



## CXOLAT

### CXOLAT

The CXOLAT 32.768kHz surface-mount oscillator achieves the low power comparable with a tuning fork design and the fast start-up and tight frequency stability attained by an AT cut crystal design. Designed for applications requiring ultra-low current (15 $\mu$ A), fast start-up time (15ms) and a tight frequency stability ( $\pm$ 30 ppm to  $\pm$ 100 ppm) over a wide temperature range (-55°C to +125°C). These oscillators are

Model Name	Description
CXOLAT 1.8V	1.8V Version
CXOLAT 2.5V	2.5V Version
CXOLAT 3.0V	3.0V Version
CXOLAT 3.3V	3.3V Version

ISSUE 1; June 2019

### Description

- This product is designed and manufactured by Statek Corporation in California, USA and distributed by IQD. The CXOLAT 32.768kHz surface-mount oscillator achieves the low power comparable with a tuning fork design and the fast start-up and tight frequency stability attained by an AT cut crystal design. Designed for applications requiring ultra-low current (15µA), fast start-up time (15ms) and a tight frequency stability ( $\pm 30$  ppm to  $\pm 100$  ppm) over a wide temperature range (-55°C to +125°C). These oscillators are also capable of withstanding significantly higher shock than a standard tuning fork design.
- SM1 Gold Plated (RoHS)
- SM4 Solder Plated (RoHS)
- SM5 Solder Dipped (RoHS)
- FEATURES:
  - Ultra low current (typical 15µA)
  - Fast start-up (typical 15ms)
  - Tight tolerance
  - High shock resistance
  - Low ageing
  - CMOS output
  - Optional Output Enable/Disable with Tri-State
  - Hermetically sealed ceramic package
- APPLICATIONS:
  - Aerospace & Avionics -
  - Communications
  - Navigation
  - GPS
  - Industrial, Computer & Communications -
  - Handheld instrumentation
  - Transponder/Animal migration
- Please note that all data is only valid at 25°C unless otherwise stated.

### Frequency Parameters

- Frequency 32.768kHz
- Frequency Tolerance  $\pm 25.00$ ppm
- Tolerance Condition @ 25°C
- Frequency Stability  $\pm 10.00$ ppm to  $\pm 100.00$ ppm
- Ageing  $\pm 5$ ppm max in 1st year @ 25°C
- Frequency Stability does not include Frequency Tolerance @ 25°C
- All parameters are measured at 25°C with a 10MΩ and 15pF load at 3.3V
- Note: Other Frequency Tolerances and Stabilities are available - please contact an IQD Sales Office

### Electrical Parameters

- Supply Voltage 1.8V  $\pm 10\%$
- Supply Current: 15µA typ
- Supply Voltage (absolute maximum rating): -0.5V to 5.0V

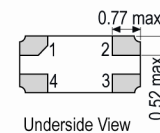
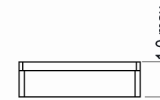
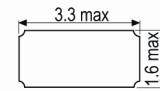
### Operating Temperature Ranges

- 10 to 70°C
- 40 to 85°C
- 55 to 125°C

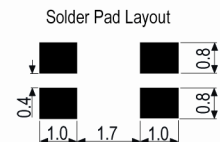
### Output Details

- Output Compatibility CMOS
- Drive Capability 15pF
- Output Level High Voh: 90%Vs min  
Output Level Low Vol: 10%Vs max
- Rise Time (10%-90%): 2.8ns typ, 10ns max  
Fall Time (90%-10%): 2.4ns typ, 10ns max

### Outline (mm) SM1 = Gold Plated (RoHS)



Pad Connections  
 1. Output  
 2. GND  
 3. Enable/Disable/NC  
 4. +Vs



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**Output Control**

- Start-Up Time: 15ms typ

**Environmental Parameters**

- Shock: 5000G, 0.3ms, 1/2 sine
- Vibration: MIL-STD-202G, Method 204D, Condition D: 20G, 10Hz-2000Hz swept sine
- Note: Random Vibration test is also available - please contact an IQD Sales Office
- Storage Temperature Range: -55 to 125°C

**Manufacturing Details**

- Maximum Process Temperature: 260°C for 20sec max

**Ordering Information**

- Frequency\*
- Model\*
- Termination Variant\*
- Output
- Frequency Tolerance (@ 25°C)\*
- Frequency Stability (over operating temperature range)\*
- Operating Temperature Range\*
- Pad 3 Function\* (minimum required\*)
- Termination Variants:
  - SM1 = Gold Plated
  - SM4 = Solder Plated
  - SM5 = Solder Dipped
 (Note: Non-RoHS compliant terminations also available - please contact an IQD Sales Office)
- Pad 3 Function Options:
  - EN = Enable/Disable
  - NC = No connection
- Example  
32.768kHz CXOLAT 1.8V SM1  
CMOS ±25ppm ±100ppm -40 to 85C NC

**Compliance**

- RoHS Status (2015/863/EU)      Optional
- REACH Status                      Compliant
- MSL Rating (JDEC-STD-033):    Not Applicable

**Packaging Details**

- Pack Style: Tray      Supplied on a tray  
Pack Size: 1
- Pack Style: Reel      Tape & reel in accordance with EIA-481-D  
Pack Size: 1,000

**Electrical Specification - maximum limiting values 1.80V ±10%**

Frequency Min	Temperature Range	Stability (Min)	Current Draw	Rise and Fall Time	Duty Cycle
	°C	ppm	mA	ns	%
32.768kHz	-55 to 125	±50.00	-	-	45/55%
	-40 to 85	±20.00	-	-	45/55%
	-10 to 70	±10.00	-	-	45/55%

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### Description

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- SM1 Gold Plated (RoHS)
- SM4 Solder Plated (RoHS)
- SM5 Solder Dipped (RoHS)
- FEATURES:
  - Ultra low current (typical 15µA)
  - Fast start-up (typical 15ms)
  - Tight tolerance
  - High shock resistance
  - Low ageing
  - CMOS output
  - Optional Output Enable/Disable with Tri-State
  - Hermetically sealed ceramic package
- APPLICATIONS:
  - Aerospace & Avionics -
    - Communications
    - Navigation
    - GPS
  - Industrial, Computer & Communications -
    - Handheld instrumentation
    - Transponder/Animal migration
- Please note that all data is only valid at 25°C unless otherwise stated.

### Frequency Parameters

- Frequency 32.768kHz
- Frequency Tolerance  $\pm 25.00$ ppm
- Tolerance Condition @ 25°C
- Frequency Stability  $\pm 10.00$ ppm to  $\pm 100.00$ ppm
- Ageing  $\pm 5$ ppm max in 1st year @ 25°C
- Frequency Stability does not include Frequency Tolerance @ 25°C
- All parameters are measured at 25°C with a 10MΩ and 15pF load at 3.3V
- Note: Other Frequency Tolerances and Stabilities are available - please contact an IQD Sales Office

### Electrical Parameters

- Supply Voltage 2.5V  $\pm 10\%$
- Supply Current: 15µA typ
- Supply Voltage (absolute maximum rating): -0.5V to 5.0V

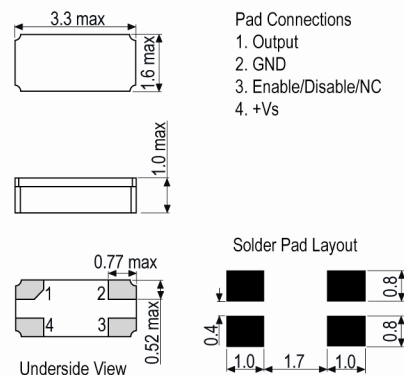
### Operating Temperature Ranges

- -10 to 70°C
- -40 to 85°C
- -55 to 125°C

### Output Details

- Output Compatibility CMOS
- Drive Capability 15pF
- Output Level High Voh: 90%Vs min  
Output Level Low Vol: 10%Vs max
- Rise Time (10%-90%): 2.8ns typ, 10ns max  
Fall Time (90%-10%): 2.4ns typ, 10ns max

### Outline (mm) SM1 = Gold Plated (RoHS)



Pad Connections  
 1. Output  
 2. GND  
 3. Enable/Disable/NC  
 4. +Vs

Solder Pad Layout

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**Output Control**

- Start-Up Time: 15ms typ

**Environmental Parameters**

- Shock: 5000G, 0.3ms, 1/2 sine
- Vibration: MIL-STD-202G, Method 204D, Condition D: 20G, 10Hz-2000Hz swept sine
- Note: Random Vibration test is also available - please contact an IQD Sales Office
- Storage Temperature Range: -55 to 125°C

**Manufacturing Details**

- Maximum Process Temperature: 260°C for 20sec max

**Ordering Information**

- Frequency\*
- Model\*
- Termination Variant\*
- Output
- Frequency Tolerance (@ 25°C)\*
- Frequency Stability (over operating temperature range)\*
- Operating Temperature Range\*
- Pad 3 Function\* (minimum required\*)
- Termination Variants:
  - SM1 = Gold Plated
  - SM4 = Solder Plated
  - SM5 = Solder Dipped
 (Note: Non-RoHS compliant terminations also available - please contact an IQD Sales Office)
- Pad 3 Function Options:
  - EN = Enable/Disable
  - NC = No connection
- Example  
32.768kHz CXOLAT 2.5V SM1  
CMOS ±25ppm ±100ppm -40 to 85C NC

**Compliance**

- RoHS Status (2015/863/EU)      Optional
- REACH Status                      Compliant
- MSL Rating (JDEC-STD-033):    Not Applicable

**Packaging Details**

- Pack Style: Tray      Supplied on a tray  
Pack Size: 1
- Pack Style: Reel      Tape & reel in accordance with EIA-481-D  
Pack Size: 1,000

**Electrical Specification - maximum limiting values 2.50V ±10%**

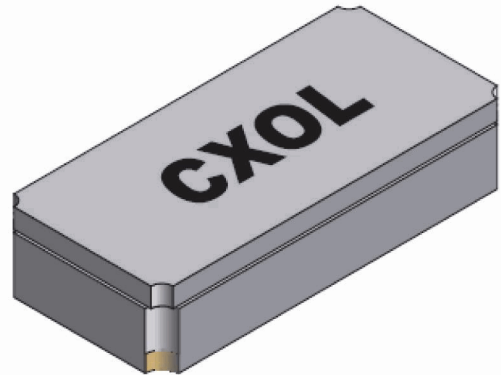
Frequency Min	Temperature Range	Stability (Min)	Current Draw	Rise and Fall Time	Duty Cycle
	°C	ppm	mA	ns	%
32.768kHz	-55 to 125	±50.00	-	-	45/55%
	-40 to 85	±20.00	-	-	45/55%
	-10 to 70	±10.00	-	-	45/55%

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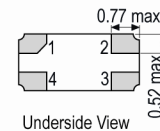
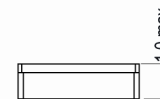
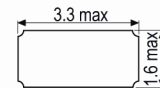
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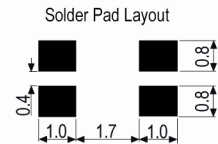
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- SM1 Gold Plated (RoHS)
- SM4 Solder Plated (RoHS)
- SM5 Solder Dipped (RoHS)
- FEATURES:
  - Ultra low current (typical 15µA)
  - Fast start-up (typical 15ms)
  - Tight tolerance
  - High shock resistance
  - Low ageing
  - CMOS output
  - Optional Output Enable/Disable with Tri-State
  - Hermetically sealed ceramic package
- APPLICATIONS:
  - Aerospace & Avionics - Communications
  - Navigation
  - GPS
  - Industrial, Computer & Communications - Handheld instrumentation
  - Transponder/Animal migration
- Please note that all data is only valid at 25°C unless otherwise stated.



Outline (mm) SM1 = Gold Plated (RoHS)



Pad Connections  
 1. Output  
 2. GND  
 3. Enable/Disable/NC  
 4. +Vs



### Frequency Parameters

- Frequency 32.768kHz
- Frequency Tolerance  $\pm 25.00$ ppm
- Tolerance Condition @ 25°C
- Frequency Stability  $\pm 10.00$ ppm to  $\pm 100.00$ ppm
- Ageing  $\pm 5$ ppm max in 1st year @ 25°C
- Frequency Stability does not include Frequency Tolerance @ 25°C
- All parameters are measured at 25°C with a 10MΩ and 15pF load at 3.3V
- Note: Other Frequency Tolerances and Stabilities are available - please contact an IQD Sales Office

### Electrical Parameters

- Supply Voltage 3.0V  $\pm 10\%$
- Supply Current: 15µA typ
- Supply Voltage (absolute maximum rating): -0.5V to 5.0V

### Operating Temperature Ranges

- -10 to 70°C
- -40 to 85°C
- -55 to 125°C

### Output Details

- Output Compatibility CMOS
- Drive Capability 15pF
- Output Level High Voh: 90%Vs min  
Output Level Low Vol: 10%Vs max
- Rise Time (10%-90%): 2.8ns typ, 10ns max  
Fall Time (90%-10%): 2.4ns typ, 10ns max

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**Output Control**

- Start-Up Time: 15ms typ

**Environmental Parameters**

- Shock: 5000G, 0.3ms, 1/2 sine
- Vibration: MIL-STD-202G, Method 204D, Condition D: 20G, 10Hz-2000Hz swept sine
- Note: Random Vibration test is also available - please contact an IQD Sales Office
- Storage Temperature Range: -55 to 125°C

**Manufacturing Details**

- Maximum Process Temperature: 260°C for 20sec max

**Ordering Information**

- Frequency\*
- Model\*
- Termination Variant\*
- Output
- Frequency Tolerance (@ 25°C)\*
- Frequency Stability (over operating temperature range)\*
- Operating Temperature Range\*
- Pad 3 Function\* (minimum required\*)
- Termination Variants:
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  - SM4 = Solder Plated
  - SM5 = Solder Dipped
 (Note: Non-RoHS compliant terminations also available - please contact an IQD Sales Office)
- Pad 3 Function Options:
  - EN = Enable/Disable
  - NC = No connection
- Example
  - 32.768kHz CXOLAT 3.0V SM1
  - CMOS ±25ppm ±100ppm -40 to 85C NC

**Compliance**

- RoHS Status (2015/863/EU)      Optional
- REACH Status                      Compliant
- MSL Rating (JDEC-STD-033):    Not Applicable

**Packaging Details**

- Pack Style: Reel      Tape & reel in accordance with EIA-481-D  
Pack Size: 1,000
- Pack Style: Tray      Supplied on a tray  
Pack Size: 1

**Electrical Specification - maximum limiting values 3.00V ±10%**

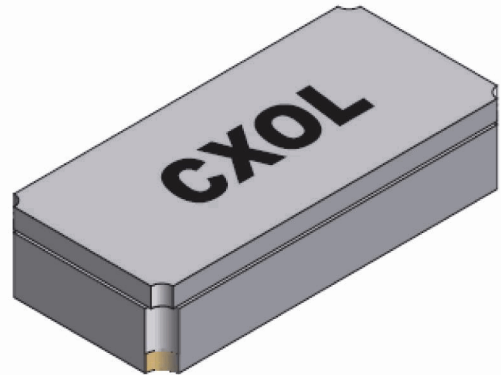
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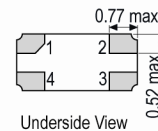
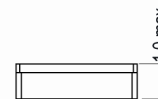
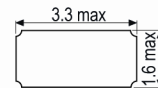
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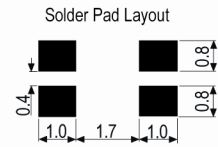
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Outline (mm) SM1 = Gold Plated (RoHS)



Pad Connections  
 1. Output  
 2. GND  
 3. Enable/Disable/NC  
 4. +Vs



### Frequency Parameters

- Frequency 32.768kHz
- Frequency Tolerance  $\pm 25.00$ ppm
- Tolerance Condition @ 25°C
- Frequency Stability  $\pm 10.00$ ppm to  $\pm 100.00$ ppm
- Ageing  $\pm 5$ ppm max in 1st year @ 25°C
- Frequency Stability does not include Frequency Tolerance @ 25°C
- All parameters are measured at 25°C with a 10MΩ and 15pF load at 3.3V
- Note: Other Frequency Tolerances and Stabilities are available - please contact an IQD Sales Office

### Electrical Parameters

- Supply Voltage 3.3V  $\pm 10\%$
- Supply Current: 15µA typ
- Supply Voltage (absolute maximum rating): -0.5V to 5.0V

### Operating Temperature Ranges

- -10 to 70°C
- -40 to 85°C
- -55 to 125°C

### Output Details

- Output Compatibility CMOS
- Drive Capability 15pF
- Output Level High Voh: 90%Vs min  
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- Rise Time (10%-90%): 2.8ns typ, 10ns max  
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#### Output Control

- Start-Up Time: 15ms typ

#### Environmental Parameters

- Shock: 5000G, 0.3ms, 1/2 sine
- Vibration: MIL-STD-202G, Method 204D, Condition D: 20G, 10Hz-2000Hz swept sine
- Note: Random Vibration test is also available - please contact an IQD Sales Office
- Storage Temperature Range: -55 to 125°C

#### Manufacturing Details

- Maximum Process Temperature: 260°C for 20sec max

#### Ordering Information

- Frequency\*
- Model\*
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- Example  
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CMOS ±25ppm ±100ppm -40 to 85C NC

#### Compliance

- RoHS Status (2015/863/EU)      Optional
- REACH Status                      Compliant
- MSL Rating (JDEC-STD-033):    Not Applicable

#### Packaging Details

- Pack Style: Reel      Tape & reel in accordance with EIA-481-D  
Pack Size: 1,000
- Pack Style: Tray      Supplied on a tray  
Pack Size: 1

#### Electrical Specification - maximum limiting values 3.30V ±10%

Frequency Min	Temperature Range	Stability (Min)	Current Draw	Rise and Fall Time	Duty Cycle
	°C	ppm	mA	ns	%
32.768kHz	-55 to 125	±50.00	-	-	45/55%
	-40 to 85	±20.00	-	-	45/55%
	-10 to 70	±10.00	-	-	45/55%

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Courtesy of Statek Corporation

Crystal Clock Oscillator Specification  
**CXOLAT 3.3V**

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UK: +44 (0)1460 270200  
Germany: 0800 1808 443

France: 0800 901 383  
USA: +1.760.318.2824

Email: [info@iqdfrequencyproducts.com](mailto:info@iqdfrequencyproducts.com)  
Web: [www.iqdfrequencyproducts.com](http://www.iqdfrequencyproducts.com)

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