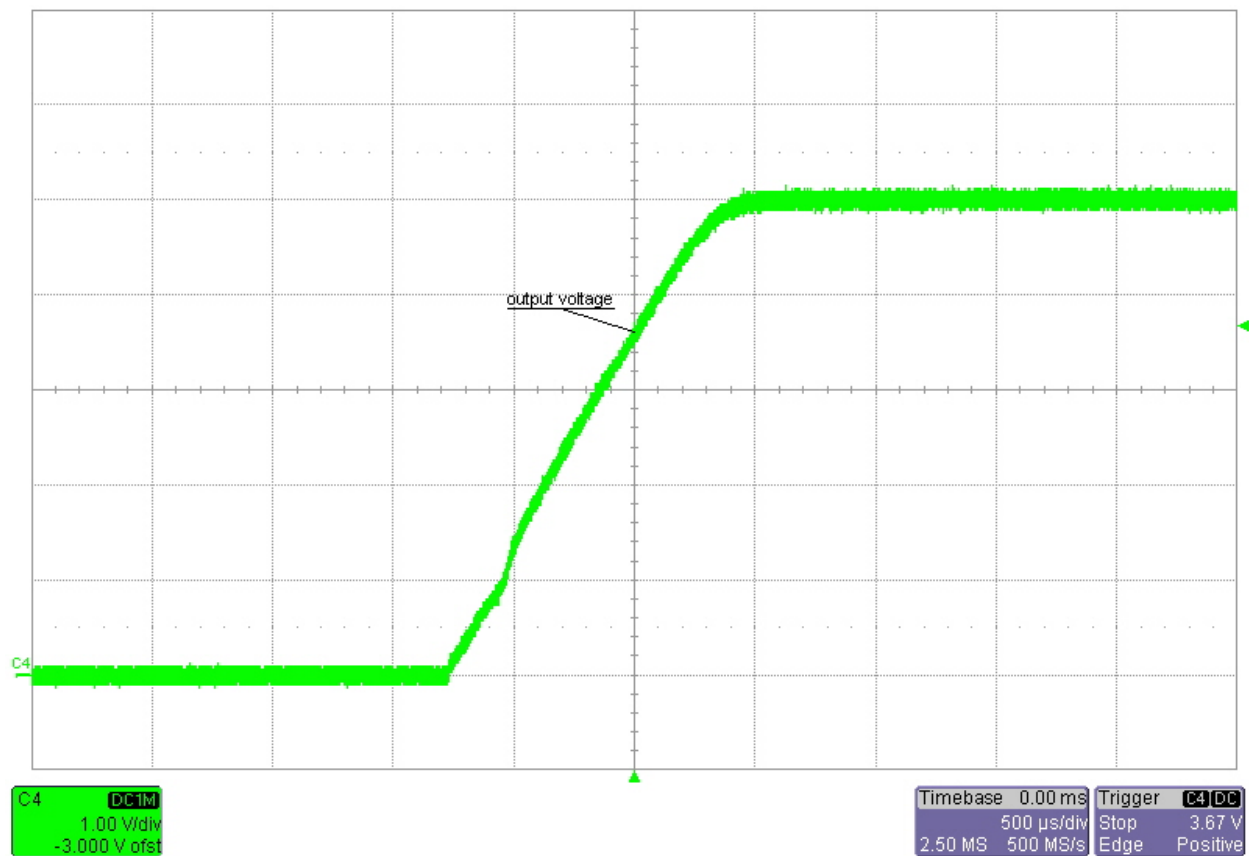


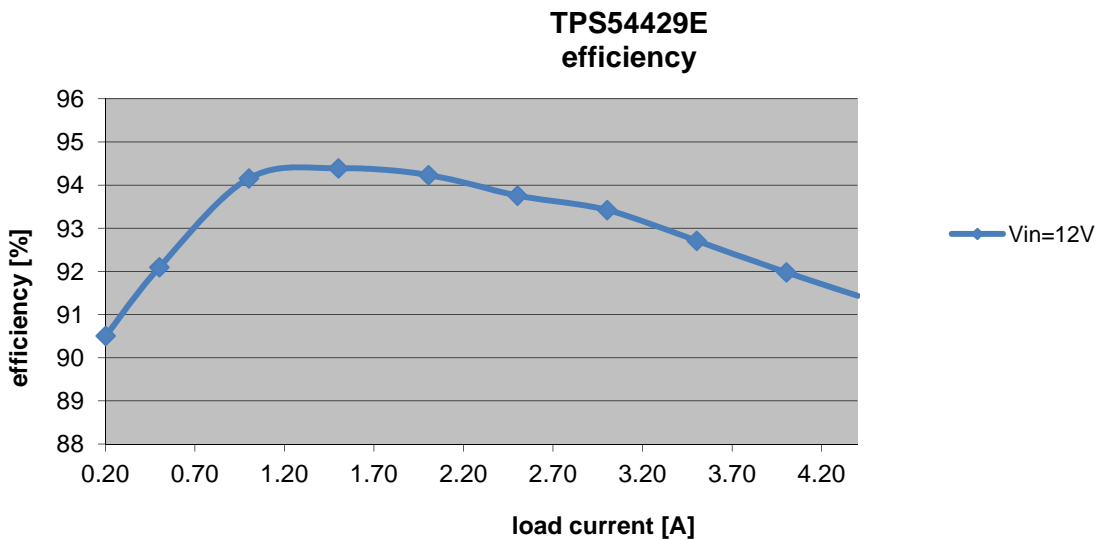
1 TPS54229EEVM (5.0V@4.4A)

1.1 Startup

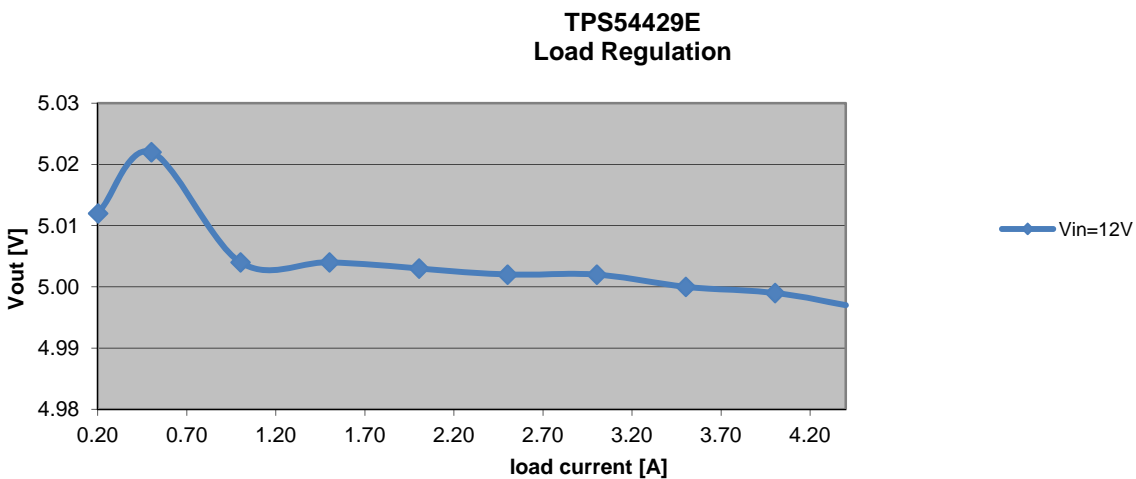
Input voltage = 12V
Load current = 4.4A



1.2 Efficiency

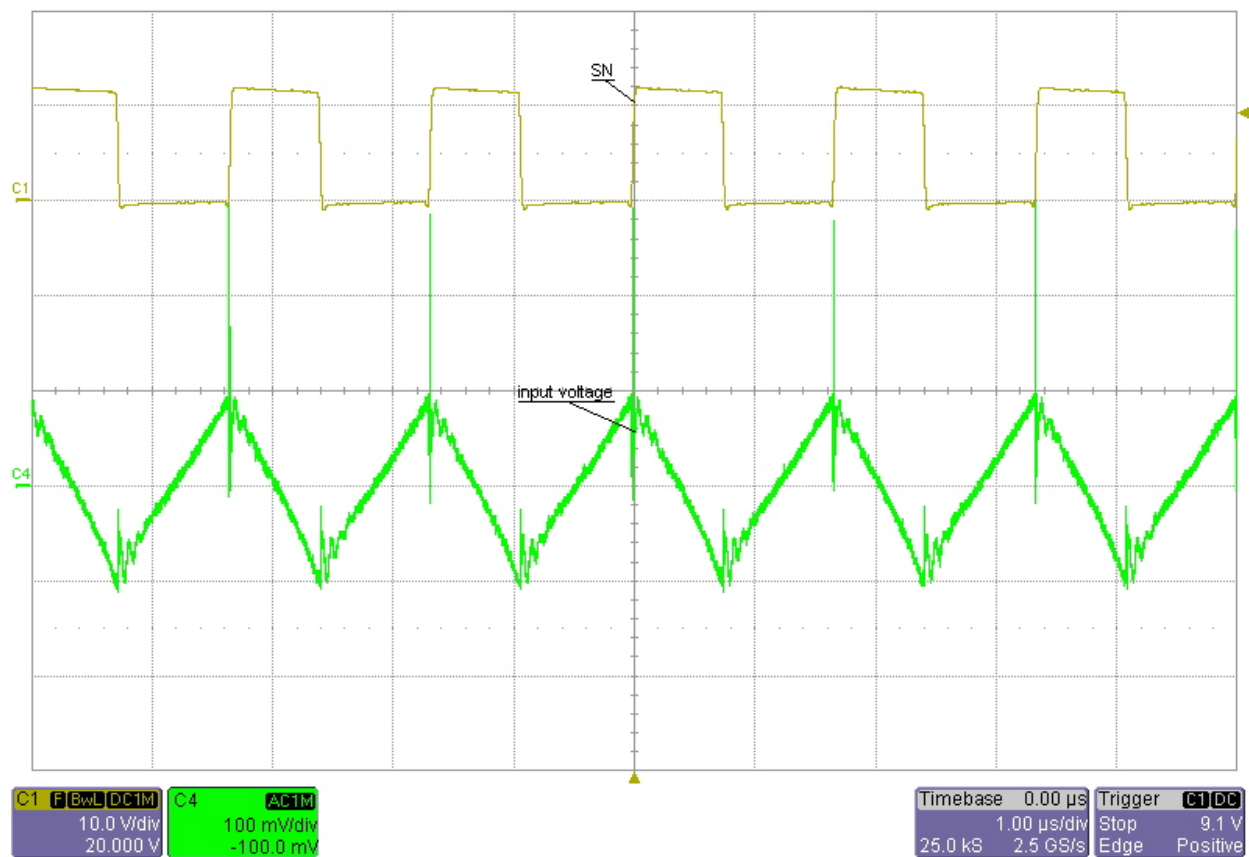


1.3 Load regulation



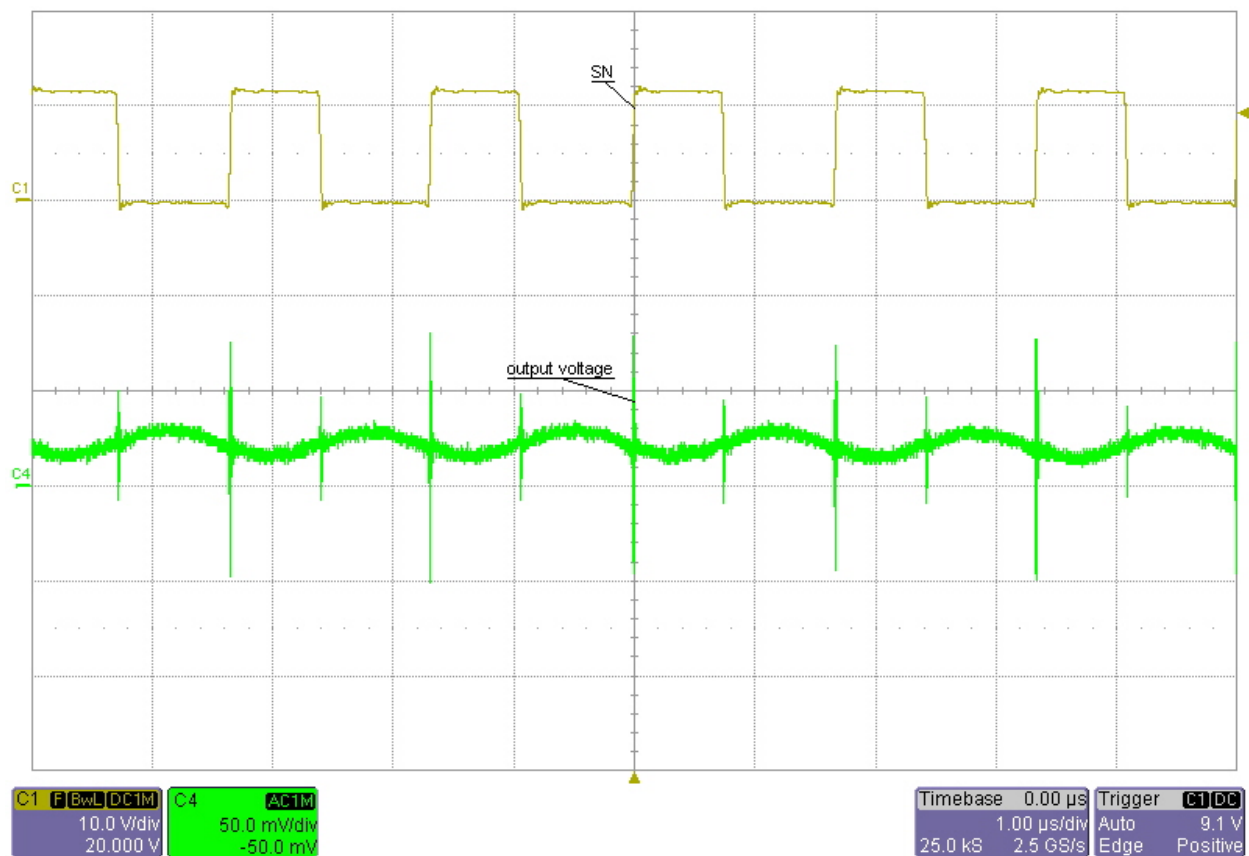
1.4 Input ripple voltage

Input voltage = 12V
Load current = 4.4A



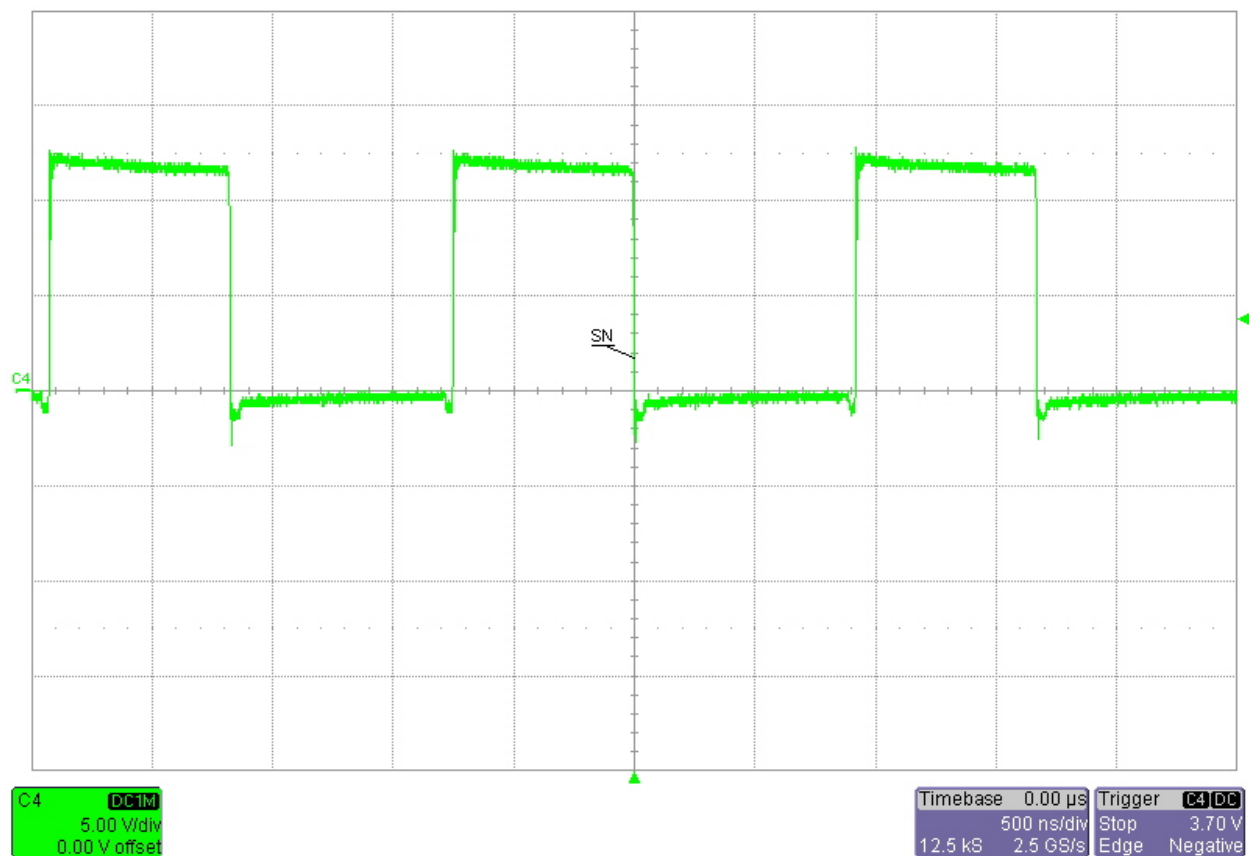
1.5 Output ripple voltage

Input voltage = 12V
Load current = 4.4A



1.6 Switch Node

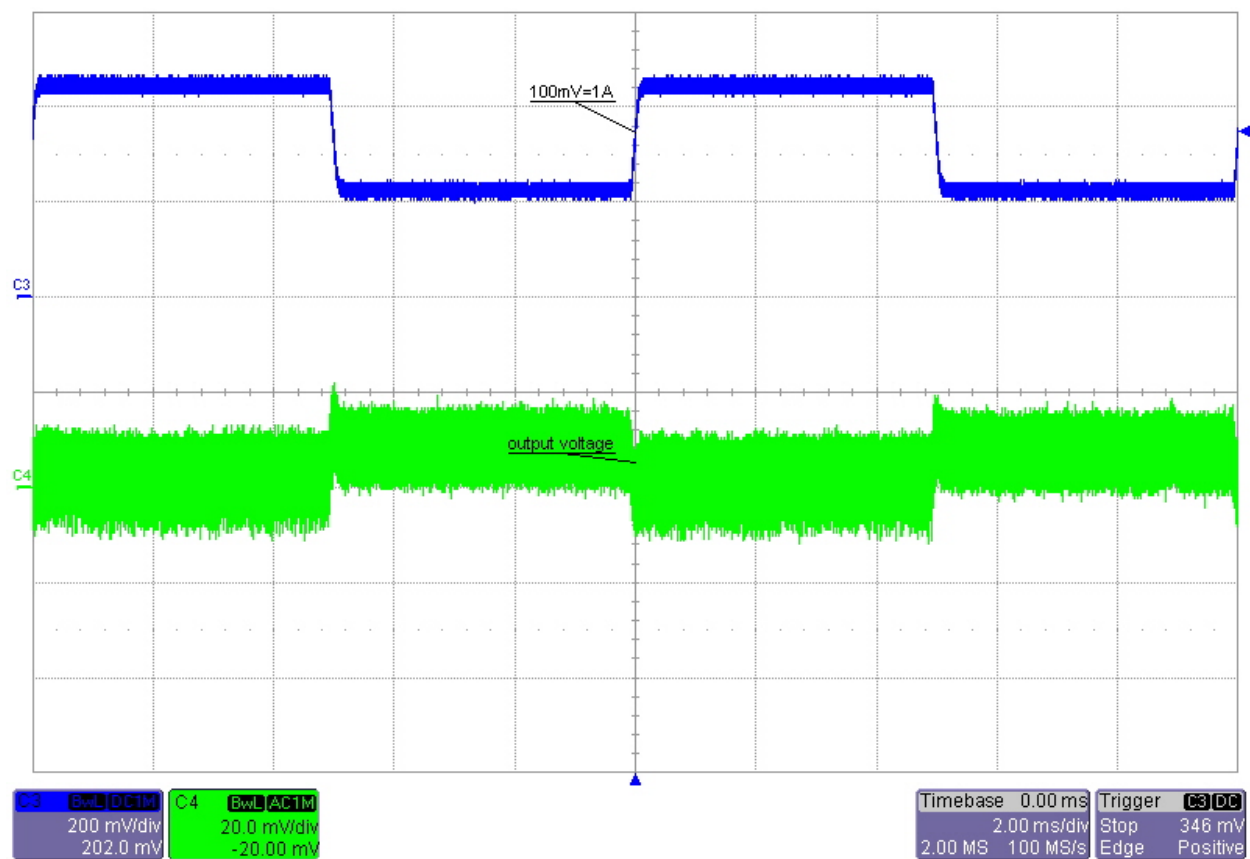
Input voltage = 12V
Load current = 4.4A



1.7 Load Transients

Input voltage = 12V

Load current = 2.2A to 4.4A

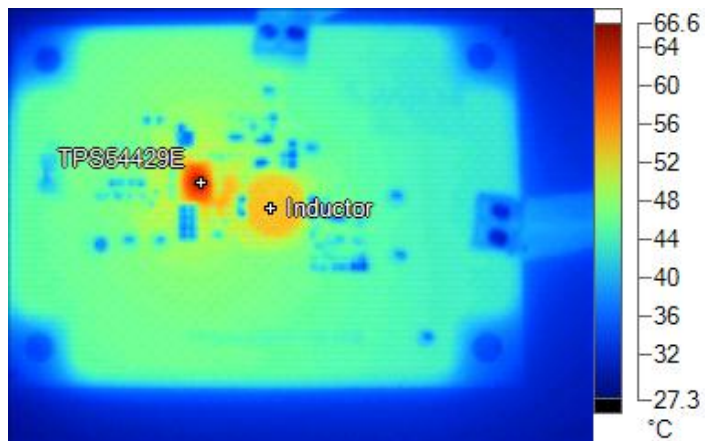


1.8 Thermal Analysis

The images below show the infrared images taken from the FlexCam after 15min at full load (5V@4.4A).

Input voltage = 12V

Ambient temperature = 25°C

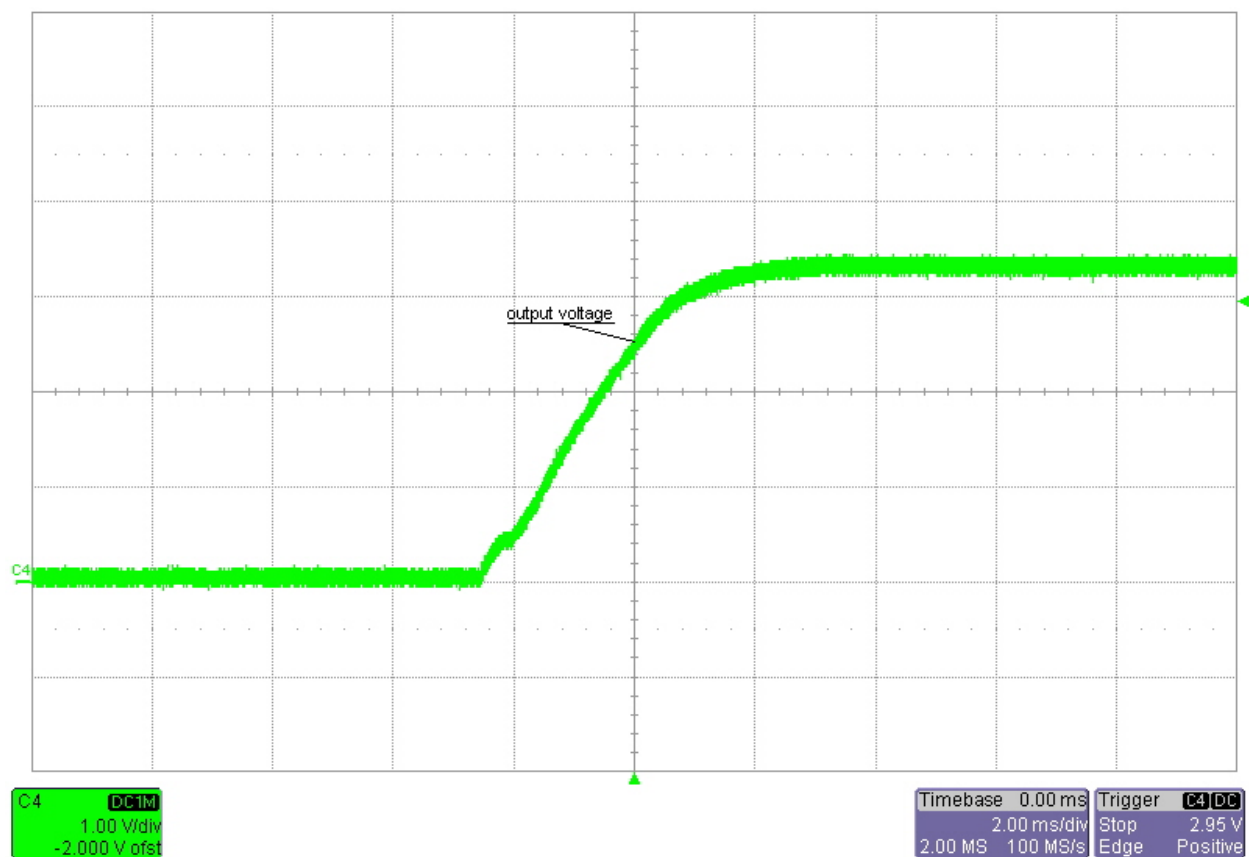


Name	Temperature	
Inductor	53.6°C	
TPS54429E	65.6°C	

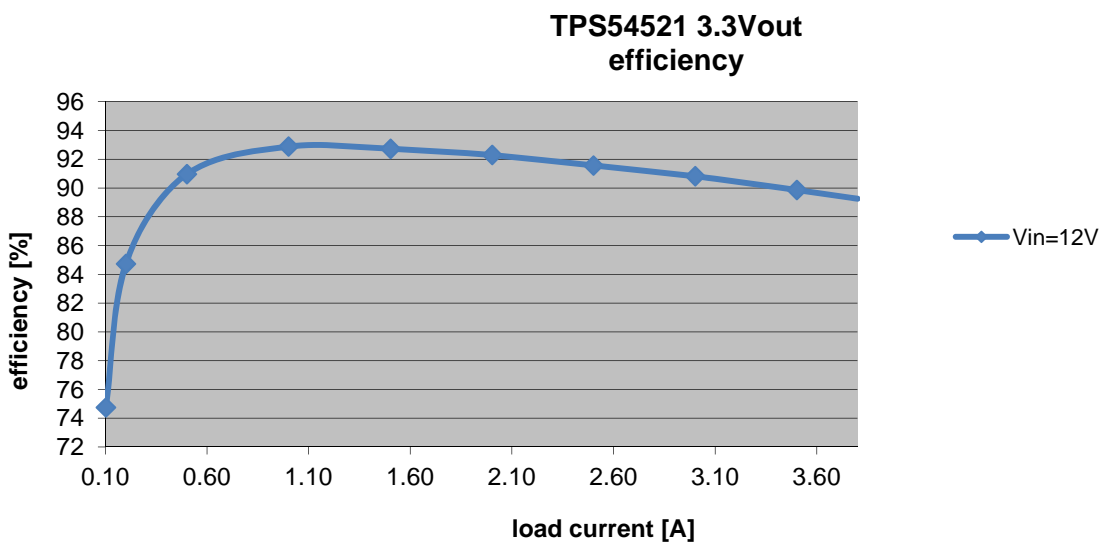
2 TPS54521EVM (3.3V@3.8A)

2.1 Startup

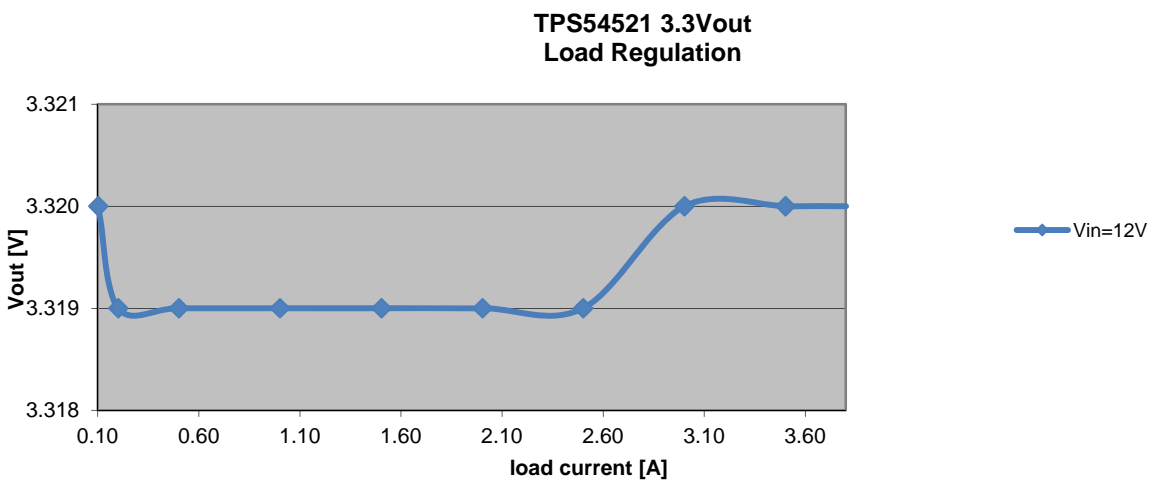
Input voltage = 12V
Load current = 3.8A



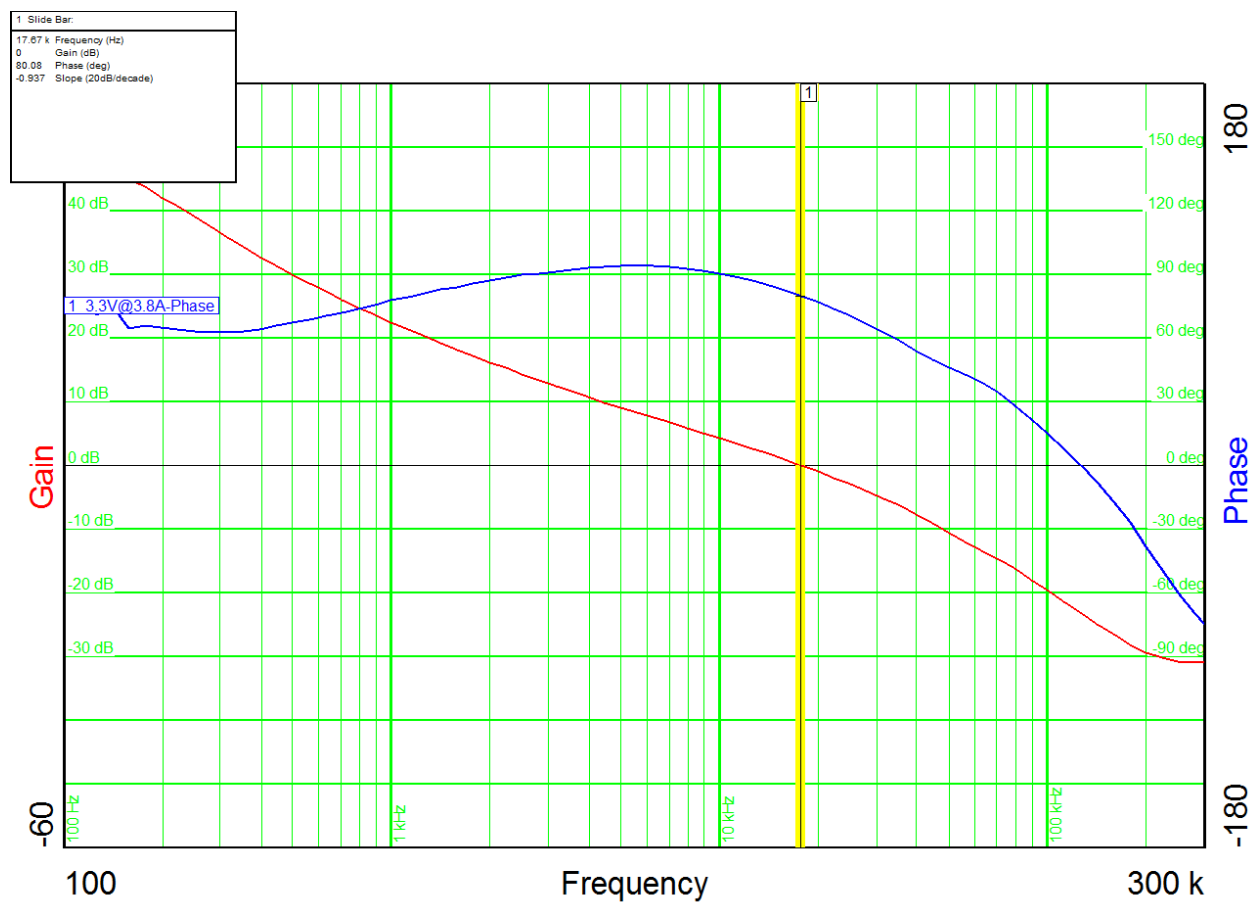
2.2 Efficiency



2.3 Load regulation



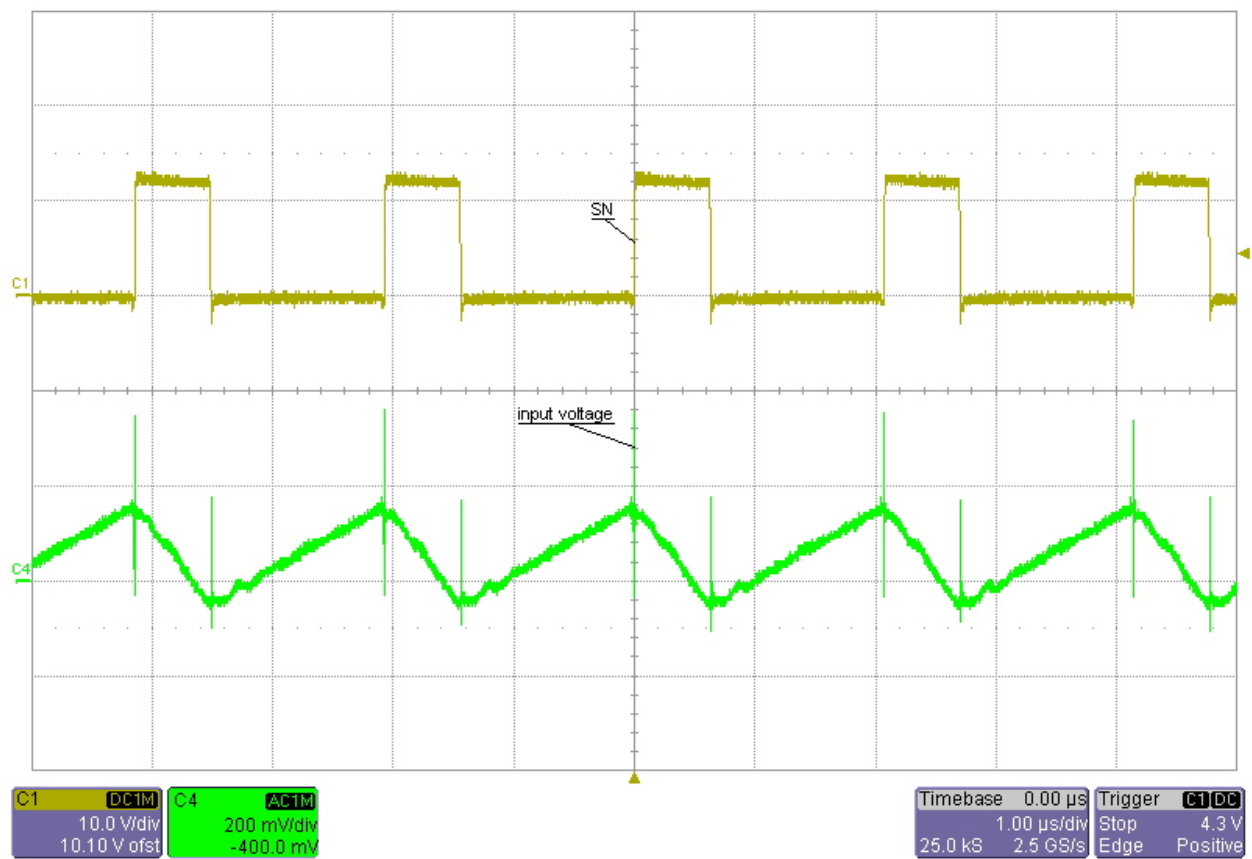
2.4 Control Loop Frequency Response



Input voltage = 12V
Phase margin = 80.1°
Bandwidth = 17.7 kHz

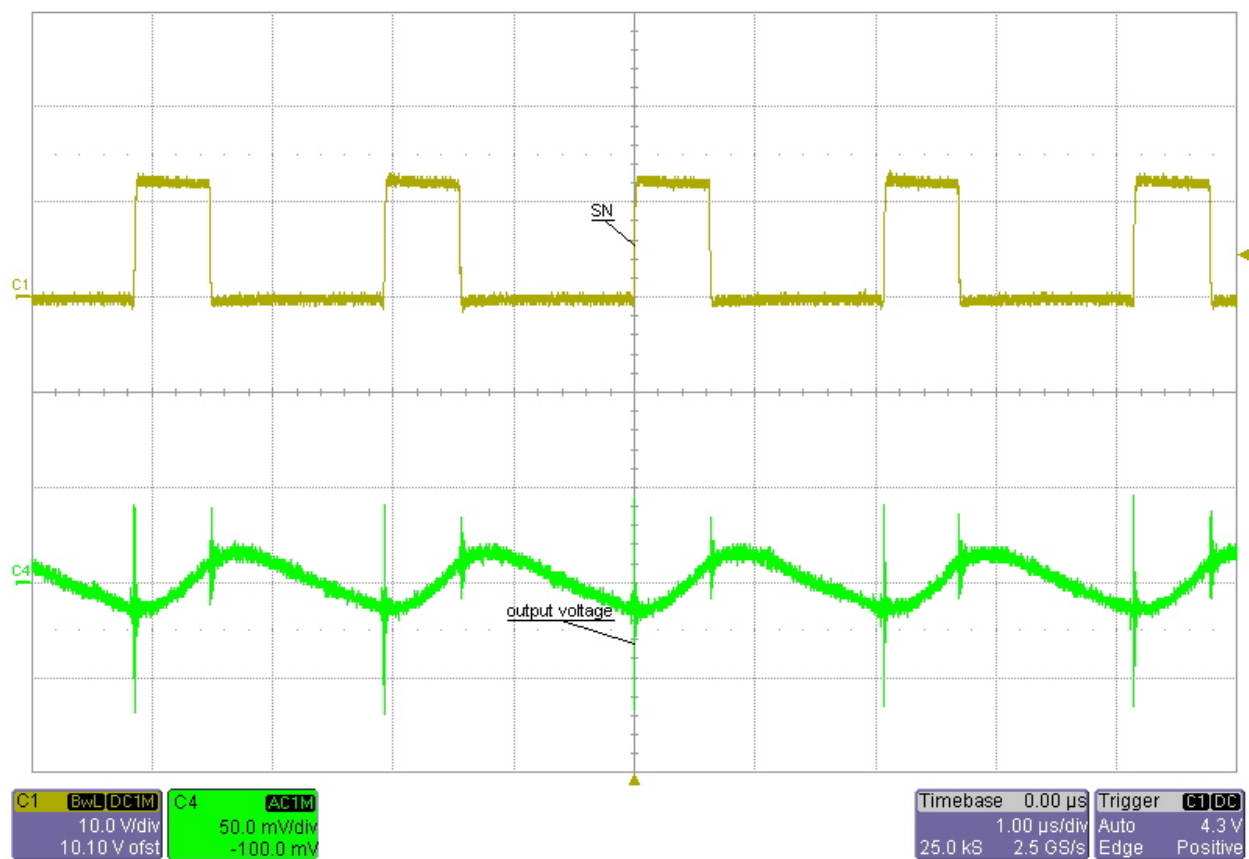
2.5 Input ripple voltage

Input voltage = 12V
Load current = 3.8A



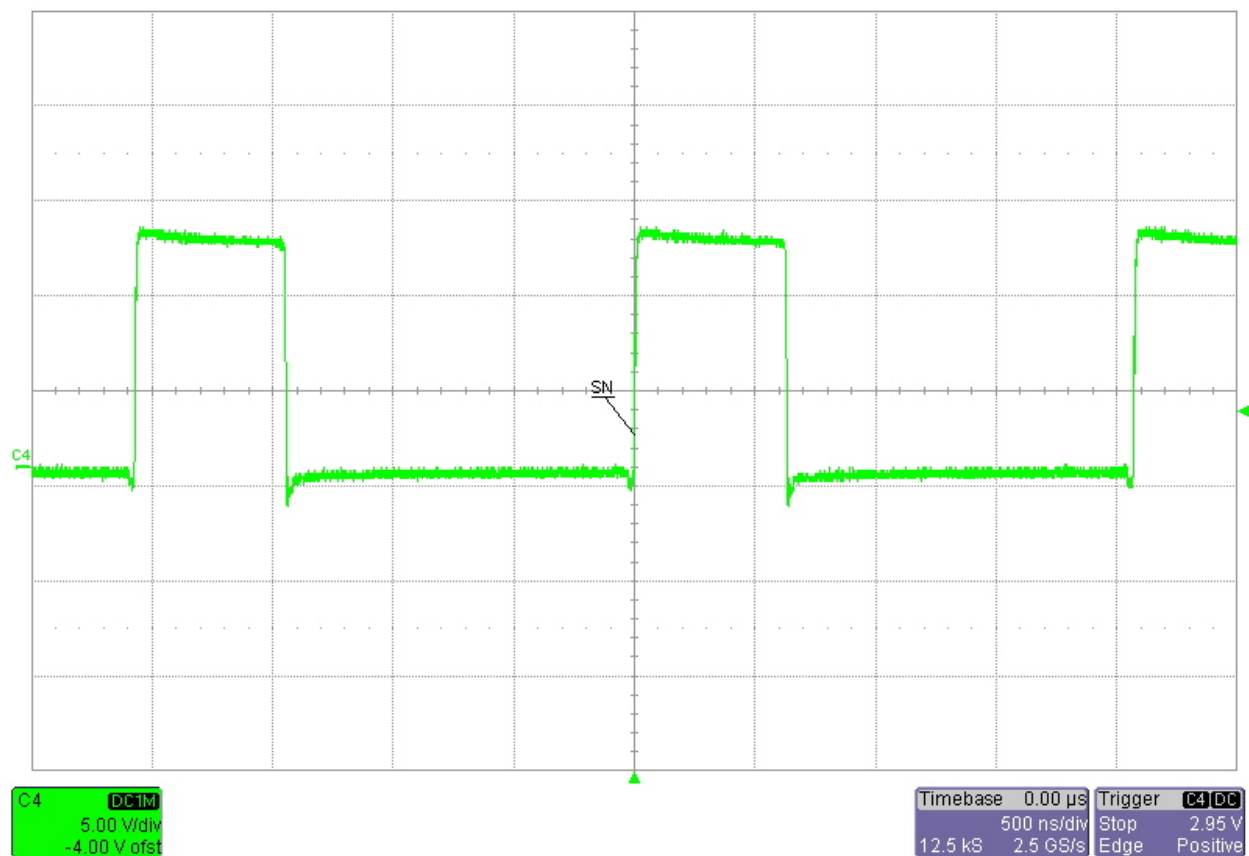
2.6 Output ripple voltage

Input voltage = 12V
Load current = 3.8A



2.7 Switch Node

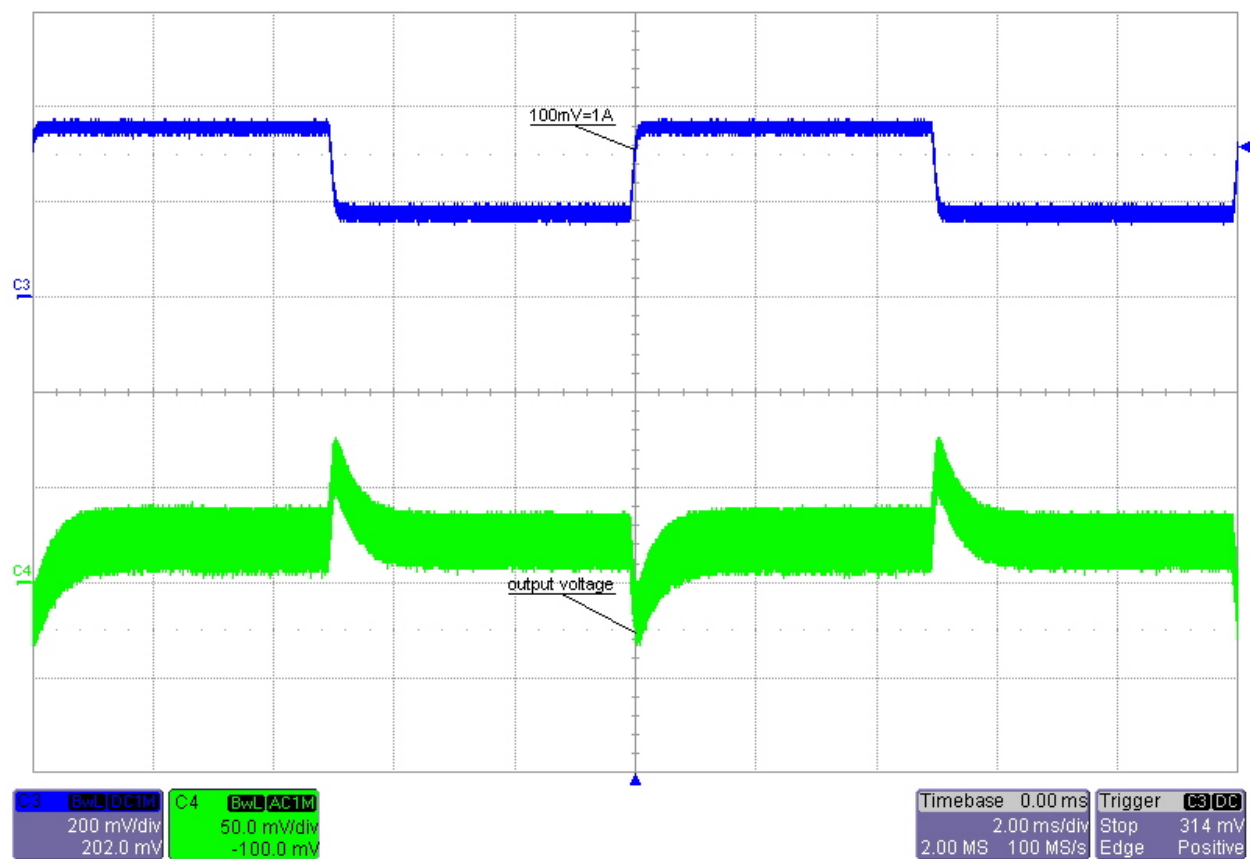
Input voltage = 12V
Load current = 3.8A



2.8 Load Transients

Input voltage = 12V

Load current = 1.9A to 3.8A

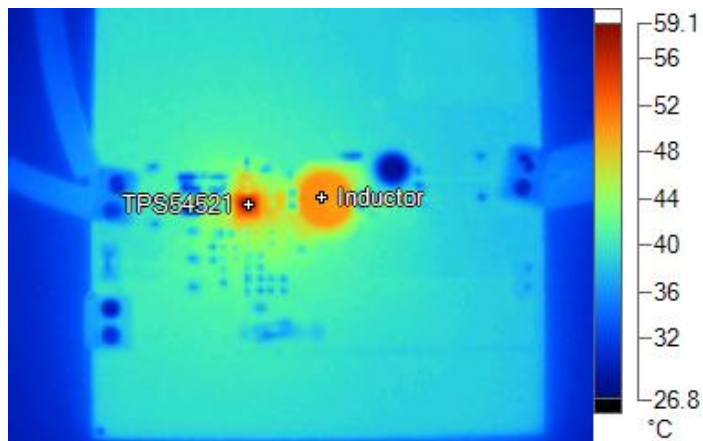


2.9 Thermal Analysis

The images below show the infrared images taken from the FlexCam after 15min at full load (3.3V@3.8A).

Input voltage = 12V

Ambient temperature = 25°C



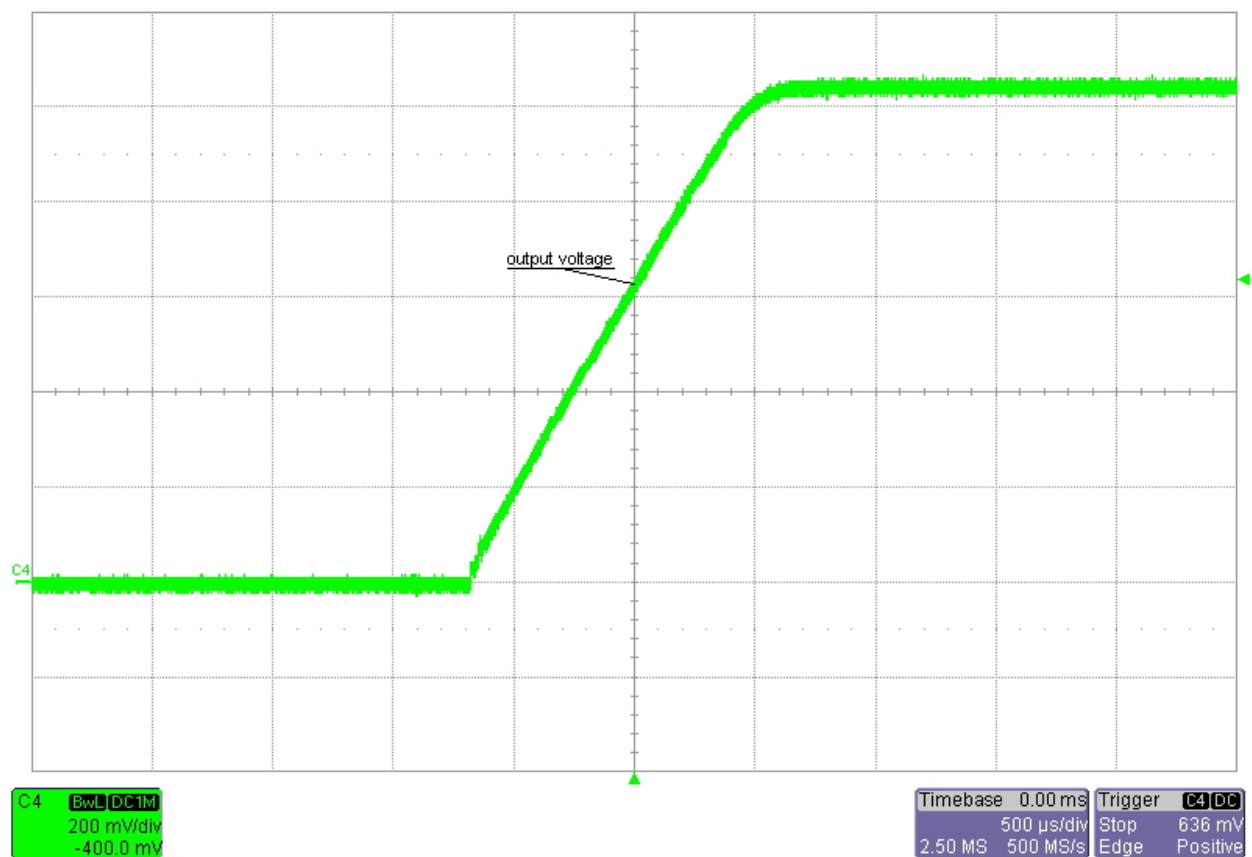
Name	Temperature	
Inductor	50.1°C	
TPS54521	58.0°C	

3 TPS54326EVM ([1.05V@3.05A](#))

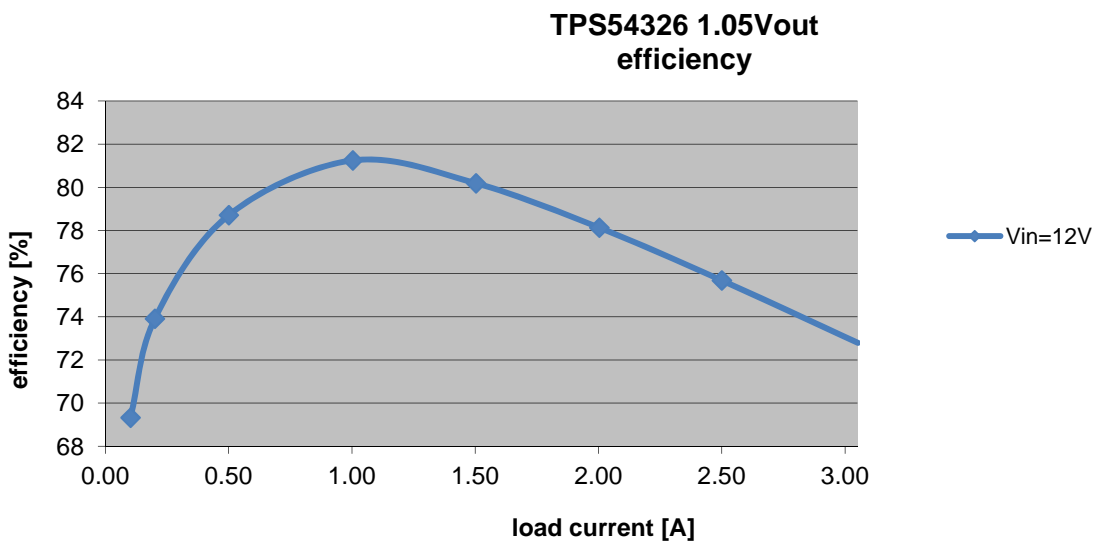
3.1 Startup

Input voltage = 12V

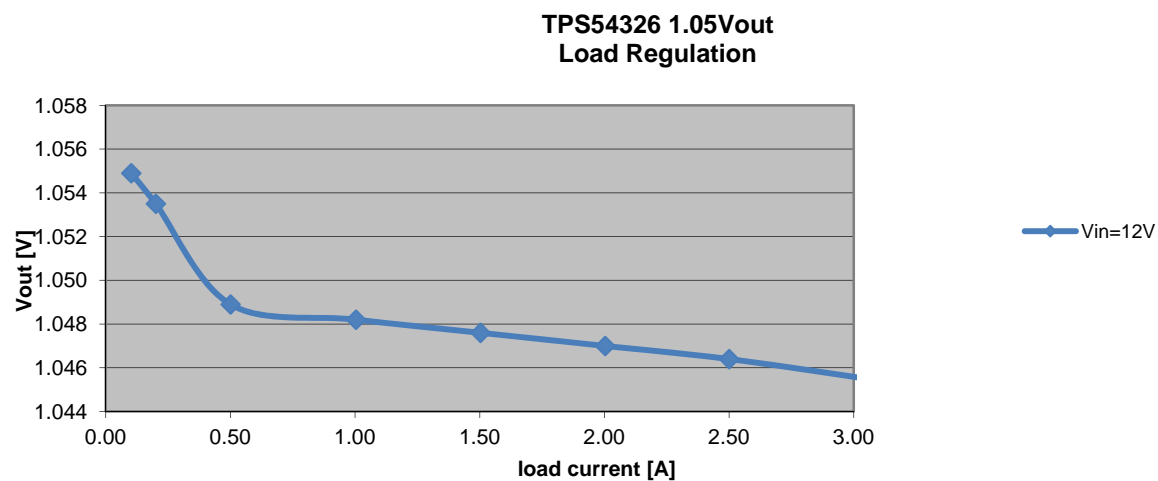
Load current = 3.05A



3.2 Efficiency



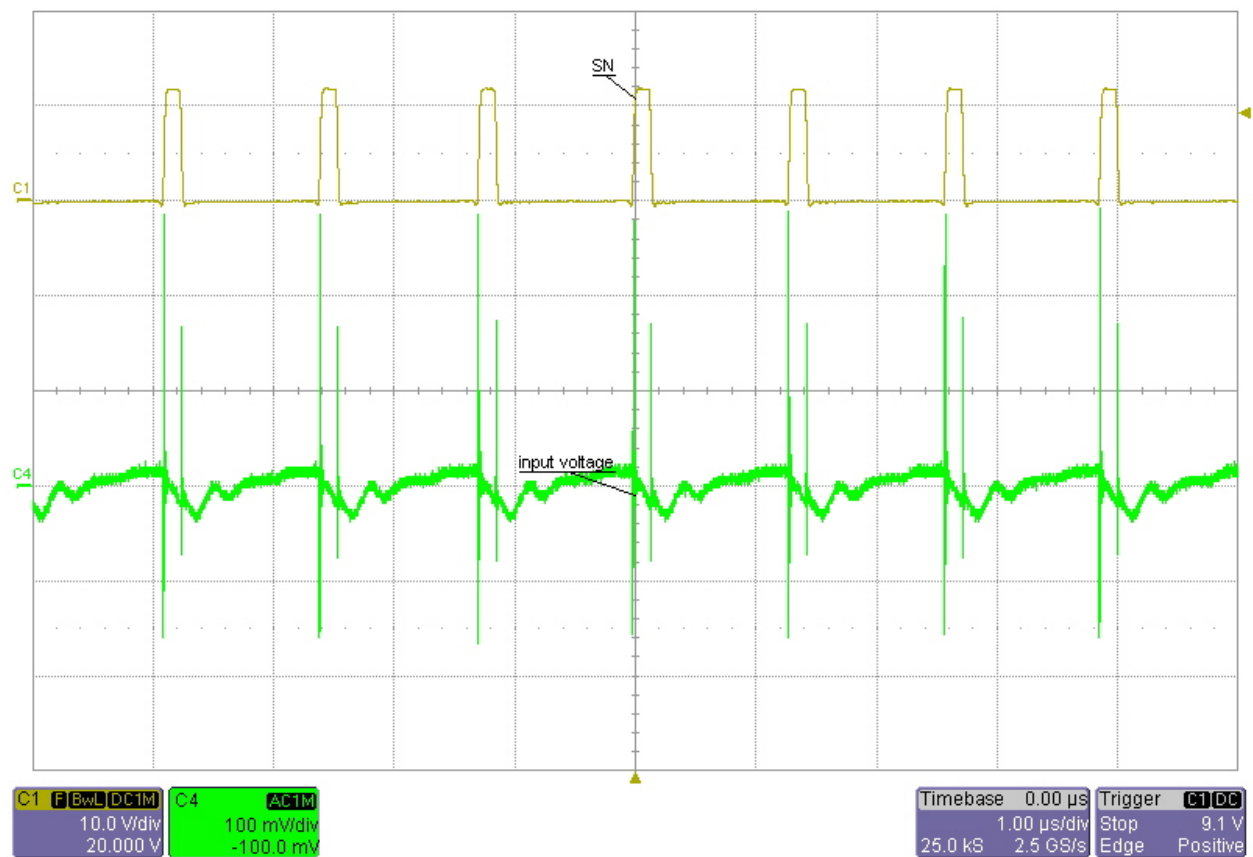
3.3 Load regulation



3.4 Input ripple voltage

Input voltage = 12V

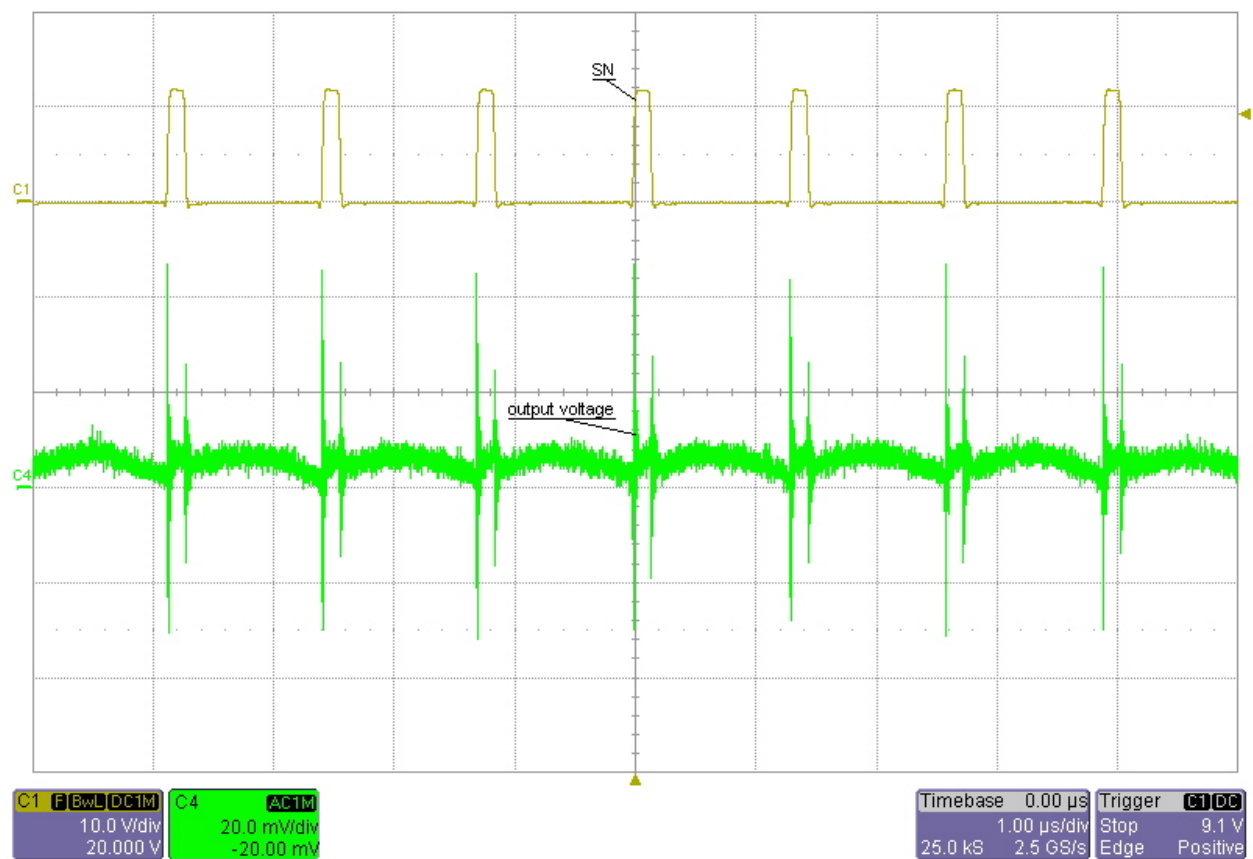
Load current = 3.05A



3.5 Output ripple voltage

Input voltage = 12V

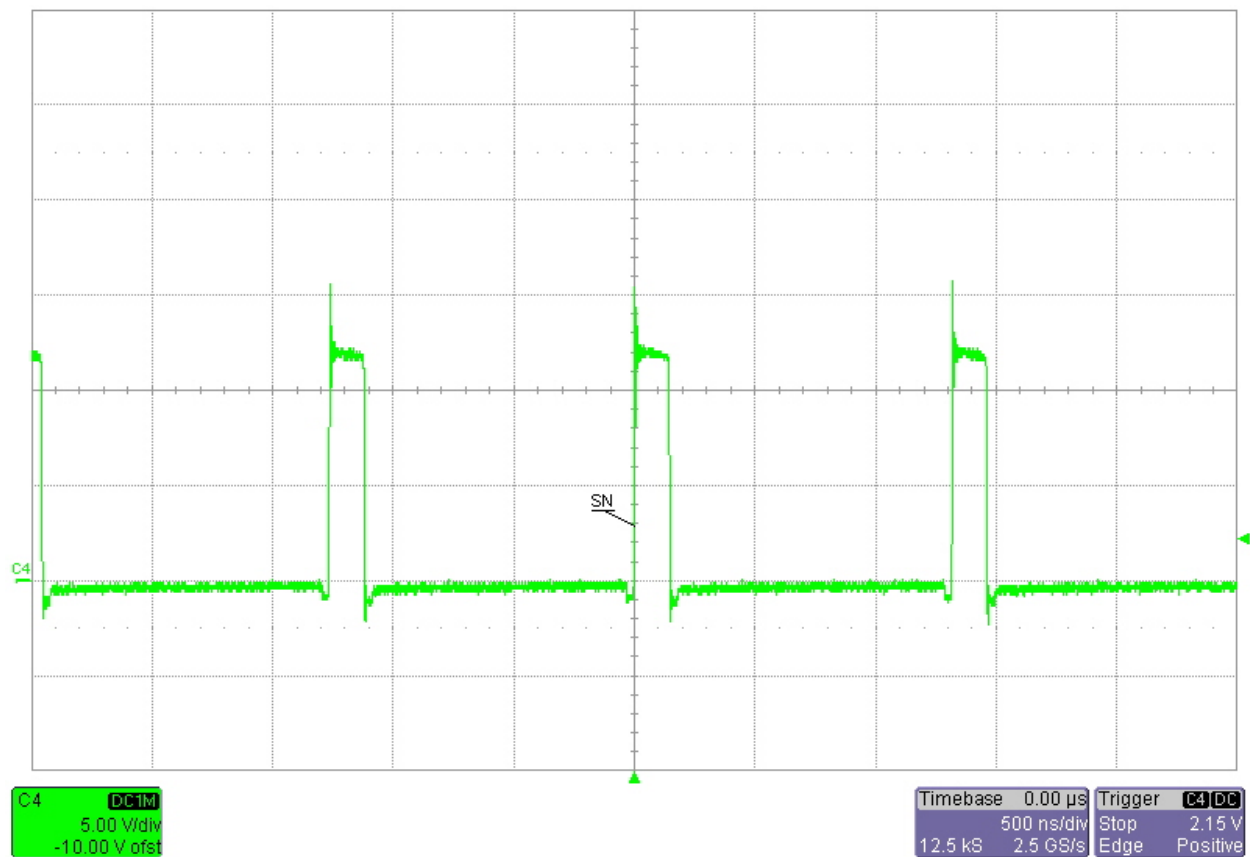
Load current = 3.05A



3.6 Switch Node

Input voltage = 12V

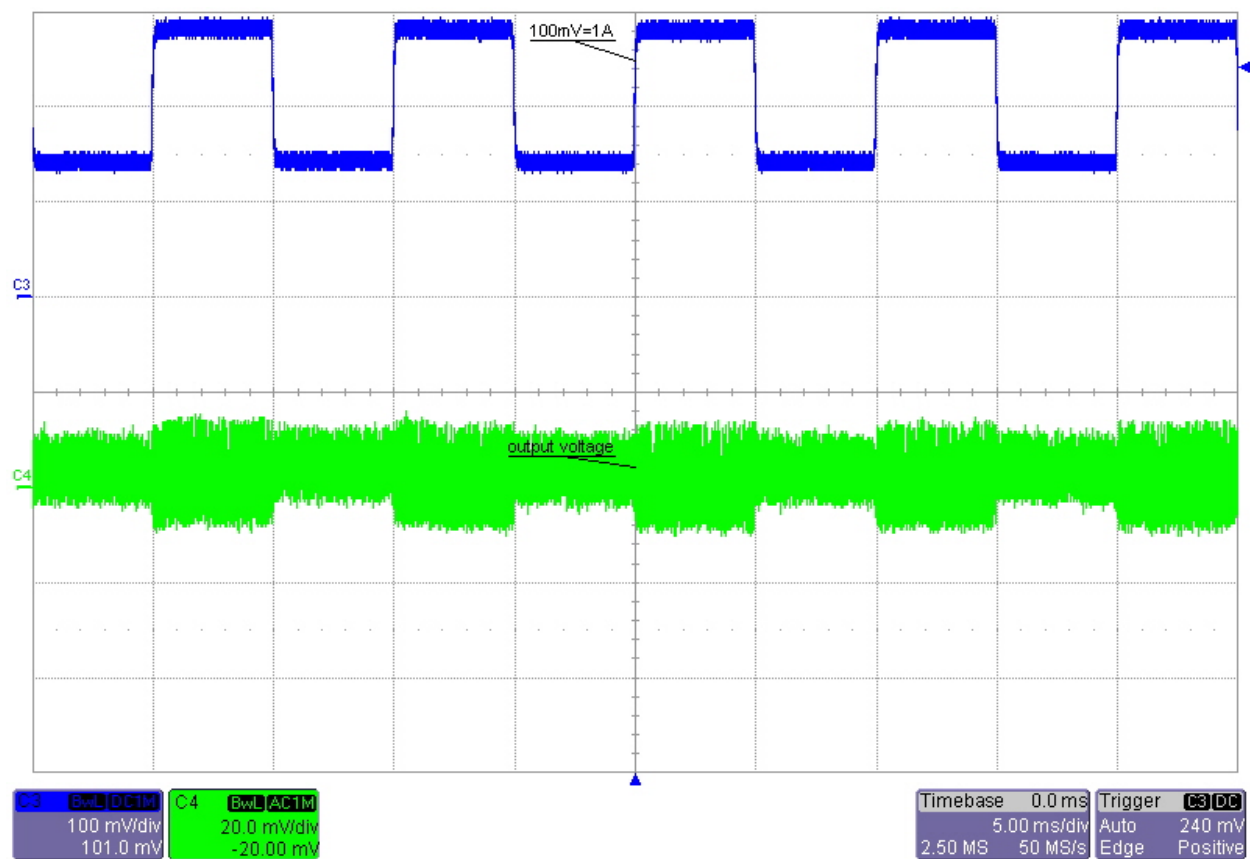
Load current = 3.05A



3.7 Load Transients

Input voltage = 12V

Load current = 1.5A to 3.05A

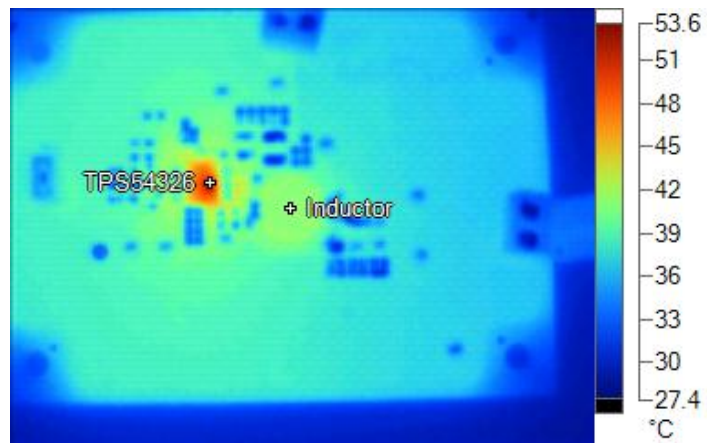


3.8 Thermal Analysis

The images below show the infrared images taken from the FlexCam after 15min at full load (1.05V@3.05A).

Input voltage = 12V

Ambient temperature = 25°C



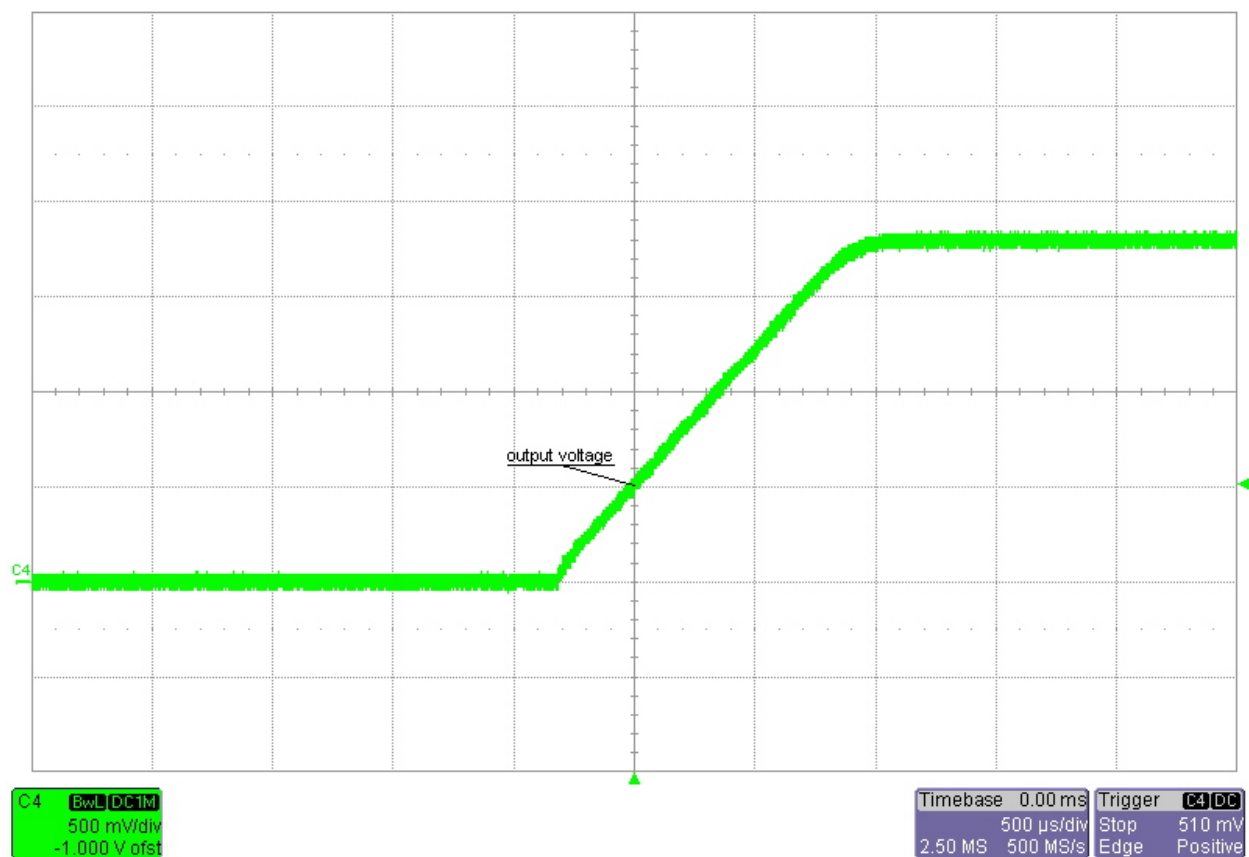
Name	Temperature	
Inductor	41.2°C	
TPS54326	51.5°C	

4 TPS54326EVM ([1.8V@1.74A](#))

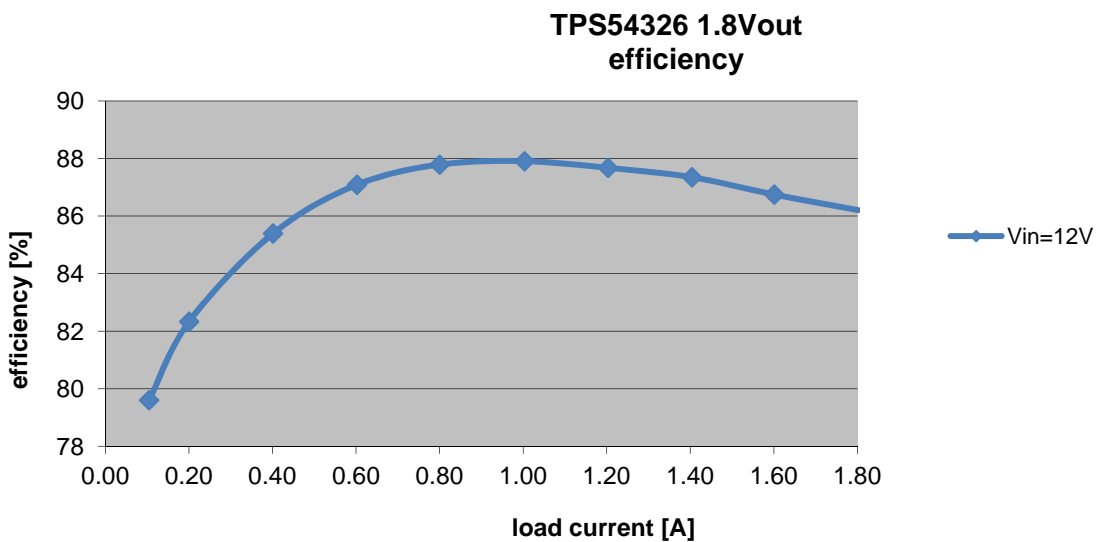
4.1 Startup

Input voltage = 12V

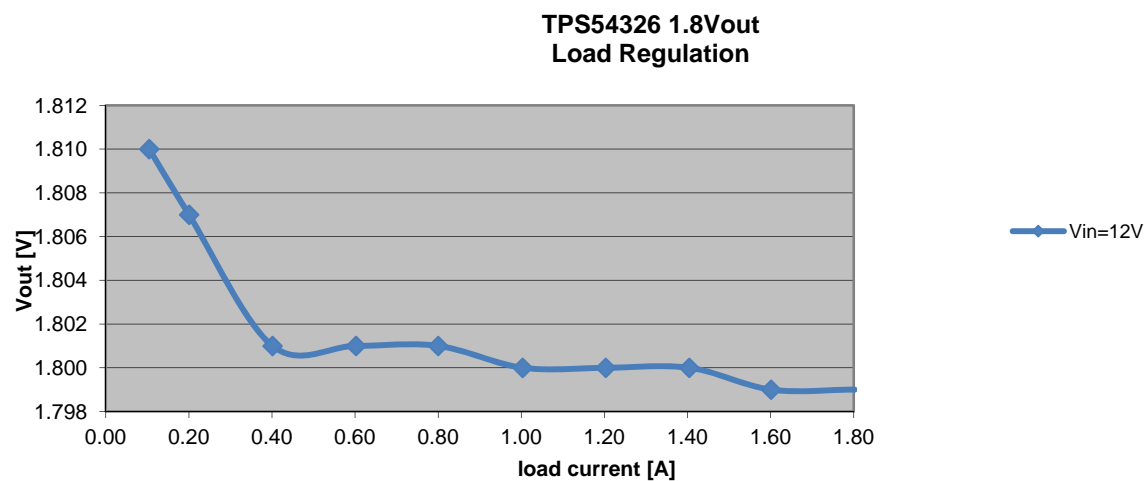
Load current = 1.74A



4.2 Efficiency



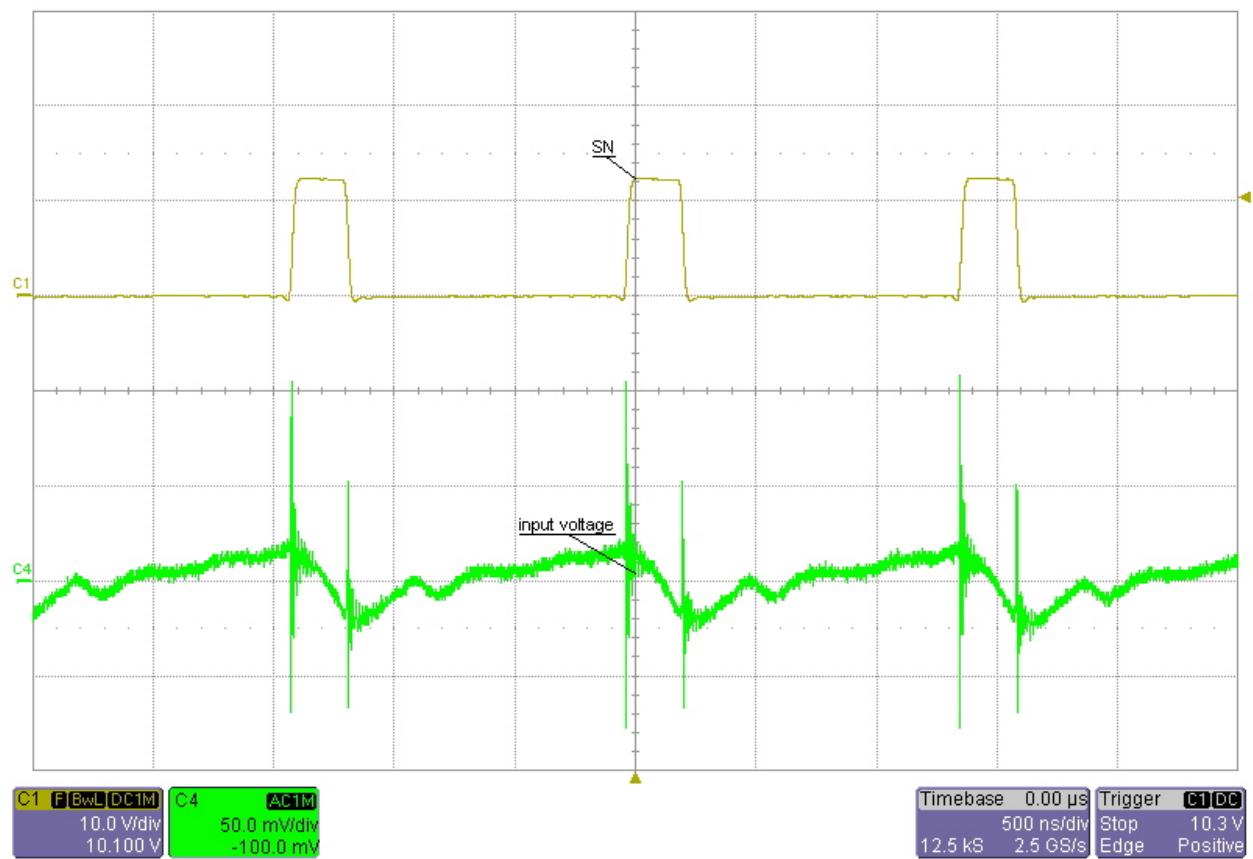
4.3 Load regulation



4.4 Input ripple voltage

Input voltage = 12V

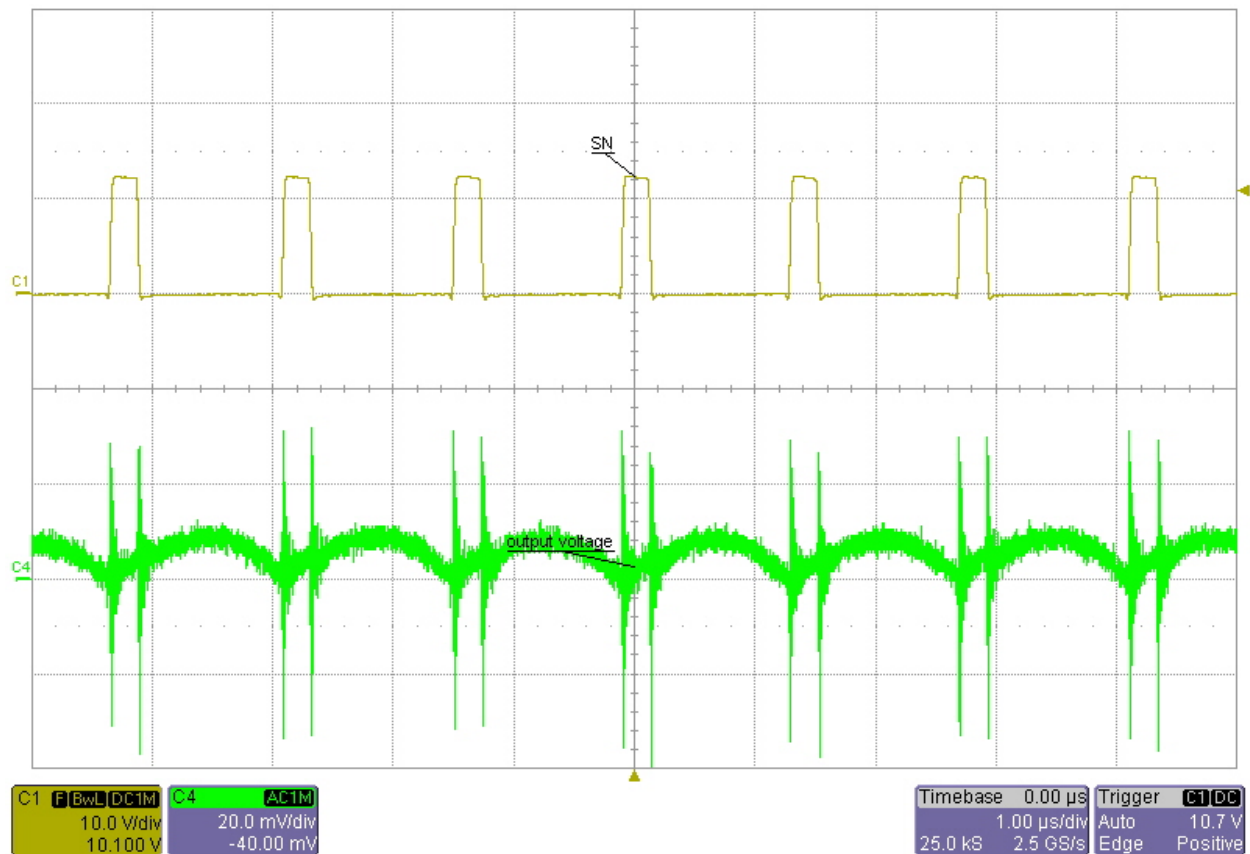
Load current = 1.74A



4.5 Output ripple voltage

Input voltage = 12V

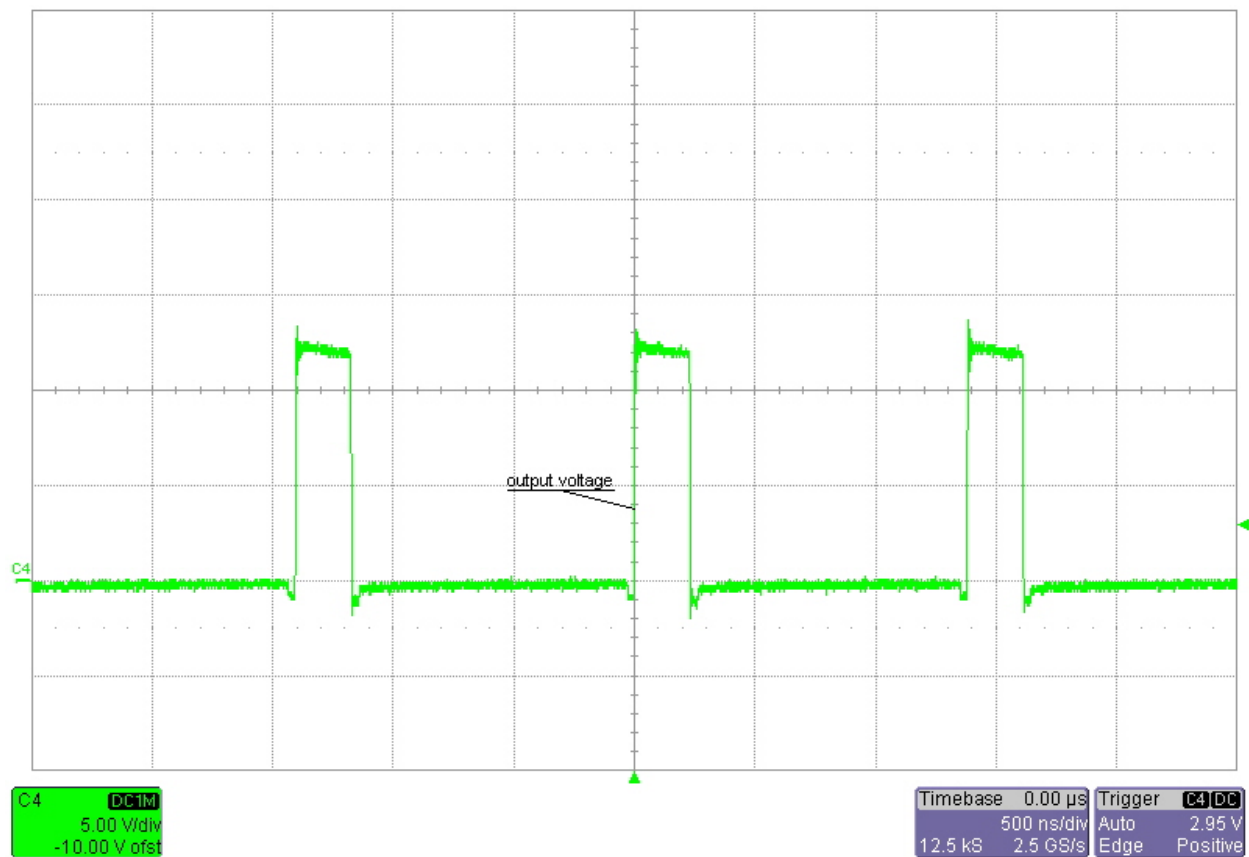
Load current = 1.74A



4.6 Switch Node

Input voltage = 12V

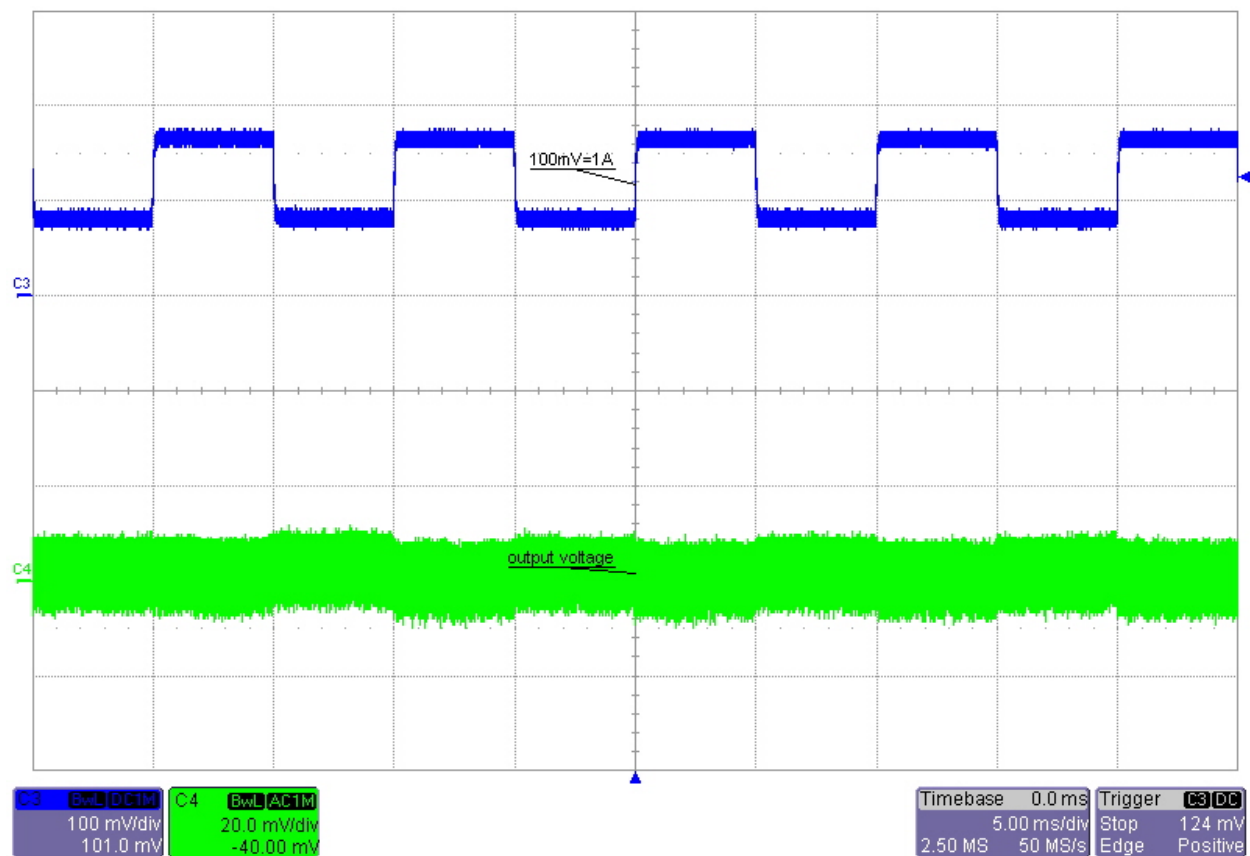
Load current = 1.74A



4.7 Load Transients

Input voltage = 12V

Load current = 0.8A to 1.8A

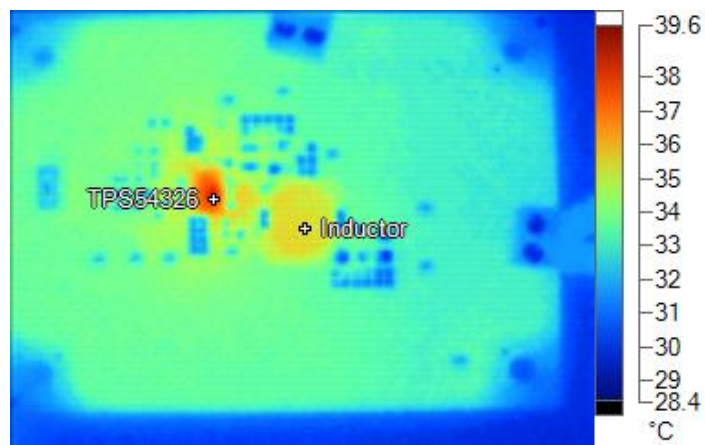


4.8 Thermal Analysis

The images below show the infrared images taken from the FlexCam after 15min at full load (1.8V@1.74A).

Input voltage = 12V

Ambient temperature = 25°C



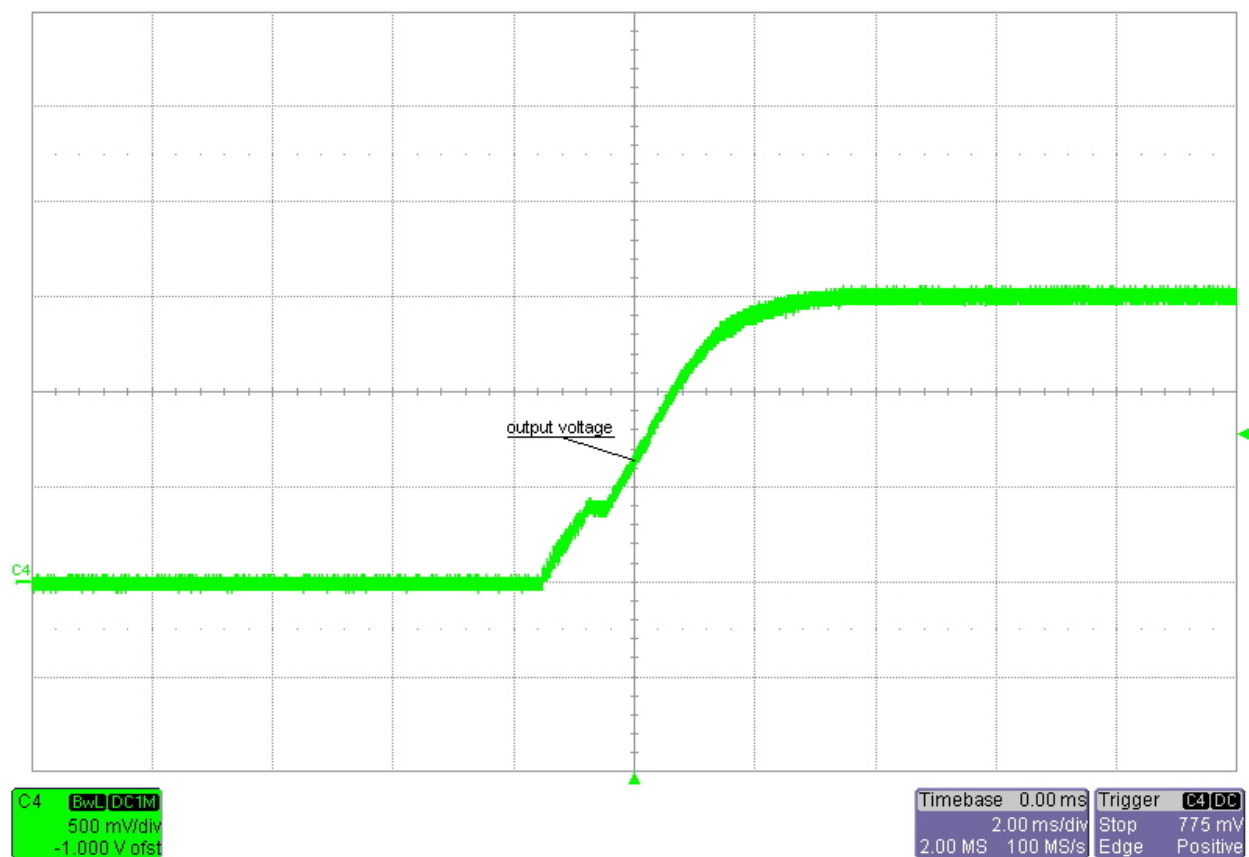
Name	Temperature	
Inductor	35.4°C	
TPS54326	38.7°C	

5 TPS54521EVM ([1.5V@3.55A](#))

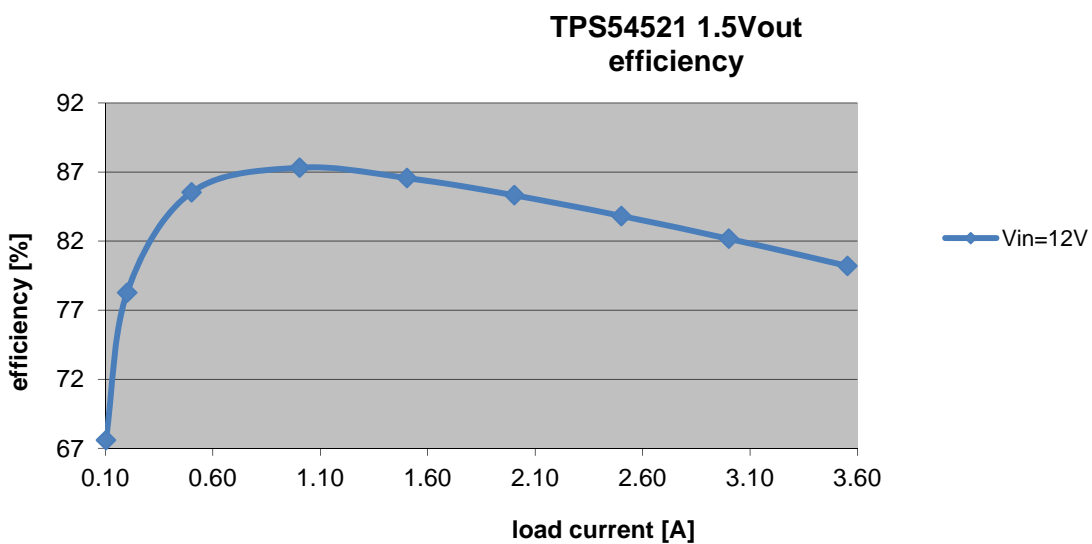
5.1 Startup

Input voltage = 12V

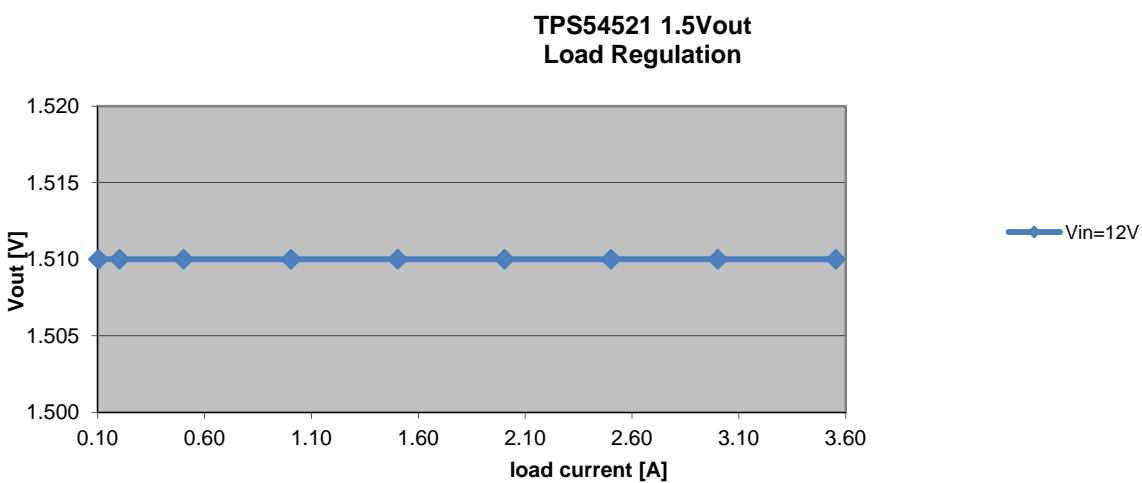
Load current = 3.55A



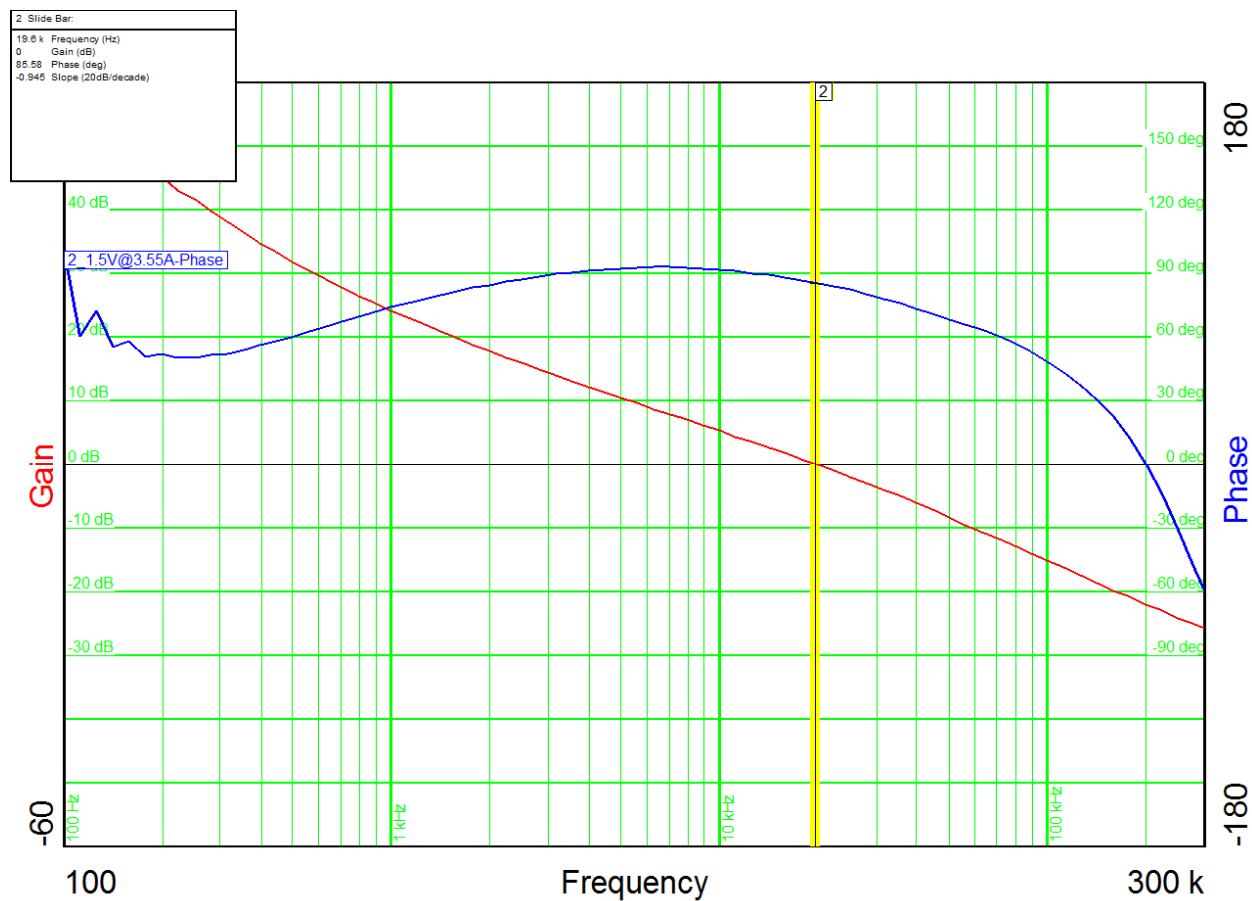
5.2 Efficiency



5.3 Load regulation



5.4 Control Loop Frequency Response

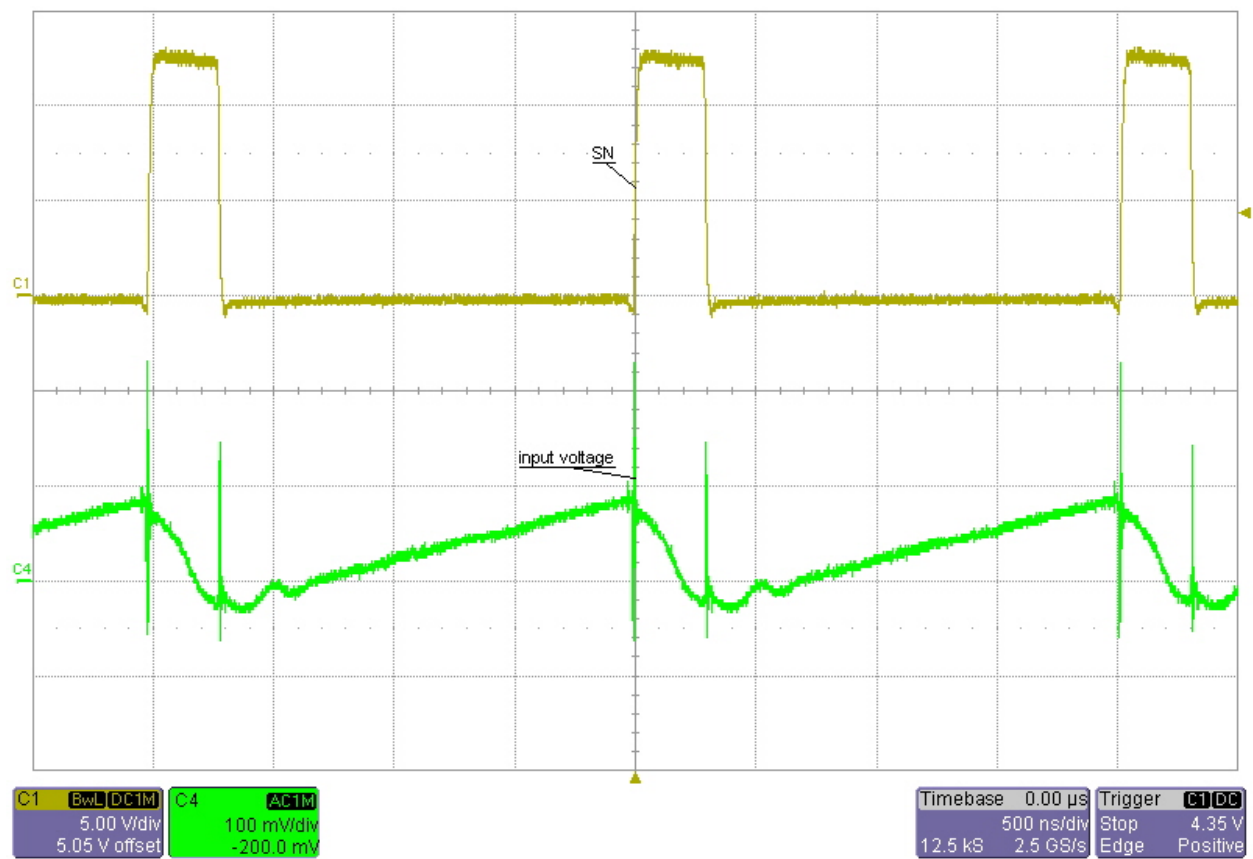


Input voltage = 12V
Phase margin = 85.6°
Bandwidth = 19.6 kHz

5.5 Input ripple voltage

Input voltage = 12V

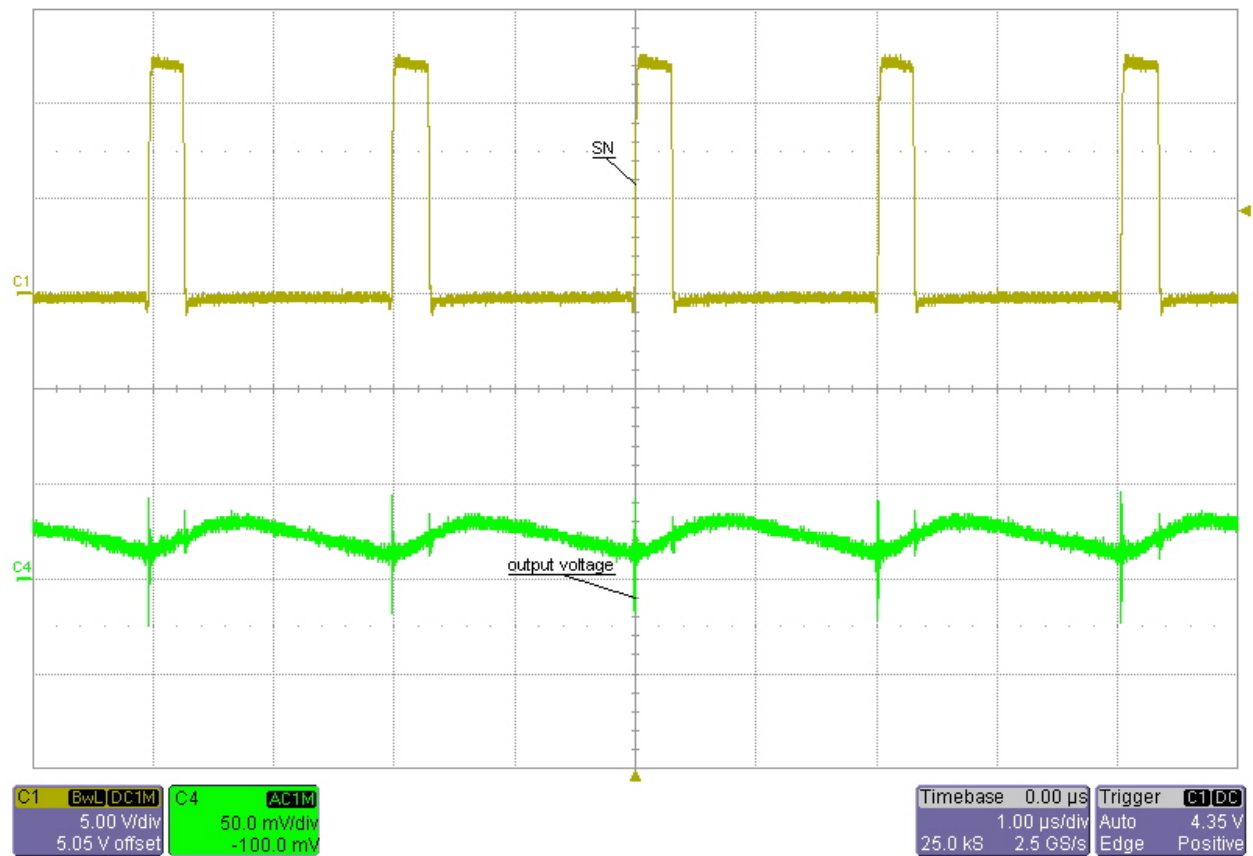
Load current = 3.55A



5.6 Output ripple voltage

Input voltage = 12V

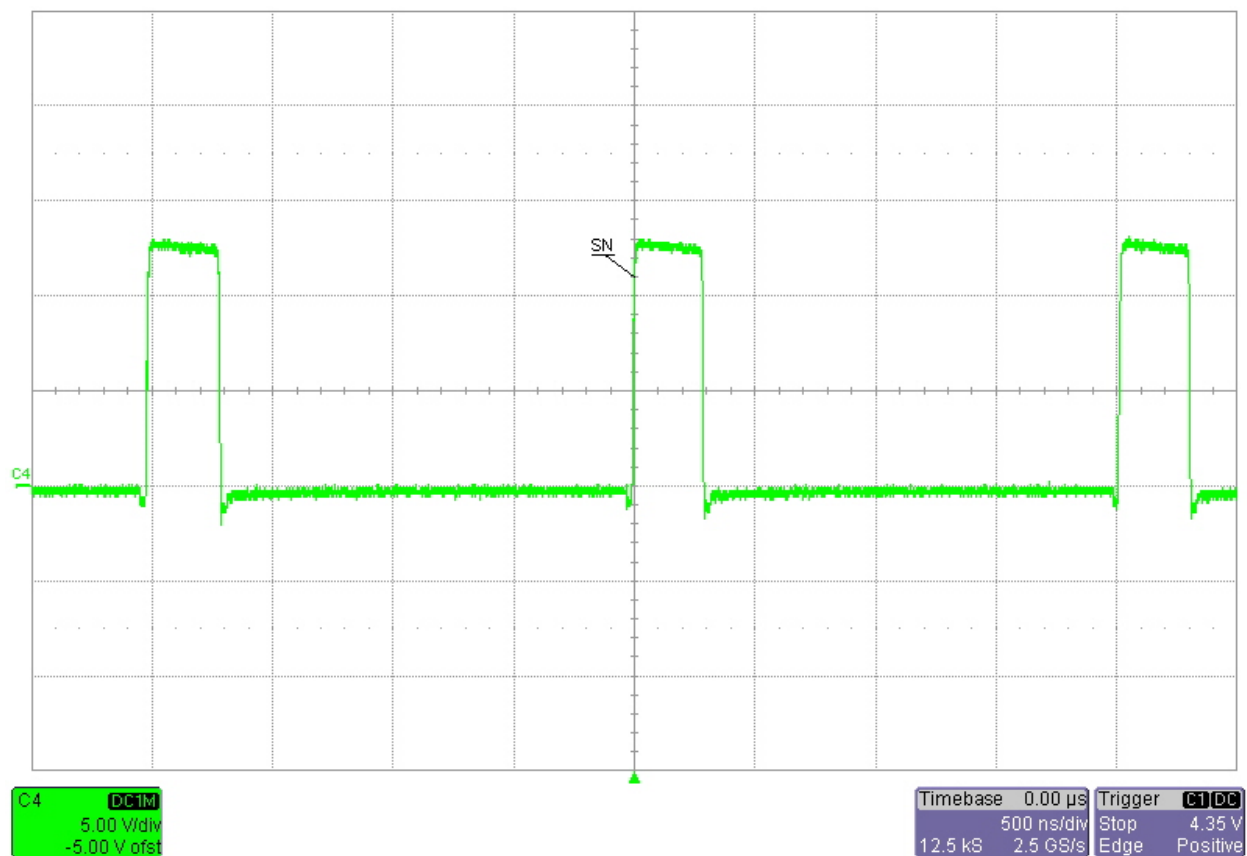
Load current = 3.55A



5.7 Switch Node

Input voltage = 12V

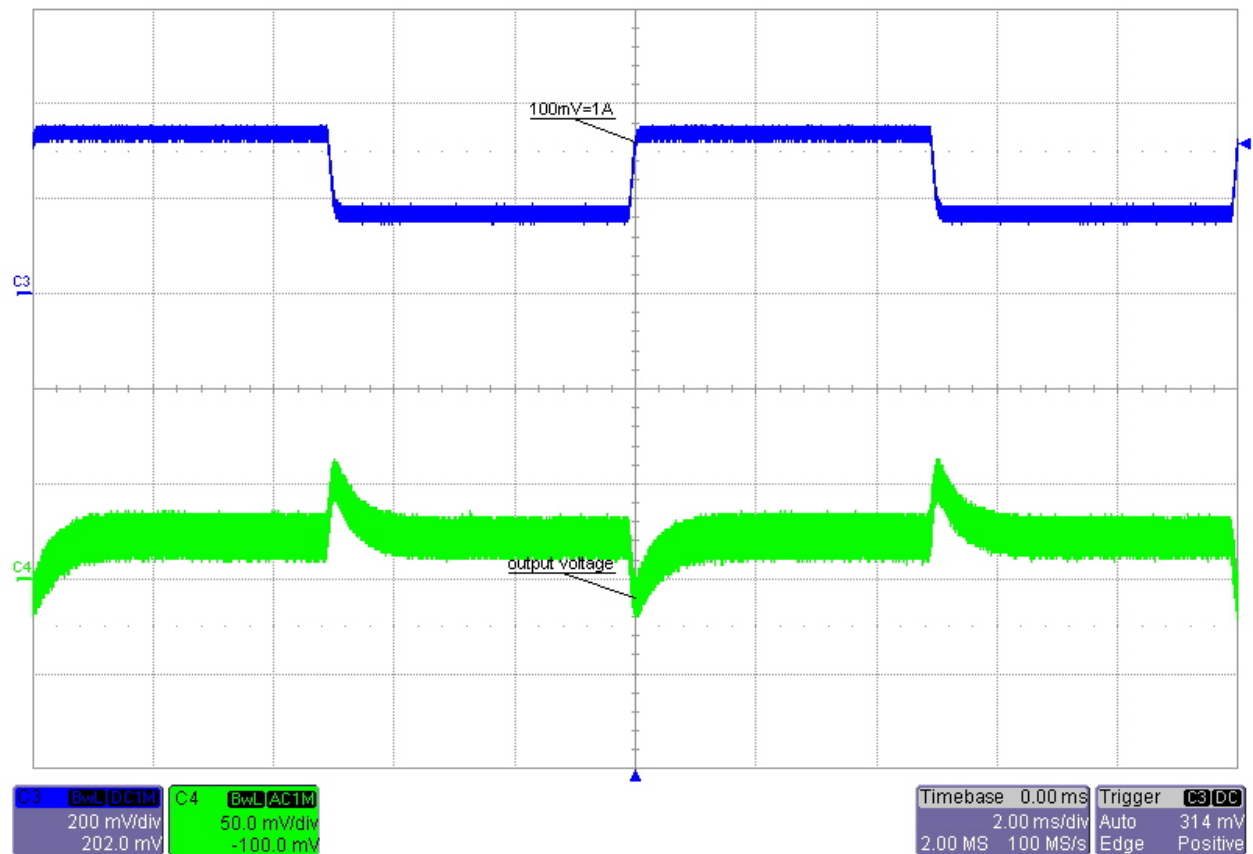
Load current = 3.55A



5.8 Load Transients

Input voltage = 12V

Load current = 1.8A to 3.6A

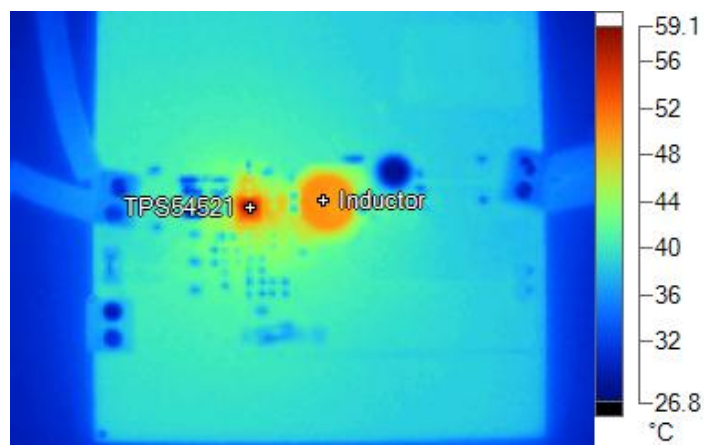


5.9 Thermal Analysis

The images below show the infrared images taken from the FlexCam after 15min at full load (1.5V@3.55A).

Input voltage = 12V

Ambient temperature = 25°C



Name	Temperature	
Inductor	50.1°C	
TPS54521	58.0°C	

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1. You have unique knowledge concerning Federal, State and local regulatory requirements (including but not limited to Food and Drug Administration regulations, if applicable) which relate to your products and which relate to your use (and/or that of your employees, affiliates, contractors or designees) of the EVM for evaluation, testing and other purposes.
2. You have full and exclusive responsibility to assure the safety and compliance of your products with all such laws and other applicable regulatory requirements, and also to assure the safety of any activities to be conducted by you and/or your employees, affiliates, contractors or designees, using the EVM. Further, you are responsible to assure that any interfaces (electronic and/or mechanical) between the EVM and any human body are designed with suitable isolation and means to safely limit accessible leakage currents to minimize the risk of electrical shock hazard.
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.

Certain Instructions. Exceeding the specified EVM ratings (including but not limited to input and output voltage, current, power, and environmental ranges) may cause property damage, personal injury or death. If there are questions concerning these ratings please contact a TI field representative prior to connecting interface electronics including input power and intended loads. Any loads applied outside of the specified output range may result in unintended and/or inaccurate operation and/or possible permanent damage to the EVM and/or interface electronics. Please consult the EVM User's Guide prior to connecting any load to the EVM output. If there is uncertainty as to the load specification, please contact a TI field representative. During normal operation, some circuit components may have case temperatures greater than 60°C as long as the input and output ranges are maintained at nominal ambient operating temperature. These components include but are not limited to linear regulators, switching transistors, pass transistors, and current sense resistors which can be identified using the EVM schematic located in the EVM User's Guide. When placing measurement probes near these devices during normal operation, please be aware that these devices may be very warm to the touch.

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