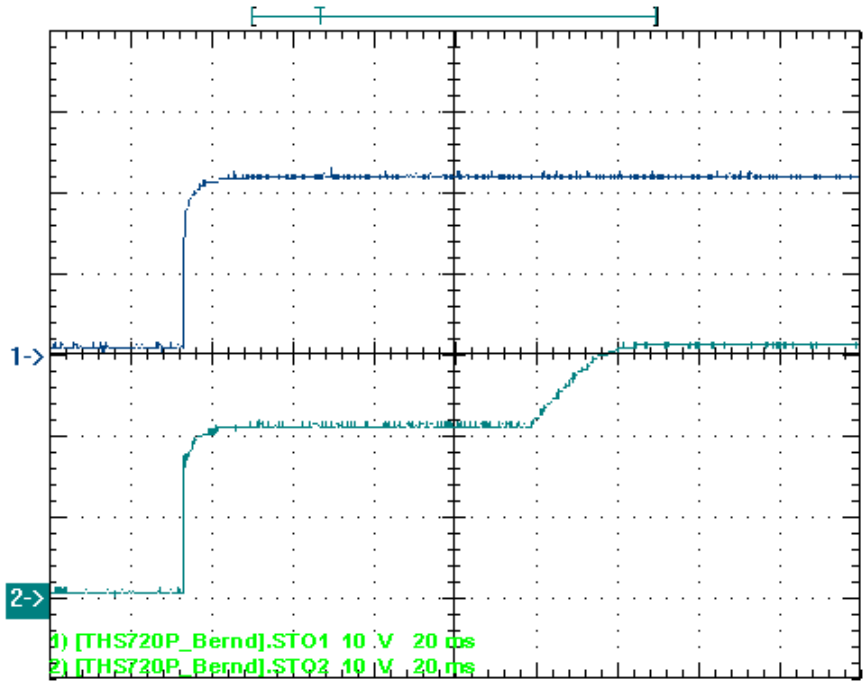
PMP5702RevA Test Results

1 Startup

The startup waveform is shown in the Figure 1. The input voltage was set to 21.6V, with 2.5A load at the output.



Ch2=> input voltage 10V/div

Ch1=> output voltage 10V/div

20ms/div

20MHz bandwidth

Figure 1

The startup waveform is shown in the

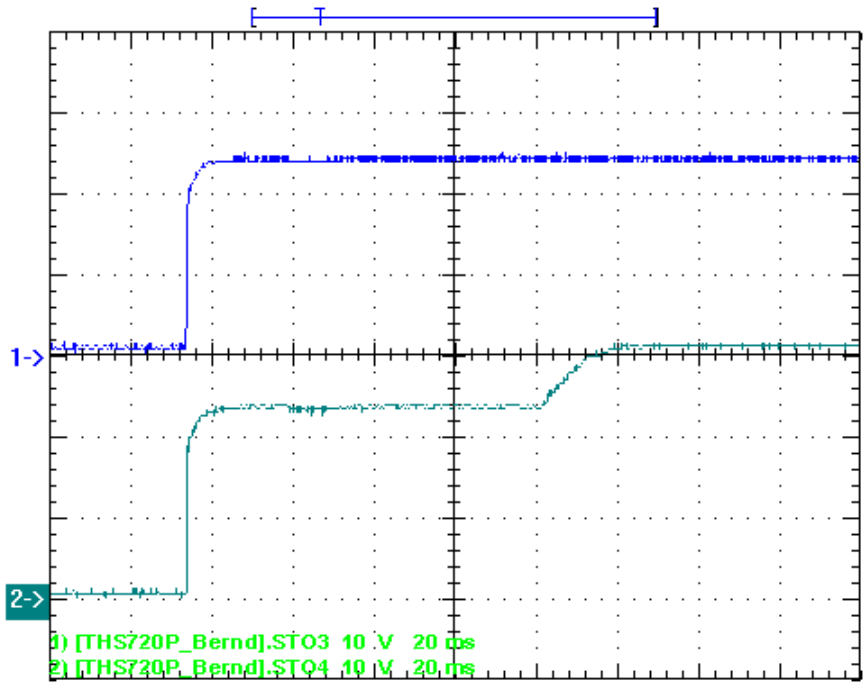


Figure 2. The input voltage was set to 24V, with 2.5A load at the output.

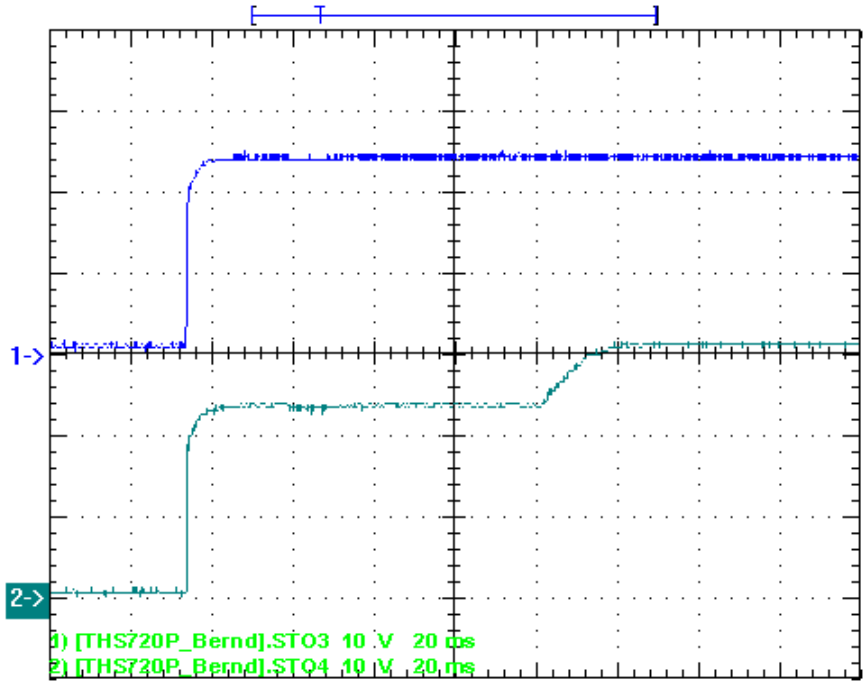


Figure 2

Ch2=> input voltage
10V/div

Ch1=> output voltage
10V/div

20ms/div

20MHz bandwidth

The startup waveform is shown in the Figure 4. The input voltage was set to 26.4V, with 2.5A load at the output.

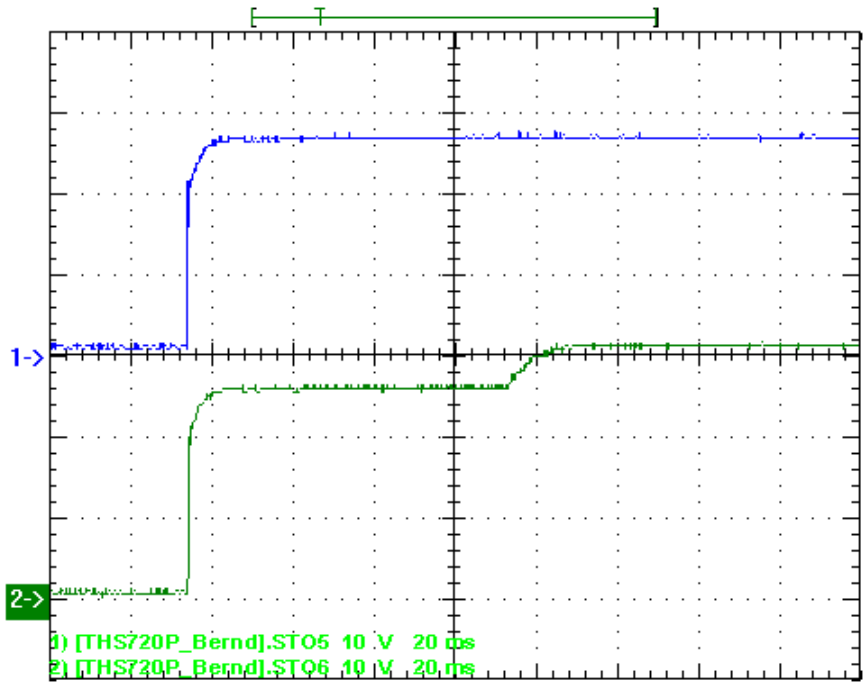


Figure 3

Ch2=> input voltage 10V/div

Ch1=> output voltage 10V/div

20ms/div

20MHz bandwidth

2 Shutdown

The shutdown waveform is shown in the Figure 4 at 21.6V input voltage. With 2.5A load applied at the output.

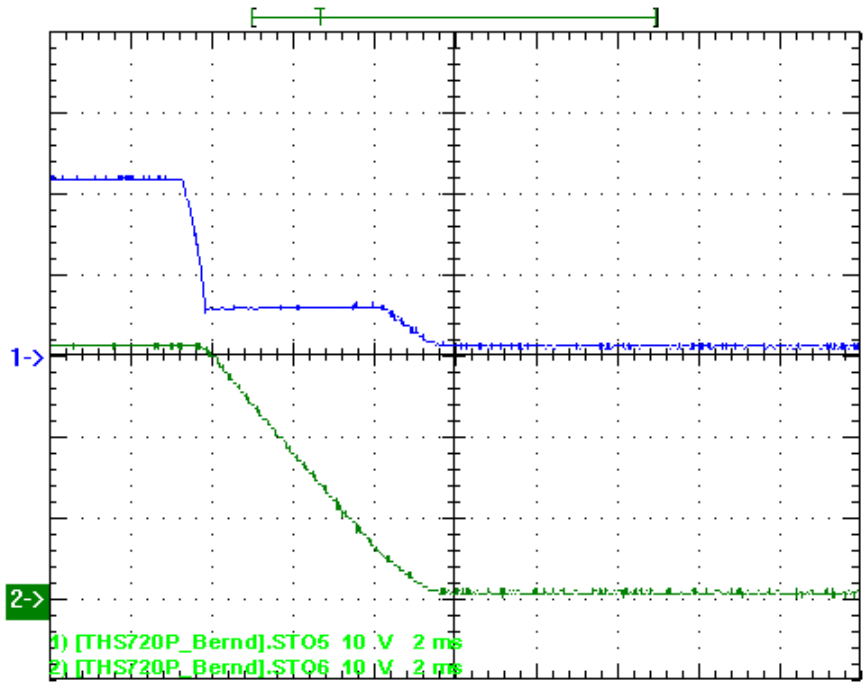


Figure 4

Ch2=> input voltage 10V/div

Ch1=> output voltage 10V/div

2ms/div

20MHz bandwidth

The shutdown waveform is shown in the Figure 5 at 24V input voltage. With 2.5A load applied at the output.

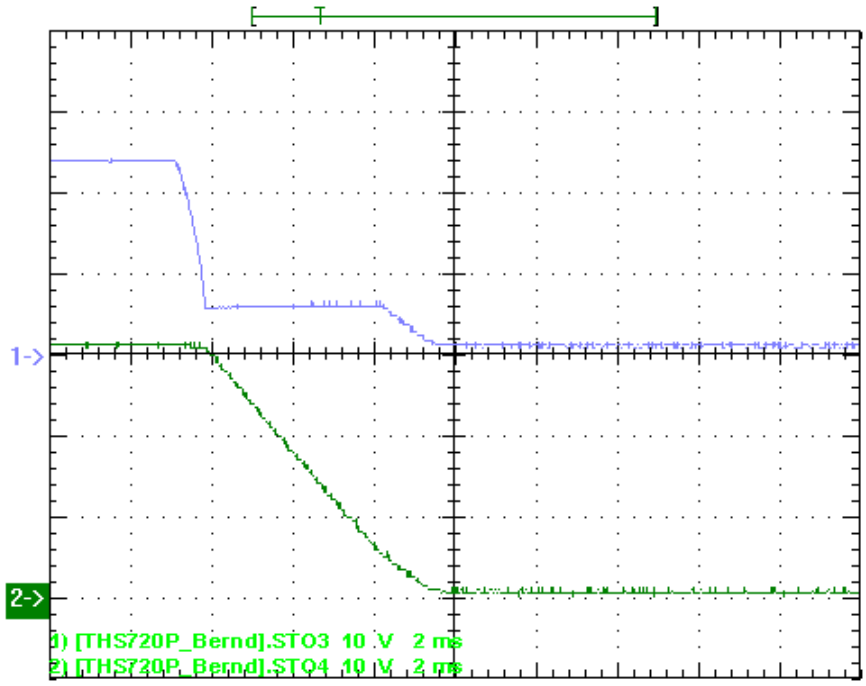


Figure 5

Ch2=> input voltage 10V/div

Ch1=> output voltage 10V/div

2ms/div

20MHz bandwidth

The shutdown waveform is shown in the Figure 6 at 26.4V input voltage. With 2.5A load applied at the output.

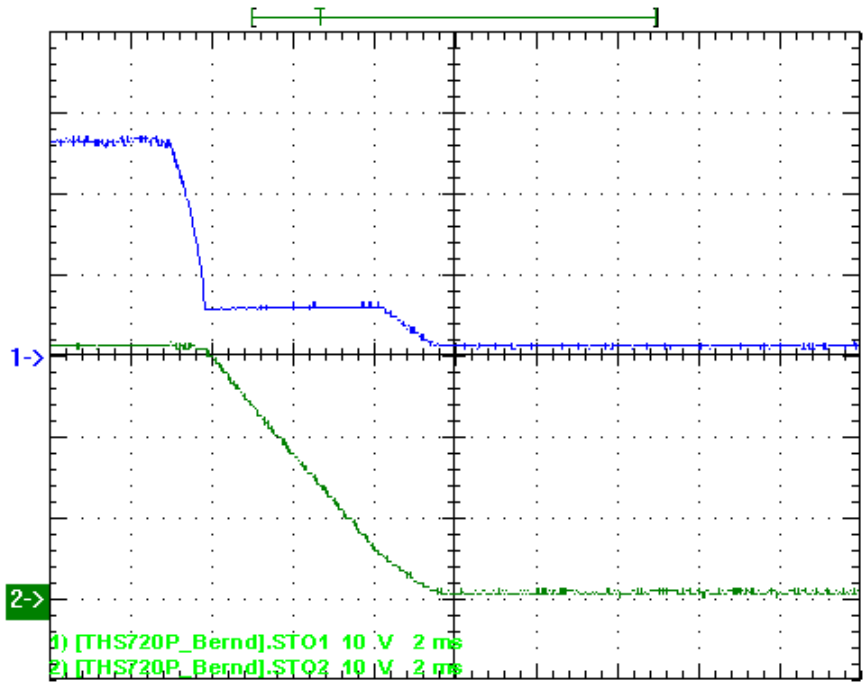


Figure 6

Ch2=> input voltage 10V/div

Ch1=> output voltage 10V/div

2ms/div

20MHz bandwidth

3 Efficiency

The efficiencies with different input voltages are shown in the Figure 7 below.

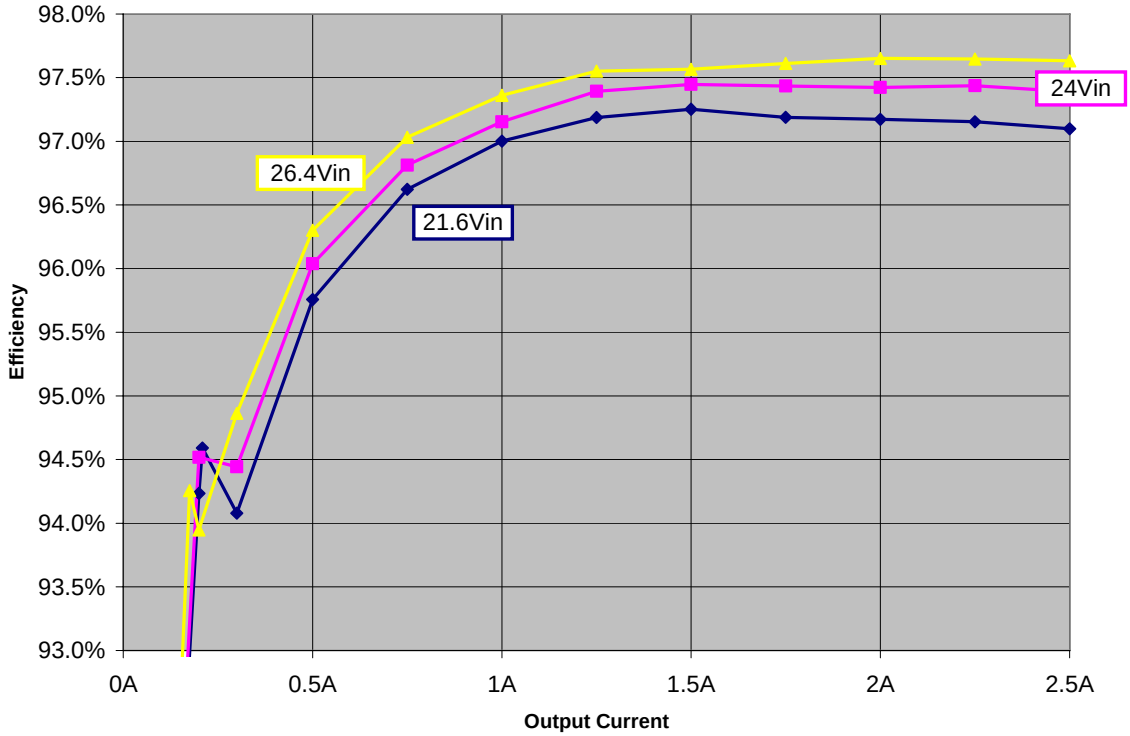


Figure 7

4 Load regulation

The load regulation at different input voltages are shown in Figure 8.

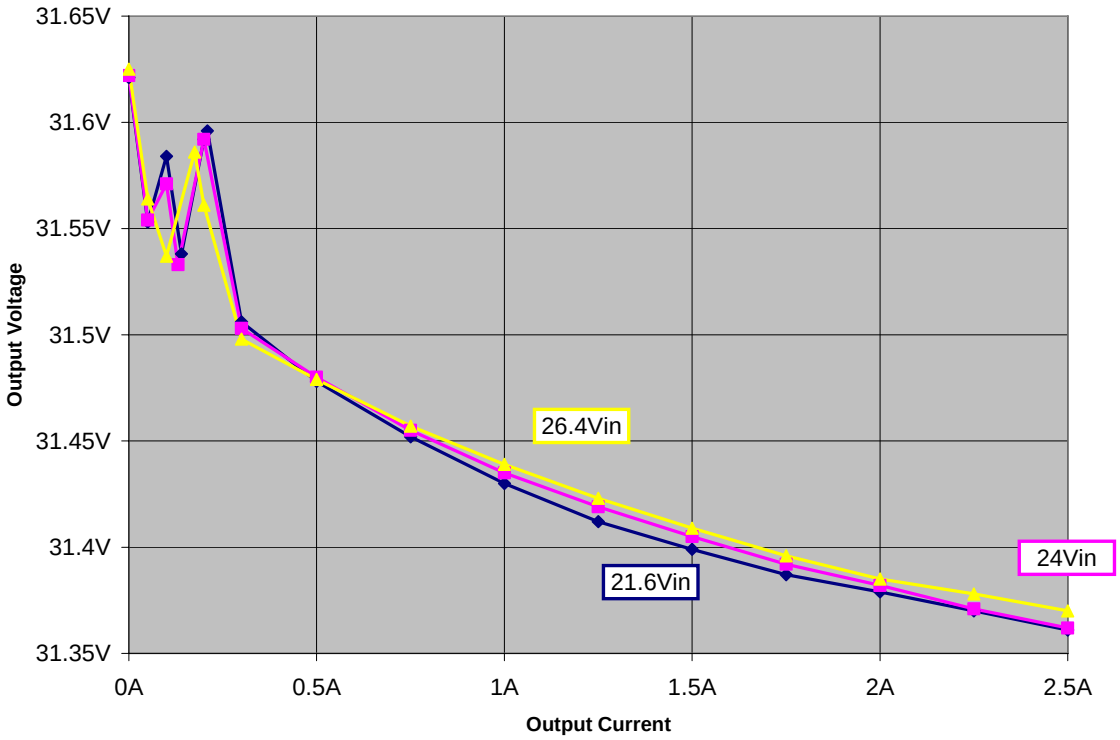


Figure 8

5 Line Regulation

The line regulation at 2.5A output current is shown in Figure 9.

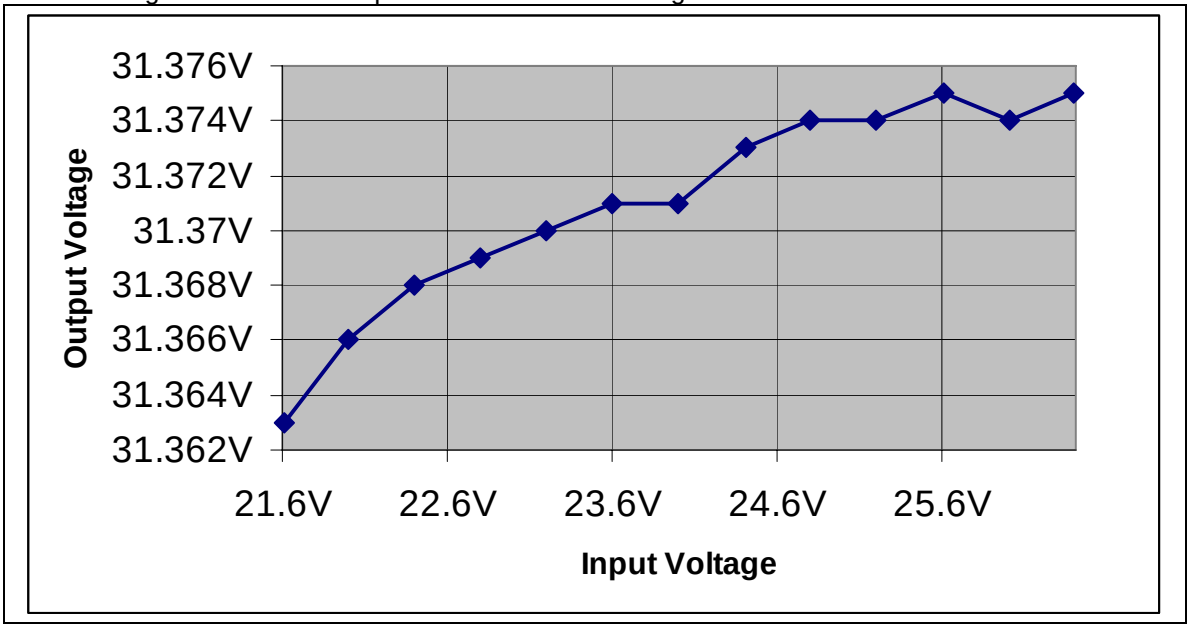


Figure 9

With the same measurement setup the efficiencies are shown in Figure 10.

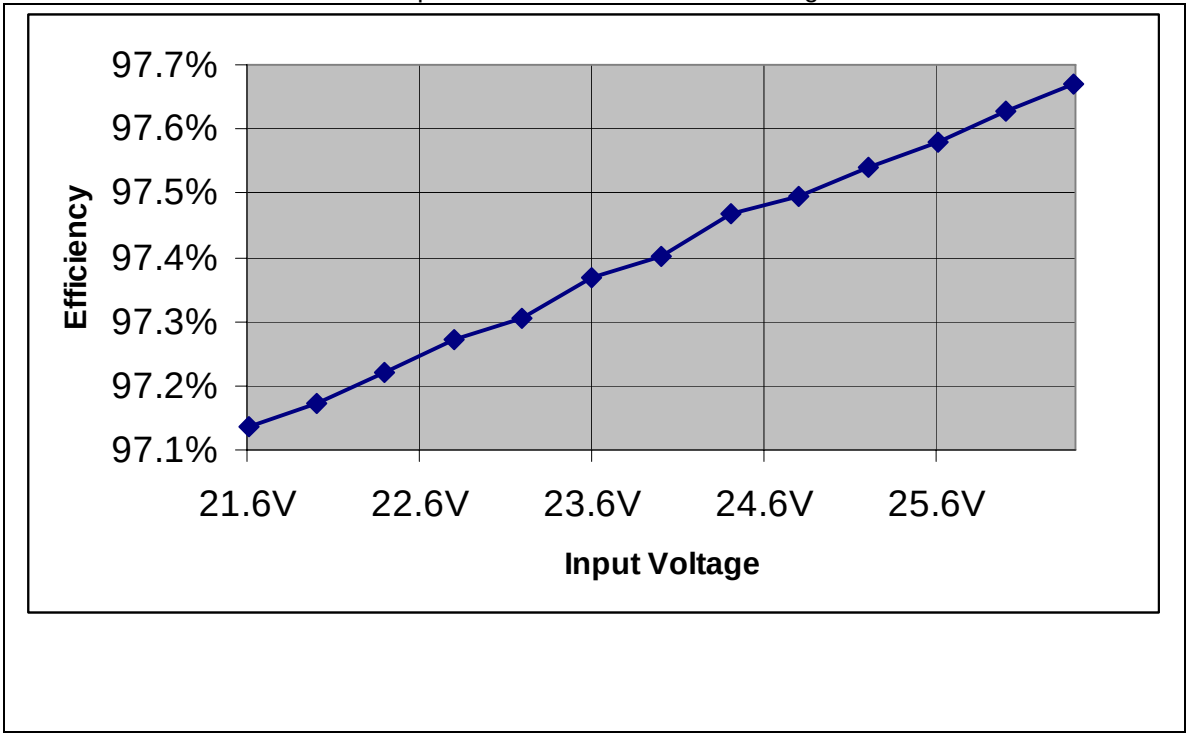
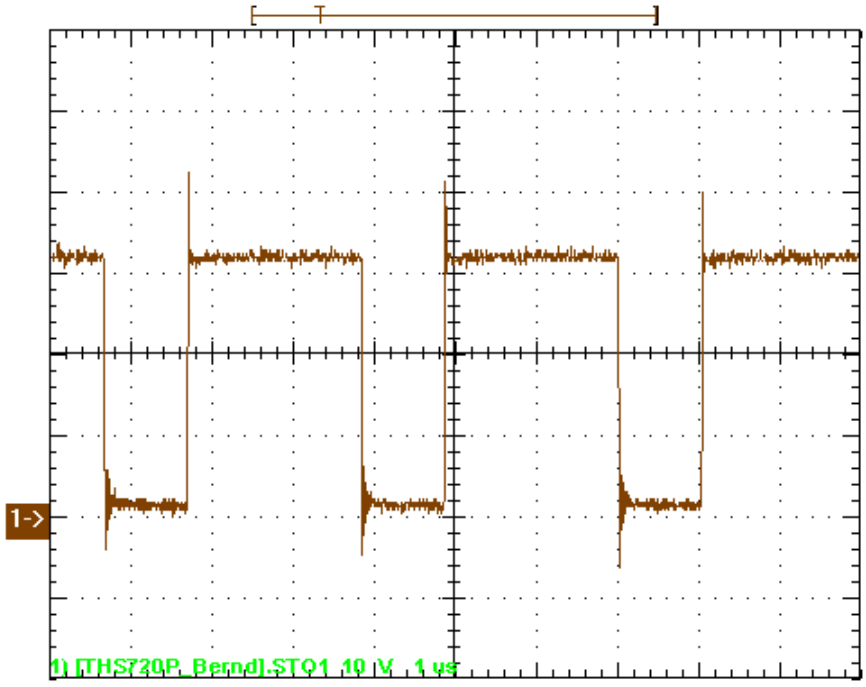


Figure 10

6 Switch Node Waveform

With 2.5A load results in the waveforms shown in Figure 11. 21.6V were applied to the input.

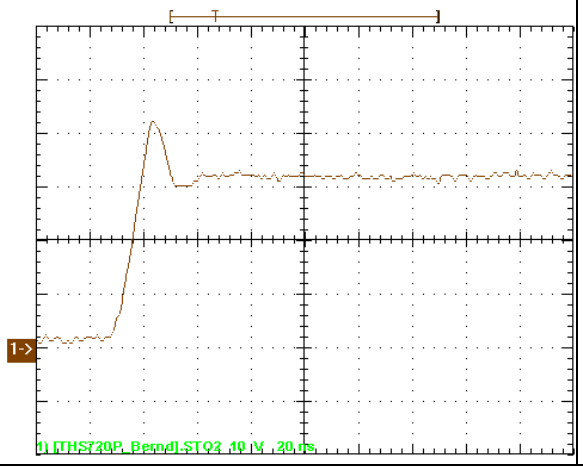


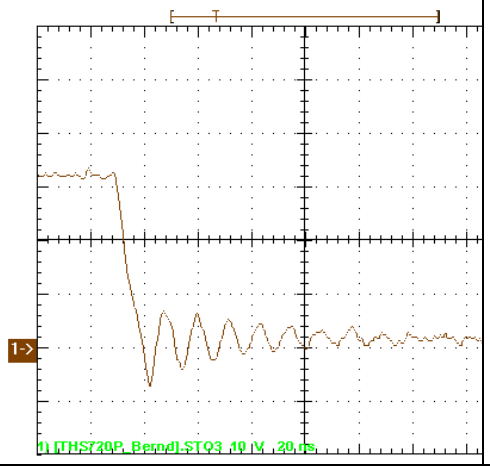
Ch1 => switchnode
10V/div

1µs/div

full bandwidth

Figure 11





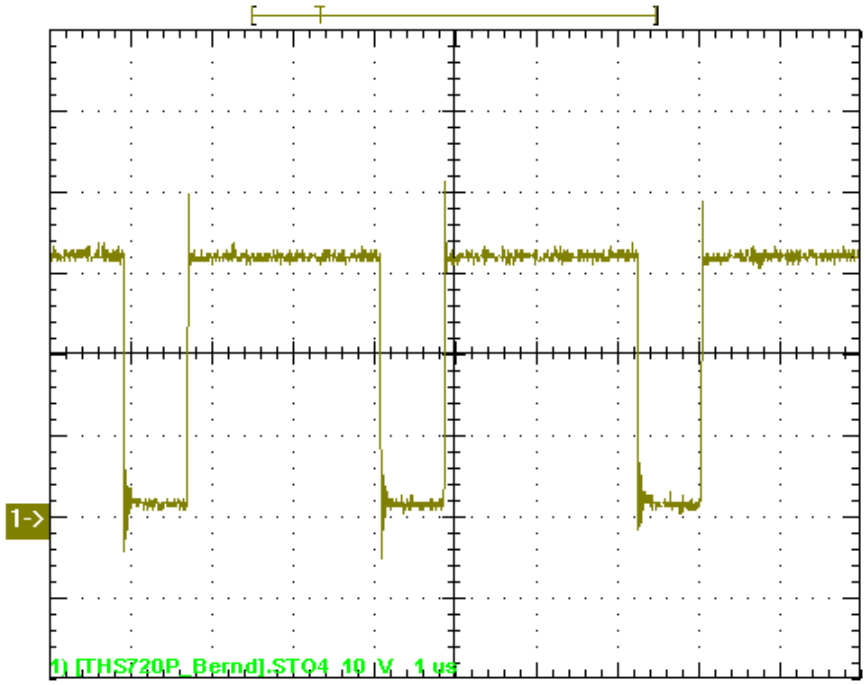
Ch1 => switchnode
10V/div

20ns/div

full bandwidth

Figure 12

With 2.5A load results in the waveforms shown in Figure 13. 24V were applied to the input.

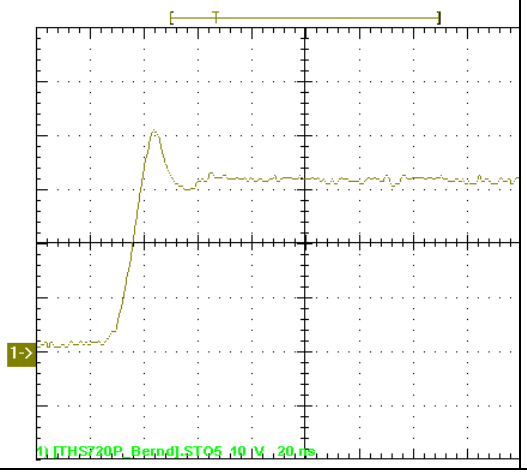


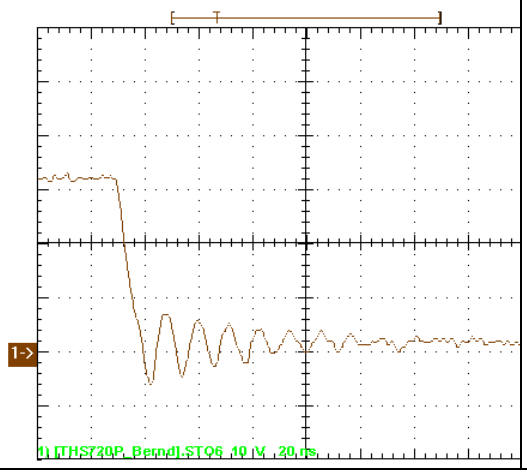
Ch1 => switchnode
10V/div

1µs/div

full bandwidth

Figure 13





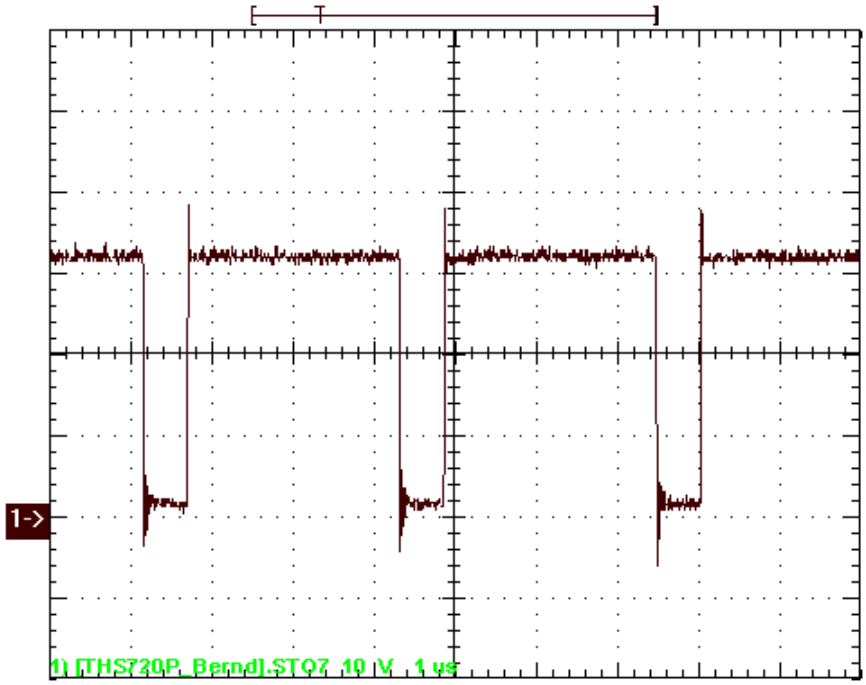
Ch1 => switchnode
10V/div

20ns/div

full bandwidth

Figure 14

With 2.5A load results in the waveforms shown in Figure 15. 26.4V were applied to the input.

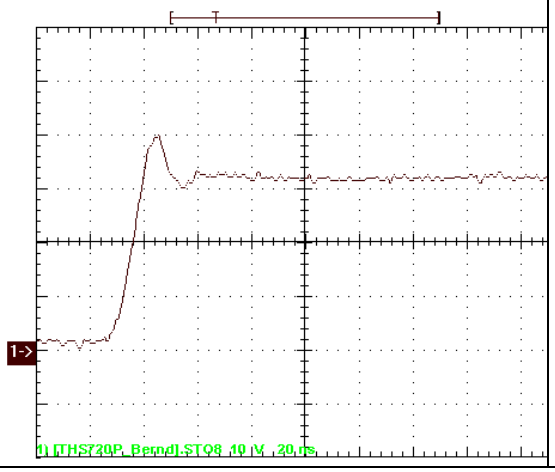


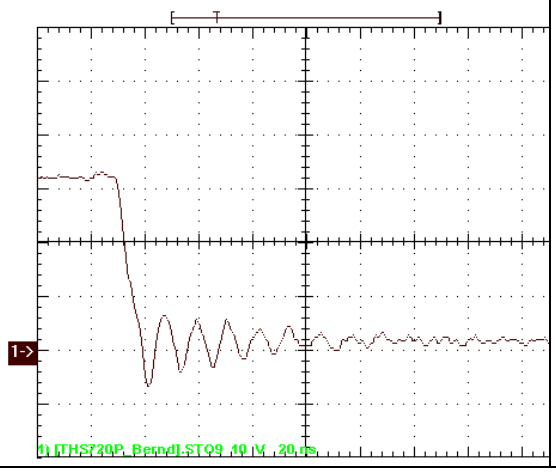
Ch1 => switchnode
10V/div

1µs/div

full bandwidth

Figure 15





Ch1 => switchnode
10V/div

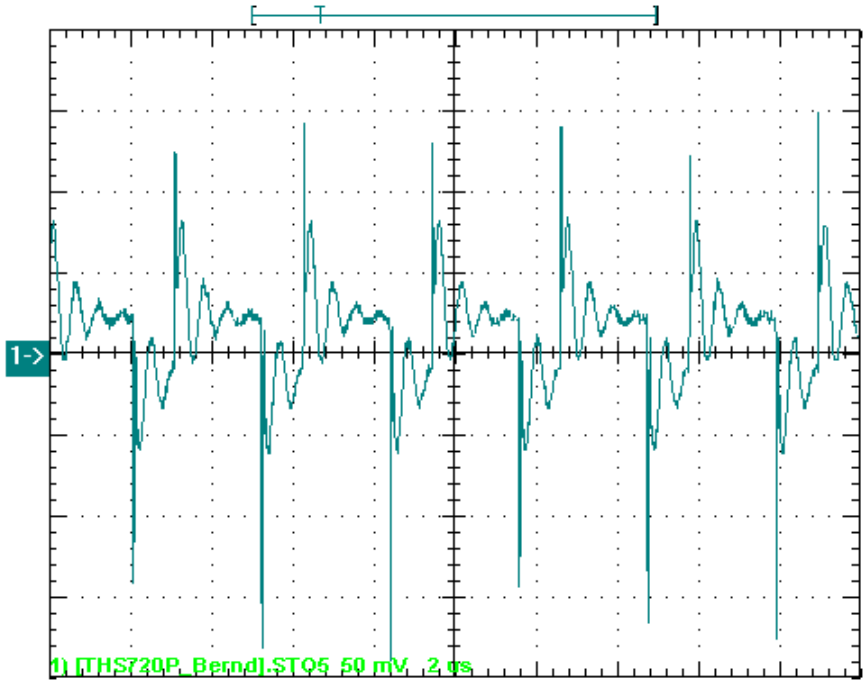
20ns/div

full bandwidth

Figure 16

7 Ripple Voltages

The output ripple voltage is displayed in Figure 17. The input voltage was set to 21.6V with output current 2.5A.



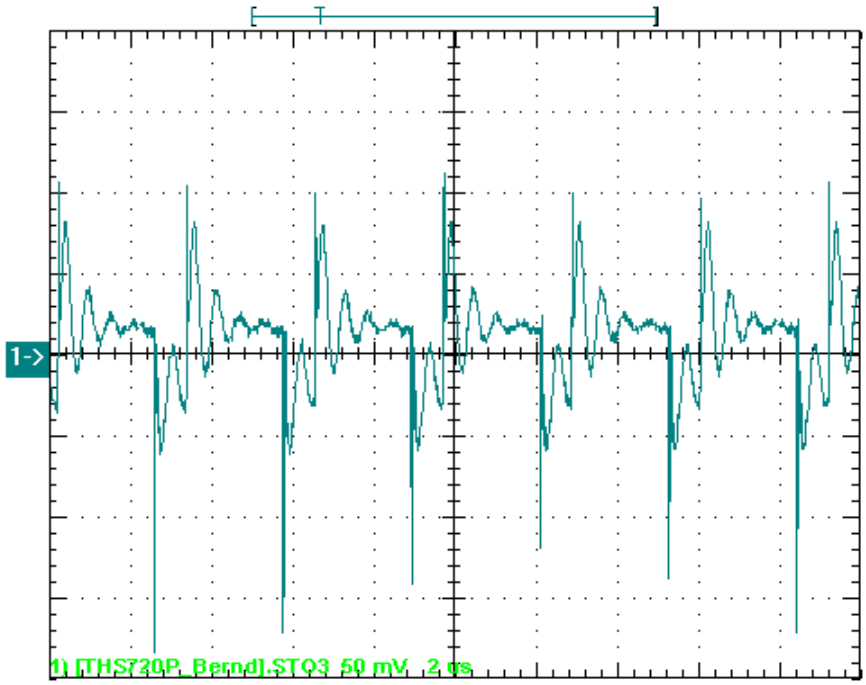
Ch1=> output voltage
50mV/div

2µs/div
AC coupling

20MHz bandwidth

Figure 17

The output ripple voltage is displayed in Figure 18. The input voltage was set to 24V with output current 2.5A.



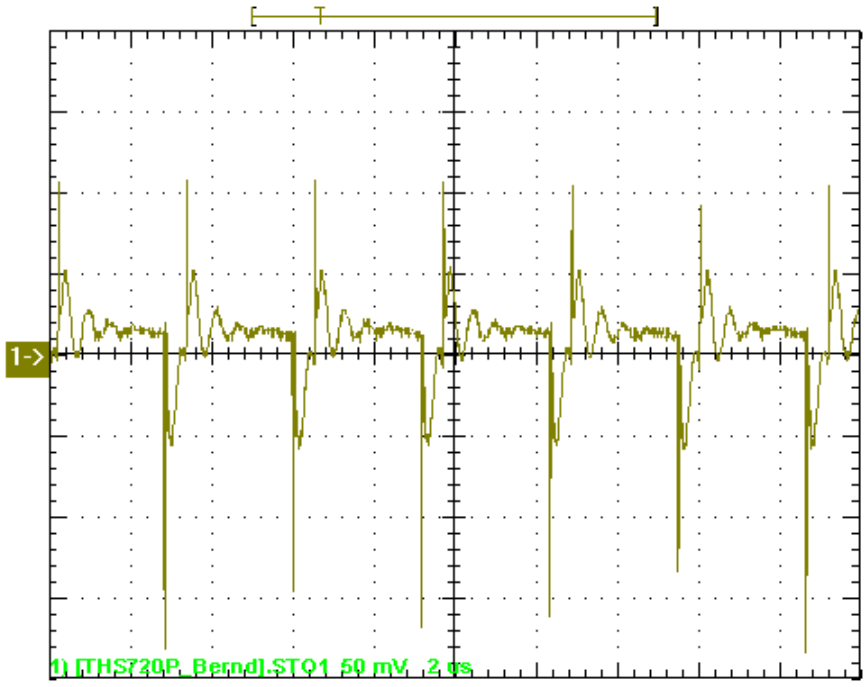
Ch1=> output voltage
50mV/div

2µs/div
AC coupling

20MHz bandwidth

Figure 18

The output ripple voltage is displayed in Figure 19. The input voltage was set to 26.4V with output current 2.5A.



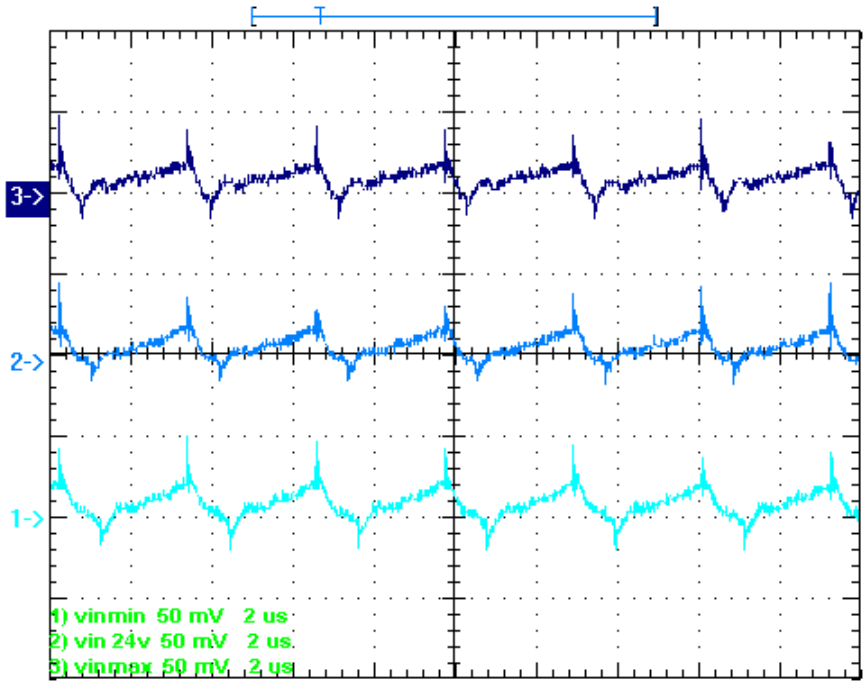
Ch1=> output voltage 50mV/div

2µs/div
AC coupling

20MHz bandwidth

Figure 19

The **input** ripple voltage is displayed in Figure 20. The input voltage was set to 21.6V, 24V and 26.4V with output current 2.5A.



Ch3=> input voltage 50mV/div@26.4Vin

Ch2=> input voltage 50mV/div@24Vin

Ch1=> input voltage 50mV/div@21.6Vin

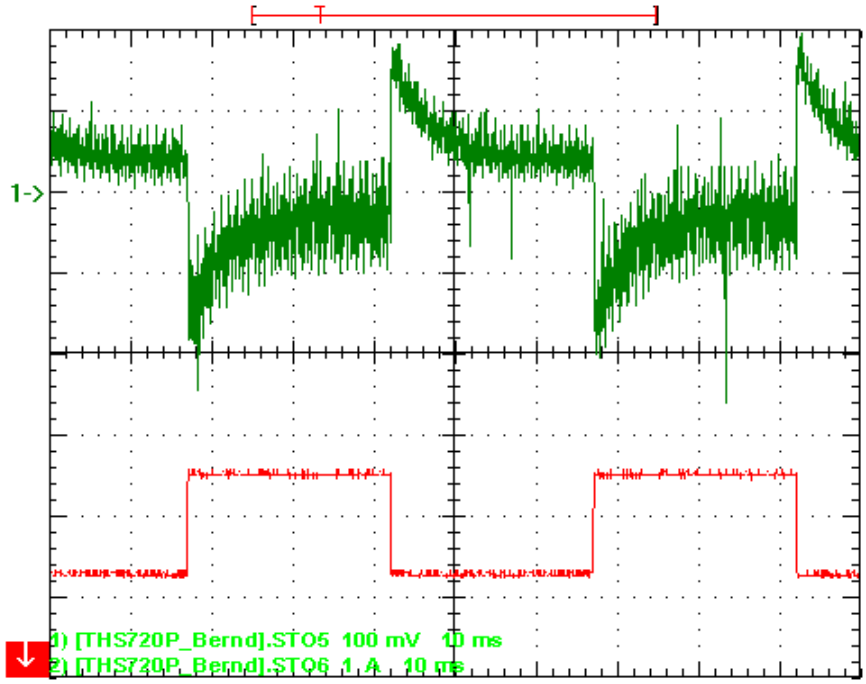
2µs/div
AC coupling

20MHz bandwidth

Figure 20

8 Load Transients

A output current change from 1.25A to 2.5A (20Hz) results in following Figure 21.The input voltage was set to 21.6V



Ch1=> output voltage
AC coupled
100mV/div

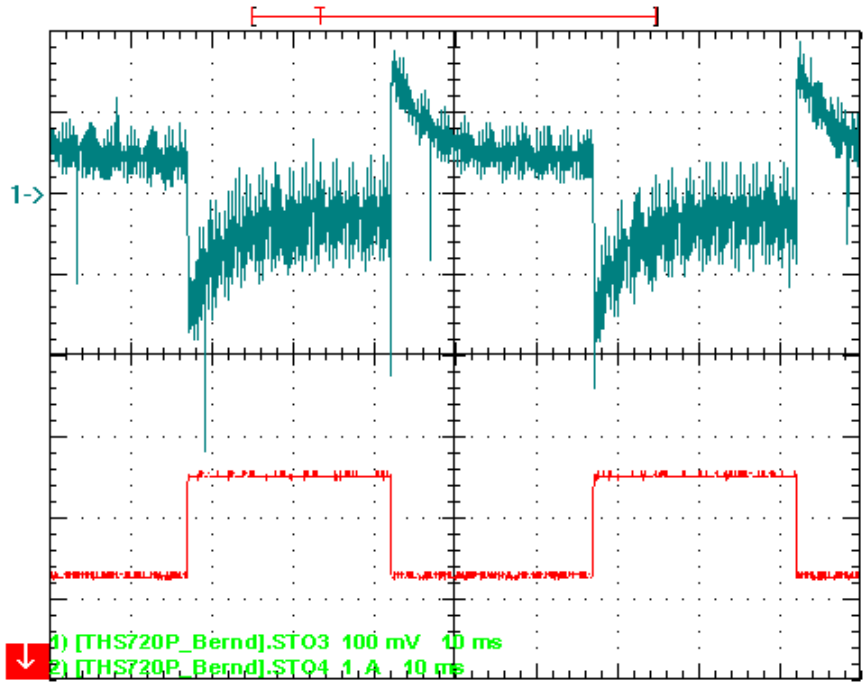
Ch2=> output current
1A/div

10ms/div

20MHz bandwidth

Figure 21

A output current change from 1.25A to 2.5A results in following Figure 22.The input voltage was set to 24V



Ch1=> output voltage
AC coupled
100mV/div

Ch2=> output current
1A

10ms/div

20MHz bandwidth

Figure 22

A output current change from 1.25A to 2.5A results in following Figure 23.The input voltage was set to 26.4V

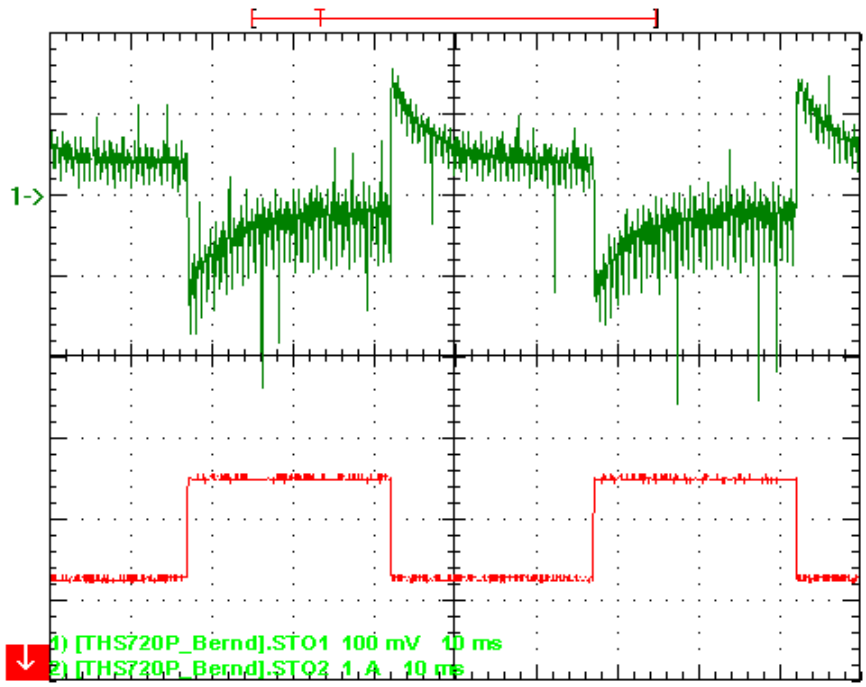


Figure 23

Ch1=> output voltage
AC coupled
100mV/div

Ch2=> output current
1A

10ms/div

20MHz bandwidth

9 Control Loop Frequency Response

The control loop frequency response with 2.5A load and 21.6V, 24V and 26.4V input voltage are shown in Figure 24

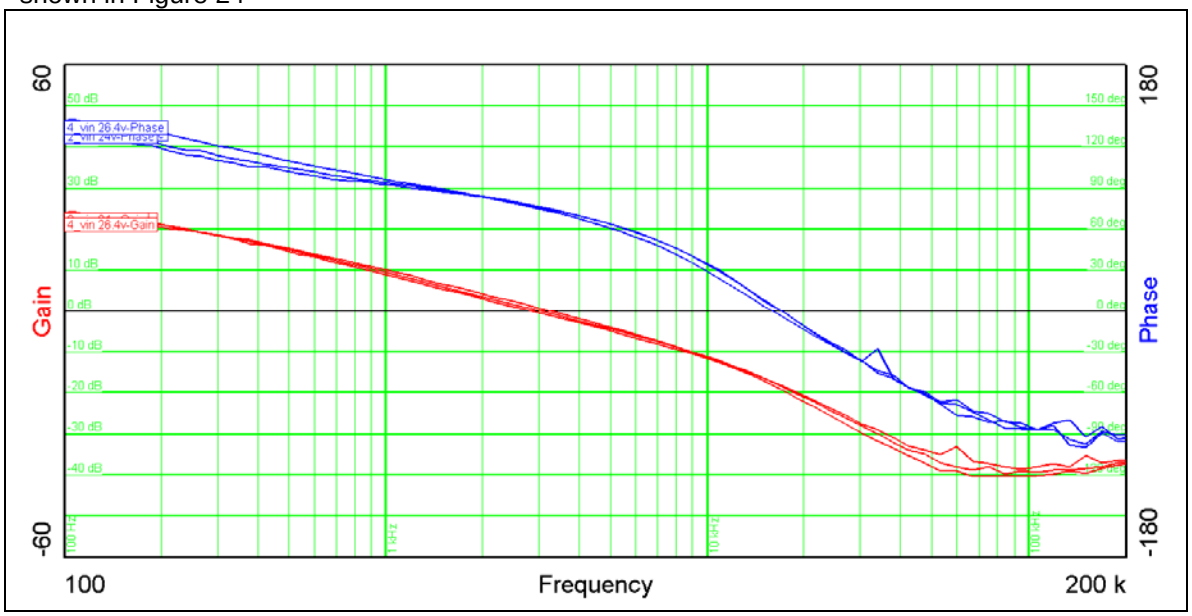


Figure 24

Table 1 summarizes the results.

Vin	21.6V	24V	26.4V
Bandwidth (kHz)	2.87	3.06	3.27
Phase margin	77°	76°	72.8°
slope (20dB/decade)	-0.96	-1	-1
gain margin (dB)	-18.3	-18.4	-18.2
slope (20dB/decade)	-1.78	-1.88	-2
freq (kHz)	17	16.9	15.9

Table 1

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