

**ECN/PCN No.: 4118**

| For Manufacturer   |   |  |  |
|--|---|--|--|
| <b>Product Description:</b><br>PLASTIC SMD MEMS OSCILLATOR   | <b>Abracon Part Number / Part Series:</b><br>ASTMUPLD   | <input type="checkbox"/> Documentation only<br><input type="checkbox"/> ECN<br><input checked="" type="checkbox"/> EOL | <input checked="" type="checkbox"/> Series<br><input type="checkbox"/> Part Number |
| <b>Affected Revision:</b><br>I.R.  | <b>New Revision:</b><br>EOL   | <b>Application:</b>  | <input type="checkbox"/> Safety<br><input checked="" type="checkbox"/> Non-Safety  |
| <b>Prior to Change:</b><br>Active<br><a href="https://abracon.com/Oscillators/ASTMUPLD.pdf">https://abracon.com/Oscillators/ASTMUPLD.pdf</a>   |   |  |  |
| <b>After Change:</b><br>EOL  |   |  |  |
| <b>Cause/Reason for Change:</b><br>Discontinuation of manufacturing capability.  |   |  |  |
| Change Plan  |   |  |  |
| <b>Effective Date:</b><br>2/7/2022   | <b>Additional Remarks:</b><br>N/A   |  |  |
| <b>Change Declaration:</b><br>N/A  |   |  |  |
| <b>Issued Date:</b><br>2/7/2022  | <b>Issued By:</b>   | <b>Issued Department:</b>  |  |
| <b>Approval:</b>   | <b>Approval:</b>  | <b>Approval:</b>   |  |
| For Abracon EOL only   |   |  |  |
| <b>Last Time Buy (if applicable):</b><br>5/7/2022  | <b>Alternate Part Number / Part Series:</b><br>ASEDV (3.2x2.5mm), ASFLDV (5.0x3.2mm), ASVDV (7.0x5.0mm) |  |  |
| <b>Additional Approval:</b>  | <b>Additional Approval:</b>   | <b>Additional Approval:</b>  |  |
| Customer Approval (If Applicable)  |   |  |  |
| <b>Qualification Status:</b><br><input type="checkbox"/> Approved <input type="checkbox"/> Not accepted<br><i>Note: It is considered approved if there is no feedback from the customer 1 month after ECN/PCN is released.</i> |   |  |  |
| <b>Customer Part Number:</b>   |   | <b>Customer Project:</b>   |  |
| <b>Company Name:</b>   | <b>Company Representative:</b>  | <b>Representative Signature:</b>   |  |
| <b>Customer Remarks:</b>   |   |  |  |

# High Performance, Programmable LVDS SMD MEMS Oscillator



3.2 x 2.5 x 0.75mm;  
5.0 x 3.2 x 0.75mm;  
7.0 x 5.0 x 0.9mm

ASTMUPLD



RoHS/RoHS II compliant

Moisture Sensitivity Level (MSL) – 1

## FEATURES:

- Industry Standard package sizes: 3.2 x 2.5 x 0.75mm, 5.0 x 3.2 x 0.75mm, 7.0 x 5.0 x 0.9mm
- Any frequency between 1MHz and 625MHz
- Supply Voltage options: 3.3V, 2.8V, 2.25V~3.63V
- Ultra-low RMS phase jitter: 0.6ps typ. (@156.25MHz, integration bandwidth: 12kHz to 20MHz)
- Frequency Stability options: ±10ppm, ±20ppm, ±25ppm, ±50ppm over -20 to +70°C and -40 to +85°C

## APPLICATIONS:

- 10GB Ethernet, SONET, SATA, SAS, Fiber Channel, PCI Express
- Storage
- Servers
- Networking
- Telecom
- Instrumentation
- Harsh environment (vibration, shock-prone and humid)

## STANDARD SPECIFICATIONS:

| Parameters  |                      | Min                 | Typ | Max                 | Unit | Notes  |
|---|----------------------|---------------------|-----|---------------------|------|--|
| Output Frequency Range (F)                          |                      | 1                   |     | 625                 | MHz  | See Note 1 for Frequencies not supported   |
| Frequency Stability (F <sub>stab</sub> )            |                      | -10                 |     | +10                 | ppm  | Inclusive of initial tolerance at 25°C, and variations over operating temperature, rated power supply voltage and load |
|   |                      | -20                 |     | +20                 |      |  |
|   |                      | -25                 |     | +25                 |      |  |
|   |                      | -50                 |     | +50                 |      |  |
| Operating Temperature Range (T <sub>use</sub> )     |                      | -20                 |     | +70                 | °C   | Option "E"   |
|   |                      | -40                 |     | +85                 |      | Option "L"   |
| Aging@25°C  | 1 <sup>st</sup> year | -2                  |     | +2                  | ppm  |  |
|   | 10 years             | -5                  |     | +5                  |      |  |
| Supply Voltage (V <sub>dd</sub> )                   |                      | 2.25                | 2.5 | 2.75                | V    | Option "25"  |
|   |                      | 2.97                | 3.3 | 3.63                |      | Option "33"  |
|   |                      | 2.25                | -   | 3.63                |      | Option "Blank" (default)   |
| Input High Voltage (V <sub>IH</sub> )               |                      | 70%*V <sub>dd</sub> |     |                     | V    | Pin 1  |
| Input Low Voltage (V <sub>IL</sub> )                |                      |                     |     | 30%*V <sub>dd</sub> | V    | Pin 1  |
| Input Pull-up Impedance (Z <sub>in</sub> )          |                      | 100                 |     | 250                 | kΩ   | Pin 1, OE logic high or logic low, $\overline{ST}$ logic high  |
|   |                      | 2                   |     |                     | MΩ   | Pin 1, $\overline{ST}$ logic low   |
| Startup Time (T <sub>start</sub> )                  |                      |                     | 6   | 10                  | ms   | Measured from the time V <sub>dd</sub> reaches its rated minimum value   |
| Resume Time (T <sub>resume</sub> )                  |                      |                     | 6   | 10                  | ms   | In standby mode. Measured from the time $\overline{ST}$ pin crosses 50% threshold                                      |
| Duty Cycle  |                      | 45                  |     | 55                  | %    |  |
| Output Type   |                      | LVDS                |     |                     |      |  |
| Current Consumption (I <sub>dd</sub> )              |                      |                     | 47  | 55                  | mA   | Excluding load termination current, V <sub>dd</sub> =2.5V or 3.3V  |
| OE Disable Current (I <sub>OD</sub> )               |                      |                     |     | 35                  | mA   | OE=Low   |
| Output Disable Leakage Current (I <sub>leak</sub> ) |                      |                     |     | 1                   | μA   | OE=Low   |
| Standby Current (I <sub>std</sub> )                 |                      |                     |     | 100                 | μA   | $\overline{ST}$ =Low, for all V <sub>dd</sub>  |

Note: 1. Frequencies not supported:

Range 1: From 209.000001MHz to 210.999999MHz

Range 2: From 251.000001MHz to 263.999999MHz

Range 3: From 314.000001MHz to 422.999999MHz

Range 4: From 502.000001MHz to 527.999999MHz



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REVISED: 12/14/2018

ABRACON IS  
ISO9001:2015  
CERTIFIED

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5.0 x 3.2 x 0.75mm;  
7.0 x 5.0 x 0.9mm

ASTMUPLD



RoHS/RoHS II compliant

(Continued)

| Parameters                                    | Min   | Typ | Max   | Unit | Notes  |
|---|-------|-----|-------|------|--|
| Differential Output Voltage ( $V_{OD}$ )      | 250   | 350 | 450   | mV   |  |
| $V_{OD}$ Magnitude Change ( $\Delta V_{OD}$ ) |       |     | 50    | mV   |  |
| Offset Voltage ( $V_{OS}$ )                   | 1.125 | 1.2 | 1.375 | V    |  |
| $V_{OS}$ Magnitude Change ( $\Delta V_{OS}$ ) |       |     | 50    | mV   |  |
| Rise/Fall Time ( $T_r/T_f$ )                  |       | 495 | 700   | ps   | 20%-80%, Freq. = 1MHz~220MHz                                       |
|   |       | 495 | 600   |      | 20%-80%, Freq. = 220MHz~625MHz                                     |
| OE Enable/Disable Time ( $T_{oe}$ )           |       |     | 115   | ns   | F=212.5MHz, 220MHz. For other frequencies, $T_{oe}=100ns+3*cycles$ |
| RMS Period Jitter ( $T_{jit}$ )               |       | 1.2 | 1.7   | ps   | F=100MHz, 156.25MHz, 212.5MHz, 622.08MHz, $V_{dd}=2.5V$ or 3.3V    |
|   |       | 1.4 | 1.7   |      | F=266MHz, 312.5MHz, $V_{dd}=2.5V$ or 3.3V                          |
| RMS Phase Jitter (random) ( $T_{phj}$ )       |       | 0.6 | 0.85  | ps   | F=156.25MHz, 312.5MHz, integration bandwidth=12kHz to 20MHz        |

## Standard Frequencies

| Standard Frequency (MHz) |            |            |            |            |            |            |            |
|--------------------------|------------|------------|------------|------------|------------|------------|------------|
| 25.000000                | 50.000000  | 74.175824  | 74.250000  | 75.000000  | 98.304000  | 100.000000 | 106.250000 |
| 125.000000               | 133.000000 | 133.300000 | 133.330000 | 133.333000 | 133.333300 | 133.333330 | 133.333333 |
| 148.351648               | 148.500000 | 150.000000 | 155.520000 | 156.250000 | 161.132800 | 166.000000 | 166.600000 |
| 166.660000               | 166.666000 | 166.666600 | 166.666660 | 166.666666 | 200.000000 | 212.500000 |            |

## Absolute Maximum Ratings

Attempted operation outside the absolute maximum ratings may cause permanent damage to the part. Actual performance of the IC is only guaranteed within the operational specifications, not at absolute maximum ratings.

| Parameters  | Min. | Max. | Unit |
|---|------|------|------|
| Storage Temperature   | -65  | 150  | °C   |
| $V_{DD}$  | -0.5 | 4    | V    |
| Electrostatic Discharge (HBM)   |      | 2000 | V    |
| Soldering Temperature<br>(follow standard Pb free soldering guidelines) |      | 260  | °C   |

## Thermal Consideration

| Package            | $\theta_{JA}$ , 4 Layer Board<br>(°C/W) | $\theta_{JC}$ , Bottom<br>(°C/W) |
|--------------------|---|----------------------------------|
| 7.0 x 5.0mm, 6-pin | 142                                     | 27                               |
| 5.0 x 3.2mm, 6-pin | 97                                      | 20                               |
| 3.2 x 2.5mm, 6-pin | 109                                     | 20                               |

# High Performance, Programmable LVDS SMD MEMS Oscillator



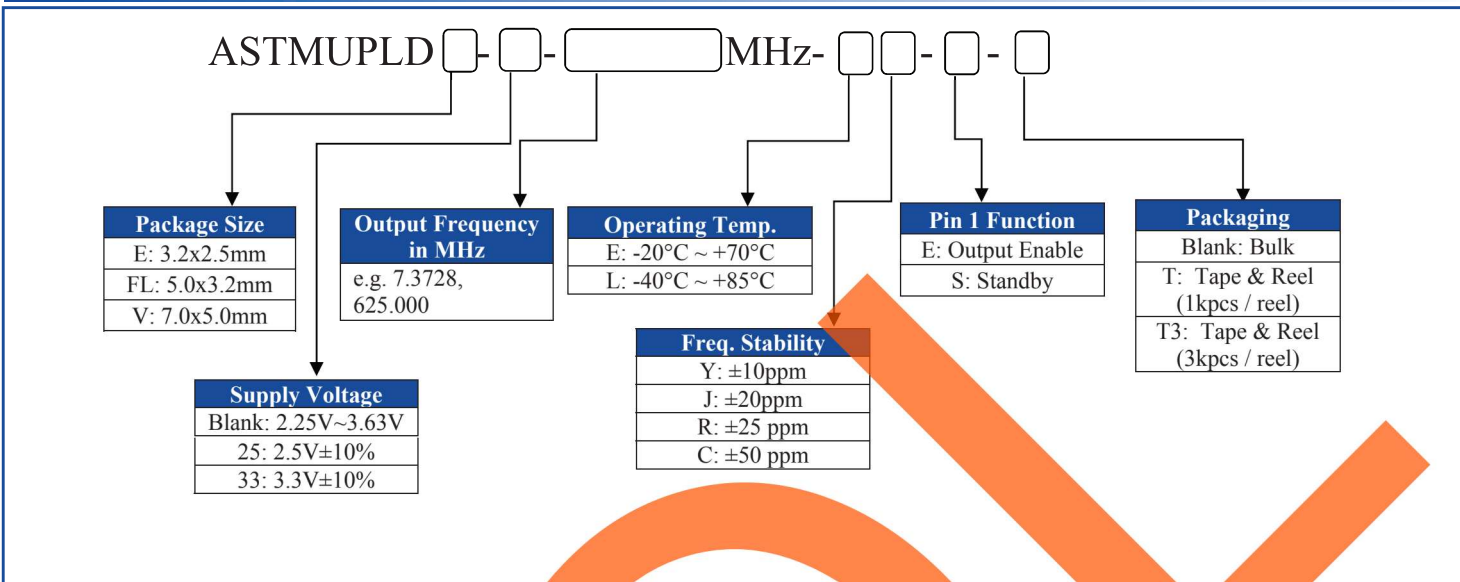
3.2 x 2.5 x 0.75mm;  
5.0 x 3.2 x 0.75mm;  
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ASTMUPLD

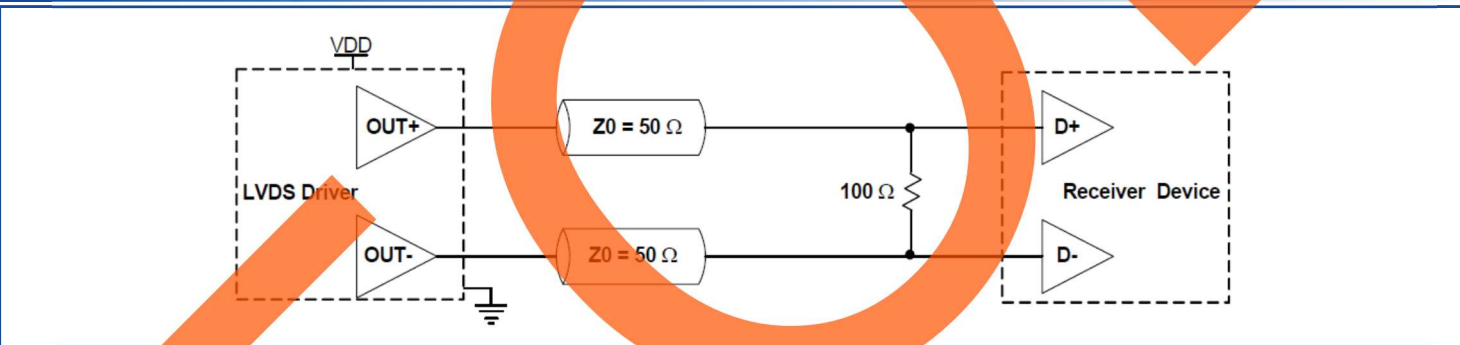


RoHS/RoHS II compliant

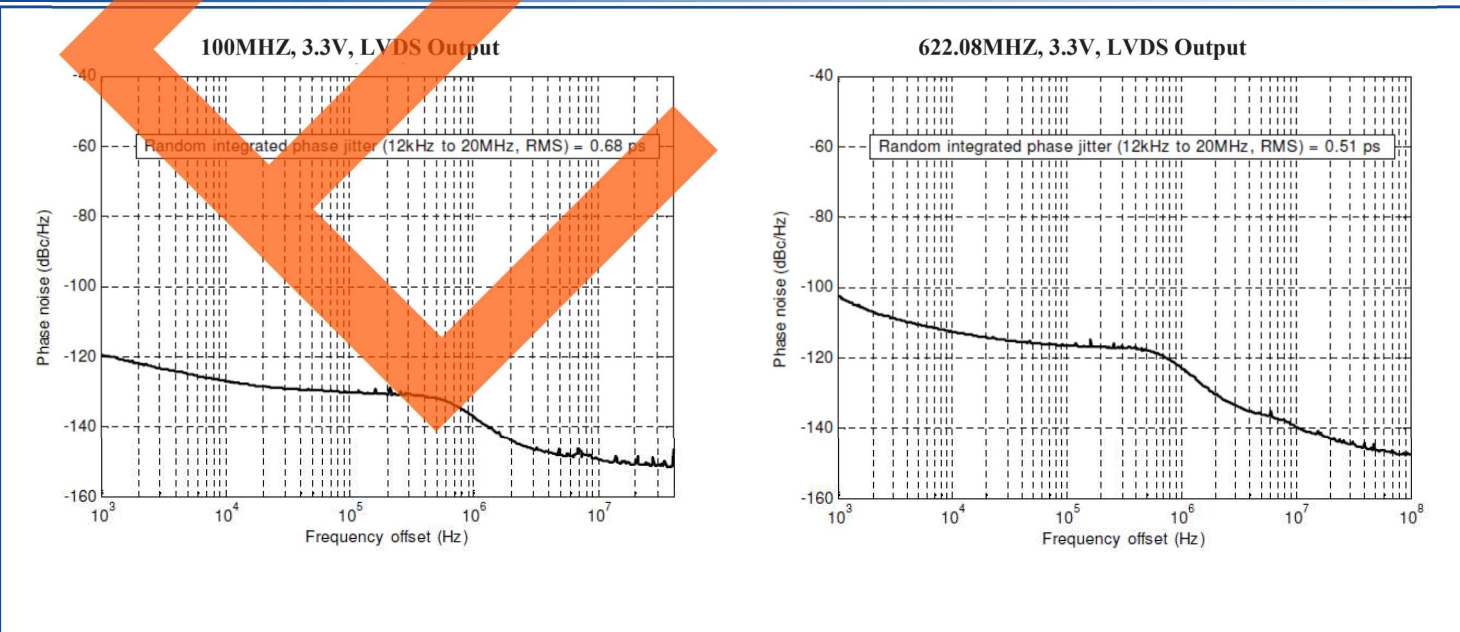
## PART IDENTIFICATION:



## RECOMMENDED TERMINATION DIAGRAM



## TYPICAL PHASE NOISE



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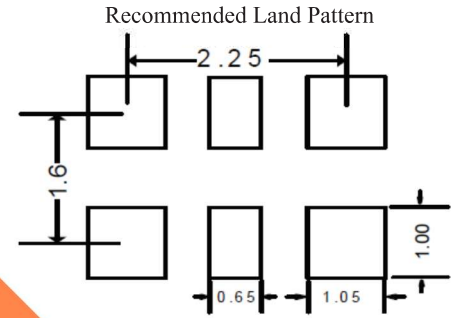
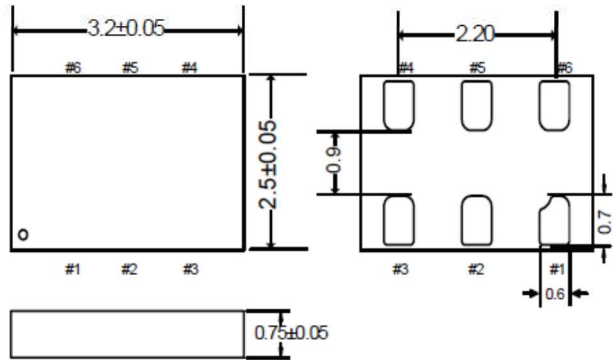
ASTMUPLD



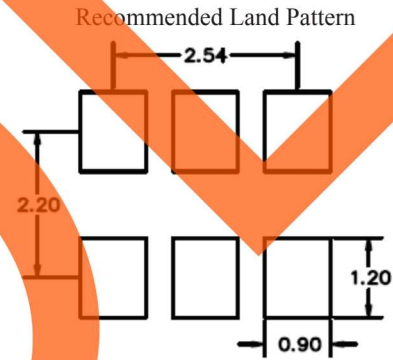
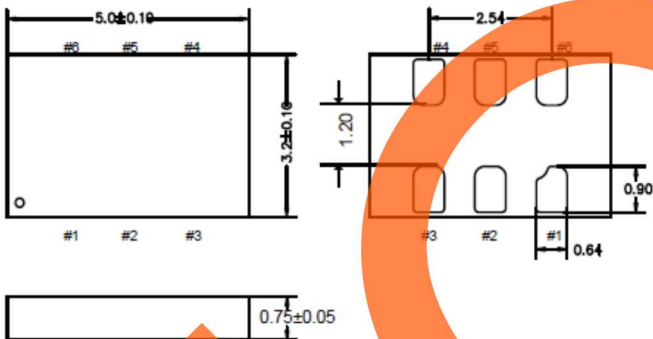
RoHS/RoHS II compliant

## OUTLINE DIMENSION:

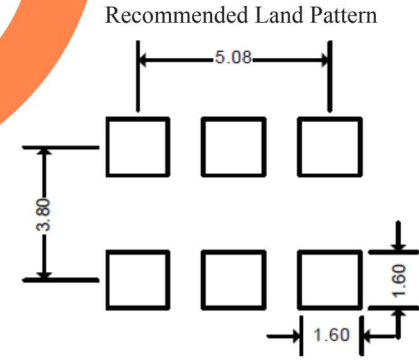
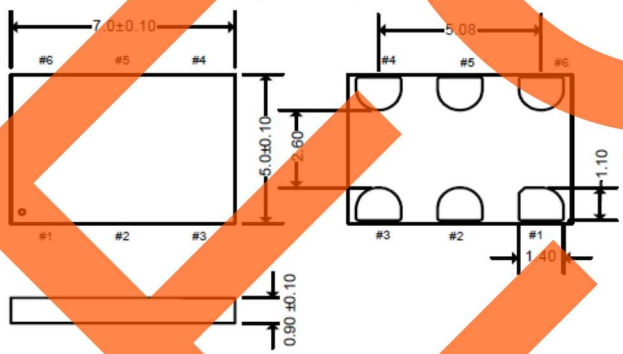
### 3.2 x 2.5mm Package (Option "E")



### 5.0 x 3.2mm Package (Option "FL")



### 7.0 x 5.0mm Package (Option "V")



Dimensions: mm

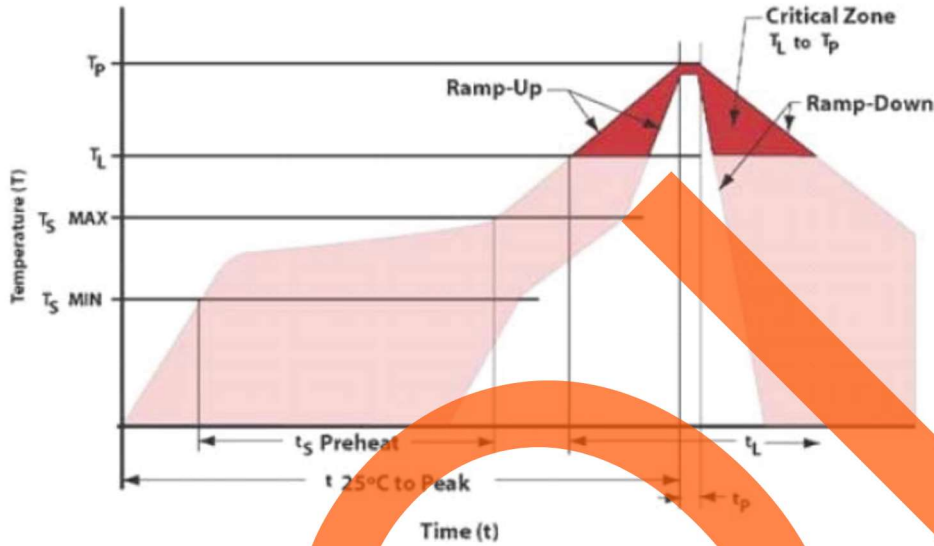
| Pin | Name          | Functionality  |
|-----|---------------|--|
| 1   | Output Enable | H or Open: specified frequency output<br>L: output is high impedance. Only output driver is disabled   |
|     | Standby       | H or Open: specified frequency output<br>L: output is low (weak pull down). Device goes to sleep mode. Supply current reduces to $I_{std}$ . |
| 2   | NC            | No Connect<br>Leave it floating or connect to GND for better heat dissipation  |
| 3   | GND           | Power<br>$V_{dd}$ power supply ground <sup>(1)</sup>   |
| 4   | Out+          | Output<br>Oscillator output  |
| 5   | Out-          | Output<br>Complementary oscillator output  |
| 6   | $V_{dd}$      | Power<br>Power supply voltage <sup>(1)</sup>   |

Notes: 1. A capacitor value of 0.1µF between  $V_{dd}$  and GND is recommended.



3.2 x 2.5 x 0.75mm;  
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## REFLOW PROFILE:



| Item  | Conditions       |
|---|------------------|
| $T_S$ MAX to $T_L$ (Ramp-up Rate)           | 3°C/second max   |
| Preheat                                     |                  |
| Temperature Minimum ( $T_S$ MIN)            | 150°C            |
| Temperature Typical ( $T_S$ TYP)            | 175°C            |
| Temperature Maximum ( $T_S$ 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 ( $T_L$ ) | 217°C            |
| Time ( $t_L$ )                              | 60 – 150 seconds |
| Peak Temperature ( $T_p$ )                  | 260°C max        |
| Target Peak Temperature ( $T_p$ Target)     | 255°C            |
| Time within 5°C of actual peak ( $t_p$ )    | 20 – 40 seconds  |
| Max. Number of Reflow Cycles                | 3                |
| Ramp-down Rate                              | 6°C/second max   |
| Time 25°C to Peak Temperature (t)           | 8 minutes max    |

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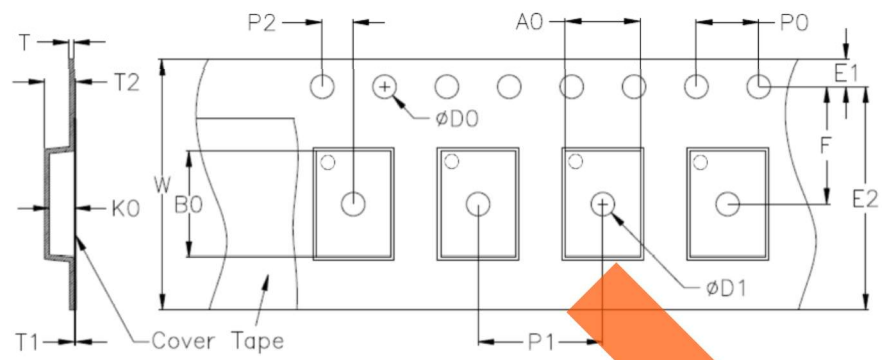


3.2 x 2.5 x 0.75mm;  
5.0 x 3.2 x 0.75mm;  
7.0 x 5.0 x 0.9mm

ASTMUPLD

**Pb** | RoHS/RoHS II compliant

## TAPE & REEL:

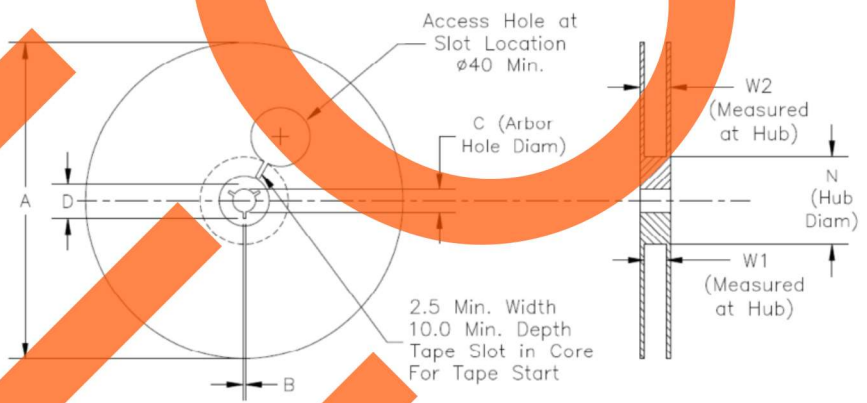


Unit: mm

| Device Size | D0           | D1 min. | E1       | E2 min. | F        | P0      | P1      | P2       |
|-------------|--------------|---------|----------|---------|----------|---------|---------|----------|
| 3225        | 1.5+0.1/-0.0 | 1.5     | 1.75±0.1 | 10.25   | 5.5±0.05 | 4.0±0.1 | 4.0±0.1 | 2.0±0.05 |
| 5032        | 1.5+0.1/-0.0 | 1.5     | 1.75±0.1 | 10.25   | 5.5±0.05 | 4.0±0.1 | 8.0±0.1 | 2.0±0.05 |
| 7050        | 1.5+0.1/-0.0 | 1.5     | 1.75±0.1 | 14.25   | 7.5±0.1  | 4.0±0.1 | 8.0±0.1 | 2.0±0.1  |

Unit: mm

| Device Size | T   | T1 max. | T2 max. | W max. | A0       | B0       | K0        |
|-------------|-----|---------|---------|--------|----------|----------|-----------|
| 3225        | 0.6 | 0.1     | 1.65    | 12.3   | 2.8±0.10 | 3.5±0.10 | 1.10±0.10 |
| 5032        | 0.6 | 0.1     | 1.65    | 12.3   | 3.5±0.10 | 5.3±0.10 | 1.10±0.10 |
| 7050        | 0.6 | 0.1     | 1.80    | 16.3   | 5.4±0.10 | 7.4±0.10 | 1.3±0.10  |



Unit: mm

| Tape Size | A max. | B min. | C        | D min. | N       | W1          | W2 max. |
|-----------|--------|--------|----------|--------|---------|-------------|---------|
| 12mm      | 180    | 1.5    | 13.0±0.2 | 20.2   | 60±0.5  | 12.4+2.0/-0 | 18.4    |
|           | 330    | 1.5    | 13.0±0.2 | 20.2   | 100±0.5 | 12.4+2.0/-0 | 18.4    |
| 16mm      | 180    | 1.5    | 13.0±0.2 | 20.2   | 60±0.5  | 16.4+2.0/-0 | 22.4    |
|           | 330    | 1.5    | 13.0±0.2 | 20.2   | 100±0.5 | 16.4+2.0/-0 | 22.4    |

| Device Size | "T" (1k/reel) |         | "T3" (3k/reel) |          |
|-------------|---------------|---------|----------------|----------|
| 3225        | 12mm Tape     | 7" Reel | 12mm Tape      | 7" Reel  |
| 5032        | 12mm Tape     | 7" Reel | 12mm Tape      | 13" Reel |
| 7050        | 16mm Tape     | 7" Reel | 16mm Tape      | 13" Reel |

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