Design Checklist for LTC297X Family of PSM Mamagers

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INTRODUCTION

Please follow this checklist to insure a working LTC2978/LTC2974 board design. If you make any exceptions to these rules, please call applications to make sure your design will work properly.

POWER CIRCUIT

1. Addressing

2. The address select pins (ASELs) are tri-level, check the addressing table on Page 22 of the LTC2978 datasheet (LTC2974 has the same addressing scheme).

3. Check for collision with other devices on the bus and any global addresses published in their datasheets (i.e. cannot use LTC4306).

4. Must have a single base address for in system programming.

5. Connect the output enable pins of LTC297X to the RUN pins of the switchers (**call apps engineer immediately if you want otherwise**)

    a. Insure appropriate pullups on all V_{OUT_EN}
    b. The ABS_MAX voltages of the V_{OUT_EN} pins are:
        i. V_{OUT_EN}[3:0]: -0.3V to 15V (for both LTC2974 and LTC2978)
        ii. V_{OUT_EN}[7:4]: -0.3V to 6V (LTC2978)

2. Anti-aliasing filters
    a. Add anti-aliasing filters to the LTC297X inputs V_{SENSEP}, V_{SENSEM}, I_{SENSEP} and I_{SENSEM}.
    b. The recommended filtering for voltage inputs is 100 Ω and 100nF.
    c. The recommended filtering for current sensing is 1kΩ and 10nF.
    d. Add a first stage matched filter when using DCR current sensing.
    e. There is no need to add an external resistive divider to sense 12V, the V_{IN_SNS} has a calibrated divider built-in.

3. Remote Temperature Sensing (LTC2974 only)
    a. Use a diode-connected PNP or NPN.
    b. Do **not** use real diodes such as 1N4148 for temperature sensing!
    c. The ground connection should go back to the LTC2974 local ground.
    d. Use up to 330nF decoupling capacitance if the layout is noisy.
    e. Route the temperature sensing traces away from switch nodes or other noise sources.

4. Decoupling Capacitors
    a. Use 100nF decoupling capacitors for V_{PWR}, V_{DD33}, V_{DD25} and between REFP and REFM

5. Connect Logic/Coordination signals

    a. All open drain pins (ALERTB, SCL, SDA, SHARE_CLK,FAULTB) should have a single common pull up.

    b. Short all ALERTB together, pull up to 3.3V with a 10kΩ resistor.

    c. Short all SCL/SDA together, pull up to 3.3V with a 10kΩ resistor.

    d. Adjust SDA/SCL pull up or add an I2C bus buffer if stray capacitance is an issue. Check the rising edges of SCL/SDA with an oscilloscope to confirm.

    e. Short all SHARE_CLK together, pull up to 3.3V with a 5.49kΩ resistor

    f. Short all WP together and pull up to 3.3V with a 10kΩ resistor

    g. Do not leave CONTROL pins floating! Pull up to 3.3V with a 10kΩ resistor.

6. FAULT Handling
   a. For maximum flexibility and software control, short all FAULTB pins together and pull up to 3.3V with a single 10kΩ resistor.

    b. Do not mix power good, fault and control pins to design custom fault-handling or event-based sequencing schemes. These approaches are extremely difficult to debug and do not allow last minute software fixes.

7. Floating Inputs
    a. Connect all unused V_{SENSEP}, V_{SENSEM} and DACM pins to GND.

8. Programming
    a. Use the schematic below for each LTC297X if programming with dongle power only is desired.

    b. Ensure that V_{DD33} consumes less than 100mA to avoid overloading the I2C dongle.

   c. No body diodes between SDA/SCL from any slave device are allowed.
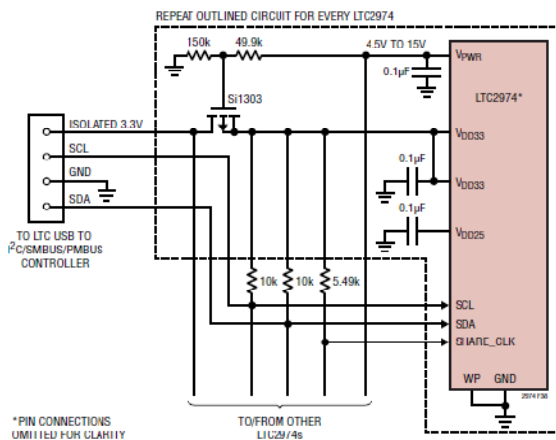
9. Trim DAC Resistors
    a. Select the trim DAC resistors using the resistor-selection tool in the LTpowerPlay GUI

    b. From the main menu "Utilities" -> "Resistor Selection Tool"

    c. Enter the required information in the form (feedback voltage, desired trim range etc.)
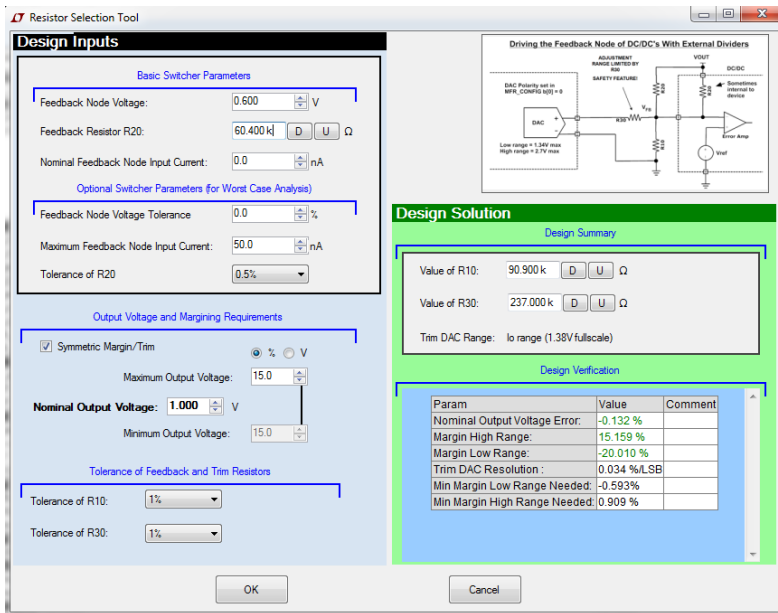
10. ☐Use the LTpowerPlay GUI to get Factory Apps support. The email alias automatically copies multiple people depending on availability/vacation etc.
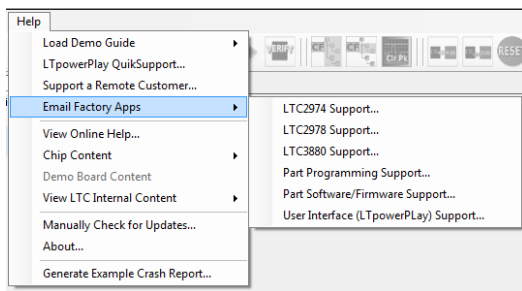
REVISION HISTORY

Rev	Date	Description	Page Number