

# LOW VOLTAGE HCMOS SURFACE-MOUNT CRYSTAL CLOCK OSCILLATOR

ASD SERIES



RoHS  
Compliant



2.5 X 2.0 X 0.95 mm

## FEATURES:

- Low height 0.95mm max
- Low current consumption
- Tri-state function
- Suitable for RoHS compliant reflow
- Tight stability option
- Seam sealed package assures high reliability

## APPLICATIONS:

- CCD clock for VTR Camera
- Equipment connected to PC or PC cards
- Thin equipment

## STANDARD SPECIFICATIONS:

| Parameters                  |             | Minimum  | Typical | Maximum  | Units | Notes                                 |
|-----------------------------|-------------|----------|---------|----------|-------|---------------------------------------|
| Frequency Range             |             | 0.750    | -----   | 75       | MHz   |                                       |
| Operating Temperature       |             | -20      | -----   | +70      | °C    | STD temp. Option code E (See options) |
| Storage Temperature         |             | -55      | -----   | +100     | °C    |                                       |
| Overall Frequency Stability |             | -100     | -----   | +100     | ppm   | See options                           |
| Supply Voltage (Vdd)        |             | +3.135   | +3.3    | +3.465   | V     | ASD (Standard)                        |
|                             |             | +2.85    | +3.0    | +3.15    |       | ASD1                                  |
|                             |             | +2.375   | +2.5    | +2.625   |       | ASD2                                  |
|                             |             | +1.71    | +1.8    | +1.89    |       | ASD3                                  |
|                             |             | +0.95    | +1.0    | +1.05    |       | ASD6                                  |
| Input Current (Idd)         | ASD (3.3V)  | -----    | 2.5     | 5        | mA    | 0.750~15.999 MHz                      |
|                             |             | -----    | 4       | 7        |       | 16.000~39.999 MHz                     |
|                             |             | -----    | 9       | 13       |       | 40.000~66.666 MHz                     |
|                             | ASD1 (3.0V) | -----    | 2.5     | 4        | mA    | 0.750~15.999 MHz                      |
|                             |             | -----    | 3.5     | 6        |       | 16.000~39.999 MHz                     |
|                             |             | -----    | 8       | 12       |       | 40.000~66.666 MHz                     |
|                             | ASD2 (2.5V) | -----    | 2       | 3.5      | mA    | 0.750~15.999 MHz                      |
|                             |             | -----    | 3       | 5        |       | 16.000~39.999 MHz                     |
|                             |             | -----    | 7       | 10       |       | 40.000~66.666 MHz                     |
|                             | ASD3 (1.8V) | -----    | 1       | 2.5      | mA    | 0.750~15.999 MHz                      |
|                             |             | -----    | 2       | 4        |       | 16.000~39.999 MHz                     |
|                             |             | -----    | 4       | 7        |       | 40.000~66.666 MHz                     |
|                             | ASD6 (1.0V) | -----    | 1.0     | 2.5      | mA    | 25.000 MHz                            |
| Symmetry @ 1/2Vdd           |             | 40       | -----   | 60       | %     | STD (See option)                      |
| Output Load:                |             | -----    | -----   | 15       | pF    | CMOS                                  |
| Output Voltage (VOH):       |             | 0.9* Vdd | -----   | -----    | V     |                                       |
| Output Voltage (VOL):       |             | -----    | -----   | 0.1* Vdd | V     |                                       |



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## STANDARD SPECIFICATIONS... continued:

| Parameters                       |             | Minimum                                                                            | Typical | Maximum | Units | Notes             |
|----------------------------------|-------------|------------------------------------------------------------------------------------|---------|---------|-------|-------------------|
| Rise and Fall Time<br>(Tr/Tf):   | ASD (3.3V)  | -----                                                                              | 3       | 7       | ns    | 0.750~15.999 MHz  |
|                                  |             | -----                                                                              | 2.5     | 6       |       | 16.000~39.999 MHz |
|                                  |             | -----                                                                              | 2       | 4       |       | 40.000~66.666 MHz |
|                                  | ASD1 (3.0V) | -----                                                                              | 3       | 7       | ns    | 0.750~15.999 MHz  |
|                                  |             | -----                                                                              | 2.5     | 6       |       | 16.000~39.999 MHz |
|                                  |             | -----                                                                              | 2       | 4       |       | 40.000~66.666 MHz |
|                                  | ASD2 (2.5V) | -----                                                                              | 4       | 8       | ns    | 0.750~15.999 MHz  |
|                                  |             | -----                                                                              | 3       | 7       |       | 16.000~39.999 MHz |
|                                  |             | -----                                                                              | 2.5     | 5       |       | 40.000~66.666 MHz |
|                                  | ASD3 (1.8V) | -----                                                                              | 5       | 10      | ns    | 0.750~15.999 MHz  |
|                                  |             | -----                                                                              | 3.5     | 8       |       | 16.000~39.999 MHz |
|                                  |             | -----                                                                              | 3       | 6       |       | 40.000~66.666 MHz |
|                                  | ASD6 (1.0V) | -----                                                                              | 1.9     | 6.0     | ns    | 25.000 MHz        |
| Start-up Time:                   | ASD (3.3V)  | -----                                                                              | 6       | 10      | ms    | 0.750~15.999 MHz  |
|                                  |             | -----                                                                              | 6       | 10      |       | 16.000~39.999 MHz |
|                                  |             | -----                                                                              | 5       | 10      |       | 40.000~66.666 MHz |
|                                  | ASD1 (3.0V) | -----                                                                              | 6       | 10      | ms    | 0.750~15.999 MHz  |
|                                  |             | -----                                                                              | 6       | 10      |       | 16.000~39.999 MHz |
|                                  |             | -----                                                                              | 5       | 10      |       | 40.000~66.666 MHz |
|                                  | ASD2 (2.5V) | -----                                                                              | 6       | 10      | ms    | 0.750~15.999 MHz  |
|                                  |             | -----                                                                              | 6       | 10      |       | 16.000~39.999 MHz |
|                                  |             | -----                                                                              | 5       | 10      |       | 40.000~66.666 MHz |
|                                  | ASD3 (1.8V) | -----                                                                              | 6       | 10      | ms    | 0.750~15.999 MHz  |
|                                  |             | -----                                                                              | 6       | 10      |       | 16.000~39.999 MHz |
|                                  |             | -----                                                                              | 5       | 10      |       | 40.000~66.666 MHz |
|                                  | ASD6 (1.0V) | -----                                                                              | 2.0     | 10      | ms    | 25.000 MHz        |
| Tri-state function (Stand-by) :  |             | "1" (VIH≥0.7*Vdd) or Open: Oscillation;<br>"0" (VIH<0.3*Vdd) : No oscillation/Hi Z |         |         |       |                   |
| Phase Jitter<br>(12kHz to 20MHz) | ASD (3.3V)  | -----                                                                              | 0.4     | 1.0     | ps    | 0.750~15.999 MHz  |
|                                  |             | -----                                                                              | 0.4     | 1.0     |       | 16.000~39.999 MHz |
|                                  |             | -----                                                                              | 0.3     | 1.0     |       | 40.000~66.666 MHz |
|                                  | ASD1 (3.0V) | -----                                                                              | 0.4     | 1.0     | ps    | 0.750~15.999 MHz  |
|                                  |             | -----                                                                              | 0.4     | 1.0     |       | 16.000~39.999 MHz |
|                                  |             | -----                                                                              | 0.3     | 1.0     |       | 40.000~66.666 MHz |
|                                  | ASD2 (2.5V) | -----                                                                              | 0.5     | 1.0     | ps    | 0.750~15.999 MHz  |
|                                  |             | -----                                                                              | 0.5     | 1.0     |       | 16.000~39.999 MHz |
|                                  |             | -----                                                                              | 0.5     | 1.0     |       | 40.000~66.666 MHz |
|                                  | ASD3 (1.8V) | -----                                                                              | 0.5     | 1.0     | ps    | 0.750~15.999 MHz  |
|                                  |             | -----                                                                              | 0.5     | 1.0     |       | 16.000~39.999 MHz |
|                                  |             | -----                                                                              | 0.5     | 1.0     |       | 40.000~66.666 MHz |
|                                  | ASD6 (1.0V) | -----                                                                              | 0.3     | 1.0     | ps    | 25.000 MHz        |
| Period Jitter RMS                | ASD (3.3V)  | -----                                                                              | 3.0     | 5.0     | ps    | 0.750~15.999 MHz  |
|                                  |             | -----                                                                              | 3.0     | 5.0     |       | 16.000~39.999 MHz |
|                                  |             | -----                                                                              | 3.0     | 5.0     |       | 40.000~66.666 MHz |
|                                  | ASD1 (3.0V) | -----                                                                              | 3.0     | 5.0     | ps    | 0.750~15.999 MHz  |
|                                  |             | -----                                                                              | 3.0     | 5.0     |       | 16.000~39.999 MHz |
|                                  |             | -----                                                                              | 3.0     | 5.0     |       | 40.000~66.666 MHz |
|                                  | ASD2 (2.5V) | -----                                                                              | 3.0     | 5.0     | ps    | 0.750~15.999 MHz  |
|                                  |             | -----                                                                              | 3.0     | 5.0     |       | 16.000~39.999 MHz |
|                                  |             | -----                                                                              | 3.0     | 5.0     |       | 40.000~66.666 MHz |
|                                  | ASD3 (1.8V) | -----                                                                              | 3.0     | 5.0     | ps    | 0.750~15.999 MHz  |
|                                  |             | -----                                                                              | 3.0     | 5.0     |       | 16.000~39.999 MHz |
|                                  |             | -----                                                                              | 3.0     | 5.0     |       | 40.000~66.666 MHz |
|                                  | ASD6 (1.0V) | -----                                                                              | 4.8     | 6.0     | ps    | 25.000 MHz        |
| Aging at 25°C/year               |             | -5                                                                                 | -----   | +5      | ppm   |                   |
| Disable Current:                 |             | -----                                                                              | -----   | 10      | µA    |                   |



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2.5 X 2.0 X 0.8mm

## OPTIONS AND PART IDENTIFICATION:

(Left blank if standard)

ASD  -  MHz -  -  -  -

| P/N and Vdd (V) |
|-----------------|
| Blank: 3.3±5%   |
| 1: 3.0±5%       |
| 2: 2.5±5%       |
| 3: 1.8±5%       |
| 6: 1.0±5%       |

| Frequency in MHz |
|------------------|
| e.g. 24.576MHz   |
| 14.31818MHz      |
| 26.000MHz        |

| Operating Temp.        |
|------------------------|
| E: -20°C ~ +70°C (STD) |
| F: -30°C ~ +70°C       |
| N: -30°C ~ +85°C       |
| L: -40°C ~ +85°C       |
| M(**): -40°C ~ +105°C  |
| V(**): -40°C ~ +125°C  |

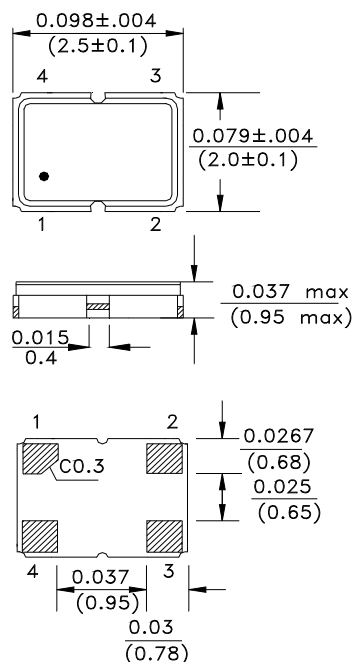
| Overall Freq. Stability |
|-------------------------|
| J(*): ±20ppm            |
| R(**): ±25ppm           |
| K: ±30ppm               |
| H: ±35ppm               |
| C: ±50ppm               |

| Duty Cycle              |
|-------------------------|
| Blank : 40/60% @ 1/2Vdd |
| S: 45/55% @ 1/2Vdd      |

| Packaging        |
|------------------|
| Blank: Bulk      |
| T: 1000pcs/Reel  |
| T2: 250pcs/Reel  |
| T3: 3000pcs/Reel |

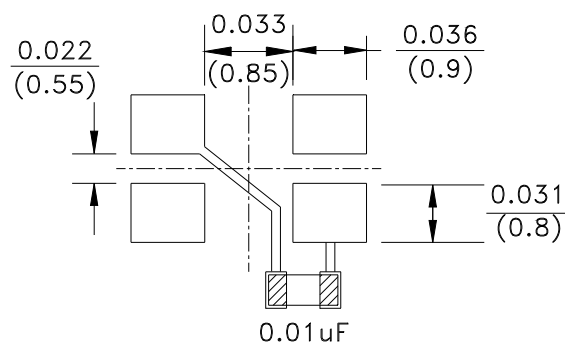
\*: Standard only  
\*\*: E, F, N, and L only  
\*\*\*: ± 100 ppm only

## OUTLINE DRAWING:



Bottom view

Recommended land pattern



| PIN | FUNCTION         |
|-----|------------------|
| 1   | Tri-State (STBY) |
| 2   | GND/Case         |
| 3   | Output           |
| 4   | Vdd              |

**Note1:** Recommend using an approximately 0.01uF bypass capacitor between PIN 2 and 4.

Dimensions: inches (mm)

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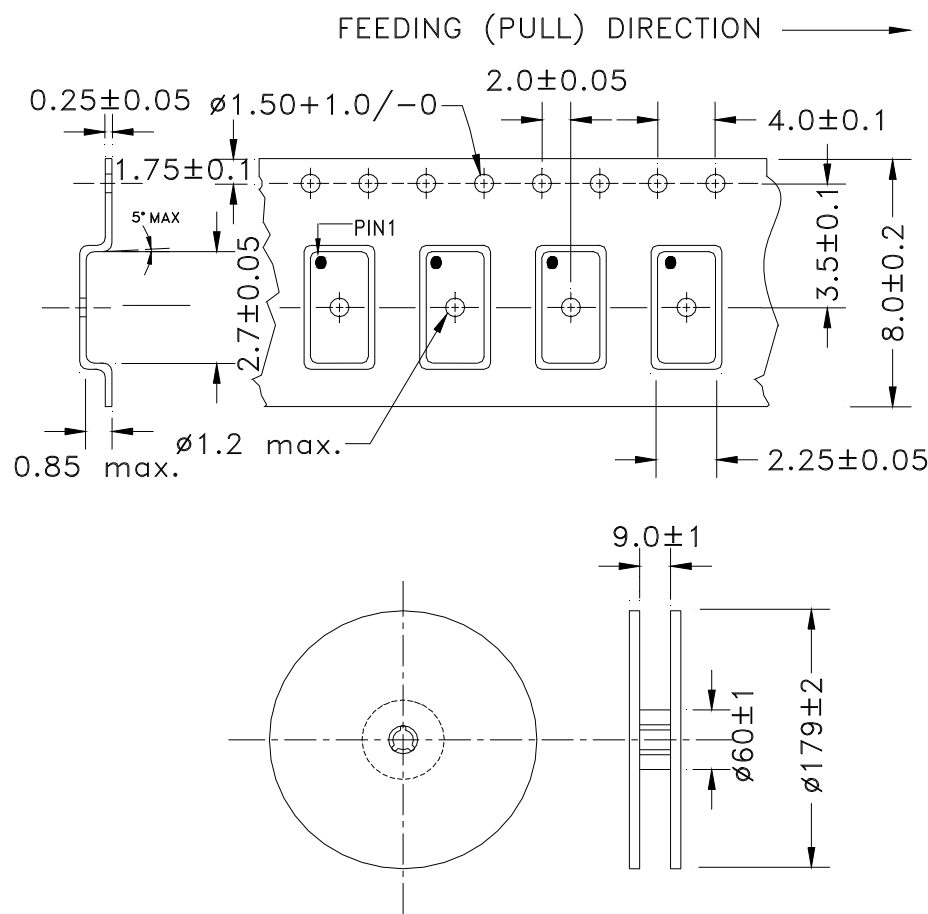
RoHS  
Compliant



2.5 X 2.0 X 0.8mm

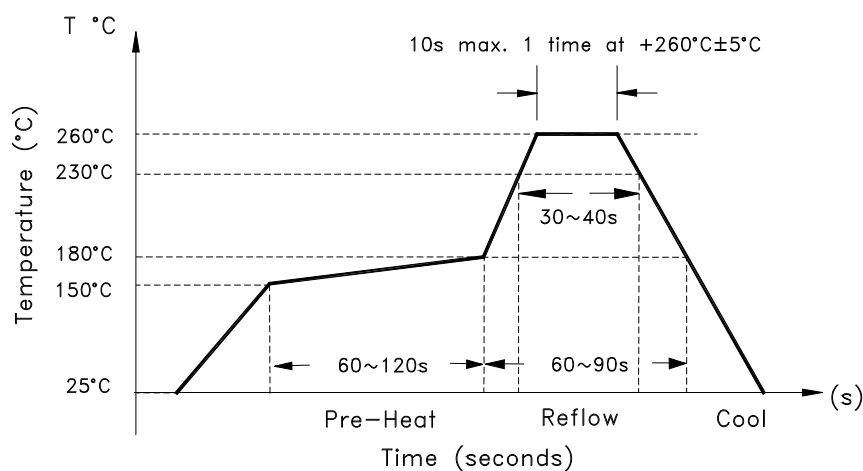
## TAPE & REEL:

T: 1000pcs/reel  
T2: 250pcs/reel  
T3: 3000pcs/reel



Dimensions: mm

## REFLOW PROFILE:



Need a test socket for the ASD Series? To view compatible **PRECISION TEST & BURN-IN SOCKETS** for these parts, [click here. P/N AXS-2520-04-01](#)

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