



actual size

# Oscillator JTS32CS(V) · (VC)TCXO

- temp. compensated crystal oscillator, 3.2 x 2.5 mm
- low jitter Stratum 3 compliant TCXO / VCTCXO
- temperature range up to -40 °C ~ +85 °C
- JTS32CSV with frequency tuning option
- ask for customized options



RoHS compliant



Pb free



REACH compliant



Conflict mineral free

GENERAL DATA		
TYPE	JTS32CS / JTS32CSV (clipped sine output)	
frequency range	9.60 ~ 50.0 MHz (see table 4 on next page)	
frequency tolerance / stability	at +25 °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 <sub>DC</sub> ± 5%)
	load change (*5)	± 0.1 ppm max. (at nom load ± 5%)
	aging first year (*6)	± 1.0 ppm max. (at +25 °C)
	aging per day (*7)	± 0.02 ppm max.
	short term (ADEV)	0.2 ppb max. / 0.1 ppb typ. with τ = 1 sec
holdover stability (*8)	± 0.37 ppm max.	
free run frequency stability (*9)	± 4.6 ppm max.	
current consumption max.	3.0 mA max.	
supply voltage V <sub>DC</sub>	1.8V / 2.5V / 2.8V / 3.0V / 3.3V (all ± 5%)	
temperature	operating	see table 1
	operable	-40 °C ~ +85 °C
	storage	-55 °C ~ +105 °C
output	nominal load	10 kΩ // 10 pF
	level min.	0.6 V <sub>pp</sub> (clipped sine)
start-up time max.	3.0 ms	
V <sub>c</sub> frequ. tuning range JTS32CSV	see examples in table 2 (ask for options)	
V <sub>c</sub> frequ. tuning voltage JTS32CSV	see examples in table 3 (ask for options)	

For (\*1) ~ (\*9) please refer to definitions shown on the 2nd page of this datasheet

TABLE 1: FREQUENCY STABILITY CODE

frequency stability temperature code	F				
	± 0.28 ppm				
-20 °C ~ +70 °C	B	○			
-30 °C ~ +75 °C	G	○			
-40 °C ~ +85 °C	K	○			

○ available

TABLE 2: DEPENDENT FREQUENCY TUNING RANGE CODING METHOD

V <sub>c</sub> frequency tuning range of JTS32CSV	code	minimal	maximal
table shows examples, ask for more options	0510	± 5.0 ppm	± 10.0 ppm
	0813	± 8.0 ppm	± 13.0 ppm
	1015	± 10.0 ppm	± 15.0 ppm
	05X0	± 5.0 ppm	undefined

TABLE 3: VC CODING METHOD (EXAMPLES)

V <sub>c</sub> center voltage and V <sub>c</sub> range	code	center of V <sub>c</sub>	range of V <sub>c</sub>	
	1515	1.5 V	± 1.5 V	1.5 V ± 1.5 V at V <sub>DC</sub> = 3.0 V & 3.3 V
	1510	1.5 V	± 1.0 V	1.5 V ± 1.0 V at V <sub>DC</sub> = 2.5 V ~ 3.3 V
	1414	1.4 V	± 1.4 V	1.4 V ± 1.4 V at V <sub>DC</sub> ≥ 2.8 V
	1410	1.4 V	± 1.0 V	1.4 V ± 1.0 V at V <sub>DC</sub> = 2.5 V & 2.8 V
	0909	0.9 V	± 0.9 V	0.9 V ± 0.9 V at V <sub>DC</sub> = 1.8 V
V <sub>c</sub> properties	input impedance of V <sub>c</sub> min.		100 kΩ	
	V <sub>c</sub> frequ. tuning linearity max.		10 %	

## DIMENSIONS

top view

side view

bottom view

pad layout

TCXO  
JTS32CS  
# 1: GND  
# 2: GND  
# 3: output  
# 4: V<sub>DC</sub>

VCTCXO  
JTS32CSV  
# 1: Vcontrol  
# 2: GND  
# 3: output  
# 4: V<sub>DC</sub>

pin connection

in mm

## ORDER INFORMATION

0	frequency	type	frequency stability code	operating temp. code	supply voltage	control voltage (for JTS32CSV)	tuning range (for JTS32CSV)
Oscillator	9.60 ~ 50.0 MHz	JTS32CS = TCXO JTS32CSV = VCTCXO	F = ± 0.28 ppm see table 1	B = -20 °C ~ +70 °C G = -30 °C ~ +75 °C K = -40 °C ~ +85 °C	1.8 = 1.8 V 2.5 = 2.5 V 2.8 = 2.8 V 3.0 = 3.0 V 3.3 = 3.3 V	see table 3	see table 2

**Example: 0 10.0-JTS32CSV-F-K-3.3-1510-1015-LF** (Suffix LF = RoHS compliant / Pb free)

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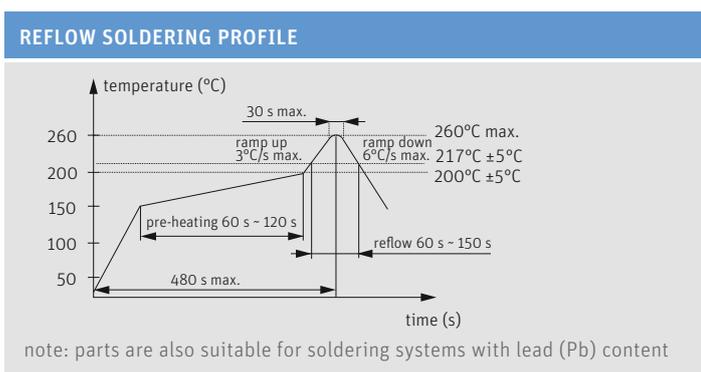
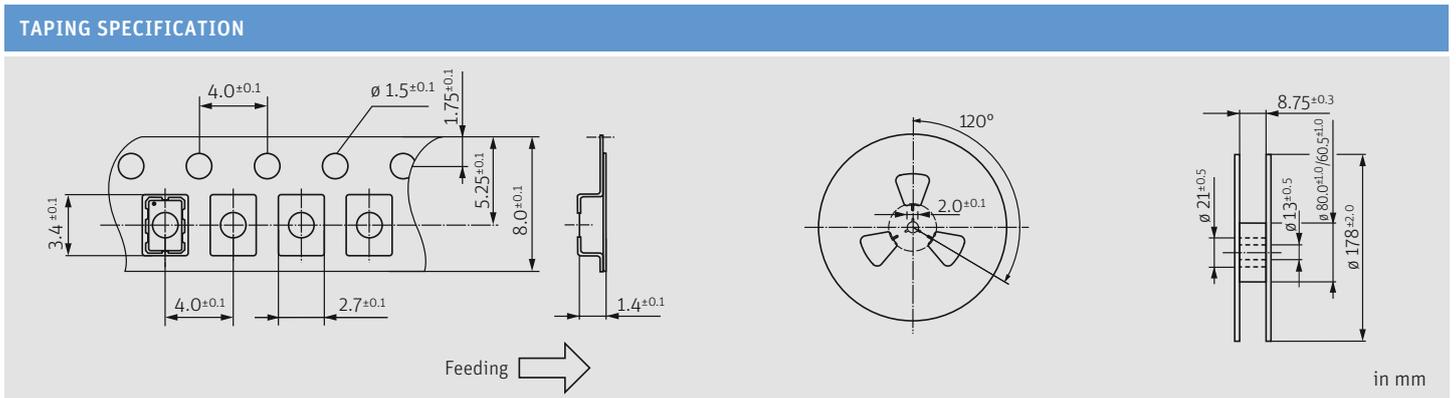
PHASE NOISE INFORMATION		
phase noise at f0 10.0 MHz, V <sub>DC</sub> = 3.3 V @ 25 °C	at 10 Hz	-90 dBc/Hz typ.
	at 100 Hz	-120 dBc/Hz typ.
	at 1 KHz	-140 dBc/Hz typ.
	at 10 KHz	-145 dBc/Hz typ.
	at 100 KHz	-148 dBc/Hz typ.

PACKAGING NOTE
- non-multiple packing units are only supplied taped / bulk
- moisture sensitivity: MSL1

TABLE 4: DEVELOPED FREQUENCIES					
all frequencies in MHz:	10.0	12.80	16.320	16.3840	19.20
	19.440	20.0	25.0	26.0	30.720
	32.0	38.40	40.0	48.0	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 nominal load, 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 nominal load, 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 f <sub>ref</sub> = (f <sub>max</sub> + f <sub>min</sub> )/2, 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.
*8: The maximum frequency deviation within 24 hours including temperature variation. 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.
*9: The maximum frequency deviation including stability vs. temperature, tolerance ex. factory, aging over 20 years, supply and load variation.



MARKING
frequency / internal code (optional)
dot / D / internal code
note: for more information please contact Jauch