UMC

UM7126

3½-Digit Single Chip A/D Converter

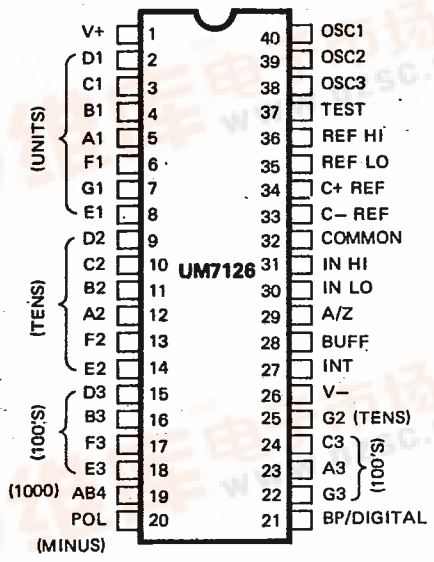
Features

- True differential input and refernce
- 1pA typical input current
- True polarity at zero for precise null detection
- No additional active circuits required
- Direct display drive — no external components required for LCD application
- Low noise-less than 15μV p-p
- On-Chip clock and reference
- Guaranteed zero reading for 0 volts input on all scales

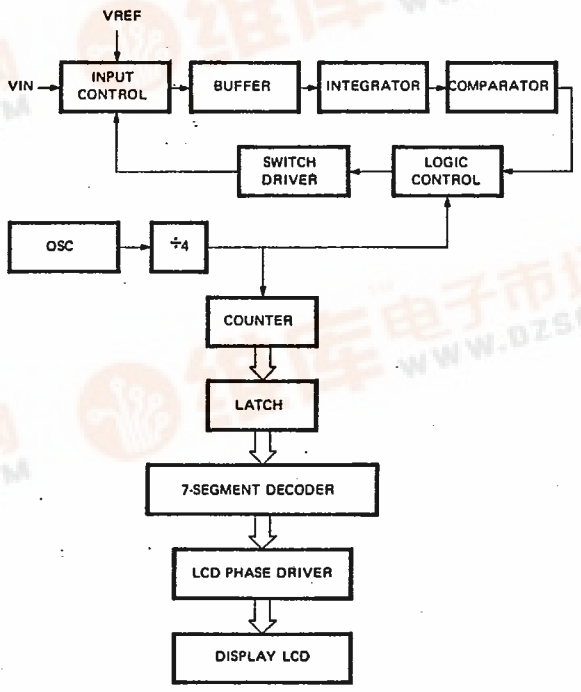
General Description

The UM7126 is a high performance, low power 3½ digit A/D converter. All the necessary active devices are contained on a single CMOS IC, including seven segment decoders, display drivers, reference, and a clock. The UM7126 is designed to interface with a liquid crystal display (LCD)

Pin Configuration



Block Diagram



Data Converters

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Absolute Maximum Ratings*

Supply Voltage (V+ to V–) 15V
Analog Input Voltage (either input) (Note 1) . . . . V+ to V–
Reference Input Voltage (either input) . . . . . V+ to V–
Clock Input . . . . . Test to V+
Power Dissipation (Note 2)
Plastic Package . . . . . 800 mW
Operating Temperature. . . . . 0°C to + 70°C
Storage Temperature . . . . . –65°C to +160°C
Lead Temperature (Soldering, 60 sec) . . . . . 300°C

Notes:
1. Input voltages may exceed the supply voltages provided the input current is limited to + 100 μA.
2. Dissipation rating assumes device is mounted with all leads soldered to printed circuit board.

*Comments

Stress above those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only. Functional operation of this device at these or any other conditions above those indicated in the operational sections of this specification is not implied and exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Electrical Characteristics

Unless otherwise noted, specifications apply to the UM7126 at $T_A = 25°C$, fclock = 48 KHz.

The UM7126 is tested in the CKT of Fig. 1.

Characteristics	Conditions	Min.	Typ.	Max.	Units
Zero Input Reading	Vin = 0.0V Full Scale 200mV	–000.0	±000.0	+000.0	Digital Reading
Ratiometric Reading	Vin = V_{ref} V_{ref} = 100mV	999	999/1000	1000	Digital Reading
Linearity (Max. Deviation)	Full scale 200mV or 2.000V	–1	±0.2	+1	counts
Noise	Vin = 0V Full Scale 200mV		15		μA
Leakage Current @ Input	Vin = 0V		1		pA
Zero Reading Drift	Vin = 0 $0° < T_A < 70°C$		0.2	1	μV/°C
Scale Factor Temp. Coeffi.	Vin = 199.0mV $0 < T_A < 70°C$		1	5	ppm/°C
Analog Common Voltage (With respect to Pos. Supply)	250KΩ between Common and Pos. Supply	2.6	2.8	3.2	V
Roll Over Error	–Vin = +Vin ≅200.0mV	–1	±0.2	+1	counts

Electrical Characteristics (Continued)

Characteristics	Conditions	Min.	Typ.	Max.	Units
Temp. Coeff. of Analog Common	250KΩ between Common and Pos. Supply		80		ppm/°C
Supply Current	Vin = 0		50	200	μA
PK–PK Segment Drive Voltage	Vsupply = 9V	4	5	6	V
PK–PK Backplane Drive Voltage	Vsupply = 9V	4	5	6	V

Typical Application

(1) The UM7126 with Liquid Crystal Display

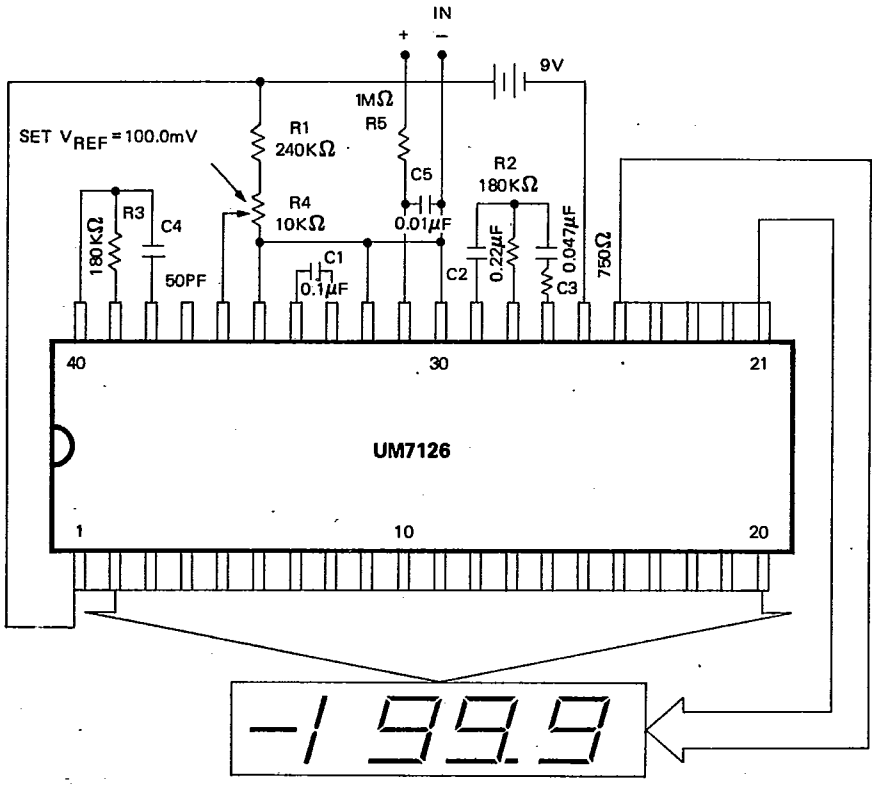

Figure 1. The UM7126 with LCD display

(2) AC to DC converter with UM7126

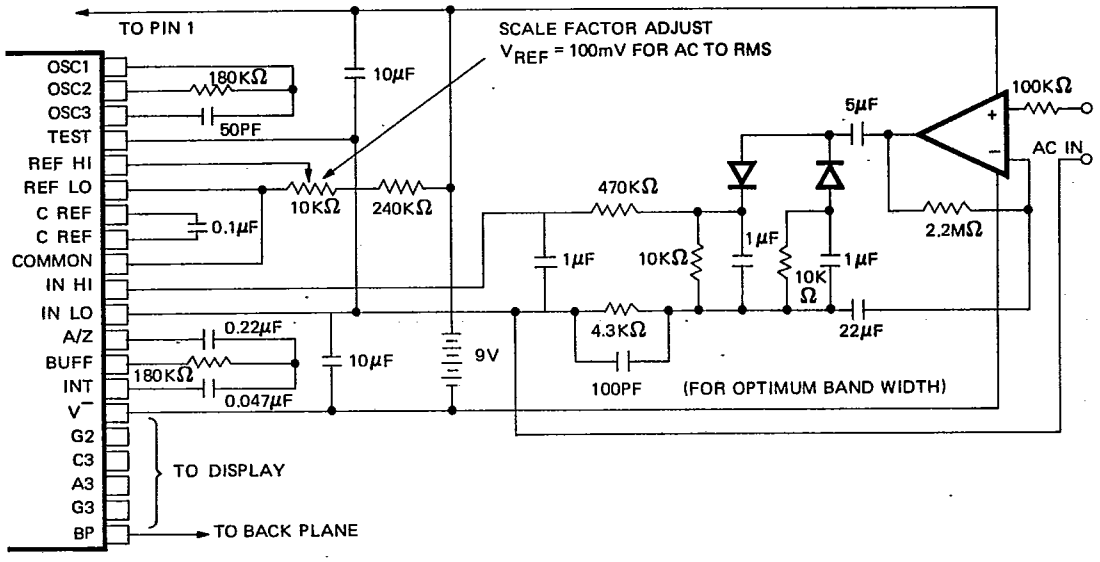

Figure 2. In AC to DC Converter with UM7126, test is used as a common mode reference level to ensure compatibility with most op-amps.