



### Features

- Ultra-miniature 2.0 x 2.5 x 0.9mm package
- Frequency Range 2MHz to 60MHz
- Tristate (Enable/Disable) function as standard
- Supply voltage 1.8, 2.5 or 3.3 Volts

### Description

QTX2 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	2.000 to 60.000MHz
Output Logic	HCMOS
Temperature Stability*	±100ppm
	±50ppm
	±30ppm
	±25ppm
Phase Jitter RMS	<1ps typ.
Aging per year	±5ppm
Operating Temperature Range	Standard -10 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	2.000 to 10.000MHz	3mA	6mA	7mA
	10.100 to 20.000MHz	5mA	8mA	7mA
	20.100 to 32.000MHz	5mA	8mA	12mA
	32.100 to 60.000MHz	10mA	20mA	20mA
Output Voltage	Logic High (Voh)	90% (80% at 1.8) Vdd min.		
	Logic Low (Vol)	10% (20% at 1.8) 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	5ns max.	7ns max.	6ns max.
	10.100 to 20.000MHz	5ns max.	7ns max.	6ns max.
	20.100 to 32.000MHz	5ns max.	6ns max.	5ns max.
	32.100 to 60.000MHz	5ns max.	6ns max.	5ns max.
Enable-Disable Function	Tri-State			
Start Up Time	10 ms max.			

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

Part Numbering Guide									
QT Code	Package	Supply Voltage	Frequency Stability	Frequency	Operating Temperature Range	Automotive Indicator	Load Capacitance	Tight Symmetry Indicator	Packaging
QT = Quarztechnik	X2 = 2.5x2.0	18 = 1.8V 25 = 2.5V 33 = 3.3V	A = ±25ppm <b>B = ±50ppm</b> C = ±100ppm D = ±20ppm	in MHz, always 8 digits including the decimal point (f.ie. 20.00000)	A = -20 to +70°C <b>B = -40 to +85°C</b> 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: QTX233B20.00000B15R							bold letters = recommended standard specification		



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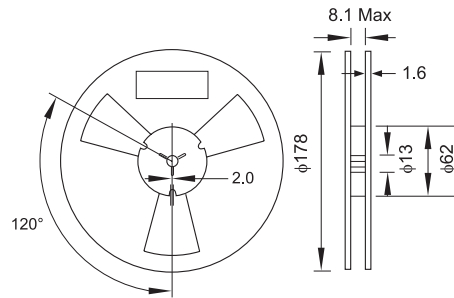
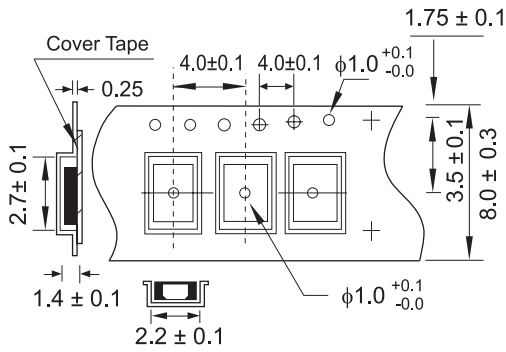
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### Tape and Reel Dimensions



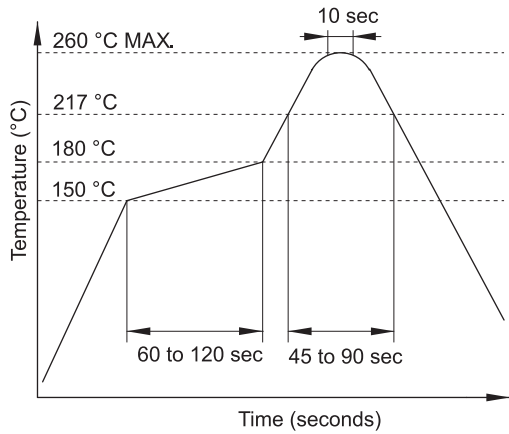
### Marking Code Guide

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	20ppm	25ppm	50ppm	100ppm	Volt	PN Code	
February	B	August	H	2013	3	2014	4	2015	5	-20 to +70°C	A	B	C	D	1.8	1
March	C	September	I							-40 to +85°C	E	F	G	H	2.5	2
April	D	October	J							-40 to +105°C	-	-	I	J	3.3	3
May	E	November	K							-40 to +125°C	-	-	-	K	custom	S
June	F	December	L													

*Example:* First Line: QA4G3 (Quarztechnik – January – 2014 – ±50ppm / -40 to +85°C – 3.3V) Second Line: 20.0 (Frequency)

### Solder Reflow Profile



### 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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