

UTC LM318 LINEAR INTEGRATED CIRCUIT

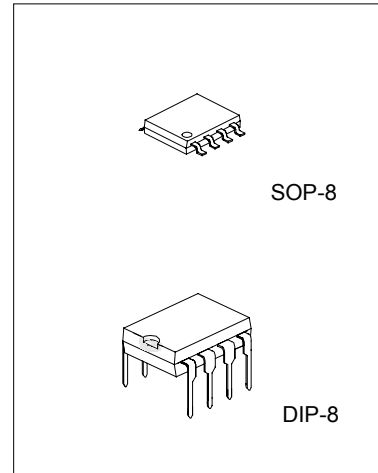
DESCRIPTION

The UTC LM318 is precision high speed operational amplifier designed for applications requiring wide bandwidth and high slew rate. It features a factor of ten increase in speed over general purpose device without sacrificing DC performance.

The LM318 has internal unity gain frequency compensation. This considerably simplifies its application since no external components are necessary for operation. However, unlike most internally compensated amplifiers, external frequency compensation may be added for optimum performance. For inverting applications, feed forward compensation will boost the slew rate to over 150V/ μ s and almost double the bandwidth. Overcompensation can be used with the amplifier for greater stability when maximum bandwidth is not needed. Further, a single capacitor can be added to reduce the 0.1% settling time to under 1 μ s.

The high speed and fast settling time of the op amps make it useful in A/D converters, oscillators, active filters, sample and hold circuits, or general purpose amplifiers. The device is easy to apply and offer an order of magnitude better AC performance than industry standards such as the LM709.

The UTC LM318 is specified from 0°C to +70°C.



FEATURES

- *15MHz small signal bandwidth
- *Guaranteed 50V/ μ s slew rate
- *Maximum bias current of 250nA
- *Operates from supplies of ± 5 V to ± 20 V
- *Internal frequency compensation
- *Input and output overload protected
- *Pin compatible with general purpose op amps

ABSOLUTE MAXIMUM RATINGS

PARAMETER	VALUE	UNIT
Supply Voltage	± 20	V
Power Dissipation (Note 1)	500	mW
Differential Input Current (Note 2)	± 10	mA
Input Voltage (Note 3)	± 15	V
Output Short-Circuit Duration	Continuous	
Operating Temperature Range	0 to +70	°C
Storage Temperature Range	-65 to +150	°C

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ELECTRICAL CHARACTERISTICS (Note 4)

PARAMETER	TEST CONDITION	MIN	TYP	MAX	UNIT
Input Offset Voltage	$T_A=25^{\circ}\text{C}$		4	10	mV
Input Offset Current	$T_A=25^{\circ}\text{C}$		30	200	nA
Input Bias Current	$T_A=25^{\circ}\text{C}$		150	500	nA
Input Resistance	$T_A=25^{\circ}\text{C}$	0.5	3		M Ω
Supply Current	$T_A=25^{\circ}\text{C}$		5	10	mA
Large Signal Voltage Gain	$T_A=25^{\circ}\text{C}$, $V_s=\pm 15\text{V}$ $V_{OUT}=\pm 10\text{V}$, $R_L\geq 2\text{K}\Omega$	25	200		V/mV
Slew Rate	$T_A=25^{\circ}\text{C}$ $V_s=\pm 15\text{V}$ $A_v=1$ (Note 5)	50	70		V/ μs
Small Signal Bandwidth	$T_A=25^{\circ}\text{C}$ $V_s=\pm 15\text{V}$		15		MHz
Input Offset Voltage				15	mV
Input Offset Current				300	nA
Input Bias Current				750	nA
Large Signal Voltage Gain	$V_s=\pm 15\text{V}$ $V_{OUT}=\pm 10\text{V}$, $R_L\geq 2\text{K}\Omega$	20			V/mV
Output Voltage Swing	$V_s=\pm 15\text{V}$, $R_L=2\text{K}\Omega$	± 12	± 13		V
Input Voltage Range	$V_s=\pm 15\text{V}$	± 11.5			V
Common Mode Rejection Ratio		70	100		dB
Supply Voltage Rejection Ratio		65	80		dB

Note 1: The LM318 is 110°C . For operating at elevated temperatures, devices in the H08 package must be derated based on a thermal resistance of 160°C/W , junction to ambient, or 20°C/W , junction to case. The thermal resistance of the dual-in-line package is 100°C/W , junction to ambient.

Note 2: The inputs are shunted with back-to-back diodes for over voltage protection. Therefore, excessive current will flow if a differential input voltage in excess of 1V is applied between the inputs unless some limiting resistance is used.

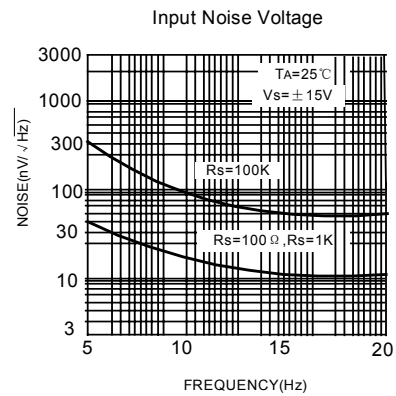
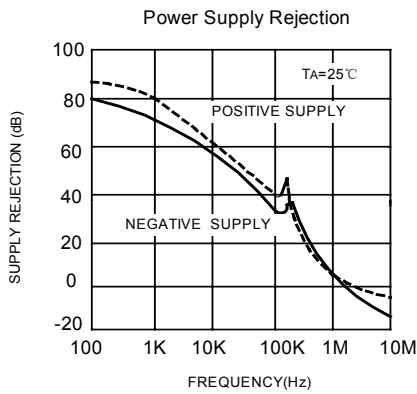
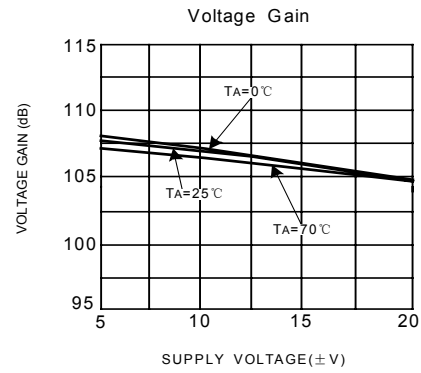
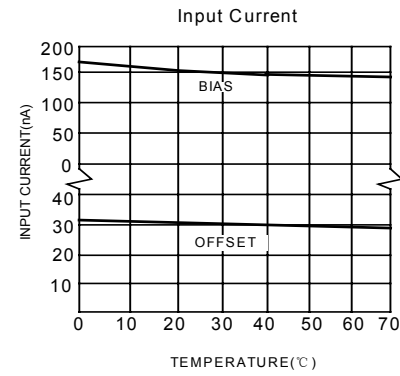
Note 3: For supply voltage less than $\pm 15\text{V}$, the absolute maximum input voltage is equal to the supply voltage.

Note 4: These specifications apply for $\pm 5\text{V}\leq V_s\leq\pm 20\text{V}$ and $0^{\circ}\text{C}\leq T_A\leq +70^{\circ}\text{C}$. Also, power supplies must be bypassed with 0.1 μF disc capacitors.

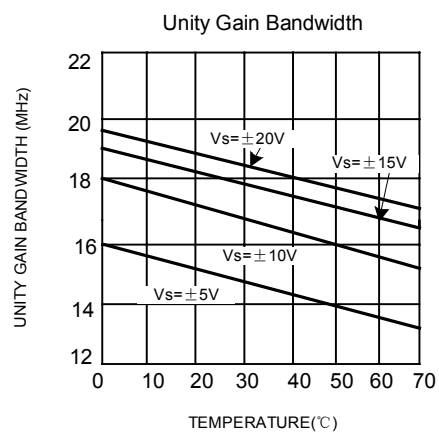
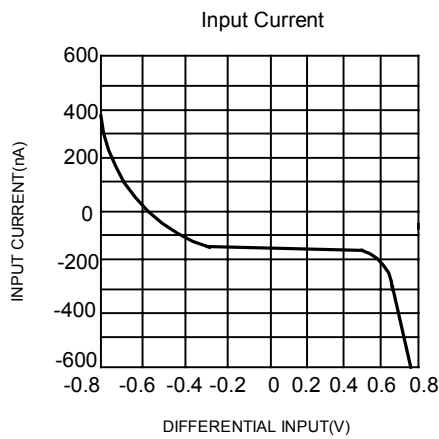
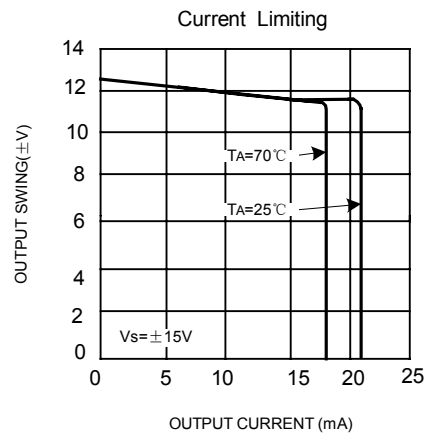
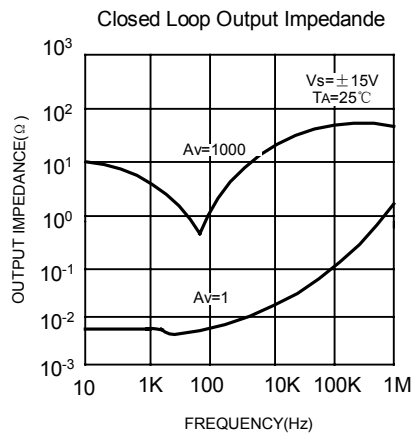
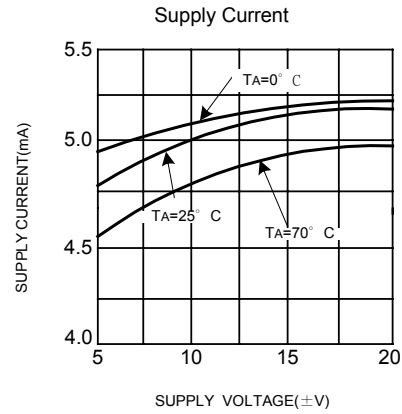
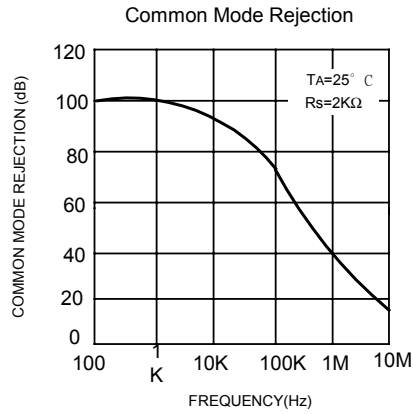
Note 5: Slew rate is tested with $V_s=\pm 15\text{V}$. V_{IN} is stepped from -7.5V to +7.5V and vice versa. The slew rate between -5.0V and +5.0V and vice versa are tested and guaranteed to exceed 50 V/ μs .

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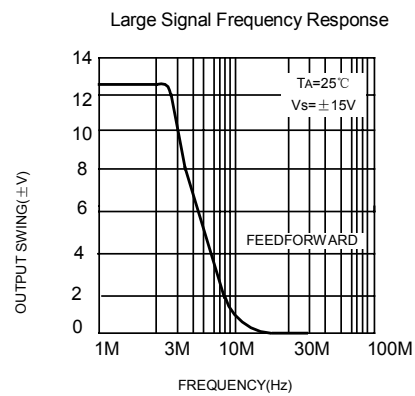
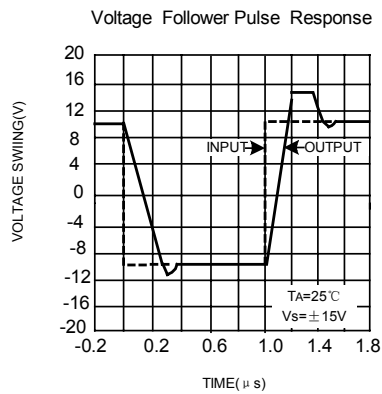
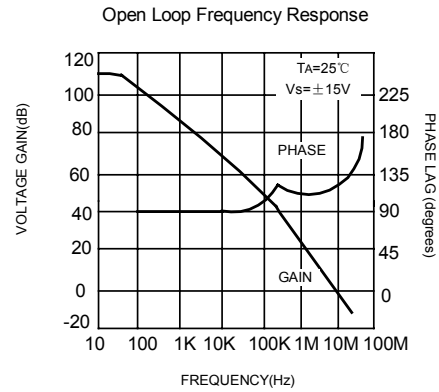
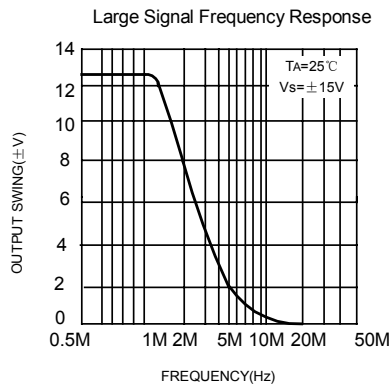
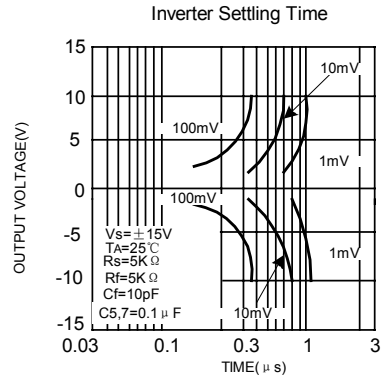
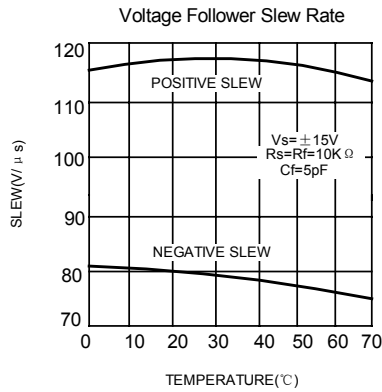
TYPICAL PERFORMANCE CHARACTERISTICS



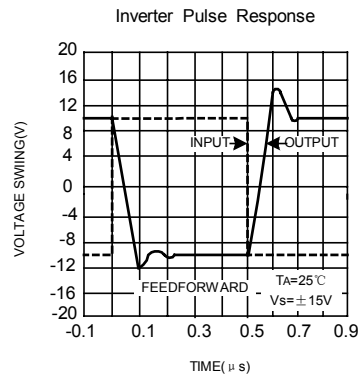
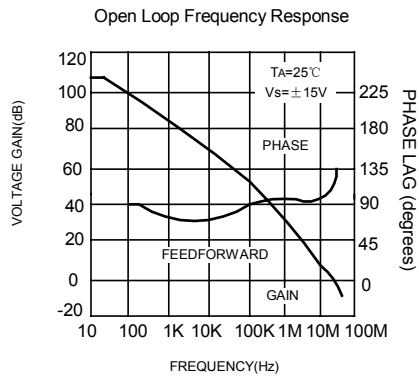
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SCHEMATIC DIAGRAM

