

# OVEN CONTROLLED CRYSTAL OSCILLATOR

AOCJY2 Series



RoHS  
Compliant



21.0 x 21.0 x 11.0 mm

## FEATURES:

- 21.0 x 21.0 x 11.0 mm Leaded- RoHS Compliant Reflow-able Package
- SC-Cut, High “Q” resonator based design
- Either Sinewave or CMOS RF output
- Available with  $\pm 30$  ppb over  $-40^{\circ}\text{C}$  to  $+75^{\circ}\text{C}$  operating temperature range
- Tighter Stabilities to  $\pm 5.0$  ppb over  $0^{\circ}\text{C}$  to  $+50^{\circ}\text{C}$  also available
- Exceptional long-term Aging of  $\pm 500$  ppb max. over 10-Year Product Life
- Excellent close-in phase noise ( $-140$  dBc/Hz Max. @100Hz offset; 10MHz carrier)

## APPLICATIONS:

- Cellular Infrastructure
- Radar Systems
- Test & Measurement Equipment
- GPS Tracking with precision hold-over accuracy
- WiMax / WLAN

## STANDARD SPECIFICATIONS:

| Parameters  | Minimum  | Typical             | Maximum      | Units              | Notes                        |
|---|--|---------------------|--------------|--------------------|------------------------------|
| <b>RF Output</b>  |  |                     |              |                    |                              |
| Frequency   | 10.00  |                     | 100.00       | MHz                | Overall Frequency range      |
| Standard Available Frequencies                          | 10.00, 12.80, 13.00, 26.00, 38.88, 40.00, 100.00 MHz |                     |              |                    |                              |
| <b>Waveform</b>   |  |                     |              |                    |                              |
| <b>CMOS</b>   |  |                     |              |                    |                              |
| Level "1" (Logic High)                                  | 0.9*Vdd  |                     |              | Volts              |                              |
| Level "0" (Logic Low)                                   |  |                     | 0.1*Vdd      | Volts              |                              |
| Load  |  | 15                  |              | pf                 |                              |
| Rise & Fall Time  |  |                     | 6.0          | ns                 |                              |
| Duty Cycle  | 45   |                     | 55           | %                  |                              |
| <b>Waveform</b>   |  |                     |              |                    |                              |
| <b>Sinewave</b>   |  |                     |              |                    |                              |
| Peak Power  | 2.00   |                     |              | dBm                |                              |
| Output Load   |  | 50                  |              | $\Omega$           |                              |
| <b>Short Term Stability</b>                             |  | $2 \times 10^{-10}$ |              | /second            | <b>Alan Variance</b>         |
| <b>Operable Temperature Range</b>                       | -40  |                     | 75           | $^{\circ}\text{C}$ | <i>See Stability Options</i> |
| <b>Frequency Stability Options</b>                      |  |                     |              |                    |                              |
| $0^{\circ}\text{C}$ to $+50^{\circ}\text{C}$ (Note #1)  |  |                     | $\pm 5.00$   | ppb                | Default Spec.                |
| $-20^{\circ}\text{C}$ to $+70^{\circ}\text{C}$          |  |                     | $\pm 10.00$  | ppb                | Option “E”                   |
| $-40^{\circ}\text{C}$ to $+75^{\circ}\text{C}$          |  |                     | $\pm 30.00$  | ppb                | Option “F”                   |
| Frequency Stability vs. Supply Voltage (Vdd $\pm 5\%$ ) |  |                     | $\pm 5.00$   | ppb                |                              |
| Frequency Stability vs. Load Variation ( $\pm 10\%$ )   |  |                     | $\pm 5.00$   | ppb                |                              |
| Warm-Up @ $25^{\circ}\text{C}$                          |  |                     | $\pm 100.00$ | ppb                | In $\leq 3$ -minutes         |
| Power Consumption @ turn on                             |  |                     | 3.00         | Watts              |                              |
| Power Consumption Steady State                          |  |                     | 1.00         | Watts              |                              |
| Supply Voltage (Vdd)                                    | 3.13   | 3.30                | 3.46         | Volts              | <i>See Options</i>           |

**Note #1:**  $\pm 5.00$  ppb stability is only available for  $F_0 \leq 40\text{MHz}$ . For frequencies above 40MHz, the best available frequency stability is  $\pm 10.00$  ppb over  $-20^{\circ}\text{C}$  to  $+70^{\circ}\text{C}$

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## STANDARD SPECIFICATIONS - continued.

| Parameters                             | Minimum      | Typical  | Maximum      | Units | Notes                          |
|--|--------------|----------|--------------|-------|--------------------------------|
| <b>Aging</b>                           |              |          |              |       |                                |
| Daily                                  |              |          | ±1.0         | ppb   |                                |
| First Year                             |              |          | ±100         | ppb   |                                |
| 10-Years                               |              |          | ±500         | ppb   |                                |
| <b>Spectral Content</b>                |              |          |              |       |                                |
| Spurious Response                      |              |          | -35          | dBc   |                                |
| Phase Noise (10MHz Carrier) @ 5V       |              |          |              |       |                                |
| @ 1 Hz offset                          |              |          | -90          | dBc   |                                |
| @ 10 Hz offset                         |              |          | -120         | dBc   |                                |
| @ 100 Hz offset                        |              |          | -140         | dBc   |                                |
| @ 1,000 Hz offset                      |              |          | -145         | dBc   |                                |
| @ 10,000 Hz offset                     |              |          | -150         | dBc   |                                |
| <b>Electrical Frequency Adjustment</b> |              |          |              |       |                                |
| Control Voltage Range (Vc)             | 0.0          |          | Vdd          | Volts |                                |
| Frequency Pull Range                   | ±0.70        |          |              | ppm   |                                |
| Frequency Pull Slope                   |              | Positive |              |       |                                |
| Control Voltage Port Impedance         | 10           |          |              | kΩ    | Control Voltage Port Impedance |
| Center Control Voltage                 | (Vdd/2) -0.5 | Vdd/2    | (Vdd/2) +0.5 | Volts | Center Control Voltage         |
| <b>Reference Voltage (Vdd=3.3V)</b>    | 2.70         | 2.80     | 2.90         | Volts | Output @ Pin#5                 |
| <b>Reference Voltage (Vdd=5.0V)</b>    | 4.40         | 4.50     | 4.60         | Volts | Output @ Pin#5                 |
| Storage Temperature                    | -40          |          | +100         | °C    |                                |

## OPTIONS AND PART IDENTIFICATION (Left blank if standard)

AOCJY2 -  -  MHz -  -

| Supply Voltage Option |
|-----------------------|
| Blank : 3.30V         |
| A : 5.00V             |

| Frequency in MHz    |
|---------------------|
| Such as; 10.000 MHz |
| 26.000 MHz          |
| 100.000 MHz         |

| Temperature Options |
|---------------------|
| E : -20°C to +70°C  |
| F : -40°C to +75°C  |

| RF Output Options |
|-------------------|
| Blank : CMOS      |
| SW : Sinewave     |

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## OUTLINE DIMENSIONS



Bottom View



| PIN | FUNCTION:            |
|-----|----------------------|
| 1   | Power Supply         |
| 2   | Output               |
| 3   | GND                  |
| 4   | Control Voltage      |
| 5   | Reference Voltage/NC |

Unit:mm

## PACKAGING: (20) units per tray



## REFLOW PROFILE:



|  |                           |
|--|---------------------------|
| T <sub>S</sub> max to T <sub>L</sub> (Ramp-up Rate)    | 3°C/second max.           |
| Preheat  |                           |
| Temperature Min. (T <sub>S</sub> Min.)                 | 150°C                     |
| Temperature Typical (T <sub>S</sub> Typ.)              | 175°C                     |
| Temperature Max. (T <sub>S</sub> Max.)                 | 200°C                     |
| Time (t <sub>s</sub> )                                 | 60 ~ 180 seconds          |
| Ramp-up rate (T <sub>L</sub> to T <sub>P</sub> )       | 3°C/second max.           |
| Time Maintained Above:                                 |                           |
| --Temperature (T <sub>L</sub> )/Time (T <sub>L</sub> ) | 217°C/60 ~ 150 seconds    |
| Peak Temperature (T <sub>P</sub> )                     | 250°C max. for 10 seconds |
| Target Peak Temperature (T <sub>P</sub> Target)        | 250°C +0/-5°C             |
| Time within 5°C of actual peak (t <sub>p</sub> )       | 20 ~ 40 seconds           |
| Ramp-down Rate   | 6°C/second max.           |
| Tune 25°C to Peak Temperature (t)                      | 8 minutes max.            |

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