FORCE TECHNOLOGIES LTD

FT1006

Precision, Single Supply Op Amp

Features

- Single Supply Operation
  - Input Voltage Range Extends to Ground
  - Output Swings to Ground while Sinking Current
- *Guaranteed* Offset Voltage: 50μV Max
- *Guaranteed* Low Drift: 1.3μV/°C Max
- *Guaranteed* Offset Current: 0.5nA Max
- *Guaranteed* High Gain
  - 5mA Load Current: 1.5 Million Min
  - 17mA Load Current: 0.8 Million Min
- *Guaranteed* Low Supply Current: 520μA Max
- Supply Current can be Reduced by a Factor of 4
- Low Voltage Noise, 0.1Hz to 10Hz: 0.55μV_{P-P}
  - Low Current Noise—
  - Better than OP-07: 0.07pA/√Hz at 10Hz
- High Input Impedance: 250MΩ Min
- Minimum Supply Voltage: 2.7V Min

Application

- Low Power Sample-and-Hold Circuits
- Battery-Powered Precision Instrumentation
  - Strain Gauge Signal Conditioners
  - Thermocouple Amplifiers
- 4mA to 20mA Current Loop Transmitters
- Active Filters

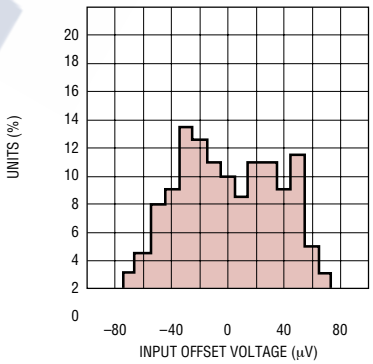
Description

The FT1006 is the first precision single supply operational amplifier. Its design has been optimised for single supply operation with a full set of specifications at 5V. Specifications at ±15V are also provided.

The FT1006 has a low offset voltage of 20μV, drift of 0.2μV/°C, offset current of 120pA, gain of 2.5 million, common mode rejection of 114dB and power supply rejection of 126dB.

Although supply current is only 340μA, a novel output stage can source or sink in excess of 20mA while retaining high voltage gain. Common mode input range includes ground to accommodate low ground-referenced inputs from strain gauges or thermocouples, and output can swing to within a few millivolts of ground. If a higher slew rate (in excess of 1V/μs) or micropower operation (supply current down to 90μA) is required, the operating currents can be modified by connecting an external optional resistor to Pin 8.

For similar single supply precision dual and quad op amps, please see the FT1013/FT1014 data sheet. For micropower dual and quad op amps, please see the FT1078/FT1079 data sheet.



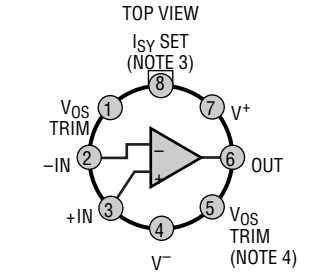
V_S = 5V, 0V
T_A = 25°C
350 LT1006s TESTED
FROM TWO RUNS
J AND N PACKAGES

Absolute Maximum Ratings(Note 1)

Supply Voltage ..... ±22V
Input Voltage ..... Equal to Positive Supply Voltage
Input Voltage ..... 5V Below Negative Supply Voltage
Differential Input Voltage 30V
Output Short-Circuit Duration ..... Indefinite

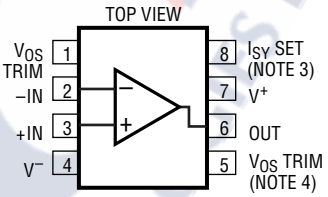
Operating Temperature Range
FT1006AM/FT1006M ..... –55°C to 125°C
FT1006AC/FT1006C/FT1006S8 ..... 0°C to 70°C
Storage Temperature Range ..... –65°C to 150°C
Lead Temperature (Soldering, 10 sec) ..... 300°C

Package/Order Information



H PACKAGE
8-LEAD TO-5 METAL CAN
T_{JMAX} = 150°C, θ_{JA} = 150°C, θ_{JC} = 45°C

ORDER PART NUMBER
FT1006AMH
FT1006MH
FT1006ACH
FT1006CH



N8 PACKAGE
8-LEAD PDIP

S8 PACKAGE
8-LEAD PLASTIC SO

T_{JMAX} = 100°C, θ_{JA} = 130°C/W (N8)
T_{JMAX} = 150°C, θ_{JA} = 200°C/W (S8)

J8 PACKAGE 8-LEAD CERDIP
T_{JMAX} = 100°C, θ_{JA} = 130°C/W

ORDER PART NUMBER
FT1006CN8
FT1006S8
S8 PART MARKING
1006
FT1006AMJ8
FT1006MJ8
FT1006ACJ8
FT1006CJ8

Electrical Characteristics

V_S = 5V, V_{CM} = 0V, V_{OUT} = 1.4V, T_A = 25°C, unless otherwise noted.

SYMBOL	PARAMETER	CONDITIONS	FT1006AM/AC MIN	FT1006AM/AC TYP	FT1006AM/AC MAX	FT1006M/C MIN	FT1006M/C TYP	FT1006M/C MAX	UNITS
V_{OS}	Input Offset Voltage			20	50		30	80	µV
		FT1006S8					8	400	µV
$\frac{\Delta V_{OS}}{\Delta Time}$	Long-Term Input Offset Voltage Stability			0.4			0.5		µV/Mo
		FT1006S8					0		µV/Mo
I_{OS}	Input Offset Current			0.12	0.5		0.15	0.9	nA
I_B	Input Bias Current			9	15		10	25	nA
e_n	Input Noise Voltage	0.1Hz to 10Hz		0.55			0.55		μV_{P-P}
	Input Noise Voltage Density	f_O = 10Hz		23	32		23	32	nV/√Hz
		f_O = 1000Hz		22	25		22	25	nV/√Hz
i_n	Input Noise Current Density	f_O = 10Hz		0.07			0.08		pA/√Hz
	Input Resistance	(Note 2)							
	Differential Mode		180	400		100	300		MΩ
	Common Mode			5			4		GΩ

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