# T. J. Rodgers RLE Laboratory

Video Index for Forum 2023.09.29

**Nano Dimension**

0:30 Intro to Nano Dimension and **Justin Mattern**

1:45 Nano Dimension is in Waltham

3:30 Intro to **Ryan Bahr**, background in inkjet-printed mmWave electronics

5:25 Review of 3D printed PCB samples on the table

9:05 The **DragonFLy IV** 3D PCB printer

12:55 3D PCB comparison to traditional PCB

15:55 Benefits of 3D structures in a PCB

16:40 How do you CAD 3D PCBs?

20:25 More description of the example parts they brought

21:35 Hand soldering is typical, reflow must be done with low-temp solder process

23:50 **RF properties** of DragonFly PCBs

26:55 Notes on cryogenic PCBs and 3D for interesting packaging

32:10 Surface finishes

32:30 Polishing for use as interposer, etc

35:25 IPC standards for AME circuit boards

39.30 **Admatec Ceramic and metal 3D milliprinting**

10-200 micron layers depending on material, 25 um lateral resolution

43:35 Printing is one layer of slurry at a time.

44:10 What is the sintering time/process/equipment?

45:55 What is the purity of the material after sintering?

47:25 Do fine features warp during debinding and/or sintering?

48:15 Can you co-print ceramic and metal?

50:20 **Fabrica 3D plastic microprinting** 1 um layers and 2 um lateral

55:45 Process for trying things out on the machines