USB-PD source validation record

Framework FRANDVCH00 / C1 / s_sample1

19 October 2026 | 100 Vac and 230 Vac / 50 Hz | FW-FRANDVCH00-20261019-01

Finding: 33/33 cases completed at each AC input

Two independent uninterrupted runs passed all 66 cases: 33 at 100 Vac and 33 at 230 Vac. Discovered PDOs, cases and settings matched apart from AC input metadata. Coverage includes Fixed, SPR AVS and EPR AVS measurements up to 5 A, round trips, 120 s loaded holds and returns to 5 V.

At the nominal Fixed 48 V / 5 A hold, median measured ASD input power was 236.285 W at 100 Vac and 236.270 W at 230 Vac. The nominal 240 W is 48 V x 5 A, not 240 W measured at the load input.

PPS was absent from the discovered PDOs at both inputs and was skipped. Five concatenated receive buffers and four unavailable optional CC readbacks are documented acquisition qualifications. Findings apply to this one source sample and the setup below.

Test setup

Item	Condition
Source	Framework FRANDVCH00; FRANDVCH00_s_sample1; C1; entered port rating 240 W
Fixture cable	Reference A; 1.0 m; detachable; ReferenceA_c_sample1; entered rating 240 W
Power path	SRC > Cable > CY4500-EPR > ASD-PD31
PC control	ASD USB Type-B / CY4500 microUSB via externally powered CH319M-MagIso-R0 hubs (operator-reported); COM3
Input / CC	100 or 230 Vac, 50 Hz; manually set, operator-entered metadata; CC2 requested
Sampling	3 readings/point; current steps 0.2 A from 0.2 A; loaded holds 120 s / 1 s interval; hold settling 1 s; inter-case cooldown 5 s
Control / capture	Controller v5.8.13; mandatory live CY4500 capture; 67 captures per AC input

One run per input, one source sample, one cable sample and the as-connected orientation. No independent AC input metering, calibration certificate, source temperature measurement or USB-IF compliance test is included.

Capabilities and measurement coverage

Native ASD PDO snapshots matched at both inputs, including all 33 per-case preflight snapshots in each run. Missing indices 6 and 7 were not filled with inferred objects.

Obj	Type	Advertised capability	Raw PDO
1	Fixed	5 V / 3 A	0x0A91912C
2	Fixed	9 V / 3 A	0x0012D12C
3	Fixed	15 V / 3 A	0x0014B12C
4	Fixed	20 V / 5 A	0x001641F4
5	SPR_AVS	9-20 V; 9-15 V: 3 A; 15-20 V: 5 A	0xE404B1F4
8	Fixed	28 V / 5 A	0x0018C1F4
9	Fixed	36 V / 5 A	0x001B41F4
10	Fixed	48 V / 5 A	0x001F01F4
11	EPR_AVS	15-48 V; 240 W; decoded maximum 5 A	0xD7C096F0

Identical 33-case coverage at each input

Cases	Measurement	Conditions
T01-T07	Fixed baseline	5 / 9 / 15 / 20 / 28 / 36 / 48 V at 1 A; 3 steady readings each
T08-T09	AVS voltage baseline	SPR 9-20 V; EPR 15-48 V; 1 V steps at 1 A; outbound
T10-T16	Fixed current round trips	0.2 A steps to 3 A at 5/9/15 V; to 5 A at 20/28/36/48 V
T17-T19	SPR AVS current round trips	9 V to 3 A; 16 / 20 V to 5 A
T20-T22	EPR AVS current round trips	15 / 16 / 48 V to 5 A
T23-T24	AVS voltage round trips	SPR 16-20 V / 5 A; EPR 36-48 V / 5 A; 1 V steps; minimum 5 s/point
T25-T27	Loaded holds	Fixed 48 V, SPR AVS 20 V, EPR AVS 48 V; 5 A; 120 s each
T28-T33	Light-load returns to 5 V	From 48 / 36 / 28 / 20 / 9 / 15 V; 0.1 A; 3 readings per endpoint
Skipped	PPS	Not present in observed capabilities; no PPS requests generated

Voltage tracking uses the ASD input setpoint +/-1.000 V; current tracking uses the load setpoint +/-max(0.050 A, 2%). Prechecks and ramps were independently recalculated too. PD request current and electronic-load current are recorded separately. Safety ceilings are 252 W, 5.25 A and 80 degrees C ASD internal temperature. These are procedure limits, not USB specification limits.

Complete case results

Every case passed at both inputs with verified LOAD_OFF after each case. N counts steady measurement rows only; prechecks, ramps and 5 V preflights are stored separately.

ID	Case name	N/input	100 V	230 V
T01	Fixed O1 5v baseline	3	PASS	PASS
T02	Fixed O2 9v baseline	3	PASS	PASS
T03	Fixed O3 15v baseline	3	PASS	PASS
T04	Fixed O4 20v baseline	3	PASS	PASS
T05	Fixed O8 28v baseline	3	PASS	PASS
T06	Fixed O9 36v baseline	3	PASS	PASS
T07	Fixed O10 48v baseline	3	PASS	PASS
T08	AVS O5 voltage baseline	36	PASS	PASS
T09	AVS O11 voltage baseline	102	PASS	PASS
T10	Fixed O1 5v current	87	PASS	PASS
T11	Fixed O2 9v current	87	PASS	PASS
T12	Fixed O3 15v current	87	PASS	PASS
T13	Fixed O4 20v current	147	PASS	PASS
T14	Fixed O8 28v current	147	PASS	PASS
T15	Fixed O9 36v current	147	PASS	PASS
T16	Fixed O10 48v current	147	PASS	PASS
T17	AVS O5 9v current	87	PASS	PASS
T18	AVS O5 16v current	147	PASS	PASS
T19	AVS O5 20v current	147	PASS	PASS
T20	AVS O11 15v current	147	PASS	PASS
T21	AVS O11 16v current	147	PASS	PASS
T22	AVS O11 48v current	147	PASS	PASS
T23	AVS O5 high voltage roundtrip	27	PASS	PASS
T24	AVS O11 high voltage roundtrip	75	PASS	PASS
T25	Fixed O10 48v hold	120	PASS	PASS
T26	AVS O5 20v hold	120	PASS	PASS
T27	AVS O11 48v hold	120	PASS	PASS
T28	Fixed O10 48v to 5v light	6	PASS	PASS
T29	Fixed O9 36v to 5v light	6	PASS	PASS
T30	Fixed O8 28v to 5v light	6	PASS	PASS
T31	Fixed O4 20v to 5v light	6	PASS	PASS
T32	Fixed O2 9v to 5v light	6	PASS	PASS
T33	Fixed O3 15v to 5v light	6	PASS	PASS

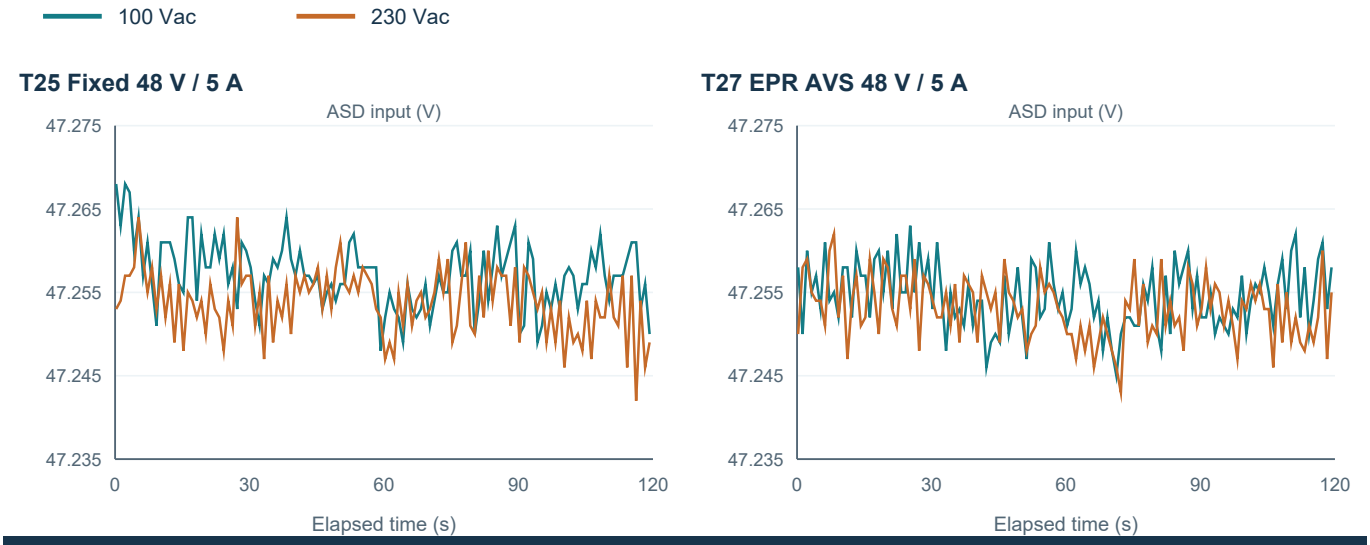
Measurement rows	100 Vac	230 Vac
Steady case rows	2328	2328
Precheck / ramp rows	14 / 24	14 / 24
5 V preflight rows	66	66
All numeric ADC rows	2432	2432
Voltage / current tracking deviations	0 / 0	0 / 0

Loaded holds and AC input comparison

Each hold is configured for 120 s and contains 120 readings at 1 s intervals. The 1 s startup settling wait is outside the hold. Recorded sample spans are about 119 s, distinct from the configured duration. All values are measured at the ASD input.

Case/AC	V min	V median	V max	I median A	P median W
T25 / 100	47.2480	47.2570	47.2680	5.000	236.285
T26 / 100	19.2720	19.2800	19.2880	5.000	96.400
T27 / 100	47.2450	47.2545	47.2630	5.000	236.270
T25 / 230	47.2420	47.2540	47.2640	5.000	236.270
T26 / 230	19.2680	19.2750	19.2830	5.000	96.375
T27 / 230	47.2430	47.2530	47.2620	5.000	236.265

T25: Fixed 48 V / 5 A. T26: SPR AVS 20 V / 5 A. T27: EPR AVS 48 V / 5 A.



Comparison	Median voltage at 230 V minus 100 V
T25	-3.0 mV
T26	-5.0 mV
T27	-1.5 mV

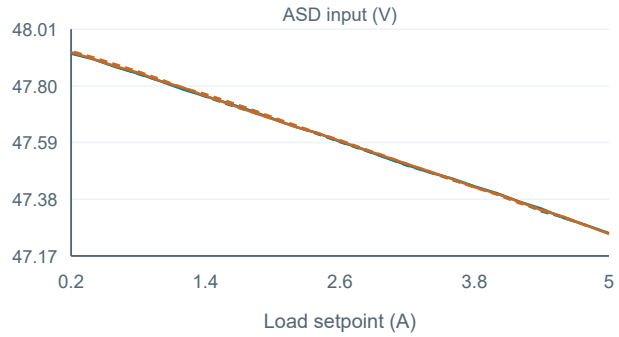
The largest absolute median-voltage difference across the three holds was 5.0 mV. These were sequential single runs, so the differences do not isolate an AC-input effect or establish measurement uncertainty.

The roughly 47.25 V reading at a 48 V setpoint includes source load regulation, cable, contacts, CY4500-EPR and the ASD input path. It is not reported as source-terminal droop or isolated cable resistance.

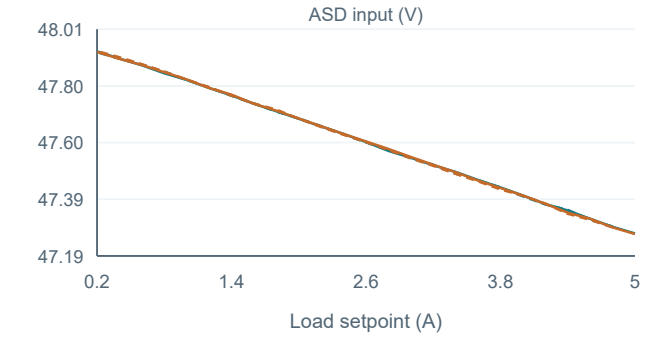
Current round-trip sweeps

All 13 cases increased from 0.2 A to the bounded PDO current limit and returned in the same steps, with three readings per point. Charts show point-voltage medians for four representative cases. Line style distinguishes outbound and return.

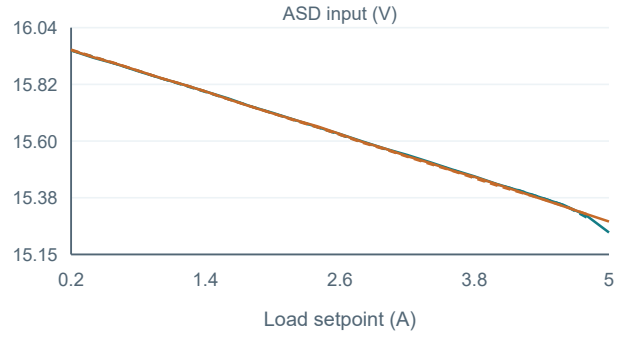
T16 Fixed 48 V



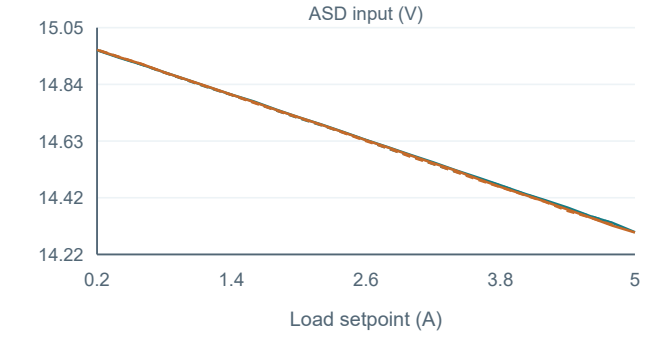
T22 EPR AVS 48 V



T18 SPR AVS 16 V



T20 EPR AVS 15 V



Voltage medians at the maximum current point

ID	Setting	Limit A	V at 100 Vac	V at 230 Vac
T10	Fixed 5 V	3	4.978	4.975
T11	Fixed 9 V	3	8.683	8.678
T12	Fixed 15 V	3	14.678	14.676
T13	Fixed 20 V	5	19.386	19.378
T14	Fixed 28 V	5	27.271	27.271
T15	Fixed 36 V	5	35.257	35.253
T16	Fixed 48 V	5	47.257	47.254
T17	SPR AVS 9 V	3	8.582	8.580
T18	SPR AVS 16 V	5	15.241	15.284
T19	SPR AVS 20 V	5	19.283	19.281
T20	EPR AVS 15 V	5	14.297	14.296
T21	EPR AVS 16 V	5	15.238	15.285
T22	EPR AVS 48 V	5	47.268	47.266

Table values are medians of the three outbound maximum-current readings. All outbound/return points and measured current are in analysis/current_sweep_points.csv.

At the outbound 16 V / 5 A endpoint, median voltage at 230 Vac minus 100 Vac was +43 mV for SPR AVS and +47 mV for EPR AVS. These are separate from hold comparisons and are not attributed solely to AC input.

AVS voltage round trips and 5 V returns

SPR AVS covered 16-20 V and EPR AVS 36-48 V, in 1 V round trips at 5 A. Each point used a minimum 5 s dwell and three readings after 1.25 s settling. Charts show measured median voltage minus the voltage setpoint.

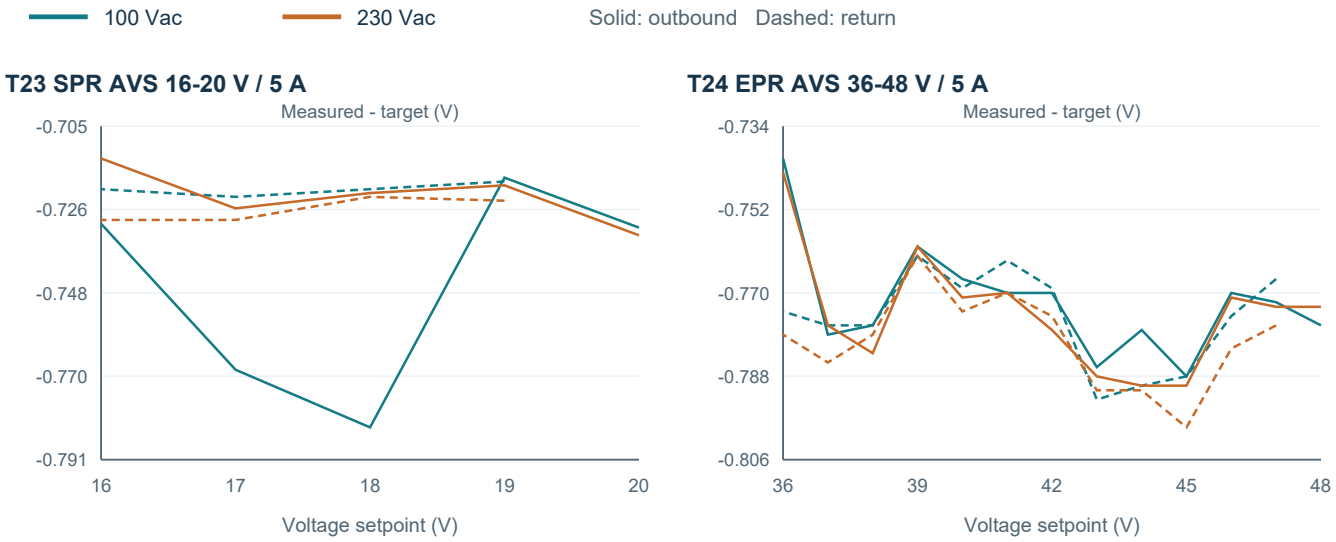


Chart legend: teal = 100 Vac; orange = 230 Vac. Solid = outbound; dashed = return.

Fixed returns at light load

ID	Transition V	5 V readings at 100 Vac	5 V readings at 230 Vac
T28	48 > 5	5.079-5.083 V	5.079-5.083 V
T29	36 > 5	5.076-5.082 V	5.078-5.081 V
T30	28 > 5	5.078-5.081 V	5.078-5.083 V
T31	20 > 5	5.077-5.082 V	5.079-5.082 V
T32	9 > 5	5.077-5.081 V	5.079-5.081 V
T33	15 > 5	5.077-5.082 V	5.078-5.082 V

Each transition used 0.1 A, three readings at each endpoint and a configured 2 s delay. This checks settled endpoint behavior; it is not a 2 s hold test or USB-PD transition-time compliance test. All 12 transitions met the 5 V and load-current tracking checks.

Interpretation of coverage

This is power-function screening. PPS, USB data speed, all orientations, long-duration endurance, transient waveforms, standards-based ripple measurements, efficiency, insulation, EMC and product safety are outside scope. Temperature fields describe fan-dependent ASD internal temperature and are not used to assess source, cable or plug temperature.

PD records and data traceability

PD capture record	100 Vac	230 Vac
Captures / live inline proof	67 / 67	67 / 67
All capture rows	22665	22621
REQUEST	406	405
EPR_REQUEST	211	210
PS_RDY	617	615
SOFT_RESET	151	150
HARD_RESET	0	0
REJECT	0	0
WAIT	0	0
Invalid SOP packets (Ok != 1)	0	0

Each set of 67 captures comprises one discovery, 33 separate 5 V preflights and 33 measurement cases. Every capture contains valid SOP Request or EPR_Request and PS_RDY evidence and passed live inline proof. Soft_Reset totals span the complete test sequence, including reacquisition and contract changes; they are not interpreted as spontaneous fault counts.

Acquisition qualifications

All 8,368 logged receive buffers were rechecked. Four buffers at 100 Vac and one at 230 Vac logged CRC false for a 38-byte combined response. Splitting each into a 29-byte status and 9-byte ACK produced valid CRCs, matching request-CRC echoes and later standalone CC2 readbacks. Original warnings are retained.

Separately, two optional CC readbacks per input returned no response. Each had a CRC-valid CC-setting ACK and successful subsequent power, PD capture and measurements. Missing readbacks were not rewritten as successful. All 4,864 numeric ADC rows passed independent raw-response CRC, voltage/current decoding, power-arithmetic and tracking checks.

Evidence package

ID	AC	Original run
R01	100 Vac	initial_suite_20261019_142316_604687
R02	230 Vac	initial_suite_20261019_154626_956665

reports contains Japanese/English PDFs and Markdown. evidence/asd/R01 and R02 retain anonymized ADC/PD CSVs, terminal/event logs, PDOs, instrument versions, plans and outcomes. analysis contains normalized rows, cases, holds, sweeps, returns, PD/CRC checks and readback warnings. evidence_index.csv maps runs; manifest_sha256.csv records file sizes and SHA-256.

Original mode values do not contain a literal steady value. Measurement rows without -precheck or -ramp suffixes are classified as steady; normalized CSVs add measurement_phase. source_csv is package-relative and source_csv_line is the original line number with the header as line 1.

ASD: Type 05.54; Power FW/HW 09.18/05.01; Protocol 04.77/04.00; Display 01.74/00.02. All 134 instrument-version snapshots matched.