

# SPECIFICATION

## FOR APPRONAL

Customer : \_\_\_\_\_

Product Name : MEMS Microphone \_\_\_\_\_

Model Name : VSM3526DT-S26-G1F \_\_\_\_\_

Drawing No. : VS20250111011 \_\_\_\_\_

### Signature of Voise

Approved by	Checkde by	Issued by	Date

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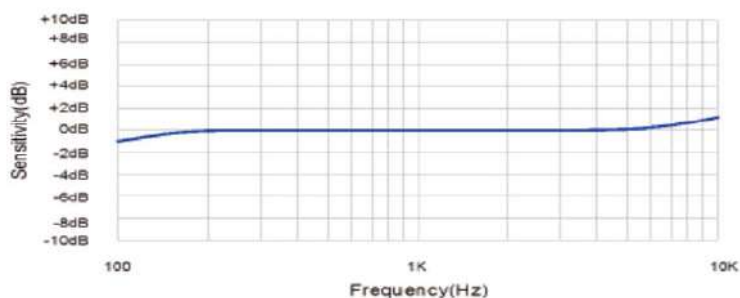
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## 1. Acoustic and Electrical Characteristics

Test conditions:  $T_a=23\pm 2^\circ\text{C}$ ,  $RH=55\pm 20\%$  R.H.,  $V_{DD}=1.8\text{V}$ , Clock Frequency = 2.048 MHz  
Duty Cycle=50%, SELECT pin grounded, no load, unless otherwise indicated.

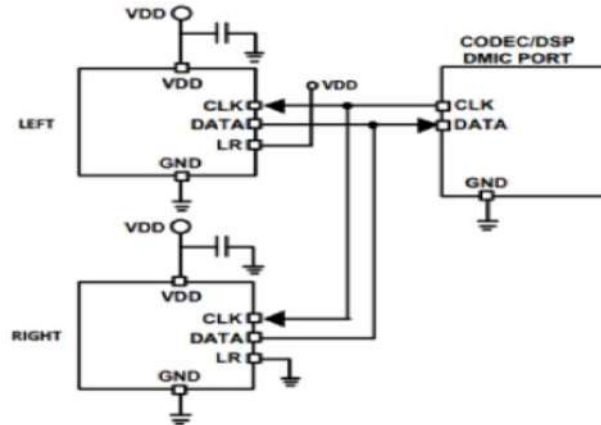
Parameter	Symbol	Conditions	Min.	Typ.	Max	Units
Directivity			Omnidirectional			
Data Format			1/2 Cycle 1 bit PDM			
Supply Voltage	$V_{DD}$		1.6		3.6	V
Clock Frequency	f CLOCK		1.024	2.048	3.072	MHz
Clock Duty Cycle			40	50	60	%
Clock Rise/Fall Time	T EDGE				10	ns
Supply Current	$I_{DD}$	Normal operation		650	850	$\mu\text{A}$
	$I_{\text{sleep}}$	Sleep mode, fCLOCK off			5	$\mu\text{A}$
Sensitivity	S	94 dB SPL @ 1 kHz	-27	-26	-25	dBFS
Signal to Noise Ratio	SNR	94 dB SPL @ 1 kHz, A-weighted		65		dB(A)
Output impedance	ZOUT	@1KH			100	$\Omega$
Total Harmonic Distortion	THD	100 dB SPL @ 1 kHz, S = Typ.		0.2	0.5	%
		115 dB SPL @ 1 kHz, S = Typ.		0.5	1	
Acoustic Overload Point	AOP	< 10% THD @ 1 kHz, S = Typ.		120		dB SPL
Power Supply Rejection	PSR	100mVpp square wave @ 217Hz, A-weighted		-85		dBFS
Logic Input High	$V_{IH}$		$0.75 \times V_{DD}$			V
Logic Input Low	$V_{IL}$				$0.25 \times V_{DD}$	V
Logic Output High	$V_{OH}$		$0.9 \times V_{DD}$			V
Logic Output Low	$V_{OL}$				$0.1 \times V_{DD}$	V
Output Load	$C_{LOAD}$				100	pF
Short Circuit Output Current		94dB SPL @1KHz	1		10	mA

## 2. Frequency Response Curve



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### 3. Standard R/L channel Circuit



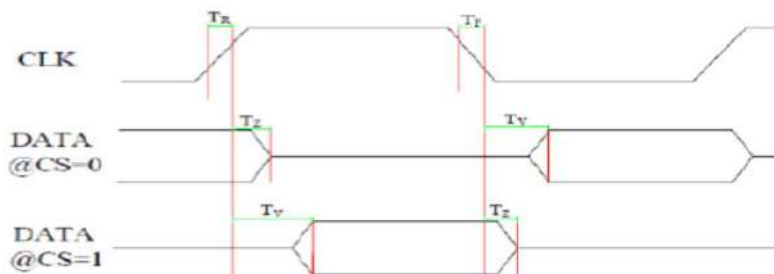
Microphone	SELECT	Asserts DATA On	Latch DATA On
Mic (High)	V <sub>DD</sub>	Rising Clock Edge	Falling Clock Edge
Mic (Low)	GND	Falling Clock Edge	Rising Clock Edge

Note:

1. All GND pins must be connected to ground.
2. Capacitors near the microphone should not contain Class 2 dielectrics.

### 4 Timing Diagram

Parameter	Symbol	Min	Typ.	Max	Unit	Comments
Clock Rising Time	T <sub>R</sub>			10	ns	RL=1MΩ, CL=12pF
Clock Falling Time	T <sub>F</sub>			10	ns	RL=1MΩ, CL=12pF
DATA into Hi Z Time	T <sub>Z</sub>	0		15	ns	RL=1MΩ, CL=12pF
DATA Valid Time	T <sub>V</sub>	18		40	ns	RL=1MΩ, CL=12pF
Clock Jitter				0.5	ns	Period jitter in RMS
Clock Duty Cycle		40	50	60	%	
Clock Frequency		1.024	2.048	3.072	MHZ	



Note:

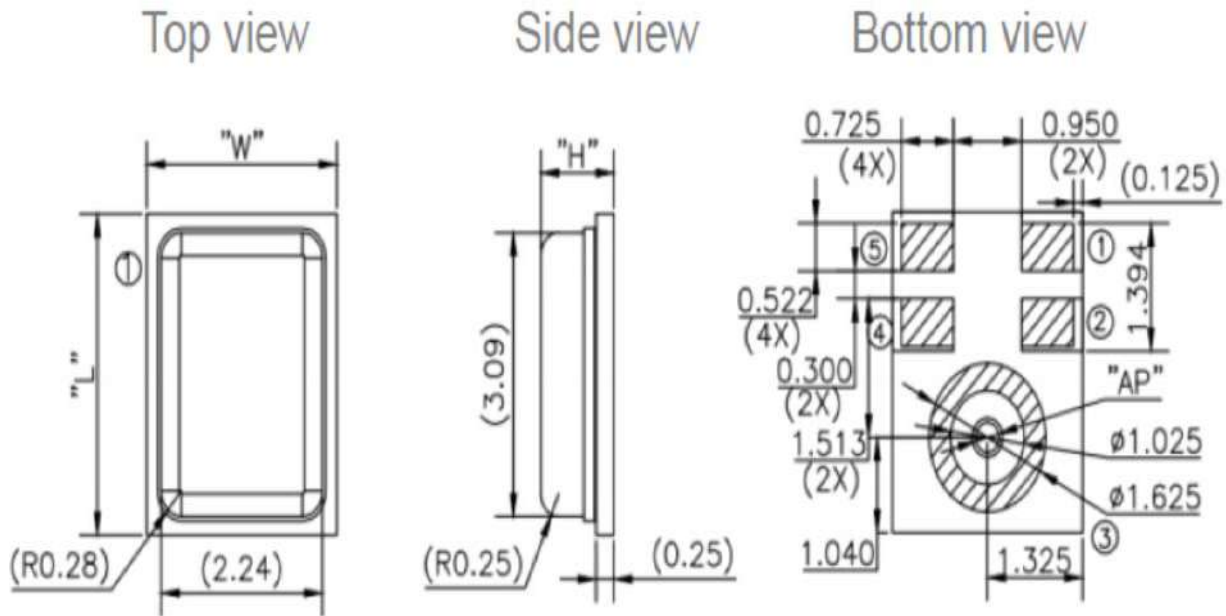
1. For one-microphone application, the DATA waveform will be @ CS (SELECT) = 0.
2. For two-microphone application, system needs to set CS (SELECT) = 0 & 1 for two microphones respectively.
3. Please refer to reference schematic in Section 7.

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## 5. Mechanical Specifications



Item	Nominal	Tolerance	Units
Length (L)	3.50	±0.10	mm
Width (W)	2.65	±0.10	mm
Height (H)	0.98	±0.10	mm
Acoustic Port Diameter (AP)	0.325	±0.05	mm

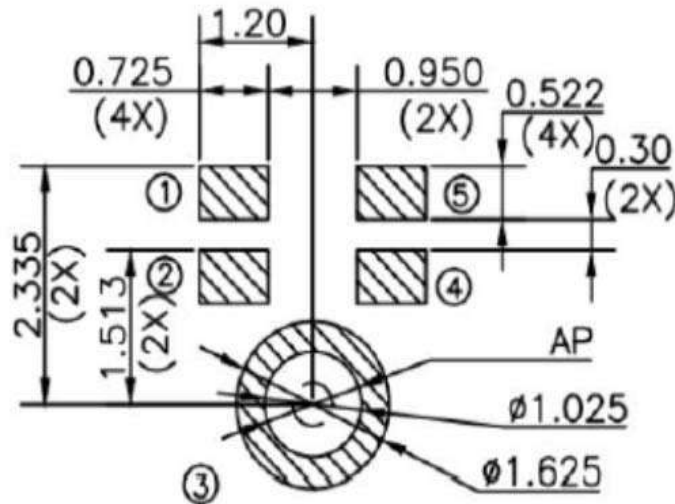
Pin #	Pin Name	Description
1	DATA	PDM Output
2	SELECT	Lo/Hi (L/R) Select This pin is internally pulled low but should not be left floating.
3	GND	Ground
4	CLOCK	Clock input
5	V <sub>DD</sub>	Power Supply

Notes:

1. Dimensions are in millimeters unless otherwise specified.
2. Tolerance is ±0.10mm unless otherwise specified.
3. Pick Area only extends to 0.25 mm of any edge or hole unless otherwise specified.
4. Suggestion to use the same date code microphone in one array microphone module.

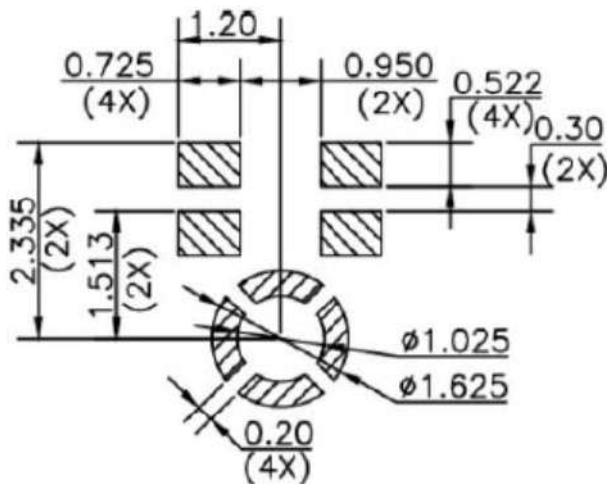
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## 6. Vacuum Nozzle pickup Location



Example of Land Pattern Drawing

## 7. Example solder stencil pattern



Example of Solder Stencil Pattern Drawing

### Notes:

1. Dimensions are in millimeters unless otherwise specified.
2. Further optimizations based on application should be performed.

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## 8. Reflow Guarantee

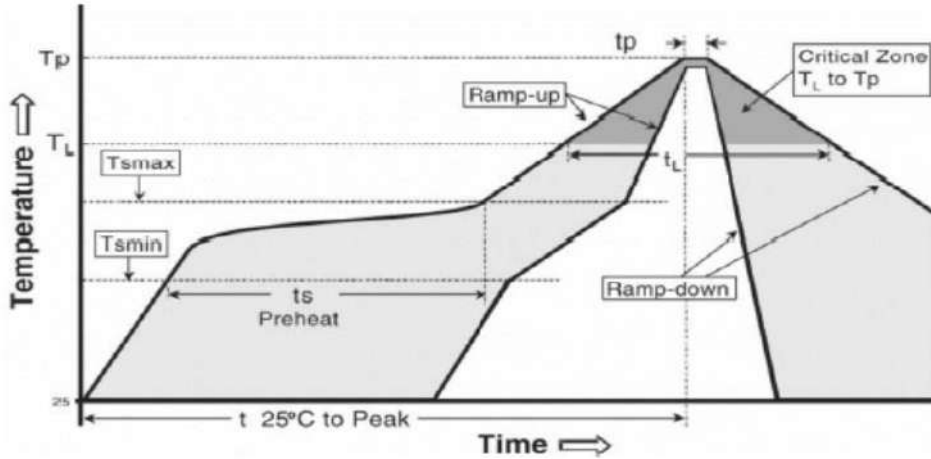


Figure Reflow Profile

Profile Feature	Pb-Free
Average ramp-up rate (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> )	60-180 seconds
Time maintained above	
- Temperature (T <sub>L</sub> )	217°C
- Time (T <sub>L</sub> )	60-150 seconds
Peak Temperature (T <sub>p</sub> )	260°C
Time within 5°C of actual Peak Temperature (t <sub>p</sub> )	20-40 seconds
Ramp-down Rate	6°C/second max.
Temperature 25°C to Peak Temperature	8 minutes max.

Table Reflow Profile

### Notes:

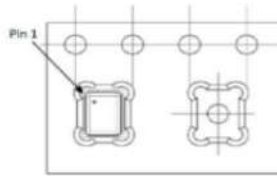
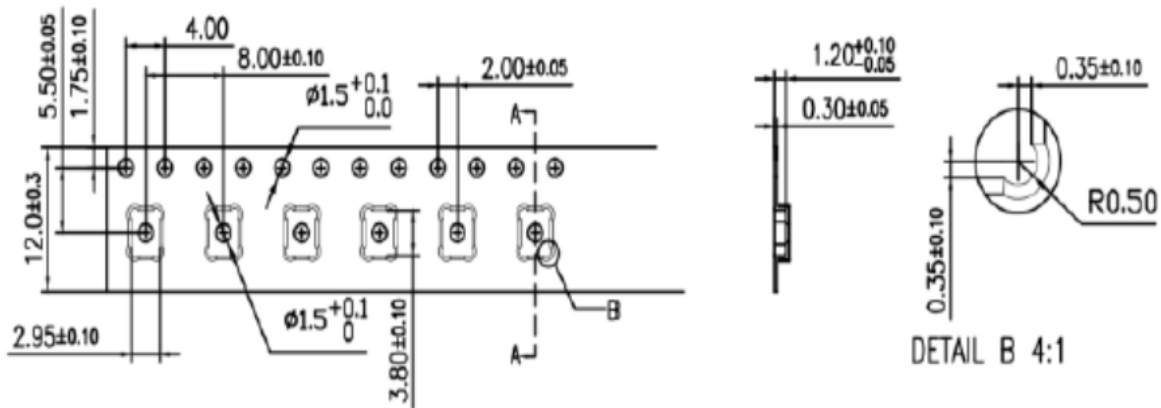
1. Do not board wash or clean after the reflow process.
2. Do not brush board with or without solvents after the reflow process.
3. Do not directly expose to ultrasonic processing, welding, or cleaning.
4. Do not insert any object in acoustic port hole of device at any time.
5. Do not apply air pressure into the acoustic port hole.
6. Do not pull a vacuum over acoustic port hole of the microphone.
7. Do not apply a vacuum when repacking into sealed bags at a rate faster than 0.5 atm/sec.
8. Recommended number of reflow is not more than 5 times.

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## 9. Packaging Specifications

### 9.1 Tape Specification

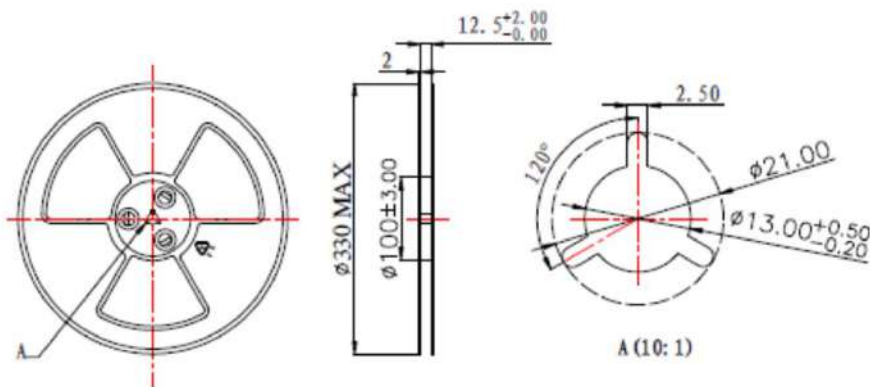


Pin1 :

Line	Character	Description
1	YXXX	Y=Year code, WW=Week code, XX=Date code
2	WWXX	

### 9.2 Reel Dimension

#### 13" reel dimensions (unit:mm)



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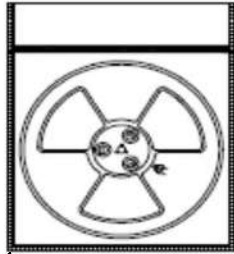
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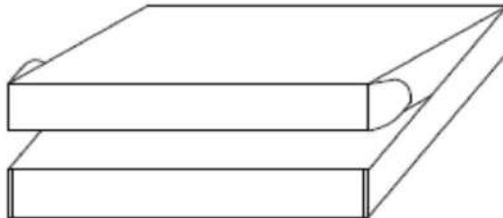
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9.3.The Content of Box(13" reel)



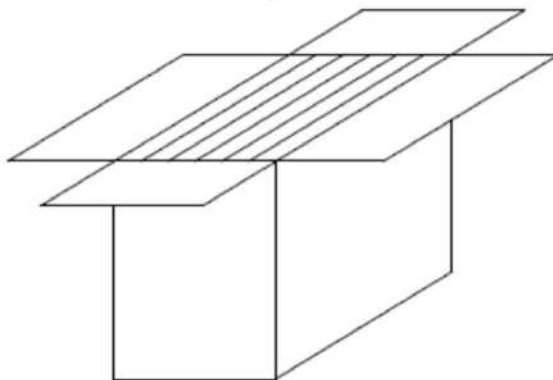
**Packing(5000pcs)**

2Sets



**Inner Box (10000pcs)**

6Sets



**Outer Box(60000pcs)**

Qty/ Reel	Qty/ One Inner Box	Qty/ Outer Box (Six Inner Box)
5000 pcs	10,000 pcs	60,000 pcs
Φ 330mm	355×340×45mm	365×290×370mm

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## 10. Storage and Transportation

1. Keep MEMS MIC in warehouse with less than 75% humidity and without sudden temperature change, acid air, any other harmful air or strong magnetic field.
2. Recommend storage period no more than 1 year and floor life(out of bag) atfactory no more than 4 weeks.
3. The MEMS MIC with normal pack can be transported by ordinary conveyances. Please protect products against moist, shock, sunburn and pressure during transportation.
4. Storage Temperature Range:  $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$  (Microphone units with package)
5. Operating Temperature Range:  $-40^{\circ}\text{C} \sim +105^{\circ}\text{C}$

## 11. Reliability Specifications

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

Test Item	Detail
Thermal Shock Test	100 cycles of air-air thermal shock from $-40^{\circ}\text{C}$ to $+105^{\circ}\text{C}$ with 15 minute soaks.
High Temperature Test	$+105^{\circ}\text{C}$ environment while under bias for 240 hours.
Low Temperature Test	$-40^{\circ}\text{C}$ environment while under bias for 240 hours.
Humidity Test	$+85^{\circ}\text{C}/85\%$ R.H. environment while under bias for 240 hours.
Vibration Test	16 minutes in each X, Y, Z axis from 20 to 2,000 Hz with peak acceleration of 20G
Drop Test	1.5-meter height onto a concrete surface each time at three directions in state of packaging.
Reflow Test	5 reflow cycles with peak temperature of $+260^{\circ}\text{C}$ .
ESD Test	Under $C=150\text{pF}$ , $R=330\text{ohm}$ . Tested to $\pm 8\text{KV}$ contact to the case and tested to $\pm 2\text{kV}$ contact to I/O terminals. 10 times. Grounding.