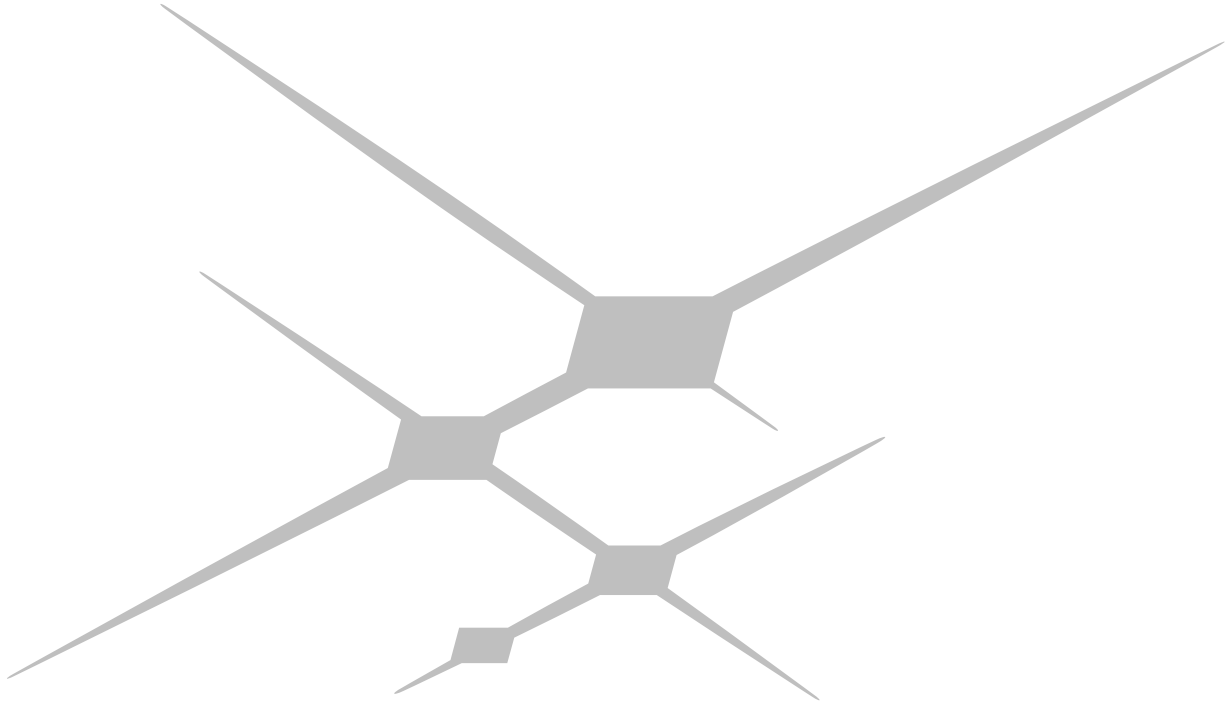

APPLICATION NOTE

Tape and Reel Information – RF Modules

Production quantities of Skyworks RF Modules are shipped in standard tape and reel format. The enclosed information provides the formats and dimensions for the popular sizes of current modules.

SKYWORKS™
BREAKTHROUGH SIMPLICITY

Revision History

Revision	Level	Date	Description
A		April 24, 2002	Add: 4 x 4mm and 8 x 10 mm Tape and Reel Drawings
B		May 10, 2002	Add: ESD information
C		July 12, 2002	Add: Table 2
D		August 12, 2004	Revise: Section 1.0; Figures 3, 5, 9, 11, 13, 15 Add: Section 2.0; Figures 1, 2, 4, 6, 7, 8, 10, 12, 14, 16, 17
E		October 6, 2004	Delete: Shipping Tray information (Refer to Application Note: Shipping Tray Information - RF Modules_200079A) Add: Figure 7 (9 x 10 mm Body Size)

References

3M™ is a trademark of the 3M Company

EPAK® is a registered trademark of ePAK International, Inc.

Kostat® is registered trademark of Kostat, Inc.

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1.0 Carrier Tapes

Production quantities of Skyworks RF products can be delivered in standard tape-and-reel format for attachment in a production solder-reflow environment. The carrier tapes identified in this Application Note may be manufactured of either polycarbonate or polystyrene material. The material used for each individual carrier tape is identified on the tape and reel drawing under NOTES.

The diagrams within in this Application Note provide information on materials, dimensions, adherence to industry standards, and part numbers for placing orders. Carrier tape diagrams are arranged by size. For example, the sequence of part sizes in Figures 1 through 9 begin with the 3 x 3, followed by the 4 x 4, the 6 x 6, and so on through Figure 9 with the 10 x 14. Figure 10 illustrates the orientation of the carrier tape to the supply reel and the direction of the tape as it unreels. Any diagram within this document may be quickly located from the List of Figures on page 1.

2.1 Carrier Tapes – Black Conductive Polycarbonate

Black conductive polycarbonate carrier tapes possess electrical and triboelectrical properties that help protect static-sensitive components with an effective balance of the carrier's electrostatic shielding and electrostatic decay properties. The electrically conductive polycarbonate carrier shows a nominal surface resistivity in the pocket of $\geq 10^4$ Ω /square and $\leq 10^8$ Ω/square, which minimizes dV/dt to afford ESD protection to devices in Classes I through III. These properties make the black polycarbonate carrier appropriate for packaging electrostatically sensitive components.

2.2 Carrier Tapes – Black Conductive Polystyrene

Black conductive polystyrene carrier tapes possess electrical and triboelectrical properties that help protect static-sensitive components with an effective balance of the carrier's electrostatic shielding and electrostatic decay properties. The electrically static dissipative polystyrene carrier shows a nominal surface resistivity of 10^{10} Ω/square, which minimizes dV/dt to afford ESD protection to devices in Classes I through III. These properties make the black polystyrene carrier appropriate for packaging electrostatically sensitive components.

2.0 Electrostatic Discharge (ESD) Sensitivity

Table 1. Classes of ESD Sensitive Parts

ESD Model	ESD Class	Voltage Range
HBM	I	> 0 V–1,999 V
	II	2,000 V–3,999 V
	III	4000 V–15,999 V

Table 2. Static Shielding Foil Moisture Vapor Barrier Bag

Electrical Properties	Method	Units	Typical Value
Surface Resistance	EOS/ESD S11.11	ohms	In 1.0E+11 Out 1.0E+11
Static Decay	FTMS 101C/METHOD 4046	Sec.	+ 0.01 – 0.01
Energy Test	EOS/ESD S11.31	nano-Joules	10

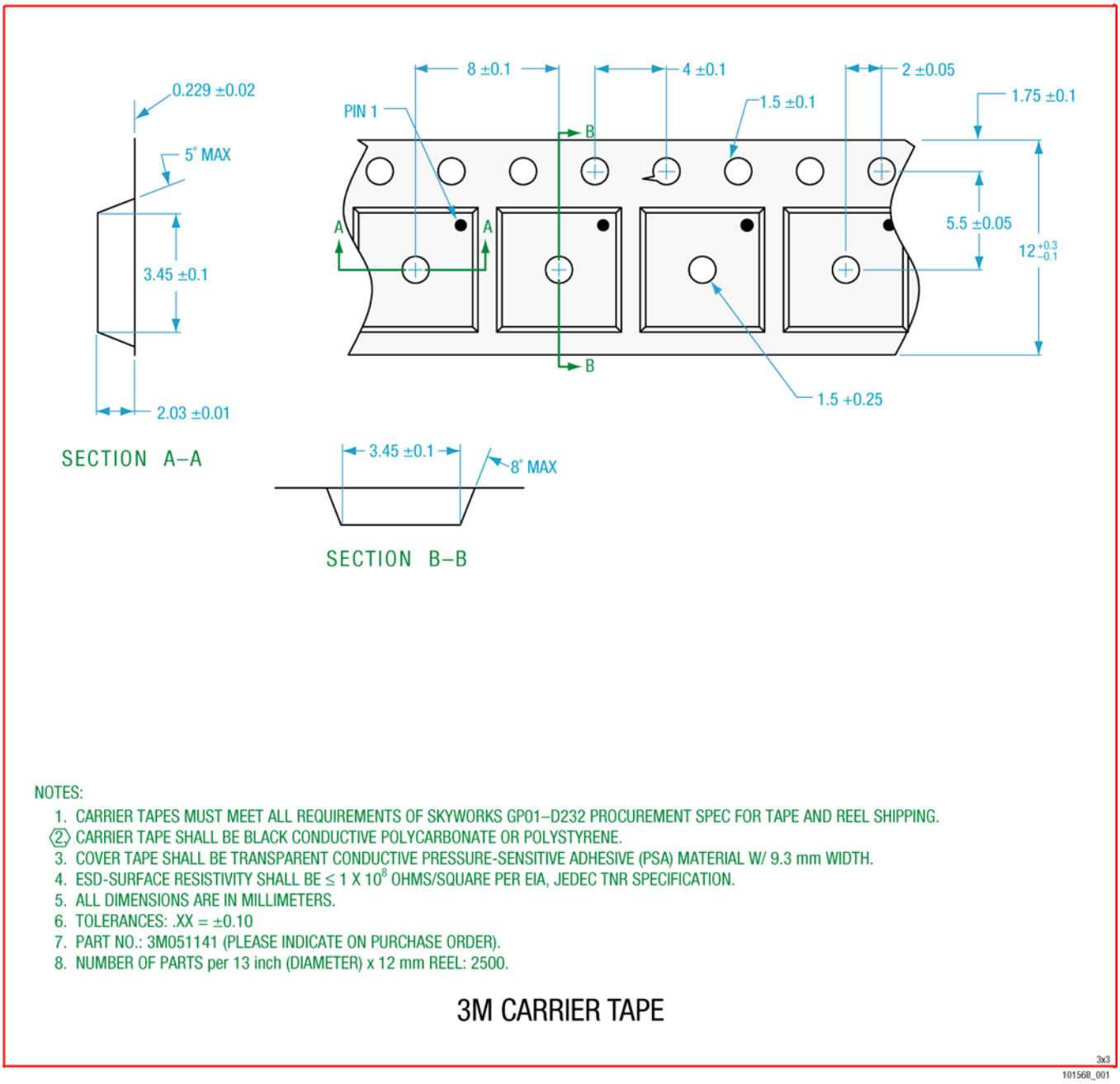

Figure 1. Carrier Tape Overmold MCM/RFLGA – 3.0 x 3.0 mm Body Size

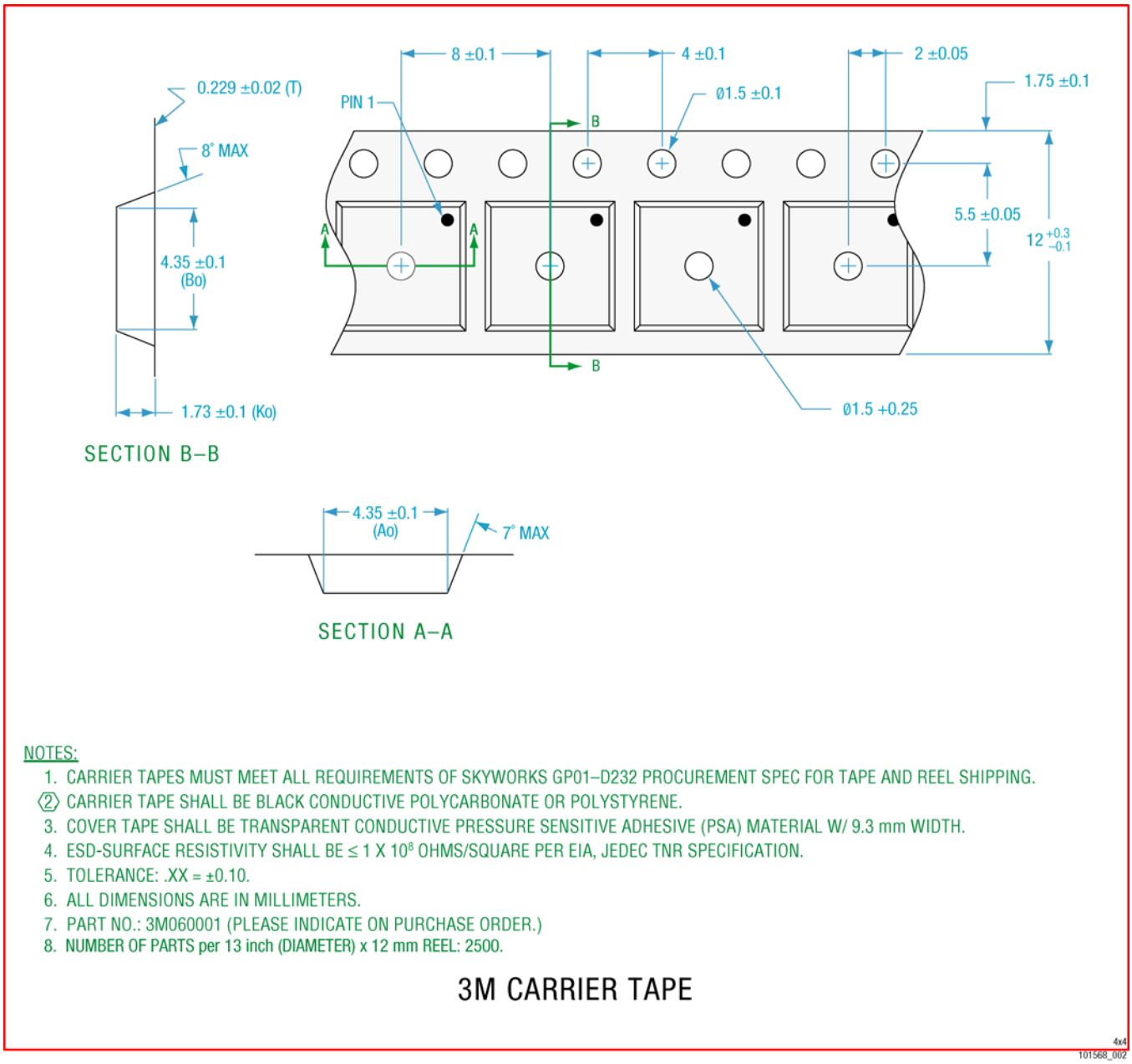

Figure 2. Carrier Tape Overmold MCM / RFLGA / QFN – 4.0 x 4.0 mm Body Size

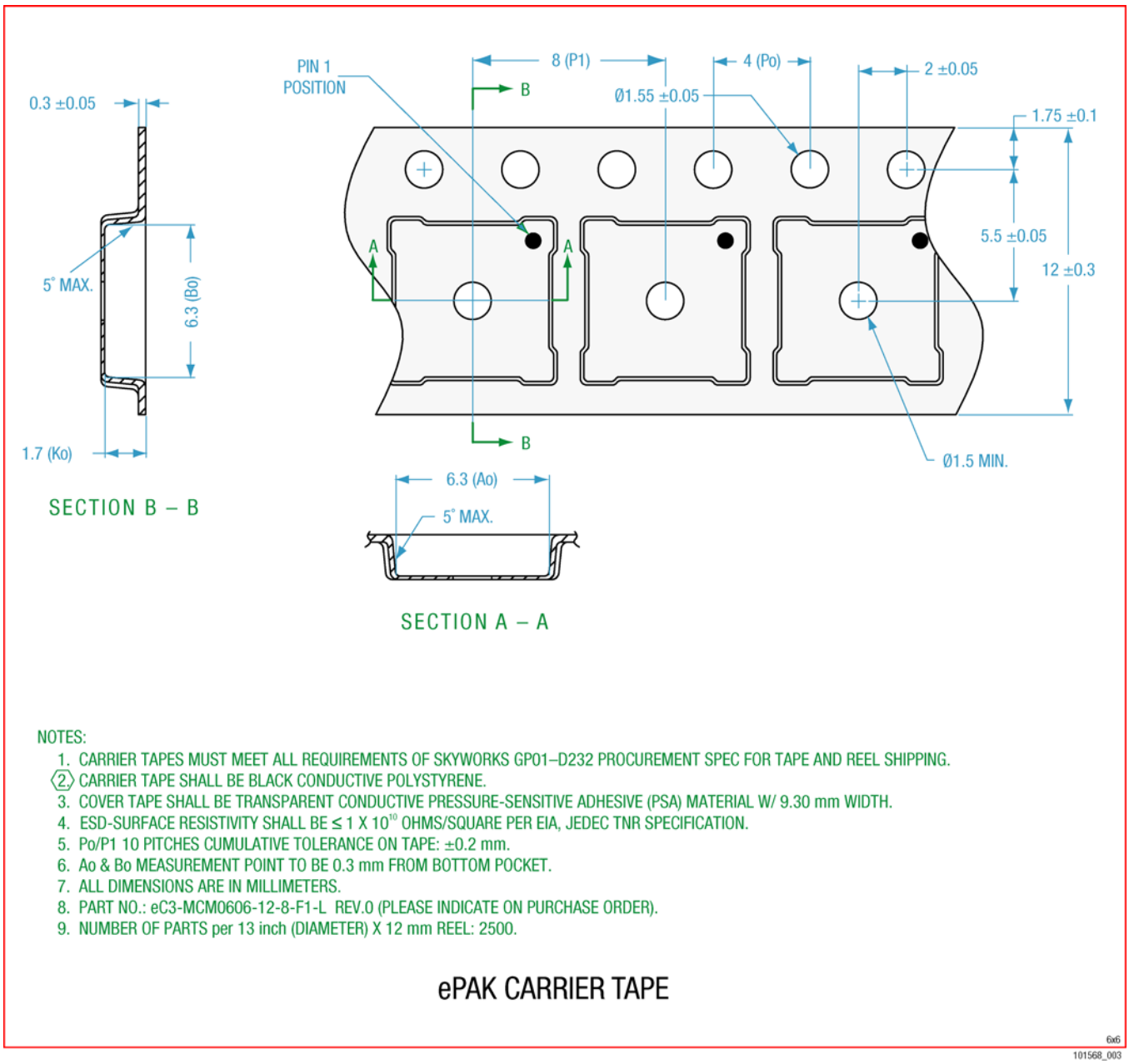

Figure 3. Carrier Tape Overmold MCM / RFLGA – 6.0 x 6.0 mm Body Size

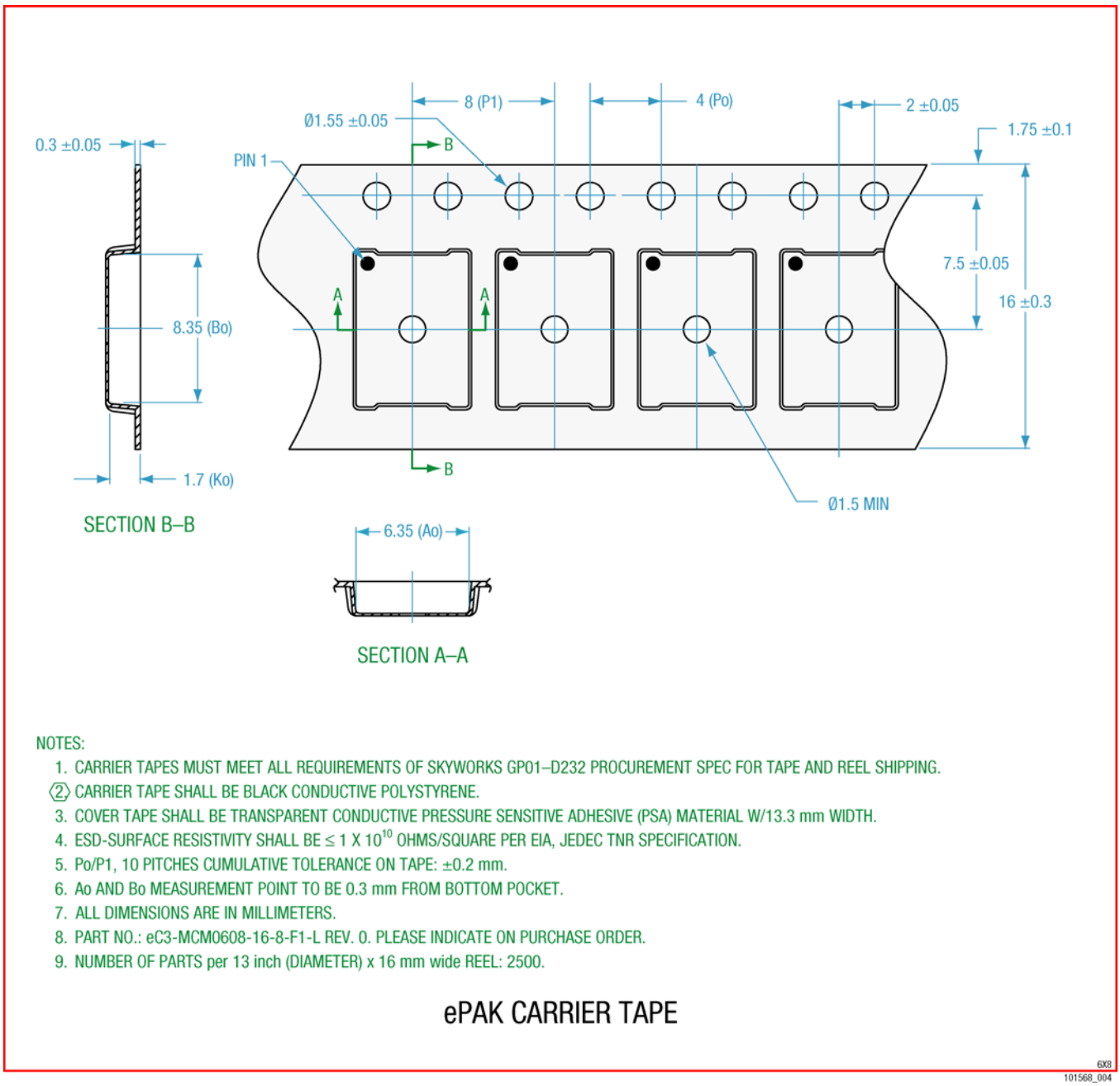

Figure 4. Carrier Tape Overmold MCM – 6.0 x 8.0 mm Body Size

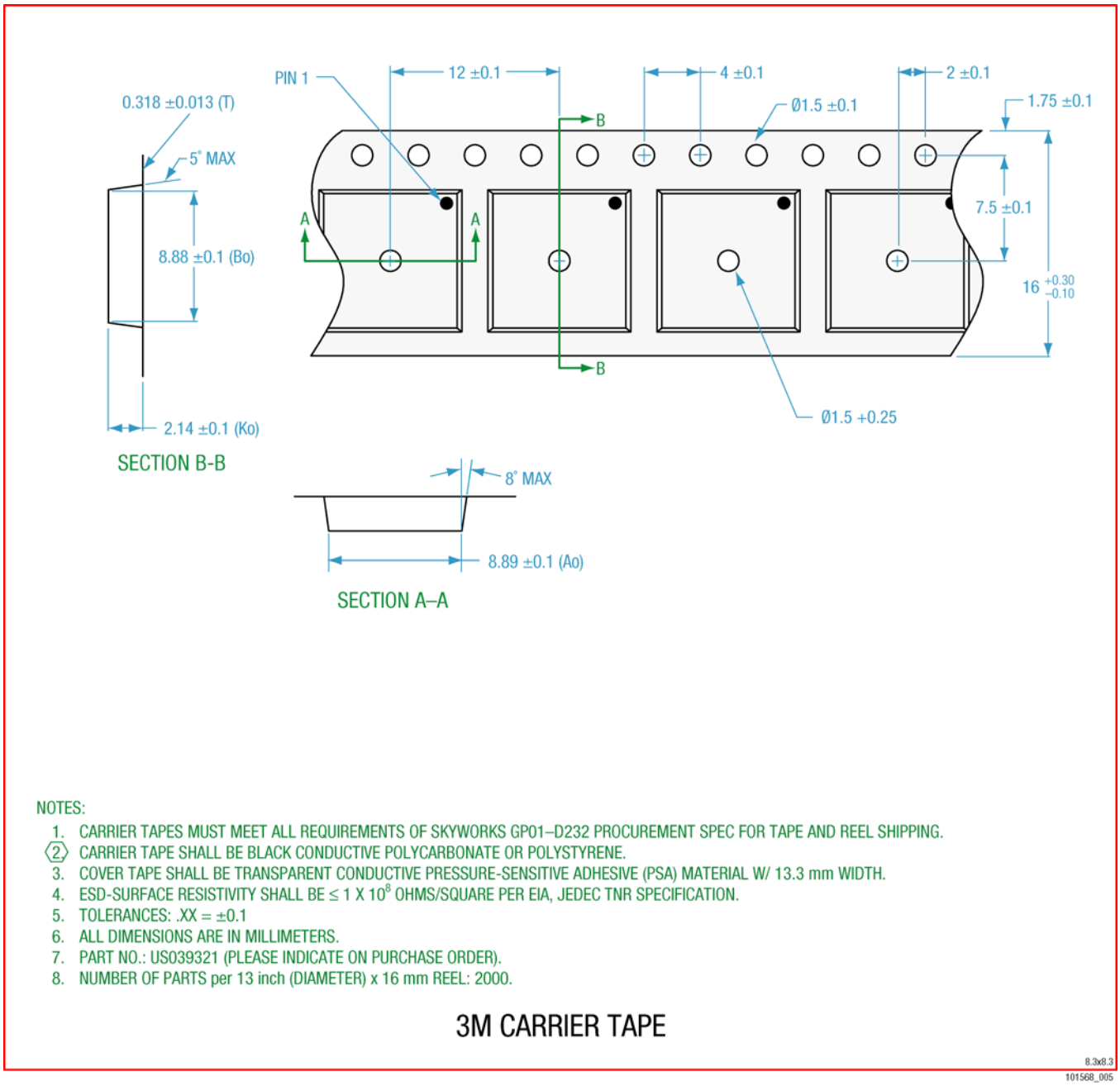

Figure 5. Carrier Tape Ceramic MCM – 8.3 x 8.3 mm Body Size

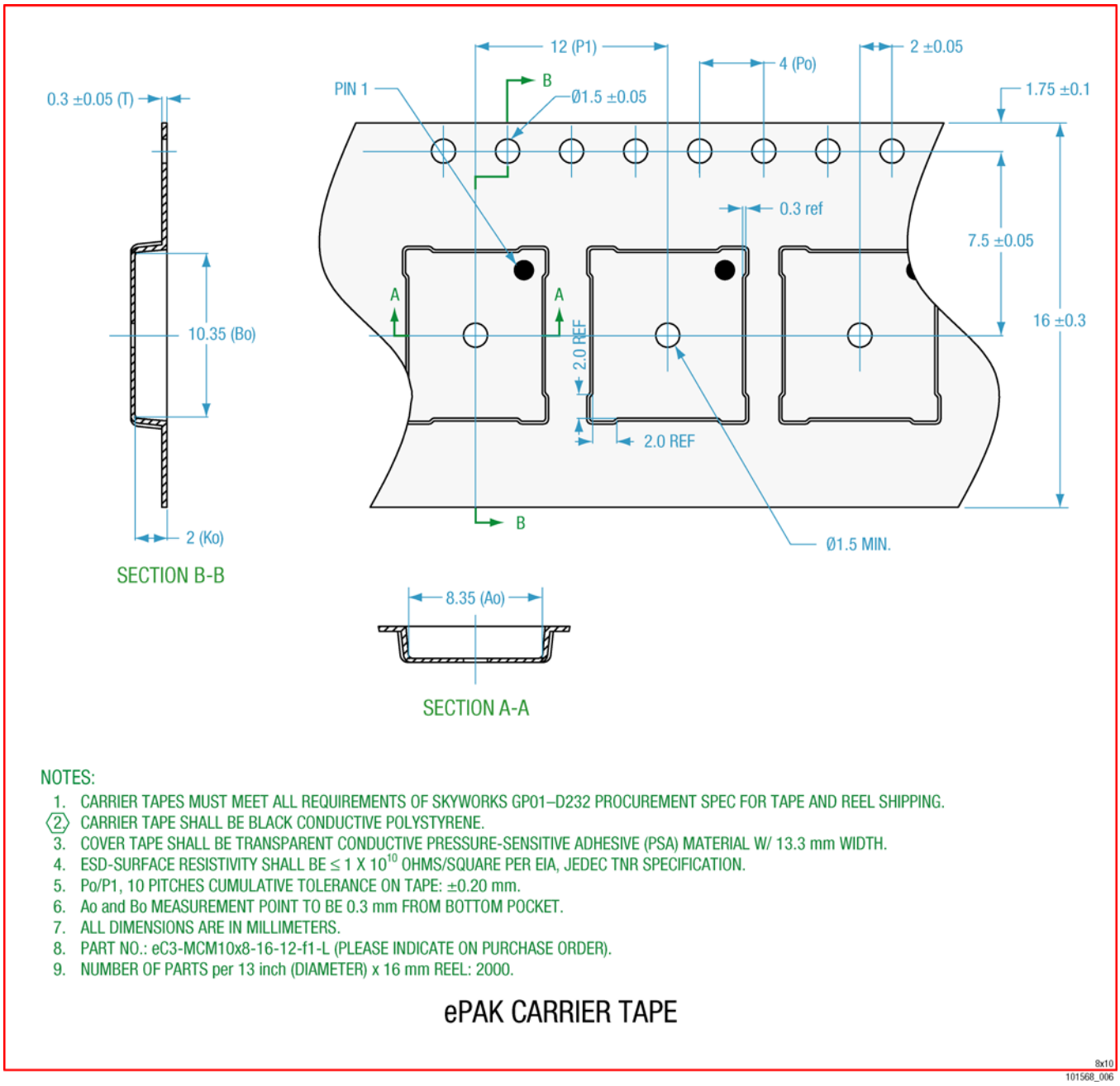

Figure 6. Carrier Tape Overmold MCM – 8.0 x 10.0 mm Body Size

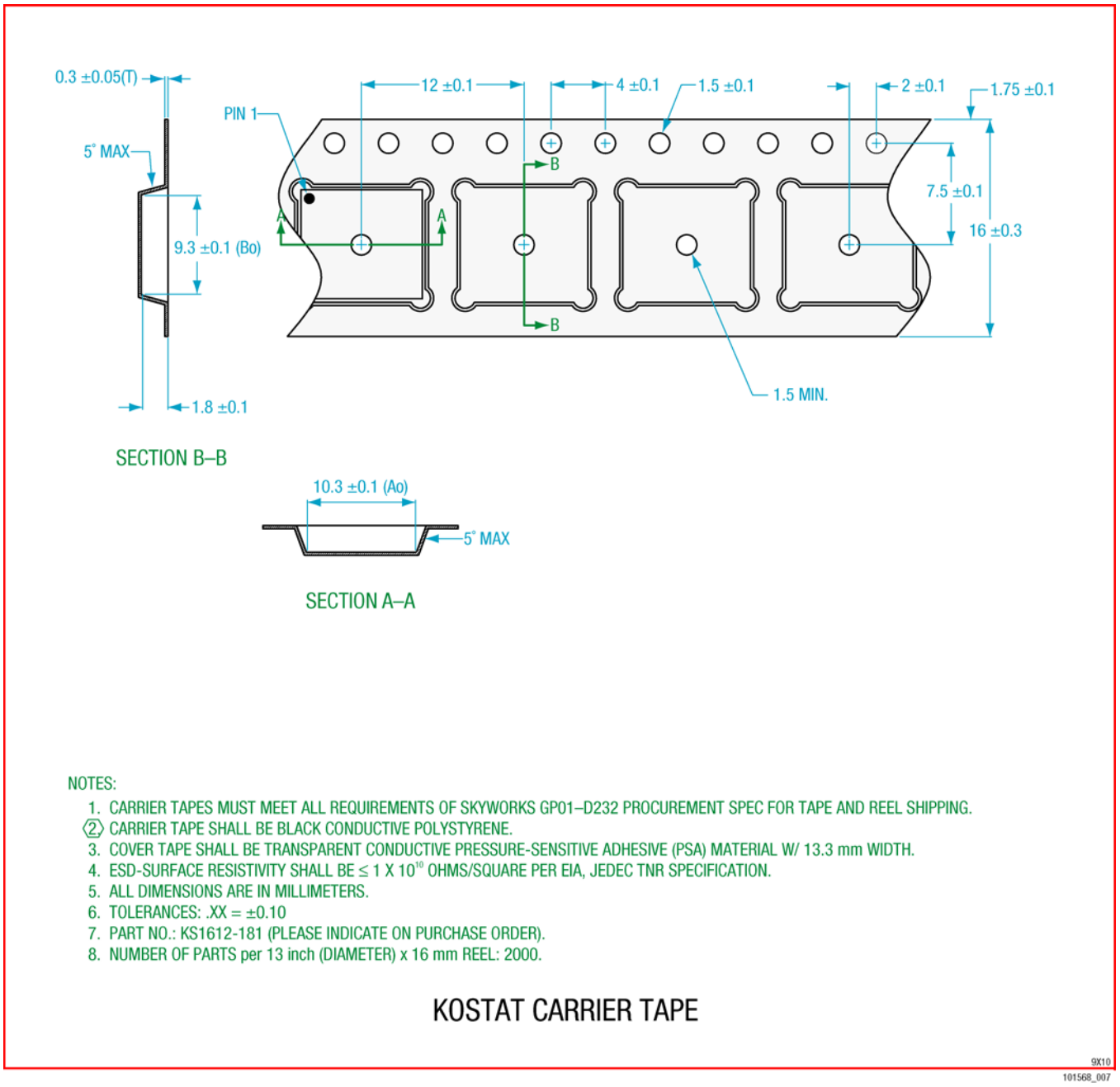

Figure 7. Carrier Tape Overmold MCM – 9.0 x 10.0 mm Body Size

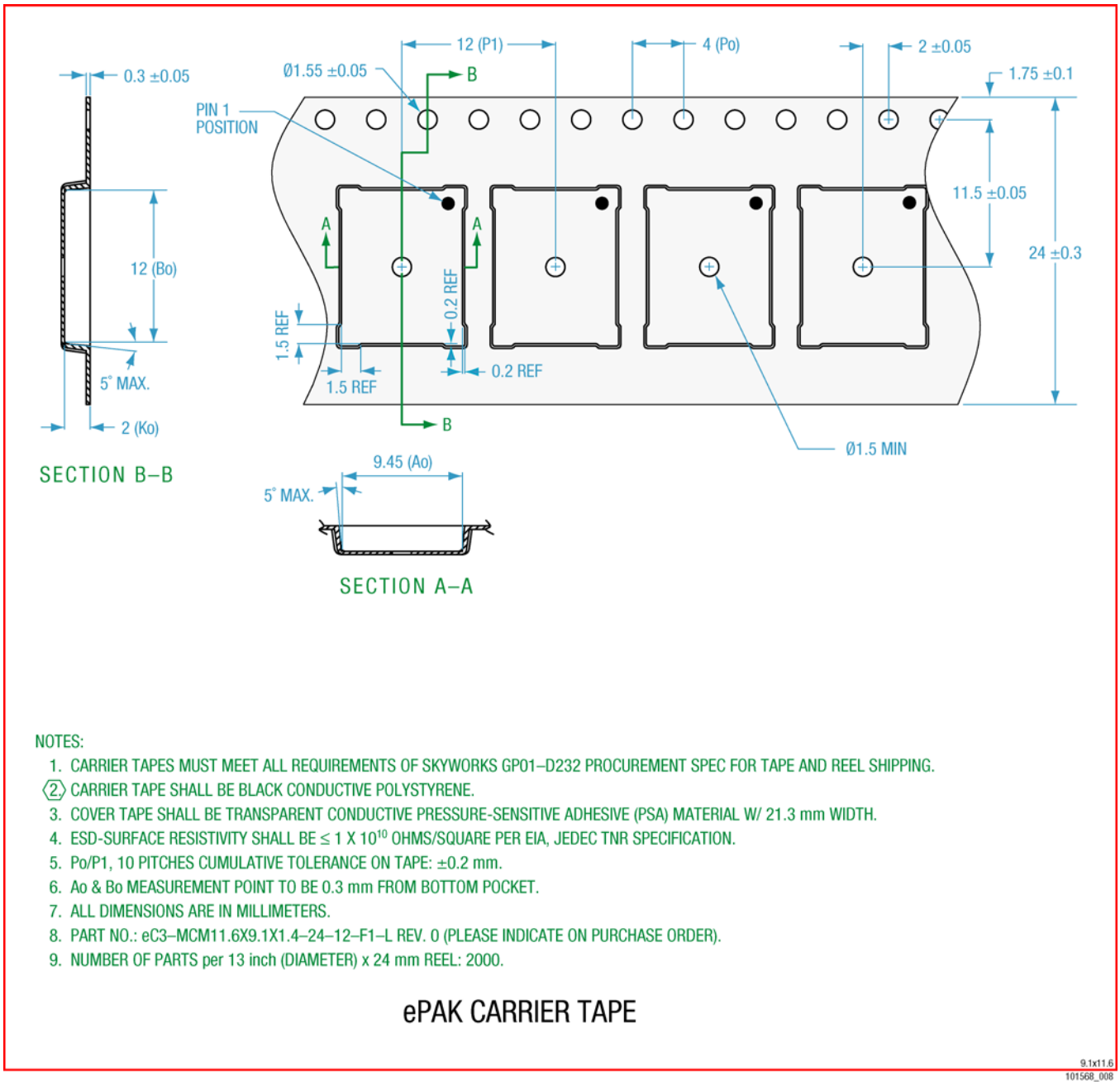

Figure 8. Carrier Tape Overmold MCM – 9.1 x 11.6 mm Body Size

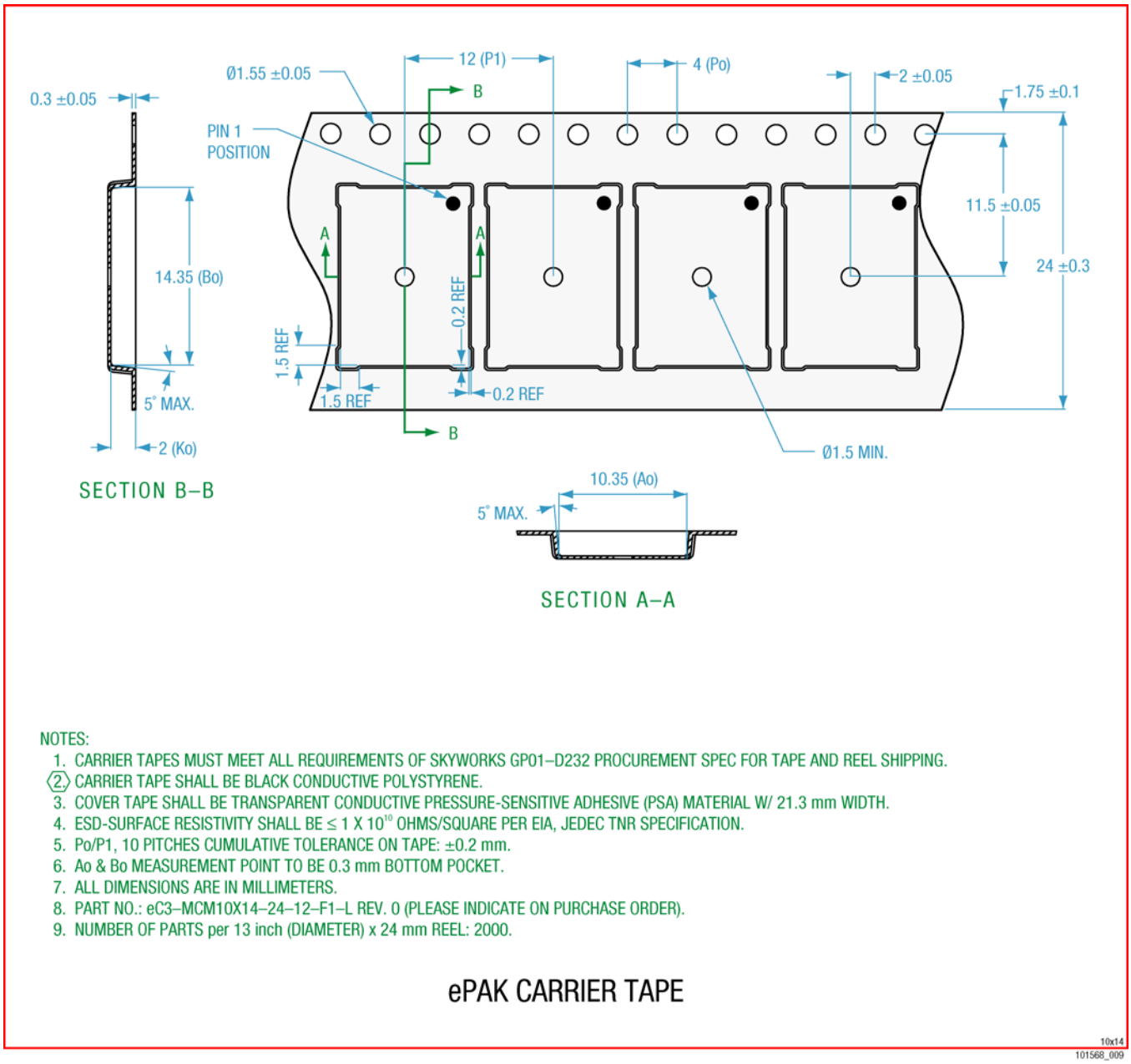

Figure 9. Carrier Tape Overmold MCM – 10.0 x 14.0 mm Body Size

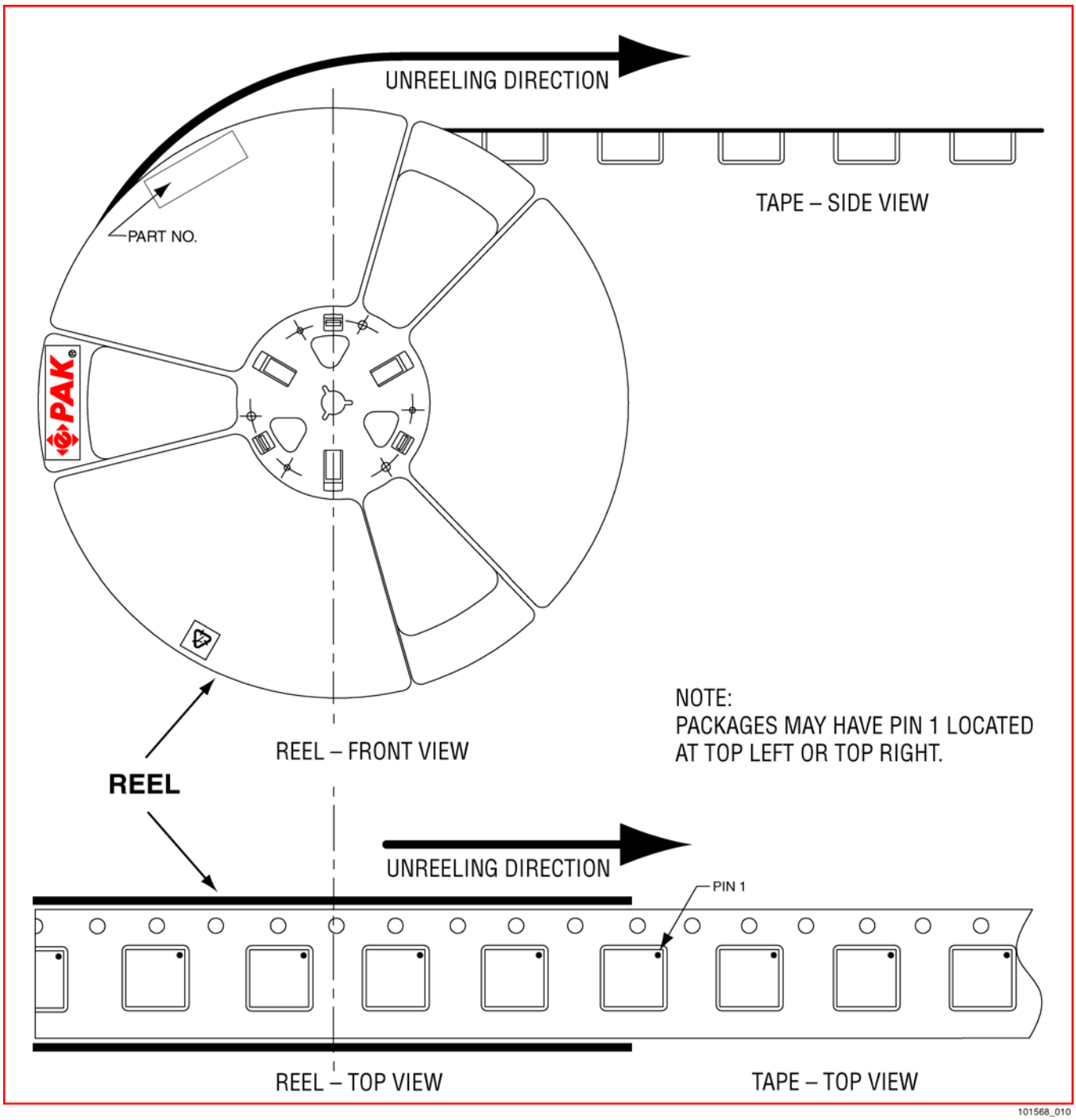

Figure 10. Tape-to-Reel Orientation, Unreeling Direction

General Information:
Skyworks Solutions, Inc.
20 Sylvan Road
Woburn, MA 01801
www.skyworksinc.com