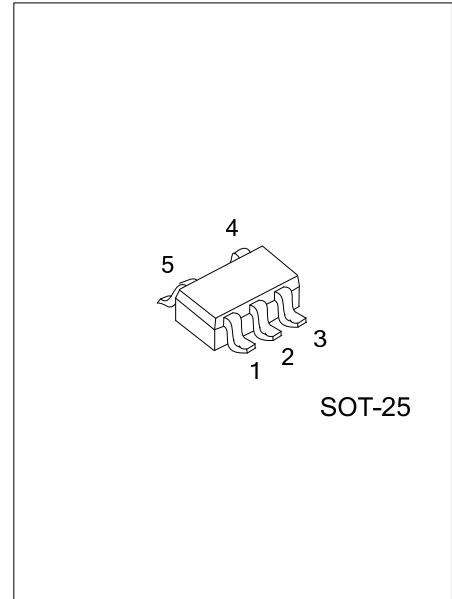




ULV8551XN

CMOS IC

ZERO-DRIFT, SINGLE-SUPPLY, RAIL-TO-RAIL INPUT/OUTPUT CMOS OPERATIONAL AMPLIFIERS



DESCRIPTION

The UTC **ULV8551XN** has ultralow offset, drift, and bias current. The UTC **ULV8551XN** is single amplifiers featuring rail-to-rail input and output swings. Single supply as low as 2.7V and up to 5.5V may be used.

The combination of characteristics makes the UTC **ULV8551XN** good choices for temperature, position and pressure sensors, medical equipment and strain gauge amplifiers, or any other 2.7V to 5.5V application requiring precision and long term stability.

The UTC **ULV8551XN** is specified for the extended industrial/automotive (-40°C to +125°C) temperature range

FEATURES

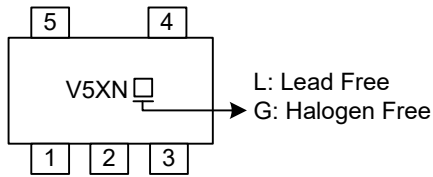
- * Single-supply operation: 2.7V ~ 5.5V
- * Low Offset Voltage: 20µV (TYP) at +5V
- * Rail-to-Rail Input and Output
- *Slew Rate: 0.7V/µs

ORDERING INFORMATION

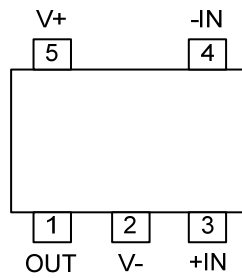
Ordering Number		Package	Packing
Lead Free	Halogen Free		
ULV8551XNL-AF5-R	ULV8551XNG-AF5-R	SOT-25	Tape Reel

ULV8551XNG-AF5-R 	(1) Packing Type (2) Package Type (3) Green Package	(1) R: Tape Reel (2) AF5: SOT-25 (3) G: Halogen Free and Lead Free, L: Lead Free
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■ MARKING



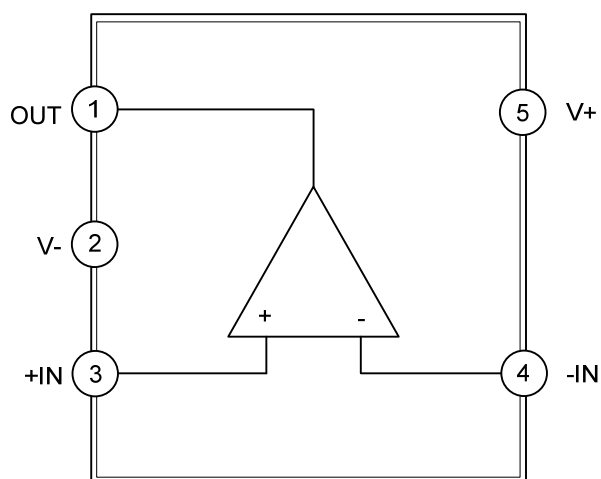
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	OUT	Output pin of AMP
2	V-	Negative power supply
3	+IN	Non-inverting input of AMP
4	-IN	Inverting input pin of AMP
5	V+	Positive power supply

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage, V+ to V-	V_{CC}	6	V
Input Voltage	V_{IN}	$(V_-) - 0.1 \sim (V_+) + 0.1$	V
Differential Input Voltage	V_{ID}	± 5.0	V
Junction Temperature	T_J	+150	$^{\circ}C$
Operating Temperature Range	T_{OPR}	-40 ~ +125	$^{\circ}C$
Storage Temperature Range	T_{STG}	-65 ~ +150	$^{\circ}C$

Note: 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.

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	230	$^{\circ}C/W$

■ ELECTRICAL CHARACTERISTICS

($T_A=25^{\circ}C$, $V_S=5V$, $R_L=10k\Omega$ connected to $V_S/2$, and $V_{OUT}=V_S/2$, unless otherwise specified.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
POWER SUPPLY						
Quiescent Current	I_Q	$V_O=V_S/2$		465	700	μA
Power Supply Rejection Ratio	PSRR	$V_S=2.7V \sim 5V$	90	110		dB
OFFSET VOLTAGE						
Input Offset Voltage	V_{OS}	$V_{CM}=0V \sim 5V$		20	45	μV
Input Offset Voltage Drift	$\Delta V_{OS}/\Delta T$	$-40^{\circ}C \leq T_A \leq +125^{\circ}C$		20		$nV/^{\circ}C$
INPUT BIAS CURRENT						
Input Bias Current	I_B	$V_{CM}=0V$		25		μA
Input Offset Current	I_{OS}			5		μA
Common-Mode Voltage Range	V_{CM}		0		5	V
Common-Mode Rejection Ratio	CMRR	$V_{CM} = 0V \sim 5V$	90	105		dB
Large Signal Voltage Gain	A_V	$R_L=10k\Omega$, $V_O=0.3V \sim 4.7V$	90	135		dB
		$-40^{\circ}C \leq T_A \leq +125^{\circ}C$	86			dB
OUTPUT CHARACTERISTICS						
Output Voltage High	V_{OH}	$R_L=100k\Omega \sim V_-$	4.99	4.998		V
		$R_L=10k\Omega \sim V_-$	4.985	4.996		V
Output Voltage Low	V_{OL}	$R_L=100k\Omega \sim V_+$		2	10	mV
		$R_L=10k\Omega \sim V_+$		6	15	mV
Short-Circuit Current	I_{SC}		30	48		mA
DYNAMIC PERFORMANCE						
Slew Rate	SR	$A_V=+1$, $R_L=10k\Omega$		0.73		$V/\mu s$
Gain-Bandwidth Product	GBW	$A_V=+100$		1.02		MHz
NOISE PERFORMANCE						
Input Voltage Noise	e_n p-p	0.1Hz ~ 10Hz		0.90		μV_{p-p}
Input Voltage Noise Density	e_n	f=1kHz		53		nV/\sqrt{Hz}

■ ELECTRICAL CHARACTERISTICS

($T_A=25^{\circ}\text{C}$, $V_S=2.7\text{V}$, $R_L=10\text{k}\Omega$ connected to $V_S/2$, and $V_{OUT}=V_S/2$, unless otherwise specified.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
POWER SUPPLY						
Quiescent Current	I_Q	$V_O=V_S/2$		435	680	μA
Power Supply Rejection Ratio	PSRR	$V_S=2.7\text{V} \sim 5\text{V}$	90	110		dB
OFFSET VOLTAGE						
Input Offset Voltage	V_{OS}	$V_{CM}=0\text{V} \sim 2.7\text{V}$		16	45	μV
Input Offset Voltage Drift	$\Delta V_{OS}/\Delta T$	$-40^{\circ}\text{C} \leq T_A \leq +125^{\circ}\text{C}$		20		$\text{nV}/^{\circ}\text{C}$
INPUT CHARACTERISTICS						
Input Bias Current	I_B	$V_{CM}=0\text{V}$		16		pA
Input Offset Current	I_{OS}			8		pA
Common-Mode Voltage Range	V_{CM}		0		2.7	V
Common-Mode Rejection Ratio	CMRR	$V_{CM} = 0\text{V} \sim 2.7\text{V}$	90	105		dB
Large Signal Voltage Gain	A_V	$R_L=10\text{k}\Omega$, $V_O=0.3\text{V} \sim 2.4\text{V}$	90	130		dB
		$-40^{\circ}\text{C} \leq T_A \leq +125^{\circ}\text{C}$	85			dB
OUTPUT CHARACTERISTICS						
Output Voltage High	V_{OH}	$R_L=100\text{k}\Omega \sim V_-$	2.69	2.699		V
		$R_L=10\text{k}\Omega \sim V_-$	2.685	2.698		V
Output Voltage Low	V_{OL}	$R_L=100\text{k}\Omega \sim V_+$		1	10	mV
		$R_L=10\text{k}\Omega \sim V_+$		3	15	mV
Short-Circuit Current	I_{SC}		20	28		mA
DYNAMIC PERFORMANCE						
Slew Rate	SR	$A_V=+1$, $R_L=10\text{k}\Omega$		0.7		$\text{V}/\mu\text{s}$
Gain-Bandwidth Product	GBW	$A_V=+100$		0.97		MHz
NOISE PERFORMANCE						
Voltage Noise	e_n p-p	0.1Hz ~ 10Hz		1.0		μV_{p-p}
Voltage Noise Density	e_n	f = 1kHz		60		$\text{nV}/\sqrt{\text{Hz}}$

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