TEXAS INSTRUMENTS INCORPORATED

PMP20026 Rev A

Power Design Services Test Report

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PMP20026 Rev A Test Results

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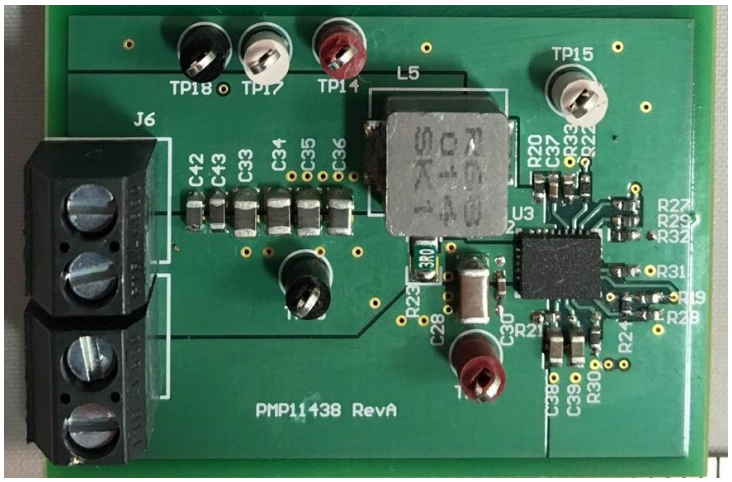
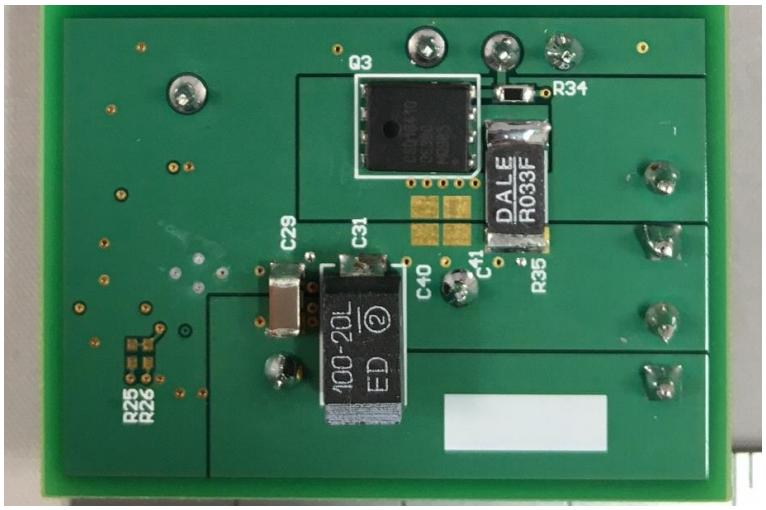
1 PMP20026 REVA 1.2V/6A – TPS53515

1.1 Board Photos

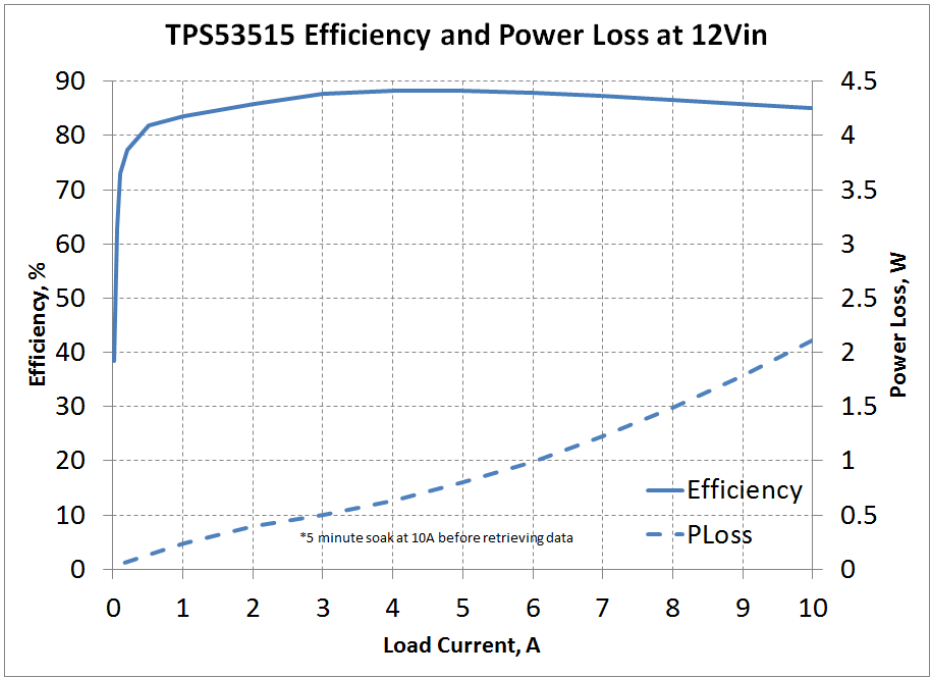
The top and bottom images of PMP20026 TPS53515 are shown below.





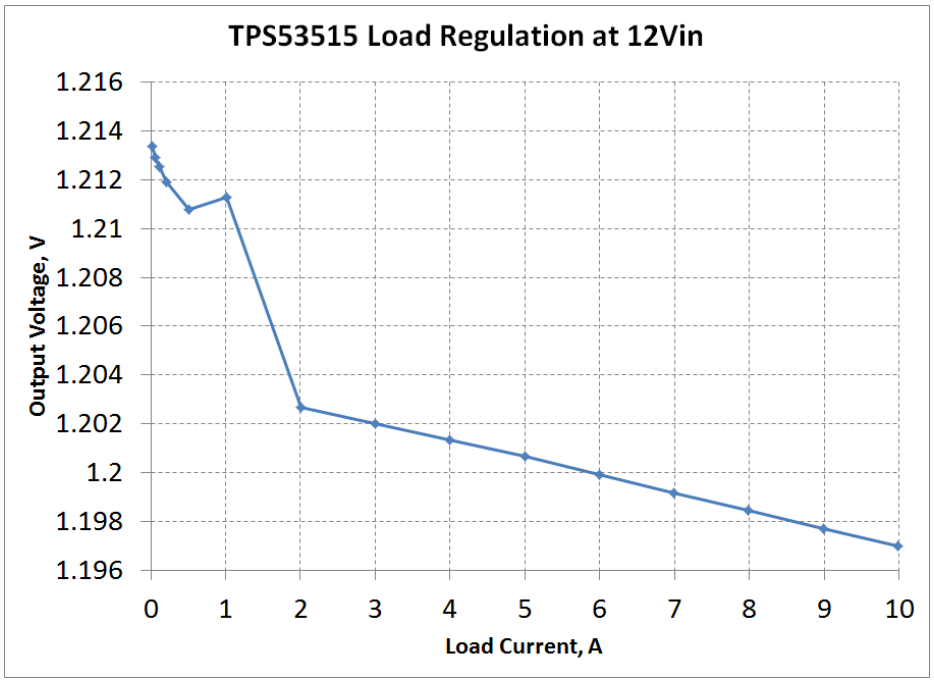
1.2 Efficiency and Power Loss

The efficiency and power loss of the power supply is shown below at 12Vin with natural convection.



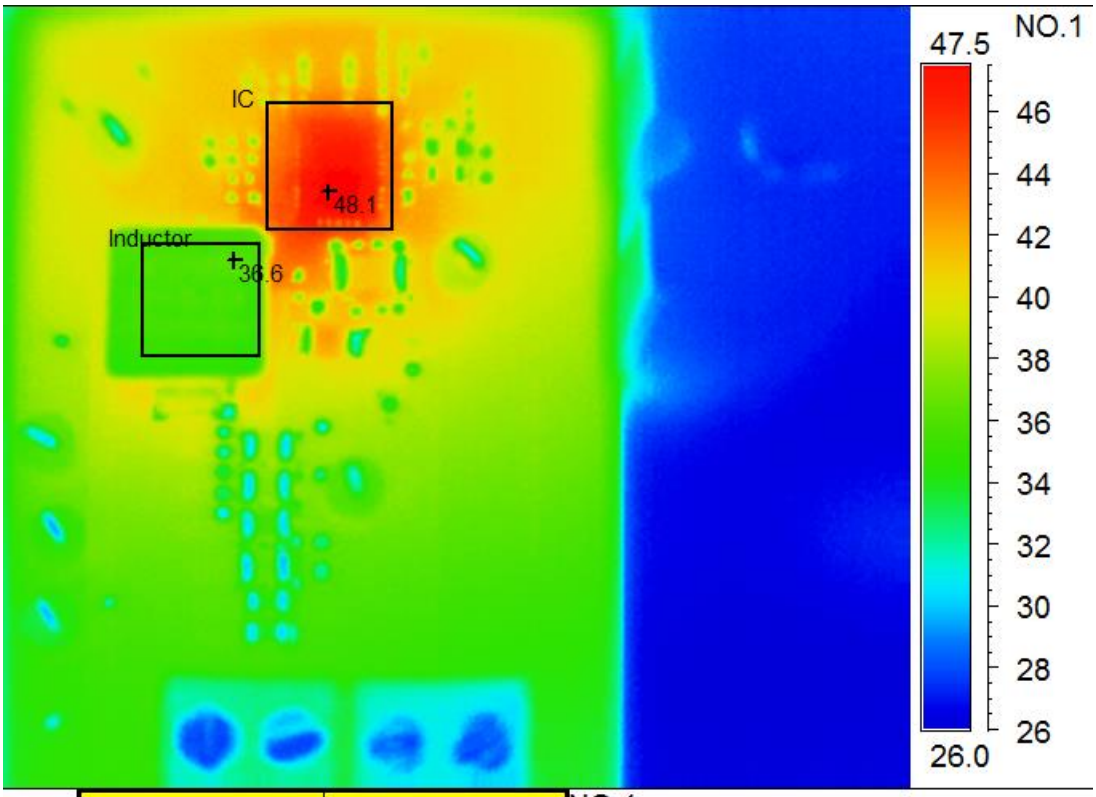
1.3 Load Regulation

The load regulation of the power supply is shown below at 12Vin.



1.4 Thermal

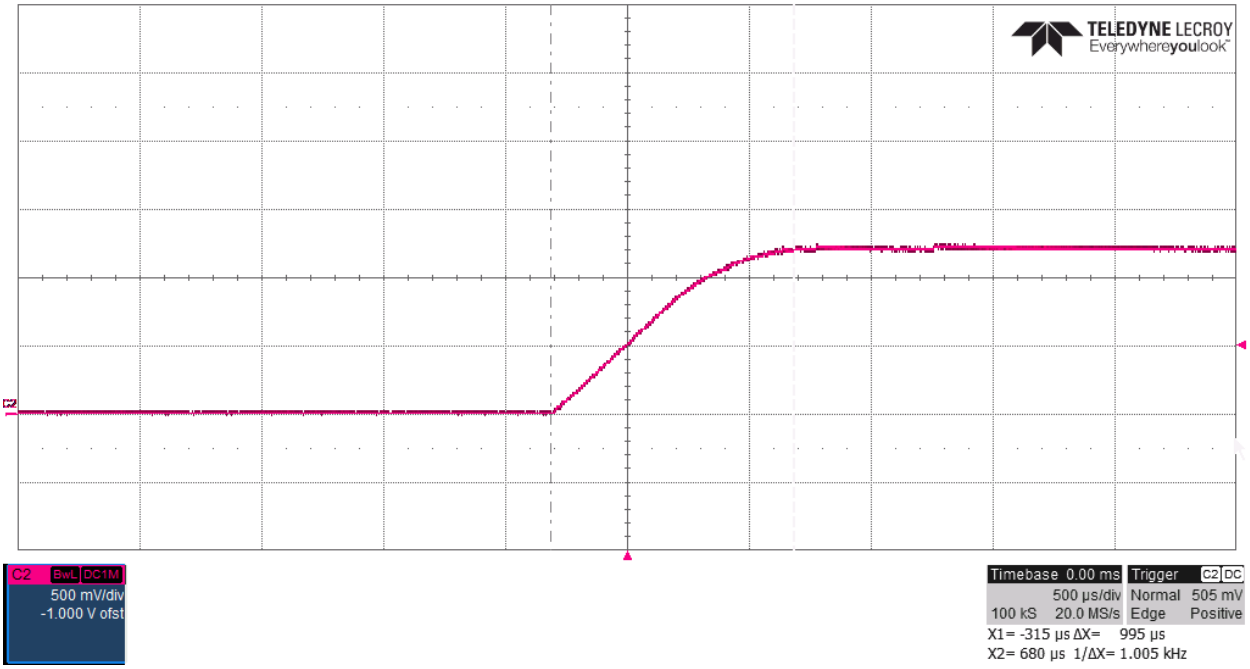
The thermal image of the power supply is shown at room temperature with 12Vin, 6Aout, and natural convection. The power supply soaked for 10min at 6A before the measurement was taken. The IC, which has integrated MOSFETs, is one of the hottest components at 48.1°C.



Area analysis	Value
Inductor Max	36.6°C
IC Max	48.1°C

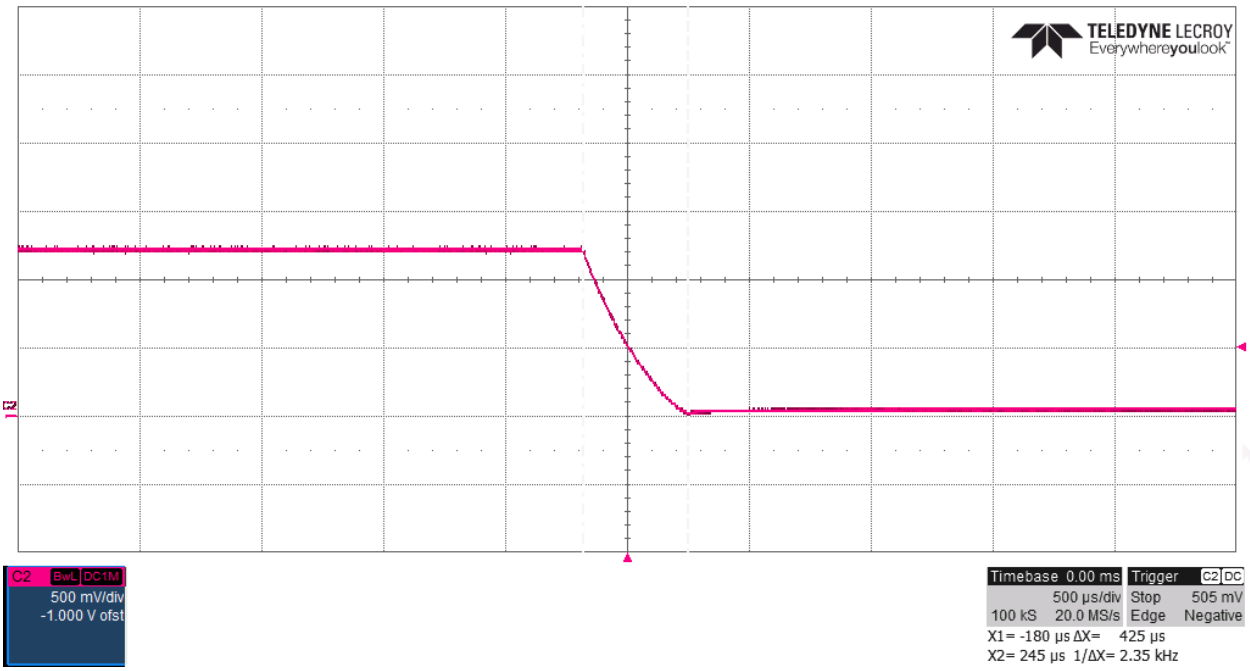
1.5 Startup

The power supply startup at 0A is shown below. The startup time is 750µs.



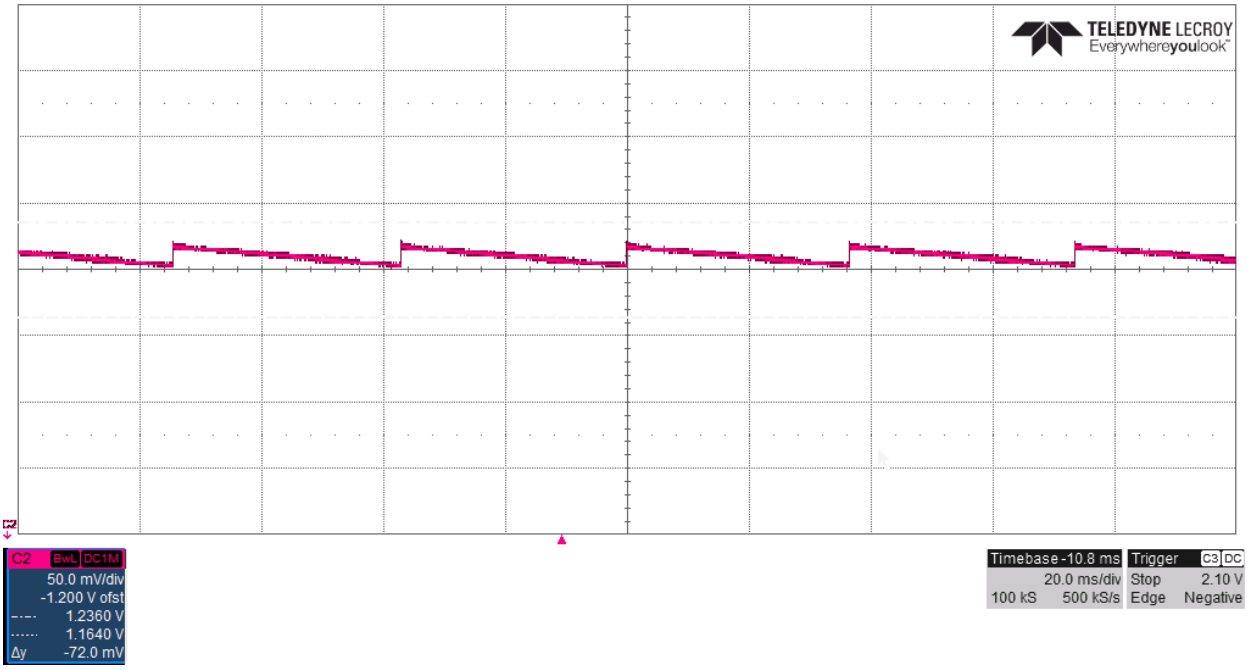
1.6 Shutdown

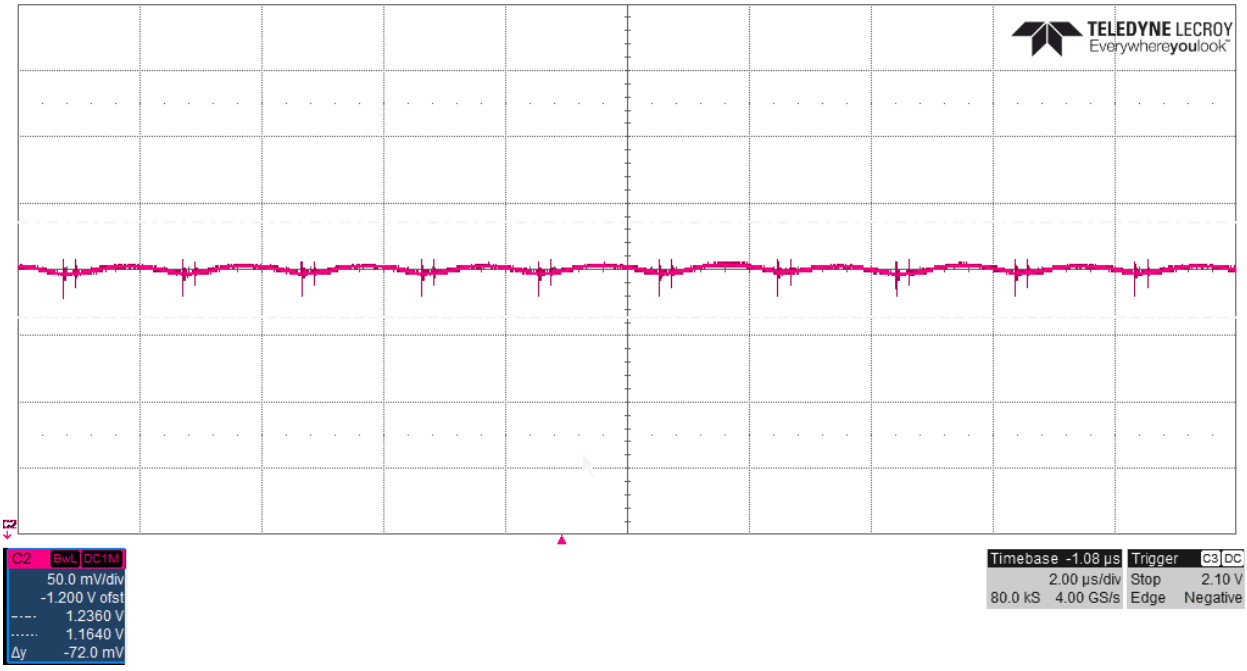
The shutdown of the power supply with 1.2Ω constant-resistance load is shown below.



1.7 Output Ripple

The 1.2V output ripple is shown in red below, DC coupled with offset, for 0A, 6A and 10A, respectively.





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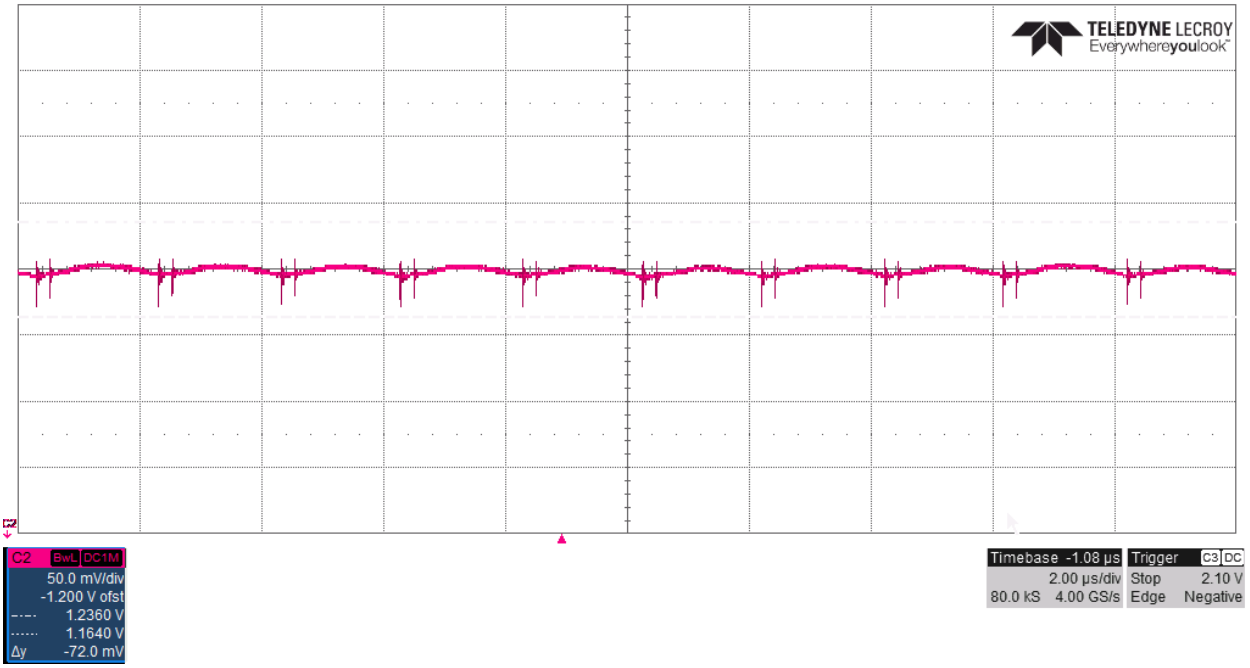
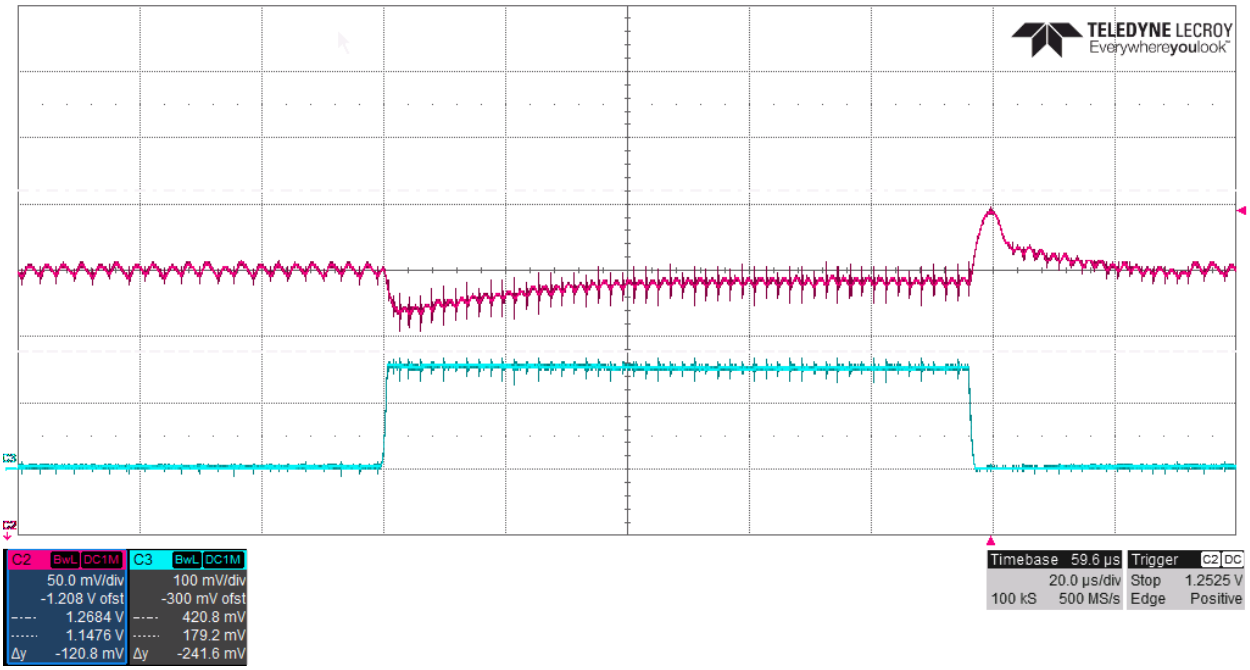


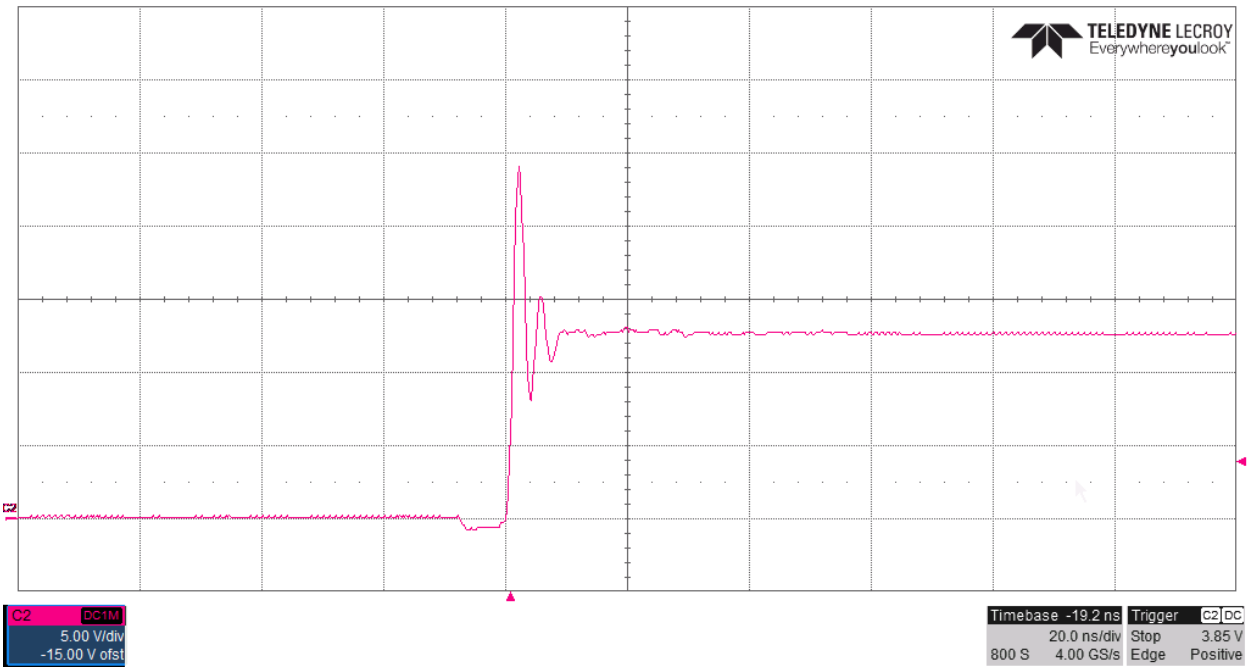
1.8 Transient response

The transient response is shown in the plot below where the red trace is the DC offset output voltage. The current step is 1A-6A-1A at 5A/us slew rate.



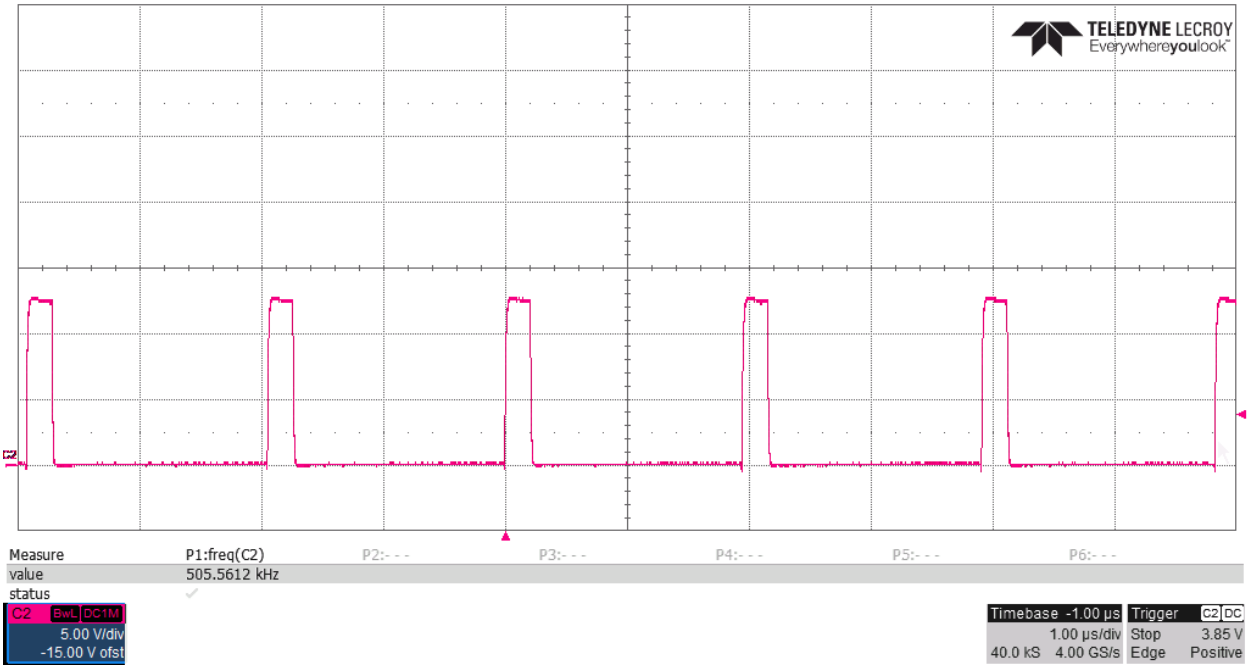
1.9 Synchronous Rectifier Stress

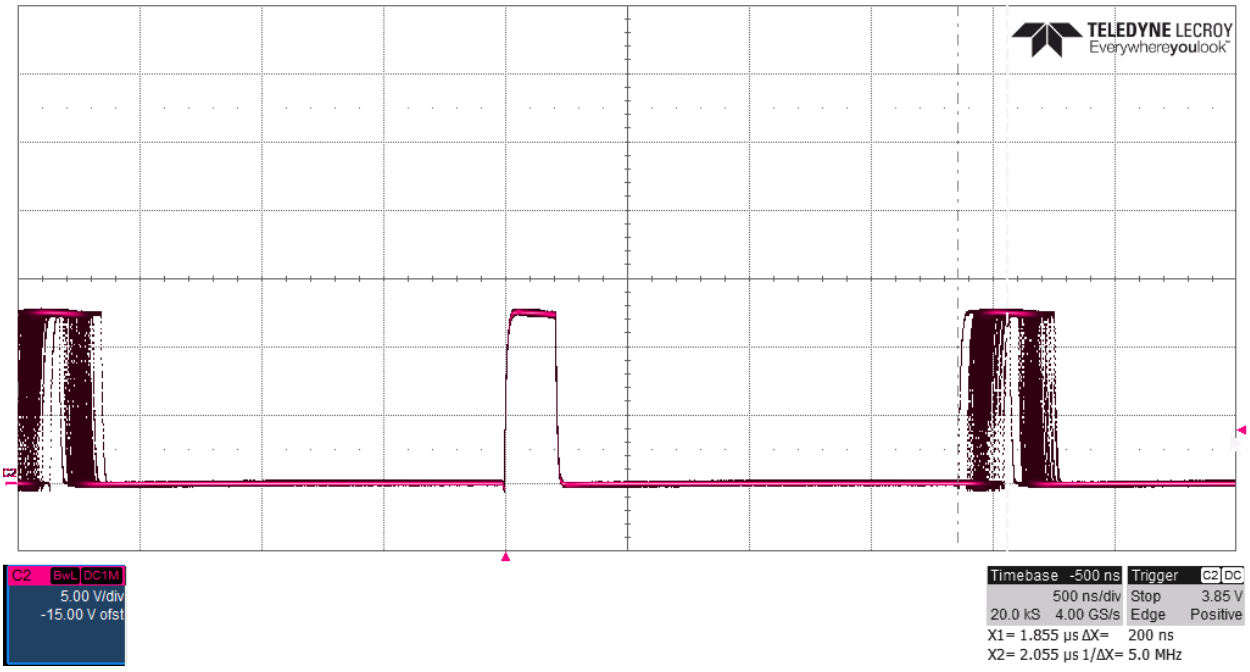
The voltage stresses on the synchronous MOSFETs are shown below. The image is taken at 12Vin and 6A with 200MHz of bandwidth limit.



1.10 Frequency Characteristics

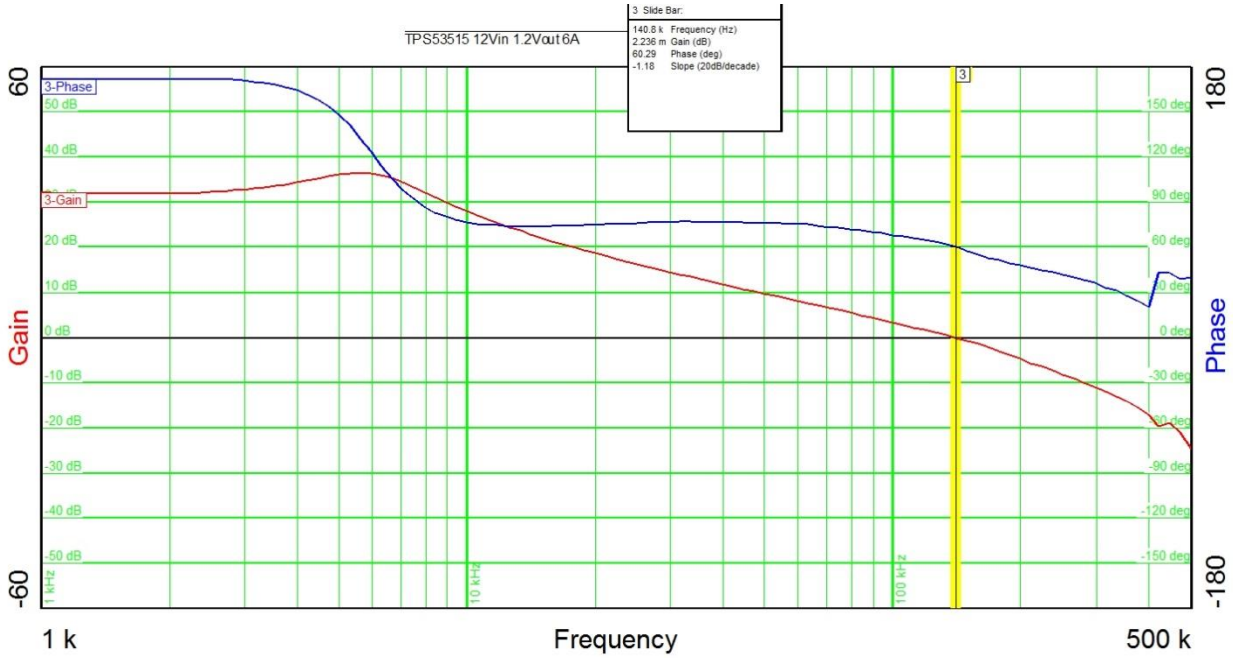
The switch node is shown below in red and measured on the inductor. The first image illustrates the power supply switching frequency of ~500kHz per phase. The second image shows ~200ns of frequency jitter. Both images are taken with 12Vin and 6Aout.





1.11 Loop Response

The loop response of the power supply at 12Vin and 6A load current is shown below. The bandwidth is 140kHz with ~60° of phase margin.



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