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NEC Electronics Inc.

μPC324
QUAD LOW-POWER OPERATIONAL AMPLIFIER

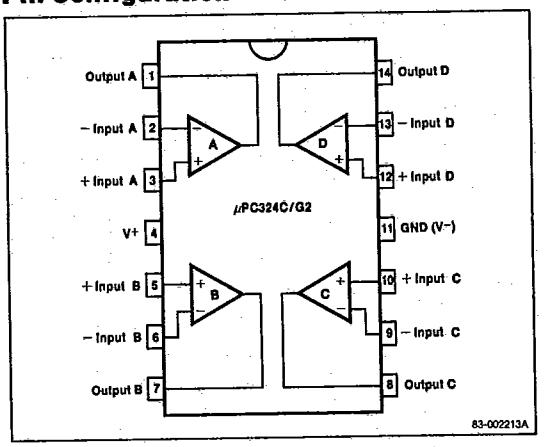
Description

The μPC324 is a quad operational amplifier designed to operate from either single or split power supplies, with very low current drain. The input common mode voltage of these amplifiers includes ground and they are internally frequency compensated for unity gain stability.

Features

- ☐ Internal frequency compensation
- ☐ Large output voltage swing: 0 V to V+ — 1.5 V DC
- ☐ Input common mode voltage range includes ground
- ☐ Wide power supply range:
  - Single supply 3 V to 30 V DC
  - Dual supplies ±1.5 V to ±15 V DC
- ☐ LM324 direct replacement

Pin Configuration

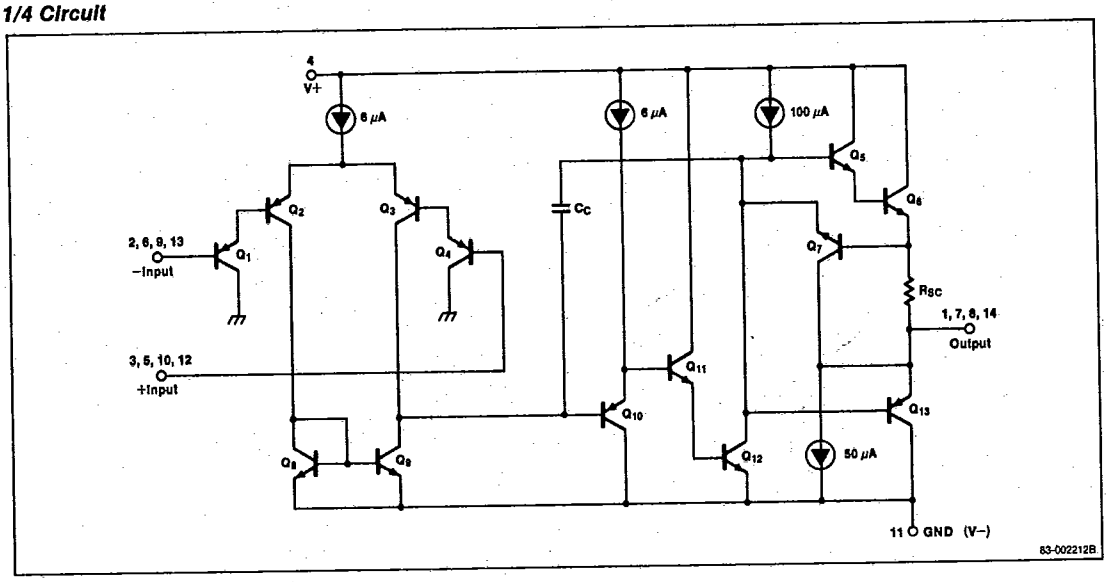


Ordering Information

Part Number	Package	Operating Temperature Range
μPC324C	Plastic DIP	0° to +70°C
μPC324G2	Plastic Miniflat	0° to +70°C

Equivalent Circuit

1/4 Circuit



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Absolute Maximum Ratings

$T_A = 25°C$, $V\pm = \pm 5$ V

Voltage Between V+ and V−	32 V
Differential Input Voltage	32 V
Input Voltage	−0.3 to +32 V
Power Dissipation, C Package	570 mW
Power Dissipation, G Package	550 mW
Operating Temperature Range, C or G Package	0 to +70°C
Storage Temperature Range, C or G Package	−55 to +125°C

Electrical Characteristics

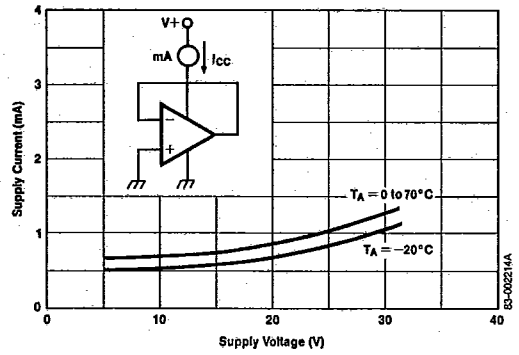
$T_A = 25°C$, $V\pm = \pm 5$ V

Parameter	Symbol	Limit Min.	Typ.	Max.	Unit	Test Conditions
Input Offset Voltage	V_{IO}		2	7	mV	$R_S = 0\ \Omega$
Input Bias Current	I_b		45	250	nA	
Input Offset Current	I_{IO}		5	50	nA	
Common Mode Input Voltage Range	V_{ICM}	0		V+ − 1.5	V	
Supply Current	I_{CC}		0.8	2	mA	$R_L = \infty$ on all op-amps
Large Signal Voltage Gain	A_{VOL}	88	100		dB	$R_L \geq 2\ k\Omega$
Output Voltage Swing	V_{OM}	0		V+ − 1.5	V	$R_L = 2\ k\Omega$
Common Mode Rejection Ratio	CMRR	65	85		dB	
Supply Voltage Rejection Ratio	SVRR	65	10		dB	
Channel Separation	CS		120		dB	f = 1 kHz to 20 kHz
Output Current (Source)	$I_{OSOURCE}$	20	40		mA	+ Input = 1 V, − Input = 0 V
Output Current (Sink)	I_{OSINK}	10	20		mA	− Input = 1 V, + Input = 0 V
Output Current (Sink)	I_{OSINK}	12	50		mA	− Input = 1 V, + Input = 0 V

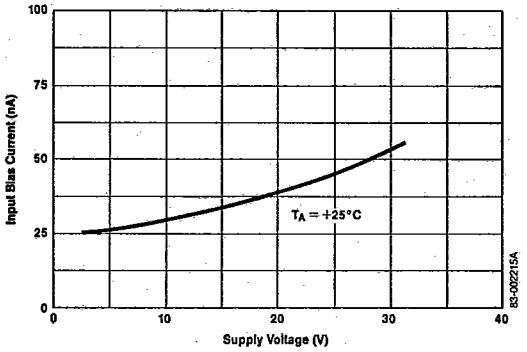
Operating Characteristics

$T_A = 25°C$

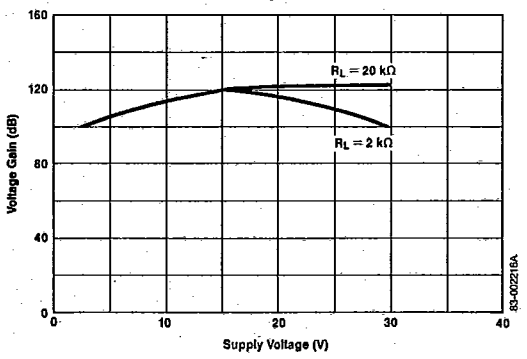
Supply Current



Input Bias Current



Voltage Gain



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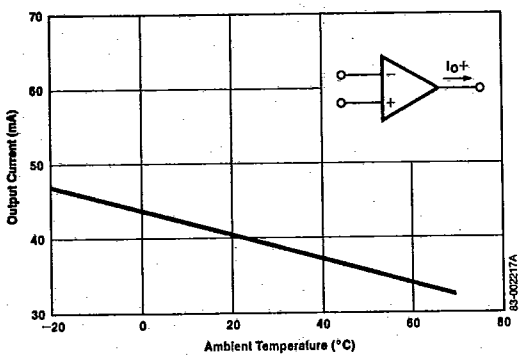
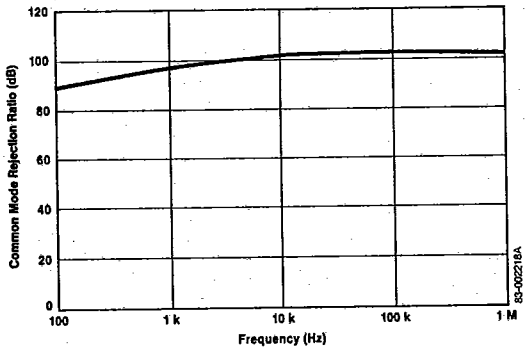
Operating Characteristics (Cont.)

$T_A = 25°C$

Current Limiting



Common Mode Rejection Ratio



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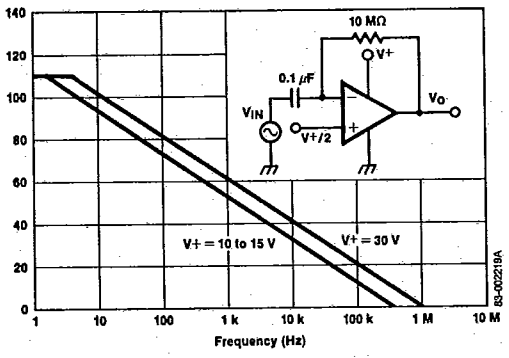
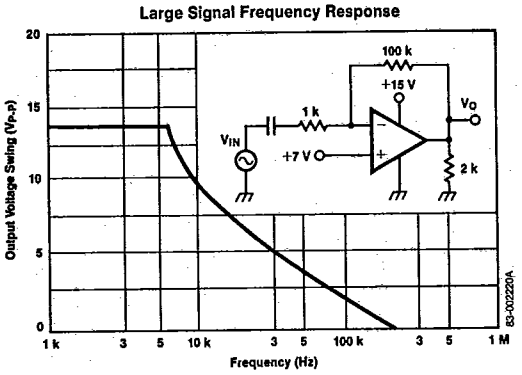
Open Loop Frequency Response



Large Signal Frequency Response



Voltage Follower Large Signal Pulse Response