

## Surface Mount Type

|                                  |                                  |                                  |
|----------------------------------|----------------------------------|----------------------------------|
| <b>1N</b><br>[ 2.0×1.6×0.70 mm ] | <b>2N</b><br>[ 2.5×2.0×0.80 mm ] | <b>3N</b><br>[ 3.2×2.5×1.00 mm ] |
|----------------------------------|----------------------------------|----------------------------------|

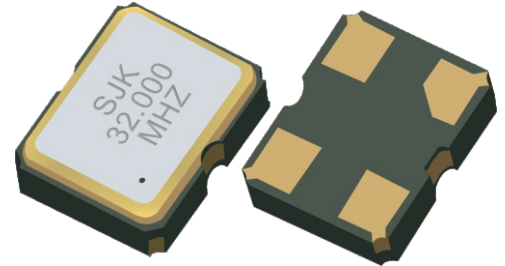
|               |
|---------------|
| <b>Output</b> |
| <b>CMOS</b>   |

|                  |
|------------------|
| Supply Voltage   |
| <b>1.8V~3.3V</b> |

|                       |
|-----------------------|
| Frequency Range       |
| <b>32 kHz~220 MHz</b> |

## Features

- Ultra smallest size SMD crystal oscillator with 2.0×1.6 (2016), 2.5×2.0 (2520), 3.2×2.5 (3225).
- Simple Package Crystal Oscillator (SPXO)
- CMOS output, frequency range from 32.768 kHz to 220 MHz
- Low voltage operation and low current consumption
- RoHS Compliant
- Automatic mount and re-flow soldering
- Tri-state available
- Applications: Ethernet, Fibre channel, Telecommunications, Graphics, HDTV, Radio communications, and more



## Standard Specifications

| Item / Type                         | <b>1N</b> (SMD 2016 SPXO)   | <b>2N</b> (SMD 2520 SPXO) | <b>3N</b> (SMD 3225 SPXO) |
|-------------------------------------|-----------------------------|---------------------------|---------------------------|
| Dimensions                          | 2.0×1.6×0.70 mm             | 2.5×2.0×0.80 mm           | 3.2×2.5×1.00 mm           |
| Output                              | CMOS                        |                           |                           |
| Output load                         | 15pF, or specify            |                           |                           |
| Output frequency range              | 1 MHz~220 MHz               | 32.768 kHz~220 MHz        | 32.768 kHz~220 MHz        |
| Supply voltage                      | 1.8 V~3.3 V                 |                           |                           |
| Frequency tolerance (All condition) | ±25 ppm, ±50 ppm, ±100 ppm  |                           |                           |
| Operating temperature               | -20~+70°C, -40~+85°C        |                           |                           |
| Supply consumption                  | 7mA max. (@1.8V)            | 10mA max. (@2.5V)         | 15mA max. (@3.3V)         |
| Stand-by current                    | 2.1µA max. (@1.8V)          | 2.5µA max. (@2.5V)        | 2.7µA max. (@3.3V)        |
| Symmetry                            | 45 % to 55 %                |                           |                           |
| Output voltage Voh (min.)           | 90% Vcc min. /Vcc-0.4V min. |                           |                           |
| Output voltage Vol (max.)           | 10% Vcc max. /0.4V max.     |                           |                           |
| Input voltage Vih (min.)            | 80% Vcc min.                |                           |                           |
| Input voltage Vil (max.)            | 20% Vcc max.                |                           |                           |
| Rise time / Fall time               | 3ns max.                    |                           |                           |
| Start-up time                       | 3ms max.                    |                           |                           |
| Storage temperature                 | -55~+125°C                  |                           |                           |
| Aging                               | ±3ppm /year max.            |                           |                           |

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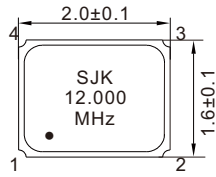
|               |
|---------------|
| <b>Output</b> |
| <b>CMOS</b>   |

|                       |
|-----------------------|
| <b>Supply Voltage</b> |
| <b>1.8V~3.3V</b>      |

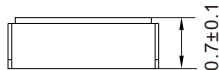
|                        |
|------------------------|
| <b>Frequency Range</b> |
| <b>32 kHz~220 MHz</b>  |

## Outline Dimensions (Unit: mm)

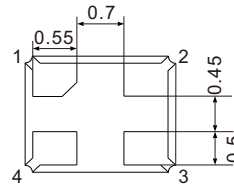
### 1N (SMD 2016 SPXO)



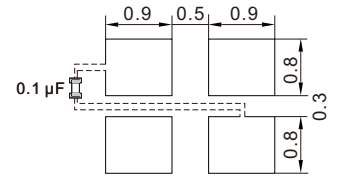
Top View



Side View

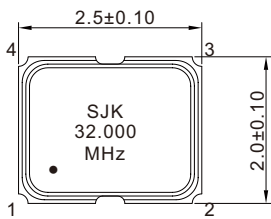


Bottom View

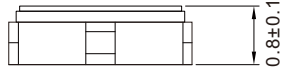


Footprint (Recommender)

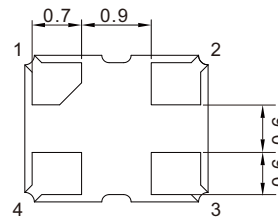
### 2N (SMD 2520 SPXO)



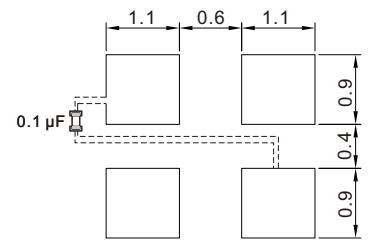
Top View



Side View

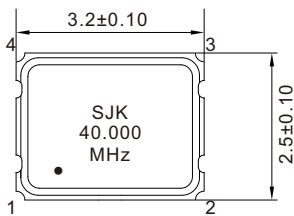


Bottom View

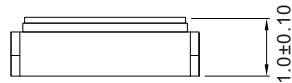


Footprint (Recommender)

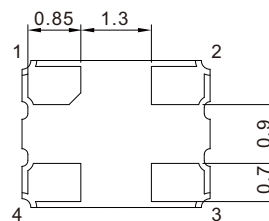
### 3N (SMD 3225 SPXO)



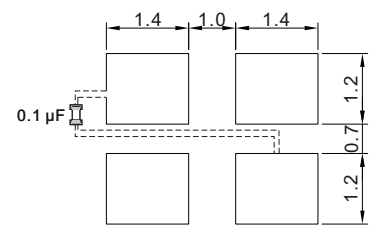
Top View



Side View



Bottom View



Footprint (Recommender)

## Pin Map

| Pin | Connection      | Function                 |                    |                             |
|-----|-----------------|--------------------------|--------------------|-----------------------------|
|     |                 | $\overline{ST}$ function | Oscillator circuit | Output                      |
| 1   | $\overline{ST}$ | High or "open"           | Oscillation        | Specified frequency: Enable |
|     |                 | LOW                      | Oscillator stop    | High impedance: Disable     |
|     |                 | Ground                   |                    |                             |
| 2   | GND             | Ground                   |                    |                             |
| 3   | OUT             | Clock output             |                    |                             |
| 4   | Vcc             | Power supply             |                    |                             |