



LHGAT

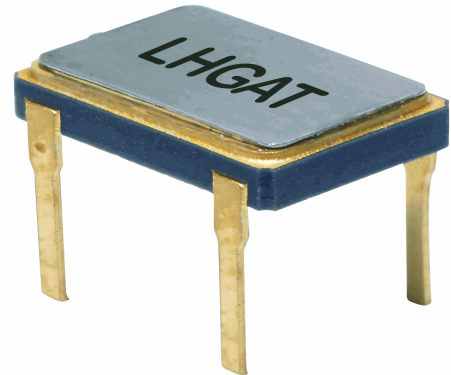
An increasing number of high temperature applications require the use of leaded (through-hole) ceramic packaged oscillators. For these applications, IQD offers the LHGAT 7 x 5mm crystal oscillator. The oscillator is designed to operate over a temperatures range of -55 to 125°C with high shock survivability.

Model Name	Description
LHGAT 1.8V	A 1.8V Version
LHGAT 2.5V	A 2.5V Version
LHGAT 3.0V	A 3.0V Version
LHGAT 3.3V	A 3.3V Version
LHGAT 5.0V	A 5.0V Version

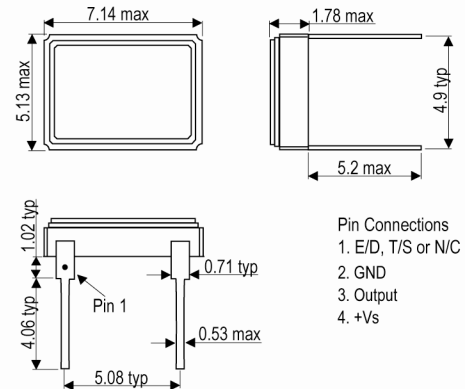
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Description

- An increasing number of high temperature applications require the use of leaded (through-hole) ceramic packaged oscillators. For these applications, IQD offers the LHGAT 7 x 5mm crystal oscillator. The oscillator is designed to operate over a temperatures range of -55 to 125°C with high shock survivability.
- A 5000G, Gold Plated (RoHS)
- A-05 5000G, Solder Dipped (RoHS)
- B 10000G, Gold Plated (RoHS)
- B-05 10000G, Solder Dipped (RoHS)
- C 20000G, Gold Plated (RoHS)
- C-05 20000G, Solder Dipped (RoHS)
- D 30000G, Gold Plated (RoHS)
- D-05 30000G, Solder Dipped (RoHS)
- FEATURES:
 - Excellent stability over temperature
 - High shock resistance
 - CMOS output - output enable/disable
 - Hermetically sealed ceramic package - 7 x 5mm
 - Double hermetically sealed package option
 - Through-hole leaded package
 - Reduces mechanical and thermal mounting stresses
 - Robust lead-attach eutectic brazing process
 - Gold plated Kovar leads
- APPLICATIONS:
 - Aerospace -
 - Navigation / Communications
 - Avionics applications
 - Flight recorder
 - Engine control
- Please note that all data is only valid at 25°C unless otherwise stated.



Outline (mm) A = 5000G, Gold Plated (RoHS)



Frequency Parameters

- Frequency: 320.0kHz to 50.0MHz
- Frequency Tolerance: $\pm 20.00\text{ppm}$ to $\pm 100.00\text{ppm}$
- Tolerance Condition: @ 25°C
- Frequency Stability: $\pm 15.00\text{ppm}$ to $\pm 100.00\text{ppm}$
- Ageing: $\pm 5\text{ppm}$ max 1st year @ 25°C
- Frequency Stability does not include Frequency Tolerance @ 25°C
- Note: Tighter Frequency Tolerances and higher Operating Temperatures (up to 200°C) are available - please contact an IQD Sales Office

Electrical Parameters

- Supply Voltage: 1.8V $\pm 10\%$
- Current Draw (typical for the 3.3V version):
 - 24MHz - 3.0mA
 - 32MHz - 5.0mA
 - 40MHz - 5.5mA
 - 50MHz - 6.0mA
- Absolute Maximum Supply Voltage: -0.5V to 4.0V
- Note: Tighter Duty Cycles are available - please contact an IQD Sales Office

Operating Temperature Ranges

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

Output Details

- Output Compatibility: CMOS
- Drive Capability: 15pF

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Output Control

- Start-Up Time: 5ms max

Environmental Parameters

- Shock: Level (A to D), 0.5ms, 1/2 sine
- Vibration: 20G, 10-2000Hz swept sine
- Storage Temperature Range: -55 to 125°C

Manufacturing Details

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

Ordering Information

- Frequency*
- Model*
- Supply Voltage
- Shock Level*
- Terminations Variant*
- Output
- Frequency Tolerance (@ 25°C)*
- Frequency Stability (over operating temperature range)*
- Operating Temperature Range*
- Pin 1 Function*
- (*minimum required)
- Shock Level Options:
 - A = 5000G (standard)
 - B = 10000G
 - C = 20000G
 - D = 30000G
 Note: Shock levels above 30000G are available - please contact an IQD Sales Office
- Termination Variants:
 - 'Blank' = Gold Plated
 - 05 = Solder Dipped
 Note: non-RoHS compliant terminations are available - please contact an IQD Sales Office
- Pin 1 Function Options:
 - EN = Enable/Disable
 - TS = Tri-State
 - NC = No connection
- Example
 - 10.0MHz LHGAT 1.8V A-05
 - CMOS ±50ppm ±100ppm -40 to 85C EN

Compliance

- RoHS Status (2011/65/EU) Optional
- REACH Status Compliant
- MSL Rating (JDEC-STD-033): Not Applicable

Packaging Details

- Pack Style: Tube Supplied in tubes
- Pack Size: 1

Electrical Specification - maximum limiting values 1.8V ±10%

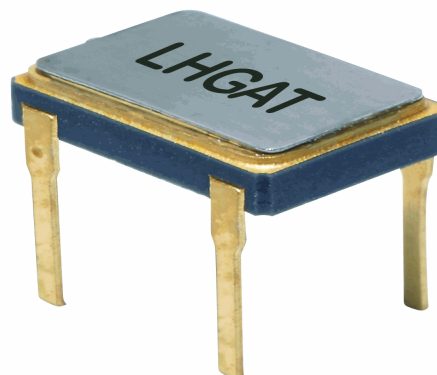
Frequency Min	Frequency Max	Temperature Range	Stability (Min)	Current Draw	Rise and Fall Time	Duty Cycle
		°C	ppm	mA	ns	%
320.0kHz	50.0MHz	-10 to 70	±15.0	-	8	40/60%
		-40 to 85	±30.0	-	8	40/60%
		-55 to 125	±40.0	-	8	40/60%

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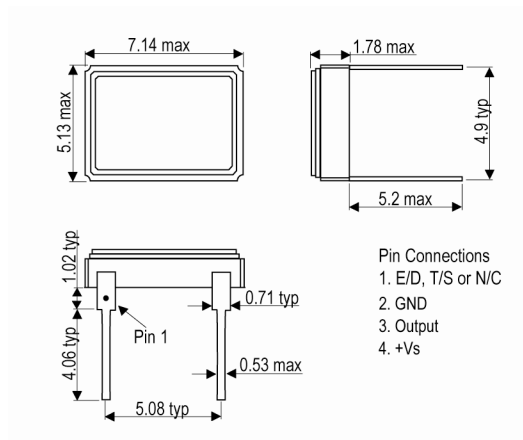
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Description

- An increasing number of high temperature applications require the use of leaded (through-hole) ceramic packaged oscillators. For these applications, IQD offers the LHGAT 7 x 5mm crystal oscillator. The oscillator is designed to operate over a temperature range of -55 to 125°C with high shock survivability.
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- A-05 5000G, Solder Dipped (RoHS)
- B 10000G, Gold Plated (RoHS)
- B-05 10000G, Solder Dipped (RoHS)
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- C-05 20000G, Solder Dipped (RoHS)
- D 30000G, Gold Plated (RoHS)
- D-05 30000G, Solder Dipped (RoHS)
- FEATURES:
 - Excellent stability over temperature
 - High shock resistance
 - CMOS output - output enable/disable
 - Hermetically sealed ceramic package - 7 x 5mm
 - Double hermetically sealed package option
 - Through-hole leaded package
 - Reduces mechanical and thermal mounting stresses
 - Robust lead-attach eutectic brazing process
 - Gold plated Kovar leads
- APPLICATIONS:
 - Aerospace -
 - Navigation / Communications
 - Avionics applications
 - Flight recorder
 - Engine control
- Please note that all data is only valid at 25°C unless otherwise stated.



Outline (mm) A = 5000G, Gold Plated (RoHS)



Frequency Parameters

- Frequency: 320.0kHz to 50.0MHz
- Frequency Tolerance: ±20.00ppm to ±100.00ppm
- Tolerance Condition: @ 25°C
- Frequency Stability: ±15.00ppm to ±100.00ppm
- Ageing: ±5ppm max 1st year @ 25°C
- Frequency Stability does not include Frequency Tolerance @ 25°C
- Note: Tighter Frequency Tolerances and higher Operating Temperatures (up to 200°C) are available - please contact an IQD Sales Office

Electrical Parameters

- Supply Voltage: 2.5V ±10%
- Current Draw (typical for the 3.3V version):
 - 24MHz - 3.0mA
 - 32MHz - 5.0mA
 - 40MHz - 5.5mA
 - 50MHz - 6.0mA
- Absolute Maximum Supply Voltage: -0.5V to 4.0V
- Note: Tighter Duty Cycles are available - please contact an IQD Sales Office

Operating Temperature Ranges

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

Output Details

- Output Compatibility: CMOS
- Drive Capability: 15pF

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Output Control

- Start-Up Time: 5ms max

Environmental Parameters

- Shock: Level (A to D), 0.5ms, 1/2 sine
- Vibration: 20G, 10-2000Hz swept sine
- Storage Temperature Range: -55 to 125°C

Manufacturing Details

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

Ordering Information

- Frequency*
- Model*
- Supply Voltage
- Shock Level*
- Terminations Variant*
- Output
- Frequency Tolerance (@ 25°C)*
- Frequency Stability (over operating temperature range)*
- Operating Temperature Range*
- Pin 1 Function*
- (*minimum required)
- Shock Level Options:
 - A = 5000G (standard)
 - B = 10000G
 - C = 20000G
 - D = 30000G
 Note: Shock levels above 30000G are available - please contact an IQD Sales Office
- Termination Variants:
 - 'Blank' = Gold Plated
 - 05 = Solder Dipped
 Note: non-RoHS compliant terminations are available - please contact an IQD Sales Office
- Pin 1 Function Options:
 - EN = Enable/Disable
 - TS = Tri-State
 - NC = No connection
- Example
 - 10.0MHz LHGAT 2.5V A-05
 - CMOS ±50ppm ±100ppm -40 to 85C EN

Compliance

- RoHS Status (2011/65/EU) Optional
- REACH Status Compliant
- MSL Rating (JDEC-STD-033): Not Applicable

Packaging Details

- Pack Style: Tube Supplied in tubes
- Pack Size: 1

Electrical Specification - maximum limiting values 2.5V ±10%

Frequency Min	Frequency Max	Temperature Range	Stability (Min)	Current Draw	Rise and Fall Time	Duty Cycle
		°C	ppm	mA	ns	%
320.0kHz	50.0MHz	-10 to 70	±15.0	-	8	40/60%
		-40 to 85	±30.0	-	8	40/60%
		-55 to 125	±40.0	-	8	40/60%

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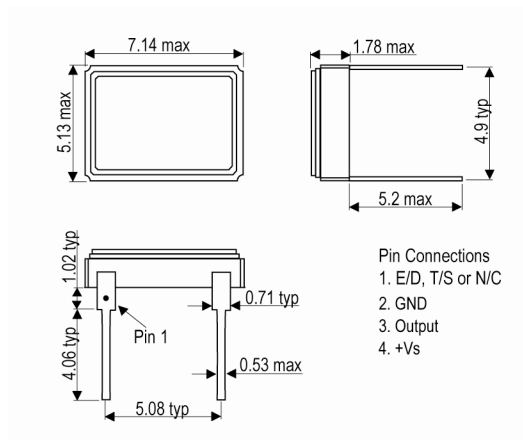
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Description

- An increasing number of high temperature applications require the use of leaded (through-hole) ceramic packaged oscillators. For these applications, IQD offers the LHGAT 7 x 5mm crystal oscillator. The oscillator is designed to operate over a temperature range of -55 to 125°C with high shock survivability.
- A 5000G, Gold Plated (RoHS)
- A-05 5000G, Solder Dipped (RoHS)
- B 10000G, Gold Plated (RoHS)
- B-05 10000G, Solder Dipped (RoHS)
- C 20000G, Gold Plated (RoHS)
- C-05 20000G, Solder Dipped (RoHS)
- D 30000G, Gold Plated (RoHS)
- D-05 30000G, Solder Dipped (RoHS)
- FEATURES:
 - Excellent stability over temperature
 - High shock resistance
 - CMOS output - output enable/disable
 - Hermetically sealed ceramic package - 7 x 5mm
 - Double hermetically sealed package option
 - Through-hole leaded package
 - Reduces mechanical and thermal mounting stresses
 - Robust lead-attach eutectic brazing process
 - Gold plated Kovar leads
- APPLICATIONS:
 - Aerospace -
 - Navigation / Communications
 - Avionics applications
 - Flight recorder
 - Engine control
- Please note that all data is only valid at 25°C unless otherwise stated.



Outline (mm) A = 5000G, Gold Plated (RoHS)



Frequency Parameters

- Frequency 320.0kHz to 50.0MHz
- Frequency Tolerance $\pm 20.00\text{ppm}$ to $\pm 100.00\text{ppm}$
- Tolerance Condition @ 25°C
- Frequency Stability $\pm 15.00\text{ppm}$ to $\pm 100.00\text{ppm}$
- Ageing $\pm 5\text{ppm}$ max 1st year @ 25°C
- Frequency Stability does not include Frequency Tolerance @ 25°C
- Note: Tighter Frequency Tolerances and higher Operating Temperatures (up to 200°C) are available - please contact an IQD Sales Office

Electrical Parameters

- Supply Voltage 3.0V $\pm 10\%$
- Current Draw (typical for the 3.3V version):
 - 24MHz - 3.0mA
 - 32MHz - 5.0mA
 - 40MHz - 5.5mA
 - 50MHz - 6.0mA
- Absolute Maximum Supply Voltage: -0.5V to 4.0V
- Note: Tighter Duty Cycles are available - please contact an IQD Sales Office

Operating Temperature Ranges

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

Output Details

- Output Compatibility CMOS
- Drive Capability 15pF

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Output Control

- Start-Up Time: 5ms max

Environmental Parameters

- Shock: Level (A to D), 0.5ms, 1/2 sine
- Vibration: 20G, 10-2000Hz swept sine
- Storage Temperature Range: -55 to 125°C

Manufacturing Details

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

Ordering Information

- Frequency*
- Model*
- Supply Voltage
- Shock Level*
- Terminations Variant*
- Output
- Frequency Tolerance (@ 25°C)*
- Frequency Stability (over operating temperature range)*
- Operating Temperature Range*
- Pin 1 Function*
- (*minimum required)
- Shock Level Options:
 - A = 5000G (standard)
 - B = 10000G
 - C = 20000G
 - D = 30000G
 Note: Shock levels above 30000G are available - please contact an IQD Sales Office
- Termination Variants:
 - 'Blank' = Gold Plated
 - 05 = Solder Dipped
 Note: non-RoHS compliant terminations are available - please contact an IQD Sales Office
- Pin 1 Function Options:
 - EN = Enable/Disable
 - TS = Tri-State
 - NC = No connection
- Example
 - 10.0MHz LHGAT 3.0V A-05
 - CMOS ±50ppm ±100ppm -40 to 85C EN

Compliance

- RoHS Status (2011/65/EU) Optional
- REACH Status Compliant
- MSL Rating (JDEC-STD-033): Not Applicable

Packaging Details

- Pack Style: Tube Supplied in tubes
- Pack Size: 1

Electrical Specification - maximum limiting values 3.0V ±10%

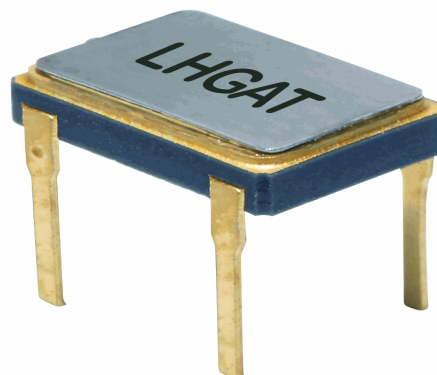
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		°C	ppm	mA	ns	%
320.0kHz	50.0MHz	-10 to 70	±15.0	-	8	40/60%
		-40 to 85	±30.0	-	8	40/60%
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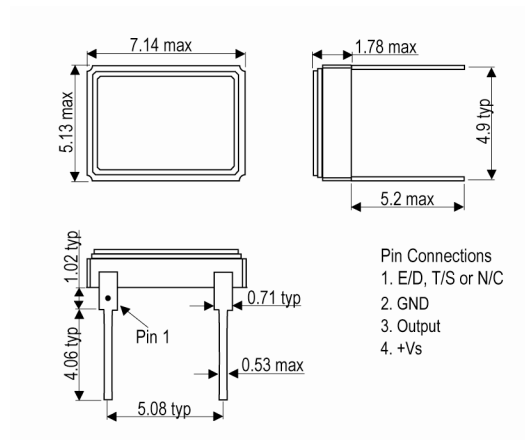
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- FEATURES:
 - Excellent stability over temperature
 - High shock resistance
 - CMOS output - output enable/disable
 - Hermetically sealed ceramic package - 7 x 5mm
 - Double hermetically sealed package option
 - Through-hole leaded package
 - Reduces mechanical and thermal mounting stresses
 - Robust lead-attach eutectic brazing process
 - Gold plated Kovar leads
- APPLICATIONS:
 - Aerospace -
 - Navigation / Communications
 - Avionics applications
 - Flight recorder
 - Engine control
- Please note that all data is only valid at 25°C unless otherwise stated.



Outline (mm) A = 5000G, Gold Plated (RoHS)



Frequency Parameters

- Frequency: 320.0kHz to 50.0MHz
- Frequency Tolerance: ±20.00ppm to ±100.00ppm
- Tolerance Condition: @ 25°C
- Frequency Stability: ±15.00ppm to ±100.00ppm
- Ageing: ±5ppm max 1st year @ 25°C
- Frequency Stability does not include Frequency Tolerance @ 25°C
- Note: Tighter Frequency Tolerances and higher Operating Temperatures (up to 200°C) are available - please contact an IQD Sales Office

Electrical Parameters

- Supply Voltage: 3.3V ±10%
- Current Draw (typical):
 - 24MHz - 3.0mA
 - 32MHz - 5.0mA
 - 40MHz - 5.5mA
 - 50MHz - 6.0mA
- Absolute Maximum Supply Voltage: -0.5V to 4.0V
- Note: Tighter Duty Cycles are available - please contact an IQD Sales Office

Operating Temperature Ranges

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

Output Details

- Output Compatibility: CMOS
- Drive Capability: 15pF

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Output Control

- Start-Up Time: 5ms max

Environmental Parameters

- Shock: Level (A to D), 0.5ms, 1/2 sine
- Vibration: 20G, 10-2000Hz swept sine
- Storage Temperature Range: -55 to 125°C

Manufacturing Details

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

Ordering Information

- Frequency*
- Model*
- Supply Voltage
- Shock Level*
- Terminations Variant*
- Output
- Frequency Tolerance (@ 25°C)*
- Frequency Stability (over operating temperature range)*
- Operating Temperature Range*
- Pin 1 Function*
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 - B = 10000G
 - C = 20000G
 - D = 30000G
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- Termination Variants:
 - 'Blank' = Gold Plated
 - 05 = Solder Dipped (RoHS)
 Note: non-RoHS compliant terminations are available - please contact an IQD Sales Office
- Pin 1 Function Options:
 - EN = Enable/Disable
 - TS = Tri-State
 - NC = No connection
- Example
 - 10.0MHz LHGAT 3.3V A-05
 - CMOS ±50ppm ±100ppm -40 to 85C EN

Compliance

- RoHS Status (2011/65/EU) Optional
- REACH Status Compliant
- MSL Rating (JDEC-STD-033): Not Applicable

Packaging Details

- Pack Style: Tube Supplied in tubes
- Pack Size: 1

Electrical Specification - maximum limiting values 3.3V ±10%

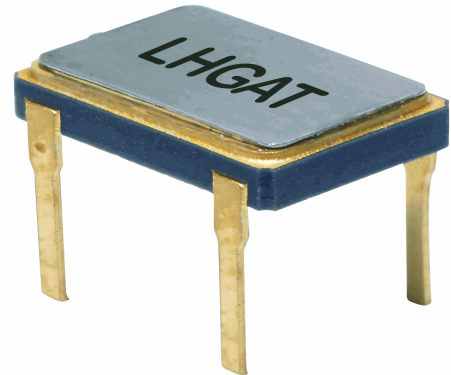
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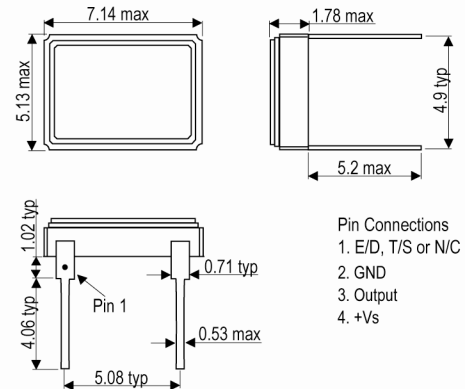
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 - Engine control
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Outline (mm) A = 5000G, Gold Plated (RoHS)



Frequency Parameters

- Frequency 320.0kHz to 50.0MHz
- Frequency Tolerance $\pm 20.00\text{ppm}$ to $\pm 100.00\text{ppm}$
- Tolerance Condition @ 25°C
- Frequency Stability $\pm 15.00\text{ppm}$ to $\pm 100.00\text{ppm}$
- Ageing $\pm 5\text{ppm}$ max 1st year @ 25°C
- Frequency Stability does not include Frequency Tolerance @ 25°C
- Note: Tighter Frequency Tolerances and higher Operating Temperatures (up to 200°C) are available - please contact an IQD Sales Office

Electrical Parameters

- Supply Voltage 5.0V $\pm 10\%$
- Current Draw (typical):
 - 24MHz - 8mA
 - 32MHz - 10mA
 - 40MHz - 12mA
 - 50MHz - 13mA
- Absolute Maximum Supply Voltage: -0.5V to 7.0V
- Note: Tighter Duty Cycles are available - please contact an IQD Sales Office

Operating Temperature Ranges

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

Output Details

- Output Compatibility CMOS
- Drive Capability 15pF

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Output Control

- Start-Up Time: 5ms max

Environmental Parameters

- Shock: Level (A to D), 0.5ms, 1/2 sine
- Vibration: 20G, 10-2000Hz swept sine
- Storage Temperature Range: -55 to 125°C

Manufacturing Details

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

Ordering Information

- Frequency*
- Model*
- Supply Voltage
- Shock Level*
- Terminations Variant*
- Output
- Frequency Tolerance (@ 25°C)*
- Frequency Stability (over operating temperature range)*
- Operating Temperature Range*
- Pin 1 Function*
- (*minimum required)
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 - 'Blank' = Gold Plated
 - 05 = Solder Dipped (RoHS)
 Note: non-RoHS compliant terminations are available - please contact an IQD Sales Office
- Pin 1 Function Options:
 - EN = Enable/Disable
 - TS = Tri-State
 - NC = No connection
- Example
 - 10.0MHz LHGAT 5.0V A-05
 - CMOS ±50ppm ±100ppm -40 to 85C EN

Compliance

- RoHS Status (2011/65/EU) Optional
- REACH Status Compliant
- MSL Rating (JDEC-STD-033): Not Applicable

Packaging Details

- Pack Style: Tube Supplied in tubes
- Pack Size: 1

Electrical Specification - maximum limiting values 5.0V ±10%

Frequency Min	Frequency Max	Temperature Range	Stability (Min)	Current Draw	Rise and Fall Time	Duty Cycle
		°C	ppm	mA	ns	%
320.0kHz	50.0MHz	-10 to 70	±15.0	-	8	40/60%
		-40 to 85	±30.0	-	8	40/60%
		-55 to 125	±40.0	-	8	40/60%

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Crystal Clock Oscillator Specification
LHGAT 5.0V

ISSUE 2; October 2018

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