DEMO CIRCUIT 1359
QUICK START GUIDE

LT3640

Dual Monolithic Buck Regulator with Power-On Reset and Watchdog Timer

DESCRIPTION

Demonstration circuit 1359 is a Dual Monolithic Buck Regulator with Power-On Reset and Watchdog Timer featuring the LT3640. The board operates from inputs up to 35V and withstands transients up to 55V. The outputs are 3.3V, 0.8A and 1.2V, 1A. At light loads, both regulators operate in low ripple Burst Mode® to maintain high efficiency and low output ripple. Users can populate R13 on the EN/UVLO pin to provide a programmable under voltage lockout. Both channels have cycle-by-cycle current limit, providing protection against shorted outputs.

The power-on reset and watchdog timer periods are independently adjustable using external capacitors. Tight accuracy specifications and glitch immunity ensure reliable operation of the circuit. Watchdog can be enabled or disabled by JP1.

The circuit can be synchronized to an external clock connected to the SYNC terminal. If the SYNC function is used, the Rt resistor (R9) should be chosen to set the LT3640 internal switching frequency at least 20% below the lowest synchronization input frequency.

The LT3640 datasheet gives complete descriptions of the part, operation and application information. The datasheet must be read in conjunction with this quick start guide for working on or modifying the demo circuit 1359.

Design files for this circuit board are available. Call the LTC factory.

PERFORMANCE SUMMARY

Specifications are at TA = 25°C

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
V_{IN}	Input Supply Range	V_{OUT1} = 3.3V, I_{OUT1} = 0.8A V_{OUT2} = 1.2V, I_{OUT2} = 1A	5		35	V
V_{OUT1}	Output Voltage 1	V_{IN} = 12V, I_{OUT1} = 0.8A	3.20	3.30	3.40	V
V_{OUT2}	Output Voltage 2	V_{IN} = 12V, I_{OUT2} = 1A	1.16	1.20	1.24	V
I_{OUT1}	Output Current 1		0		0.8	A
I_{OUT2}	Output Current 2		0		1	A
I_Q	No Load Quiescent Current	V_{IN} = 12V, V_{OUT1} = 3.3V, V_{OUT2} = 1.2V, No Load		0.33		mA
F_{SW}	Switching Frequency		1.75	2	2.35	MHz
T_{WDU}	Watchdog Upper Boundary Period	C7 = 1500pF		55.5		ms
T_{WDL}	Watchdog Lower Boundary Period	C7 = 1500pF		3.5		ms
T_{RST}	Programmed Reset Period	C8 = 1500pF		55.5		ms

QUICK START PROCEDURE

Demonstration circuit 1359 is easy to set up to evaluate the performance of the LT3640. Refer to Figure 1 for proper measurement equipment setup and follow the procedure below:

1. Place Jumper JP1 in the following position:

OFF: Watchdog Disabled

ON: Watchdog Enabled

2. With power off, connect the input power supply to VIN and GND.

3. With power off, connect loads from VOUT1 to GND and VOUT2 to GND.

4. Turn on the power at the input.

NOTE. Make sure that the input voltage does not exceed 35V.

5. Check for the proper output voltages:

VOUT1 = 3.3V, VOUT2 = 1.2V

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

6. Once the proper output voltages are established, adjust the loads within the operating range and observe the output voltage regulation, ripple voltage, efficiency and other parameters.

7. To test the watchdog timer, connect a clock input to the WDI terminal. Observe the output at the $\overline{WDO}$ terminal while the clock parameters are adjusted.

8. To test Power-On Reset, observe output at the RESET terminals: $\overline{RST1}$ and $\overline{RST2}$.

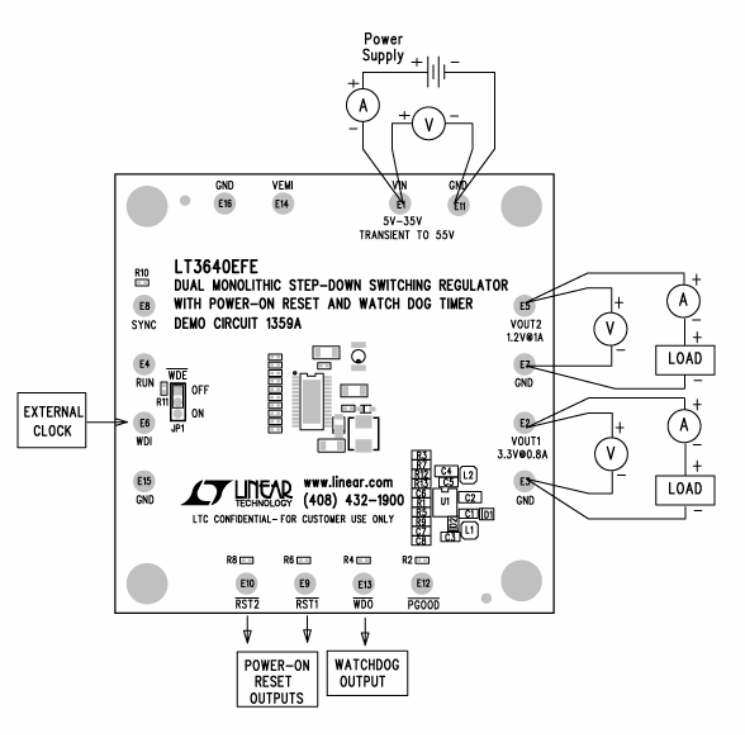


Figure 1. Proper Measurement Equipment Setup

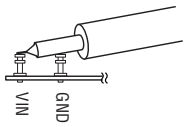
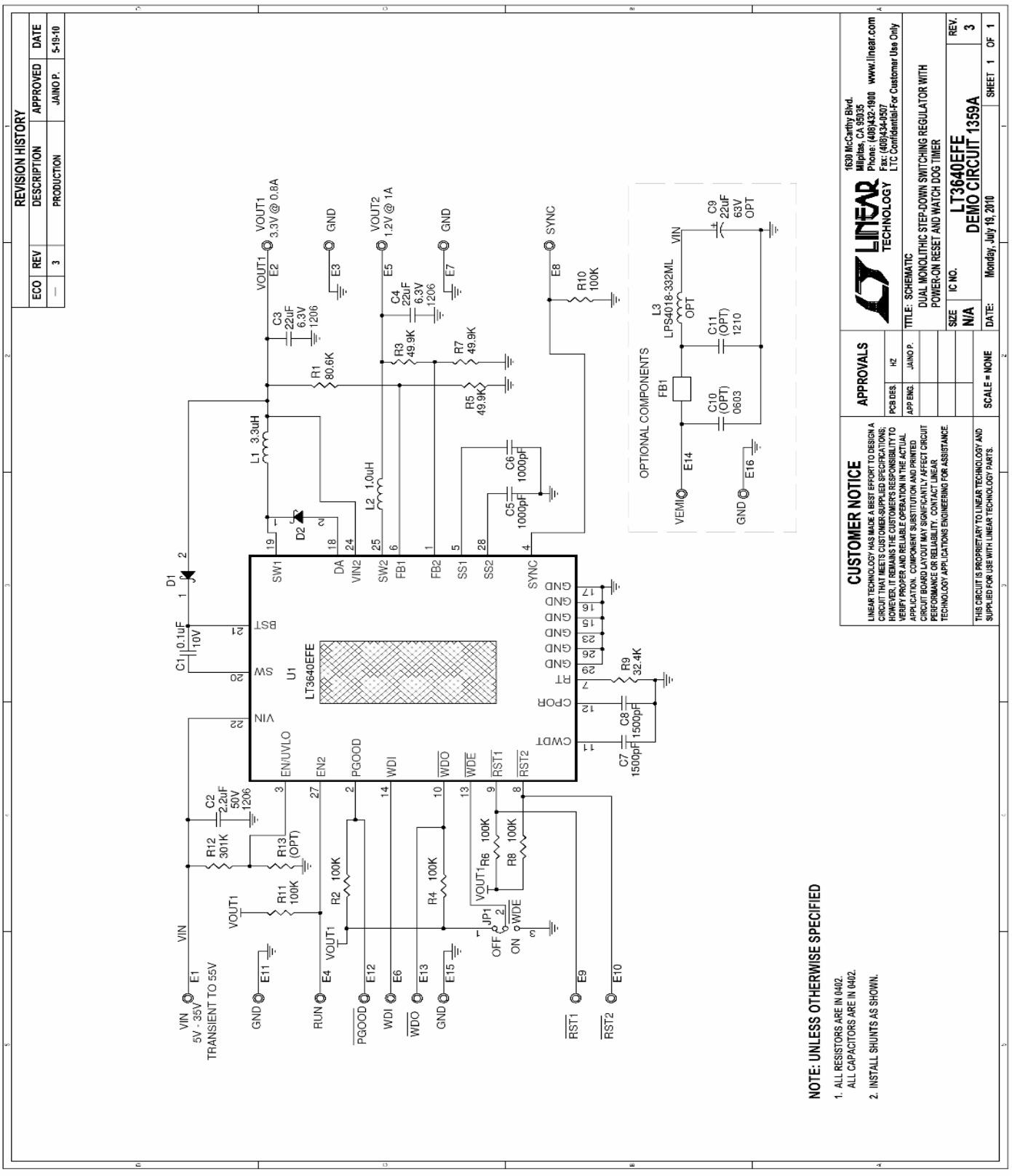


Figure 2. Measuring Input or Output Ripple


REVISION HISTORY
ECO REV DESCRIPTION APPROVED DATE
— 3 PRODUCTION JAINO P. 5-19-10
LT3640EFE
U1
VIN
5V - 35V
TRANSIENT TO 55V
VOUT1
3.3V @ 0.6A
VOUT2
1.2V @ 1A
L1 3.3uH
L2 1.0uH
L3
LPS4018-332ML
OPTIONAL COMPONENTS
SYNC
RUN
PGOOD
WDI
WDO
RST1
RST2
JP1
OFF
ON
WDE
NOTE: UNLESS OTHERWISE SPECIFIED
1. ALL RESISTORS ARE IN 0402.
ALL CAPACITORS ARE IN 0402.
2. INSTALL SHUNTS AS SHOWN.
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APP ENG. JAINO P.
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1630 McCarthy Blvd.
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LTC Confidential-For Customer Use Only
TITLE: SCHEMATIC
DUAL MONOLITHIC STEP-DOWN SWITCHING REGULATOR WITH
POWER-ON RESET AND WATCH DOG TIMER
SIZE IC NO.
N/A
LT3640EFE
DEMO CIRCUIT 1359A
REV. 3
SCALE = NONE
DATE: Monday, July 19, 2010
SHEET 1 OF 1