RNT7050A

The RNT7050A offers best-in-class frequency stability of ±50 ppb frequency stability for 5G and other telecommunication applications and is available in a 7x5mm footprint. At the core is Rakon's in-house designed XMEMS™ crystal resonator technology. XMEMS™ is based on Rakon's proprietary NanoQuartz™ photolithography process. The US-TCXO achieves ±50 ppb frequency stability over a temperature range of -40°C to +85°C, or ±100 ppb over the extended -40°C to +105°C range and provides excellent short and medium term stability. The US-TCXO maintains long-term stability (ageing) below 1.5 ppm over 10 years. The specification meets the stringent requirements of IEEE 1588v2, ITU-T G.813, G.8273.2 and G.8262 & G8262.1.

The design and engineering for the RNT7050A recognise that 5G Remote Radio Heads (RRHs) air interfaces need tight Error Vector Magnitude (EVM) limit masks and, therefore, low contribution to EVM from the phase noise of reference clocks. An outstanding low noise floor of -160 dBc/Hz enables tight EVM masks to be met for 5G RRHs making the RNT7050A the device of choice for radio and network interfaces. Rakon's patented 'tilt compensation' technology assures the stability is maintained at any control voltage and guarantees optimum performance over the life of the equipment. The RNT7050A is an ideal choice for 5G and other telecommunication applications when low sensitivity to temperature changes, low ageing and low phase noise are crucial. Available to order with a short lead-time.

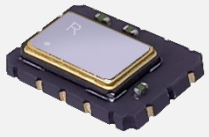
Features

- Contains Rakon's proprietary XMEMS™ technology for best-in-class FvsT
- Stability as low as ±50 ppb over -40 to 85°C. Extended temperature up to 105°C
- Ageing below 1.5 ppm over 10 years
- Excellent phase noise and RMS phase jitter
- Patented 'tilt compensation' technology removes the effects of tilt when using Vc

Applications

- 5G RRHs
- IEEE 1588v2, ITU-T G.813, G.8273.2 and G.8262 & G8262.1.
- Low noise C-RAN radios
- Microwave and millimeter wave

7.0 x 5.0 x 1.5 mm



Pb FREE

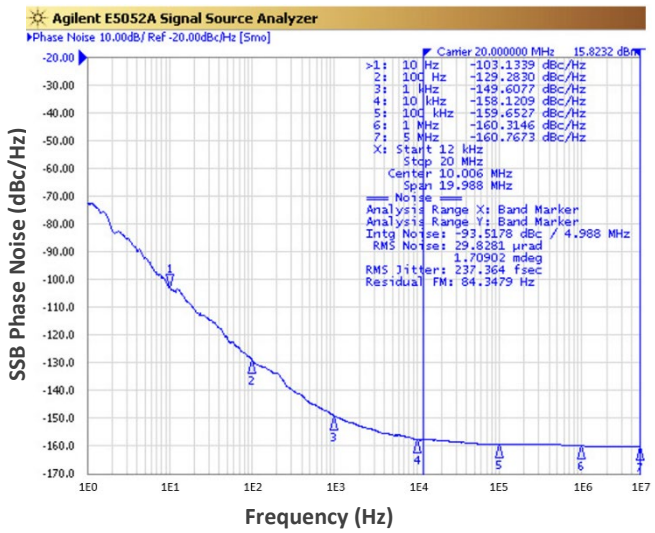
RoHS COMPLIANT

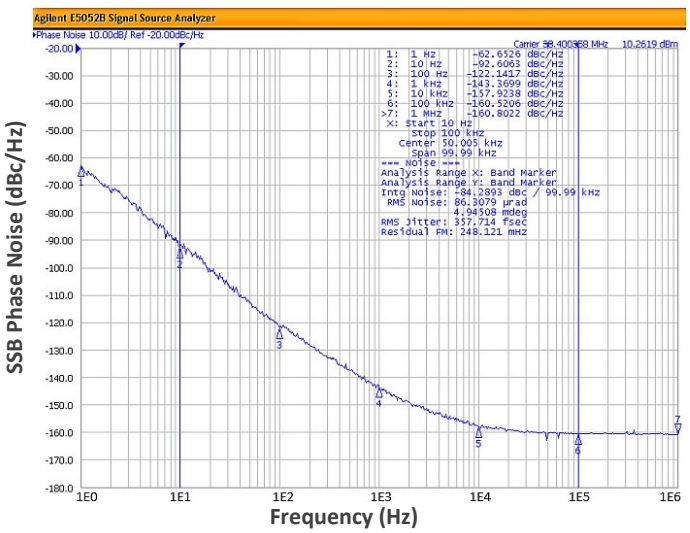
Standard Specifications

Parameter	Min.	Typ.	Max.	Unit	Test Condition / Description
Nominal frequency (Fn)		10 – 50		MHz	Standard frequencies: 10, 19.2, 20, 25, 26, 30.72, 38.4 and 40 MHz
Frequency calibration			±1	ppm	Offset from nominal frequency measured at 25°C ±2°C
Reflow shift			±1	ppm	Two consecutive reflows as per attached profile after 2 hours relaxation at 25°C
Operating temperature range	-40		105	°C	The operating temperature range over which the frequency stability is measured
Frequency stability over temperature			±50 ±100	ppb ppb	-40 to 85°C -40 to 105°C
Slope over temperature (ΔF/ΔT)			±20	ppb/°C	Minimum of one frequency reading every 2°C over the operating temperature range
Hysteresis			±20 ±50	ppb	Over a ±20°C window Operating temperature range
Sensitivity to supply voltage variations			±0.1	ppm	Supply voltage varied ±5% at 25°C
Sensitivity to load variations			±0.2	ppm	±10% load change at 25°C, 10kΩ//10pF for CS and 15 pF for CMOS
All causes stability			±4.6	ppm	Including calibration, reflow, temperature, supply & load changes and 10 years ageing
Supply voltage, V_{DD} Current C/Sine Current CMOS		2.4~3.4 3.5 6.4	 5.0 7.8	V mA	±5%. Standard values are 2.5, 3.0 and 3.3 V V_{DD} = 3.3 V, 50 MHz and 10kΩ//10pF V_{DD} = 3.3 V, 50 MHz and 15 pF
Oscillator output – CMOS Output voltage level low (V_{OL}) Output voltage level high (V_{OH}) Rise and fall times	 $0.9V_{DD}$	 6.5	 $0.1V_{DD}$	 V V ns	With a capacitive load of 15 pF
Duty cycle	40	50	60	%	At 50% V_{DD} trigger level

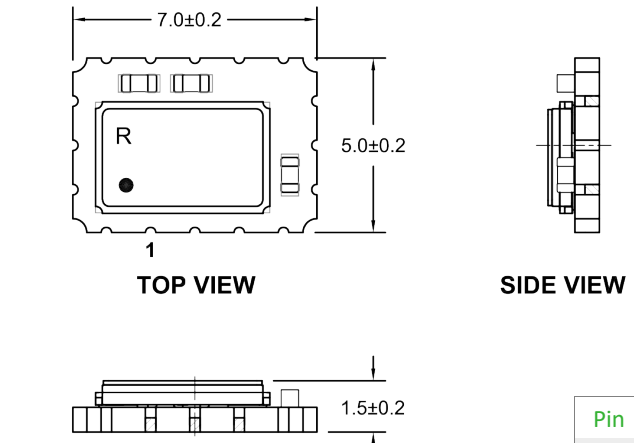
SSB Phase Noise (Typical value at 25°C)

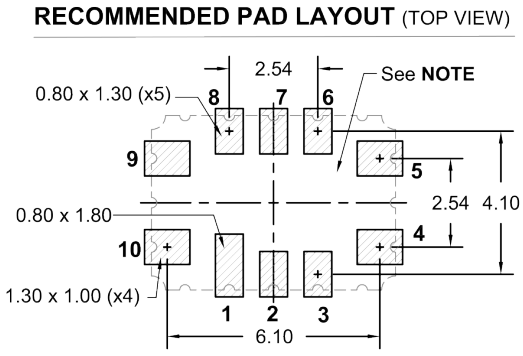
20 MHz RNT7050A SSB Phase Nose	38.4 MHz RNT7050A SSB Phase Nose





Model Outline and Recommended pad layout





Pin	Connections
1, 3, 6, 7	NC
2	Do Not Connect
4	GND
5	RF Output
8*	Do Not Connect / Tsense / Output Disable
9	V_{DD}
10*	Do Not Connect / Vc (Control Voltage)
***:** The connection depends on the specification	

NOTE: The area between the pads is a restricted area, no tracks or ground plane is allowed on any layer. Dimensions are in millimetres.