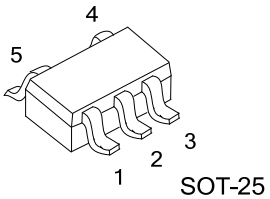
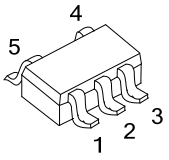
LV7239

CMOS IC

LOW POWER RAIL-TO-RAIL INPUT COMPARATOR WITH PUSH-PULL OUTPUT



SOT-25



SOT-353

■ DESCRIPTION

The UTC **LV7239** is a rail-to-rail input low power comparator, characterized at supply voltage 2.7V and 5.0V. It consumes only 65uA supply current while achieving a 200ns propagation delay.

The UTC **LV7239** 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 **LV7239** features a push-pull output stage. This feature allows operation without the need of an external pull-up resistor.

The UTC **LV7239** 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: 65μA
* Propagation Delay: 200ns
* Push-Pull Output

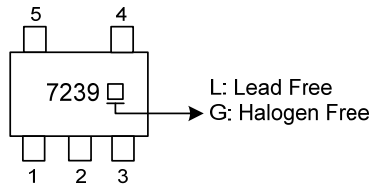
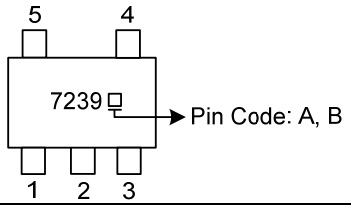
■ ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
LV7239L-AF5-R	LV7239G-AF5-R	SOT-25	Tape Reel
LV7239L-AF5-x-R	LV7239G-AF5-x-R	SOT-25	Tape Reel
LV7239L-AL5-R	LV7239G-AL5-R	SOT-353	Tape Reel
LV7239L-AL5-x-R	LV7239G-AL5-x-R	SOT-353	Tape Reel

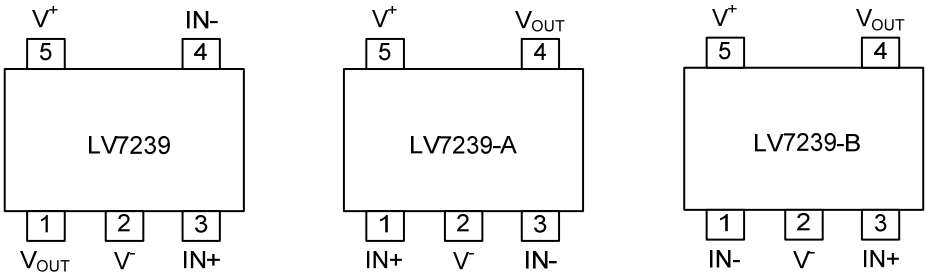
LV7239G-AF5-x-R
(1)Packing Type
(2)Pin Code
(3)Package Type
(4)Green Package

(1) R: Tape Reel
(2) x: refer to PIN CONFIGURATIONS
(3) AF5: SOT-25, AL5: SOT-353
(4) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING

LV7239	LV7239-X
	

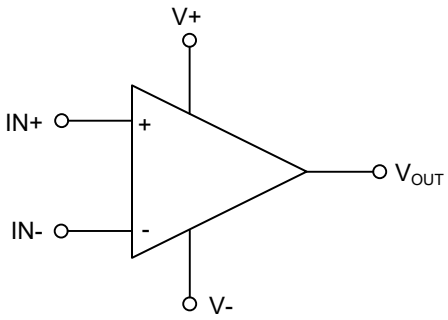
■ PIN CONFIGURATION



■ 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 OPERATING CONDITIONS

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage (V^+ - V^-)	V_S	2.7 ~ 5.5	V
Temperature Range	T_A	-40 ~ +125	°C

■ 5V ELECTRICAL CHARACTERISTICS

(V_{CM}=V^+/2, V^+= 5V, 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			30	400	nA
Input Offset Current	I_{OS}			5	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 High	V_O	I_L=4mA, V_{ID}=500mV	V^+ -0.25	V^+ -0.15		V
		I_L=0.4mA, V_{ID}=500mV		V^+ -0.01		V
Output Swing Low		I_L=-4mA, V_{ID}=-500mV		230	350	mV
		I_L=-0.4mA, V_{ID}=-500mV		10		mV
Output Short Circuit Current	I_{SC}	Sourcing, V_O=0V	25	57		mA
		Sinking, V_O=5V	30	47		mA
Supply Current	I_S	No load		65	95	µA
Propagation Delay	t_{PD}	Overdrive=20mV, C_{LOAD} =100pF		250		ns
		Overdrive=50mV, C_{LOAD} =100pF		230		ns
		Overdrive=100mV, C_{LOAD} =100pF		200		ns
Propagation Delay Skew	t_{SKEW}	Overdrive= 20mV (Note 1)		150		ns
Output Rise Time	t_r	10%~90%		1.2		ns
Output Fall Time	t_f	90%~10%		1.2		ns

Notes: 1. Propagation Delay Skew is defined as the absolute value of the difference between t_{PDLH} and t_{PDHL}.
2. The circuit needs to add a 0.1uF capacitor between V^+ and ground.

■ 2.7V ELECTRICAL CHARACTERISTICS

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

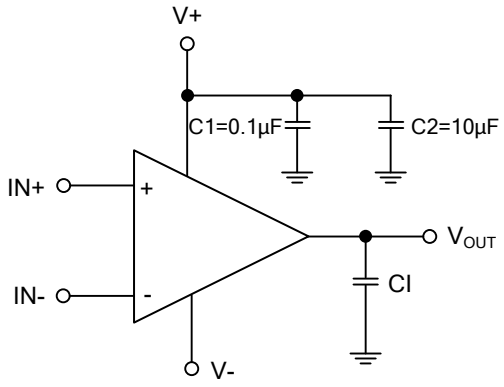
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Offset Voltage	V_{OS}		-6	±0.8	+6	mV
Input Bias Current	I_B			30	400	nA
Input Offset Current	I_{OS}			5	200	nA
Common-Mode Rejection Ratio	CMRR	0V < V_{CM} < 2.7V (Note 1)	52	62		dB
Power Supply Rejection Ratio	PSRR	V^+ = 2.7V~5V	65	85		dB
Input Common-Mode Voltage Range	V_{CM}	CMRR > 50dB	V^- - 0.1	-0.2~ 2.9	V^+ +0.1	V
Output Swing High	V_O	I_L=4mA, V_{ID}=500mV	V^+ -0.35	V^+ -0.26		V
		I_L=0.4mA, V_{ID}=500mV		V^+ -0.02		V
Output Swing Low		I_L=-4mA, V_{ID}=-500mV		230	350	mV
		I_L=-0.4mA, V_{ID}=-500mV		15		mV
Output Short Circuit Current	I_{SC}	Sourcing, V_O=0V		16		mA
		Sinking, V_O=2.7V		13.1		mA
Supply Current	I_S	No load		52	85	μA
Propagation Delay	t_{PD}	Overdrive=20mV, C_{LOAD} =100pF		255		ns
		Overdrive=50mV, C_{LOAD} =100pF		235		ns
		Overdrive=100mV, C_{LOAD} =100pF		205		ns
Propagation Delay Skew	t_{SKEW}	Overdrive=20mV (Note 2)		55		ns
Output Rise Time	t_r	10%~90%		1.7		ns
Output Fall Time	t_f	90%~10%		1.7		ns

Notes: 1. CMRR is not linear over the common mode range. Limits are guaranteed over the worst case from 0 to V^+/2 or V^+/2 to V^+.

2. Propagation Delay Skew is defined as the absolute value of the difference between t_{PDLH} and t_{PDHL}.

3. The circuit needs to add a 0.1uF capacitor between V^+ and ground.

■ TYPICAL APPLICATION CIRCUIT



■ TYPICAL CHARACTERISTICS