Test Data
For PMP9393
4/4/2014

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1. Design Specifications

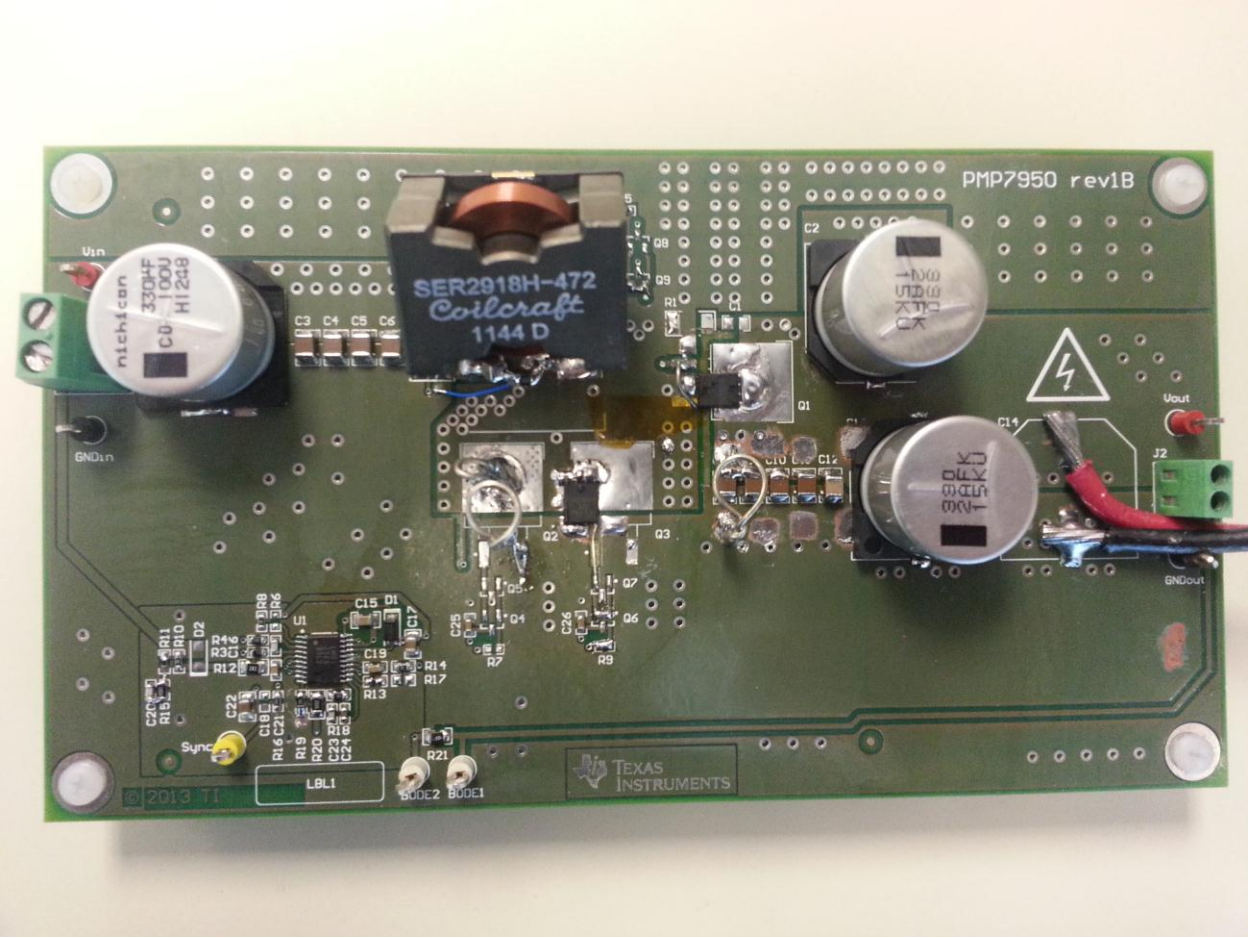
Vin Minimum	**18VDC**
Vin Maximum	**20VDC**
Vout	**48VDC**
Iout	**3A Max.**
Approximate Switching Frequency	**250KHz**

2. Circuit Description

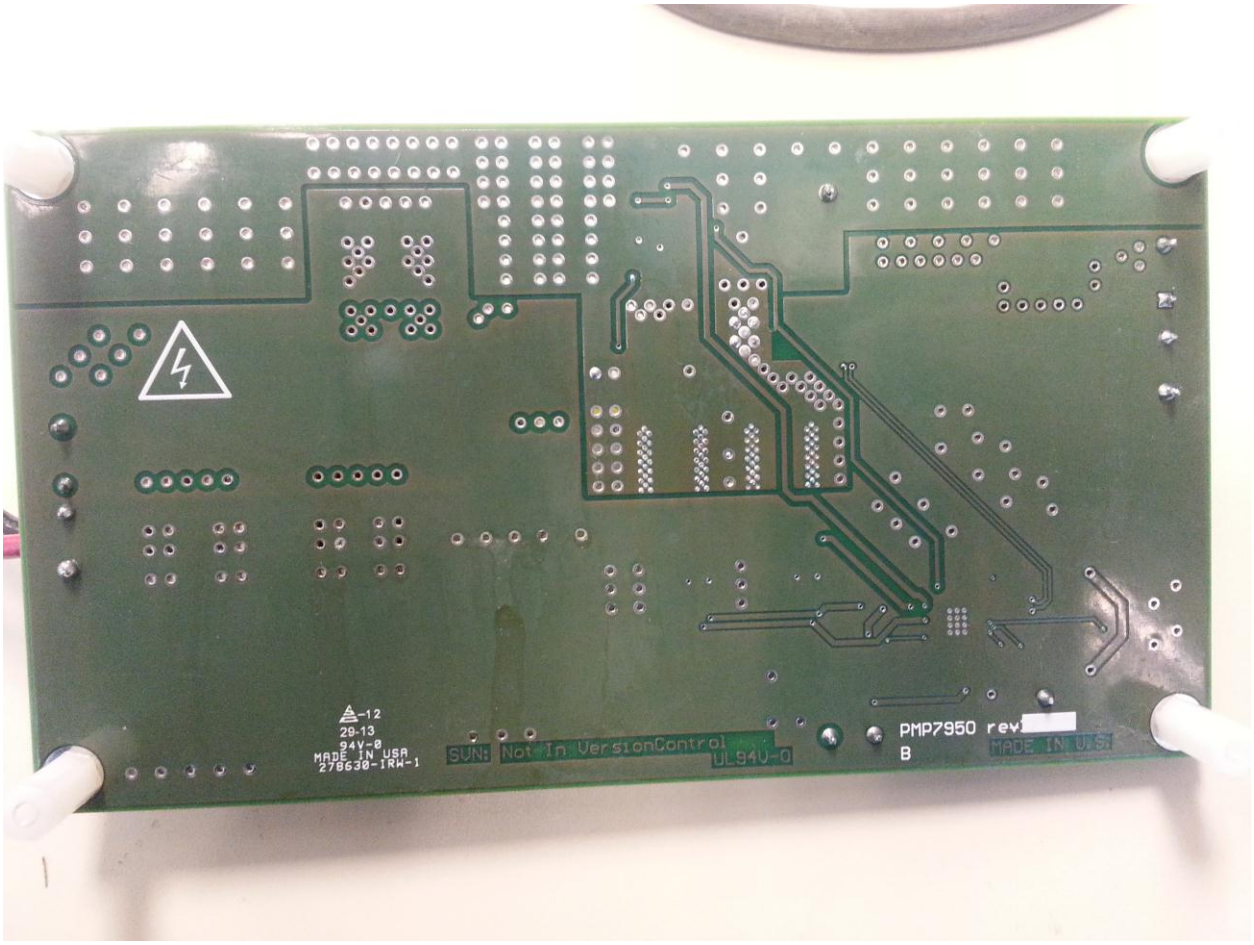
PMP9393 is a Single-Phase Synchronous Boost Converter which accepts an input voltage of 18Vin to 20Vin and provides an output of 48Vout capable of supplying a maximum of 3A of current to the load. This design was built on the PMP7950 REV1B PCB (4-layered board; 2 oz. Copper on Top and Bottom layers, 1 oz. Copper on two inner layers). The design uses an LM5122 Synchronous Boost controller and CSD18531Q5A FETs. All tests in this report were performed at 18Vin and 20Vin.

3. PMP9393 Board Photos

Board Dimensions: 6.3” x 3.5”

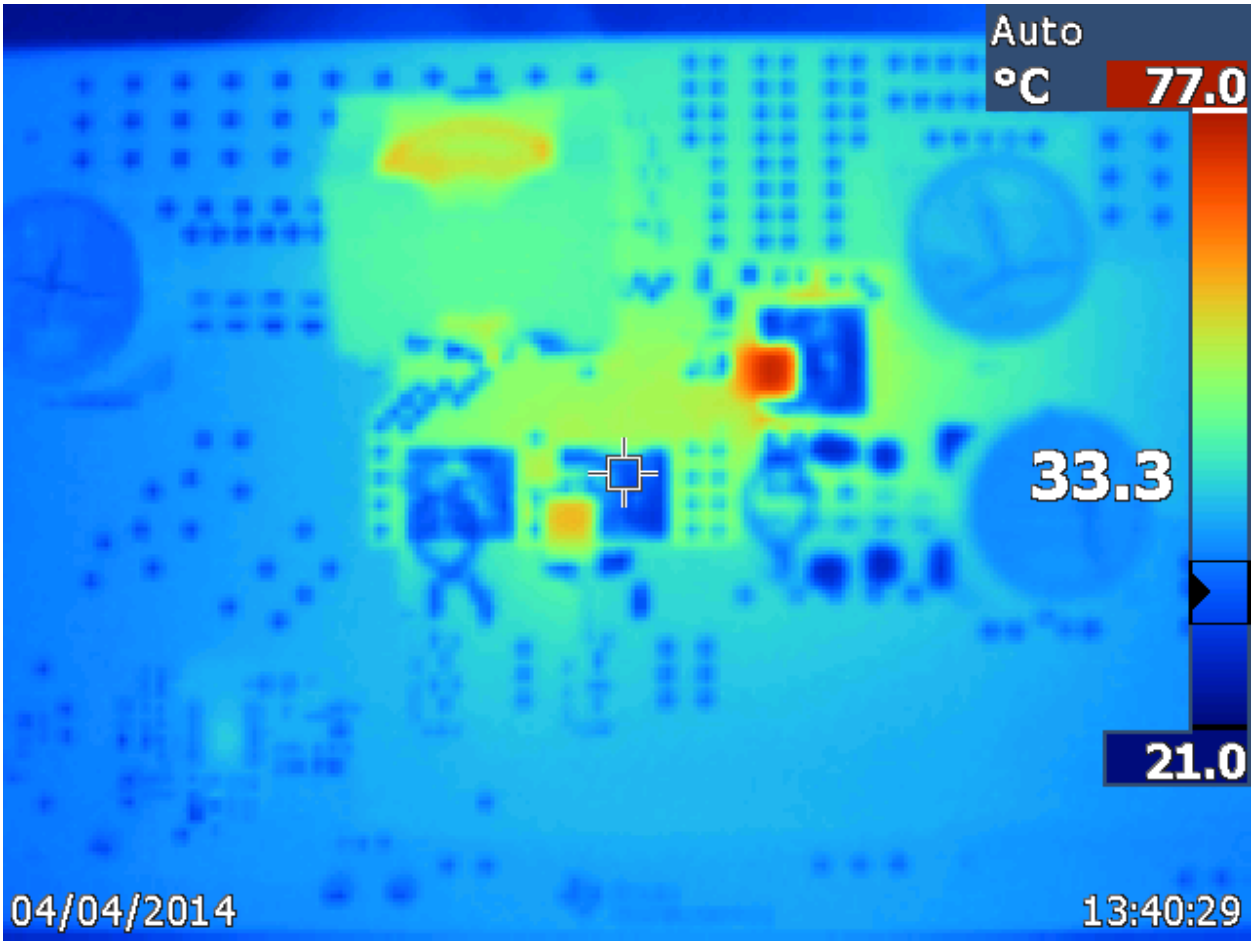


Board Photo (Top)

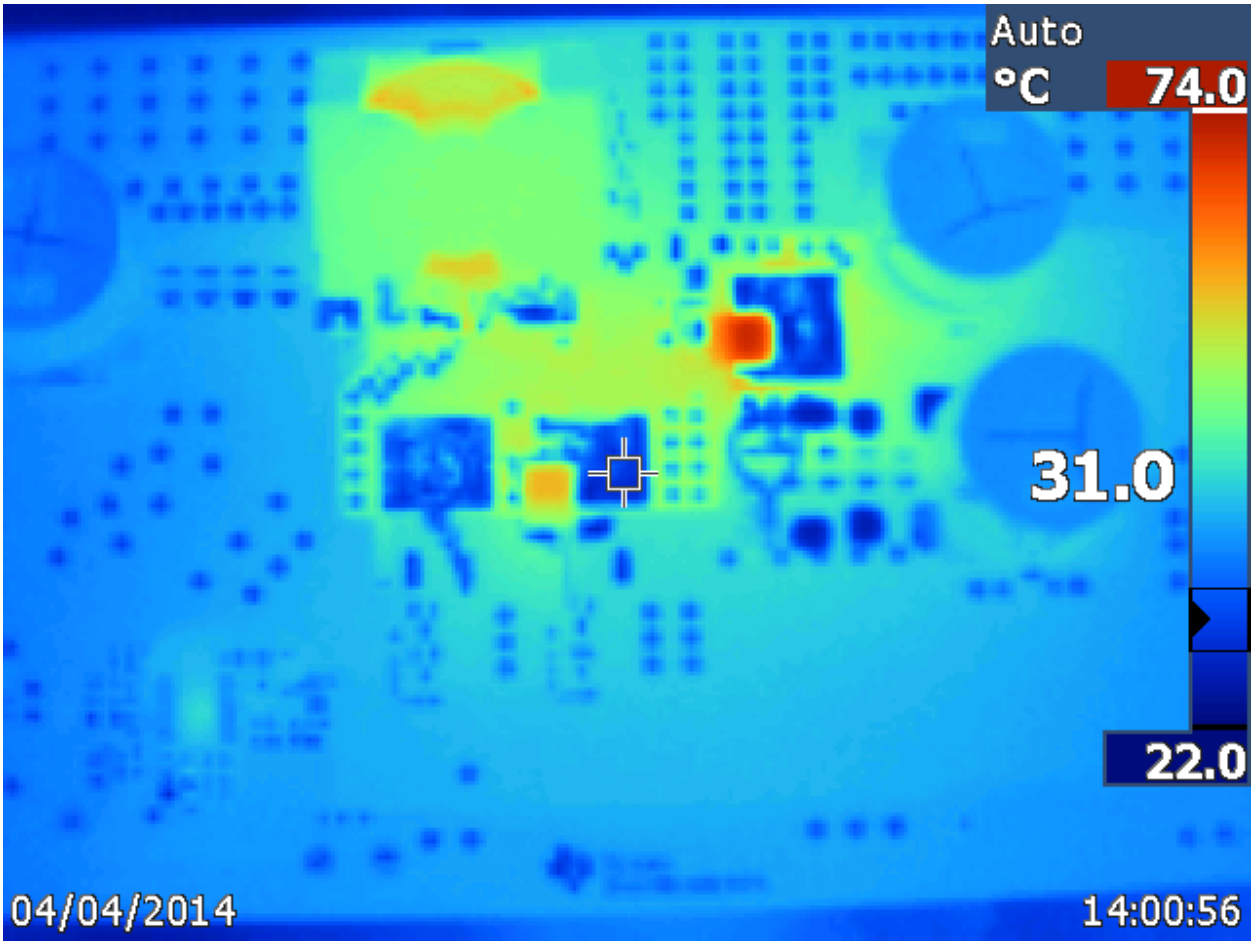


Board Photo (Bottom)

4. Thermal Data



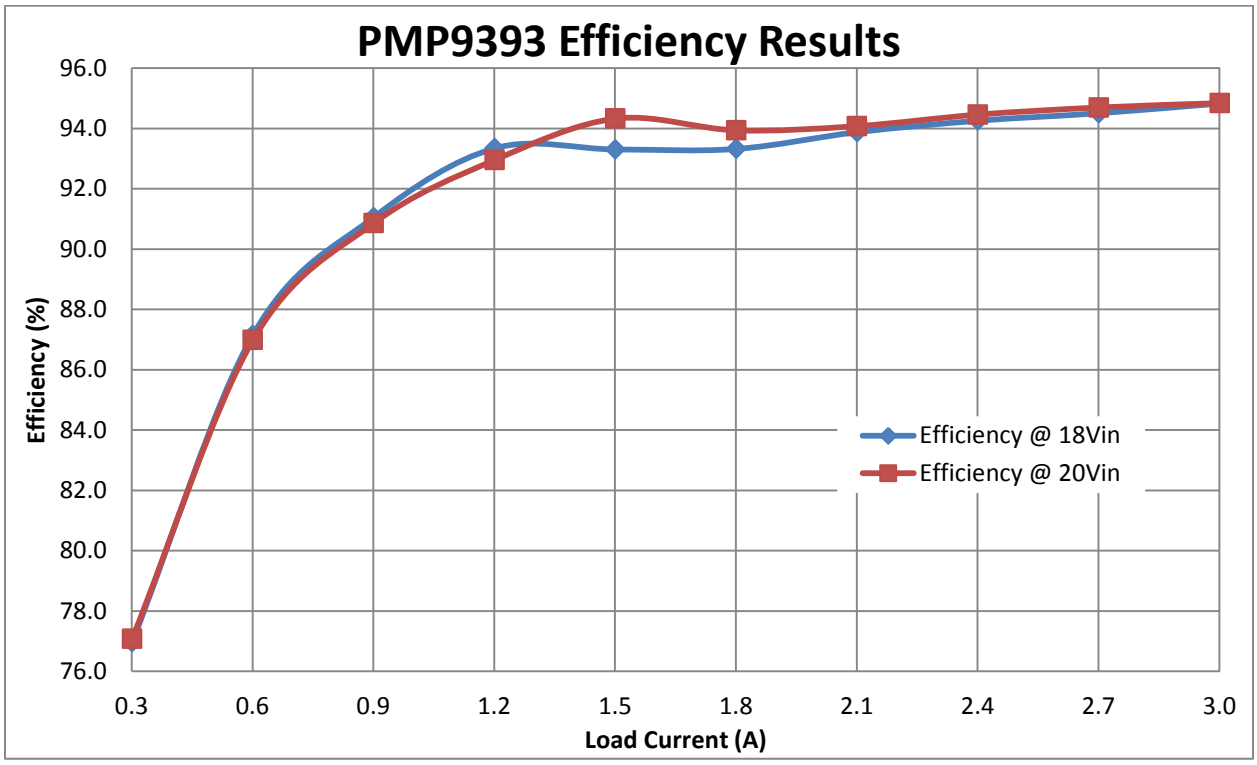
IR thermal image taken at steady state with 18Vin and 3A load (no airflow)



IR thermal image taken at steady state with 20Vin and 3A load (no airflow)

5. Efficiency

5.1 Efficiency Chart



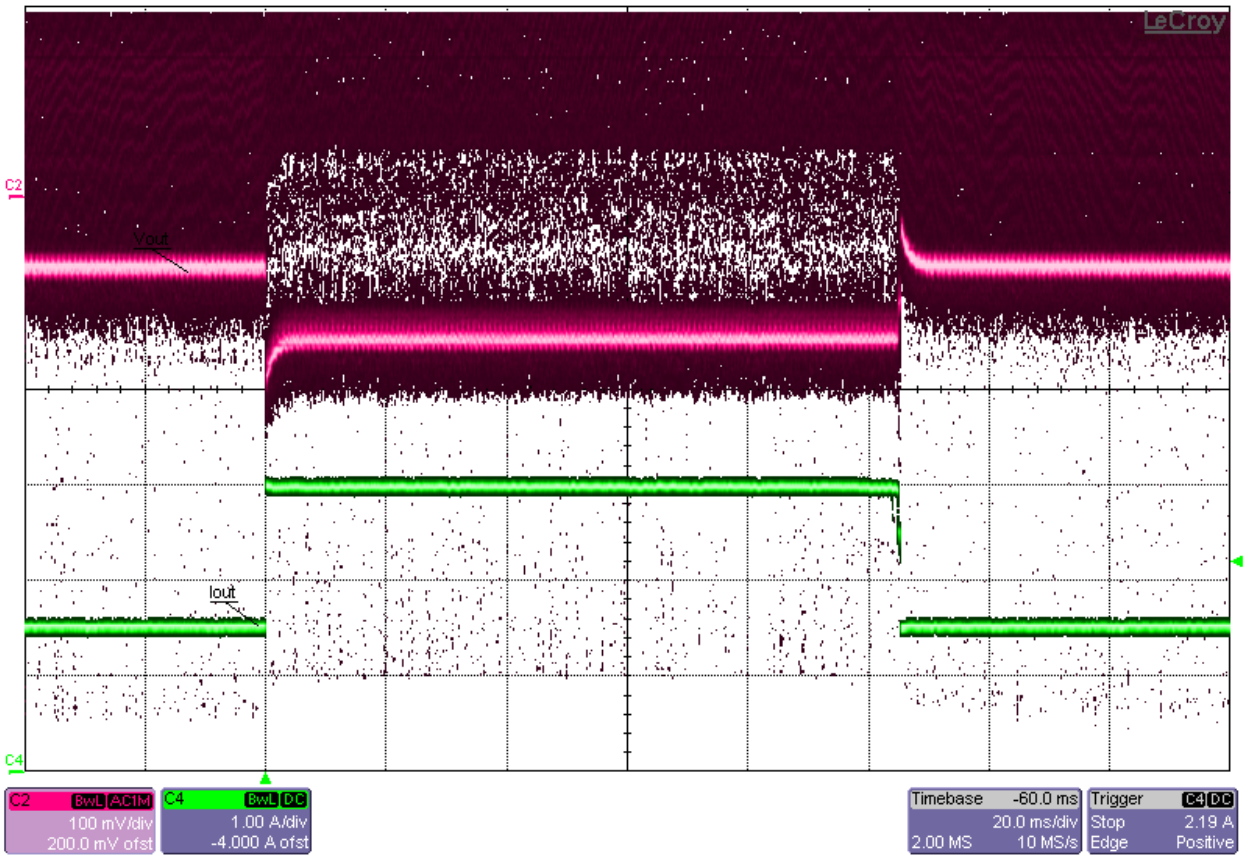
5.2 Efficiency Data

Vin (V)	Iin (A)	Vout (V)	Iout (A)	Pin (W)	Pout (W)	Efficiency (%)
17.992	1.04	48.002	0.3	18.71168	14.4006	77.0
17.992	1.837	48.001	0.6001	33.0513	28.8054	87.2
17.992	2.638	48	0.9004	47.4629	43.2192	91.1
17.992	3.43	48	1.2001	61.71256	57.6048	93.3
17.992	4.288	47.997	1.4998	77.1497	71.9859	93.3
17.992	5.145	47.993	1.8	92.56884	86.3874	93.3
17.992	5.968	47.993	2.1004	107.3763	100.8045	93.9
17.992	6.792	47.992	2.4001	122.2017	115.1856	94.3
17.992	7.62	47.992	2.6998	137.099	129.5688	94.5
17.992	8.44	47.991	3.0006	151.8525	144.0018	94.8

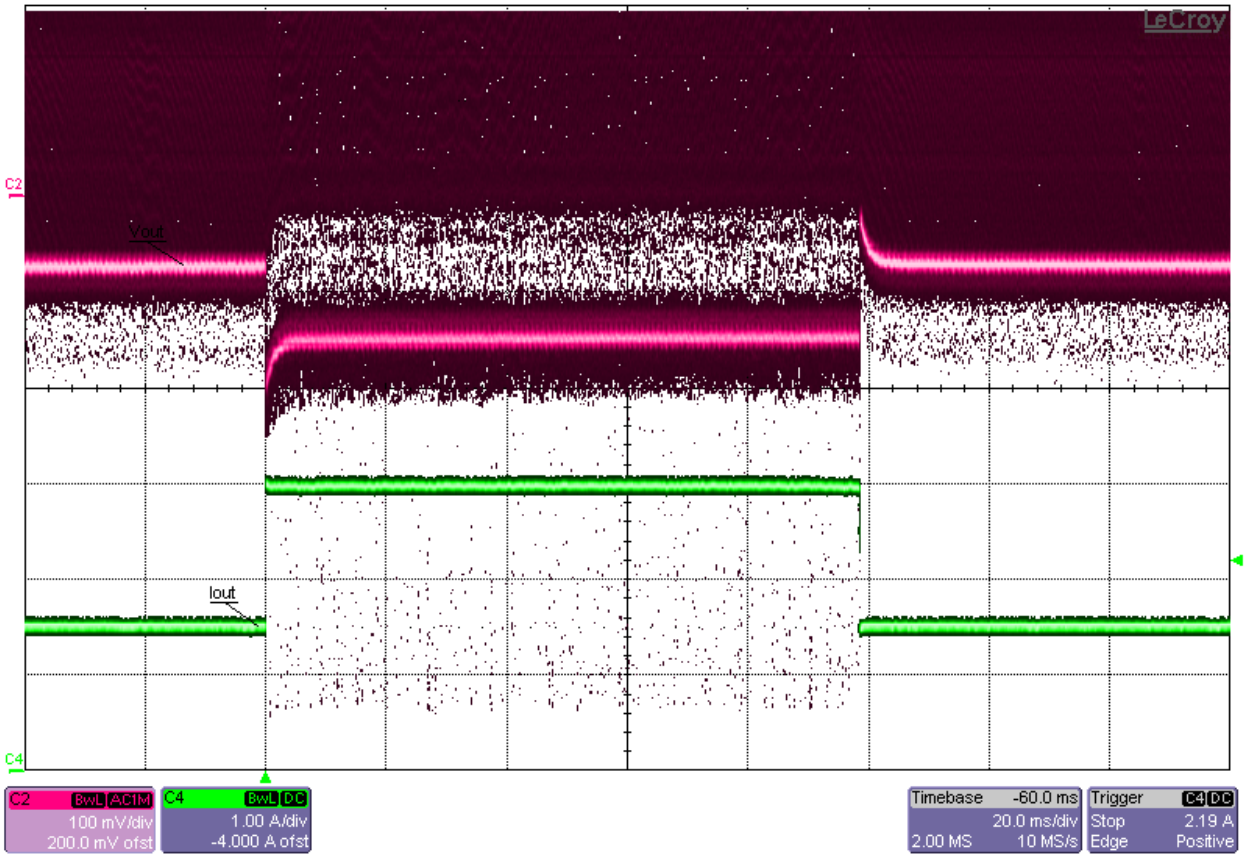
Vin (V)	Iin (A)	Vout (V)	Iout (A)	Pin (W)	Pout (W)	Efficiency (%)
19.992	0.935	47.997	0.3002	18.69252	14.4087	77.1
19.992	1.656	47.997	0.6	33.10675	28.7982	87.0
19.992	2.378	47.997	0.9	47.54098	43.1973	90.9
19.992	3.1	47.997	1.2003	61.9752	57.6108	93.0
19.992	3.818	47.997	1.5001	76.32946	72.0003	94.3
19.992	4.6	47.994	1.8	91.9632	86.3892	93.9
19.992	5.358	47.993	2.0998	107.1171	100.7757	94.1
19.992	6.098	47.993	2.3995	121.9112	115.1592	94.5
19.992	6.846	47.994	2.7005	136.8652	129.6078	94.7
19.992	7.595	47.995	3.0005	151.8392	144.009	94.8

6 Waveforms

6.1 Load Transient Response

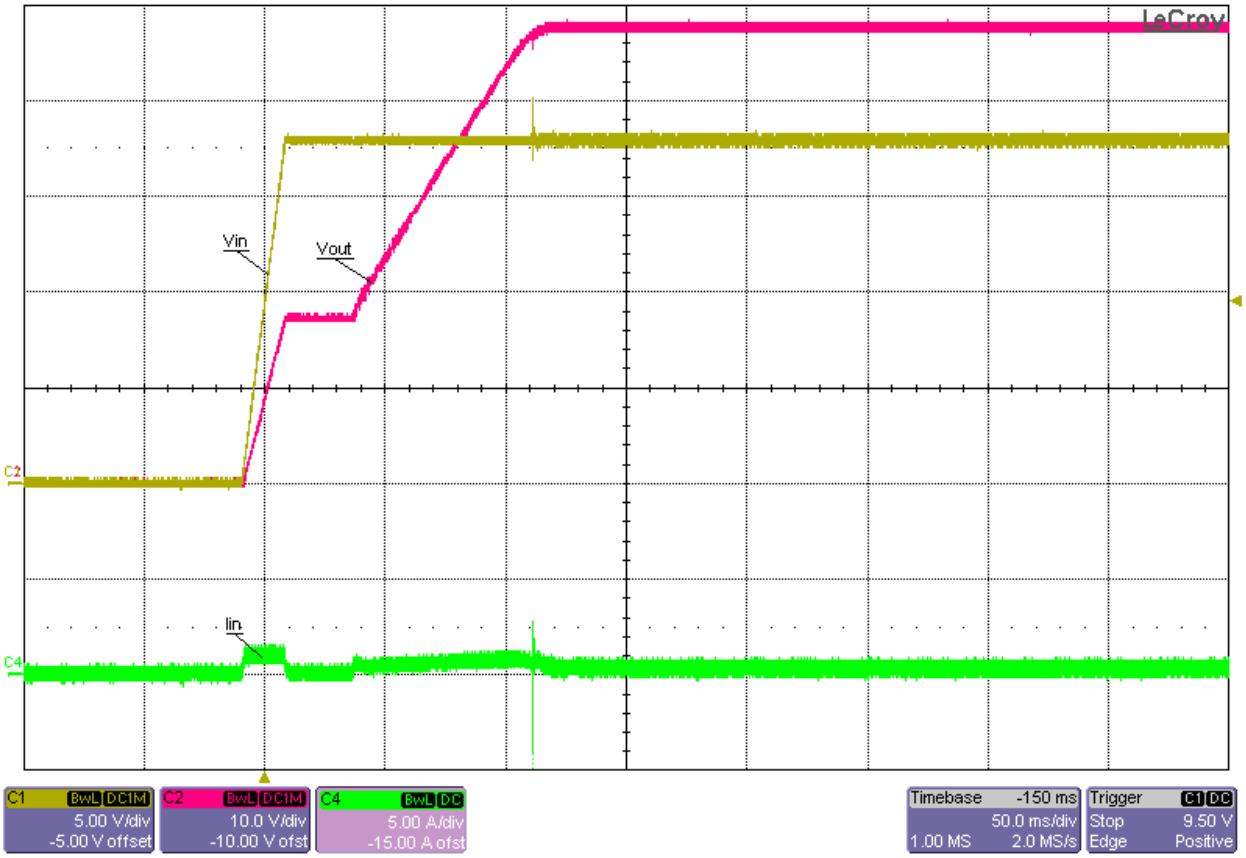


Load Transient Response at 18Vin and 50%-to-100% (1.5A-to-3A) Load Step

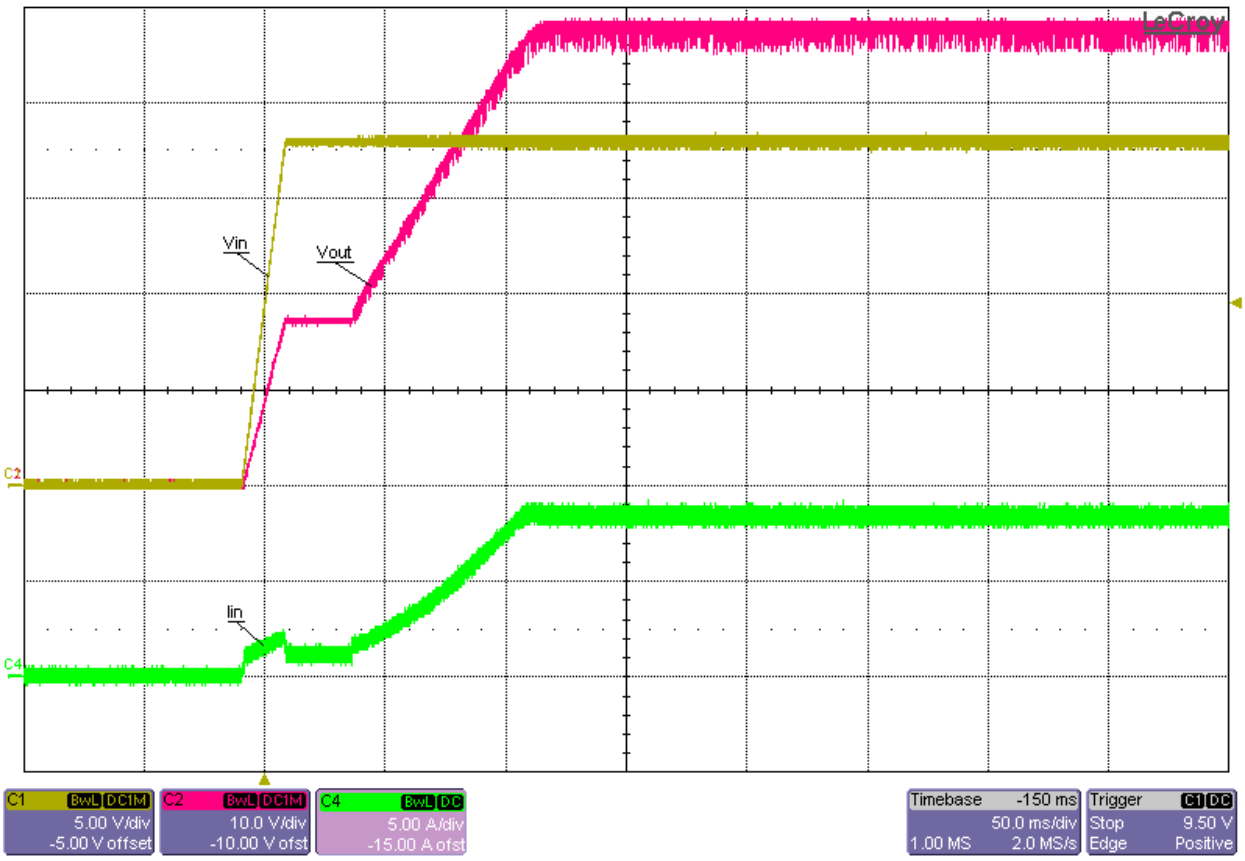


Load Transient Response at 20Vin and 50%-to-100% (1.5A-to-3A) Load Step

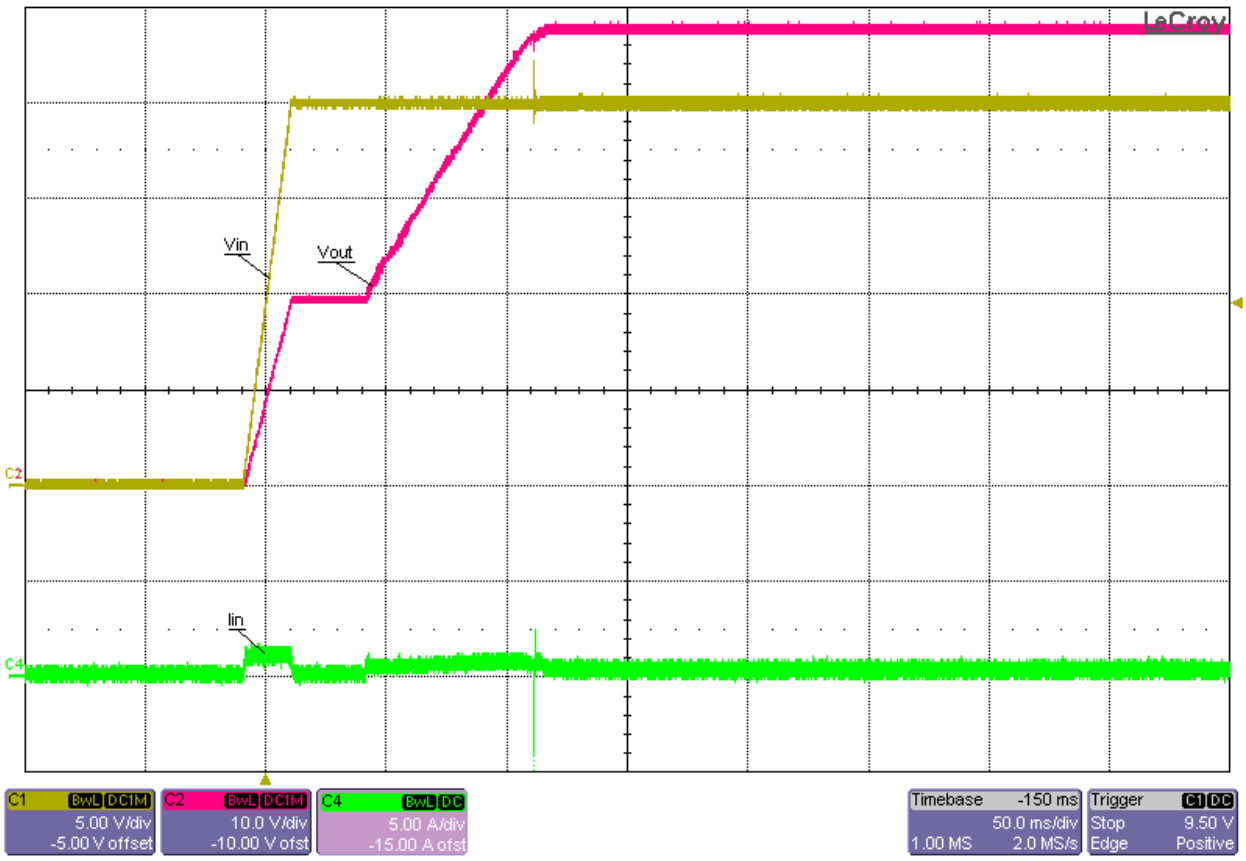
6.2 Startup



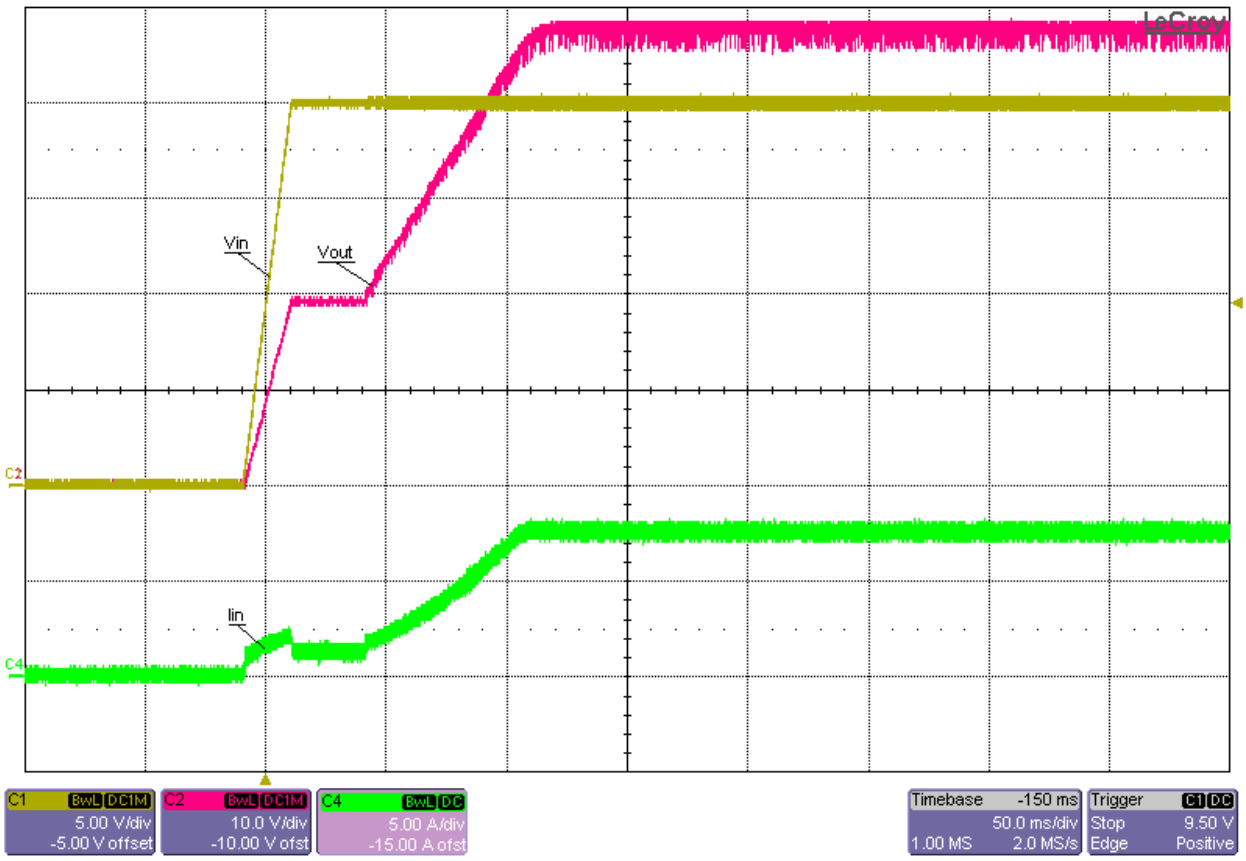
Startup into No Load at 18Vin



Startup into Full (3A) Load at 18Vin

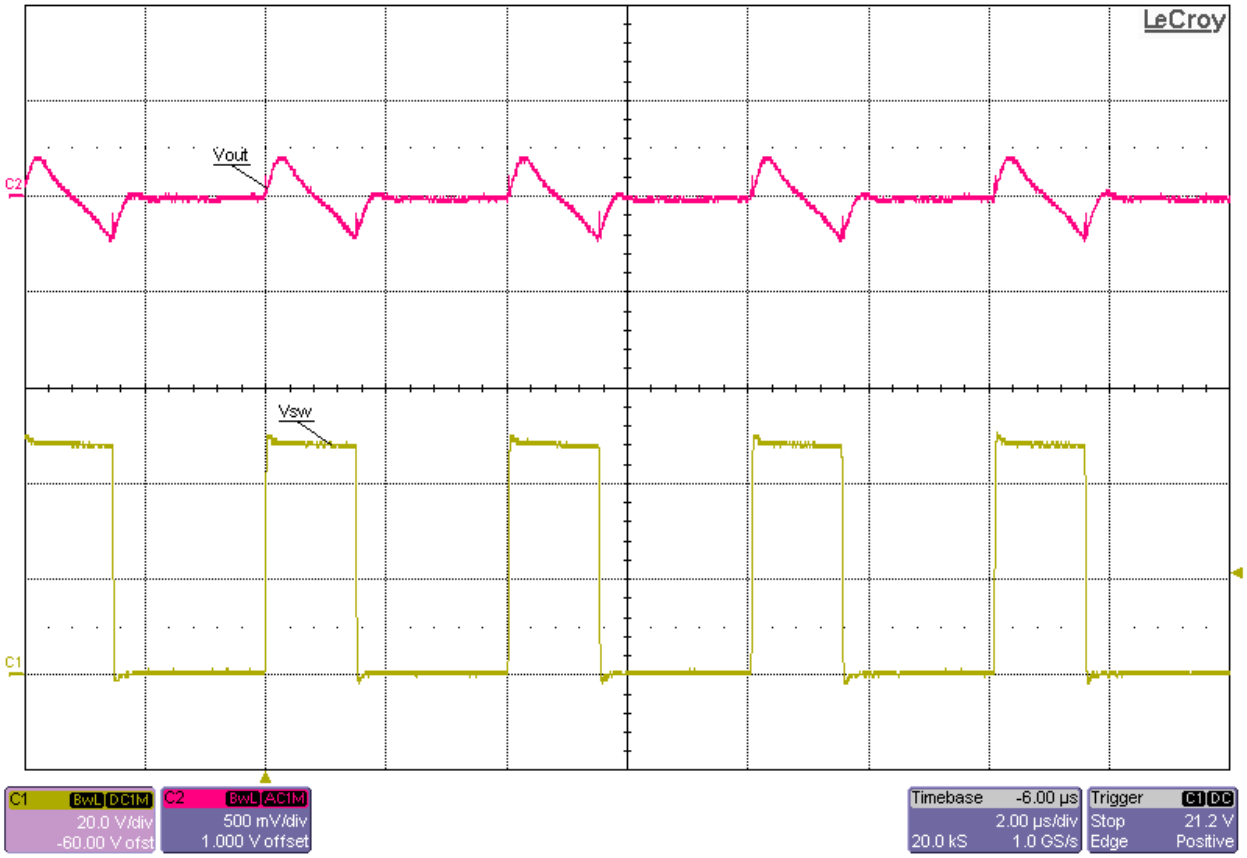


Startup into No Load at 20Vin

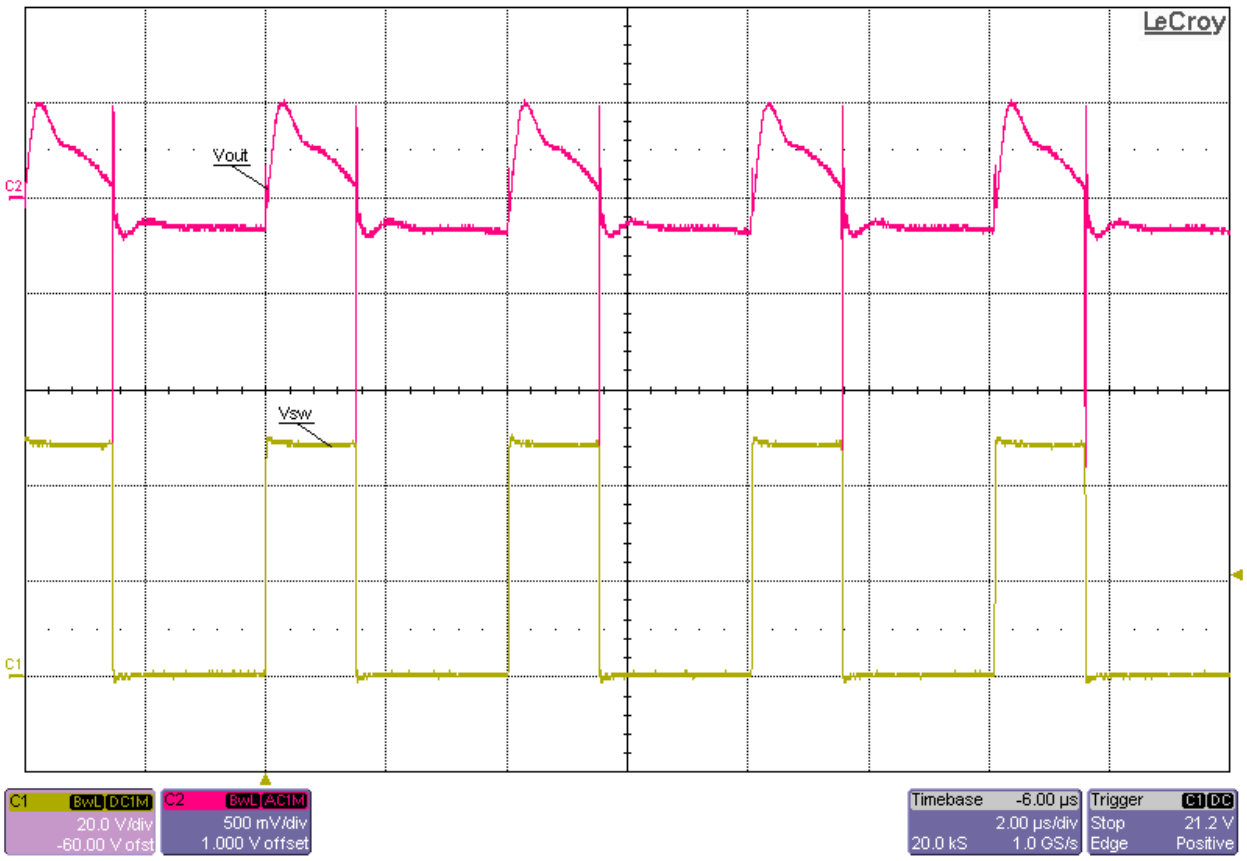


Startup into Full (3A) Load at 20Vin

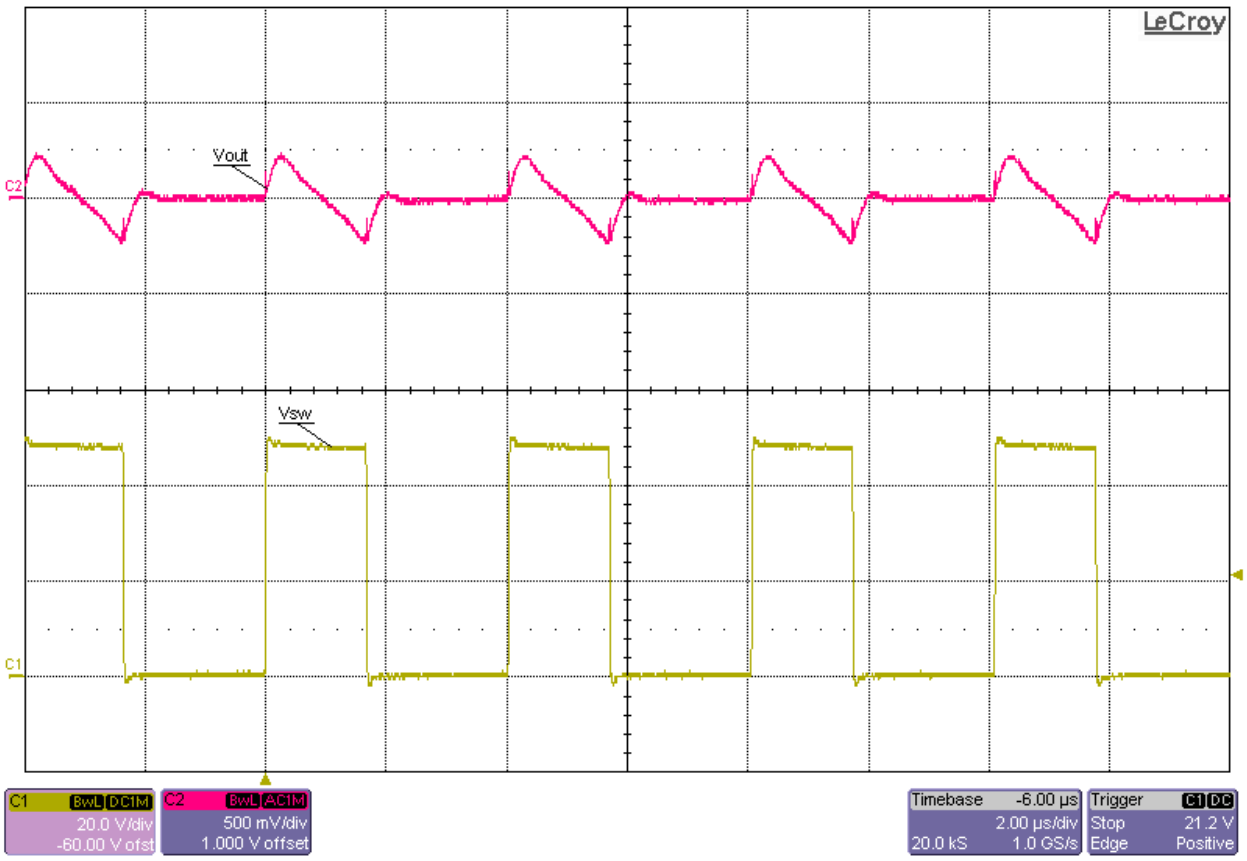
6.3 Output Voltage Ripple and Switch Node Voltage



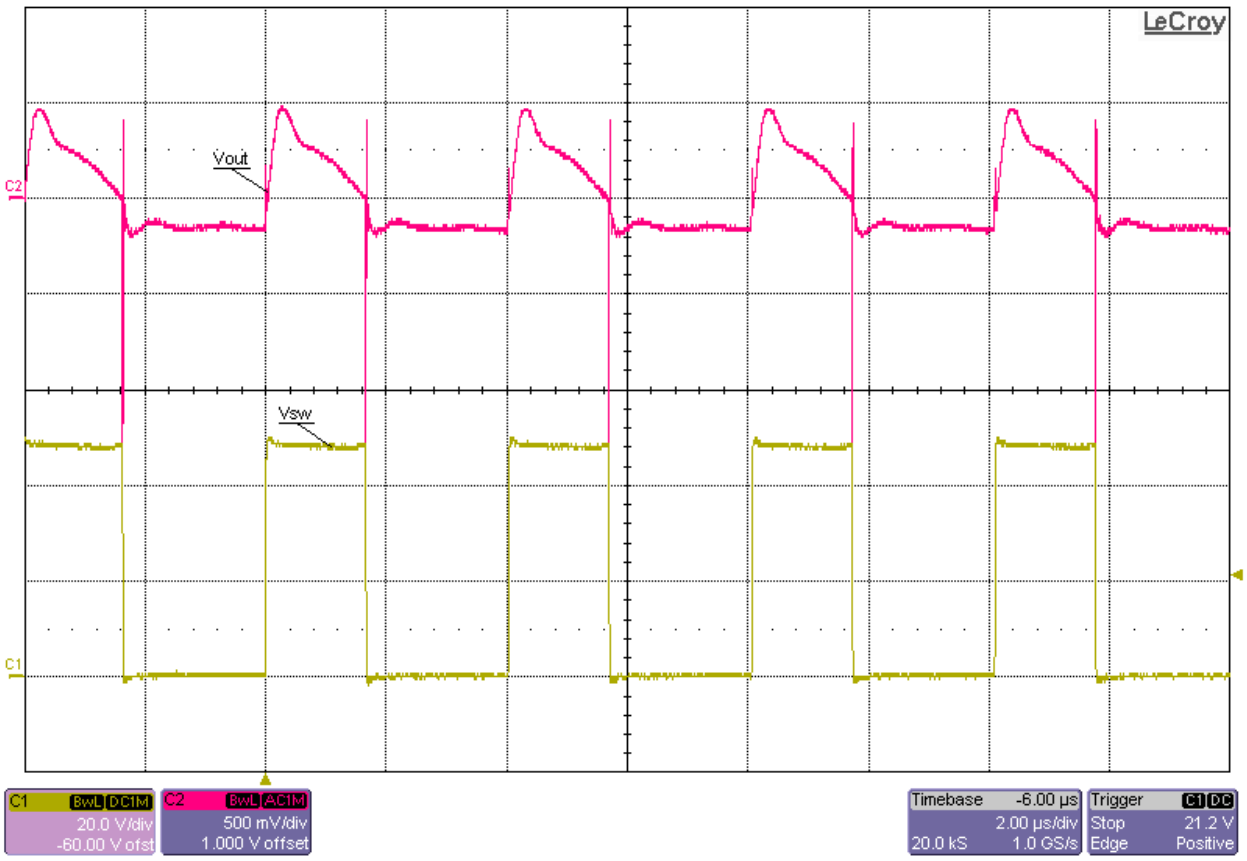
Switch Node Voltage and Output Voltage Ripple at 18Vin and No Load (Vripple ≈ 425mVp-p)



Switch Node Voltage and Output Voltage Ripple at 18Vin and Full (3A) Load (Vripple ≈ 700mVp-p)



Switch Node Voltage and Output Voltage Ripple at 20Vin and No Load (Vripple ≈ 450mVp-p)



Switch Node Voltage and Output Voltage Ripple at 20Vin and Full (3A) Load (Vripple ≈ 650mVp-p)

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