

RST3225H

The RST3225H is a series of high temperature TCXO (Temperature Compensated Crystal Oscillator) and VCTCXO (Voltage Controlled Temperature Compensated Crystal Oscillator). It is designed for high-performance Automotive and communication applications where the required frequency stability ± 0.5 ppm over operating temperature ranges from -40 to 105°C.

The RST2016H has an analogue ASIC for the oscillator and a high-order temperature compensation circuit in a small form factor 3.2 x 2.5 x 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
- Frequency stability ± 0.5 ppm over extended temperatures
- Excellent phase noise performance
- Output: Clipped sinewave, Temperature sensor

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°C $\pm 2^\circ\text{C}$
Reflow shift			± 1	ppm	Two consecutive reflows
Operating temperature range	-40		105	°C	The operating temperature range over which the frequency stability is measured
Frequency stability over temperature			± 0.5	ppm	Referenced to the midpoint between minimum and maximum frequency value over the specified temperature range ¹ . Control voltage set to the midpoint of Vc. For a 100% screen-tested product, please refer to alternative RIT3225H
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			± 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 $\pm 5\%$
Control voltage (Vc) range	0.3 0.4	0.9 1.4	1.5 2.4	V	V _{DD} \leq 2.3V V _{DD} > 2.3V
Supply current			2	mA	At maximum V _{DD} ²
Output voltage level	0.8			V _{pk-pk}	At minimum V _{DD} , specified for load stated in oscillator output section at 25°C ²
Output waveform					DC coupled clipped sinewave ³

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.

³ External AC-Coupling capacitor required. 1 nF or greater recommended.

Model Outline and Recommended Pad Layout

RECOMMENDED PAD LAYOUT
- TOP VIEW

1.20x0.95 (x4)

1.75

2.20

Pin Connections

Pin	Connections
1*	Do not connect, GND, VCO (Vc), or Tsense
2	GND
3	RF output
4	Supply voltage (V _{DD})

* Depending on the specifications

NOTE: Dimensions are in millimetre.

Test Circuit

CLIPPED SINEWAVE:

Do Not Connect for TCXO or VCO for VCTCXO (Depending on specifications)

10 to 1 Active Probe Input Capacitance = C₃

TEMPERATURE SENSOR:

10 to 1 Active Probe Input Capacitance = C₃

C ₁ : 100nF	C _T = C _L + C ₃ (C ₃ - Oscilloscope probe capacitance)
C ₂ : ≥1nF	C _T as stated in OSCILLATOR OUTPUT section
R _L : 10K	F ₁ : A ferrite bead or a resistor between 22Ω ~ 47Ω recommended.