





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                   | HC-49SMA              |                               |
| 2   | 标称频率<br>Nominal Frequency             | 20.000000MHz          |                               |
| 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 | -40℃~+85℃             |                               |
| 6   | 频率稳定度<br>Frequency Stability          | ±50ppm                |                               |
| 7   | 储存温度范围<br>Storage Temperature Range   | -40℃~+85℃             |                               |
| 8   | 负载电容<br>Load capacitance              | 20pF                  |                               |
| 9   | 谐振电阻<br>Equivalent Series Resistance  | 30 Ω max              |                               |
| 10  | 激励功率<br>Drive Level                   | 50 μ W (1000 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  | 老化率<br>Aging Per Year                 | ±5ppm                 |                               |
| 14  |                                       |                       |                               |
| 15  |                                       |                       |                               |
| 16  |                                       |                       |                               |
| 17  |                                       |                       |                               |
| 18  |                                       |                       |                               |

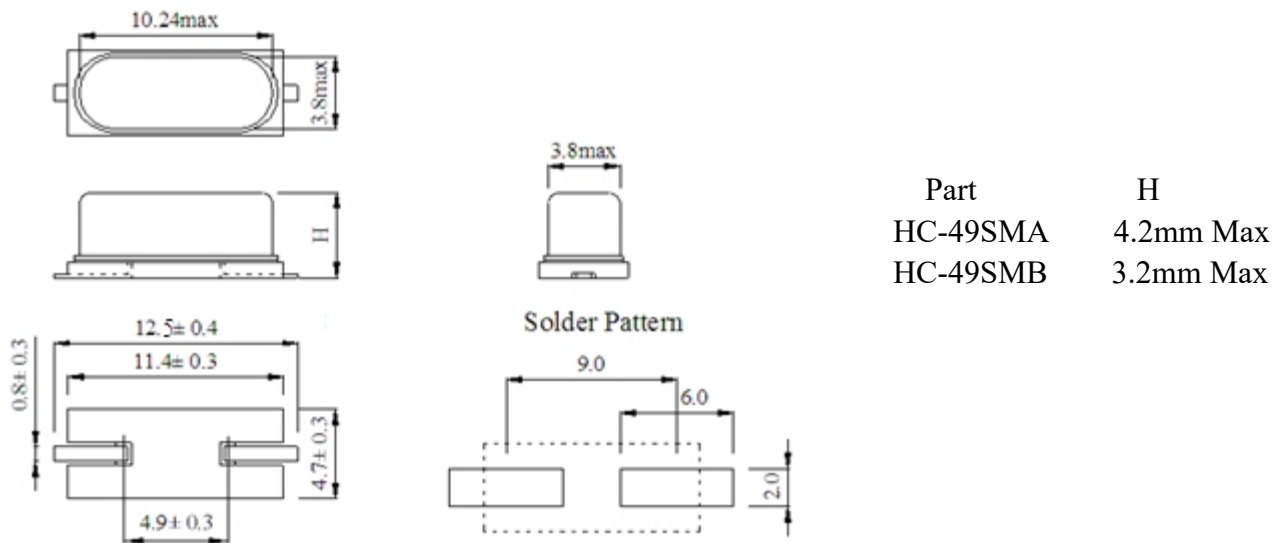


## 二、可靠性试验 Reliability test

| 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   | 气密性<br>Leakage                   | $4 \sim 5\text{Kg/cm}^2$ 压力之氦气罐中加压 $10 \pm 1$ 分钟<br>He Pressure: $4 \sim 5\text{Kg/cm}^2$<br>Time: $10 \pm 1$ min  | $\leq 3 \times 10^{-9} \text{Pa} \cdot \text{m}^3/\text{s}$                     |
| 6   | 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>$\Delta R \leq 5\text{ohm or } \leq 10\%$ |
| 7   | 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: $85^{\circ}\text{C} \pm 5^{\circ}\text{C}$<br>Time: 30 days   | $\Delta FL \leq \pm 5\text{ppm}$ ,<br>$\Delta R \leq 5\text{ohm or } \leq 10\%$ |
| 8   | 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>$\Delta R \leq 5\text{ohm or } \leq 10\%$ |
| 9   | 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: $40^{\circ}\text{C} \pm 2^{\circ}\text{C}$<br>Humidity: $90 \sim 95\%$<br>Times: 96 Hours  | $\Delta FL \leq \pm 5\text{ppm}$ ,<br>$\Delta R \leq 5\text{ohm or } \leq 10\%$ |
| 10  | 热冲击<br>Thermal Shock             | $-40^{\circ}\text{C}$ 和 $+85^{\circ}\text{C}$ , 各 $30 \pm 1$ 分钟, 循环 10 次<br>Temperature: $-40^{\circ}\text{C} \pm 2^{\circ}\text{C} \leftrightarrow 85^{\circ}\text{C} \pm 2^{\circ}\text{C}$<br>Time: $30 \pm 1$ min<br>For 10 cycles | $\Delta FL \leq \pm 5\text{ppm}$ ,<br>$\Delta R \leq 5\text{ohm or } \leq 10\%$ |

| No. | 测试项目<br>Item               | 测试条件<br>Test Conditions  | 判定标准<br>Basis of Verdict  |
|-----|----------------------------|--|---|
| 11  | 振动<br>Vibration            | 频率: 10~50Hz, 幅度: 0.75mm<br>频率: 50Hz~500Hz, 加速度幅度: 98m/s <sup>2</sup><br>周期: 10-500-10Hz, 15min<br>振动方向: X、Y、Z<br>振动时间: 每个方向 2 小时<br>Frequency: 10~50Hz, Amplitude: 0.75mm<br>Frequency: 50~500Hz, Amplitude: 98m/s <sup>2</sup><br>Cycle time: 10-500-10H, 15min<br>Direction: X、Y、Z<br>Duration: 2 Hours /direction | $\Delta FL \leq \pm 5\text{ppm}$ ,<br>$\Delta R \leq 50\text{ohm}$ or $\leq 10\%$ |
| 12  | 端子拉力强度<br>Tensile Strength | 在每个端子上, 沿端子轴方向施力 900g 的拉力 30±5 秒<br>Apply a 900g tensile load to each terminal and sustain it for 30s±5s   | 晶体无损伤<br>without distinct damage  |

### 三、外形尺寸 Outline Dimensions (unit: mm)



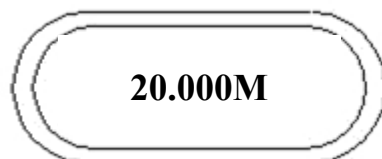
### 四、印字 Marking

由 7 位组成, 前 6 位: 频率 Mhz/7 Digitals, First 6 Digitals: Frequency in Mhz

最后 1 位: 公司代码/End 1 Digitals: company ID

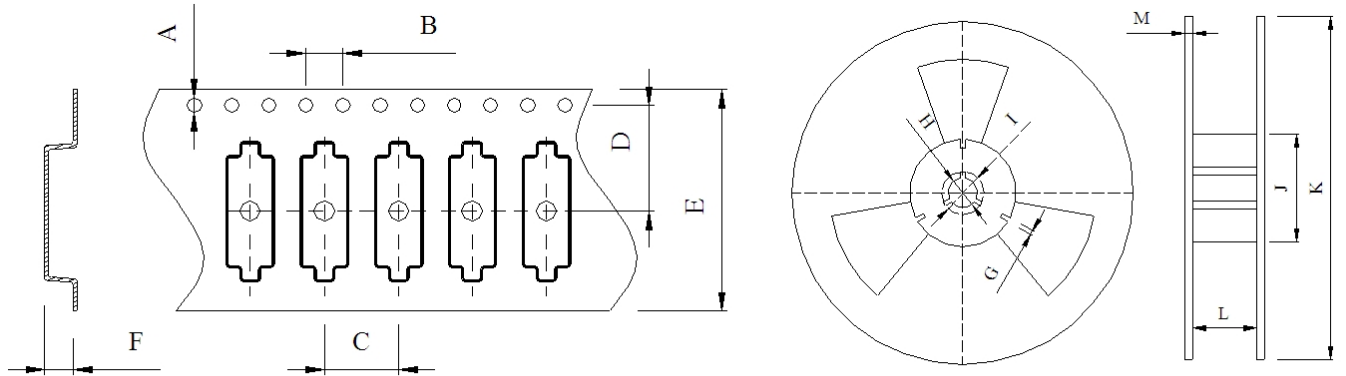
H=固定代码 Y=年份 (2018=8, 2019=9) M=月份 (A=1 月份, B=2 月份.....M=12 月份)

当前字样:



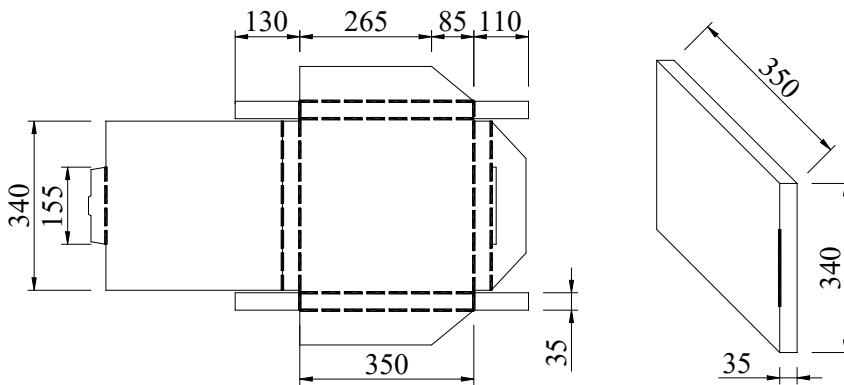
五、包装方式 Packing

T/R: 1000pcs/ REEL



单位 units : mm:

| Model    | A     | B   | C    | D    | E    | F    | G   | H     | I    | J    | K   | L    | M   |
|----------|-------|-----|------|------|------|------|-----|-------|------|------|-----|------|-----|
| HC-49SMA | Φ1.50 | 4.0 | 12.0 | 11.5 | 24.0 | 4.35 | 2.5 | Φ13.5 | 21.6 | 99.5 | 330 | 24.0 | 2.3 |
| HC-49SMB | Φ1.50 | 4.0 | 12.0 | 11.5 | 24.0 | 3.5  | 2.5 | Φ13.5 | 21.6 | 99.5 | 330 | 24.0 | 2.3 |



Notes:

1 units: mm

2 --- 折痕

1 REEL = 1 INNER BOX

10Box= 1Outer Box

| CRYSTAL UNIT |       |         |     |
|--------------|-------|---------|-----|
| P/N:         |       |         |     |
| YR P/N:      |       |         |     |
| FREQ:        | MHz   | CL:     | PF  |
| TOL: ±       | PPM ( | AT 25°C | )   |
| STAB: ±      | PPM ( | °C TO   | °C) |
| L/N:         | QTY:  |         | PCS |

Lable

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