DESCRIPTION

Demonstration circuit 634 is a low noise avalanche photodiode (APD) bias supply featuring the LT1930A.

This circuit takes an input voltage from 3V to 5.5V. The output voltage can be adjusted from 30V to 90V by applying a control voltage (4.5V to 0V) to the VPROGRAM pin.

The 2.2MHz switching frequency helps to minimize the circuit size.

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

Table 1. Performance Summary

PARAMETER	CONDITION	VALUE
Typical Output Ripple (V_{OUT} = 30V)	V_{IN} = 3V, LOAD = 47kΩ, 10MHz bandwidth	340μV_{P-P}
Typical Output Ripple (V_{OUT} =50V)	V_{IN} = 3V, LOAD = 47kΩ, 10MHz bandwidth	400μV_{P-P}
Typical Output Ripple (V_{OUT} =70V)	V_{IN} = 3V, LOAD = 47kΩ, 10MHz bandwidth	535μV_{P-P}
Nominal Switching Frequency		2.2MHz

QUICK START PROCEDURE

Demonstration circuit 634 is easy to set up to evaluate the performance of the LT1930A. Follow the procedure below:

1. Before hooking up the input supply and control voltage to the demo board, set the input supply voltage between 3V and 5.5V; set the control voltage between 0V and 4.5V. Then turn off the supplies.
2. Connect input supply, control voltage, load and meters as shown in Figure 1. If you want to monitor output ripple, also connect the BNC connector to the oscilloscope through a coaxial cable.
3. Make sure your setup is safe and the RUN/SD jumper is in the RUN position. **Remember, the output voltage will be 90V when the control voltage is 0V.**
4. Turn on the power supplies and meters. Adjust the control voltage for the desired output voltage.
5. Once the proper output voltage is established. Check the ripple voltage via the coaxial cable. (**See Application Note 92 for detailed discussion on low noise measurement techniques.)**

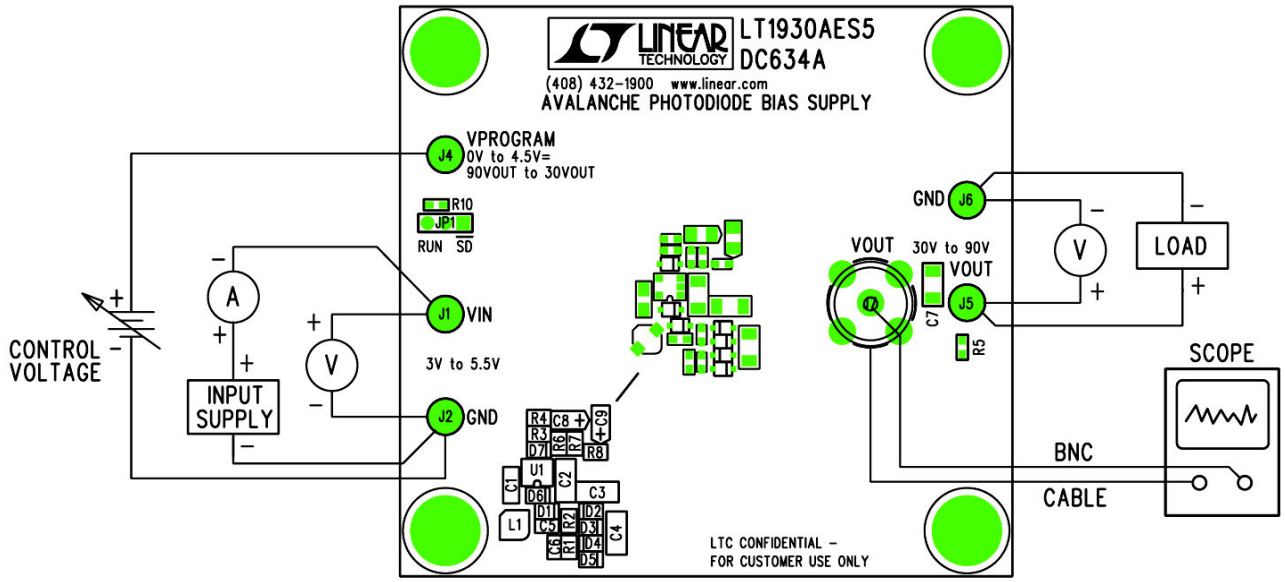


Figure 1. Proper Measurement Equipment Setup

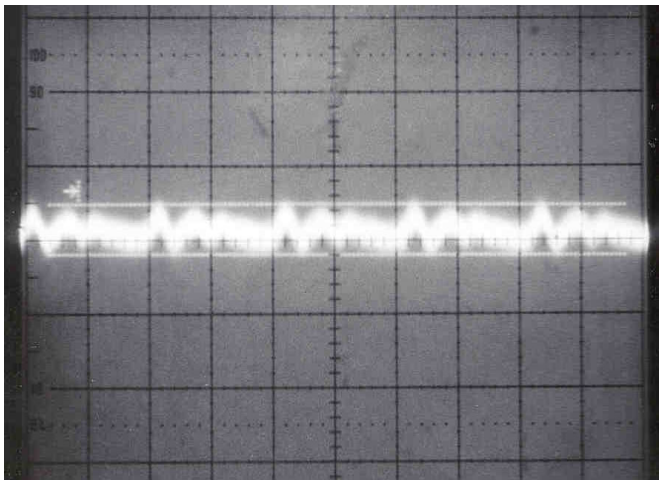


Figure 2. LT1930A Output Ripple (V_{IN}=3V, V_{OUT}=30V, LOAD = 47kΩ; 0.5mV/div ac coupled; 10MHz bandwidth)

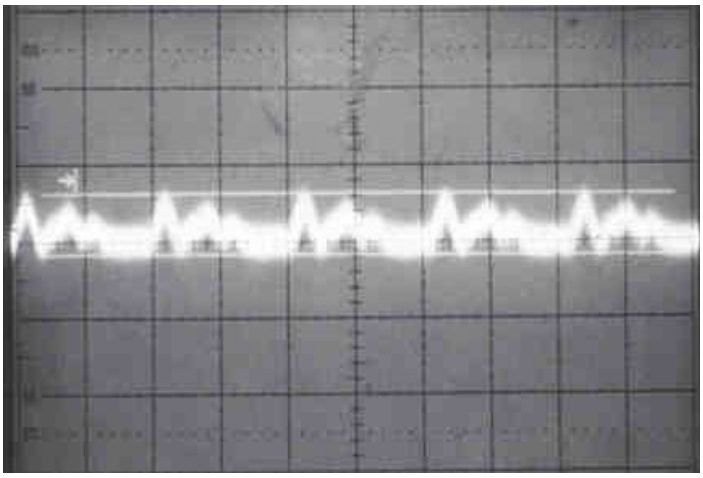


Figure 3. LT1930A Output Ripple (V_{IN}=3V, V_{OUT}=50V, LOAD = 47kΩ; 0.5mV/div ac coupled; 10MHz bandwidth)

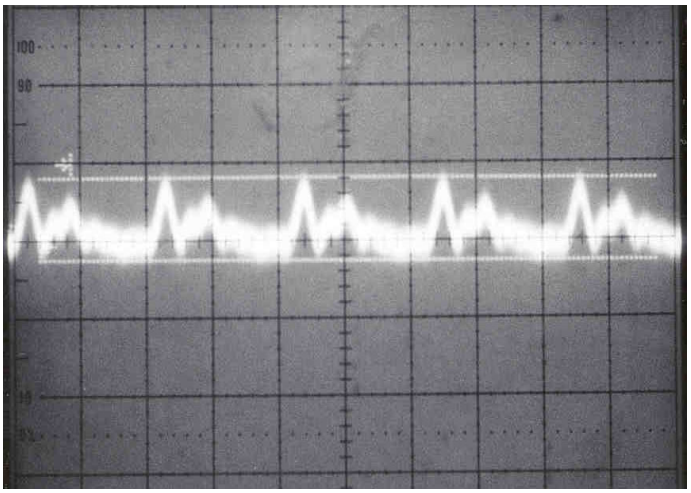
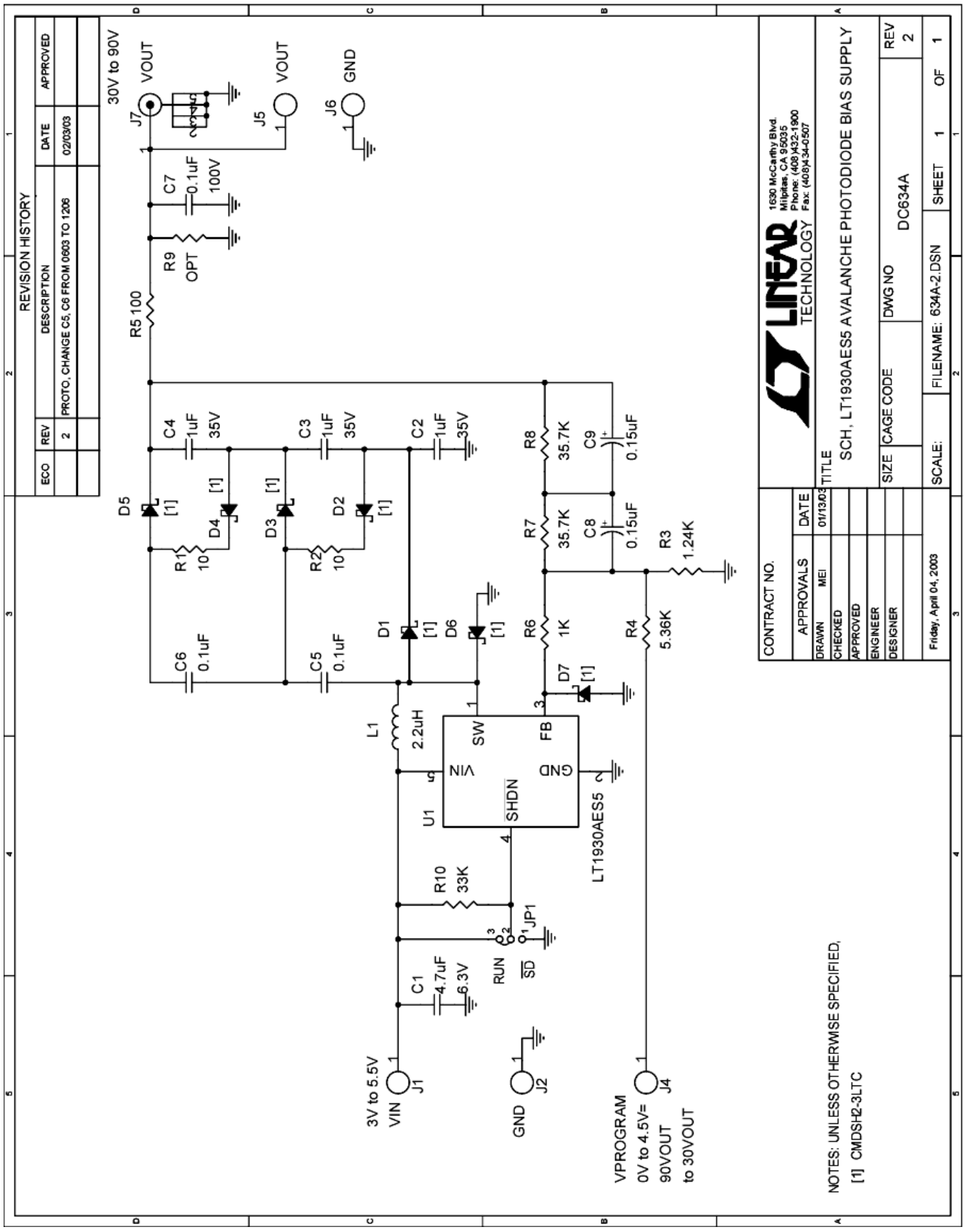


Figure 4. LT1930A Output Ripple (V_{IN}=3V, V_{OUT}=70V, LOAD = 47kΩ; 0.5mV/div ac coupled; 10MHz bandwidth)


REVISION HISTORY
ECO
REV
DESCRIPTION
DATE
APPROVED
2
PROTO, CHANGE C5, C6 FROM 0603 TO 1206
02/03/03
30V to 90V
VOUT
VOUT
GND
J7
J5
J6
C7 0.1uF 100V
R9 OPT
R5 100
C4 1uF 35V
C3 1uF 35V
C2 1uF 35V
R8 35.7K
C9 0.15uF
R7 35.7K
C8 0.15uF
R3 1.24K
R6 1K
R4 5.36K
D5 [1]
D4 [1]
D3 [1]
D2 [1]
D1 [1]
D6 [1]
D7 [1]
R1 10
R2 10
C6 0.1uF
C5 0.1uF
L1 2.2uH
U1
SW
VIN
SHDN
FB
GND
LT1930AES5
R10 33K
JP1
RUN
SD
C1 4.7uF 6.3V
3V to 5.5V
VIN
J1
GND
J2
VPROGRAM
0V to 4.5V=
90VOUT
to 30VOUT
J4
CONTRACT NO.
APPROVALS
DATE
DRAWN MEI
01/13/03
CHECKED
APPROVED
ENGINEER
DESIGNER
LINEAR TECHNOLOGY
1630 McCarthy Blvd.
Milpitas, CA 95035
Phone: (408)432-1900
Fax: (408)434-0507
TITLE
SCH, LT1930AES5 AVALANCHE PHOTODIODE BIAS SUPPLY
SIZE
CAGE CODE
DWG NO
DC634A
REV
2
SCALE:
FILENAME: 634A-2.DSN
SHEET 1 OF 1
Friday, April 04, 2003
NOTES: UNLESS OTHERWISE SPECIFIED,
[1] CMDSH2-3LTC

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DC634A