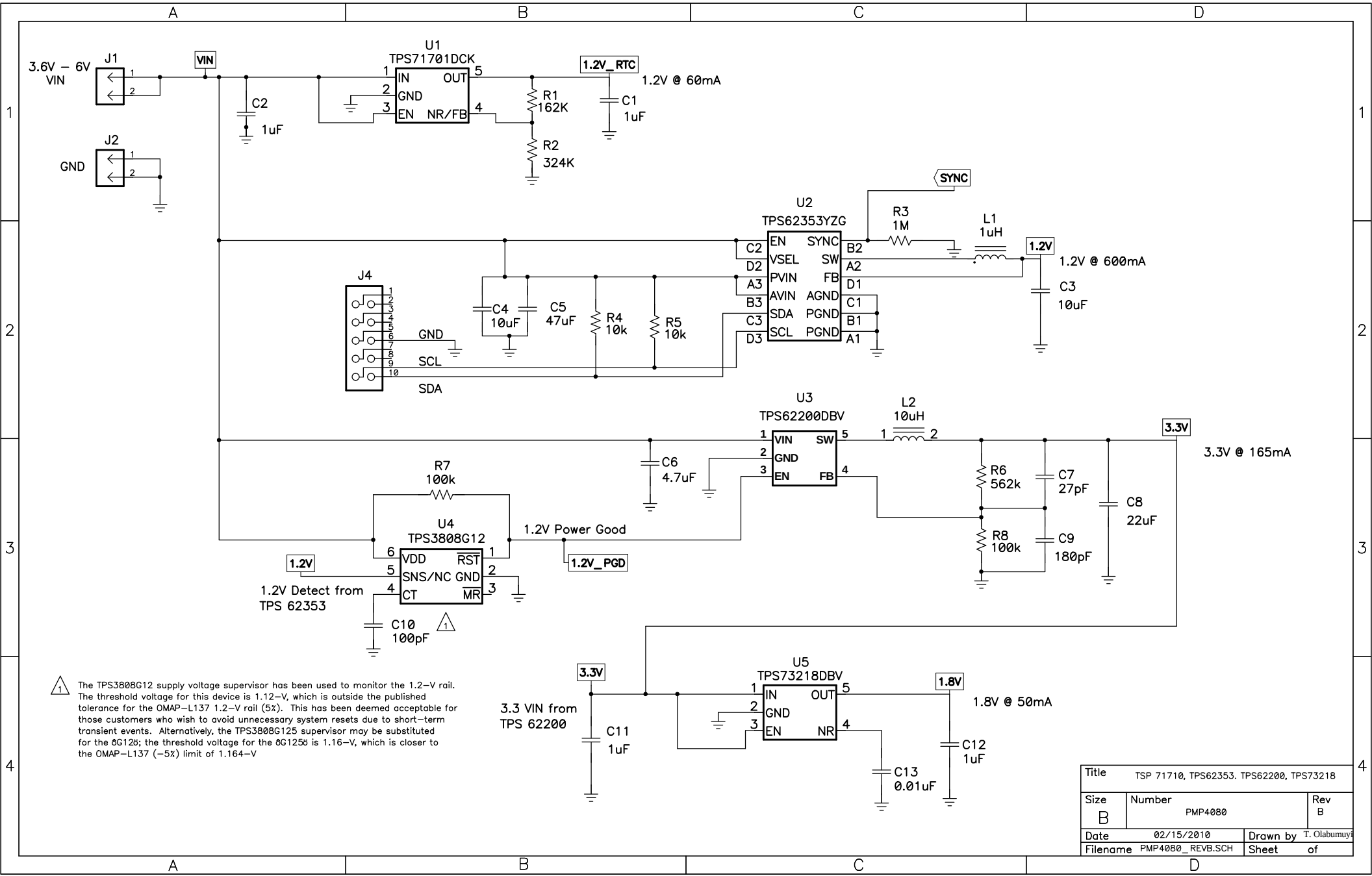
3.6V – 6V
VIN
J1
VIN
C2
1uF
U1
TPS71701DCK
IN
GND
EN
OUT
NR/FB
1.2V_RTC
1.2V @ 60mA
R1
162K
R2
324K
C1
1uF
J2
GND
SYNC
U2
TPS62353YZG
EN
VSEL
PVIN
AVIN
SDA
SCL
SYNC
SW
FB
AGND
PGND
PGND
R3
1M
L1
1uH
1.2V
1.2V @ 600mA
C3
10uF
J4
GND
SCL
SDA
C4
10uF
C5
47uF
R4
10k
R5
10k
U3
TPS62200DBV
VIN
GND
EN
SW
FB
L2
10uH
3.3V
3.3V @ 165mA
C6
4.7uF
R6
562k
C7
27pF
C8
22uF
R8
100k
C9
180pF
R7
100k
U4
TPS3808G12
VDD
SNS/NC
CT
RST
GND
MR
1.2V Power Good
1.2V_PGD
1.2V
1.2V Detect from
TPS 62353
C10
100pF
1
3.3V
3.3 VIN from
TPS 62200
U5
TPS73218DBV
IN
GND
EN
OUT
NR
1.8V
1.8V @ 50mA
C11
1uF
C12
1uF
C13
0.01uF
1 The TPS3808G12 supply voltage supervisor has been used to monitor the 1.2–V rail. The threshold voltage for this device is 1.12–V, which is outside the published tolerance for the OMAP–L137 1.2–V rail (5%). This has been deemed acceptable for those customers who wish to avoid unnecessary system resets due to short–term transient events. Alternatively, the TPS3808G125 supervisor may be substituted for the 6G126; the threshold voltage for the 6G125 is 1.16–V, which is closer to the OMAP–L137 (–5%) limit of 1.164–V
Title
TSP 71710, TPS62353. TPS62200, TPS73218
Size
B
Number
PMP4080
Rev
B
Date
02/15/2010
Drawn by
T. Olabumuyi
Filename
PMP4080_ REVB.SCH
Sheet
of

Filename: PMP4080_REVB_bom.xls
Date: 02/15/2010

PMP4080_REVB BOM

COUNT	RefDes	Value	Description	Size	Part Number	Mfr	Area
4	C1, C2, C11, C12	1uF	Capacitor, Ceramic, 6.3V, X5R, +/-15%	0603	Std	Std	
1	C10	100pF	Capacitor, Ceramic, 100-pF, 50-V, C0G, 10%	0603	C1608C0G1H101J	TDK	
1	C13	0.01uF	Capacitor, Ceramic, 6.3V, X5R, +/-15%	0603	Std	Std	
2	C3, C4	10uF	Capacitor, Ceramic, 6.3V, X5R, 10%	0603	C1608X5R0J106KT	TDK	
1	C5	47uF	Capacitor, Ceramic, 10V, X5R, 20%	1812	C4532X5R1A476M	TDK	
1	C6	4.7uF	Capacitor, Ceramic, 4.7-uF, 6.3-V, X5R, 20%	0805	Std	TDK	
1	C7	27pF	Capacitor, Ceramic, 27pF, 50-V, X7R, 5%	0603	Std	Std	
1	C8	22uF	Capacitor, Ceramic, 22-uF, 6.3-V, X5R, 20%	0805	C2012X5R0J226M	TDK	
1	C9	180pF	Capacitor, Ceramic, 180pF, 50-V, COG, 5%	0603	Std	Std	
2	J1, J2	PTC36SAAN	Header, 2-pin, 100mil spacing, (36-pin strip)	0.100 x 2	PTC36SAAN		
1	J4	2510-6002UB	Connector, Male Straight 2x10 pin, 100mil spacing, 4 Wall	0.338 x 0.788	2510-6002UB	3M	
1	L1	1uH	Inductor, SMT, 1.6A, ±30%	0.118 x 0.118	LPS3010-102NLC	Coilcraft	
1	L2	10uH	Inductor, SMT, 1840mA, 85-milliohm	0.250 x 0.250 ir	MSS6132-103MLB	Coilcraft	
1	R1	162k	Resistor, Chip, 162K, 1/16W, 1%	0603	Std	Std	
1	R2	324k	Resistor, Chip, 324K, 1/16W, 1%	0603	Std	Std	
1	R3	1M	Resistor, Chip, 1/16W, 1%	0603	Std	Std	
2	R4, R5	10k	Resistor, Chip, 1/16W, 1%	0603	Std	Std	
1	R6	562k	Resistor, Chip,562k-Ohms, 1/16-W, 1%	0603	Std	Std	
1	R7	100k	Resistor, Chip, 100k-Ohms, 1/16W, 5%	0603	Std	Std	
1	R8	100k	Resistor, Chip, 100k-Ohms, 1/16-W, 1%	0603	Std	Std	
1	U1	TPS71701DCK	IC, 150mA, Low Iq, Wide Bandwdth, LDO Linear Regulators	SC70	TPS71701DCK	TI	
1	U2	TPS62353YZG	IC, 3MHz Synchronous Step Down Converter with I²C, 800mA	CSP-12	TPS62353YZG	TI	
1	U3	TPS62200DBV	IC, Switching Buck Converter, 1.8-V, 300-mA	SOT23-5	TPS62200DBV	Texas Instruments	
1	U4	TPS3808G12	IC, Low Quiescent Current Programmable, 1.2-V, Delay Time 1ms to10s	SOT23-6	TPS3808G12DBVR	TI	
1	U5	TPS73218DBV	IC, 250mA, Low Iq, Wide Bandwdth, LDO Linear Regulators	SOT23-5	TPS73218DBV	TI	

OMAP-L137 / C6747 / C6745 / C6743
TPS62353, TPS62200, TPS71701, TPS73128
– (PMP4080)
Updated 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
TPS62353, TPS62200, TPS71701, TPS73218 Test Report

START UP WAVEFORM

Ch 1: 1.2V LDO (unloaded); TPS71701
Ch 2: 1.2V DCDC (unloaded); TPS62353
Ch 3: 3.3V DCDC (unloaded); TPS62200
Ch 4: 1.8V LDO (unloaded); TPS 73218

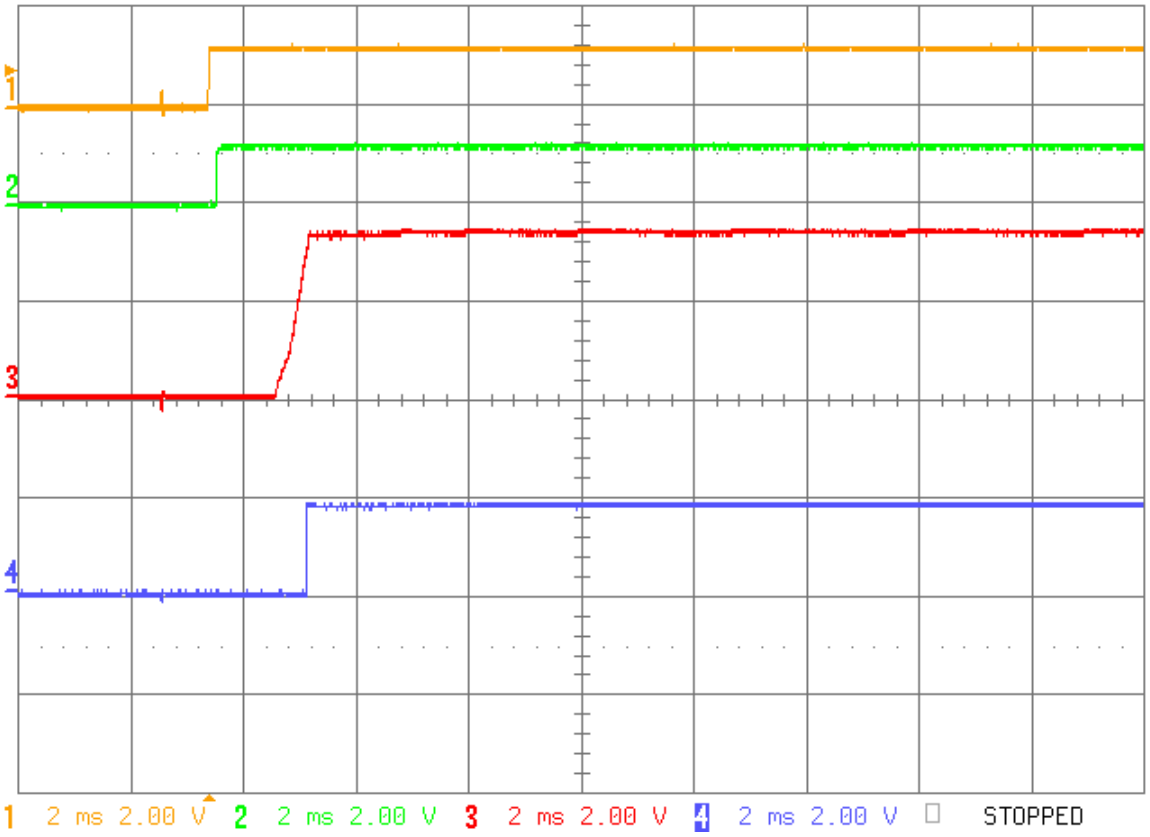

Fig 1: Start Up waveform with outputs unloaded

OMAP-L137 / C6747 / C6745 / C6743
TPS62353, TPS62200, TPS71701, TPS73218 Test Report

Ch 1: 1.2V @ 0.06A LDO; TPS71701
Ch 2: 1.2V @ 0.6A DCDC; TPS62353
Ch 3: 3.3V @ 0.165A DCDC; TPS62200
Ch 4: 1.8V @ 0.05A LDO; TPS73218

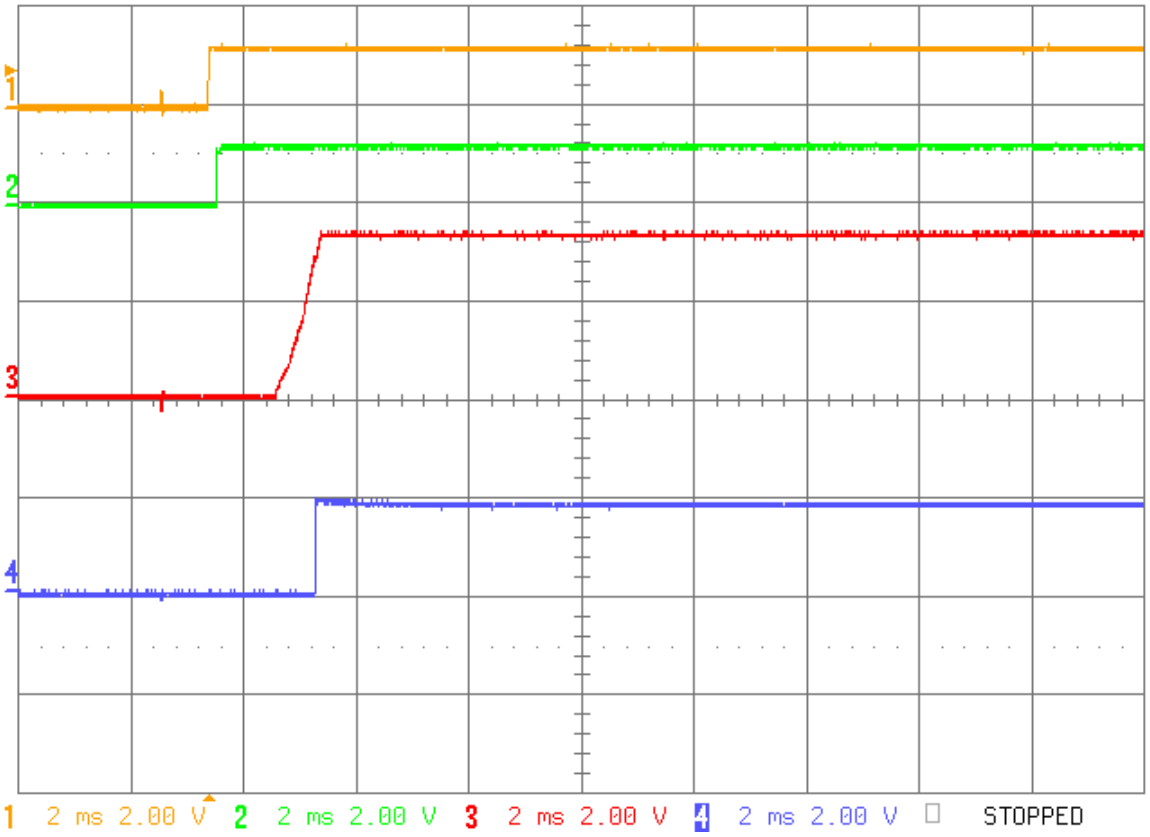

Fig 2: Start Up waveform with outputs fully loaded

TPS 71701 – LDO (1.2V @ 0.06A)

OUTPUT RIPPLE (TPS 71701)

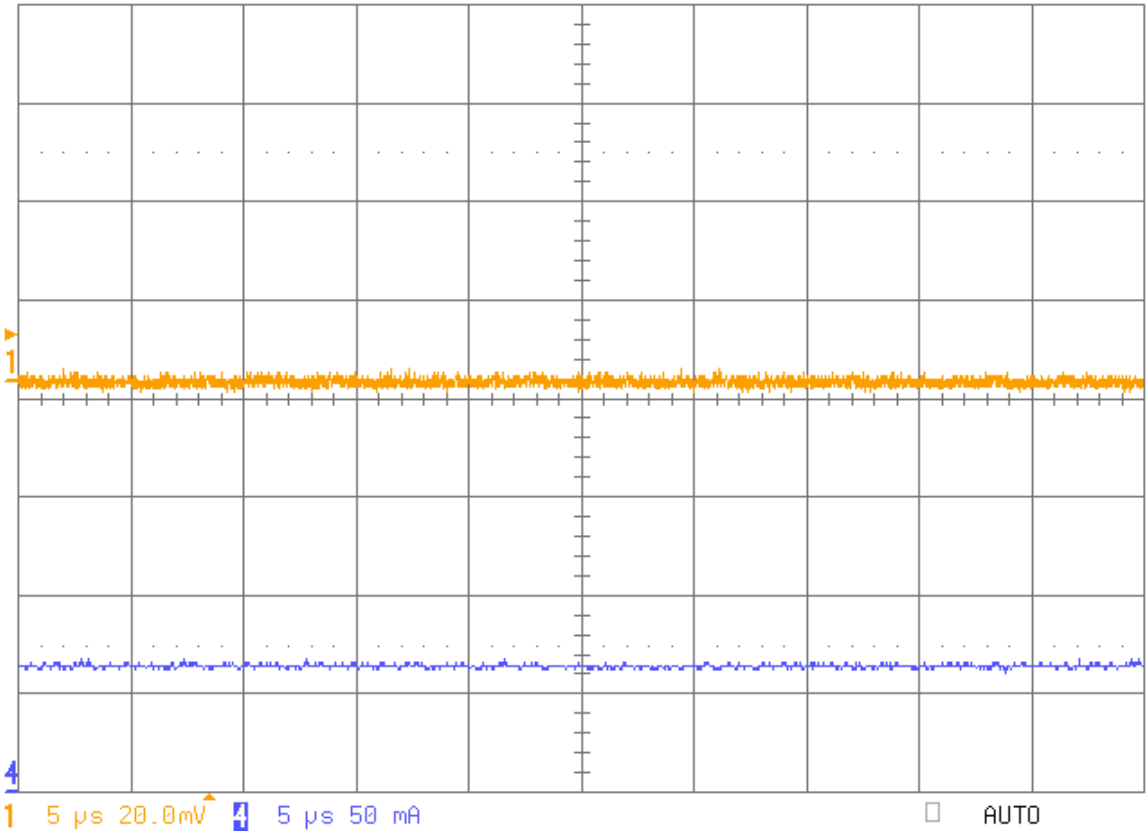

Fig 3: Output Ripple 1.2V @ 0.06A TPS 71701 LDO, 5Vin

LOAD TRANSIENT RESPONSE (TPS 71701)

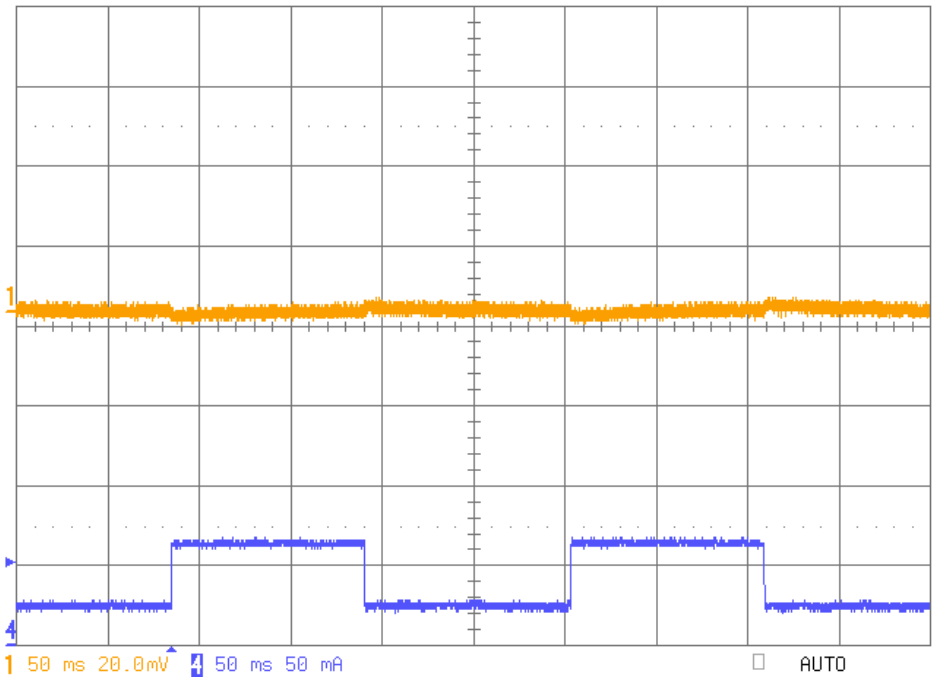

Fig 4: Load transient response on TPS71701, 1.2V output (Ch1) for load step 20mA to 60mA (Ch4 -33% to 100%), at low line 3.6Vin

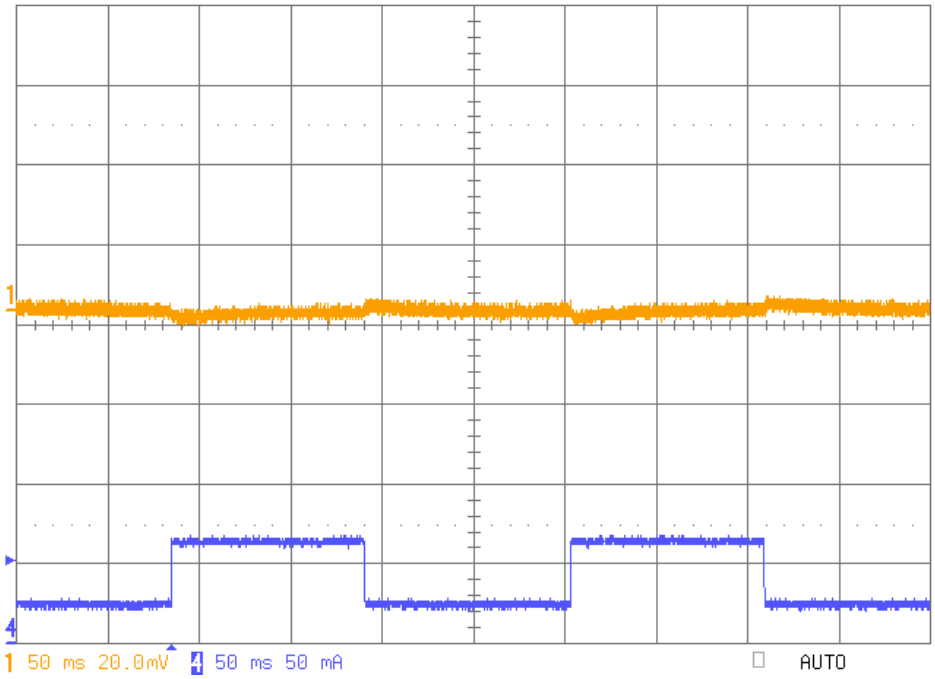

Fig 5: Load transient response on TPS71701, 1.2V output (Ch1) for load step 20mA to 60mA (Ch4 -33% to 100%), at high line 6Vin

OMAP-L137 / C6747 / C6745 / C6743
TPS62353, TPS62200, TPS71701, TPS73218 Test Report

TPS 62353 – DCDC (1.2V @ 0.06A)

Set to operate in fixed PWM mode in all test cases with 3 MHz. TPS 6235x in fixed PWM mode gives best load and line response, and reduced ripple at the expense of reduced light load efficiency. This default mode is used in these tests.

Using the I2C interface, the control registers can be configured for fast or light pulse frequency modulation mode to increase efficiency at very light load and to reduce quiescent current. Using the control registers, the TPS 6235x is also reconfigurable for adjustable slew rate of the start up ramp; synchronization with external clock; and for active discharge of output capacitor in shutdown, as well as dynamic voltage scaling between active and sleep mode.

OUTPUT RIPPLE (TPS 62353)

Full load, high line

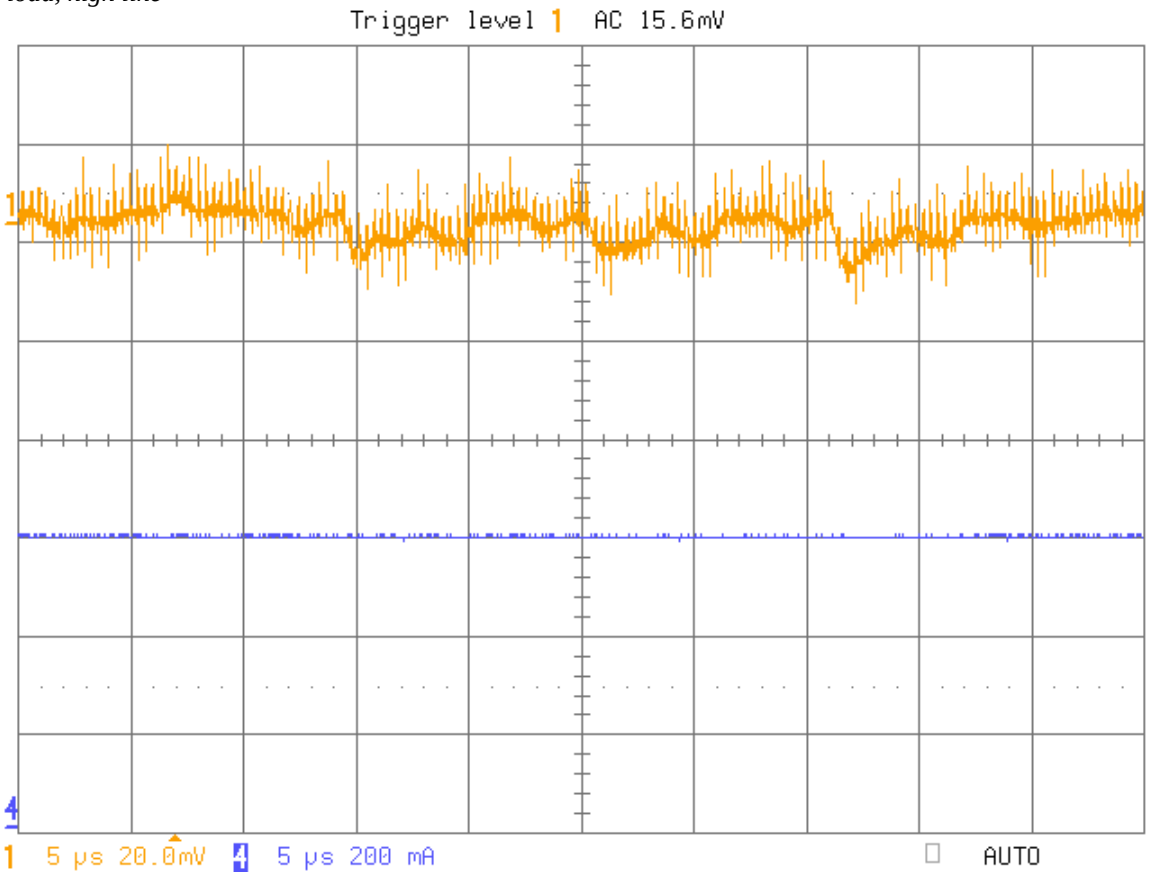

Fig 6: Output Ripple 1.2V (Ch1) @ 0.6A (Ch4) TPS 62353 DCDC, Highline 6Vin

Light load, high line

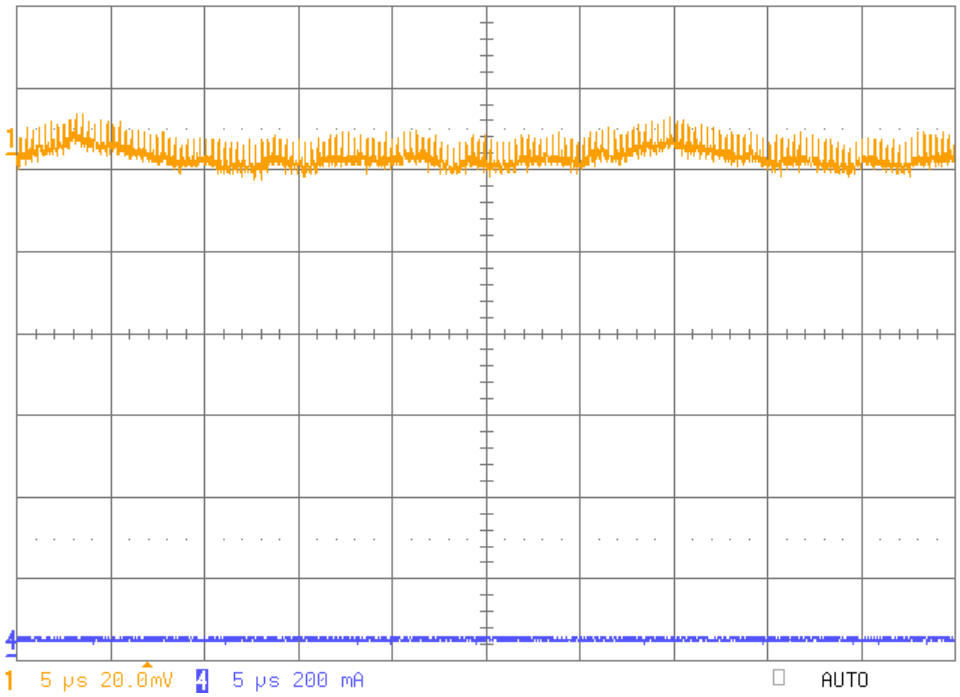

Fig 7: Output Ripple 1.2V (Ch1) @ 0.05A (Ch4) TPS 62353 DCDC, Highline 6Vin

Full load, low line

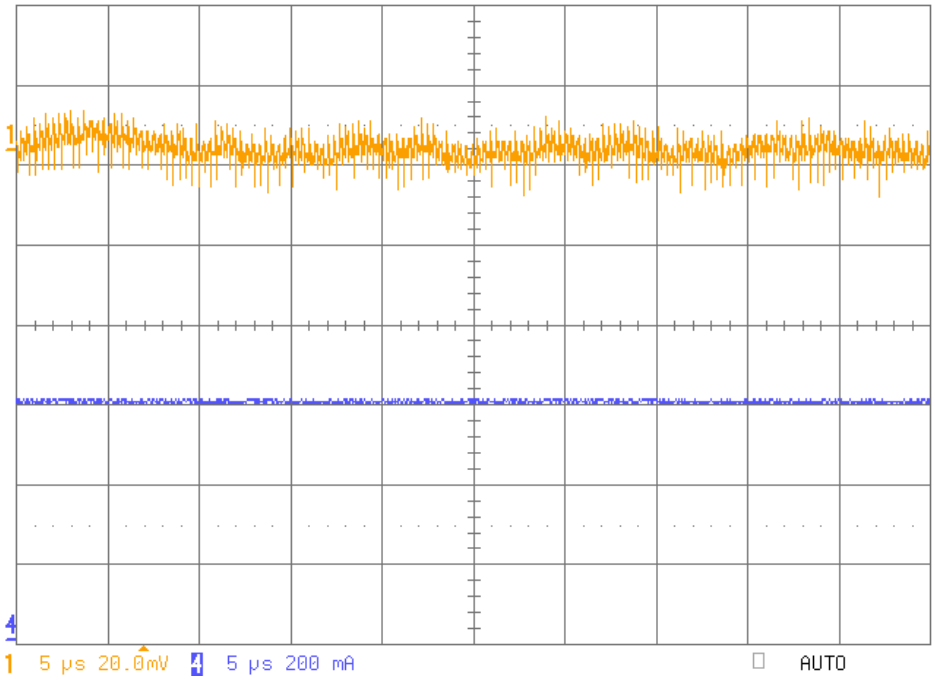

Fig 8: Output Ripple 1.2V (Ch1) @ 0.6A (Ch4) TPS 62353 DCDC, Lowline 3.6Vin

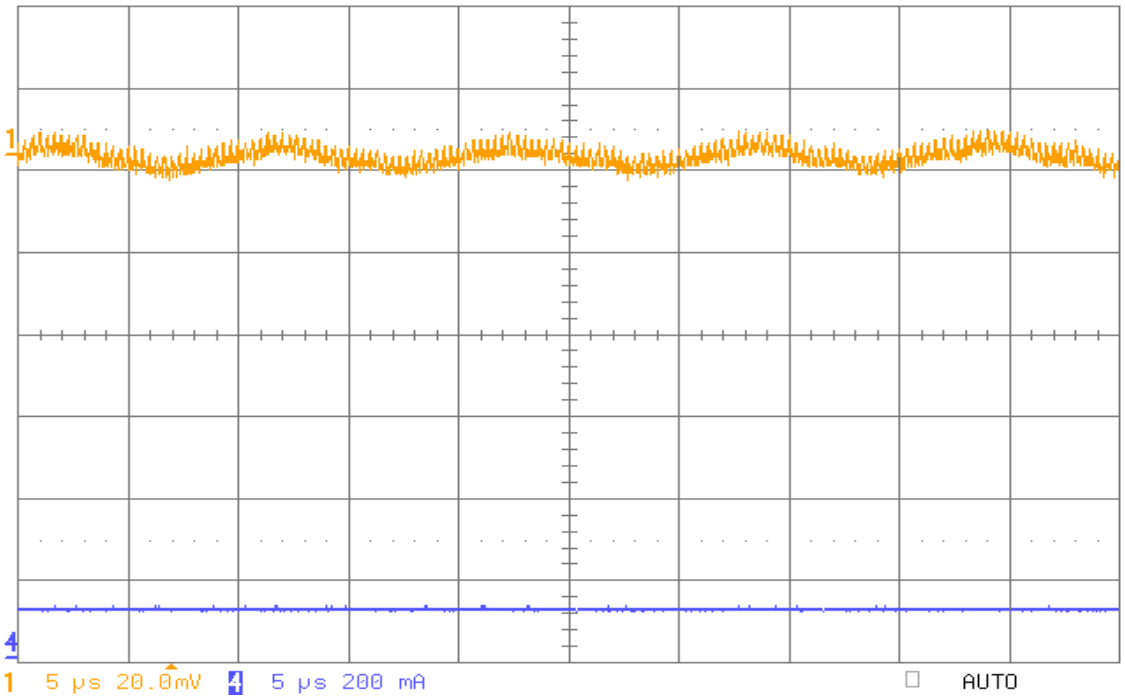

Fig 9: Output Ripple 1.2V (Ch1) @ 0.14A (Ch4) TPS 62353 DCDC, low line 3.6Vin

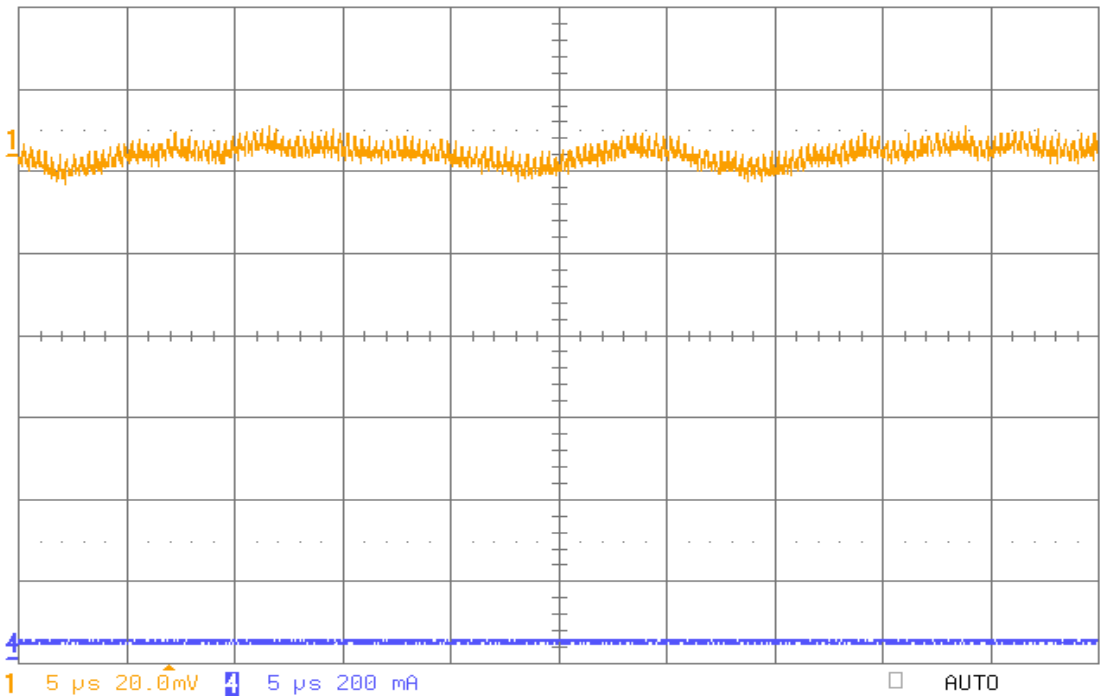

Fig 10: Output Ripple 1.2V (Ch1) @ 0.05A (Ch4) TPS 62353 DCDC, low line 3.6Vin

LOAD TRANSIENT RESPONSE (TPS 62353)

Highline

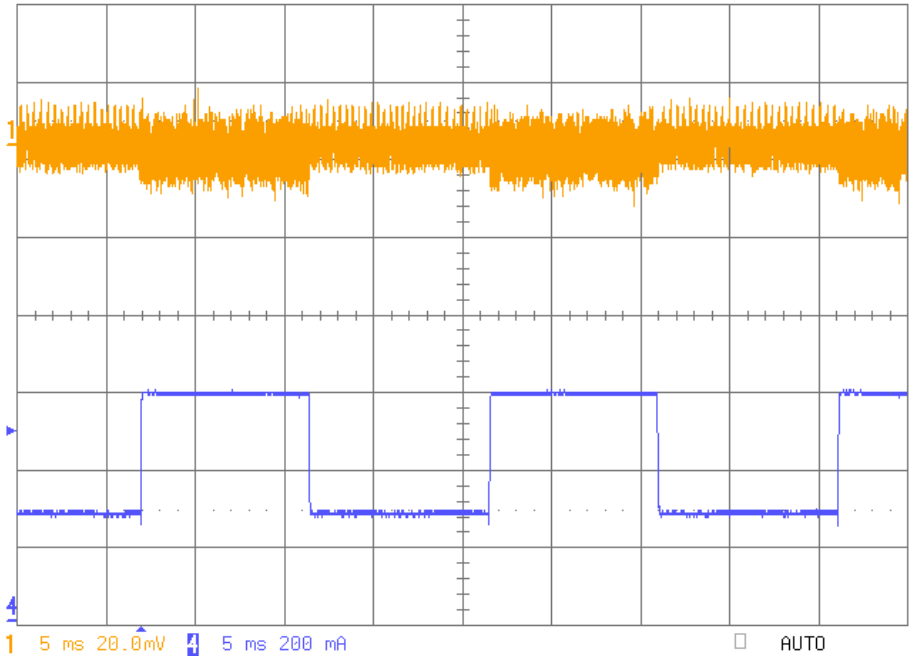

Fig 11: Load transient response on TPS62353, 1.2V output (Ch1) for load step 300mA to 600mA (Ch4 - 50% to 100%), at high line 6Vin

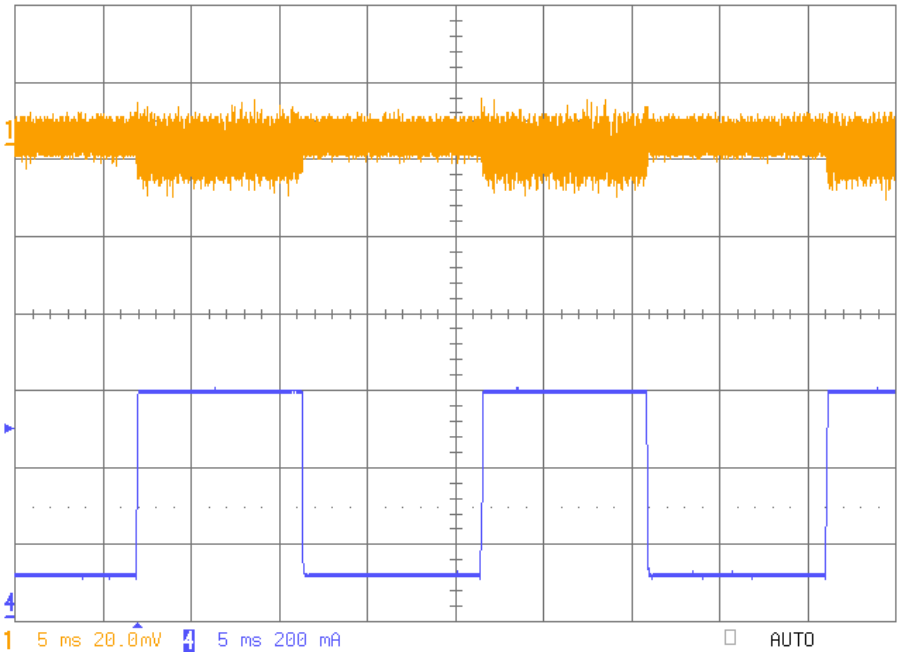

Fig 12: Load transient response on TPS62353, 1.2V output (Ch1) for load step 150mA to 600mA (Ch4 - 25% to 100%), at high line 6Vin

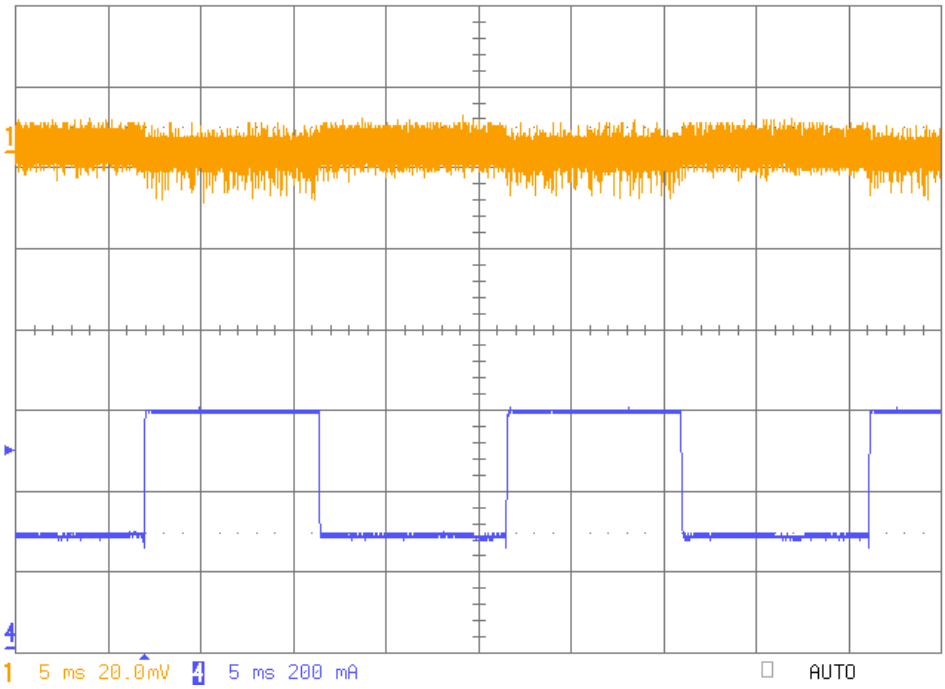

Fig 13: Load transient response on TPS62353, 1.2V output (Ch1) for load step 300mA to 600mA (Ch4 - 50% to 100%), at low line 3.6Vin

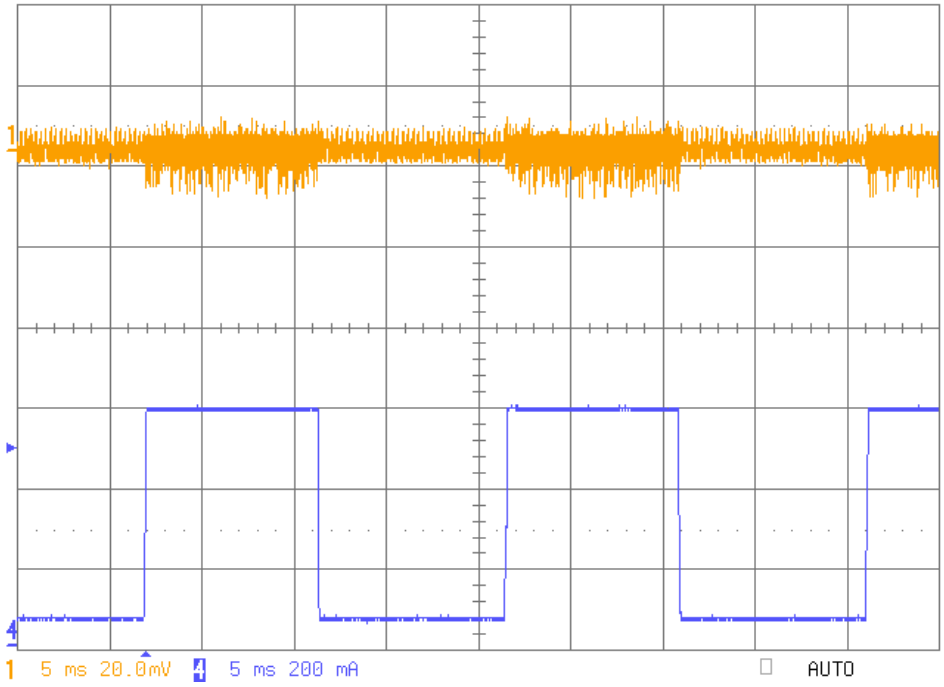

Fig 14: Load transient response on TPS62353, 1.2V output (Ch1) for load step 80mA to 600mA (Ch4 - 15% to 100%), at low line 3.6Vin

SWITCH NODE (TPS 62353)

TPS62353 exhibits a characteristic duty cycle jitter. It operates in fixed PWM mode.

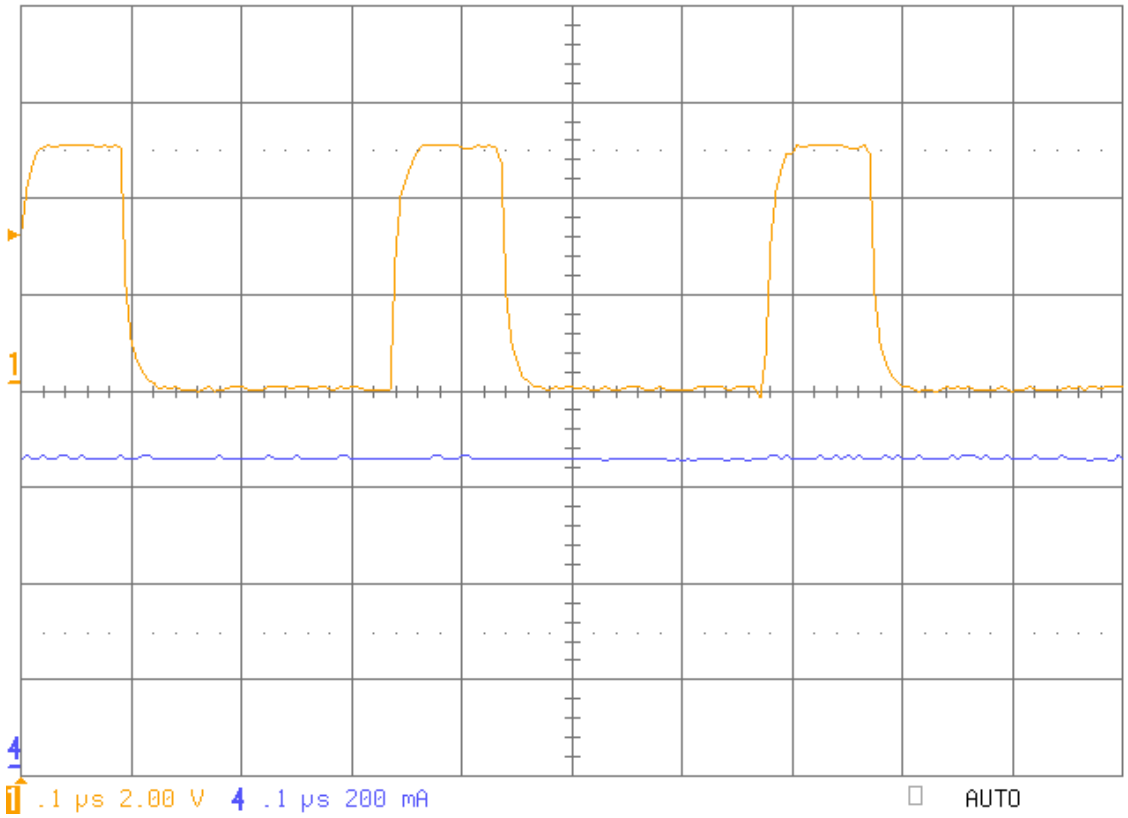

Fig 15: Switch node 1.2V @ 0.6A with 5Vin

EFFICIENCY (TPS62353)

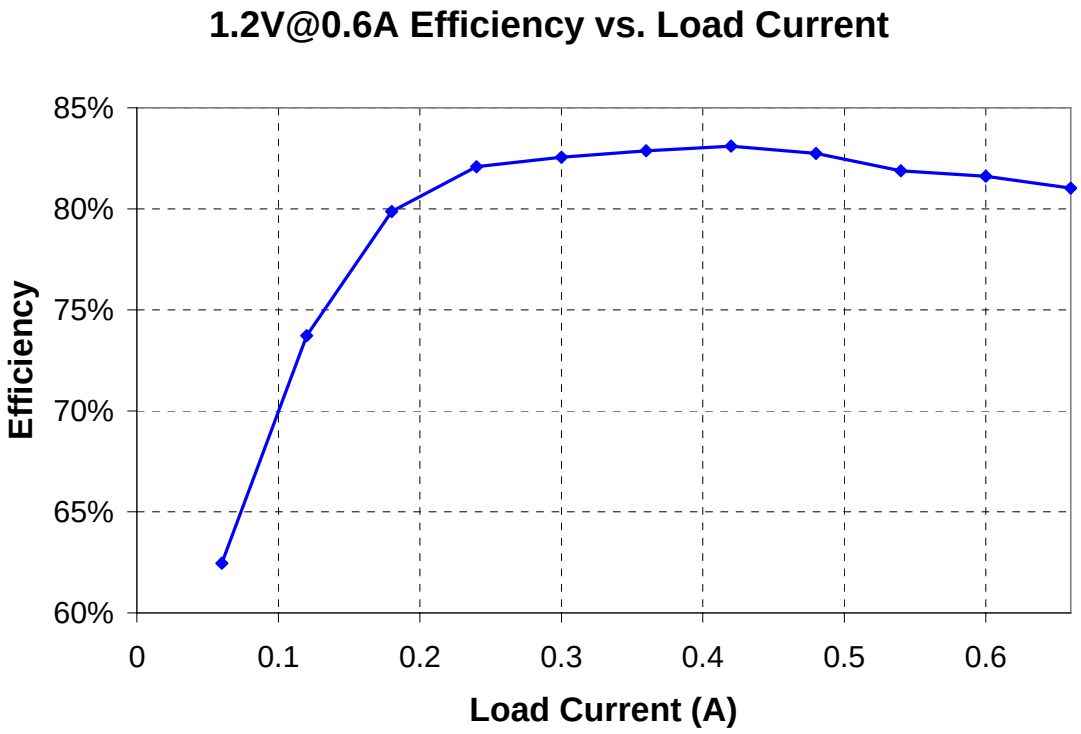

Fig 15: Efficiency of TPS62353 in Fixed PWM mode with 5Vin

LOAD REGULATION (TPS 62353)

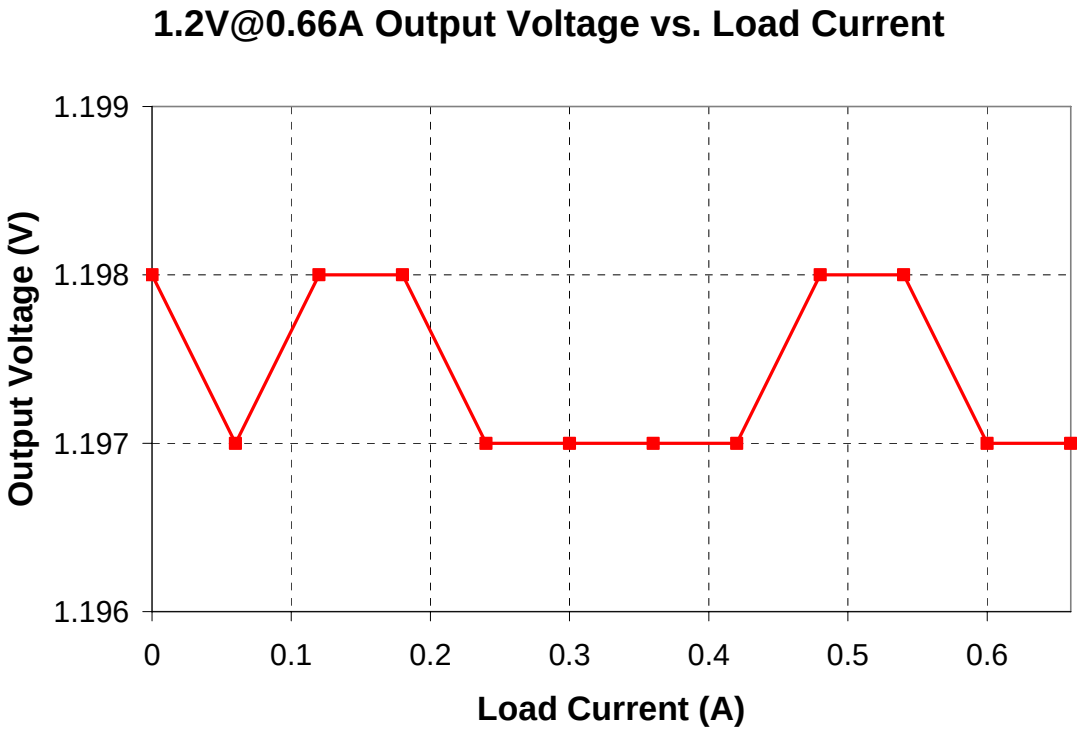

Fig 16: Load Regulation of TPS 62353 running in fixed PWM mode with 5Vin

TPS 62200 – DCDC (3.3V @ 0.165A)

TPS 62200 has a 1-Mhz fixed frequency pulse width modulation (PWM) at moderate to heavy loads. For light loads, it automatically switches to the pulse frequency modulation (PFM) to increase efficiency. The current threshold for which the converter changes operation mode depends on input voltage and also if discontinuous conduction is detected.

OUTPUT RIPPLE (TPS 62200)

No load

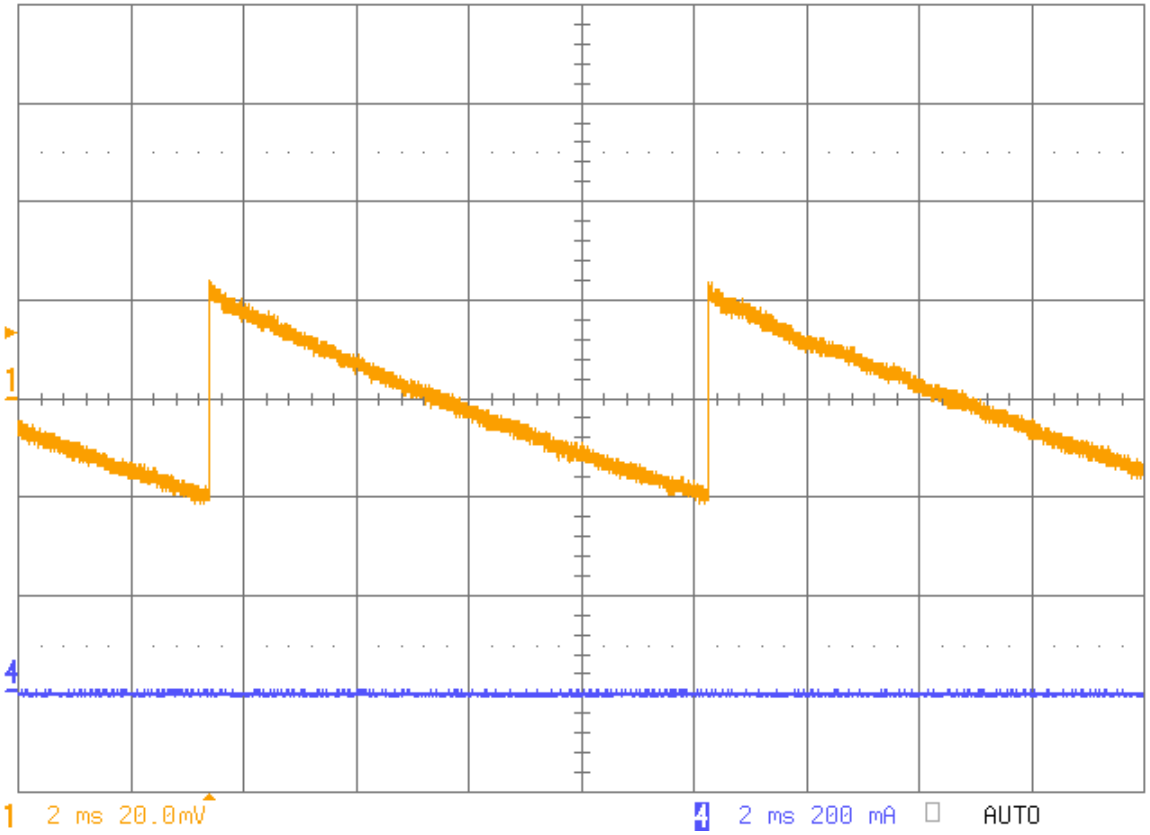

Fig 18: Output Ripple 3.3V (Ch1) @ no load (Ch4) TPS 62200 DCDC, Highline 5Vin, converter in PFM mode

Full load, high line

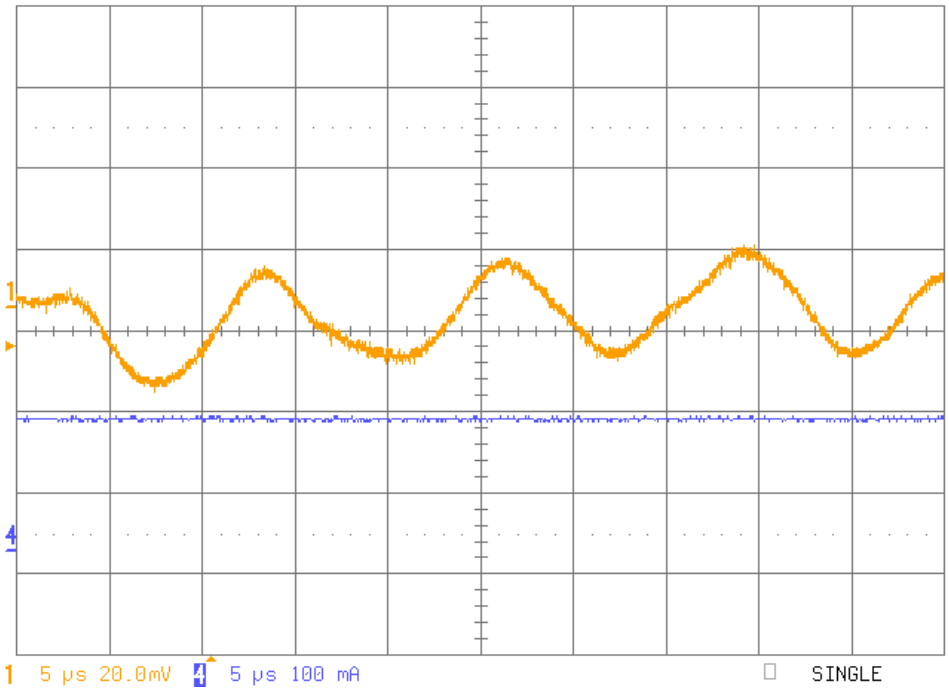

Fig 17: Output Ripple 3.3V (Ch1) @ 0.165A (Ch4) TPS 62200 DCDC, Highline 6Vin, converted in PWM mode

Light load, high line

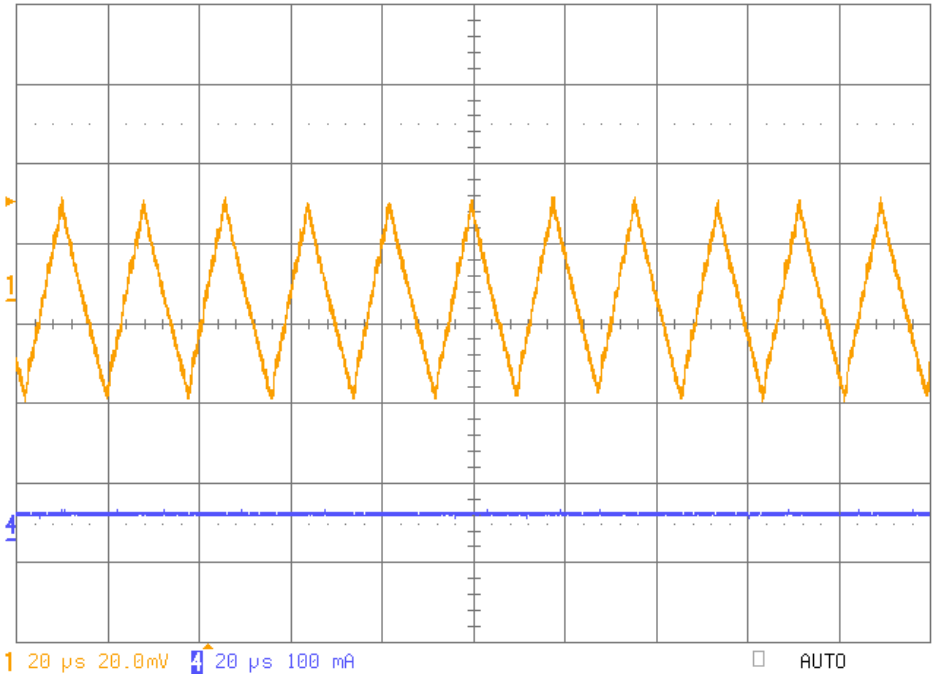

Fig 19: Output Ripple 3.3V (Ch1) @ 0.05 (Ch4) TPS 62200 DCDC, Highline 6Vin, converter in PFM mode

Heavy load, low line

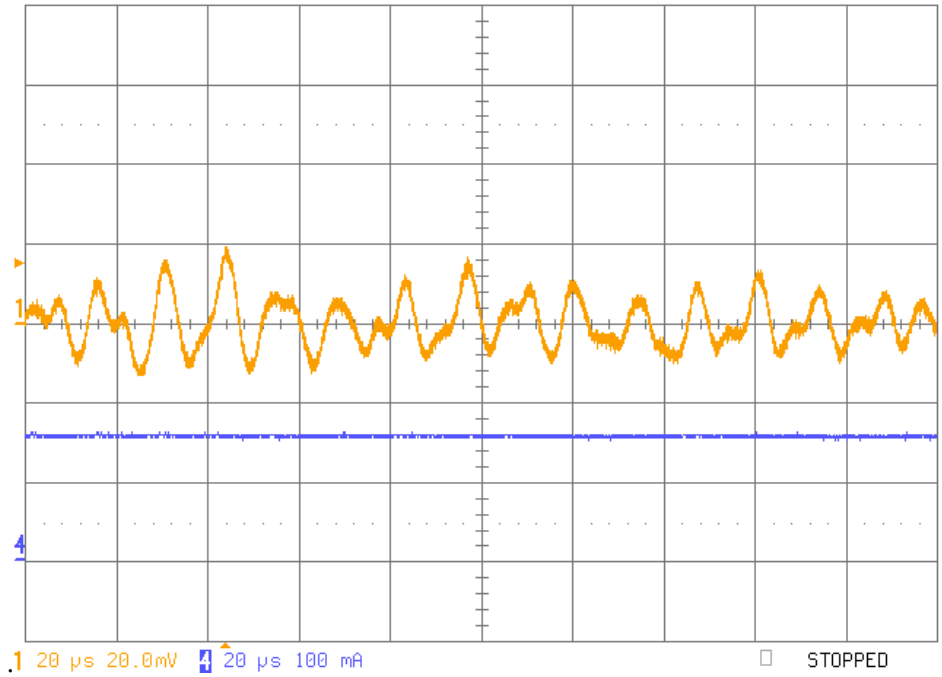

Fig 20: Output Ripple 3.3V (Ch1) @ 0.165 (Ch4) TPS 62200 DCDC, Low Line 3.6Vin, converter in PWM mode

Light load, low line, worse case

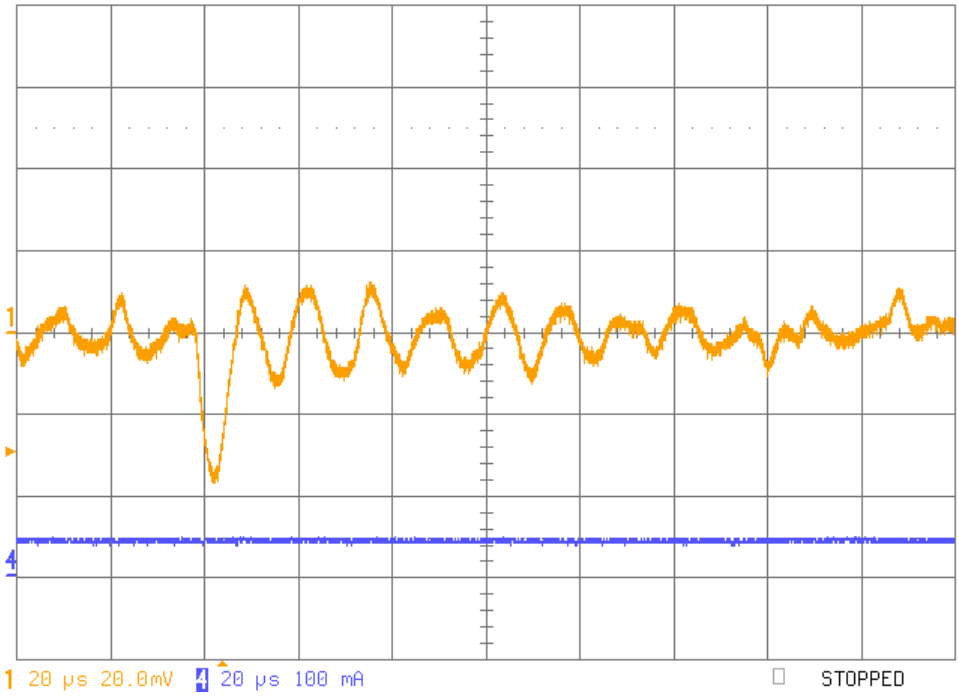

Fig 21: Output Ripple 3.3V (Ch1) @ 0.04 (Ch4) TPS 62200 DCDC, Low Line 3.6Vin, converter in PFM mode

LOAD TRANSIENT RESPONSE (TPS 62353)

Highline

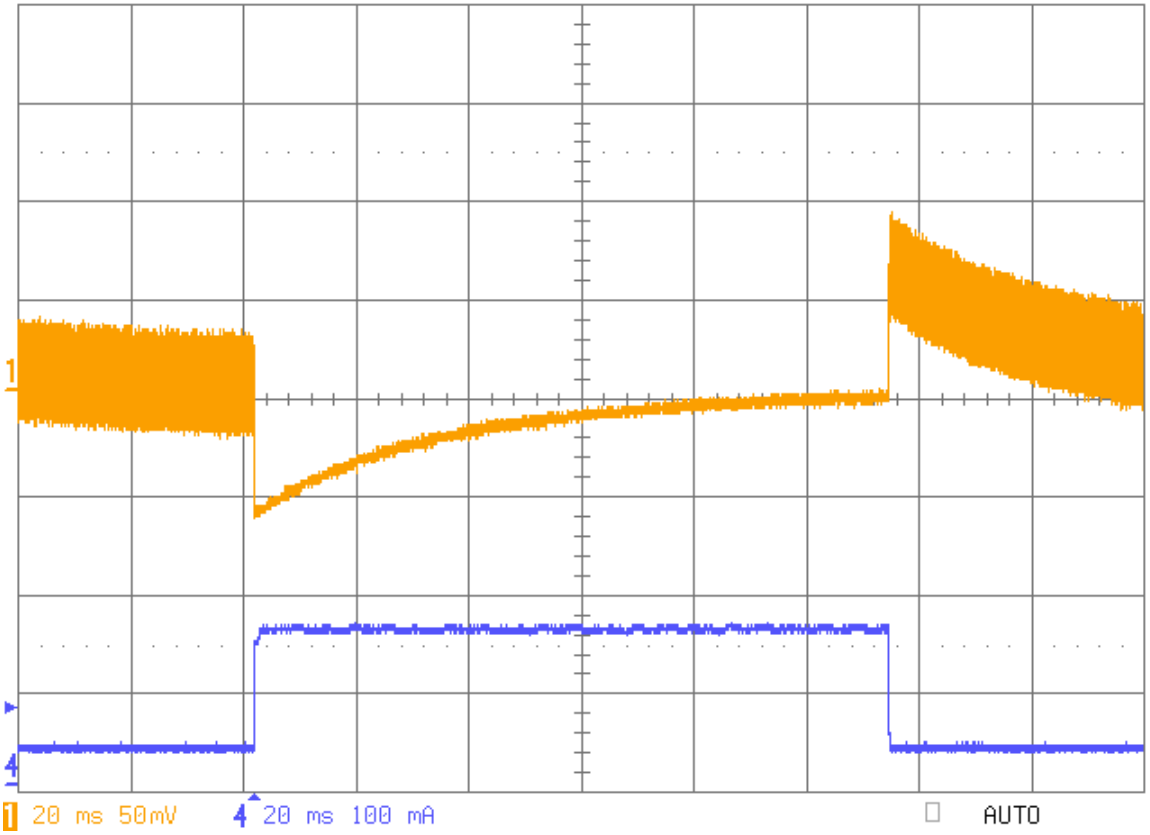

Fig 22: Load transient response on TPS62200, 3.3V output (Ch1) for load step 40mA to 165mA (Ch4 - 25% to 100%), at high line 6Vin

4Vin

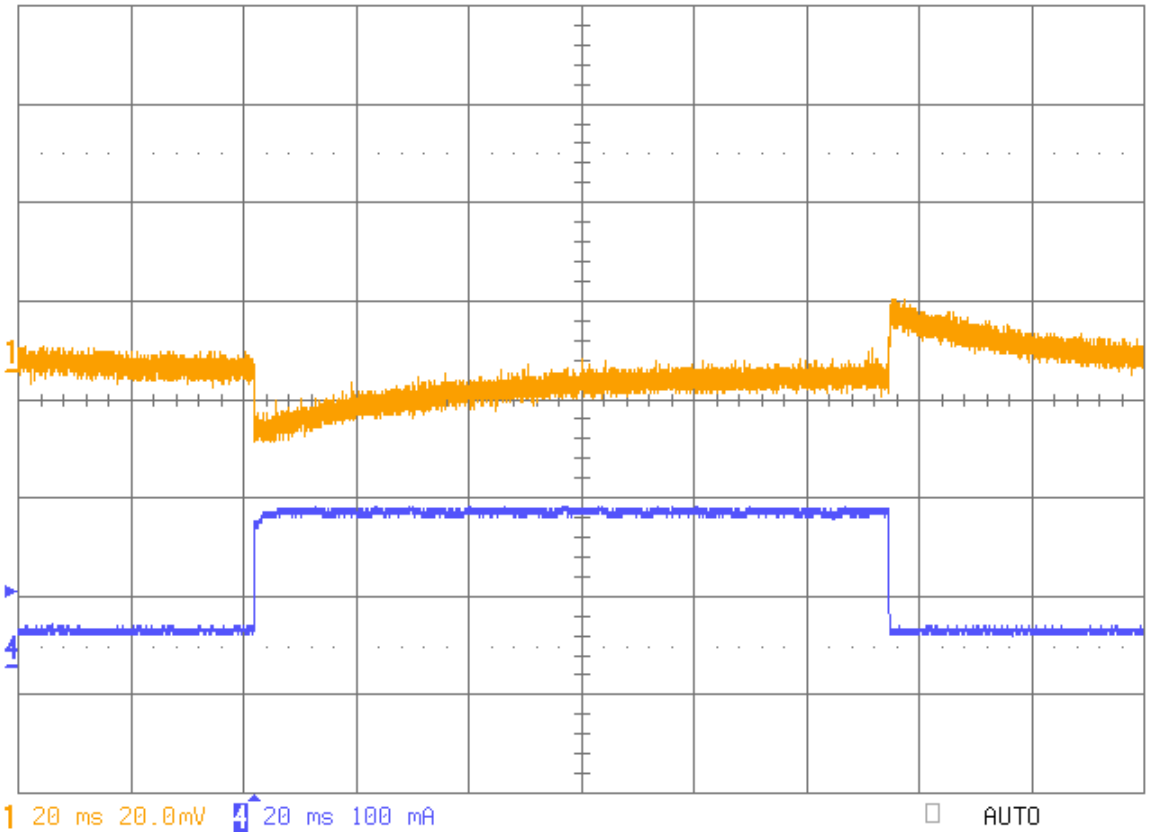

Fig 23: Load transient response on TPS62200, 3.3V output (Ch1) for load step 40mA to 165mA (Ch4 - 25% to 100%), at high line 4Vin

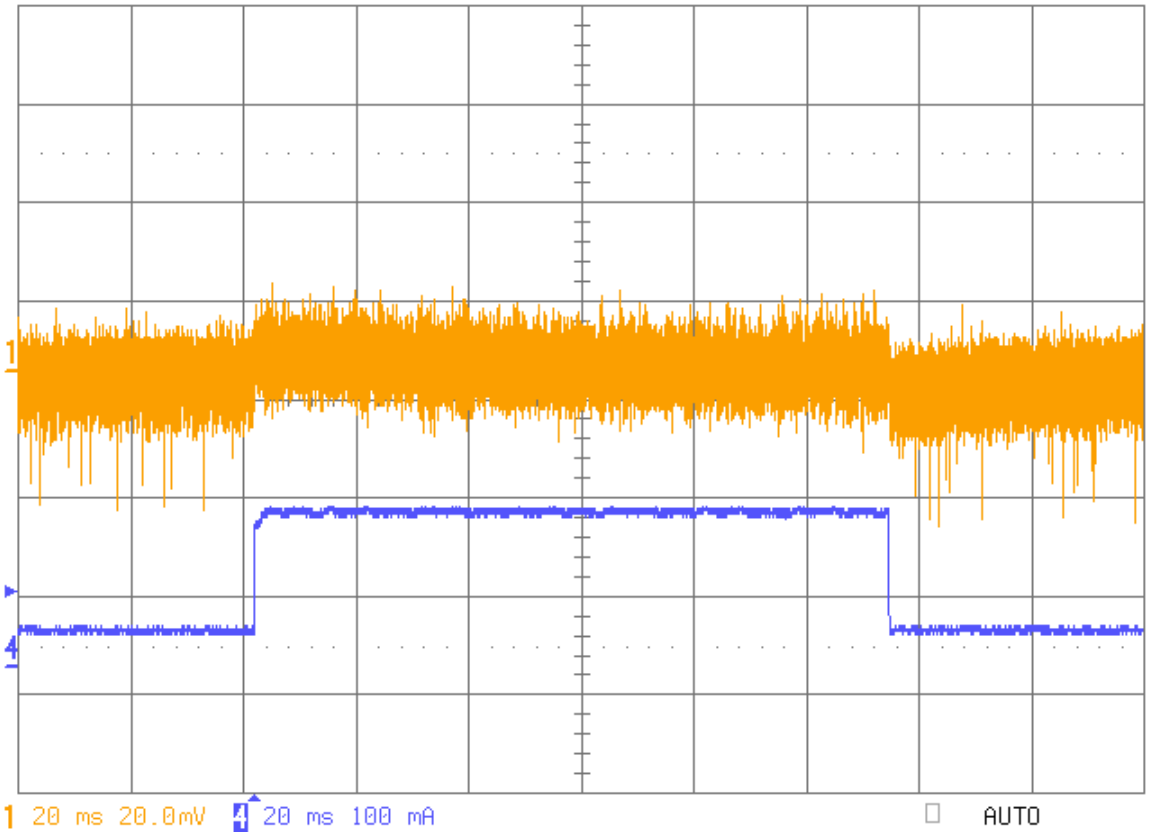

Fig 24: Load transient response on TPS62200, 3.3V output (Ch1) for load step 40mA to 165mA (Ch4 - 25% to 100%), at high line 3.6Vin

SWITCH NODE (TPS 62200)

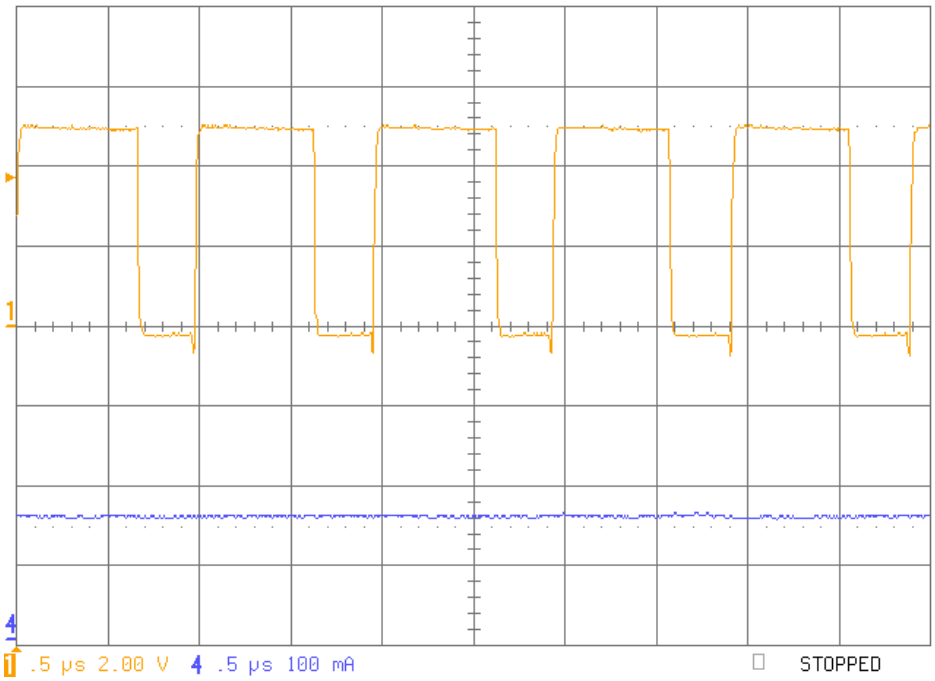

Fig 25: Switch node, PWM mode 5 V input, 3.3V@0.165A

Power Save Mode, No load

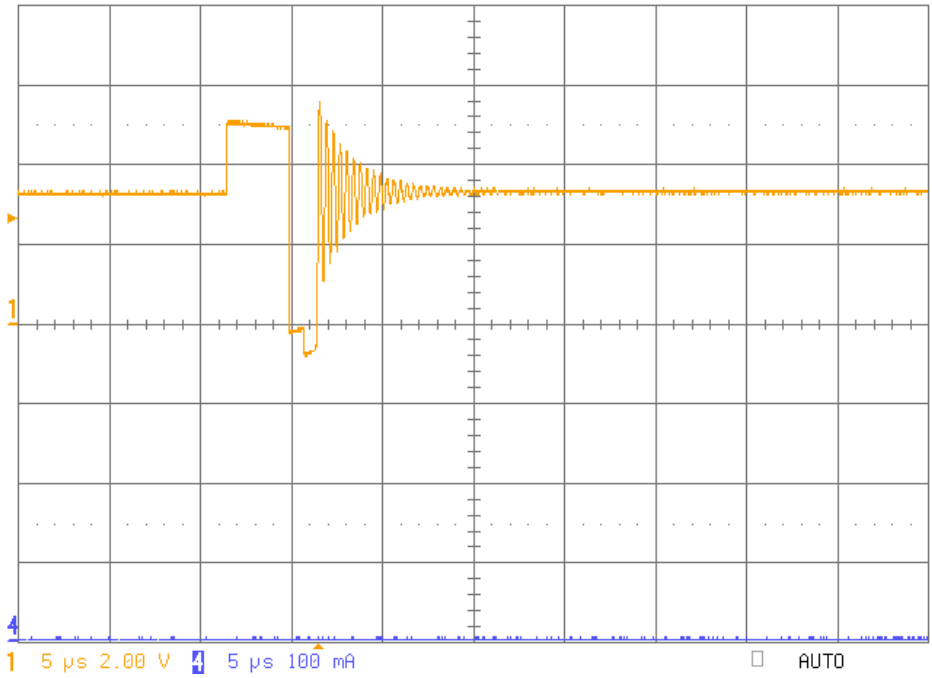

Fig 26: Switch node 5 Vin, 3.3V with no load

EFFICIENCY (TPS62200)

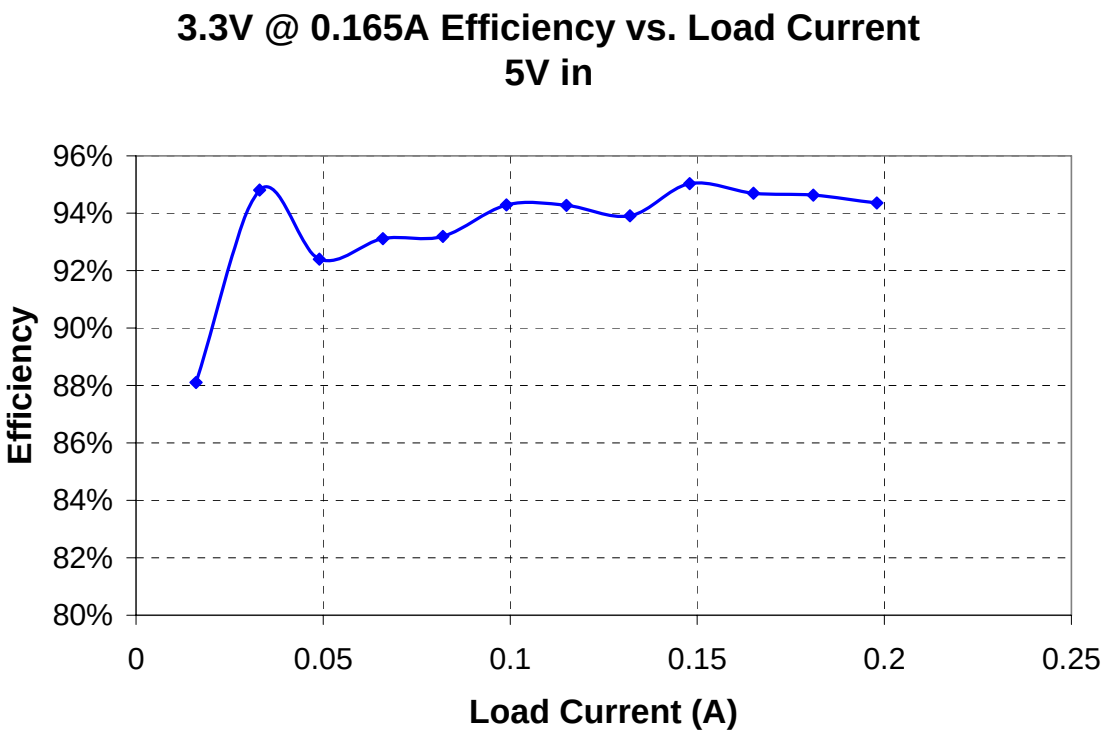

Fig 27: Efficiency of TPS62200 with 5Vin

LOAD REGULATION (TPS62200)

At light load, TPS 62200 implements dynamic voltage positioning by increasing the ouput voltage by about 0.8% above its nominal value to mitigate against the voltage drop that may occur during a load transient from light load to full load..

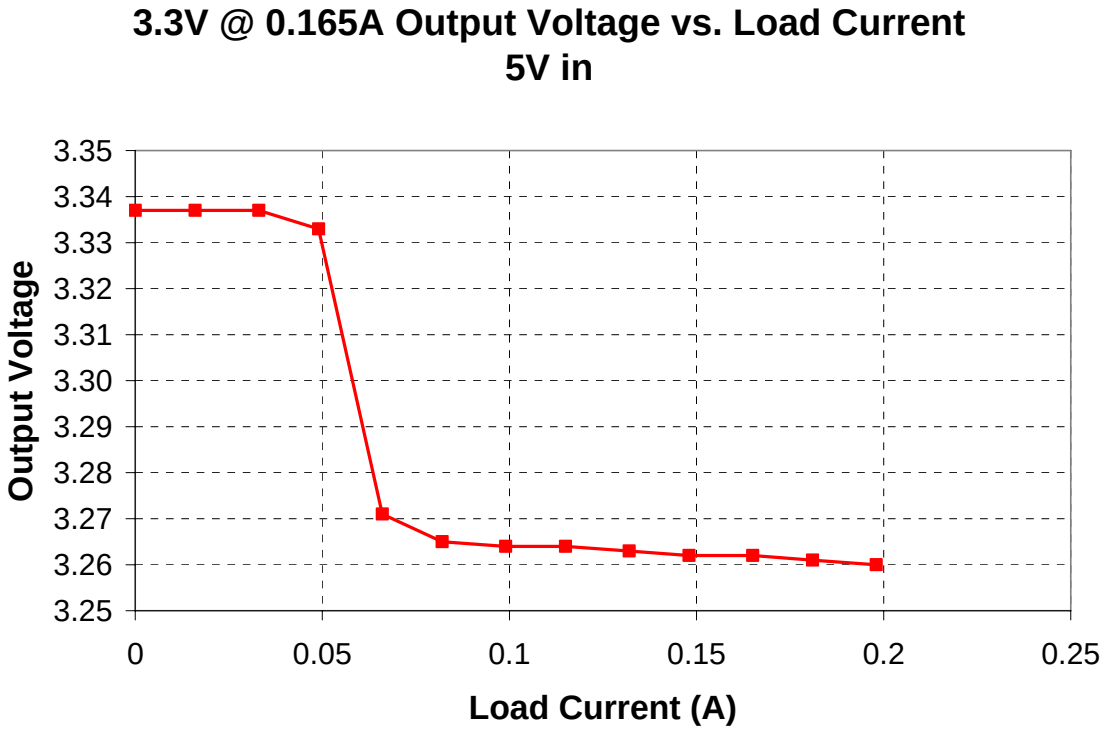

Fig 28: Load Regulation of TPS 62200 5Vin

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
DLP® Products	www.dlp.com	Communications and Telecom	www.ti.com/communications
DSP	dsp.ti.com	Computers and Peripherals	www.ti.com/computers
Clocks and Timers	www.ti.com/clocks	Consumer Electronics	www.ti.com/consumer-apps
Interface	interface.ti.com	Energy	www.ti.com/energy
Logic	logic.ti.com	Industrial	www.ti.com/industrial
Power Mgmt	power.ti.com	Medical	www.ti.com/medical
Microcontrollers	microcontroller.ti.com	Security	www.ti.com/security
RFID	www.ti-rfid.com	Space, Avionics & Defense	www.ti.com/space-avionics-defense
RF/IF and ZigBee® Solutions	www.ti.com/lprf	Video and Imaging	www.ti.com/video
		Wireless	www.ti.com/wireless-apps

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