

 AAC AAC ACOUSTIC TECHNOLOGIES (SHENZHEN) CO., LTD.		ISSUE: X7
PART No. SDM0502B-RS261-M02	Remark: GP compliant	DATE: May. 17 th . 2019

APPROVAL SHEET FOR MICROPHONE

CUSTOMER: _____

CHECKER: Chen Zhiyuan

APPROVER: Wu Zhijiang

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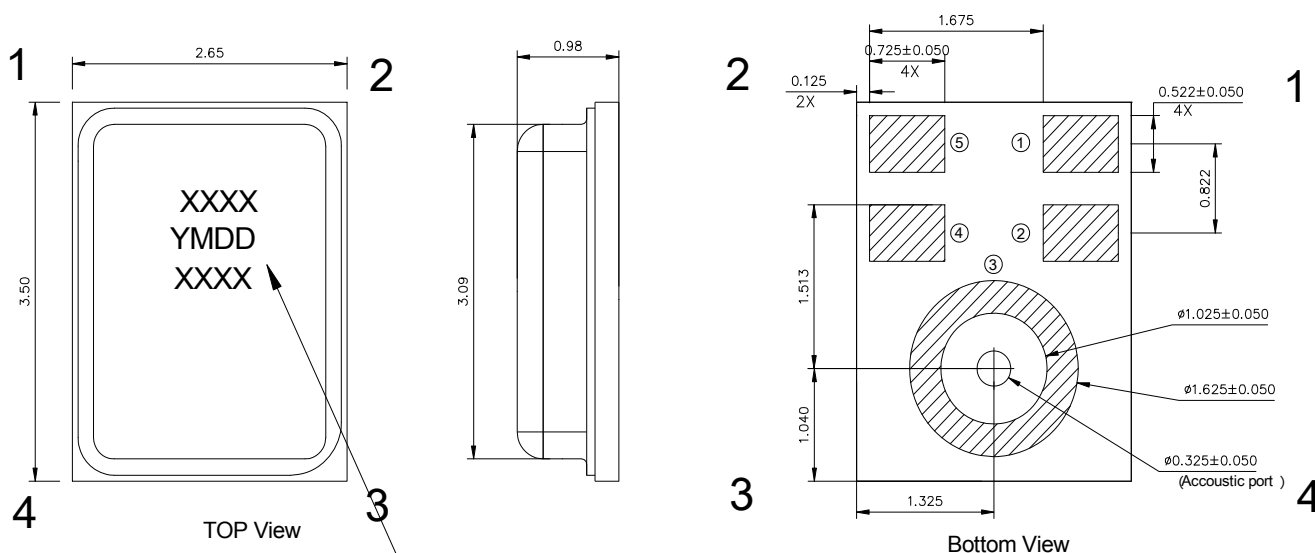
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1. Mechanical Layout and Dimensions



Y	Year, 1 number, 0~9 stand for 2010~2019
M	Month, 1 number, 1~9,A,B,C
DD	Date, 2 numbers, 01~31

Pin description

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

Product size

Item	Dim.	Tol.(+/-)	Unit
Length	3.50	0.10	mm
Width	2.65	0.10	mm
Height	0.98	0.10	mm
Port Hole	0.325	0.05	mm

Note: Tolerance +/-0.15mm unless otherwise specified

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2. Product Specifications:

Unless otherwise specified, test conditions are:

- V_{dd} = 1.8V
- Duty cycle = 50%
- F_{IN} = 1 kHz @ 94dB SPL
- T_a = 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	1.12	2.4	4.8	MHz
		Low Power Mode	0.6	0.768	0.885	MHz
		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		35		60	ns
2.11 Delay Time for High-Z	t _B		5		15	ns
2.12 Delay Time for Data Valid	t _V	R _{load} >10kOhm, C _{load} <100pF	40		80	ns
2.13 Wake-up Time					35	ms
2.14 Fall-asleep Time	t _{FSL}				10	ms
2.15 Polarity	Increase Sound Pressure		Increase 1's density			

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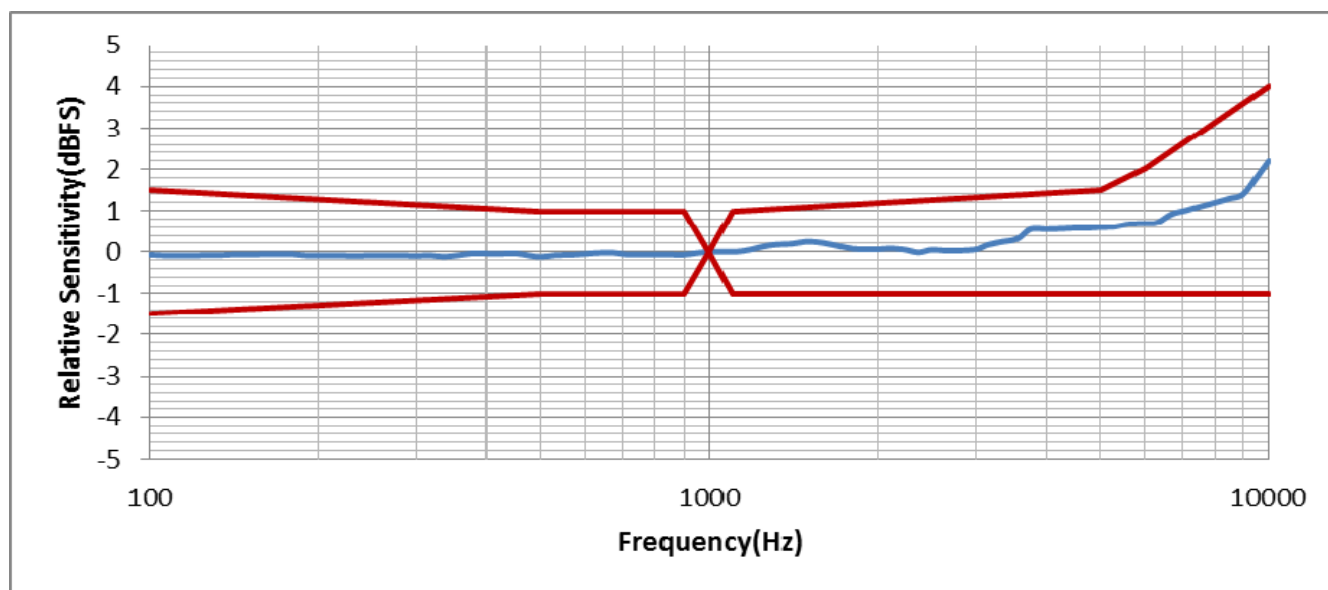
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DATE: May. 17th. 2019**Standard Performance Mode****Clock=2.4MHz, Vdd=1.8V**

2.16 Sensitivity	S	1kHz, 94dB SPL	-27	-26	-25	dBFS
2.17 Signal-to-Noise Ratio	SNR	A-weighting at 1kHz 1Pa		64		dB(A)
2.18 Total Harmonic Distortion	THD	1KHz, 94dB SPL			0.5	%
2.19 Power Supply Rejection	PSR	217Hz, 100mVpp square wave superimposed on Vdd=1.8V, A-weighted		-88		dBFS
2.20 Acoustic Overload Point	AOP	1kHz THD @ 10%		120		dB SPL
2.21 Current Consumption	I _s	No load		600	700	μA

2.22 Frequency Response Limits

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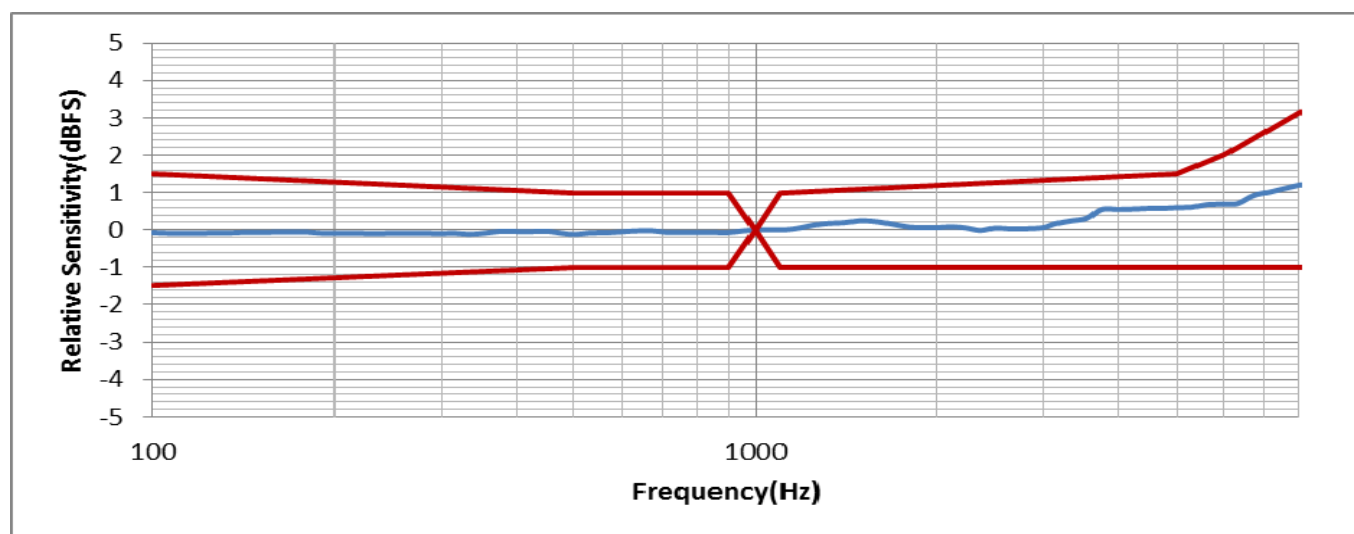
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DATE: May. 17th. 2019**Low Power Mode****Clock=768kHz, Vdd=1.8V**

2.23 Sensitivity	S	1kHz, 94dB SPL	-27	-26	-25	dBFS
2.24 Signal-to-Noise Ratio	SNR	A-weighting at 1kHz 1Pa		63		dB(A)
2.25 Total Harmonic Distortion	THD	1KHz, 94dB SPL			0.5	%
		1KHz, 105dB SPL			3	
2.26 Power Supply Rejection	PSR	217Hz, 100mVpp square wave superimposed on Vdd=1.8V		-90		dBFS
2.27 Acoustic Overload Point	AOP	1kHz THD @ 10%		120		dB SPL
2.28 Current Consumption	I _s				200	μA

2.29 Frequency Response Limits

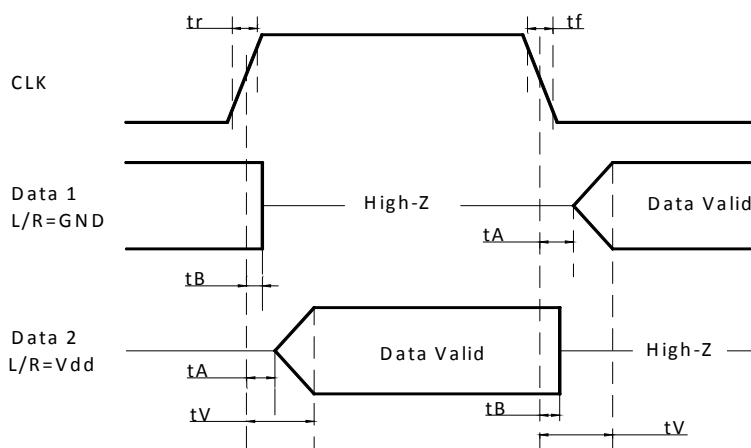
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DATE: May. 17th. 2019**2.30 Timing Diagram**

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

2.31 Operating Temperature			-30		+85	°C
2.32 Storage Temperature		Soldered onto PC Board	-40		+85	°C
		In Tape/Reel's	-10		+50	°C
2.33 Relative Humidity			25		85	%
2.34 Air Pressure			860		1060	mBar

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5. Reliability Specifications

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

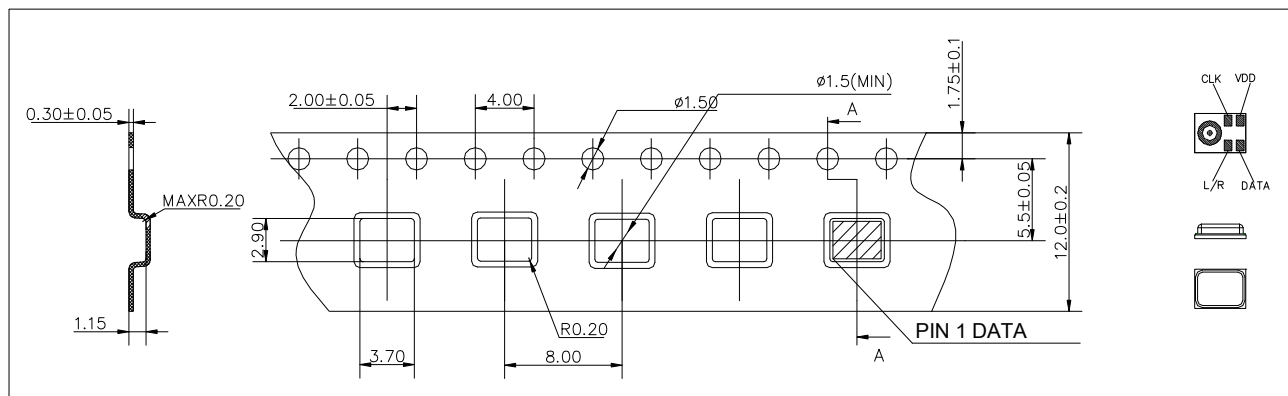
Test item	Detail	Standard
Reflow Simulation	Refer to 7. solder reflow profile, total 3 times	/
Low Temperature	Conditions: -40±3℃ Duration: 72 hours	IEC60068-2-1
High Temperature	Conditions: 85±3℃ Duration: 72 hours	IEC60068-2-2
Temperature Shock	Conditions: 30 minutes at -40℃ followed by 30 minutes at 85℃, 20 second maximum transition time between temperature extremes. 32 cycles	IEC60068-2-14
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±3℃ 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: 1) 10 discharges at +/-8kV, 150pF, 330Ω direct contact to housing ; 2) Per MIL-883F, method 3015.7, 3 discharges at +/-2kV direct contact to all pins	IEC61000-4-2

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

The sensitivity change within ±3dBFS relative to initial value.

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6. Packaging Specifications



Notes:

1. 10 sprocket hole pitch cumulative tolerance +/-0.2;
2. Camber in compliance with EIA481;
3. Pocket position relative to sprocket hole measured as true position of pocket. Not pocket hole.

Part Number	Reel Diameter	Qty per Reel
SDM0502B-RS261-M02	13"	4500

Leader length	Cells at leading end and trailing end of tape should be empty for a length of 350~450mm.
Label	Label applied to external package and directs to reel. Per JEDEC.
Empty Units	No consecutive empty pockets; No more than 3 empty pockets per reel. (Does not include empty pockets for leader/follower).

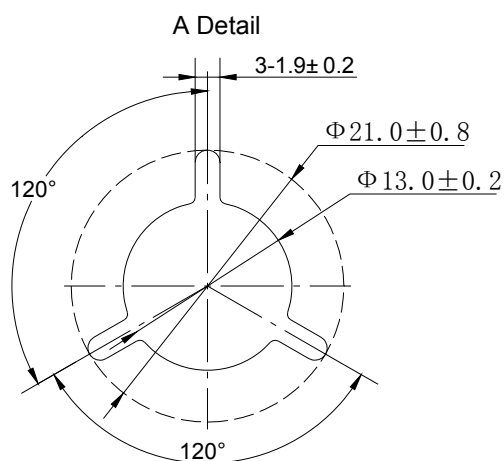
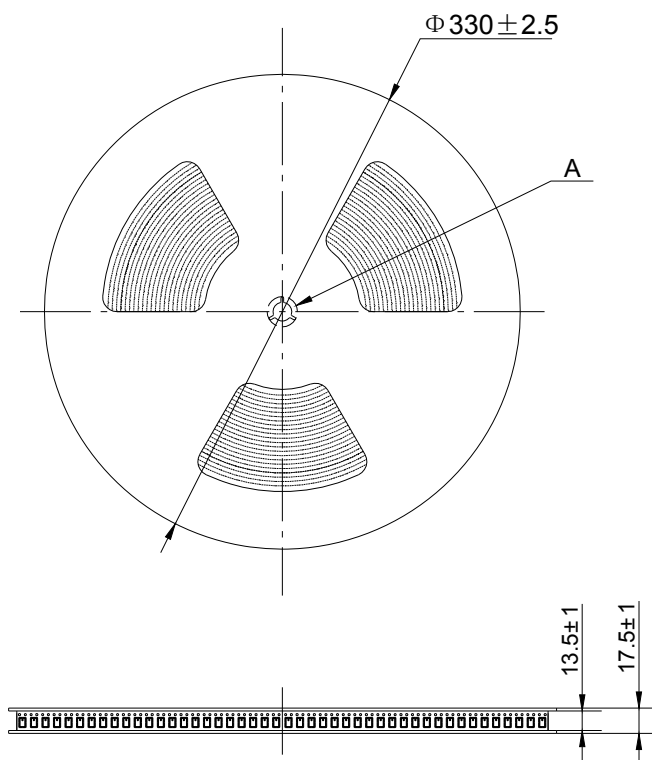
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4,500 PCS PRODUCTS/1 reel

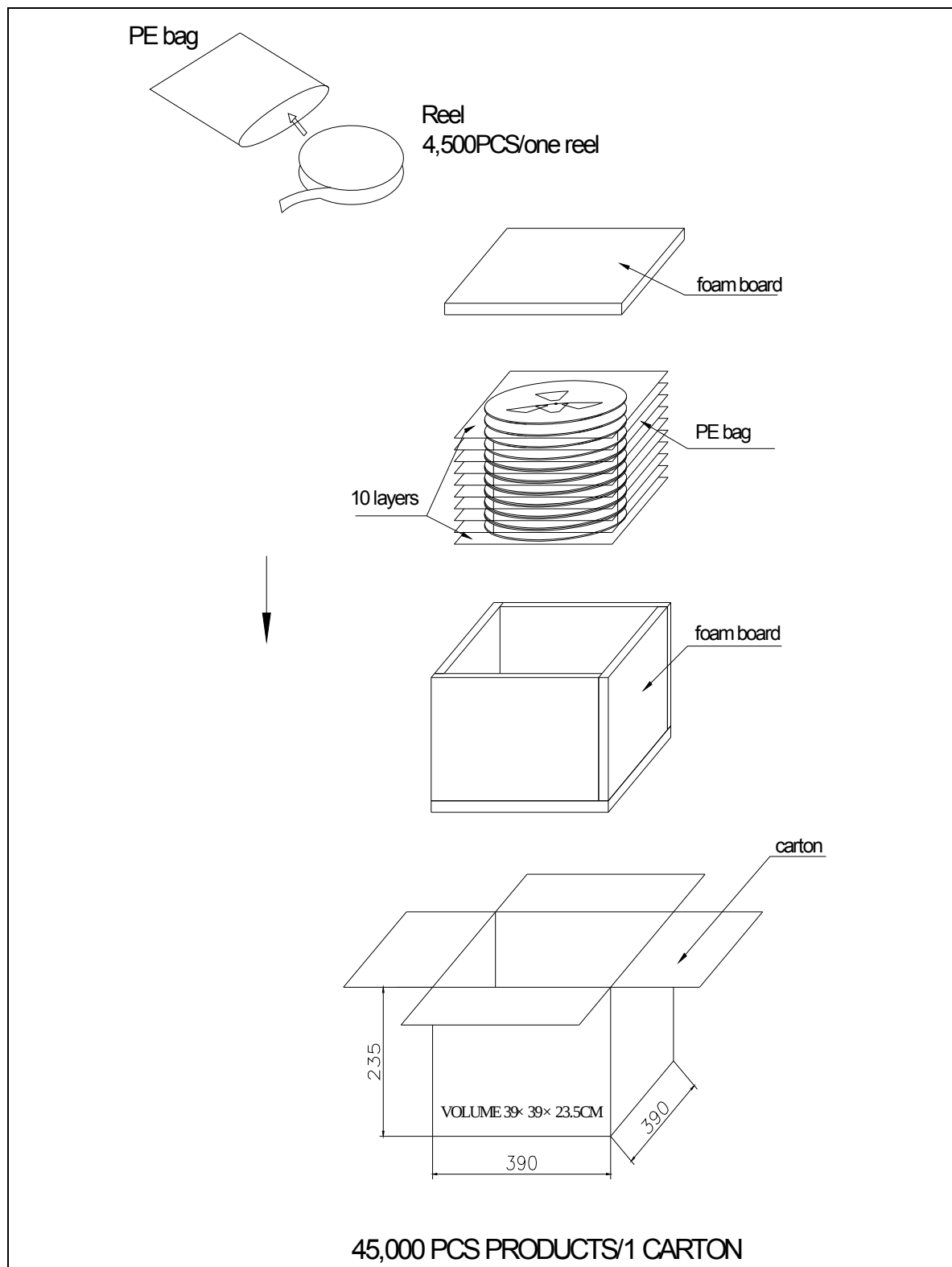
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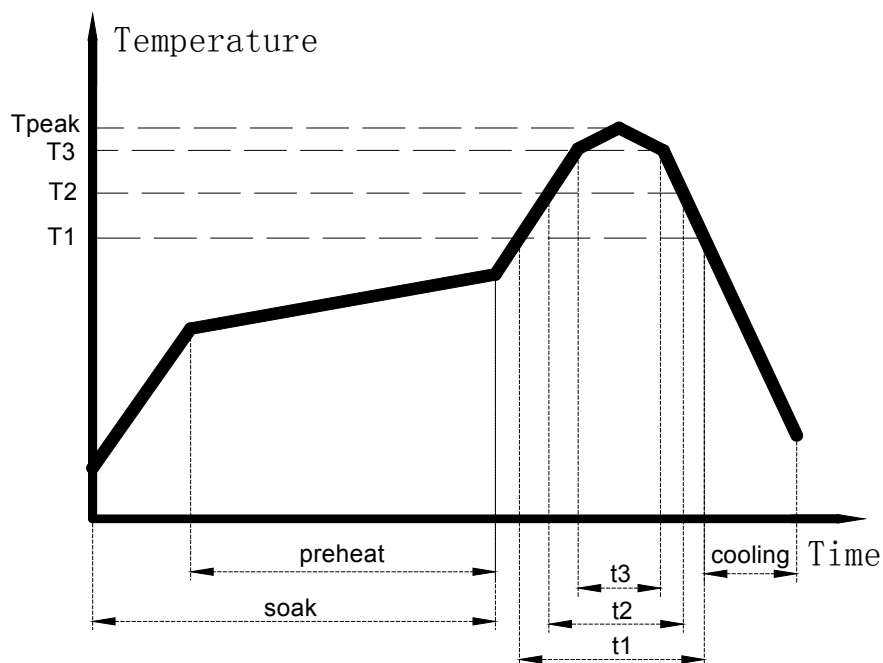
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7. Reflow Profile



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.

