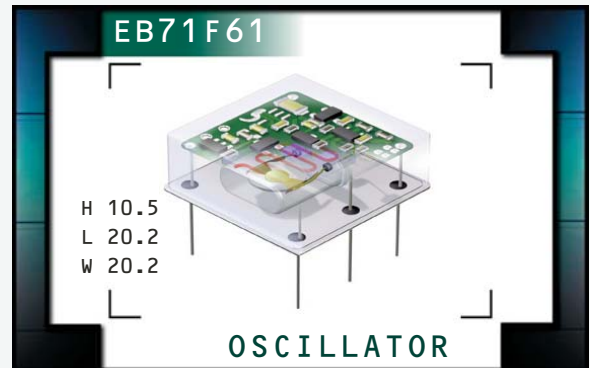


# EB71F61 Series

- Oven Controlled Crystal Oscillator (OCXO)
- AT-Cut Crystal
- HCMOS output
- 5.0V supply voltage
- 5 pin DIP package
- External control voltage
- Stability to  $\pm 50\text{ppb}$



## ELECTRICAL SPECIFICATIONS

|                                                        |                                                                          |                                                                                                                                            |
|--------------------------------------------------------|--------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Frequency Range</b>                                 |                                                                          | 10.000MHz, 12.288MHz, 12.800MHz, 16.000MHz, 19.440MHz, or 20.000MHz                                                                        |
| <b>Operating Temperature Range (OTR)</b>               |                                                                          | 0°C to 50°C, 0°C to 70°C, or -20°C to 70°C                                                                                                 |
| <b>Storage Temperature Range</b>                       |                                                                          | -55°C to 125°C                                                                                                                             |
| <b>Supply Voltage (<math>V_{DD}</math>)</b>            |                                                                          | 5.0V <sub>DC</sub> $\pm 5\%$                                                                                                               |
| <b>Frequency Tolerance / Stability</b>                 |                                                                          |                                                                                                                                            |
| vs. Initial Tolerance                                  | at Nominal $V_{DD}$ and $V_C$ , at 25°C                                  | $\pm 1.0\text{ppm}$ or $\pm 500\text{ppb}$ Maximum                                                                                         |
| vs. Temperature Stability                              | at Nominal $V_{DD}$ and $V_C$                                            | $\pm 50\text{ppb}$ , $\pm 80\text{ppb}$ , $\pm 100\text{ppb}$ , $\pm 200\text{ppb}$ , $\pm 280\text{ppb}$ , or $\pm 500\text{ppb}$ Maximum |
| vs. Vdd                                                | $V_{DD} \pm 5\%$                                                         | $\pm 20\text{ppb}$ Maximum                                                                                                                 |
| vs. Load                                               | $V_{load} \pm 5\%$                                                       | $\pm 20\text{ppb}$ Maximum                                                                                                                 |
| vs. Aging (1 Day)                                      | after 72 Hours of Operation                                              | $\pm 3.0\text{ppb}$ Maximum                                                                                                                |
| vs. Aging (1 Year)                                     | after 72 Hours of Operation                                              | $\pm 500\text{ppb}$ Maximum                                                                                                                |
| vs. Aging (10 Years)                                   | after 72 Hours of Operation                                              | $\pm 3.0\text{ppm}$ Maximum                                                                                                                |
| <b>Crystal Cut</b>                                     |                                                                          | AT-Cut                                                                                                                                     |
| <b>Warm Up Time</b>                                    | to $\pm 500\text{ppb}$ of Final Frequency at 1 Hour at 25°C              | 3 Minutes Maximum                                                                                                                          |
| <b>Power Consumption</b>                               |                                                                          |                                                                                                                                            |
| at Steady State, at 25°C                               |                                                                          | 1.2 Watts Maximum                                                                                                                          |
| During Warm Up, at 25°C                                |                                                                          | 3.6 Watts Maximum                                                                                                                          |
| <b>Output Voltage Logic High (<math>V_{OH}</math>)</b> | $I_{OH} = -8\text{mA}$                                                   | $V_{DD} - 0.5V_{DC}$ Minimum                                                                                                               |
| <b>Output Voltage Logic Low (<math>V_{OL}</math>)</b>  | $I_{OL} = +8\text{mA}$                                                   | 0.5V <sub>DC</sub> Maximum                                                                                                                 |
| <b>Rise Time / Fall Time</b>                           | Measured at 20% to 80% of Waveform                                       | 6nSec Maximum                                                                                                                              |
| <b>Duty Cycle</b>                                      | Measured at 50% of Waveform                                              | 50 $\pm 5\%$                                                                                                                               |
| <b>Load Drive Capability</b>                           |                                                                          | 15pF HCMOS Load Maximum                                                                                                                    |
| <b>Frequency Deviation</b>                             | Referenced to $F_0$ at $V_C = 2.5V_{DC}$ ; $V_{DD} = 5.0V_{DC}$ over OTR | $\pm 5\text{ppm}$ Minimum                                                                                                                  |
| <b>Control Voltage Range</b>                           |                                                                          | 0.0V <sub>DC</sub> to $V_{DD}$                                                                                                             |
| <b>Control Voltage (<math>V_C</math>)</b>              |                                                                          | 2.5V <sub>DC</sub> $\pm 2.5V_{DC}$                                                                                                         |
| <b>Transfer Function</b>                               |                                                                          | Positive Transfer Characteristic                                                                                                           |
| <b>Reference Voltage Output</b>                        |                                                                          | 4.5V <sub>DC</sub> $\pm 0.3V_{DC}$ (Pin 5)                                                                                                 |
| <b>Linearity</b>                                       |                                                                          | $\pm 10\%$ Maximum                                                                                                                         |
| <b>Input Impedance</b>                                 |                                                                          | 10kOhms Typical                                                                                                                            |
| <b>Typical Phase Noise (at 12.800MHz)</b>              |                                                                          |                                                                                                                                            |
| 1Hz Offset                                             |                                                                          | -75dBc/Hz                                                                                                                                  |
| 10Hz Offset                                            |                                                                          | -100dBc/Hz                                                                                                                                 |
| 100Hz Offset                                           |                                                                          | -130dBc/Hz                                                                                                                                 |
| 1kHz Offset                                            |                                                                          | -140dBc/Hz                                                                                                                                 |
| 10kHz Offset                                           |                                                                          | -150dBc/Hz                                                                                                                                 |

|                                |                        |                   |                      |                 |               |                    |
|--------------------------------|------------------------|-------------------|----------------------|-----------------|---------------|--------------------|
| MANUFACTURER<br>ECLIPTEK CORP. | CATEGORY<br>OSCILLATOR | SERIES<br>EB71F61 | PACKAGE<br>5 pin DIP | VOLTAGE<br>5.0V | CLASS<br>OS2B | REV. DATE<br>05/07 |
|--------------------------------|------------------------|-------------------|----------------------|-----------------|---------------|--------------------|

## PART NUMBERING GUIDE

**EB71F61 D 10 B V 2 - 20.000M**

### INITIAL TOLERANCE

C=±1.0ppm  
D=±500ppb

### FREQUENCY STABILITY

2 Digit Code Per Table 1

### OPERATING TEMPERATURE RANGE

1 Letter Code Per Table 1

### FREQUENCY

### DUTY CYCLE

2=50% ±5%

### VOLTAGE CONTROL OPTION

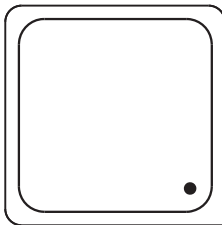
V=Voltage Control on Pin 4 and Reference  
Voltage Output on Pin 5

**TABLE 1: PART NUMBERING CODES**

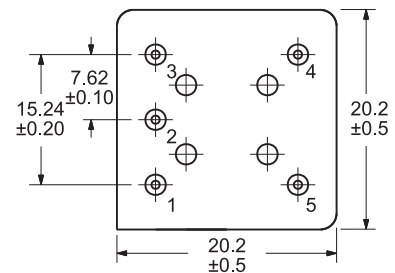
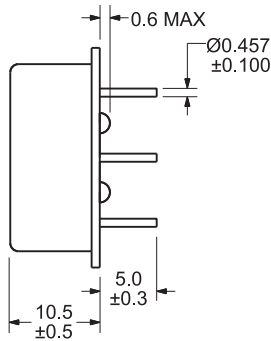
| Operating Temperature Range |              |    | FREQUENCY STABILITY<br>X Denotes availability |        |         |         |         |         |
|-----------------------------|--------------|----|-----------------------------------------------|--------|---------|---------|---------|---------|
|                             |              |    | ±50ppb                                        | ±80ppb | ±100ppb | ±200ppb | ±280ppb | ±500ppb |
|                             | Code         | 05 | 08                                            | 10     | 20      | 28      | 50      |         |
|                             | 0°C to +50°C | A  | X                                             | X      | X       | X       | X       | X       |
|                             | 0°C to +70°C | B  | X                                             | X      | X       | X       | X       | X       |
| -20°C to +70°C              | C            |    | X                                             | X      | X       | X       | X       |         |

## MECHANICAL DIMENSIONS

ALL DIMENSIONS IN MILLIMETERS



Pin 1: Supply Voltage  
Pin 2: Output  
Pin 3: Case/Ground  
Pin 4: Voltage Control  
Pin 5: Reference Voltage Output



## ENVIRONMENTAL/MECHANICAL SPECIFICATIONS

### Characteristic

Gross Leak Test  
Mechanical Shock  
Vibration  
Lead Integrity  
Solderability  
Temperature Cycling  
Resistance to Soldering Heat  
Resistance to Solvents

### Specification

MIL-STD-883, Method 1014, Condition C  
MIL-STD-202, Method 213, Condition C  
MIL-STD-883, Method 2007, Condition A  
MIL-STD-883, Method 2004  
MIL-STD-883, Method 2002  
MIL-STD-883, Method 1010  
MIL-STD-883, Method 210  
MIL-STD-883, Method 215

## MARKING SPECIFICATIONS

Line 1: ECLIPTEK

Line 2: XX.XXX M

Frequency in MHz  
(5 Digits Maximum + Decimal)

Line 3: XX Y ZZ

Week of Year  
Last Digit of Year  
Ecliptek Manufacturing Identifier

Note: Pin 1 shall be designated with a dot

MANUFACTURER  
ECLIPTEK CORP.

CATEGORY  
OSCILLATOR

SERIES  
EB71F61

PACKAGE  
5 pin DIP

VOLTAGE  
5.0V

CLASS  
OS2B

REV. # DATE  
05/07