

3M™ Polycarbonate Carrier 3002 R Series, 2D Barcode (3002UPR, 3002UBR, 3002XPR, 3002XBR, 3002NBR and 3002BDR)

Product Description

3M™ Polycarbonate Carrier 3002 R series, 2D Barcode helps customers with packaging and transporting thinner electrical and electronic devices with total thickness ≤ 0.15 mm in tape and reel. Each pocket is imprinted with a unique 2D Barcode either between the sprocket hole or the pocket on the crossbar for chip identification and traceability.

3M carrier 3002 R series features small pocket open radius design with tight pocket tolerances to allow better part capture, to improve component registration, and to help reduce thinner component tilting or migration issues. 3M carrier 3002UPR, 3002UBR, 3002XPR and 3002XBR offer 8mm width for small sized, thinner components, while 3M carrier 3002NBR and 3002BDR offer widths of 12 mm, 16 mm and 24 mm for bigger form factor. A smaller pocket hole capability is also available for vacuum designs to enhancing thin and small component stability during taping application.

3M carrier 3002UBR, 3002XBR and 3002BDR are recommended for cleanroom compatible applications

Construction

Embossed, heat-resistant, polycarbonate sheet

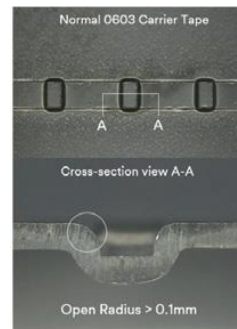
Product format

3M carrier 3002UPR, 3002XPR and 3002NBR are available as continuous, splice-free carriers in level winding format and on 330 mm (13") to 560 mm (22") plastic or recyclable cardboard reels. 3M carrier 3002UBR, 3002XBR and 3002BDR are available on plastic reels.

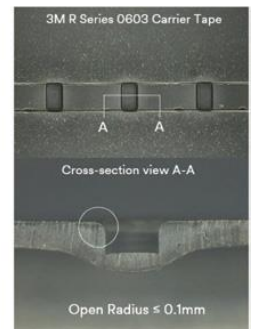
Planetary winding format is also available upon request. Reel capacity will typically be 500 m; exact lengths depend on the pocket depth, pitch and winding format.



3M™ Polycarbonate Carrier 3002 R series available in range of 8 mm – 24 mm wide in different pocket sizes to accommodate a variety of thin packages needs



3M™ Polycarbonate Ultra Precision Carrier 3002UP or 3002UB with 2D Barcode, 8mm carrier for component size 0603 mm.



3M™ Polycarbonate Ultra Precision Carrier 3002UPR or 3002UBR with 2D Barcode, 8mm carrier with improved pocket opening radius for component size 0603 mm.



3M™ Polycarbonate Carrier 3002 or 3M™ Polycarbonate Precision Carrier or 3002BD with 2D Barcode, 12 mm carrier with standard pocket opening radius



3M™ Polycarbonate Carrier 3002NBR or 3002BDR, 2D Barcode, 12 mm carrier with improved pocket opening radius

3M™ Polycarbonate Carrier 3002 R series, 2D Barcode, from 8 mm through 24 mm wide indicate sharper pocket opening.

3M™ Polycarbonate Carrier 3002 R Series, 2D Barcode

Product features

3M™ Polycarbonate Carrier 3002 R series, 2D Barcode incorporate features that are ideal for thin and/ or ultra-small components.

1. Small pocket open radius of ≤ 0.1 mm for 8mm 3M carrier 3002UPR, 3002UBR, 3002XPR and 3002XBR and ≤ 0.12 mm for 12 mm to 24 mm wide 3M carrier 3002NBR and 3002BDR, help minimize component tilting or slipping out of the pocket.
2. Tight pocket dimension tolerance for Ao, Bo and Ko (± 0.05 mm, ± 0.03 mm or ± 0.02 mm) with small side wall draft angles, enable better component fit inside the pockets.
3. Flat pocket bottom helps reduce component rotation, tilting and flipping occurrences for improved throughput.
4. A unique raised platform design helps reduce headspace between carrier and cover tape and also helps minimize component migration.
5. 3M carrier 3002UBR, 3002XBR and 3002BDR, available in a cleanroom compatible format, are cleaned and packaged in a cleanroom environment for protection from particle contamination. Each level winding or planetary reel is sealed individually into a static shielding bag for protection.
6. Unique 2D barcode chip identification and traceability for quality check & monitoring throughout the process up to final module assembly

3M Polycarbonate Carrier 3002 R series						
	3002XPR	3002XBR	3002UPR	3002UBR	3002NBR	3002BDR
Pocket opening radius	≤ 0.1 mm				≤ 0.12 mm	
Pocket dimension tolerance	± 0.02 mm		± 0.03 mm		± 0.05 mm	
Carrier width	8 mm				12 mm, 16 mm and 24 mm	
Raised platform design	Required		Preferred			
Cleanroom compatible	No	Yes	No	Yes	No	Yes

Typical mechanical properties – shrinkage

3M™ Polycarbonate Carrier 3002 R series, 2D Barcode exhibits shrinkage of less than 0.1% for P₀-10, even after 24 hours exposure at 85°C (185°F). This compares favorably to the EIA-481-F Standard which stipulates that the P₀-10, or ten-pitch tolerance, maintains a dimension of 40.0 mm \pm 0.2 mm, an implied tolerance of \pm 0.5%. Carrier shrinkage may result in problems with feeding, pocket position and, in the case of the pocket dimensions, parts sticking in the pockets. The extent of shrinkage in cold-formed polystyrene carrier pockets can be rapidly accelerated by exposure to elevated temperatures and will depend upon the duration of exposure and the maximum temperature reached.

Carrier P₀-10 shrinkage after 24 hours

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

Temperature	3M carrier 3002 R series	Typical polystyrene
52°C (126°F), 95%RH	<0.1%	<0.5%
85°C (185°F)	<0.1%	<0.5%

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Electrical properties

Electrical properties of 3M™ Polycarbonate Carrier 3002 R series, 2D Barcode help protect static-sensitive components through an effective balance between the electrostatic shielding and electrostatic decay properties of the carrier. 3M carrier 3002 R exhibits a nominal surface resistance of $1.0E4 \leq R_s < 1.0E11 \Omega$, which aligns to ANSI/ ESD S541 standard. 3M carrier tape 3002 R can dissipate charges accumulated due to triboelectric effects and is appropriate for packaging electrostatically sensitive chips.

Camber

3M carrier 3002 R meets the EIA-481-F Standard for camber which is not greater than 1 mm in 250 lineal mm in planetary format. For carrier in level winding format, camber will not be greater than 2 mm in 250 lineal mm.

Cover tape recommendations

Thin chip devices require extreme care during the de-taping process to prevent the components from bouncing out of the carrier and sticking to cover tape. Therefore, 3M™ Pressure Sensitive Adhesive Cover Tapes are recommended for these applications. 3M™ Static Dissipative Heat Activated Adhesive Cover Tapes are also suggested.

Typical physical properties and performance characteristics

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes. Final product specifications and testing methods will be outlined in the products Certificate of Analysis

(COA) that is provided once the product is approved by 3M for general commercialization and development work is completed.

Description	Type	Units	Typical Performance	Test Notes	Test Method
Material Properties	Type		Polycarbonate	1	
	Max, usable temperature	°C (°F)	125 (257)		
Physical Properties	Tensile strength (yield)	MPa (Kpsi)	57.2 (8.3)	2	ASTM-D638
	Tensile strength (break)	MPa (Kpsi)	57.2 (8.3)	2	ASTM-D638
	Impact strength	J/m(Ft-lb/in)	>70 (1.32)	3	ASTM-D256
	Camber (planetary format)	mm (in)	≤1.0 (0.039)	4	EIA-481-F
	Camber (level winding format)	mm (in)	≤2.0 (0.079)	4	EIA-481-F
	Optical	%	Opaque	5	ASTM-D1003
Electrical Properties	Resistance	Ohms	1.0×10^6	6	ANSI/ESD S541
	Static Decay	Second	0.01	7	3M test method
Chemical properties	Extractable Ionics	ppm	<5	8	3M test method
	(Cl ⁻ , NO ₃ ⁻ , SO ₄ ²⁻ , Na ⁺ , K ⁺ , Ca ²⁺)				
Product Format	Reel Type	Material	Reinforced cardboard or plastic		
	Reel hub inside diameter	mm (in)	76.2 (3.0)		
	Pockets per reel	Count	Varies per pitch		
	Length	m (f)	Varies per Ko & T ₁		

*Methods listed as ASTM are tested in accordance with the ASTM method noted

*Disclaimer if applicable to chart above

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Test notes

1. Engineering grade resin.
2. Tensile tests are conducted at 23°C (73°F), 50% RH under controlled conditions with a constant rate of jaw separation of 50 mm/minute from an initial separation of 115 mm. Yield strength is the force which produces 5% elongation of the sample. Breaking strength is the ultimate strength for the material at the break point. Impact strength testing utilizes a mandrel to hold a section of the material under test. A weight is allowed to strike the material from a known radius and after the strike the swing is measured vs free swing and the strength of the material is calculated from the difference.
3. Camber is a measurement of the weave of the material. Measured over a 250 mm length.
4. Optical properties are measured using a BYK-Gardner Haze-Gard Plus Transmission Meter, Model 4725.
5. Resistance tests are conducted at 23°C (73°F), 50% RH under controlled conditions by resistance meter. Resistance is measured at the sealing surface of a typical carrier using the defined test method. Specification tolerances for this carrier is $1.0E4 \Omega \leq R_s < 1.0E11 \Omega$.
6. Static decay is measured at carrier tape samples, with an Electrotech Systems Static Decay Meter Model 406-C under room condition.
7. 3M test method was used for the micro-contamination test for 3M carrier tapes.

Storage and Shelf Life

3M™ Polycarbonate Carrier 3002 R series (3002UPR, 3002UBR, 3002XPR, 3002XBR, 3002NBR and 3002BDR), 2D Barcode should be stored indoors, in its original packaging, in a controlled climate environment, typically at or below 35°C (95°F) and 70% relative humidity. The product must be protected from exposure to direct sunlight. Exposure to elevated humidity reduces the compressive strength of corrugated, cardboard containers. The recommended stacking height must be followed to avoid damaging the packaged product. It is recommended that the product be used on a “first-in, first-out” basis.

The shelf life of 3M carrier 3002 R series, 2D Barcode is five years from the date of manufacture when stored according to the recommended storage conditions above.

Certificate of Analysis (COA)

The 3M Certificate of Analysis (COA) for this product is established when the product is manufactured and deemed commercially available from 3M. The COA contains the 3M test methods, specifications limits and test results for the product's performance attributes that the product will be supplied against. Contact your local 3M representative for this product's COA.

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Safety Data Sheet: Consult Safety Data Sheet before use.

Regulatory: For regulatory information about this product, contact your 3M representative.

Technical Information: The technical information, recommendations and other statements contained in this document are based upon tests or experience that 3M believes are reliable, but the accuracy or completeness of such information is not guaranteed.

Product Use: Many factors beyond 3M's control and uniquely within user's knowledge and control can affect the use and performance of a 3M product in a particular application. Given the variety of factors that can affect the use and performance of a 3M product, user is solely responsible for evaluating the 3M product and determining whether it is fit for a particular purpose and suitable for user's method of application.

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