

UNISONIC TECHNOLOGIES CO., LTD

LM318

LINEAR INTEGRATED CIRCUIT

HIGH SPEED OPERATIONAL AMPLIFIER

DESCRIPTION

The UTC LM318 is a precision, high speed, high gain operational amplifier that has been specifically designed for use in high slew rate and wide bandwidth applications. Unlike many wideband amplifiers, the UTC LM318 is unity-gain stable since it has internal circuitry for frequency compensation. However, external components may be added for compensation to achieve optimum performance.

When used in inverting applications, feed-forward compensation can be used to achieve slew rate in excess of 150V/ μ s and almost double the bandwidth. For greater stability, using overcompensation with the amplifier is possible if maximum bandwidth is not needed. In general, by adding a single capacitor can reduce the settling time for 0.1% error band to under 1 μ s.

The typical applications of UTC **LM318** include A/D converters, fast integrator, oscillators, active filters, sample and hold circuits, or general purpose amplifiers.

FEATURES

- * Unit gain stable (internal frequency compensation)
- * 4mV typical input offset voltage
- * 30nA typical input offset current
- * Input bias current of 250nA (maximum)
- * 15MHz bandwidth (small signal)

ORDERING INFORMATION

- * 50V/µs slew rate (guarantee)
- * Operates voltages of ±5V to ±20V
- * Overload protection for Input and output
- * Same pin assignment as general-purpose op amps

Order Number		Deskere	Decking		
Lead Free	Halogen Free	Раскаде	Раскіпд		
LM318L-D08-T	LM318G-D08-T	DIP-8	Tube		
LM318L-S08-R	LM318G-S08-R	SOP-8	Tape Reel		

LM318G- <u>D08</u> -T		
	(1)Packing Type	(1) T: Tube, R: Tape Reel
	(2)Package Type	(2) D08: DIP-8, S08: SOP-8
	(3)Green Package	(3) G: Halogen Free and Lead Free, L: Lead Free

MARKING

DIP-8	SOP-8		
8 7 6 5 Date Code UTC □□□□ L: Lead Free LM318 □□ G: Halogen Free □□ ↓ Lot Code	8 7 6 5 UTC □□□□ L: Lead Free LM318 □ G: Halogen Free • □□ Lot Code		



LM318

PIN CONFIGURATIONS



■ SCHEMATIC DIAGRAM





ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V _{CC+}	+20	V
Supply Voltage	V _{CC} -	-20	V
Input Voltage (Note 2)	VIN	±15	V
Differential Input Current (Note 3)	I _{I(DIFF)}	±10	mA
Power Dissipation	PD	500	mW
Output Short-Circuit Duration		Continuous	
Maximum Junction Temperature	TJ	110	°C
Operating Temperature Range	T _{OPR}	0 ~ +70	°C
Storage Temperature Range	T _{STG}	-65 ~ +150	°C

Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

2. For supply voltage less than ±15V, the absolute maximum input voltage is equal to the supply voltage.

3. The inputs are shunted with two opposite-facing base-emitter diodes for over voltage protection. Therefore, excessive current flows if a differential input voltage in excess of 1V is applied between the inputs unless some limiting resistance is used.

■ ELECTRICAL CHARACTERISTICS (±5V≤ V_{CC} ≤±20V, 0°C≤T_A≤+70°C, unless other specifics)

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Input Voltage Range	VIN	V _{cc} =±15V	±11.5			V
Output Voltage Swing	Vout	V _{CC} =±15V, R _L =2KΩ	±12	±13		V
Input Offset Voltage (Note 2)	VI(OFF)	T _A =25°C		4	10	mV
					15	mV
	Gv	T _A =25°C, V _{CC} =±15V	25 /	200		\//m\/
Large Signal Voltage Gain		V _{OUT} =±10V, R _L ≥2KΩ	25	200		v/IIIv
		Vcc =±15V, Vo∪τ=±10V, R∟≥2KΩ	20			V/mV
Input Offect Current	II(OFF)	T _A =25°C		30	200	nA
					300	nA
Innut Rice Current	II(BIAS)	T _A =25°C		150	500	nA
Input Bias Current					750	nA
Supply Current	lss	T _A =25°C		5	10	mA
Input Resistance	Rs	T _A =25°C	0.5	3		MΩ
Slew Rate	SR	T _A =25°C, V _{CC} =±15V, Gv=1	50	70		V/µs
Small Signal Bandwidth	SBw	T _A =25°C, V _{CC} =±15V		15		MHz
Common Mode Rejection Ratio	CMRR		70	100		dB
Supply Voltage Rejection Ratio	SVRR		65	80		dB

Notes: 1. These power supplies must be bypassed with 0.1µF(or larger) disc ceramic capacitor within an inch of the device.

2. Input offset voltage measurements are according Figure 1, use external resistors to balance the resistance values from V_{CC}+ to Pin1 (COMP-1) and Pin5 (COMP-3) then measure.



LM318

APPLICATION CIRCUIT







LINEAR INTEGRATED CIRCUIT

TYPICAL CHARACTERISTICS













Supply Current 6.5 6.0 5.5

Supply Current (mA)



Supply Voltage (\pm V)





■ TYPICAL CHARACTERISTICS (Cont.)

600 500 400 400 300 200 100 0 20 40 60 80 100 120 140 Ambient Temperature(C)

Power Dissipation vs Ambient Temperature

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