

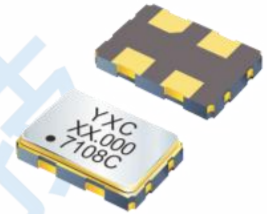
# Programmable Crystal Oscillator YSO690PR



## General Description (概述)

**YSO690PR is a programmable CMOS output quartz crystal oscillator.**

It supports programming within the frequency range of **1 MHz to 200 MHz** and can achieve precise output up to six decimal places. Various package options are available to meet different design requirements. We can service customer requirements with very fast lead times.



## Features (产品特性)

- Fast Delivery: Rapid Sample Service (typically within 2 seconds) and Quick Turn Bulk Delivery (24 to 48 hours)
- The PLL supports frequency operation across a wide range, from 1 MHz to 200 MHz
- 3.3 V, 2.5 V and 1.8 V VDD supply operation
- CMOS output
- $\pm 50$  ppm stability ( $-40^{\circ}\text{C}$  to  $85^{\circ}\text{C}$ )
- Available in 4pin metal Package: 2.0\*1.6mm, 2.5\*2.0mm, 3.2\*2.5mm, 5.0\*3.2mm, 7.0\*5.0mm
- Maximum Operating Temperature:  $-40^{\circ}\text{C}$  to  $125^{\circ}\text{C}$

## Applications (应用领域)

- Routers and switches
- Two-way radios (Walkie-talkies)
- EV charging stations
- Printers and multifunction devices
- Unmanned Aerial Vehicle Applications

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## LIST

General Description .....	1
Features .....	1
Applications .....	1
1 Specifications .....	3
Table 1 Electrical Characteristic .....	3
1.1 Phase Jitter .....	4
Table 2 Output RMS Jitter and Phase Noise .....	4
Figure 1 Representative Phase Noise Measurement@125M .....	4
Figure 2 Representative Phase Noise Measurement@156.25M .....	5
1.2 Frequency vs Temperature Test .....	5
Figure 3 Frequency vs Temperature(-40~85°C) .....	5
Figure 4 Frequency vs Temperature(-40~125°C) .....	5
2 Pin Description .....	6
Table 3 Pin Description .....	6
Figure 5 Pin Assignments .....	7
3 Dimensions and Recommended Land Pattern .....	6
4 Marking information .....	8
5 Inside Structure .....	8
Figure 6 Internal Structure .....	9
Table 4 Inside Structure .....	8
6 Test Circuit .....	8
7 Reflow profile .....	9
Figure 7 Reflow Profile .....	9
8 Taping Specification .....	9
9 Notice .....	10

# Programmable Crystal Oscillator YSO690PR



## 1 Specifications (规格参数)

Table 1 Electrical Characteristic

Item / Type	CMOS		
Frequency Range 额定频率范围	1MHz ~ 125MHz	1MHz ~ 200MHz	1MHz ~ 200MHz
Supply Voltage 电源电压 (Voltage Tolerance: $\pm 10\%$ )	1.8 V	2.5 V	3.3 V
Supply Voltage Variation 电压范围	1.62V~1.98V	2.25V~2.75V	2.97V~3.63V
Standby Current 待机电流	400uA		
Frequency Tolerance 频率偏差	$\pm 30\text{ppm}$ , $\pm 50\text{ppm}$ , $\pm 110\text{ppm}$ or specify		
Output Load 输出负载	15pF		
Operating Temperature Range 工作温度	-40~+85°C, -40~+125°C or specify		
Storage Temperature Range 储存温度	-55~+125°C		
Input Voltage 输入电压	VIH=70% VDD Min VIL=30%VDD Max		
Voltage VOH ( Min. ) / VOL ( Max. ) 输出电压	VOH = 90%VDD / VOL = 10%VDD		
Duty Cycle 占空比	45~55%		
Rise Time/Fall Time 上升沿/下降沿	5ns Max		
Start-up Time 启动时间	7ms Max		
Supply Current 消耗电流	35mA Max	1MHz~156.25MHz: 35mA Max	
		156.25MHz~200MHz: 40mA Max	
Frequency Aging (at 25°C) 老化率	$\pm 3$ ppm / year Max		
HBM/ESD 静电防护	2000V~3999V		

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## 1.1 Phase Jitter (相噪抖动)

Table 2 Output RMS Jitter and Phase Noise

Item/Type	Value	Remarks
Phase Jitter [12 kHz ~ 20 MHz]	1.5ps Typ	1MHz~200MHz
Phase Noise	-27 dBc/Hz@1Hz	@125MHz
	-52 dBc/Hz@10Hz	
	-81 dBc/Hz@100Hz	
	-109 dBc/Hz@1kHz	
	-120 dBc/Hz@10kHz	
	-120 dBc/Hz@100kHz	
	-143 dBc/Hz@1MHz	
	-147 dBc/Hz@10MHz	
	-28 dBc/Hz@1Hz	@156.25MHz
	-54 dBc/Hz@10Hz	
	-83 dBc/Hz@100Hz	
	-109 dBc/Hz@1kHz	
	-119 dBc/Hz@10kHz	
	-118 dBc/Hz@100kHz	
	-138 dBc/Hz@1MHz	
	-143 dBc/Hz@10MHz	

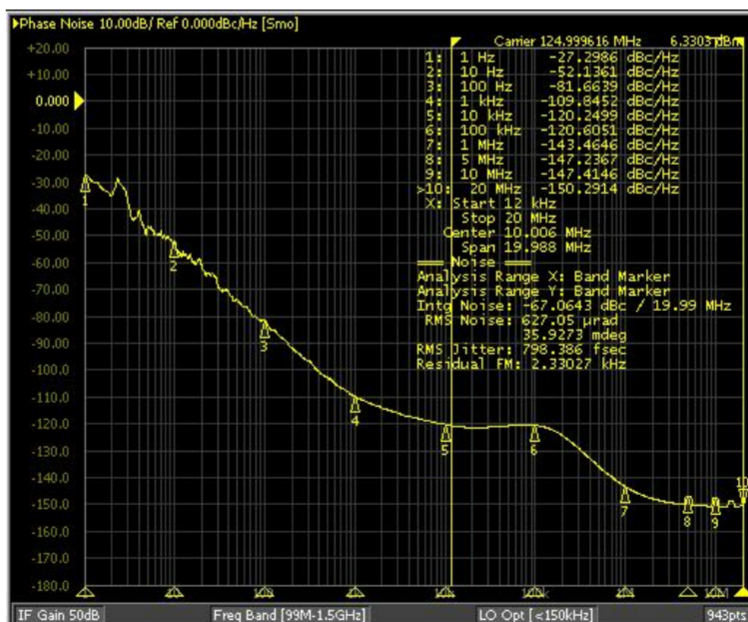


Figure 1 Representative Phase Noise Measurement@125M

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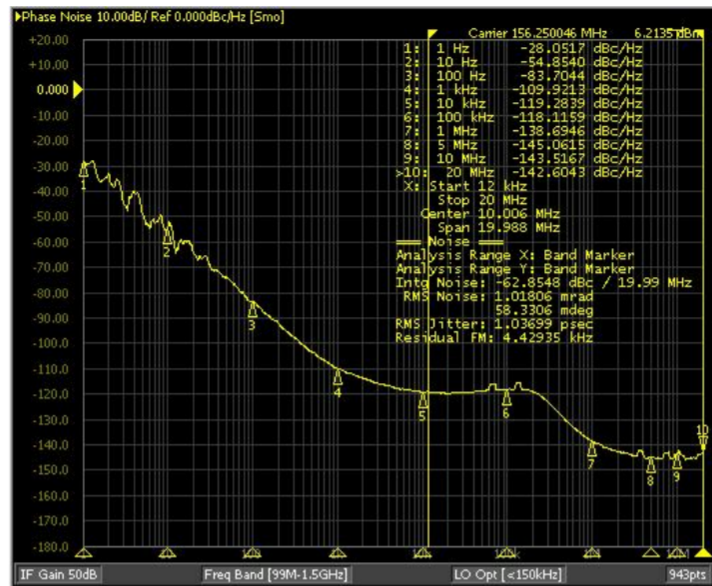


Figure 2 Representative Phase Noise Measurement @156.25M

## 1.2 Frequency vs Temperature Test (频率-温度特性测试)

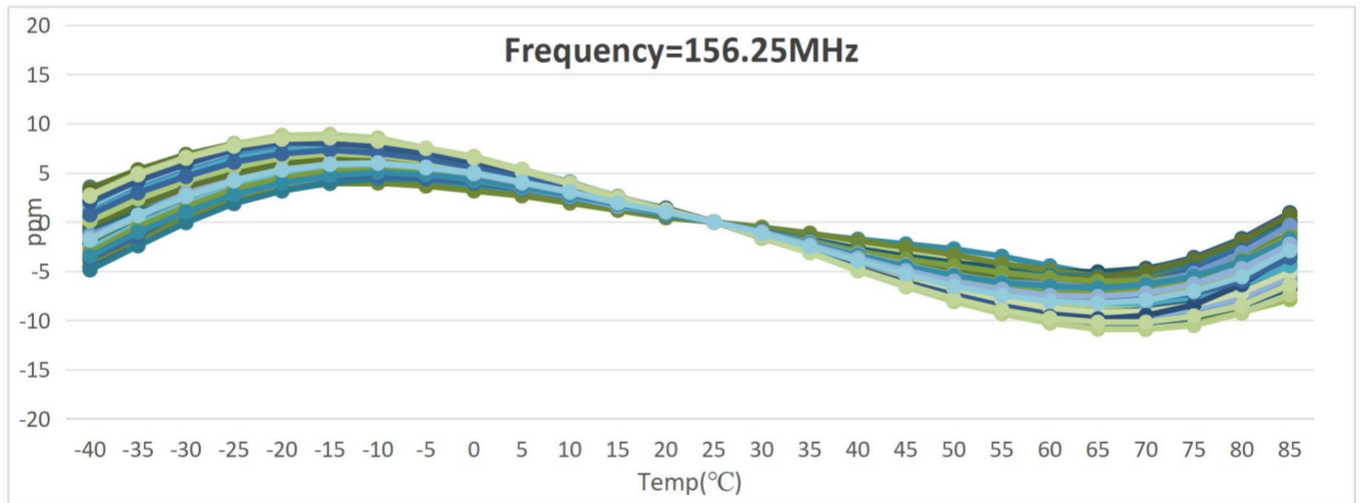


Figure 3 Frequency vs Temperature (-40~85°C)

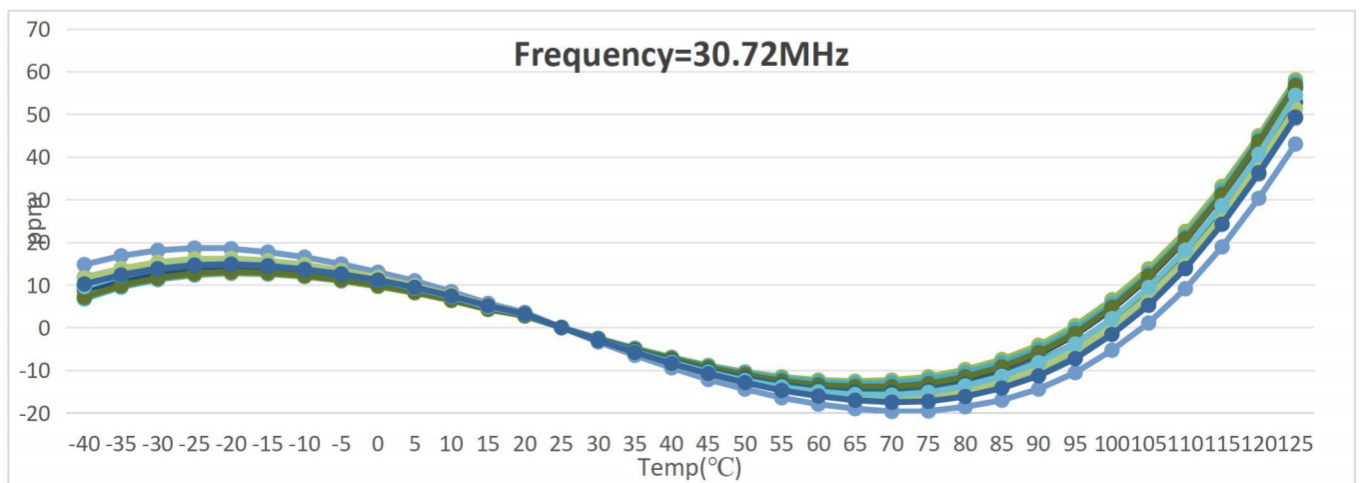


Figure 4 Frequency vs Temperature (-40~125°C)

# Programmable Crystal Oscillator YSO690PR



## 2 Pin Description (脚位说明)

Table 3 Pin Description

Pin No.	Pin Name	I/O Type	Description
1	OE/ST/NC	Output Enable	H: specified frequency output L: output is low. Specified frequency output stop.
		Standby	H: specified frequency output L: output is low. Device goes to sleep mode. Supply current reduces to 400uA(Standby Current).
		No Connect	Pin 1 = VDD or Pin 1 is Open : Specified frequency output. Pin 1 has no function
2	GND	Power	Electrical ground
3	OUT	Output	Oscillator output
4	VDD	Power	Power supply voltage

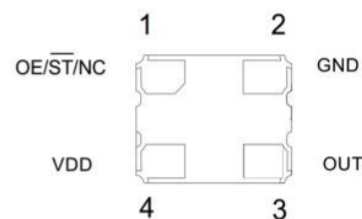


Figure 5 Pin Assignments

## 3 Dimensions and Recommended Land Pattern (外观尺寸及推荐焊盘)

Dimensions (Unit: mm)	Recommended Land Pattern (Unit: mm)
<p>2.0*1.6mm</p>	<p>Recommended soldering</p>
<p>2.5*2.0mm</p>	<p>Recommended soldering Pattern</p>

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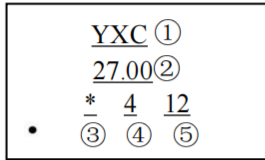


<p>3.2*2.5mm</p> <p>Top View</p> <p>Bottom View</p> <p>Side View</p>	<p>Recommended soldering Pattern</p>
<p>5.0*3.2mm</p> <p>Top View</p> <p>Bottom View</p> <p>Side View</p>	<p>Recommended soldering Pattern</p>
<p>7.0*5.0mm</p> <p>Top View</p> <p>Bottom View</p> <p>Side View</p>	<p>Recommended soldering Pattern</p>

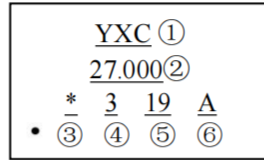
# Programmable Crystal Oscillator YSO690PR



## 4 Marking information (丝印说明)



Or



①	YangXing LOGO
②	Frequency
③	Line
④	Year
⑤	Production Cycle
⑥	Voltage+Operating Temperature

## 5 Inside Structure (内部结构)

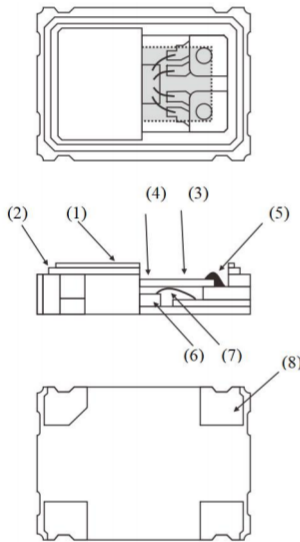
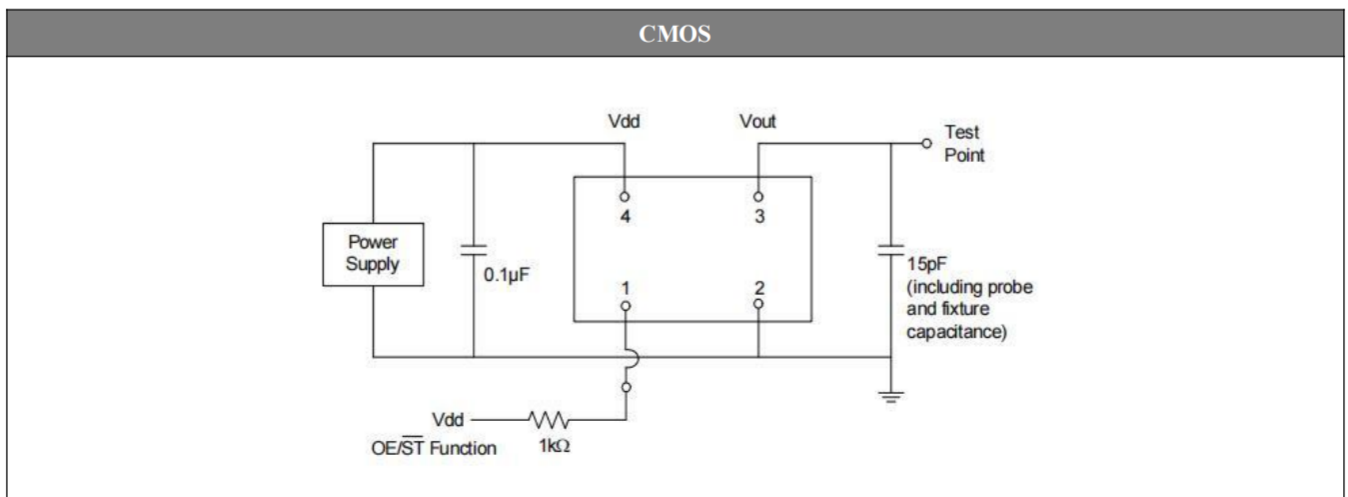


Figure 6 Internal Structure

Table 4 Inside Structure

No.	Name	Material
(1)	Can	Fe-Co-Ni
(2)	Base	Ceramic
(3)	Blank	Quartz
(4)	Electrode	Ag
(5)	Epoxy	Slilcon+Ag
(6)	IC	Slilcon
(7)	Wire	Au
(8)	Soldering Pads	Au plated

## 6 Test Circuit (测试电路)



# Programmable Crystal Oscillator YSO690PR



## 7 Reflow profile (回流焊)

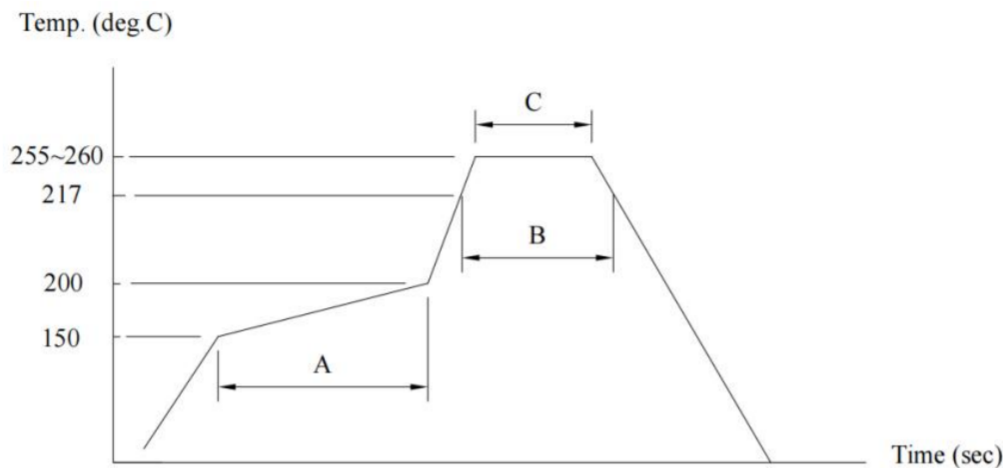
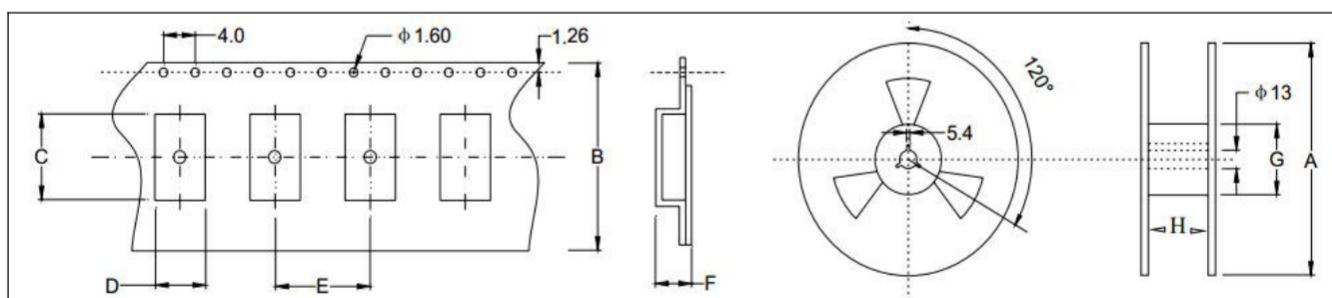


Figure 7 Reflow Profile

- (A)→Preheating area : 150~200°C, 60~120sec.
- (B)→Heating area : 217°C, 60~150sec.
- (C)→Peak temperature : 255~260°C, 30sec. Max.
- Ramp-up rate (217→260°C) : 3°C/sec. Max.
- Ramp-down rate (260→217°C) : 6°C/sec. Max.
- Time 25°C→260°C : 480sec. Max.
- Moisture Sensitivity Level : Level 1

## 8 Taping Specification (载带规格) (Unit: mm)



Size	A	B	C	D	E	F	G	H	Pcs/reel
SMD-2016	180±2.0	8.0±0.3	2.30±0.1	1.9±0.1	4.0±0.1	1.1±0.1	61.0±1.0	9.5±0.5	3000
SMD-2520	180±2.0	8.0±0.3	2.90±0.1	2.40±0.1	4.0±0.1	1.20±0.1	61.0±1.0	9.5±0.5	3000
SMD-3225	180±2.0	8.0±0.3	3.40±0.1	2.70±0.1	4.0±0.1	1.40±0.1	61.0±1.0	9.5±0.5	3000
SMD-5032	180±2.0	12.0±0.3	5.40±0.1	3.60±0.1	8.0±0.1	1.40±0.1	61.0±1.0	13.0±0.5	1000
SMD-7050	180±2.0	16.0±0.3	7.50±0.1	5.50±0.1	8.0±0.1	1.80±0.1	61.0±1.0	17.0±0.5	1000

