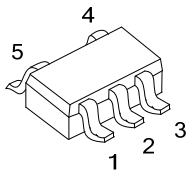
PRE-AMPLIFIER FOR MEMS MICROPHONE



SOT-23-5
(JEDEC TO-236)

■ 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

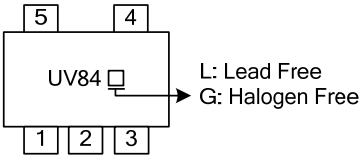
* Operating voltage: 1.5V ~ 3.60V
* Current consumption: 80μA typ.
* Bias Voltage: +12.5V
* Input equivalent noise: 3μVrms (-110dBV)
* Frequency response: 20Hz~20kHz
* Maximum output Voltage: 281mVrms (-11dBV) at THD < 5%
* Gain: -3dB
* Operating temperature: -40ºC~85ºC

■ ORDERING INFORMATION

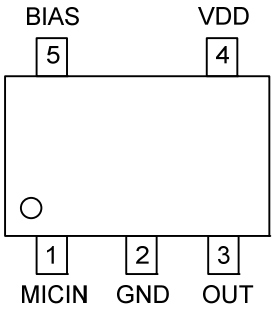
Ordering Number		Package	Packing
Lead Free	Halogen Free		
ULV7084L-AE5-R	ULV7084G-AE5-R	SOT-23-5	Tape Reel

ULV7084G-AE5-R (1)Packing Type (2)Package Type (3)Green Package	(1) R: Tape Reel (2) AE5: SOT-23-5 (3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



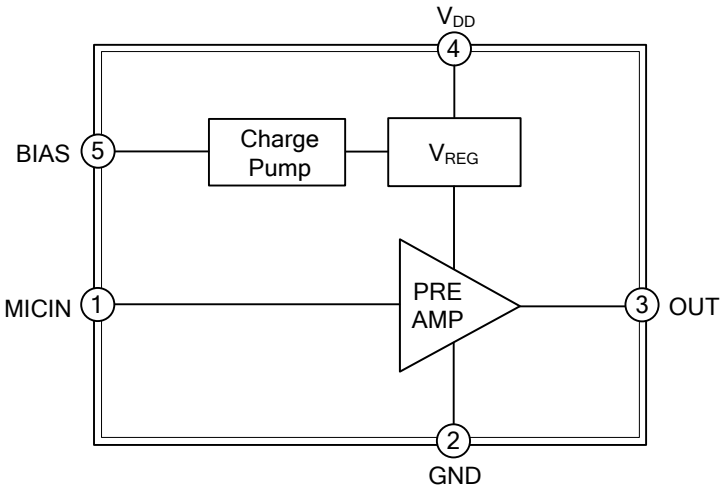
■ PIN CONFIGURATION



■ 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°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	°C
Storage Temperature	T_{STG}	-40 ~ +125	°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°C, unless otherwise specified)

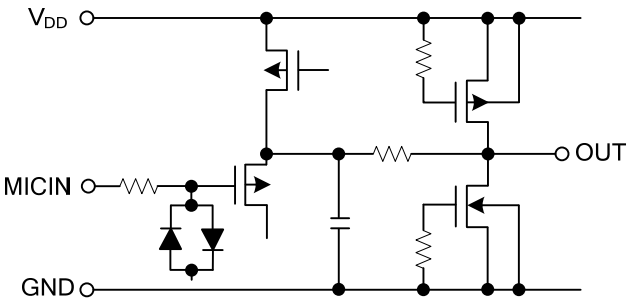
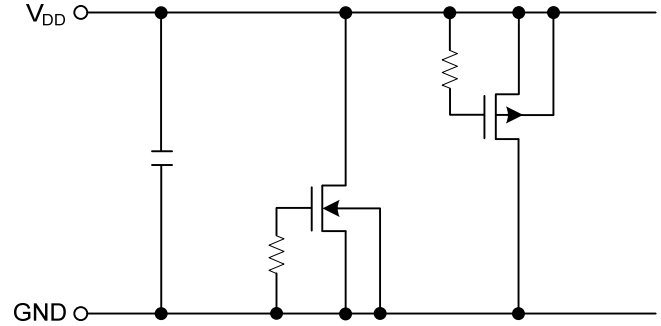
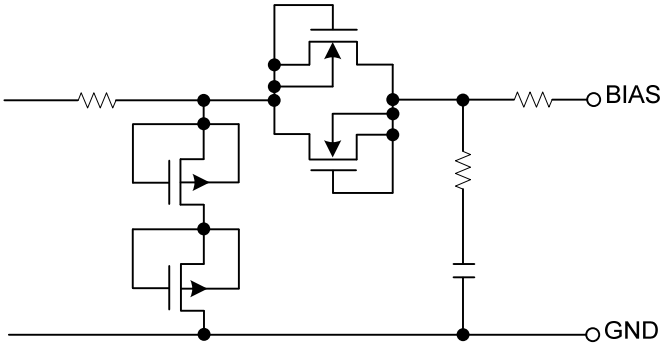
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Operating Voltage	V_{DD}		1.5	1.8	3.6	V

■ ELECTRICAL CHARACTERISTICS

(V_{DD}=1.8V, Input Capacitance=1pF, V_{IN}=-39.0dBV, f=1kHz, R_L=100kΩ, T_A=25°C, unless otherwise specified)

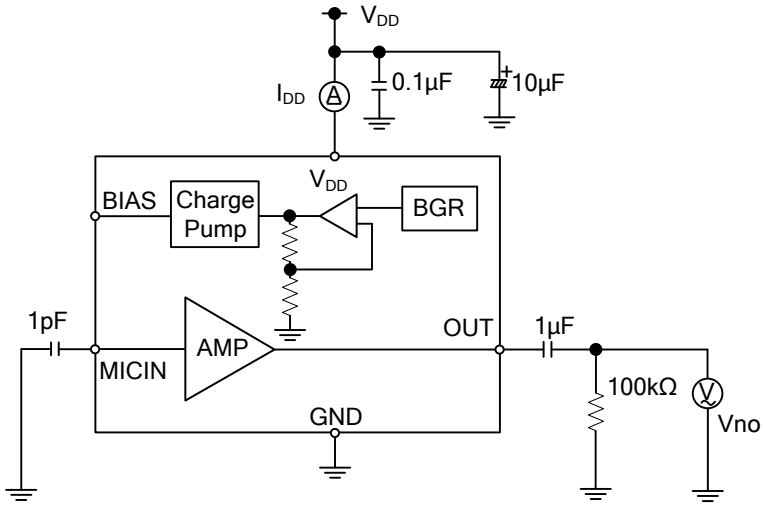
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Current Consumption	I_{DD}		50	80	120	μA
Output Noise Voltage	V_{NO}	A-weighted		3 (-110)		μVrms (dBV)
Gain	V_G			-0.2		dB
Total Harmonic Distortion	THD+N	Vin=50mVrms(=-26dBV), filter=400Hz~30kHz		0.2	1	%
Maximum Output Voltage	V_{OM}	THD<5%, filter=400Hz~30kHz	150 (-16.5)	281 (-11)		mVrms (dBV)
Cut Off Frequency	fc_L				20	Hz
Cut Off Frequency	fc_H		20			kHz
Power Supply Rejection Ratio	PSRR	f=217Hz, 0.1Vpp Square		-56		dB
Bias Voltage	V_{bias}		11.8	12.5	13.2	V
Output DC Impedance	Zo	R_L=2.2kΩ		150	300	Ω
Start Up Time	trbs	Bias Voltage 90% Rising		4	10	msec

■ TERMINAL DESCRIPTION

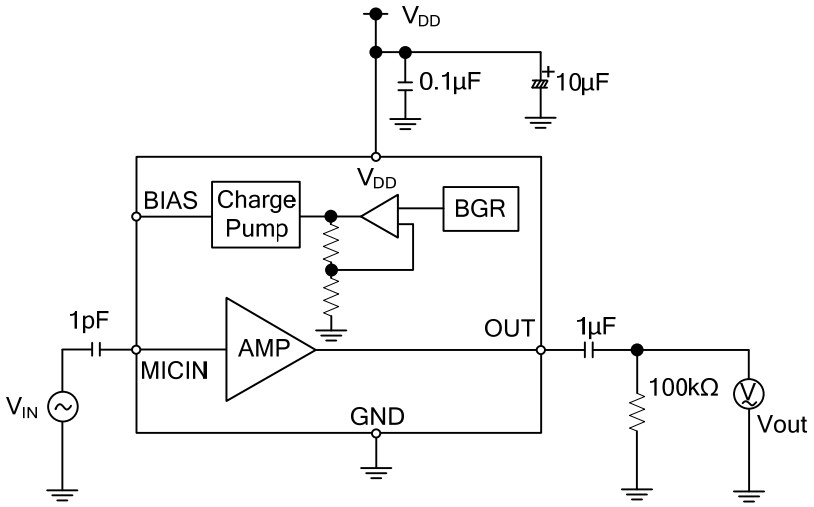
PIN NO.	SYMBOL	FUNCTION	EQUIVALENT CIRCUIT	TERMINAL VOLTAGE
1	MICIN	Microphone input (Analog input)		0V
3	OUT	Output (Analog output)		0.9V
2	GND	Ground		0V
4	V_{DD}	Power Supply		V_{DD}
5	BIAS	Bias Voltage Output		12.5V

■ TEST CIRCUIT

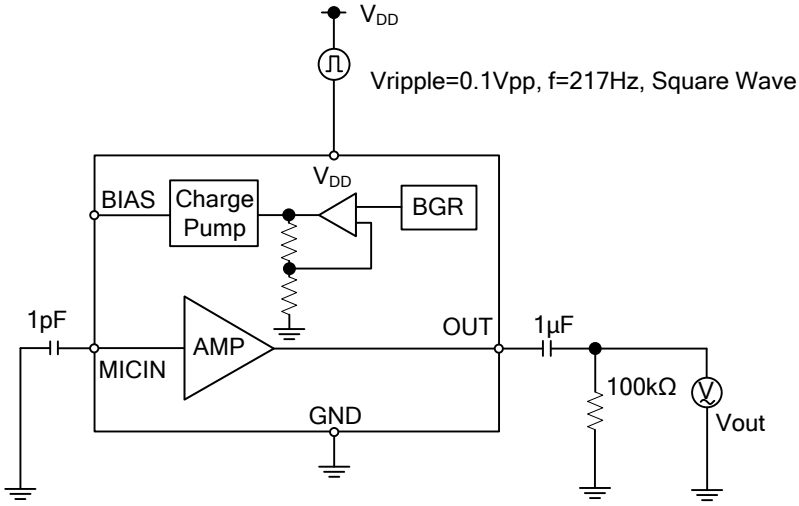
[I_{DD}, V_{NO}]



[V_G, THD+N]

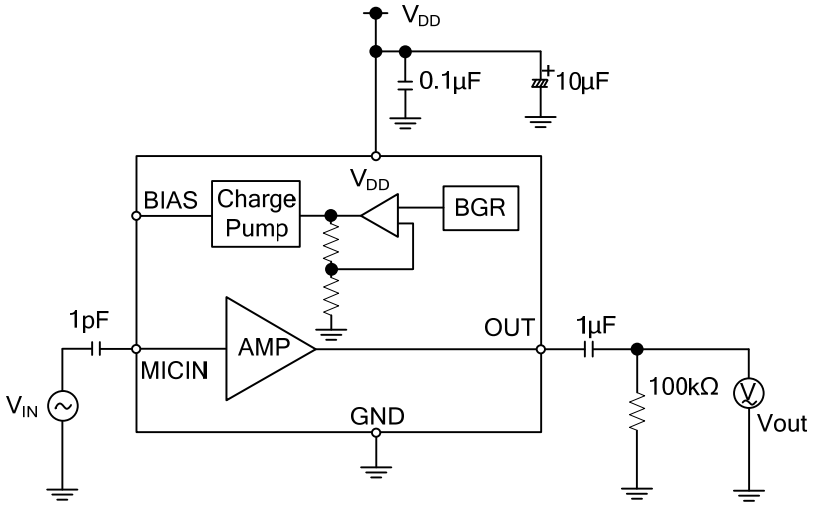


[PSRR]



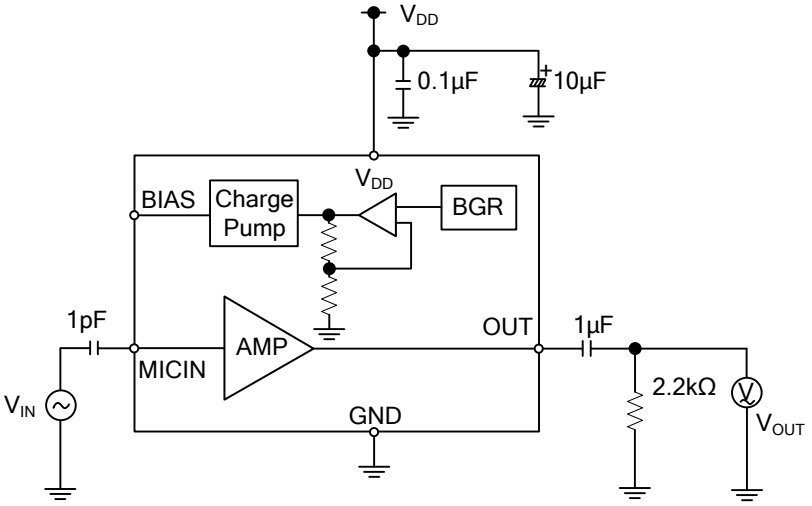
■ TEST CIRCUIT (Cont.)

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

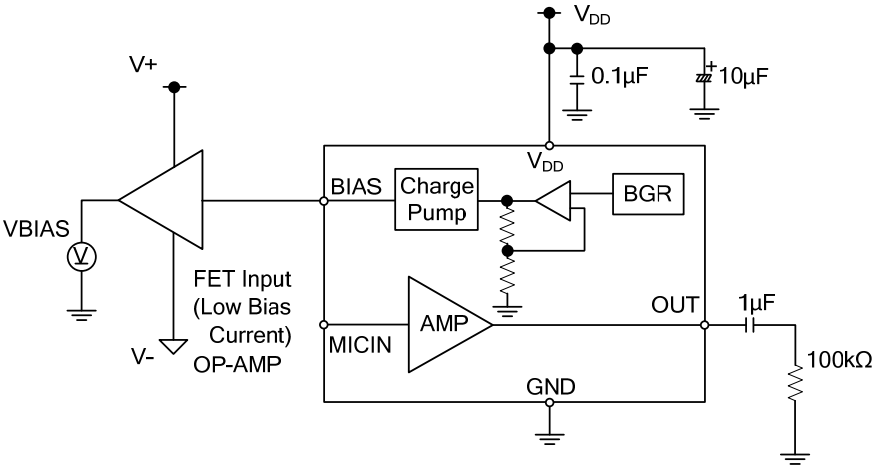


[Z_O]

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



[V_{bias}]



■ TYPICAL APPLICATION CIRCUIT