Dual JFET Input Precision High Speed Op Amp

FEATURES

- 13V/μs Slew Rate — 8V/μs Min.
- 5MHz Gain-Bandwidth Product
- Fast Settling Time — 1.3μs to 0.02%
- 300μV Offset Voltage (LT1057)
- 5μV/°C V_{OS} Drift
- 60pA Bias Current at 70°C
- Low Voltage Noise — 13nV/$\sqrt{Hz}$ at 1kHz, 26nV/$\sqrt{Hz}$ at 10Hz

APPLICATIONS

- Precision, High Speed Instrumentation
- Fast, Precision Sample and Hold
- Logarithmic Amplifiers
- D/A Output Amplifiers
- Photodiode Amplifiers
- Voltage to Frequency Converters
- Frequency to Voltage Converters

DESCRIPTION

The LT1057 is a matched JFET input dual op amp featuring a combination of outstanding high speed and precision specifications. It replaces all the popular bipolar and JFET input dual op amps. In particular, the LT1057 upgrades the performance of systems using the LF412A and OP-215 JFET input duals.

The LT1058 is the lowest offset quad JFET input operational amplifier. It offers significant accuracy improvement over presently available JFET input quad operational amplifiers. It can replace four single precision JFET input op amps, while saving board space, power dissipation and cost.

For the first time, precision dual and quad JFET op amps are available in a surface mounted package. For extended operating temperatures ($-40°C \leq T_A \leq 85°C$) the LT1057IS and LT1058IS are offered.

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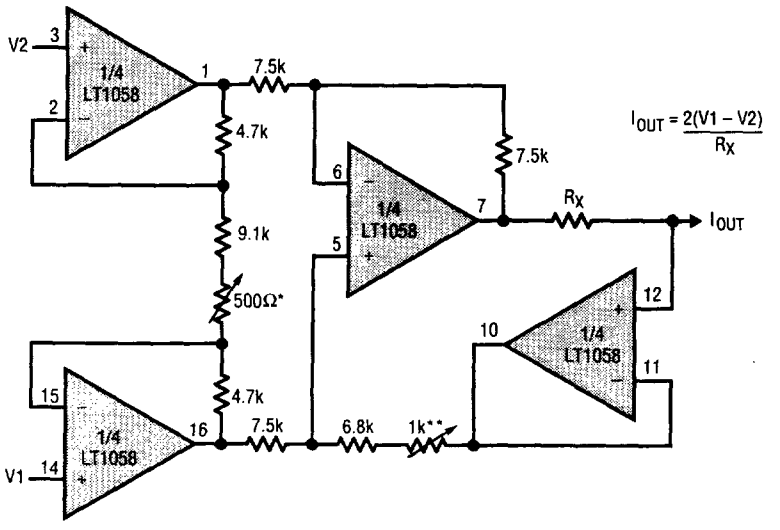
Current Output, High Speed, High Input Impedance Instrumentation Amplifier



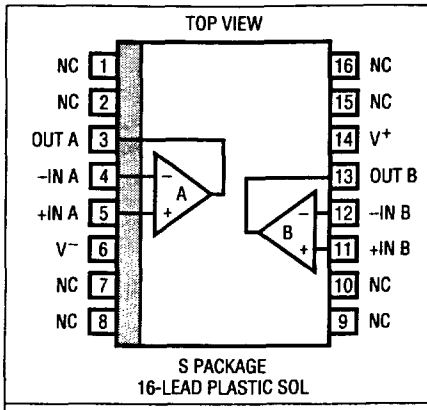
*GAIN ADJUST
**COMMON-MODE REJECTION ADJUST
BANDWIDTH ≈ 2MHz

LT1058S•TA01

ABSOLUTE MAXIMUM RATINGS

Supply Voltage ..... ±20V
Differential Input Voltage ..... ±40V
Input Voltage ..... ±20V
Output Short Circuit Duration ..... Indefinite
Operating Temperature Range
LT1057S, LT1058S ..... 0°C to 70°C
LT1057IS, LT1058IS ..... –40°C to 85°C
Storage Temperature Range
All Devices ..... –65°C to 150°C
Lead Temperature (Soldering, 10 sec.) ..... 300°C

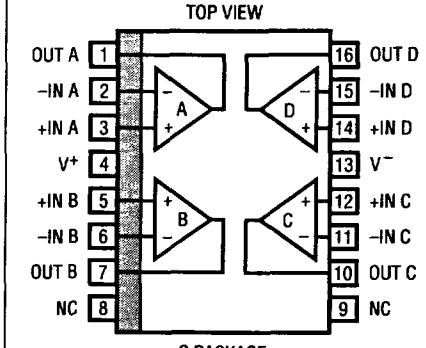
PACKAGE/ORDER INFORMATION



S PACKAGE
16-LEAD PLASTIC SOL

ORDER PART NUMBER

LT1057S
LT1057IS



S PACKAGE
16-LEAD PLASTIC SOL

LT1058S
LT1058IS

ELECTRICAL CHARACTERISTICS

V_S = ±15V, T_A = 25°C, V_{CM} = 0V unless otherwise noted.

SYMBOL	PARAMETER	CONDITIONS		MIN	TYP	MAX	UNITS
V_{OS}	Input Offset Voltage		LT1057 LT1058		0.3 0.35	2 2.5	mV
I_{OS}	Input Offset Current	Fully Warmed Up			5	50	pA
I_B	Input Bias Current	Fully Warmed Up			±10	±100	pA
	Input Resistance – Differential – Common-Mode	 V_{CM} = –11V to +8V V_{CM} = +8V to +11V			0.4 0.4 0.05		TΩ
	Input Capacitance				4		pF
e_n	Input Noise Voltage	0.1Hz to 10Hz	LT1057 LT1058		2.1 2.5		μVp-p
e_n	Input Noise Voltage Density	f_O = 10Hz f_O = 1kHz			26 13		nV/√Hz
i_n	Input Noise Current Density	f_O = 10Hz, 1kHz			1.8		fA/√Hz
A_{VOL}	Large Signal Voltage Gain	V_O = ±10V	R_L = 2k R_L = 1k	100 50	300 220		V/mV
	Input Voltage Range			±10.5	14.3 –11.5		V

ELECTRICAL CHARACTERISTICS $V_S = \pm 15V$, $T_A = 25°C$, $V_{CM} = 0V$ unless otherwise noted.

SYMBOL	PARAMETER	CONDITIONS		MIN	TYP	MAX	UNITS
CMRR	Common-Mode Rejection Ratio	$V_{CM} = \pm 10.5V$	LT1057 LT1058	82 80	98 98		dB
PSRR	Power Supply Rejection Ratio	$V_S = \pm 10V$ to $\pm 18V$		86	102		dB
V_{OUT}	Output Voltage Swing	$R_L = 2k$		± 12	± 13		V
SR	Slew Rate			8	13		V/µs
GBW	Gain-Bandwidth Product	f = 1MHz (Note 1)		3	5		MHz
I_S	Supply Current Per Amplifier				1.7	2.8	mA
	Channel Separation	DC to 5kHz, $V_{IN} = \pm 10V$			130		dB

ELECTRICAL CHARACTERISTICS $V_S = \pm 15V$, $V_{CM} = 0V$, $0°C \le T_A \le 70°C$, (LT1057S, LT1058S) or $-40°C \le T_A \le 85°C$, (LT1057IS, LT1058IS), unless otherwise noted.

SYMBOL	PARAMETER	CONDITIONS			MIN	TYP	MAX	UNITS
V_{OS}	Input Offset Voltage		LT1057 LT1058S LT1058IS	• • •		0.5 0.6 0.7	2.5 3.0 4.0	mV
	Average Temperature Coefficient of Input Offset Voltage			•		5		µV/°C
I_{OS}	Input Offset Current	Warmed Up, $T_A = 70°C$ Warmed Up, $T_A = 85°C$				20 35	250 400	pA
I_B	Input Bias Current	Warmed Up, $T_A = 70°C$ Warmed Up, $T_A = 85°C$				± 60 ± 100	± 400 ± 700	pA
A_{VOL}	Large Signal Voltage Gain	$V_O = \pm 10V$, $R_L = 2k$	LT1057 LT1058	• •	50 40	200 200		V/mV
CMRR	Common-Mode Rejection Ratio	$V_{CM} = \pm 10.5V$	LT1057 LT1058	• •	80 78	96 96		dB
PSRR	Power Supply Rejection Ratio	$V_S = \pm 10V$ to $\pm 18V$	LT1057 LT1058	• •	84 82	100 100		dB
V_{OUT}	Output Voltage Swing	$R_L = 2k$		•	± 12	± 12.8		V

The • denotes the specifications which apply over the full operating temperature range.

Note 1: Gain bandwidth product is not tested. It is guaranteed by design and by inference from the slew rate measurement.