LT8362
Low IQ Boost/SEPIC/ Inverting Regulator

DESCRIPTION

Demo circuit 2628A features the LT®8362 in boost configuration. The converter is designed to convert a 10V to 36V source to 48V at 280mA to 1000mA, depending on input voltage, and with a switching frequency of 2MHz. Please refer to Figure 4 for load current versus input voltage.

The demo board contains a selectable jumper, JP1, which makes it easy to select any desired "Sync" mode of operation. The default setting is "Burst".

The LT8362 can operate with inputs as high as 60V, however in this demo circuit, the input is limited by the level of the output voltage.

This layout is optimized for good "EMI" performance and solution size. Input and output filters and a "Hot Loop", comprised of C11 and C12 are necessary to pass CISPR25 Class 5 emissions, and are added by default. These components can be excluded in applications not requiring noise immunity. Radiated emissions plots are included in this manual.

The data sheet gives a complete description of the device, operation and application information. The data sheet must be read in conjunction with this demo manual for DC2628A.

Design files for this circuit board are available at http://www.linear.com/demo/DC2628A

PERFORMANCE SUMMARY

Specifications are at T_A = 25°C

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
V_{IN}	Input Supply Range		10		36	V
V_{OUT}	Output Voltage Range	V_{IN} = 12V, I_{LOAD} = 30mA	46.5	48	49.5	V
RIPPLE		V_{IN} = 12V, I_{LOAD} = 300mA		200		mV
EFFICIENCY		V_{IN} = 24V, I_{LOAD} = 500mA		94		%
SWITCHING FREQUENCY				2		MHz

QUICK START PROCEDURE

Demo circuit 2628A is easy to set up to evaluate the performance of the LT8362. 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. Measure the input or output voltage ripple by touching the probe tip directly across the V_{IN} or V_{OUT} and GND terminals. See Figure 2 for proper scope probe technique.

1. With power off, connect the input power supply to V_{IN} and GND.
2. Turn on the power at the input.

   Note: Make sure that the input voltage does not exceed 36V.
3. Check for the proper output voltage.

   If there is no output, temporarily disconnect the load to make sure that the load is not set too high.
4. Once the proper output voltages are established, adjust the load within the operating range and observe the output voltage regulation, ripple voltage, efficiency and other parameters.

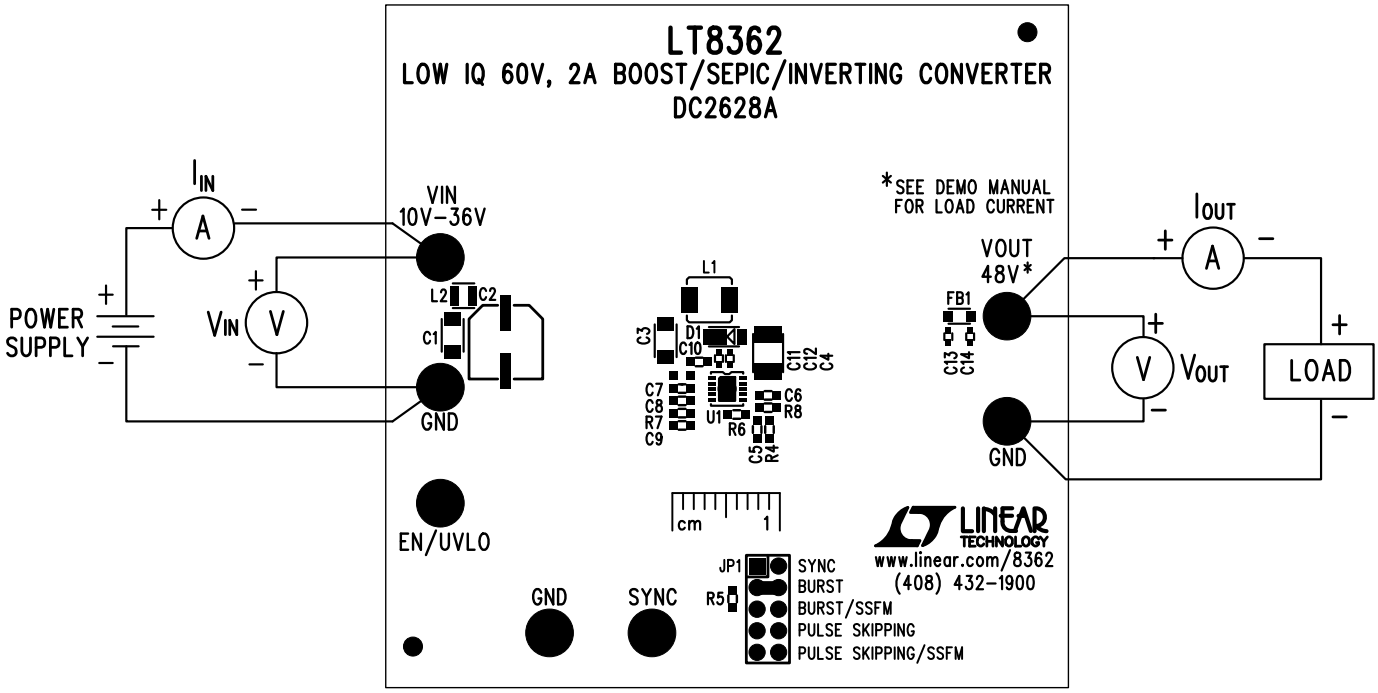


Figure 1. DC2628A Proper Equipment Setup

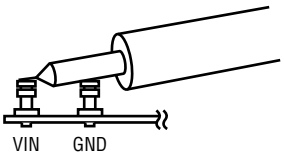


Figure 2. Measuring Input or Output Ripple

QUICK START PROCEDURE

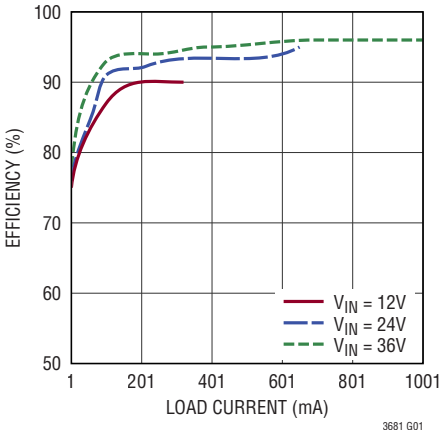


Figure 3. Efficiency vs Load Current

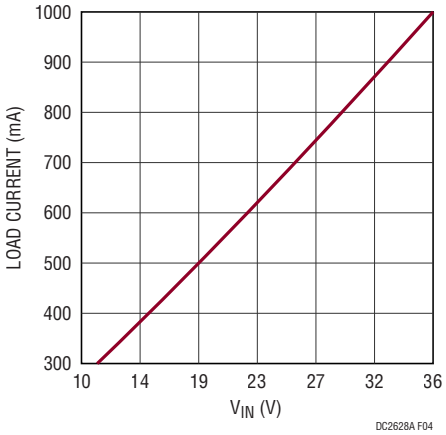


Figure 4. Load Current vs Input Voltage

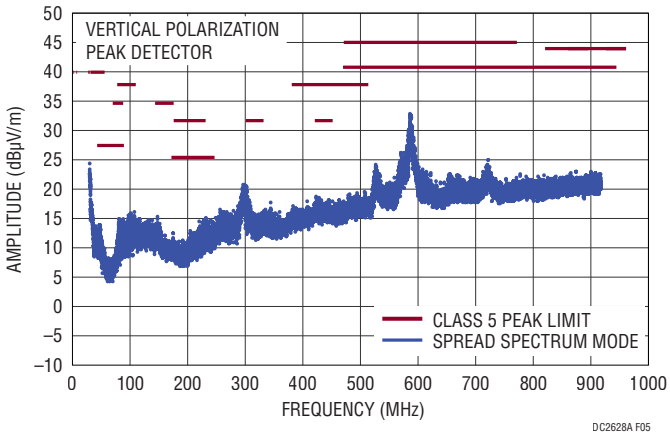


Figure 5. EMI Performance (Peak Detection) in CISPR25 Radiated Emission Test, V_{IN} = 12V, V_{OUT} = 48V, I_{OUT} = 300mA, 2MHz Switching Frequency

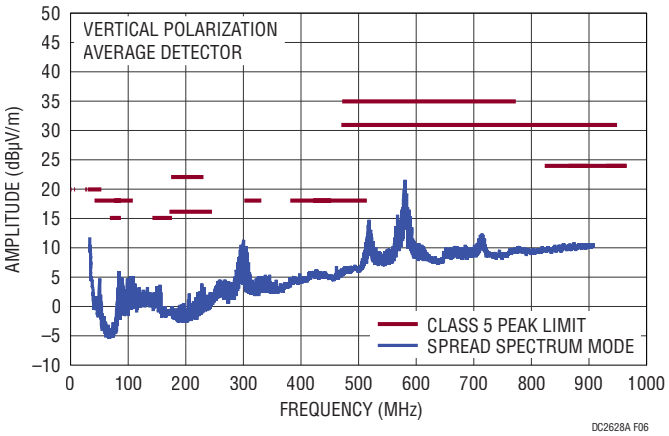
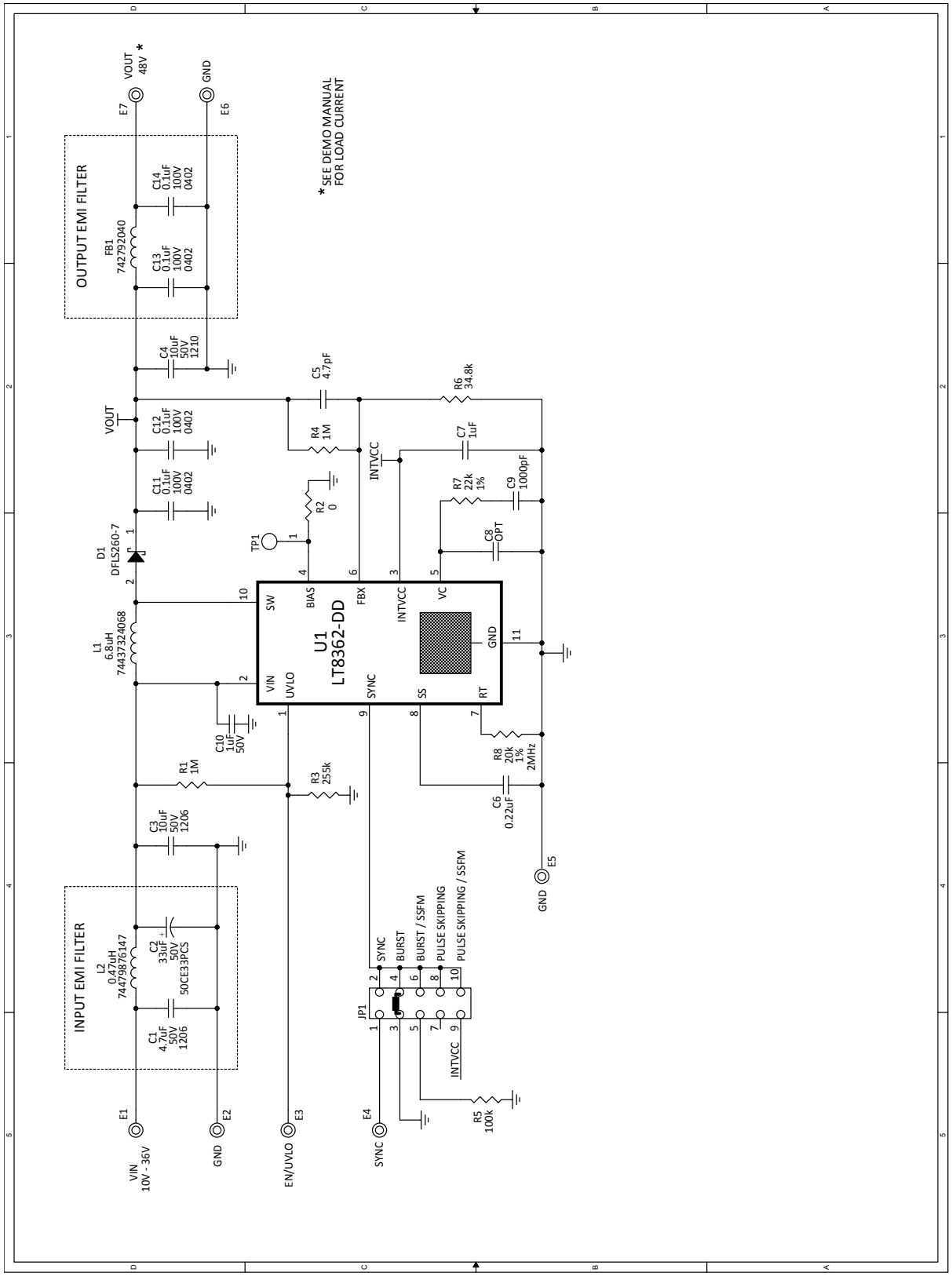


Figure 6. EMI Performance (Average Detection) in CISPR25 Radiated Emission Test, V_{IN} = 12V, V_{OUT} = 48V, I_{OUT} = 300mA, 2MHz Switching Frequency

PARTS LIST

ITEM	QTY	REFERENCE	PART DESCRIPTION	MANUFACTURER/PART NUMBER
Required Circuit Components				
1	1	C1	CAP., 4.7µF, X7R, 50V, 10%, 1206	AVX, 12065C475KAT2A
2	1	C2	CAP., 33µF, ALUM. ELECT., 50V, 20%, 6.3mm × 7.7mm	SUN ELECTRONIC INDUSTRIES CORP, 50CE33PCS
3	1	C3	CAP., 10µF, X5R, 50V, 10%, 1206	MURATA, GRM31CR61H106KA12L
4	1	C4	CAP., 10µF, X7R, 50V, 10%, 1210	MURATA, GRM32ER71H106KA12L
5	1	C5	CAP., 4.7pF, C0G, 25V, 10%, 0603	AVX, 06033A4R7KAT2A
6	1	C6	CAP., 0.22µF, X7R, 25V, 10%, 0603	MURATA, GRM188R71E224KA88D
7	1	C7	CAP., 1µF, X5R, 25V, 10%, 0603	MURATA, GRM188R61E105KA12D
8	1	C9	CAP., 1000pF, X7R, 25V, 10%, 0603	AVX, 06033C102KAT2A
9	1	C10	CAP., 1µF, X5R, 50V, 10%, 0603	MURATA, GRM188R61H105KAALD
10	4	C11, C12, C13, C14	CAP., 0.1µF, X5R, 100V, 10%, 0402	MURATA, GRM155R62A104KE14D
11	1	D1	DIODE, SCHOTTKY, 60V, 2.0A, POWER DI 123	DIODES INC., DFLS260-7
12	1	FB1	IND., 600Ω, FERRITE BEAD, 25%, 2A, 0805	WURTH ELEKTRONIK, 742792040
13	1	L1	IND., 6.8µH, PWR., 20%, 1.75A, 172mΩ, 4020, SMD	WURTH ELEKTRONIK, 74437324068
14	1	L2	IND., 0.47µH, PWR, 20%, 2.1A, 0.04Ω, 0806	WURTH ELEKTRONIK, 74479876147
15	2	R1, R4	RES., 1MΩ, 1%, 1/10W, 0603	NIC, NRC06F1004TRF
16	1	R2	RES., 0Ω, 1/10W, 0603	VISHAY, CRCW06030000Z0EA
17	1	R3	RES., 255kΩ, 1%, 1/10W, 0603	VISHAY, CRCW0603255KFKEA
18	1	R5	RES., 100kΩ, 1%,1/10W, 0603	NIC, NRC06F1003TRF
19	1	R6	RES., 34.8kΩ,1%, 1/10W, 0603	VISHAY, CRCW060334K8FKEA
20	1	R7	RES., 22kΩ, 1%, 1/10W, 0603	PANASONIC, ERJ3EKF2202V
21	1	R8	RES., 20kΩ, 1%, 1/10W, 0603	VISHAY, CRCW060320K0FKEA
22	1	U1	IC, BOOST/SEPIC/INVERTG CONVERTER, 3 × 3mm, DFN	LINEAR TECHNOLOGY, LT8362EDD#PBF
Additional Demo Board Circuit Components				
1	0	C8	CAP., OPTION, 0603	
Hardware: For Demo Board Only				
1	7	E1, E2, E3, E4, E5, E6, E7	TEST POINT, TURRET, 0.094", MTG. HOLE	MILL-MAX, 2501-2-00-80-00-00-07-0
2	1	JP1	CONN., HDR, MALE, 2 × 5, 2mm, THT, STR	SULLINS CONNECTOR SOLUTIONS, NRPN052PAEN-RC
3	1	XJP1	CONN., SHUNT, FEMALE, 2 POS, 2mm	WURTH ELEKTRONIK, 60800213421

SCHEMATIC DIAGRAM



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