



LT8601 42V Triple Monolithic Synchronous Step-Down Regulator

DESCRIPTION

Demonstration circuit 2346A is a triple power supply featuring the LT®8601. LT8601 is a 42V triple monolithic synchronous step-down regulator. The demo circuit is designed for 5V, 3.3V, and 1.8V outputs from a nominal 12V input, with switching frequency set at 2MHz to avoid audio band. The 1.8V converter is powered from the 3.3V output, and the 5V, 3.3V are powered from a wide range of 6V to 24V, transient to 42V. The current capability is 2.5A for the 3.3V output, 1.5A for the 5V output, and 1.8A for the 1.8V output when running individually. Up to 1A load current can be applied to all the channels simultaneously without special cooling.

Individual soft-start, current limit, input voltage, power good for each output simplify the complex design of quadoutput power converters. All regulators are synchronized to a common external clock input or a resistor programmable 250kHz to 2.2MHz internal oscillator. At all frequencies, a 180° phase shift is maintained between 1 and 2 channels, reducing the input peak current and voltage ripple. Programmable frequency allows optimization between

efficiency and external component size. Each output can be independently disabled using its own TRKSS or RUN pin and be placed in a low quiescent current shutdown mode. Table 1 summarizes the performance of the demo board at room temperature. The circuit can be easily modified for different applications. Figure 4 shows the typical thermal performance of the circuit.

The demo board has an EMI filter installed on the bottom layer. The radiated EMI performance of the board is shown on Figure 3. The limit in Figure 3 is CISPR Class 5, Peak. It shows the circuit passes the CISPR Class 5, Peak test with a wide margin.

The LT8601 data sheet gives a complete description of the part, operation and application information. The data sheet must be read in conjunction with this quick start quide for demo circuit 2346A.

Design files for this circuit board are available at http://www.linear.com/demo/DC2346A

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PERFORMANCE SUMMARY Sne

Specifications are at T_A = 25°C

Table 1.

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Input Voltage Range, V _{IN}		6	12	24	V
Maximum Transient V _{IN}	Transient			42	V
Standby Current When Switching	I _{OUT1,2,3} = 0mA, V _{IN} = 12V		60		μA
Output Voltage V _{OUT1}	V _{IN} = 12V, I _{OUT1} = 1A	4.80	5	5.20	V
Output Voltage V _{OUT2}	V _{IN} = 12V, I _{OUT2} = 1A	3.17	3.3	3.43	V
Output Voltage V _{OUT3}	I _{OUT3} = 1A	1.73	1.8	1.87	V
Maximum Output Current I _{OUT1}	V _{IN} = 12V, I _{OUT2,3} = 0A	1.5			A
Maximum Output Current I _{OUT2}	V _{IN} = 12V, I _{OUT1,3} = 0A	2.5			A
Maximum Output Current I _{OUT3}	I _{OUT1,2} = 0A	1.8			A
Switching Frequency	V _{IN} = 12V, I _{OUT1,2,3} = 1A	1.85	2	2.15	MHz
Efficiency, Channel 1	V _{IN} = 12V, I _{OUT1} = 1A		91		%
Efficiency, Channel 2	V _{IN} = 12V, I _{OUT2} = 1A		89		%
Efficiency, Channel 3	V _{IN} = 12V, I _{OUT3} = 1A		90		%

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Demo circuit 2346A is easy to set up to evaluate the performance of the LT8601. Refer to Figure 1 for proper equipment setup and follow the procedure below.

1. With power off, connect the input power supply to the board through V_{IN} and GND terminals on the top layer. Connect the loads to the terminals V_{OUT1} and GND, V_{OUT2} and GND, V_{OUT3} and GND on the board. The default positions of the headers are given in Table 2.

Table 2. Default Positions of the Headers

NAME		POSITION
EN/UVLO	JP1	ON
TRKSS1	JP4	ON
TRKSS2	JP5	ON
RUN3	JP2	RUN
SYNC	JP7	BURST

2. Turn on the power at the input. Increase $V_{\mbox{\scriptsize IN}}$ to 12V.

NOTE: Make sure that the input voltage is always within spec. Refer to data sheet on the Burst Mode® operation in light load and high V_{IN} condition.

3. Checkfor the proper output voltages. The output should be regulated at $5V (\pm 4\%)$, $3.3V (\pm 4\%)$, $1.8V (\pm 4\%)$.

NOTE: Do not overload unless proper thermal cooling method such as air flow or heat sink is applied.

NOTE: If there is no output, temporarily disconnect the load to make sure that the load is not set too high, and the headers of EN/UVLO, TRKSS1, TRKSS2, and RUN3 are set in right positions.

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

NOTE: Refer to the thermal derating curves in LT8601 data sheet for high input voltage and/or high ambient temperature operations.

NOTE: By default, SYNC is grounded, and the circuit is set in low ripple Burst Mode operation. The circuit can be set in pulse-skipping Mode, and it runs in full frequency with lower load current. Refer to the data sheet for details on the input voltage and load current ranges that the circuit runs in full frequency. To synchronize to an external clock, apply the external clock to the SYNC turret.

NOTE: When measuring the input or output voltage ripples, 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 V_{IN} or V_{OUT} capacitor terminals. See Figure 2 for proper scope probe technique.

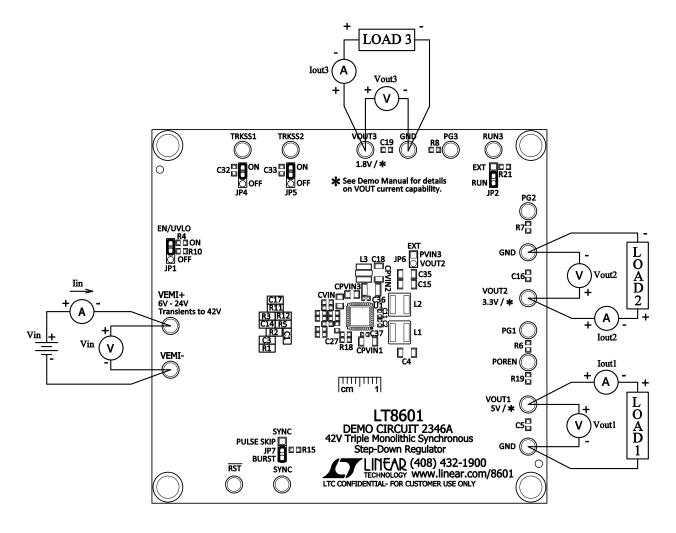


Figure 1. Proper Measurement Equipment Setup

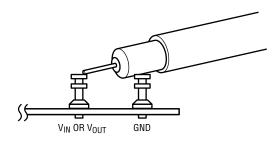
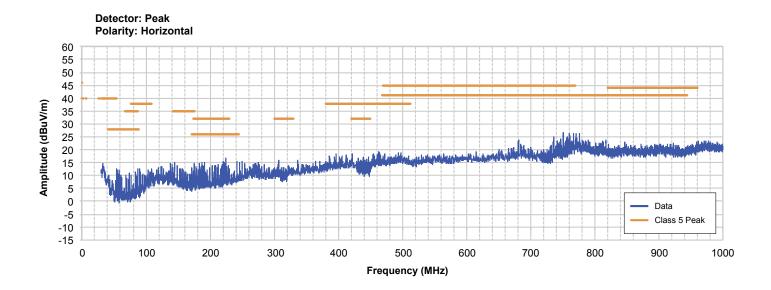


Figure 2. Proper Scope Probe Placement for Measuring Input or Output Ripple





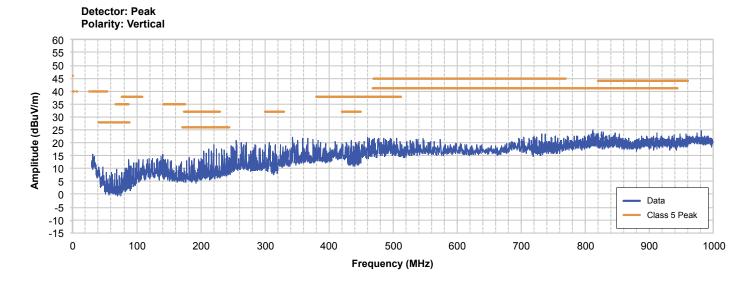
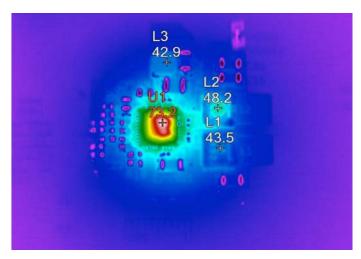
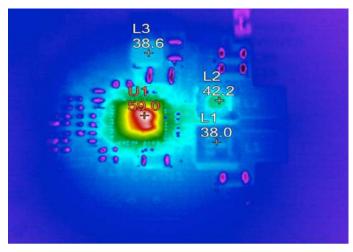


Figure 3. Radiated EMI Performance (Vertical/Horizontal), V_{IN} = 14V, $I_{OUT1,2,3}$ = 1A (CISPR25 Radiated Emission Test with Class 5 Peak Limits)

LINEAD



A. $V_{IN} = 24V$



B. $V_{IN} = 14V$

Figure 4. Thermal Image Top View, $I_{OUT1,2,3} = 1A$, $T_A = 25$ °C, $F_{SW} = 2MHz$



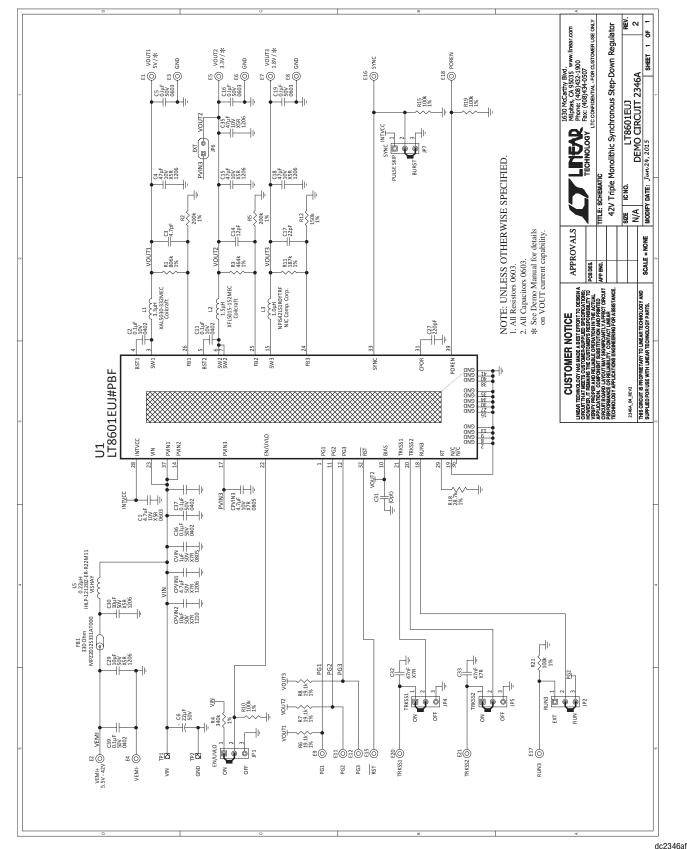
PARTS LIST

Required Circuit Components	ITEM	QTY	REFERENCE	PART DESCRIPTION	MANUFACTURER/PART NUMBER	
2 1 CPVIN2 Cap. 10µF X7R 50V 10% 1210 Murata GRM32ER71H106KA12L 3 1 CPVIN3 Cap. 4,7µF X7R 10V 10% 08005 Murata GRM21BR71A775KA73L 4 1 CVINI Cap. 1µF X7R 50V 10% 08005 TDK C2012X7R1H105K 5 1 C1 Cap. 4,7µF X7R 10V 10% 08003 TDK C1002X7R1H105K 6 2 C2, C11 Cap. 0,1µF X8R 10V 10% 0803 AVX 6003X4R7XAT2A 7 1 C3 Cap. 1,2µF X8R 10V 10% 0803 AVX 6003X4R7KAT2A 8 4 C4, C15, C18, C35 Cap. 1,2µF X8R 10V 10% 0803 Murata GRM31CR81X4F6ME15L 9 3 C5, C16, C19 Cap. 0,1µF X7R 50V 10% 0803 Murata GRM31CR81X4F6ME15L 9 3 C5, C16, C19 Cap. 0,1µF X7R 50V 10% 0803 Murata GRM318R71H104KA93D 10 1 C6 Cap. 0,1µF X7R 50V 10% 0803 AVX 08033A4278MA12A 12 1 C17 Cap. 2,22pF X7R 52V 10% 0803 AVX 08033A4220A472A 12 1 C17 Cap. 2,22pF X7R 52V 10% 0803 AVX 08033A422MA17AA 14 2	Require	d Circuit	Components			
3 1 CPVIN3 Cap. 4.7p × X7R 10V 10% 0805 Murata GRM21BR714A75KA73L 4 1 CVIN Cap. 1.1p × X7R 50V 10% 0805 TDK C2012X7FIH105K 5 1 C1 Cap. 4.7p × XSR 10V 10% 0803 TDK C1060XSE1N4775K 6 2 C2, C11 Cap. 0.1p × XSR 10V 10% 0603 AVX 0402ZD104KA72A 7 1 C3 Cap. 4.7p × XSR 10V 10% 0603 AVX 06033A4R7AA72A 8 4 C4, C15, C18, C35 Cap. 4.7p × XSR 10V 10% 0603 Murata GRM188871H104KA93D 9 3 C5, C16, C19 Cap. 0.1p × X7R 50V 10% 0603 Murata GRM188871H104KA93D 10 1 C6 Cap. Alum 22p × 50V 10% 0603 AVX 06033A120KA72A 11 1 C14 Cap. 12p × NPO 25V 9% 0603 AVX 06033A2CAA72A 12 1 C17 Cap. 220p × X7R 25V 10% 0603 AVX 06033A2CAA7A72A 13 1 C27 Cap. 220p × X7R 25V 10% 0603 AVX 06033A2CAA7A7A7A 14 2 C29, C30 Cap. 10p × X7R 50V 10% 120e TDK CGAA5L3XSR1H106K160AB 15 2	1	1	CPVIN1	Cap, 4.7µF X7R 50V 10% 1206	TDK C3216X7R1H475K	
4 1 CVIN Cap. 1µF X7R 50V 10% 0805 TDK C2012X7R1H105K 5 1 C1 Cap. 4.7µF X8R 10V 10% 0603 TDK C1608X8F1A475K 6 2 C2, C11 Cap. 0.1µF X8R 10V 10% 0603 AVX 0402ZD104K472A 7 1 C3 Cap. 4.7pF NPO 28V 10% 0603 AVX 06033A4R7K472A 8 4 C4, C15, C18, C35 Cap. 4.7pF X8R 10V 20% 1206 Murata GRM13CR61A476ME15L 9 3 C5, C16, C19 Cap. 0.1pF X7R 50V 10% 0603 Murata GRM18B877H104KA9SD 10 1 C6 Cap. 12pF NPO 25V 10% 0603 AVX 06033A120KA12A 11 1 C14 Cap. 12pF NPO 25V 10% 0603 AVX 06033A120KA12A 12 1 C17 Cap. 22pF XPR 25V 10% 0603 AVX 06033A120KA12A 14 2 C29, C30 Cap. 10pF X7R 25V 10% 0603 AVX 06033C221MA72A 14 2 C29, C30 Cap. 10pF X7R 25V 10% 0603 AVX 06033C221MA72A 15 2 C32, C33 Cap. 20pF X7R 25V 20% 0603 AVX 06033C221MA72A 16 3 C36, C37, C39	2	1	CPVIN2	Cap, 10µF X7R 50V 10% 1210	Murata GRM32ER71H106KA12L	
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To C3	5	1	C1	Cap, 4.7µF X5R 10V 10% 0603	TDK C1608X5R1A475K	
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9 3 C5, C16, C19 Cap, 0.1 μF X7R 50V 10% 0603 Murata GRM188R71H104KA93D	7	1	C3	Cap, 4.7pF NPO 25V 10% 0603	AVX 06033A4R7KAT2A	
10	8	4	C4, C15, C18, C35	Cap, 47µF X5R 10V 20% 1206	Murata GRM31CR61A476ME15L	
11 1 C14 Cap. 12pF NPO 25V 10% 0603 AVX 06033A120KAT2A 12 1 C17 Cap. 22pF NPO 25V 5% 0603 AVX 06033A220JAT2A 13 1 C27 Cap. 22ppF X7R 25V 10% 0603 AVX 06033A220JAT2A 14 2 C29, C30 Cap. 10pF X7R 25V 10% 0603 AVX 06033C22TMAT2A 15 2 C32, C33 Cap. 0.1pF X7R 25V 20% 0603 AVX 06033C475MAT2A 16 3 C36, C37, C39 Cap. 0.1pF X7R 50V 10% 0402 TDK CGA2B3X7R1H104K050BB 17 1 FB1 Ferrite Bead, 330Ω TDK COrp. MPZ2012S331AT000 18 1 L1 Inductor, 3.3pH XAL5030 Colicraft XAL5030-332MEC 19 1 L2 Inductor, 1.5pH x3.5030 Colicraft XAL5030-332MEC 20 1 L3 Inductor, 1.5pH x3.5030 Colicraft XAL5030-332MEC 21 1 L5 Inductor, 0.22pH Vishay CRCW06033MBKFKEA 21 1 L5 Inductor, 0.22pH Vishay CRCW060330KFKEA 23 2 R2, R5 Res, Chip 264k 0.06W 1% 0603<	9	3	C5, C16, C19	Cap, 0.1µF X7R 50V 10% 0603	Murata GRM188R71H104KA93D	
12	10	1	C6	Cap, Alum 22µF 50V 10%	Sun Elect. 50CE22BSS	
13	11	1	C14	Cap, 12pF NPO 25V 10% 0603	AVX 06033A120KAT2A	
14 2 C29, C30 Cap, 10µF X5R 50V 10% 1206 TDK CGA5L3X5R1H106K160AB 15 2 C32, C33 Cap, 47nF X7R 25V 20% 0603 AVX 06033C473MAT2A 16 3 C36, C37, C39 Cap, 0.1µF X7R 50V 10% 0402 TDK CGA2B3X7R1H104K050BB 17 1 FB1 Ferrite Bead, 3302 TDK Corp. MPC212S331AT000 18 1 L1 Inductor, 3.3µH XAL5030 Colicraft XAL520312S3MECC 19 1 L2 Inductor, 1.5µH XAL5030 Colicraft XFL5015-152MEC 20 1 L3 Inductor, 1.9µH xAL5030 Colicraft XFL5015-152MEC 21 1 L5 Inductor, 1.9µH xAL5030 Colicraft XFL5015-152MEC 21 1 L5 Inductor, 0.22µH Vishay IHLP-1212BZ-ER-R22M11 22 1 R1 Res, Chip 806k 0.06W 1% 0603 Vishay CRCW0603806KFKEA 23 2 R2, R5 Res, Chip 806k 0.06W 1% 0603 Vishay CRCW0603806KFKEA 24 1 R3 Res, Chip 340k 0.06W 1% 0603 Vishay CRCW060346KFKEA 25 1 R4	12	1	C17	Cap, 22pF NPO 25V 5% 0603	AVX 06033A220JAT2A	
15 2 C32, C33 Cap, 47nF X7R 25V 20% 0603 AVX 06033C473MAT2A 16 3 C36, C37, C39 Cap, 0.1μF X7R 50V 10% 0402 TDK CGA2B3X7R1H104K050BB 17 1 FB1 Ferrite Bead, 330Ω TDK Corp. MPZ2012S331AT000 18 1 L1 Inductor, 3.9μH XAL5030 Colicraft XAL5030-332MEC 19 1 L2 Inductor, 1.5μH XAL5030 Colicraft XAL5015-152MEC 20 1 L3 Inductor, 1.5μH XAL5030 NIC Comp. Corp. NIPS42LS1R0YTRF 21 1 L5 Inductor, 0.22μH Vishay CRCW0603806KFKEA 22 1 R1 Res, Chip 806k 0.06W 1% 0603 Vishay CRCW0603806KFKEA 23 2 R2, R5 Res, Chip 200k 0.06W 1% 0603 Vishay CRCW0603200KFKEA 24 1 R3 Res, Chip 464k 0.06W 1% 0603 Vishay CRCW0603340KFKEA 25 1 R4 Res, Chip 340k 0.06W 1% 0603 Vishay CRCW060319KFKEA 26 3 R6, R7, R8 Res, Chip 10k 0.06W 1% 0603 Vishay CRCW060319KFKEA 28 1 R11 <td>13</td> <td>1</td> <td>C27</td> <td>Cap, 220pF X7R 25V 10% 0603</td> <td>AVX 06033C221MAT2A</td>	13	1	C27	Cap, 220pF X7R 25V 10% 0603	AVX 06033C221MAT2A	
TDK CGA2B3X7R1H104K050BB	14	2	C29, C30	Cap, 10µF X5R 50V 10% 1206	TDK CGA5L3X5R1H106K160AB	
To	15	2	C32, C33	Cap, 47nF X7R 25V 20% 0603	AVX 06033C473MAT2A	
18	16	3	C36, C37, C39	Cap, 0.1µF X7R 50V 10% 0402	TDK CGA2B3X7R1H104K050BB	
19	17	1	FB1	Ferrite Bead, 330Ω	TDK Corp. MPZ2012S331AT000	
1	18	1	L1	Inductor, 3.3µH XAL5030	Coilcraft XAL5030-332MEC	
21	19	1	L2	Inductor, 1.5µH XAL5030	Coilcraft XFL5015-152MEC	
22	20	1	L3	Inductor, 1µH ±30% NPIS42LS	NIC Comp. Corp. NPIS42LS1R0YTRF	
23 2 R2, R5 Res, Chip 200k 0.06W 1% 0603 Vishay CRCW0603200KFKEA 24 1 R3 Res, Chip 464k 0.06W 1% 0603 Vishay CRCW0603464KFKEA 25 1 R4 Res, Chip 340k 0.06W 1% 0603 Vishay CRCW0603340KFKEA 26 3 R6, R7, R8 Res, Chip 19.1k 0.06W 1% 0603 Vishay CRCW060319K1FKEA 27 4 R10, R15, R19, R21 Res, Chip 100k 0.06W 1% 0603 Vishay CRCW060310KFKEA 28 1 R11 Res, Chip 187k 0.06W 1% 0603 Vishay CRCW0603150KFKEA 29 1 R12 Res, Chip 150k 0.06W 1% 0603 Vishay CRCW0603150KFKEA 30 1 R18 Res, Chip 28.7k 0.06W 1% 0603 Vishay CRCW060328K7FKEA 31 1 U1 IC, Buck Regulator QFN(40) (UJ) 6MM × 6MM Linear Technology Corporation LT8601EUJ#PBF Additional Demo Board Circuit Components 1 0 R31 (Opt) Res, 0603 Hardware: For Demo Board Only 2 5 XJP1, XJP2, XJP4, XJP5, XJP7 Shunt, 2mm Ctrs Samtec 2SN-BK-G 3 17	21	1	L5	Inductor, 0.22µH	Vishay IHLP-1212BZ-ER-R22M11	
24 1 R3 Res, Chip 464k 0.06W 1% 0603 Vishay CRCW0603464KFKEA 25 1 R4 Res, Chip 340k 0.06W 1% 0603 Vishay CRCW0603340KFKEA 26 3 R6, R7, R8 Res, Chip 19.1k 0.06W 1% 0603 Vishay CRCW060319K1FKEA 27 4 R10, R15, R19, R21 Res, Chip 100k 0.06W 1% 0603 Vishay CRCW0603100KFKEA 28 1 R11 Res, Chip 187k 0.06W 1% 0603 Vishay CRCW0603187KFKEA 29 1 R12 Res, Chip 150k 0.06W 1% 0603 Vishay CRCW0603150KFKEA 30 1 R18 Res, Chip 28.7k 0.06W 1% 0603 Vishay CRCW060328K7FKEA 31 1 U1 IC, Buck Regulator QFN(40) (UJ) 6MM × 6MM Linear Technology Corporation LT8601EUJ#PBF Additional Demo Board Circuit Components 1 0 R31 (Opt) Res, 0603 Hardware: For Demo Board Only 1 0 TP1,TP2 (Opt) Testpoint 2 5 XJP1, XJP2, XJP4, XJP5, XJP4, XJP5, XJP7 Shunt, 2mm Ctrs Samtec 2SN-BK-G 3 17 E1, E2, E3, E4, E	22	1	R1	Res, Chip 806k 0.06W 1% 0603	<u> </u>	
25	23	2	R2, R5	Res, Chip 200k 0.06W 1% 0603	Vishay CRCW0603200KFKEA	
26 3 R6, R7, R8 Res, Chip 19.1k 0.06W 1% 0603 Vishay CRCW060319K1FKEA 27 4 R10, R15, R19, R21 Res, Chip 100k 0.06W 1% 0603 Vishay CRCW0603100KFKEA 28 1 R11 Res, Chip 187k 0.06W 1% 0603 Vishay CRCW0603187KFKEA 29 1 R12 Res, Chip 150k 0.06W 1% 0603 Vishay CRCW0603150KFKEA 30 1 R18 Res, Chip 28.7k 0.06W 1% 0603 Vishay CRCW060328K7FKEA 31 1 U1 IC, Buck Regulator QFN(40) (UJ) 6MM × 6MM Linear Technology Corporation LT8601EUJ#PBF Additional Demo Board Circuit Components 1 0 R31 (Opt) Res, 0603 Hardware: For Demo Board Only 1 0 TP1,TP2 (Opt) Testpoint 2 5 XJP1, XJP2, XJP4, XJP5, XJP4, XJP5, XJP7 Shunt, 2mm Ctrs Samtec 2SN-BK-G 3 17 E1, E2, E3, E4, E5, E6, E7, E8, E9, E11, E12, E15, E16, E17, E18, E20, E21 TEST POINT, TURRET, 0.094" MTH HOLE Mill Max 2501-2-00-80-00-00-00-07-0 4 5 JP1, JP2, JP4, JP5, JP7 Headers, 3 Pins 2mm Ctrs Samtec TMM-103-02-L-	24	1	R3	Res, Chip 464k 0.06W 1% 0603	-	
27	25	1	R4	Res, Chip 340k 0.06W 1% 0603	Vishay CRCW0603340KFKEA	
28 1 R11 Res, Chip 187k 0.06W 1% 0603 Vishay CRCW0603187KFKEA 29 1 R12 Res, Chip 150k 0.06W 1% 0603 Vishay CRCW0603150KFKEA 30 1 R18 Res, Chip 28.7k 0.06W 1% 0603 Vishay CRCW060328K7FKEA 31 1 U1 IC, Buck Regulator QFN(40) (UJ) 6MM × 6MM Linear Technology Corporation LT8601EUJ#PBF Additional Demo Board Circuit Components 1 0 R31 (Opt) Res, 0603 Hardware: For Demo Board Only 1 0 TP1,TP2 (Opt) Testpoint 2 5 XJP1, XJP2, XJP4, XJP5, XJP5, XJP7 Shunt, 2mm Ctrs Samtec 2SN-BK-G 3 17 E1, E2, E3, E4, E5, E6, E7, E8, E9, E11, E12, E15, E16, E17, E18, E20, E21 TEST POINT, TURRET, 0.094" MTH HOLE Mill Max 2501-2-00-80-00-00-07-0 4 5 JP1, JP2, JP4, JP5, JP7 Headers, 3 Pins 2mm Ctrs Samtec TMM-103-02-L-S	26	3	R6, R7, R8	Res, Chip 19.1k 0.06W 1% 0603	Vishay CRCW060319K1FKEA	
29 1 R12 Res, Chip 150k 0.06W 1% 0603 Vishay CRCW0603150KFKEA 30 1 R18 Res, Chip 28.7k 0.06W 1% 0603 Vishay CRCW060328K7FKEA 31 1 U1 IC, Buck Regulator QFN(40) (UJ) 6MM × 6MM Linear Technology Corporation LT8601EUJ#PBF Additional Demo Board Circuit Components 1 0 R31 (Opt) Res, 0603 Hardware: For Demo Board Only 1 0 TP1,TP2 (Opt) Testpoint 2 5 XJP1, XJP2, XJP4, XJP5, XJP7 Shunt, 2mm Ctrs Samtec 2SN-BK-G 3 17 E1, E2, E3, E4, E5, E6, E7, E8, E9, E11, E12, E15, E16, E17, E18, E20, E21 TEST POINT, TURRET, 0.094" MTH HOLE Mill Max 2501-2-00-80-00-00-07-0 4 5 JP1, JP2, JP4, JP5, JP7 Headers, 3 Pins 2mm Ctrs Samtec TMM-103-02-L-S	27	4	R10, R15, R19, R21	Res, Chip 100k 0.06W 1% 0603	Vishay CRCW0603100KFKEA	
30	28	1	R11	Res, Chip 187k 0.06W 1% 0603	Vishay CRCW0603187KFKEA	
31 1 U1 IC, Buck Regulator QFN(40) (UJ) 6MM × 6MM Linear Technology Corporation LT8601EUJ#PBF Additional Demo Board Circuit Components 1 0 R31 (Opt) Res, 0603 Hardware: For Demo Board Only 1 0 TP1,TP2 (Opt) Testpoint 2 5 XJP1, XJP2, XJP4, XJP5, XJP7 Shunt, 2mm Ctrs Samtec 2SN-BK-G 3 17 E1, E2, E3, E4, E5, E6, E7, E8, E9, E11, E12, E15, E16, E17, E18, E20, E21 TEST POINT, TURRET, 0.094" MTH HOLE Mill Max 2501-2-00-80-00-00-07-0 4 5 JP1, JP2, JP4, JP5, JP7 Headers, 3 Pins 2mm Ctrs Samtec TMM-103-02-L-S	29	1	R12	Res, Chip 150k 0.06W 1% 0603	Vishay CRCW0603150KFKEA	
Additional Demo Board Circuit Components 1 0 R31 (Opt) Res, 0603 Hardware: For Demo Board Only 1 0 TP1,TP2 (Opt) Testpoint 2 5 XJP1, XJP2, XJP4, XJP5, XJP4, XJP5, XJP7 Shunt, 2mm Ctrs 3 17 E1, E2, E3, E4, E5, E6, E7, E8, E9, E11, E12, E15, E16, E17, E18, E20, E21 TEST POINT, TURRET, 0.094" MTH HOLE Mill Max 2501-2-00-80-00-00-07-0 4 5 JP1, JP2, JP4, JP5, JP7 Headers, 3 Pins 2mm Ctrs Samtec TMM-103-02-L-S	30	1	R18	Res, Chip 28.7k 0.06W 1% 0603	Vishay CRCW060328K7FKEA	
1 0 R31 (Opt) Res, 0603 Hardware: For Demo Board Only 1 0 TP1,TP2 (Opt) Testpoint 2 5 XJP1, XJP2, XJP4, XJP5, XJP7 Shunt, 2mm Ctrs 3 17 E1, E2, E3, E4, E5, E6, E7, E3, E4, E5, E6, E7, E3, E4, E5, E16, E17, E18, E20, E21 TEST POINT, TURRET, 0.094" MTH HOLE Mill Max 2501-2-00-80-00-00-07-0 4 5 JP1, JP2, JP4, JP5, JP7 Headers, 3 Pins 2mm Ctrs Samtec TMM-103-02-L-S	31	1	U1	IC, Buck Regulator QFN(40) (UJ) 6MM × 6MM	Linear Technology Corporation LT8601EUJ#PBF	
Hardware: For Demo Board Only 1 0 TP1,TP2 (Opt) Testpoint 2 5 XJP1, XJP2, XJP4, XJP5, XJP5, Shunt, 2mm Ctrs Samtec 2SN-BK-G 3 17 E1, E2, E3, E4, E5, E6, E7, E8, E9, E11, E12, E15, E16, E17, E18, E20, E21 TEST POINT, TURRET, 0.094" MTH HOLE Mill Max 2501-2-00-80-00-00-07-0 4 5 JP1, JP2, JP4, JP5, JP7 Headers, 3 Pins 2mm Ctrs Samtec TMM-103-02-L-S	Addition	al Demo	Board Circuit Components			
1 0 TP1,TP2 (Opt) Testpoint 2 5 XJP1, XJP2, XJP4, XJP5, XJP7 Shunt, 2mm Ctrs Samtec 2SN-BK-G 3 17 E1, E2, E3, E4, E5, E6, E7, E8, E9, E11, E12, E15, E16, E17, E18, E20, E21 TEST POINT, TURRET, 0.094" MTH HOLE Mill Max 2501-2-00-80-00-00-07-0 4 5 JP1, JP2, JP4, JP5, JP7 Headers, 3 Pins 2mm Ctrs Samtec TMM-103-02-L-S	1	0	R31 (Opt)	Res, 0603		
2 5 XJP1, XJP2, XJP4, XJP5, XJP7 Shunt, 2mm Ctrs Samtec 2SN-BK-G 3 17 E1, E2, E3, E4, E5, E6, E7, E8, E9, E11, E12, E15, E16, E17, E18, E20, E21 TEST POINT, TURRET, 0.094" MTH HOLE Mill Max 2501-2-00-80-00-00-07-0 4 5 JP1, JP2, JP4, JP5, JP7 Headers, 3 Pins 2mm Ctrs Samtec TMM-103-02-L-S	Hardwar	e: For D	emo Board Only			
XJP7	1	0	TP1,TP2 (Opt)	Testpoint		
E8, E9, E11, E12, E15, E16, E17, E18, E20, E21 4 5 JP1, JP2, JP4, JP5, JP7 Headers, 3 Pins 2mm Ctrs Samtec TMM-103-02-L-S	2	5		Shunt, 2mm Ctrs	Samtec 2SN-BK-G	
	3	17	E8, E9, E11, E12, E15, E16,	TEST POINT, TURRET, 0.094" MTH HOLE	Mill Max 2501-2-00-80-00-07-0	
5 1 JP6 Jumper, 2 Pins 2mm Ctrs Samtec TMM-102-02-L-S	4	5	JP1, JP2, JP4, JP5, JP7	Headers, 3 Pins 2mm Ctrs	Samtec TMM-103-02-L-S	
	5	1	JP6	Jumper, 2 Pins 2mm Ctrs	Samtec TMM-102-02-L-S	

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dc2346a

SCHEMATIC DIAGRAM



DEMO MANUAL DC2346A

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Mailing Address:

Linear Technology 1630 McCarthy Blvd. Milpitas, CA 95035

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