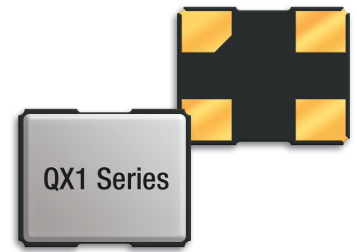


QX1 Series

1.6x2.0 SMD HCMOS Clock Oscillator



Features

- Ultra-miniature 1.6 x 2.0 x 0.6mm package
- Frequency Range 4MHz to 50 MHz
- Tristate (Enable/Disable) function as standard
- Supply voltage 1.8, 2.5 or 3.3 Volts

Description

QX1 ultra-miniature oscillators consist of a TTL/HCMOS-compatible hybrid circuit and a miniature quartz crystal packaged in a low-profile, industry-standard ceramic package.

General Specifications

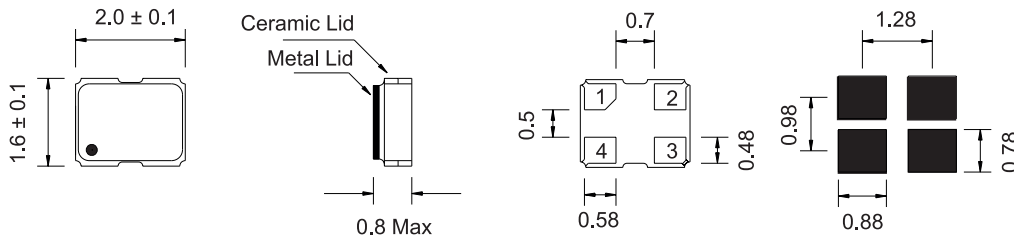
| | | |
|-----------------------------|--------------------|---------------|
| Frequency Range | 1.000 to 50.000MHz | |
| Output Logic | HCMOS | |
| Temperature Stability* | ±100ppm | |
| | ±50ppm | |
| | ±30ppm | |
| | ±25ppm | |
| Phase Jitter RMS | <1ps typ. | |
| Aging per year | ±5ppm | |
| Operating Temperature Range | Standard | -20 to +70°C |
| | Industrial | -40 to +85°C |
| | Extended | -40 to +105°C |
| | Automotive | -40 to +125°C |
| Storage Temperature Range | -55 to +125°C | |

* Frequency stability is inclusive of calibration tolerance at 25°C, frequency change due to shock & vibration, ±10% supply voltage variation and stability over temperature range.

Electrical Specifications

| | | | | |
|-------------------------|---------------------|--------------|-------------|----------|
| Supply Voltage | 1.8Vdd ± 5% | 2.5Vdd ± 5% | 3.3Vdd ± 5% | |
| Input Current | 1.000 to 10.000MHz | 3mA | 4mA | 5mA |
| | 10.100 to 20.000MHz | 4mA | 5mA | 6mA |
| | 20.100 to 32.000MHz | 5mA | 6mA | 7mA |
| | 32.100 to 50.000MHz | 6mA | 7mA | 8mA |
| Output Voltage | Logic High (Voh) | 90% Vdd min. | | |
| | Logic Low (Vol) | 10% Vdd max. | | |
| Output Symmetry | Standard | 40 to 60% | | |
| | Tight | 45 to 55% | | |
| Output Load | 15pF max. | | | |
| Rise and Fall Time | 1.000 to 10.000MHz | 6ns max. | 5ns max. | 5ns max. |
| | 10.100 to 20.000MHz | 6ns max. | 5ns max. | 5ns max. |
| | 20.100 to 32.000MHz | 5ns max. | 5ns max. | 5ns max. |
| | 32.100 to 50.000MHz | 4ns max. | 4ns max. | 4ns max. |
| Enable-Disable Function | Tri-State | | | |
| Start Up Time | 10 ms max. | | | |

Mechanical Dimensions



Part Numbering Guide

| Qantek Code | Package | Supply Voltage | Frequency Stability | Frequency | Operating Temperature Range | Automotive Indicator | Load Capacitance | Tight Symmetry Indicator | Packaging |
|-------------|--------------|-------------------------------------|--|--|---|----------------------|------------------|--------------------------|--|
| Q = Qantek | X1 = 1.6x2.0 | 18 = 1.8V 25 = 2.5V 33 = 3.3V | A = ±25ppm B = ±50ppm C = ±100ppm D = ±20ppm | in MHz, always 8 digits including the decimal point (f.ie. 20.00000) | A = -20 to +70°C B = -40 to +85°C C = -40 to +105°C D = -40 to +125°C | A = AEC-Q200 | 15 = 15pF | T = 45/55 | R = Tape&Reel M = Minireel (250pcs Tape&Reel) |

Example: QX133B20.00000B15R

bold letters = recommended standard specification



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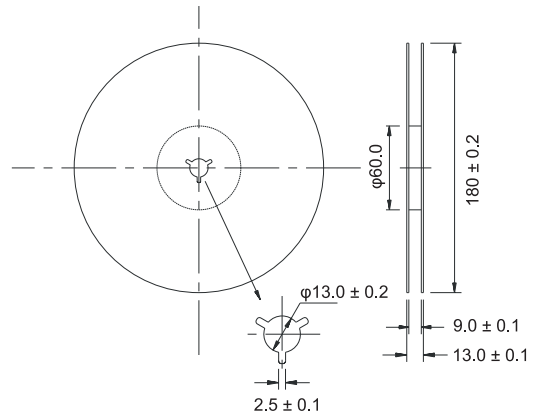
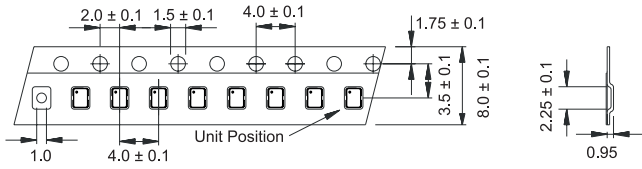
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QX1 Series

1.6x2.0 SMD HCMOS Clock Oscillator

Tape and Reel Dimensions



Marking Code Guide

Contains frequency, Qantek manufacturing code, production code (month and year), stability, temperature range and voltage indicator.

Year/Month Codes

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|-------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 2015 / 2019 | A | B | C | D | E | F | G | H | J | K | L | M |
| 2016 / 2020 | N | P | Q | R | S | T | U | V | W | X | Y | Z |
| 2017 / 2021 | a | b | c | d | e | f | g | h | j | k | l | m |
| 2018 / 2022 | n | p | q | r | s | t | u | v | w | x | y | z |

Stability / Temperature Range

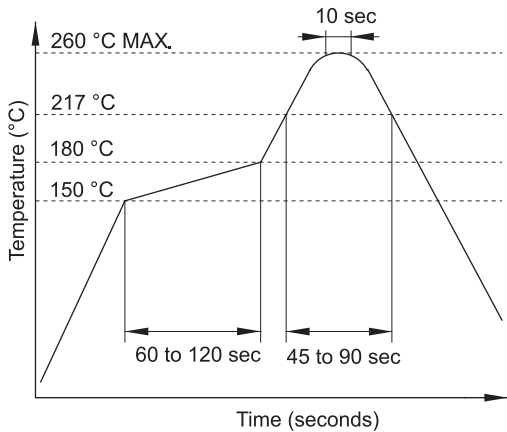
| | ppm | 20 | 25 | 50 | 100 |
|---------------|-----|----|----|----|-----|
| -20 to +70°C | | A | B | C | D |
| -40 to +85°C | | E | F | G | H |
| -40 to +105°C | | - | - | I | J |
| -40 to +125°C | | - | - | - | K |

Voltage

| Volt | PN Code |
|--------|---------|
| 1.8 | 1 |
| 2.5 | 2 |
| 3.3 | 3 |
| custom | S |

Example: First Line: QAG3 (QANTEK – January 2019 – ±50ppm / -40 to +85°C – 3.3V) Second Line: 250 (Frequency)

Solder Reflow Profile



All specifications are subject to change without notice.

Environmental Specifications

| | |
|------------------|-------------------------------|
| Mechanical Shock | MIL-STD-202, Method 213, C |
| Vibration | MIL-STD-202, Method 201 & 204 |
| Thermal Cycle | MIL-STD, Method 1010, B |
| Gross Leak | MIL-STD-202, Method 112 |
| Fine Leak | MIL-STD-202, Method 112 |



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