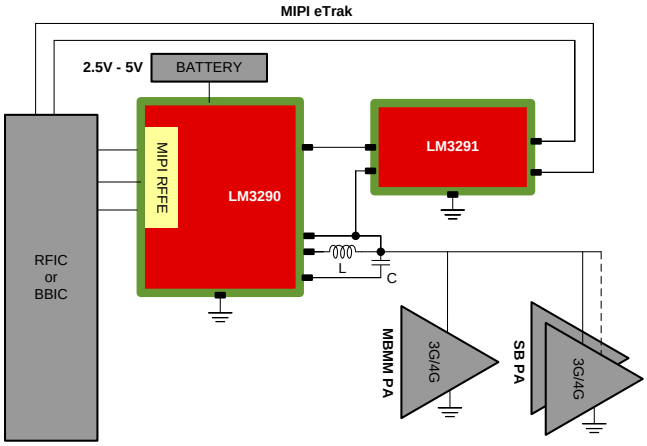
LM3291 Product Brief

FEATURES

- **Highly Programmable High-Current Linear Amplifier**
- **> 75 MHz Typical Small Signal Bandwidth**
- **Extremely Low Output Impedance**
- **High Linearity**
- **Differential Analog Input Compatible with eTrak 1.0 Standard**
- **Low Output Noise**
- **When paired with the LM3290 provides a complete Envelope Modulator solution for 3G/4G Envelope Tracking Power Amplifiers.**
- **Automatically controlled through LM3290 in an envelope modulation solution using MIPI® RFFE 1.1-compatible interface.**

APPLICATIONS

- **3G/LTE Handsets**
- **3G//LTE Tablets**
- **3G/LTE Data Cards and Wireless Modems**



DESCRIPTION

The LM3291 is a high-speed linear amplifier that, with its companion IC LM3290, constitutes an RF Envelope Modulator (EM) for supplying 3G/4G Power Amplifiers (PA) in envelope tracking systems. The amplifier provides extremely low output impedance and low output noise over a wide bandwidth.

In conjunction with an Envelope Tracking (ET) capable RFIC and PA, the LM3291 and LM3290 greatly improve PA efficiency for 3G and LTE operation.

In ET mode, the LM3291 and LM3290 provide envelope tracking supply voltage for the PA maximizing total EM + PA efficiency. The envelope modulator follows the differential envelope reference input signal delivered by the RFIC to the LM3291. The output is a single-ended dynamic power supply voltage to the PA.

The LM3291 supports 3G and LTE operation up to 20 MHz signal bandwidth.

The LM3291's programmable parameters are controlled by LM3290 via a direct serial interface between the two devices. No additional controls are needed in the system. This interface provides flexible control and adjustment options to optimize LM3291 efficiency and noise performance for various frequency bands and power levels.

At high TX output power, the EM can be operated in ET mode where LM3290 and LM3291 together modulate the supply of the PA with the envelope signal to improve overall system efficiency. At low TX output power, the EM can be transitioned to Average Power Tracking (APT) mode where LM3291 is placed into shutdown mode to improve system efficiency.

The LM3291 is available in a 12-pin lead-free DSBGA package.

For the full datasheet, samples, or the EVM hardware and software please contact a TI representative at ET@list.ti.com.

PACKAGING INFORMATION

Orderable part number	Status (1)	Material type (2)	Package | Pins	Package qty | Carrier	RoHS (3)	Lead finish/ Ball material (4)	MSL rating/ Peak reflow (5)	Op temp (°C)	Part marking (6)
LM3291TME/NOPB	NRND	Production	DSBGA (YFQ) | 12	250 | SMALL T&R	Yes	SNAGCU	Level-1-260C-UNLIM	-30 to 85	AE
LM3291TME/NOPB.A	NRND	Production	DSBGA (YFQ) | 12	250 | SMALL T&R	Yes	SNAGCU	Level-1-260C-UNLIM	-30 to 85	AE

(1) **Status:** For more details on status, see our product life cycle.

(2) **Material type:** When designated, preproduction parts are prototypes/experimental devices, and are not yet approved or released for full production. Testing and final process, including without limitation quality assurance, reliability performance testing, and/or process qualification, may not yet be complete, and this item is subject to further changes or possible discontinuation. If available for ordering, purchases will be subject to an additional waiver at checkout, and are intended for early internal evaluation purposes only. These items are sold without warranties of any kind.

(3) **RoHS values:** Yes, No, RoHS Exempt. See the TI RoHS Statement for additional information and value definition.

(4) **Lead finish/Ball material:** Parts may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead finish/Ball material values may wrap to two lines if the finish value exceeds the maximum column width.

(5) **MSL rating/Peak reflow:** The moisture sensitivity level ratings and peak solder (reflow) temperatures. In the event that a part has multiple moisture sensitivity ratings, only the lowest level per JEDEC standards is shown. Refer to the shipping label for the actual reflow temperature that will be used to mount the part to the printed circuit board.

(6) **Part marking:** There may be an additional marking, which relates to the logo, the lot trace code information, or the environmental category of the part.

Multiple part markings will be inside parentheses. Only one part marking contained in parentheses and separated by a "~" will appear on a part. If a line is indented then it is a continuation of the previous line and the two combined represent the entire part marking for that device.

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