



# Product Specification

XBLW ICL7660

Switched-Capacitor Voltage Converters

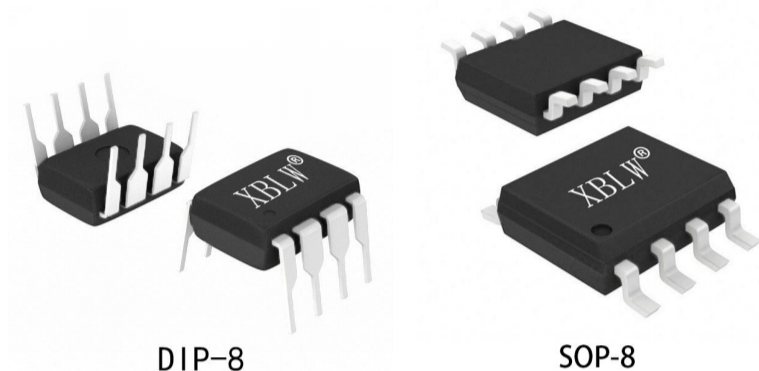
WEB | [www.xinboleic.com](http://www.xinboleic.com)



## Descriptions

The ICL7660 is monolithic, DC/DC switched-capacitor voltage converters that invert, double, divide, or multiply a positive input voltage. Operation is guaranteed from 1.5V to 9V with no external diode over the full temperature range. They deliver 10mA with a 0.5V output drop. The ICL7660 has a BOOST pin that raises the oscillator frequency above the audio band and reduces external capacitor size requirements. The ICL7660 combine low quiescent current and high efficiency. Oscillator control circuitry and four power

MOSFET switches are included on-chip. Application modes include: negative voltage generation, double voltage generation, and input voltage 1/2 partial voltage. The series of products are widely used in data acquisition system, portable instrument and other electronic products.



## Feature

- 1.5V to 10.0V Operating Supply Voltage Range
- Low Quiescent Current , Typ.=65uA at 5V
- 98% Typical Power-Conversion Efficiency
- Invert, Double, Divide, or Multiply Input Voltages
- BOOST Pin Increases the Oscillation Frequency
- Package: DIP8, SOP8

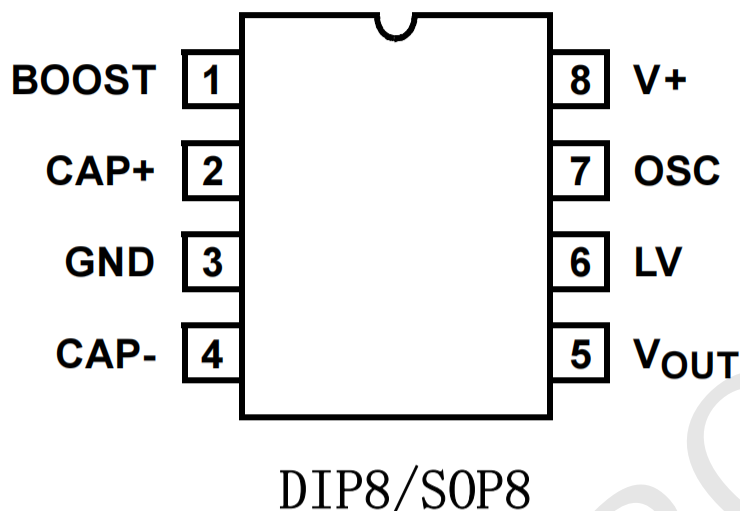
## Applications

- Dual Power Operational Amplifier Power Supply
- Data-Acquisition Systems
- PAD, Handheld Instruments
- As Voltage Conversion, Voltage Divider
- Portable Apparatus

## Ordering Information

Product Model	Package Type	Marking	Packing	Packing Qty
XBLW ICL7660N	DIP-8	ICL7660N	Tube	2000Pcs/Box
XBLW ICL7660DTR	SOP-8	ICL7660	Tape	2500Pcs/Reel

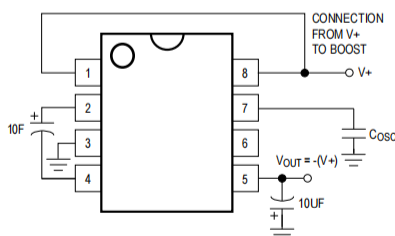
## Pins Configuration



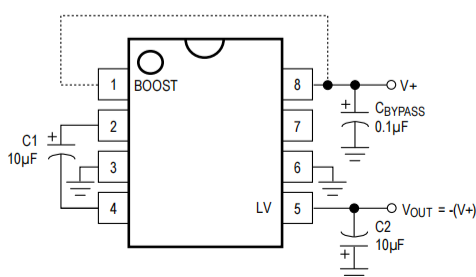
Name	No.	Description
BOOST	1	Frequency Boost. Connecting BOOST to V+ increases the oscillator frequency by a factor of six. When the oscillator is driven externally, BOOST has no effect and should be left open.
CAP+	2	Connection to positive terminal of Charge-Pump Capacitor.
GND	3	Ground. For most applications, the positive terminal of the reservoir capacitor is connected to this pin.
CAP-	4	Connection to negative terminal of Charge-Pump Capacitor
V <sub>OUT</sub>	5	Negative Voltage Output. For most applications, the negative terminal of the reservoir capacitor is connected to this pin.
LV	6	Low-Voltage Operation. Connect to ground for supply voltages below 3.5V.
OSC	7	Oscillator Control Input. Connecting an external capacitor reduces the oscillator frequency.
V+	8	Power-Supply Positive Voltage Input. (1.5V to 9V). V+ is also the substrate connection.

## Typical Application

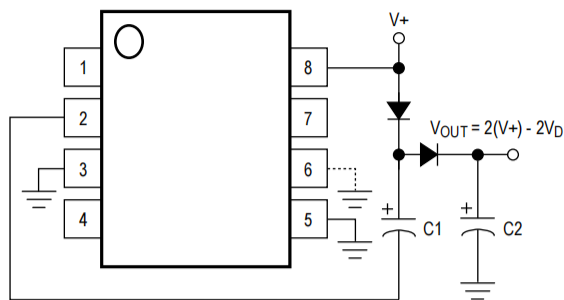
Negative Voltage Converter with BOOST and C<sub>OSC</sub>



Negative Voltage Converter with BOOST and LV



### Voltage Doubler Circuit



## Absolute Maximum Ratings

Item	Symbol	Parameter	Value	Unit
Supply Voltage	V+	Input Voltage V+ to GND	9	V
	Vout	Output Voltage GND to VOUT	9	V
	Vin	Input Voltage Pin6/Pin7	-0.3 ~V+ +0.3	V
Input Current	ILV	Input Current Pin LV	20	uA
Temperature	TA	Ambient Temperature	-20-85	°C
	TS	Storage Temperature	-65-150	°C
	Tw	Welding Temperature	260,10s	°C

Stresses beyond those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability

## Electrical Characteristics

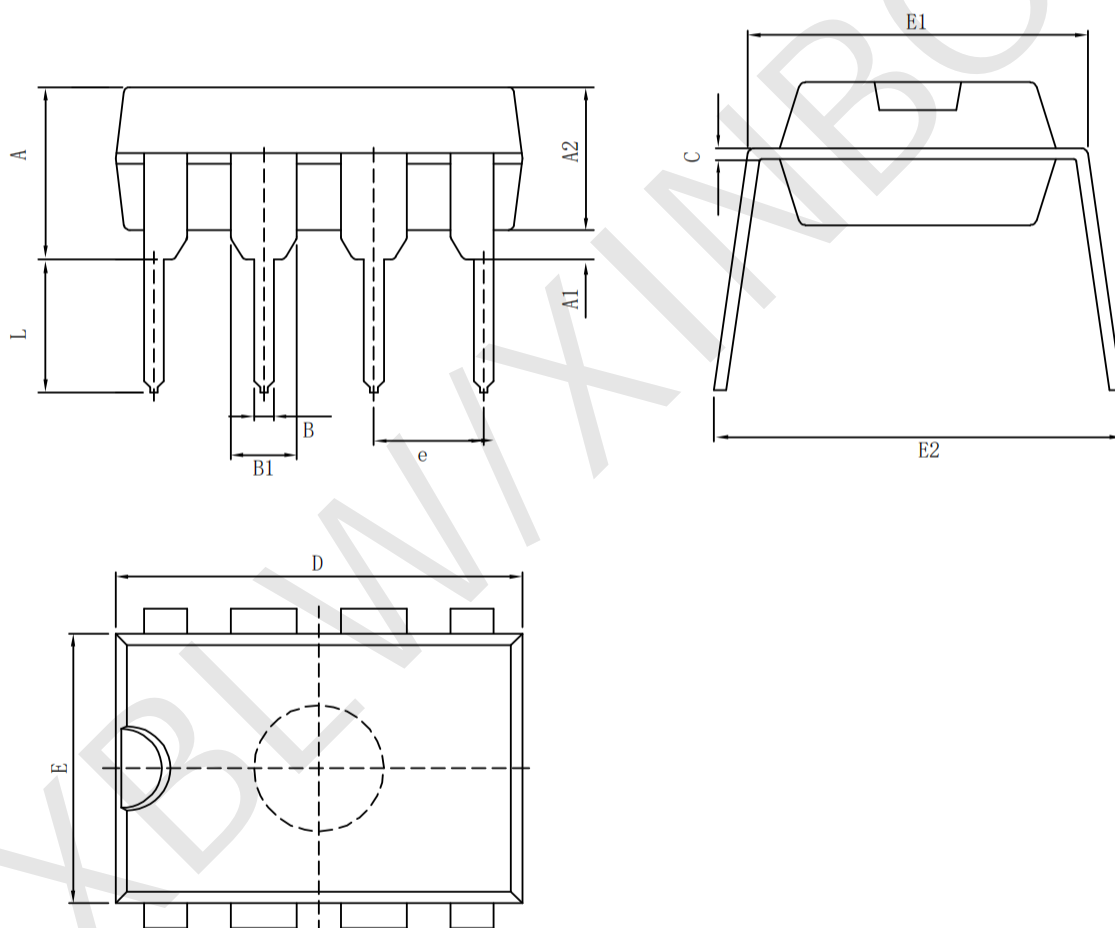
Vcc=6V , Tamb=25°C, unless otherwise specified.

Parameter	Test Conditions		Min.	Typ.	Max.	Unit
Supply Current	RL = ∞, pins 1 and 7 no connection, LV open	TA=+25 °C		30	180	μA
		TA=0 °C ~+70 °C			200	
		TA=-20 °C ~+85 °C			200	
	RL=+∞ , Pin 1 and Pin 7=V+=3V			10		
Supply Voltage Range	RL=10KΩ, LV open					V
	RL=10KΩ, LV to GND		1.5		9.0	
Output Resistance	IL=20mA fosc=5 kHz LV open	TA=+25 °C		65	100	Ω
		TA=0 °C ~+70 °C			130	
		TA=-20 °C ~+85 °C			130	
	fosc=1 kHz V+=2V, IL=3mA LV to GND	TA=+25 °C			325	
		TA=0 °C ~+70 °C			325	
		TA=-20 °C ~+85 °C			325	
Oscillator Frequency	Cosc=1pF , LV to GND	V+=5V	5			kHz
		V+=2V	1			
Power Efficiency	RL=5kΩ, TA=+25 °C, fosc=5kHz, LV open		95	98		%
Voltage Conversion Efficiency	RL=+∞ , TA=+25°C, LV open		97.0	99.9		%
Oscillator Sink or Source Current	Vosc=0V or V+, LV open	Pin 1=0v			3	MΩ
		Pin 1=V+			20	
Oscillator Impedance	TA=+25 °C	V+=5V		1000		kΩ
		V+=2V		100		

## Package Information

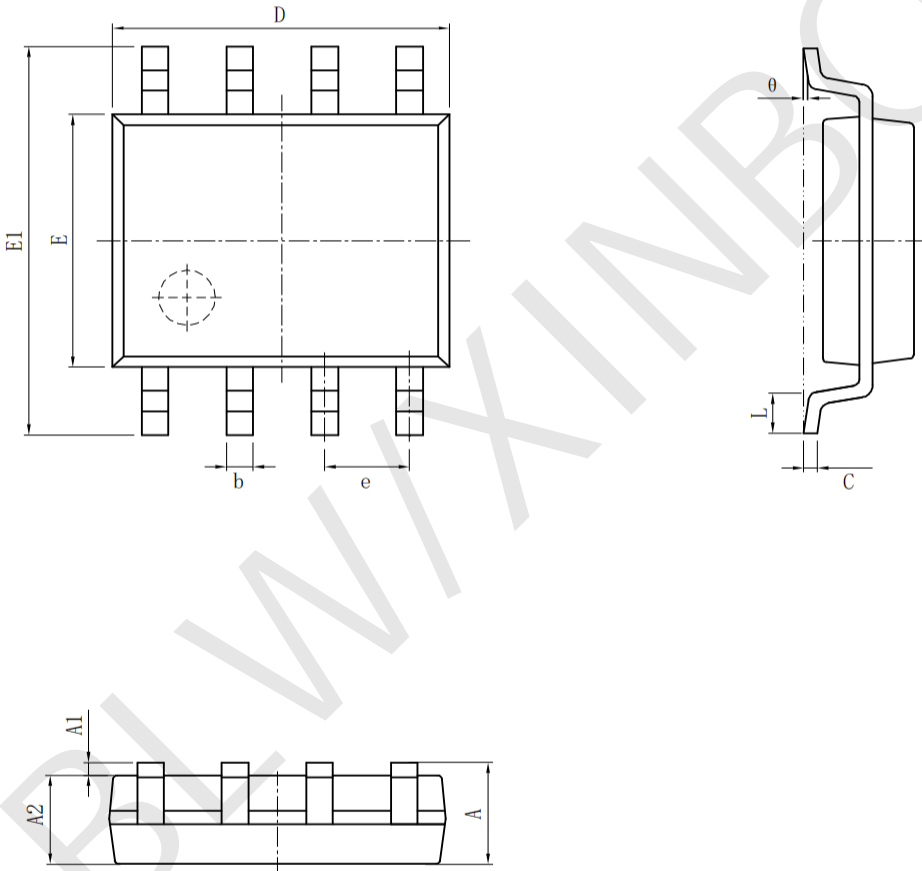
### • DIP-8

Symbol	Size	Dimensions In Millimeters		Symbol	Size	Dimensions In Inches	
		Min (mm)	Max (mm)			Min (in)	Max (in)
A		3.710	4.310	A		0.146	0.170
A1		0.510		A1		0.020	
A2		3.200	3.600	A2		0.126	0.142
B		0.380	0.570	B		0.015	0.022
B1		1.524 (BSC)		B1		0.060 (BSC)	
C		0.204	0.360	C		0.008	0.014
D		9.000	9.400	D		0.354	0.370
E		6.200	6.600	E		0.244	0.260
E1		7.320	7.920	E1		0.288	0.312
e		2.540 (BSC)		e		0.100 (BSC)	
L		3.000	3.600	L		0.118	0.142
E2		8.400	9.000	E2		0.331	0.354



• SOP-8

Symbol	Dimensions In Millimeters		Symbol	Dimensions In Inches	
	Min (mm)	Max (mm)		Min (in)	Max (in)
A	1.350	1.750	A	0.053	0.069
A1	0.100	0.250	A1	0.004	0.010
A2	1.350	1.550	A2	0.053	0.061
b	0.330	0.510	b	0.013	0.020
c	0.170	0.250	c	0.006	0.010
D	4.700	5.100	D	0.185	0.200
E	3.800	4.000	E	0.150	0.157
E1	5.800	6.200	E1	0.228	0.224
e	1.270 (BSC)		e	0.050 (BSC)	
L	0.400	1.270	L	0.016	0.050
θ	0°	8°	θ	0°	8°



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