



LV7235

CMOS IC

LOW POWER RAIL-TO-RAIL INPUT COMPARATOR WITH OPEN-DRAIN OUTPUT

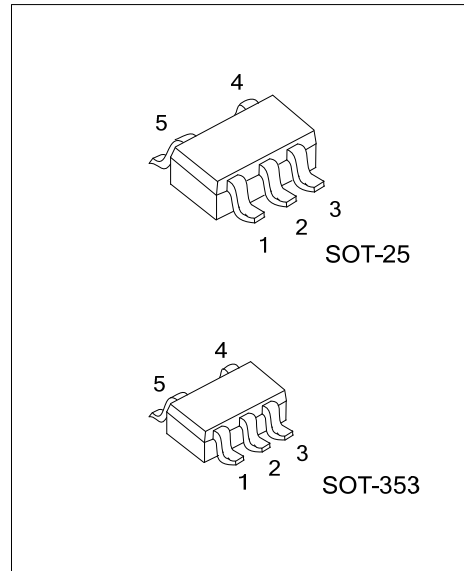
DESCRIPTION

The UTC **LV7235** is a rail-to-rail input low power comparator, characterized at supply voltage 2.7V and 5.0V. It consumes only 60uA supply current while achieving a 78ns propagation delay.

The UTC **LV7235** has a greater than rail-to-rail common-mode voltage range. The input common mode voltage range extends 200mV below ground and 200mV above supply, allowing both ground and supply sensing.

The UTC **LV7235** features an open drain output. By connecting an external resistor, the output of the comparator can be used as a level shifter.

The UTC **LV7235** is available in SOT-25 and SOT-353 packages, which is ideal for systems where small size and low power is critical.



FEATURES

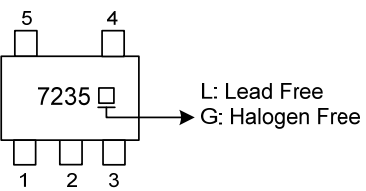
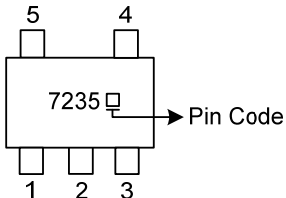
- * 2.7V and 5V, Single-Supply Applications
- * Rail-to-Rail Input
- * Low supply Current: 60μA
- * Propagation Delay: 78ns
- * Open Drain Output

ORDERING INFORMATION

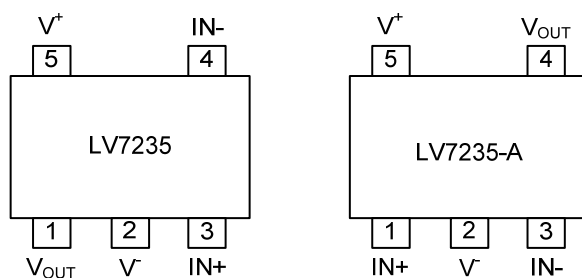
Ordering Number		Package	Packing
Lead Free	Halogen Free		
LV7235L-AF5-R	LV7235G-AF5-R	SOT-25	Tape Reel
LV7235L-AF5-A-R	LV7235G-AF5-A-R	SOT-25	Tape Reel
LV7235L-AL5-R	LV7235G-AL5-R	SOT-353	Tape Reel
LV7235L-AL5-A-R	LV7235G-AL5-A-R	SOT-353	Tape Reel

LV7235G-AF5-A-R	(1) Packing Type (2) Pin Code (3) Package Type (4) Green Package	(1) R: Tape Reel (2) Pin Code A (3) AF5: SOT-25, AL5: SOT-353 (4) G: Halogen Free and Lead Free, L: Lead Free
-----------------	---	--

MARKING

LV7235	LV7235-A
 <p>L: Lead Free G: Halogen Free</p>	 <p>Pin Code</p>

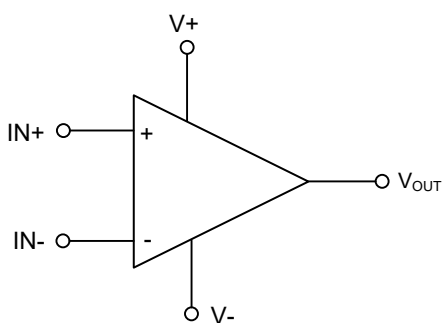
PIN CONFIGURATION



PIN DESCRIPTION

PIN NAME	DESCRIPTION
V_{OUT}	Output
V^-	Negative Supply
IN+	Non-inverting Input
IN-	Inverting Input
V^+	Positive Supply

BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING (T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage (V ⁺ - V ⁻)	V _S	6	V
Differential Input Voltage		± Supply Voltage	V
Output Short Circuit Duration		See (Note 2)	
SOLDERING INFORMATION			
Voltage at Input/Output Pins		(V ⁺) +0.3, (V ⁻) - 0.3	V
Current at Input Pin (Note 2)		±10	mA
Junction Temperature	T _J	+150	°C
Storage Temperature	T _{STG}	-65 ~ +150	°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. Applies to both single-supply and split-supply operation. Continuous short circuit operation at elevated ambient temperature can result in exceeding the maximum allowed junction temperature of 150°C. Output currents in excess of 30mA over long term may adversely affect reliability.
3. Limiting input pin current is only necessary for input voltages that exceed absolute maximum input voltage ratings.

■ RECOMMENDED OPWRAING CONDITIONS

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage (V ⁺ - V ⁻)	V _S	2.7 ~ 5.5	V
Temperature Range	T _A	-40 ~ +85	°C

■ 5V ELECTRICAL CHARACTERISTICS

(V_{CM}=V⁺/2, V⁺= 5.0V, V⁻= 0V, T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Offset Voltage	V _{OS}		-6	±1	+6	mV
Input Bias Current	I _B				400	nA
Input Offset Current	I _{OS}				200	nA
Common-Mode Rejection Ratio	CMRR	0V < V _{CM} < 5V	52	67		dB
Power Supply Rejection Ratio	PSRR	V ⁺ = 2.7V~5V	65	85		dB
Input Common-Mode Voltage Range	V _{CM}	CMRR > 50dB	V ⁻ - 0.1	-0.2~ 5.2	V ⁺ +0.1	V
Output Swing Low	V _O	I _L =-4mA, V _{ID} =-500mV		150	350	mV
		I _L =-0.4mA, V _{ID} =-500mV		10		mV
Output Short Circuit Current	I _{SC}	Sinking, V _O =5V, R _L =10k	30	50		mA
Supply Current	I _S	No load		60	95	μA
Propagation Delay	t _{PD}	Overdrive =20mV C _{LOAD} =15pF (Note 1)		92		ns
		Overdrive =50mV C _{LOAD} =15pF (Note 1)		85		ns
		Overdrive =100mV C _{LOAD} =15pF (Note 1)		78		ns
Output Rise Time	t _r	10%~90%		100		ns
Output Fall Time	t _f	90%~10%		1.7		ns
Output Leakage Current	I _{LEAKAGE}			3		nA

Note: A 10kΩ pullup resistor was used when measuring the UTC LV7235. The rise time of the UTC LV7235 is a function of the R-C time constant.

■ 2.7V ELECTRICAL CHARACTERISTICS

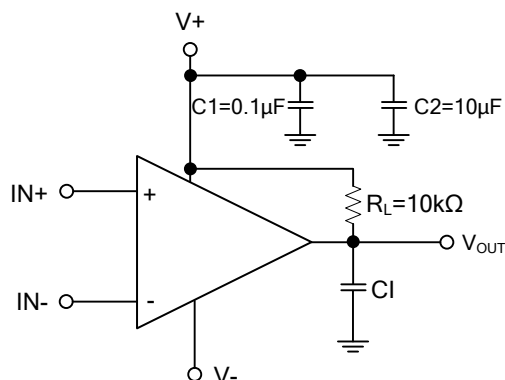
($V_{CM}=V^+/2$, $V^+=2.7V$, $V^-=0V$, $T_A=25^\circ C$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Offset Voltage	V_{OS}		-6	± 0.8	+6	mV
Input Bias Current	I_B				400	nA
Input Offset Current	I_{OS}				200	nA
Common-Mode Rejection Ratio	CMRR	$0V < V_{CM} < 2.7V$ (Note 1)	52	62		dB
Power Supply Rejection Ratio	PSRR	$V^+ = 2.7V \sim 5V$	65	85		dB
Input Common-Mode Voltage Range	V_{CM}	CMRR > 50dB	$V^- - 0.1$	-0.2~2.9	$V^+ + 0.1$	V
Output Swing Low	V_O	$I_L = -4mA$, $V_{ID} = -500mV$		230	350	mV
		$I_L = -0.4mA$, $V_{ID} = -500mV$		15		mV
Output Short Circuit Current	I_{SC}	Sinking, $V_O = 2.7V$, $R_L = 10k\Omega$		15		mA
Supply Current	I_S	No load		55	85	μA
Propagation Delay	t_{PD}	Overdrive = 20mV $C_{LOAD} = 15pF$ (Note 2)		200		ns
		Overdrive = 50mV $C_{LOAD} = 15pF$ (Note 2)		162		ns
		Overdrive = 100mV $C_{LOAD} = 15pF$ (Note 2)		144		ns
Output Rise Time	t_r	10%~90% (Note 2)		112		ns
Output Fall Time	t_f	90%~10%		2.5		ns
Output Leakage Current	$I_{LEAKAGE}$			3		nA

Notes: 1. CMRR is not linear over the common mode range. Limits are guaranteed over the worst case from 0 to $V_{CC}/2$ or $V_{CC}/2$ to V_{CC} .

2. A 10k Ω pullup resistor was used when measuring the UTC LV7235. The rise time of the UTC LV7235 is a function of the R-C time constant.

■ TYPICAL APPLICATION CIRCUIT



UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. UTC reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.