

**PRODUCT SUMMARY**

# Q845: Ultra-Fast Boosting Power Supply for 3G/4G/LTE PA Envelope Tracking

**Applications**

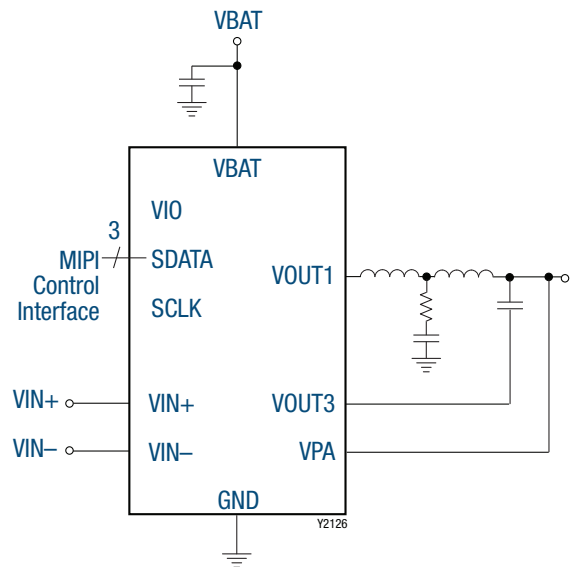
- Smartphones, tablets, data cards, mobile hotspots, and other mobile devices that feature high-speed data
- R99, HSPA, HSPA+, LTE 5 MHz, 10 MHz, and 20 MHz

**Features**

- Ultra-fast low-noise power supply for 3G/4G/LTE ET PAs:
  - 85% ET efficiency for 4G/LTE, 93% APT efficiency
  - Supports up to LTE20 (100 RB)
  - No digital predistortion (DPD) required from 1 to 100 RB
  - Dynamic PA VCC voltage boost above VBAT
  - 20 nV/√Hz output noise floor
  - 2.7 V to 5.25 VDC input voltage range
- Flexible, low overhead, MIPI® digital and analog control:
  - MIPI RFFE digital interface compliant
  - MIPI eTrak analog control interface compliant
  - High-speed ET/APT transitions with only 1 RFFE write
- Cost-effective and low-area CSP package:
  - 2.43 mm x 1.79 mm x 0.61 mm, 24-pin package
  - 6 passive components for ET/APT
- Seven modes of operation:
  - ET, APT, Bypass, Standby, Sleep, Deep Sleep, Shutdown



Skyworks Green™ products are compliant with all applicable legislation and are halogen-free. For additional information, refer to *Skyworks Definition of Green™*, document number SQ04-0074.



**Figure 1. Functional Block Diagram of the Q845**

**Description**

The Q845 ultra-fast power supply is designed for envelope tracking (ET) for 3G/4G/LTE RF PAs. It also supports average power tracking (APT).

Using patented qBoost™ technology, the Q845 simultaneously combines the high efficiency of a switching power supply with the responsiveness and low noise of a linear power supply. An innovative combining network optimizes the blend of these supply technologies and also enables the Q845 to dynamically boost its output voltage above its input voltage to track modulation peaks.

With this approach, the Q845 provides an efficient PA supply voltage with a slew rate up to 100V/μs, continuously adjusting the PA supply voltage to precisely track the modulation envelope, thus maximizing PA efficiency and peak power. This performance is achieved while still meeting ACLR, EVM, and Receive Band noise specifications. Where APT is adequate in the mid-power range of the PA, the Q845 seamlessly transitions between ET and APT as needed. Figure 1 shows a functional block diagram.

## Ordering Information

Model Name	Manufacturing Part Number	Evaluation Board Part Number
Q845: Ultra-Fast Boosting Power Supply for 3G/4G/LTE PA Envelope Tracking	Q845 B3EBD-T	Q845EK1

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