

# OCXO 8662/ 8663 Oven Controlled Crystal Oscillator



## Product Description

The **8663** series offer excellent frequency stability in low volume, low profile package.

The thermal design with down to  $2 \cdot 10^{-10}$  pp stability over temperature range, makes this device unique for severe holdover requirements.

## Features

- Sc cut 3<sup>rd</sup> overtone crystal resonator
- Wide operating temperature range (- 20°C to 70°C)
- Sine or HC-MOS / TTL-compatible output
- Option Low phase noise / Low aging

## Benefits

- Selectable long term stability
- Easily interfaces with analog or digital circuits
- Fits all telecommunications requirements
- Pin to pin compatible with 8665/6 range

## Applications

- Precise time keeping and navigation equipment:  
*GPS/GSM/UMTS/CDMA*
- Stratum II & III
- Base station

# OCXO 8662/ 8663

## Technical Specification

Standard / Option	Standard	Option
Crystal resonator	SC-cut, 3rd overtone	
Standard frequencies	4.096/ 5 / 8.192 / 10 / 13 / 16.384 MHz	4.096 to 40 MHz
Operating temperature range	<b>A:</b> - 20°C to +70°C	<b>B:</b> 0°C to +70°C <b>C:</b> 0°C to +60° C
Frequency stability ( $\Delta f/f$ )		
Long term stability (aging after 30 days of continuous operation)	2 x 10 <sup>-10</sup> /day 5 x 10 <sup>-9</sup> /month 3 x 10 <sup>-8</sup> /year	<b>G:</b> 1 x 10 <sup>-10</sup> /day <b>H:</b> 5 x 10 <sup>-11</sup> /day <b>J:</b> 3 x 10 <sup>-11</sup> /day see table
Over temperature range	Std : < 4 x 10 <sup>-9</sup> pp	<b>1:</b> < 1 x 10 <sup>-9</sup> pp <b>2:</b> < 2x 10 <sup>-10</sup> pp <b>6:</b> < 6x 10 <sup>-10</sup> pp
Versus supply voltage changes (Vcc ± 5%)	<3 x 10 <sup>-10</sup>	
Versus load changes (50 Ω ± 10%)	<5 x 10 <sup>-11</sup>	
Short term stability $\sigma$ ( $\tau$ ) (0.2s to 10s) Allan variance	<1 x 10 <sup>-11</sup>	
Electronic frequency control	≥± 0.3 ppm (0 to +10 Volts) / Linearity < 5% / Positive slope	
Power Supply (P)		
Input voltage range (DC)	<b>8662:</b> +24 Volts ± 5% <b>8663:</b> +12 Volts ± 5%	9V to 30V consult factory
Power consumption	< 2.5 W after warm-up at +25°C, < 8W during warm-up	
Environment ( not operating)		
Storage temperature	-40°C to +125°C	
Vibration	MIL-STD 167-1	
Shock	50 g, 11ms, 3 shocks in each direction of the main axis	
Size (L x W x H)	51.1 x 41.1 x 25 mm (2.01" x 1.62" x 0.98")	
Weight	100 g	
Outline and electrical connections	see drawing	
Outputs Characteristics (Z)	<b>S</b>	<b>T</b>
Wave form	Sine	Square
Level (Tol.) / Impedance	> 4 dBm / 50Ω	HCMOS / TTL compatible
Phase noise	see table	not applicable
Harmonics	< - 25 dBc	not applicable
Spurious in the frequency range up to 1MHz	< - 70 dBc	not applicable
Symmetry	not applicable	40% - 60%
Rise / Fall time (10 / 90%, 12pF)	not applicable	10 ns
Internal reference voltage		
Pin 3 : Vref out (R <sub>Load</sub> > 20 kΩ )	Std 7.8 Volt / on request 6.0 to 8.5 Volts ( source resistance 1kΩ)	
Stability vs temperature range	Vref out ± 3 mV	

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## Phase noise (BW = 1 Hz)

Frequencies		5 MHz		10 MHz	
Standard / Option L		Standard	Option L	Standard	Option L
Phase noise	1 Hz	-100 dBc	-110 dBc	-90 dBc	-100 dBc
	10 Hz	-130 dBc	-132 dBc	-120 dBc	-130 dBc
	100 Hz	-140 dBc	-140 dBc	-135 dBc	-140 dBc
	1'000 Hz	-145 dBc	-145 dBc	-145 dBc	-150 dBc

## Aging

	Standard	Option G	Option H	Option J
Aging per day	2E-10	1E-10	5E-11	3E-11
Aging per year	3E-8	2E-8	1.5E-8	1E-8
After continuous operation of	30 days	30 days	60 days	90 days
Applicable for	4.096 - 40 MHz	4.096 - 40 MHz	4.096 - 10 MHz	4.096 / 5 MHz

## Frequency stability vs temperature range

	Standard	Option 1	Option 6	Option 2
Frequency stability	4E-9 pp	1E-9 pp	6E-10 pp	2E-10 pp
Valid for temperature range	A / B / C	A / B / C	A / B / C	A / B / C

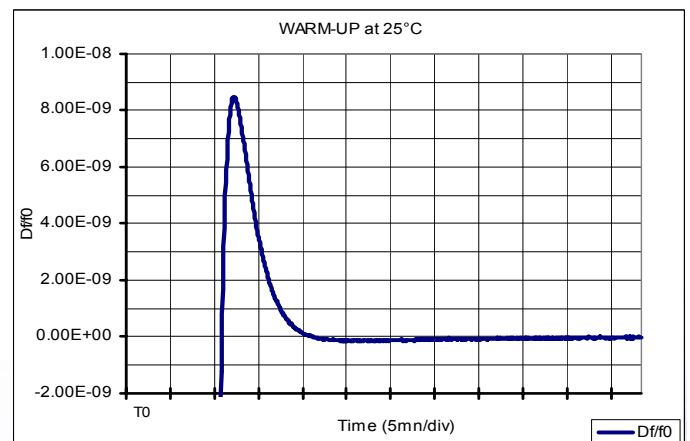
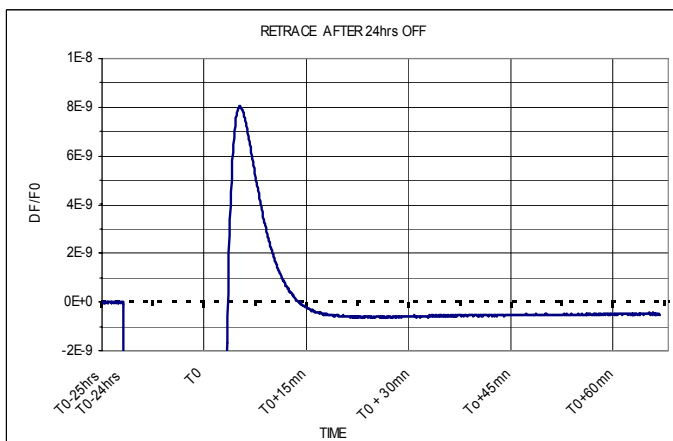
## Warm-up time and Retrace

Warm up time: Switch on +30 minutes @ +25°C:  $F_0^* = \pm 1 \times E-9$

\* $F_0$  referring to the frequency measured before after 6 hours of being switched on.

Retrace:  $F_0 \pm 1 \times E-9$  referring to frequency measured before being switched off.

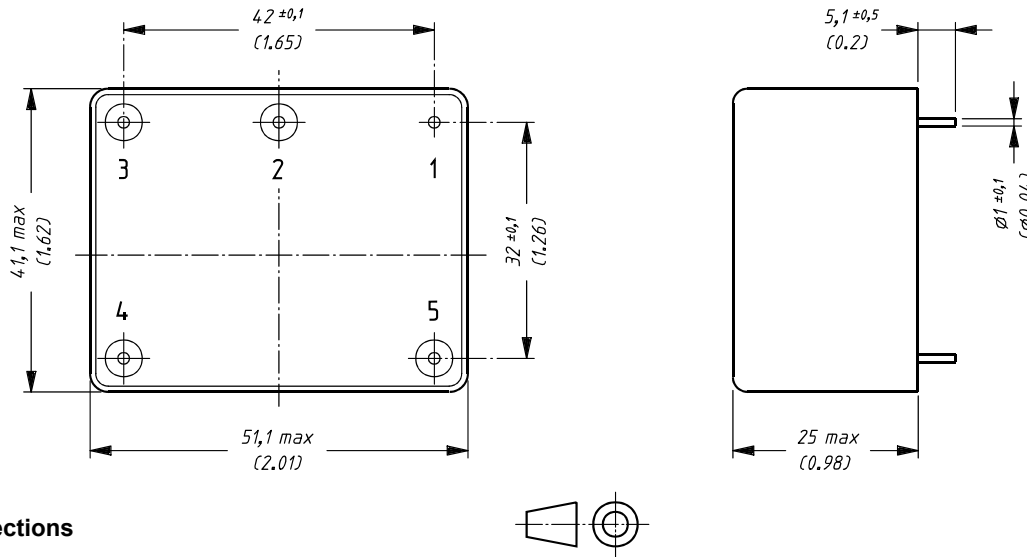
Condition: Switch off for 24 hours then measurement is performed after 2 hours of being switched on.



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## Outline and Electrical connections

All dimensions in mm (inches)



## Pin-out connections

- 1: GND
- 2: Vc input
- 3: Vref out
- 4: +Power supply
- 5: Output

## Ordering Information

Example :

8663 - A - 1 - S - G - L 5 MHz

**Type**

**Model**

3: +12VDC

**Operating temperature range**

A: Standard

**Frequency stability over temperature range**

1: < 1E-9 peak peak

**Output signal**

S: Sine wave

**Option aging**

G: 1E-10/day

**Option Low phase noise**

L: Low phase noise

**Nominal frequency output**

5 MHz

