



规格书  
SPECIFICATIONS

规格书编号/ID: M161220A  
物料描述/  
Product Description: 16M 12PF 20PPM  
料号/  
Part Number: S47SMD16.000M12PF20R30B3  
制作人/  
Approved by: 莫平会  
审核人/  
Checked by: 陈晓群  
日期/ 盖章/  
Date: 2022-11-21 Stamp: \_\_\_\_\_

客户签署/  
Customer signature required

公司名称/  
Company: \_\_\_\_\_

客户料号/  
Customer Part Number: \_\_\_\_\_

承认人/  
Approved by: \_\_\_\_\_

批准人/  
Confirmed by: \_\_\_\_\_

日期/  
Date: \_\_\_\_\_

盖章/  
Stamp: \_\_\_\_\_



四川索斯特电子有限公司  
Sichuan Source-Set Electronics Co., Ltd  
石英晶体规格书



**CRYSTAL UNIT SPECIFICATIONS**

一、电性能参数 ELECTRICAL PARAMETERS:

| No. | 特性 Characteristic                     | 范围 Limits    | 备注 Remark                     |
|-----|---------------------------------------|--------------|-------------------------------|
| 1   | 产品型号<br>Ackage Type                   | SST-M49SSMD  |                               |
| 2   | 标称频率<br>Nominal Frequency             | 16.000MHz    |                               |
| 3   | 振动模式<br>Mode of Vibration             | AT—Fund (基频) |                               |
| 4   | 常温频差<br>Frequency Tolerance           | ±20ppm       | 25±3℃ 测试<br>Measure at 25℃±3℃ |
| 5   | 工作温度范围<br>Operating Temperature Range | -20℃~+70℃    |                               |
| 6   | 频率稳定度<br>Frequency Stability          | ±30ppm       |                               |
| 7   | 储存温度范围<br>Storage Temperature Range   | -40℃~+85℃    |                               |
| 8   | 负载电容<br>Load capacitance              | 12pF         |                               |
| 9   | 谐振电阻<br>Equivalent Series Resistance  | 50 Ω max     |                               |
| 10  | 激励功率<br>Drive Level                   | 100 μ W max  |                               |
| 11  | 绝缘电阻<br>Insulation Resistance         | 500M Ω       | At 250V <sub>DC</sub>         |
| 12  | 静电容<br>Shunt Capacitance              | 5pF max      |                               |
| 13  | 年老化率<br>Aging Per Year                | ±5ppm        |                               |
| 14  |                                       |              |                               |
| 15  |                                       |              |                               |
| 16  |                                       |              |                               |
| 17  |                                       |              |                               |
| 18  |                                       |              |                               |

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**二、可靠性试验 Reliability test**

| No. | 测试项目<br>Item                     | 测试条件<br>Test Conditions                                                                                                                                                                                                                                                                                                                                                                                                                     | 判定标准<br>Basis of Verdict                                                        |
|-----|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|
| 1   | 跌落冲击<br>Drop                     | 75cm 高度自由下落到 3cm 厚度的硬质木板 3 次<br>3 Times Free Fall from 75cm height table to 3cm thickness hard wood board                                                                                                                                                                                                                                                                                                                                   | $\Delta FL \leq \pm 5\text{ppm}$ ,<br>$\Delta R \leq 5\text{ohm or } \leq 10\%$ |
| 2   | 模拟回流焊<br>Reflow                  | $240^{\circ}\text{C} \leq T \leq 265^{\circ}\text{C}$ $t=60 \pm 30\text{s}$<br>$T=260^{\circ}\text{C} \pm 5^{\circ}\text{C}$ $t=40 \pm 10\text{s}$<br>$T(\text{max}) = 265^{\circ}\text{C}$                                                                                                                                                                                                                                                 | $\Delta FL \leq \pm 5\text{ppm}$ ,<br>$\Delta R \leq 5\text{ohm or } \leq 10\%$ |
| 3   | 可焊性<br>Solder                    | $260^{\circ}\text{C} \pm 5^{\circ}\text{C}$ 焊锡槽浸润 $3 \pm 0.5$ 秒<br>Temperature: $260^{\circ}\text{C} \pm 5^{\circ}\text{C}$<br>Time: $3 \pm 0.5$ Seconds                                                                                                                                                                                                                                                                                    | 新锡覆盖率 $\geq 90\%$<br>the solder immersion surface $\geq 90\%$                   |
| 4   | 耐焊接热<br>Solder Heating           | $280^{\circ}\text{C} \pm 5^{\circ}\text{C}$ 焊锡槽浸润 $10 \pm 1$ 秒<br>Temperature: $280^{\circ}\text{C} \pm 5^{\circ}\text{C}$<br>Time: $10 \pm 1$ Seconds                                                                                                                                                                                                                                                                                      | $\Delta FL \leq \pm 5\text{ppm}$ ,<br>$\Delta R \leq 5\text{ohm or } \leq 10\%$ |
| 5   | 高温储存<br>High temperature storage | $100^{\circ}\text{C} \pm 2^{\circ}\text{C}$ 烘箱中烘烤 $96 \pm 1$ 小时<br>Temperature: $100^{\circ}\text{C} \pm 5^{\circ}\text{C}$<br>Time: $96 \pm 1$ Hours                                                                                                                                                                                                                                                                                       | $\Delta FL \leq \pm 5\text{ppm}$ ,<br>$\Delta R \leq 5\text{ohm or } \leq 10\%$ |
| 6   | 高温老化<br>High temperature ageing  | $85^{\circ}\text{C} \pm 5^{\circ}\text{C}$ 之烘箱中烘烤 30 天<br>Temperature: $85^{\circ}\text{C} \pm 5^{\circ}\text{C}$ , Time: 30days                                                                                                                                                                                                                                                                                                            | $\Delta FL \leq \pm 5\text{ppm}$ ,<br>$\Delta R \leq 5\text{ohm or } \leq 10\%$ |
| 7   | 低温储存<br>Low temperature storage  | $-40^{\circ}\text{C} \pm 2^{\circ}\text{C}$ 环境中保持 $96 \pm 1$ 小时<br>Temperature: $-40^{\circ}\text{C} \pm 2^{\circ}\text{C}$<br>Time: $96 \pm 1$ Hours                                                                                                                                                                                                                                                                                       | $\Delta FL \leq \pm 5\text{ppm}$ ,<br>$\Delta R \leq 5\text{ohm or } \leq 10\%$ |
| 8   | 恒温恒湿<br>Humidity                 | 在湿度为 $90 \sim 95\%$ , 温度为 $40 \pm 2^{\circ}\text{C}$ 环境中保持 96 小时<br>Temp: $40^{\circ}\text{C} \pm 2^{\circ}\text{C}$ , Humidity: $90 \sim 95\%$<br>Times: 96 Hours                                                                                                                                                                                                                                                                          | $\Delta FL \leq \pm 5\text{ppm}$ ,<br>$\Delta R \leq 5\text{ohm or } \leq 10\%$ |
| 9   | 振动<br>Vibration                  | 频率: $10 \sim 50\text{Hz}$ , 幅度: $0.75\text{mm}$<br>频率: $50\text{Hz} \sim 500\text{Hz}$ , 加速度幅度: $98\text{m/s}^2$<br>周期: $10-500-10\text{Hz}$ , $15\text{min}$<br>振动方向: X、Y、Z<br>振动时间: 每个方向 2 小时<br>Frequency: $10 \sim 50\text{Hz}$ , Amplitude: $0.75\text{mm}$<br>Frequency: $50 \sim 500\text{Hz}$ , Amplitude: $98\text{m/s}^2$<br>Cycle time: $10-500-10\text{H}$ , $15\text{min}$<br>Direction: X、Y、Z<br>Duration: 2 Hours /direction | $\Delta FL \leq \pm 5\text{ppm}$ ,<br>$\Delta R \leq 5\text{ohm or } \leq 10\%$ |

**CRYSTAL UNIT SPECIFICATIONS**

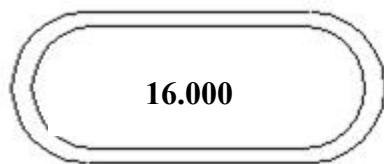
三、外形尺寸 Outline Dimensions (unit: mm)



| NO. | 规格        | H      |
|-----|-----------|--------|
| 1.  | M49S -SMD | 2.3Max |

四、印字 Marking

当前字样:



**CRYSTAL UNIT SPECIFICATIONS**

五、包装方式 Packing

T/R: 3000pcs/ REEL



单位 units : mm:

| Model     | A       | B       | D    | E        | F       | P       | P0      | T        | W      |
|-----------|---------|---------|------|----------|---------|---------|---------|----------|--------|
| SST-47SMD | 4.7±0.1 | 9.5±0.1 | Φ1.5 | 1.75±0.1 | 7.5±0.1 | 8.0±0.1 | 4.0±0.1 | 0.3±0.05 | 16±0.3 |
|           |         |         |      |          |         |         |         |          |        |

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|        |      |      |      |      |      |      |      |      |
|--------|------|------|------|------|------|------|------|------|
| SPEC 1 | 12   | 16   | 24   | 32   | 44   | 56   | 72   | 88   |
| C1±1   | 330  | 330  | 330  | 330  | 330  | 330  | 330  | 330  |
| A±0.2  | 2.3  | 2.3  | 2.3  | 2.3  | 2.3  | 2.3  | 2.3  | 2.3  |
| B±0.2  | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| H+2.0  | 12.5 | 16.5 | 24.5 | 32.5 | 44.5 | 56.5 | 72.5 | 88.5 |
| T±0.2  | 2.1  | 2.1  | 2.1  | 2.1  | 2.1  | 2.1  | 2.1  | 2.1  |
| D±0.5  | ∅100 | ∅100 | ∅100 | ∅100 | ∅100 | ∅100 | ∅100 | ∅100 |

