USB-C cable power validation

ChargerLab PDlink / 0.3 m / c_sample1

20 October 2026 | 100 Vac / 50 Hz | PDLINK-20261020-100V-01 | Public edition

Finding: all 29 cases passed in one uninterrupted run

All 29 cases passed the v5.8.13 full cable procedure. The original outcome is SCREENING_COMPLETE. Coverage comprises Fixed 5 / 9 / 15 / 20 / 28 / 36 / 48 V current round trips, seven 120 s loaded holds, before/after light-load baselines and a final 48 V to 5 V return. The earlier initial under-current at 36 V light load did not recur.

Median ASD input during the 120 s hold at the 48 V / 5 A setpoint was 47.318 V / 5.000 A / 236.590 W. Nominal 240 W is the setpoint product, not measured power of 240 W at the ASD input.

Voltage droop was approximately 34 - 37 mV lower at 3 A and 53 - 59 mV lower at 5 A than Reference A 1.0 m. This path comparison includes the 0.3 m versus 1.0 m length difference; it does not measure isolated cable resistance.

Specimen and setup

Item	Record
DUT	ChargerLab PDlink; 0.3 m; detachable; entered rating 240 W
Specimen name	ChargerLab_PDlink_0p3m_c_sample1
SRC	Framework FRANDVCH00_s_sample1; C1; entered maximum 240 W
Power path	SRC > DUT Cable > CY4500-EPR > ASD-PD31
Reference	Reference A 1.0 m; commercial comparison cable; RA01
AC / orientation	100 Vac / 50 Hz; operator-entered; as-connected; ASD cc2
Procedure	full; 0.1 A start; 0.2 A steps; 3 readings/point; 120 s holds; hold-settle 1 s; cooldown 5 s
Capture / control	Mandatory CY4500 guard; ASD v5.8.13; COM3 USB Type-B

The public reference label is Reference A 1.0 m. Its manufacturer, model and identifying E-Marker details are withheld. Measurements, test conditions, outcomes and warnings are retained.

Loaded holds and Reference A comparison

All seven 120 s holds yielded 120 samples each at 1 s intervals, spanning approximately 119 s in recorded sample times. The 1 s wait after LOAD_ON is outside the hold duration.

Target V/A	V min	V median	V max	I median	P median W
5/3	5.007	5.011	5.016	3.000	15.033
9/3	8.711	8.714	8.717	3.000	26.142
15/3	14.706	14.710	14.715	3.000	44.130
20/5	19.425	19.432	19.447	5.000	97.160
28/5	27.316	27.327	27.340	5.000	136.635
36/5	35.301	35.311	35.328	5.000	176.555
48/5	47.303	47.318	47.333	5.000	236.590

Difference = DUT minus Reference A 1.0 m

Target V/A	DUT droop V	Ref droop V	Delta mV	Apparent path delta mOhm
5/3	0.0645	0.0985	-34.0	-11.72
9/3	0.3640	0.4005	-36.5	-12.59
15/3	0.3645	0.3990	-34.5	-11.90
20/5	0.6270	0.6800	-53.0	-10.82
28/5	0.6180	0.6765	-58.5	-11.94
36/5	0.6225	0.6775	-55.0	-11.22
48/5	0.6205	0.6790	-58.5	-11.94

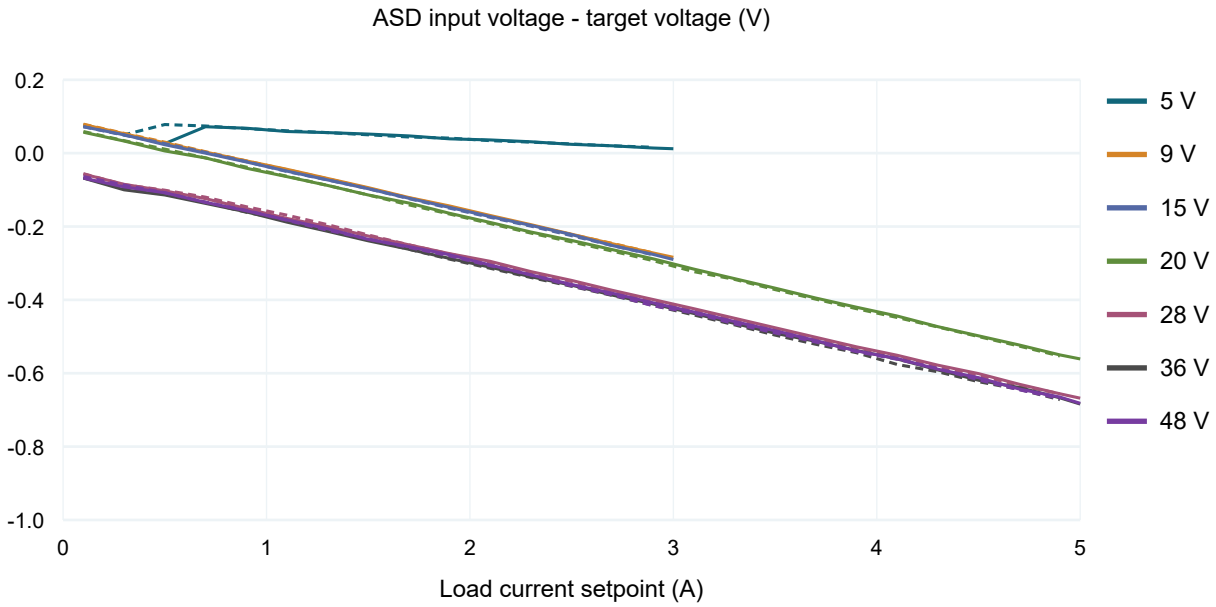
RA01 is the 17 October 2026 Reference A 1.0 m single full run, 29/29 PASS. Source/port, 100 Vac / 50 Hz metadata, cc2 and procedure settings match. This is a same-bench working reference, not a calibration standard.

Droop = mean of before/after 0.1 A voltage medians minus the loaded-hold median. Apparent path resistance = droop / measured high-low current difference. DUT and public Reference A metrics were independently reproduced from their measurement rows. Negative differences indicate lower DUT path droop.

Source regulation, contacts, CY4500, the ASD input path, cable length and acquisition time contribute. Do not convert these results into isolated cable resistance or resistance per unit length. The reference used RS232 ASD control; this test used USB Type-B.

Current round trips and light-load return

Round trips reached 3 A at 5 / 9 / 15 V and 5 A at 20 / 28 / 36 / 48 V. Traces show medians of three readings per point, with solid/dashed lines distinguishing the two legs. All measured points, including return legs, met the procedure tracking checks.



Previous stop condition and final return

Condition	Voltage V	Current A	Result
36 V / 0.1 A before	35.933, 35.933, 35.934	0.100, 0.100, 0.101	PASS
36 V / 0.1 A after	35.933, 35.934, 35.935	0.100, 0.100, 0.100	PASS
48 V > 5 V / 0.1 A	5.081, 5.079, 5.080	0.100, 0.100, 0.100	PASS

The 36 V light-load checks read 0.100 - 0.101 A. Final return uses a configured 2 s delay and three readings per endpoint. It verifies settled endpoints, not PD transition-time compliance. Final LOAD_OFF acknowledgement and zero-current verification also succeeded.

Tracking checks use +/-1 V and +/-max(0.050 A, 2% of load setpoint). Safety ceilings are 252 W, 5.25 A and 80 degrees C ASD internal temperature. These are procedure conditions, not USB compliance thresholds.

Retest history and capture audit

Record	Outcome / startup condition
H01 / 2026-10-16	23 PASS + 1 failed; v5.8.9; no explicit hold settling wait.
H02 / 2026-10-16	Resumed 9 cases PASS; original INCOMPLETE; v5.8.10; 1 s settling.
R01 / 2026-10-20	All 29 PASS; SCREENING_COMPLETE; v5.8.13; 1 s settling.

H01 stopped on its first reading after requesting 36 V / 0.100 A: 35.899 V / 0.049 A. The current error exceeded the +/-0.050 A window by 0.001 A. It did not recur in H02 or R01. This is consistent with startup timing effects, but settling was not the only controlled variable in a repeated experiment; the original causal component remains unconfirmed.

One control-response warning event in R01

T18 preflight logged CRC ok: False and an unconfirmed CC-setting ACK. The 38-byte buffer concatenated a 29-byte status response and a 9-byte ACK. Both constituent CRCs are valid, the ACK echoes the request CRC, and a later standalone readback confirms CC2. Warnings remain preserved; every ADC measurement CRC is valid.

Audit item	Result
Measurements / cleanup	1,786 case rows (1,779 steady + 7 precheck); 58 preflight rows; 29 LOAD_OFF verified
ADC audit	All 1,844 CRCs, V/I decodes, tracking and P=V x I checked (within 0.00101 W).
Capture / versions	59 guard PASS; 59 PD CSVs; 59 matching version snapshots; max hold gap 1.029 s

PD CSV totals: 14,820 rows, 282 REQUEST, 132 EPR_REQUEST, 414 PS_RDY and 131 SOFT_RESET. HARD_RESET, REJECT, WAIT and invalid SOP counts are zero. Discovery/preflight/main captures are included; each request has a later PS_RDY in its capture. This is not strict one-to-one matching or timing certification.

SOFT_RESET totals include procedure-driven reacquisition and must not all be counted as spontaneous faults. ASD/CY4500 used separate externally powered CH319M-MagIso-R0 USB paths. No USB capture stall was observed in R01.

Coverage map for all 29 cases

Case	Phase	Target V/A	Steady N	Result
T01	low_before	5/0.1	3	PASS
T02	current	5/3	93	PASS
T03	loaded_hold	5/3	120	PASS
T04	low_after	5/0.1	3	PASS
T05	low_before	9/0.1	3	PASS
T06	current	9/3	93	PASS
T07	loaded_hold	9/3	120	PASS
T08	low_after	9/0.1	3	PASS
T09	low_before	15/0.1	3	PASS
T10	current	15/3	93	PASS
T11	loaded_hold	15/3	120	PASS
T12	low_after	15/0.1	3	PASS
T13	low_before	20/0.1	3	PASS
T14	current	20/5	153	PASS
T15	loaded_hold	20/5	120	PASS
T16	low_after	20/0.1	3	PASS
T17	low_before	28/0.1	3	PASS
T18	current	28/5	153	PASS
T19	loaded_hold	28/5	120	PASS
T20	low_after	28/0.1	3	PASS
T21	low_before	36/0.1	3	PASS
T22	current	36/5	153	PASS
T23	loaded_hold	36/5	120	PASS
T24	low_after	36/0.1	3	PASS
T25	low_before	48/0.1	3	PASS
T26	current	48/5	153	PASS
T27	loaded_hold	48/5	120	PASS
T28	low_after	48/0.1	3	PASS
T29	transition	48/0.1	6	PASS

All selected cases come from the current R01 single run. H01/H02 are separate history and are excluded from current statistics. T29 lists its initial 48 V setpoint; its return endpoint is 5 V.

Identity, public scope and evidence

Subject	Record
ChargerLab PDlink DUT	Passive; 5 A / 48 V; VID 0x367E; PID 0x8488; Cable VDO 0x000A2644
DUT CH32	C01/C02; matching cable fields; C01 linked to load test; physical association operator-declared
Reference A 1.0 m	Commercial comparison cable; 2026-10-17 full run, 29 PASS; manufacturer/model/identifying E-Marker withheld.

DUT CH32 speed fields are usb_speed=4, decoder label usb4_gen4. These are E-Marker observations and a decoder label, not measured USB data-transfer performance. ASD cannot read E-Markers; CH32 observations provide separate identity evidence.

Assessment scope

This specimen passed all 29 cases on the recorded 100 Vac setup and orientation; the earlier stop did not recur. No reproduced result positively indicates a cable defect, but this does not establish the original cause or fault-free behavior under every condition.

This is Fixed-power screening of one specimen under one condition. PPS/AVS loaded sweeps, all orientations, temperature rise, insulation, mechanical durability, long-duration operation and USB-IF certification were not evaluated. Temperature columns are fan-dependent ASD internal readings, not source/cable/plug temperatures. Independent ripple bandwidth/calibration checks, traceable calibration evidence and independent AC meter logs are not included.

Package guide

reports contains bilingual PDFs and Markdown. analysis contains current cases, ADC/preflight rows, holds, sweeps, comparisons, warnings, PD/CRC audits and historical hold comparisons. evidence/asd/R01 is the current acquisition; history/H01 and H02 retain previous acquisitions; evidence/ch32 identifies the DUT. reference/Reference_A_1p0m_validation-data.zip is a power-data subset of the existing public reference edition, excluding identifying packet evidence.

Original mode has no literal steady value; measured rows without -precheck/-ramp suffixes are steady. Normalized source_csv/source_csv_line trace original measurement records. Public SHA-256 values describe distributed files, not private originals before anonymization. See ANONYMIZATION.md for the policy and evidence_index.csv for evidence mapping.