

N55PA03A

Data Sheet

3W PWM Power Amplifier

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Table of Contents

1.	General Description	3
2.	Features.....	3
3.	Block Diagram.....	4
4.	Pin Description	5
5.	Electrical Characteristics	6
5.1	Absolute Maximum Ratings	6
5.2	D.C. Characteristics	6
5.3	A.C. Characteristics	6
6.	Typical Application Circuit	7
7.	Package Information.....	8
7.1	PIN Assignment.....	8
7.2	Package Dimension.....	9
8.	Ordering Information.....	10
9.	Revision History	10

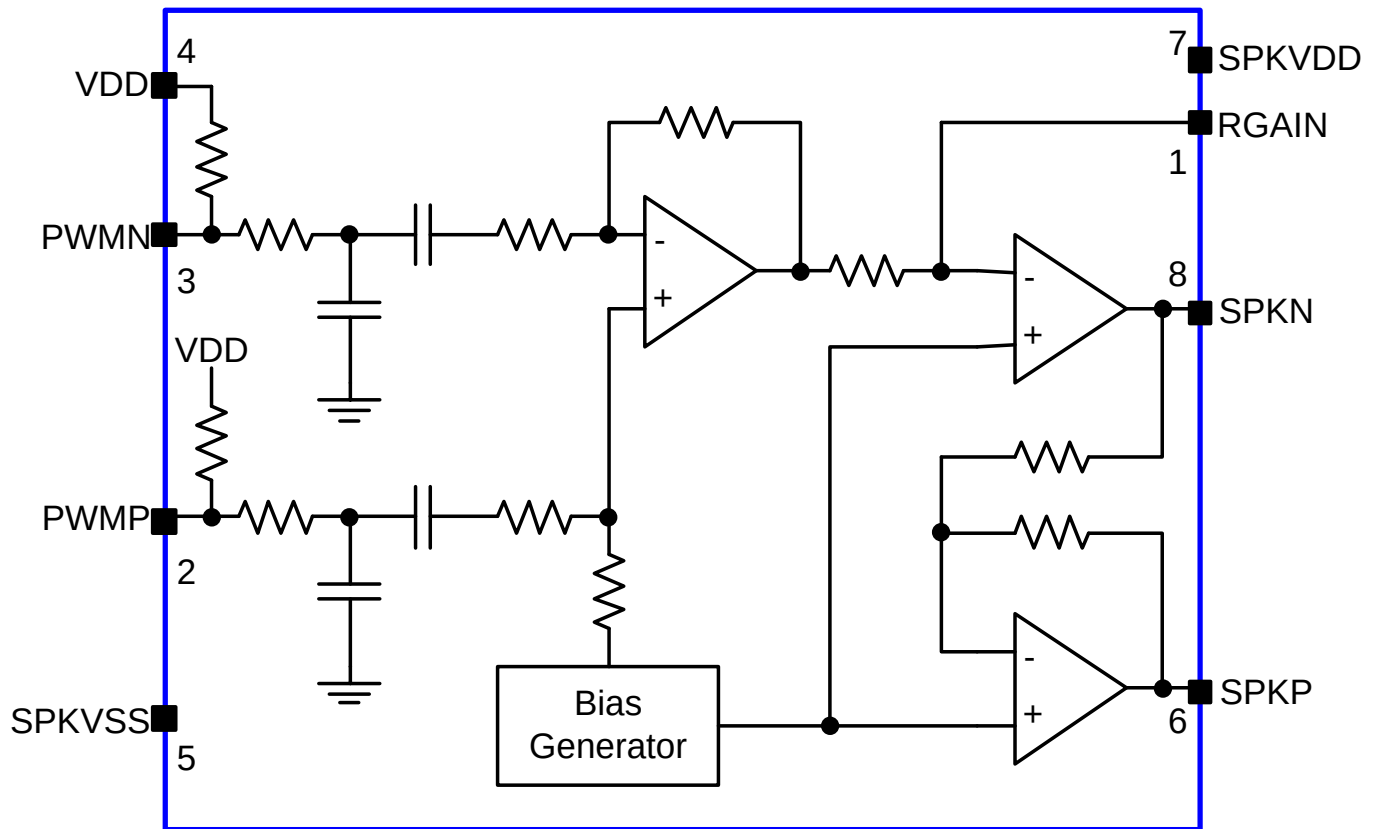
1. General Description

The N55PA03A is an amplifier to amplify output signal (max. 3W @5.5V, 4Ω) from PWM and/or MIC Line-in. It supports Nuvoton Speech/MIDI/NuVoice IC PWM output without extra components. The gain is adjustable by external resistor.

2. Features

- Operation Voltage:
 - 2.0V ~ 5.5 V
- Accept both PWM signal without external components
- Mute Function
- Standby current: typical 2uA
- Adjustable gain by external R
- Auto power on/off
- Support MIC Line In
- Max. output power: 3W @5.5V (THD+N: 10%), 4Ω.
- Package form:
 - SOP8
 - Package is Halogen-free, RoHS-compliant and TSCA-compliant.

3. Block Diagram



4. Pin Description

Pin No.	Name	I/O	Power Supply	Description
1	RGAIN	I	-	Gain control pin
2	PWMP	I	VDD	PWM driver positive signal input
3	PWMN	I	VDD	PWM driver negative signal input
4	VDD	P	-	Positive power for IC internally
5	SPKVSS	P	-	Negative power supply for speaker driving
6	SPKP	O	SPKVDD	Positive speaker signal amplified output
7	SPKVDD	P	-	Positive power supply for speaker driving
8	SPKN	O	SPKVDD	Negative speaker signal amplified output

Note: VDD and SPKVDD can have different input voltage level. VDD needs less than or equal to SPKVDD

5. Electrical Characteristics

5.1 Absolute Maximum Ratings

Parameter	Symbol	Conditions	Rated Value	Unit
Input Voltage	VIN	All Inputs	VSS -0.3 to VDD +0.3	V
Storage Temp.	TSTG	-	-55 to +150	°C
Operating Temp.	TOPR	-	-20 to +85	°C

Note: Exposure to conditions beyond those listed under the Absolute Maximum Ratings table may adversely affect the life and reliability of the device.

5.2 D.C. Characteristics

(VDD – VSS = 4.5V, TA = 25° C, No Load unless otherwise specified)

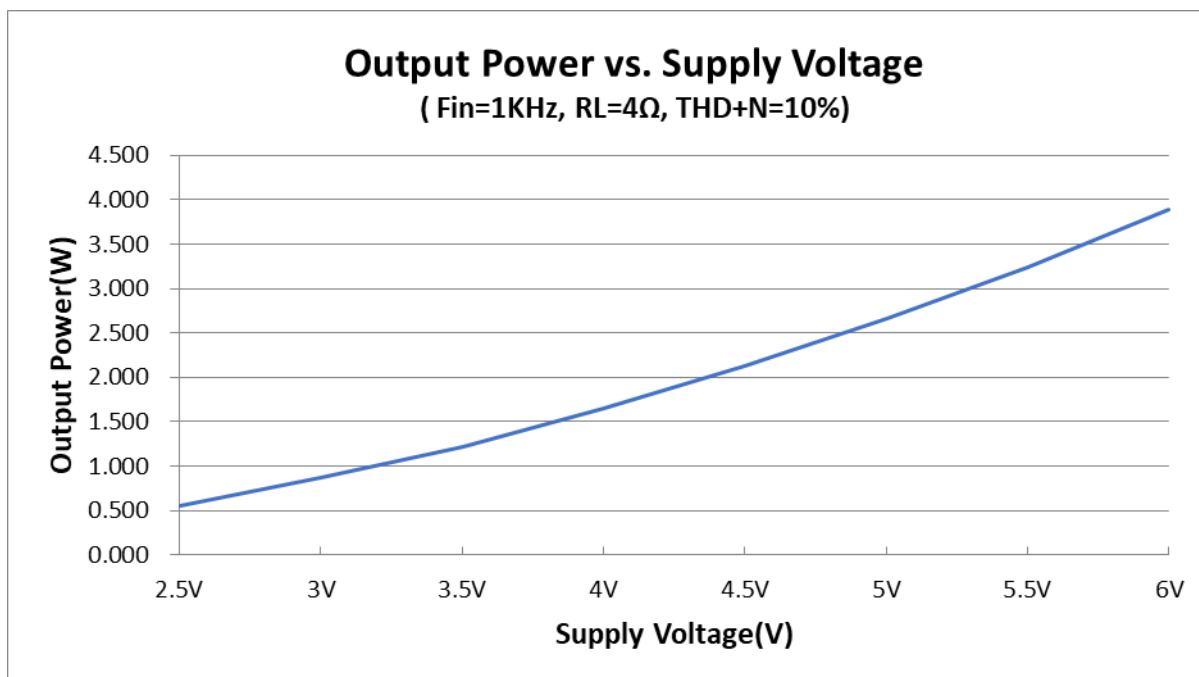
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	UNIT
Operating Voltage	VDD		2.0	-	5.5	V
Operating Current	IOP	No load, VDD = SPKVDD = 5.5V	-	6.5	10	mA
Standby Current	ISTB	No load, VDD = SPKVDD = 5.5V (PWMP=floating, PWMN=floating)	-	2	3	μA
Pull high Resistor (PWMP/PWMN)	RPH	VDD=3.3V	1.4	2	2.6	MΩ

5.3 A.C. Characteristics

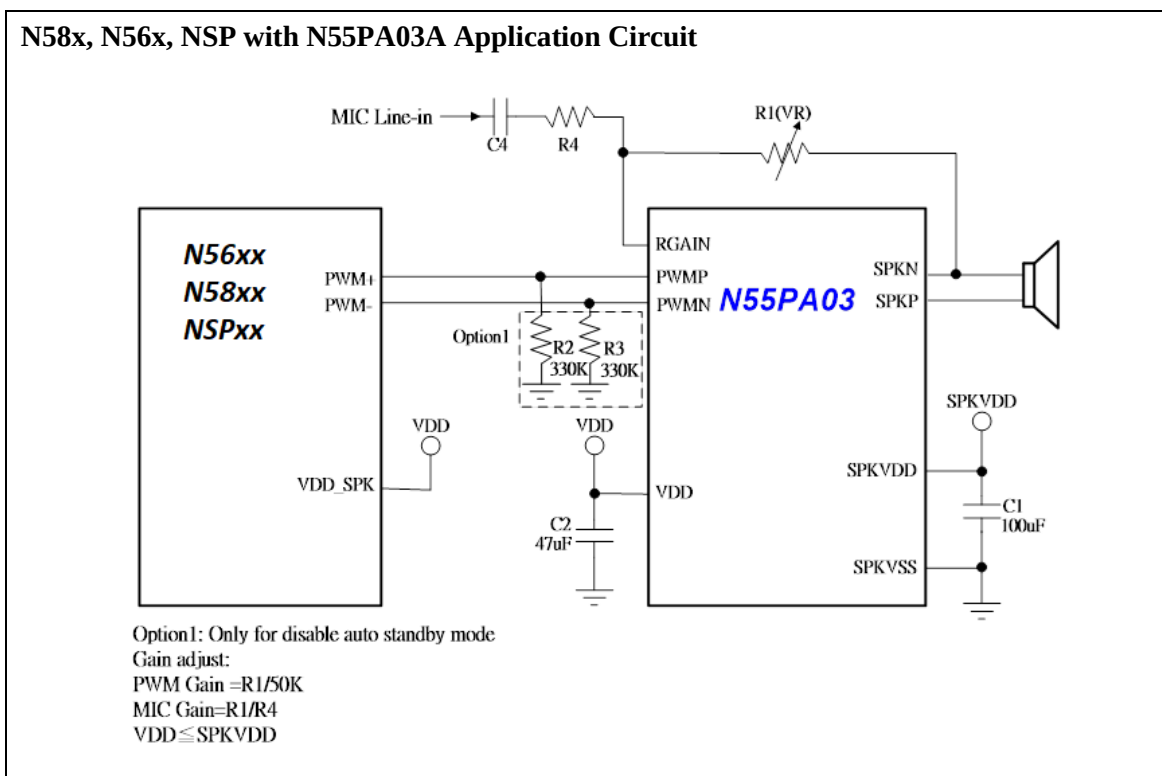
(VDD = 4.5V, TA = 25°C, No Load unless otherwise specified)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	UNIT
Standby time	St	Ton			25	mS
		Toff			200	
Output power	Pout	SPKVDD=5.5V, THD+N=10%, RL=4Ω		3		W

6. Output Power vs. Supply Voltage



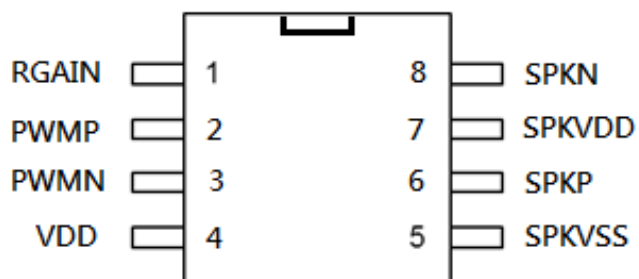
7. Typical Application Circuit



8. Package Information

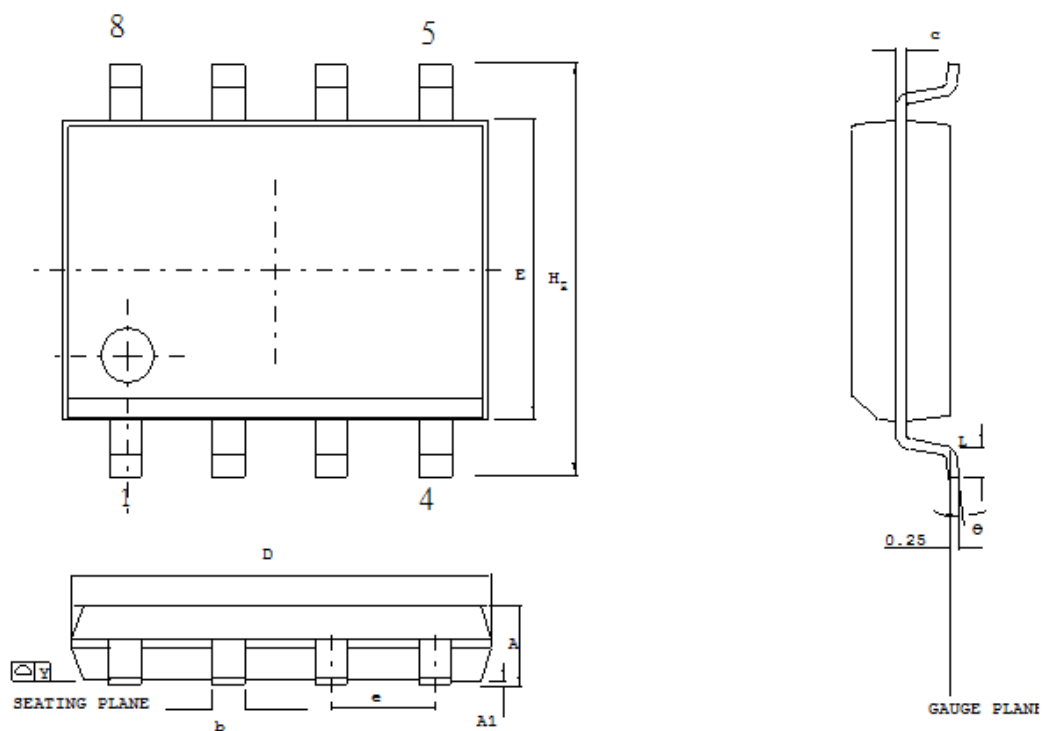
8.1 PIN Assignment

N55PA03A, SOP8 (150 mil)



8.2 Package Dimension

SOP8, 150 mil



Control dimensions are in millimeters.

SYMBOL	DIMENSION IN MM		DIMENSION IN INCH	
	MIN.	MAX.	MIN.	MAX.
A	1.35	1.75	0.053	0.069
A1	0.1	0.25	0.004	0.01
B	0.33	0.51	0.013	0.02
C	0.19	0.25	0.008	0.01
E	3.8	4	0.15	0.157
D	4.8	5	0.188	0.196
e	1.27 BSC		0.050 BSC	
H _F	5.8	6.2	0.228	0.244
Y	—	0.1	—	0.004
L	0.4	1.27	0.016	0.05
θ	0	10	0	10

9. Ordering Information

Part No.	Shape	Type
N55PA03A	E	Package: SOP8 (150mil)

10. Revision History

Revision	Date	Substantial Changes	Page
1.0	Feb. 2024	Initial Release	All

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