

Y5V Dielectric, 6.3 – 50 VDC (Commercial Grade)



Overview

Benefits

- Lead (Pb)-free, RoHS and REACH compliant
- EIA 0402, 0603, 0805, 1206, and 1210 case sizes

Applications

and bypass.

for excellent solderability



Ordering Information

C	1210	C	226	Z	4	V	A	C	TU
Ceramic	Case Size (L" x W")	Series	Capacitance	Capacitance Tolerance	Rated (VDC)	Dielectric			Grade (C-Spec) ¹
	0402 0603 0805 1206 1210	C = Standard	of zeros		9 = 6.3 8 = 10 4 = 16 3 = 25 5 = 50	V = Y5V	A = N/A		See C-Spec Options Table" below

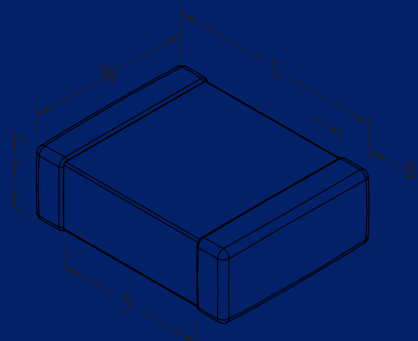
¹!Beejujpbolufsn jobujpo!Jojt i!pqujpot! n bz!c f!bwbjnbcnf!!Dpoubdu!LFNFU!gps!e fubjnt/

Packaging C-Spec Ordering Options Table

Packaging Type ¹	Packaging/Grade Ordering Code (C-Spec)
	7411 (EIA 0603 and smaller case size)
7" Reel/Marked	TM
13" Reel/Marked	7040 (EIA 0603 and smaller case size)
²	7081
²	7082

!Efgbvmlqbd l bhjohlj t!#Cvr l!Cbh#!Bo!pse fsjohldpe f!D.Tq fd!jt!lopulsf r vjsf elgps!#Cvr l!Cbh#lqbd l bhjoh/
 !U i f!u fs n t!#Nbs l fe!boel#Vo n bsl fe!q f subjolup!bt fsl n bsl joh!pqjpo!pg!dbqbdjups t!Bmlqbd l bhjoh!pqjpo t!m bc f#f e!bt!#Vo n bsl fe!x jml!dpoubjo!dbqbdjups t!
 u i bul i bwf!opulc f fo!bt fsl n bsl fe!Qr fbt f!dpoubdul!LFNFU!jglzpvlsf r vjsf!b!bt fsl n bsl f elpqjpo!Gps!n psf!jogps n bujpo!t f f!#Dbqbdjups!Nbs l joh#/
 ?U i f!3!n n!qjud i!pqjpo!b!mp x t!gps!epvc!f!u i f!qbd l bhjoh!r vboujuz!pg!dbqbdjups t!polbhjw f!osf f!t j!f!U i j t!pqjpo!j t!nj n ju f elup!FJB!1714!2719!n fusjd!dbt f!
 t j!f le fwj d f t!Gps!n psf!jogps n bujpo!s f hbsejoh!3!n n tqjud i!pqjpo!t f f!#Ubq f! !S f f!Qbd l bhjoh!ogps n bujpo#

Dimensions – Millimeters (Inches)



EIA Size Code	Metric Size Code	L Length	W Width	T Thickness	B Bandwidth	S Separation Minimum	Mounting Technique
0402	1005	1.00 (0.040) ±0.05 (0.002)	0.50 (0.020) ±0.05 (0.002)	See Table 2 for	0.30 (0.012) ±0.10 (0.004)	0.30 (0.012)	Only
0603	1608	1.60 (0.063) ±0.15 (0.006)	0.80 (0.032) ±0.15 (0.006)		0.35 (0.014) ±0.15 (0.006)	0.70 (0.028)	Solder Wave o
0805	2012	2.00 (0.079) ±0.20 (0.008)	1.25 (0.049) ±0.20 (0.008)		0.50 (0.02) ±0.25 (0.010)	0.75 (0.030)	
1206	3216	3.20 (0.126) ±0.20 (0.008)	1.60 (0.063) ±0.20 (0.008)		0.50 (0.02) ±0.25 (0.010)	N/A	Only
1210	3225	3.20 (0.126) ±0.20 (0.008)	2.50 (0.098) ±0.20 (0.008)		0.50 (0.02) ±0.25 (0.010)		

Qualification/Certification

Environmental Compliance

Electrical Parameters/Characteristics

Item	Parameters/Characteristics
1	
2	
3	
4	

¹ S f h b s e j o h ! B h j o h ! S b u f ! ! D b q b d j u b o d f ! n f b t v s f n f o u t ! ! j o d r v e j o h ! u p r f s b o d f * l b s f ! j o e f y f e ! u p ! b l s f g f s f f ! u j n f ! p g ! 5 9 ! p s ! 2 - 1 1 1 ! i p v s t ! ! Q m f b t f ! s f g f s ! u p ! b ! q b s u ! o v n c f s ! t q f d j d l e b u b t i f f u l g p s l s f g f s f f ! u j n f l e f u b j n t /

² E X W j t ! u i f ! w p n u b h f ! b ! d b q b d j u p s ! d b o ! x j u i t u b o e ! ! t v s w j w f * l g p s ! b ! t i p s u ! q f s j p e ! p g ! u j n f ! ! J u ! f y d f f e t ! u i f ! o p n j o b ! ! b o e ! d p o u j o v p v t ! x p s ! j o h ! w p n u b h f ! p g ! u i f ! d b q b d j u p s /

⁴ D b q b d j u b o d f ! b o e ! e j t t j q b u j p o ! g b d u p s ! ! E G * ! n f b t v s f e ! v o e f s l u i f ! g p m p x j o h ! d p o e j u j p o t ;

! 2 1 l { ! 2 1 6 1 l { ! b o e ! 2 / 1 1 2 1 / 3 ! W s n t ! j g ! d b q b d j u b o d f ! E 2 1 ! G

! 2 3 1 l { ! 2 1 2 1 l { ! b o e ! 1 / 6 ! 2 1 1 / 2 ! W s n t ! j g ! d b q b d j u b o d f ! 2 2 1 ! G

⁵ U p ! p c u b j o ! ! S h j n j u - l e j w j e f ! N ù . ! G l w b v f ! c z l u i f ! d b q b d j u b o d f ! b o e ! d p n q b s f ! u p ! H ù ! n j n j u ! ! T f n f d u l u i f ! n p x f s ! p g ! u i f ! u x p ! n j n j u t /

O p u f ; ! X i f o ! n f b t v s j o h ! d b q b d j u b o d f ! j u l t l j n q p s u b o u ! u p ! f o t v s f ! u i f ! t f u ! w p n u b h f ! n f w f n ! j t ! i f n e ! d p o t u b o u ! ! U i f ! ! Q 5 3 9 5 ! * ! B h j n f o u ! F 5 : 9 1 ! i b w f ! b ! g f b u v s f ! ! o p x o ! b t !

B v u p n b u j d ! M f w f n ! D p o u s p ! ! B M D * ! ! U i f ! B M D ! g f b u v s f ! t i p v m e ! c f ! t x j u d i f e ! u p ! # P O # /

Post Environmental Limits

High Temperature Life, Biased Humidity, Moisture Resistance					
Dielectric	Rated DC	Capacitance		Capacitance	Resistance
Y5V	> 25	All		7.5	Limit
	16/25			10.0	
	< 16			15.0	

Insulation Resistance Limit Table

EIA Case Size	100 Megohm Microfarads or 10 GΩ	50 Megohm Microfarads or 10 GΩ
All		

Table 2A – Chip Thickness/Tape & Reel Packaging Quantities

Thickness Code	Case Size ¹	Thickness ± Range (mm)	Paper Quantity ¹		Plastic Quantity	
			7" Reel	13" Reel	7" Reel	13" Reel
BB	0402	0.50±0.05	10,000	50,000	0	0
	0603	0.80±0.07*	4,000	15,000	0	0
CG	0603	0.80±0.10*	4,000	15,000	0	0
	0805	0.78±0.10*	4,000	15,000	0	0
DO	0805	0.80±0.10*	4,000	15,000	0	0
	0805	0.90±0.10*	4,000	15,000	0	0
DL	0805	0.95±0.10	0	0	4,000	10,000
	0805	1.10±0.10	0	0	2,500	10,000
DG	0805	1.25±0.15	0	0	2,500	10,000
	1206	0.78±0.10	4,000	10,000	4,000	10,000
EC	1206	0.90±0.10	0	0	4,000	10,000
	1206	1.00±0.10	0	0	2,500	10,000
EP	1206	1.20±0.20	0	0	2,500	10,000
	1206	1.25±0.15	0	0	2,500	10,000
EH	1206	1.60±0.20	0	0	2,000	8,000
	1206	1.70±0.20	0	0	2,000	8,000
	1210	0.95±0.10	0	0	4,000	10,000
	1210	1.00±0.10	0	0	2,500	10,000
	1210	1.10±0.10	0	0	2,500	10,000
	1210	1.25±0.15	0	0	2,500	10,000
	1210	1.55±0.15	0	0	2,000	8,000
	1210	1.85±0.20	0	0	2,000	8,000
	1210	1.90±0.20	0	0	2,000	8,000
	1210	2.50±0.30	0	0	1,000	4,000
	1210	2.50±0.30	0	0	1,000	4,000
Thickness Code	Case Size ¹	Thickness ± Range (mm)	7" Reel	13" Reel	7" Reel	13" Reel
			Paper Quantity ¹		Plastic Quantity	

Qbd l bhf! r vboujuz! cbt fel! pol! Jojt i feld i jql! i jd l of t t! tq f dj! Jdb! jpot /

!Ug! pse f sjoh! v t joh! u i f! 3! n n! Ubq f! boel! S f f! tqjud i! pqujpo! t f! qbd l bhjoh! r vboujuz! pvunjo f e! jo! u i f! lbcnf! bcpwf! x jmtcf! epvcnf e! /U i jt! pqujpo! jt! nj n ju felup! FJB! 1714!) 2719! n fusjd! ldbt f! t j { fle fwjdf t! /Gps! n psf! jogps n bujpos! f hbsejoh! 3! n n! tqjud i! pqujpo! t f f! Ubq f! ' IS f f! Qbd l bhjoh! Jogps n bujpo! t /

Table 2B – Bulk Packaging Quantities

Packaging Type		Loose Packaging	
		N/A ²	
Case Size		Packaging Quantities (pieces/unit packaging)	
EIA (in)	Metric (mm)	1	50,000
0402	1005		
0603	1608		
0805	2012		
1206	3216		
1210	3225		
1808	4520		
1812	4532		
1825	4564		
2220	5650		
2225	5664		
		20,000	

¹U i f!#Qbd l bhjoh!D. Tq f d!jt lb!5!up!9!ejhjuldp e f!x i jd i!je foujJ f t!u i f!qbd l bhjoh!uzq f!boe0ps!qspevdu!hsbe f!/X i f o!pse f sjoh-lu i f!qspq f!sdpe f!n vt!tcf! jod rve fe!joh!u i f!26u i lu i spvh i!33oeld i bsbduf!sqpt jujpo t!pglu i f!pse f sjoh!dpe f!T f f!#Pse f sjoh!Jogps n bujpo#!t fdujpo!pglu i jt!epdv n fou!gps!gvsu i fs!e fubjnt!/ Dp n n fsdjbn!Hsbe f!qspevdu!pse f s f e!x ju i pvu!b!qbd l bhjoh!D. Tq f d!x j m!e f gbv!u!up!pvst!tuboebse!#Cv!l!Cbh#!qbd l bhjoh!/Dpoubdu!LFNFU!jg!zpv!s f r vjs f!b!cv!l! cbh!qbd l bhjoh!pqujpo!gps!Bvup n pujwf!Hsbe f!qspevdu t/

²B!qbd l bhjoh!D. Tq f d!)t f f!opu f!2!bcpw f!jt!lopuls f r vjs f e!gps!#Cv!l!Cbh#!qbd l bhjoh!)fydrve joh!Bouj. Tubujd!Cv!l!Cbh!boe!Bvup n pujwf!Hsbe f!qspevdu t*!U i f! 26u i lu i spvh i!33oeld i bsbduf!sqpt jujpo t!pglu i f!pse f sjoh!dpe f!t i pv!e!tcf!m fgu!c!r!bo l /!Bm!qspevdu!pse f s f e!x ju i pvu!b!qbd l bhjoh!D. Tq f d!x j m!e f gbv!u!up!pvst! tuboebse!#Cv!l!Cbh#!qbd l bhjoh!/

Table 3 – Chip Capacitor Land Pattern Design Recommendations per IPC-7351

EIA Size Code	Metric Size Code	Density Level A: Maximum (Most) Land Protrusion (mm)					Density Level B: Median (Nominal) Land Protrusion (mm)					Density Level C: Minimum (Least) Land Protrusion (mm)				
		C	Y	X	V1	V2	C	Y	X	V1	V2	C	Y	X	V1	V2
0402	1005	0.50	0.72	0.72	2.20	1.20	0.45	0.62	0.62	1.90	1.00	0.40	0.52	0.52	1.60	0.80
0603	1608	0.90	1.15	1.10	4.00	2.10	0.80	0.95	1.00	3.10	1.50	0.60	0.75	0.90	2.40	1.20
0805	2012	1.00	1.35	1.55	4.40	2.60	0.90	1.15	1.45	3.50	2.00	0.75	0.95	1.35	2.80	1.70
1206	3216	1.60	1.35	1.90	5.60	2.90	1.50	1.15	1.80	4.70	2.30	1.40	0.95	1.70	4.00	2.00
1210	3225	1.60	1.35	2.80	5.65	3.80	1.50	1.15	2.70	4.70	3.20	1.40	0.95	2.60	4.00	2.90
1210	3225	1.50	1.60	2.90	5.60	3.90	1.40	1.40	2.80	4.70	3.30	1.30	1.20	2.70	4.00	3.00

1 Poiz!gps!dbqbdjubod f!wbv f t!F331!G

Density Level A:!Gps!p x .e f o t j u z!q s p e v d u!b q q i d b u j p o t! /S f d p n n f o e f e!g p s! x b w f! t p r e f s!b q q i d b u j p o t! b o e!q s p w j e f t! b! x j e f s!q s p d f t t! x j o e p x! g p s! f! b p x! t p r e f s!q s p d f t t t! /L F N F U! p o r z! s f d p n n f o e t! x b w f! t p r e f s! j o h! p g! F J B! 1 7 1 4 -! 1 9 1 6 -! b o e! 2 3 1 7! d b t f! t j! { f t /

Density Level B: Gps!q s p e v d u! t x j u i! b! n p e f s b u f! n f w f! p g! d p n q p o f o u l e f o t j u z! Q s p w j e f t! b! s p c v t! t p r e f s! b u u b d i n f o u l d p o e j u p o! g p s! f! b p x! t p r e f s! q s p d f t t t t /

Density Level C:!Gps!i j h! i d p n q p o f o u l e f o t j u z!q s p e v d u!b q q i d b u j p o t! /C f g p s! f! b e b q! j o h! u i f! n j o j n v n! b o e! q b u u f s o! w b s j b u j p o t! u i f! v t f s! t i p v r e! q f s g p s n! r v b j J d b u j p o! u f t u j o h! c b t f e! p o! u i f! d p o e j u p o t! p v u j o f e! j o! Q D! T u b o e b s e! 8 4 6 2! / Q D A 8 4 6 2 * /

J n b h f c f p x! c b t f e! p o! E f o t j u z! M f w f! C! g p s! b o! F J B! 2 3 2 1! d b t f! t j! { f /

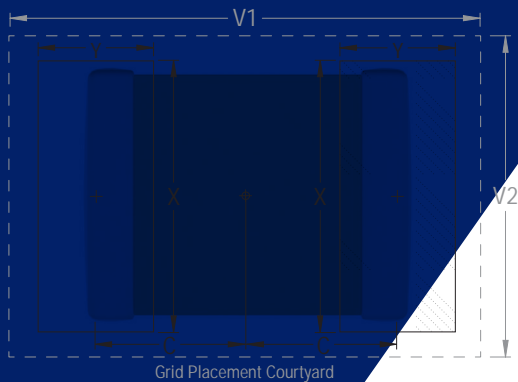
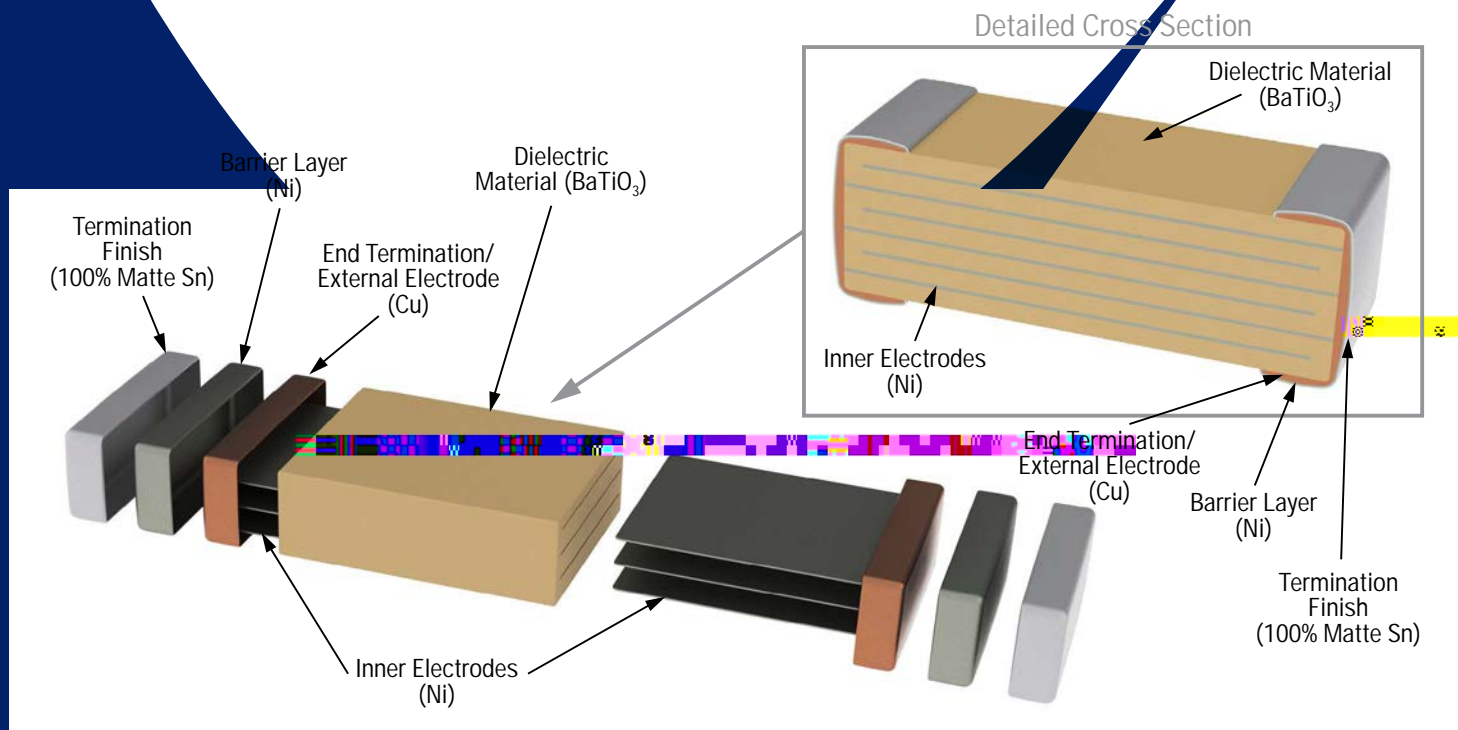


Table 4 – Performance & Reliability: Test Methods and Conditions

Stress	Reference	Test or Inspection Method
Solderability		
	103	
	106	
	107	
	108 /EIA-198	
Vibration	108	
	204	
	213	
Resistance to Solvents	215	

Storage and Handling

Construction (Typical)



Capacitor Marking (Optional):

- EIA 0402 case size devices

Tape & Reel Packaging Information

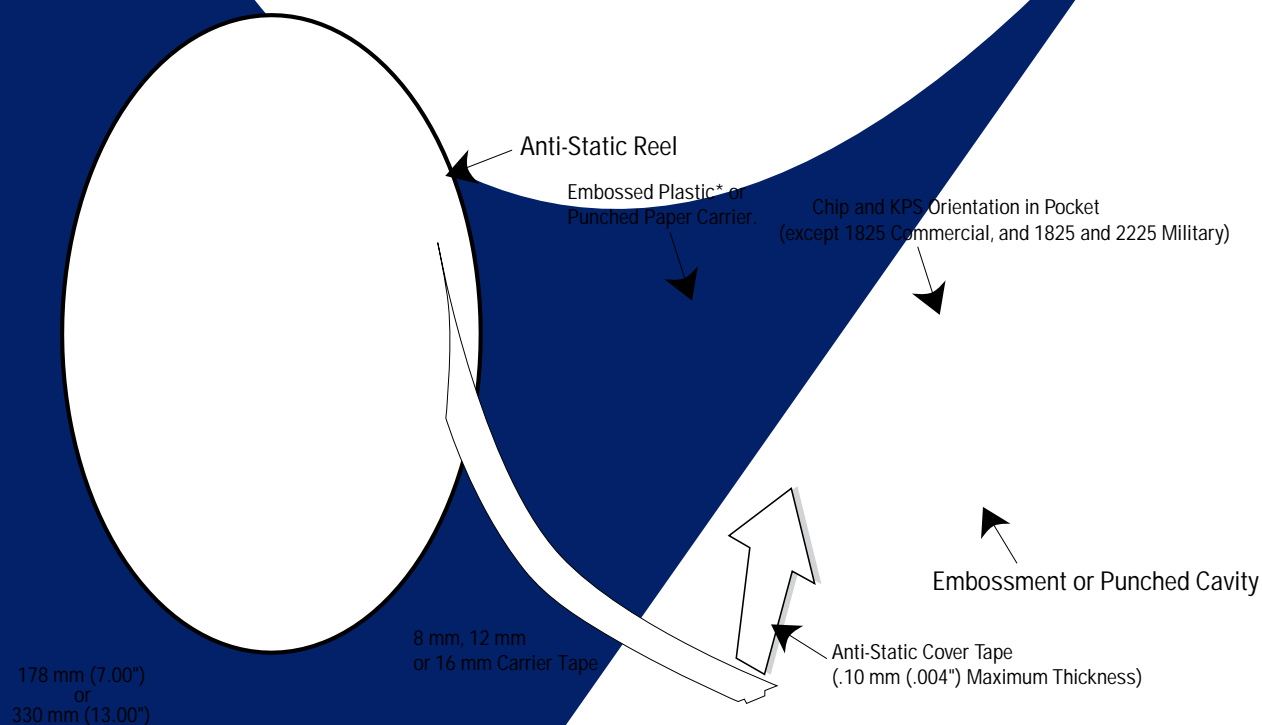


Figure 1 – Embossed (Plastic) Carrier Tape Dimensions

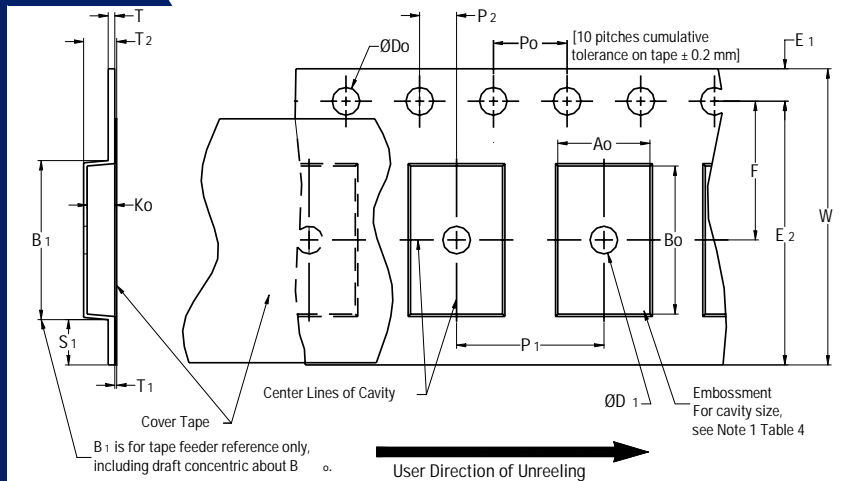


Table 6 – Embossed (Plastic) Carrier Tape Dimensions

Constant Dimensions – Millimeters (Inches)									
Tape Size	D ₀	D ₁ Note 1	E ₁	P ₀	P ₂	R Referenc Note 2	S ₁ Note 3	T	T ₁
8 mm	0.0)	1.0 (0.039)	1.75 ± 0.10 (0.069 ± 0.004)	4.0 ± 0.10 (0.157 ± 0.004)	2.0 ± 0.05 (0.079 ± 0.002)	25.0 (0.984)	0.600 (0.024)	0.600 (0.024)	0.100 (0.004)
12 mm		1.5 (0.059)				30 (1.181)			
16 mm									
Variable Dimensions – Millimeters (Inches)									
Tape Size	B ₁ Note 4	E ₂	P ₁	T ₂	W	A ₀ , B ₀ , ø			
8 mm	4.35 (0.171)	6.25 (0.246)	3.5 ± 0.05 (0.138 ± 0.002)	4.0 ± 0.10 (0.157 ± 0.004)	2.5 (0.098)	8.3 (0.327)			
12 mm	8.2 (0.323)	10.25 (0.404)	5.5 ± 0.05 (0.217 ± 0.002)	8.0 ± 0.10 (0.315 ± 0.004)	4.6 (0.181)	12.3 (0.484)			
16 mm	Triple (12 mm) 12.1 (0.476)	14.25 (0.561)	7.5 ± 0.05 (0.138 ± 0.002)	12.0 ± 0.10 (0.157 ± 0.004)	4.6 (0.181)	16.3 (0.642)			

2/!U i f! f n cpt t n fou! i pnf! pdbujpo! t i bmm! c f! n fbt vsf e! gsp n lu i f! tqspdl fu! i pnf! dpouspmmjoh! lu i f! pdbujpo! pg! lu i f! f n cpt t n fou! E! j n fot jpot! pg! f n cpt t n fou!
 pdbujpo! boe! i pnf! pdbujpo! t i bmm! c f! bqjnj f e! j Joe f q fo e fou! pg! f bdi! pu i f s/
 3/!U i f! ubq f! x ju i! ps! x ju i! pvu! dp n qpo fou! t t i bmm! qb t! bspvoe! S! x ju i! pvu! eb n bh f! t f! G! jhvs f! 7*!
 4/!U! j T₁ = 12/1! n n - lu i f s! f! n bz! opu! c f! fopvh i! bsb! b! gps! dpw f! slubq f! lup! c f! qspq f! sz! b! qjnj f e! t f! F! J! B! T! uboebse! 592! qb! sbhsbq i! 5/4! t f! dujpo! c*!
 5/!C! j! e! n f o t j! po! j! t! b! s! f! g! f! s! f! o! d! f! e! j! n f o t j! po! g! ps! l! ubq f! g! f! f e! f! s! d! n f! b! sbod f! po! z!
 6/!U i f! dbw! j! z! e! f! Jo! r! e! c! z! B₁ - C₁! boe! L₁! t i bmm! t vss! pvoe! lu i f! dp n qpo fou! x ju i! t! v! g! J! dj! f! ou! d! n f! b! sbod f! lu i! b;!
 !) b*! lu i f! dp n qpo fou! lep f! t! opu! q! sp! us! ve! f! b! cpw f! lu i f! lup! q! t! vs! g! b! d f! pg! lu i f! db! ss! f! s! l! ubq f! /
 !) c*! lu i f! dp n qpo fou! d! bo! t! c! f! s! f! n p! w! f! e! g! sp n lu i f! dbw! j! z! o! b! w! f! s! u! j! d! b! n! e! j! s! f! dujpo! x ju i! pvu! n f! d! i! bo! j! d! b! n! s! f! t! us! j! dujpo! - l! b! g! u! f! s! lu i f! lup! q! d! p! w! f! slubq f! i! b! t! c! f! f! o! s! f! n p! w! f! e! /
 !) d*! sp! ub! j! po! pg! lu i f! dp n qpo fou! j! t! n! j! n j! u! f! e! lup! 31! ±! n! by! j! n v n! ! g! ps! 9! boe! 23! n n! ! ubq f! t! boe! 21! ±! n! by! j! n v n! ! g! ps! 27! n n! ! ubq f! t! t f! G! j! h! v! s! f! 4*!
 !) e*! n! b! u! f! s! b! n! n! p! w! f! n fou! pg! lu i f! dp n qpo fou! j! t! s! f! t! us! j! du! f! e! lup! 1/6! n n! ! by! j! n v n! ! g! ps! 9! boe! 23! n n! ! x! j! e! f! ! ubq f! ! boe! lup! 2/1! n n! ! by! j! n v n! ! g! ps! 27! n n! ! ubq f! t! t f! f! /
 G! j! h! v! s! f! 5*!
 !) f*! ! g! ps! L! Q! T! T! f! s! j! f! t! q! s! p! e! v! du! - B₁ boe! C₁! b! s! f! n f! b! t! v! s! f! e! po! b! q! i! bo! f! 1/4! n n! ! b! c! p! w! f! lu i f! c! pu! up n! pg! lu i f! q! p! d! l! fu! /
 !) g*! t! f! f! B! ee! f! o! e! v! n! j! o! F! J! B! T! uboebse! 592! ! g! ps! t! uboebse! t! s! f! n! bu! j! oh! lup! n! p! s! f! q! s! f! d! j! t! f! ! ubq! j! oh! s! f! r! v! j! s! f! n fou! /

Packaging Information Performance Notes

1. Cover Tape Break Force:
2. Cover Tape Peel Strength:

Tape Width	Peel Strength
8 mm	
12 and 16 mm	

3. Labeling:

Tuboebse t!667!boe!735.

Sfgfs!up!FJB!

Figure 3 – Maximum Component Rotation

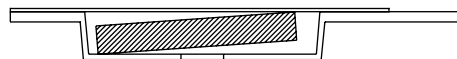
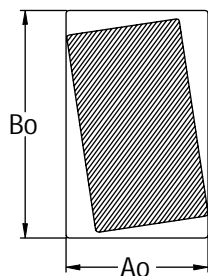
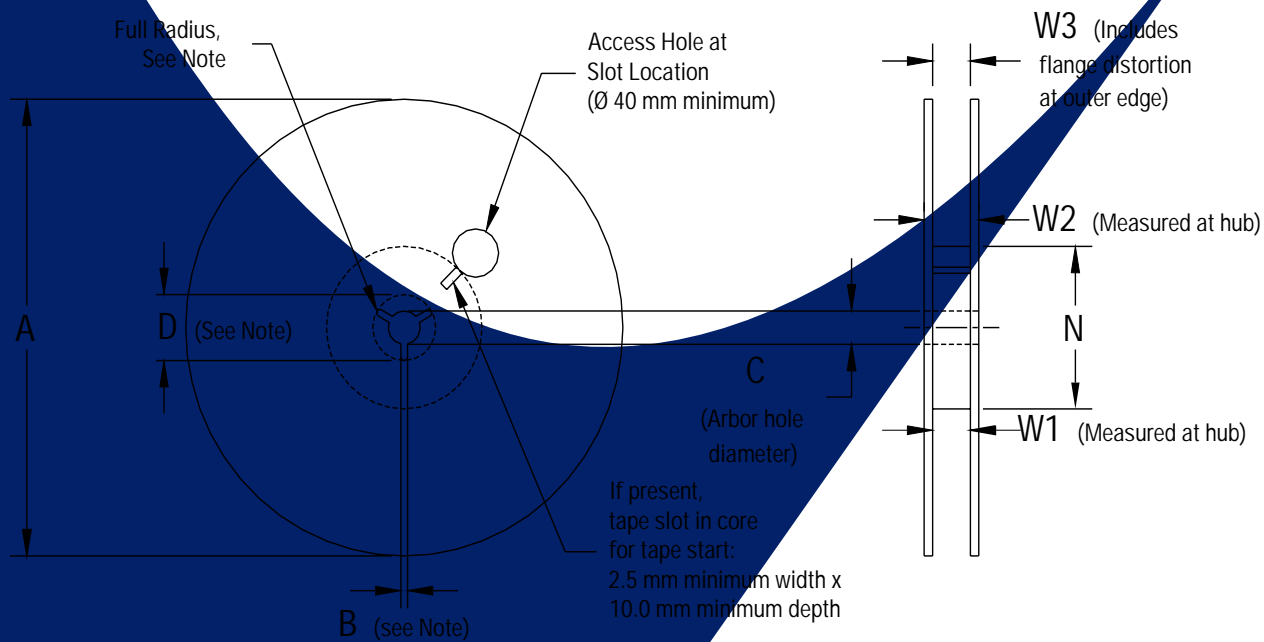


Figure 6 – Reel Dimensions



Note: Drive spokes optional: if used, dimensions B and D shall apply.

Table 8 – Reel Dimensions

Figure 7 – Tape Leader & Trailer Dimensions

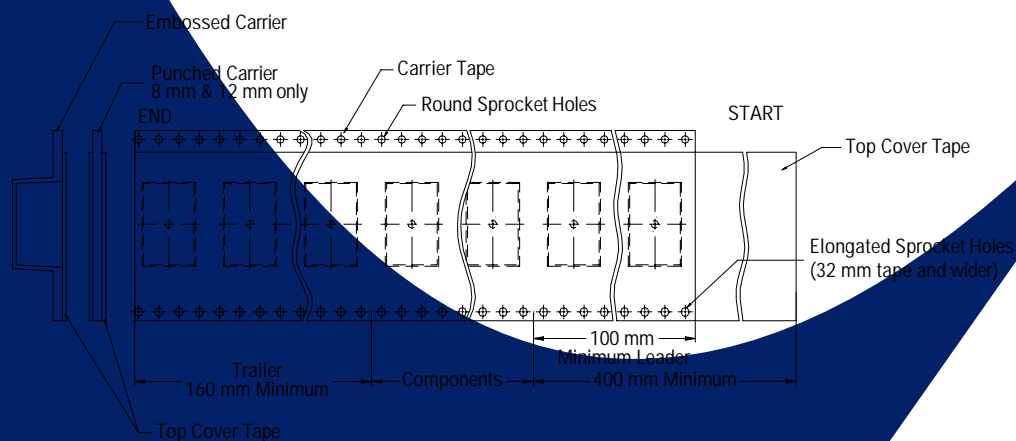


Figure 8 – Maximum Camber

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