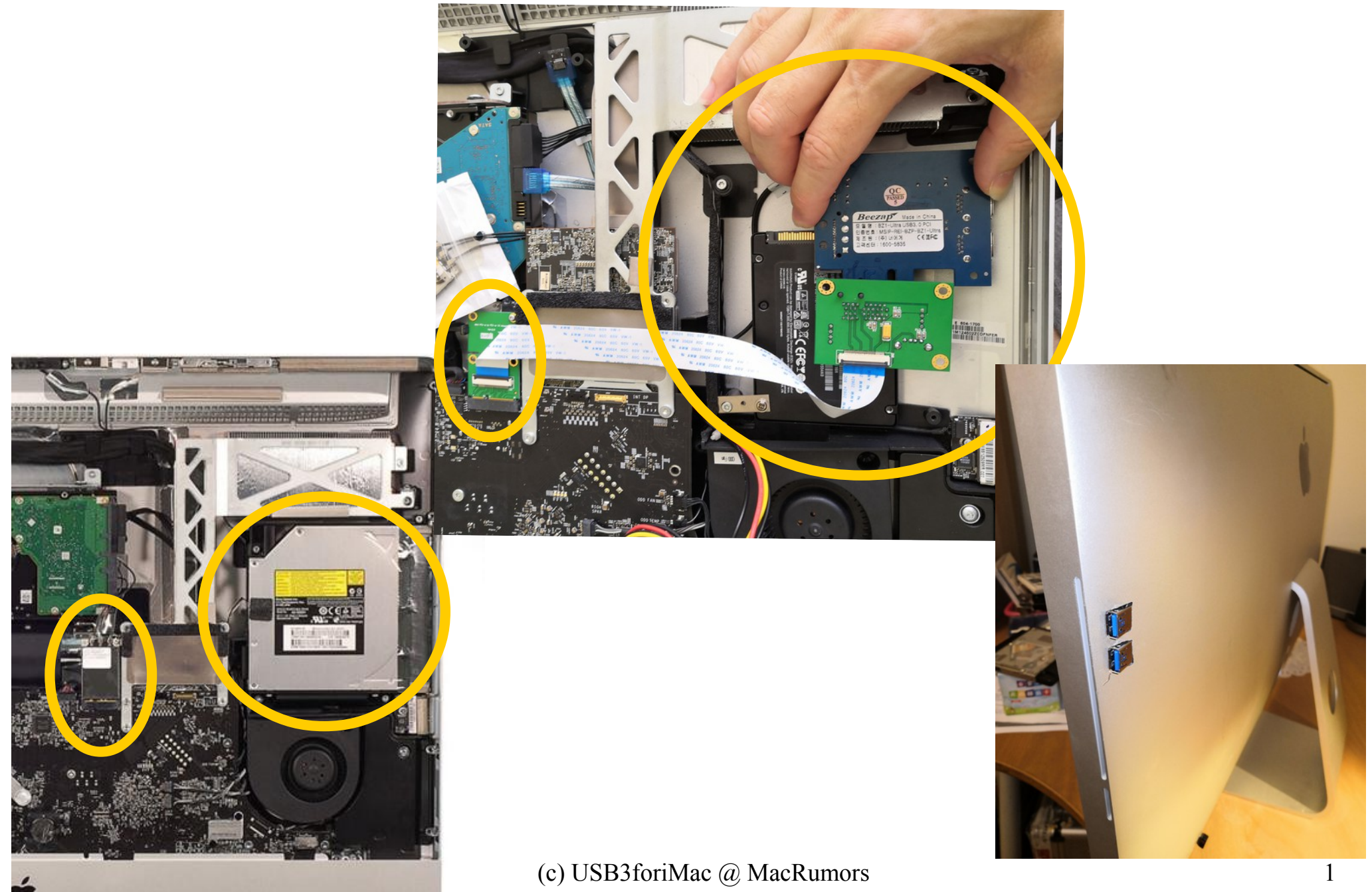


# USB3.0 (5Mbit/s) for iMAC mid 2011



# Overall steps

- Open iMac (Remove glass and screen)
- Remove WLAN card
  - You will lose WLAN, but you can use a USB WLAN dongle
    - Check other sources for which WLAN dongle works
- Remove DVD drive
  - Throw it away
- If you want to add SSD, you need to remove the logic board. I totally recommend this if you have not done so yet.
- Make holes for the two USB3 ports
- Add the mini PCIE (PCI Express) card to PCI-E adapter
- Add the USB3 card (Must have **FRESCO FL1100** chip!!!!)
- Add the SATA power splitter that came with the USB3 card, either to your HDD or to your SSD. If you are handy, you can modify the ODD (DVD drive) SATA power connector. The USB3 card only needs 5V and 0V. The 12V (yellow) are **not needed**.
- Connect power to the USB3 card. You do **not need** to add power to the mini PCIE to PCI-E adapter card.
- Enjoy USB3 speed up to 5 Gbit/s!!!!

# SANDISK Ultra Flair 32GB USB3

iMac

▼ Hardware

- ATA
- Audio
- Bluetooth
- Camera
- Card Reader
- Controller
- Diagnostics
- Disc Burning
- Ethernet Cards
- Fibre Channel
- FireWire
- Graphics/Displays
- Hardware RAID
- Memory
- NVMeExpress
- PCI
- Parallel SCSI
- Power
- Printers
- SAS
- SATA/SATA Express
- SPI
- Storage
- Thunderbolt
- USB

▼ Network

- Firewall
- Locations
- Volumes
- WWAN
- Wi-Fi

▼ Software

- Accessibility
- Applications
- Components
- Developer
- Disabled Software
- Extensions
- Fonts
- Frameworks

USB Device Tree

- ▼ Hub
  - USB Receiver
    - ▼ BRCM2046 Hub
      - Bluetooth USB Host Controller
      - USB 2.0 Bus
      - ▼ USB 3.0 Bus
        - Ultra USB 3.0
          - BKL-AL20

USB 3.0 Bus:

Host Controller Driver: AppleUSBXHCIFL1100  
PCI Device ID: 0x1100  
PCI Revision ID: 0x0010  
PCI Vendor ID: 0x1b73

Ultra USB 3.0:

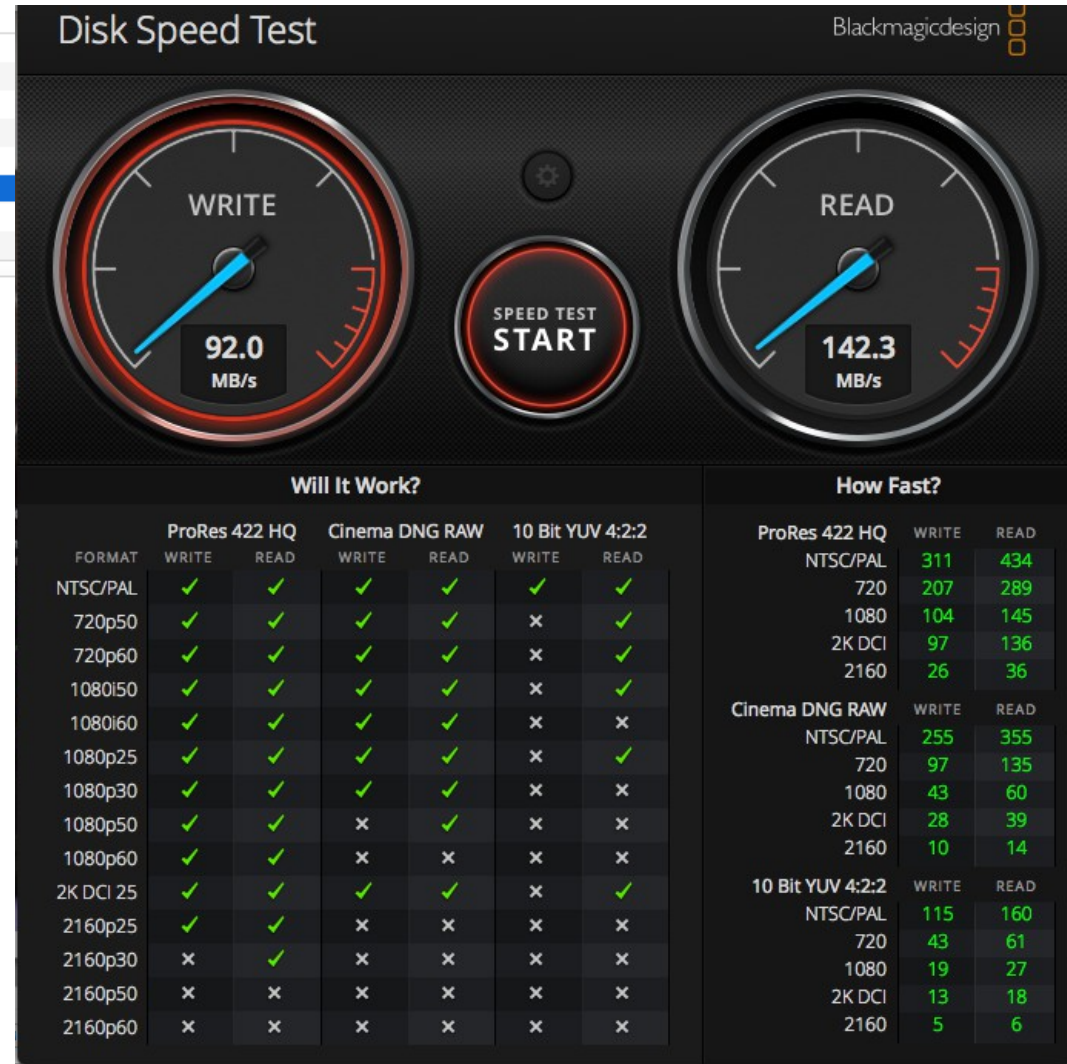
Product ID: 0x5591  
Vendor ID: 0x0781 (SanDisk Corporation)  
Version: 1.00  
Serial Number: 4C530001090207103503  
Speed: Up to 5 Gb/sec  
Manufacturer: SanDisk  
Location ID: 0x00500000 / 5  
Current Available (mA): 900  
Current Required (mA): 896  
Extra Operating Current (mA): 0  
Media:

Ultra USB 3.0:

Capacity: 30.75 GB (30,752,000,000 bytes)  
Removable Media: Yes  
BSD Name: disk3  
Logical Unit: 0  
Partition Map Type: MBR (Master Boot Record)  
USB Interface: 0  
Volumes:

32GB\_USB3:

Capacity: 30.75 GB (30,750,951,424 bytes)  
Available: 29.06 GB (29,064,888,320 bytes)  
Writable: Yes  
File System: ExFAT  
BSD Name: disk3s1  
Mount Point: /Volumes/32GB\_USB3  
Content: Windows\_NTFS  
Volume UUID: CEDB1076-A2C0-3C57-96F8-E5565AC40411





# SSD Intel 520 240GB connected via USB3-to-SATA cable

The image shows a screenshot of an iMac's system information window and a Blackmagic Disk Speed Test application. The system information window displays details for the USB 3.0 Bus and the connected Ultra USB 3.0 device (SanDisk 32GB USB3). The Disk Speed Test application shows write and read speeds of 235.2 MB/s and 340.9 MB/s respectively, along with compatibility and performance tables for various video formats.

**USB Device Tree**

- ▼ Hub
  - USB Receiver
    - ▼ BRCM2046 Hub
      - Bluetooth USB Host Controller
      - USB 2.0 Bus
      - ▼ USB 3.0 Bus
        - Ultra USB 3.0
          - BKL-AL20

**USB 3.0 Bus:**

- Host Controller Driver: AppleUSBXHCIFL1100
- PCI Device ID: 0x1100
- PCI Revision ID: 0x0010
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**Ultra USB 3.0:**

- Product ID: 0x5591
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- Version: 1.00
- Serial Number: 4C530001090207103503
- Speed: Up to 5 Gb/sec
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- Location ID: 0x00500000 / 5
- Current Available (mA): 900
- Current Required (mA): 896
- Extra Operating Current (mA): 0
- Media:
  - Ultra USB 3.0:**
    - Capacity: 30.75 GB (30,752,000,000 bytes)
    - Removable Media: Yes
    - BSD Name: disk3
    - Logical Unit: 0
    - Partition Map Type: MBR (Master Boot Record)
    - USB Interface: 0
    - Volumes:
      - 32GB\_USB3:**
        - Capacity: 30.75 GB (30,750,951,424 bytes)
        - Available: 29.06 GB (29,064,888,320 bytes)
        - Writable: Yes
        - File System: ExFAT
        - BSD Name: disk3s1
        - Mount Point: /Volumes/32GB\_USB3
        - Content: Windows\_NTFS
        - Volume UUID: CEDB1076-A2C0-3C57-96F8-E5565AC40411

**BKL-AL20:**

**Disk Speed Test**

WRITE: 235.2 MB/s

READ: 340.9 MB/s

**Will It Work?**

FORMAT	ProRes 422 HQ		Cinema DNG RAW		10 Bit YUV 4:2:2	
	WRITE	READ	WRITE	READ	WRITE	READ
NTSC/PAL	✓	✓	✓	✓	✓	✓
720p50	✓	✓	✓	✓	✓	✓
720p60	✓	✓	✓	✓	✓	✓
1080i50	✓	✓	✓	✓	✓	✓
1080i60	✓	✓	✓	✓	✓	✓
1080p25	✓	✓	✓	✓	✓	✓
1080p30	✓	✓	✓	✓	✓	✓
1080p50	✓	✓	✓	✓	✗	✓
1080p60	✓	✓	✓	✓	✗	✓
2K DCI 25	✓	✓	✓	✓	✓	✓
2160p25	✓	✓	✗	✓	✗	✗
2160p30	✓	✓	✗	✓	✗	✗
2160p50	✓	✓	✗	✗	✗	✗
2160p60	✗	✓	✗	✗	✗	✗

**How Fast?**

ProRes 422 HQ	WRITE		READ	
	WRITE	READ	WRITE	READ
NTSC/PAL	694	1039	694	1039
720	463	693	463	693
1080	231	346	231	346
2K DCI	217	325	217	325
2160	58	87	58	87

**Cinema DNG RAW**

Cinema DNG RAW	WRITE		READ	
	WRITE	READ	WRITE	READ
NTSC/PAL	568	851	568	851
720	216	323	216	323
1080	96	144	96	144
2K DCI	62	93	62	93
2160	22	34	22	34

**10 Bit YUV 4:2:2**

10 Bit YUV 4:2:2	WRITE		READ	
	WRITE	READ	WRITE	READ
NTSC/PAL	256	383	256	383
720	97	145	97	145
1080	43	65	43	65
2K DCI	28	42	28	42
2160	10	15	10	15

# How to...

- Buy a flat (!) mini-PCIE (PCI Express) card to PCI-E (PCI Express) card
  - I bought this for US\$ 12: <https://www.aliexpress.com/item/4000337432516.html>



2020 New Mini PCIE to PCI-E Express X1+USB Riser Card with FFC Cable High Speed DIY 90 Degree Slot

★★★★★ 5.0~ 1 Review 1 order

**US \$10.08** ~~US \$13.62~~ -26%

US \$1.00 off on US \$25.00 [Get coupons](#)

Quantity:

— 1 + 9998 pieces available

**Shipping: US \$1.68**

to Singapore via Singapore Post~

Estimated Delivery: 16-36 days ?

**Buy Now**

**Add to Cart**

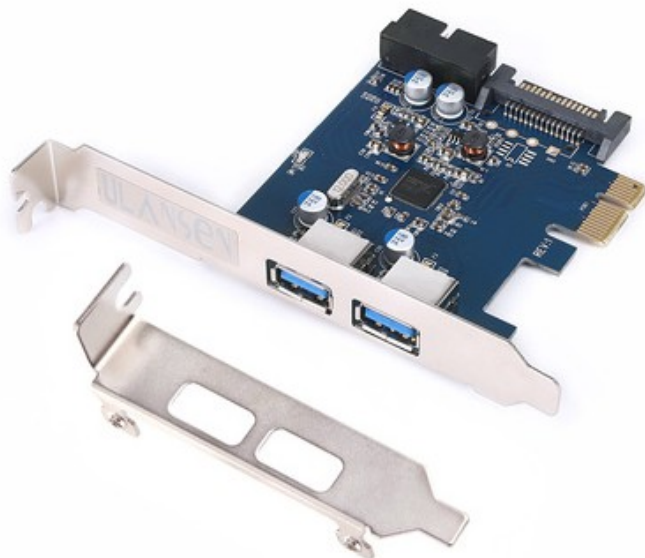
♥ 9

✓ **60-Day Buyer Protection**  
Money back guarantee

Check the mounting of the PCI-E connector! It needs to be horizontal.

# How to...

- Buy a 2-port USB3 card with **FRESCO FL1100** chip
  - A 4-port card will likely not fit into the space BUT I HAVE NOT VERIFIED THIS. TAKE A LOOK AT THE PICS TO DECIDE.
  - I bought this at Taobao (China local) for USD 10 incl. Shipping to Singapore: <https://a.m.taobao.com/i571660067813.htm>



## PCI-E转USB3.0 2口19pin扩展卡Mac Pro黑苹果转接卡免驱 FL1100

价格

¥30.00

约 SGD 6.04

9

累计评论

17

交易成功

配送

广东深圳 至 北京石景山区 ▾ 快递 免运费 ▾ 付款后3天内发货

数量

1

+

件(库存28件)

立即购买

加入购物车

承诺

官方物流配送

支付



Master



The card comes with a **short** SATA power splitter cable. You *may* require a longer SATA power splitter, depending on where you can tap power.

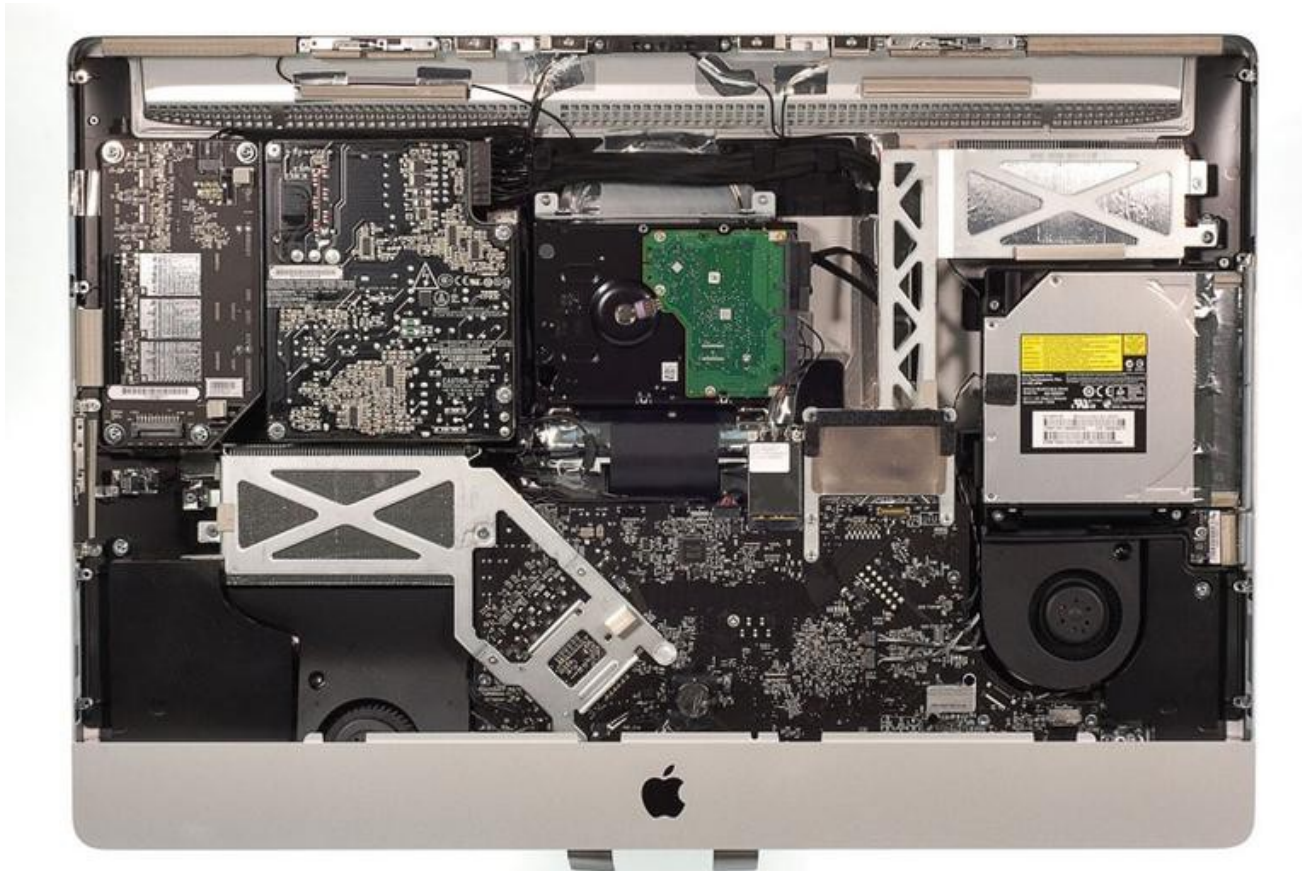
# How to...

- Since Taobao only ships within China, I can buy for you. Fix price (US\$ 15 at time of writing 2020-04) inclusive unregistered shipping from China via Singapore to your country. Add US\$2 for tracking option.
- Send enquiry to my MacRumors account “USB3foriMac”



# How to...

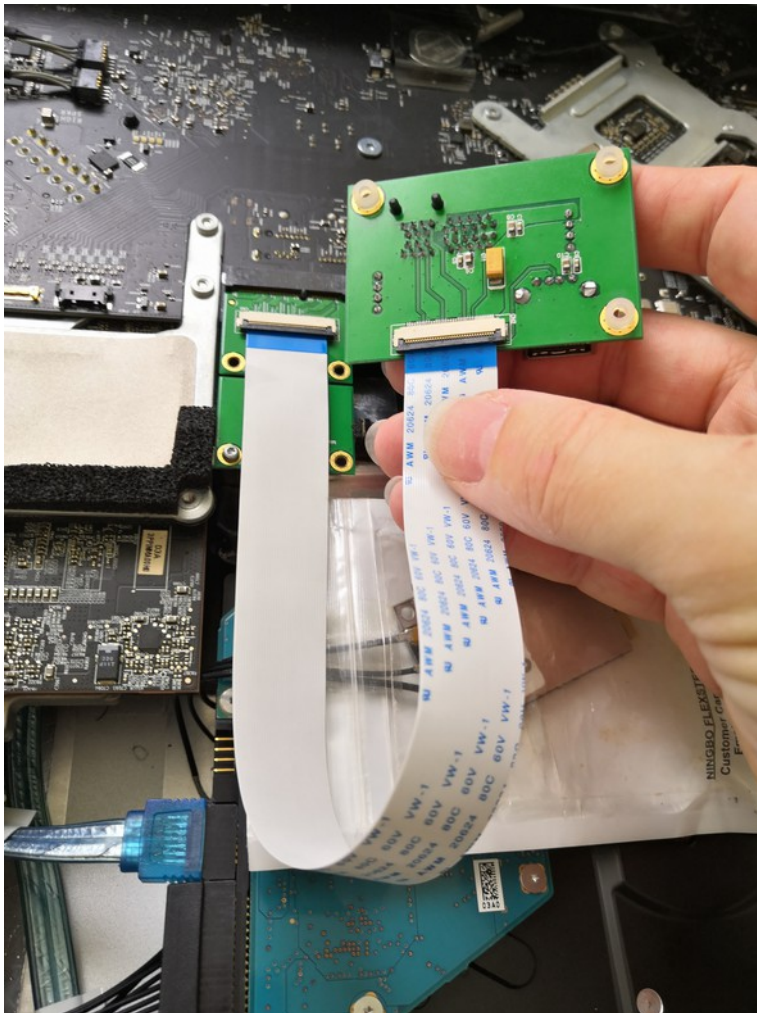
- Open iMac
  - Works for iMac 2011, all screen sizes.
  - Follow the guide on iFixit, e.g. This one:
  - <https://www.ifixit.com/Guide/iMac+Intel+27-Inch+EMC+2429+AirPort+Card+Replacement/7552>





# How to...

- Remove WLAN card, replace with mini PCIE adapter



Note the orientation of the flexible cable.

The card comes with a short and a long flexible cable. Use the long cable, not the short one.

To change, lift the brown lever upwards with **little** force.

Remove the short cable and insert the long one. Make sure the blue end is inserted properly into the socket. Then flip the lever back down to lock the cable in place.

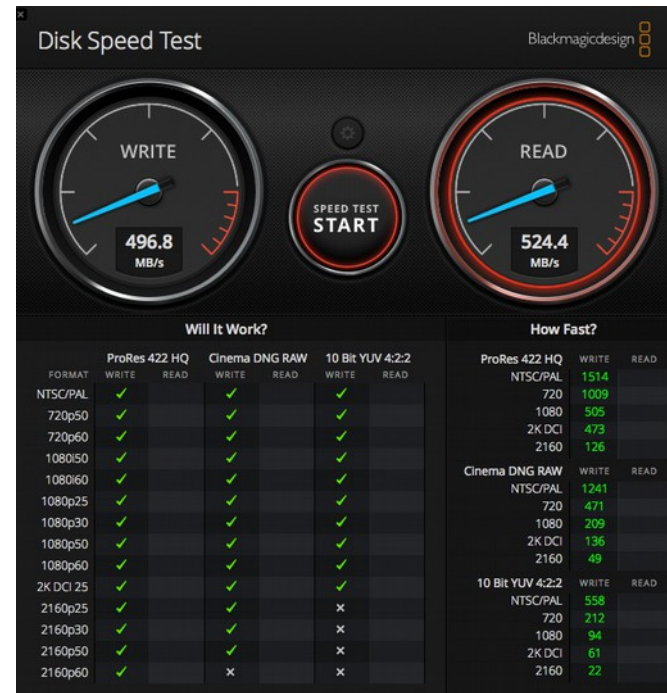
**Don't forget to tighten the small screw.**

# How to...

[https://www.ifixit.com/Guide/Installing+iMac+Intel+27-Inch+EMC+2429+Dual+Drive+Kit+\(HDD+or+SSD\)/7575](https://www.ifixit.com/Guide/Installing+iMac+Intel+27-Inch+EMC+2429+Dual+Drive+Kit+(HDD+or+SSD)/7575)

- Remove DVD drive, replace with SSD if desired. If you do so, best is to prepare two SATA connectors for SSD and USB3 card. If you don't have that, use the SATA power splitter which is included with the USB3 card.

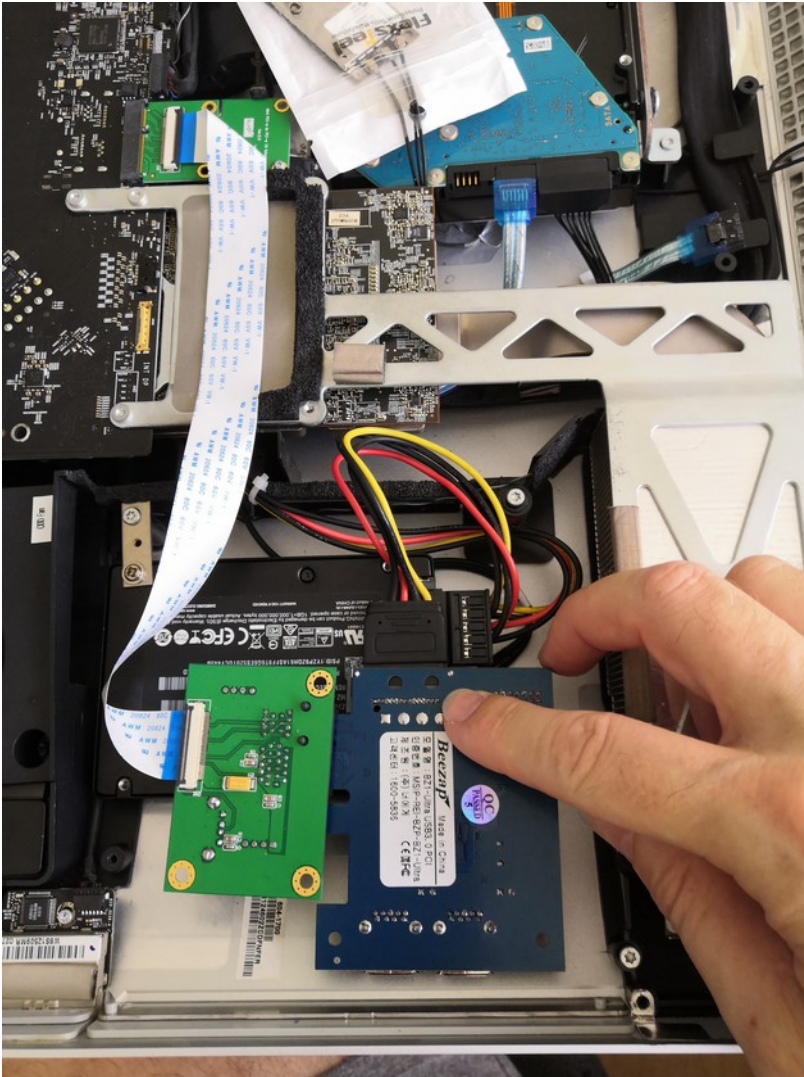
If you add SSD, make sure you use the “SSD” connector on the logic board, and not the ODD connector for the DVD drive. The DVD drive only runs with 3 Gigabit, the SSD connector can use 6 Gigabit. Only then will your SSD run at maximum possible speed.



Samsung  
850 Pro 1TB  
in iMac 2011

# How to...

- Position the PCIE adapter, together with your USB3 card



You need to be approximately 1cm away from the DVD slot.

If the aluminium back side is too flat, your hole need to be too large.

At 1cm away, the housing is sufficiently curved, so that the holes will be just nice.

You will not have to do precision work, as it is on the back. But the more precise you work, the nicer it will look.

Indicate the position of the USB3 ports with a marker/pencil.



# How to...

- Indicate the position of the USB3 ports with a marker/pencil.



Use double-sided tape and a huge plastic bag with cut-out to cover the electronics in your iMac. You do not want the grinded aluminium floating around in your electronics.

**KEEP YOUR ELECTRONICS FREE  
FROM ANY METAL DUST.**



# How to...

- Start by drilling a hole. If you have milling bits, use a milling bit which can mill with the face side (front/tip/whatever this is called).



**KEEP YOUR ELECTRONICS FREE  
FROM ANY METAL DUST.**

# How to...

- Keep in mind that the USB3 port needs to go through the hole **horizontally**. Hence, on each side of the hole, you need to flatten the metal so that you get a horizontal surface, as indicated.



**KEEP YOUR ELECTRONICS FREE  
FROM ANY METAL DUST.**

# How to...

- Use a rasp/file (the file on a swiss army knife is great for this!) to flatten both sides of the hole, even at the same time.



**KEEP YOUR ELECTRONICS FREE  
FROM ANY METAL DUST.**





# How to...

- Pretty smooth already...

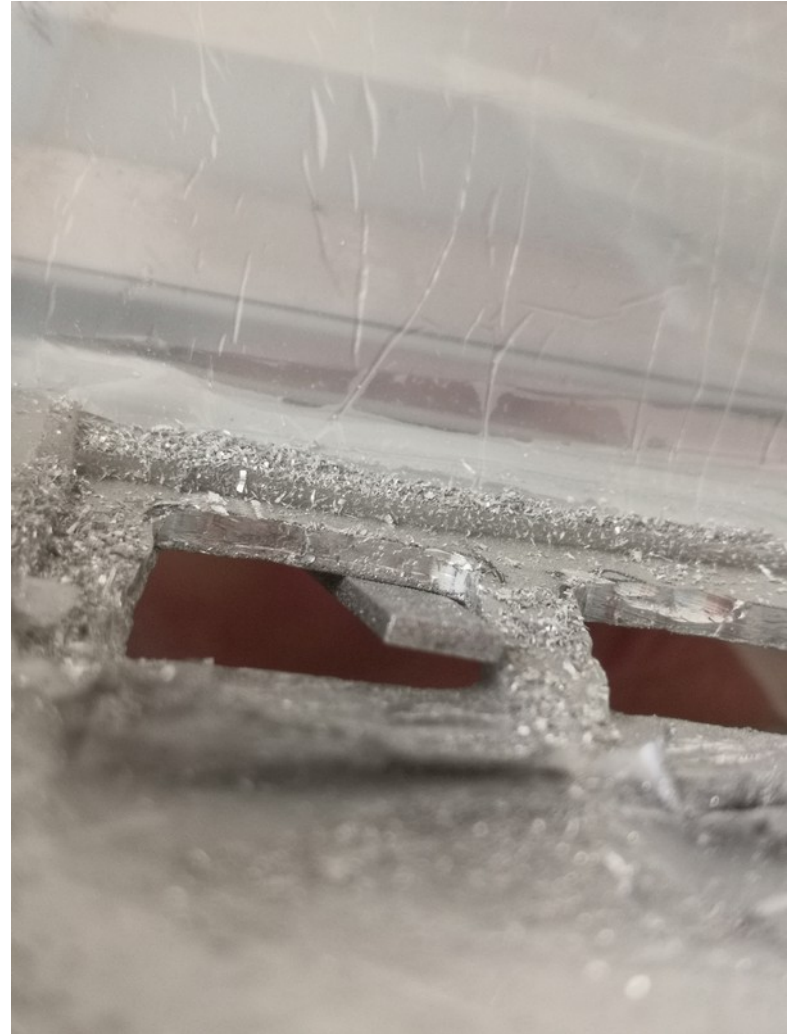


A bit more...



# How to...

- You can also use Dremel from the outside



Or file from the outside...

# How to...

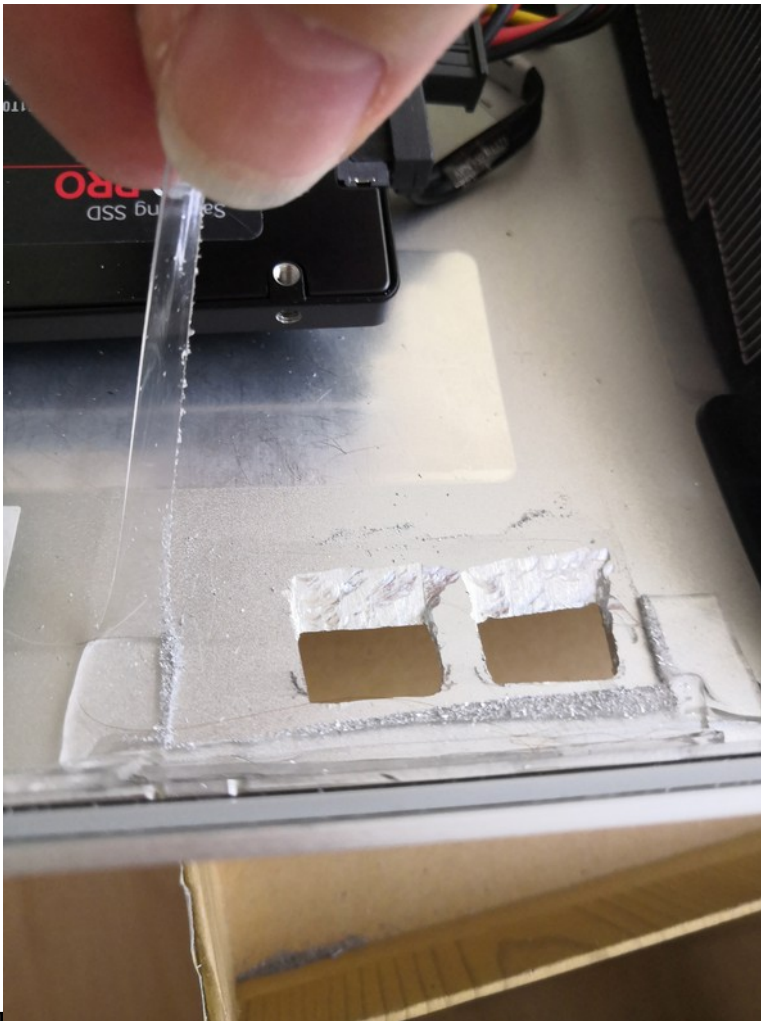
- Check now and then how the card fits. It needs to go through the holes!



This is how it should be...  
(except for the scratch...)

# How to...

- Done! The right hole is slightly larger and not entirely rectangular, due to the oval shape of the iMac housing.
- Remove the double-sided tape. USE VACUUM TO REMOVE ANY DUST!!!



This is how it should be..



# How to...



Mount the USB3 card to the PCI-E adapter card. Make sure you have a nice routing of your flexible cable. Don't fold it too tight on the blue part, as the blue section might tear off.

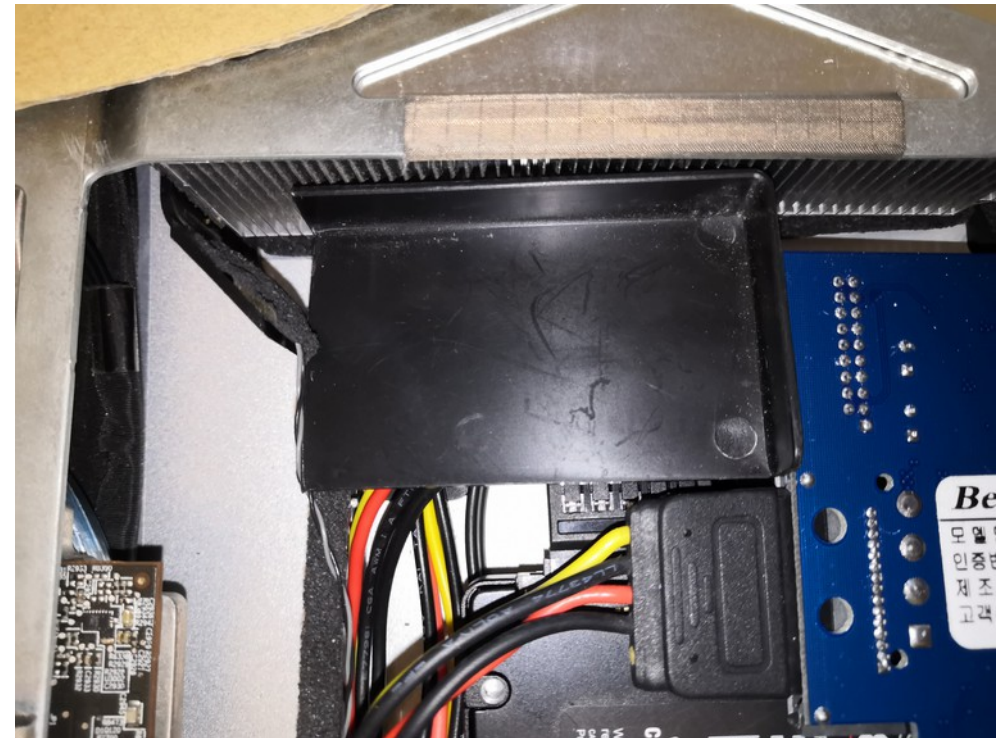
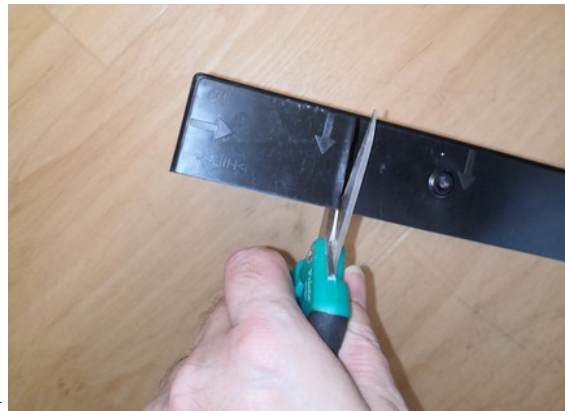
You can bend the flex cable, but try to avoid folding it firmly. This may cause signal distortions. Also, keep it away from other electronics. Best is to route it as shown.

You could now use plenty of hot glue to fix the USB3 card in place. I used another method: the black plastic piece.



# How to...

- Choose any plastic piece from your junk box that could be used to hold the card in place.
- Mark approximate dimensions, and cut to size (scissor, wire cutter, etc).



# How to...

- Cut the shape so that it can hold the USB3 card in place, but does not block the airflow to the GPU heatsink.



# How to...

- There is a mounting point where the DVD drive was screwed in. Mark the hole location on your plastic piece.





# How to...

- There is a mounting point where the DVD drive was screwed in. Mark the hole location on your plastic piece.



# How to...

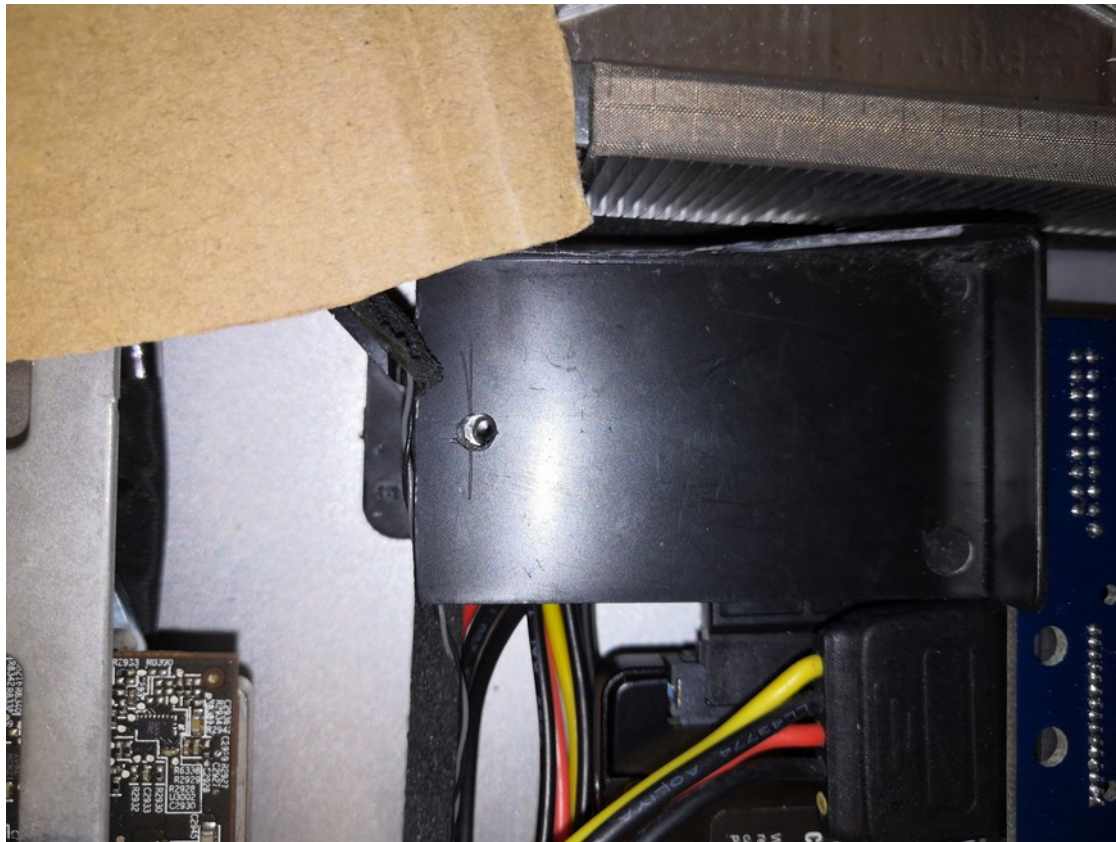
- Drill the hole.





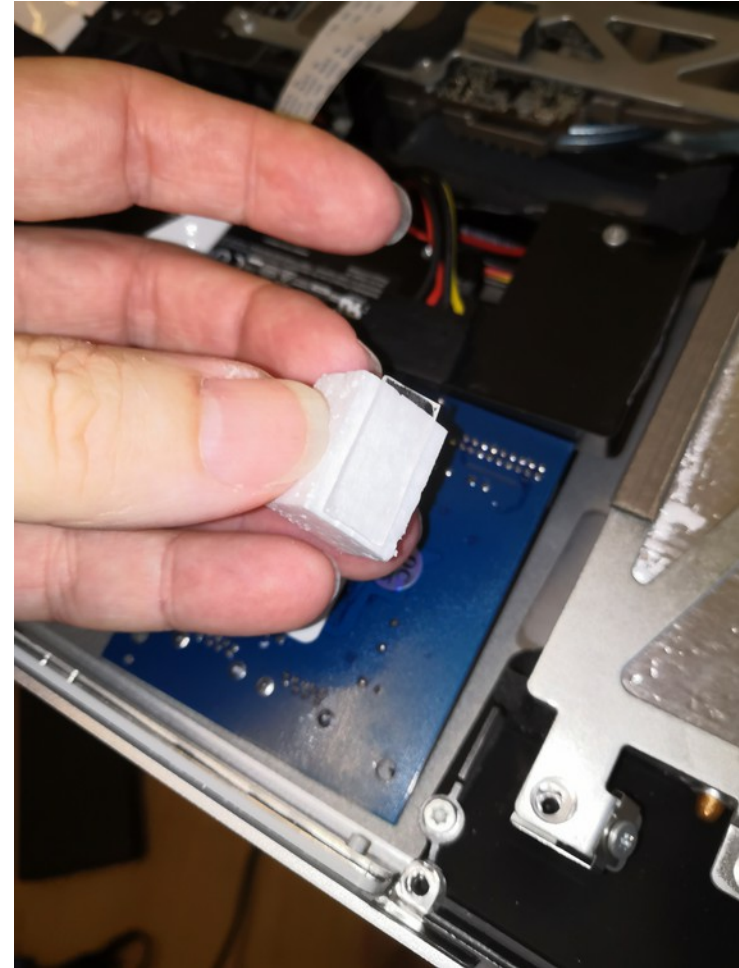
# How to...

- Well done, holes aligned. Screw it on.





# How to...



To avoid the card moving when inserting a thumbdrive, prepare some sponge with double-sides tape. I used styrofoam, but then make sure you cut accurately.

# How to...

If elastic foam, the high should be ~1cm more than the level of the GPU cooler.

If you use styrofoam, you should be only slightly (few mm) above the level of the GPU cooler.

Remember that the screen will sit on this, so your styrofoam should not apply much pressure onto the screen.



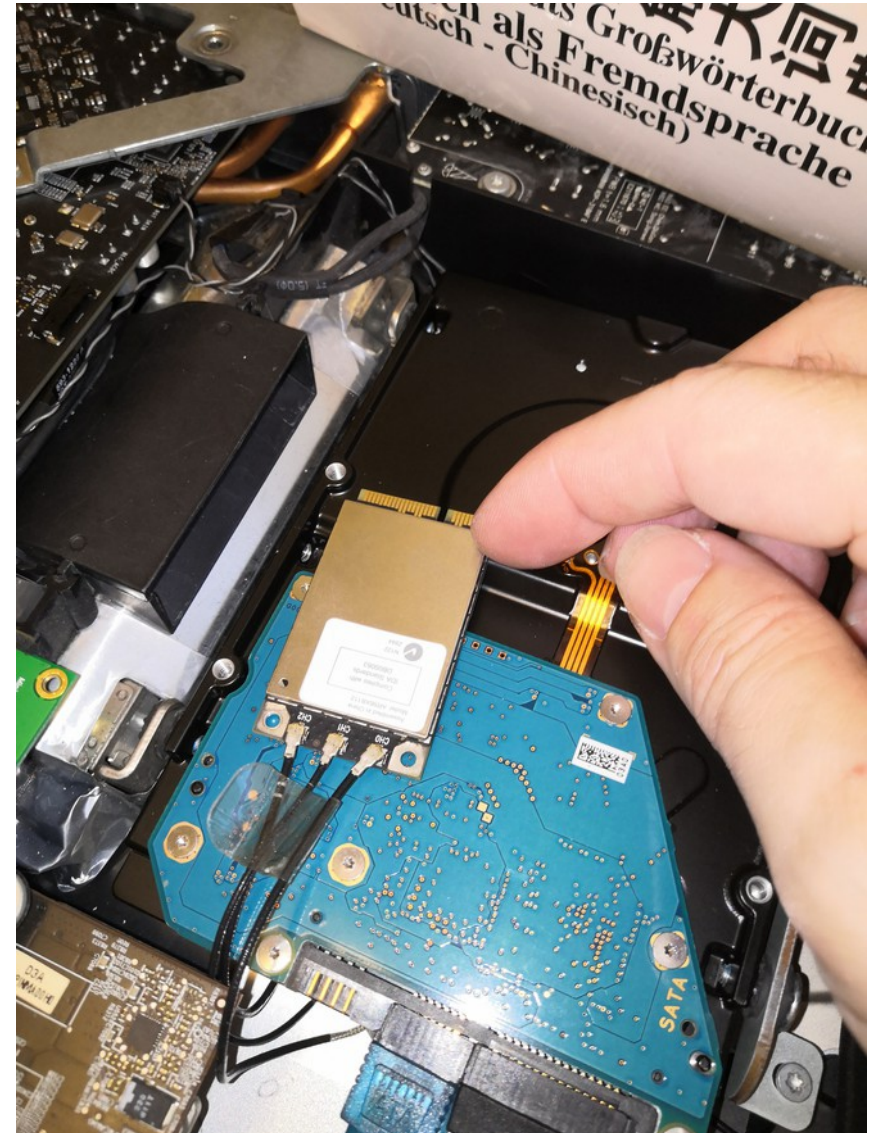


# How to...

Use some double-sided tape and get the old WLAN card out of the way. You can stick it onto the back of the HDD.

Make sure there is no electrical contact!

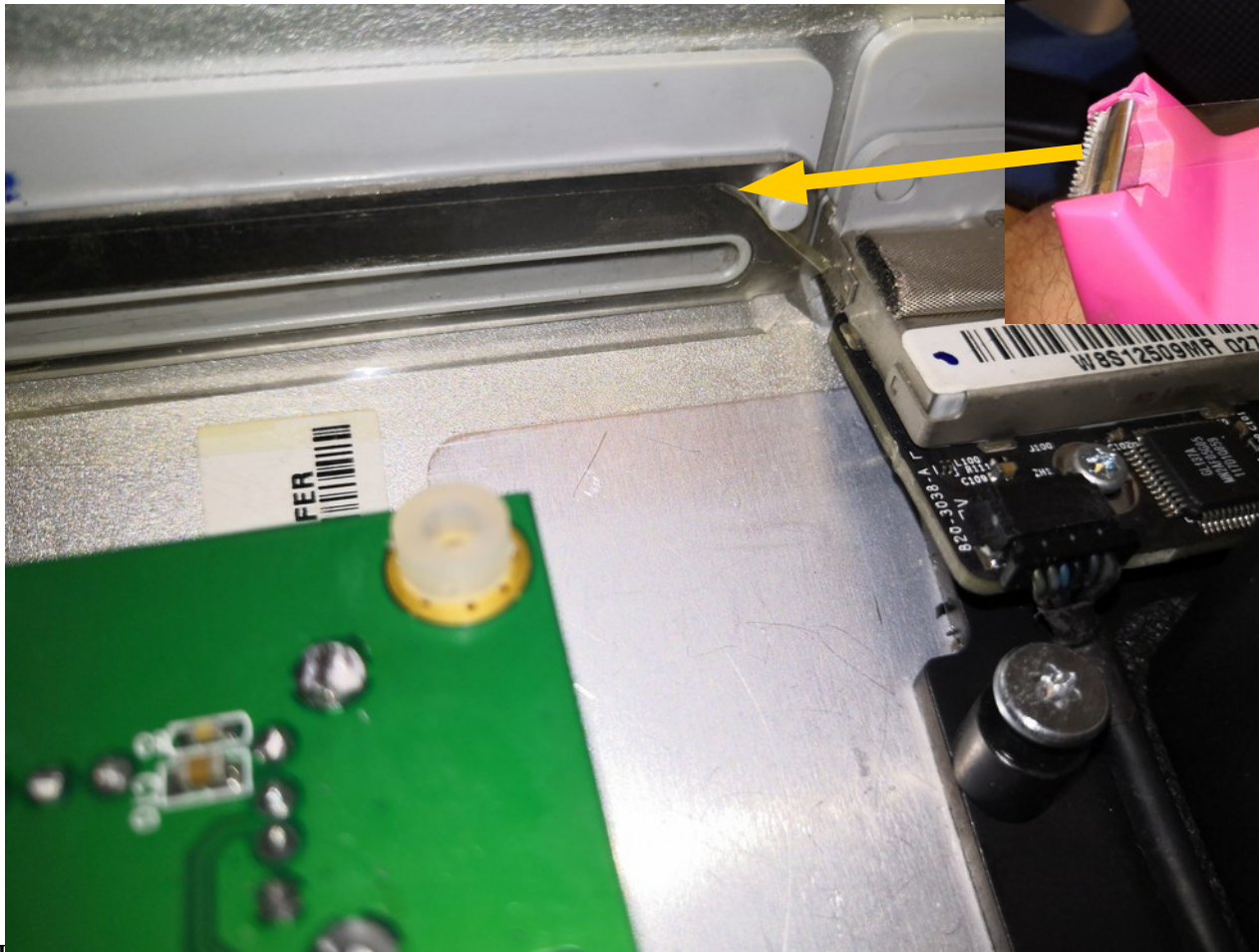
You can also remove the card entirely, and take the three antenna wires to something.





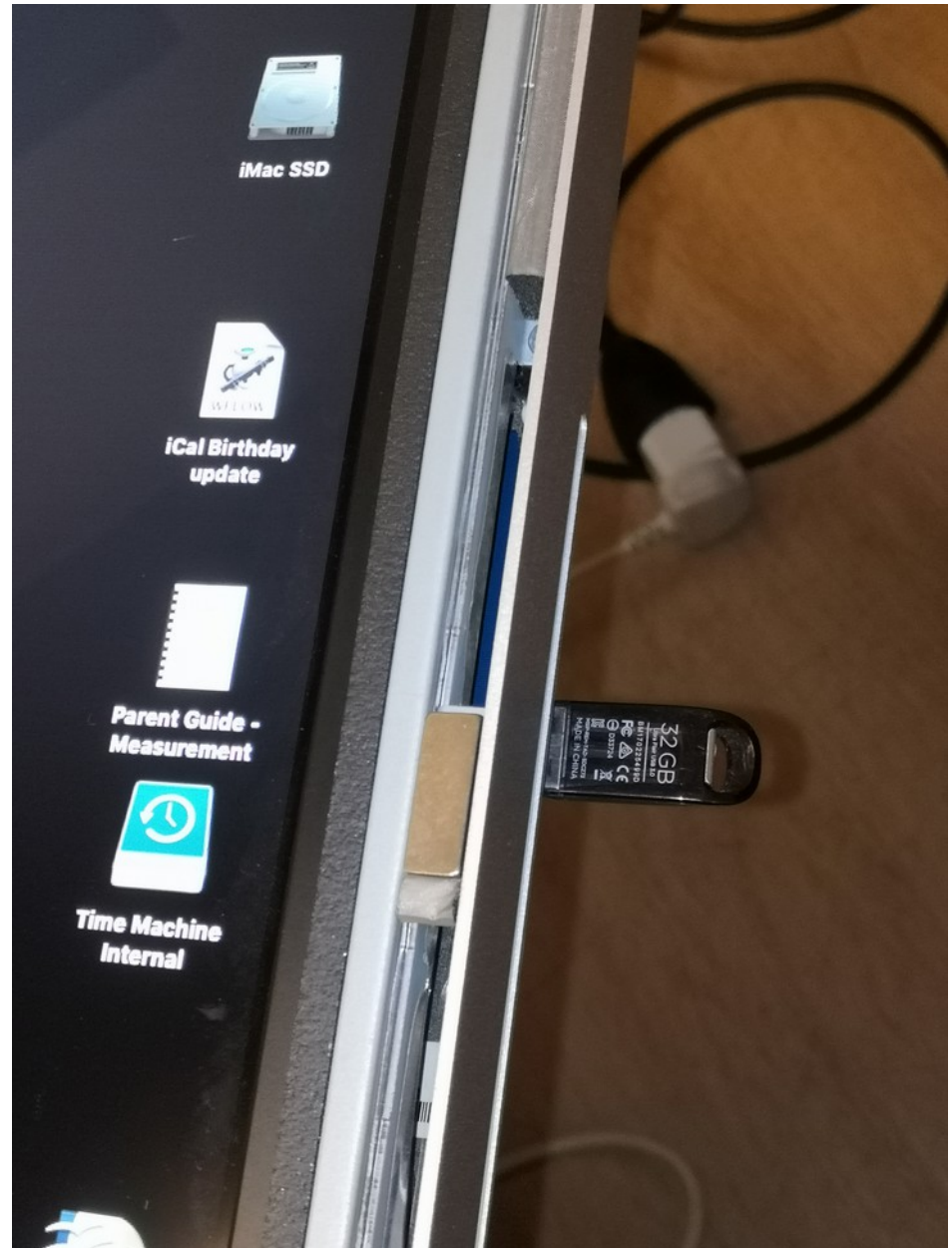
# How to...

Apply some tape on the INSIDE of the DVD drive slot.  
This is to avoid dust getting in.



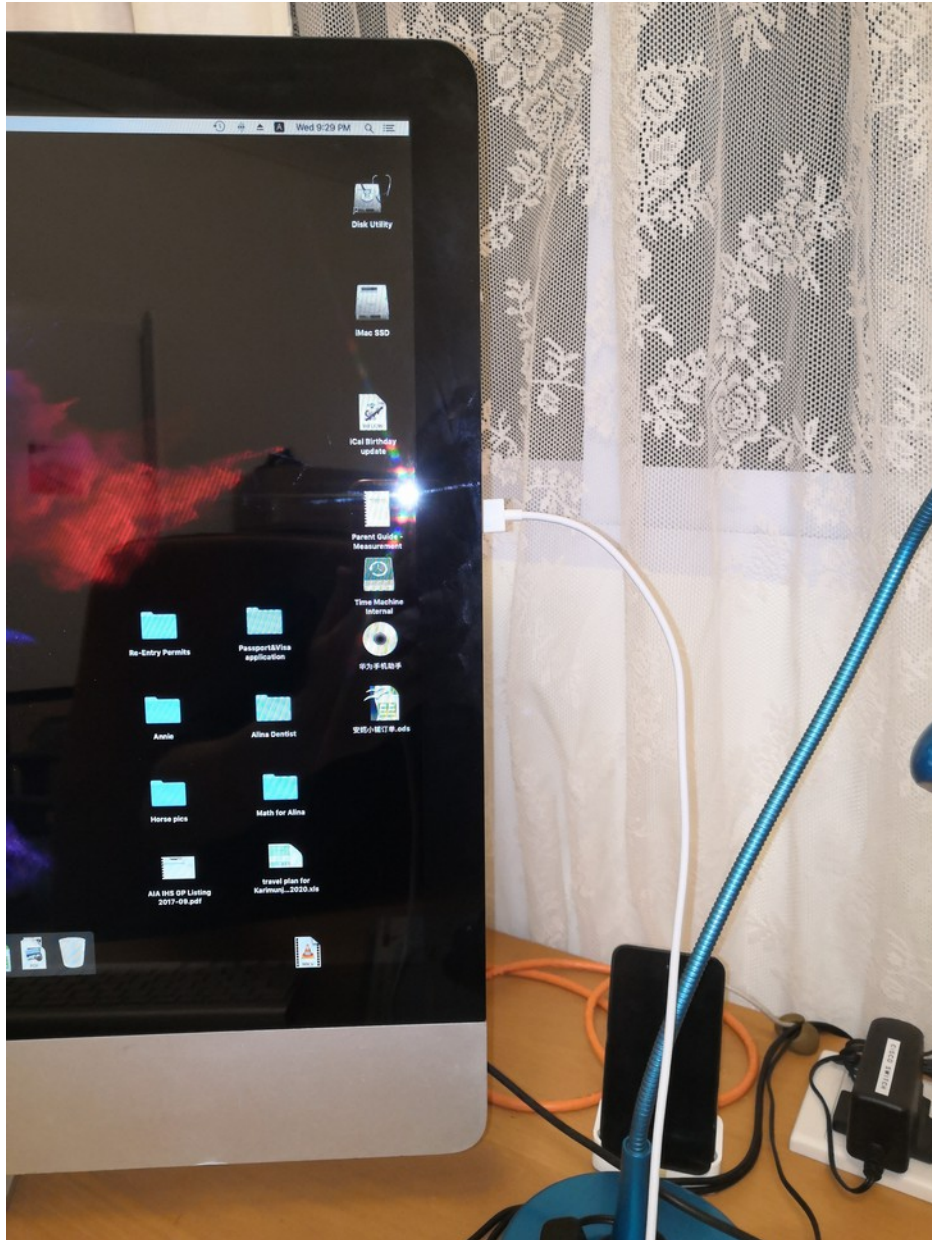
# How to...

Mount the screen for a test. If it works, assemble properly.





# That's it





# How to...

Mount the screen for a test. If it works, assemble properly.

