SCI7660C/M Series

CMOS DC/DC CONVERTER

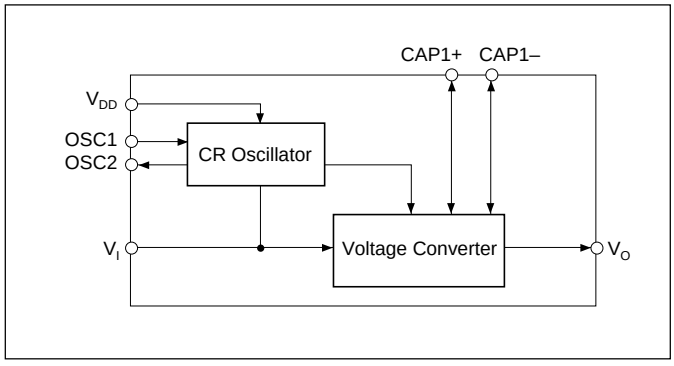
■ DESCRIPTION

The SCI7660C/M CMOS DC/DC Converter features high operational performance with low power dissipation. The booster generates a doubled output voltage from the input.
It is possible to drive an LSI that needs another power supply other than the main power supply (LCD drivers, Analog LSI, etc.). Its very low power requirement makes it ideal to supply handy equipments with power.

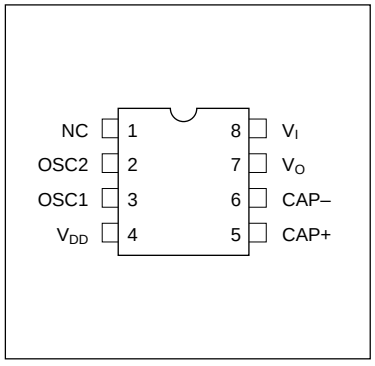
■ FEATURES

- High performance with low power dissipation
- Simple conversion of V_{DD}(+5V) to $-V_I$(–5V), $+2V_I$ (+10V)
- Output current ..... 30mA Max (V_{DD}=5V)
- Power conversion efficiency ..... 95% Typ
- Cascade connection (two device connected V_{DD}=5V, V_O=–10V)
- Low power ..... Ideal for dry cell battery
- On–chip CR oscillator
- Package ..... SCI7660C$_{OA}$ ..... DIP–8pin (plastic)
  SCI7660M$_{OA}$ ..... SOP4–8pin (plastic)
  SCI7660D$_{OA}$ ..... DIE

■ BLOCK DIAGRAM



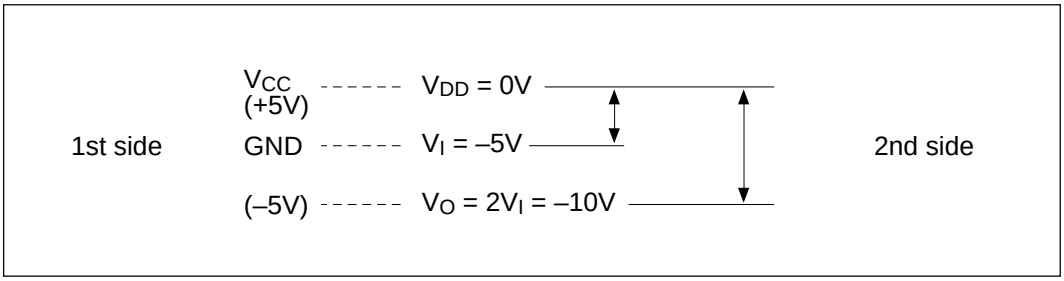
■ PIN CONFIGURATION



■ PIN DESCRIPTION

Pin Name	Pin No.	Function
OSC1	3	Oscillation resistor connection terminal
OSC2	2	
V_{DD}	4	Power supply terminal (positive, system supply V_{CC})
CAP1+	5	Terminal for connection of capacitor for booster (positive)
CAP1–	6	Terminal for connection of capacitor for booster (negative)
V_O	7	Output terminal at doubling
V_I	8	Power supply terminal (negative, system supply GND)

■ VOLTAGE RELATIONS



■ ABSOLUTE MAXIMUM RATINGS

(V_{DD}=0V, T_a=25°C)

Parameter	Symbol	Ratings	Unit
Input voltage	V_I	–10.0 to 0.5	V
Output voltage	V_O	–20.0 to V_I	V
Power dissipation	P_D	300	mW
Operating temperature	T_{opr}	–30 to 85	°C
Storage temperature	T_{stg}	–65 to 150	°C
Soldering temperature and time	T_{sol}	260°C, 10s (at lead)	—

Note: When this IC is soldered in the solder–reflow process, be sure to maintain the reflow furnace temperature at the curve shown in "Figure 3–5 Reflow Furnace Temperature Curve" of DATA BOOK. And this IC cannot be exposed to high temperature of the solder dipping.

■ ELECTRICAL CHARACTERISTICS

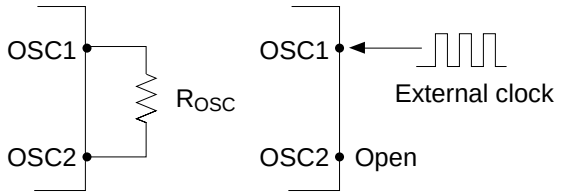
(V_{DD}=0V, T_a=–30° to 85°C)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Input voltage	V_I		–8.0	—	–1.2	V
Output voltage	V_O		–16.0	—	—	V
Booster current consumption	I_{opr}	R_L=∞, R_{OSC}=1MΩ, V_I=–5V	—	40	70	μA
Stationary current	I_Q	R_L=∞, V_I=–8V	—	—	2.0	μA
Output impedance	R_O	I_O=10mA, V_I=–5V	—	80	120	Ω
Booster power conversion efficiency	P_{eff}	I_O=5mA, V_I=–5V	90	95	—	%
Input leakage current	I_{LI}	OSC1 terminal, V_I=–8V	—	—	2.0	μA
Oscillation frequency	f_{OSC}	R_{OSC}=1MΩ, V_1=–5V	16	20	24	kHz

■ CIRCUIT DESCRIPTION

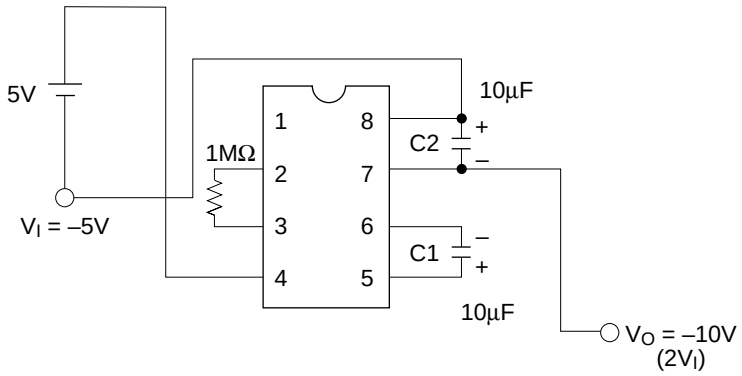
● C–R Oscillator

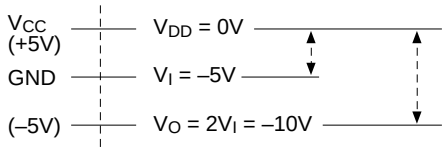
The SCI7660C/M contains a C–R oscillator for internal oscillation. It consists of an external resistor R_{OSC} connected between the OSC1 pin and OSC2 pin.



● Voltage Converters

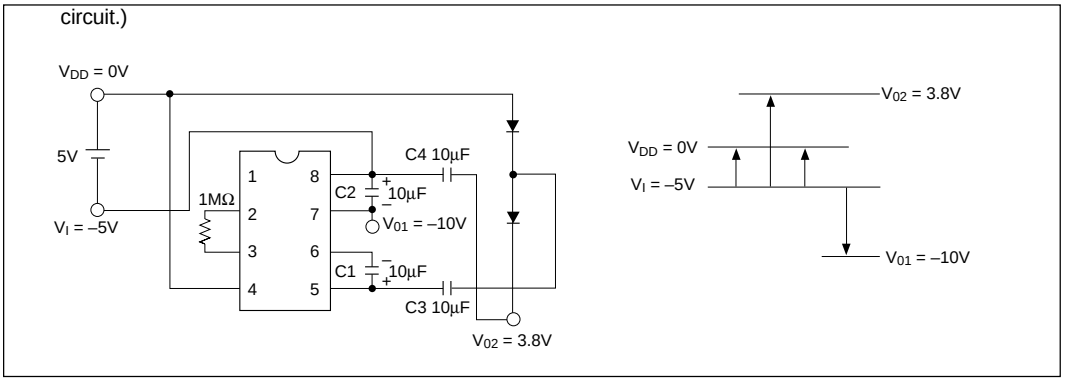
The voltage converters double the input supply voltage (V_I) using clocks generated by the C-R oscillator. A doubled voltage can be obtained with a booster capacitor between CAP+ and CAP–, and with an external smoothing capacitor between V_I and V_O.





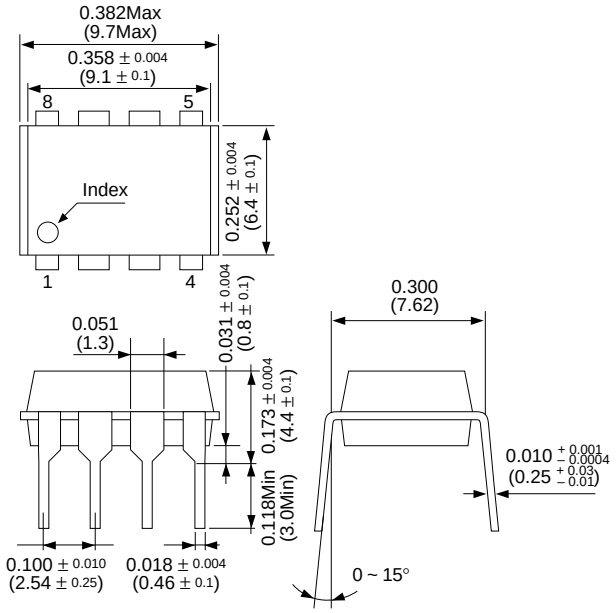
Typical doubled voltage relations

- **Negative Voltage Conversion + Positive Voltage Conversion** (This circuit produces outputs of –10V and +3.8V from the –5V input by combination of voltage doubler circuit and positive voltage conversion circuit.)



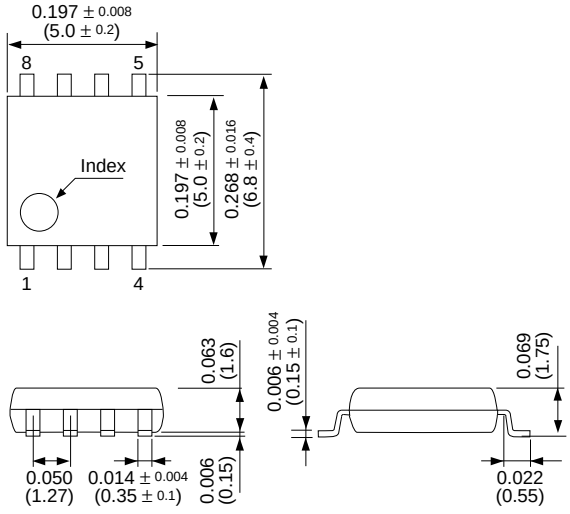
■ PACKAGE DIMENSIONS

Plastic DIP–8pin



unit : inch (mm)

Plastic SOP4–8pin



unit : inch (mm)

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