

## Top-Inlet Analog Silicon Microphone Specification

### 1.GENERAL DESCRIPTION

SLM42Q3AT is an analog top port MEMS microphone with high SNR and low-power consumption. The SLM42Q3AT integrates a MEMS microphone element, an impedance converter, and an output amplifier.

Other high-performance specifications include 130 dB SPL acoustic overload point in high performance mode,  $\pm 3$ dB sensitivity tolerance and enhanced immunity to both radiated and conducted RF interface.

Excellent acoustic performance, along with the compact size is best-suited for a wide range of consumer electronic products, offering a product with high-quality to meet the application requirement.

#### Product Features

Low Current Consumption  
 RF Protection  
 HD Voice MEMS Microphone  
 Omnidirectional  
 Pb-free and RoHS Compliant  
 Standard SMD Reflow

#### Typical Application

Smartphones  
 Microphone Arrays  
 Tablets  
 Cameras  
 Headsets  
 Notebook PCs  
 Smart home devices, Internet of Things

### 2.ABSOLUTEMAXIMUM RATINGS

Parameter	Absolute Maximum Rating	Units
Voltage Range of V <sub>DD</sub> to Ground	-0.3 to +3.9	V
Voltage Range of Output to Ground	-0.3 to +3.9	V
Input Current to Any Pin	$\pm 5$	mA
Temperature Range	-40 to +100	°C
ESD Tolerance -The Lid Mode	$\pm 8$ k	V
ESD Tolerance - The I/O Pin	$\pm 2$ k	V

Table 1. Absolute Maximum Ratings

Stresses exceeding these “Absolute Maximum Ratings” could cause permanent damage to the microphone. These are stress rating only. Functional operation at these or any other conditions beyond those indicated under “Absolute and Electrical Characteristics” is not implied. Exposure beyond those indicated under “Acoustic and Electrical Characteristics” for extended periods may affect microphone reliability.

TEMPERATURE CHARACTERISTICS					
Parameter	Conditions	Min	Typ	Max	Unit
Operating Temperature		-40		+85	°C
Storage Temperature	Solder on PC board	-40		+105	°C
	In Tape and Reel	-10		+50	°C

Table 2. Temperature Characteristics

## 3.ACOUSTIC & ELECTRICAL SPECIFICATIONS

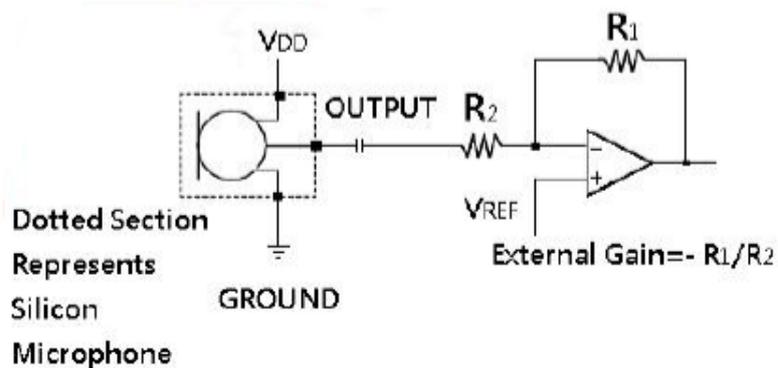
Test conditions:

Unless otherwise specified, test conditions are:

Supply voltage  $V_{DD} = 1.8V$ ,  $23 \pm 2^\circ C$ ,  $55 \pm 20\% RH$ ,

Item	Symbol	Test Conditions	Min	Typ	Max	Unit
Sensitivity	S	94dB SPL @ 1kHz	-45	-42	-39	dBV/Pa
Directivity	D( $\theta$ )		Omnidirectional			
Current Consumption	I		—	150	—	$\mu A$
Power Supply Rejection Ratio	PSRR	200mVpp sinewave @	—	62	—	dB
Power Supply Rejection	PSR+N	100 mVpp square wave @ 217 Hz, $V_{DD} = 2.0V$ , A-weighted	—	-93	—	dBV(A)
S/N Ratio	SNR	94dB SPL @ 1kHz, A-weighted	—	57	—	dB(A)
Operating Voltage Range	$V_{DD}$		1.62	1.8	3.6	V
Total Harmonic Distortion	THD	94dB SPL @ 1kHz	—	0.2	0.5	%
Acoustic Overload Point	AOP	10% THD @ 1kHz	—	130	—	dB SPL
Output Impedance	$Z_{out}$	1kHz	—	—	400	$\Omega$

Table 3. General Microphone Specifications



Typical Application Circuit

Notes:

1. All Ground pins must be connected to ground
2. Capacitors near the microphone should not contain Class 2 dielectrics due to their piezoelectric effects.

## 4.MECHANICAL SPECIFICATIONS

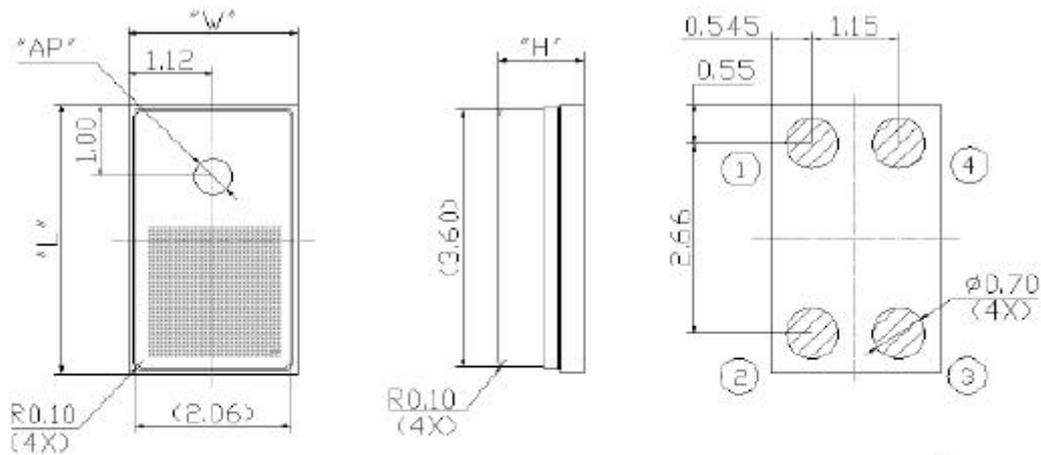


Figure 3. Detailed mechanical drawings

Pin #	Pin Name	Type	Description
1	V <sub>DD</sub>	Power	Power Supply
2	GND	Power	Ground (Lid)
3	GND	Power	Ground
4	OUTPUT	Signal	Output Signal

Table 4. Pin Definition

ITEM	DIMENSION	TOLERANCE	UNITS
LENGTH(L)	3.76	±0.10	mm
WIDTH(W)	2.24	±0.10	mm
HEIGHT(H)	1.1	±0.10	mm
ACOUSTIC PORT(AP)	Φ0.5	±0.05	mm

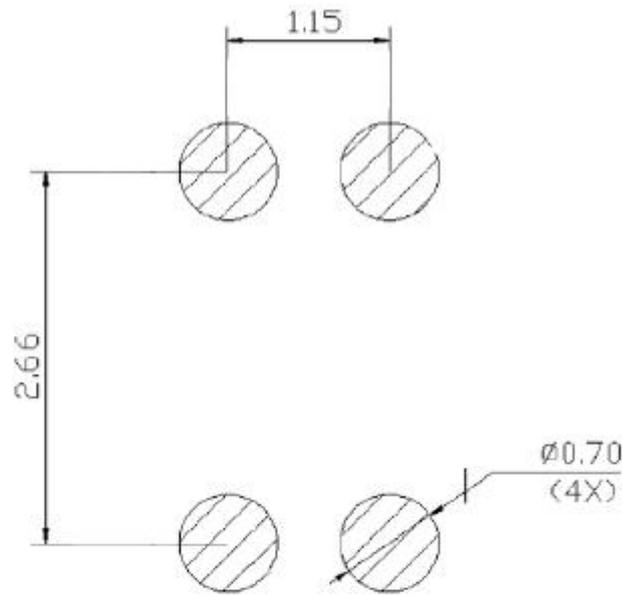
Table 5. Mechanical Dimension

Notes:

1. Dimensions are in millimeters unless otherwise specified. Tolerance is ±0.15mm unless otherwise specified.
2. Pick Area only extends to 0.25 mm of any edge or hole unless otherwise specified.
3. In the acoustic path, recommended Gasket Cavity Diameter is  $D \geq 1.0\text{mm}$ ; and Case Hole Diameter is  $1.0\text{mm} < D < 1.5\text{mm}$ .

5. Recommended Soldering Surface Land Pattern & Stencil Pattern

Example of Land Pattern



Unit: mm

Figure 4. Example of Land Pattern Drawing

Example of Solder Stencil Pattern

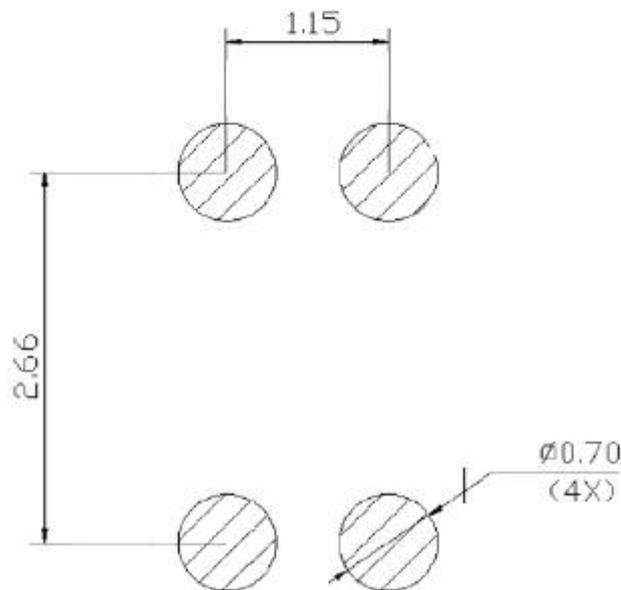
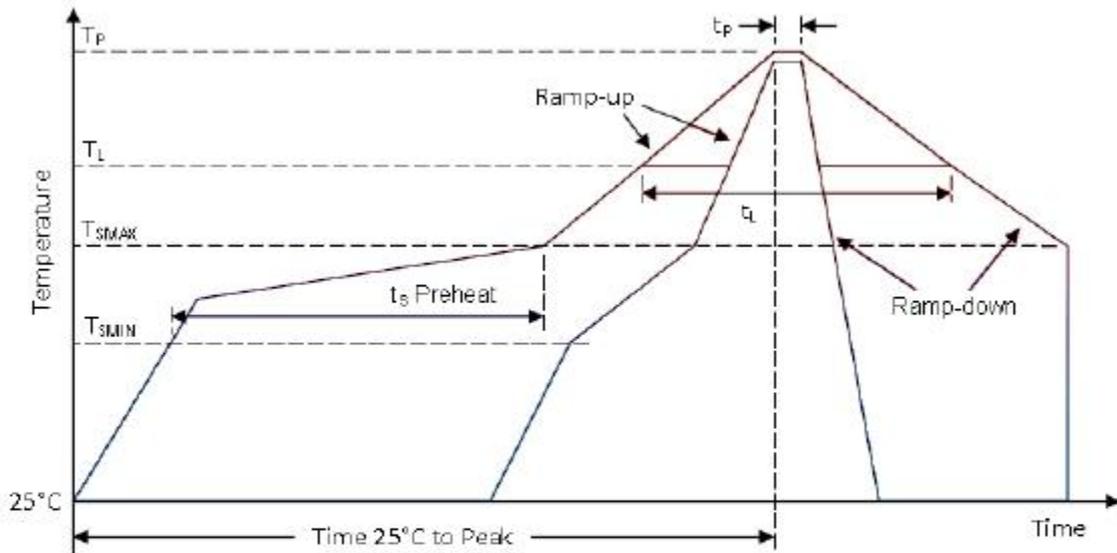


Figure 5. Example of Solder Stencil Patter

## 6. SOLDER REFLOW PROFILE



Profile Feature	Pb-Free
Average Ramp-up rate ( $T_{SMAX}$ to $T_P$ )	3°C/second max.
Preheat	
Temperature Min ( $T_{SMIN}$ )	150°C
Temperature Max ( $T_{SMAX}$ )	200°C
Time ( $T_{SMIN}$ to $T_{SMAX}$ ) ( $t_s$ )	60-180 seconds
Time maintained above:	
Temperature ( $T_L$ )	217°C
Time ( $t_l$ )	60-150 seconds
Peak Temperature ( $T_P$ )	260°C
Time within 5°C of actual Peak Temperature ( $t_r$ )	20-40 seconds
Ramp-down rate ( $T_P$ to $T_{SMAX}$ )	6°C/second max
Time 25°C to Peak Temperature	8 minutes max

Figure 9. Recommended leadless solder reflow temperature profile

### Notes:

- Based on IPC/JDEC J-STD-020 Revision C.
- All temperatures refer to topside of the package, measured on the package body surface
- MSL (moisture sensitivity level) Class 2
- Maximum of 3 reflow cycles is recommended.
- To avoid device damage:
  - Do not board wash or clean after the reflow process.
  - Do not brush board with or without solvents after the reflow process.
  - Do not directly expose to ultrasonic processing, welding, or cleaning.
  - Do not insert any object in acoustic port hole of device at any time.
  - Do not apply air pressure into the acoustic port hole.
  - Do not pull a vacuum over acoustic port hole of the microphone.
  - Do not apply a vacuum when repacking into sealed bags at a rate faster than 0.5 atm/sec.