
 <b>AAC</b> AAC ACOUSTIC TECHNOLOGIES (SHENZHEN) CO., LTD.		ISSUE: X2
PART No. <b>SDM0103B-EASJ261-W02</b>	Remark: GP compliant	DATE: Jul. 05 <sup>th</sup> . 2022

## APPROVAL SHEET FOR MICROPHONE

CUSTOMER: \_\_\_\_\_

CHECKER:                     HongTingting                    

APPROVER:                     Zhang Rui

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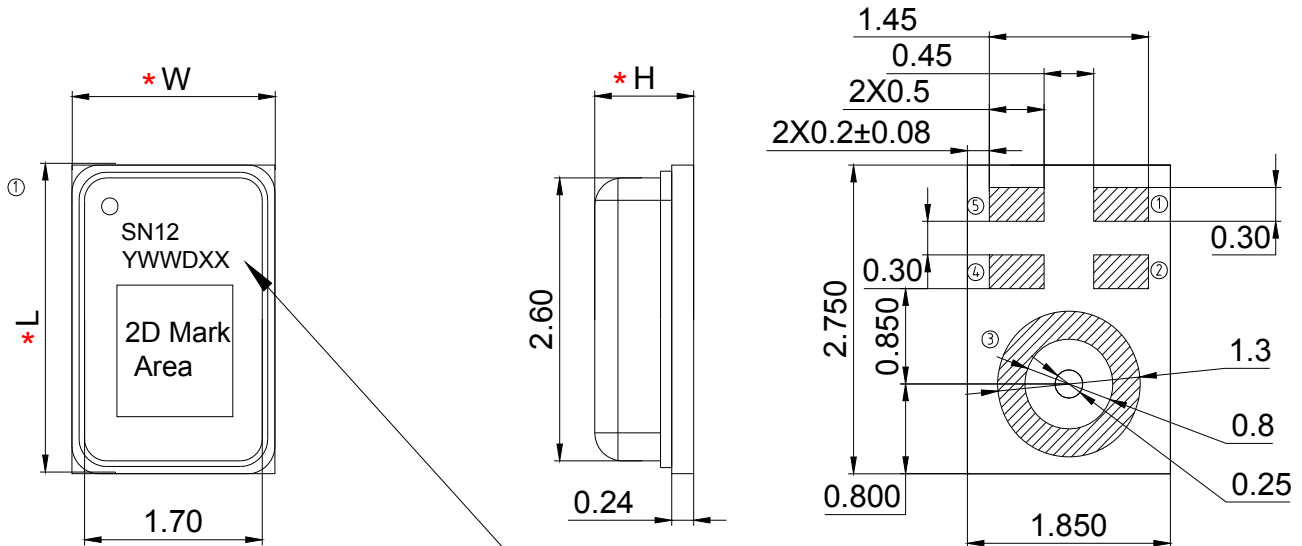
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## 1. Mechanical Layout and Dimensions



SN12	Identify Mark
YWWDD	Indicates year, week, and date seperately
XX	Indicates LOT NO.

### 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	2.75	0.10	mm
Width	1.85	0.10	mm
Height	1.0	0.10	mm
Port Hole	0.25	0.05	mm

Note: Tolerance +/-0.15mm unless otherwise specified

**Package Type: SIP**

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## 2. Product Specifications:

Unless otherwise specified, test conditions are:

- V<sub>dd</sub> = 1.8V
- Duty cycle = 50%
- F<sub>IN</sub> = 1 kHz @ 94dB SPL
- T<sub>a</sub> = 27°C, Room Humidity = 50%

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

Items	Symbol	Condition	Limits			Unit
			Min.	Typ.	Max.	
<b>ELECTRICAL CHARACTERISTICS</b>						
2.1 Directivity		Omni-Directional				
2.2 Supply Voltage	V <sub>dd</sub>		1.64	1.8	3.6	V
2.3 Clock Frequency	F <sub>clk</sub>	Standard Performance Mode	1.12	2.4	4.8	MHz
		Low Power Mode	600	768	885	KHz
		Sleep Mode			250	KHz
2.4 Duty Cycle			40	50	60	%
2.5 Clock Rise Time	T <sub>cr</sub>				13	ns
2.6 Clock Fall Time	T <sub>cf</sub>				13	ns
2.7 Input Logic High	V <sub>IH</sub>		0.65*V <sub>dd</sub>		V <sub>dd</sub> +0.3	V
2.8 Input Logic Low	V <sub>IL</sub>		-0.3		0.35*V <sub>dd</sub>	V
2.9 Output Logic High	V <sub>OH</sub>		0.65V <sub>dd</sub>		V <sub>dd</sub>	V
2.10 Output Logic Low	V <sub>OL</sub>		0		0.35V <sub>dd</sub>	V
2.11 Sleep Current	I <sub>sleep</sub>				50	uA
2.12 Short Circuit Current					20	mA
2.13 Load Capacitance					150	pF
2.14 Delay Time for Data Driven	T <sub>dd</sub>				85	ns
2.15 Delay Time For Data Valid on Rising/Falling Clock Edge	T <sub>dvr</sub> / T <sub>dvf</sub>				120	ns
2.16 Delay Time for High-Z	T <sub>dz</sub>				30	ns

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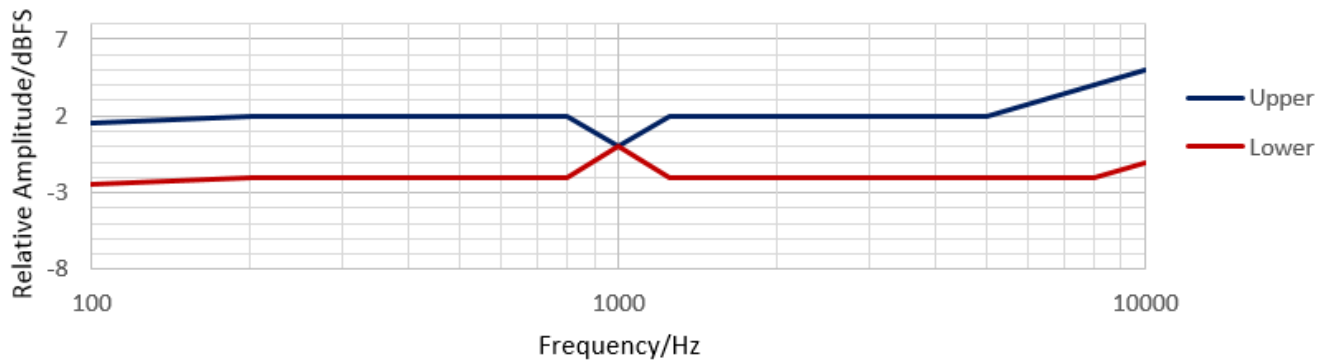
PART No. **SDM0103B-EASJ261-W02**

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DATE: Jul. 05<sup>th</sup>. 2022**Standard Performance Mode**

(Vdd=1.8V, Fclock=2.4MHz (D.C.=50%) ;Decimation Rate =64x;Temp=20±2℃, Room Humidity = 60±5%)

Sensitivity	S	1kHz, 94dB SPL	-27	-26	-25	dBFS
Signal-to-Noise Ratio	SNR	A-weighting at 1kHz 1Pa	-	66	-	dB(A)
Sensitivity Drop	ΔS	94dB SPL @ 1kHz, Vs=3.6→1.64V	-0.25		0.25	dBFS
Total Harmonic Distortion	THD	94dB SPL@1kHz		0.1	0.5	%
Power Supply Rejection Ratio	PSRR	200mVpp sinewave, 1KHz, Vdd=1.8V	-	70	-	dB V/FS
Power Supply Rejection	PSR	100mVpp square wave@217Hz Vdd=1.8V,A-weighted	-	-90	-	dBFS(A)
Acoustic Overload Point	AOP	1kHz THD @ 10%	-	120	-	dB SPL
Current Consumption	I <sub>s</sub>		-	700	-	μA

**Frequency Response Limits****FR Mask (Normal Mode)**

频率 (Hz)	100	200	800	1000	1250	5000	8000	10000
Upper	1.5	2	2	0	2	2	4	5
Lower	-2.5	-2	-2	0	-2	-2	-2	-1

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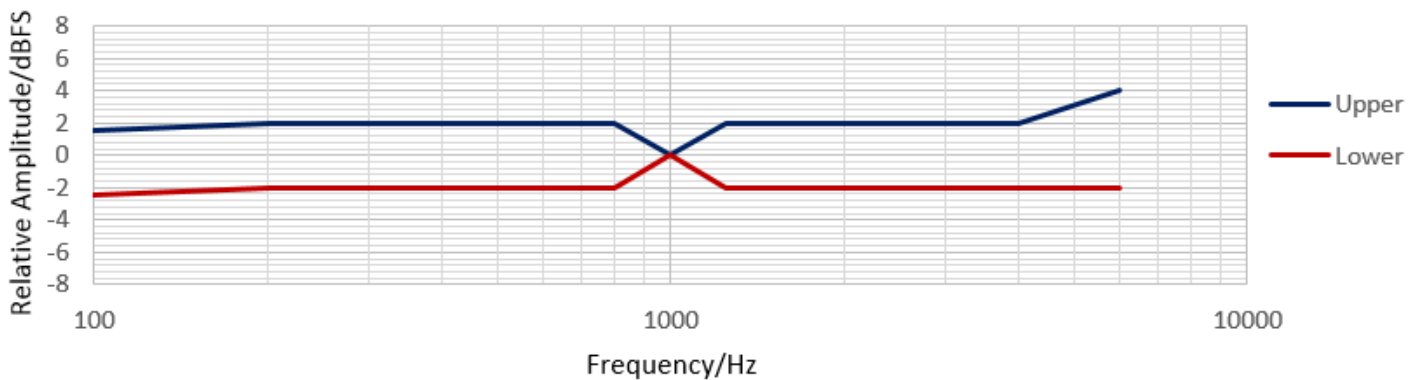
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DATE: Jul. 05<sup>th</sup>. 2022**Low Power Mode**

VDD=1.8V; Fclock=768kHz (D.C.=50%); Decimation Rate=64x; Temp=20±2°C, Room Humidity = 60±5%

Sensitivity	S	1kHz, 94dB SPL	-27	-26	-25	dBFS
Signal-to-Noise Ratio	SNR	A-weighted (BW: 20~6kHz)	-	66	-	dB(A)
Sensitivity Drop	ΔS	94dB SPL @ 1kHz, Vs=3.3→1.64V	-0.25		0.25	dBFS
Total Harmonic Distortion	THD	1KHz, 94dB SPL		0.1	0.5	%
Power Supply Rejection Ratio	PSRR	200mVpp sinewave, 1KHz	-	70	-	dB V/FS
Power Supply Rejection	PSR	100mVpp square wave@217Hz Vdd=2V,A-weighted, 20~20kHz	-	-90	-	dBFS(A)
Acoustic Overload Point	AOP	1kHz THD @ 10%	-	115	-	dB SPL
Current Consumption	I <sub>s</sub>		-	250	-	uA

**Frequency Response Limits****FR Mask (Low Power Mode)**

频率 (Hz)	100	200	800	1000	1250	4000	6000
Upper	1.5	2	2	0	2	2	4
Lower	-2.5	-2	-2	0	-2	-2	-2



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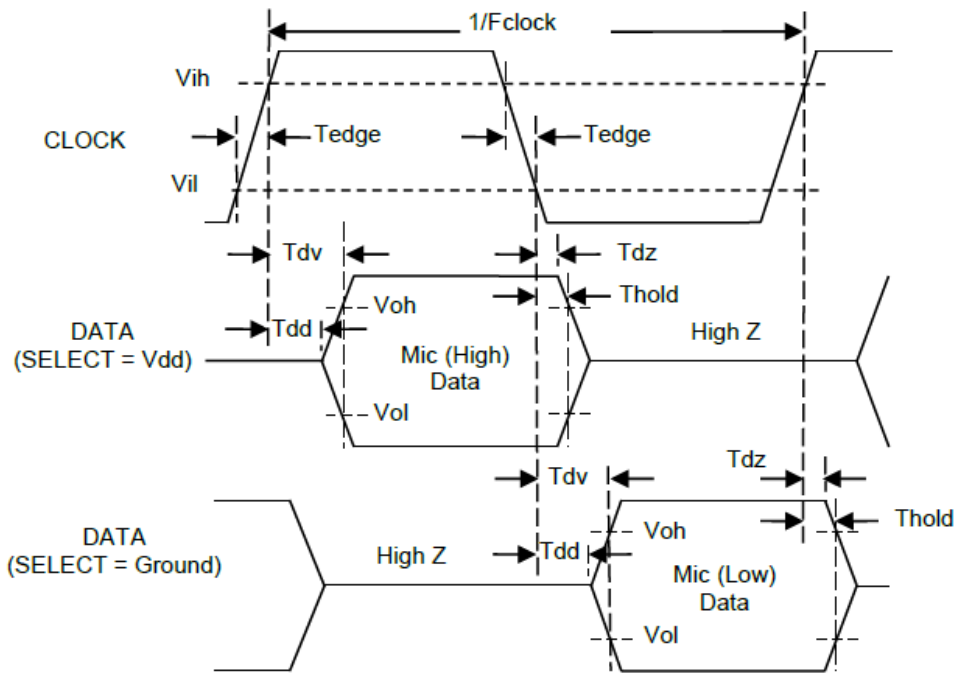
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**Timing Diagram**



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**

Operating Temperature			-30		+70	°C
Storage Temperature		Soldered onto PC Board	-40		+85	°C
		In Tape/Reel's	-10		+50	°C
Relative Humidity			25		85	%
Air Pressure			860		1060	mBar



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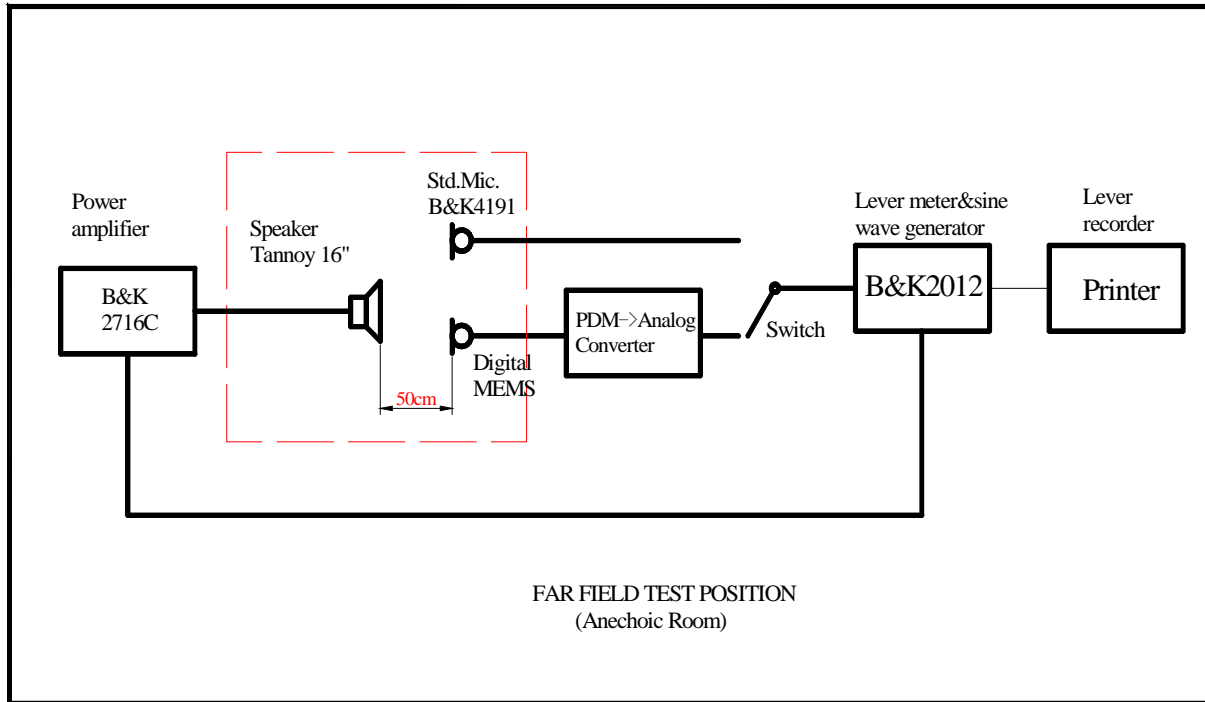
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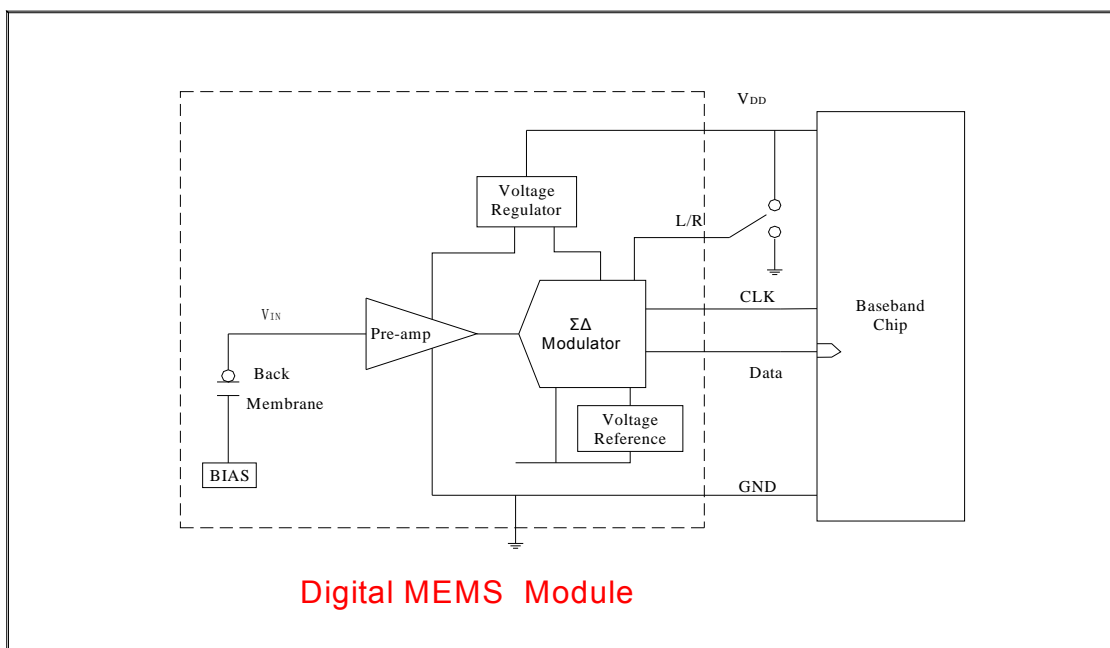
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### 3. Test Setup



### 4. Recommended Interface Circuit



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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
Reflow	Microphone is tested to 3 passes through reflow oven, with microphone mounted upside-down under conditions of 260°C for 30 seconds maximum.
Thermal Shock	Microphone unit must operate when exposed to air-to-air thermal shock 100 cycles From -40°C to +125°C with 15 minute soaks. (IEC 60068-2-14)
Mechanical Shock	Microphone must operate after exposure to shock test of 3,000 G (IEC60068-2-27)
Low Temperature	Microphone unit must maintain sensitivity after storage at -40±3°C for 72 hours. ( IEC60068-2-1)
High Temperature	Microphone unit must maintain sensitivity after storage at +85±3°C for 72 hours. ( IEC60068-2-2)
Vibration Test	Microphone unit must operate under test condition: 4 cycles, from 20 to 2,000Hz in each direction (x, y, z), 48 minutes, using peak acceleration of 20 G (+20%,-0%). (IEC60068-2-6)
Damp heat	Tested under bias at 55±3°C/95%R.H for 96 hours. ( IEC60068-2-3)
Drop Test	1.5 Meter height onto a concrete surface each time at three directions in state of packing, total 18 times. (IEC60068-2-32)
ESD	HBM: 100pF,1500 ohms, +/-2kV direct contact Power Pin and Output Pin; MM: 100pF, 0 ohms, +/-200V direct contact Power Pin and Output Pin. 3 times each supply, total 6 times

### NOTE

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

After reliability tests are performed, the sensitivity of the microphones shall not deviate more than ±3dB from its initial value

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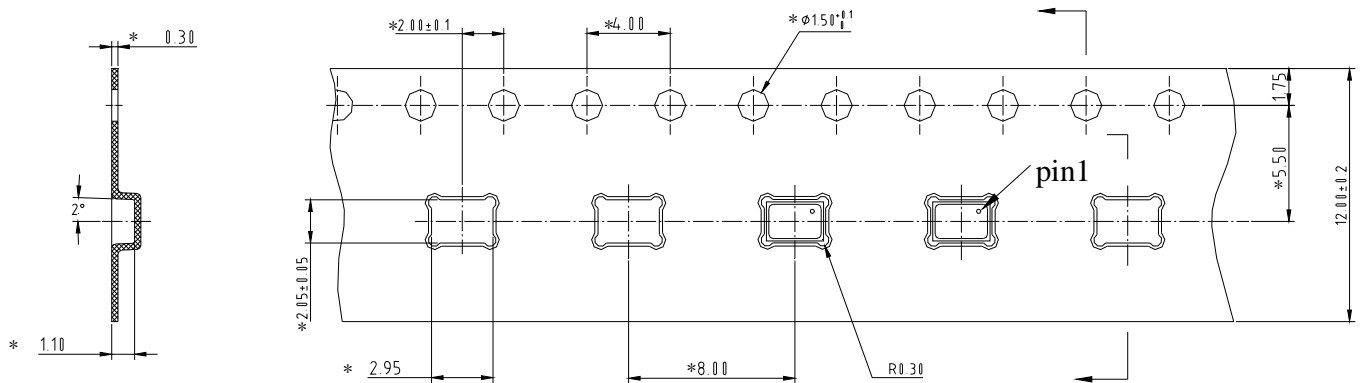
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## 6. Packaging Specifications

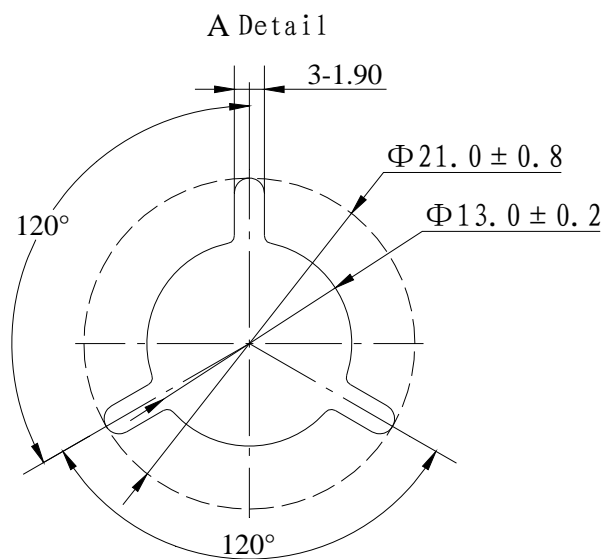
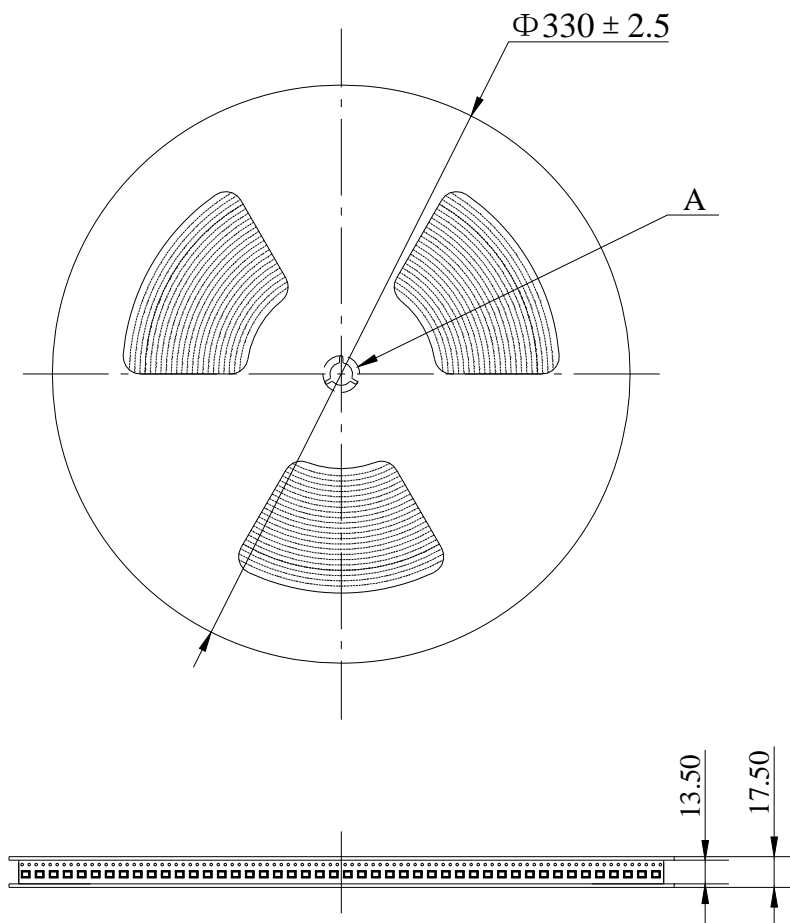


### Notes:

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
<b>SDM0103B-EASJ261-W02</b>	<b>13"</b>	<b>4500</b>

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).



4,500 PCS PRODUCTS/1 reel



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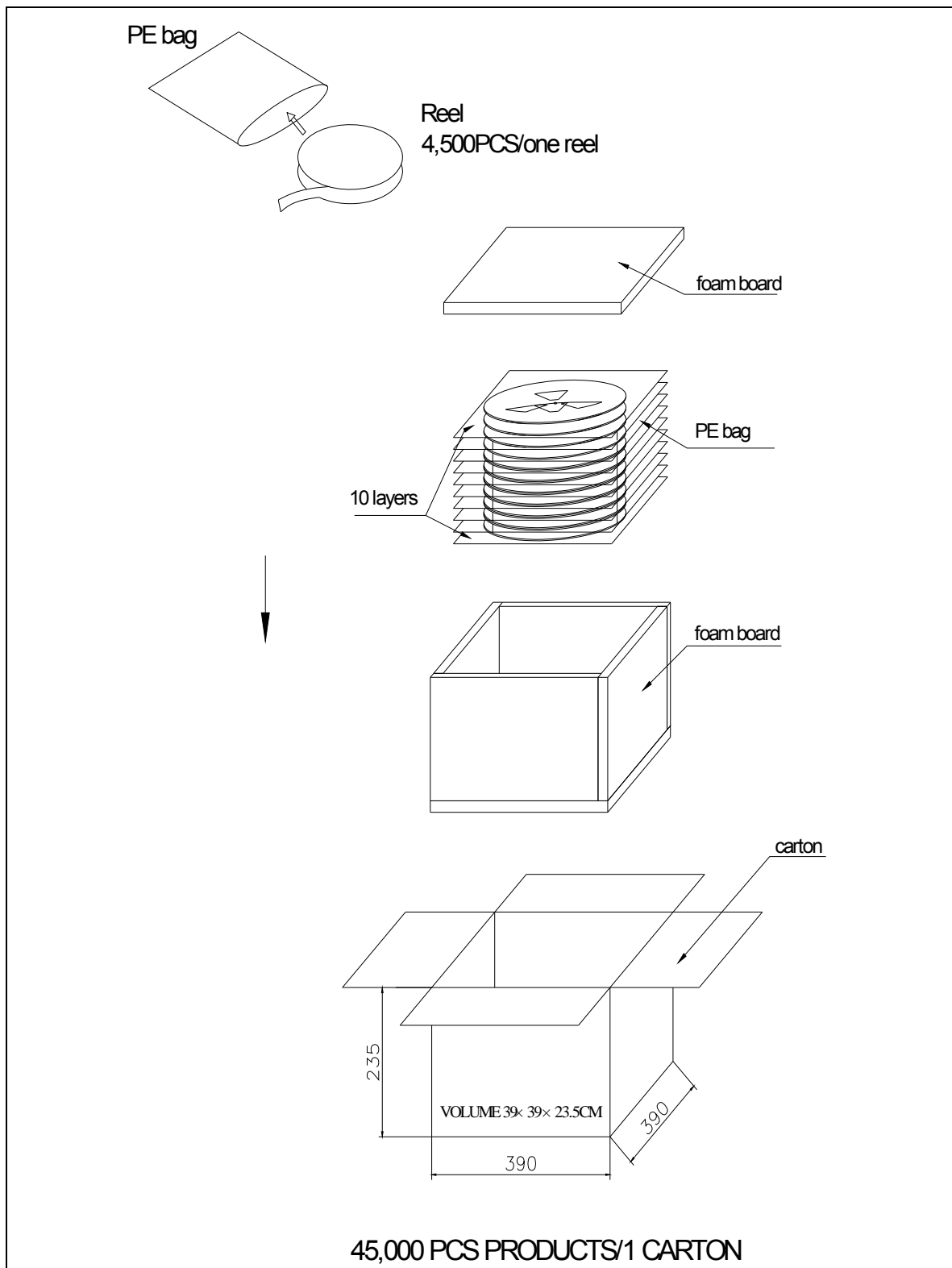
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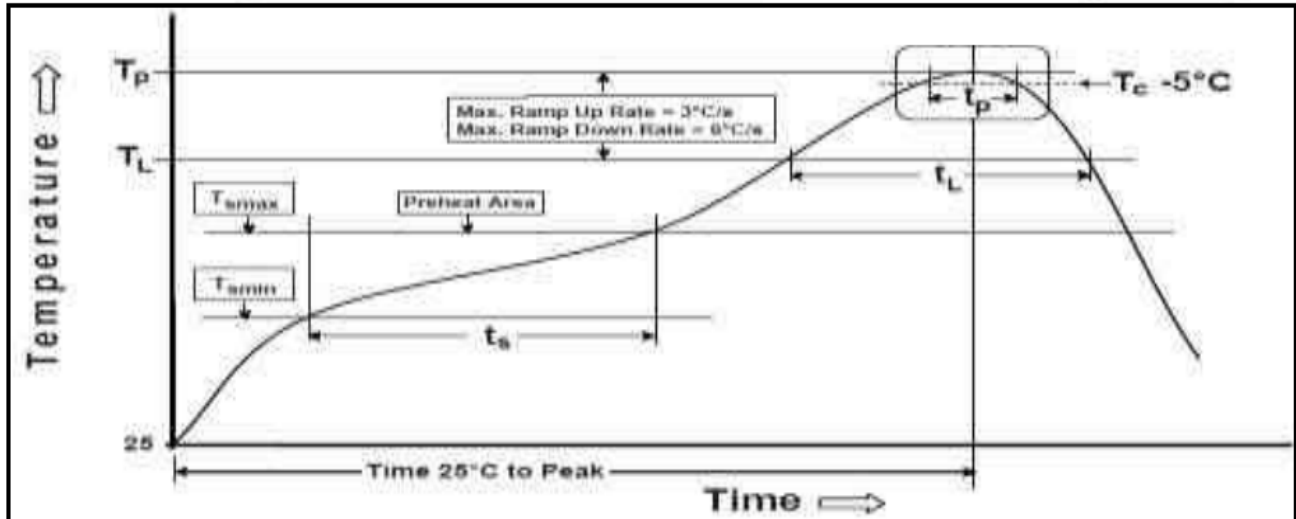
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## 7. Reflow Profile



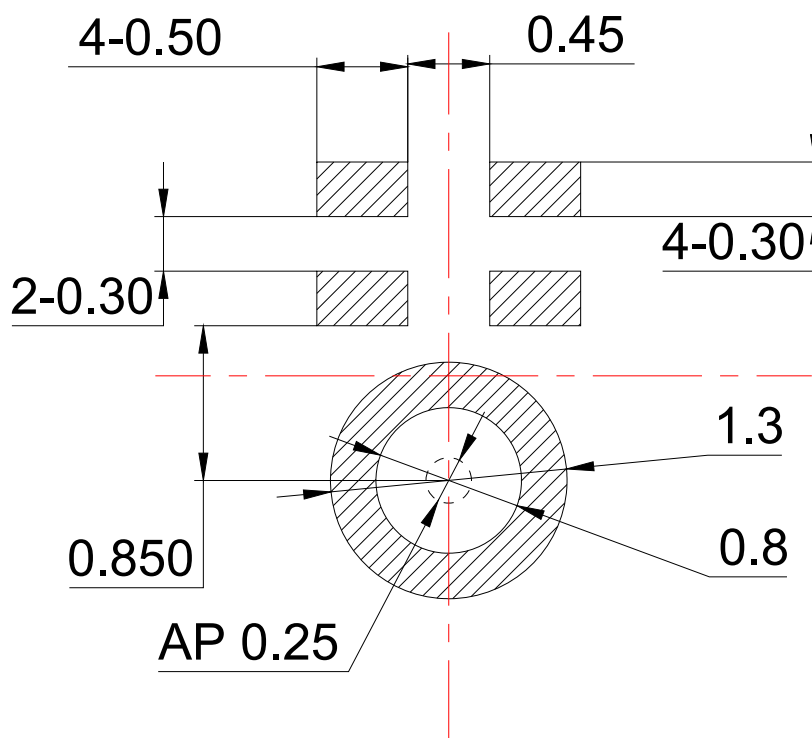
Average Ramp-up rat(T <sub>smax</sub> to T <sub>p</sub> )	3°C/second max.
Preheat:	
Temperature Min(T <sub>smin</sub> )	150°C
Temperature Max(T <sub>smax</sub> )	200°C
Time(T <sub>smin</sub> to T <sub>smax</sub> )(t <sub>s</sub> )	60~180s
Time maintained above:	
Temperature(T <sub>L</sub> )	217°C
Time(t <sub>L</sub> )	60~150s
Peak Temperature(T <sub>p</sub> )	260°C
Time within 5°C of actual Peak Temperature(t <sub>p</sub> ):	30-40s
Ramp-down rate(T <sub>p</sub> to T <sub>smax</sub> )	6°C / s max
Time 25°C to Peak Temperature	8min max
Reflow times	>3

### Notes:

1. Pulling vacuum over acoustical hole of the microphone is not allowed, because the device can be damaged by vacuum.
2. 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.
3. Recommended number of reflow is no more than 3 times.



### 8. Recommended Customer Land Pattern:



### 9. Specification History

ISSUE	PREP	CHKD	DETAIL SPEC CHANGES:	DATE
X1	Hong Tingting	Zhang Rui	Initial Version Release	Apr. 21 <sup>st</sup> . 2022
X2	Hong Tingting	Zhang Rui	Update Mechanical Dimensions	Jul. 05 <sup>th</sup> .2022