



## IQXT-205-2

IQXT-205-2 is a 2.0 x 1.6mm SMD Voltage Controlled Temperature Compensated Crystal Oscillator (VCTCXO) in a hermetically sealed package.

Model Name	Description
IQXT-205-2-18	A 1.8V version
IQXT-205-2-25	A 2.5V version
IQXT-205-2-28	A 2.8V version
IQXT-205-2-30	A 3.0V version
IQXT-205-2-33	A 3.3V version

ISSUE 1; March 2018

### Description

- IQXT-205-2-18 is a 2.0 x 1.6mm SMD Voltage Controlled Temperature Compensated Crystal Oscillator (VCTCXO) in a hermetically sealed package.
- Developed frequencies: 16.2, 16.368, 16.369, 19.2, 20.0, 24.0, 25.0, 26.0, 27.456, 28.925, 28.974, 30.0, 32.0, 33.6, 38.4, 48.0, 50.0 and 52.0MHz



### Frequency Parameters

- Frequency: 13.0MHz to 52.0MHz
- Frequency Tolerance Max:  $\pm 1.50\text{ppm}$
- Tolerance Condition: @ 25°C  $\pm 2^\circ\text{C}$
- Frequency Stability:  $\pm 0.50\text{ppm}$  to  $\pm 2.00\text{ppm}$
- Ageing:  $\pm 1\text{ppm}$  max per year @ 25°C  $\pm 3^\circ\text{C}$
- Frequency Tolerance: Referred to nominal frequency before reflow soldering.
- Supply Voltage Variation:
  - @  $\pm 5\%$  change for  $\pm 0.5\text{ppm}$  stability:  $\pm 0.1\text{ppm}$  max
  - @  $\pm 5\%$  change for  $\pm 2.0\text{ppm}$  stability:  $\pm 0.2\text{ppm}$  max
- Load Variation:
  - @  $\pm 10\%$  change for  $\pm 0.5\text{ppm}$  stability:  $\pm 0.1\text{ppm}$  max
  - @  $\pm 10\%$  change for  $\pm 2.0\text{ppm}$  stability:  $\pm 0.2\text{ppm}$  max
- Short Term Stability (Allan variance):  $\pm 1\text{ppb}$  max (Tau = 0.1s)
- IR Reflow Resistance (ref to frequency before reflow):  $\pm 1\text{ppm}$  max

### Electrical Parameters

- Supply Voltage: 1.8V  $\pm 5\%$
- Absolute Maximum Ratings:
  - Supply Voltage: -0.6V to 4.6V
  - Control Voltage: -0.6V to Vs+0.6V

### Frequency Adjustment

- Pulling:  $\pm 8\text{ppm}$  min to  $\pm 13\text{ppm}$  max
- Control Voltage: 0.9V  $\pm 0.8\text{V}$
- Slope: Positive

### Operating Temperature Ranges

- 30 to 85°C

### Output Details

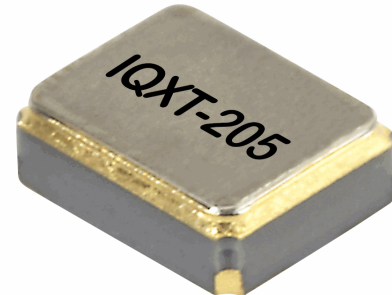
- Output Compatibility: Clipped Sine
- Drive Capability: 10k $\Omega$ /10pF
- Output: DC coupled
- Output Level: 0.8V pk-pk min
- Start Up Time (90% of V pk-pk): 2ms max
- Start Up Time (within  $\pm 0.5\text{ppm}$ ): 2ms max

### Noise Parameters

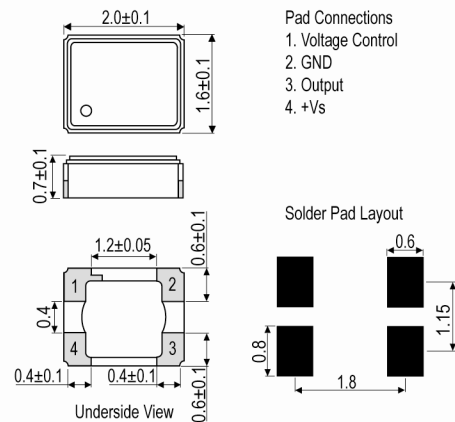
- Phase Noise (typ): -135dBc/Hz @ 1kHz
- Harmonic Distortion: -5.0dBc max

### Environmental Parameters

- Storage Temperature Range: -40 to 85°C



### Outline (mm)



ISSUE 1; March 2018

**Ordering Information**

- \*Minimum info required
  - Frequency\*
  - Model\*
  - Output
  - Frequency Stability (over operating temperature range)\*
  - Operating Temperature Range\*
  - Supply Voltage
- Example
  - 20.0MHz IQXT-205-2-18
  - Clipped Sine  $\pm 0.5\text{ppm}$  -30 to 85C 1.8V  $\pm 8\text{ppm}$  min to  $\pm 13\text{ppm}$  max

**Compliance**

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

**Packaging Details**

- Pack Style: Cutt      Cut tape  
 Pack Size: 100
- Pack Style: Reel      Tape & reel in accordance with EIA-481-D  
 Pack Size: 2,000

**Electrical Specification - maximum limiting values 1.8V  $\pm 5\%$**

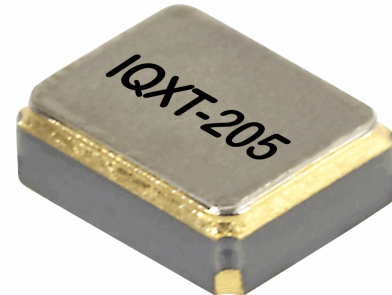
Frequency Min	Frequency Max	Temperature Range	Stability (Min)	Current Draw	Rise and Fall Time	Duty Cycle
		°C	ppm	mA	ns	%
13.0MHz	29.999999MHz	-30 to 85	$\pm 0.5$	1.5	-	-
30.0MHz	39.999999MHz	-30 to 85	$\pm 0.5$	1.7	-	-
40.0MHz	52.0MHz	-30 to 85	$\pm 0.5$	2	-	-

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ISSUE 1; March 2018

### Description

- IQXT-205-2-25 is a 2.0 x 1.6mm SMD Voltage Controlled Temperature Compensated Crystal Oscillator (VCTCXO) in a hermetically sealed package.
- Developed frequencies: 16.2, 16.368, 16.369, 19.2, 20.0, 24.0, 25.0, 26.0, 27.456, 28.925, 28.974, 30.0, 32.0, 33.6, 38.4, 48.0, 50.0 and 52.0MHz



### Frequency Parameters

- Frequency: 13.0MHz to 52.0MHz
- Frequency Tolerance Max:  $\pm 1.50\text{ppm}$
- Tolerance Condition: @ 25°C  $\pm 2^\circ\text{C}$
- Frequency Stability:  $\pm 0.50\text{ppm}$  to  $\pm 2.00\text{ppm}$
- Ageing:  $\pm 1\text{ppm}$  max per year @ 25°C  $\pm 3^\circ\text{C}$
- Frequency Tolerance: Referred to nominal frequency before reflow soldering.
- Supply Voltage Variation:
  - @  $\pm 5\%$  change for  $\pm 0.5\text{ppm}$  stability:  $\pm 0.1\text{ppm}$  max
  - @  $\pm 5\%$  change for  $\pm 2.0\text{ppm}$  stability:  $\pm 0.2\text{ppm}$  max
- Load Variation:
  - @  $\pm 10\%$  change for  $\pm 0.5\text{ppm}$  stability:  $\pm 0.1\text{ppm}$  max
  - @  $\pm 10\%$  change for  $\pm 2.0\text{ppm}$  stability:  $\pm 0.2\text{ppm}$  max
- Short Term Stability (Allan variance):  $\pm 1\text{ppb}$  max (Tau = 0.1s)
- IR Reflow Resistance (ref to frequency before reflow):  $\pm 1\text{ppm}$  max

### Electrical Parameters

- Supply Voltage: 2.5V  $\pm 5\%$
- Absolute Maximum Ratings:
  - Supply Voltage: -0.6V to 4.6V
  - Control Voltage: -0.6V to Vs+0.6V

### Frequency Adjustment

- Pulling:  $\pm 9\text{ppm}$  min to  $\pm 15\text{ppm}$  max
- Control Voltage: 1.25V  $\pm 1.0\text{V}$
- Slope: Positive

### Operating Temperature Ranges

- -30 to 85°C

### Output Details

- Output Compatibility: Clipped Sine
- Drive Capability: 10k $\Omega$ /10pF
- Output: DC coupled
- Output Level: 0.8V pk-pk min
- Start Up Time (90% of V pk-pk): 2ms max
- Start Up Time (within  $\pm 0.5\text{ppm}$ ): 2ms max

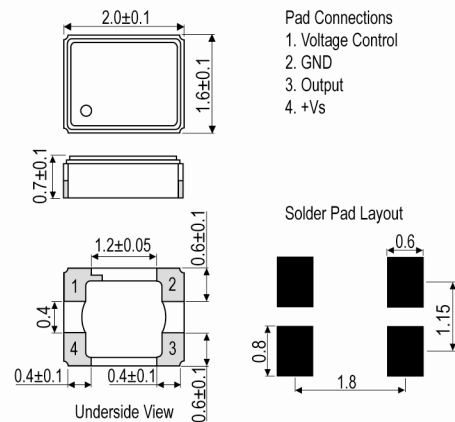
### Noise Parameters

- Phase Noise (typ): -135dBc/Hz @ 1kHz
- Harmonic Distortion: -5.0dBc max

### Environmental Parameters

- Storage Temperature Range: -40 to 85°C

### Outline (mm)



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**Ordering Information**

- \*Minimum info required
  - Frequency\*
  - Model\*
  - Output
  - Frequency Stability (over operating temperature range)\*
  - Operating Temperature Range\*
  - Supply Voltage
- Example
  - 20.0MHz IQXT-205-2-25
  - Clipped Sine  $\pm 0.5\text{ppm}$  -30 to 85C 2.5V  $\pm 9\text{ppm}$  min to  $\pm 15\text{ppm}$  max

**Compliance**

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

**Packaging Details**

- Pack Style: Cutt      Cut tape  
   Pack Size: 100
- Pack Style: Reel      Tape & reel in accordance with EIA-481-D  
   Pack Size: 2,000

**Electrical Specification - maximum limiting values 2.5V  $\pm 5\%$**

Frequency Min	Frequency Max	Temperature Range	Stability (Min)	Current Draw	Rise and Fall Time	Duty Cycle
		°C	ppm	mA	ns	%
13.0MHz	29.999999MHz	-30 to 85	$\pm 0.5$	1.5	-	-
30.0MHz	39.999999MHz	-30 to 85	$\pm 0.5$	1.7	-	-
40.0MHz	52.0MHz	-30 to 85	$\pm 0.5$	2	-	-

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ISSUE 1; March 2018

### Description

- IQXT-205-2-28 is a 2.0 x 1.6mm SMD Voltage Controlled Temperature Compensated Crystal Oscillator (VCTCXO) in a hermetically sealed package.
- Developed frequencies: 16.2, 16.368, 16.369, 19.2, 20.0, 24.0, 25.0, 26.0, 27.456, 28.925, 28.974, 30.0, 32.0, 33.6, 38.4, 48.0, 50.0 and 52.0MHz



### Frequency Parameters

- Frequency: 13.0MHz to 52.0MHz
- Frequency Tolerance Max:  $\pm 1.50\text{ppm}$
- Tolerance Condition: @ 25°C  $\pm 2^\circ\text{C}$
- Frequency Stability:  $\pm 0.50\text{ppm}$  to  $\pm 2.00\text{ppm}$
- Ageing:  $\pm 1\text{ppm}$  max per year @ 25°C  $\pm 3^\circ\text{C}$
- Frequency Tolerance: Referred to nominal frequency before reflow soldering.
- Supply Voltage Variation:
  - @  $\pm 5\%$  change for  $\pm 0.5\text{ppm}$  stability:  $\pm 0.1\text{ppm}$  max
  - @  $\pm 5\%$  change for  $\pm 2.0\text{ppm}$  stability:  $\pm 0.2\text{ppm}$  max
- Load Variation:
  - @  $\pm 10\%$  change for  $\pm 0.5\text{ppm}$  stability:  $\pm 0.1\text{ppm}$  max
  - @  $\pm 10\%$  change for  $\pm 2.0\text{ppm}$  stability:  $\pm 0.2\text{ppm}$  max
- Short Term Stability (Allan variance):  $\pm 1\text{ppb}$  max (Tau = 0.1s)
- IR Reflow Resistance (ref to frequency before reflow):  $\pm 1\text{ppm}$  max

### Electrical Parameters

- Supply Voltage: 2.8V  $\pm 5\%$
- Absolute Maximum Ratings:
  - Supply Voltage: -0.6V to 4.6V
  - Control Voltage: -0.6V to Vs+0.6V

### Frequency Adjustment

- Pulling:  $\pm 9\text{ppm}$  min to  $\pm 15\text{ppm}$  max
- Control Voltage: 1.4V  $\pm 1.0\text{V}$
- Slope: Positive

### Operating Temperature Ranges

- -30 to 85°C

### Output Details

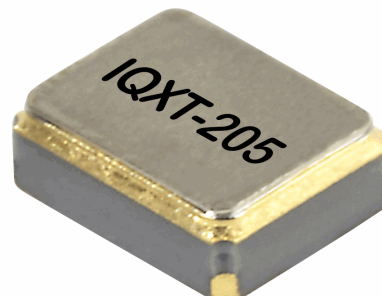
- Output Compatibility: Clipped Sine
- Drive Capability: 10k $\Omega$ /10pF
- Output: DC coupled
- Output Level: 0.8V pk-pk min
- Start Up Time (90% of V pk-pk): 2ms max
- Start Up Time (within  $\pm 0.5\text{ppm}$ ): 2ms max

### Noise Parameters

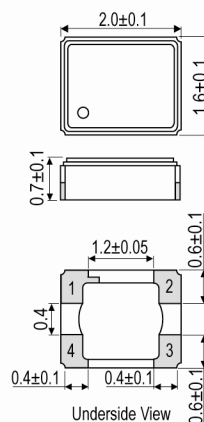
- Phase Noise (typ): -135dBc/Hz @ 1kHz
- Harmonic Distortion: -5.0dBc max

### Environmental Parameters

- Storage Temperature Range: -40 to 85°C



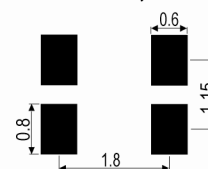
### Outline (mm)



### Pad Connections

1. Voltage Control
2. GND
3. Output
4. +Vs

### Solder Pad Layout



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**Ordering Information**

- \*Minimum info required
  - Frequency\*
  - Model\*
  - Output
  - Frequency Stability (over operating temperature range)\*
  - Operating Temperature Range\*
  - Supply Voltage
- Example
  - 20.0MHz IQXT-205-2-28
  - Clipped Sine  $\pm 0.5\text{ppm}$  -30 to 85C 2.8V  $\pm 9\text{ppm}$  min to  $\pm 15\text{ppm}$  max

**Compliance**

- RoHS Status (2011/65/EU)      Compliant
- 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: 2,000
- Pack Style: Cutt      Cut tape  
     Pack Size: 100

**Electrical Specification - maximum limiting values 2.8V  $\pm 5\%$**

Frequency Min	Frequency Max	Temperature Range	Stability (Min)	Current Draw	Rise and Fall Time	Duty Cycle
		°C	ppm	mA	ns	%
13.0MHz	29.999999MHz	-30 to 85	$\pm 0.5$	1.5	-	-
30.0MHz	39.999999MHz	-30 to 85	$\pm 0.5$	1.7	-	-
40.0MHz	52.0MHz	-30 to 85	$\pm 0.5$	2	-	-

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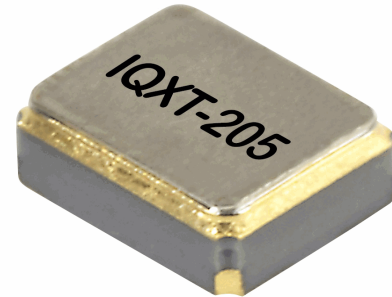
### Description

- IQXT-205-2-30 is a 2.0 x 1.6mm SMD Voltage Controlled Temperature Compensated Crystal Oscillator (VCTCXO) in a hermetically sealed package.
- Developed frequencies: 16.2, 16.368, 16.369, 19.2, 20.0, 24.0, 25.0, 26.0, 27.456, 28.925, 28.974, 30.0, 32.0, 33.6, 38.4, 48.0, 50.0 and 52.0MHz



### Frequency Parameters

- Frequency: 13.0MHz to 52.0MHz
- Frequency Tolerance Max:  $\pm 1.50\text{ppm}$
- Tolerance Condition: @ 25°C  $\pm 2^\circ\text{C}$
- Frequency Stability:  $\pm 0.50\text{ppm}$  to  $\pm 2.00\text{ppm}$
- Ageing:  $\pm 1\text{ppm}$  max per year @ 25°C  $\pm 3^\circ\text{C}$
- Frequency Tolerance: Referred to nominal frequency before reflow soldering.
- Supply Voltage Variation:
  - @  $\pm 5\%$  change for  $\pm 0.5\text{ppm}$  stability:  $\pm 0.1\text{ppm}$  max
  - @  $\pm 5\%$  change for  $\pm 2.0\text{ppm}$  stability:  $\pm 0.2\text{ppm}$  max
- Load Variation:
  - @  $\pm 10\%$  change for  $\pm 0.5\text{ppm}$  stability:  $\pm 0.1\text{ppm}$  max
  - @  $\pm 10\%$  change for  $\pm 2.0\text{ppm}$  stability:  $\pm 0.2\text{ppm}$  max
- Short Term Stability (Allan variance):  $\pm 1\text{ppb}$  max (Tau = 0.1s)
- IR Reflow Resistance (ref to frequency before reflow):  $\pm 1\text{ppm}$  max



### Electrical Parameters

- Supply Voltage: 3.0V  $\pm 5\%$
- Absolute Maximum Ratings:
  - Supply Voltage: -0.6V to 4.6V
  - Control Voltage: -0.6V to Vs+0.6V

### Frequency Adjustment

- Pulling:  $\pm 9\text{ppm}$  min to  $\pm 15\text{ppm}$  max
- Control Voltage: 1.5V  $\pm 1.0\text{V}$
- Slope: Positive

### Operating Temperature Ranges

- 30 to 85°C

### Output Details

- Output Compatibility: Clipped Sine
- Drive Capability: 10k $\Omega$ /10pF
- Output: DC coupled
- Output Level: 0.8V pk-pk min
- Start Up Time (90% of V pk-pk): 2ms max
- Start Up Time (within  $\pm 0.5\text{ppm}$ ): 2ms max

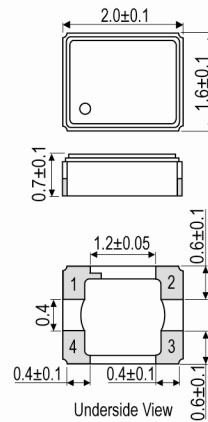
### Noise Parameters

- Phase Noise (typ): -135dBc/Hz @ 1kHz
- Harmonic Distortion: -5.0dBc max

### Environmental Parameters

- Storage Temperature Range: -40 to 85°C

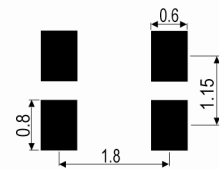
### Outline (mm)



### Pad Connections

1. Voltage Control
2. GND
3. Output
4. +Vs

### Solder Pad Layout





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**Ordering Information**

- \*Minimum info required
  - Frequency\*
  - Model\*
  - Output
  - Frequency Stability (over operating temperature range)\*
  - Operating Temperature Range\*
  - Supply Voltage
- Example
  - 20.0MHz IQXT-205-2-30
  - Clipped Sine  $\pm 0.5\text{ppm}$  -30 to 85C 3.0V  $\pm 9\text{ppm}$  min to  $\pm 15\text{ppm}$  max

**Compliance**

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

**Packaging Details**

- Pack Style: Cutt      Cut tape  
   Pack Size: 100
- Pack Style: Reel      Tape & reel in accordance with EIA-481-D  
   Pack Size: 2,000

**Electrical Specification - maximum limiting values 3.0V  $\pm 5\%$**

Frequency Min	Frequency Max	Temperature Range	Stability (Min)	Current Draw	Rise and Fall Time	Duty Cycle
		°C	ppm	mA	ns	%
13.0MHz	29.999999MHz	-30 to 85	$\pm 0.5$	1.5	-	-
30.0MHz	39.999999MHz	-30 to 85	$\pm 0.5$	1.7	-	-
40.0MHz	52.0MHz	-30 to 85	$\pm 0.5$	2	-	-

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### Description

- IQXT-205-2-33 is a 2.0 x 1.6mm SMD Voltage Controlled Temperature Compensated Crystal Oscillator (VCTCXO) in a hermetically sealed package.
- Developed frequencies: 16.2, 16.368, 16.369, 19.2, 20.0, 24.0, 25.0, 26.0, 27.456, 28.925, 28.974, 30.0, 32.0, 33.6, 38.4, 48.0, 50.0 and 52.0MHz



### Frequency Parameters

- Frequency: 13.0MHz to 52.0MHz
- Frequency Tolerance Max:  $\pm 1.50\text{ppm}$
- Tolerance Condition: @ 25°C  $\pm 2^\circ\text{C}$
- Frequency Stability:  $\pm 0.50\text{ppm}$  to  $\pm 2.00\text{ppm}$
- Ageing:  $\pm 1\text{ppm}$  max per year @ 25°C  $\pm 3^\circ\text{C}$
- Frequency Tolerance: Referred to nominal frequency before reflow soldering.
- Supply Voltage Variation:
  - @  $\pm 5\%$  change for  $\pm 0.5\text{ppm}$  stability:  $\pm 0.1\text{ppm}$  max
  - @  $\pm 5\%$  change for  $\pm 2.0\text{ppm}$  stability:  $\pm 0.2\text{ppm}$  max
- Load Variation:
  - @  $\pm 10\%$  change for  $\pm 0.5\text{ppm}$  stability:  $\pm 0.1\text{ppm}$  max
  - @  $\pm 10\%$  change for  $\pm 2.0\text{ppm}$  stability:  $\pm 0.2\text{ppm}$  max
- Short Term Stability (Allan variance):  $\pm 1\text{ppb}$  max (Tau = 0.1s)
- IR Reflow Resistance (ref to frequency before reflow):  $\pm 1\text{ppm}$  max

### Electrical Parameters

- Supply Voltage: 3.3V  $\pm 5\%$
- Absolute Maximum Ratings:
  - Supply Voltage: -0.6V to 4.6V
  - Control Voltage: -0.6V to Vs+0.6V

### Frequency Adjustment

- Pulling:  $\pm 9\text{ppm}$  min to  $\pm 15\text{ppm}$  max
- Control Voltage: 1.65V  $\pm 1.0\text{V}$
- Slope: Positive

### Operating Temperature Ranges

- 30 to 85°C

### Output Details

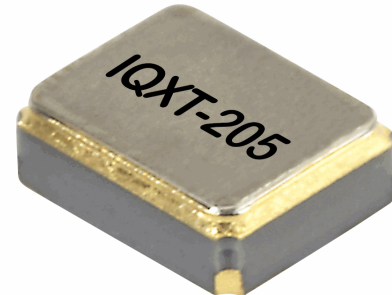
- Output Compatibility: Clipped Sine
- Drive Capability: 10k $\Omega$ /10pF
- Output: DC coupled
- Output Level: 0.8V pk-pk min
- Start Up Time (90% of V pk-pk): 2ms max
- Start Up Time (within  $\pm 0.5\text{ppm}$ ): 2ms max

### Noise Parameters

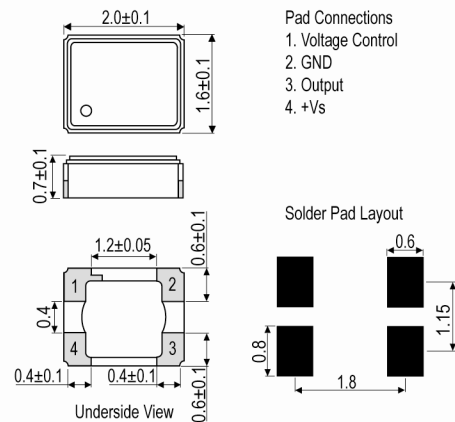
- Phase Noise (typ): -135dBc/Hz @ 1kHz
- Harmonic Distortion: -5.0dBc max

### Environmental Parameters

- Storage Temperature Range: -40 to 85°C



### Outline (mm)



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**Ordering Information**

- \*Minimum info required
  - Frequency\*
  - Model\*
  - Output
  - Frequency Stability (over operating temperature range)\*
  - Operating Temperature Range\*
  - Supply Voltage
- Example
  - 20.0MHz IQXT-205-2-33
  - Clipped Sine  $\pm 0.5\text{ppm}$  -30 to 85C 3.3V  $\pm 9\text{ppm}$  min to  $\pm 15\text{ppm}$  max

**Compliance**

- RoHS Status (2011/65/EU)      Compliant
- 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: 2,000
- Pack Style: Cutt      Cut tape  
     Pack Size: 100

**Electrical Specification - maximum limiting values 3.3V  $\pm 5\%$**

Frequency Min	Frequency Max	Temperature Range	Stability (Min)	Current Draw	Rise and Fall Time	Duty Cycle
		°C	ppm	mA	ns	%
13.0MHz	29.999999MHz	-30 to 85	$\pm 0.5$	1.5	-	-
30.0MHz	39.999999MHz	-30 to 85	$\pm 0.5$	1.7	-	-
40.0MHz	52.0MHz	-30 to 85	$\pm 0.5$	2	-	-

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