RST2520H

The RST2520H 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 applications to comply with AEC-Q200, where the required frequency stability ±0.5 ppm over operating temperature ranges from -40 to 105°C.

The RST2520H has an analogue ASIC for the oscillator and a high-order temperature compensation circuit in a small font factor 2.5 x 2.0 x 0.8 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

2.5 x 2.0 x 0.8 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 ±2°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 the alternative RIT2520H
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 ±5% at 25°C
Sensitivity to load variations			±0.1	ppm	±10% load change at 25°C[2]
Long term stability			±1	ppm	Frequency drift over 1 year at 25°C
Supply voltage (V_{DD})		1.8 – 3.3		V	With a tolerance of ±5%
Control voltage (Vc) range	0.2	0.9 1.2	VDD - 0.2	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.

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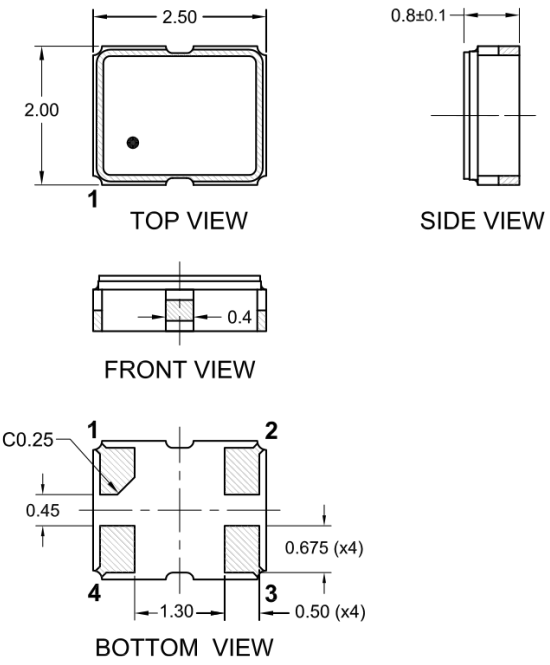
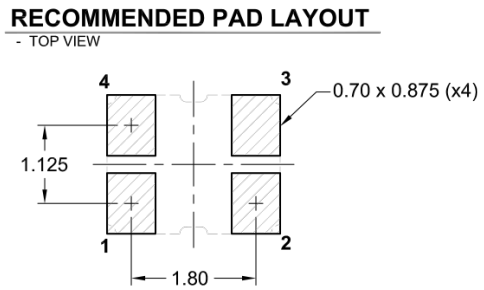
Model Outline and Recommended Pad Layout



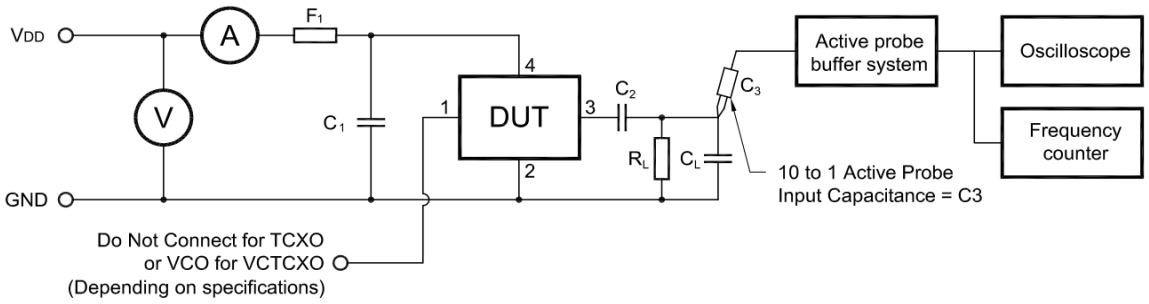


Pin	Connections
1*	Do not connect, GND, VCO (V_C), or Tsense
2	GND
3	RF output
4	Supply voltage (V_{DD})
	* Depending on the specifications

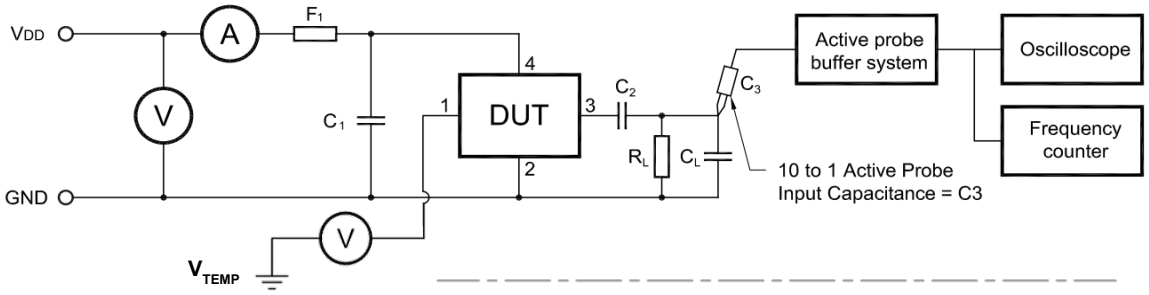
NOTE: Dimensions are in millimetre.

Test Circuit

CLIPPED SINEWAVE:



TEMPERATURE SENSOR:



C_1: 100nF C_2: ≥1nF R_L: 10K	$C_T = C_L + C_3$ (C_3 - Oscilloscope probe capacitance) C_T as stated in OSCILLATOR OUTPUT section F_1: A ferrite bead or a resistor between 22Ω ~ 47Ω recommended.

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