

Power Management Unit for Application/Multimedia Processors and Sub-Systems

General Description

This device is a multi-function, programmable Power Management Unit (PMU), optimized for sub block power solutions. This device integrates two highly efficient 600 mA step-down DC/DC converters configurable up to 800 mA load with Dynamic Voltage Scaling (DVS) through an I²C, two low noise analog LDOs, three digital LDOs for up to 300 mA load current each, two Low Input Low Output (LILO) regulators and an I²C-compatible serial interface to allow a host controller access to the internal control registers. The device also features programmable power-on sequencing. LDO regulators provide high PSRR and low noise ideally suited for supplying power to both analog and digital loads.

The device can be configured either as a Sub_PMU for modules (for example, camera/multimedia modules) or as a stand-alone PMU that powers the processor itself.

"Notice: This document is not a datasheet. For more information regarding this product or to order samples please contact your local National Semiconductor sales office or visit <http://www.national.com/support/dir.html>.

Features

- Two High Efficiency Step-Down DC/DC Converters, I_{OUT} = 600 mA, with a 4MHz switching frequency using small 1µH inductors, with options up to 800 mA.
- Three digital LDOs for up to 300 mA load current each
- Two low-noise analog 300 mA LDOs
- Two low-input low output regulators, I_{OUT} = 300 mA
- I²C-compatible interface for the controlling of internal registers
- Adjustable startup sequence through I²C or configuration
- Thermal shutdown protection

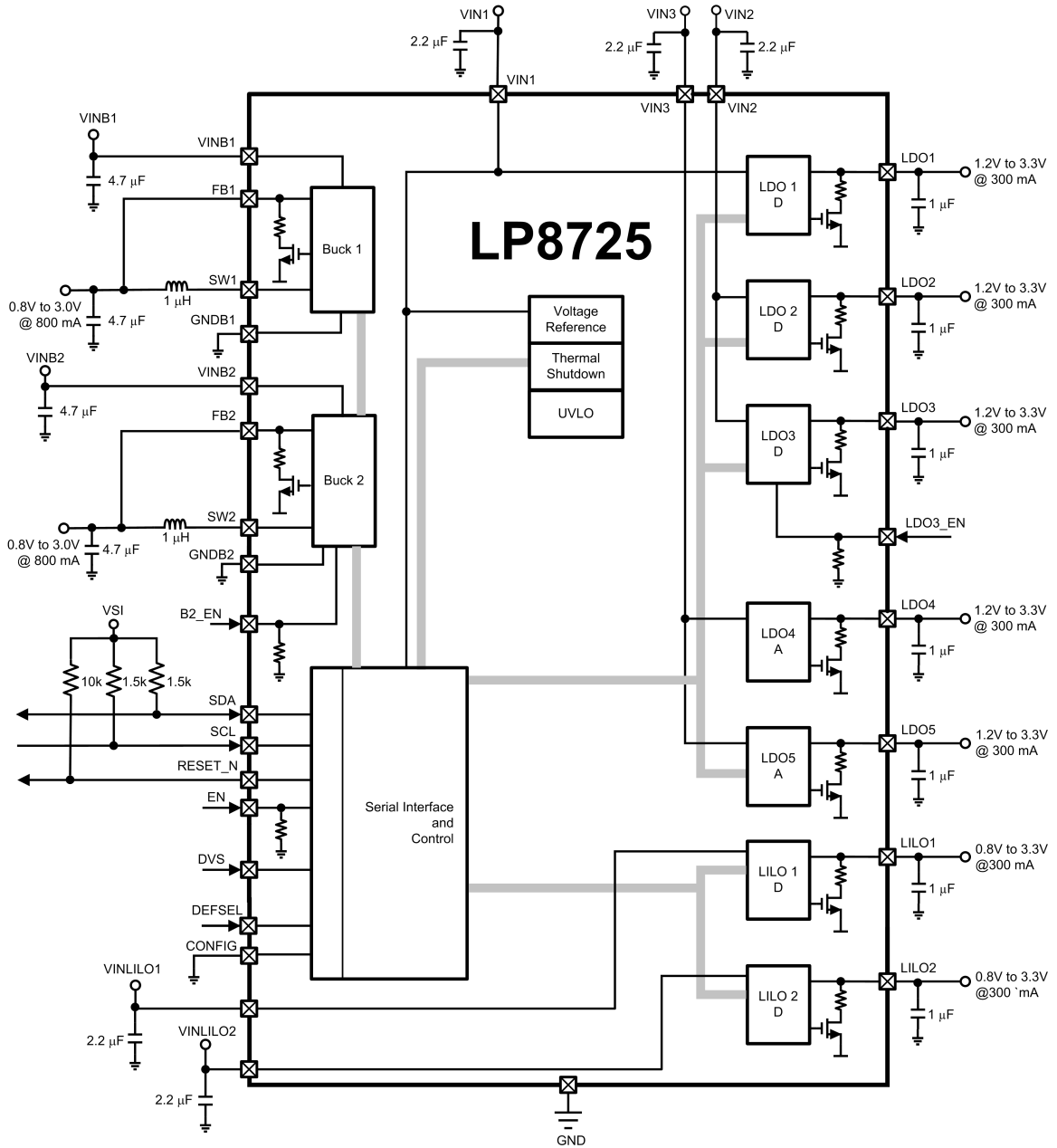
Key Specifications

- 190 mV typ. Dropout Voltage on digital LDOs @ 300 mA
- 2% typ. Output Voltage Accuracy on digital and analog LDOs
- 10 µVrms Output Noise on analog LDOs
- ±2% typ. Output Voltage Bucks up to 93% efficiency
- 30-bump micro SMD package (0.5 mm pitch)

Applications

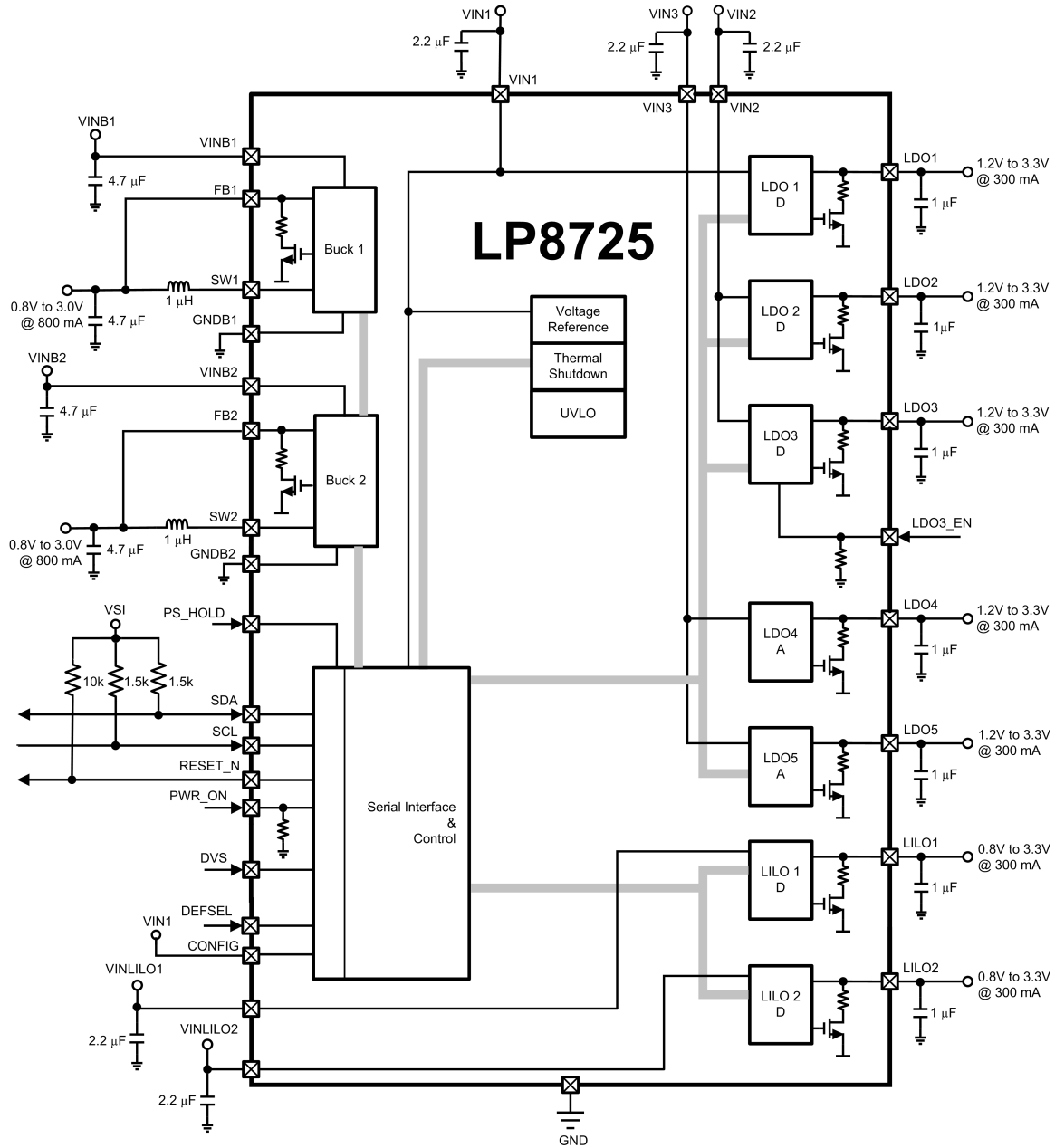
- Multi-media Processors
- Portable Handheld Products

Typical Application (SUB-PMU)



30098001

Typical Application (PMU)



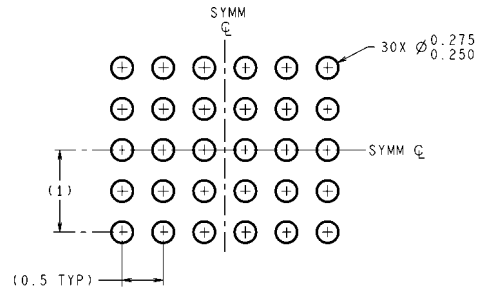
30098005

Ordering Information

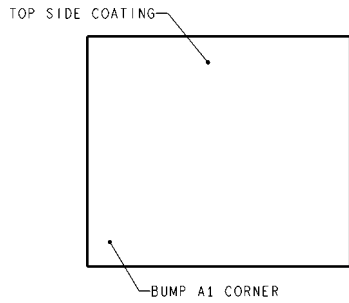
Order Number	Package Type	Product Identification	Supplied as
LP8725TLE	micro SMD	8725	250 Tape & Reel
LP8725TLX	micro SMD	8725	3000 Tape & Reel
LP8725TLE-A	micro SMD	V023	250 Tape & Reel
LP8725TLX-A	micro SMD	V023	3000 Tape & Reel
LP8725TLE-B	micro SMD	V028	250 Tape & Reel
LP8725TLX-B	micro SMD	V028	3000 Tape & Reel
LP8725TLE-D	micro SMD	V031	250 Tape & Reel
LP8725TLX-D	micro SMD	V031	3000 Tape & Reel

The LP8725-A, LP8725-B and LP8725-D variants offer alternative startup default configurations to the standard LP8725 part (see Start-up Sequences and Default Output Voltages).

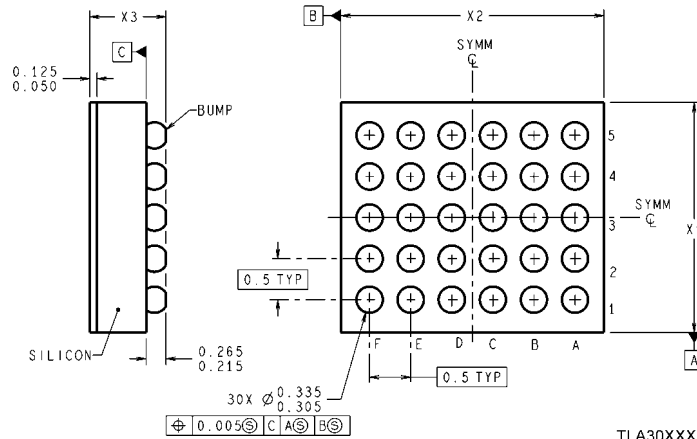
Physical Dimensions inches (millimeters) unless otherwise noted



LAND PATTERN RECOMMENDATION



DIMENSIONS ARE IN MILLIMETERS
DIMENSIONS IN () FOR REFERENCE ONLY



TLA30XXX (Rev C)

30-bump micro SMD Package
NS Package Number TLA30D1A
X1 = 2.568 mm ±0.030 mm
X2 = 2.974 mm ±0.030 mm
X3 = 0.600 mm ±0.075 mm

Notes

For more National Semiconductor product information and proven design tools, visit the following Web sites at:
www.national.com

Products		Design Support	
Amplifiers	www.national.com/amplifiers	WEBENCH® Tools	www.national.com/webench
Audio	www.national.com/audio	App Notes	www.national.com/appnotes
Clock and Timing	www.national.com/timing	Reference Designs	www.national.com/refdesigns
Data Converters	www.national.com/adc	Samples	www.national.com/samples
Interface	www.national.com/interface	Eval Boards	www.national.com/evalboards
LVDS	www.national.com/lvds	Packaging	www.national.com/packaging
Power Management	www.national.com/power	Green Compliance	www.national.com/quality/green
Switching Regulators	www.national.com/switchers	Distributors	www.national.com/contacts
LDOs	www.national.com/lido	Quality and Reliability	www.national.com/quality
LED Lighting	www.national.com/led	Feedback/Support	www.national.com/feedback
Voltage References	www.national.com/vref	Design Made Easy	www.national.com/easy
PowerWise® Solutions	www.national.com/powerwise	Applications & Markets	www.national.com/solutions
Serial Digital Interface (SDI)	www.national.com/sdi	Mil/Aero	www.national.com/milaero
Temperature Sensors	www.national.com/tempensors	SolarMagic™	www.national.com/solarmagic
PLL/VCO	www.national.com/wireless	PowerWise® Design University	www.national.com/training

THE CONTENTS OF THIS DOCUMENT ARE PROVIDED IN CONNECTION WITH NATIONAL SEMICONDUCTOR CORPORATION ("NATIONAL") PRODUCTS. NATIONAL MAKES NO REPRESENTATIONS OR WARRANTIES WITH RESPECT TO THE ACCURACY OR COMPLETENESS OF THE CONTENTS OF THIS PUBLICATION AND RESERVES THE RIGHT TO MAKE CHANGES TO SPECIFICATIONS AND PRODUCT DESCRIPTIONS AT ANY TIME WITHOUT NOTICE. NO LICENSE, WHETHER EXPRESS, IMPLIED, ARISING BY ESTOPPEL OR OTHERWISE, TO ANY INTELLECTUAL PROPERTY RIGHTS IS GRANTED BY THIS DOCUMENT.

TESTING AND OTHER QUALITY CONTROLS ARE USED TO THE EXTENT NATIONAL DEEMS NECESSARY TO SUPPORT NATIONAL'S PRODUCT WARRANTY. EXCEPT WHERE MANDATED BY GOVERNMENT REQUIREMENTS, TESTING OF ALL PARAMETERS OF EACH PRODUCT IS NOT NECESSARILY PERFORMED. NATIONAL ASSUMES NO LIABILITY FOR APPLICATIONS ASSISTANCE OR BUYER PRODUCT DESIGN. BUYERS ARE RESPONSIBLE FOR THEIR PRODUCTS AND APPLICATIONS USING NATIONAL COMPONENTS. PRIOR TO USING OR DISTRIBUTING ANY PRODUCTS THAT INCLUDE NATIONAL COMPONENTS, BUYERS SHOULD PROVIDE ADEQUATE DESIGN, TESTING AND OPERATING SAFEGUARDS.

EXCEPT AS PROVIDED IN NATIONAL'S TERMS AND CONDITIONS OF SALE FOR SUCH PRODUCTS, NATIONAL ASSUMES NO LIABILITY WHATSOEVER, AND NATIONAL DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY RELATING TO THE SALE AND/OR USE OF NATIONAL PRODUCTS INCLUDING LIABILITY OR WARRANTIES RELATING TO FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT.

LIFE SUPPORT POLICY

NATIONAL'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS PRIOR WRITTEN APPROVAL OF THE CHIEF EXECUTIVE OFFICER AND GENERAL COUNSEL OF NATIONAL SEMICONDUCTOR CORPORATION. As used herein:

Life support devices or systems are devices which (a) are intended for surgical implant into the body, or (b) support or sustain life and whose failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in a significant injury to the user. A critical component is any component in a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system or to affect its safety or effectiveness.

National Semiconductor and the National Semiconductor logo are registered trademarks of National Semiconductor Corporation. All other brand or product names may be trademarks or registered trademarks of their respective holders.

Copyright© 2010 National Semiconductor Corporation

For the most current product information visit us at www.national.com



National Semiconductor Americas Technical Support Center
 Email: support@nsc.com
 Tel: 1-800-272-9959

National Semiconductor Europe Technical Support Center
 Email: europe.support@nsc.com

National Semiconductor Asia Pacific Technical Support Center
 Email: ap.support@nsc.com

National Semiconductor Japan Technical Support Center
 Email: jpn.feedback@nsc.com