

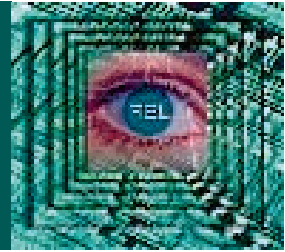
FEATURES	APPLICATIONS
<ul style="list-style-type: none"> ■ Wide Frequency Range ■ Additional EMI Protection ■ Custom Manufacturing Capability ■ Fast Turnaround Options 	<ul style="list-style-type: none"> ■ Microprocessor Systems ■ Datacommunications ■ Consumer Electronics ■ Automotive Electronics

STANDARD	SPECIFICATION
	Frequency Range: 300 kHz to 225 MHz
	Adjustment Tolerance at 25°C: ± 30PPM Max.
	Frequency Stability: ± 50PPM Max.
	Operating Temperature Range: -10°C to +60°C
	Load Capacity: 30pF
	E.S.R.: See Table
	Drive level: 500 MicroWatt
	Ageing: ± 5PPM 1st Year Max.
Frequency Range	E.S.R
300kHz ~ 800 kHz	3000 Ω
800kHz ~ 1.3 MHz	5000 Ω
1.8 MHz ~ 2.0 MHz	800 Ω
2.0MHz ~ 2.4 MHz	300 Ω
2.4MHz ~ 3.0 MHz	250 Ω
3.0MHz ~ 3.2 MHz	120 Ω
3.2MHz ~ 4.0 MHz	90 Ω
4.0MHz ~ 4.2 MHz	100 Ω
4.2MHz ~ 6.0 MHz	50 Ω
6.0MHz ~ 8.0 MHz	40 Ω
8.0MHz ~ 36 MHz	25 Ω
36MHz ~ 64 MHz	40 Ω
64MHz ~ 125 MHz	80 Ω
125MHz ~ 200 MHz	140 Ω

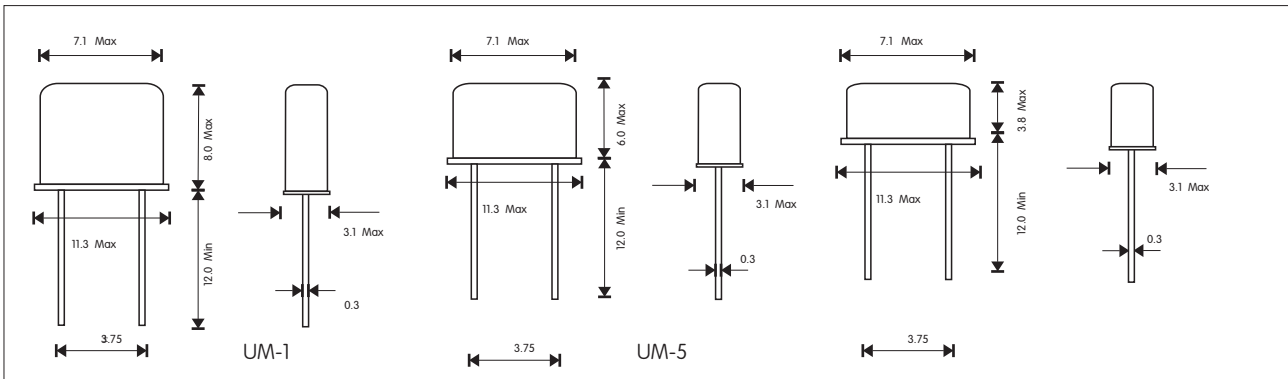
AVAILABLE OPTIONS	SPECIFICATION																
	Frequency Range: 300 kHz ~ 225 MHz																
	Adjustment Tolerance: ±5PPM ~ ± 100PPM																
	Load Capacity: Series or 9pF ~ 50pF																
	Shunt Capacity (C0): 4.5pF ~ 7pF (Typ.)																
	Dynamic Capacity (C1): 18fF ~ 20fF (Typ.)																
Frequency Stability vs Operating Temperature Range																	
<table border="0" style="width: 100%;"> <tr> <td style="text-align: center;">Operating Temperature Range</td> <td style="text-align: center;">Temperature Stability</td> </tr> <tr> <td style="text-align: center;">-10 to +60 -20 to +70 -40 to +90 -55 to +105 -55 to +125</td> <td style="text-align: center;"> <table border="0" style="width: 100%;"> <tr> <td style="text-align: center;">+/-5PPM</td> <td style="text-align: center;">+/-10PPM</td> <td style="text-align: center;">+/-20PPM</td> <td style="text-align: center;">+/-30PPM</td> <td style="text-align: center;">+/-40PPM</td> <td style="text-align: center;">+/-50PPM</td> </tr> <tr> <td style="text-align: center;">■</td> <td style="text-align: center;">■</td> <td style="text-align: center;">■</td> <td style="text-align: center;">■</td> <td style="text-align: center;">■</td> <td style="text-align: center;">■</td> </tr> </table> </td> </tr> </table>	Operating Temperature Range	Temperature Stability	-10 to +60 -20 to +70 -40 to +90 -55 to +105 -55 to +125	<table border="0" style="width: 100%;"> <tr> <td style="text-align: center;">+/-5PPM</td> <td style="text-align: center;">+/-10PPM</td> <td style="text-align: center;">+/-20PPM</td> <td style="text-align: center;">+/-30PPM</td> <td style="text-align: center;">+/-40PPM</td> <td style="text-align: center;">+/-50PPM</td> </tr> <tr> <td style="text-align: center;">■</td> <td style="text-align: center;">■</td> <td style="text-align: center;">■</td> <td style="text-align: center;">■</td> <td style="text-align: center;">■</td> <td style="text-align: center;">■</td> </tr> </table>	+/-5PPM	+/-10PPM	+/-20PPM	+/-30PPM	+/-40PPM	+/-50PPM	■	■	■	■	■	■	
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■	■	■	■	■	■												
Value Added Services																	
In addition, AEL Crystals Ltd are able to offer our customers the following value added services:-																	
<ul style="list-style-type: none"> ■ Fitted Insulators ■ Radial Taping ■ Lead Pre-Forming 	<ul style="list-style-type: none"> ■ Lead Cropping ■ Earth Lead ■ Bar-Coding 																

Specify AEL

UM-1 UM-5 & UM-4 Miniature Crystals



Quartz Crystal Resonators



FEATURES

- Small Size
- Wide Frequency Range
- High Stability
- Fast Turnaround Options

APPLICATIONS

- Pagers
- Radio Communications
- Telemetry Systems
- Automotive Electronics

STANDARD SPECIFICATION

Frequency Range: 4.00 MHz to 300.00 MHz*

Adjustment Tolerance at 25°C: ± 30PPM Max.

Frequency Stability: ± 50PPM Max.

Operating Temperature Range: -10°C to +60°C

Load Capacity: 30pF

E.S.R.: See Table

Drive level: 100 MicroWatt

Ageing: ± 3PPM 1st Year Max.
(*UM-4/UM-5 From 10MHz)

Frequency Range	E.S.R	Mode
4.00 MHz ~ 4.99 MHz	200	Ω Fund
5.00 MHz ~ 5.99 MHz	150	Ω Fund
6.00 MHz ~ 6.99 MHz	120	Ω Fund
7.00 MHz ~ 8.99 MHz	100	Ω Fund
8.00 MHz ~ 9.99 MHz	90	Ω Fund
10.00 MHz ~ 15.99 MHz	40	Ω Fund
16.00 MHz ~ 22.99 MHz	30	Ω Fund
23.00 MHz ~ 39.99 MHz	60	Ω 3 O/T
40.00 MHz ~ 100.00 MHz	60	Ω 3 O/T
50.00 MHz ~ 150.00 MHz	90	Ω 5 O/T
100.0 MHz ~ 300.00 MHz	150	Ω 7 O/T

AVAILABLE OPTIONS

Frequency Range: 4.00MHz ~ 300 MHz

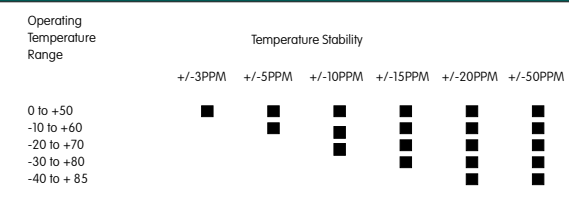
Adjustment Tolerance ± 5PPM ~ ± 30PPM

Load Capacity: Series or 9pF ~ 50pF

Shunt Capacity (C0): 4.5pF ~ 7pF (Typ.)
18fF ~ 20fF (Typ.)

Also available with SMD Metal Clip (UM-1 & UM-5)

Frequency Stability vs Operating Temperature Range



Value Added Services

In addition, AEL Crystals Ltd are able to offer our customers the following value added services:-

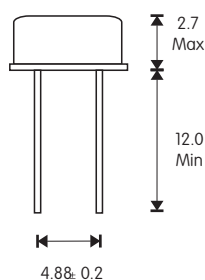
- Fitted Insulators
- Radial Taping
- Lead Pre-Forming
- Lead Cropping
- Earth Lead
- Bar-Coding



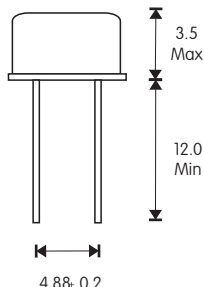
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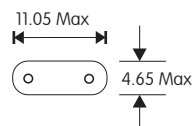
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HC-49/SS



HC-49/S

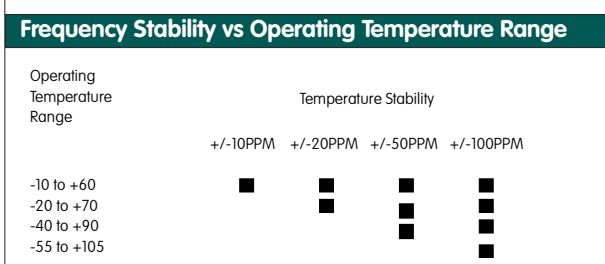


FEATURES	APPLICATIONS
<ul style="list-style-type: none"> ■ Standard Frequencies Ex-Stock ■ Low Cost Solution ■ Standard I.C Height ■ Standard HC49U Base 	<ul style="list-style-type: none"> ■ Microprocessor Systems ■ Datacommunications ■ Consumer Electronics ■ Automotive Electronics

STANDARD SPECIFICATION
Frequency Range: 3.20 MHz to 70.00 MHz
Adjustment Tolerance at 25°C: ±30PPM Max.
Frequency Stability: ±50PPM Max.
Operating Temperature Range: -10°C to +60°C
Load Capacity: 30pF
E.S.R: See Table
Drive level: 100 MicroWatt
Ageing: ±5PPM 1st Year Max.

AVAILABLE OPTIONS
Frequency Range: 3.2 MHz ~ 70.0 MHz
Adjustment Tolerance: ±10PPM ~ ±100PPM
Load Capacity: Series or 9pF ~ 50pF
Shunt Capacity (C0): 4.5pF ~ 7pF (Typ.)
Dynamic Capacity (C1): 18fF ~ 20fF (Typ.)

Frequency Range	E.S.R
3.2 MHz ~ 3.49 MHz	200 Ω Fund
3.5 MHz ~ 3.99 MHz	140 Ω Fund
4.0 MHz ~ 4.39 MHz	120 Ω Fund
4.4 MHz ~ 4.89 MHz	100 Ω Fund
4.9 MHz ~ 5.99 MHz	80 Ω Fund
6.0 MHz ~ 6.99 MHz	60 Ω Fund
7.0 MHz ~ 7.99 MHz	50 Ω Fund
8.0 MHz ~ 10.99 MHz	45 Ω Fund
11.0 MHz ~ 11.99 MHz	40 Ω Fund
12.0 MHz ~ 14.99 MHz	35 Ω Fund
15.0 MHz ~ 36.00 MHz	30 Ω Fund
27.0 MHz ~ 70.00 MHz	100 Ω 3 O/T



e e Service
In addition, AEL Crystals Ltd are able to offer our customers the following value added services:-
<ul style="list-style-type: none"> <li style="width: 50%;">■ Fitted Insulators <li style="width: 50%;">■ Lead Cropping <li style="width: 50%;">■ Radial Taping <li style="width: 50%;">■ Earth Lead <li style="width: 50%;">■ Lead Pre-Forming <li style="width: 50%;">■ Bar-Coding



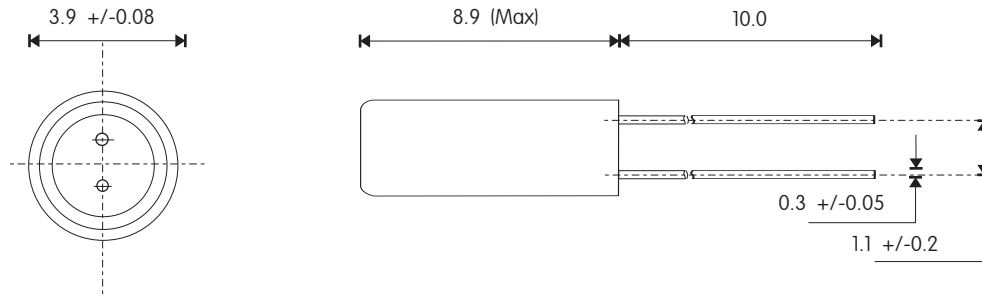
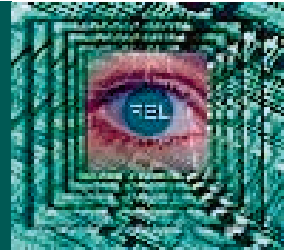
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Specify AEL

3x9mm AT-Cut Crystals



All Dims. in mm

Quartz Crystal Resonators

FEATURES

- Small Size
- Wide Frequency Range
- High Shock Tolerance
- Good Frequency Stability

APPLICATIONS

- Instrumentation
- Microprocessor Systems
- Process Control
- Automotive Electronics

STANDARD SPECIFICATION

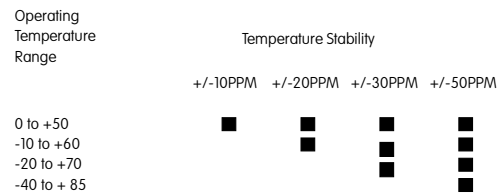
Frequency Range: 3.579 MHz to 70.00 MHz
 Adjustment Tolerance at 25°C: ± 30PPM Max.
 Frequency Stability: ± 50PPM Max.
 Operating Temperature Range: -10°C to +60°C
 Load Capacity: 30pF
 E.S.R: See Table
 Drive level: 100 MicroWatt
 Ageing: ± 3PPM 1st Year Max.

Frequency Range	E.S.R	Mode
3.57 MHz	3.00 Ω	Fund
4.00 MHz	4.49 Ω	Fund
4.50 MHz	4.99 Ω	Fund
5.00 MHz	5.99 Ω	Fund
6.00 MHz	8.99 Ω	Fund
9.00 MHz	9.99 Ω	Fund
10.00 MHz	12.99 Ω	Fund
13.00 MHz	18.99 Ω	Fund
19.00 MHz	29.99 Ω	Fund
30.00 MHz	33.00 Ω	Fund
30.00 MHz	34.99 Ω	3 O/T
35.00 MHz	39.99 Ω	70 Ω 3 O/T
40.00 MHz	44.99 Ω	65 Ω 3 O/T
45.00 MHz	49.99 Ω	60 Ω 3 O/T
50.00 MHz	70.00 Ω	80 Ω 3 O/T

AVAILABLE OPTIONS

Frequency Range: 3.57MHz ~ 70 MHz
 Adjustment Tolerance: ± 10PPM ~ ± 30PPM
 Load Capacity: Series or 9pF ~ 50pF
 Shunt Capacity (C0): 4.5pF ~ 7pF (Typ.)
 18fF ~ 20fF (Typ.)

Frequency Stability vs Operating Temperature Range



Value Added Services

In addition, AEL Crystals Ltd are able to offer our customers the following value added services:-

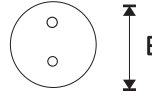
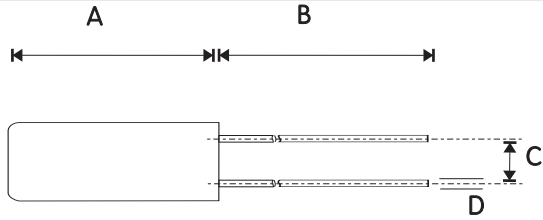
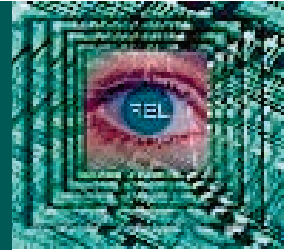
- Lead Cropping
- Bar-Coding
- Lead Pre-Forming



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Package Style	A	B	C	D	E
3x8	8.2	9.0	1.10	0.35	3.10
2x6	6.2	9.0	0.70	0.26	2.10
1x5	5.1	4.0	0.45	0.15	1.50

FEATURES

- Range of Sizes
- Low Cost
- High Shock Resistance
- Extensive UK Stocks

APPLICATIONS

- Time Keeping
- Datacommunications
- Consumer Electronics
- Automotive Electronics

STANDARD SPECIFICATION

Frequency Range: 32.768 kHz
 Adjustment Tolerance at 25°C: ± 20PPM
 Frequency Stability: -0.038PPM/°C²
 Operating Temperature Range: -10°C to +60°C
 Load Capacity: 12.5pF
 E.S.R: 35 kOhm
 Drive level: 1MicroWatt
 Ageing: ± 1PPM 1st Year Typ.

Frequency Range	E.S.R
20.0 kHz	29.9 kHz 55k Ω
30.0 kHz	39.9 kHz 45k Ω
40.0 kHz	59.9 kHz 20k Ω
60.0 kHz	69.9 kHz 15k Ω
70.0 kHz	119.9 kHz 12k Ω
120.0 kHz	164.9 kHz 10k Ω
307.20 kHz	6k Ω

AVAILABLE OPTIONS

Frequency Range: 20 kHz to 165 kHz & 307.2kHz

Adjustment Tolerance ± 20PPM ± 50PPM ± 100PPM

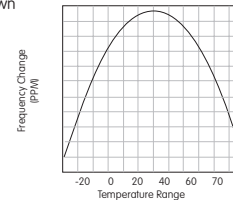
Load Capacity: 6pF ~ ∞

Shunt Capacity (C0): 4.0pF Max

Also available from stock is a 32.768 kHz crystal specifically designed for the Dallas Semiconductor RTC

Frequency Stability vs Operating Temperature Range

Tuning fork crystals exhibit a parabolic temperature coefficient with a response curve typically as shown



Handling Note

Crystals utilising a tuning fork element should not be subjected to ultrasonic cleaning. This is because the blank can be damaged due to the frequency of the ultrasonic bath being in resonance with the crystal itself.



Crystals Limited

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