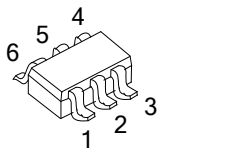
NANOPOWER, 1.8V, COMPARATOR WITH VOLTAGE REFERENCE



SOT-26

■ DESCRIPTION

The UTC **LMV3012** is a push-pull output comparator and can provide an independent on-chip voltage reference. The UTC **LMV3012** has 5μA (max) quiescent current, 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 **LMV3012** is also available in the tiny SC59-6 package for space-conservative designs. The device is specified for the temperature range of -40°C~+125°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
* Push-pull output
* The lower supply voltage: 1.8V ~ 5.5V
* Fast response time:6μs propagation delay with 100mV overdrive

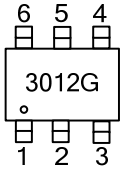
■ ORDERING INFORMATION

Ordering Number	Package	Packing
LMV3012G-AG6-R	SOT-26	Tape Reel

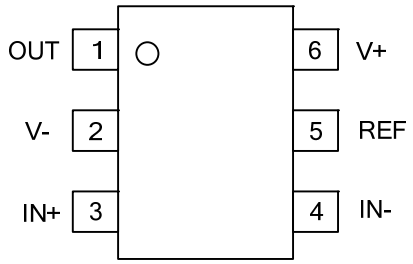
Note: Pin Assignment: G: Gate D: Drain S: Source

LMV3012G-AG6-R (1)Packing Type (2)Package Type (3)Green Package	(1) R: Tape Reel (2) AG6: SOT-26 (3) G: Halogen Free and Lead Free

■ MARKING



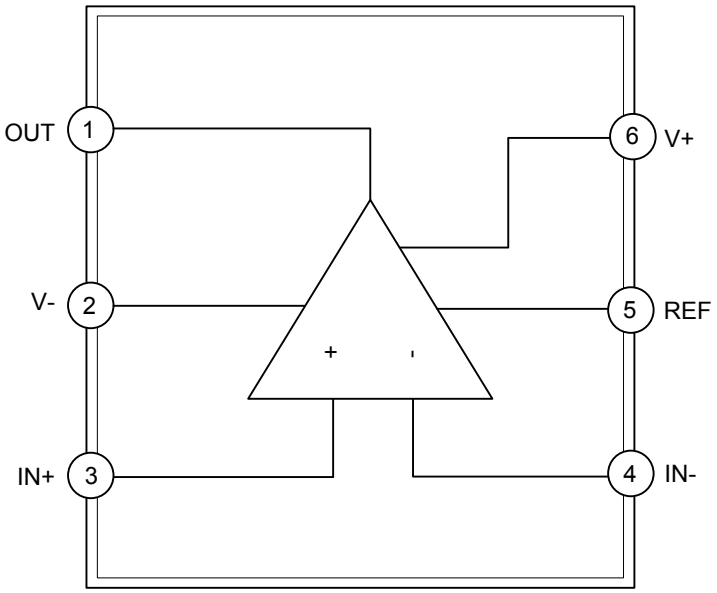
■ PIN CONFIGURATION



■ 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)	T_L	+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)

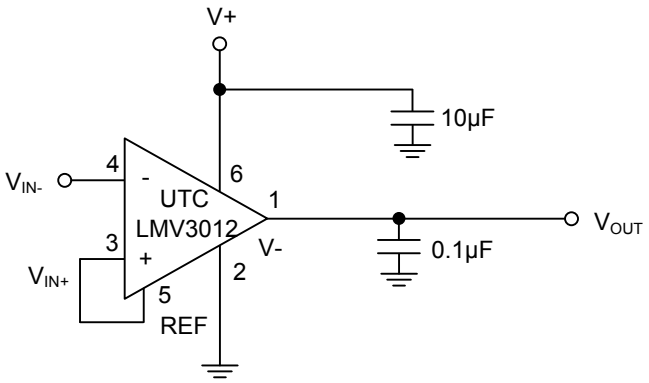
Boldface limits apply over the specified temperature range, T_A=-40°C~+125°C. At T_A=+25°C, V_{OUT}=V_S, unless otherwise noted

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFFSET VOLTAGE						
Input Offset Voltage	V_{OS}	V_{CM}=0V, I_O=0A		0.5	12	mV
V_S Temperature	dV_{OS}/dT	T_A=-40°C~ +125°C		±12		μV/°C
V_S 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	pA
Input Offset Current	I_{OS}	V_{CM}=V_S/2		±1	±10	pA
NPUT VOLTAGE RANGE						
Common-Mode Voltage Range	V_{CM}		(V-) -0.2V		(V+)+0.2V	V
Common-Mode Rejection Ratio	CMRR	V_{CM}=-0.2V~ (V+)-1.5V	60	74		dB
		V_{CM}=-0.2V~ (V+)+0.2V	54	62		dB
INPUT IMPEDANCE						
Common-Mode				10^{13}‖2		Ω‖pF
Differential				10^{13}‖4		Ω‖pF
SWITCHING CHARACTERISTICS (f=10kHz, V_{STEP}=1V)						
Propagation Delay Time, Low-to-High	$t_{(PLH)}$	Input Overdrive=10mV		12		μs
		Input Overdrive=100mV		6		μs
Propagation Delay Time, High-to-Low	$t_{(PHL)}$	Input Overdrive=10mV		13.5		μs
		Input Overdrive=100mV		6.5		μs
Rise Time	t_R	C_L=10pF		100		ns
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
Voltage Output High From Rail	V_{OH}	I_{OUT}=5mA, V_S-V_{OUT}		90	200	mV
Short-Circuit Current		V_{CC}=5V		110		mA

■ ELECTRICAL CHARACTERISTICS(Cont.)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
VOLTAGE REFERENCE							
Voltage Reference		V_{OUT}	V_{IN}=5V	1.230	1.242	1.254	V
Initial Accuracy						±1	%
Temperature Drift		dV_{OUT}/dT	-40°C≤T_A≤125°C		40	100	ppm/°C
Load Regulation	Sourcing	dV_{OUT}/dI_{LOAD}	0mA< I_{SOURCE} ≤0.5mA		0.36	1	mV/mA
	Sinking		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 Voltage Noise			f=0.1Hz~10Hz		0.2		mV_{PP}
POWER SUPPLY							
Specified Voltage		V_S		1.8		5.5	V
Operating Voltage Range				1.8		5.5	V
Quiescent Current		I_Q	V_S=5V, V_O=High		2.8	5	μA

■ TYPICAL APPLICATION CIRCUIT



■ TYPICAL CHARACTERISTICS