ICL7107CM44-TD

3-1/2 Digit, LED Display, A/D Converter

The Document is Applied to: ICL7107GP, ICL7107GN, ICL7107B

1、General Description

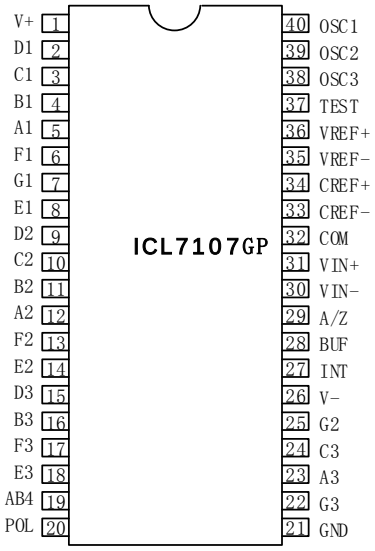
The ICL7107 is a high performance, low power, 3-1/2digit, dual-slope integrating A/D converters, with on-chip display drivers. The ICL7107 is designed for a single battery operated system, will drive non-multiplexed LED display directly. The A/D converter is inherently versatile and accurate. It is immune to the high noise environments. The true differential high impedance inputs and differential reference are very useful for making ratiometric measurement, such as resistance, strain gauge and bridge transducers. The built-in auto-zero feature automatically corrects the system offset without any external adjustment.

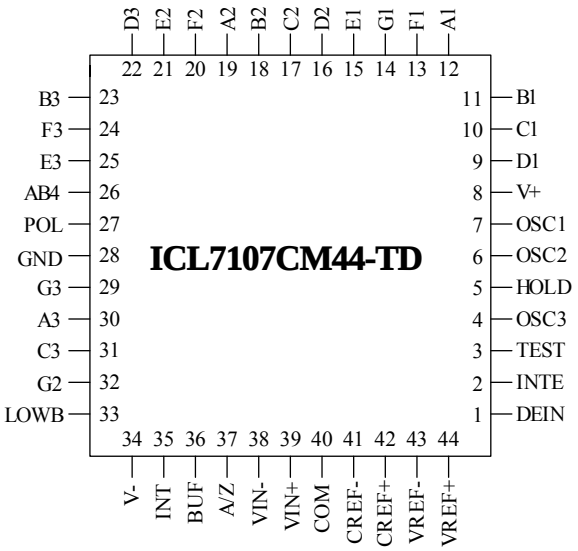
Features

- Designed for a single battery operated system, (7-15 voltage), convenient 9V battery operation.
- Internal reference with low temperature drift.
- Can drive LED display directly.
- High impedance CMOS differential inputs.
- Low noise for stable display.
- Auto-zero cycle eliminates need for zero adjustment.
- Inside OSC with out R and C.
- 3.0V reference voltage presented by COM.
- Display-hold, low-battery flag, integration and de-integration status flags are four additional features that are available in the 44-pin package).
- Package: DIP40, QFP44, Die.

2、Function Diagram and Pin Description

2. 1、Pin Configuration





2. 2、Pin Description and Structure Scheme

2.2.1. V+ and V- are connected to positive supply voltage and negative supply voltage respectively.

2.2.2. A1 ~ G1、A2 ~ G2、A3 ~ G3 are units-digit driver, tens-digit driver and hundreds-digit driver respectively.

2.2.3. AB4: Thousand-digit, B&C segments driver.

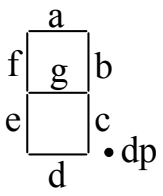
2.2.4. POL: Negative-polarity driver

2.2.5. GND: Digit circuit GND.

2.2.6. OSC1 ~ OSC3: Make up the oscillator.

2.2.7. COM: Analog-common.

2.2.8. TEST: Display-test pin.



2.2.9. VREF+, VREF-: Analog-reference input, positive terminal and negative terminal.

2.2.10. CREF+, CREF-: Reference capacitor, positive terminal and negative terminal.

2.2.11. VIN+、VIN-: The analog HIGH input signal is connected to VIN+, and the analog LOW input signal is connected to VIN-.

2.2.12. A/Z: Auto-zero capacitor connection-point, to be connected to CAZ.

2.2.13. BUF: Integrator resistor connection-point, to be connected to RINT.

2.2.14. INT: Integrator output, to be connected to CINT.

2.2.15. HOLD: Hold pin.

2.2.16. LOWB: Low-battery indication.

2.2.17. DEEN: A/D integration status flag.

2.2.18. INTEN: A/D de-integration status flag.

3、Electrical Characteristics

3. 1、Absolute Maximum Ratings

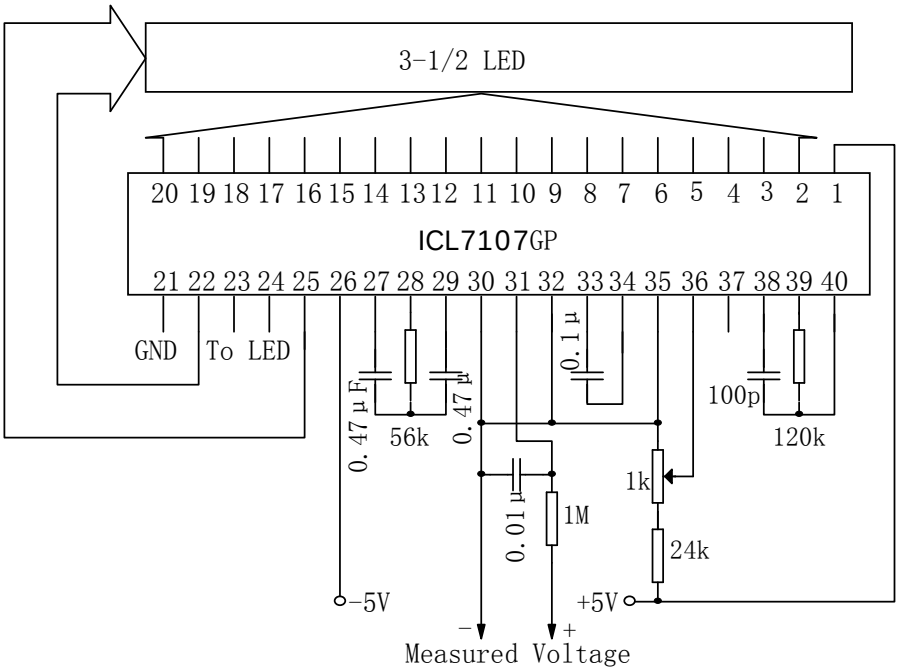
Parameter	Symbol	Limit		Unit
		Min.	Max.	
Supply voltage V+	V_{DD}		6	V
Supply voltage V-	V_{EE}	-6		V
Clock voltage	V_{CLOCK}		6	V
Operation temperature	T_{amb}	-25	+70	°C
Storage Temperature	Tstg	-55	+150	°C
Power Dissipation	P_D		800	mW

3. 2、Electrical Characteristics

Unless otherwise specified, Ta=25℃， V_{DD}=4.5V， V_{EE}=-4.5V

Parameter	Conditions	Min	Typ	Max	Unit
Zero Input Reading	V_{IN}=0V, Full-Scale=200mV	-000.0	± 000.0	+000.0	Digital Reading
Ratiometric Reading	V_{IN}=V_{REF}, V_{REF}=100mV	999	999/1000	1000	Digital Reading
Roll-Over Error (Difference, in Reading for Equal Positive and Negative Reading Near Full-Scale)	-V_{IN}=+V_{IN}=200mV	-1	± 0.2	+1	Counts
Linearity (Max. Deviation From Best Straight Line Fit)	Full-Scale=200mV or 2.000V	-1	± 0.2	+1	Counts
Common-Mode Rejection Ratio	V_{CM}=±1V, V_{IN}=0V, Full-Scale=200.0mV	—	50	—	μV/V
Noise	V_{IN}=0V, Full-Scale =200.0mV	—	15	—	μV
Leakage Current at Input	V_{IN}=0V	—	1	10	pA
Zero Reading Drift	V_{IN}=0V	—	0.2	1	μV/℃
Temperature Coefficient	V_{IN}=199.0mV	—	1	5	ppm/℃
Low Battery Flag	V + ~ V −	6.3	7.0	7.7	V
Supply Current	V_{IN}=0V	—	0.8	1.8	mA
Analog Common Voltage (with respect to V+)	25kΩ Between Common and V+	2.7	3.05	3.35	V
Temp. Coefficient of Analog Common (with respect to V+)	25kΩ Between Common and V+	—	20	50	ppm/℃
Segment Sinking Current (Except Segment AB4)	V+=5.0V Segment Voltage3V	5	8.0	—	mA
Segment Sinking Current (Segment AB4)	V+=5.0V Segment Voltage3V	10	16	—	mA

4、Typical Application Circuit and Information



5、Pad Assignment (The IC substrate should be connected to V_{DD} in the PCB layout artwork.)