



ULV7084

Preliminary

CMOS IC

PRE-AMPLIFIER FOR MEMS MICROPHONE

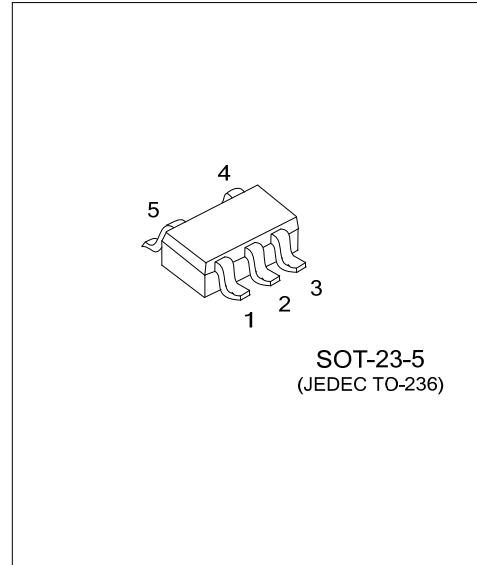
DESCRIPTION

The UTC **ULV7084** is a pre-amplifier for MEMS microphone.

The UTC **ULV7084** has integrated low noise bias circuit for MEMS microphone, and high performance analog pre-amplifier deliver the genuine sound quality and support flexible microphone systems.

FEATURES

- * Operating voltage: 1.5V ~ 3.60V
- * Current consumption: 80µA typ.
- * Bias Voltage: +12.5V
- * Input equivalent noise: 3µVrms (-110dBV)
- * Frequency response: 20Hz~20kHz
- * Maximum output Voltage: 281mVrms (-11dBV) at THD < 5%
- * Gain: -3dB
- * Operating temperature: -40°C~85°C

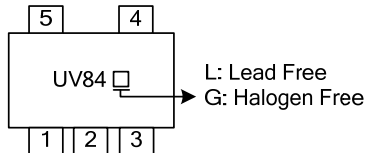


ORDERING INFORMATION

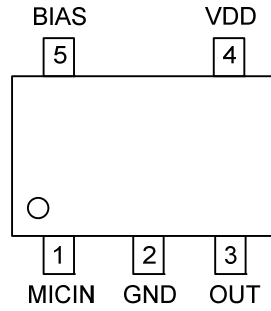
Ordering Number		Package	Packing
Lead Free	Halogen Free		
ULV7084L-AE5-R	ULV7084G-AE5-R	SOT-23-5	Tape Reel

<p>ULV7084G-AE5-R</p> <ul style="list-style-type: none"> (1) Packing Type (2) Package Type (3) Green Package 	<ul style="list-style-type: none"> (1) R: Tape Reel (2) AE5: SOT-23-5 (3) G: Halogen Free and Lead Free, L: Lead Free
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MARKING



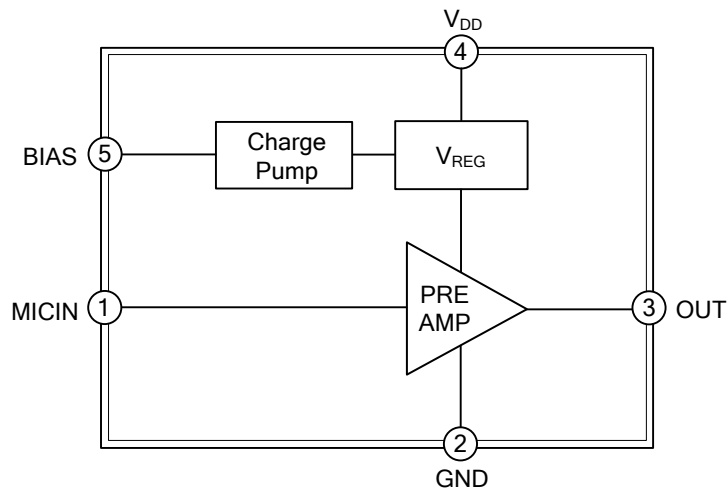
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	MICIN	Microphone input (Analog input)
2	GND	Ground
3	OUT	Output (Analog output)
4	V _{DD}	Power Supply
5	BIAS	Bias Voltage Output

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING ($T_A=25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Power Supply Voltage	V_{DD}	5	V
Maximum Input Voltage	V_{IM}	± 0.4	V
Operating Temperature	T_{OPR}	-40 ~ +85	$^\circ\text{C}$
Storage Temperature	T_{STG}	-40 ~ +125	$^\circ\text{C}$

Note: 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.

■ RECOMMENDED OPERATING ($T_A=25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Operating Voltage	V_{DD}		1.5	1.8	3.6	V

■ ELECTRICAL CHARACTERISTICS

($V_{DD}=1.8\text{V}$, Input Capacitance=1pF, $V_{IN}=-39.0\text{dBV}$, $f=1\text{kHz}$, $R_L=100\text{k}\Omega$, $T_A=25^\circ\text{C}$, unless otherwise specified)

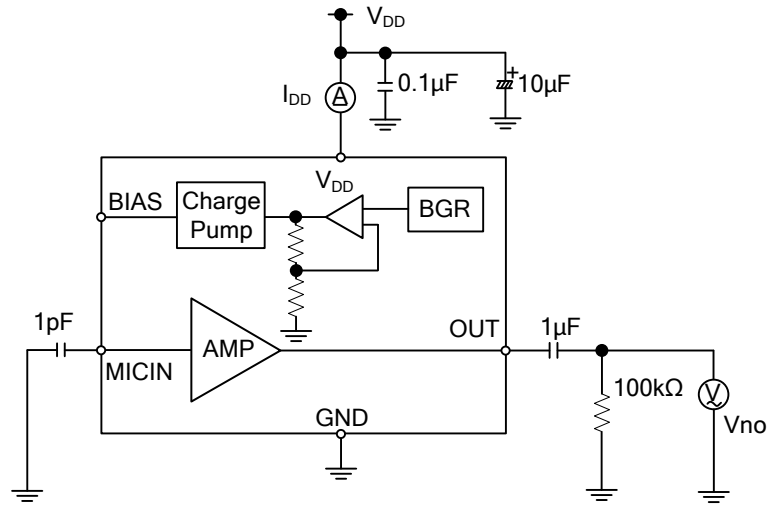
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Current Consumption	I_{DD}		50	120	250	μA
Output Noise Voltage	V_{NO}	A-weighted		3 (-110)		μVrms (dBV)
Gain	V_G			-0.2		dB
Total Harmonic Distortion	THD+N	$V_{in}=50\text{mVrms}$ (=-26dBV), filter=400Hz~30kHz		0.2	1	%
Maximum Output Voltage	V_{OM}	THD<5%, filter=400Hz~30kHz	150 (-16.5)	281 (-11)		mVrms (dBV)
Cut Off Frequency	f_{CL}				20	Hz
Cut Off Frequency	f_{CH}		20			kHz
Power Supply Rejection Ratio	PSRR	$f=217\text{Hz}$, 0.1Vpp Square		-56		dB
Bias Voltage	V_{bias}		11.8	12.5	13.2	V
Output DC Impedance	Z_o	$R_L=2.2\text{k}\Omega$		150	300	Ω
Start Up Time	trbs	Bias Voltage 90% Rising		4	10	msec

■ TERMINAL DESCRIPTION

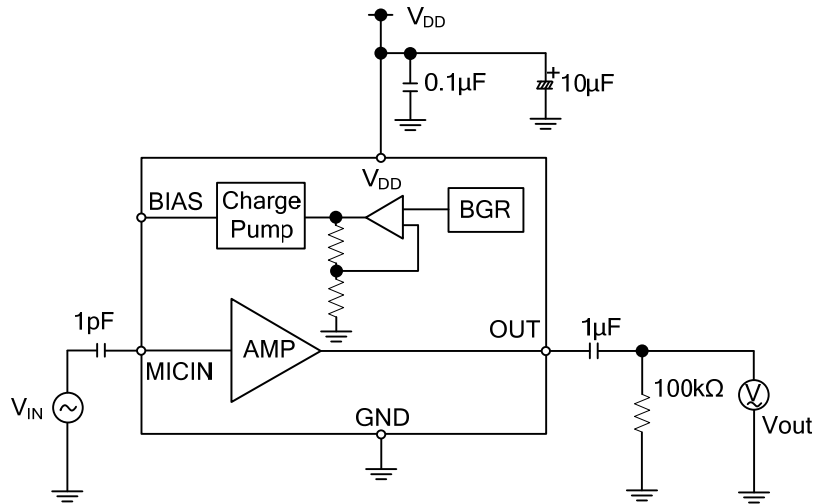
PIN NO.	SYMBOL	FUNCTION	EQUIVALENT CIRCUIT	TERMINAL VOLTAGE
1	MICIN	Microphone input (Analog input)		0V
3	OUT	Output (Analog output)		0.9V
2	GND	Ground		0V
4	V _{DD}	Power Supply		V _{DD}
5	BIAS	Bias Voltage Output		12.5V

■ TEST CIRCUIT

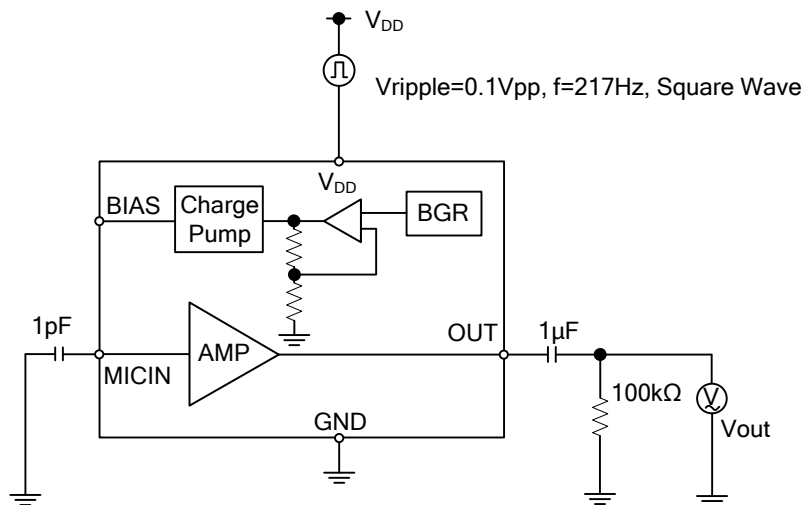
[I_{DD} , V_{NO}]



[V_G , THD+N]

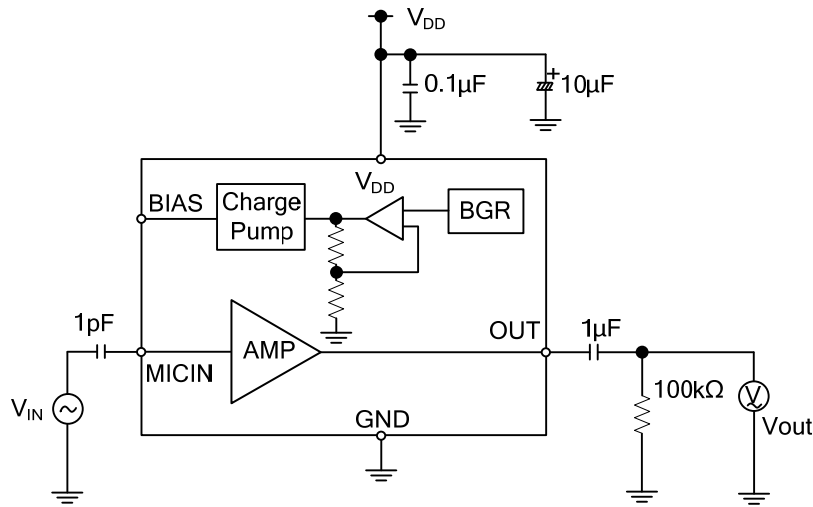


[PSRR]



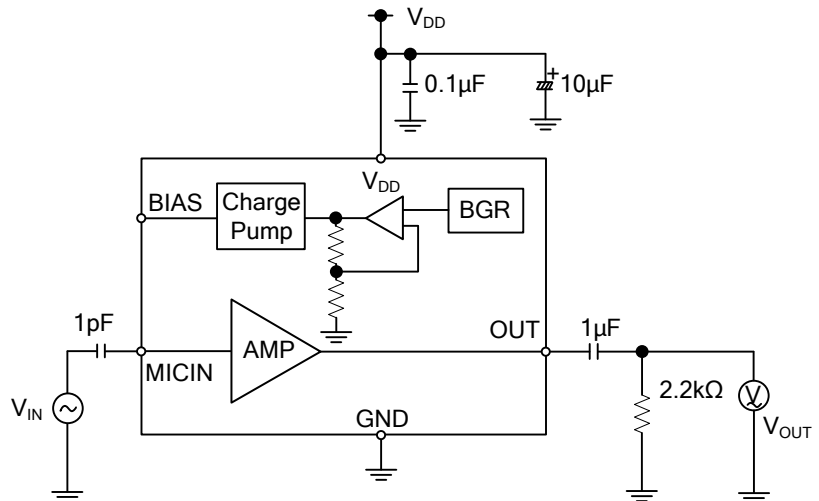
■ TEST CIRCUIT (Cont.)

[V_{OM}, f_{CL}, f_{CH}]

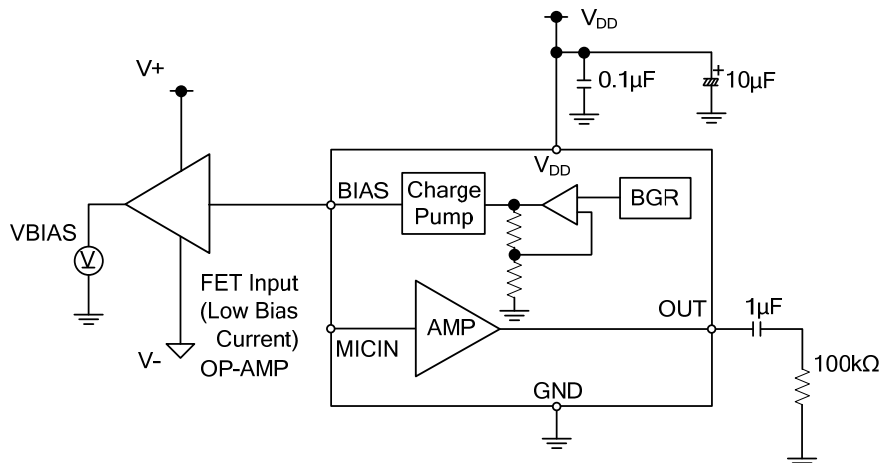


[Z_o]

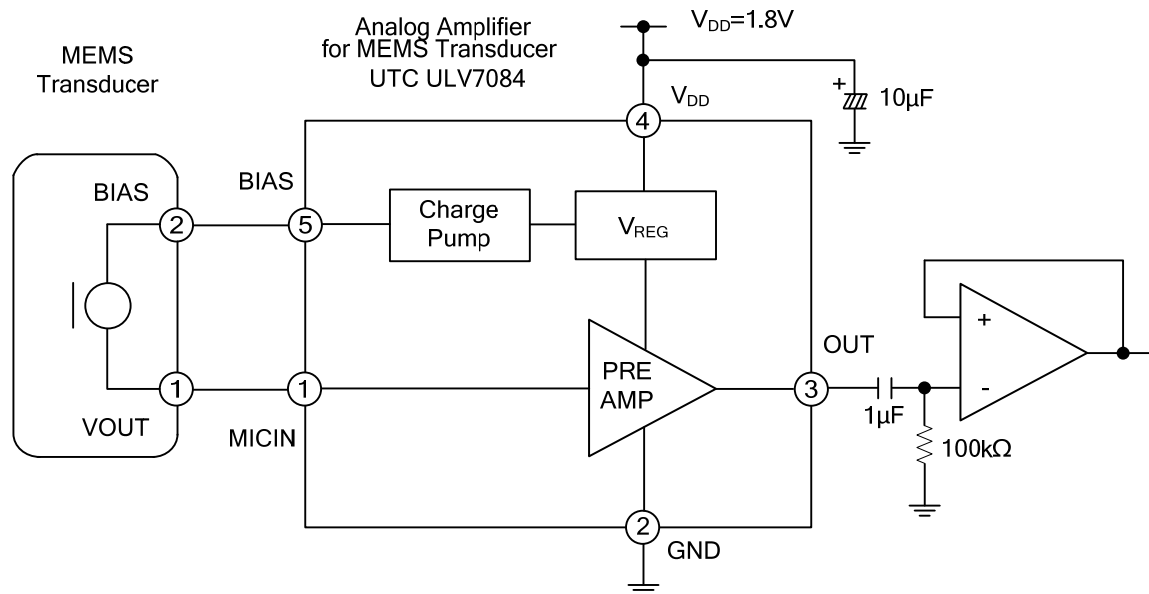
$$Z_o = 100k\Omega \times \frac{V_G\text{-Measurement} \cdot \frac{1-10}{20}}{V_G\text{-Measurement} \cdot \frac{100k\Omega}{2.2k\Omega}}$$



[V_{bias}]



■ TYPICAL APPLICATION CIRCUIT



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