USB-C cable validation record

Reference A / 1.0 m / c_sample1

17 October 2026 | 100 Vac / 50 Hz | RA-20261017-100V-02

Finding: all 29 cases completed in one run

All 29 cases passed the v5.8.13 full 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 48 V to 5 V return.

Median ASD input at the 48 V / 5 A hold was 47.263 V / 5.000 A / 236.315 W. Nominal 240 W is the setpoint product, not measured power delivered at the ASD input.

Suitable as a conditional working-reference candidate for comparative Fixed-power screening on the same bench. Two concatenated control-response warnings remain documented qualifications. This is not a calibration standard, certification verification or all-orientation qualification.

Test setup

Item	Recorded condition
Cable	Reference A; 1.0 m; detachable; c_sample1; entered rating 240 W
Connected source	Framework FRANDVCH00; FRANDVCH00_s_sample1; C1; entered port rating 240 W
Power/control path	SRC > Cable > CY4500-EPR > ASD-PD31; COM3 via RS232 isolator (operator-reported)
AC / orientation	100 Vac / 50 Hz; operator-entered metadata; as-connected; ASD cc2
Procedure	full; 0.2 A steps from 0.1 A; 3 readings/point; 120 s holds; hold-settle 1 s; cooldown 5 s
Capture	CY4500 required; live inline proof; controller v5.8.13 throughout
Original run	initial_cable_suite_20261017_170736_724469

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 settings, not USB compliance thresholds.

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Loaded holds and path metrics

All seven voltage levels completed configured 120 s holds with 120 readings at 1 s intervals, spanning 119 s in recorded timestamps. The 1 s wait after LOAD_ON is outside the hold duration. Values below are measured at the ASD input.

Target V/A	V min	V median	V max	I median	P median W	N
5/3	4.972	4.977	4.981	3.000	14.931	120
9/3	8.675	8.679	8.682	3.000	26.037	120
15/3	14.672	14.676	14.679	3.000	44.027	120
20/5	19.373	19.380	19.387	5.000	96.900	120
28/5	27.262	27.272	27.282	5.000	136.360	120
36/5	35.251	35.258	35.266	5.000	176.290	120
48/5	47.252	47.263	47.274	5.000	236.315	120

Droop from before/after light-load baselines

Target V	Droop V	Apparent path mΩ	Baseline drift mV
5	0.0985	33.97	+1.0
9	0.4005	138.10	-1.0
15	0.3990	137.59	+1.0
20	0.6800	138.78	+4.0
28	0.6765	138.06	+2.0
36	0.6775	138.27	+5.0
48	0.6790	138.57	+0.0

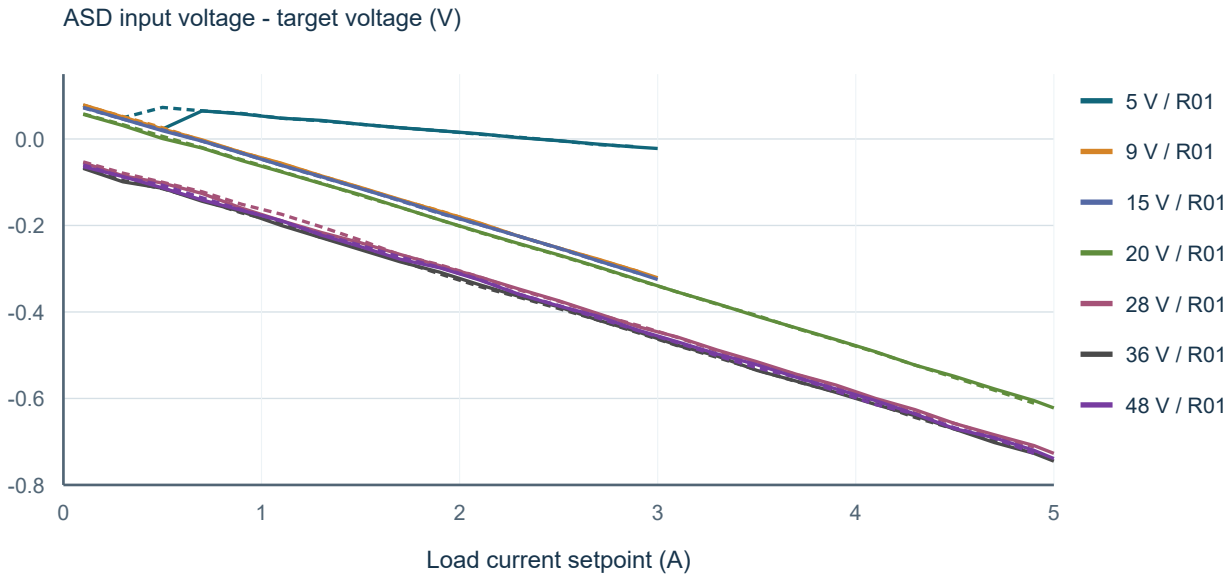
Droop = mean of before/after 0.1 A voltage medians minus loaded-hold voltage median. Apparent path resistance = droop / measured high-low current difference. Baseline drift = after minus before voltage. All pairs come from this one run; independent recalculation matched the original metrics.

Do not use apparent path resistance as isolated cable resistance. Results are approximately 138 mOhm at 9 - 48 V and 34 mOhm at 5 V. Source regulation, contacts, CY4500-EPR and the ASD input path are included; the voltage-dependent difference cannot be assigned to the cable conductors.

ASD-reported ripple during the 48 V hold was 154 - 173 mV, median 162 mV. This is not an independently calibrated or bandwidth-qualified oscilloscope evaluation and is not used as a cable compliance verdict.

Current sweeps and historical comparison

Points show medians of three readings. Solid/dashed traces are the two sweep legs. Sweeps reached 3 A at 5 / 9 / 15 V and 5 A at 20 / 28 / 36 / 48 V; every acquired point, including the return legs, met the procedure tracking checks.



Comparison with selected holds from 16 October 2026

Target V	Previous run	Previous median V	Current median V	Delta mV
5	M01	4.978	4.977	-1.0
9	M01	8.679	8.679	+0.0
15	M01	14.674	14.676	+1.5
20	M02	19.376	19.380	+4.0
28	M02	27.266	27.272	+5.5
36	M03	35.253	35.258	+5.5
48	M03	47.259	47.263	+4.0

Previously, M01 (5 / 9 / 15 V) and M02 (20 / 28 V) used v5.8.9 without an explicit settling wait; M03 (36 / 48 V) used v5.8.10 with 1 s settling. This run uses v5.8.13, 1 s settling and mandatory CY4500 monitoring throughout. Hold medians differ by at most 5.5 mV, consistent with the previous observations. This is not a same-procedure repeatability study; historical composite data are excluded from current statistics.

The previous communication stop, initial low-load under-current and subsequent retests remain in the anonymized H01 package. Those measurement failures did not recur in this full run.

Data integrity and control warnings

Check	Result
Measurements / raw responses	1,786 case rows (1,779 steady + 7 precheck) and 58 recovery rows; all ADC CRCs and voltage/current raw decodes verified
Tracking / calculations	0 voltage or current mismatches; power agrees with V x I within 0.00101 W; path metrics independently matched
Plan / cleanup	29 named cases match plan order; 29 exit code 0; 29 LOAD_OFF verifications; all preflight PDO raw values unchanged
Live capture	59 guard PASS records; 59 exported CY4500 CSVs; no CY4500 safety stop
PD packet inventory	14,827 CSV rows; 282 REQUEST + 132 EPR_REQUEST; 414 PS_RDY; all 414 requests have a later PS_RDY in their capture
Resets / responses	131 SOFT_RESET; 0 HARD_RESET, REJECT or WAIT; 0 SOP packets marked invalid by CY4500
Hold continuity	7 x 120 samples; elapsed spans approximately 119 s; maximum adjacent sample gap 1.025 s

PD counts cover 59 files: discovery, each case recovery check and each main test. Negotiation traffic, including SOFT_RESET, is preserved. A later PS_RDY was checked for each request; this is not certification of transition timing or complete protocol compliance.

Two warnings: concatenated CC-setup receive buffers

T05 main-test and T20 preflight logs record CRC ok: False and an unconfirmed CC-setup ACK on a 38-byte receive buffer. Splitting each buffer into a 29-byte status response and 9-byte ACK gives four valid frame CRCs with matching request-CRC echoes. A subsequent standalone CRC-valid status response confirms CC2 in both cases.

Only these two of 3,030 audited receive buffers fail the aggregate CRC calculation. After splitting the concatenations, all 3,032 frames have valid CRCs. These are not invalid measurement ADC responses, so no readings were excluded or corrected. Original warnings remain; reference use is qualified accordingly.

Instrument versions

All 59 snapshots agree: Type 05.54; Power FW/HW 09.18/05.01; Protocol FW/HW 04.77/04.00; Display FW/HW 01.74/00.02. The internal calibration field is not treated as a calibration certificate or traceability verification.

Measurement ledger for all 29 cases

Every case is from R01, one acquisition run and one controller version. Before/after 0.1 A baselines and loaded holds come from their respective voltage blocks. Every case exited with code 0 and verified load-off.

ID	Target V	Phase	Max A	Steady N	Result
T01	5	0.1 A baseline before	0.1	3	PASS
T02	5	Current round trip	3	93	PASS
T03	5	Loaded hold, 120 s	3	120	PASS
T04	5	0.1 A baseline after	0.1	3	PASS
T05	9	0.1 A baseline before	0.1	3	PASS
T06	9	Current round trip	3	93	PASS
T07	9	Loaded hold, 120 s	3	120	PASS
T08	9	0.1 A baseline after	0.1	3	PASS
T09	15	0.1 A baseline before	0.1	3	PASS
T10	15	Current round trip	3	93	PASS
T11	15	Loaded hold, 120 s	3	120	PASS
T12	15	0.1 A baseline after	0.1	3	PASS
T13	20	0.1 A baseline before	0.1	3	PASS
T14	20	Current round trip	5	153	PASS
T15	20	Loaded hold, 120 s	5	120	PASS
T16	20	0.1 A baseline after	0.1	3	PASS
T17	28	0.1 A baseline before	0.1	3	PASS
T18	28	Current round trip	5	153	PASS
T19	28	Loaded hold, 120 s	5	120	PASS
T20	28	0.1 A baseline after	0.1	3	PASS
T21	36	0.1 A baseline before	0.1	3	PASS
T22	36	Current round trip	5	153	PASS
T23	36	Loaded hold, 120 s	5	120	PASS
T24	36	0.1 A baseline after	0.1	3	PASS
T25	48	0.1 A baseline before	0.1	3	PASS
T26	48	Current round trip	5	153	PASS
T27	48	Loaded hold, 120 s	5	120	PASS
T28	48	0.1 A baseline after	0.1	3	PASS
T29	48 > 5	48 V to 5 V return	0.1	6	PASS

Each 120 s hold also has one precheck reading, excluded from the steady counts above. The final transition reads 48 V and 5 V three times each at 0.1 A, with delay set to 2 s. After return, values are 5.077 - 5.081 V / 0.100 A. Original paths/lines are in analysis/asd_measurements.csv; names are in analysis/case_results.csv.

Identity and reference-use scope

Item	CH32 evidence
Cable	Passive; advertised 5 A / 48 V; VID Hidden; PID Hidden; Cable VDO Hidden
USB speed	usb4_gen3 advertised; no data-transfer test performed.
Sessions	C01: session_0001 / CC2; C02: session_0002 / CC1; matching cable VDO
Physical association	Legacy CH32 asset labels are blank; an explicit operator note associates the capture with this c_sample1.

ASD does not read the E-Marker. CH32 declarations, the operator-entered 240 W rating and loaded results are separate evidence. The operator reports a retail USB-IF certification claim; listing identifiers and certification status were not independently verified here.

Conditions for use as a comparison baseline

Use this physical cable with the same Framework unit and C1 port, 100 Vac / 50 Hz, the same CY4500-EPR/ASD path and cc2. Match full profile, 0.2 A steps, three readings/point, 120 s holds, 1 s settling and 5 s cooldown. Keep reference and DUT identities distinct. Recheck the reference after contact, equipment, procedure or orientation changes, or when results are suspect.

The R01 original run folder is eligible as a candidate --reference-dir for automatic comparison, rather than an earlier partial-run folder. There is one uninterrupted full run under the current procedure; statistical repeatability and long-term stability have not been established.

Scope and evidence organization

Scope is Fixed-power screening. PPS is absent on the connected Framework; SPR/EPR AVS were observed but were not loaded by this cable procedure. All plug orientations/end reversals, USB data, insulation/endurance and cable/plug temperatures are outside scope. ASD temperature is internal and fan-dependent; it is not used as cable thermal evidence.

R01 contains anonymized current originals; C01/C02 are the CH32 sessions; H01 is the previous evidence ZIP, including bilingual reports and stop/retest history. Analysis separates current rows, recovery checks, cases, holds, PD/CRC audits and history. Original mode has no literal steady value; measured rows without -precheck / -ramp suffixes are classified as steady. manifest_sha256.csv records every packaged file size and SHA-256.