Design PMP40060 Test Results

1 GENERAL

1.1 PURPOSE

The PMP40060 is a fast charger solution with secondary-side regulation UCC28740DR which provides Constant-Voltage Constant-Current feature. The design supports 3.5V 7A lower output voltage closely to battery voltage and also 5.5V 7A output power level. This output performance will enable direct charge between PMP40060 and PMP40133 (adapter side) and BQ25871 EVM (phone side). Secondary voltage-second balance synchronous rectifier UCC24636 enables high efficiency with maximum SR conduction time.

1.2 REFERENCE DOCUMENTATION

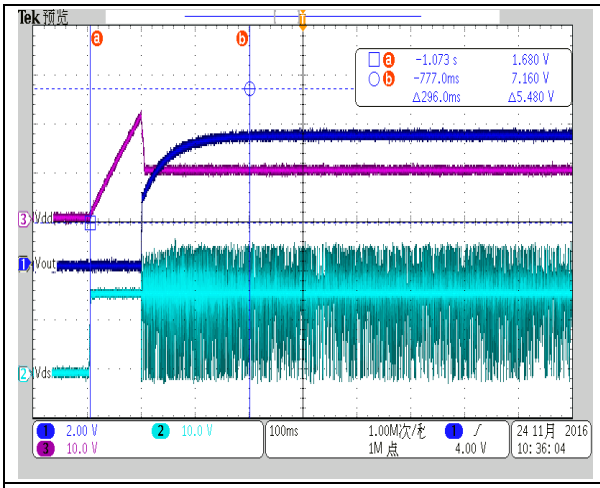
Schematic: PMP40060E1(001)_Sch.PDF
PCB: GerberNCdrills.zip
BOM: PMP40060E1(001)_TI-BOM.PDF

1.3 TEST EQUIPMENTS

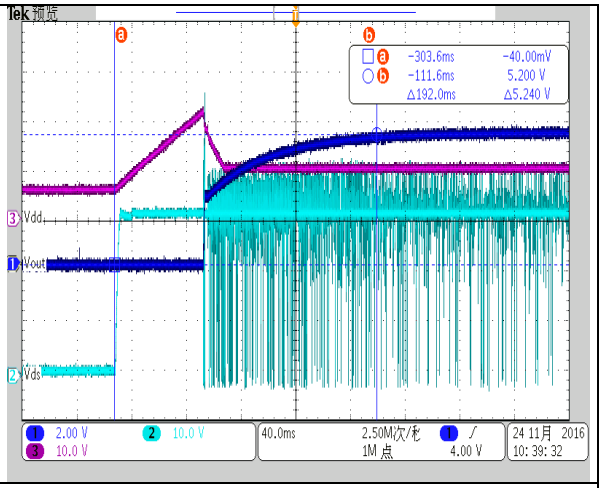
Multi-meter (current): Fluke 287C*2
Multi-meter (voltage): Agilent 34401A
AC Source: Chroma 61503
E-Load: Chroma 63101 module

2 Performance data and waveform

2.1 Start Up



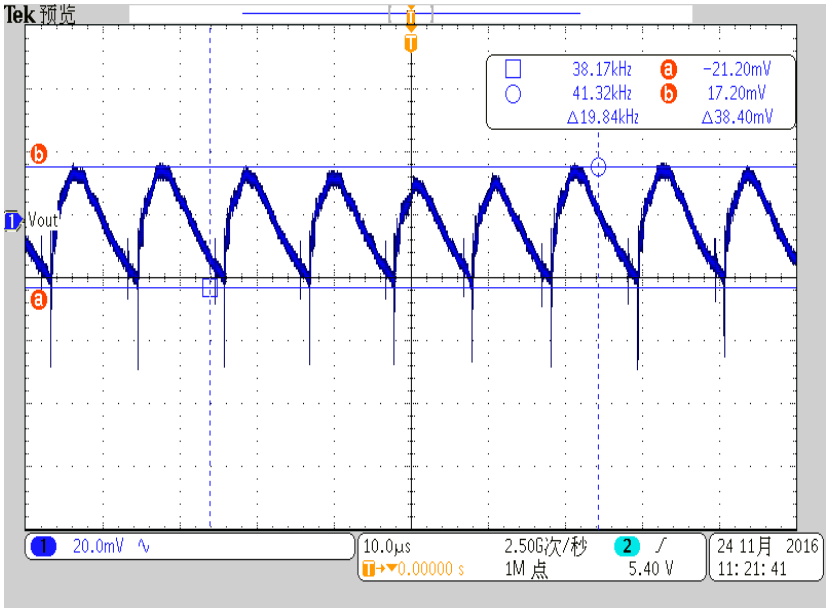
115Vac No-Load Startup



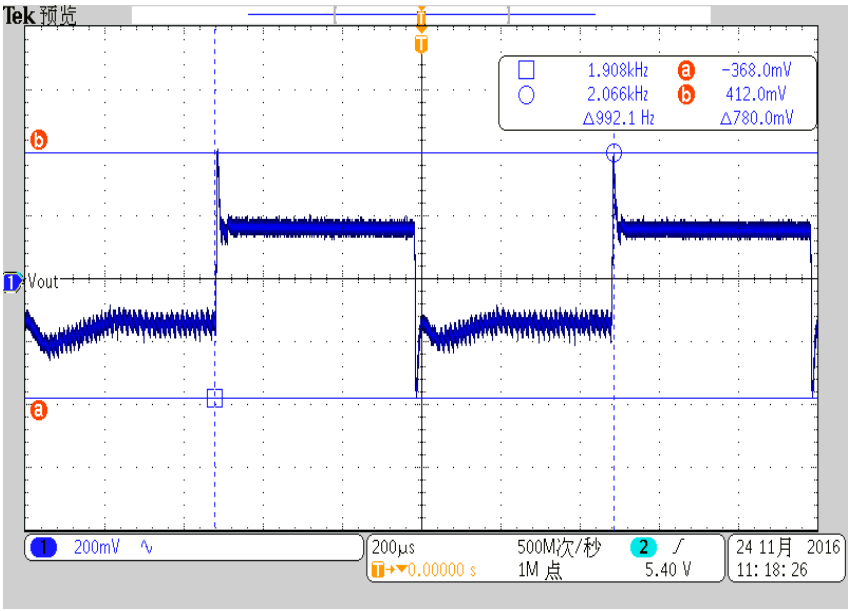
230Vac No-Load Startup

2.2 Output voltage ripple

115Vac full load



2.3 Transient Response

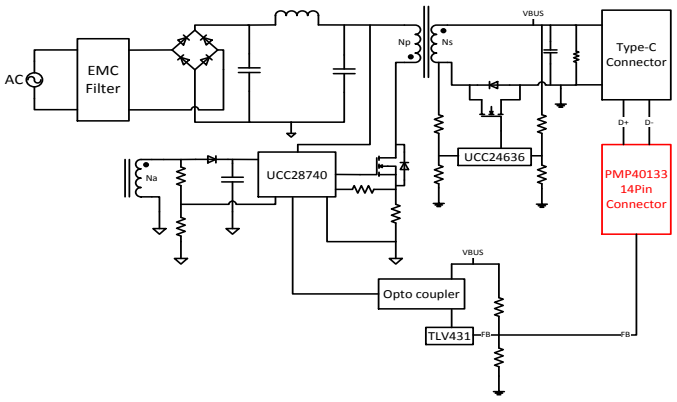


230Vin 0-5A Load; 1kHz Cycle; 1.6A/us

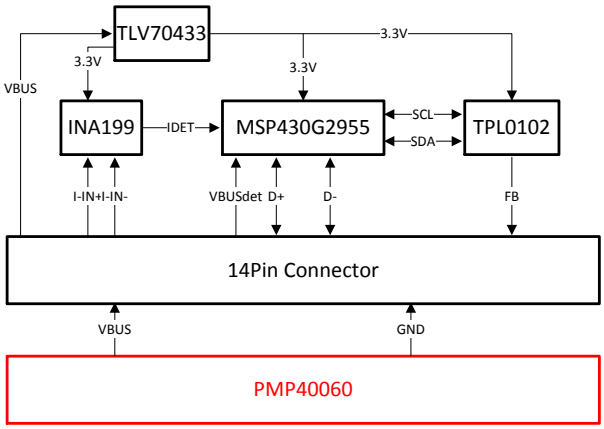
3 Fast charge recognition transition

The following waveform is based on PMP40060 and PMP40133 board. PMP40060 connects TI fast charger BQ25871 EVM board (phone side) through type-c cable. For more information about BQ25871, please contact TI sales or field application engineer. Check the website:
http://www.ti.com/tool/BQ25871EVM-813?keyMatch=BQ25871&tisearch=Search-EN-Everything

Block diagram:

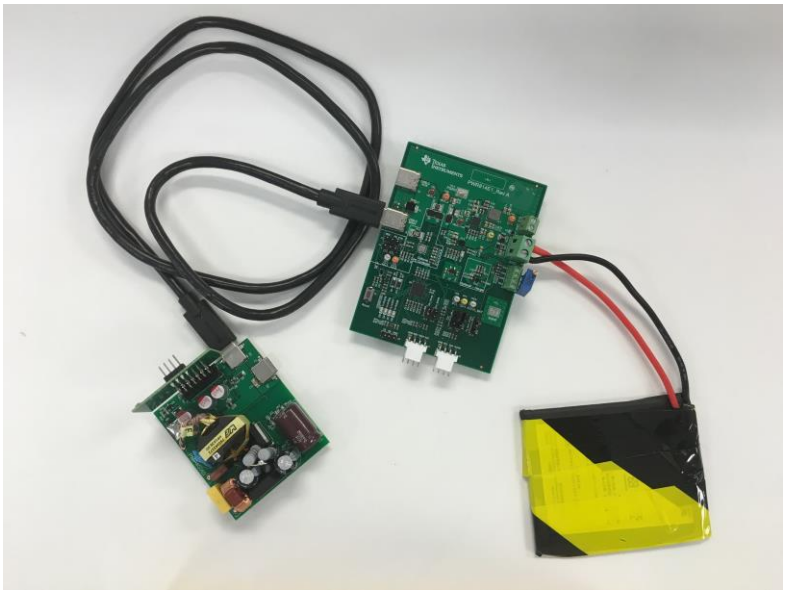


PMP40060

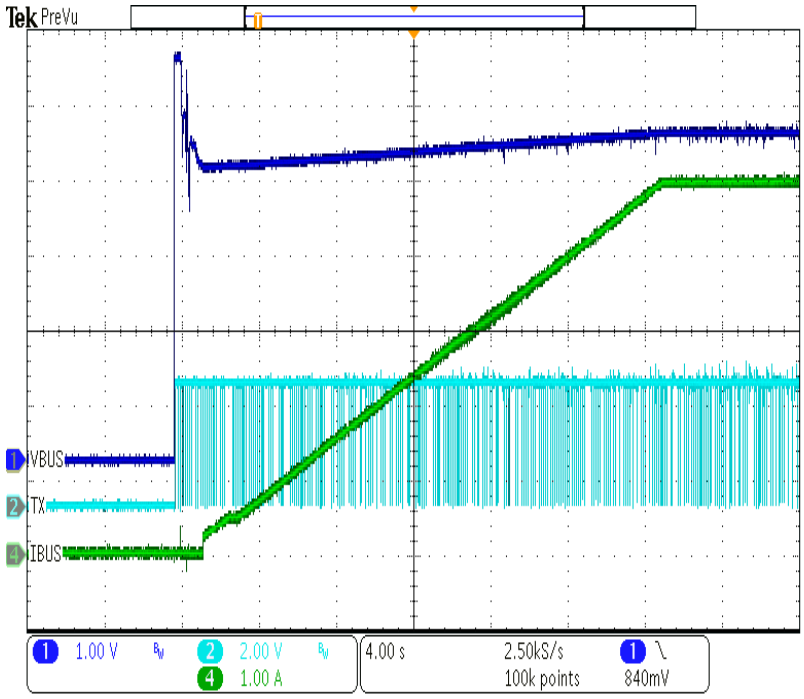


PMP40133

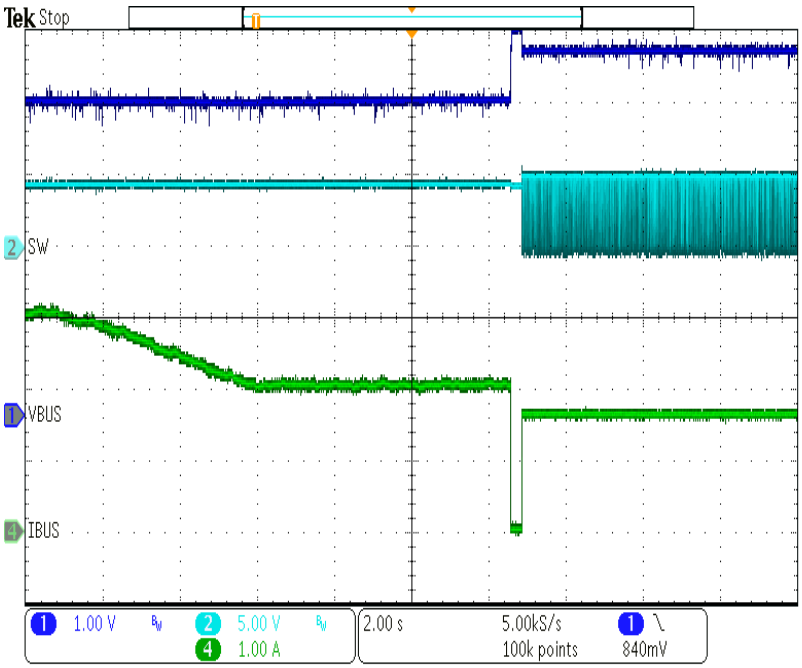
Prototype setup:



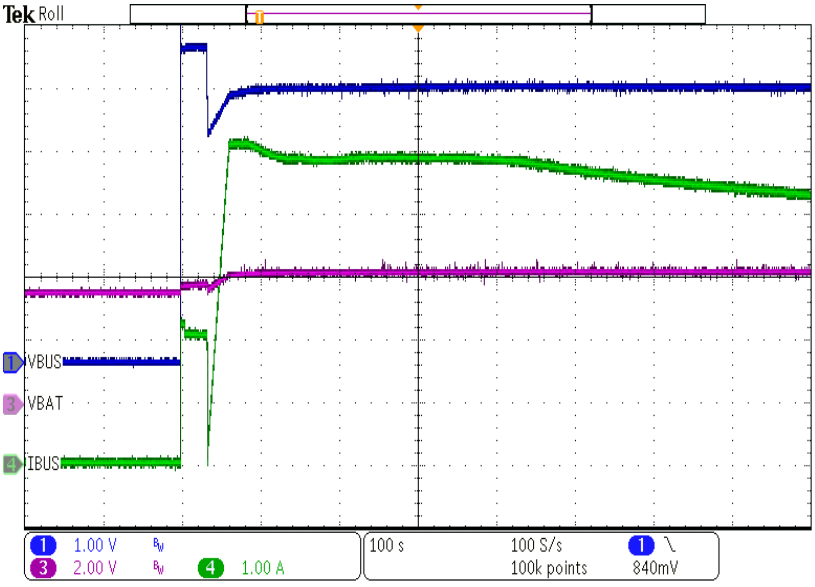
3.1 5V startup and directly ramp to 5A fast charge



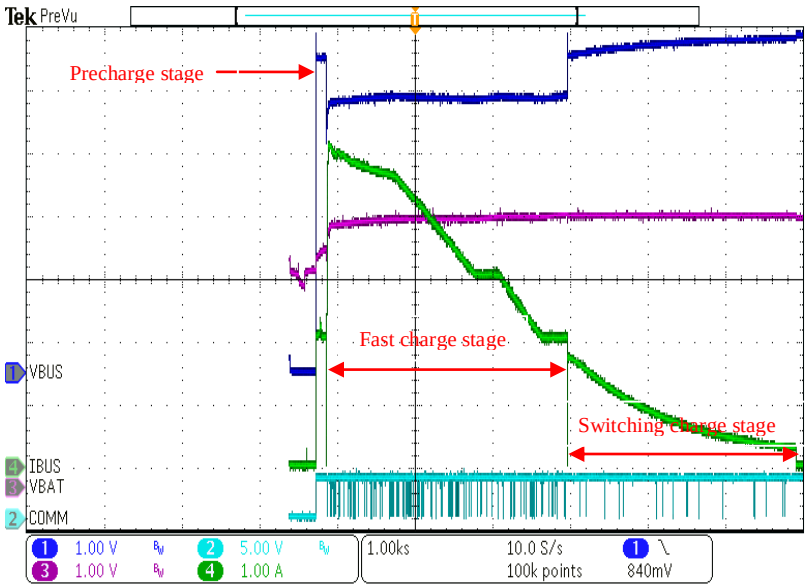
3.2 5V Fast charge to switch charge transition



3.3 Precharge to fast charge transition



3.4 Full charge cycle-precharge, fast charge and switching charge to battery taper full


Tek PreVu
Precharge stage
Fast charge stage
Switching charge stage
VBUS
IBUS
VBAT
COMM
1.00 V
5.00 V
1.00 V
1.00 A
1.00ks
10.0 S/s
100k points
840mV

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