DEMO CIRCUIT 1412A
QUICK START GUIDE

LT3758EMSE
FLYBACK CONVERTER

DESCRIPTION

Demonstration circuit 1412A features LT3758EMSE in a 300kHz Flyback converter circuit, designed for 3.3V output from a 18V to 75V input.

The LT3758EMSE operates over an input range of 5.5V to 100V, suitable for automotive, telecom and industrial applications. It also exhibits low shutdown quiescent current of 1µA, making them an ideal fit for battery-operated systems. Thanks to a novel FBX pin architecture, the LT3758EMSE can be connected directly to a divider from either the positive output or the negative output to ground. It also packs many popular features such as soft-start, input undervoltage lockout, adjustable frequency and synchronization in a small 10-lead MSOP package or a 3mm × 3mm QFN package.

The LT3758EMSE datasheet gives a complete description of the part, operation and application information. The datasheet must be read in conjunction with this quick start guide for demo circuit 1412A.

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

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Table 1. Performance Summary for 300kHz Flyback Regulator (TA = 25°C)

PARAMETER	CONDITION	VALUE
Minimum Input Voltage		18V
Maximum Input Voltage		75V
Output Voltage V_{OUT}		3.3V +/-3%
Maximum Output Current		3A
Typical Switching Frequency		300kHz

QUICK START PROCEDURE

Demonstration circuit 1412A is easy to set up to evaluate the performance of the LT3758EMSE. 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 Vin or Vout and GND terminals. See Figure 2 for proper scope probe technique.

1. Place JP1 on the ON position.
2. With power off, connect the input power supply to Vin and GND.
3. Turn on the power at the input.

   NOTE. Make sure that the input voltage does not exceed the maximum input voltage.
4. Check for the proper output voltages.

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

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.

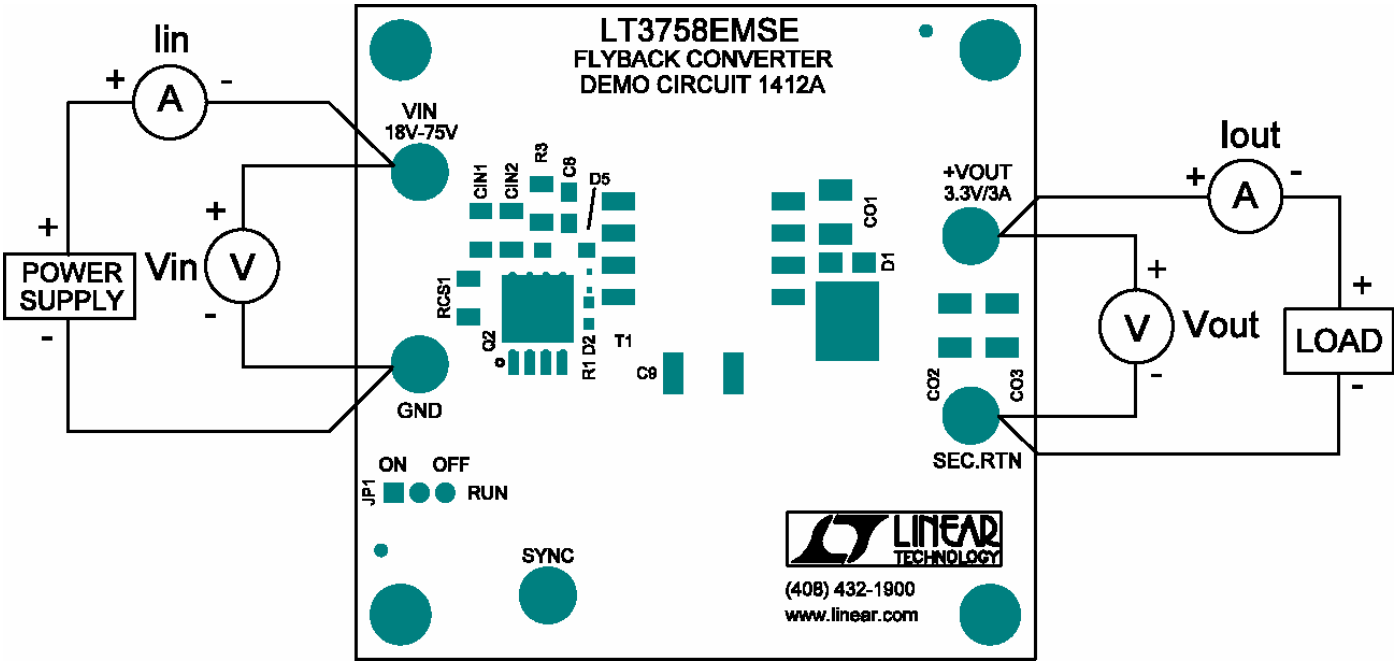


Figure 1. Proper Measurement Equipment Setup

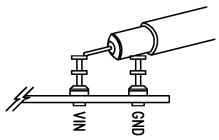
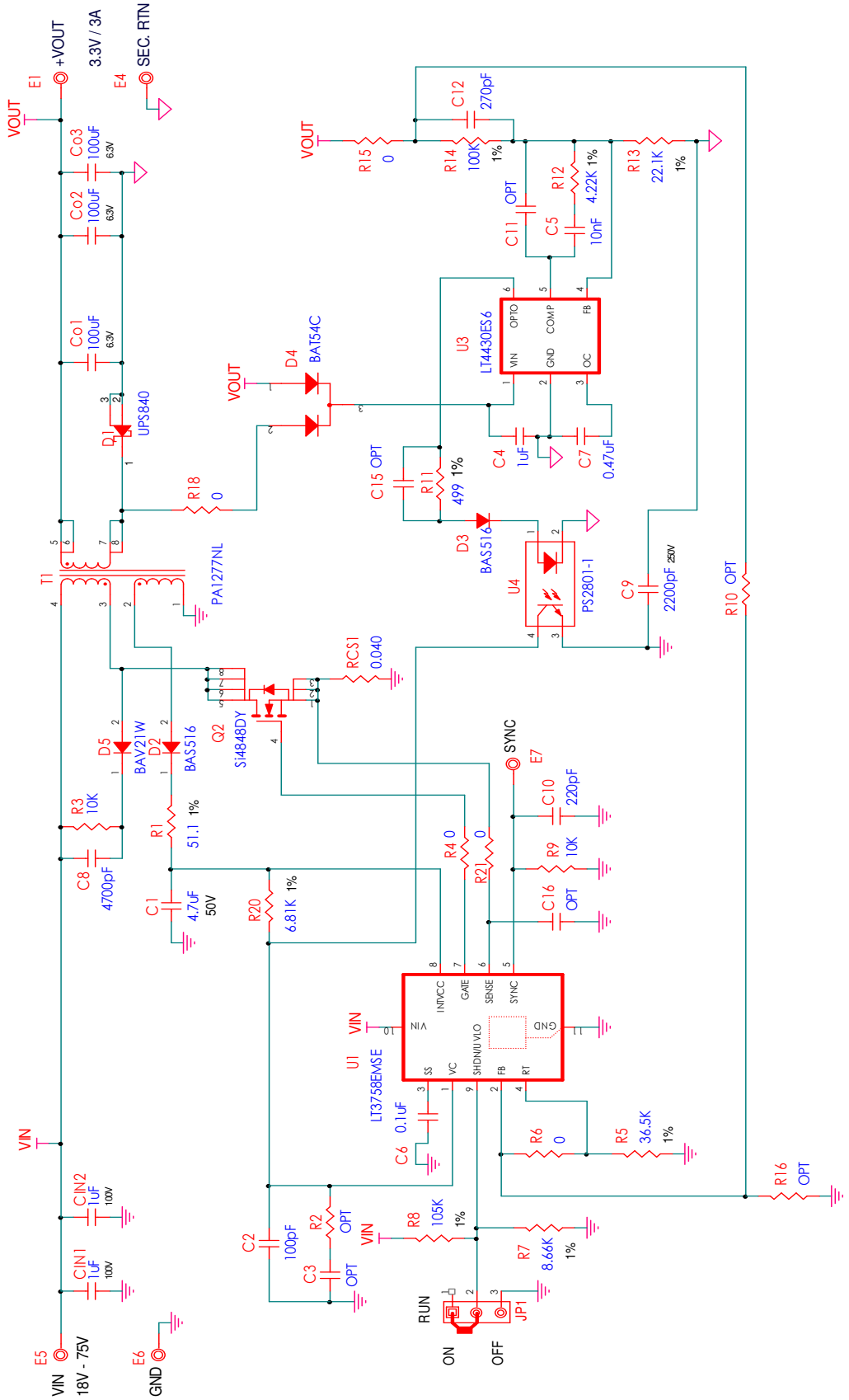


Figure 2. Measuring Input or Output Ripple


E1 +VOUT
3.3V / 3A
E4 SEC. RTN
VOUT
Co3 100uF 6.3V
Co2 100uF 6.3V
Co1 100uF 6.3V
D1 UPS840
R18 0
T1
PA1277NL
D4 BAT54C
R15 0
C12 270pF
R14 100K 1%
R12 4.22K 1%
R13 22.1K 1%
C11 OPT
C5 10nF
U3 LT4430ES6
OPTO
COMP
FB
VIN
GND
OC
C4 1uF
C7 0.47uF
C15 OPT
R11 499 1%
D3 BAS516
U4 PS2801-1
C9 2200pF 250V
R10 OPT
RCS1 0.040
Q2 Si4848DY
D5 BAV21W
D2 BAS516
SYNC
E7
R3 10K
C8 4700pF
R1 51.1 1%
C1 4.7uF 50V
R20 6.81K 1%
R4 0
R21 0
C10 220pF
R9 10K
C16 OPT
U1 LT3758EMSE
INTVCC
GATE
SENSE
SYNC
VIN
GND
SS
VC
SHDN/UVLO
FB
RT
C6 0.1uF
R6 0
R5 36.5K 1%
R16 OPT
C2 100pF
R2 OPT
C3 OPT
R8 105K 1%
R7 8.66K 1%
CIN2 1uF 100V
CIN1 1uF 100V
E5 VIN
18V - 75V
E6 GND
RUN
ON
OFF
JP1