



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of "Quality Parts,Customers Priority,Honest Operation,and Considerate Service",our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



## Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



## Monaural Microphone Amplifier

### ■ GENERAL DESCRIPTION

The **NJM2781** is a monaural microphone amplifier IC with a standby function, and can vary a voltage gain by adjusting an external resistor.

Since the **NJM2781** operates with a low voltage range of +2.7V to +4.5V and is available in tiny packages of MSOP8(TVSP8)\* and SSOP8, it is ideally suited for portable and handheld components.

### ■ PACKAGE OUTLINE



**NJM2781RB1**  
MSOP8(TVSP8)



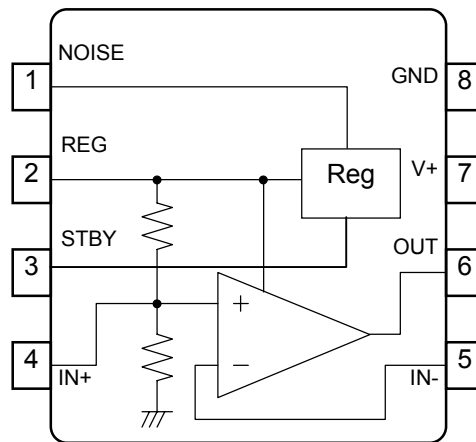
**NJM2781V**  
(SSOP8)

### ■ FEATURES

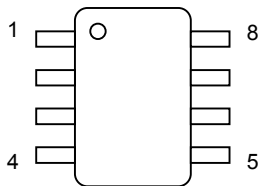
- Operating Voltage +2.7V to +4.5 V
- Operating Current 1.8mA typ.  
1μA max. (in Standby mode)
- Bipolar Technology
- Package Outline MSOP8(TVSP8) \*  
SSOP8

\*MEET JEDEC MO-187-DA / THIN TYPE

### ■ BLOCK DIAGRAM



### ■ PIN FUNCTION



No.	SYMBOL	FUNCTION	No.	SYMBOL	FUNCTION
1	NOISE	Noise Bypass	5	IN-	Inverted Input
2	REG	Regulator Output	6	OUT	Output
3	STBY	Standby On/Off	7	V+	Power Supply
4	IN+	Non-Inverted Input	8	GND	Ground

## ■ ABSOLUTE MAXIMUM RATING (Ta=25°C)

PARAMETER	SYMBOL	RATING	UNIT
Supply Voltage	V <sup>+</sup>	5	V
Power Dissipation	P <sub>D</sub>	MSOP8(TVSP8):320, SSOP8:250	mW
Operating Temperature Range	Topr	-40 to 85	°C
Storage Temperature Range	Tstg	-40 to 125	°C

## ■ ELECTRICAL CHARACTERISTICS

(Ta=25°C, V<sup>+</sup>=2.8V, Vin=-40dBV, f=1kHz, R<sub>L</sub>=9kΩ)

### ● Power Supply

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Voltage	V <sup>+</sup>		2.7	2.8	4.5	V
Operating Current 1	I <sub>cc1</sub>	No signal, Standby		-	1	μA
Operating Current 2	I <sub>cc2</sub>	No signal, Active		1.8	4	mA
Mic Power Supply Voltage	V <sub>o</sub>	RL=6.8kΩ	2.3	2.42	2.54	V

### ● Amplifier

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	V <sub>o</sub>		1.28	1.35	1.42	V
Voltage Gain	G <sub>v</sub>	Test Circuit 1	24	25	26	dB
Maximum Output Voltage	V <sub>OM</sub>	THD=0.1%	-2.7 (0.73)	-1.5 (0.84)	-	dBV (V <sub>rms</sub> )
Total Harmonic Distortion (THD+N)	THD		-	0.025	0.1	%
Output Noise	V <sub>NO</sub>	Rg=600Ω, A-Weighted	-	-98 (12.6)	-90 (31.6)	dBV (μV <sub>rms</sub> )
Power Supply Ripple Rejection	PSRR	Rg=600Ω, V <sub>ripple</sub> =-20dBV	65	80	-	dB

### ● Control

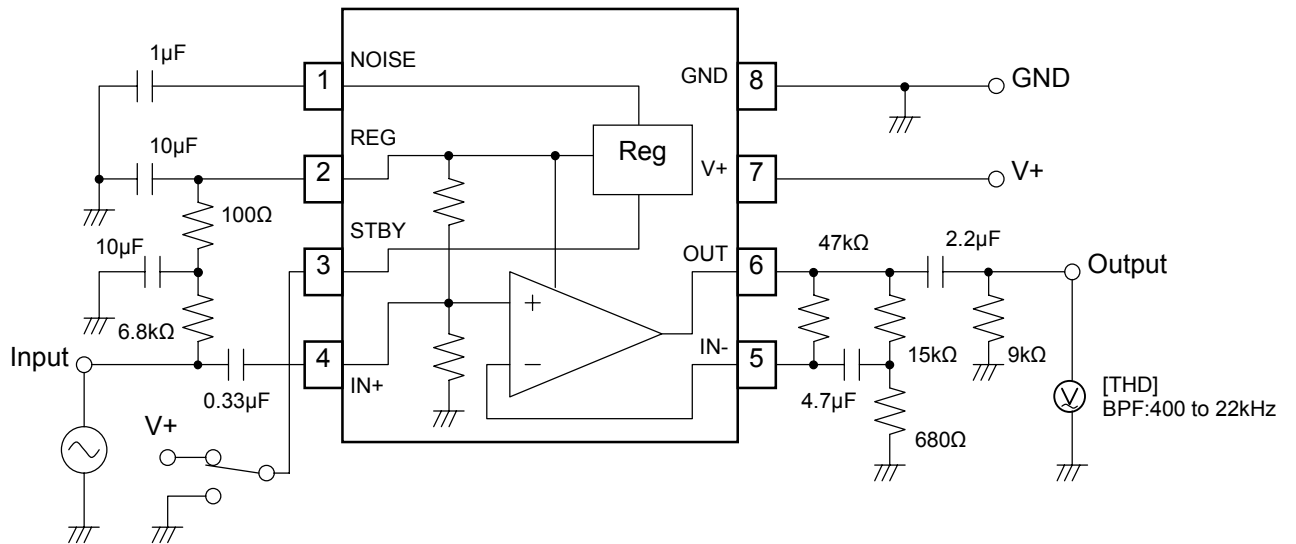
PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
High Level Input Voltage	V <sub>IH</sub>	STBY terminal	2	-	V <sup>+</sup>	V
Low Level Input Voltage	V <sub>IL</sub>	STBY terminal	0	-	0.5	V

### ■ Standby Mode Operation

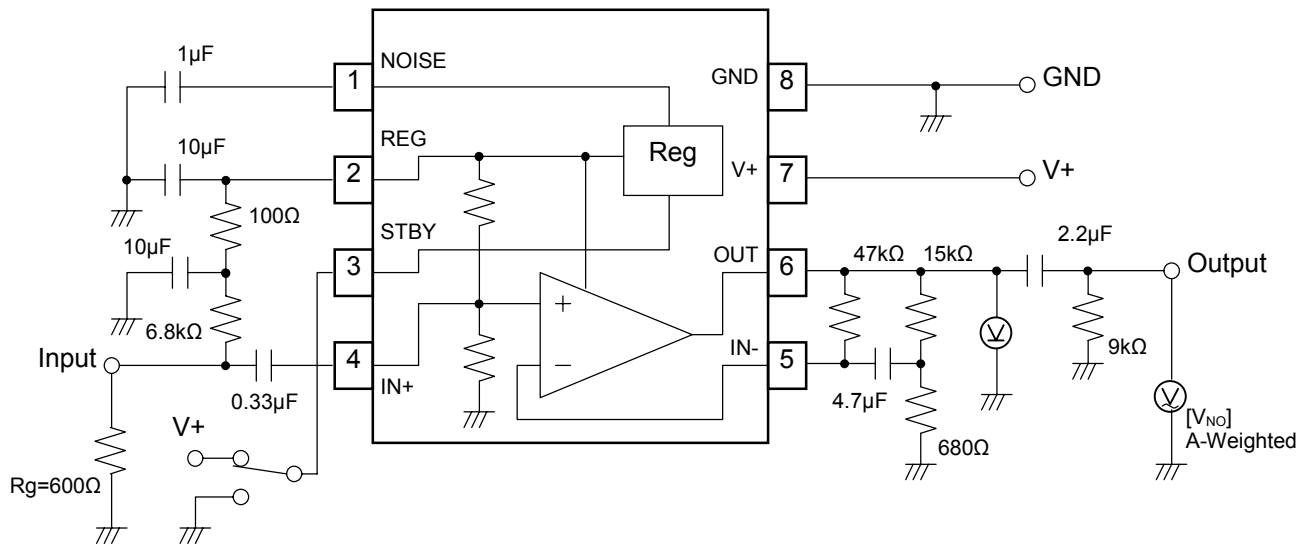
Status	Control Terminal	IC Condition
	STBY	
Active	H	IC active
Standby	L, OPEN	IC standby

## ■ TEST CIRCUIT

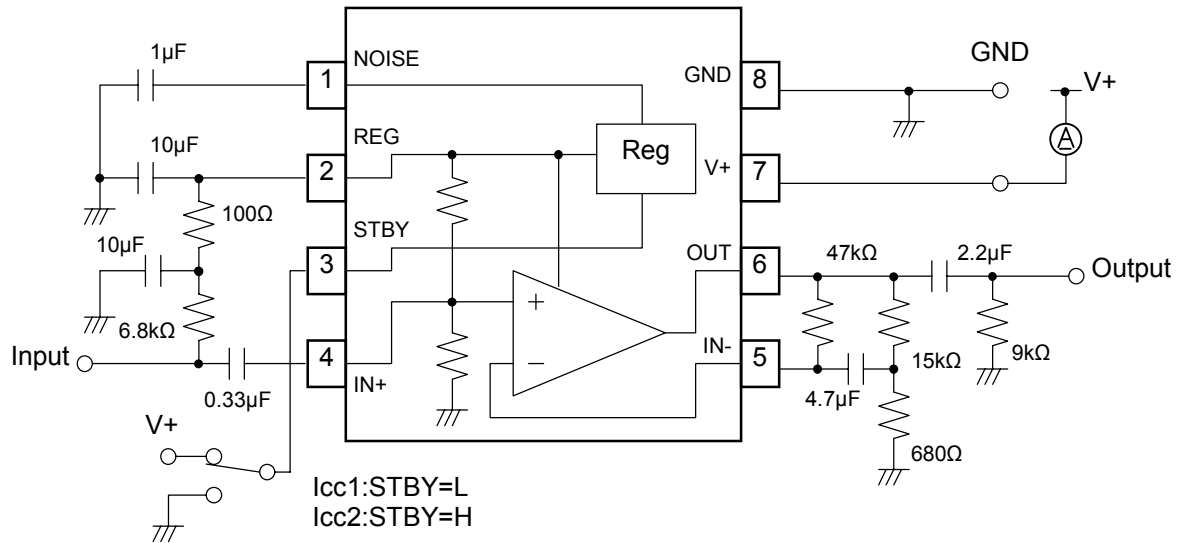
Test Circuit 1 (Voltage Gain  $G_V$ , Maximum Output Voltage  $V_{OM}$ , Total Harmonic Distortion THD)



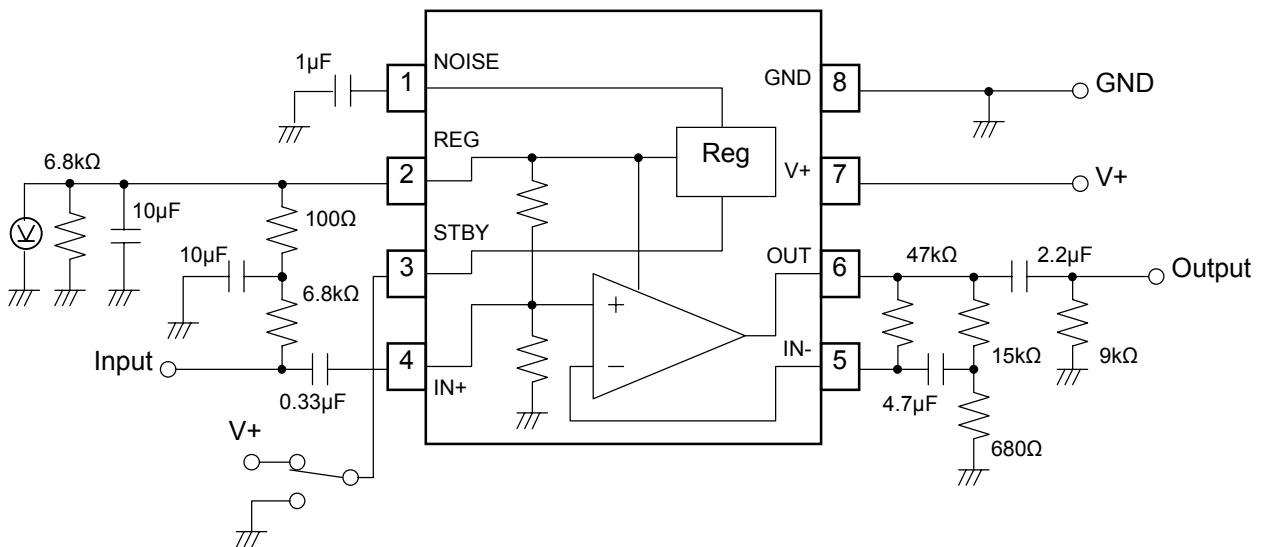
Test Circuit 2 (DC Output Voltage  $V_O$ , Output Noise  $V_{NO}$ )



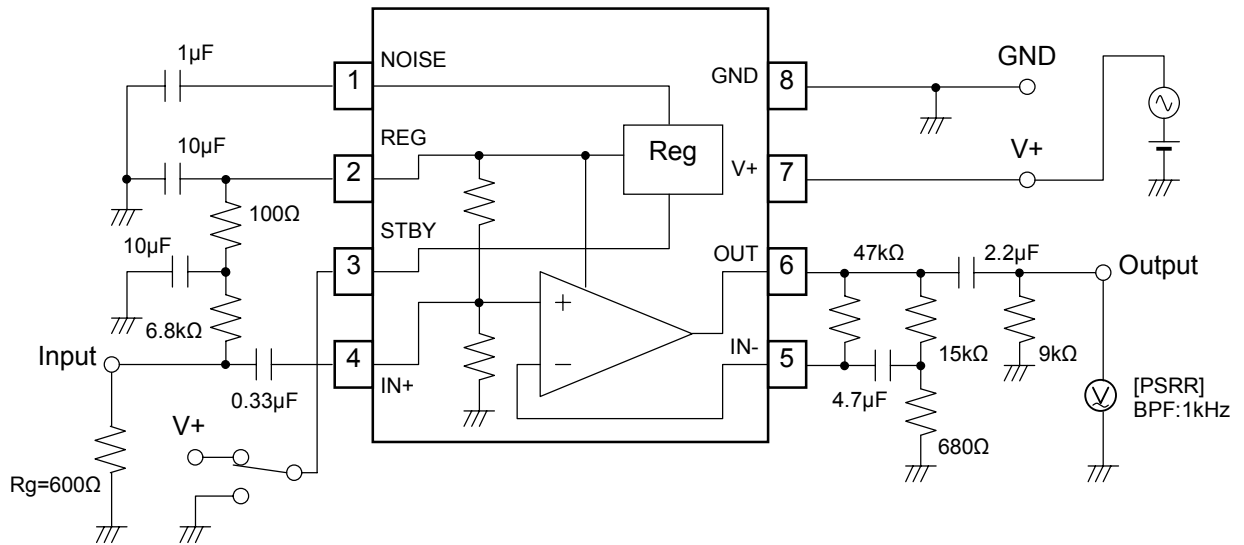
Test Circuit 3 (Operating Current  $I_{cc1}, I_{cc2}$ )



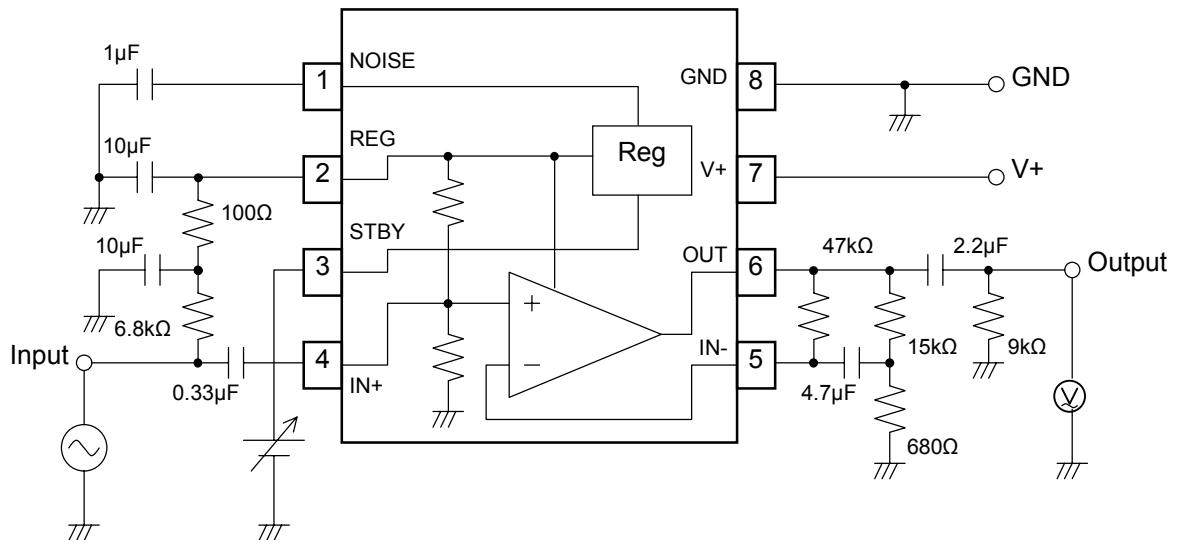
Test Circuit 4 (Mic Power Supply Voltage  $V_O$ )



Test Circuit 5 (Power Supply Ripple Rejection PSRR)

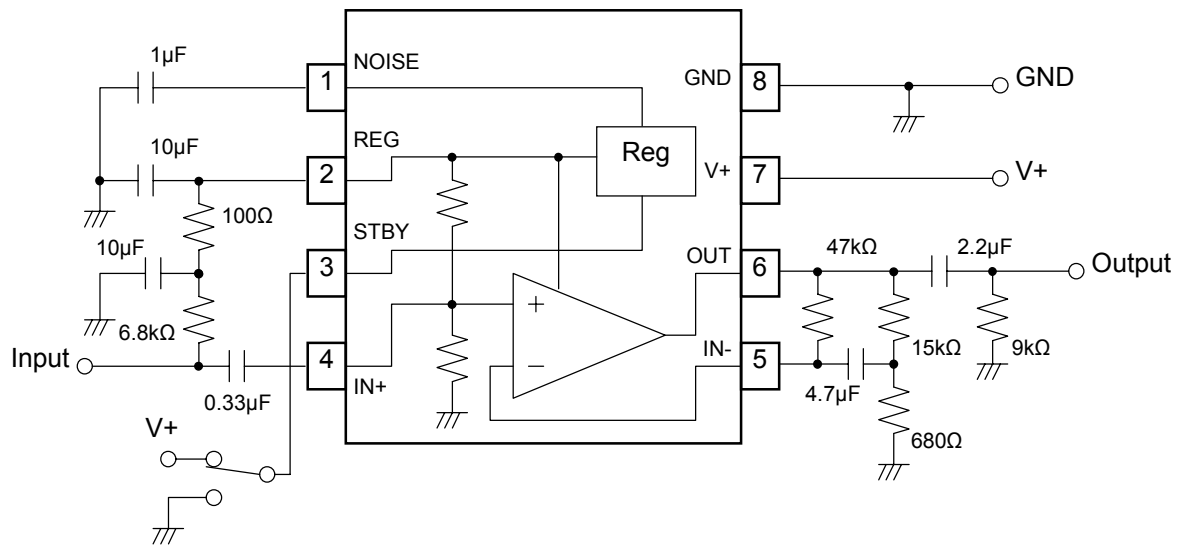


Test Circuit 6 (Stand-By Control Voltage  $V_{IH}$ ,  $V_{IL}$ )



# NJM2781

## ■ APPLICATION CIRCUIT



## ■ TERMINAL DESCRIPTION

PIN NO.	SYMBOL	FUNCTION	EQUIVALENT CIRCUIT	TERMINAL VOLTAGE
1	NOISE	Noise Bypass		0.54V
2	REG	Regulator Output		2.42V
3	STBY	Standby On/Off		0V
4	IN+	Non-Inverted Input		1.35V



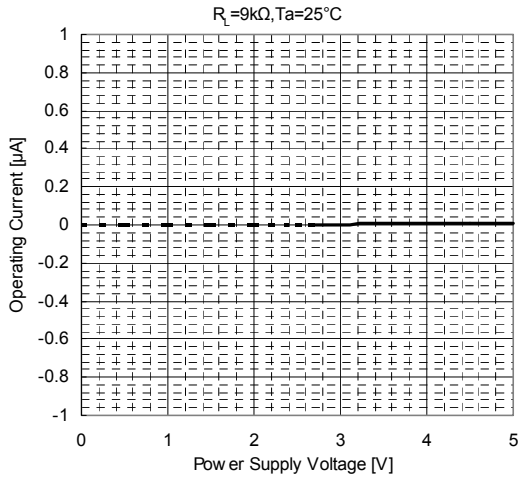
# NJM2781

## ■ TERMINAL DESCRIPTION

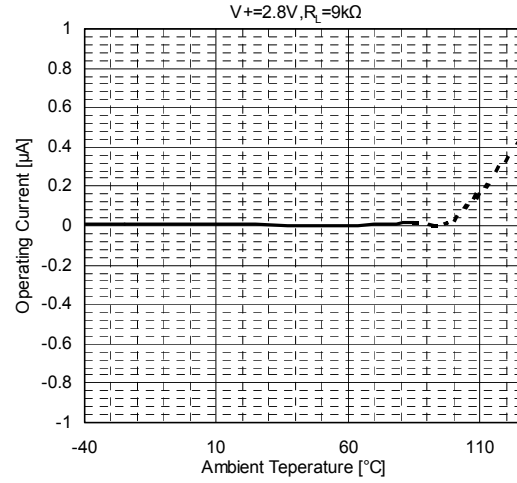
PIN NO.	SYMBOL	FUNCTION	EQUIVALENT CIRCUIT	TERMINAL VOLTAGE
5	IN-	Inverted Input		1.35V
6	OUT	Output		1.35V

## ■ TYPICAL CHARACTERISTICS

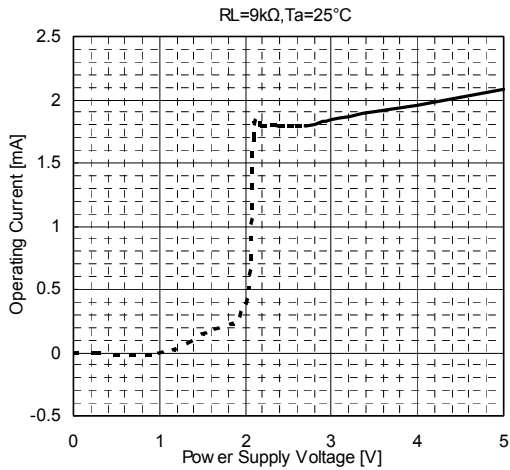
Operating Current vs. Power Supply Voltage (Standby)



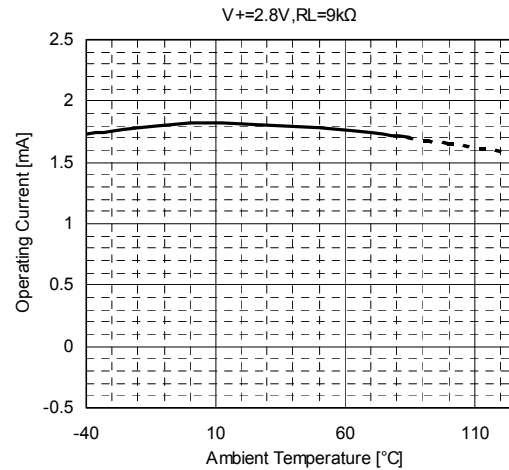
Operating Current vs. Ambient Temperature (Standby)



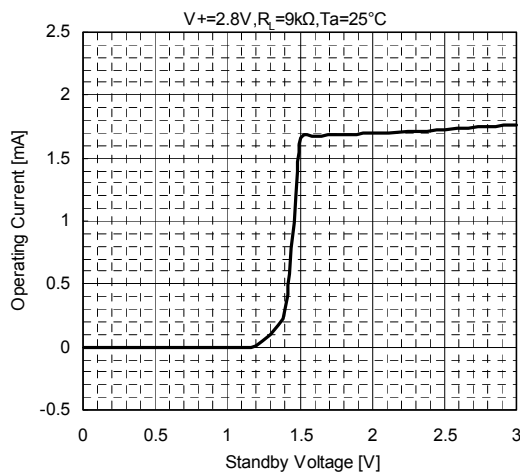
Operating Current vs. Power Supply Voltage (Active)



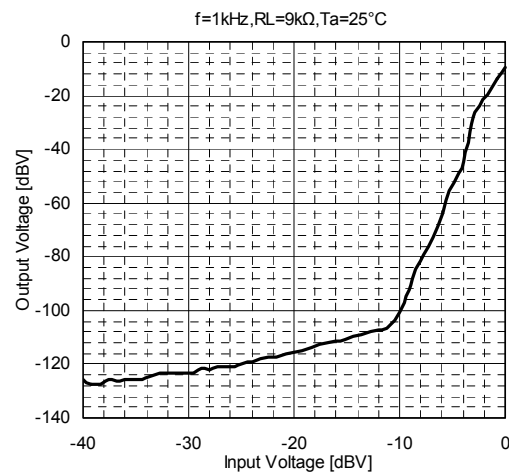
Operating Current vs. Ambient Temperature (Active)



Operating Current vs. Standby Voltage

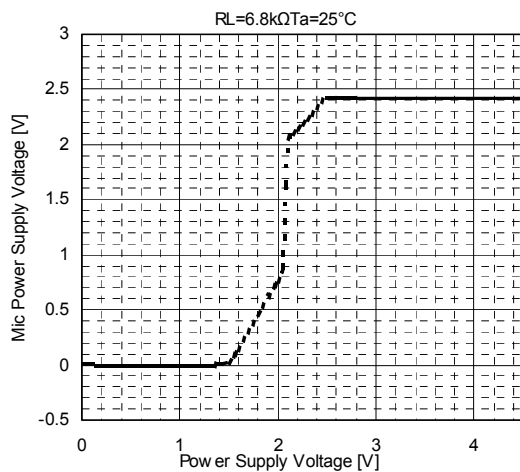


Output Voltage vs. Input Voltage (Standby)

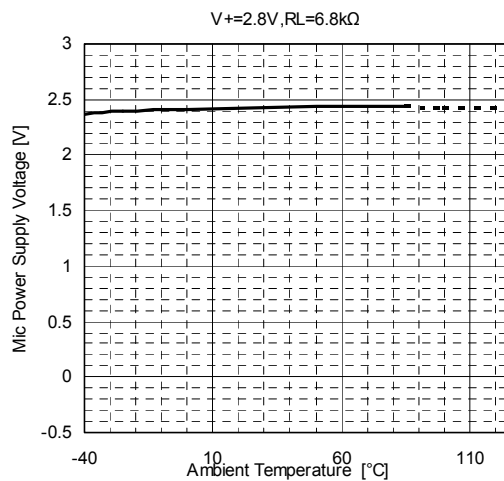


## TYPICAL CHARACTERISTICS

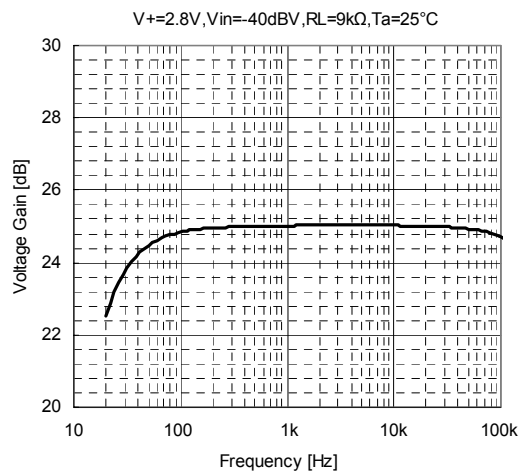
Mic Power Supply Voltage vs. Power Supply Voltage



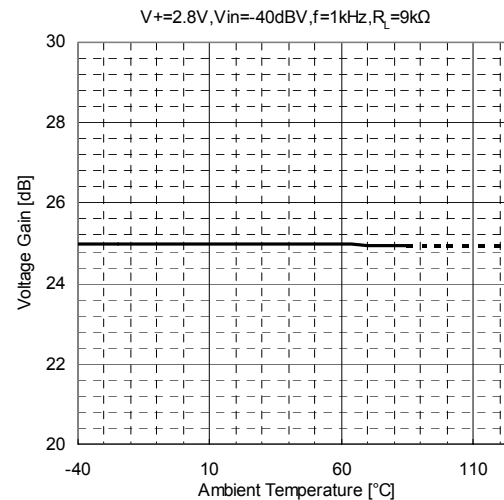
Mic Power Supply Voltage vs. Ambient Temperature



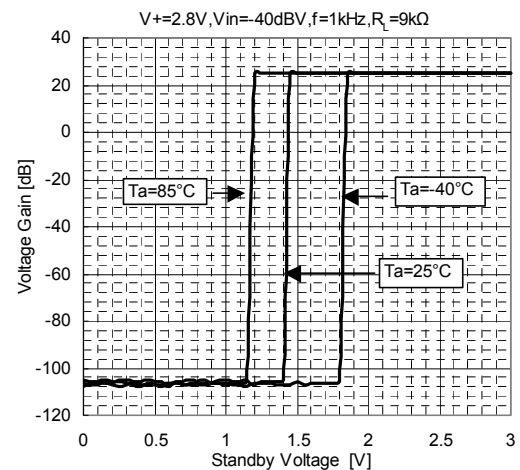
Voltage Gain vs. Frequency



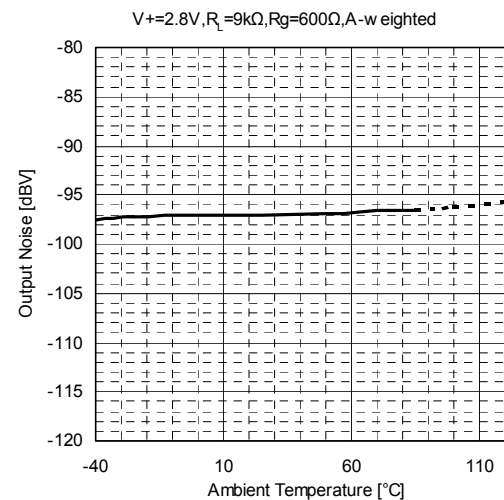
Voltage Gain vs. Ambient Temperature



Voltage Gain vs. Standby Voltage (Ta)

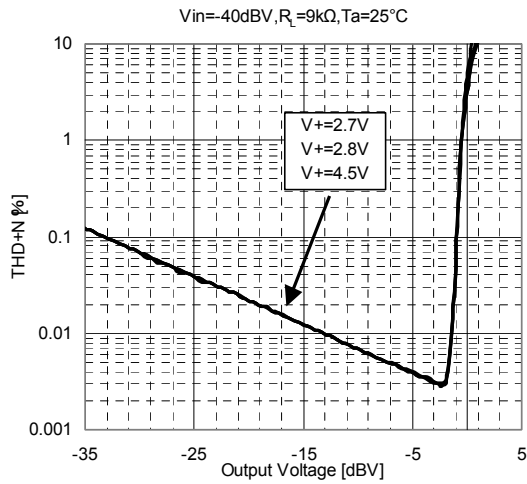


Output Noise vs. Ambient Temperature

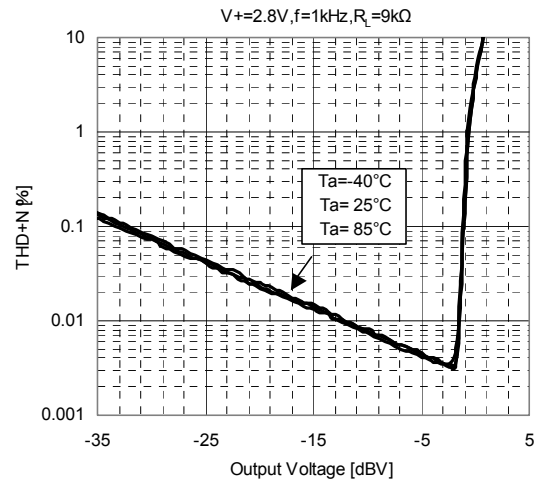


## ■ TYPICAL CHARACTERISTICS

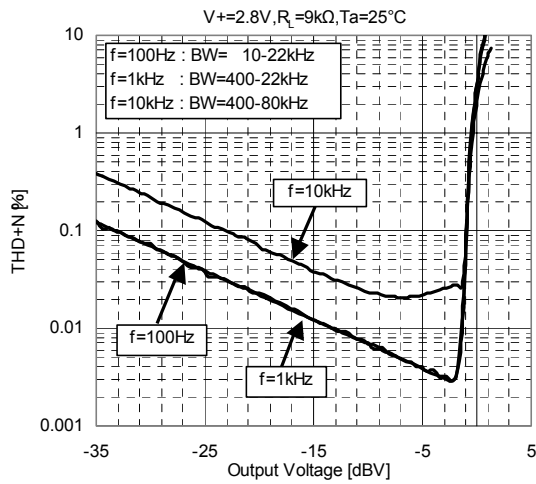
Total Harmonic Distortion vs. Output Voltage (V+)



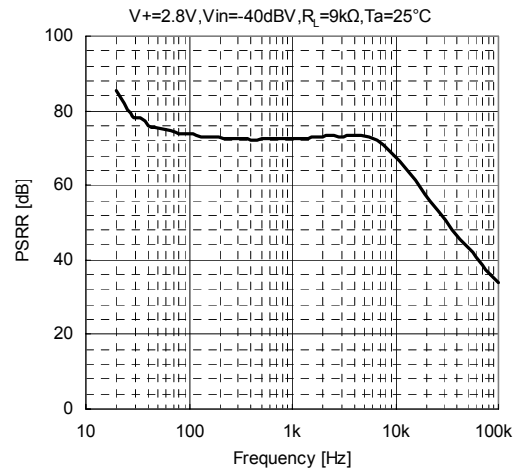
Total Harmonic Distortion vs. Output Voltage (Ta)



Total Harmonic Distortion vs. Output Voltage (f)



Power Supply Ripple Rejection vs. Frequency



**[CAUTION]**  
 The specifications on this data book are only given for information, without any guarantee as regards either mistakes or omissions. The application circuits in this data book are described only to show representative usages of the product and not intended for the guarantee or permission of any right including the industrial rights.