

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 2.5V to 14V
- Rail-to-Rail Output $V_{OH} \geq 4.9\text{V Typ.}$ (at $V^+ = 5\text{V}, R_L = 5\text{k}\Omega$)
 $V_{OL} \leq 0.1\text{V Typ.}$ (at $V^+ = 5\text{V}, R_L = 5\text{k}\Omega$)
- Offset Voltage 1mV Typ.
- Slew Rate 3.5V/ μs Typ.
- Low Distortion 0.001% Typ. (at $V^+ = 5\text{V}, f = 1\text{kHz}$)
- Low Input Voltage Noise 10nV/ $\sqrt{\text{Hz}}$ Typ. (at $f = 1\text{kHz}$)
- Bipolar Technology
- Package Outline DMP8,
SSOP8,
MSOP8 (TVSP8) MEET JEDEC MO-187-DA/ THIN TYPE
SOP8 JEDEC 150mil,
ESON8 (2020)

■ PACKAGE INFORMATION



NJM2746KU1
(ESON8)



NJM2746M
(DMP8)



NJM2746E
(SOP8)

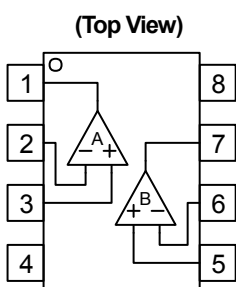


NJM2746V
(SSOP8)



NJM2746RB1
(MSOP8 (TVSP8))

■ PIN CONFIGURATION

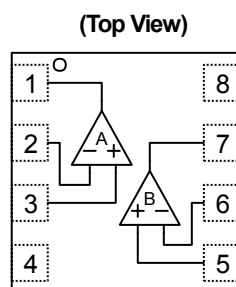


NJM2746M

NJM2746E

NJM2746V

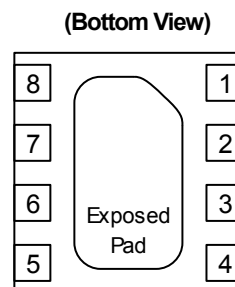
NJM2746RB1



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⁺

NJM2746

■ 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

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

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

■ ELECTRICAL CHARACTERISTICS

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

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Current	I_{CC}	$R_L=\infty, V_{IN}=2.5\text{V}$, No signal	-	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
Voltage Gain	A_v	$R_L \geq 10\text{k}\Omega$ to 2.5V, $V_o=0.5\text{V}\sim 4.5\text{V}$	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	$V^+=2.5\text{V}\sim 14\text{V}$	60	80	-	dB
Maximum Output Voltage	V_{OH}	$R_L \geq 5\text{k}\Omega$ to 2.5V	4.75	4.9	-	V
	V_{OL}	$R_L \geq 5\text{k}\Omega$ to 2.5V	-	0.1	0.25	V
Common Mode Input 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
Gain Bandwidth Product	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	-	%
Channel 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 ($V^+=5\text{V}, T_a=25^\circ\text{C}$)

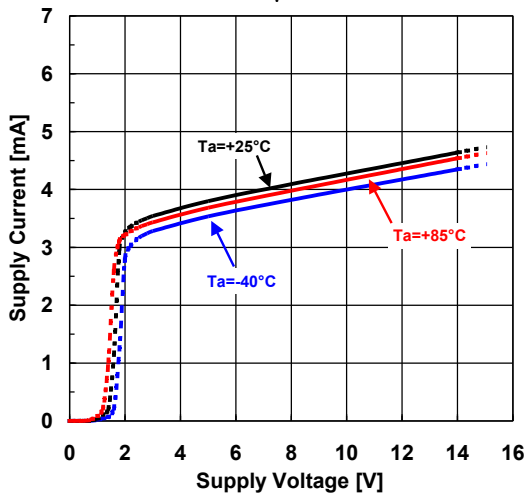
PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Slew Rate(Note4)	SR	$A_v=1, V_{IN}=2\text{Vpp}$ $R_L=10\text{k}\Omega$ to 2.5V, $C_L=10\text{pF}$ to 2.5V	-	3.5	-	V/ μs

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

■ TYPICAL CHARACTERISTICS

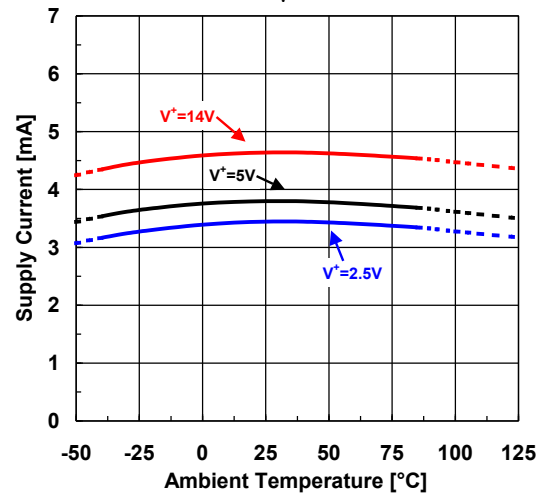
Supply Current vs. Supply Voltage

$G_V=0\text{dB}$



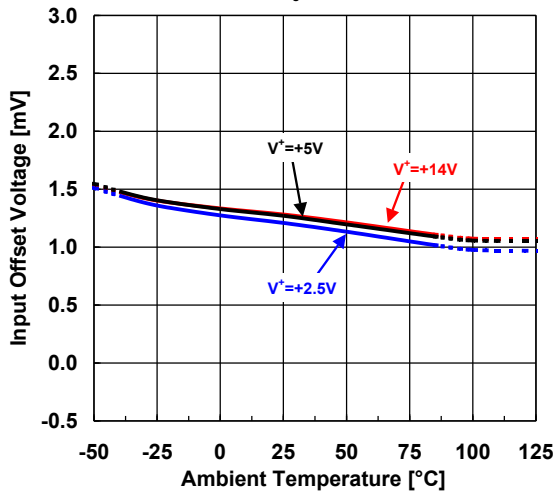
Supply Current vs. Temperature

$G_V=0\text{dB}$



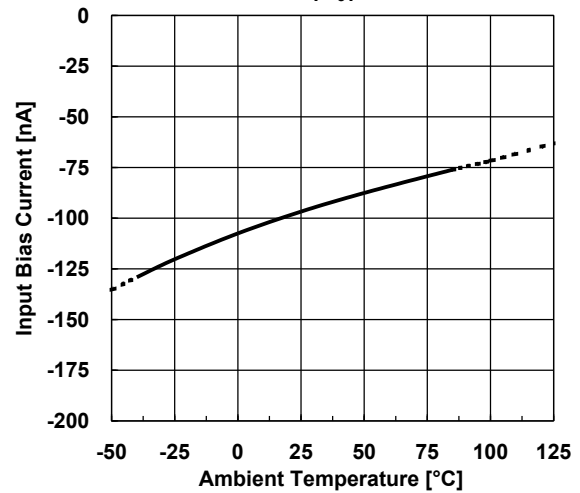
Input Offset Voltage vs. Temperature

$R_S=10\text{k}\Omega$



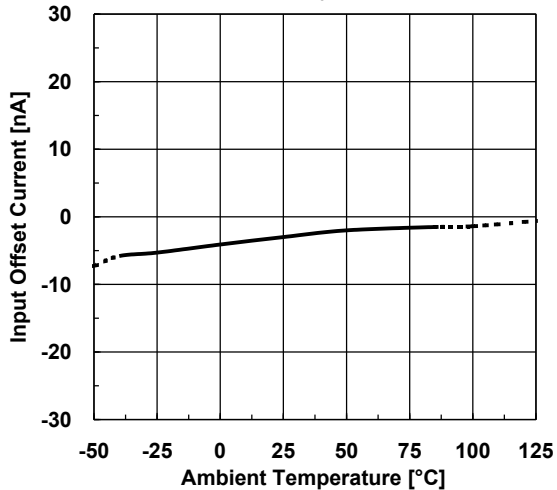
Input Bias Current vs. Temperature

$V_I=5\text{V}$



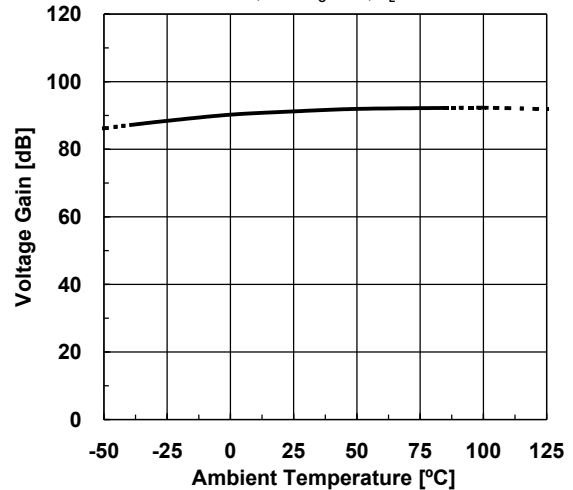
Input Offset Current vs. Temperature

$V_I=5\text{V}$

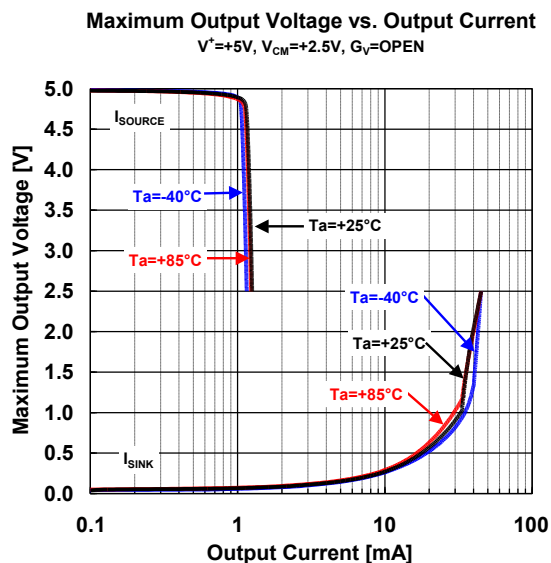
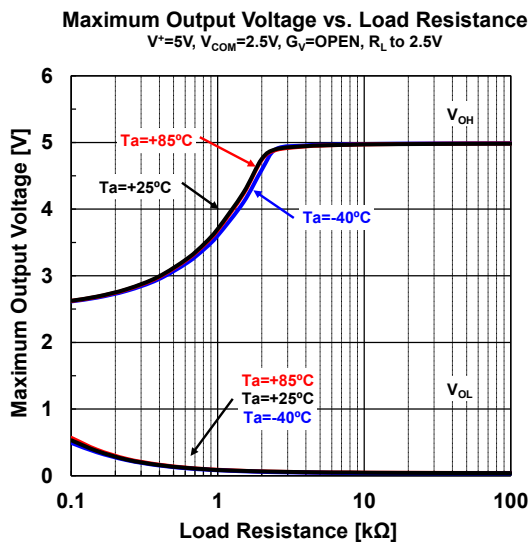
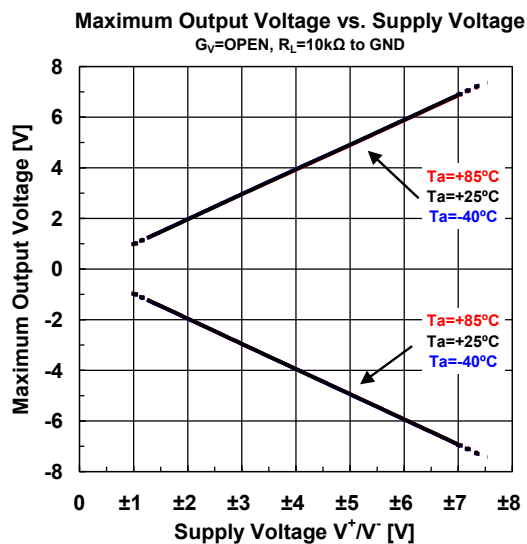
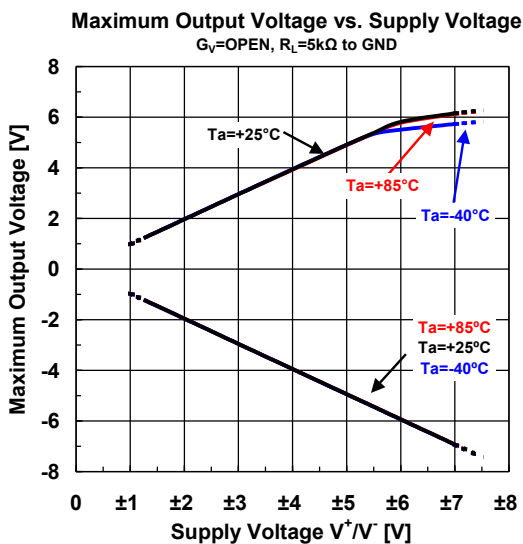
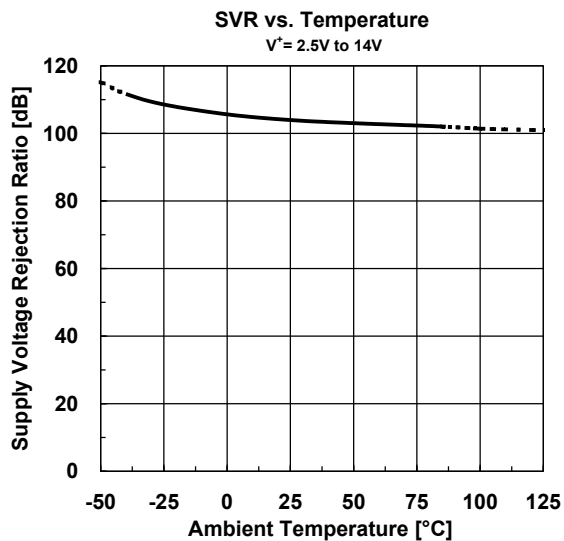
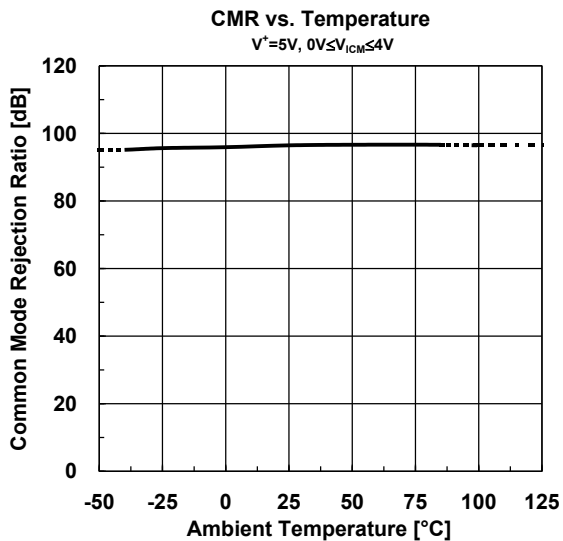


Large Signal Voltage Gain vs. Temperature

$V_I=5\text{V}, 0.5\text{V} \leq V_O \leq 4.5\text{V}, R_L=10\text{k}\Omega$



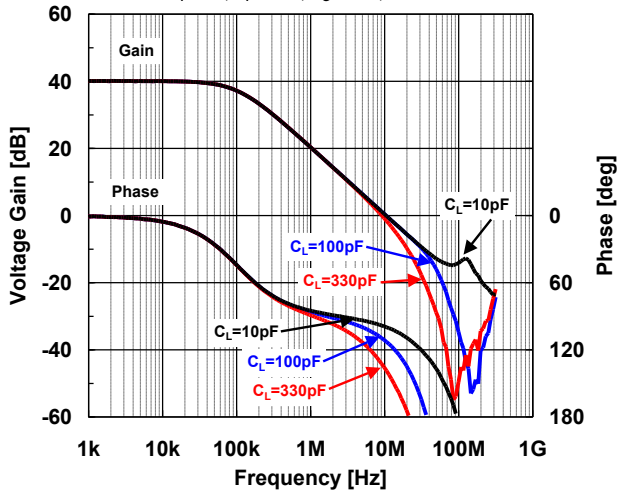
■ TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS

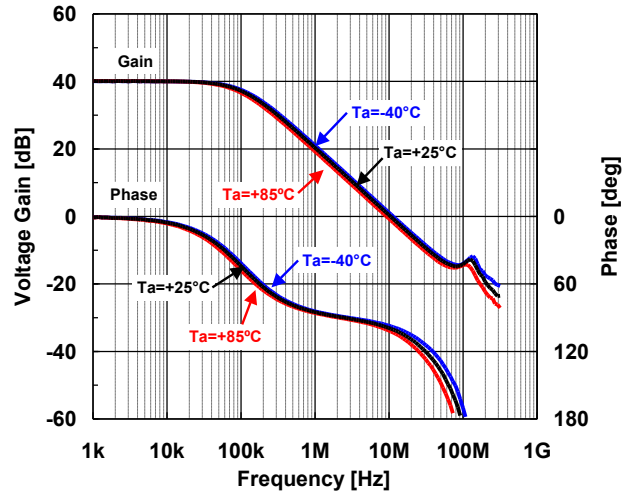
Gain/Phase vs. Frequency

$V^+=5V, V_{IN}=0.02V_{pp}, G_V=40dB,$
 $R_T=50\Omega, R_F=10k\Omega, R_G=100\Omega, T_a=25^\circ C$



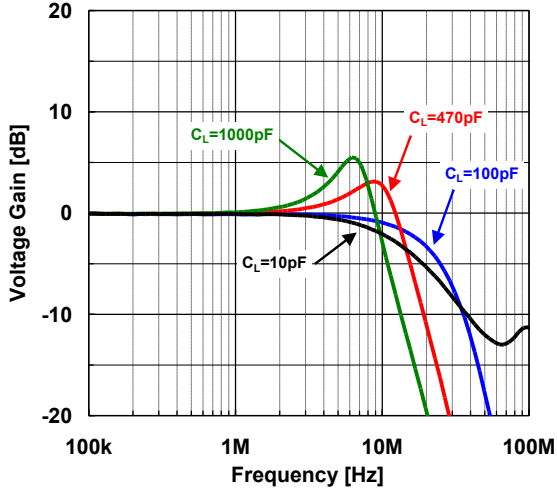
Gain/Phase vs. Frequency

$V^+=5V, V_{IN}=0.02V_{pp}, G_V=40dB$
 $R_T=50\Omega, R_F=10k\Omega, R_G=100\Omega, C_L=10pF$



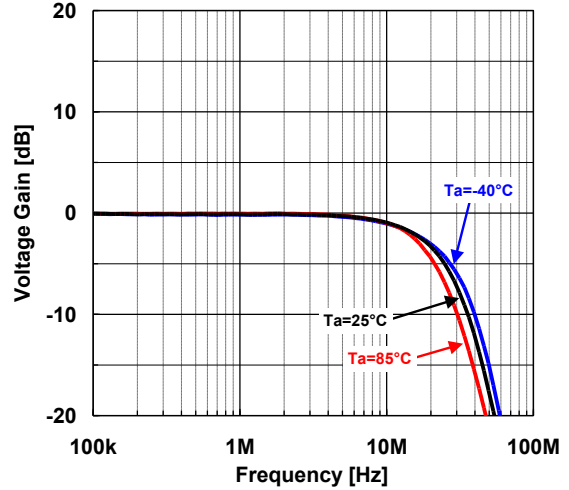
Gain vs. Frequency

$V^+=5V, V_{IN}=0.02V_{pp}, A_V=+1, T_a=25^\circ C$



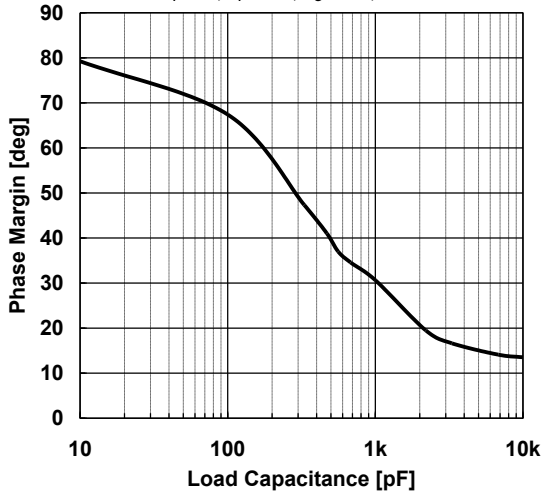
Gain vs. Frequency

$V^+=5V, V_{IN}=0.02V_{pp}, A_V=+1, C_L=100pF$



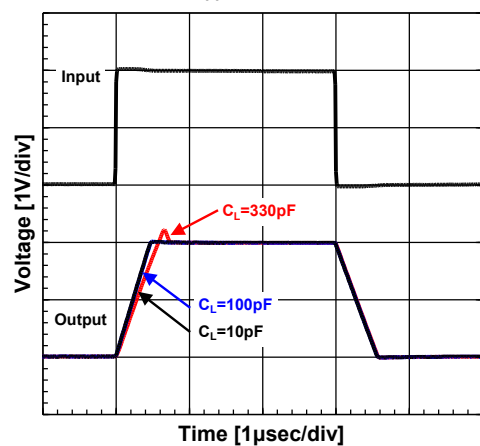
Phase Margin vs. Load Capacitance

$V^+=5V, V_{IN}=0.02V_{pp}, V_O=V^+/2, G_V=40dB,$
 $R_T=50\Omega, R_F=10k\Omega, R_G=100\Omega, T_a=25^\circ C$

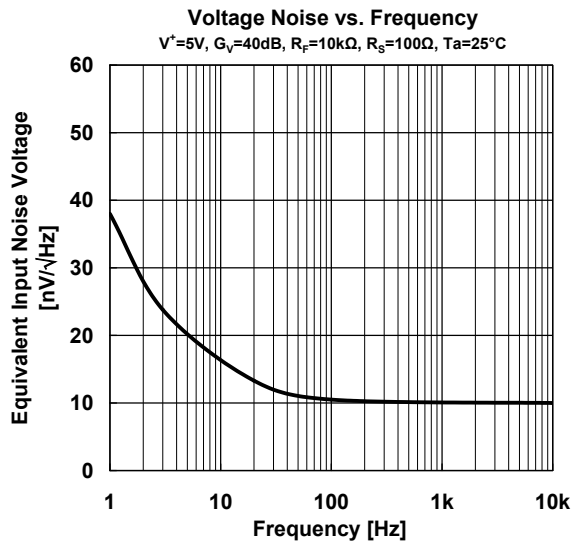
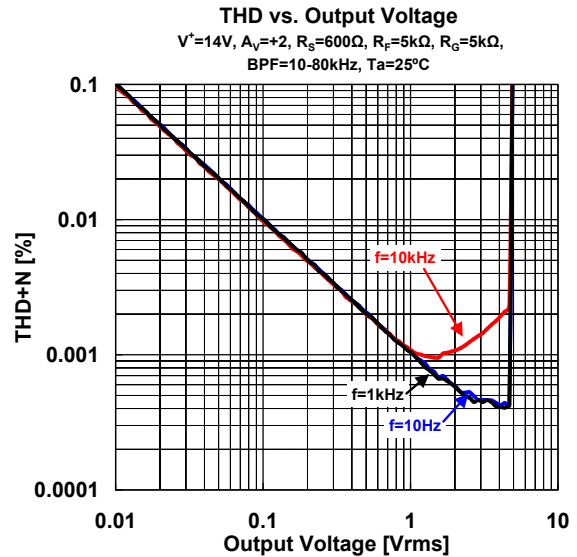
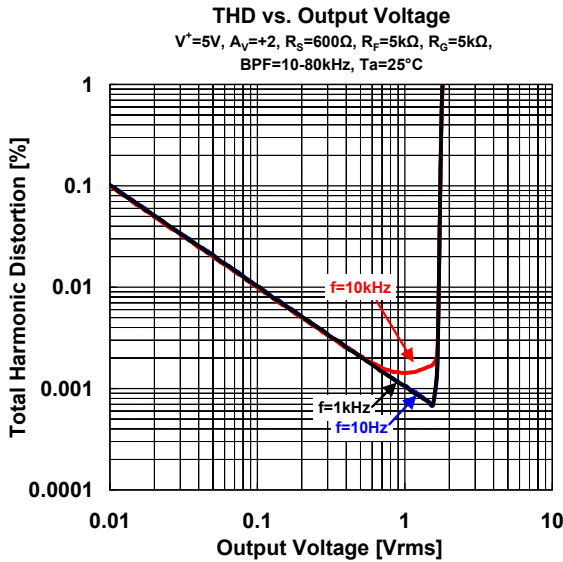
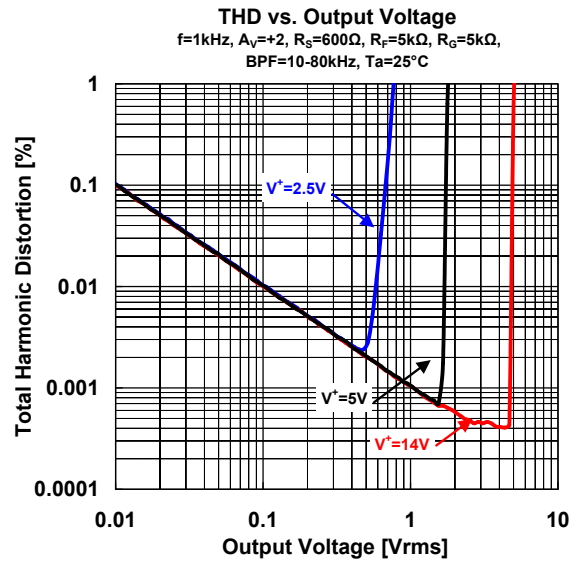
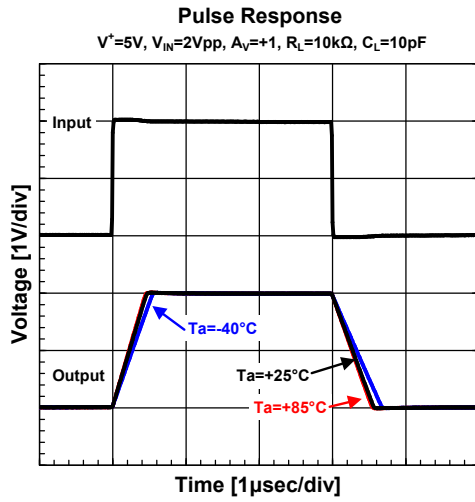


Pulse Response

$V^+=5V, V_{IN}=2V_{pp}, A_V=+1, R_L=10k\Omega, T_a=25^\circ C$



■ TYPICAL CHARACTERISTICS



[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.

联系我们

深圳市泰德兰电子有限公司（简称：泰德兰），是一家专业代理国内外品牌电子元器件代理商。“泰德兰”的目标是为客户提供高性价比的产品和服务。我们一贯坚持：“品质第一、价格合理、交货快捷、服务至上、凝聚客户”的发展理念和宗旨以向采购商提供最满意的服务为己任，向采购商提供规范化、专业化、多元化、全方位的优质服务，真诚欢迎海内外直接用户前来洽谈合作，共谋发展！也希望能与电子界同行进行广泛的交流合作共同为行业的繁荣发展做出贡献！

目前，泰德兰电子主要代理：霍尼韦尔、理光、NJRC、英集芯、维安、贝岭、捷捷微、冠禹、松木、辉芒微、茂捷和元拓等。

主营产品线有 LDO、DC/DC、AC-DC、电压检测器、充电 IC、负载开关 IC、保险丝、多功能集成保护 IC、功率 TVS 管、二三极管、PMU、马达驱动、LED 驱动、功率器件、数字电源、Hall IC、磁组、传感器 IC、汽容胶传感器、压力传感器、位移传感器、惯导模块、锂电保护芯片、微动开关、PTC、ESD、EEPROM, 8bit/32bit MCU, PMIC、中低压 MOS 管、高压 COOL MOS、高压平面 MOSFET 等。

“泰德兰”代理的产品被广泛应用于液晶电视、笔记本、联网、便携式设备、机顶盒、闭路电视/安全、桌面、LED 照明、玩具、网络电视机、无人机、扫地机、无线充、蓝牙设备、汽车应用、行车记录仪、无线路由等领域。

“泰德兰”所代理的产品均通过 ISO 9001:2000 品质管理系统检验；获得原厂颁发的代理授权证书。

深圳公司

深圳市泰德兰电子有限公司

地址：深圳市福田区彩田南路 2010 号中深花园 A 座六层

电话：0755-83322522 传真：0755-83648400

手机：131-89714166 Q Q：2853781768

香港公司

香港富研科技有限公司

地址：香港葵涌青山公路葵涌段 313 号天际中心 15 楼 1506 室

电话：852-23113966 邮箱：ll@icbest.com

苏州公司

苏州市泰美兰电子有限公司

地址：苏州姑苏区总官堂路 555 号苏尚新地生活广场 1 幢 802 室

电话：0512-67665578 邮箱：wg@icbest.com