

LM3209-G3 PRODUCT BRIEF Seamless-Transition Buck-Boost Converter for Battery-Powered 3G/4G RF Power Amplifiers

Check for Samples: [LM3209-G3](#)

FEATURES

- Operates from a single Li-Ion cell: 2.7V to 5.5V
- Adjustable Output Voltage: 0.6V to 4.2V
- 1A Maximum Load Capability for $V_{IN} \geq 3.2V$, $V_{OUT} = 3.6V$
- 2.4 MHz (typ.) Switching Frequency
- Seamless Buck-Boost Mode Transition
- Fast Output Voltage Transition: 0.8V to 4.0V in 20 μs
- High-Efficiency: 95% typ. at 3.7V_{IN}, 3.5V_{OUT}, at 300 mA

- Cycle-by-cycle Over-Current Limit
- Output Over-Voltage Clamp
- Internal Compensation
- 12-bump micro SMD Package

APPLICATIONS

- Battery-Powered 3G/4G RF Power Amplifiers
- Cellular Phones
- Portable Hard Disk Drives
- PDAs

DESCRIPTION

The LM3209-G3 is buck-boost DC/DC converter designed to generate output voltages above or below a given input voltage. It is particularly suitable for single cell Li-ion batteries for portable applications.

The LM3209-G3 operates at a 2.4 MHz typical switching frequency in full synchronous operation providing seamless transitions between buck and boost operating modes.

The power converter topology needs only one external inductor and two capacitors. Five internal power switches enable high overall efficiency.

The LM3209-G3 is internally compensated for buck and boost modes of operation thus providing an optimal transient response.

The LM3209-G3 is available in an 12-bump lead-free micro SMD package of size 2.0 mm x 2.5 mm x 0.6 mm.

Notice: This document is not a full datasheet. For more information regarding this product or to order samples, please contact your local National Semiconductor/Texas Instruments sales office.



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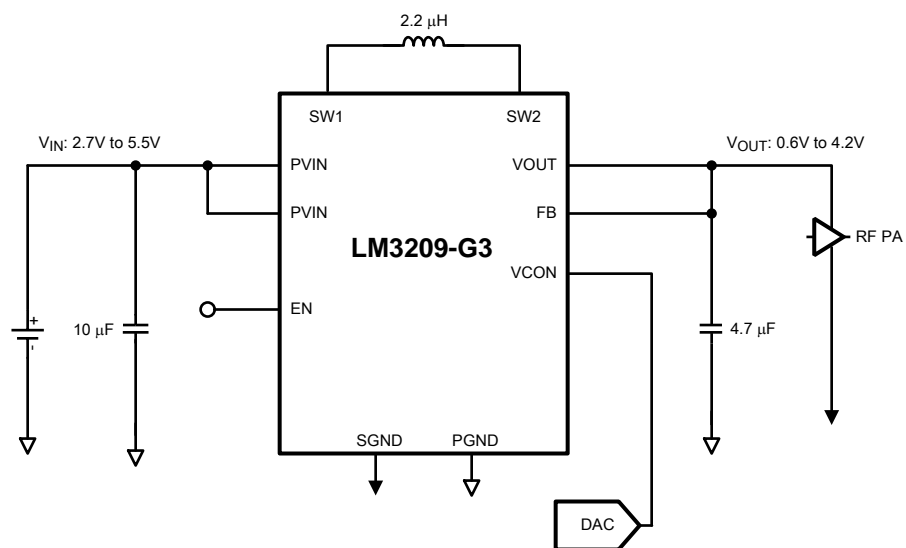
PRODUCTION DATA information is current as of publication date. Products conform to specifications per the terms of the Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.

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These devices have limited built-in ESD protection. The leads should be shorted together or the device placed in conductive foam during storage or handling to prevent electrostatic damage to the MOS gates.

Typical Application Circuit



PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish	MSL Peak Temp (3)	Samples (Requires Login)
LM3209TLE-G3/NOPB	ACTIVE	DSBGA	YZR	12	250	Green (RoHS & no Sb/Br)	SNAGCU	Level-1-260C-UNLIM	
LM3209TLX-G3/NOPB	ACTIVE	DSBGA	YZR	12	3000	Green (RoHS & no Sb/Br)	SNAGCU	Level-1-260C-UNLIM	

(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.

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TAPE AND REEL INFORMATION


*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
LM3209TLE-G3/NOPB	DSBGA	YZR	12	250	178.0	8.4	2.18	2.69	0.76	4.0	8.0	Q1
LM3209TLX-G3/NOPB	DSBGA	YZR	12	3000	178.0	8.4	2.18	2.69	0.76	4.0	8.0	Q1

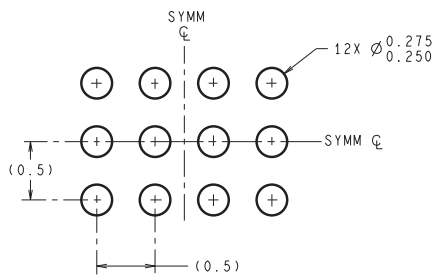
TAPE AND REEL BOX DIMENSIONS



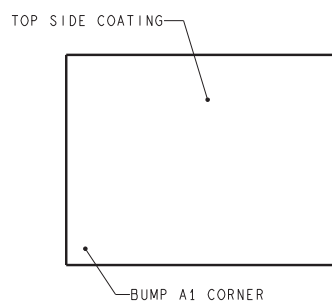
*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
LM3209TLE-G3/NOPB	DSBGA	YZR	12	250	203.0	190.0	41.0
LM3209TLX-G3/NOPB	DSBGA	YZR	12	3000	206.0	191.0	90.0

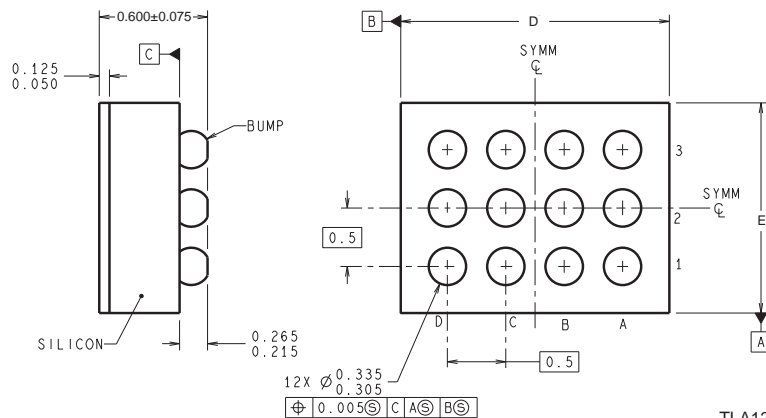
YZR0012



LAND PATTERN RECOMMENDATION



DIMENSIONS ARE IN MILLIMETERS
 DIMENSIONS IN () FOR REFERENCE ONLY



TLA12XXX (Rev C)

D: Max = 2.549 mm, Min = 2.449 mm

E: Max = 2.042 mm, Min = 1.941 mm

4215049/A 12/12

NOTES: A. All linear dimensions are in millimeters. Dimensioning and tolerancing per ASME Y14.5M-1994.
 B. This drawing is subject to change without notice.

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