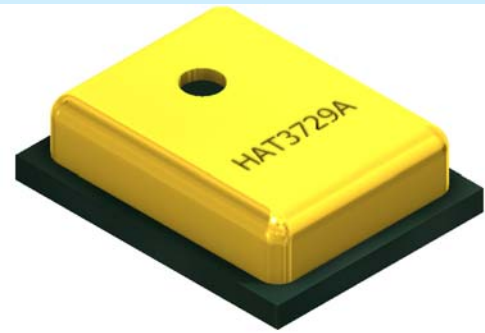


## HAT3729A4

### ULTRALOW NOISE MICROPHONE WITH TOP PORT AND ANALOG OUTPUT



RoHS Compliance

Pb Free

#### Features

- Surface-mount package :  
3.76mmx2.95mmx1.1mm
- Stable sensitivity over power supply range of 1.5V-3.6V.
- SNR of 59dBA.
- Sensitivity of -42dBV.
- Low current consumption of <200μA.

#### Applications

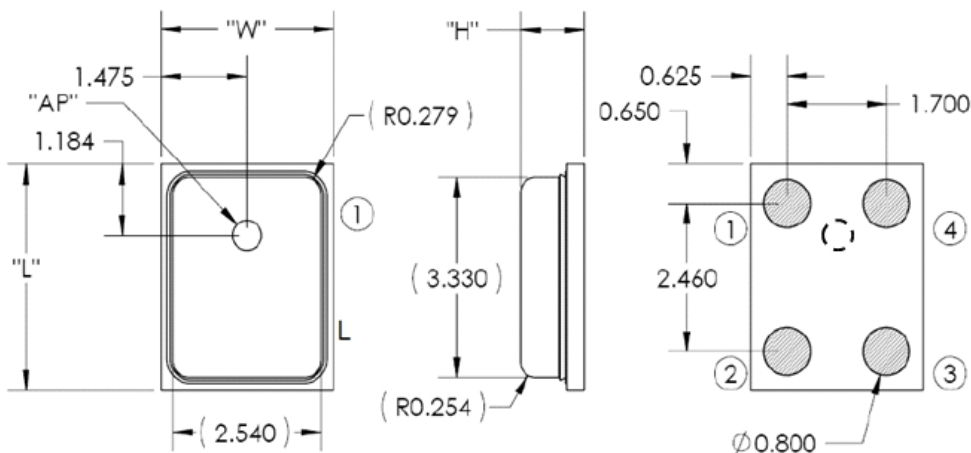
- Mobile telephones
- PDAs
- Digital video cameras
- Portable media devices with audio input

#### Description

The HAT3729A4 is a high quality, low cost, low power analog output top-ported omni-directional MEMS microphone. HAT3729A4 consists of a MEMS microphone element and an preamplifier. HAT3729A4 has a high SNR and flat wideband frequency response, resulting in natural sound with high intelligibility. Due to built-in filter, HAT3729A4 shows high immunity to EMI. The HAT3729A4 is available in a thin 3.76mm × 2.95mm × 1.1mm surface-mount package. It is reflow solder compatible with no sensitivity degradation. The HAT3729A4 is halide free.

#### MECHANICAL SPECIFICATIONNS

##### Dimension



Item	Dimension	Tolerance	Units
Length (L)	3.76	±0.10	mm
Width (W)	2.95	±0.10	mm
Height (H)	1.10	±0.10	mm
Acoustic Port (AP)	Φ0.5	±0.10	mm

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Pin #	Pin Name	Type	Description
1	VDD	Power	Power Supply
2	GROUND	Power	Ground
3	GROUND	Power	Ground
4	OUTPUT	Signal	Output Signal

## STANDARD SPECIFICATION

### Production Specification

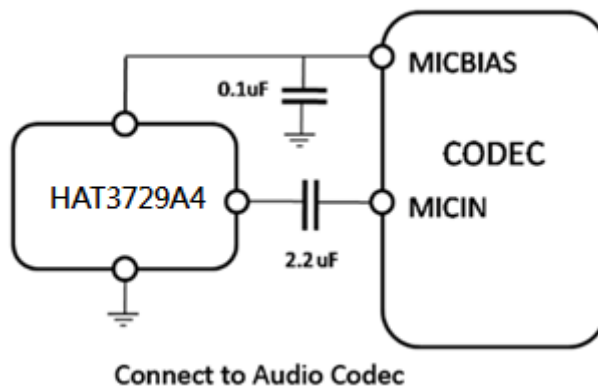
(TA = +25°C, VDD = +1.8V, unless otherwise noted.)

Parameter	Symbol	Test Conditions	Min	Type	Max	Units
Directivity				Omni		
Supply Voltage	V <sub>DD</sub>		1.5		3.6	V
Current Consumption	I <sub>DD</sub>				200	μA
Sensitivity (Note)		1kHz, 94dB SPL	-43	-42	-41	dBV
Signal-to-Noise-Ratio	SNR			59		dB
Equivalent Input Noise	EIN			33		dBASPL
Total Harmonic Distortion	THD	1kHz, 94dB SPL			3	%
Power Supply Rejection Ratio	PSRR	217Hz, 100mV V <sub>p-p</sub> , square wave on VDD		65		dB
Maximum Acoustic Input				120		dB SPL
Output Impedance	Z <sub>out</sub>			200		Ω
Output DC Offset				0.75		V
Output Current Limit				90		μA
Polarity				Noninverting		

Note: Base on BK sound test system.

### Typical Applications

The HAT3729A4 output can be connected to a codec microphone input or to a high input impedance gain stage. A dc-blocking capacitor is required at the output of the microphone.



### Absolute Maximum Ratings

Parameter	Absolute Maximum Rating	Units
Supply Voltage	-0.5~4	V
Sound Pressure Level	160	dB
Mechanical Shock	10000	g
Vibration	Per MIL-STD-883 Method 2007, Test Condition B	
Temperature Range	-40~100	°C

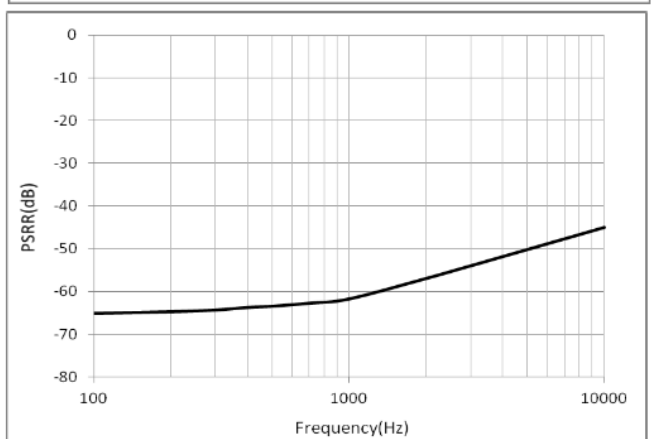
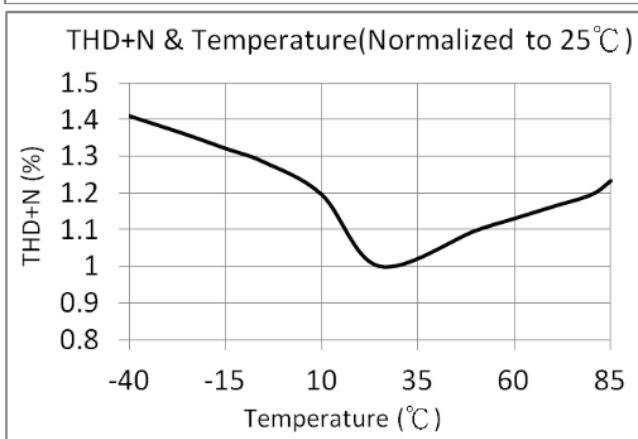
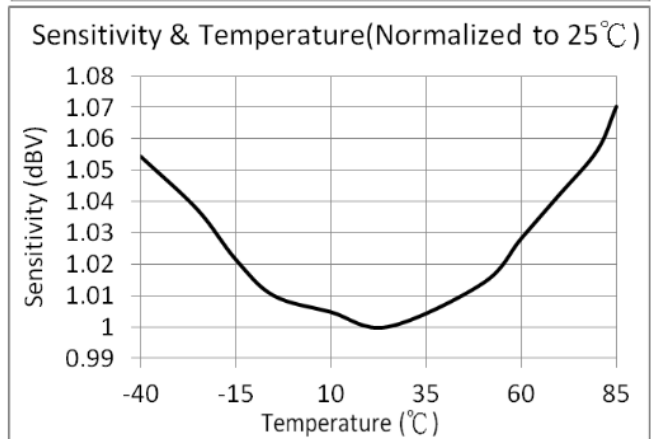
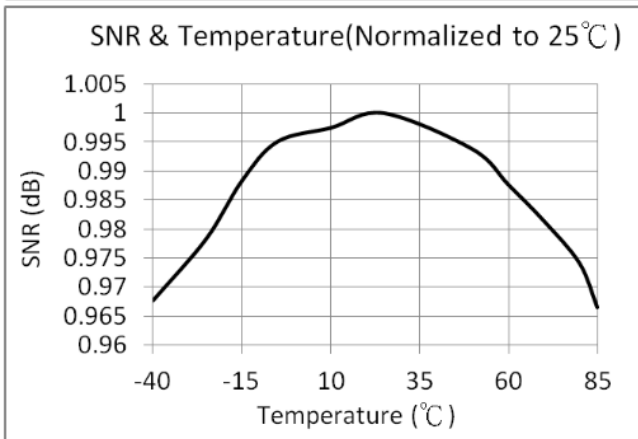
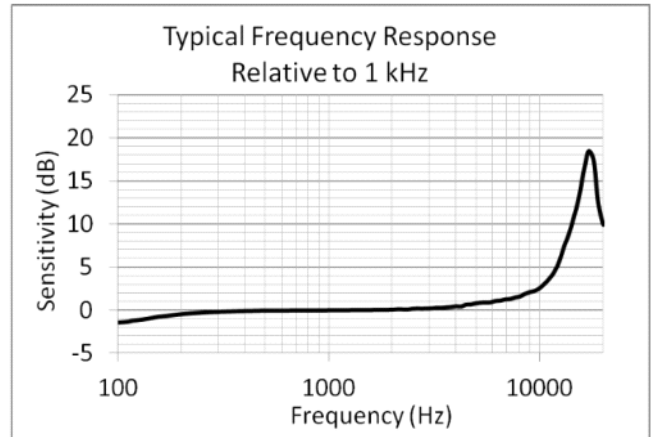
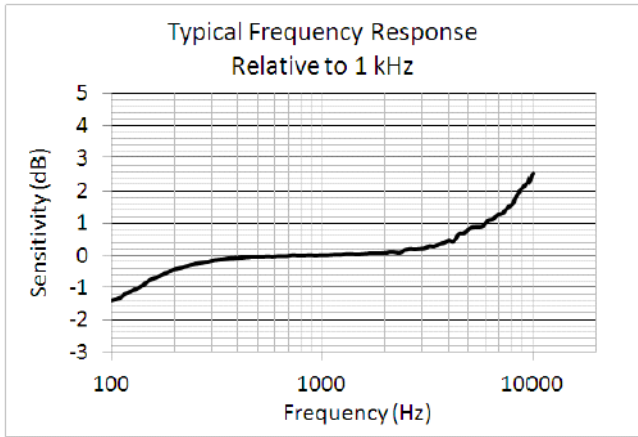
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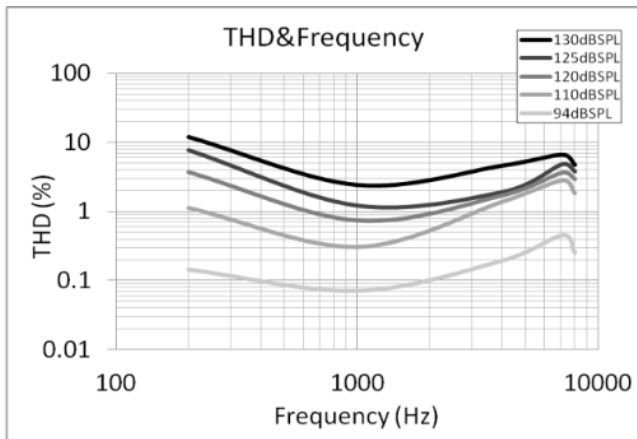
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CAUTION: Stresses above those listed in "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied.

### Typical Performance Characteristics





### Electro-Static Discharge Sensitivity

This integrated circuit can be damaged by ESD. It is recommended that all integrated circuits be handled with proper precautions. Failure to observe proper handling and installation procedures can cause damage. ESD damage can range from subtle performance degradation to complete device failure.

### RELIABILITY SPECIFICATIONS

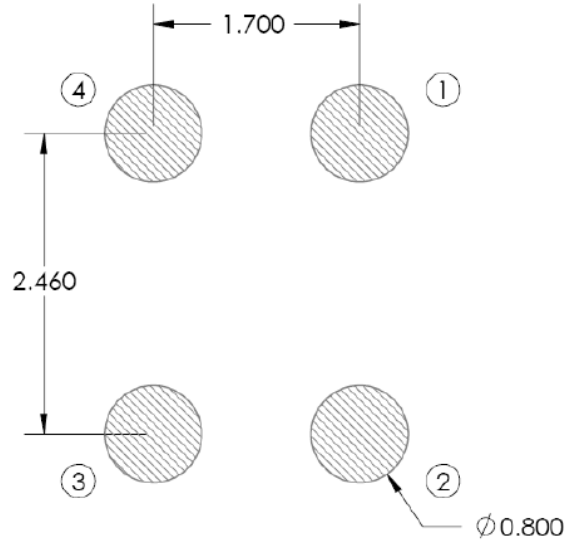
The microphone sensitivity after stress must deviate by no more than  $\pm 3\text{dB}$  from the initial value.

Stress Test	Description
Low Temperature Operating Life	-40°C, 500 hours, powered.
High Temperature Operating Life	+125°C, 500 hours, powered.
THB	+65°C/85% relative humidity, 500 hours, powered.
Temperature Cycle	-40°C/+125°C, one cycle per hour, 100 cycles.
High Temperature Storage	+150°C, 500 hours.
Low Temperature Storage	-40°C, 500 hours.
Electrostatic Discharge	3 discharges at +/-8kV direct contact to the lid when unit is grounded (IEC 61000-4-2) and 3 discharges at +/-2kV direct contact to the I/O pins(MIL 883E, Method 3015.7).

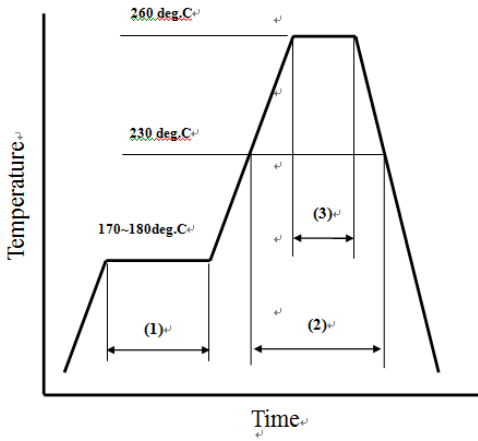
### SUGGESTIONS

#### Recommended Customer Land Pattern

The recommended PCB land pattern for the HAT3729A4 should have a 1:1 ratio to the solder pads on the microphone package. Care should be taken to avoid applying solder paste to the sound hole in PCB. The dimensions of suggested solder paste pattern refer to the land pattern which should be shrunk by 0.025 per side.

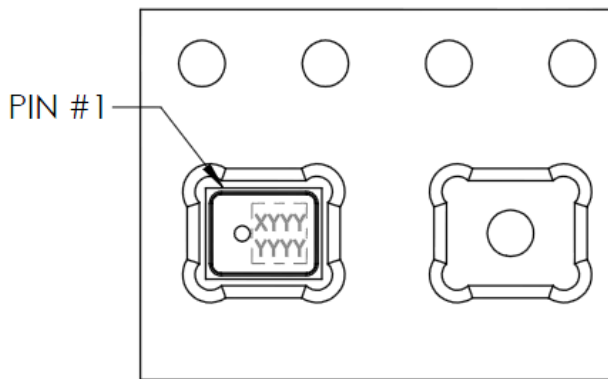


Solder Flow Profile



Stage	Temperature Profile	Time (maximum)
Pre-heat	+170°C ~ +180°C	120sec
Primary heat	> +230°C	100sec
Peak	+260°C maximum	30sec

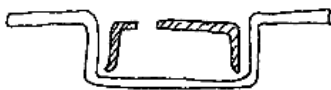
PACKAGING & MARKING DETAIL

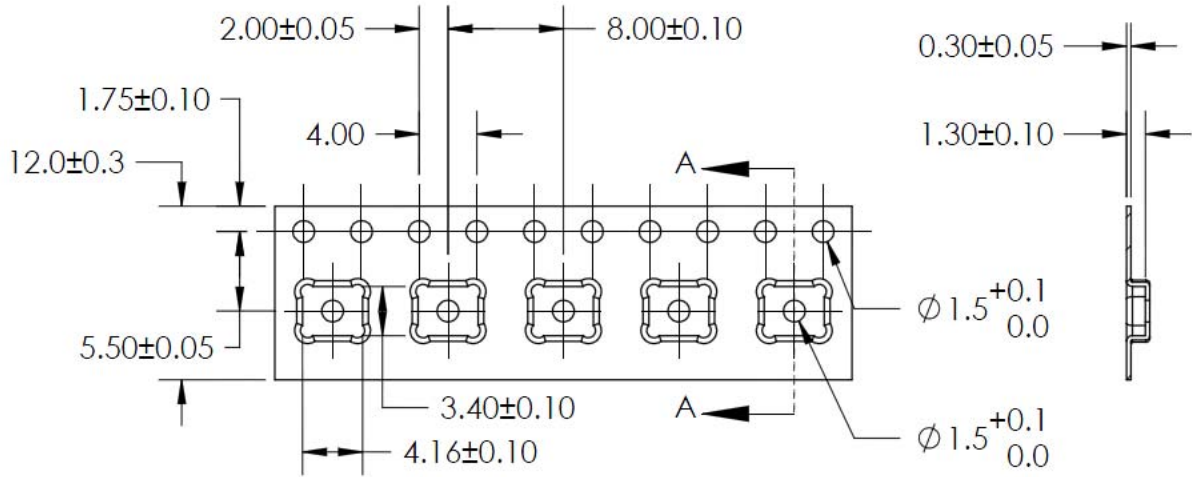


MODEL NUMBER	SUFFIX	REEL DIAMETER	QUANTITY PER REEL
	-2	7"	1,200
	-7	13"	5,700

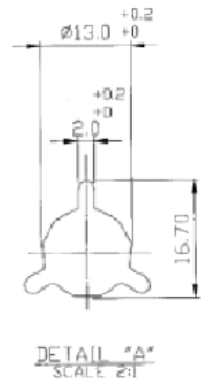
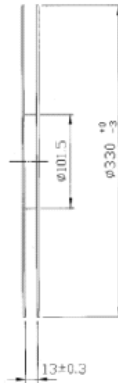
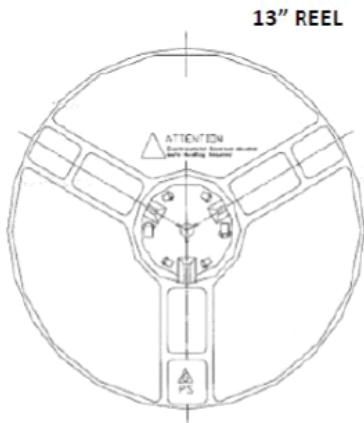
TAPE & REEL	PER EIA-481
LABEL	LABEL APPLIED TO EXTERNAL PACKAGE & DIRECT TO REEL.

COMPONENT ORIENTATION



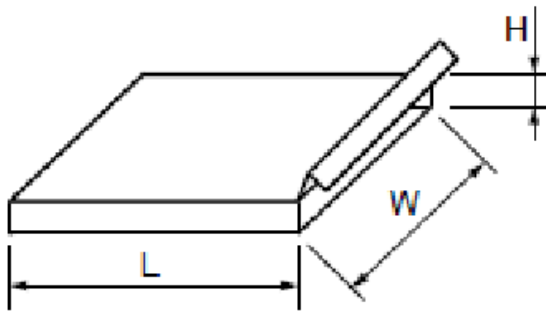


Note: Dimensions are in millimeters unless otherwise specified.



Part NO.	Reel Diameter	Quantity Per Reel	Quantity Per Inner Box	Quantity Per Outer Box
HAT3729A4	13"	5200	5200	46800

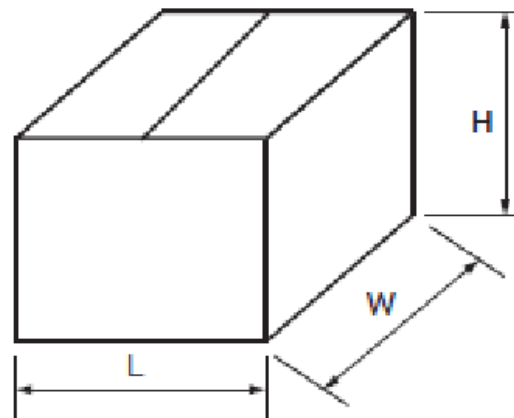
Dimensions for Inner Box



Unit : mm

L	W	H
335	339	45

Dimensions for Outer Box



Unit : mm

L	W	H
445	360	372

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