TIDA-00591 Test Report

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Abstract

TI design TIDA-00591 is a single cell Li-Ion battery charger for single cell Li-Ion and Li-polymer batteries used in a wide range of tablets and other portable devices. It also supports adjustable voltage for USB OTG. The included application circuit illustrates how bq24298 can be easily implemented.

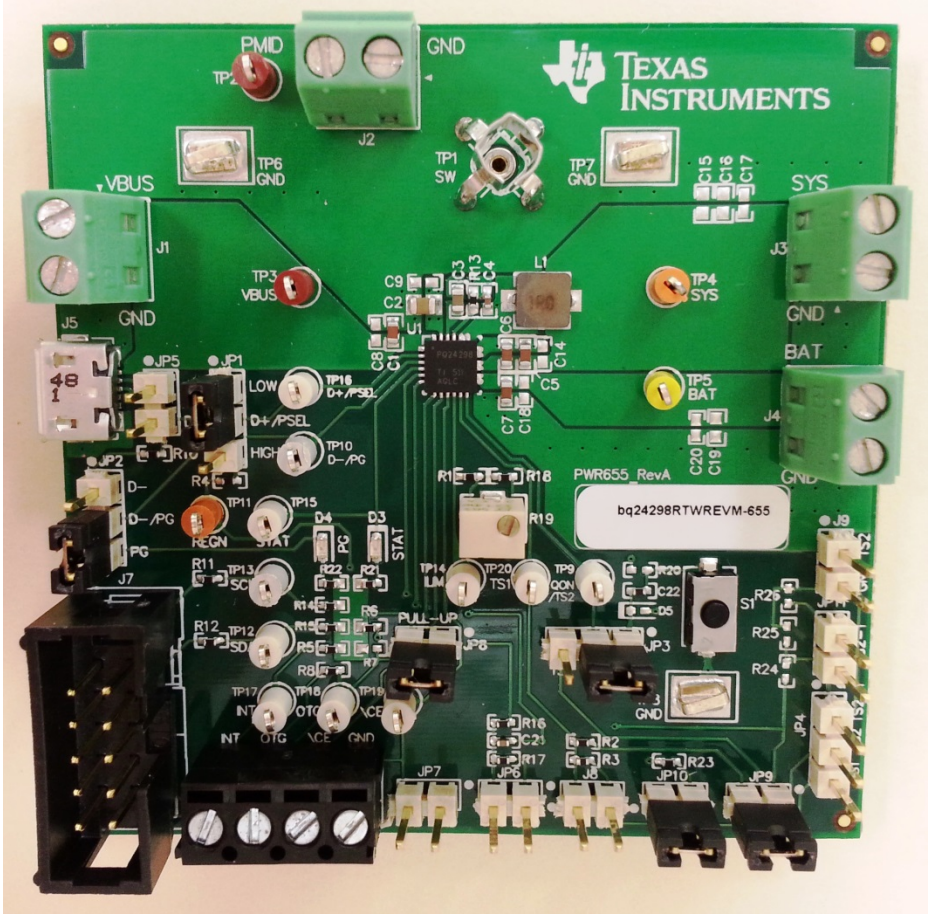

Figure 1. Board Photo

Document History

Version	Date	Author	Notes
1.0	05/21/2015	Ning Tang	First release

Bench Set up

- TIDA-00591 was tested on a bench setup using bq24298RTWREVM-655. The test equipment are as follows:
  - Oscilloscope: Tektronix DPO 4050
  - Passive Voltage Probes: Tektronix P6139A – 500 Mhz, 8 pF, 10 MΩ, 10x
  - Current Probe: Tektronix TCP202A Current Probe
  - Power Supply: HP 6654A DC, KEPCO BOP20-5D
  - Electronic Load: HP 6060B
  - Multi-meter: HP 34401A

Application Circuits

- The application circuit shown in Figure 2 illustrates the implementation of the single cell Li-Ion battery charger using bq24298.

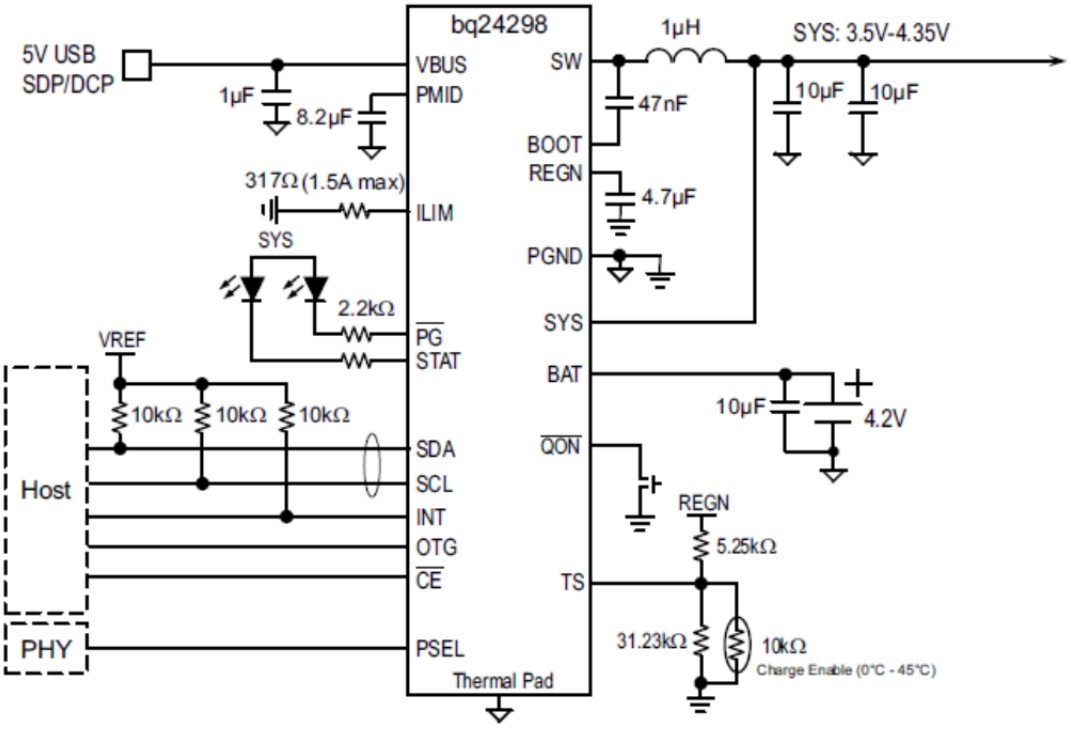

Figure 2. bq24298 Application Circuit

Efficiency

- Figure 3 shows the charging efficiency across the charge current range with the bq24298 at 25ºC.

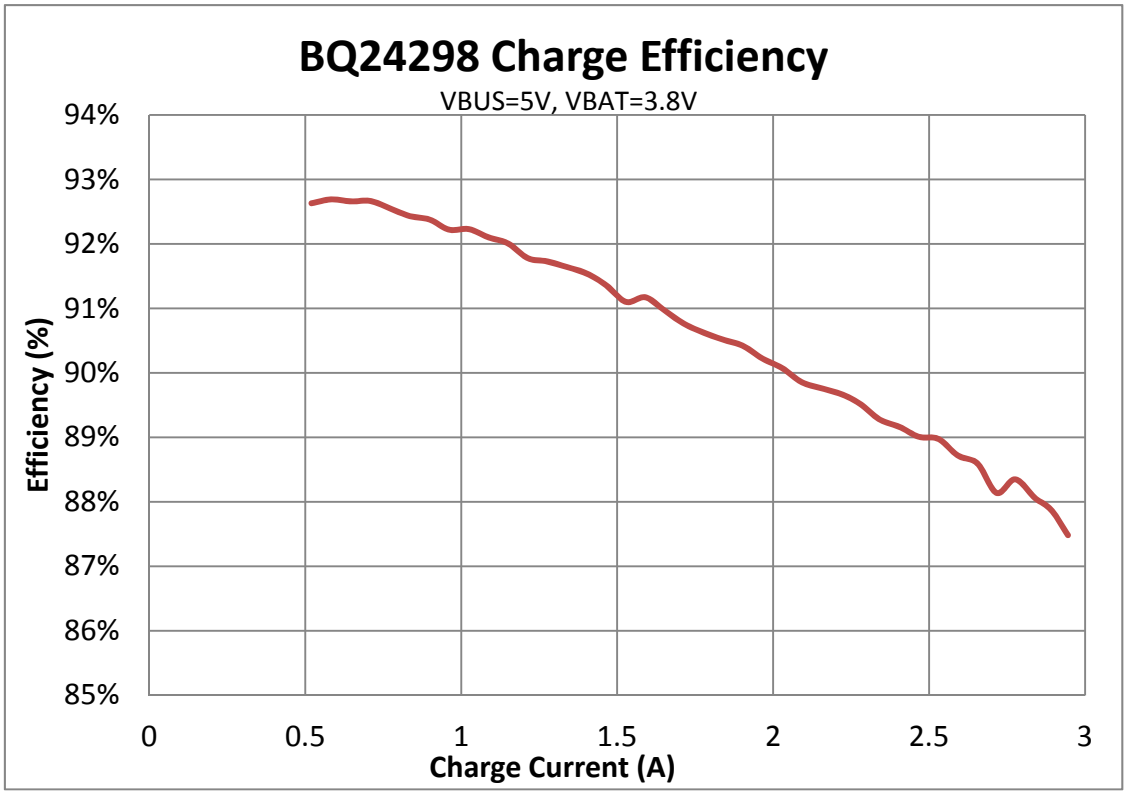

Figure 3. TIDA-00591 Charging Efficiency

- Figure 4 shows the system efficiency across the load current range with the bq24298 at 25ºC. At 3A load current, the overall system efficiency is greater than 89%.

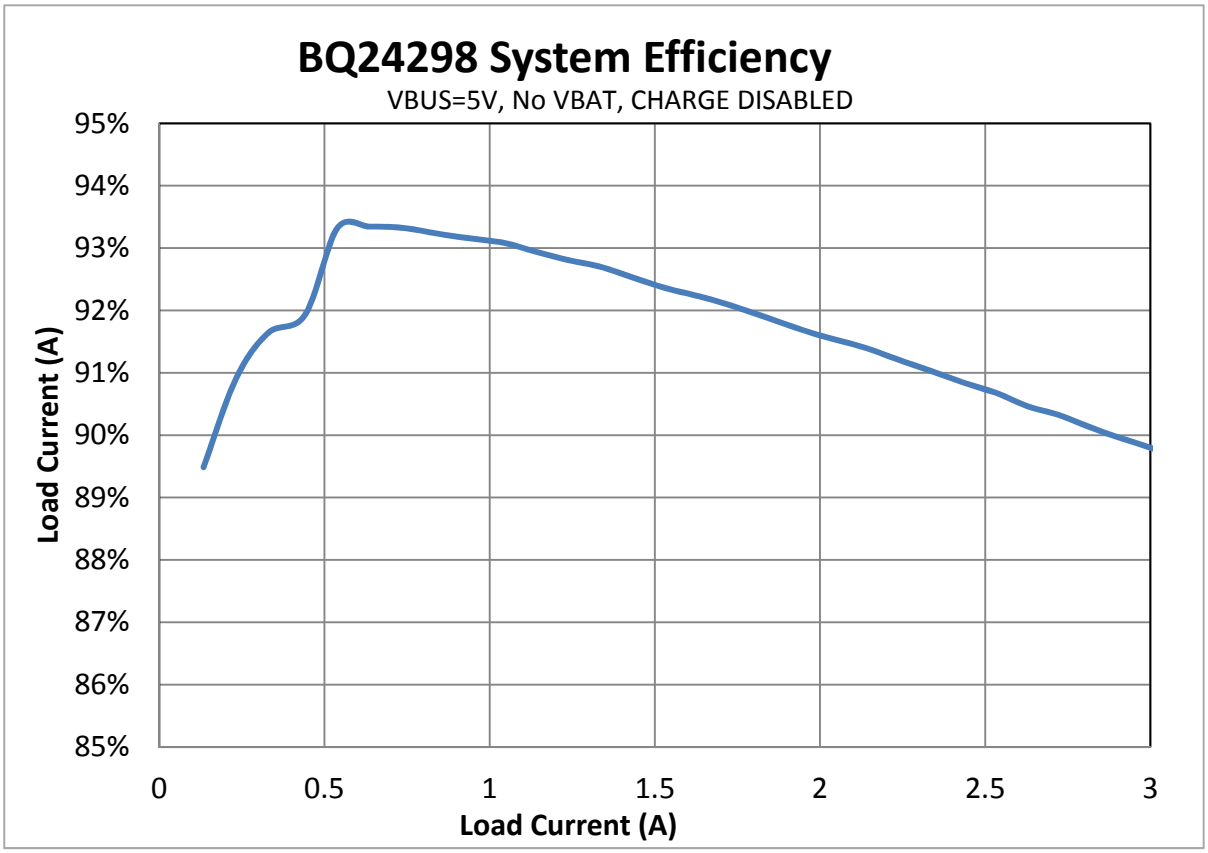

Figure 4. TIDA-00591 System Efficiency

Accuracy

- Figure 5 shows the charge current accuracy across the charge current settings with the bq24298 at 25ºC.

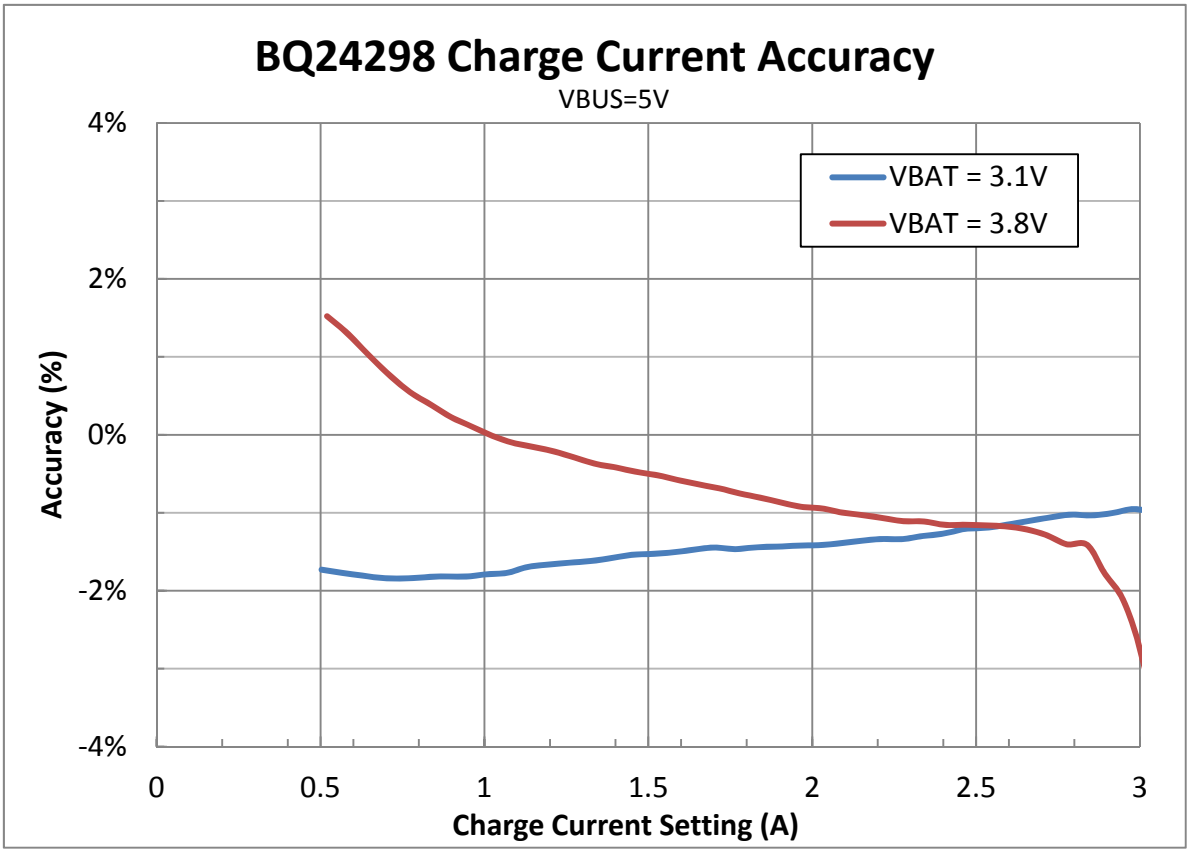

Figure 5. TIDA-00591 Charge Current Accuracy

- Figure 6 shows the input current accuracy across the input current settings with the bq24298 at 25ºC.

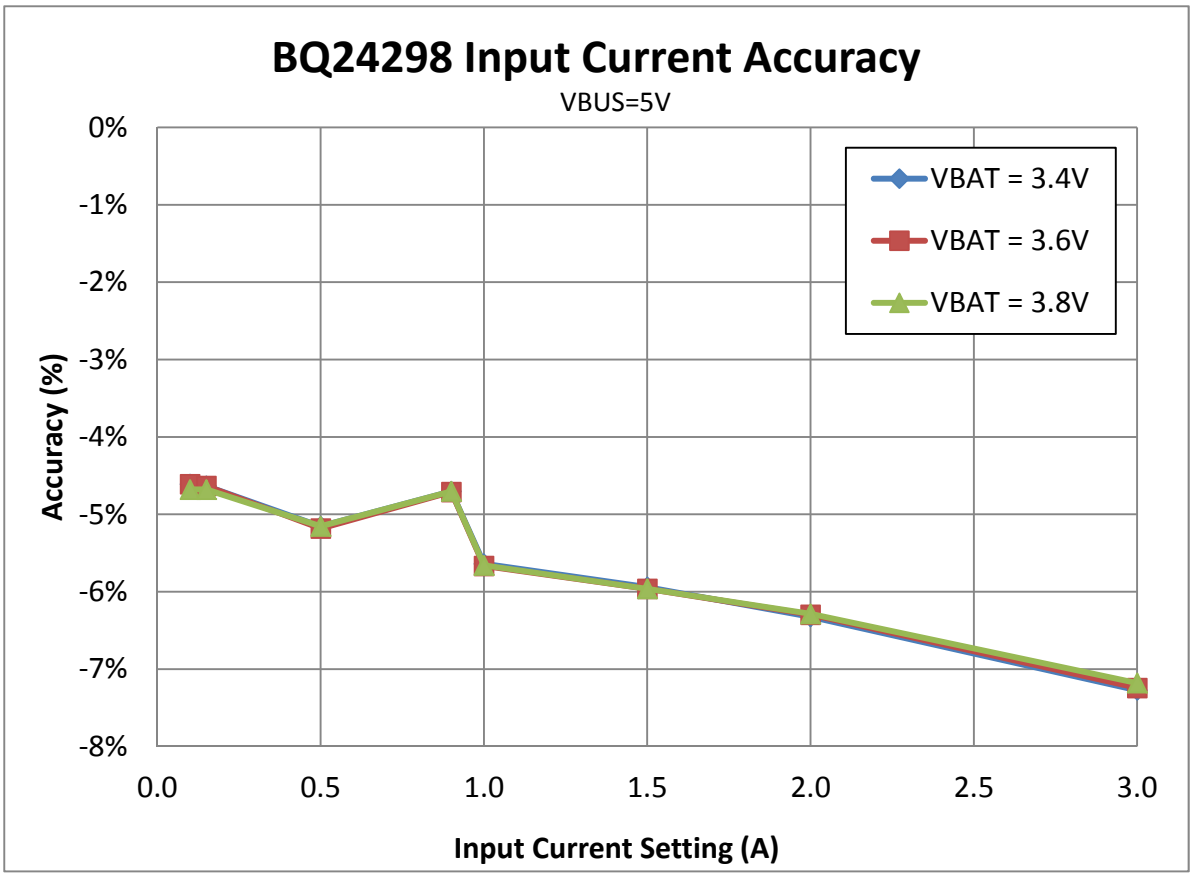

Figure 6. TIDA-00591 Input Current Accuracy

/QON Functions

- BATFET System Reset

When /QON is driven to logic low by at least t_{QON_RST} 12.5s typically while VBUS is not plugged in and BATFET_DISABLE = 0, the BATFET is turned off for t_{BATFET_RST} which is usually between 250ms and 400ms. The BATFET is re-enabled after t_{BATFET_RST} duration. This function allows systems connected to SYS to have power-on-reset. This function can be disabled by setting BATFET_RST_EN bit to 0.

Figure 7 shows the BATFET system reset function with the bq24298 at 25ºC.

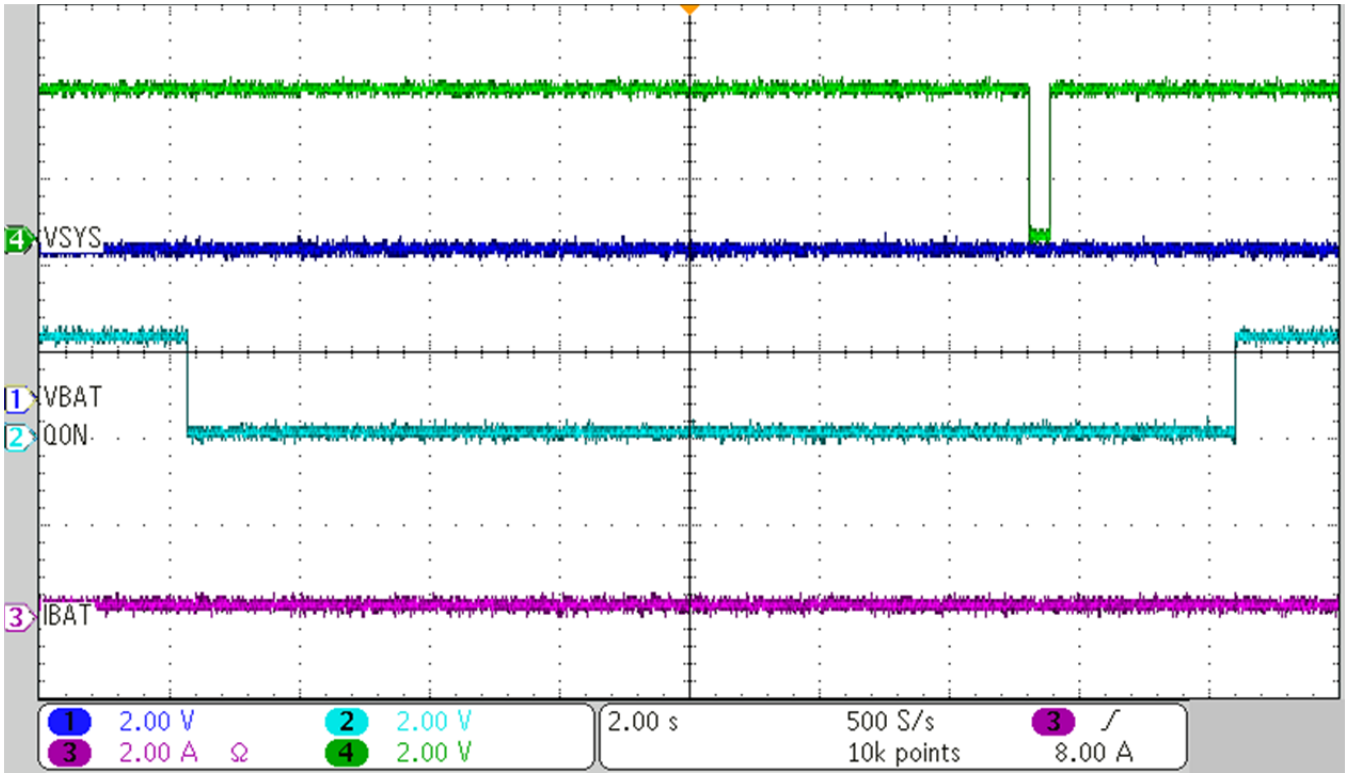

Figure 7. TIDA-00591 BATFET System Reset

- Shipping Mode Exit

A logic high to low transition on /QON pin with longer than $t_{QON\_ON\_1}$ 0.6s to 1.5s typically deglitch turns on BATFET and exit shipping mode.

Figure 8 shows the shipping mode exit with the bq24298 at 25ºC.

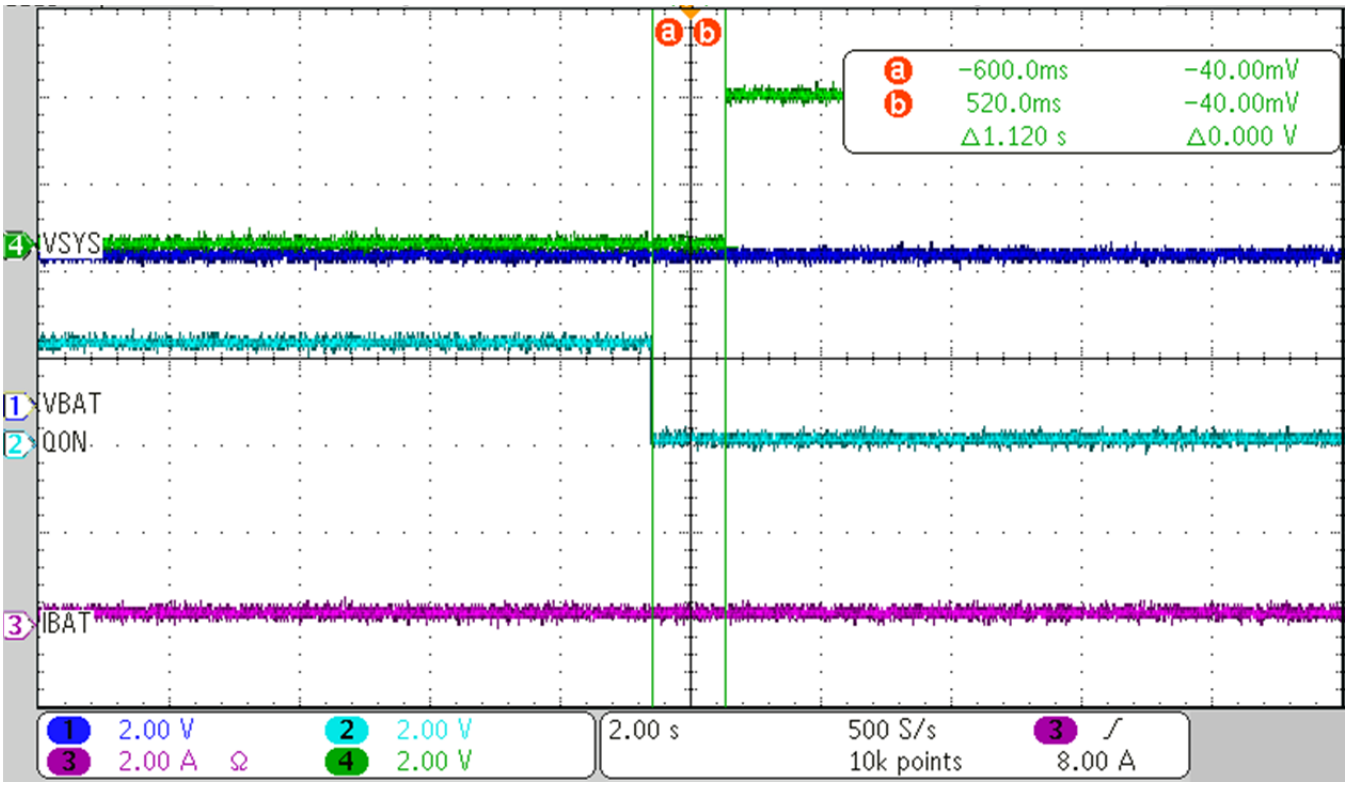

Figure 8. TIDA-00591 Shipping Mode Exit

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