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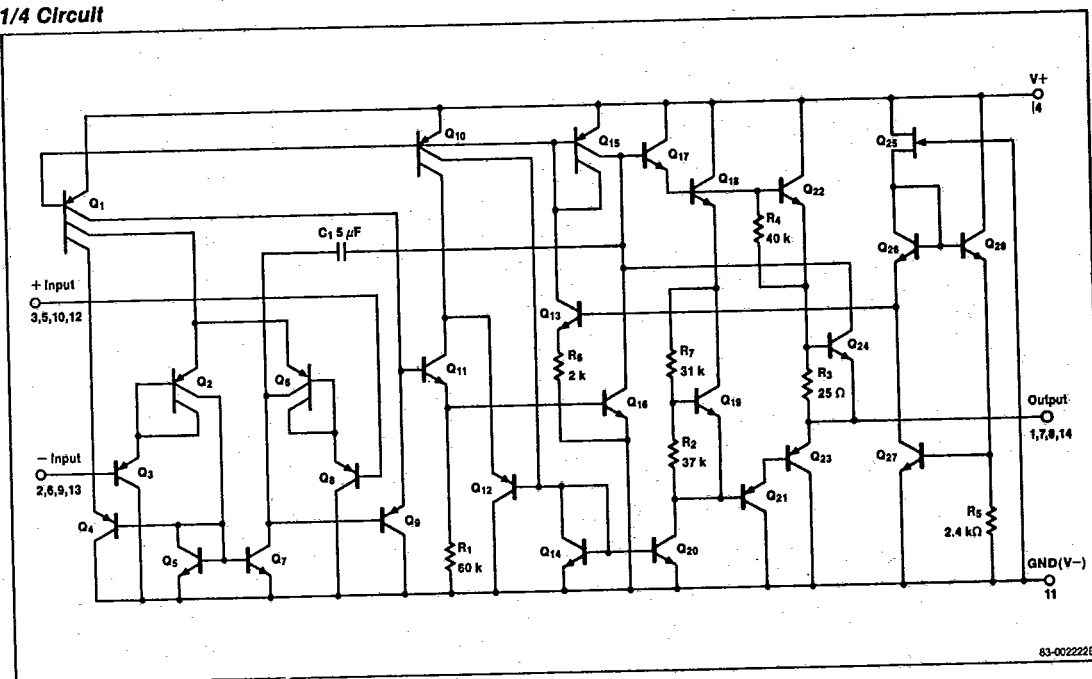
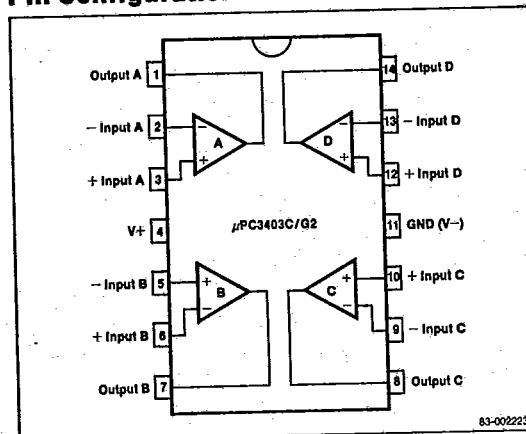
NEC Electronics Inc.

 **μ PC3403
QUAD HIGH-PERFORMANCE
OPERATIONAL AMPLIFIER****Description**

The μ PC3403 quad operational amplifier is designed with four independent high gain frequency compensated operational amplifiers. Featuring operations from either single or split power supplies from 3 V to ± 18 V. The common mode input range includes the negative supply which eliminates the need for external biasing circuitry in most applications.

Features

- ☐ Input common mode voltage range includes ground or negative supply
- ☐ Output voltage can swing to ground or negative supply
- ☐ Wide power supply range:
 - Single supply of 3.0 to 36 V
 - Split supplies of ± 1.5 to 18 V
- ☐ Class AB output stage for minimal crossover distortion
- ☐ Short-circuit protected outputs
- ☐ MC3403 direct replacement

Equivalent Circuit**1/4 Circuit****Pin Configuration****3**

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μPC3403**NEC****Absolute Maximum Ratings** $T_A = 25^\circ\text{C}$

Voltage Between V^+ and V^-	36 V
Differential Input Voltage	± 36 V
Input Voltage (Note 1)	± 18 V
Power Dissipation, C Package	570 mW
Power Dissipation, G2 Package	550 mW
Operating Temperature Range	0 to $+70^\circ\text{C}$
Storage Temperature Range	-55 to $+125^\circ\text{C}$

Note: 1. The absolute maximum input voltage is equal to the supply voltage.

Comment: Stress above those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Ordering Information

Part Number	Package	Operating Temperature Range
μPC3403C	Plastic DIP	0°C to $+70^\circ\text{C}$
μPC3403G2	Plastic Miniflat	0°C to $+70^\circ\text{C}$

Electrical Characteristics $T_A = 25^\circ\text{C}$, $V^\pm = \pm 15$ V

Parameter	Symbol	Limits			Unit	Test Conditions
		Min.	Typ.	Max.		
Input Offset Voltage	V_{IO}		2.0	7.0	mV	$V^+ = +5$ V, $V^- = \text{GND}$
Input Offset Current	I_{IO}		5	50	nA	$V^+ = +5$ V, $V^- = \text{GND}$
Input Bias Current	I_b		45	250	nA	$V^+ = +5$ V, $V^- = \text{GND}$
Large Signal Voltage Gain	A_{VOL}	86	98		dB	$V_O = \pm 10$ V, $R_L = 2$ k Ω
		86	98		dB	$V^+ = +5$ V, $V^- = \text{GND}$, $R_L = 2$ k Ω
Input Voltage Range	V_{icm}	+13 to -15	+13.5 to -15		V	
Common Mode Rejection Ratio	CMRR	70	90		dB	
Supply Voltage Rejection Ratio	SVRR		89	103	dB	
				103	dB	$V^+ = +5$ V, $V^- = \text{GND}$
Supply Current	I_{CC}		2.8	7.0	mA	$V_O = 0$, $R_L = \infty$, all channels
			2.5	7.0	mA	$V^+ = +5$ V, $V^- = \text{GND}$, all channels
Output Short Circuit Current (see Note)	$I_{O\text{SHORT}}$	± 10	± 20	± 45	mA	
Output Voltage Swing	V_{OM}	± 12	± 13.5			$R_L = 10$ k Ω
		± 10	± 13		V	$R_L = 2.0$ k Ω
		$V^+ - 1.7$	$V^+ - 1.5$		V	$R_L = 10$ k Ω , 5 V $\leq V^+ \leq 30$ V, $V^- = \text{GND}$
Channel Separation	CS		120		dB	$f = 1$ kHz to 20 kHz

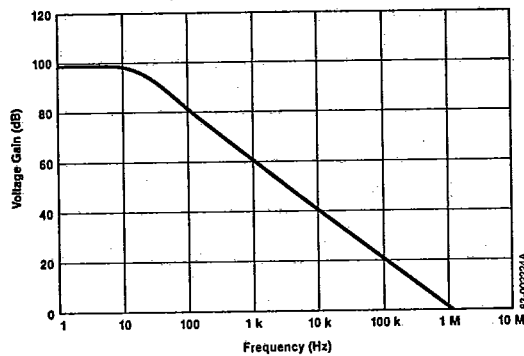
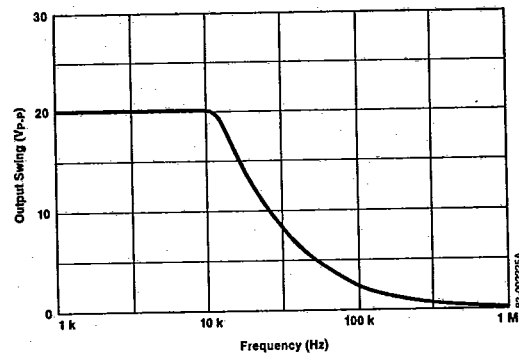
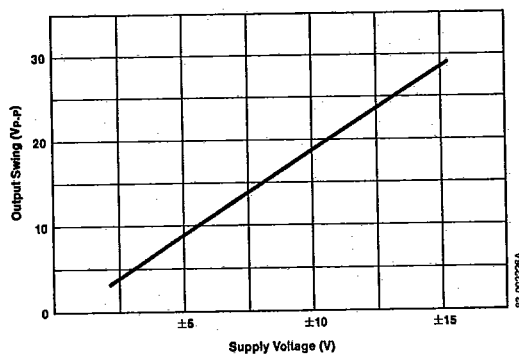
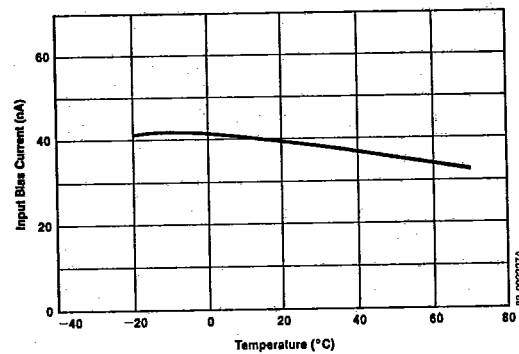
Note: Do not exceed the maximum power dissipation rating.

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NEC **μ PC3403****Operating Characteristics** $T_A = 25^\circ\text{C}$ **Open Loop Frequency Response****Power Bandwidth****Output Swing****Input Bias Current****Input Bias Current**