

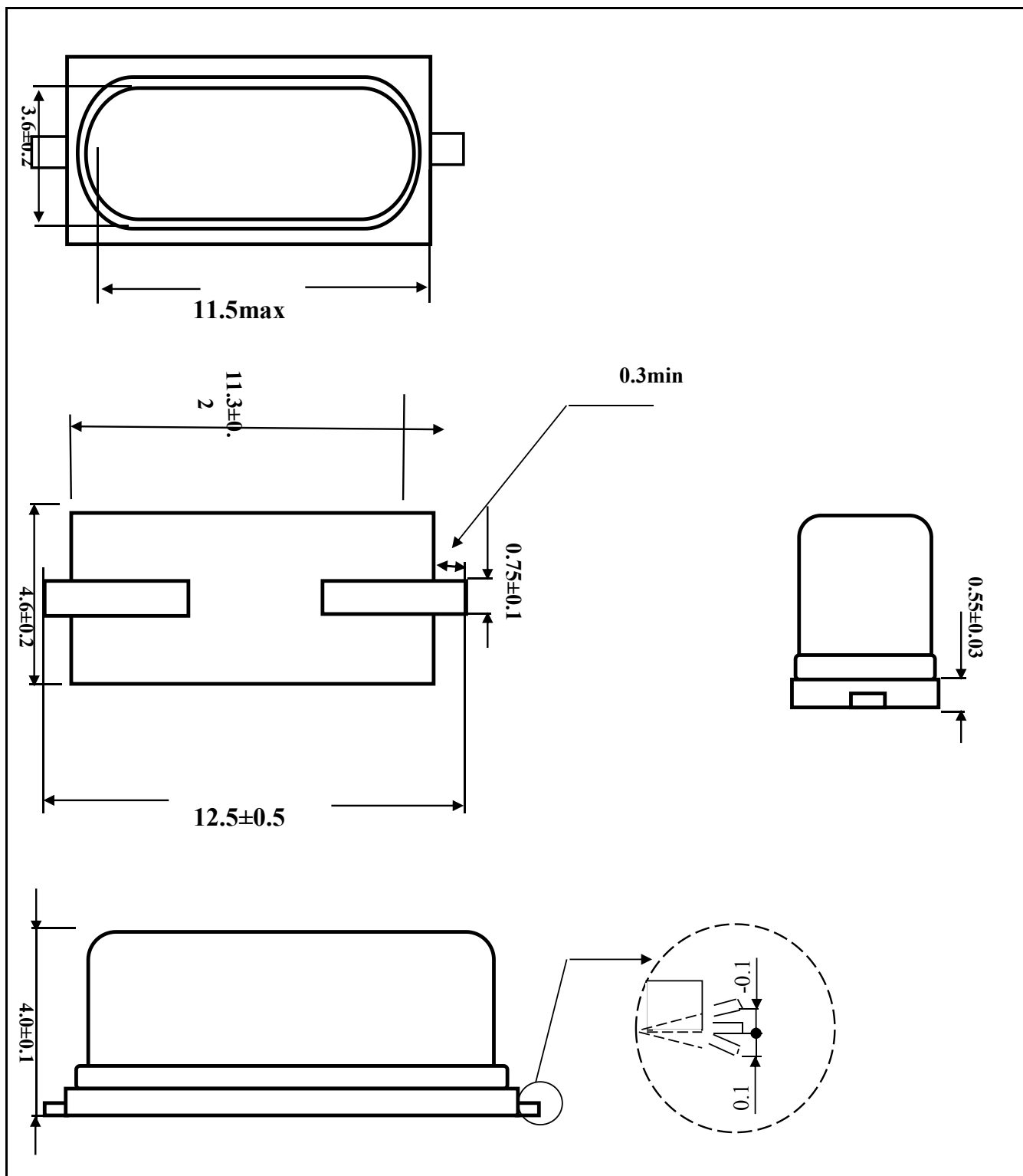
HC-49US/SMD 石英晶振  
27.000MHZ/20PF/±20PPM

# **SPECIFICATION REQUIREMENTS FOR CRYSTAL**

## **晶体产品要求**

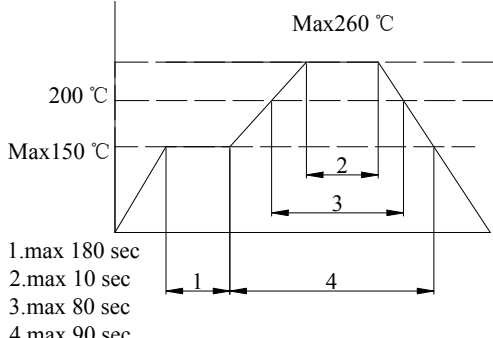
### **□ 电气参数 Electrical Characteristic:**

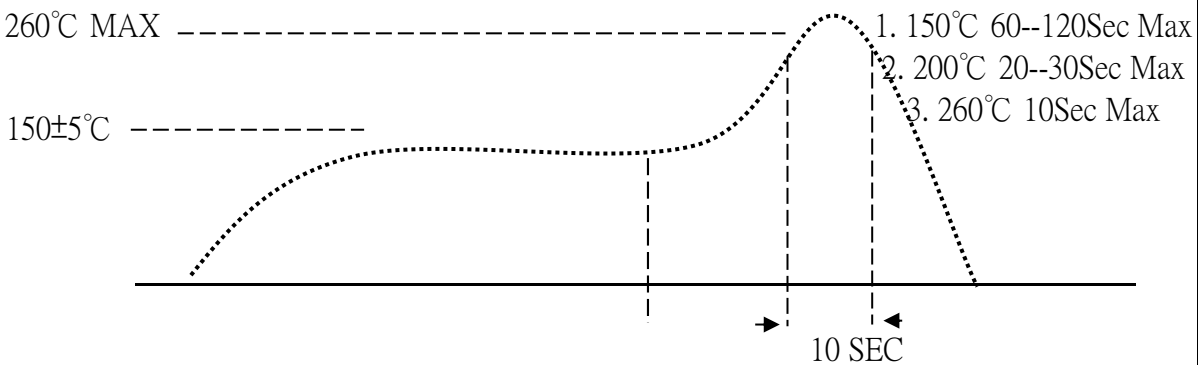
|                               |                                                                                                                                                                                                                                                                                                                     |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Model No.                  | <input type="checkbox"/> HC-49US <input checked="" type="checkbox"/> HC-49US/SMD <input type="checkbox"/> HC-49U<br><input type="checkbox"/> HC-49USS <input type="checkbox"/> HC-49USS/SMD <input type="checkbox"/> 2×6<br><input type="checkbox"/> 3×8 <input type="checkbox"/> 3×9 <input type="checkbox"/> 3×10 |
| 2. Nominal Frequency(FR)      | 27.000MHZ                                                                                                                                                                                                                                                                                                           |
| 3. Oscillation Mode           | <input checked="" type="checkbox"/> Fundamental    3RD overtone <input type="checkbox"/> 5th overtone                                                                                                                                                                                                               |
| 4. Frequency stability(Tol)   | ± 20ppm(ref. at 25℃)                                                                                                                                                                                                                                                                                                |
| 5. Operation Temperature      | -20℃ to +70℃                                                                                                                                                                                                                                                                                                        |
| 6. Storage Temperature        | -40℃ to +85℃                                                                                                                                                                                                                                                                                                        |
| 7. Temperature Characteristic | ± 30ppm                                                                                                                                                                                                                                                                                                             |
| 8. Load Capacitance( CL )     | 20pF                                                                                                                                                                                                                                                                                                                |
| 9. Series Resisitance(ESR)    | ≤ 30 Ω                                                                                                                                                                                                                                                                                                              |
| 10. Drive Level               | 100uW                                                                                                                                                                                                                                                                                                               |
| 11. Shunt Capacitance (Co)    | ≤ 5pF Max ( Or    PF~    PF )                                                                                                                                                                                                                                                                                       |
| 12. Aging Rate Per Year       | ± 3ppm/year                                                                                                                                                                                                                                                                                                         |
| 13. Insulation Resistance     | 500M Ω min.at DC 100V ± 10V                                                                                                                                                                                                                                                                                         |
| 14 Test Circuit.              | <b>Measured by S&amp;A 250B</b>                                                                                                                                                                                                                                                                                     |



|                |                  |              |          |          |
|----------------|------------------|--------------|----------|----------|
| FREQUENCY SPEC | <b>HOLDER</b>    | HC-49US/ SMD | ENGINEER | APPROVED |
|                | <b>TYPE</b>      |              |          |          |
|                | <b>DIMENSION</b> | <b>mm</b>    |          |          |
|                | <b>SCALE</b>     | <b>5:1</b>   |          |          |

## 可靠性实验规范 RELIABILITY SPECIFICATION

| 序号 | RELIABILITY                          | RELIABILITY CONDITIONS                                                                                                                           | SPECIFICATION                                                                       |
|----|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|    | 试验名称                                 | 可靠度试验条件                                                                                                                                          | 规格说明                                                                                |
| 1  | ELECTRODE TERMINAL PULL<br>电极端子拉力    | 1KG FORCE IN AXES OF ELECTRODE TERMINATION 10±1sec<br>1KG力垂直施于电极端子上10±1秒                                                                         | 1.GLASS HERMETICITY & VISUAL.<br>玻璃密封性和外观检初                                         |
| 2  | ELECTRODE WIRE-LEAD BEND<br>电极端子弯曲拉力 | 2.5mm FROM ELECTRODE TERMINAL,BEND 90°, ' 0.45kg MASS APPLIED 3TIMES.<br>2.5毫米处电极端子弯曲 90°                                                        | 2. LEAD CRACKED or BROKEN NOT ALLOWED'<br>不允许引线断裂或破裂                                |
| 3  | SOLDERABILITY<br>产品可焊性               | SOLDER:235±5℃,DIPPING:5±0.5sec.<br>焊接温度:235±5℃,浸渍时间:5±0.5秒                                                                                       | AT LEAST 95% COATING.<br>至少覆盖率为95%                                                  |
| 4  | RESISTANCE TO<br>产品可焊耐热时间            | SOLDER:260+5℃,DIPPING:10±1sec.<br>焊接温度:260±5℃,浸渍时间:10±1秒<br> | 1.AT LEAST 95% COATING.<br>至少覆盖率为95%<br>2.△F/F≤±5ppm<br>△F/Rr≤±10% or 2Ω BETTER,20% |
| 5  | VIBRATION TEST<br>振动测试               | 10g,10~55~10hz 1MINUTE,X、Y、Z PLANE EACH 2hrs.<br>10G, 10~55~10赫兹 1分钟,X、Y、Z 水平面,每 2小时                                                             | △F/F≤±5ppm<br>△F/Rr≤±10% or 2Ω BETTER,20%                                           |
| 6  | DROP TEST<br>跌落测试                    | 75CM HIGH,3 TIMES ON HARD BOARD<br>75厘米高, 3次坠落在硬木质板上                                                                                             | △F/F≤±5ppm<br>△F/Rr≤±10% Oor 2Ω BETTER,20%                                          |
| 7  | AGING TEST<br>老化测试                   | 85℃ Dynamic 1000hrs<br>85℃ 动态测试1000小时                                                                                                            | △F/F≤±5ppm<br>△F/Rr≤±10% or 2Ω BETTER,20%                                           |
| 8  | CCELERATED AGING<br>加速老化测试           | 125℃±3℃, TIME:168 hrs. Dynamic<br>125℃±3℃, 的动态下:168小时.                                                                                           | △F/F≤±5ppm<br>△F/Rr≤±10% or 2Ω BETTER,20%                                           |

|    |                                                                                                                                                                                                                                                                                     |                                                                                         |                                                         |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|---------------------------------------------------------|
| 9  | SALT SPRAY<br>盐水喷雾试验                                                                                                                                                                                                                                                                | 5% NaCL 35°C±2°C<br>CHAMBER,48hrs.PH:6.5~7.2                                            | 1.NO CORROSION ON<br>LEAD&CAN1.<br>基座和外壳无腐蚀             |
|    |                                                                                                                                                                                                                                                                                     | 5% NaCL(碳酸钠),35°C±2°C的温箱里,48小时                                                          | $\Delta F/F \leq \pm 5\text{ppm}$                       |
|    |                                                                                                                                                                                                                                                                                     | PH值:6.5~7.2                                                                             | $\Delta F/Rr \leq \pm 10\%$ or 2 $\Omega$<br>BETTER,20% |
| 10 | HIGH-LOW<br>TEM.STORAGE(STATIC                                                                                                                                                                                                                                                      | HIGH TEM:125°C±2°C,1000hrs LOW TEM:-40°C±3°C,1000hrs                                    | $\Delta F/F \leq \pm 5\text{ppm}$                       |
|    | STORAGE(STATIC)<br>高低温储存（静态测试）                                                                                                                                                                                                                                                      | LOW TEM:-40°C±3°C,1000hrs<br>低温:-40°C±3°C,1000小时                                        | $\Delta F/Rr \leq \pm 10\%$ or 2 $\Omega$<br>BETTER,20% |
| 11 | HIGH TEM. & HUM.<br>STORAGE TEST<br>高温高湿储存试验                                                                                                                                                                                                                                        | TEM:40°C±2°C HUM:83%-88%,96hrs<br>温度:40°C±2 湿度:83%-88% ,储存96小时                          | $\Delta F/F \leq \pm 5\text{ppm}$                       |
|    |                                                                                                                                                                                                                                                                                     |                                                                                         | $\Delta F/Rr \leq \pm 10\%$ or 2 $\Omega$<br>BETTER,20% |
| 12 | TEM. & HUM. CYCLING<br>TEST                                                                                                                                                                                                                                                         | TEM:-10°C±2°C ~ 65°C±2°C 24hrs 1 cycle'<br>HUM:93±3% 5 cycles                           | $\Delta F/F \leq \pm 5\text{ppm}$                       |
|    | 温湿度循环测试                                                                                                                                                                                                                                                                             | 温度:-10°C ± 2°C ~ 65°C ± 2°C,湿度:93 ± 3%, 24小时为1循环, 运行5个循环                                | $\Delta F/Rr \leq \pm 10\%$ or 2 $\Omega$<br>BETTER,20% |
| 13 | HIGH-LOW TEM.OPERATING<br>TEST                                                                                                                                                                                                                                                      | HIGH TEM:70°C±2°C,2hrs LOW TEM:-20°C±2°C,2hrs<br>高温:70°C±2                              | $\Delta F/F \leq \pm 5\text{ppm}$                       |
|    | OPERATING TEST<br>高-低温运行测试                                                                                                                                                                                                                                                          | LOW TEM:-20°C±2°C,2hrs<br>低温:-20°C±2°C运行2小时                                             | $\Delta F/Rr \leq \pm 10\%$ or 2 $\Omega$<br>BETTER,20% |
| 14 | FREQUENCY/Rr V.S<br>OPERATING TEM..                                                                                                                                                                                                                                                 | TEM:-10°C ~ +60°C 、 -20°C ~ +70°C 、 0°C ~ 70°C 'MEASURE POINT: EVERY 10°C<br>DEVIATION. | AS SPECIFICATION                                        |
|    | 频率/电阻在操作温度下之变化测试                                                                                                                                                                                                                                                                    | 温度:-10°C ~ +60°C、 -20°C ~ +70°C<br>0°C ~ 70°C                                           | 依客户要求                                                   |
| 15 | <p>HIGH LOW SHOCK<br/>高低温冲击</p>  <p>SPECIFICATION</p> <p>规格说明: <math>\Delta F/F \leq \pm 5\text{ppm}</math><br/> <math>\Delta F/Rr \leq \pm 10\%</math> or 2 <math>\Omega</math> BETTER,20%</p> |                                                                                         |                                                         |