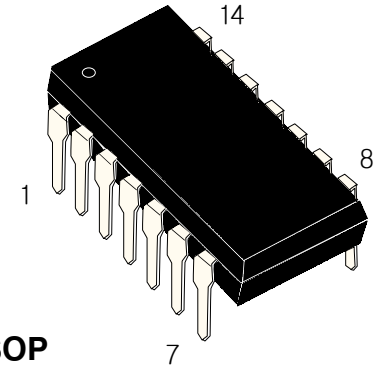
LOW POWER QUAD OPERATIONAL AMPLIFIER

The WSL324 contains four independent high gain operational amplifiers with internal frequency compensation.The four Op-Amps operate over a wide voltage range from a single power supply.Also use a split power supply.The device has low power supply current drain,regardless of the power supply voltage. The low power drain also makes the WSL324 a good choice for Battery operation.

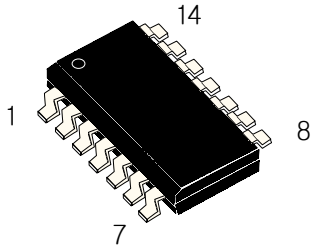
When your project calls for a traditional Op-Amp function,now you can streamline your design with a simple single power supply.Use ordinary +5V DC common to practically any Digital System or Personal Computer application,without requiring an extra 15V power supply just to have the interface electronics you need.

The WSL324 is a versatile,rugged workhouse with a thousand-and-one use,from amplifyng signals from a variety of transducers to DC gain blocks,or any OP-Amp function.The attached pages offer some recipes that will have your project cooking in no time.

14DIP



14SOP



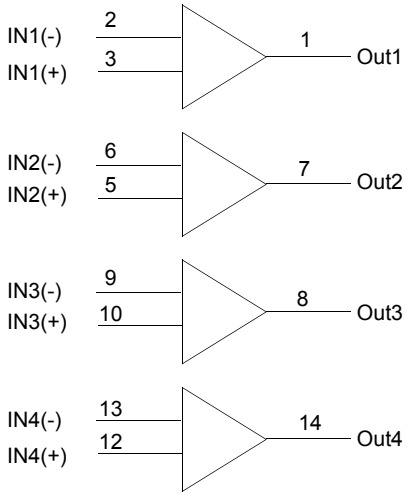
FEATURES

- ◇ Internally frequency compensated for unity gain
- ◇ Large DC voltage gain :100dB
- ◇ Wide power supply range :3V~32V(or ± 1.5~± 16V)
- ◇ Input common mode Voltage range includes ground
- ◇ Large output voltage swing:0V DC to Vcc-1.5V DC
- ◇ Power drain suitable for Battery operation
- ◇ Low input offset voltage and offset current
- ◇ differential input range equal to the power supply voltage

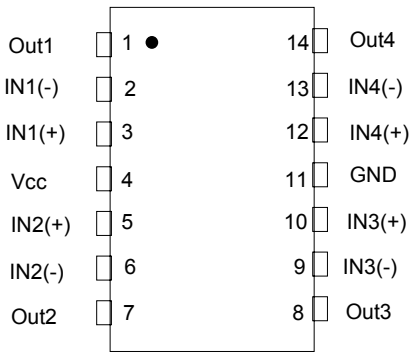
Ordering Information

Device	Operating Temperature	Package
WSL324PZ	0~70℃	14DIP
WSL324RZ		14SOP

LOGIC DIAGRAM



PIN ASSIGNMENT



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ABSOLUTE MAXIMUM RATINGS*

Characteristic	Symbol	Value	Unit
Power Supply Voltages Single Supply Split Supplies	V_{CC}	32 ± 16	V
Input Differential Voltage Range(1)	V_{IDR}	± 32	V
Input Common Mode Voltage Range	V_{ICR}	-0.3 to 32	V
Output Short Circuit Duration	I_{SC}	Continuous	
Junction Temperature(14DIP)	T_j	150	℃
Storage Temperature(14DIP)	T_{stg}	-55~125	℃
Input Current,per Pin(2)	I_{IN}	50	mA
Lead Temperature,1mm from Case for 10sec.	T_L	260	℃

* Maximum Ratings are those values beyond which damage to the device may occur.
Function operation should be restricted to the Recommended Operating Conditions.
 derating :14DIP :-10mW/℃ from 65℃ to 125℃
8SOP :-7mW/℃ from 65℃ to 125℃

[NOTE]
(1)Split Power Supplies
(2)V_{IN}<0.3V. This input current will only exist when voltage at any of the input leads is driven negative.

RECOMMENDED OPERATING CONDITIONS

Characteristic	Symbol	Min	Max	Unit
DC Supply Voltage	V_{CC}	± 2.5 or 5.0	± 15 or 30	V
Operating Temperature (All Package Types)	T_A	0	+70	℃

This device contains protection circuitry to guard against damage due to high static voltages or electric fields. However,precautions must be taken to avoid applications of any voltage higher than maximum rated voltages to this high-impedance circuit.For proper operation,V_{IN} and V_{OUT} should be constrained to the range GND≤ (V_{IN} and V_{OUT})≤ V_{CC}.

Unused inputs must always be tied to an appropriate logic voltage level(e.g.,either GND or V_{CC}). Unused outputs must be left open.

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ELECTRICAL CHARACTERISTICS

T_A=0~70℃

Characteristic	Symbol	Test condition	Min.	Typ.	Max.	Unit
Maximum Input Offset Voltage	V_{IO}	V_O=1.4V V_{CC}=5.0~30V R_S=0Ω ,V_{ICM}=0V to V_{CC}-1.7V			9.0	mV
Input offset Voltage Drift	Δ V_{IO}/Δ T	R_S=0Ω ,V_{CC}=30V		7.0		μV/℃
Maximum Input offset Current	I_{IO}	V_{CC}=5.0V			150	nA
Input offset Current Drift	Δ I_{IO}/Δ T	R_S=0Ω ,V_{CC}=30V		10		pA/℃
Maximum Input Bias current	I_{IB}	V_{CC}=5.0V			-500	nA
Input Common Mode Voltage Range	V_{ICR}	V_{CC}=30V	0		28	V
Maximum Power Supply Current	I_{CC}	RL=∞ ,V_{CC}=30V ,V_0=0V RL=∞ ,V_{CC}=5V , V_0=0V			3 1.2	mA
Minimum Large Signal Open-Loop Voltage Gain	A_{VOL}	V_{CC}=15V ,RL≥ 2kΩ	15			V/mV
Minimum Output High Level Voltage Swing	V_{OH}	V_{CC}=30V ,RL=2kΩ V_{CC}=30V ,RL=10kΩ	26 27			V
Maximum Output low Level Voltage Swing	V_{OL}	V_{CC}=5V ,RL=10kΩ			20	mV
Common Mode Rejection	CMR	V_{CC}=30V ,Rs=10kΩ	65*			dB
Power Supply Rejection	PSR	V_{CC}=30V	65			dB
Channel Seperation	CS	f=1KHz to 20KHz,V_{CC}=30V	-120*			dB
maximum Output Short Circuit to GND	I_{SC}	V_{CC}=30V			60*	mA
Minimum Output Source Current	I_{SOURCE}	V_{IN+}=1V ,V_{IN-}=0V ,V_{CC}=15V,V_0=0V	10			mA
Minimum Output Sink Current	I_{SINK}	V_{IN+}=0V ,V_{IN-}=1V, V_{CC}=15V, V_0=15V V_{IN+}=0V ,V_{IN-}=1V, V_{CC}=15V, V_0=0.2V	5 12*			mA μA
Differential Input Voltage Range	V_{IDR}	All V_{IN}≥ GND or V-supply(If Used)			V_{CC}*	V

*=@ 25℃

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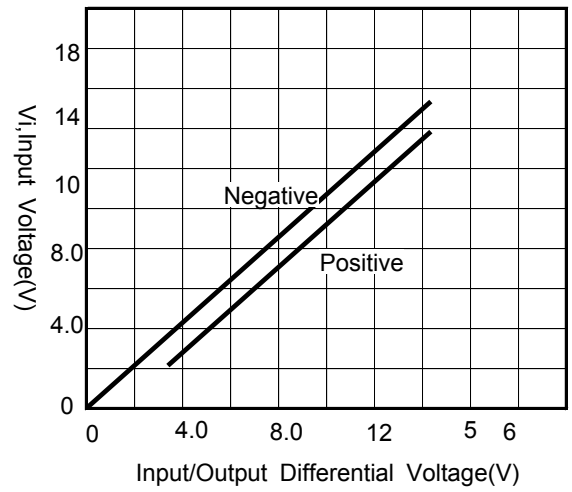
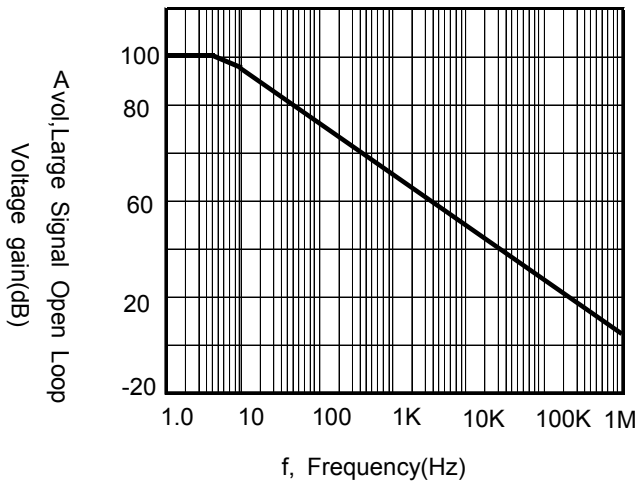
TYPICAL PERFORMANCE CHARACTERISTICS

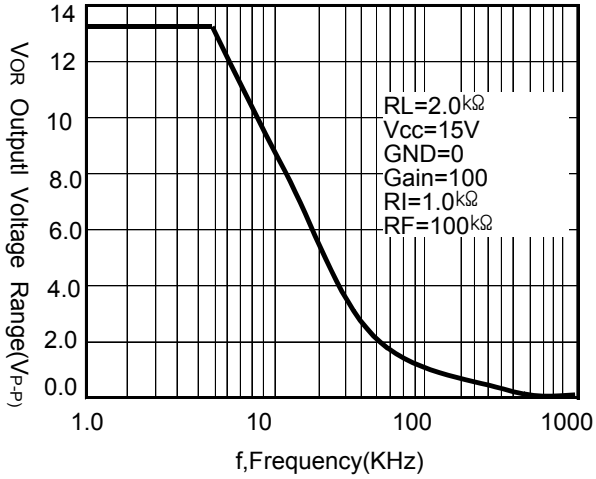
Input Voltage Range



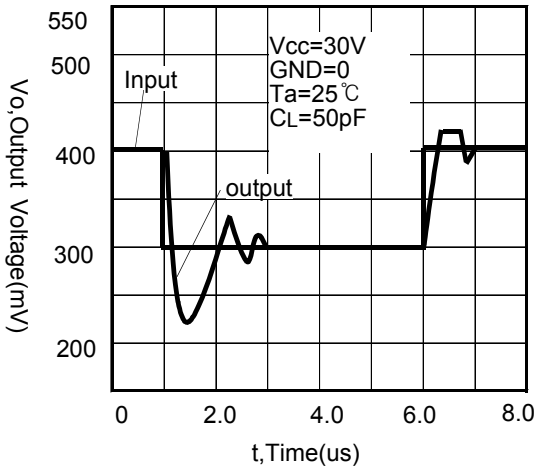
Open -Loop Frequency



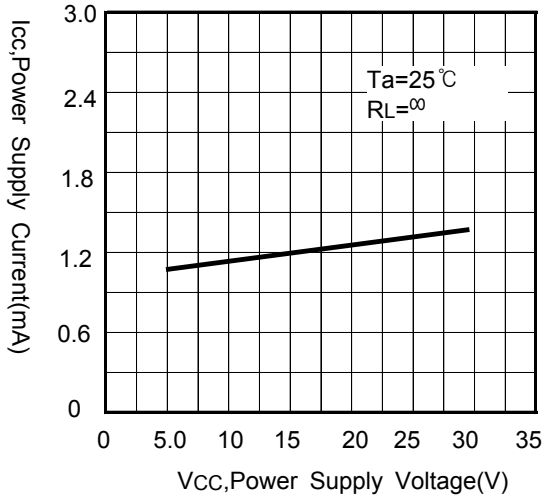
Large Signal Frequency Response



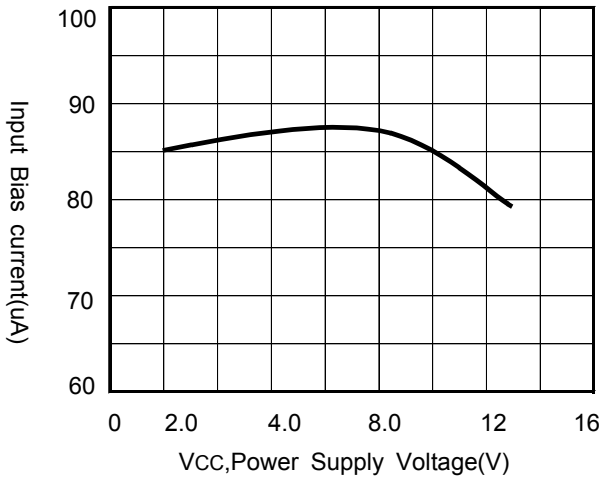
Small Signal Voltage Follower Pulse Respnse(Noninverting)



Power Supply Current-Voltage



Input Bias current-Power Supply Volatge



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