1 Startup

The startup waveform with input voltage=5V is shown in Figure 1. A load of 4A was applied at the output.

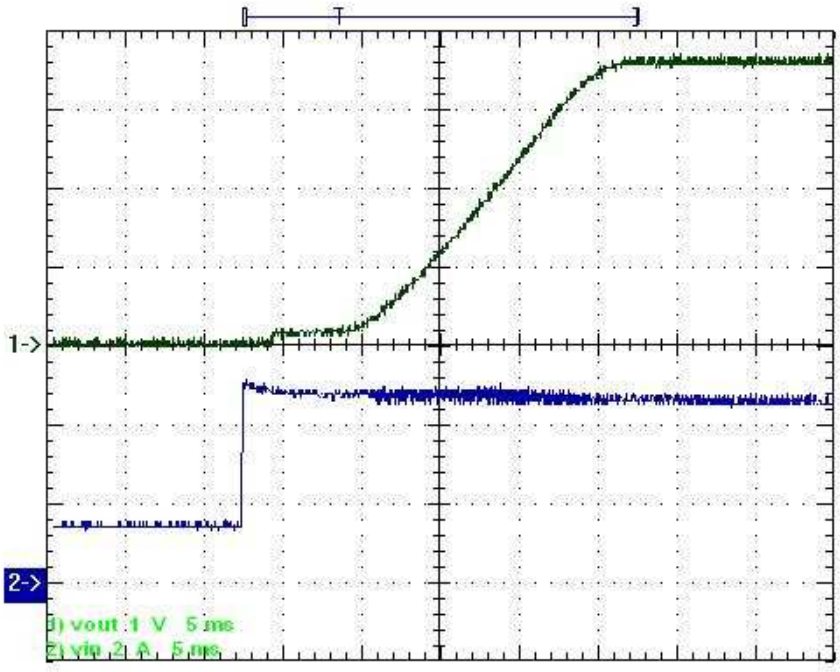


Figure 1

Channel C2: input voltage 2V/div

Channel C1: output voltage 1V/div

Time Base: 5ms/div

The startup waveform with input voltage=11.5V is shown in Figure 2. A load of 4A was applied at the output.

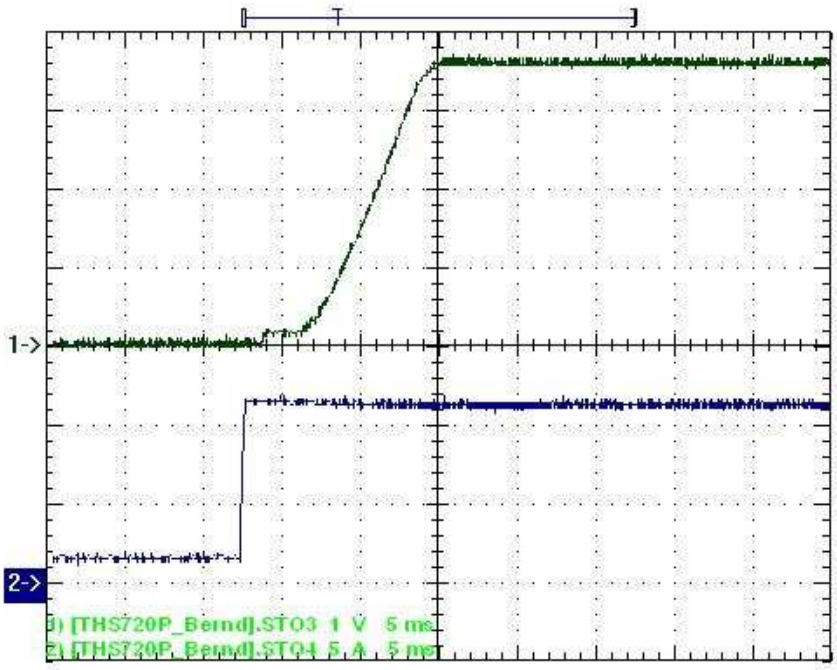


Figure 2

Channel C2: input voltage 5V/div

Channel C1: output voltage 1V/div

Time Base: 5ms/div

The startup waveform with input voltage=18V is shown in Figure 3. A load of 4A was applied at the output.

Channel C2: input voltage 10V/div

Channel C1: output voltage 1V/div

Time Base: 5ms/div

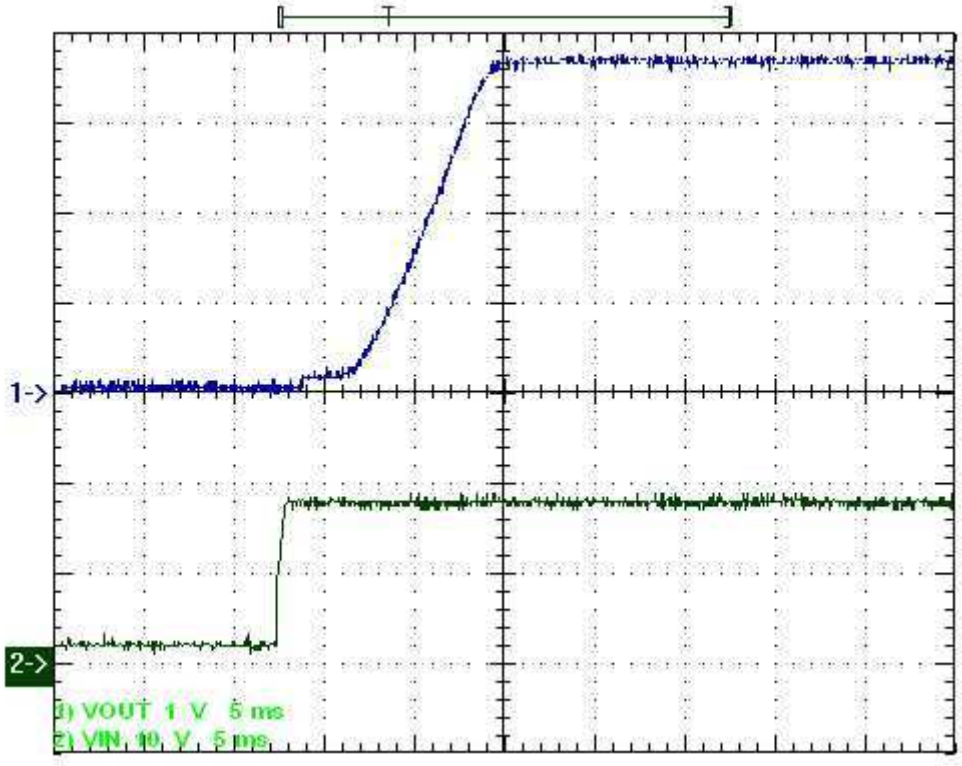
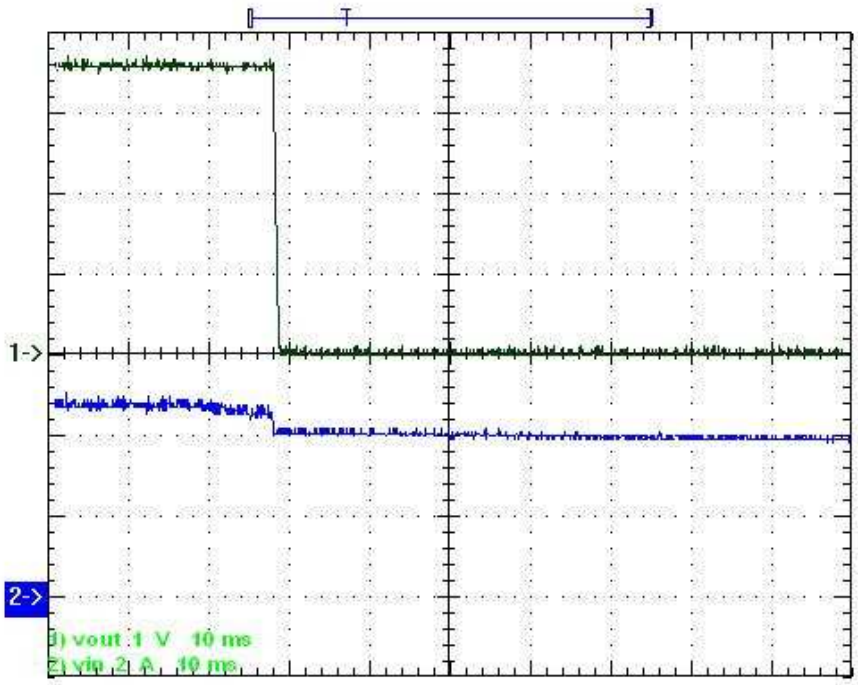


Figure 3

2 Shut down

The shut down waveform with input voltage=5V is shown in Figure 4. A load of 4A was applied



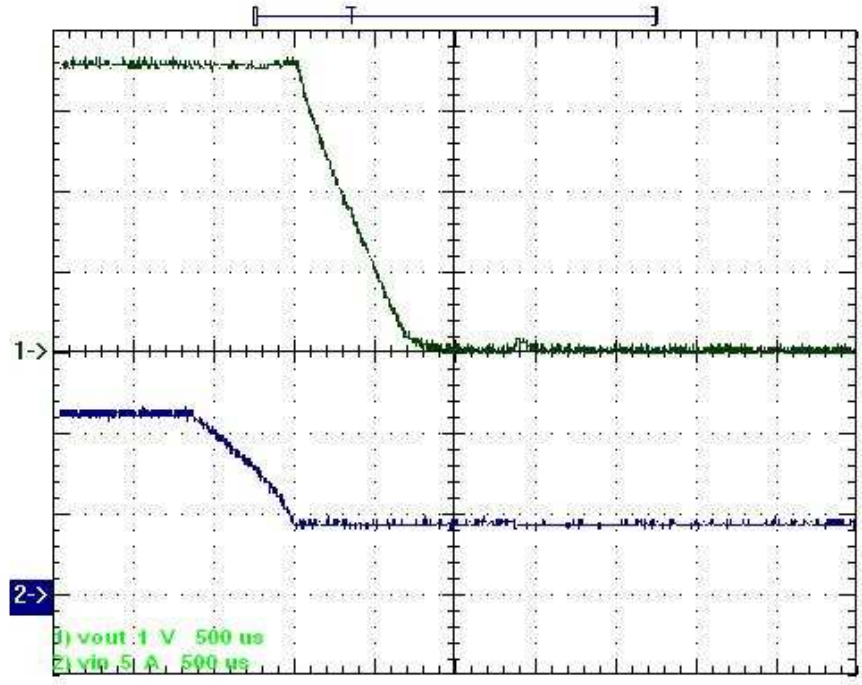
Channel C2: input voltage 2V/div

Channel C1: output voltage 1V/div

Time Base: 10ms/div

Figure 4

The shut down waveform with input voltage=5V is shown in Figure 5. A load of 4A was applied



Channel C2: input voltage 5V/div

Channel C1: output voltage 1V/div

Time Base: 500µs/div

Figure 5

The shut down waveform with input voltage=18V is shown in Figure 6. A load of 4A was applied

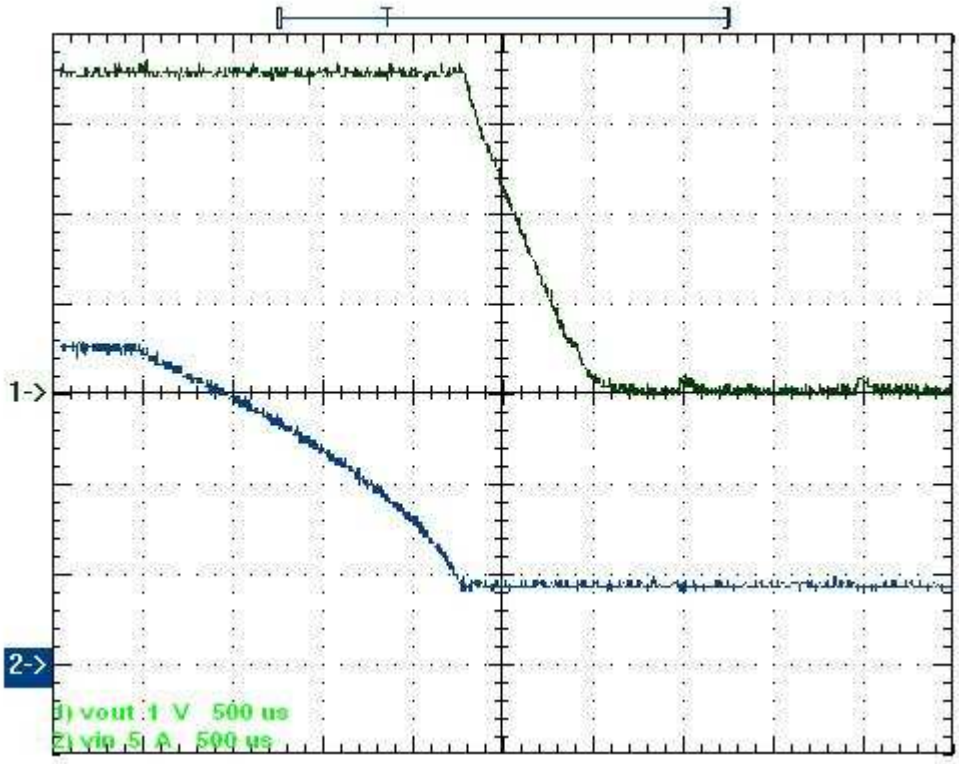


Figure 6

Channel C2: input voltage 5V/div

Channel C1: output voltage 1V/div

Time Base: 500µs/div

3 Efficiency

The efficiency is shown in Figure 7.

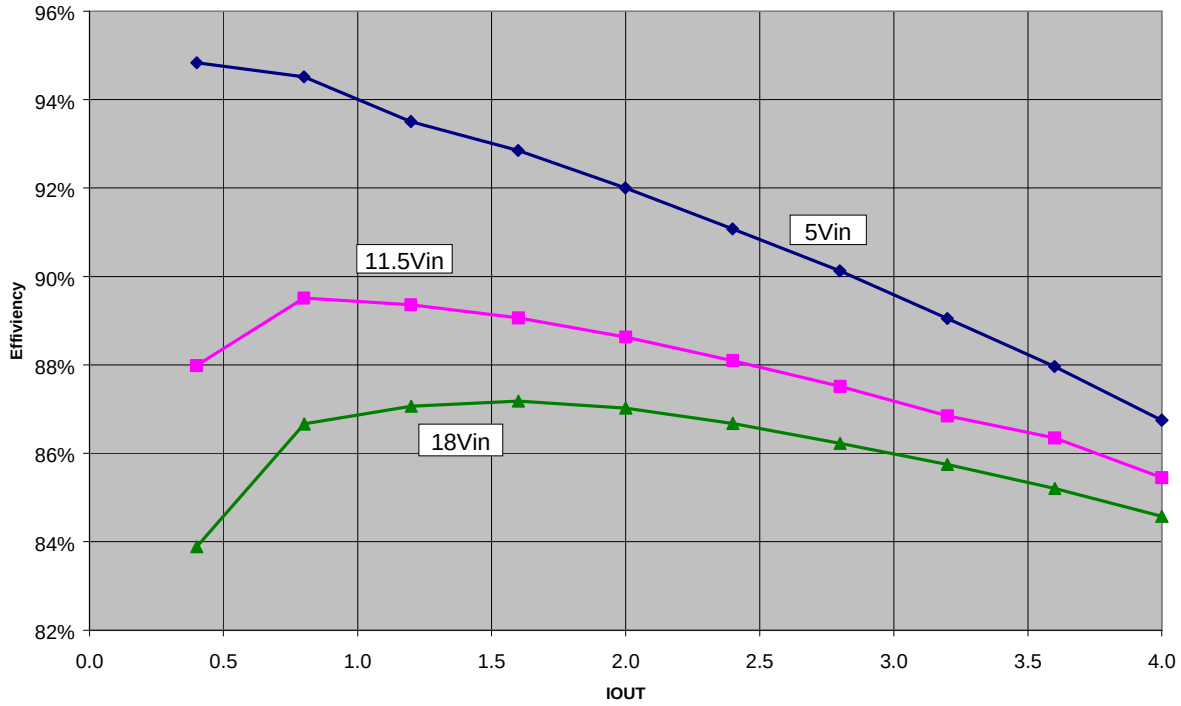


Figure 7

4 Load Regulation

The output power with different input voltages is shown in Figure 8

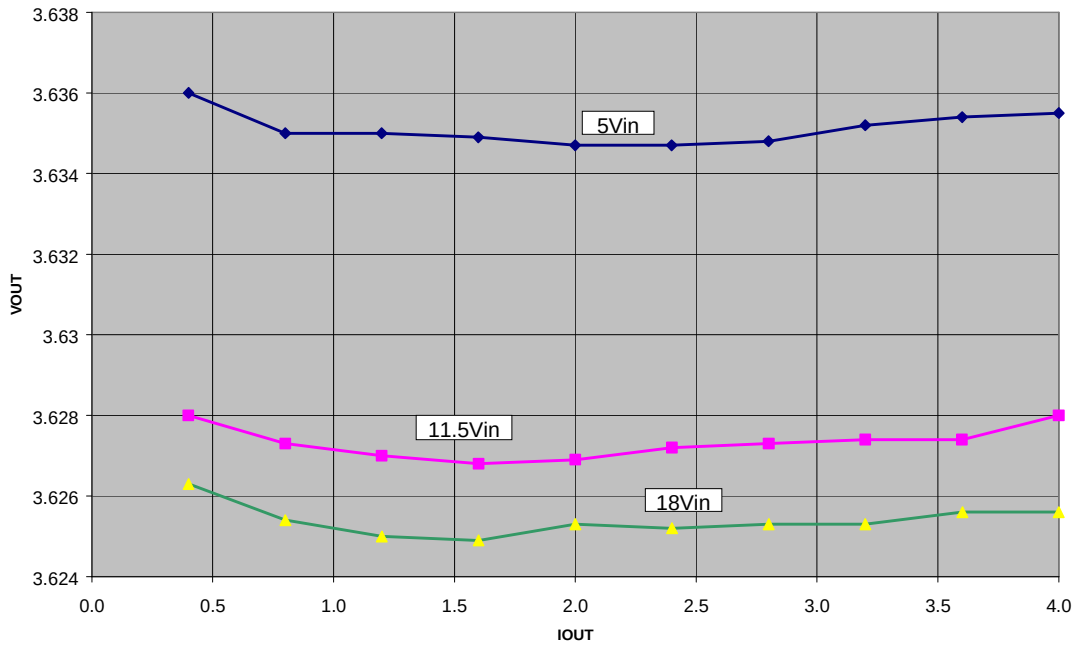
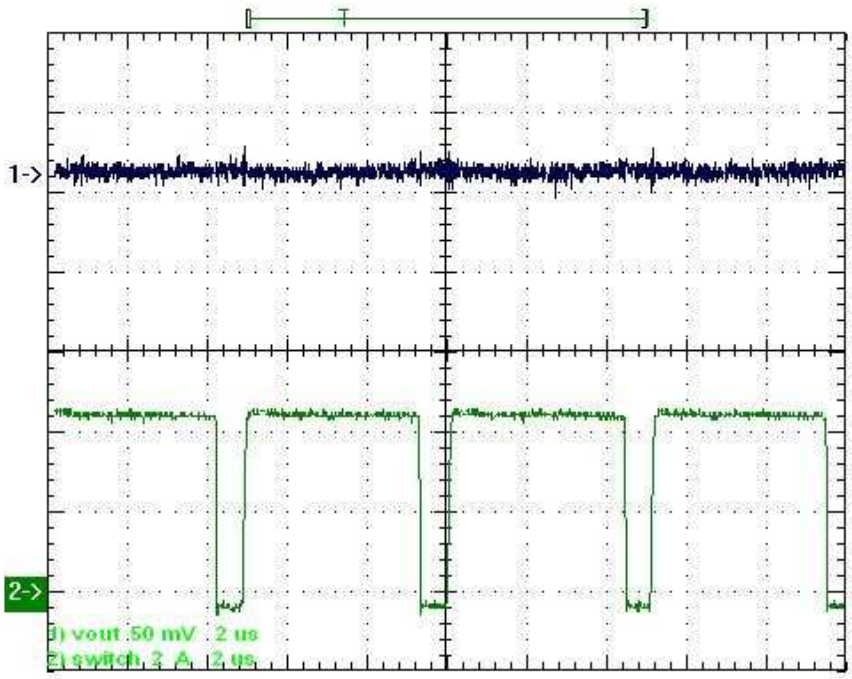


Figure 8

5 Output ripple voltage

The output ripple voltage at 5V input voltage with a load of 4A is displayed in Figure 9. Output voltage was measured directly at C12. The waveform was taken with AC-coupled and with full bandwidth.



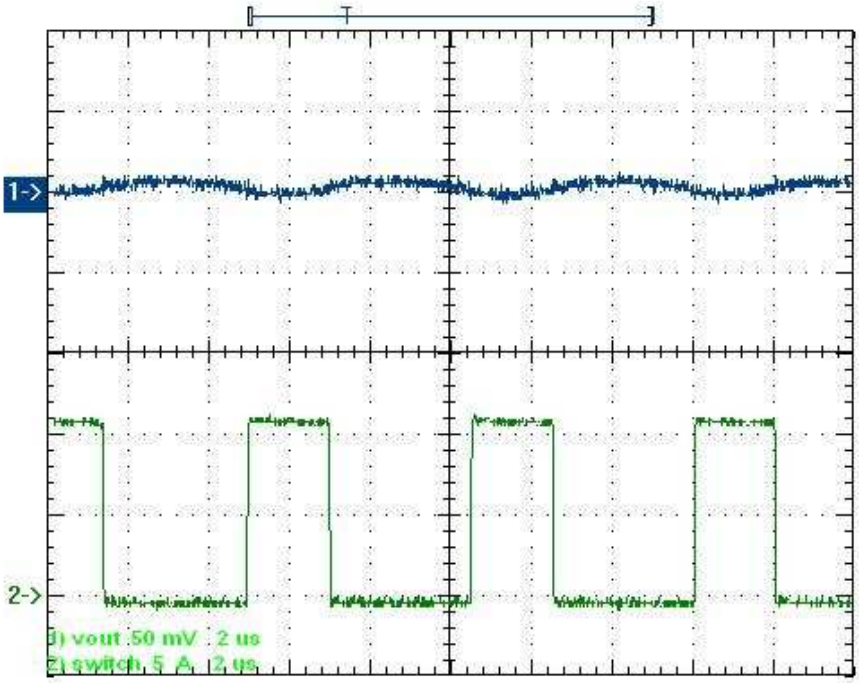
Channel C2: voltage at switch node 2V/div

Channel C1: output voltage (C12) 50mV/div

Time Base: 2µs/div

Figure 9

The output ripple voltage at 11.5V input voltage with a load of 4A is displayed in Figure 10. The waveform was taken with AC-coupled and with 20MHz bandwidth.



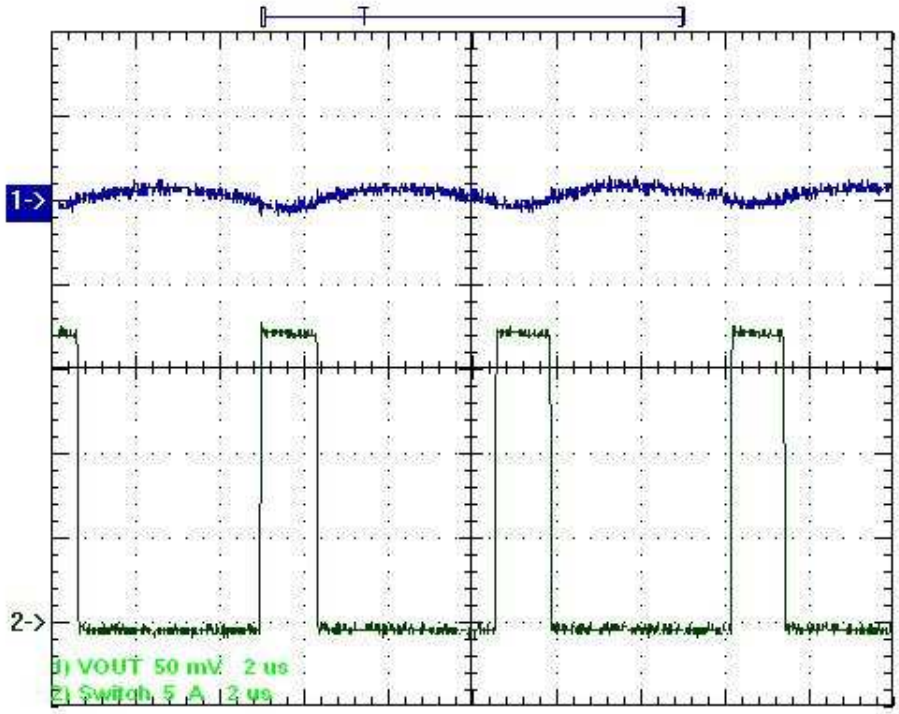
Channel C2: voltage at switch node 5V/div

Channel C1: output voltage (C12) 50mV/div

Time Base: 2µs/div

Figure 10

The output ripple voltage at 18V input voltage with a load of 4A is displayed in Figure 11. The waveform was taken with AC-coupled and with 20MHz bandwidth.



Channel C2: voltage at switch node 5V/div

Channel C1: output voltage (C12) 50mV/div

Time Base: 2µs/div

Figure 11

6 Frequency response

Figure 12 shows the loop response with 4A load.

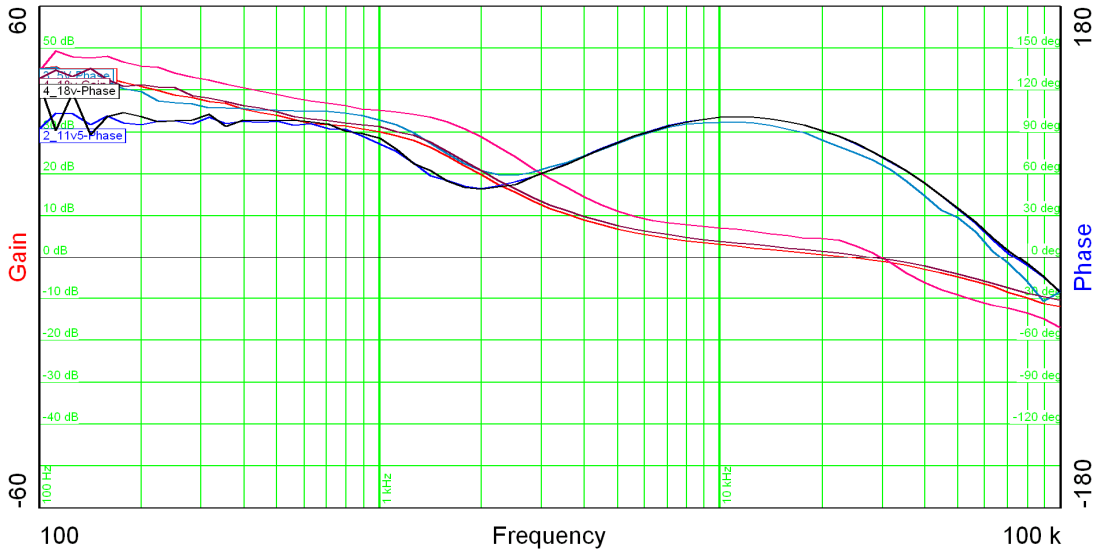


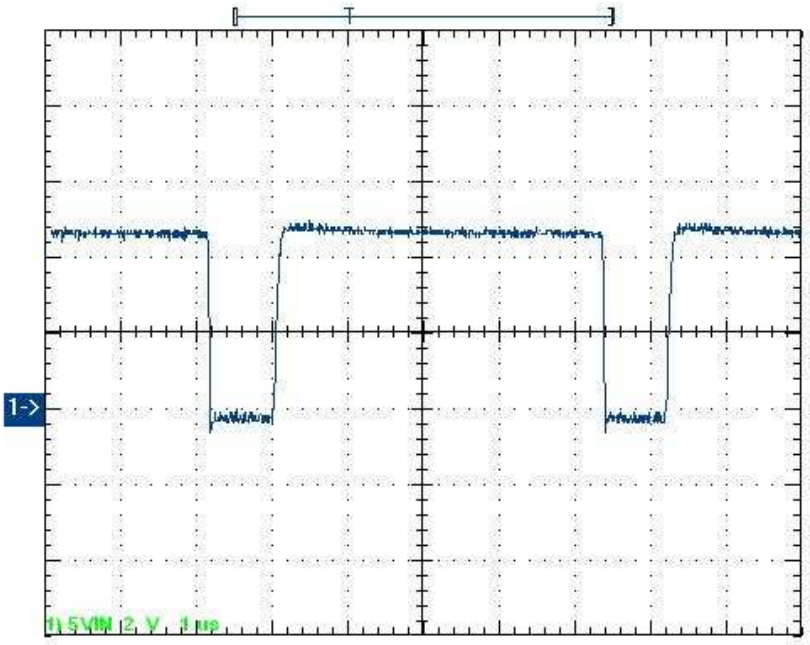
Figure 12

VIN	5V	11.5V	18V
fco	29.7kHz	23.84kHz	28.05kHz
Phasemargin	66.5°	83.9°	75.9°
gainmargin	-11.9dB	-8.9dB	-8.1dB

Table 1

7 Miscellaneous waveforms

The voltage on the switch node is shown in Figure 13 @ 4A Iout and 5V input voltage (with 20MHz bandwidth) (fsw ~ 180kHz D ~ 80%)

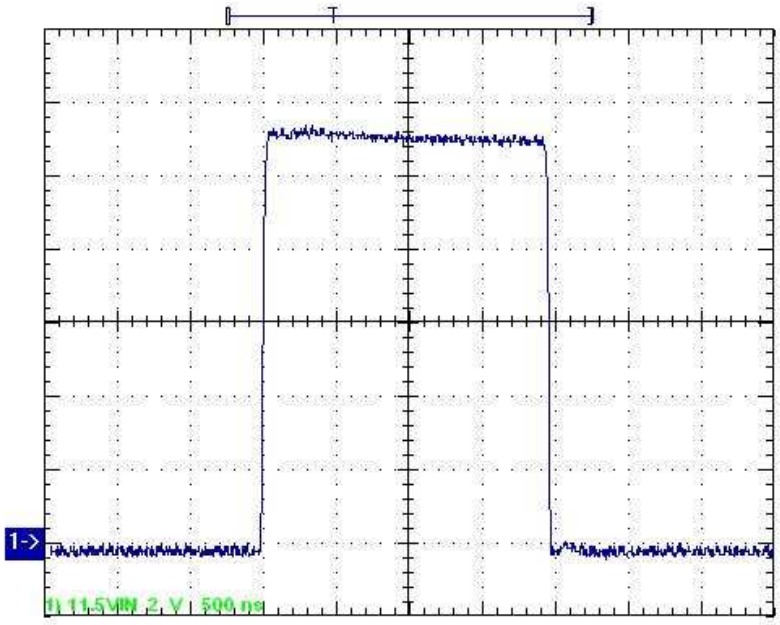


Channel C1:
voltage at switch node
2V/div

Time Base:
1µs/div

Figure 13

The voltage on the switch node is shown in Figure 14 @ 4A Iout and 11.5V input voltage (with 20MHz bandwidth) (D ~ 35%)

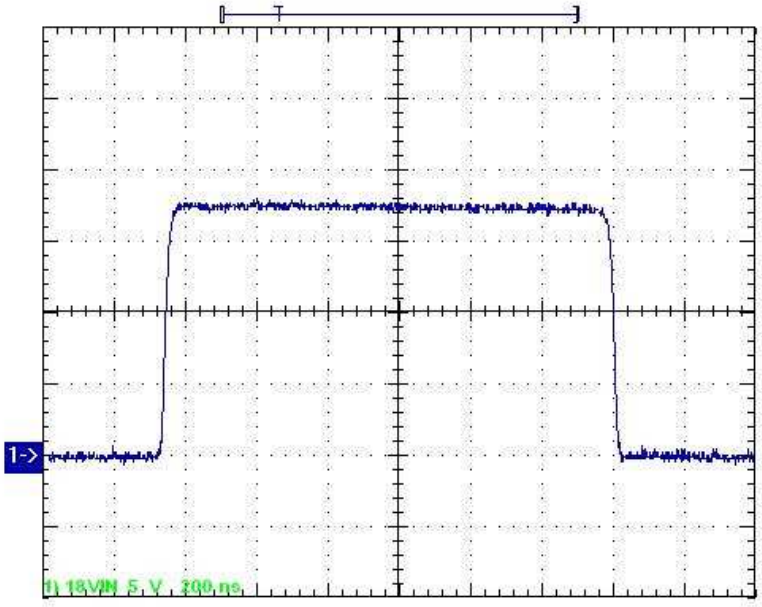


Channel C1:
voltage at switch node
2V/div

Time Base:
500ns/div

Figure 14

The voltage on the switch node is shown in Figure 15 @ 4A Iout and 18V input voltage (with 20MHz bandwidth) (D ~ 23%)



Channel C1:
voltage at switch node
2V/div

Time Base:
500ns/div

Figure 15

Figure 20 shows the waveform at switchnode with full bandwidth (18V at the input) Time base was set to 20ns/div

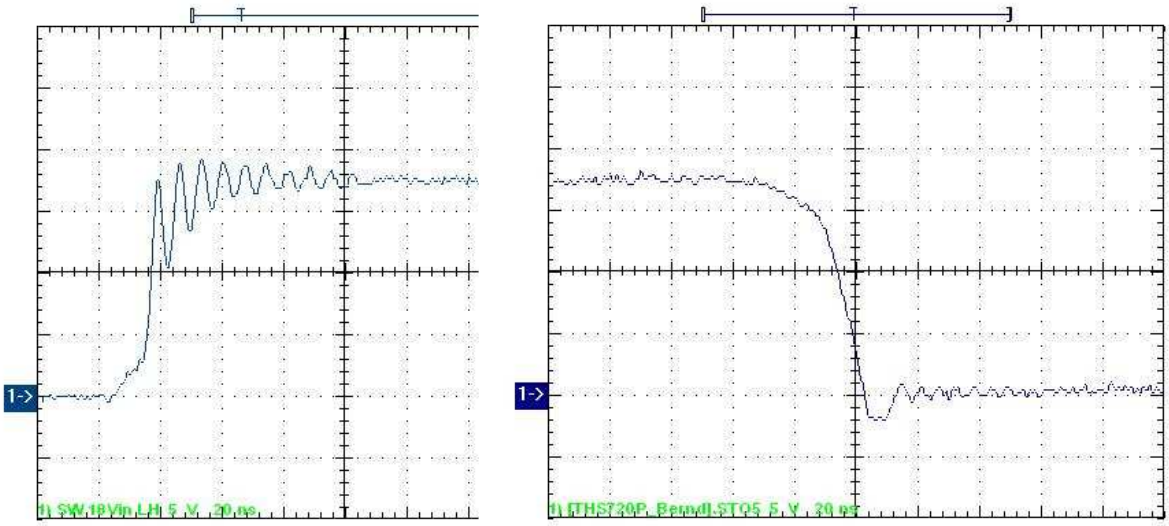


Figure 16

8 Load Transient

The waveforms were taken with a transient from 2A to 4A (100Hz) l.
Figure 21 shows the waveform with 5V input.(Vout measured with 20MHz bandwidth)

Channel C2: output current 2A/div

Channel C1: output voltage (C12) 50mV/div

Time Base: 1ms/div

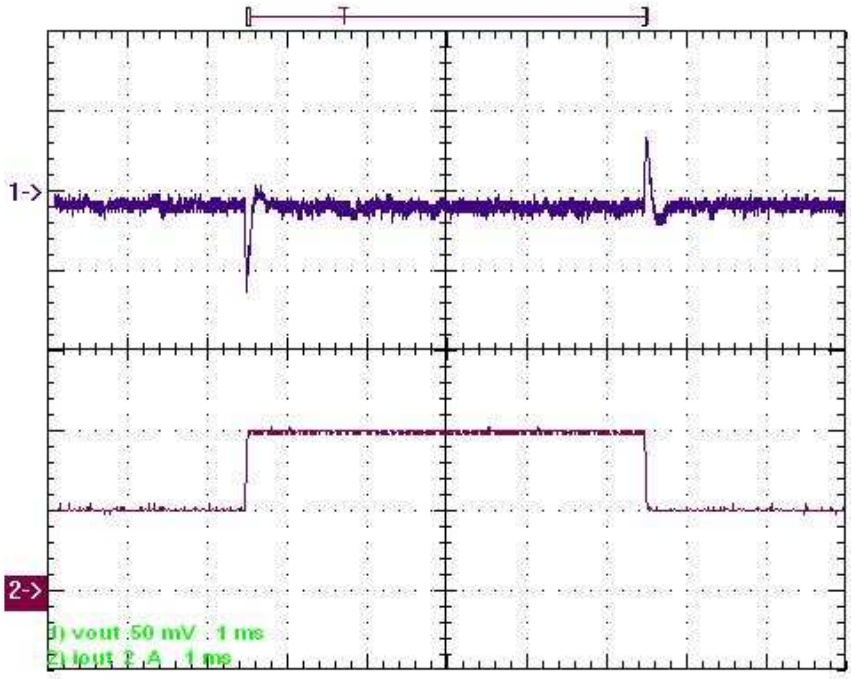


Figure 17

Figure 18 shows the transitions of with time base 100µs/div

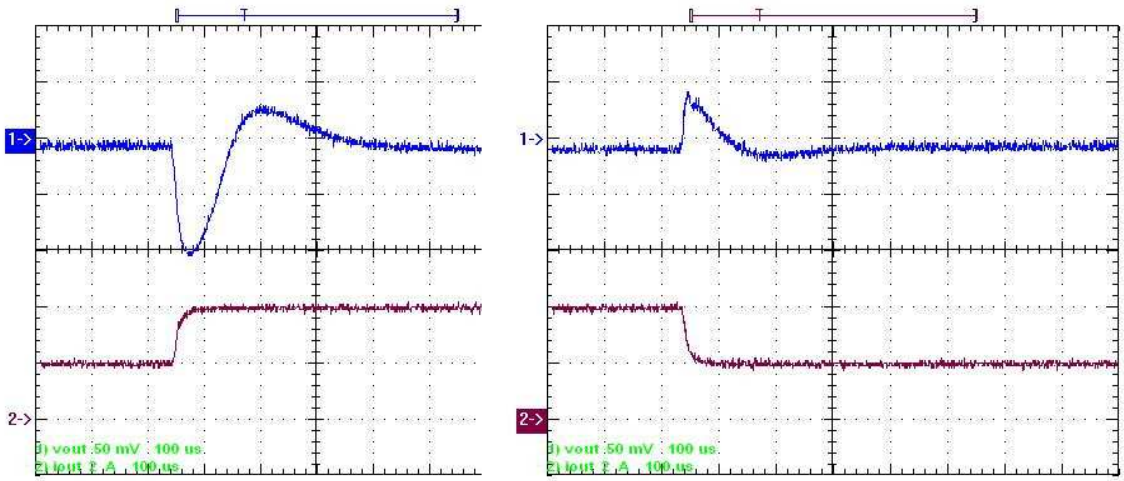


Figure 18

The waveforms were taken with a transient from 2A to 4A (100Hz) l.
Figure 19 shows the waveform with 11.5V input.

Channel C2: output current 2A/div

Channel C1: output voltage (C12) 50mV/div

Time Base: 1ms/div

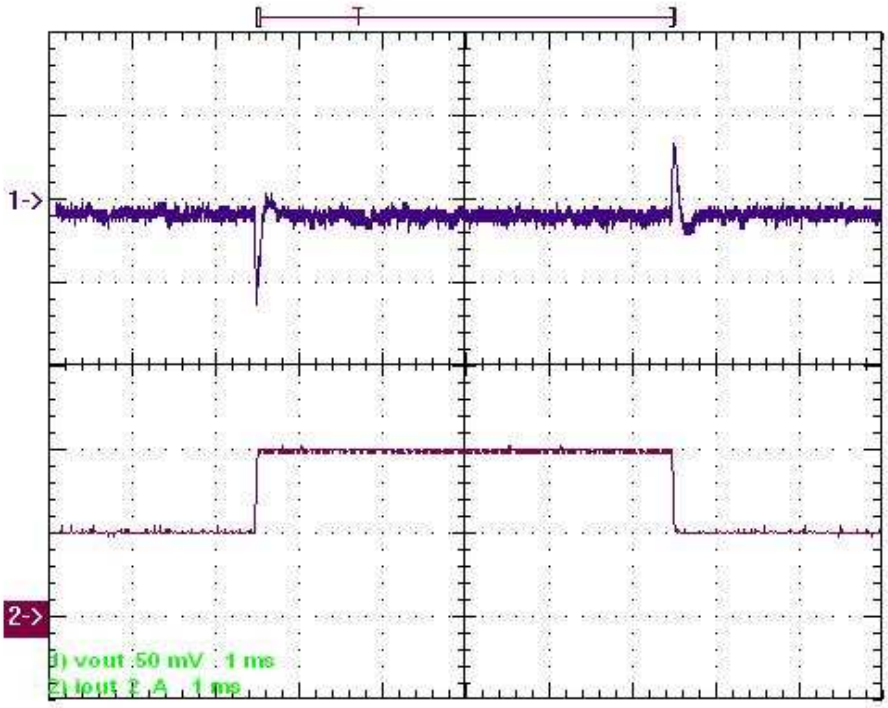


Figure 19

Figure 20 shows the transitions of with time base 100µs/div

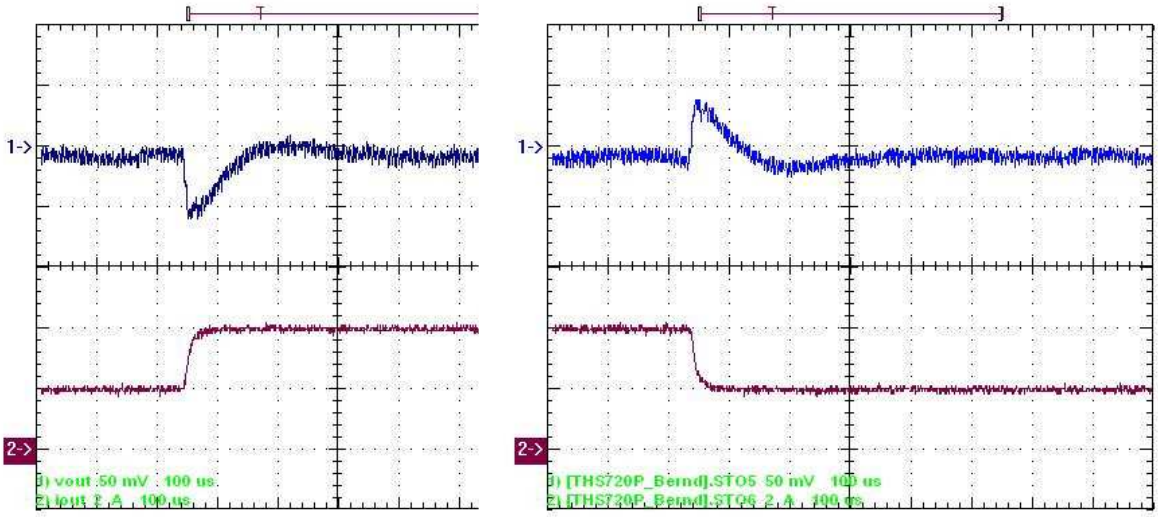


Figure 20

The waveforms were taken with a transient from 2A to 4A (100Hz) l.
Figure 21 shows the waveform with 18V input.

Channel C2: output current 2A/div

Channel C1: output voltage (C12) 50mV/div

Time Base: 1ms/div

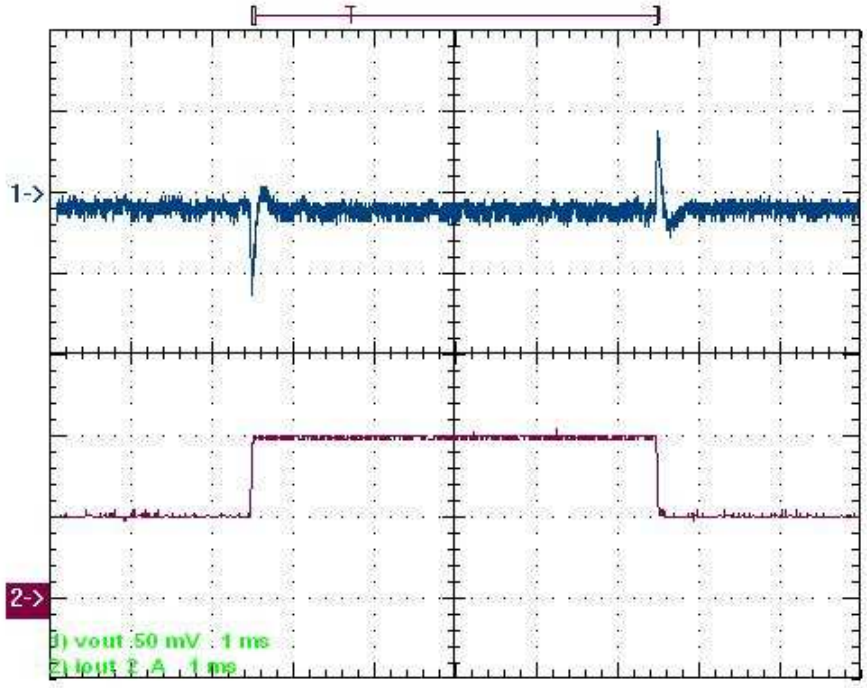


Figure 21

Figure 22 shows the transitions of with time base 100µs/div

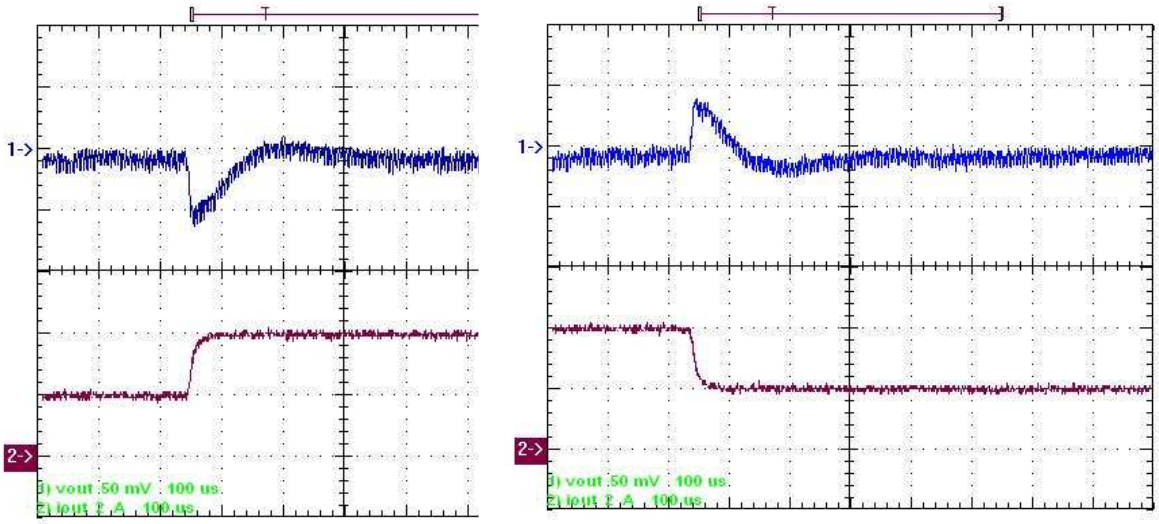


Figure 22

9 Infrared Image

After some minutes with 4A output current the following IR-Image Figure 23 was obtained.

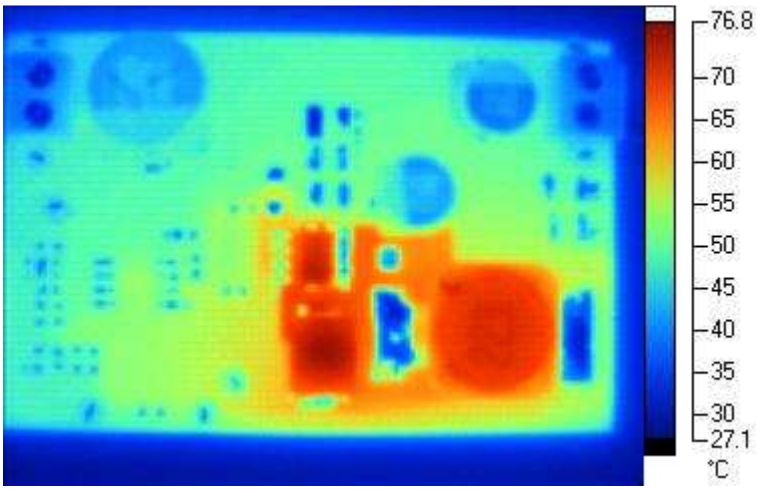


Figure 23

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