

# **MQ & MQ2 CRYSTALS**

32768

EQZ

7 x 5mm SMD, 4 pad or 2 pad

# FEATURES

- Miniature size: 7.0mm x 5mm x 1.2mm height
- Gold-plated ceramic base with metal seam-welded lid
- To minimize EMI the whole crystal may be grounded
- Tight tolerance of  $\pm 10$  pppm for telecommunications use
- High shock and vibration resistance
- Ideal for PDAs, GPS, PCMCIA and hand-held equipment

### DESCRIPTION

Miniature surface-mount MQ crystals are produced using a ceramic substrate and fitted with a hermetically-sealed metal lid. The crystals are competitively priced, well-suited to mass-market electronic applications and may also be produced to close tolerances making this crystal a good choice for applications requiring low mass and tight tolerances. There are two package variants, 4 pad and two pad.

#### SPECIFICATION

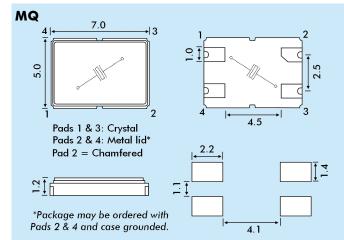
Frequency Range			
AT-Cut Fundamental:	6.0MHz to 45.0MHz		
AT-Cut 3rd Overtone:	30.0MHz to 125.0MHz		
Calibration Tolerance at 25°C*:	from ±5ppm		
	$(\pm 10, \pm 20 \text{ or } \pm 30 \text{ ppm standard})$		
Frequency stability			
-10° to +60°C	from ±5ppm		
-20° to +70°C	from ±10ppm		
-40° to +90°C	from ±15ppm		
-55 to +125°C	from ±20ppm		
Storage Temperature:	-55°~+105°C		
Effective Series Resistance:	See table		
Shunt Capacitance (C0):	2pF to 4pF typical, 7pF maximum		
Load Capacitance (CL):	Series or from 10pF to 32pF		
	(Customer specified CL)		
Ageing:	<±3ppm per year at +25°C		
Drive level:	100 μW maximum		
Reflow Soldering:	10s maximum, 260°C twice		
	or 180s at 230°C, once.		
Package:	Ceramic base, metal lid,		
	Hermetic seal		
Packaging:	16mm EIA tape and reel		
	1000 pieces per reel		

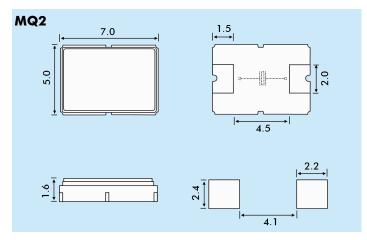
## **EFFECTIVE SERIES RESISTANCE**

Frequency Range MHz	Crystal Cut/ Mode	ESR Ohms Max.
6.0 ~ 11.0	AT Fund.	60
11.1 ~ 14.0	AT Fund.	50
14.1 ~ 45.0	AT Fund.	40
30.0 ~ 40.0	AT 3rd OT	100
40.1 ~ 50.0	AT 3rd OT	80
50.1 ~ 125	AT 3rd OT	90



#### **OUTLINE & DIMENSIONS**





# PART NUMBER GENERATION

Example:	12.000MHz	<u>MQ/20/3</u>	<u>30/-10-</u>	+60/18	3pF/60	R
Nominal Freque	ncy					
Package (MQ = 4 pad, M	Q2 = 2 pad					
Calibration toler at 25°C (±ppm)	ance					
Temperature Sta over temp. range						
Operating Temp (Lower and uppe						
Load Capacitanc (Either SR for seri						
Equivalent Series (Optional - use w value is required)	hen special					

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