

# QESM09

SMD 2.0x1.6 Crystal – Ceramic SMD packaged  
*Specification (Rev-C)*

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Specification (rev-C)

Oct 20<sup>th</sup>, 2020

### Electrical Characteristics

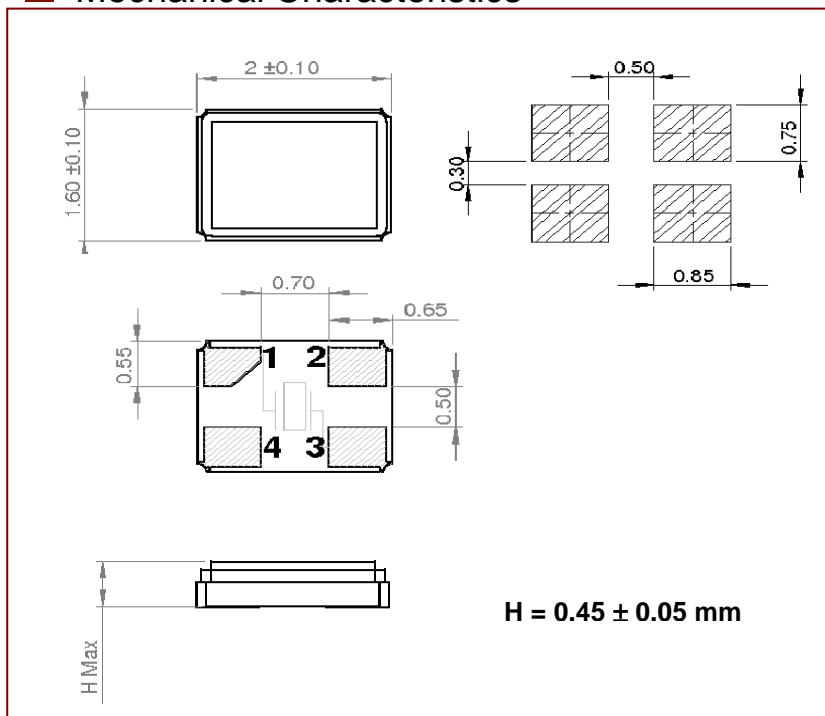
Electrical Parameters	Unit	Minimum	Typical	Maximum	Test conditions
Frequency range	MHz	16.000		62.500	
Frequency Tolerance (at 25°C)	± ppm	10	15	30	Refer to Ordering Information
Temperature Stability	± ppm	10	15	30	Refer to Ordering Information
Operating Temperature Range	°C		-20/+70	-40/+85	Refer to Ordering Information
Storage temperature range	°C	-55		+125	
Shunt capacitance C <sub>0</sub>	pF			3.0	
Load capacitance	pF	8pF ~ 16pF			Refer to Ordering Information
Drive level	µW		50	100	
Aging (First Year)	± ppm			2	Ref at 25°C
Insulator resistance	MΩ	500			At 100V <sub>DC</sub>

Customized specification upon request

### ESR vs. frequency range and Mode of vibration

Frequency range (MHz)	Mode of vibration	Max ESR (Ω)
16.000 to 18.999	Fundamental (AT-cut)	200
19.000 to 24.999	Fundamental (AT-cut)	100
25.000 to 29.999	Fundamental (AT-cut)	80
30.000 to 62.500	Fundamental (AT-cut)	60

### Mechanical Characteristics



#### Marking for QESM09

Line 1	Rakon code (6 digits)
Line 2	T+date code (YWW)

#### Mechanical conditions

Vibration	10g, 10Hz to 2KHz according to standard CEI 68-2-63
Shocks	100g, 6ms according to standard CEI 68-2-27

**Note 1:** QESM09 is compliant with RoHS 3 (EU Directive 2015/863).



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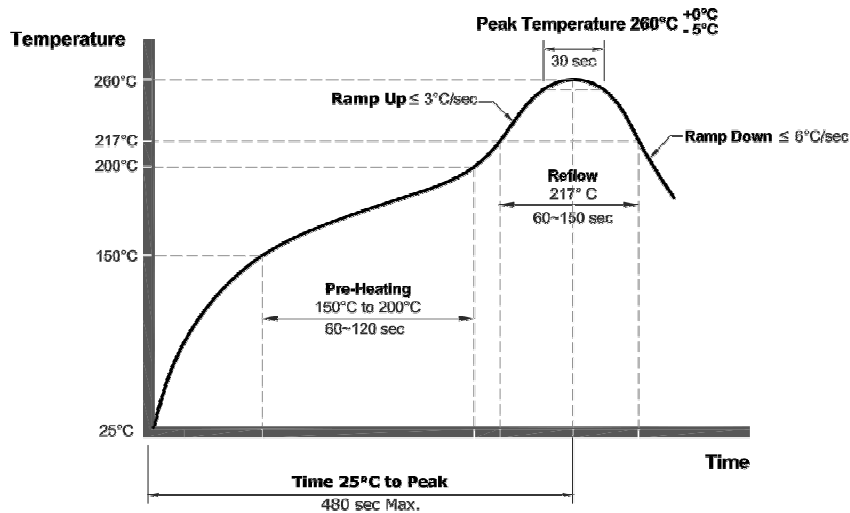
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### Ordering Information

Part numbering system						
QESM09	1	15	HQ	15	10	30.000MHZ
Package type	Vibration mode	Frequency tolerance	Operating temperature range	Frequency stability	Load Capacitance	Nominal Frequency (MHz)
<b>SMD Package</b> <b>QESM09</b> : SMD ceramic 2.0 x 1.6	1=Fundamental	10=±10ppm 15=±15ppm 20=±20ppm 30=±30ppm	D=-40°C F= -30°C H=-20°C J=-10°C L=0°C M=+50°C N=+55°C O=+60°C Q=+70°C T=+85°C	10=±10ppm 15=±15ppm 20=±20ppm 30=±30ppm	10=10pF  Please, enter the value of load capacitance	Please enter the nominal frequency

### Suggested Reflow Soldering Profile



#### Note:

- The Pb-free Reflow follows the guidelines of IPC/JEDC J-STD-020E.
- The product has been tested to withstand the Reflow Profile shown. The Reflow Profile used to solder Rakon products is determined by the solder paste Manufacturer's specification. It is recommended that the Reflow Profile used does not exceed the one shown above.

TITLE: Pb-Free Crystal & Oscillator Reflow (Classification Temperature Tc = 260°C)

FILENAME: CAT541

RELATED DRAWINGS:

REVISION: C

DATE: 16-May-2019

SCALE: NTS

Millimetres

**rakon**

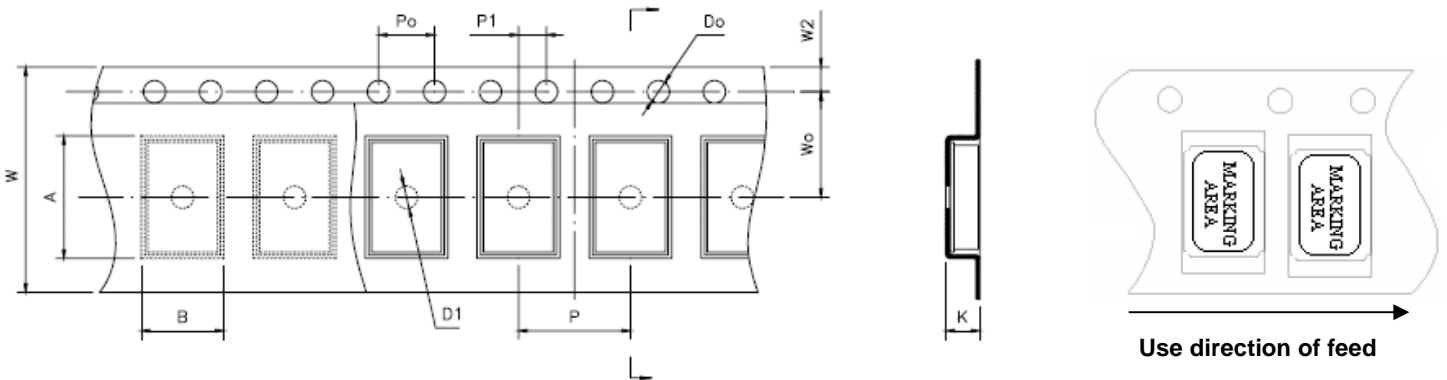
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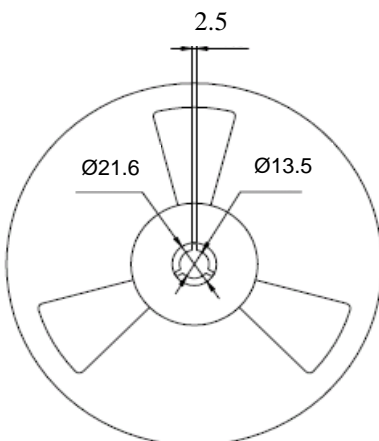
### ▣ Tape Drawing



Item	Code	Dimension	Tolerance
Pitch of components	P	4.0	± 0.1
Pitch of sprocket hole	Po	4.0	± 0.1
Length from hole center to component center	P1	2.0	± 0.1
Width of carrier tape	W	8.0	± 0.3
Width of adhesive tape	W0	3.5	± 0.1
Height of component hole	A	2.3	± 0.1
Width of component hole	B	1.9	± 0.1
Gap of hold down tape and carrier tape	W2	0.5	± 0.1
Diameter of sprocket hole	Do	∅ 1.5	± 0.05
Diameter of feed hole	D1	∅ 1.5	± 0.25
Total of tape thickness	K	1.0	± 0.1

### ▣ Reel Drawing

(unit : mm)



**Multiple :**  
3000pcs per reel

