

Product Overview

The NSC6273 is a pre-amplifier for MEMS Microphone. The NSC6273 has integrated low noise bias circuit for MEMS microphone, and high performance analog pre-amplifier deliver the genuine sound quality and support flexible microphone systems. Both of the bias voltage and the analog pre-amplifier gain can be trimmed by the internal fuse banks (OTP), so the NSC6273 can support MEMS transducers with different parameters. It also improves the yield and provide better consistency of sensitivity. The NSC6273 has two output pads for bias voltage with different location, either of which is chosen depending on the location of top plate of MEMS microphone.

Key Features

- Operation voltage: 2.3V~3.6V
- Current consumption: 125uA typ.
- Input equivalent noise: 4uVrms (-108dBV)
- Maximum output voltage: 780mVrms (-2.2dBV) @THD<10%
- Gain (OTP Trimming): -4.0dB~11dB with 0.5dB/step
- Frequency response: 20Hz~20kHz
- Bias voltage: 7.5V~16V

- Operation temperature: -40°C~85°C
- Package: Chip(Wafer)

Applications

- Portable Audio equipment
- MEMS Microphone module
- Cellular Phone

Block Diagrams

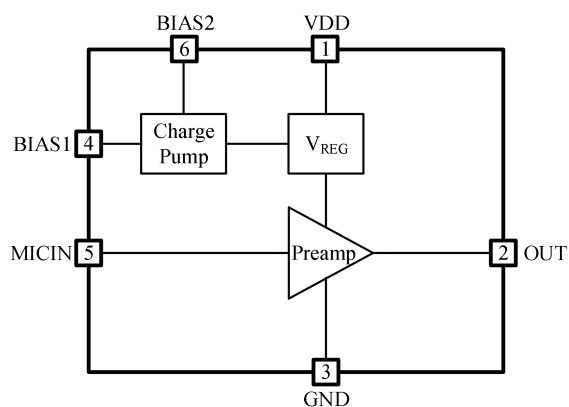


Figure 1. NSC6273 Block Diagram

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1. Pad Configuration

Chip Size: 0.559mm x 0.572mm (Exclude Scribe Line)

Chip Thickness: >200μm

Pad Size: 60μm x 60μm

Pad Thickness: 0.9μm

Scribe Line: 60μm

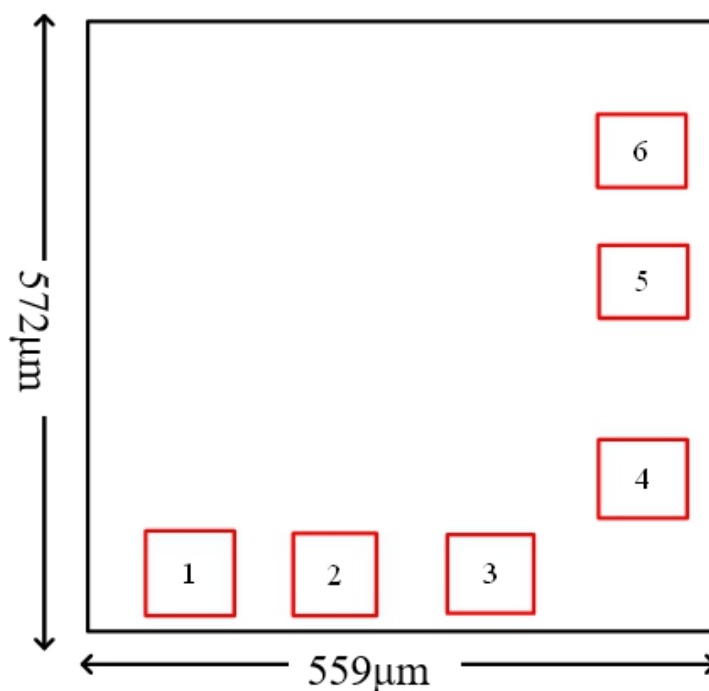


Figure 1.1 Chip Outline

Table 1.1 NSi8266W Pin Configuration and Description

NSC6273PIN NO.	SYMBOL	FUNCTION				
1	VDD	Power Supply	176.00	μm	60.00	μm
2	OUT	Analog output	287.00	μm	60.00	μm
3	GND	Ground	414.00	μm	60.00	μm
4	BIAS1	First Bias Voltage Output	508.00	μm	141.00	μm
5	MICIN	Microphone Input	508.00	μm	351.00	μm
6	BIAS2	Second Bias Voltage Output	508.00	μm	468.00	μm

2. Absolute Maximum Ratings

Parameters	Symbol	Min	Typ	Max	Unit	Comments
Power Supply Voltage	VDD	-0.3		4.2	V	
Maximum Input Voltage	VIN	-0.4		+0.4	V	
Operating Temperature	Topr	-40		85	°C	
Storage Temperature	Tstg	-40		125	°C	
Electrostatic discharge	HBM		±4		kV	VDD/OUT to GND
	HBM		±3		kV	OUT to VDD
	HBM		±100		V	AIN to GND
	HBM		±50		V	VPUMP to GND
	CDM		±250		V	VDD/OUT/GND

3. Recommended Operating Conditions

Parameters	Symbol	Min	Typ	Max	Unit	Comments
Operation Voltage	VDD	2.3		3.6	V	

4. Electrical Characteristics

Parameters	Symbol	Min	Typ	Max	Unit	Comments
Current Consumption	I _{DD}		125	160	μA	
Output Noise Voltage	V _{NO}		6		μV	A-weighted when Gain=3.5dB
Gain	V _G	-4.0		11.0	dB	OTP Trimming, 0.5dB/Step. Default is 3.5dB
Total Harmonic Distortion	THD+N		0.2	1	%	Vin=50mVrms (-26dBV)
Maximum Output Voltage	V _{OM}		780 (-2.2)		mVrms dBV	THD<10%
Low Cut Off Frequency	f _{CL}			20	Hz	
High Cut Off Frequency	f _{CH}	20			kHz	
Power Supply Rejection Ratio	PSRR		-70		dB	1KHz, 0.1Vpp SIN on VDD
Bias Voltage	V _{bias}	7.5		16	V	OTP Trimming, 0.3V/Step. Default is 7.5V. Extra step is 16V when fuse<10:6> code is '11101'.
Output DC Voltage	V _{out,dc}		1.15		V	

Output DC Impedance	R_{out}		180	250	ohm	Vdd=1.8V,f=1Kz,input connected to MEMS
Load Resistor	R_L	8			Kohm	AC coupled
Load Capacitance	CL			100	pf	DC coupled
Start Up Time	trbs		10		msec	Bias Voltage 90% rising
VDD Ramp Up Time	V_{DD_Ramp}	0.001		5	ms	

5. Application Note

5.1. Typical Application Circuit

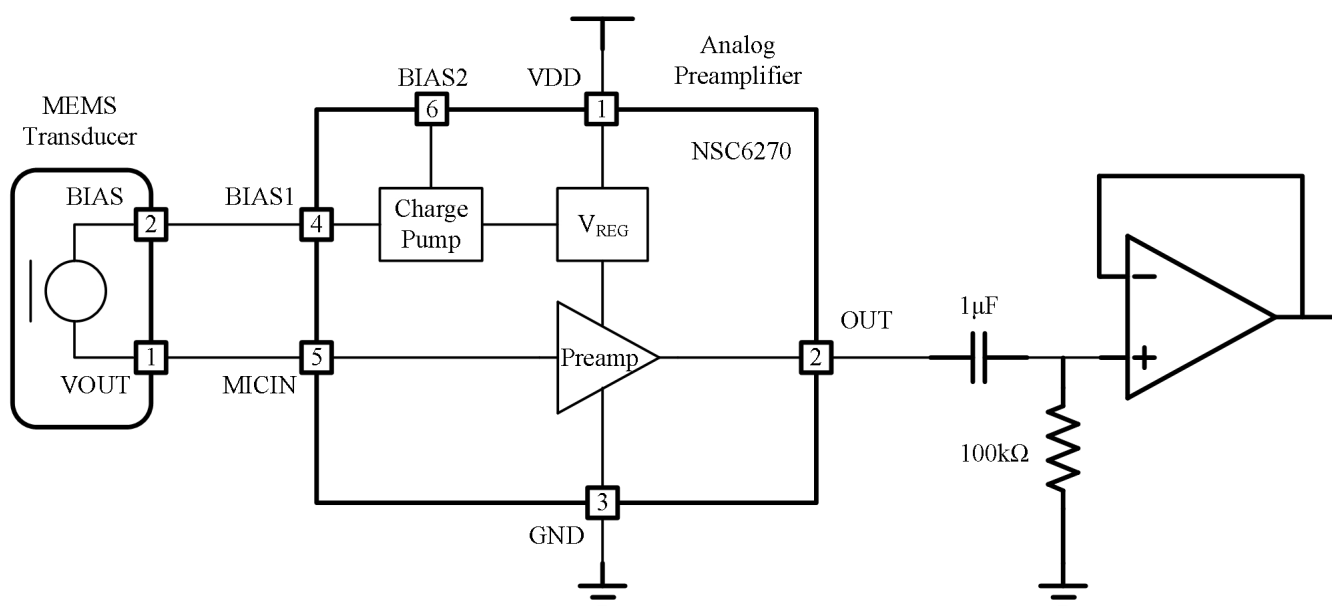


Figure 5.1 Typical Application circuit for NSC6273

NOTE: Since the DC voltage of MICIN is 0.7V, the voltage actually loaded to the MEMS is about 0.7V lower than the programmed value. For example, when Vbias is programmed to be 12.4V, the actual voltage of the MEMS is 11.7V. Customers need to pay attention to the note.

6. Ordering Information

Please refer to “NSC6273_Part_Selection_Guide.xlsx”.

7. Revision History

Revision	Description	Date
1.0	Initial Version.	2022/9/14

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Suzhou Novosense Microelectronics Co., Ltd