

The second secon

Richard Hammerl – Community Manager Fusion 360

Richard is a Mechanical Engineer with over 20 years' experience in the design of electronics components. As one of the earliest experts of the now-standard EAGLE PCB design software, Richard provided technical support and documentation in direct contact with customers and board manufacturers – making him one of the most well-known faces in the PCB industry in Europe and helping to grow the popularity of EAGLE to make it the most highly used PCB software worldwide.

His experience and expertise has driven him to integrate PCB design into mechanical CAD – EAGLE is now part of Fusion 360 - providing PCB designers and mechanical engineers with better functionality, less errors, and shorter lead times – which helps his customers to remain competitive in worldwide markets and increasing profit margins for anyone creating assemblies with integrated electronics.

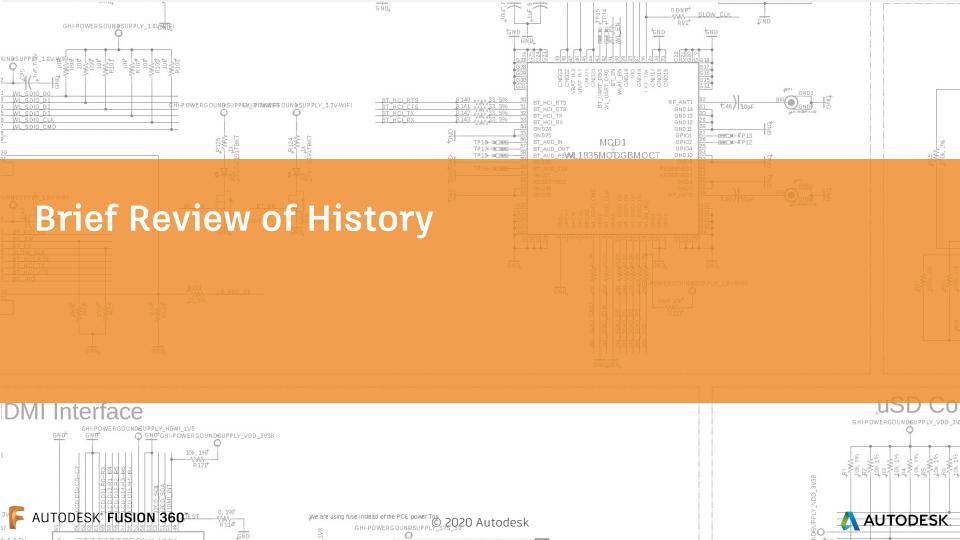


Agenda

- Short Review History of EAGLE
- Electronics in General
- Fusion Electronics Why?
- Brief Overview of Fusion Electronics
- Fusion Electronics –Specs
- Live with Fusion Electronics
- Q\$A







CadSoft EAGLE - Autodesk EAGLE -**Fusion Electronics**



CadSoft Computer



EAGLE - Easily Applicable Graphical Layout Editor

est. 1988

2009-2016 part of Premier Farnell







Autodesk EAGLE V8.0 2016



Fusion 360 Electronics 2020



Autodesk EAGLE

V 8.6 V 9.2 V 9.4 V 8.0 V 8.2 V 8.4 V 9.0 Managed Libraries SPICE Design Manager for Digital and Mixed Mode **Object Inspector** Design Block Simulation Manufacturing Flyout Design Blocks **Board Inspection SPICE Simulation** Selection filter Editor Live Design One-click **BGA Fanout FANOUT** for parts/signals Quick Connect for ROUTEDIFF Place Design Block Rule Check Manufacturing Pin Snapping net/bus breakouts STEP export ROUTEMULTI in SCH and BRD Board Flip View **GERBER X2 & DXF** Routing Seament **New BUS Creation PAINTROLLER** EDIT3D, CUSTOM3D with mouse click Live Preview export Undo Quick Route **PATTERN** commands Layers Revised CAM **Snap Indicator Smooth Signal** Pin/Pad/SMD array CAM Processor: **Command Line** Processor Loop Removal RIPUP w/ clever options Reposition: smashed by Assembly output, Autocomplete Enhanced Libraries Slice SMASH -> Reposition default Copy objects into **Export ULP** Attributes Improved DRC window library MAY **AUG** JAN MAR AUG OCT DEC JAN MAR **APR** JUN SEP JAN MAY 2017 2019 2018 V 8.1 V 8.3 V 8.5 V 8.7 V 9.1 V 9.3 V 9.5 **Manual Proxy** Package Settinas Creator for ECAD <> MCAD **PinBreakout** Fanout - Allow Verwaltete Ordner Integration capabilities 2D/3D SMD MOVE 45/90° violation mode Gruppen Obstacle Library Editor with 3D Enhanced Packages Selection filter maintaining angles Design Manager im Avoidance execution to 3D Packages models **CAM Processor FUSIONTEAM** Schaltplan **Alignment Tools ULP and Scripts** shareable as Manual Route - Toggle improvements publishing Filter Library import Lock Traces STEP/OBJ file start position Spice Sim Window LOCK-Befehl **New Directory** Table content view and Polygons Library.io site ROUTE allows micro-vias non modal structure Erweiterung Added Ctrl-C and Push & Shove Automatic Label when routing out of a SMD **HIG** Interface CAM Processor CAM Prozessor -



Ctrl-V operations

to EAGLE

Added Design Blocks by

New internal Vector Font

SparkFun and Adafruit



Pick&Place

Bibliothek -Löschen

von Objekten/Varianten

with NET and

BUS

3D packages

EAGLE

editable inside

improvements

for 2D and 3D

Package Generator

Routing

Autodesk EAGLE

The biggest EDA Community



Free content for EAGLE users (libraries, ULPs). Very active EAGLE forums.



Readable standard format → easy sharing of data / projects



EAGLE is widely recognized by open source hardware designers for its ease of use, communitybased culture and open XML file format

Who uses EAGLE?





Teachers & **Students**



Institutes

Start-ups

Educational Institutes

Where? In all areas of electronics













Automotive

Health care Consumer

Electronics conductors

Semi-

High-tech IoT **Electronics**









Aerospace & Military

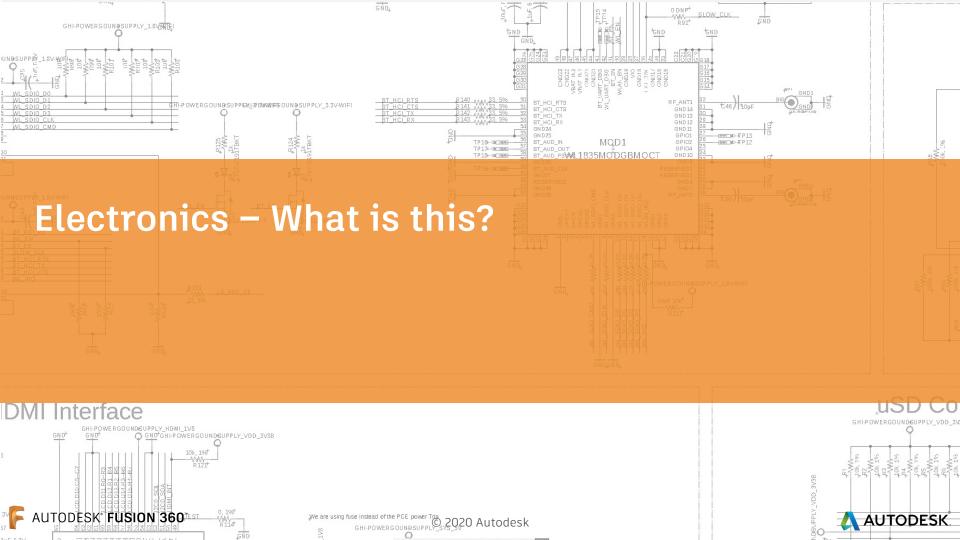
Communication

Industrial Controls& **Automation**

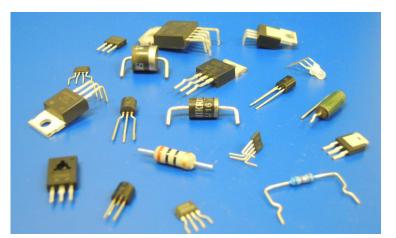
R&D

Ш



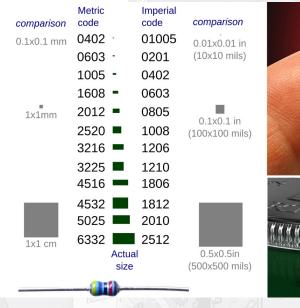


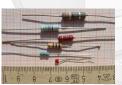
Electronic Components

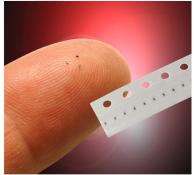




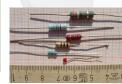






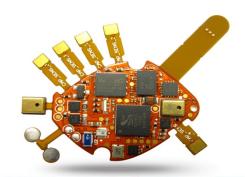






Printed Circuit Boards

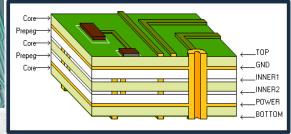






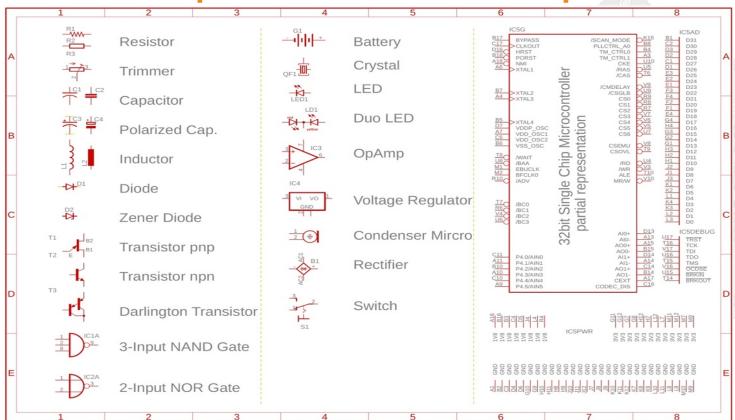




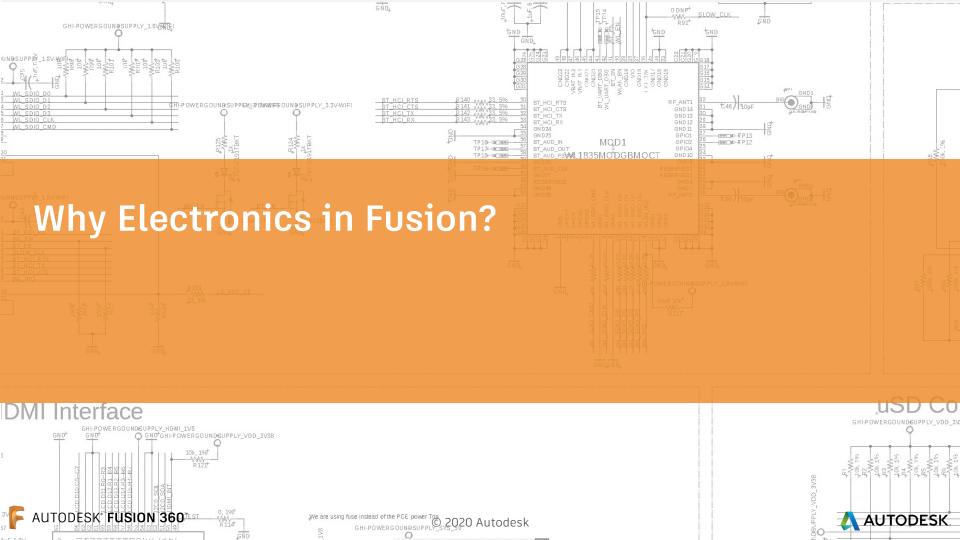




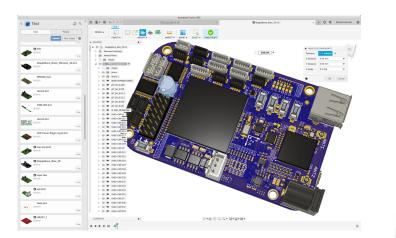
Schematic Representation of Components

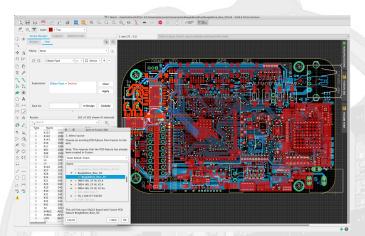






Product Development is MCAD + ECAD





AUTODESK®

EAGLE













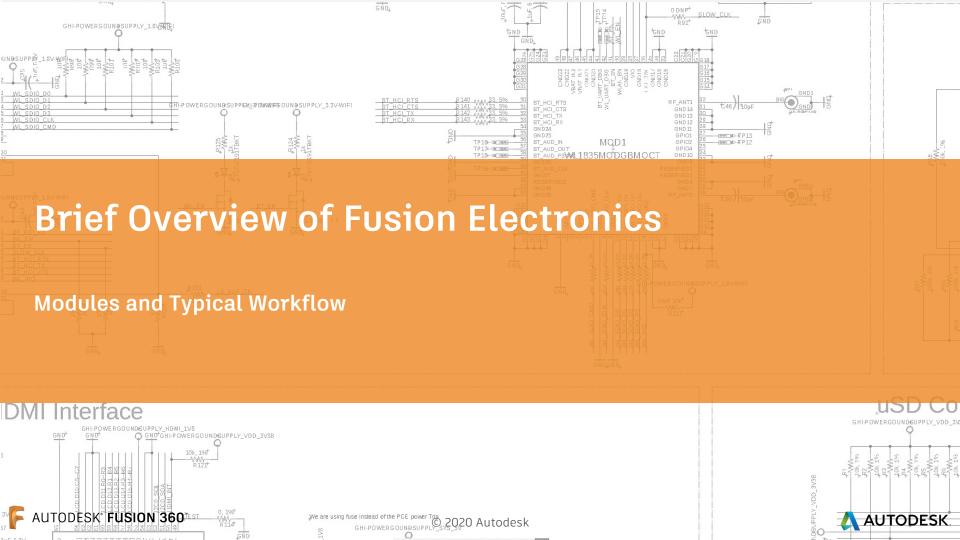
Product Development is MCAD + ECAD



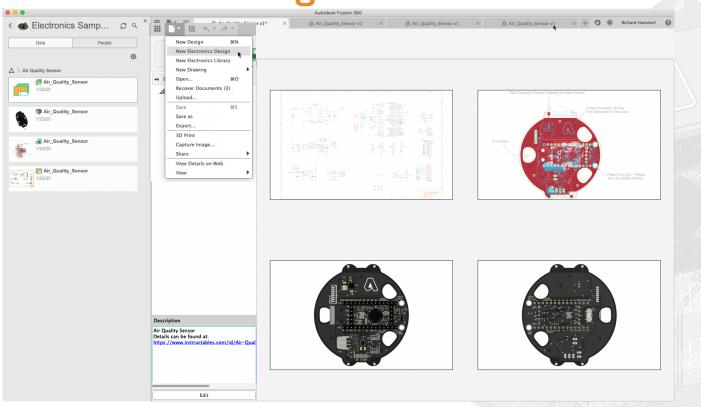
Fusion 360 as one platform for the whole product development process

- Electronics development is fully integrated in the product development process
- · One platform Make Anything
- Data centric No error-prone data conversion
- Bi-directional cooperation between MCAD and ECAD
- Easy data sharing and colaboration with your teams





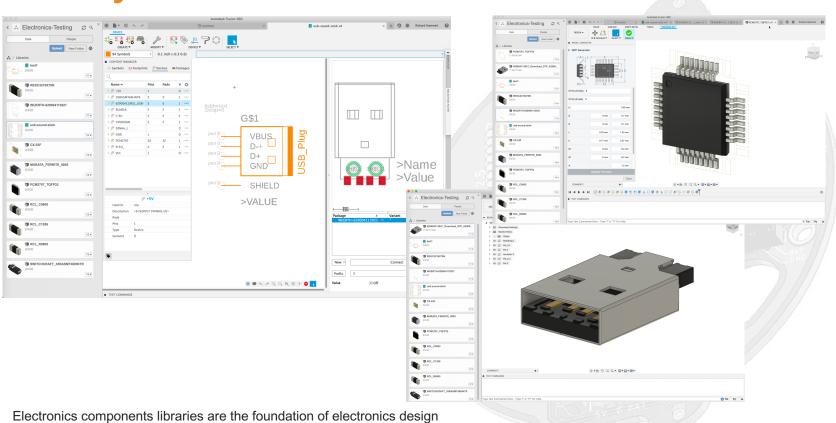
Electronics Design



Starting Point for Electronics Design – Projects overview

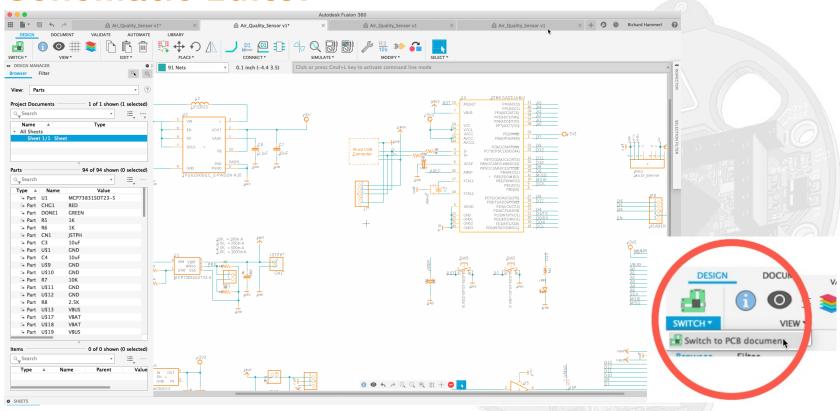


Library Editor





Schematic Editor

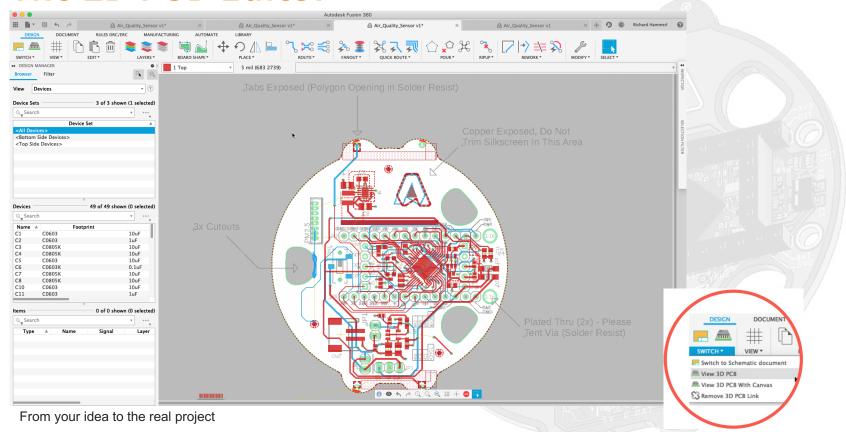




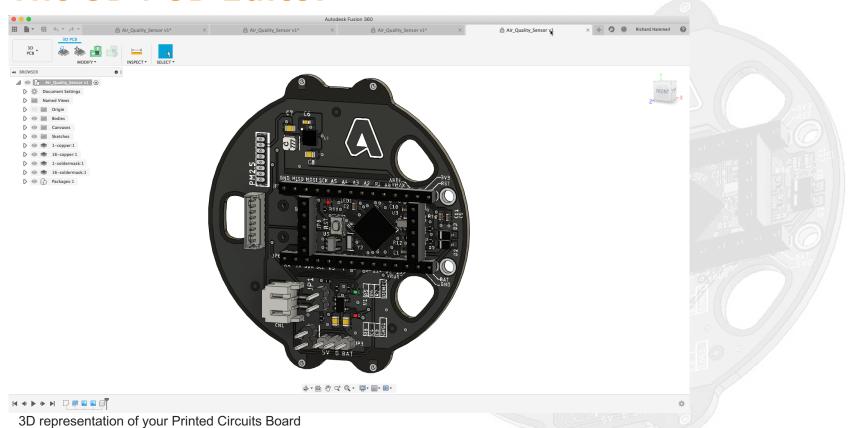




The 2D PCB Editor

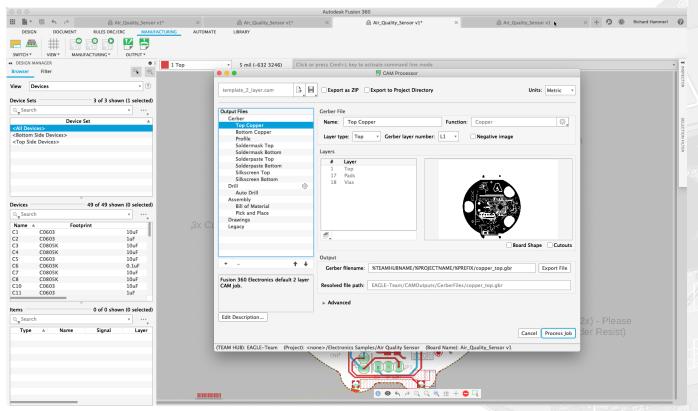


The 3D PCB Editor





The CAM Processor

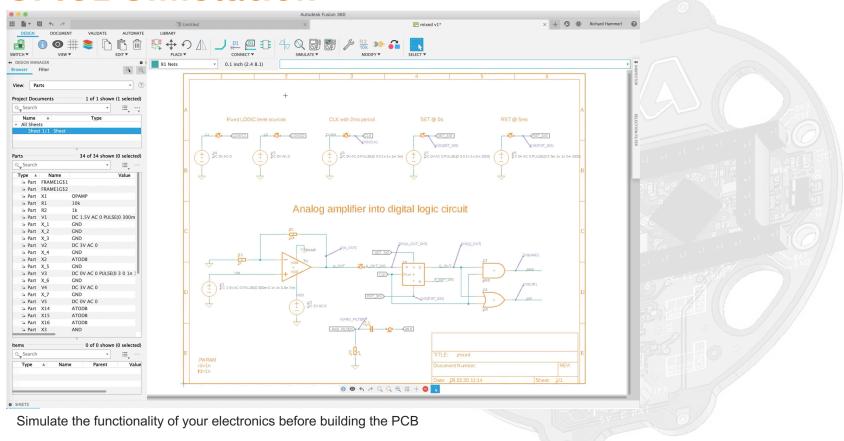


Creating manufacturing data

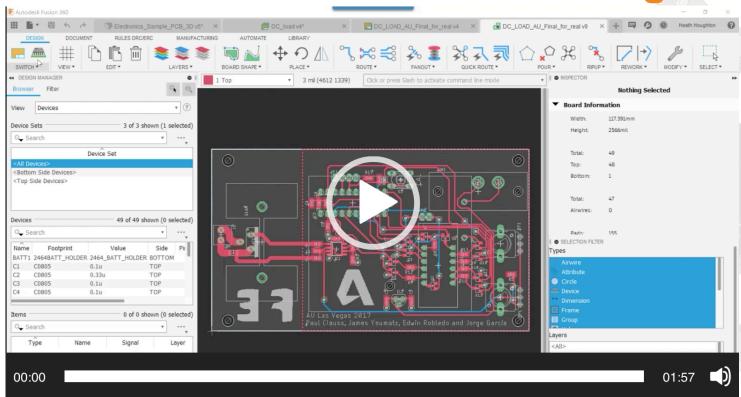




SPICE Simulation



Preview Feature: Electronics Cooling



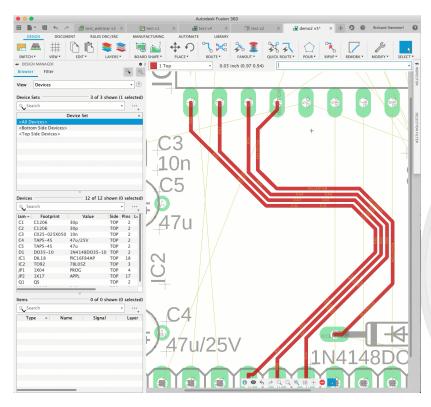
Simulate the thermal situation in your product

More at: https://www.autodesk.com/products/fusion-360/blog/electronics-cooling-preview-coming-soon-to-your-fusion-360/blog/electronics-cooling-preview-coming-soon-to-your-fusion-360/blog/electronics-cooling-preview-coming-soon-to-your-fusion-360/blog/electronics-cooling-preview-coming-soon-to-your-fusion-360/blog/electronics-cooling-preview-coming-soon-to-your-fusion-360/blog/electronics-cooling-preview-coming-soon-to-your-fusion-360/blog/electronics-cooling-preview-coming-soon-to-your-fusion-360/blog/electronics-cooling-preview-coming-soon-to-your-fusion-360/blog/electronics-cooling-preview-coming-soon-to-your-fusion-360/blog/electronics-cooling-preview-coming-soon-to-your-fusion-360/blog/electronics-cooling-preview-coming-soon-to-your-fusion-360/blog/electronics-cooling-preview-coming-soon-to-your-fusion-360/blog/electronics-cooling-preview-coming-soon-to-your-fusion-360/blog/electronics-cooling-preview-coming-soon-to-your-fusion-360/blog/electronics-cooling-preview-coming-soon-to-your-fusion-360/blog/electronics-cooling-preview-coming-soon-to-your-fusion-360/blog/electronics-cooling-preview-coming-soon-to-your-fusion-360/blog/electronics-cooling-preview-coming-soon-to-your-fusion-360/blog/electronics-cooling-preview-coming-soon-to-your-fusion-360/blog/electronics-cooling-preview-cooling





How to Activate Preview Feature

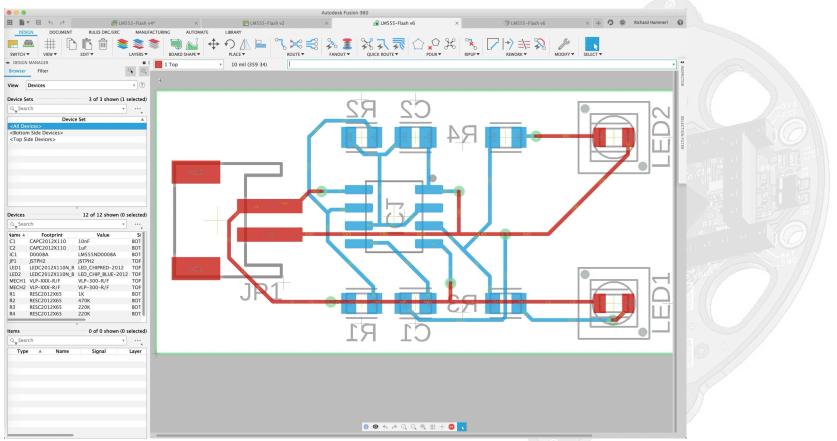


Click onto your name / Preferences

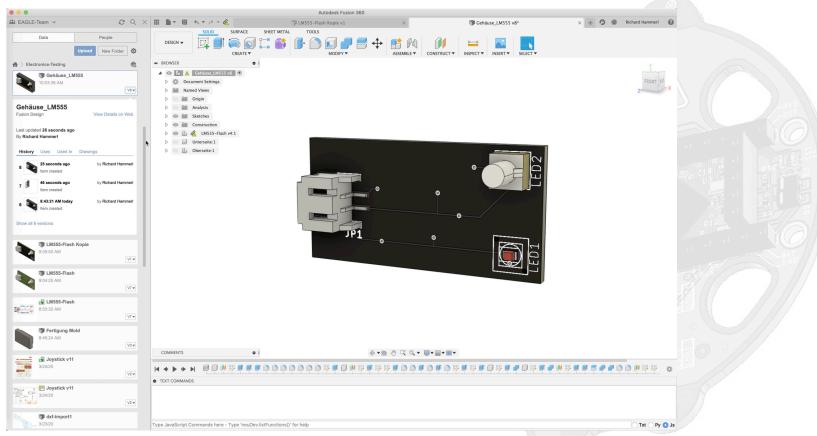




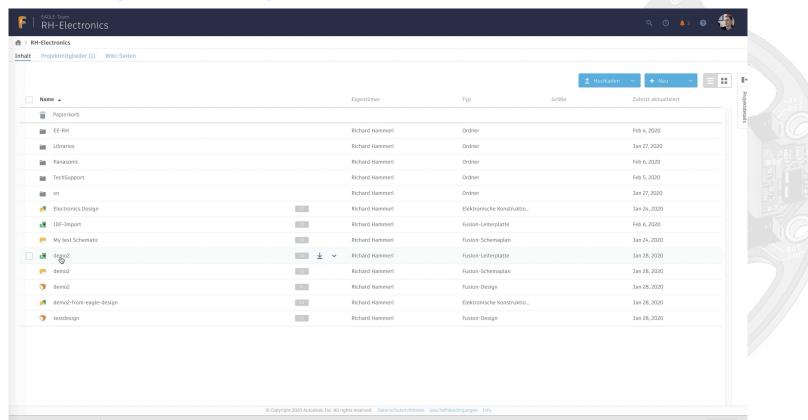
Bi-directional 2D - 3D Workflow



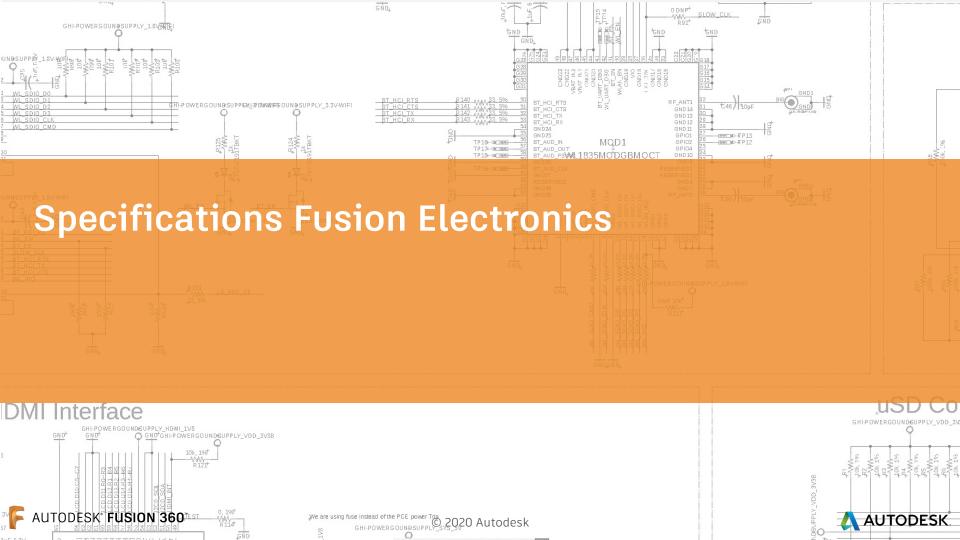
Bi-directional 2D - 3D Workflow



Share your Project with Fusion Team







Specifications

Fusion Electronics (Premium)

- 999 sheets per schematic
- o "unlimited" size of pcb (max. 4000mm x 4000mm)
- o max. 16 signal layers
- o Integrated SPICE simulation
- o 2D-3D bidirectional cooperation
- Fully integrated into product design workflow
- 3D component libraries
- Managed folders for team colaboration
- Team hubs
- Access to "Fusion Team"
- Hierachical schematics
- Real-time Forward/Back Annotation
- QuickRoute, Push\$Shove, Autorouting, Diff-Pair routing

Fusion Electronics Free Limits

- o 2 sheets per schematic
- o pcb area (max. 8000 mm2)
- o max. 2 signal layers







Make anything...

Autodesk is a registered trademark of Autodesk, Inc., and/or its subsidiaries and/or affiliates in the USA and/or other countries. All other brand names, product names, or trademarks belong to their respective holders. Autodesk reserves the right to alter product and services offerings, and specifications and pricing at any time without notice, and is not responsible for typographical or graphical errors that may appear in this document.