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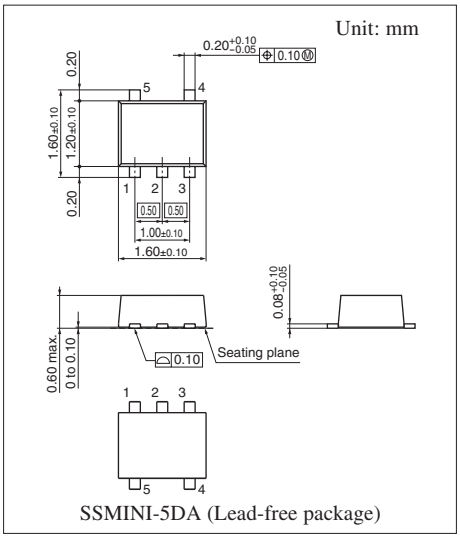
AN1101SSM

CMOS single power supply

■ Overview

AN1101SSM is an operational amplifier with a single power supply by CMOS diffusion process.

It has low current-consumption compared to general purpose operational amplifier by bipolar diffusion process. 0 V to V_{DD} is available for both input voltage and output voltage. And this IC is widely applicable to the buttery-driven equipment and to many amplifier circuits which adopt small package products.



SSMINI-5DA (Lead-free package)

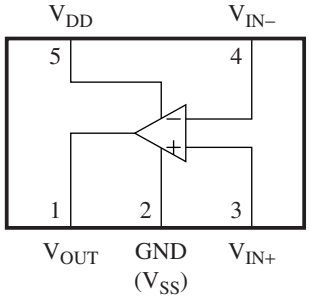
■ Features

- Low current-consumption: I_{DD} = 55 µA (typ.), V_{DD} = 3 V
- Operating input/output voltage range: 0 V to V_{DD}
- Small offset voltage: 0.5 mV (typ.)
- Small input bias current: 1 pA (typ.)
- Operating supply voltage range:
  2.5 V to 5.5 V or ±1.25 V to ±2.75 V

■ Applications

- Various small-size general consumer electronics equipment

■ Block Diagram



■ Pin Descriptions

Pin No.	Symbol	Description
1	V_{OUT}	Output
2	GND (V_{SS})	Ground, V_{SS} (negative supply) at using two power supply
3	V_{IN+}	Input (positive)
4	V_{IN-}	Input (negative)
5	V_{DD}	Power supply

Note) The AN1101SSM has been designed for general consumer electronics equipment, not for the specific one requiring such a high reliability that may prevent it from threatening the human lives.

■ Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Supply voltage	V_{DD}	5.6	V
Differential input voltage	DV_{IN}	±5.6	V
Input voltage	V_{IN}	V_{SS} to V_{DD}	V
Supply current	I_{DD}	—	mA
Power dissipation *2	P_D	50	mW
Operating ambient temperature *1	T_{opr}	−30 to +85	°C
Storage temperature *1	T_{stg}	−55 to +125	°C

Note) 1. ∗1: Except for the operating ambient temperature and storage temperature, all ratings are for T_a = 25°C.
∗2: The value at T_a = +85°C.
2. This IC is not suitable for car electrical equipment.

■ Recommended Operating Range

Parameter	Symbol	Range	Unit
Supply voltage	V_{DD}	2.5 to 5.5	V
		±1.25 to ±2.75	

■ Electrical Characteristics at V_{DD} = 3.0 V, V_{SS} = GND, T_a = 25°C ± 2°C

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Input offset voltage	V_{IO}	Buffer circuit	—	0.5	5.5	mV
Common-mode input voltage	CMV_{IN}	R_S = 10 kΩ, R_F = 10 kΩ	0	—	3	V
Open-loop gain	GV	f = 100 Hz	60	90	—	dB
Maximum output amplitude voltage 1	V_{OH}	R_L ≥ 10 kΩ	2.90	2.98	—	V
Maximum output amplitude voltage 2	V_{OL}	R_L ≥ 10 kΩ	—	0.01	0.05	V
Common-mode input voltage rejection ratio	CMRR	V_{IN} = 0.0 V to 3.0 V, R_S = R_F = 10 kΩ	50	65	—	dB
Supply voltage ripple rejection ratio *	SVRR	V_{DD} = 2.5 V to 5.5 V	55	70	—	dB
Supply current	I_{DD}	No load	—	55	100	µA

Note) ∗ : Except for the supply voltage ripple rejection ratio (SVRR), V_{DD} = 3 V.

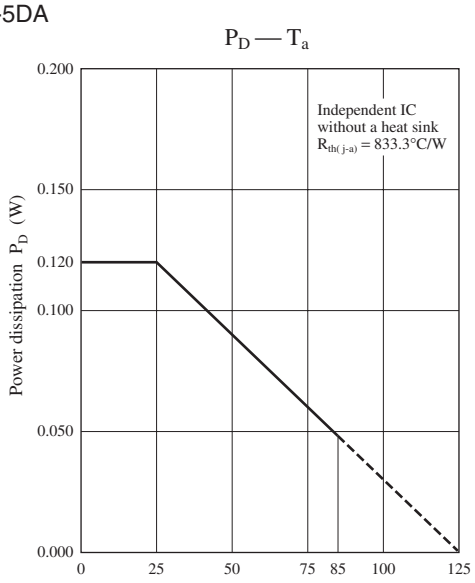
• Design reference data

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

Parameter	Symbol	Conditions	Reference	Unit
Offset current	I_O	—	1	pA
Input bias current	I_{IO}	—	1	pA
Slew rate	SR	R_L ≥ 10 kΩ	0.35	V/µs
Zero-cross frequency	f_T	A_V = 1	0.8	MHz

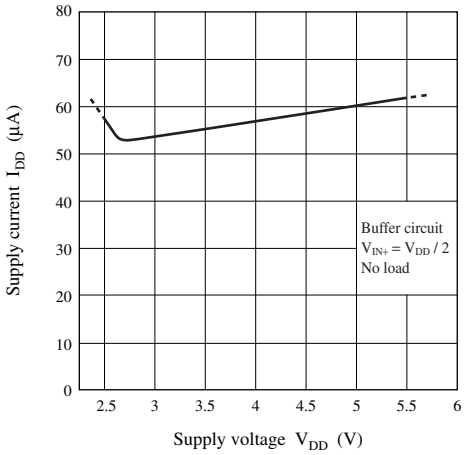
■ Technical Data

• P_D — T_a curve of SSMINI-5DA

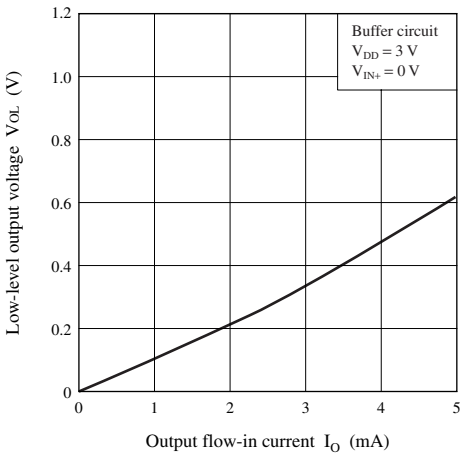


• Main characteristics

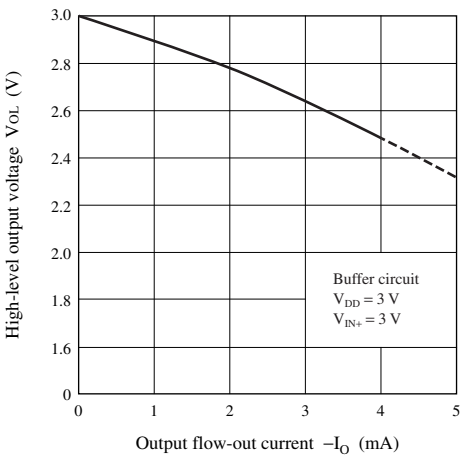
Supply current — Supply voltage



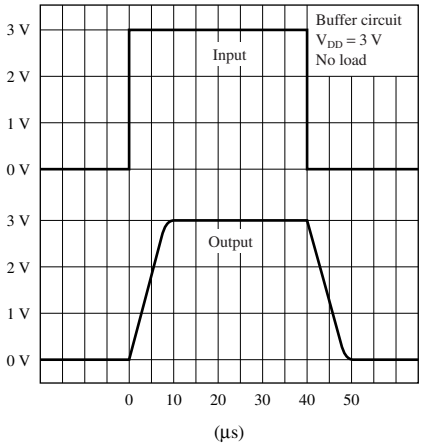
Low-level output voltage — Output flow-in current



High-level output voltage — Output flow-out current



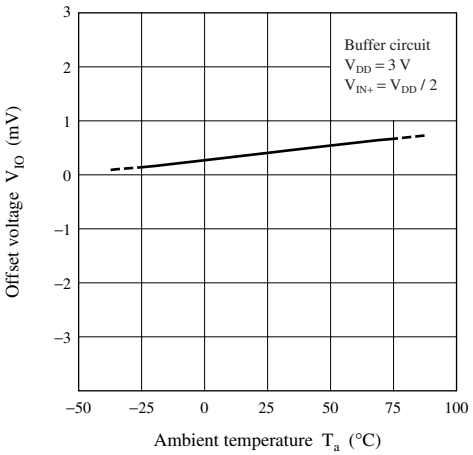
Slew rate SR



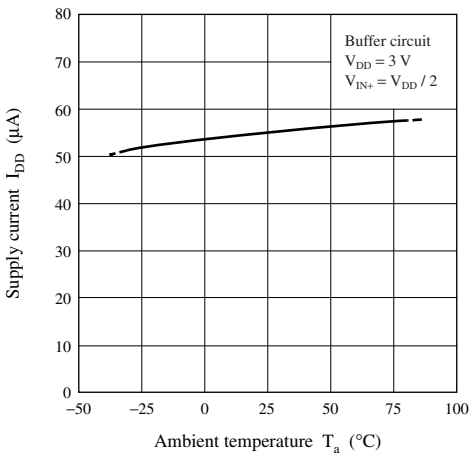
■ Technical Data (continued)

• Main characteristics (continued)

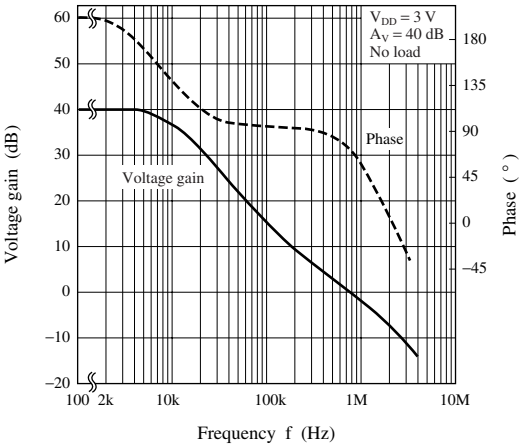
Offset voltage — Ambient temperature



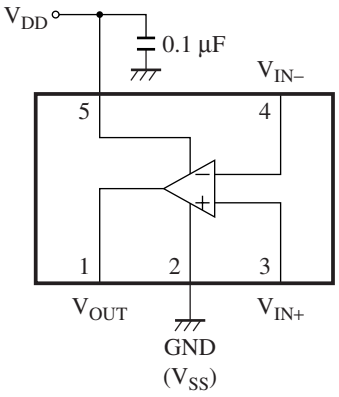
Supply current — Ambient temperature



Voltage gain · Phase — Frequency characteristics



■ Application Circuit Example



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