



# QESM405

HC49 SMD 4 pins Crystal SERIES – Microprocessor Application  
*Specification (Rev-D)*

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# QESM405

## HC49 SMD 4 Pins Crystal SERIES – Microprocessor Application Specification (rev-D)

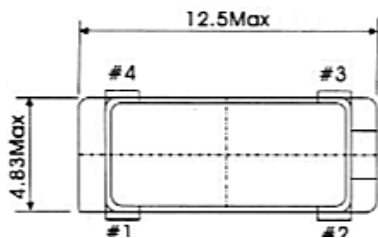
January 27<sup>th</sup>, 2006

### Electrical Characteristics

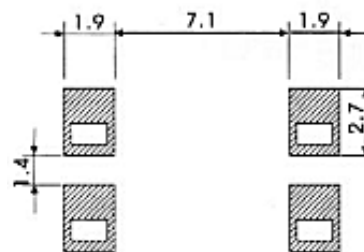
Electrical Parameters	Unit	Minimum	Typical	Maximum	Test conditions
Frequency range	MHz	3.579		60	
Frequency tolerance at 25°C	±ppm	10	30	50	Refer to Ordering Information
Frequency stability	±ppm	10	30	50	Refer to Ordering Information
Operating temperature range (see table 1)	°C		-10 to +70	-40 to +85	Refer to Ordering Information
Storage temperature range	°C	-40		+85	
Shunt capacitance C0	pF			7.0	
Load capacitance	pF	10pF ~ 30pF or series			Refer to Ordering Information
Drive Level	µW		100	500	
Aging (First Year)	± ppm			5	Ref at 25°C
Insulation Resistance	MΩ	500			Ref at 100Vdc

### Mechanical Characteristics

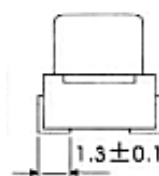
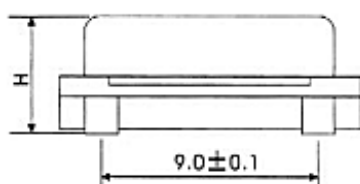
#### BOTTOM VIEW



#### SUGGESTED PAD



Hmax = 4.2 mm



#### Marking

QESM405	A + Frequency in MHz (6 digits on the top)
QESM406	B + Frequency in MHz (6 digits on the top)
QESM407	C + Frequency in MHz (6 digits on the top)

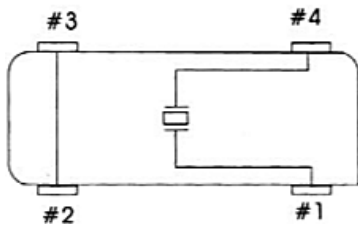
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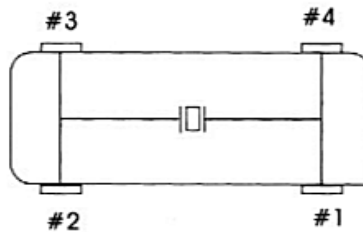
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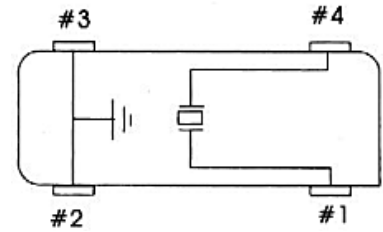
### Internal Connection



**QESM405**



**QESM406**



**QESM407**

### ESR vs Frequency range

**Table 1 : ESR vs frequency range**

Frequency range (MHz)	Mode of vibration	Max. ESR (Ω)	Frequency range (MHz)	Mode of vibration	Max. ESR (Ω)
3.579 ~ 5.000	Fund. / AT	150	9.001 ~ 10.000	Fund. / AT	60
5.001 ~ 6.000	Fund. / AT	120	10.001 ~ 13.000	Fund. / AT	50
6.001 ~ 7.000	Fund. / AT	100	13.001 ~ 30.000	Fund. / AT	40
7.001 ~ 8.000	Fund. / AT	90	30.000 ~ 60.000	3 <sup>rd</sup> / AT	80
8.001 ~ 9.000	Fund. / AT	80			

### Ordering Information

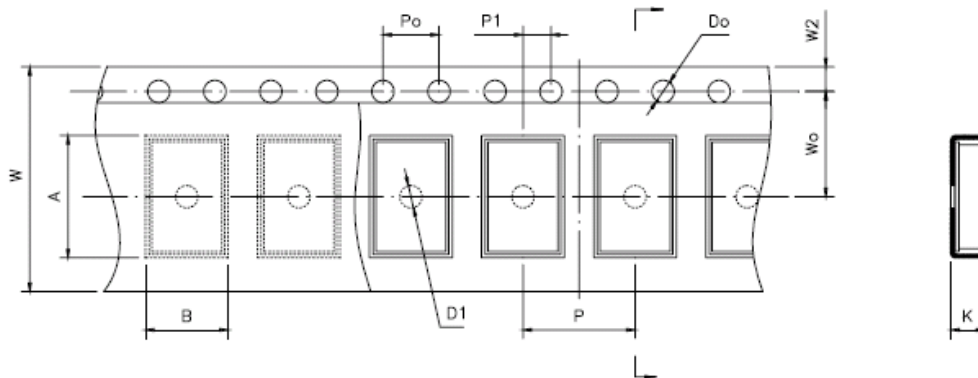
Part numbering system						
QESM405	1	30	HQ	50	30	3.57954MHZ
Package type	Vibration mode	Frequency tolerance	Operating temperature range	Frequency stability	Load capacitance	Nominal Frequency (MHz)
<b>HC49 SMD 4 Pins</b> <b>Package</b> <b>QESM405</b> <b>QESM406</b> <b>QESM407</b>	1 : Fundamental 3 : 3rd Overtone	10 : ± 10ppm 30 : ± 30ppm 50 : ± 50ppm	D : -40°C F : -30°C J : -10°C L : 0°C M : +50°C N : +55°C O : +60°C Q : +70°C T : +85°C	10 : ± 10ppm 30 : ± 30ppm 50 : ± 50ppm	00 : series 10 : 10pF 30 : 30pF  Please, enter the value of load capacitance	Please enter the nominal frequency

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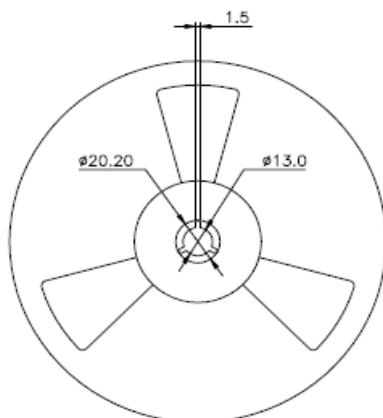
January 27<sup>th</sup>, 2006

## ▣ Tape Drawing



Item	Code	Dimension	Tolerance
Pitch of components	P	12.0	± 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	24.0	± 0.3
Width of adhesive tape	W0	11.5	± 0.1
Height of component hole	A	13.4	± 0.1
Width of component hole	B	5.20	± 0.1
Gap of hold down tape and carrier tape	W2	1.75	± 0.1
Diameter of sprocket hole	Do	∅ 1.55	± 0.05
Diameter of feed hole	D1	∅ 2.0	± 0.2
Total of tape thickness	K	5.2 or 4.3	± 0.1

## ▣ Reel Drawing



Multiple : 1Kpcs per Reel

Unit : mm

