

# OVEN CONTROLLED CRYSTAL OSCILLATOR

AOCJY3 Series



RoHS  
Compliant



25.4x 25.4 x 13.0 mm

## FEATURES:

- 25.4x 25.4 x 13.0 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 Typical @100 Hz 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                   |
|--|--|---------------------|-------------|--------------------|-------------------------|
| RF Output  |  |                     |             |                    |                         |
| 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 |                     |             |                    |                         |
| Waveform   | CMOS   |                     |             |                    |                         |
| Level "1" (Logic High)                                   | 0.9*Vdd  |                     |             | Volts              | (Note #1)               |
| Level "0" (Logic Low)                                    |  |                     | 0.1*Vdd     | Volts              | (Note #1)               |
| Load   |  | 15                  |             | pf                 |                         |
| Rise & Fall Time   |  |                     | 6.0         | ns                 |                         |
| Duty Cycle   | 45   |                     | 55          | %                  |                         |
| Waveform   | Sinewave   |                     |             |                    |                         |
| Peak Power   | 2.00   |                     |             | dBm                |                         |
| Output Load  |  | 50                  |             | $\Omega$           |                         |
| Short Term Stability                                     |  | $1 \times 10^{-10}$ |             | /second            | Alan Variance           |
| Operable Temperature Range                               | -40  |                     | 75          | $^{\circ}\text{C}$ | See Stability Options   |
| Frequency Stability Options                              |  |                     |             |                    |                         |
| 0 $^{\circ}\text{C}$ to +50 $^{\circ}\text{C}$ (Note #2) |  |                     | $\pm 5.00$  | 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 $\pm 5\%$ )  |  |                     | $\pm 2.00$  | ppb                |                         |
| Frequency Stability vs. Load Variation ( $\pm 10\%$ )    |  |                     | $\pm 2.00$  | ppb                |                         |
| Warm-Up @ 25 $^{\circ}\text{C}$                          |  |                     | $\pm 30.00$ | ppb                | In $\leq 3$ -minutes    |
| Power Consumption @ turn on                              |  |                     | 3.60        | Watts              |                         |
| Power Consumption Steady State                           |  |                     | 1.20        | Watts              |                         |
| Supply Voltage (Vdd)                                     | 3.13   | 3.30                | 3.46        | Volts              | See Options             |

**Note #1:** When Vdd=12.0V; Level "1" = 4.50 V minimum; Level "0" = 0.50V maximum

**Note #2:**  $\pm 5.00$  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                      |              |          | -155         | dBc   |                        |
| <b>Electrical Frequency Adjustment</b>  |              |          |              |       |                        |
| Control Voltage Range (Vc)              | 0.0          |          | Vdd          | Volts |                        |
| Frequency Pull Range                    | ±0.700       |          |              | ppm   |                        |
| Frequency Pull Slope                    |              | Positive |              |       |                        |
| Control Voltage Port Impedance          | 10           |          |              | kΩ    |                        |
| Center Control Voltage <i>(Note #3)</i> | (Vdd/2) -0.5 | Vdd/2    | (Vdd/2) +0.5 | Volts | Center Control Voltage |
| Control Port Linearity                  |              | ±10      |              | %     |                        |
| <b>Reference Voltage (Vdd=3.3V)</b>     | 2.70         | 2.80     | 2.90         | Volts | Output @ Pin#4         |
| <b>Reference Voltage (Vdd=5.0V)</b>     | 4.40         | 4.50     | 4.60         | Volts | Output @ Pin#4         |
| <b>Reference Voltage (Vdd=12.0V)</b>    | 4.90         | 5.00     | 5.10         | Volts | Output @ Pin#4         |
| Storage Temperature                     | -40          |          | +100         | °C    |                        |

**Note #3:** When Vdd=12.0V, Control Voltage Range is 0.0V to 5.0V and therefore, the Center Control Voltage is (2.50V±0.50V)

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



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## OUTLINE DIMENSIONS



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

Unit:mm

## PACKAGING: 15 pcs/tray



## REFLOW PROFILE:



|  |                           |
|--|---------------------------|
| $T_S$ max to $T_L$ (Ramp-up Rate)        | 3°C/second max.           |
| Preheat                                  |                           |
| Temperature Min. ( $T_S$ Min.)           | 150°C                     |
| Temperature Typical ( $T_S$ Typ.)        | 175°C                     |
| Temperature Max. ( $T_S$ Max.)           | 200°C                     |
| Time ( $t_s$ )                           | 60 ~ 180 seconds          |
| Ramp-up rate ( $T_L$ to $T_p$ )          | 3°C/second max.           |
| Time Maintained Above:                   |                           |
| --Temperature ( $T_L$ )/Time ( $T_L$ )   | 217°C/60 ~ 150 seconds    |
| Peak Temperature ( $T_p$ )               | 250°C max. for 10 seconds |
| Target Peak Temperature ( $T_p$ Target)  | 250°C +0/-5°C             |
| Time within 5°C of actual peak ( $t_p$ ) | 20 ~ 40 seconds           |
| Ramp-down Rate                           | 6°C/second max.           |
| Tune 25°C to Peak Temperature (t)        | 8 minutes max.            |

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