1. DESCRIPTION

0832 is an 8-bit A/D converter, connected with single-chip microcomputer through three-wire interface, low power consumption, suitable for use in a variety of intelligent instruments.

0832 Its maximum resolution can reach 256 levels, which can adapt to the general analog conversion requirements. The chip has double data output, which can be used as data verification, reducing a few data errors, fast conversion speed and strong stable performance. Independent chip enables input, making multi-device connection and processor control more convenient, DI data input side, can easily achieve the choice of channel functions.

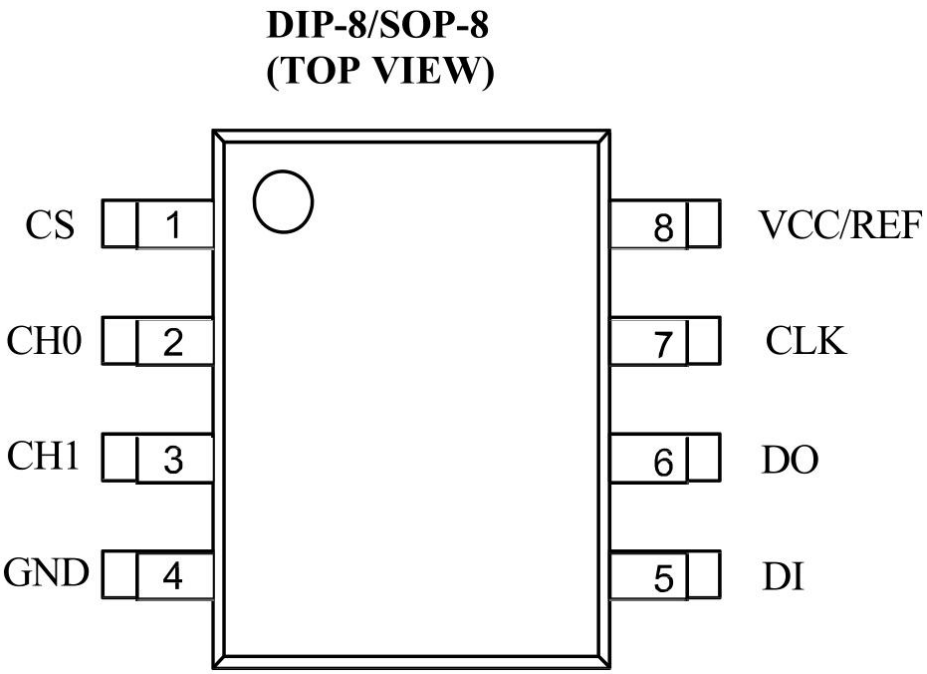
2. FEATURES

- 8-bit resolution A/D converter
- 5V single power supply
- Dual-channel A/D conversion
- Total non-adjustable error ±1 LSB MAX
- The operating frequency is 250KHz and the conversion time is 32uS
- I/O levels are TTL/CMOS compatible
- Power consumption as low as 15mW
- Package option: XL0832DR (SOP8), XD0832CC(DIP8)

3. TYPICAL APPLICATION

- Handheld device
- Portable monitors and power management
- Industrial signal monitoring
- Measurement and control instrument

4. PIN CONFIGURATIONS AND FUNCTIONS



Pin	Symbol	Description
1	CS	Slice selection enabled, low level valid
2	CH0	Analog input channels that can be used as IN+/IN-
3	CH1	Analog input channels that can be used as IN+/IN-
4	GND	ground
5	DI	Channel selection control, data signal input
6	DO	Data conversion interface output
7	CLK	Clock input
8	VCC/REF	Power input and reference voltage input

5. LIMITING PARAMETER

VCC end to GND voltage..... －0.5V to 6.5V
All digital pins to GND voltage.....V to VCC+0.3V
All analog pins to GND voltage.....V to VCC+0.3V
Peak current of all input pins.....15mA
Storage temperature..... －65℃ to +150℃
Operating ambient temperature..... －40℃ to +85℃
Welding temperature (10 seconds).....+260℃
Maximum junction temperature.....+150℃
Diffusion power dissipation.....0.8W
ESD withstand voltage.....V

6. ELECTRICAL CHARACTERISTIC

(Unless otherwise specified, VDD =5.5V, TA =25℃)

Symbol	Parameter	Conditions	Min	TYPE	Max	Unit
VCC	Power Supply	–	4.5	–	6.3	V
ICC	Supply Current	–	0.9	2	2.5	mA
VIH	Logical “1” Input Voltage (Min)	VCC=5.25V	2	–	2	V
VIL	VIN(0), Logical “0” Input Voltage (Max)	VCC=4.75V	–	–	0.8	V
IIH	IIN(1), Logical “1” Input Current (Max)	VIN=5.0V	–	0.005	1	μA
IIL	IIN(0), Logical “0” Input Current (Max)	VIN=0V	–	–0.005	–1	μA
VOH	VOUT(1), Logical “1” Output Voltage (Min)	VCC=4.75V	–			
		IOUT=–360 μA	–	–	2.4	V
		IOUT=–10 μA	–	–	4.5	V
VOL	VOUT(0), Logical “0” Output Voltage (Max)	VCC=4.75V	–	–	0.4	V
		IOUT=1.6 mA	–			
ISOURCE	Output Source Current (Min)	VOUT=0V	–	–14	–6.5	mA
ISINK	Output Sink Current (Min)	VOUT=VCC		16	8	–
fCLK	Clock Frequency Min Max	–	10	–	400	kHz
tC	Conversion Time	Not including MUX Addressing Time	8	–	–	1/fCLK
	Clock Duty Cycle	–	40	–	60	%
tSET-UP	CS Falling Edge or Data Input Valid to CLK Rising Edge	–	–	–	250	ns
tHOLD	Data Input Valid after CLK Rising Edge	–	–	–	90	ns
tpd1, tpd0	CLK Falling Edge to Output Data Valid	CL=100 pF	–	–	–	–
		Data MSB First		650	1500	ns
		Data LSB First		250	600	ns
t1H, t0H	Rising Edge of CS to Data Output and SARS Hi– Z	CL=10 pF, RL=10k	–	125	250	ns
		CL=100 pf, RL=2k	500	–	–	ns
Cin	Capacitance of Logic Input	–	–	5	–	pF
Cout	Capacitance of Logic Outputs	–	–	5	–	pF

7. FUNCTION DESCRIPTION AND SEQUENCE DIAGRAM

0832 uses the structure of sample-data-comparator, adopts the method of successive approximation for conversion, according to the software configuration of the multiplexer, the input voltage to be converted is connected to the input end and the ground end under the single-ended input mode; In the differential input mode, the two input terminals can be assigned as the positive and negative terminals of the power supply, which are configured by the DI terminal. It should be noted that when the input voltage connected to the positive side is lower than the negative side of the power supply, the conversion results are all zero. The serial communication format makes it possible to place the converter and analog sensor together for serial communication with the remote control processor, without the need for remote transmission of low-level analog signals. This allows the digital data returned to the processor to be noiseless, avoiding interference and attenuation in the remote transmission of analog signals.

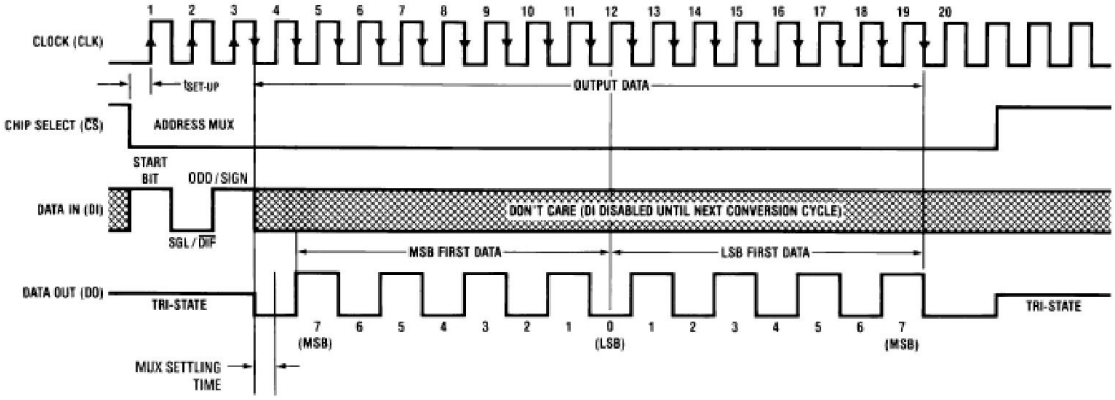
Single channel mode

MUX Address		Channel #	
SGL/$\overline{DIF}$	ODD/SIGN	0	1
1	0	+	
1	1		+

Difference mode

MUX Address		Channel #	
SGL/$\overline{DIF}$	ODD/SIGN	0	1
0	0	+	−
0	1	−	+

XL0832 Timing



When 2-bit data is set to 1 or 0, only the CH0 is converted in single channel.
If the 2-bit data is set to 1 or 1, only the CH1 is converted in single channel.
When 2-bit data is set to 0 or 0, CH0 serves as the IN+ and CH1 serves as the IN- of the positive input end.
When 2-bit data is set to 0 or 1, CH0 serves as the negative input IN- and CH1 serves as the positive input IN+.

The conversion process of XL0832 is:

1. Chip selection: Set CS to low and start the conversion to enable all logic circuits. In this case, the DO end has high resistance, and the DI end waits for the command. CS must be set to low throughout the conversion process.
2. Start: Then make the DI end output the first logical high, indicating the start bit, the input configuration of 0832 is carried out in the multiplexer addressing timing, the multiplexer address is moved to the converter through the DI end. The router address selection of the analog input channel also determines whether the input is single-ended or differential. If the input is differential, the input channel polarity needs to be assigned, and both channels can be used as positive or negative. The DI data transfer into the Navel address shift register occurs with each rise jump of the clock, so each time a bit of data is placed into DI, a jump of 0 to 1 is entered into the CLK side.
3. Configuration, the next two bits are 0832 at the rising jump edge of two consecutive clocks, the two bits of configuration are moved into the shift register, the first 0 represents a single-channel differential input, 1 represents a dual-channel unipolar input; The second digit represents polarity selection for a single channel differential input or for a double channel unipolar input.
4. Conversion: When the start bit and configuration bit are moved to the address register, the conversion starts. At the same time, the DI end changes to the high-resistance state and the DO end leaves the high-resistance state to prepare for output data. The DI terminal is detected only when the multiplexer is addressing, and the DO terminal is in a high resistance state. During the conversion process, the DO terminal is out of the high resistance state. At this time, the shift register of the DI terminal and the multiplexer is turned off.
5. Read: At the falling edge of the fourth pulse, start to read one bit of data at the DO end, from high to low, to the 11th pulse, read 8 bits of data, and then the 12th to 19th pulse, from low to high output again, the lowest level is shared.
6. End: CS sets high to end the process.

The whole process is as follows: when three clock pulses arrive, the input level of the DI end loses its input function, and then the DO/DI end begins to read the converted data. From the fourth clock pulse, the DO end outputs the highest bit of data, and then each pulse DO end outputs the next bit of data. Until the 11th pulse emits the lowest data D0, one byte of data output is complete. It then begins to output the next opposite byte of data, which is D0 from the 11th clock pulse. Then output 8 bits of data, to the 19th pulse when the data output is complete, marking the completion of an A/D conversion, CS high level, disable the chip.

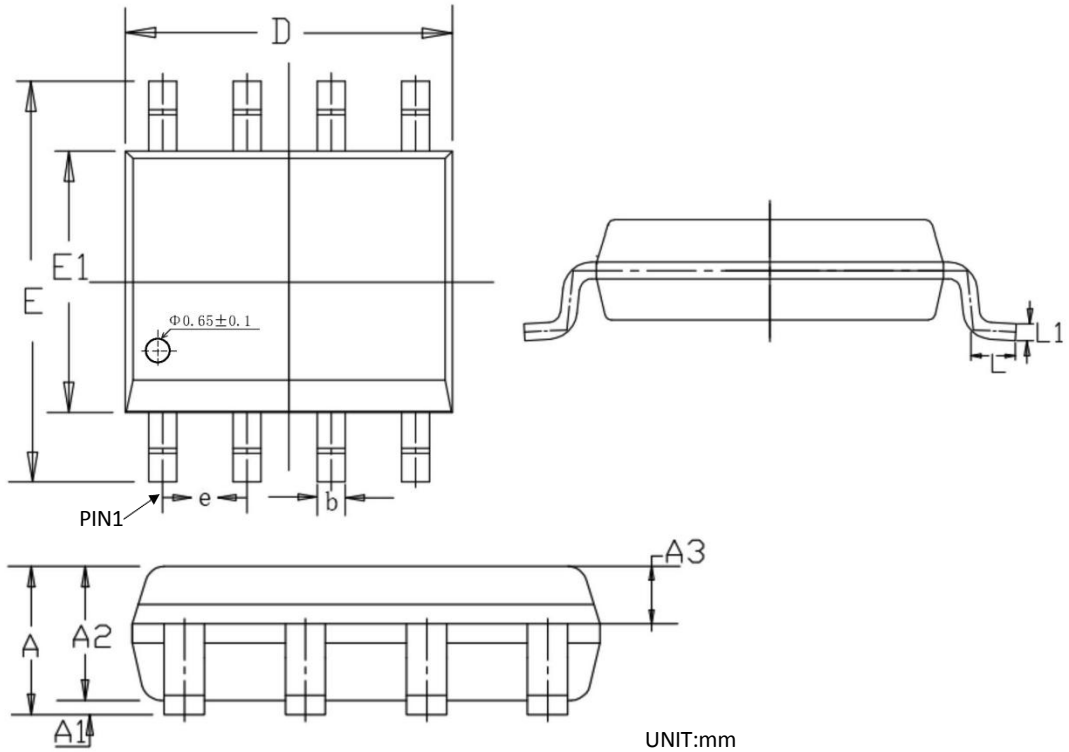
8. ORDERING INFORMATION

Ordering Information

Part Number	Device Marking	Package Type	Body size (mm)	Temperature (°C)	MSL	Transport Media	Package Quantity
XL0832DR	XL0832DR	SOP8	4.90 * 3.90	- 40 to 85	MSL3	T&R	2500
XD0832CC	XD0832CC	DIP8	9.25 * 6.38	- 40 to 85	MSL3	Tube 50	2000

9. DIMENSIONAL DRAWINGS

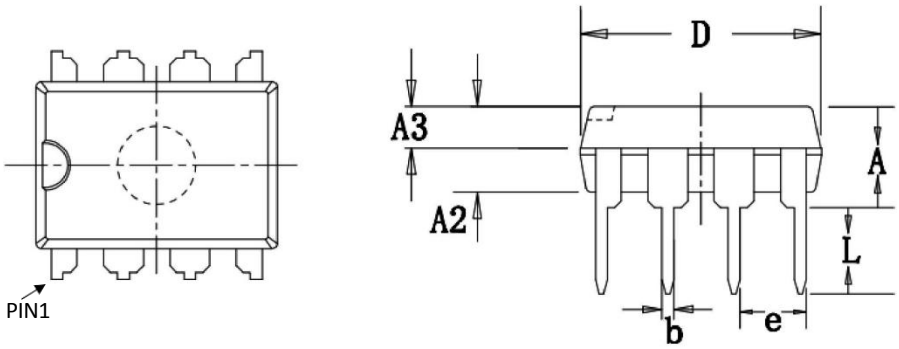
SOP8

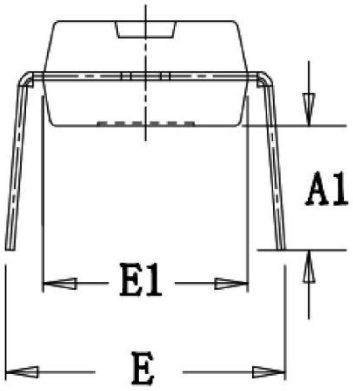


UNIT:mm

	MIN	NOM	MAX
A	1.450	1.550	1.650
A1	0.100	0.150	0.200
A2	1.300	1.400	1.500
A3	0.600	0.650	0.700
b	0.380	–	0.510
e	1.240	1.270	1.300
D	4.800	4.900	5.000
E	5.800	6.000	6.200
E1	3.800	3.900	4.000
L	0.450	0.600	0.750
L1	–	0.25BSC	–

DIP8





UNIT:mm

	MIN	NOM	MAX
A	3.600	3.800	4.000
A1	3.786	3.886	3.986
A2	3.200	3.300	3.400
A3	1.550	1.600	1.650
b	0.440	–	0.490
e	2.510	2.540	2.570
D	9.150	9.250	9.350
E	7.800	8.500	9.200
E1	6.280	6.380	6.480
L	3.000	–	–