FEATURES

- Slew rate: 0.1V/μs
- Bandwidth:2.1MHz
- Low supply current:1.67mA(Typical)
- Offset Voltage:93μV (Typical)
- Wide Supply Voltage Range: ±3 V to ±18 V
- Operation Temperature Range: -40°C to 125°C
- Micro Size Packages: SOIC

APPLICATIONS

- Instrument circuit
- Stress test circuit
- Current measuring circuit
- Consumer electronics
- Precision filters
- Wireless base station control circuits

GENERAL DESCRIPTION

The MT0007 are single operational amplifiers with low noise and low offset voltage. These amplifiers have the characteristics of wide supply voltage range, low power and stable high frequency response. These amplifiers achieve very good AC performance with 2.1MHz bandwidth, 0.1V/μs slew rate and low distortion while drawing only 1.67mA of quiescent current per amplifier. These amplifiers have the characteristics of low input bias current and high open-loop gain. The MT0007 has a very low input offset voltage, which is obtained by trimming during the wafer stage. These low offset voltages usually eliminate any need for external zeroing.

MT0007 has wide temperature range from -40°C to +125°C.

Single or dual supplies as low as 6V(±3V) and up to 36V(±18V) can be used.

The MT0007 is available in the 8-Pin SOIC packages.

SIMPLIFIED SCHEMATIC

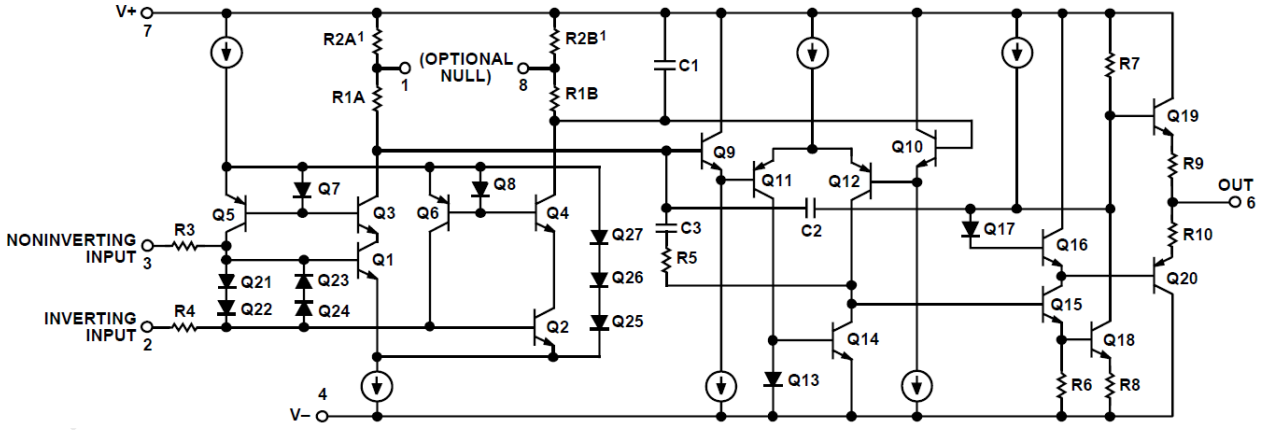
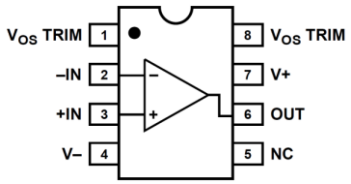


Figure 1. Simplified schematic

ABSOLUTE MAXIMUM RATINGS (Note 1)

Supply Voltage.....+3V to +18V
Input Offset Voltage.....93μV(typical)
Input Offset Current.....8nA(typical)
Maximum Operating Junction Temperature.....150°C
Operating Temperature Range.....-40°C to 125°C
Storage Temperature .....-65°C to 150°C

PACKAGE/ORDER INFORMATION

TOP VIEW	Order Part Number	Package	Top Marking
	MT0007	8-Pin SOIC	MT0007AJ

DEVICE INFORMATION

Order Part Number	Top Marking	Package
MT0007	MT0007AJ	SOIC-8

PIN DESCRIPTION

Pin Name	Pin Number	Description
OUT	-	Output
-IN	-	Inverting input
+IN	-	Noninverting input
-V	-	Positive (highest) power supply
+V	-	Negative (lowest) power supply
Vos TRIM	-	External trimming resistor trimming terminal

ELECTRICAL CHARACTERISTICS (Note 3)

(At T_A = 25°C, +VS=+13V, -VS=-13V, R_L =2KΩ, C_L =0, unless otherwise noted.)

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
Input Offset Voltage	V_S=±13.0V		93	150	μV
Input Offset Voltage Drift	TA = -40°C to 125°C		0.4	2.0	μV/°C
Input Bias Current	T_A = 25°C		9.2		nA
Input Offset Current			8.0		nA
Power Supply Rejection Ratio			126		dB
Common-mode Rejection Ratio			139		dB
Open Loop Voltage Gain	R_L =2KΩ		129		dB
Gain-bandwidth product	R_L =2KΩ, V_S=± 13.0V		2.1		MHz
Slew Rate	G=+1, R_L =2KΩ, V_S=±13.0V		0.1		V/μs
Input Voltage Noise	f = 0.1Hz to 10Hz		0.38		μV_{PP}
Input Voltage Noise Density	f = 1kHz		9.8		nV/√Hz
Supply Current (per amplifier)			1.67		mA
Operating Temperature Range		-40		125	°C
Storage Temperature Range		-65		150	°C

Note 1: Absolute Maximum Ratings are those values beyond which the life of a device may be impaired.
Note 2: T_J is calculated from the ambient temperature T_A and power dissipation P_D according to the following formula: $T_J = T_A + (P_D)$ x (170°C/W).
Note 3: 100% production test at +25°C. Specifications over the temperature range are guaranteed by design and characterization.

TYPICAL PERFORMANCE CHARACTERISTICS

(At T_A = 25°C, +VS=+13V, -VS=-13V, R_L =2KΩ, unless otherwise noted.)

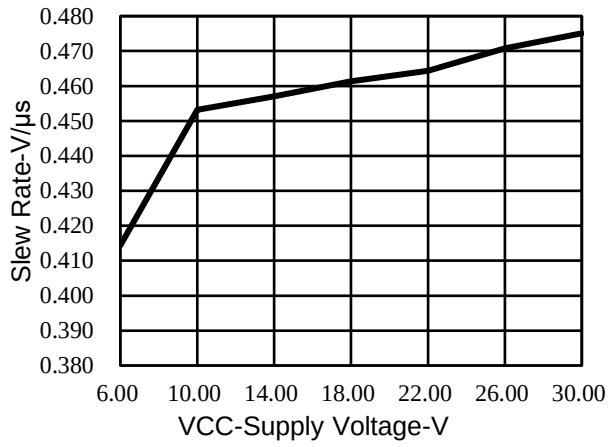


Figure 2. Slew Rate vs Supply Voltage

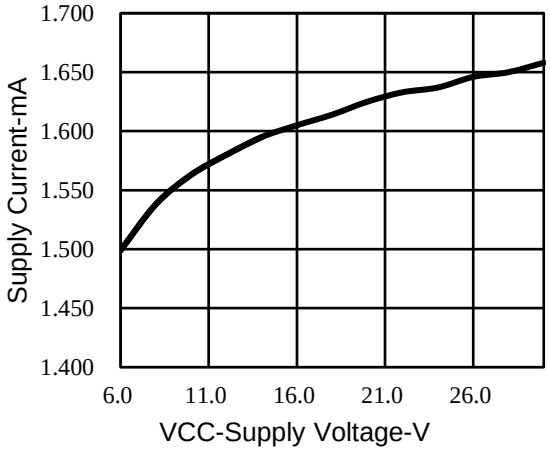


Figure 3. Supply Current vs Supply Voltage

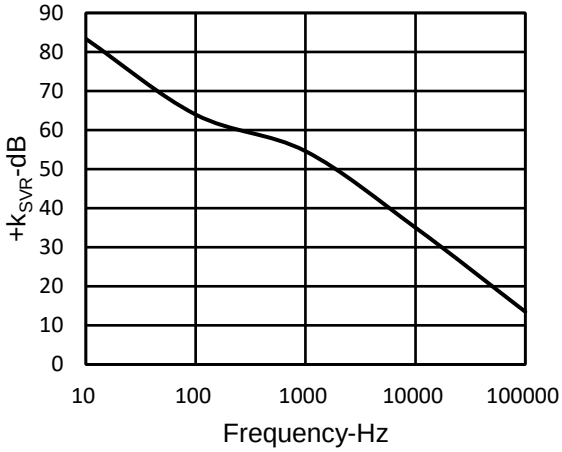


Figure 4. $+k_{SVR}$ vs Frequency

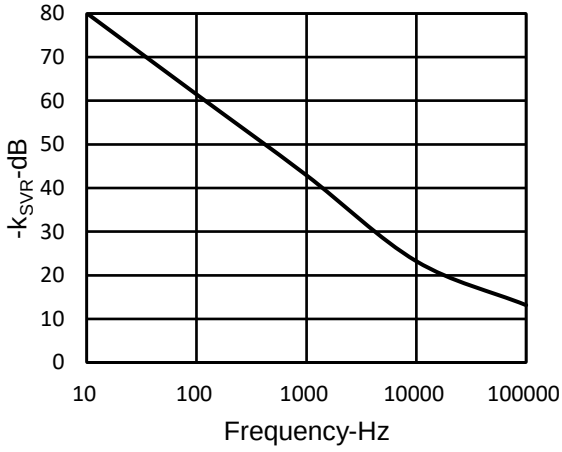


Figure 5. $-k_{SVR}$ vs Frequency

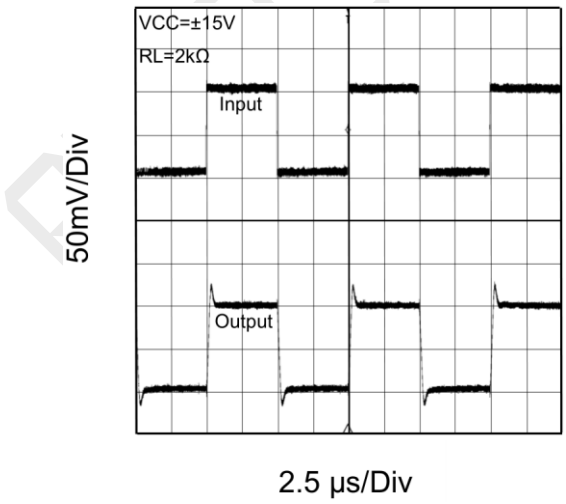


Figure 6. Noninverting Small-Signal Pulse Response

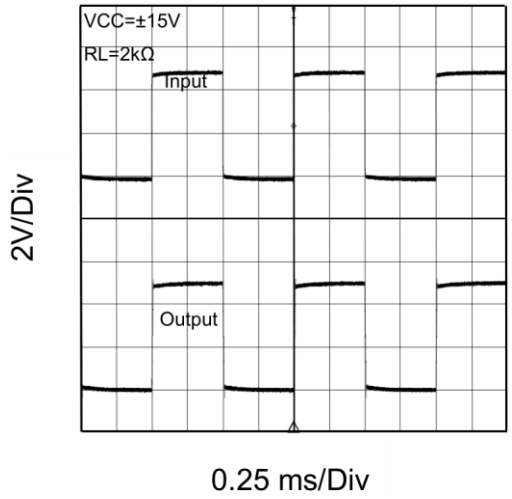


Figure 7. Noninverting Large-Signal Pulse Response

TYPICAL PERFORMANCE CHARACTERISTICS

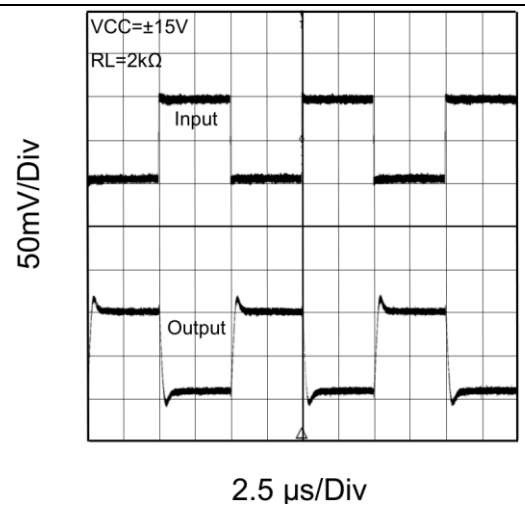


Figure 8. Inverting Small-Signal Pulse Response

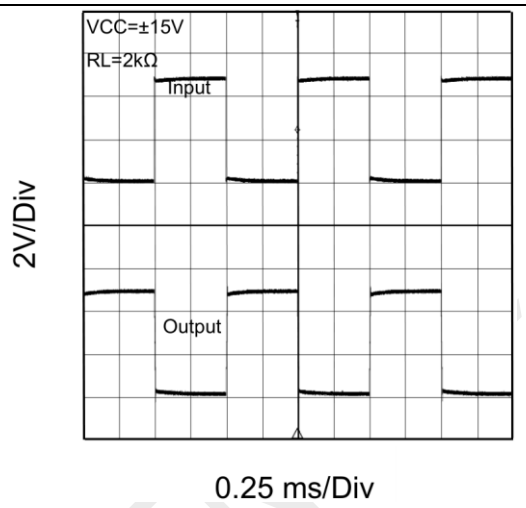


Figure 9. Inverting Large-Signal Pulse Response

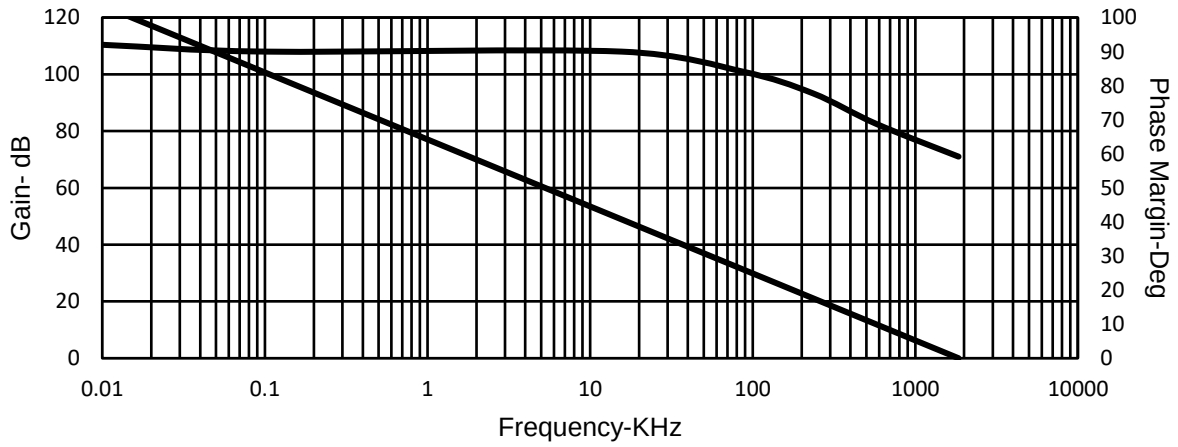


Figure 10. Open-Loop Gain and Phase

APPLICATIONS INFORMATION

MT0007 are high supply voltage operational Amplifiers. This amplifier has the characteristics of wide supply voltage range, low noise, low supply current and high speed operation. MT0007 has wide temperature range from -40°C to +85°C. Single or dual supplies as low as 6V(±3V) and up to 36V(±18V) can be used.

Voltage follower

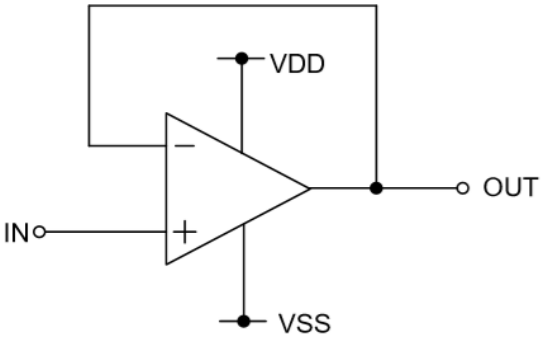


Figure 11. Voltage follower

Voltage gain is 0dB. Using this circuit, the output voltage (OUT) is configured to be equal to the input voltage (IN). This circuit also stabilizes the output voltage (OUT) due to high input impedance and low output impedance. Computation for output voltage (OUT) is shown below. OUT=IN.

Inverting amplifier

For inverting amplifier, input voltage (IN) is amplified by a voltage gain and depends on the ratio of R1 and R2. The out-of-phase output voltage is shown in the next expression

$$OUT=-(R2/R1)\cdot IN$$

This circuit has input impedance equal to R1.

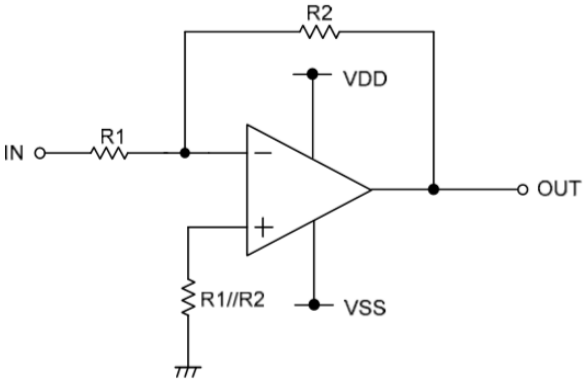


Figure 12. Inverting amplifier circuit

Non-inverting amplifier

For non-inverting amplifier, input voltage (IN) is amplified by a voltage gain, which depends on the ratio of R1 and R2. The output voltage (OUT) is in-phase with the input voltage (IN) and is shown in the next expression.

$$OUT=(1+R2/R1)\cdot IN$$

Effectively, this circuit has high input impedance since its input side is the same as that of the operational amplifier.

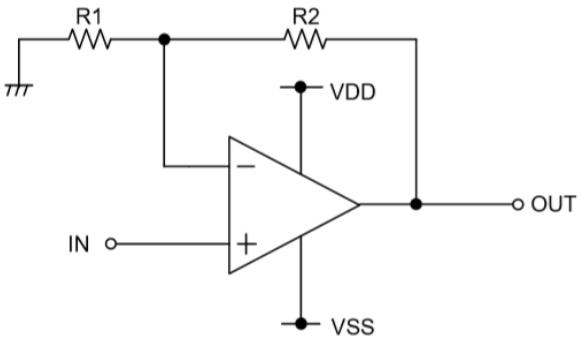
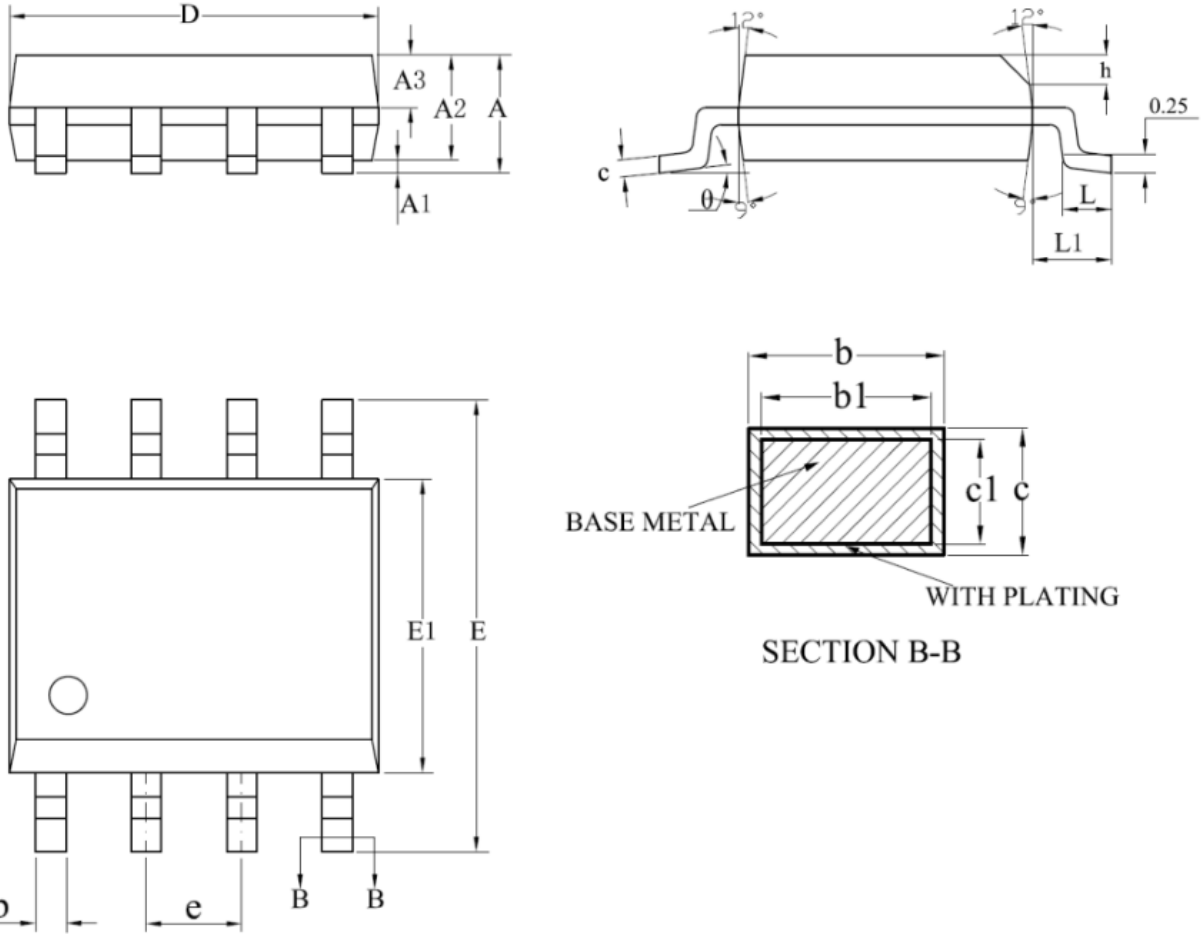


Figure 13. Non-inverting amplifier circuit

PACKAGE DESCRIPTION

SOIC-8



SYMBOL	millimeter		
	min	nom	max
A	-	-	1.75
A1	0.10	-	0.23
A2	1.30	1.40	1.50
A3	0.60	0.65	0.70
b	0.39	-	0.47
b1	0.38	0.41	0.44
c	0.20	-	0.24
c1	0.19	0.20	0.21
D	4.80	4.90	5.00
E	5.80	6.00	6.20
E1	3.80	3.90	4.00
e	1.27BSC		
h	0.25	-	0.50
L	0.50	-	0.80

L1	1.05REF		
θ	0	-	8°

NOTE:
1.All linear dimensions are in inches (millimeters).
2.This drawing is subject to change without notice.
3.Body length does not include mold flash,protrusions,or gate burrs.mold flash,protrusions,or gate burrs shall not exceed 0.006 (0.15) each side.
4.Body width does not include interlead flash.interlead flash shall not exceed 0.017 (0.43)each side.

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