Tape and reel shipping media for STM8 and STM32 microcontrollers in FPN packages

Introduction

FPN packages can be supplied in tape and reel shipping media.

The reels have a 13” typical diameter. The types of reel used are in plastic either antistatic or conductive, with a black conductive cavity tape. The cover tape is transparent antistatic or conductive.

The devices are positioned in the cavities with the identifying pin (normally Pin “1”) on the same side as the sprocket holes in the tape.

STMicroelectronics tape and reels are compliant with EIA 481 and IEC 60286-3 standard specifications.

Table 1 lists the FPN packages available for STM32 microcontrollers, as well as the corresponding shipping media.

Table 1. FPN packages available in tape and reel packing

Package	Tape width	Tape pitch	Reel diameter
FPN 3 × 3	12 mm	8 mm	13”
FPN 4 × 4	12 mm	8 mm	
FPN 5 × 5	12 mm	8 mm	
FPN 6 × 6	16 mm	12 mm	
FPN 7 × 7	16 mm	12 mm	
FPN 8 × 8	16 mm	12 mm	

1 Reel description

Figure 1. Reel diagram

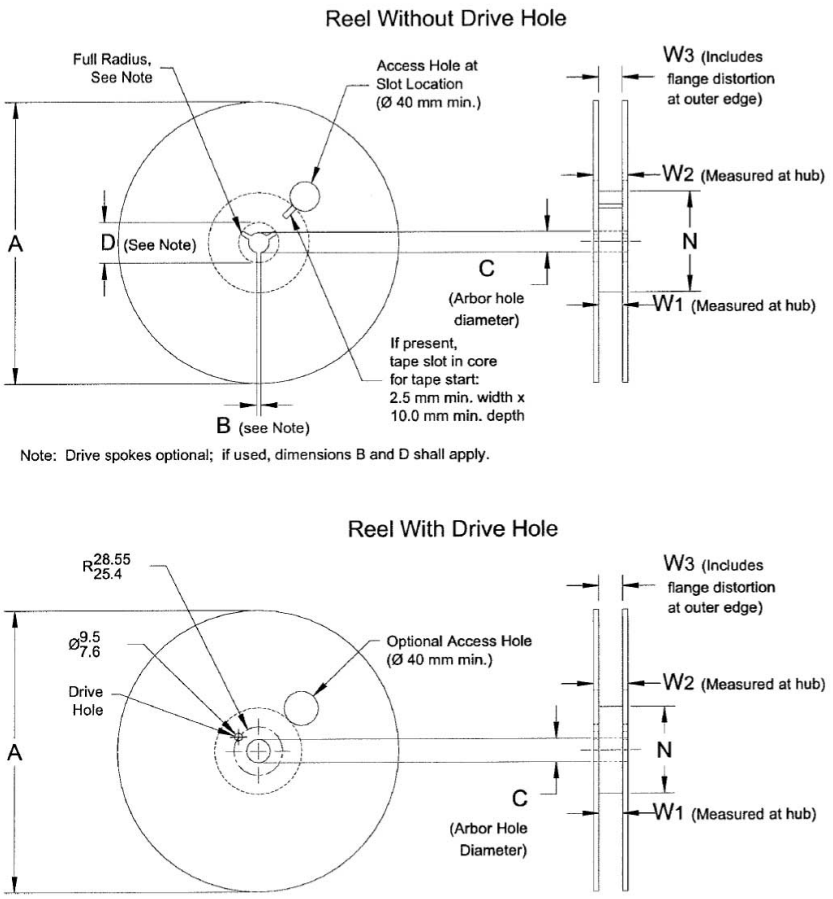

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Table 2. Reel dimensions

Reel size (inch)	Tape size (mm)	A max. (mm)	Reeds without drive hole			Reeds with drive hole			N (mm)	W1 min. (mm)(1)	W2 max. (mm)
			B min. (mm)	C min. (mm)	D min. (mm)	B min. (mm)	C max. (mm)	D min. (mm)			
13	8	330	1.5	13.0 +0.5/-0.2	20.2	NA(2)	29.2	NA	100	8.4 +1.5/-0	14.4
	12								100	12.4 +2/-0	18.4
									178 ±5		
	16								100	16.4 +2/-0	22.4
									178		

1. *W1 is measured at the hub.*
2. *NA stands for "not applicable".*

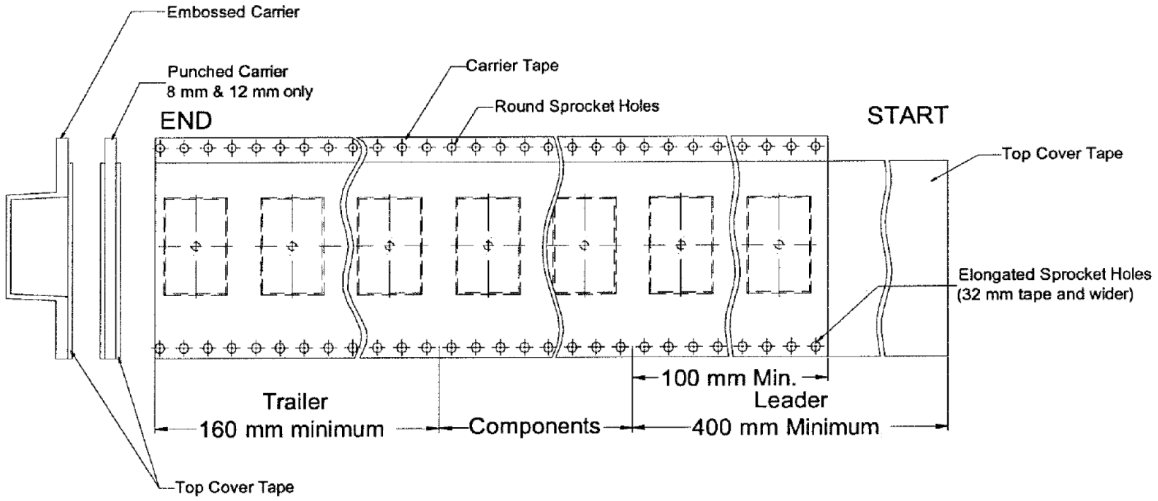
2 Leader and trailer tape specifications

The leader has a minimum width of 400 mm which includes at least 100 mm of carrier tape with empty cavities and sealed cover tape (see Figure 2). The leader tape is affixed to the last turn of carrier tape by using a transparent adhesive anti static or paper based tape of a width not higher than the one of the cover tape.

The trailer is a carrier tape which minimum width is 160 mm with empty cavities and sealed cover tape, as shown in Figure 2. The trailer tape must be affixed to the reel by using the tape slot of the reel hub.

During the unwinding operation, the entire carrier tape must be easily released from the reel hub as the last portion of the tape unwinds from the reel without damaging the carrier tape and the remaining components in the cavities.

Figure 2. Leader and trailer tape schematics



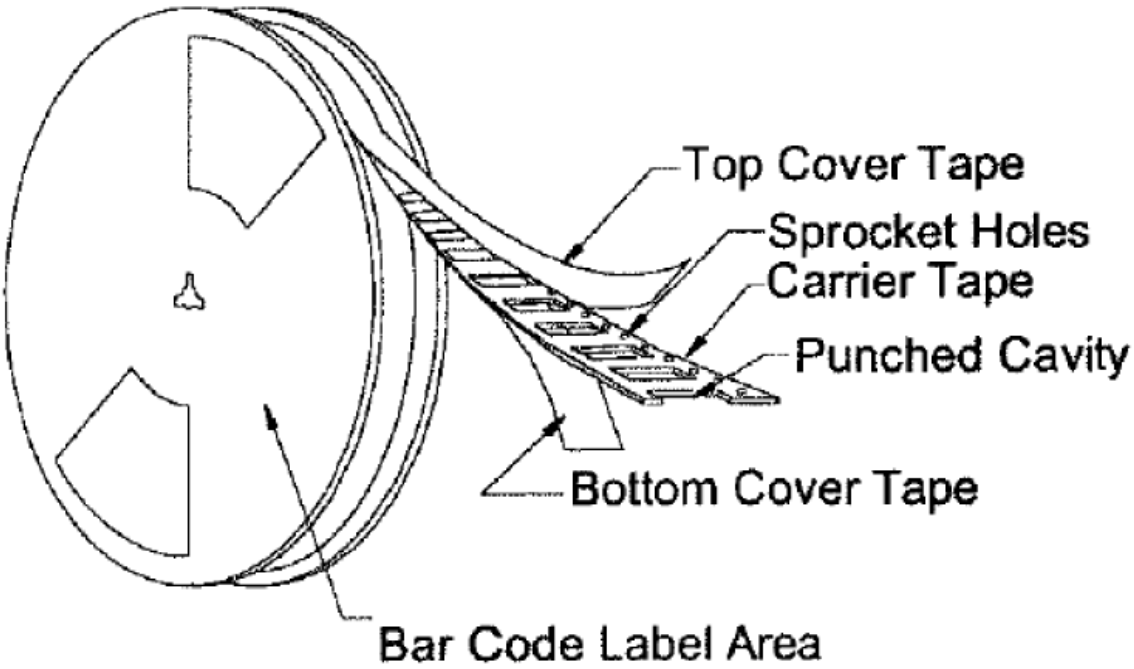
3 Labeling

STMicroelectronics “inner box” standard label is placed on each reel at the following locations:

- On the box that directly holds the reel
- On the damp proof bag if the units are dry packed
- On the reel itself

The label is attached to the flange that is facing the user when the tape is extracted from the reel at the top right (see Figure 3).

Figure 3. Labeling location on reel for carrier tape

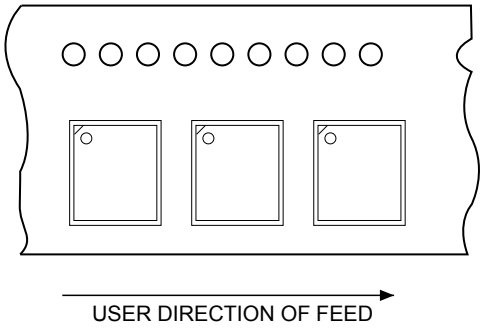


4 Device orientation

The largest axis of the component outline is perpendicular to the tape length.

The device is positioned in the carrier tape cavity as shown in Figure 4. Pin 1 is located on the top-left corner of the package.

Figure 4. Device orientation on tape



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5 Carrier tape mechanical dimensions

Possible widths are 8, 12, and 16 mm (refer to Table 1. FPN packages available in tape and reel packing).

Figure 5. Embossed carrier tape

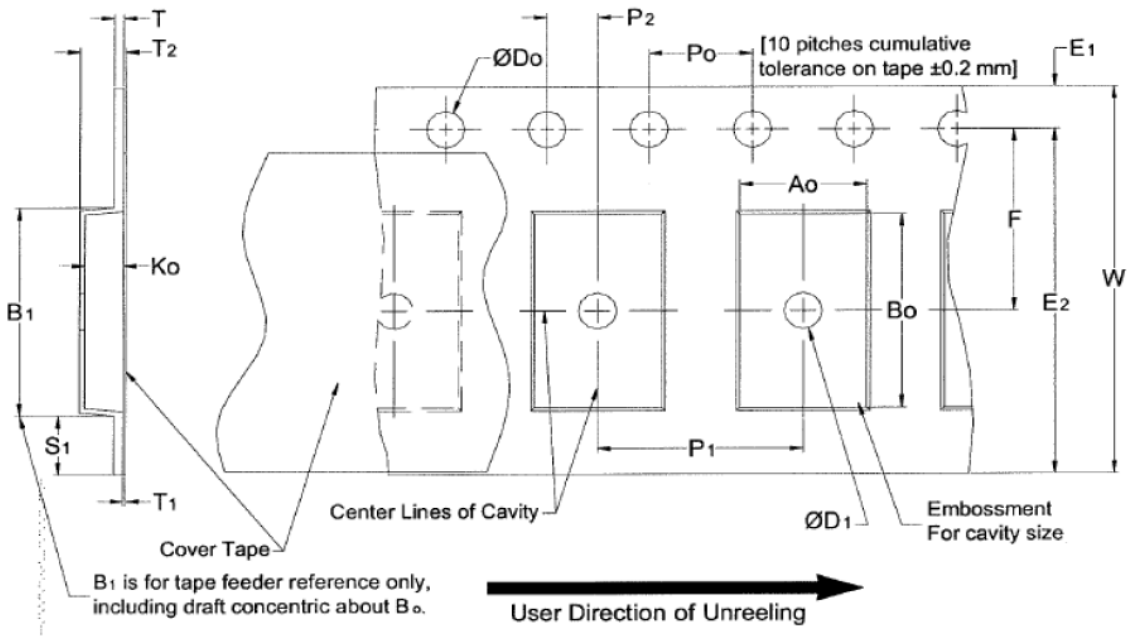


Table 3. Carrier tape constant dimensions

Tape width	D0	D1 min	E1	P0	P2	R(1)	S1	T max.	T1 max.	Unit
8 mm	1.5 +0.1/-0.0	1.0	1.75 ±0.1	4.0 ±0.1	2.0 ±0.05	25	0.6	0.6	0.1	mm
12 mm		1.5			2.0 ±0.1	30				
16 mm										

1. *The maximum radius the tape with or without components can bend without damage is specified in Section 6: Bending radius requirements).*

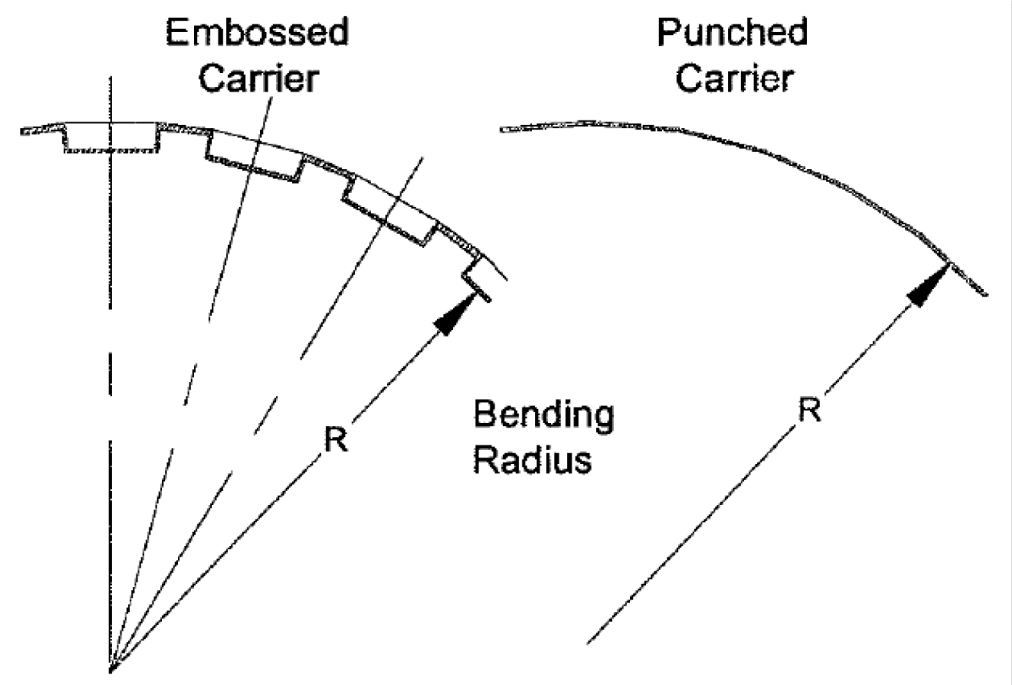
Table 4. Carrier tape variable dimensions

Tape width	B1	E2	F	P1	T2 max.	W max.	A0, B0, K0	Unit
8 mm	4.35	6.25	3.5 ±0.05	4.0 ±0.10	2.5	8.3	(1)	mm
12 mm	8.2	10.25	5.5 ±0.05	4.0 ±0.1 or 8.0 ±0.1	6.5	12.3		
16 mm	12.1	14.25	7.5 ±0.1	8.0 ±0.1 or 12.0 ±0.1	8.0	16.3		

1. *The cavity defined by A0, B0, and K0 surrounds the component with sufficient clearance so that:*
   - *The component does not protrude above the top surface of the carrier tape.*
   - *The component can be removed vertically from the cavity without mechanical restriction, after the top cover tape has been removed.*
   - *Rotation of the component is limited to 20° maximum for 12 mm tapes and to 10° maximum for 16 mm tapes.*
   - *Lateral movements of the component are restricted to 0.5 mm maximum for 12 mm tapes and to 1.0 mm maximum for 16 mm tapes.*

6 Bending radius requirements

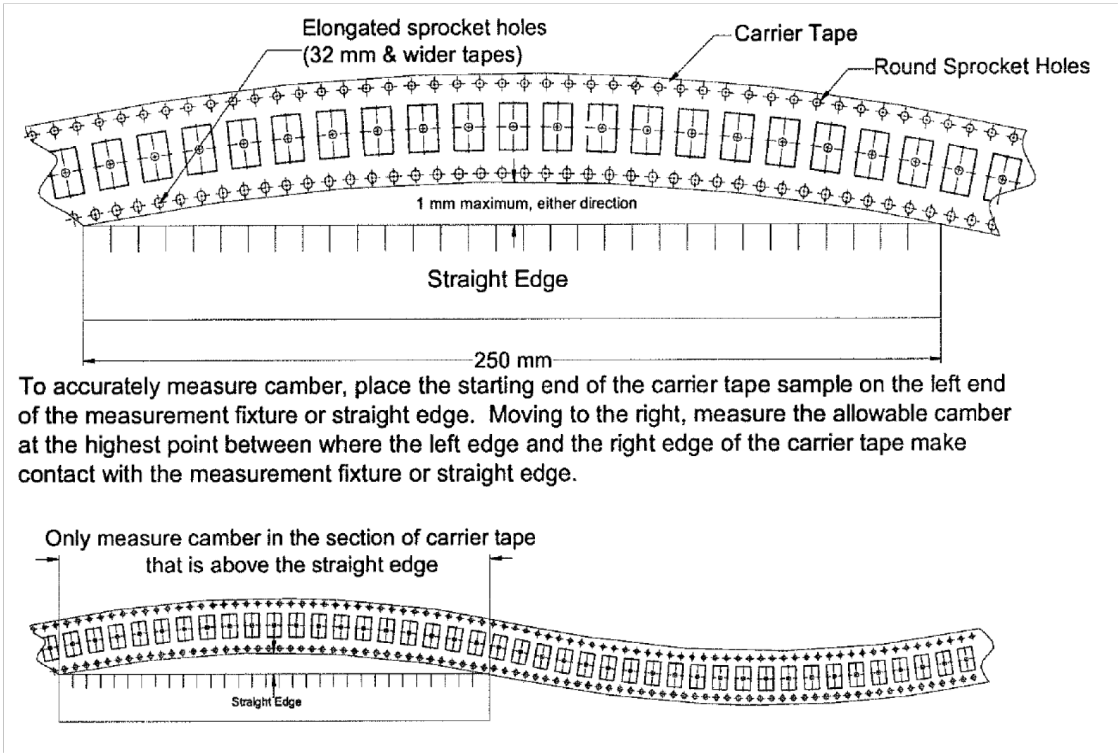
Figure 6. **Bending radius requirements**



7 Camber requirements

Carrier camber must not exceed more than 1 mm in 250 mm of carrier tape length.

Figure 7. Camber requirements



Revision history

Table 5. **Document revision history**

Date	Version	Changes
19-Feb-2015	1	Initial release.
26-Mar-2015	2	Updated Figure 4: Device orientation on tape.
21-Apr-2015	3	Updated pin 1 location in Section 4: Device Orientation. Updated P1 dimension and note 1. in Table 4: Carrier tape variable dimensions.
28-Oct-2025	4	Updated Table 1. FPN packages available in tape and reel packing.

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