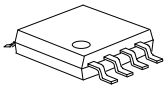
LV942

CMOS IC

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



MSOP-8

■ DESCRIPTION

The UTC **LV942** is low power 100-ns comparators. They are ensured to operate over the full supply voltage range of 2.7V to 5.5V. The device achieves a 100-ns propagation delay while consuming only 65μA of supply current at 5V.

The UTC **LV942** has a greater than rail-to-rail common-mode voltage range. The input common mode voltage range extends 100mV below ground and 100mV above supply, allowing both ground and supply sensing.

The UTC **LV942** features a push-pull output stage. This feature allows operation without the need of an external pull-up resistor.

■ FEATURES

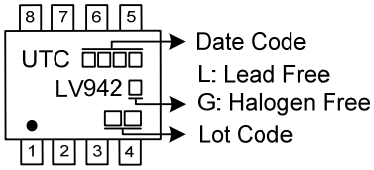
* Supply Voltage: 2.7~5.5V
* Supply current 65μA/ Comparator (typ.)
* Input Offset Voltage: 6mV (Max.)
* Rail-to-Rail input
*Push-Pull Output
* Propagation Delay: 100ns (typ.)

■ ORDERING INFORMATION

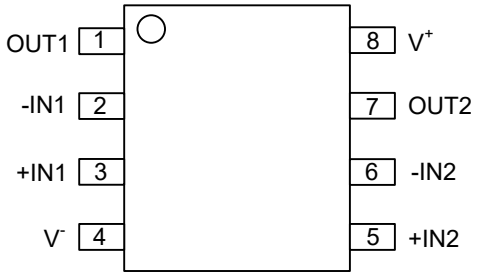
Ordering Number		Package	Packing
Lead Free	Halogen Free		
LV942L-SM1-R	LV942G-SM1-R	MSOP-8	Tape Reel

LV942G-SM1-R (1)Packing Type (2)Package Type (3)Green Package	(1) R: Tape Reel (2) SM1: MSOP-8 (3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



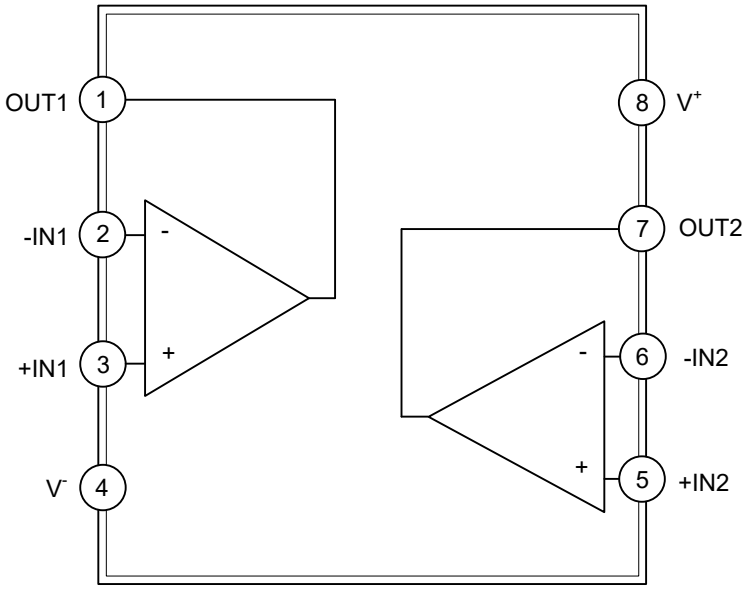
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	OUT1	Output of 1 AMP
2	-IN1	Inverting Input of 1 AMP
3	+IN1	Non-inverting input of 1 AMP
4	V^-	Negative Power Supply
5	+IN2	Non-inverting input of 2 AMP
6	-IN2	Inverting input of 2 AMP
7	OUT2	Output of 2 AMP
8	V^+	Positive Power Supply

■ BLOCK DIAGRAM



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

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	$V^+ - V^-$	6	V
Differential Input Voltage		± Supply Voltage	V
Output Short Circuit Duration		See (Note 2)	
SOLDERING INFORMATION			
Voltage at Input/Output Pins		$V^+ - 0.3 \sim V^- + 0.3$	V
Current at Input Pin (Note 3)		±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	$V^+ - V^-$	2.7 ~ 5.5	V
Temperature Range	T_A	-40 ~ +85	°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
Supply Current/Comparator	IQ	No Load		65	95	μA
Power Supply Rejection Ratio	PSRR	V^+ = 2.7V~5V	65	75		dB
Input Offset Voltage	V_{IO}		-6	±1	+6	mV
Input Bias Current	I_B			160	400	nA
Input Offset Current	I_{OS}			110	200	nA
Input Common-Mode Voltage Range	V_{CM}	CMRR > 50dB	V^- - 0.1	-0.2~5.2	V^+ +0.1	V
Common-Mode Rejection Ratio	CMRR	0V < V_{CM} < 5V	52	70		dB
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	49		mA
Propagation Delay	t_{PD}	Overdrive=20mV, C_{LOAD}=15pF		115		ns
		Overdrive=50mV, C_{LOAD}=15pF		107		ns
		Overdrive=100mV, C_{LOAD}=15pF		100		ns
Propagation Delay Skew	t_{SKEW}	Overdrive= 20mV (Note)		30		ns
Output Rise Time	t_r	10%~90%		1.2		ns
Output Fall Time	t_f	90%~10%		1.2		ns

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

■ 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
Supply Current/Comparator	IQ	No Load		55	85	μA
Power Supply Rejection Ratio	PSRR	V^+ = 2.7V~5V	65	75		dB
Input Offset Voltage	V_{IO}		-6	±0.8	+6	mV
Input Bias Current	I_B			85	400	nA
Input Offset Current	I_{OS}			80	200	nA
Input Common-Mode Voltage Range	V_{CM}	CMRR > 50dB	V- - 0.1	-0.2~2.9	V+ +0.1	V
Common-Mode Rejection Ratio	CMRR	0V < V_{CM} < 2.7V (Note 1)	52	70		dB
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		17		mA
		Sinking, V_O=2.7V		16		mA
Propagation Delay	t_{PD}	Overdrive=20mV, C_{LOAD} =15pF		125		ns
		Overdrive=50mV, C_{LOAD} =15pF		117		ns
		Overdrive=100mV, C_{LOAD} =15pF		110		ns
Propagation Delay Skew	t_{SKEW}	Overdrive=20mV (Note 2)		23		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_{CC}/2 or V_{CC}/2 to V_{CC}.

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

■ TYPICAL CHARACTERISTICS