TP1
R1 49.9
R2 10K
C2 0.01uF
R3 5.76K
U1 TPS5410D
1 BOOT
2 NC
3 NC
4 VSENSE
PH 8
VIN 7
GND 6
ENA 5
TP5
TP2
C6 10uF 16V
D1 MBRA130
L1 68uH
C4 100uF 6.3V
C5 10uF 6.3V
TP3
2
1
J1
3.3V at 175mA GND
TP4

C8 1uF 10V
U2 TPS73201DRB
8 IN
7 NC
6 NC
5 EN
OUT 1
NC 2
NR/FB 3
GND 4
PwPd 9
R100 28K
C10 DNP
TP6
2
1
J2
1.8V at 210mA GND
C9 10uF 6.3V
R101 56.2K
TP8

J3
12VIN GND
1
2
TP7
C11 68uF 16V
TP9

R16 DNP
R5 10K
U3 TPS3808G12DBVR
6 VDD
5 SNS
4 CT
RST 1
GND 2
MR 3
C12 100pF
R17 0
R18 DNP

TP10
U4 TPS73115DBV
1 IN
2 GND
3 EN
OUT 5
NR/FB 4
C13 1uF 10V
C14 1uF 10V
C15 0.01uF
TP11
2
1
J4
1.5V at 66mA GND
TP13

TP12
U5 TPS3808G33DBVR
1 RST
2 GND
3 MR
VDD 6
SNS 5
CT 4
C16 100pF

R19 0

U7 TPS54550PWP
1 VIN
2 VIN
3 UVLO
4 PWRGD
5 RT
6 SYNC
7 SS/ENA
8 COMP
BOOT 16
PH 15
PH 14
LSG 13
VBIAS 12
PGND 11
AGND 10
VSENSE 9
PwrPd 17
TP18
C19 0.1uF
R6 24
TP15
L2 3.3uH
Q1 Si4420BDY
8 7 6 5
4
3 2 1
R102 10
C23 330uF 2V
C24 330uF 2V
C25 10uF 6.3V
C26 1uF 10V
C100 220pF

C17 1uF 10V
U6 TPS736125DRB
8 IN
7 NC
6 NC
5 EN
OUT 1
NC 2
NR/FB 3
GND 4
PwPd 9
C18 10uF 6.3V
C22 0.01uF
TP14
2
1
J5
1.25V at 275mA GND
TP16

C20 10uF 16V
C21 10uF 16V
R7 6.19K
R8 1K
R9 150K
R10 10K
C27 0.047uF

R11 9.09K
C28 0.015uF
C30 100pF
C29 3300pF
R12 549
R13 10K
R14 49.9
R15 28.7K
TP20

TP17
2
1
J6
1.2V at 3A GND
TP19

Title: C6455 Processor Power Supply, 12V Input
Size: C
Number: PMP3164.2   Texas Instruments
Rev: B
Date: 03-24-08
Drawn by: D Strasser
Filename: PMP3164.2_RevB.sch
Sheet 1 of 1

Filename: PMP3164.2_RevB_bom.xls
Date: 03/24/2008

PMP3164.2 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
3	C2, C15, C22	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
6	C5, C8, C13, C14, C17, C26	1uF	Capacitor, Ceramic, 10V, X5R, 20%	603	Std	Std
3	C9, C18, 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
6	J1, J2, J3, J4, J5, 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	R17, R19	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
0	R16, R18	DNP	Resistor, Chip, 1/16W, 1%	603	Std	Std
12	TP1, TP2, TP3, TP6, TP7, TP10, TP11, TP12, TP14, TP15, TP17, TP20		Test Point, Red, Thru Hole Color Keyed	0.100 x 0.100	5000	Keystone
8	TP4, TP5, TP8, TP9, TP13, TP16, 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	U3		IC, Programmable 1.2V, Delay Time: 1.25ms to10s	SOT23-6	TPS3808G12DBVR	TI
1	U4		IC, 150mA LDO Regulator With Reverse Current Protection	SOT23-5	TPS73115DBV	TI
1	U5		IC, Programmable 3.3V, Delay Time: 1.25ms to10s	SOT23-6	TPS3808G33DBVR	TI
1	U6		IC, 400mA LDO Regulator With Reverse Current Protection	QFN-8	TPS736125DRB	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:

TPS5410 Efficiency, 3.3V Output, 12V Input
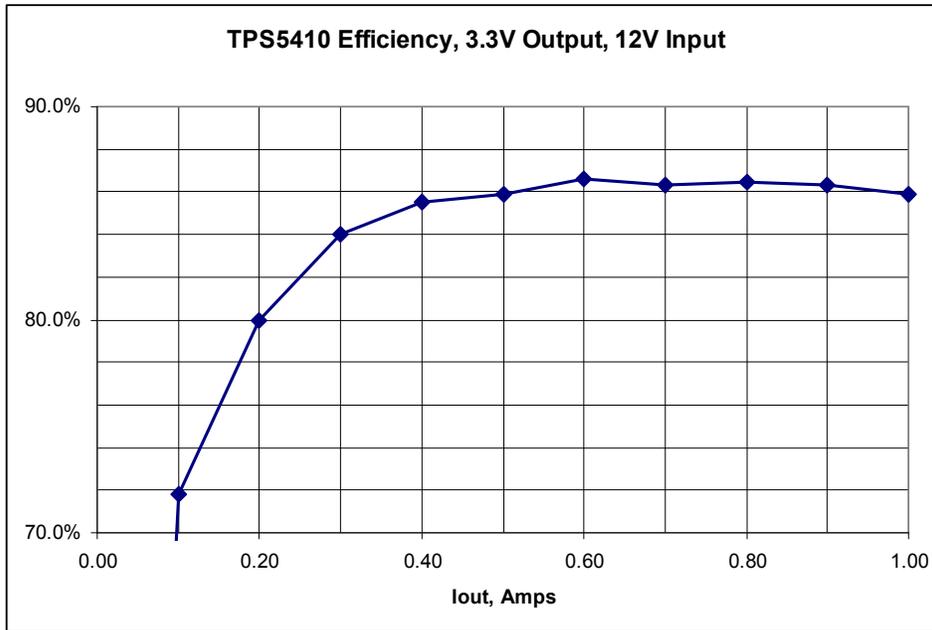
The efficiency of theTPS54550 converter with a 1.2V output and a 12V input:

**TPS54550 Efficiency, 1.2V Output, 12V Input**
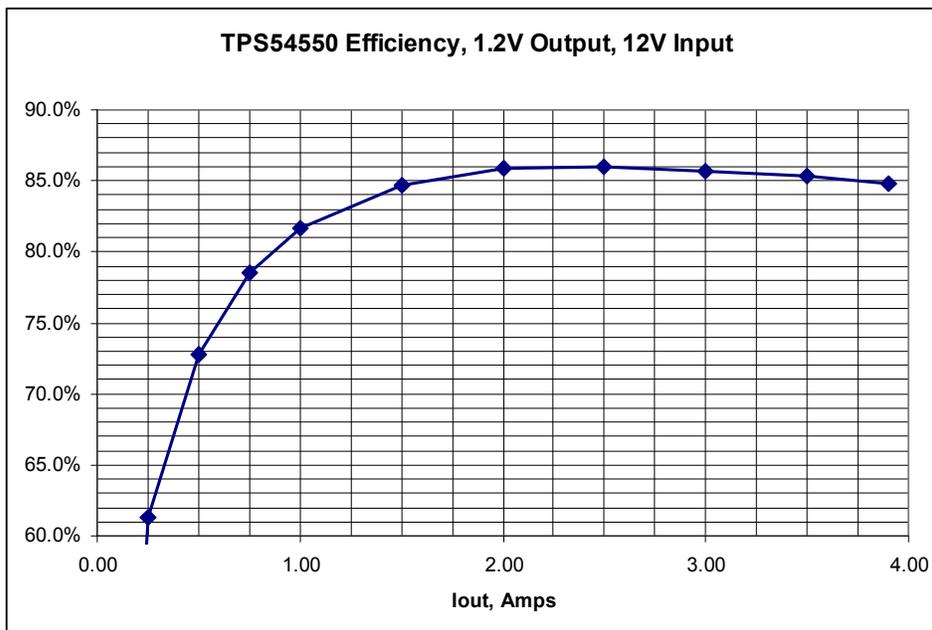
Ripple and Noise

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

Output ripple/noise 3.3V output: Output ripple/noise 1.8V output:
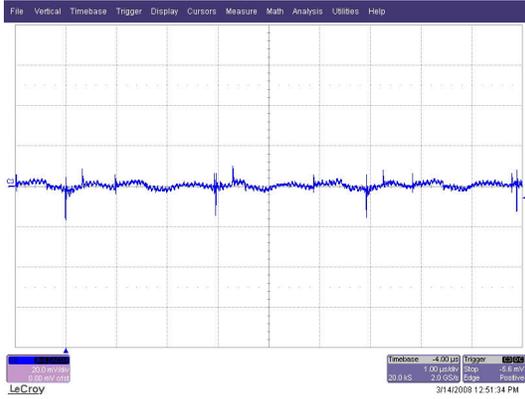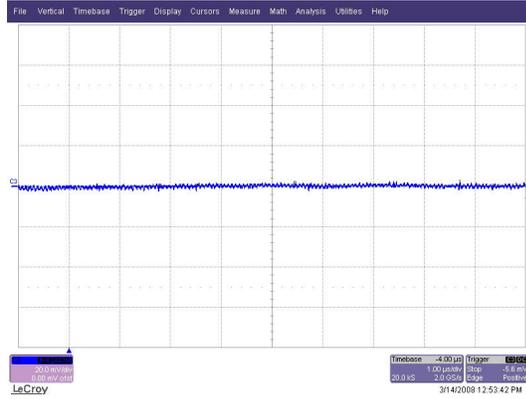
Output ripple/noise 1.5V output: Output ripple/noise 1.25V output:
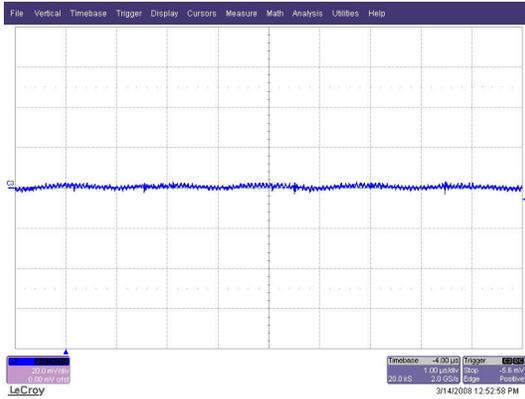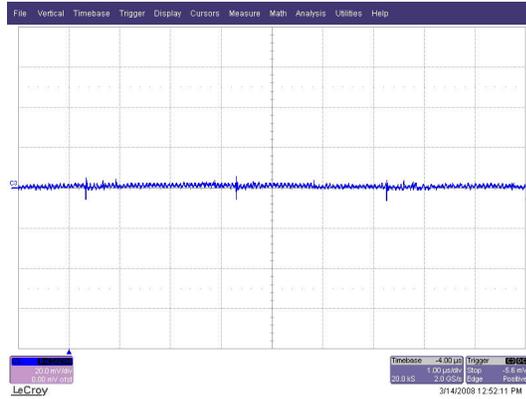
Output ripple/noise 1.2V output: Input ripple/noise 12V input:
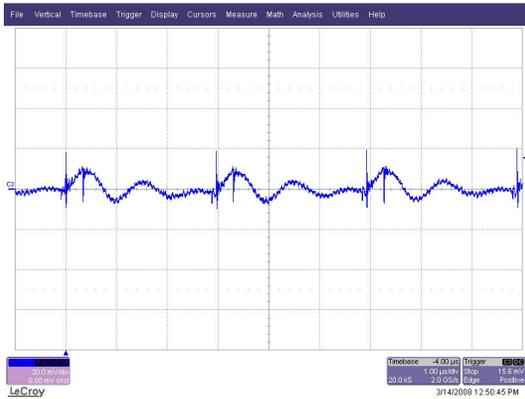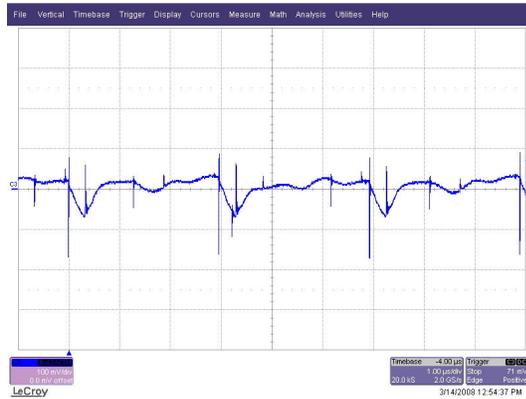
Dynamic Loading

Dynamic load response 1.2V output:
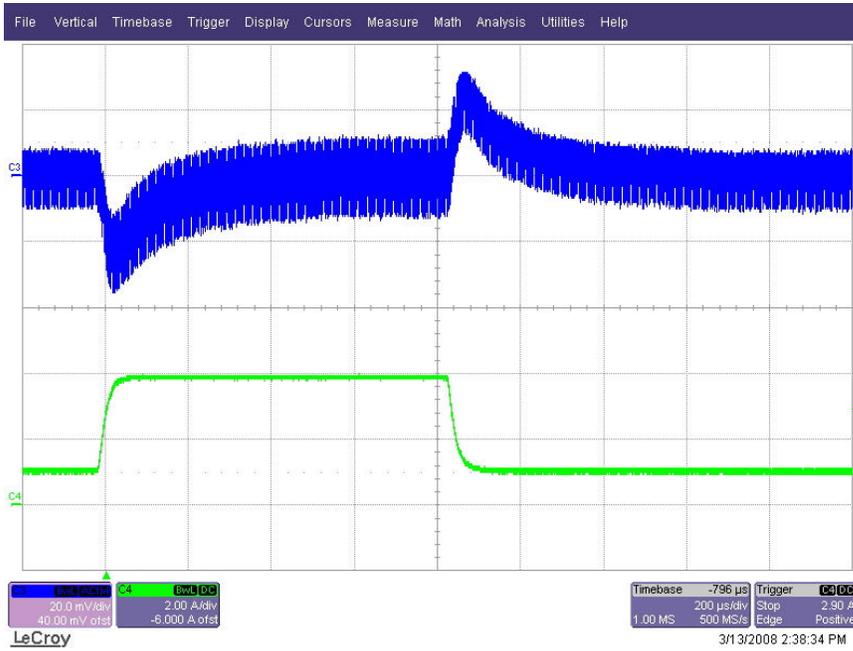
Turn On Response

Output voltage turn-on response (traces, top to bottom, are: 12VIN, 3.3V, 1.8V, 1.2V):
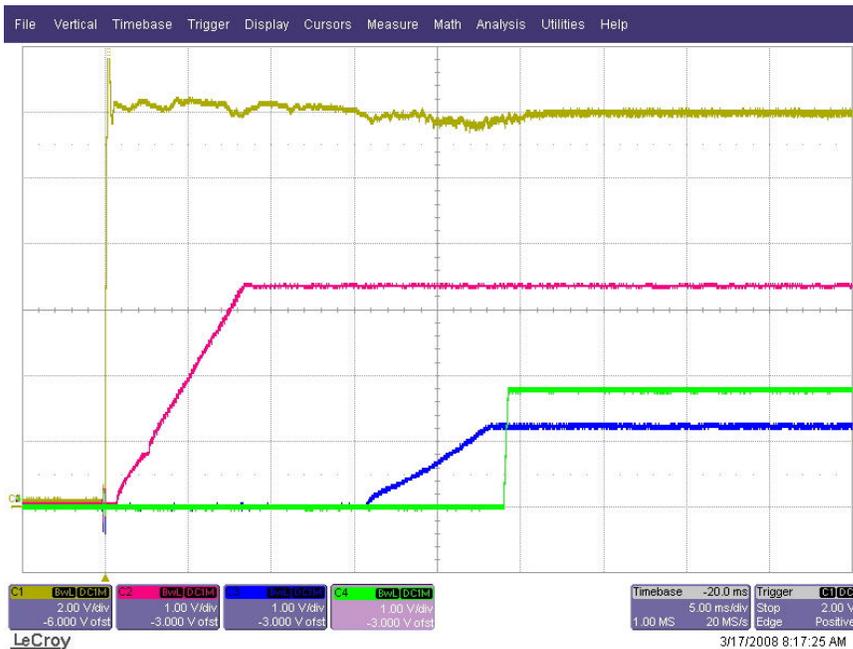
Output voltage turn-on response (traces, top to bottom, are: 1.8V, 1.5V, 1.25V, 1.2V):
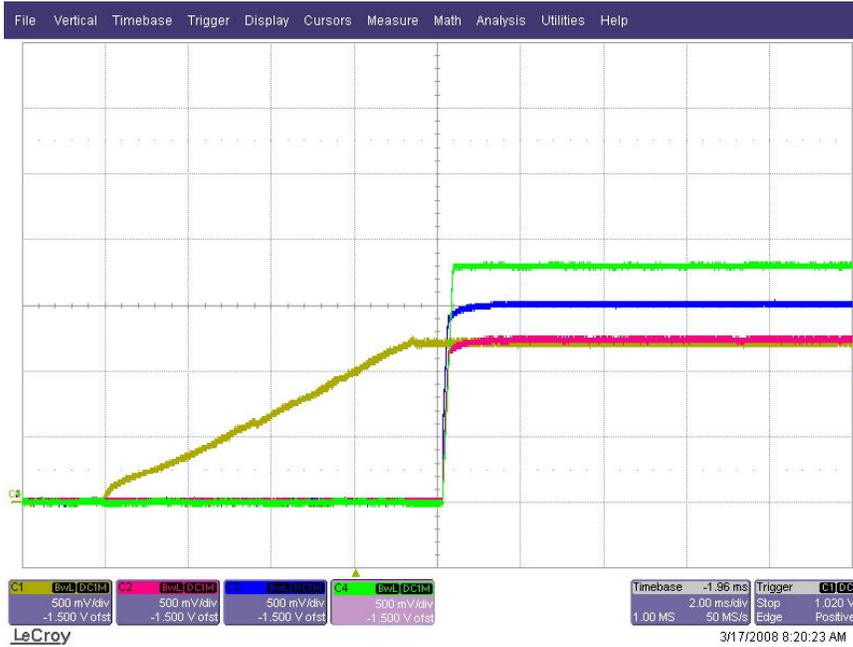
Stability Analysis (Loop Gain)

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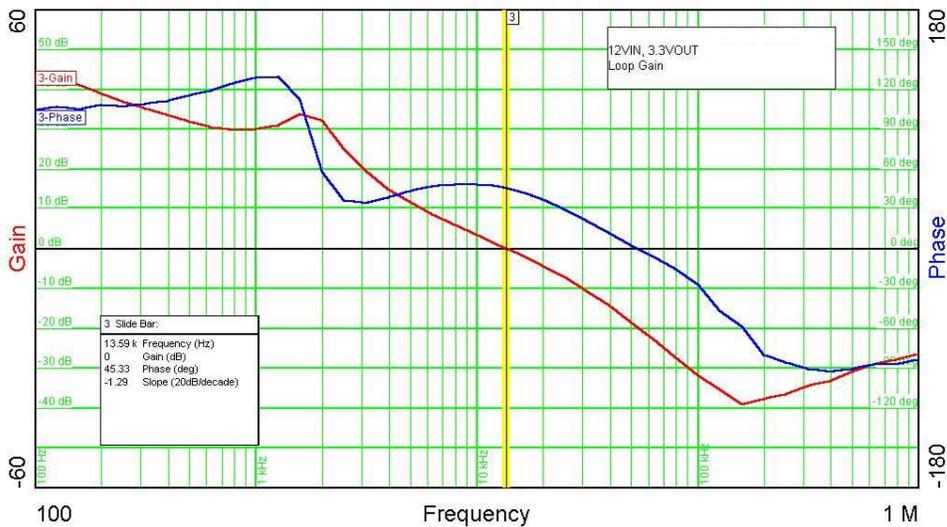
The figure below is the loop gain of the TPS54550 converter with max load. The bandwidth is 20 KHz, the phase margin is 82 degrees, and the gain margin is 28dB.

IMPORTANT NOTICE