

# **BQ5105XB Product Overview**

1A, High-Efficiency Qi v1.1-Compliant Wireless Power Receiver and Battery Charger

BQ51050B, BQ51051B

October 25, 2012

# New bq5105XB: Key Design Features for Engineers

1A, High-Efficiency Qi v1.1-Compliant Wireless Power Receiver and Battery Charger

## 1. **NEW !** Single-Stage Wireless Power Receiver & Li-Ion/Li-Pol Battery Charger

- Combines Wireless Power Receiver, Rectifier and Battery Charger in a Single Small Package
- 4.2V (bq51050B) and 4.35V (bq51051B) Output Voltage Options
- Supports up to 1.5A Charging Current
- 93% Peak AC-DC Charging Efficiency

## 2. Robust Architecture

- 20V Maximum Input Voltage Tolerance, with Input OV Protection Clamp
- Thermal Shutdown and Over Current Protection
- Temperature Monitoring and Fault Detection

## 3. Compatible with WPC v1.1 “Qi” Industry Standard

## 4. **NEW !** Power Stage Output Tracks Rectifier and Battery Voltage to Ensure Maximum Efficiency Across the Full Charge Cycle

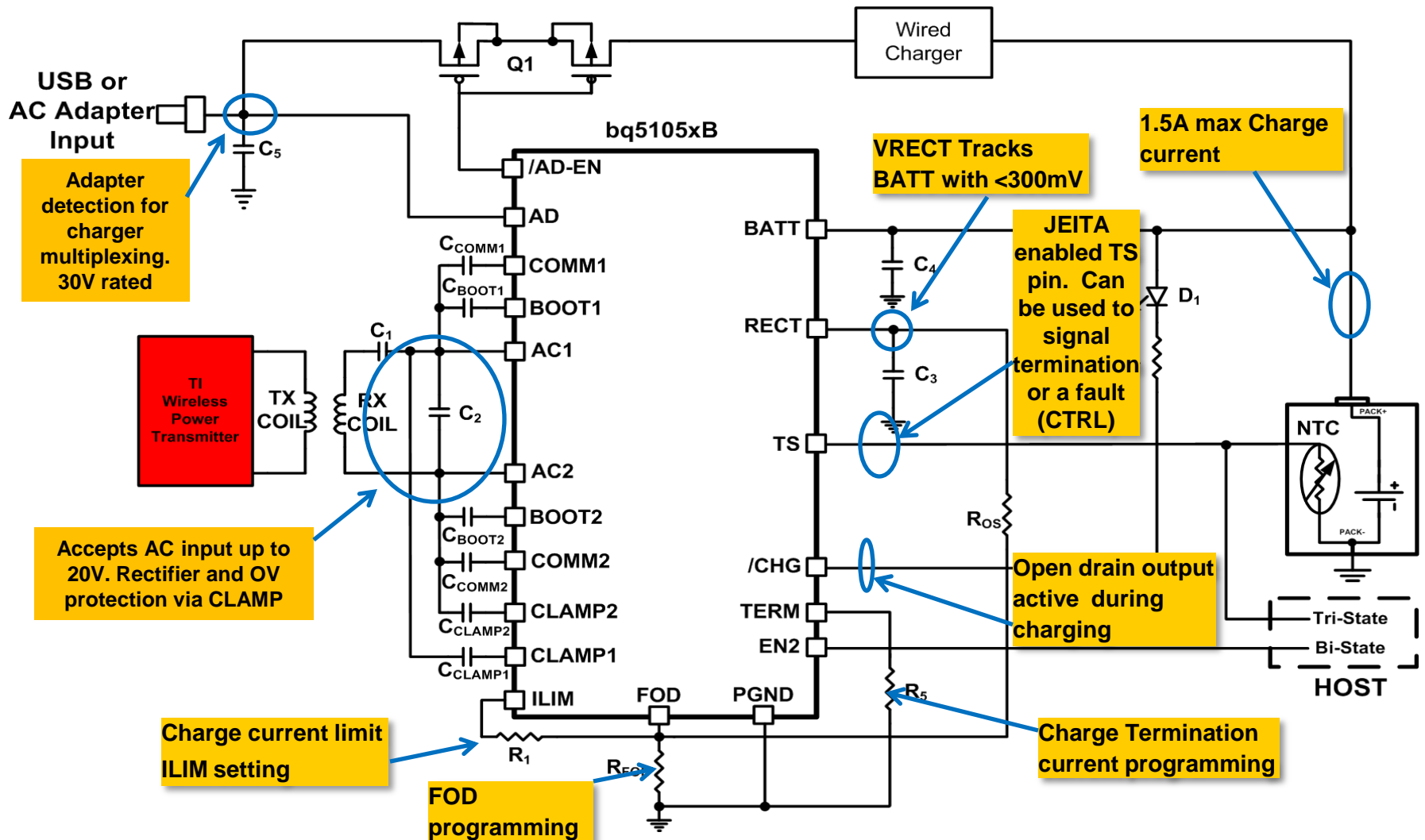
## 5. 1.9 x 3.0mm WCSP and 4.5 x 3.5mm QFN Package Options



bq51050BEVM-764

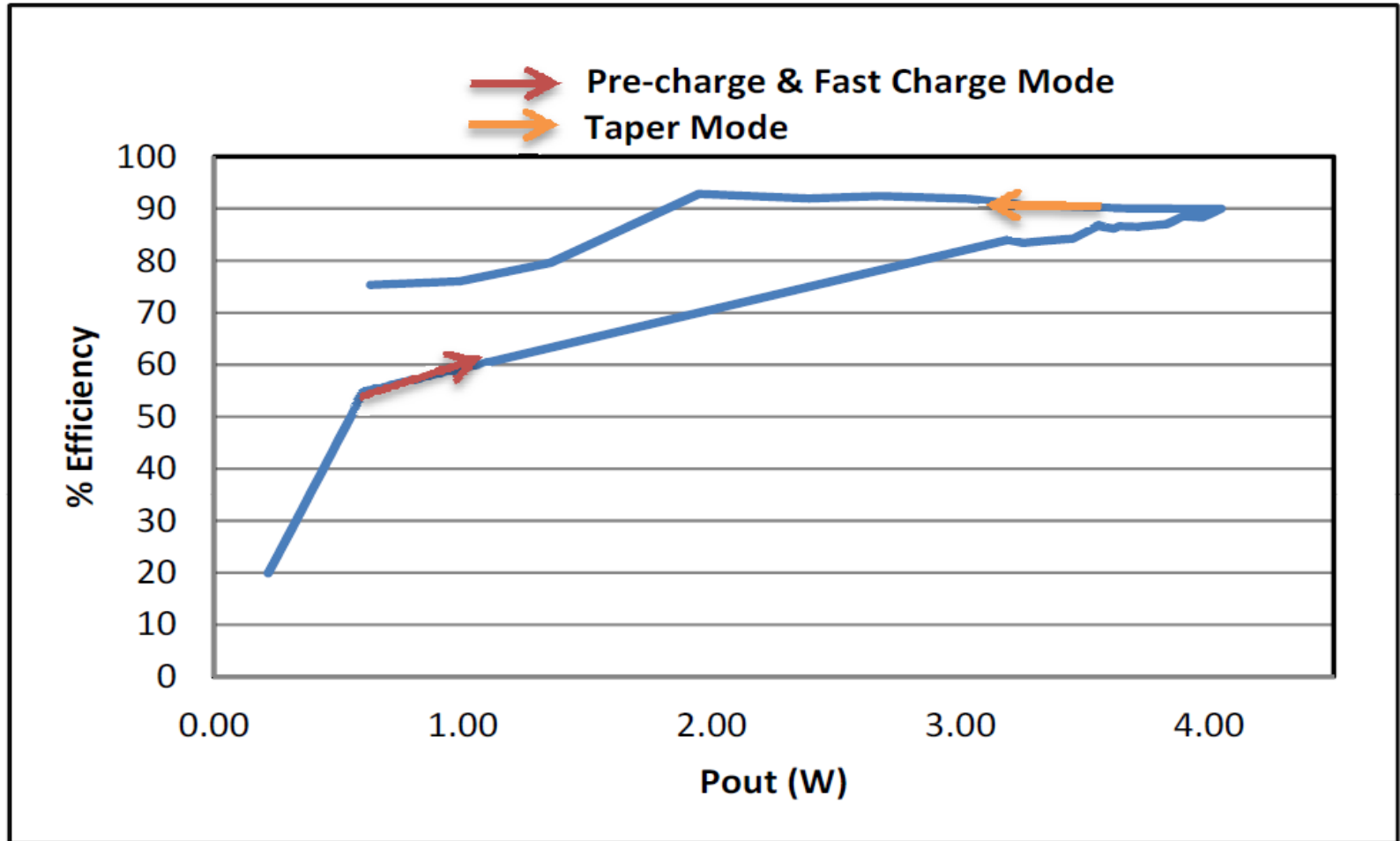
# New bq5105XB: Application Diagram

1A, High-Efficiency Qi v1.1-Compliant Wireless Power Receiver and Battery Charger



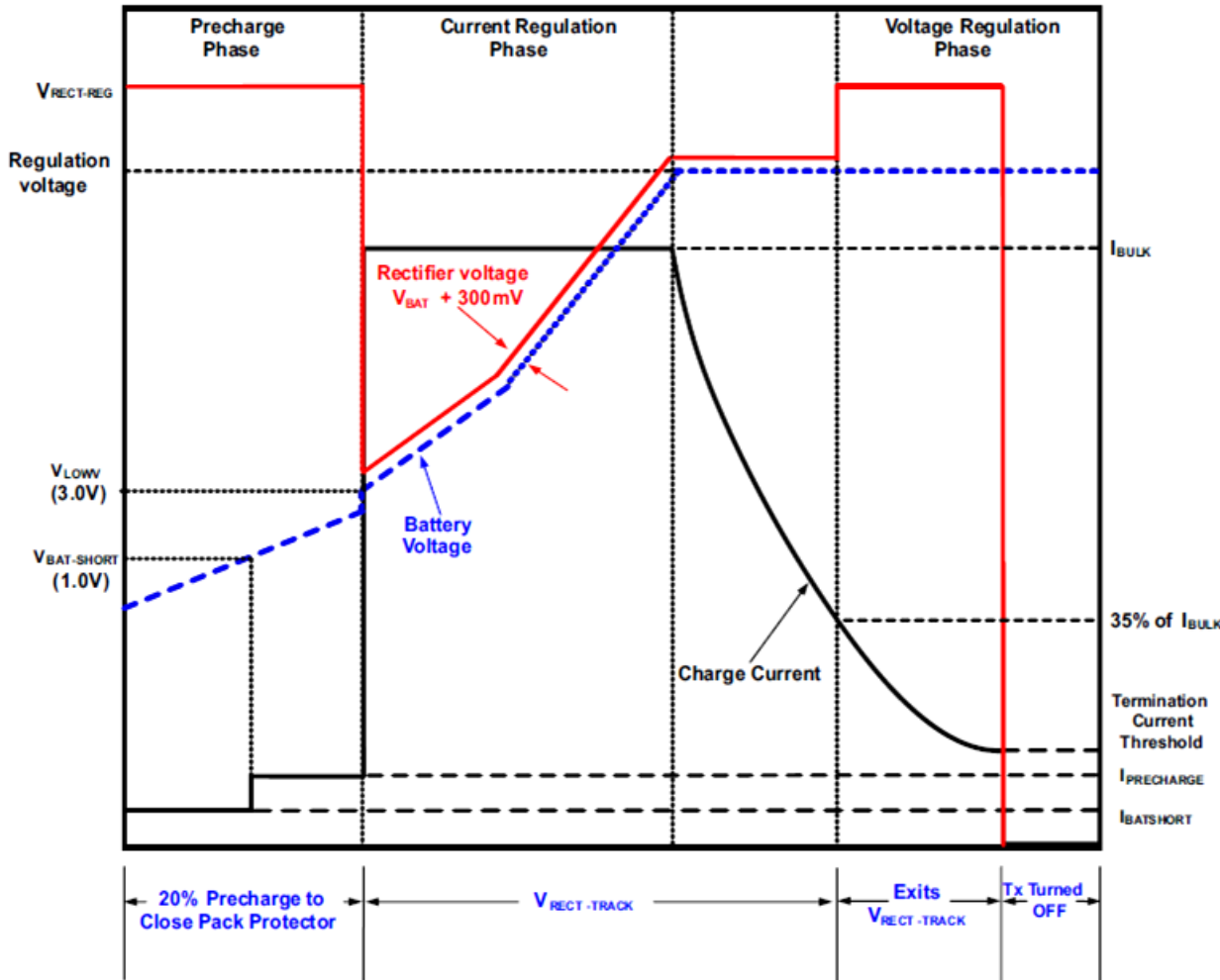
# New bq5105XB: Efficiency

1A, High-Efficiency Qi v1.1-Compliant Wireless Power Receiver and Battery Charger



# New bq5105XB: Li-Ion Charging Profile

1A, High-Efficiency Qi v1.1-Compliant Wireless Power Receiver and Battery Charger



## Precharge Mode ( $V_{BAT} \leq V_{LOWV}$ )

The bq5105xB regulates charge current limit to 20% of the fast charge current ( $I_{BULK}$ ) setting.

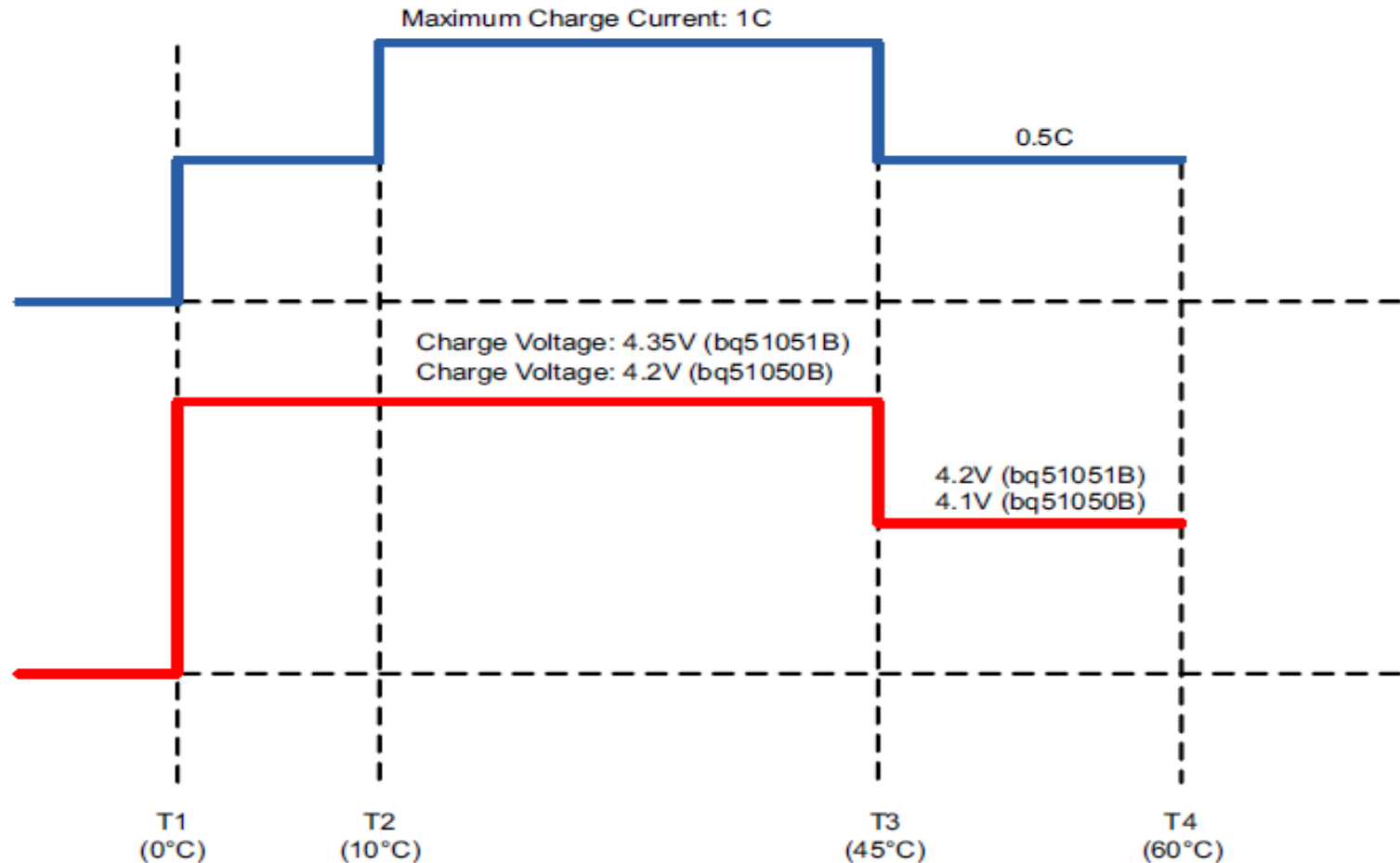
## Fast Charge Mode

bq5105xB sends the charge current ( $I_{BULK}$ ) which is regulated using the internal MOSFETs between RECT and BATT.

Later bq5105xB enters Constant voltage (CV) phase and regulates battery voltage to  $V_{BAT(REG)}$  and the charging current is reduced.

# New bq5105XB: Safety and JEITA Guidelines

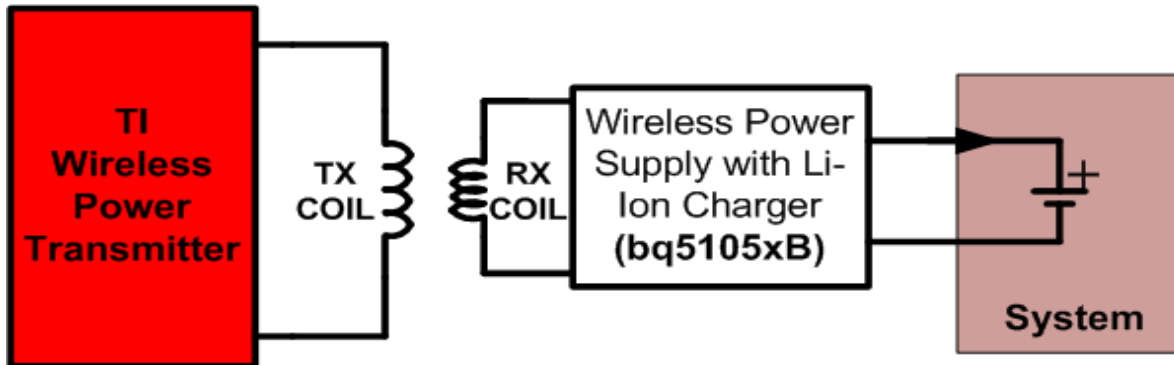
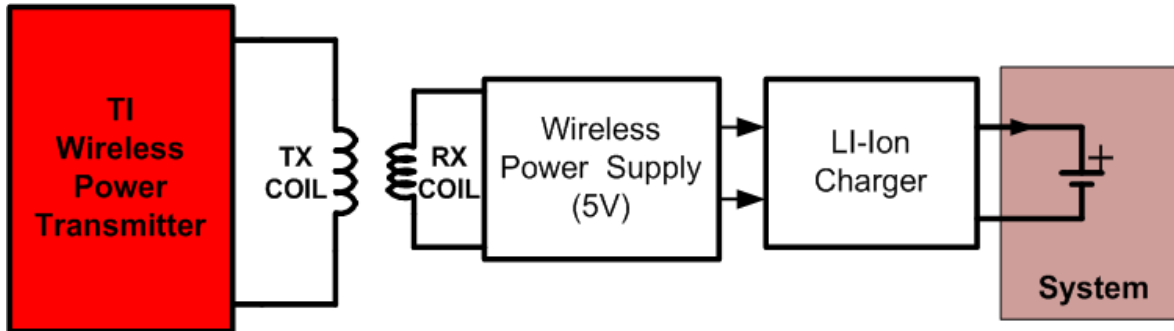
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# New bq5105XB: System Design Benefits

1A, High-Efficiency Qi v1.1-Compliant Wireless Power Receiver and Battery Charger

## System Design without bq5105xB



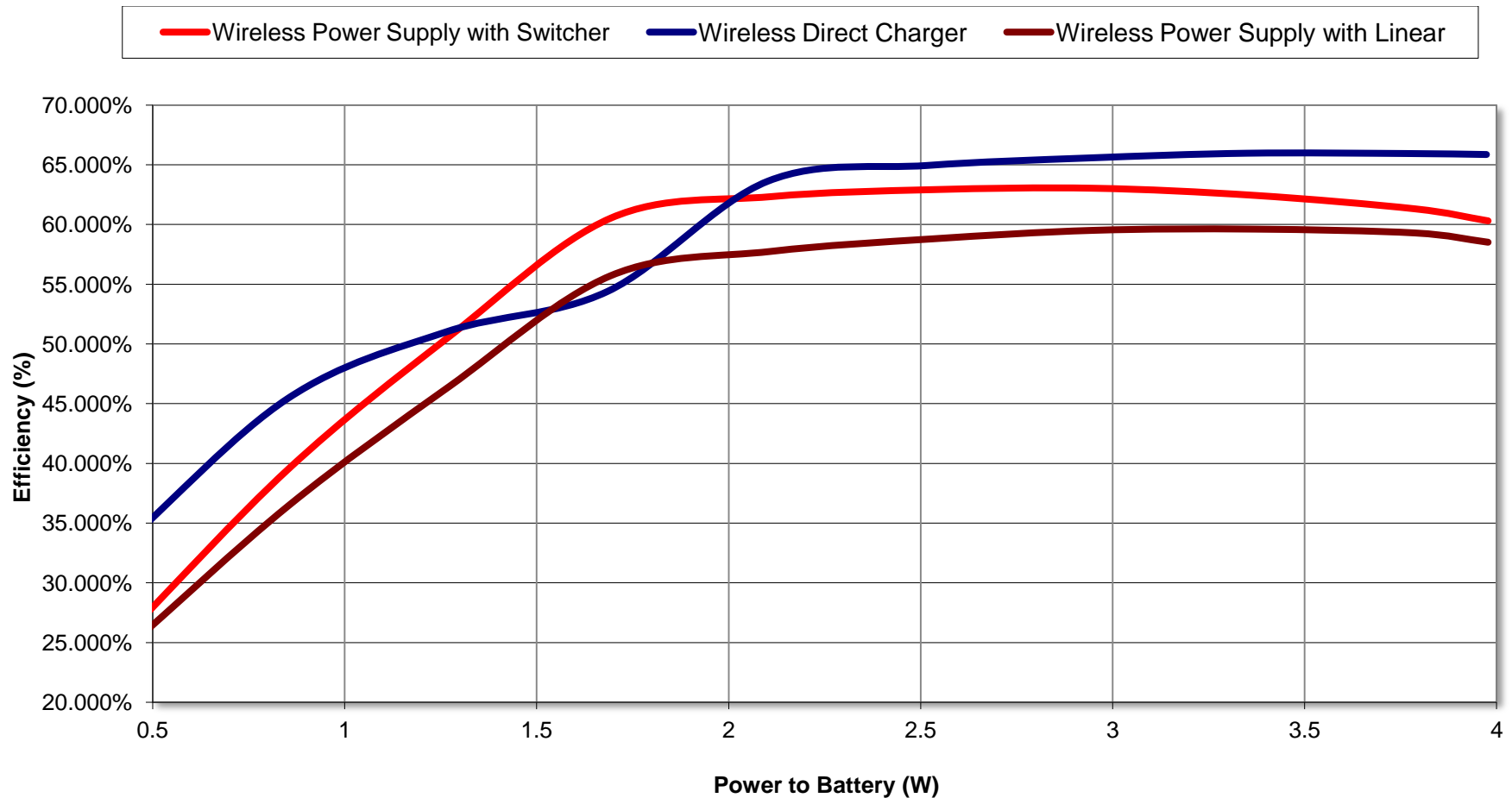
## System Design with bq5105xB

### TI Advantage:

- bq5105xB is the only IC (with few discrete) needed for complete wireless power Li-Ion charger
- bq5105xB based system offers Low part count, saves real estate on system board
- The single stage is more efficient
- The bq5105xB efficiency peaks about 93%.

# New bq5105XB: Provides Highest Efficiency

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# New bq5105XB: Competitive Comparisons

1A, High-Efficiency Qi v1.1-Compliant Wireless Power Receiver and Battery Charger

- Currently, there is no competition for bq5105XB.

## TI Advantages

1. **NEW !** Single-Stage Wireless Power Receiver & Li-Ion/Li-Pol Battery Charger
2. Robust Architecture
3. Compatible with WPC v1.1 “Qi” Industry Standard
4. **NEW !** Power Stage Output Tracks Rectifier and Battery Voltage to Ensure Maximum Efficiency Across the Full Charge Cycle
5. 1.9 x 3.0mm WCSP and 4.5 x 3.5mm QFN Package Options