LMV721IDBVR-TP

10MHz, CMOS Rail-to-Rail Operational Amplifier

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Features

- General Purpose, Low Cost
- Gain Bandwidth Product: 10MHz
- Quiescent Current: 800μA/Amplifier(Typ.)
- Input Bias Current: 20pA
- Rail-to-Rail Input and Output
- Single-Supply Operation from +2.2V ~ +5.5V
- Operating Temperature: -40°C ~ +125°C
- Type Package:SOT23-5

Applications

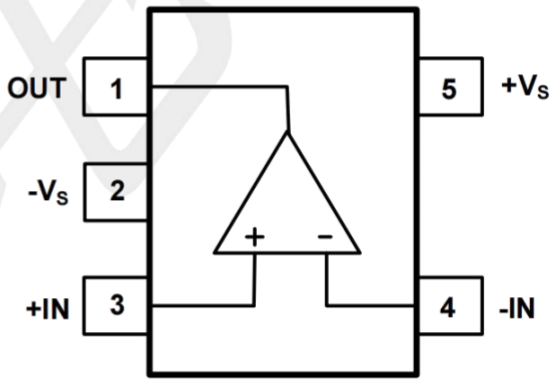
- Temperature Sensors
- Battery-Powered Instruments
- Smoke/Gas/Environment Sensors
- Medical Equipment
- Portable Instruments and Mobile Device
- Active Filters
- Piezo Electrical Transducer Amplifier
- Sensor Interface
- Handheld Test Equipment

General Description

The is wide band, low-noise, low-distortion dual operational amplifier, that offer rail-to rail inputs / outputs and single supply operation down to 2.2V.They draw 1.6mA of quiescent supply current while featuring ultra-low distortion(0.0002% THD+N), as well as low input voltage noise density (15nV/Hz) and low input current noise density (0.5fA/Hz).These features make the devices an ideal choice for applications that require low distortion and/or low noise.

These amplifiers have inputs and outputs which swing rail-to rail and their input common mode voltage range includes ground. The maximum input offset of these amplifiers is less than 5mV.

Pinout (top view)



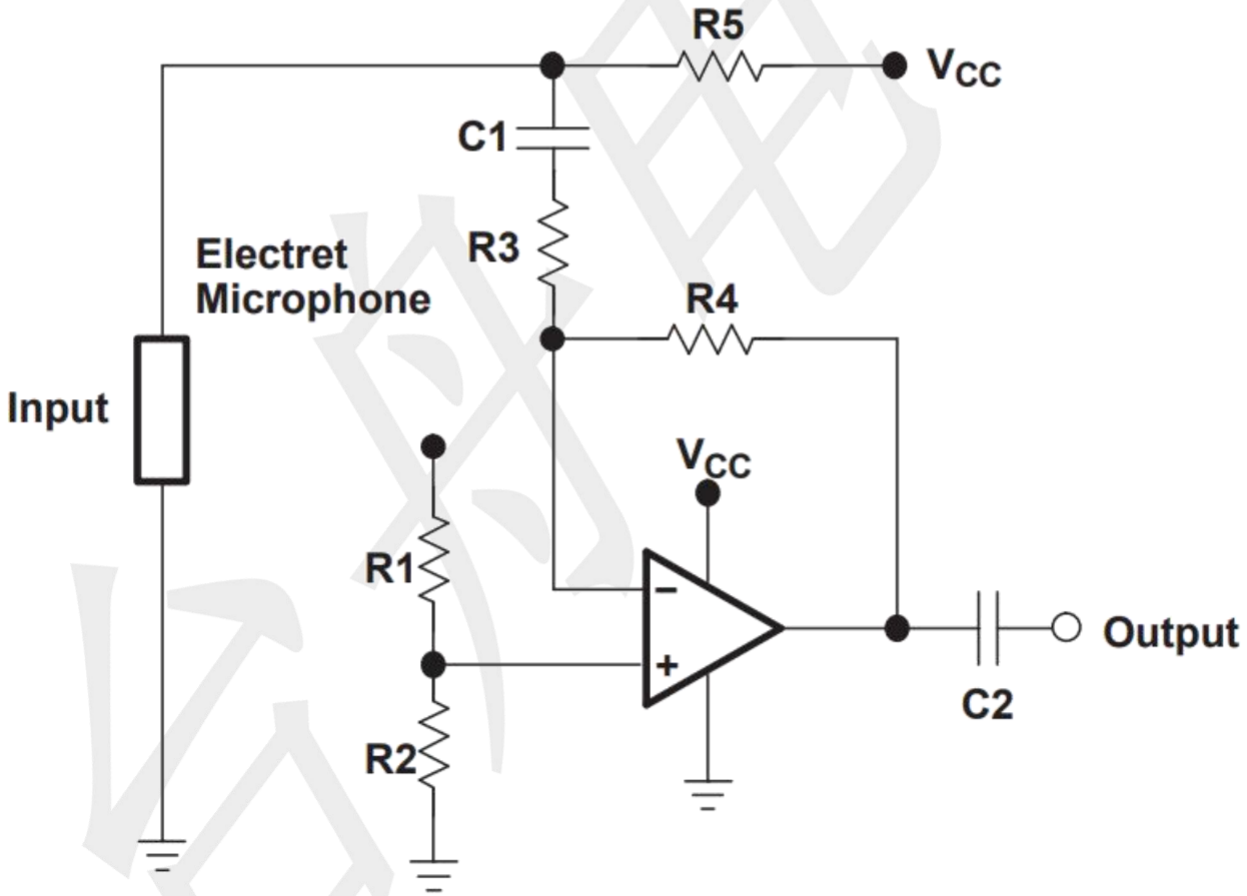
Pin Configurations

Pin Number	Pin Name	Pin Function
1	OUT	Output
2	-Vs	Chip Supply Voltage(Negative)/GND
3	+IN	In-phase input
4	-IN	Reverse input
5	+Vs	Chip Supply Voltage(Positive)/VDD

Absolute Maximum Ratings (@TA = +25°C, unless otherwise specified.)

Condition		Rating		UNIT
VDD to GND	Power Supply Voltage	-0.5V~+7V		V
IN+ or IN-	Signal Input Terminals Voltage	GND-0.5V~VDD+0.5V		V
PDB	Input Voltage	-0.5V~+7V		V
OUT to GND	Output Short-Circuit	Continuous		mA
TJ	Junction Temperature	150		°C
LT	Lead Temperature (Soldering, 10 sec.)	260		°C
TA	Operating Temperature Range	-55	150	°C
Tstg	Storage Temperature Range	-65	150	°C

Typical Application



Electrical Characteristics (At TA = +25℃,VS = +5V, unless otherwise noted.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Supply-Voltage Range	V_{DD}	Guaranteed by the PSRR test	2.2	--	5.5	V
Quiescent Supply Current (per Amplifier)	I_{DD}	V_{DD} = 3V	--	0.8	--	mA
		V_{DD} = 5V	--	0.8	1.2	
Input Offset Voltage	V_{OS}	T_A = +25°C	--	--	±5	mV
		T_A = -40°C to +85°C	--	--	--	
		T_A = -40°C to +125°C	--	--	±1.5	
Input Offset Voltage Tempco	$\Delta V_{OS}/\Delta T$		--	±0.3	±6	μV/°C
Input Bias Current	I_B	(Note 3)	--	±1	±100	pA
Input Offset Current	I_{OS}	(Note 3)	--	±1	±100	pA
Input Common-Mode Voltage Range	V_{CM}	Guaranteed by the T_A = 25°C	-0.2	--	V_{DD}+0.2	V
		CMRR test T_A = -40°C to +125°C	0	--	V_{DD}0	
Common-Mode Rejection Ratio	CMRR	Vss-0.2V≤V_{CM}≤V_{DD}+0.2V T_A = +25°C	--	75	--	dB
		Vss≤V_{CM}≤5V T_A = +25°C	65	80	--	
		Vss-0.2V≤V_{CM}≤V_{DD}+0.2V T_A = -40°C to +125°C	--	65	--	
Power-Supply Rejection Ratio	PSRR	V_{DD} = +2.2V to +5.5V	75	90	--	dB
Open-Loop Voltage Gain	A_V	R_L=100kΩ to V_{DD}/2, 100mV≤V_O≤V_{DD} -125mV	90	100	--	dB
		R_L=1kΩ to V_{DD}/2, 200mV≤V_O≤V_{DD} -250mV	75	85	--	
		R_L=500Ω to V_{DD}/2, 350mV≤V_O≤V_{DD} -500mV	55	65	--	
Output Voltage Swing	V_{OUT}	|V_{IN+}-V_{IN-}| ≥ 10mV,V_{DD}-V_{OH}	--	10	35	mV
		R_L = 10kΩ to V_{DD}/2,V_{OL}-V_{SS}	--	10	30	
		|V_{IN+}-V_{IN-}| ≥ 10mV,V_{DD}-V_{OH}	--	80	200	
		R_L = 1kΩ to V_{DD}/2,V_{OL}-V_{SS}	--	50	150	
		|V_{IN+}-V_{IN-}| ≥ 10mV,V_{DD}-V_{OH}	--	100	350	
		R_L = 500Ω to V_{DD}/2 V_{OL}-V_{SS}	--	80	260	

Electrical Characteristics (At TA = +25℃,VS = +5V, unless otherwise noted.)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Output Short-Circuit Current	I_{SC}	Sinking or Sourcing	--	±50	--	mA
PDB Logic Low	V_{IL}		--	--	0.8	V
PDB Logic High	V_{IH}		2	--	--	V
Turn-On Time	T_{ON}		--	2.2	--	μs
Turn-Off Time	T_{OFF}		--	0.8	--	μs
Output Leakage Current	I_{LEAK}	Shutdown Mode (PDB = V_{SS}), V_{OUT} = V_{SS} to V_{DD}	--	±0.001	±1.0	μA
Input Capacitance	C_{IN}		--	10	--	pF
Gain Bandwidth Product	GBW	A_V = +1V/V	--	10	--	MHz
Slew Rate	SR	A_V = +1V/V	--	4.5	--	V/μs
Full Power Bandwidth		Av = +1V/V	--	0.4	--	MHz
Phase Margin	ϕ_m	Av = +1V/V	--	55	--	deg
Gain Margin	G_m	Av = +1V/V	--	12	--	dB
Settling Time	ts	To 0.01%, V_{OUT} = 2V step Av = +1V/V	--	1	--	μs
Capacitive-Load Stability	C_{LOAD}	No sustained oscillations.Av = +1V/V	--	200	--	pF
Peak-to-Peak Input Noise Voltage	e_n(p-p)	f = 0.1Hz to 10Hz	--	5	--	μVp-p
Input Voltage Noise Density	e_n	f = 10Hz f = 1kHz f = 30kHz	-- -- --	60 30 15	-- -- --	nV/√Hz
Input Current Noise Density	i_n	f = 1kHz				fA/√Hz
Total Harmonic Distortion plus Noise	THD+N	V_{OUT} = 2Vp-p, Av = +1V/V, f = 1kHz RL = 10kΩ to GND f = 20kHz V_{OUT} = 2Vp-p, Av = +1V/V, f = 1kHz RL = 1kΩ to GND f = 20kHz	-- -- -- --	0.0001 0.002 0.0002 0.004	-- -- -- --	%

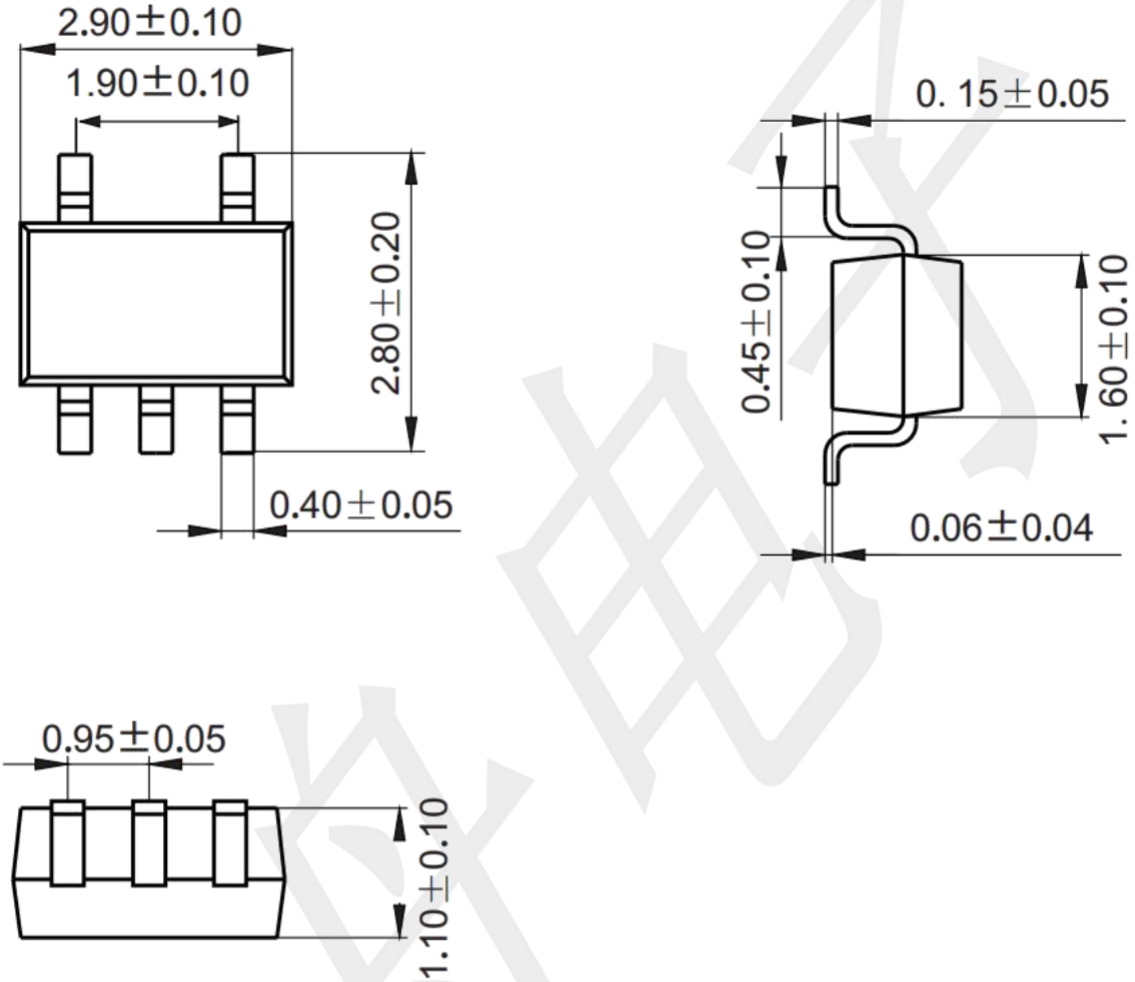
Note 1: All devices are 100% production tested at TA = +25°C ; all specifications over the automotive temperature range is guaranteed by design, not production tested.

Note 2: Parameter is guaranteed by design.

Note 3: Peak-to-peak input noise voltage is defined as six times RMS value of input noise voltage.

Package information (Unit: mm)

SOT23-5



Mounting Pad Layout (Unit: mm)