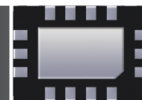


# LOW JITTER PIN CONFIGURABLE LVDS OUTPUT ULTRA MINIATURE PURE SILICON™ SMD CLOCK OSCILLATORS

ASEMCLV



3.2 x 2.5 x 0.85 mm

**ASEMCLV**



**RoHS**  
Compliant

## FEATURES:

- Ultra Miniature Pure Silicon™ Clock Oscillator
- Pin Configurable LVDS output
- Low Jitter (Period Jitter RMS 2.5ps typical)
- Low Integrated Phase Jitter 2ps max
- Tight Stability +/-10ppm -40 to +85C
- Excellent Shock & Vibration Immunity

## APPLICATIONS:

- Consumer Electronics
- Storage Area Networks
- SATA, SAS, Fibre Channel
- Passive Optical Networks
- EPON, 10G-EPON, GPON, 10G-PON
- Ethernet
- 1G, 10GBASE-T/KR/LR/SR, and FCoE
- PCI Express

Low Jitter  
Pin Configurable  
CMOS Output  
3G MEMS

## STANDARD SPECIFICATIONS:

### Pre-programmed Output Frequency Configuration

| Ordering Info                    | Freq (MHz)       | Freq Select Bits [FS1, FS0] – Default is [11] |          |       |              |
|----------------------------------|------------------|-----------------------------------------------|----------|-------|--------------|
|                                  |                  | 00                                            | 01       | 10    | 11           |
| Standard Frequency Configuration | f <sub>OUT</sub> | 148.35165                                     | 74.17582 | 148.5 | <b>74.25</b> |
| Custom Configuration             | f <sub>OUT</sub> | Contact Abracon for customized configurations |          |       |              |

Frequency select bits [FS1, FS0] are weakly tied high so if left **floated**, the default setting will be [11] and the device will output the associated frequency highlighted in **Bold**. If other frequency combinations are required, please contact Abracon for customized configuration. Please see the configurable frequency range in the section 2.0

## Key Electrical Specifications

| Parameters                           | Minimum                                                              | Typical | Maximum | Units | Notes                             |
|--------------------------------------|----------------------------------------------------------------------|---------|---------|-------|-----------------------------------|
| Configurable frequency range         | 10                                                                   | -----   | 460     | MHz   | Commercial, Industrial temp range |
| Operating Temperature                | -20                                                                  | -----   | +70     | °C    | See options                       |
| Storage Temperature                  | -55                                                                  | -----   | +150    | °C    |                                   |
| Overall Frequency Stability*1        | -50                                                                  | -----   | +50     | ppm   | See options                       |
| Supply Voltage (Vdd)                 | +2.25                                                                | -----   | +3.6    | V     |                                   |
| Startup Time                         | -----                                                                | -----   | 5       | ms    | T=25°C                            |
| Enable Time                          | -----                                                                | -----   | 20      | ns    |                                   |
| Disable Time                         | -----                                                                | -----   | 5       | ns    |                                   |
| Disable Current                      | -----                                                                | 21      | 23      | mA    |                                   |
| Tri-state Function (Standby/Disable) | "1" (VIH≥0.75*Vdd) or Open: Oscillation<br>"0" (VIL<0.25*Vdd) : Hi Z |         |         | V     | 40kΩ pull-up resistor embedded    |
| Aging                                | -5.0                                                                 | -----   | +5.0    | ppm   | First year                        |
| Supply Current (I <sub>dd</sub> )    | -----                                                                | 29      | 32      | mA    | RL=100Ω, 156.25MHz                |
| Output Offset Voltage                | 1.125                                                                | -----   | 1.40    | V     | RL=100Ω Differential              |
| Delta Offset Voltage                 | -----                                                                | -----   | 50      | mV    |                                   |
| Peak to Peak Output Swing            |                                                                      | 350     |         | mV    | Single Ended                      |
| Rise Time                            | Tr                                                                   | -----   | 200     | ps    | RL=100Ω, CL=2pF<br>20%/80%*VDD    |
| Fall Time                            | Tf                                                                   | -----   | 200     | ps    |                                   |
| Duty Cycle                           |                                                                      | 48      | 52      | %     | Differential                      |

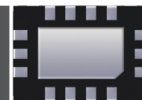
\*1. Frequency stability includes frequency variations due to initial tolerance, temp. and power supply voltage

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### Key Electrical Specifications (continued)

| Parameters                           | Minimum | Typical | Maximum | Units | Notes                        |
|--------------------------------------|---------|---------|---------|-------|------------------------------|
| Period Jitter RMS ( $J_{PER}$ )      | -----   | 2.5     | -----   | ps    | F0= 156.25MHz                |
| Integrated Phase Jitter ( $J_{PH}$ ) | -----   | 0.28    | 2       | ps    | 200kHz ~ 20MHz,<br>156.25MHz |
|                                      | -----   | 0.40    | 2       |       | 100kHz ~ 20MHz,<br>156.25MHz |
|                                      | -----   | 1.70    | 2       |       | 12kHz ~ 20MHz,<br>156.25MHz  |

### ➤ ABSOLUTE MAXIMUM RATINGS:

| Item            | Minimum | Maximum      | Unit | Condition |
|-----------------|---------|--------------|------|-----------|
| Supply Voltage  | -0.3    | +4.0         | V    |           |
| Input Voltage   | -0.3    | $V_{DD}+0.3$ | V    |           |
| Junction Temp.  | -----   | +150         | °C   |           |
| Storage Temp.   | -55     | +150         | °C   |           |
| Soldering Temp. | -----   | +260         | °C   | 40sec max |
| ESD             |         |              | V    |           |
| HBM             |         | 4,000        |      |           |
| MM              |         | 400          |      |           |
| CDM             |         | 1,500        |      |           |

### ➤ OPTIONS AND PART IDENTIFICATION:

(left blank if standard)

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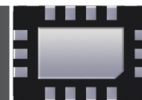
| Operating Temp.      | Overall Freq. Stability | Packaging            |
|----------------------|-------------------------|----------------------|
| Blank: -20°C ~ +70°C | Blank: ±50ppm           | Blank: 110pcs / Tube |
| L: -40°C ~ +85°C     | R: ±25 ppm              | T: 1,000pcs / reel   |
|                      | Y: ±10ppm*              | T3: 3,000pcs / reel  |
|                      |                         | T5: 5,000pcs / reel  |

| Ordering Info                    | Freq (MHz) | Freq Select Bits [FS1, FS0] – Default is [11] |          |       |       |
|----------------------------------|------------|-----------------------------------------------|----------|-------|-------|
|                                  |            | 00                                            | 01       | 10    | 11    |
| Standard Frequency Configuration | $f_{OUT}$  | 148.35165                                     | 74.17582 | 148.5 | 74.25 |
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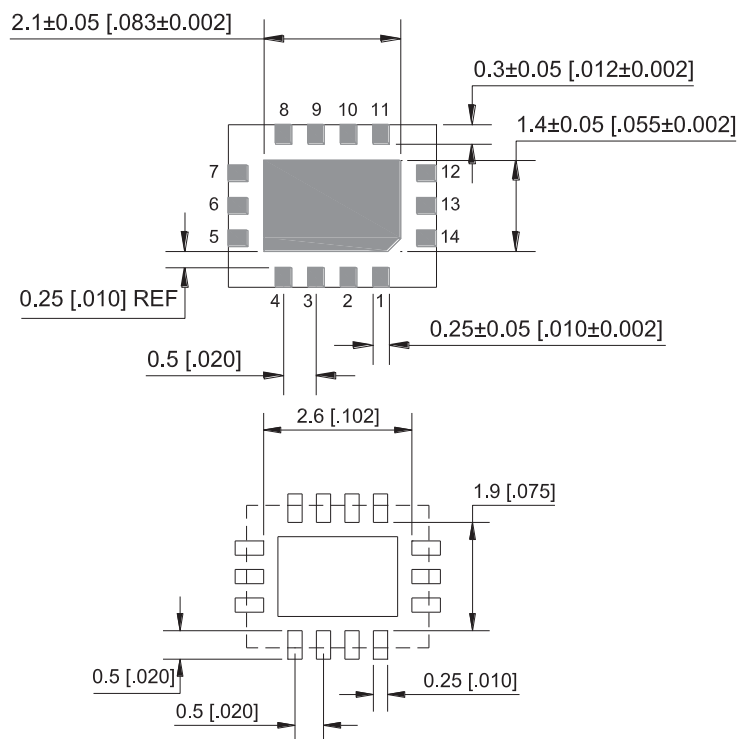
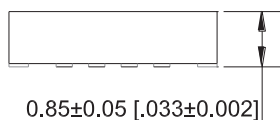
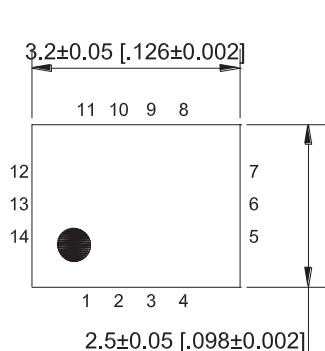
Default condition: Frequency select bits [FS1, FS0] are all left floated. FS1, FS0 are pulled high [11]

Frequency combination and default frequency is customized upon request. Please contact Abracon for the frequency combinations.





## MECHANICAL DIMENSIONS



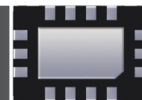
Recommended Land Pattern

| Pin No. | Pin Name | Pin Type | Description                                     |
|---------|----------|----------|-------------------------------------------------|
| 1       | Enable   | I        | Enables outputs when high and disables when low |
| 2       | NC       | NA       | Leave unconnected or grounded                   |
| 3       | NC       | NA       | Leave unconnected or grounded                   |
| 4       | GND      | Power    | Ground                                          |
| 5       | FS0      | I        | Least significant bit for frequency selection   |
| 6       | FS1      | I        | Most significant bit for frequency selection    |
| 7       | NC       | NA       | Leave unconnected or grounded                   |
| 8       | Output+  | O        | Positive LVDS Output                            |
| 9       | Output-  | O        | Negative LVDS Output                            |
| 10      | NC       | NA       | Leave unconnected or grounded                   |
| 11      | NC       | NA       | Leave unconnected or grounded                   |
| 12      | VDD2     | Power    | Power Supply                                    |
| 13      | VDD      | Power    | Power Supply                                    |
| 14      | NC       | NA       | Leave unconnected or grounded                   |

Dimensions: mm (inches)

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ASEMCLP



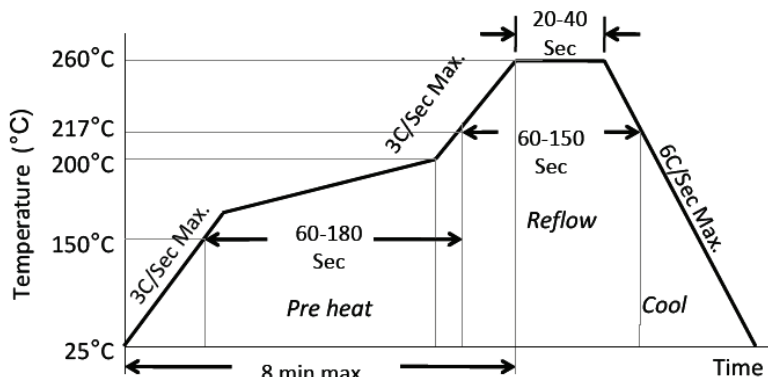
3.2 x 2.5 x 0.85 mm

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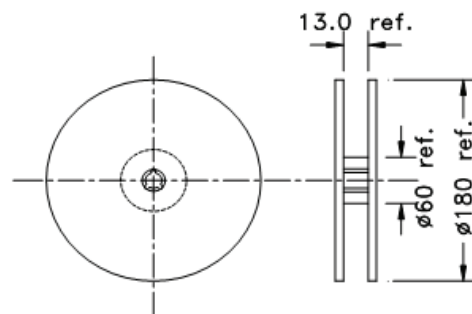
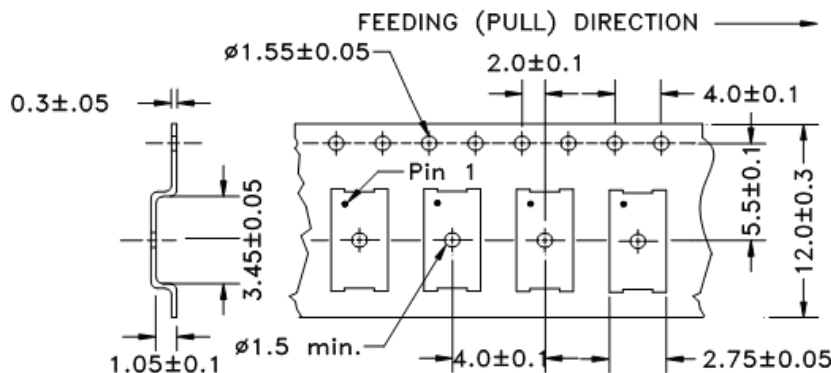
## REFLOW PROFILE



|                                   |              |
|-----------------------------------|--------------|
| Ramp-Up Rate (200°C to Peak Temp) | 3°C/Sec Max. |
| Preheat Time 150°C to 200°C       | 60-180 Sec   |
| Time maintained above 217°C       | 60-150 Sec   |
| Peak Temperature                  | 255-260°C    |
| Time within 5°C of actual Peak    | 20-40 Sec    |
| Ramp-Down Rate                    | 6°C/Sec Max. |
| Time 25°C to Peak Temperature     | 8 min Max.   |

## TAPE & REEL:

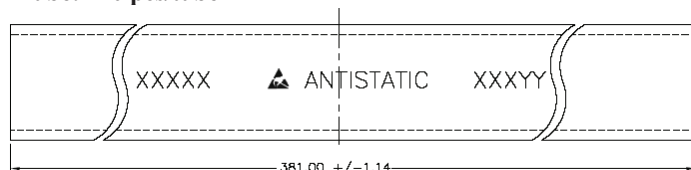
T= 1,000pcs/reel (D=180mm)  
T3= 3,000pcs/reel (D=180mm)  
T5= 5,000pcs/reel (D=330mm)



Unit orientation in tube:



Tube: 110 pcs/tube



Dimensions: mm

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