

Wide Input Synchronous Boost Controller with Multiple Phase Capability

Check for Samples: [LM5122/LM5122Q](#)

FEATURES

- Available in AEC-Q100 Grade 1 (LM5122Q)
- Maximum Input Voltage : 65 V
- Minimum Input Voltage : 3.0 V (4.5 V for startup)
- Output Voltage up to 100 V
- Bypass ($V_{OUT} = V_{IN}$) Operation
- Free-Run/Synchronizable Switching up to 1 MHz
- Peak Current Mode Control
- Robust 3-A Integrated Gate Drivers
- Adaptive Dead-Time Control
- Optional Diode Emulation Mode
- Programmable Cycle-by-Cycle Current Limit
- Hiccup Mode Overload Protection
- Programmable Line UVLO
- Programmable Soft-Start
- Thermal Shutdown Protection
- Low Shutdown Quiescent Current: 9 μ A
- Programmable Slope Compensation
- Programmable Skip Cycle Mode Reduces Standby Power
- Allows External VCC Supply
- Inductor DCR Current Sensing Capability
- Multiphase Capability
- 20-Pin PowerPAD™ Thermally Enhanced Package

APPLICATIONS

- 12 V, 24 V, and 48 V Power Systems
- Automotive Start-Stop
- Audio Power Supply
- High Current Boost Power Supply Converter

DESCRIPTION

The LM5122 is a multiphase capable synchronous boost controller intended for high-efficiency synchronous boost regulator applications. The control method is based upon peak current mode control. Current mode control provides inherent line feed-forward, cycle-by-cycle current limiting and ease of loop compensation.

The switching frequency is programmable up to 1 MHz. Higher efficiency is achieved by two robust N-channel MOSFET gate drivers with adaptive dead-time control. A user-selectable diode emulation mode also enables discontinuous mode operation for improved efficiency at light load conditions.

An internal charge pump allows 100% duty cycle for high-side synchronous switch (Bypass operation). A 180° phase shifted clock output enables easy multiphase interleaved configuration. Additional features include thermal shutdown, frequency synchronization, hiccup mode current limit and adjustable line undervoltage lockout.

PRODUCT PREVIEW

Please be aware that an important notice concerning availability, standard warranty, and use in critical applications of Texas Instruments semiconductor products and disclaimers thereto appears at the end of this data sheet.

SIMPLIFIED APPLICATION DIAGRAM

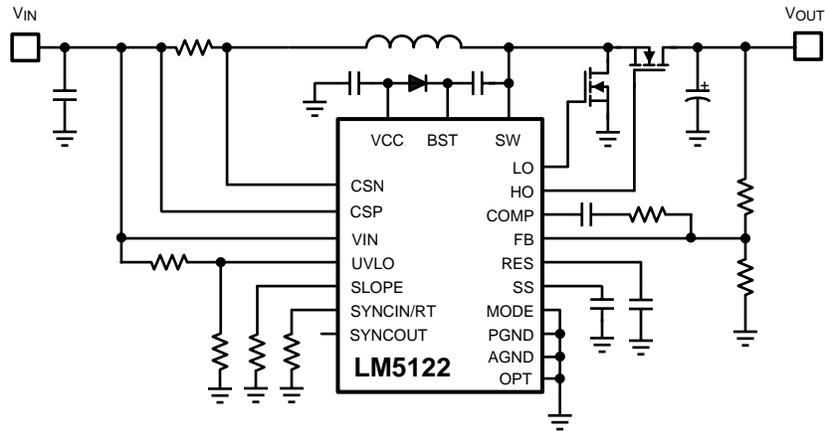


Figure 1. SIMPLIFIED APPLICATION DIAGRAM

PRODUCT PREVIEW

PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish	MSL Peak Temp (3)	Op Temp (°C)	Top-Side Markings (4)	Samples
LM5122MH/NOPB	PREVIEW	HTSSOP	PWP	20		TBD	Call TI	Call TI	-40 to 125		
LM5122MHX/NOPB	PREVIEW	HTSSOP	PWP	20	2500	TBD	Call TI	Call TI	-40 to 125		
LM5122QMH/NOPB	PREVIEW	HTSSOP	PWP	20		TBD	Call TI	Call TI	-40 to 125		
LM5122QMHX/NOPB	PREVIEW	HTSSOP	PWP	20	2500	TBD	Call TI	Call TI	-40 to 125		

(1) The marketing status values are defined as follows:

ACTIVE: Product device recommended for new designs.

LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

PREVIEW: Device has been announced but is not in production. Samples may or may not be available.

OBSOLETE: TI has discontinued the production of the device.

(2) Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check <http://www.ti.com/productcontent> for the latest availability information and additional product content details.

TBD: The Pb-Free/Green conversion plan has not been defined.

Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.

Pb-Free (RoHS Exempt): This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.

Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

(3) MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

(4) Only one of markings shown within the brackets will appear on the physical device.

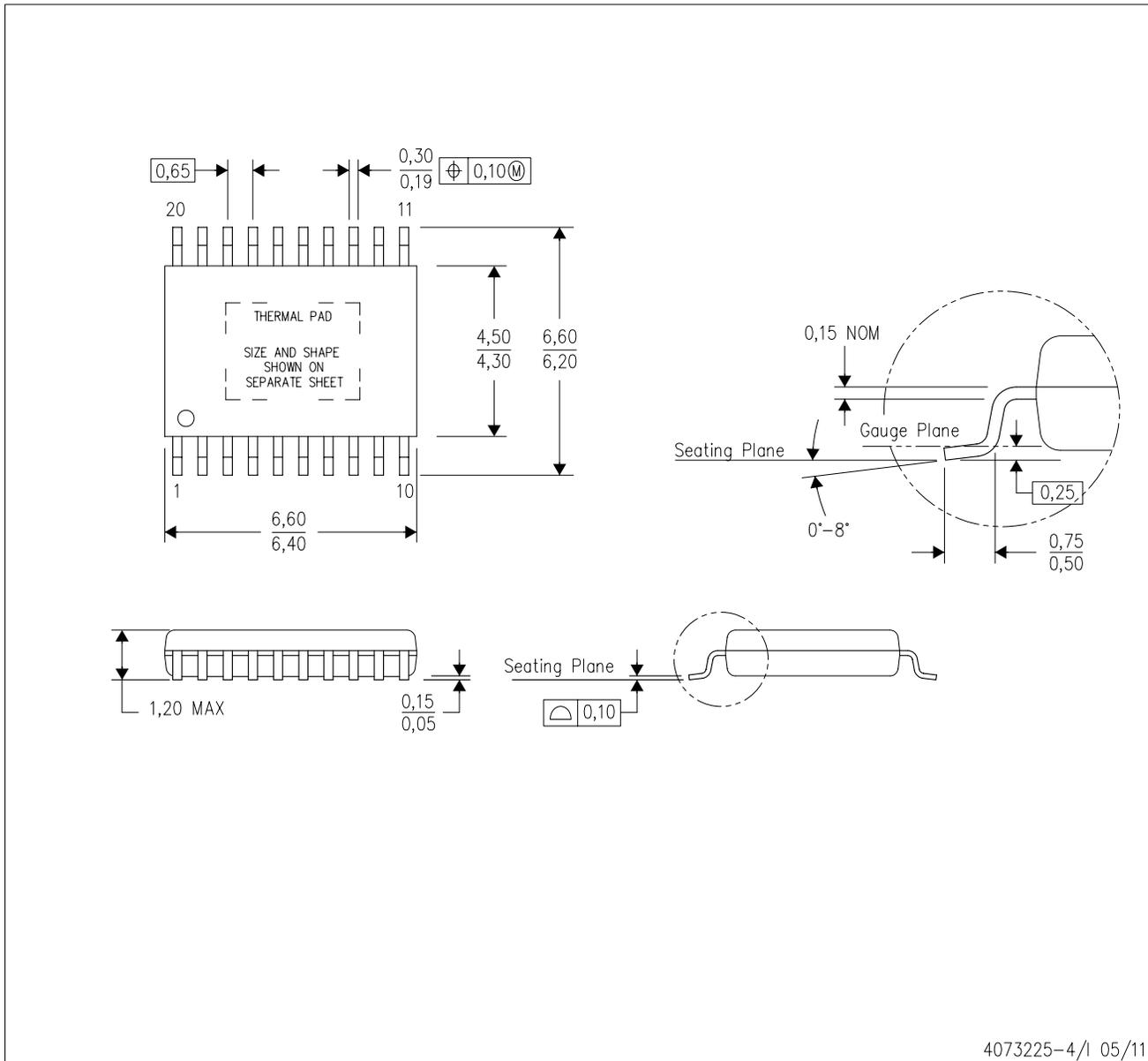
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MECHANICAL DATA

PWP (R-PDSO-G20)

PowerPAD™ PLASTIC SMALL OUTLINE



4073225-4/1 05/11

- NOTES:
- All linear dimensions are in millimeters.
 - This drawing is subject to change without notice.
 - Body dimensions do not include mold flash or protrusions. Mold flash and protrusion shall not exceed 0.15 per side.
 - This package is designed to be soldered to a thermal pad on the board. Refer to Technical Brief, PowerPad Thermally Enhanced Package, Texas Instruments Literature No. SLMA002 for information regarding recommended board layout. This document is available at www.ti.com <<http://www.ti.com>>.
 - See the additional figure in the Product Data Sheet for details regarding the exposed thermal pad features and dimensions.
 - Falls within JEDEC MO-153

PowerPAD is a trademark of Texas Instruments.

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