

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

■GENERAL DESCRIPTION

The NJM2746 is a Rail-to-Rail Output single supply dual operational amplifier with a low noise of $10\text{nV}/\sqrt{\text{Hz}}$.

It has an output voltage swing closer to the rails, which can offer a wide dynamic range of output voltage easier compared with conventionally single supply operational amplifiers.

And Input voltage range extended from ground level makes it suited for single supply operation. The NJM2746 is suitable for various amplifiers and filters using in sound processing, signal detection and other applications. The NJM2746 is available in a wide variety of packages, SOP8 (DMP8), SOP8 JEDEC 150 mil, SSOP8, MSOP8 (TVSP8) and a small lead-less 2020 size package of ESON8 which allows high-density mounting.

■FEATURES

- Operating Voltage
- Rail-to-Rail Output
- Offset Voltage
- Slew Rate
- Low Distortion
- Low Input Voltage Noise
- Bipolar Technology
- Package Outline

2.5V to 14V
 $V_{OH} \geq 4.9\text{V Typ. (at } V^+=5\text{V, } R_L=5\text{k}\Omega)$
 $V_{OL} \leq 0.1\text{V Typ. (at } V^+=5\text{V, } R_L=5\text{k}\Omega)$
 1mV Typ.
 3.5V/ $\mu\text{s Typ.}$
 0.001% Typ. (at $V^+=5\text{V, } f=1\text{kHz}$)
 $10\text{nV}/\sqrt{\text{Hz Typ. (at } f=1\text{kHz)}$

DMP8
 SSOP8
 MSOP8 (TVSP8) MEET JEDEC MO-187-DA/ THIN TYPE
 SOP8 JEDEC 150mil
 ESON8 (2020)

■PACKAGE INFORMATION



NJM2746KU1
(ESON8)



NJM2746M
(DMP8)



NJM2746E
(SOP8)

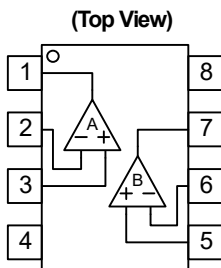


NJM2746V
(SSOP8)

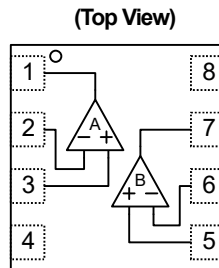


NJM2746RB1
(MSOP8 (TVSP8))

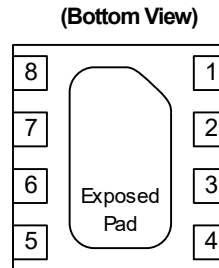
■PIN CONFIGURATION



NJM2746M
 NJM2746E
 NJM2746V
 NJM2746RB1



NJM2746KU1



About Exposed Pad
 Connect the Exposed Pad on the GND.

PIN FUNCTION

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

■ ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATING	UNIT
Supply Voltage	V ⁺	15	V
Common Mode Input Voltage Range	V _{ICM}	0~15(Note1)	V
Differential Input Voltage Range	V _{ID}	±15(Note1)	V
Power Dissipation	P _D	(DMP8) 300 (SOP8) 300 (SSOP8) 250 (MSOP8(TVSP8)) 320 (ESON8) 360(Note2) (ESON8) 940(Note3)	mW
Operating Temperature Range	T _{opr}	-40~+85	°C
Storage Temperature Range	T _{stg}	-50~+125	°C

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

(Note2) Mounted on the EIA/JEDEC standard board (76.2×114.3×1.6mm, 2 layer, FR-4).

(Note3) Mounted on the EIA/JEDEC standard board (76.2×114.3×1.6mm, 4 layer, FR-4).

■ OPERATING VOLTAGE

(Ta=25°C)

PARAMETER	SYMBOL	RATING	UNIT
Supply Voltage	V ⁺	2.5~14	V

■ ELECTRICAL CHARACTERISTICS

● DC CHARACTERISTICS (V⁺=5V, Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Current	I _{CC}	R _L =∞, V _{IN} =2.5V, No signal	-	4	5.5	mA
Input Offset Voltage	V _{IO}	R _S ≤10kΩ	-	1	6	mV
Input Bias Current	I _B		-	100	350	nA
Input Offset Current	I _{IO}		-	5	100	nA
Voltage Gain	A _V	R _L ≥10kΩ to 2.5V, V _O =0.5V~4.5V	65	85	-	dB
Common Mode Rejection Ratio	CMR	0V≤V _{CM} ≤4V	60	75	-	dB
Supply Voltage Rejection Ratio	SVR	V ⁺ =2.5V~14V	60	80	-	dB
Maximum Output Voltage	V _{OH}	R _L ≥5kΩ to 2.5V	4.75	4.9	-	V
	V _{OL}	R _L ≥5kΩ to 2.5V	-	0.1	0.25	V
Common Mode Input Voltage Range	V _{ICM}	CMR≥60dB	0	-	4	V

● AC CHARACTERISTICS (V⁺=5V, Ta=25°C)

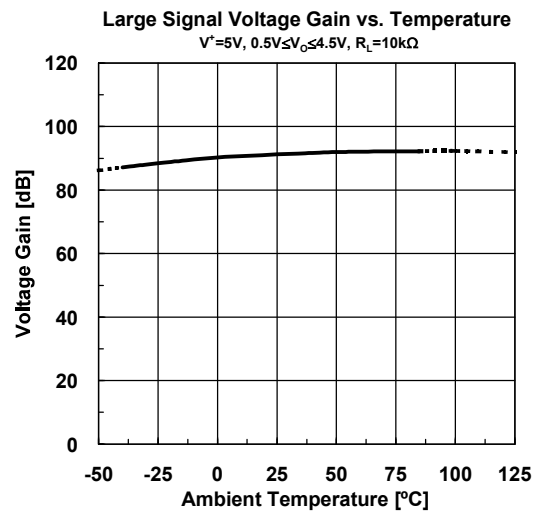
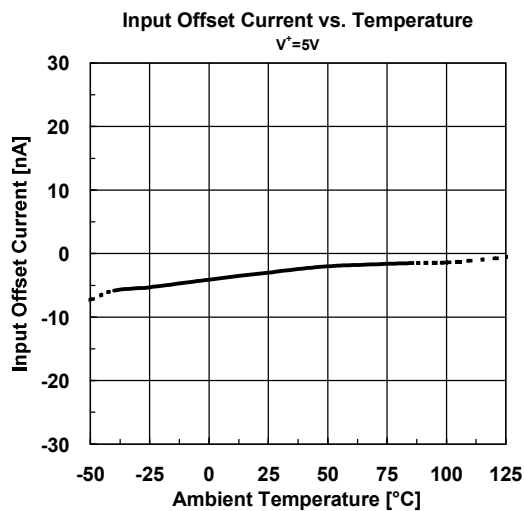
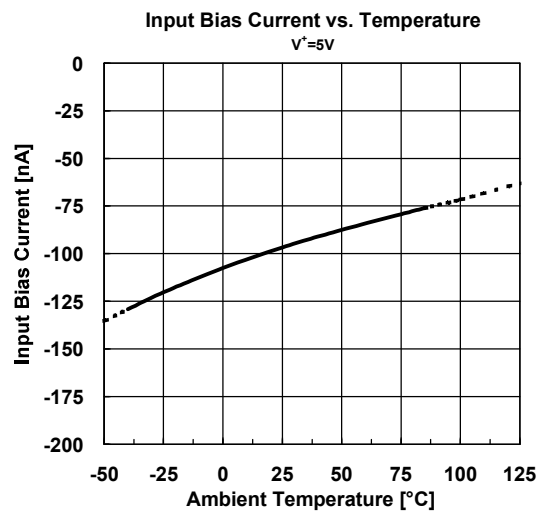
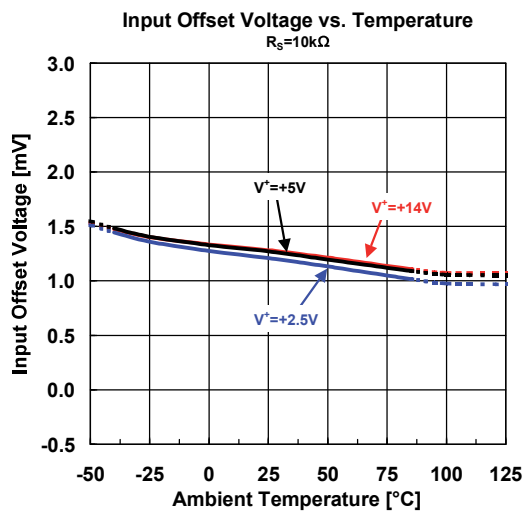
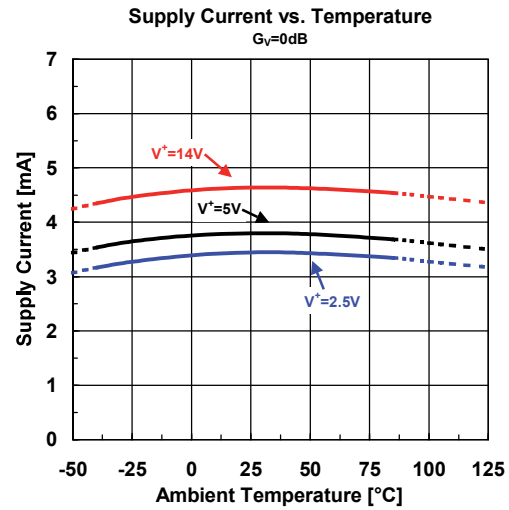
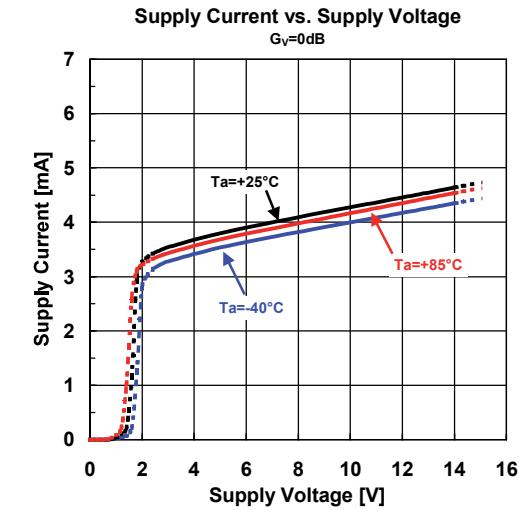
PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Gain Bandwidth Product	GB	f=1MHz	-	10	-	MHz
Phase Margin	Φ _M	R _L =10kΩ, C _L =10pF	-	75	-	deg
Equivalent Input Noise Voltage	V _{NI}	f=1kHz, V _{CM} =2.5V	-	10	-	nV/√Hz
Total Harmonic Distortion	THD	f=1kHz, A _V =+2, R _L =10kΩ to 2.5V, V _O =1.5Vrms	-	0.001	-	%
Channel Separation	CS	f=1kHz, R _L =10kΩ to 2.5V, V _O =1.5Vrms	-	120	-	dB

● AC CHARACTERISTICS (V⁺=5V, Ta=25°C)

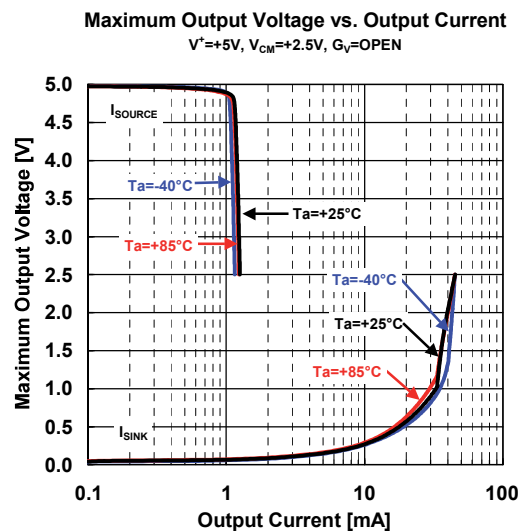
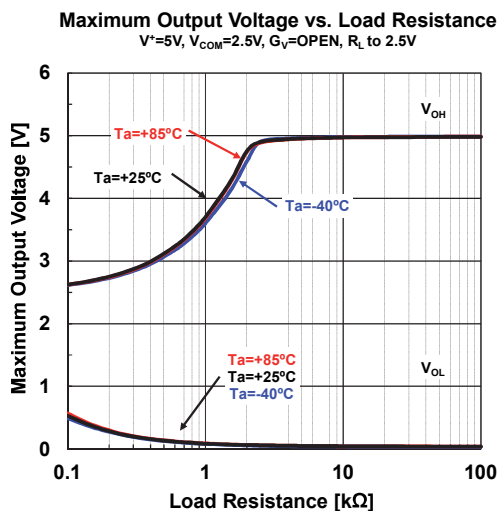
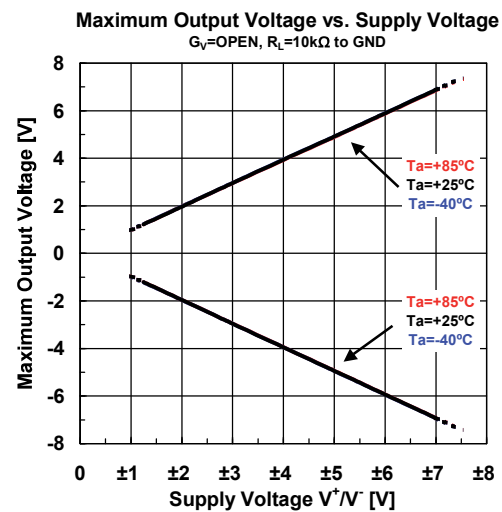
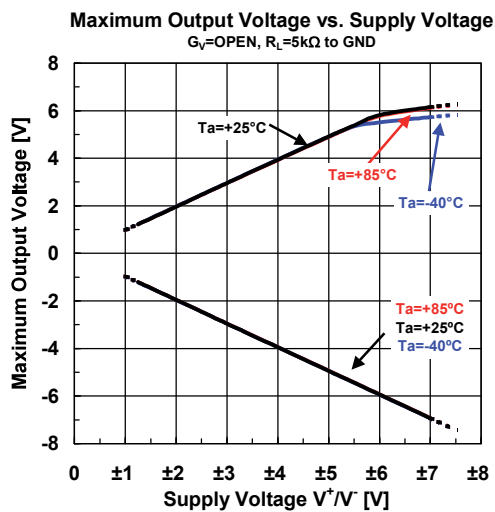
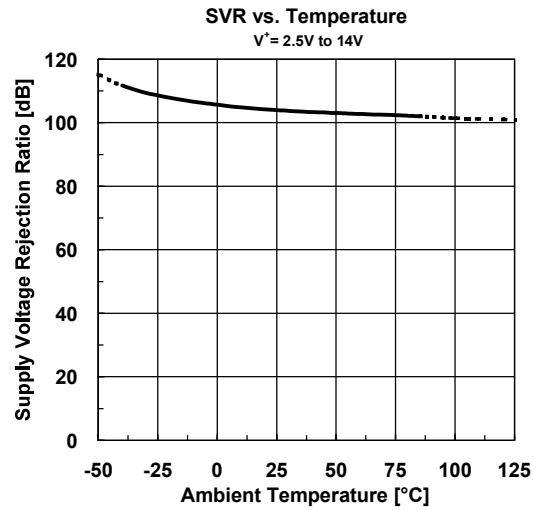
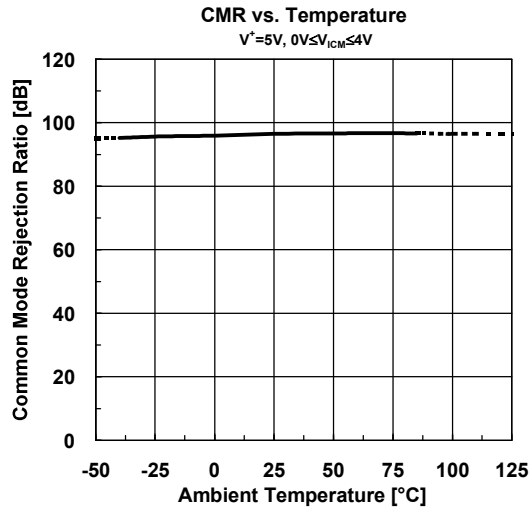
PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Slew Rate(Note4)	SR	A _V =1, V _{IN} =2Vpp R _L =10kΩ to 2.5V, C _L =10pF to 2.5V	-	3.5	-	V/μs

(Note4) Number specified is the slower of the positive and negative slew rates.

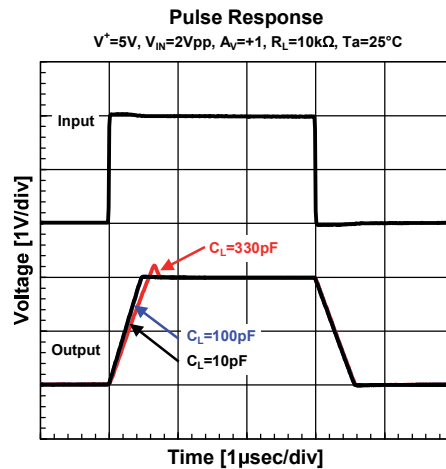
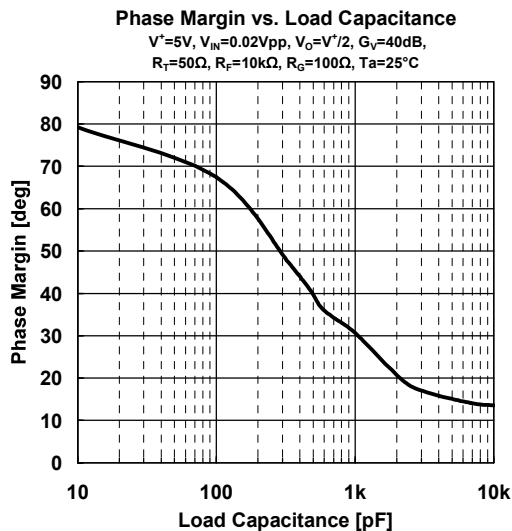
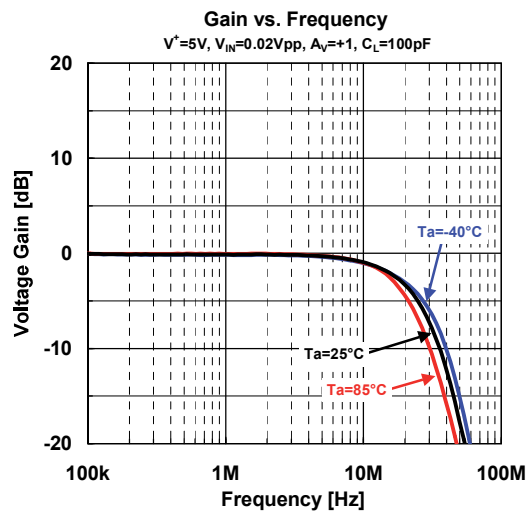
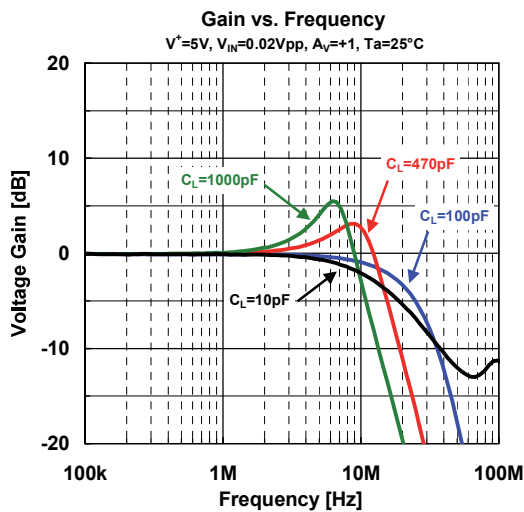
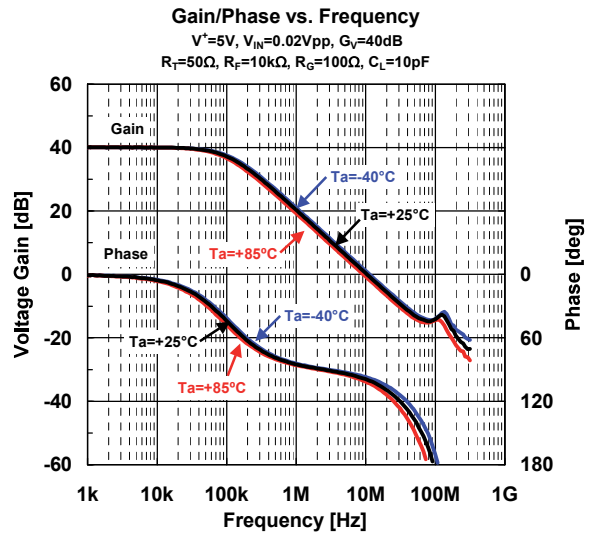
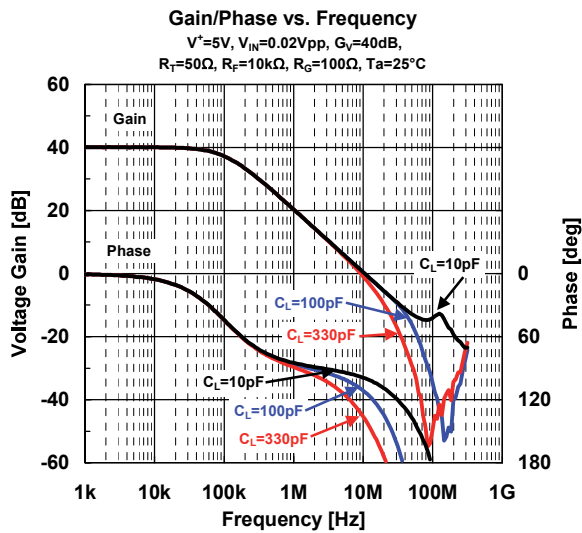
■ TYPICAL CHARACTERISTICS



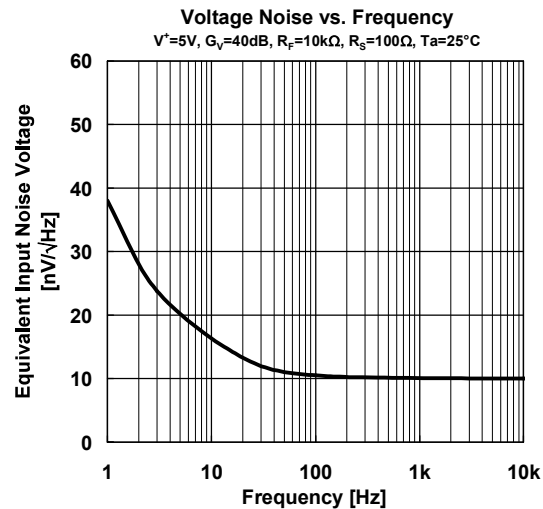
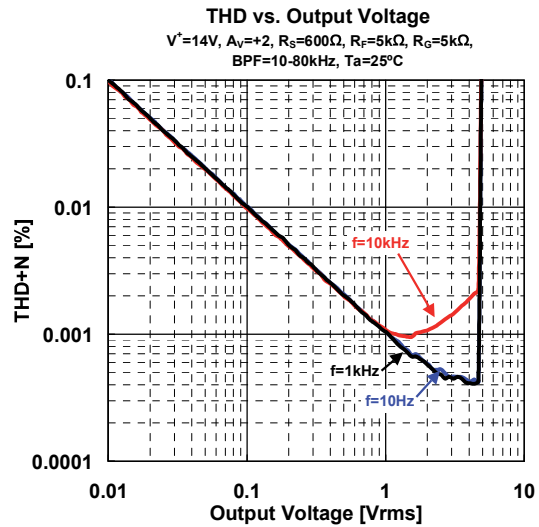
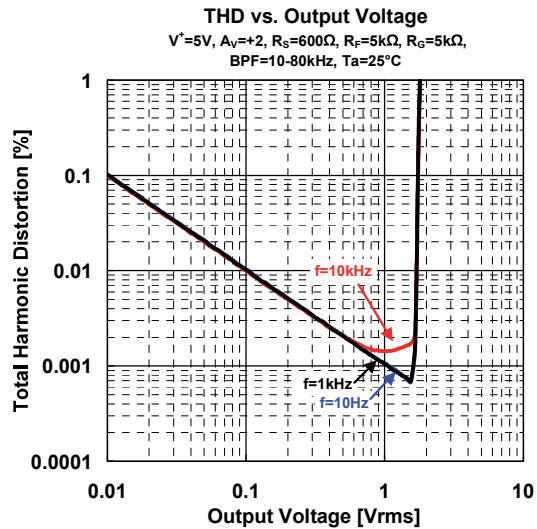
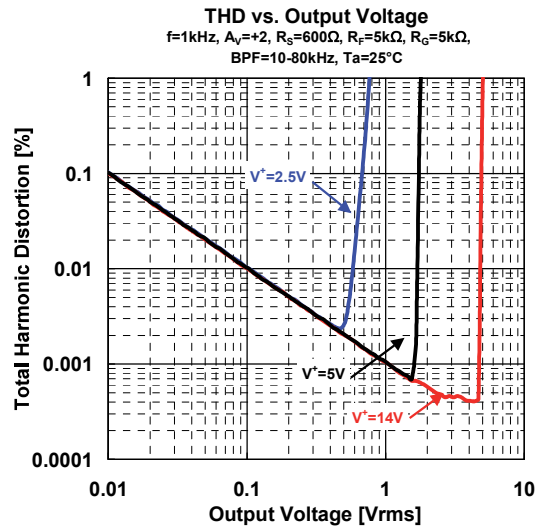
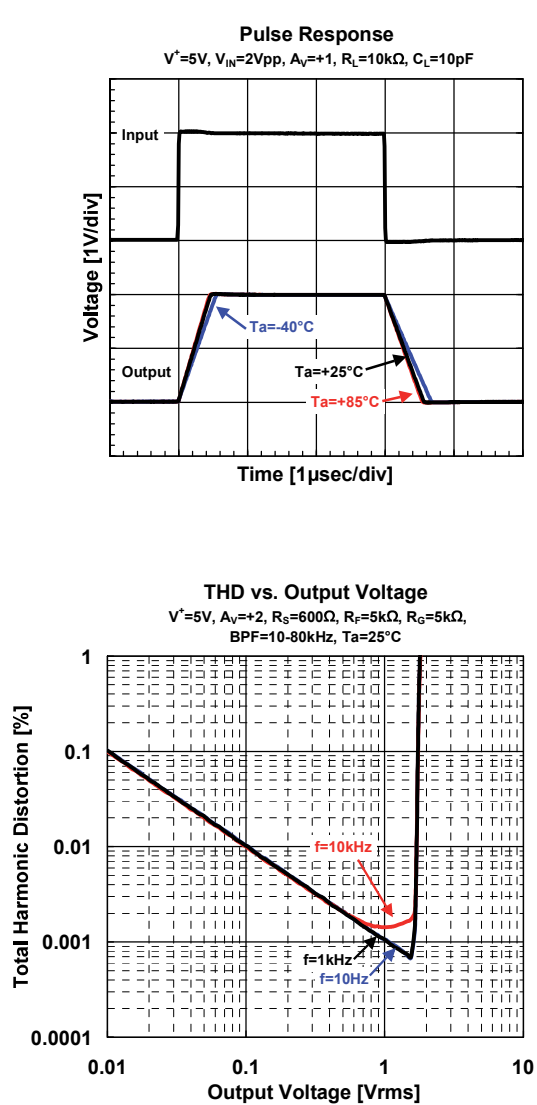
■ TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS



[CAUTION]

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