

# AN1201SM

## Polarity inverting charge pump DC/DC converter IC

### ■ Overview

AN1201SM is a negative voltage generation IC for bias voltage of transmission power module of cellular phones. This IC is a polarity inverting DC/DC converter to change from positive voltage into negative voltage.

### ■ Features

- High power conversion efficiency: 89% typ. (when output current is 5 mA.)
- Low output resistance: 20  $\Omega$  typ.
- High voltage conversion efficiency: 99.9%
- Small (S-MINI) package

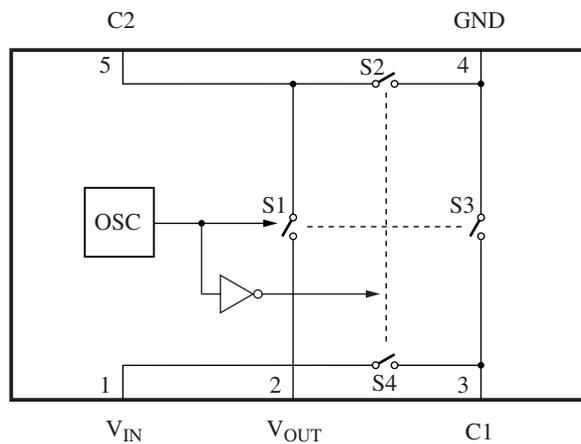
### ■ Applications

- Cellular phones

### ■ Package

- SMINI-5DA

### ■ Block Diagram



### ■ Pin Descriptions

Pin No.	Symbol	Description
1	V <sub>IN</sub>	Supply voltage pin
2	V <sub>OUT</sub>	Inverted output pin
3	C1	Charge pump capacitor's positive polarity side connecting pin
4	GND	Ground pin
5	C2	Charge pump capacitor's negative polarity side connecting pin

### ■ Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Supply voltage	V <sub>IN</sub>	3.3	V
Supply current	I <sub>IN</sub>	10	mA
Output current	I <sub>O</sub>	20	mA
Power dissipation *2	P <sub>D</sub>	48	mW
Operating ambient temperature *2	T <sub>opr</sub>	-30 to +85	°C
Storage temperature *1	T <sub>stg</sub>	-55 to +125	°C

Note) 1. Do not apply external currents or voltages to any pins not specifically mentioned.

For circuit currents, (+) denotes current flowing into the IC, and (-) denotes current flowing out of the IC.

2. \*1: Except for the power dissipation, operating ambient temperature and storage temperature, all ratings are for T<sub>a</sub> = 25°C.

\*2: T<sub>a</sub> = 85°C, For the independent IC without a heat sink.

### ■ Recommended Operating Range

Parameter	Symbol	Range	Unit
Supply voltage	V <sub>IN</sub>	2.0 to 3.0	V

### ■ Electrical Characteristics at V<sub>IN</sub> = 2.5 V, C1 = 1 μF, T<sub>a</sub> = 25°C

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Consumption current	I <sub>CC</sub>	No load	—	0.25	1	mA
Oscillator frequency	f <sub>OSC</sub>	No load	90	125	160	kHz
Output resistance	R <sub>OUT</sub>	Load 500 Ω	—	—	50	Ω
Voltage conversion efficiency	V <sub>η</sub>	No load	95.0	99.9	—	%
Power efficiency	P <sub>η</sub>	Load 500 Ω	80	89	—	%
Consumption current in Sleep mode	I <sub>OFF</sub>	V <sub>IN</sub> = 0.2 V, no load	—	—	1	μA

### • Design reference data

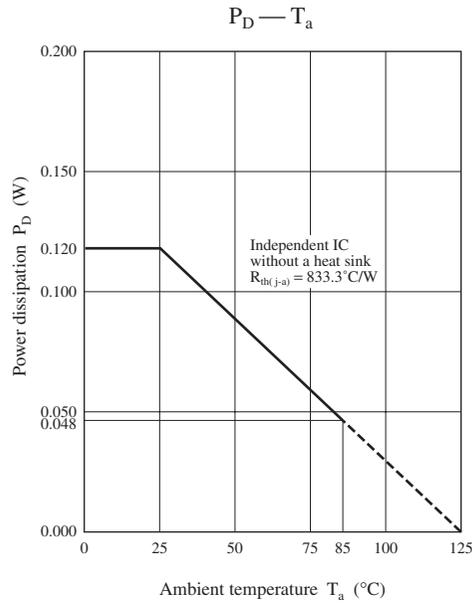
Note) The characteristics listed below are theoretical values based on the IC design and are not guaranteed.

Unless otherwise specified: V<sub>IN</sub> = 2.5 V, T<sub>a</sub> = 25°C

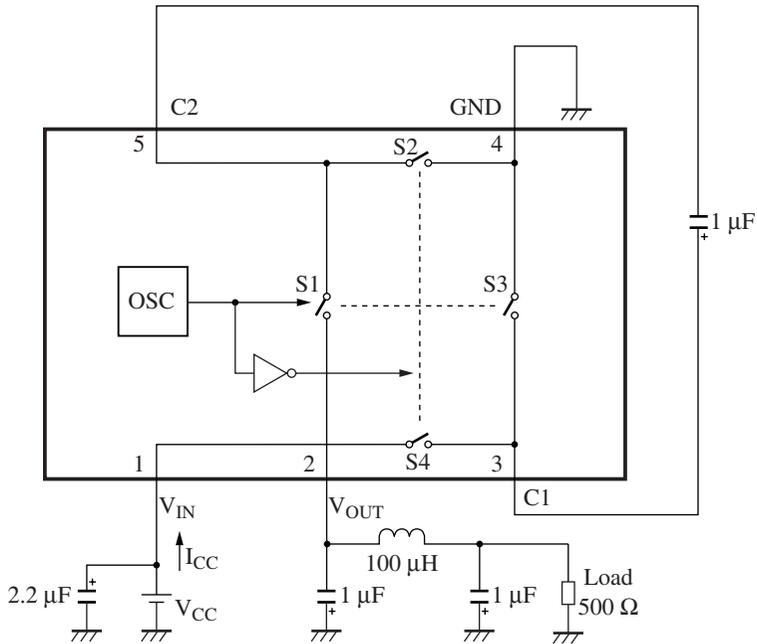
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Oscillator frequency	f <sub>OSC</sub>	V <sub>IN</sub> = 2.5 V, no load T <sub>a</sub> = -30°C to 85°C	66	125	198	kHz

■ Technical Data

- $P_D - T_a$  curves of SMINI-5DA



■ Application Circuit Example



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