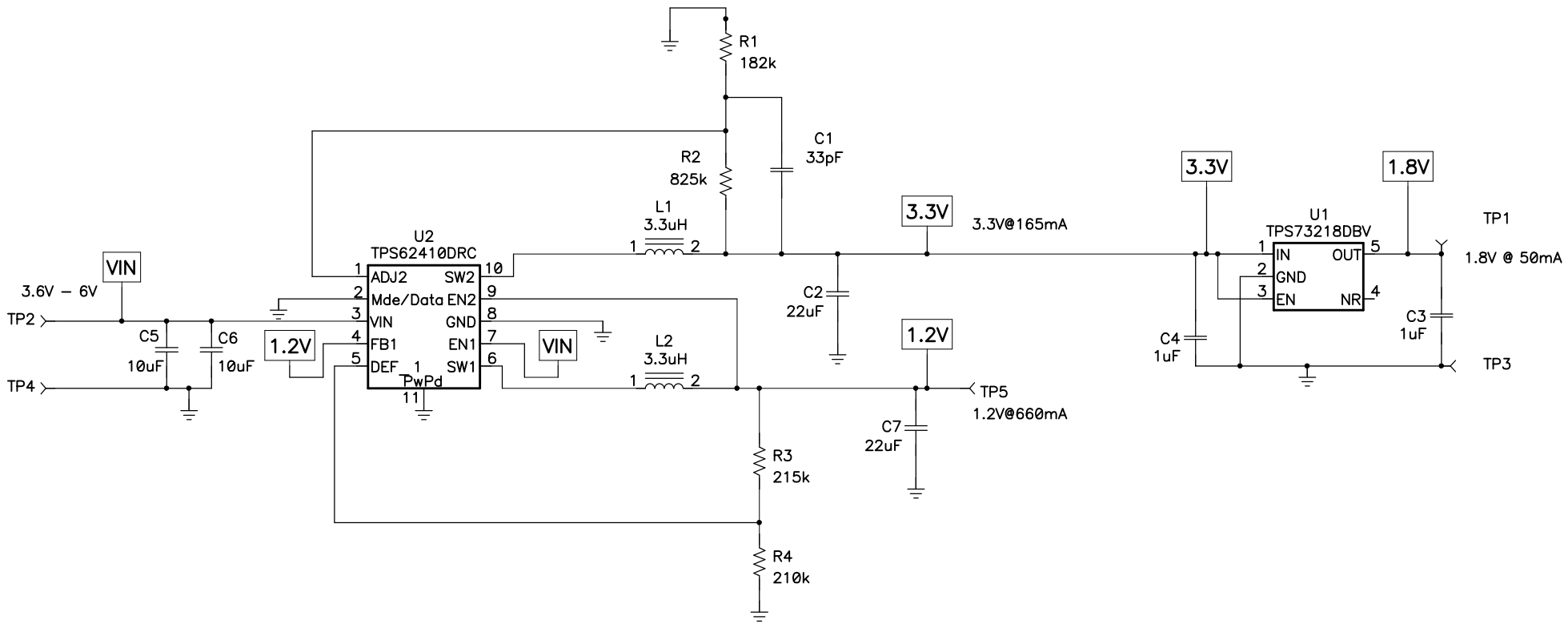

Texas Instruments TPS62410 & TPS73218

Title	Primus Processor Power Supply	
Size B	Number PMP4078	Rev B
Date Mon Feb 15, 2010		Drawn by T. Olabumuyi
Filename PMP4078_REVB.SCH		Sheet 1 of 1

10:48:14

Filename: PMP4078_REVB_bom.xls
Date: 02/15/2010

PMP4078_REVA BOM

COUNT	RefDes	Value	Description	Size	Part Number	MFR	AREA
1	C1	33pF	Capacitor, Ceramic, vvV, [temp], [tol]	0402	std	std	2800
2	C2, C7	22uF	Capacitor, Ceramic, 10V, X5R, 10%, 22uF	0805	C2012X5R1A226K	TDK	10560
2	C3, C4	1uF	Capacitor, Ceramic, 6.3V, X5R, 15%	0402	Std	TDK	2800
2	C5, C6	10uF	Capacitor, Ceramic, 10V, X5R, 10%	0805	C2012X5R1A106K	TDK	10560
2	L1, L2	3.3uH	Inductor, SMT, 1.5 A, 130 milliohm	0.118 x 0.118 inch	LPS3015-332MLB	Coilcraft	26,560
1	R1	182k	Resistor, Chip, 1/16W, x%	0402	Std	Std	2800
1	R2	825k	Resistor, Chip, 825k, 1/16W, x%	0402	Std	Std	2800
1	R3	215k	Resistor, Chip, 215k, 1/16W, x%	0402	Std	Std	2800
1	R4	210k	Resistor, Chip, 1/16W, x%	0402	Std	Std	2800
5	TP1, TP2, TP3, TP4, TP5	5006	Test Point, Black, Thru Hole Compact Style	0.125 x 0.125 inch	5006	Keystone	
1	U1	TPS73218DBV	IC, 250mA, Low Iq, Wide Bandwdth, LDO Linear Regulators	SOT23-5	TPS73218DBV	TI	23360
1	U2	TPS62410DRC	IC, 2.25 MHz Dual Step Down Converter	QFN10	TPS62400DRC	TI	36.229

OMAP-L137 / C6747 / C6745 / C6743
TPS62410, TPS73218 Test Report

OMAP-L137 / C6747 / C6745 / C6743
TPS62410, TPS73218 – (PMP4078)
3/24/2010

The following test report includes measurements for the following output voltage rails using a **5V input**.

This design meets the power sequencing requirements required by OMAP-L137 / C6747 / C6745 / C6743.

Contents

OMAP-L137 / C6747 / C6745 / C6743
TPS62410, TPS73218 Test Report

Start Up Waveform

Ch 1: 1.2V unloaded
Ch 2: 3.3V unloaded
Ch3: 1.8V unloaded

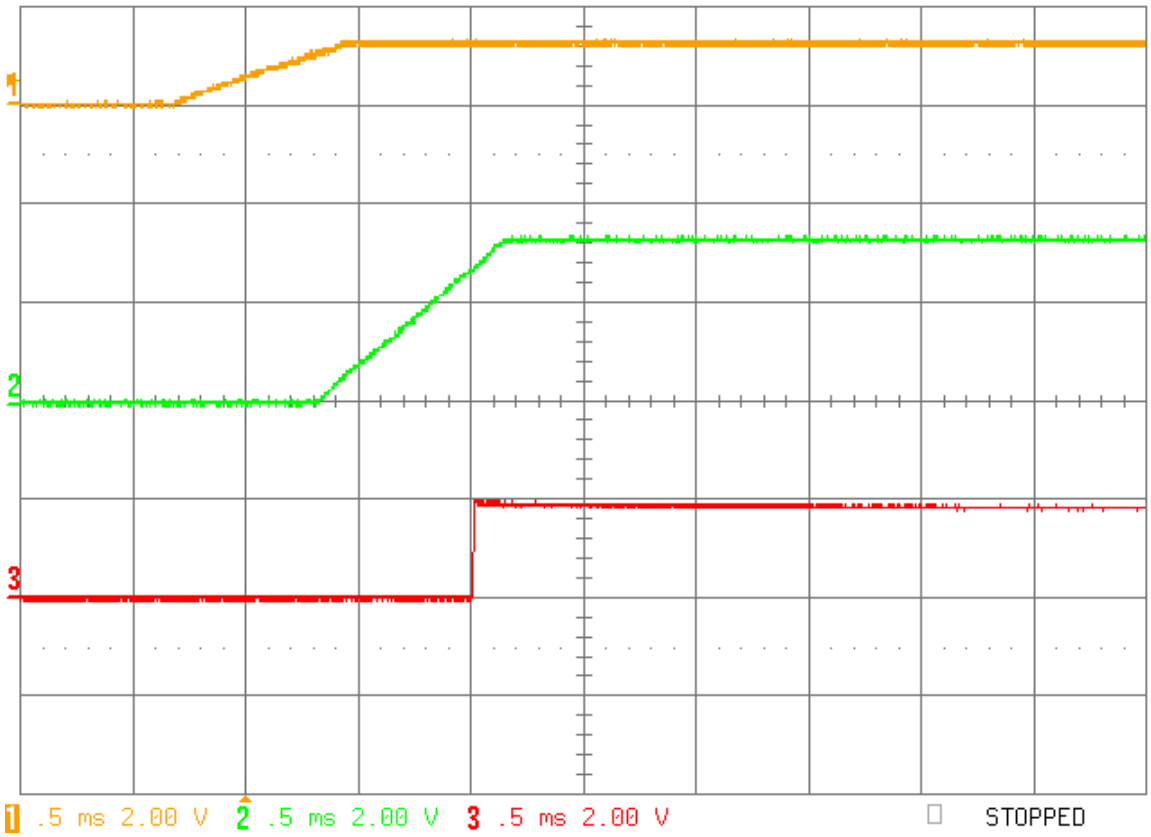

Fig 1: Start up waveform with outputs unloaded

OMAP-L137 / C6747 / C6745 / C6743
TPS62410, TPS73218 Test Report

Start Up Waveform

Ch 1: 1.2V @ 0.66A (DUAL BUCK OUT 1 TPS62410)
Ch 2: 3.3V @ 0.165A (DUAL BUCK OUT 2 TPS62410)
Ch3: 1.8V @ 0.05A (LDO TPS 73218)

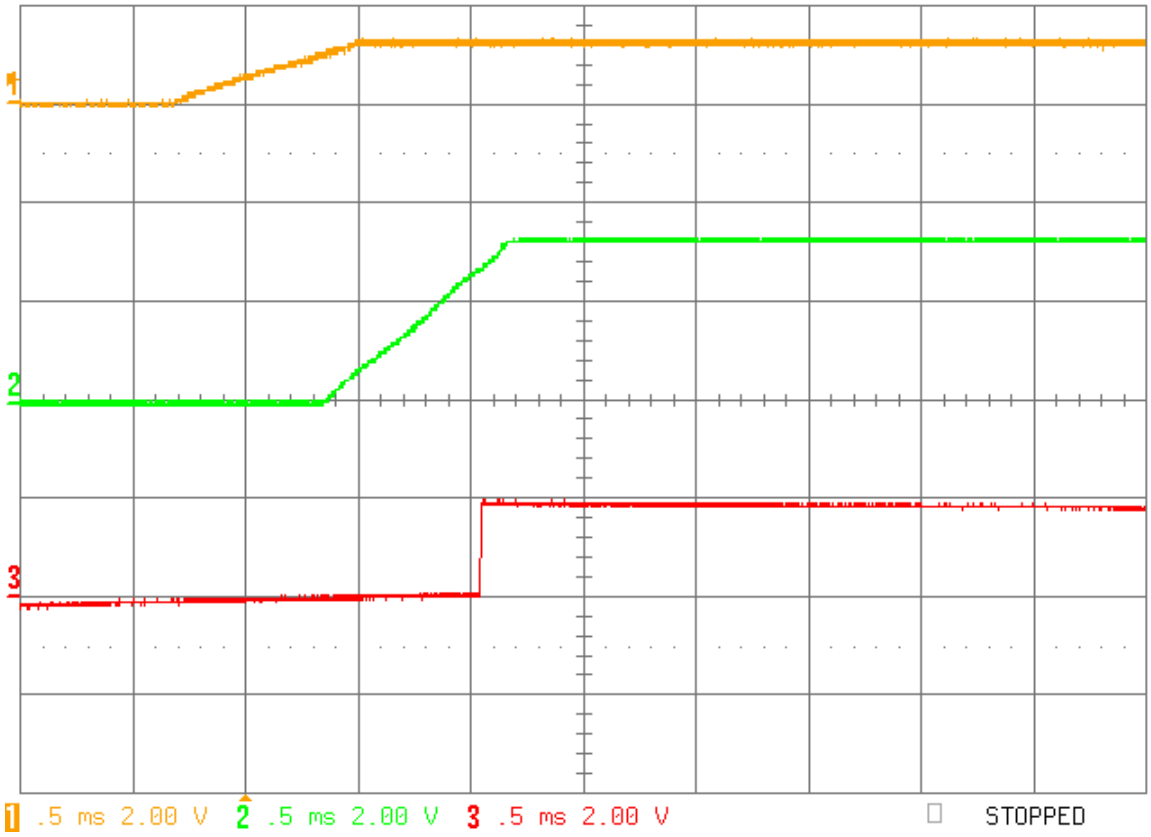

Fig 2: Start up waveform with all outputs fully loaded

OMAP-L137 / C6747 / C6745 / C6743
TPS62410, TPS73218 Test Report

Dual Buck - TPS62410

NOTES ON POWER SAVE MODE

In this application, MODE/DATA pin is tied low, ensureing the device automatically transitions between power save mode and Pulse Width Modulation (PWM) mode. This increases the efficiency at light loads, at the expense of increase ripple noise. At light loads the converter operates in Pulse Frequency Modulation (PFM) mode.

OUTPUT RIPPLE

Low Line (3.6Vin)

Output Ripple – 1.2V @ 0.66A (TPS 62410 – DCDC 1)

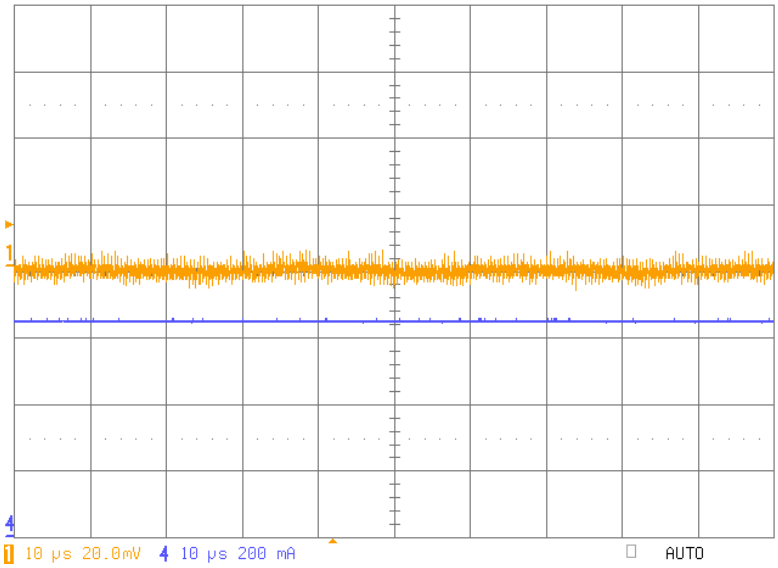

Fig 3: Output ripple on 1.2V @ 0.66A with 3.6Vin (Low line), Ch1: Output ripple, Ch4: Output load

Output Ripple – 3.3V @ 0.165A (TPS 62410 – DCDC2)

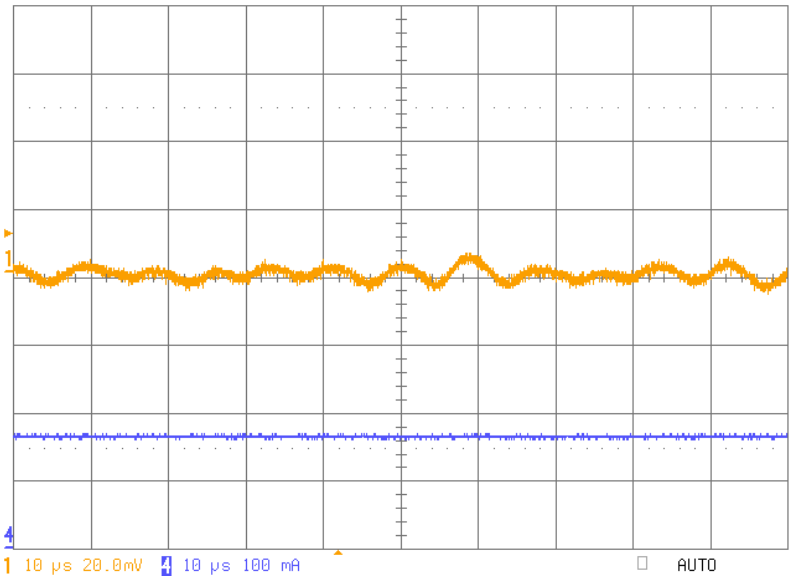

Fig 4: Output ripple on 3.3V@ 0.165A with 3.6Vin (Low Line), Ch1: Output ripple, Ch4: Output load

OMAP-L137 / C6747 / C6745 / C6743
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High Line (6Vin)

At high line , with 165mA current on 3.3V output, the controller is operating in transition between PFM and PWM mode, this affects the 1.2V output hence the increased ripple on the outputs as shown in waveform in fig 5 and fig 7.

Output Ripple – 1.2V @ 0.66A (TPS 62410 – DCDC 1)

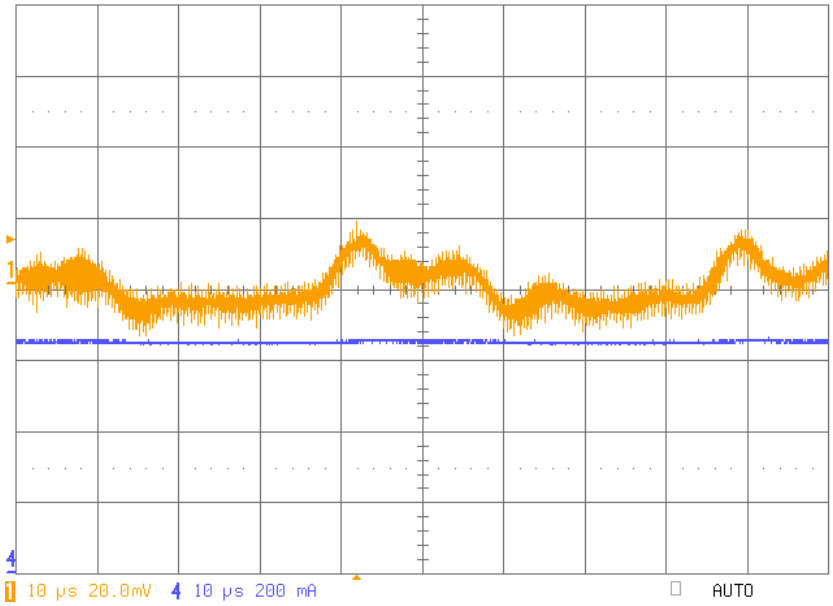

Fig 5: Output ripple on 1.2V @ 0.66A with 6Vin (high line), Ch1: Output ripple, Ch4: Output load

Output Ripple – 3.3V @ 0.04A (TPS 62410 – DCDC2) – Light Load
Device operates in full PFM mode. Gig 6 shows a relatively reduced ripple compared to fig 7

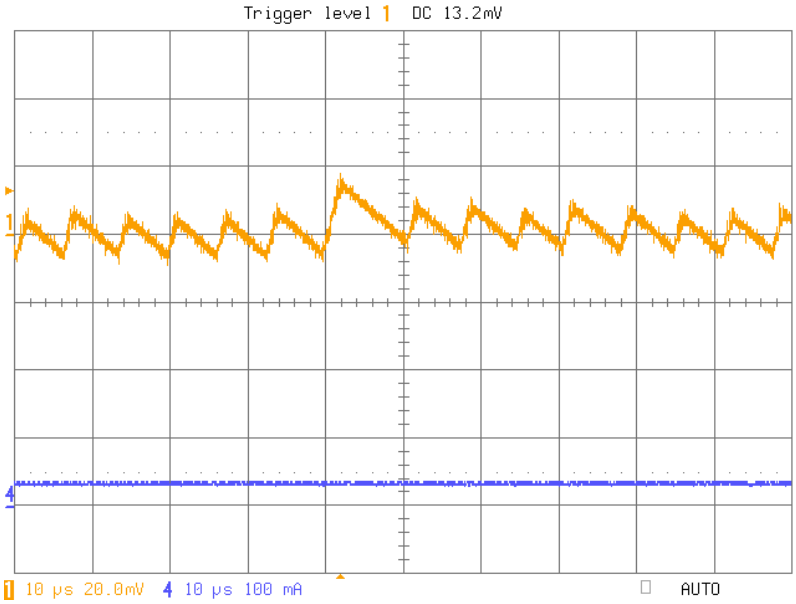

Fig 6: Output ripple on 3.3V @ 0.04A with 6Vin (high line), Ch1: Output ripple, Ch4: Output load

Output Ripple – 3.3V @ 0.165A (TPS 62410 – DCDC2) – Transitioning between modes

Device operates in transition between PFM and PWM, hence the increased ripple

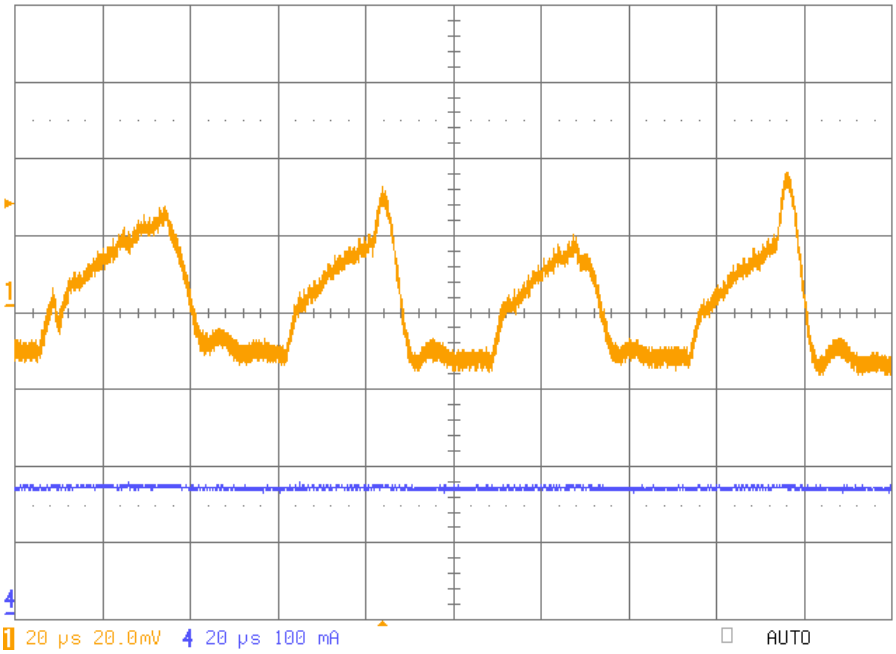

Fig 7: Output ripple on 3.3V @ 0.165A with 6Vin (high line), Ch1: Output ripple, Ch4: Output load

Output Ripple – 3.3V @ 0.2A (TPS 62410 – DCDC2) – PWM Mode

Device operates PWM, hence the reduced ripple

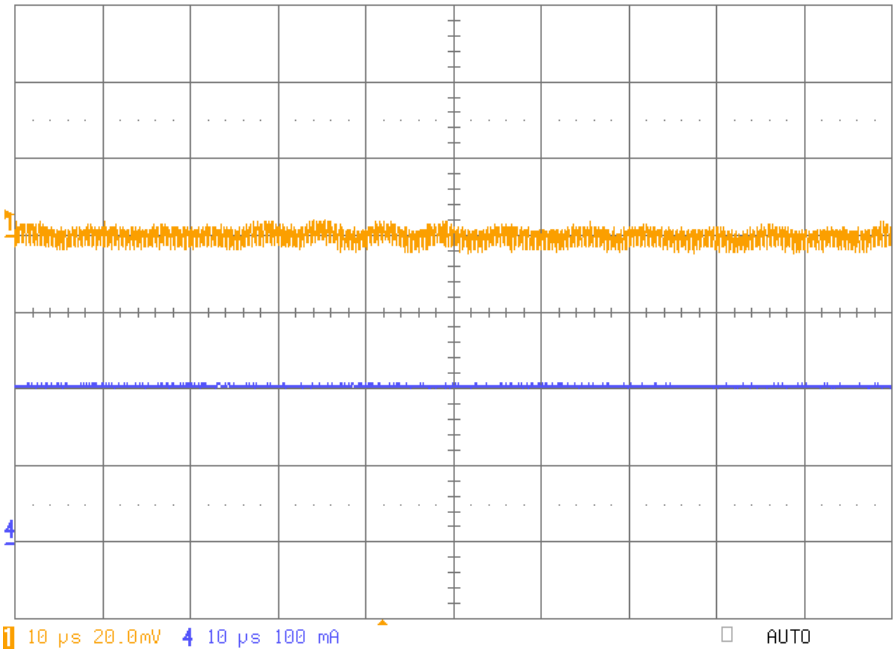

Fig 8: Output ripple on 3.3V @ 0.2A with 6Vin (high line), Ch1: Output ripple, Ch4: Output load

TRANSIENT RESPONSE

Low Line (3.6Vin)

50% to 100% Transient – 1.2V @ 0.66A (TPS 62410 – DCDC 1)

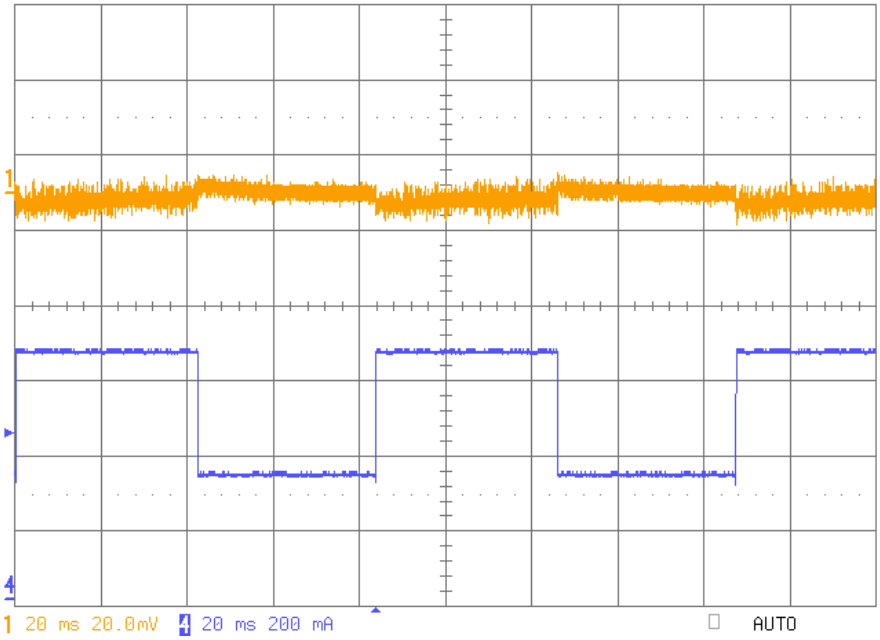

Fig 9: 50% to 100% transient 1.2V @0.66A output with 3.6Vin. Ch 1: 1.2V output; Ch 4: Load current

50% to 100% Transient – 3.3V @ 0.165A (TPS 62410 – DCDC2)

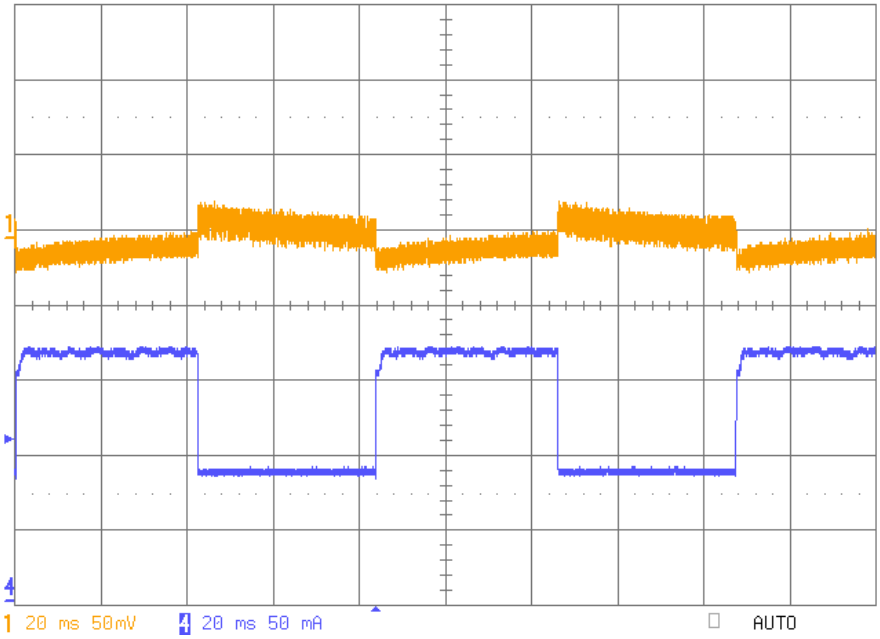

Fig 10: 50% to 100% transient 3.3V @ 0.165A output with 3.6Vin.
Ch 1: 3.3V output; Ch 4: Load current

OMAP-L137 / C6747 / C6745 / C6743
TPS62410, TPS73218 Test Report

High Line (6Vin)

50% to 100% Transient – 1.2V @ 0.66A (TPS 62410 – DCDC 1)

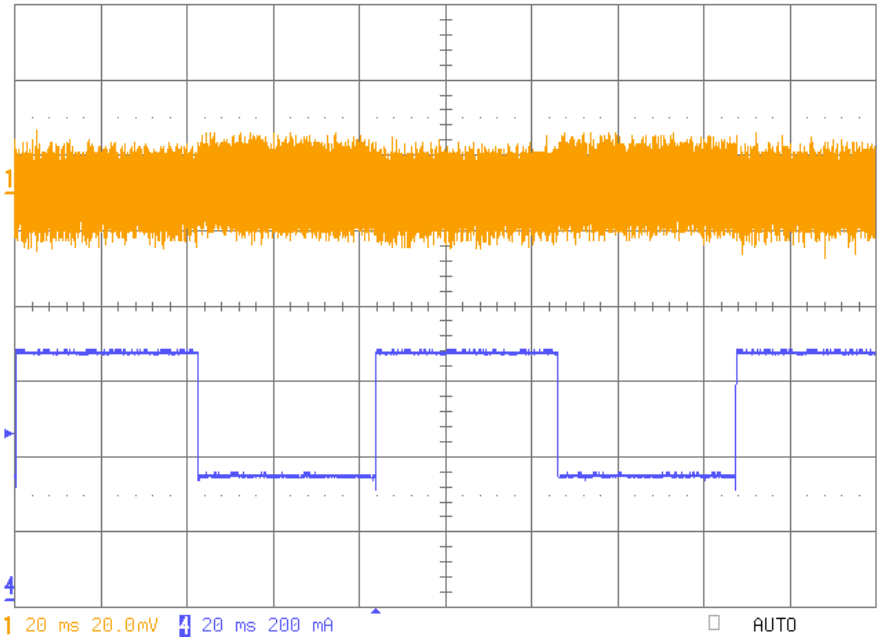

Fig 11: 50% to 100% transient 1.2V @ 0.66A output with 6Vin.
Ch 1: 1.2V output; Ch 4: Load current

50% to 100% Transient – 3.3V @ 0.165A (TPS 62410 – DCDC2)

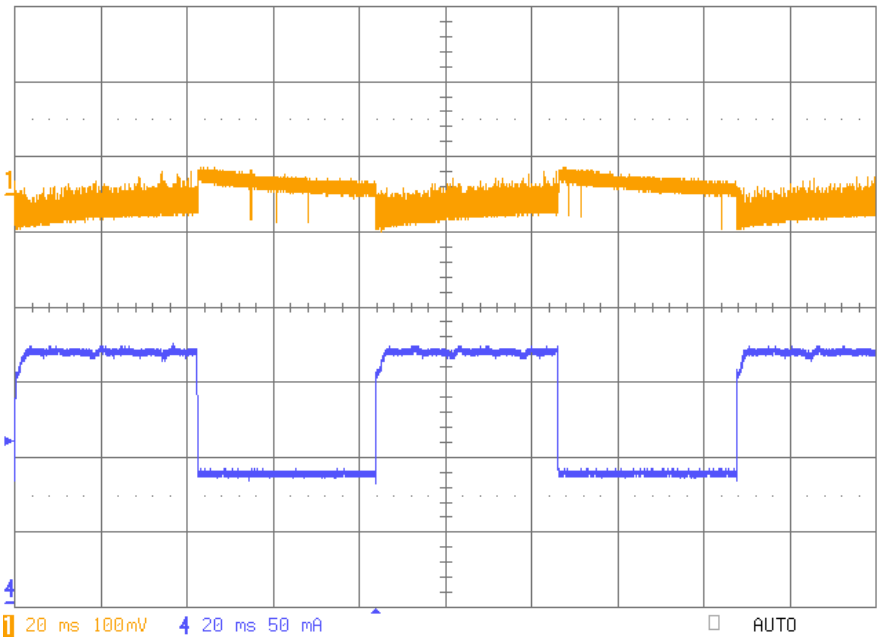

Fig 12: 50% to 100% transient 3.3V @ 0.66A output with 6Vin.
Ch 1: 3.3V output; Ch 4: Load current

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SWITCH NODE

Fig 13 and 14 shows the switch node with both converters in PWM mode and 5V input

Switch Node **– 1.2V @ 0.66A (TPS 62410 – DCDC 1)**

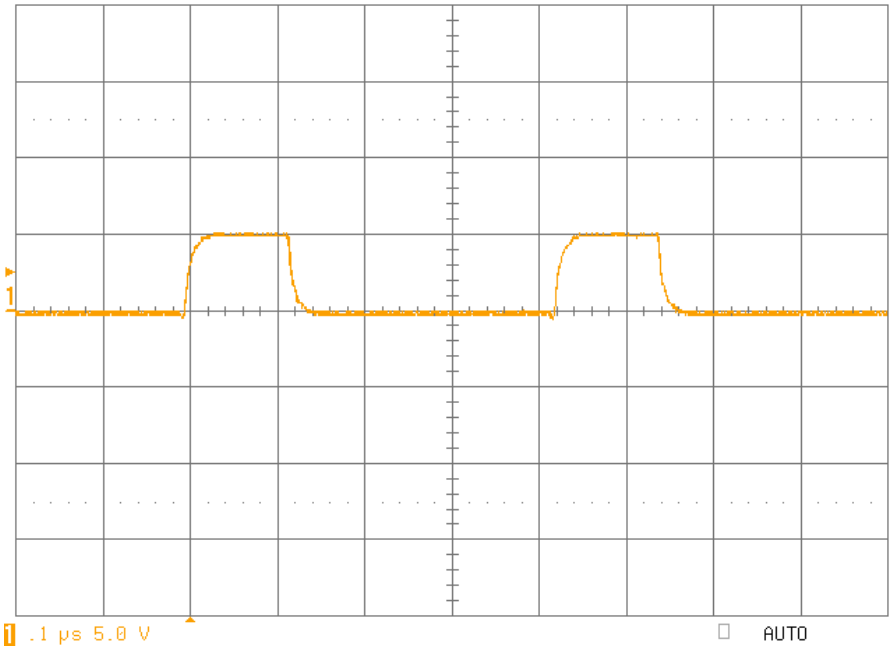

Fig 13: Switch Node on 1.2V@ 0.66A (PWM Mode)

Switch Node – 3.3V @ 0.165A (TPS 62410 – DCDC2)

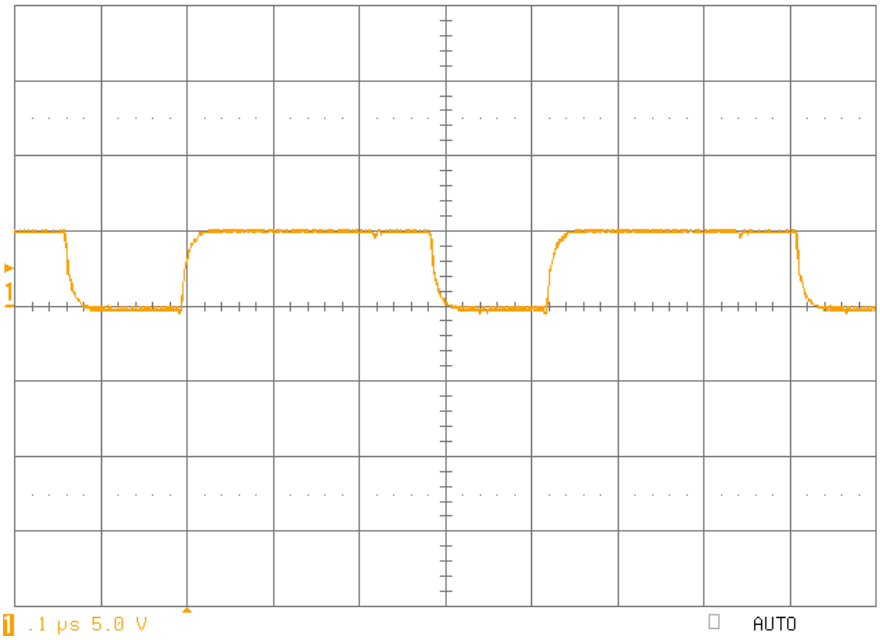

Fig 14: Switch Node on 3.3V@ 0.2A (PWM Mode)

COMBINED EFFICIENCY

TPS 62410 – 3.3V@0.165A & 1.2V@0.66A

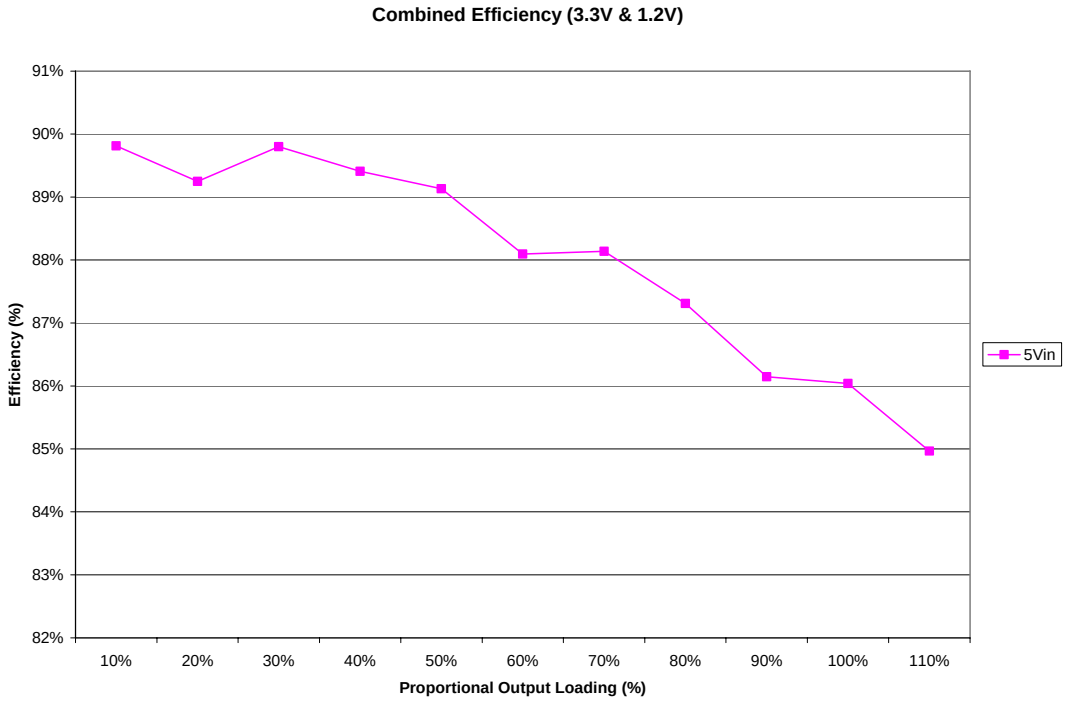

Fig 15: Combined Efficiency of 3.3V and 1.2V

LOAD REGULATION

TPS 62410 –& 1.2V@0.66A

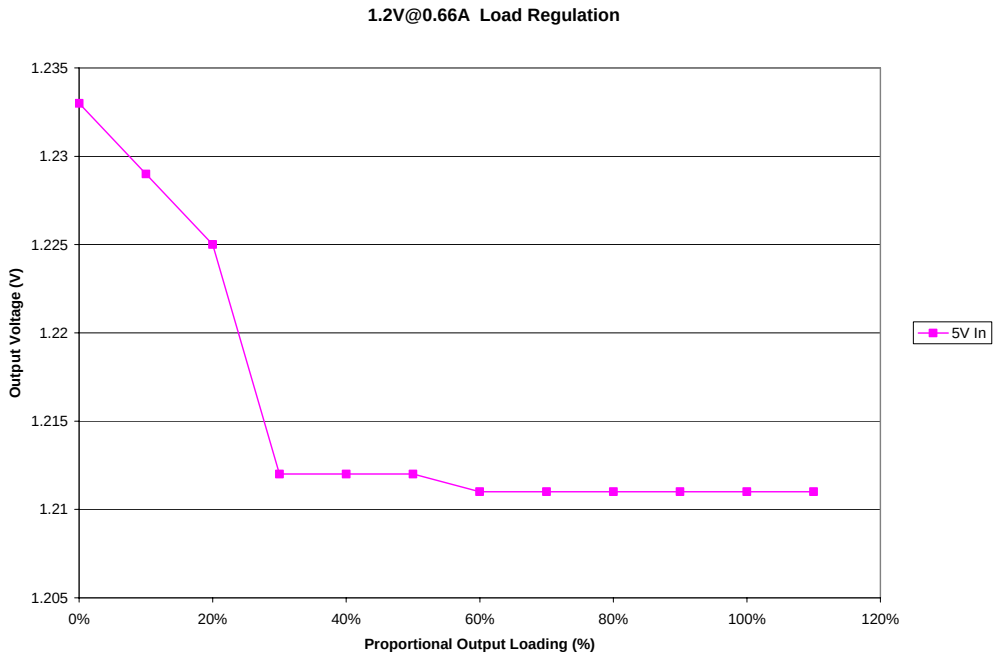

Fig 16: Load regulation on 1.2V output, 3.3V output is proportionally loaded

TPS 62410 – 3.3V@0.165A

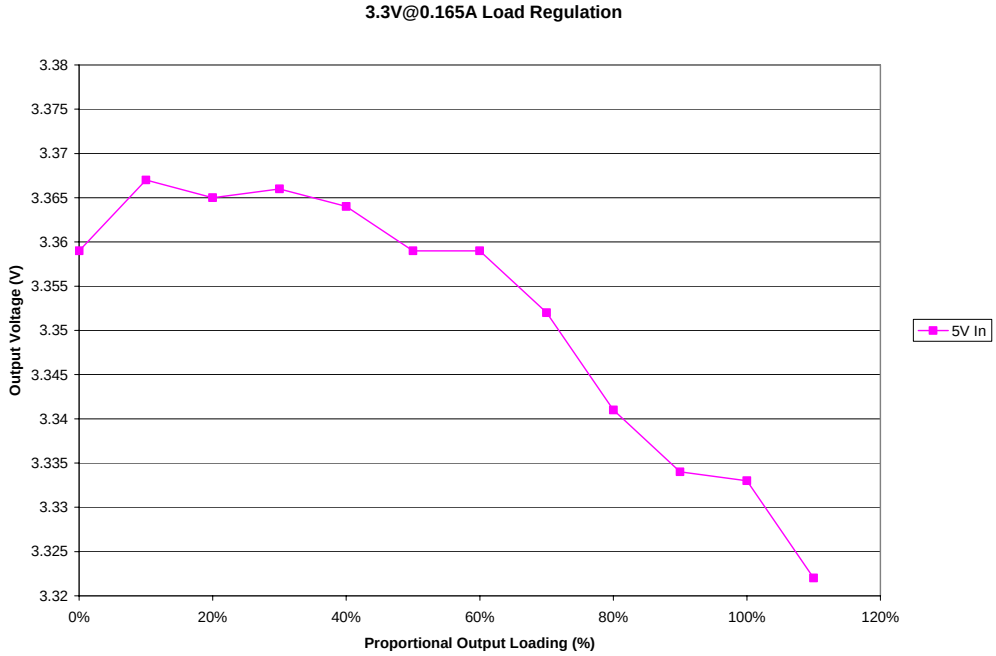

Fig 17: Load regulation on 3.3V output, 1.2V output is proportionally loaded

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