



深圳市晶友嘉电子有限公司

SHENZHEN JINGYOUJIA ELECTRONIC CO., LTD



## CRYSTAL RESONATOR SPECIFICATIONS

### 石英晶体谐振器承认书

客户 Customer:	立创商城
型号 Product:	TO21
客户料号 Code No:	
我司料号 Code No:	TO2124000CWBC
频率 Frequency:	24.000MHz
数量 Sample Quantity:	
日期 Date:	2021-6-7

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供应商确认栏:

制作 Handler	确认 Checked	核审 Approved
戴晓嘉	陈斌	李晨

客户承认

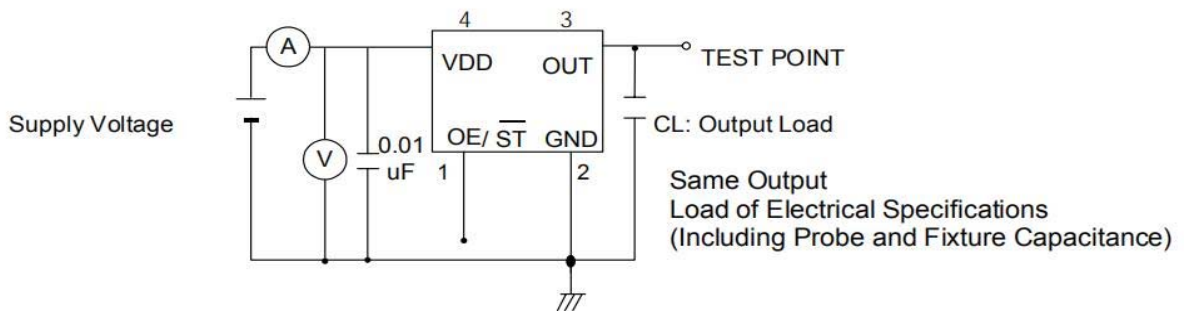
承认 Checked	核审 Approved



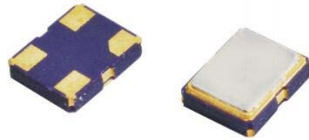
**1. Electrical Parameters**

No.	Parameters	Symbol	Condition	Electrical Specification			
				Min.	Type	Max.	Units
1	Nominal Frequency	-		24.00000			MHz
2	Operating Temperature	Topr		-40	-	85	°C
3	Storage Temperature	Tstg		-55	-	125	°C
4	Frequency Stability	-	Note 1	±20			ppm
5	Supply Voltage	VDD		3.27	3.3	3.33	V
6	Current Consumption	Icc				10	mA
7	Output Type	-		CMOS			
8	Output Load	CL		15			pF
9	Output Voltage High	VoH		90%VDD	-	-	V
10	Output Voltage Low	VoL		-	-	10%VD	V
11	Rise Time	Tr	10%→90%VDD Level	-	-	8	nS
12	Fall Time	Tf	90%→10%VDD Level	mS	mS	mS	nS
13	Symmetry or Duty Cycle	TH/T		40	50	60	%
14	Start-up Time	Tosc		-	-	10	mS
15	Enable Voltage High (Logic 1)	Vh	Note 2	70%VDD	-	-	V
16	Disable Voltage Low (Logic 0)	Vlo	Note 2	-	-	30%VD D	V
17	Aging	-	1st. Year at 25°C	±3			ppm
18	Output Disable Time	T off		-	-	150	μS
19	Output Enable Time	T on		-	-	150	μS

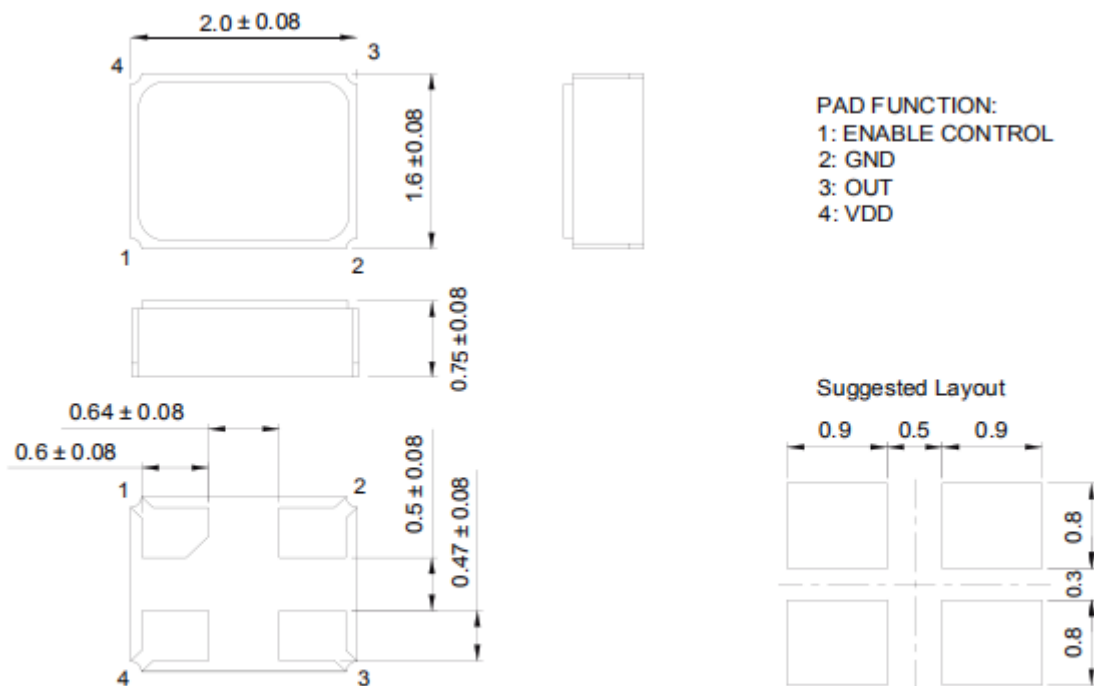
**■ TESTING CIRCUIT**



### 3.实物 Product

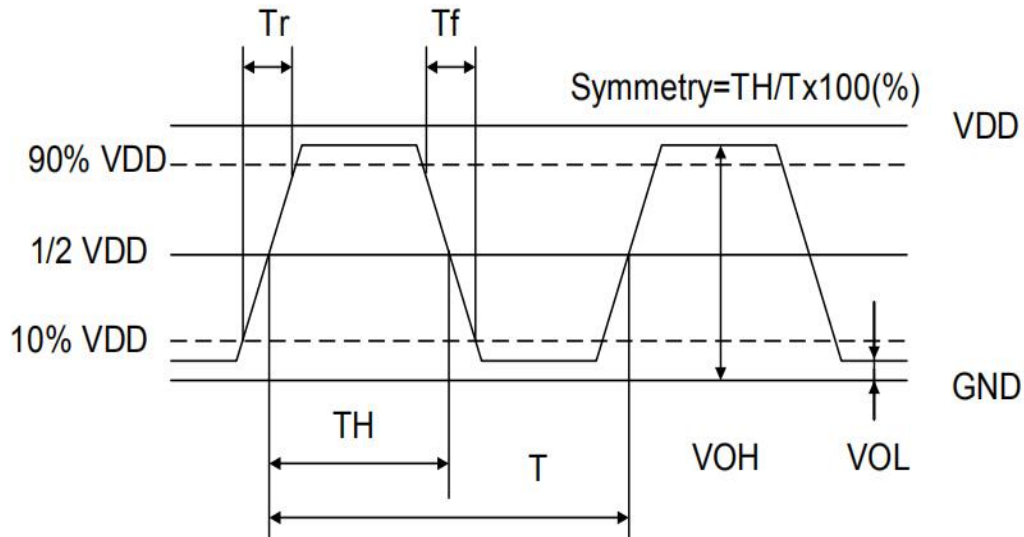


### 4.外型尺寸 Outline Dimensions (unit:mm)

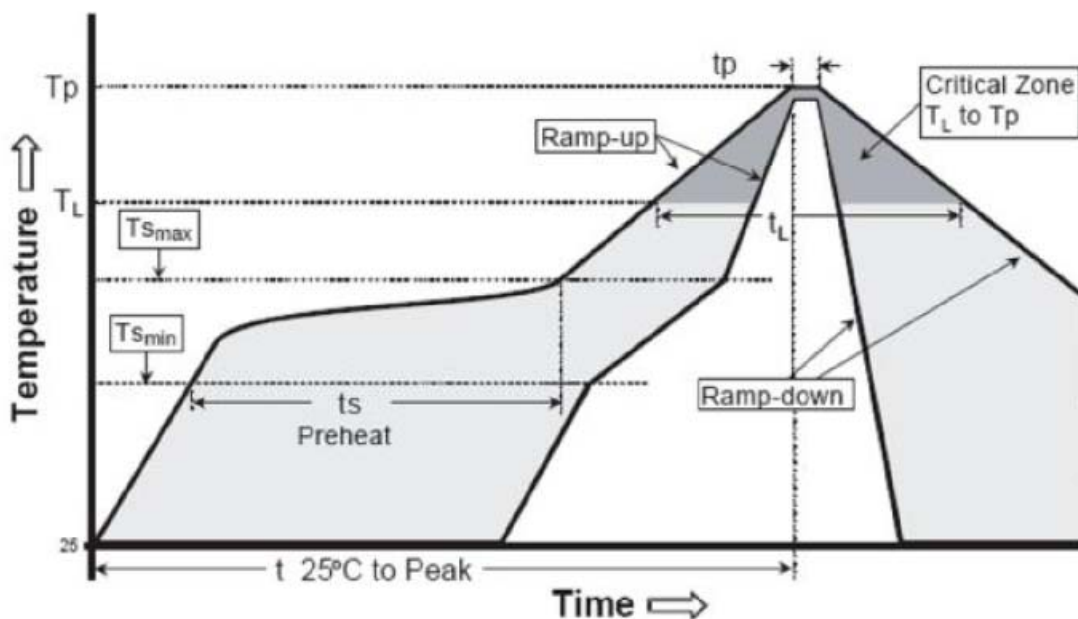


## 5. 波型条件 WAVEFORM CONDITIONS

Waveform measurement system should have a min. bandwidth of 5 times the frequency being tested.



## 6. 回流焊曲线 Reflow Profiles



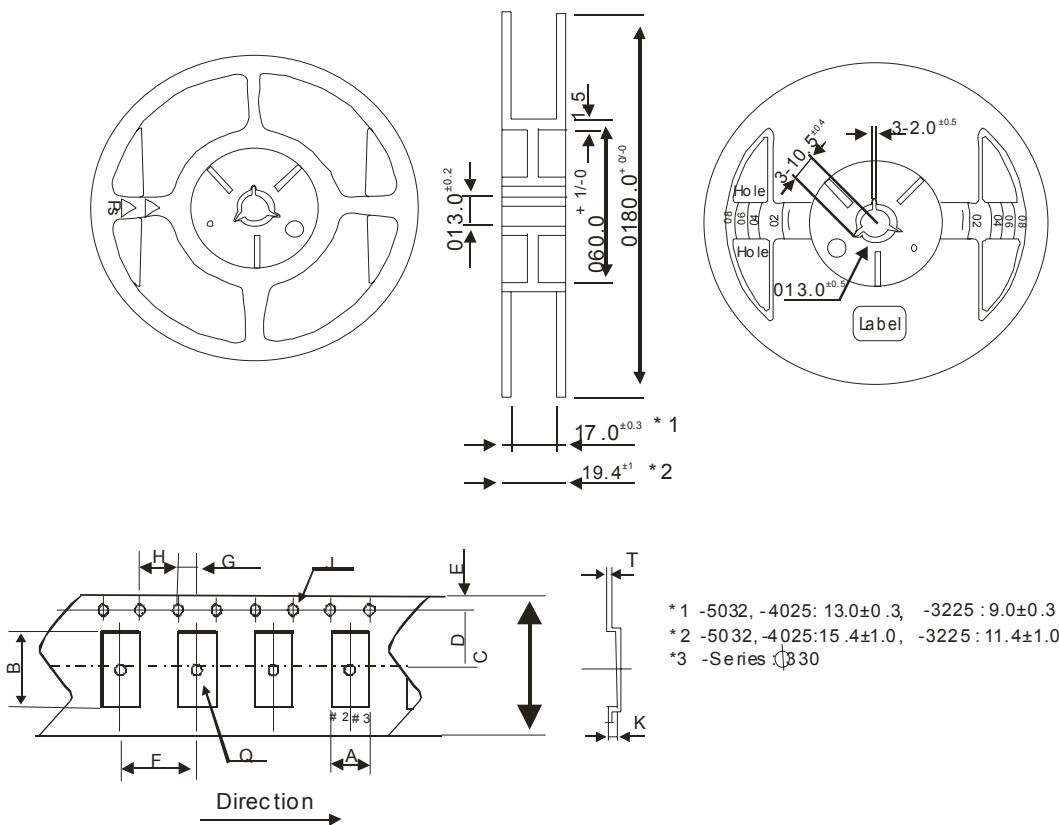


7.机械可靠/信赖性 Mechanical Performance

	Item	Condition	Standard
1.	Drop characteristics	Free drop from 50cm height on a hard wooden board for 3 times. (Board is thickness more than 30 mm.)	Frequency change: ≤5ppm Rr as specification
2..	Shake characteristics	Shake frequency 10~55Hz, cyc1~2 minutes, swing 1.5mm, direction x/y/z, all 30 minutes, test after 1 hours.	Frequency change: ≤5ppm Rr as specification
3.	Airproof characteristics	Put crystal into the pressure cabin with alcohol, keep pressure 0.4~0.5mpa 10 minutes, then take out and blow for 5 minutes	IR≥500MΩ
4.	Weld characteristics	260℃ Max, 10 seconds	90% exhibit tin ok
5.	Humidity characteristics	+40±2℃ & 90%~95% R.H. 250 hours	Frequency change: ≤5ppm Rr as specification
6.	Low temperature characteristics	-30±2℃, 250 hours, put in room temperature, test after 1 hours.	Frequency change: ≤5ppm Rr as specification
7.	High temperature characteristics	+85±2℃, 250 hours, put in room temperature, test after 1 hours.	Frequency change: ≤5ppm Rr as specification
8.	Temperature cycling	-30±3℃/30±3 min~+85±2℃/30±3min, 5 cycles	Frequency change: ≤5ppm Rr as specification

## 8.Dimension of Inside Package

内包装尺寸图



- Standard quantity of 2016 : 3.000 pcs/reel
- Standard quantity of others : 1.000 pcs/reel
- Carrier tape : Antistatic material (PS)
- Each reel can be recycled

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[233N25E200.000000](#) [9102AI-232H25S125.000000](#) [9102AI-133N25E200.000000](#)