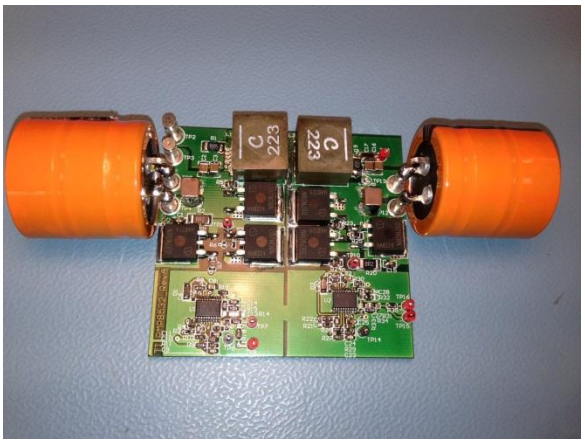
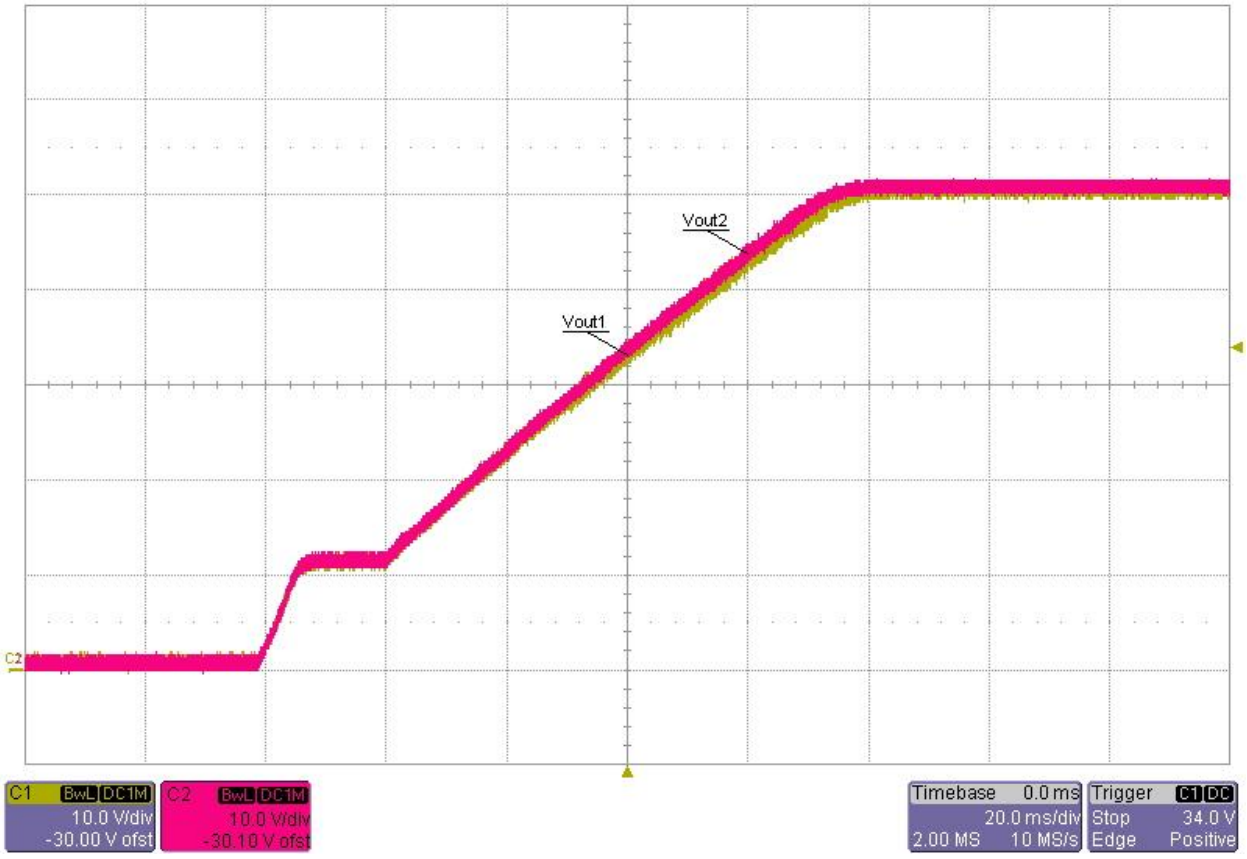


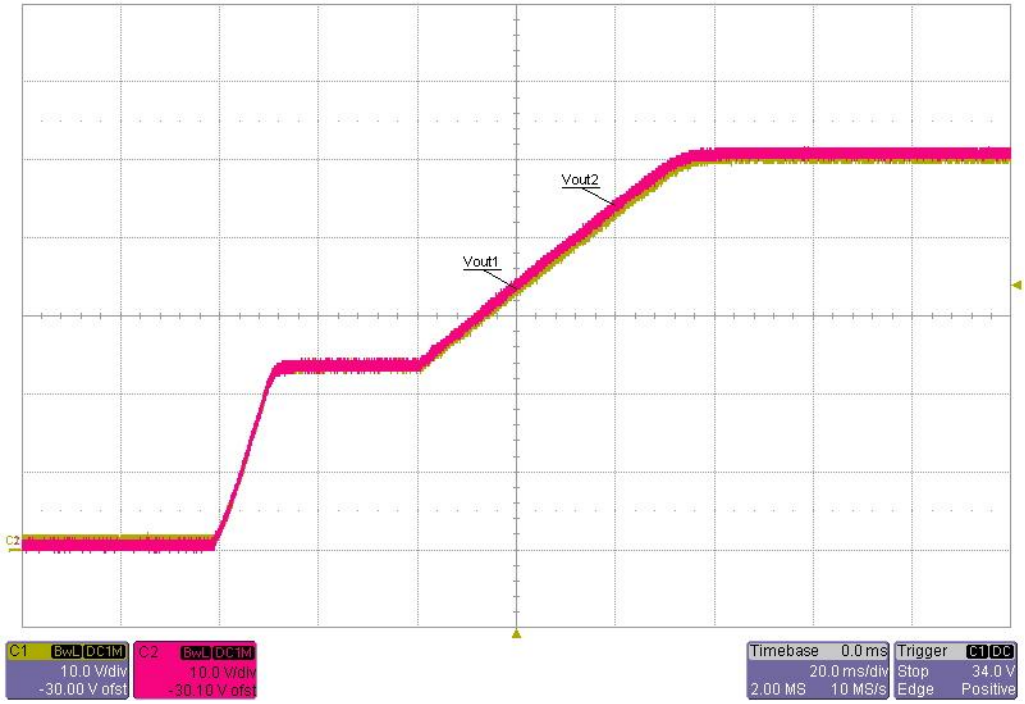
1 Startup

An additional input bulk capacitor is recommended for input voltage < 9V during startup.

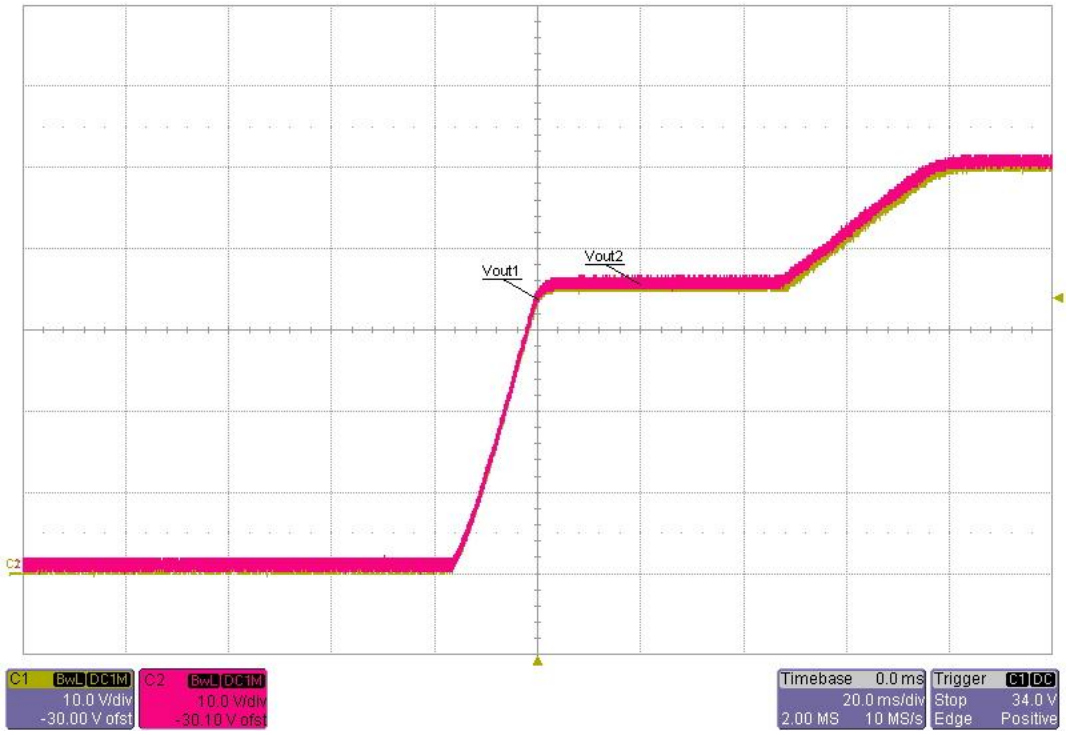
Input voltage = 12VDC
Load current = 0A



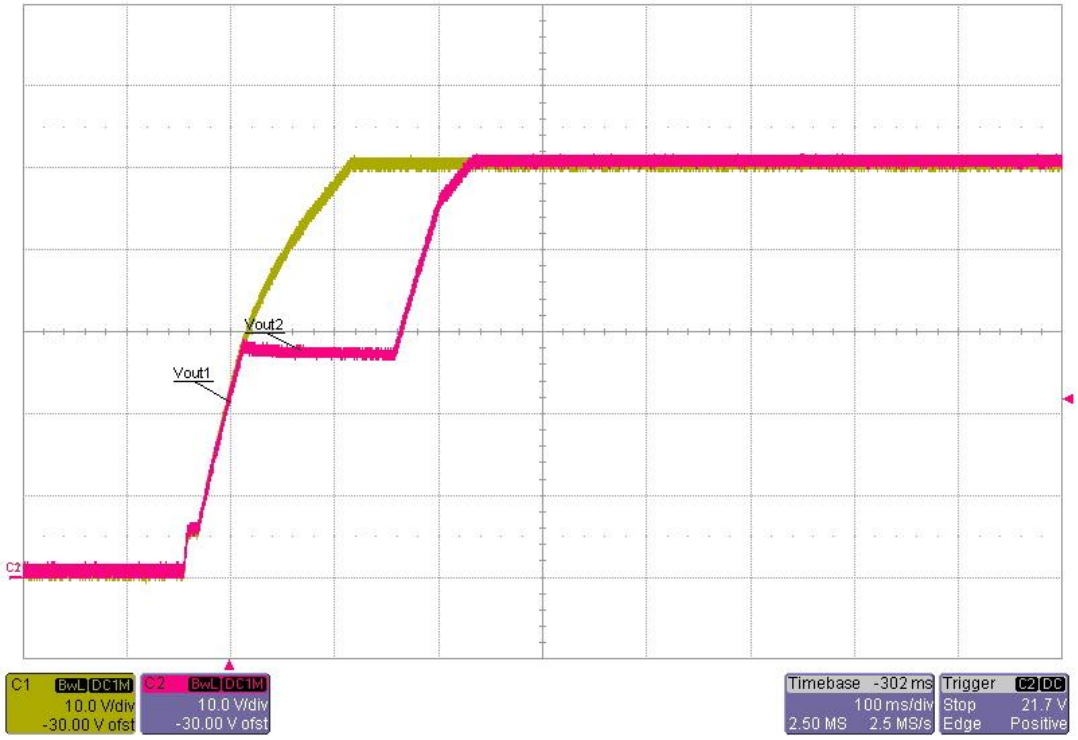
Input voltage = 24VDC
Load current = 0A



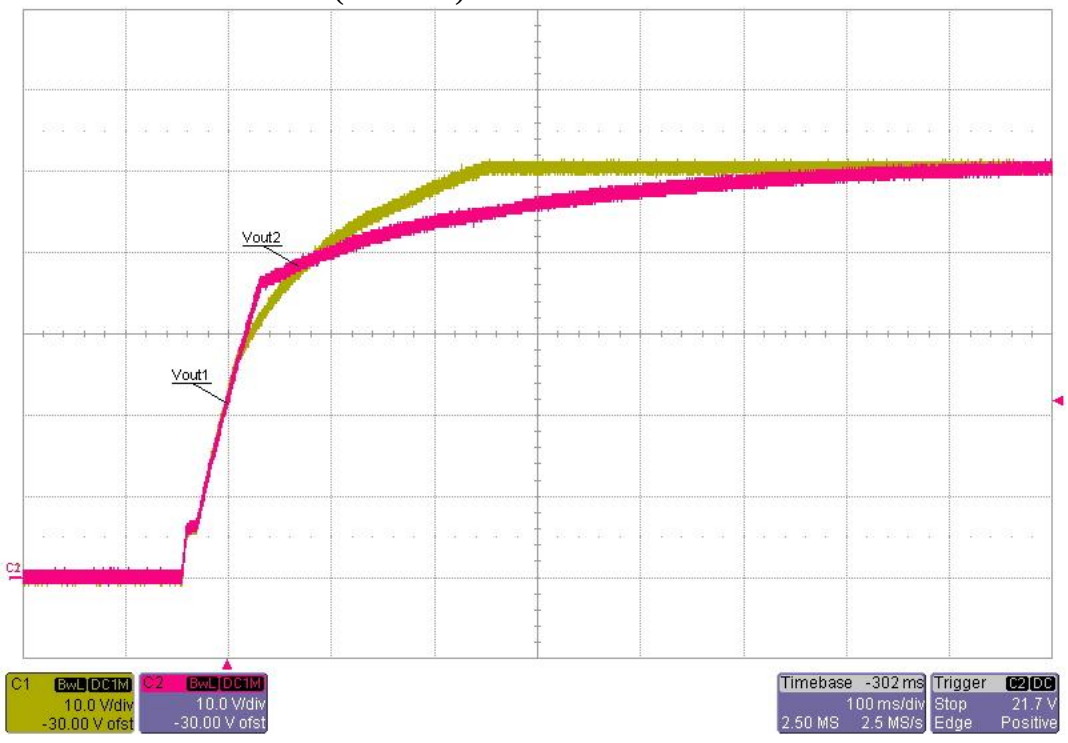
Input voltage = 36VDC
Load current = 0A



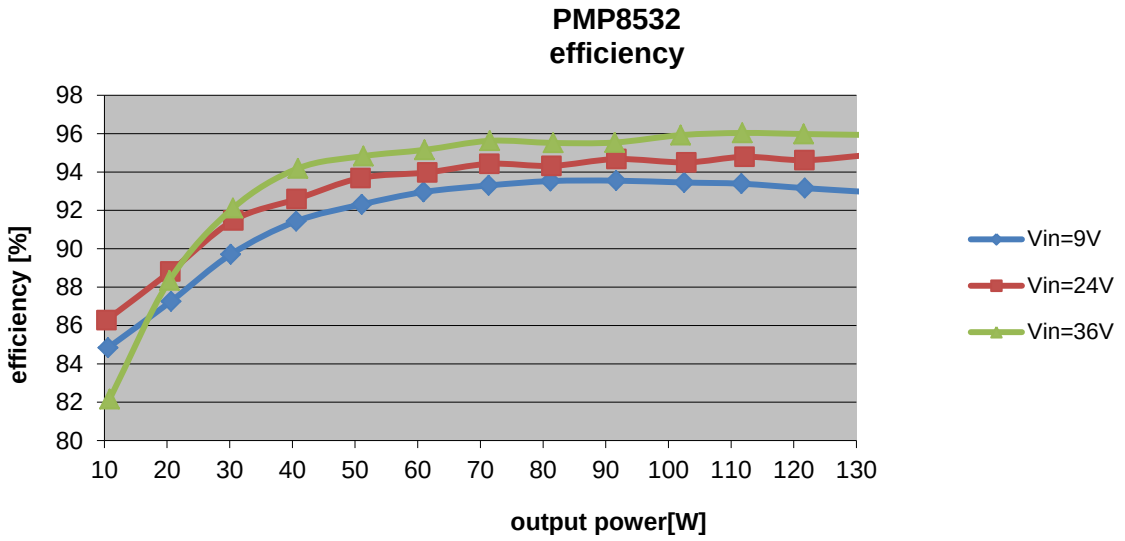
Input voltage = 6.5VDC
Load current = 0A



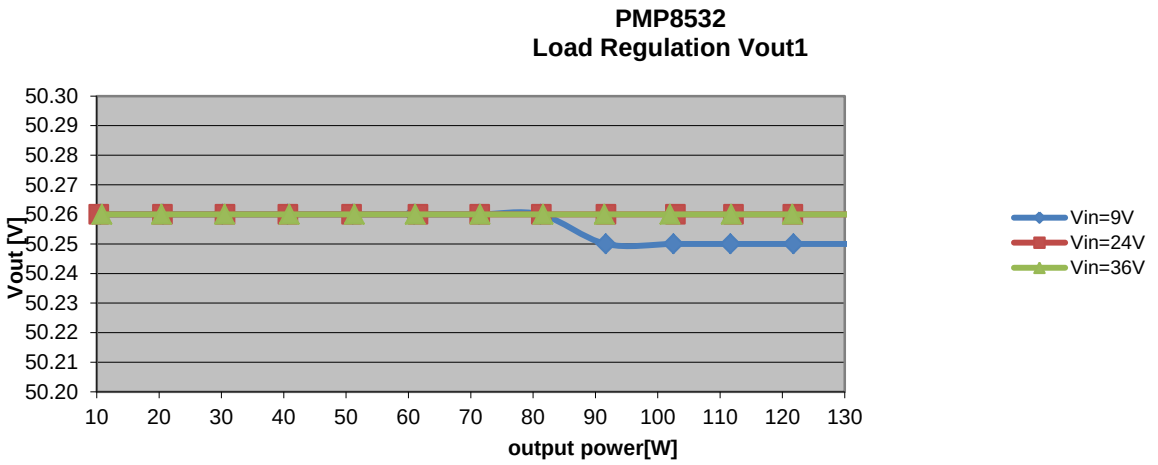
Input voltage = 6.5VDC
Load current = full load (2 x 0.5A)

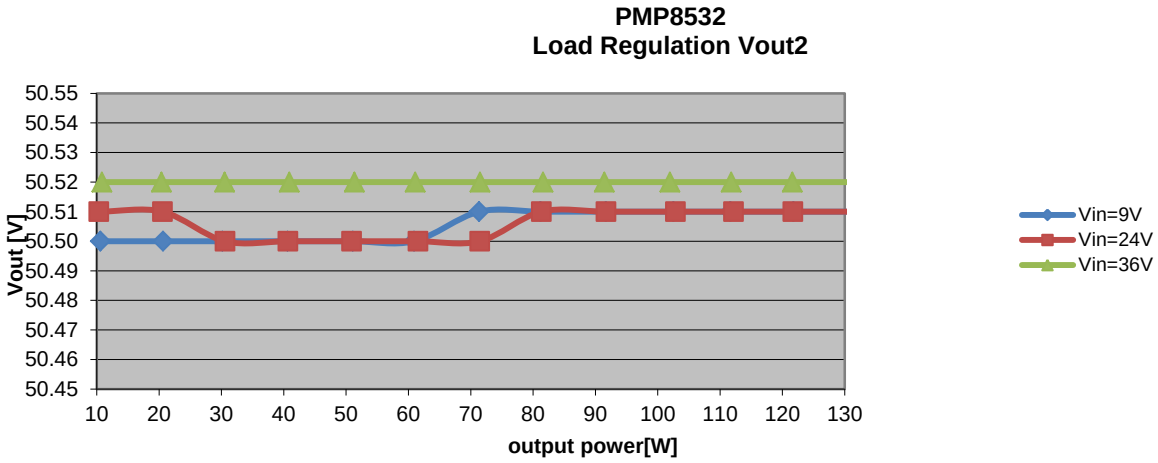


2 Efficiency



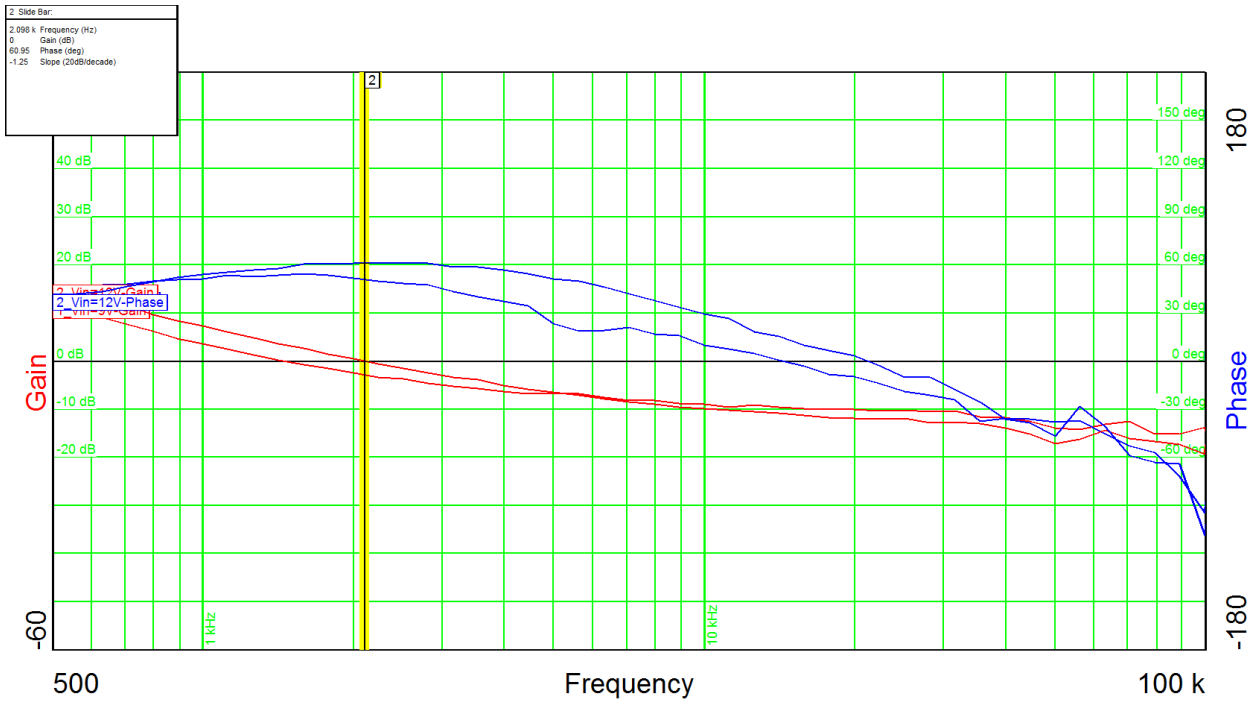
3 Load regulation





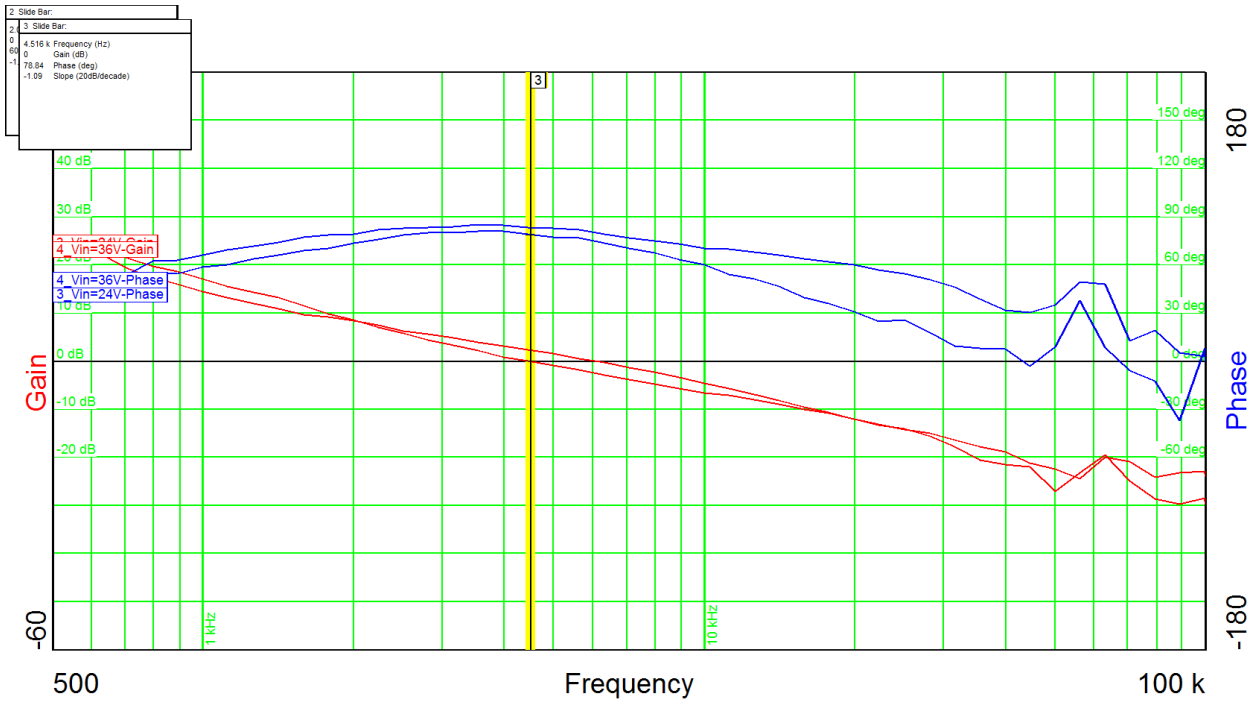
4 Control Loop Frequency Response

4.1 Vout1 (Cout = 3.9mF):



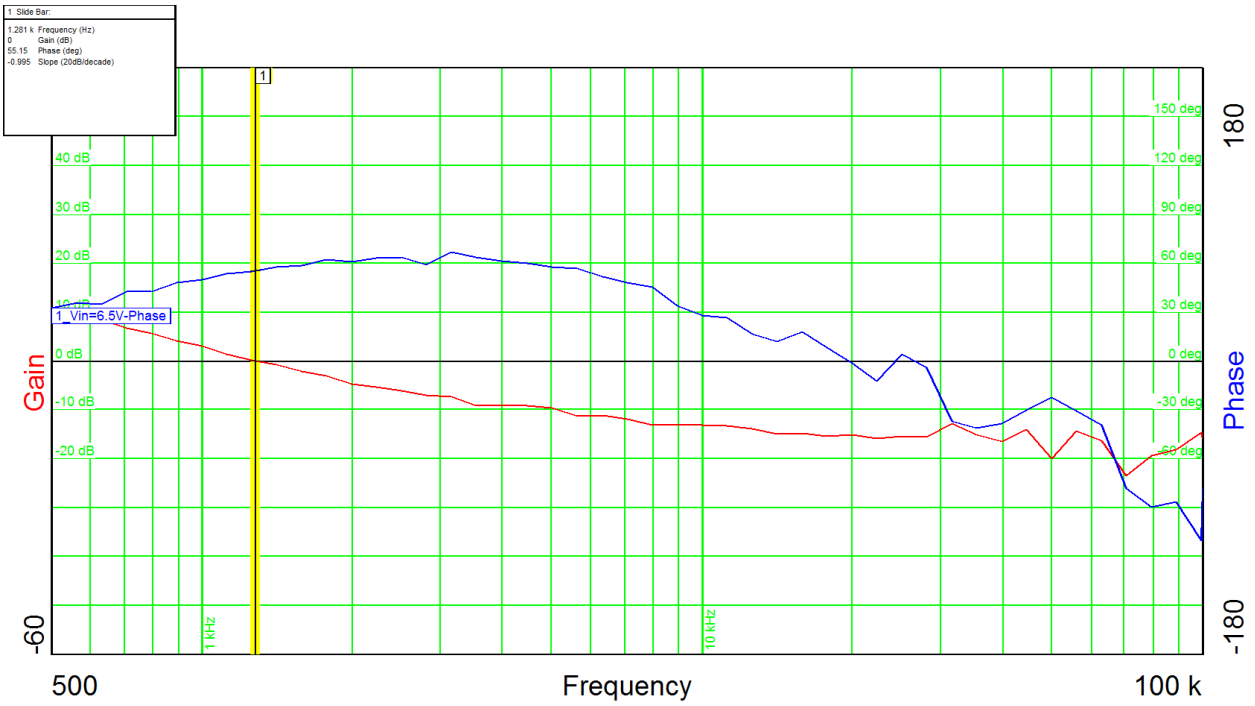
Output power = 51V@1.25A
Input voltage = 9VDC
Phase margin = 54°
Bandwidth = 1.5kHz

Output power = 51V@1.25A
Input voltage = 12VDC
Phase margin = 61°
Bandwidth = 2.1kHz



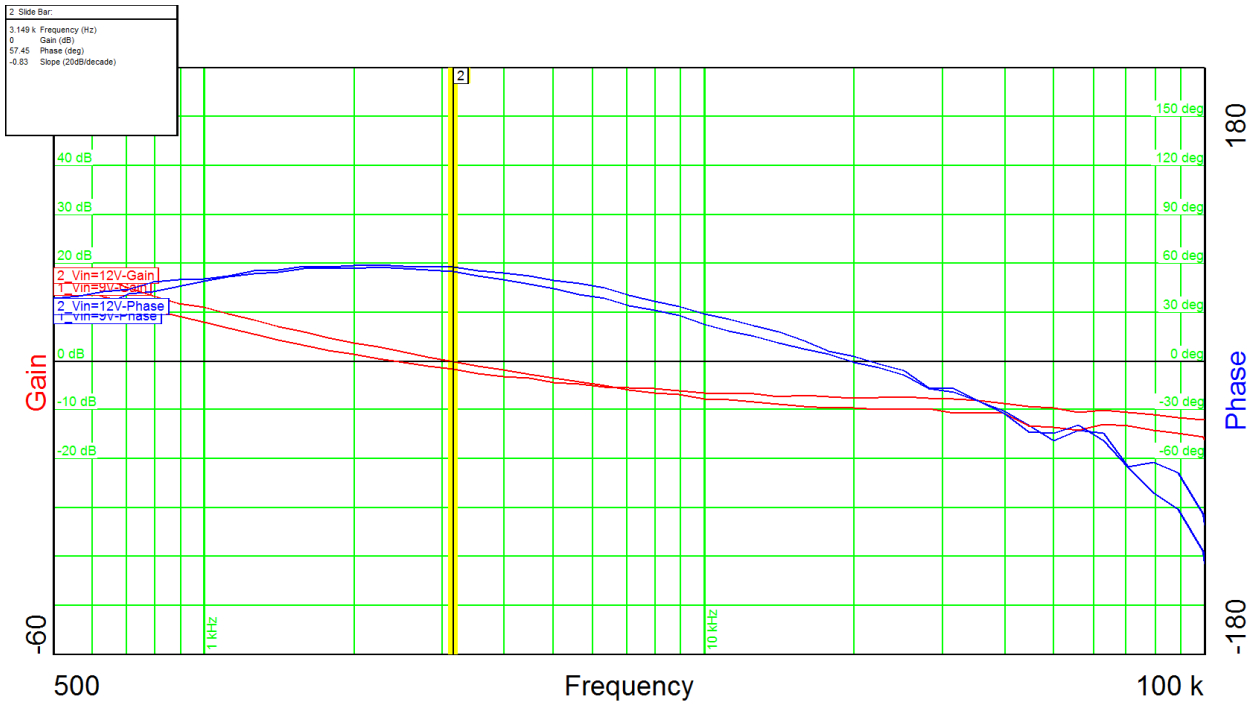
Output power = 51V@1.25A
Input voltage = 24VDC
Phase margin = 79°
Bandwidth = 4.5kHz

Output power = 51V@1.25A
Input voltage = 36VDC
Phase margin = 80°
Bandwidth = 6.0kHz



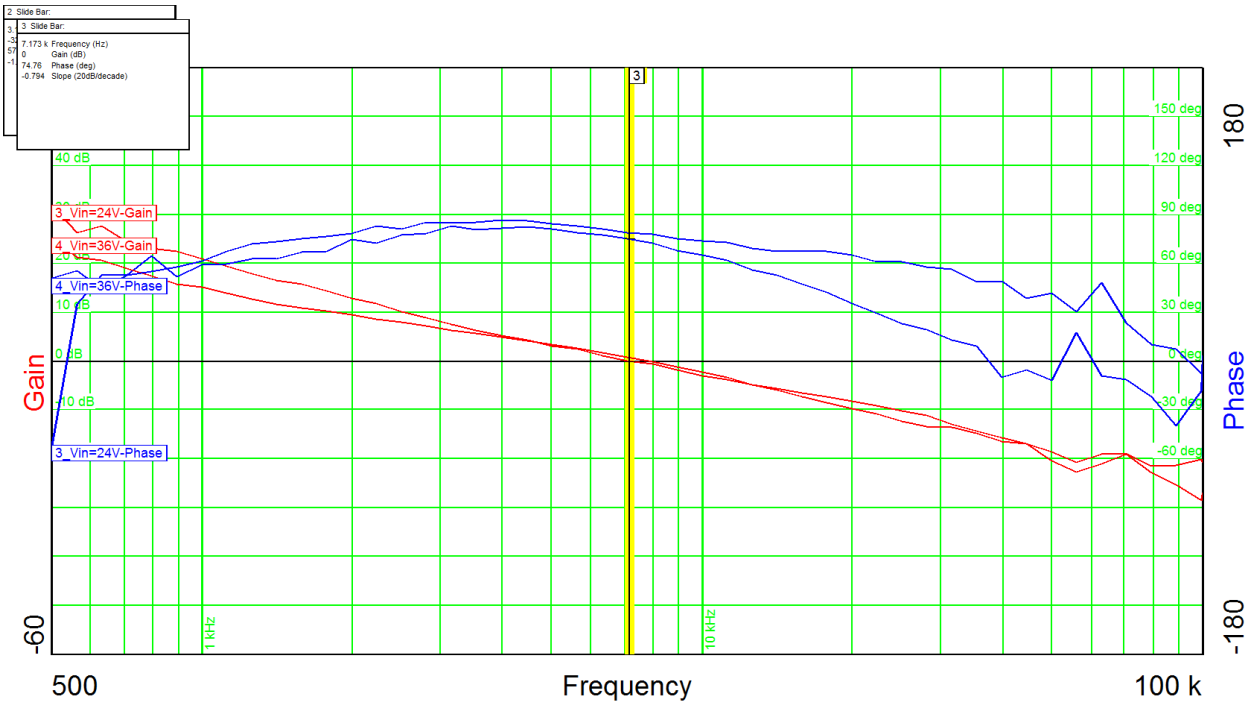
Output power = 51V@0.5A
Input voltage = 6.5VDC
Phase margin = 55°
Bandwidth = 1.3kHz

4.2 Vout2 (Cout = 2.7mF):



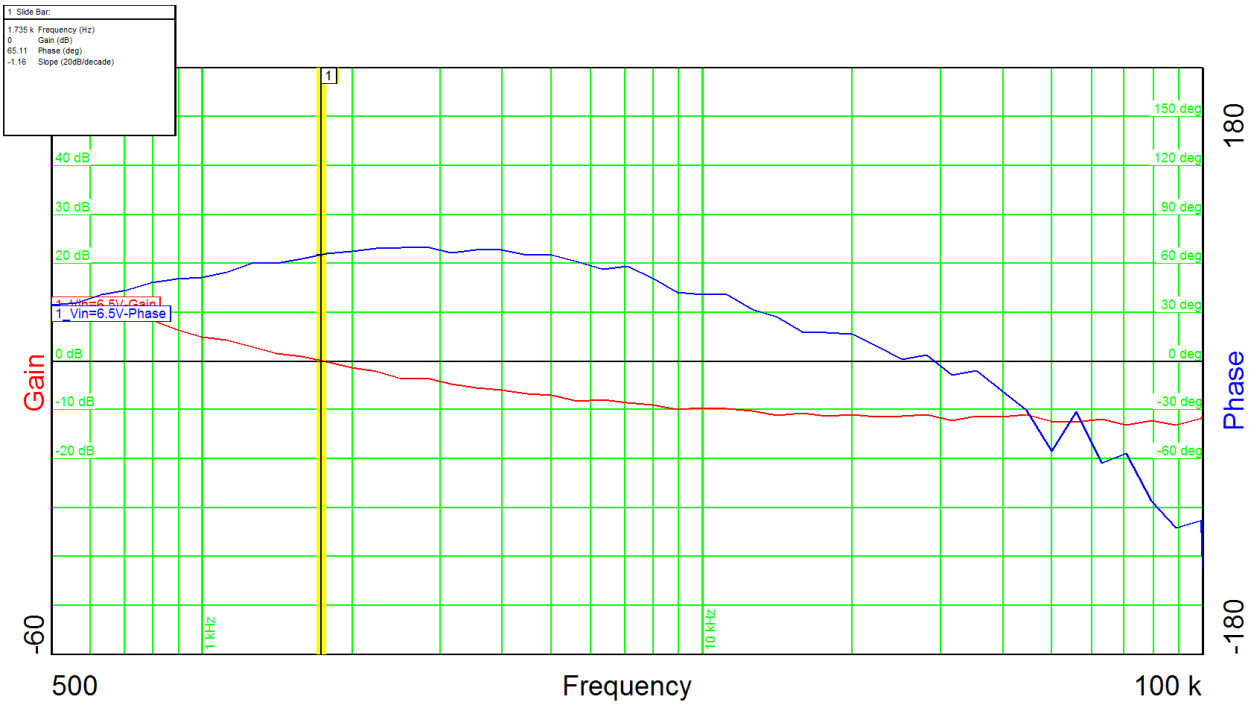
Output power = 51V@1.25A
Input voltage = 9VDC
Phase margin = 57°
Bandwidth = 2.4kHz

Output power = 51V@1.25A
Input voltage = 12VDC
Phase margin = 57°
Bandwidth = 3.1kHz



Output power = 51V@1.25A
Input voltage = 24VDC
Phase margin = 75°
Bandwidth = 7.2kHz

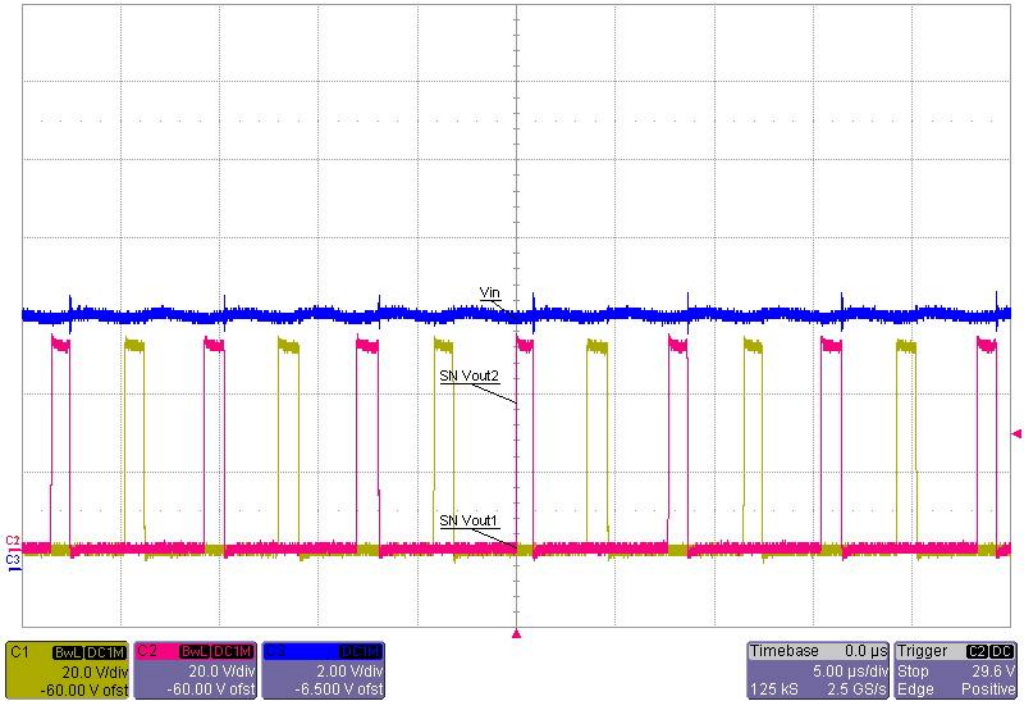
Output power = 51V@1.25A
Input voltage = 36VDC
Phase margin = 78°
Bandwidth = 7.8kHz



Output power = 51V@0.5A
Input voltage = 6.5VDC
Phase margin = 65°
Bandwidth = 1.7kHz

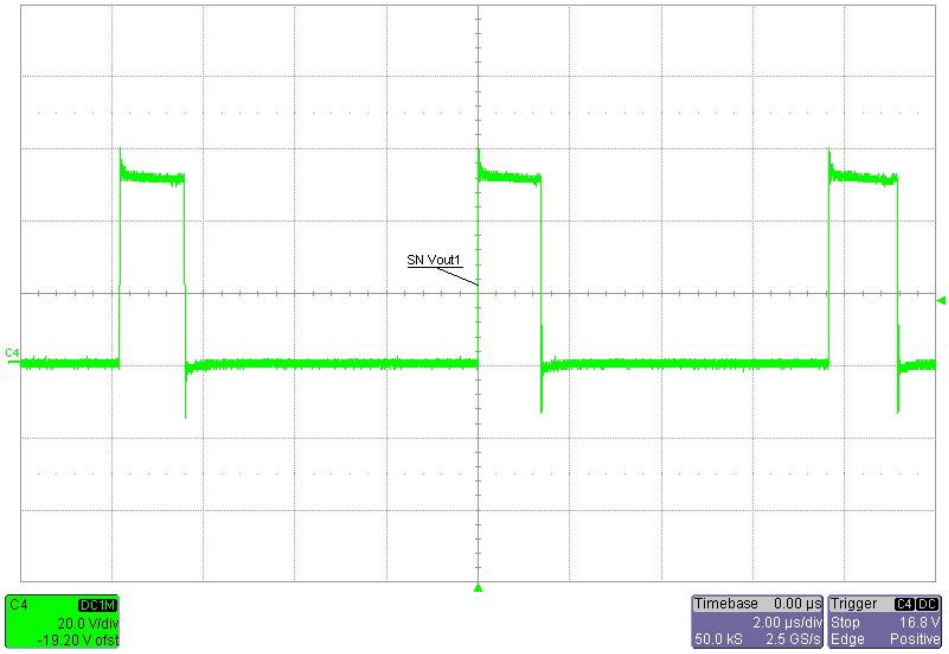
5 Switch Node

Input voltage = 6.5VDC
Load current = full load (2x 0.5A)

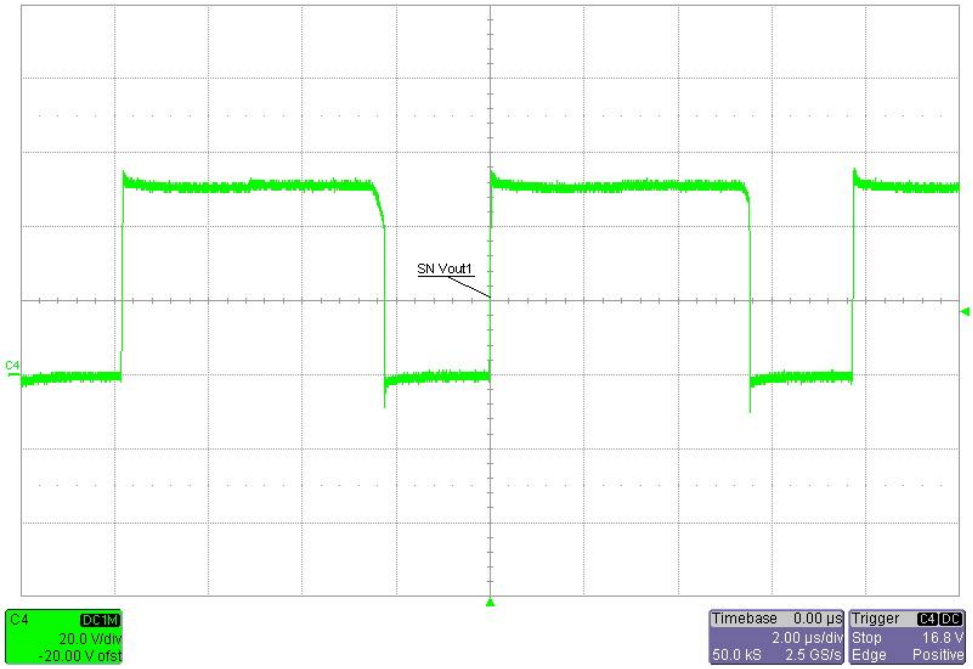


5.1 Vout1

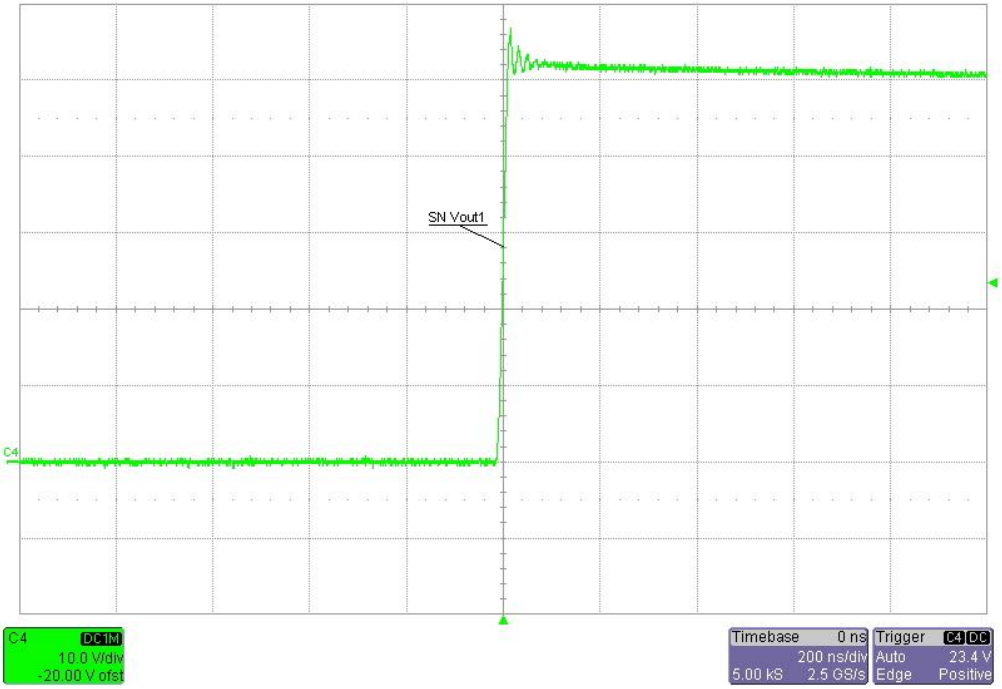
Input voltage = 9VDC
Load current = 1.25A



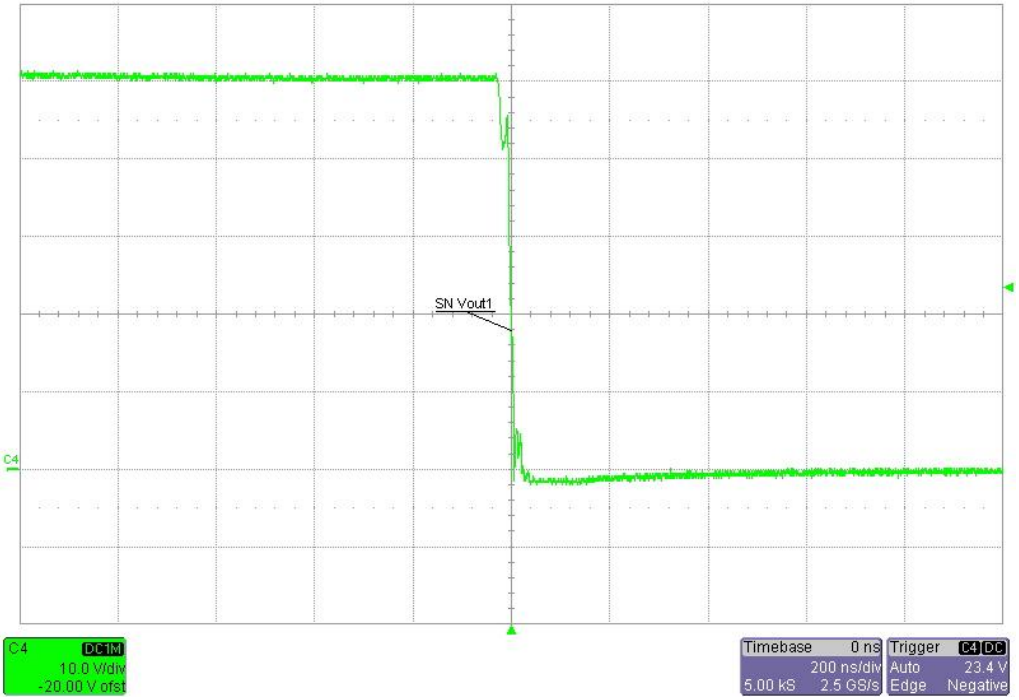
Input voltage = 36VDC
Load current = 1.25A



Input voltage = 12VDC
Load current = 1.25A

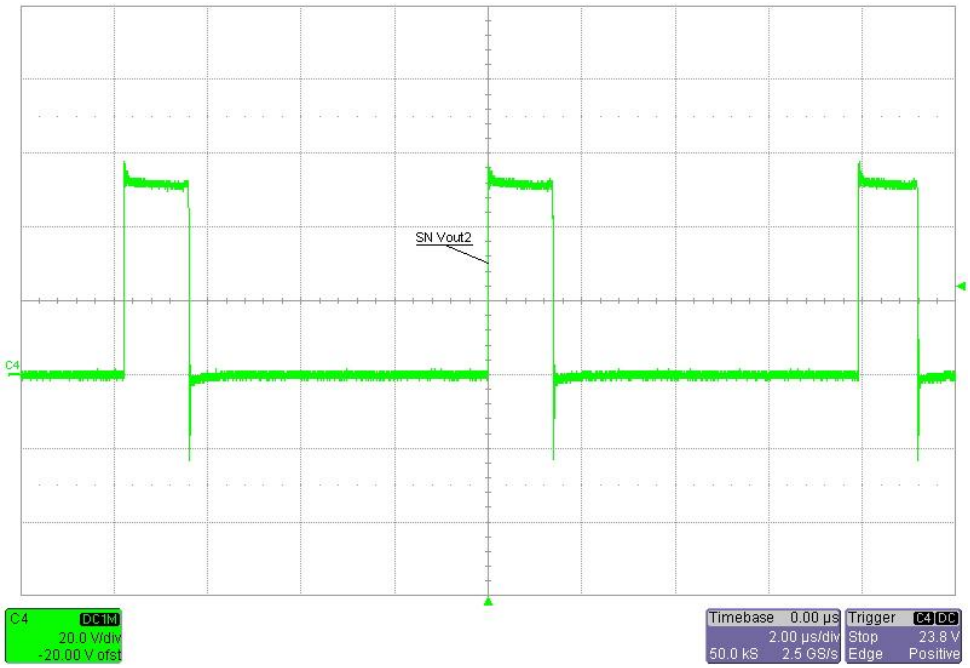


Input voltage = 12VDC
Load current = 1.25A

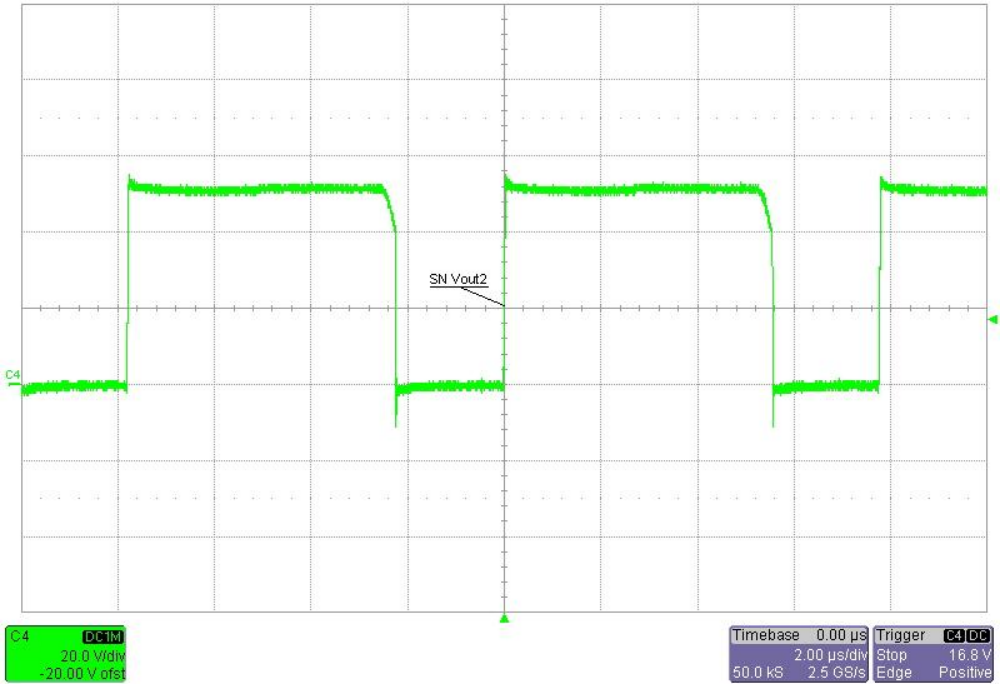


5.2 Vout2

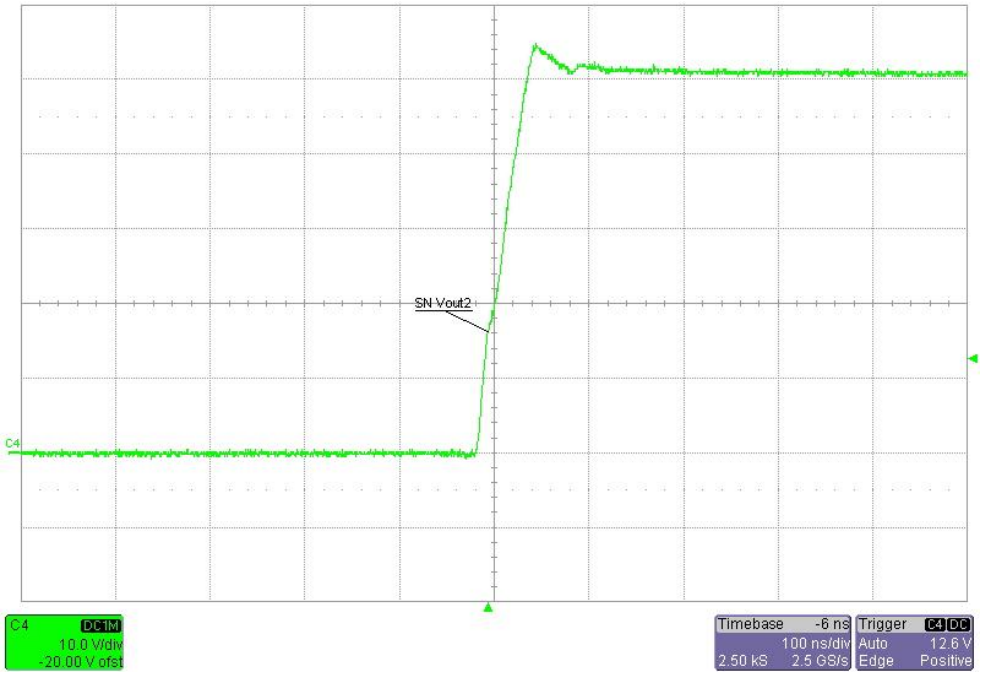
Input voltage = 9VDC
Load current = 1.25A



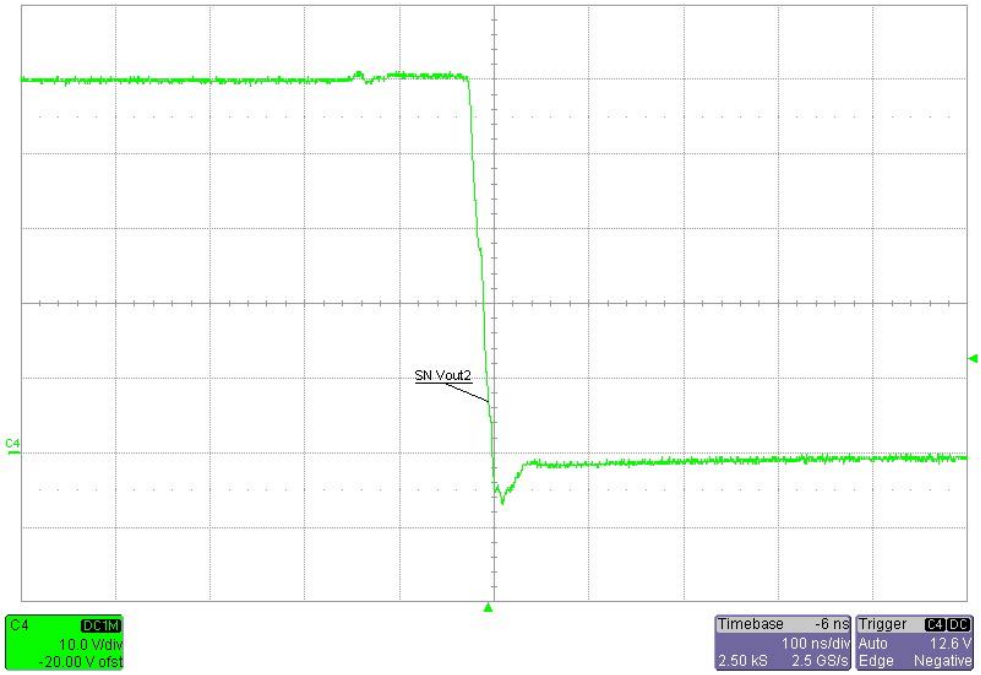
Input voltage = 36VDC
Load current = 1.25A



Input voltage = 12VDC
Load current = 1.25A



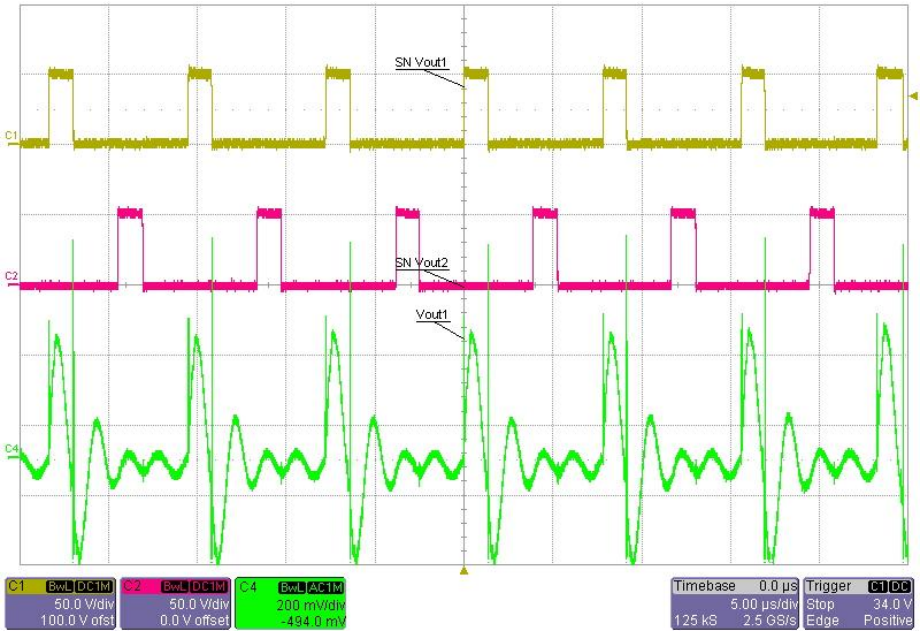
Input voltage = 12VDC
Load current = 1.25A



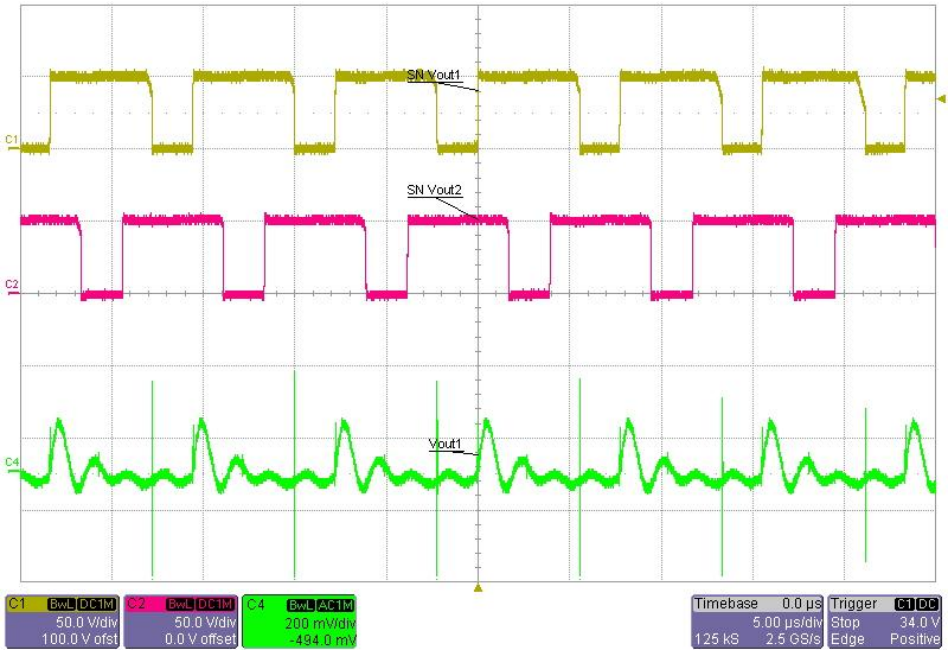
6 Output ripple voltage

6.1 Vout1

Input voltage = 9VDC
Load current = 1.25A

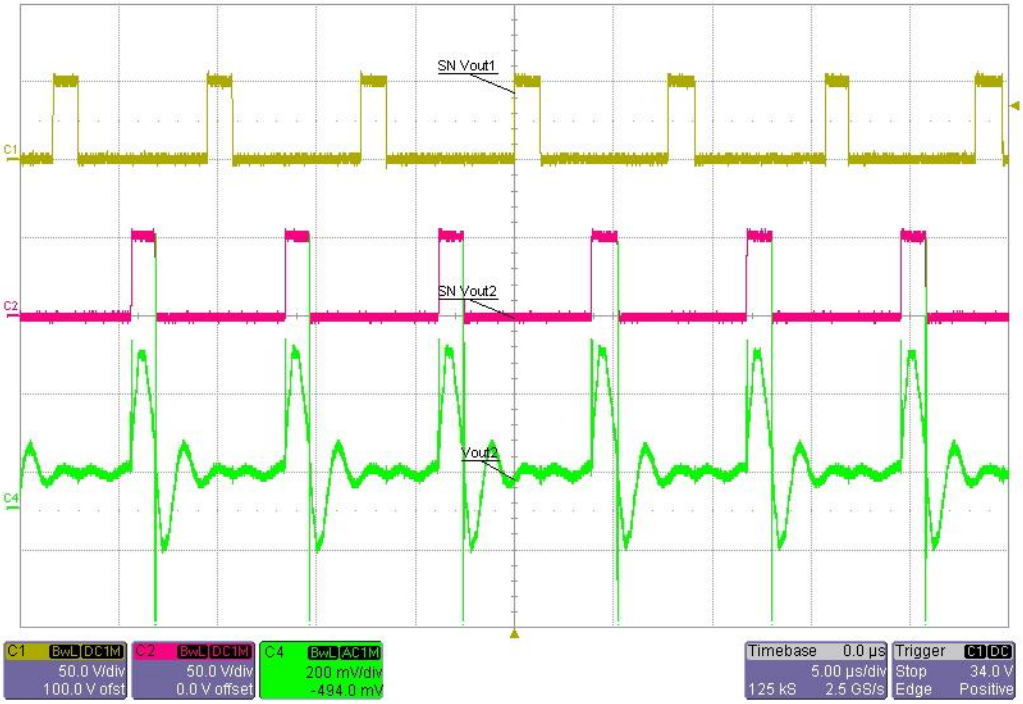


Input voltage = 36VDC
Load current = 1.25A

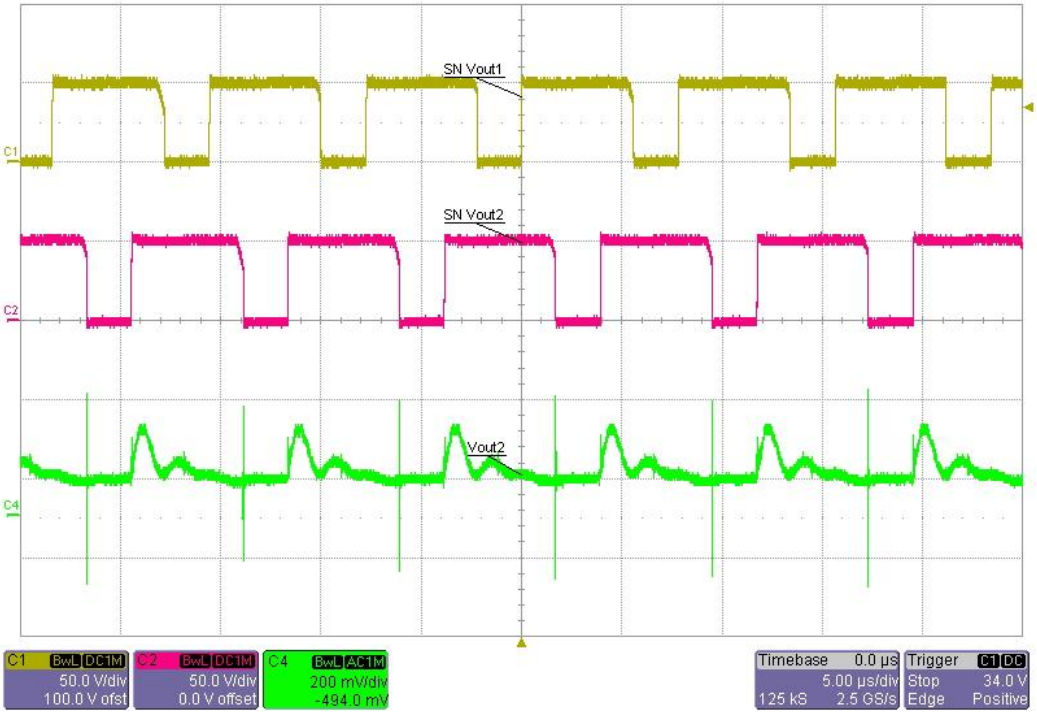


6.2 Vout2

Input voltage = 9VDC
Load current = 1.25A



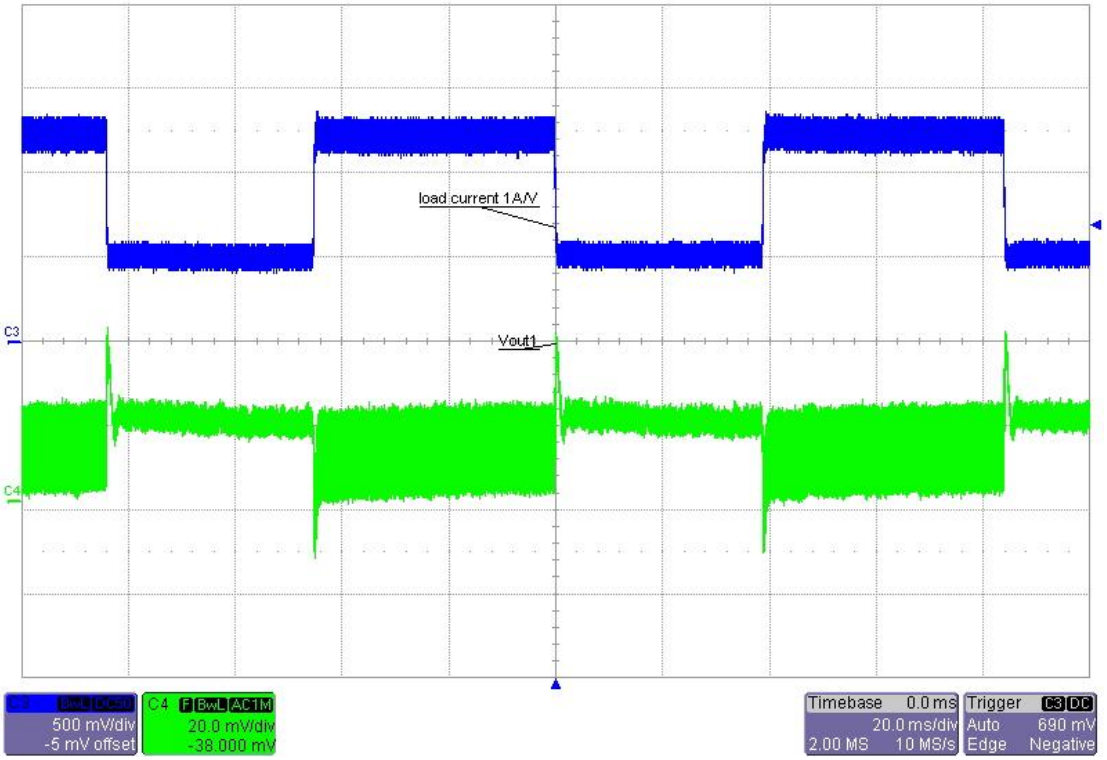
Input voltage = 36VDC
Load current = 1.25A



7 Load Transients

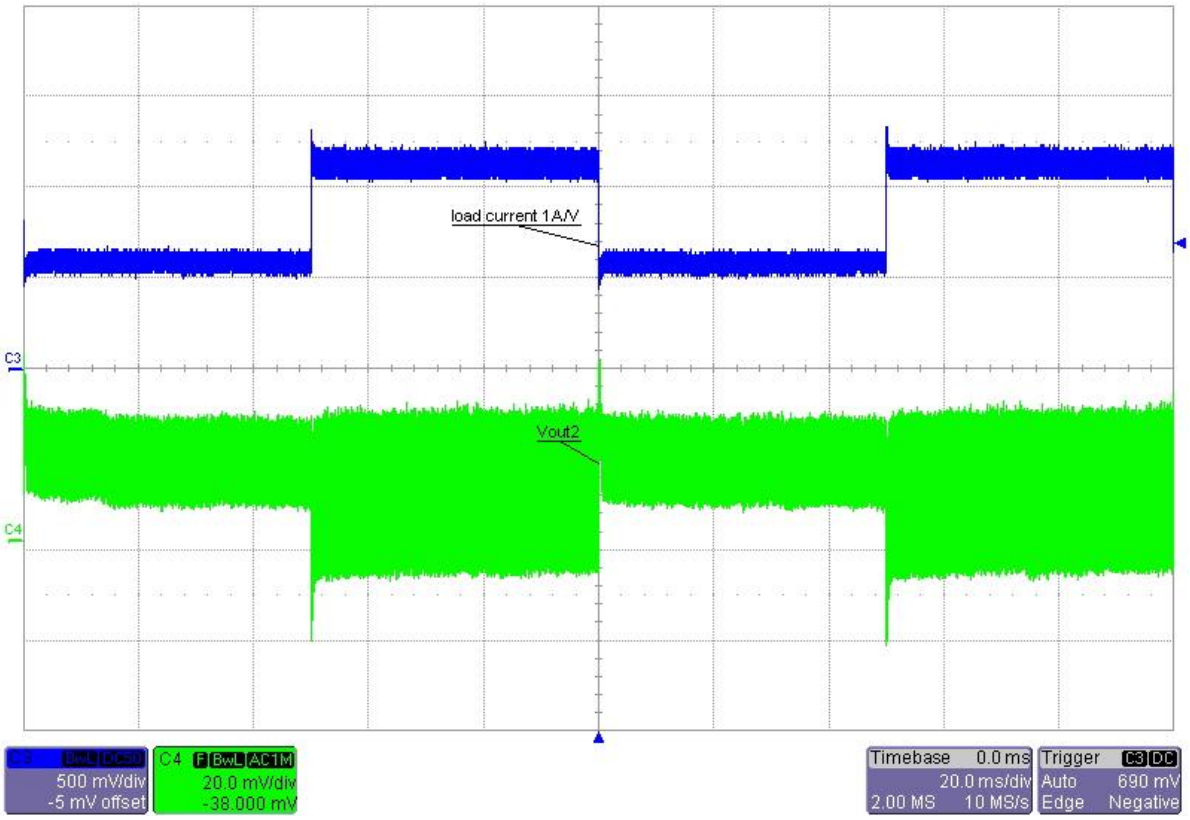
7.1 Vout1

Input voltage = 12VDC
Load current = 0.5A to 1.25A



7.2 Vout2

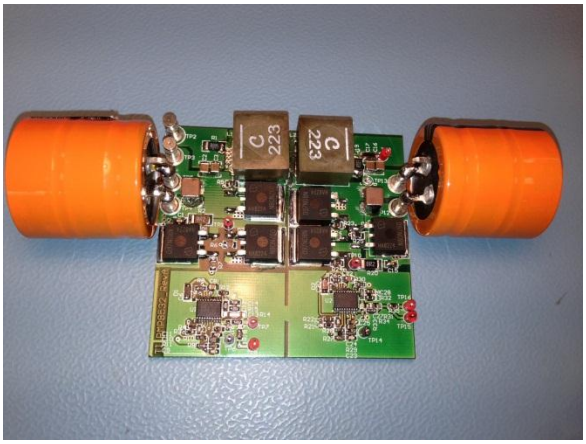
Input voltage = 12VDC
Load current = 0.5A to 1.25A



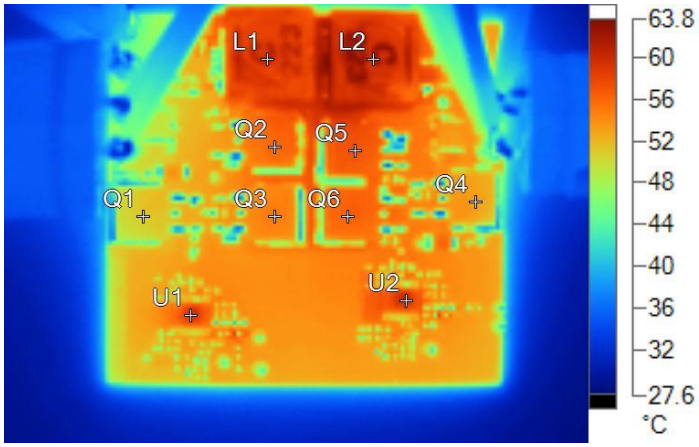
8 Thermal Analysis

The images below show the infrared images taken from the FlexCam after 15min at full load (130W).
The bottom of the board will be thermally connected to a heatsink.

All measurements are done without a heatsink and without airflow!

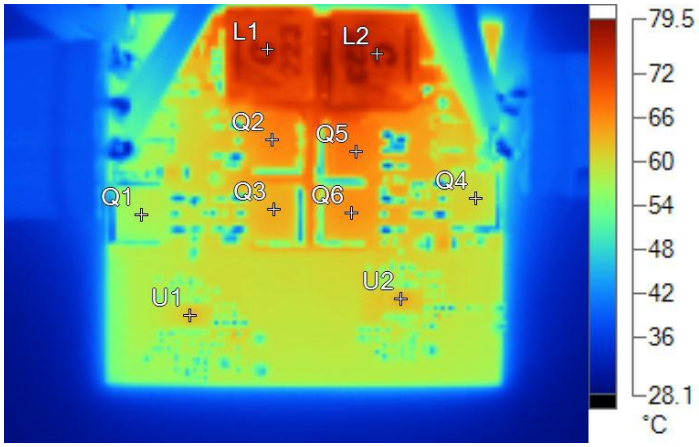


Input voltage = 36VDC
Output power = 130W
Ambient temperature = 25°C
No heatsink, no airflow



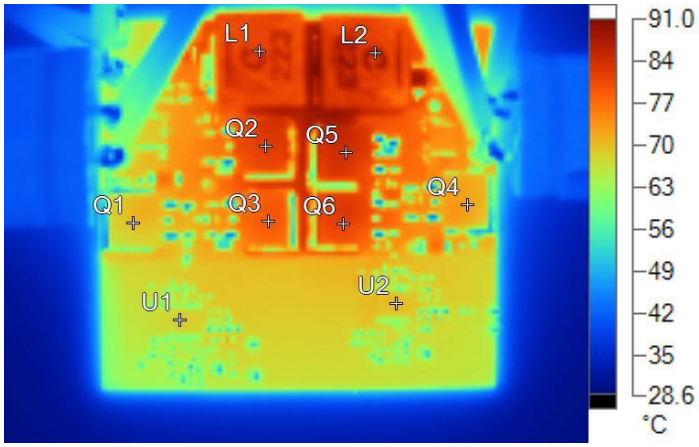
Name	Temperature	
L1	61.0°C	
L2	61.3°C	
Q2	55.9°C	
Q3	55.0°C	
Q5	57.0°C	
Q6	56.3°C	
Q4	53.1°C	
Q1	51.1°C	
U1	59.3°C	
U2	60.0°C	

Input voltage = 24VDC
Output power = 130W
Ambient temperature = 25°C
No heatsink, no airflow



Name	Temperature	
L1	75.4°C	
L2	77.1°C	
Q2	66.1°C	
Q3	63.5°C	
Q5	67.1°C	
Q6	65.5°C	
Q1	57.3°C	
Q4	60.1°C	
U1	62.4°C	
U2	63.6°C	

Input voltage = 9VDC
Output power = 130W
Ambient temperature = 25°C
No heatsink, no airflow



Name	Temperature	
L2	88.4°C	
L1	85.8°C	
Q2	82.2°C	
Q3	79.1°C	
Q5	83.9°C	
Q6	81.7°C	
Q1	69.9°C	
Q4	72.5°C	
U1	68.9°C	
U2	70.6°C	

For Feasibility Evaluation Only, in Laboratory/Development Environments. The EVM is not a complete product. It is intended solely for use for preliminary feasibility evaluation in laboratory / development environments by technically qualified electronics experts who are familiar with the dangers and application risks associated with handling electrical / mechanical components, systems and subsystems. It should not be used as all or part of a production unit.

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3. Since the EVM is not a completed product, it may not meet all applicable regulatory and safety compliance standards (such as UL, CSA, VDE, CE, RoHS and WEEE) which may normally be associated with similar items. You assume full responsibility to determine and/or assure compliance with any such standards and related certifications as may be applicable. You will employ reasonable safeguards to ensure that your use of the EVM will not result in any property damage, injury or death, even if the EVM should fail to perform as described or expected.

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