



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

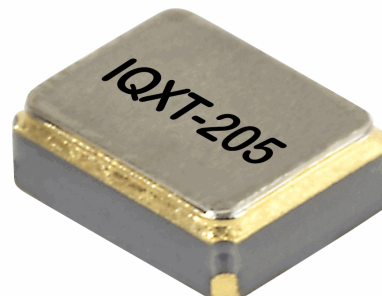
- Output Compatibility Clipped Sine
- Drive Capability 10k Ω /10pF
- Output: DC coupled
- Output Level: 0.8V pk-pk min
- Start Up Time (90% of V pk-pk): 2ms max
- Start Up Time (within $\pm 0.5\text{ppm}$): 2ms max

Noise Parameters

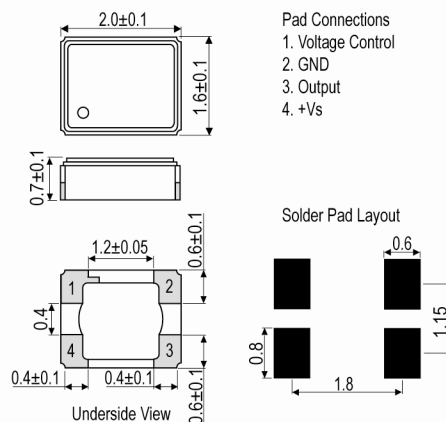
- Phase Noise (typ): -135dBc/Hz @ 1kHz
- Harmonic Distortion: -5.0dBc max

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

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	± 0.5	1.5	-	-
30.0MHz	39.999999MHz	-30 to 85	± 0.5	1.7	-	-
40.0MHz	52.0MHz	-30 to 85	± 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

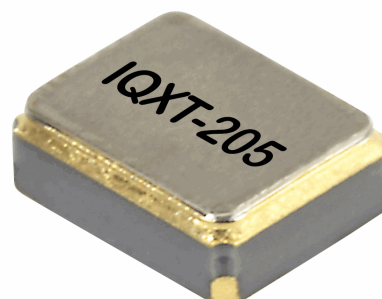
- Output Compatibility: Clipped Sine
- Drive Capability: 10k Ω /10pF
- Output: DC coupled
- Output Level: 0.8V pk-pk min
- Start Up Time (90% of V pk-pk): 2ms max
- Start Up Time (within $\pm 0.5\text{ppm}$): 2ms max

Noise Parameters

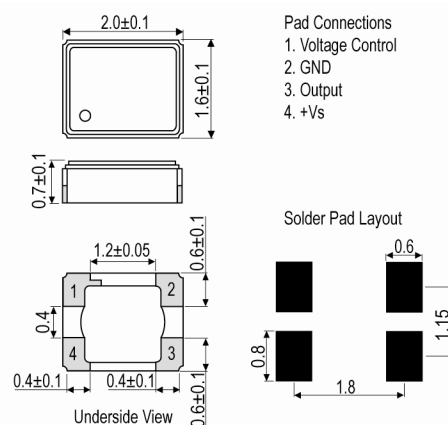
- Phase Noise (typ): -135dBc/Hz @ 1kHz
- Harmonic Distortion: -5.0dBc max

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-205-2-25
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	± 0.5	1.5	-	-
30.0MHz	39.999999MHz	-30 to 85	± 0.5	1.7	-	-
40.0MHz	52.0MHz	-30 to 85	± 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 @ $25^{\circ}\text{C} \pm 2^{\circ}\text{C}$
- Frequency Stability $\pm 0.50\text{ppm}$ to $\pm 2.00\text{ppm}$
- Ageing $\pm 1\text{ppm}$ max per year @ $25^{\circ}\text{C} \pm 3^{\circ}\text{C}$
- 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 $2.8\text{V} \pm 5\%$
- Absolute Maximum Ratings:
 - Supply Voltage: -0.6V to 4.6V
 - Control Voltage: -0.6V to $V_s + 0.6\text{V}$

Frequency Adjustment

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

Operating Temperature Ranges

- -30 to 85°C

Output Details

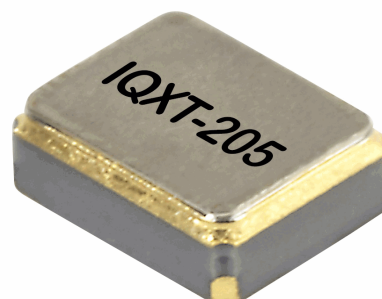
- Output Compatibility Clipped Sine
- Drive Capability $10\text{k}\Omega / 10\text{pF}$
- Output: DC coupled
- Output Level: 0.8V pk-pk min
- Start Up Time (90% of V pk-pk): 2ms max
- Start Up Time (within $\pm 0.5\text{ppm}$): 2ms max

Noise Parameters

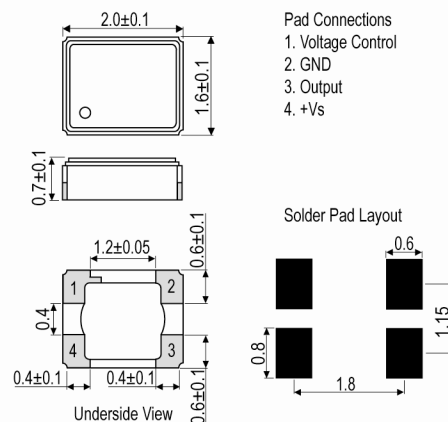
- Phase Noise (typ): -135dBc/Hz @ 1kHz
- Harmonic Distortion: -5.0dBc max

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

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-205-2-28
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	± 0.5	1.5	-	-
30.0MHz	39.999999MHz	-30 to 85	± 0.5	1.7	-	-
40.0MHz	52.0MHz	-30 to 85	± 0.5	2	-	-

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ISSUE 1; March 2018

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 @ $25^{\circ}\text{C} \pm 2^{\circ}\text{C}$
- Frequency Stability $\pm 0.50\text{ppm}$ to $\pm 2.00\text{ppm}$
- Ageing $\pm 1\text{ppm}$ max per year @ $25^{\circ}\text{C} \pm 3^{\circ}\text{C}$
- 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 $3.0\text{V} \pm 5\%$
- Absolute Maximum Ratings:
 - Supply Voltage: -0.6V to 4.6V
 - Control Voltage: -0.6V to $V_s + 0.6\text{V}$

Frequency Adjustment

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

Operating Temperature Ranges

- -30 to 85°C

Output Details

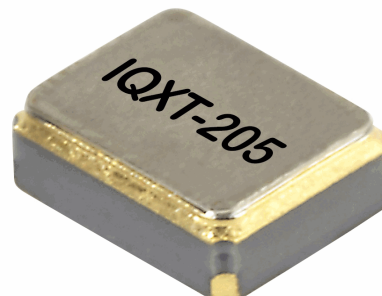
- Output Compatibility Clipped Sine
- Drive Capability $10\text{k}\Omega / 10\text{pF}$
- Output: DC coupled
- Output Level: 0.8V pk-pk min
- Start Up Time (90% of V pk-pk): 2ms max
- Start Up Time (within $\pm 0.5\text{ppm}$): 2ms max

Noise Parameters

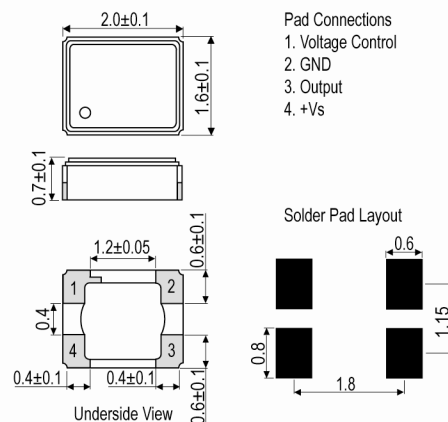
- Phase Noise (typ): -135dBc/Hz @ 1kHz
- Harmonic Distortion: -5.0dBc max

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-205-2-30
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	± 0.5	1.5	-	-
30.0MHz	39.999999MHz	-30 to 85	± 0.5	1.7	-	-
40.0MHz	52.0MHz	-30 to 85	± 0.5	2	-	-

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ISSUE 1; March 2018

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

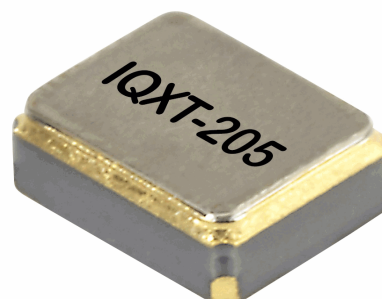
- Output Compatibility Clipped Sine
- Drive Capability 10k Ω /10pF
- Output: DC coupled
- Output Level: 0.8V pk-pk min
- Start Up Time (90% of V pk-pk): 2ms max
- Start Up Time (within $\pm 0.5\text{ppm}$): 2ms max

Noise Parameters

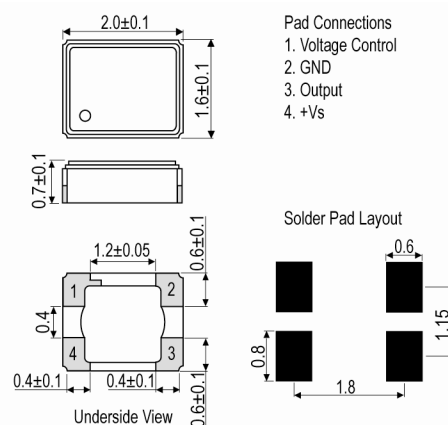
- Phase Noise (typ): -135dBc/Hz @ 1kHz
- Harmonic Distortion: -5.0dBc max

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-205-2-33
 - 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	± 0.5	1.5	-	-
30.0MHz	39.999999MHz	-30 to 85	± 0.5	1.7	-	-
40.0MHz	52.0MHz	-30 to 85	± 0.5	2	-	-

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