



**LT1057S/LT1057IS  
LT1058S/LT1058IS**

## Dual JFET Input Precision High Speed Op Amp

### FEATURES

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

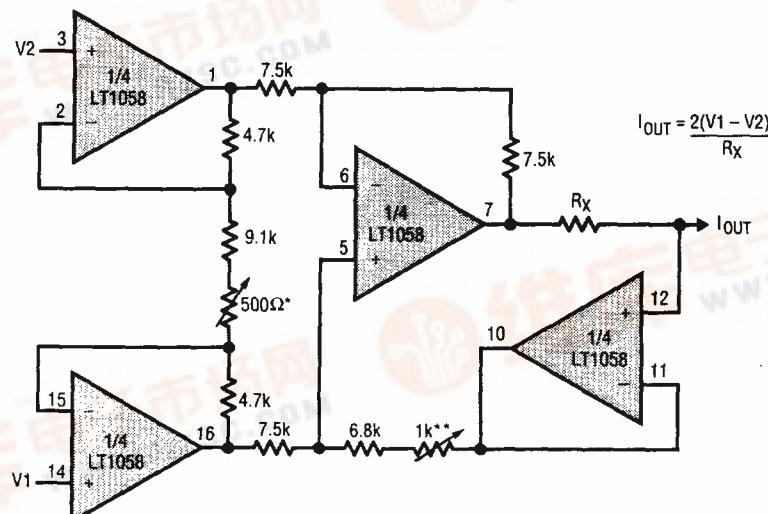
The LT1057 is a matched JFET input dual op amp featuring a combination of outstanding high speed and precision specifications. It replaces all the popular bipolar and JFET input dual op amps. In particular, the LT1057 upgrades the performance of systems using the LF412A and OP-215 JFET input duals.

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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 ( $-40^{\circ}\text{C} \leq T_A \leq 85^{\circ}\text{C}$ ) the LT1057IS and LT1058IS are offered.

### Current Output, High Speed, High Input Impedance Instrumentation Amplifier



\*GAIN ADJUST

\*\*COMMON-MODE REJECTION ADJUST  
BANDWIDTH = 2MHz

LT1058S-TA01

# LT1057S/LT1057IS LT1058S/LT1058IS

## ABSOLUTE MAXIMUM RATINGS

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

## PACKAGE/ORDER INFORMATION

TOP VIEW	ORDER PART NUMBER
 S PACKAGE 16-LEAD PLASTIC SOL	LT1057S LT1057IS
 S PACKAGE 16-LEAD PLASTIC SOL	LT1058S LT1058IS

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

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
$V_{OS}$	Input Offset Voltage			0.3 0.35	2 2.5	mV
		LT1057 LT1058				
$I_{OS}$	Input Offset Current	Fully Warmed Up	5	50	pA	
$I_B$	Input Bias Current	Fully Warmed Up	$\pm 10$	$\pm 100$	pA	
	Input Resistance – Differential – Common-Mode	$V_{CM} = -11V$ to $+8V$ $V_{CM} = +8V$ to $+11V$	0.4 0.4 0.05			T $\Omega$
	Input Capacitance		4			pF
$e_n$	Input Noise Voltage	0.1Hz to 10Hz	LT1057 LT1058	2.1 2.5		$\mu V_{p-p}$
$e_n$	Input Noise Voltage Density	$f_0 = 10Hz$ $f_0 = 1kHz$		26 13		nV/ $\sqrt{Hz}$
$i_n$	Input Noise Current Density	$f_0 = 10Hz, 1kHz$		1.8		fA/ $\sqrt{Hz}$
$A_{VOL}$	Large Signal Voltage Gain	$V_0 = \pm 10V$	$R_L = 2k$ $R_L = 1k$	100 50	300 220	V/mV
	Input Voltage Range			$\pm 10.5$ -11.5	14.3	V

# LT1057S/LT1057IS LT1058S/LT1058IS

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

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

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

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SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
$V_{OS}$	Input Offset Voltage	LT1057	●	0.5	2.5	mV
		LT1058S	●	0.6	3.0	
		LT1058IS	●	0.7	4.0	
	Average Temperature Coefficient of Input Offset Voltage		●	5		$\mu$ V/ $^\circ$ C
I <sub>OS</sub>	Input Offset Current	Warmed Up, $T_A = 70^\circ C$		20	250	pA
		Warmed Up, $T_A = 85^\circ C$		35	400	
I <sub>B</sub>	Input Bias Current	Warmed Up, $T_A = 70^\circ C$		$\pm 60$	$\pm 400$	pA
		Warmed Up, $T_A = 85^\circ C$		$\pm 100$	$\pm 700$	
AVOL	Large Signal Voltage Gain	$V_0 = \pm 10V$ , $R_L = 2k$	LT1057	●	50	V/mV
			LT1058	●	40	
CMRR	Common-Mode Rejection Ratio	$V_{CM} = \pm 10.5V$	LT1057	●	80	dB
			LT1058	●	78	
PSRR	Power Supply Rejection Ratio	$V_S = \pm 10V$ to $\pm 18V$	LT1057	●	84	dB
			LT1058	●	82	
$V_{OUT}$	Output Voltage Swing	$R_L = 2k$		●	$\pm 12$	$\pm 12.8$

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.