

Product Overview

The NSC6275 is an analog low noise amplifier for MEMS Microphone. It has integrated low noise bias voltage output, high-performance analog amplifier and trimming circuit for difference MEMS transducers. The NSC6275 has compact die size and high performance, which is suitable for cost effective microphone applications.

Key Features

- Operation voltage range: 1.6V~3.6V
- Current consumption: 124 μ A @ 1.8V
- SNR: 70dB(A) (ASIC only)
- AOP: 127dB SPL @ 1.8V
- HBM ESD: \pm 4kV
- Small Die Size: 480 μ m x 480 μ m
- Operation temperature: -40°C ~ 85°C
- RoHS compliance

Calibration

The microphone's sensitivity can be calibrated to a specific value according to customers' requirements. Sensitivity calibration is carried out using calibration board or communication protocol provided by NOVOSENSE.

Applications

- MEMS Microphone module
- Portable Audio equipment
- Cellular Phone

Package

NSC6275 provides raw wafer for MEMS Microphone module.

Functional Block Diagrams

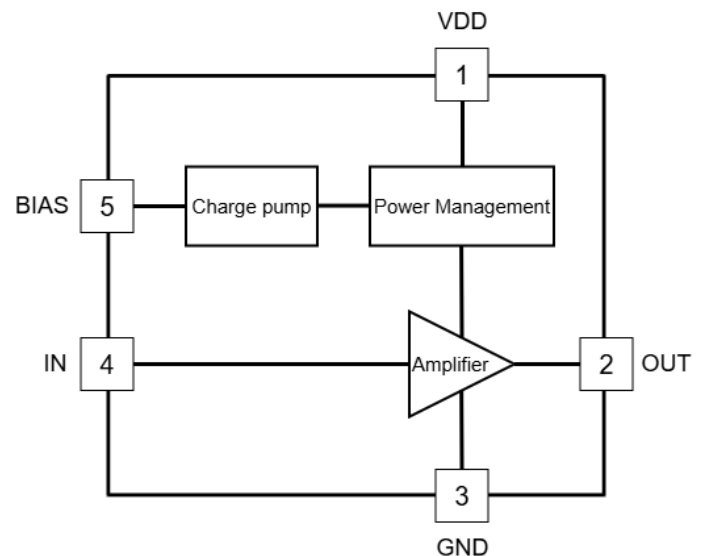


Figure 1. NSC6275 Block Diagram

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1. Pad Configuration and Functions

Die Size: 480 μm x 480 μm (Exclude Scribe Line)

Pad Size: 60 μm x 60 μm

Scribe Line: 60 μm

Pad Thickness: 0.9 μm

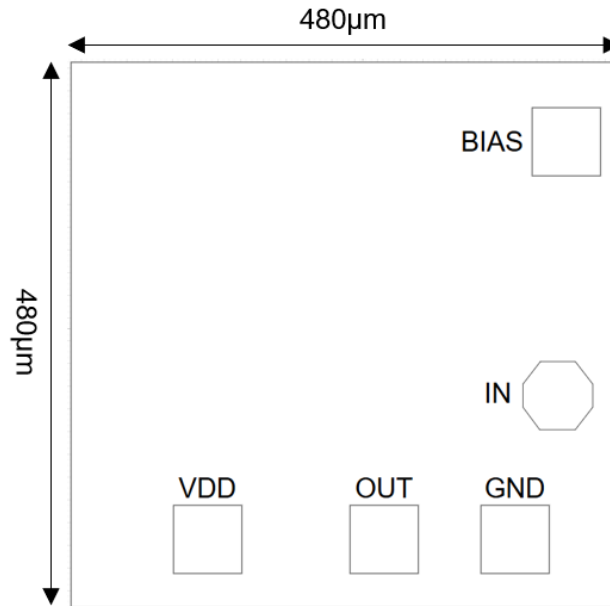


Figure 1.1 NSC6275 Pad Configuration Diagram

Table 1.1 NSC6275 Pad Configuration and Description

Pad No.	Symbol	Function	Pad Coordinates (X, Y) [μm] ⁽¹⁾	
1	VDD	Power Supply	-119.727	-179
2	OUT	Analog output	35.65	-179
3	GND	Ground	148.99	-179
4	IN	MEMS Sensitivity Input	188	-54.65
5	BIAS	BIAS Voltage Output	193	167.58

⁽¹⁾ The center point of the chip is the origin

2. Absolute Maximum Ratings

Parameters	Symbol	Min	Typ	Max	Unit	Comments
Power Supply Voltage	VDD	-0.3		4.2	V	
Storage Temperature	Tstg	-40		125	°C	

Stresses greater than those listed under Absolute Maximum Ratings may cause permanent damage to the device. These are stress ratings only. Functional operation of the devices at these or any other conditions greater than those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability

3. ESD Ratings

Items	Ratings	Value	Unit
Electrostatic discharge	Human body model (HBM), per ESDA/JEDEC JS-001-2023		
	● BIAS, IN	±100	V
	● VDD, OUT	±4.0	kV
	Charged device model (CDM), per ESDA/JEDEC JS -002-2022		
	● BIAS, IN	±150	V
	● VDD, OUT	±500	V

4. Recommended Operating Conditions

Parameters	Symbol	Min	Typ	Max	Unit	Comments
Power Supply Voltage	VDD	1.6	1.8	3.6	V	
Operating Temperature	Topr	-40		85	°C	

5. Electrical Characteristics

Test conditions are VDD=1.8V, Ta=25±2°C, ASIC only test, unless otherwise noted.

Parameters	Symbol	Min	Typ	Max	Unit	Comments
Current Consumption	I _{DD}		124	160	μA	
Gain Range		-3.6		10.6	dB	OTP Trimming, 0.5dB/Step. Default is 3.2dB. Determined by MEMS transducer.
BIAS Voltage	V _{BIAS}	9.5		16.2	V	OTP Trimming, 0.3V/Step. Default is 9.5V.
VDD Ramp Up Time	T _{VDD_Ramp}			10	ms	VDD reaches its final value within ± 10% tolerance.
Start Up Time1	T _{Start1}			30	ms	Not disable OWI, Time to start up which means Sens reaches ± 0.5dB after VDD has reached minimum operation voltage.
Start Up Time2	T _{Start2}			10	ms	Disable OWI, Time to start up which means Sens reaches ± 0.5dB after VDD has reached minimum operation voltage.
Output DC Voltage	V _{OUT_DC}		0.8		V	Determined by MEMS transducer.
Output impedance	Z _{OUT}			250	Ω	@1kHz sine wave.
Load resistor	R _L	8			kΩ	AC-coupled
Load capacitance	C _L			100	pF	DC-coupled
Signal to Noise Ratio	SNR		70		dB(A)	Gain=0dB, BW=20Hz~20kHz, A weighted. There is a 1.5pF capacitor between in and BIAS.
Acoustic Overload Point	AOP		127		dB SPL	Sens=-38dBV@1kHz sine wave, determined by MEMS transducer.
Power Supply Rejection Ratio	PSRR		75		dB	200mVpp 1kHz sine wave on VDD, default gain. There is a 1.5pF capacitor between in and BIAS.

6. Typical Application Circuit

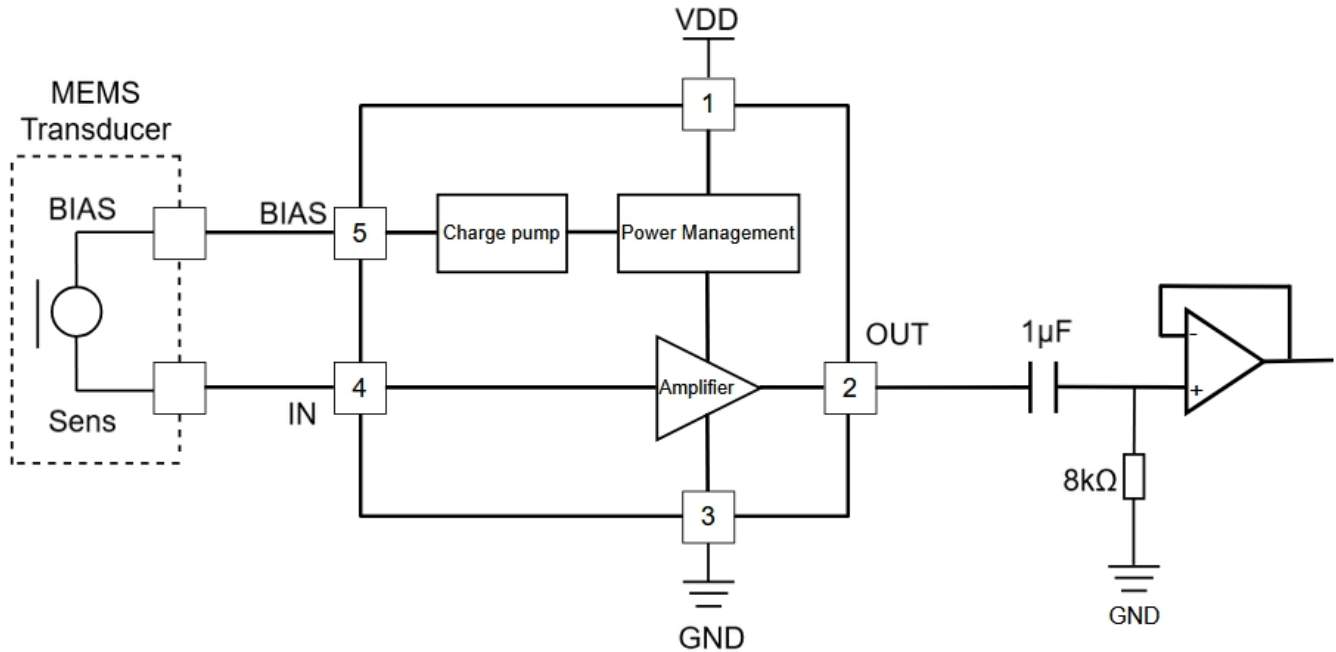


Figure 6.1 Typical Application Circuit

7. Ordering Information

Part Number	Package	Wafer Size	Minimum Ordering Quantity (MOQ)	GDPW	NOTE
NSC6275-0900D	Whole Wafer	8 inches	1pcs wafer	99208	No thinning.
NSC6275-0900D-DS200	Whole Wafer	8 inches	1pcs wafer	99208	Thinning and dicing with 200µm

8. Revision History

Revision	Descriptions	Date
1.0	Initial version.	2025/5/29

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