



### Features

- 2.0 x 1.6 x 0.5mm ultra miniature package
- Seam sealed ceramic package with metal lid assures high precision and reliability

### Applications

- High density applications
- Modem, communication and test equipment
- PCMCIA, wireless applications
- Automotive applications

### General Specifications

Frequency Range	20.000 to 52.000MHz (Fundamental)
Frequency Tolerance at 25°C	±10 to ±30ppm (±30ppm standard)
Frequency Stability over Temperature Range	See Stability vs. Temperature Table
Storage Temperature	-55 to +125°C
Aging per Year	±3ppm max.
Load Capacitance $C_L$	7 to 32pF and Series Resonance
Shunt Capacitance $C_0$	7.0pF
Equivalent Series Resistance (ESR)	See ESR Table
Drive Level	50µW max.
Insulation Resistance (MΩ)	500 at 100Vdc ±15Vdc

### Equivalent Series Resistance (ESR)

Frequency Range - MHz	Ω max.	Mode of Operation
20.000 to 40.000	100	Fundamental
40.100 to 52.000	60	

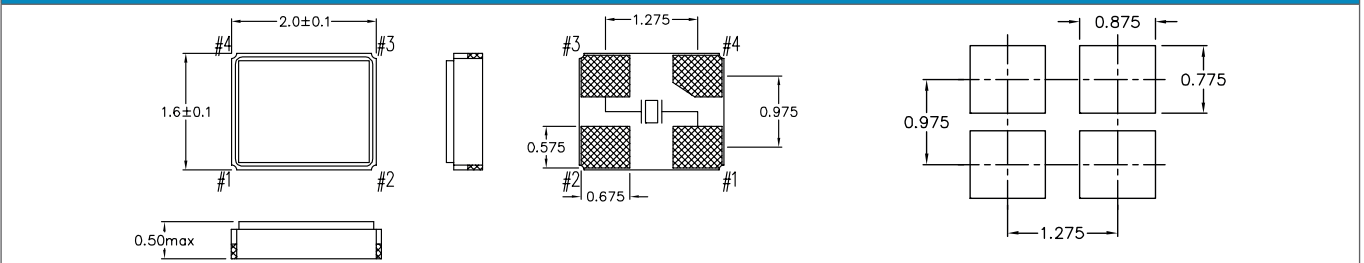
custom values available upon request

### Frequency Stability vs. Temperature

Operating Temperature	±10ppm	±20ppm	±30ppm	±50ppm	±100ppm
-20 to +70°C	○	○	○	○	○
-40 to +85°C	-	○	●	○	○

● standard ○ available

### Mechanical Dimensions



### Part Numbering Guide

Quartz-technik Code	Package	Nominal Frequency (in MHz)	Vibration Mode	Load Capacitance	Frequency Tolerance	Operating Temperature Range	Frequency Stability	Automotive Indicator	Packaging
QT = Quartz-technik	C20 = 1.6x2.0 4-Pad SMD	7 digits including the decimal point (f.i.e. 12.0000)	F = AT-Fund	S = Series A = 8pF B = 12pF C = 16pF D = 18pF E = 20 pF	T1 = ±10ppm T2 = ±20ppm T3 = ±30ppm T5 = ±50ppm T0 = ±100ppm	C = -20 - +70°C I = -40 - +85°C	10 = ±10ppm 15 = ±15ppm 20 = ±20ppm 30 = ±30ppm 50 = ±50ppm 00 = ±100ppm	A = AEC-Q200	M = 250pcs Tape&Reel R = 1000pcs Tape&Reel B = Bulk

Example: QTC2012.0000FBT3I30R

bold letters = recommended standard specification



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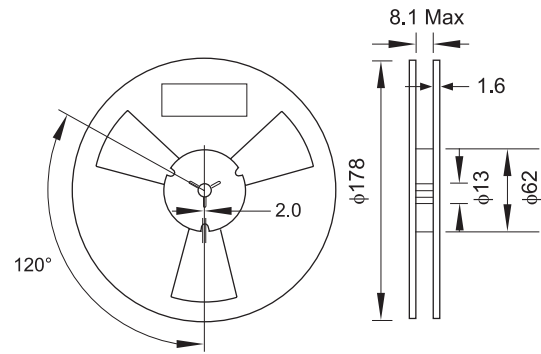
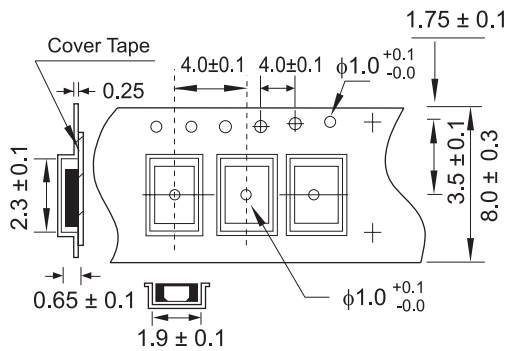
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### Tape and Reel Dimensions



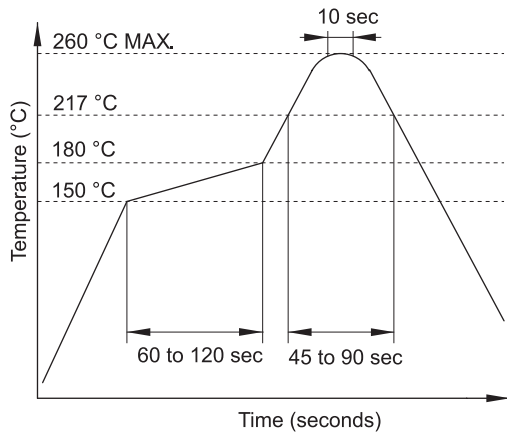
### Marking Code Guide

Contains frequency, Quarztechnik manufacturing code, production code (month and year) and load capacitance.

Month Codes				Year Codes						Load Capacitance Code in pF			
January	A	July	G	2016	6	2017	7	2018	8	pF	PN Code	pF	PN Code
February	B	August	H	2019	9	2020	0	2021	1	12	A	20	F
March	C	September	I	2022	2	2023	3	2024	4	18	B	22	G
April	D	October	J	2025	5	2026	6	2027	7	8	C	30	H
May	E	November	K							10	D	32	I
June	F	December	L							16	E	S	S

Example: First Line: 12.0 (Frequency) Second Line: QA4A (Quarztechnik - January - 2014 - 12 pF)

### 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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