

# QX5 Series

## 3.2x5.0 SMD HCMOS Clock Oscillator

### Features

- Ultra-miniature 3.2 x 5.0 x 1.3mm package
- Frequency Range 1.000 to 155.520MHz
- Tristate (Enable/Disable) function as standard
- Supply voltage 1.8, 2.5 or 3.3 Volts

### Description

QX5 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 155.520MHz |
| Output Logic                                                                                                                                                                        |            | HCMOS               |
| Temperature Stability*                                                                                                                                                              |            | ±100ppm             |
|                                                                                                                                                                                     |            | ±50ppm              |
|                                                                                                                                                                                     |            | ±25ppm              |
|                                                                                                                                                                                     |            | ±20ppm              |
| 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 32.000MHz   | 7mA                       | 10mA        | 15mA        |
|                           | 32.100 to 50.000MHz  | 15mA                      | 12mA        | 20mA        |
|                           | 50.100 to 67.000MHz  | -                         | -           | 25mA        |
|                           | 67.100 to 80.000MHz  | -                         | -           | 25mA        |
|                           | 80.100 to 155.520MHz | -                         | -           | 40mA        |
| Output Voltage            | Logic High (Voh)     | 90% (80% at 1.8) Vdd min. |             |             |
|                           | Logic Low (Vol)      | 10% (20% at 1.8) Vdd max. |             |             |
|                           | Standard             | 40 to 60%                 |             |             |
|                           | Tight                | 45 to 55%                 |             |             |
| Output Current            | Lol/Loh              | ±2mA min.                 |             |             |
| Output Load               |                      | 15pF max.                 |             |             |
| Rise and Fall Time        | 1.000 to 32.000MHz   | 5ns max.                  | 5ns max.    | 7ns max.    |
|                           | 32.100 to 50.000MHz  | 3.5ns max.                | 5ns max.    | 7ns max.    |
|                           | 50.100 to 67.000MHz  | -                         | -           | 7ns max.    |
|                           | 67.100 to 80.000MHz  | -                         | -           | 7ns max.    |
|                           | 80.100 to 155.520MHz | -                         | -           | 7ns max.    |
| Standby Current           |                      | 10µA max.                 |             |             |
| Enable-Disable Function   |                      | Tri-State                 |             |             |
| Output Disable Time       |                      | 300ns max.                | 150ns max.  |             |
| Output Enable Time        |                      | 10ms max.                 | 10ms max.   |             |
| Start Up Time             |                      | 10 ms max.                |             |             |

| Mechanical Dimensions                                                                                                                                    |  |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
|                                                                                                                                                          |  |  |
| <p>Pin Connection: #1 E/D, #2 GND, #3 Output, #4 VDC</p> <p>Enable/Disable Function: E/D (#1) Output (#3), High (Open) Operating, Low High Impedance</p> |  |  |

| Part Numbering Guide                              |              |                                     |                                                              |                                                                      |                                                                                       |                      |                  |                          |                                                  |
|---------------------------------------------------|--------------|-------------------------------------|--------------------------------------------------------------|----------------------------------------------------------------------|---------------------------------------------------------------------------------------|----------------------|------------------|--------------------------|--------------------------------------------------|
| Qantek Code                                       | Package      | Supply Voltage                      | Frequency Stability                                          | Frequency                                                            | Operating Temperature Range                                                           | Automotive Indicator | Load Capacitance | Tight Symmetry Indicator | Packaging                                        |
| Q = Qantek                                        | X5 = 3.2x5.0 | 18 = 1.8V<br>25 = 2.5V<br>33 = 3.3V | A = ±25ppm<br><b>B = ±50ppm</b><br>C = ±100ppm<br>D = ±20ppm | in MHz, always 8 digits including the decimal point (f.ie. 20.00000) | A = -20 to +70°C<br><b>B = -40 to +85°C</b><br>C = -40 to +105°C<br>D = -40 to +125°C | A = AEC-Q200         | 15 = 15pF        | T = 45/55                | R = Tape&Reel<br>M = Minireel (250pcs Tape&Reel) |
| Example: QX533B20.00000B15R                       |              |                                     |                                                              |                                                                      |                                                                                       |                      |                  |                          |                                                  |
| bold letters = recommended standard specification |              |                                     |                                                              |                                                                      |                                                                                       |                      |                  |                          |                                                  |



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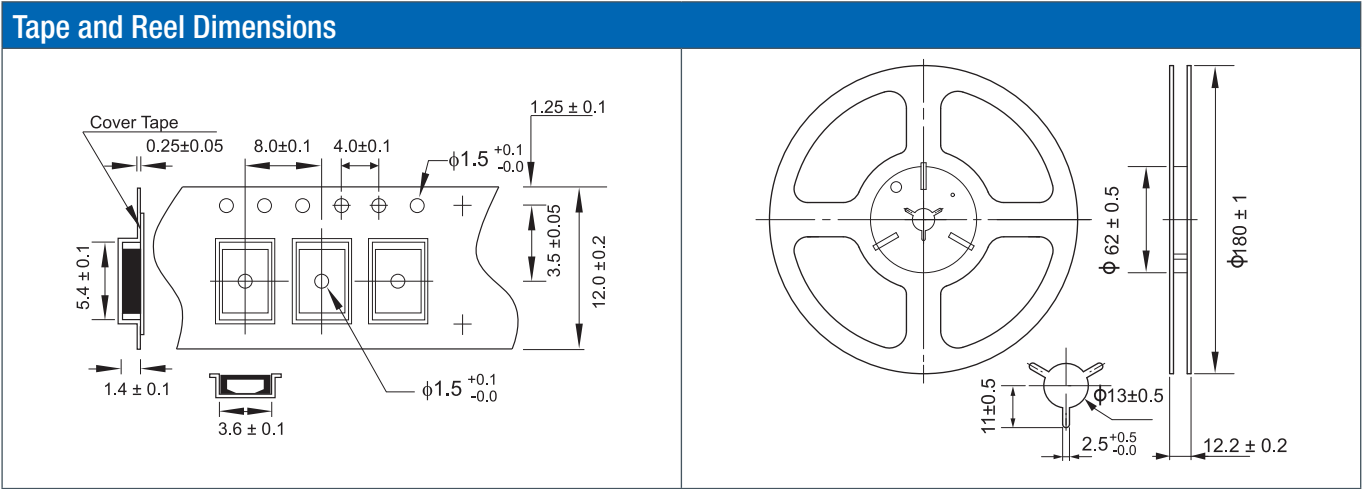
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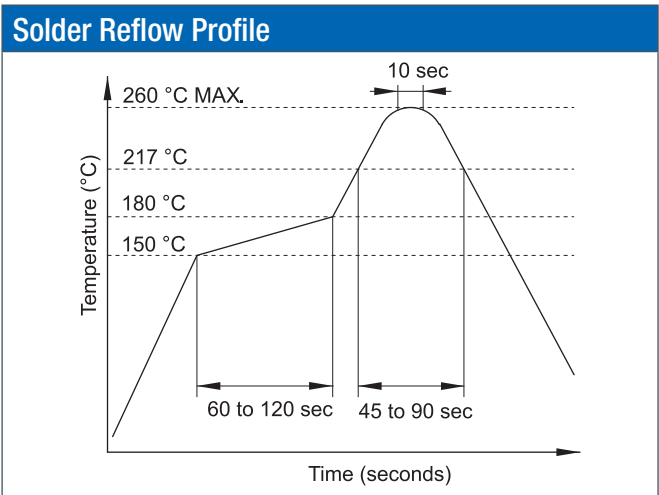


Marking Code Guide

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

| Month Codes |   |           |   | Year Codes |   |      |   |      |   | Stability |         | Temperature Range |         | Voltage |         |
|-------------|---|-----------|---|------------|---|------|---|------|---|-----------|---------|-------------------|---------|---------|---------|
| January     | A | July      | G | 2010       | 0 | 2011 | 1 | 2012 | 2 | ppm       | PN Code | °C                | PN Code | Volt    | PN Code |
| February    | B | August    | H | 2013       | 3 | 2014 | 4 | 2015 | 5 | 20        | D       | -20 to +70°C      | A       | 1.8     | 1       |
| March       | C | September | I |            |   |      |   |      |   | 25        | A       | -40 to +85°C      | B       | 2.5     | 2       |
| April       | D | October   | J |            |   |      |   |      |   | 50        | B       | -40 to +105°C     | C       | 3.3     | 3       |
| May         | E | November  | K |            |   |      |   |      |   | 100       | C       | -40 to +125°C     | D       | 5.0     | 5       |
| June        | F | December  | L |            |   |      |   |      |   | custom    | S       | custom            | S       | custom  | S       |

Example: First Line: 20.000 (Frequency) Second Line: QA1BB3 (Qantek – January – 2011 – ±50ppm – -40 to +85°C – 3.3V)



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       |

All specifications are subject to change without notice.