UNISONIC TECHNOLOGIES CO., LTD

LMV3011

Preliminary

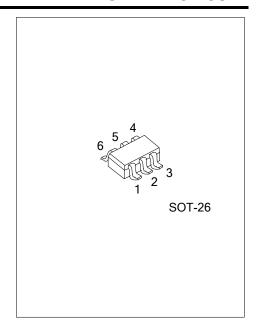
LINEAR INTEGRATED CIRCUIT

NANOPOWER, 1.8V, COMPARATOR WITH VOLTAGE REFERENCE

■ DESCRIPTION

The UTC **LMV3011** is a low-power, open-drain logic compatible output comparator and can provide an independent on-chip voltage reference. The UTC **LMV3011** has 5μ A (max) quiescent current, and input common-mode range 200mV beyond the supply rails. Single-supply operation can range from 1.8V to 5.5V. The integrated 1.242V series voltage reference with low 100ppm/°C (max) drift is stable with up to 10nF capacitive load, and the output current can be up to 0.5mA (Typ).

The UTC **LMV3011** is also available in the tiny SOT-26 package for space-conservative designs. The device is specified for the temperature range of $-40^{\circ}\text{C} \sim +125^{\circ}\text{C}$.



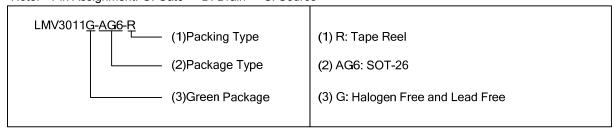
■ FEATURES

- * Low quiescent current: 5µA (max)
- * Stable on-chip voltage reference: 1.242V
- * Voltage reference initial accuracy: ±1%
- * Reference output current: 0.5mA (Typ)
- * Input common-mode range: 200mV beyond rails
- * The lower supply voltage: 1.8V ~ 5.5V
- * fast response time: $6\mu s$ propagation delay with 100mV overdrive ($R_{PULL-UP}$ =10k Ω)

■ ORDERING INFORMATION

Ordering Number	Package	Packing
LMV3011G-AG6-R	SOT-26	Tape Reel

Note: Pin Assignment: G: Gate D: Drain S: Source

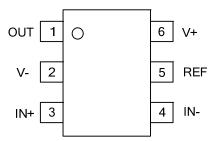


■ MARKING



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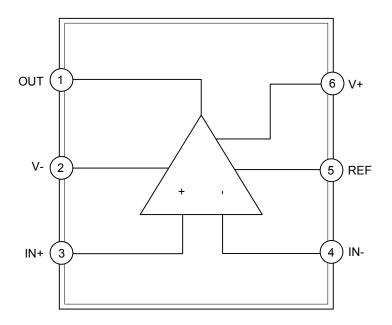
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	OUT	Comparator output.
2	V-	Negative supply.
3	IN+	Noninverting comparator input.
4	IN-	Inverting comparator input.
5	REF	Voltage reference output.
6	V+	Positive supply.

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	+7	V
Signal Input Terminals, Voltage (Note 1)		-0.5~(V+)+0.5	V
Signal Input Terminals, Current (Note 1)		±10	mA
Output Short-Circuit (Note 2)		Continuous	
Junction Temperature	T_J	+150	°C
Operating Temperature	T _{OPR}	-40~+125	°C
Storage Temperature	T _{STG}	-55~+150	°C
Lead Temperature (soldering, 10s)	TL	+300	°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. Input terminals are diode-clamped to the power-supply rails. Input signals that can swing more than 0.5V beyond the supply rails should be current limited to 10mA or less.
 - 3. Short-circuit to ground

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	230	°C/W

■ ELECTRICAL CHARACTERISTICS (V_s=+1.8V~+5.5V)

Boldface limits apply over the specified temperature range, T_A =-40°C~+125°C. At T_A =+25°C, V_{OUT} = V_S , unless otherwise noted; RPULL-UP=10k Ω connected to V_S .

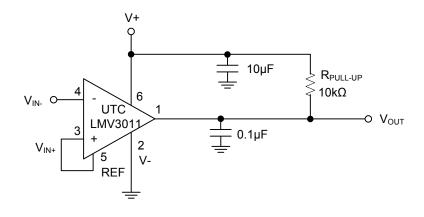
Otherwise Hoted, INFOLL-OF - TOKS2	connected to	, v ₅ .					
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
OFFSET VOLTAGE							
Input Offset Voltage	Vos	$V_{CM}=0V$, $I_{O}=0A$		0.5	12	mV	
vs Temperature	dV _{OS} /dT	T _A =-40°C~ +125°C		±12		μV/°C	
vs Power Supply	PSRR	V _S =1.8V~5.5V		100	1000	μV/V	
INPUT BIAS CURRENT							
Input Bias Current	I _B	V _{CM} =V _S /2		±1	±10	pА	
Input Offset Current	Ios	V _{CM} =V _S /2		±1	±10	pА	
NPUT VOLTAGE RANGE							
Common-Mode Voltage Range	V_{CM}		(V-) -0.2V		(V+)+0.2V	V	
Common Mode Dejection Datio	CMRR	V _{CM} =-0.2V~ (V+)-1.5V	60	74		dB	
Common-Mode Rejection Ratio		V _{CM} =-0.2V~ (V+)+0.2V	54	62		dB	
INPUT IMPEDANCE							
Common-Mode				10 ¹³ 2		ΩllpF	
Differential				10 ¹³ 4		ΩllpF	
SWITCHING CHARACTERISTICS	(f=10kHz, V	STEP=1V)					
Propagation Delay Time,	4	Input Overdrive=10mV		12		μs	
Low-to-High	t _(PLH)	Input Overdrive=100mV		6		μs	
Propagation Delay Time,	4	Input Overdrive=10mV		13.5		μs	
High-to-Low	t _(PHL)	Input Overdrive=100mV		6.5		μs	
Rise Time	t _R			See Note 1			
Fall Time	t _F	C _L =10pF		100		ns	
OUTPUT (V _S =5V)							
Voltage Output Low from Rail	V _{OL}	I _{OUT} =-5mA		150	200	mV	

■ ELECTRICAL CHARACTERISTICS (Cont.)

PARAI	METER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
VOLTAGE REFERENCE							
Voltage Reference	e	V_{OUT}	V _{IN} =5V	1.230	1.242	1.254	V
Initial Accuracy						±1	%
Temperature Drif	t	dV _{OUT} /dT	-40°C≤T _A ≤125°C		40	100	ppm/°C
Load Regulation	Sourcing	ما/ / الما	0mA< I _{SOURCE} ≤0.5mA		0.36	1	mV/mA
	Sinking	dV _{OUT} /dI _{LOAD}	0mA< I _{SINK} ≤ 0.5mA		6.6		mV/mA
Output Current		I_{LOAD}			0.5		mA
Line Regulation		dV_{OUT}/dV_{IN}	1.8V≤V _{IN} ≤5.5V		10	100	μV/V
NOISE					_		
Reference Voltag	e Noise		f=0.1Hz~10Hz		0.2		mV_{PP}
POWER SUPPLY							
Specified Voltage	1	Vs		1.8		5.5	V
Operating Voltage	e Range			1.8		5.5	V
Quiescent Currer	nt	IQ	V _S =5V, V _O =High		2.8	5	μA

Note: t_R dependent on $R_{\text{PULL-UP}}$ and C_{LOAD} .

■ TYPICAL APPLICATION CIRCUIT



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