

actual size

Oscillator JTP75HC(V) · (VC)TCXO

- precision temperature compensated crystal oscillator, 7.0 x 5.0 mm
- frequency stability of ± 50 ppb available
- temperature range up to $-40^{\circ}\text{C} \sim +105^{\circ}\text{C}$
- JTP75HCV with frequency tuning option
- for a Stratum 3 compliant version refer to JTS75HC(V)



RoHS compliant



Pb free



REACH compliant



Conflict mineral free

| GENERAL DATA | | |
|---|--|--|
| TYPE | JTP75HC / JTP75HCV (HCMOS output) | |
| frequency range | 9.60 ~ 50.0 MHz (see developed frequ.) | |
| frequency tolerance / stability | at $+25^{\circ}\text{C}$ (*1) | ± 1.0 ppm max. |
| | after 2x reflow (*2) | ± 0.5 ppm max. |
| | temperature (*3) | see table 1 |
| | supply voltage (*4) | ± 0.1 ppm max. (at $V_{\text{DC}} \pm 5\%$) |
| | load change (*5) | ± 0.1 ppm max. (at nom load $\pm 5\%$) |
| | aging first year (*6) | ± 1.0 ppm max. (at $+25^{\circ}\text{C}$) |
| | aging per day (*7) | ± 10.0 ppb max. |
| | short term (ADEV) | 0.1 ppb max. / 0.05 ppb typ. with $\tau = 1$ sec |
| current consumption max. | 10.0 mA max. | |
| supply voltage V_{DC} | 3.3V (all $\pm 5\%$) | |
| temperature | operating | see table 1 |
| | operable | $-40^{\circ}\text{C} \sim +105^{\circ}\text{C}$ |
| | storage | $-55^{\circ}\text{C} \sim +105^{\circ}\text{C}$ |
| output | rise/fall time max. | 8ns (10% \leftrightarrow 90% of VDC) |
| | load max. | 15 pF |
| | low level max. | 0.4V |
| | high level min. | $V_{\text{DC}} - 0.4\text{V}$ |
| start-up time max. | 2.0 ms | |
| V_{C} frequ. tuning range JTP75HCV | examples in table 2 (ask for more options) | |
| V_{C} frequ. tuning voltage JTP75HCV | examples in table 3 (ask for more options) | |

For (*1) ~ (*7) please refer to definitions shown on the 2nd page of this datasheet

TABLE 1: FREQUENCY STABILITY CODE

| frequency stability temperature code | E | F*1 | H*1 | G*1 | J*1 |
|---|---------------|----------------|----------------|----------------|----------------|
| | ± 0.5 ppm | ± 0.28 ppm | ± 0.20 ppm | ± 0.10 ppm | ± 0.05 ppm |
| $-30^{\circ}\text{C} \sim +75^{\circ}\text{C}$ | G | O | O | O | O |
| $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$ | K | O | O | O | O |
| $-40^{\circ}\text{C} \sim +105^{\circ}\text{C}$ | P | O | O | O | O |

O available

*1 frequency stability options F / H / G and J can be ordered as Stratum 3 compliant versions, see separate JTS75HC(V) datasheet

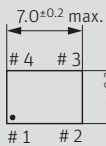
TABLE 2: VC DEPENDENT FREQUENCY TUNING RANGE CODING METHOD

| V_{C} frequency tuning range | code | minimal | maximal |
|---------------------------------------|------|---------------|----------------|
| | 05X0 | ± 5.0 ppm | undefined |
| | 08X0 | ± 8.0 ppm | undefined |
| | 0510 | ± 5.0 ppm | ± 10.0 ppm |
| | 0812 | ± 8.0 ppm | ± 12.0 ppm |

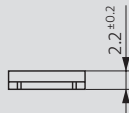
TABLE 3: VC CODING METHOD (EXAMPLES)

| V_{C} center voltage and V_{C} range | code | center of V_{C} | range of V_{C} | |
|--|--|--------------------------|-------------------------|--|
| | 1616 | 1.65 V | ± 1.65 V | $1.65 \text{ V} \pm 1.65 \text{ V}$ at $V_{\text{DC}} = 3.3 \text{ V}$ |
| | 1610 | 1.65 V | ± 1.0 V | $1.65 \text{ V} \pm 1.0 \text{ V}$ at $V_{\text{DC}} = 3.3 \text{ V}$ |
| V_{C} properties | input impedance of V_{C} min. | | 100 kOhm | |
| | V_{C} frequency tuning linearity max. | | 10 % | |

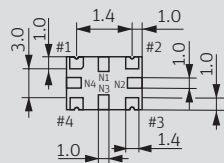
DIMENSIONS



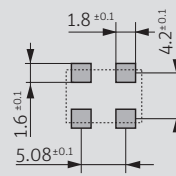
top view



side view



bottom view



pad layout

| | |
|----------------------|----------------------|
| TCXO | VCTCXO |
| JTP75HC | JTP75HCV |
| N1, N2, N3, N4: NC | N1, N2, N3, N4: NC |
| # 1: NC | # 1: V_{C} |
| # 2: GND | # 2: GND |
| # 3: output | # 3: output |
| # 4: V_{CC} | # 4: V_{CC} |

in mm

ORDER INFORMATION

| 0 | frequency | type | frequency stability code | operating temp. code | supply voltage | control voltage (for JTP75HCV) | tuning range (for JTP75HCV) |
|------------|---------------|-------------------------------------|--|--|----------------|--------------------------------|-----------------------------|
| Oscillator | 9.60 ~ 50 MHz | JTP75HC = TCXO JTP75HCV = VCTCXO | E = ± 0.50 ppm F = ± 0.28 ppm H = ± 0.20 ppm G = ± 0.10 ppm J = ± 0.05 ppm | G = $-30^{\circ}\text{C} \sim 75^{\circ}\text{C}$ K = $-40^{\circ}\text{C} \sim 85^{\circ}\text{C}$ P = $-40^{\circ}\text{C} \sim 105^{\circ}\text{C}$ | 3.3 = 3.3 V | see table 3 | see table 2 |

Example: 0 10.0-JTP75HCV-F-K-3.3-1616-08X0-LF (Suffix LF = RoHS compliant / Pb free)

Oscillator JTP75HC(V) · Precision TCXO & VCTCXO

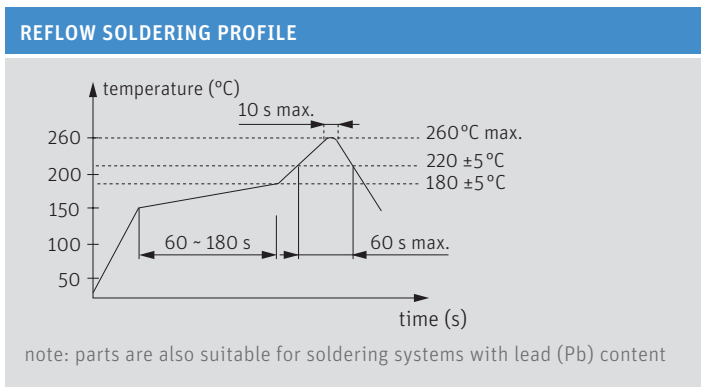
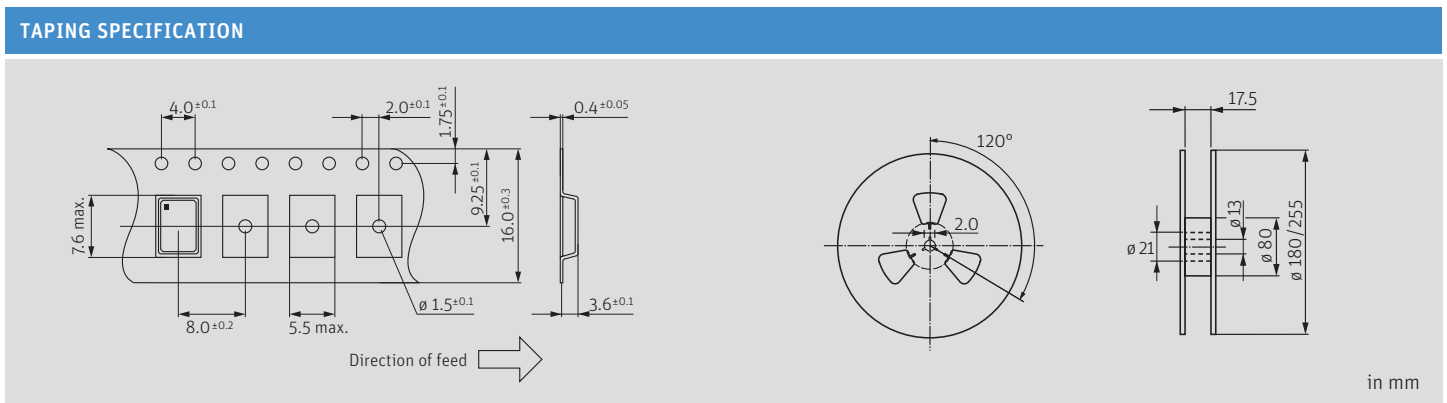
| PHASE NOISE INFORMATION | | |
|--|------------|------------------|
| phase noise at f ₀ 19.2 MHz, V _{DC} = 3.3 V @ +25 °C | at 10 Hz | -93 dBc/Hz typ. |
| | at 100 Hz | -120 dBc/Hz typ. |
| | at 1 KHz | -145 dBc/Hz typ. |
| | at 10 KHz | -157 dBc/Hz typ. |
| | at 100 KHz | -159 dBc/Hz typ. |

| PACKAGING NOTE |
|---|
| - non-multiple packing units are only supplied taped / bulk |
| - moisture sensitivity: MSL2 |

| DEVELOPED FREQUENCIES | | | | | |
|----------------------------|---------|--------|--------|------|---------|
| all frequencies in MHz: | 9.60 | 10.0 | 12.80 | 13.0 | 16.3840 |
| | 18.4320 | 19.20 | 19.440 | 20.0 | 25.0 |
| | 26.0 | 30.720 | 38.880 | 40.0 | 50.0 |

| NOTE |
|---|
| - for best supply noise rejection, connect a capacitor of 100nF and a second capacitor of 10µF closely to the supply voltage pins |
| - a separate voltage supply rail ensures best phase noise |
| - keep digital or high frequency signals as far away from V _C pin as possible |

| DEFINITIONS |
|--|
| *1: Measured frequency observed with T _A =+25°C and C _L =15pF, at nominal V _{DC} and nominal center V _C (if applicable) within 30 days after ex-factory. The measured frequency is referenced to the specified nominal frequency. |
| *2: At specified reflow soldering profile, tested with T _A =+25 °C and C _L =15pF, at nominal V _{DC} and nominal center V _C (if applicable). At least 4 hours of static placement at room temperature is necessary after completion of 2 times reflow. |
| *3: T _A varied in the specified operating temperature range, frequency variation is normalized to the middle point of whole frequency excursion, at nominal V _{DC} and nominal center V _C (if applicable), and at nominal output load, temperature variable speed less than 2°C per minute. |
| *4: Frequency variation if V _{DC} is varied by ± 5% of nominal V _{DC} , frequency variation is normalized to frequency observed at nominal V _{DC} , nominal center V _C (if applicable), T _A =+25 °C and nominal load. |
| *5: Frequency variation if the load is varied by ± 5% of nominal load, frequency variation is normalized to frequency observed at nominal V _{DC} , nominal center V _C (if applicable), T _A =+25 °C and nominal load. |
| *6: The maximum 1st-year frequency deviation from the ex-factory status. T _A =+25 °C, at nominal V _{DC} , nominal center V _C (if applicable), T _A =+25 °C and nominal load. Normally, the largest frequency deviation occurs within the 1st year. |
| *7: The maximum frequency deviation within 24 hours in a steady state. The initial status acquired at T _A =+25 °C, at nominal V _{DC} , nominal center V _C (if applicable), nominal load and after 1h of continuous operation. |



| MARKING |
|--|
| internal code (optional) / frequency |
| dot / DP / date code (WWYY) |
| date code: two digits for week and two digits for year |