

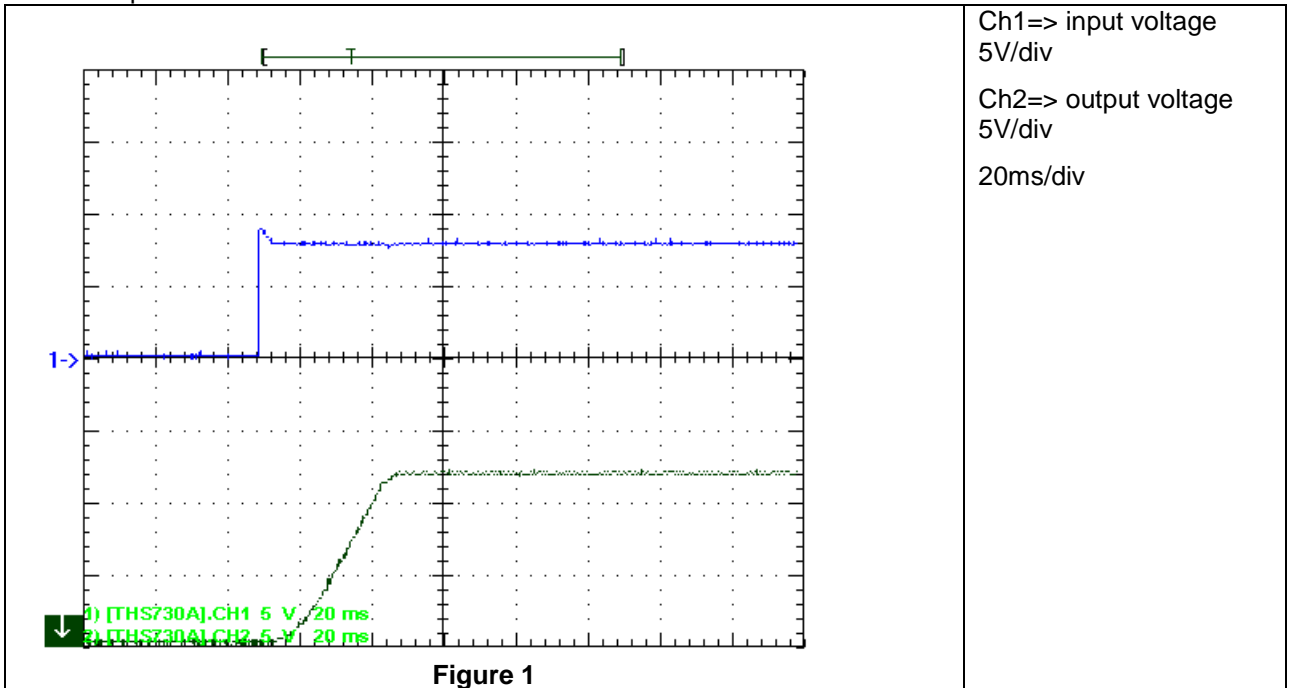
PMP7156RevB Test Results

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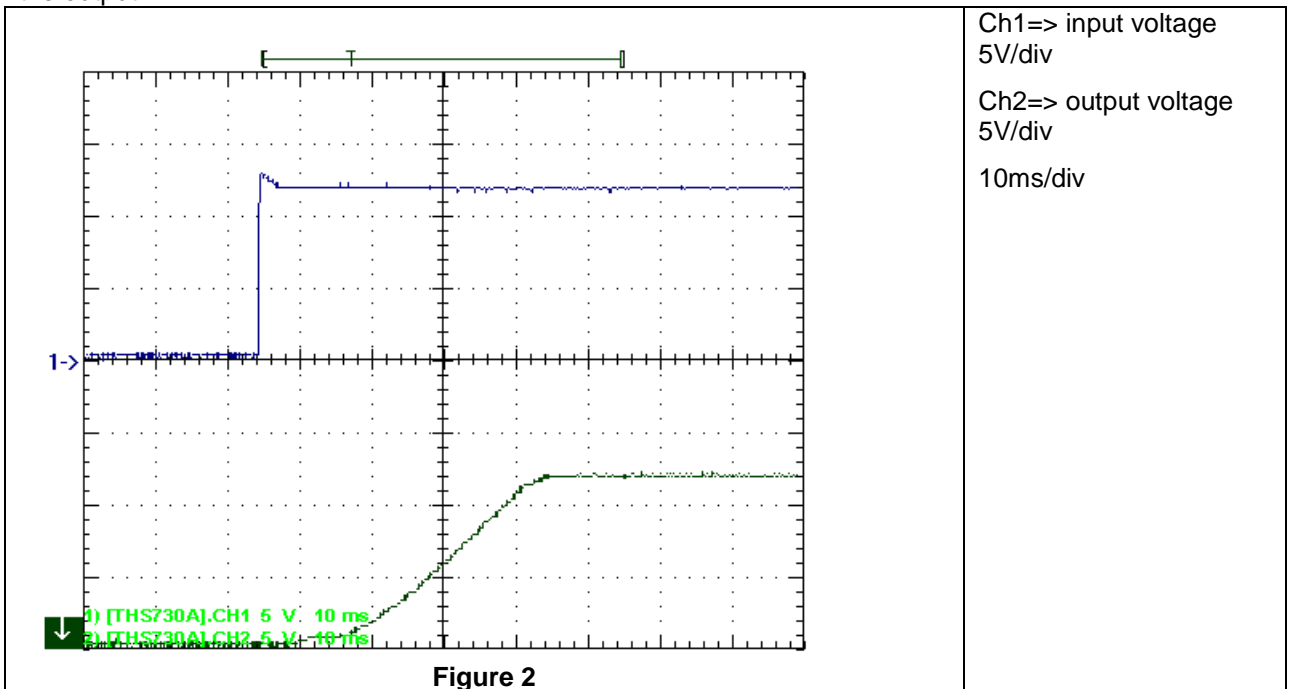
Topology: "Two switch" Buck-Boost with single gate pulse generator (non inverter)
Device: TPS40200

1 Startup

The startup waveform is shown in the Figure 1. The input voltage was set at 8V, with 0.92A load at the output.

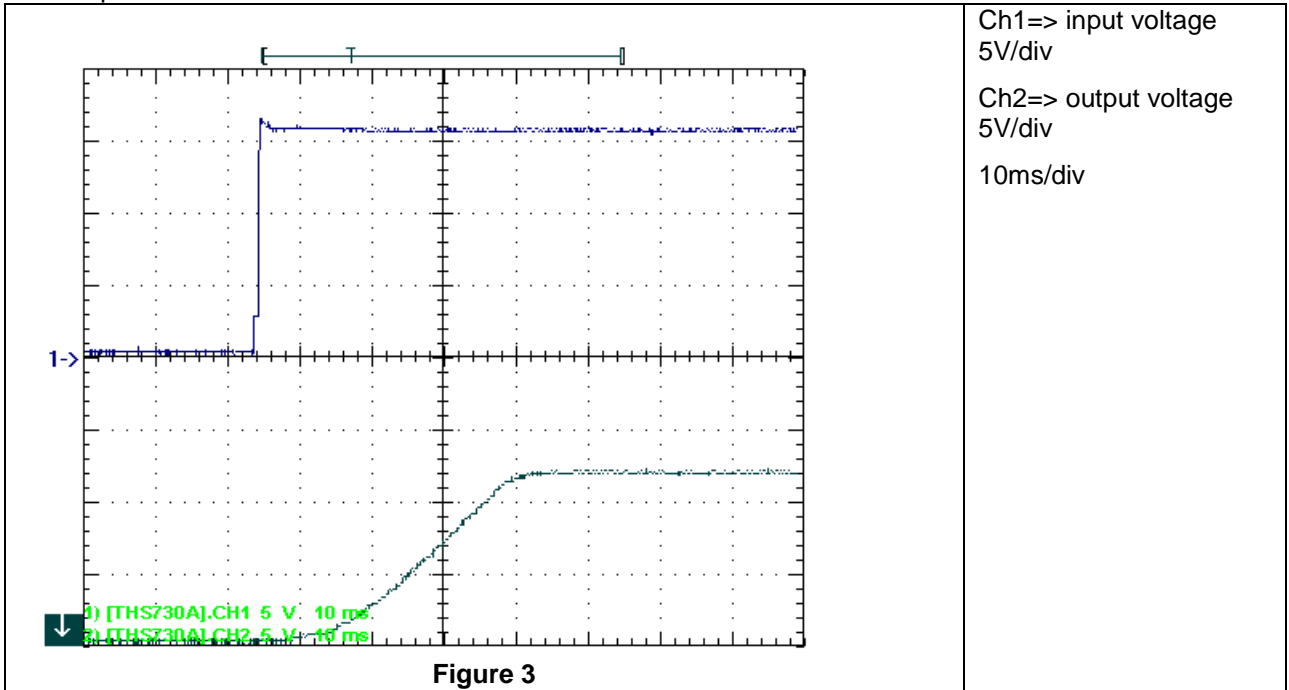


The startup waveform is shown in the Figure 2. The input voltage was set at 12V, with 1A load at the output.



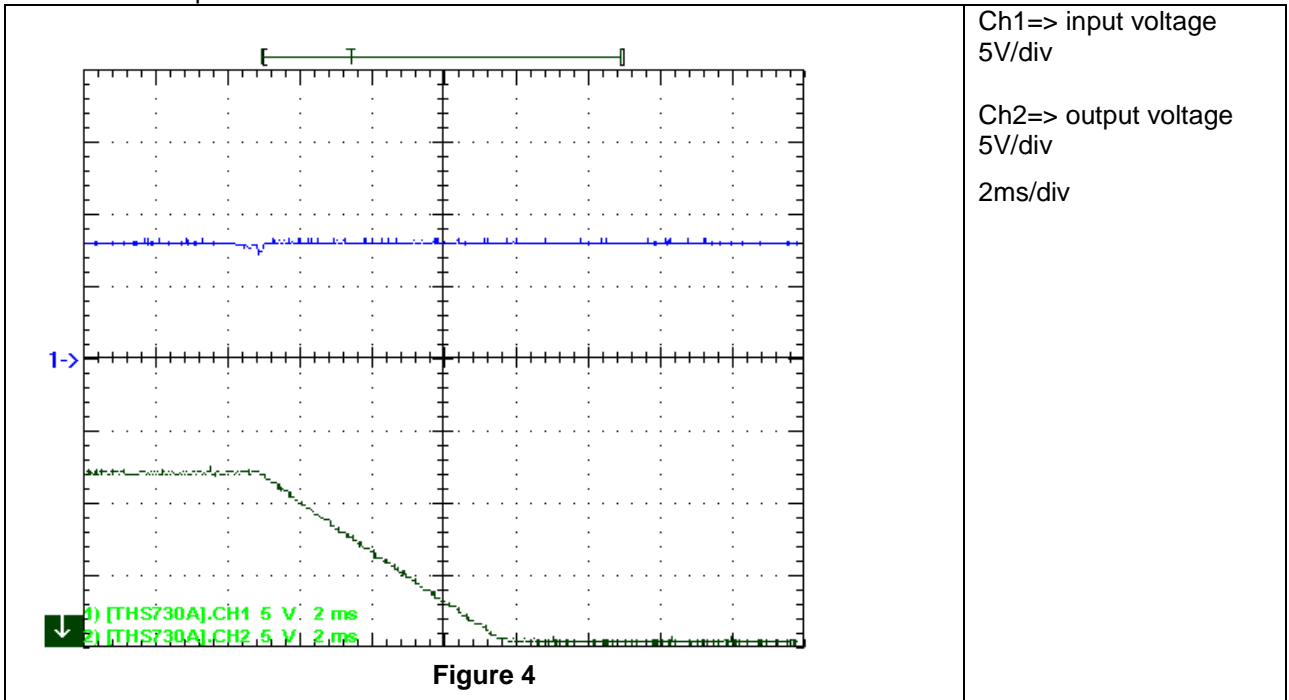
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The startup waveform is shown in the Figure 3. The input voltage was set at 16V, with 1A load at the output.

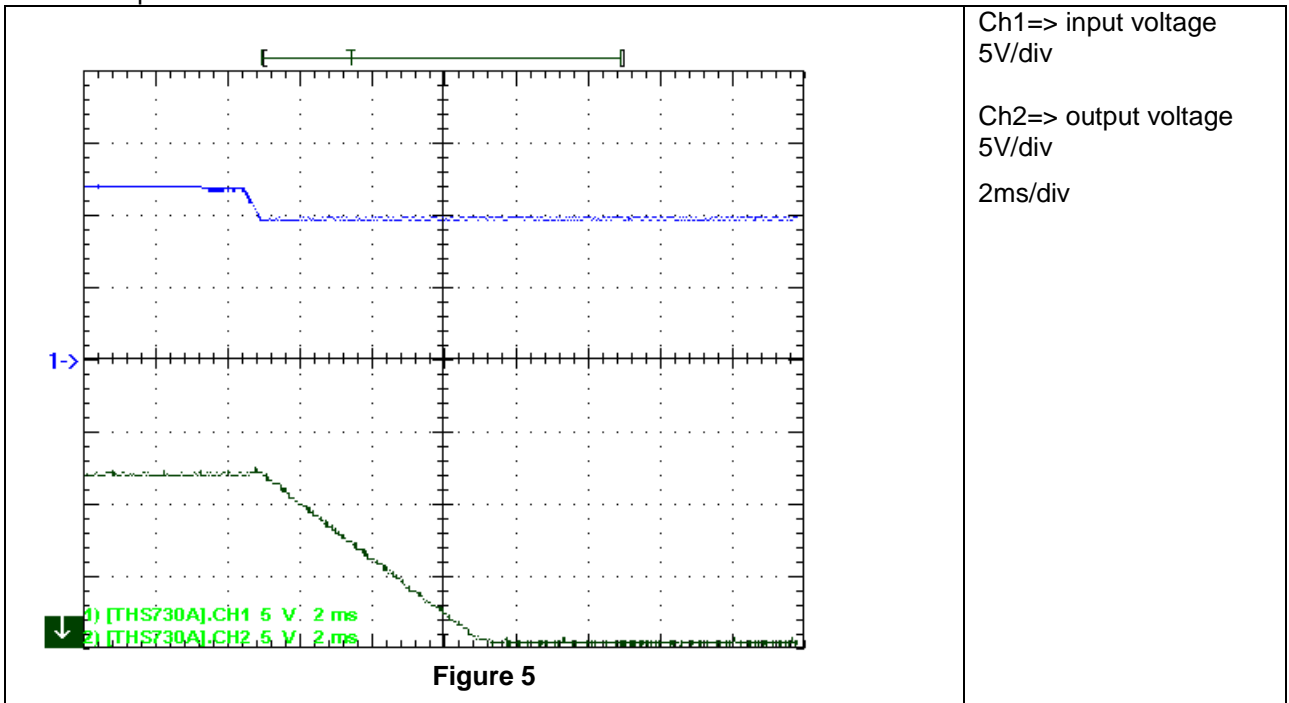


2 Shutdown

The shutdown waveform is shown in the Figure 4. The input voltage was set at 9V, with 0.92A load on the output.

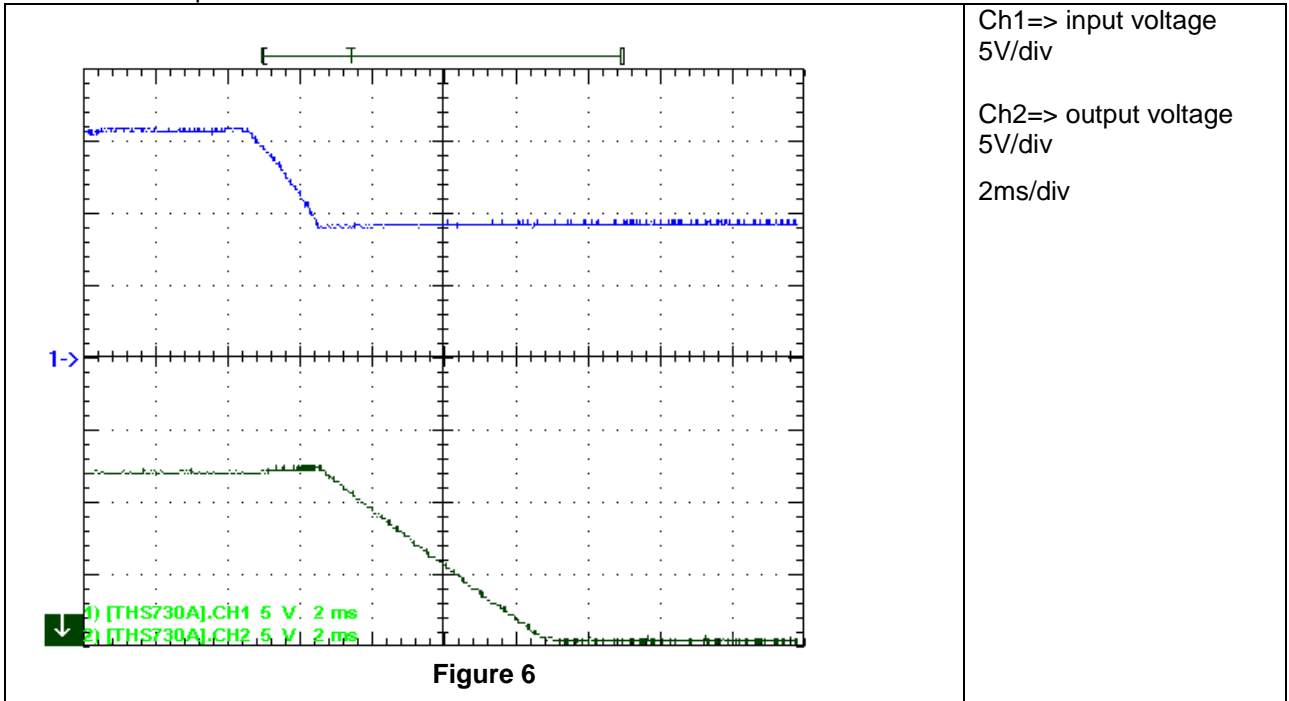


The shutdown waveform is shown in the Figure 5. The input voltage was set at 12V, with 1A load on the output.



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The shutdown waveform is shown in the Figure 6. The input voltage was set at 40V, with 2.5A load on the output.



3 Efficiency

The efficiency is shown in the Figure 7 below.

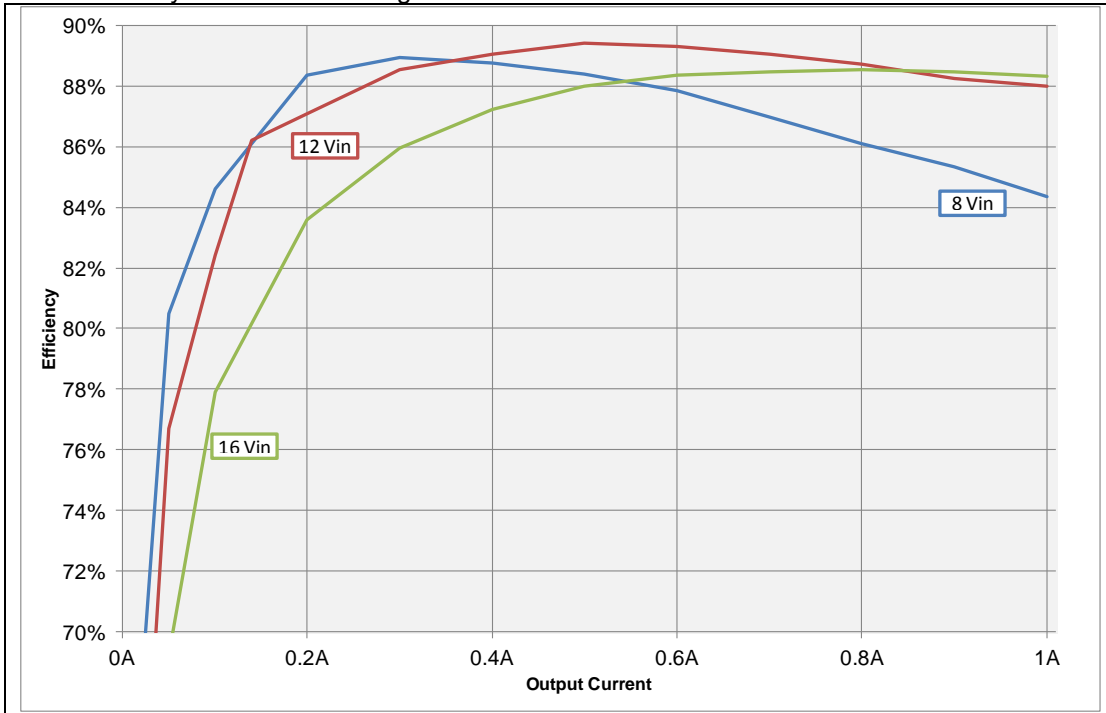


Figure 7

4 Load Regulation

The load regulation of the output is shown in the Figure 8 below.

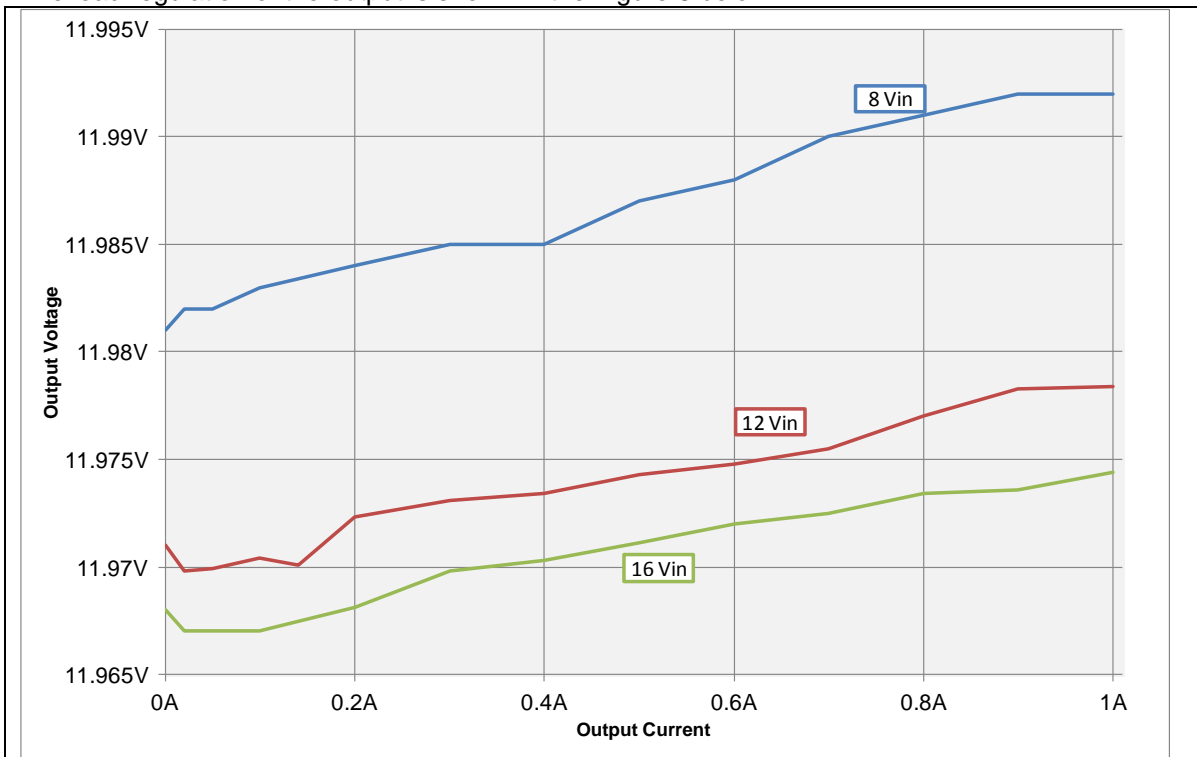
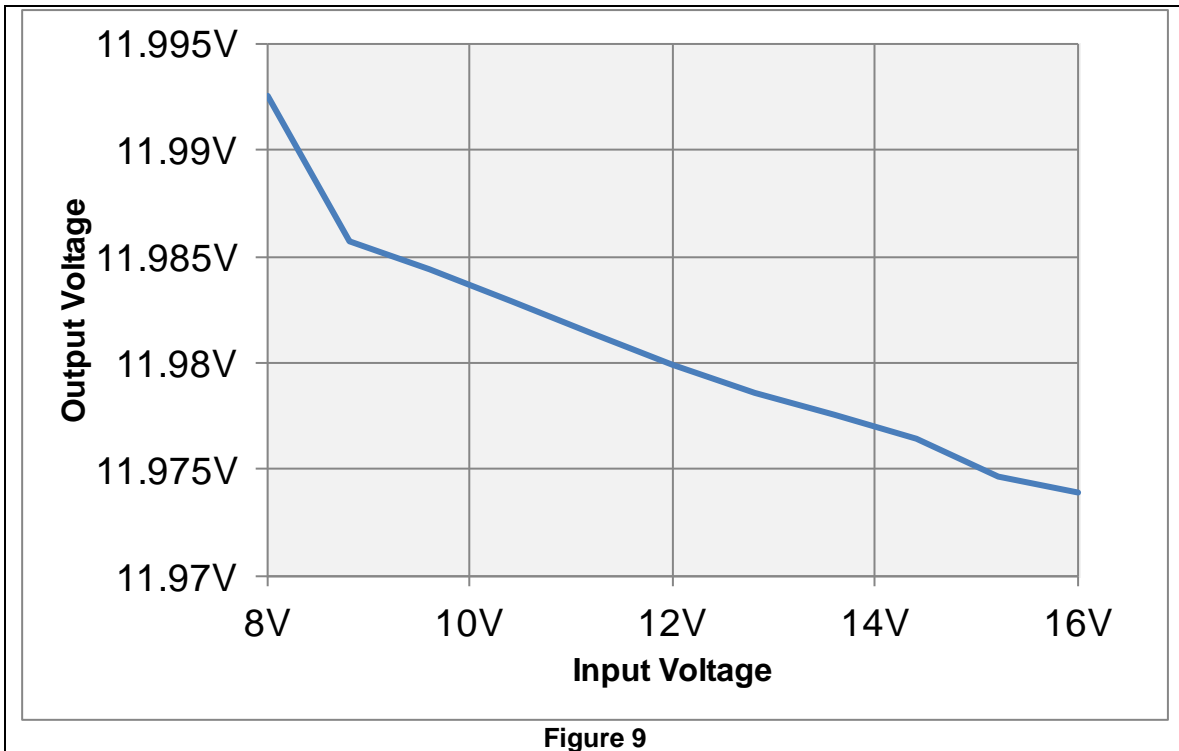


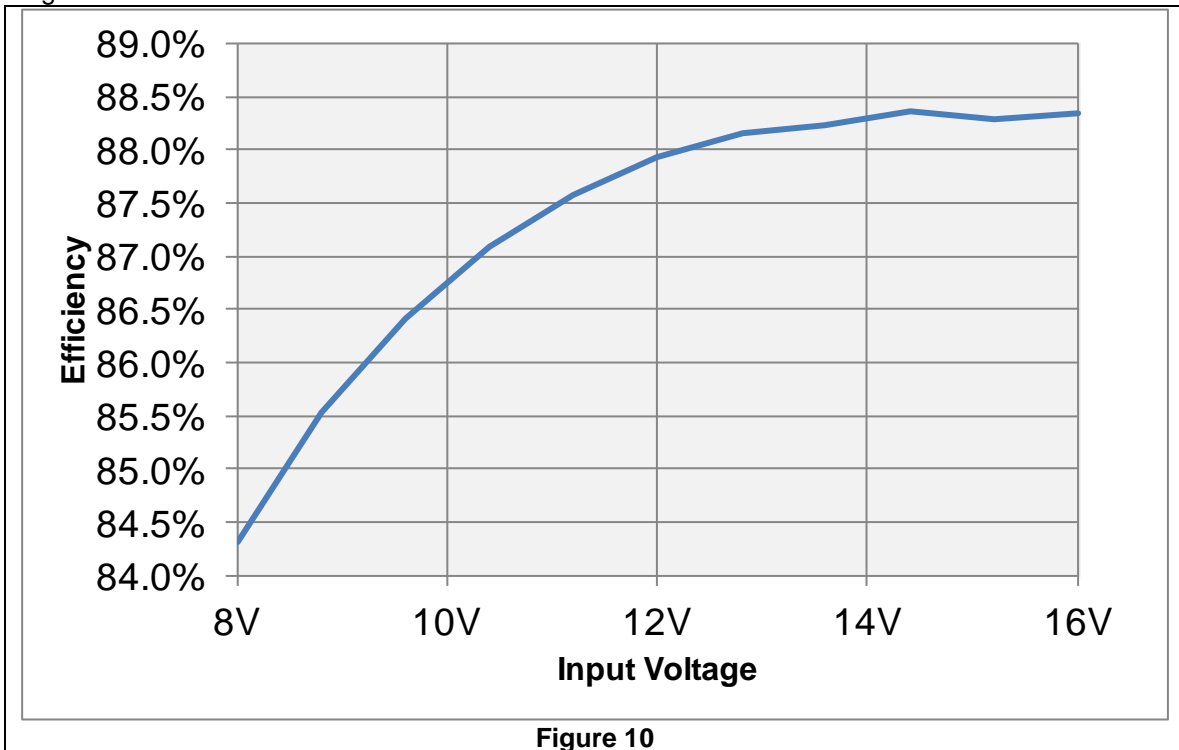
Figure 8

5 Line Regulation

Figure 9 shows the line regulation at 1A load.

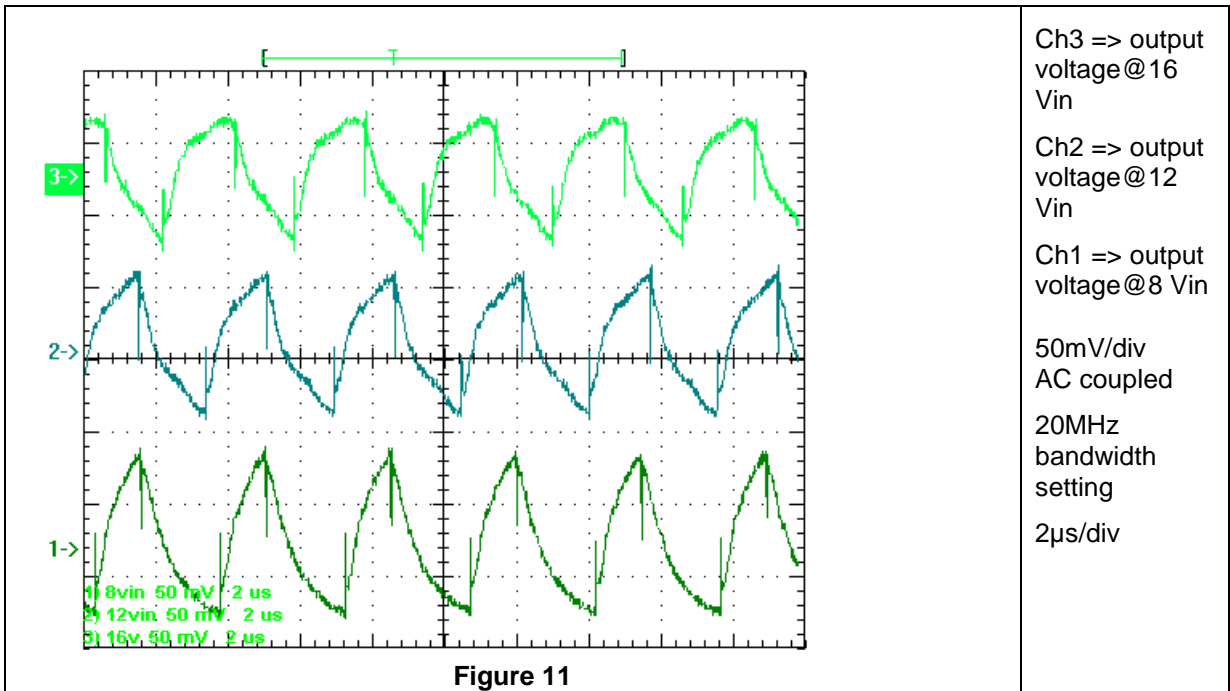


With the same measurement setup the also the efficiencies were calculated. This is shown in Figure 10.

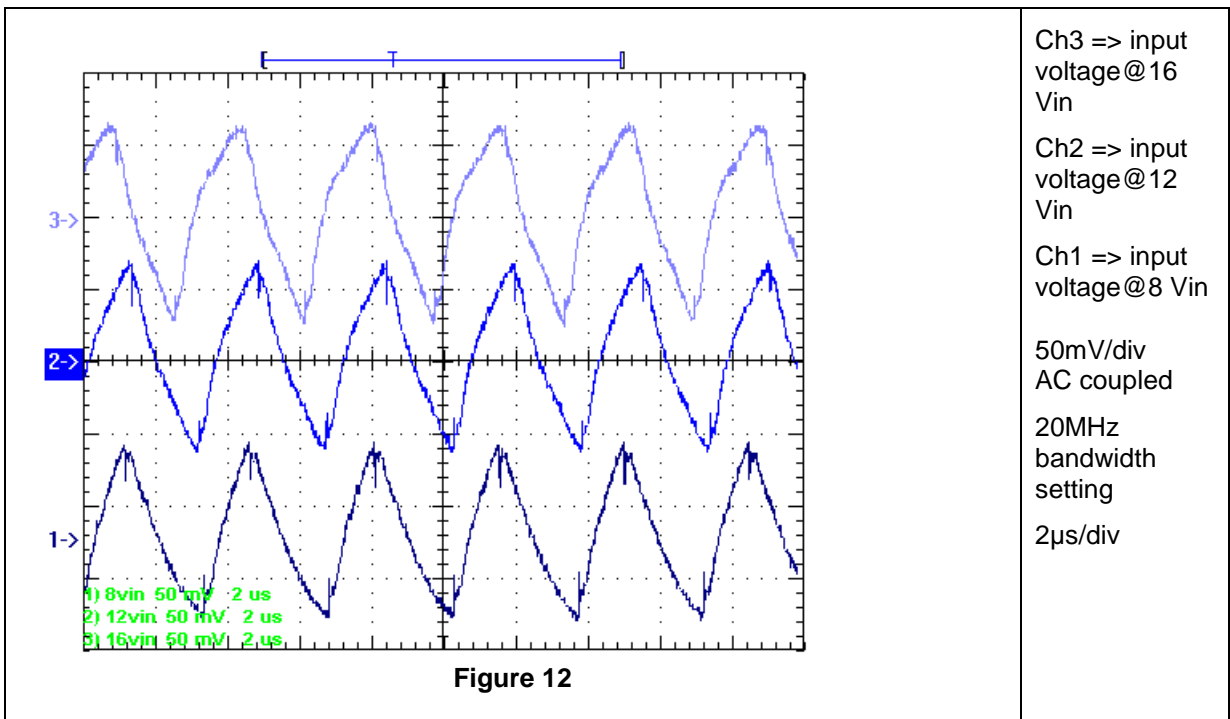


6 Ripple Voltage

The output ripple voltage is shown in Figure 11. The image was taken with a 1A load.



The input ripple voltage is shown in Figure 12. The image was taken with a 1A load.



7 Control Loop Frequency Response

Figure 13 shows the loop response with 2.5A load and 40V input.

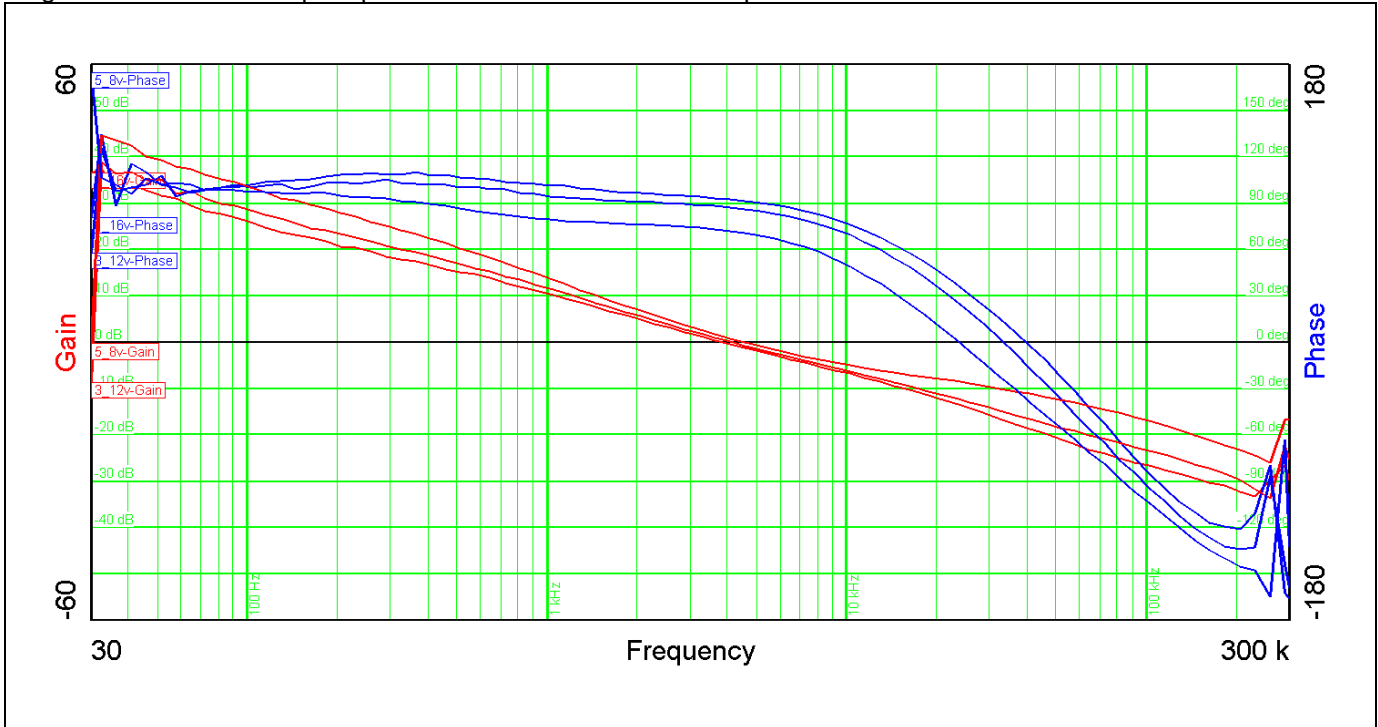


Figure 13

Table 1 summarizes the results from Figure 13

Input Voltage (V)	8	12	16
Bandwidth (kHz)	4.55	4.14	3.85
Phasemargin	70.6°	87	92.8
slope (20dB/decade)	-0.892	-0.87	-0.85
gain margin (dB)	-8.6	15	-18.5
slope (20dB/decade)	-0.49	-0.87	-1
freq (kHz)	23.7	33.3	39.7

Table 1

8 Load Transients

The Figure 14 shows the response to load transients. The load is switching from 0.5A to 1A. with 50Hz frequency. The input voltage was set to 8V

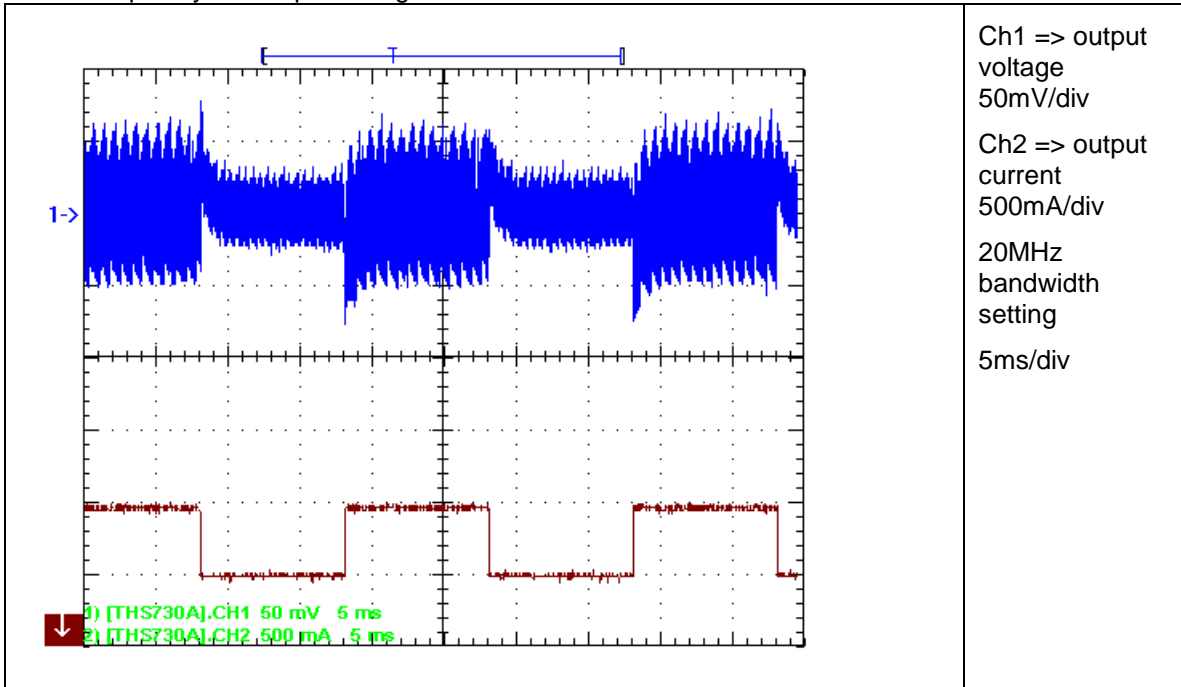


Figure 14

The Figure 15 shows the response to load transients. The load is switching from 0.5A to 1A. with 50Hz frequency. The input voltage was set to 12V

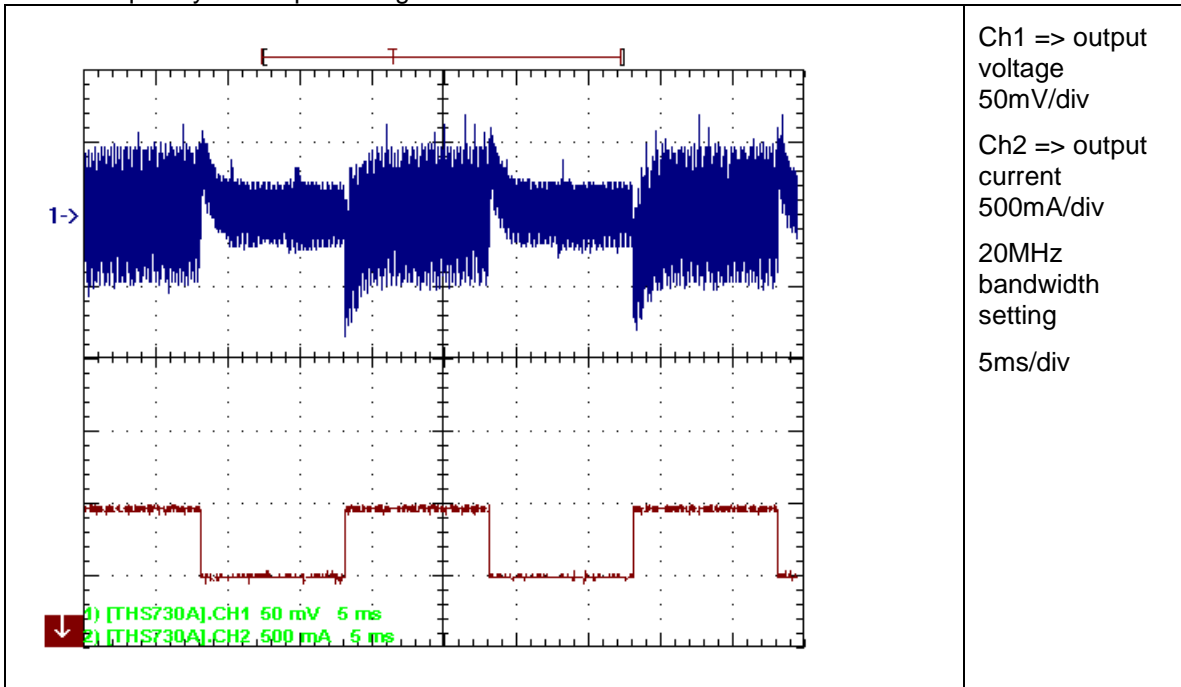


Figure 15

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The Figure 16 shows the response to load transients. The load is switching from 0.5A to 1A. with 50Hz frequency. The input voltage was set to 16V

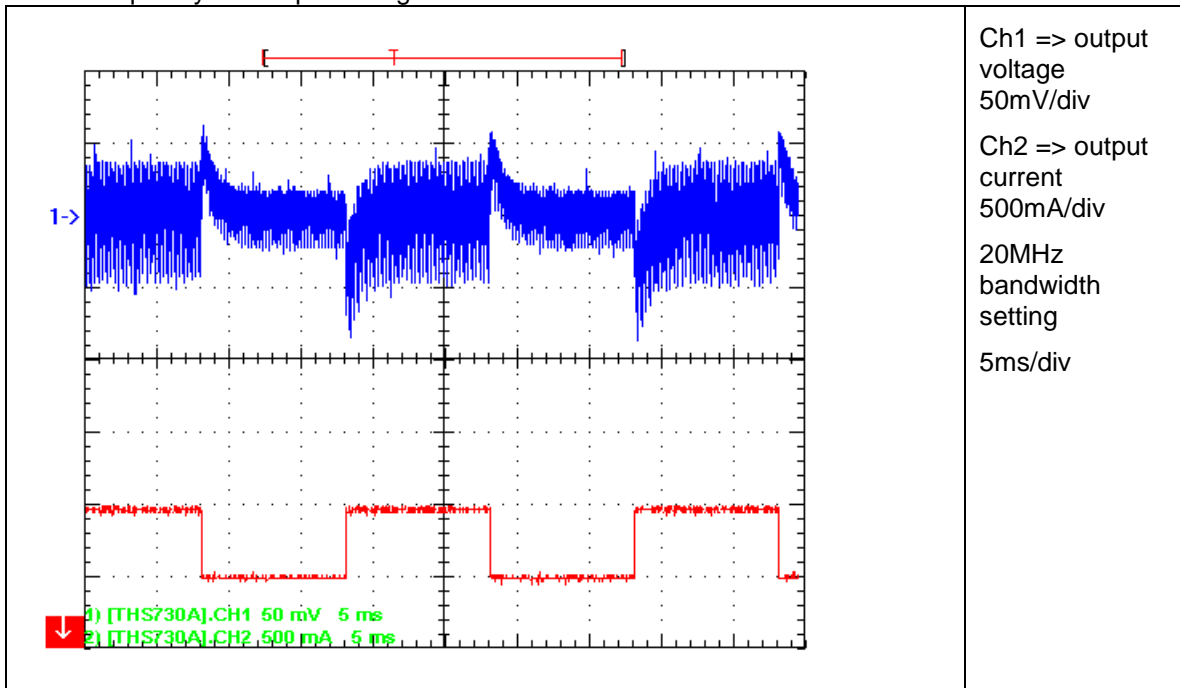


Figure 16

9 Miscellaneous Waveforms

9.1 Switch node 1 (D3)

With input voltage set to 8V and 1A lout results in the waveform shown in Figure 17

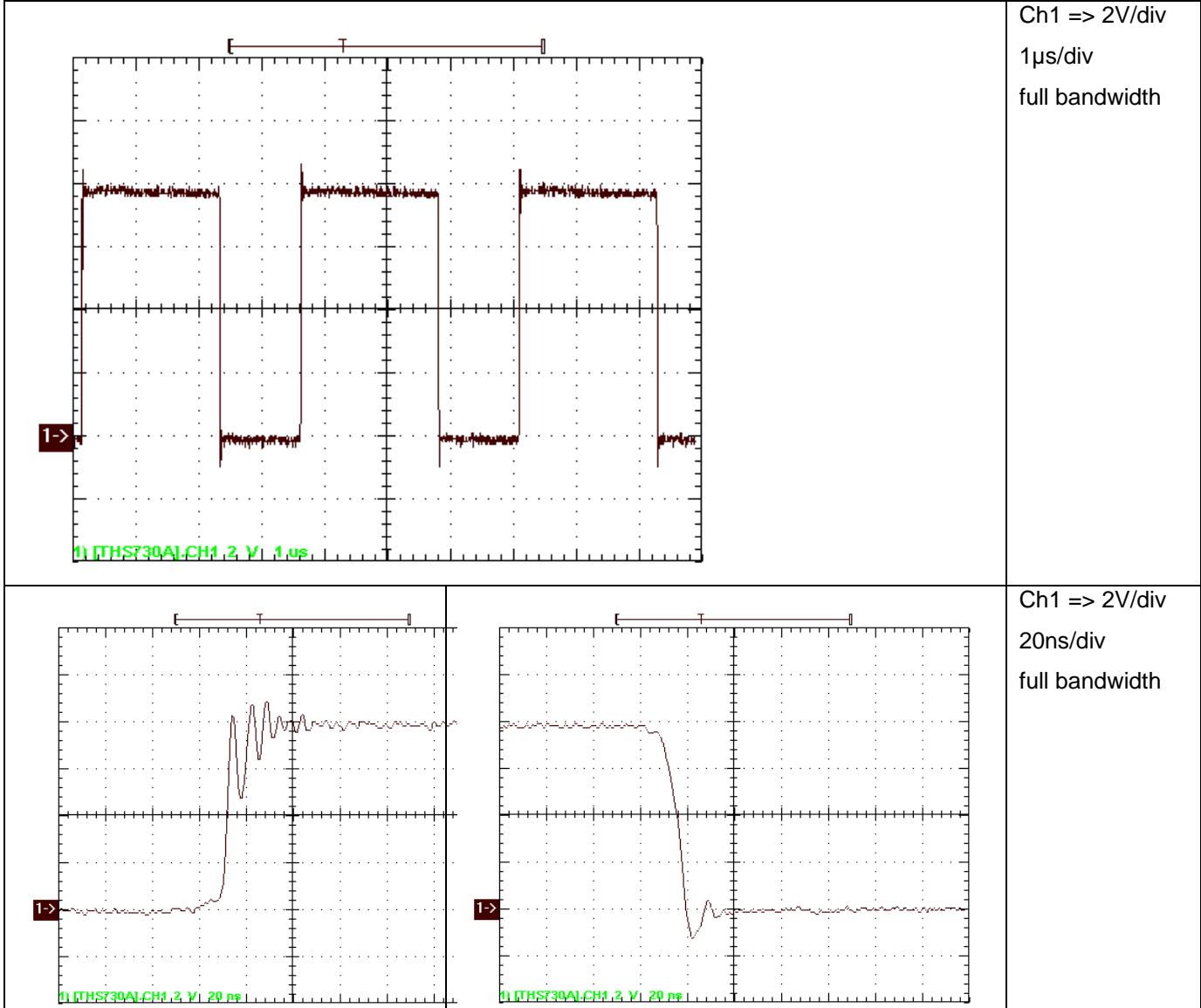


Figure 17

With input voltage set to 12V and 1A lout results in the waveform shown in Figure 18

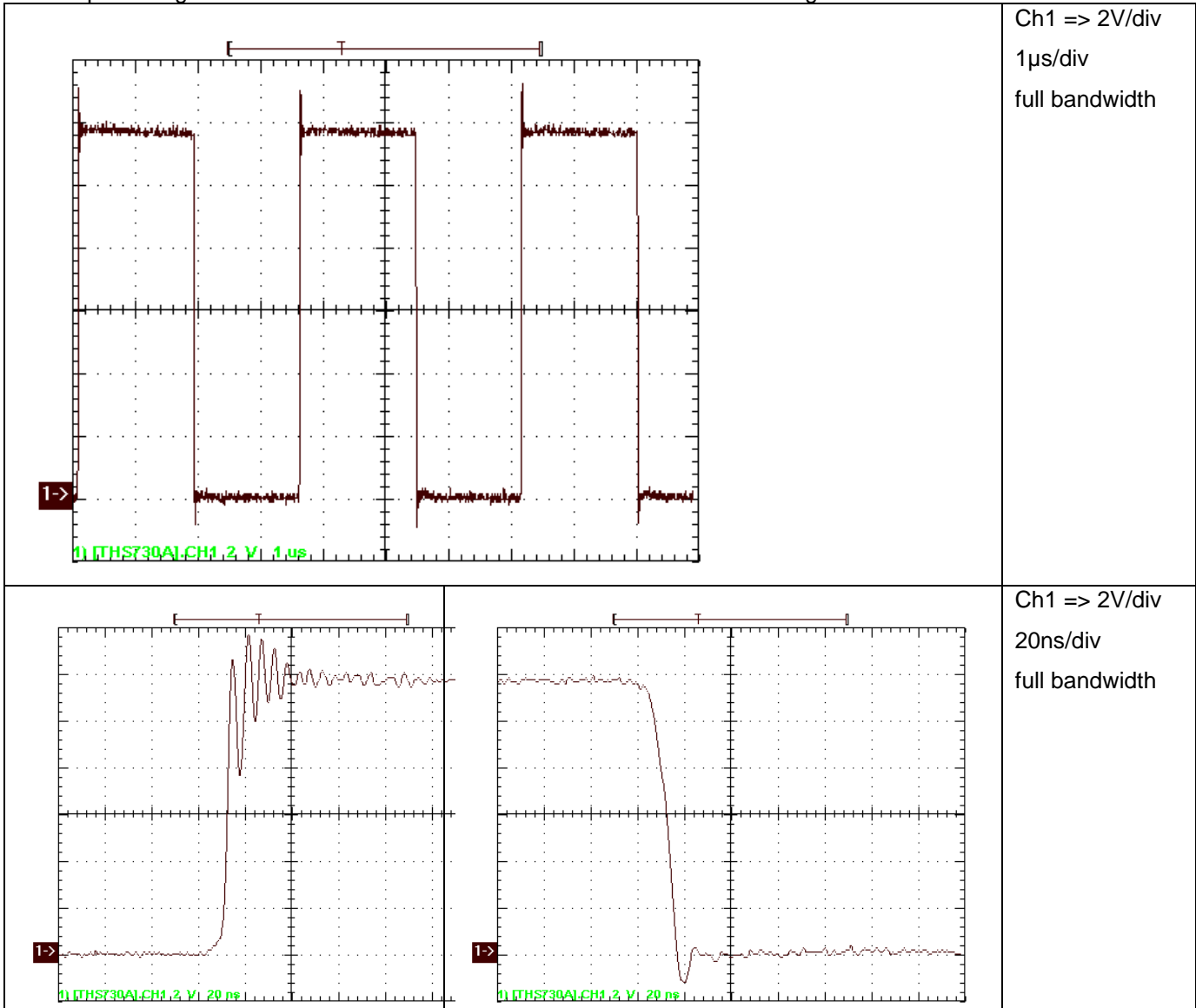


Figure 18

With input voltage set to 16V and 1A lout results in the waveform shown in Figure 19

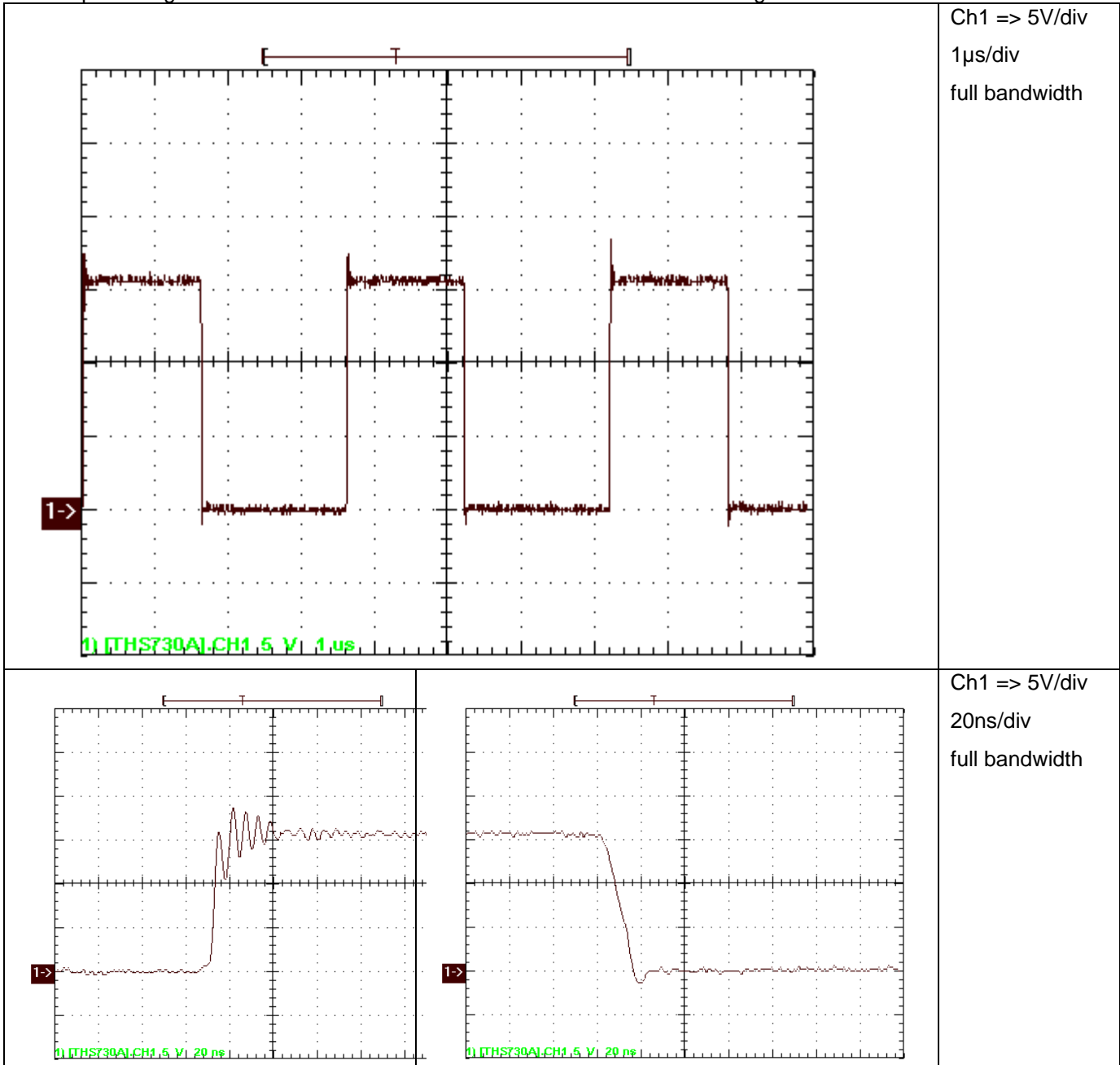


Figure 19

9.2 Switchnode 2 (Q3 d/s)

With input voltage set to 8V and 1A lout results in the waveform shown in Figure 20

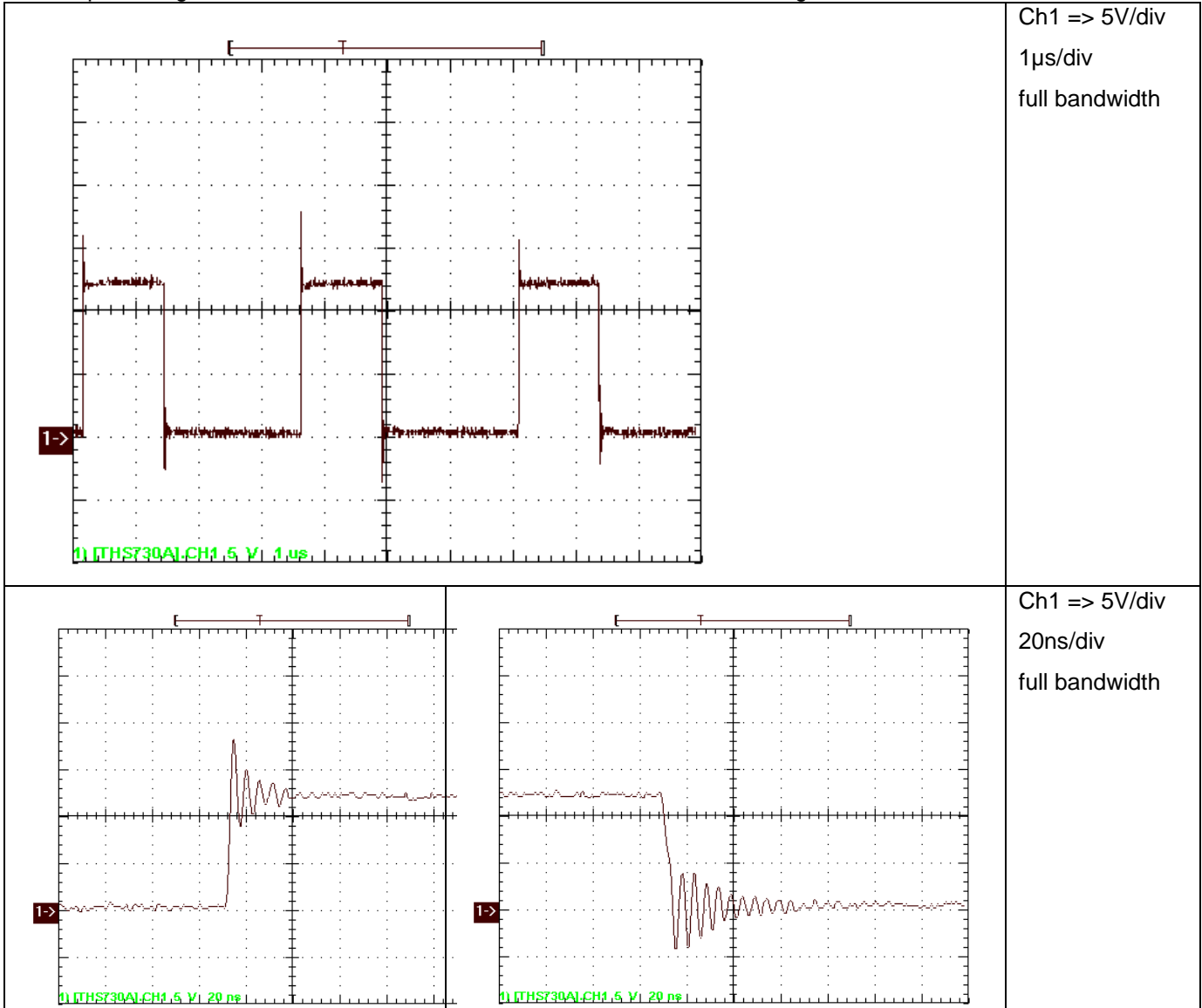


Figure 20

With input voltage set to 12V and 1A Iout results in the waveform shown in Figure 21

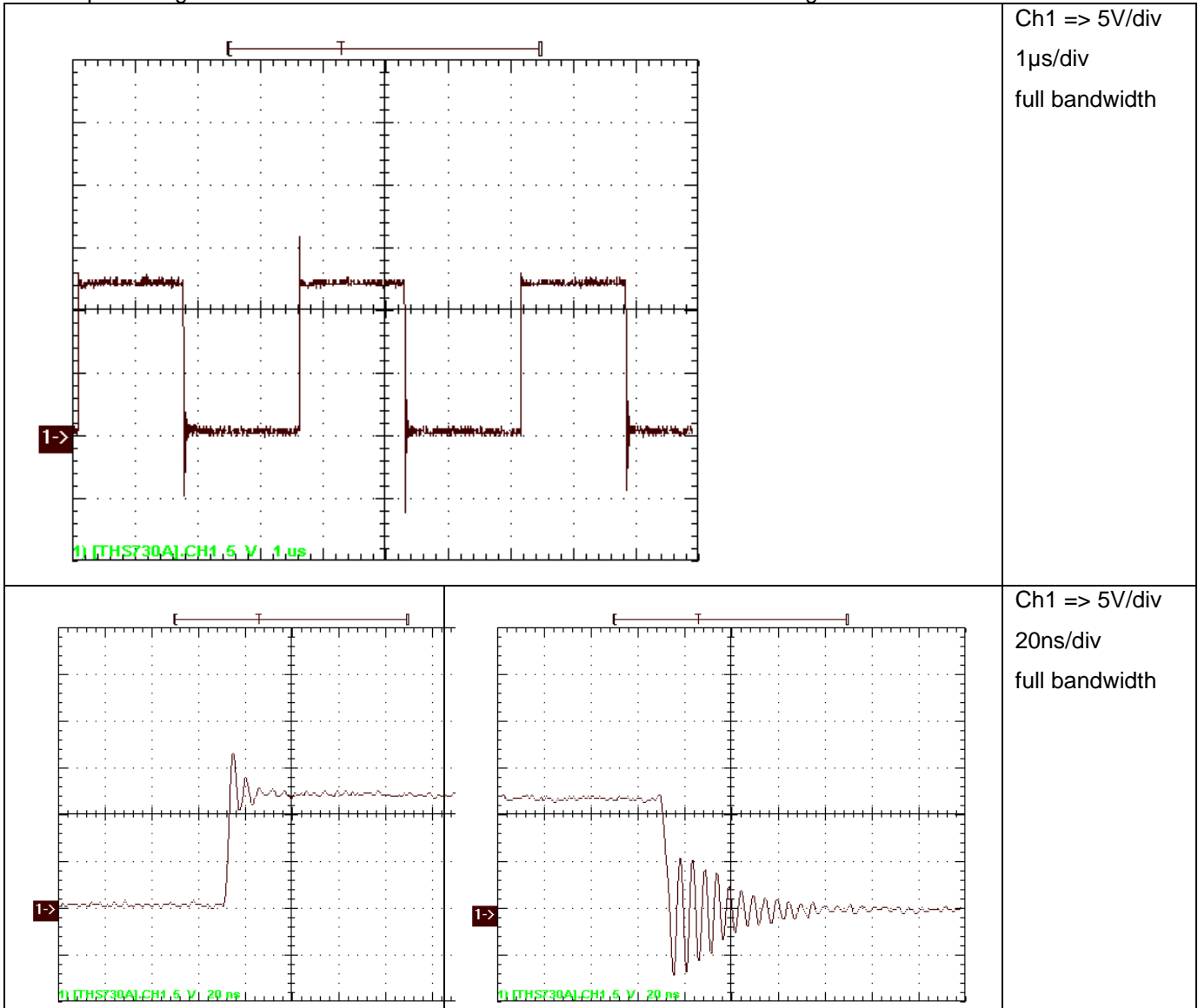


Figure 21

With input voltage set to 16V and 1A lout results in the waveform shown in Figure 22

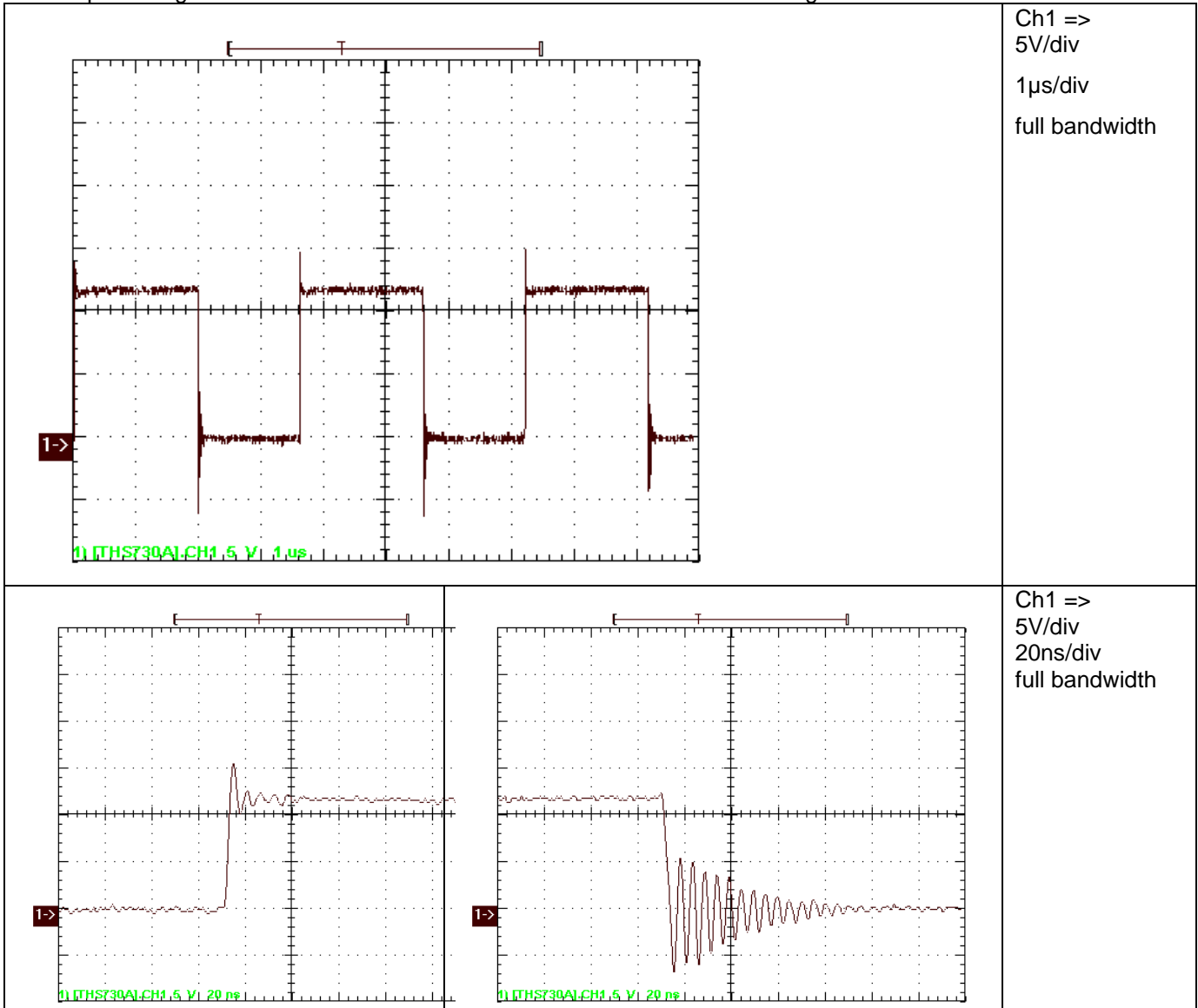


Figure 22

10 Thermal Image

10.1 0.5A Output Current @ 12V Input

Figure 23 shows the thermal image at 12V input and 0.5A output

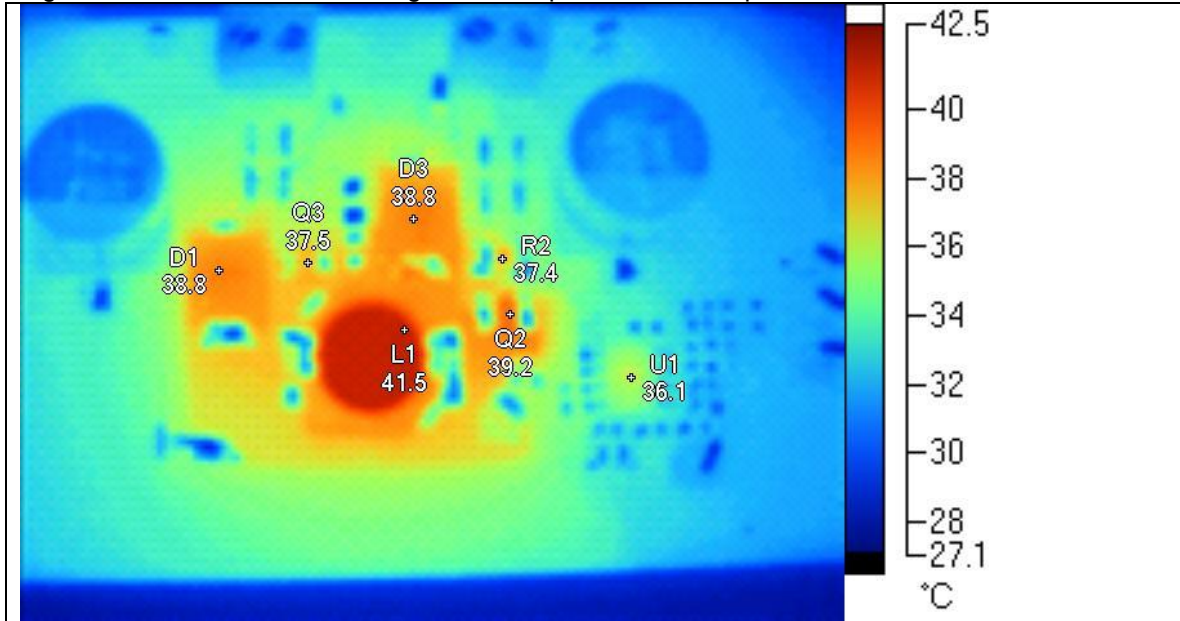


Figure 23

Name	Temperature
L1	41.5°C
D1	38.8°C
D3	38.8°C
Q2	39.2°C
R2	37.4°C
U1	36.1°C
Q3	37.5°C

Table 2

10.2 1A Output Current @ 12V Input

Figure 24 shows the thermal image at 12V input and 1A output

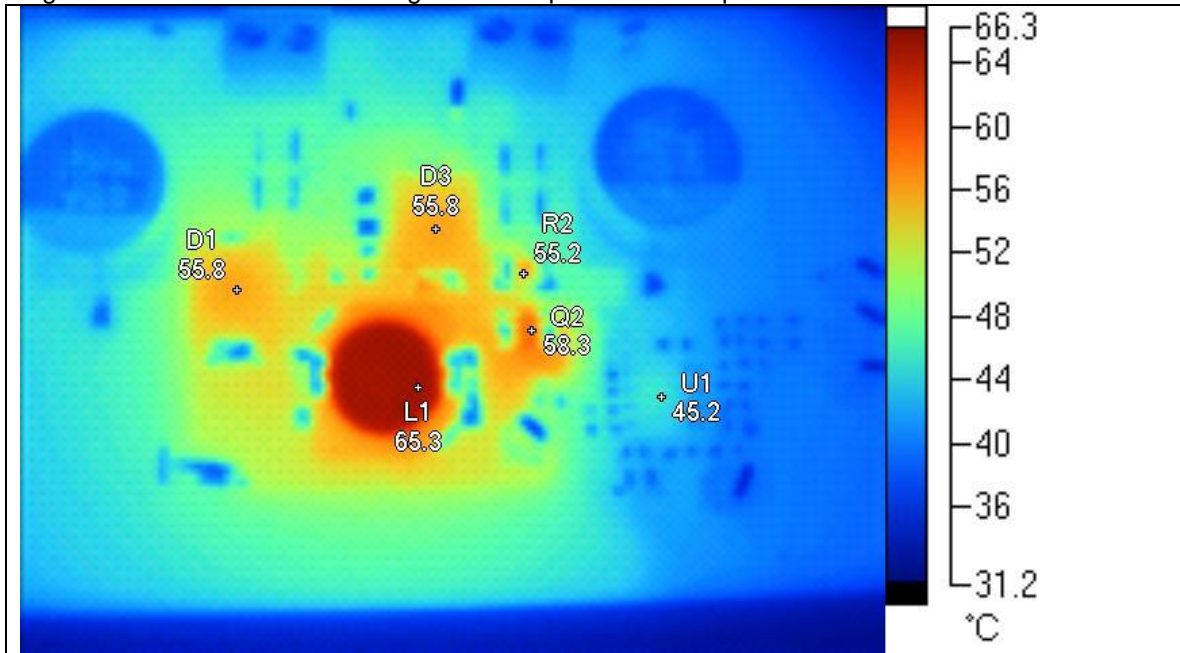


Figure 24

Name	Temperature
L1	65.3°C
Q2	58.3°C
U1	45.2°C
R2	55.2°C
D1	55.8°C
D3	55.8°C

Table 3

10.3 bottom side

Figure 25 shows the thermal image at 40V input and 21A output

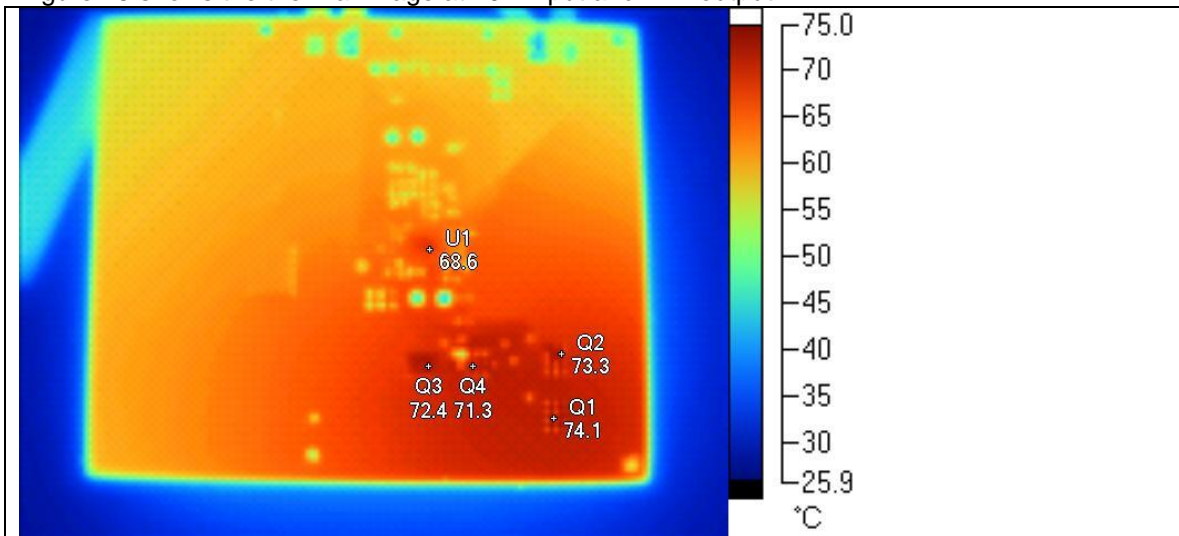


Figure 25

Name	Temperature
Q1	74.1°C
Q2	73.3°C
Q3	72.4°C
Q4	71.3°C
U1	68.6°C

Table 4

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