LM3242

Dynamic Output Voltage DC/DC Converter for 3G/4G RF Power Amplifiers

TEXAS INSTRUMENTS

Product Bulletin

DC/DC Switching Converter Significantly Reduces Battery Current Consumption and Power Dissipation for Longer Battery Life and Simplified Thermal Design of Handsets

Dynamically Adjustable Output Enables Huge Energy Savings

The biggest challenges for handset and tablet device design are maximizing battery life and managing heat — especially with increases in data driven usage. Both problems can be addressed by using a switching supply for power amplifier DC/DC converter from Texas Instruments.

Operation of the RF power amplifiers in 3G/4G portable devices accounts for a significant amount of the total power consumption — up to 30% or more when using high-speed uplink channels.

Traditionally, an RF power amplifier (PA) is connected directly to the fixed battery supply. With this approach, a significant amount of energy is dissipated in the PA, diminishing battery life and generating heat.

TI's LM3242 is an adaptive power supply designed to optimize the RF PA power consumption for all operating conditions. By minimizing energy waste, the LM3242 extends battery life and simplifies thermal design for 3G/4G portable devices.

Key Features

- Operates from a single Li-Ion cell (2.7 to 5.5V)
- Adjustable output voltage (0.4 to 3.6V) maximizes RF PA power savings
- 750 mA maximum load capability (up to 1A in bypass) increases performance reliability during transients
- 6 MHz (typ) PWM switching frequency minimizes inductor footprint
- High efficiency (95% typ)
- Automatic ECO/PWM/BP mode change for optimal operation during all load requirements and battery conditions
- Current and thermal overload protection
- Soft-start protection
- Small solution size
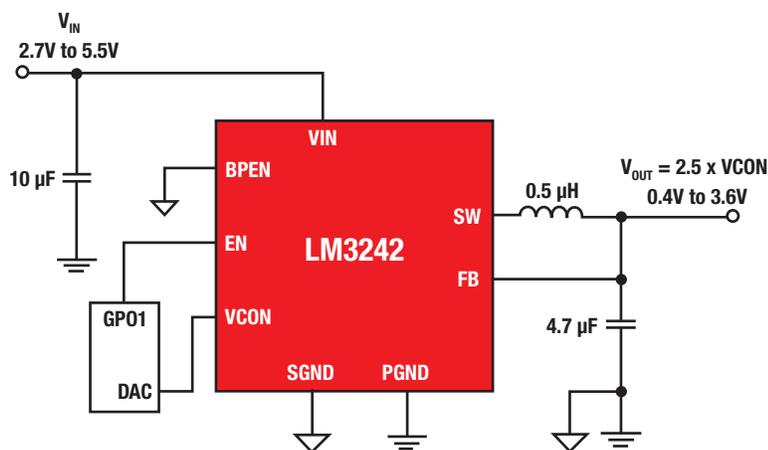
LM3242 application circuit with just three tiny surface mount components

LM3242 Designed Specifically for Powering RF Power Amplifiers

When compared to alternate solutions, the LM3242 provides several key benefits:

High Efficiency Extends Battery Life
- 20% – 50% less battery current consumption
- Extends talk/usage time
- Enables use of smaller battery

Reduced Heat Improves System Reliability and Simplifies Design
- Up to 30ºC reduction of worst case hot temperature
- Reduced heat transfer design requirements

Small Solution Size Saves Space and Cost
- Tiny microSMD package
- Only three small, surface mount components required
- High 6 MHz PWM switching frequency minimizes inductor footprint

Multiple Operation Modes Optimize Performance for All Output and Battery Conditions
- Automatic, seamless transition
- ECO, Sleep, and Shutdown modes save power during light loads
- Bypass mode supports high output power requirements, even at low battery
- High current capability supports worst case transients due to mismatch losses condition

LM3242 Drives Leading RFIC Platforms

The LM3242 has been qualified, designed in, and software supported by multiple Tier 1 RFIC reference design/platform suppliers. Product compatibility and performance is proven and trusted. TI has an extensive RF DC/DC portfolio that support 2G/3G/4G air standards.

LM3242 reduces PA heat by 30ºC at max RF power (28 dBm)
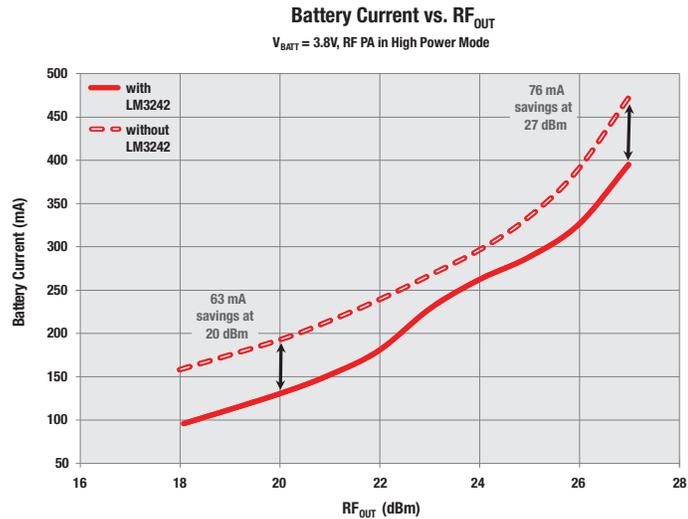
LM3242 extends battery life with dramatically reduced current consumption
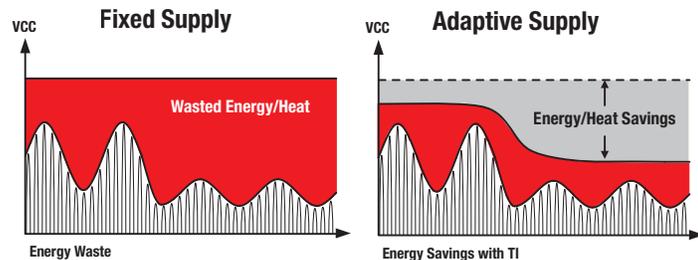
Energy waste reduction with TI adaptive supply design

Visit www.ti.com/supply_for_rfpa for more information.

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