

LT8336

Low I_Q Synchronous Boost Silent Switcher with 2.5A, 40V Switch

DESCRIPTION

Demonstration circuit 2505A is a low I_Q , Silent Switcher® synchronous boost converter featuring the LT®8336. DC2505A is designed to convert an 8V to 20V source to 24V output, with up to 1.5A load current, depending on the input voltage. DC2505A operates at 2MHz switching frequency.

The DC2505A contains a selectable jumper, JP1, to aid in the selection of the desired SYNC pin mode of operation. The default setting is pulse-skipping mode of operation.

The DC2505A has an EMI filter installed. The EMI filter can be included by connecting the source to the VEMI terminal and the output to the VOUT2 terminal.

The Performance Summary section details the ratings of the DC2505A at room temperature.

The LT8336 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 guide for DC2505A.

Design files for this circuit board are available.

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PERFORMANCE SUMMARY

Specifications are at $T_A = 25^\circ\text{C}$

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Input Voltage		8	12	20	V
Output Voltage		23.25	24	24.75	V
Maximum Output Current	$V_{IN} = 8\text{V}$	0.6			A
	$V_{IN} = 12\text{V}$	0.9			A
	$V_{IN} = 16\text{V}$	1.2			A
	$V_{IN} = 20\text{V}$	1.5			A
Output Voltage Ripple (Peak-to-Peak)*			100		mV
Efficiency	$V_{IN} = 12\text{V}$, $I_{OUT} = 0.9\text{A}$		94		%
Switching Frequency			2		MHz

*Measured Across C15

DEMO MANUAL DC2505A

QUICK START PROCEDURE

Easily evaluate the performance of the LT8336 with DC2505A. Refer to Figure 1 for proper measurement equipment setup and follow the procedure below:

1. With power off, connect the input power supply to the DC2505A demo board through VIN (E1) and GND (E2) terminals. Connect the load to the terminals VOUT1 (E7) and GND (E4) on the demo board.
2. Turn on the power at the input.

Note: Make sure that the input voltage is always within the specification range of 8V to 20V. To operate the DC2505A demo board with higher input/output voltage, input capacitor, output capacitor with higher voltage ratings might be needed.

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

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 VIN (E1) and GND (E2), or VOUT1 (E7) and GND (E4) terminals. See Figure 2 for proper scope probe technique.

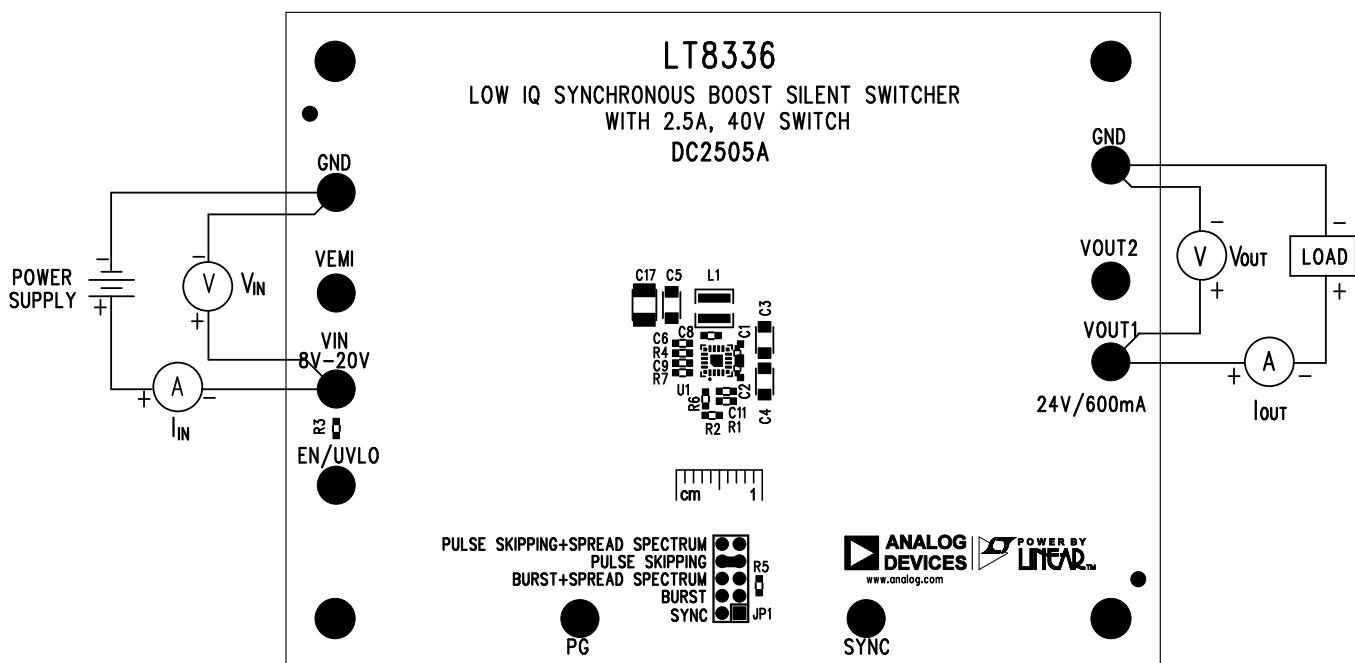


Figure 1. Proper Measurement Equipment Setup

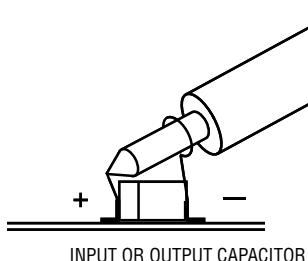


Figure 2. Proper Scope Probe Placement for Measuring Input or Output Ripple

QUICK START PROCEDURE

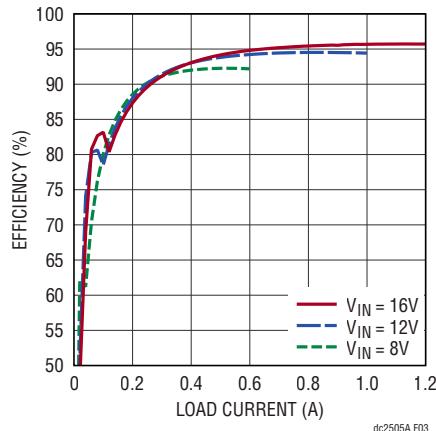


Figure 3. Typical Efficiency Curves

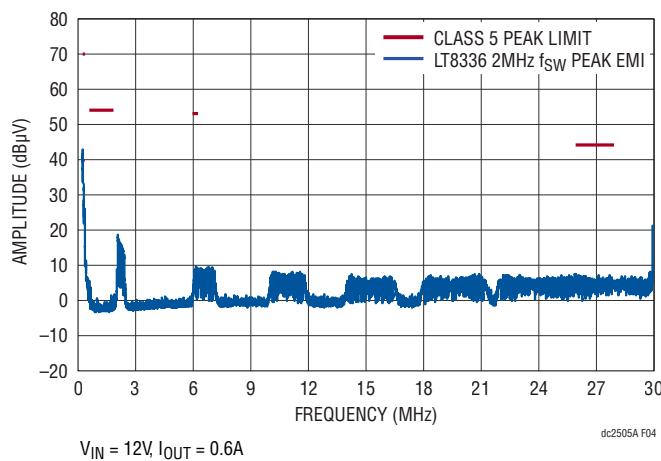


Figure 4. Conducted Emission Test (CISPR25 Class 5 Peak)

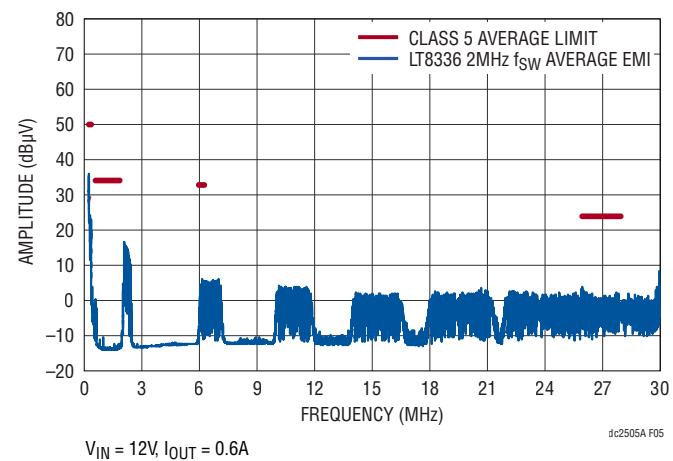


Figure 5. Conducted Emission Test (CISPR25 Class 5 Peak Average)

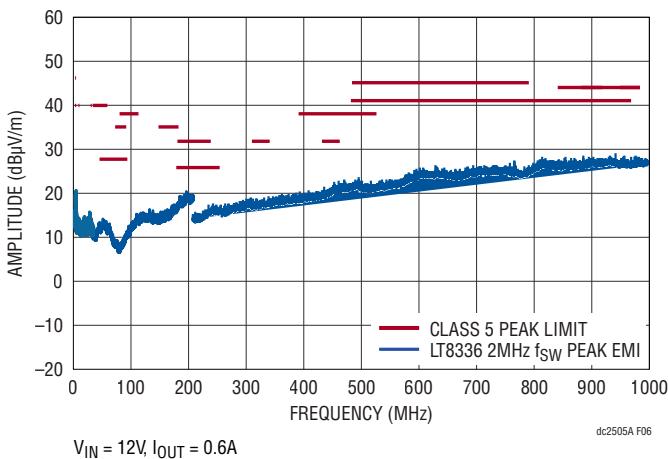


Figure 6. Radiated Emission Test (CISPR25 Class 5 Peak)

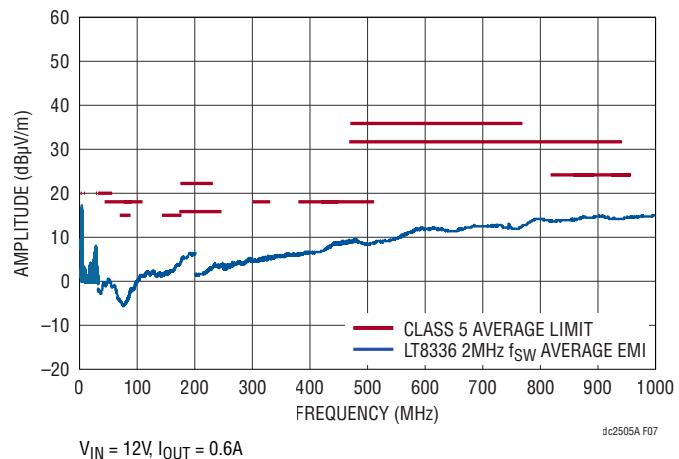


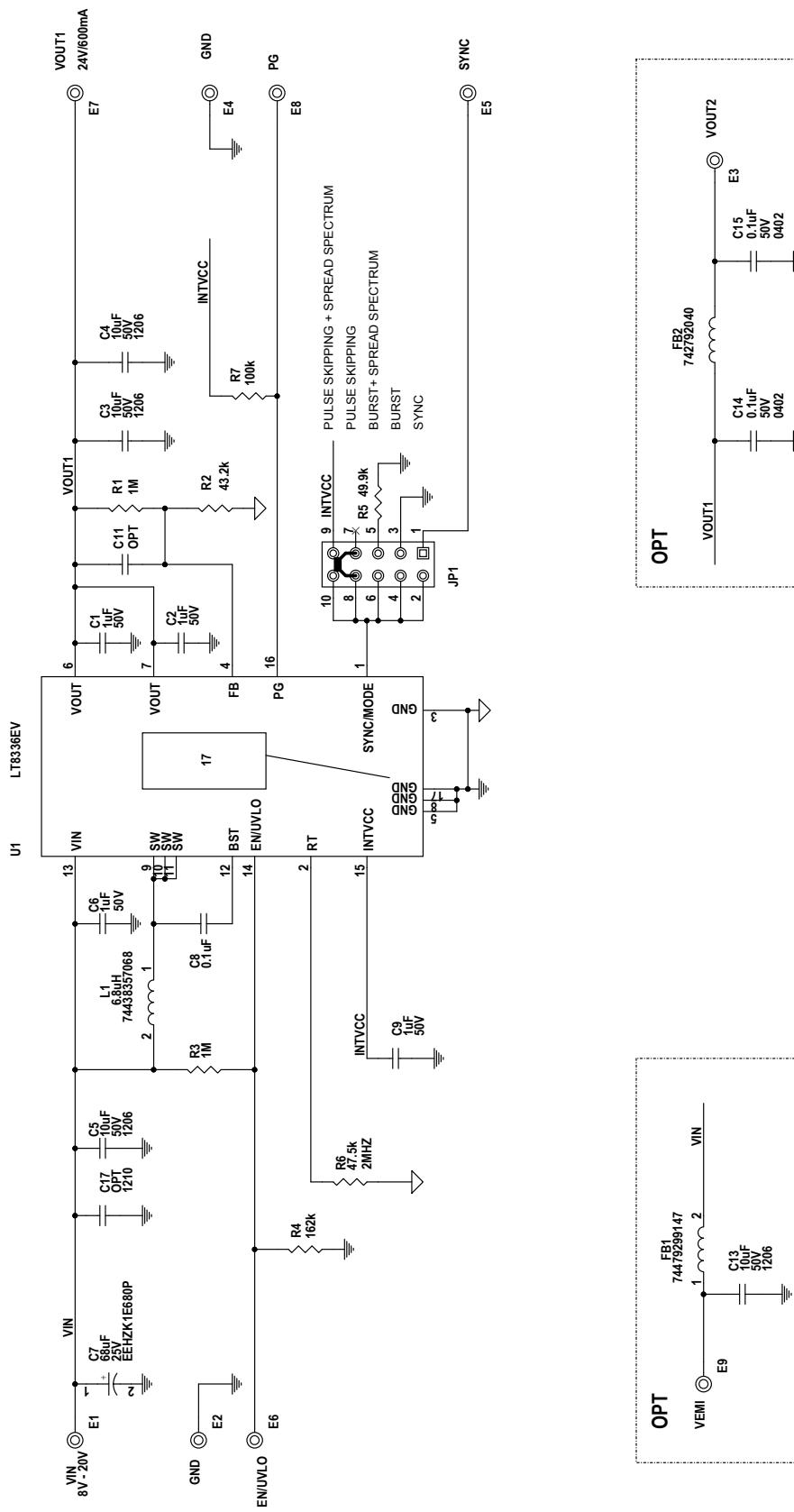
Figure 7. Radiated Emission Test (CISPR25 Class 5 Peak Average)

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PARTS LIST

ITEM	QTY	REFERENCE	PART DESCRIPTION	MANUFACTURER/PART NUMBER
Required Circuit Components				
1	4	C1, C2, C6, C9	CAP, 1µF, X7R, 50V, 10%, 0603	AVX, 06035C105KAT2A
2	4	C3–C5, C13	CAP, 10µF, X7R, 50V, 10%, 1206	SAMSUNG, CL31B106KBHNNNE
3	1	C7	CAP, 68µF, ALUM POLY HYB, 25V, 20%, 6.3mm × 5.8mm, AEC-Q200	PANASONIC, EEHZK1E680P
4	1	C8	CAP, 0.1µF, X7R, 50V, 10%, 0603	AVX, 06035C104KAT2A
5	2	C14, C15	CAP, 0.1µF, X7R, 50V, 10%, 0402, AEC-Q200	MURATA, GCM155R71H104KE02D
6	1	FB1	IND., 0.47µH, PWR, SHIELDED, 30%, 3.6A, 31mΩ, 1210	WURTH ELEKTRONIK, 74479299147
7	1	FB2	IND., 600Ω @100MHz, FERRITE BEAD, 25%, 2A, 150mΩ, 0805	WURTH ELEKTRONIK, 742792040
8	1	L1	IND., 6.8µH, PWR, SHIELDED, 20%, 3A, 74mΩ, 4030	WURTH ELEKTRONIK, 74438357068
9	2	R1, R3	RES., 1MΩ, 1%, 1/10W, 0603, AEC-Q200	VISHAY, CRCW06031M00FKEA
10	1	R2	RES., 43.2k, 1%, 1/10W, 0603, AEC-Q200	PANASONIC, ERJ3EKF4322V
11	1	R4	RES., 162k, 1%, 1/10W, 0603, AEC-Q200	PANASONIC, ERJ3EKF1623V
12	1	R5	RES., 49.9k, 1%, 1/10W, 0603	NIC, NRC06F4992TRF
13	1	R6	RES., 47.5k, 1%, 1/10W, 0603	VISHAY, CRCW060347K5FKEA
14	1	R7	RES., 100k, 1%, 1/10W, 0603	STACKPOLE ELECTRONICS, INC., RMCF0603FG100K
15	1	U1	IC, µPOWER SYNC. BOOST CONVERTER, LQFN-16, 40V, 2A	ANALOG DEVICES, LT8336EV#PBF
Additional Demo Board Circuit Components				
1	0	C17	CAP, OPTION, 1210	
2	0	C11	CAP, OPTION, 0603	
Hardware				
1	9	E1–E9	TEST POINT, TURRET, 0.094" MTG. HOLE, PCB 0.062" THK	MILL-MAX, 2501-2-00-80-00-00-07-0
2	1	JP1	CONN., HDR, MALE, 2x5, 2mm, VERT, ST, THT	WURTH ELEKTRONIK, 62001021121
3	4	MP1–MP4	STANDOFF, NYLON, SNAP-ON, 11.1mm	WURTH ELEKTRONIK, 702934000
4	1	XJP1	CONN., SHUNT, FEMALE, 2 POS, 2mm	WURTH ELEKTRONIK, 60800213421

SCHEMATIC DIAGRAM



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ESD Caution

ESD (electrostatic discharge) sensitive device. Charged devices and circuit boards can discharge without detection. Although this product features patented or proprietary protection circuitry, damage may occur on devices subjected to high energy ESD. Therefore, proper ESD precautions should be taken to avoid performance degradation or loss of functionality.

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Rev. 0

07/20

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