

## **Ecliptek ECSM Series Crystal Frequently Asked Questions**

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### **1. Why is Ecliptek discontinuing the ECSM crystal series?**

Ecliptek Corporation is making it a point to offer products to the marketplace that are industry standard in design and configuration. While the ECSM crystal series is a surface mount offering, the footprint is not similar to the products offered by other leading manufacturers in the frequency control industry. Ecliptek has responded with the introduction of the EC3SM crystal series, which is manufactured at our joint venture factory, Korea Quartz Technology (KQT).

### **2. Can I continue to purchase the ECSM crystal series in the future?**

The ECSM series will be available for purchase through September 24<sup>th</sup>, 1999. After this date no further orders will be accepted.

### **3. Can I place a “lifetime buy” order for this crystal series?**

Placement of lifetime buy orders will be accepted though September 24<sup>th</sup>, 1999. After this date no further orders will be accepted. All shipments must be scheduled for delivery by December 31<sup>st</sup>, 1999.

### **4. What product series can I use in the future as an acceptable alternate to the ECSM crystal series?**

Ecliptek has developed the EC3SM crystal series as a cost-effective replacement to the ECSM crystal series. The specification sheet for the EC3SM crystal series is attached. It can also be found on our web site at [ecliptek.com](http://ecliptek.com).

### **5. What are the electrical differences between the ECSM crystal product family and the EC3SM crystal product family?**

All of the electrical parameters of the EC3SM crystal series are identical to the ECSM crystal series, with the exception of crystal resistance (ESR) on overtone crystals in the 30Mhz to 60Mhz frequency range. The standard ESR for the ECSM series for this frequency range is 80 ohms maximum. The standard ESR for the EC3SM series for this frequency range is 100 ohms maximum. If an overtone crystal is needed with an ESR specification of 80 ohms maximum, please contact Ecliptek for a custom part number.

**6. What are the mechanical differences between the ECSM crystal series and the EC3SM crystal series?**

There are minor mechanical differences between the ECSM crystal and the EC3SM crystal. However, these differences will not effect crystal performance. Please review the attached data sheets showing the mechanical drawings for these two crystal series. These specification sheets can also be found on our web site at [ecliptek.com](http://ecliptek.com).

**7. Do I need to redesign my printed circuit board solder pad layout to accept the EC3SM crystal series?**

If the customer is currently using the suggested solder pad layout recommended by Ecliptek for the ECSM crystal series, there is no need to redesign the printed circuit board solder pad layout for the EC3SM crystal series. The EC3SM crystal can simply be placed onto the existing ECSM solder pads. Please see attached drawing showing the EC3SM crystal series surface mounted on the ECSM crystal series suggested solder pad layout.

**8. What benefit does the EC3SM crystal series offer?**

The EC3SM crystal series offers expanded capabilities such as tighter stability over an extended (-40°C to 85°C) temperature range in an industry standard foot print at an extremely competitive price.

**9. What information is needed to order an EC3SM series crystal?**

In most cases, the new part number will be identical to the old part number with the exception of the prefix. For example, if the old part number was ECSMC-14.31818M TR, the new part number shall be EC3SMC-14.31818M TR. It is recommended that the customer review the attached EC3SM specification sheet to create a new part number based upon the ECSM part number. Or, go to the 'Part Number Generator' on our web site at [ecliptek.com](http://ecliptek.com) to generate a new part number for the EC3SM series.

**10. Can I obtain samples of this new recommended EC3SM product?**

Samples are available for the EC3SM crystal series. Please contact your Ecliptek sales representative or distributor to obtain samples.

# CRYSTAL

Plastic Surface Mount *ECSM* Series



## PART NUMBERING GUIDE

**ECSM A T - 20 - 30.000M TR**

<p><b>FREQUENCY TOLERANCE / STABILITY</b></p> <p>Blank=±50ppm at 25°C, ±100ppm from 0°C to 70°C          A=±50ppm at 25°C, ±100ppm from -20°C to 70°C          B=±50ppm at 25°C, ±100ppm from -40°C to 85°C          C=±30ppm at 25°C, ±50ppm from 0°C to 70°C          D=±30ppm at 25°C, ±50ppm from -20°C to 70°C          E=±30ppm at 25°C, ±50ppm from -40°C to 85°C</p> <p><b>MODE OF OPERATION / CRYSTAL CUT</b></p> <p>Blank=Fundamental / AT          T=Third Overtone / AT</p>	<p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>	<p><b>PACKAGING OPTIONS</b></p> <p>Blank=Bulk, TR=Tape and Reel (pg. L1)</p> <p><b>FREQUENCY</b></p> <p>_____</p> <p><b>LOAD CAPACITANCE</b></p> <p>Blank=18pF (Standard)          S=Series, XX=XXpF (Custom)</p>
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## ELECTRICAL SPECIFICATIONS

Marking Specifications See pg. G1, Group C

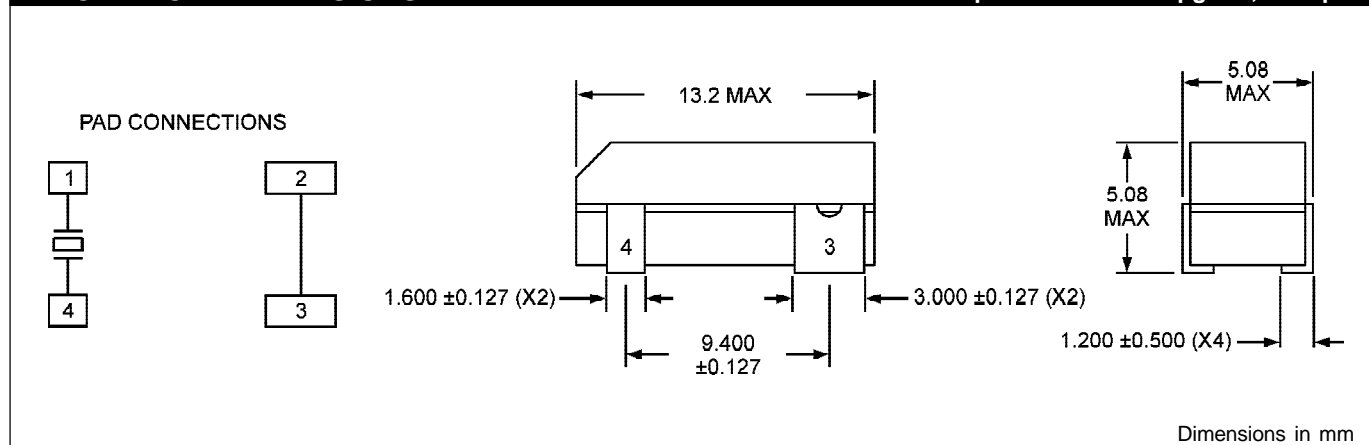
Frequency Range	3.579545MHz to 70.000MHz
Frequency Tolerance / Stability	±50ppm / ±100ppm (Standard) or
Over Operating Temperature Range	±30ppm / ±50ppm
Operating Temperature Range	0°C to 70°C (Standard), -20°C to 70°C, or -40°C to 85°C
Aging (at 25°C)	±5ppm / year Maximum
Storage Temperature Range	-40°C to 85°C
Shunt Capacitance	7pF Maximum
Insulation Resistance	500 Megaohms Minimum at 100V <sub>DC</sub>
Drive Level	1 mWatt Maximum
Load Capacitance (C <sub>L</sub> )	18pF (Standard), Custom C <sub>L</sub> ≥12pF, or Series Resonant

## EQUIVALENT SERIES RESISTANCE (ESR) AND MODE OF OPERATION (MODE)

Frequency Range	ESR (Ω)	Mode / Cut	Frequency Range	ESR (Ω)	Mode / Cut
3.579545MHz to 4.999MHz	200 Max	Fundamental / AT	10.000MHz to 14.999MHz	70 Max	Fundamental / AT
5.000MHz to 5.999MHz	150 Max	Fundamental / AT	15.000MHz to 15.999MHz	60 Max	Fundamental / AT
6.000MHz to 7.999MHz	120 Max	Fundamental / AT	16.000MHz to 30.000MHz	50 Max	Fundamental / AT
8.000MHz to 8.999MHz	90 Max	Fundamental / AT	30.000MHz to 49.999MHz	80 Max	Third Overtone / AT
9.000MHz to 9.999MHz	80 Max	Fundamental / AT	50.000MHz to 70.000MHz	80 Max	Third Overtone / AT

## MECHANICAL DIMENSIONS

Environmental / Mechanical Specifications See pg. H1, Group B



3545 Cadillac Avenue, Costa Mesa, CA., 92626-1401 • Phone: (714) 433-1200 • Fax: (714) 433-1234

Email: sales@ecliptek.com • Internet: <http://www.ecliptek.com>

Specifications subject to change without notice. • Contact factory for latest revision • 1/99 • (CR02)

### PART NUMBERING GUIDE

**EC3SM A - T - 20 - 30.000M TR**

**PAD LAYOUT**  
3 or 4 (See Mechanical Dimensions Below for Pad Layout)

**FREQUENCY TOLERANCE / STABILITY**  
 Blank=±50ppm at 25°C, ±100ppm from 0°C to 70°C  
 A=±50ppm at 25°C, ±100ppm from -20°C to 70°C  
 B=±50ppm at 25°C, ±100ppm from -40°C to 85°C  
 C=±30ppm at 25°C, ±50ppm from 0°C to 70°C  
 D=±30ppm at 25°C, ±50ppm from -20°C to 70°C  
 E=±30ppm at 25°C, ±50ppm from -40°C to 85°C  
 F=±15ppm at 25°C, ±30ppm from 0°C to 70°C  
 G=±15ppm at 25°C, ±30ppm from -20°C to 70°C  
 H=±15ppm at 25°C, ±30ppm from -40°C to 85°C

**PACKAGING OPTIONS**  
Blank=Bulk, TR=Tape and Reel (pg. L1)

**FREQUENCY**

**LOAD CAPACITANCE**  
Blank=18pF (Standard), S=Series, XX=XXpF (Custom)

**MODE OF OPERATION / CRYSTAL CUT**  
Blank=Fundamental / AT, B=Fundamental / BT, T=Third Overtone / AT

### ELECTRICAL SPECIFICATIONS

Marking Specifications See pg. G1, Group C

<b>Frequency Range</b>	3.579545MHz to 60.000MHz
<b>Frequency Tolerance / Stability</b>	±50ppm / ±100ppm (Standard),
<b>Over Operating Temperature Range</b>	±30ppm / ±50ppm (AT- Cut Only), or ±15ppm / ±30ppm (AT- Cut Only)
<b>Operating Temperature Range</b>	0°C to 70°C (Standard), -20°C to 70°C (AT- Cut Only), or -40°C to 85°C (AT -Cut
<b>Aging (at 25°C)</b>	Only)
<b>Storage Temperature Range</b>	±5ppm / year Maximum
<b>Shunt Capacitance</b>	-40°C to 85°C
<b>Insulation Resistance</b>	7pF Maximum
<b>Drive Level</b>	500 Megaohms Minimum at 100V <sub>DC</sub>
<b>Load Capacitance (C<sub>L</sub>)</b>	1 mWatt Maximum

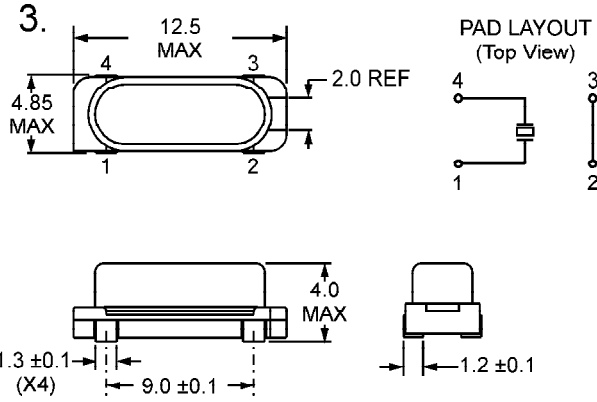
### EQUIVALENT SERIES RESISTANCE (ESR), MODE OF OPERATION (MODE), AND CUT

Frequency Range	ESR (Ω)	Mode / Cut	Frequency Range	ESR (Ω)	Mode / Cut
3.579545MHz to 4.999MHz	200 Max	Fundamental / AT	15.000MHz to 15.999MHz	60 Max	Fundamental / AT
5.000MHz to 5.999MHz	150 Max	Fundamental / AT	16.000MHz to 23.999MHz	50 Max	Fundamental / AT
6.000MHz to 7.999MHz	120 Max	Fundamental / AT	24.000MHz to 30.000MHz	40 Max	Fundamental / AT
8.000MHz to 8.999MHz	90 Max	Fundamental / AT	24.000MHz to 48.000MHz	40 Max	Fundamental / BT
9.000MHz to 9.999MHz	80 Max	Fundamental / AT	24.576MHz to 29.999MHz	150 Max	Third Overtone / AT
10.000MHz to 14.999MHz	70 Max	Fundamental / AT	30.000MHz to 60.000MHz	100 Max	Third Overtone / AT

### MECHANICAL DIMENSIONS

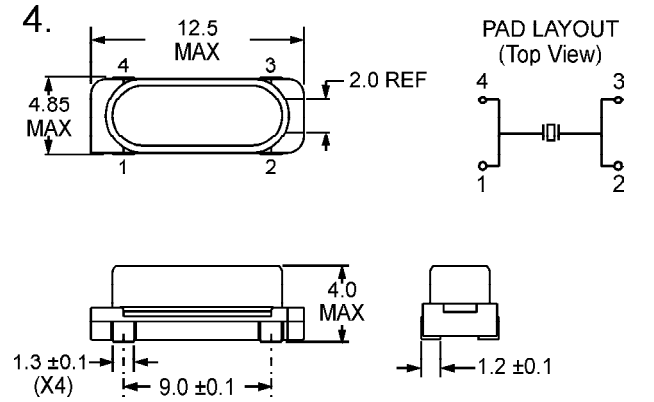
Environmental / Mechanical Specifications See pg. H1, Group B

**3.**



PAD LAYOUT  
(Top View)

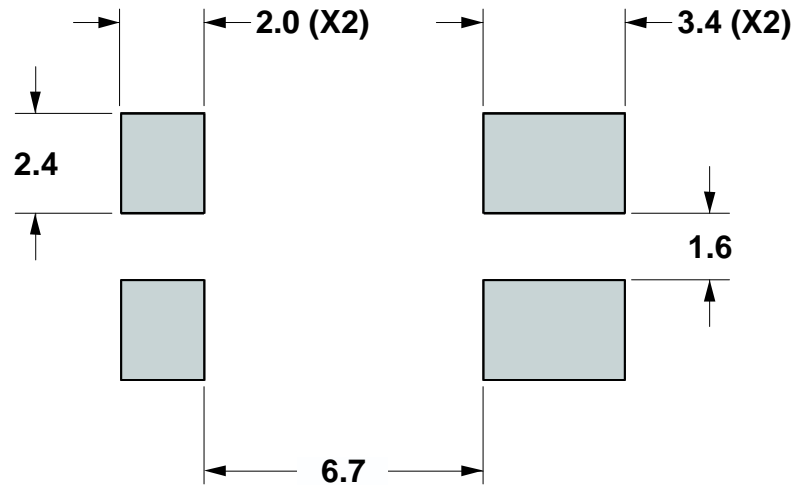
**4.**



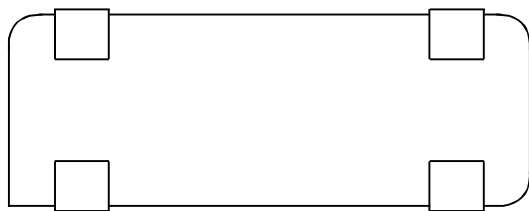
PAD LAYOUT  
(Top View)

Dimensions in mm

**RECOMMENDED  
SOLDER PAD LAYOUT  
FOR EC3SM SERIES**



**EC3SM SERIES CRYSTAL  
(Top View)**



**EC3SM SERIES USING THE  
RECOMMENDED SOLDER  
PAD LAYOUT FOR EC3SM SERIES**

