

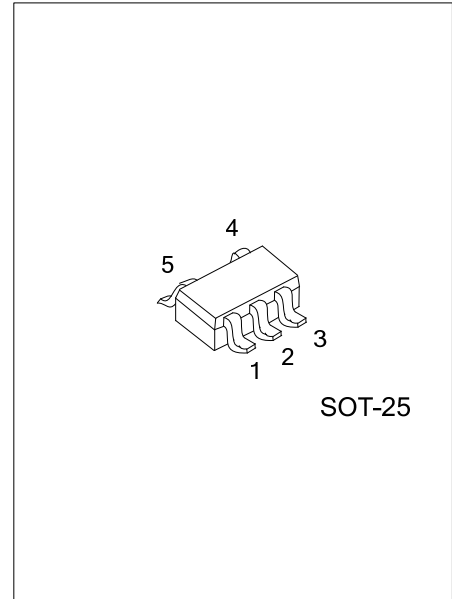


ULV8551XK

Preliminary

CMOS IC

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



DESCRIPTION

The UTC **ULV8551XK** has ultralow offset, drift, and bias current. The UTC **ULV8551XK** 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 **ULV8551XK** 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 **ULV8551XK** is specified for the extended industrial and automotive temperature range (-40°C to +125°C).

FEATURES

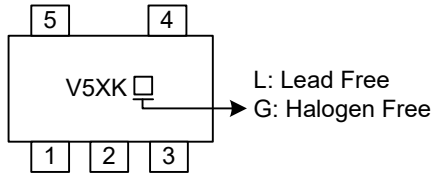
- * Single-supply operation: 2.7V ~ 5.5V
- * Low Offset Voltage: 18µV (TYP) at +5V
- * Rail-to-Rail Input and Output
- * Slew Rate: 2.0V/µs

ORDERING INFORMATION

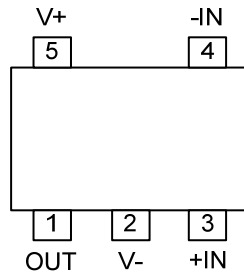
Ordering Number		Package	Packing
Lead Free	Halogen Free		
ULV8551XKL-AF5-R	ULV8551XKG-AF5-R	SOT-25	Tape Reel

<p>ULV8551XKG-AF5-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) AF5: SOT-25</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p>
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■ MARKING



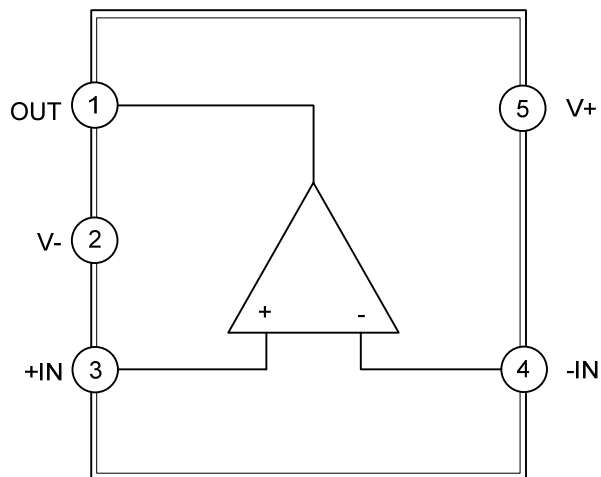
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	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}	6.0	V
Input Voltage	V _{IN}	(V-) - 0.1~ (V+) + 0.1	V
Differential Input Voltage	V _{ID}	±5.0	V
Junction Temperature	T _J	+150	°C
Operating Temperature Range	T _{OPR}	-40 ~ +125	°C
Storage Temperature Range	T _{STG}	-65~ +150	°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	°C/W

■ ELECTRICAL CHARACTERISTICS

(T_A=25°C, V_S=5V, R_L=10kΩ connected to V_S/2, and V_{OUT}=V_S/2, unless otherwise specified.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
POWER SUOOLY						
Quiescent Current / Amplifier	I _Q	V _O =V _S /2		640	870	μA
Power Supply Rejection Ratio	PSRR	V _S =2.7V~5V	90	110		dB
OFFSET VOLTAGE						
Input Offset Voltage	V _{OS}	V _{CM} =0V~5V		18	45	μV
Input Offset Voltage Drift	ΔV _{OS} /ΔT	-40°C ≤ T _A ≤ +125°C		10		nV/°C
INPUT CHARACTERISTICS						
Input Bias Current	I _B	V _{CM} =0V		50		pA
Input Offset Current	I _{OS}			15		pA
Common-Mode Voltage Range	V _{CM}		0		5	V
Common-Mode Rejection Ratio	CMRR	V _{CM} =0V~5V	90	105		dB
Large Signal Voltage Gain	A _V	R _L =10KΩ, V _O =0.3V~4.7V	90	130		dB
		-40°C ≤ T _A ≤ +125°C	88			dB
OUTPUT CHARACTERISTICS						
Output Voltage High	V _{OH}	R _L =100kΩ ~ V-	4.99	4.998		V
		R _L =10kΩ ~ V-	4.95	4.98		V
Output Voltage Low	V _{OL}	R _L =100kΩ ~ V+		1	10	mV
		R _L =10kΩ ~ V+		10	30	mV
Short-Circuit Current	I _{SC}		30	48		mA
DYNAMIC PERFORMANCE						
Slew Rate	SR	A _V =+1, R _L =10kΩ		2.0		V/μs
Gain-Bandwidth Product	GBW	A _V =+100		3.2		MHz
NOISE PERFORMANCE						
Input Voltage Noise	e _n p-p	f=0.01Hz~10Hz		0.8		μVpp
Input Voltage Noise Density	e _n	f=1KHz		38		nV/√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 $V_{\text{OUT}}=V_S/2$, unless otherwise specified.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
POWER SUPPLY						
Quiescent Current	I_Q	$V_O=V_S/2$		590	850	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}	$V_{CM}=0\text{V} \sim 2.7\text{V}$		15	45	μV
Input Offset Voltage Drift	$\Delta V_{OS}/\Delta T$	$-40^{\circ}\text{C} \leq T_A \leq +125^{\circ}\text{C}$		10		$\text{nV}/^{\circ}\text{C}$
INPUT CHARACTERISTICS						
Input Bias Current	I_B	$V_{CM} = 0\text{V}$		40		pA
Input Offset Current	I_{OS}			10		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	125		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
		$R_L=10\text{k}\Omega \sim V_+$		10	30	mV
Short-Circuit Current	I_{SC}		20	28		mA
DYNAMIC PERFORMANCE						
Slew Rate	SR	$A_V=+1$, $R_L=10\text{k}\Omega$		2.1		$\text{V}/\mu\text{s}$
Gain-Bandwidth Product	GBW	$A_V=+100$		3.3		MHz
NOISE PERFORMANCE						
Voltage Noise	e_n , p-p	0.1Hz ~ 10Hz		0.9		$\mu\text{V}_{\text{p-p}}$
Voltage Noise Density	e_n	f = 1kHz		42		$\text{nV}/\sqrt{\text{Hz}}$

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