SAND2021-7524PE

# SANDIA TALKS

# HOW TO “PHOTOCOPY” A PRINTED CIRCUIT BOARD

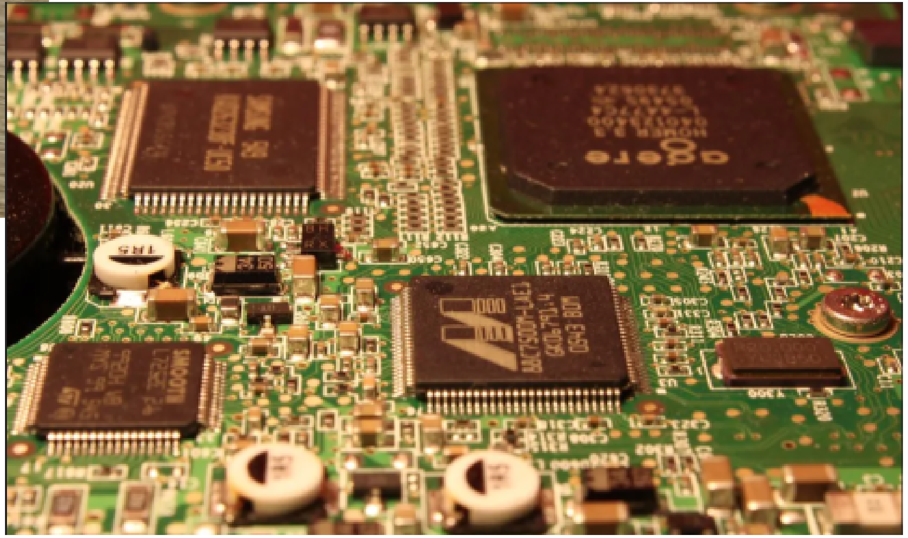
*Eric Sorte, 5964*

# WHAT’S THE PROBLEM?

# HOW AND WHY TO COPY

2D printing

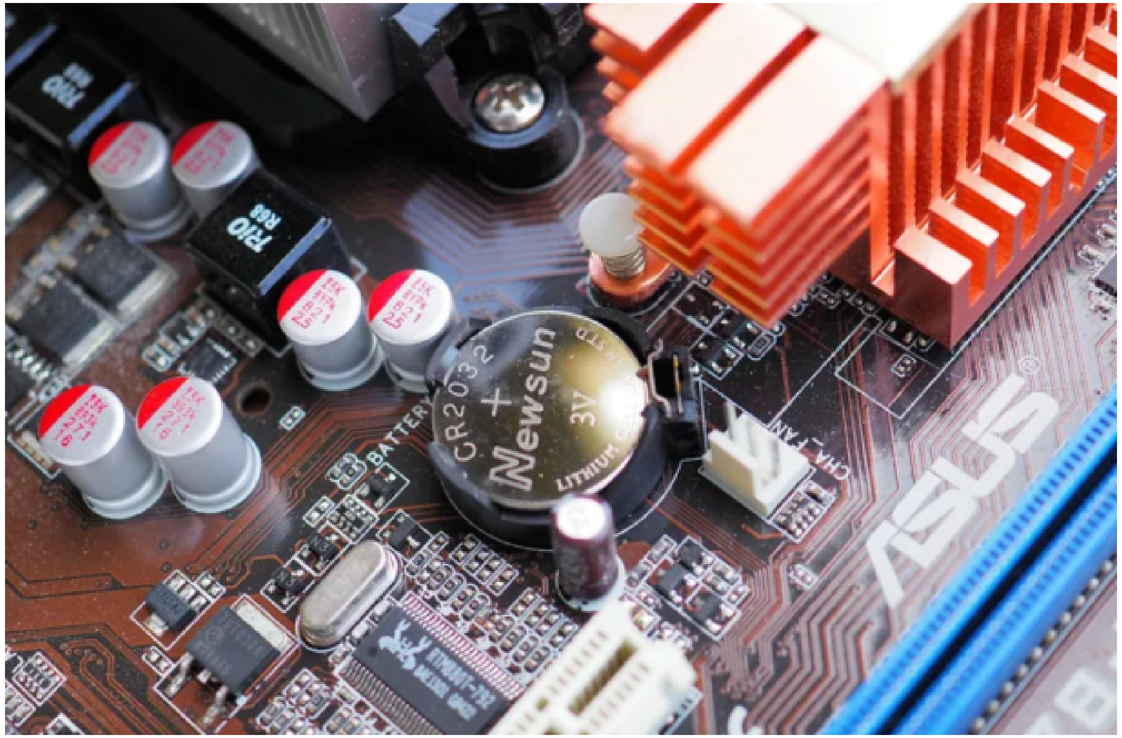
3D printing functional devices



Circuit board?

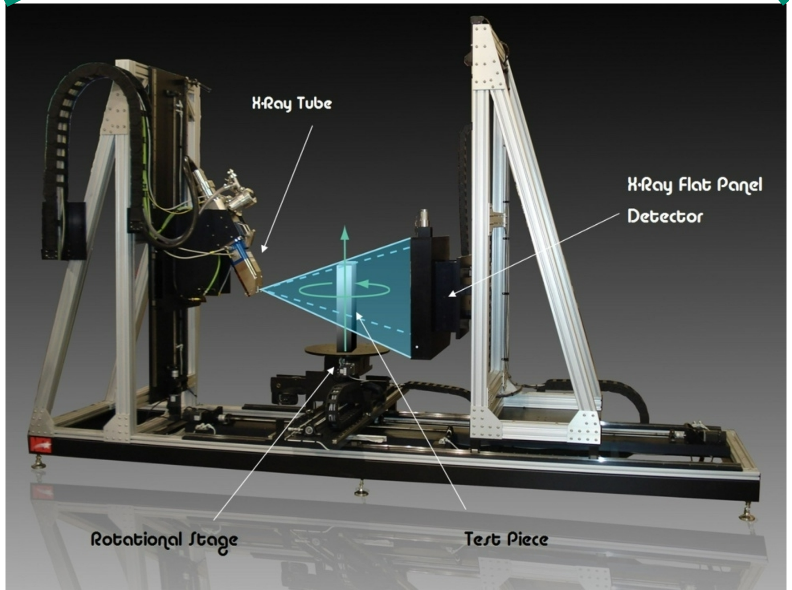
# XRAY/CT

Bag of water with some bones



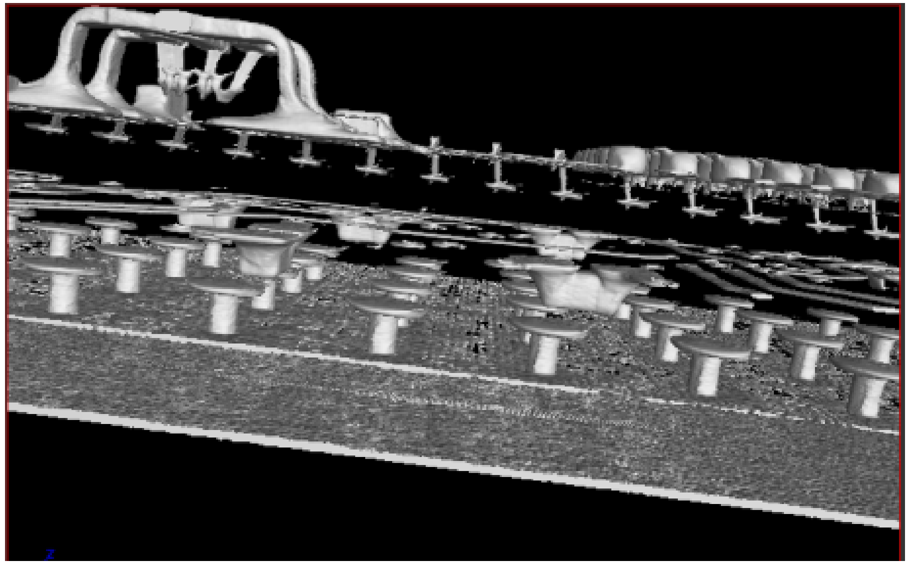
Lots of metal
Multiple heterogeneous materials
Multiple important layers
Very small features (50 microns)

# INDUSTRIAL XRAY SYSTEM



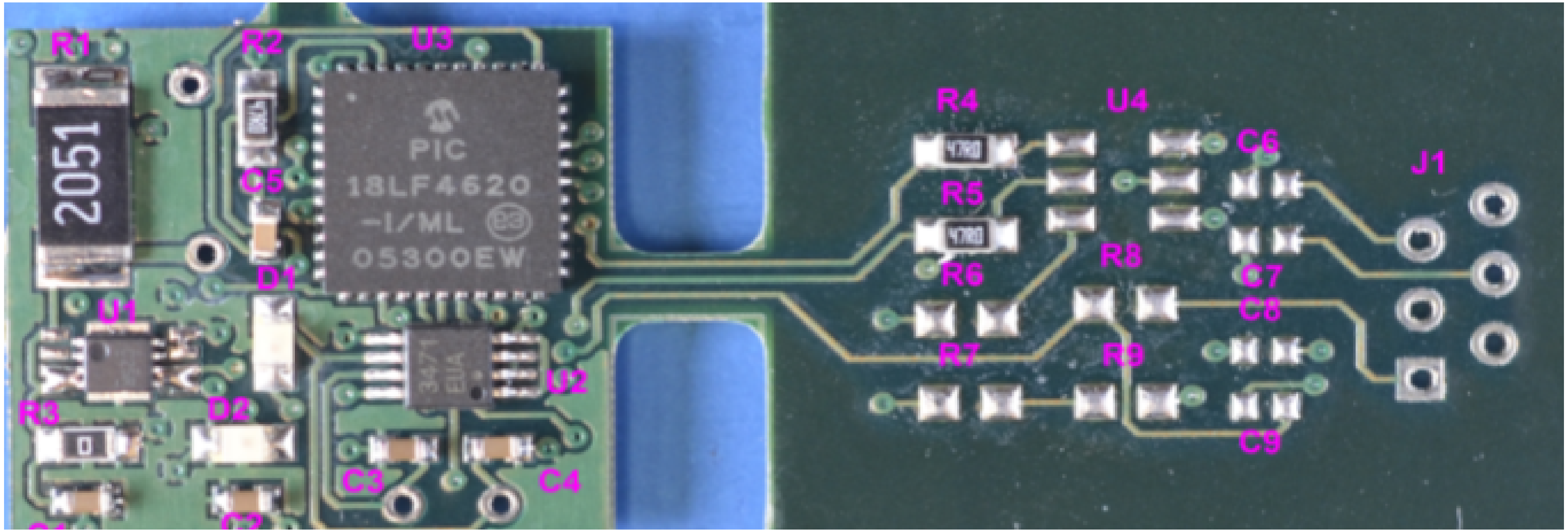
2D Xray

3D CT



# CAPABILITY PROCESS

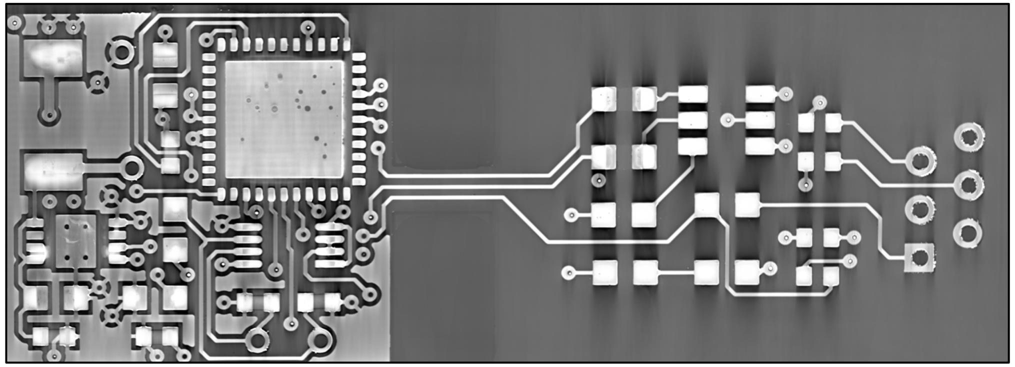
Original



# CAPABILITY PROCESS

## X-ray

Layer 1



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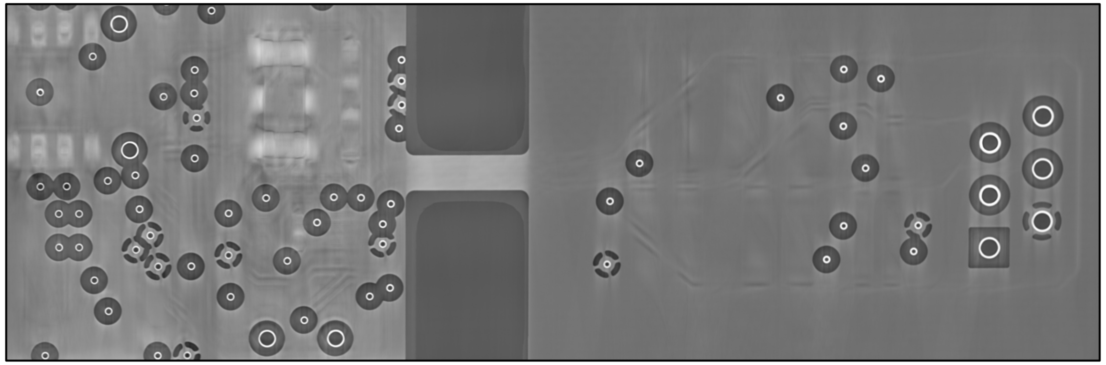

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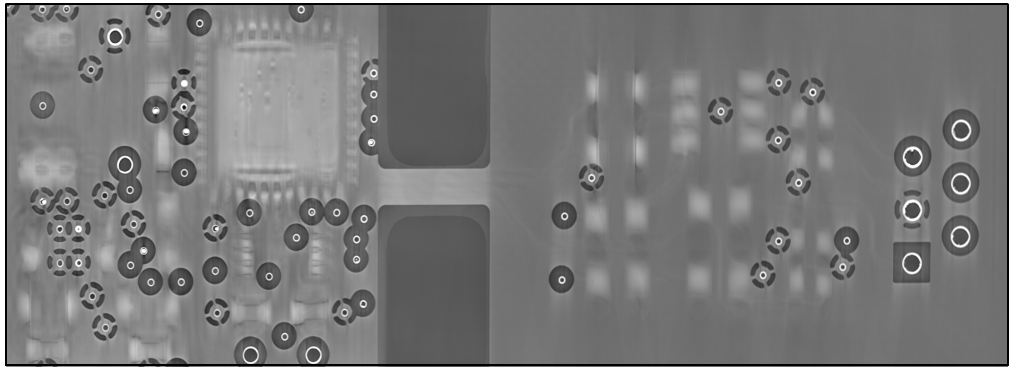

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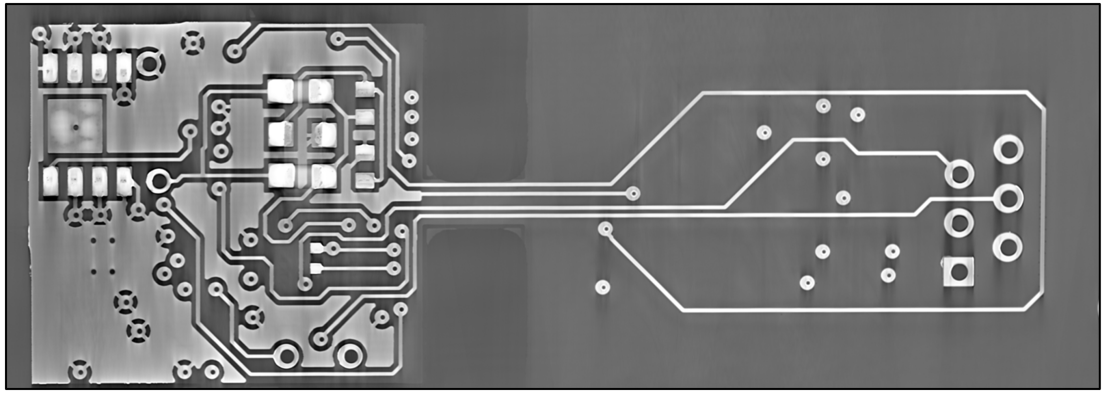
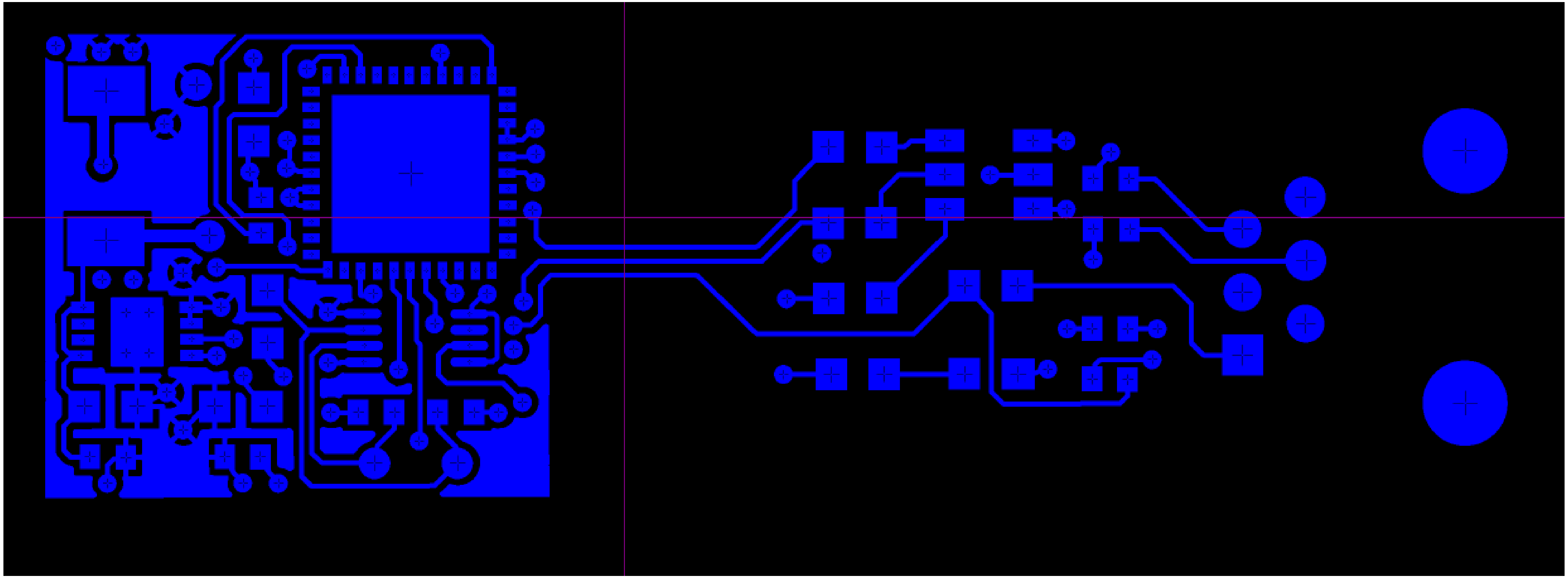


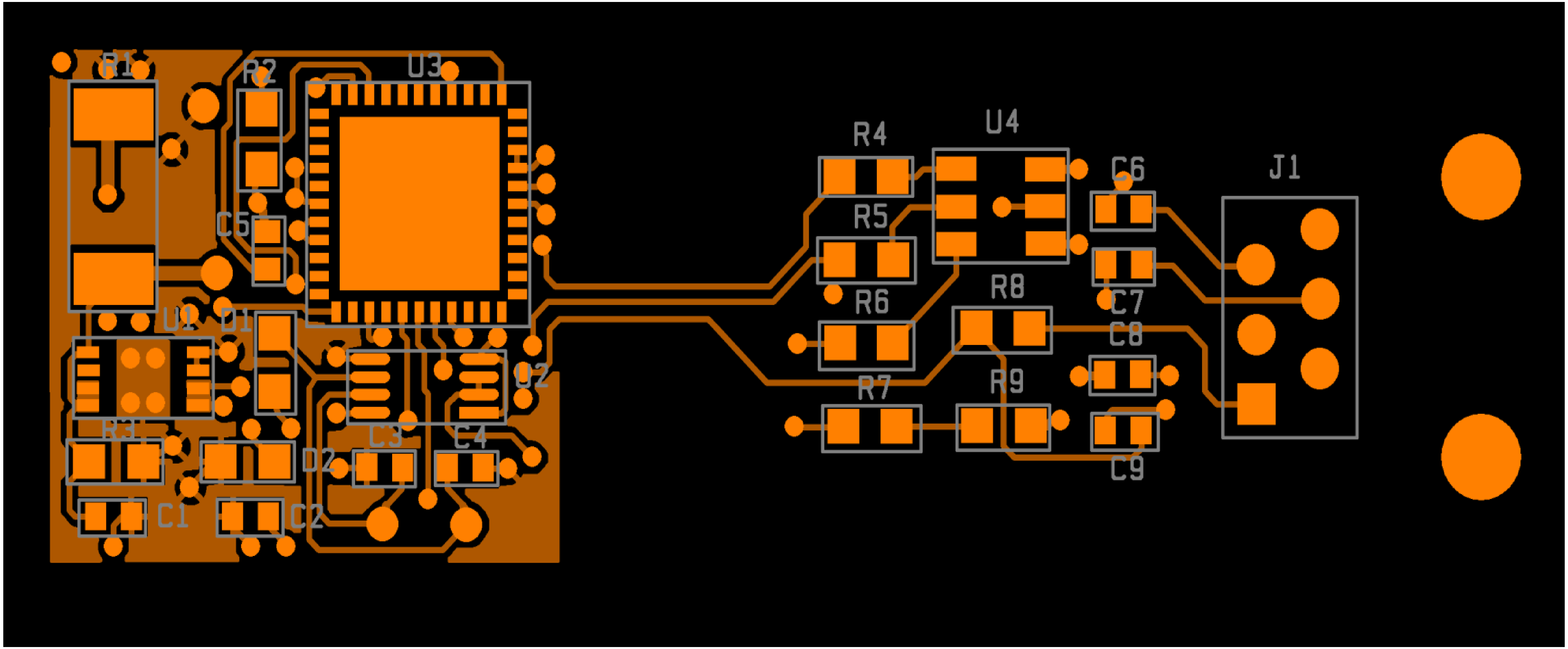
# CAPABILITY PROCESS

## Binary



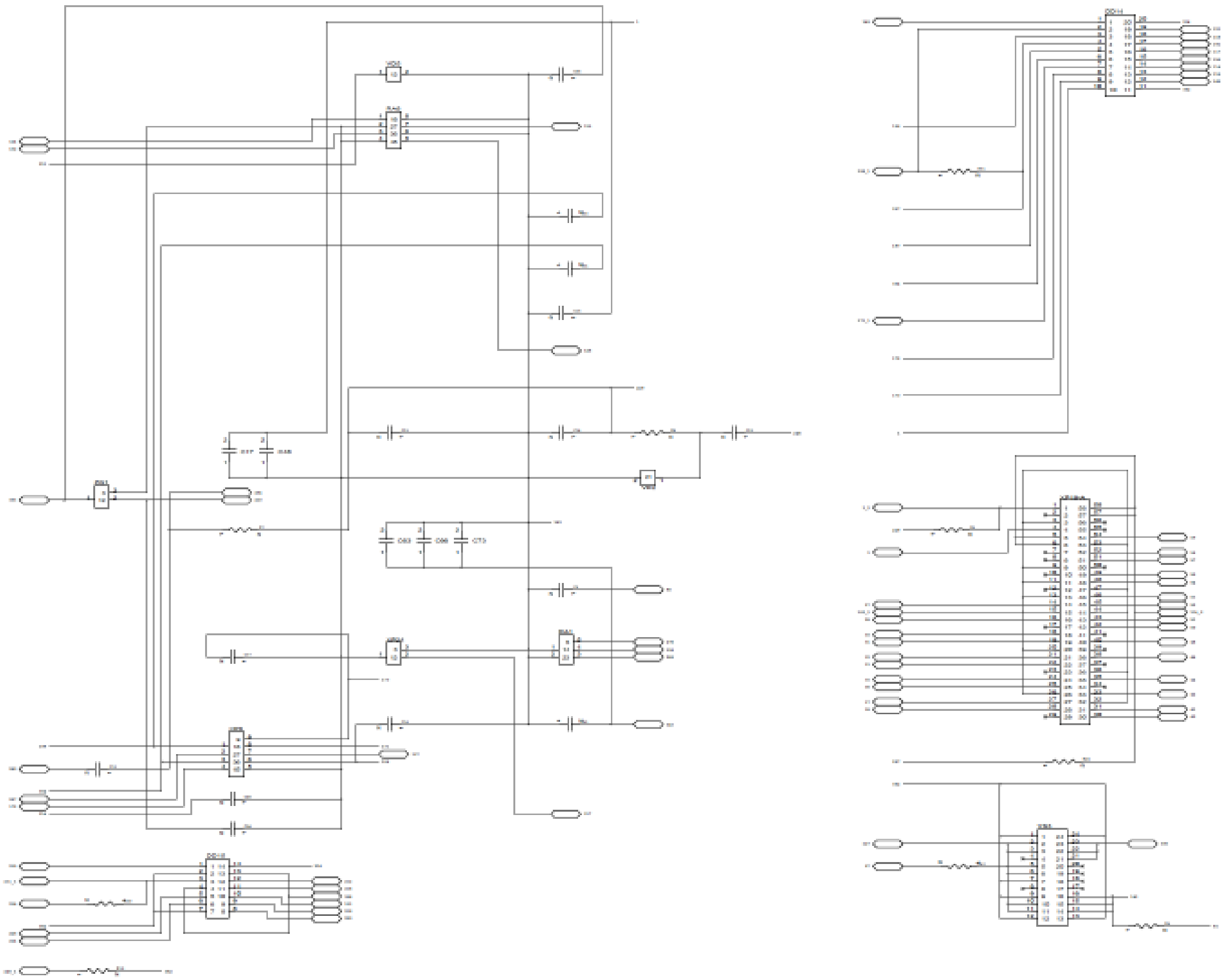
# CAPABILITY PROCESS

## Design Files

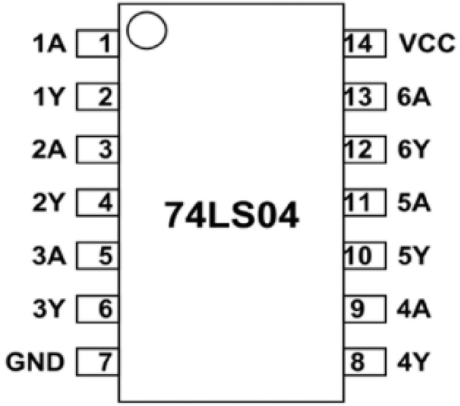


# CAPABILITY PROCESS

## Schematic

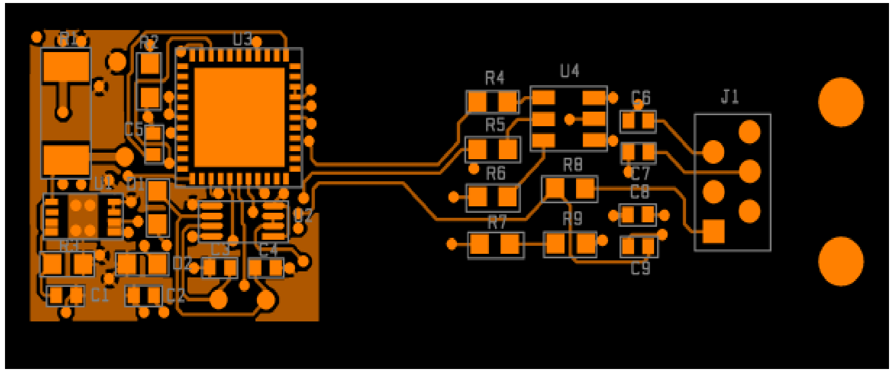


## Bill of Materials

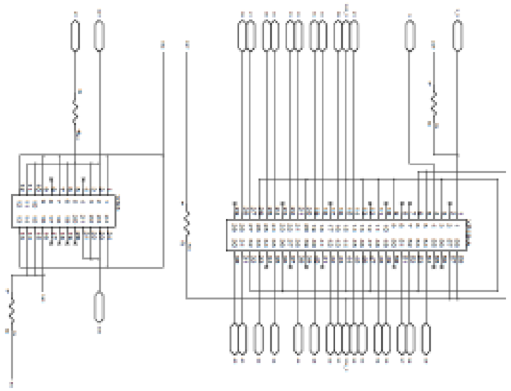


# CAPABILITY PROCESS

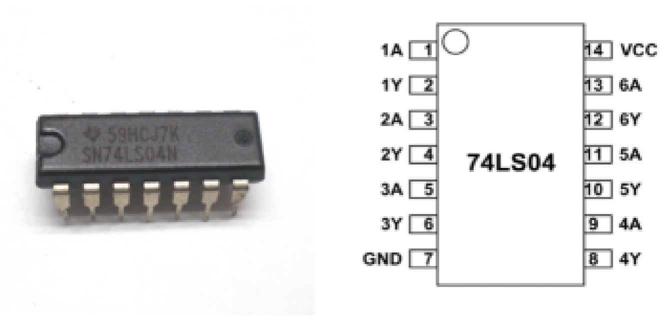
Design Files



Schematic



Bill of Materials



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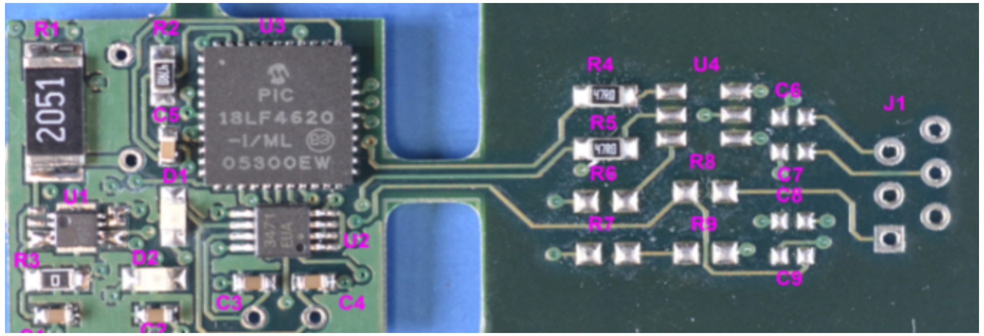
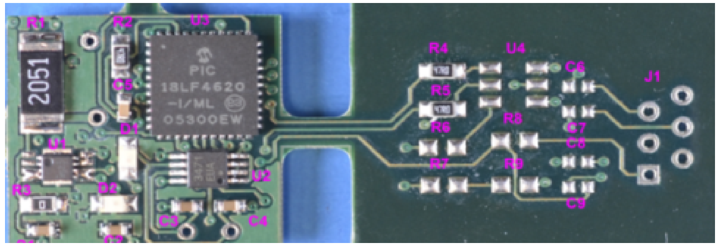
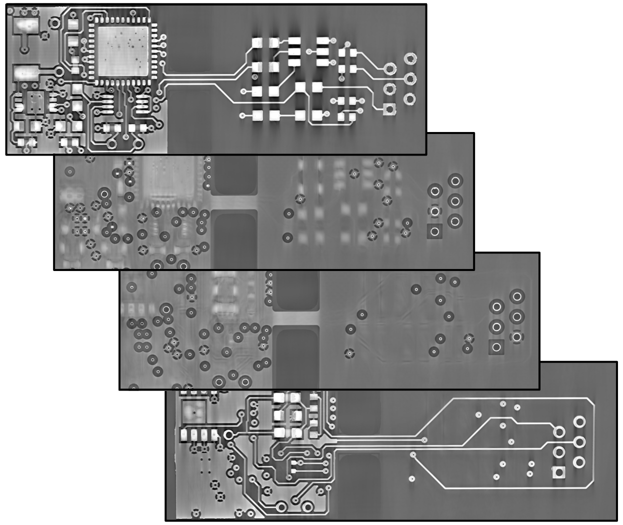


# CAPABILITY PROCESS

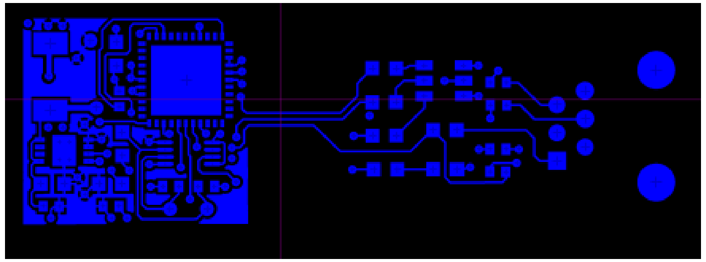
Original



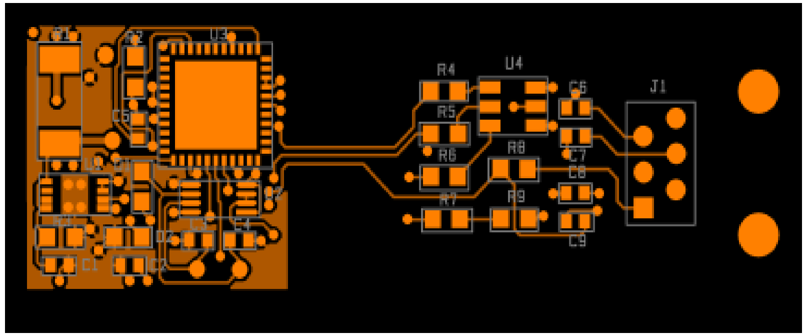
X-ray



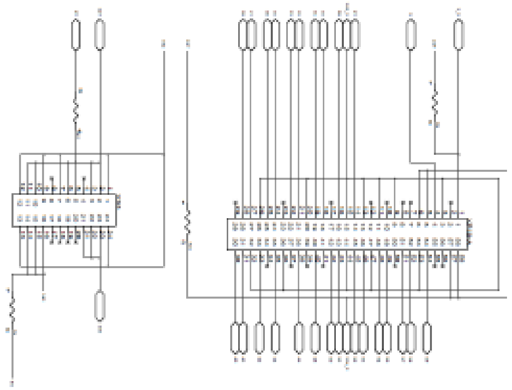
Binary



Design Files



Schematic/Bill of Materials



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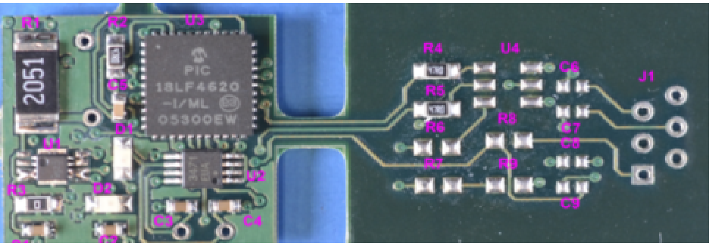

# SANDIA TALKS

THANK
YOU