DESCRIPTION

Demonstration circuit 529 is an IMVP4 power supply for powering Intel mobile Banias CPUs. The input voltage is 7.5V to 20V, the output voltage is programmed by the 6-bit VID inputs as well as the mode signals (DPRSLPVR, STPCPU#, PSI). The maximum output current is 32A. This demo board is designed to meet Intel spec **"RS-IMVP-IV Mobile Processor and Mobile Chipset Voltage Regulation with Power Status Indicator (PSI) Specification", Rev 0.1, REF NO. 11338.**

There are two versions of DC529:

-A version: Steelcliff module intended for Intel Cooperspur platform with interposer and headers. Customers may receive this version of demo board from Intel directly. One can follow Intel instruction to test this version of demo board.

-B version: general purpose demo board that has separate input/output terminals, built-in dynamic load tester, and jumpers for setting operation modes and output voltage. All demo boards being shipped by LTC should be Version B.

Design files for this circuit board are available. Call the LTC factory.

Table 1. Performance Summary

PARAMETER	CONDITION	VALUE
Minimum Input Voltage		7.5V
Maximum Input Voltage		21V
Maximum Output Current		25A
V_{OUT} REG		See IMVP4 spec

QUICK START PROCEDURE

Demonstration circuit DC529A-B is easy to set up to evaluate the performance of the LTC3735 Refer to Figure 1 for proper measurement equipment setup and follow the procedure below:

NOTE: When measuring the input or output voltage ripple, care must be taken to avoid a long ground lead on the oscilloscope probe. In this particular demo board, the output ripple voltage can be measured directly on the BNC connector **+VCC_CORE**.

1. Check the default jumper setting.

DLC	DLC BIAS	MCH_PG	CORE_VR_ON	+V5S	+V3.3S
OFF	OFF	1	OFF	EXT	INT

PSI#	DPRSLPVR	STPCPU#	B5	B4	B3	B2	B1	B0
1	0	1	0	0	1	1	1	1

2. With all supplies off, connect the VIN (14V) power supply and output wires as shown in Figure 1. Input wires should be able to handle at least 5A dc current, and the output wires must handle at least 25A dc current. Also apply 5V power supply. Preset the load at 0A.
3. Turn on VIN supply first. Then turn on +5V Supply.
4. Switch Jumper **CORE_VR_ON** to "**ON**". Measure output voltages:

   Vout=1.451V to 1.485V at 0A
5. Apply Load of 25A, measure output voltages to be

   Vout=1.376V to 1.410V at 25A
6. Reset load current to 0A.
7. **Deep Sleep Mode**: Switch Jumper **STPCPU# to "0".** Measure output voltage

   Vout=1.436V to 1.470V at 0A
8. **Deeper Sleep Mode**: Switch Jumpers **DPRSLPVR** to "**1**" and **PSI#** to "**0**". Measure output voltage:

   Vout=0.728V to 0.768V at 0A
9. **Boot Mode**: Switch Jumpers **STPCPU# to "1", DPRSLPVR** to "**0**", **PSI#** to "**1**", and **MCH_PG** to "**0**". Measure output voltage:

   Vout=1.18-1.22V at 0A
10. Load Transient Test: Vin=20V, load current changes between 7.8A and 25A.

    Measure load ***change*** from BNC connector IOSTEP and output voltage from BNC connector +VCC_CORE.

    a. Change the following jumpers to obtain an output voltage of 1.467-1.501Vat 0A.

PSI#	DPRSLPVR	STPCPU#	B5	B4	B3	B2	B1	B0
1	0	1	0	0	1	1	1	0

b. Apply output load current at 7.8A

c. Change Jumpers **DLC** and **DLC BIAS** to "**ON**" positions.

d. Measure the load step change from BNC connector **IOSTEP**. The up-slope, down-slope and step amplitude of the load change can be varied by changing **R46, R40 and R41**, respectively. Every 5mV measured on the Oscilloscope is equivalent to 1A load change.

e. Measure the output voltage from BNC connector **+VCC_CORE**.

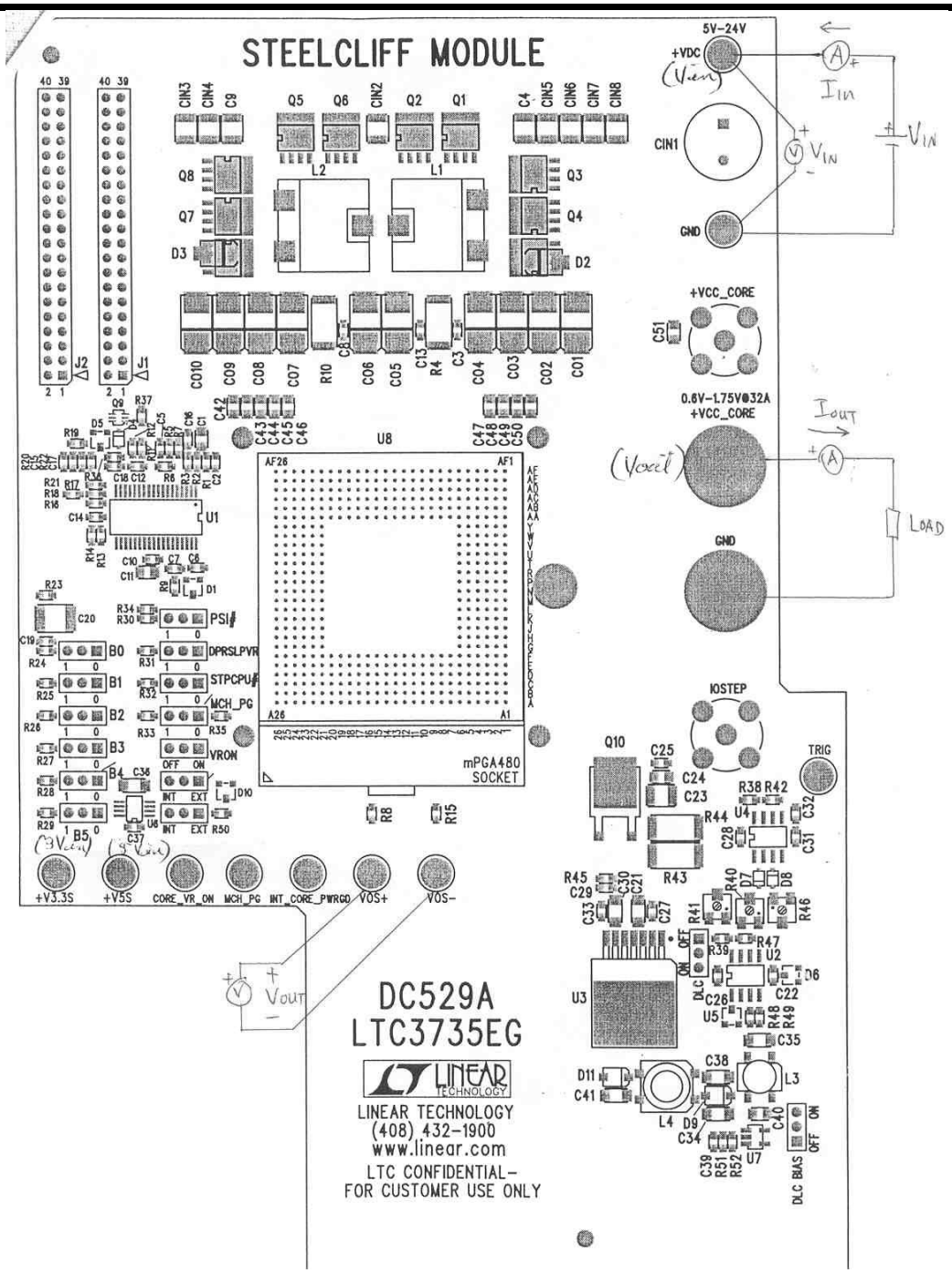
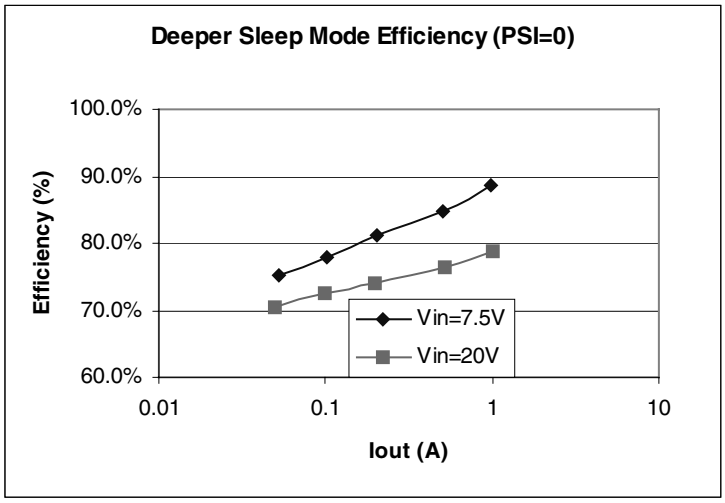
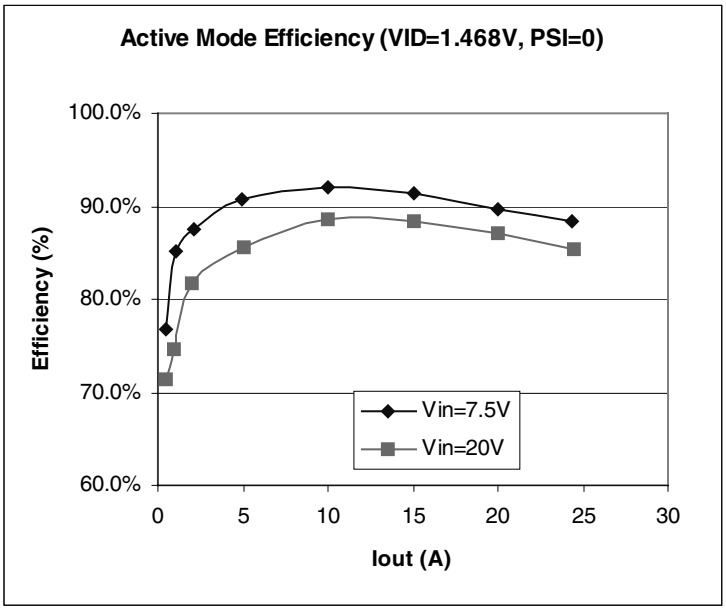


Figure 1 Test Diagram of DC529A-B

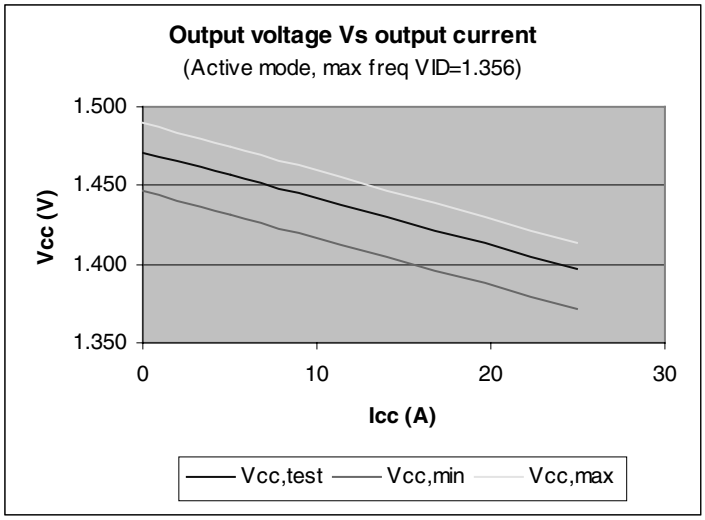
TEST DATA

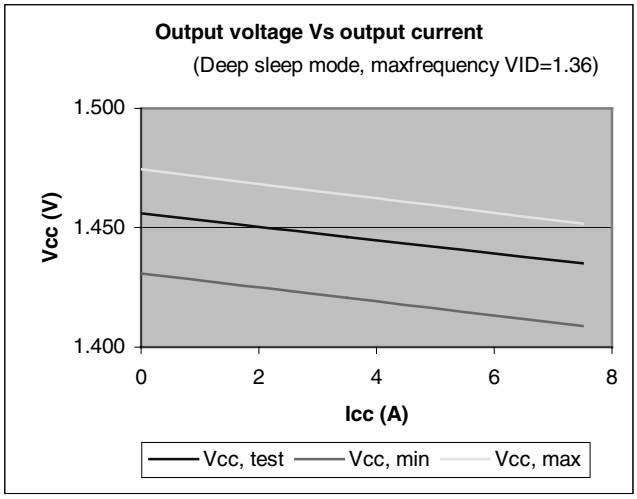
Efficiency Results:

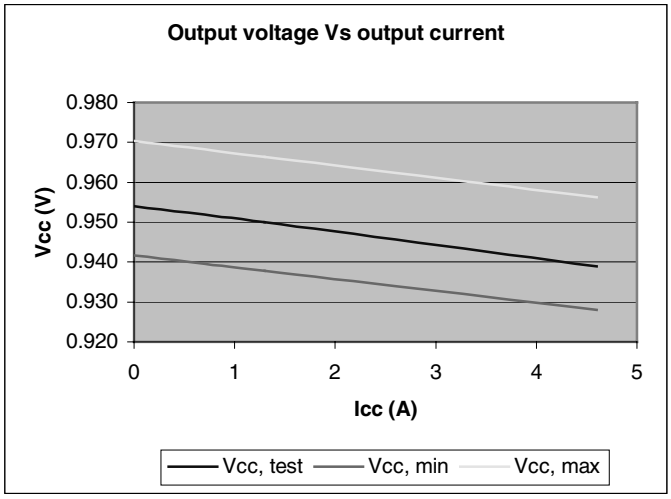


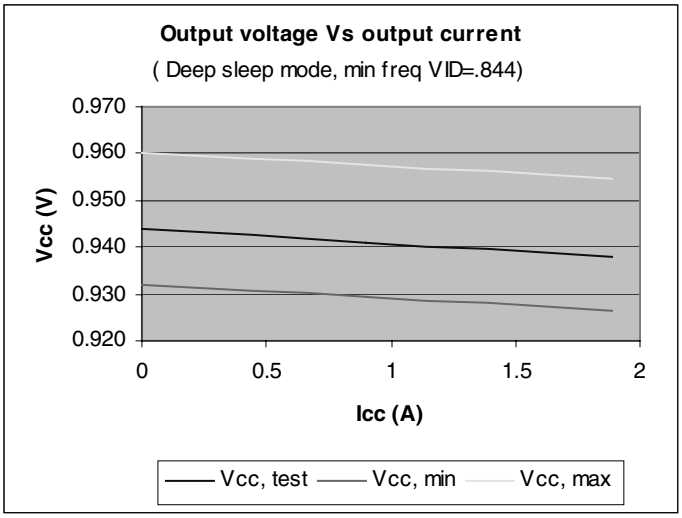


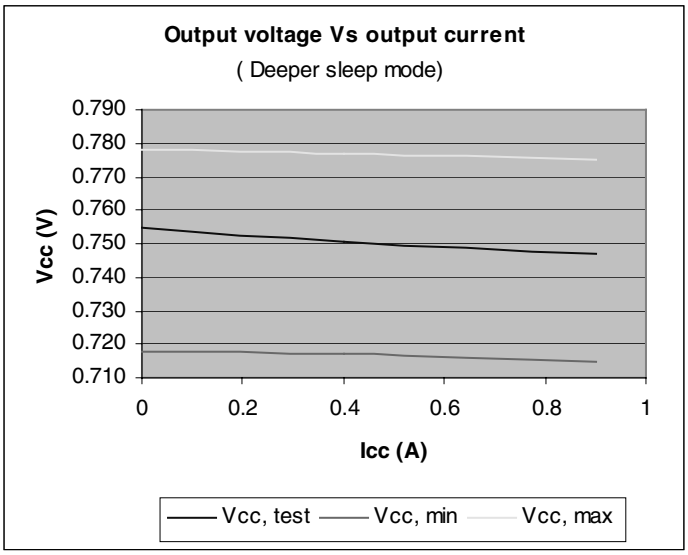
Loadlines:


Output voltage Vs output current
(Active mode, max freq VID=1.356)
1.500
1.450
1.400
1.350
Vcc (V)
0
10
20
30
Icc (A)
Vcc,test
Vcc,min
Vcc,max


Output voltage Vs output current
(Deep sleep mode, maxfrequency VID=1.36)
1.500
1.450
1.400
Vcc (V)
0
2
4
6
8
Icc (A)
Vcc, test
Vcc, min
Vcc, max

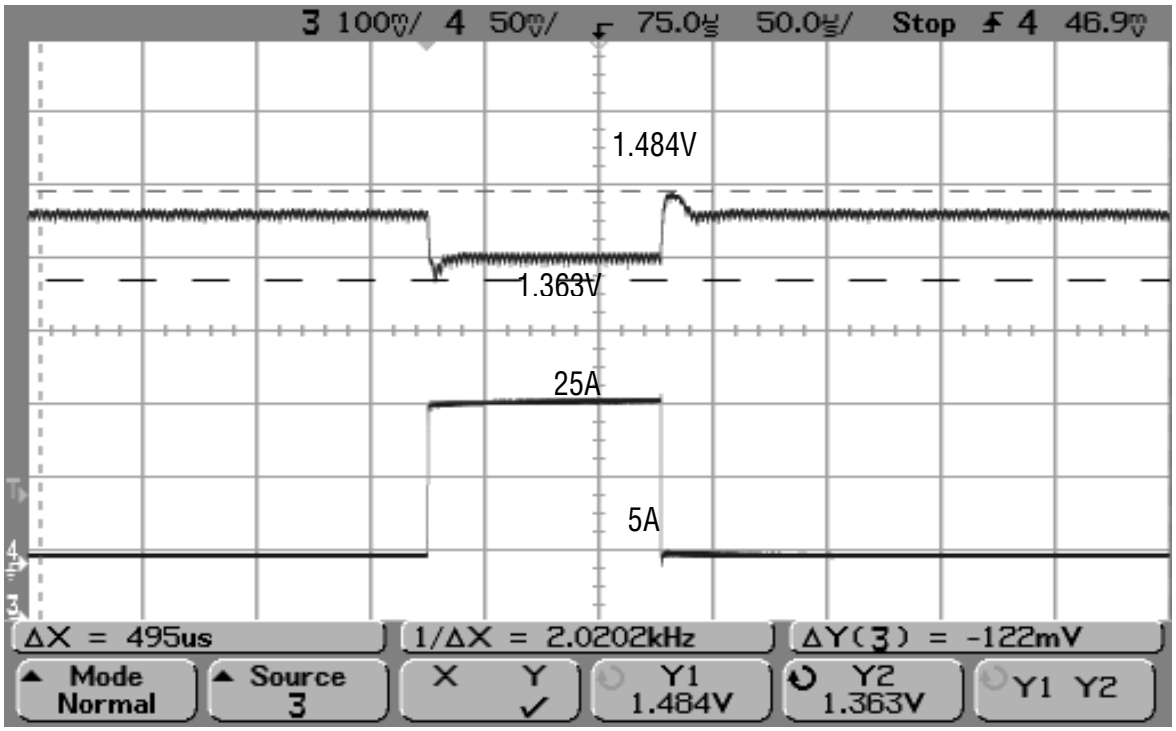

Output voltage Vs output current
0.980
0.970
0.960
0.950
0.940
0.930
0.920
Vcc (V)
0
1
2
3
4
5
Icc (A)
Vcc, test
Vcc, min
Vcc, max


Output voltage Vs output current
(Deep sleep mode, min freq VID=.844)
0.970
0.960
0.950
0.940
0.930
0.920
Vcc (V)
0
0.5
1
1.5
2
Icc (A)
Vcc, test
Vcc, min
Vcc, max



Load Transient Responses

Vin=20V, VID=1.468V, Output caps: 4x270uF/2V SP CAPs



Vout (100mV/div)

Iout (10A/div)