

# Ultra-Low Phase Jitter LVPECL SMD Clock Oscillator

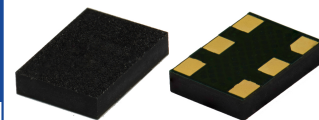
ASVMX-312.500MHz-3BBA



ESD Sensitive



RoHS/RoHS II compliant



7.0 x 5.0 x 1.4mm

Moisture Sensitivity Level – MSL 3

## FEATURES:

- 312.5MHz LVPECL
- Typical phase noise: 80fs (Integration range: 1.875MHz-20MHz)
- $\pm 50$ ppm total frequency stability over  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$  temperature range
- Industry standard 6-Pin 7 x 5mm LGA package

## APPLICATIONS:

- 10/40/400 Gigabit Ethernet
- Fibre Channel 10G/12G SERDES

## KEY ELECTRICAL SPECIFICATIONS

| Item                       | Minimum | Maximum | Unit               | Condition |
|----------------------------|---------|---------|--------------------|-----------|
| Supply Voltage             | -0.3    | +3.6    | V                  |           |
| Storage Temp.              | -55     | +125    | $^{\circ}\text{C}$ |           |
| Lead Temp.(soldering, 10s) |         | +260    | $^{\circ}\text{C}$ |           |
| ESD (HBM)                  |         | 2       | kV                 |           |

VDD = 2.375 - 3.63V, TA =  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$ , outputs terminated with 50 Ohms to VDD - 2.<sup>(1)</sup>

| Parameters                                      | Minimum                                 | Typical               | Maximum               | Units                | Notes                                 |
|---|---|-----------------------|-----------------------|----------------------|---------------------------------------|
| Frequency                                       | 312.500                                 |                       |                       | MHz                  |                                       |
| Operating Temperature (TA)                      | -40                                     |                       | +85                   | $^{\circ}\text{C}$   |                                       |
| Overall Frequency Stability <sup>(2)</sup>      | -50                                     |                       | +50                   | ppm                  |                                       |
| Supply Voltage (VDD)                            | +2.375                                  |                       | +3.63                 | V                    |                                       |
| Supply Current (IDD)                            |   |                       | 120                   | mA                   |                                       |
| Output Logic Level                              | V <sub>OH</sub>                         | V <sub>DD</sub> -1.35 | V <sub>DD</sub> -1.01 | V <sub>DD</sub> -0.8 | V                                     |
|   | V <sub>OL</sub>                         | V <sub>DD</sub> -2.0  | V <sub>DD</sub> -1.78 | V <sub>DD</sub> -1.6 | V                                     |
| Peak to Peak Output Swing (V <sub>swing</sub> ) | 0.65                                    | 0.77                  | 0.95                  | V                    | Single ended                          |
| Start-up Time                                   |   |                       | 20                    | ms                   |                                       |
| Rise Time (Tr)                                  | 85                                      |                       | 350                   | ps                   | RL=50 $\Omega$ , CL=0pF<br>20% to 80% |
| Fall Time (Tf)                                  | 85                                      |                       | 350                   |                      |                                       |
| Duty Cycle                                      | 45                                      |                       | 55                    | %                    |                                       |
| Phase Noise                                     | Integration Range:<br>12kHz to 20MHz    |                       | 175                   | fsRMS                |                                       |
|   | Integration Range:<br>1.875MHz to 20MHz |                       | 80                    |                      |                                       |

### Notes:

1. Guaranteed after thermal equilibrium
2. Inclusive of initial accuracy, temperature drift, aging, shock, vibration from  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$ .

## PART IDENTIFICATION

ASVMX-312.500MHz -3BBA -

### Packing

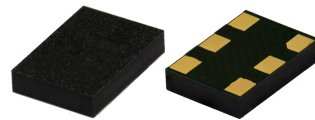
Blank: Bulk or Tube  
T: Tape & Reel (1k/reel)

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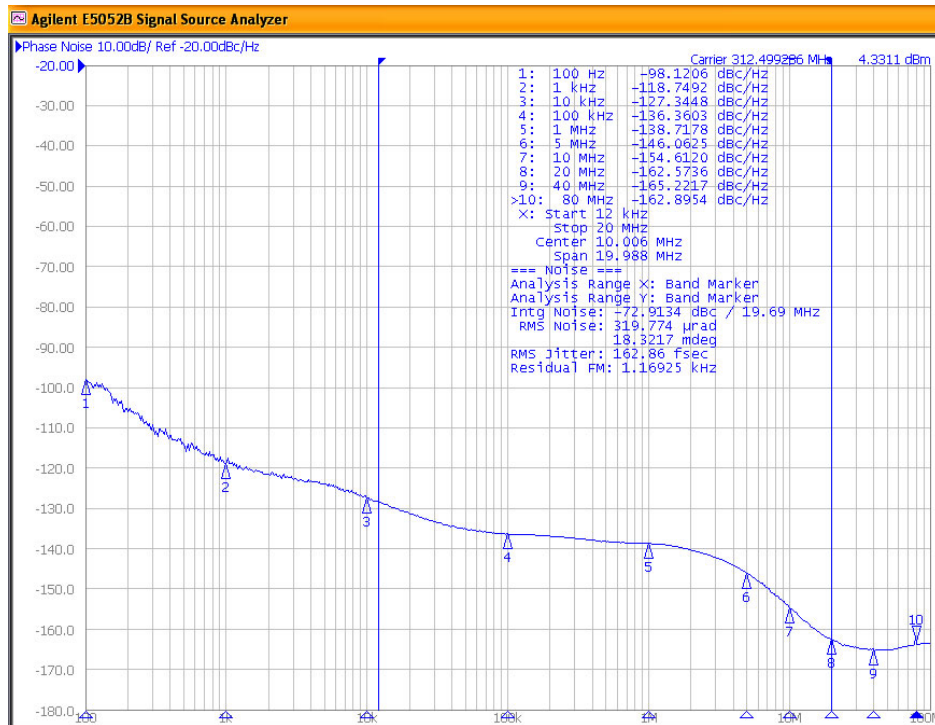
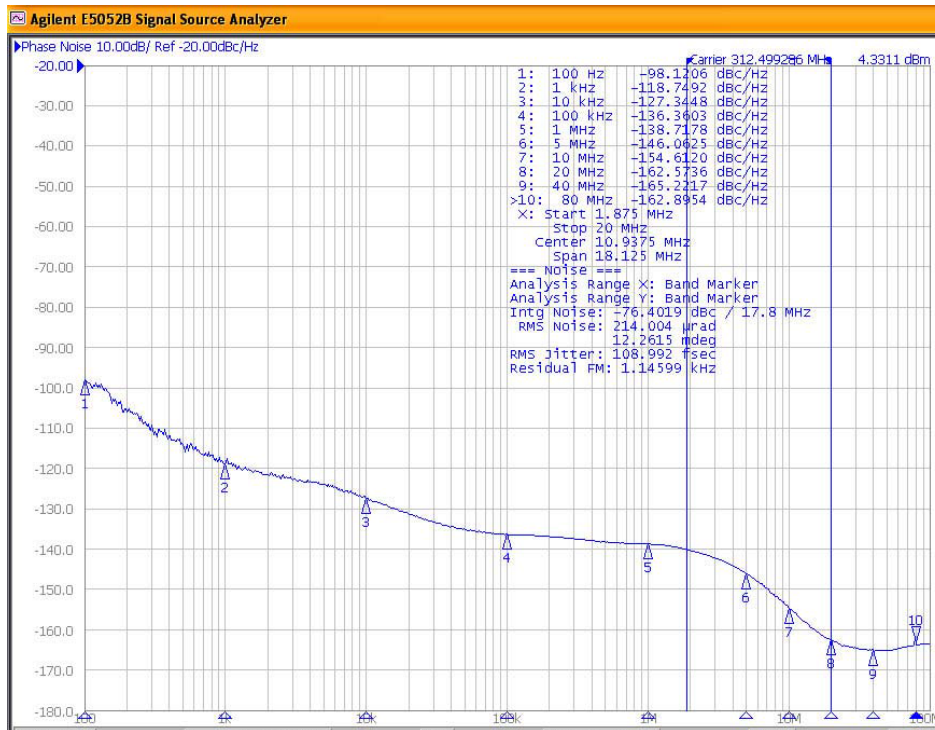


RoHS/RoHS II compliant



7.0 x 5.0 x 1.4mm

## TYPICAL PHASE NOISE

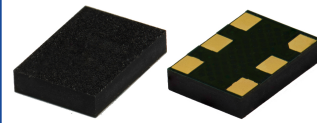


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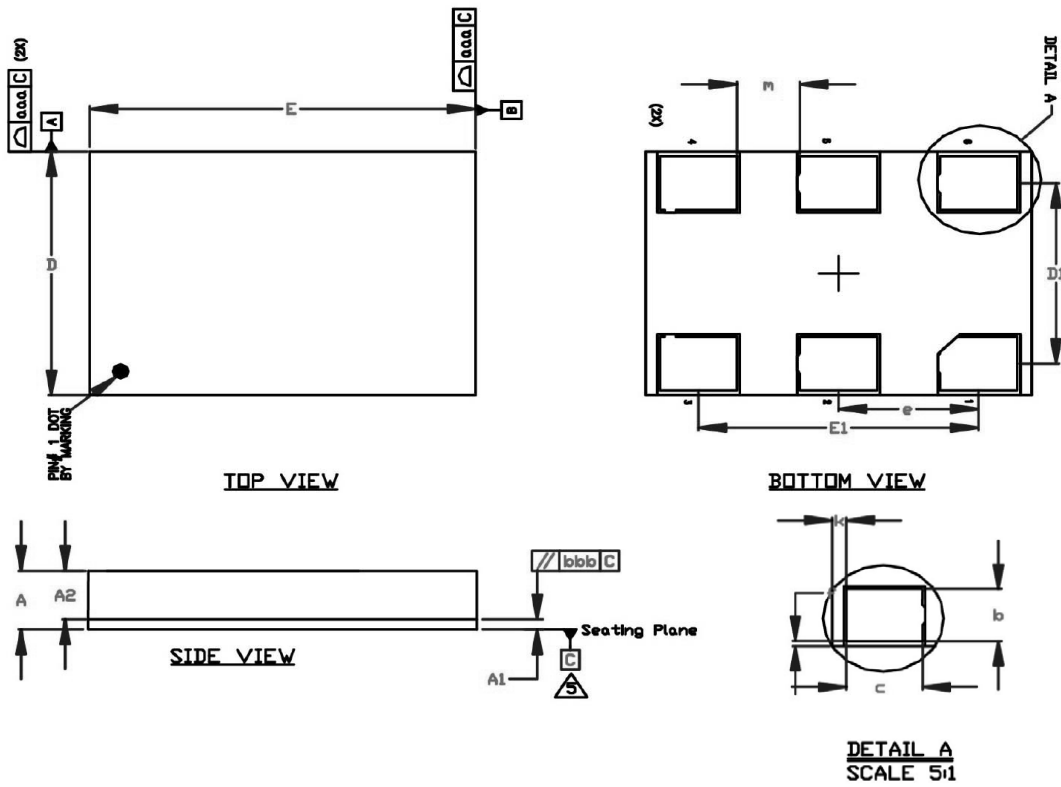


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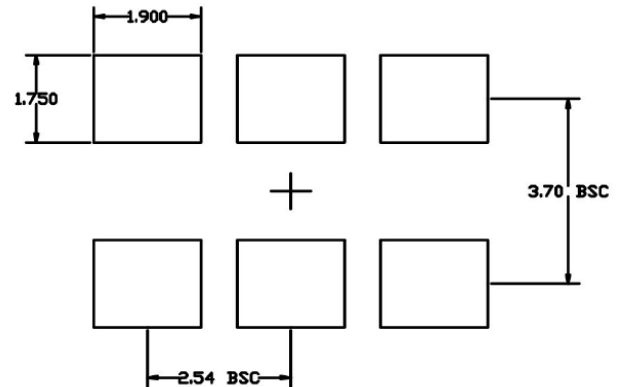
## OUTLINE DIMENSION



| Ref. | Min.      | Nom.  | Max.  |
|------|-----------|-------|-------|
| A    | 1.260     | 1.330 | 1.400 |
| A1   | 0.190     | 0.230 | 0.270 |
| A2   | 1.070     | 1.100 | 1.130 |
| D    | 4.900     | 5.000 | 5.100 |
| D1   | 3.700 BSC |       |       |
| E    | 6.900     | 7.000 | 7.100 |
| E1   | 5.080 BSC |       |       |
| b    | 1.050     | 1.100 | 1.150 |
| c    | 1.350     | 1.400 | 1.450 |
| e    | 2.540 BSC |       |       |
| f    | 0.050     | 0.100 | 0.150 |
| k    | 0.210     | 0.260 | 0.310 |
| m    | 1.090     | 1.140 | 1.190 |
| n    | 36        |       |       |

| Dimensional Tolerance |       |
|-----------------------|-------|
| aaa                   | 0.100 |
| bbb                   | 0.070 |

## Recommended Land Pattern



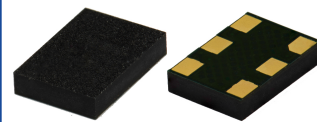
Dimensions: mm

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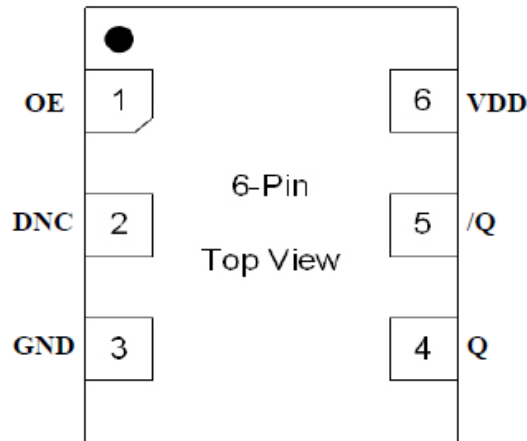


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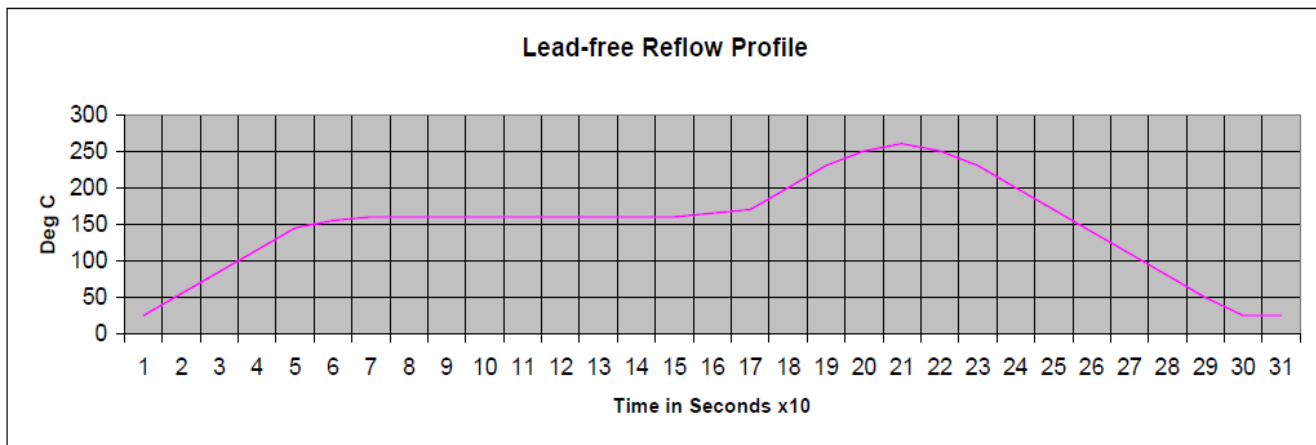
7.0 x 5.0 x 1.4mm

## PIN CONFIGURATION



| Pin # | Pin Name | Pin Type | Pin Level | Pin Function  |
|-------|----------|----------|-----------|---|
| 1     | OE       | I, SE    | LVC MOS   | Output Enable, disables output to tri-state. 0 = Disabled, 1= Enabled, 50k $\Omega$ Pull-up |
| 2     | DNC      |          |           | Make no connection, leave floating  |
| 3     | GND      | PWR      |           | Power Supply Ground   |
| 4     | Q        | O        | LVPECL    | Clock Output  |
| 5     | /Q       | O        | LVPECL    | Complimentary Clock Output  |
| 6     | VDD      | PWR      |           | Power Supply  |

## REFLOW PROFILE



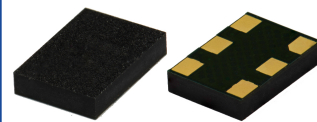
| Parameters                | Specifications     |
|---------------------------|--------------------|
| Average Ramp-up Rate      | 3°C /second max.   |
| Pre-Heat Temp 150 – 200°C | 60 – 180 second    |
| Temp > 217°C              | 60 – 150 second    |
| Time @ Peak Temperature   | 20 – 40 second     |
| Peak Temperature          | 260°C + 0°C / -5°C |
| Ramp-down Rate            | -6°C / second max. |
| Time 25°C to Peak Temp.   | 8 minutes max.     |

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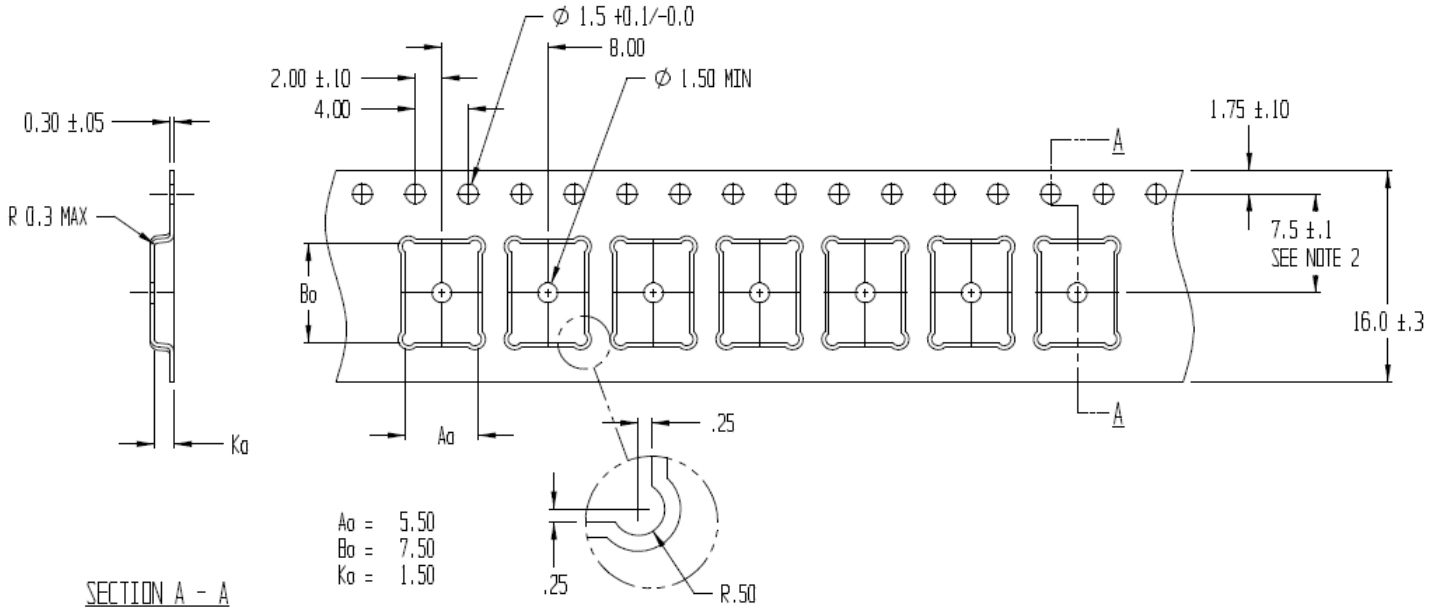


7.0 x 5.0 x 1.4mm

## TAPE & REEL

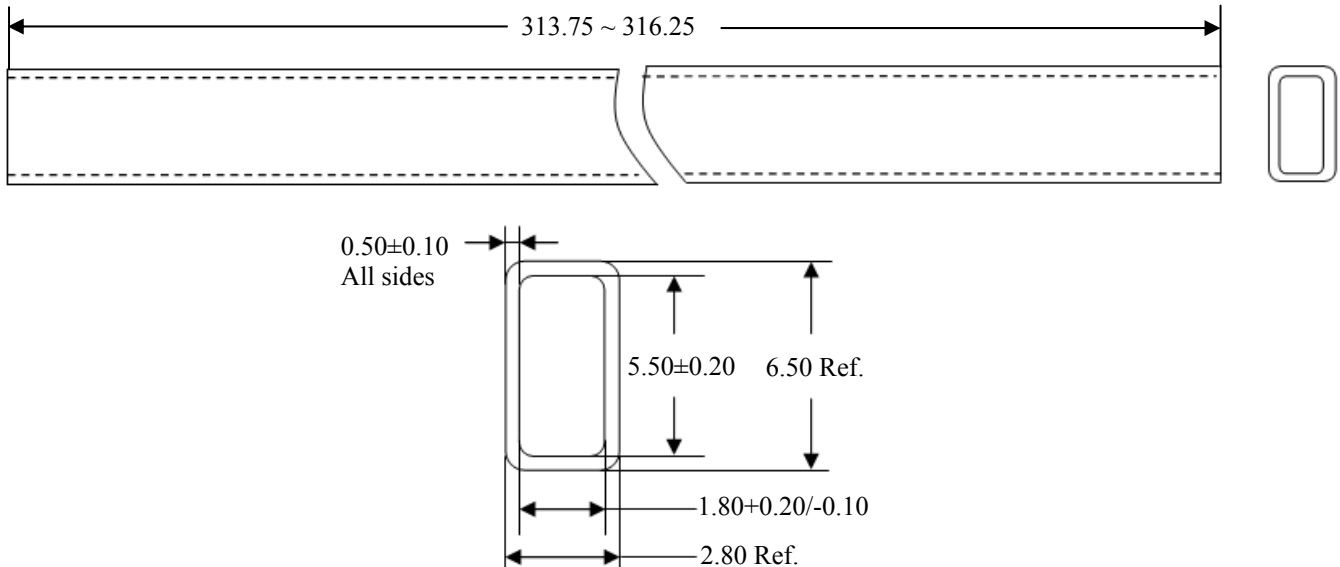
**T= Tape & Reel, 1000pcs/reel. Reel Size = 7-inch Reel**

**MSL-3 packaging applies to -T option.**



**Blank = Bulk or Tube (43pcs/tube)**

**MSL-3 packaging applies to MOQ=43 units (tube)**



**Dimensions: mm**

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