

CRYSTAL SEPECIFICATION

Customer : _____

Customer P/N : _____

Part Name : 49SMD 10M 20PF 20PPM

Product Description : <u>49SMD-10.000000M-20PF-20PPM</u>

Issue Date : <u>2017.10.20</u>

CUSTOMER'S APPROVAL

(PLEASE RETURN A COPY WITH APPOVAL

Hubei TKD Electronic Technology Co.,LTD

湖北泰晶电子科技股份有限公司

| APPROVED | DESIGNER |
|----------|----------|
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| REV. | Description of Revision History | Date | Designer | Checked By |
|------|---|-----------------|------------------|---------------------|
| EV. | Description of Revision History New revision | Date 2015-11-25 | Designer DaiWei | Checked By Huangx m |
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CRYSTAL SEPECIFICATION

Description: Quartz Crystal
 Nominal Frequency: 10.000000MHz
 Oscillation Mode: Fundamental

4. Cutting Mode: AT cut

5. Measurement Instrument: S&A 250B(Measured FL)

6. Electrical Characteristics:[1]Operation Conditions:

| Item | Symbol | MIN. | TYP. | MAX. | Unit | Condition |
|-----------------------------|--------|------|------|------|------------|-----------|
| Operating Temperature Range | Topt | -20 | | 75 | $^{\circ}$ | |
| Storage Temperature Range | Tstg | -40 | | 85 | $^{\circ}$ | |
| Load Capacitance | CL | | 20 | | pF | |
| Drive Level | DL | 0.1 | | 100 | uW | |

[2]Frequency Stability:

| Item | Symbol | MIN. | TYP. | MAX. | Unit | Condition |
|----------------------------|--------|------|------|------|------|---------------------------------|
| Tolerance | dF/Fo | -20 | | 20 | ppm | Refer to Center Frequency@25±3℃ |
| Stability Over Temperature | dF/F25 | -30 | | 30 | ppm | Refer to Operating Temperature |
| Aging | dF/F25 | -5 | | 5 | ppm | Per Year |

dF/Fo:Frequency Deviation Refer to Center Frequency

dF/F25:Frequency Deviation Refer to 25℃ Frequency

[3]Electrical Performance:

| Item | Symbol | MIN. | TYP. | MAX. | Unit | Condition |
|------------------------------|--------|------|------|------|------|--------------|
| Equivalent Series Resistance | ESR | | | 30 | Ω | @Series |
| Shunt Capacitance | C0 | | | 7 | pF | |
| Insulation Resistance | IR | 500 | | | ΜΩ | @DC 100 Volt |

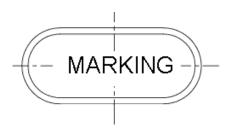
7. Marking:Laser

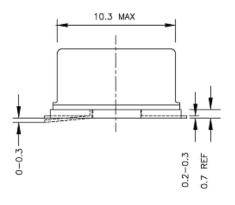
10.00 :Nominal Frequency

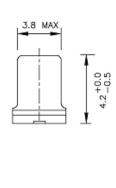
10.00

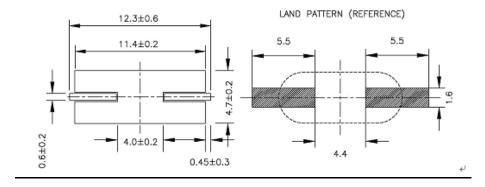


8. Outline drawing (unit: mm)









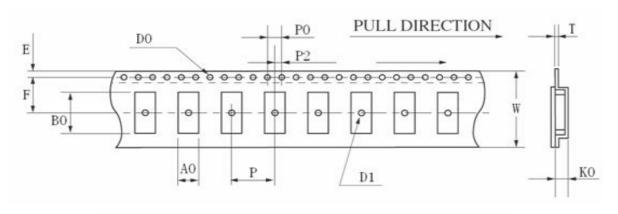


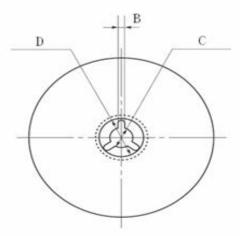
| 9. Reliability | / Specification | n | | | | | |
|------------------|-----------------|---|-------------------------|---------------------------|----------------------------------|--|--|
| , | <u> </u> | | | | Performance | | |
| Test Item | l | Co | ondition of test | | Requirements | | |
| Tensile Strength | The unit's lea | ad wire should withstand | a tensile force applied | to the | There should be no | | |
| Termination | | n the direction of its dra | | abnormalities detected on | | | |
| | maintained as | | | - | the unit | | |
| Solder ability | The lead is | immersed in a 235±5° | 2±0.5 | A new uniform coating of | | | |
| - | seconds. | | | solder shall cover min | | | |
| | l | | | | mun 95% of the surface | | |
| | I | | | | being immersed. | | |
| Vibration | Endurance co | ondition by a frequency sv | weep shall be made. Th | he | (1).Frequency | | |
| | entire freque | ency range from 10HZ t | to 50HZ and return to | | Change:±5ppm | | |
| | 10HZ,shall be | e transverseb in 1min. Am | nplitude(total | | (2).Resistance:±15% | | |
| | excursion):1.5 | 5mm this motion shall be | applied for a period of | 2h | | | |
| | each of 3 mut | tually perpendicular axes | (a total of 6h) | | | | |
| Drop | Form 70cm he | eight 3 times on 3cm har | d wooden floor | | (1).Frequency | | |
| | l | | | | Change:±5ppm | | |
| | | 2 | | | (2).Resistance:±15% | | |
| Shock | | | n of the pulse :6ms | | (1).Frequency | | |
| | | hocks shall be applied in | | utually | • | | |
| | | r axes(a total of 18 shock | • | | (2).Resistance:±15% | | |
| Damp heat | | Il be stored at a temper | | | (1).Frequency | | |
| | Ī | 90%to95% for 48h, the | | | Change:±5ppm | | |
| | | mospheric conditions | for 1 \sim 2h atter | which | (2).Resistance:±15% | | |
| | | t shall be made. | | 2.41 | = | | |
| Dry heat | | Il be stored at a temper | | | (1).Frequency | | |
| | | be subjected to standard | • | s tor | Change:±5ppm | | |
| Cold | | hich measurement shall I | | - than | (2).Resistance:±15% | | |
| Cold | | l be stored at a temperatu | | | (1).Frequency | | |
| | _ | ojected to standard atmos neasurement shall be mad | • | 1~211 | Change:±5ppm (2).Resistance:±15% | | |
| Aging | | l be stored at a temperatu | | than it | Refer to verdict | | |
| Aging | | ected to standard atmosp | | | specification verdict | | |
| | _ | neasurement shall be mad | | Z11 | Specification | | |
| Temperature | | I be subjected to 5 succe | | rature | Refer to verdict | | |
| cycling | | as show in table below, | • | | specification | | |
| J.c9 | | mospheric conditions | | | opcomodator: | | |
| | | t shall be made | VV 1.1.G | | | | |
| | | Temperature | | | | | |
| | 1 -4 | -40℃±3℃ | Duration 30min | | | | |
| | | Standard atmospheric | Within 30s | | | | |
| i | | conditions | | | | | |
| | 3 1 | 100℃±3℃ | 30min | | | | |
| 1 | l | Standard atmospheric | Within 30s | | | | |
| i | | conditions | | | | | |
| | | | | | | | |

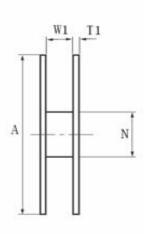


| Test Item | Condition of test | Performance Requirements |
|------------------------------|---|--------------------------------|
| Sealing | The crystal filter unit shall be immersed in a industry alcohol for 5±0.5 minutes then 25±3°C 1~2 Hr before testing | |
| Resistance to soldering heat | PEAK 10S MAX 265 0 2000 1500 25°C to Peak: 360s TIME (Seconds) Total: 420S Reflow soldering cure see the chart. Soldering iron method: Bit temperature: 350°C±10°C | Refer to verdict specification |
| | Application time of soldering iron:5s Max | |









| | (HC-49SMID | 8045 | 7050 | 6035 | 5032 | 4025 | 3225 |
|----|---------------|---------------|------------------|---------------|--------------|-----------------|---------------|
| w | 24.00 ± 0.30 | 16.00 ± 0.05 | 16.00 ± 0.05 | 12.00 ± 0.05 | 12.00 ± 0.05 | 12.00 ± 0.05 | 12.00 ± 0.05 |
| E | 1.75 ± 0.10 | 1.75 ± 0.10 | 1.75 ± 0.10 | 1.75 ± 0.10 | 1.75 ± 0.10 | 1.75 ± 0.10 | 1.75 ± 0.10 |
| F | 11.5 ± 0.10 | 7.5 ± 0.10 | 7.5 ± 0.10 | 5.5 ± 0.10 | 5.5 ± 0.10 | 5.5 ± 0.10 | 5.5 ± 0.10 |
| T | 0.40 ± 0.05 | 0.35 ± 0.05 | 0.35 ± 0.05 | 0.35 ± 0.05 | 0.35 ± 0.05 | 0.35 ± 0.05 | 0.30 ± 0.05 |
| P | 12.00 ± 0.10 | 8.00 ± 0.10 | 8.00 ± 0.10 | 8.00 ± 0.10 | 8.00 ± 0.10 | 8.00 ± 0.10 | 8.00 ± 0.10 |
| P0 | 4.00 ± 0.10 | 4.00 ± 0.10 | 4.00 ± 0.10 | 4.00 ± 0.10 | 4.00 ± 0.10 | 4.00 ± 0.10 | 4.00 ± 0.10 |
| P2 | 2.00 ± 0.10 | 2.00 ± 0.10 | 2.00 ± 0.10 | 2.00 ± 0.10 | 2.00 ± 0.10 | 2.00 ± 0.10 | 2.00 ± 0.10 |
| D0 | ф1.50+0.10 | ф1.50+0.10 | ф1.50+0.10 | ф1.50+0.10 | ф1.50+0.10 | ф1.50+0.10 | ф1.50+0.10 |
| D1 | Ф 1.50МПМ | ф 1.50МПМ | ф1.50 MIN | ф 1.50МПN | ф 1.50MIN | ф 1.50МШМ | Ф 1.50МПМ |
| A0 | 4.60 ± 0.10 | 4.85 ± 0.10 | 5.40 ± 0.10 | 3.90 ± 0.10 | 3.60 ± 0.10 | 2.80 ± 0.10 | 2.85 ± 0.10 |
| K0 | 4.40 ± 0.10 | 1.90 ± 0.10 | 1.80 ± 0.10 | 1.50 ± 0.10 | 1.10 ± 0.10 | 0.90 ± 0.10 | 0.85 ± 0.10 |
| В0 | 14.20 ± 0.15 | 8.60 ± 0.15 | 7.40 ± 0.10 | 6.40 ± 0.10 | 5.40 ± 0.10 | 4.30 ± 0.10 | 3.55 ± 0.10 |
| A | ф330 ± 1.0 | ф 178 ± 2.0 | Φ 178 ± 2.0 | ф 178 ± 2.0 | ф 178 ± 2.0 | ф 178 ± 2.0 | ф 178 ± 2.0 |
| В | 2.30 ± 0.20 | 2.00 ± 0.50 | 2.00 ± 0.50 | 2.00 ± 0.50 | 2.00 ± 0.50 | 2.00 ± 0.50 | 2.00 ± 0.50 |
| С | ф 13.5 ± 0.20 | ф 13.2 ± 0.20 | Φ13.2±0.20 | ф 13.2 ± 0.20 | ф13.2±0.20 | φ 13.2 ± 0.20 | φ 13.2 ± 0.20 |
| D | Ф21.5±0.20 | ф20.0±0.50 | Ф20.0 ± 0.50 | Ф20.0 ± 0.50 | ф20.0±0.50 | Φ20.0 ± 0.50 | ф20.0±0.50 |
| И | ф 100.0 ± 0.5 | Φ60.5 ± 1.0 | Φ60.5 ± 1.0 | Φ60.5 ± 1.0 | Φ60.5 ± 1.0 | Φ60.5 ± 1.0 | Φ60.5 ± 1.0 |
| W1 | 24.5 ± 0.20 | 16.5 ± 0.20 | 16.5 ± 0.20 | 12.5 ± 0.20 | 12.5 ± 0.20 | 12.5 ± 0.20 | 12.5 ± 0.20 |
| T1 | 2.30 ± 0.20 | 1.80 ± 0.20 | 1.80 ± 0.20 | 1.80 ± 0.20 | 1.80 ± 0.20 | 1.80 ± 0.20 | 1.80 ± 0.20 |