Quick Start Guide for DC371

By Wei Chen

DC371 is an IMVP2 compatible power supply for powering the Intel mobile Tualatin processor. The input voltage is 7–21V, the output voltage is programmed by the 5-bit VID which is compatible with the IMVP2 spec. The circuit is designed to deliver 23A continuous current. The demo board has an on-board dynamic load tester to facilitate the dynamic load test.

Quick Start Guide

Refer to Figure 2 for proper measurement equipment setup and follow the procedure below:

1. Connect a 21V bench supply to V_{IN} and GND pins, a 5V supply to 5V pin and GND pin, and a 3.3V supply to 3.3V pin and GND. All supplies must be off.

2. Connect an electronic load to V_{CORE} and GND pins using a wire gauge suitable for 23A. Preset load current to 0A.

3. Initial jumper setup for **performance mode operation**:

   JP7
   Short to 5V side

   JP11
   Short

VID4	VID3	VID2	VID1	VID0
Short	Short	Open	Open	Open

DPSLP#	VRON	DPSLPVR	GMUXSEL
Short	Open	Open	Short

4. Apply 21V, then 5V and 3.3V

5. Short Jumper VRON. Measure $V_{CORE} = 1.380 \sim 1.420$ V

6. Apply load current of 23A, measure voltage across C15 to be: 1.288 ~ 1.328V

   $V_{IN} = 21V \pm 0.5V$, $I_{IN} < 2A$

7. Change load to 0A

8. Open Jumper DPSLP#, measure $V_{CORE} = 1.318 \sim 1.358V$

9. Decrease V_{IN} from 21V to 14V, change jumpers for **battery mode operation**:

VID4	VID3	VID2	VID1	VID0
Short	*Open*	Open	*Short*	*Short*

DPSLP#	VRON	DPSLPVR	GMUXSEL
Short	*Short*	Open	*Open*

10. Measure V_{CORE} = 1.115 ~1.155V

11. Open Jumper DPSLP#, measure V_{CORE} = 1.064 ~ 1.104V

12. Short Jumper DPRSLPVR, set VID jumpers for **deeper sleep mode operation**:

VID4	VID3	VID2	VID1	VID0
Open	*Short*	Open	Short	*Open*

13. Measure V_{CORE} = 0.82~0.88V

14. Short Jumper GMUXSEL, measure V_{CORE} = 0.82~ 0.88V

Dynamic Load Transient Tests

1. After the output voltage reaches the preset values, apply the load current equal to the minimum load current of the load step test.

2. Apply ±12V supplies to +12V, PGND and −12V pins. Then remove jumper JP11.

3. Use the oscilloscope to test the output step currents from BNC connector "IO". Adjust potentiometers R44, R45 and R49 to vary the slew down slope, slew up slope and step amplitudes (respectively) of the load current change.

4. Measure the output voltage directly across Cap C15.

   While doing the load transient tests, one should make sure that the input bench supply should have sufficient decoupling capacitance. The following waveform is taken in the performance mode: V_{IN} = 21V, VID = 1.4V, GMUSEL = DPSLP# = 1, DPRSLPVR = 0. The minimum load current is 8A, and the maximum load current is 23A. The minimum output voltage is 1.30V and the maximum output voltage is 1.39V.
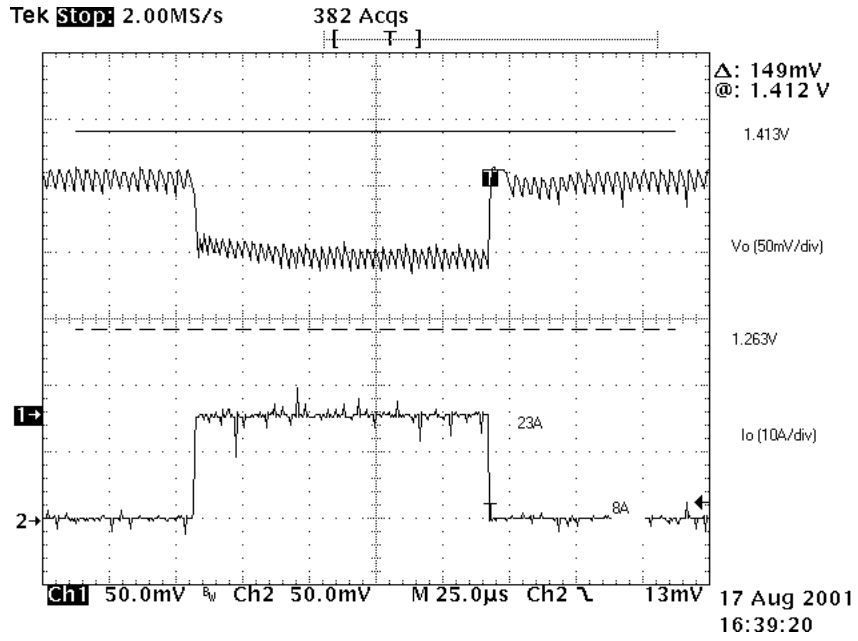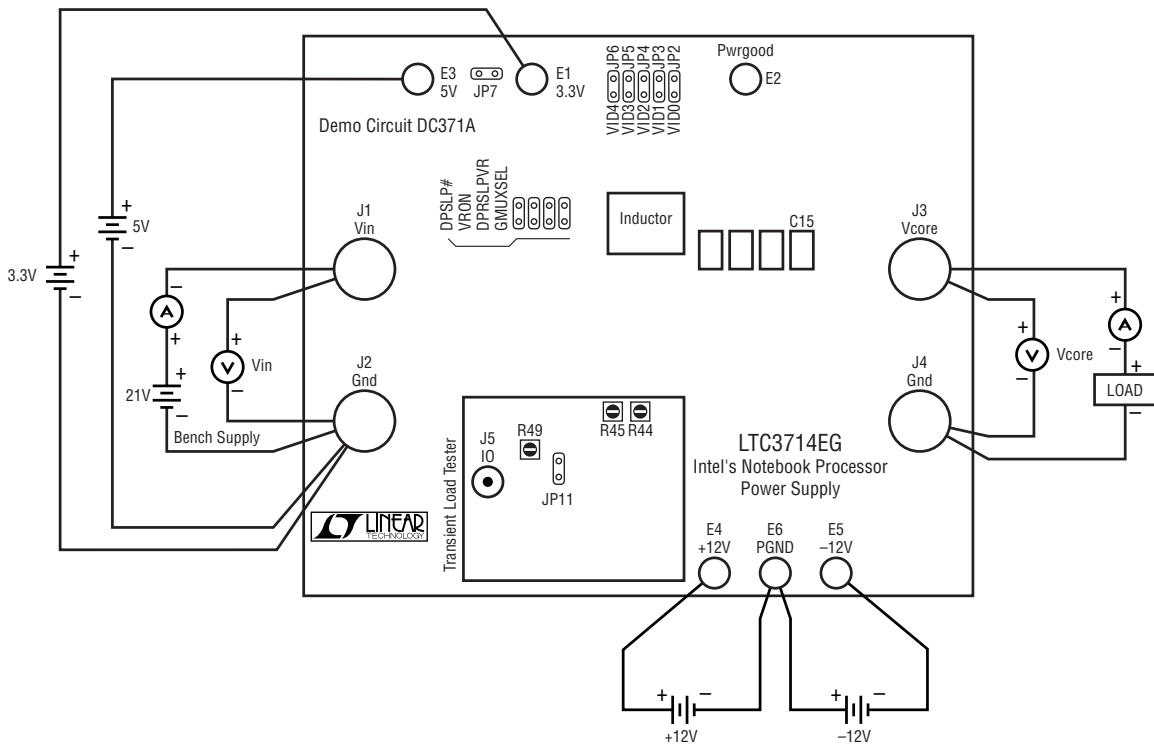
Figure 1.   Timing

Figure 2.   Proper Measurement Equipment Setup