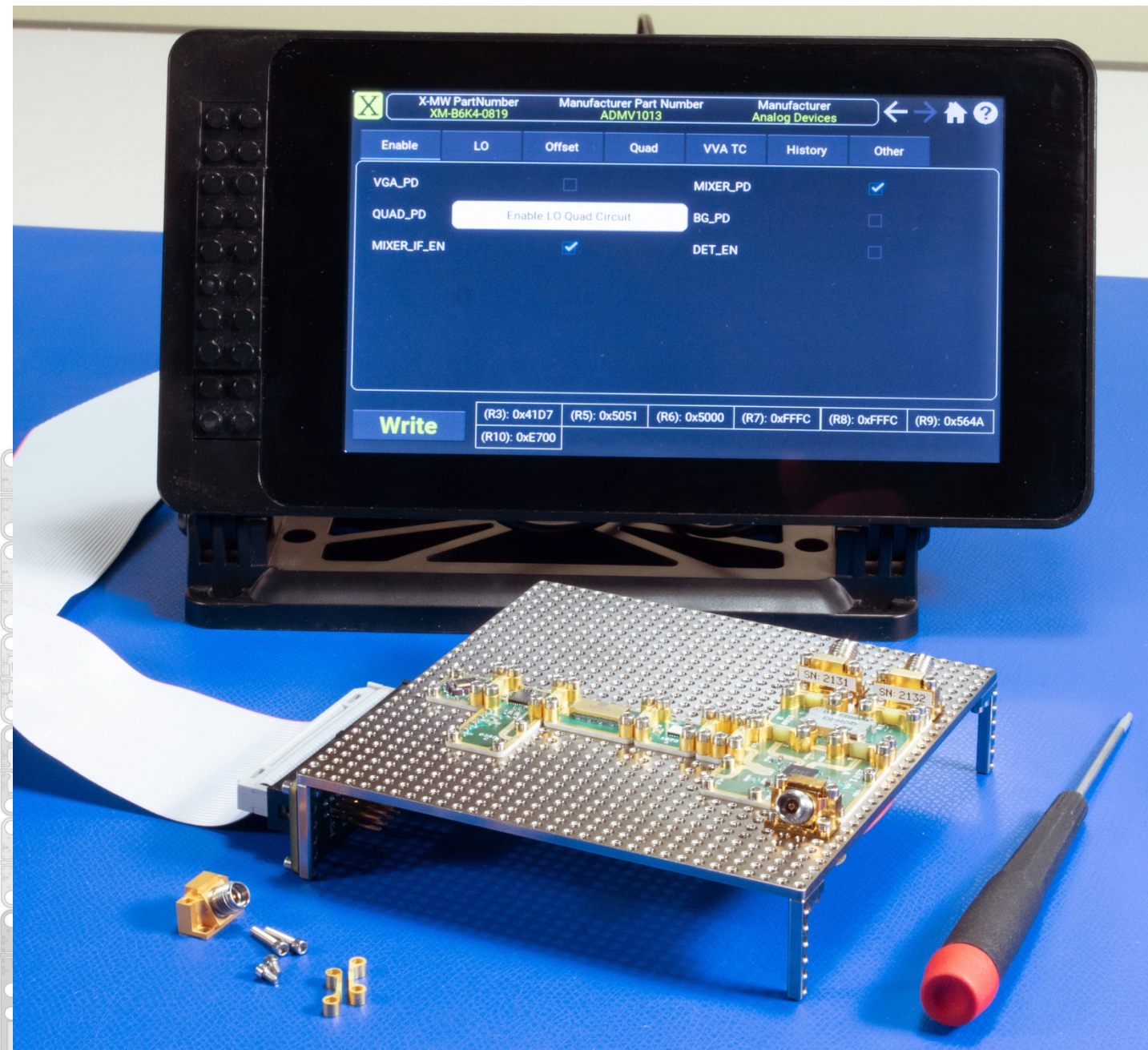
### (7) Hybrid Coupler

90 Deg Hybrid, XM-C373-0509D, Mini-Circuits QCH-63, [PCB 1300], F=2G-6G

### (8,9) LTCC Low Pass Filter

Low Pass Filter, XM-A1B8-0204D, Mini-Circuits LFCN-6000+, [PCB 30], F=3GHz

Note: PCB 1301 replaced  
With PCB 1528



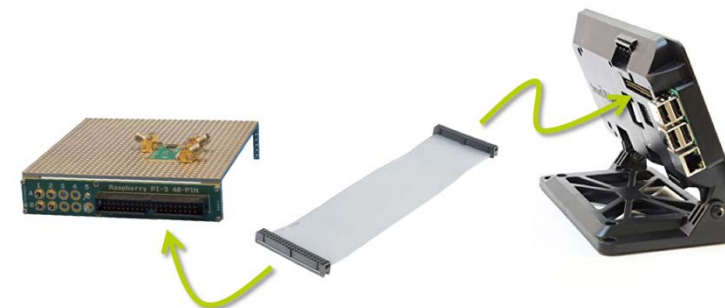
## Powering Each Prototyping Plate

(A1) +6.5 VDC      (B5) GND  
@ 1A limit

## XM-RDK-201 Control Information (X-MWcontroller)

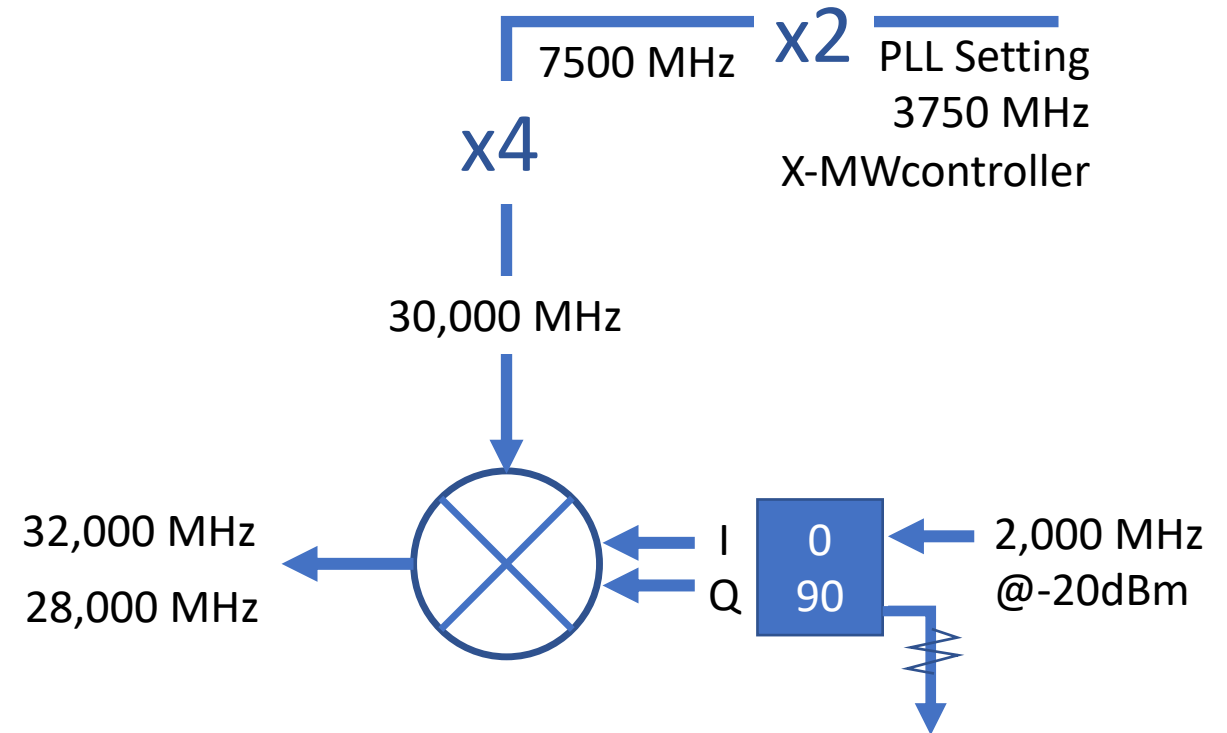
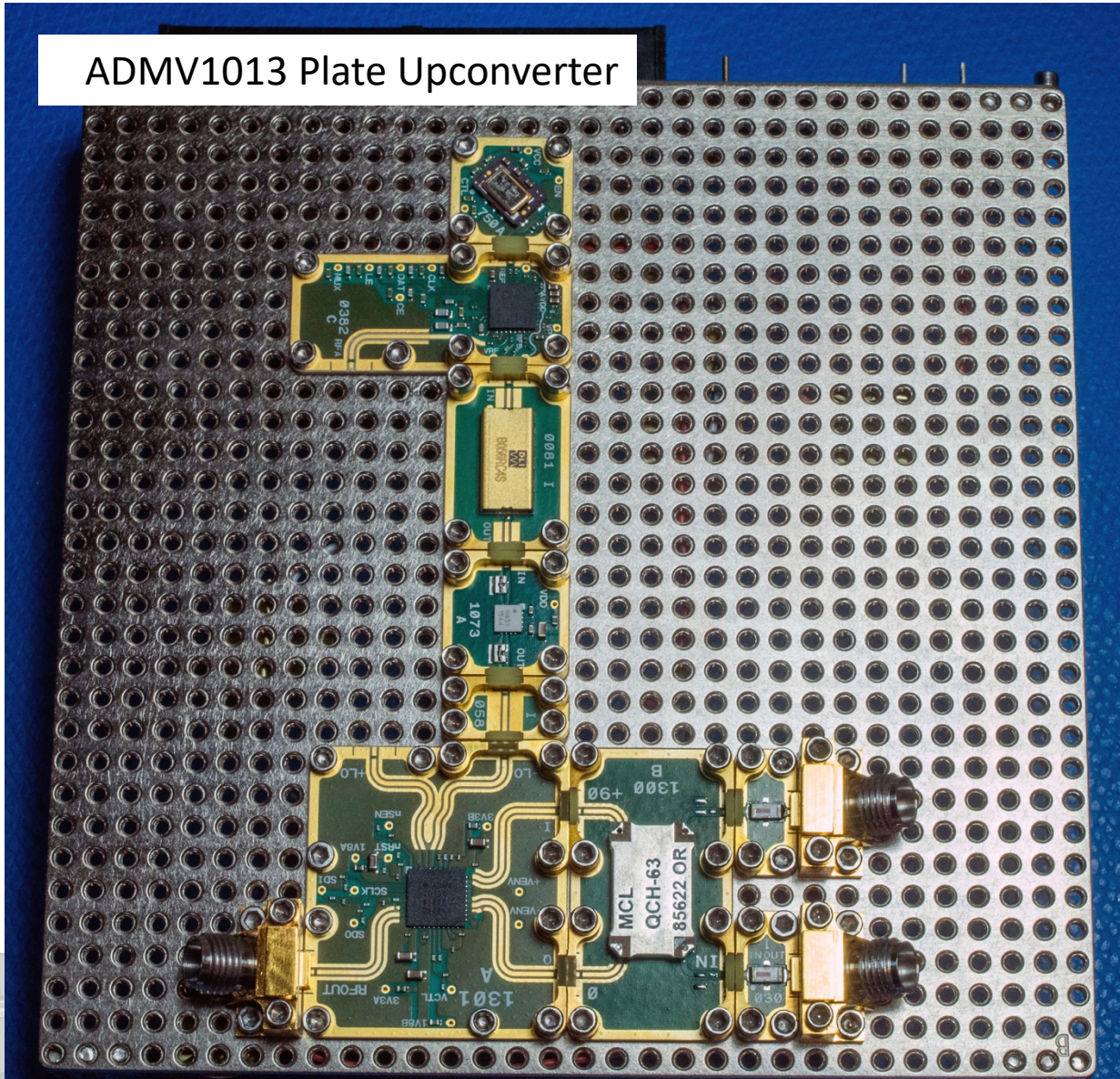
LE0 = X4M-A5Y9-009D, ADI ADF5356

LE 1 = XM-B913-0809D, ADI ADMV1013



# ADMV1013 Default Configuration

ADMV1013 Plate Upconverter



Note: New PCB 1528  
replaces PCB 1301

# XM-RDK-201 Spare Parts

- Additional parts included for signal chain customization:

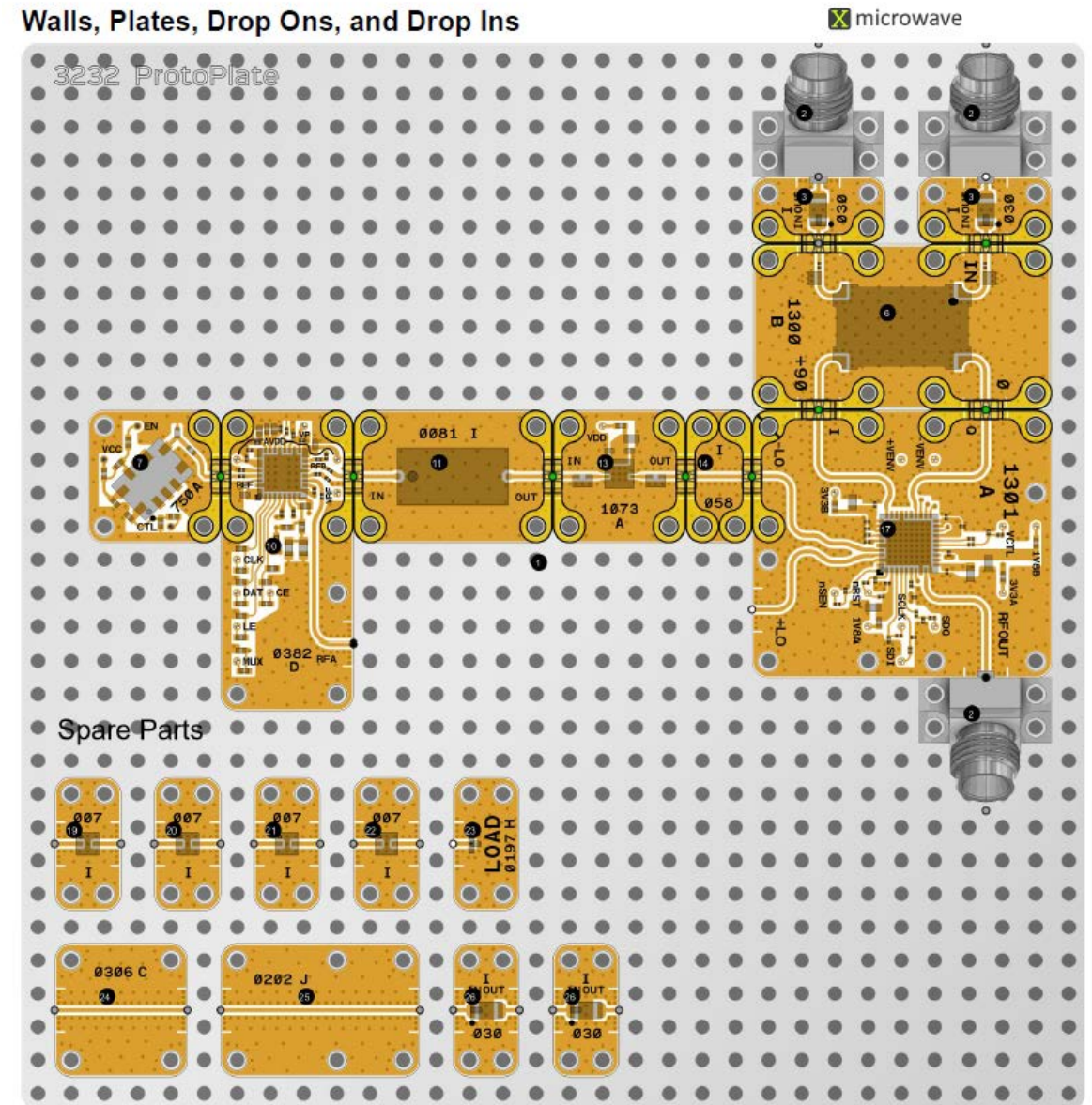
## Top Row

- 1dB Pad (Qty 1)
- 3dB Pad (Qty 1)
- 5dB Pad (Qty 1)
- 10dB Pad (Qty 1)
- 50 Ohm Load (Qty 1)

## Bottom Row

- 0404 Transmission Line (Qty 1)
- 0604 Transmission line (Qty 1)
- 3GHz LPF (Qty 2)

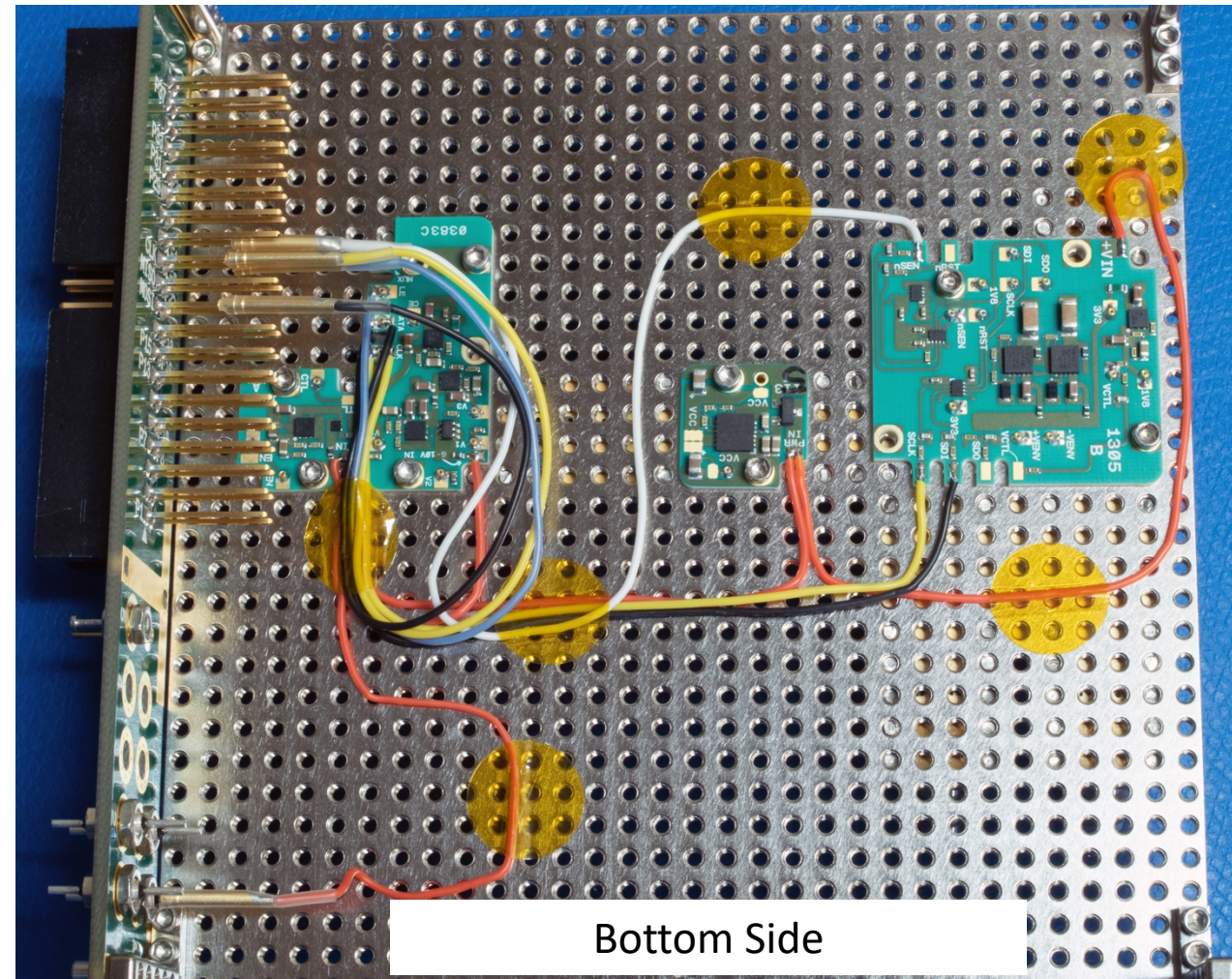
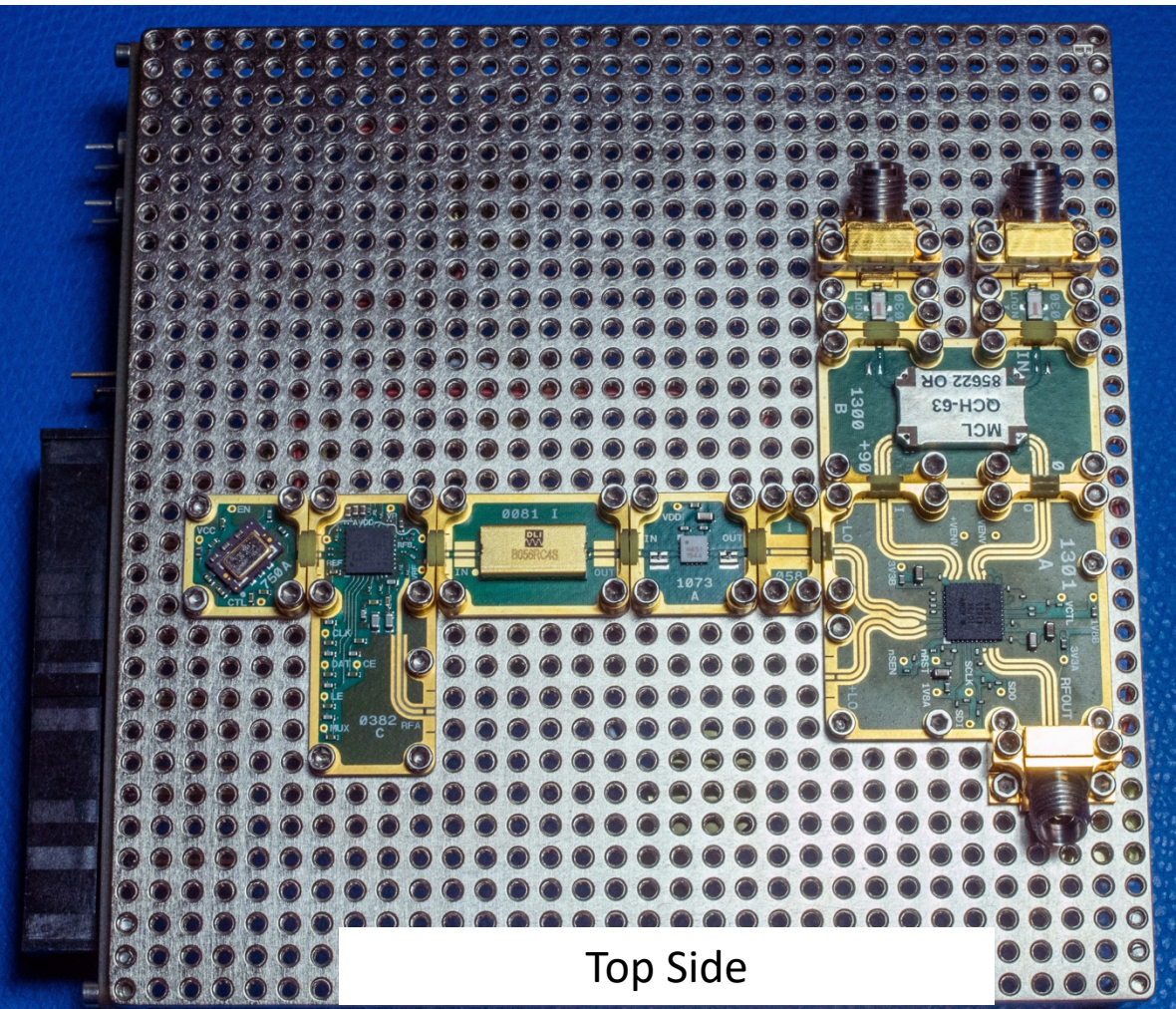
## Walls, Plates, Drop Ons, and Drop Ins



Note: New PCB 1528  
replaces PCB 1301

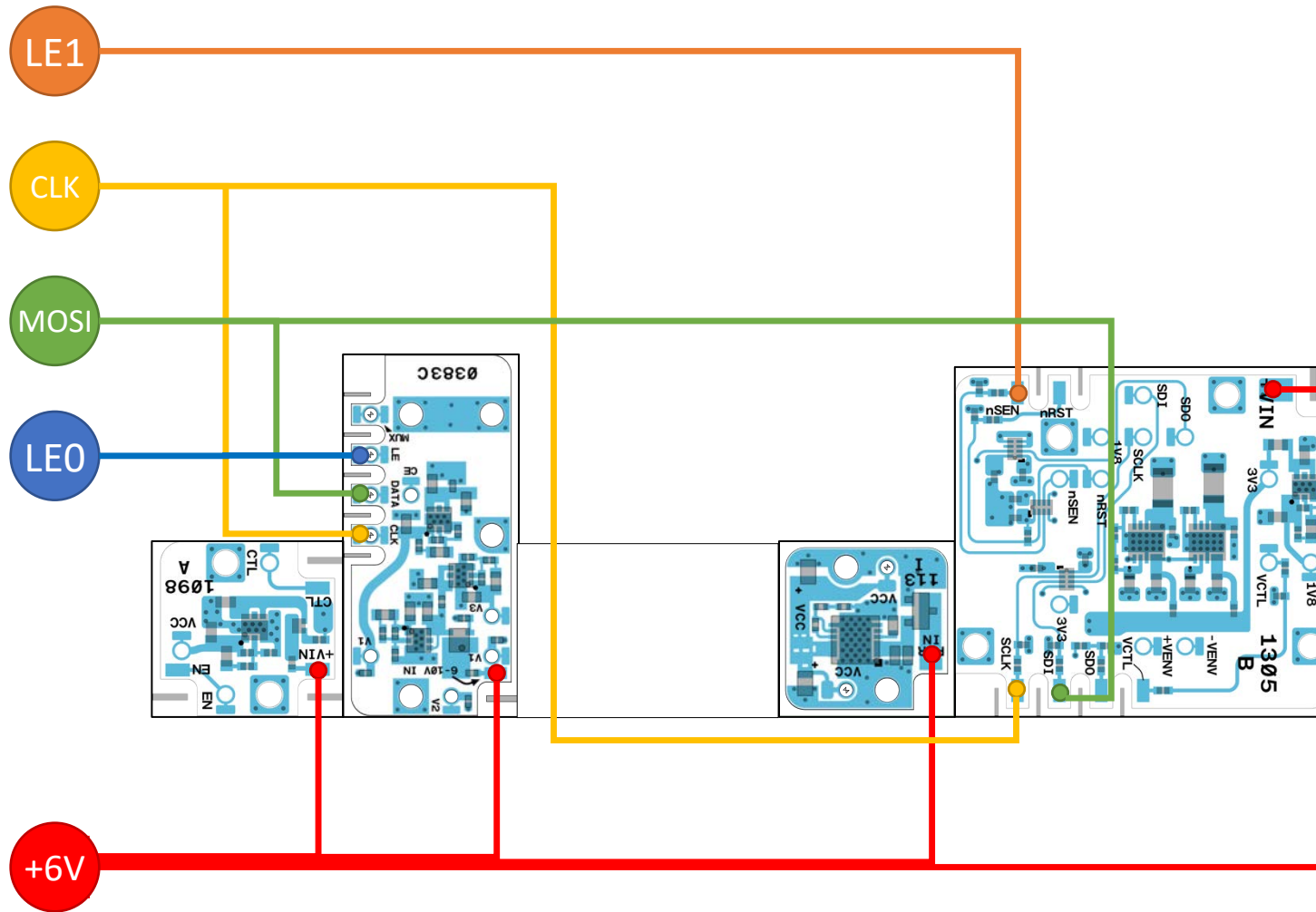


# ADMV1013 Reference Photos



Note: New PCB 1528  
replaces PCB 1301

# XM-RDK-201 Upconverter Bias and Control



The background of the slide is composed of several overlapping, semi-transparent fragments of a printed circuit board (PCB) layout. These fragments are arranged in a stepped, staircase-like pattern, with some pieces appearing to be cut out from a larger sheet. The layout details visible include various components, traces, and circular pads, all rendered in a light gray color against a white background.

# ADMV1014 Downconverter

XM-RDK-202

## ADMV1014 Plate Downconverter

# XM-RDK-202 Signal Chain

### (1) Reference Oscillator

OSC, XM-A7T7-0404D, Connor-Winfield TB522-100.0M, [PCB 750], F=100M TCXO

### (2) PLL with Integrated VCO

PLL-VCO, XM-A5Y9-0409D, ADI ADF5356 [PCB 382], F=53.125M – 13.6G

### (3) Planar Filter

Band Pass Filter, XM-A2C3-0604D, DLI B056RC4S, [PCB 81], CF=6G BW=4.6G

### (4) Amplifier

Amplifier, XM-C598-0404D, ADI HMC451LC3, [PCB 1073], F=5G-20G -4dB +19dB -7dB

### (5) Transmission Line / Placeholder

0204 Transmission Line, XM-A2M5-0204D, [PCB 58], F=DC-50 GHz

### (6) IF Downconverter

IF Downconverter, XM-B9U7-0909D, ADI ADMV1014, [PCB 1526], F=24GHz – 44GHz

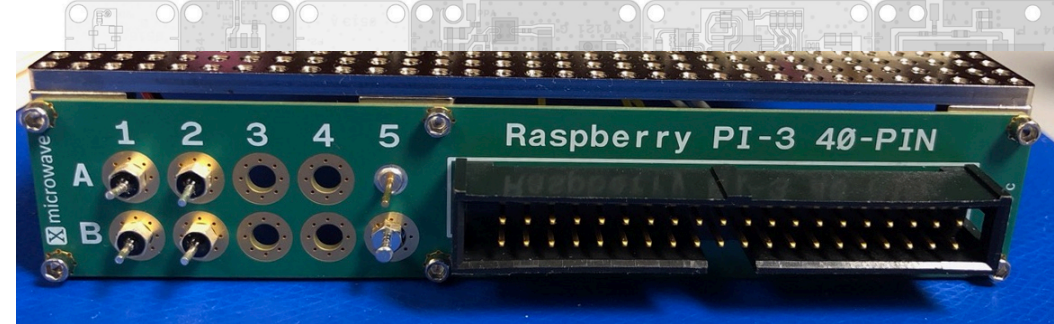
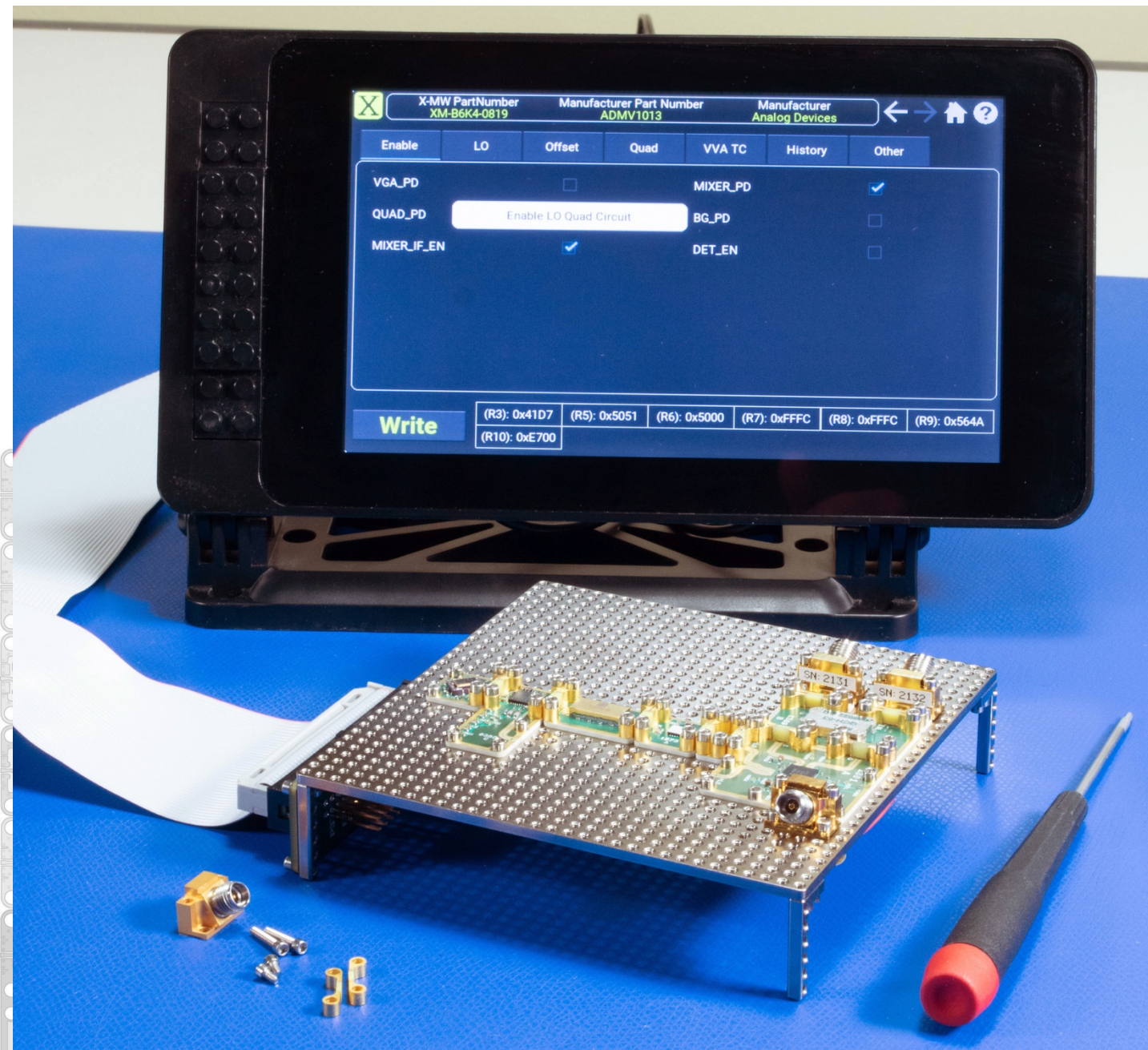
### (7) Hybrid Coupler

90 Deg Hybrid, XM-C373-0509D, Mini-Circuits QCH-63, [PCB 1300], F=2G-6G

### (8,9) LTCC Low Pass Filter

Low Pass Filter, XM-A1B8-0204D, Mini-Circuits LFCN-6000+, [PCB 30], F=3GHz

Note: New PCB 1526  
Replaces PCB 1299



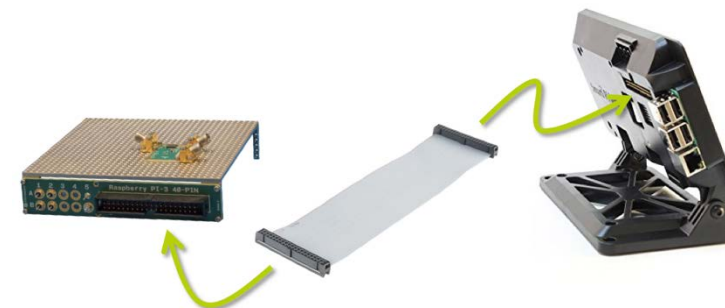
## Powering Each Prototyping Plate

(A1) +6.5 VDC      (B5) GND  
@ 1A limit

## XM-RDK-202 Control Information (X-MWcontroller)

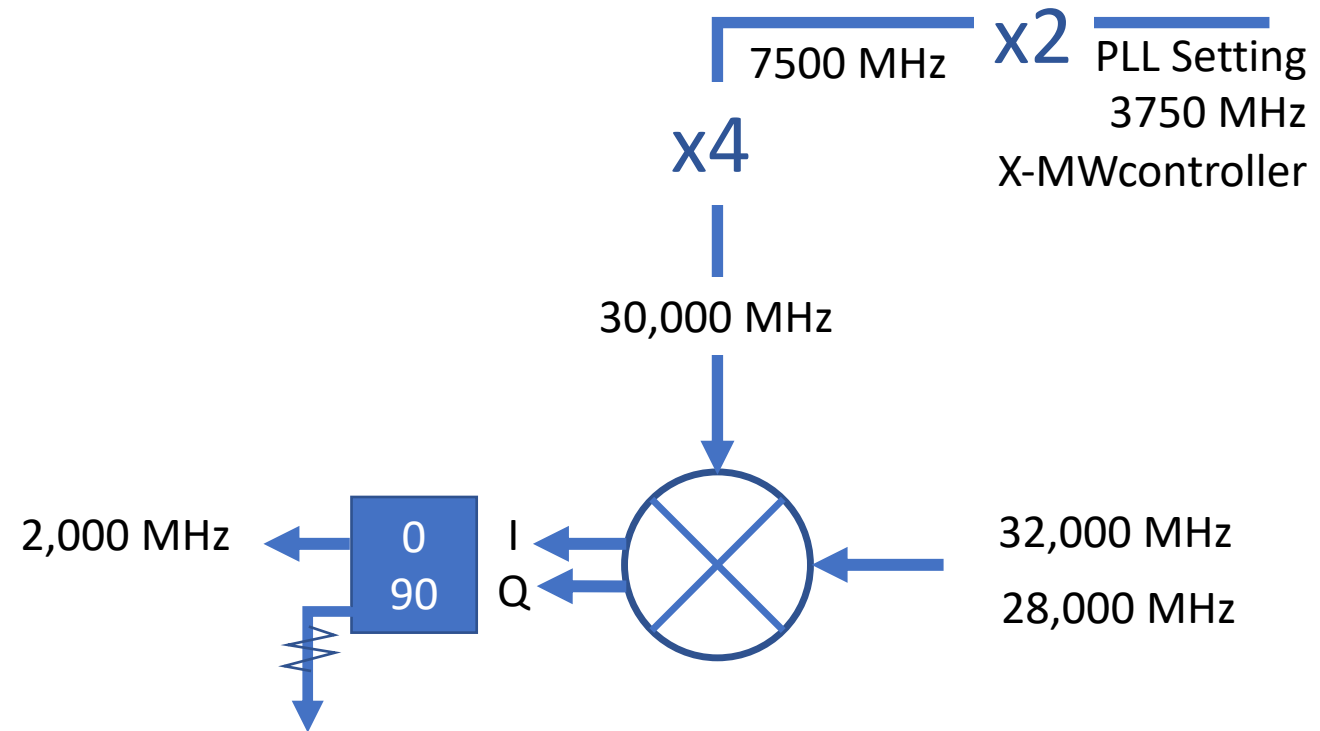
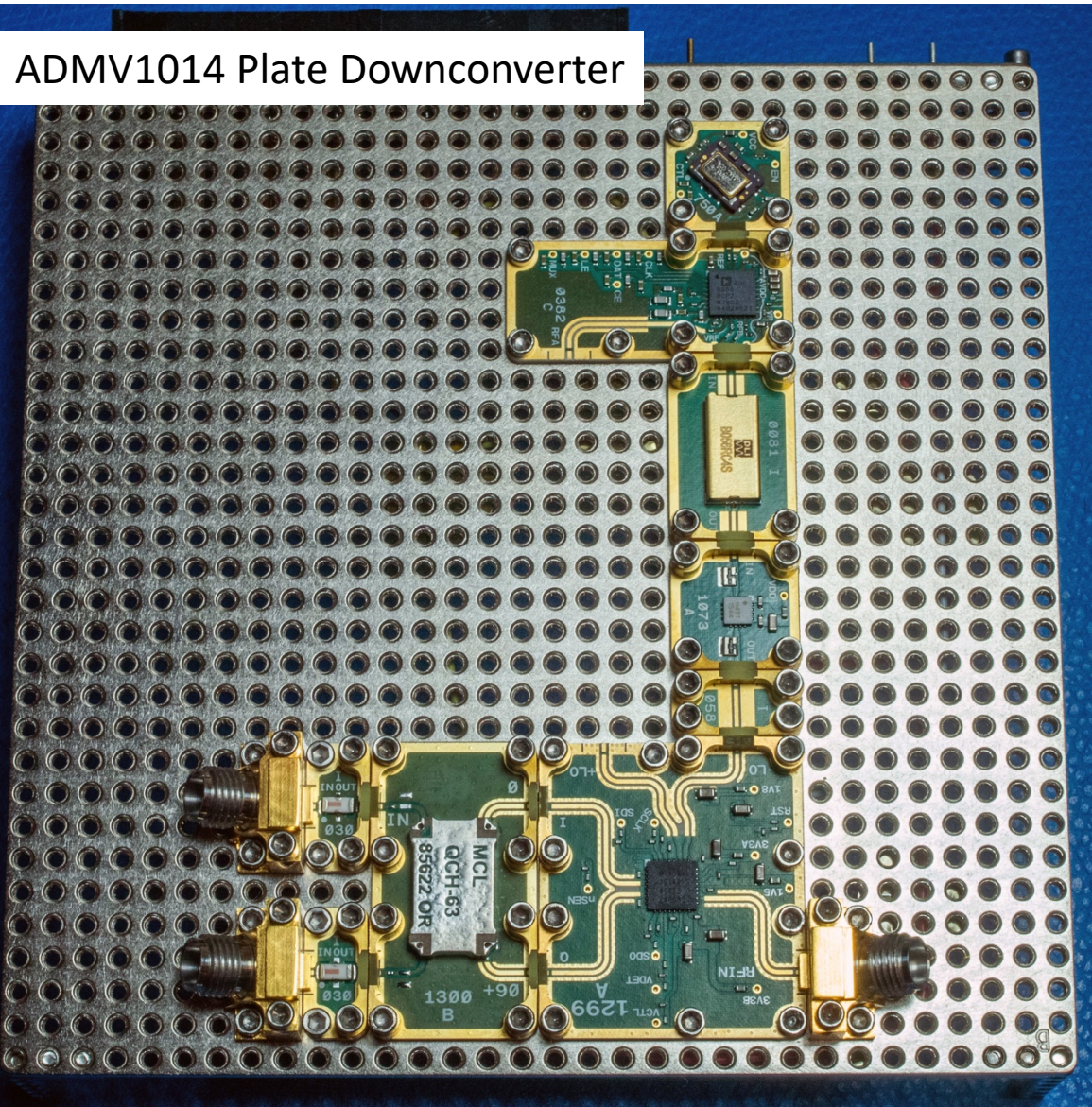
LE0 = X4M-A5Y9-009D, ADI ADF5356

LE 1 = XM-B914-0809D, ADI ADMV1014



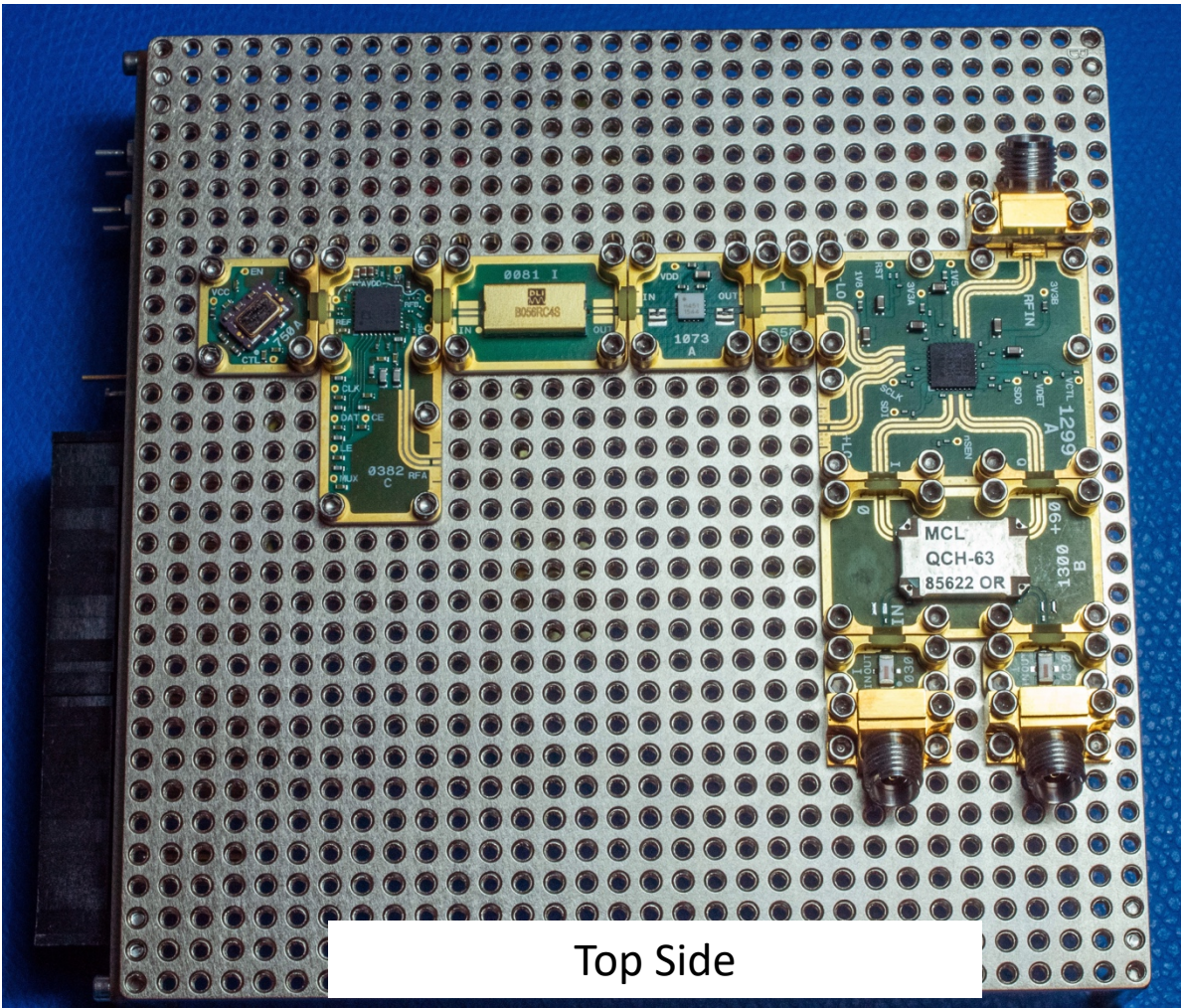
# ADMV1014 Default Configuration

ADMV1014 Plate Downconverter

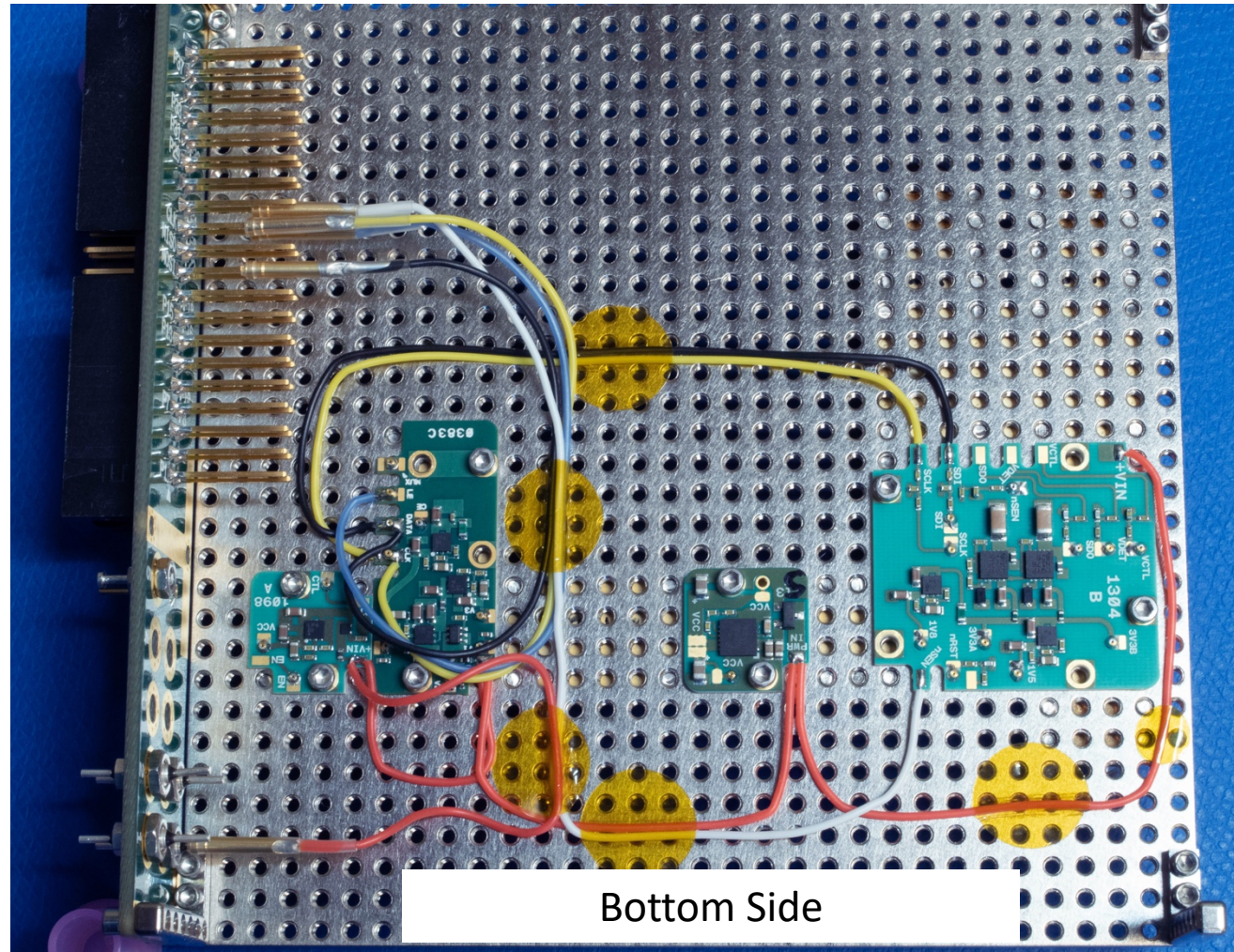


Note: New PCB 1526  
Replaces PCB 1299

# ADMV1014 Reference Photos



Top Side



Bottom Side

Note: New PCB 1526  
Replaces PCB 1299

# XM-RDK-202 Spare Parts

- Additional parts included for signal chain customization:

## Top Row

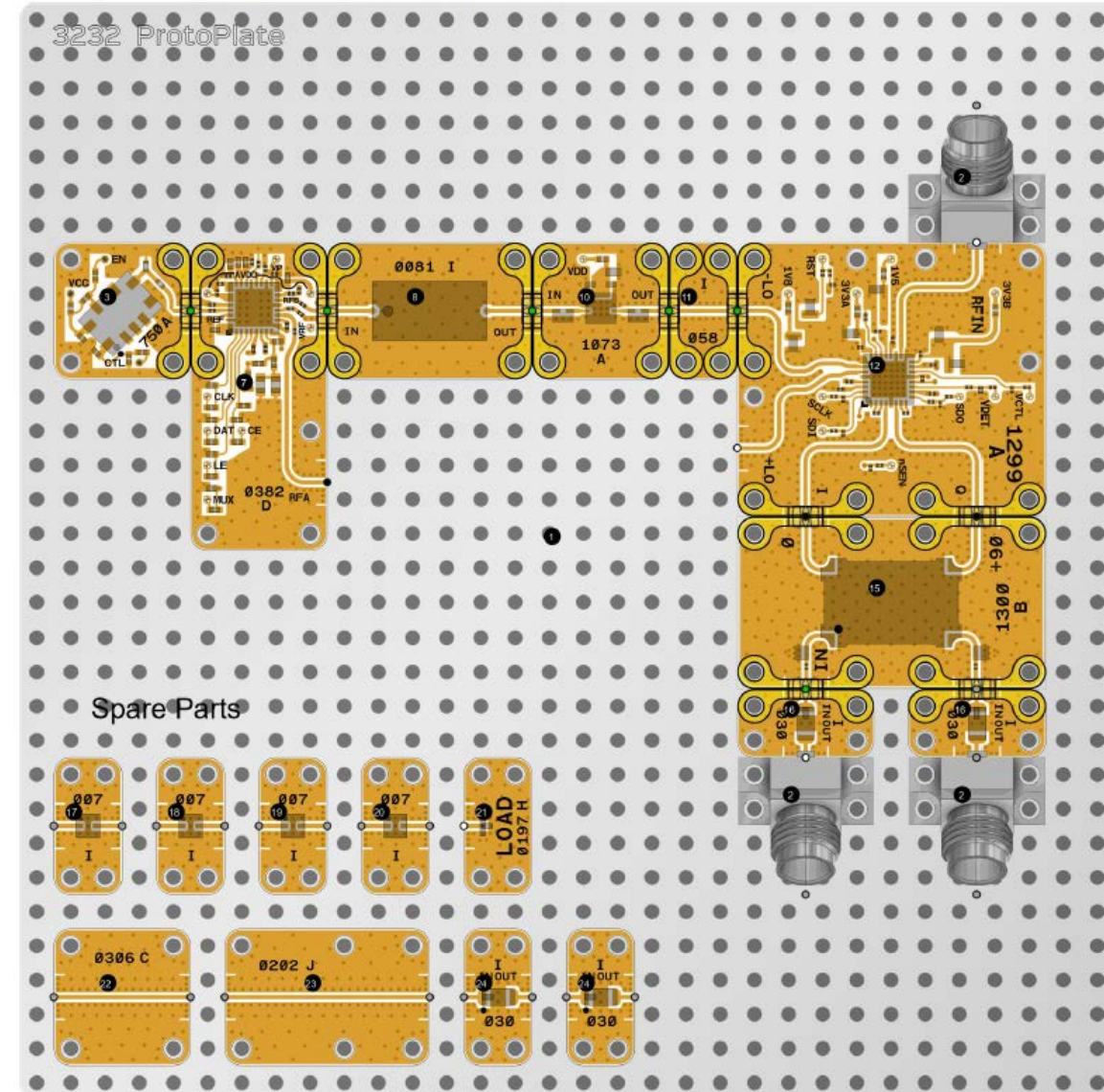
- 1dB Pad (Qty 1)
- 3dB Pad (Qty 1)
- 5dB Pad (Qty 1)
- 10dB Pad (Qty 1)
- 50 Ohm Load (Qty 1)

## Bottom Row

- 0404 Transmission Line (Qty 1)
- 0604 Transmission line (Qty 1)
- 3GHz LPF (Qty 2)

Walls, Plates, Drop Ons, and Drop Ins

X microwave

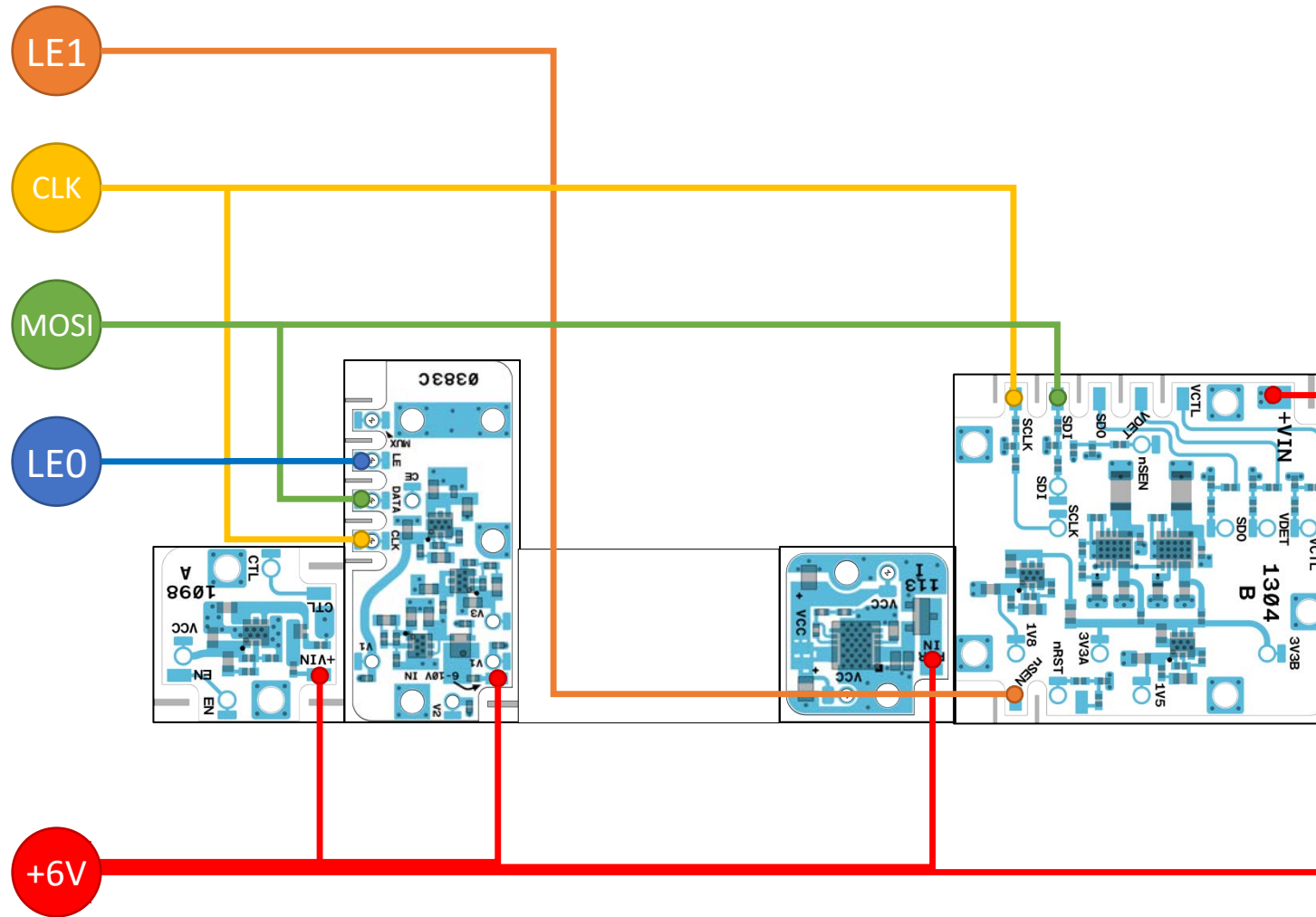


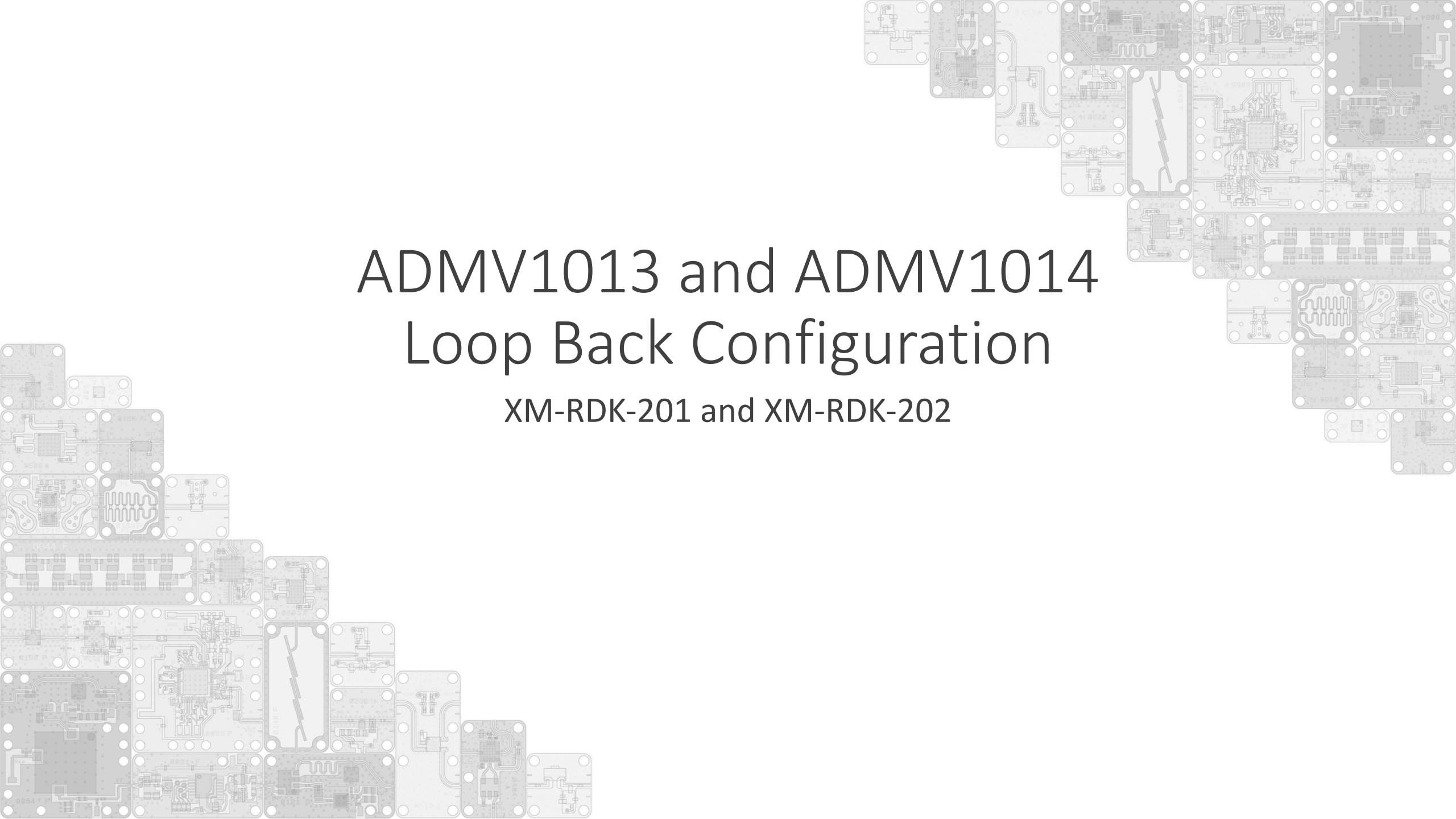
Note: New PCB 1526  
Replaces PCB 1299

X microwave



# XM-RDK-202 Downconverter Bias and Control



The background of the slide features a collage of various circuit board layouts, including PCB traces, components, and connectors, arranged in a stepped, overlapping pattern. The boards are rendered in a light gray, semi-transparent style, creating a technical and industrial aesthetic.

# ADMV1013 and ADMV1014 Loop Back Configuration

XM-RDK-201 and XM-RDK-202

# Loop Back Configuration

ADMV1014 Plate Downconverter

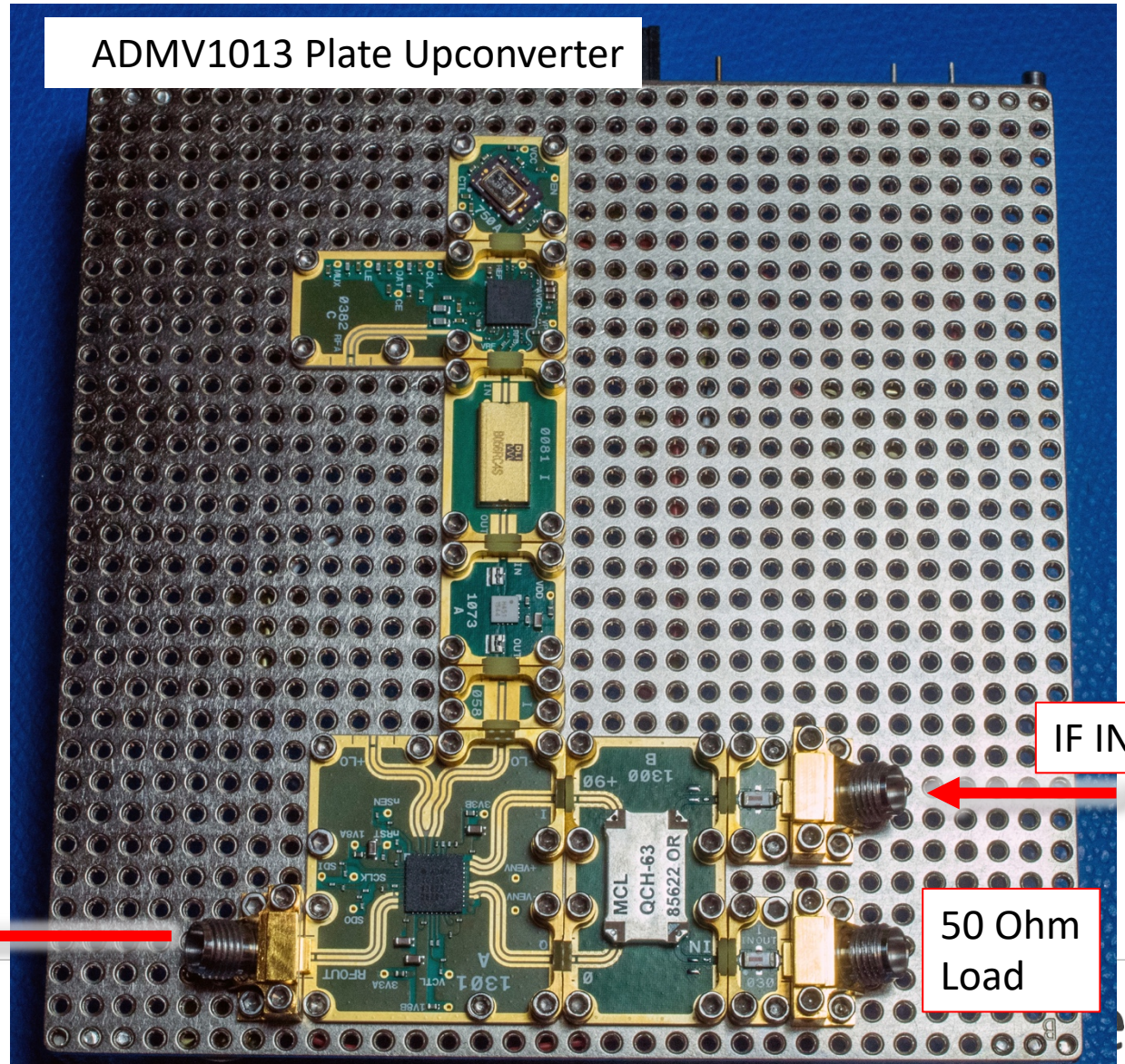
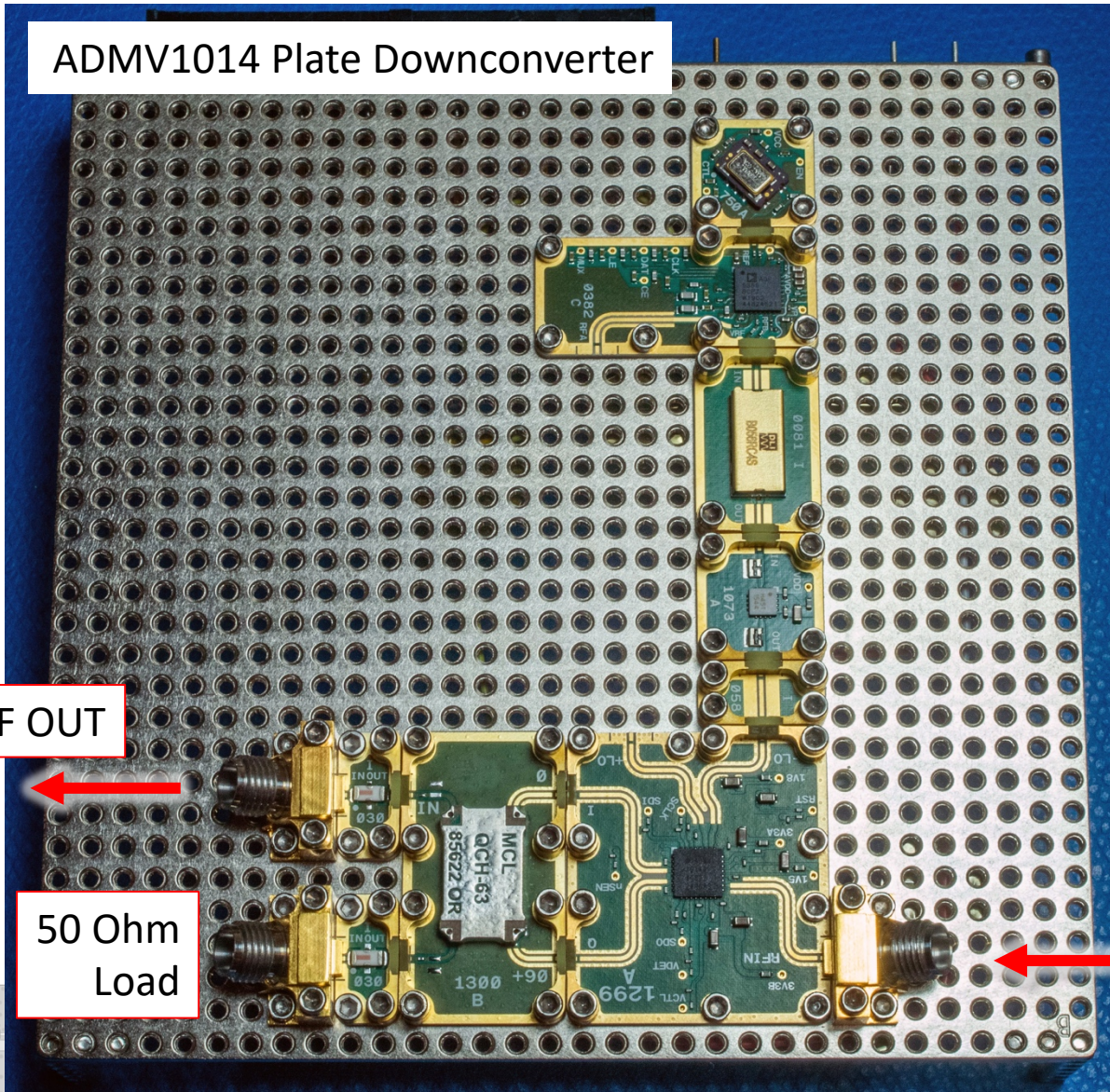
IF OUT

50 Ohm Load

ADMV1013 Plate Upconverter

IF IN

50 Ohm Load

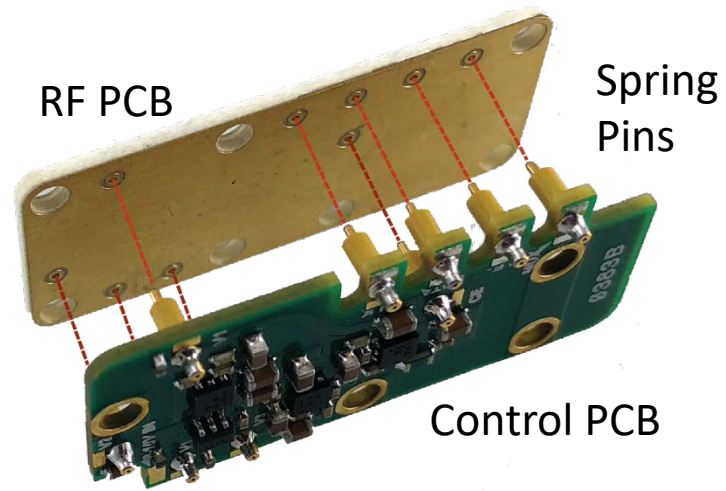


The background of the page is decorated with a pattern of light gray circuit board traces. These traces form a grid-like structure that is more densely packed in the corners and fades out towards the center. The traces include various components like pads, vias, and connecting lines, typical of a printed circuit board layout.

# Helpful Resources

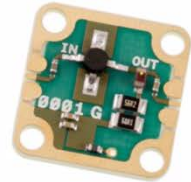
## Appendix

# X-Microwave Essentials



## X-MWsystem Vocabulary

X-MWblock  
RF



X-MWprobe



Anchor



gsg Jumper



X-MWblock  
Bias and Control



X-MWprotoplate



X-MWwall



X-MWlid



X-MWblocks  
(bottom of plate)

1-72 x 1/8"  
(0.125")



X-MWblocks (top)  
X-MWprobe (short)

1-72 x 5/32"  
(0.156")



Lid (top)

1-72 x 3/16"  
(0.187")



X-MWanchor  
Pinbridge

1-72 x 1/4"  
(0.25")



X-MWProbe (tall)  
X-MWwall (short)

1-72 x 3/8"  
(0.375")



X-MWwall (tall)

1-72 x 1/2"  
(0.5")

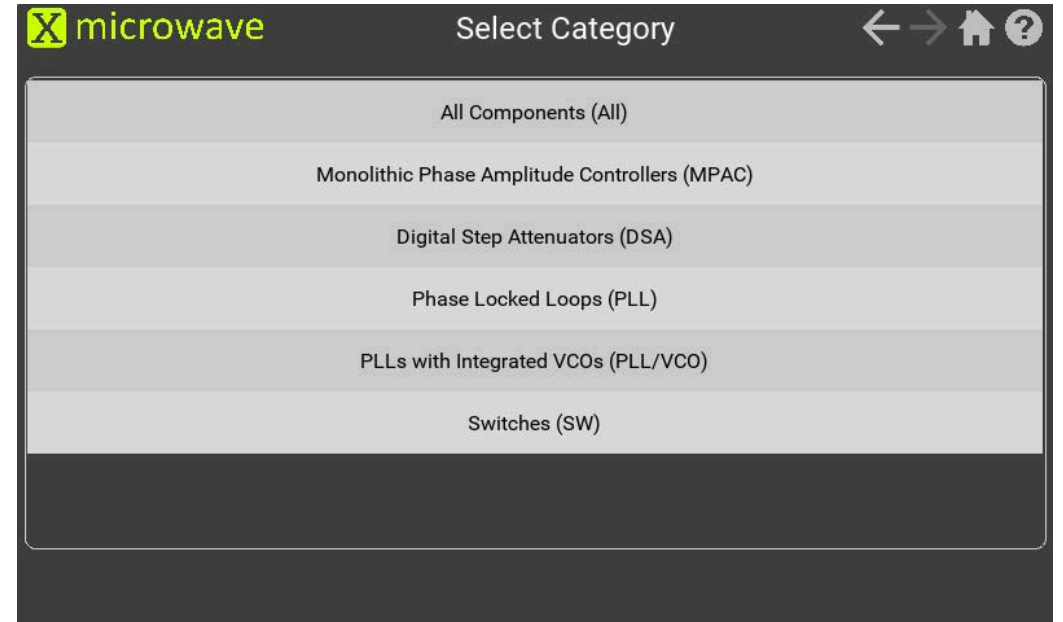


X-MWwall  
Edge with Lid

1-72 x 5/8"  
(0.625")



# X-Microwave Controller



- One-touch config for all manufacturers' parts
- Plug and play operation
- Supports for Serial (SPI) and parallel control
- Control over TCP with Python or LabVIEW

Learn more: <https://xmwcontroller.xmicrowave.com/>