

3-1/2 Digit Analog-to-Digital Converters

Features:

- Internal Reference with Low Temperature Drift:
 - TC7126: 80ppm/°C, Typical
 - TC7126A: 35ppm/°C, Typical
- Zero Reading with Zero Input
- Low Noise: 15μV_{P-P}
- High Resolution: 0.05%
- Low Input Leakage Current: 1pA Typ., 10pA Max.
- Precision Null Detectors with True Polarity at Zero
- High-Impedance Differential Input
- Convenient 9V Battery Operation with Low-Power Dissipation: 500μW Typ., 900μW Max.

Applications:

- Thermometry
- Bridge Readouts: Strain Gauges, Load Cells, Null Detectors
- Digital Meters and Panel Meters:
 - Voltage/Current/Ohms/Power, pH
- Digital Scales, Process Monitors

Device Selection Table

Package Code	Package	Temperature Range
CPL	40-Pin PDIP	0°C to +70°C
IPL	40-Pin PDIP (TC7126 Only)	-25°C to +85°C
CKW	44-Pin PQFP	0°C to +70°C
CLW	44-Pin PLCC	0°C to +70°C

General Description:

The TC7126A is a 3-1/2 digit CMOS Analog-to-Digital Converter (ADC) containing all the active components necessary to construct a 0.05% resolution measurement system. Seven-segment decoders, digit and polarity drivers, voltage reference, and clock circuit are integrated on-chip. The TC7126A directly drives a Liquid Crystal Display (LCD), and includes a backplane driver.

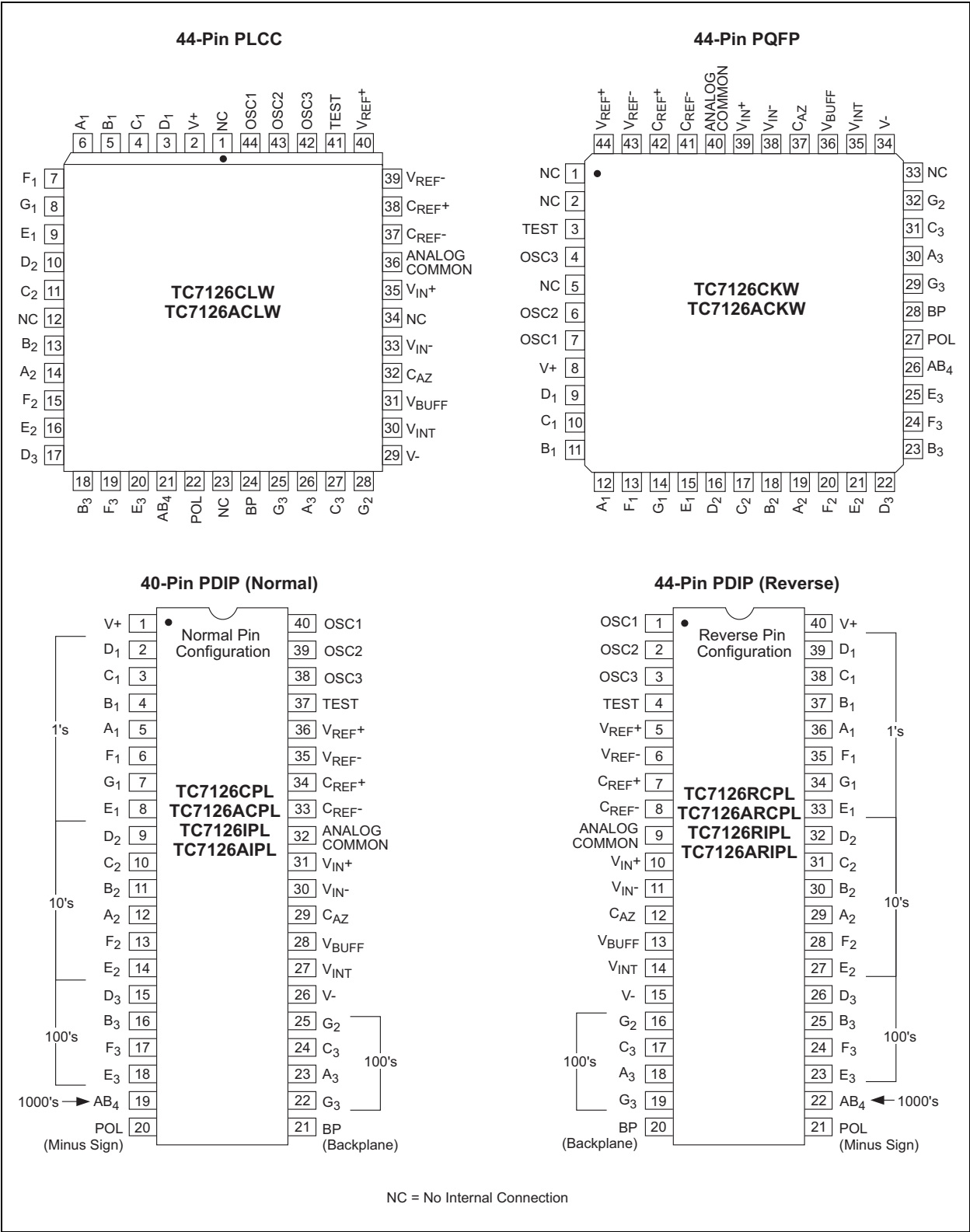
A low-cost, high resolution indicating meter requires only a display, four resistors, and four capacitors. The TC7126A's extremely low-power drain and 9V battery operation make it ideal for portable applications.

The TC7126A reduces linearity error to less than 1 count. Rollover error (the difference in readings for equal magnitude, but opposite polarity input signals) is below ±1 count. High-impedance differential inputs offer 1pA leakage current and a 10¹²Ω input impedance. The 15μV_{P-P} noise performance ensures a "rock solid" reading, and the auto-zero cycle ensures a zero display reading with a 0V input.

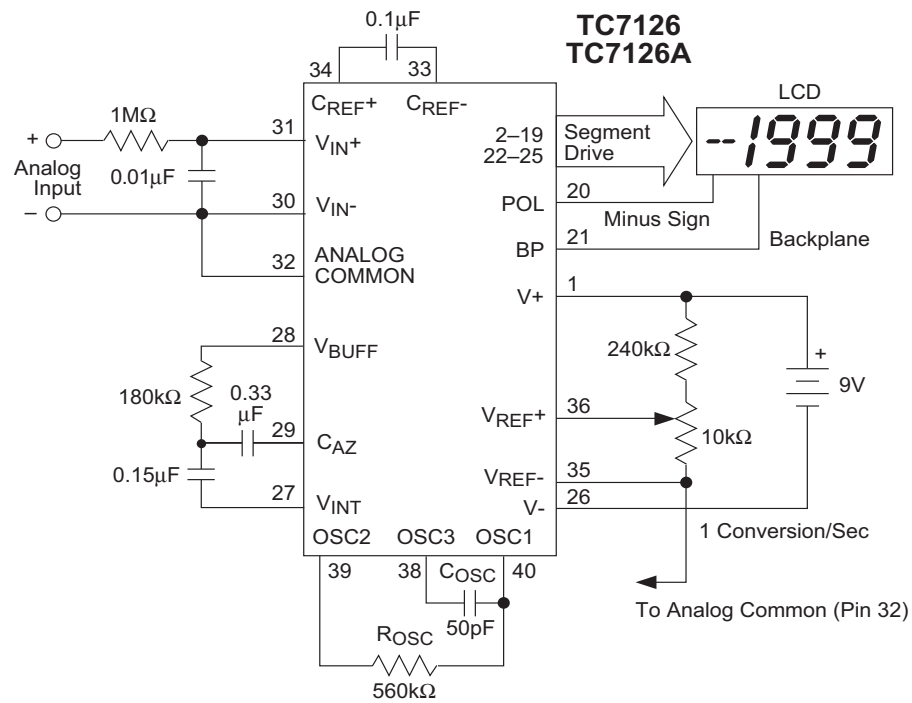
The TC7126A features a precision, low drift internal voltage reference and is functionally identical to the TC7126. A low drift external reference is not normally required with the TC7126A.

TC7126/A

Package Type



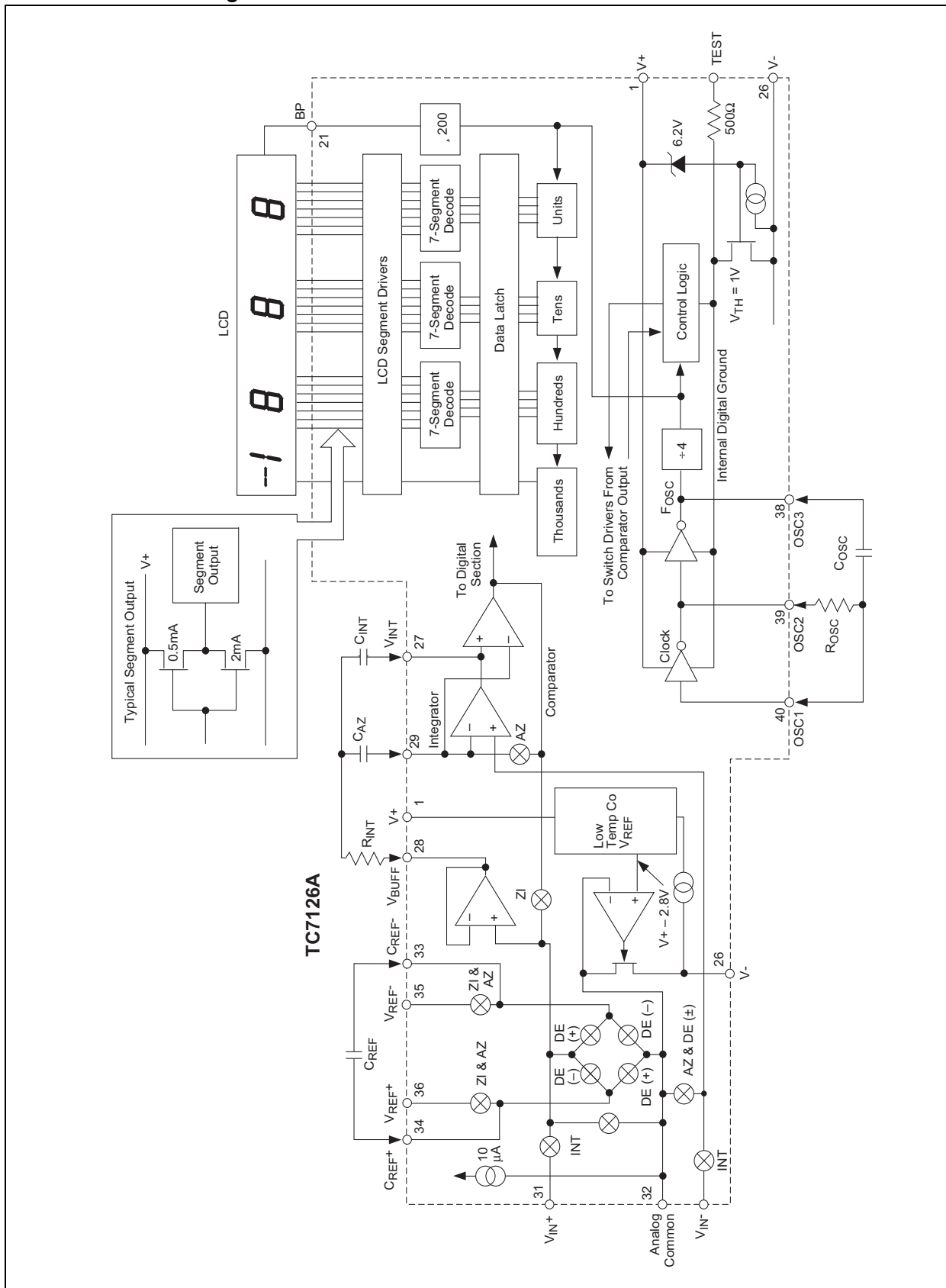
Typical Application



Note: Pin numbers refer to 40-pin DIP.

TC7126/A

Functional Block Diagram



TC7126/A

TABLE 1-1: TC7126/A ELECTRICAL SPECIFICATIONS (CONTINUED)

Electrical Characteristics: $V_S = +9V$, $f_{CLK} = 16kHz$, and $T_A = +25^\circ C$, unless otherwise noted.						
Symbol	Parameter	Min	Typ	Max	Unit	Test Conditions
V_C	Analog Common Voltage	2.7	3.05	3.35	V	250k Ω Between Common and V+
LCD Drive						
V_{SD}	LCD Segment Drive Voltage	4	5	6	V_{P-P}	V+ to V- = 9V
V_{BD}	LCD Backplane Drive Voltage	4	5	6	V_{P-P}	V+ to V- = 9V
Power Supply						
I_S	Power Supply Current	—	55	100	μA	$V_{IN} = 0V$, V+ to V- = 9V (Note 6)

- Note**
- 1: Input voltages may exceed the supply voltages, provided the input current is limited to $\pm 100\mu A$.
 - 2: Dissipation rating assumes device is mounted with all leads soldered to printed circuit board.
 - 3: Refer to "Differential Input" discussion.
 - 4: Backplane drive is in phase with segment drive for "OFF" segment, 180° out of phase for "ON" segment. Frequency is 20 times conversion rate. Average DC component is less than 50mV.
 - 5: See "Typical Application".
 - 6: During Auto-Zero phase, current is 10-20 μA higher. A 48kHz oscillator increases current by 8 μA (Typical). Common current is not included.

