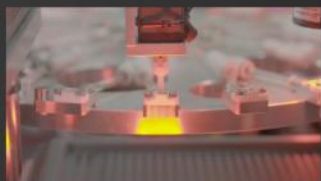


**SCTF<sup>®</sup>**



# 32.768KHz 石英晶体

值得信赖的专业频率控制元件制造商



[www.sctf-crystal.com](http://www.sctf-crystal.com)

值得信赖的专业频率控制元件制造商



## 企业简介

Company introduction

Since 2003

专业研发、生产、销售系列石英晶体及振荡器产品

推行国际标准质量管理体系：ISO9001:2015、ISO14001: 2015、IATF16949: 2016

国家高新技术企业、专精特新企业、创新型中小型企业

符合ROHS、REACH标准

以客户为中心 视质量为生命

提供晶振及周边电路运用解决方案



**SCTF** 深圳市星通时频电子有限公司  
SHENZHEN SCTF ELECTRONICS CO.,LTD

[www.sctf-crystal.com](http://www.sctf-crystal.com)

0755-86097105

[sales@sctf-crystal.com](mailto:sales@sctf-crystal.com)

# 产品外观

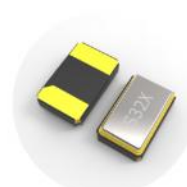
Product Appearance



■ TF308  
3.0×8.0mm



■ TF206  
2.0×6.0mm



■ TF1610  
1.6×1.0mm



■ TF2012/TF2012R  
2.0×1.2mm



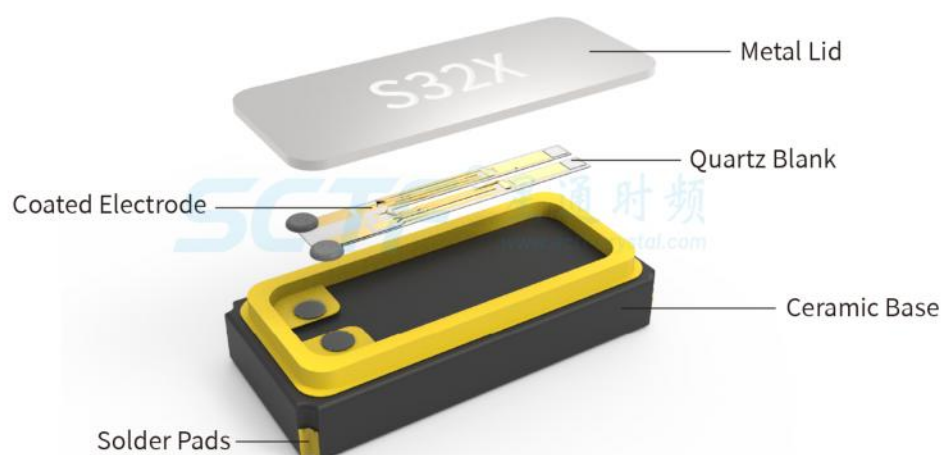
■ TF7015  
7.0×1.5mm



■ TF3215/3215R  
3.2×1.5mm

# 产品结构

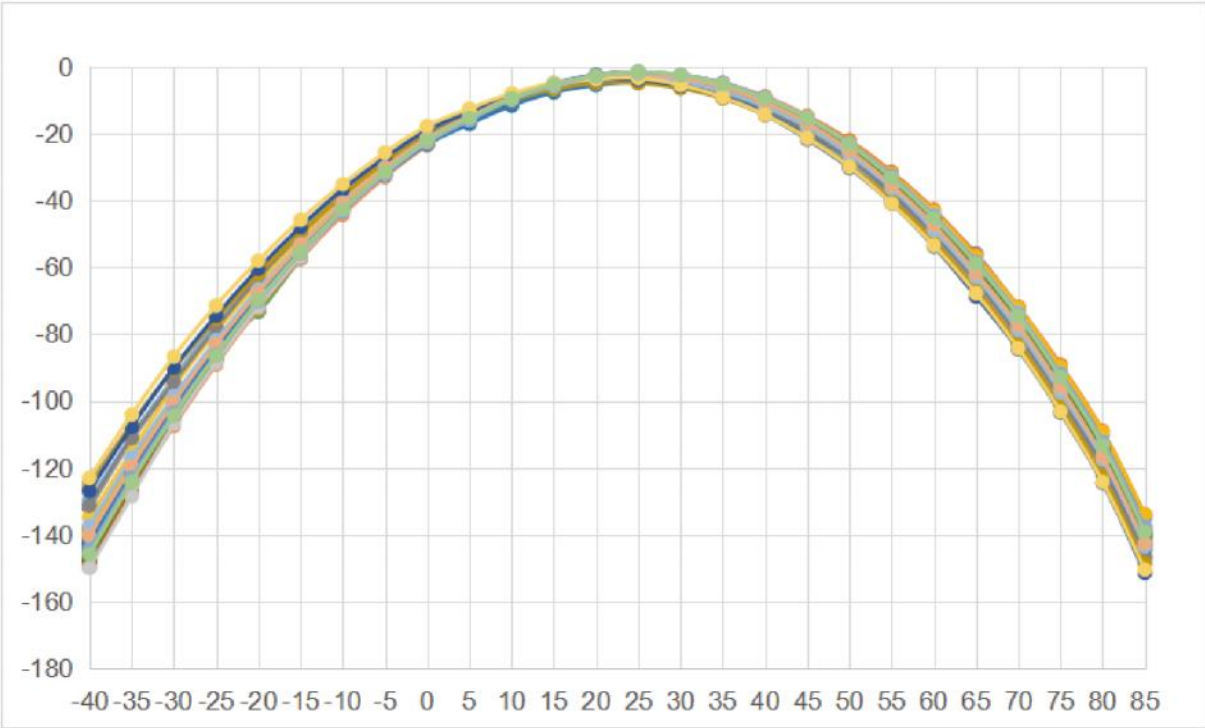
Product Structure





# 频率温度特性曲线

Frequency Temperature Characteristics



# 零部件编码示意

Options and Part Identification

Options and Part Identification : Example **SXTF3215R32768A20F**

| Company      | Ceramic Package      | Effective Resistance      | Frequency Code [KHZ] | Load Capacitance      | Frequency Tolerance      | Operating Temperature      |
|--------------|----------------------|---------------------------|----------------------|-----------------------|--------------------------|----------------------------|
| <b>SX</b>    | <b>TF3215</b>        | <b>R</b>                  | <b>32768</b>         | <b>A</b>              | <b>20</b>                | <b>F</b>                   |
| Code Company |                      | Code Effective Resistance | Frequency            | Code Load Capacitance | Code Frequency Tolerance | Code Operating Temperature |
| SX SCTF      |                      | Blank Standard            | 32.768               | A 12.5pF              | 10 ±10ppm                | E -20°C ~ +70°C            |
|              |                      | R 50kΩ max.               |                      | G 9pF                 | 20 ±20ppm                | F -40°C ~ +85°C            |
|              |                      |                           |                      | C 7pF                 |                          |                            |
|              |                      |                           |                      | D 6pF                 |                          |                            |
|              | Code Ceramic Package |                           |                      |                       |                          |                            |
|              | TF1610 1.6×1.0×0.5mm |                           |                      |                       |                          |                            |
|              | TF2012 2.0×1.2×0.6mm |                           |                      |                       |                          |                            |
|              | TF3215 3.2×1.5×0.8mm |                           |                      |                       |                          |                            |
|              | TF7015 7.0×1.5×1.4mm |                           |                      |                       |                          |                            |
|              | TF206 Φ2.0×6.0 mm    |                           |                      |                       |                          |                            |
|              | TF308 Φ3.0×8.0 mm    |                           |                      |                       |                          |                            |

If you have other parameter requirements, you can contact **SCTF** at any time.

# 产品选型指南

Product Selection Guide

| Item<br>Series | Size [mm] |     | Nominal<br>Frequency | Load Capacitance            | Frequency Tolerance<br>[@25°C] | ESR<br>[max.] | Operating<br>Temperature |
|----------------|-----------|-----|----------------------|-----------------------------|--------------------------------|---------------|--------------------------|
|                | L         | W   |                      |                             |                                |               |                          |
| TF1610         | 1.6       | 1.0 | 32.768KHz            | 6pF<br>7pF<br>9pF<br>12.5pF | ±10ppm<br>±20ppm               | 90KΩ          | -40℃～+85℃                |
| TF2012         | 2.0       | 1.2 |                      |                             |                                | 80KΩ          |                          |
| TF2012R        |           |     |                      |                             |                                | 50KΩ          |                          |
| TF3215         | 3.2       | 1.5 |                      |                             |                                | 70KΩ          |                          |
| TF3215R        |           |     |                      |                             |                                | 50KΩ          |                          |
| TF7015         | 7.0       | 1.5 |                      |                             |                                | 65KΩ          |                          |
| TF206          | Φ 2.0     | 6   |                      |                             |                                | 30KΩ          | -10℃～+60℃                |
| TF308          | Φ 3.0     | 8   |                      |                             |                                |               | -20℃～+70℃                |

若需要更详细的资料请查询详细规格书或和我们的技术人员联系。

1. 选择需要的封装规格及产品系列：3.2×1.5mm; TF3215 Series
2. 选择需要的频率：32.768KHz
3. 确定负载电容值 (CL)：12.5pF
4. 选择需要的精度：±20ppm
5. 选择需要的工作温度范围：-40°C ~ +85°C
- 您需要的产品是：TF3215 Series 32.768KHz 12.5pF ±20ppm -40~+85°C

## TF1610 Series

## 1.6 x 1.0 mm TUNING FORK Crystal

### Feature

- Ultra Miniature Ceramic surface mount with Metal Lid
- Package Size: 1.6 x 1.0 x 0.5mm max
- Low Aging, Low Power Consumption, high reliability characteristics
- RoHS Compliant / Pb Free

### Applications

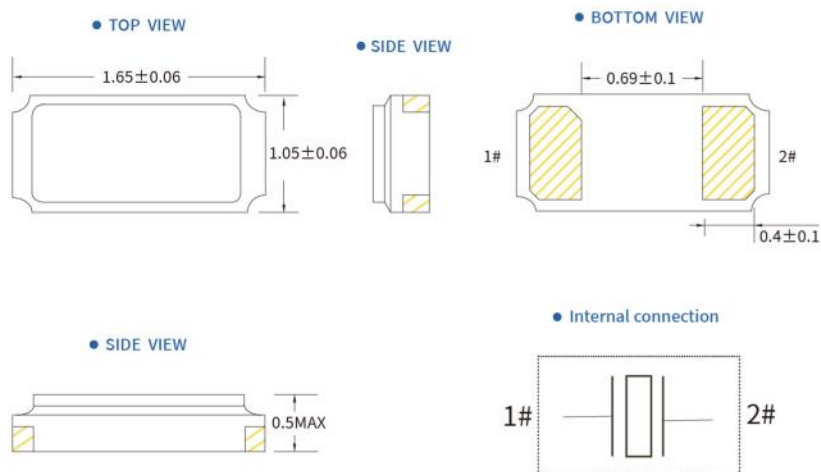
- Real Time Clock
- Portable Electronics
- Smart Meters
- Communication Electronics
- IoT Devices



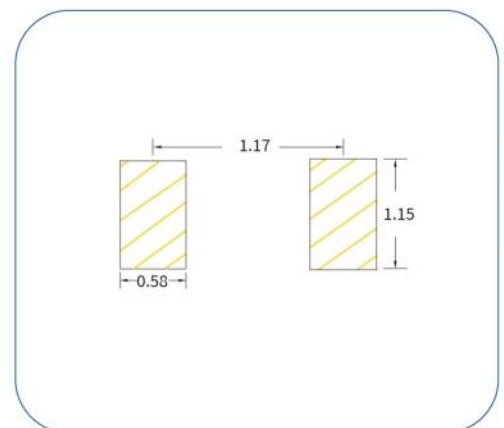
### Electrical Specifications

| Item                         | Symb.            | Electrical spec.                  | Notes                                       |
|------------------------------|------------------|-----------------------------------|---------------------------------------------|
| Nominal Frequency            | Freq.            | 32.768KHz                         |                                             |
| Operating Temperature        | T <sub>use</sub> | -40°C~+85°C                       |                                             |
| Storage Temperature Range    | T <sub>stg</sub> | -55°C~+125°C                      |                                             |
| Oscillation Mode             |                  | Fundamental                       |                                             |
| Frequency Tolerance          | f <sub>tol</sub> | ±10ppm / ±20ppm                   | at 25°C±3°C                                 |
| Turnover Temperature         | T <sub>i</sub>   | +25°C±5°C                         |                                             |
| Parabolic curvature constant | B                | -0.042ppm/(Δ°C) <sup>2</sup> max. | Over Operating Temp. Range (Reference 25°C) |
| Drive Level                  | DL               | 0.5 μW Max.                       |                                             |
| Load Capacitance             | CL               | 6pF;7pF;9pF;12.5pF                |                                             |
| Effective Resistance         | RR               | 90kΩ max.                         |                                             |
| Aging                        | f <sub>age</sub> | ±3 ppm Max.                       | 1st.Year at 25°C                            |

### Dimensions (UNIT:mm)



### Solder pad layout (UNIT:mm)



## TF2012 Series

## 2.0 x 1.2 mm TUNING FORK Crystal

### Feature

- Miniature Ceramic surface mount with Metal Lid
- Package Size: 2.05 x 1.2 x 0.6mm max.
- Low Aging, Low Power Consumption, high reliability characteristics
- RoHS Compliant / Pb Free

### Applications

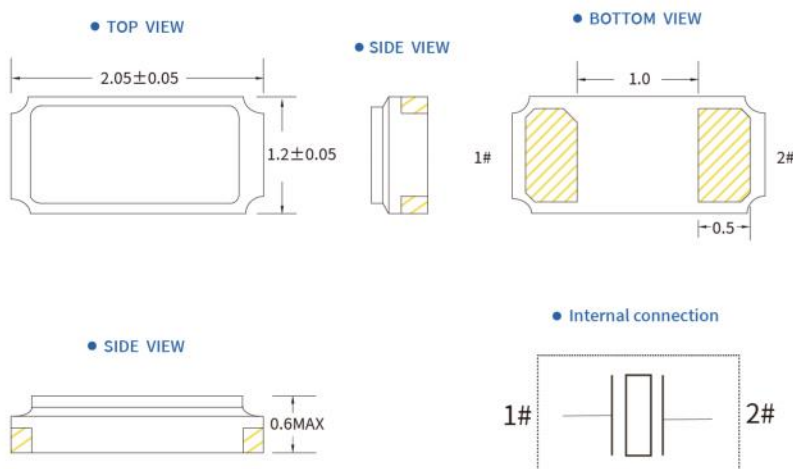
- Real Time Clock
- Portable Electronics
- Smart Meters
- Communication Electronics
- IoT Devices



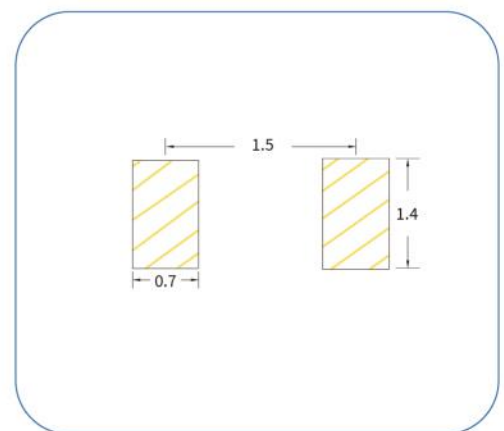
### Electrical Specifications

| Item                         | Symb.            | Electrical spec.                  |           | Notes                                       |
|------------------------------|------------------|-----------------------------------|-----------|---------------------------------------------|
|                              |                  | TF2012                            | TF2012R   |                                             |
| Nominal Frequency            | Freq.            | 32.768KHz                         |           |                                             |
| Operating Temperature        | T <sub>use</sub> | -40°C~+85°C                       |           |                                             |
| Storage Temperature Range    | T <sub>stg</sub> | -55°C~+125°C                      |           |                                             |
| Oscillation Mode             |                  | Fundamental                       |           |                                             |
| Frequency Tolerance          | f <sub>tol</sub> | ±10ppm / ±20ppm                   |           | at 25°C±3°C                                 |
| Turnover Temperature         | T <sub>i</sub>   | +25°C±5°C                         |           |                                             |
| Parabolic curvature constant | B                | -0.042ppm/(Δ°C) <sup>2</sup> max. |           | Over Operating Temp. Range (Reference 25°C) |
| Drive Level                  | DL               | 0.5 μW Max.                       |           |                                             |
| Load Capacitance             | CL               | 6pF; 7pF; 9pF; 12.5pF             |           |                                             |
| Effective Resistance         | RR               | 80kΩ max.                         | 50kΩ max. |                                             |
| Aging                        | f <sub>age</sub> | ±3 ppm Max.                       |           | 1st. Year at 25°C                           |

### Dimensions (UNIT:mm)



### Solder pad layout (UNIT:mm)





## TF3215 Series

## 3.2 x 1.5 mm TUNING FORK Crystal

### Feature

- Miniature Ceramic surface mount with Metal Lid
- Package Size: 3.2 x 1.5 x 0.8mm max.
- Low Aging, Low Power Consumption, High reliability characteristics
- RoHS Compliant / Pb Free

### Applications

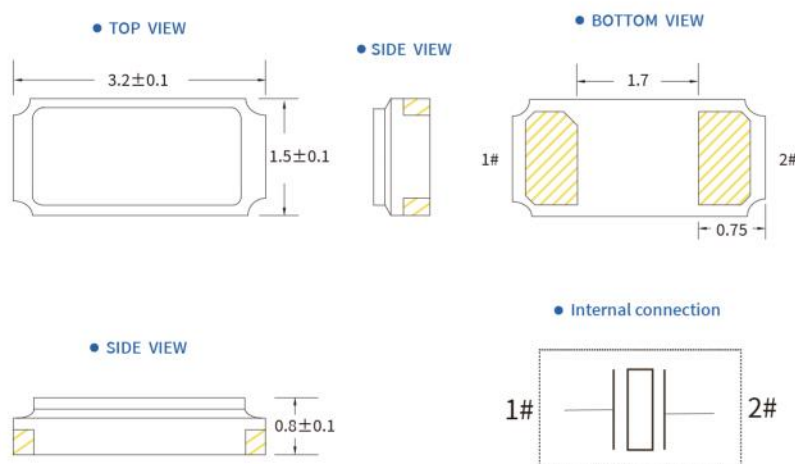
- Real Time Clock
- Portable Electronics
- Smart Meters
- Communication Electronics
- IoT Devices



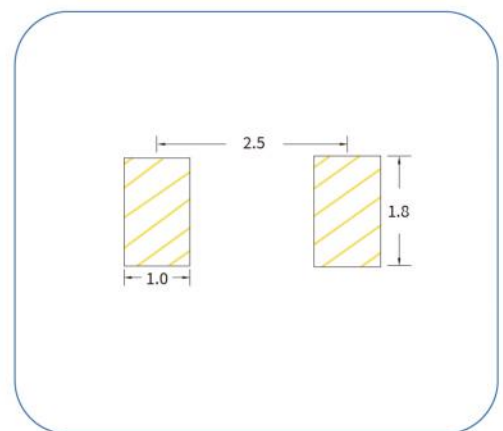
### Electrical Specifications

| Item                         | Symb.            | Electrical spec.                  |           | Notes                                       |
|------------------------------|------------------|-----------------------------------|-----------|---------------------------------------------|
|                              |                  | TF3215                            | TF3215R   |                                             |
| Nominal Frequency            | Freq.            | 32.768KHz                         |           |                                             |
| Operating Temperature        | T <sub>use</sub> | -40°C~+85°C                       |           |                                             |
| Storage Temperature Range    | T <sub>stg</sub> | -55°C~+125°C                      |           |                                             |
| Oscillation Mode             |                  | Fundamental                       |           |                                             |
| Frequency Tolerance          | f <sub>tol</sub> | ±10ppm / ±20ppm                   |           | at 25°C±3°C                                 |
| Turnover Temperature         | T <sub>i</sub>   | +25°C±5°C                         |           |                                             |
| Parabolic curvature constant | B                | -0.042ppm/(Δ°C) <sup>2</sup> max. |           | Over Operating Temp. Range (Reference 25°C) |
| Drive Level                  | DL               | 0.5 μW Max.                       |           |                                             |
| Load Capacitance             | CL               | 6pF;7pF;9pF;12.5pF                |           |                                             |
| Effective Resistance         | RR               | 70kΩ max.                         | 50kΩ max. |                                             |
| Aging                        | f <sub>age</sub> | ±3 ppm Max.                       |           | 1st.Year at 25°C                            |

### Dimensions (UNIT:mm)



### Solder pad layout (UNIT:mm)





# TF7015 Series

## 7.0 x 1.5 mm TUNING FORK Crystal

### Feature

- Ceramic surface mount
- Package Size: 7.0 x 1.5 x 1.4mm max
- Low Aging, Low Power Consumption, high reliability characteristics
- RoHS Compliant / Pb Free

### Applications

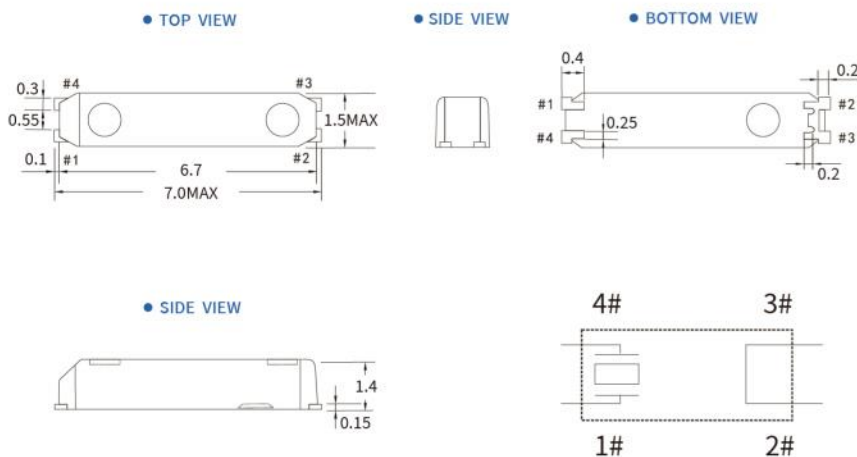
- Real Time Clock
- Portable Electronics
- Smart Meters
- Communication Electronics
- IoT Devices



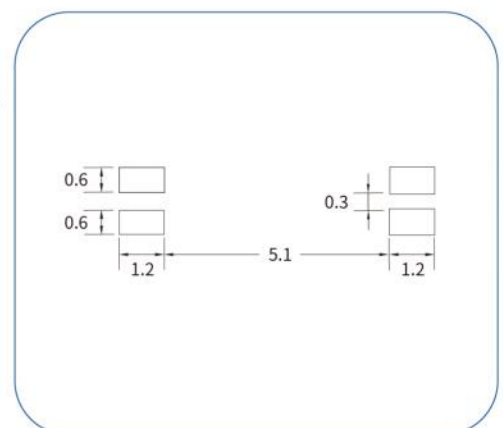
### Electrical Specifications

| Item                         | Symb.            | Electrical spec.                  | Notes                                       |
|------------------------------|------------------|-----------------------------------|---------------------------------------------|
| Nominal Frequency            | Freq.            | 32.768KHz                         |                                             |
| Operating Temperature        | T <sub>use</sub> | -40°C~+85°C                       |                                             |
| Storage Temperature Range    | T <sub>stg</sub> | -55°C~+125°C                      |                                             |
| Oscillation Mode             |                  | Fundamental                       |                                             |
| Frequency Tolerance          | f <sub>tol</sub> | ±10ppm / ±20ppm                   | at 25°C±3°C                                 |
| Turnover Temperature         | Ti               | +25°C±5°C                         |                                             |
| Parabolic curvature constant | B                | -0.042ppm/(Δ°C) <sup>2</sup> max. | Over Operating Temp. Range (Reference 25°C) |
| Drive Level                  | DL               | 0.5 μW Max.                       |                                             |
| Load Capacitance             | CL               | 7pF;9pF;12.5pF                    |                                             |
| Effective Resistance         | RR               | 65kΩ max.                         |                                             |
| Aging                        | f <sub>age</sub> | ±3 ppm Max.                       | 1st.Year at 25°C                            |

### Dimensions (UNIT:mm)



### Solder pad layout (UNIT:mm)



Notes:  
 (1) Do not connect 2# and 3# to external device.  
 (2) The metal case inside of the molding compound may be exposed on the top or bottom of this product. This purely cosmetic and does not have any effect on quality reliability or electrical specs.

## TF206/TF308 Series

Φ2.0 x 6.0 mm Φ3.0 x 8.0 mm  
TUNING FORK Crystal

### Feature

- Miniature Cylindrical Tuning Fork Crystals
- Package Size: Φ2.0 x 6.0 mm/Φ3.0 x 8.0 mm
- Low Aging, Low Power Consumption, High Shock
- RoHS Compliant / Pb Free

### Applications

- Real Time Clock
- Consumer Devices
- Portable Electronics
- Time Display Devices



### Electrical Specifications

| Item                         | Symb.            | Electrical spec.                  | Notes                                       |
|------------------------------|------------------|-----------------------------------|---------------------------------------------|
| Nominal Frequency            | Freq.            | 32.768KHz                         |                                             |
| Operating Temperature        | T <sub>use</sub> | -10°C~+60°C/-20°C~+70°C           |                                             |
| Storage Temperature Range    | T <sub>stg</sub> | -40°C~+85°C                       |                                             |
| Oscillation Mode             |                  | Fundamental                       |                                             |
| Frequency Tolerance          | f <sub>tol</sub> | ±10ppm / ±20ppm                   | at 25°C±3°C                                 |
| Turnover Temperature         | T <sub>i</sub>   | +25°C±5°C                         |                                             |
| Parabolic curvature constant | B                | -0.042ppm/(Δ°C) <sup>2</sup> max. | Over Operating Temp. Range (Reference 25°C) |
| Drive Level                  | DL               | 1 μW Max.                         |                                             |
| Load Capacitance             | CL               | 6pF;7pF;9pF;12.5pF                |                                             |
| Effective Resistance         | RR               | 30kΩ max.                         |                                             |
| Aging                        | f <sub>age</sub> | ±3 ppm Max.                       | 1st.Year at 25°C                            |

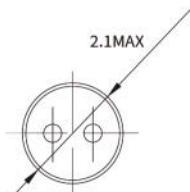
### Dimensions (UNIT:mm)

#### • TF206 Series

##### • SIDE VIEW



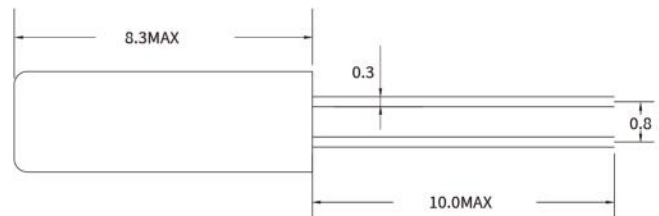
##### • BOTTOM VIEW



### Dimensions (UNIT:mm)

#### • TF308 Series

##### • SIDE VIEW



##### • BOTTOM VIEW

