

## **3SM102EZT13C MEMS Microphone**

### **Product Description**

The 3SM102EZT13C brings excellent performance on the applications of **ANC headphone, TWS headset, Beam-forming device** and **Voice Recognition device** by the unique features of tiny package size, flat frequency response, uniform sensitivity and phase coherence.

### **Features**

- High performance single chip analog CMOS MEMS microphone
- High stability - no risk of membrane aging
- Suitable for automatic pick-and-place handler and SMT process
- Analog microphone with a footprint of only 4.32mm<sup>2</sup>
- Miniature dimension 2.40mm x 1.80mm x 1.10mm
- Low current consumption 140uA
- RoHS/Green Compliant
- Sensitivity deviation within  $\pm 1$ dB
- Package type : LGA 4-pin

### **Applications**

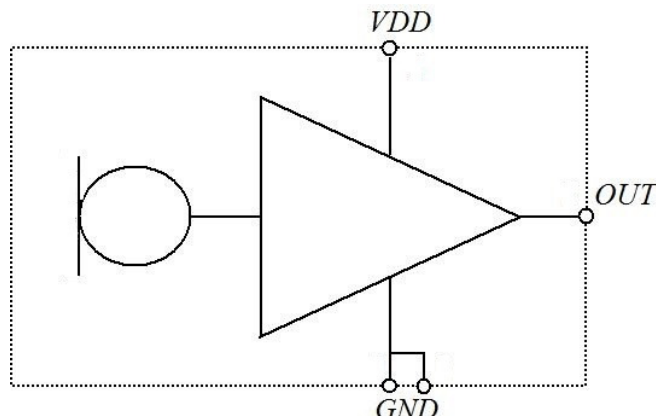
- ANC Headsets
- TWS Headsets
- Wearable Devices
- IoT Devices

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## Functional Block Diagram



## Acoustical and Electrical Characteristics

Table 1 Typical test conditions are  $T_A = 23\text{ }^\circ\text{C}$ ,  $V_{DD} = 2.1\text{ V}$  and  $R.H. = 50\%$  measured in a pressure chamber test setup. All voltages refer to GND node

Parameters	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
<b>Acoustic</b>						
Sensitivity	S	-39	-38	-37	dBV/Pa	1kHz, 94dB SPL
Signal to Noise Ratio	S/N		59		dB	A-weighted
Equivalent Noise Level	ENL		35		dB	A-weighted
Total Harmonic Distortion	THD		0.2		%	94dB SPL
Acoustic Overload Point	AOP		120		dB SPL	
<b>Electrical</b>						
Supply Voltage	V <sub>dd</sub>	1.2		3.6	V	
Current Consumption	I <sub>sb</sub>		140		$\mu\text{A}$	
Power Supply Rejection	PSR+N		-86		dB	217Hz, 100 mV peak to peak square wave superimposed on V <sub>cc</sub> 2.1V
Power Supply Rejection Ratio	PSRR		67		dB	217Hz, 200 mV peak to peak sine wave superimposed on V <sub>cc</sub> 2.1V
Output Impedance	Z <sub>out</sub>			200	$\Omega$	
Output DC Offset			0.93		V	

## Temperature Range

Table 2

Storage Temperature	T <sub>STG</sub>	-40°C ~ 100°C
Operating Temperature Range	T <sub>A</sub>	-40°C ~ 85°C

## Reliability Qualifications

Table 3

Test Item	Description
High Temperature Storage	Storage at 105°C for 1,000 hours IEC 60068-2-2 Test Ba
Low Temperature Storage	Storage at -40°C for 1,000 hours IEC 60068-2-1 Test Aa
High Temperature Operation Bias	Under Bias at 105°C for , 1,000 hours IEC 60068-2-2 Test Ba
Low Temperature Operation Bias	Under Bias at -40°C for , 1,000 hours IEC 60068-2-1 Test Aa
Temperature Humidity Bias	Under Bias at 85°C/85%RH for 1,000 hours JESD22-A101-B
Thermal Shock	Thermal Shock 100 cycles from -40°C~125°C, 100 cycles IEC 60068-2-14
Reflow	5 reflow cycles with peak 260°C J-STD-020D
Vibration	4 cycles lasting 12 minutes from 20 to 2,000Hz in X, Y and Z with peak acceleration of 20G MIL 883E, Method 2007.2, A
Shock	3 pulses 10,000G in X,Y and Z IEC 60068-2-27, Test Ea
ESD	HBM: 3KV, MM:300V, CDM:500V JESD22-A114(HBM); JESD22-A115(MM)

## Reflow Profile

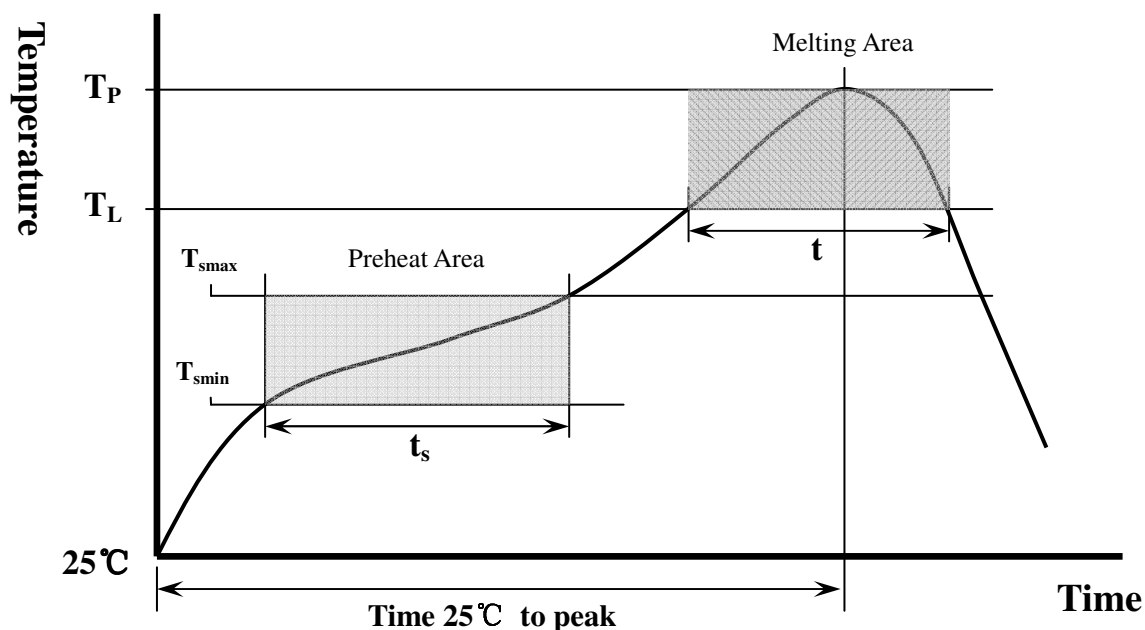


Table 4. Recommended Reflow Profile Limits

Profile Feature	Pb-free
Preheat	
Minimum temperature ( $T_{smin}$ )	150 °C
Maximum temperature ( $T_{smax}$ )	200 °C
Time ( $t_s$ )	60~180 sec
Average Ramp up rate ( $T_{smax}$ to $T_P$ )	3 °C/sec
Melting area	
Melting temperature ( $T_L$ )	217 °C
Time maintained above melting ( $t$ )	60~150 sec
Peak Temperature ( $T_P$ )	260 °C
Time within 5°C of actual peak temperature	20~40 sec
Ramp down rate	6 °C/sec maximum
Time 25°C to peak temperature	8 minute maximum

## Pin Definition and Function

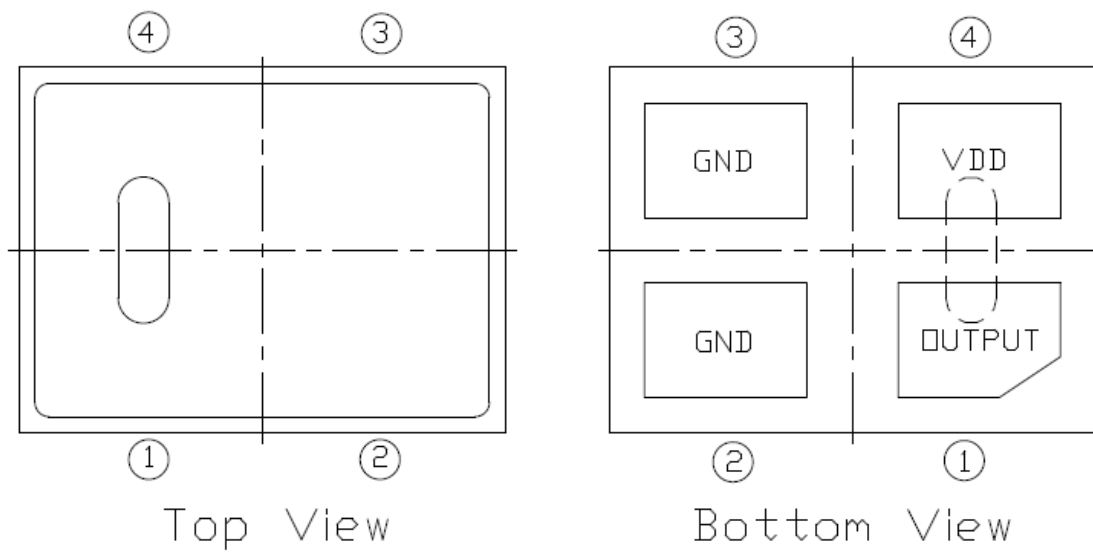
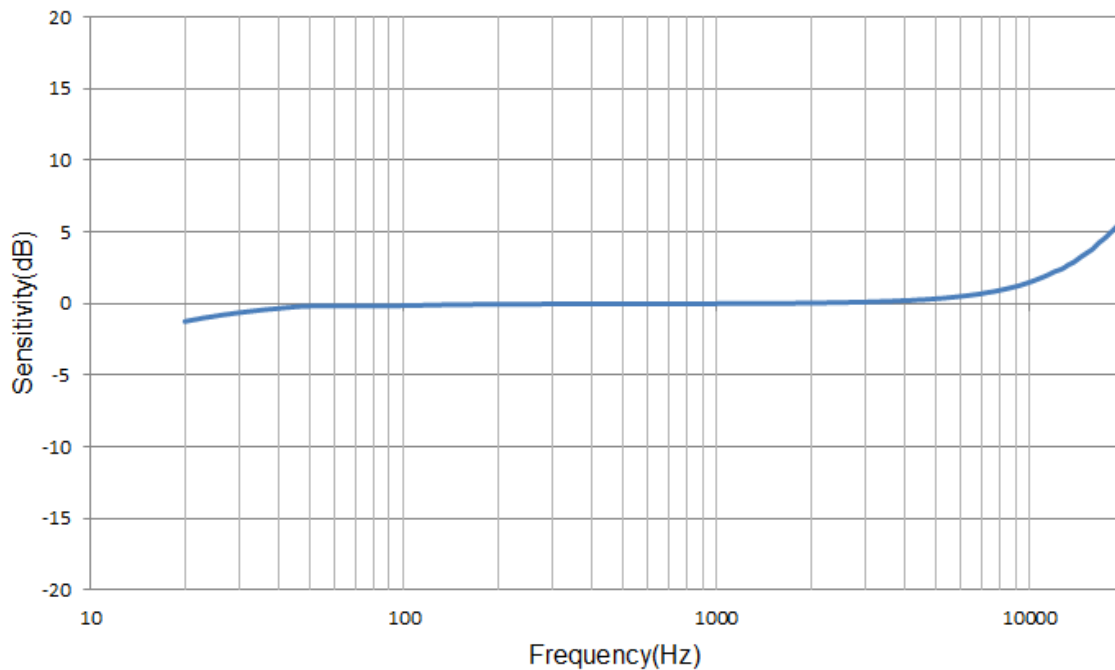


Table 5

Pin #	Symbol	Function
1	OUTPUT	Analog signal output
2	GND	Ground
3	GND	Ground
4	VDD	Power supply

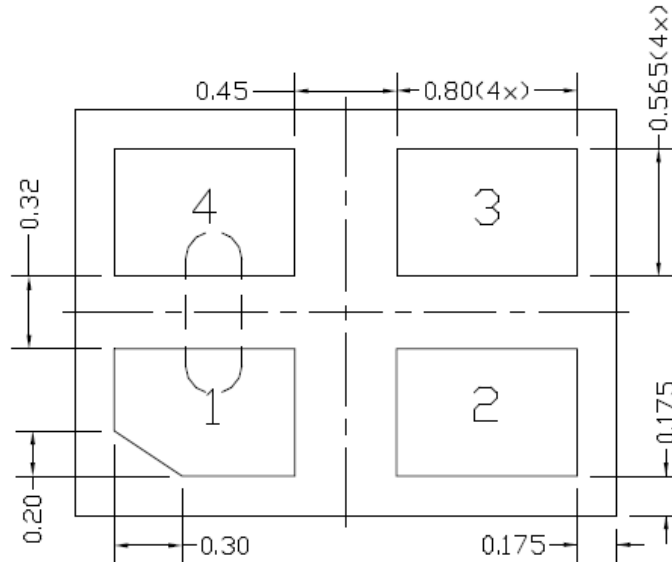
## Frequency Response



*Typical frequency response normalized to 1KHz (Measured)*

## PCB Land Pattern Layout

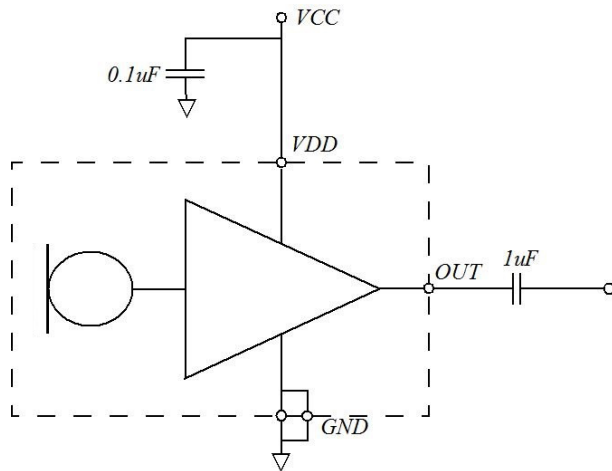
### Recommended Land Pattern





## Application Circuit

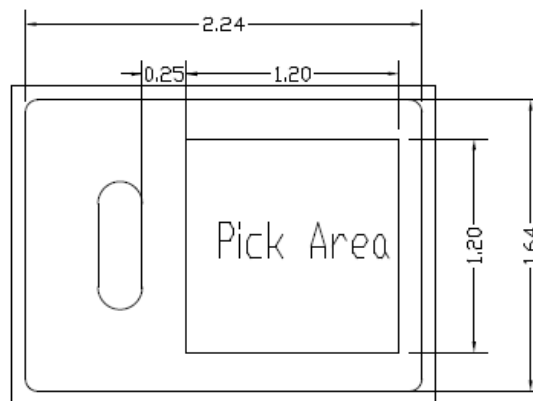
Typical Application:



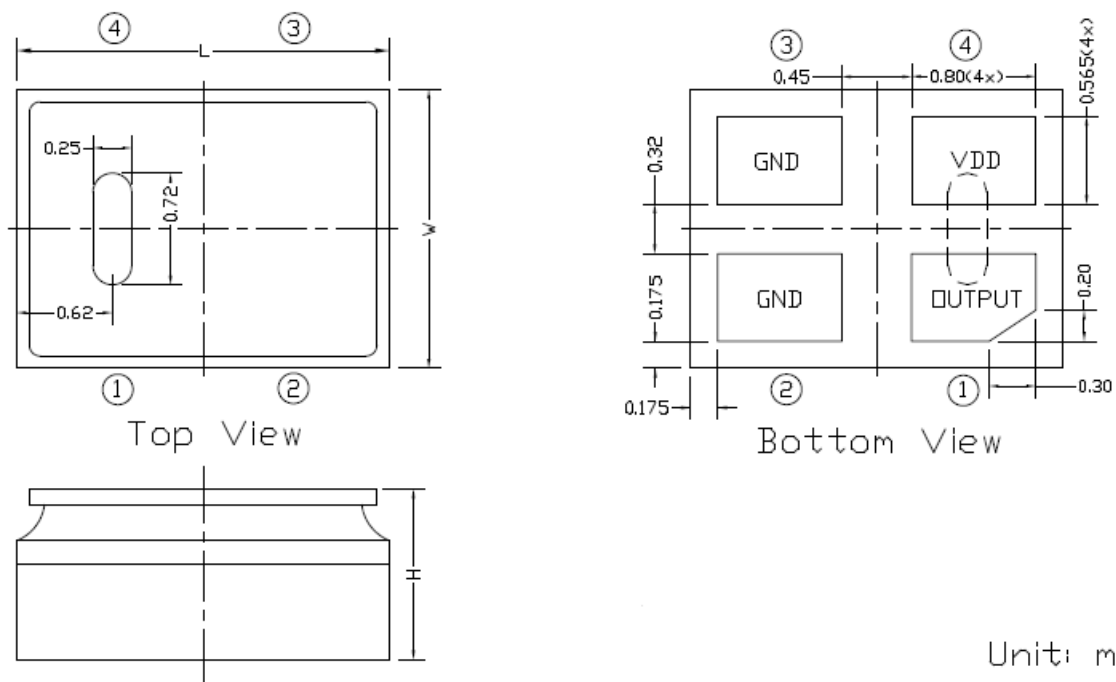
## Handling Instructions

The MEMS microphone can be handled using standard pick-and-place and chip-shooting equipment. Care should be taken to avoid damage to the MEMS microphone structure as follows:

- Do not apply vacuum nozzle over the acoustic port (AP) of the microphone to avoid damage to the device.
- Do not blow air directly into acoustic port. If air gun cleaning is required, the minimum distance is 10cm and the maximum air blow pressure is 30psi.
- Brushing the board with/without solvents may damage the device.
- Do not use excessive force to place the microphone on the PCB.
- In case of manual handling, it should be handled with plastic tweezers to avoid damage to the device.
- Do not open and remove MEMS Microphone from packaging until devices are ready to be mounted.
- Suggest PCB depaneling be done with depaneling cutter/router, or manually de-panel PCB with care and without any contact of MEMS Microphone.



## Dimensions



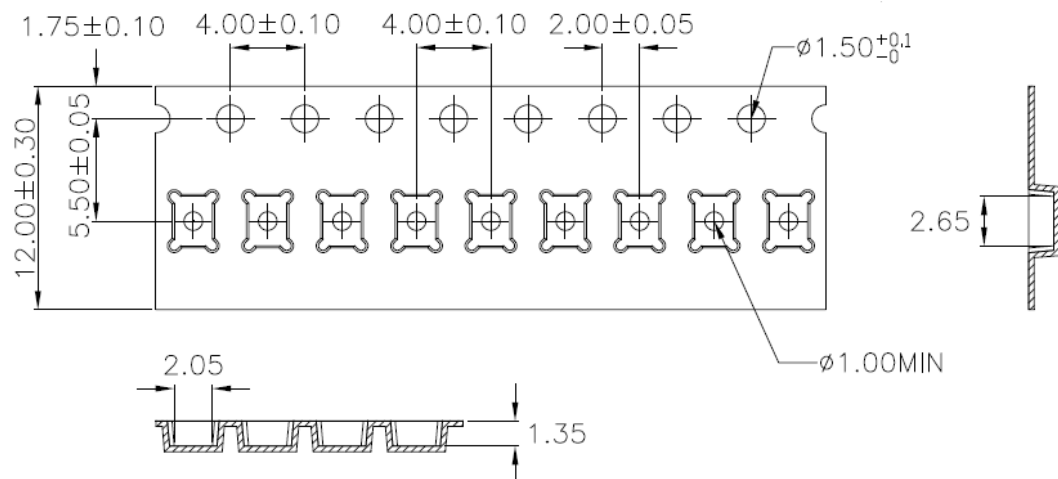
Unit: mm

Table 6(Top View)

Item	Dimension	Tolerance
Length (L)	2.40 mm	$\pm 0.10$ mm
Width (W)	1.80 mm	$\pm 0.10$ mm
Height (H)	1.10 mm	$\pm 0.10$ mm

## Package Information

### Carrier Tape:



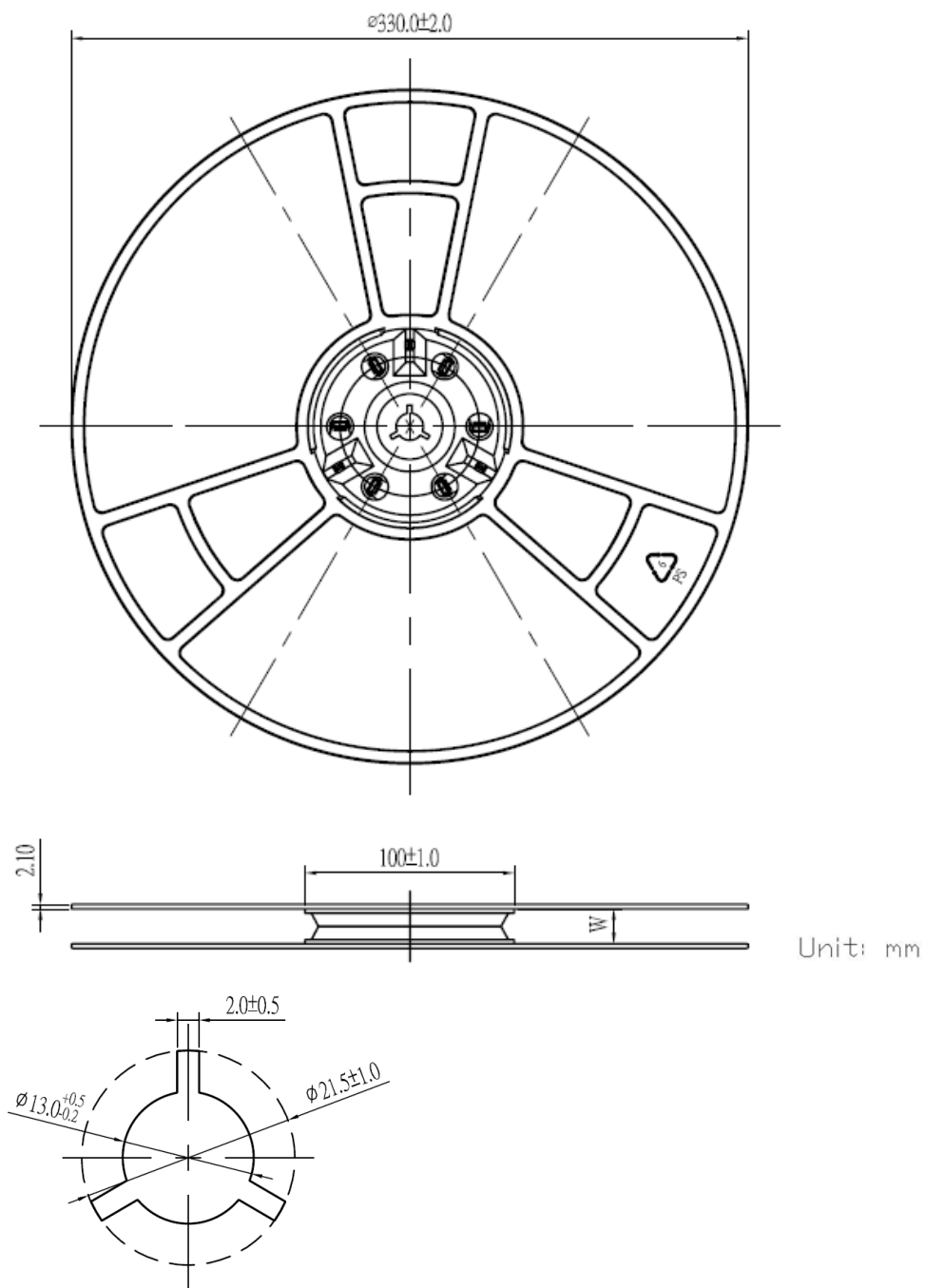
1. 10 sprocket hole pitch cumulative tolerance  $\neq 0.20$ .
2. Carrier camber is within 1 mm in 250 mm.
3. Material : Black Conductive Polystyrene Alloy.
4. All dimensions meet EIA-481-D requirements.
5. Thickness :  $0.30 \pm 0.05$ mm.

Unit: mm

### Note:

1. MSL(Moisture sensitivity level) Class1.

13" Tape Reel :



**Revision History**

<b>Revision</b>	<b>Date</b>	<b>Description</b>
1.0	2018/09/28	Formal release
1.1	2019/01/10	Modify "Frequency Response"
1.2	2019/01/14	Modify "Frequency Response"

单击下面可查看定价，库存，交付和生命周期等信息

[>>3S\(Solid state system\)\(鑫创科技\)](#)