

Single Supply, Rail-to-Rail Output Dual Operational Amplifier

■ GENERAL DESCRIPTION

NJM2746 is a low noise Rail-to-Rail Output dual operational amplifier.

Rail-to-Rail Output function provides wide dynamic range, is from ground to power supply level. And Input range rails from ground level.

It is suitable for audio section of portable sets, PCs and any General-purpose applications.

■ FEATURES

- Operating Voltage 2.5V to 14V
 - Rail-to-Rail Output $V_{OH} \geq 4.9V$ Typ. (at $V^+=5V$, $R_L=5k\Omega$)
 $V_{OL} \leq 0.1V$ Typ. (at $V^+=5V$, $R_L=5k\Omega$)
 - Offset Voltage 1mV Typ.
 - Slew Rate $3.5V/\mu s$ Typ.
 - Low Distortion 0.001% Typ. (at $V^+=5V$, $f=1kHz$)
 - Low Input Voltage Noise $10nV/\sqrt{Hz}$ Typ. (at $f=1kHz$)
 - Bipolar Technology
 - Package Outline
- NJM2746M : DMP8, NJM2746E : EMP8
 NJM2746V : SSOP8, NJM2746RB1 : TVSP8

■ PACKAGE INFORMATION



NJM2746M



NJM2746E

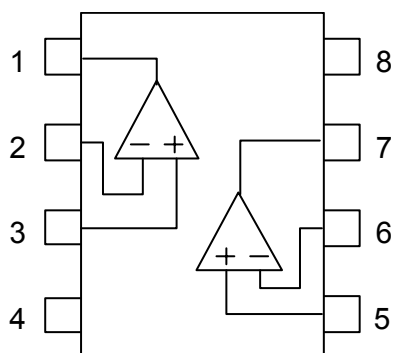


NJM2746V



NJM2746RB1

■ PIN CONFIGURATION



PIN FUNCTION

1. A OUTPUT
2. A -INPUT
3. A +INPUT
4. GND
5. B +INPUT
6. B -INPUT
7. B OUTPUT
8. V^+

NJM2746M
 NJM2746E
 NJM2746V
 NJM2746RB1
 (Top View)

■ ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V^+	15	V
Differential Input Voltage Range	V_{ID}	± 15 (Note1)	V
Common Mode Input Voltage Range	V_{ICM}	0 to 15 (Note1)	V
Power Dissipation	P_D	DMP8 (300) EMP8 (300) SSOP8 (250) TVSP8 (320)	mW
Operating Temperature Range	T_{opr}	-40 to +85	°C
Storage Temperature Range	T_{stg}	-50 to +125	°C

(Note1) For supply voltage less than 15V, the absolute maximum input voltage is equal to the supply voltage.

■ OPERATING VOLTAGE ($T_a=25^\circ\text{C}$)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V^+	2.5 to 14	V

■ ELECTRICAL CHARACTERISTICS

●DC CHARACTERISTICS ($V^+=5\text{V}, T_a=25^\circ\text{C}$)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Current	I_{CC}	$R_L=\infty, V_{IN}=2.5\text{V}$, No Signal Apply	-	4	5.5	mA
Input Offset Voltage	V_{IO}	$R_S \leq 10\text{k}\Omega$	-	1	6	mV
Input Bias Current	I_B		-	100	350	nA
Input Offset Current	I_{IO}		-	5	100	nA
Large Signal Voltage Gain	A_V	$R_L \geq 10\text{k}\Omega$ to 2.5V, $V_O=0.5\text{V}$ to 4.5V	65	85	-	dB
Common Mode Rejection Ratio	CMR	$0\text{V} \leq V_{CM} \leq 4\text{V}$	60	75	-	dB
Supply Voltage Rejection Ratio	SVR	$V^+=2.5\text{V}$ to 14V	60	80	-	dB
Output Voltage	V_{OH}	$R_L=5\text{k}\Omega$ to 2.5V	4.75	4.9	-	V
	V_{OL}	$R_L=5\text{k}\Omega$ to 2.5V	-	0.1	0.25	V
Input Common Mode Voltage Range	V_{ICM}	CMR $\geq 60\text{dB}$	0	-	4	V

●AC CHARACTERISTICS ($V^+=5\text{V}, T_a=25^\circ\text{C}$)

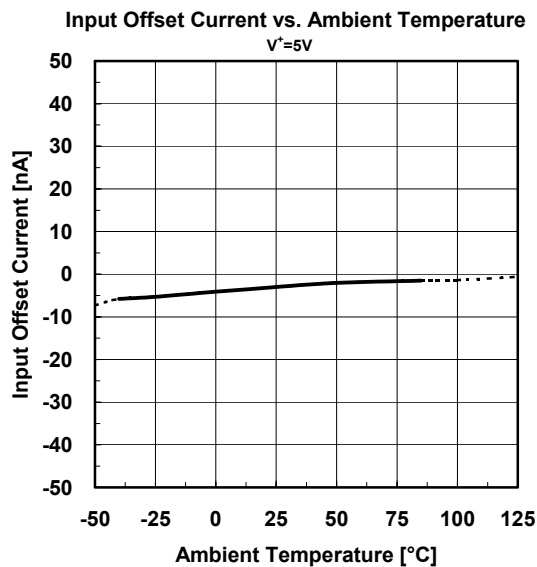
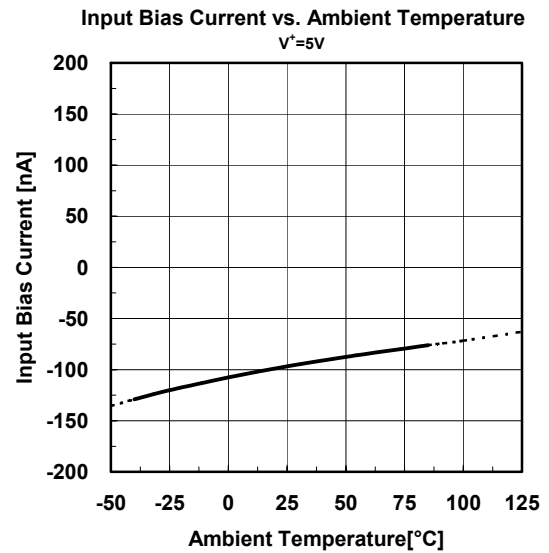
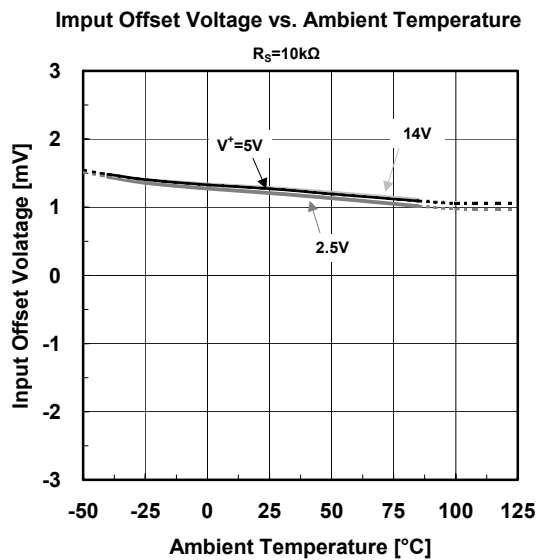
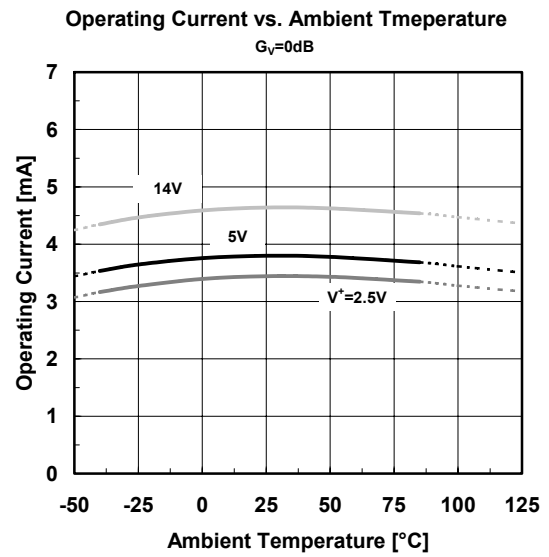
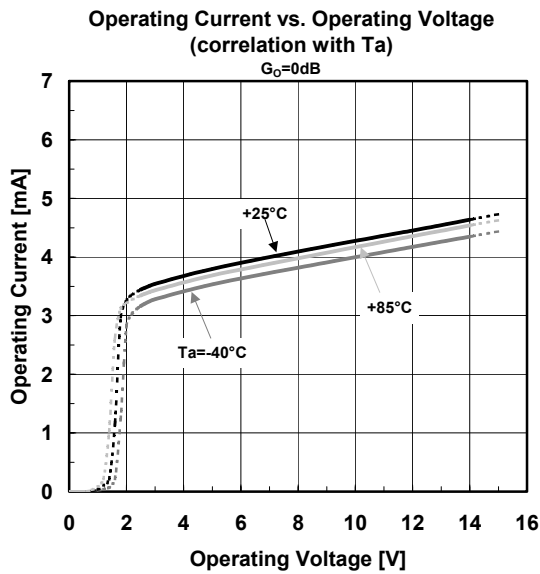
PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Unity Gain Bandwidth	GB	$f=1\text{MHz}$	-	10	-	MHz
Phase Margin	Φ_M	$R_L=10\text{k}\Omega, C_L=10\text{pF}$	-	75	-	Deg
Equivalent Input Noise Voltage	V_{NI}	$f=1\text{kHz}, V_{CM}=2.5\text{V}$	-	10	-	nV/ $\sqrt{\text{Hz}}$
Total Harmonic Distortion	THD	$f=1\text{kHz}, A_V=+2$ $R_L=10\text{k}\Omega$ to 2.5V, $V_O=1.5\text{Vrms}$	-	0.001	-	%
Amp to Amp Separation	CS	$f=1\text{kHz}$ $R_L=10\text{k}\Omega$ to 2.5V, $V_O=1.5\text{Vrms}$	-	120	-	dB

●AC CHARACTERISTICS ($V^+=5\text{V}, T_a=25^\circ\text{C}$)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Slew Rate	SR	(Note 2), $A_V=1, V_{IN}=2\text{Vpp}$ $R_L=10\text{k}\Omega$ to 2.5V $C_L=10\text{pF}$ to 2.5V	-	3.5	-	V/ μs

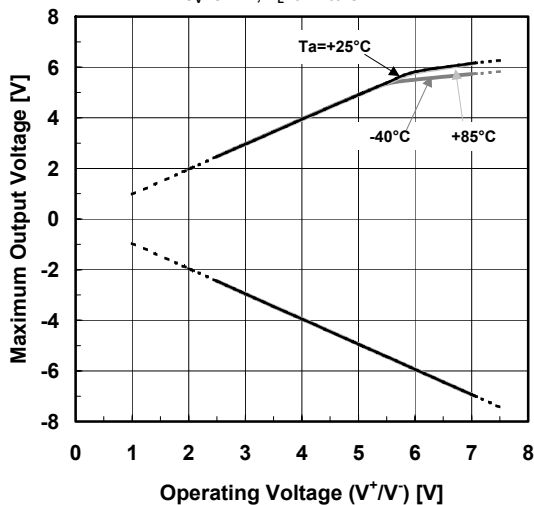
(Note 2) Number specified is the slower of the positive and negative slew rates.

■ TYPICAL CHARACTERISTICS

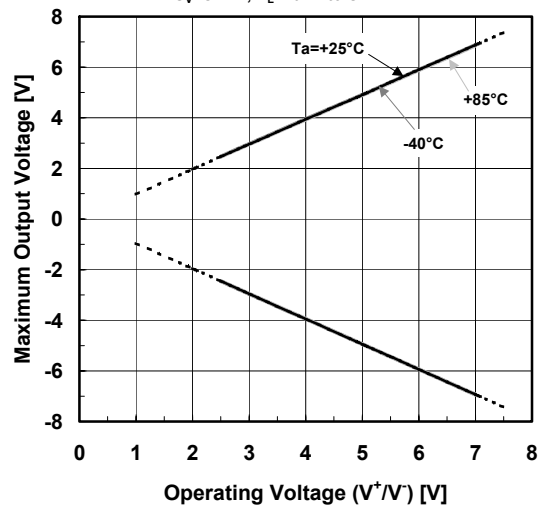


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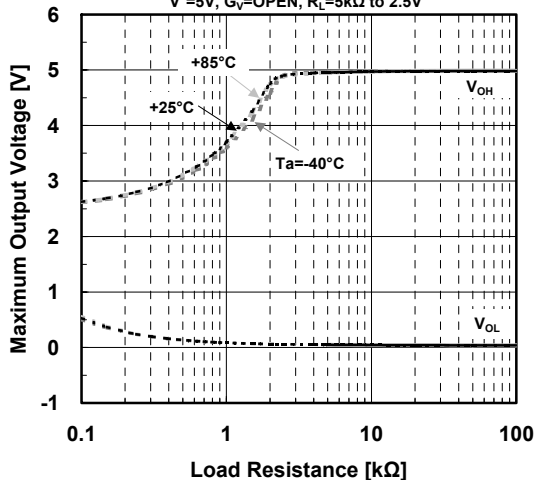
Maximum Output Voltage vs. Operating Voltage
 $G_V = \text{OPEN}$, $R_L = 5\text{k}\Omega$ to GND



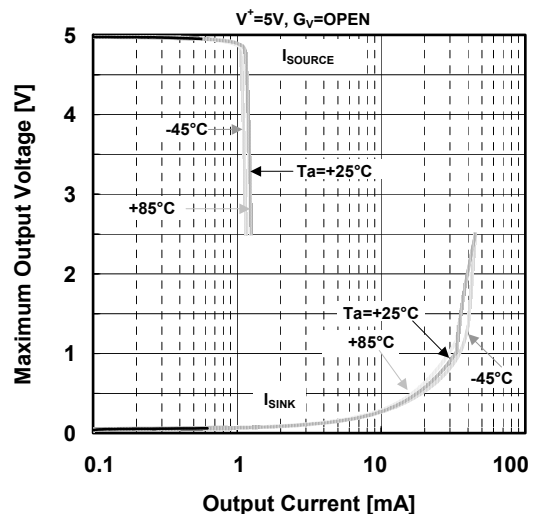
Maximum Output Voltage vs. Operating Voltage
 $G_V = \text{OPEN}$, $R_L = 10\text{k}\Omega$ to GND



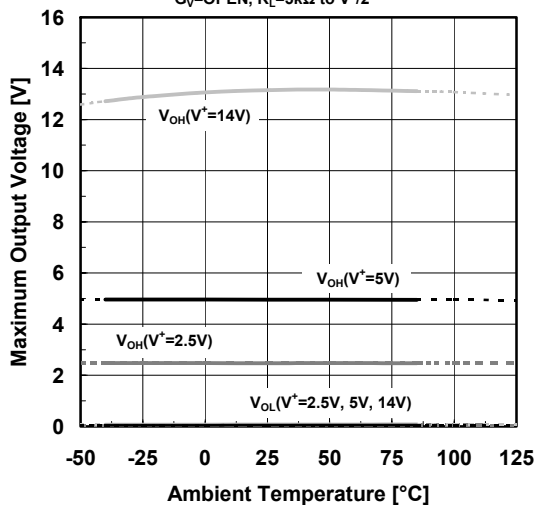
Maximum Output Voltage
 vs. Load Resistance (Correlation with Ta)
 $V^+ = 5\text{V}$, $G_V = \text{OPEN}$, $R_L = 5\text{k}\Omega$ to 2.5V



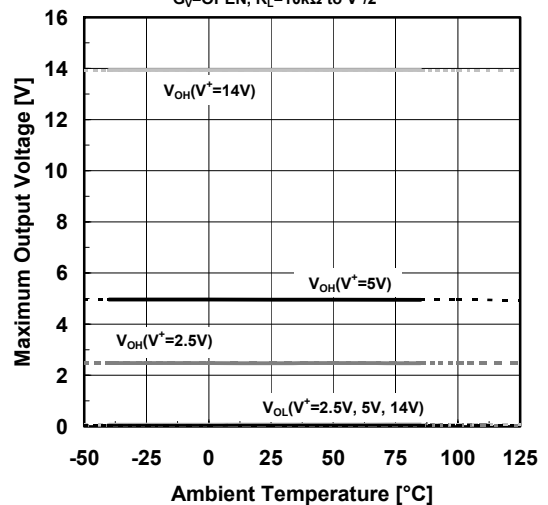
Maximum Output Voltage vs. Output Current
 (correlation with Ta)
 $V^+ = 5\text{V}$, $G_V = \text{OPEN}$



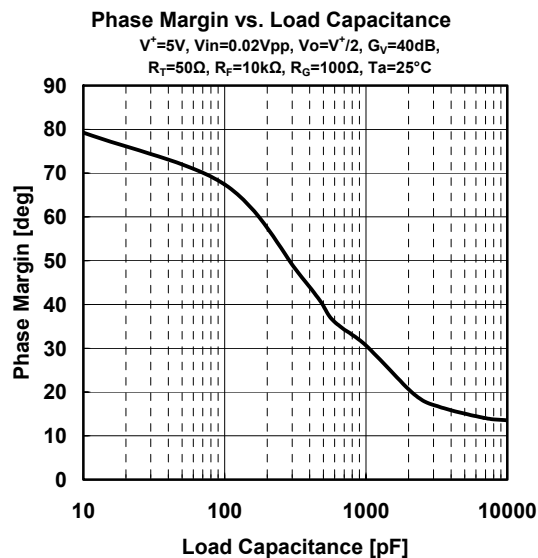
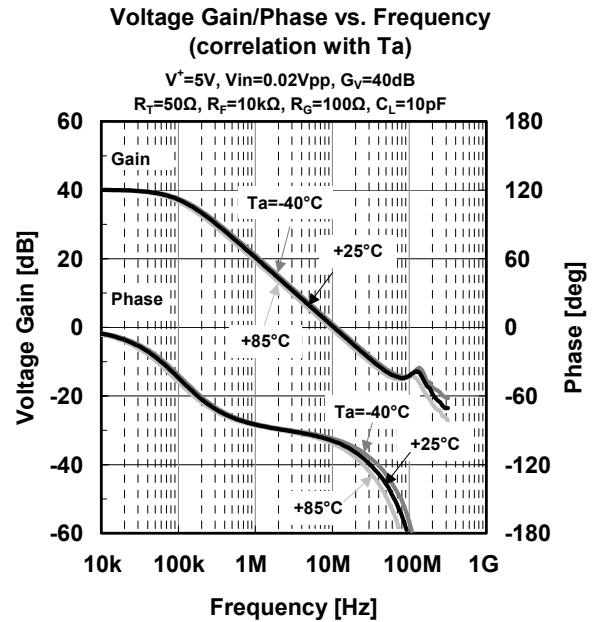
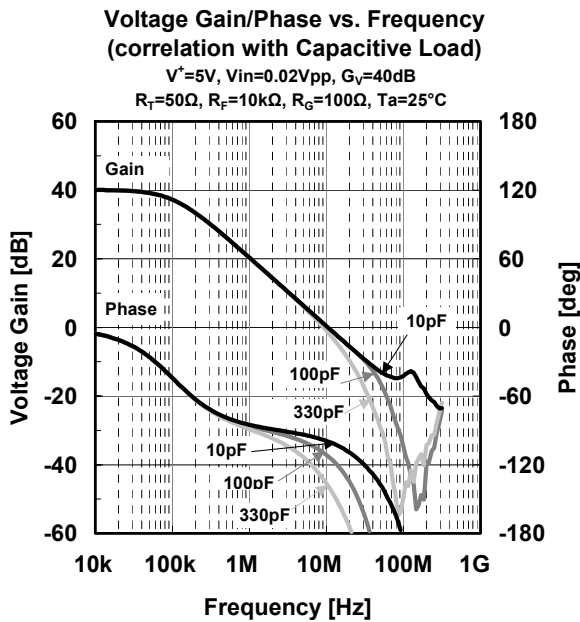
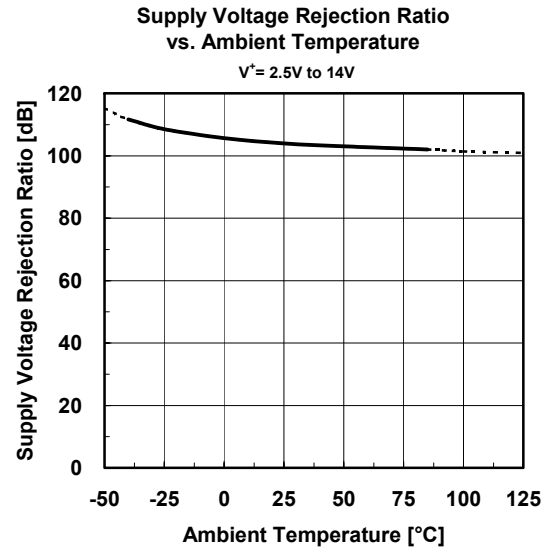
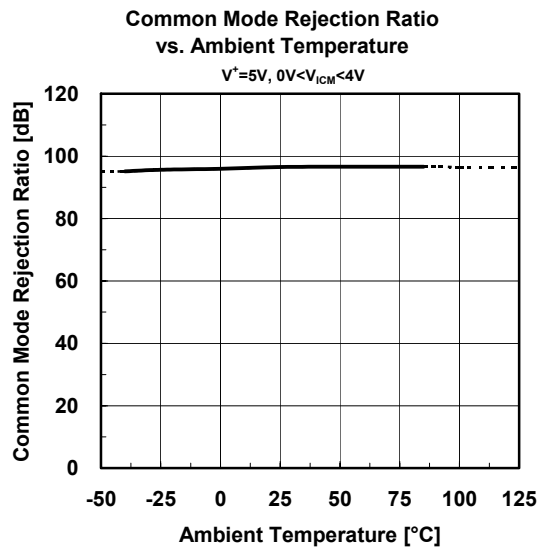
Maximum Output Voltage vs. Ambient Temperature
 $G_V = \text{OPEN}$, $R_L = 5\text{k}\Omega$ to V⁺/2



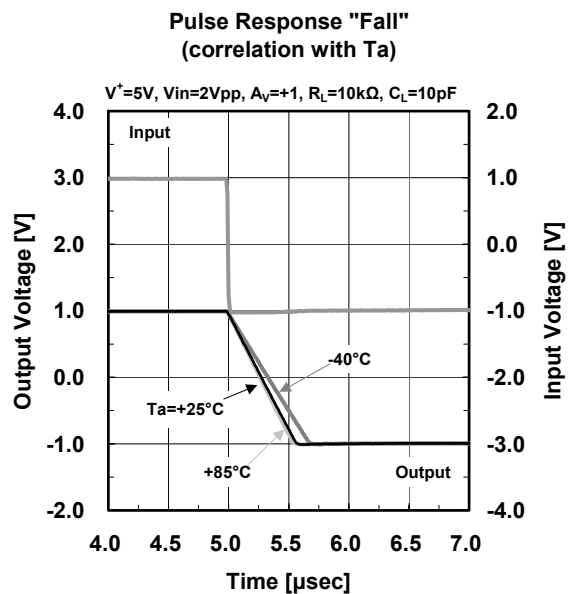
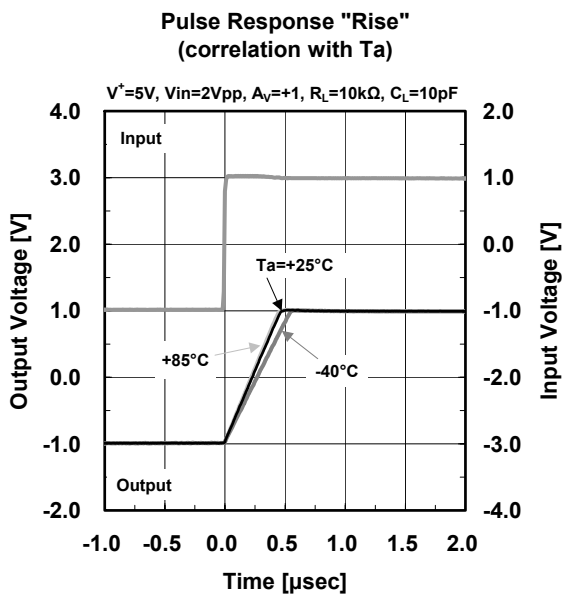
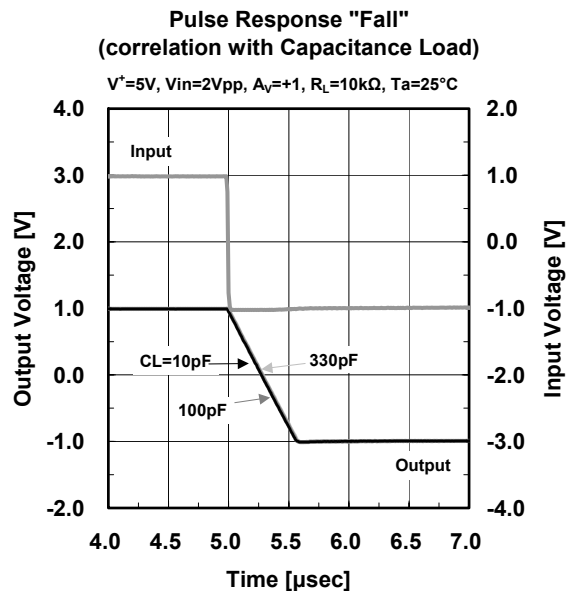
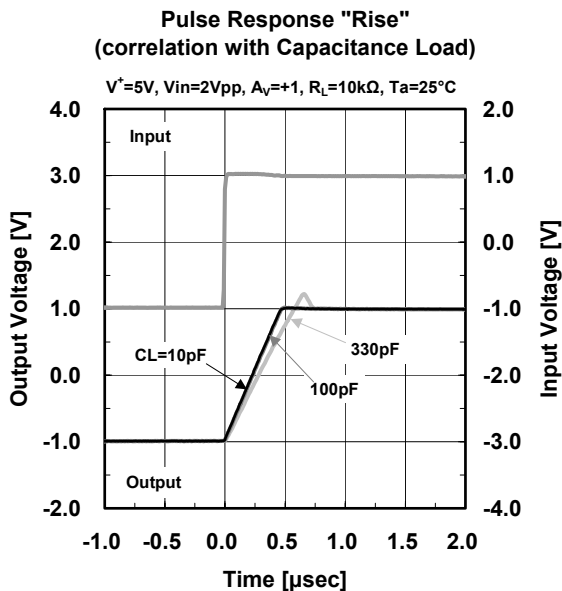
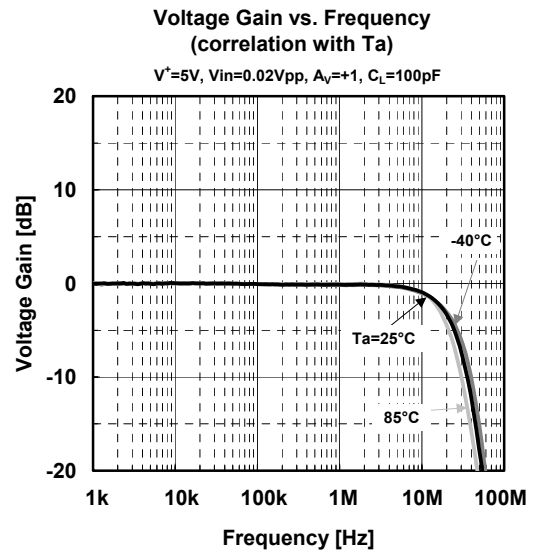
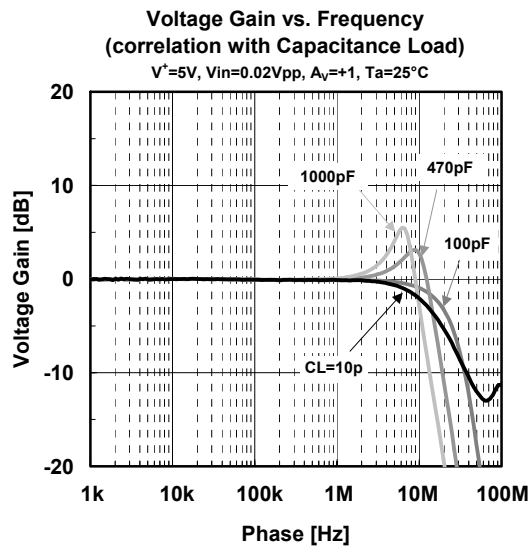
Maximum Output Voltage vs. Ambient Temperature
 $G_V = \text{OPEN}$, $R_L = 10\text{k}\Omega$ to V⁺/2



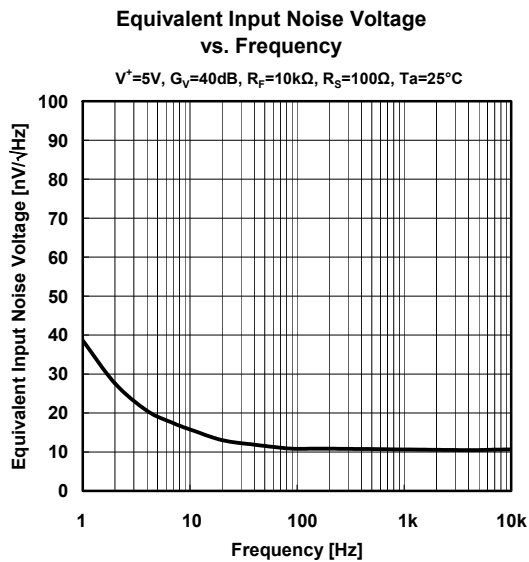
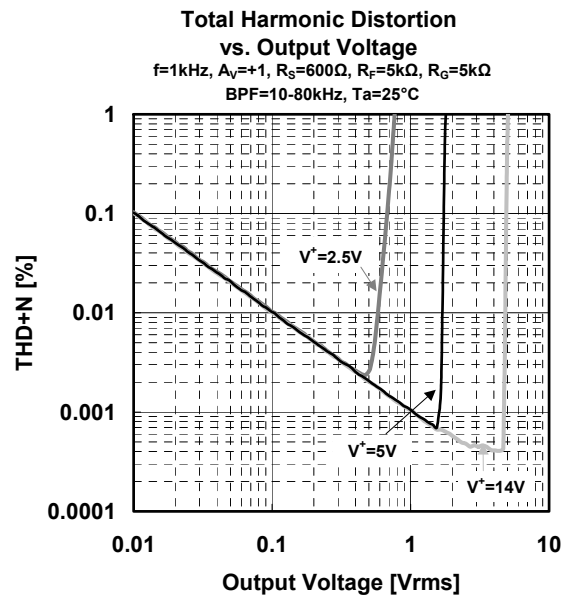
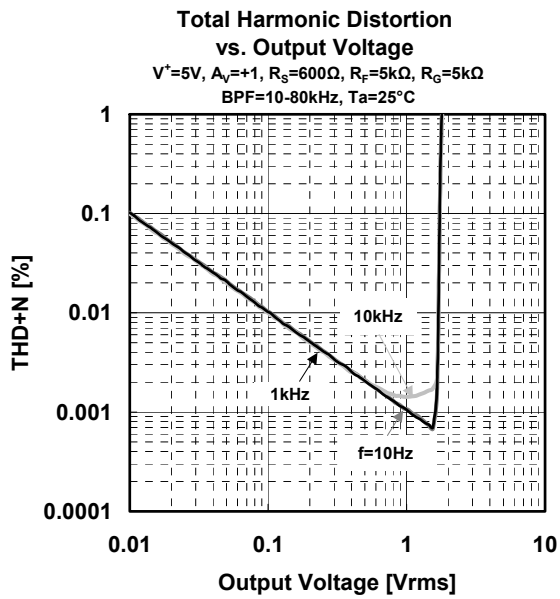
■ TYPICAL CHARACTERISTICS



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■ MEMO

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