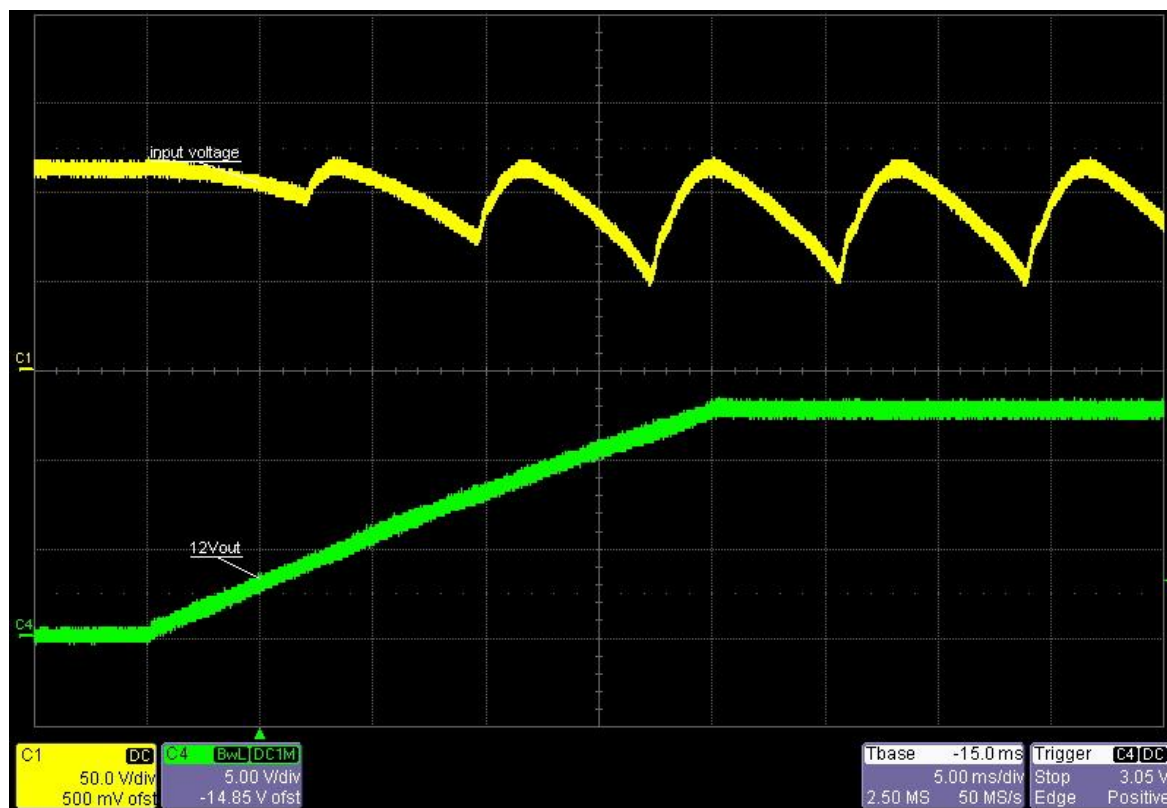# 1 Startup

Input voltage = 85VAC/60Hz
Load current 12Vout = 0.9A
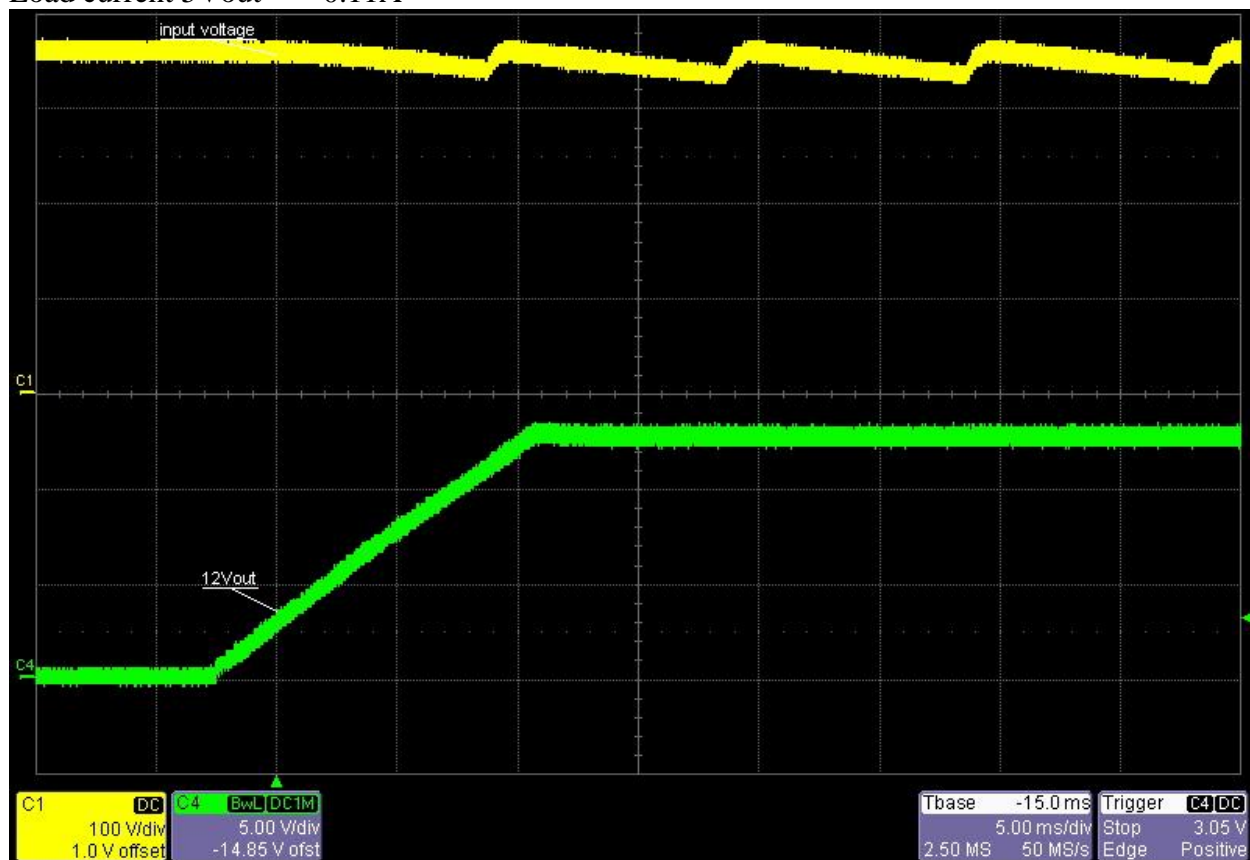Load current 5Vout = 0.11A

Input voltage = 265VAC/50Hz
Load current 12Vout = 0.9A
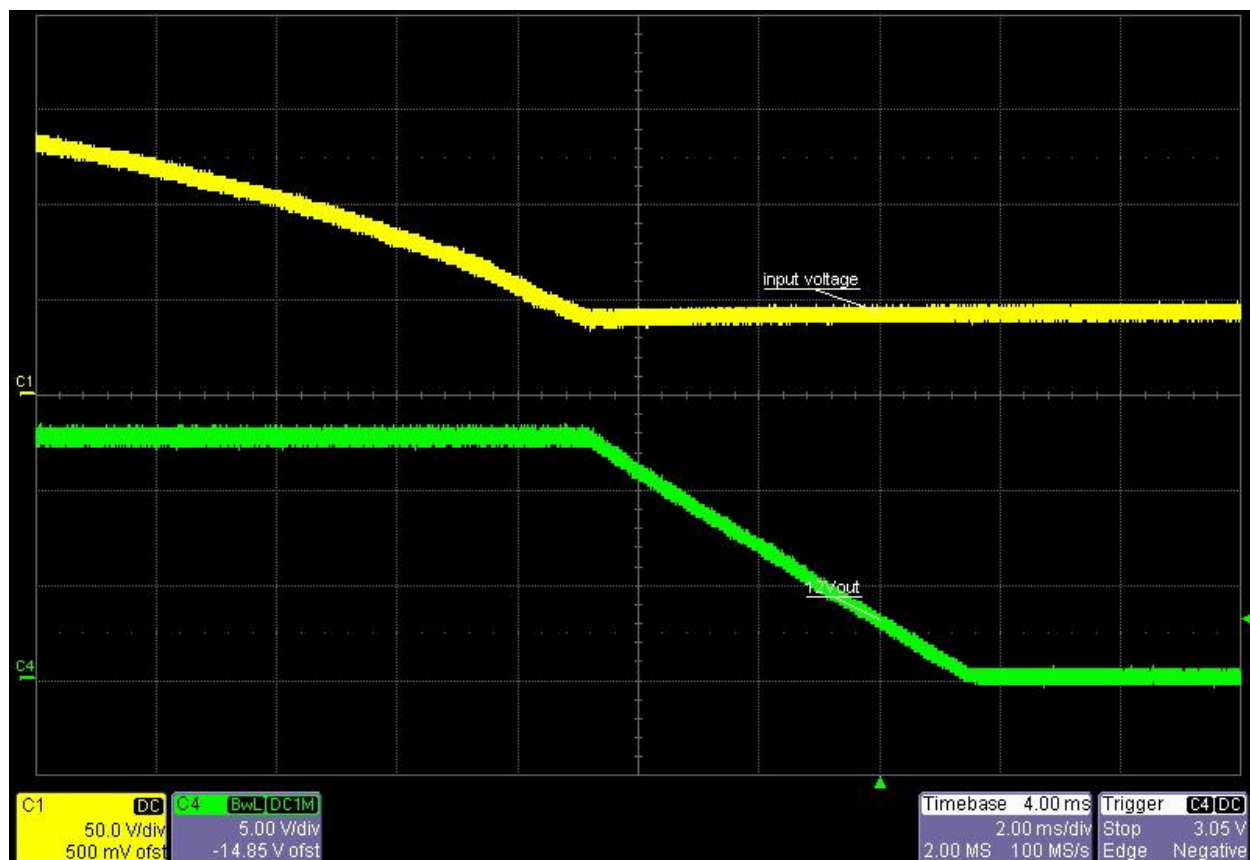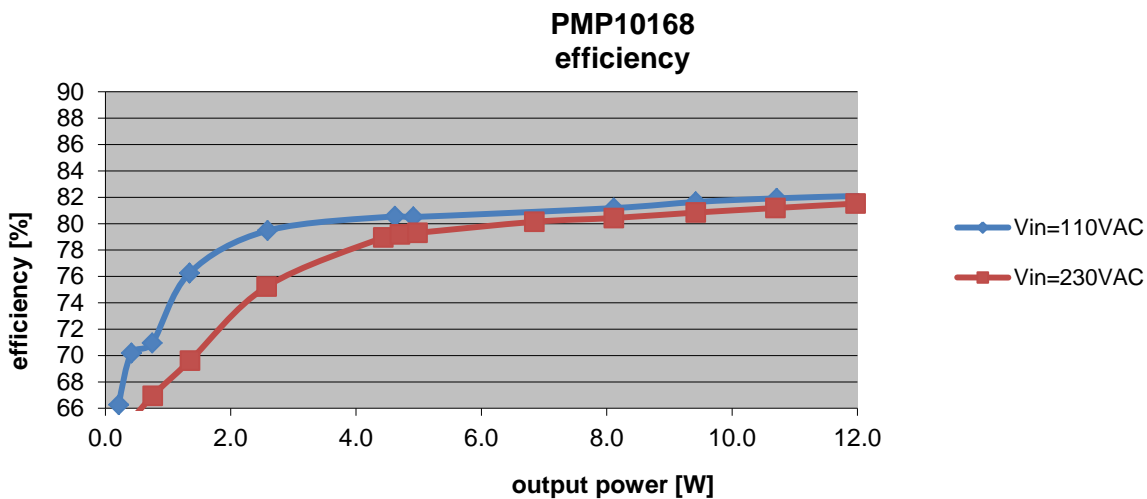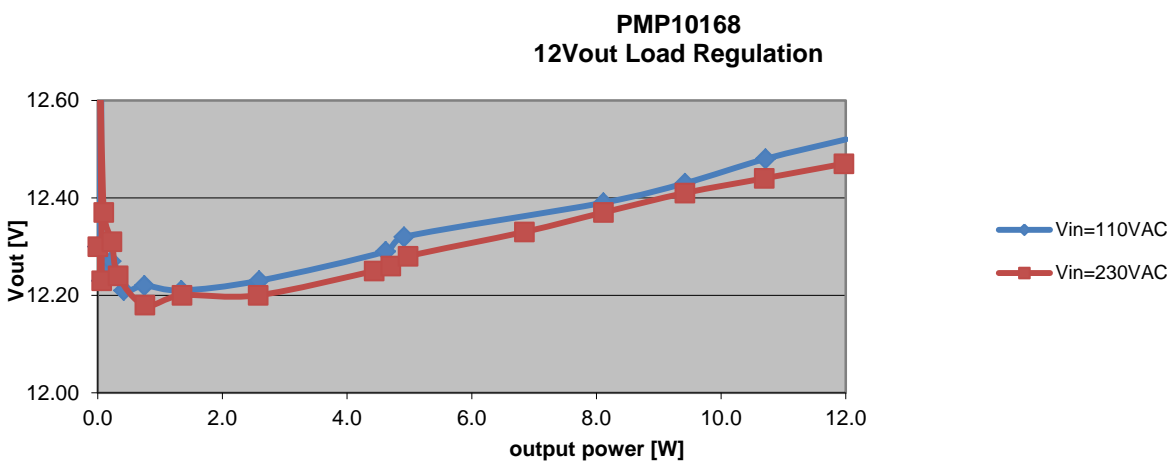Load current 5Vout = 0.11A

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2 Shutdown

Input voltage   = 230VAC/50Hz
Load current 12Vout   = 0.9A
Load current 5Vout   = 0.11A

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3 Efficiency

PMP10168 efficiency

4 Load regulation

PMP10168 12Vout Load Regulation
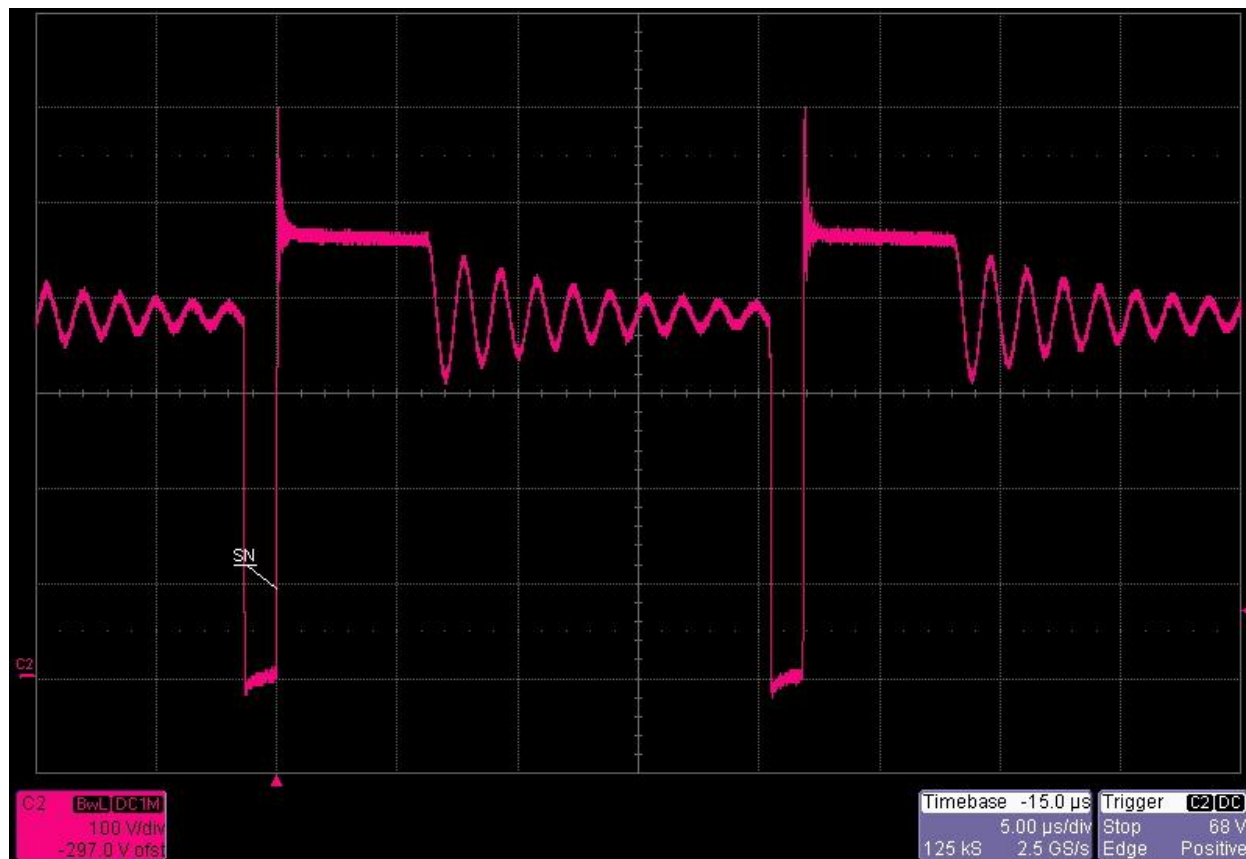
5   Switch Node

Input voltage   = 375VDC
Load current 12Vout   = 0.9A
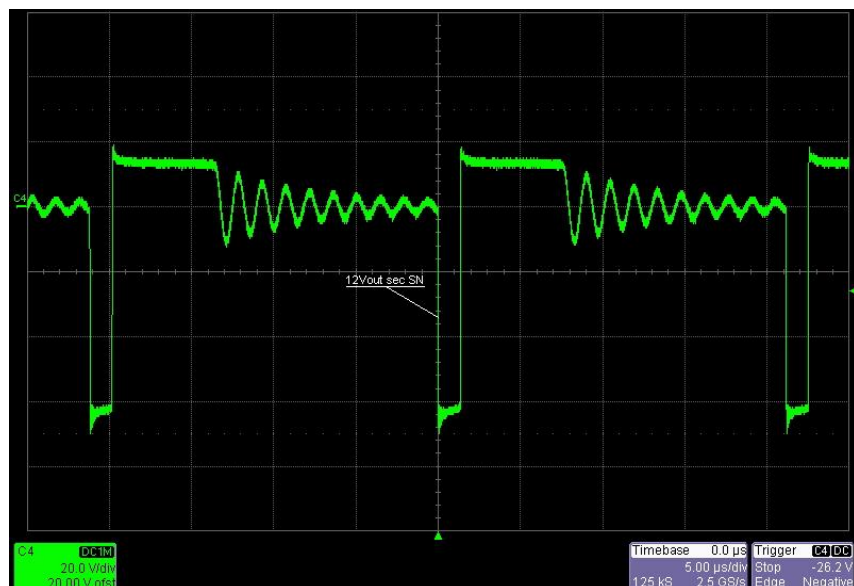Load current 5Vout   = 0.11A

6 Secondary Switch Nodes

6.1 12Vout Switch Node

Input voltage   = 375VDC
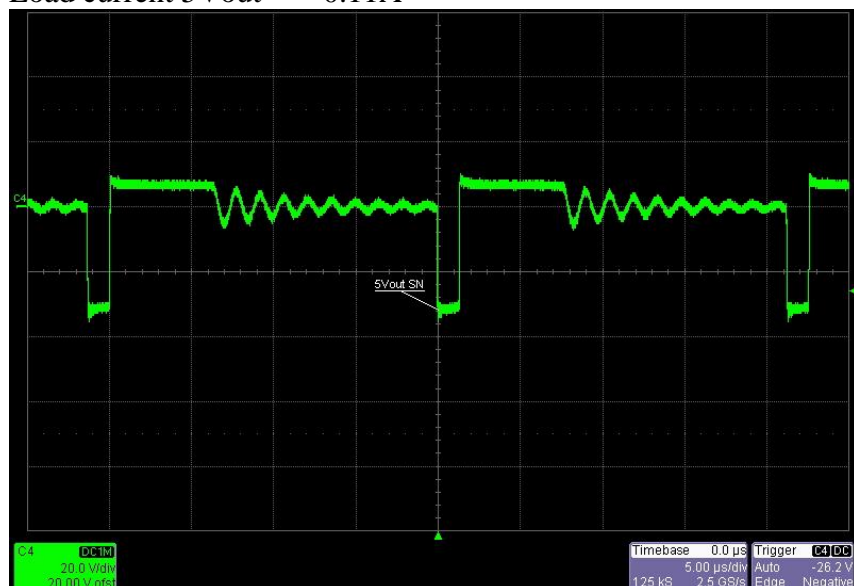Load current 12Vout = 0.9A
Load current 5Vout   = 0.11A

6.2 5Vout Switch Node

Input voltage   = 375VDC
Load current 12Vout = 0.9A
Load current 5Vout   = 0.11A

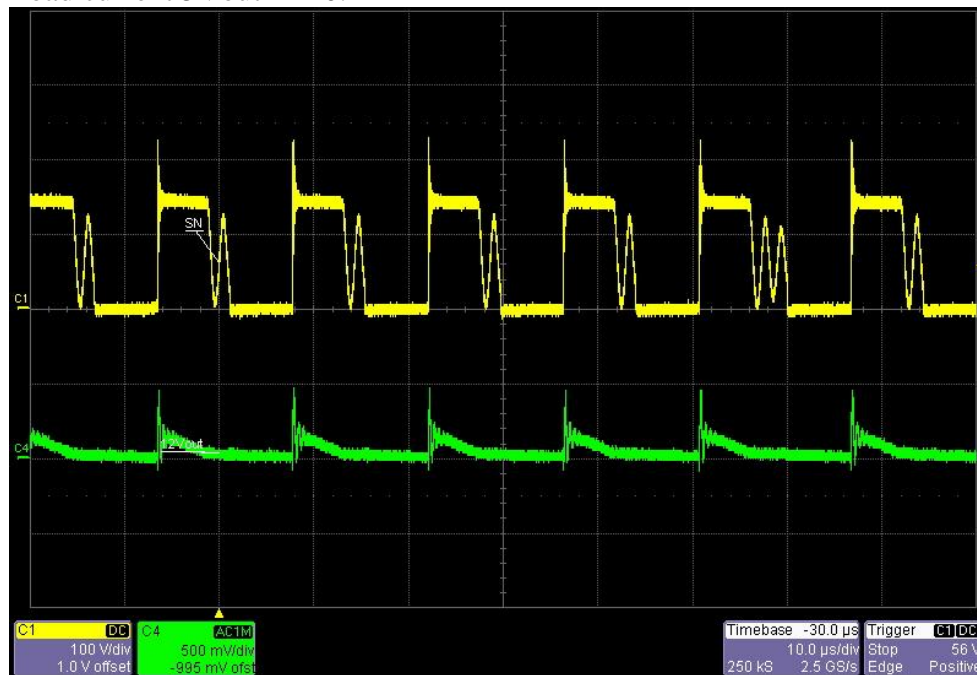Power Management Solutions

7 Output ripple voltage (12Vout)

Input voltage   = 85VAC
Load current 12Vout = 0.9A
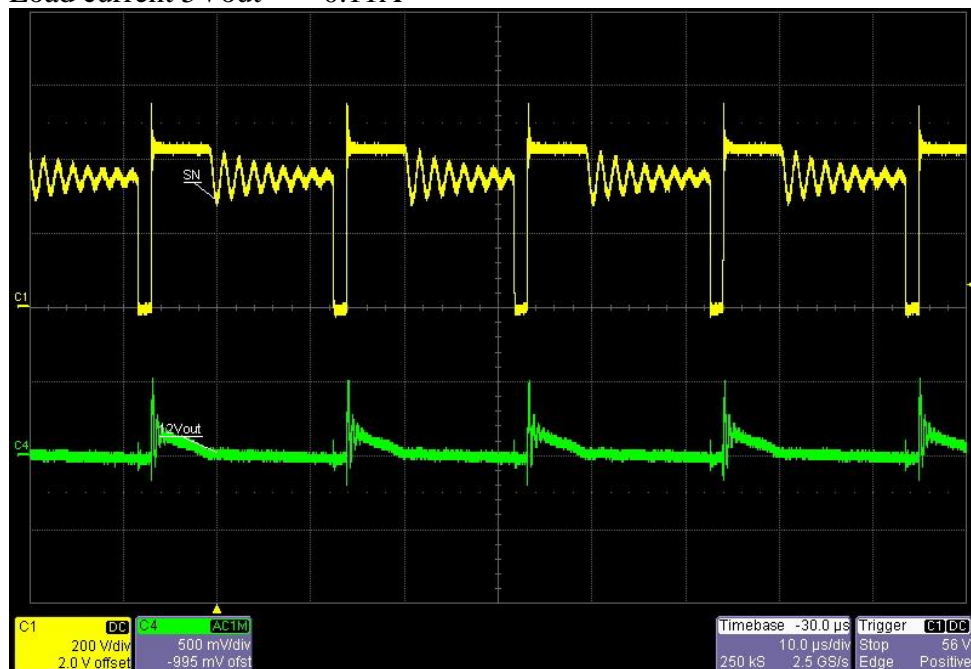Load current 5Vout   = 0.11A

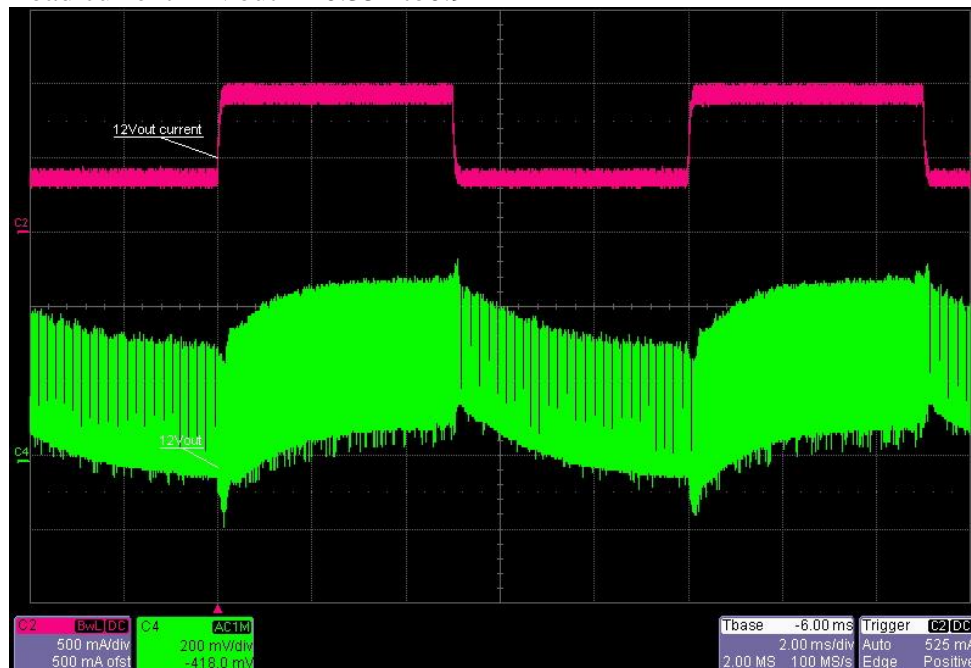Input voltage   = 265VAC
Load current 12Vout = 0.9A
Load current 5Vout   = 0.11A
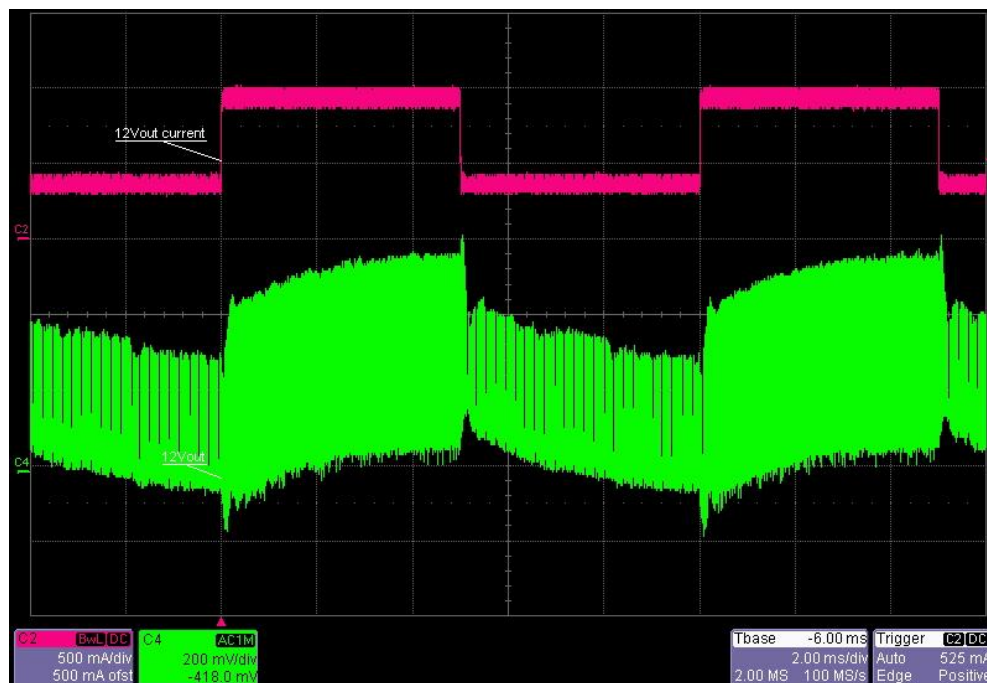
8   Load Transients (12Vout)

Input voltage   = 85VAC
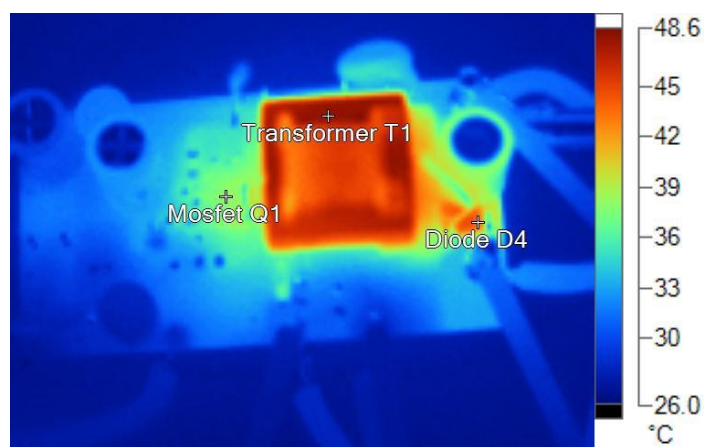Load current 12Vout   = 0.35Ato0.9A

Input voltage   = 265VAC
Load current 12Vout   = 0.35Ato0.9A

TEXAS INSTRUMENTS

9 Thermal Analysis

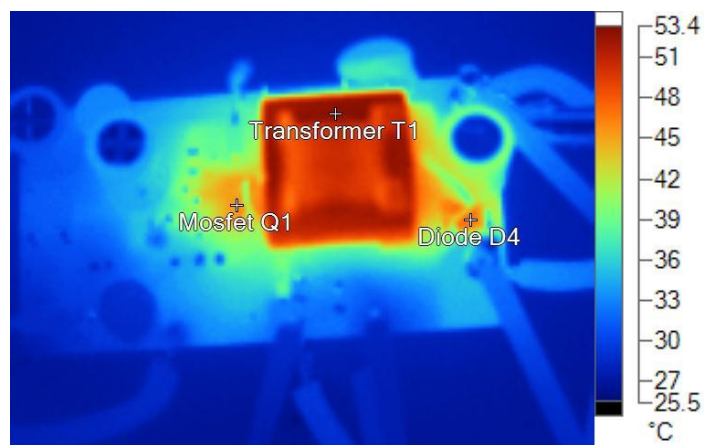The images below show the infrared images taken from the FlexCam after 15min.

Input voltage   = 110VAC
Nominal Output power   = 4.75W (12V@0.35A, 5V@0.11A)
Ambient temperature   = 25°C
No heatsink, no airflow

Name	Temperature	
Mosfet Q1	38.0°C	
Transformer T1	48.1°C	
Diode D4	43.8°C	

IR20150428_0566 nom load Vin=110VAC.is2

Input voltage   = 230VAC
Nominal Output power   = 4.75W (12V@0.35A, 5V@0.11A)
Ambient temperature   = 25°C
No heatsink, no airflow

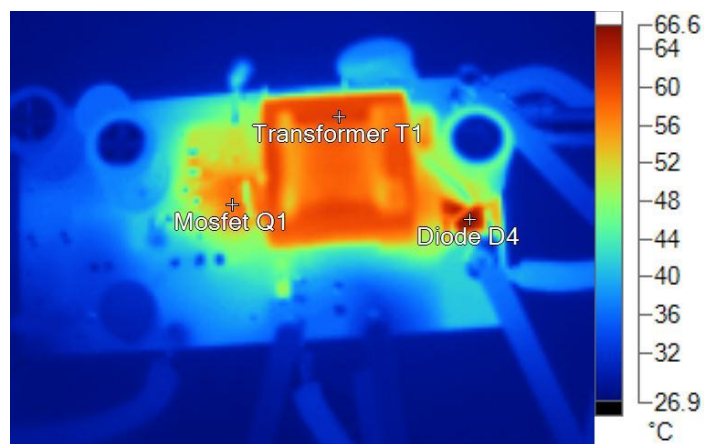| Name	Temperature	
Mosfet Q1	45.5°C	
Transformer T1	53.1°C	
Diode D4	47.0°C	

IR20150428_0565 nom load Vin=230VAC.is2

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Input voltage   = 230VAC
Output power   = 12W
Ambient temperature = 25°C
No heatsink, no airflow

IR20150428_0564 full load Vin=230VAC.is2

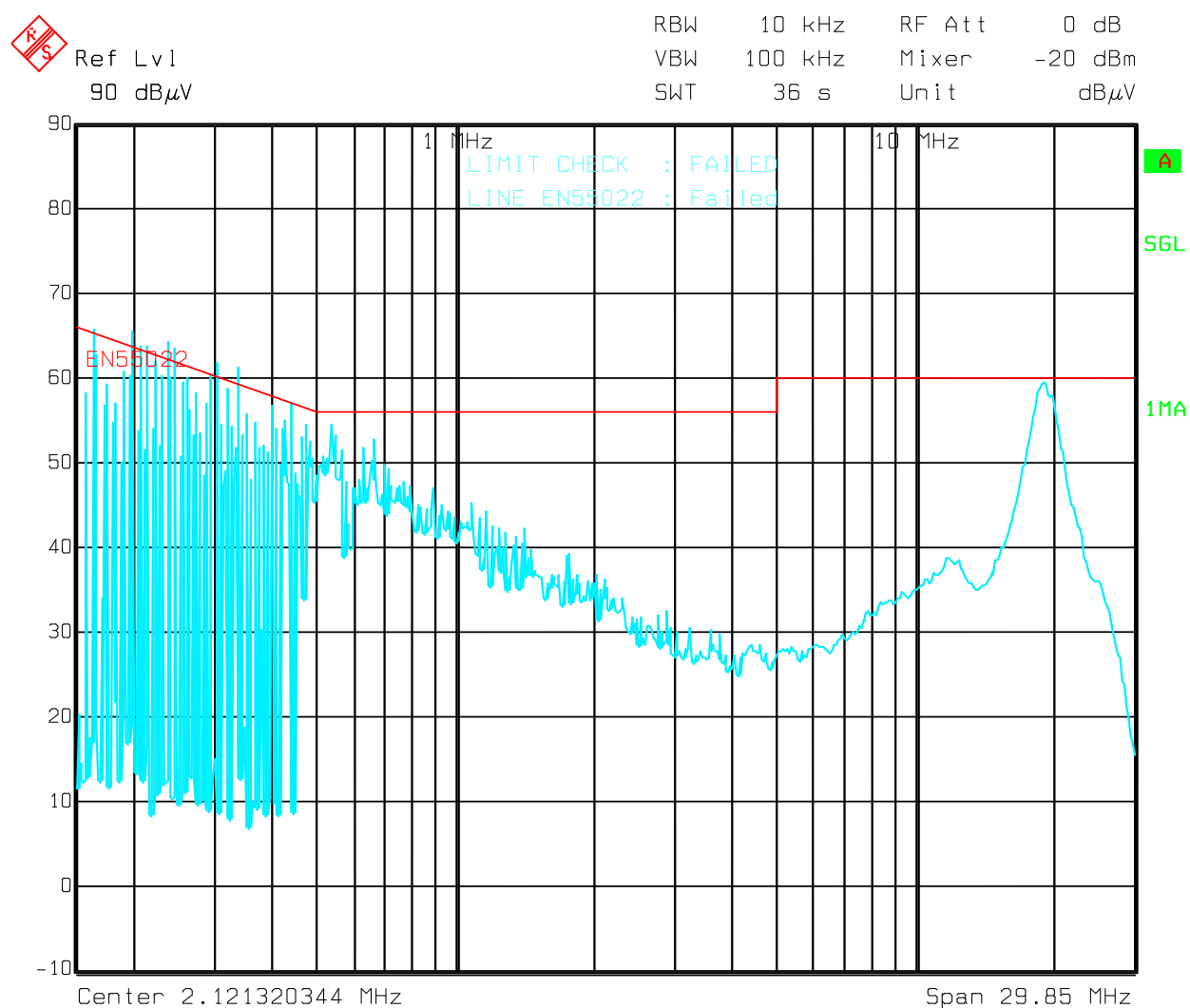| Name	Temperature	
Mosfet Q1	57.6°C	
Transformer T1	61.1°C	
Diode D4	66.3°C	

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10 EMI Measurement

The graph below shows the conducted emission EMI noise and the EN55022 Class-B Quasi-Peak limits (measurement from the worst case line). The load was connected to a LISN and an isolation transformer; two power resistors were connected to the outputs (12V@0.35A and 5V@0.11A). The receiver was set to Quasi-peak detector, 10 KHz bandwidth. The secondary side GND of the converter was connected to the ground of the LISN.

R1 = DNP (DO NOT POPULATE)
Input voltage = 230VAC
Output power = 4.75W (12V@0.35A, 5V@0.11A)

R1 = DNP (DO NOT POPULATE)
Input voltage = 110VAC
Output power = 4.75W (12V@0.35A, 5V@0.11A)

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