

OP113/OP213/OP413

FEATURES

- Single- or Dual-Supply Operation
- Low Noise: 4.7 nV/√Hz @ 1 kHz
- Wide Bandwidth: 3.4 MHz
- Low Offset Voltage: 100 μV
- Very Low Drift: 0.2 V/°C
- Unity Gain Stable
- No Phase Reversal

APPLICATIONS

- Digital Scales
- Multimedia
- Strain Gages
- Battery Powered Instrumentation
- Temperature Transducer Amplifier

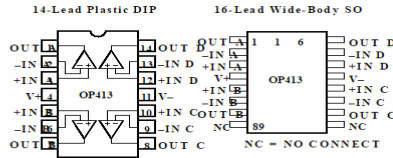
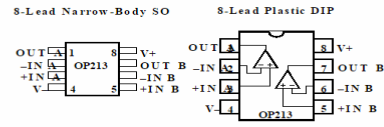
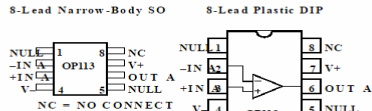
GENERAL DESCRIPTION

The OP113 family of single supply operational amplifiers features both low noise and drift. It has been designed for systems with internal calibration. Often these processor-based systems are capable of calibrating corrections for offset and gain, but they cannot correct for temperature drifts and noise. Optimized for these parameters, the OP113 family can be used to take advantage of superior analog performance combined with digital correction. Many systems using internal calibration operate from unipolar supplies, usually either +5 volts or +12 volts. The OP113 family is designed to operate from single supplies from +4 volts to +36 volts, and to maintain its low noise and precision performance.

The OP113 family is unity gain stable and has a typical gain bandwidth product of 3.4 MHz. Slew rate is in excess of 1 V/μs. Noise density is a very low 4.7 nV/√Hz, and noise in the 0.1 Hz to 10 Hz band is 120 nV p-p. Input offset voltage is guaranteed and offset drift is guaranteed to be less than 0.8 μV/°C. Input common-mode range includes the negative supply and to within 1 volt of the positive supply over the full supply range. Phase reversal protection is designed into the OP113 family for cases where input voltage range is exceeded. Output voltage swings also include the negative supply and go to within 1 volt of the positive rail. The output is capable of sinking and sourcing current throughout its range and is specified with 600 Ω loads.

Digital scales and other strain gage applications benefit from the very low noise and low drift of the OP113 family. Other applications include use as a buffer or amplifier for both A/D and

PIN CONNECTIONS



D/A sigma-delta converters. Often these converters have high resolutions requiring the lowest noise amplifier to utilize their full potential. Many of these converters operate in either single supply or low supply voltage systems, and attaining the greater signal swing possible increases system performance.

The OP113 family is specified for single +5 volt and dual ±1.5 volt operation over the XIND—extended industrial (-40 °C to +85 °C) temperature range. They are available in plastic and SOIC surface mount packages.

ABSOLUTE MAXIMUM RATINGS

Supply Voltage	±18 V
Input Voltage	±18 V
Differential Input Voltage	±10 V
Output Short-Circuit Duration to GND	Indefinite
Storage Temperature Range	-65 °C to +150 °C
Operating Temperature Range	-40 °C to +85 °C
Junction Temperature Range	-40 °C to +150 °C
Lead Temperature Range (Soldering, 60 sec)	+300 °C

Package Type	J _A ²	J _C	Units
8-Lead Plastic DIP (P)	103	43	°C/W
8-Lead SOIC (S)	158	43	°C/W
14-Lead Plastic DIP (P)	83	39	°C/W
16-Lead SOIC (S)	92	27	°C/W

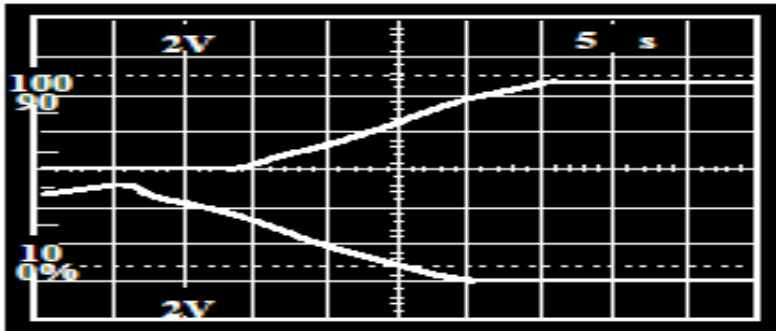
NOTES

1 Absolute maximum ratings apply to both DICE and packaged parts, unless otherwise noted.

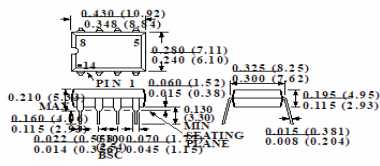
2 J_A is specified for the worst case conditions. J_C is specified for device in socket for certain P-DIP and LCC packages. J_C is specified for device soldered in circuit board for SOIC package.

ORDERING GUIDE

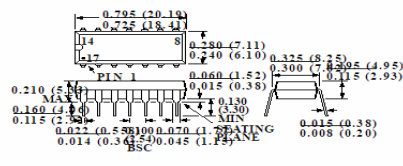
Model	Temperature Range	Package Description	Package Options
OP113EP	-40 °C to +85 °C	8-Lead Plastic DIP N-8	
OP113ES	-40 °C to +85 °C	8-Lead SOIC	SO-8
OP113FP	-40 °C to +85 °C	8-Lead Plastic DIP N-8	
OP113FS	-40 °C to +85 °C	8-Lead SOIC	SO-8
OP213EP	-40 °C to +85 °C	8-Lead Plastic DIP N-8	
OP213ES	-40 °C to +85 °C	8-Lead SOIC	SO-8
OP213FP	-40 °C to +85 °C	8-Lead Plastic DIP N-8	
OP213FS	-40 °C to +85 °C	8-Lead SOIC	SO-8
OP413EP	-40 °C to +85 °C	14-Lead Plastic DIP N-14	
OP413ES	-40 °C to +85 °C	14-Lead Wide SOIC R-16	
OP413FP	-40 °C to +85 °C	14-Lead Plastic DIP N-14	
OP413FS	-40 °C to +85 °C	14-Lead Wide SOIC R-16	



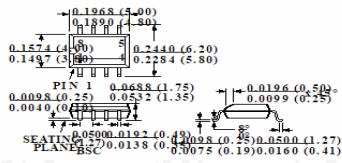
8-Lead Plastic DIP
(N-8)



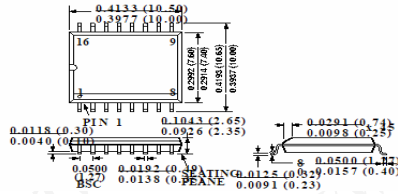
14-Lead Plastic DIP
(N-14)



8-Lead Narrow-Body Plastic DIP
(SO-8)



16-Lead Wide Body SOIC
(R-16)



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