



# Microsoft Surface Pro 5 Teardown

Teardown of the Microsoft Surface Pro 5 on June 15, 2017.

Written By: Blake Klein



# INTRODUCTION

Microsoft hardware is having a little bit of an identity crisis. Microsoft calls this new Surface Pro "the most versatile laptop", which means that this tablet is actually a laptop (that can transform into a studio surface). Tell ya what Microsoft, we are going to reach deep inside and see if we can't help. Friends, we present to you the Surface Pro 5 ~~self-discovery~~ teardown!

We want to help all Microsoft devices figure out what they are made of. You can view our [Surface Laptop teardown here!](#)

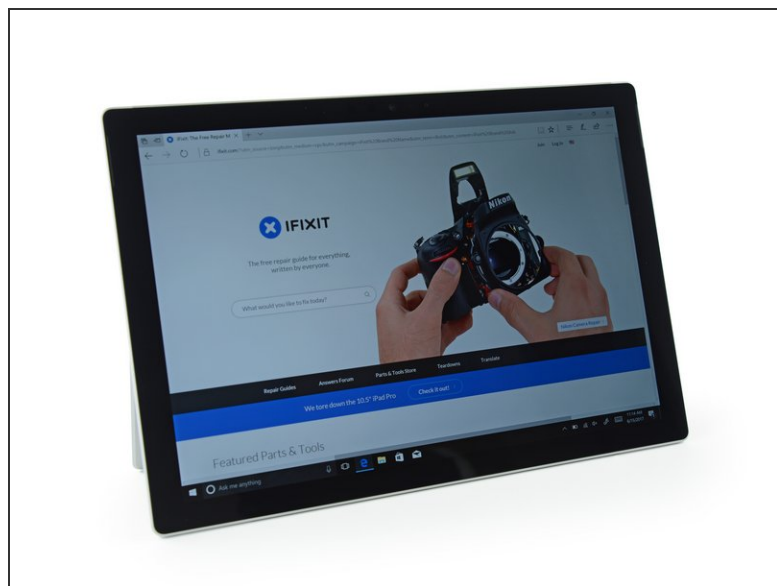
Want to help us help devices? Make sure to stay informed by following us on [Facebook](#), [Instagram](#), or [Twitter](#) for the latest teardown news.



## TOOLS:

- [iOpener](#) (1)
  - [Spudger](#) (1)
  - [iFixit Opening Picks \(Set of 6\)](#) (1)
  - [Tweezers](#) (1)
  - [T5 Torx Screwdriver](#) (1)
  - [T3 Torx Screwdriver](#) (1)
-

## Step 1 — Microsoft Surface Pro 5 Teardown



- From the outside, this Surface Pro looks pretty similar to last year's model. But you know what they say, it's what's on the inside that matters:
  - 12.3" IPS PixelSense Display with 2736 × 1824 resolution (267 PPI)
  - Intel Kaby Lake Core m3 (4M Cache, 2.70 GHz) up to Core i7 (4M Cache, 4.00 GHz) CPU
  - 4 GB/8 GB/16 GB 1600 MHz DDR3L RAM
  - 128 GB/256 GB/512 GB/1 TB of solid state storage
  - 8 MP rear-facing 1080p camera, and 5 MP front-facing 1080p Windows Hello camera
  - USB 3.0 port, micro-SD slot, Mini DisplayPort, and SurfaceConnect charging port
  - 802.11a/b/g/n/ac Wi-Fi, Bluetooth 4.1

## Step 2



- Stacked on top of its elder sibling, the 5th gen Pro looks very nearly identical. It has the exact same ports in the exact same places, and features the same physical dimensions.
- The only difference we spy is that the vents are larger—but cut in a different face of the perimeter [trench](#), rendering them much less visible.
- On the back side, Microsoft engineers show off their latest advancement in hinge technology, with a newly designed mechanism that ekes out an extra *15 degrees* of range, up to a 165° angle. Fantastic.

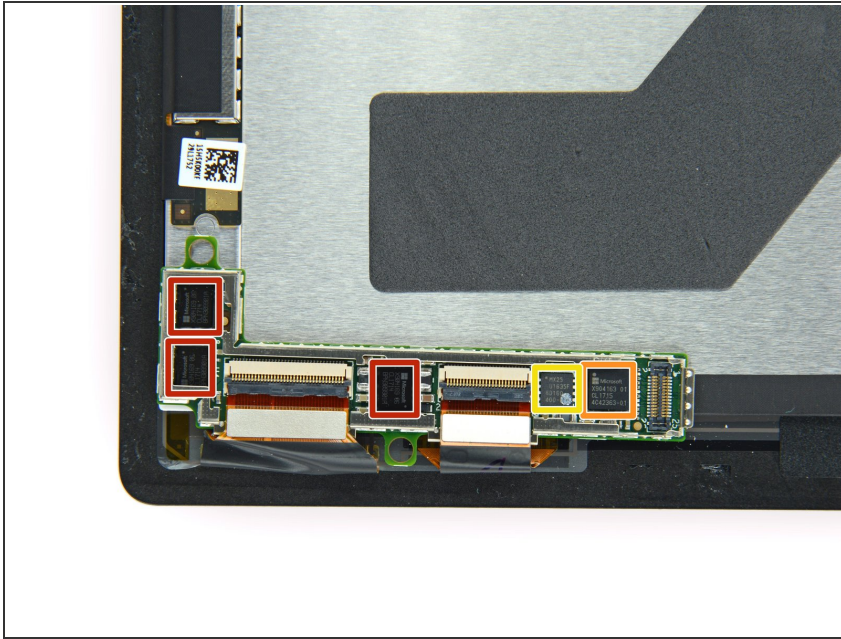
## Step 3



- With such a similar exterior, it's no surprise that we find an identical opening procedure. Just as in the [Surface Pro 4](#), we apply some [iOpener](#) heat, suction up the display, and slice through the adhesive with an opening pick.
- We start looking for [differences](#) and pick out a whopper—Microsoft has traded away the removable blade SSD for a little more battery real estate. There goes the sole upgradeable feature from last year's model.
- Additional, less-exciting differences include a more spidery heat sink design, four-cell instead of two-cell battery, and svelte new black color scheme.



## Step 4



- The back of the display houses a number of chips that look suspiciously similar to the [N-trig modules](#) found in the Surface Pro 4:
  - Microsoft X904169 06 CL1714
  - Microsoft X904163 01 CL1715
  - Macronix [MX25U1635F](#) 1.8V 16 Mb MXSMIO serial flash memory

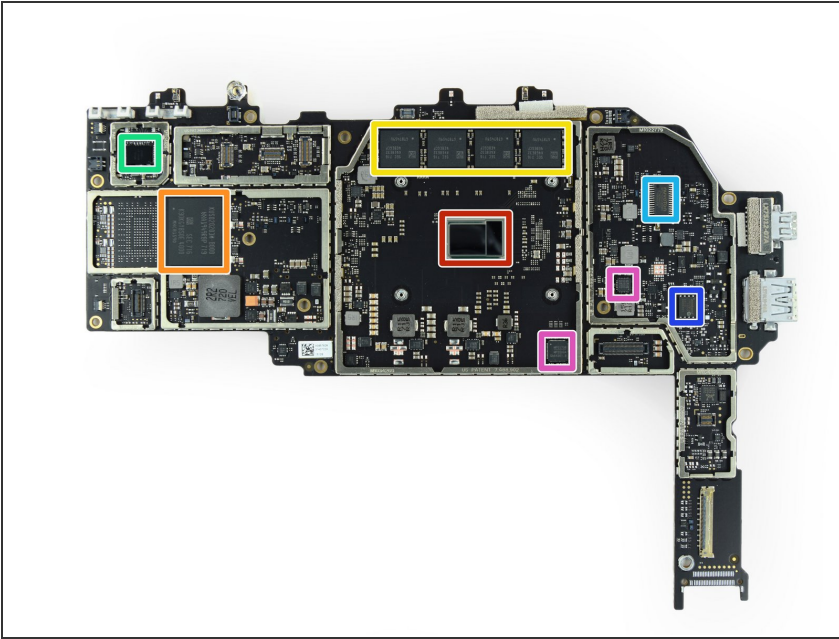
**i** Microsoft [acquired](#) N-trig in 2015. Looks like they've finally fully integrated their tech, slapping a Microsoft label on the chips.

## Step 5



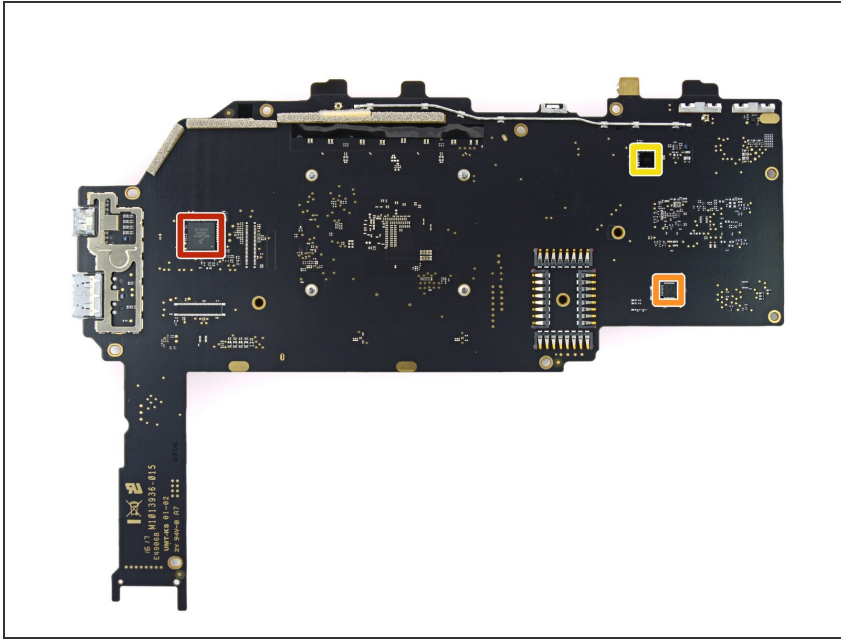
- Microsoft claims to have wholly redesigned the passive cooling, to allow both the Core m3 and Core i5 models to run 100% fanless, instead of just the m3 model like last year.
- i** It looks like most of the improvement came from shaping the heat sink like a certain [Zerg](#) unit.
- With the heat sink out of the way, we still have to remove a couple of components before the motherboard is free. It's trapped under one speaker and a sensor/camera bezel.

## Step 6



- Now that the motherboard is out, let's have some chips:
- Intel Core [m3-7Y30](#) Processor
- Samsung [KUS020203M-B000](#) NAND flash memory
- Samsung [K4E8E324EB-EGCF](#) 1 GB LPDDR3 1866 MHz DRAM (4 chips for 4 GB total)
- Marvell Avastar [88W8897](#) 802.11ac, NFC and Bluetooth SoC
- Nuvoton [NPCT650SBBWX](#) trusted platform module
- Winbond [W25Q128FV](#) 128M-bit Serial Flash Memory
- Monolithic Power Systems MP2949A tri-loop digital multi-phase controller w/ PMBus interface and [MP3376A](#) 8-ch. WLED driver

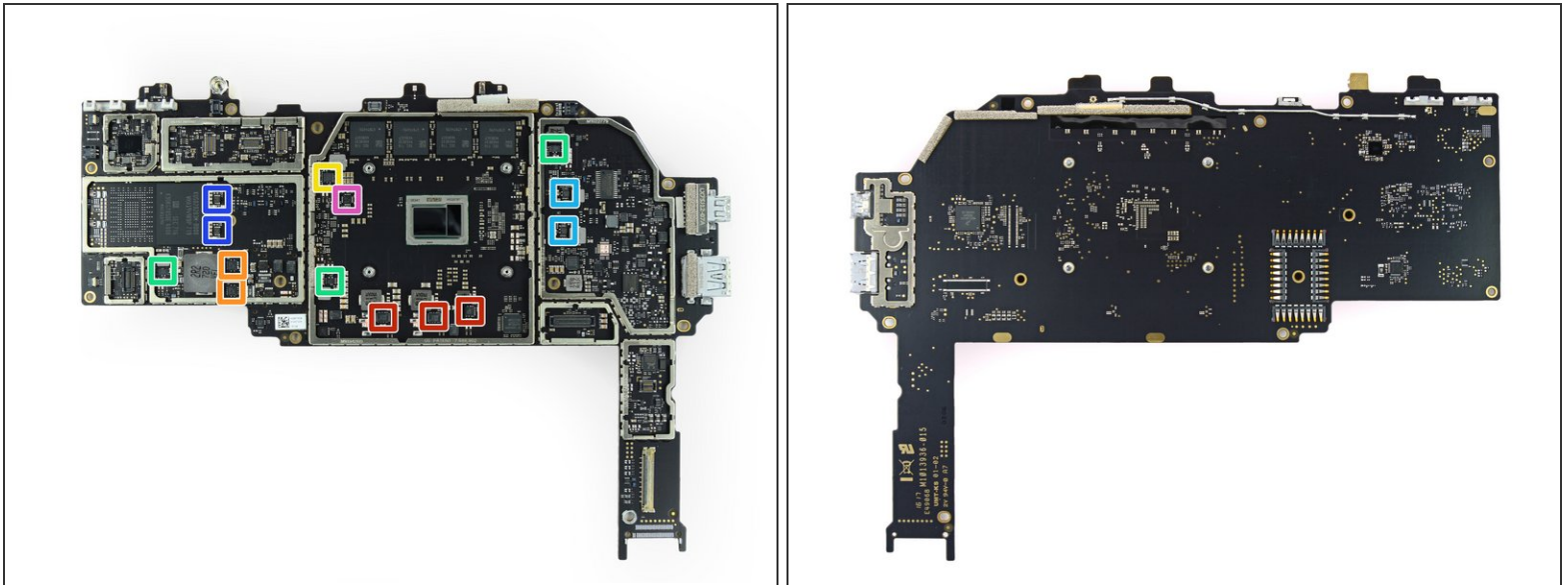
## Step 7



- On the flip side, bonus chips:
  - Freescale/NXP [M22J9VDC](#)  
Kinetis K22F 512KB 120 MHz  
ARM Cortex-M4 Based MCU
  - Texas Instruments [BQ25700A](#)  
Battery Buck-Boost Charge  
Controller
  - Realtek ALC3269 Audio Codec

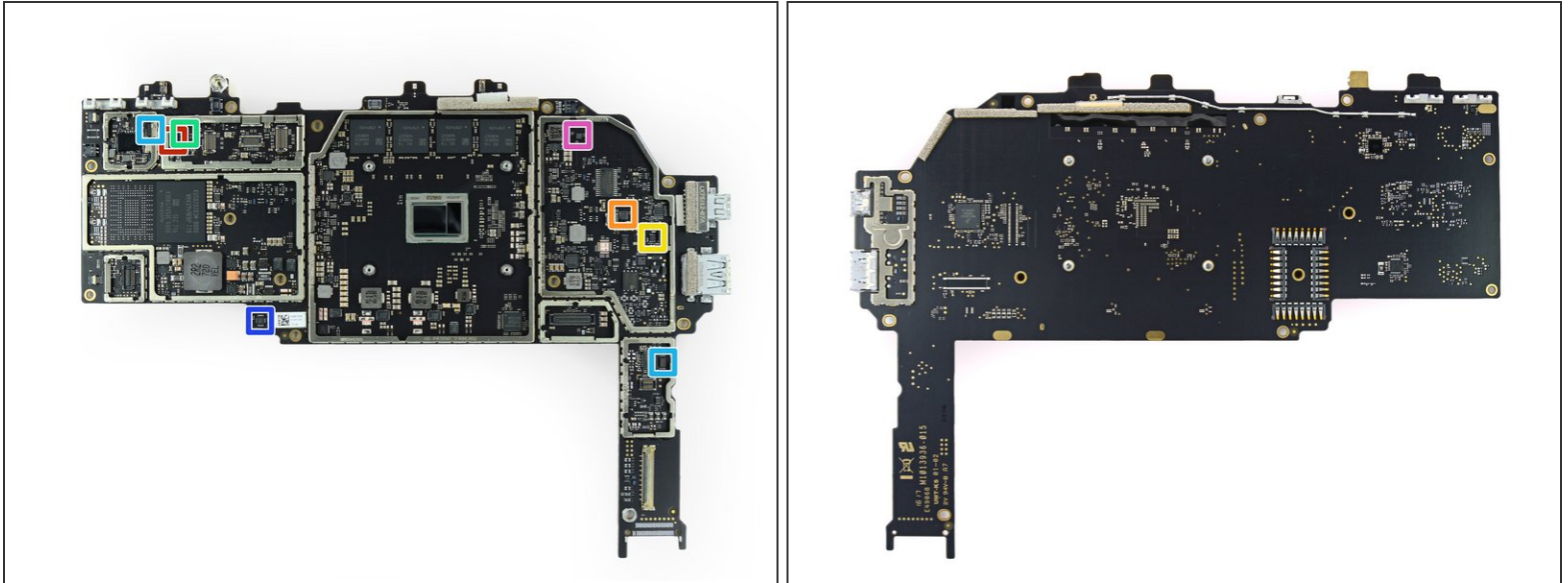


## Step 8



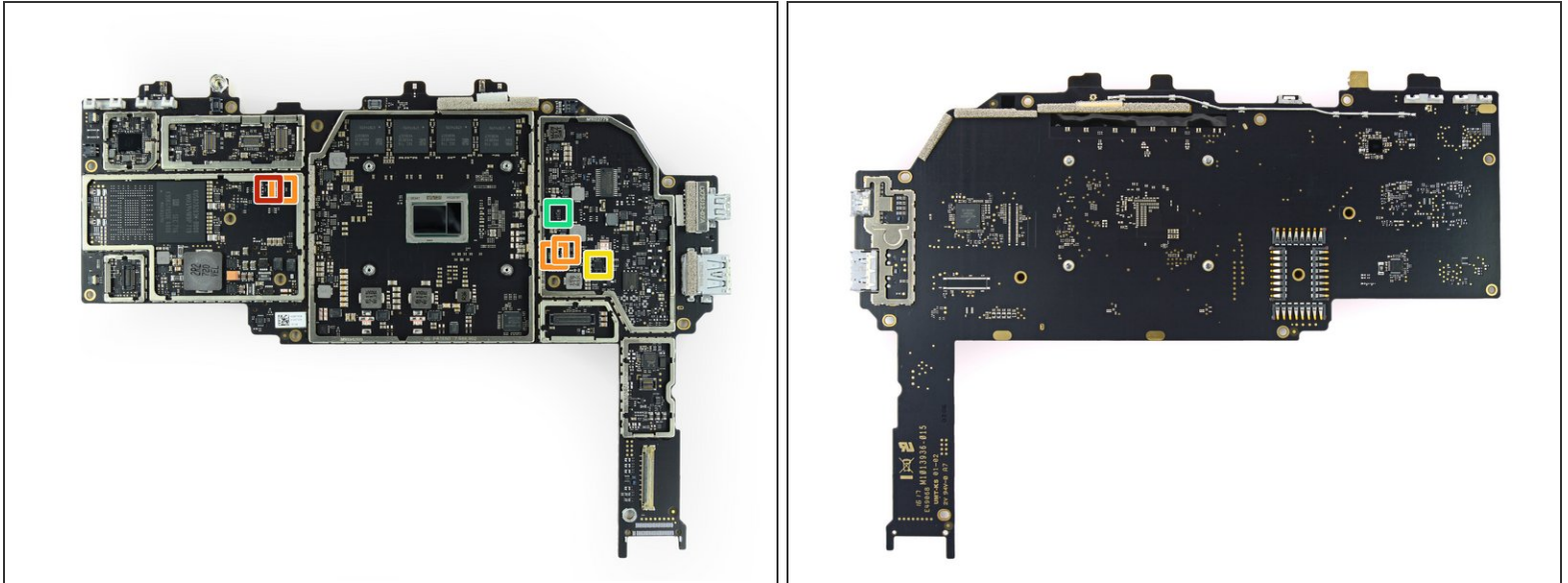
- IC Identification, pt. 2:
  - Monolithic Power Systems MP86901-A and MP86902-B power phase
  - Texas Instruments [CSD87334Q3D](#) 20 A power block
  - Monolithic Power Systems [NB685A](#) 12 A synchronous buck converter
  - Monolithic Power Systems [NB679A](#) and [NB680GD](#) 8 A synchronous buck converter
  - Monolithic Power Systems [NB681](#) 6 A synchronous buck converter
  - Texas Instruments [TPS62085](#) 3 A step-down converter
  - Texas Instruments [TPS62140](#) 2 A step-down converter

## Step 9



- IC Identifications, pt. 3:
  - Monolithic Power Systems [MP2370DGT](#) white LED driver
  - Texas Instruments [TPS62175](#) 0.5 A step down converter
  - Texas Instruments [TPS70933](#) 150 mA LDO regulator
  - Texas Instruments [TLV3011](#) comparator w/ voltage reference
  - ON Semiconductor [CAT24C16](#) 16 Kb serial EEPROM memory and Winbond [W25X40CL](#) 4 Mb serial NOR flash memory
  - Bosch Sensortec [BMI160](#) 3-axis accelerometer/gyroscope
  - Bosch Sensortec BMA254 accelerometer (likely)

## Step 10



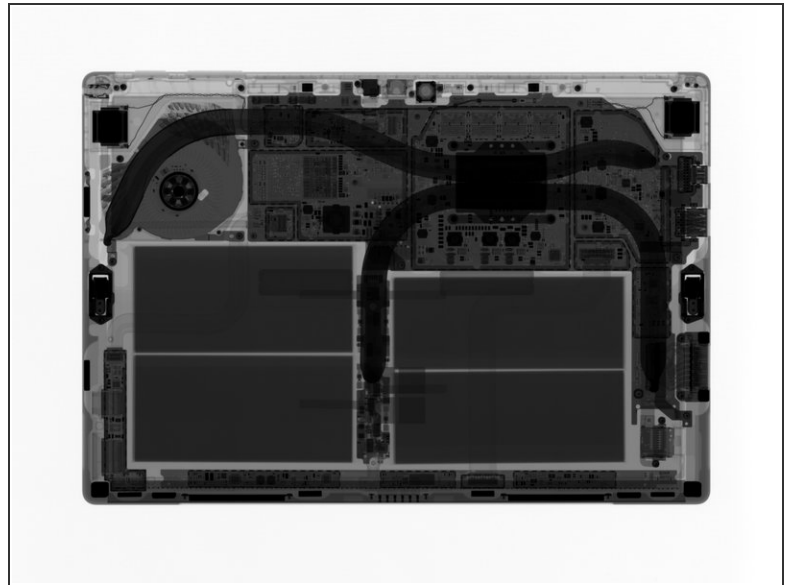
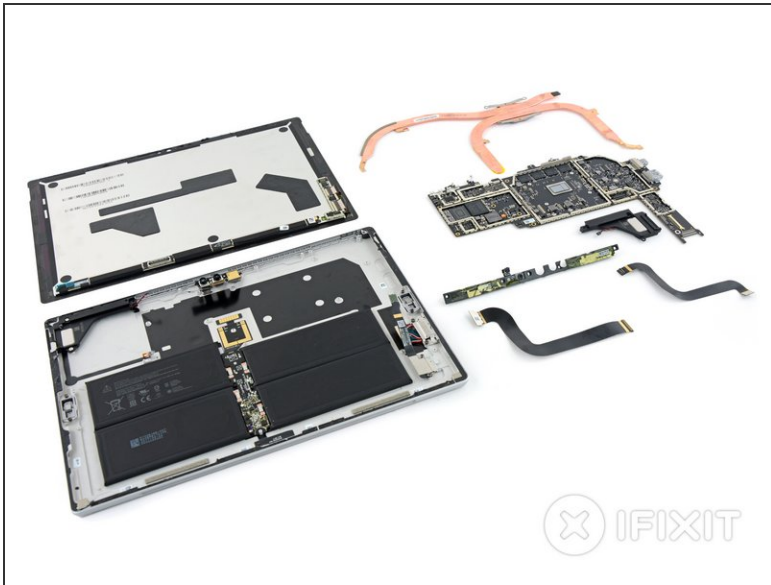
- IC Identifications, pt. 4:
  - Texas Instruments [SN74AVC2T245](#) dual-supply bus transceiver
  - Texas Instruments [TS3USB30E](#) high-speed USB 2.0 1:2 mux/demux switch
  - Nexperia (formerly NXP Semiconductor) [74LVC125A](#) 3-state quad buffer/line driver
  - Nexperia (formerly NXP Semiconductor) [74AUP1G32](#) 2-input OR-gate

## Step 11



- If we learned anything from the last [Surface Pro](#) we tore down, it's that the battery is a pain to remove, and it doesn't go back in quite the same.
- So, we're gonna keep it glued in today...
- This four-cell LiPo measures in at 45 Wh (7.57 V x 5940 mAh). That's a nearly 18% increase in battery capacity (and 100% increase in cell count) over the previous model.
- To compare Apples to Apples Surfaces, the [10.5" iPad Pro](#) we tore down last week sports a 30.8 Wh battery.

## Step 12



- That's all folks!
  - All told, it's nearly identical to its predecessor—aside from ditching the *last remaining upgradable component, the modular SSD*. Yeah, Microsoft impressed us—by being way worse than we expected.
  - For more teardown action, check out our [Surface Laptop](#) teardown!
- 🔍 Psst—hey, wanna take a peek at the Core i7 Surface Pro? Thanks to [Creative Electron](#), we got the goods.
- Not much difference between the models, but that mysterious empty space under the heat sink is indeed filled with extra cooling power in the form of a fan.



## Step 13 — Final Thoughts

### REPAIRABILITY SCORE:



- Microsoft Surface Pro 5 Repairability Score: **1 out of 10** (10 is easiest to repair)
  - Although we like connectors, the ones present in the Surface Pro aren't standard, making display removal tricky.
  - The display removal procedure is simplified by the use of thin foam adhesive and a fused display, but is still not trivial.
- Adhesive holds many components in place, including the display and battery.
- Replacement of any part requires removal of the display assembly, an easy part to damage.
- The SSD is no longer replaceable.