

Report Summary

Products tested	VCCR300-xx
Products Description	300W DC/DC Single Output Power Supply
Design Phase	3 – Verification
Tested Products and Serials	VCCR300-12 (S/N 10111311001100003)
Test Goals	Test according to EN50155:2021 cl. 13.4.5
Test dates	1 ST to 16 TH February 2023
Report date	27 TH April 2023

Authorisation

Jorge Almendros

27TH April 2023

Test performed by (Print)

Date

Jorge Almendros

27TH April 2023

Test report written by (Print)

Date

Brian McDonald

27TH April 2023

Test report Authorised by (Signed)

Date

Brian McDonald

27TH April 2023

Test report reviewed by (Signed)

Date

1 Objective

Dry Heat Test is a mandatory test required to comply with EN50155 standard. The objective of this report is to show compliance with the requirements of EN50155 clause 13.4.5 for Dry heat test.

2 Executive Summary

The dry heat test verifies the correct operation of the power supply under high temperature conditions bringing the product above the specified thermal ratings. It was carried out in accordance with EN50155 clause 13.4.5 on a VCCR300-12 converter (lowest output voltage variant) as it is the worst-case thermally from the VCCR300 series due to its higher output current rating.

The test temperature and increased operating temperature at switch on class for the product as per defined in the standard are: $T_{TEST} = +70^{\circ}\text{C}$ (OT4 temperature class), Class ST2.

The test was carried out at lowest and highest nominal input voltage sequenced in a single cycle, ensuring that the stabilisation time and that the continuous operational checks time are respected at the provided test temperature for both test voltages as the standard requires. Those input voltages are $48\text{V} \times 1.15 = 55.2\text{V}$ and $110\text{V} \times 1.15 = 126.5\text{V}$ as per defined in product datasheet using the specified multiplier in the referred standard.

The test consists of three cycles: Cycle A, cycle B and cycle C which are defined in the standard subclauses 13.4.5.2, 13.4.5.3 and 13.4.5.4 respectively.

The product operated correctly on all the test cycles as shown in the continuous operational checks and functional test results in Appendix A. The definition of continuous operational checks and functional test can be found in the sections 3.2 and 3.3 of this report respectively.

It can be concluded that the Dry Heat test was passed successfully.

3 Test Equipment and Setup

3.1 Description of Test Equipment

The test equipment listed in Table 1 below was used to carry out the continuous operational checks and functional testing for the Dry Heat test.

Table 1 – Equipment description				
Description	Manufacturer	Model	S/N	Calibration Certificate
Thermal test Chamber	Votsch	VT7010	521/83674 (VOX0015)	Not required
AC Source	Chroma	61505	000685 (VOX0097)	VOX0097-0522
Electronic Load	Chroma	6314A+63103Ax4	0003599 (VOX0098)	VOX0098-0522
Oscilloscope	Keysight	DSO2014A	MY53160421 (VOX0095)	VOX0095-0522
Datalogger	Agilent	34970A	MY41025109 (VOX0070)	VOX0070-0522
Power Meter	Chroma	66202	662021001062 (VOX0101)	VOX0101-0522

3.2 Continuous Operational Checks Data Collection

Various environmental, electrical and product performance data was collected and logged at regular intervals throughout the process. Thermocouples were attached to various points on the devices.

The data collected is listed in Table 3 and the test results are detailed in appendix A.

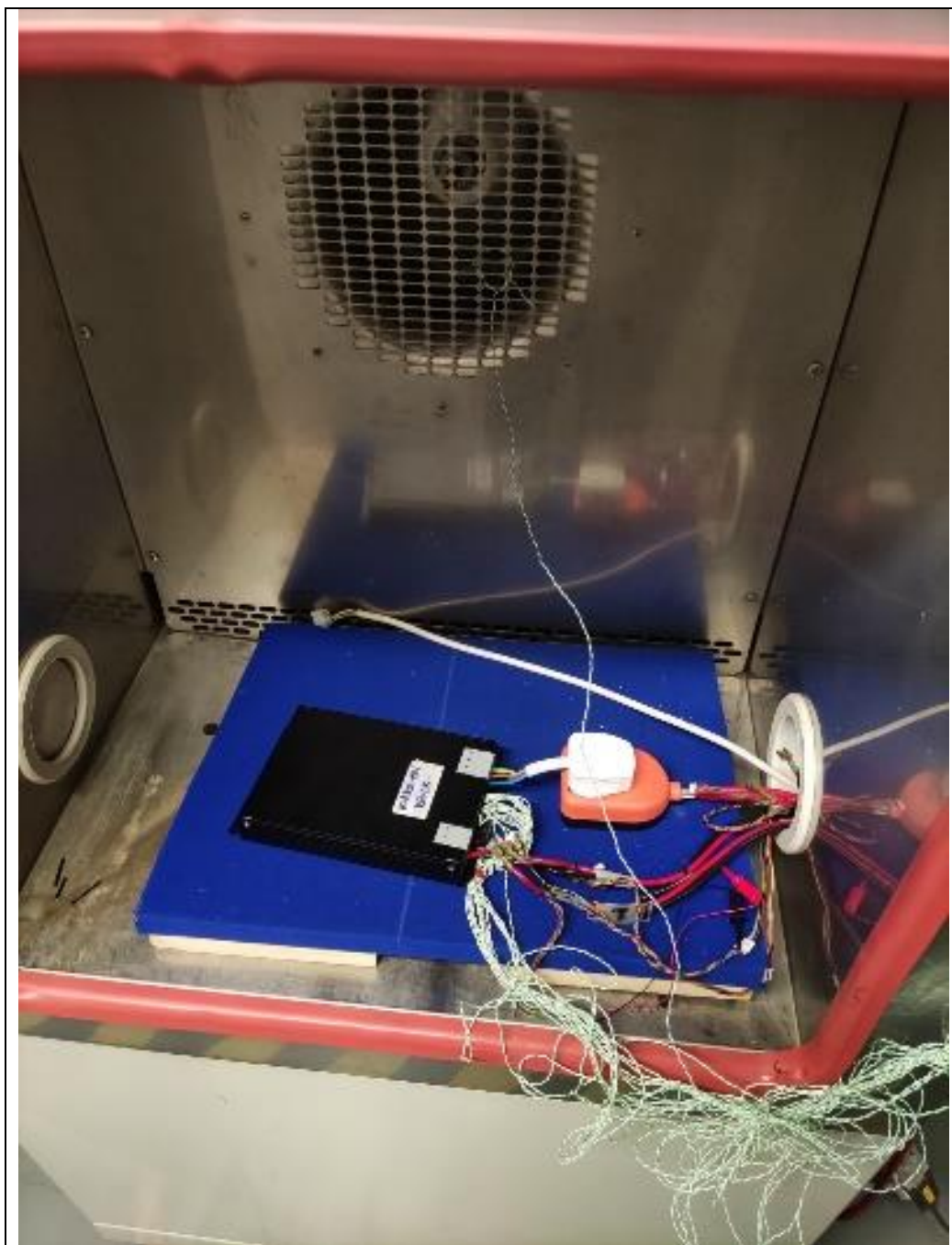
Table 3 – Data to be collected	
Type	Description
Time	Time stamp
Step #	Step number of test sequence
Chamber Temp	Chamber air temperature (Read from Chamber)
Chamber Temp DL	Chamber air temperature (Read from calibrated Datalogger - thermocouple)
Product Temp DL	Product temperature – (Read from calibrated Datalogger - thermocouple)
Vo1	Product output voltage
Io1	Product output current in load channel 1
Io2	Product output current in load channel 2
Iout	Product output current total
Vin (V)	Product input voltage
Pin (W)	Product input power
Pout	Product output power
Eff	Product efficiency

3.3 Functional Test Description

The device under test was connected to external equipment and was functionally tested when required. The set of functional tests are listed in Table 4.

Table 4 – Functional Test List	
Type	Description
Unit_Trim_TestOption	Output voltage model, Output voltage trim and test option
Sheet	Current test cycle
Step	Step number of test sequence
Time	Time stamp
Chamber Temp	Chamber air temperature
Product Temp	Product temperature
Vout	Output voltage reading. $V_{IN} = 110V_{DC}$, $P_{OUT} = 0W$
EFF_48V	Efficiency. $V_{IN} = 48V_{DC}$
EFF_110V	Efficiency. $V_{IN} = 110V_{DC}$
HOLDUP_300W	Holdup test for 300W output power. $V_{IN} = 48V_{DC}$, $P_{OUT} = 300W$, $T_{DROP} = 12.5mS$
HOLDUP_180W	Holdup test for 180W output power. $V_{IN} = 48V_{DC}$, $P_{OUT} = 180W$, $T_{DROP} = 22mS$
Loadreg	Load regulation test. $V_{IN} = 110V_{DC}$, $P_{OUT} = 0W$ to 300W.
Linereg	Line regulation test. $V_{IN} = 48V_{DC}$ to $110V_{DC}$, $P_{OUT} = 0W$ & 300W.
Ripple_0%Load	Ripple test. $V_{IN} = 110V_{DC}$, $P_{OUT} = 0W$
Ripple_100%Load	Ripple test. $V_{IN} = 110V_{DC}$, $P_{OUT} = 300W$
Vtrans	Transient peak voltage. $V_{IN} = 110V_{DC}$, $P_{OUT} = 75W$ to 225W, 1A/uS
Ttrans	Transient recovery time. $V_{IN} = 110V_{DC}$, $P_{OUT} = 75W$ to 225W, 1A/uS
Trise_0%Load	Rise time. $V_{IN} = 110V_{DC}$, $P_{OUT} = 0W$
Trise_100%Load	Rise time. $V_{IN} = 110V_{DC}$, $P_{OUT} = 300W$
OCP	Over current protection tripping point. $V_{IN} = 110V_{DC}$, Load = $CV_{MODE} V_{NOM} * 0.9$

3.4 Test Setup Pictures

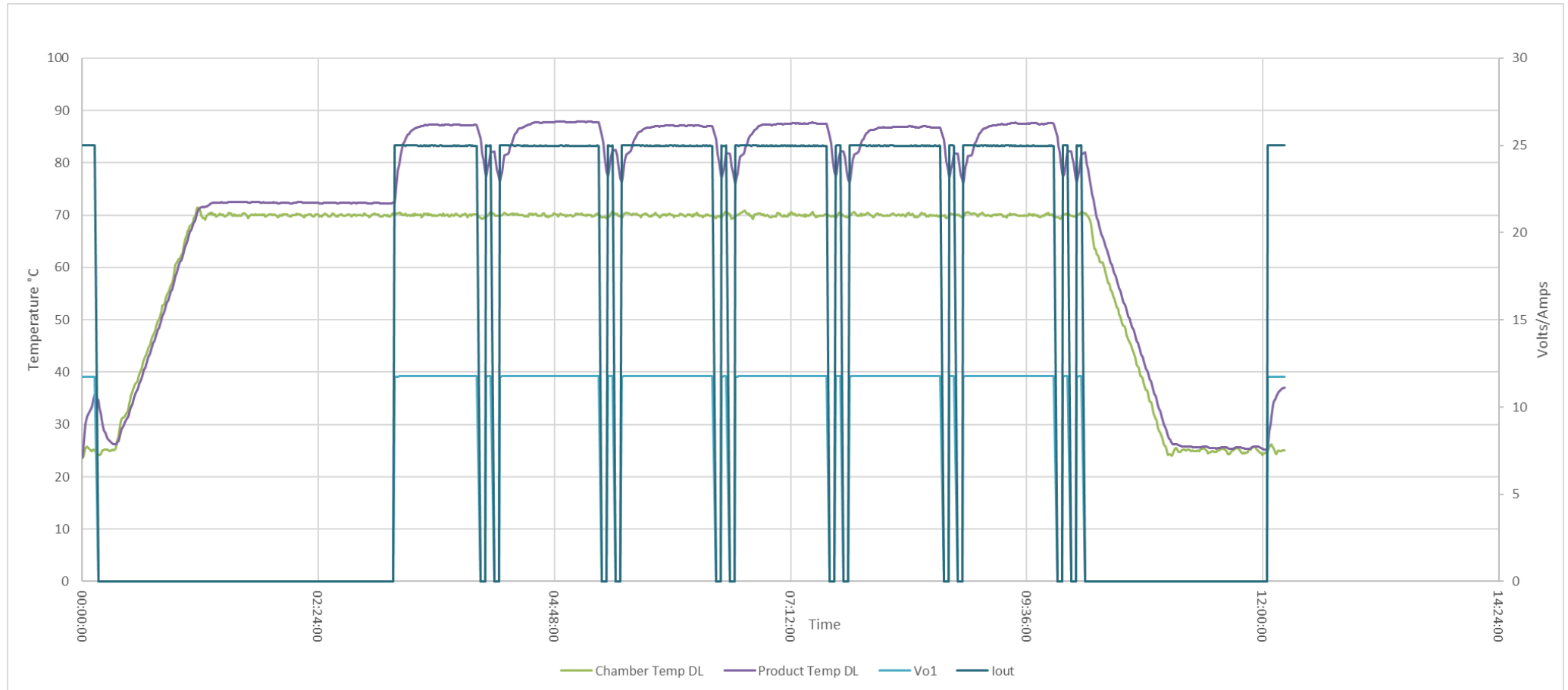


4 Appendix A: Test Results

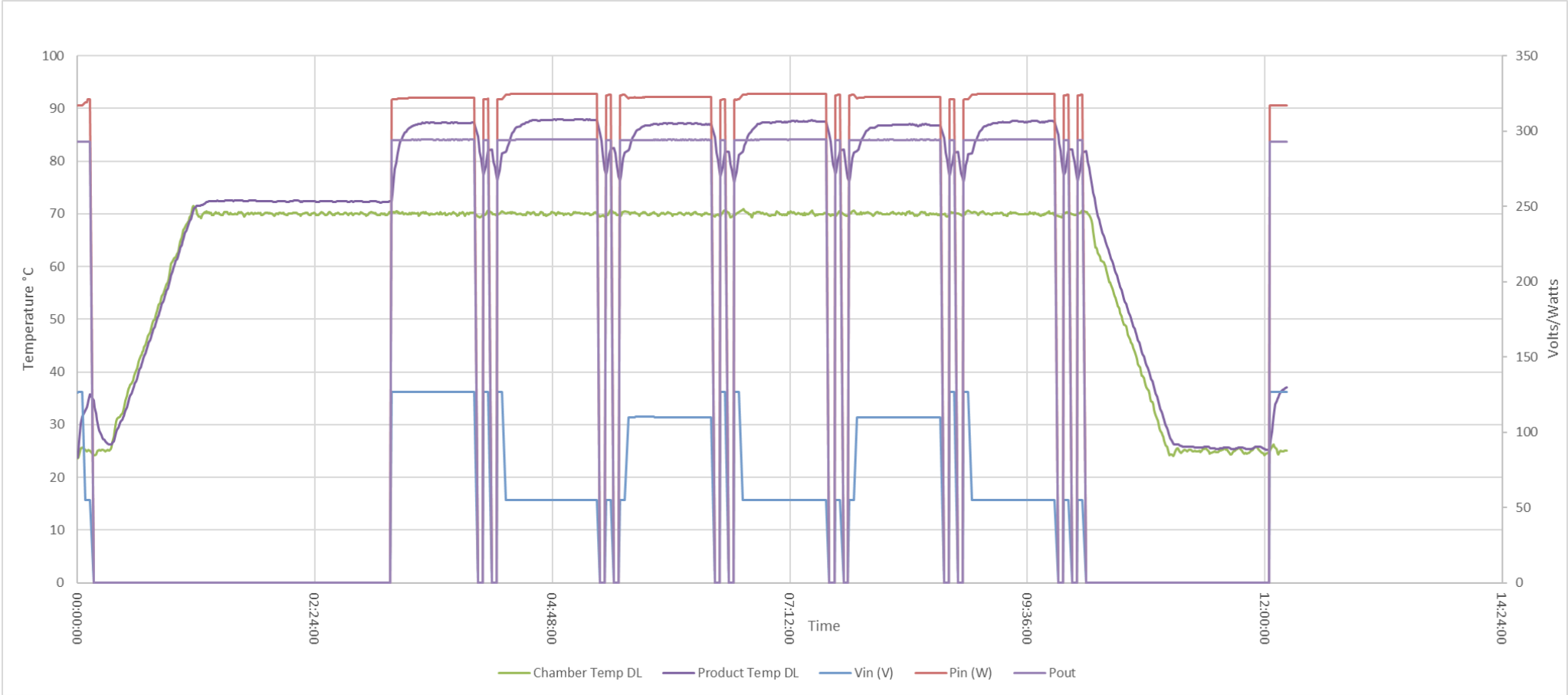
4.1 Cycle A

4.1.1 Operational Check Graphs

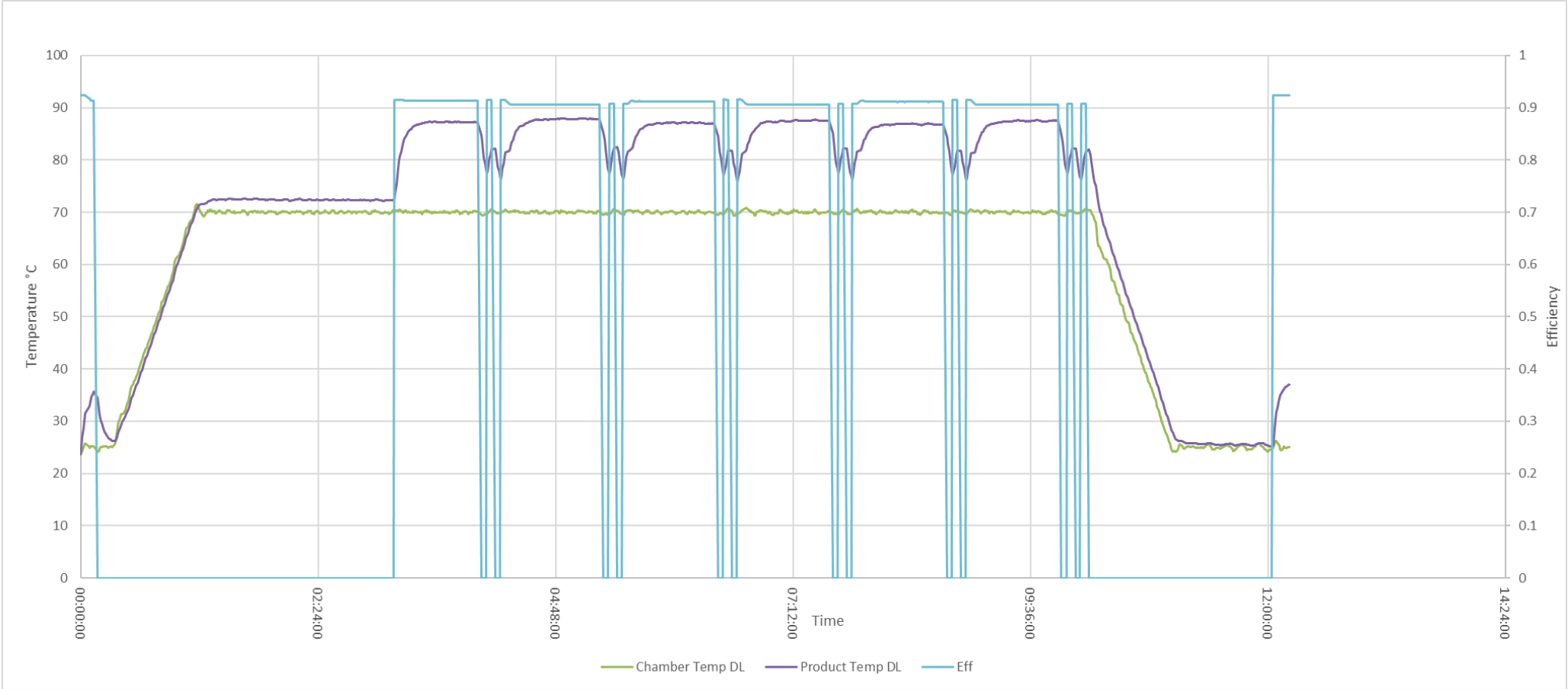
4.1.1.1 Output Voltage & Output Current



4.1.1.2 Input Voltage, Input Power & Output Power



4.1.1.3 Efficiency



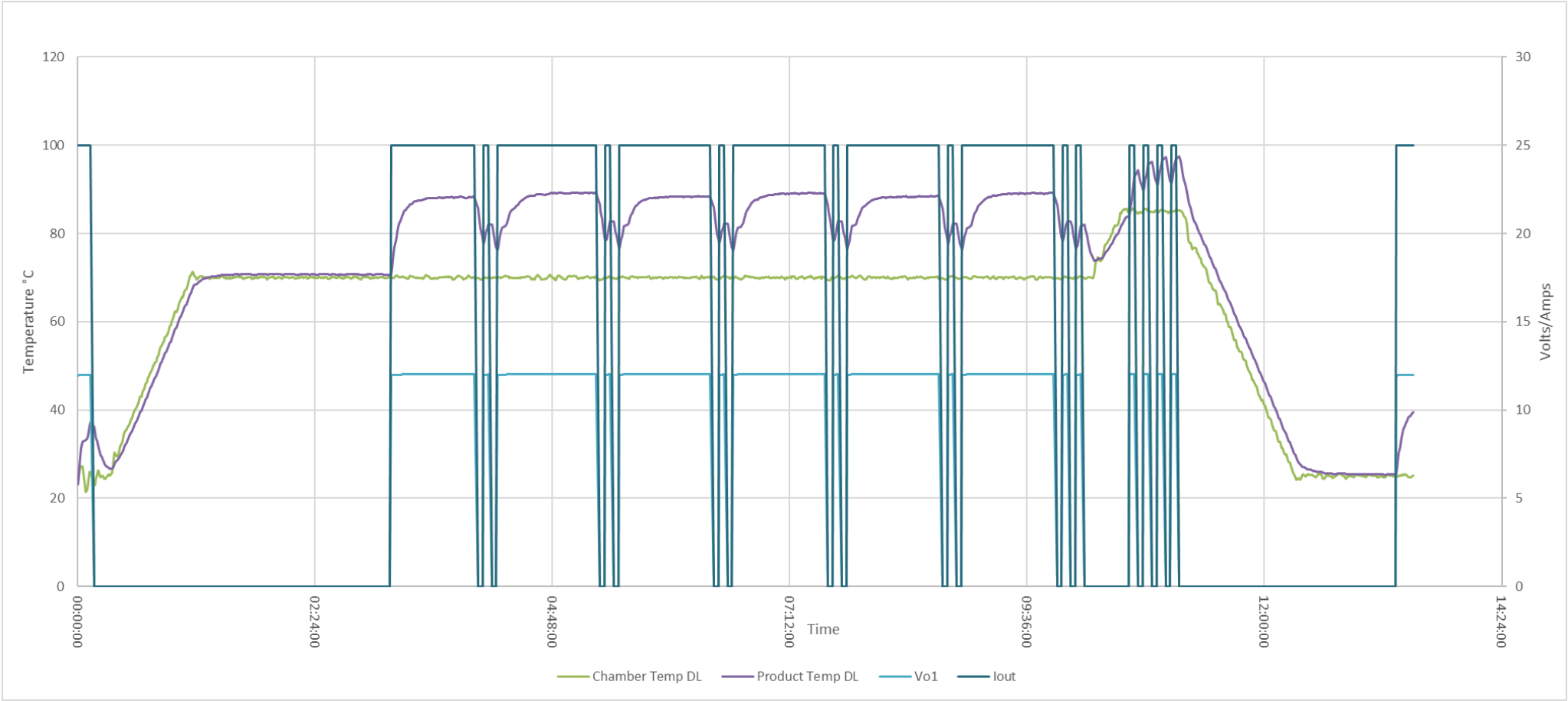
4.1.2 Functional Test Results

Unit_Trim _TestOption	Sheet	Step	Time	Chamber Temp (°C)	Product Temp (°C)	Vout (V)	EFF 48V (%)	EFF 110V (%)	HOLDUP 300W (ΔV)	HOLDUP 180W (ΔV)	Loadreg (ΔV)	Linereg (ΔV)	Ripple 0%Load (V)	Ripple 100%Load (V)	Vtrans (V)	Ttrans (S)	Trise 0%Load (S)	Trise 100%Load (S)	OCp (A)
VCCR300-12V_NOMINAL_Norm	CycleA	0	00:03:17	25.85	32.54	11.72	0.916	0.923	-0.1200	-0.0900	0.0416300	-0.0007040	0.1070	0.1030	0.279	0.0001220	0.034852	0.034978	27.70
VCCR300-12V_NOMINAL_Norm	CycleA	1	00:08:20	25.06	36.09	11.72	0.911	0.918	-0.1200	-0.1200	0.0502650	-0.0042460	0.1350	0.1070	0.282	0.0001240	0.034992	0.034972	27.68
VCCR300-12V_NOMINAL_Norm	CycleA	5	04:01:15	70.01	87.18	11.77	0.904	0.912	-0.0900	-0.0700	0.0520770	-0.0074480	0.1430	0.1110	0.376	0.0002170	0.032794	0.032778	27.57
VCCR300-12V_NOMINAL_Norm	CycleA	7	04:09:35	70.70	82.70	11.76	0.905	0.913	-0.0900	-0.0900	0.0544840	-0.0076890	0.1230	0.0910	0.358	0.0001620	0.033152	0.033210	27.53
VCCR300-12V_NOMINAL_Norm	CycleA	9	04:18:02	70.45	82.16	11.76	0.905	0.913	-0.0900	-0.0700	0.0562130	0.0042240	0.1190	0.0830	0.358	0.0001700	0.033070	0.033310	27.47
VCCR300-12V_NOMINAL_Norm	CycleA	10	05:10:40	69.98	87.77	11.77	0.904	0.913	-0.0900	-0.1200	0.0549960	0.0046970	0.1270	0.0950	0.358	0.0001940	0.032494	0.032506	27.55
VCCR300-12V_NOMINAL_Norm	CycleA	12	05:19:06	70.67	83.04	11.76	0.905	0.914	-0.0900	-0.0700	0.0492120	0.0072490	0.1230	0.0910	0.358	0.0002140	0.032628	0.033086	27.56
VCCR300-12V_NOMINAL_Norm	CycleA	14	05:27:33	70.51	82.41	11.76	0.905	0.913	-0.1200	-0.0900	0.0500920	-0.0050050	0.1310	0.1030	0.358	0.0001960	0.032892	0.033106	27.57
VCCR300-12V_NOMINAL_Norm	CycleA	15	06:20:09	69.98	86.93	11.77	0.904	0.912	-0.0900	-0.0900	0.0562220	0.0066450	0.1270	0.0990	0.363	0.0001920	0.032254	0.032570	27.56
VCCR300-12V_NOMINAL_Norm	CycleA	17	06:28:35	70.64	82.47	11.76	0.905	0.913	-0.0900	-0.0900	0.0529770	0.0114290	0.1230	0.0870	0.354	0.0002070	0.032896	0.033014	27.55
VCCR300-12V_NOMINAL_Norm	CycleA	19	06:37:02	70.53	81.99	11.76	0.905	0.913	-0.0900	-0.0900	0.0474950	0.0096470	0.1270	0.0870	0.349	0.0001960	0.032808	0.033042	27.56
VCCR300-12V_NOMINAL_Norm	CycleA	20	07:29:38	70.06	87.50	11.77	0.904	0.913	-0.1200	-0.0700	0.0563090	-0.0027940	0.1230	0.0950	0.358	0.0001980	0.032042	0.032324	27.55
VCCR300-12V_NOMINAL_Norm	CycleA	22	07:38:05	70.37	82.87	11.76	0.905	0.913	-0.0900	-0.0700	0.0551480	-0.0037730	0.1350	0.0990	0.362	0.0001800	0.032546	0.032842	27.56
VCCR300-12V_NOMINAL_Norm	CycleA	24	07:46:29	70.31	82.32	11.76	0.905	0.914	-0.1200	-0.0900	0.0483700	0.0049500	0.1350	0.0950	0.342	0.0001760	0.032818	0.032924	27.54
VCCR300-12V_NOMINAL_Norm	CycleA	25	08:39:08	69.73	86.79	11.77	0.904	0.913	-0.1700	-0.0700	0.0534770	-0.0025970	0.1230	0.0990	0.370	0.0001960	0.032556	0.032532	27.50
VCCR300-12V_NOMINAL_Norm	CycleA	27	08:47:27	70.38	82.35	11.76	0.905	0.913	-0.0900	-0.1200	0.0573190	-0.0041580	0.1190	0.1070	0.354	0.0001710	0.032658	0.032910	27.55
VCCR300-12V_NOMINAL_Norm	CycleA	29	08:55:47	70.64	81.98	11.76	0.905	0.913	-0.0900	-0.0900	0.0577730	-0.0029260	0.1150	0.0950	0.362	0.0001810	0.033136	0.033068	27.57
VCCR300-12V_NOMINAL_Norm	CycleA	30	09:48:27	69.71	87.40	11.77	0.904	0.913	-0.0900	-0.0900	0.0513680	-0.0001430	0.1190	0.1070	0.349	0.0001750	0.032028	0.032266	27.54
VCCR300-12V_NOMINAL_Norm	CycleA	32	09:56:54	70.57	82.79	11.77	0.905	0.914	-0.0900	-0.0700	0.0536820	-0.0002310	0.1190	0.0990	0.362	0.0001670	0.032816	0.032816	27.57
VCCR300-12V_NOMINAL_Norm	CycleA	34	10:05:15	70.58	82.36	11.76	0.905	0.914	-0.0900	-0.0900	0.0528430	-0.0071720	0.1270	0.1030	0.354	0.0001960	0.032314	0.032628	27.52
VCCR300-12V_NOMINAL_Norm	CycleA	37	12:08:57	24.99	37.09	11.72	0.916	0.923	-0.1200	-0.0700	0.0486870	-0.0077880	0.1230	0.0870	0.282	0.0001260	0.035200	0.035328	27.65

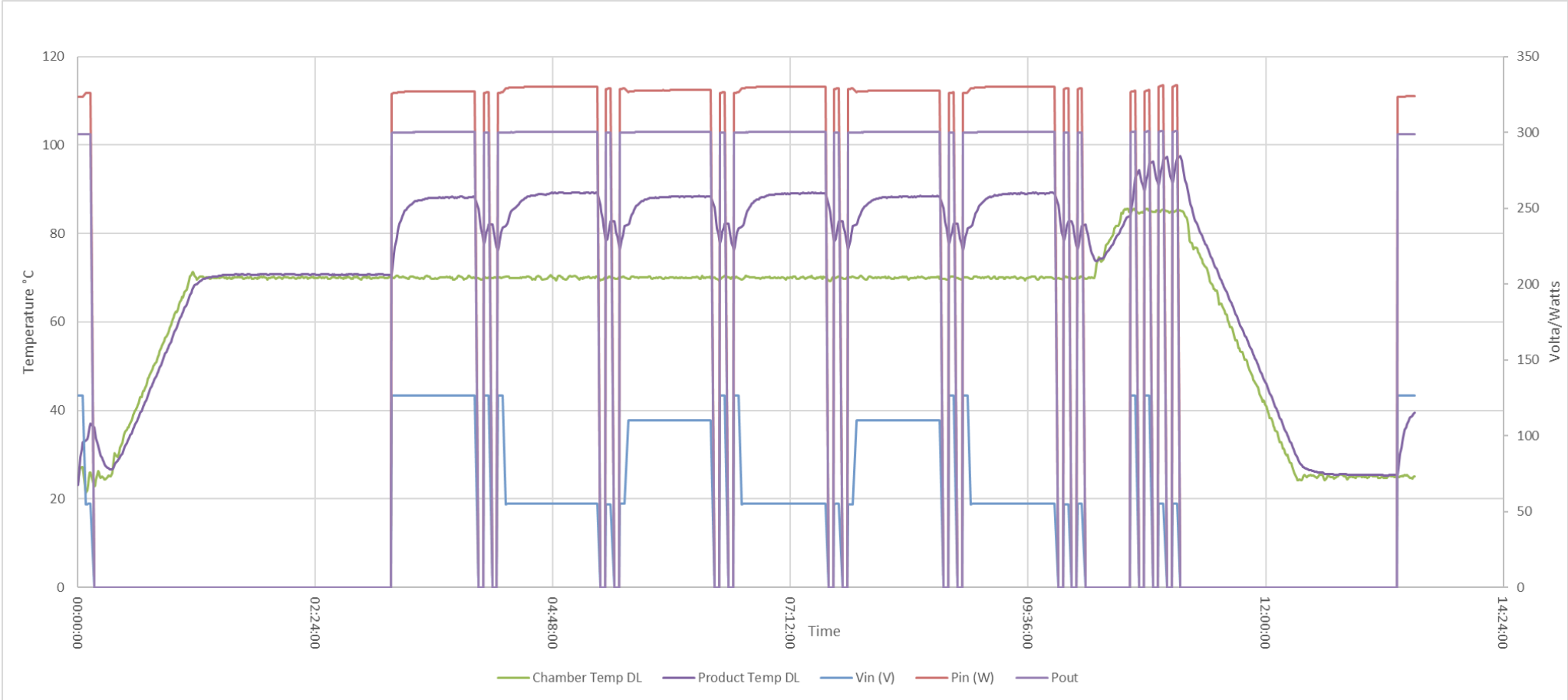
4.2 Cycle B

4.2.1 Operational Check Graphs

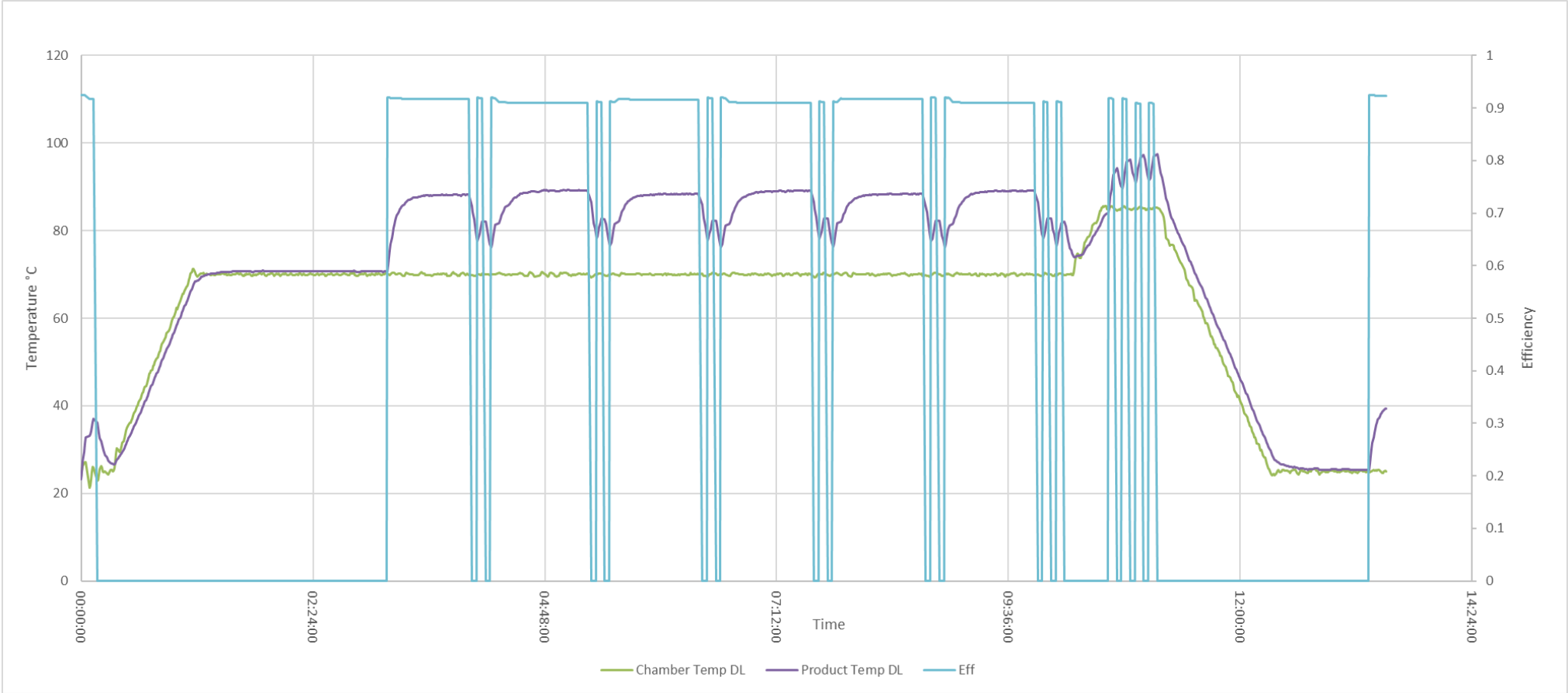
4.2.1.1 Output Voltage & Output Current



4.2.1.2 Input Voltage, Input Power & Output Power



4.2.1.3 Efficiency



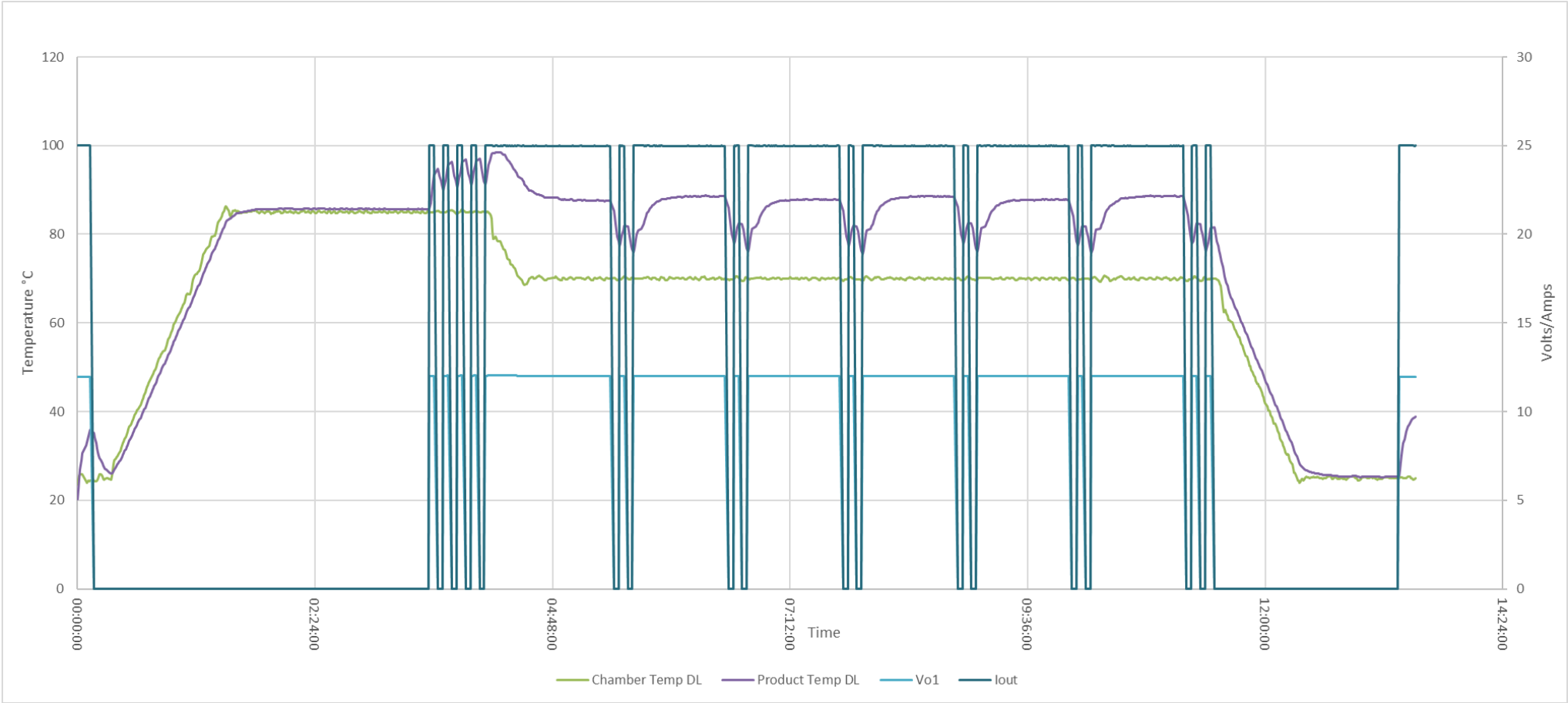
4.2.2 Functional Test Results

Unit Trim _TestOption	Sheet	Step	Time	Chamber Temp (°C)	Product Temp (°C)	Vout (V)	EFF 48V (%)	EFF 110V (%)	HOLDUP 300W (ΔV)	HOLDUP 180W (ΔV)	Loadreg (ΔV)	Linereg (ΔV)	Ripple 0%Load (V)	Ripple 100%Load (V)	Vtrans (V)	Ttrans (S)	Trise 0%Load (S)	Trise 100%Load (S)	OCF (A)
VCCR300-12V_NOMINAL_Norm	CycleB	0	00:03:18	26.18	33.96	11.96	0.916	0.923	-0.1200	-0.1000	0.0430210	0.0079440	0.1270	0.1070	0.300	0.0001250	0.036222	0.035786	27.67
VCCR300-12V_NOMINAL_Norm	CycleB	1	00:08:19	24.96	37.65	11.96	0.915	0.923	-0.1200	-0.1000	0.0434820	0.0002860	0.1310	0.1070	0.310	0.0001100	0.035566	0.035866	27.68
VCCR300-12V_NOMINAL_Norm	CycleB	5	04:01:07	69.91	88.24	12.01	0.908	0.917	-0.1000	-0.0700	0.0568260	-0.0063990	0.1350	0.0830	0.376	0.0001720	0.032470	0.032458	27.54
VCCR300-12V_NOMINAL_Norm	CycleB	7	04:09:26	70.28	82.66	12.00	0.909	0.918	-0.1000	-0.0700	0.0558330	0.0043030	0.1350	0.1030	0.349	0.0001960	0.032770	0.032866	27.57
VCCR300-12V_NOMINAL_Norm	CycleB	9	04:17:48	70.18	82.00	12.00	0.909	0.918	-0.1200	-0.0700	0.0616810	-0.0113650	0.1190	0.0910	0.367	0.0002020	0.033020	0.033092	27.57
VCCR300-12V_NOMINAL_Norm	CycleB	10	05:10:29	70.11	89.26	12.02	0.908	0.917	-0.1000	-0.0700	0.0545090	0.0072820	0.1350	0.0670	0.363	0.0001760	0.032294	0.032336	27.54
VCCR300-12V_NOMINAL_Norm	CycleB	12	05:18:51	70.00	83.34	12.01	0.909	0.918	-0.1000	-0.1000	0.0525230	0.0006620	0.1310	0.0950	0.363	0.0001800	0.033058	0.032910	27.52
VCCR300-12V_NOMINAL_Norm	CycleB	14	05:27:10	69.97	82.31	12.00	0.909	0.918	-0.1400	-0.0700	0.0482190	0.0032000	0.1310	0.1030	0.358	0.0001640	0.032948	0.033074	27.57
VCCR300-12V_NOMINAL_Norm	CycleB	15	06:19:25	70.16	88.39	12.02	0.908	0.917	-0.1200	-0.1000	0.0541780	-0.0002210	0.1270	0.0870	0.363	0.0001570	0.032256	0.032308	27.54
VCCR300-12V_NOMINAL_Norm	CycleB	17	06:27:47	70.43	82.92	12.00	0.909	0.918	-0.1000	-0.1000	0.0596950	0.0030900	0.1270	0.0830	0.366	0.0001650	0.033096	0.033214	27.56
VCCR300-12V_NOMINAL_Norm	CycleB	19	06:36:10	69.83	81.99	12.00	0.909	0.918	-0.1000	-0.0700	0.0530740	-0.0080550	0.1230	0.0950	0.349	0.0001800	0.032998	0.033040	27.58
VCCR300-12V_NOMINAL_Norm	CycleB	20	07:28:50	69.95	89.08	12.02	0.908	0.917	-0.1000	-0.0700	0.0549500	0.0041930	0.1350	0.1190	0.367	0.0001730	0.032254	0.032234	27.54
VCCR300-12V_NOMINAL_Norm	CycleB	22	07:37:13	70.34	83.45	12.01	0.909	0.918	-0.1000	-0.1000	0.0455710	0.0098200	0.1350	0.0870	0.349	0.0001840	0.032982	0.033004	27.57
VCCR300-12V_NOMINAL_Norm	CycleB	24	07:45:33	70.25	82.45	12.00	0.909	0.918	-0.1000	-0.0700	0.0604670	0.0045240	0.1150	0.0870	0.358	0.0001840	0.032608	0.033020	27.57
VCCR300-12V_NOMINAL_Norm	CycleB	25	08:38:18	69.58	88.28	12.02	0.908	0.917	-0.1000	-0.1000	0.0511990	-0.0040830	0.1270	0.0870	0.367	0.0001940	0.032348	0.032292	27.55
VCCR300-12V_NOMINAL_Norm	CycleB	27	08:46:40	70.24	82.86	12.00	0.909	0.918	-0.1000	-0.1000	0.0507570	0.0055170	0.1230	0.0950	0.358	0.0001660	0.033000	0.032882	27.57
VCCR300-12V_NOMINAL_Norm	CycleB	29	08:55:00	69.96	81.92	12.00	0.909	0.918	-0.1000	-0.0700	0.0575980	-0.0043030	0.1190	0.0990	0.350	0.0001800	0.032732	0.033134	27.57
VCCR300-12V_NOMINAL_Norm	CycleB	30	09:47:45	69.93	89.09	12.02	0.908	0.917	-0.1000	-0.0700	0.0588120	-0.0097100	0.1270	0.0950	0.367	0.0001810	0.031966	0.031996	27.53
VCCR300-12V_NOMINAL_Norm	CycleB	32	09:56:07	70.02	83.39	12.01	0.909	0.918	-0.1000	-0.0700	0.0473360	-0.0044130	0.1230	0.0910	0.349	0.0001660	0.032920	0.032612	27.57
VCCR300-12V_NOMINAL_Norm	CycleB	34	10:04:29	70.13	82.44	12.00	0.909	0.918	-0.1200	-0.0700	0.0569360	0.0025380	0.1390	0.0950	0.341	0.0001730	0.032768	0.032884	27.57
VCCR300-12V_NOMINAL_Norm	CycleB	38	10:36:49	85.10	93.75	12.03	0.907	0.916	-0.1200	-0.0700	0.0606880	-0.0017660	0.1270	0.0910	0.376	0.0001680	0.031156	0.030832	27.53
VCCR300-12V_NOMINAL_Norm	CycleB	40	10:45:13	85.05	96.52	12.04	0.906	0.916	-0.1200	-0.0700	0.0486610	0.0029800	0.1270	0.0950	0.367	0.0001930	0.030644	0.030546	27.52
VCCR300-12V_NOMINAL_Norm	CycleB	42	10:53:36	85.34	97.40	12.04	0.906	0.916	-0.1200	-0.0700	0.0517500	-0.0033100	0.1350	0.0950	0.376	0.0001940	0.030458	0.030312	27.51
VCCR300-12V_NOMINAL_Norm	CycleB	44	11:02:00	85.38	97.70	12.04	0.906	0.916	-0.1200	-0.0700	0.0495430	0.0014340	0.1190	0.0750	0.376	0.0001910	0.030384	0.029946	27.50
VCCR300-12V_NOMINAL_Norm	CycleB	47	13:26:18	24.96	39.55	11.96	0.915	0.923	-0.1200	-0.0700	0.0524640	0.0030890	0.1310	0.1030	0.306	0.0001440	0.035744	0.035676	27.70

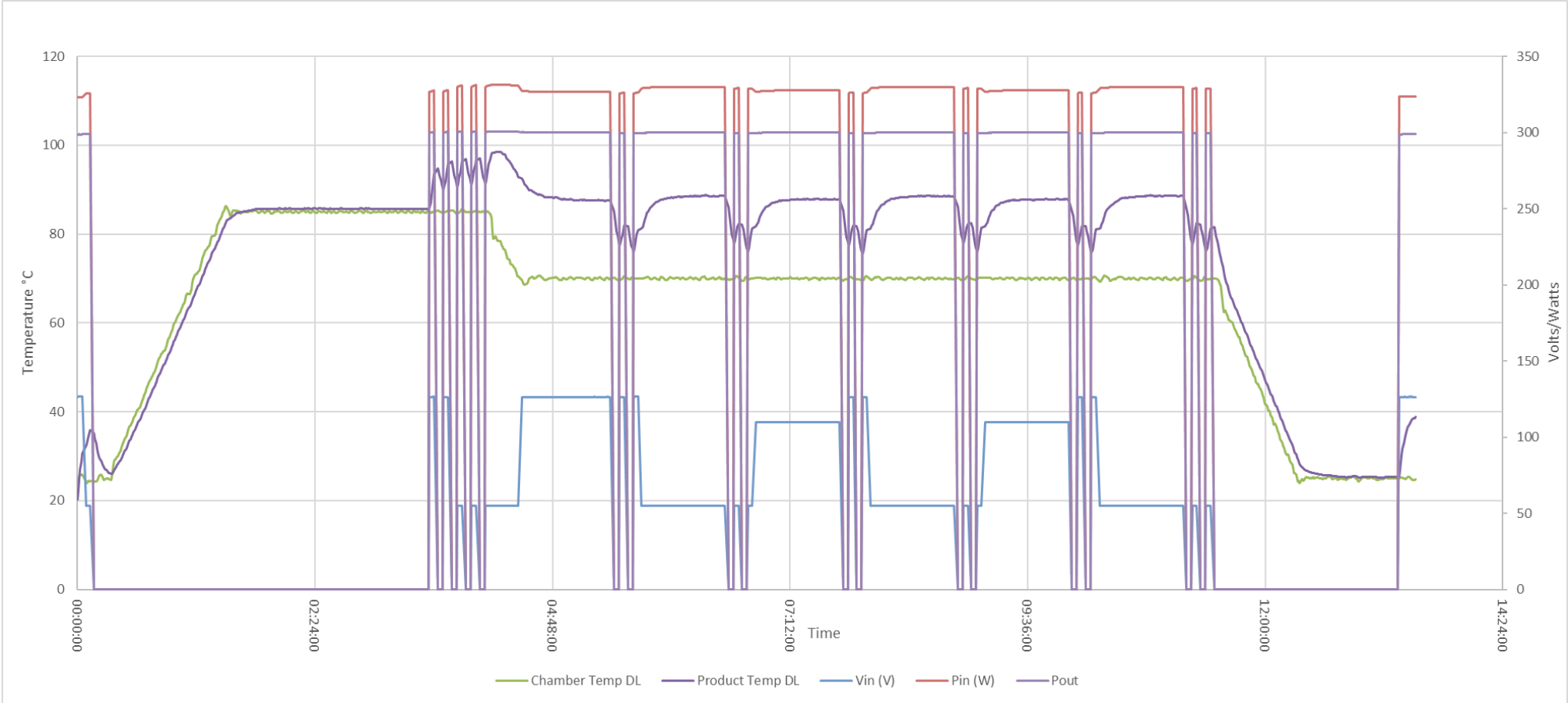
4.3 Cycle C

4.3.1 Operational Check Graphs

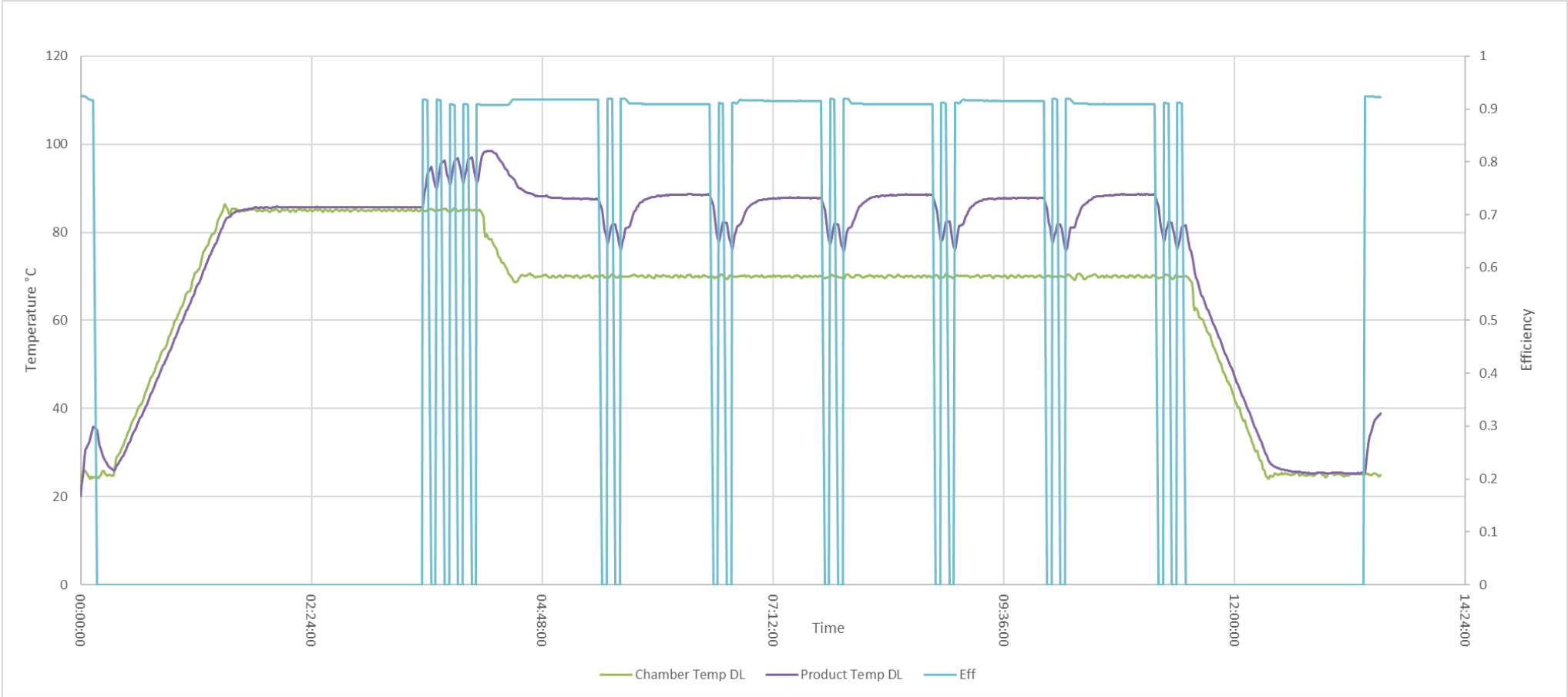
4.3.1.1 Output Voltage & Output Current



4.3.1.2 Input Voltage, Input Power & Output Power



4.3.1.3 Efficiency



4.3.2 Functional Test Results

Unit_Trim _TestOption	Sheet	Step	Time	Chamber Temp (°C)	Product Temp (°C)	Vout (V)	EFF 48V (%)	EFF 110V (%)	HOLDUP 300W (ΔV)	HOLDUP 180W (ΔV)	Loadreg (ΔV)	Linereg (ΔV)	Ripple 0%Load (V)	Ripple 100%Load (V)	Vtrans (V)	Ttrans (S)	Trise 0%Load (S)	Trise 100%Load (S)	OCP (A)
VCCR300-12V_NOMINAL_Norm	CycleC	0	00:03:17	26.04	31.81	11.95	0.915	0.923	-0.1400	-0.1000	0.0433100	-0.0011030	0.1190	0.1190	0.293	0.0001320	0.036170	0.036320	27.62
VCCR300-12V_NOMINAL_Norm	CycleC	1	00:08:19	24.53	36.29	11.96	0.915	0.923	-0.1400	-0.1000	0.0427880	0.0067310	0.1390	0.1150	0.308	0.0001340	0.036276	0.036176	27.69
VCCR300-12V_NOMINAL_Norm	CycleC	6	03:36:44	85.28	94.36	12.02	0.906	0.916	-0.1000	-0.0700	0.0613500	0.0101520	0.1350	0.0950	0.367	0.0001790	0.031438	0.031172	27.52
VCCR300-12V_NOMINAL_Norm	CycleC	8	03:45:10	85.29	96.44	12.03	0.906	0.915	-0.1000	-0.1000	0.0507570	0.0091590	0.1350	0.0870	0.376	0.0001860	0.031000	0.030908	27.51
VCCR300-12V_NOMINAL_Norm	CycleC	10	03:53:36	85.58	97.25	12.03	0.905	0.915	-0.1000	-0.1500	0.0591430	-0.0024280	0.1230	0.0830	0.376	0.0001970	0.030770	0.030468	27.50
VCCR300-12V_NOMINAL_Norm	CycleC	12	04:02:02	85.38	97.44	12.03	0.905	0.916	-0.1000	-0.1000	0.0471160	-0.0107030	0.1310	0.1190	0.371	0.0001940	0.030842	0.030384	27.51
VCCR300-12V_NOMINAL_Norm	CycleC	15	05:18:47	70.09	87.71	12.00	0.908	0.917	-0.1500	-0.0700	0.0585910	-0.0052960	0.1350	0.0990	0.376	0.0001640	0.032930	0.032894	27.54
VCCR300-12V_NOMINAL_Norm	CycleC	17	05:27:11	70.48	82.44	11.99	0.909	0.918	-0.1200	-0.1000	0.0499430	0.0040820	0.1350	0.0830	0.363	0.0001790	0.033488	0.033282	27.57
VCCR300-12V_NOMINAL_Norm	CycleC	19	05:35:34	69.91	81.63	11.99	0.908	0.918	-0.1000	-0.0700	0.0584230	0.0028690	0.1190	0.1230	0.354	0.0002000	0.033350	0.033474	27.56
VCCR300-12V_NOMINAL_Norm	CycleC	20	06:28:10	70.11	88.60	12.01	0.908	0.917	-0.1000	-0.1000	0.0598050	0.0032000	0.1230	0.0870	0.367	0.0001630	0.032410	0.032488	27.54
VCCR300-12V_NOMINAL_Norm	CycleC	22	06:36:34	70.09	83.06	12.00	0.908	0.918	-0.1000	-0.1000	0.0530500	0.0013240	0.1270	0.0950	0.349	0.0001610	0.033070	0.033146	27.56
VCCR300-12V_NOMINAL_Norm	CycleC	24	06:44:59	70.03	82.06	11.99	0.909	0.918	-0.1000	-0.0700	0.0505160	0.0099310	0.1470	0.0950	0.367	0.0001960	0.033286	0.033288	27.55
VCCR300-12V_NOMINAL_Norm	CycleC	25	07:37:37	70.09	87.91	12.00	0.908	0.917	-0.1000	-0.1000	0.0558330	-0.0016550	0.1310	0.0870	0.367	0.0001780	0.032354	0.032578	27.53
VCCR300-12V_NOMINAL_Norm	CycleC	27	07:46:03	69.90	82.52	12.00	0.908	0.917	-0.1000	-0.0700	0.0542820	0.0013240	0.1270	0.1110	0.367	0.0001730	0.033342	0.033284	27.57
VCCR300-12V_NOMINAL_Norm	CycleC	29	07:54:28	70.47	81.74	11.99	0.909	0.918	-0.1200	-0.1000	0.0518590	0.0116960	0.1350	0.0990	0.354	0.0001860	0.033074	0.033318	27.57
VCCR300-12V_NOMINAL_Norm	CycleC	30	08:47:08	69.94	88.48	12.01	0.908	0.917	-0.1200	-0.1000	0.0515300	-0.0061790	0.1350	0.0870	0.358	0.0001780	0.032188	0.032234	27.53
VCCR300-12V_NOMINAL_Norm	CycleC	32	08:55:31	70.59	83.00	12.00	0.908	0.918	-0.1200	-0.0700	0.0590080	-0.0017650	0.1310	0.0950	0.354	0.0001930	0.033080	0.032646	27.56
VCCR300-12V_NOMINAL_Norm	CycleC	34	09:03:56	70.17	82.15	11.99	0.909	0.918	-0.1000	-0.0700	0.0458500	-0.0065100	0.1270	0.0830	0.354	0.0001860	0.033028	0.033070	27.57
VCCR300-12V_NOMINAL_Norm	CycleC	35	09:56:33	69.93	87.72	12.00	0.907	0.917	-0.1000	-0.0700	0.0573780	0.0035310	0.1310	0.0910	0.358	0.0001690	0.032418	0.032428	27.55
VCCR300-12V_NOMINAL_Norm	CycleC	37	10:04:57	69.92	82.38	12.00	0.908	0.918	-0.1200	-0.0700	0.0566630	0.0003310	0.1190	0.1070	0.363	0.0001690	0.032808	0.033100	27.57
VCCR300-12V_NOMINAL_Norm	CycleC	39	10:13:22	69.93	81.69	11.99	0.909	0.918	-0.1000	-0.1000	0.0489330	0.0024270	0.1350	0.0910	0.354	0.0001800	0.033384	0.033276	27.57
VCCR300-12V_NOMINAL_Norm	CycleC	40	11:06:00	69.88	88.54	12.01	0.907	0.917	-0.1000	-0.1000	0.0556120	0.0072820	0.1270	0.1030	0.367	0.0001770	0.032316	0.032302	27.53
VCCR300-12V_NOMINAL_Norm	CycleC	42	11:14:24	70.03	83.07	12.00	0.908	0.918	-0.1200	-0.1000	0.0502050	-0.0128000	0.1270	0.1190	0.349	0.0001810	0.033024	0.032862	27.55
VCCR300-12V_NOMINAL_Norm	CycleC	44	11:22:50	69.98	82.04	11.99	0.909	0.918	-0.1000	-0.1000	0.0540030	-0.0076140	0.1270	0.0950	0.358	0.0001630	0.033154	0.032870	27.57
VCCR300-12V_NOMINAL_Norm	CycleC	47	13:26:58	24.96	38.98	11.96	0.915	0.922	-0.1200	-0.1000	0.0438590	-0.0055170	0.1230	0.1150	0.304	0.0001420	0.035674	0.036002	27.68