



# THE DATASHEET OF LMV243BLEVAL



## **AN-1805 LMV243 Single-Channel, Quad-Band GSM Power Controller Evaluation Board**

---

---

---

### **1 General Description**

This board can be used to evaluate the Texas Instruments LMV243 Single-Channel, Quad-Band GSM Power Controller. The device is intended for use within an RF transmit power control loop in GSM mobile phones and supports GaAs HBT and bipolar RF single supply power amplifiers (PA's). The key value is its immunity to changes in the PA gain control function. It contains a 50 dB logarithmic amplifier detector and interfaces directly with the directional coupler. The operating frequency range of the device is from 450 MHz to 2 GHz .

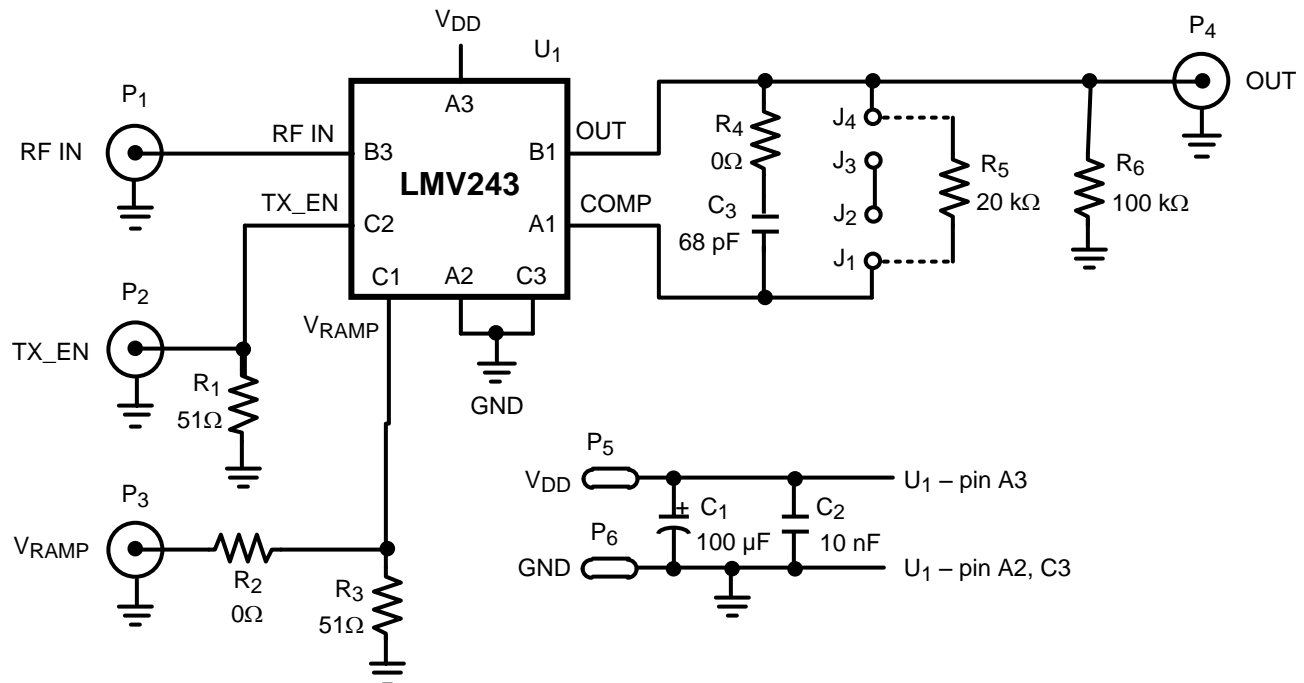
### **2 Basic Operation**

The LMV243 RF power controller provides an accurate temperature compensated DC output voltage (with a negative slope) that relates linearly to the applied RF input power in dBm. To evaluate the LMV243 in a simple straight forward way, the control loop is formed by the LMV243 and resistor  $R_5$  instead of LMV243, PA, and a directional coupler. In an actual closed loop TX control system, including a PA, resistor  $R_5$  should be removed. In an open loop measurement configuration the output voltage ramps down with increasing input power from a maximum voltage defined by  $V_{RAMP}$ . This maximum output voltage equals  $V_{OUT} = V_{RAMP} * R_5 / R_{RAMP}$ , where  $1/R_{RAMP}$  is the transconductance defined in the datasheet.

The single supply voltage ranges from 2.7V to 3.3V and can be applied through connectors  $P_5$  and  $P_6$ . The input interface consists of the RF input ( $P_1$ ), a ramp voltage applied through  $P_3$  and a digital input TX\_EN ( $P_2$ ) to perform the function "Shutdown/Transmit Enable." The device will be active in the case TX\_EN = HI, otherwise, the device is in a low power consumption shutdown mode. During shutdown the output will be in high impedance mode (tristate). A single external RC combination is used to provide stable operations that accommodates individual PA characteristics. This is done with resistor  $R_4$  and capacitor  $C_3$ .

### 3 Schematic

The schematic of the evaluation board is shown in [Figure 1](#).



**Figure 1. Schematic of the Evaluation Board**

### 4 Bill of Materials

The Bill of Material (BOM) of the evaluation board is listed in [Table 1](#).

**Table 1. Bill of Materials of the Evaluation Board**

Designator	Description	Comment
C1	Case_D Capacitor	100 μF
C2	0603 Capacitor	10 nF
C3	0603 Capacitor	68 pF
P1	Connector	SMA
P2, P3, P4	Connector	BNC
P5, P6	Connector	Banana
R1, R3	0603 Resistor	51Ω
R2, R4	0603 Resistor	0Ω
R5	Axial Resistor	20 kΩ
R6	0603 Resistor	100 kΩ
U1	DSBGA	LMV243

## 5 Layout

The layout of the evaluation board is shown in [Figure 2](#).

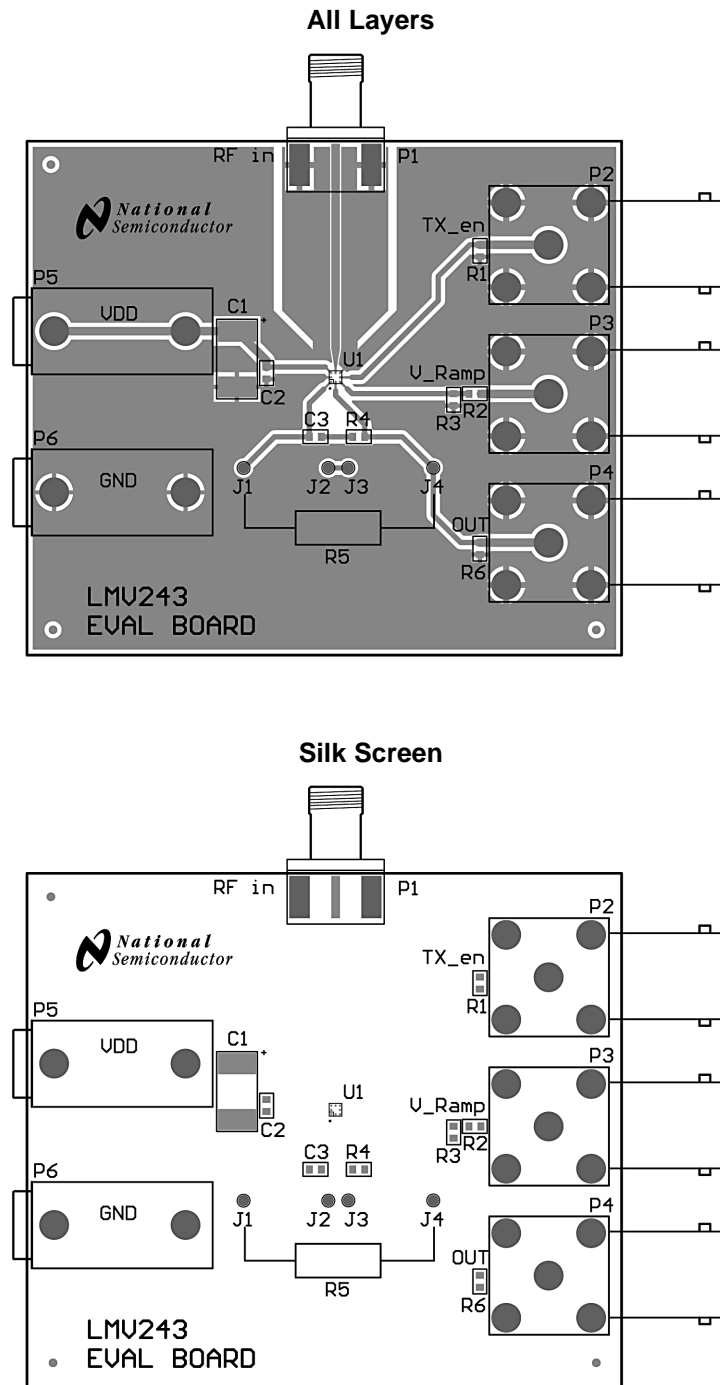
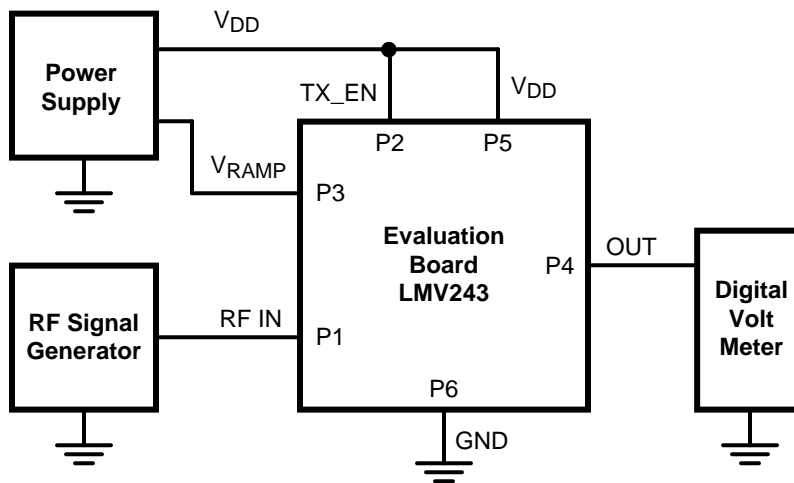


Figure 2. Layout of the Evaluation Board

## 6 Measurement Procedure

The performance of the LMV243 can be measured with the setup shown in [Figure 3](#).

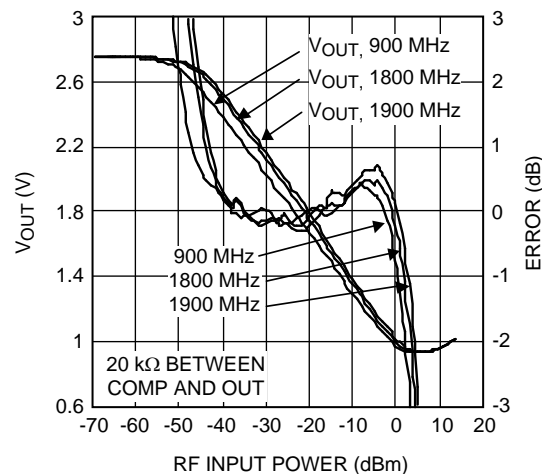
In this measurement example a supply voltage of 2.8V is applied by the power supply. The LMV243 is set in active mode by connecting TX\_EN (P<sub>2</sub>) to V<sub>DD</sub>, which is 2.8V. V<sub>RAMP</sub> is set to 1.4V. An RF signal is applied by the RF generator to connector P<sub>1</sub>. The RF power is swept from -70 dBm to +16 dBm. The resulting output voltage is measured with a multimeter connected to P<sub>4</sub>.



**Figure 3. Measurement Setup**

## 7 Measurement Results

[Figure 4](#) shows the output voltage and the log conformance error versus the applied RF power. The RF power is swept for three different frequencies.



**Figure 4. Frequency Response**

## IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, enhancements, improvements and other changes to its semiconductor products and services per JESD46, latest issue, and to discontinue any product or service per JESD48, latest issue. Buyers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All semiconductor products (also referred to herein as "components") are sold subject to TI's terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its components to the specifications applicable at the time of sale, in accordance with the warranty in TI's terms and conditions of sale of semiconductor products. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by applicable law, testing of all parameters of each component is not necessarily performed.

TI assumes no liability for applications assistance or the design of Buyers' products. Buyers are responsible for their products and applications using TI components. To minimize the risks associated with Buyers' products and applications, Buyers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any patent right, copyright, mask work right, or other intellectual property right relating to any combination, machine, or process in which TI components or services are used. Information published by TI regarding third-party products or services does not constitute a license to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of significant portions of TI information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. TI is not responsible or liable for such altered documentation. Information of third parties may be subject to additional restrictions.

Resale of TI components or services with statements different from or beyond the parameters stated by TI for that component or service voids all express and any implied warranties for the associated TI component or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

Buyer acknowledges and agrees that it is solely responsible for compliance with all legal, regulatory and safety-related requirements concerning its products, and any use of TI components in its applications, notwithstanding any applications-related information or support that may be provided by TI. Buyer represents and agrees that it has all the necessary expertise to create and implement safeguards which anticipate dangerous consequences of failures, monitor failures and their consequences, lessen the likelihood of failures that might cause harm and take appropriate remedial actions. Buyer will fully indemnify TI and its representatives against any damages arising out of the use of any TI components in safety-critical applications.

In some cases, TI components may be promoted specifically to facilitate safety-related applications. With such components, TI's goal is to help enable customers to design and create their own end-product solutions that meet applicable functional safety standards and requirements. Nonetheless, such components are subject to these terms.

No TI components are authorized for use in FDA Class III (or similar life-critical medical equipment) unless authorized officers of the parties have executed a special agreement specifically governing such use.

Only those TI components which TI has specifically designated as military grade or "enhanced plastic" are designed and intended for use in military/aerospace applications or environments. Buyer acknowledges and agrees that any military or aerospace use of TI components which have **not** been so designated is solely at the Buyer's risk, and that Buyer is solely responsible for compliance with all legal and regulatory requirements in connection with such use.

TI has specifically designated certain components as meeting ISO/TS16949 requirements, mainly for automotive use. In any case of use of non-designated products, TI will not be responsible for any failure to meet ISO/TS16949.

### Products

Audio	<a href="http://www.ti.com/audio">www.ti.com/audio</a>
Amplifiers	<a href="http://amplifier.ti.com">amplifier.ti.com</a>
Data Converters	<a href="http://dataconverter.ti.com">dataconverter.ti.com</a>
DLP® Products	<a href="http://www.dlp.com">www.dlp.com</a>
DSP	<a href="http://dsp.ti.com">dsp.ti.com</a>
Clocks and Timers	<a href="http://www.ti.com/clocks">www.ti.com/clocks</a>
Interface	<a href="http://interface.ti.com">interface.ti.com</a>
Logic	<a href="http://logic.ti.com">logic.ti.com</a>
Power Mgmt	<a href="http://power.ti.com">power.ti.com</a>
Microcontrollers	<a href="http://microcontroller.ti.com">microcontroller.ti.com</a>
RFID	<a href="http://www.ti-rfid.com">www.ti-rfid.com</a>
OMAP Applications Processors	<a href="http://www.ti.com/omap">www.ti.com/omap</a>
Wireless Connectivity	<a href="http://www.ti.com/wirelessconnectivity">www.ti.com/wirelessconnectivity</a>

### Applications

Automotive and Transportation	<a href="http://www.ti.com/automotive">www.ti.com/automotive</a>
Communications and Telecom	<a href="http://www.ti.com/communications">www.ti.com/communications</a>
Computers and Peripherals	<a href="http://www.ti.com/computers">www.ti.com/computers</a>
Consumer Electronics	<a href="http://www.ti.com/consumer-apps">www.ti.com/consumer-apps</a>
Energy and Lighting	<a href="http://www.ti.com/energy">www.ti.com/energy</a>
Industrial	<a href="http://www.ti.com/industrial">www.ti.com/industrial</a>
Medical	<a href="http://www.ti.com/medical">www.ti.com/medical</a>
Security	<a href="http://www.ti.com/security">www.ti.com/security</a>
Space, Avionics and Defense	<a href="http://www.ti.com/space-avionics-defense">www.ti.com/space-avionics-defense</a>
Video and Imaging	<a href="http://www.ti.com/video">www.ti.com/video</a>

### TI E2E Community

[e2e.ti.com](http://e2e.ti.com)

## Looking for pricing, stock, or lifecycle information?

Click below to explore more details on WIN SOURCE:

 [View LMV243BLEVAL](#) on WIN SOURCE

 [Texas Instruments](#) Information

## Optimize Your Supply Chain with WIN SOURCE Solutions

-  Global Sourcing Solution
-  Obsolete Management
-  Cost Control Management
-  Shortage Management
-  Alternative Solution
-  Excess Inventory Management