LT3061
45V V_{IN}, Micropower, Low Noise, 100mA LDO with Output Discharge

DESCRIPTION

Demonstration circuit 2177A-A features the LT®3061, a micropower, low noise and low dropout voltage linear regulator with output discharge. The input voltage ranges from 2.1V to 45V and the maximum output current is 100mA. A resistor divider determines the output voltage, and a jumper adjusts the divider to set the output voltage to either 1.2V, 1.5V, 1.8V, 2V, 2.5V, 3.3V, 5V or a voltage that is user-programmed but requires the installation of a resistor. The output uses a 10µF ceramic capacitor and the internal reference is bypassed with a 10nF capacitor to reduce output noise and program the soft-start. There is also a 10nF feedforward capacitor to improve load transient response and decrease noise at higher output voltages. The position of the VOUTEN jumper either pulls up the $\overline{SHDN}$ pin to the input supply through a 100k resistor, shorts $\overline{SHDN}$ to ground or floats the $\overline{SHDN}$ pin so it can be driven directly by a signal applied to the $\overline{SHDN}$ terminal. The input supply to the LT3061 is bypassed by a 2.2µF ceramic capacitor and there is also a 50V tantalum polymer capacitor on the input to dampen ringing that may occur when the input is hot-plugged using long leads.

The LT3061 saves energy by being micropower and low dropout. The LT3061 has excellent regulation and fast response to load transients and also tolerates wide input voltage variations and discharges its output in a controlled manner as required by some image sensor loads.

The LT3061 targets systems with inputs that are battery-powered or have multiple sources, especially those with sensitive loads. DC2177A-A features the LT3061 in the 8-lead 2mm × 3mm DFN package. The LT3061 data sheet must be read in conjunction with this demo manual to properly use or modify demo circuit DC2177A-A.

Design files for this circuit board are available at http://www.linear.com/demo/DC2177A-A

PERFORMANCE SUMMARY

Specifications are at T_A = 25°C

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Minimum Input Voltage, V_{IN}	$V_{IN} - V_{OUT} \geq 290mV$			2.1	V
Maximum Input Voltage, V_{IN}		45			V
Output Voltage, V_{OUT}	V_{OUT} SELECT = 1.2V	1.17	1.2	1.23	V
	V_{OUT} SELECT = 1.5V	1.47	1.5	1.54	V
	V_{OUT} SELECT = 1.8V	1.76	1.8	1.85	V
	V_{OUT} SELECT = 2V	1.97	2.0	2.07	V
	V_{OUT} SELECT = 2.5V	2.43	2.5	2.56	V
	V_{OUT} SELECT = 3.3V	3.23	3.3	3.41	V
	V_{OUT} SELECT = 5V	4.85	5.0	5.13	V
Maximum Output Current, I_{OUT}	V_{IN} = 2.2V, V_{OUT} = 1.8V	100			mA
Output Discharge Time	V_{OUT} = 2.9V, C_{OUT} = 10µF		750		µs

QUICK START PROCEDURE

To use DC2177A-A to evaluate the performance of the LT3061, refer to Figure 1 for the proper measurement equipment setup and follow the procedure below:

1. With the input supply and load off and turned down, make all connections according to Figure 1. Make sure the jumper to set VOUT is in the proper position for the desired output voltage and the VOUTEN jumper is in the ON position.
2. Turn on the input supplies and increase them to the desired input voltages.

Note When Setting The Input Voltage: An input voltage that is too close to the programmed output voltage (too low) may cause dropout operation and a loss of output voltage regulation. Also, an input voltage that is too high above the output may increase power dissipation to an unacceptable level.

3. Increase the load to the desired output current. Verify that the V_{OUT} voltage is as programmed by the jumper.

Note: If the output voltage is low, temporarily disconnect the load to make sure that it is not set too high.

4. Once the proper output voltage is established, adjust the input voltage and load within the operating range and observe the output voltage regulation, low quiescent current, shutdown, output discharge operation and other parameters.

QUICK START PROCEDURE

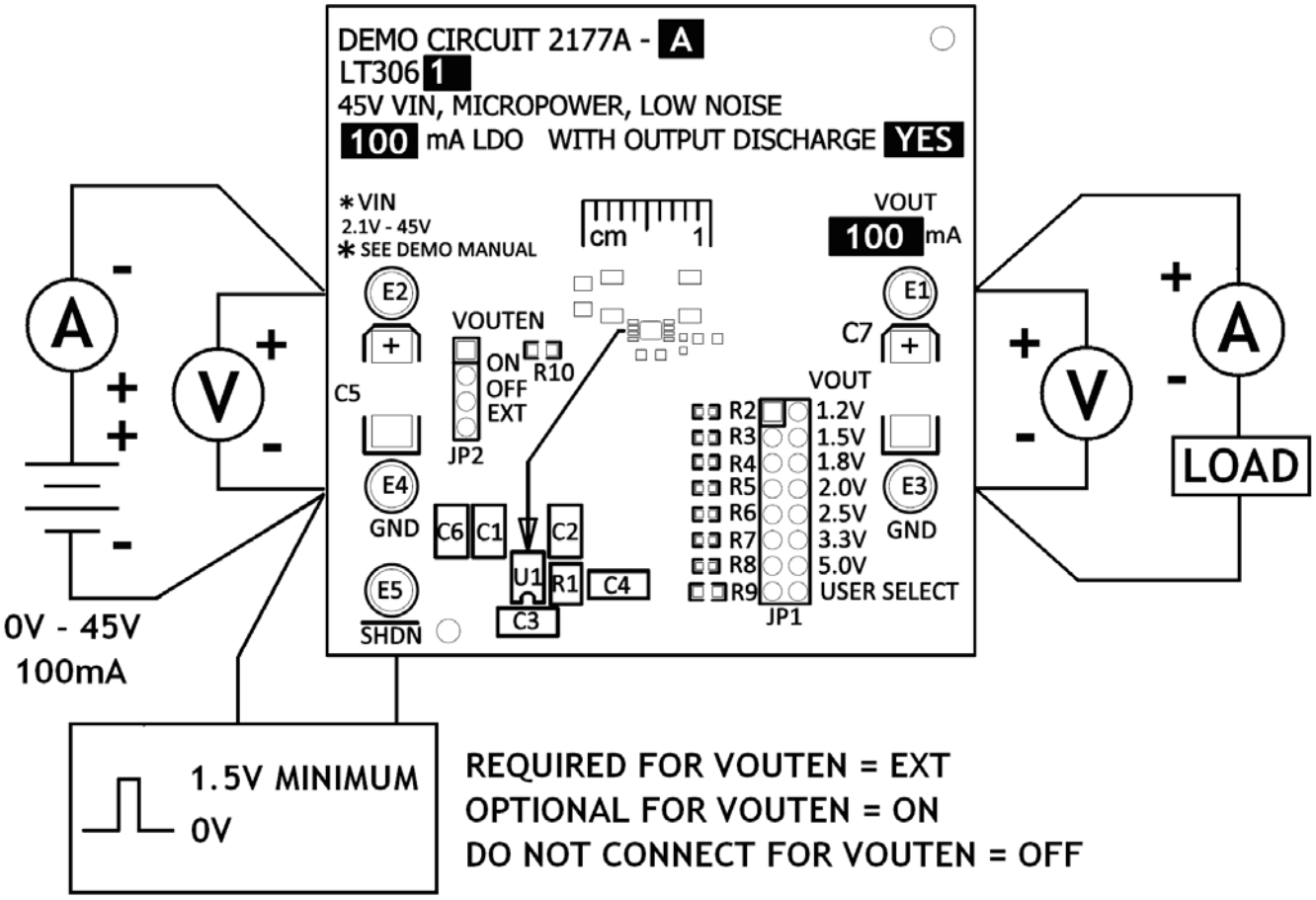
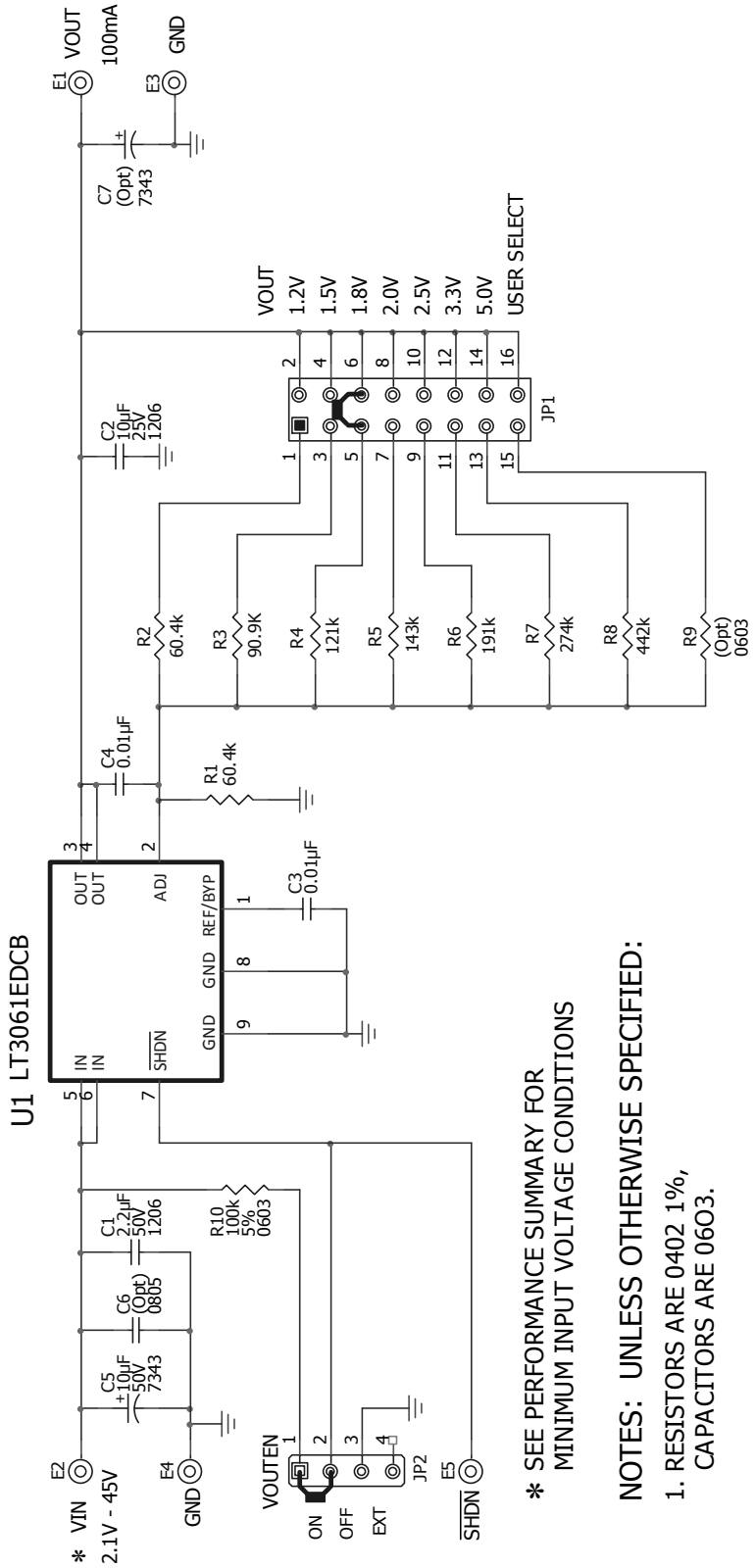


Figure 1. Proper Measurement Equipment Setup for DC2177A-A

PARTS LIST

ITEM	QTY	REFERENCE	PART DESCRIPTION	MANUFACTURER/PART NUMBER
Required Circuit Components				
1	1	C1	Cap., X5R 2.2µF 50V 10% 1206	Murata GRM31CR61H225KA88K
2	1	C2	Cap., X7R 10µF 25V 20% 1206	TDK C3216X7R1E106MT
3	2	R1, R2	Res., Chip 60.4k 0.06W 1% 0402	Vishay CRCW040260K4FKED
4	1	U1	I.C., Low Dropout Reg. DFN(08)(DCB)2MMX3MM	Linear Tech. Corp. LT3061EDCB
Optional Demo Circuit Components				
1	2	C3, C4	Cap., X7R 0.01µF 25V 10% 0603	AVX 06033C103KAT2A
2	1	C5	Cap., Tant. Polymer 10µF 50V 20% 7343	AVX TCJD106M050R0120
3	0	C6 (Opt)	Cap., 0805	
4	0	C7 (Opt)	Cap., 7343	
5	1	R3	Res., Chip 90.9k 0.06W 1% 0402	Vishay CRCW040290K9FKED
6	1	R4	Res., Chip 121k 0.06W 1% 0402	Vishay CRCW0402121KFKED
7	1	R5	Res., Chip 143k 0.06W 1% 0402	Vishay CRCW0402143KFKED
8	1	R6	Res., Chip 191k 0.06W 1% 0402	Vishay CRCW0402191KFKED
9	1	R7	Res., Chip 274k 0.06W 1% 0402	Vishay CRCW0402274KFKED
10	1	R8	Res., Chip 442k 0.06W 1% 0402	Vishay CRCW0402442KFKED
11	0	R9 (Opt)	Res., 0603	
12	1	R10	Res., Chip 100k 0.06W 5% 0603	Vishay CRCW0603100KJNEA
Hardware				
1	5	E1, E2, E3, E4, E5	Turret, Testpoint	Mill Max 2501-2-00-80-00-00-07-0
2	1	JP1	Headers, 2 x 8 (2mm Ctrs.)	Sullins NRPN082PAEN-RC
3	1	JP2	Headers, 4 Pins 2mm Ctrs.	Sullins NRPN041PAEN-RC
4	2	XJP1, XJP2	Shunt, 2mm Ctrs.	Samtec 2SN-BK-G

SCHEMATIC DIAGRAM



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