

# High Performance Low Jitter SMD XO

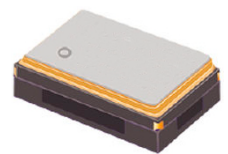
ASG2-LJ



ESD Sensitive



RoHS / RoHS II Compliant



2.5 x 2.0 x 1.0 mm

Moisture Sensitivity Level (MSL) – 1

## FEATURES:

- LVCMOS, LVDS or LVPECL output option
- +2.5V or +3.3V operation
- -40°C to +85°C standard operating temperature range
- Ultra low RMS Jitter: 0.5ps typical, 1.0ps max (12kHz to 20MHz BW)
- Miniature size 2.5 x 2.0 x 1.0 mm Ceramic SMT Package
- Short lead time

## APPLICATIONS:

- Networking
- SONET/SDH
- WiMax / WLAN
- Computing
- Phase Locked Loops
- Direct Digital Synthesis (DDS)
- DSL/ADSL
- Base Terminal Stations

## STANDARD SPECIFICATIONS:

| Parameters                                               |                        | Minimum                                                                                                                    | Typical | Maximum | Units | Notes        |
|----------------------------------------------------------|------------------------|----------------------------------------------------------------------------------------------------------------------------|---------|---------|-------|--------------|
| Operating Temperature                                    |                        | -40                                                                                                                        |         | +85     | °C    |              |
| Storage Temperature                                      |                        | -55                                                                                                                        |         | +125    | °C    |              |
| Overall Frequency Stability                              |                        | -50                                                                                                                        |         | +50     | ppm   | See Note # 1 |
| Initial Tolerance + Stability over operating temperature |                        | -35.00                                                                                                                     |         | +35.00  | ppm   |              |
| Supply Voltage (V <sub>dd</sub> )                        | V <sub>dd</sub> = 3.3V | 3.135                                                                                                                      | 3.300   | 3.465   | V     |              |
|                                                          | V <sub>dd</sub> = 2.5V | 2.375                                                                                                                      | 2.500   | 2.625   | V     |              |
| Enable/Disable Function :                                |                        | "1" (V <sub>IH</sub> ≥ 0.7*V <sub>dd</sub> ) or Open: Oscillation<br>"0" (V <sub>IL</sub> < 0.3*V <sub>dd</sub> ) : High Z |         |         |       |              |
| Phase jitter RMS (12kHz to 20MHz BW)                     |                        |                                                                                                                            | 0.5     | 1       | ps    |              |

**Note #1:** Inclusive of initial tolerance at 25°C±3°C, operating temperature range, input voltage variation, load variation & 15 years aging at 25°C.

### Key Electrical Specifications – LVCMOS

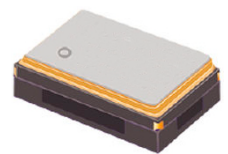
| Parameters                        |                 | Minimum             | Typical | Maximum             | Units | Notes      |
|-----------------------------------|-----------------|---------------------|---------|---------------------|-------|------------|
| Frequency Range                   |                 | 8                   |         | 200                 | MHz   |            |
| Supply Current (I <sub>dd</sub> ) |                 |                     |         | 40                  | mA    |            |
| Output Logic Level                | V <sub>OH</sub> | 0.9*V <sub>dd</sub> |         |                     | V     | I = ±6mA   |
|                                   | V <sub>OL</sub> |                     |         | 0.1*V <sub>dd</sub> | V     |            |
| Rise Time                         | T <sub>r</sub>  |                     |         | 3                   | ns    | 10% to 90% |
| Fall Time                         | T <sub>f</sub>  |                     |         | 3                   | ns    |            |
| Duty Cycle                        |                 | 48                  | 50      | 52                  | %     |            |
| Output Load                       |                 |                     |         | 15                  | pF    |            |

### Key Electrical Specifications – LVDS

| Parameters                        |                | Minimum | Typical | Maximum | Units | Notes           |
|-----------------------------------|----------------|---------|---------|---------|-------|-----------------|
| Frequency Range                   |                | 8       |         | 1500    | MHz   |                 |
| Supply Current (I <sub>dd</sub> ) |                |         |         | 40      | mA    | Freq. dependent |
| Differential Output Voltage Swing |                |         | 350     |         | mV    |                 |
| Duty Cycle                        |                | 45      |         | 55      | %     | @1.25V          |
| Rise Time                         | T <sub>r</sub> |         |         | 600     | ps    | RL=100Ω/CL=10pF |
| Fall Time                         | T <sub>f</sub> |         |         | 600     |       |                 |

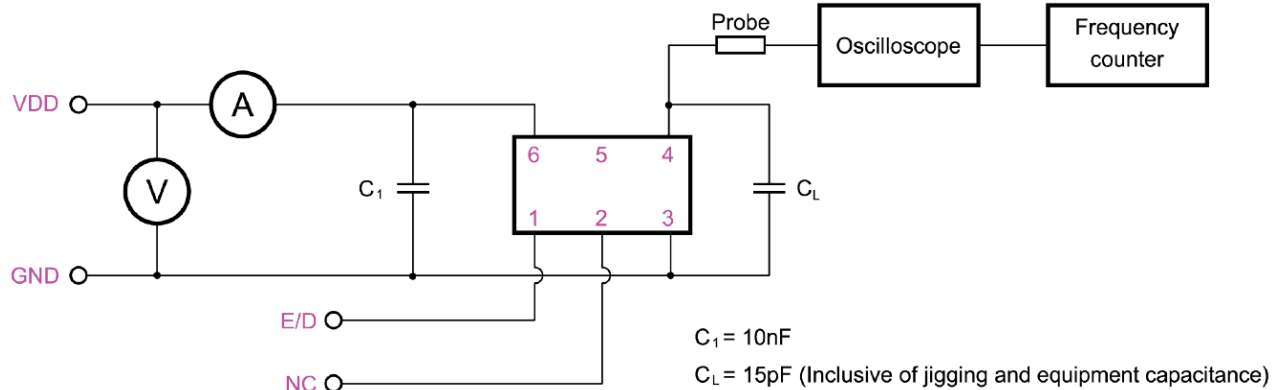
### Key Electrical Specifications – LVPECL

| Parameters                        |                 | Minimum                 | Typical | Maximum                | Units | Notes                  |
|-----------------------------------|-----------------|-------------------------|---------|------------------------|-------|------------------------|
| Frequency Range                   |                 | 8                       |         | 1500                   | MHz   |                        |
| Supply Current (I <sub>dd</sub> ) |                 |                         |         | 65                     | mA    | Freq. dependent        |
| Output Logic Level                | V <sub>OH</sub> | V <sub>dd</sub> - 1.025 |         |                        | V     | 50Ω nominal load       |
|                                   | V <sub>OL</sub> |                         |         | V <sub>dd</sub> - 1.62 | V     |                        |
| Duty Cycle                        |                 | 45                      |         | 55                     | %     | @V <sub>dd</sub> -1.3V |
| Rise Time                         | T <sub>r</sub>  |                         |         | 600                    | ps    | 20% to 80%             |
| Fall Time                         | T <sub>f</sub>  |                         |         | 600                    |       |                        |

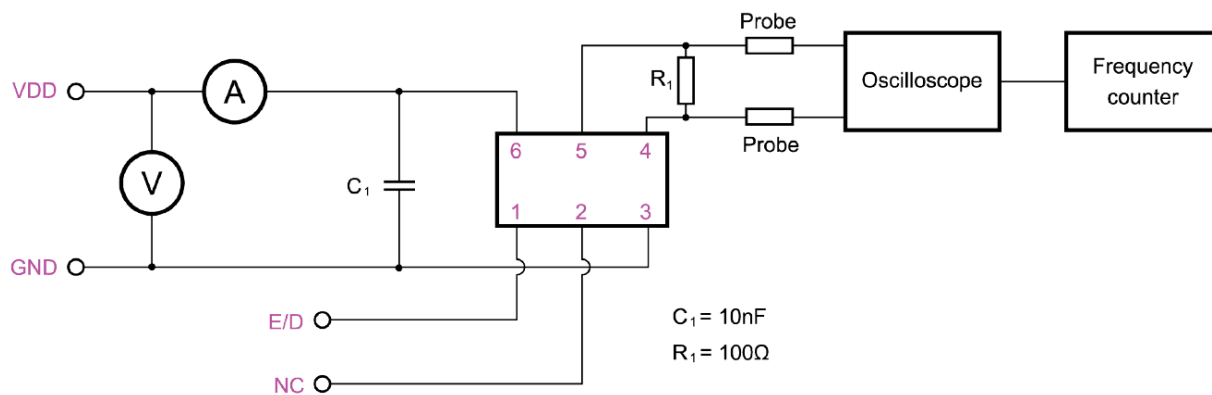


### TEST CIRCUIT

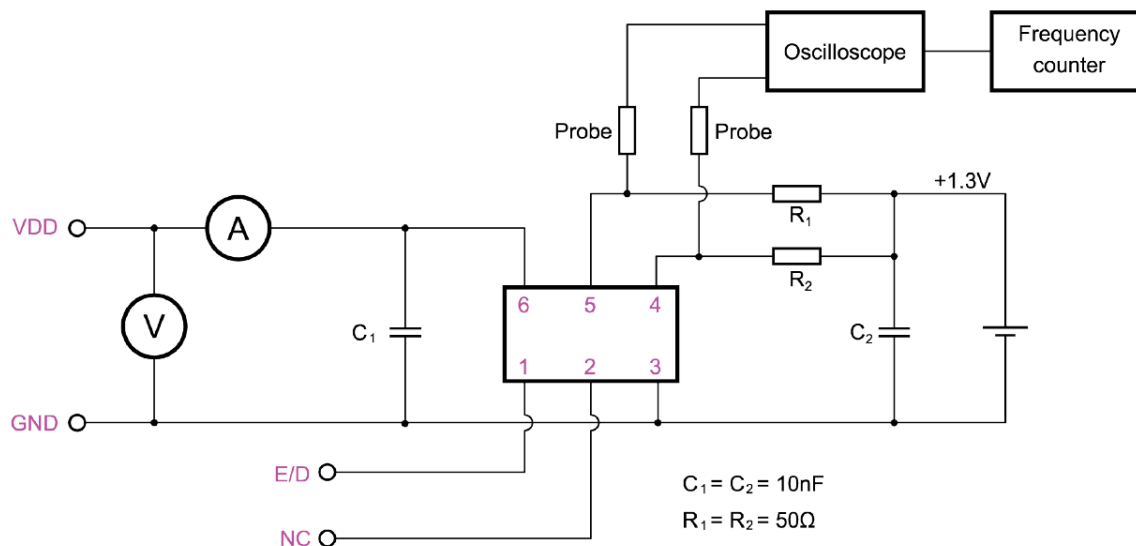
#### LVC MOS Output:

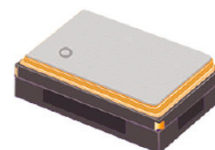


#### LVDS Output:

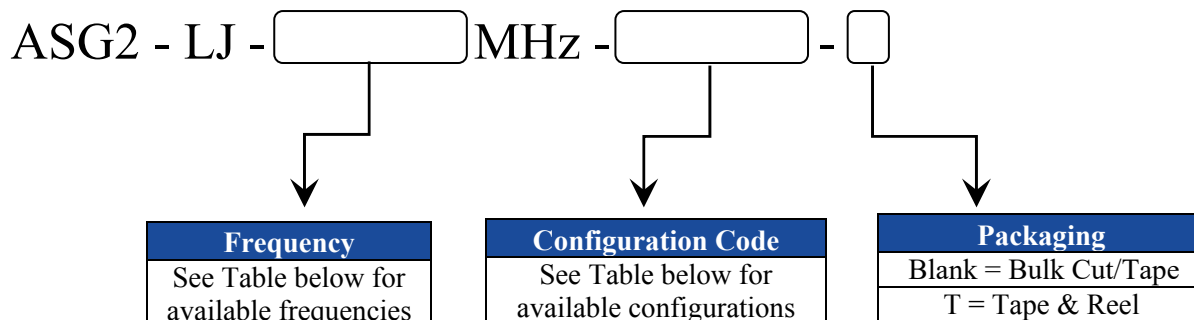


#### LVPECL Output:



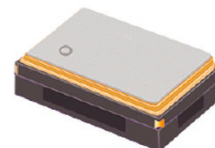


### OPTIONS & PART IDENTIFICATION:



**Table of Available Configurations**

| Abracon P/N               | Frequency (MHz) | Freq. Stability Over Temperature (ppm) | Operating Temperature (°C) | Supply Voltage (V) | Output Type |
|---------------------------|-----------------|----------------------------------------|----------------------------|--------------------|-------------|
| ASG2-LJ-100.000MHz-513259 | 100             | ±35                                    | -40 to +85                 | 3.3                | LVPECL      |
| ASG2-LJ-125.000MHz-513280 | 125             | ±35                                    | -40 to +85                 | 3.3                | LVPECL      |
| ASG2-LJ-125.000MHz-513281 | 125             | ±35                                    | -40 to +85                 | 2.5                | LVPECL      |
| ASG2-LJ-156.250MHz-513282 | 156.25          | ±35                                    | -40 to +85                 | 3.3                | LVPECL      |
| ASG2-LJ-156.250MHz-513283 | 156.25          | ±35                                    | -40 to +85                 | 2.5                | LVPECL      |
| ASG2-LJ-200.000MHz-513284 | 200             | ±35                                    | -40 to +85                 | 3.3                | LVPECL      |
| ASG2-LJ-212.500MHz-513285 | 212.5           | ±35                                    | -40 to +85                 | 3.3                | LVPECL      |
| ASG2-LJ-250.000MHz-513286 | 250             | ±35                                    | -40 to +85                 | 3.3                | LVPECL      |
| ASG2-LJ-312.500MHz-513287 | 312.5           | ±35                                    | -40 to +85                 | 3.3                | LVPECL      |
| ASG2-LJ-285.000MHz-516733 | 285             | ±35                                    | -40 to +85                 | 3.3                | LVPECL      |
| ASG2-LJ-400.000MHz-513288 | 400             | ±35                                    | -40 to +85                 | 3.3                | LVPECL      |



### OPTIONS & PART IDENTIFICATION:

**Table of Available Configurations (continued)**

| Abracon P/N                | Frequency (MHz) | Freq. Stability Over Temperature (ppm) | Operating Temperature (°C) | Supply Voltage (V) | Output Type |
|----------------------------|-----------------|----------------------------------------|----------------------------|--------------------|-------------|
| ASG2-LJ-1000.000MHz-513289 | 1000            | ±35                                    | -40 to +85                 | 3.3                | LVPECL      |
| ASG2-LJ-100.000MHz-513290  | 100             | ±35                                    | -40 to +85                 | 2.5                | LVDS        |
| ASG2-LJ-125.000MHz-513291  | 125             | ±35                                    | -40 to +85                 | 2.5                | LVDS        |
| ASG2-LJ-156.250MHz-513292  | 156.25          | ±35                                    | -40 to +85                 | 2.5                | LVDS        |
| ASG2-LJ-200.000MHz-513293  | 200             | ±35                                    | -40 to +85                 | 2.5                | LVDS        |
| ASG2-LJ-212.500MHz-513294  | 212.5           | ±35                                    | -40 to +85                 | 2.5                | LVDS        |
| ASG2-LJ-250.000MHz-513295  | 250             | ±35                                    | -40 to +85                 | 2.5                | LVDS        |
| ASG2-LJ-312.500MHz-513296  | 312.5           | ±35                                    | -40 to +85                 | 2.5                | LVDS        |
| ASG2-LJ-400.000MHz-513297  | 400             | ±35                                    | -40 to +85                 | 2.5                | LVDS        |
| ASG2-LJ-100.000MHz-513298  | 100             | ±35                                    | -40 to +85                 | 2.5                | LVC MOS     |
| ASG2-LJ-125.000MHz-513299  | 125             | ±35                                    | -40 to +85                 | 2.5                | LVC MOS     |
| ASG2-LJ-156.250MHz-513300  | 156.25          | ±35                                    | -40 to +85                 | 2.5                | LVC MOS     |
| ASG2-LJ-200.000MHz-513301  | 200             | ±35                                    | -40 to +85                 | 2.5                | LVC MOS     |
| ASG2-LJ-1500.000MHz-515410 | 1500            | ±50<br>(Including 10-year aging)       | -40 to +85                 | 3.3                | LVPECL      |

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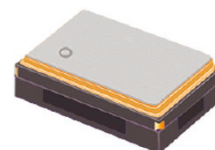
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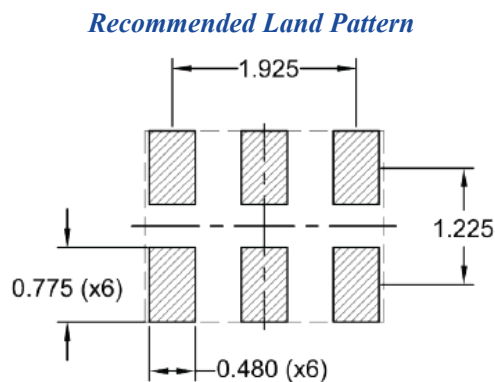
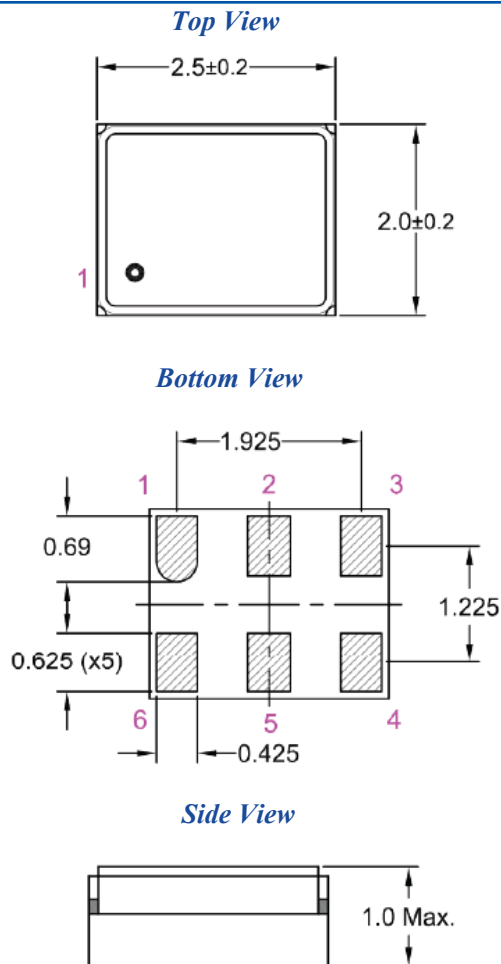


RoHS / RoHS II Compliant



2.5 x 2.0 x 1.0 mm

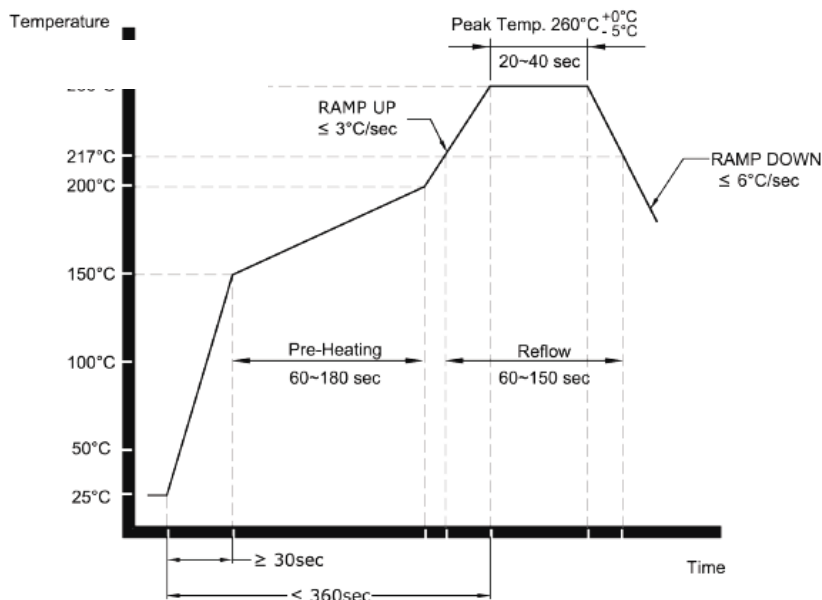
## OUTLINE DIMENSION:



| Pin # | Pin Description    |                      |
|-------|--------------------|----------------------|
|       | LVC MOS            | LVDS/LVPECL          |
| 1     | Output Enable (OE) |                      |
| 2     | No Connect (N/C)   |                      |
| 3     | GND                |                      |
| 4     | RF Output          |                      |
| 5     | No Connect (N/C)   | Complimentary Output |
| 6     | Vdd                |                      |

Dimensions: mm

## RECOMMENDED REFLOW PROFILE



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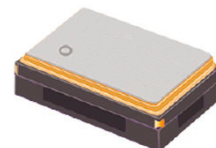
ASG2-LJ



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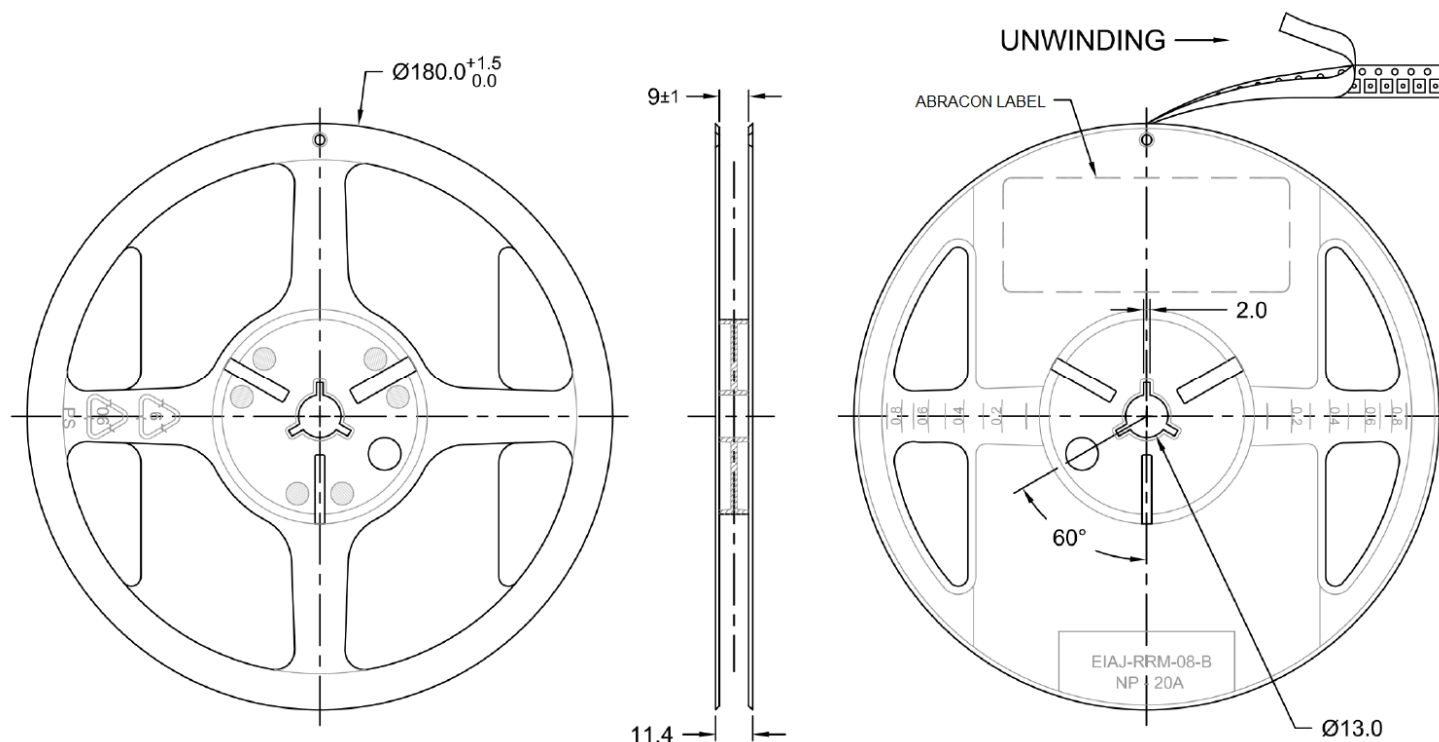
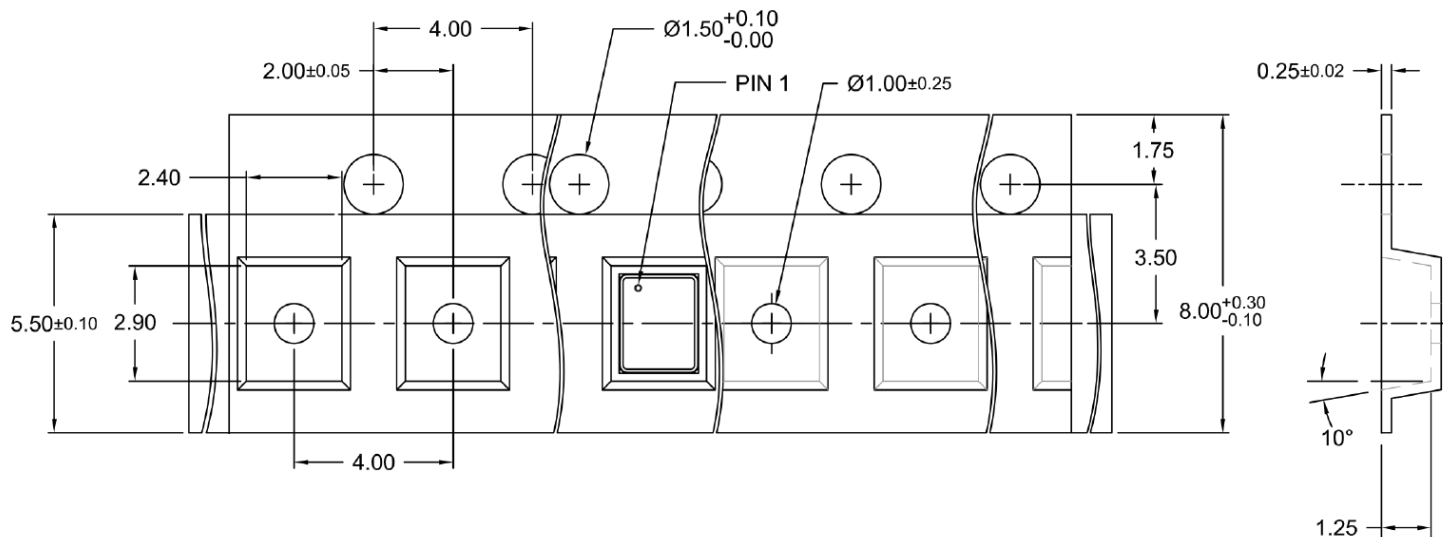
Pb | RoHS / RoHS II Compliant



2.5 x 2.0 x 1.0 mm

## TAPE & REEL:

T= Tape and reel (3,000pcs/reel)



Dimensions: mm

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