



## ULV7011

Preliminary

CMOS IC

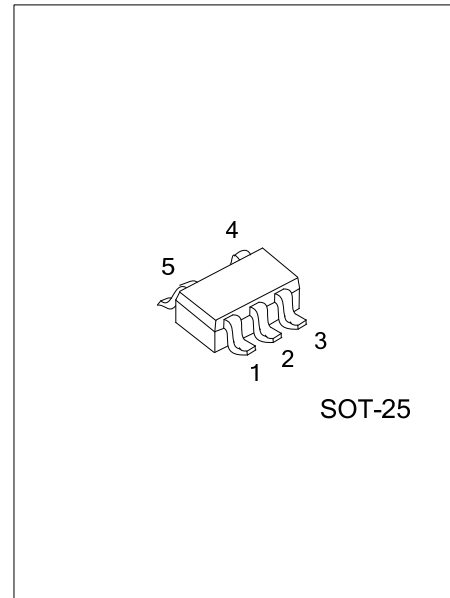
### LOW-POWER TINY SINGLE CMOS OPERATIONAL AMPLIFIER

#### DESCRIPTION

The UTC **ULV7011** is single CMOS operational amplifiers operated on a single-power-supply, low voltage and low operating current. Operation is fully specified from 1V to 5.5V single supply. The minimum operating voltage is 1V and the output stage permits output signal to swing between both of the supply rails.

#### FEATURES

- \* CMOS Technology
- \* Wide Operating Voltage ( $V_{DD}=1\sim 5.5V$ )
- \* Wide Output Swing Range ( $V_{OM}=2.9V$  min. @ 3.0V)
- \* Low Operating Current
- \* Slew Rate (0.15V/ $\mu s$  typ.)
- \* Unity Gain Bandwidth (0.4MHz typ.)
- \* Internal Compensation Capacitor

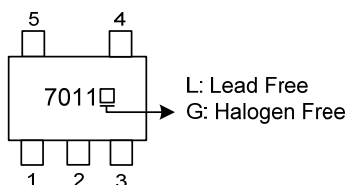


#### ORDERING INFORMATION

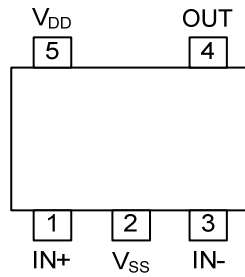
Ordering Number		Package	Packing
Lead Free	Halogen Free		
ULV7011L-AF5-R	ULV7011G-AF5-R	SOT-25	Tape Reel

<p>ULV7011G-AF5-R</p>	<p>(1) R: Tape Reel (2) AF5: SOT-25 (3) G: Halogen Free and Lead Free, L: Lead Free</p>
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#### MARKING



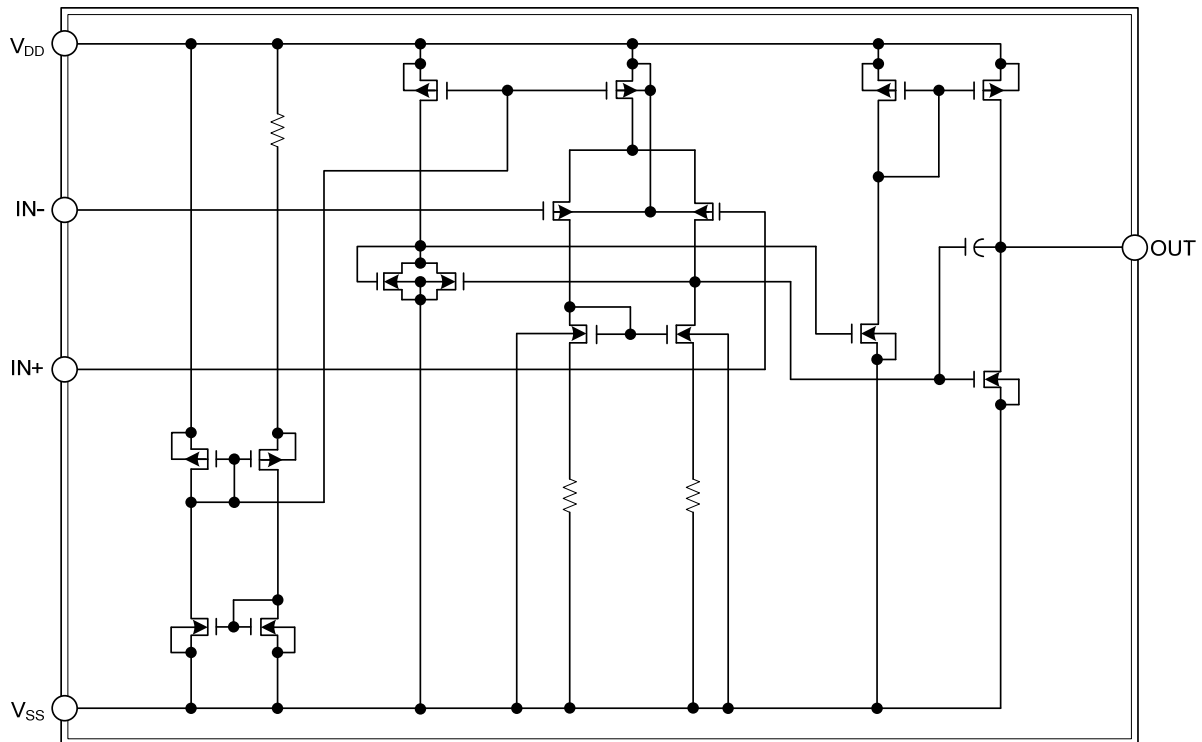
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	IN+	Non-inverting input
2	V <sub>SS</sub>	Ground
3	IN-	Inverting input
4	OUT	Output
5	V <sub>DD</sub>	Positive Power supply

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING ( $T_A=25^{\circ}\text{C}$ , unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	$V_{DD}$	6.5	V
Differential Input Voltage	$V_{ID}$	$\pm 6.5$ (Note 2)	V
Common Mode Input Voltage	$V_{IC}$	-0.3 ~ 6.5	V
Power Dissipation	$P_D$	200	mW
Operating Temperature Range	$T_{OPR}$	-40 ~ +85	$^{\circ}\text{C}$
Storage Temperature Range	$T_{STG}$	-55 ~ +125	$^{\circ}\text{C}$

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. If the supply voltage ( $V_{DD}$ ) is less than 6.5V, the input voltage must not over the  $V_{DD}$  level though 6.5V is limit specified.

3. Decoupling capacitor should be connected between  $V_{DD}$  and  $V_{SS}$  due to the stabilized operation for the circuit.

■ ELECTRICAL CHARACTERISTICS ( $V_{DD}=3.0\text{V}$ ,  $R_L=\infty$ ,  $T_A=25^{\circ}\text{C}$ , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Offset Voltage	$V_{IO}$	$V_{IN}=1/2V_{DD}$			10	mV
Input Offset Current	$I_{IO}$			1		pA
Input Bias Current	$I_{IB}$			1		pA
Input Impedance	$R_{IN}$			1		$\text{T}\Omega$
Large Signal Voltage Gain	$A_{VD}$		60	70		dB
Input Common Mode Voltage Range	$V_{ICM}$		0~2.5			V
Maximum Output Swing Voltage	$V_{OM1}$	$R_L=1\text{M}\Omega$	$V_{DD}-0.1$			V
	$V_{OM2}$	$R_L=1\text{M}\Omega$			$V_{SS}+0.1$	V
Common Mode Rejection Ratio	CMR	$V_{IN}=1/2V_{DD}$	55	65		dB
Supply Voltage Rejection Ratio	SVR	$V_{DD}=1.5\sim 5.5\text{V}$	60	70		dB
Operating Current	$I_{DD}$			15	25	$\mu\text{A}$
Slew Rate	SR			0.15		$\text{V}/\mu\text{s}$
Unity Gain Bandwidth	$F_t$	$A_V=40\text{dB}$ , $C_L=10\text{pF}$		0.4		MHz

Note: The source current is less than  $2.9\mu\text{A}$  (at  $V_{OM}/R_L=2.9\text{V}/1\text{M}\Omega$ ).

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