

Auto-Zero, High Precision Single Operational Amplifier

■GENERAL DESCRIPTION

The NJU7098 is Auto Zero high precision operational amplifiers available in the SOT-23-5 packages. The NJU7098 operates from a single 3V to 10V supply. The NJU7098 of CMOS operational amplifier use Auto Zero techniques to simultaneously provide very low offset voltage, and near-zero drift over temperature (0.05 μ V/ $^{\circ}$ C Max.).

The NJU7098 includes a shutdown mode. Under logic control, the amplifiers can be switched from normal operation to a standby. When the SHDN pin is connected high, the amplifier is active. Connecting $\overline{\text{SHDN}}$ low disables the amplifier.

■PACKAGE OUTLINE



NJU7098F1

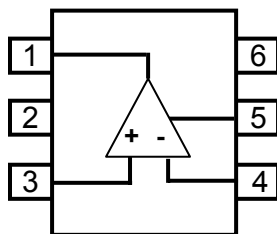
■FEATURES

- Low Offset Voltage Drift 0.05 μ V/ $^{\circ}$ C max.
- Low Offset Voltage 15 μ V max.
- Operating Voltage +3V to +10V
- High Voltage Gain 140dB typ.
- CMR, SVR 130dB typ.
- Operating Current 0.6mA typ. (at $V_{DD}=+5V$)
- Output Full-Swing ($R_L=10k\Omega$)
- Shutdown
- Ground Sensing
- Package Outline SOT-23-6

■APPLICATIONS

- Thermocouple / Thermopile Amplifiers
- Strain Gauge / Pressure sensor Amplifiers
- Load Cell and Bridge Transducer Amplifiers
- High Resolution Data Acquisition
- Precision Current Sensing

■PIN CONFIGURATION

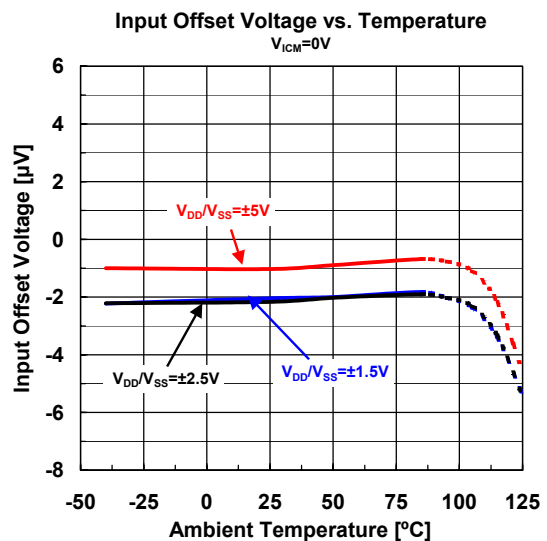


NJU7098F1
(Top View)

PIN FUNCTION

1. OUTPUT
2. V_{SS}
3. +INPUT
4. -INPUT
5. $\overline{\text{SHDN}}$
6. V_{DD}

■TYPICAL CHARACTERISTICS



■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

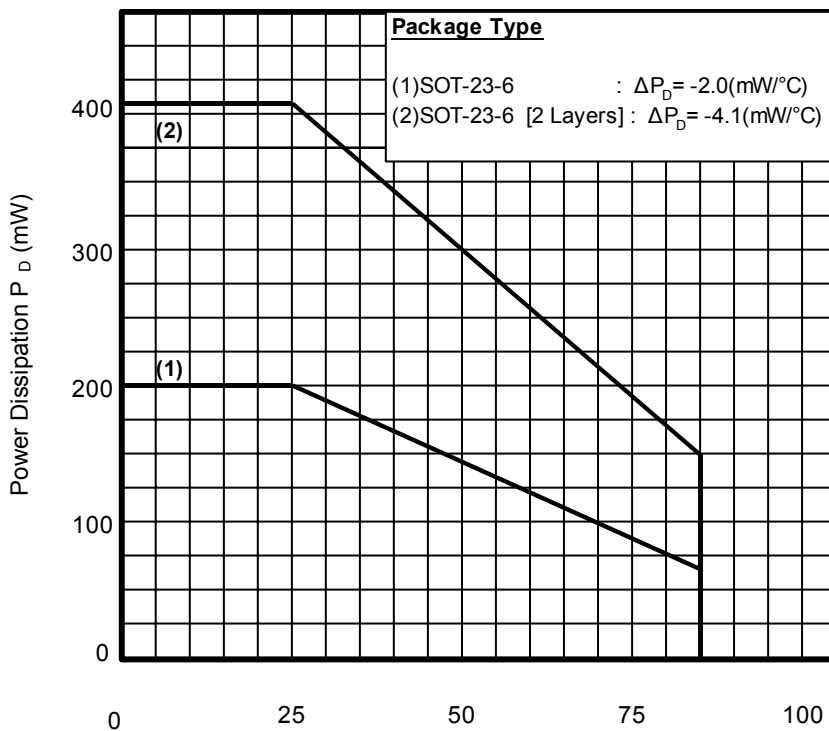
PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V _{DD}	11	V
Common Mode Input Voltage Range	V _{ICM}	-0.3 to V _{DD} +0.3	V
Differential Input Voltage Range	V _{ID}	±11(Note 1)	V
Power Dissipation	P _D	200 [SOT23-6]	mW
		410 [SOT23-6] (Note 2)	
Operating Temperature Range	T _{opr}	-40 to +85	°C
Storage Temperature Range	T _{stg}	-40 to +125	°C

(Note 1) For supply voltage less than 11V, the absolute maximum input voltage is equal to the supply voltage.

(Note 2) On the PCB " EIA/JEDEC (76.2x114.3x1.6mm, two layers, FR-4) "

(Note 3) Do not exceed "Power dissipation: P_D" in which power dissipation in IC is shown by the absolute maximum rating.
Refer to following Figure 1 for a permissible loss when ambient temperature (Ta) is Ta≥25°C .

Figure 1: Power Dissipation – Ambient Temperature



■ OPERATING VOLTAGE (Ta=-40 to +85°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V _{DD}	3 to 10	V

■ ELECTORIC CHARACTERISTICS

● DC CHARACTERISTICS ($V_{DD}=+3V$, $V_{SS}=GND$, $V_{COM}=V_{DD}/2$, $V_{SHDN}=V_{DD}$, $T_a=-40\sim 85^{\circ}C$ unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Supply Current	I_{DD}	$R_L=\infty$, No Signal	-	0.55	1.1	mA
Input Offset Voltage1	V_{IO1}	$T_a=25^{\circ}C$	-	3	15	μV
Input Offset Voltage2	V_{IO2}		-	3	15	μV
Input Offset Voltage Drift	$V_{IO}/\Delta t$		-	-	0.05	$\mu V/^{\circ}C$
Input Bias Current1	I_{B1}	$T_a=25^{\circ}C$	-	15	50	pA
Input Bias Current2	I_{B2}		-	-	100	pA
Input Offset Current1	I_{IO1}	$T_a=25^{\circ}C$	-	-	100	pA
Input Offset Current2	I_{IO2}		-	-	200	pA
Voltage Gain1	A_{V1}	$R_L \geq 10k\Omega$, $V_o=0.35\sim 2.65V$, $T_a=25^{\circ}C$	120	140	-	dB
Voltage Gain2	A_{V2}	$R_L \geq 10k\Omega$, $V_o=0.35\sim 2.65V$	115	140	-	dB
Input Common Mode Voltage Range	V_{ICM}	$CMR \geq 110dB$	0	-	1.7	V
Common Mode Rejection Ratio1	CMR1	$V_{ICM}=0\sim 1.7V$, $T_a=25^{\circ}C$	110	130	-	dB
Common Mode Rejection Ratio2	CMR2	$V_{ICM}=0\sim 1.7V$	110	130	-	dB
Supply Voltage Rejection Ratio1	SVR1	$V_{DD}=3\sim 10V$, $T_a=25^{\circ}C$	110	130	-	dB
Supply Voltage Rejection Ratio2	SVR2	$V_{DD}=3\sim 10V$	110	130	-	dB
Maximum Output Voltage1	V_{OH1}	$R_L=2k\Omega$ to GND	2.85	2.94	-	V
	V_{OL1}	$R_L=2k\Omega$ to GND	-	1	10	mV
Maximum Output Voltage2	V_{OH2}	$R_L=10k\Omega$ to GND	2.95	2.98	-	V
	V_{OL2}	$R_L=10k\Omega$ to GND	-	1	10	mV
Output Source Current	I_{SOURCE}	$V_o=2.5V$	5	20	-	mA
Output Sink Current	I_{SINK}	$V_o=0.5V$	3	25	-	mA

● AC CHARACTERISTICS ($V_{DD}=+3V$, $V_{SS}=GND$, $V_{COM}=V_{DD}/2$, $V_{SHDN}=V_{DD}$, $T_a=+25^{\circ}C$ unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Gain Bandwidth Product	GB	$R_L=10k\Omega$	-	2	-	MHz
Phase Margin	Φ_M	$R_L=10k\Omega$, $C_L=50pF$	-	30	-	deg
Equivalent Input Noise Voltage	V_{NI}	$f=10Hz$	-	120	-	nV/\sqrt{Hz}
Internal Sampling Frequency	F_S		-	7.5	-	kHz

● TRANSIENT CHARACTERISTICS ($V_{DD}=+3V$, $V_{SS}=GND$, $V_{COM}=V_{DD}/2$, $V_{SHDN}=V_{DD}$, $T_a=+25^{\circ}C$ unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Positive Slew Rate	+SR	$A_V=1$, $V_{IN}=1V_{P-P}$, $R_L=10k\Omega$	-	3	-	$V/\mu s$
Negative Slew Rate	-SR	$A_V=1$, $V_{IN}=1V_{P-P}$, $R_L=10k\Omega$	-	8	-	$V/\mu s$

● SHUTDOWN CHARACTERISTICS

($V_{DD}=+3V$, $V_{SS}=GND$, $V_{COM}=V_{DD}/2$, $V_{SHDN}=V_{DD}$, $T_a=-40\sim 85^{\circ}C$ unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Shutdown Supply Current	I_{DDSHDN}	$R_L=\infty$, $V_{SHDN}=GND$, No Signal	-	-	10	μA
Turn On Voltage to Enable Part	V_{SHDNON}	$I_{DD} \geq 300\mu A$	2.5	-	3	V
Turn off Voltage to Disable Part	$V_{SHDNOFF}$	$I_{DD} \leq 10\mu A$	GND	-	0.5	V
Shutdown Bias Current	I_{SHDN}	$V_{SHDN}=GND$	-	0.5	3.0	μA

■ ELECTRIC CHARACTERISTICS

● DC CHARACTERISTICS ($V_{DD}=+5V$, $V_{SS}=GND$, $V_{COM}=V_{DD}/2$, $V_{SHDN}=V_{DD}$, $T_a=-40\sim 85^\circ C$ unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Supply Current	I_{DD}	$R_L=\infty$, No signal	-	0.6	1.2	mA
Input Offset Voltage1	V_{IO1}	$T_a=25^\circ C$	-	3	15	μV
Input Offset Voltage2	V_{IO2}		-	3	15	μV
Input Offset Voltage Drift	$V_{IO}/\Delta t$		-	-	0.05	$\mu V/^\circ C$
Input Bias Current1	I_{B1}	$T_a=25^\circ C$	-	20	50	pA
Input Bias Current2	I_{B2}		-	-	100	pA
Input Offset Current1	I_{IO1}	$T_a=25^\circ C$	-	-	100	pA
Input Offset Current2	I_{IO2}		-	-	200	pA
Voltage Gain1	A_{V1}	$R_L \geq 10k\Omega$, $V_o=1\sim 4V$, $T_a=25^\circ C$	125	140	-	dB
Voltage Gain2	A_{V2}	$R_L \geq 10k\Omega$, $V_o=1\sim 4V$	120	140	-	dB
Input Common Mode Voltage Range	V_{ICM}	$CMR \geq 115dB$	0	-	3.5	V
Common Mode Rejection Ratio1	$CMR1$	$V_{ICM}=0\sim 3.5V$, $T_a=25^\circ C$	120	130	-	dB
Common Mode Rejection Ratio2	$CMR2$	$V_{ICM}=0\sim 3.5V$	115	130	-	dB
Supply Voltage Rejection Ratio1	$SVR1$	$V_{DD}=4\sim 10V$, $T_a=25^\circ C$	115	130	-	dB
Supply Voltage Rejection Ratio2	$SVR2$	$V_{DD}=4\sim 10V$	115	130	-	dB
Maximum Output Voltage1	V_{OH1}	$R_L=2k\Omega$ to GND	4.85	4.94	-	V
	V_{OL1}	$R_L=2k\Omega$ to GND	-	1	10	mV
Maximum Output Voltage2	V_{OH2}	$R_L=10k\Omega$ to GND	4.95	4.98	-	V
	V_{OL2}	$R_L=10k\Omega$ to GND	-	1	10	mV
Output Source Current	I_{SOURCE}	$V_o=4.5V$	10	30	-	mA
Output Sink Current	I_{SINK}	$V_o=0.5V$	4	40	-	mA

AC CHARACTERISTICS ($V_{DD}=+5V$, $V_{SS}=GND$, $V_{COM}=V_{DD}/2$, $V_{SHDN}=V_{DD}$, $T_a=+25^\circ C$ unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Gain Bandwidth Product	GB	$R_L=10k\Omega$	-	3	-	MHz
Phase Margin	Φ_M	$R_L=10k\Omega$, $C_L=50pF$	-	30	-	deg
Equivalent Input Noise Voltage	V_{NI}	$f=10Hz$	-	120	-	nV/\sqrt{Hz}
Internal Sampling Frequency	F_S		-	7.5	-	kHz

● TRANSIENT CHARACTERISTICS ($V_{DD}=+5V$, $V_{SS}=GND$, $V_{COM}=V_{DD}/2$, $V_{SHDN}=V_{DD}$, $T_a=+25^\circ C$ unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Positive Slew Rate	+SR	$A_V=1$, $V_{IN}=2V_{P-P}$, $R_L=10k\Omega$	-	3	-	$V/\mu s$
Negative Slew Rate	-SR	$A_V=1$, $V_{IN}=2V_{P-P}$, $R_L=10k\Omega$	-	12	-	$V/\mu s$

● SHUTDOWN CHARACTERISTICS

($V_{DD}=+5V$, $V_{SS}=GND$, $V_{COM}=V_{DD}/2$, $V_{SHDN}=V_{DD}$, $T_a=-40\sim 85^\circ C$ unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Shutdown Supply Current	I_{DDSHDN}	$R_L=\infty$, $V_{SHDN}=GND$, No Signal	-	-	15	μA
Turn On Voltage to Enable Part	V_{SHDNON}	$I_{DD} \geq 300\mu A$	4.5	-	5	V
Turn off Voltage to Disable Part	$V_{SHDNOFF}$	$I_{DD} \leq 15\mu A$	GND	-	0.5	V
Shutdown Bias Current	I_{SHDN}	$V_{SHDN}=GND$	-	2.0	7.0	μA

■ ELECTORIC CHARACTERISTICS

● DC CHARACTERISTICS ($V_{DD}=+10V$, $V_{SS}=GND$, $V_{COM}=V_{DD}/2$, $V_{SHDN}=V_{DD}$, $T_a=-40\sim 85^\circ C$ unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Supply Current	I_{DD}	$R_L=\infty$, No Signal	-	0.7	1.5	mA
Input Offset Voltage1	V_{IO1}	$T_a=25^\circ C$	-	3	15	μV
Input Offset Voltage2	V_{IO2}		-	3	15	μV
Input Offset Voltage Drift	$V_{IO}/\Delta t$		-	-	0.05	$\mu V/^\circ C$
Input Bias Current1	I_{B1}	$T_a=25^\circ C$	-	40	200	pA
Input Bias Current2	I_{B2}		-	-	200	pA
Input Offset Current1	I_{IO1}	$T_a=25^\circ C$	-	-	400	pA
Input Offset Current2	I_{IO2}		-	-	400	pA
Voltage Gain1	A_{V1}	$R_L \geq 10k\Omega$, $V_o=1\sim 9V$, $T_a=25^\circ C$	125	140	-	dB
Voltage Gain2	A_{V2}	$R_L \geq 10k\Omega$, $V_o=1\sim 9V$	120	140	-	dB
Input Common Mode Voltage Range	V_{ICM}	$CMR \geq 115dB$	0	-	8.5	V
Common Mode Rejection Ratio1	$CMR1$	$V_{ICM}=0\sim 8.5V$, $T_a=25^\circ C$	120	130	-	dB
Common Mode Rejection Ratio2	$CMR2$	$V_{ICM}=0\sim 8.5V$	115	130	-	dB
Supply Voltage Rejection Ratio1	$SVR1$	$V_{DD}=4\sim 10V$, $T_a=25^\circ C$	115	130	-	dB
Supply Voltage Rejection Ratio2	$SVR2$	$V_{DD}=4\sim 10V$	115	130	-	dB
Maximum Output Voltage1	V_{OH1}	$R_L=2k\Omega$ to GND	9.5	9.94	-	V
	V_{OL1}	$R_L=2k\Omega$ to GND	-	1	10	mV
Maximum Output Voltage2	V_{OH2}	$R_L=10k\Omega$ to GND	9.6	9.98	-	V
	V_{OL2}	$R_L=10k\Omega$ to GND	-	1	10	mV
Output Source Current	I_{SOURCE}	$V_o=9.5V$	14	40	-	mA
Output Sink Current	I_{SINK}	$V_o=0.5V$	5	60	-	mA

● AC CHARACTERISTICS ($V_{DD}=+10V$, $V_{SS}=GND$, $V_{COM}=V_{DD}/2$, $V_{SHDN}=V_{DD}$, $T_a=+25^\circ C$ unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Gain Bandwidth Product	GB	$R_L=10k\Omega$	-	2	-	MHz
Phase Margin	Φ_M	$R_L=10k\Omega$, $C_L=50pF$	-	30	-	deg
Equivalent Input Noise Voltage	V_{NI}	$f=10Hz$	-	120	-	nV/\sqrt{Hz}
Internal Sampling Frequency	F_S		-	7.5	-	kHz

● TRANSIENT CHARACTERISTICS ($V_{DD}=+10V$, $V_{SS}=GND$, $V_{COM}=V_{DD}/2$, $V_{SHDN}=V_{DD}$, $T_a=+25^\circ C$ unless otherwise specified)

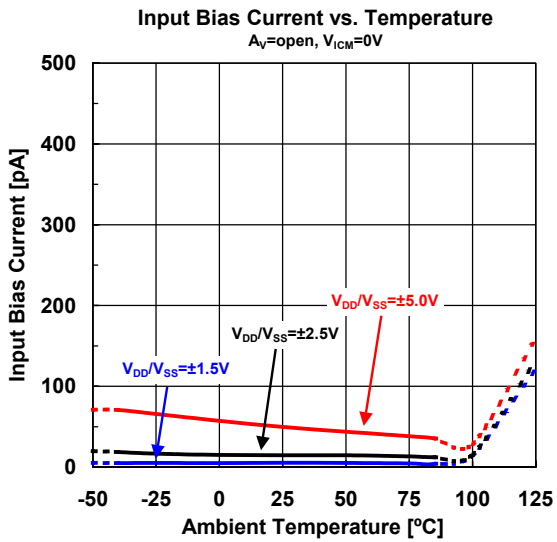
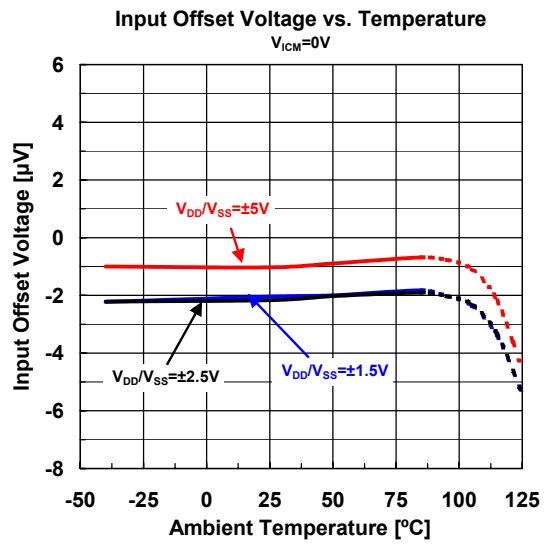
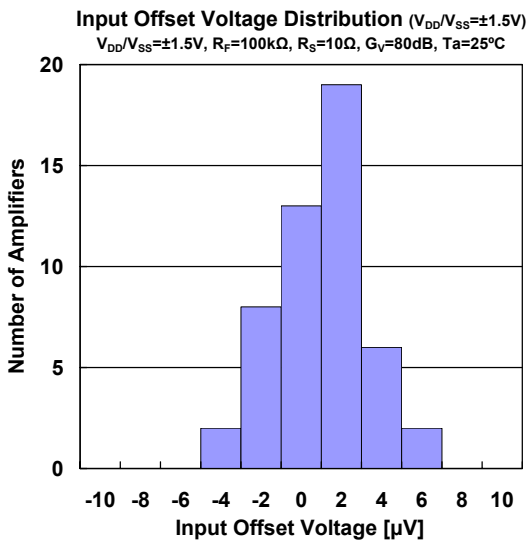
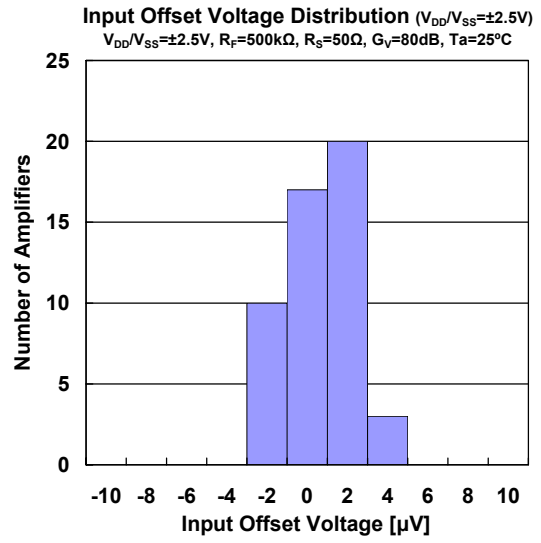
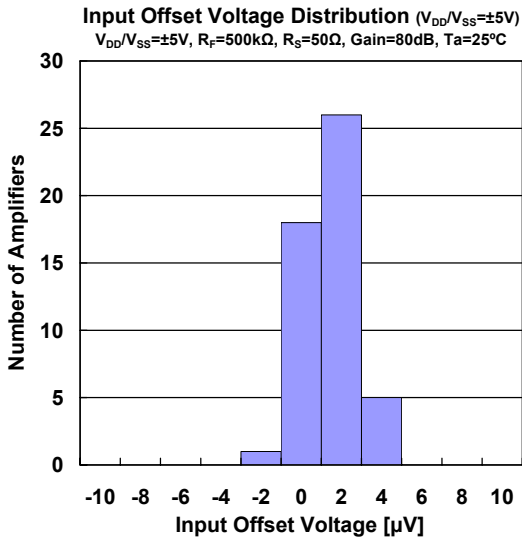
PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Positive Slew Rate	+SR	$A_V=1$, $V_{IN}=2V_{P-P}$, $R_L=10k\Omega$	-	4	-	$V/\mu s$
Negative Slew Rate	-SR	$A_V=1$, $V_{IN}=2V_{P-P}$, $R_L=10k\Omega$	-	14	-	$V/\mu s$

● SHUTDOWN CHARACTERISTICS

($V_{DD}=+10V$, $V_{SS}=GND$, $V_{COM}=V_{DD}/2$, $V_{SHDN}=V_{DD}$, $T_a=-40\sim 85^\circ C$ unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Shutdown Supply Current	I_{DDSHDN}	$R_L=\infty$, $V_{SHDN}=GND$, No Signal	-	-	25	μA
Turn On Voltage to Enable Part	V_{SHDNON}	$I_{DD} \geq 400\mu A$	9.5	-	10	V
Turn off Voltage to Disable Part	$V_{SHDNOFF}$	$I_{DD} \leq 25\mu A$	GND	-	0.5	V
Shutdown Bias Current	I_{SHDN}	$V_{SHDN}=GND$	-	7.5	20	μA

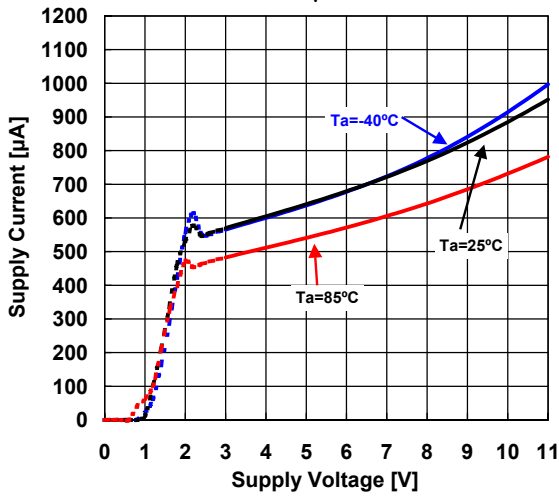
■ TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS

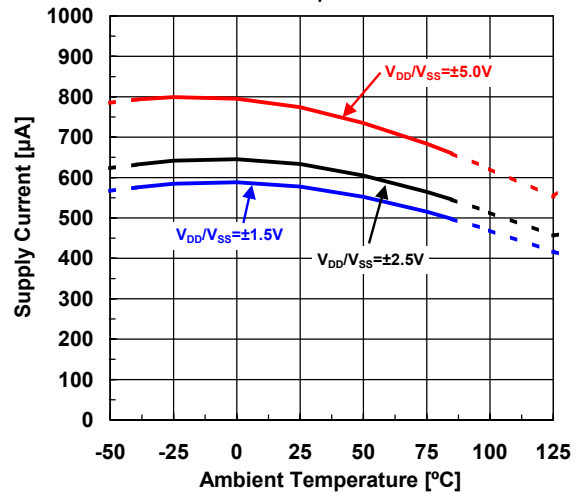
Supply Current vs. Supply Voltage

$A_v=0dB$



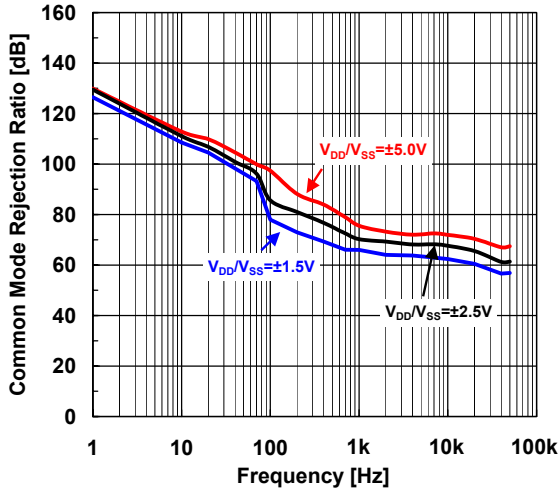
Supply Current vs. Temperature

$A_v=0dB$



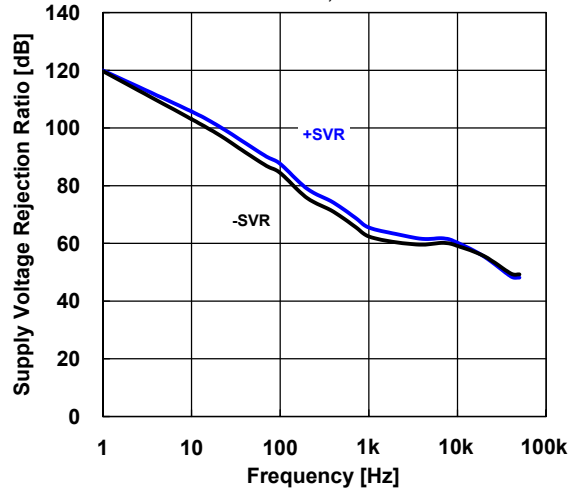
CMR vs. Frequency (Supply Voltage)

$R_f=100k, R_s=10, G_v=80dB, Ta=25°C$



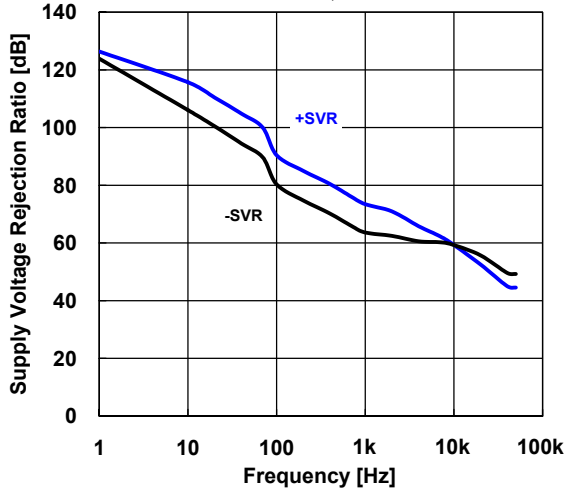
SVR vs. Frequency

$V^*/V=±5V, Ta=25°C$



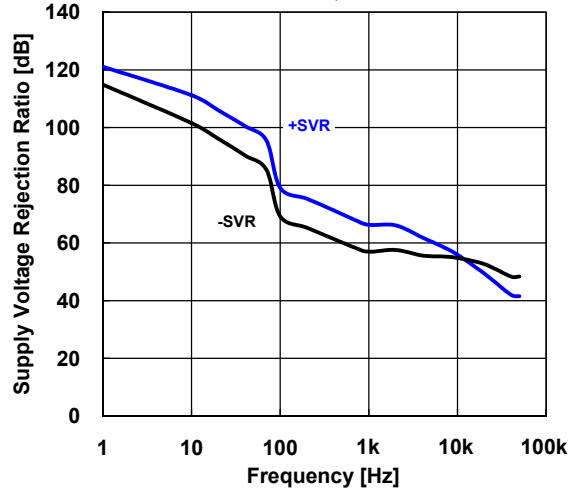
SVR vs. Frequency

$V^*/V=±2.5V, Ta=25°C$

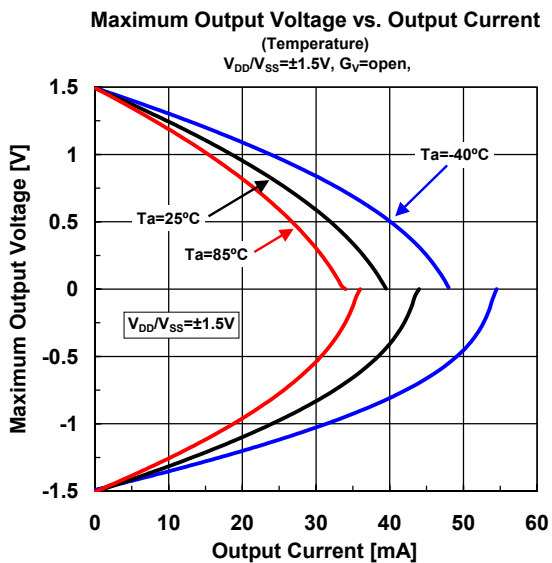
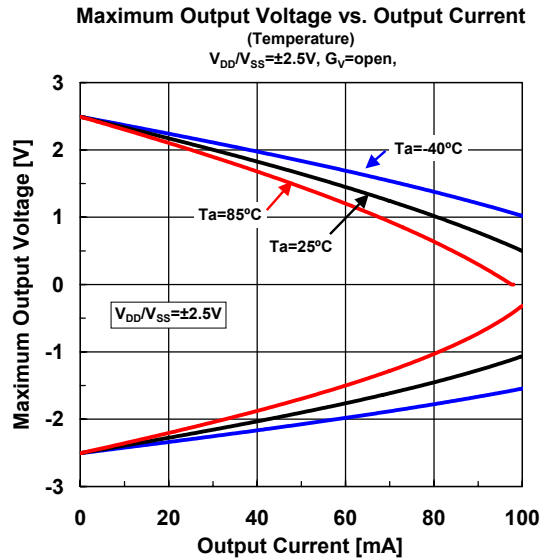
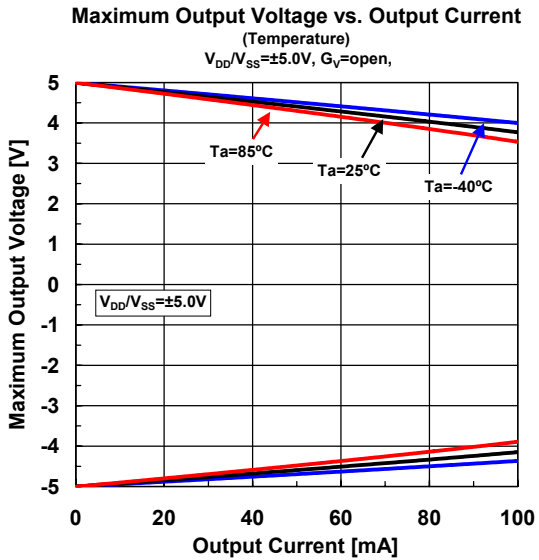
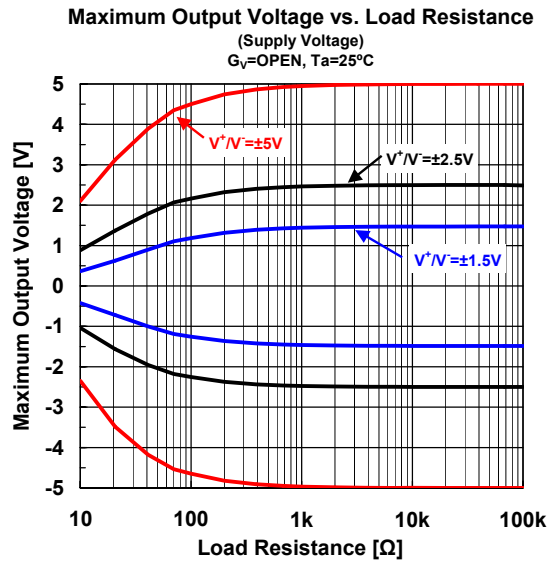
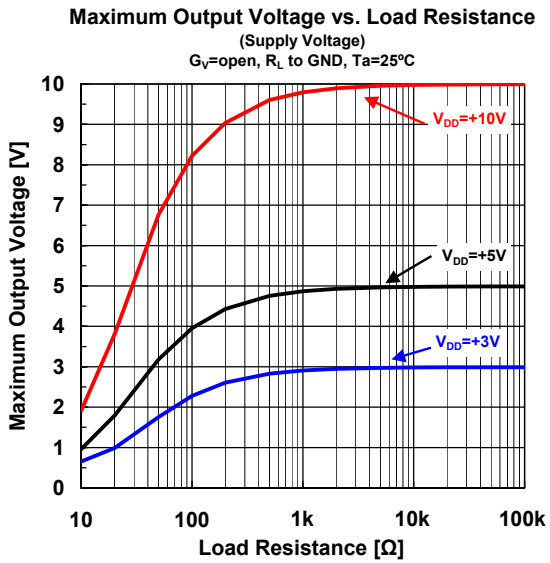


SVR vs. Frequency

$V^*/V=±1.5V, Ta=25°C$

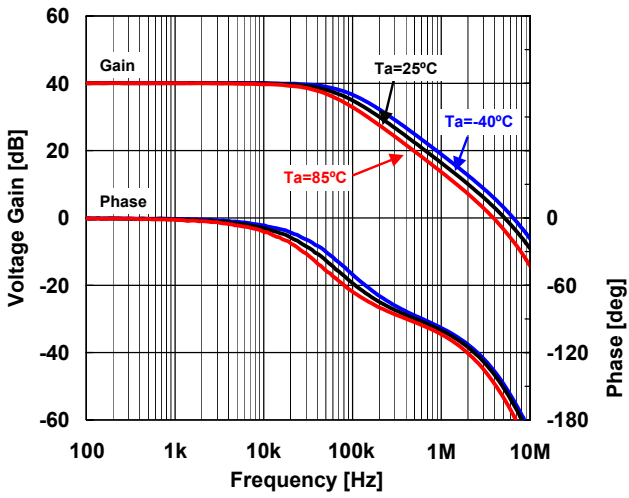


■ TYPICAL CHARACTERISTICS

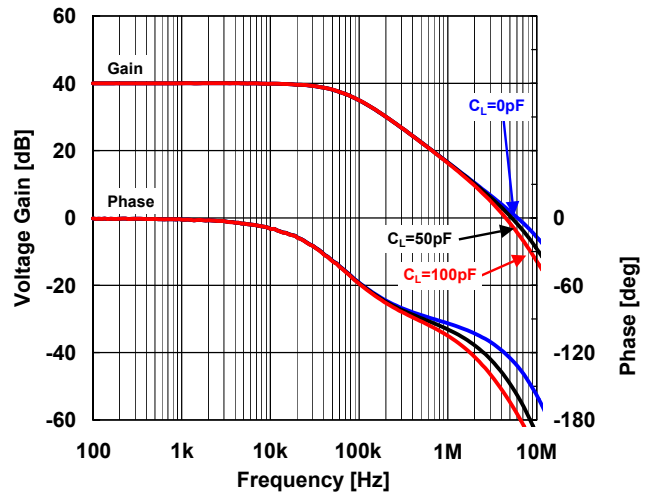


■ TYPICAL CHARACTERISTICS

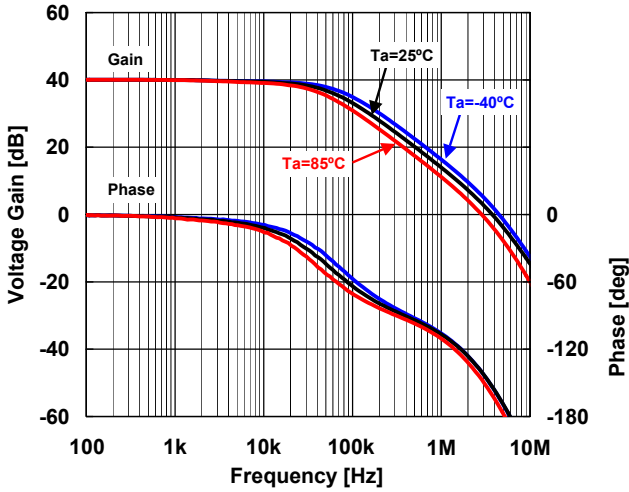
40dB Gain/Phase vs. Frequency
 ($V_{DD}/V_{SS}=\pm 5V$, Temperature)
 $V_{DD}/V_{SS}=\pm 5V$, $G_v=40dB$, $R_L=10k\Omega$, $C_L=50pF$



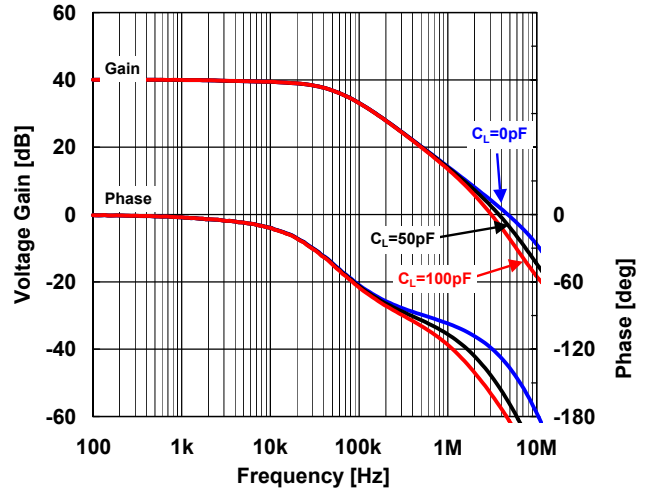
40dB Gain/Phase vs. Frequency
 ($V_{DD}/V_{SS}=\pm 5V$, Load Capacitance)
 $V_{DD}/V_{SS}=\pm 5V$, $G_v=40dB$, $R_L=10k\Omega$, $T_a=25^\circ C$



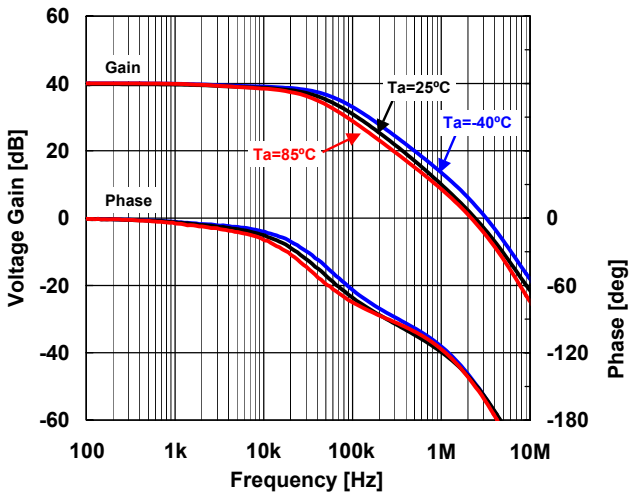
40dB Gain/Phase vs. Frequency
 ($V_{DD}/V_{SS}=\pm 2.5V$, Temperature)
 $V_{DD}/V_{SS}=\pm 2.5V$, $G_v=40dB$, $R_L=10k\Omega$, $C_L=50pF$



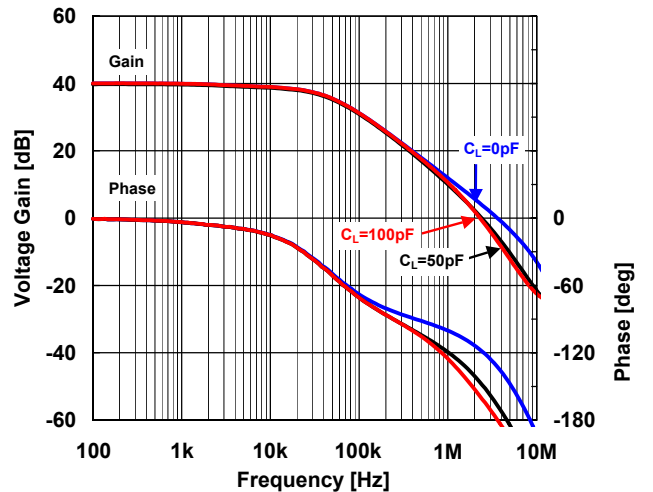
40dB Gain/Phase vs. Frequency
 ($V_{DD}/V_{SS}=\pm 2.5V$, Load Capacitance)
 $V_{DD}/V_{SS}=\pm 2.5V$, $G_v=40dB$, $R_L=10k\Omega$, $T_a=25^\circ C$



40dB Gain/Phase vs. Frequency
 ($V_{DD}/V_{SS}=\pm 1.5V$, Temperature)
 $V_{DD}/V_{SS}=\pm 1.5V$, $G_v=40dB$, $R_L=10k\Omega$, $C_L=50pF$

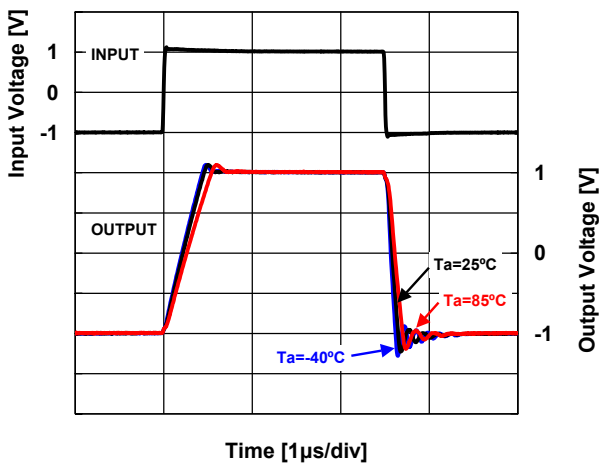


40dB Gain/Phase vs. Frequency
 ($V_{DD}/V_{SS}=\pm 1.5V$, Load Capacitance)
 $V_{DD}/V_{SS}=\pm 1.5V$, $G_v=40dB$, $R_L=10k\Omega$, $T_a=25^\circ C$

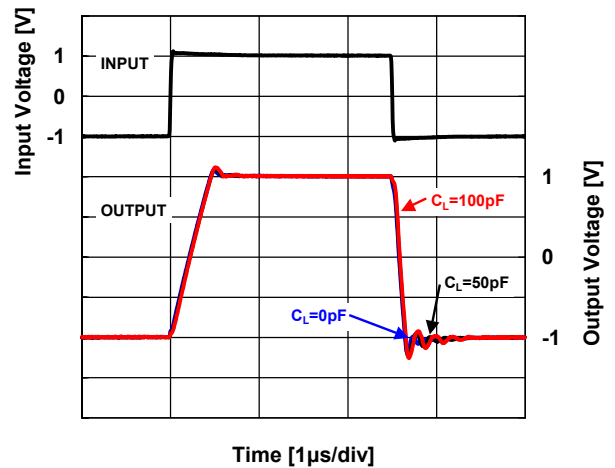


■ TYPICAL CHARACTERISTICS

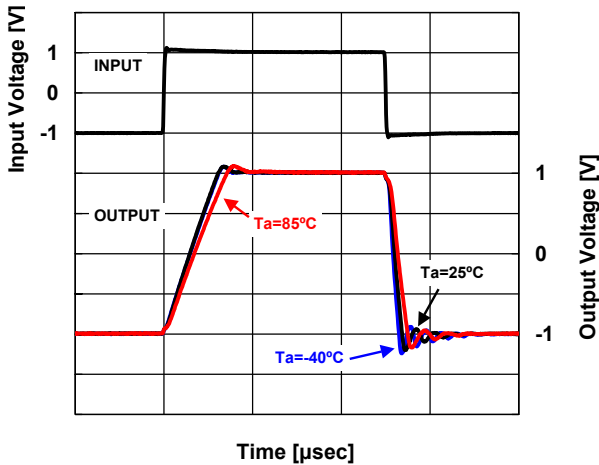
Pulse Response ($V_{DD}/V_{SS}=\pm 5V$, Temperature)
 $V_{DD}/V_{SS}=\pm 5.0V$, $G_v=0dB$, $f=100kHz$,
 $V_{IN}=\pm 1V$, $R_L=10k\Omega$, $C_L=50pF$



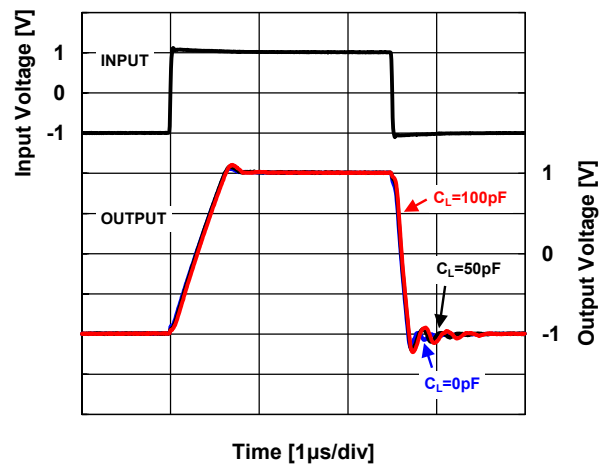
Pulse Response ($V_{DD}/V_{SS}=\pm 5V$, Load Capacitance)
 $V_{DD}/V_{SS}=\pm 5.0V$, $G_v=0dB$, $f=100kHz$,
 $V_{IN}=\pm 1V$, $R_L=10k\Omega$, $T_a=25^\circ C$



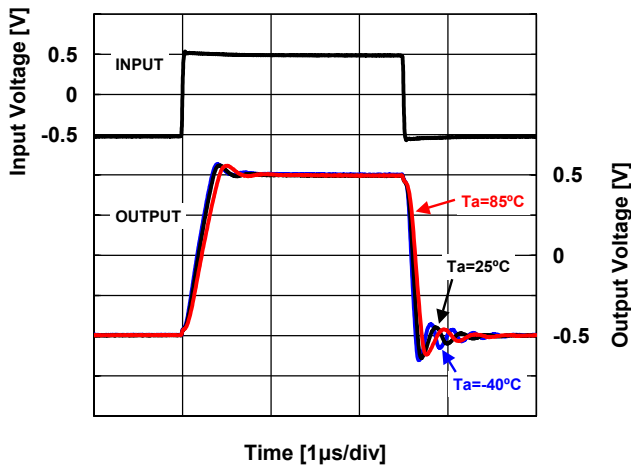
Pulse Response ($V_{DD}/V_{SS}=\pm 2.5V$, Temperature)
 $V_{DD}/V_{SS}=\pm 2.5V$, $G_v=0dB$, $f=100kHz$,
 $V_{IN}=\pm 1V$, $R_L=10k\Omega$, $C_L=50pF$



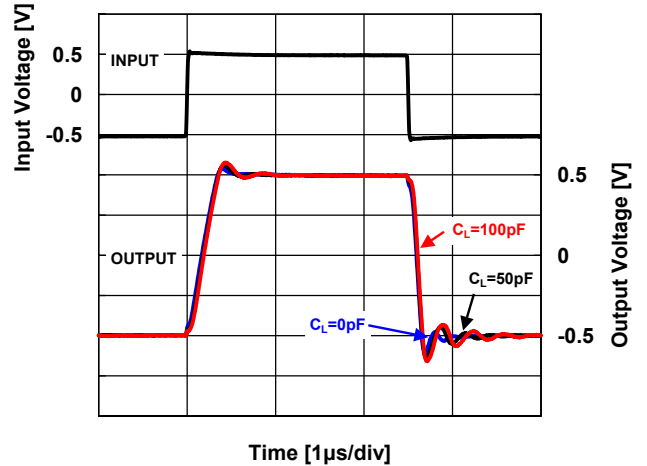
Pulse Response ($V_{DD}/V_{SS}=\pm 2.5V$, Load Capacitance)
 $V_{DD}/V_{SS}=\pm 2.5V$, $G_v=0dB$, $f=100kHz$,
 $V_{IN}=\pm 1V$, $R_L=10k\Omega$, $T_a=25^\circ C$



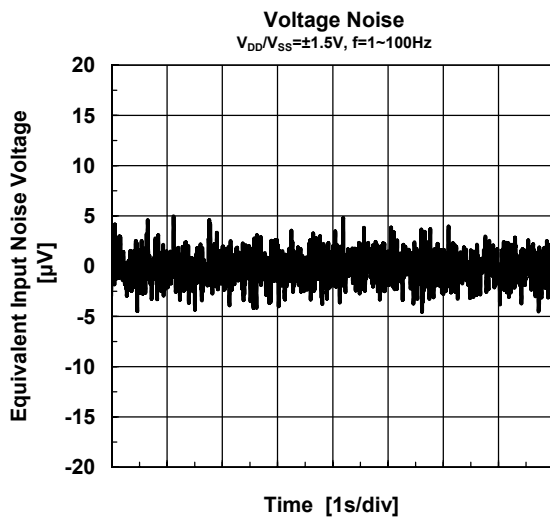
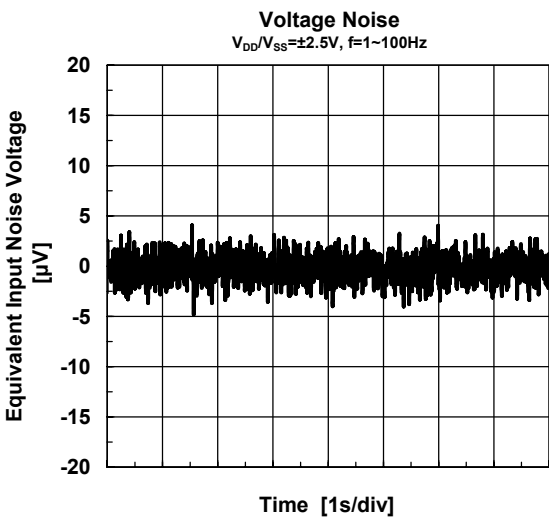
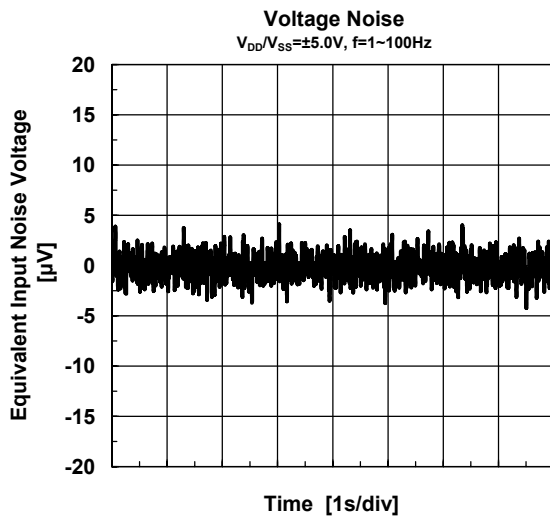
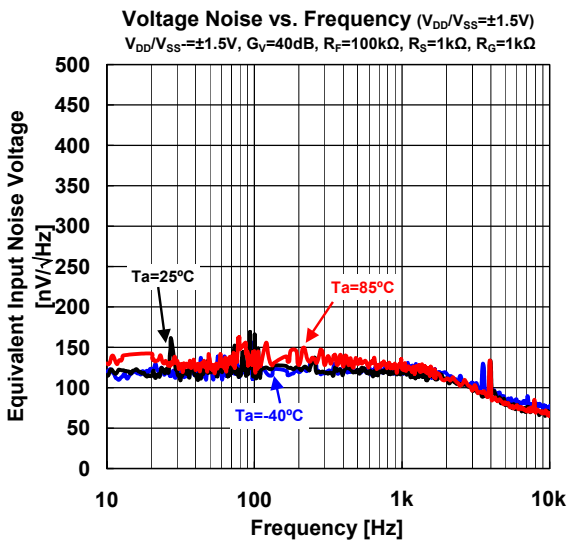
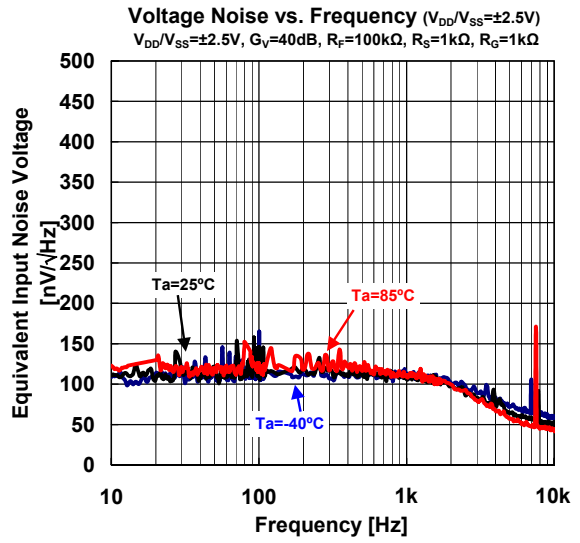
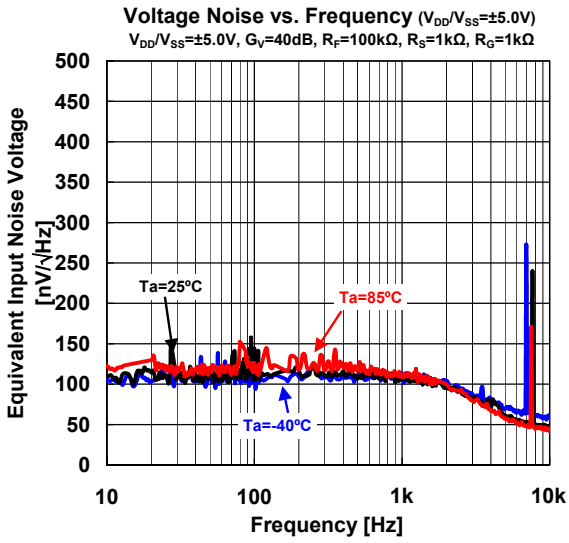
Pulse Response ($V_{DD}/V_{SS}=\pm 1.5V$, Temperature)
 $V_{DD}/V_{SS}=\pm 1.5V$, $G_v=0dB$, $f=100kHz$,
 $V_{IN}=\pm 0.5V$, $R_L=10k\Omega$, $C_L=50pF$



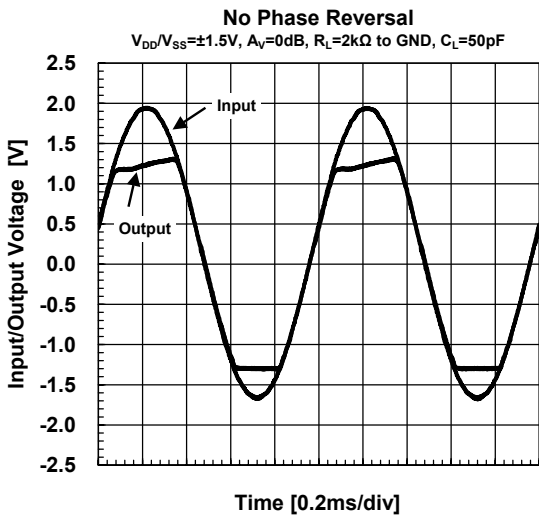
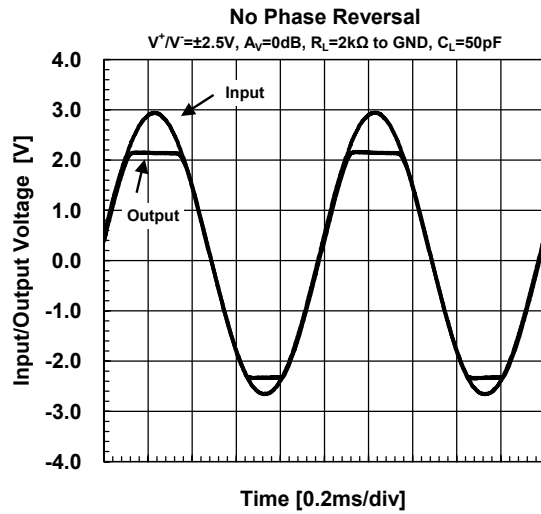
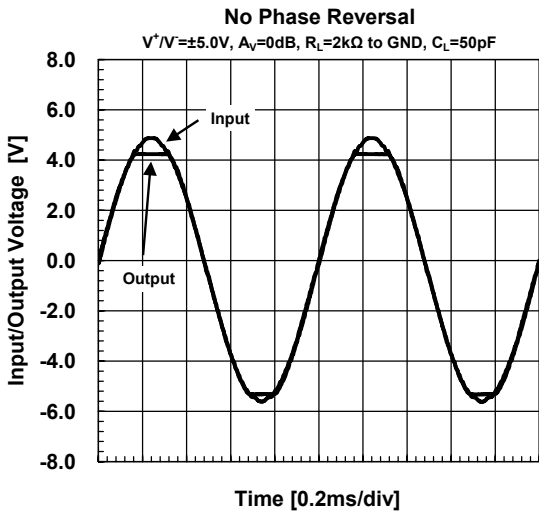
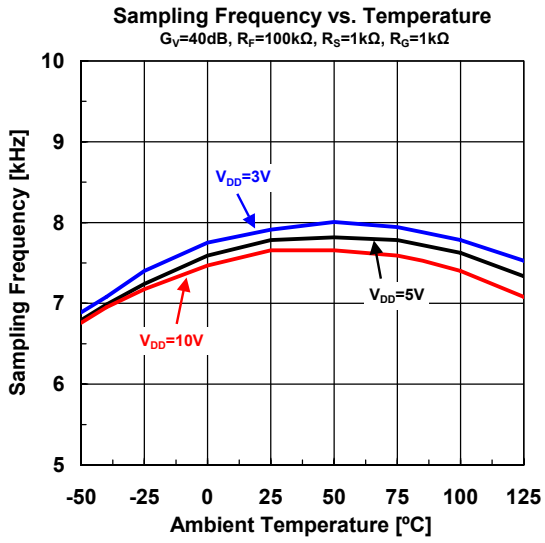
Pulse Response ($V_{DD}/V_{SS}=\pm 1.5V$, Load Capacitance)
 $V_{DD}/V_{SS}=\pm 1.5V$, $G_v=0dB$, $f=100kHz$,
 $V_{IN}=\pm 0.5V$, $R_L=10k\Omega$, $T_a=25^\circ C$



■ TYPICAL CHARACTERISTICS



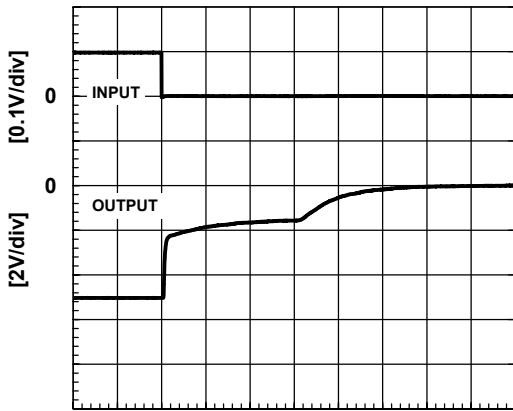
■ TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS

Positive Overload Recovery Response

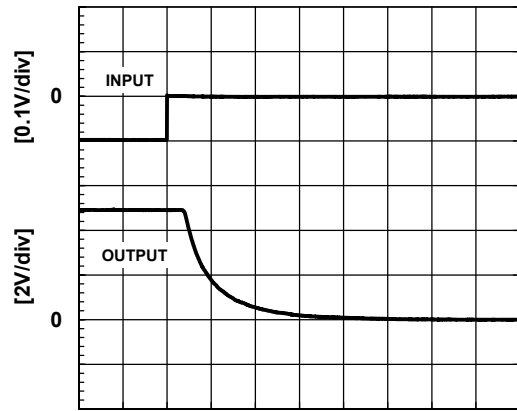
$V^+/V^- = \pm 5.0V$,
 $A_v = 100$, $R_1 = 1k\Omega$, $R_2 = 100k\Omega$



Time [0.1ms/div]

Negative Overload Recovery Response

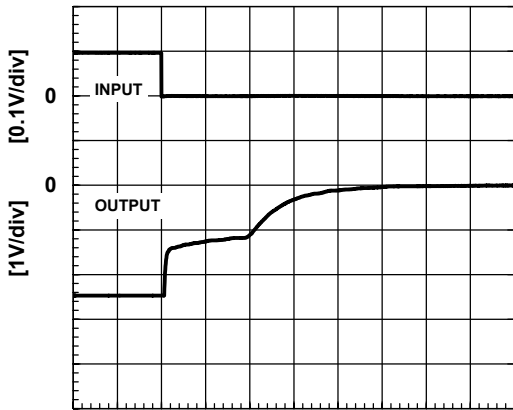
$V^+ / V^- = \pm 5.0V$, $A_v = 100$, $R_1 = 1k\Omega$, $R_2 = 100k\Omega$



Time [0.1ms/div]

Positive Overload Recovery Response

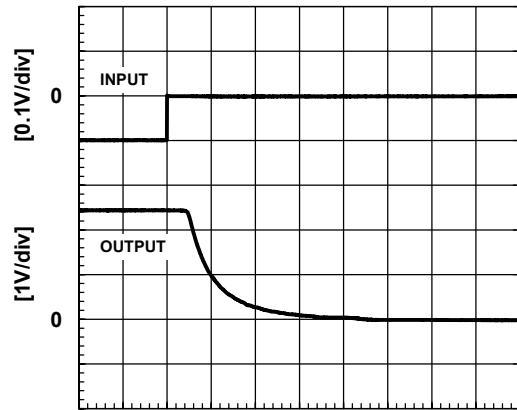
$V^+ / V^- = \pm 2.5V$, $A_v = 100$, $R_1 = 1k\Omega$, $R_2 = 100k\Omega$



Time [0.1ms/div]

Negative Overload Recovery Response

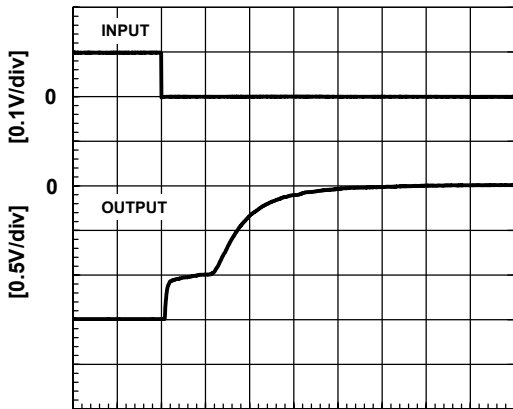
$V^+ / V^- = \pm 2.5V$, $A_v = 100$, $R_1 = 1k\Omega$, $R_2 = 100k\Omega$



Time [0.1ms/div]

Positive Overload Recovery Response

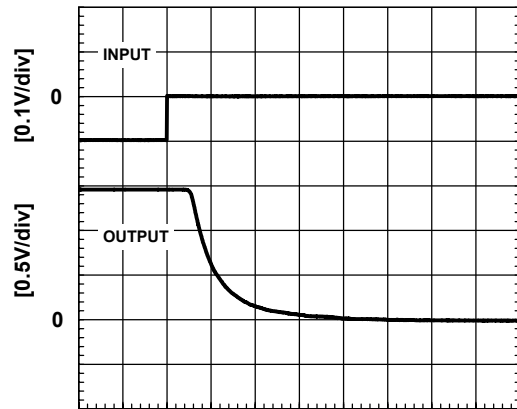
$V^+ / V^- = \pm 1.5V$, $A_v = 100$, $R_1 = 1k\Omega$, $R_2 = 100k\Omega$



Time [0.1ms/div]

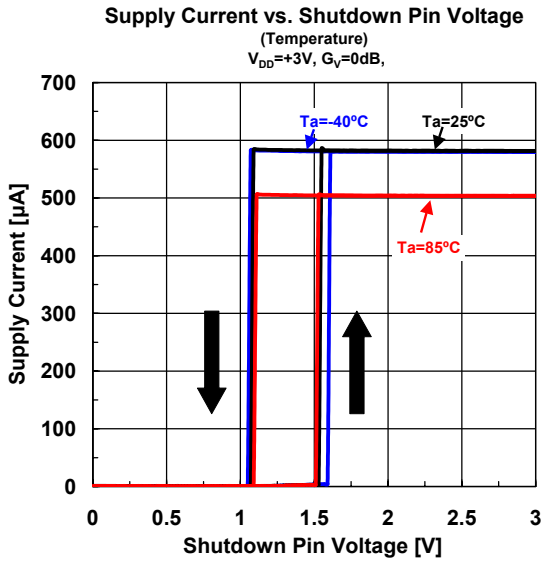
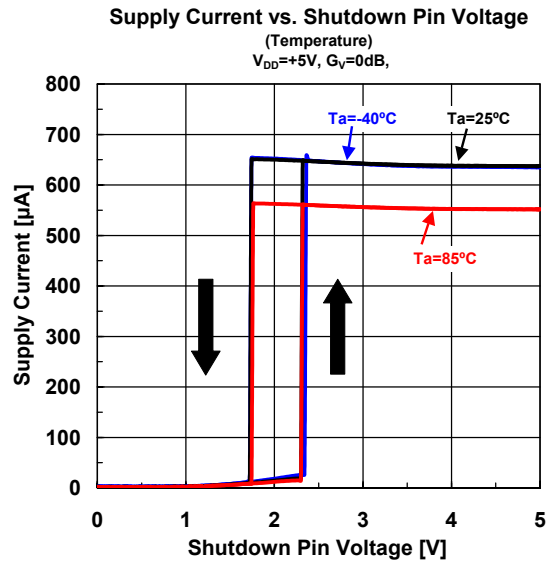
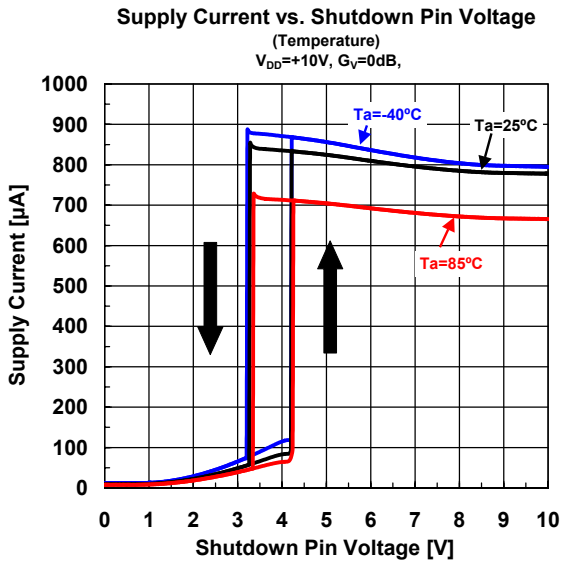
Negative Overload Recovery Response

$V^+ / V^- = \pm 1.5V$, $A_v = 100$, $R_1 = 1k\Omega$, $R_2 = 100k\Omega$



Time [0.1ms/div]

■ 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.