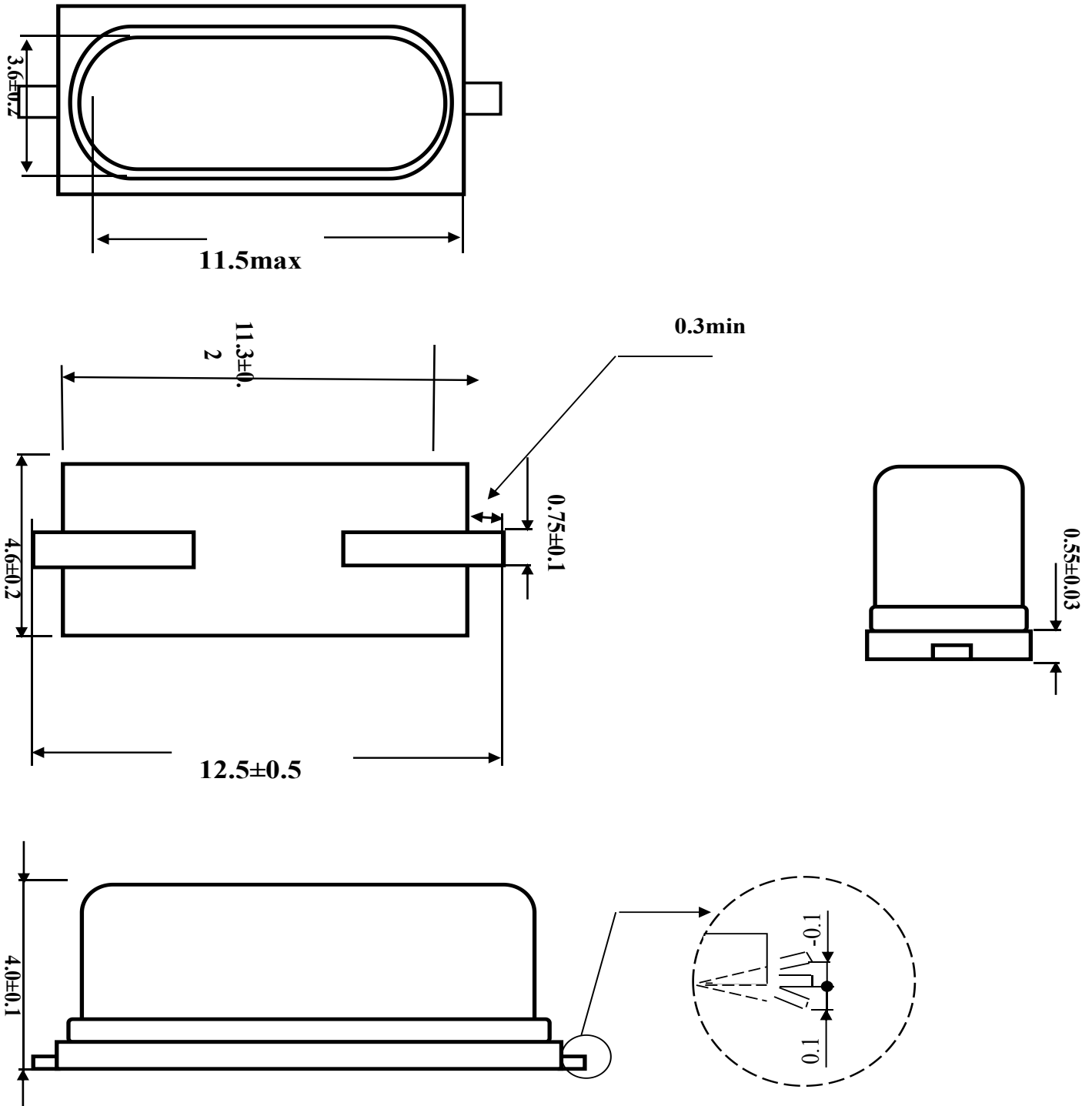


HC-49US/SMD 石英晶振  
12.000MHZ/20PF/±20PPM

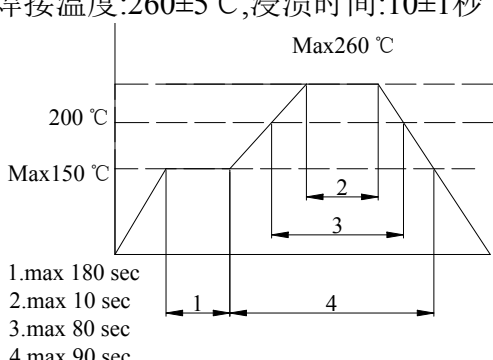
**SPECIFICATION REQUIREMENTS FOR CRYSTAL**
**晶体产品要求**
 电气参数 **Electrical Characteristic:**

|                               |   |
|-------------------------------|---|
| 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)      | 12.000MHZ   |
| 3. Oscillation Mode           | <input checked="" type="checkbox"/> Fundamental    3RD overtone <input type="checkbox"/> 5th overtone   |
| 4. Frequency stability(Tol)   | ± 20ppm(ref. at 25°C)   |
| 5. Operation Temperature      | -20°C to +70°C  |
| 6. Storage Temperature        | -40°C to +85°C  |
| 7. Temperature Characteristic | ± 30ppm   |
| 8. Load Capacitance( CL )     | 20pF  |
| 9. Series Resisitance(ESR)    | ≤ 40 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.              | Measured by S&A 250B  |



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

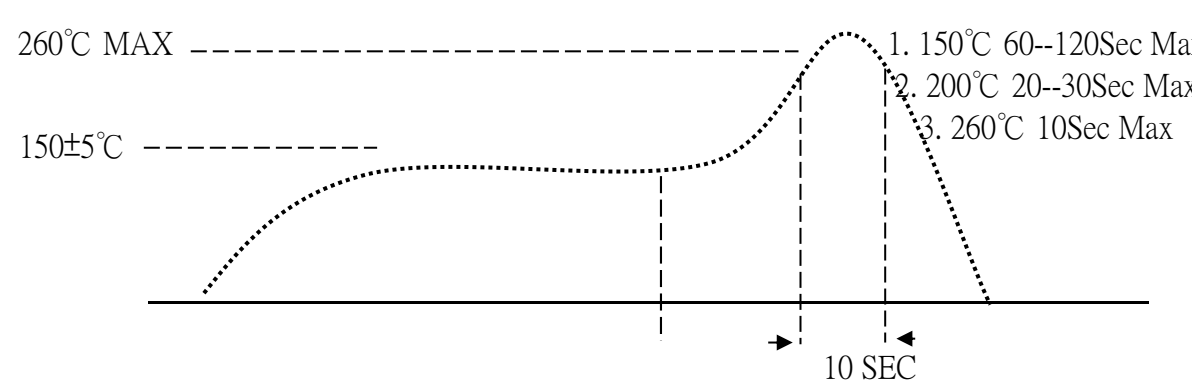
## 可靠性实验规范 RELIABILITY SPECIFICATION

| 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查   |
| 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°C,DIPPING:5±0.5sec.<br>焊接温度:235±5°C,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°C,DIPPING:10±1sec.<br>焊接温度:260±5°C,浸渍时间:10±1秒<br><br>1.max 180 sec<br>2.max 10 sec<br>3.max 80 sec<br>4.max 90 sec | 1.AT LEAST 95% COATING.<br>至少覆盖率为95%<br>2.ΔF/F≤±5ppm<br>ΔF/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   | ΔF/F≤±5ppm<br>ΔF/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  | ΔF/F≤±5ppm<br>ΔF/Rr≤±10% Oor 2Ω BETTER,20%  |
| 7  | AGING TEST<br>老化测试                   | 85°C Dynamic 1000hrs<br>85°C 动态测试1000小时   | ΔF/F≤±5ppm<br>ΔF/Rr≤±10% or 2Ω BETTER,20%   |
| 8  | CCELERATED AGING<br>加速老化测试           | 125°C±3°C, TIME:168 hrs. Dynamic<br>125°C ±3°C, 的动态下:168小时.   | ΔF/F≤±5ppm<br>ΔF/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<br>PH值:6.5~7.2  | △F/F≤±5ppm<br>△F/Rr≤±10% or 2Ω<br>BETTER,20% |
| 10 | HIGH-LOW<br>TEM.STORAGE(STATIC               | HIGH TEM:125°C±2°C,1000hrs LOW TEM:-<br>40°C±3°C,1000hrs 高                           | △F/F≤±5ppm                                   |
|    | 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                                     | △F/Rr≤±10% or 2Ω<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                       | △F/F≤±5ppm<br>△F/Rr≤±10% or 2Ω<br>BETTER,20% |
|    |  | TEM:-10°C±2°C ~65°C±2°C 24hrs 1 cycle'<br>HUM:93±3% 5 cycles                         | △F/F≤±5ppm                                   |
| 12 | TEM. & HUM. CYCLING<br>TEST                  | 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                                       | △F/Rr≤±10% or 2Ω<br>BETTER,20%               |
|    | 温湿度循环测试                                      |  |  |
| 13 | HIGH-LOW TEM.OPERATING<br>TEST               | HIGH TEM:70°C±2°C,2hrs LOW TEM:-20°C<br>±2°C,2hrs 高温:70°C±2                          | △F/F≤±5ppm                                   |
|    | 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  | △F/Rr≤±10% or 2Ω<br>BETTER,20%               |
| 14 | FREQUENCY/Rr V.S<br>OPERATING TEM..          | TEM:-10°C ~+60°C、-20°C ~+70°C、 0°C<br>~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**

HIGH LOW SHOCK  
高低温冲击



260°C MAX

150±5°C

1. 150°C 60--120Sec Max  
2. 200°C 20--30Sec Max  
3. 260°C 10Sec Max

10 SEC

**SPECIFICATION**

规格说明: △F/F≤±5ppm  
△F/Rr≤±10% or 2Ω BETTER,20%

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