

# Customer Service Note

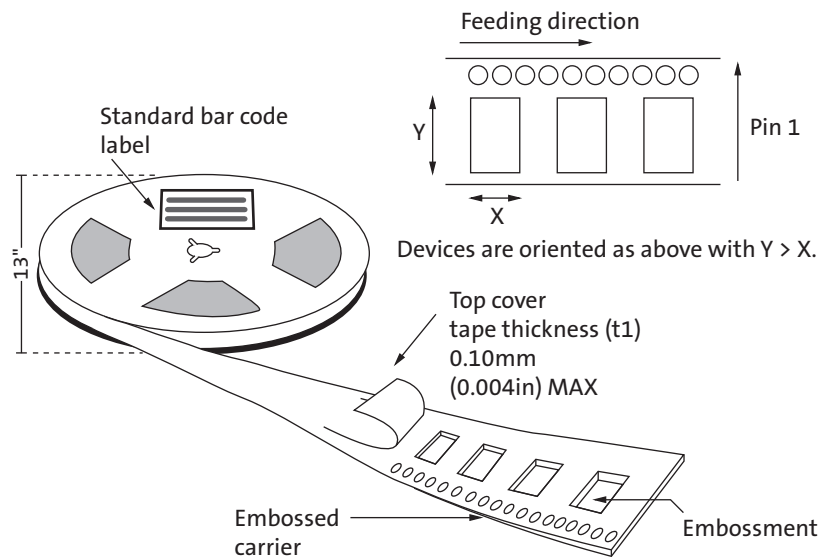
## Tape-and-Reel Procedures

### Introduction

Aptina supports the Electronic Industries Association's (EIA) standardization of tape-and-reel specifications, number 481-C. Specifications for Aptina's tape-and-reel offerings are detailed in the following figures and tables.

### Tape-and-Reel Specifications

Figure 1: Reel

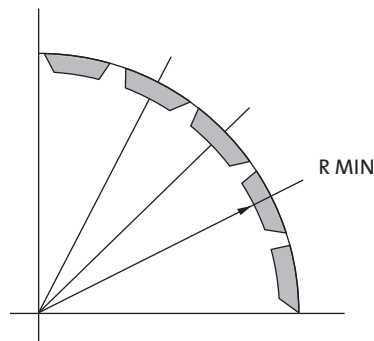


Note: The leader and trailer lengths on Aptina's tape-and-reel carriers are >400mm and >160mm, respectively.

When ordering tape-and-reel carriers, "TR" must be added to the ordering part number (for example, MT9D011D00STC TR).

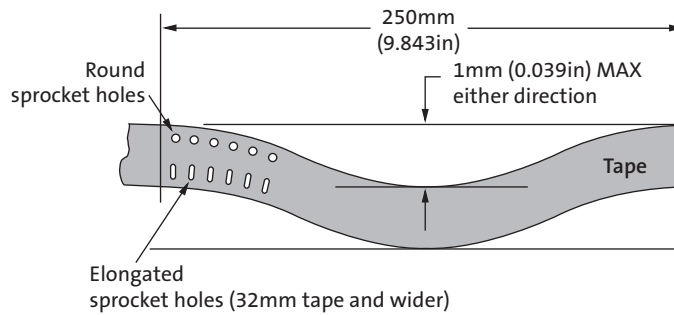
Refer to Aptina's customer service note "ACSN-12: Shipping Information: Quantities and Weights," for tape dimensions of specific Aptina™ devices.

**Figure 2: Bending Radius**



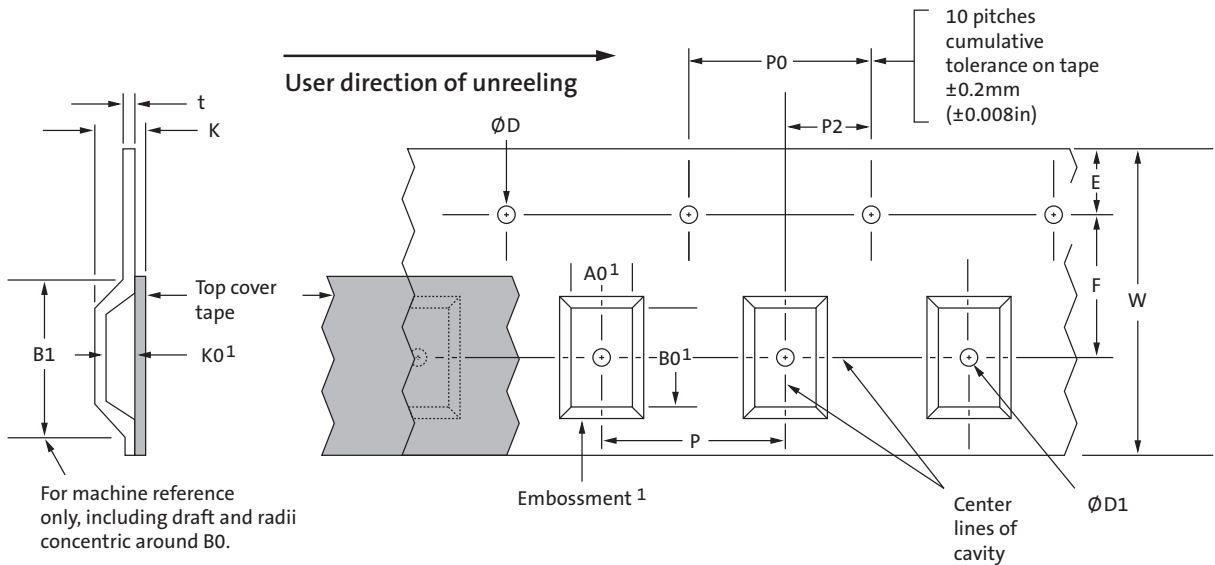
Note: Tape and components shall pass around radius “R” without damage.

**Figure 3: Camber (top view)**



Note: Allowable camber to be 1mm/250mm.

Figure 4: Embossed Carrier Dimensions (16mm and 24mm tape)



- Notes:
1. The cavity defined by A0, B0, and K0 shall surround the component with sufficient clearance that:
    - 1a. The component does not protrude above the top surface of the carrier tape.
    - 1b. After the top cover tape has been removed, the component can be removed from the cavity in a vertical direction without mechanical restriction.
    - 1c. Rotation of the component is limited to 10 degrees maximum for 16mm and 24mm tapes.
    - 1d. Lateral movement of the component is restricted to 1.0mm MAX for 16mm- and 24mm-wide tapes. See Figure 7 on page 5.

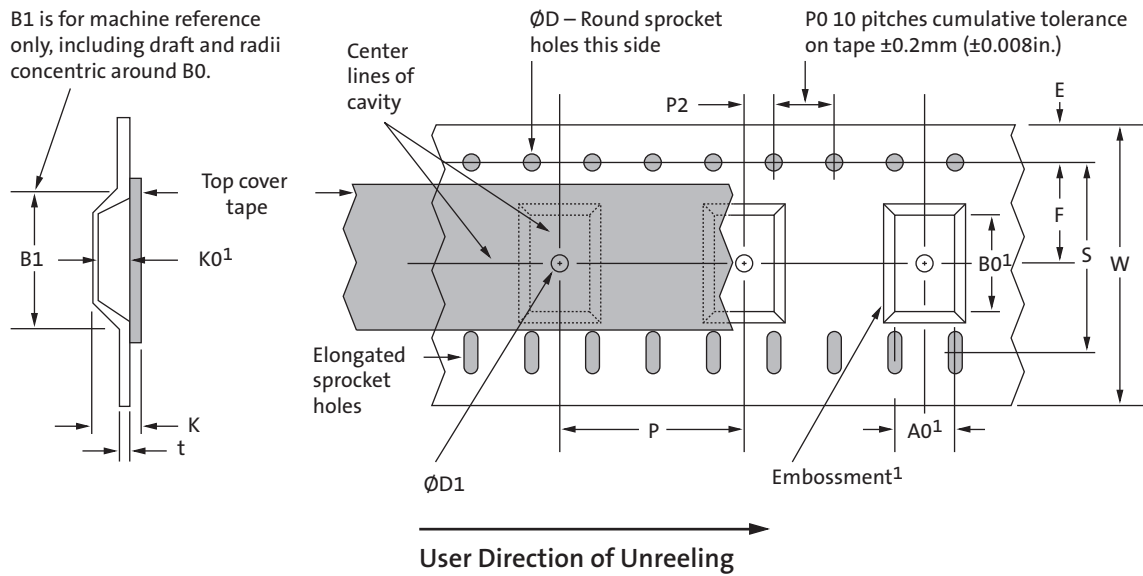
Table 1: 12mm, 16mm, and 24mm Embossed Tape Dimensions<sup>1</sup>

| Tape Size | ØD                  | E              | P0             | t (MAX) | A0, B0, K0 | B1 (MAX)     | ØD1 (MIN)      |
|-----------|---------------------|----------------|----------------|---------|------------|--------------|----------------|
| 12mm      | 1.5 +0.1/-0.0       | 1.75 ±0.10     | 4.0 ±0.1       | 0.6     | See note 2 | 8.2 (0.323)  | 1.5<br>(0.059) |
| 16mm      | (0.059 +0.004/-0.0) | (0.069 ±0.004) | (0.157 ±0.004) | (0.024) |            | 12.1 (0.476) |                |
| 24mm      |                     |                |                |         |            | 20.1 (0.791) |                |

| Tape Size | F                           | K (MAX)         | P2                          | R (MIN)                     | W (MAX)         | P  |
|-----------|-----------------------------|-----------------|-----------------------------|-----------------------------|-----------------|--|
| 12mm      | 5.5 ±0.05<br>(0.217 ±0.002) | 6.5<br>(0.256)  | 2.0 ±0.05<br>(0.079 ±0.002) | 30<br>(1.181)<br>See note 3 | 12.3<br>(0.484) | 2.0 ±0.05 or<br>4.0 ±0.1 or 8.0 ±0.1         |
| 16mm      | 7.5 ±0.1<br>(0.295 ±0.004)  | 8.0<br>(0.375)  | 2.0 ±0.1<br>(0.079 ±0.004)  |                             | 16.3<br>(0.642) | 4.0 ±0.1 to 12.0 ±0.1<br>(in 4.0 increments) |
| 24mm      | 11.5 ±0.1<br>(0.453 ±0.004) | 12.0<br>(0.472) |                             |                             | 24.3<br>(0.957) | 4.0 ±0.1 to 20.0 ±0.1<br>(in 4.0 increments) |

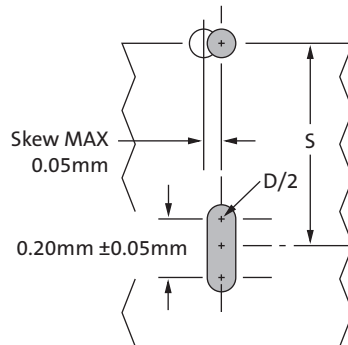
- Notes:
1. All dimensions in millimeters (inches).
  2. The cavity defined by A0, B0, and K0 shall surround the component with sufficient clearance that:
    - 2a. The component does not protrude above the top surface of the carrier tape.
    - 2b. After the top cover tape has been removed, the component can be removed from the cavity in a vertical direction without mechanical restriction.
    - 2c. Rotation of the component is limited to 10 degrees maximum for 16mm and 24mm tapes.
    - 2d. Lateral movement of the component is restricted to 1.0mm MAX for 16mm- and 24mm-wide tapes. See Figure 7 on page 5.
  3. Tape and components shall pass around radius “R” without damage. Refer to Figure 2 on page 2.

**Figure 5: Embossed Carrier Dimensions (32mm and 44mm tape only)**

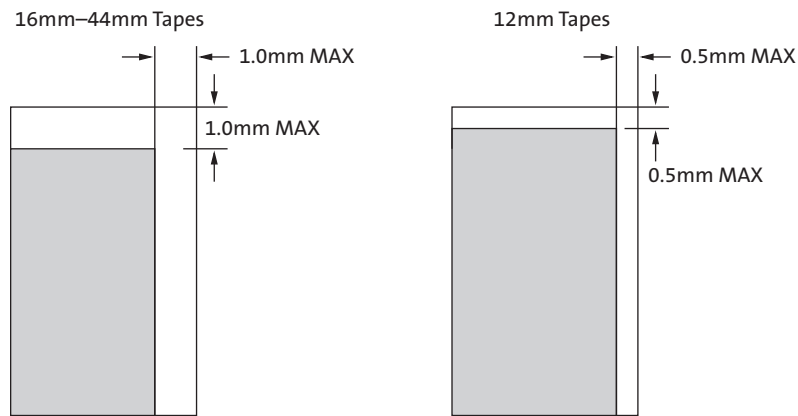


- Notes:
1. The cavity defined by A0, B0, and K0 shall surround the component with sufficient clearance that:
    - 1a. The component does not protrude above the top surface of the carrier tape.
    - 1b. After the top cover tape has been removed, the component can be removed from the cavity in a vertical direction without mechanical restriction.
    - 1c. Rotation of the component is limited to 10 degrees MAX for 32mm and 44mm tapes.
    - 1d. Lateral movement of the component is restricted to 1.0mm MAX for 32mm- and 44mm-wide tapes. See Figure 7 on page 5.

**Figure 6: Detail of Elongated Hole**



**Figure 7: Maximum Lateral Movement for Punched and Embossed Carrier**



**Table 2: 32mm and 44mm Embossed Tape<sup>1</sup>**

| Tape Size | ØD                                       | ØD1 (MIN)      | E                           | K (MAX)         | P0                         | t (MAX)        | A0, B0, K0 | B1 (MAX)        |
|-----------|--|----------------|-----------------------------|-----------------|----------------------------|----------------|------------|-----------------|
| 32mm      | 1.5 +0.1/-0.0<br>(0.059 +0.004/<br>-0.0) | 2.0<br>(0.079) | 1.75 ±0.1<br>(0.069 ±0.004) | 12.0<br>(0.472) | 4.0 ±0.1<br>(0.157 ±0.004) | 0.6<br>(0.024) | See note 2 | 23.0<br>(0.906) |
| 44mm      |  |                |                             | 16.0<br>(0.630) |                            |                |            | 35.0<br>(1.378) |

| Tape Size | F                            | P2                          | S                            | W                            | R (MIN)       | P (in 4.0 increments)    |
|-----------|------------------------------|-----------------------------|------------------------------|------------------------------|---------------|--------------------------|
| 32mm      | 14.2 ±0.1<br>(0.559 ±0.004)  | 2.0 ±0.1<br>(0.079 ±0.004)  | 28.4 ±0.1<br>(1.118 ±0.004)  | 32.0 ±0.3<br>(1.26 ±0.012)   | 50<br>(1.973) | 4.0 ±0.1 to<br>32.0 ±0.1 |
| 44mm      | 20.2 ±0.15<br>(0.795 ±0.006) | 2.0 ±0.15<br>(0.079 ±0.006) | 40.4 ±0.10<br>(1.591 ±0.004) | 44.0 ±0.30<br>(1.732 ±0.012) | See note 3    | 4.0 ±0.1 to<br>44.0 ±0.1 |

- Notes:
1. All dimensions in millimeters (inches).
  2. The cavity defined by A0, B0, and K0 shall surround the component with sufficient clearance that: The component does not protrude above the top surface of the carrier tape.
    - 2a. After the top cover tape has been removed, the component can be removed from the cavity in a vertical direction without mechanical restriction.
    - 2b. Rotation of the component is limited to 10 degrees MAX for 32mm and 44mm tapes.
    - 2c. Lateral movement of the component is restricted to 1.0mm MAX for 32mm- and 44mm-wide tapes. See Figure 7.
  3. Tape and components shall pass around radius “R” without damage. See Figure 2 on page 2.

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## Revision History

|                     |                |
|---------------------|----------------|
| <b>Rev. A</b> ..... | <b>11/2008</b> |
| • Initial release   |                |

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