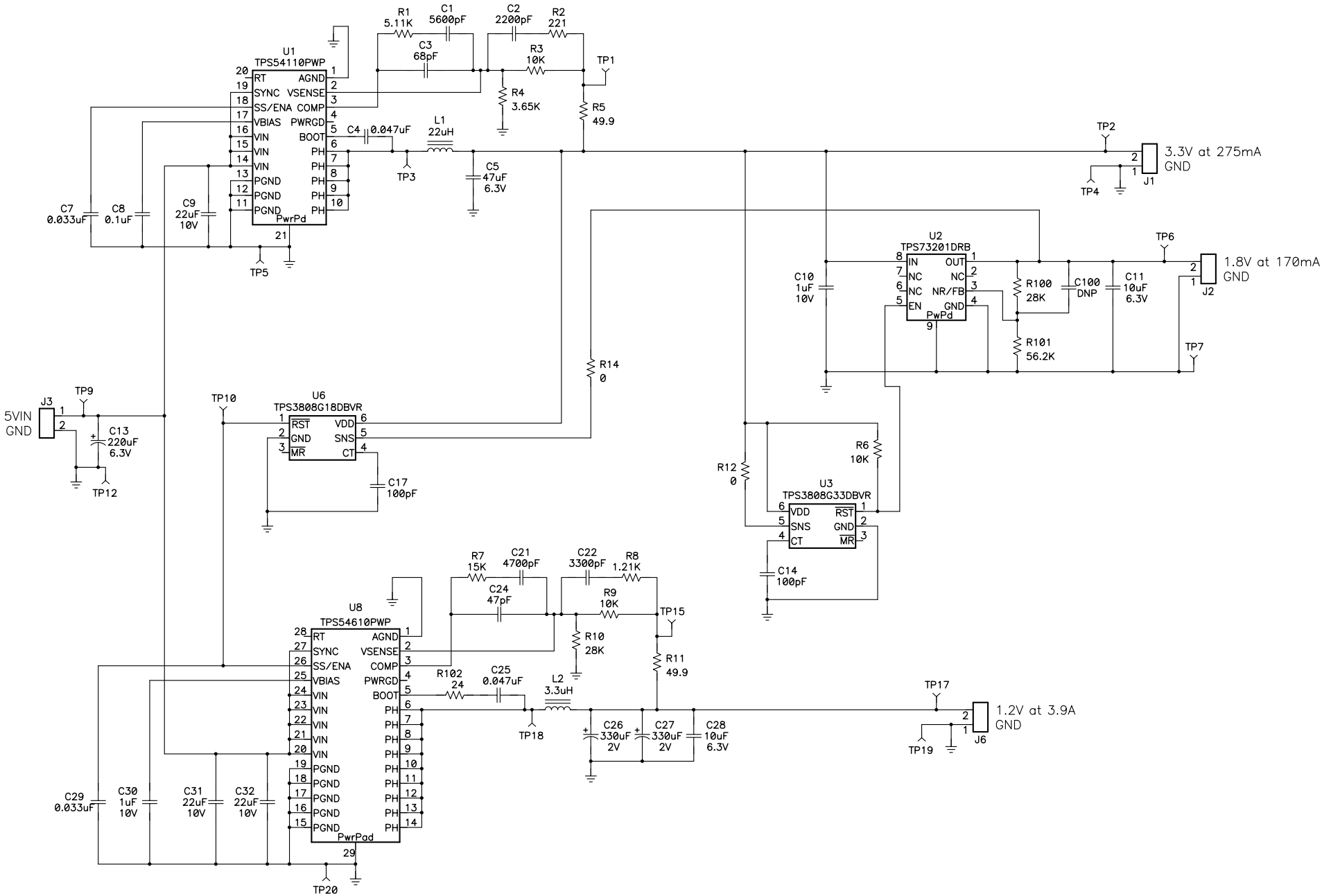


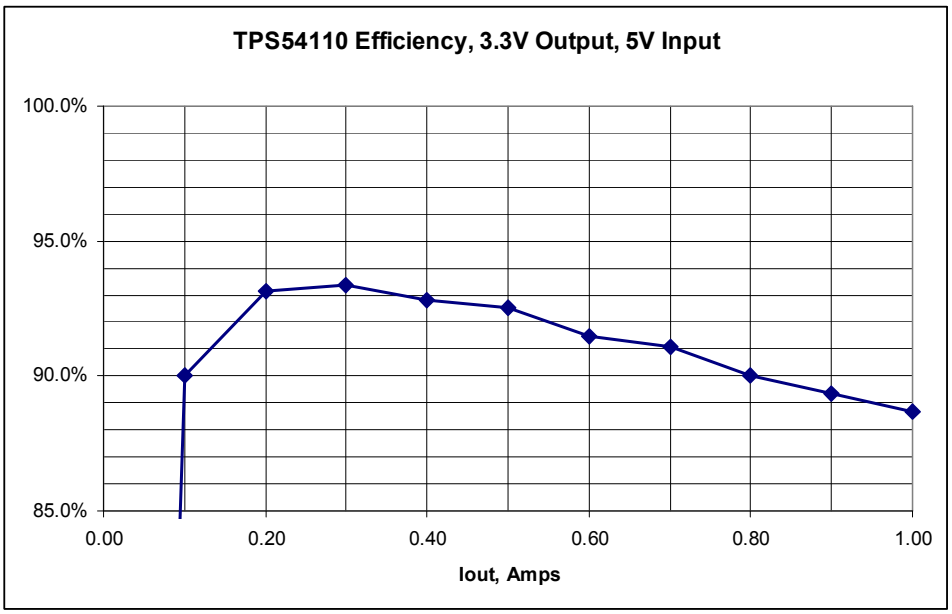
Build on PMP3164.1 Rev B PCB

Title	Processor Power Supply, 5V Input	
Size: C	Number: PMP3165.1 Texas Instruments	Rev: B
Date: 03-24-08	Drawn by: D Strasser	
Filename: PMP3165.1_RevB.sch	Sheet 1 of 1	

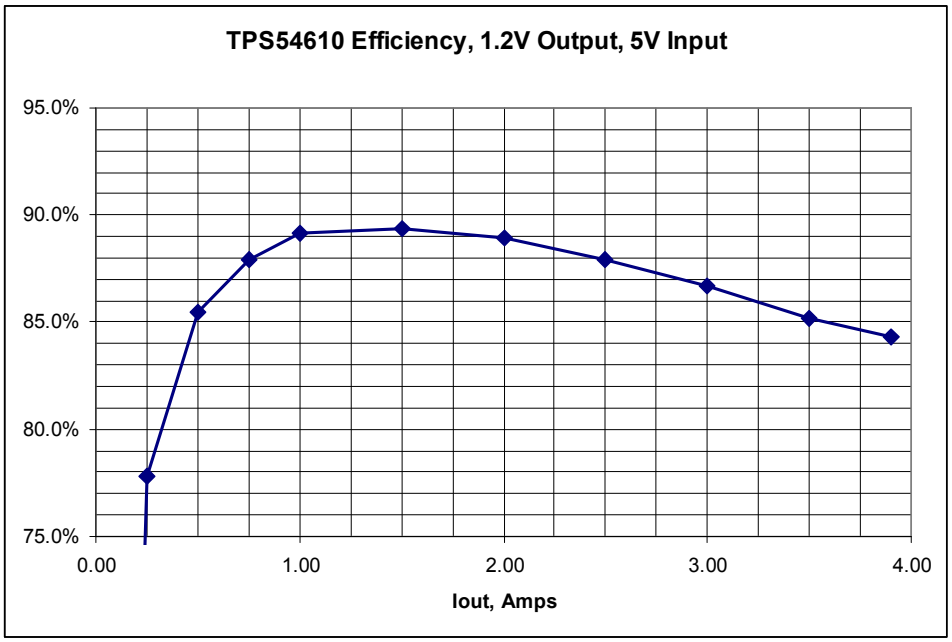
Filename: PMP3165.1_RevB_bom.xls						
Date: 03/17/2008						
		PMP3165.1 REV B BOM				
COUNT	**RefDes**	**Value**	**Description**	**Size**	**Part Number**	**MFR**
1	C24	47pF	Capacitor, Ceramic, 50V, C0G, 5%	603	Std	Std
1	C3	68pF	Capacitor, Ceramic, 50V, C0G, 5%	603	Std	Std
2	C14, C17	100pF	Capacitor, Ceramic, 50V, C0G, 5%	603	Std	Std
1	C2	2200pF	Capacitor, Ceramic, 50V, X7R, 10%	603	Std	Std
1	C22	3300pF	Capacitor, Ceramic, 50V, X7R, 10%	603	Std	Std
1	C21	4700pF	Capacitor, Ceramic, 50V, X7R, 10%	603	Std	Std
1	C1	5600pF	Capacitor, Ceramic, 50V, X7R, 10%	603	Std	Std
2	C7, C29	0.033uF	Capacitor, Ceramic, 50V, X7R, 10%	603	Std	Std
2	C4, C25	0.047uF	Capacitor, Ceramic, 50V, X7R, 10%	603	Std	Std
1	C8	0.1uF	Capacitor, Ceramic, 50V, X7R, 10%	603	Std	Std
2	C10, C30	1uF	Capacitor, Ceramic, 10V, X5R, 20%	603	Std	Std
2	C11, C28	10uF	Capacitor, Ceramic, 6.3V, X5R, 20%	603	Std	Std
0	C12	DNP				
3	C9, C31, C32	22uF	Capacitor, Ceramic, 10V, X5R, 20%	1206	C3216X5R1A226M	TDK
1	C5	47uF	Capacitor, Ceramic, 6.3V, X5R, 20%	1206	C3216X5R0J476M	TDK
1	C13	220uF	Capacitor, POSCAP, vvV, 40milliohm, 20%	7343(D)	6TPB220ML	Sanyo
2	C26, C27	330uF	Capacitor, POSCAP, 2V, 6milliohm, 20%	7343(D)	2TPF330M	Sanyo
4	J1, J2, J3, J6		Terminal Block, 2-pin, 6-A, 3.5mm	0.27 x 0.25	ED555/2DS	OST
1	L1	22uH	Inductor, SMT, 0.77A, 104milliohm	6x6mm	SLF6028T-220MR77-PF	TDK
1	L2	3.3uH	Inductor, SMT, 6.2A, 10.5milliohm	10x9,7mm	VLF10040T-3R3N6R2	TDK
2	R12, R14	0	Resistor, Chip, 1/16W, 1%	603	Std	Std
1	R102	24	Resistor, Chip, 1/16W, 5%	603	Std	Std
2	R5, R11	49.9	Resistor, Chip, 1/16W, 1%	603	Std	Std
1	R2	221	Resistor, Chip, 1/16W, 1%	603	Std	Std
1	R8	1.21K	Resistor, Chip, 1/16W, 1%	603	Std	Std
1	R4	3.65K	Resistor, Chip, 1/16W, 1%	603	Std	Std
1	R1	5.11K	Resistor, Chip, 1/16W, 1%	603	Std	Std
3	R3, R6, R9	10K	Resistor, Chip, 1/16W, 1%	603	Std	Std
1	R7	15K	Resistor, Chip, 1/16W, 1%	603	Std	Std
2	R10, R100	28K	Resistor, Chip, 1/16W, 1%	603	Std	Std
1	R101	56.2K	Resistor, Chip, 1/16W, 1%	603	Std	Std
9	TP1, TP2, TP3, TP6, TP9, TP10, TP15, TP17, TP18		Test Point, Red, Thru Hole Color Keyed	0.100 x 0.100	5000	Keystone
6	TP4, TP5, TP7, TP12, TP19, TP20		Test Point, Black, Thru Hole Color Keyed	0.100 x 0.100	5001	Keystone
1	U1		IC, IFET Power Controller, adjV, 1.5A	PWP20	TPS54110PWP	TI
1	U2		IC, 250mA, Cap Free LDO, Adj	SON-8	TPS73201DRB	TI
1	U6		IC, Programmable 1.8V, Delay Time: 1.25ms to10s	SOT23-6	TPS3808G18DBVR	TI
1	U3		IC, Programmable 3.3V, Delay Time: 1.25ms to10s	SOT23-6	TPS3808G33DBVR	TI
1	U8		IC, 6A Output Synchronous Buck PWM (SWIFT)	PWP28	TPS54610PWP	TI

Efficiency

The efficiency of theTPS54110 converter with a 3.3V output and 5V input:



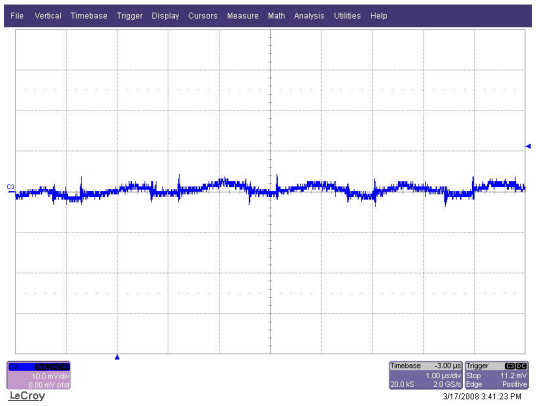
The efficiency of theTPS54610 converter with a 1.2V output and a 5V input:



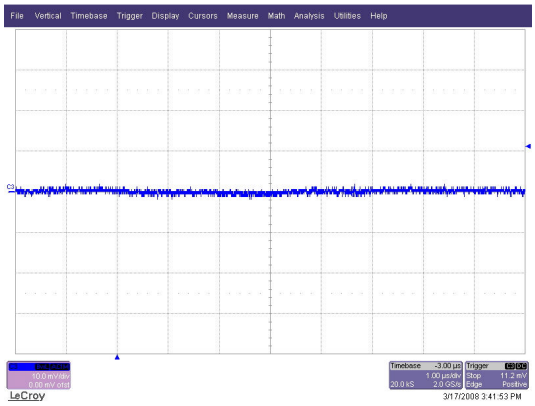
Ripple and Noise

All ripple measurements taken with a 20MHz bandwidth and maximum loading

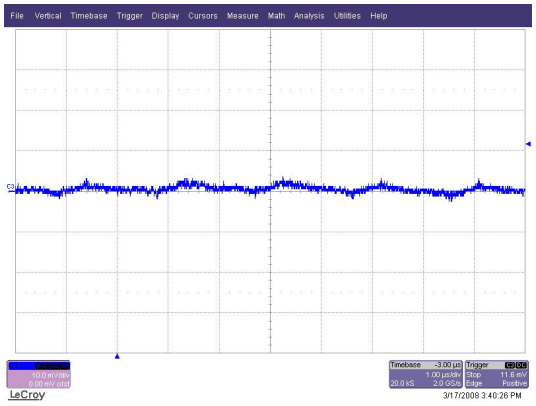
Output ripple/noise 3.3V output:



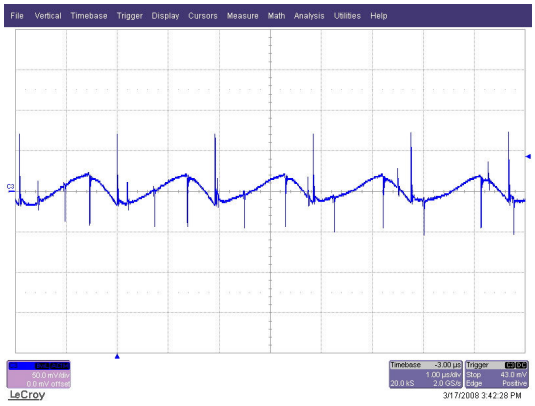
Output ripple/noise 1.8V output:



Output ripple/noise 1.2V output:

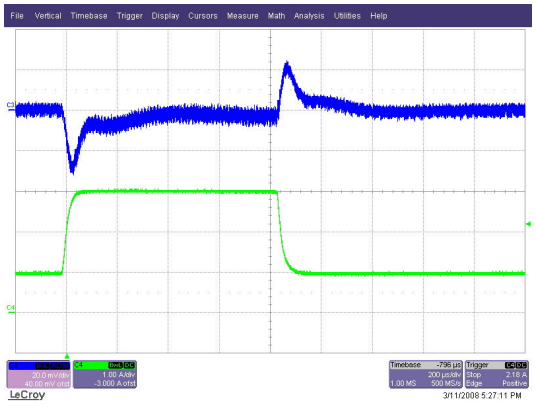


Input ripple/noise 5V input:



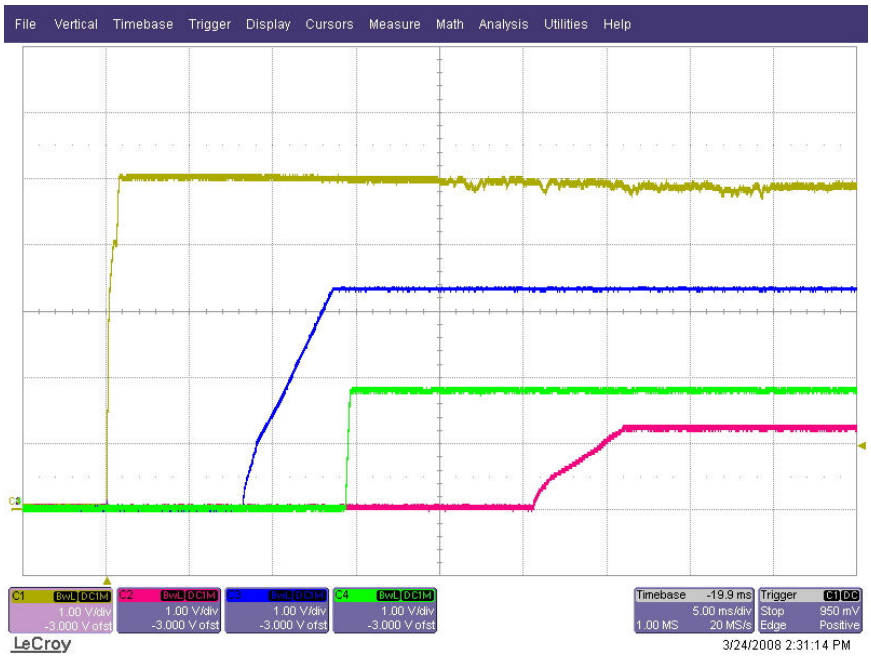
Dynamic Loading

Dynamic load response 1.2V output:



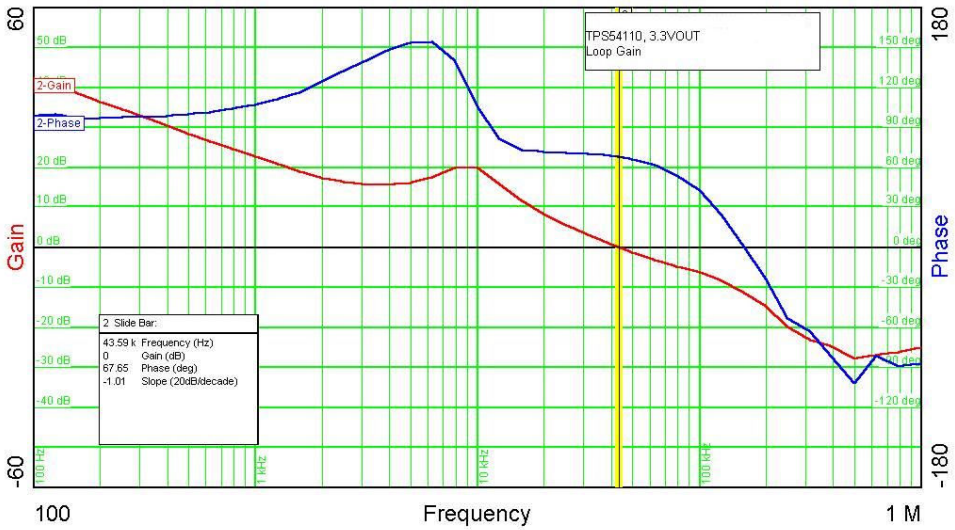
Turn On Response

Output voltage turn-on response (traces, top to bottom, are: 5VIN, 3.3V, 1.8V, 1.2V):

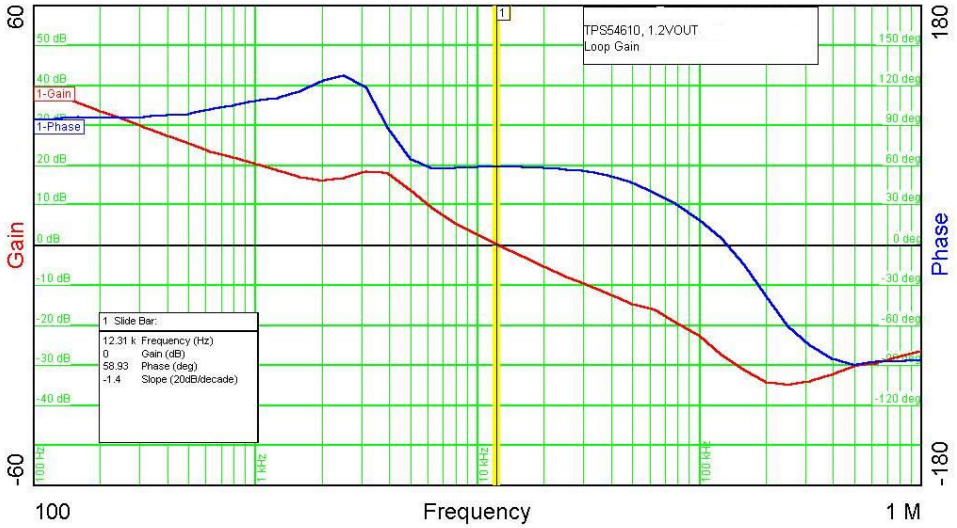


Stability Analysis (Loop Gain)

The figure below is the loop gain of the TPS54110 converter with max load. The bandwidth is 43 KHz, the phase margin is 68 degrees, and the gain margin is 12dB.



The figure below is the loop gain of the TPS54610 converter with max load. The bandwidth is 12 KHz, the phase margin is 59 degrees, and the gain margin is 28dB.



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**	
Amplifiers	amplifier.ti.com	Audio	www.ti.com/audio
Data Converters	dataconverter.ti.com	Automotive	www.ti.com/automotive
DSP	dsp.ti.com	Broadband	www.ti.com/broadband
Clocks and Timers	www.ti.com/clocks	Digital Control	www.ti.com/digitalcontrol
Interface	interface.ti.com	Medical	www.ti.com/medical
Logic	logic.ti.com	Military	www.ti.com/military
Power Mgmt	power.ti.com	Optical Networking	www.ti.com/opticalnetwork
Microcontrollers	microcontroller.ti.com	Security	www.ti.com/security
RFID	www.ti-rfid.com	Telephony	www.ti.com/telephony
RF/IF and ZigBee® Solutions	www.ti.com/lprf	Video & Imaging	www.ti.com/video
		Wireless	www.ti.com/wireless

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