LM3212 PRODUCT BRIEF Step-Down DC-DC Converter with Analog Bypass Mode for RF Power Amplifiers

Check for Samples: LM3212

FEATURES

- **1.6 MHz (typ.) PWM Switching Frequency**
- **ACB reduces inductor requirements and size**
- **Operates from a single Li-Ion cell (2.7V to 5.5V)**
- **Dynamically Adjustable Output Voltage (0.5V to 3.4V)**
- **2.5A Maximum Load Current**
- **Analog bypass function with low bypass resistance (33 mΩ typ.)**
- **High Efficiency to 95% with Internal Synchronous Rectification**
- **16-bump micro SMD Package**
- **Current Overload Protection**
- **Thermal Overload Protection**

APPLICATIONS

- **Battery-Powered 2G/3G/4G RF Power Amplifiers**
- **Hand-Held Radios**
- **RF PC Cards**

DESCRIPTION

The LM3212 is a DC-DC converter optimized for powering GSM RF power amplifiers (PAs) from a single Lithium-Ion cell; however, it may also be used in other applications. The LM3212 steps down an input voltage from 2.7V to 5.5V to a dynamically adjustable output voltage of 0.5V to 3.4V. The output voltage is set through a VCON analog input that adjusts the output voltage to ensure efficient operation at all power levels of the RF PA.

The LM3212 has a unique Active Current Bypass (ACB) feature that speeds up output voltage transition times, provides extra drive and a low-resistance analog bypass. The LM3212 has an AUTO_BY pin to force the LM3212 into bypass mode during low input voltage operation, thus overriding the automatic analog bypass feature. Forced bypass can also be achieved by setting VCON > VIN/2.5.

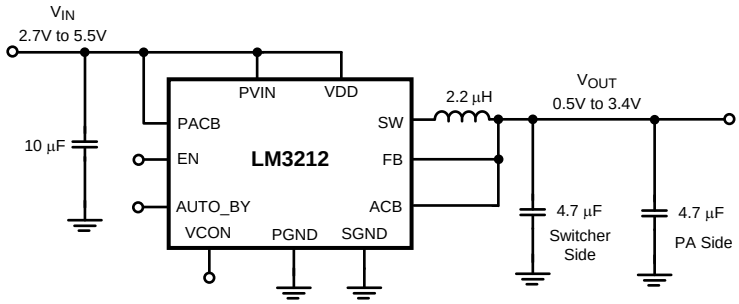
In addition, the LM3212 offers a fixed-frequency PWM mode to minimize RF interference and a shutdown mode to turn the device off and reduce battery consumption to 0.02 µA (typ.).

The LM3212 is available in a 16-bump lead-free micro SMD package. A 1.6 MHz switching frequency allows use of tiny surface-mount components for the required inductor and two ceramic capacitors.

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

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



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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)
LM3212TL/NOPB	ACTIVE	DSBGA	YZR	16	250	Green (RoHS & no Sb/Br)	SNAGCU	Level-1-260C-UNLIM	
LM3212TLX/NOPB	ACTIVE	DSBGA	YZR	16	3000	Green (RoHS & no Sb/Br)	SNAGCU	Level-1-260C-UNLIM	

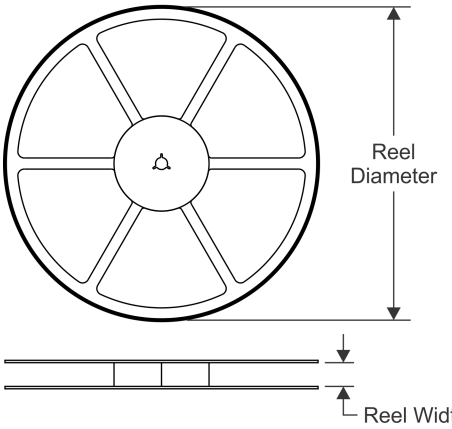
(1) The marketing status values are defined as follows:
ACTIVE: Product device recommended for new designs.
LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.
NRND: Not recommended for new designs. Device is in production to support existing customers, 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)

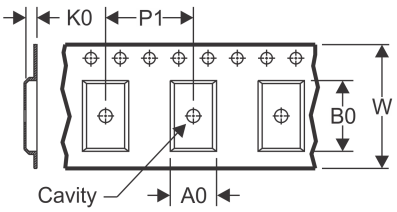
(3) MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

TAPE AND REEL INFORMATION

REEL DIMENSIONS

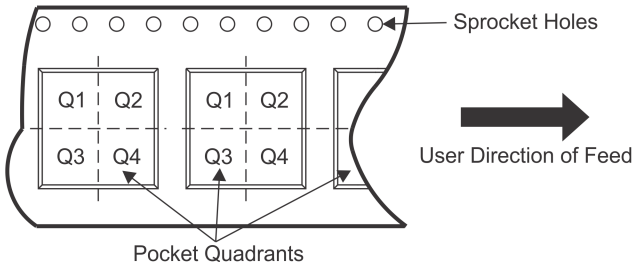


TAPE DIMENSIONS



A0	Dimension designed to accommodate the component width
B0	Dimension designed to accommodate the component length
K0	Dimension designed to accommodate the component thickness
W	Overall width of the carrier tape
P1	Pitch between successive cavity centers

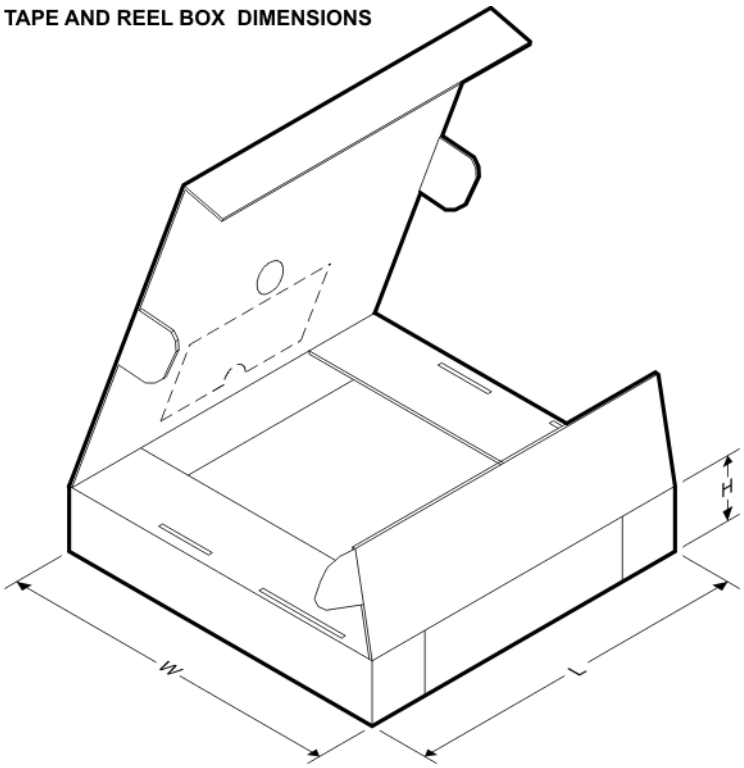
QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



*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
LM3212TL/NOPB	DSBGA	YZR	16	250	178.0	8.4	2.43	2.48	0.75	4.0	8.0	Q1
LM3212TLX/NOPB	DSBGA	YZR	16	3000	178.0	8.4	2.43	2.48	0.75	4.0	8.0	Q1

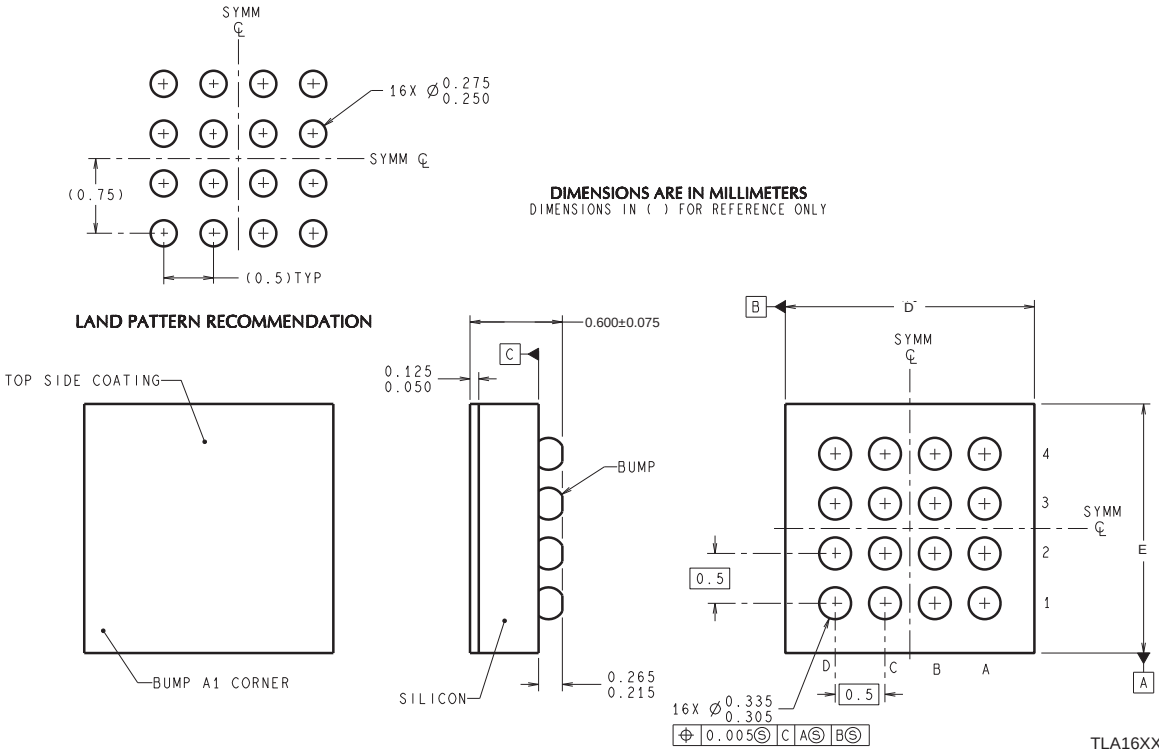
TAPE AND REEL BOX DIMENSIONS



*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
LM3212TL/NOPB	DSBGA	YZR	16	250	203.0	190.0	41.0
LM3212TLX/NOPB	DSBGA	YZR	16	3000	206.0	191.0	90.0

YZR0016



D: Max = 2.346 mm, Min =2.246 mm

E: Max = 2.246 mm, Min =2.145 mm

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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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