



OP27

LINEAR INTEGRATED CIRCUIT

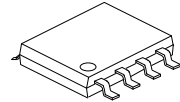
LOW-NOISE, PRECISION OPERATIONAL AMPLIFIER

DESCRIPTION

The UTC **OP27** precision operational amplifier combines the low offset and drift of the OP07 with both high speed and low noise. A gain-bandwidth product of 8MHz and a 1.9V/ μ sec slew rate provides excellent dynamic accuracy in high-speed, data-acquisition systems.

A low input bias current of ± 80 nA is achieved by use of a bias-current-cancellation circuit. Over the military temperature range, this circuit typically holds I_B and I_{OS} to ± 25 nA and 20nA, respectively.

The output stage has good load driving capability. A guaranteed swing of ± 10 V into 600 Ω and low output distortion make the UTC **OP27** an excellent choice for professional audio applications.



SOP-8

FEATURES

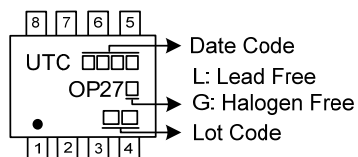
- * Supply Voltage: $\pm 4.0 \sim \pm 22.0$ V
- * Supply Current/Amplifier: 6.2 mA (Max.)
- * Input Offset Voltage: 110 μ V (Max.)
- * Slew Rate: 1.9V/ μ s (Typ.)
- * Excellent CMRR: 120dB at V_{CM} of ± 11 V

ORDERING INFORMATION

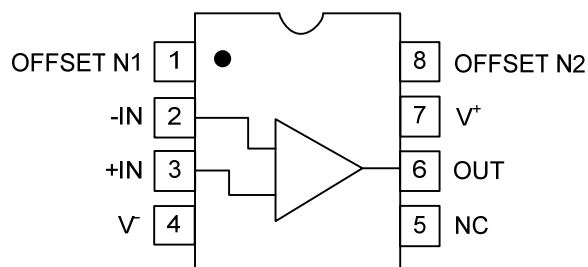
Ordering Number		Package	Packing
Lead Free	Halogen Free		
OP27L-S08-R	OP27G-S08-R	SOP-8	Tape Reel

<p>OP27G-S08-R</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Green Package</p>	<p>(1) R: Tape Reel</p> <p>(2) S08: SOP-8</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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MARKING



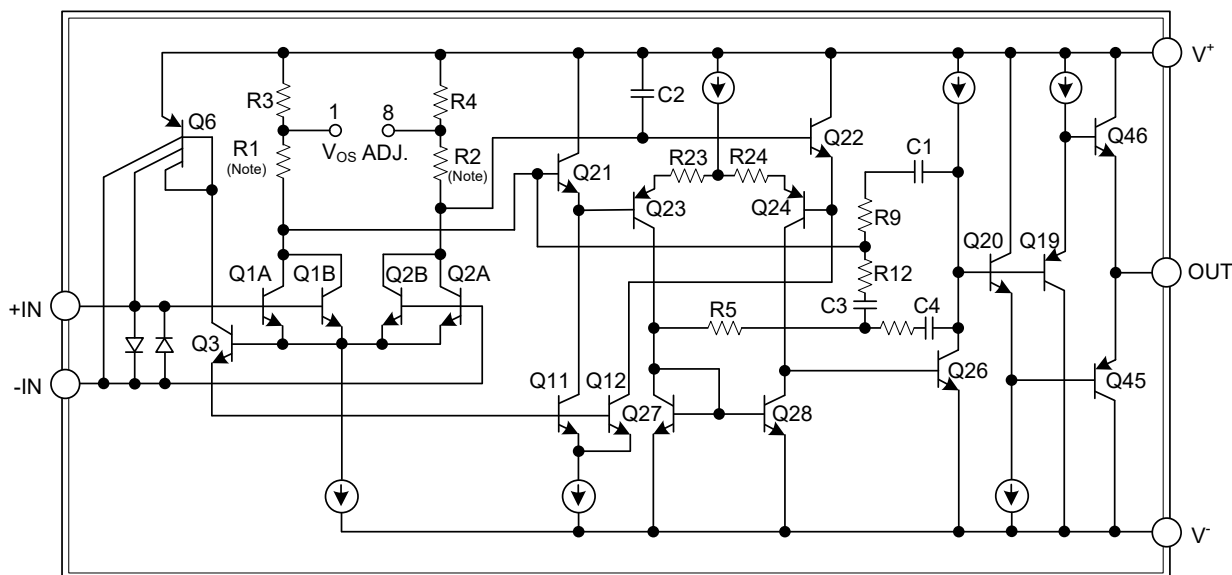
PIN CONFIGURATION



PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	OFFSET N1	External input offset voltage adjustment
2	-IN	Inverting input
3	+IN	Non-Inverting input
4	V ⁻	Negative Power supply
5	NC	No connect
6	OUT	Output
7	V ⁺	Positive power supply
8	OFFSET N2	External input offset voltage adjustment

BLOCK DIAGRAM



Note: R1 and R2 are permanently adjusted at wafer test for minimum offset voltage.

■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	$V^+ - V^-$	± 22	V
Differential Input Voltage (Note 1)		± 0.7	V
Voltage at Input or Output Pin (Note 2)		± 22	V
Junction Temperature	T_J	+150	°C
Storage Temperature Range	T_{STG}	-65 ~ +150	°C

Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

2. The UTC **OP27**'s inputs are protected by back-to-back diodes. Current limiting resistors are not used in order to achieve low noise. If differential input voltage exceeds $\pm 0.7V$, the input current should be limited to 25mA.

3. For supply voltages less than $\pm 22V$, the absolute maximum input voltage is equal to the supply voltage.

■ ELERECOMMENDED OPWRAING CONDITIONS

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	$V^+ - V^-$	$\pm 4 \sim \pm 22$	V
Operating Junction Temperature Range	T_{OPR}	-40 ~ +125	°C

■ ELECTRICAL CHARACTERISTICS ($V^+ - V^- = \pm 15V$, $T_A = 25^\circ C$ unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Current/Amplifier	I_Q			3.2	6.2	mA
Power Supply Rejection Ratio	PSRR	$V_S = \pm 4V \sim \pm 18V$		125	150	dB
Input Offset Voltage (Note 1)	V_{OS}			50	110	μV
Offset Adjustment Range		$R_P = 10k\Omega$		± 4.0		mV
Input Bias Current	I_B			± 70	± 110	nA
Input Offset Current	I_{OS}			12	80	nA
Common-Mode Voltage Range	V_{CM}		± 11	± 12.3		V
Common Mode Rejection Ratio	CMRR	$V_{CM} = \pm 11V$	100	120		dB
Large Signal Voltage Gain	A_V	$R_L \geq 600\Omega, V_O = \pm 10V$	95	115		dB
		$R_L \geq 2k\Omega, V_O = \pm 10V$	95	115		dB
Output Voltage	V_O	$R_L \geq 600\Omega$	V_{OH}	10	11.5	V
			V_{OL}		-11.5	V
		$R_L \geq 2k\Omega$	V_{OH}	11.2	13.5	V
			V_{OL}		-13.5	V
Slew Rate (Note 2)	SR	$R_L \geq 2k\Omega$		1.9		V/ μs
Gain Bandwidth Product (Note 2)	GBW			8.0		MHz
Input Noise Voltage Density (Note 3)	e_n	$f_o = 10Hz$		3.8		nV/ \sqrt{Hz}
		$f_o = 30Hz$		3.3		nV/ \sqrt{Hz}
		$f_o = 1000Hz$		3.2		nV/ \sqrt{Hz}
Input Noise Current Density (Note 3, 4)	i_n	$f_o = 10Hz$		1.7		pA/ \sqrt{Hz}
		$f_o = 30Hz$		1.0		pA/ \sqrt{Hz}
		$f_o = 1000Hz$		0.7		pA/ \sqrt{Hz}
Input Noise Voltage (Note 3, 5)	$e_{n\ p-p}$	0.1Hz to 10Hz		0.1		$\mu V\ p-p$

Notes: 1. Input offset voltage measurements are according Figure 1, use external resistors to balance the resistance values from V^+ to Pin1 (OFFSET N1) and Pin8 (OFFSET N2) then measure.

2. Guaranteed by design.

3. Sample tested.

4. See test circuit for current noise measurement.

5. See test circuit and frequency response curve for 0.1Hz to 10Hz tester.

■ PARAMETER MEASUREMENT INFORMATION

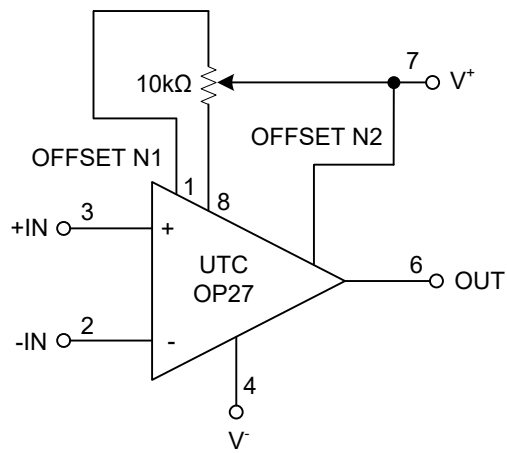
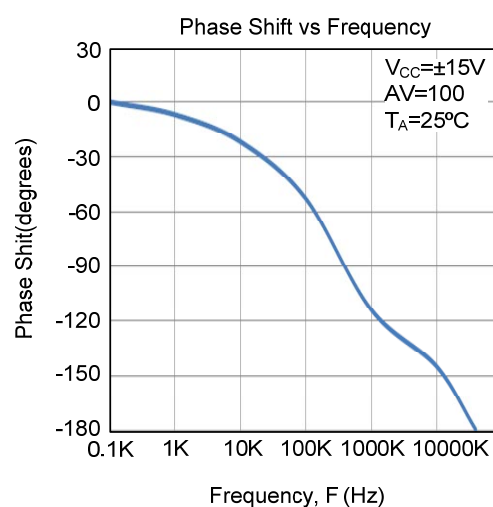
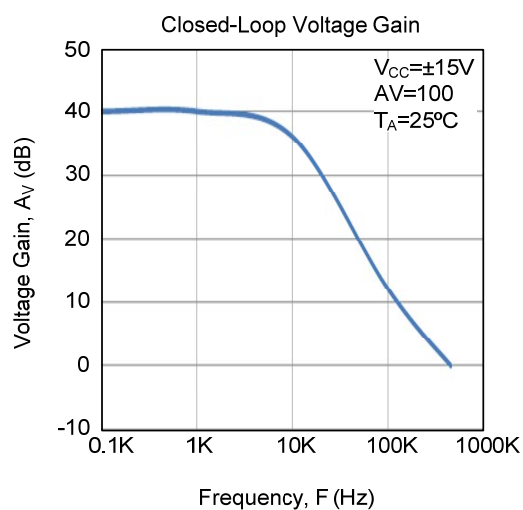
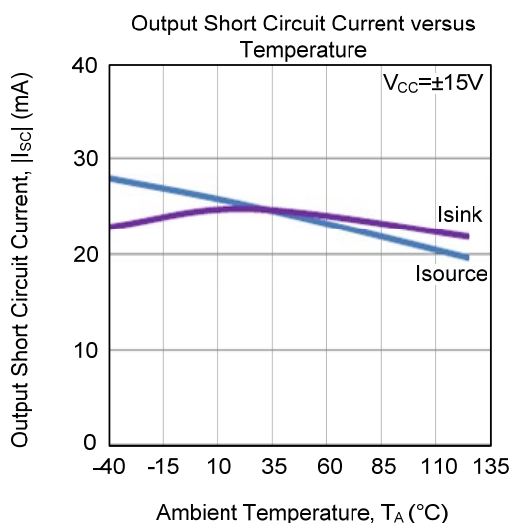
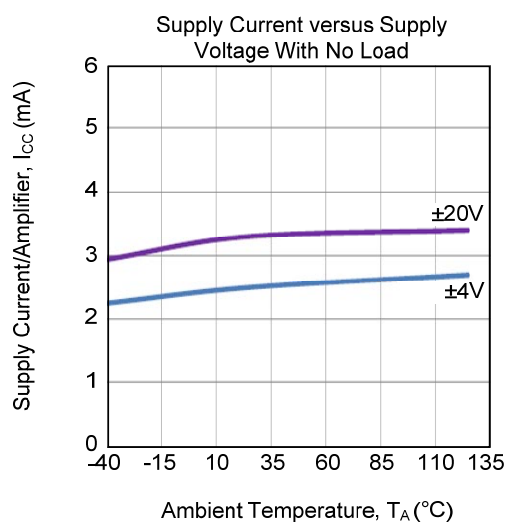
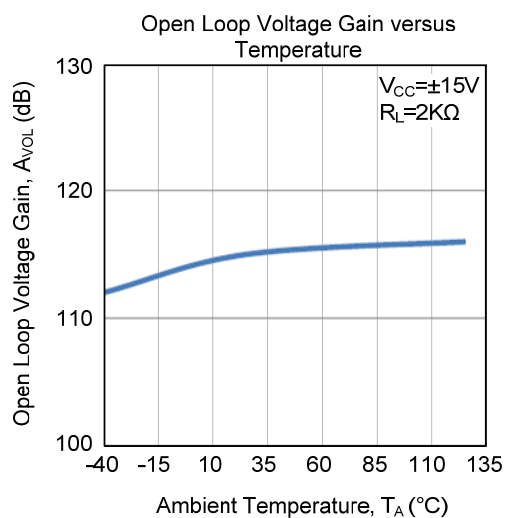
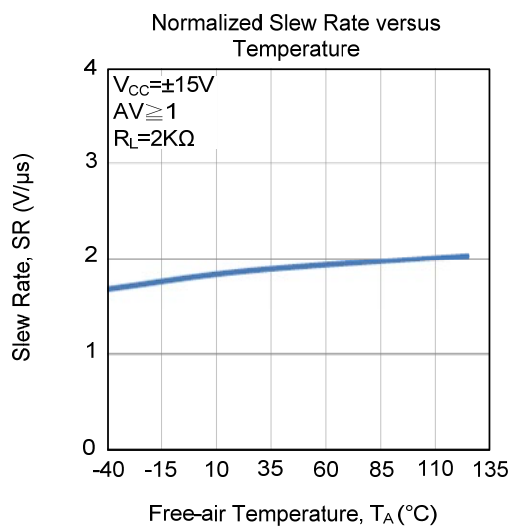


Figure 1. Input Offset Voltage Null Circuit

TYPICAL CHARACTERISTICS



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