

# The USB Situation

Cables are one part data and one part charging. 

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## The Big Lie "IT'S USB-C, SO IT ALL WORKS THE SAME."

### THE LIE

Every USB-C cable and port looks identical, so they must all do the same thing. Except a USB-C port running USB 2 and a USB-C port running Thunderbolt 5 differ by 250x.

### THE TRUTH

USB-C is a **connector shape** — the small oval that plugs in either way. (USB-A is the rectangle you have to flip three times.) The protocol running through it (USB 2, USB 3, USB4, Thunderbolt) determines speed, display, and power.

### THE CHAIN

Your speed = the weakest link in the chain. A USB 2 cable in a Thunderbolt 5 port guarantees you get USB 2 speed... just like the original iPod.

## Why Is This So Hard? A SHORT LIST OF THINGS NOBODY TOLD YOU.

### THE TRAP

#### You can't tell by looking

### WHAT'S GOING ON

A \$3 USB 2 cable and a \$99 Thunderbolt 5 cable are identical on the outside. One moves 50 GB in 24 minutes; the other does it in 8 seconds.

#### Apple doesn't mark their ports

Every USB-C port on every Mac looks identical, but the MacBook Neo's left port runs 20x faster than the right one. macOS will tell you when you've plugged into the wrong one, which is fine until you're reaching behind a desk in the dark.

#### The cable in the box is called a "Charge Cable"

That's the entire disclosure, printed on a box you threw away. Apple ships every device with a charging cable rather than a data cable, the same pattern as their chargers.

#### Even the cable can lie

USB-C cables above USB 2 carry a small chip (the "e-Marker") that tells the device what the cable can do. Manufacturers can program that chip to lie, and verifying the truth requires test equipment that starts in the five figures. USB-IF certification is the only filter most of us have.

## What Each Port Delivers SEVEN POTENTIAL PROTOCOLS AT THE PORT. THE CABLE DECIDES.

USB 2 and USB 3 are the old open standards; Thunderbolt is Intel's premium tier. USB4 (2019) is USB-IF's open version of Thunderbolt 3 — same 40 Gb/s, but features like dual 4K are optional rather than guaranteed. "USB4" on a box could mean almost anything.

STANDARD	CONNECTOR	MAX SPEED	~50 GB TRANSFER	MONITORS	MAX POWER
<b>USB 2</b>	A or C	480 Mb/s	<b>~24 min</b>	—	15W
<b>USB 3</b> (5 Gb/s)	A or C	5 Gb/s	~2 min	—	100W
<b>USB 3</b> (10 Gb/s)	A or C	10 Gb/s	~1 min	1× 4K	240W
<b>USB4</b>	C only	40 Gb/s	~17 sec	2× 4K	240W
<b>Thunderbolt 3</b>	C only	40 Gb/s	~17 sec	1–2× 4K	100W
<b>Thunderbolt 4</b>	C only	40 Gb/s	~17 sec	2× 4K	100W
<b>Thunderbolt 5</b>	C only	120 Gb/s	<b>~8 sec</b>	3× 4K	240W

USB 2 and USB 3 come in both USB-A (the rectangle) and USB-C (the oval). USB4 and Thunderbolt are USB-C only. The "same shape" problem is about USB-C — everything from USB 2 through Thunderbolt 5 runs through the same oval plug. Transfer times assume a modern SSD. Monitor counts are maximums — check the device tables below. Data speed matters when you're moving large files: backups, video projects, external drives. For keyboards, mice, or charging, USB 2 is fine. For details on charging, see [The Apple Charging Situation](#).

## MacBooks THE ONE DEVICE THAT ACTUALLY NEEDS A DATA CABLE. NONE OF THEM SHIP WITH ONE.

DEVICE	USB-C PORTS	PROTOCOL	MAX SPEED	MAX DISPLAYS
<b>MBP 16"/14"</b> (M5 Max)	3 + HDMI	Thunderbolt 5	<b>120 Gb/s</b>	4
<b>MBP 16"/14"</b> (M5 Pro)	3 + HDMI	Thunderbolt 5	<b>120 Gb/s</b>	3
<b>MBP 14"</b> (M5)	3 + HDMI	Thunderbolt 4	40 Gb/s	2
<b>Air 15"/13"</b> (M5)	2	Thunderbolt 4	40 Gb/s	2
<b>MacBook Neo</b>	2	USB 3 + USB 2	10 Gb/s†	1

†Left port: USB 3 (10 Gb/s) with DisplayPort 1.4. Right port: USB 2 (480 Mb/s), no display. They look identical; macOS will tell you if you plug a display into the wrong one. All MacBooks ship with a MagSafe or USB-C charge cable rather than a data cable — whatever you plug in for transfers, you supplied. (The Neo also ships with a 20W charger on a 30W device.)

## iPhones ONLY THE PRO IPHONES GET THE FAST PORT.

DEVICE	PROTOCOL	SPEED	VIDEO OUT	CABLE GAP
<b>iPhone 17 Pro Max · 17 Pro</b>	USB 3	10 Gb/s	DisplayPort ✓	<b>20x</b>
<b>iPhone 17</b>	USB 2	480 Mb/s	DisplayPort ✓	—
<b>iPhone 16 · 16 Plus</b>	USB 2	480 Mb/s	DisplayPort ✓	—
<b>iPhone 17e · Air</b>	USB 2	480 Mb/s	None	—

"Cable Gap" = how much faster the port is than the USB-C Charge Cable in the box (USB 2, 480 Mb/s). The 17e and Air can't output video over USB-C at all — no DisplayPort support. Every iPhone box contains the same cable.

## iPads **THUNDERBOLT PORT, USB 2 CABLE IN THE BOX.**

DEVICE	PROTOCOL	SPEED	MAX DISPLAY	CABLE GAP
<a href="#">iPad Pro 13"/11" (M5)</a>	Thunderbolt / USB 4	40 Gb/s	6K@60Hz	<b>83x</b>
<a href="#">iPad Air 13"/11" (M4)</a>	USB 3	10 Gb/s	6K@60Hz	<b>20x</b>
<a href="#">iPad mini (A17 Pro)</a>	USB 3	10 Gb/s	4K@60Hz	<b>20x</b>
<a href="#">iPad (A16)</a>	USB 2.0	480 Mb/s	4K@60Hz	—

Every iPad ships with a 20W adapter and a "USB-C Charge Cable" — USB 2 speeds. The iPad Pro's Thunderbolt port is 83x faster than the cable in its \$1,299 box. The cable that actually uses the port costs \$69–\$129.

## Your Cables **WHY "CHARGE CABLE" IS THE ENTIRE DISCLOSURE.**

CABLE	WHERE IT CAME FROM	SPEED	GOOD FOR
<a href="#">USB-C Charge Cable (1 m)</a>	Every iPhone & iPad box	<b>480 Mb/s</b>	Charging
<a href="#">USB-C Charge Cable (1.5 m)</a>	MacBook Neo box	<b>480 Mb/s</b>	Charging
<a href="#">USB-C to MagSafe 3 (2 m)</a>	MacBook Air & Pro box	No data	Charging only
<a href="#">240W USB-C Charge Cable (2 m)</a>	Apple Store	<b>480 Mb/s</b>	Charging (240W!)
<a href="#">Short thick USB-C</a>	External SSD	10 Gb/s	Data transfers
<a href="#">Thunderbolt 4 Pro Cable (1–3 m)</a>	Apple Store, dock	<b>40 Gb/s</b>	Everything (100W)
<a href="#">Thunderbolt 5 Pro Cable (1 m)</a>	Apple Store	<b>120 Gb/s</b>	Everything (240W)
<a href="#">USB-A to USB-C</a>	Old phone, accessories	5 Gb/s max	Peripherals
<a href="#">USB-A to Lightning</a>	The drawer	—	Nothing anymore

The 240W Charge Cable is the trap — it looks premium, charges at full speed, and still transfers data at USB 2. The Thunderbolt Pro Cables are what actually match your ports. Thunderbolt 4 Pro: \$69 (1 m) / \$129 (1.8 m) / \$159 (3 m). Thunderbolt 5 Pro: \$69 (1 m only). For longer Thunderbolt 5 runs, see [CalDigit \(2 m, \\$140\)](#) — which Apple itself resells in a 0.5 m version — or [OWC \(2 m, \\$80\)](#).

## When the Cable Matters **FOR MOST THINGS, ANY CABLE WORKS. CHILL.**

### CABLE DOESN'T MATTER

Charging a phone or laptop (any USB-C cable does it). Keyboards, mice, audio interfaces, printers. The "USB-C Charge Cable" in the box is fine.

### CABLE MATTERS

External SSDs and large file transfers. Driving an external display. One-cable docks. eGPUs. Backing up an iPhone Pro at full speed.

## What You Can Actually Do MINIMUM PORT AND CABLE FOR COMMON SETUPS.

TASK	MINIMUM PORT	MINIMUM CABLE	NOTES
Charge a laptop	Any USB-C	Any USB-C	Wattage matters, not protocol
One 4K@60Hz display	USB 3 + DisplayPort	USB 3+ cable	Or any Thunderbolt port
Two 4K displays	Thunderbolt 4	Thunderbolt 4 cable	Check your Mac's display limit
Fast external SSD	USB 3 (10 Gb/s)	USB 3 cable	The SSD's cable usually works
eGPU	Thunderbolt 3+	Thunderbolt cable	Thunderbolt only — USB4 won't work
One-cable dock	Thunderbolt 3+	Thunderbolt cable (short)	Power + display + data, one plug
Keyboard, mouse	Any	Any	USB 2 is fine for input devices

These are floor specs, not recommendations. A Thunderbolt cable handles all of them, so if you have a Thunderbolt port, buy one good Thunderbolt cable and stop thinking about it.

## The One Cable to Buy TWO CABLES, DEPENDING ON WHETHER YOU HAVE THUNDERBOLT.

TIER	CABLE	PRICE	WHAT IT BUYS YOU
Premium	<a href="#">Apple Thunderbolt 5 Pro Cable (1 m)</a>	<b>\$69</b>	120 Gb/s, 240W charging, DisplayPort 2.1. Down-shifts cleanly through Thunderbolt 4, USB4, USB 3, and USB 2 — every Apple port from a Vision Pro to a Mac Pro talks to it at full spec. Metal-clad connectors and a braided jacket. The cable that survives a year in a backpack.
Value	<a href="#">Cable Matters 10 Gbps USB-C (1 m)</a>	<b>~\$15</b>	USB 3 at 10 Gb/s, 100W charging, up to 8K@60Hz over DisplayPort. Exactly matches the iPhone Pro, iPad Air, and MacBook Neo USB 3 ports. USB-IF certified. The right answer if you don't have a Thunderbolt port.

**"Apple if you have Thunderbolt. Cable Matters if you don't."**

*Skip the look-alikes.* Apple's [240W USB-C Charge Cable](#) (\$39) charges at full speed but transfers at USB 2; "Charge" in the name is meant literally. Anker's [765 240W braided cable](#) looks like the obvious upgrade and is also USB 2 only. The [Apple Thunderbolt 4 Pro Cable](#) is fine but caps at 40 Gb/s and 100W; at 1 m the [Thunderbolt 5 cable](#) costs the same and future-proofs you for 240W and 120 Gb/s.

## How They Renamed It USB-IF RENAMED 5 GB/S FOUR TIMES IN 15 YEARS.

YEAR	THEY CALLED 5 GB/S	YEAR	THEY CALLED 10 GB/S
2008	<b>USB 3.0</b>	2013	<b>USB 3.1 Gen 2</b>
2013	<b>USB 3.1 Gen 1</b>	2017	<b>USB 3.2 Gen 2</b>
2017	<b>USB 3.2 Gen 1</b>	2023	<b>USB 10Gbps</b>
2023	<b>USB 5Gbps</b>		<i>Three names, one speed.</i>

Every time USB-IF added a faster tier, they renamed the old ones so existing products sounded current. In 2023 they finally switched to speed-based names — the right call. But manufacturers still use the old "Gen" names on boxes. Both systems coexist.

## The Lunacy A SHORT LIST OF THINGS THAT SHOULD NOT BE TRUE.

THE FACT	WHAT'S ACTUALLY HAPPENING
<b>USB4 has no space in the name</b>	USB-IF wanted a clean break from the "USB 3.x Gen X" pattern. They rebranded by deleting a space character.
<b>Every Thunderbolt port also speaks USB4</b>	No Apple device is labeled "USB4." Only the iPad Pro gets the hybrid "Thunderbolt / USB 4" label.
<b>USB-IF switched to speed-based names in 2023</b>	Manufacturers ignored it. Boxes still say "USB 3.2 Gen 2x2." Apple just calls it "USB 3 (10 Gb/s)."
<b>Most cables aren't labeled</b>	Thunderbolt cables get a small lightning bolt with a version number. Everything else — including every charge cable Apple ships — typically has no marking.

A few flickers of progress: the EU is requiring physical wattage labels ("60W" or "240W") on every USB-C cable plug by December 2028 ([Regulation 2025/2052](#)). Thunderbolt 5 mandates what USB4 v2 makes optional, so the Thunderbolt 5 logo is finally a useful guarantee. The MacBook Pro M5 Pro/Max ships with Thunderbolt 5 across the line — the first of Apple's lineup to consolidate.

## The Cheat Sheet TAPE THIS TO THE INSIDE OF A DRAWER.

WHEN THEY SAY	THEY MEAN
<b>USB-C</b>	A connector shape. Not a speed. Not a protocol. Just an oval hole.
<b>USB-A</b>	The rectangle. Black/white interior = USB 2 (480 Mb/s); blue interior = USB 3 (5–10 Gb/s). No Thunderbolt, no USB4, no DisplayPort.
<b>USB 2.0 · Hi-Speed</b>	480 Mb/s. The phone cable speed.
<b>USB 3.0 · 3.1 Gen 1 · 3.2 Gen 1 · USB 5Gbps</b>	All the same thing: <b>5 Gb/s</b> . Four names for one speed.
<b>USB 3.1 Gen 2 · 3.2 Gen 2 · USB 10Gbps</b>	All the same thing: <b>10 Gb/s</b> . What Apple calls "USB 3."
<b>USB4</b>	40 Gb/s. Open standard. Features optional — check the device.
<b>Thunderbolt 3</b>	40 Gb/s. Intel certified. Features vary by implementation.
<b>Thunderbolt 4</b>	40 Gb/s. Intel certified. Features <b>guaranteed</b> rather than optional.
<b>Thunderbolt 5</b>	120 Gb/s. Intel certified. Everything guaranteed.
<b>Thunderbolt / USB 4</b>	Apple's label for the iPad Pro port. Thunderbolt 3 speeds, USB4 compatible.
<b>USB-C Charge Cable</b>	Apple's included cable. Charges fine; transfers data at USB 2 (480 Mb/s).
<b>240W USB-C Charge Cable</b>	Full-speed charging, still USB 2 data. "Charge" in the name is meant literally.
<b>Thunderbolt Pro Cable</b>	The cable that actually matches your port. \$69–\$159.

**"Every Thunderbolt port also supports USB4. The iPad Pro is the only Apple device that admits it on the label."**

### HOW THIS WAS BUILT

Designed and researched by Rands. Built by Grumbles, *who can identify a USB 2 cable by weight alone*.

All specs from [apple.com](#) tech specs pages. Transfer times are estimates assuming a modern SSD (±20%). Real-world speeds depend on the cable, the drive, and the phase of the moon. [Receipts & Revisions](#).

