DATA SHEET

NEC

MOS ANALOG INTEGRATED CIRCUIT

μPD5747T6J

LOW NOISE AND HIGH GAIN AMPLIFIER FOR IMPEDANCE CONVERTER OF MICROPHONE

DESCRIPTION

The μPD5747T6J 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 3-pin thin-type lead-less minimold, suitable for surface mount.

FEATURES

- Low Noise : N_V = –101 dBV TYP. @ V_{DD} = 1.5 V, C_{in} = 3 pF, R_L = 2.2 kΩ
  : N_V = –102 dBV TYP. @ V_{DD} = 1.5 V, C_{in} = 5 pF, R_L = 2.2 kΩ
- High Gain : G_V = +5.7 dB TYP. @ V_{DD} = 1.5 V, C_{in} = 3 pF, R_L = 2.2 kΩ
  : G_V = +7.7 dB TYP. @ V_{DD} = 1.5 V, C_{in} = 5 pF, R_L = 2.2 kΩ
- Low Consumption Current : I_{DD} = 190 μA TYP. @ V_{DD} = 1.5 V, R_L = 2.2 kΩ
- Built-in the capacitor for RF noise immunity
- High ESD voltage
- 3-pin thin-type lead-less minimold (1.2 × 1.0 × 0.33 mm)

APPLICATIONS

- Microphone, Sensor, etc.

ORDERING INFORMATION

Part Number	Order Number	Package	Marking	Supplying Form
μPD5747T6J-E4	μPD5747T6J-E4-A	3-pin thin-type lead-less minimold (Pb-Free)	6X	• Embossed tape 8 mm wide • Pin 3 (GND) 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: μPD5747T6J

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

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ABSOLUTE MAXIMUM RATINGS (T_A = +25°C)

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}	0.5	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 CONDITIONS (T_A = +25°C)

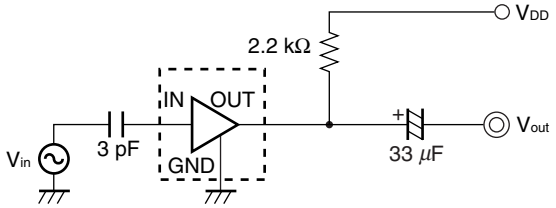
Parameter	Symbol	MIN.	TYP.	MAX.	Unit
Supply Voltage [Note]	V_{DD}	1.0	1.5	5.0	V

Note R_L = 2.2 kΩ

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

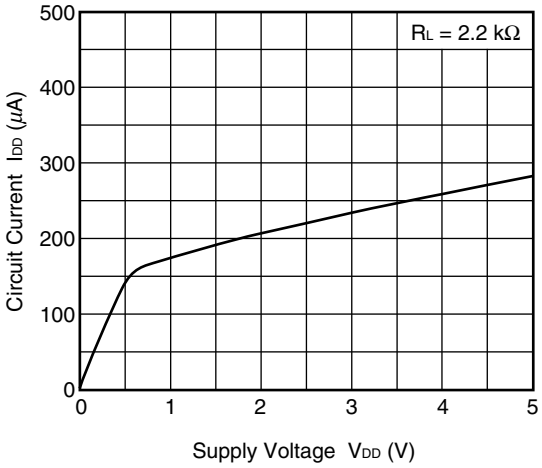
Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Circuit Current	I_{DD}	V_{DD} = 1.5 V, V_{in} = 0 V, R_L = 2.2 kΩ	140	190	250	μA
Input Capacitance	C_{input}	V_{DD} = 1.5 V, R_L = 2.2 kΩ, f = 1 MHz	–	1.5	–	pF
Voltage Gain	G_V	V_{DD} = 1.5 V, V_{in} = 10 mV, R_L = 2.2 kΩ, C_{in} = 3 pF, f = 1 kHz, see Test Circuit	4.5	5.7	7.0	dB
Reduced Voltage Gain Characteristics	ΔG_{VV}	V_{DD} = 1.5 → 1.0 V, V_{in} = 10 mV, R_L = 2.2 kΩ, C_{in} = 3 pF, f = 1 kHz, see Test Circuit	–	0.7	–	dB
Frequency Characteristics	ΔG_{Vf}	V_{DD} = 1.5 V, V_{in} = 10 mV, R_L = 2.2 kΩ, C_{in} = 3 pF, f = 1 kHz → 110 Hz, see Test Circuit	–	0	–	dB
Output Noise Voltage	N_V	V_{DD} = 1.5 V, V_{in} = 0 V, R_L = 2.2 kΩ, C_{in} = 3 pF, A-Curve, see Test Circuit	–	−101	–	dBV
Total Harmonic Distortion	THD	V_{DD} = 1.5 V, V_{out} = 50 mV, R_L = 2.2 kΩ, C_{in} = 3 pF, f = 1 kHz, see Test Circuit	–	0.7	–	%

TEST CIRCUIT (Voltage Gain, Frequency Characteristics, Output Noise Voltage, Total Harmonic Distortion)

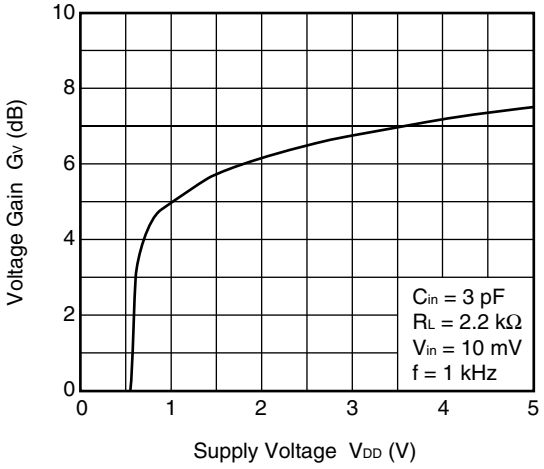


TYPICAL CHARACTERISTICS (T_A = +25°C, unless otherwise specified)

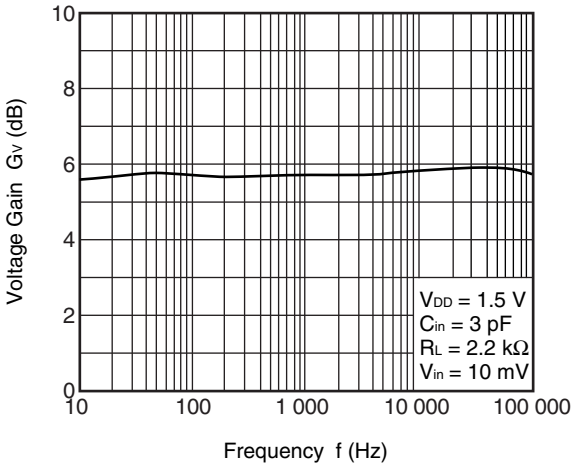
CIRCUIT CURRENT vs. SUPPLY VOLTAGE



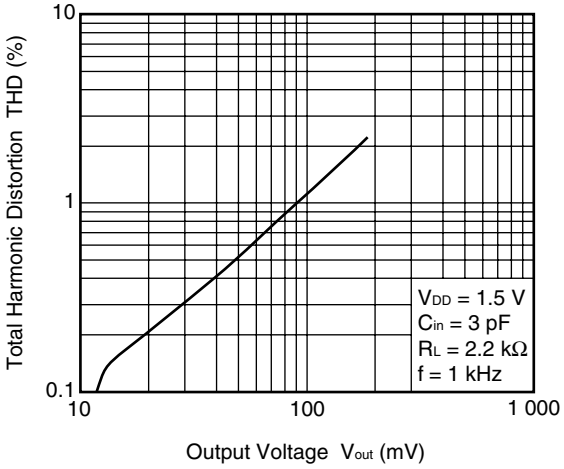
VOLTAGE GAIN vs. SUPPLY VOLTAGE



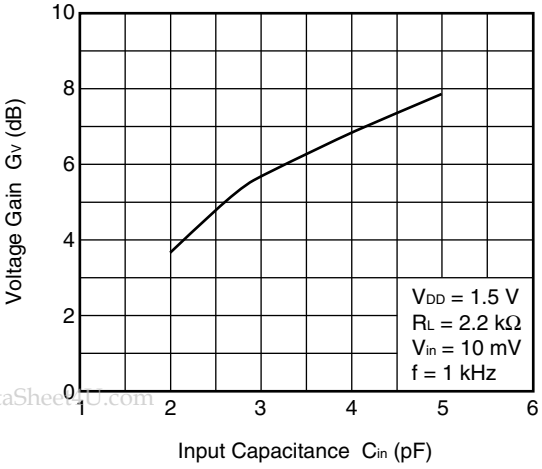
VOLTAGE GAIN vs. FREQUENCY



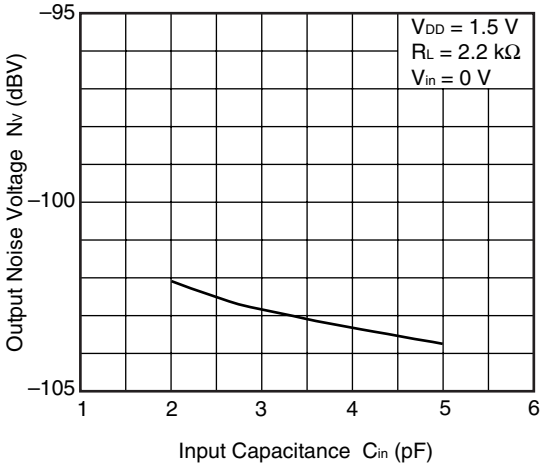
TOTAL HARMONIC DISTORTION vs. OUTPUT VOLTAGE



VOLTAGE GAIN vs. INPUT CAPACITANCE



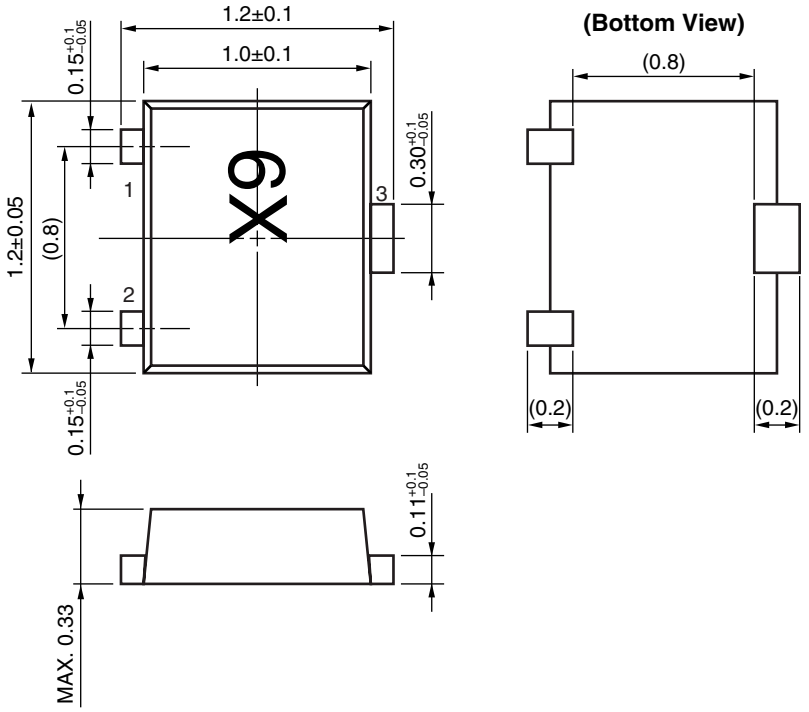
OUTPUT NOISE VOLTAGE vs. INPUT CAPACITANCE



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

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

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