

 AAC AAC ACOUSTIC TECHNOLOGIES (SHENZHEN) CO., LTD.		ISSUE: X6
PART No. SDM0502-RFS261-G02	Remark: GP compliant	DATE: Nov. 05 th . 2024

APPROVAL SHEET FOR MICROPHONE

CUSTOMER: _____

CHECKER: _____ Sean Ma

APPROVER: _____ Zhang Rui

 AAC AAC ACOUSTIC TECHNOLOGIES (SHENZHEN) CO., LTD.		ISSUE: X6
PART No. SDM0502-RFS261-G02	Remark: GP compliant	DATE: Nov. 05 th . 2024

CONTENTS

1. Mechanical Layout and Dimensions-----	3
2. Product Specifications-----	4
3. Test Setup-----	8
4. Recommended Interface Circuit -----	8
5. Reliability Specifications-----	9
6. Packaging Specifications-----	10
7. Solder Reflow Profile-----	13
8. Recommended Customer Land Pattern-----	14
9. Specification History-----	14

**AAC**

AAC ACOUSTIC TECHNOLOGIES (SHENZHEN) CO., LTD.

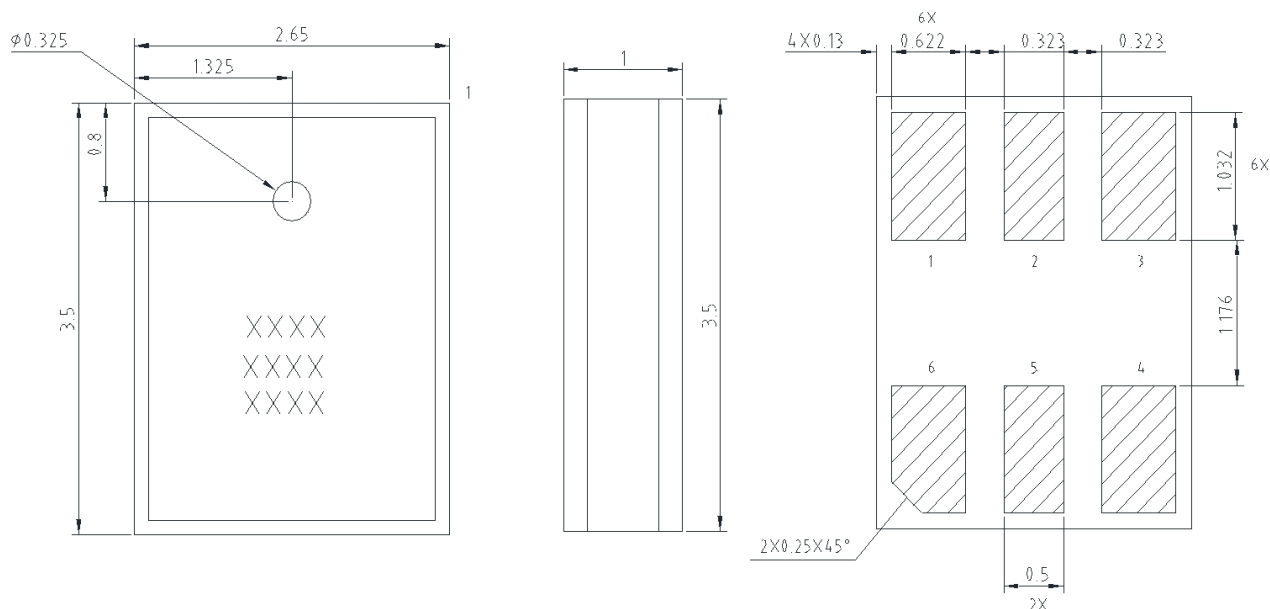
ISSUE: X6

PART No. **SDM0502-RFS261-G02**

Remark: GP compliant

DATE: Nov. 05th. 2024

1. Mechanical Layout and Dimensions



Pin description

No.	Name	Description
1	Power	Supply IO voltage for the microphone
2	Clock	Clock input to the microphone
3	Data	PDM data output from the microphone
4	Ground	Ground
5	L/R	Left/Right(DATA2/DATA1) channel selection
6	Ground	Ground

Product size

Item	Dim.	Tol. (+/-)	Unit
Length	3.50	0.10	mm
Width	2.65	0.10	mm
Height	1.00	0.10	mm
Port Hole	0.325	0.05	mm

Note: Tolerance +/-0.15mm unless otherwise specified

2. Product Specifications:

Unless otherwise specified, test conditions are:

- Vdd = 1.8V
- Duty cycle = 50%
- F_{IN} = 1 kHz @ 94dB SPL
- Ta = 27°C, Room Humidity = 50%

SNR & noise measurement is based on 20-20kHz pass band with A-weighting filter applied

Items	Symbol	Condition	Limits			Unit
			Min.	Typ.	Max.	
ELECTRICAL CHARACTERISTICS						
2.1 Directivity		Omni-Directional				
2.2 Supply Voltage	V _{dd}		1.64	1.8	3.6	V
2.3 Clock Frequency	F _{clk}	Standard Performance Mode	1.45	2.4	4.8	MHz
		Low Power Mode	500	750	1100	KHz
		Sleep Mode			250	KHz
2.4 Duty Cycle			40	50	60	%
2.5 Logic high IO Voltage	V _{IOH}		0.65*V _{dd}		V _{dd} +0.3	V
2.6 Logic Low IO Voltage	V _{IOL}		-0.3		0.35*V _{dd}	V
2.7 Sleep Current	I _{sleep}				50	uA
2.8 Short Circuit Current		Maximum logic output current	1		20	mA
2.9 Load Capacitance					150	pF
2.10 Delay Time for Data Driven	t _A		40		80	ns
2.11 Delay Time for High-Z	t _B				24	ns
2.12 Wake-up Time					10	ms
2.13 Fall-asleep Time	t _{FSL}				10	ms
2.14 Polarity	Increase Sound Pressure		Increase 1's density			

**AAC**

AAC ACOUSTIC TECHNOLOGIES (SHENZHEN) CO., LTD.

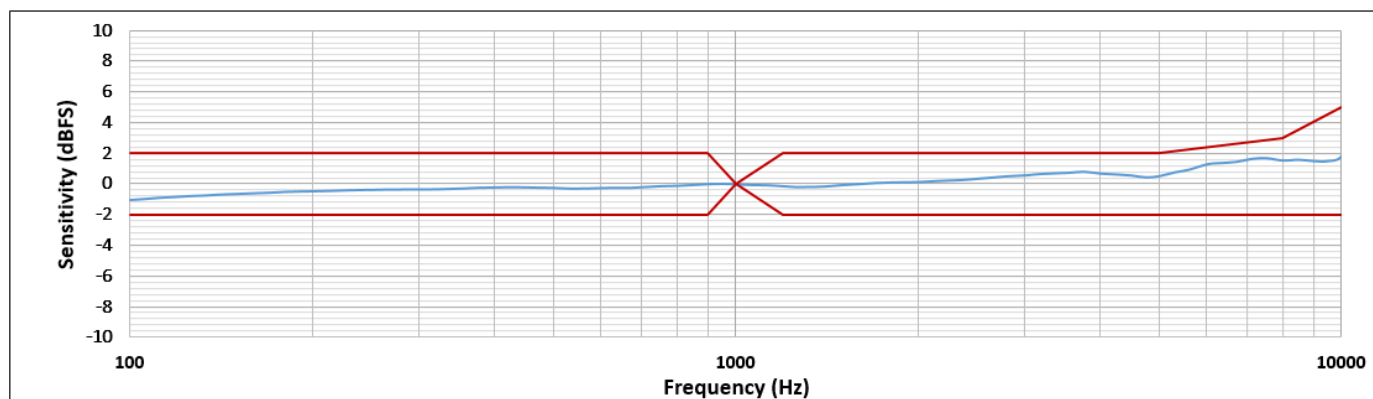
ISSUE: X6

PART No. **SDM0502-RFS261-G02**

Remark: GP compliant

DATE: Nov. 05th. 2024**Standard Performance Mode($F_{clk}=2.4\text{MHz}$, $V_{dd}=1.8\text{V}$)**

2.15 Sensitivity	S	1kHz, 94dB SPL	-27	-26	-25	dBFS
2.16 Signal-to-Noise Ratio	SNR	A-weighting at 1kHz 1Pa	-	64.5	-	dB(A)
2.17 Total Harmonic Distortion	THD	94dB SPL@1kHz	-	0.2	0.3	%
2.18 Acoustic Overload Point	AOP	1kHz THD @ 10%	-	120	-	dB SPL
2.19 Power Supply Rejection Ratio	PSRR	200 mVpp sinewave @ 1 kHz	-	60	-	dBV/FS
2.20 Power Supply Rejection	PSR+N	217Hz,100mVpp square wave, A-weighted	-	-85	-	dBFS(A)
2.21 Current Consumption	I_s	Fclock=2.4MHz	-	700	-	μA
2.22 DC offset	DC	Fclock=2.4MHz	-4	0	-4	%

2.22 Frequency Response Limits

Frequency(Hz)	100	200	900	1000	1200	5000	8000	10000
Upper Limit(dB)	2	2	2	0	2	2	3	5
Lower Limit(dB)	-2	-2	-2	0	-2	-2	-2	-2

**AAC**

AAC ACOUSTIC TECHNOLOGIES (SHENZHEN) CO., LTD.

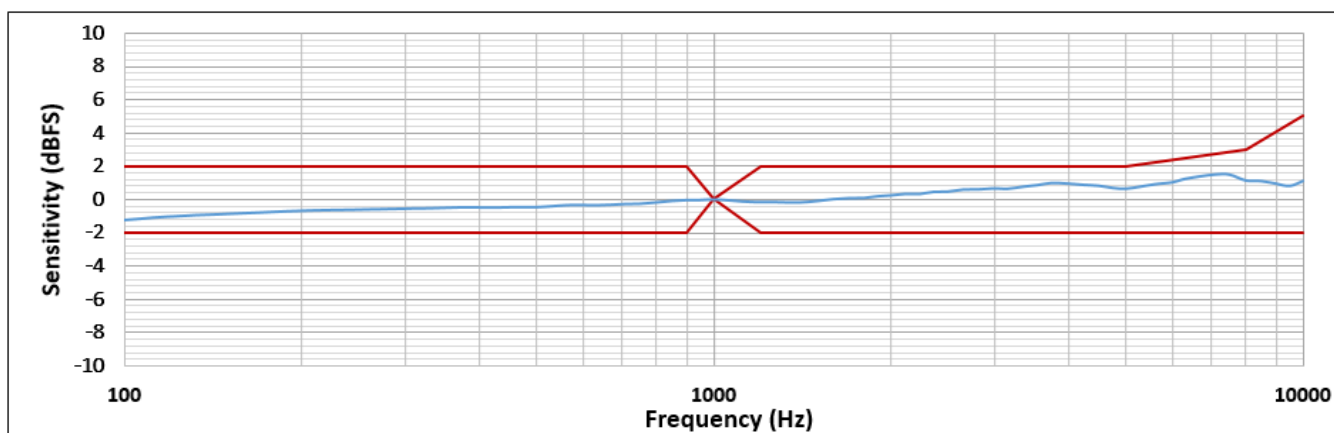
ISSUE: X6

PART No. **SDM0502-RFS261-G02**

Remark: GP compliant

DATE: Nov. 05th. 2024**Low Power Mode($F_{clk}=768kHz$, $V_{dd}=1.8V$)**

2.23 Sensitivity	S	1kHz, 94dB SPL	-27	-26	-25	dBFS
2.24 Signal-to-Noise Ratio	SNR	A-weighting at 1kHz 1Pa	-	64.5	-	dB(A)
2.25 Total Harmonic Distortion	THD	1KHz, 94dB SPL	-	0.2	0.5	%
2.26 Acoustic Overload Point	AOP	1kHz THD @ 10%	-	120	-	dB SPL
2.27 Power Supply Rejection Ratio	PSRR	200 mVpp sinewave @ 1 kHz	-	60	-	dB V/FS
2.28 Power Supply Rejection	PSR+N	217Hz, 100mVpp square wave, A-weighted	-	-85	-	dBFS(A)
2.29 Current Consumption	I_s	$F_{clock}=768kHz$	-	250	-	μA

2.30 Frequency Response Limits

Frequency(Hz)	100	200	900	1000	1200	5000	8000	10000
Upper Limit(dB)	2	2	2	0	2	2	3	5
Lower Limit(dB)	-2	-2	-2	0	-2	-2	-2	-2

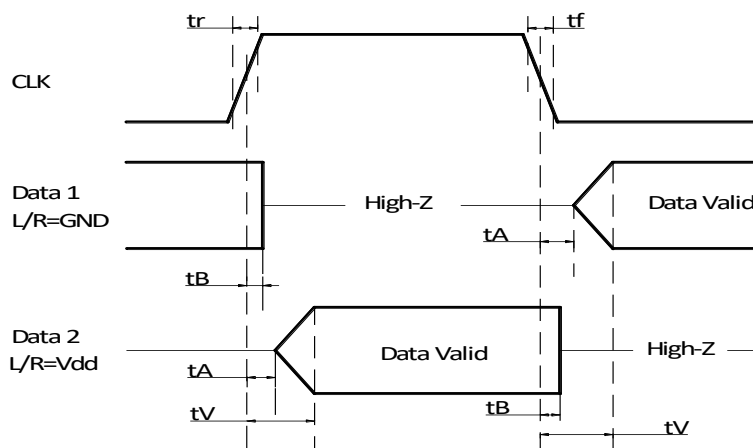
**AAC**

AAC ACOUSTIC TECHNOLOGIES (SHENZHEN) CO., LTD.

ISSUE: X6

PART No. **SDM0502-RFS261-G02**

Remark: GP compliant

DATE: Nov. 05th. 2024**2.31 Timing Diagram**

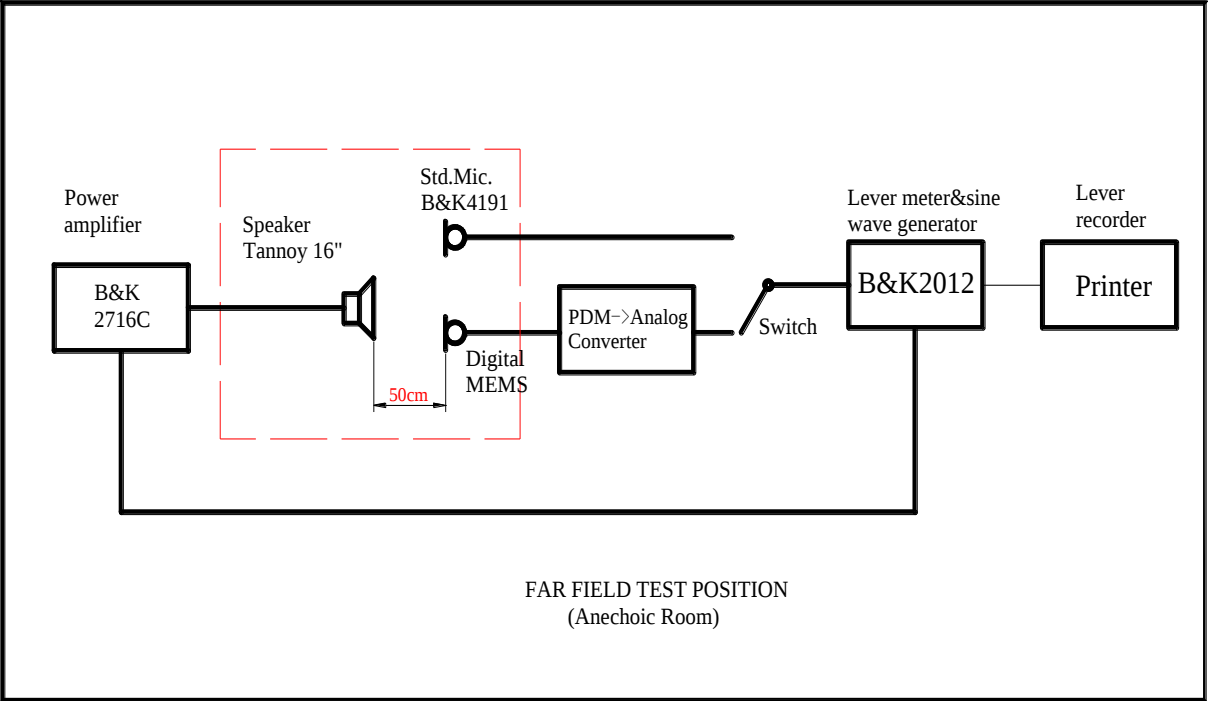
Label	L/R	Drives Data After	High-Z After
Data 1	Low (L)	Falling Clock Edge	Rising Clock Edge
Data 2	High (H)	Rising Clock Edge	Falling Clock Edge

ENVIRONMENTAL CHARACTERISTICS

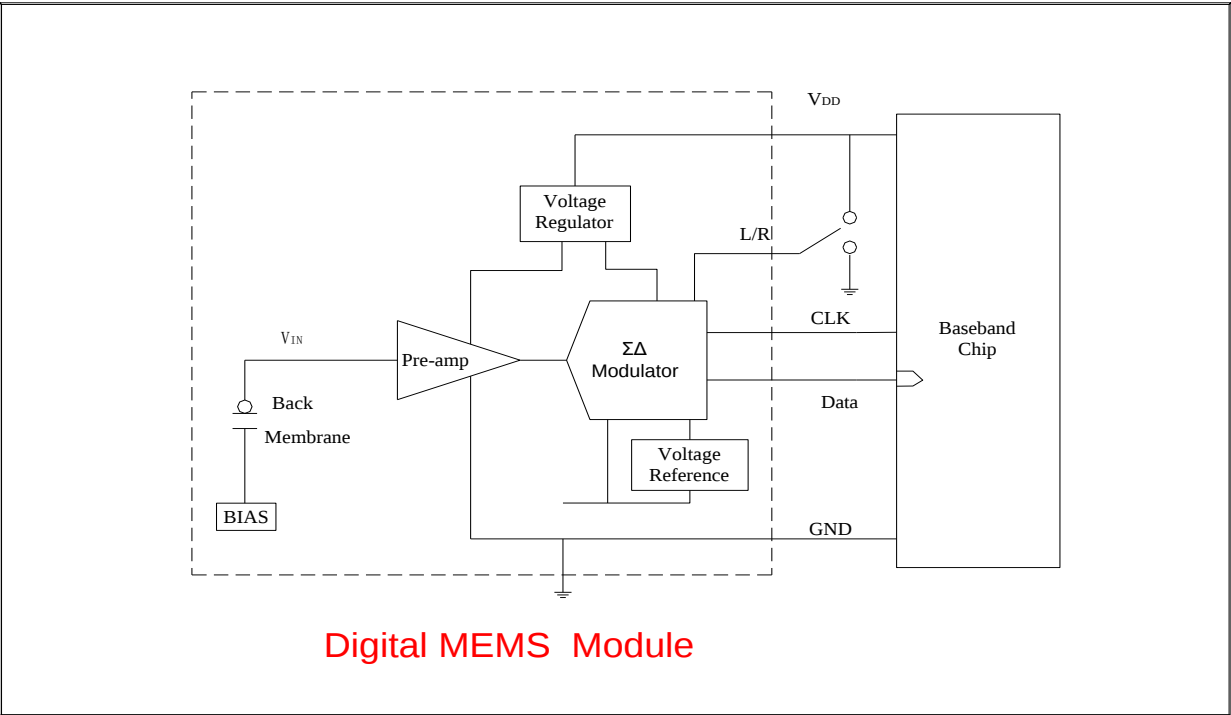
2.32 Operating Temperature			-40		+105	°C
2.33 Storage Temperature		Soldered onto PC Board	-40		+125	°C
		In Tape/Reel's	-10		+80	°C
2.34 Relative Humidity			25		85	%
2.35 Air Pressure			860		1060	mBar

 AAC AAC ACOUSTIC TECHNOLOGIES (SHENZHEN) CO., LTD.		ISSUE: X6
PART No. SDM0502-RFS261-G02	Remark: GP compliant	DATE: Nov. 05 th . 2024

3. Test Setup



4. Recommended Interface Circuit



 AAC AAC ACOUSTIC TECHNOLOGIES (SHENZHEN) CO., LTD.		ISSUE: X6
PART No. SDM0502-RFS261-G02	Remark: GP compliant	DATE: Nov. 05 th . 2024

5. Reliability Specifications

As per customer's requirements. If no customer's requirements available please refer to following tests.

Test item	Detail	Standard
Reflow Simulation	Refer to 7. solder reflow profile, total 3 times	/
Low Temperature	Conditions: $-40\pm 3^{\circ}\text{C}$ Duration: 72 hours	IEC60068-2-1
High Temperature	Conditions: $105\pm 3^{\circ}\text{C}$ Duration: 72 hours	IEC60068-2-2
Temperature Shock	Conditions: 30 minutes at -40°C followed by 30 minutes at 105°C , 20 second maximum transition time between temperature extremes 32 cycles	EC60068-2-14
Vibration Test	Conditions: 10~60Hz: 0.35mm 60~500Hz: 5g 1 oct/min Duration: 15 minutes per plane.	IEC60068-2-6
Damp heat	Conditions: $55\pm 3^{\circ}\text{C}$ 93%RH Duration: 96 hours	IEC60068-2-56
Drop Test	Conditions: 1.5 Meter height onto a concrete surface each time at three direction in state of 150g weight packing	IEC60068-2-32
ESD	Conditions: 3 discharges at $\pm 8\text{kV}$, 150pF, 330 Ω direct contact to housing and per MIL-883F, method 3015.7, 3 discharges at $\pm 2\text{kV}$ direct contact to all pins Air discharge $\pm 12\text{kV}$, total 3 times	IEC61000-4-2

The measurement shall to be done after 2 hours of conditioning at room temperature.

The sensitivity change within $\pm 3\text{dBFS}$ relative to initial value.

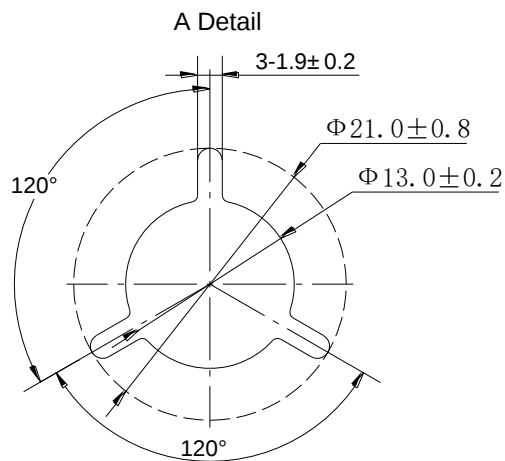
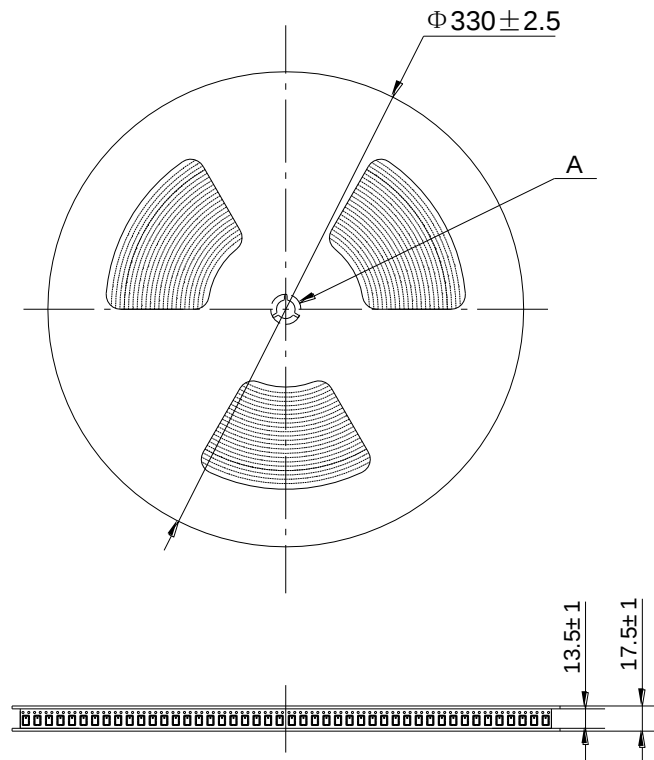
**AAC**

AAC ACOUSTIC TECHNOLOGIES (SHENZHEN) CO., LTD.

ISSUE: X6

PART No. **SDM0502-RFS261-G02**

Remark: GP compliant

DATE: Nov. 05th. 2024

4,500 PCS PRODUCTS/1 reel

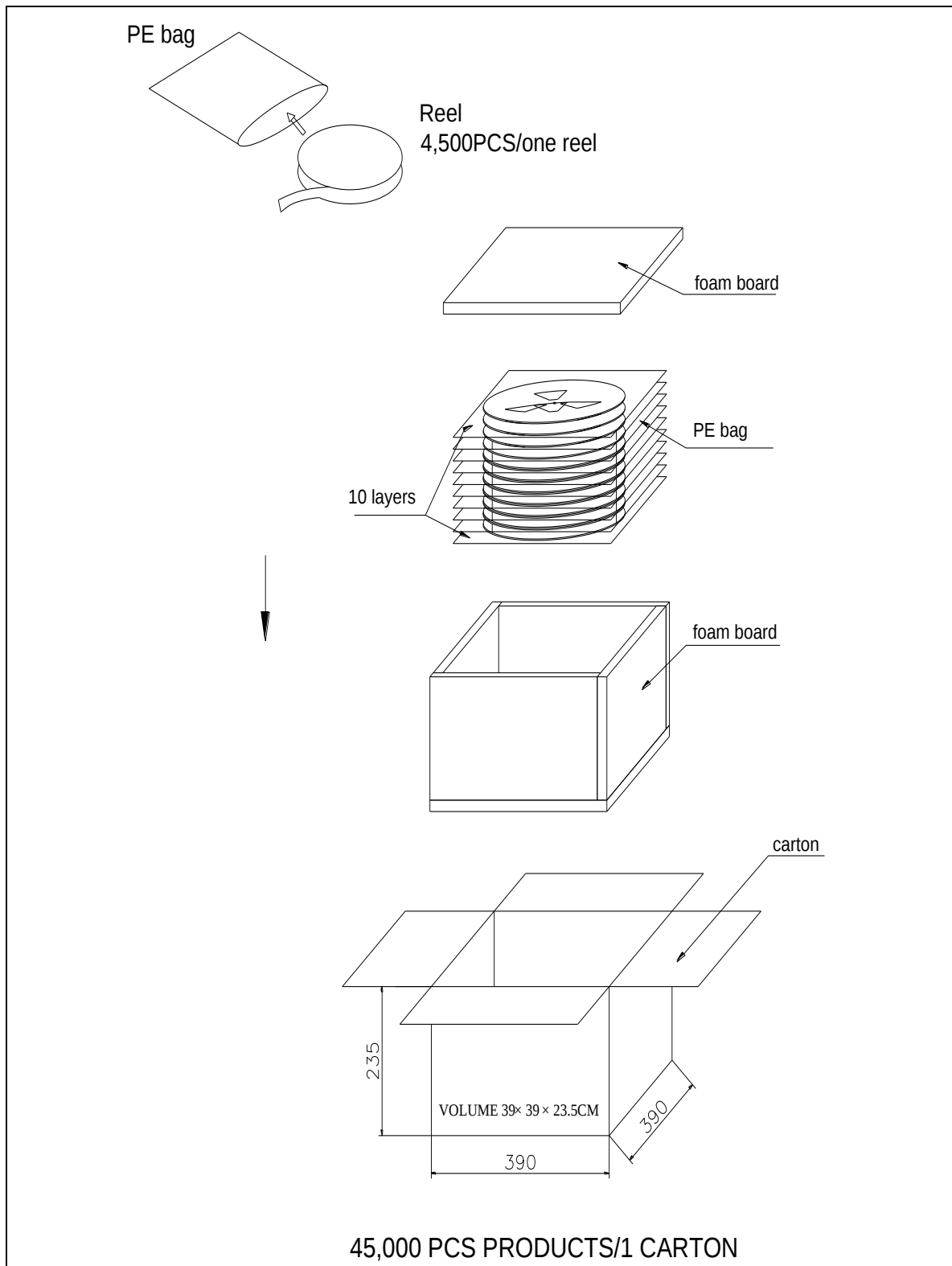
**AAC**

AAC ACOUSTIC TECHNOLOGIES (SHENZHEN) CO., LTD.

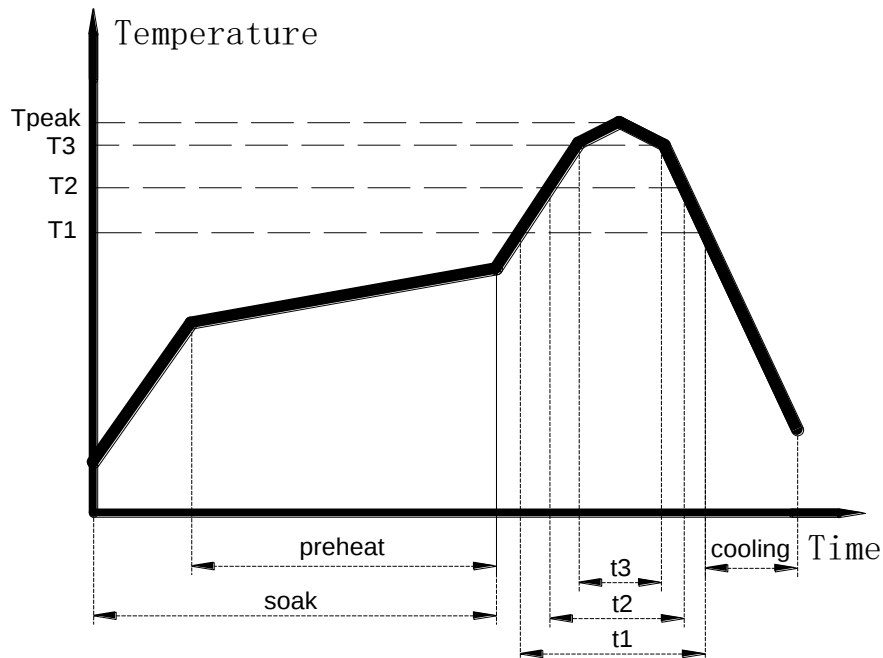
ISSUE: X6

PART No. **SDM0502-RFS261-G02**

Remark: GP compliant

DATE: Nov. 05th. 2024

7. Reflow Profile



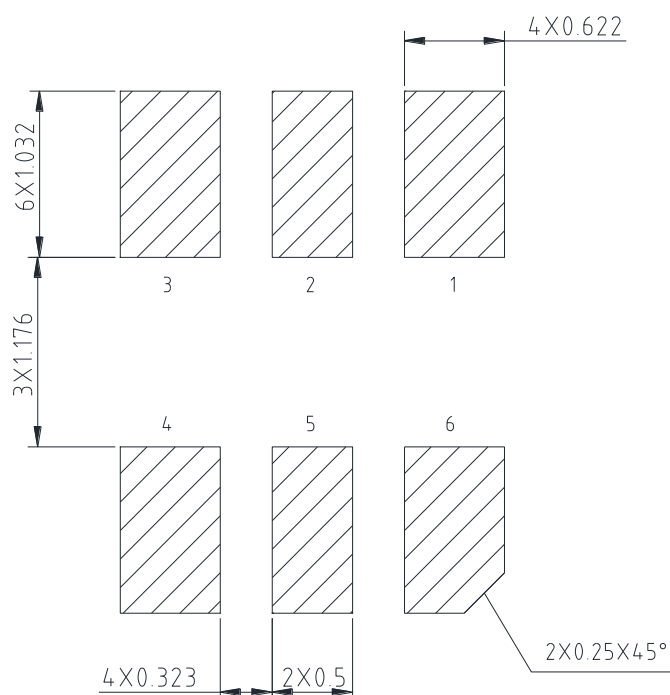
Average temperature gradient in preheating		Max 3°C/s
Preheat time	150-180°C	Max 120s
Soak time	t_{soak}	2-3 minutes
Time above 217°C	t_1	Max 90s
Time above 230°C	t_2	Max 60s
Time above 250°C	t_3	Max 30s
Peak temperature in reflow	T_{peak}	260°C(-0/+5°C)
Cooling time		Max 60s
Temperature gradient In cooling		Max -5°C/s

Notes:

- Pulling vacuum or blowing air over acoustical hole of the microphone is not allowed, Because the device can be damaged.
- Wash the board after reflow process is not allowed, because board washing and cleaning agents can damage the device. Device should not be exposed to ultrasonic processing or cleaning, and air blowing.
- Recommended number of reflow is no more than 3 times.

 AAC AAC ACOUSTIC TECHNOLOGIES (SHENZHEN) CO., LTD.		ISSUE: X6
PART No. SDM0502-RFS261-G02	Remark: GP compliant	DATE: Nov. 05 th . 2024

8. Recommended Customer Land Pattern:



9. Specification History

ISSUE	PREP	CHKD	DETAIL SPEC CHANGES:	DATE
X1	Hong Tingting	Wu Zhijiang	Initial Version Release	Jul.26 th . 2019
X2	Hong Tingting	Wu Zhijiang	Update Mechanical Layout and Dimensions, PSR+N and ESD Detail	Aug.13 th .2019
X3	Hong Tingting	Wu Zhijiang	Update THD Spec, add DC offset	Mar. 24 th .2021
X4	Sean Ma	Zhang Rui	Update Product Specifications	May. 05 th . 2022
X5	Sean Ma	Zhang Rui	Update the marking	May. 05 th . 2024
X6	Sean Ma	Zhang Rui	Update the Operating Temperature	Nov. 05 th . 2024