PMP5922 rev C is what TPS59610EVM-732 is based upon. Below are additional waveforms for each of the 5 switchers on the board. But first is shown a detailed thermal picture of the highest current switcher, the 1.8V at 5A.

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DDR2 channel 1.8V 5A TPS51916 & CSD86330Q3D off 3.3V

Full load switching Thermal image: 0.9V linear not loaded
PMP5922C: TPS51916 DDR2 switcher only loaded 667kHz
3.634Vin 2.843In 1.790Vout at 5.07A Chokes MPT420-R47 x2
Chokes hottest at 61 & 58 degrees Celsius;
dual switch CSD86330Q3D at 44 degrees C;
ambient at 23-25 deg. C
DDR2 channel continued: Major Waveform:

Output ripple:
Efficiency calculations above ignore power from 5V used mostly for gate drive.
DDR2 continued:

Step load response:

17-Jan-11 Reading Floppy Disk Drive
26:18:34

26 &s 20.0 mV

26 &s 10.0 mV

maximum(1) 3.7 mV
Freq(1) 55.4939 kHz
Fall(1) 5.835 μs
rise(1) 18.832 μs

26 μs 80 mV

50 mV DC

18 mV 500 Q

Qq

PMP5922C 1.8V 5A Step load response TPS51016 675kHz 3.75Vin and 5V Bias
Upper trace channel 4 at 5A/V load from zero to 5A at about 1A/sec.
Lower trace the 1.8V/µs at terminals about 40mV peak undershoot from initial Vout of 1.8V.
CPU Channel waveforms:

Full Load Ripple:

Load step & dump:
GPU Channel waveforms:

Beyond Full Load Ripple:

Load step and Dump response:
using on board dynamic load of 4.7A
(720 & R711 were 100mW each)

〜1A DC load
peak undershoot of -42mV from final value
peak overshoot of +32mV from final value
On board load step now 3A
Dynamic load: Note: Step and dump well above max expected application load

PMP-5922C 1.8V 5A off 3.3Vin Test Report (TPS51916)  Texas Instruments
Qq

1.05V 3.5A off 3.3V TPS53219 & CSD86330Q3D
Main waveform:

Load step and dump response:
- Using on board dynamic load of 4.3A
- R712 & R713 were 100mΩ each
- 16 DC load
- Peak undershoot of ~10mv from final value
- Peak overshoot of 34mv from final value
- On-board load step now 1.5A

259 mV/s
SLOW TRIGGER
NORMAL
Output ripple:

Main switching waveform at full load
667kHz
Rise and fall times well under 2ns
1.05V 3.5A off 3.3V TPS3219 & CSD86330Q3D continued:
Step load response:

Output ripple at full load:
6375μV
13mV peak to peak
Load dump response:
1.2V Channel: TPS53311 with integrated FETs
Main waveform:
Output ripple:
1.2V Channel: TPS53311 with integrated FETs continued:

Step load response:

Output ripple at full load
less than 10mV peak to peak
Load dump response:

- Load dump response:

  - **Maximum**: 15.1 mW
  - **Freq**: --
  - **Fall**: 3.026 mV
  - **Rise**: 21.853 mV
  - **Peak**: 168.3 mV

**Step load response**

- From no load to about 2A load
- Top trace is Tout at 2V/div
- Bottom trace is Vout at 50mV/division
- 10 mV/division
- 100 mV/division

**Note**: 15:57:01
PMP5922C 1.8V 5A off 3.3Vin Test Report (TPS51916) Texas Instruments

18-Jan-11
13:59:51

26 μs
50mV

26 μs
18.6mV

maximum(1)
141.6mV
peak(1)
2.36162 MHz
Fall(1)
18.778 μs
rise(1)
3.658 μs

50 mV AC
2.5 V DC
50 mV DC
4 DC 7.4mV

Load dump response
From about 2A to no load
Top trace is 400V at 2A/50V
Bottom trace is Vout at 50mV / division
100mV overshoot

Josh Mandelcorn page 18 of 18 January 7-18, 2011
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