USB-C cable validation record

POWER-Z AK001 / 1.5 m

ChargerLAB

100Vac / 50Hz | One specimen | Measured and reviewed 2026-10-21 | Fixed PDO screening and display comparison

Principal findings

Electrical screening completed all 29 cases in one selected run (SCREENING_COMPLETE). Seven Fixed voltage levels reached the planned 3A or 5A load; each loaded hold supplied 120 steady samples over a configured 120 seconds. At nominal 48V/5A, median ASD input was 47.252V / 236.262W.

All steady measurements remained within the separate nominal +/-1V observation band. Loaded cases used a +/-1.5V live stop; this distinction is retained and is not a USB-IF compliance statement.

At seven selected simultaneous video views, AK001 displayed current approximately 7.9-10.4% above the ASD panel. At 48:00, AK001 showed 5.51861A / 259.174W while ASD showed 5.000A; ASD power calculated from its visible voltage and current was 236.275W.

Specimen and bench

Item	Recorded condition
Source	Framework FRANDVCH00_s_sample1 / C1 / 240W
Input	100Vac / 50Hz (operator-set metadata)
Power path	Source -> DUT cable -> CY4500-EPR -> ASD-PD31
Control	ASD-PD31 v5.8.13 / COM3 / 115200 / CC2
Procedure	Fixed 5, 9, 15V at up to 3A; 20, 28, 36, 48V at up to 5A
Public baseline	Reference A 1.0 m / 2026-10-17

AK001 orientation: recorded as as-connected; the physical end assignment was not documented. No all-orientation claim is made.

Electrical screening results

E01 is the selected complete 29-case acquisition. The table uses steady ASD readings at the electronic-load input; the nominal rating and actual received power are distinguished.

Target V	Load A	Voltage min / median / max (V)	Median W	N
5	3.0	4.971 / 4.974 / 4.979	14.924	120
9	3.0	8.670 / 8.674 / 8.677	26.022	120
15	3.0	14.667 / 14.671 / 14.675	44.013	120
20	5.0	19.364 / 19.371 / 19.380	96.857	120
28	5.0	27.256 / 27.264 / 27.274	136.320	120
36	5.0	35.239 / 35.249 / 35.258	176.240	120
48	5.0	47.243 / 47.252 / 47.262	236.262	120

Each hold: configured 120s, 1s startup settling, approximately 1s sampling, 120 steady readings. N counts steady samples, not prechecks. Power is the recorded ASD voltage-current product; it is not source-side delivered power.

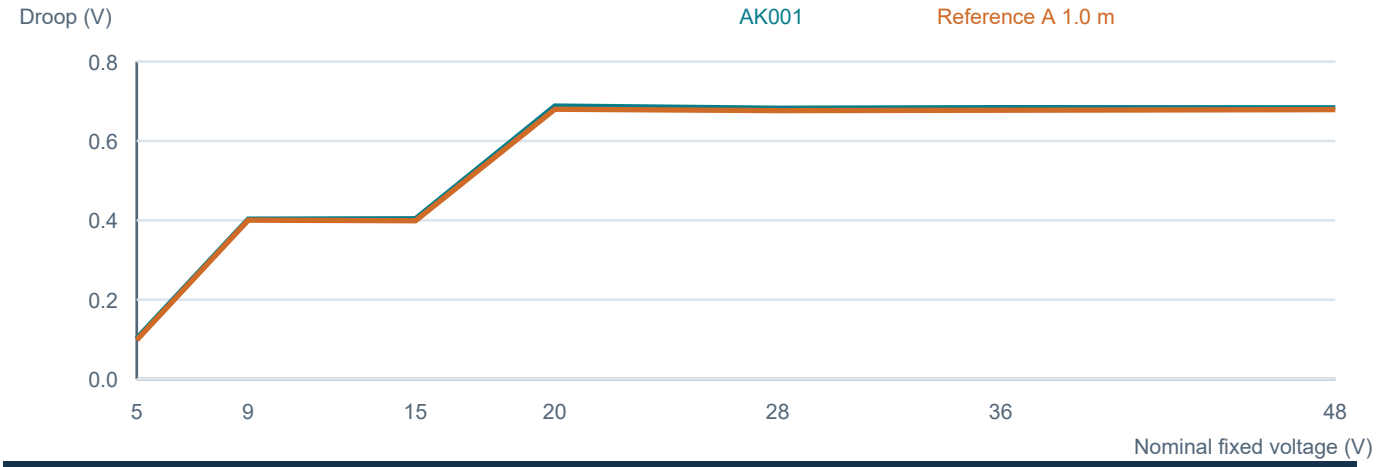
Round-trip load-current sweeps

Target V	Range A	Leg/point groups	Readings	Result
5	0.1 - 3.0	31	93	PASS
9	0.1 - 3.0	31	93	PASS
15	0.1 - 3.0	31	93	PASS
20	0.1 - 5.0	51	153	PASS
28	0.1 - 5.0	51	153	PASS
36	0.1 - 5.0	51	153	PASS
48	0.1 - 5.0	51	153	PASS

0.2A increments, three readings per point, outward and return legs. A shared turning point may belong to one leg only. Fourteen additional cases provide paired 0.1A before/after baselines; the final case checks the highest Fixed voltage returning to 5V at light load. All 29 cases passed with verified LOAD_OFF.

Comparison with Reference A 1.0 m

Paired light-load / loaded / light-load medians reduce the effect of a single nominal-voltage offset. The chart compares the observed change along the entire bench path.



Target V	DUT droop V	Reference droop V	Extra droop mV	Path mOhm
5	0.1025	0.0985	+4.0	35.3
9	0.4030	0.4005	+2.5	139.0
15	0.4040	0.3990	+5.0	139.3
20	0.6880	0.6800	+8.0	140.4
28	0.6825	0.6765	+6.0	139.3
36	0.6840	0.6775	+6.5	139.6
48	0.6835	0.6790	+4.5	139.5

Droop = mean(before/after 0.1A voltage medians) - loaded-hold voltage median. Apparent path resistance = droop / measured high-low current difference. Positive extra droop means more droop than Reference A.

AK001 showed about 3-5mV extra droop at 3A and 5-8mV at 5A relative to the baseline. These small differences do not establish an accuracy-qualified ranking.

These are not isolated cable resistance measurements: source regulation, connectors, CY4500 and ASD input are included. Reference A was measured on 2026-10-17; the earlier ASD control used RS232, whereas this acquisition used USB Type-B. Contact repeatability and drift are not removed, and no traceable uncertainty budget is supplied.

CH32 cable identity evidence

The loaded test is linked by SHA-256 to the indicated CH32 session. The usable cable response declares passive-cable, 5A / 48V and USB2 capabilities.

Field	Observed value
Linked evidence / CC	C03 / CC1
Cable VDO	000A4650
VID / PID	2F85 / 0001
Cable capability	5A / 48V / passive / USB2
Identity basis	SOP-prime observation; operator-declared specimen association

All supplied identity sessions

ID	CC	Overall	Cable	Capability basis
C01	1	PASS	unknown	Identity not established
C02	2	PASS	unknown	Identity not established
C03	1	PASS	pass	5A / 48V
C04	2	PASS	unknown	Identity not established

The first capture produced cable UNKNOWN on both CC1 and CC2. The second capture supplied the linked CC1 cable PASS; CC2 remained UNKNOWN. All four sessions are retained. Source overall PASS must not be treated as cable identity PASS. Fallback values such as 0A / 20V in UNKNOWN rows are not established cable ratings.

Scope and untested properties

Fixed PDO power screening only. The source has no PPS; SPR/EPR AVS was not load-tested here. No USB throughput or signal-integrity test, complete end/CC reversal matrix, insulation, mechanical or long-term endurance qualification was performed. A declared 240W or USB2/480Mbps capability is not certification or measured data throughput.

Temperature fields refer only to the fan-dependent ASD-PD31 internal temperature. They do not measure the source, cable, connectors or display unit. ASD ripple values have no independently established measurement bandwidth or calibration in this record.

Simultaneous video display comparison

V01: seven selected frames show the ASD panel and cable display at the same time. Times below are elapsed video times. Currents are manually transcribed; displayed digits are retained without implying that precision is accurate.

Video time	Target V	ASD panel A	Cable display A	Relative delta
05:00	5	3.000	3.23756	+7.9%
11:20	9	3.000	3.23893	+8.0%
17:40	15	3.000	3.27381	+9.1%
25:10	20	5.000	5.44427	+8.9%
32:50	28	5.000	5.49326	+9.9%
40:30	36	5.000	5.52179	+10.4%
48:00	48	5.000	5.51861	+10.4%

Relative current delta = 100 x (cable display current / ASD panel current - 1). These are selected observations, not a time-averaged or exhaustive display audit.

ASD-PD31 panel | video 48:00

AK001 display

48:00 frame: ASD panel 47.255V x 5.000A = 236.275W (calculated). Cable display: 46.9637V / 5.51861A / 259.174W. The 259.174W reading is the cable display, not the ASD measurement.

ASD is a comparison instrument, not an independently calibrated absolute current reference. Measurement positions, display self-consumption, update rates, filtering and resolution may differ. No cause is isolated. Absolute video-to-CSV timing was not established; this figure is not matched to a specific CSV row.

Evidence audit and distribution

Original electrical statuses are retained. ADC frames were independently checked for length, CRC, decoded voltage/current and calculated power; case results were checked against configured current and voltage bounds.

Audit item	Result
Cases / verified LOAD_OFF	29 PASS / 29 verified
Case / preflight ADC rows	1786 / 58
ADC CRC/decode/current/power errors	0
Steady samples outside nominal +/-1V	0
CY4500 CSV exports	59
PD hard reset / reject / wait	0 / 0 / 0
PD Soft Reset / PS_RDY	131 / 414
CH32 sessions / video observations	4 / 7

2 serial receive buffers contained a valid 29-byte status frame followed by a valid 9-byte ACK; their whole-buffer CRC warning was checked by validating both component CRCs. Original warnings remain in the evidence.

PD totals cover all exports, including discovery, setup and preflights. Soft Reset events are retained rather than omitted.

Live protection settings

Loaded current/hold voltage stop +/-1.5V; independent preflight, low-load and light-transition voltage stop +/-1V. Current tracking +/-max(0.05A, 2% of target), absolute current 5.25A, power 252W, ASD internal temperature cutoff 80C. CY4500 capture guards remain mandatory. These bench thresholds do not establish USB-IF compliance.

Package and reproducibility

reports/: four PDFs and editable Markdown. analysis/: ADC, case, hold, sweep, path, identity, video and audit tables. evidence/: electrical text records, all CH32 sessions and seven full video frames. reference/: anonymous Reference A power-data subset. The original MP4 is retained separately; filename, size, duration and SHA-256 are supplied. Indexes and manifests identify evidence, redactions, exclusions and distributed file hashes.

Original mode contains no literal steady value. Rows without -precheck or -ramp suffixes are steady; normalized measurement_phase explicitly labels phases. source_csv is package-relative and source_csv_line counts CSV records with header=1.

Reference A manufacturer, model and identifying E-Marker/raw-byte fields are withheld. DUT identity is retained. Original private evidence is unchanged. Completion here does not diagnose intermittent CY4500 USB failures elsewhere.

Assessment: the selected specimen completed the stated power-screening procedure. Its on-cable display must be evaluated separately from power-path completion; the observed display differences are relative to ASD and are not a calibrated absolute-error certificate.