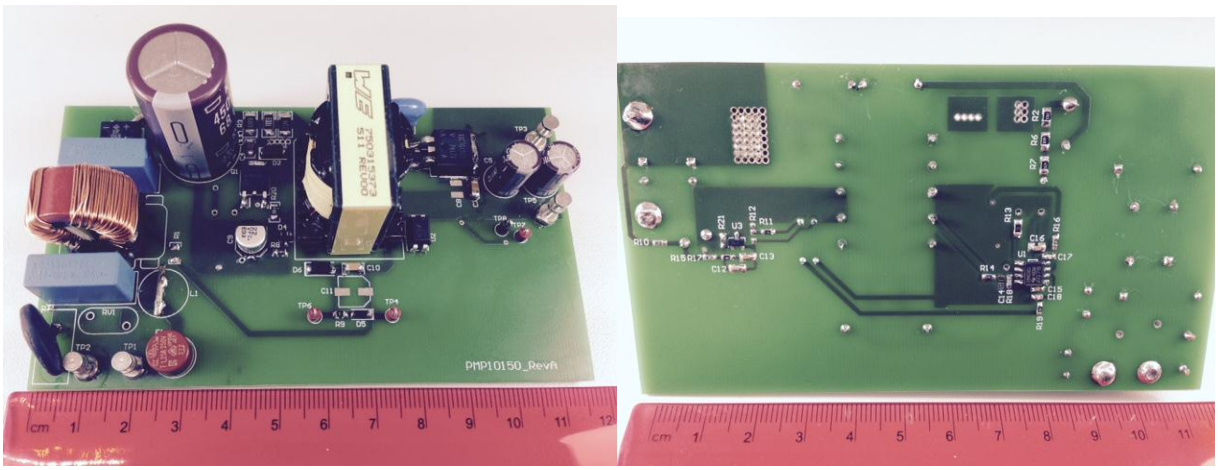
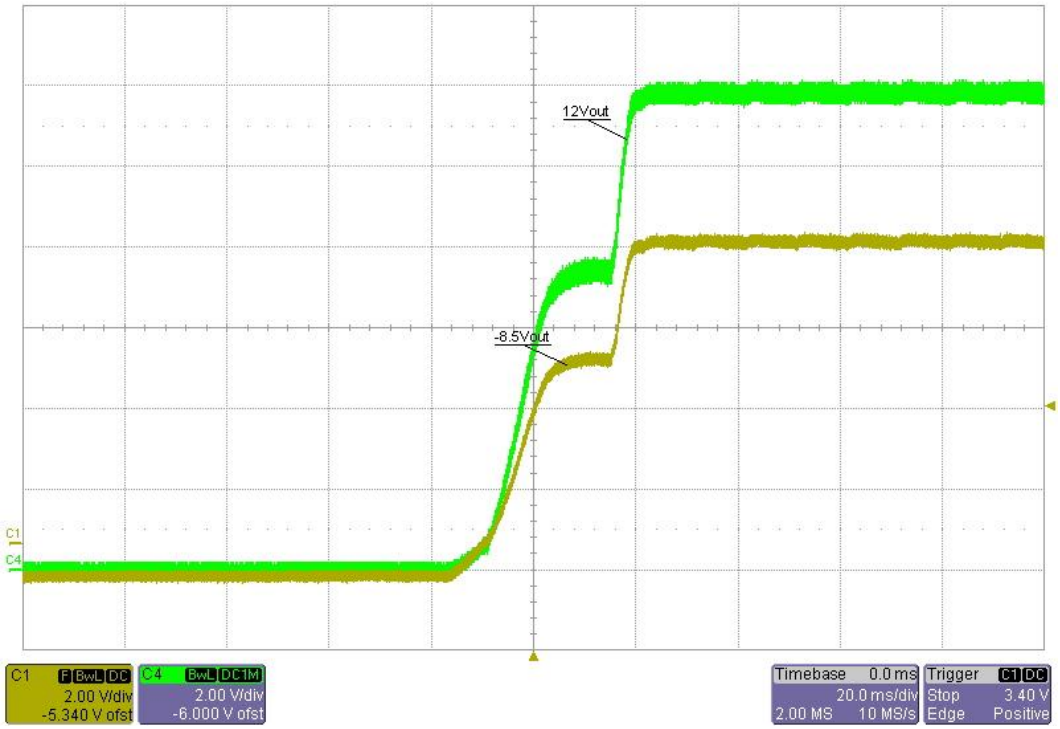
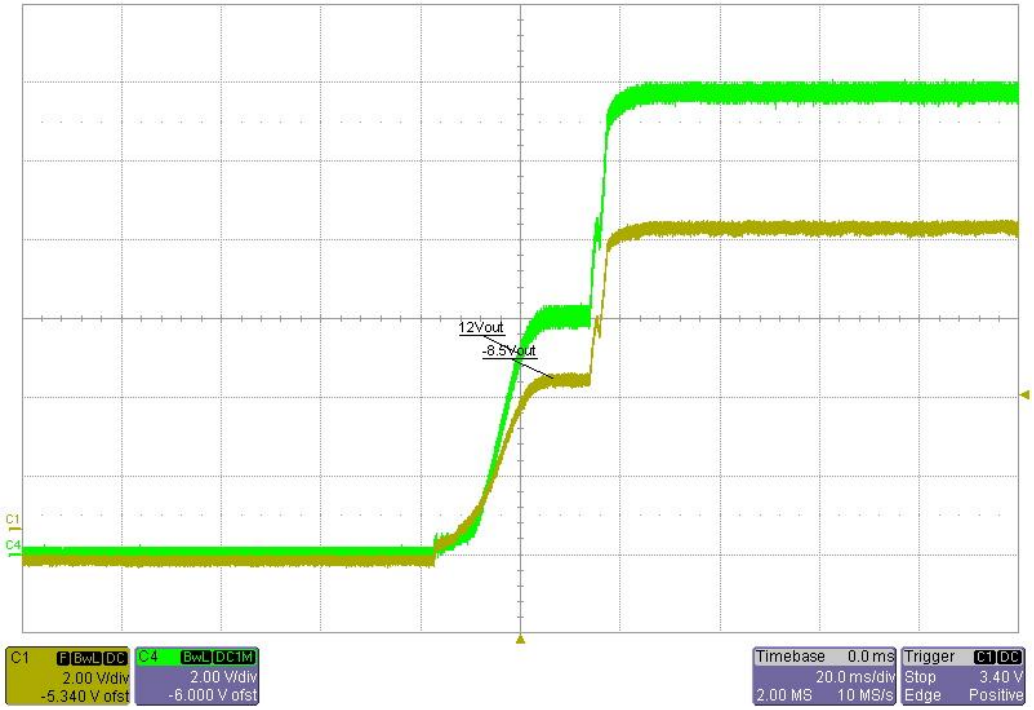


1 Startup

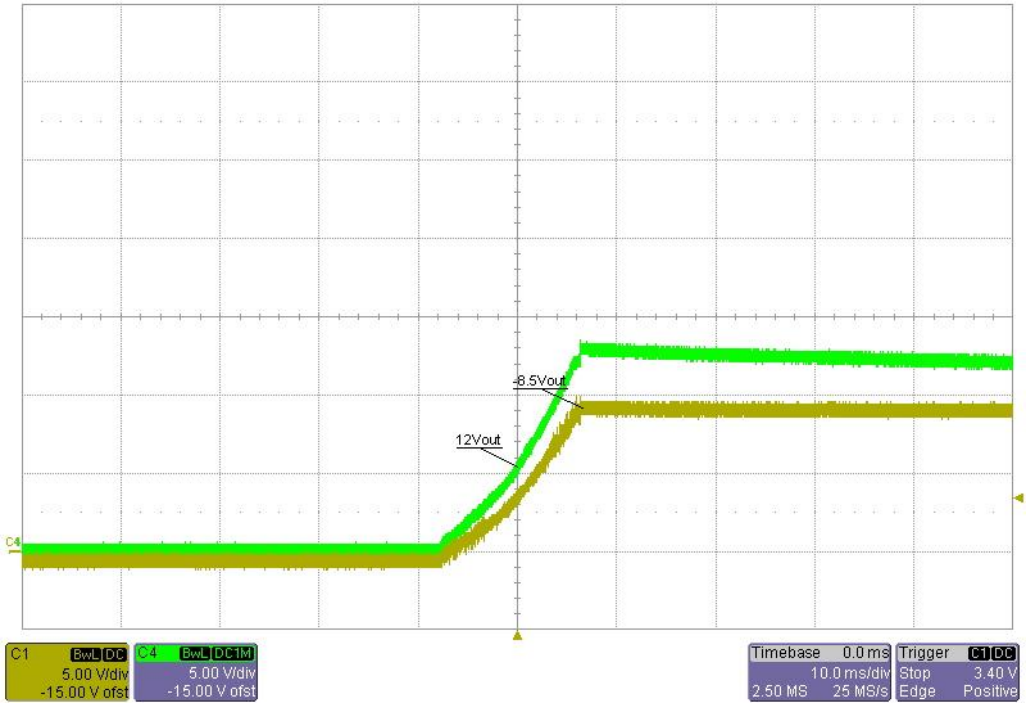
Input voltage = 85VAC
Load current 12Vout = 2.5A
Load current 8.5Vout = 0.05A



Input voltage = 230VAC
Load current 12Vout = 2.5A
Load current 8.5Vout = 0.05A

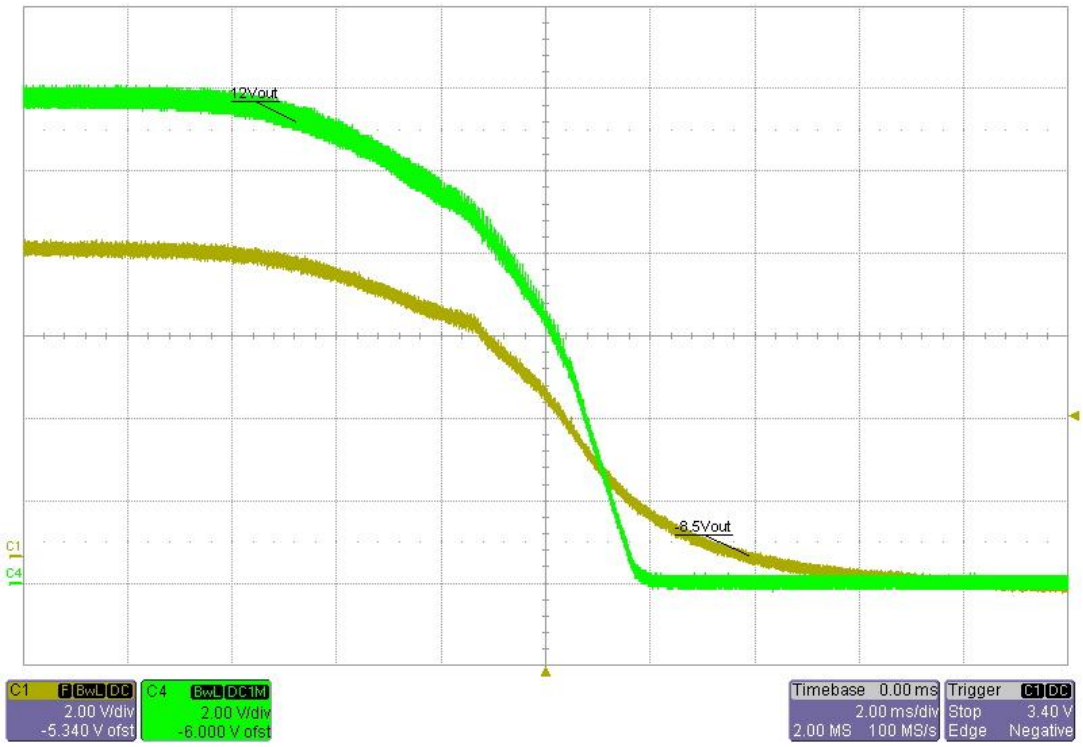


Input voltage = 230VAC
Load current 12Vout = 0A
Load current 8.5Vout = 0A

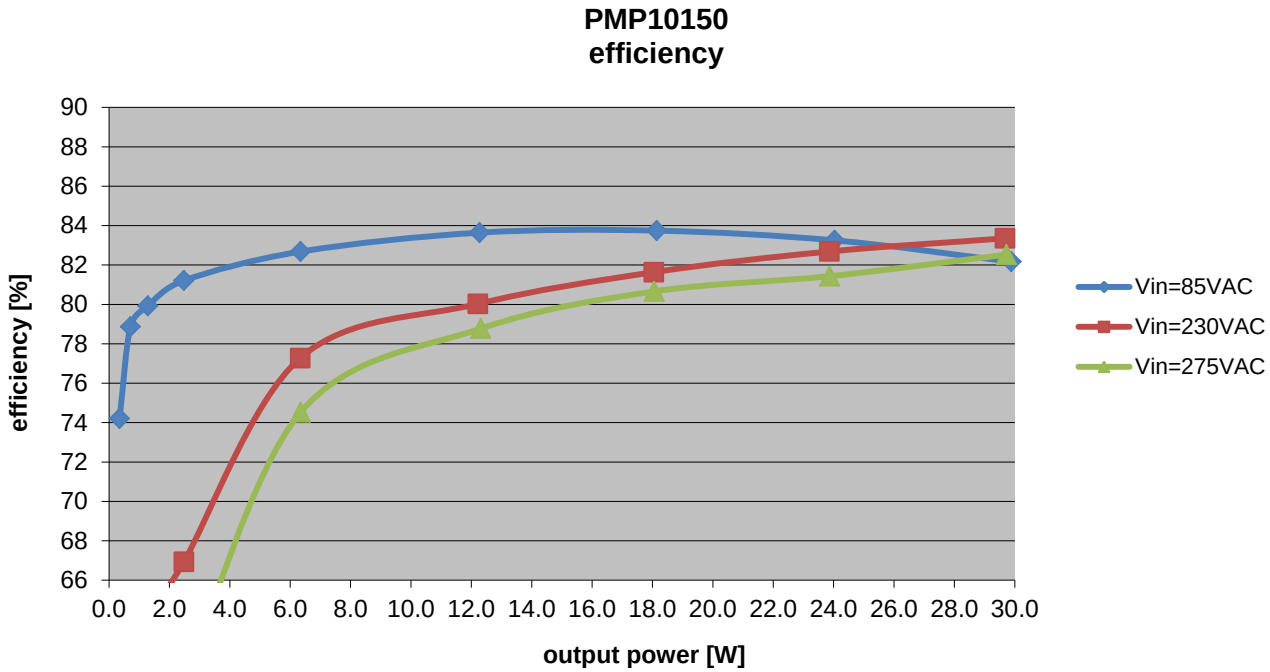


2 Shutdown

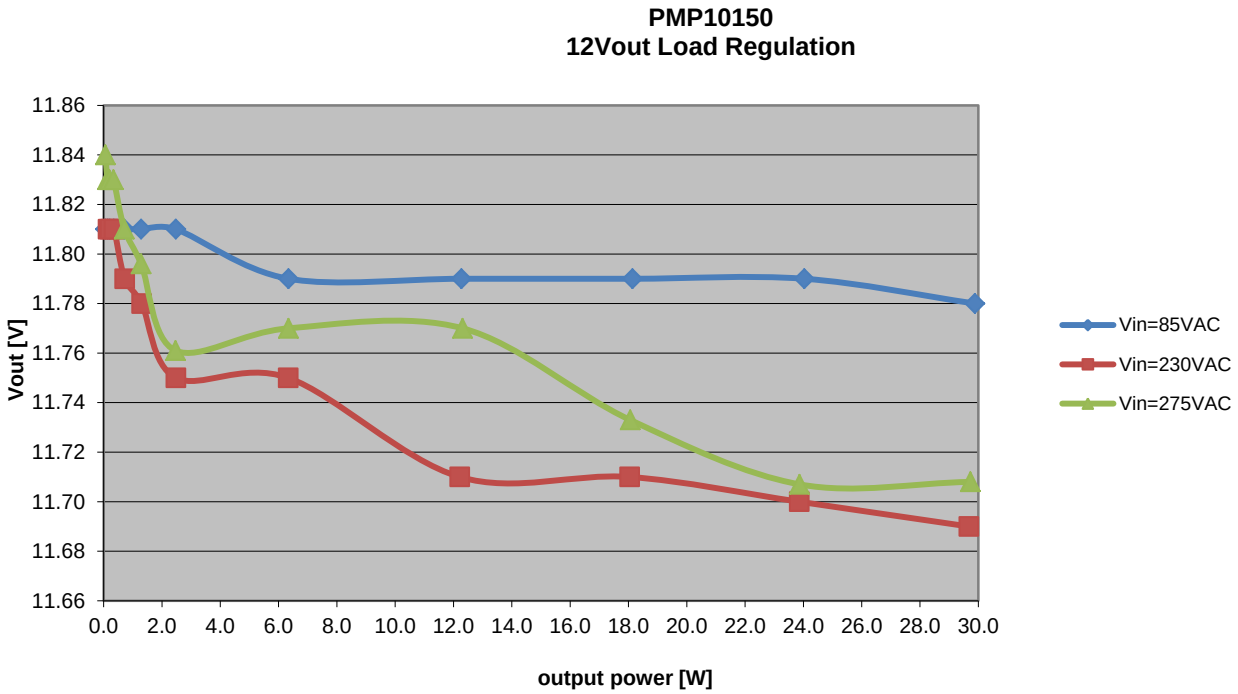
Input voltage = 230VAC
Load current 12Vout = 2.5A
Load current 8.5Vout = 0.05A



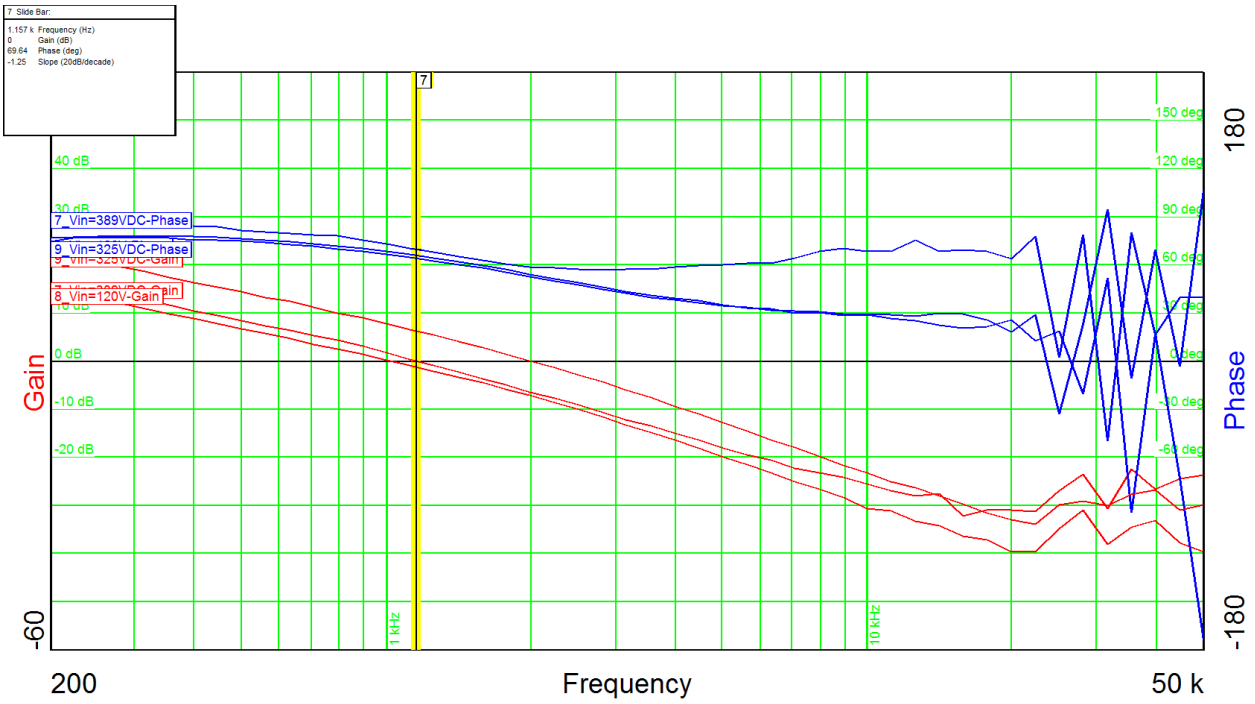
3 Efficiency



4 Load regulation



5 Control Loop Frequency Response



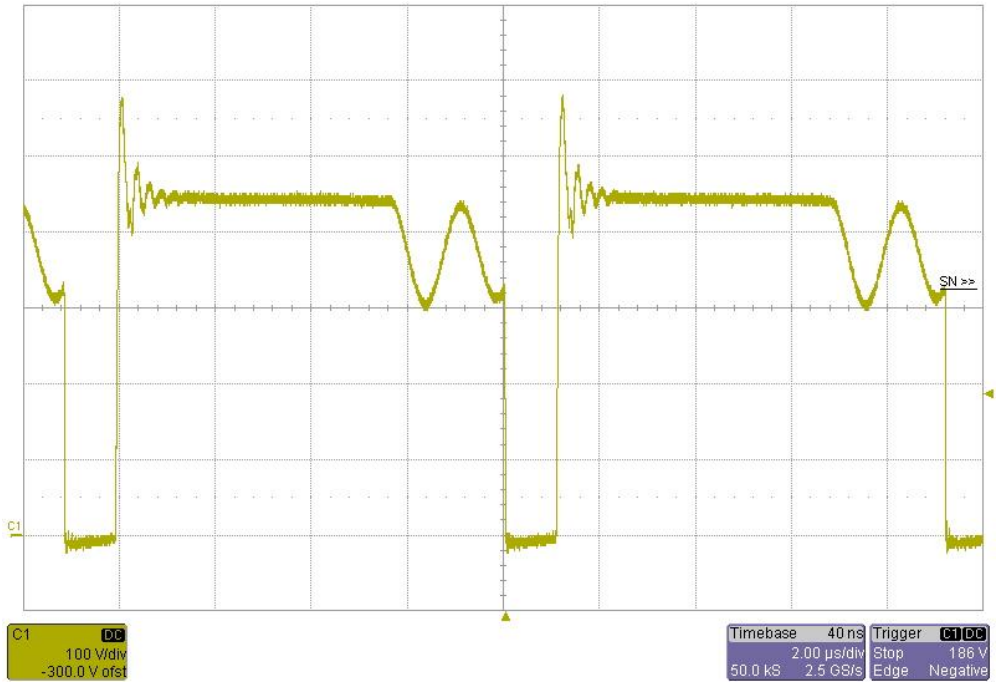
Output power = 30W
Input voltage = 120VDC
Phase margin = 68°
Bandwidth = 1.0kHz

Output power = 30W
Input voltage = 325VDC
Phase margin = 53°
Bandwidth = 2.0kHz

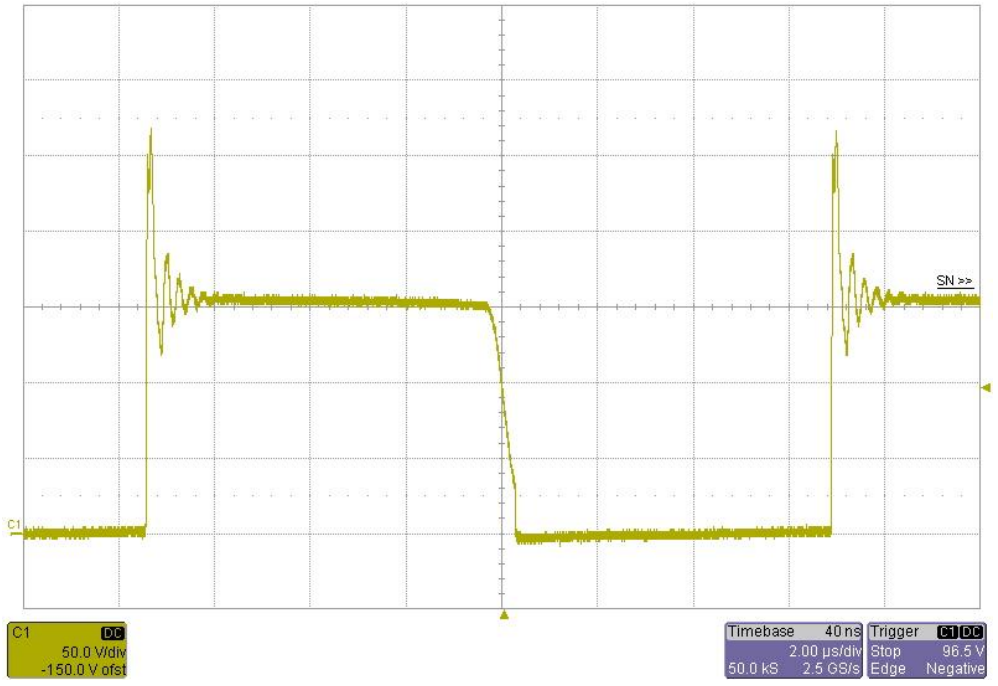
Output power = 30W
Input voltage = 390VDC
Phase margin = 70°
Bandwidth = 1.2kHz

6 Switch Node

Input voltage = 390VDC
Load current 12Vout = 2.5A
Load current 8.5Vout = 0.05A

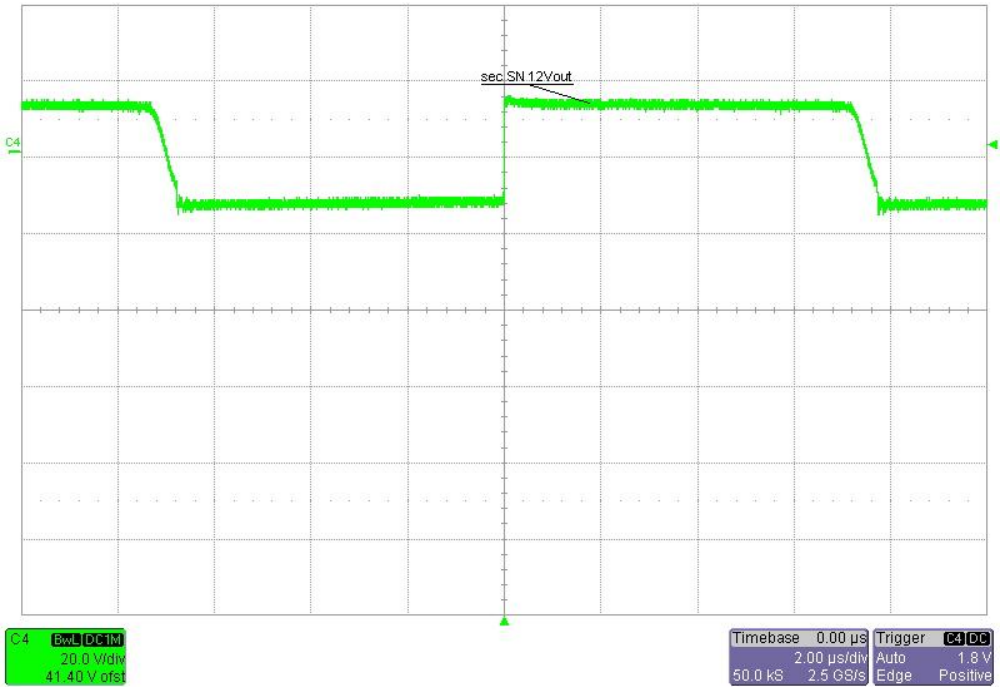


Input voltage = 85VDC
Load current 12Vout = 2.5A
Load current 8.5Vout = 0.05A

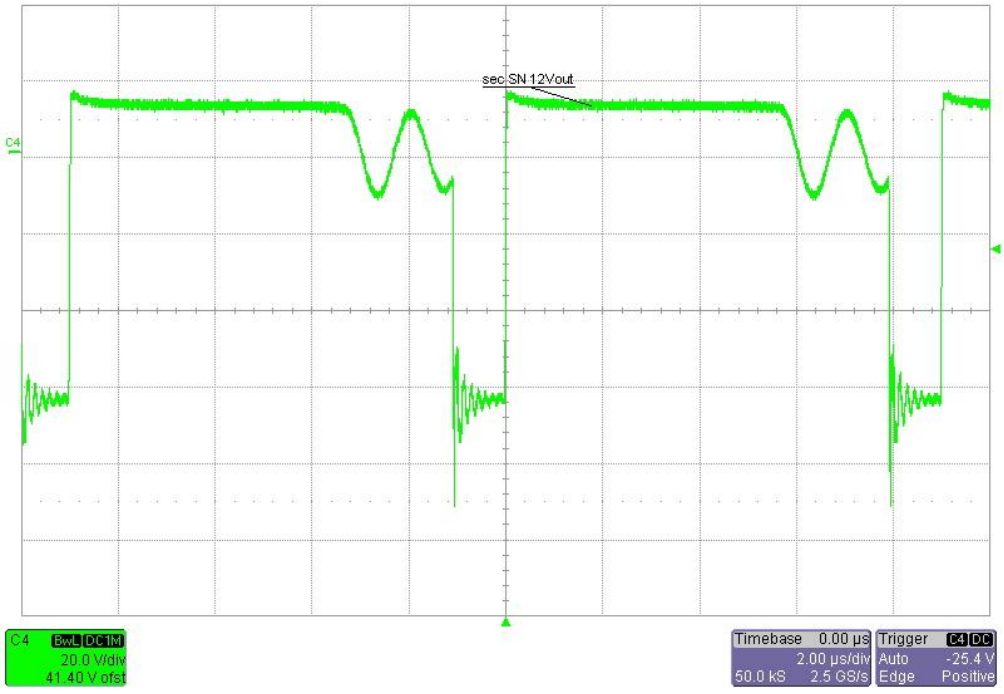


7 Switch Node secondary side (12Vout)

Input voltage = 85VDC
Load current 12Vout = 2.5A

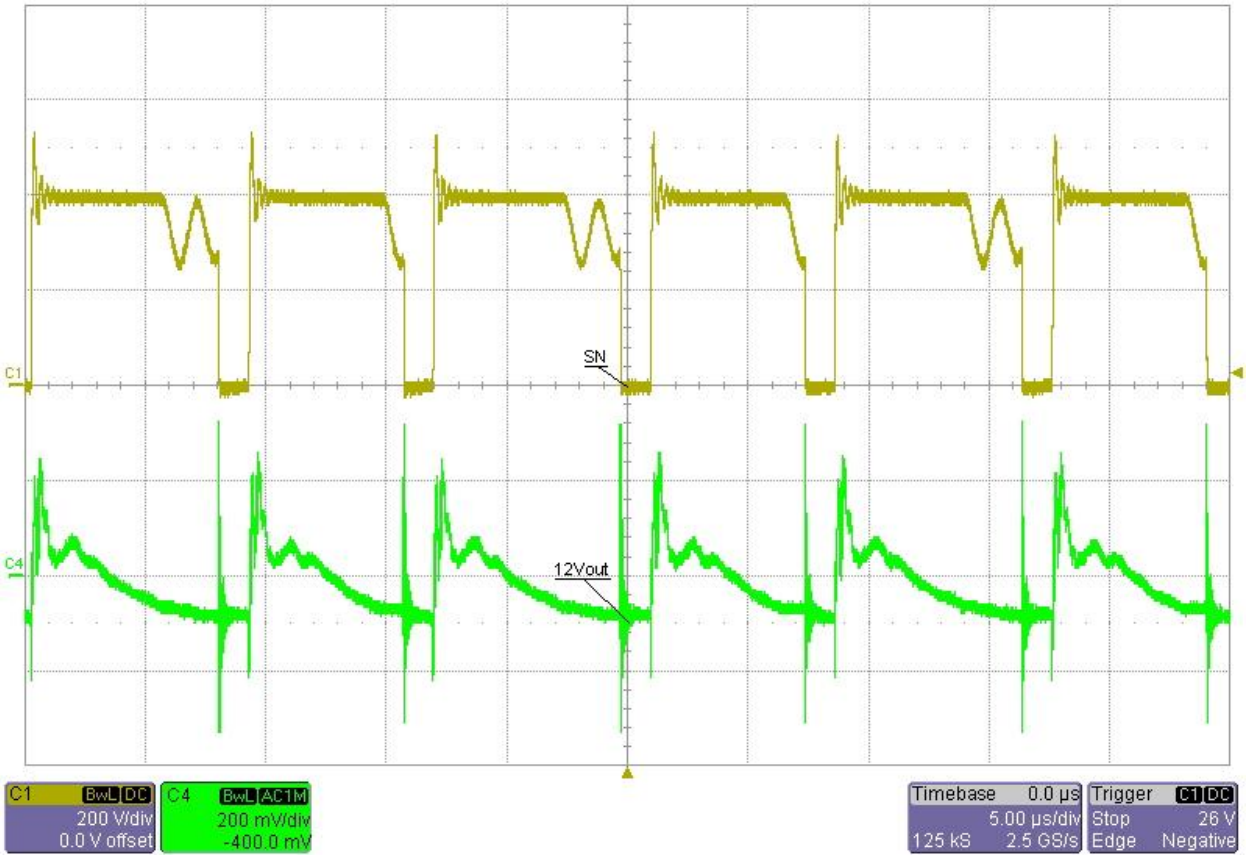


Input voltage = 390VDC
Load current 12Vout = 2.5A



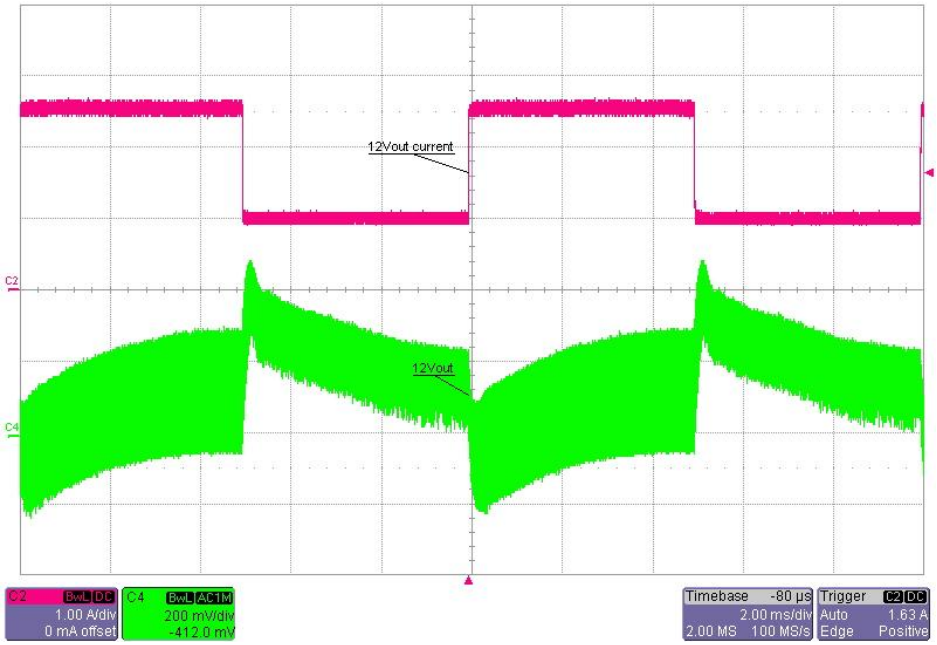
8 Output ripple voltage (12Vout)

Input voltage = 230VAC
Load current 12Vout = 2.5A
Load current 8.5Vout = 0.05A

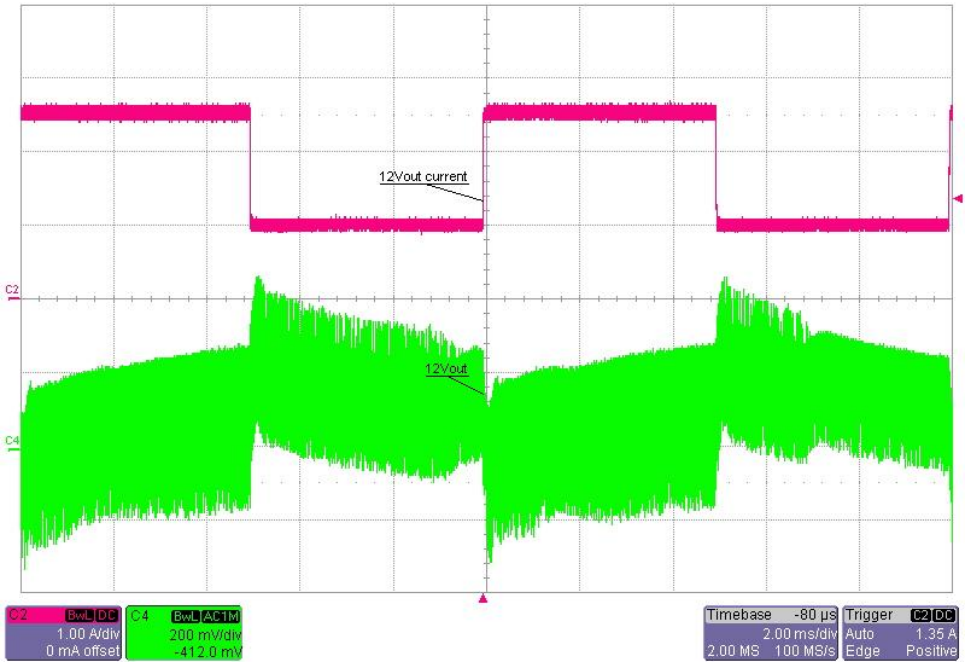


9 Load Transients (12Vout)

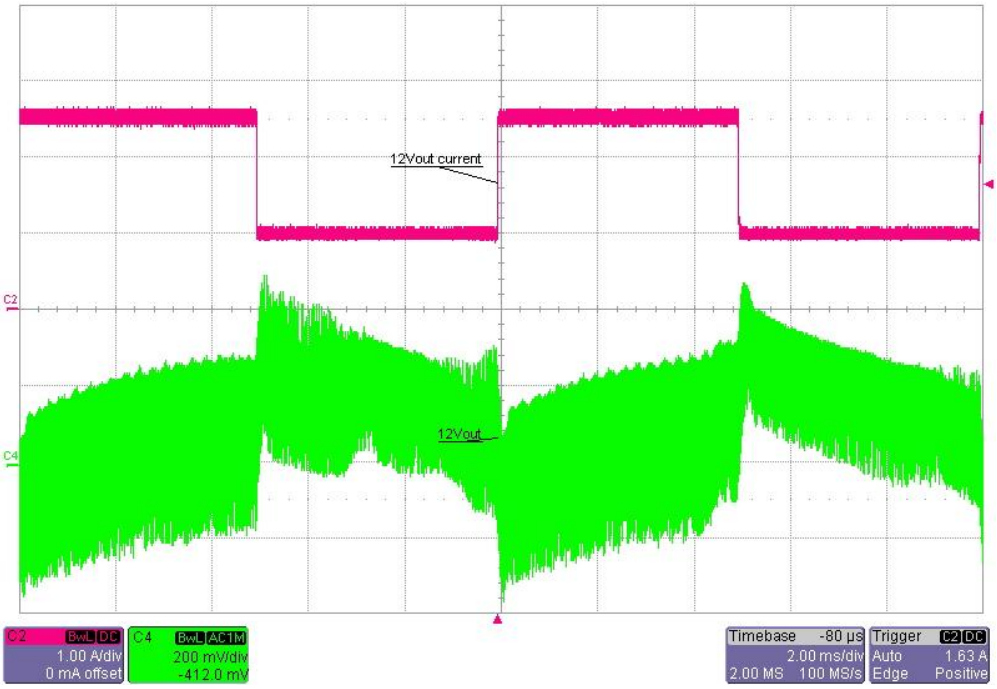
Input voltage = 85VAC
Load current 12Vout = 1Ato2.5A



Input voltage = 230VAC
Load current 12Vout = 1Ato2.5A



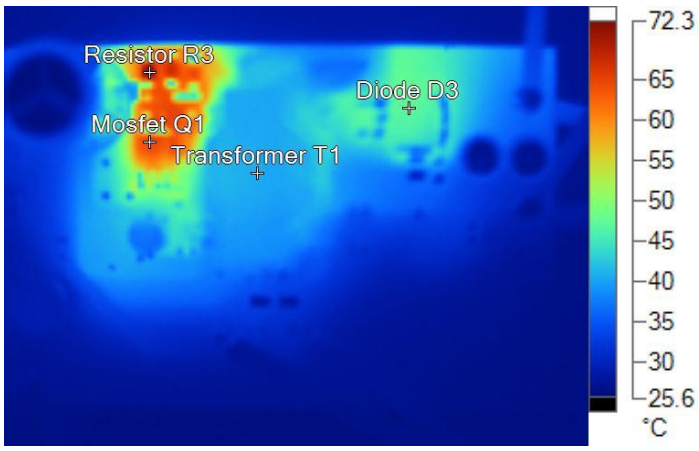
Input voltage = 265VAC
Load current 12Vout = 1Ato2.5A



10 Thermal Analysis

The images below show the infrared images taken from the FlexCam after 15min at 18.5W output power.

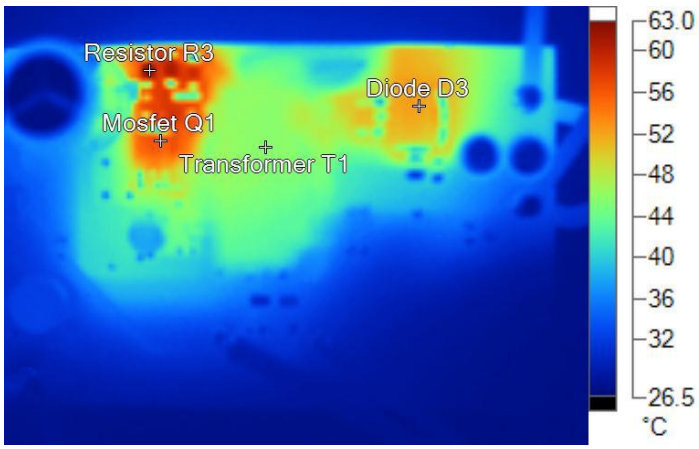
Input voltage = 230VAC
Output power = 18.5W
Ambient temperature = 25°C
No heatsink, no airflow



Name	Temperature	
Mosfet Q1	64.6°C	
Resistor R3	72.3°C	
Transformer T1	40.8°C	
Diode D3	47.1°C	

IR20150409_0555 Vin=230VAC 8.5V@50mA 12V@1.5A.is2

Input voltage = 120VAC
Output power = 18.5W
Ambient temperature = 25°C
No heatsink, no airflow

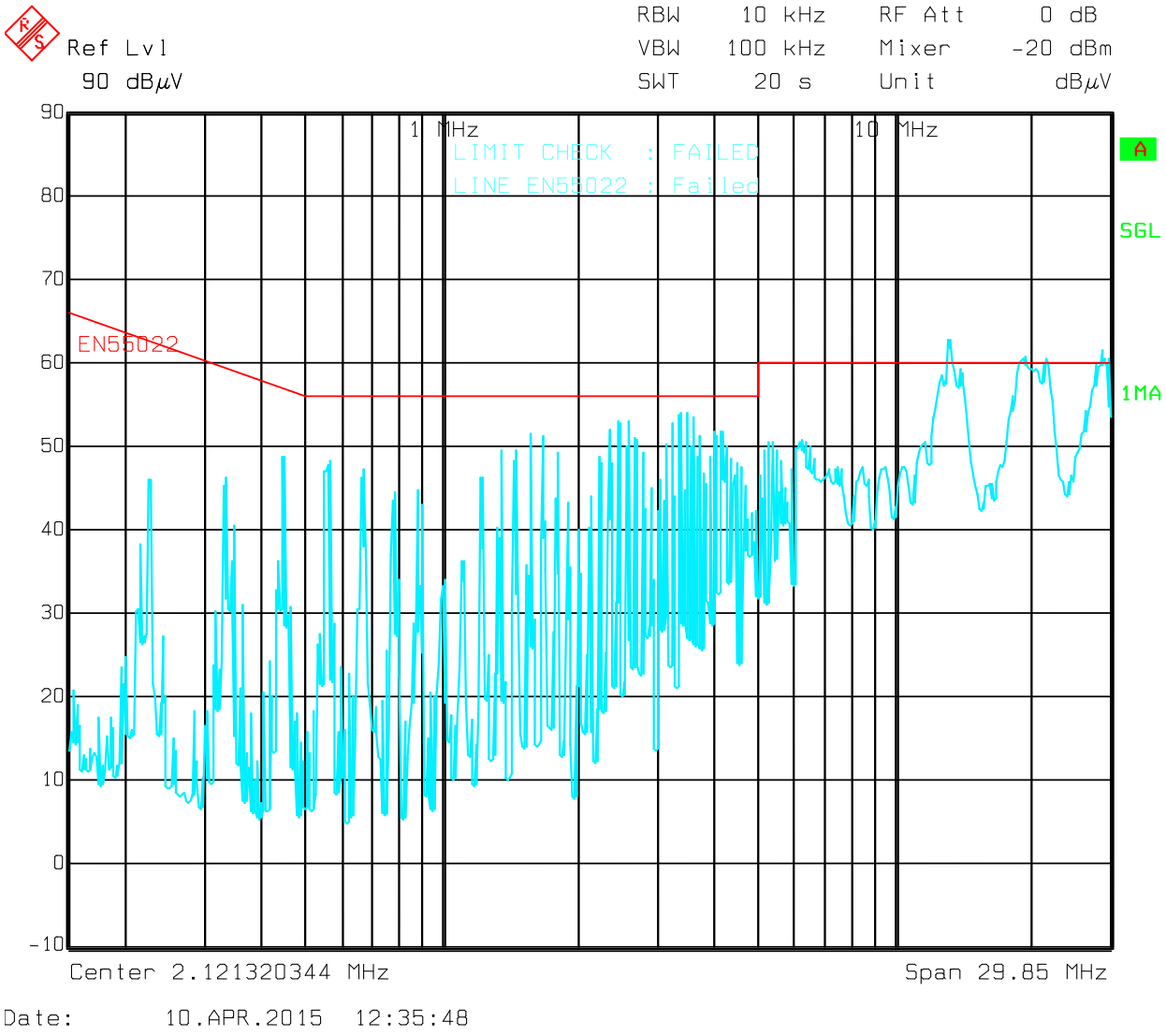


Name	Temperature	
Mosfet Q1	56.1°C	
Resistor R3	63.0°C	
Transformer T1	45.8°C	
Diode D3	52.1°C	

IR20150409_0558 Vin=120VAC 8V@50mA 12V@1.5A.is2

11 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; the load was a power resistor (12V@1.5A), while the input voltage was 230Vac. The resistor R1 was not populated. 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.



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