

# " OCXO " [ Oven Controlled Crystal Oscillators ]

**OC14T**

Square Wave

Best stability

± 30 ppb

Voltage Control

DIP

3.3V

5.0V

Min.

5 MHz

Max.

40 MHz

## Applications

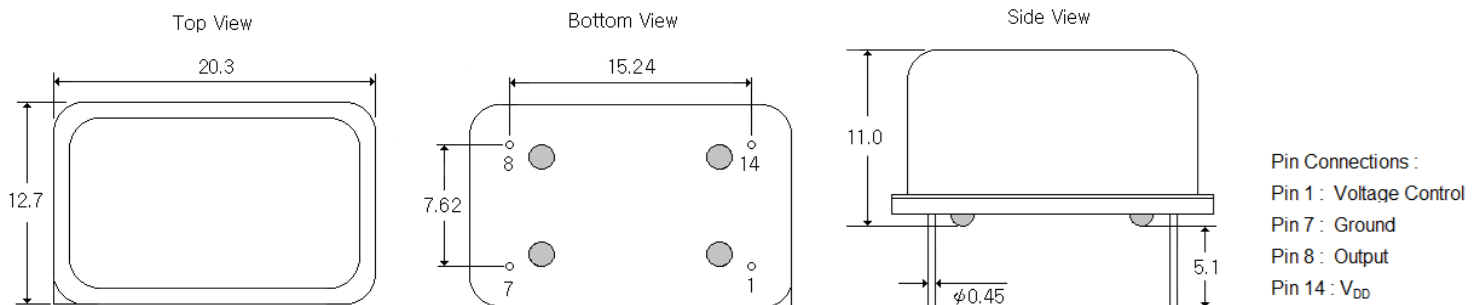
- OC14\_ ( 20.3 \* 12.7 \* 11.0 mm)
- +3.3V , +5.0V Supply Voltages
- Voltage control ( Electronic Frequency Tuning ) is standard .



## General Specifications ( at+25°C and specified input voltage )

| Output Waveform                         |                                                | Square wave . Waveform code is " T "                                                |          |                                               |        |
|-----------------------------------------|------------------------------------------------|-------------------------------------------------------------------------------------|----------|-----------------------------------------------|--------|
| Supply Voltage                          |                                                | +3.3 V                                                                              |          | +5.0 V                                        |        |
| Supply Voltage range , " Voltage code " |                                                | +3.3V ± 5% , " 3 "                                                                  |          | +5.0V ± 5% , " 5 "                            |        |
| Frequency Range                         |                                                | 5 ~ 40.0 MHz<br>Standard Frequency : 10.0 MHz                                       |          | 5 ~ 40.0 MHz<br>Standard Frequency : 10.0 MHz |        |
| Initial Calibration Tolerance           |                                                | ± 500 ppb ( max.)                                                                   |          | ± 500 ppb ( max.)                             |        |
|                                         |                                                | Vcon = +1.65 V                                                                      |          | Vcon = +2.5 V                                 |        |
| Type of Crystal Cut Used                |                                                | " SC - cut " crystal or " IT - cut " crystal                                        |          |                                               |        |
| Frequency Stability                     | vs Temperature<br>( refer to +25°C )           | ± 50 ppb ( max.) over 0°C to +70°C                                                  |          |                                               |        |
|                                         |                                                | ± 100 ppb ( max.) over -30°C to +70°C                                               |          |                                               |        |
|                                         |                                                | ± 100 ppb ( max.) over -40°C to +85°C                                               |          |                                               |        |
|                                         | vs Voltage Change                              | ± 50ppb ( max.) , for a ± 5% input voltage change .                                 |          |                                               |        |
|                                         | vs Warm-up time (+25°C)                        | 10 minute max. Within ± 100 ppb of its reference frequency.                         |          |                                               |        |
|                                         | vs Aging                                       | ± 5 ppb max./after 30 days ; ± 500 ppb max./first year ; ± 3 ppm max.over 10 years. |          |                                               |        |
| Voltage Control                         | Freq. Deviation Range                          | > ± 5 ppm Reference to fo at +25°C and over operating temperature range.            |          |                                               |        |
| On pin 1 (EFC)                          | Control Voltage Range                          | +1.65V ± 1.65V                                                                      |          | +2.5V ± 2.5V                                  |        |
|                                         | Transfer Function                              | Positive : Increasing control voltage increases output frequency .                  |          |                                               |        |
| ( Electronic Freq. Tuning )             | Input Impedance                                | 50 K ohms min.                                                                      |          |                                               |        |
|                                         | EFC Linearity                                  | ± 10 % ( max.)                                                                      |          |                                               |        |
| Power                                   | Power Dissipation<br>( at +25°C )              | 0.8 Watts max. at steady-state; 600 mA max. at turn-on.                             |          |                                               |        |
| Output                                  | Output Logic High ( V <sub>OH</sub> )          | +2.4 V ( min.)                                                                      |          | +2.4 V ( min.)                                |        |
|                                         | Output Logic Low ( V <sub>OL</sub> )           | + 0.5 V ( max.)                                                                     |          | + 0.5 V ( max.)                               |        |
|                                         | Duty Cycle ( V <sub>DD</sub> )                 | 50 % ± 5% @ + 2.0V                                                                  |          |                                               |        |
|                                         | Output Load                                    | 15pF                                                                                |          |                                               |        |
|                                         | Rise and Fall Time                             | 7 nS ( max.) ( 20% → 80% of waveform )                                              |          |                                               |        |
|                                         | Phase Noise Offset [ 10.0 MHz ]<br>( typical ) | 1 Hz                                                                                | 10 Hz    | 1 KHz                                         | 10 KHz |
|                                         | -70 dBc                                        | -108 dBc                                                                            | -140 dBc | -150 dBc                                      |        |

## Outline Dimensions ( Unit : ±0.2 mm )



# " OCXO " [ Oven Controlled Crystal Oscillators ]

Square Wave " OC \_ T "

Clipped Sine Wave " OC \_ S "

True Sine Wave " OC \_ E "

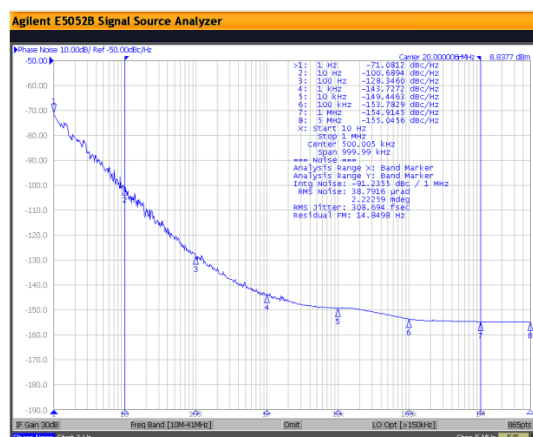
## Part Number Format and Example

|          | [ 1 ]       | [ 2 ]       | [ 3 ]          | - | [ 4 ]            | -   | [ 5 ]               | / | [ 6 ]                 |
|----------|-------------|-------------|----------------|---|------------------|-----|---------------------|---|-----------------------|
|          | Holder Type | Output Wave | Supply Voltage |   | Center Frequency |     | Frequency Stability |   | Operating Temp. Range |
| Examples | (1)         | OC14        | T              | 5 | 5.000            | 10  | -40+85              |   |                       |
|          | (2)         | OC18        | E              | 5 | 100.000          | 100 | -30+70              |   |                       |
|          | (3)         | OC51        | S              | 3 | 10.000           | 30  | -20+70              |   |                       |
|          | (4)         | OC12        | E              | 3 | 10.000           | 200 | 0+70                |   |                       |

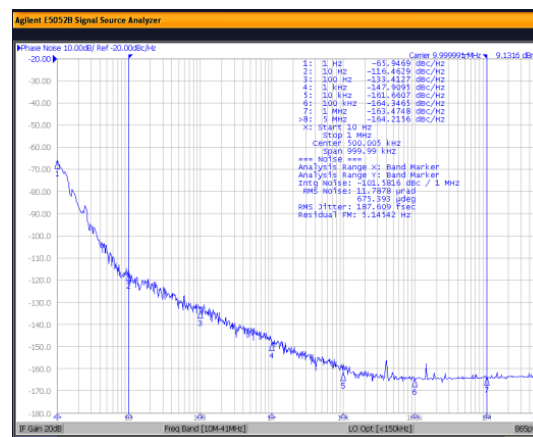
Ex (1) : OC14T5 - 5.000 - 10 / -40+85 [ OC14 type , Square Wave , 5.0V , 5.000MHz ,  $\pm 10$ ppb from -40°C to 85°C ]  
 Ex (2) : OC18E5 - 100.000 - 100 / -30+70 [ OC18 type , True Sine Wave , 5.0V , 100.000MHz ,  $\pm 100$ ppb from -30°C to 70°C ]  
 Ex (3) : OC51S3 - 10.000 - 30 / -20+70 [ OC51 type , Clipped Sine Wave , 3.3V , 10.000MHz ,  $\pm 30$ ppb from -20°C to 70°C ]  
 Ex (4) : OC12E3 - 10.000 - 200 / 0+70 [ OC12 type , True Sine Wave , 3.3V , 10.000MHz ,  $\pm 200$ ppb from 0°C to 70°C ]

|       |                                                                                                                                                                                                                                                                                                     |
|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| [ 1 ] | Holder Type<br>" OC _ " stands for OCXO ,                                                                                                                                                                                                                                                           |
| [ 2 ] | " T " stands for Square Wave , " E " stands for True Sine Wave , " S " stands for Clipped Sine Wave<br>ex 1 : OC14T , OC14 package , Square Wave ; ex 2 : OC18E , OC18 package , True Sine Wave ;<br>ex 3 : OC51S , OC51 package , Clipped Sine Wave ; ex 4 : OC12E , OC12 package , True Sine Wave |
| [ 3 ] | Supply voltage , " 5 " for 5.0V D.C , " 3 " for 3.3V D.C                                                                                                                                                                                                                                            |
| [ 4 ] | Center Frequency in MHz                                                                                                                                                                                                                                                                             |
| [ 5 ] | Frequency stability in $\pm$ _ ppb ; ex 1 : $\pm 10$ ppb ---10 , ex 2 : $\pm 100$ ppb ---100 , ex 3 : $\pm 30$ ppb ---30 , ex 4 : $\pm 200$ ppb ---200                                                                                                                                              |
| [ 6 ] | Operating temperature range in °C<br>ex 1 : -40 °C to 85°C ----- -40+85 ; ex 2 : -30 °C to 70°C ----- -30+70 ; ex 3 : -20 °C to 70°C ----- -20+70 ; ex 4 : 0 °C to 70°C ----- 0+70                                                                                                                  |

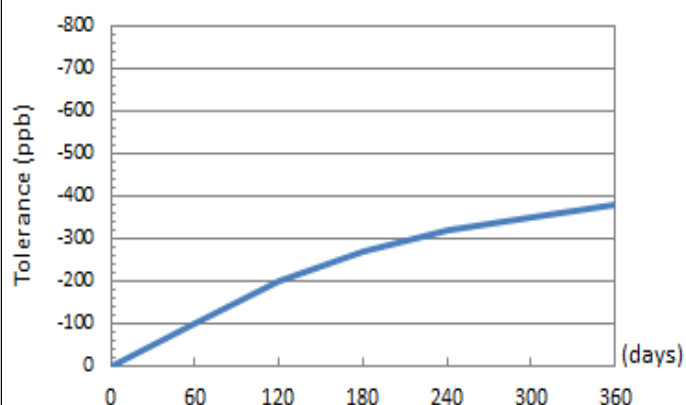
SSB Phase Noise : Clipped Sine Wave(OC51S-20.000)



SSB Phase Noise : Square Wave(OC13T-10.000)



Aging : OC51S-20.000



Power Consumption vs Temperature (OC13T5-10.000)

