

4. Typical Performance Graphs

4.1 Battery Charging Only (No BFET)

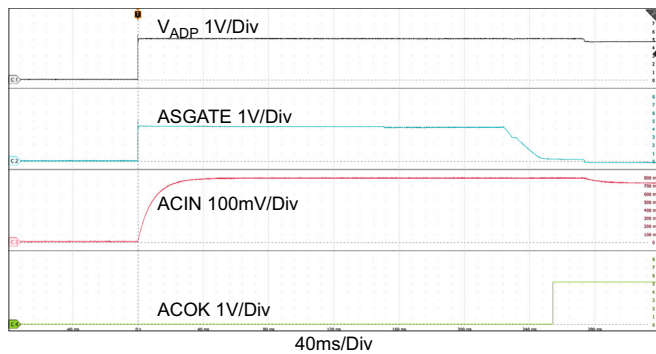


Figure 7. Adapter Insertion, V_{ADP} : 0V $\rightarrow$ 5V,
 V_{BAT} = 18V, ChargeCurrent = 0.256A

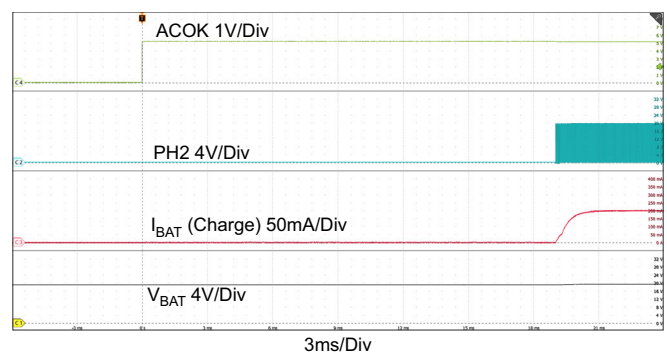


Figure 8. Adapter Insertion, V_{ADP} : 0V $\rightarrow$ 5V,
 V_{BAT} = 18V, ChargeCurrent = 0.256A
(Figure 7 Zoomed In)

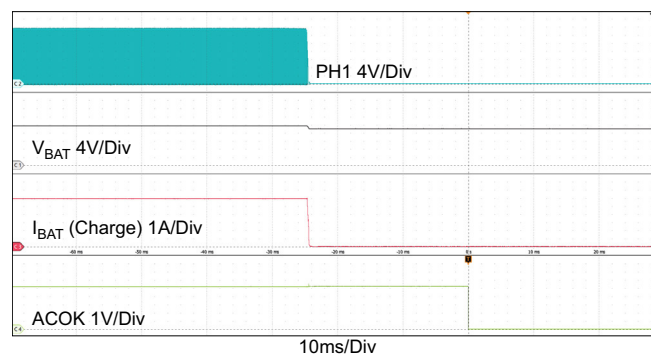


Figure 9. Adapter Removal, V_{ADP} : 28V $\rightarrow$ 0V,
 V_{BAT} = 18V, ChargeCurrent = 6A

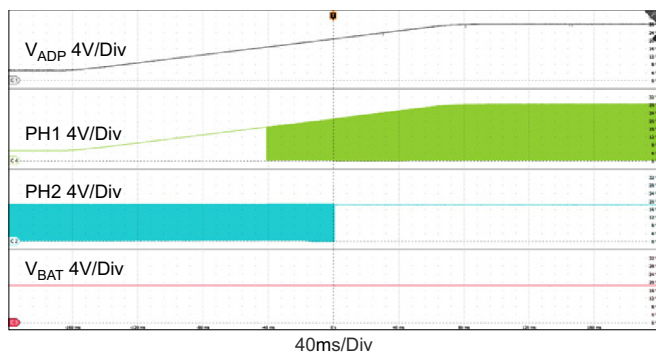


Figure 10. Adapter Voltage Ramp Up, Boost $\rightarrow$
Buck-Boost $\rightarrow$ Buck Operation Mode Transitions

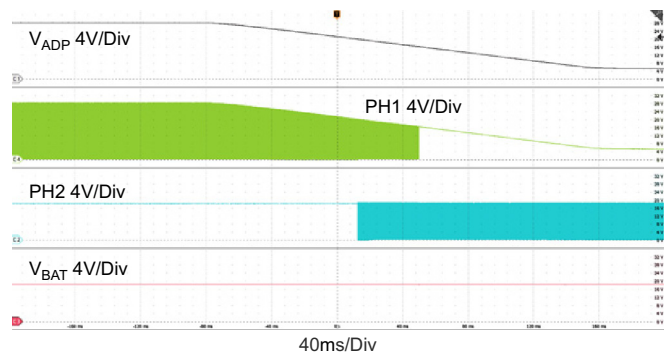


Figure 11. Adapter Voltage Ramp Down, Buck $\rightarrow$
Buck-Boost $\rightarrow$ Boost Operation Mode Transitions

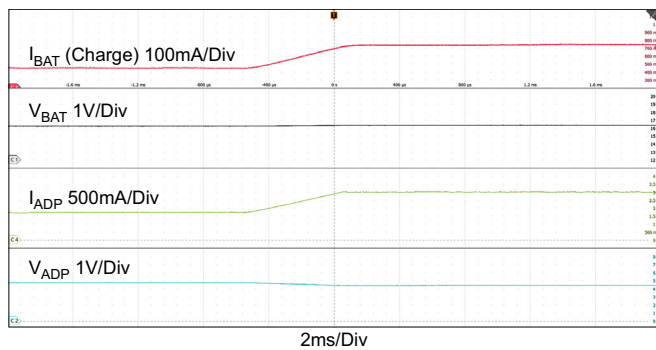


Figure 12. Boost Mode: Charge Current Loop to Adapter
Current Loop, $V_{ADP} = 5V$, $V_{BAT} = 16V$,
AdapterCurrentLimit = 3A, ChargeCurrent: 0.5A → 1A

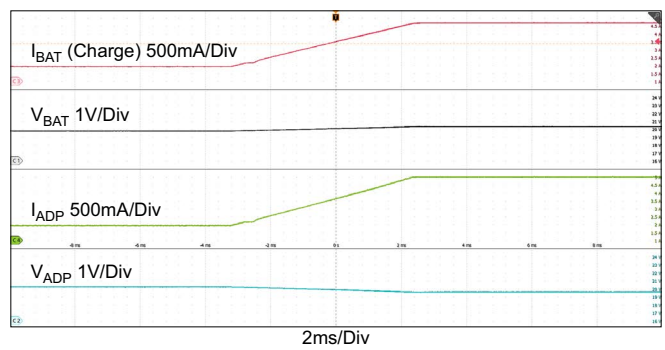


Figure 13. Buck_Boost Mode: Charge Current Loop to
Adapter Current Loop, $V_{ADP} = 20V$, $V_{BAT} = 19V$,
AdapterCurrentLimit = 5A, ChargeCurrent: 2A → 6A
Buck_Boost_CCM_stretch_period = 2x

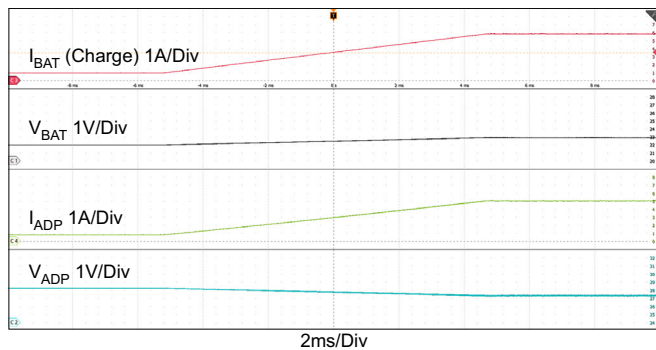


Figure 14. Buck Mode: Charge Current Loop to Adapter
Current Loop, $V_{ADP} = 28V$, $V_{BAT} = 22V$,
AdapterCurrentLimit = 5A, ChargeCurrent: 1A → 7A

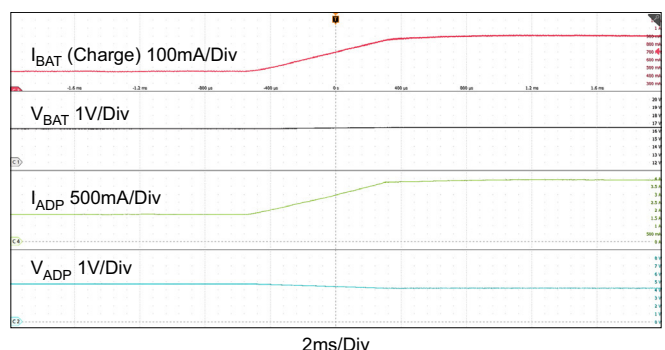


Figure 15. Boost Mode: Charge Current Loop to Input
Voltage Loop, $V_{ADP} = 5V$, $V_{BAT} = 16V$, ChargeCurrent:
0.5A → 2A, InputVoltageLimit = 4.096V

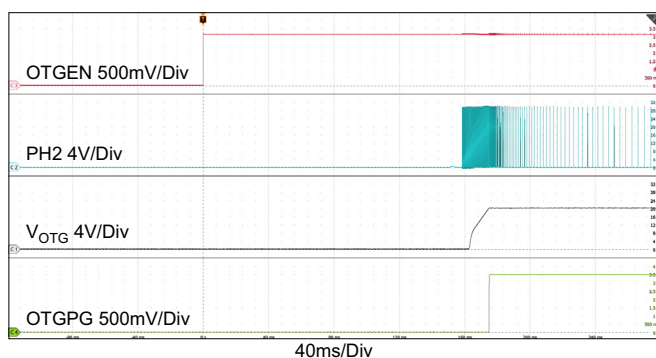


Figure 16. OTG Mode Enable, OTG_Debounce = 150ms,
 $V_{BAT} = 29.4V$, $V_{OTG} = 20V$

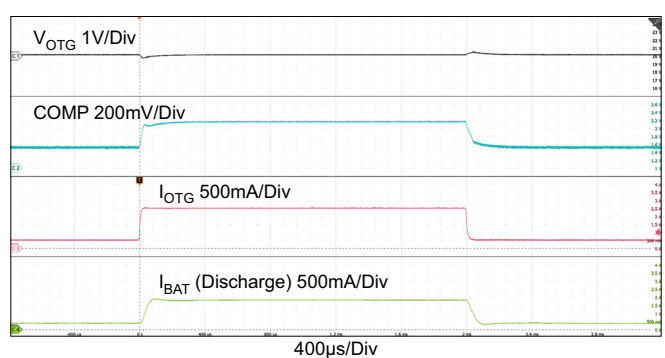


Figure 17. OTG Mode Transients, $V_{BAT} = 29.4V$,
 $V_{OTG} = 20V$, OTG Load: 0.5A ↔ 3A

4.2 NVDC Charging (with BFET)

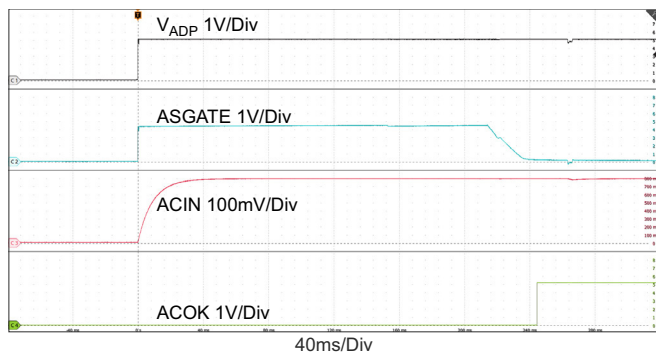


Figure 18. Adapter Insertion, V_{ADP} : 0V $\rightarrow$ 5V,
 V_{BAT} = 18V, ChargeCurrent = 0A

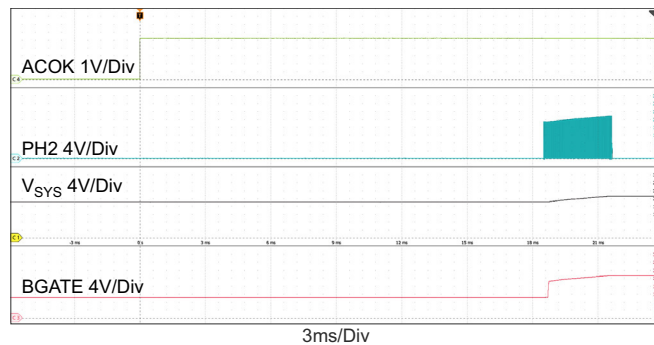


Figure 19. Adapter Insertion, V_{ADP} : 0V $\rightarrow$ 5V,
 V_{BAT} = 18V, ChargeCurrent = 0A
(Figure 18 Zoomed In)

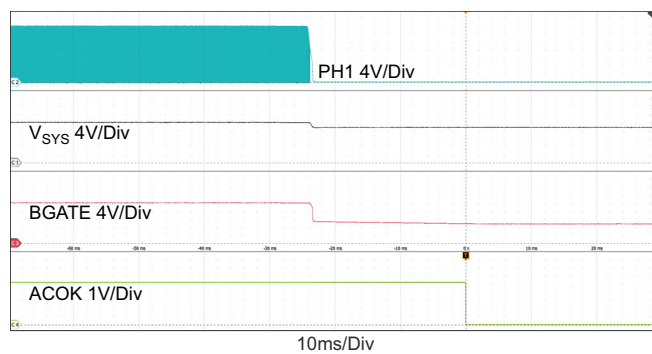


Figure 20. Adapter Removal, V_{ADP} : 28V $\rightarrow$ 0V,
 V_{BAT} = 18V, SystemLoad = 2A

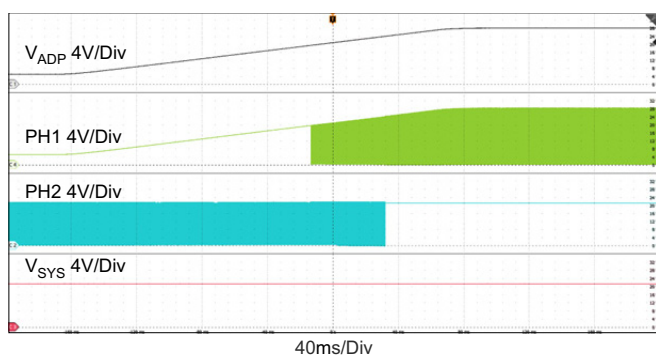


Figure 21. Adapter Voltage Ramp Up, Boost $\rightarrow$
Buck-Boost $\rightarrow$ Buck Operation Mode Transitions

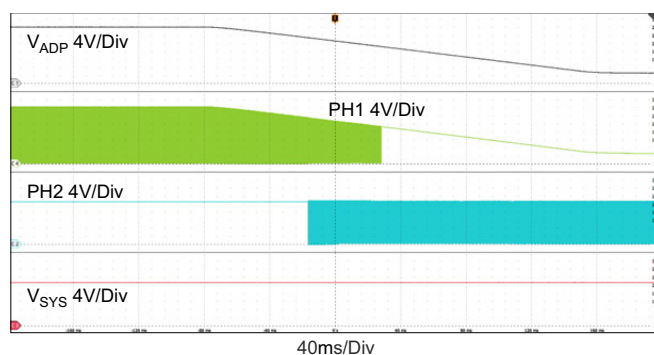


Figure 22. Adapter Voltage Ramp Down, Buck $\rightarrow$
Buck-Boost $\rightarrow$ Boost Operation Mode Transitions

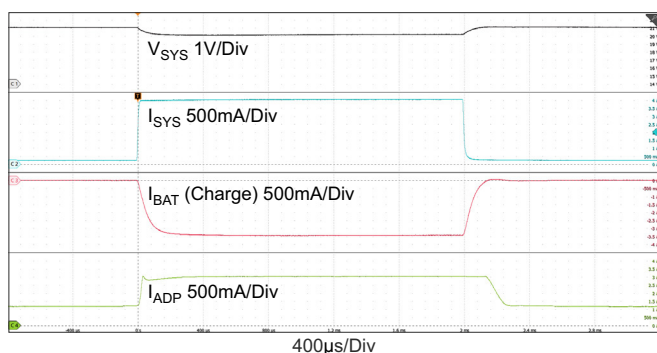


Figure 23. Boost Mode: Output Voltage Loop ↔ Adapter Current Loop, $V_{ADP} = 5V$, MaxSystemVoltage = 21V, $V_{BAT} = 20.5V$, AdapterCurrentLimit = 3A, ChargeCurrent = 0A, SystemLoad: 0.2A ↔ 4A

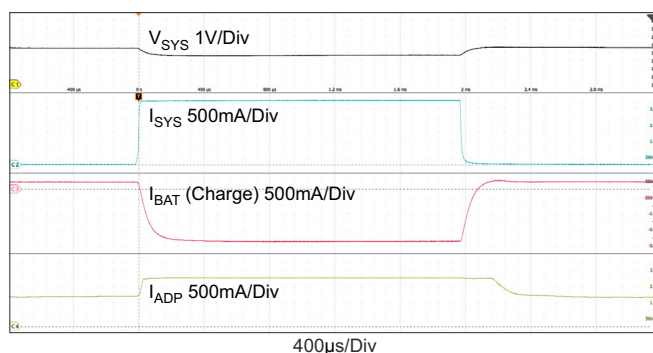


Figure 24. Boost Mode: Charge Current Loop ↔ Adapter Current Loop, $V_{ADP} = 5V$, MaxSystemVoltage = 21V, $V_{BAT} = 16V$, AdapterCurrentLimit = 3A, ChargeCurrent = 0.5A, SystemLoad: 0A ↔ 4A

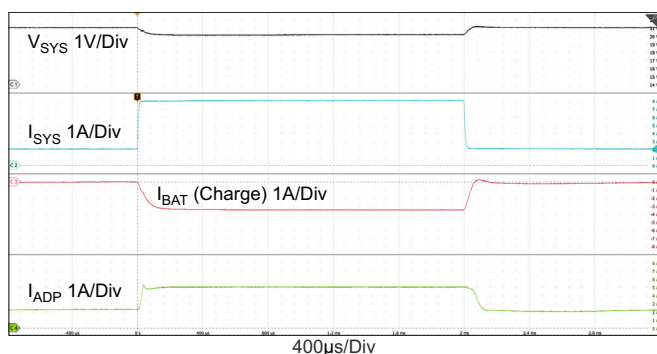


Figure 25. Buck-Boost Mode: Output Voltage Loop ↔ Adapter Current Loop, $V_{ADP} = 20V$, MaxSystemVoltage = 21V, $V_{BAT} = 20.5V$, AdapterCurrentLimit = 5A, ChargeCurrent = 0A, SystemLoad: 2A ↔ 8A, Buck_Boost_CCM_stretch_period = 2x

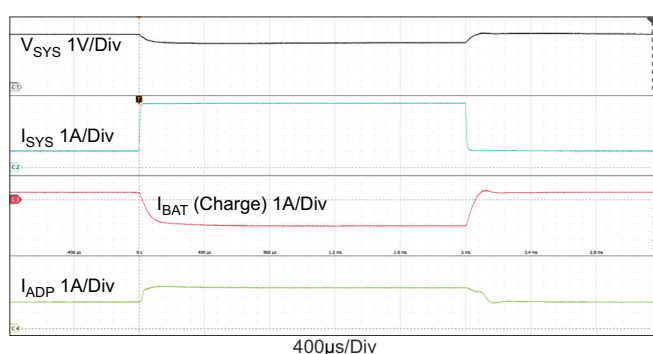


Figure 26. Buck-Boost Mode: Charge Current Loop ↔ Adapter Current Loop, $V_{ADP} = 20V$, MaxSystemVoltage = 21V, $V_{BAT} = 20V$, AdapterCurrentLimit = 5A, ChargeCurrent = 1A, SystemLoad: 2A ↔ 8A, Buck_Boost_CCM_stretch_period = 2x

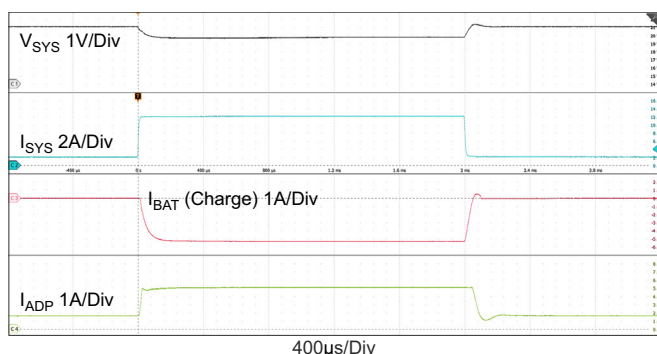


Figure 27. Buck Mode: Output Voltage Loop ↔ Adapter Current Loop, $V_{ADP} = 28V$, MaxSystemVoltage = 21V, $V_{BAT} = 20.5V$, AdapterCurrentLimit = 5A, ChargeCurrent = 0A, SystemLoad: 2A ↔ 12A

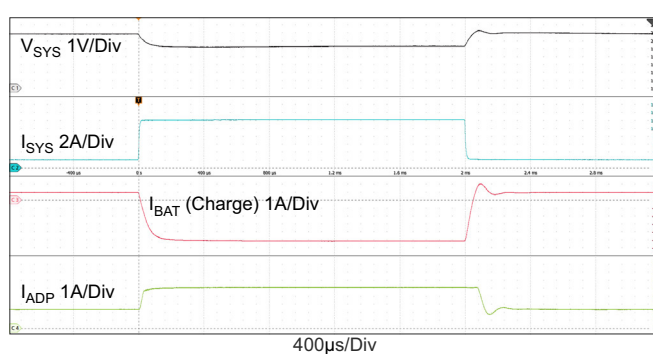


Figure 28. Buck Mode: Charge Current Loop ↔ Adapter Current Loop, $V_{ADP} = 28V$, MaxSystemVoltage = 21V, $V_{BAT} = 20V$, AdapterCurrentLimit = 5A, ChargeCurrent = 1A, SystemLoad: 2A ↔ 12A

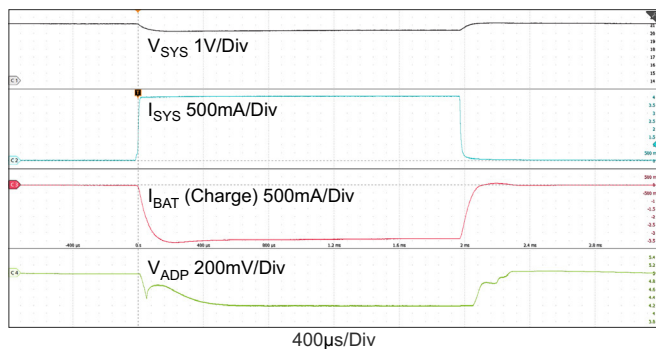


Figure 29. Boost Mode: Output Voltage Loop ↔ Input Voltage Loop, $V_{ADP} = 5V$, MaxSystemVoltage = 21V, $V_{BAT} = 20.5V$, InputVoltageLimit = 4.096V, ChargeCurrent = 0A, SystemLoad: 0A ↔ 4A

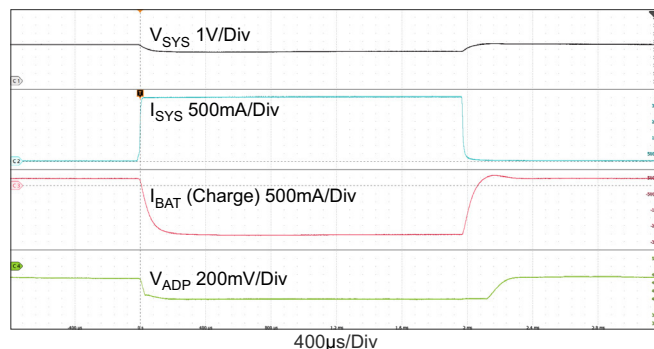


Figure 30. Boost Mode: Charge Current Loop ↔ Input Voltage Loop, $V_{ADP} = 5V$, MaxSysVoltage = 21V, $V_{BAT} = 16V$, InputVoltageLimit = 4.096V, ChargeCurrent = 0.5A, SystemLoad: 0A ↔ 4A

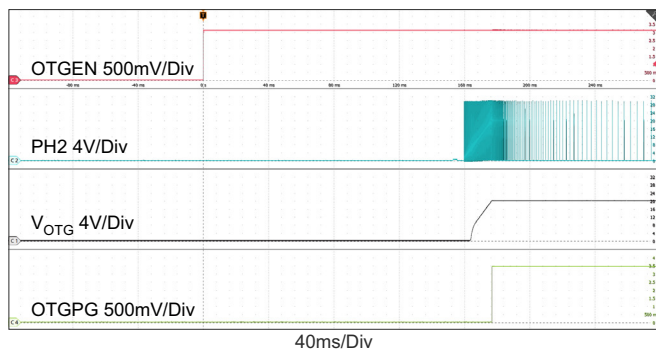


Figure 31. OTG Mode Enable. OTG_Debounce = 150ms, $V_{BAT} = 29.4V$, $V_{OTG} = 20V$

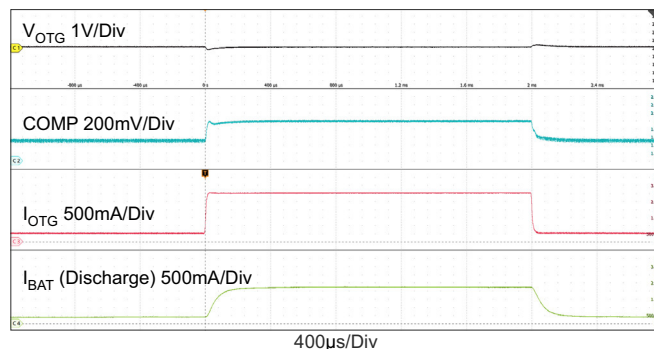


Figure 32. OTG Mode Transients. $V_{BAT} = 29.4V$, $V_{OTG} = 20V$, OTG Current = 5A, OTG Load: 0.5A ↔ 3A