



## ULC3491

Advance

LINEAR INTEGRATED CIRCUIT

### 1.8V, NANOPOWER, CMOS INPUT, PUSH-PULL OUTPUT COMPARATOR

#### DESCRIPTION

The UTC **ULC3491** is a push-pull output comparators with <math><1.2\mu\text{A}</math> (maximum) nanopower capability and fast ULC3491 an ideal choice for low-voltage applications.

Micro-sized packages provide options for portable and space-restricted applications.

#### FEATURES

- \* Very Low Supply Current:  $0.85\mu\text{A}$  (Typical)
- \* Supply Voltage: 1.8V~5.5V
- \* Rail-to-Rail Input
- \* Input Common-Mode Range: 200-mV Beyond Supply Rails
- \* High Speed:  $6\mu\text{s}$
- \* Push-Pull CMOS Output Stage

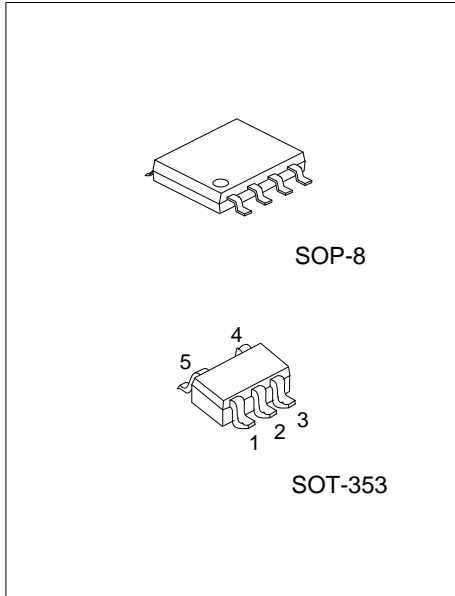
#### ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
ULC3491L-AL5-R	ULC3491G-AL5-R	SOT-353	Tape Reel
ULC3491L-S08-R	ULC3491G-S08-R	SOP-8	Tape Reel

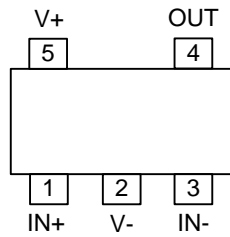
<p>ULC3491G-AL5-R</p> <ul style="list-style-type: none"> <li>(1) Packing Type</li> <li>(2) Package Type</li> <li>(3) Green Package</li> </ul>	<ul style="list-style-type: none"> <li>(1) R: Tape Reel</li> <li>(2) AL5: SOT-353, S08: SOP-8</li> <li>(3) G: Halogen Free and Lead Free, L: Lead Free</li> </ul>
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#### MARKING

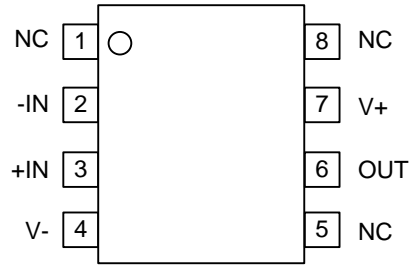
SOT-353	SOP-8
	<ul style="list-style-type: none"> <li>UTC</li> <li>ULC3491</li> <li>Lot Code</li> </ul>



■ PIN CONFIGURATION



SOT-353

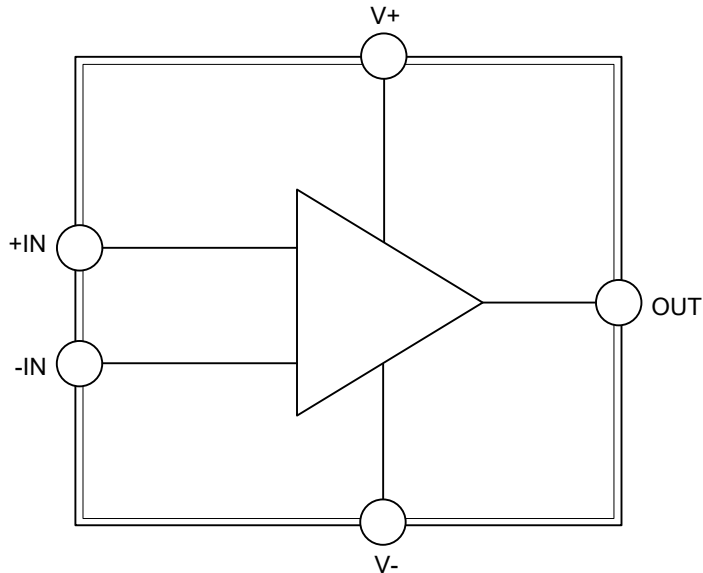


SOP-8

■ PIN DESCRIPTION

PIN NO.		PIN NAME	DESCRIPTION
SOT-353	SOP-8		
1	3	+IN	Noninverting input
2	4	V-	Negative (lowest) power supply
3	2	-IN	Inverting input
4	6	OUT	Output
5	7	V+	Positive (highest) power supply
-	1, 5, 8	NC	No internal connection (can be left floating)

■ BLOCK DIAGRAM



### ■ ABSOLUTE MAXIMUM RATING

(over operating free-air temperature range, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	$V_{CC}$	5.5	V
Signal Input Pin Voltage	$V_{IN}$	(V-) - 0.5 ~ (V+) + 0.5	V
Signal Input Pin Current	$I_{IN}$	-10 ~ 10	mA
Output Short Circuit Current		Continuous	
Junction Temperature	$T_J$	+150	°C
Storage Temperature	$T_{STG}$	-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.

### ■ RECOMMENDED OPERATING CONDITIONS

(over operating free-air temperature range, unless otherwise specified)

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Supply Voltage	$V_{CC}$	1.8		5.5	V
Specified Temperature	$T_A$	-40		+125	°C

### ■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT	
Junction to Ambient	SOT-353	$\theta_{JA}$	300	°C/W
	SOP-8		202	°C/W

### ■ ELECTRICAL CHARACTERISTICS

( $V_S=1.8V\sim 5.5V$ ,  $T_A=25^\circ C$ , unless otherwise specified)

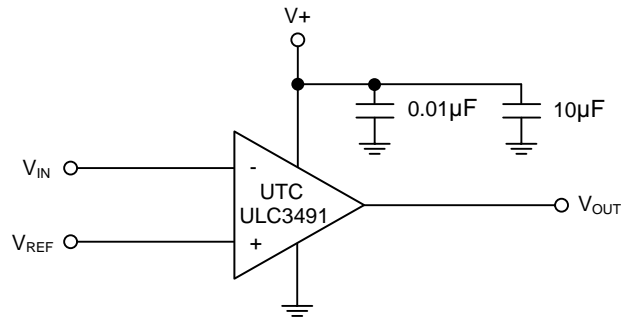
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFFSET VOLTAGE</b>						
Input Offset Voltage	$V_{OS}$	$T_A=25^\circ C$ , $V_{CM}=0V$ , $I_O=0V$		±3	±15	mV
Input Offset Voltage Versus Temperature	$dV_{OS}/dT$	$T_A=-40^\circ C\sim 125^\circ C$		±12		$\mu V/^\circ C$
Input Offset Voltage Versus Power Supply	PSRR	$V_S=1.8V\sim 5.5V$		350	1000	$\mu V/V$
<b>INPUT BIAS CURRENT</b>						
Input Bias Current	$I_B$	$V_{CM}=V_{CC}/2$		±1	±10	pA
Input Offset Current	$I_{OS}$	$V_{CM}=V_{CC}/2$		±1	±10	pA
<b>INPUT VOLTAGE</b>						
Common-Mode Voltage	$V_{CM}$		(V-) - 0.2V		(V+) + 0.2V	V
Common-Mode Rejection Ratio	CMRR	$V_{CM}=-0.2V\sim (V+) - 1.5V$	60	74		dB
		$V_{CM}=-0.2V\sim (V+) + 0.2V$	54	62		dB
<b>INPUT CAPACITANCE</b>						
Common-Mode				2		pF
Differential				4		pF
<b>OUTPUT (<math>V_S=5V</math>)</b>						
Voltage Output High from Rail	$V_{OH}$	$I_{OUT}=5mA$		90	200	mV
Voltage Output Low from Rail	$V_{OL}$	$I_{OUT}=5mA$		160	200	mV
<b>POWER SUPPLY</b>						
Operating Voltage			1.8		5.5	V
Quiescent Current	$I_Q$	$V_O=5V$ , $V_O=high$		0.85	1.2	$\mu A$

### ■ SWITCHING CHARACTERISTICS

(f =10kHz, V<sub>STEP</sub>=1V, V<sub>S</sub>=1.8V~5.5V, T<sub>A</sub>=25°C, unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation Delay Time, Low-to-High	t <sub>(PLH)</sub>	Input Overdrive =10mV		12		μs
		Input Overdrive =100mV		6		μs
Propagation Delay Time, High-to-Low	t <sub>(PLH)</sub>	Input Overdrive =10mV		13.5		μs
		Input Overdrive =100mV		6.5		μs
Rise Time	t <sub>R</sub>	C <sub>L</sub> =10pF		100		ns
Fall Time	t <sub>F</sub>	C <sub>L</sub> =10pF		100		ns

■ TYPICAL APPLICATION CIRCUIT



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