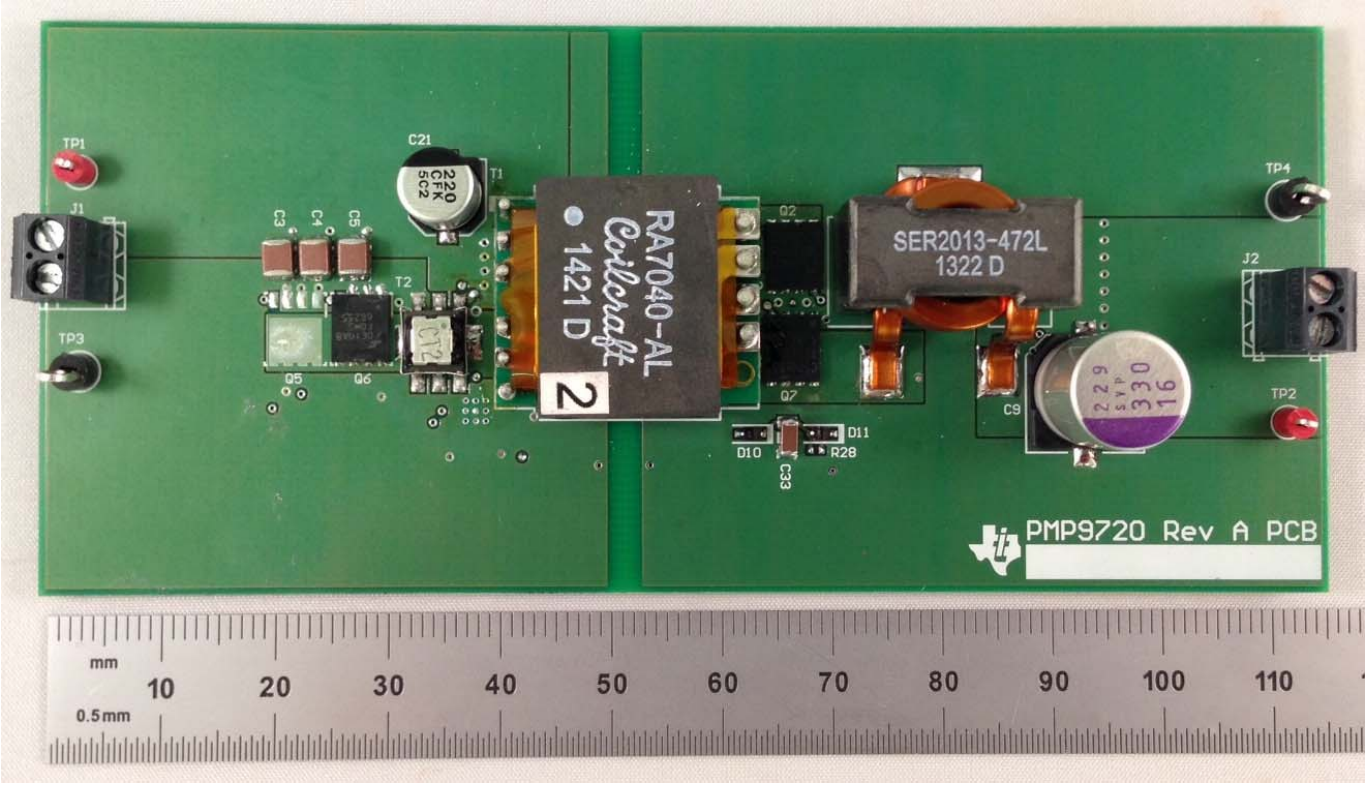
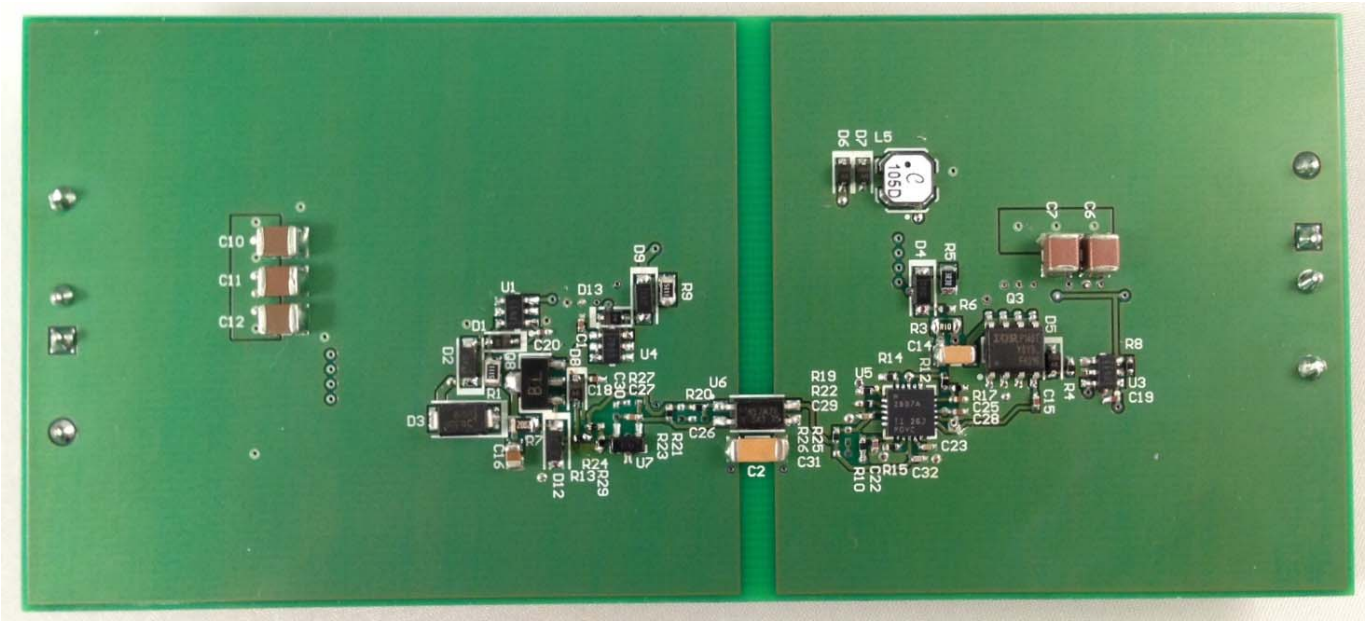
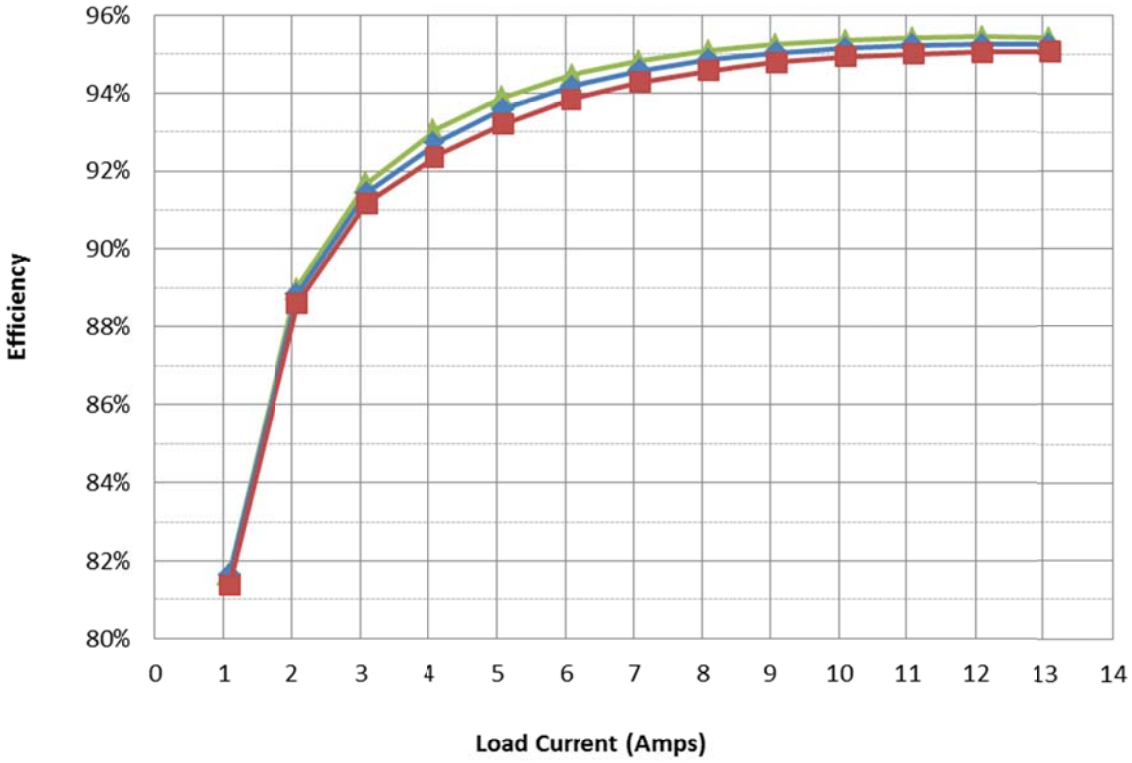
1 Photos


TP1
J1
TP3
C21
T1
C3
C4
C5
T2
Q5
Q6
RA7040-AL
Coilcraft
1421 D
2
Q2
Q7
SER2013-472L
1322 D
TP4
J2
TP2
C9
D10
D11
R28
C33
PMP9720 Rev A PCB
mm
0.5mm
10
20
30
40
50
60
70
80
90
100
110


C10
C11
C12
U1
D13
D9
R9
D1
D2
C20
U4
D3
R1
R7
C16
D12
R13
R24
R29
R27
C27
C18
R20
U6
C26
R21
R23
U7
C2
R19
R22
C29
R25
R26
C31
R10
R15
C22
C32
C23
R14
U5
R12
R17
C25
C28
C14
R3
R6
Q3
D4
R5
D6
D7
L5
C7
C6
D5
R4
R8
U3
C19
C15

2 Efficiency



Iout	Vout	Vin	Iin	Pout	Losses	Efficiency
0.001	12.07	48.0	0.059	0.01	2.823	0.3%
1.074	12.06	48.0	0.331	12.96	2.914	81.6%
2.076	12.06	48.0	0.586	25.04	3.105	89.0%
3.078	12.06	48.0	0.844	37.13	3.369	91.7%
4.079	12.06	48.0	1.102	49.20	3.687	93.0%
5.08	12.06	48.0	1.360	61.29	3.993	93.9%
6.08	12.06	48.0	1.618	73.35	4.309	94.5%
7.09	12.06	48.0	1.878	85.45	4.667	94.8%
8.09	12.06	48.0	2.137	97.54	5.039	95.1%
9.09	12.06	48.0	2.398	109.61	5.473	95.2%
10.09	12.06	48.0	2.659	121.68	5.936	95.3%
11.09	12.06	48.0	2.920	133.73	6.432	95.4%
12.09	12.06	48.0	3.183	145.79	6.973	95.4%
13.09	12.06	48.0	3.448	157.87	7.603	95.4%

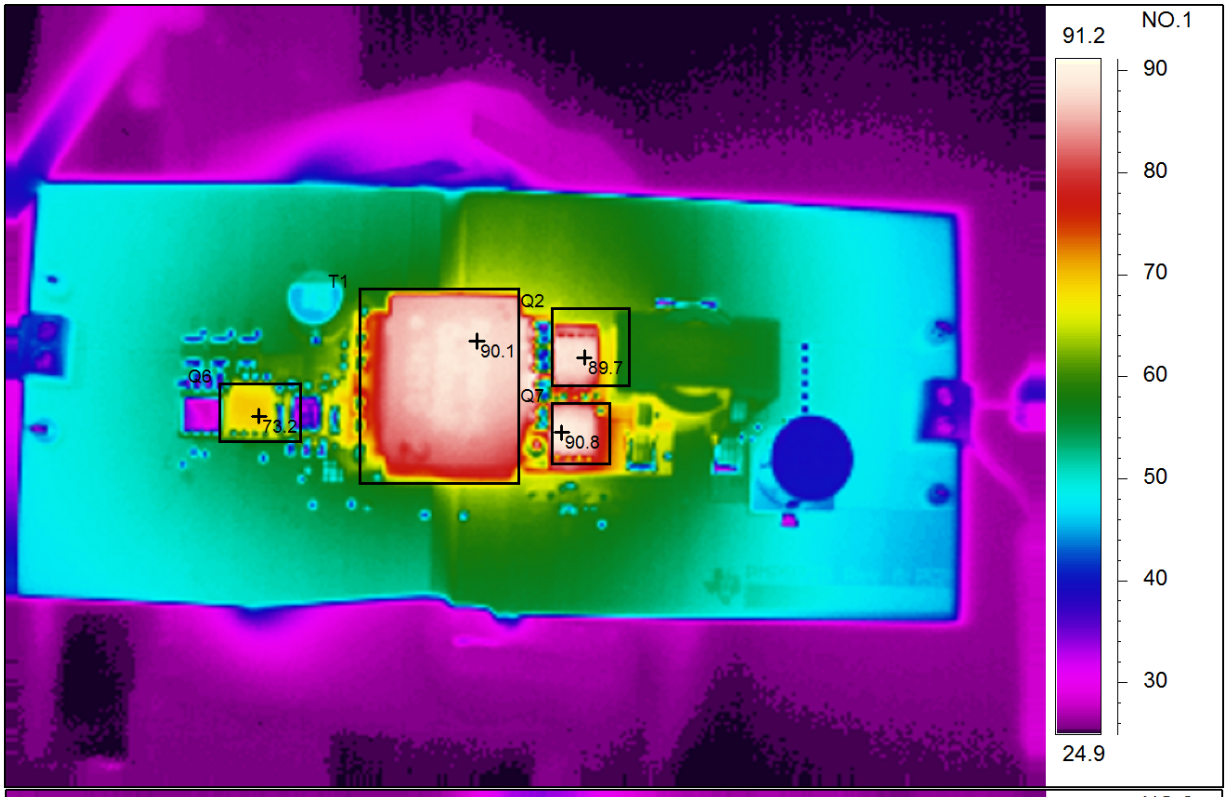
PMP9720 Rev A Test Results

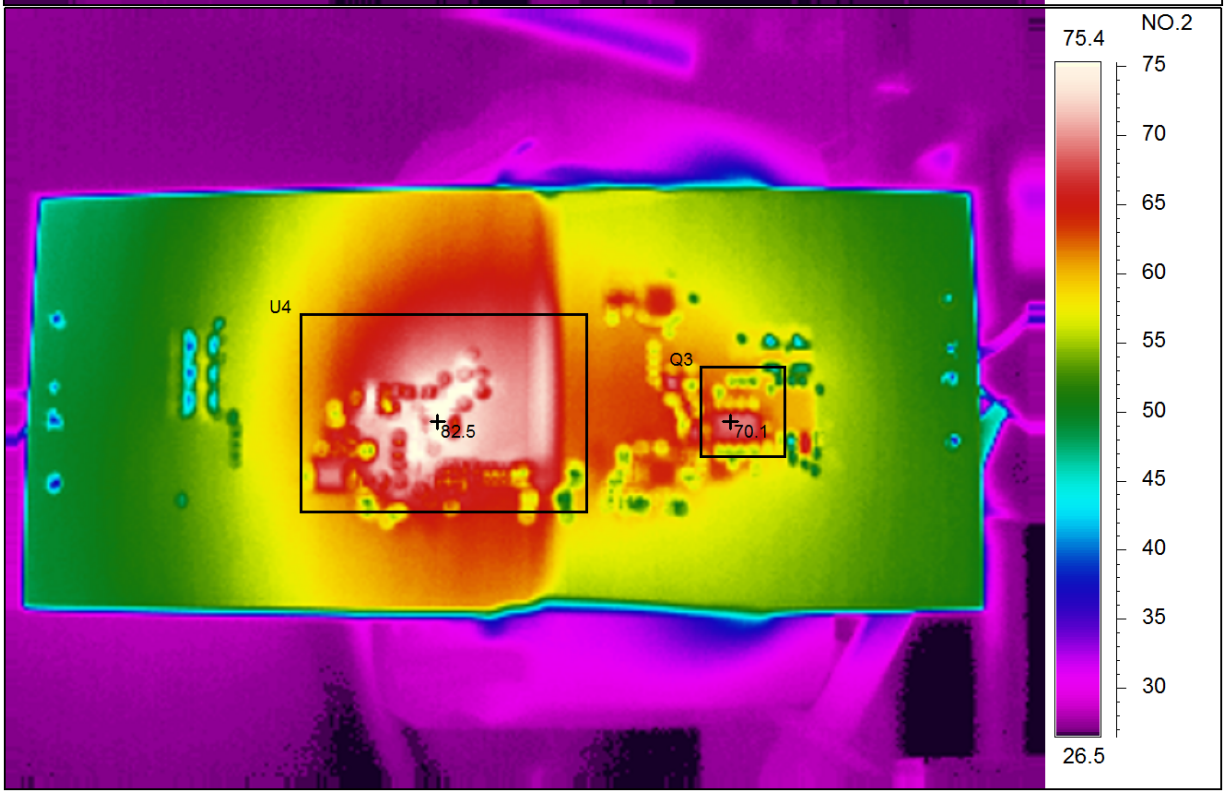
Iout	Vout	Vin	Iin	Pout	Losses	Efficiency
0.001	12.07	54.0	0.052	0.01	2.825	0.3%
1.080	12.07	54.0	0.296	13.04	2.935	81.6%
2.082	12.07	54.0	0.524	25.12	3.158	88.8%
3.084	12.07	54.0	0.754	37.21	3.485	91.4%
4.084	12.07	54.0	0.984	49.28	3.877	92.7%
5.09	12.06	54.0	1.215	61.38	4.218	93.6%
6.09	12.06	54.0	1.444	73.43	4.547	94.2%
7.09	12.06	54.0	1.675	85.53	4.904	94.6%
8.09	12.06	54.0	1.906	97.61	5.303	94.8%
9.09	12.06	54.0	2.138	109.69	5.730	95.0%
10.10	12.06	54.0	2.370	121.76	6.202	95.2%
11.10	12.06	54.0	2.602	133.81	6.706	95.2%
12.10	12.06	54.0	2.836	145.88	7.277	95.2%
13.10	12.06	54.0	3.071	157.95	7.882	95.2%

Iout	Vout	Vin	Iin	Pout	Losses	Efficiency
0.001	12.07	60.0	0.048	0.01	2.886	0.3%
1.084	12.07	60.0	0.268	13.09	2.997	81.4%
2.085	12.07	60.0	0.473	25.17	3.235	88.6%
3.088	12.07	60.0	0.681	37.26	3.612	91.2%
4.088	12.07	60.0	0.890	49.33	4.087	92.4%
5.09	12.07	60.0	1.099	61.43	4.484	93.2%
6.09	12.07	60.0	1.305	73.49	4.829	93.8%
7.09	12.07	60.0	1.513	85.59	5.204	94.3%
8.10	12.06	60.0	1.721	97.68	5.604	94.6%
9.10	12.06	60.0	1.930	109.77	6.034	94.8%
10.10	12.06	60.0	2.139	121.85	6.501	94.9%
11.100	12.06	60.0	2.349	133.89	7.047	95.0%
12.101	12.06	60.0	2.559	145.96	7.598	95.1%
13.103	12.06	60.0	2.771	158.03	8.197	95.1%

3 Thermal

The thermal images below show the circuit board with a 54V input and 13A load. The ambient temperature was 25C with no forced air flow.





Area analysis	Value
T1Max	90.1°C
Q2Max	89.7°C
Q7Max	90.8°C
Q6 Max	73.2°C

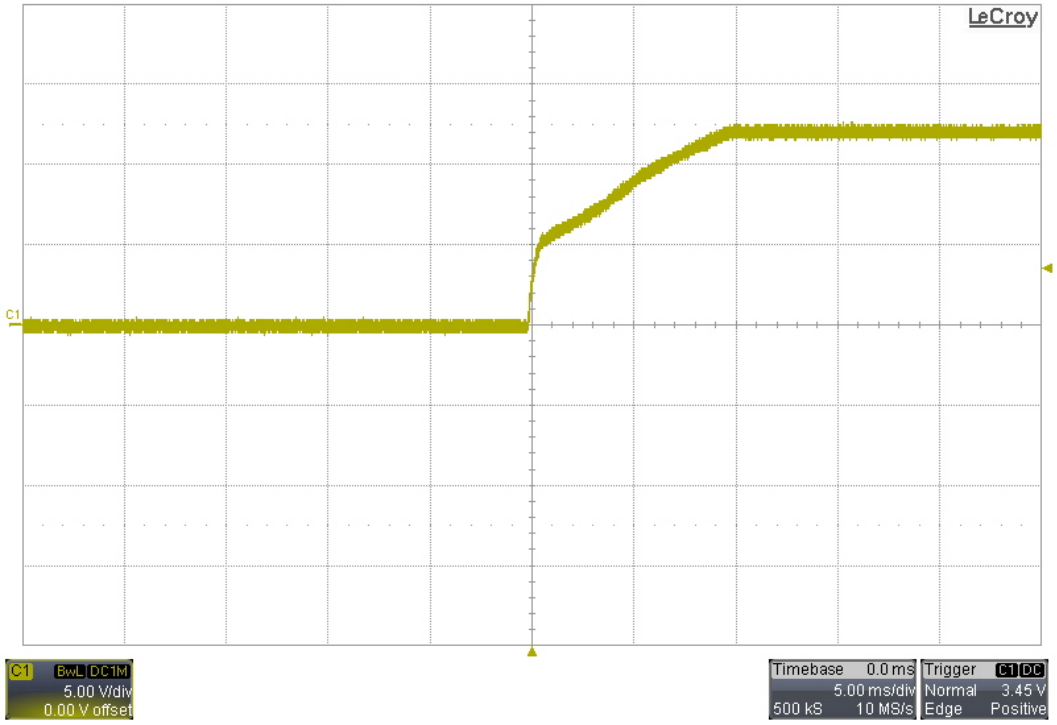
NO.1

Area analysis	Value
U4Max	82.5°C
Q3 Max	70.1°C

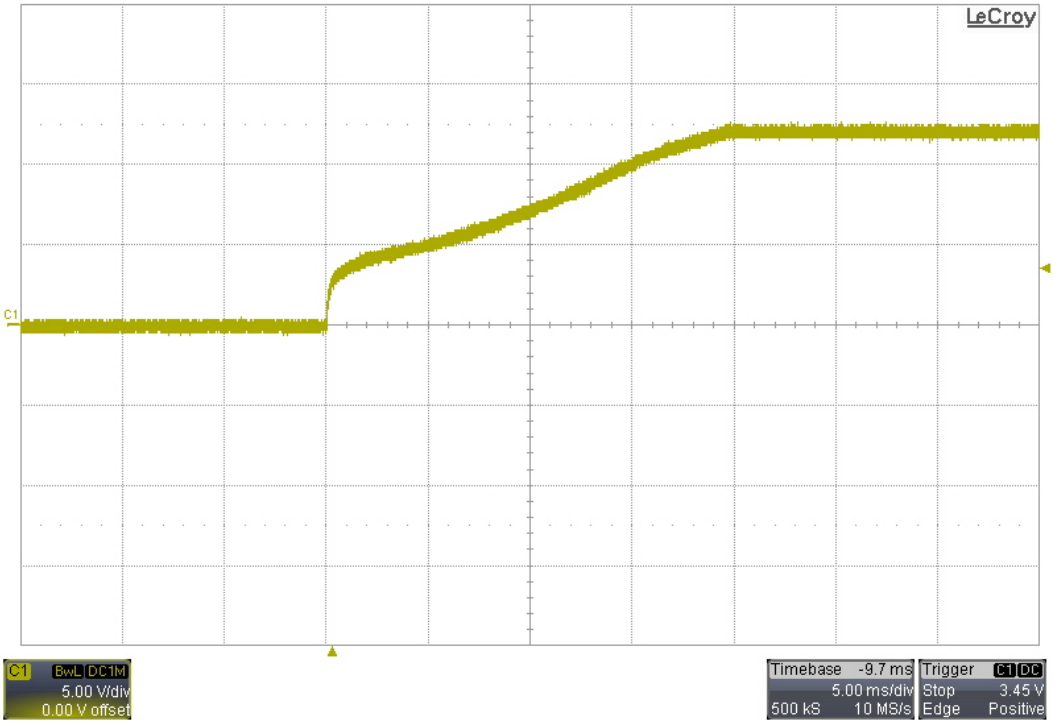
NO.2

4 Startup

4.1 54V Input, No Load

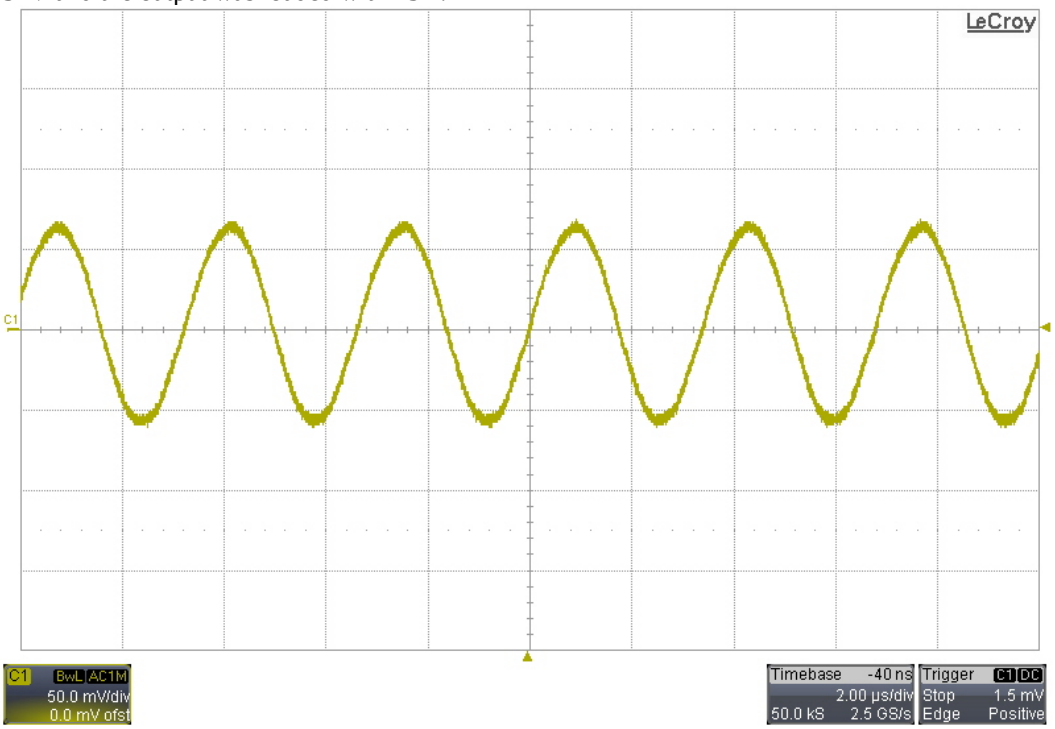


4.2 54V Input, 1Ω Load

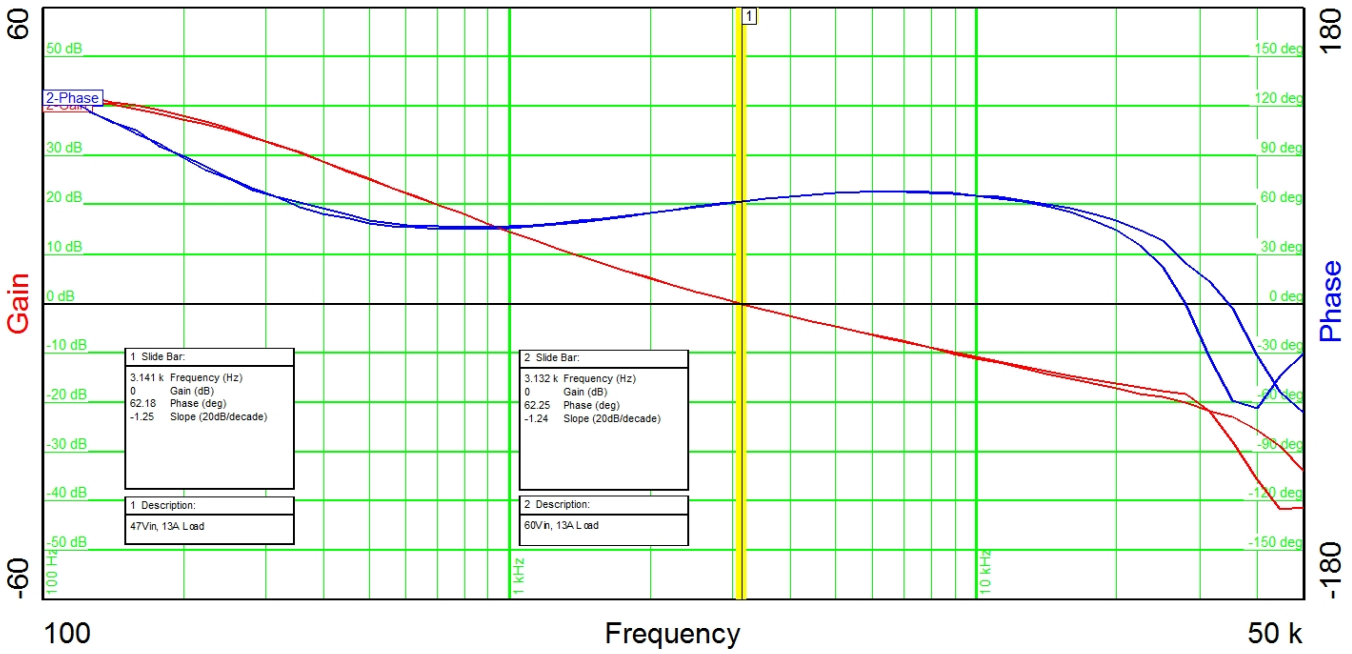


5 Output Ripple Voltage

The input was 54V and the output was loaded with 13A.

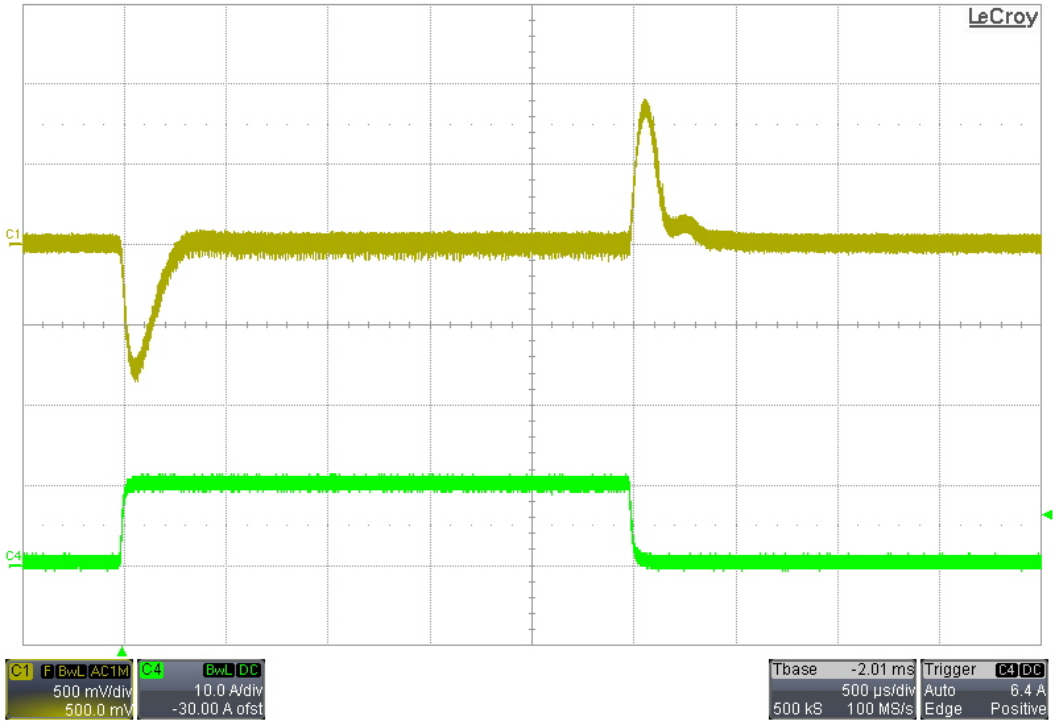


6 Frequency Response



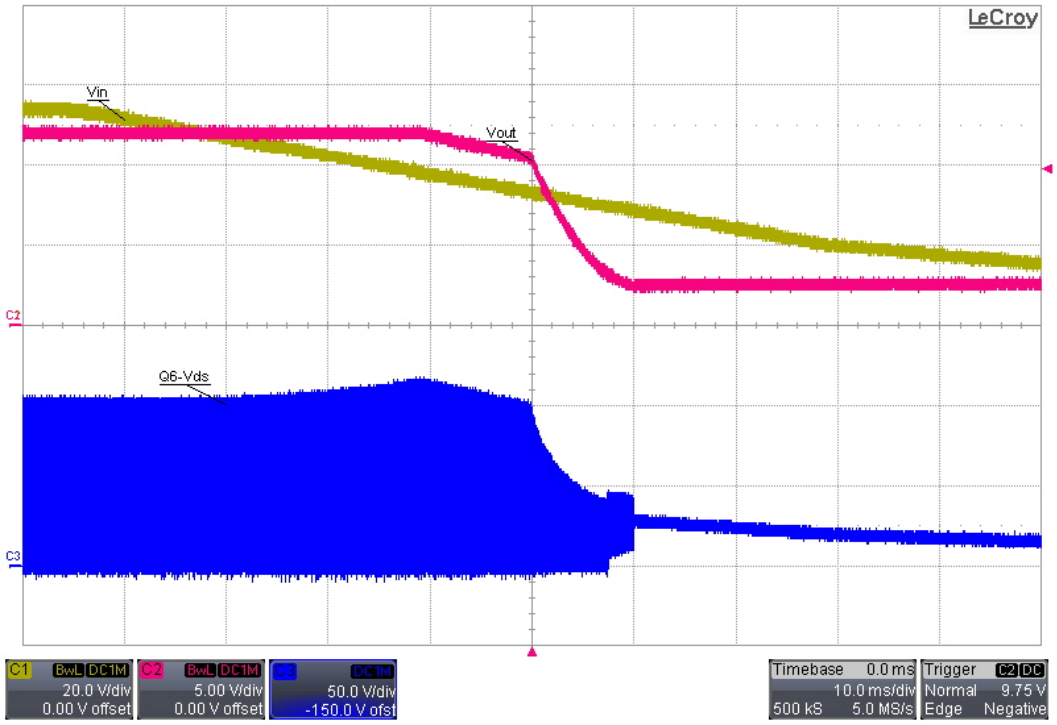
7 Load Transients

The input was set to 54V. Channel 1 shows the output voltage, ac coupled. Channel 4 shows the load current.



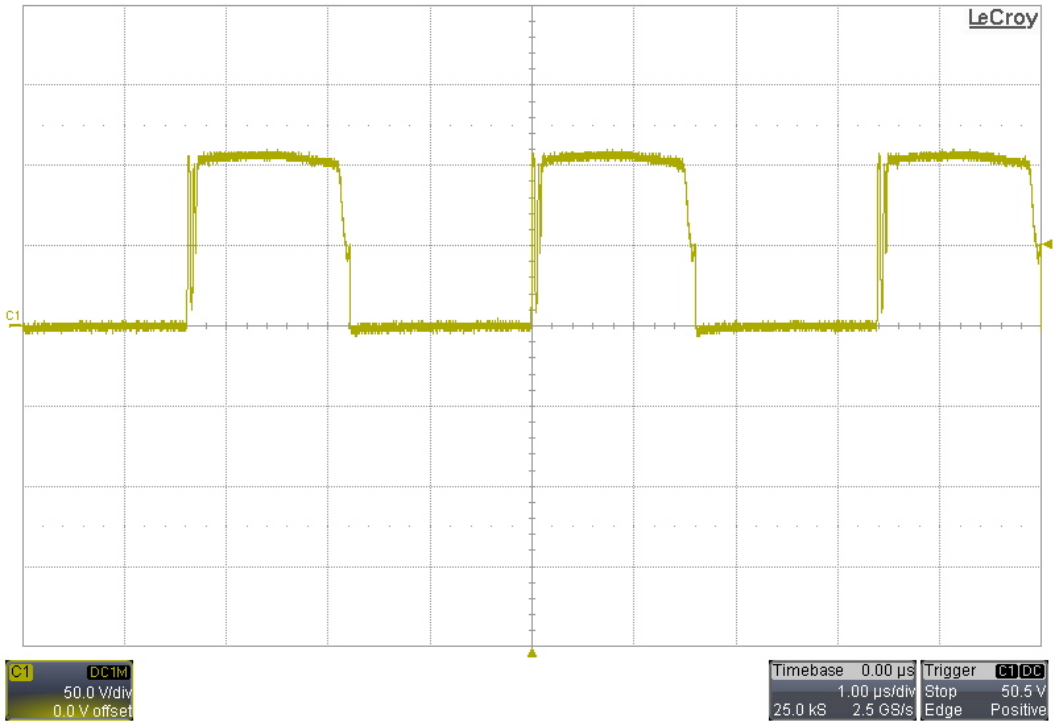
8 Shutdown

The output was unloaded.

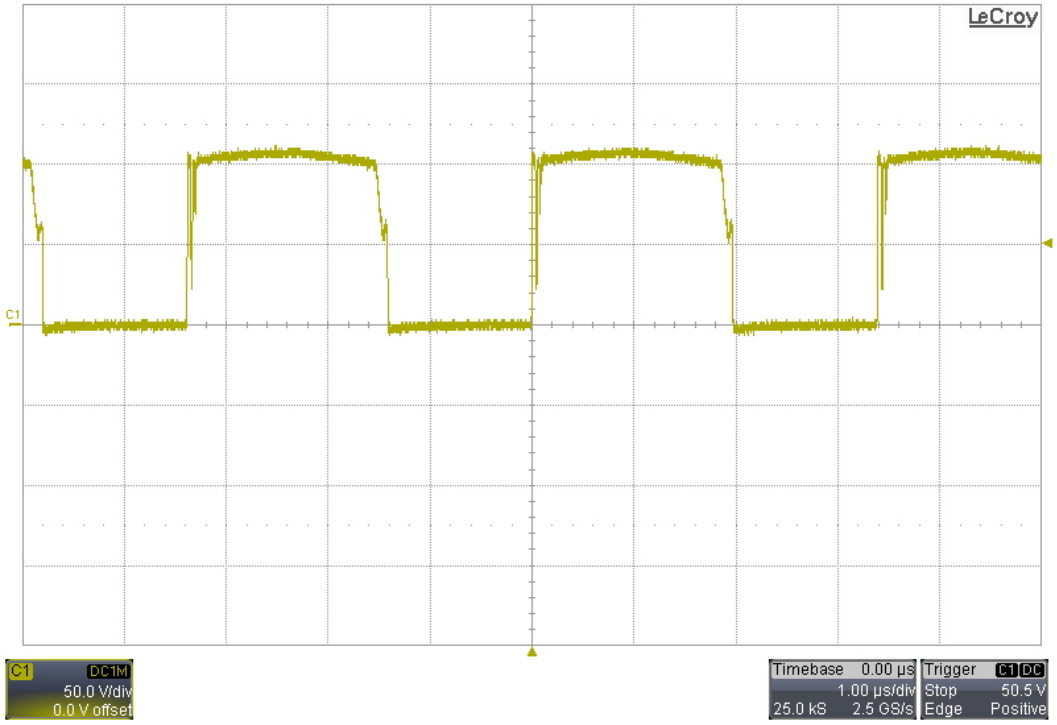


9 Switching Waveforms

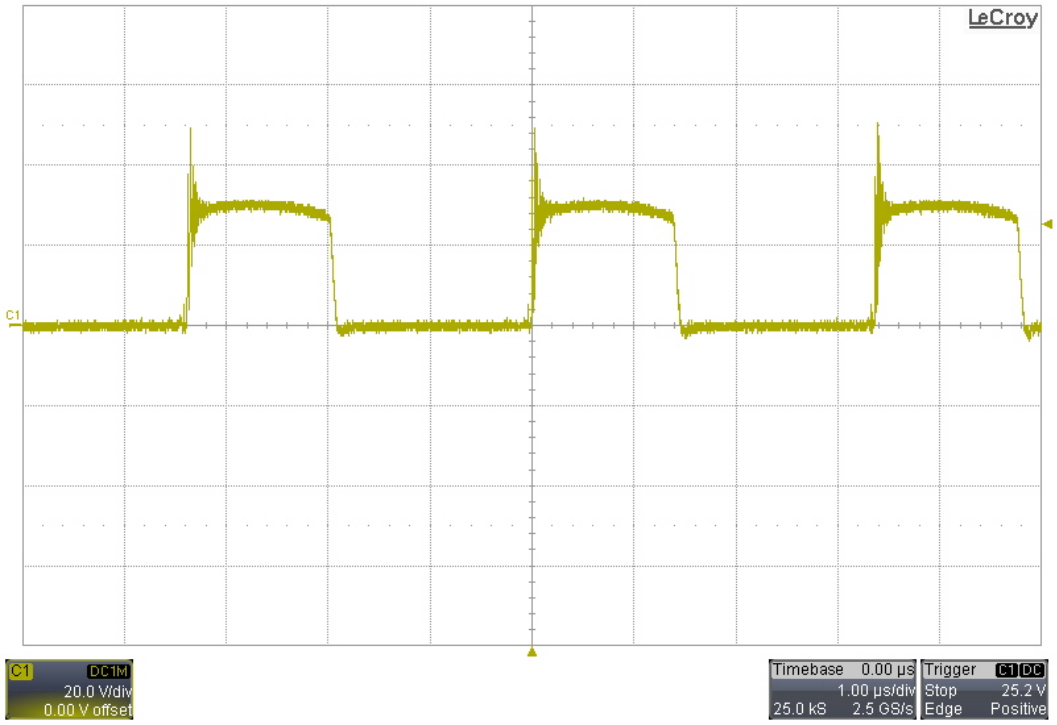
9.1 Primary FET Vds (Q6) – 48Vin, 13A Load



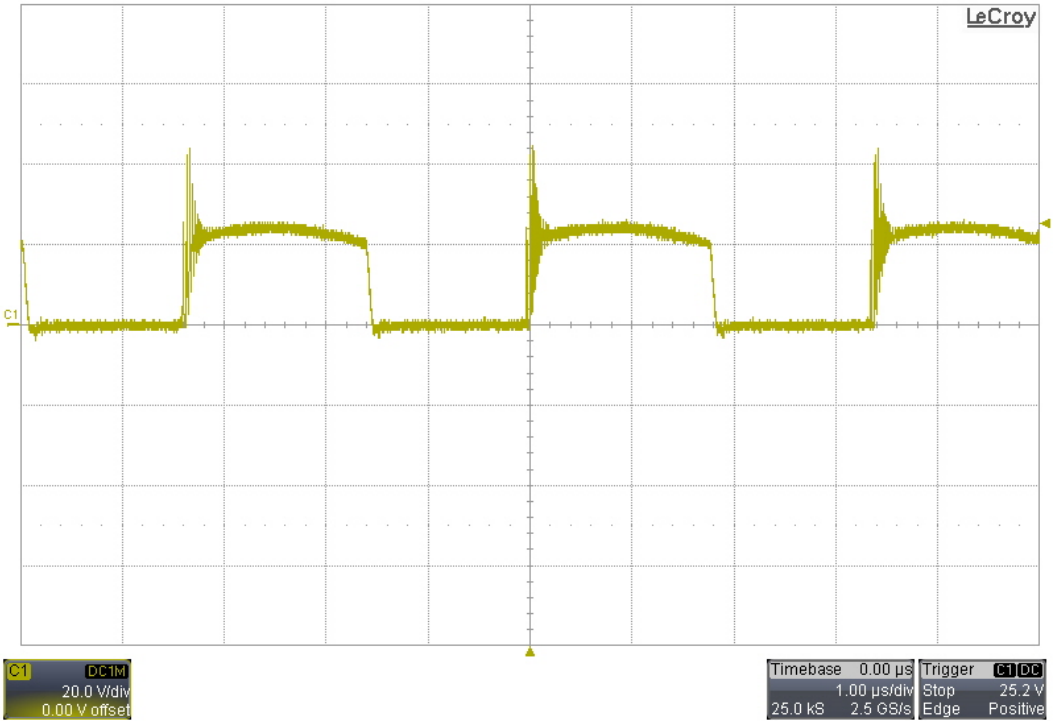
9.2 Primary FET Vds (Q6) – 60Vin, 13A Load



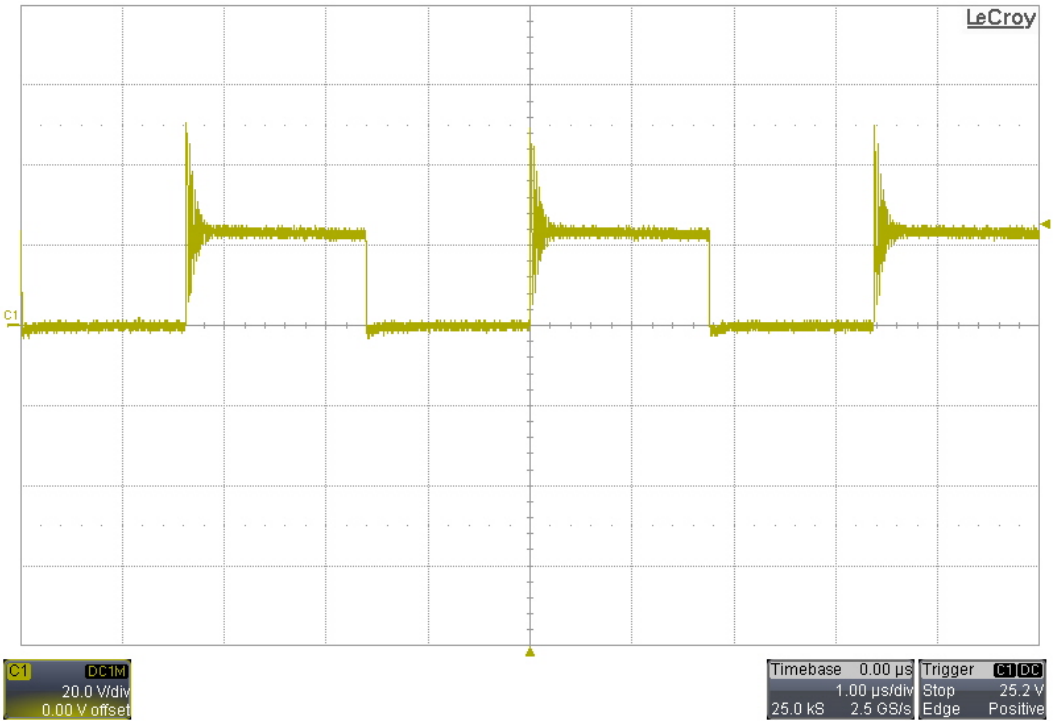
9.3 Sync FET Vds (Q2) – 48Vin, 13A Load



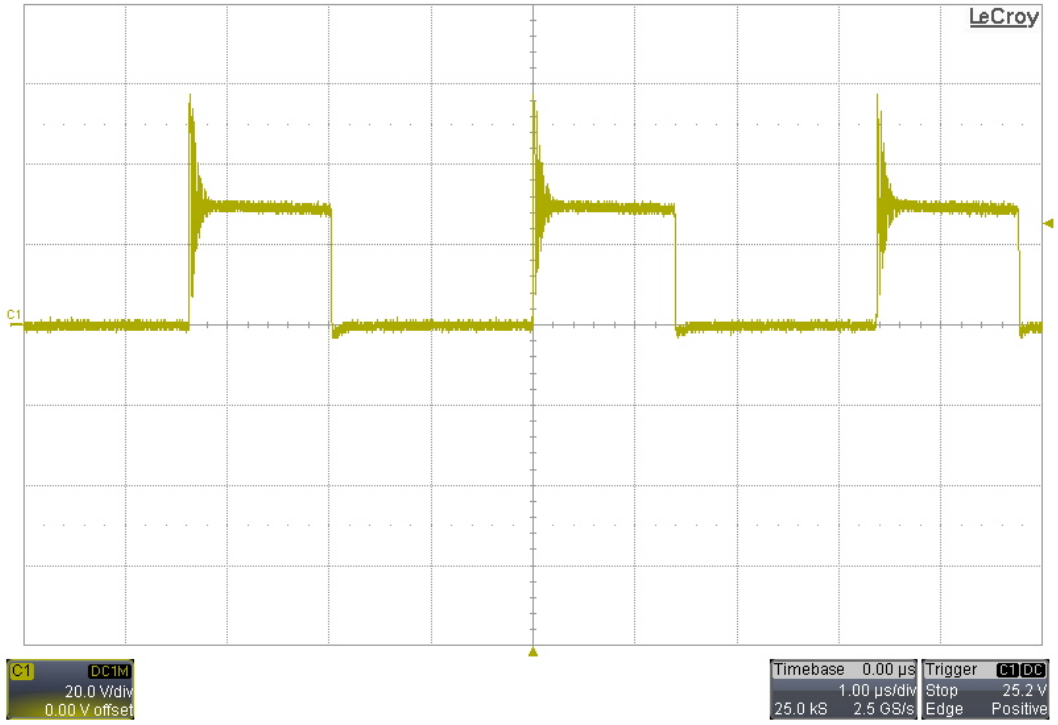
9.4 Sync FET Vds (Q2) – 60Vin, 13A Load



9.5 Sync FETs Vds (Q7) – 48Vin, 13A Load



9.6 Sync FET Vds (Q7) – 60Vin, 13A Load



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