μPD5759T6J

Low Noise and High Gain Amplifier IC for Impedance Converter of Microphone

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DESCRIPTION

The μPD5759T6J is a silicon MOS monolithic integrated circuit designed as high gain impedance converter for electret condenser microphone. This device exhibits low noise and high voltage gain characteristics.
The package is a 3-pin thin-type lead-less minimold, suitable for high-density surface mounting.

FEATURES

- Low noise : N_V = –98 dBV TYP. @V_{DD} = 2.0 V, C_{in} = 3 pF, R_L = 2.2 kΩ
  : N_V = –99 dBV TYP. @V_{DD} = 2.0 V, C_{in} = 5 pF, R_L = 2.2 kΩ
- High gain : G_V = +9.0 dB TYP. @V_{DD} = 2.0 V, C_{in} = 3 pF, R_L = 2.2 kΩ
  : G_V = +11.0 dB TYP. @V_{DD} = 2.0 V, C_{in} = 5 pF, R_L = 2.2 kΩ
- Low input capacitance : C_{input} = 2.0 pF TYP. @V_{DD} = 2.0 V, R_L = 2.2 kΩ
- Low consumption current : I_{DD} = 310 μA TYP. @V_{DD} = 2.0 V, R_L = 2.2 kΩ
- High-density surface mounting : 3-pin thin-type lead-less minimold (1.2 × 1.0 × 0.33 mm)
- Built-in the capacitor for RF noise immunity
- High ESD voltage

APPLICATIONS

- Microphone, Sensor etc.

ORDERING INFORMATION

Part Number	Order Number	Package	Marking	Supplying Form
μPD5759T6J-E4	μPD5759T6J-E4-A	3-pin thin-type lead-less minimold (Pb-Free)	6Z	• Embossed tape 8 mm wide • Pin 3 face the perforation side of the tape • Qty 10 kpcs/reel

Remark To order evaluation samples, please contact your nearby sales office.
Part number for sample order: μPD5759T6J

CAUTION

Observe precautions when handling because these devices are sensitive to electrostatic discharge.

ABSOLUTE MAXIMUM RATINGS (T_A = +25°C, unless otherwise specified)

Parameter	Symbol	Ratings	Unit
Input Voltage (IN-GND)	V_{in}	–0.5 to +0.5	V
Input Current (IN-GND)	I_{in}	0.5	mA
Output Voltage (OUT-GND)	V_{out}	0 to +5	V
Output Current (OUT-GND)	I_{out}	1	mA
Channel Temperature	T_{ch}	130	°C
Operating Ambient Temperature	T_A	–40 to +85	°C
Storage Temperature	T_{stg}	–65 to +150	°C

RECOMMENDED OPERATING RANGE (T_A = +25°C)

Parameter	Symbol	MIN.	TYP.	MAX.	Unit
Supply Voltage Note	V_{DD}	1.4	2.0	5.0	V

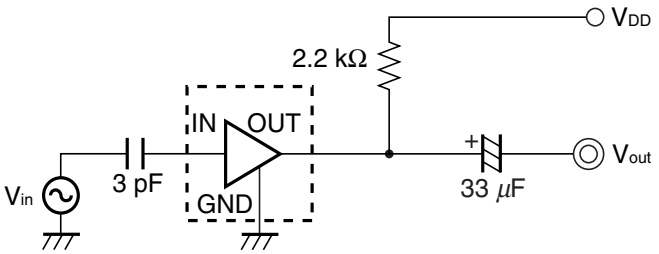
Note: R_L = 2.2 kΩ

ELECTRICAL CHARACTERISTICS (T_A = +25°C, R_L = 2.2 kΩ, unless otherwise specified)

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Circuit Current	I_{DD}	V_{DD} = 2.0 V, V_{in} = 0 V	235	310	400	μA
Input Capacitance	C_{input}	V_{DD} = 2.0 V, f = 1 MHz	–	2.0	–	pF
Voltage Gain	G_V	V_{DD} = 2.0 V, V_{in} = 10 mVrms, C_{in} = 3 pF, f = 1 kHz, see **TEST CIRCUIT**	8.0	9.0	10.0	dB
Reduced Voltage Characteristics	ΔG_{VV}	V_{DD} = 2.0 → 1.5 V, V_{in} = 10 mVrms, C_{in} = 3 pF, f = 1 kHz, see TEST CIRCUIT	–	1.0	–	dB
Frequency Characteristics	ΔG_{Vf}	V_{DD} = 2.0 V, V_{in} = 10 mVrms, C_{in} = 3 pF, f = 1 kHz → 110 Hz, see **TEST CIRCUIT**	–	0	–	dB
Output Noise Voltage	N_V	V_{DD} = 2.0 V, V_{in} = 0 Vrms, C_{in} = 3 pF, A-Curve, see **TEST CIRCUIT**	–	–98	–	dBV
Total Harmonic Distortion	THD	V_{DD} = 2.0 V, V_{out} = 50 mVrms, C_{in} = 3 pF, f = 1 kHz, see **TEST CIRCUIT**	–	0.3	–	%

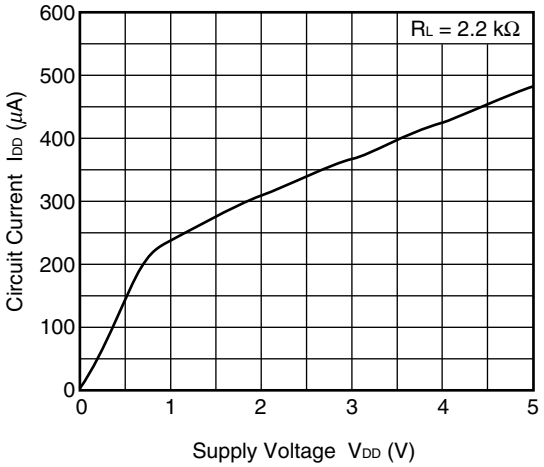
TEST CIRCUIT

Voltage Gain, Frequency Characteristics, Output Noise Voltage, Total Harmonic Distortion

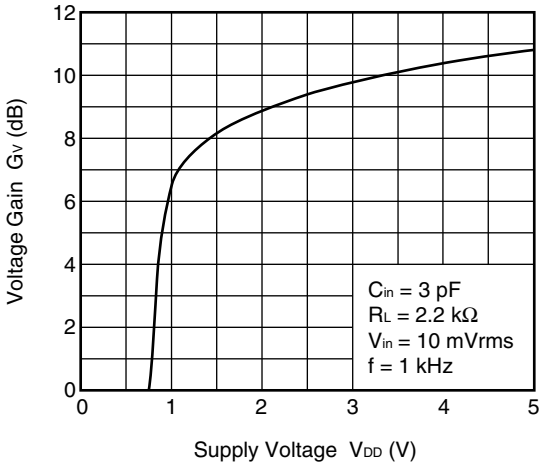


TYPICAL CHARACTERISTICS (T_A = +25°C, unless otherwise specified)

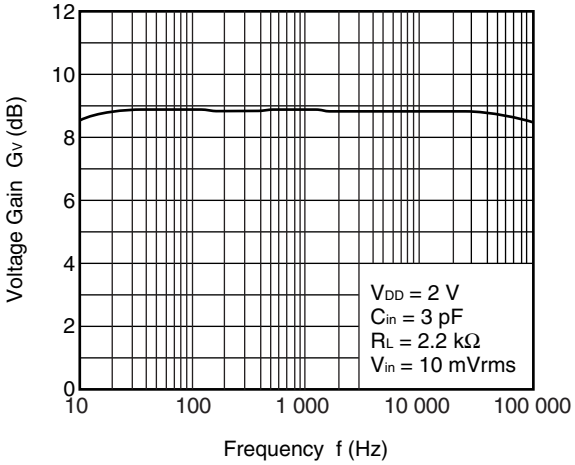
CIRCUIT CURRENT vs. SUPPLY VOLTAGE



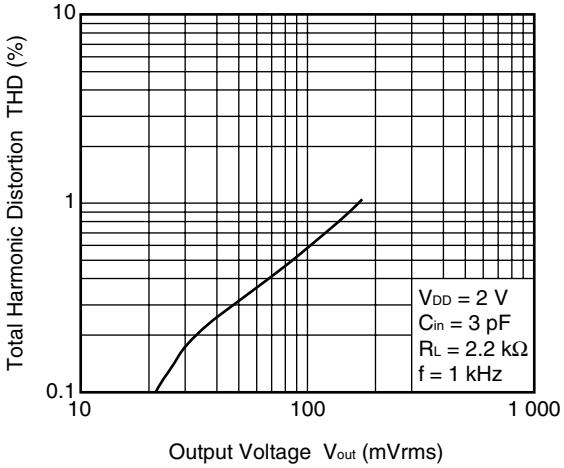
VOLTAGE GAIN vs. SUPPLY VOLTAGE



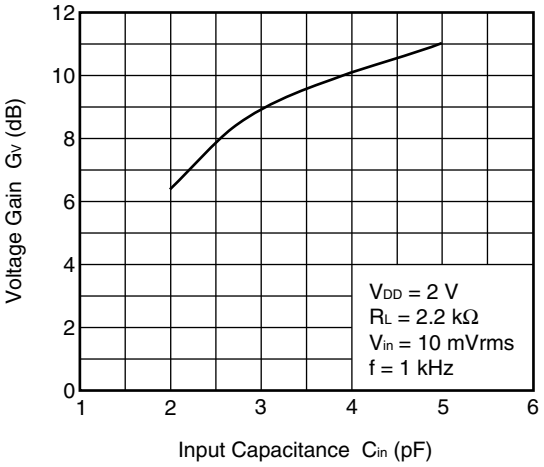
VOLTAGE GAIN vs. FREQUENCY



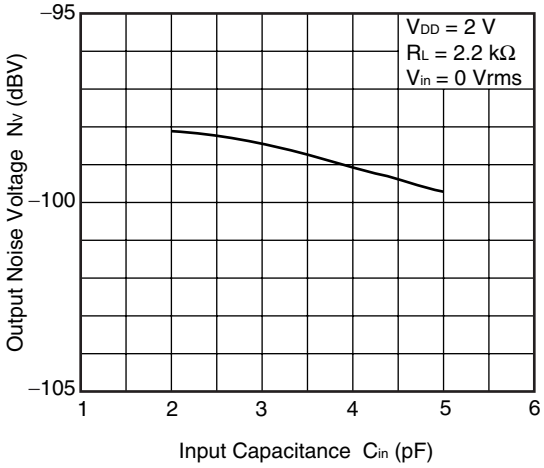
TOTAL HARMONIC DISTORTION vs. OUTPUT VOLTAGE



VOLTAGE GAIN vs. INPUT CAPACITANCE



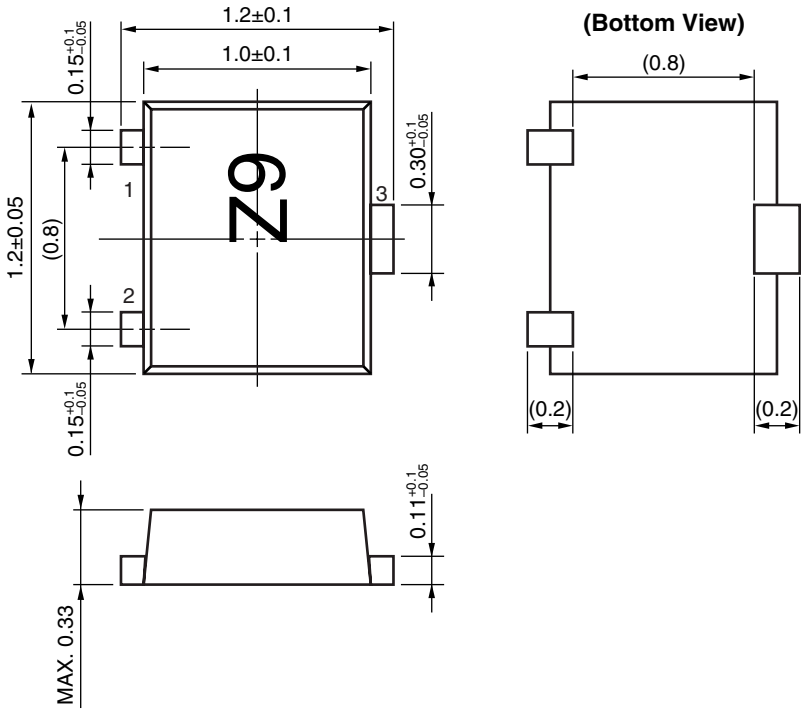
OUTPUT NOISE VOLTAGE vs. INPUT CAPACITANCE



Remark The graphs indicate nominal characteristics.

PACKAGE DIMENSIONS

3-PIN THIN-TYPE LEAD-LESS MINIMOLD (UNIT: mm)



PIN CONNECTIONS

1. OUT
2. IN
3. GND

Remark ( ): Reference value

RECOMMENDED SOLDERING CONDITIONS

This product should be soldered and mounted under the following recommended conditions. For soldering methods and conditions other than those recommended below, contact your nearby sales office.

Soldering Method	Soldering Conditions	Condition Symbol
Infrared Reflow	Peak temperature (package surface temperature) : 260°C or below Time at peak temperature : 10 seconds or less Time at temperature of 220°C or higher : 60 seconds or less Preheating time at 120 to 180°C : 120±30 seconds Maximum number of reflow processes : 3 times Maximum chlorine content of rosin flux (% mass) : 0.2%(Wt.) or below	IR260
Wave Soldering	Peak temperature (molten solder temperature) : 260°C or below Time at peak temperature : 10 seconds or less Preheating temperature (package surface temperature) : 120°C or below Maximum number of flow processes : 1 time Maximum chlorine content of rosin flux (% mass) : 0.2%(Wt.) or below	WS260
Partial Heating	Peak temperature (terminal temperature) : 350°C or below Soldering time (per side of device) : 3 seconds or less Maximum chlorine content of rosin flux (% mass) : 0.2%(Wt.) or below	HS350

CAUTION

Do not use different soldering methods together (except for partial heating).

Revision History	μPD5759T6J Data Sheet

Rev.	Date	Description	
		Page	Summary
1.00	Apr 18, 2011	–	First edition issued

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