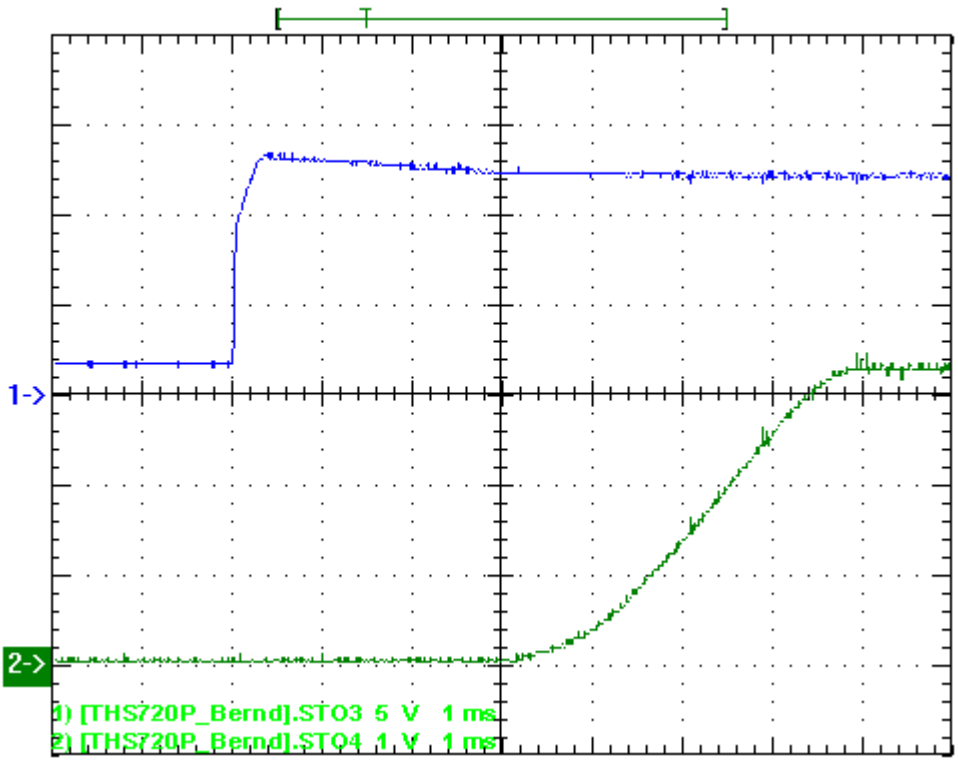
PMP5573RevB Test Results

1 Startup

The startup waveform is shown in the Figure 1. The input voltage was set at 12V, with 10A load at the output.



Ch1=> input voltage 5V/div

Ch2=> output voltage 1V/div

1ms/div

20MHz bandwidth

Figure 1

2 Shutdown

The shutdown waveform is shown in the Figure 2 at 12V input voltage. With 10A load applied at the output.

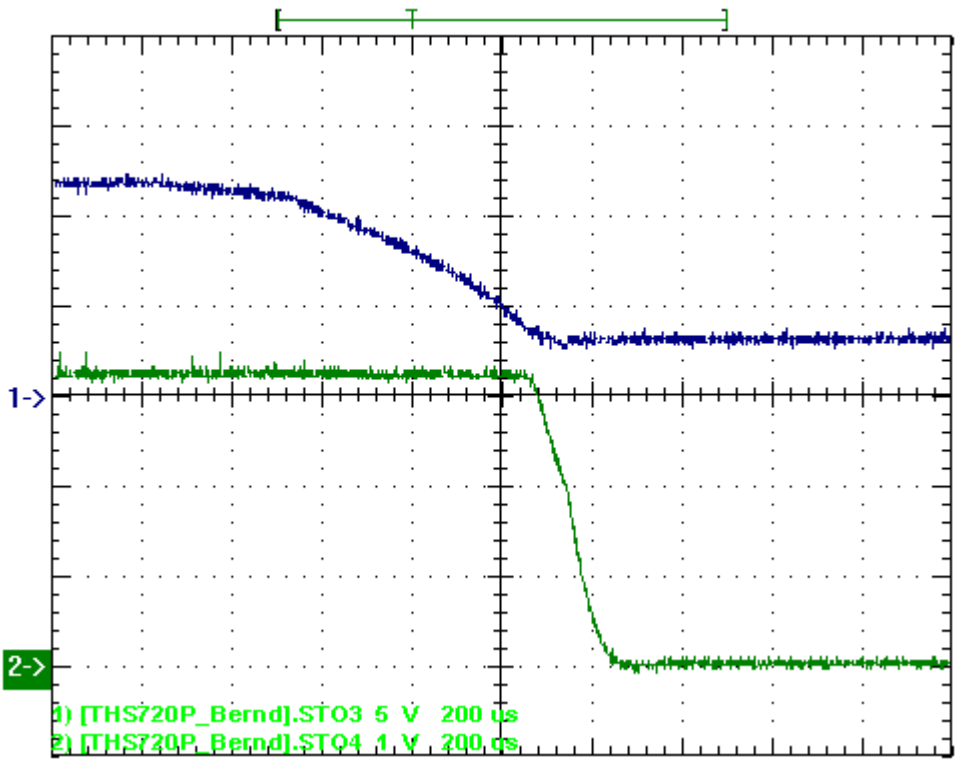


Figure 2

Ch1=> input voltage
5V/div

Ch2=> output voltage
1V/div

200µs/div

20MHz bandwidth

3 Efficiency

The efficiency is shown in the Figure 3 below. The current measurements were taken directly from the voltage source (GEN80-9.5) and load (N3305A)
The VOUT+ measurement-point was placed near C12. Some additional copper on VOUT plane were added to lower the ohmic resistance between L1 and C18, C15, C14, C13, C12.

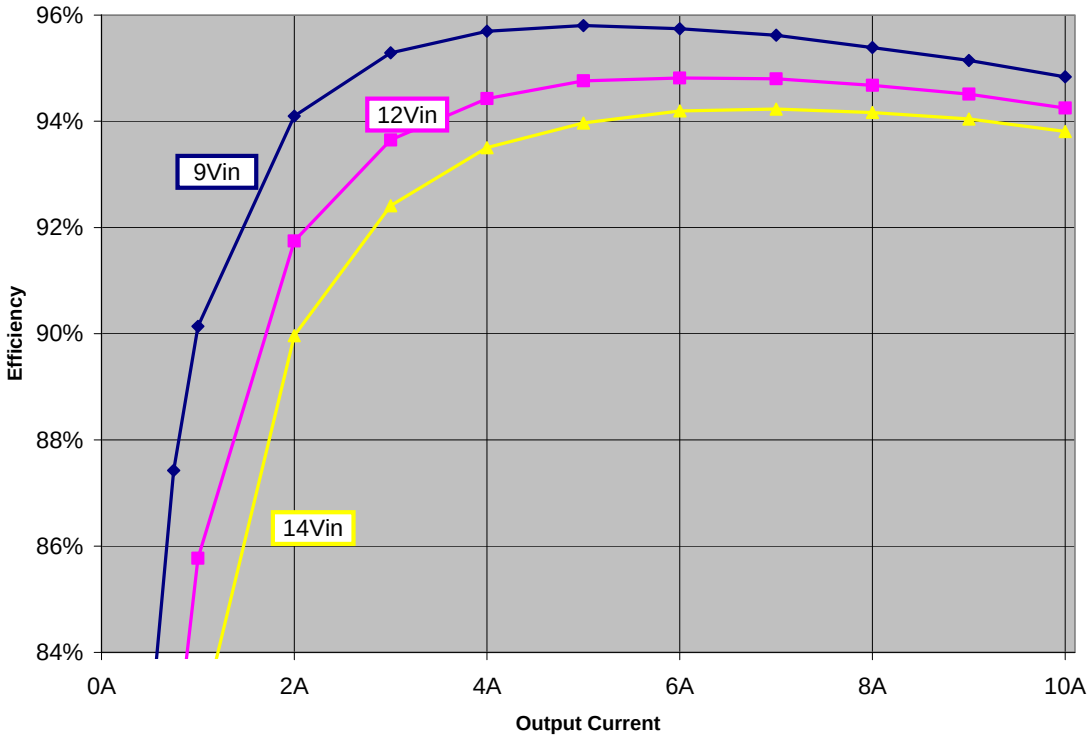


Figure 3

4 Load regulation

The load regulation for different input voltage is shown in Figure 4. The current measurements were taken directly from the voltage source (GEN80-9.5) and load (N3305A)
The VOUT+ measurement-point was placed near C12. Some additional copper on VOUT plane were added to lower the ohmic resistance between L1 and C18, C15, C14, C13, C12.

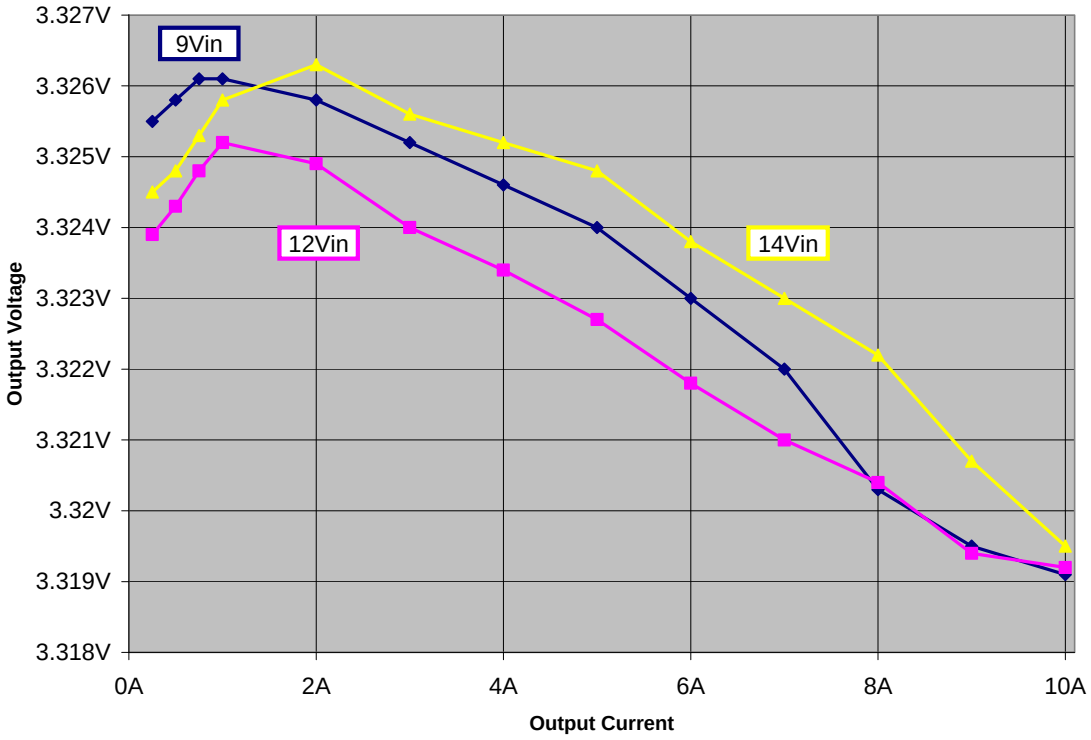


Figure 4

5 Line Regulation

Figure 5 shows the line regulation at 10A load. The VOUT+ measurement-point was placed near C12. Some additional copper on VOUT plane were added to lower the ohmic resistance between L1 and C18, C15, C14, C13, C12.

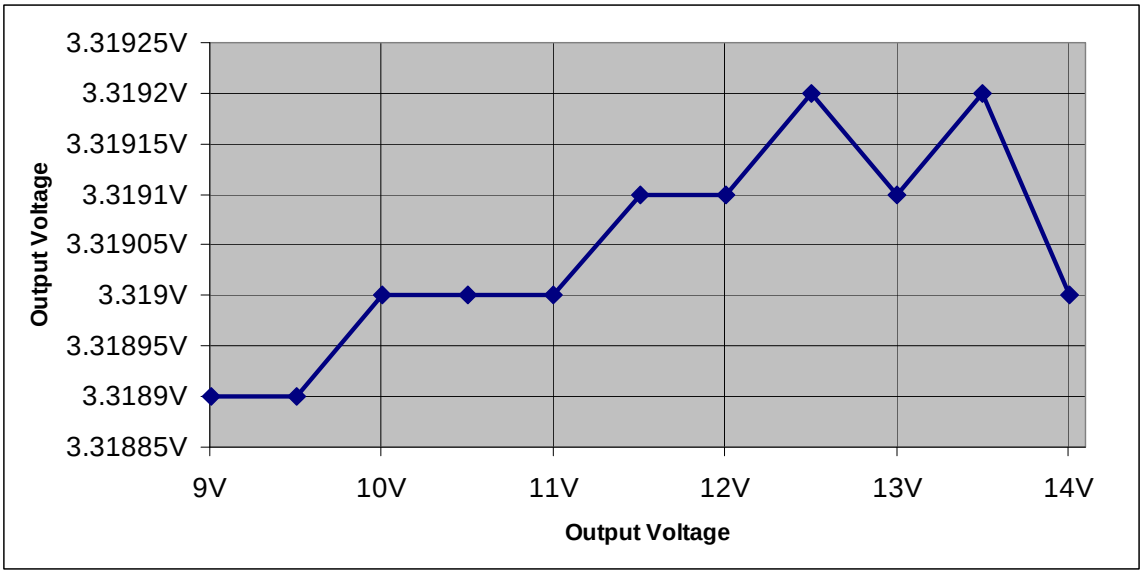


Figure 5

With this measurement also the efficiency-data were derived. This is shown in Figure 6. The current measurements were taken directly from the voltage source (GEN80-9.5) and load (N3305A)

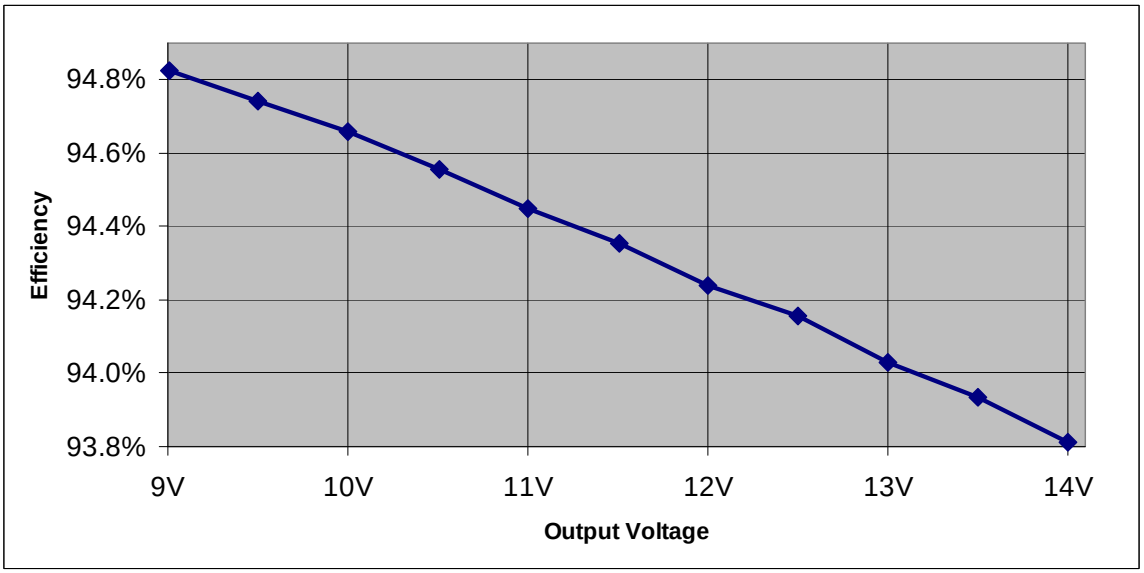


Figure 6

6 Control Loop Frequency Response

Figure 7 shows the loop response. 10A-load applied. The input voltage was set to 9V and 14V.

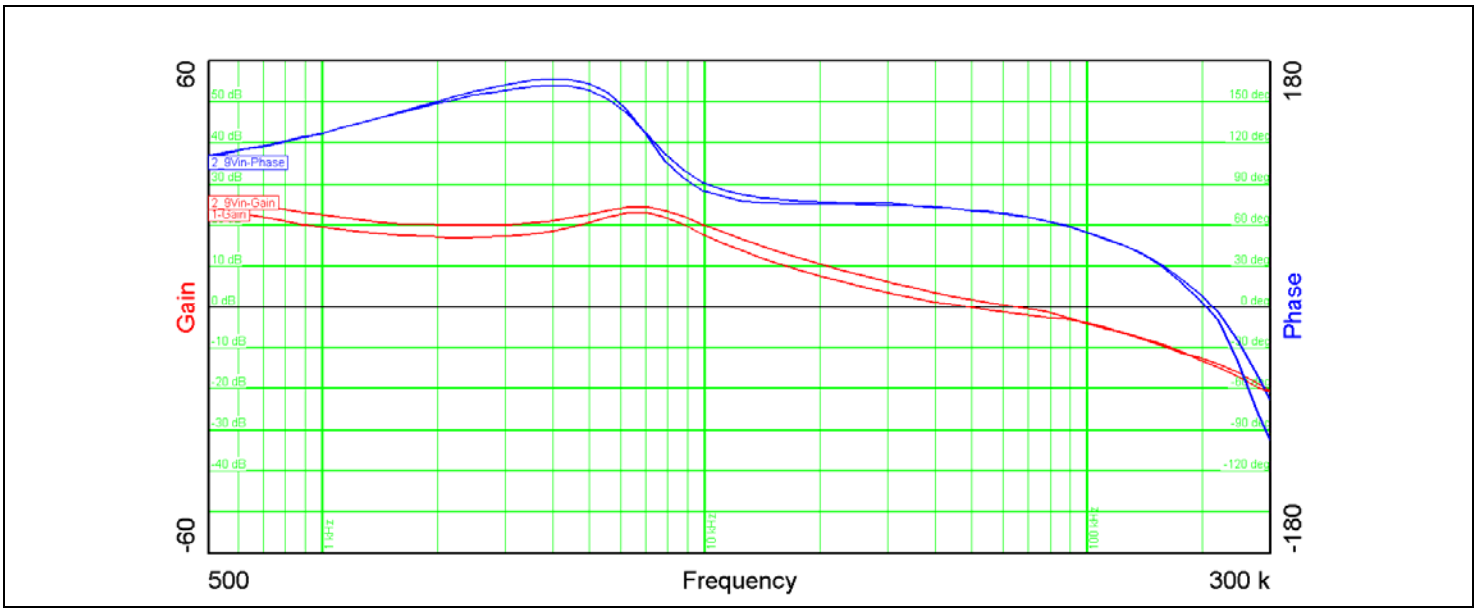


Figure 7

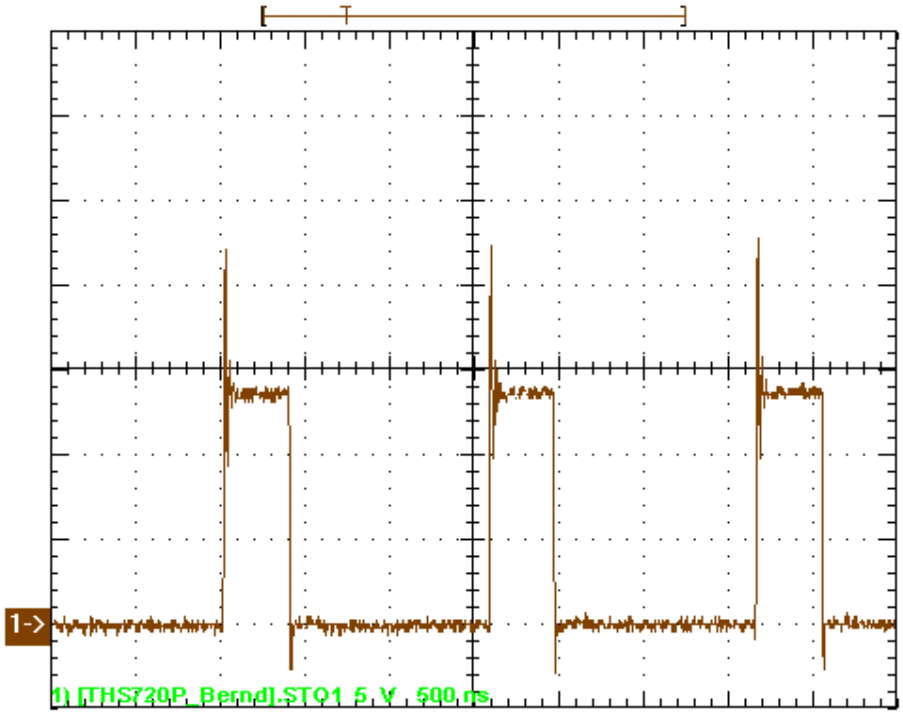
Table 1 summarizes the results from Figure 7

Vin	9V	14V
Bandwidth (kHz)	66.4	48.7
Phase margin	66.9°	71.2°
slope (20dB/decade)	-0.756	-0.708
gain margin (dB)	-13.6	-13.6
slope (20dB/decade)	-1.78	-1.5
freq (kHz)	204	213

Table 1

7 Switch Node Waveform

With 10A load results in the waveforms shown in Figure 8 and Figure 9. 14V were applied to the input.

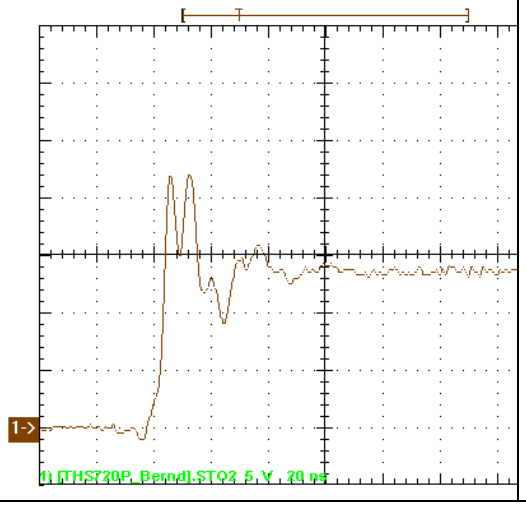


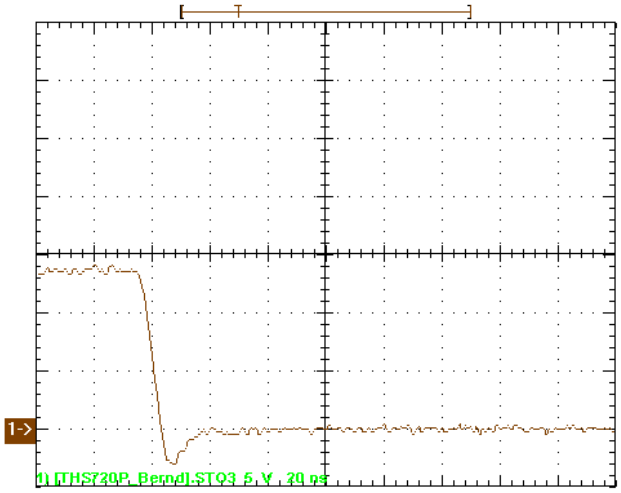
Ch1 => switchnode primary 5V/div

500ns/div

full bandwidth

Figure 8





Ch1 => switchnode 5V/div

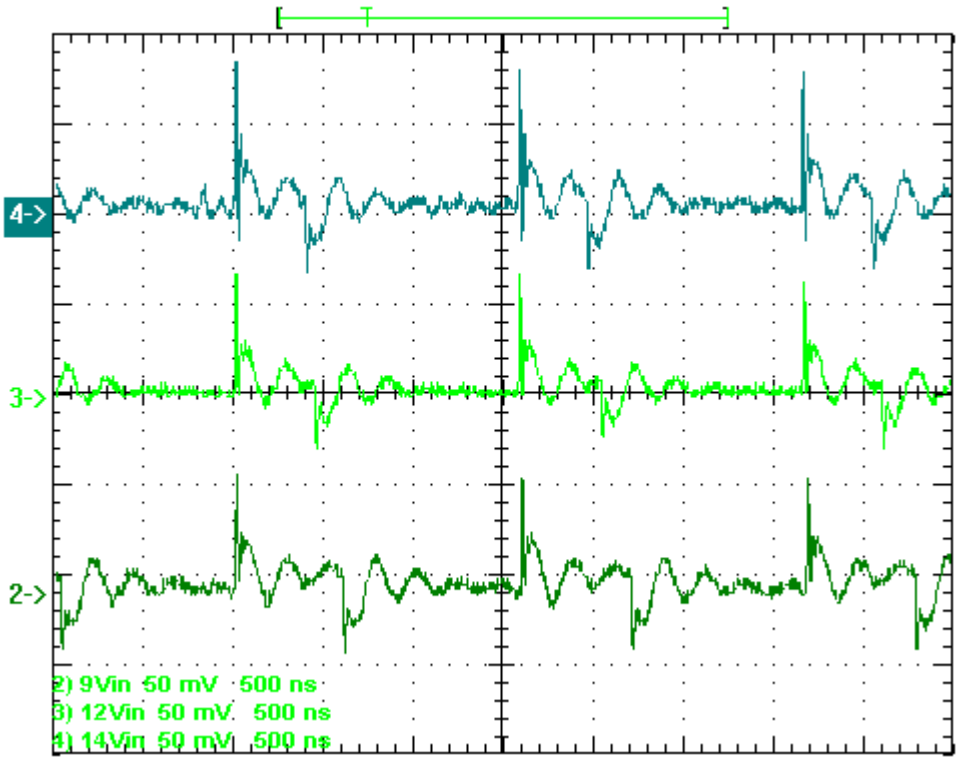
20ns/div

full bandwidth

Figure 9

8 Ripple Voltages

The output ripple voltage is displayed in Figure 10. The input voltage was set to 9V, 12 and 14V with output current 10A.



Ch4=> output voltage@14Vin 50mV/div

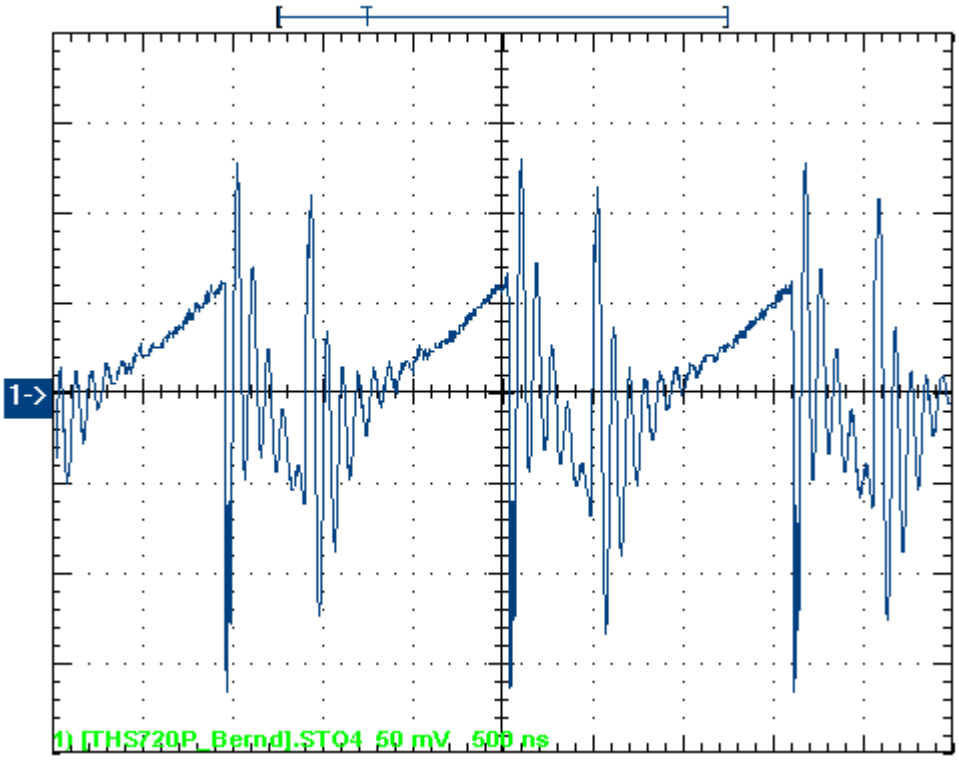
Ch3=> output voltage@12Vin 50mV/div

Ch2=> output voltage@9Vin 50mV/div

500ns/div
AC coupling
20MHz bandwidth

Figure 10

The input ripple voltage is displayed in Figure 11. The input voltage was set to 12V with output current 10A.



Ch1=> input voltage
50mV/div

500ns/div
AC coupling
20MHz bandwidth

Figure 11

9 Load Transients

A output current change from 0A to 10A (500Hz) results in following Figure 12.The input voltage was set to 12V

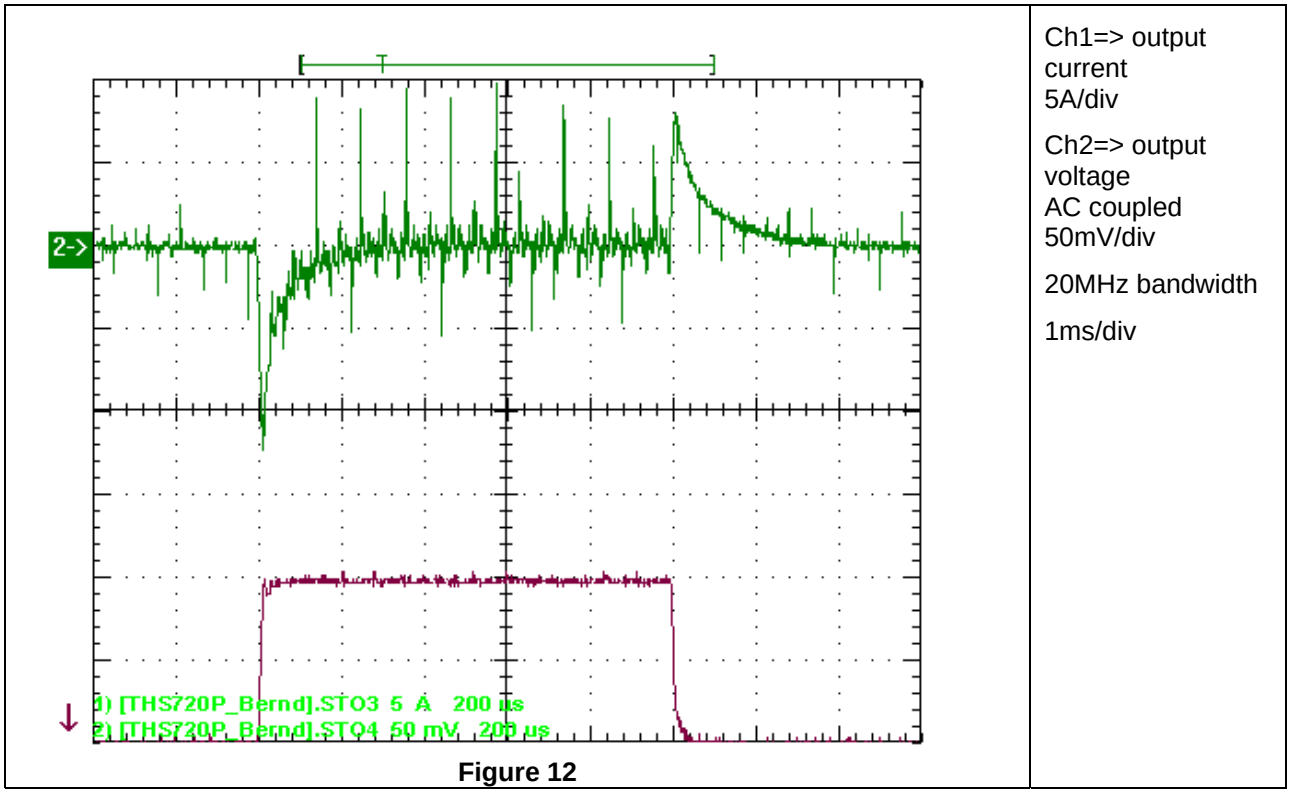


Figure 12

A output current change from 5A to 10A (100Hz) results in following Figure 12.The input voltage was set to 12V

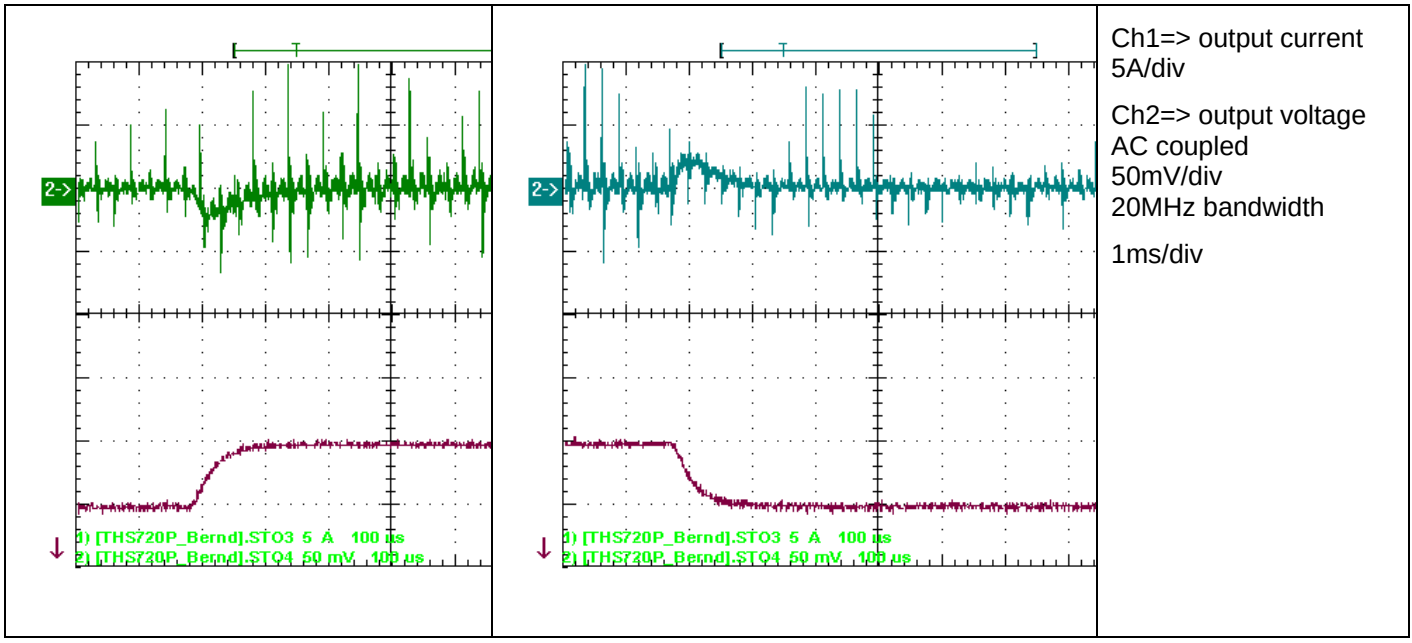


Figure 13

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