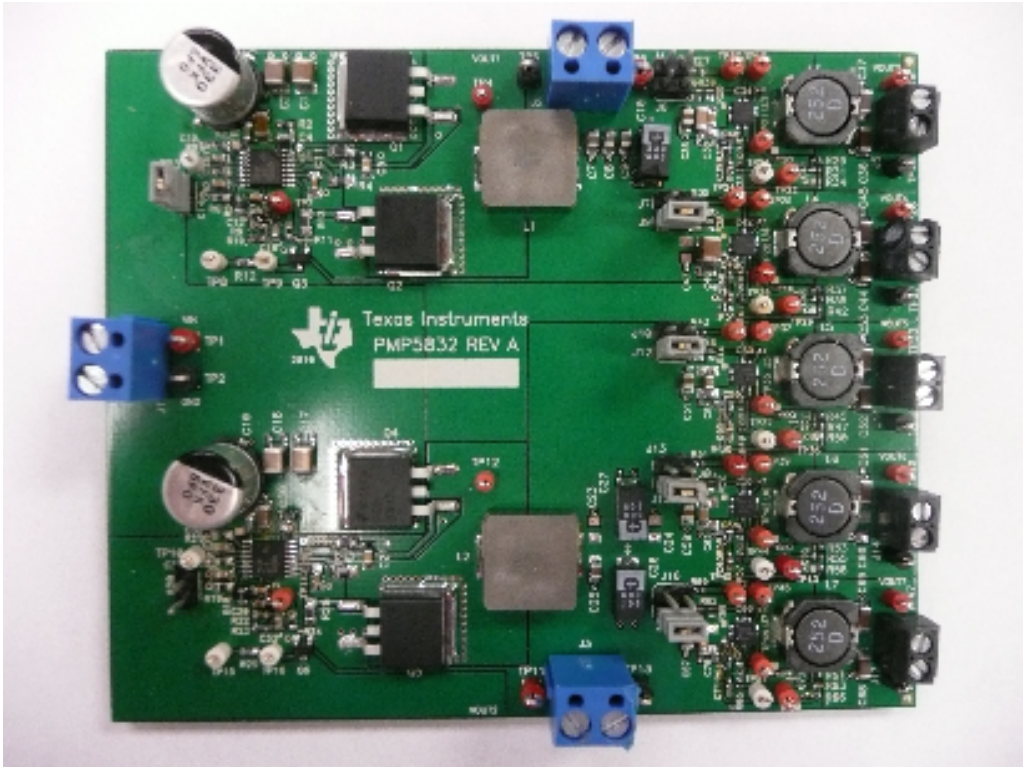
PMP5832 Test Report

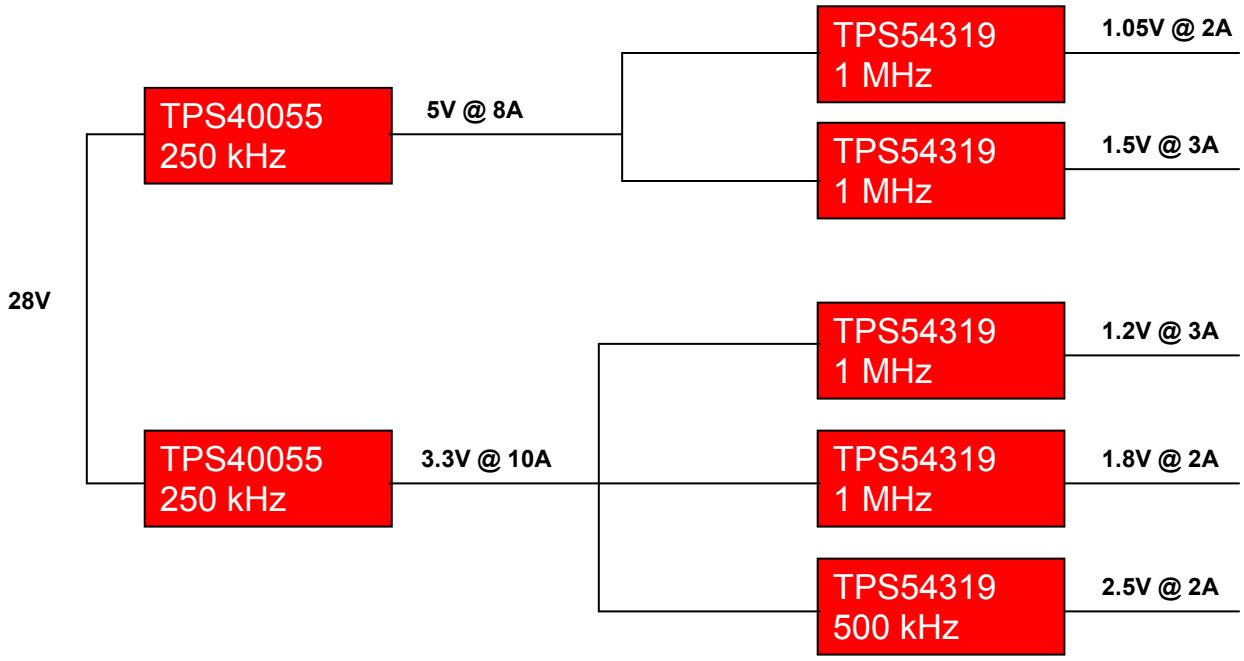
Operating Parameters

Parameter	Min	Typ	Max	Unit
V_{in}	26	28	30	V
V_{out}	1.05		5	V
I_{out}	2		3	A
$F_{switching}$	500		1000	kHz

1 PMP5832 Board Image



2 Block Diagram



3 TPS40055 – 5.0V Output

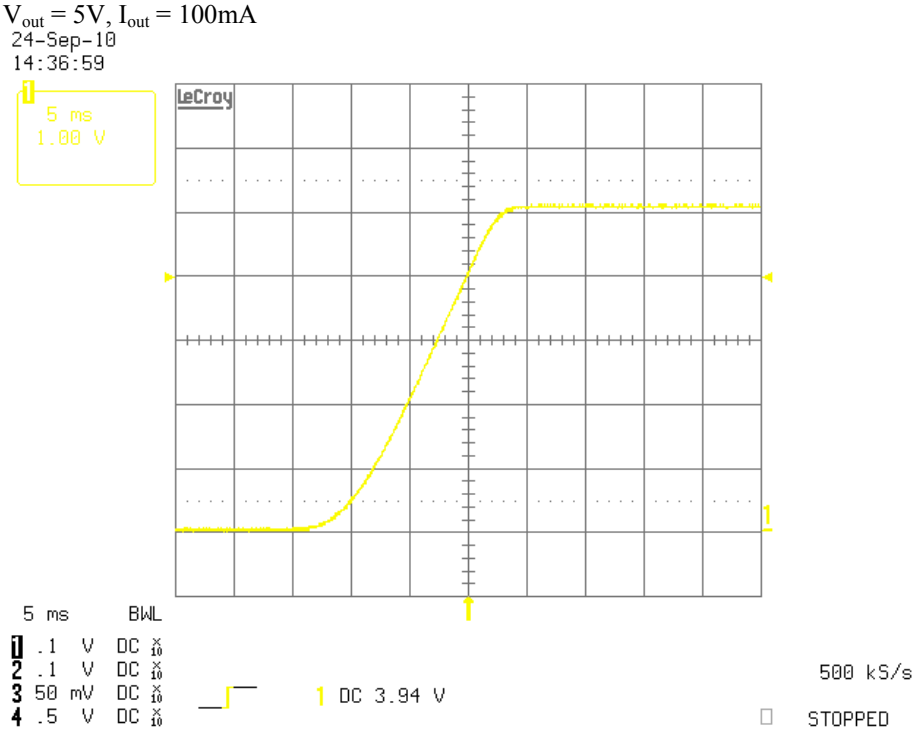
3.1 Performance Summary

Performance parameters below represent data obtained from the PMP5832 design; changes to the design, component selection or layout may result in varied performance.

Parameter	Test Conditions	Min	Typ	Max	Unit
Loop Bandwidth	V_{in}=28V , I_{out}=8A		31.92		kHz
Phase Margin	V_{in}=28V , I_{out}=8A		74.37		º
Output Voltage Ripple	I_{out}=8A		15.5		mV
Maximum Efficiency			90.6		%
Load Regulation	V_{in}=28V, I_{out}= 0A to 8A		0.5		%
Switching Frequency			264		kHz

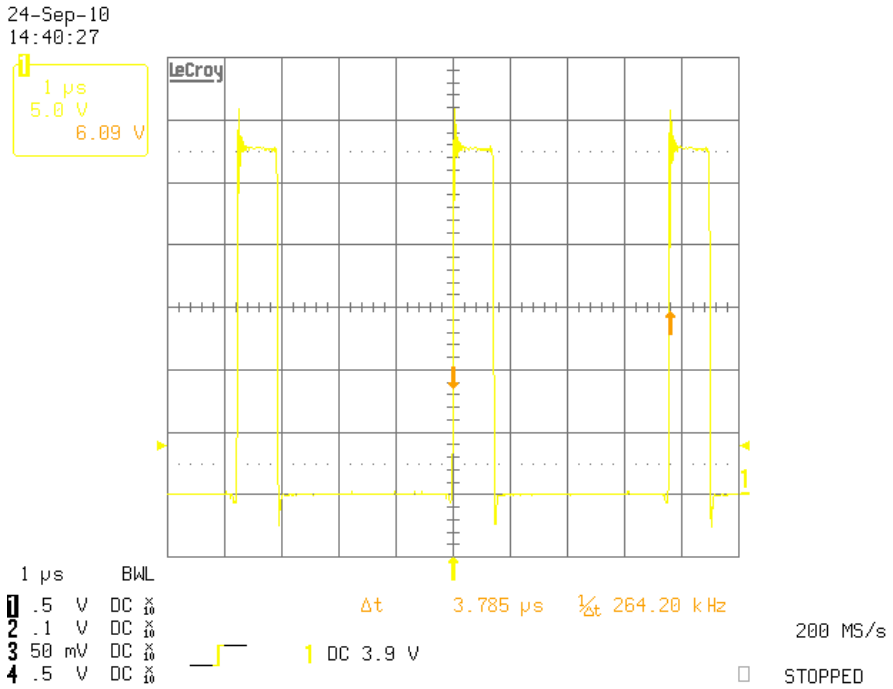
3.2 Start-up Waveform

V_{in} = 28V, V_{out} = 5V, I_{out} = 100mA

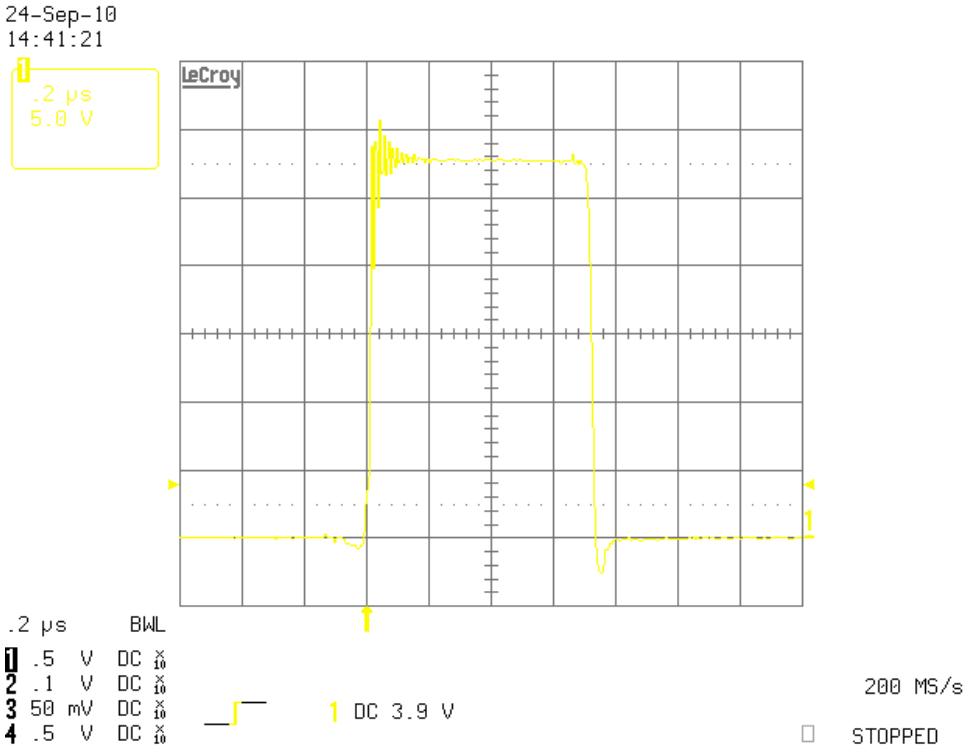


3.3 Switch Node

V_{in} = 28V, V_{out} = 5V, I_{out} = 8A

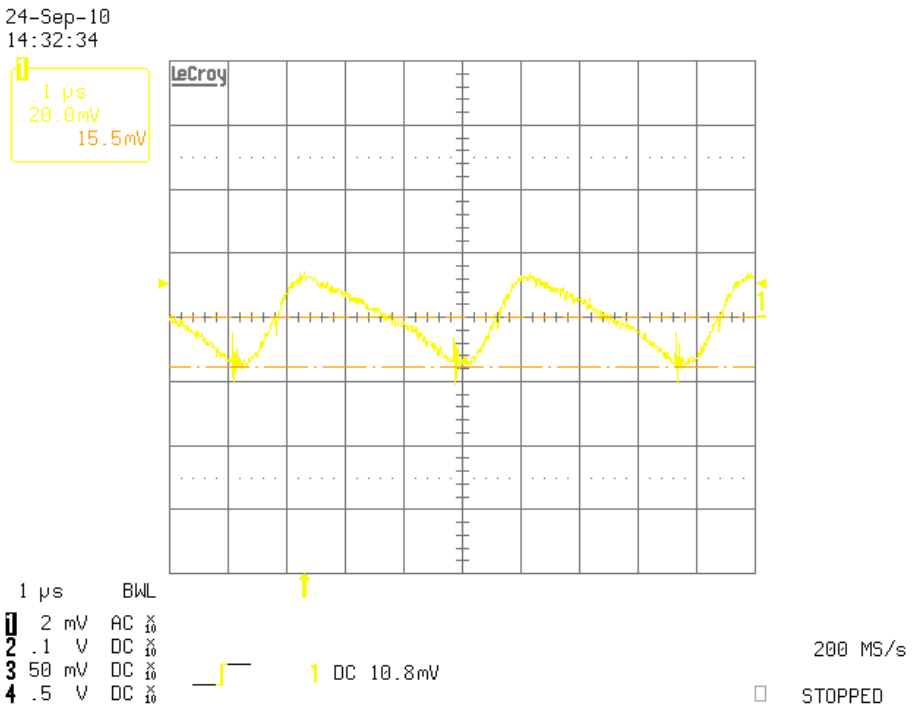


Zoom



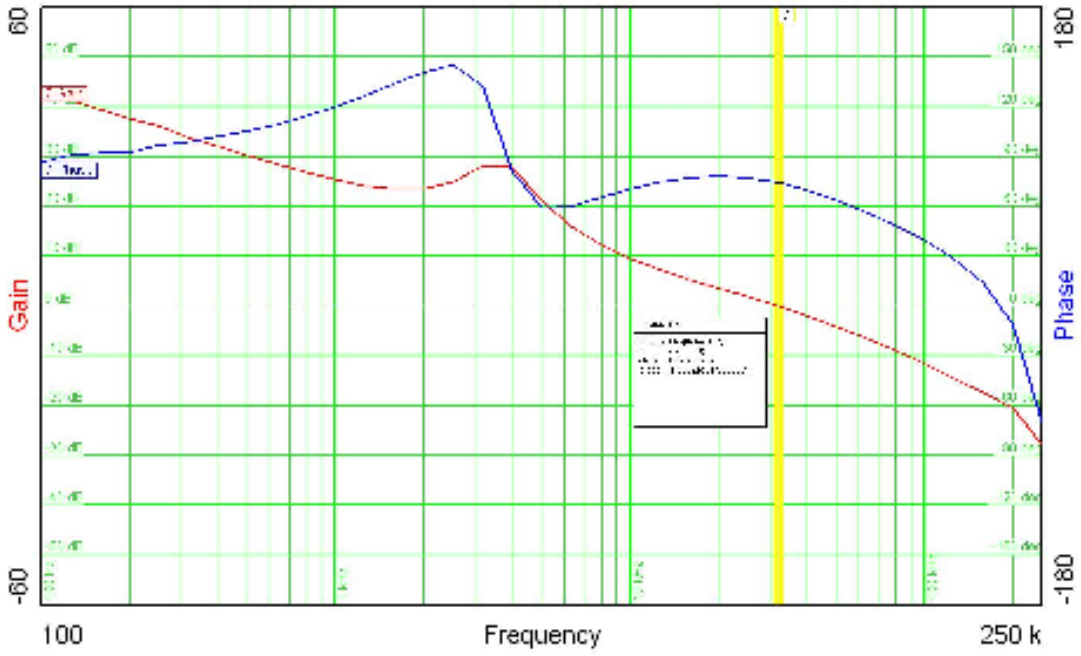
3.4 Output Voltage Ripple

V_{in} = 28V, V_{out} = 5V, I_{out} = 8A



3.5 Loop Response

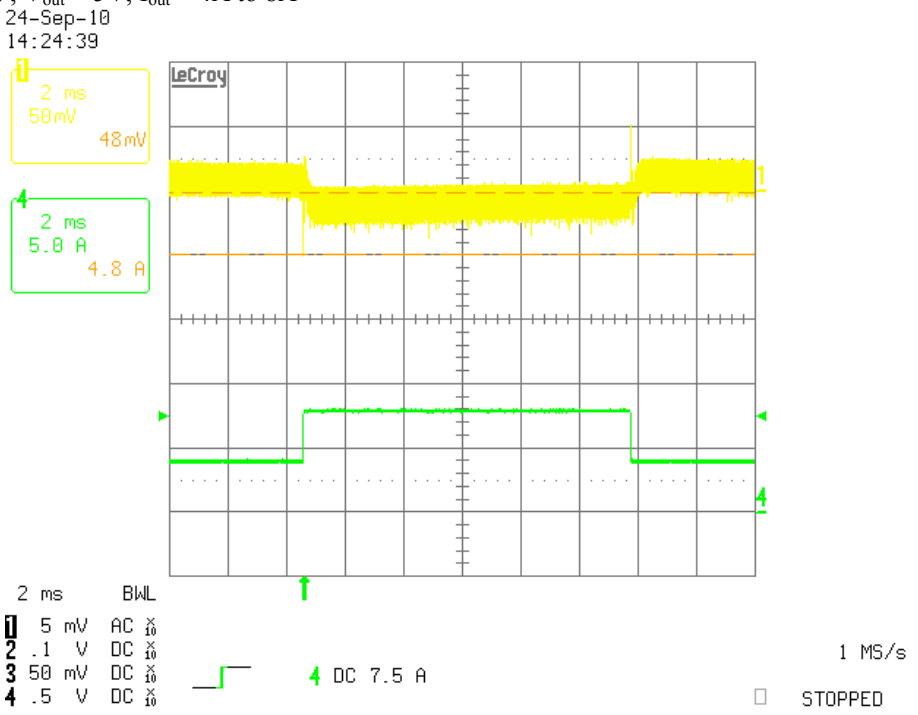
V_{in} = 28V, V_{out} = 5V, I_{out} = 8A



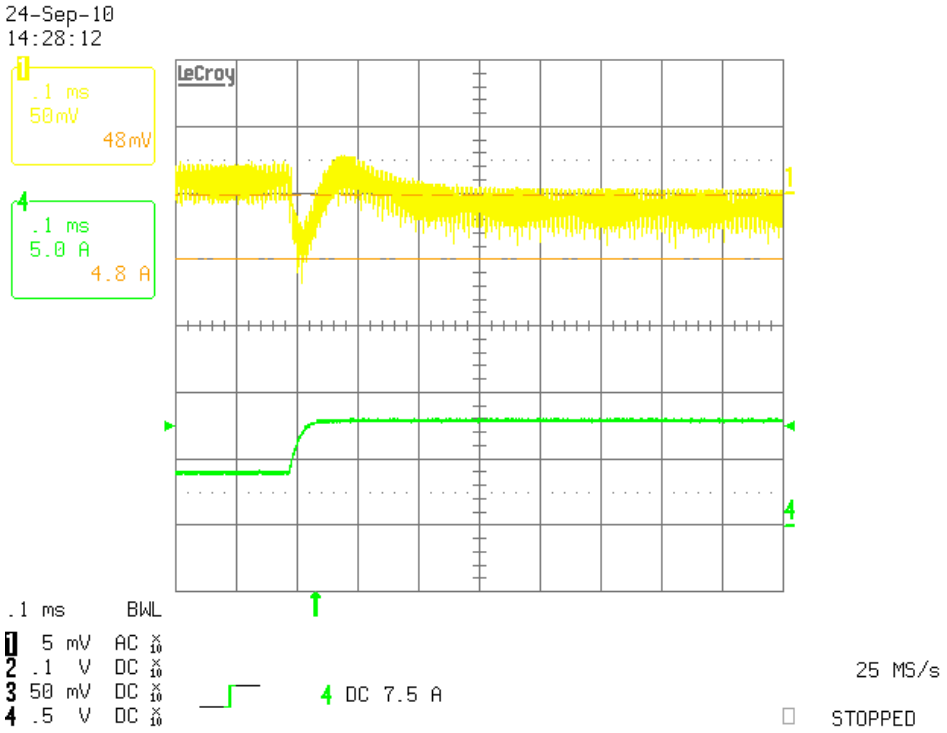
Phase margin = 74.37 @ 31.92 kHz

3.6 Transient Response

V_{in} = 28V, V_{out} = 5V, I_{out} = 4A to 8A

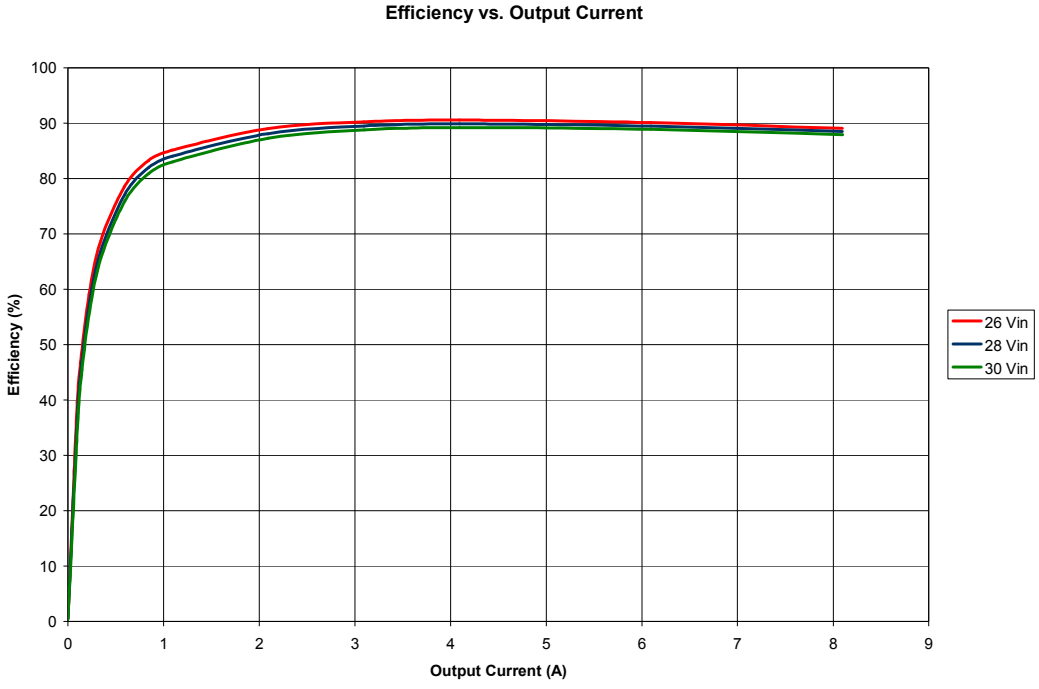


Zoom



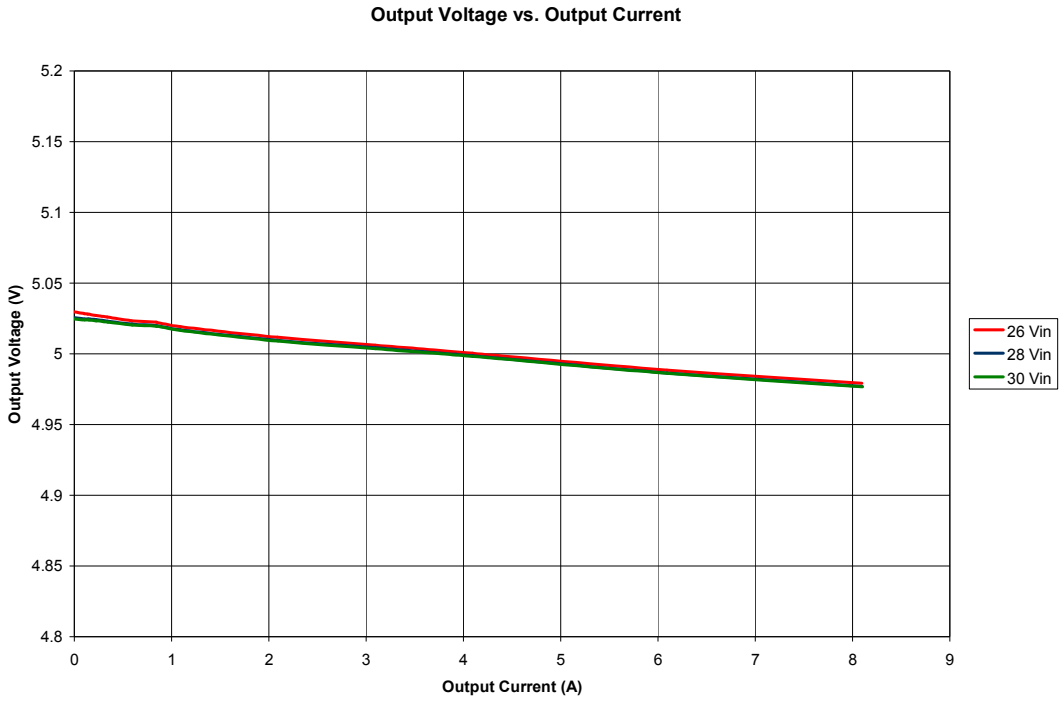
3.7 Efficiency

V_{out} = 5V, I_{out} = 0A to 8A



3.8 Load Regulation

V_{out} = 5V, I_{out} = 0A to 8A



4 TPS40055 – 3.3V Output

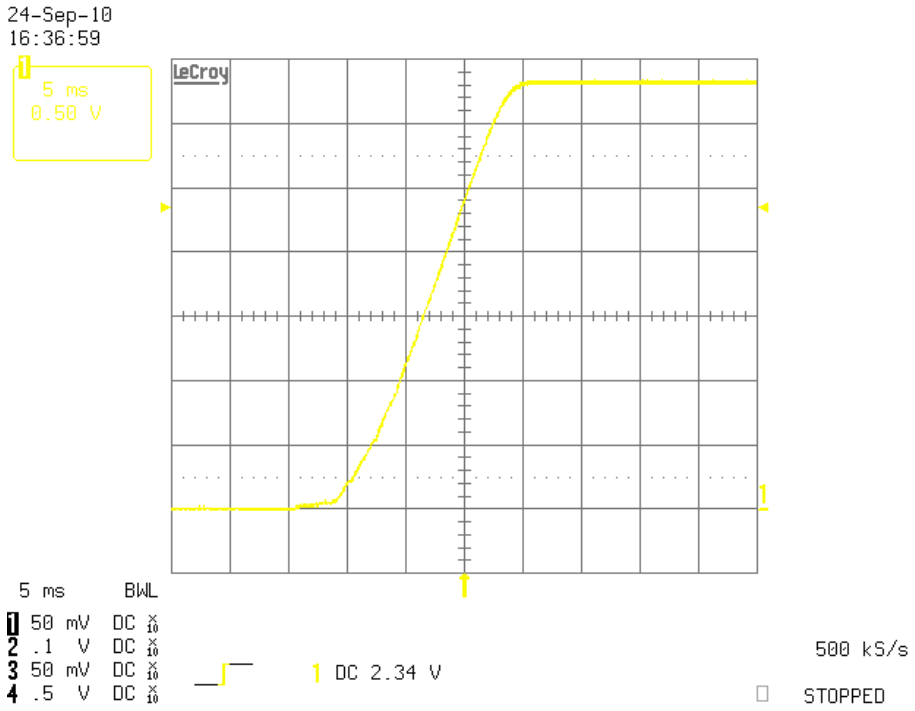
4.1 Performance Summary

Performance parameters below represent data obtained from the PMP5832 design; changes to the design, component selection or layout may result in varied performance.

Parameter	Test Conditions	Min	Typ	Max	Unit
Loop Bandwidth	V_{in}=28V , I_{out}=10A		21.96		kHz
Phase Margin	V_{in}=28V , I_{out}=10A		62.03		°
Output Voltage Ripple	I_{out}=10A		11.9		mV
Maximum Efficiency			87.6		%
Load Regulation	V_{in}=28V, I_{out}= 0A to 10A		0.8		%
Switching Frequency			268		kHz

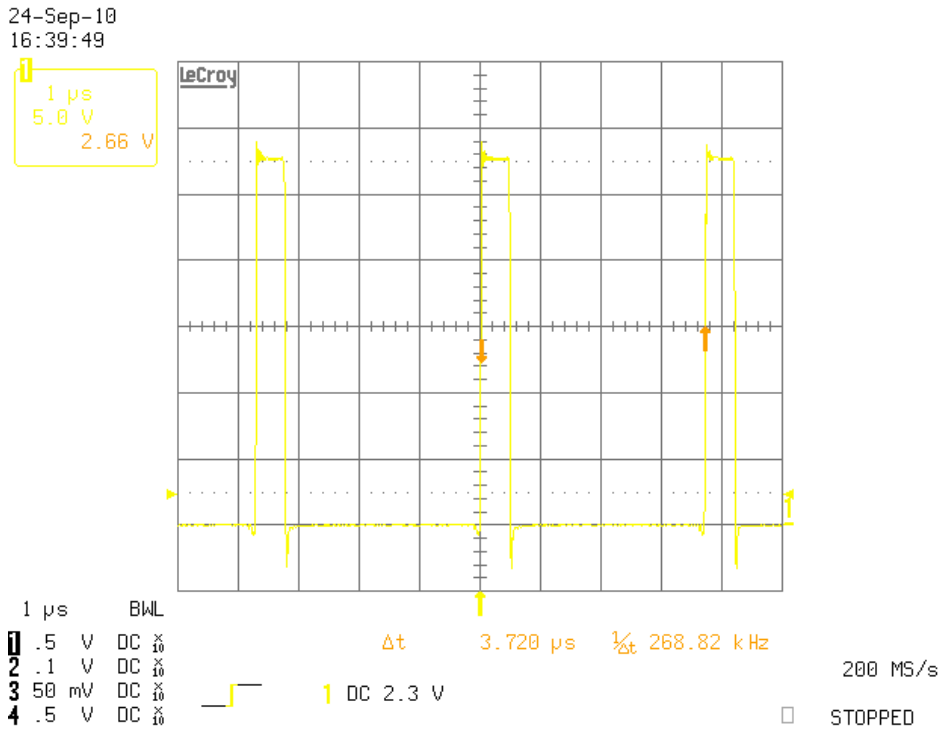
4.2 Startup Waveform

V_{in} = 28V, V_{out} = 3.3V, I_{out} = 150A

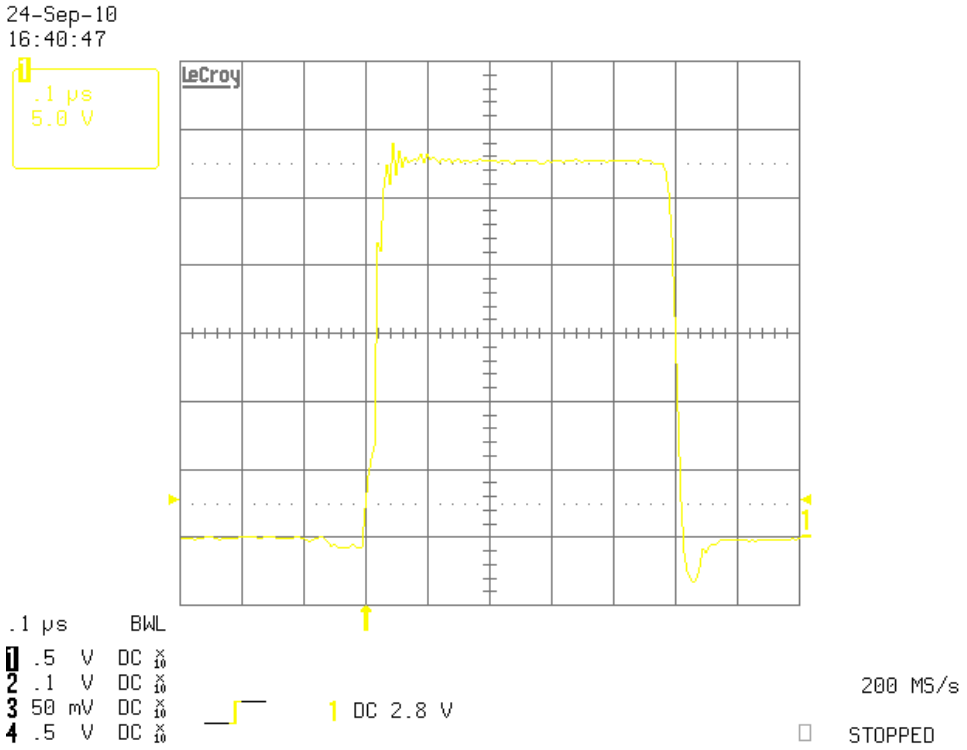


4.3 Switch Node

V_{in} = 28V, V_{out} = 3.3V, I_{out} = 10A

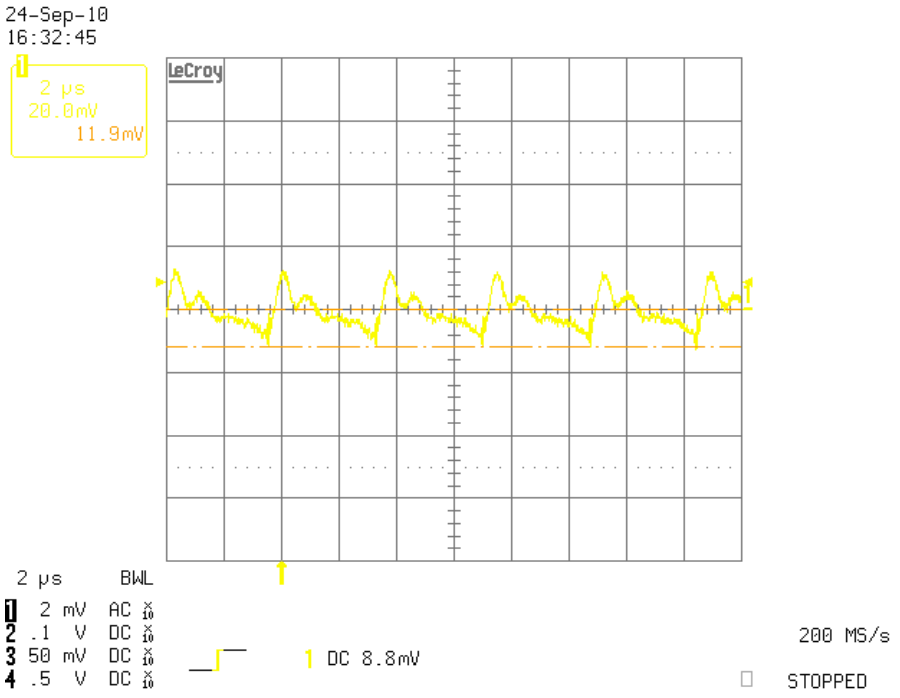


Zoom



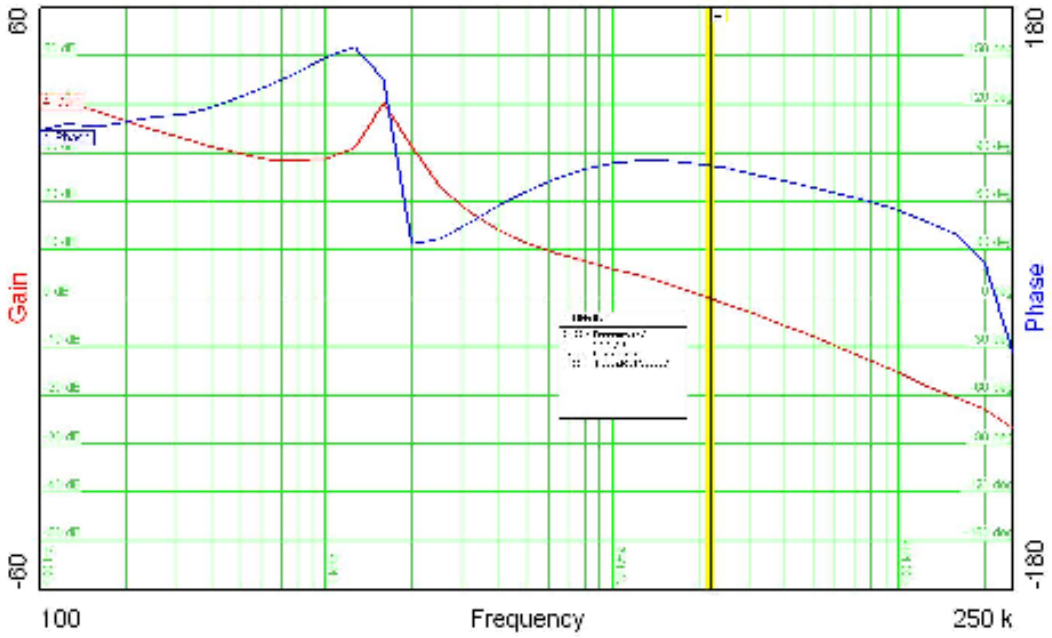
4.4 Output Voltage Ripple

V_{in} = 28V, V_{out} = 3.3V, I_{out} = 10A



4.5 Loop Response

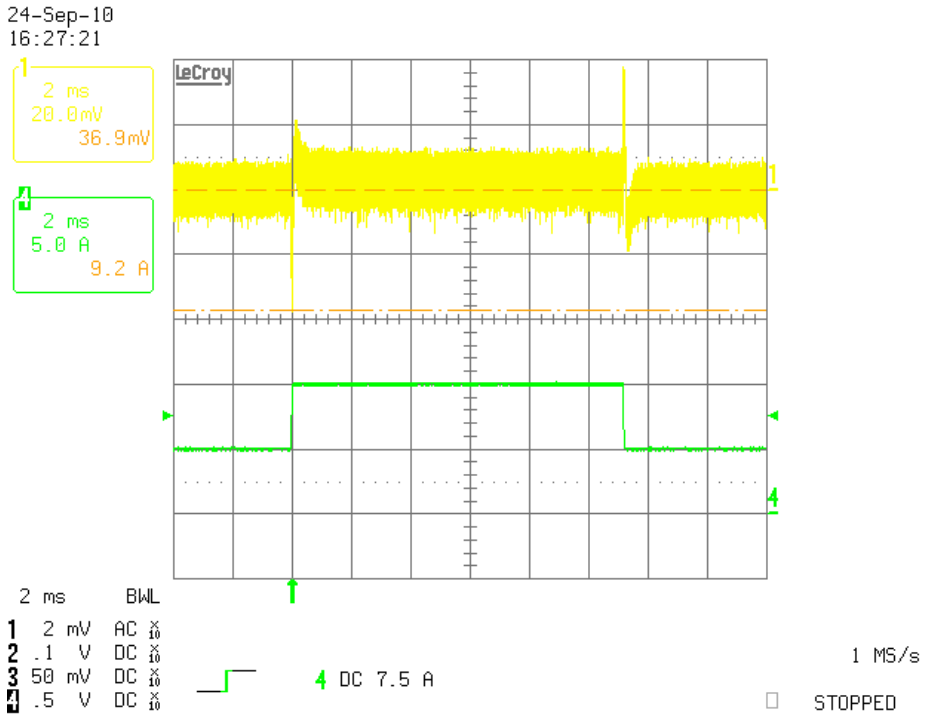
V_{in} = 28V, V_{out} = 3.3V, I_{out} = 10A



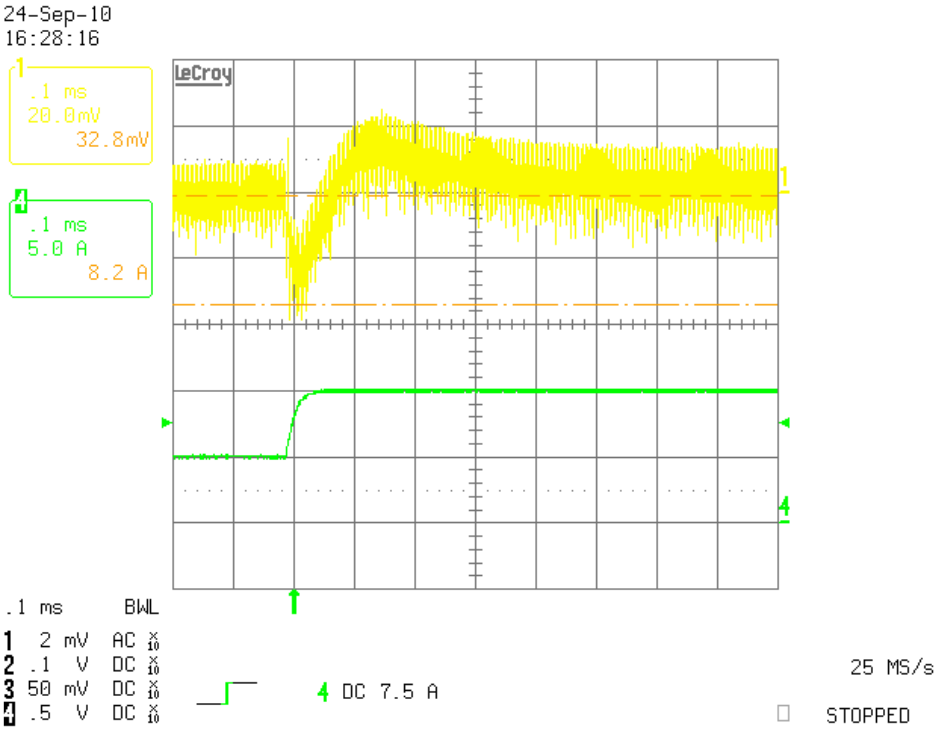
Phase Margin = 62.03 @ 21.96k

4.6 Transient Response

V_{in} = 28V, V_{out} = 3.3V, I_{out} = 5A to 10A

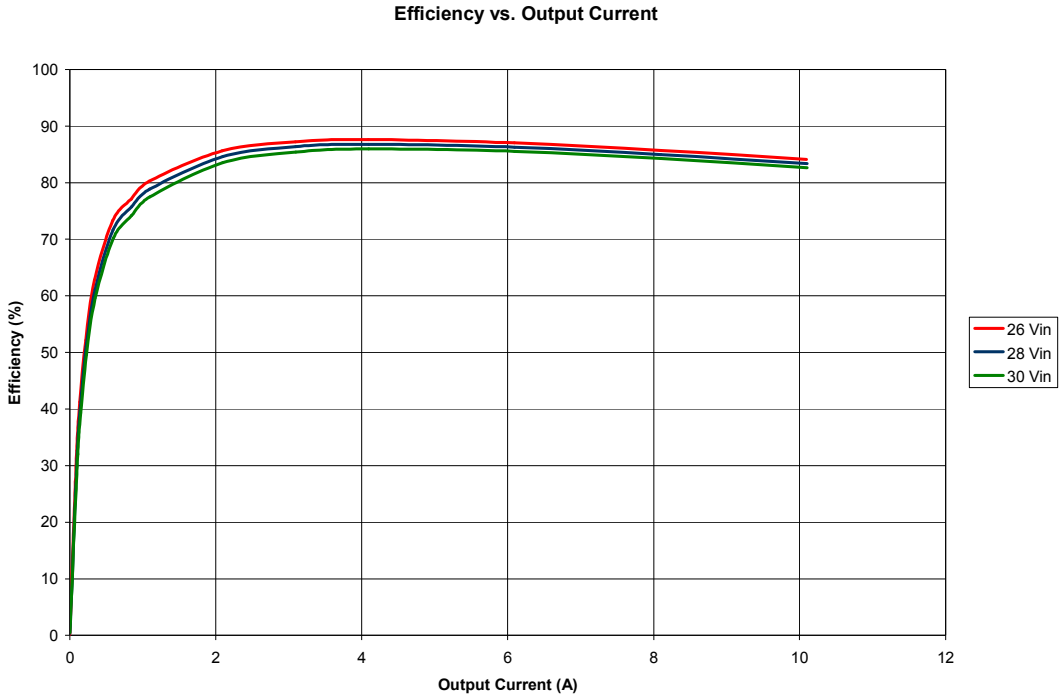


Zoom



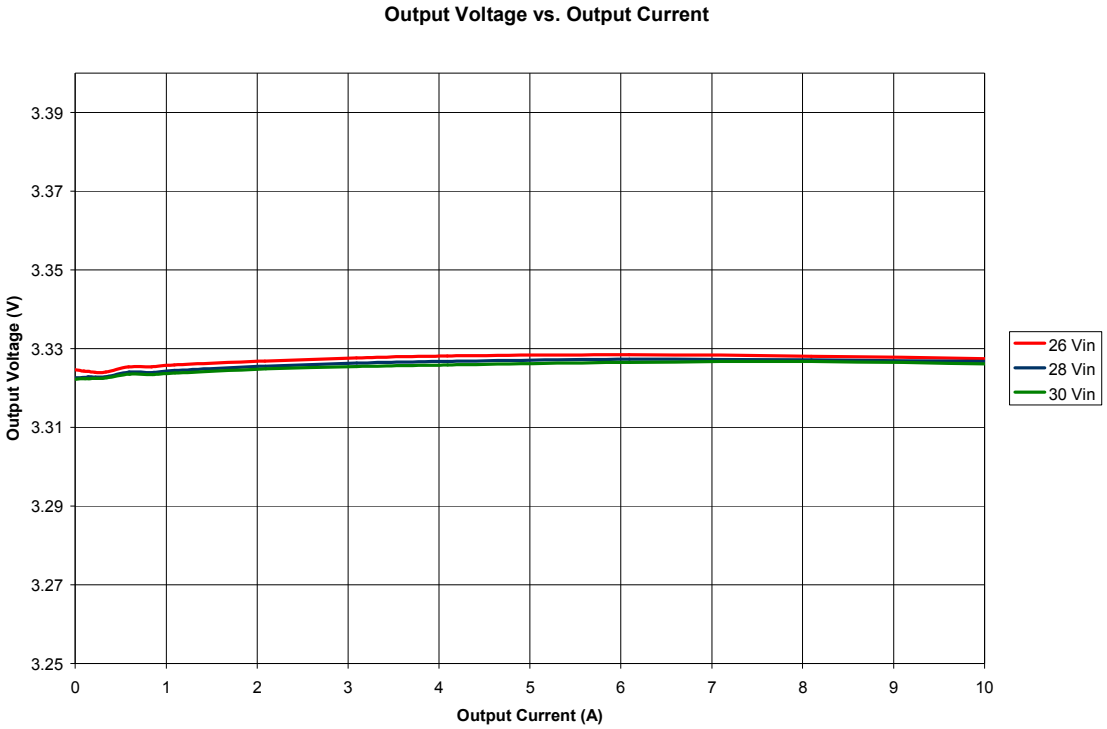
4.7 Efficiency

V_{in} = 28V, V_{out} = 3.3V, I_{out} = 0A to 10A



4.8 Load Regulation

V_{in} = 28V, V_{out} = 3.3V, I_{out} = 0A to 10A



5 TPS54319 – 1.05V Output

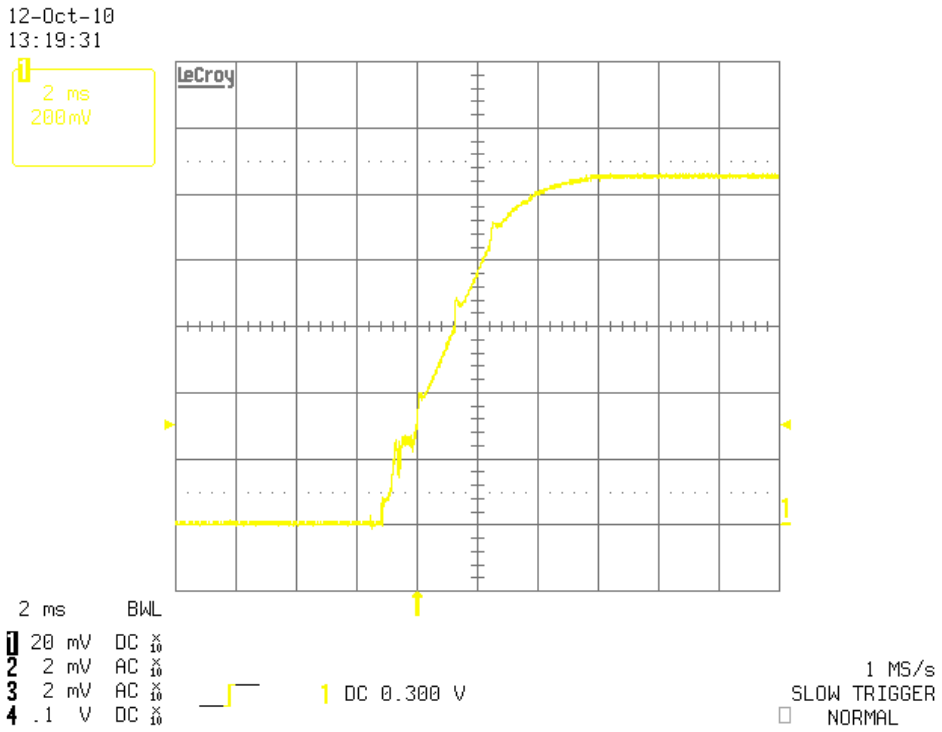
5.1 Performance Summary

Performance parameters below represent data obtained from the PMP5832 design; changes to the design, component selection or layout may result in varied performance.

Parameter	Test Conditions	Min	Typ	Max	Unit
Loop Bandwidth	V_{in}=5V , I_{out}=2A		29.65		kHz
Phase Margin	V_{in}=5V , I_{out}=2A		62.05		º
Output Voltage Ripple	I_{out}=2A		4.6		mV
Maximum Efficiency			90.7		%
Load Regulation	V_{in}=5V, I_{out}= 0A to 2A		0.2		%
Switching Frequency			941		kHz

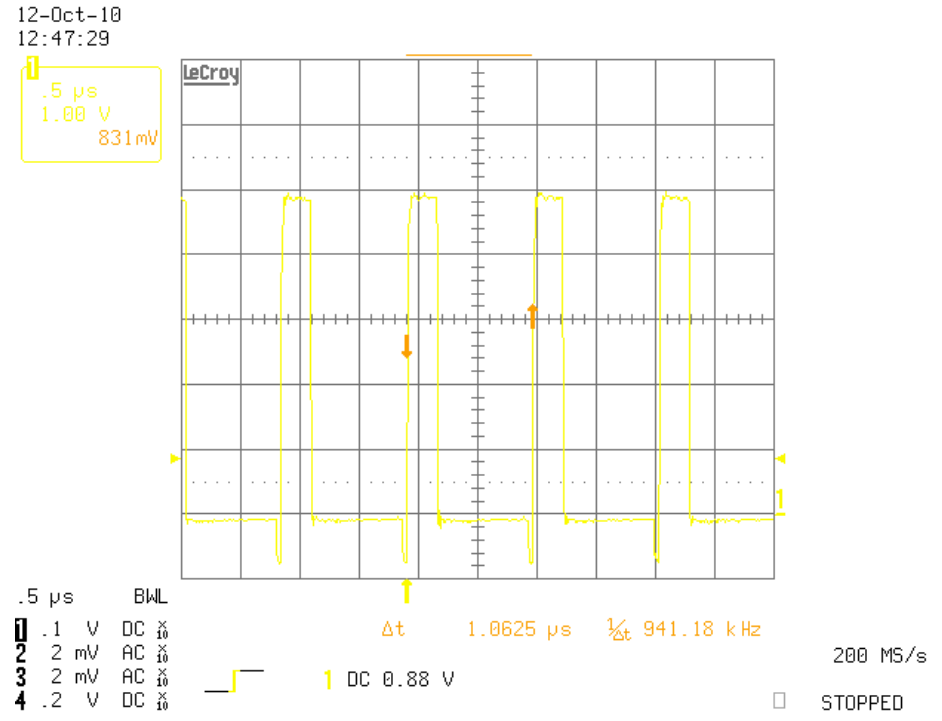
5.2 Startup Waveform

V_{in} = 5V, V_{out} = 1.05V, I_{out} = 100mA

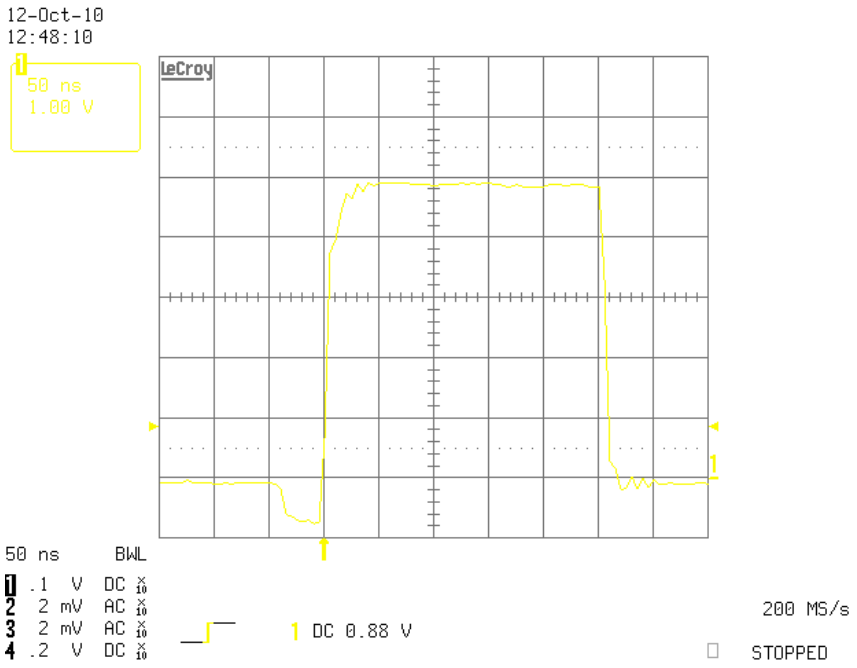


5.3 Switch Node

V_{in} = 5V, V_{out} = 1.05V, I_{out} = 2A

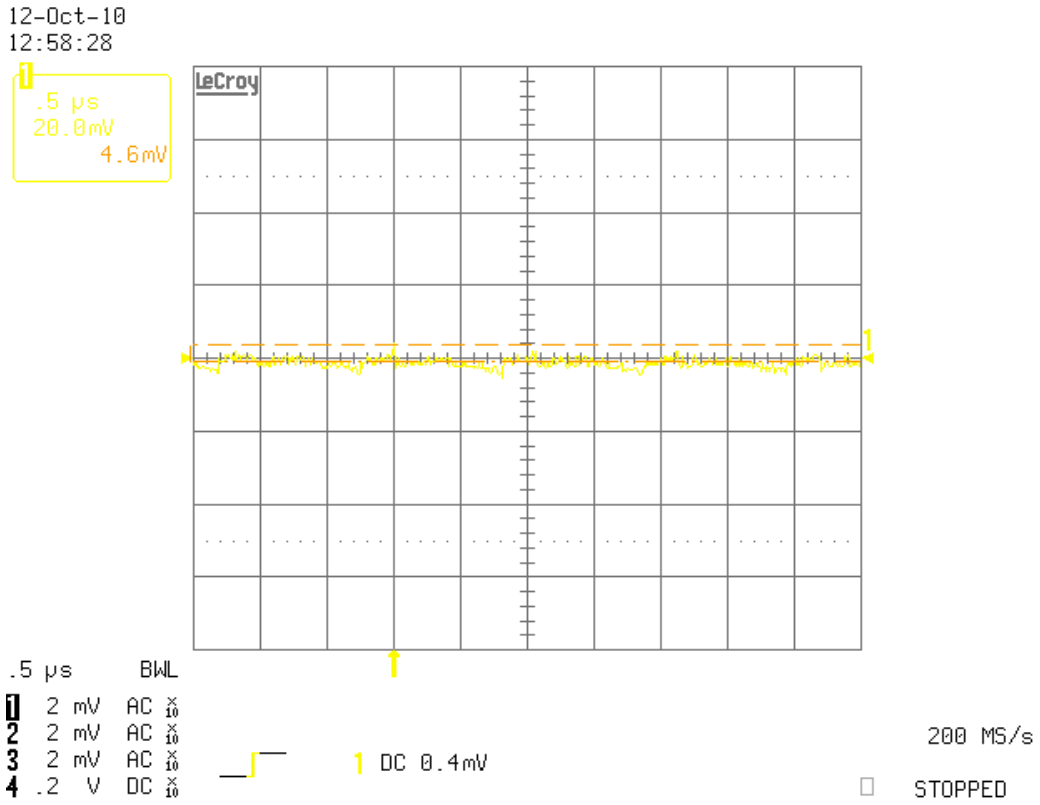


Zoom



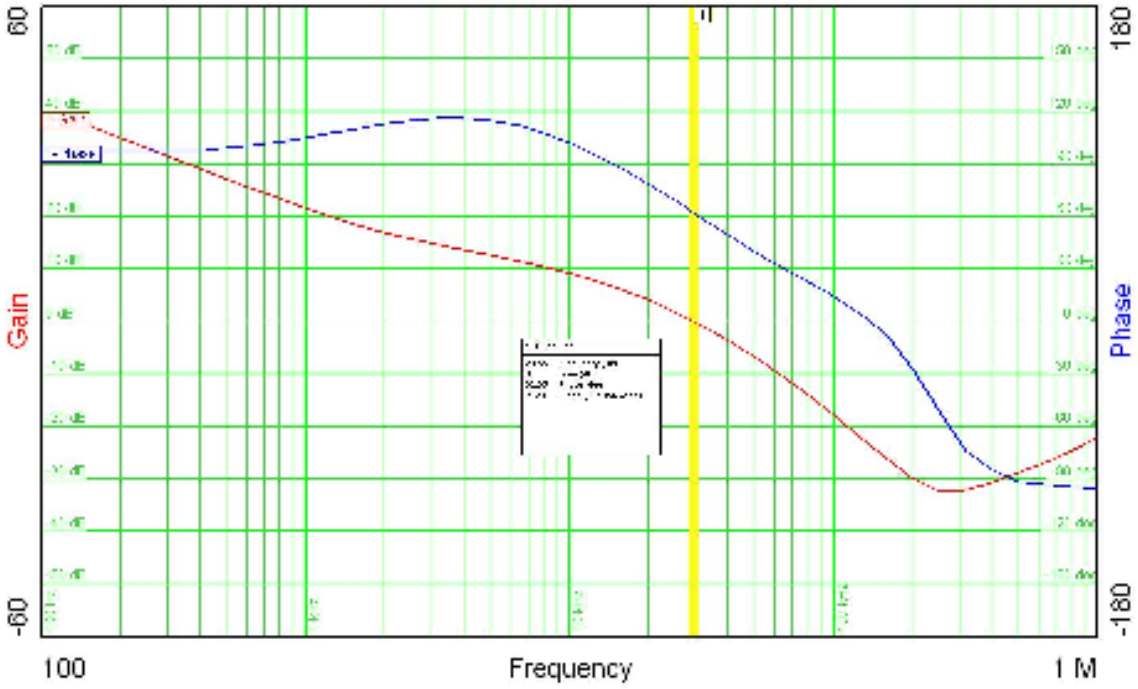
5.4 Output Voltage Ripple

V_{in} = 5V, V_{out} = 1.05V, I_{out} = 2A



5.5 Loop Response

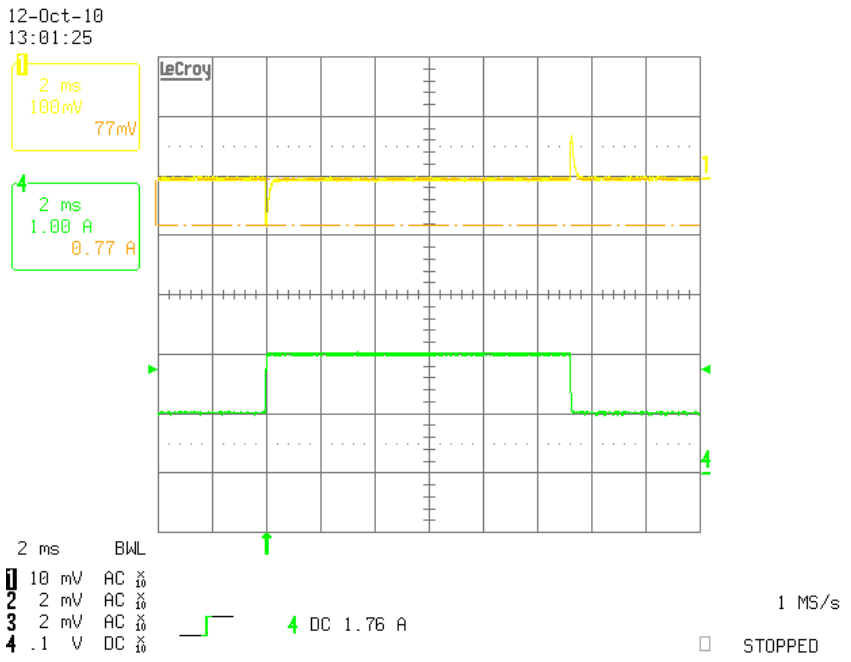
V_{in} = 5V, V_{out} = 1.05V, I_{out} = 2A



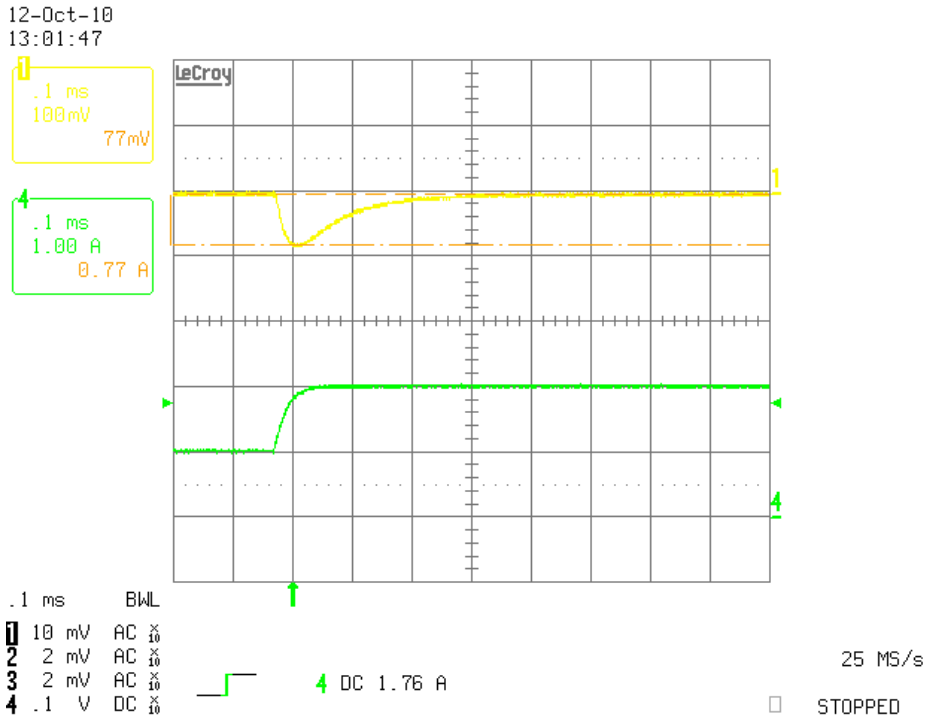
Phase Margin = 62.05 @ 29.65

5.6 Transient Response

V_{in} = 5V, V_{out} = 1.05V, I_{out} = 1A to 2A

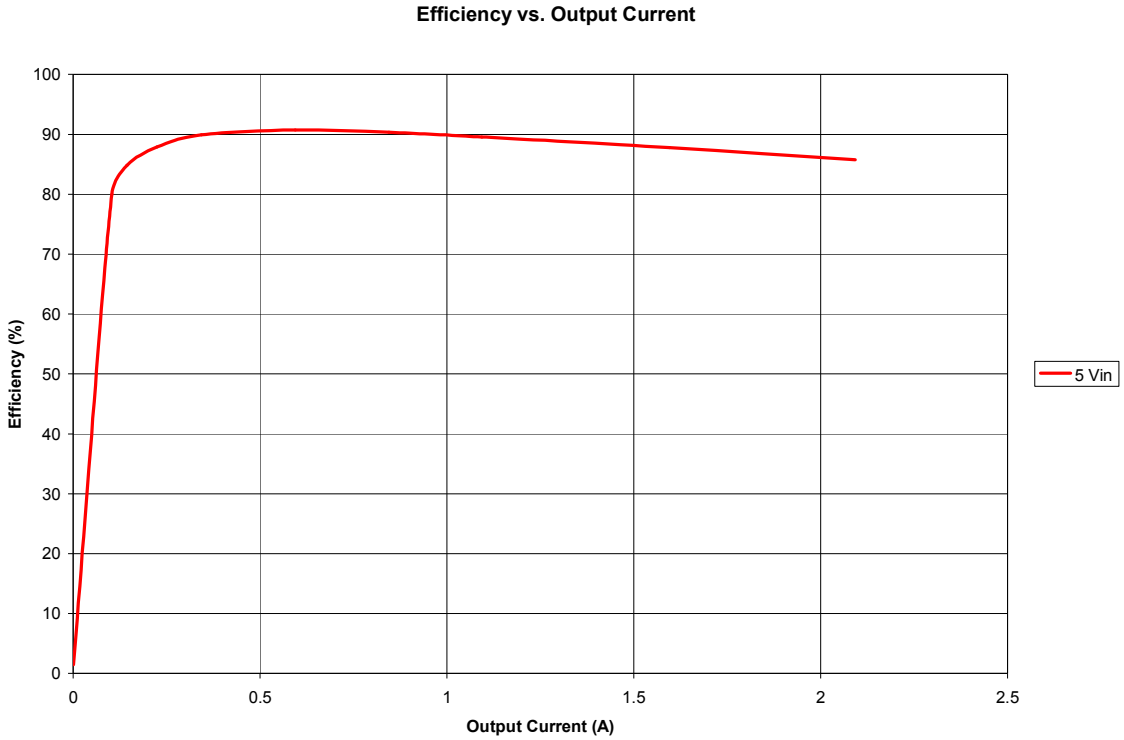


Zoom



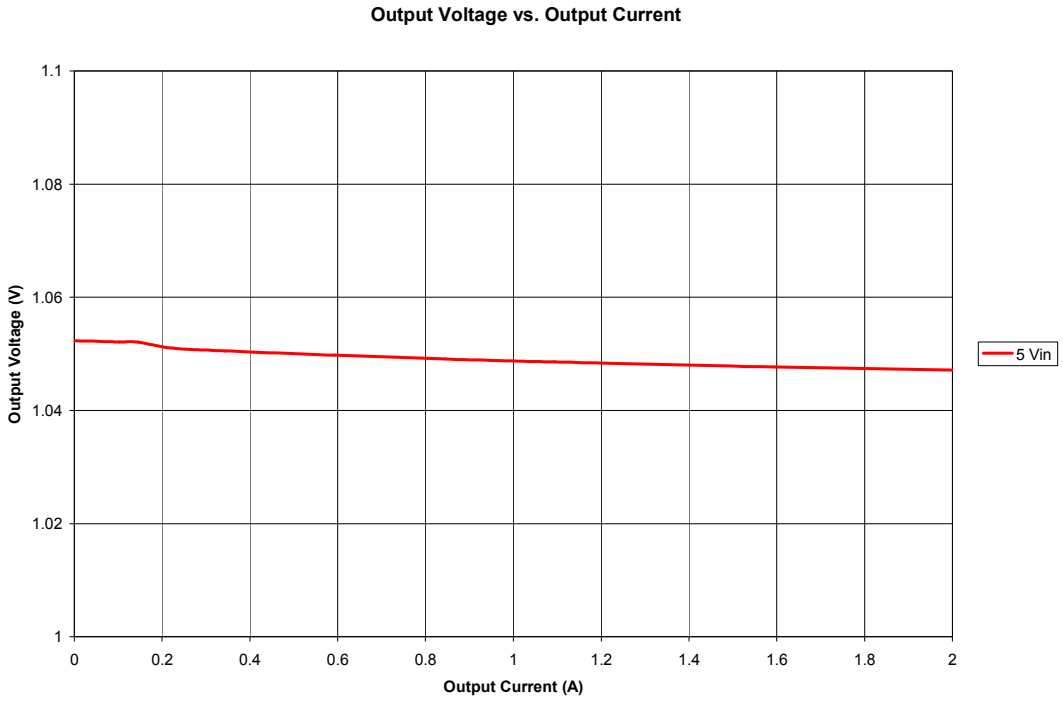
5.7 Efficiency

V_{in} = 5V, V_{out} = 1.05V



5.8 Load Regulation

V_{in} = 5V, V_{out} = 1.05V



6 TPS54319 – 1.5V Output

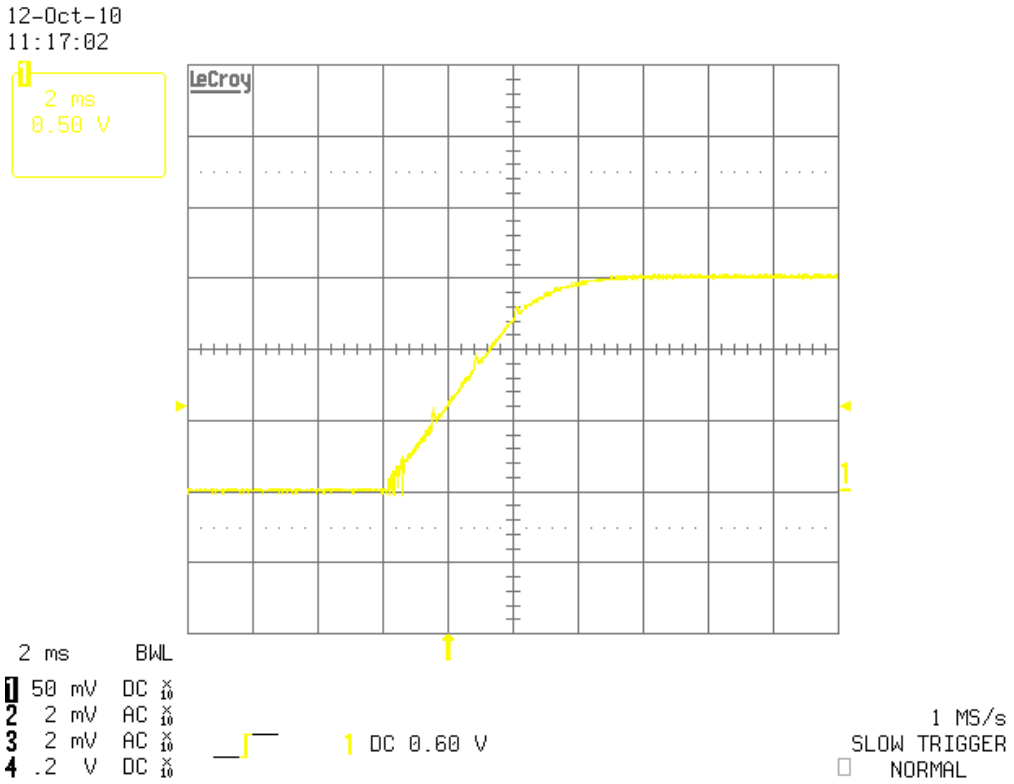
6.1 Performance Summary

Performance parameters below represent data obtained from the PMP5832 design; changes to the design, component selection or layout may result in varied performance.

Parameter	Test Conditions	Min	Typ	Max	Unit
Loop Bandwidth	V_{in}=5V , I_{out}=3A		22.13		kHz
Phase Margin	V_{in}=5V , I_{out}=3A		62.85		°
Output Voltage Ripple	I_{out}=3A		3.6		mV
Maximum Efficiency			93.2		%
Load Regulation	V_{in}=5V, I_{out}= 0A to 3A		0.6		%
Switching Frequency			943		kHz

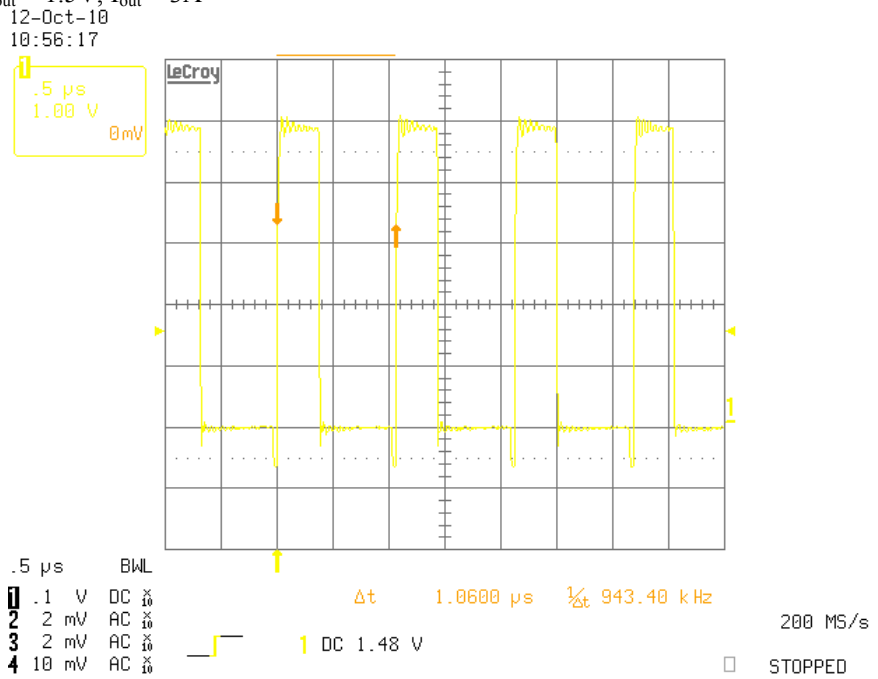
6.2 Startup Waveform

V_{in} = 5V, V_{out} = 1.5V, I_{out} = 150mA

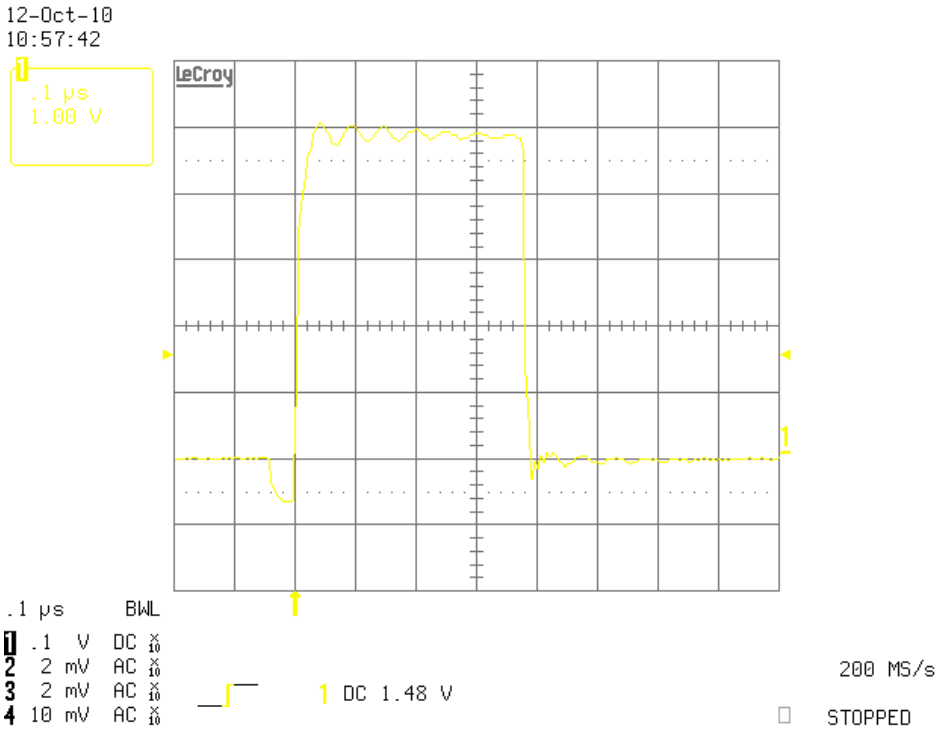


6.3 Switch Node

V_{in} = 5V, V_{out} = 1.5V, I_{out} = 3A

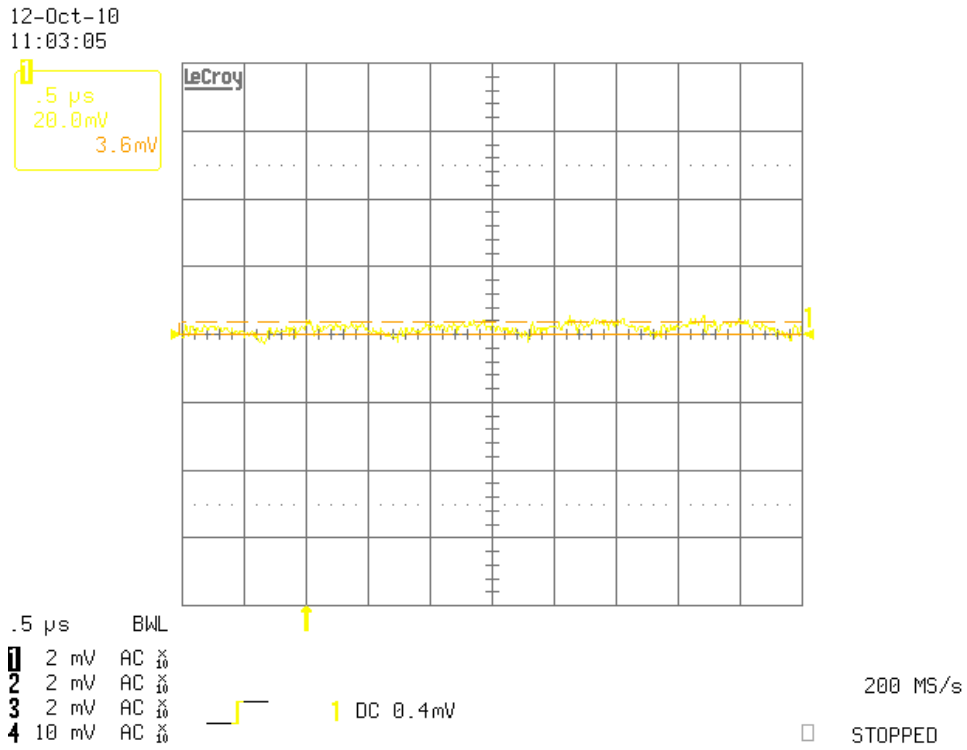


Zoom



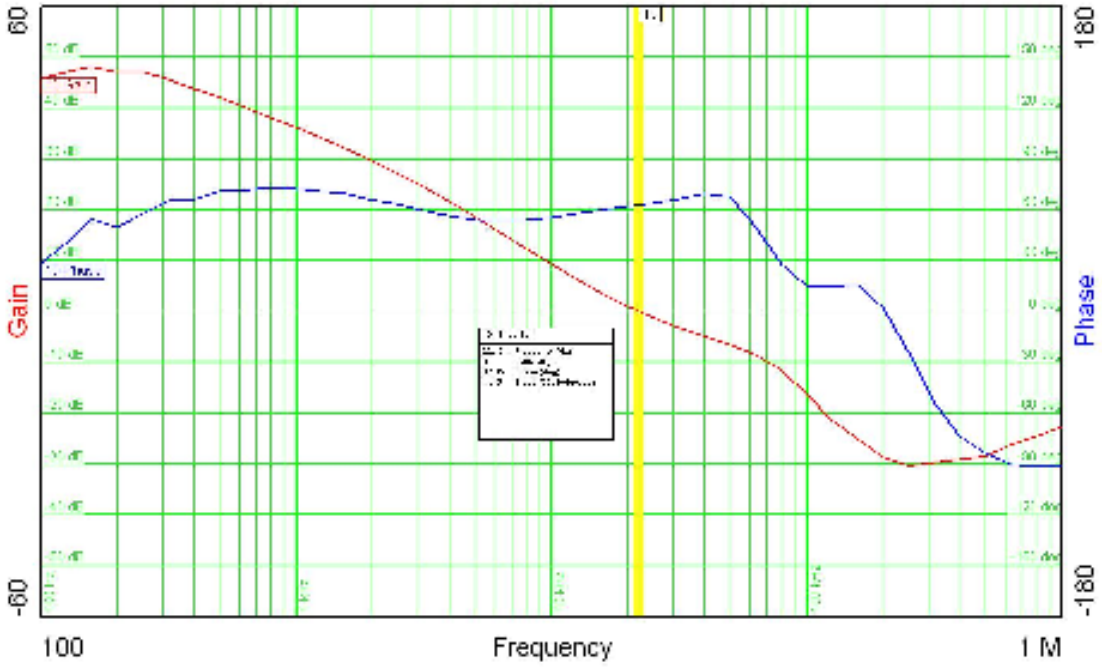
6.4 Output Voltage Ripple

V_{in} = 5V, V_{out} = 1.5V, I_{out} = 3A



6.5 Loop Response

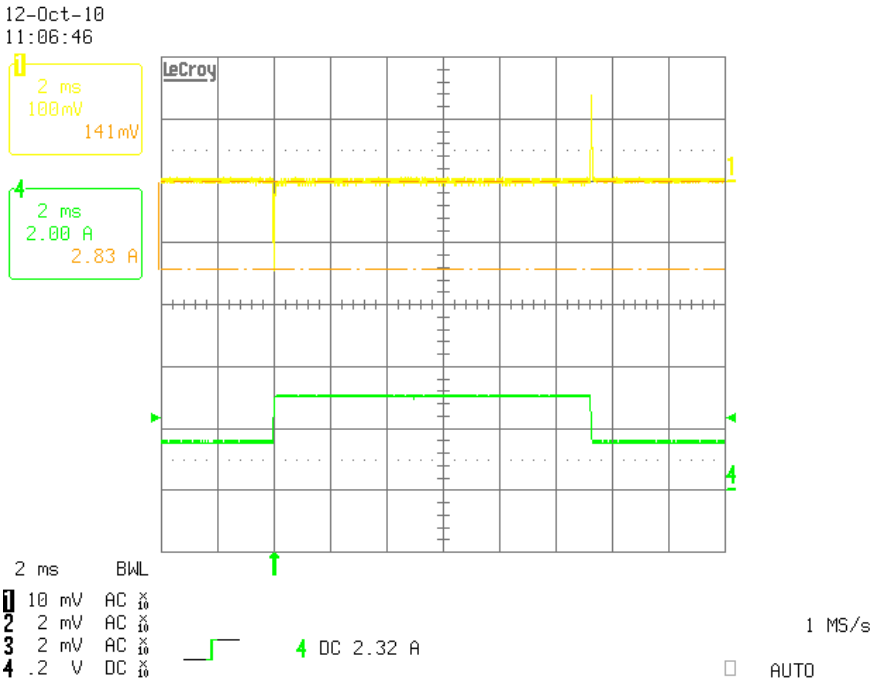
V_{in} = 5V, V_{out} = 1.5V, I_{out} = 3A



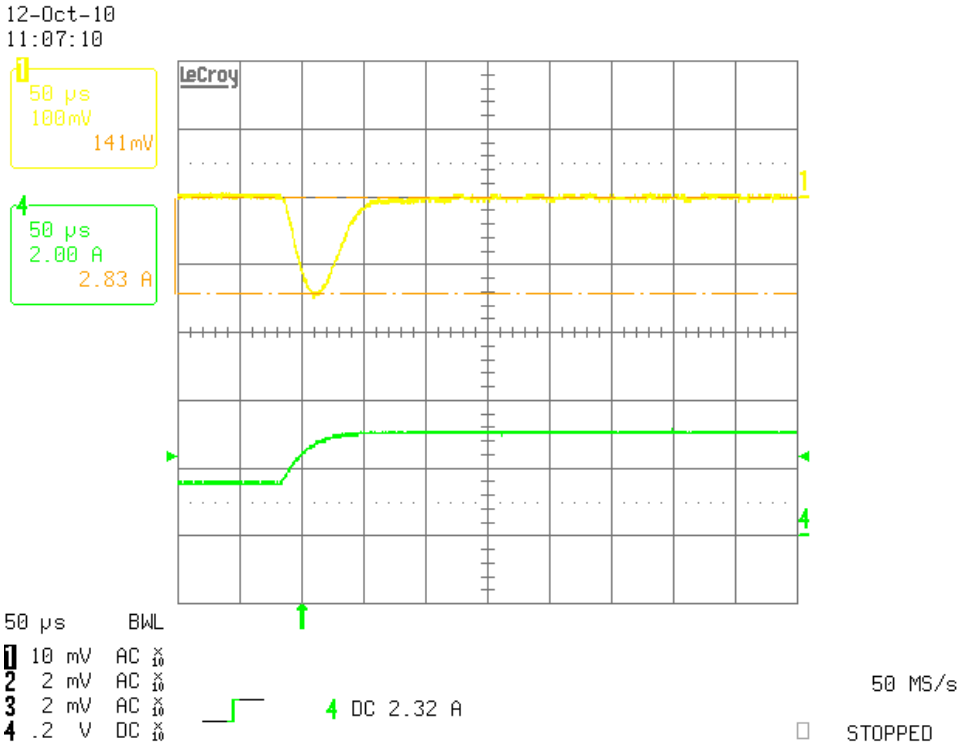
Phase Margin = 62.85 @ 22.13 kHz

6.6 Load Transient

V_{in} = 5V, V_{out} = 1.5V, I_{out} = 1.5A to 3A

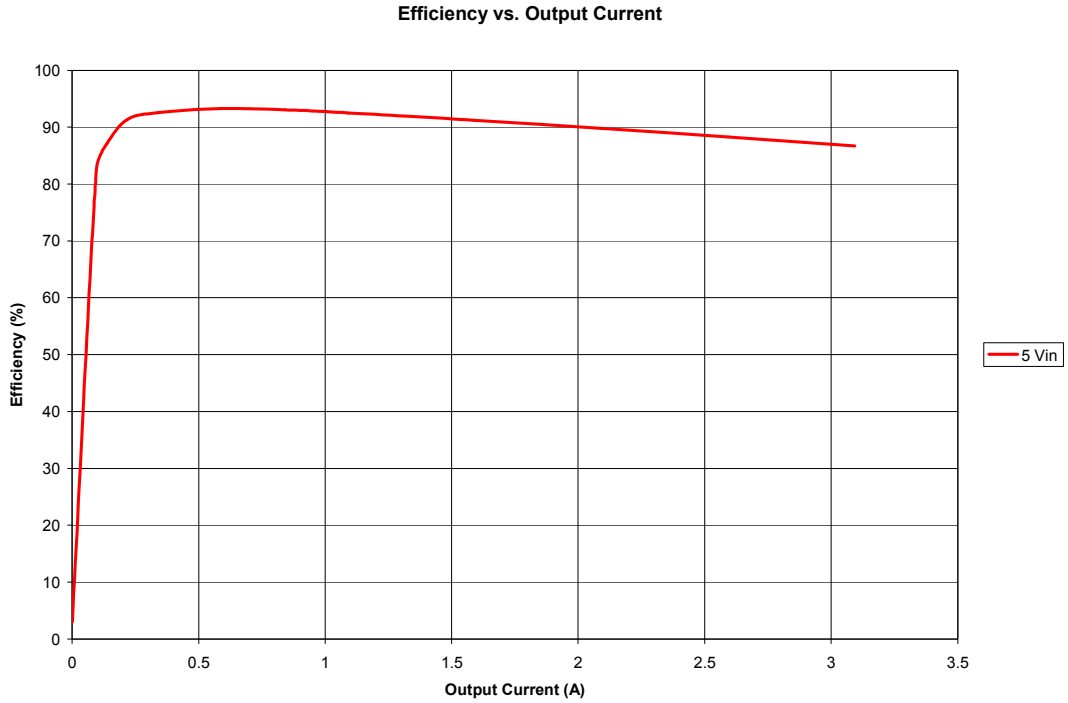


Zoom



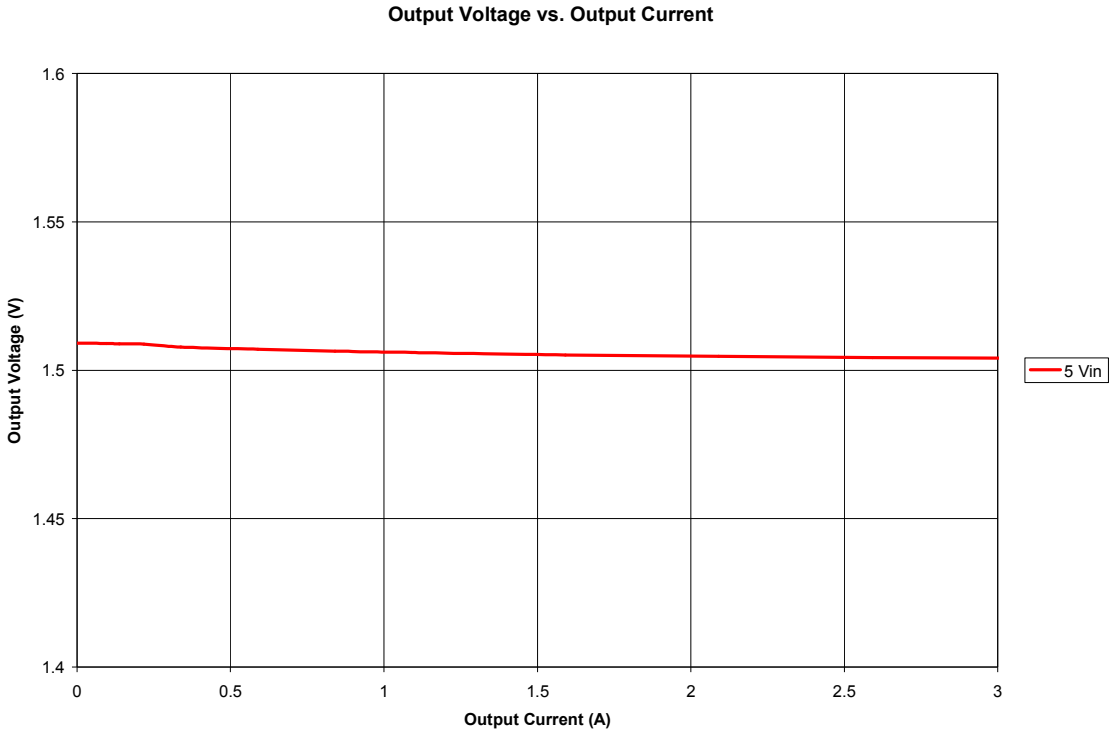
6.7 Efficiency

V_{in} = 5V, V_{out} = 1.5V



6.8 Load Regulation

V_{in} = 5V, V_{out} = 1.5V



7 TPS54319 – 1.2V Output

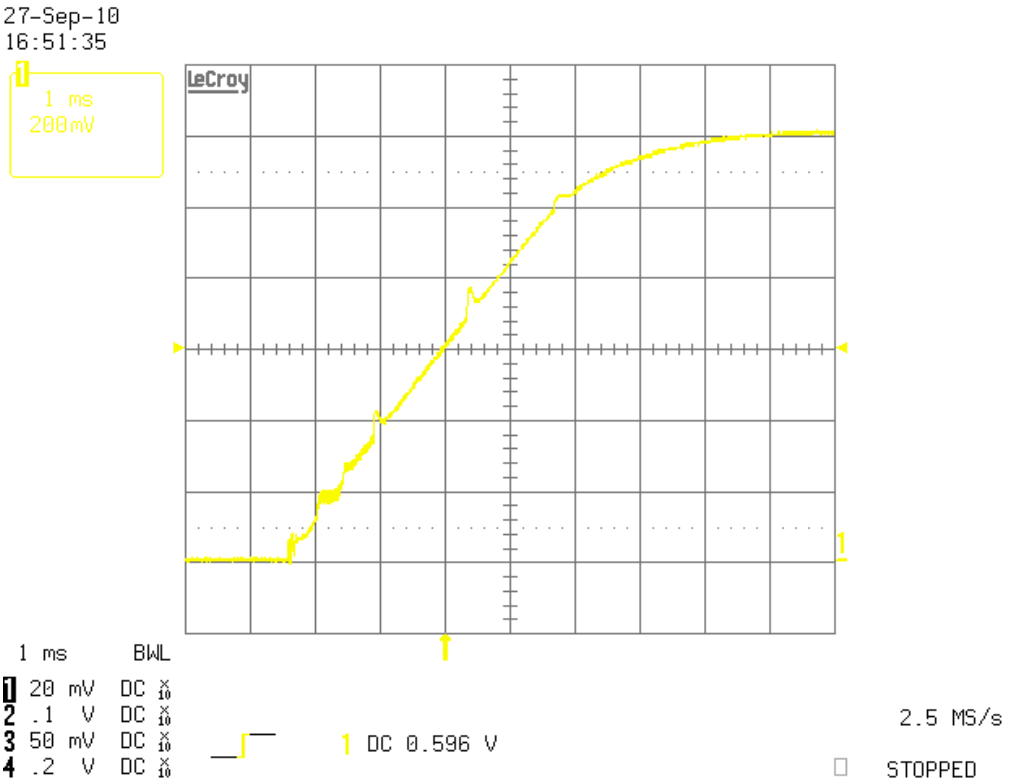
7.1 Performance Summary

Performance parameters below represent data obtained from the PMP5832 design; changes to the design, component selection or layout may result in varied performance.

Parameter	Test Conditions	Min	Typ	Max	Unit
Loop Bandwidth	V_{in}=3.3V , I_{out}=3A		25.69		kHz
Phase Margin	V_{in}=3.3V , I_{out}=3A		56.45		º
Output Voltage Ripple	I_{out}=3A		2.7		mV
Maximum Efficiency			93.1		%
Load Regulation	V_{in}=3.3V, I_{out}= 0A to 3A		0.6		%
Switching Frequency			928		kHz

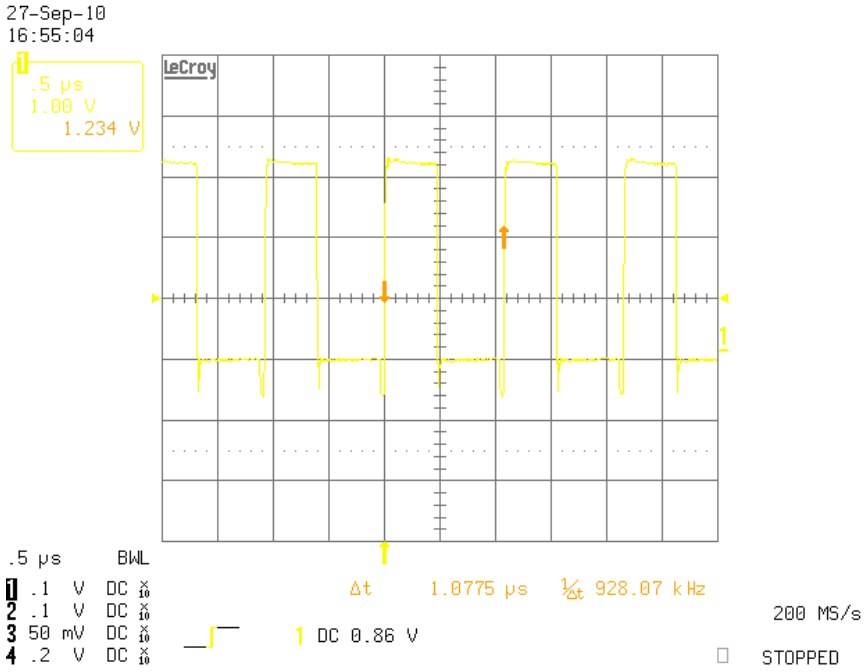
7.2 Startup Waveform

V_{in} = 3.3V, V_{out} = 1.2V, I_{out} = 150mA

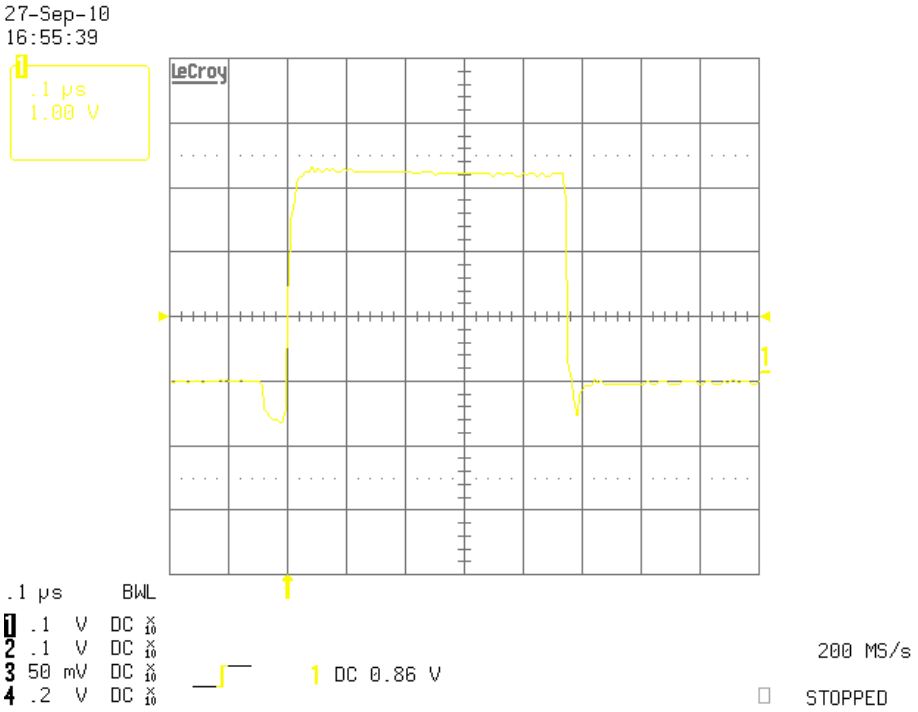


7.3 Switch Node

V_{in} = 3.3V, V_{out} = 1.2V, I_{out} = 3A

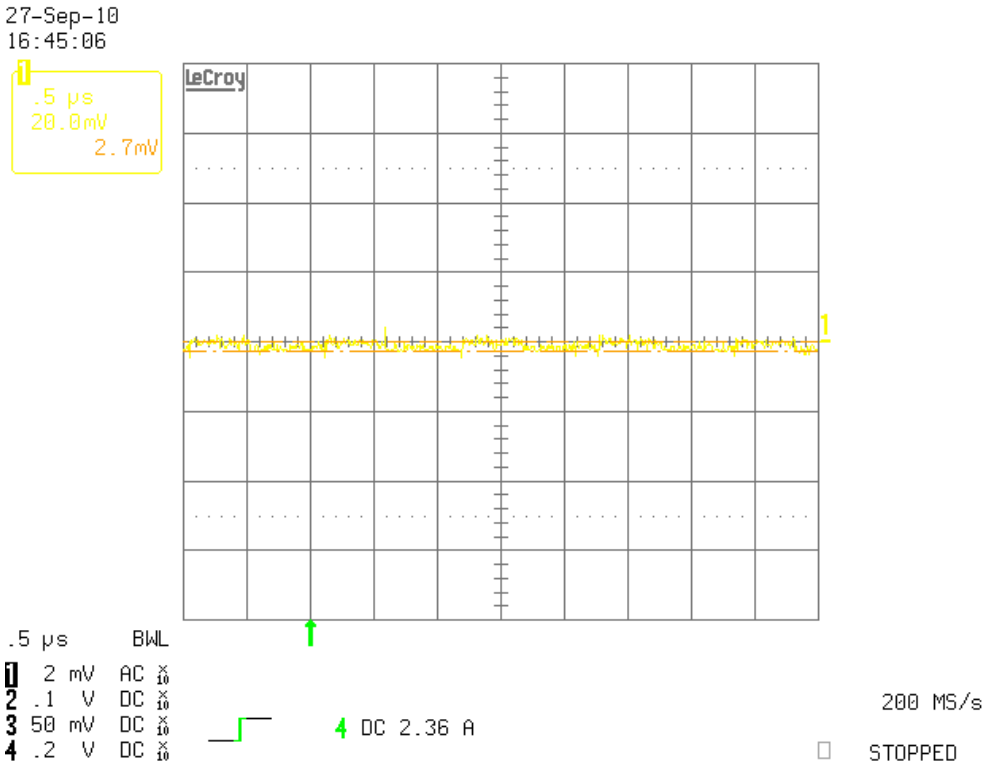


Zoom



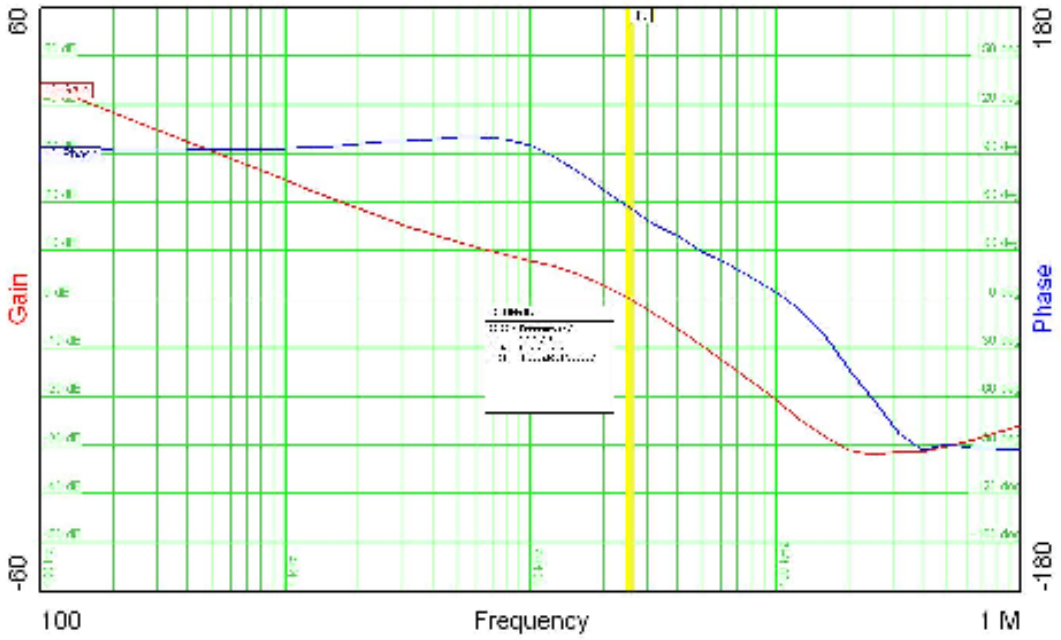
7.4 Output Voltage Ripple

V_{in} = 3.3V, V_{out} = 1.2V, I_{out} = 3A



7.5 Loop Response

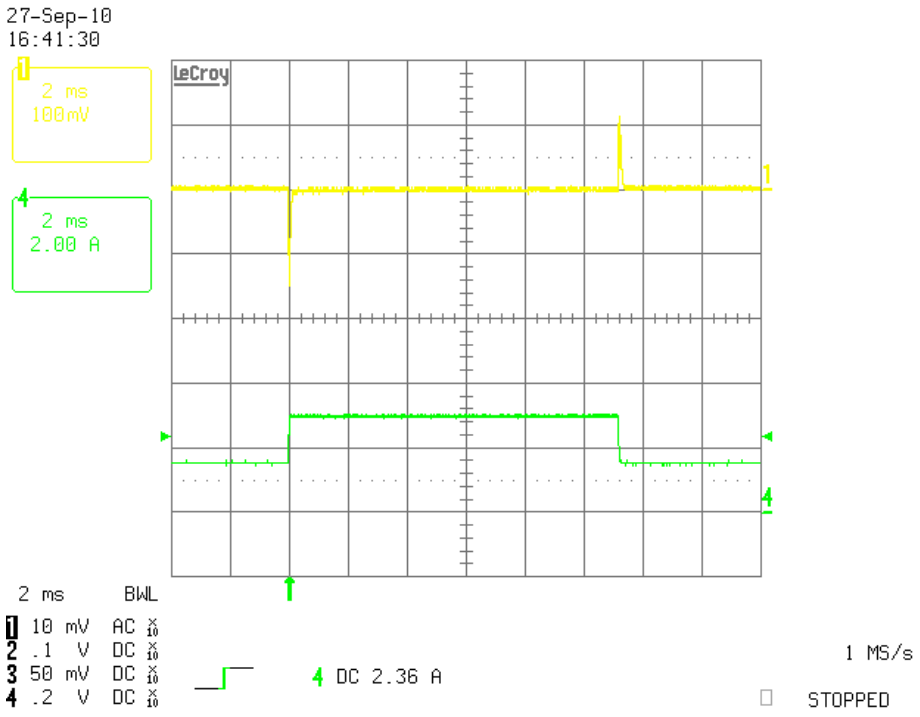
V_{in} = 3.3V, V_{out} = 1.2V, I_{out} = 3A



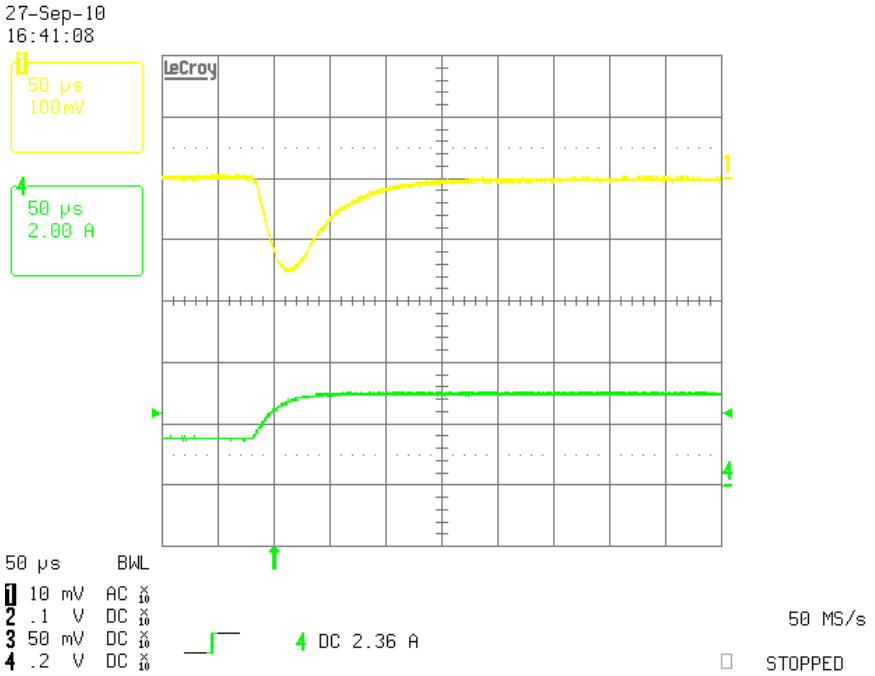
Phase Margin = 56.45 @ 25.69 kHz

7.6 Load Transient

V_{in} = 3.3V, V_{out} = 1.2V, I_{out} = 1.5A to 3A

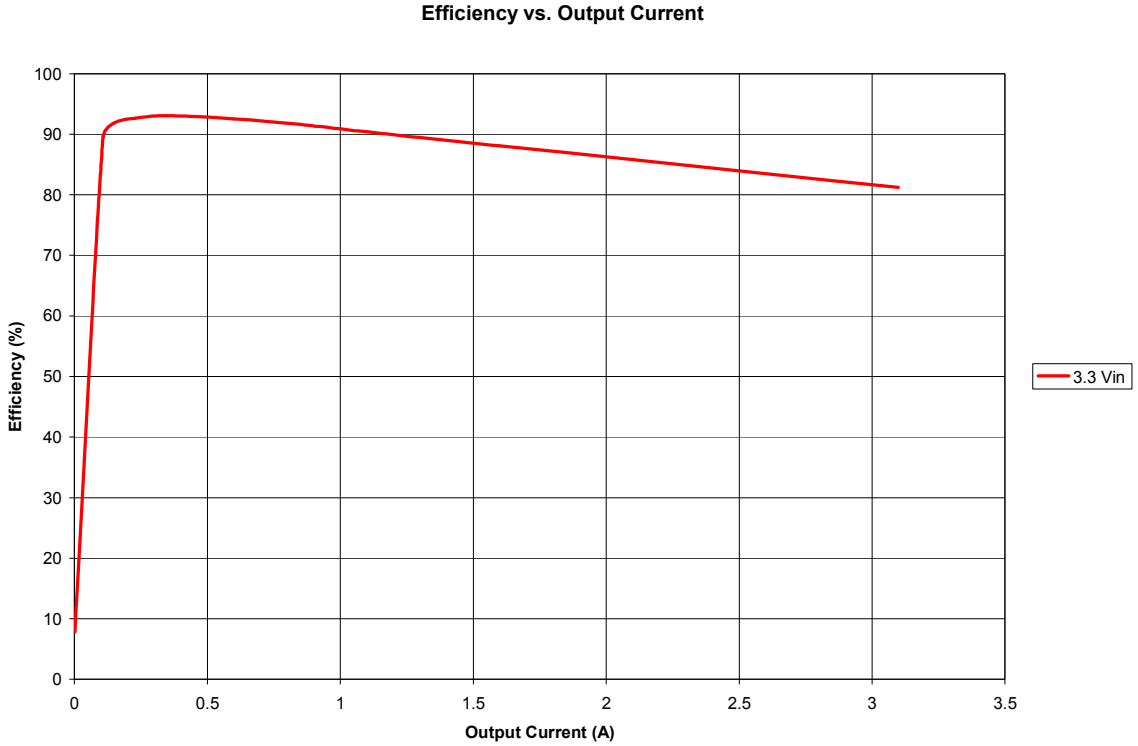


Zoom



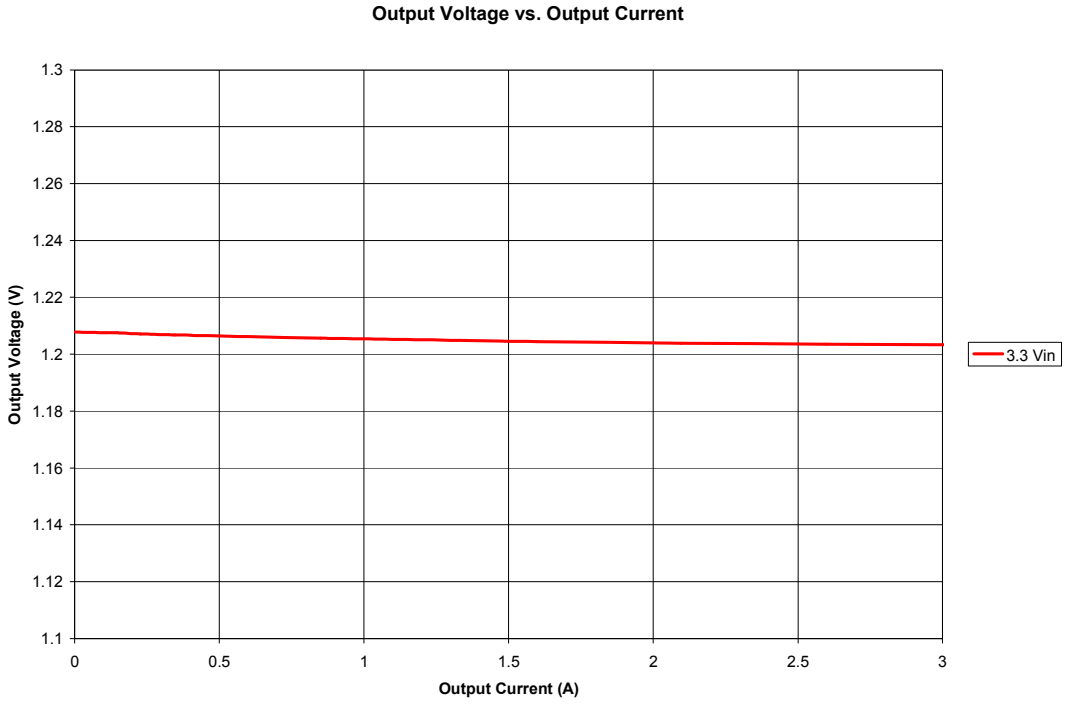
7.7 Efficiency

V_{in} = 3.3V, V_{out} = 1.2V



7.8 Load Regulation

V_{in} = 3.3V, V_{out} = 1.2V



8 TPS54319 – 1.8V Output

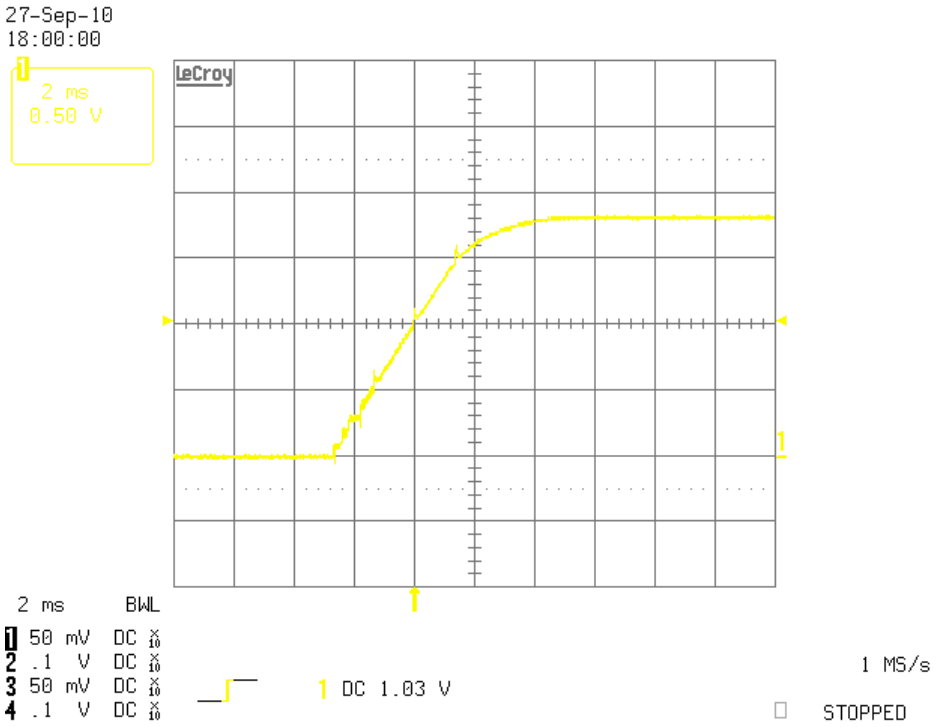
8.1 Performance Summary

Performance parameters below represent data obtained from the PMP5832 design; changes to the design, component selection or layout may result in varied performance.

Parameter	Test Conditions	Min	Typ	Max	Unit
Loop Bandwidth	V_{in}=3.3V , I_{out}=2A		27.49		kHz
Phase Margin	V_{in}=3.3V , I_{out}=2A		60.1		º
Output Voltage Ripple	I_{out}=2A		2.3		mV
Maximum Efficiency			95.5		%
Load Regulation	V_{in}=3.3V, I_{out}= 0A to 2A		0.8		%
Switching Frequency			932		kHz

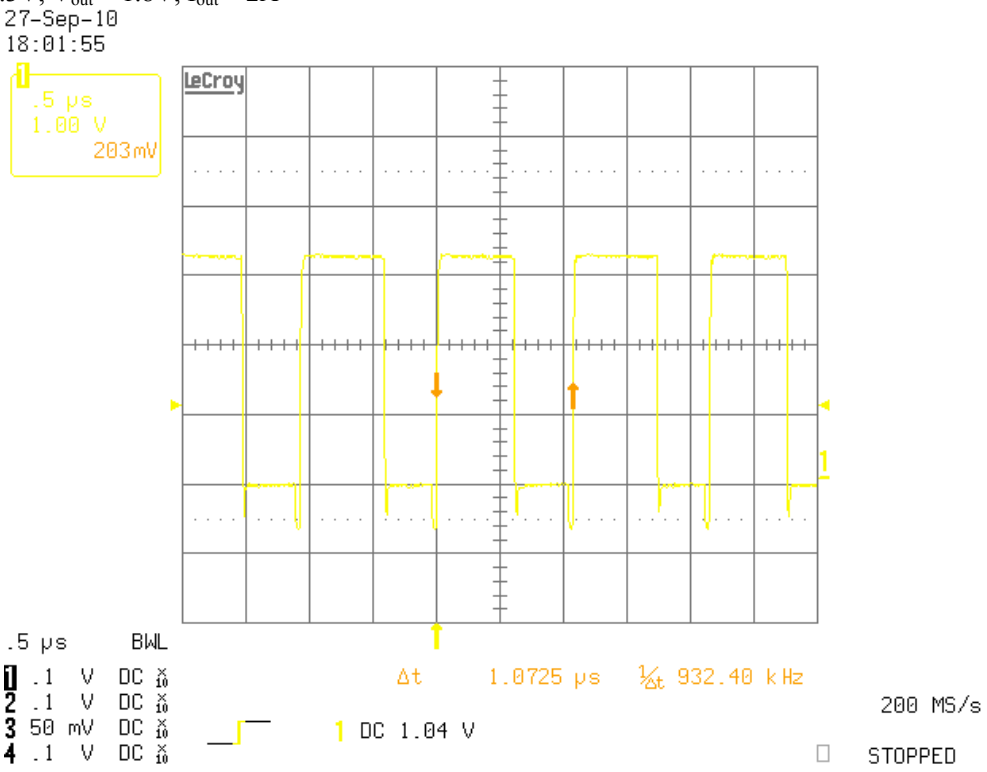
8.2 Startup Waveform

V_{in} = 3.3V, V_{out} = 1.8V, I_{out} = 150mA

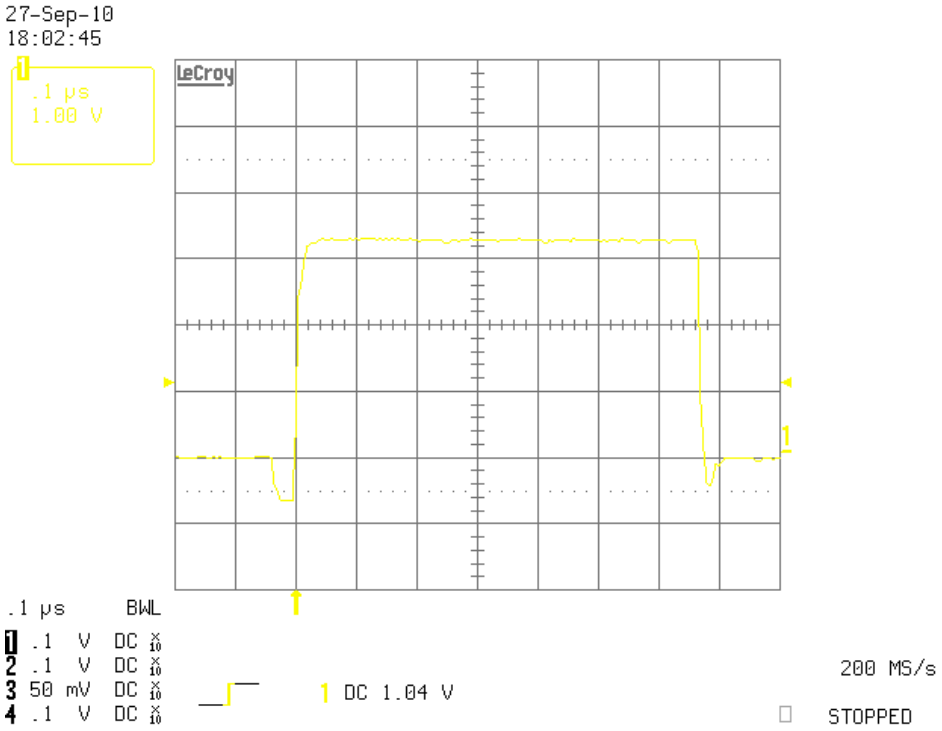


8.3 Switch Node

V_{in} = 3.3V, V_{out} = 1.8V, I_{out} = 2A

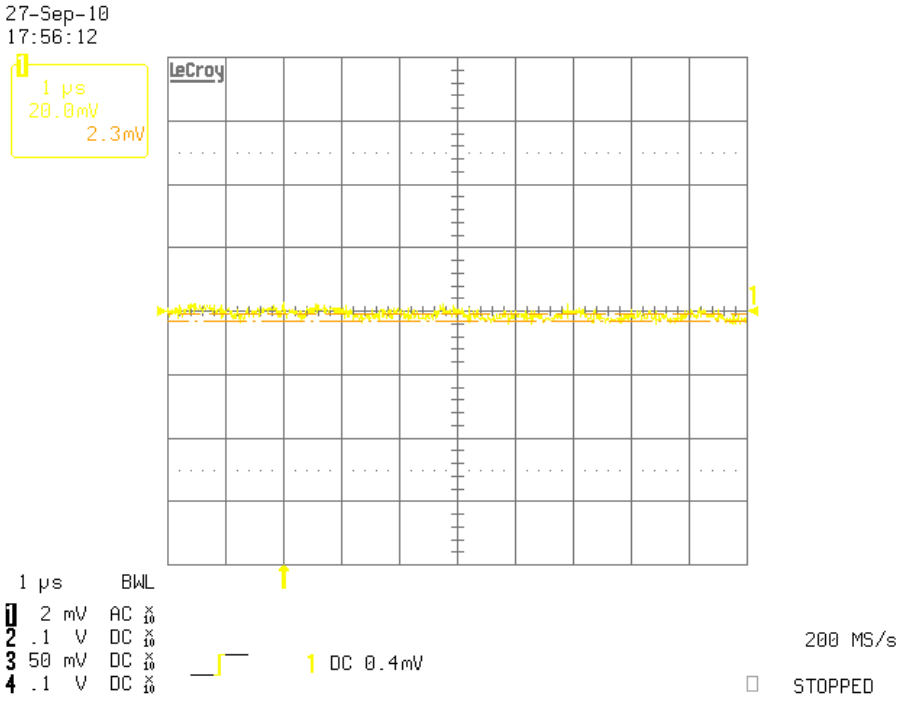


Zoom



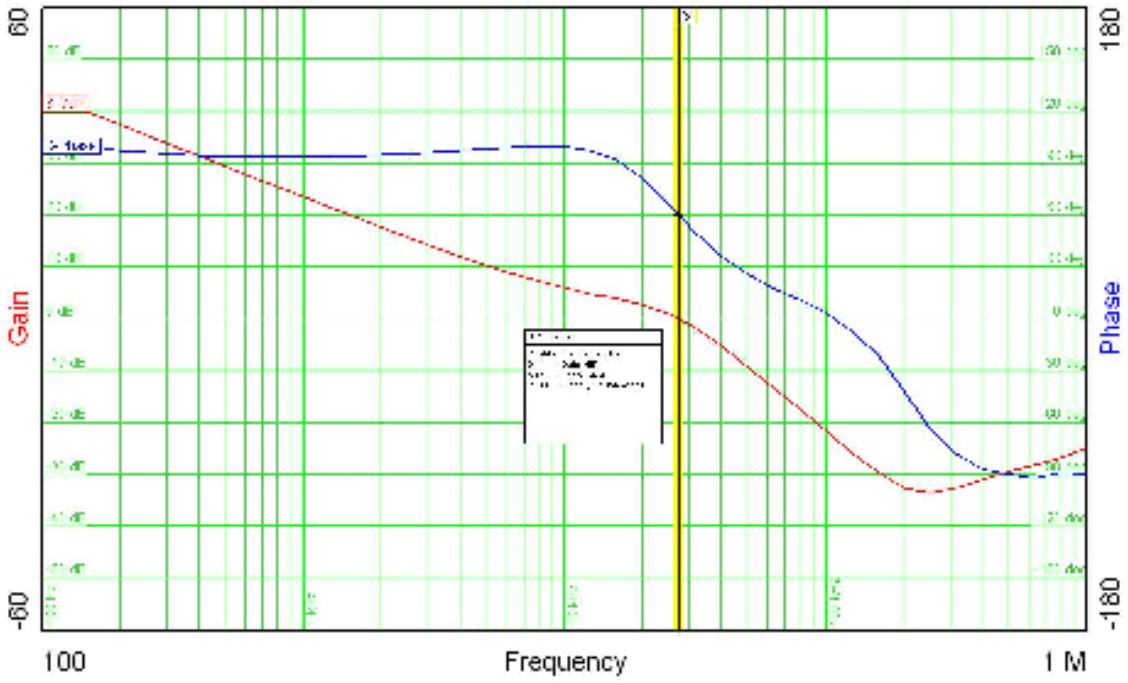
8.4 Output Voltage Ripple

V_{in} = 3.3V, V_{out} = 1.8V, I_{out} = 2A



8.5 Loop Response

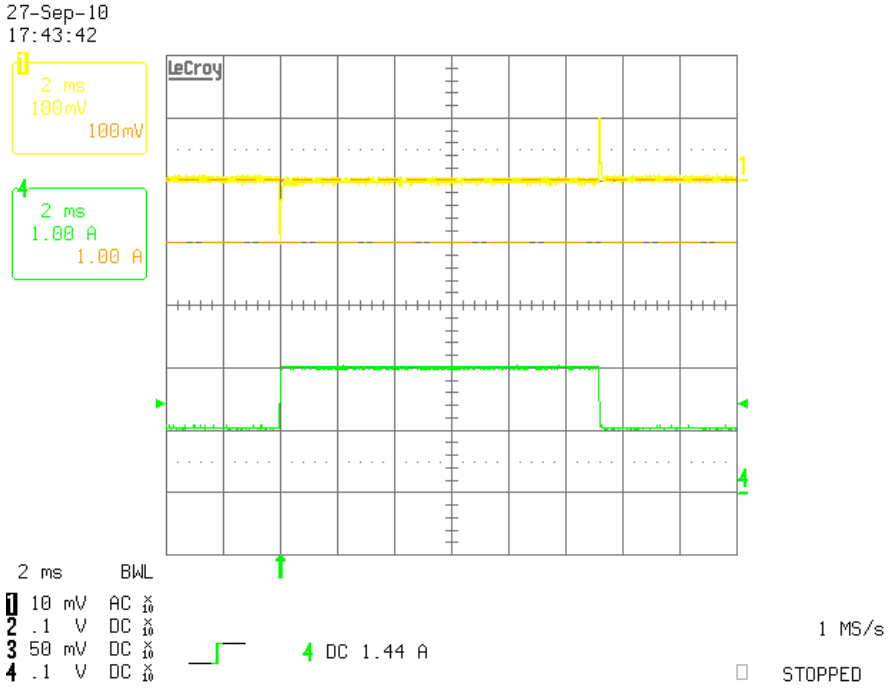
V_{in} = 3.3V, V_{out} = 1.8V, I_{out} = 2A



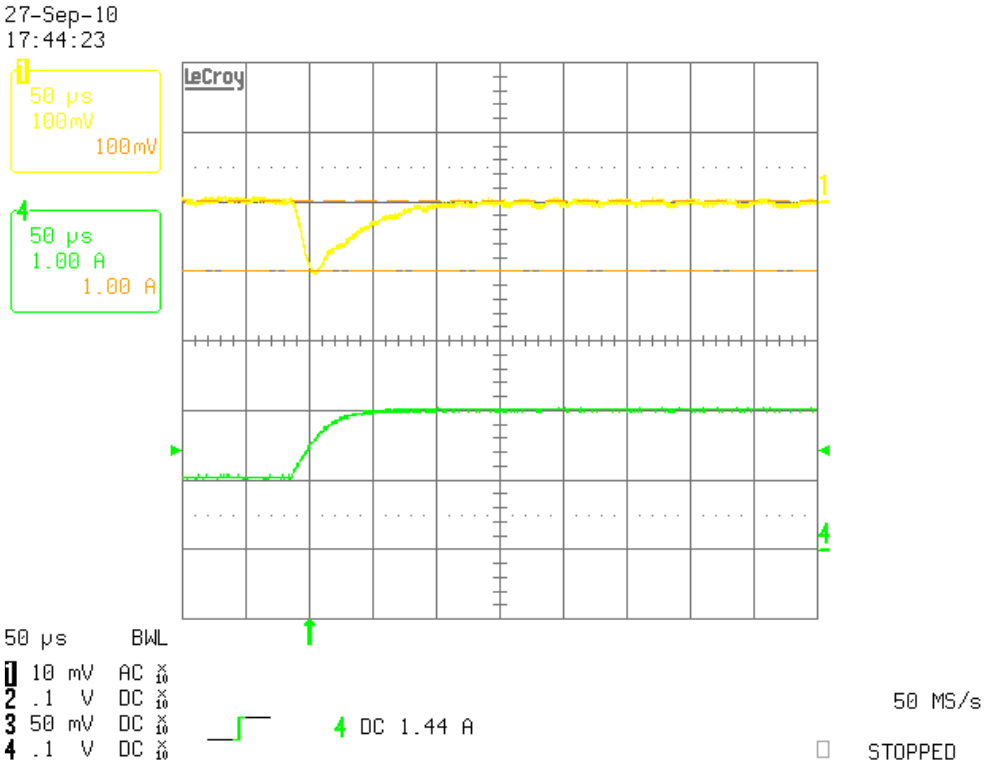
Phase Margin = 60.1 @ 27.49 kHz

8.6 Load Transient

V_{in} = 3.3V, V_{out} = 1.8V, I_{out} = 1A to 2A

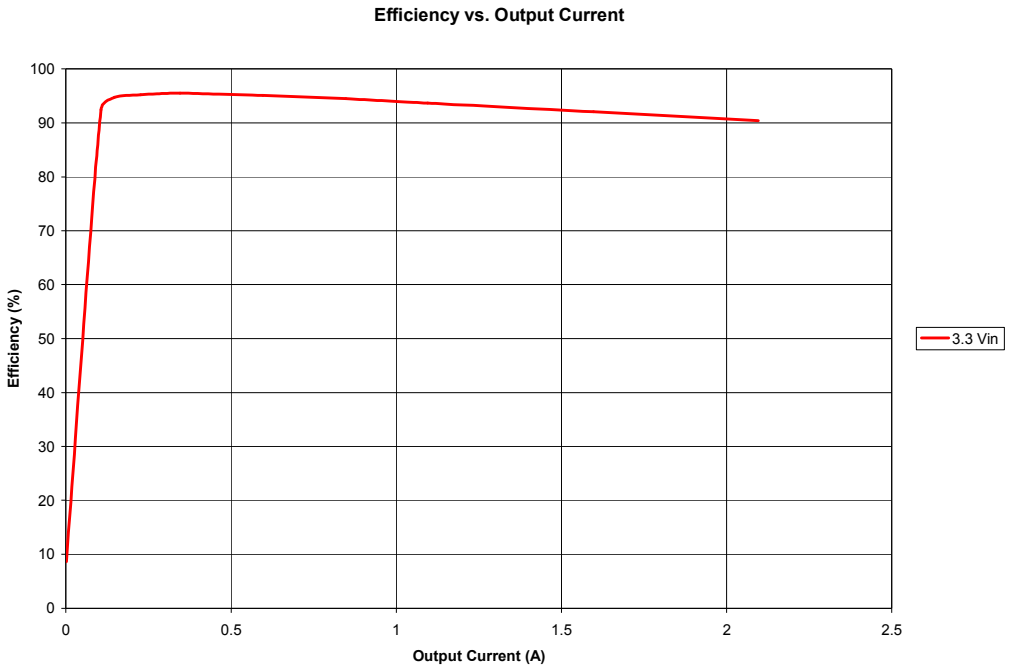


Zoom



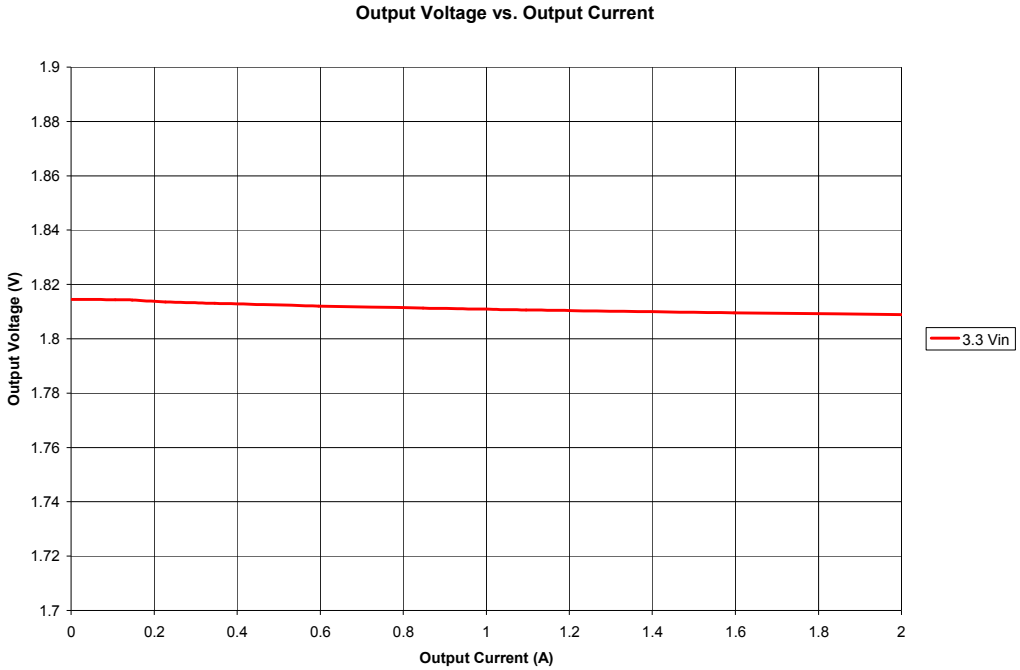
8.7 Efficiency

V_{in} = 3.3V, V_{out} = 1.8V



8.8 Load Regulation

V_{in} = 3.3V, V_{out} = 1.8V



9 TPS54319 – 2.5V Output

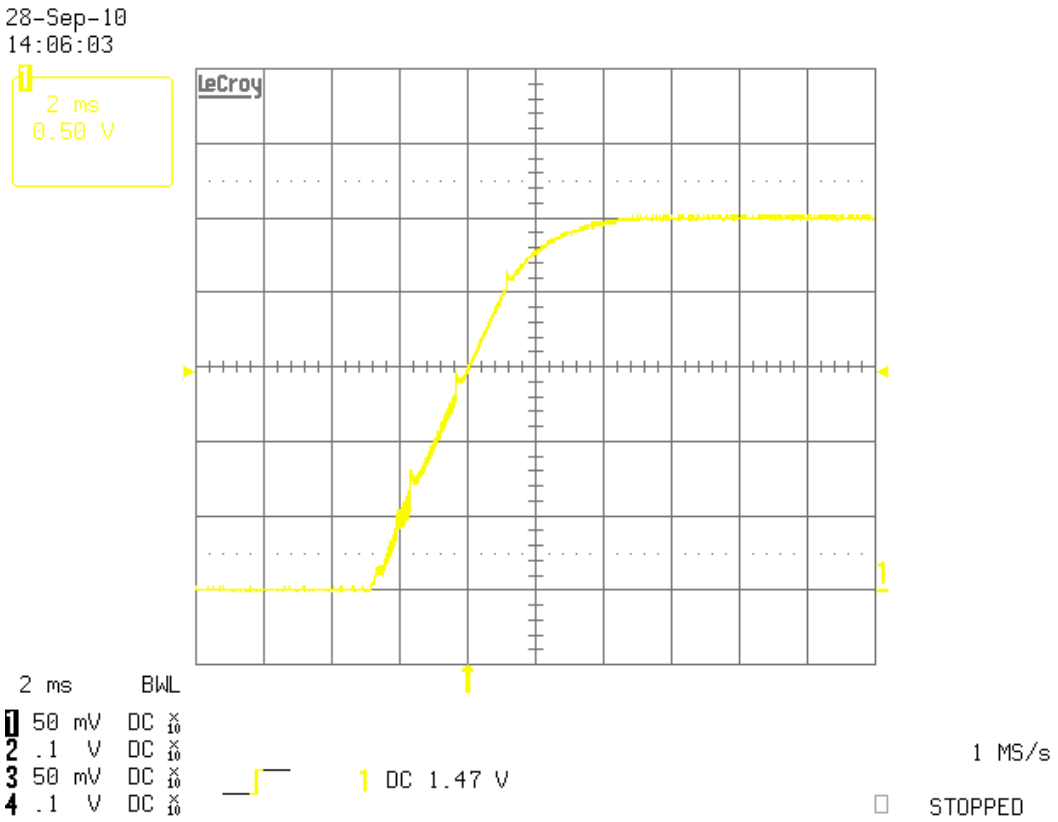
9.1 Performance Summary

Performance parameters below represent data obtained from the PMP5832 design; changes to the design, component selection or layout may result in varied performance.

Parameter	Test Conditions	Min	Typ	Max	Unit
Loop Bandwidth	V_{in}=3.3V , I_{out}=2A		33.88		kHz
Phase Margin	V_{in}=3.3V , I_{out}=2A		51.89		°
Output Voltage Ripple	I_{out}=2A		2.7		mV
Maximum Efficiency			97.4		%
Load Regulation	V_{in}=3.3V, I_{out}= 0A to 2A		0.2		%
Switching Frequency			463		kHz

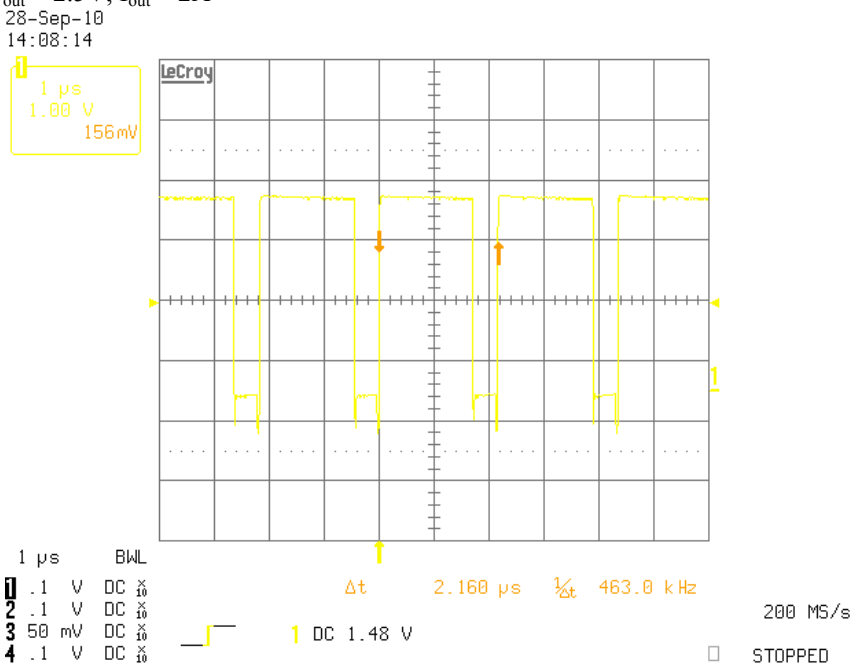
9.2 Startup Waveform

V_{in} = 3.3V, V_{out} = 2.5V, I_{out} = 150mA

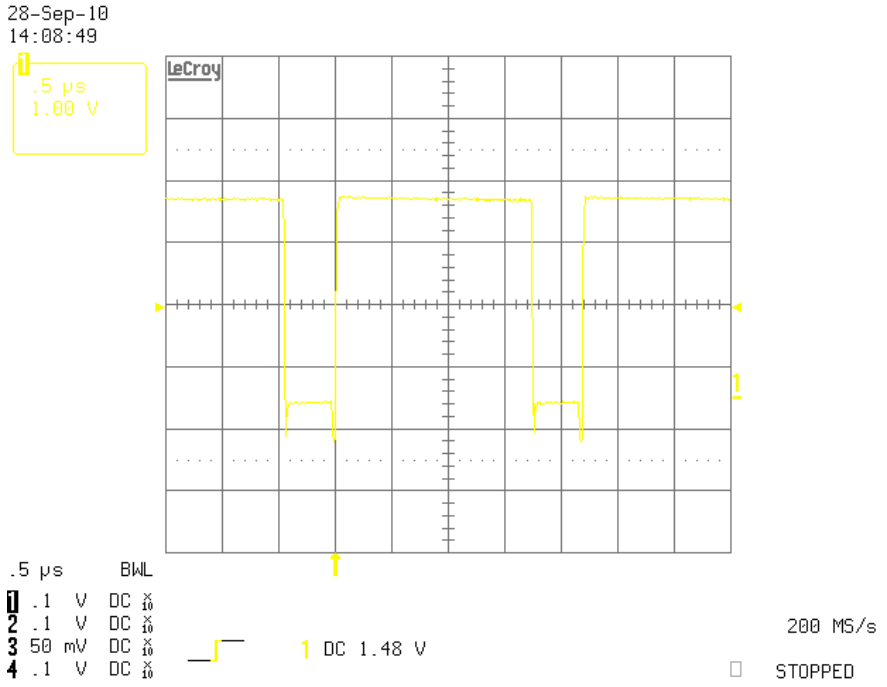


9.3 Switch Node

V_{in} = 3.3V, V_{out} = 2.5V, I_{out} = 2A

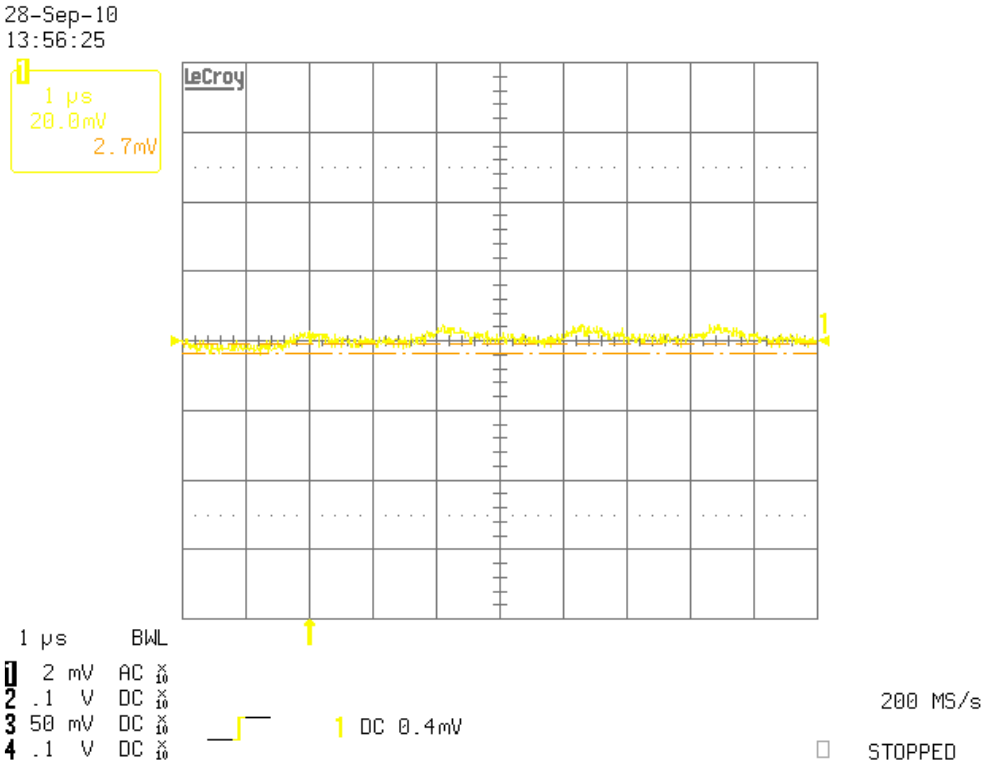


Zoom



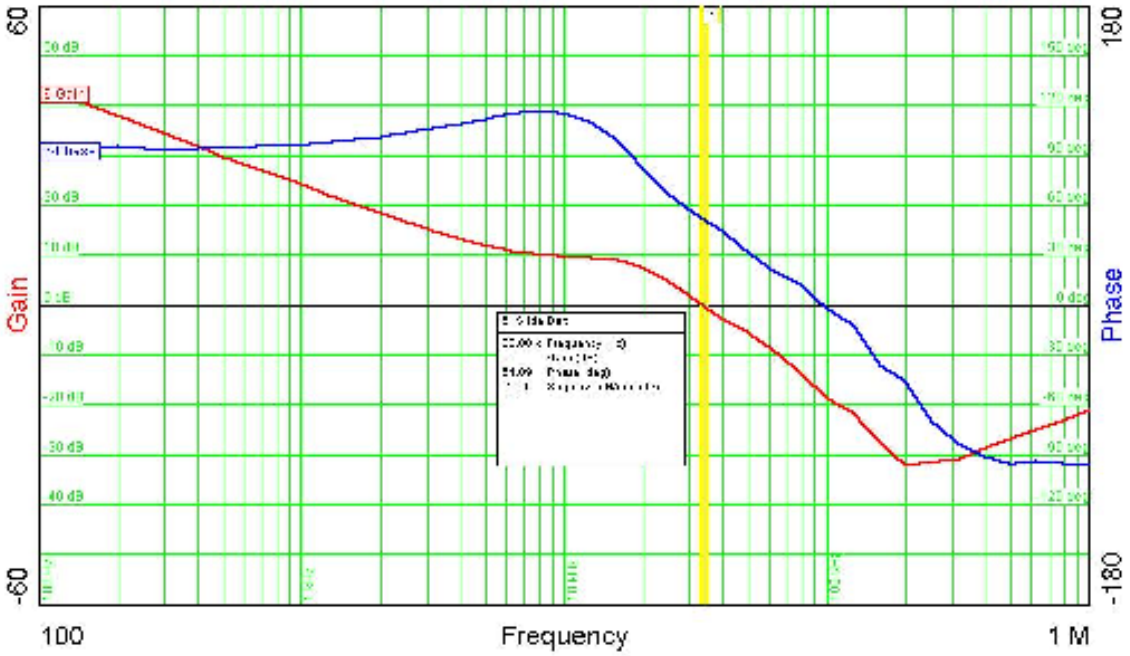
9.4 Output Voltage Ripple

V_{in} = 3.3V, V_{out} = 2.5V, I_{out} = 2A



9.5 Loop Response

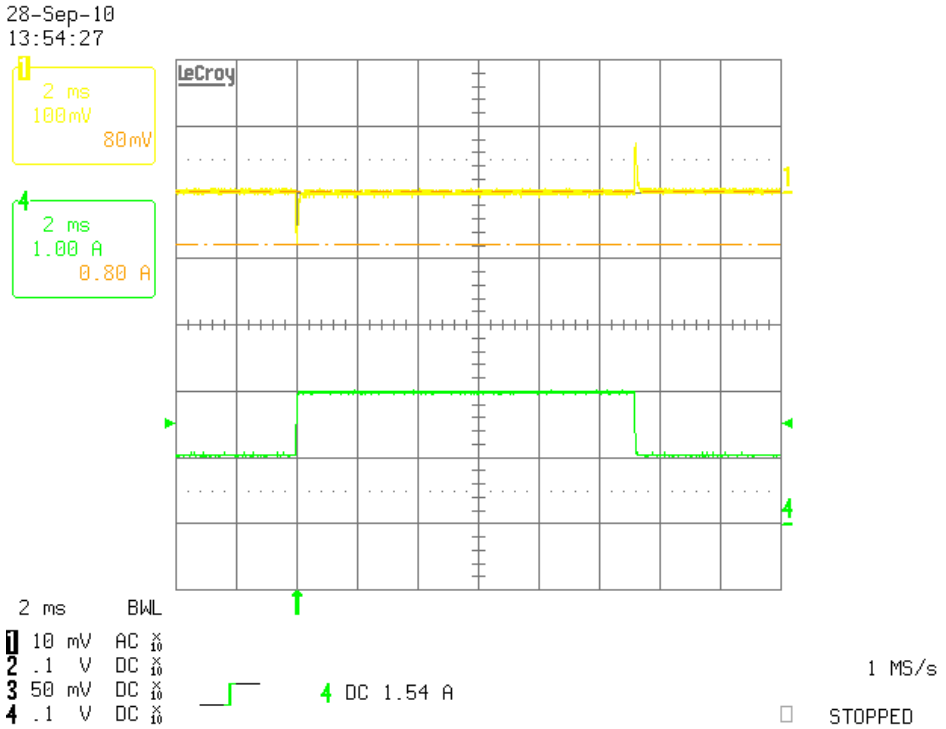
V_{in} = 3.3V, V_{out} = 2.5V, I_{out} = 2A



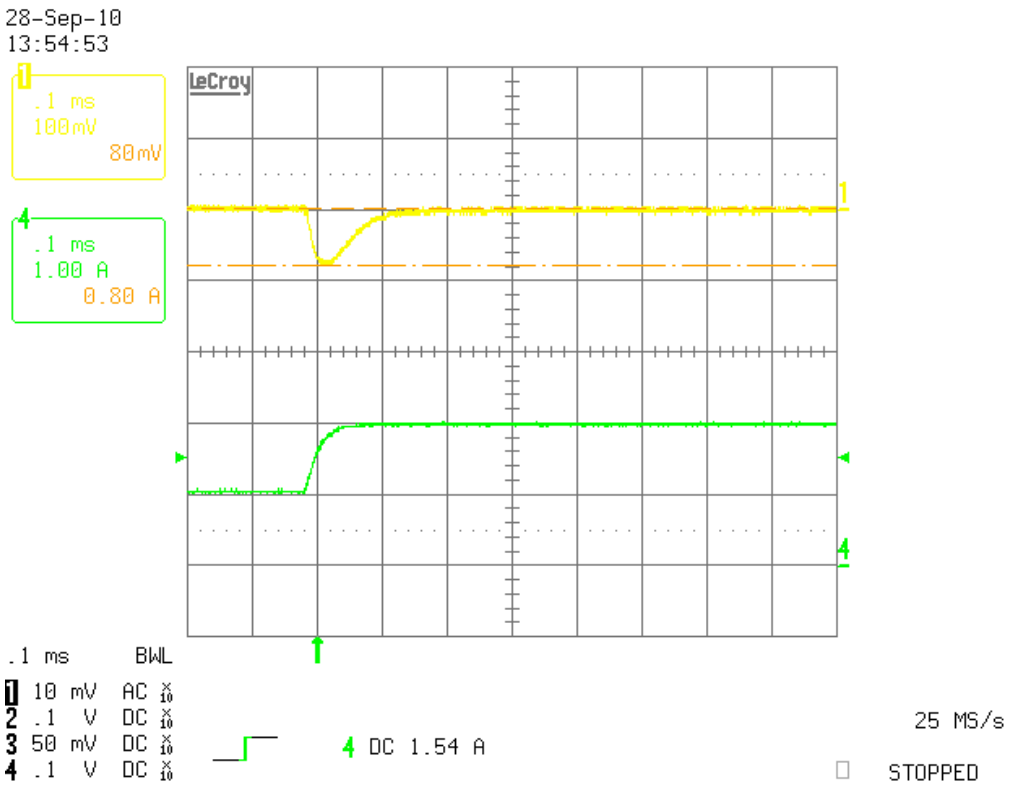
Phase Margin = 51.89 @ 33.88 kHz

9.6 Load Transient

V_{in} = 3.3V, V_{out} = 2.5V, I_{out} = 1A to 2A

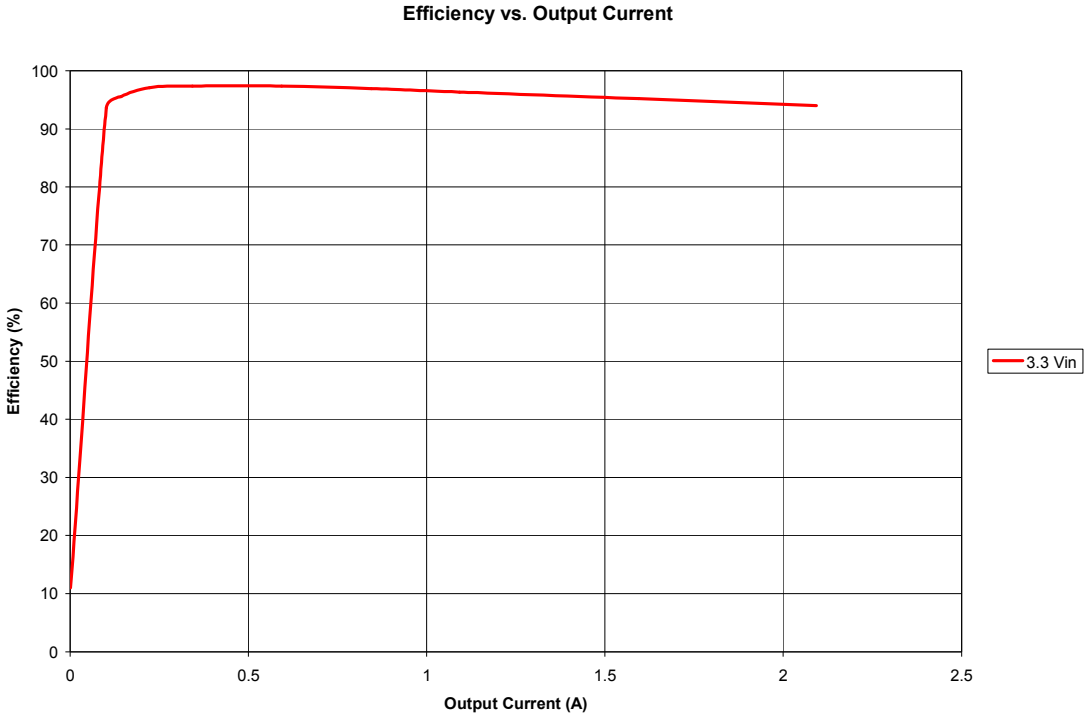


Zoom



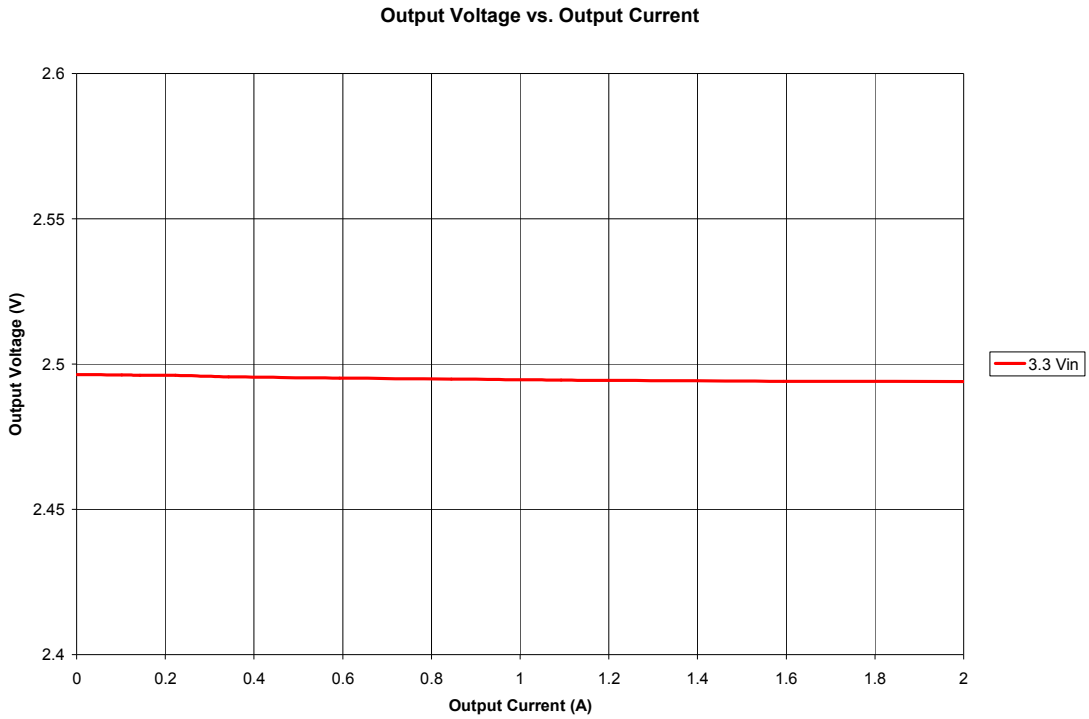
9.7 Efficiency

V_{in} = 3.3V, V_{out} = 2.5V



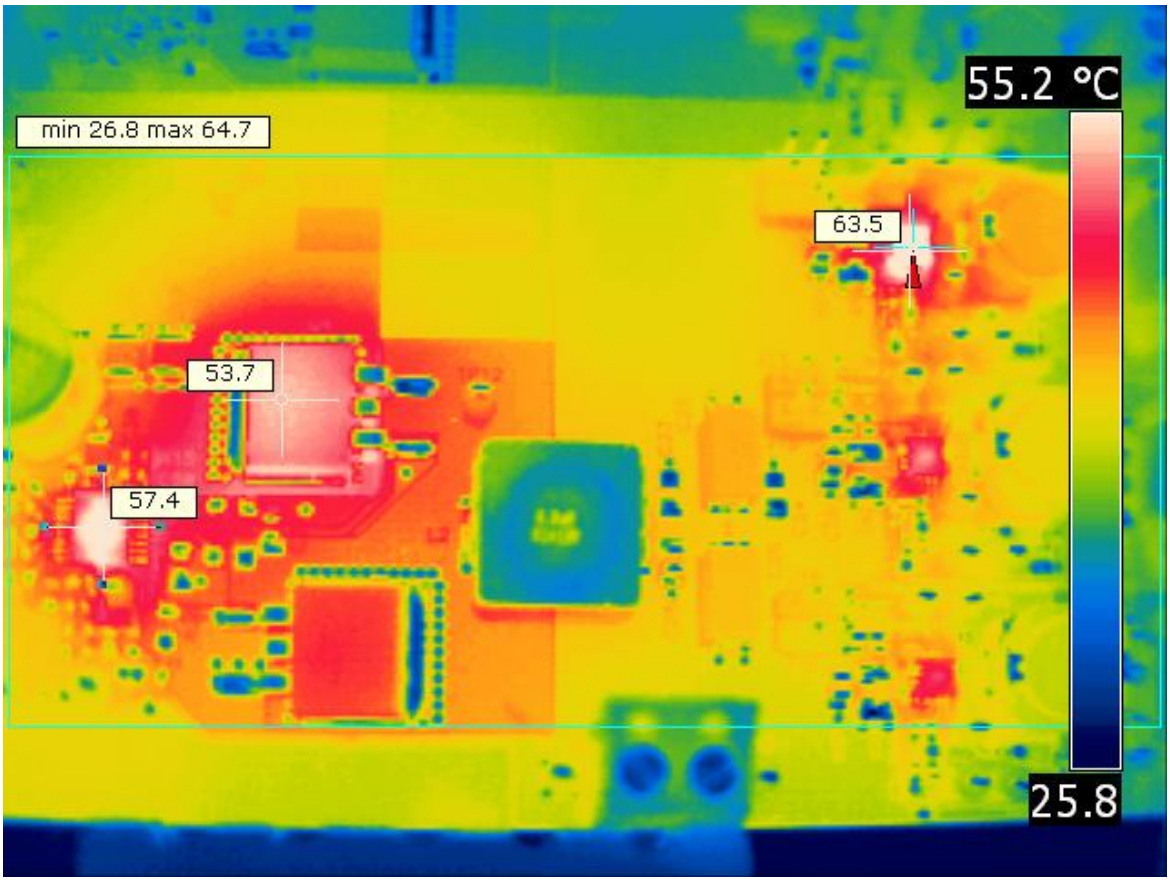
9.8 Load Regulation

V_{in} = 3.3V, V_{out} = 2.5V



10 Thermal Image

3.3V, 1.2V @ 3A, 1.8V @ 2A, 2.5V @ 2A after 2 hours



IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, modifications, enhancements, improvements, and other changes to its products and services at any time and to discontinue any product or service without notice. Customers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All products are sold subject to TI's terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its hardware products to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by government requirements, testing of all parameters of each product is not necessarily performed.

TI assumes no liability for applications assistance or customer product design. Customers are responsible for their products and applications using TI components. To minimize the risks associated with customer products and applications, customers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any TI patent right, copyright, mask work right, or other TI intellectual property right relating to any combination, machine, or process in which TI products or services are used. Information published by TI regarding third-party products or services does not constitute a license from TI to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of TI information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. Reproduction of this information with alteration is an unfair and deceptive business practice. TI is not responsible or liable for such altered documentation. Information of third parties may be subject to additional restrictions.

Resale of TI products or services with statements different from or beyond the parameters stated by TI for that product or service voids all express and any implied warranties for the associated TI product or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

TI products are not authorized for use in safety-critical applications (such as life support) where a failure of the TI product would reasonably be expected to cause severe personal injury or death, unless officers of the parties have executed an agreement specifically governing such use. Buyers represent that they have all necessary expertise in the safety and regulatory ramifications of their applications, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of TI products in such safety-critical applications, notwithstanding any applications-related information or support that may be provided by TI. Further, Buyers must fully indemnify TI and its representatives against any damages arising out of the use of TI products in such safety-critical applications.

TI products are neither designed nor intended for use in military/aerospace applications or environments unless the TI products are specifically designated by TI as military-grade or "enhanced plastic." Only products designated by TI as military-grade meet military specifications. Buyers acknowledge and agree that any such use of TI products which TI has not designated as military-grade is solely at the Buyer's risk, and that they are solely responsible for compliance with all legal and regulatory requirements in connection with such use.

TI products are neither designed nor intended for use in automotive applications or environments unless the specific TI products are designated by TI as compliant with ISO/TS 16949 requirements. Buyers acknowledge and agree that, if they use any non-designated products in automotive applications, TI will not be responsible for any failure to meet such requirements.

Following are URLs where you can obtain information on other Texas Instruments products and application solutions:

Products		**Applications**	
Audio	www.ti.com/audio	Communications and Telecom	www.ti.com/communications
Amplifiers	amplifier.ti.com	Computers and Peripherals	www.ti.com/computers
Data Converters	dataconverter.ti.com	Consumer Electronics	www.ti.com/consumer-apps
DLP® Products	www.dlp.com	Energy and Lighting	www.ti.com/energy
DSP	dsp.ti.com	Industrial	www.ti.com/industrial
Clocks and Timers	www.ti.com/clocks	Medical	www.ti.com/medical
Interface	interface.ti.com	Security	www.ti.com/security
Logic	logic.ti.com	Space, Avionics and Defense	www.ti.com/space-avionics-defense
Power Mgmt	power.ti.com	Transportation and Automotive	www.ti.com/automotive
Microcontrollers	microcontroller.ti.com	Video and Imaging	www.ti.com/video
RFID	www.ti-rfid.com	Wireless	www.ti.com/wireless-apps
RF/IF and ZigBee® Solutions	www.ti.com/lprf		
	TI E2E Community Home Page		e2e.ti.com

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265