

RST3225HC

The RST3225HC is a series of high-temperature TCXO (Temperature-Compensated Crystal Oscillator) and VCTCXO (Voltage-Controlled Temperature-Compensated Crystal Oscillator) with CMOS output. It is designed for high-performance Automotive applications to comply with AEC-Q200, where the required frequency stability is ± 2.5 ppm over operating temperatures from -40 to 105°C .

The RST3225HC has an analogue ASIC for the oscillator and a high-order temperature compensation circuit in a small form factor $3.2 \times 2.5 \times 0.9$ mm package. This low-power SMD TCXO provides a voltage control option of VCTCXO, with a wide frequency range available from 10 to 52 MHz. Supply voltage options are 1.8 to 3.3 V.

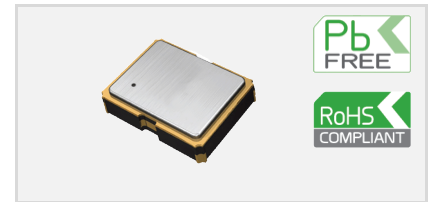
Features

- High-end operating temperature up to 105°C
- Excellent phase noise performance
- Output: CMOS

Applications

- Automotive
- Communications
- Consumer devices
- Wi-Fi

3.2 x 2.5 x 0.9 mm



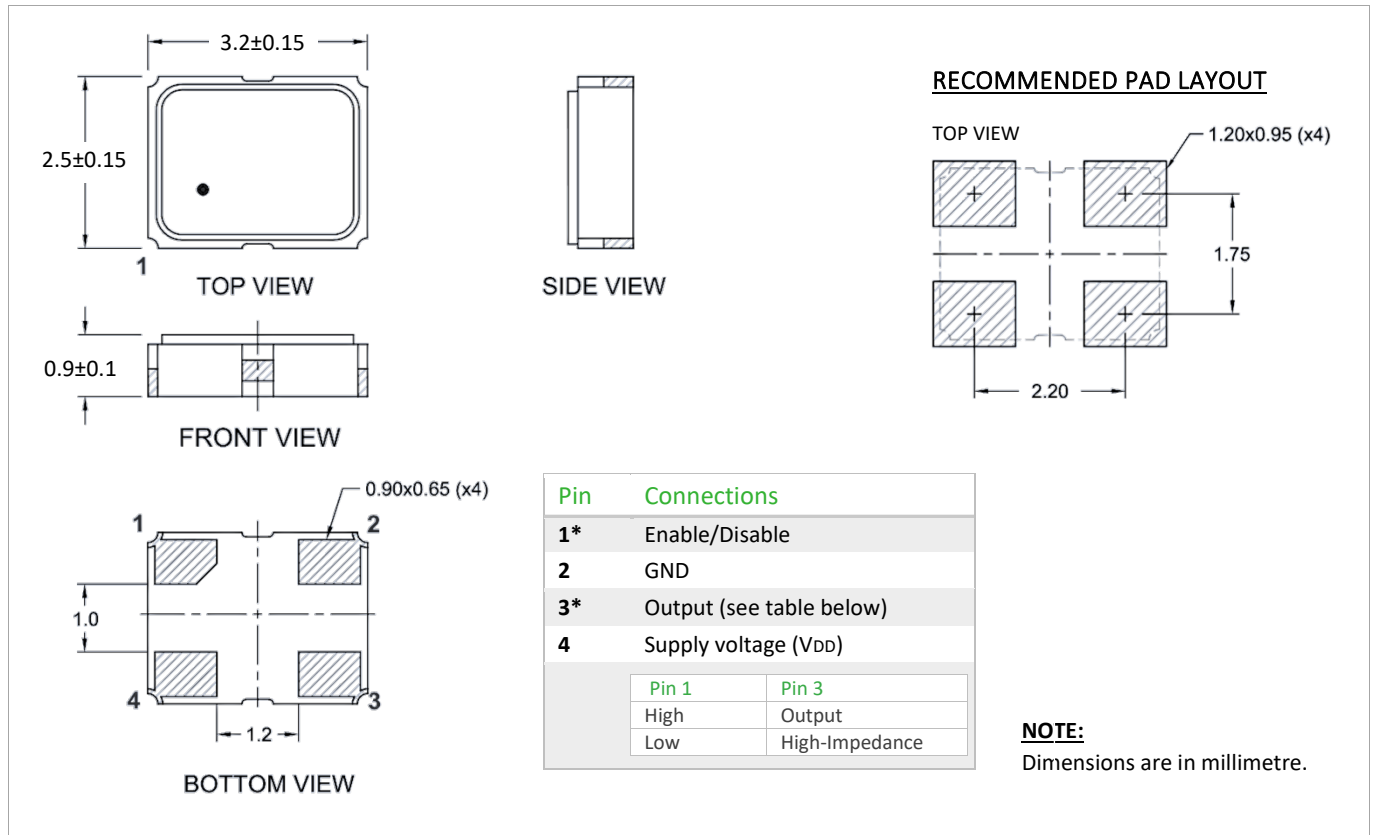
Standard Specifications

Parameter	Min.	Typ.	Max.	Unit	Test Condition / Description
Nominal frequency (Fn)		10 – 52		MHz	
Frequency calibration			± 1	ppm	Offset from nominal frequency measured at $25^{\circ}\text{C} \pm 2^{\circ}\text{C}$
Reflow shift			± 1	ppm	Two consecutive reflows
Operating temperature range	-40		105	$^{\circ}\text{C}$	The operating temperature range over which the frequency stability is measured
Frequency stability over temperature			± 2.5	ppm	Referenced to the midpoint between minimum and maximum frequency value over the specified temperature range ¹
Static temperature hysteresis			0.6	ppm	Frequency change after reciprocal temperature ramped over the operating range. Frequency measured before and after at 25°C
Sensitivity to supply voltage variations			± 0.1	ppm	V_{DD} varied $\pm 5\%$ at 25°C
Sensitivity to load variations			± 0.1	ppm	$\pm 10\%$ load change at 25°C ²
Long-term stability (Ageing)			± 1	ppm	Frequency drift over 1 year at 25°C
Acceleration sensitivity			1	ppb/g	Gamma vector of all three axes from 30 to 1500Hz
Supply voltage (V_{DD})		1.8 – 3.3		V	With a tolerance of $\pm 5\%$
Supply current			3.8	mA	At maximum V_{DD} ²
Power down	$\geq 80\%$		$\leq 20\%$	V_{DD}	Oscillation Enable (Vih) Oscillation Disable (Vil)
Output voltage level low (V_{OL}) Output voltage level high (V_{OH})	90		10	$\%V_{\text{DD}}$	Measured with a capacitive load of 15pF
Duty cycle	45		55		Measured at 50% V_{DD} trigger level
Output load			15	pF	
Start-up time			3	ms	@ 26 MHz ± 2.5 ppm
			2		Fast mode
Rise time / Fall time			5	ns	@ 10% to 90% V_{DD} , CMOS output

¹ Parts should be shielded from drafts causing unexpected thermal gradients. Temperature changes due to ambient air currents on the oscillator can lead to short term frequency drift.

² Specified for load stated in oscillator output section at 25°C .

Model Outline and Recommended Pad Layout



Test Circuit – CMOS

