

## DESCRIPTION

Demonstration circuit 483 is a step-down converter featuring the LTC3720 synchronous current mode controller with VRM 8.5 compliant 5 bit VID code. The demo board can operate at 20A load continuously. The droop is set at 4mV/Amp. Consult LTC factory for modifica-

tions required for other droop or no droop requirements. The demo board features a dynamic step load circuit for the convenience of the user.

**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
$V_{OUT}$	VRM8.5 Jumper programmable	1.05V-1.825V
$V_{OUT}$	VID=11010, $I_{OUT}$ =10A	1.400V Nominal
Typical Output Ripple	$V_{IN}$ = 15V, $V_{OUT}$ =1.4V, $I_{OUT}$ = 20A	15mV <sub>p-p</sub>
Nominal Switching Frequency		400kHz

## QUICK START PROCEDURE

Demonstration circuit 483 is easy to set up to evaluate the performance of the LTC3720. Refer to Figures 1 and 2 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. Measure the input or output voltage ripple by touching the probe tip directly across the input or output capacitors. See Figures 3 and 4 for proper scope probe technique.

- Place jumper JP1 and JP8 in the OFF position and JP5 in the INT position (EXT if using external 3.3V). Set the VID jumpers as follows:

VID3	VID2	VID1	VID0	VID25MV
1	1	0	1	0

**NOTE:** VID names are different than those used in LTC3720 datasheet. Use Table 2 when setting VID jumpers.

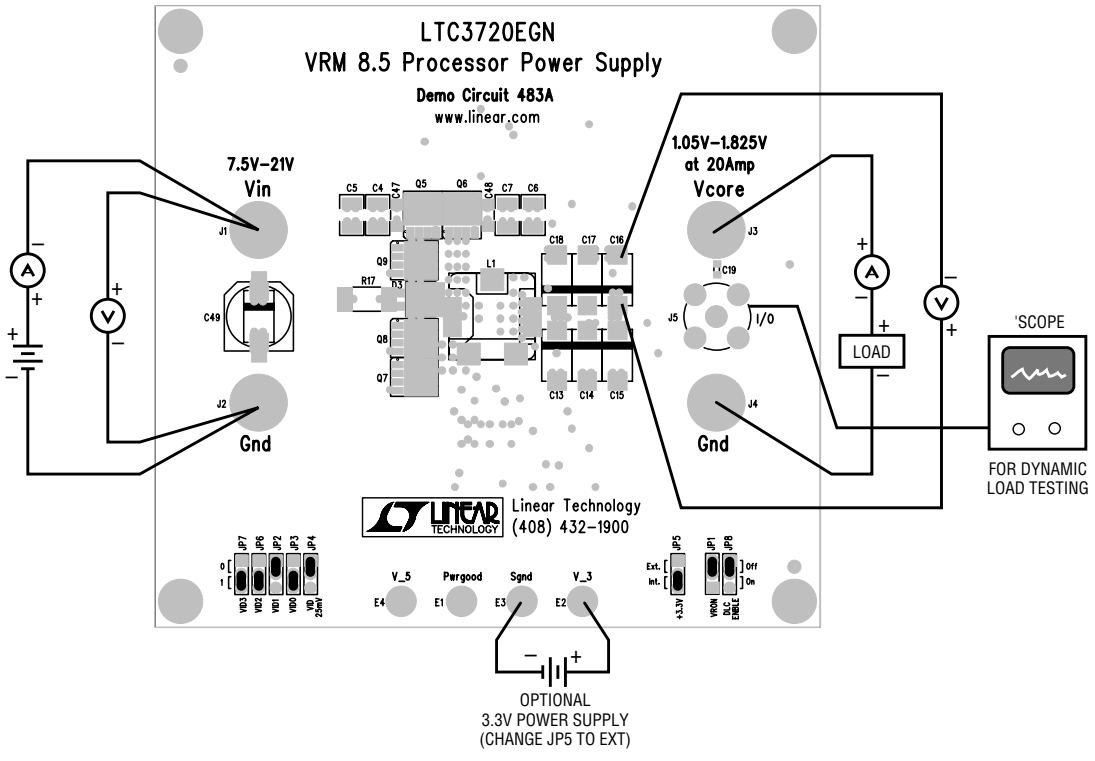
- With power off, connect the input power supply to  $V_{in}$  and GND making sure the input voltage does not exceed 21V
- Turn on the power at the input in this sequence:  $V_{IN}$ , 3.3V (If used), and 5V if used. When turning power off, turn off 5V first.
- Move JP1 (VRON) to ON
- Measure  $V_{core}$  = 1.420V – 1.460V at no load.
- Set Load current to 10A. Measure  $V_{core}$ . It should drop about 40mV (35mV-45mV) from no load value.

If there is no output, temporarily disconnect the load to make sure that the load is not set too high.

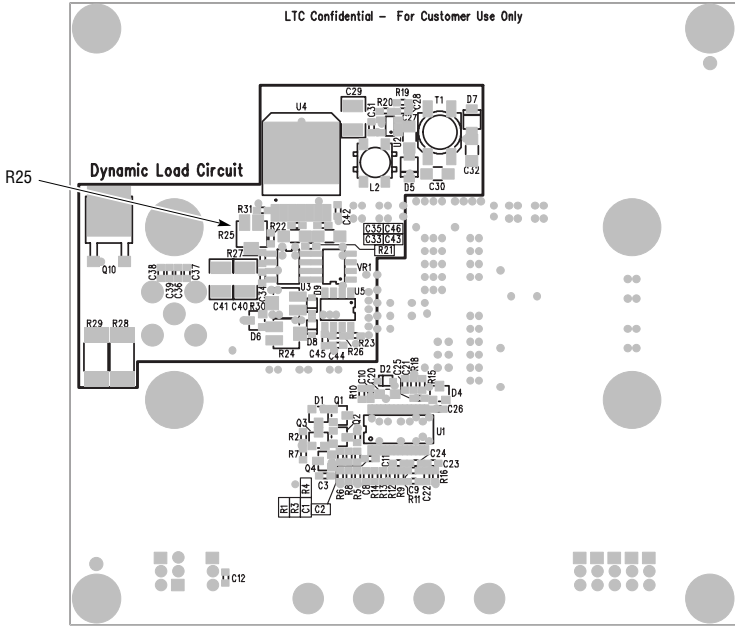
Once the proper output voltage is established, adjust the load within the operating range and observe the output voltage regulation, ripple voltage, efficiency and other parameters.

# QUICK START GUIDE FOR DEMONSTRATION CIRCUIT 483

## VRM8.5 POWER SUPPLY



**Figure 1. Proper Measurement Equipment Setup (Top of Board)**



**Figure 2. Proper Measurement Equipment Setup (Bottom of Board)**

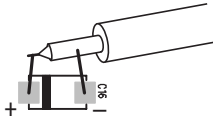


Figure 3. Measuring Output Ripple (At C16)

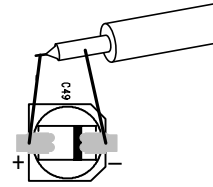


Figure 4. Measuring Input Ripple (At C49)

### DYNAMIC LOAD TRANSIENT TESTS

1. Change the external load current to 0A.
2. Set dynamic load adjustment pot R25 on the back side of the demo board to max clockwise (0 load) position.
3. Move JP8 (DLC EN) to the ON position
4. Attach a BNC cable between an oscilloscope and BNC connector I/O.
5. Adjust the external DC load to 5A.
6. Adjust R25 counter clockwise to slowly increase the dynamic load current observing on the BNC channel. The deflection is 5mV per Amp. Set the dynamic load amplitude at 15 Amps.
7. Measure the output waveform at output capacitor C16. A typical waveform is shown in Figure 5.

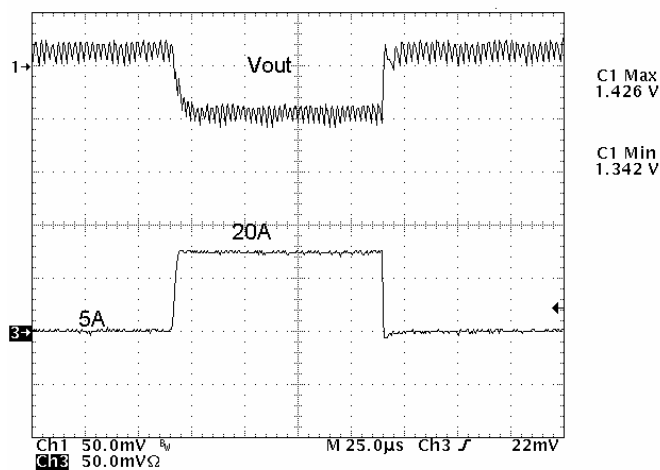
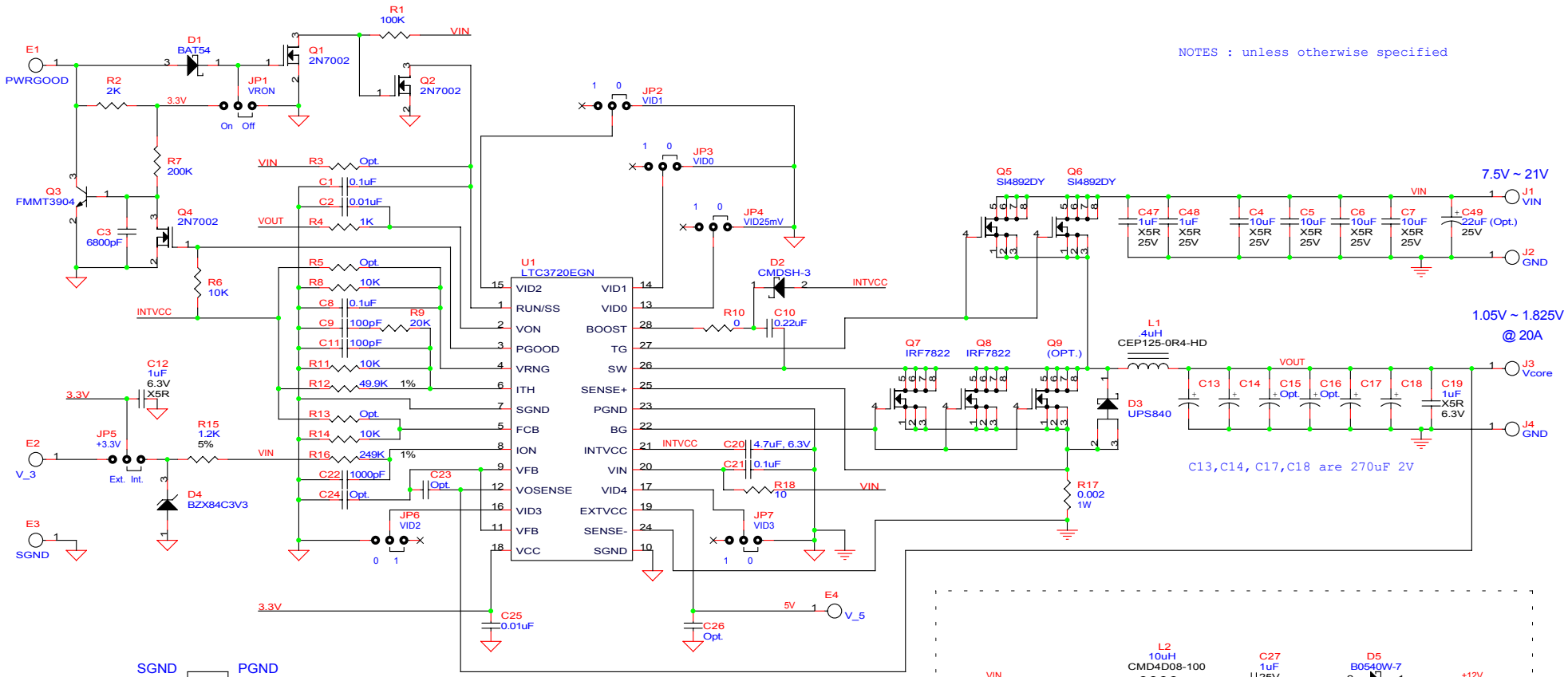


Figure 5. Transient Load Response  
( $V_{OUT}$  = Top Trace, 50mA/DIV,  $I_{OUT}$  = Bottom Trace, 10A/DIV)

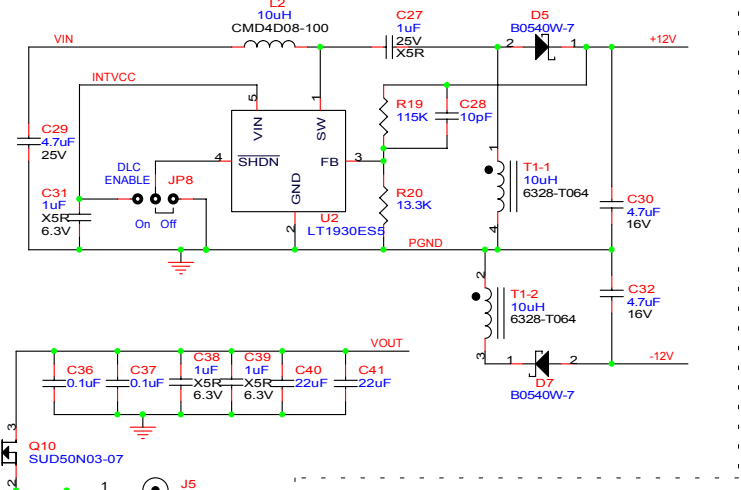
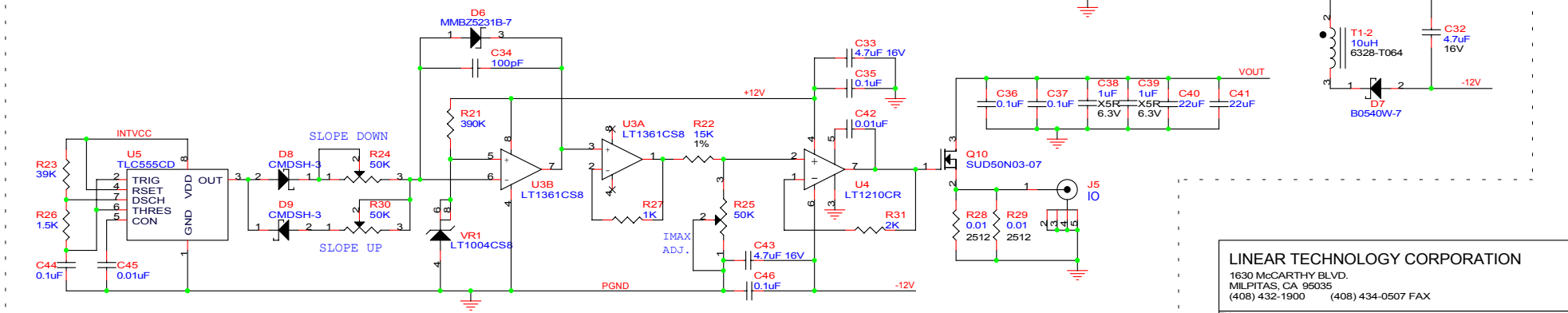
Table 2. VID Codes

VID3	VID2	VID1	VID0	VID25MV	VOUT(V)
0	0	0	0	0	1.250
0	0	0	0	1	1.275
0	0	0	1	0	1.200
0	0	0	1	1	1.225
0	0	1	0	0	1.150
0	0	1	0	1	1.175
0	0	1	1	0	1.100
0	0	1	1	1	1.125
0	1	0	0	0	1.050
0	1	0	0	1	1.075
0	1	0	1	0	1.800
0	1	0	1	1	1.825
0	1	1	0	0	1.750
0	1	1	0	1	1.775
0	1	1	1	0	1.700
0	1	1	1	1	1.725
1	0	0	0	0	1.650
1	0	0	0	1	1.675
1	0	0	1	0	1.600
1	0	0	1	1	1.625
1	0	1	0	0	1.550
1	0	1	0	1	1.575
1	0	1	1	0	1.500
1	0	1	1	1	1.525
1	1	0	0	0	1.450
1	1	0	0	1	1.475
1	1	0	1	0	1.400
1	1	0	1	1	1.425
1	1	1	0	0	1.350
1	1	1	0	1	1.375
1	1	1	1	0	1.300
1	1	1	1	1	1.325



NOTES : unless otherwise specified

### DYNAMIC LOAD CIRCUIT



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VRM 8.5 Processor Power Supply			
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	DEMO 483A	LTC3720EGN	
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