PMP5540RevB Test Results

1 Startup

The startup waveform is shown in the Figure 1. The input voltage was set to 4.5V, with 1.2A load at the output.

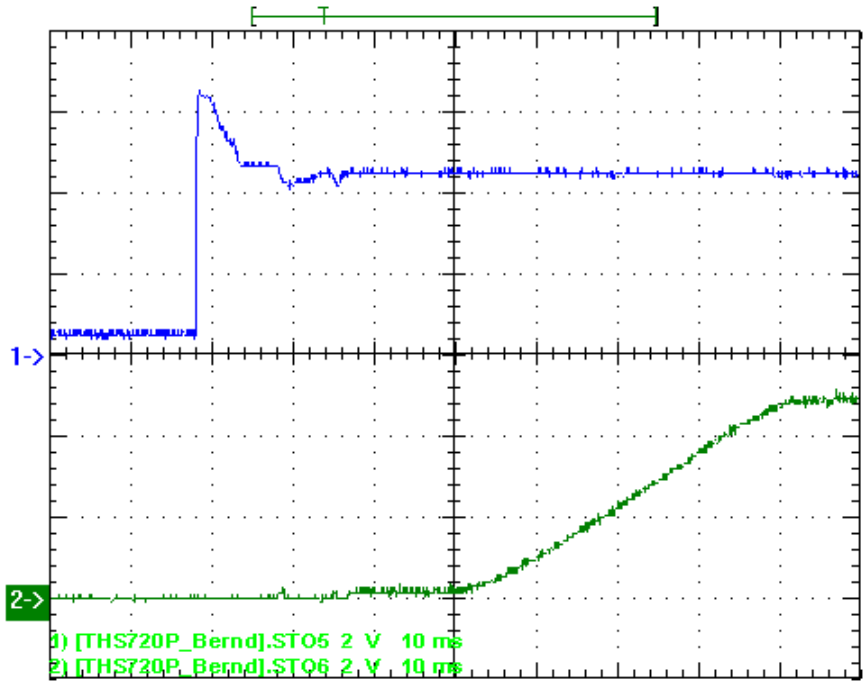


Figure 1

Ch1=> input voltage 2V/div

Ch2=> output voltage 2V/div

10ms/div

full bandwidth

The startup waveform is shown in the Figure 2. The input voltage was set to 6.5V, with 1.2A load at the output.

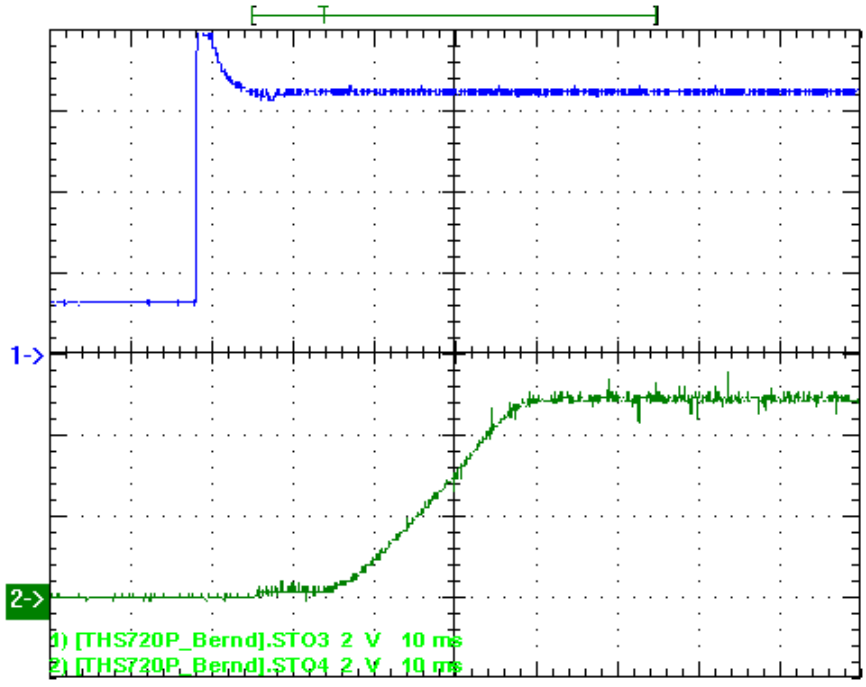


Figure 2

Ch1=> input voltage 2V/div

Ch2=> output voltage 2V/div

10ms/div

full bandwidth

The startup waveform is shown in the Figure 3. The input voltage was set to 10V, with 1.2A load at the output.

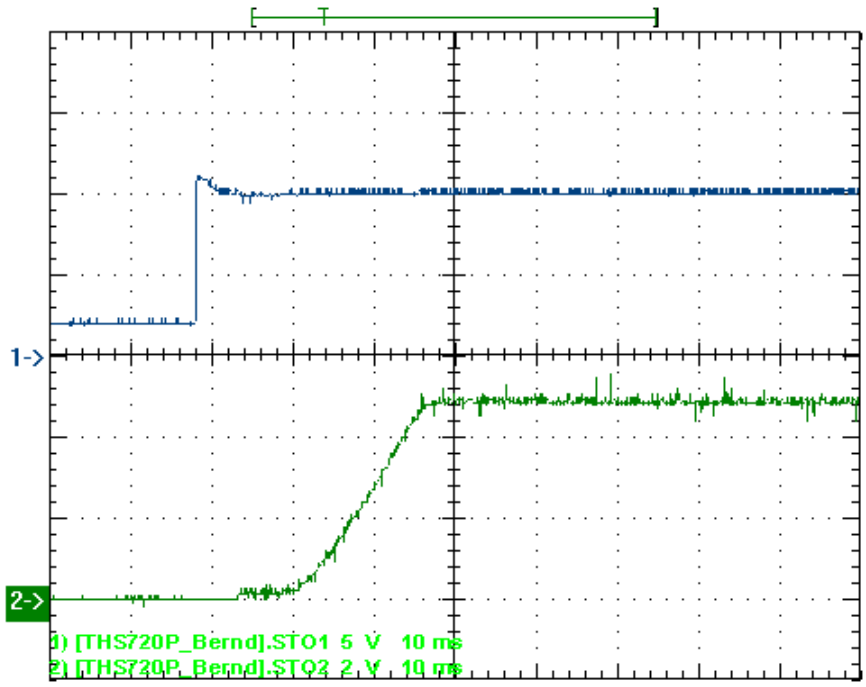


Figure 3

Ch1=> input voltage 5V/div

Ch2=> output voltage 2V/div

10ms/div

full bandwidth

2 Shutdown

The shutdown waveform is shown in the Figure 4 to 2.9V input voltage. With 1.2A load applied at the output.

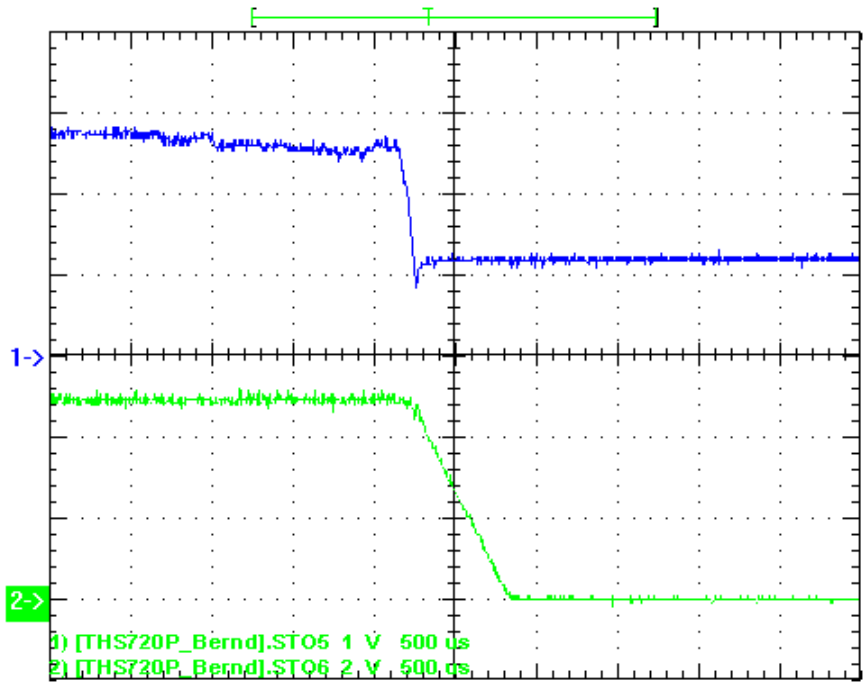


Figure 4

Ch1=> input voltage 1V/div

Ch2=> output voltage 2V/div

500µs/div

full bandwidth

3 Efficiency

The efficiency is shown in the Figure 5 below. The input voltage was adjusted to 3V, 6.5V and 10V.

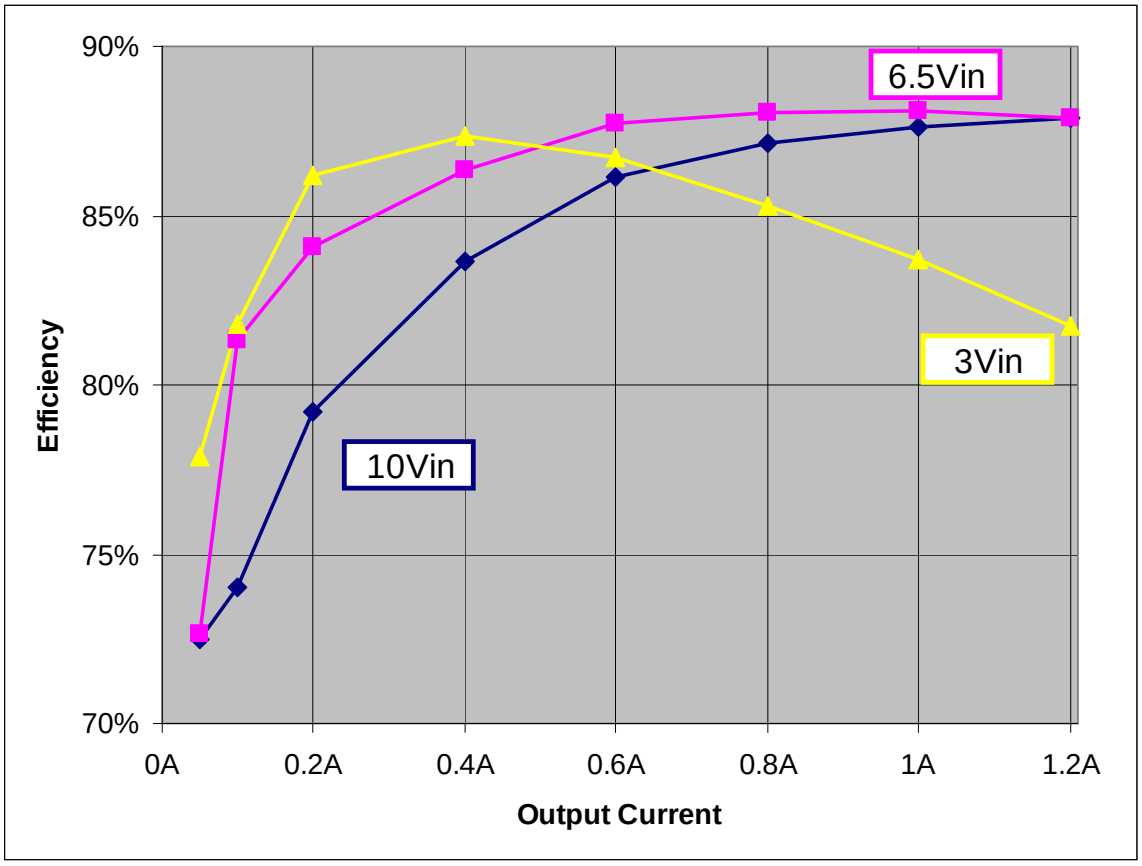


Figure 5

4 Load regulation

The load regulation for 3V, 6.5V and 10V input voltage is shown in Figure 6.

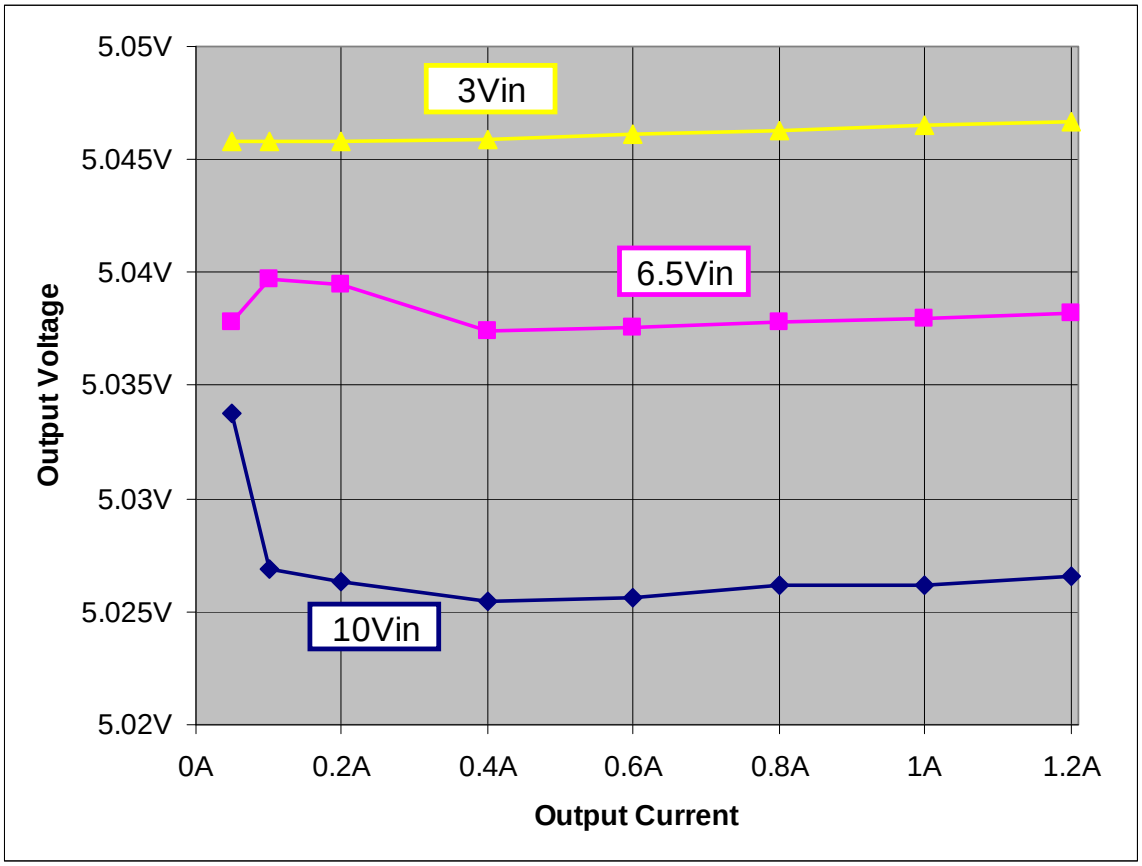


Figure 6

5 Line Regulation

The line regulation at 1.2A output current is shown in Figure 7

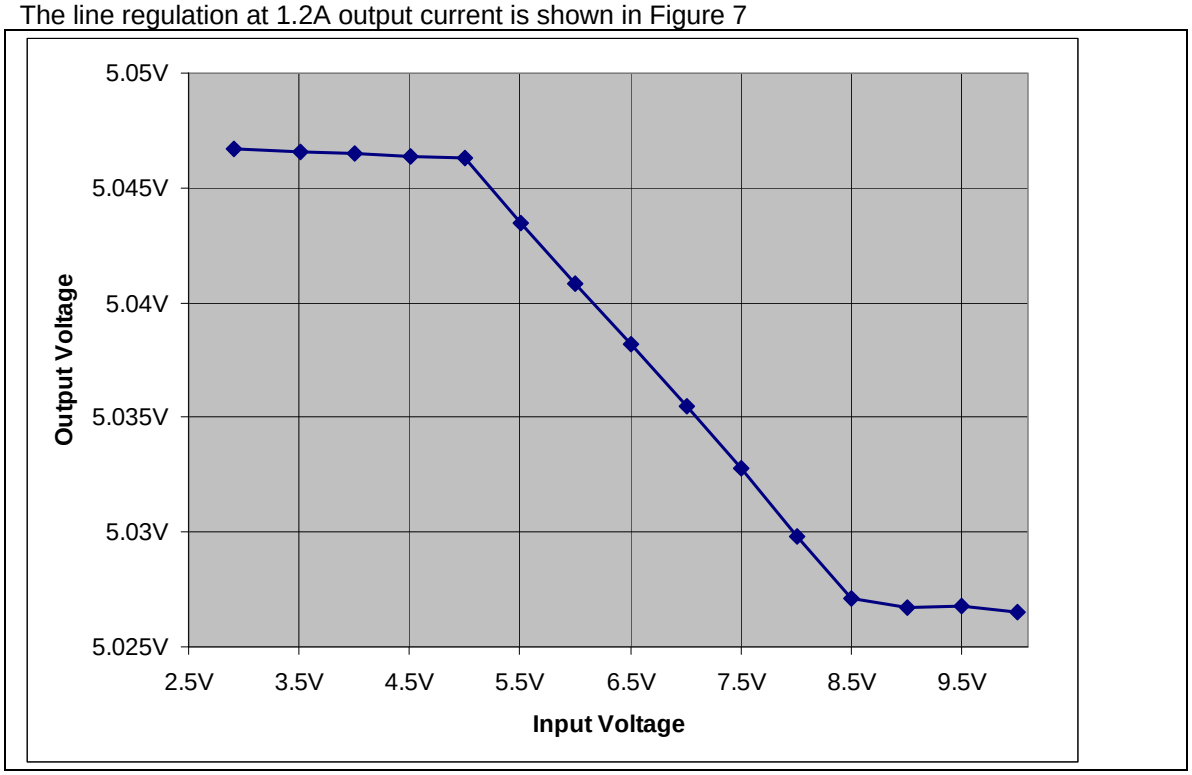


Figure 7

With the same measurement setup the efficiencies are shown in Figure 8.

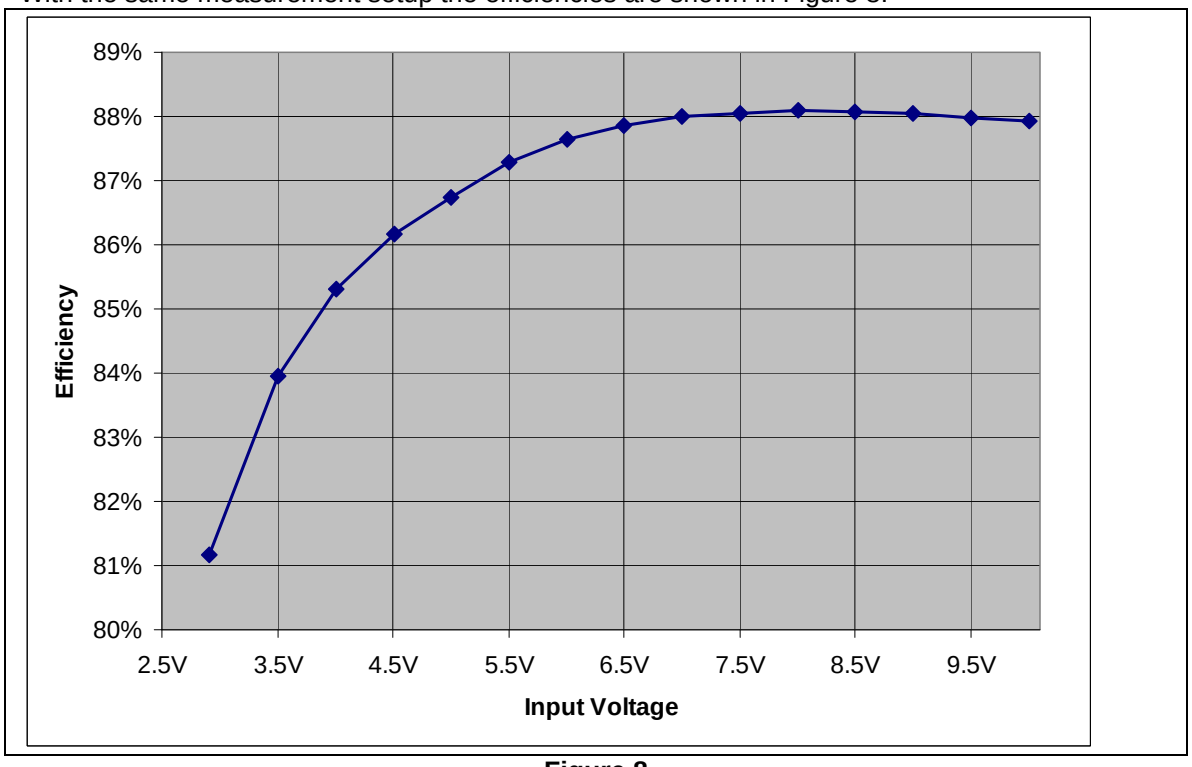


Figure 8

6 Control Loop Frequency Response

Figure 9 shows the loop response. 1.2A-load applied. The input voltage was set to 2.9V.

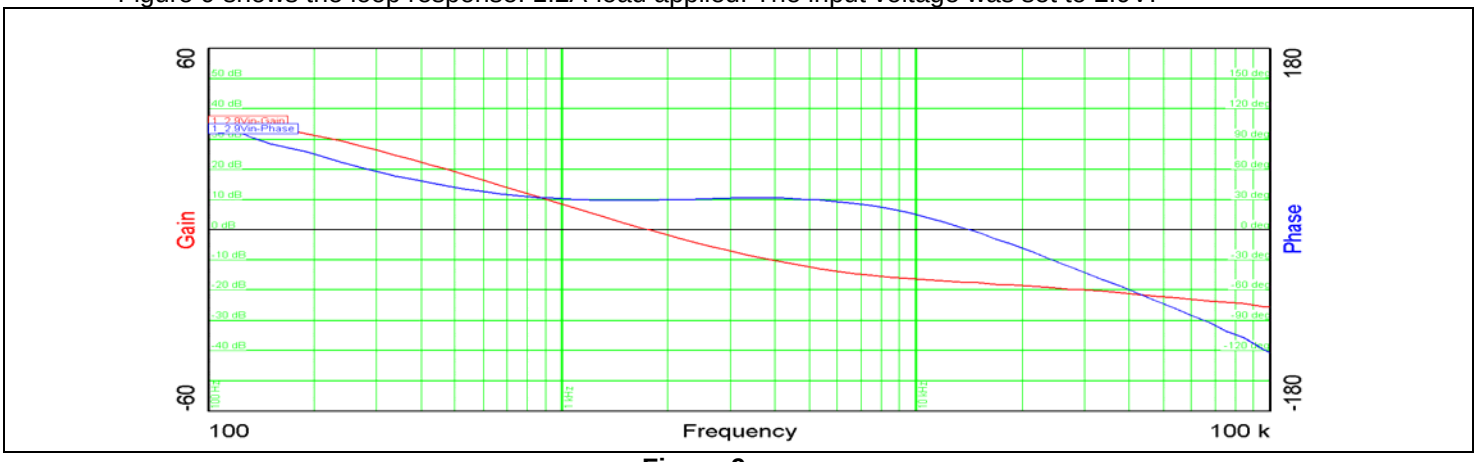


Figure 9

Figure 10 shows the loop response. 1.2A-load applied. The input voltage was set to 6.5V.

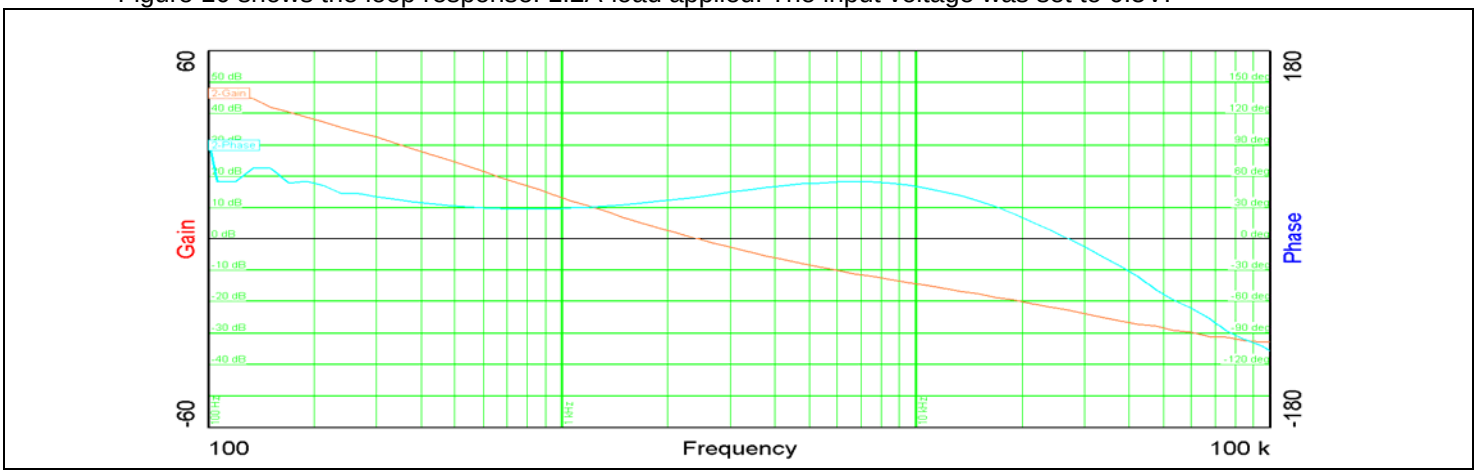


Figure 10

Figure 11 shows the loop response. 1.2A-load applied. The input voltage was set to 10V.

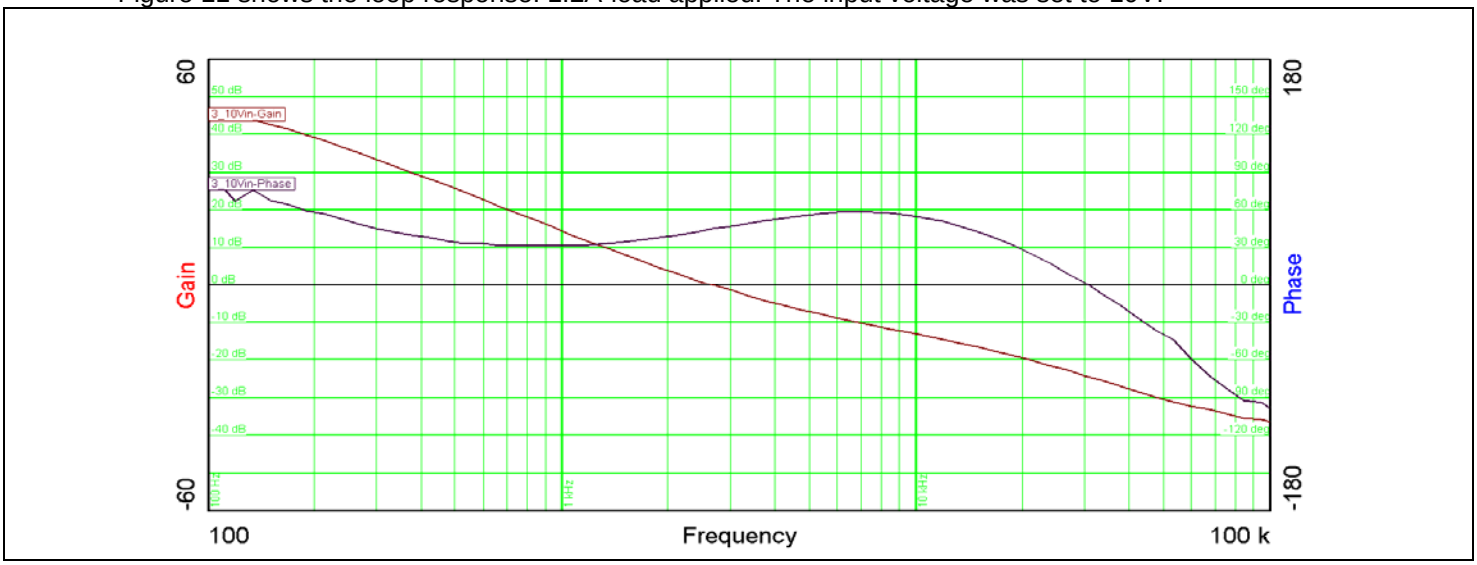


Figure 11

PMP5540RevB Test Results

Table 1 summarizes the results from Figure 9, Figure 10 and Figure 11

Vin	2.9V	6.5V	10V
Bandwidth (kHz)	1.75	2.42	2.66
Phase margin	29°	40.6°	44.6°
slope (20dB/decade)	-1.67	-1.54	-1.53
gain margin (dB)	-17.5	-22.8	-24.5
slope (20dB/decade)	-0.337	-1.1	-1.37
freq (kHz)	14.15	26.8	30.8

Table 1

7 Switch Node Waveform

7.1 Switchnode primary

With 1.2A load results in the waveforms shown in Figure 12 and Figure 13. 2.9V were applied to the input.

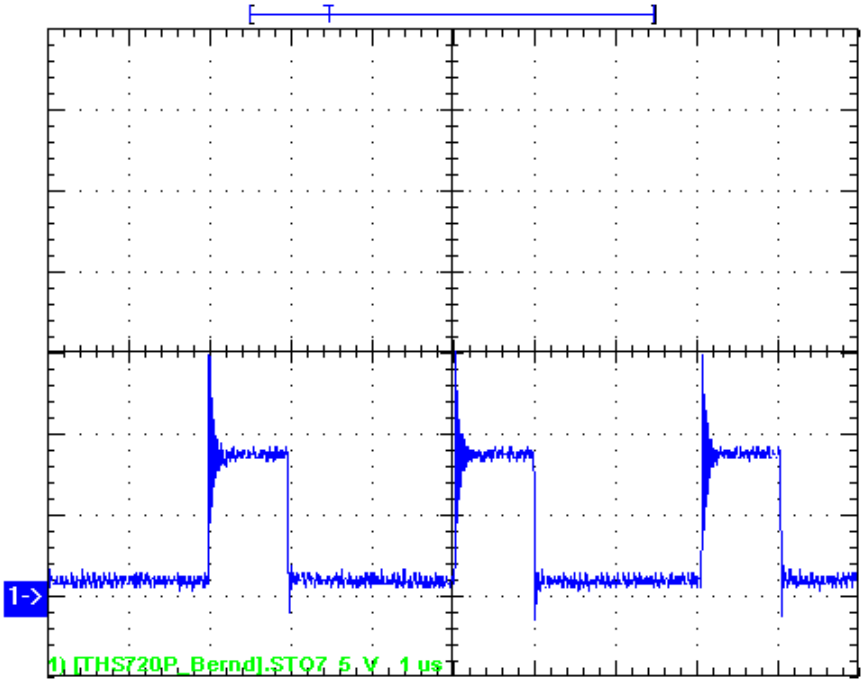


Figure 12

Ch1 => switchnode primary 5V/div

1µs/div

full bandwidth

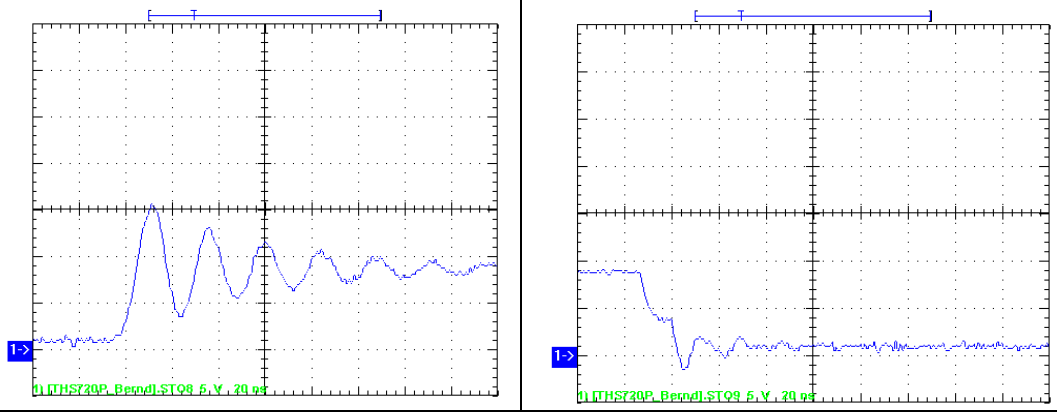


Figure 13

Ch1 => switchnode 5V/div

20ns/div

full bandwidth

With 1.2A load results in the waveforms shown in Figure 14 and Figure 15. 6.5V were applied to the input.

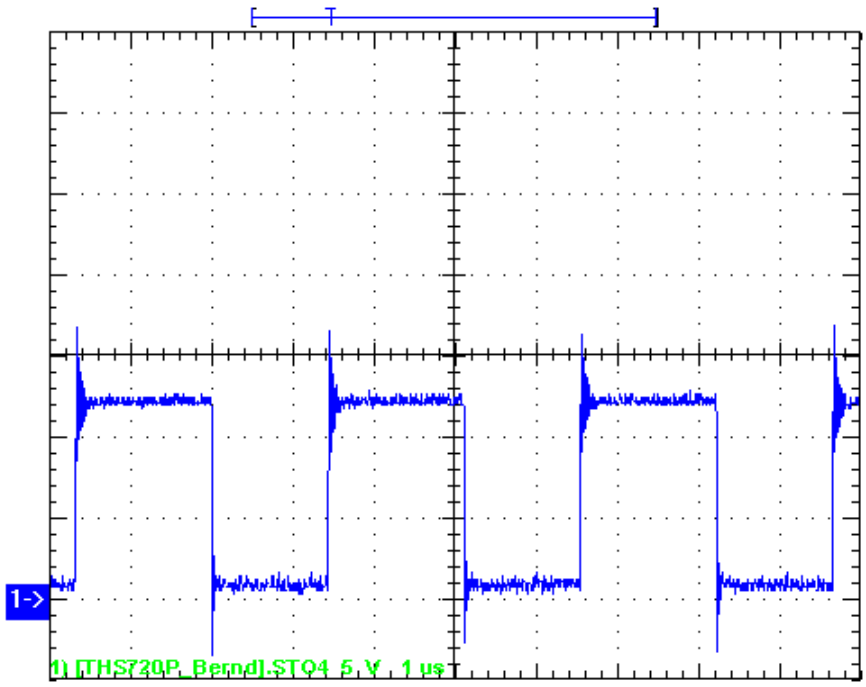


Figure 14

Ch1 => switchnode primary
5V/div

1µs/div

full bandwidth

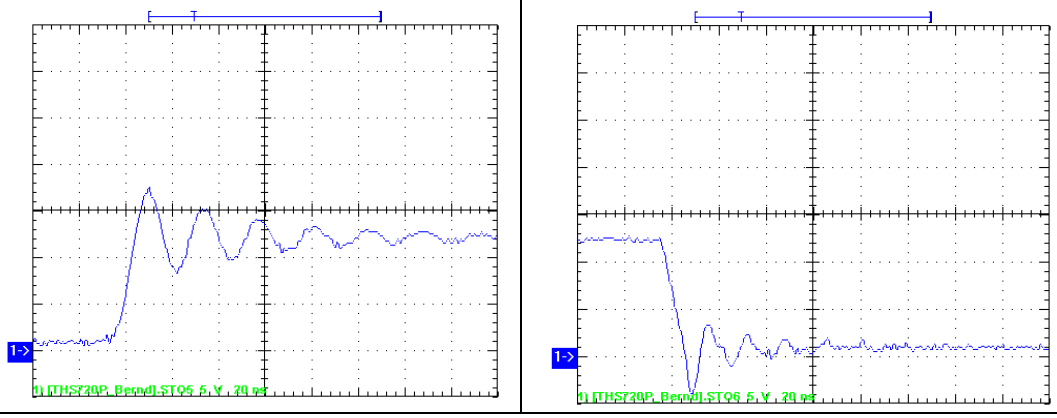


Figure 15

Ch1 => switchnode
5V/div

20ns/div

full bandwidth

With 1.2A load results in the waveforms shown in Figure 16 and Figure 17. 10V were applied to the input.

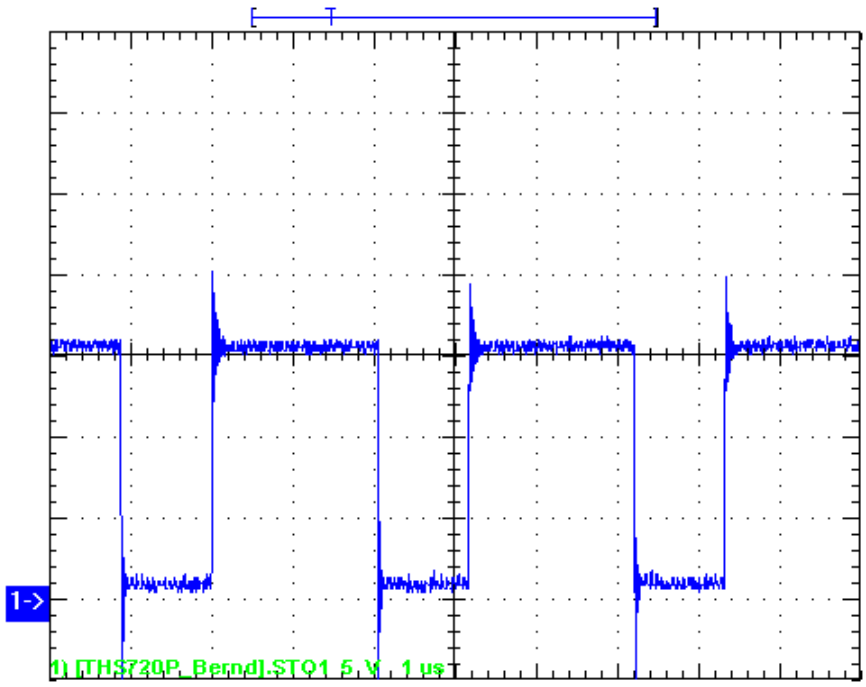


Figure 16

Ch1 => switchnode primary
5V/div

1µs/div

full bandwidth

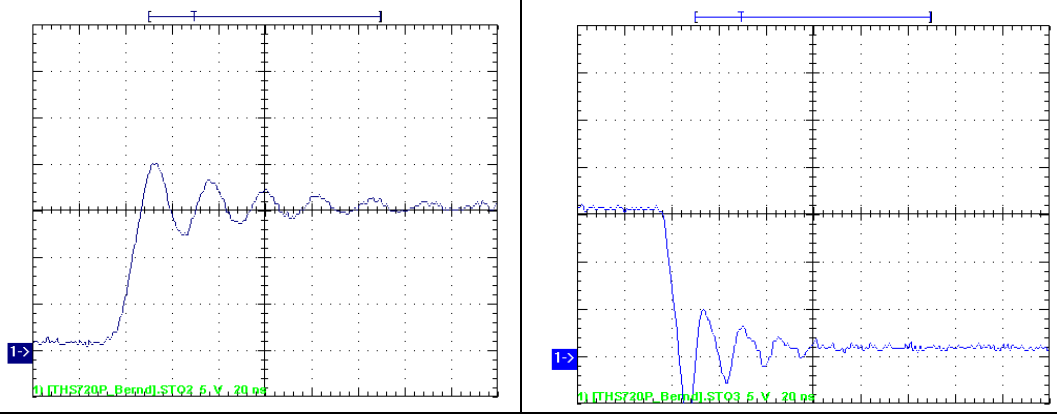


Figure 17

Ch1 => switchnode
5V/div

20ns/div

full bandwidth

7.2 Switch secondary

With 1.2A load results in the waveforms shown in Figure 18. 2.9V were applied to the input.

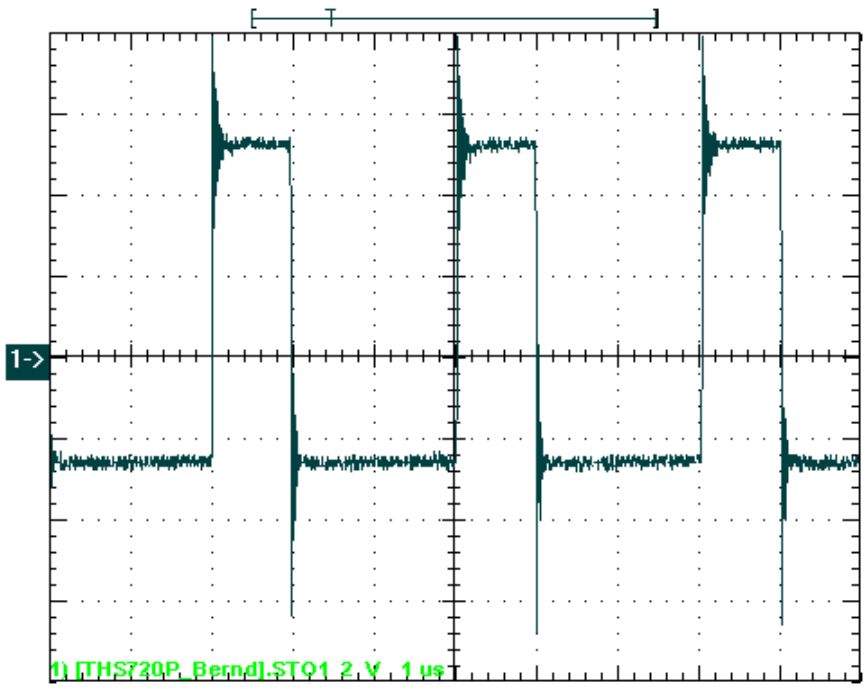


Figure 18

Ch2 => switchnode
2V/div

1µs/div

full bandwidth

With 1.2A load results in the waveforms shown in Figure 19. 6.5V were applied to the input.

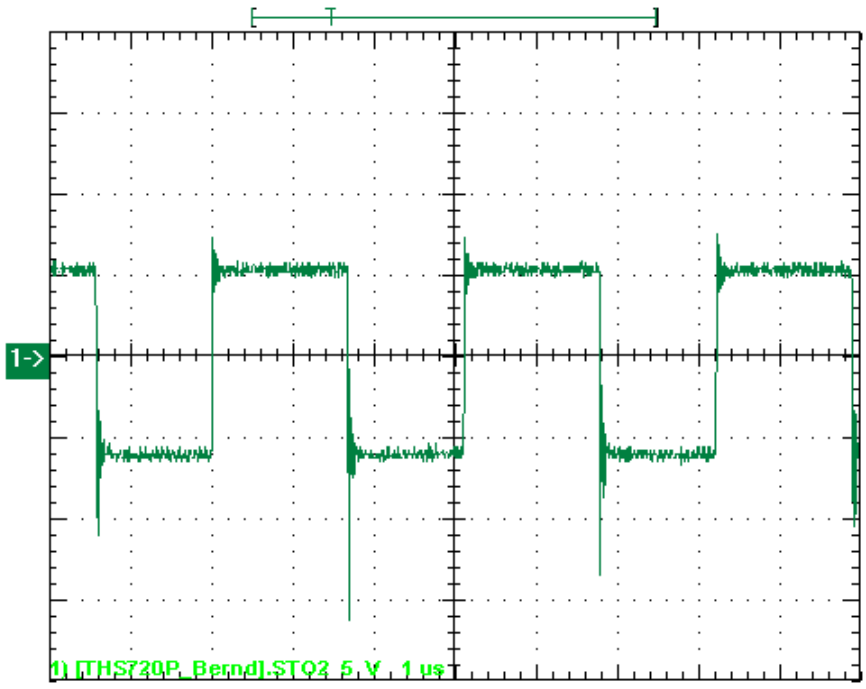


Figure 19

Ch2 => switchnode
5V/div

1µs/div

full bandwidth

With 1.2A load results in the waveforms shown in Figure 20. 10V were applied to the input.

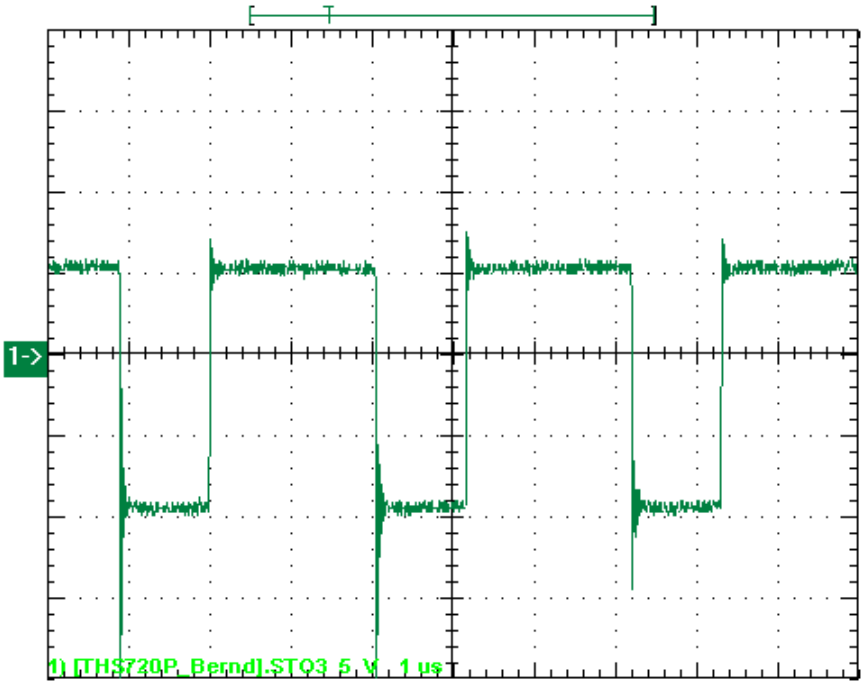


Figure 20

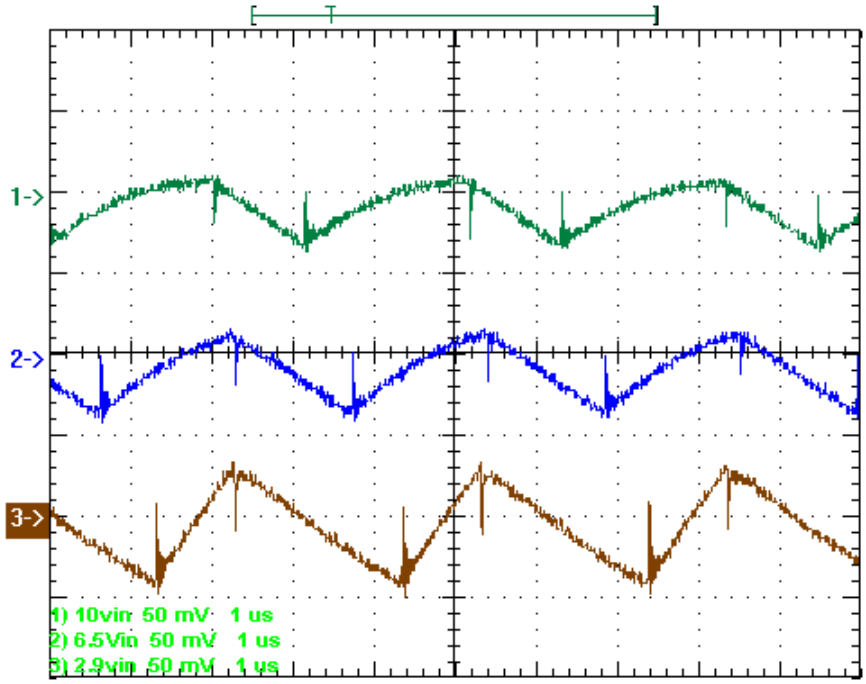
Ch2 => switchnode 5V/div

1µs/div

full bandwidth

8 Ripple Voltages

The output ripple voltage is displayed in Figure 21. The input voltage was set to 2.9V, 6.5V and 10V with output current 1.2A.



Ch1=> output voltage @ 10Vin

Ch2=> output voltage @ 6.5Vin

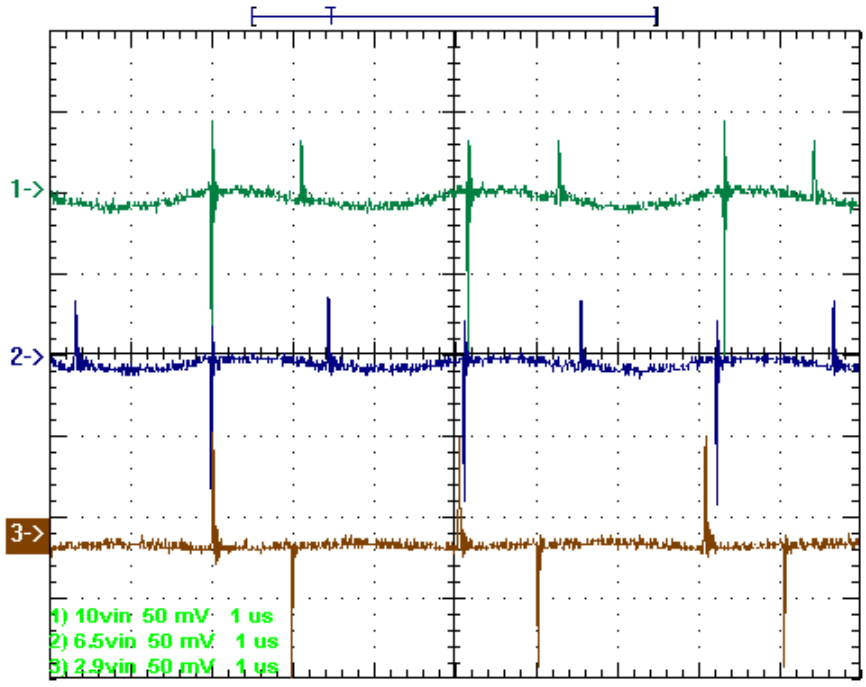
Ch3=> output voltage @ 2.9Vin

50mV/div

1µs/div
AC coupling
20MHz bandwidth

Figure 21

The input ripple voltage is displayed in Figure 22. The input voltage was set to 2.9V, 6.5V and 10V with output current 1.2A.



Ch1=> input voltage @ 10Vin

Ch2=> input voltage @ 6.5Vin

Ch3=> input voltage @ 2.9Vin

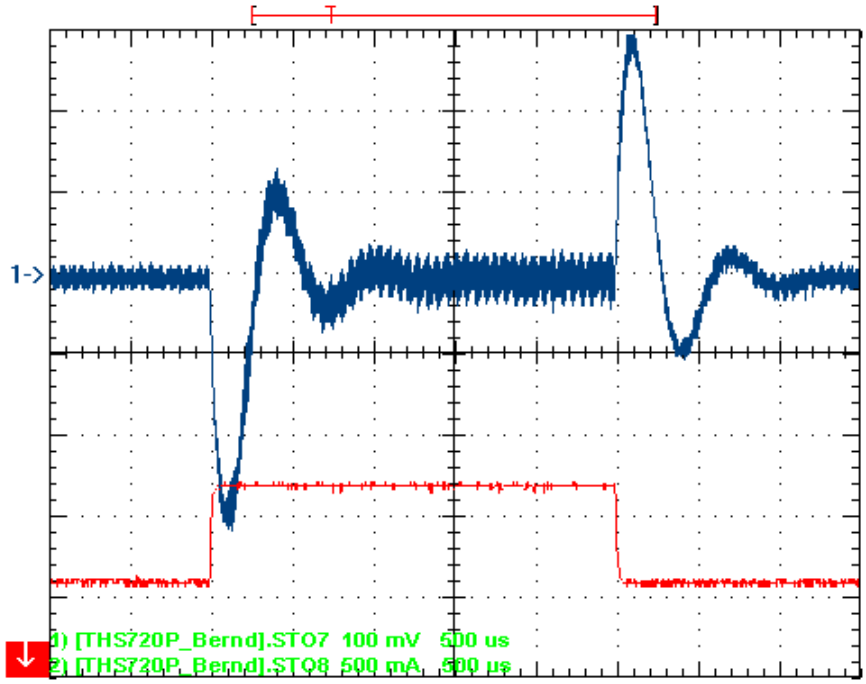
50mV/div

1µs/div
AC coupling
20MHz bandwidth

Figure 22

9 Load Transients

A output current change from 0.6A to 1.2A (200Hz) results in following Figure 23.The input voltage was set to 3V



Ch1=> output voltage
AC coupled
100mV/div

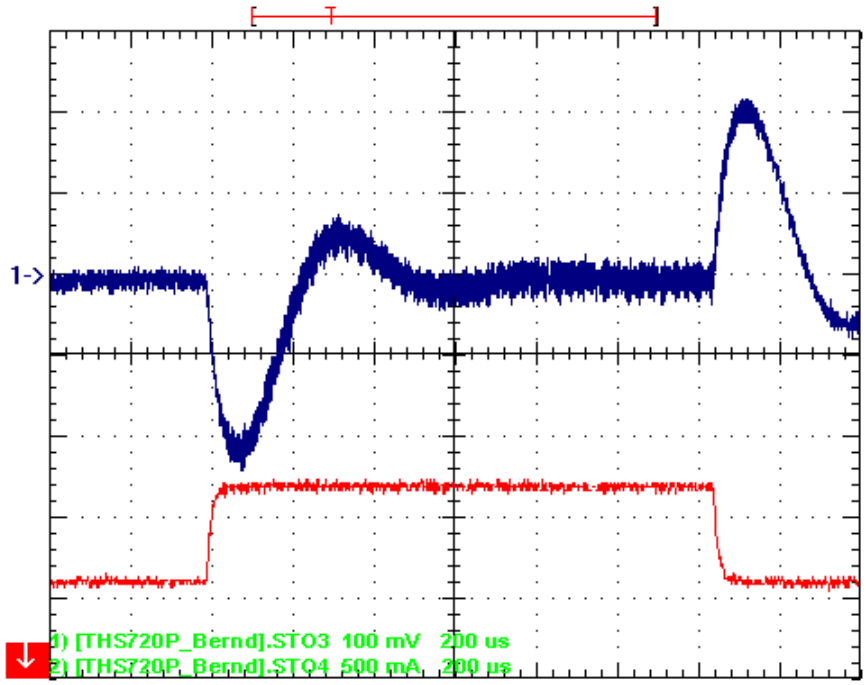
Ch2=> output current
500mA/div

500µs/div

20MHz bandwidth

Figure 23

A output current change from 0.6A to 1.2A (400Hz) results in following Figure 24.The input voltage was set to 6.5V



Ch1=> output voltage
AC coupled
100mV/div

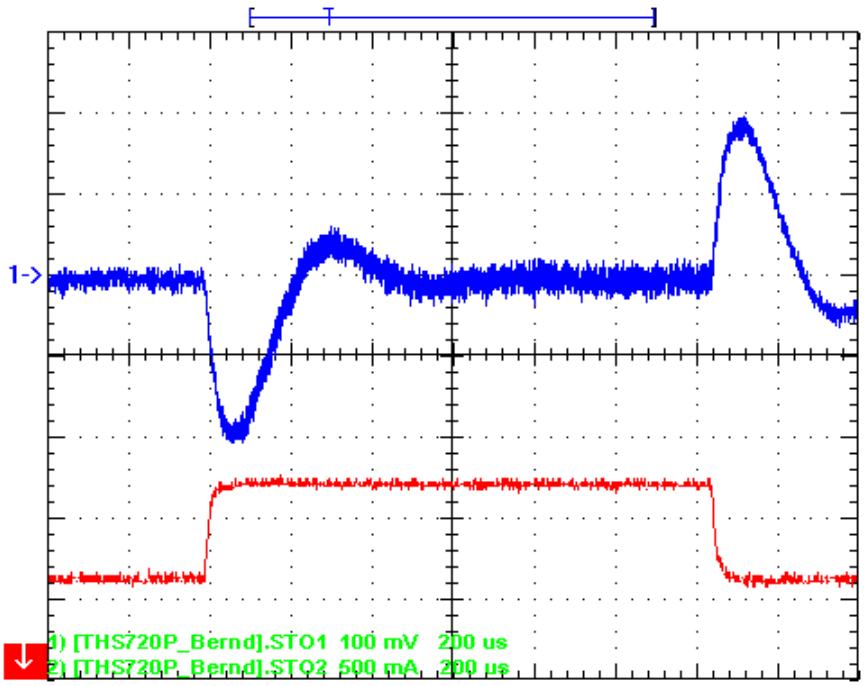
Ch2=> output current
500mA

200µs/div

20MHz bandwidth

Figure 24

A output current change from 0.6A to 1.2A (400Hz) results in following Figure 25.The input voltage was set to 10V



Ch1=> output voltage
AC coupled
100mV/div

Ch2=> output current
500mA

200µs/div

20MHz bandwidth

Figure 25

10 Thermal Image

Figure 26 is the photo taken with 6.5V input voltage and 1.2A output current.

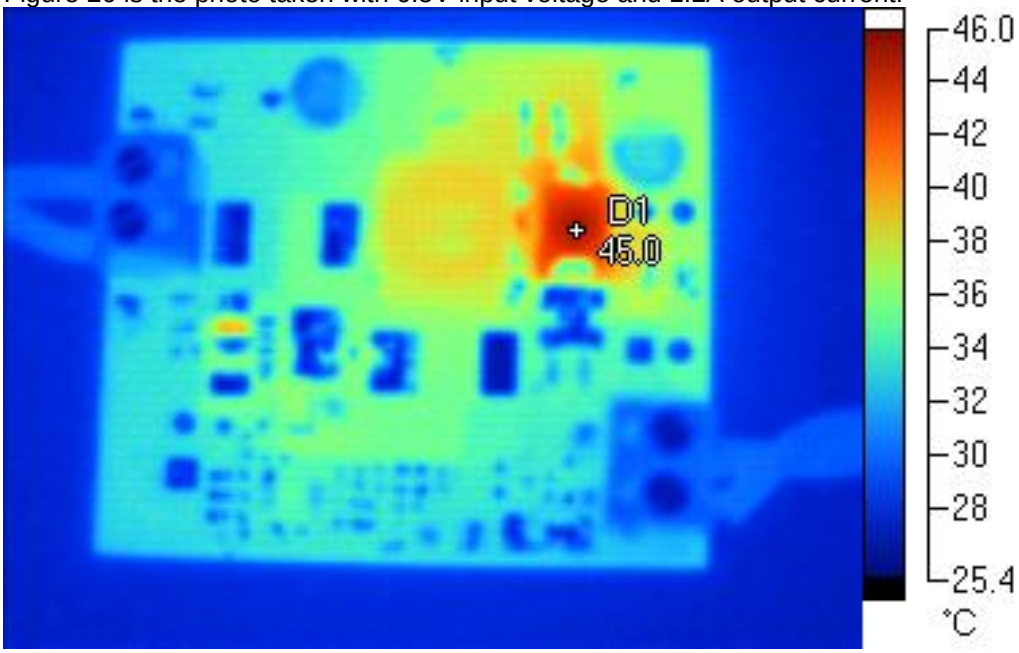


Figure 26

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RFID	www.ti-rfid.com		
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