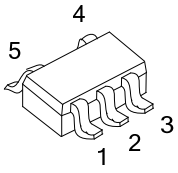
ZERO-DRIFT, SINGLE-SUPPLY, RAIL-TO-RAIL INPUT/OUTPUT CMOS OPERATIONAL AMPLIFIERS



SOT-25

■ 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

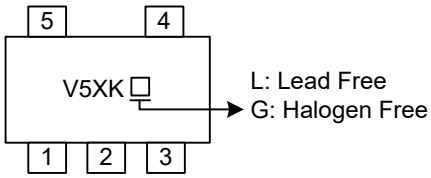
* Single-supply operation: 2.7V ~ 5.5V
* Low Offset Voltage: 18μV (TYP) at +5V
* Rail-to-Rail Input and Output
* Slew Rate: 2.0V/μs

■ ORDERING INFORMATION

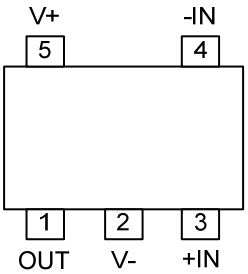
Ordering Number		Package	Packing
Lead Free	Halogen Free		
ULV8551XKL-AF5-R	ULV8551XKG-AF5-R	SOT-25	Tape Reel

ULV8551XKG-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

■ MARKING



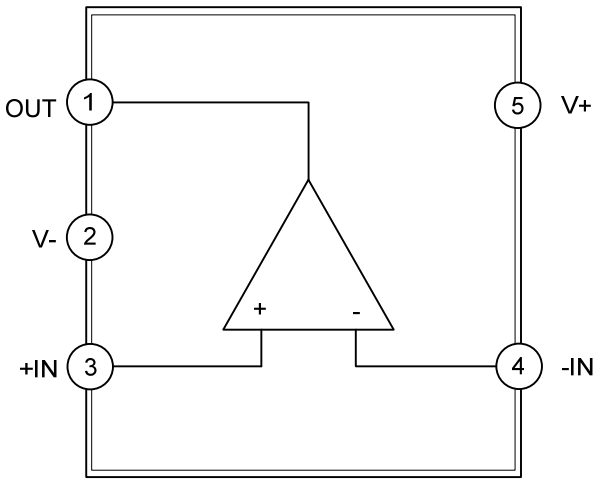
■ PIN CONFIGURATION



■ 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, Vs=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	$\Delta V_{OS}/\Delta T$	-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_np-p	f=0.01Hz~10Hz		0.8		μVpp
Input Voltage Noise Density	e_n	f=1KHz		38		nV/$\sqrt{Hz}$

■ ELECTRICAL CHARACTERISTICS

(T_A=25°C, Vs=2.7V, 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 SUPPLY						
Quiescent Current	I_Q	V_O=V_S/2		590	850	μA
Power Supply Rejection Ratio	PSRR	V_S =2.7V ~ 5V	90	110		dB
OFFSET VOLTAGE						
Input Offset Voltage	V_{OS}	V_{CM}=0V~2.7V		15	45	μV
Input Offset Voltage Drift	$\Delta V_{OS}/\Delta T$	-40°C ≤ T_A ≤ +125°C		10		nV/°C
INPUT CHARACTERISTICS						
Input Bias Current	I_B	V_{CM} = 0V		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} = 0V ~ 2.7V	90	105		dB
Large Signal Voltage Gain	A_V	R_L=10kΩ, V_O=0.3V ~ 2.4V	90	125		dB
		-40°C ≤ T_A ≤ +125°C	85			dB
OUTPUT CHARACTERISTICS						
Output Voltage High	V_{OH}	R_L=100kΩ ~ V-	2.69	2.699		V
		R_L=10kΩ ~ V-	2.685	2.698		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}		20	28		mA
DYNAMIC PERFORMANCE						
Slew Rate	SR	A_V =+1, R_L=10kΩ		2.1		V/μs
Gain-Bandwidth Product	GBW	A_V =+100		3.3		MHz
NOISE PERFORMANCE						
Voltage Noise	e_n p-p	0.1Hz ~ 10Hz		0.9		μV_{P-P}
Voltage Noise Density	e_n	f =1kHz		42		$nV/\sqrt{Hz}$