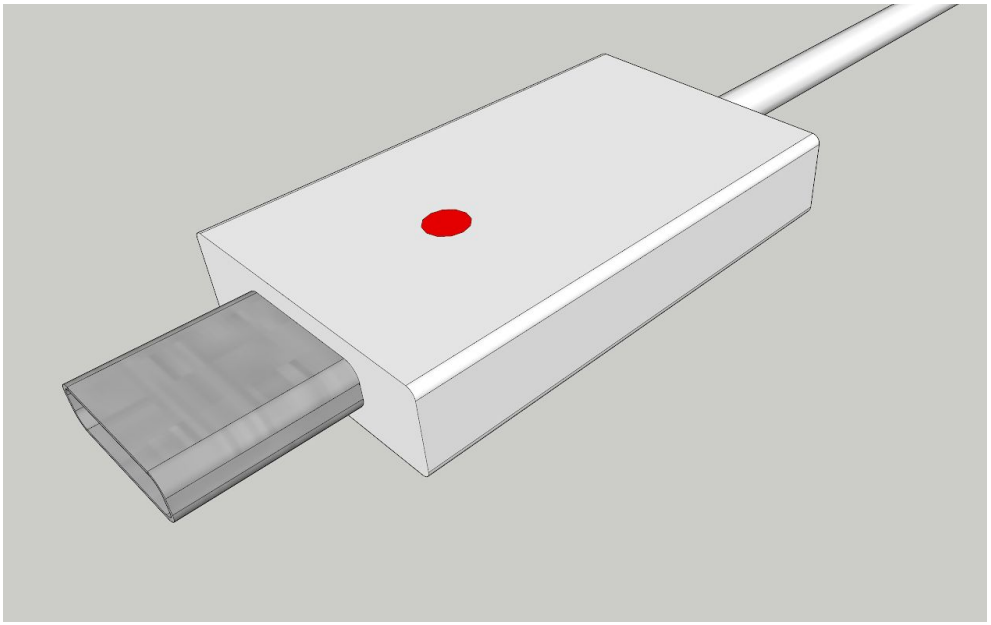
Surface-C

Designed by Noah Sweilem



Charge a Surface Pro 3/4 or Book 1/2 with USB-C

- Not as bulky as the official adapter
- Automatic USB-PD® power negotiation
- Charge with up to 45W of power - more than the charger in the box*
- Low current detection with bright indicator
- Only $50

* Applicable to Surface Pro 3/4 without discrete GPU only (36W charger in box)

Technical details

- USB® type-C with USB-PD. Operates in 3 modes**:
    - 12V @ 2A (24W)
    - 12V @ 3A (36W)
    - 15V @ 3A (45W)
- Texas Instruments® TPS-65986 USB-PD Controller
- Low current indicator LED
    - Lights when V_{BUS} < 12V or when I(V_{BUS}) < 2A

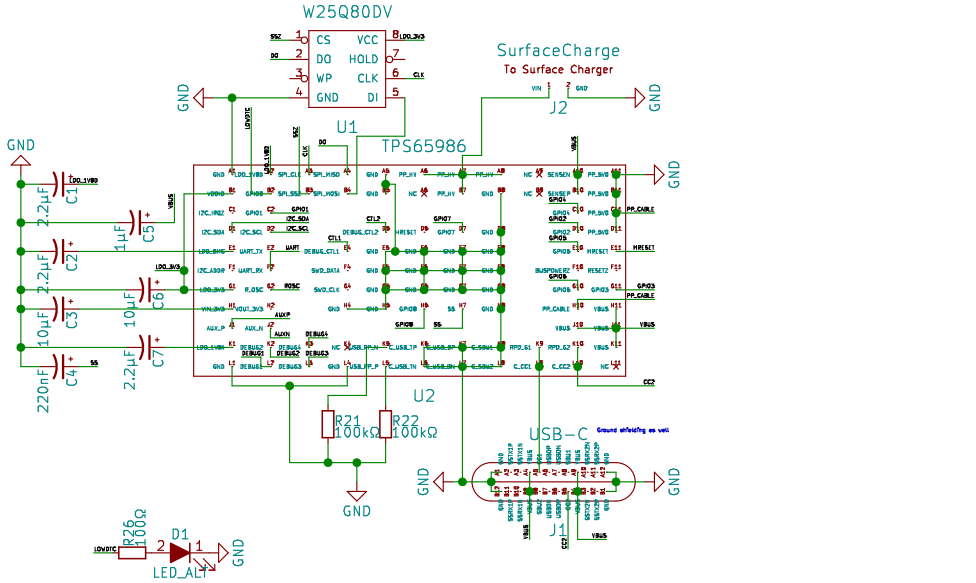
**Required PD mode 5V @ 2A mode triggers low current indicator since it cannot charge the Surface.

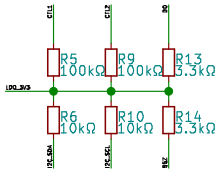
Bill of Materials

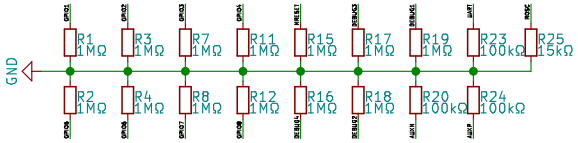
Designator	Value/MPN	Quantity	Package
C1, C2, C7	2.2µF	3	0402 SMD
C3, C6	10µF	2	0402 SMD
C4	220nF	1	0402 SMD
C5	1µF	1	0402 SMD
D1	RED	1	1206 SMD
J1	1054440001	1	N/A
R6, R10	10kΩ	2	0402 SMD
R1 - R4, R7 - R8, R11 - R12, R15 - R19	1MΩ	13	0402 SMD
R13, R14	3.3kΩ	2	0402 SMD
R5, R9, R20 - R24	100kΩ	7	0402 SMD
R25	15kΩ	1	0402 SMD
R26	100Ω	1	0402 SMD
U1	W25Q80DV	1	SOIC-8
U2	TPS65986	1	96pin BGA MICROSTAR JR.

Note: Currently, the TPS65986 is marked NRND by TI, however, the TPS65987D that succeeds it has an entirely different footprint. The TPS65987D may be used if a future revision is created.

Schematic Diagram







Surface-C

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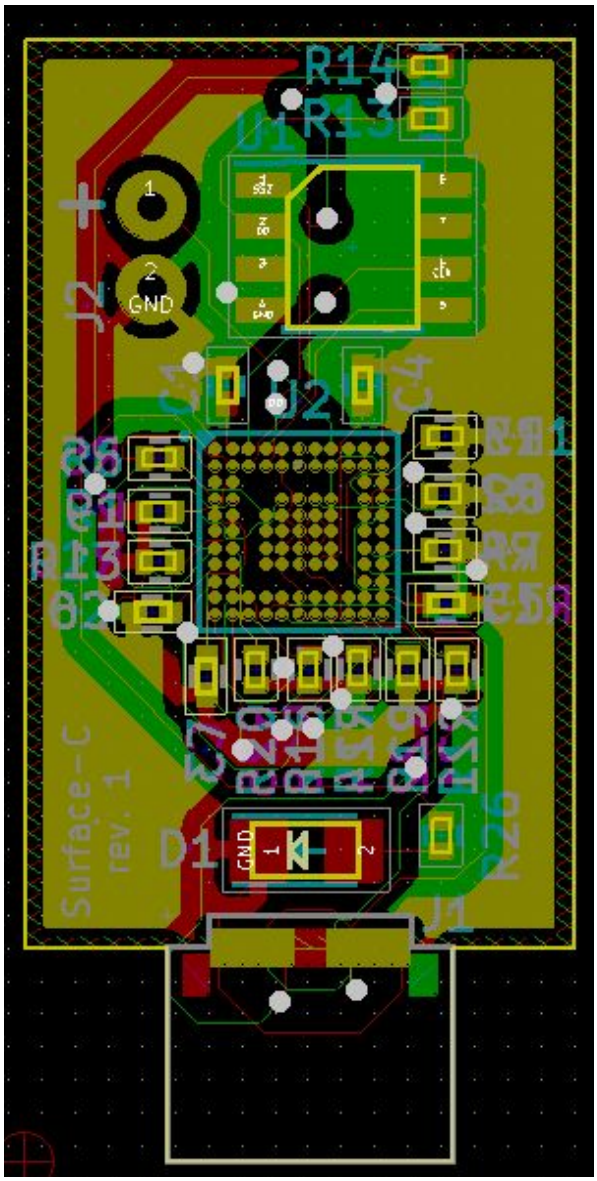
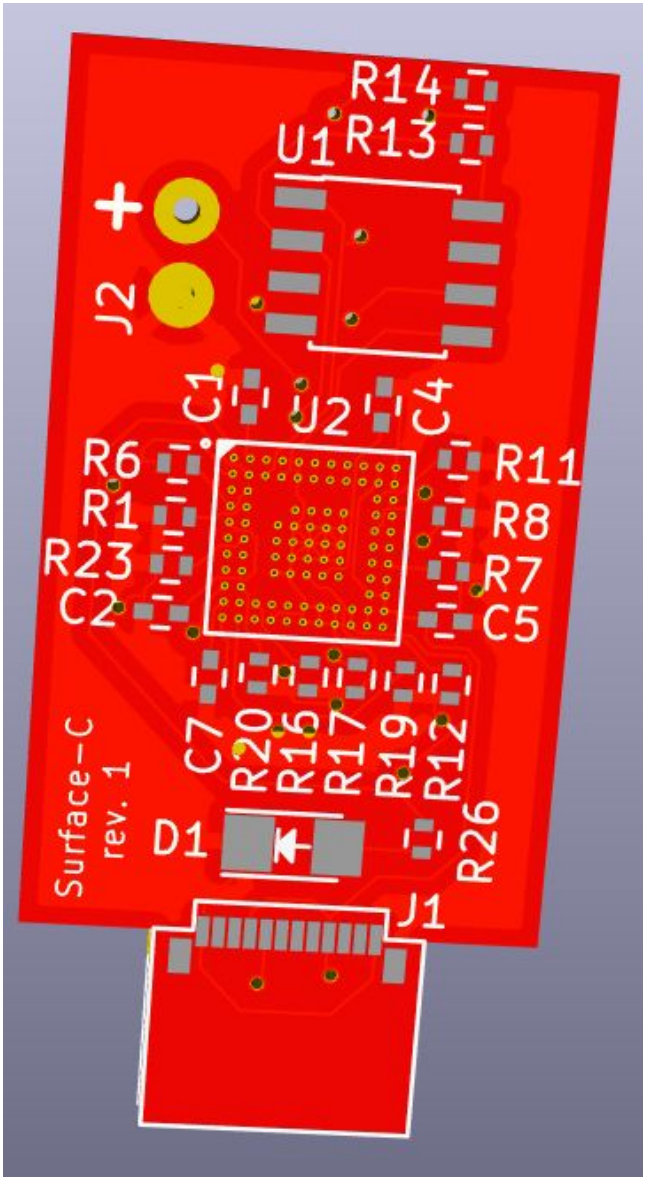
Size: USLetter	Date: October 19, 2018	**Rev:**
KiCad E.D.A. kicad 4.0.5+dfsg1-4		Id: 1/1

Boardview + 3D board render





KiCAD Files + Gerbers

Find it all on GitHub at nununoisy/surface-c! (Feel free to submit a PR!)O

Questions? Comments?

Contact me at noah.sweilem@gmail.com if you have any questions or would like to contact me.