

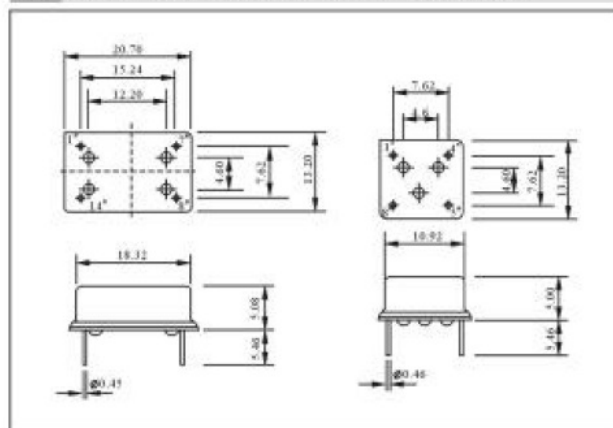
CLOCK OSCILLATOR

钟控振荡器

14PIN / 8PIN 全尺寸/半尺寸



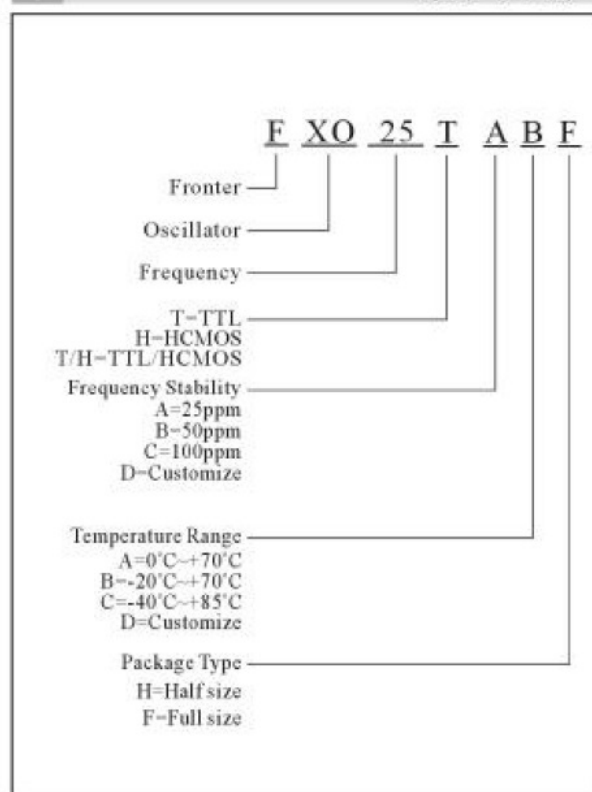
DIMENSIONS (Unit:mm) 外形尺寸



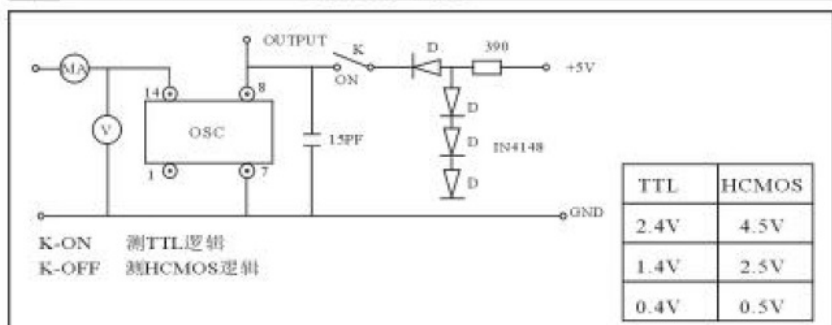
PARAMETERS 技术参数

Output 输出逻辑	TTL	HCMOS	TTL/HCMOS
Frequency Range 频率范围	32KHz~155MHz	32KHz~80MHz	32KHz~155MHz
Frequency Reliability 频率稳定度	±25ppm, ±50ppm, ±100ppm (Std.)		
Storage Temperature Range 储存温度范围	0°C~+70°C		
Operating Temperature Range 工作温度范围	-40°C~+85°C		
Input Voltage 输入电压	5.0 ± 0.5 V, 3.3 ± 0.3V		
Max Input Current 最大输入电流	30mA (0.5~23.99MHz) 40mA (24~49.99MHz) 60mA (50~140MHz)	20mA (0.5~23.99MHz) 40mA (24~80MHz)	20mA (0.5~23.99MHz) 40mA (24~80MHz)
Rate 占空比	60/40% or 40/60%(1.4V)	60/40% or 40/60%(1.2V _{in})	60/40% or 40/60%(1.2V _{in})
Time Rise & Fall 上升时间和下降时间	15nS (0.5~8.99MHz) 10nS (9~31.99MHz)	10nS (0.5~23.99MHz) 6nS (24~80MHz)	10nS (0.5~23.99MHz) 6nS (24~80MHz)
Lower Potentiometer 低电平	0.4V (0.5~31.99MHz) 0.5V (32~140MHz)max	0.5V(10%V _{DD})max	0.5V(10%V _{DD})max
Higher Potentiometer 高电平	2.4V	4.5V(90%V _{DD})min	4.5V(90%V _{DD})min
Output Resistance 输出负载	1~10TTL	CL=15pF	CL=15pF or 1~10LSTTL

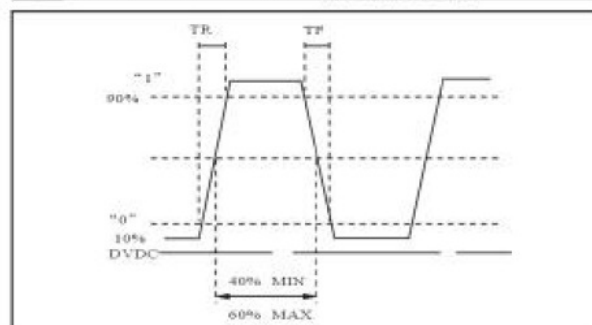
PART NUMBER GUIDE 部件号示例



TEST CIRCUIT 测试原理图



OUTPUT WAVE 输出波形图



SMD QUARTZ CRYSTAL OSCILLATOR

石英晶体振荡器



4 Pad Version 2.5x2.0 mm

- ±20 ppm type available
- Excellent Reliability Performance
- EMI shielding possible by grounded lid
- Reflow soldering temperature: 260°C max
- Ceramic Seam Weld package



RoHS compliant

★ PARAMETERS 技术参数

PARAMETERS	参数	SPECIFICATION 规格
Frequency Range	频率范围	2~50MHz
Supply voltage	工作电压	1.8V、2.5V、2.8V、3.3V
Input Current	输入电流	See Below
Frequency Stability Overall	频率稳定性	±20ppm~±50ppm
Operating Temp. Range	工作温度范围	-10~+60°C to -40~+85°C
Storage Temp. Range	储存温度范围	-55~+125°C
Output Load	输出负载	HCMOS/TTL (15pF~30pF/10TTL)
Symmetry	占空比	45% ~ 55% typ. (40% ~ 60% max.) at 0.5×Vdc
Start-up time	起振时间	10mS max
Enable/ Disable Function	三态控制	O/E or E/D

◎ All specification subject change without notice. 规格变化, 恕不另行通知。

★ FREQUENCY STABILITY VS. TEMPERATURE 频率温度特性

Operation Temperature Range	Frequency Stability			
	±20ppm	±25ppm	±30ppm	±50ppm
-10°C~+60°C	○	●	○	○
-20°C~+70°C		○	●	○
-40°C~+85°C				●

● standard ○ available

★ Rise & Fall TIME MAX. 上升/下降时间

Frequency	Rise & Fall Time	V _{DC}	Rise & Fall Time	V _{DC}
2.0-9.9 MHz	5nS max	3.3V	6nS max	1.8V
10.0-19.9 MHz	5nS max		5nS max	
20.0-31.9 MHz	5nS max		4nS max	
32.0-50MHz	5nS max		4nS max	

★ DIMENSIONS & LAND PATTERN LAYOUT (Unit: mm) 外形尺寸

Pin	Connection
1	Tri-state or no connect
2	GND
3	Output
4	V _{DC}

Recommended land Pattern

★ PART NUMBER GUIDE 部件号示例 e.g. FXO12.000AA3.3SM3 (*SM3=3.2×2.5 SMD TYPE)

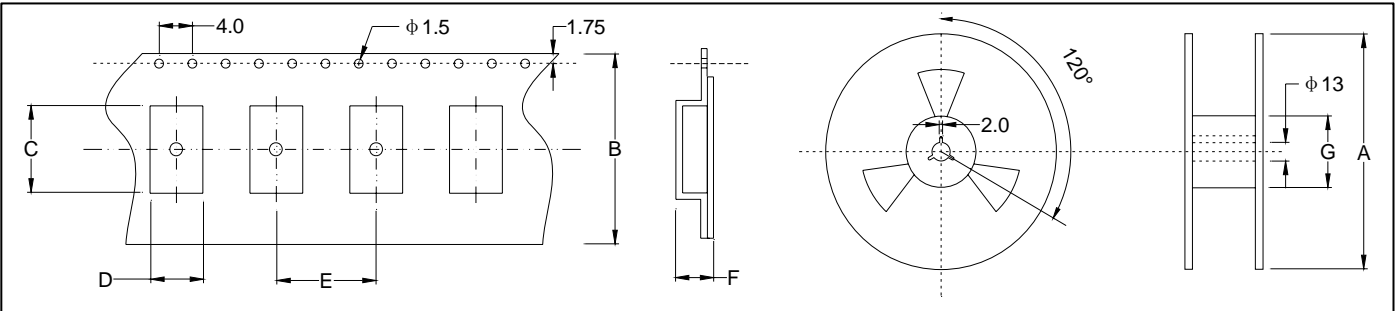
	Quartz Crystal Oscillator 石英晶体振荡器	Frequency 频率	Frequency Stability 频率稳定度	Operating Temp. 工作温度	Supply voltage 工作电压	Package 盒型
F	XO	12.000	A	A	3.3	SM2

Definition	Description	Definition	Description
Frequency Stability 频率稳定度	A: $\pm 25\text{ppm}$	Operating Temp. 工作温度	A: $0\sim+70^{\circ}\text{C}$
	B: $\pm 50\text{ppm}$		B: $-20\sim+70^{\circ}\text{C}$
	C: $\pm 100\text{ppm}$		C: $-40\sim+85^{\circ}\text{C}$
	D: Customer specified		D: Customer specified

★ INPUT CURRENT 工作电流

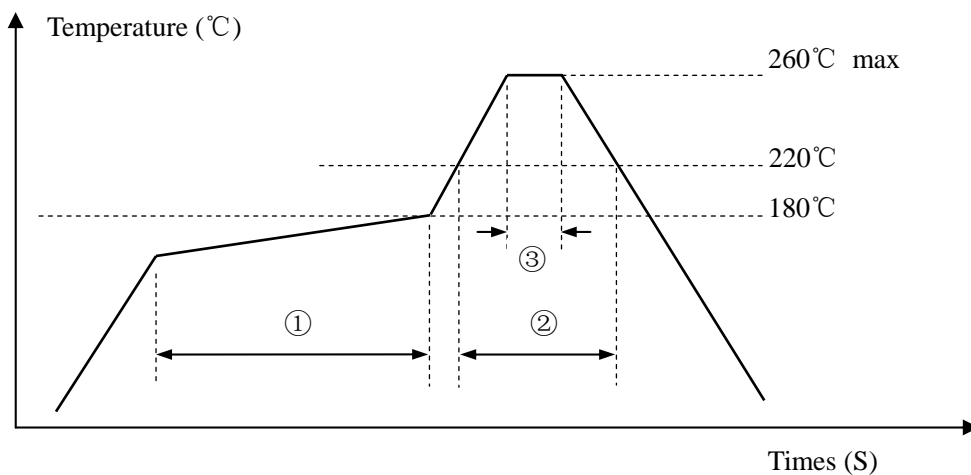
Vdc=3.3V		Vdc=2.5V		Vdc=1.8V	
2.0 ~ 9.9 MHz	7 mA	2.0 ~ 9.9 MHz	6 mA	2.0 ~ 9.9 MHz	3 mA
10.0 ~ 19.9 MHz	7 mA	10.0 ~ 19.9 MHz	8 mA	10.0 ~ 19.9 MHz	5 mA
20.0 ~ 31.9 MHz	12 mA	20.0 ~ 31.9 MHz	8 mA	20.0 ~ 31.9 MHz	5 mA
32.0 ~ 50.0 MHz	20 mA	32.0 ~ 50.0 MHz	20 mA	32.0 ~ 50.0 MHz	10 mA

★ TAPING SPECIFICATION (Unit: mm) 编带规格



	A	B	C	D	E	F	G
OSC-SMD2520	178 ± 2.0	8.0 ± 0.2	2.80 ± 0.10	2.30 ± 0.10	4.0 ± 0.1	1.15 ± 0.1	60.5 ± 1.0
3000 pcs per reel							

★ REFLOW SOLDERING PROFILE 回流焊特性



Pb free reflow A	①	Preheat	160~180°C	120sec. max
	②	Primary heat	220°C	60sec. max
	③	Peak	260°C	10sec. max.

SMD QUARTZ CRYSTAL OSCILLATOR

石英晶体振荡器



4 Pad Version 3.2x2.5 mm

- ±20 ppm type available
- Excellent Reliability Performance
- EMI shielding possible by grounded lid
- Reflow soldering temperature: 260°C max
- Ceramic Seam Weld package



RoHS compliant

★ PARAMETERS 技术参数

PARAMETERS	参数	SPECIFICATION 规格
Frequency Range	频率范围	2.0~80MHz, 32.768KHz
Supply voltage	工作电压	1.8V、2.5V、2.8V、3.3V、5.0V
Input Current	输入电流	See Below
Frequency Stability Overall	频率稳定性	±20ppm~±50ppm
Operating Temp. Range	工作温度范围	-10~+60°C to -40~+85°C
Storage Temp. Range	储存温度范围	-55~+125°C
Output Load	输出负载	HCMOS/TTL (15pF~30pF/10TTL)
Symmetry	占空比	45% ~ 55% typ. (40% ~ 60% max.) at 0.5×Vdc
Start-up time	起振时间	10mS max
Enable/ Disable Function	三态控制	O/E or E/D

◎ All specification subject change without notice. 规格变化, 恕不另行通知。

★ FREQUENCY STABILITY VS. TEMPERATURE 频率温度特性

Operation Temperature Range	Frequency Stability			
	±20ppm	±25ppm	±30ppm	±50ppm
-10°C~+60°C	○	●	○	○
-20°C~+70°C	○	○	●	○
-40°C~+85°C				●

● standard ○ available

★ Rise & Fall TIME MAX. 上升/下降时间

Frequency	Rise & Fall Time	Note
1.0~9.9 MHz	6nS max	rise time: 0.1 Vdc ~ 0.9 Vdc fall time: 0.9 Vdc ~ 0.1 Vdc
10.0~39.9 MHz	5nS max	
40.0~80.9 MHz	4nS max	

★ DIMENSIONS & LAND PATTERN LAYOUT (Unit: mm) 外形尺寸

Pin	Connection
1	Tri-state or no connect
2	GND
3	Output
4	V _{dc}

Recommended land Pattern

★ PART NUMBER GUIDE 部件号示例 e.g. FXO12.000AA3.3SM3 (*SM3=3.2×2.5 SMD TYPE)

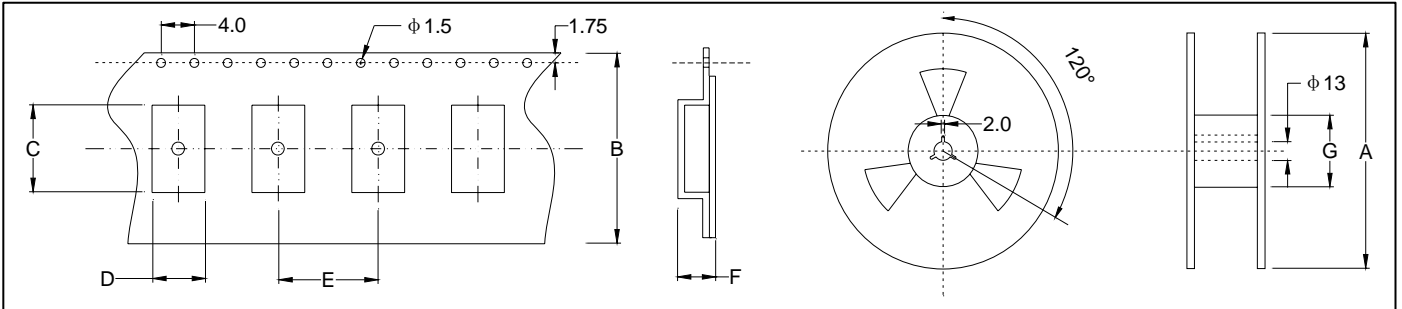
	Quartz Crystal Oscillator 石英晶体振荡器	Frequency 频率	Frequency Stability 频率稳定度	Operating Temp. 工作温度	Supply voltage 工作电压	Package 盒型
F	XO	12.000	A	A	3.3	SM3

Definition	Description	Definition	Description
Frequency Stability 频率稳定度	A: $\pm 25\text{ppm}$	Operating Temp. 工作温度	A: $0\sim+70^{\circ}\text{C}$
	B: $\pm 50\text{ppm}$		B: $-20\sim+70^{\circ}\text{C}$
	C: $\pm 100\text{ppm}$		C: $-40\sim+85^{\circ}\text{C}$
	D: Customer specified		D: Customer specified

★ INPUT CURRENT 工作电流

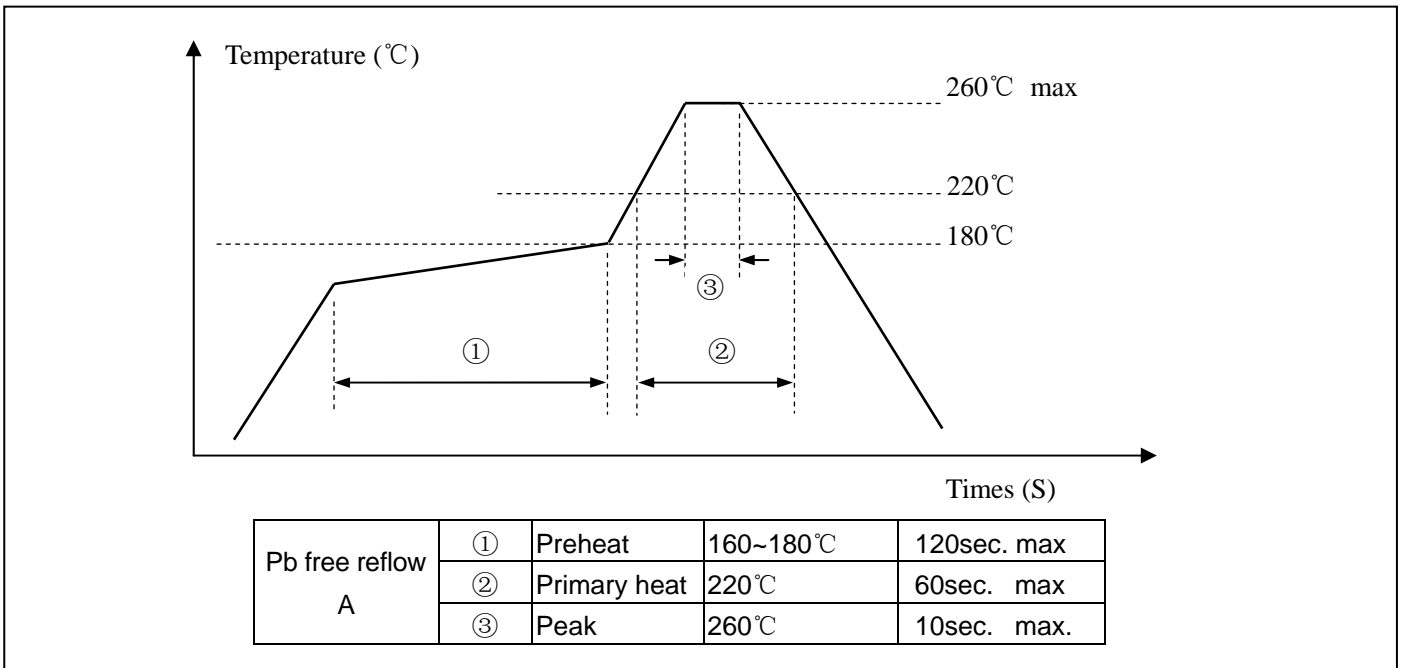
Vdc=3.3V				Vdc=1.8V			
15pF load		30pF load		15pF load		30pF load	
1.0 ~ 19.9 MHz	4 mA	1.0 ~ 19.9 MHz	6 mA	1.0 ~ 19.9 MHz	2 mA	1.0 ~ 19.9 MHz	6 mA
20.0 ~ 39.9 MHz	7 mA	20.0 ~ 39.9 MHz	13 mA	20.0 ~ 39.9 MHz	3 mA	20.0 ~ 29.9 MHz	10 mA
40.0 ~ 59.9 MHz	19 mA	40.0 ~ 49.9 MHz	24 mA	40.0 ~ 59.9 MHz	10 mA	30.0 ~ 40.0 MHz	12 mA
60.0 ~ 79.9 MHz	24 mA	50.0 ~ 60.0 MHz	35 mA	60.0 ~ 80.0 MHz	12 mA		

★ TAPING SPECIFICATION (Unit: mm) 编带规格



	A	B	C	D	E	F	G
OSC-SMD3225	178 ± 2.0	8.0 ± 0.3	3.55 ± 0.10	2.80 ± 0.10	4.0 ± 0.1	1.4 ± 0.1	60.5 ± 1.0
3000 pcs per reel							

★ REFLOW SOLDERING PROFILE 回流焊特性



SMD QUARTZ CRYSTAL OSCILLATOR

石英晶体振荡器



4 Pad Version 5.0x3.2 mm

- ±20 ppm type available
- Excellent Reliability Performance
- EMI shielding possible by grounded lid
- Reflow soldering temperature: 260°C max
- Ceramic Seam Weld package



RoHS compliant

★ PARAMETERS 技术参数

PARAMETERS	参数	SPECIFICATION 规格
Frequency Range	频率范围	1 ~ 125MHz
Supply voltage	工作电压	1.8V、2.5V、2.8V、3.3V、5.0V
Input Current	输入电流	See Below
Frequency Stability Overall	频率稳定性	±20ppm ~ ±50ppm
Operating Temp. Range	工作温度范围	-10 ~ +60°C to -40 ~ +85°C
Storage Temp. Range	储存温度范围	-55 ~ +125°C
Output Load	输出负载	HCMOS/TTL (15pF~30pF/10TTL)
Symmetry	占空比	45% ~ 55% typ. (40% ~ 60% max.) at 0.5×Vdc
Start-up time	起振时间	10mS max
Enable/ Disable Function	三态控制	O/E or E/D

◎ All specification subject change without notice. 规格变化, 恕不另行通知。

★ FREQUENCY STABILITY VS. TEMPERATURE 频率温度特性

Operation Temperature Range	Frequency Stability			
	±20ppm	±25ppm	±30ppm	±50ppm
-10°C ~ +60°C	○	●	○	○
-20°C ~ +70°C	○	○	●	○
-40°C ~ +85°C	○	○	○	●

● standard ○ available

★ Rise & Fall TIME MAX. 上升/下降时间

Frequency	Rise & Fall Time	Note
1.0-9.9 MHz	6nS max	rise time: 0.1 Vdc ~ 0.9 Vdc fall time: 0.9 Vdc ~ 0.1 Vdc
10.0-39.9 MHz	5nS max	
40.0-80.9 MHz	4nS max	

★ DIMENSIONS & LAND PATTERN LAYOUT (Unit: mm) 外形尺寸

Pin	Connection
1	E/D
2	GND
3	Output
4	V _{DC}

Recommended land Pattern

★ PART NUMBER GUIDE 部件号示例 e.g. FXO12.000MAA3SM3 (*SM3=3.2×2.5 SMD TYPE)

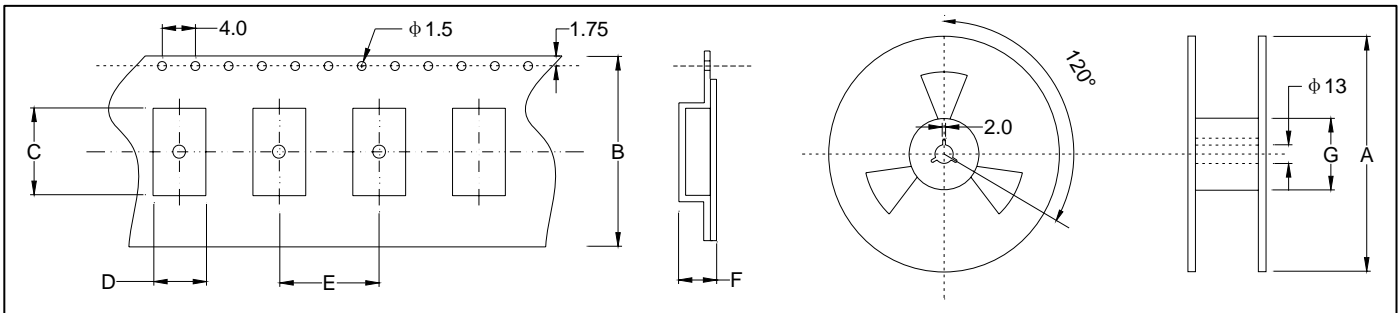
	Quartz Crystal Oscillator 石英晶体振荡器	Frequency 频率	Frequency Stability 频率稳定度	Operating Temp. 工作温度	Supply voltage 工作电压	Package 盒型
F	XO	12.000M	A	A	3(3.3V)	SM5

Definition	Description	Definition	Description
Frequency Stability 频率稳定度	A: $\pm 25\text{ppm}$	Operating Temp. 工作温度	A: $0\sim+70^{\circ}\text{C}$
	B: $\pm 50\text{ppm}$		B: $-20\sim+70^{\circ}\text{C}$
	C: $\pm 100\text{ppm}$		C: $-40\sim+85^{\circ}\text{C}$
	D: Customer specified		D: Customer specified

★ INPUT CURRENT 工作电流

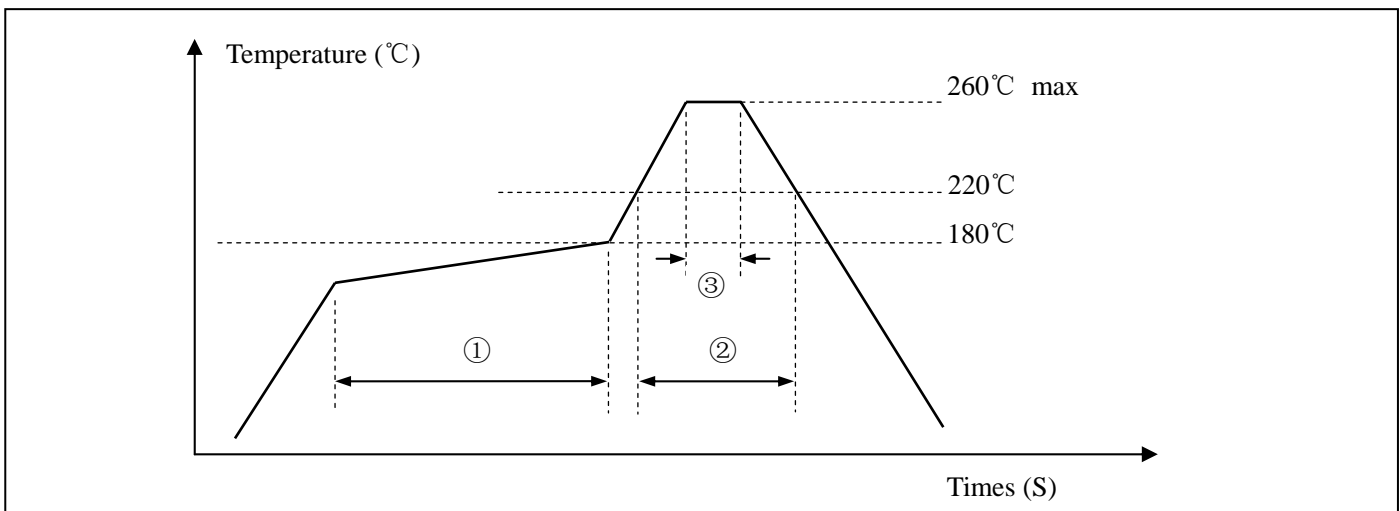
Vdc=5.0V				Vdc=3.5V			
15pF load		30pF load		15pF load		30pF load	
1.0 ~ 19.9 MHz	4 mA	1.0 ~ 19.9 MHz	6 mA	1.0 ~ 19.9 MHz	2 mA	1.0 ~ 19.9 MHz	6 mA
20.0 ~ 39.9 MHz	7 mA	20.0 ~ 39.9 MHz	13 mA	20.0 ~ 39.9 MHz	3 mA	20.0 ~ 29.9 MHz	10 mA
40.0 ~ 59.9 MHz	19 mA	40.0 ~ 49.9 MHz	24 mA	40.0 ~ 59.9 MHz	10 mA	30.0 ~ 40.0 MHz	12 mA
60.0 ~ 79.9 MHz	24 mA	50.0 ~ 60.0 MHz	35 mA	60.0 ~ 80.0 MHz	12 mA		

★ TAPING SPECIFICATION (Unit: mm) 编带规格



	A	B	C	D	E	F	G
OSC-SMD3225	178 ± 2.0	12.0 ± 0.3	3.55 ± 0.10	2.80 ± 0.10	4.0 ± 0.1	1.4 ± 0.1	60.5 ± 1.0
3000 pcs per reel							

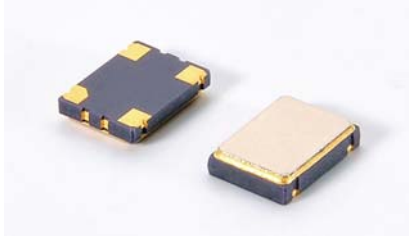
★ REFLOW SOLDERING PROFILE 回流焊特性



Pb free reflow A	①	Preheat	160~180°C	120sec. max
	②	Primary heat	220°C	60sec. max
	③	Peak	260°C	10sec. max.

SMD QUARTZ CRYSTAL OSCILLATOR

石英晶体振荡器



4 Pad Version 7.0x5.0 mm

- ± 20 ppm type available
- Excellent Reliability Performance
- EMI shielding possible by grounded lid
- Reflow soldering temperature: 260°C max
- Ceramic Seam Weld package



RoHS compliant

★ PARAMETERS 技术参数

PARAMETERS	参数	SPECIFICATION 规格
Frequency Range	频率范围	1~125MHz
Supply voltage	工作电压	1.8V、2.5V、2.8V、3.3V、5.0V
Input Current	输入电流	See Below
Frequency Stability Overall	频率稳定性	± 20 ppm~ ± 50 ppm
Operating Temp. Range	工作温度范围	-10~+60°C to -40~+85°C
Storage Temp. Range	储存温度范围	-55~+125°C
Output Load	输出负载	HCMOS/TTL (15pF~30pF/10TTL)
Symmetry	占空比	45% ~ 55% typ. (40% ~ 60% max.) at 0.5xVdc
Start-up time	起振时间	10mS max
Enable/ Disable Function	三态控制	O/E or E/D

◎ All specification subject change without notice. 规格变化, 恕不另行通知。

★ FREQUENCY STABILITY VS. TEMPERATURE 频率温度特性

Operation Temperature Range	Frequency Stability			
	± 20 ppm	± 25 ppm	± 30 ppm	± 50 ppm
-10°C~+60°C	○	●	○	○
-20°C~+70°C	○	○	●	○
-40°C~+85°C	○	○	○	●

● standard ○ available

★ Rise & Fall TIME MAX. 上升/下降时间

Frequency	Rise & Fall Time	Note
1.0-9.9 MHz	6nS max	rise time: 0.1 Vdc ~ 0.9 Vdc
10.0-39.9 MHz	5nS max	
40.0-69.9 MHz	4nS max	fall time: 0.9 Vdc ~ 0.1 Vdc
70.0-125.0 MHz	3nS max	

★ DIMENSIONS & LAND PATTERN LAYOUT (Unit: mm) 外形尺寸

Pin	Connection
1	E/D
2	GND
3	Output
4	V _{DC}

Recommended land Pattern

★ PART NUMBER GUIDE 部件号示例 e.g. FXO12.000AA3.3SM3 (*SM3=3.2x2.5 SMD TYPE)

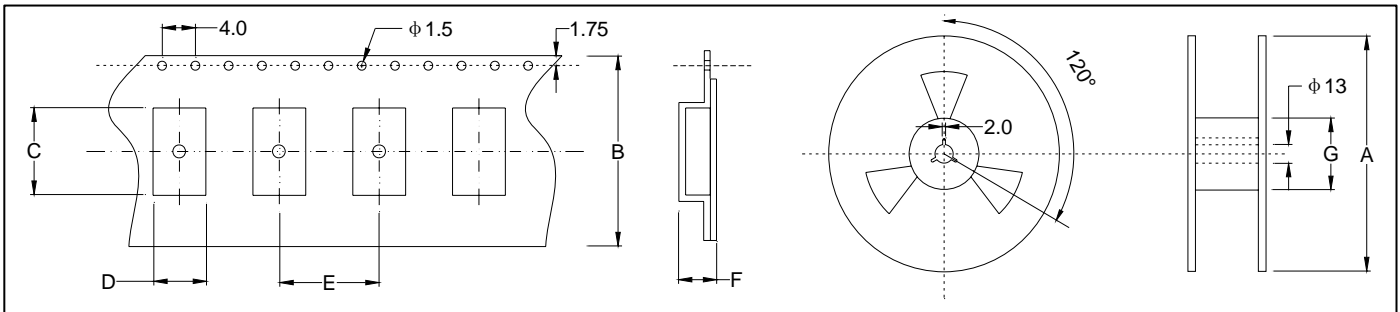
	Quartz Crystal Oscillator 石英晶体振荡器	Frequency 频率	Frequency Stability 频率稳定度	Operating Temp. 工作温度	Supply voltage 工作电压	Package 盒型
F	XO	12.000	A	A	3.3	SM7

Definition	Description	Definition	Description
Frequency Stability 频率稳定度	A: $\pm 25\text{ppm}$	Operating Temp. 工作温度	A: $0\sim+70^{\circ}\text{C}$
	B: $\pm 50\text{ppm}$		B: $-20\sim+70^{\circ}\text{C}$
	C: $\pm 100\text{ppm}$		C: $-40\sim+85^{\circ}\text{C}$
	D: Customer specified		D: Customer specified

★ INPUT CURRENT 工作电流

Vdc=5.0V				Vdc=3.3V			
15pF load		30pF load		15pF load		30pF load	
1.0 ~ 19.9 MHz	12 mA	1.0 ~ 19.9 MHz	15 mA	1.0 ~ 19.9 MHz	8 mA	1.0 ~ 19.9 MHz	15 mA
20.0 ~ 39.9 MHz	20 mA	20.0 ~ 39.9 MHz	30 mA	20.0 ~ 39.9 MHz	15 mA	20.0 ~ 39.9 MHz	25 mA
40.0 ~ 59.9 MHz	30 mA	40.0 ~ 59.9 MHz	35 mA	40.0 ~ 59.9 MHz	25 mA	40.0 ~ 59.9 MHz	30 mA
60.0 ~ 79.9 MHz	45 mA	50.0 ~ 80.0 MHz	55 mA	60.0 ~ 79.9 MHz	35 mA	60.0 ~ 79.9 MHz	35 mA
80.0 ~ 125.0MHz	60 mA			80.0 ~ 125.0MHz	45 mA		

★ TAPING SPECIFICATION (Unit: mm) 编带规格



	A	B	C	D	E	F	G
OSC-SMD7050	178 ± 2.0	16.0 ± 0.3	7.40 ± 0.15	5.40 ± 0.15	8.0 ± 0.1	2.2 ± 0.1	60.5 ± 1.0
1000 pcs per reel							

★ REFLOW SOLDERING PROFILE 回流焊特性

