PMP7760

PMP7760 Test Results

Literature Number:SNVU012

High Voltage Flyback Converter
TI reference design number: PMP 7760
(Formerly National Semiconductor design NSC1024)

Input: 30V-800V DC
Output: 21V@1.5A

DC-DC Test Results

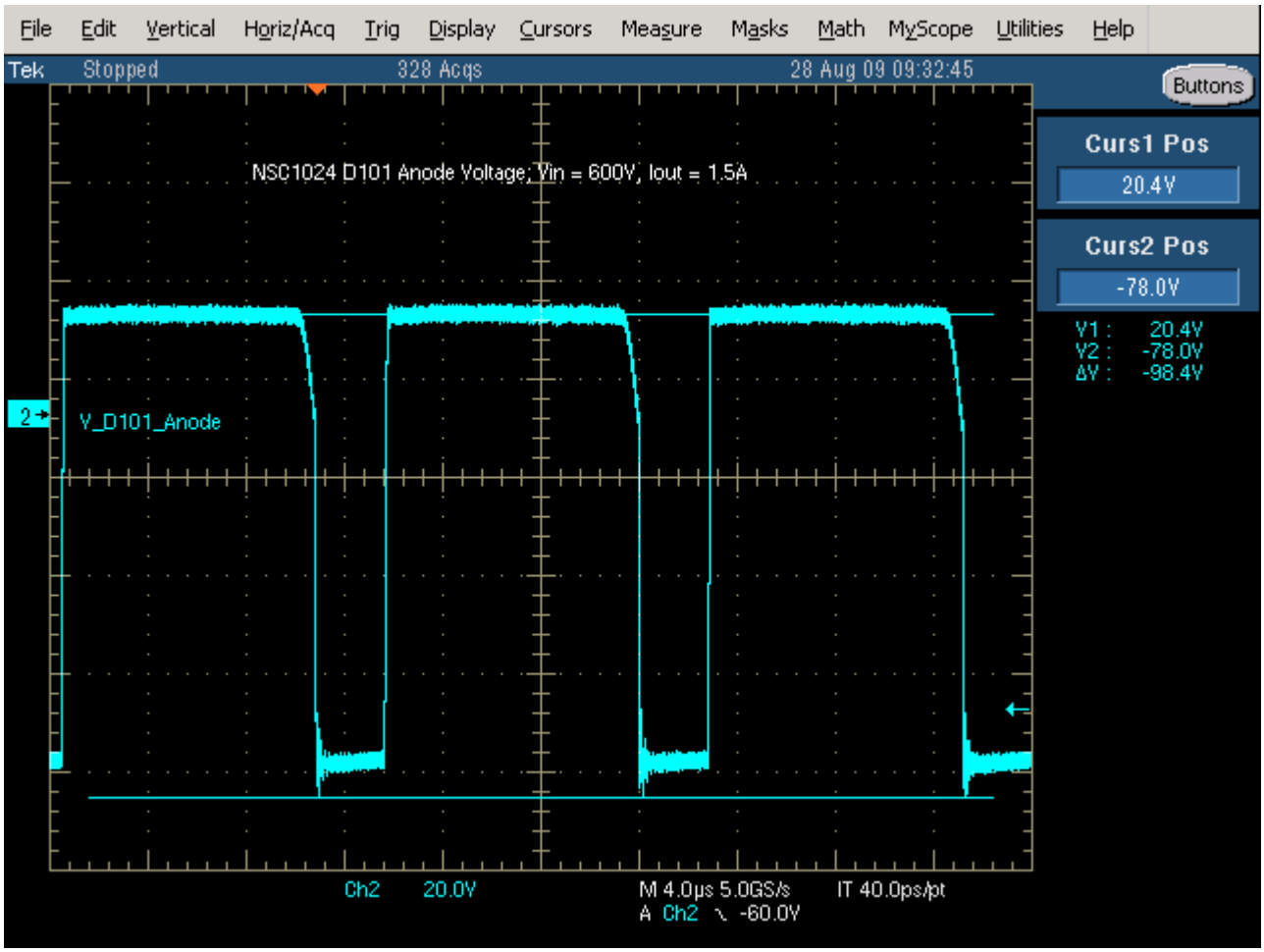
Table of Contents

1.0 Circuit Description

PMP7760 is a high voltage flyback DC-DC converter with Q100 and D100 qualification. The design includes an external bias supply to withstand 800V. LM5022 used in the circuit has additional features like an error amplifier, precision reference, line under-voltage lockout, cycle-by-cycle current limit, slope compensation, soft-start, external synchronization capability and thermal shutdown.

2.0 Waveforms

2.1 Anode Voltage for Vin = 600V and Iout = 1.5A



Anode voltage

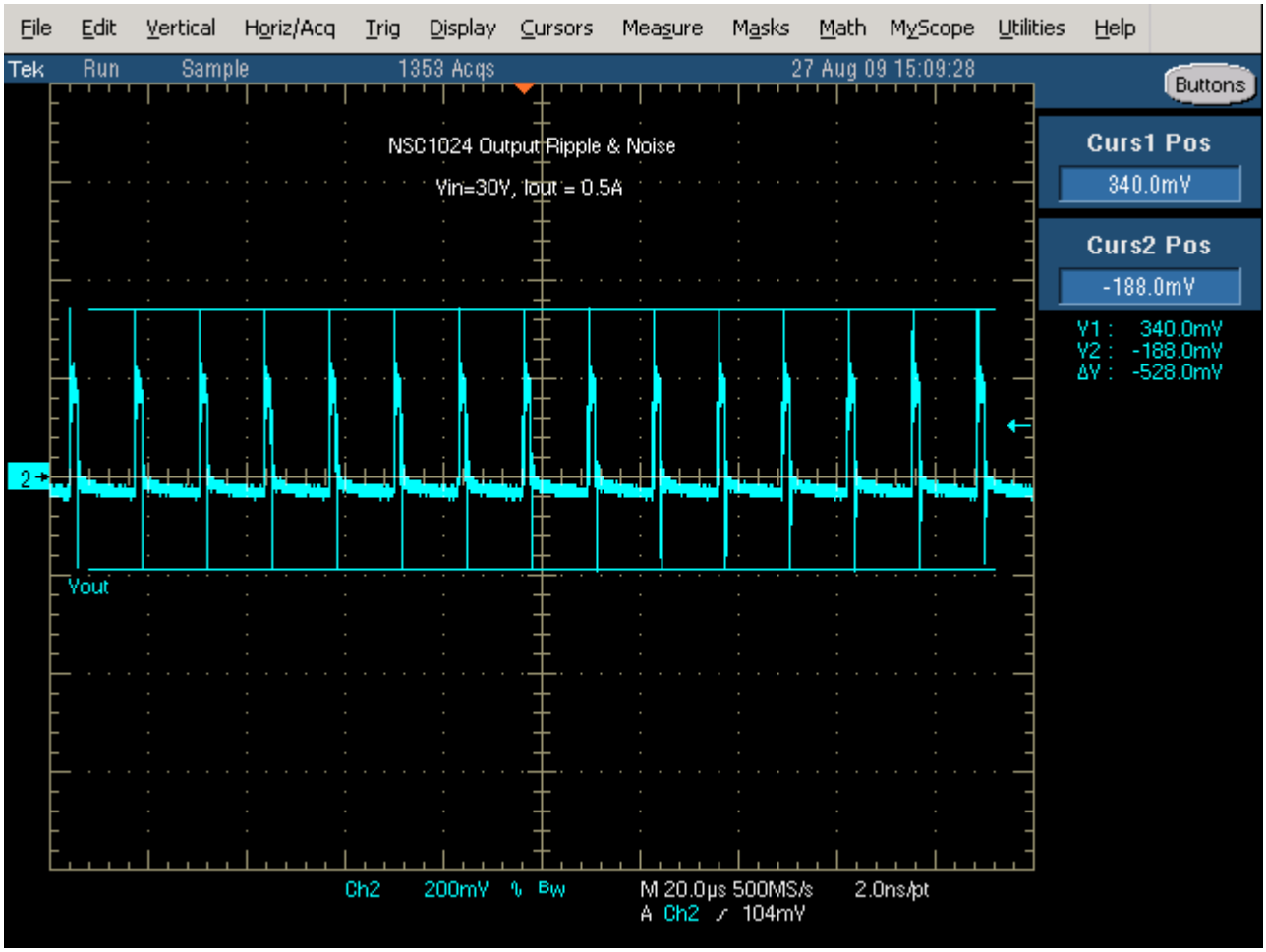
2.2 Load Transient Response for Vin = 400V and Iout from 0.375A to 1.125A

Output voltage
Output current

2.3 Load Transient Response for Vin = 600V, Iout from 0.375A to 1.125A

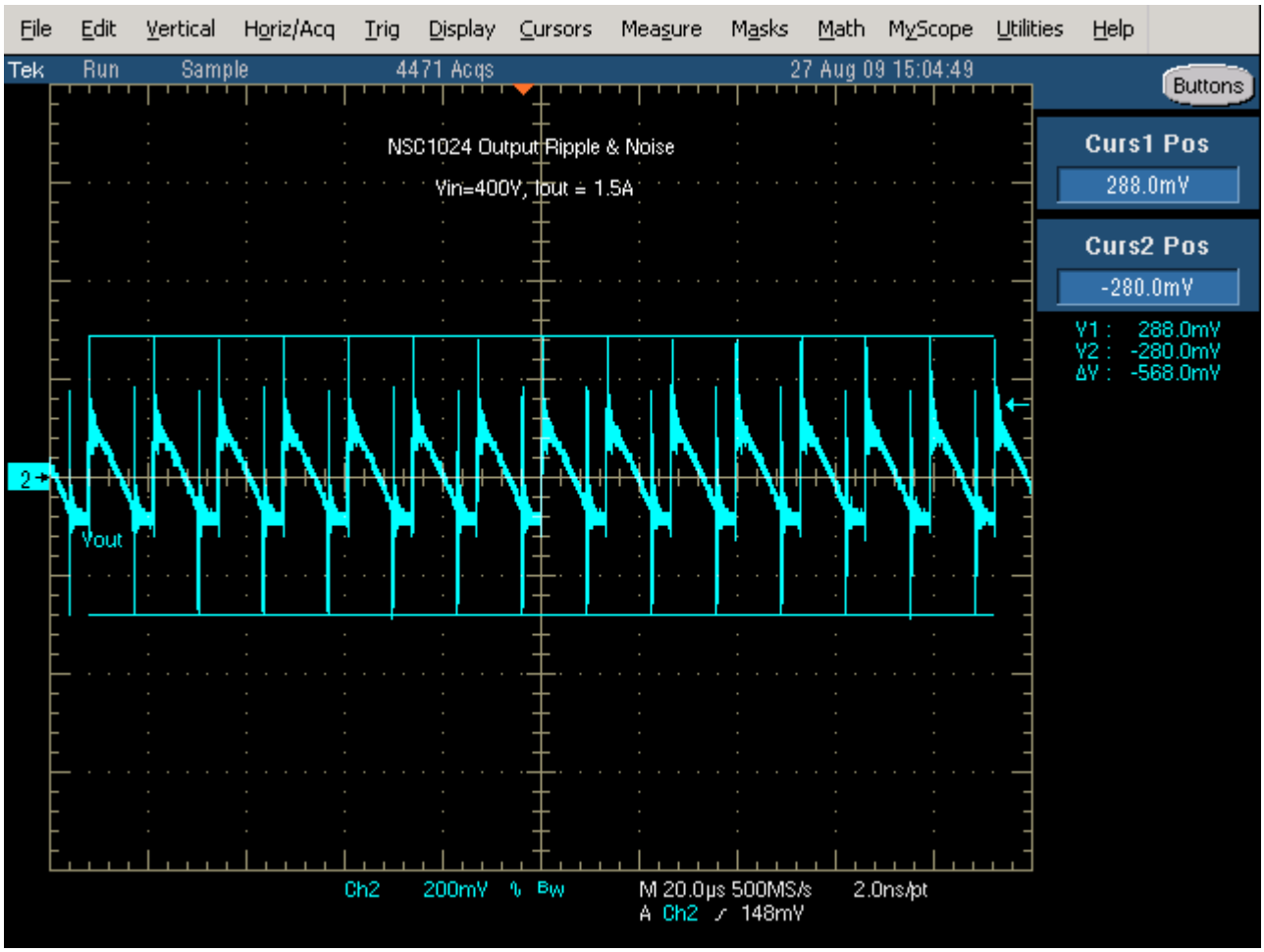
Output voltage
Output current

2.4 Output Ripple and Noise for Vin = 30 V, Iout = 0.5A



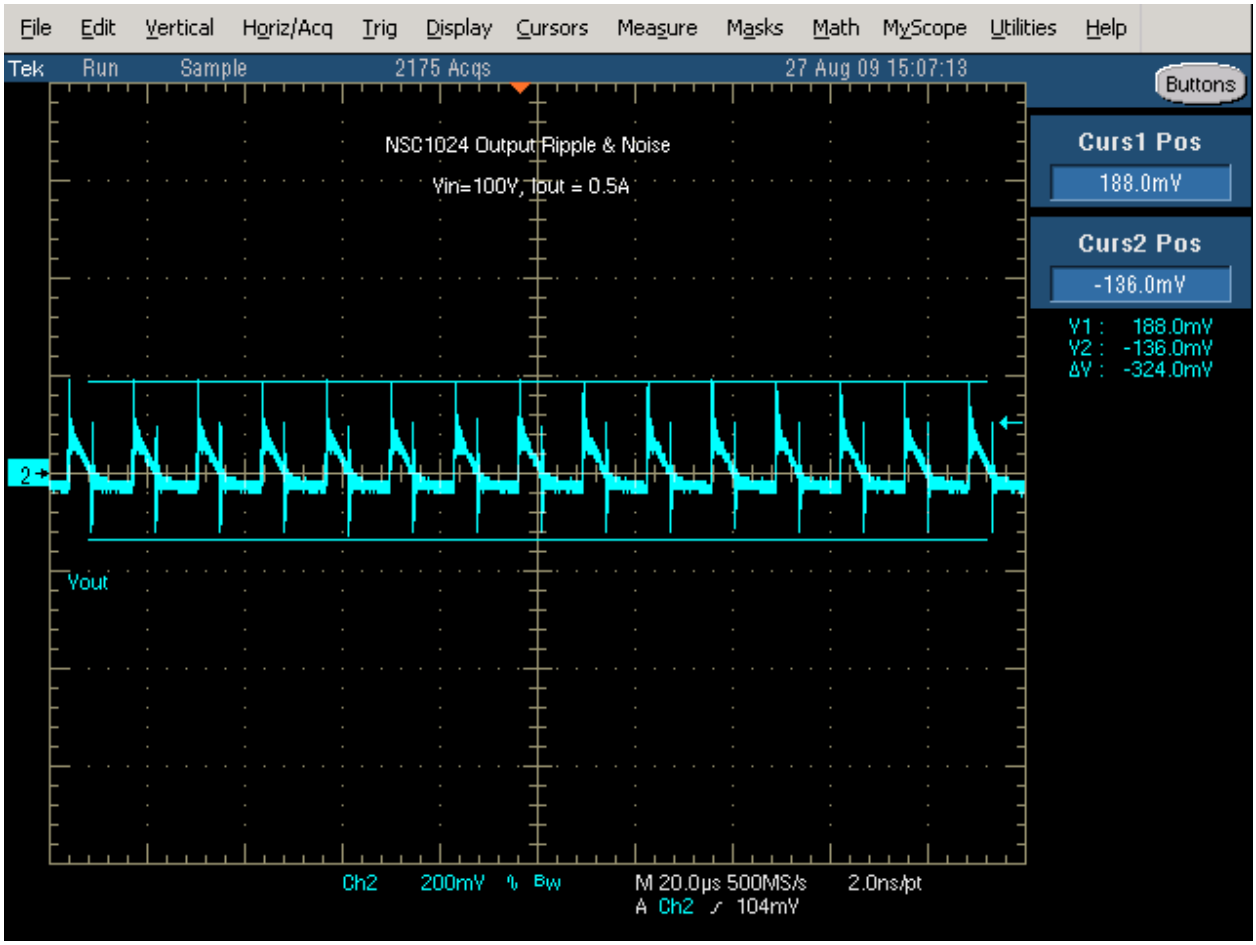
Output ripple and noise

2.5 Output Ripple and Noise for Vin = 400V, Iout = 1.5A



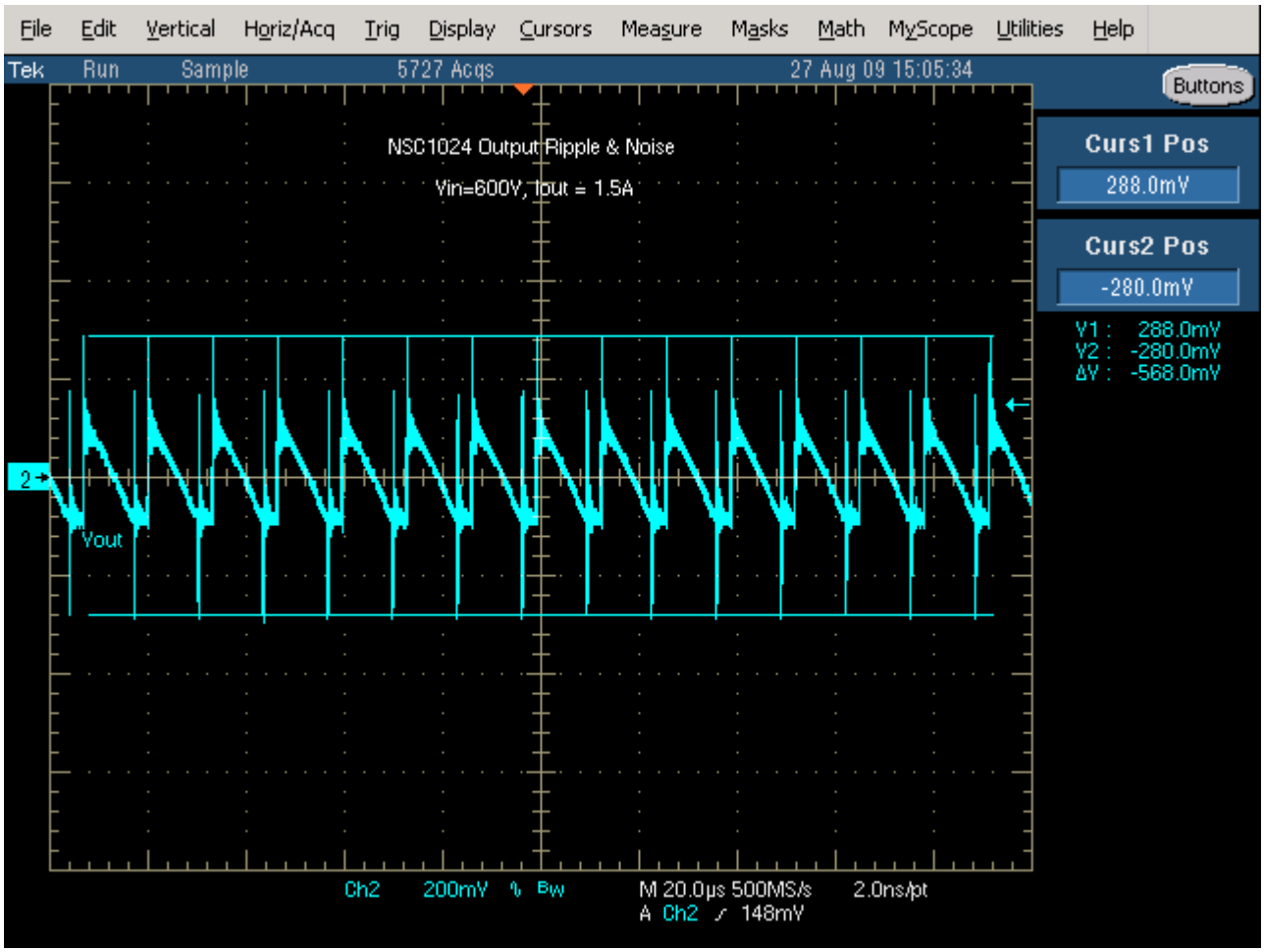
Output ripple and noise

2.6 Output Ripple and Noise for Vin = 100 V and Iout = 0.5A



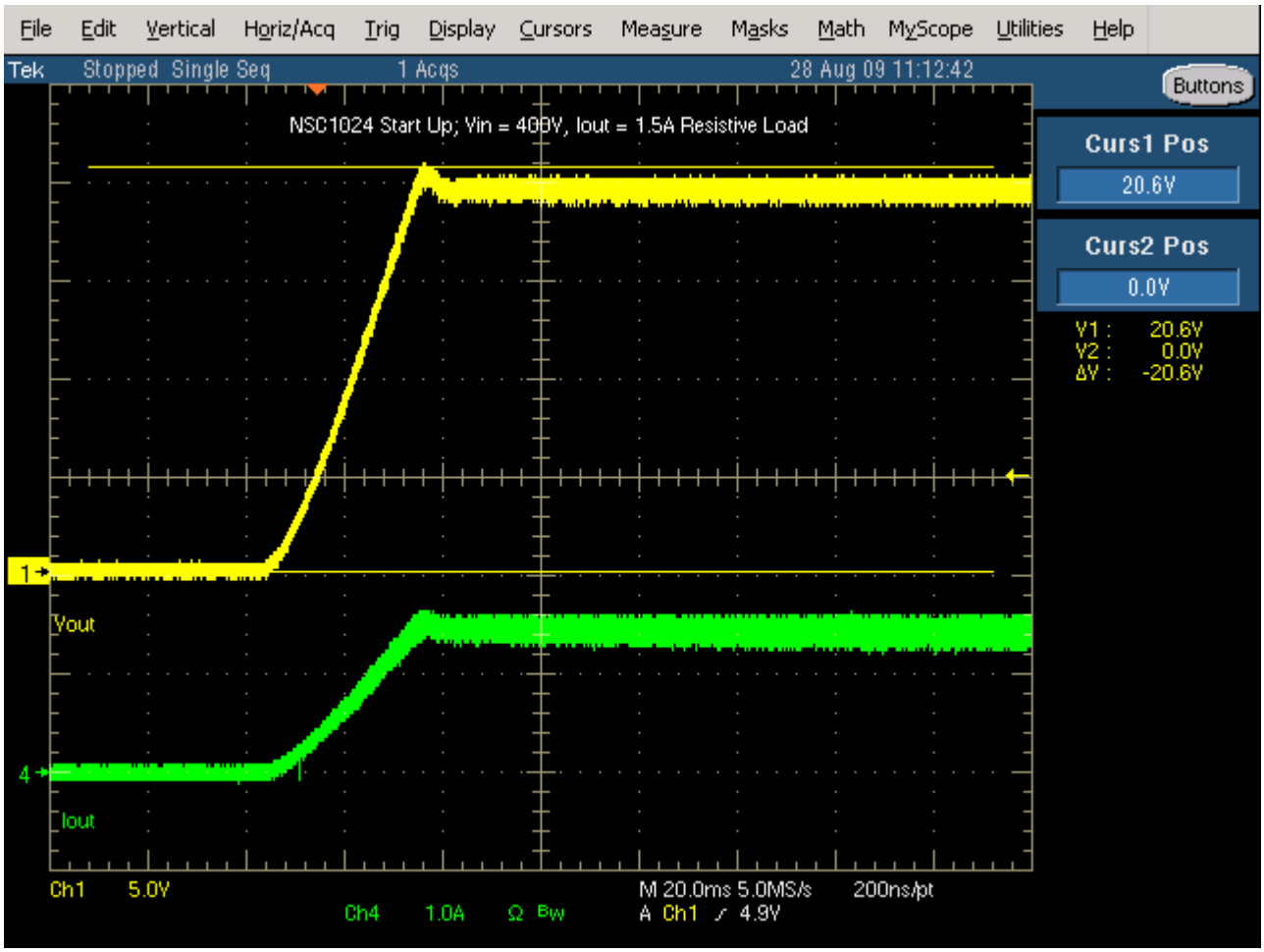
Output ripple and noise

2.7 Output Ripple and Noise for Vin = 600 V, Iout = 1.5A



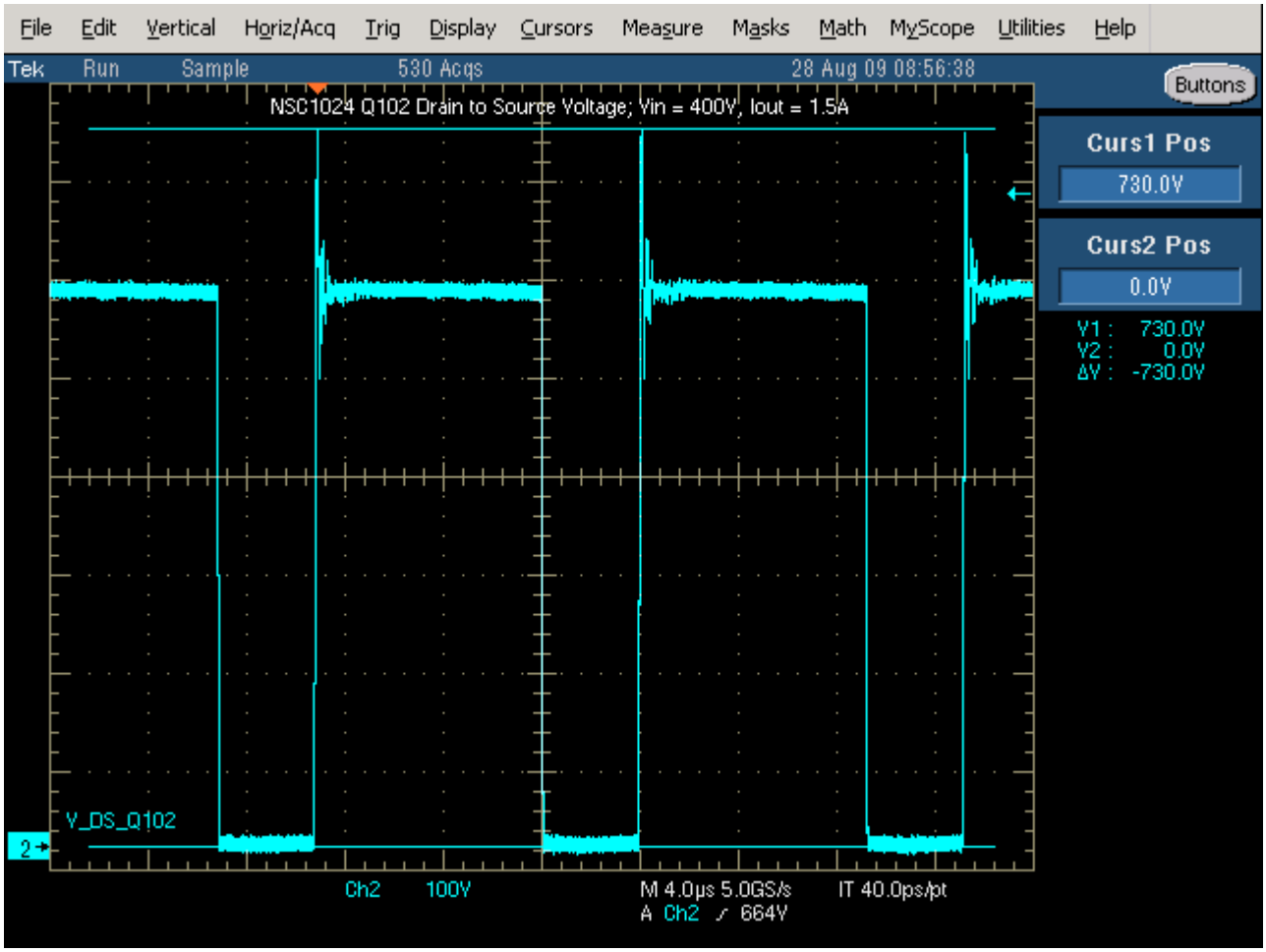
Output ripple and noise

2.8 Waveform during startup with a Resistive load for Vin = 400V



Output voltage
Output current

2.9 Drain to Source Voltage for Vin = 400V, Iout = 1.5A



Drain to source voltage

3.0 Efficiency Results

Vin (V)	Iin (mA)	Vout (V)	Iout (mA)	Eff (%)	Vin (V)	Iin (mA)	Vout (V)	Iout (mA)	Eff(%)
30	107	21.86	100	68.0997	50	59	20.86	100	70.7119
30	194	21.72	200	74.6392	50	105	20.71	200	78.8952
30	289	21.63	300	74.8443	50	152	20.62	300	81.3947
30	400	21.6	400	72.0000	50	200	20.54	400	82.1600
30	484	20	500	68.8705	50	249	20.47	500	82.2088
Vin (V)	**Iin (mA)**	**Vout (V)**	**Iout (mA)**	**Eff (%)**	**Vin (V)**	**Iin (mA)**	**Vout (V)**	**Iout (mA)**	**Eff (%)**
400	18.68	20.05	300	80.5005	600	13.23	20.07	300	75.8503
400	34	19.77	600	87.2206	600	24.79	19.78	600	79.7902
400	51.43	19.65	900	85.9664	600	34.92	19.65	900	84.4072
400	66.65	19.57	1200	88.0870	600	45.66	19.58	1200	85.7643
400	83.57	19.53	1500	87.6361	600	55.83	19.54	1500	87.4978

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**	
Audio	www.ti.com/audio	Automotive and Transportation	www.ti.com/automotive
Amplifiers	amplifier.ti.com	Communications and Telecom	www.ti.com/communications
Data Converters	dataconverter.ti.com	Computers and Peripherals	www.ti.com/computers
DLP® Products	www.dlp.com	Consumer Electronics	www.ti.com/consumer-apps
DSP	dsp.ti.com	Energy and Lighting	www.ti.com/energy
Clocks and Timers	www.ti.com/clocks	Industrial	www.ti.com/industrial
Interface	interface.ti.com	Medical	www.ti.com/medical
Logic	logic.ti.com	Security	www.ti.com/security
Power Mgmt	power.ti.com	Space, Avionics and Defense	www.ti.com/space-avionics-defense
Microcontrollers	microcontroller.ti.com	Video and Imaging	www.ti.com/video
RFID	www.ti-rfid.com		
OMAP Mobile Processors	www.ti.com/omap		
Wireless Connectivity	www.ti.com/wirelessconnectivity		
	TI E2E Community Home Page		e2e.ti.com

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