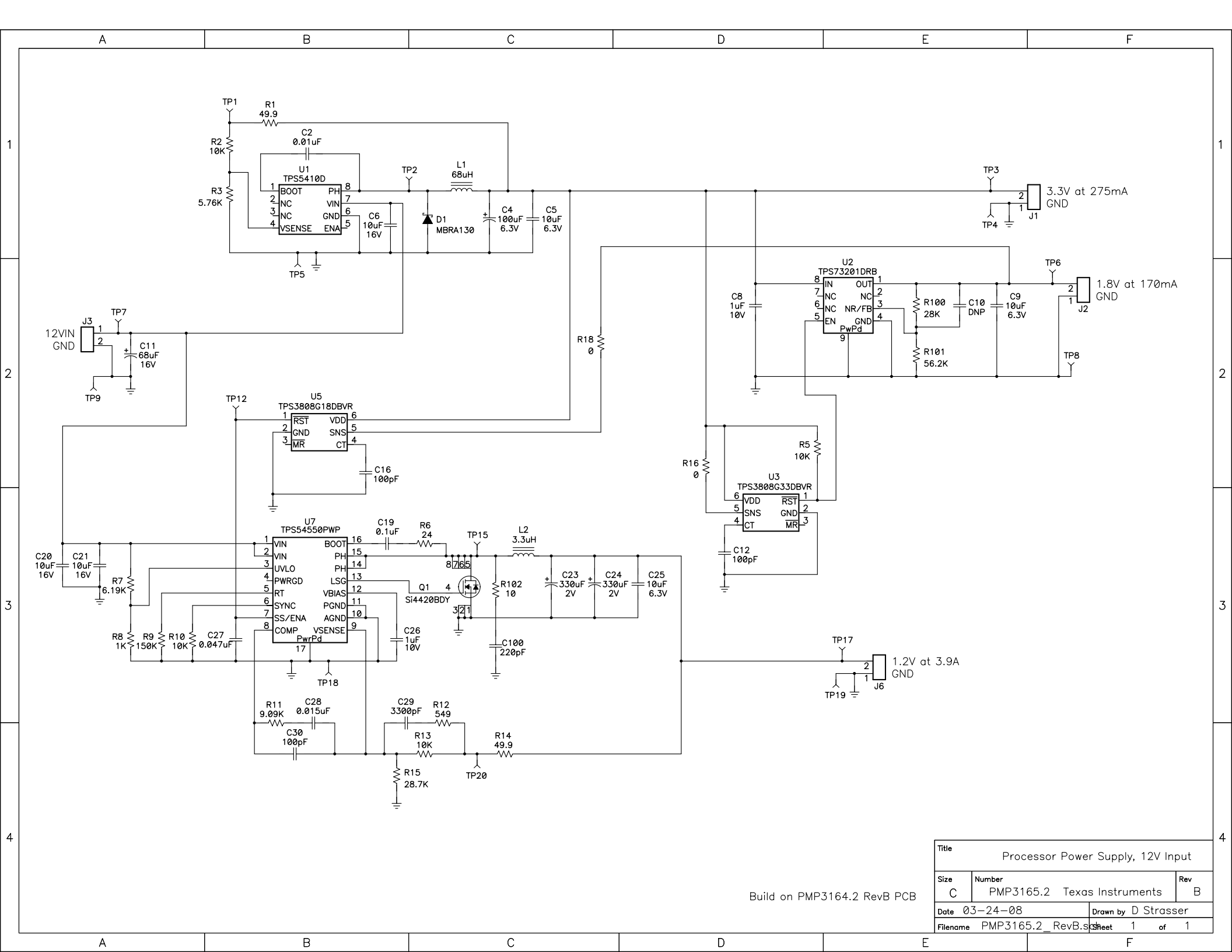
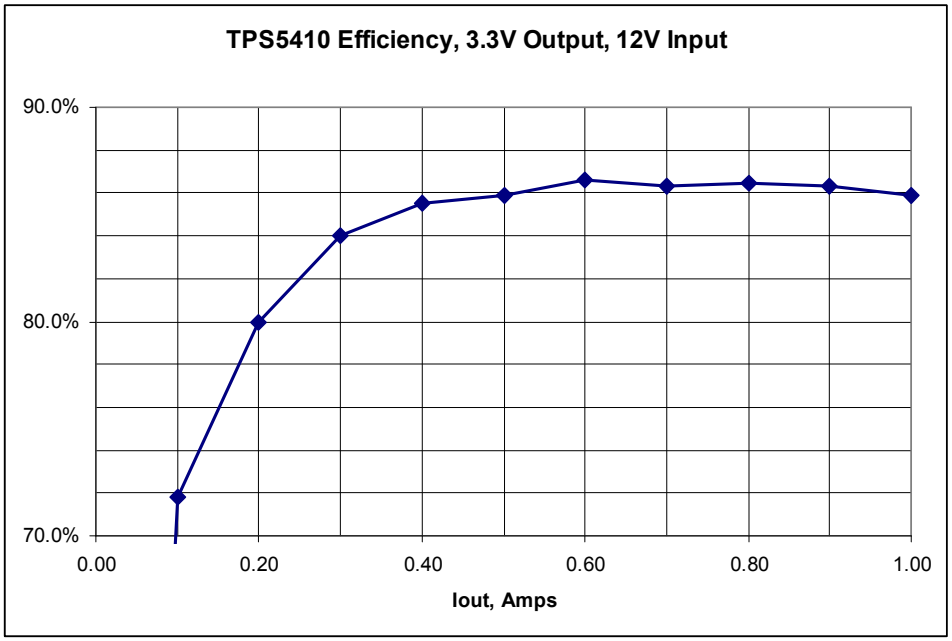

TP1
R1
49.9
R2
10K
C2
0.01uF
U1
TPS5410D
BOOT
NC
NC
VSENSE
PH
VIN
GND
ENA
R3
5.76K
TP2
L1
68uH
D1
MBRA130
C6
10uF
16V
C4
100uF
6.3V
C5
10uF
6.3V
TP5
TP3
TP4
3.3V at 275mA
GND
J1
U2
TPS73201DRB
IN
NC
NC
EN
OUT
NC
NR/FB
GND
PwPd
C8
1uF
10V
R100
28K
C10
DNP
C9
10uF
6.3V
R101
56.2K
TP6
TP8
1.8V at 170mA
GND
J2
J3
12VIN
GND
TP7
C11
68uF
16V
TP9
R18
0
TP12
U5
TPS3808G18DBVR
RST
GND
MR
VDD
SNS
CT
C16
100pF
R16
0
R5
10K
U3
TPS3808G33DBVR
VDD
SNS
CT
RST
GND
MR
C12
100pF
U7
TPS54550PWP
VIN
VIN
UVLO
PWRGD
RT
SYNC
SS/ENA
COMP
BOOT
PH
PH
LSG
VBIAS
PGND
AGND
VSENSE
PwrPd
C19
0.1uF
R6
24
TP15
L2
3.3uH
Q1
Si4420BDY
R102
10
C23
330uF
2V
C24
330uF
2V
C25
10uF
6.3V
C20
10uF
16V
C21
10uF
16V
R7
6.19K
R8
1K
R9
150K
R10
10K
C27
0.047uF
C26
1uF
10V
C100
220pF
TP18
TP17
TP19
1.2V at 3.9A
GND
J6
R11
9.09K
C28
0.015uF
C30
100pF
C29
3300pF
R12
549
R13
10K
R14
49.9
R15
28.7K
TP20
Build on PMP3164.2 RevB PCB
Title
Processor Power Supply, 12V Input
Size
C
Number
PMP3165.2 Texas Instruments
Rev
B
Date
03-24-08
Drawn by
D Strasser
Filename
PMP3165.2_ RevB.sch
Sheet
1
of
1

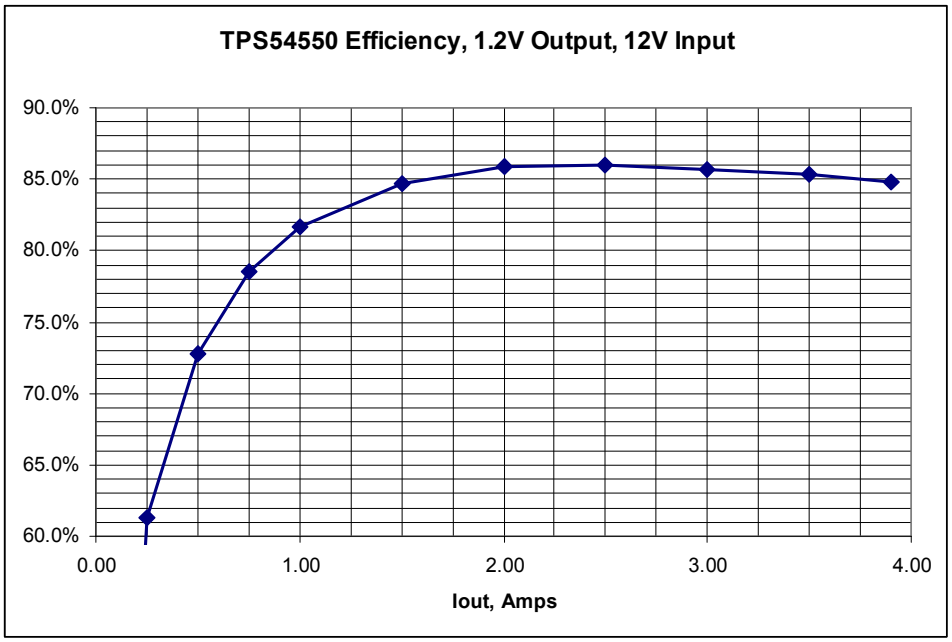
Filename: PMP3165.2_RevB_bom.xls						
Date: 03/17/2008						
		PMP3165.2 REV B BOM				
COUNT	**RefDes**	**Value**	**Description**	**Size**	**Part Number**	**MFR**
3	C12, C16, C30	100pF	Capacitor, Ceramic, 50V, C0G, 5%	603	Std	Std
1	C100	220pF	Capacitor, Ceramic, 50V, C0G, 5%	603	Std	Std
1	C29	3300pF	Capacitor, Ceramic, 50V, X7R, 10%	603	Std	Std
1	C2	0.01uF	Capacitor, Ceramic, 50V, X7R, 10%	603	Std	Std
1	C28	0.015uF	Capacitor, Ceramic, 50V, X7R, 10%	603	Std	Std
1	C27	0.047uF	Capacitor, Ceramic, 50V, X7R, 10%	603	Std	Std
1	C19	0.1uF	Capacitor, Ceramic, 50V, X7R, 10%	603	Std	Std
2	C8, C26	1uF	Capacitor, Ceramic, 10V, X5R, 20%	603	Std	Std
3	C5, C9, C25	10uF	Capacitor, Ceramic, 6.3V, X5R, 20%	603	Std	Std
0	C10	DNP				
3	C6, C20, C21	10uF	Capacitor, Ceramic, 16V, X5R, 20%	1206	C3216X5R1C106M	TDK
1	C4	100uF	Capacitor, POSCAP, 6.3V, 55milliohm, 20%	3528(B)	6TPB100MA	Sanyo
1	C11	68uF	Capacitor, POSCAP, 16V, 50milliohm, 20%	7343(D)	16TQC68M	Sanyo
2	C23, C24	330uF	Capacitor, POSCAP, 2V, 6milliohm, 20%	7343(D)	2TPF330M	Sanyo
1	D1		Diode, Schottky, 1A, 30V	SMA	MBRA130LT3	On Semi
4	J1, J2, J3, J6		Terminal Block, 2-pin, 6-A, 3.5mm	0.27 x 0.25	ED555/2DS	OST
1	L1	68uH	Inductor, SMT, 1.4A, 155milliohm	10x9.7mm	VLF10040T-680M1R4	TDK
1	L2	3.3uH	Inductor, SMT, 6.2A, 10.5milliohm	10x9.7mm	VLF10040T-3R3N6R2	TDK
1	Q1		MOSFET, N-ch, 30V, 11A, 11milliohm	SO8	Si4420BDY	Vishay
2	R16, R18	0	Resistor, Chip, 1/16W, 5%	603	Std	Std
1	R102	10	Resistor, Chip, 1/16W, 5%	603	Std	Std
1	R6	24	Resistor, Chip, 1/16W, 5%	603	Std	Std
2	R1, R14	49.9	Resistor, Chip, 1/16W, 1%	603	Std	Std
1	R12	549	Resistor, Chip, 1/16W, 1%	603	Std	Std
1	R8	1K	Resistor, Chip, 1/16W, 1%	603	Std	Std
1	R3	5.76K	Resistor, Chip, 1/16W, 1%	603	Std	Std
1	R7	6.19K	Resistor, Chip, 1/16W, 1%	603	Std	Std
1	R11	9.09K	Resistor, Chip, 1/16W, 1%	603	Std	Std
4	R2, R5, R10, R13	10K	Resistor, Chip, 1/16W, 1%	603	Std	Std
1	R100	28K	Resistor, Chip, 1/16W, 1%	603	Std	Std
1	R15	28.7K	Resistor, Chip, 1/16W, 1%	603	Std	Std
1	R101	56.2K	Resistor, Chip, 1/16W, 1%	603	Std	Std
1	R9	150K	Resistor, Chip, 1/16W, 1%	603	Std	Std
9	TP1, TP2, TP3, TP6, TP7, TP12, TP15, TP17, TP20		Test Point, Red, Thru Hole Color Keyed	0.100 x 0.100	5000	Keystone
6	TP4, TP5, TP8, TP9, TP18, TP19		Test Point, Black, Thru Hole Color Keyed	0.100 x 0.100	5001	Keystone
1	U1		IC, 1-A Wide Input Range Step-Down SWIFT Converter	SO8	TPS5410D	TI
1	U2		IC, 250mA, Cap Free LDO, Adj	SON-8	TPS73201DRB	TI
1	U5		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	U7		IC, 4.5 to 20V Input, 3A Step Down Converter	PWP16	TPS54550PWP	TI

Efficiency

The efficiency of theTPS5410 converter with a 3.3V output and 12V input:



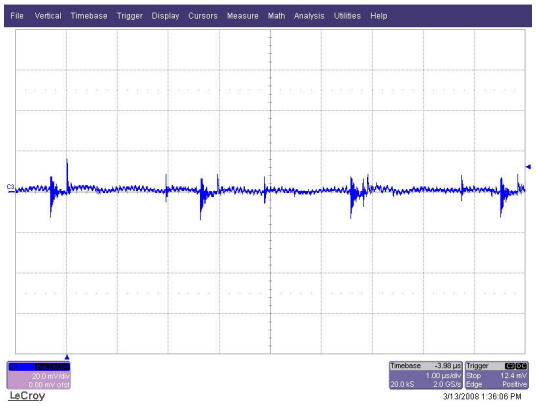
The efficiency of theTPS54550 converter with a 1.2V output and a 12V input:



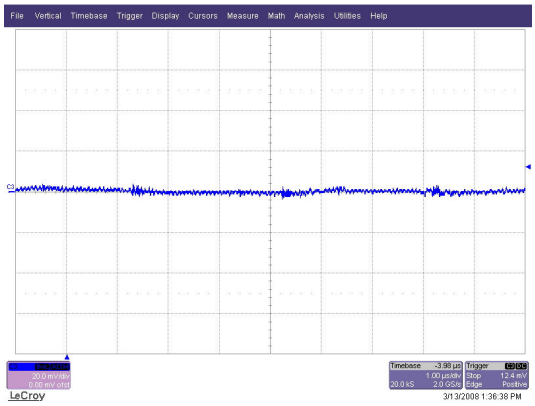
Ripple and Noise

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

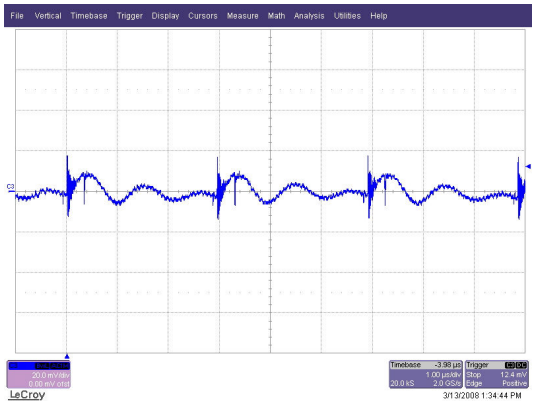
Output ripple/noise 3.3V output:



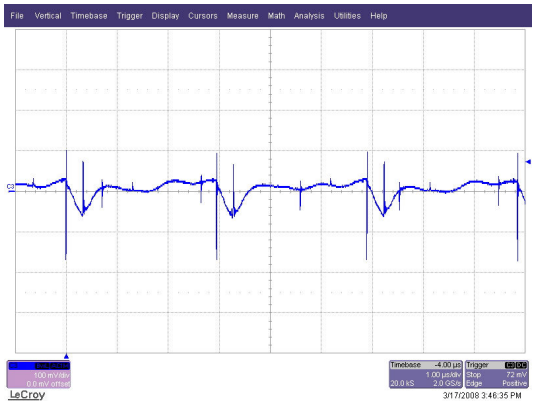
Output ripple/noise 1.8V output:



Output ripple/noise 1.2V output:

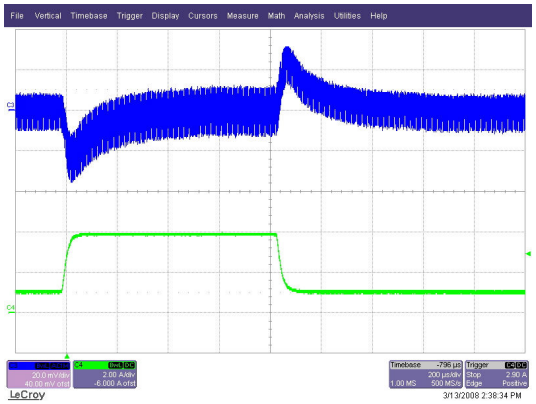


Input ripple/noise 12V input:



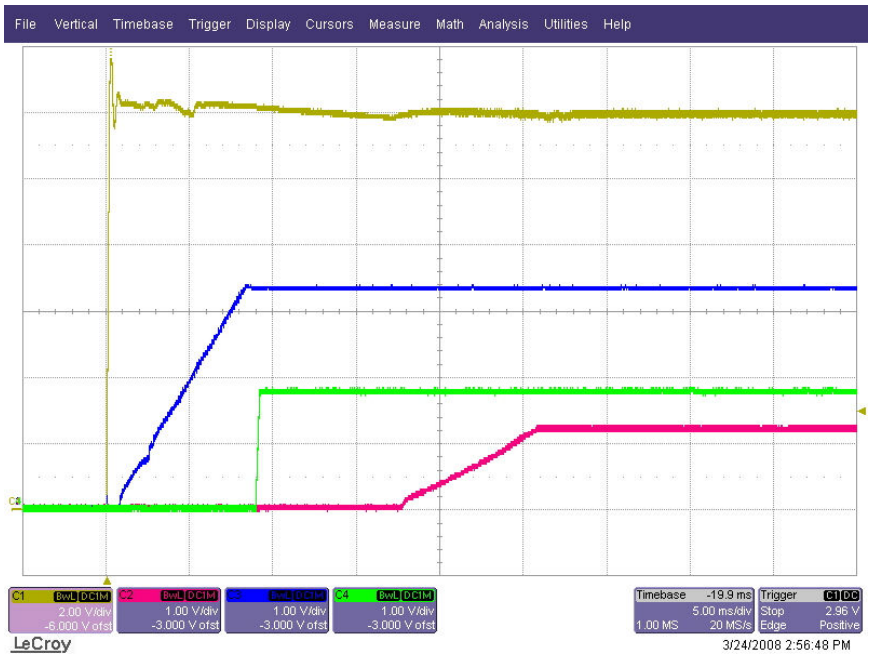
Dynamic Loading

Dynamic load response 1.2V output:



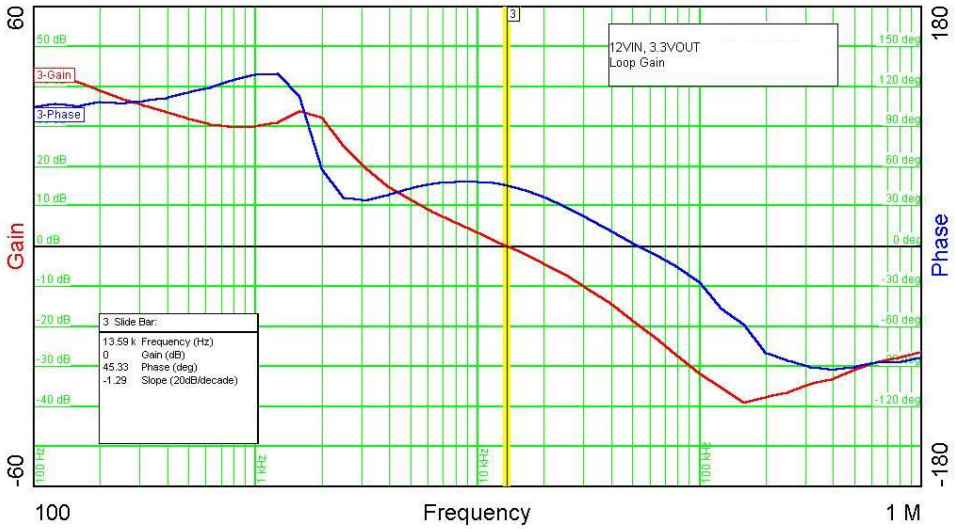
Turn On Response

Output voltage turn-on response (traces, top to bottom, are: 12VIN, 3.3V, 1.8V, 1.2V):

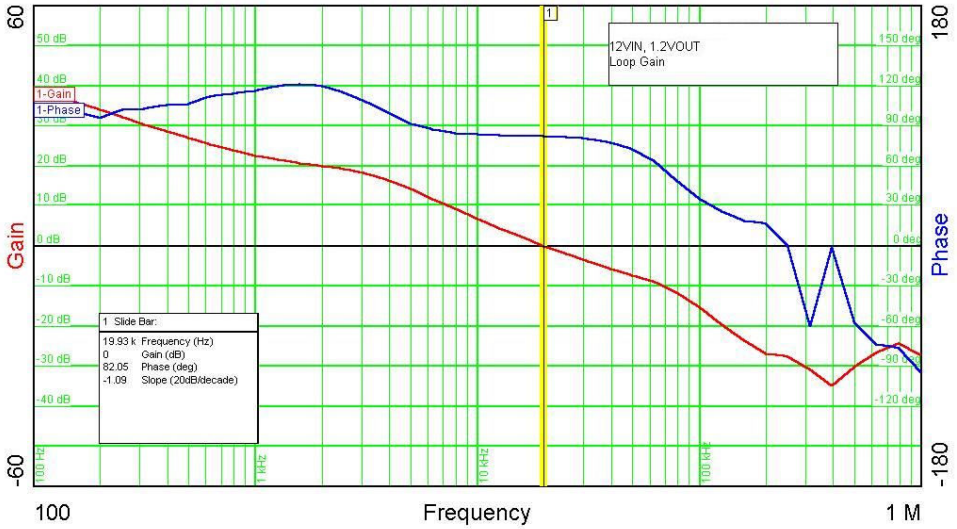


Stability Analysis (Loop Gain)

The figure below is the loop gain of the TPS5410 converter with max load. The bandwidth is 13 KHz, the phase margin is 45 degrees, and the gain margin is 20dB.



The figure below is the loop gain of the TPS54550 converter with max load. The bandwidth is 20 KHz, the phase margin is 82 degrees, and the gain margin is 28dB.



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