

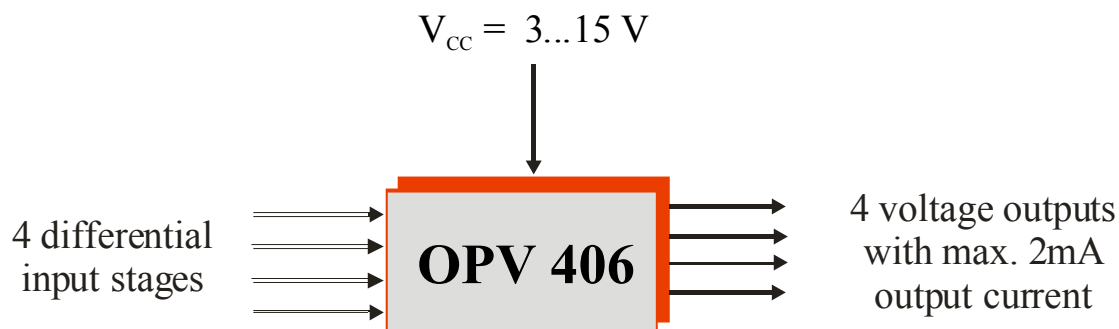
QUAD PRECISION-OPERATIONAL AMPLIFIER OPV406

PRINCIPLE DESCRIPTION

General purpose quad operational amplifier with four independent configurable single amplifiers. All amplifiers are short-circuit protected and unity-gain stable.

No external stabilization capacities needed.

Single- or dual power supply mode is possible.



TYPICAL APPLICATIONS

- Precision circuits with up to four operational amplifiers
- Instrumental amplifiers
- Signal conditioner
- Impedance converters
- Filter applications
- Differential line driver

analog microelectronics
integrated circuits

Analog Microelectronics GmbH
An der Fahrt 13, D – 55124 Mainz

Phone: +49 (0)6131/91 073-0
Fax: +49 (0)6131/91 073-30
Internet: <http://www.analogmicro.de>
E-Mail: info@analogmicro.de

QUAD PRECISION-OPERATIONAL AMPLIFIER OPV406

CONTENTS

PRINCIPLE FUNCTION	1
TYPICAL APPLICATIONS	1
CONTENTS	2
FEATURES	3
BLOCK DIAGRAM	3
GENERAL DESCRIPTION	3
ELECTRICAL SPECIFICATIONS	4
BLOCK DIAGRAM AND PINOUT	5
DELIVERY	6
NOTES	6

The logo for Analog Microelectronics features the company name in a red, sans-serif font. The words "analog microelectronics" are on the top line, and "integrated circuits" is on the bottom line. A red curved line arches over the text, and another red curved line arches under the text.

analog microelectronics
integrated circuits

Analog Microelectronics GmbH
An der Fahrt 13, D – 55124 Mainz

Phone: +49 (0)6131/91 073-0
Fax: +49 (0)6131/91 073-30
Internet: <http://www.analogmicro.de>
E-Mail: info@analogmicro.de

December 2008 -Rev1.0- Page 2/6

QUAD PRECISION-OPERATIONAL AMPLIFIER OPV406

FEATURES

- Four independent precision operational amplifiers in one case
- Supply voltage (single/dual supply): 3V ... 15V bzw. $\pm 1.5V$... $\pm 7.5V$
- Input currents: typ. 6nA (15V)
- Offset voltage: typ. 120 μ V
- PSRR: 130dB
- GBW: 820kHz (15V)
- Slew Rate : 0,3V/ μ s (15V)
- Temperature range: -40°C ... +125°C
- Unity-gain stable
- Rail-to-rail output stage
- Output short circuit protected
- Load capacities up to $C_L=1nF$
- Output current up to 2mA (5V ... 15V)
- RoHS-compliant

GENERAL DESCRIPTION

The OPV406 is a general purpose quad precision operation amplifier. Its four integrated single amplifiers can be operated completely independently or in combination. Circuits with up to four precision operational amplifiers can be realized with only one integrated circuit (IC).

The IC can be operated in single supply mode (positive operating voltage and GND) or dual supply mode (two operating voltages with positive and negative polarity). If two operating voltages are selected, the output can be controlled toward positive and negative output values.

The OPV406 has the industry standard quad operation amplifier pinout, and is thereby pin-compatible with all types of quad operational amplifiers.

BLOCK DIAGRAM

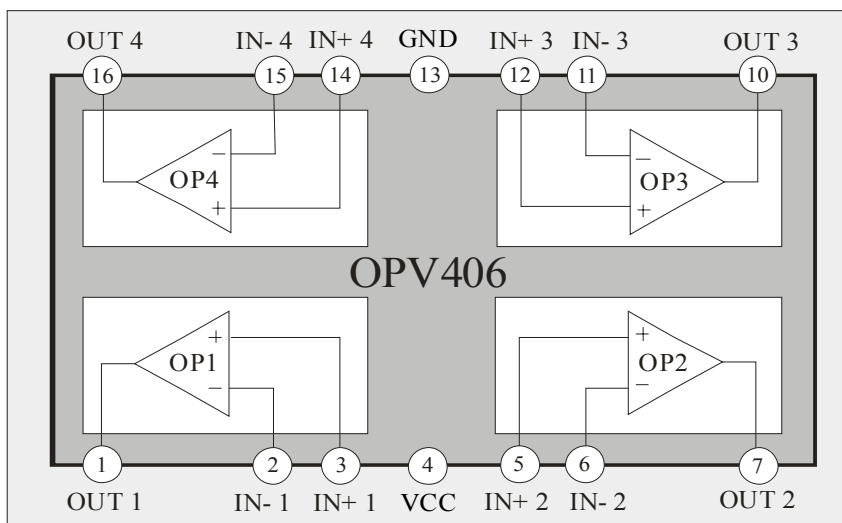


Figure 1: Block diagram of OPV406

analog microelectronics
integrated circuits

Analog Microelectronics GmbH
An der Fahrt 13, D – 55124 Mainz

Phone: +49 (0)6131/91 073-0
Fax: +49 (0)6131/91 073-30
Internet: <http://www.analogmicro.de>
E-Mail: info@analogmicro.de

QUAD PRECISION-OPERATIONAL AMPLIFIER OPV406

ELECTRICAL SPECIFICATIONS

$T_{amb} = +25^{\circ}\text{C}$ (unless otherwise noted). Currents flowing into the IC are negative. V_{CM} = Common Mode Input Voltage

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Supply Voltage(s)	$V_{CC}(V+/V-)$	Single supply (Dual supply)	3 (± 1.5)		15 (± 7.5)	V
Temperature Specifications						
Operating	T_{amb}		-40		125	$^{\circ}\text{C}$
Storage	T_{st}		-55		150	$^{\circ}\text{C}$
Junction	T_J				150	$^{\circ}\text{C}$
Operational Amplifier Specifications						
Quiescent Current (All 4 Amplifiers)	I_{CC}	$V_{CC}=3V$ $T_{amb} = -40 \dots +125^{\circ}\text{C}, V_{CC}=3V$ $V_{CC}=15V$ $T_{amb} = -40 \dots +125^{\circ}\text{C}, V_{CC}=15V$	1.1 1.7	1.9 3.0	3.2 4.7 4.8 7.0	mA
Offset Voltage	V_{OS}	$V_{CC}=3 \dots 15V$		± 120	± 500	μV
V_{OS} vs. Temperature	dV_{OS}/dT	$T_{amb} = -40 \dots 105^{\circ}\text{C}, V_{CC}=3 \dots 15V$		± 0.5	± 3	$\mu\text{V}/^{\circ}\text{C}$
V_{OS} vs. Temperature	dV_{OS}/dT	$T_{amb} = 105 \dots 125^{\circ}\text{C}, V_{CC}=3 \dots 15V$			± 6	$\mu\text{V}/^{\circ}\text{C}$
Input Bias Current	I_B	$V_{CM} = 2.5V, V_{CC}=15V$	0	12	24	nA
I_B vs. Temperature	dI_B/dT	$T_{amb} = -40 \dots 95^{\circ}\text{C}, V_{CC}=15V$ $T_{amb} = 95 \dots 125^{\circ}\text{C}, V_{CC}=15V$		± 30 -250		$\text{pA}/^{\circ}\text{C}$
Input Resistance	dR_{IN}	$dV_{CM} / dI_{B,typ} V_{CC}=15V$		-0.9		G Ω
Input Capacitance	C_{IN}	by design		3		pF
Common Mode Input Range	$CMIR$	$V_{CC}=3 \dots 15V$	1		$V_{CC}-1.7$	V
Common Mode Rejection Ratio	$CMRR$	$V_{CC}=3V$ $V_{CC}=15V$	95 100	120 125		dB
Open Loop Gain	G_0	$C_L = 1\text{nF}, I_{out}=0.5\text{mA}, V_{CC}=3V$ $C_L = 1\text{nF}, I_{out}=2\text{mA}, V_{CC}=5 \dots 15V$		120 110		dB
Adjustable Gain	G	$V_{CC}=3 \dots 15V$	1			
Output Voltage Range	V_{OUT}		0.2		$V_{CC} - 0.2$	V
Output Current	I_{OUT}	Sink and Source, $V_{CC}<5V$ Sink and Source, $V_{CC}=5 \dots 15V$			0.5 2.0	mA
Short Circuit Current	I_{SC}	Sink, $V_{CC}=3V$ Source, $V_{CC}=3V$ Sink, $V_{CC}=15V$ Source, $V_{CC}=15V$	-3.5 +1.5 -50 +9	-2.4 +2.4 -37.0 +12.0	-1.5 +3.5 -30.0 +20.0	mA
Output Load Capacitance	C_L				1	nF
Power Supply Rejection Ratio	$PSRR$	$V_{CC}=3 \dots 15V$	110	130		dB
Gain Bandwidth Product	GBW	$C_L=1\text{nF}, I_L=0.5\text{mA}, V_{CC}=3V$ $C_L=1\text{nF}, I_L=2\text{mA}, V_{CC}=15V$		680 820		kHz
Slew Rate	SR	$V_{CC}=3V$ $V_{CC}=15V$		0.25 0.30		V/ μs
Input Voltage Noise	e_n	$f_g=1\text{kHz}, V_{CC}=15V$		12.5		nV/ $\sqrt{\text{Hz}}$

Table 1: Specifications **Single Supply:** $V_{CC} = V_{CC}$ and $\text{Gnd} = \text{Gnd}$, **Dual Supply:** $V_{CC} = V+$ and $\text{Gnd} = V-$


analog microelectronics
integrated circuits

Analog Microelectronics GmbH
An der Fahrt 13, D – 55124 Mainz

Phone: +49 (0)6131/91 073-0
Fax: +49 (0)6131/91 073-30
Internet: <http://www.analogmicro.de>
E-Mail: info@analogmicro.de

QUAD PRECISION-OPERATIONAL AMPLIFIER OPV406

BLOCK DIAGRAM AND PINOUT

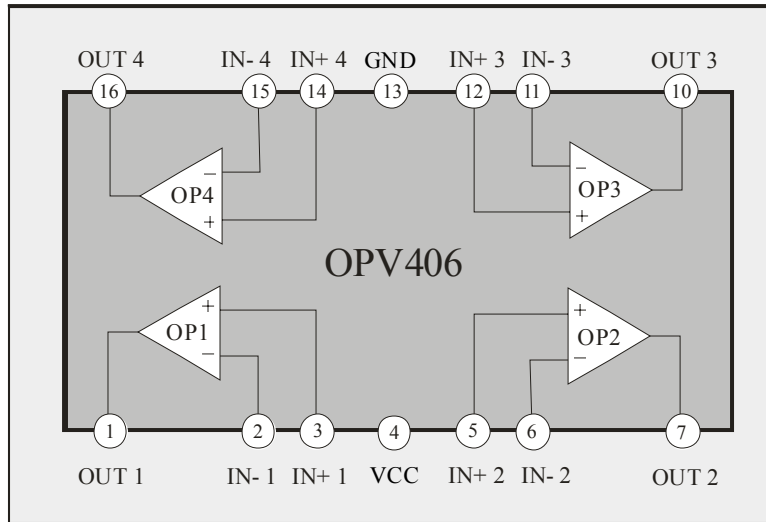


Figure 2: Block Diagram of OPV406

PIN	NAME	DESCRIPTION
1	<i>OUT 1</i>	Output OP1
2	<i>IN- 1</i>	Inverting input OP1
3	<i>IN+ 1</i>	Non-inverting input OP1
4	<i>VCC</i>	Positive supply voltage
5	<i>IN+ 2</i>	Non-inverting input OP2
6	<i>IN- 2</i>	Inverting input OP2
7	<i>OUT 2</i>	Output OP2
8	<i>N.C.</i>	Not connected
9	<i>N.C.</i>	Not connected
10	<i>OUT 3</i>	Output OP3
11	<i>IN- 3</i>	Inverting input OP3
12	<i>IN+ 3</i>	Non-inverting input OP3
13	<i>GND</i>	negative supply voltage / GND
14	<i>IN+ 4</i>	Non-inverting input OP4
15	<i>IN- 4</i>	Inverting input OP4
16	<i>OUT 4</i>	Output OP4

Table 2: Pinout of OPV406

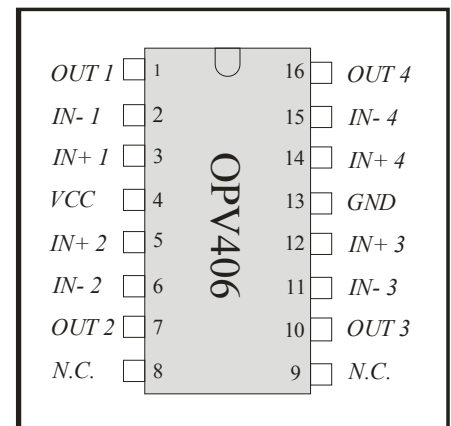


Figure 3: Pinout of OPV406

QUAD PRECISION-OPERATIONAL AMPLIFIER OPV406

DELIVERY

The OPV406 is available as:

- SSOP 16

Package dimensions: see <http://www.analogmicro.de/products/analogmicro.de.en.package.pdf>

NOTES

Analog Microelectronics GmbH reserves the right to amend any dimensions, technical data or other information contained herein without prior notification.

The logo for Analog Microelectronics GmbH features the company name in a red, sans-serif font. The words "analog microelectronics" are on the top line, and "integrated circuits" is on the bottom line. A red curved line arches over the top of the text, and another red curved line arches under the bottom of the text.

analog microelectronics
integrated circuits

Analog Microelectronics GmbH
An der Fahrt 13, D – 55124 Mainz

Phone: +49 (0)6131/91 073-0
Fax: +49 (0)6131/91 073-30
Internet: <http://www.analogmicro.de>
E-Mail: info@analogmicro.de

December 2008 -Rev1.0- Page 6/6