

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 Ω typ.
- High voltage conversion efficiency: 99.9%
- Small (S-MINI) package

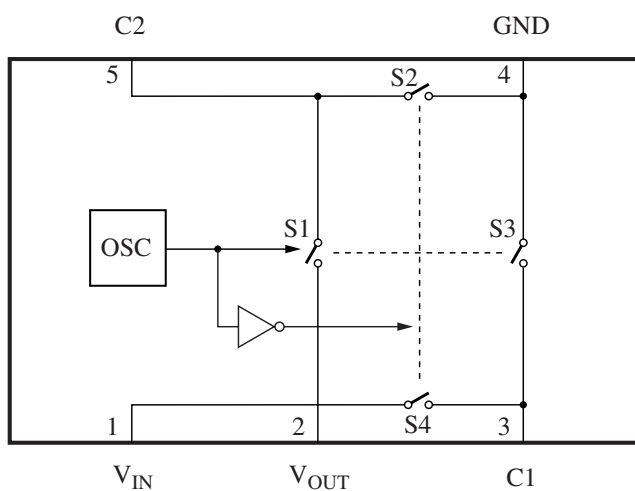
■ Applications

- Cellular phones

■ Package

- SMINI-5DA

■ Block Diagram



■ Pin Descriptions

| Pin No. | Symbol | Description |
|---------|------------------|---|
| 1 | V _{IN} | Supply voltage pin |
| 2 | V _{OUT} | 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 _{IN} | 3.3 | V |
| Supply current | I _{IN} | 10 | mA |
| Output current | I _O | 20 | mA |
| Power dissipation *2 | P _D | 48 | mW |
| Operating ambient temperature *2 | T _{opr} | -30 to +85 | °C |
| Storage temperature *1 | T _{stg} | -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_a = 25°C.

*2: T_a = 85°C, For the independent IC without a heat sink.

■ Recommended Operating Range

| Parameter | Symbol | Range | Unit |
|----------------|-----------------|------------|------|
| Supply voltage | V _{IN} | 2.0 to 3.0 | V |

■ Electrical Characteristics at V_{IN} = 2.5 V, C1 = 1 μF, T_a = 25°C

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

• Design reference data

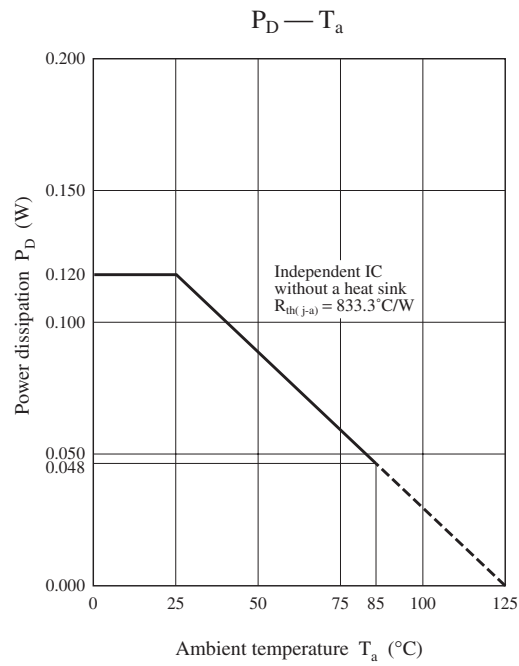
Note) The characteristics listed below are theoretical values based on the IC design and are not guaranteed.

Unless otherwise specified: V_{IN} = 2.5 V, T_a = 25°C

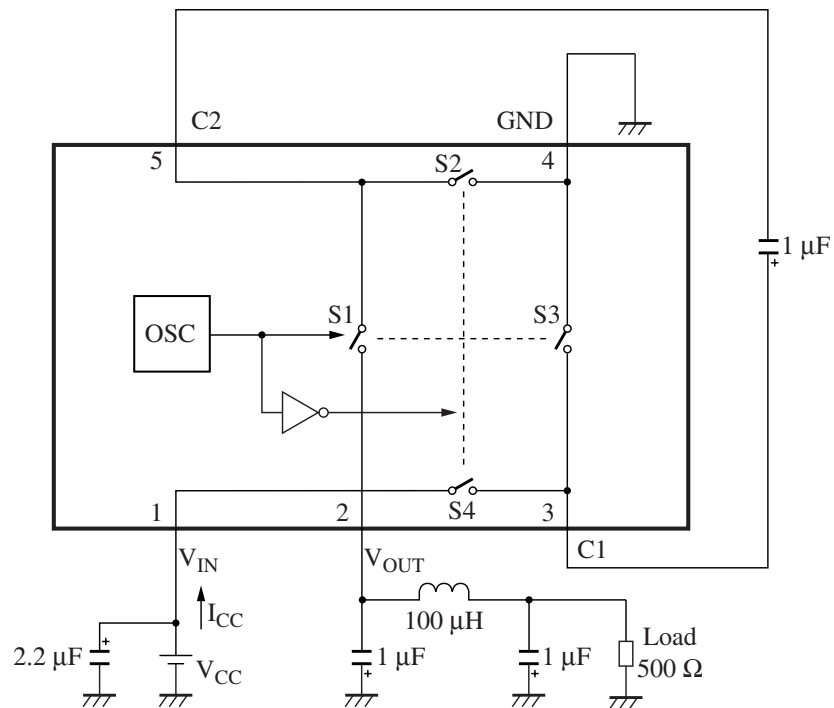
| Parameter | Symbol | Conditions | Min | Typ | Max | Unit |
|----------------------|------------------|--|-----|-----|-----|------|
| Oscillator frequency | f _{OSC} | V _{IN} = 2.5 V, no load T _a = -30°C to 85°C | 66 | 125 | 198 | kHz |

■ Technical Data

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



■ Application Circuit Example



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