

O E Type

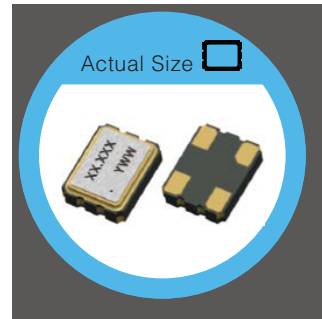
3.2 x 2.5 mm SMD Crystal Oscillator

FEATURE

- Typical 3.2 x 2.5 x 0.95mm Ceramic SMD Package
- Tight Symmetry (45 to 55%) Available
- Operation Voltage: 1.8V, 2.5V, 3.3V
- Tri-State Enable/Disable

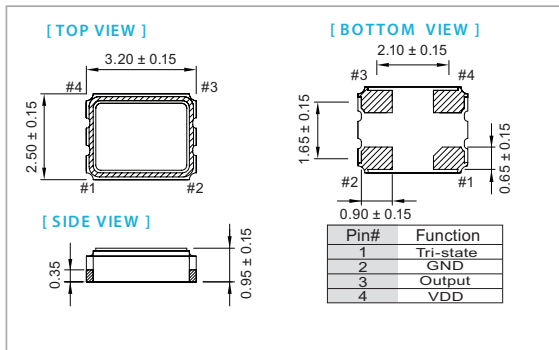
TYPICAL APPLICATION

- WLAN/WiMAX
- Mobile Phone
- DSC, Set-Top Box, HDTV

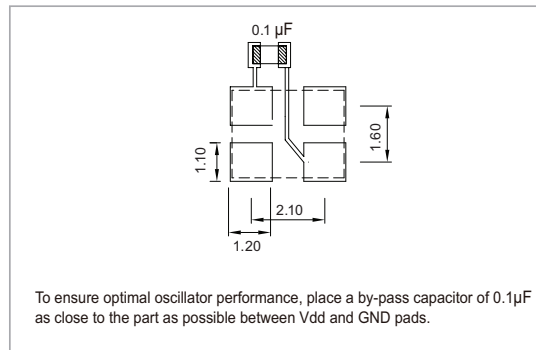


RoHS Compliant

DIMENSION (mm)



SOLDER PAD LAYOUT (mm)



ELECTRICAL SPECIFICATION

| Parameter | 3.3V | | 2.5V | | 1.8V | | Unit | | |
|--|---|---------------------|---------------------|---------------------|---------------------|---------------------|------|------|------|
| | Min. | Max. | Min. | Max. | Min. | Max. | | | |
| Supply Voltage Variation (V _{DD}) | V _{DD} -5% | V _{DD} +5% | V _{DD} -5% | V _{DD} +5% | V _{DD} -5% | V _{DD} +5% | V | | |
| Frequency Range | 1.25 | 125 | 1.25 | 125 | 1.25 | 125 | MHz | | |
| Standard Frequency | 24, 26, 30, 40 | | | | | | MHz | | |
| Supply Current | At 15pF Load | | - | 15 | - | 10 | - | 7 | mA |
| | No Load Condition, 1.25MHz ≤ Fo < 10MHz | | - | 1.5 | - | 1.5 | - | 1.2 | mA |
| | No Load Condition, 10MHz ≤ Fo < 20MHz | | - | 2 | - | 2 | - | 1.5 | mA |
| | No Load Condition, 20MHz ≤ Fo < 80MHz | | - | 3 | - | 2.5 | - | 1.5 | mA |
| | No Load Condition, 80MHz ≤ Fo < 125MHz | | - | 8 | - | 7 | - | 5 | mA |
| Duty Cycle | 45 | 55 | 45 | 55 | 45 | 55 | % | | |
| Output Level | Output High | | 2.97 | - | 2.25 | - | 1.62 | - | V |
| | Output Low | | - | 0.33 | - | 0.25 | - | 0.18 | V |
| Transition Time: Rise / Fall Time ⁺ | 1.25MHz ≤ Fo < 10MHz | | - | 3 | - | 4 | - | 5 | nSec |
| | 10MHz ≤ Fo < 20MHz | | - | 3 | - | 3 | - | 4 | nSec |
| | 20MHz ≤ Fo < 80MHz | | - | 3 | - | 3 | - | 4 | nSec |
| | 80MHz ≤ Fo < 125MHz | | - | 3 | - | 3 | - | 4 | nSec |
| Startup Time | - | 2 | - | 2 | - | 2 | - | 2 | mSec |
| Tri-State (Input to Pin 1) | Enable (High Voltage or Floating) | | 2.31 | - | 1.75 | - | 1.26 | - | V |
| | Disable (Low Voltage or GND) | | - | 0.99 | - | 0.75 | - | 0.54 | V |
| Output Loading | 15 | | 15 | | 15 | | pF | | |
| Stand by Current (@-40°C to 85°C) | - | 10 | - | 10 | - | 10 | µA | | |
| Stand by Current (@-40°C to 125°C) | - | 20 | - | 20 | - | 20 | µA | | |
| Period Jitter (Pk-Pk) | - | 40 | - | 40 | - | 40 | pSec | | |
| RMS Phase Jitter (12kHz to 20MHz) | - | 1 | - | 1 | - | 1 | pSec | | |
| Aging (@ 25°C, 1 st Year) | - | ±3 | - | ±3 | - | ±3 | ppm | | |
| Storage Temp. Range | -55 | +125 | -55 | +125 | -55 | +125 | °C | | |

Standard frequencies are frequencies which the crystal has been designed and does not imply a stock position
⁺Transition times are measured between 10% and 90% of V_{DD}, within output load of 15pF

FREQ. STABILITY vs. TEMP. RANGE

| Temp. (°C) | ppm | | |
|------------|-----|-----|-----|
| | ±20 | ±25 | ±50 |
| -10~+60 | ○ | ○ | ○ |
| -20~+70 | △ | ○ | ○ |
| -40~+85 | × | ○ | ○ |

* ○: Available △: Conditional X: Not available

*Inclusive of calibration @ 25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration load variation

Note: not all combination of options are available. Other specifications may be available upon request.

32.768kHz Series

OE / OC Type

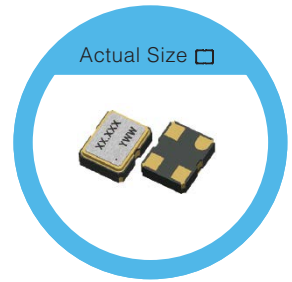
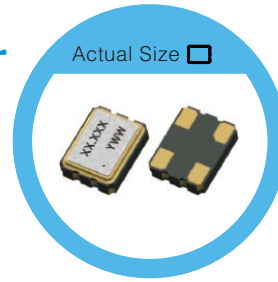
3.2 x 2.5 / 2.5 x 2.0 mm SMD Oscillator

FEATURE

- Tight symmetry (45 to 55%) available.
- Operation voltage: 1.8V, 2.5V, 3.3V
- Tri-state enable/disable
- Built-in ASIC enables reduction of current consumption.

TYPICAL APPLICATION

- Typically used for real time clock application.
- Mobile Phone
- DSC, Set-top Box, HDTV
- Car navigation systems.



RoHS Compliant

DIMENSION (mm)

SOLDER PAD LAYOUT (mm)

| <p>[TOP VIEW]</p> <p>[SIDE VIEW]</p> | <p>[BOTTOM VIEW]</p> <table border="1"> <thead> <tr> <th>Pin#</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Tri-state</td> </tr> <tr> <td>2</td> <td>GND</td> </tr> <tr> <td>3</td> <td>Output</td> </tr> <tr> <td>4</td> <td>VDD</td> </tr> </tbody> </table> | Pin# | Function | 1 | Tri-state | 2 | GND | 3 | Output | 4 | VDD | <p>To ensure optimal oscillator performance, place a by-pass capacitor of 0.1μF as close to the part as possible between Vdd and GND pads.</p> |
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| 4 | VDD | | | | | | | | | | | |

ELECTRICAL SPECIFICATION

| Parameter | 3.3V | | 2.5V | | 1.8V | | Unit |
|-------------------------------------|---------|---------|---------|---------|---------|---------|------|
| | Min. | Max. | Min. | Max. | Min. | Max. | |
| Supply Voltage Variation (VDD) | VDD-10% | VDD+10% | VDD-10% | VDD+10% | VDD-10% | VDD+10% | V |
| Supply Current (@ 15pF load) | - | 120 | - | 120 | - | 120 | uA |
| Supply Current (@ no load) | - | 80 | - | 80 | - | 80 | uA |
| Duty Cycle | 45 | 55 | 45 | 55 | 45 | 55 | % |
| Output Level (CMOS) | 2.97 | - | 2.25 | - | 1.62 | - | V |
| Output High (Logic "1") | - | 0.33 | - | 0.25 | - | 0.18 | |
| Output Low (Logic "0") | - | 0.33 | - | 0.25 | - | 0.18 | |
| Transition Time: Rise/Fall Time+ | - | 50 | - | 50 | - | 50 | nSec |
| Start Time | - | 2 | - | 2 | - | 2 | mSec |
| Tri-State (Input to Pin 1) | 2.31 | - | 1.75 | - | 1.26 | - | V |
| Enable (High voltage or floating) | - | 0.99 | - | 0.75 | - | 0.54 | |
| Disable (Low voltage or GND) | - | 0.99 | - | 0.75 | - | 0.54 | |
| Aging (@ 25°C 1 st year) | - | ±3 | - | ±3 | - | ±3 | ppm |
| Storage Temp. Range | -55 | 125 | -55 | 125 | -55 | 125 | °C |

Standard frequencies are frequencies which the crystal has been designed and does not imply a stock position
 +Transition times are measured between 10% and 90% of VDD, with an output load of 15pF

FREQ. STABILITY vs. TEMP. RANGE

| Temp. (°C) | ppm | | | |
|------------|-----|-----|-----|-----|
| | ±20 | ±25 | ±40 | ±50 |
| -10~+60 | ○ | ○ | ○ | ○ |
| -20~+70 | △ | ○ | ○ | ○ |
| -40~+85 | × | △ | ○ | ○ |
| -40~+105 | × | × | ○ | ○ |
| -40~+125 | × | × | △ | ○ |

* O: Available △: Conditional X: Not available

* Inclusive of calibration @ 25°C, operating temperature range, input voltage variation, load variation, aging (1st year), shock, and vibration load variation

Note: not all combination of options are available. Other specifications may be available upon request.