



actual size

# Oscillator JTP53HC(V) · (VC)TCXO

- precision temperature compensated crystal oscillator, 5.0 x 3.2 mm
- frequency stability of  $\pm 50$  ppb available
- temperature range up to  $-40^{\circ}\text{C} \sim +105^{\circ}\text{C}$
- JTP53HCV with frequency tuning option
- for a Stratum 3 compliant version refer to JTS53HC(V)



RoHS compliant



Pb free



REACH compliant



Conflict mineral free

GENERAL DATA		
TYPE	JTP53HC / JTP53HCV (HCMOS output)	
frequency range	9.60 ~ 50.0 MHz (see developed frequ.)	
frequency tolerance / stability	at $+25^{\circ}\text{C}$ (*1)	$\pm 1.0$ ppm max.
	after 2x reflow (*2)	$\pm 0.5$ ppm max.
	temperature (*3)	see table 1
	supply voltage (*4)	$\pm 0.1$ ppm max. (at $V_{\text{DC}} \pm 5\%$ )
	load change (*5)	$\pm 0.1$ ppm max. (at nom load $\pm 5\%$ )
	aging first year (*6)	$\pm 1.0$ ppm max. (at $+25^{\circ}\text{C}$ )
	aging per day (*7)	$\pm 10.0$ 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 $V_{\text{DC}}$	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	
$V_{\text{C}}$ frequ. tuning range JTP53HCV	examples in table 2 (ask for more options)	
$V_{\text{C}}$ frequ. tuning voltage JTP53HCV	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
$\pm 0.5$ ppm	$\pm 0.5$ ppm	$\pm 0.28$ ppm	$\pm 0.20$ ppm	$\pm 0.10$ ppm	$\pm 0.05$ 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	▷

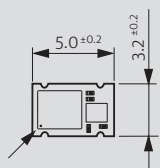
○ available ▷ ask if available

\*1 frequency stability options F / H / G and J can be ordered as Stratum 3 compliant versions, see separate JTS53HC(V) datasheet

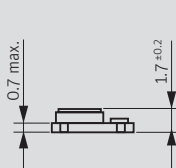
TABLE 2: VC DEPENDENT FREQUENCY TUNING RANGE CODING METHOD			
$V_{\text{C}}$ frequency tuning range	code	minimal	maximal
	0407	$\pm 4.0$ ppm	$\pm 7.0$ ppm
	08X0	$\pm 8.0$ ppm	undefined
	1015	$\pm 10.0$ ppm	$\pm 15.0$ ppm
	20X0	$\pm 20.0$ ppm	undefined

TABLE 3: VC CODING METHOD (EXAMPLES)				
$V_{\text{C}}$ center voltage and $V_{\text{C}}$ range	code	center of $V_{\text{C}}$	range of $V_{\text{C}}$	
	1515	1.50 V	$\pm 1.50$ V	$1.50 \text{ V} \pm 1.50 \text{ V}$ at $V_{\text{DC}} = 3.3 \text{ V}$
	1510	1.50 V	$\pm 1.00$ V	$1.65 \text{ V} \pm 1.00 \text{ V}$ at $V_{\text{DC}} = 3.3 \text{ V}$
$V_{\text{C}}$ properties	input impedance of $V_{\text{C}}$ min.		100 kOhm	
	$V_{\text{C}}$ frequency tuning linearity max.		10 %	

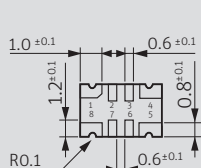
## DIMENSIONS



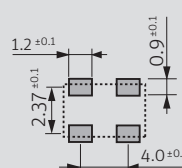
top view example



side view example



bottom view



pad layout

TCXO JTP53HC

- 1: NC
- 2, 3: NC
- 4: GND
- 5: output
- 6, 7: NC
- 8:  $V_{\text{CC}}$

pin connection

VCTCXO JTP53HCV

- 1: VC
- 2, 3: NC
- 4: GND
- 5: output
- 6, 7: NC
- 8:  $V_{\text{CC}}$

in mm

## ORDER INFORMATION

0	frequency	type	frequency stability code	operating temp. code	supply voltage	control voltage (for JTP53HCV)	tuning range (for JTP53HCV)
Oscillator	9.60 ~ 50 MHz	JTP53HC = TCXO JTP53HCV = VCTCXO	E = $\pm 0.50$ ppm F = $\pm 0.28$ ppm H = $\pm 0.20$ ppm G = $\pm 0.10$ ppm J = $\pm 0.05$ 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-JTP53HCV-F-K-3.3-1515-08X0-LF (Suffix LF = RoHS compliant / Pb free)

# Oscillator JTP53HC(V) · Precision TCXO & VCTCXO

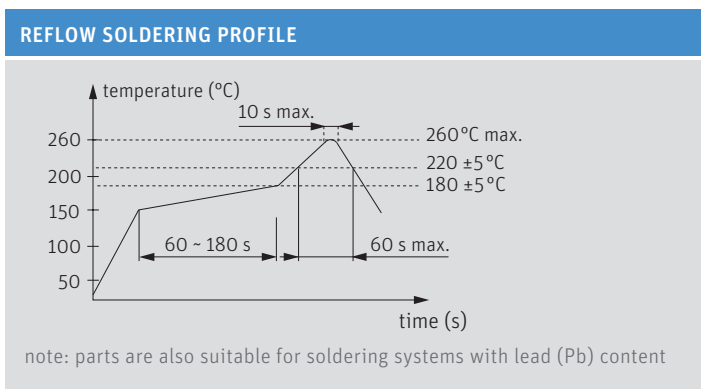
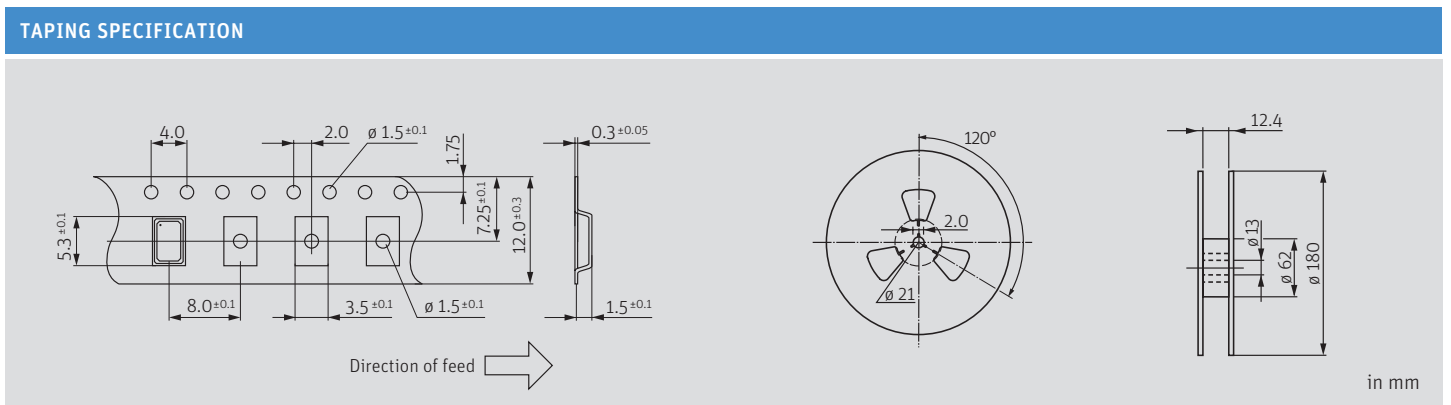
PHASE NOISE INFORMATION		
phase noise at f <sub>0</sub> 19.2 MHz, V <sub>DC</sub> = 3.3 V @ +25 °C	at 10 Hz	-93 dBc/Hz typ.
	at 100 Hz	-120 dBc/Hz typ.
	at 1 KHz	-145 dBc/Hz typ.
	at 10 KHz	-157 dBc/Hz typ.
	at 100 KHz	-159 dBc/Hz typ.

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

DEVELOPED FREQUENCIES					
all frequencies in MHz:	10.0	12.8	13.0	16.320	16.3840
	18.4320	19.20	19.440	20.0	25.0
	30.720	32.7680	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 <sub>C</sub> pin as possible

DEFINITIONS
*1: Measured frequency observed with T <sub>A</sub> =+25°C and C <sub>L</sub> =15pF, at nominal V <sub>DC</sub> and nominal center V <sub>C</sub> (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 <sub>A</sub> =+25 °C and C <sub>L</sub> =15pF, at nominal V <sub>DC</sub> and nominal center V <sub>C</sub> (if applicable). At least 4 hours of static placement at room temperature is necessary after completion of 2 times reflow.
*3: T <sub>A</sub> varied in the specified operating temperature range, frequency variation is normalized to the middle point of whole frequency excursion, at nominal V <sub>DC</sub> and nominal center V <sub>C</sub> (if applicable), and at nominal output load, temperature variable speed less than 2°C per minute.
*4: Frequency variation if V <sub>DC</sub> is varied by ± 5% of nominal V <sub>DC</sub> , frequency variation is normalized to frequency observed at nominal V <sub>DC</sub> , nominal center V <sub>C</sub> (if applicable), T <sub>A</sub> =+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 <sub>DC</sub> , nominal center V <sub>C</sub> (if applicable), T <sub>A</sub> =+25 °C and nominal load.
*6: The maximum 1st-year frequency deviation from the ex-factory status. T <sub>A</sub> =+25 °C, at nominal V <sub>DC</sub> , nominal center V <sub>C</sub> (if applicable), T <sub>A</sub> =+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 <sub>A</sub> =+25 °C, at nominal V <sub>DC</sub> , nominal center V <sub>C</sub> (if applicable), nominal load and after 1h of continuous operation.



MARKING
frequency / internal code (optional)
dot / D / date code (YWW)
date code: one digit for year and two digits for week
2: 2022    3: 2023    4: 2024    5: 2025    6: 2026    7: 2027