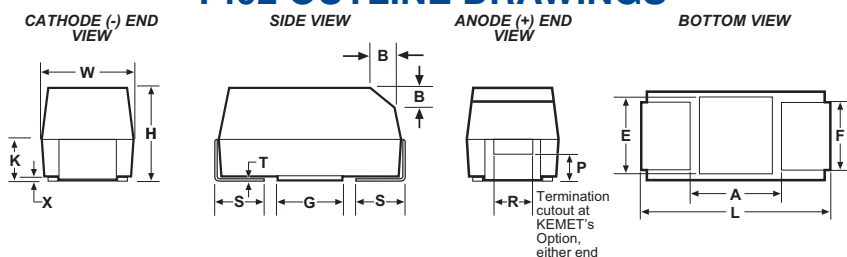


SOLID TANTALUM CHIP CAPACITORS

T492 SERIES – Style CWR11 Per Mil-PRF-55365/8

- Established reliability military version of Industrial Grade T491 series
- Taped and reeled per EIA 481-1
- Precision-molded, laser-marked case
- Symmetrical, compliant terminations
- 100% Surge Current test available for all case sizes
- Operating Temperature: -55°C to + 125°C
- Qualified to MIL-PRF-55365/8, Style CWR11:
 - Termination Options B, C, H, K
 - Weibull failure rate codes B, C and D
 - Capacitance values and voltages as shown in following part number table. (Contact KEMET for latest qualification status)

T492 OUTLINE DRAWINGS



DIMENSIONS – Millimeters (Inches)

Case Size		Component													
KEMET	EIA	L*	W*	H*	K* ± 0.20 ± (.008)	F* ± 0.1 ± (.004)	S* ± 0.3 ± (.012)	B ± 0.15 (Ref) ± .006	X (Ref)	P (Ref)	R (Ref)	T (Ref)	A (Min)	G (Ref)	E (Ref)
A	3216-18	3.2 ± 0.2 (.126 ± .008)	1.6 ± 0.2 (.063 ± .008)	1.6 ± 0.2 (.063 ± .008)	0.9 (.035)	1.2 (.047)	0.8 (.031)	0.4 (.016)	0.10 ± 0.10 (.004 ± .004)	0.4 (.016)	0.4 (.016)	0.13 (.005)	1.4 (.055)	1.1 (.043)	1.3 (.051)
B	3528-21	3.5 ± 0.2 (.138 ± .008)	2.8 ± 0.2 (.110 ± .008)	1.9 ± 0.2 (.075 ± .008)	1.1 (.043)	2.2 (.087)	0.8 (.031)	0.4 (.016)	0.10 ± 0.10 (.004 ± .004)	0.5 (.020)	1.0 (.039)	0.13 (.005)	2.1 (.083)	1.8 (.071)	2.2 (.087)
C	6032-28	6.0 ± 0.3 (.236 ± .012)	3.2 ± 0.3 (.126 ± .012)	2.5 ± 0.3 (.098 ± .012)	1.4 (.055)	2.2 (.087)	1.3 (.051)	0.5 (.020)	0.10 ± 0.10 (.004 ± .004)	0.9 (.035)	1.0 (.039)	0.13 (.005)	3.1 (.122)	2.8 (.110)	2.4 (.094)
D	7343-31	7.3 ± 0.3 (.287 ± .012)	4.3 ± 0.3 (.169 ± .012)	2.8 ± 0.3 (.110 ± .012)	1.5 (.059)	2.4 (.094)	1.3 (.051)	0.5 (.020)	0.10 ± 0.10 (.004 ± .004)	0.9 (.035)	1.0 (.039)	0.13 (.005)	3.8 (.150)	3.5 (.138)	3.5 (.138)

Notes: 1. Metric dimensions govern
2. (Ref) Dimensions provided for reference only
* Mil-PRF-55365/8 Specified Dimensions

ORDERING INFORMATION — MIL-PRF-55365 Part Number

CWR11 M H 105 K B A

Style _____
Capacitors, Chip, Fixed Tantalum
Established Reliability, (encapsulated)

Voltage _____
D = 6V J = 20V
F = 10V K = 25V
H = 15V M = 35V

Termination Finish Code _____
B = Gold Plated C = Hot Solder Dipped
H = Solder Plated K = Solder Fused

Capacitance Picofarad Code _____
First two digits represent significant figures.
Third digit specifies number of zeros to follow.

Surge Current Option
A = +25°C after Weibull
B = -55°C +85°C after Weibull
C = -55°, & +85°C before Weibull
Z = None

Failure Rate Symbol
Weibull: B (0.1%/1000 hrs.)
C (0.01%/1000 hrs.)
D (0.001%/1000 hrs.)
#Exponential: M (1.0%/1000 hrs.)
P (0.1%/1000 hrs.)
R (0.01%/1000 hrs.)
S (0.001%/1000 hrs.)

Capacitance Tolerances
M = ±10%; K = ±10%; J = ±5%

T492 SERIES ORDERING INFORMATION — KEMET Part Number

T 492 B 105 K 035 B S 4250

Tantalum _____

Series _____
T492 - Precision Molded, Style CWR11

Case Size _____
A, B, C, D

Capacitance Picofarad Code _____
First two digits represent significant figures.
Third digit specifies number of zeros to follow.

Capacitance Tolerances _____
M = ±10%; K = ±10%; J = ±5%

Voltage _____
As shown

Surge Current Option
4250 = +25°C after Weibull
4251 = -55° +85°C after Weibull
4252 = -55, & +85°C before Weibull

Lead Material
B = Gold
C = Hot Solder Dip
H or S = Solder Plated
K = Solder Fused

Failure Rate Symbol
Weibull: B (0.1%/1000 hrs.); C (0.01%/1000 hrs.); D (0.001%/1000 hrs.)
Exponential: M (1.0%/1000 hrs.); P (0.1%/1000 hrs.); R (0.01%/1000 hrs.);
S (0.001%/1000 hrs.) # Exponential not recommended for new design

* Part Number Example: T492B105K035BS (14 digits - no spaces)
* See www.kemet.com for Pb Free transition.

Note on Failure Rates: Exponential failure rate levels M, P, R and S are inactive for new design per Mil-C-55365. Parts qualified to Weibull failure rate levels are substitutable for exponential failure rate levels.

SOLID TANTALUM CHIP CAPACITORS

T492 SERIES—Style CWR11 Per Mil-PRF-55365/8

KEMET
CHARGED™

T492 (CWR11) RATINGS AND PART NUMBER REFERENCE

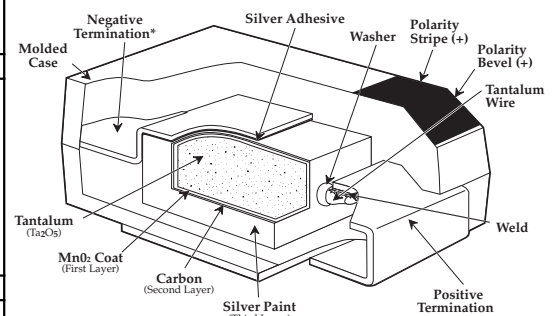
Capacitance μF	Case Size	KEMET Part Number	Mil-C-55365/8 Part Number	DCL μA @ +25°C Max	DF % @ +25°C 120 Hz Max	ESR Ω @ +25°C 100kHz Max
6 Volt Rating at +85°C (4 Volt Rating at +125°C)						
1.5	A	T492A155(1)006(2)(3)(4)	CWR11D(6)155(1)(2)(5)	0.5	6.0	8.0
2.2	A	T492A225(1)006(2)(3)(4)	CWR11D(6)225(1)(2)(5)	0.5	6.0	8.0
3.3	A	T492A335(1)006(2)(3)(4)	CWR11D(6)335(1)(2)(5)	0.5	6.0	8.0
4.7	B	T492B475(1)006(2)(3)(4)	CWR11D(6)475(1)(2)(5)	0.5	6.0	5.5
6.8	B	T492B685(1)006(2)(3)(4)	CWR11D(6)685(1)(2)(5)	0.5	6.0	4.5
10.0	B	T492B106(1)006(2)(3)(4)	CWR11D(6)106(1)(2)(5)	0.6	6.0	3.5
15.0	C	T492C156(1)006(2)(3)(4)	CWR11D(6)156(1)(2)(5)	0.9	6.0	3.0
22.0	C	T492C226(1)006(2)(3)(4)	CWR11D(6)226(1)(2)(5)	1.4	6.0	2.2
47.0	D	T492D476(1)006(2)(3)(4)	CWR11D(6)476(1)(2)(5)	2.8	6.0	1.1
10 Volt Rating at +85°C (7 Volt Rating at 125°C)						
1.0	A	T492A105(1)010(2)(3)(4)	CWR11F(6)105(1)(2)(5)	0.5	4.0	10.0
1.5	A	T492A155(1)010(2)(3)(4)	CWR11F(6)155(1)(2)(5)	0.5	6.0	8.0
2.2	A	T492A225(1)010(2)(3)(4)	CWR11F(6)225(1)(2)(5)	0.5	6.0	8.0
3.3	B	T492B335(1)010(2)(3)(4)	CWR11F(6)335(1)(2)(5)	0.5	6.0	5.5
4.7	B	T492B475(1)010(2)(3)(4)	CWR11F(6)475(1)(2)(5)	0.5	6.0	4.5
6.8	B	T492B685(1)010(2)(3)(4)	CWR11F(6)685(1)(2)(5)	0.7	6.0	3.5
15.0	C	T492C156(1)010(2)(3)(4)	CWR11F(6)156(1)(2)(5)	1.5	6.0	2.5
33.0	D	T492D336(1)010(2)(3)(4)	CWR11F(6)336(1)(2)(5)	3.3	6.0	1.1
15 Volt Rating at +85°C (10 Volt Rating at +125°C)						
0.7	A	T492A684(1)015(2)(3)(4)	CWR11H(6)684(1)(2)(5)	0.5	4.0	12.0
1.0	A	T492A105(1)015(2)(3)(4)	CWR11H(6)105(1)(2)(5)	0.5	4.0	10.0
1.5	A	T492A155(1)015(2)(3)(4)	CWR11H(6)155(1)(2)(5)	0.5	6.0	8.0
2.2	B	T492B225(1)015(2)(3)(4)	CWR11H(6)225(1)(2)(5)	0.5	6.0	5.5
3.3	B	T492B335(1)015(2)(3)(4)	CWR11H(6)335(1)(2)(5)	0.5	6.0	5.0
4.7	B	T492B475(1)015(2)(3)(4)	CWR11H(6)475(1)(2)(5)	0.7	6.0	4.0
10.0	C	T492C106(1)015(2)(3)(4)	CWR11H(6)106(1)(2)(5)	1.6	6.0	2.5
22.0	D	T492D226(1)015(2)(3)(4)	CWR11H(6)226(1)(2)(5)	3.3	6.0	1.1
20 Volt Rating at +85°C (13 Volt Rating at +125°C)						
0.5	A	T492A474(1)020(2)(3)(4)	CWR11J(6)474(1)(2)(5)	0.5	4.0	14.0
0.7	A	T492A684(1)020(2)(3)(4)	CWR11J(6)684(1)(2)(5)	0.5	4.0	12.0
1.0	A	T492A105(1)020(2)(3)(4)	CWR11J(6)105(1)(2)(5)	0.5	4.0	10.0
1.5	B	T492B155(1)020(2)(3)(4)	CWR11J(6)155(1)(2)(5)	0.5	6.0	6.0
2.2	B	T492B225(1)020(2)(3)(4)	CWR11J(6)225(1)(2)(5)	0.5	6.0	5.0
3.3	B	T492B335(1)020(2)(3)(4)	CWR11J(6)335(1)(2)(5)	0.7	6.0	4.0
4.7	C	T492C475(1)020(2)(3)(4)	CWR11J(6)475(1)(2)(5)	1.0	6.0	3.0
6.8	C	T492C685(1)020(2)(3)(4)	CWR11J(6)685(1)(2)(5)	1.4	6.0	2.4
15.0	D	T492D156(1)020(2)(3)(4)	CWR11J(6)156(1)(2)(5)	3.0	6.0	1.1
25 Volt Rating at +85°C (17 Volt Rating at +125°C)						
0.3	A	T492A334(1)025(2)(3)(4)	CWR11K(6)334(1)(2)(5)	0.5	4.0	15.0
0.5	A	T492A474(1)025(2)(3)(4)	CWR11K(6)474(1)(2)(5)	0.5	4.0	14.0
0.7	B	T492B684(1)025(2)(3)(4)	CWR11K(6)684(1)(2)(5)	0.5	4.0	7.5
1.0	B	T492B105(1)025(2)(3)(4)	CWR11K(6)105(1)(2)(5)	0.5	4.0	6.5
1.5	B	T492B155(1)025(2)(3)(4)	CWR11K(6)155(1)(2)(5)	0.5	6.0	6.5
2.2	C	T492C225(1)025(2)(3)(4)	CWR11K(6)225(1)(2)(5)	0.6	6.0	3.5
3.3	C	T492C335(1)025(2)(3)(4)	CWR11K(6)335(1)(2)(5)	0.9	6.0	3.5
4.7	C	T492C475(1)025(2)(3)(4)	CWR11K(6)475(1)(2)(5)	1.2	6.0	2.5
6.8	D	T492D685(1)025(2)(3)(4)	CWR11K(6)685(1)(2)(5)	1.7	6.0	1.4
10.0	D	T492D106(1)025(2)(3)(4)	CWR11K(6)106(1)(2)(5)	2.5	6.0	1.2
35 Volt Rating at +85°C (23 Volt Rating at +125°C)						
0.1	A	T492A104(1)035(2)(3)(4)	CWR11M(6)104(1)(2)(5)	0.5	4.0	24.0
0.2	A	T492A154(1)035(2)(3)(4)	CWR11M(6)154(1)(2)(5)	0.5	4.0	21.0
0.2	A	T492A224(1)035(2)(3)(4)	CWR11M(6)224(1)(2)(5)	0.5	4.0	18.0
0.3	A	T492A334(1)035(2)(3)(4)	CWR11M(6)334(1)(2)(5)	0.5	4.0	15.0
0.5	B	T492B474(1)035(2)(3)(4)	CWR11M(6)474(1)(2)(5)	0.5	4.0	10.0
0.7	B	T492B684(1)035(2)(3)(4)	CWR11M(6)684(1)(2)(5)	0.5	4.0	8.0
1.0	B	T492B105(1)035(2)(3)(4)	CWR11M(6)105(1)(2)(5)	0.5	4.0	6.5
1.5	C	T492C155(1)035(2)(3)(4)	CWR11M(6)155(1)(2)(5)	0.5	6.0	4.5
2.2	C	T492C225(1)035(2)(3)(4)	CWR11M(6)225(1)(2)(5)	0.8	6.0	3.5
3.3	C	T492C335(1)035(2)(3)(4)	CWR11M(6)335(1)(2)(5)	1.2	6.0	2.5
4.7	D	T492D475(1)035(2)(3)(4)	CWR11M(6)475(1)(2)(5)	1.7	6.0	1.5

PACKAGING

Note: T492 Packaging

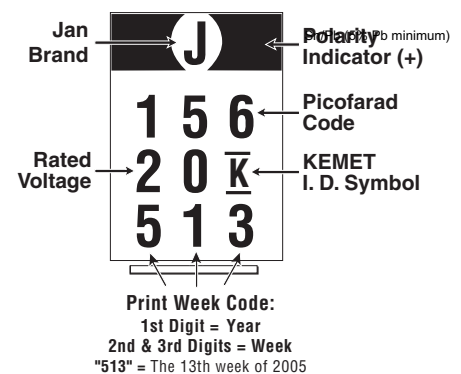
- No c-spec required for 7" reel packaging
 - C-7280 required for 13" reel packaging
 - Standard reel packaging is not mandatory
 - Bulk packaging also available using C-7610
- See page 91 for tape and reel quantities.

CONSTRUCTION



CAPACITOR MARKINGS

T492 Series — All Case Sizes



Note on Failure Rates:

Exponential failure rate levels M, P, R and S are inactive for new design per MIL-C-55365. Parts qualified to Weibull failure rate levels are substitutable for exponential failure rate levels.

Note: ESR limits are per Mil-C-55365/8

- (1) To complete KEMET/CWR part number, insert M for ±20%, K for ±10% or J for ±5% tolerance.
- (2) To complete KEMET/CWR part number, insert Failure Rate Symbol Weibull: B (0.1%/1000 Hrs.), C (0.01%/1000Hrs or D (0.001%/1000 Hrs.), Exponential: M (1.0%/1000 hrs.), P (0.1%/1000 hrs.), R (0.01%/1000 hrs.) or S (0.001%/1000 hrs.)
- (3) To complete KEMET part number, insert Termination Finish Designation B = Gold; C = Hot Solder Dipped; S = Solder Plated; K = Solder Fused.
- (4) To complete KEMET part number, insert 4250 = +25°C after Weibull; 4251 = -55° + 85°C after Weibull; or 4252 = -55, & +85°C before Weibull Surge Current Option.
- (5) To complete CWR part number, insert A = +25°C after Weibull; B = -55° + 85°C after Weibull; C = -55°, & +85°C before Weibull or Z = None for Surge Current Option.
- (6) To complete CWR part numbers, insert B = Gold; C = Hot Solder Dipped; H or S = Solder Plated; K = Solder Fused

TANTALUM, CERAMIC AND ALUMINUM CHIP CAPACITORS

Packaging Information

Performance Notes

- Cover Tape Break Force:** 1.0 Kg Minimum.
- Cover Tape Peel Strength:** The total peel strength of the cover tape from the carrier tape shall be:

Tape Width	Peel Strength
8 mm	0.1 Newton to 1.0 Newton (10g to 100g)
12 mm	0.1 Newton to 1.3 Newton (10g to 130g)

The direction of the pull shall be opposite the direction of the carrier tape travel. The pull angle of the carrier tape shall be 165° to 180° from the plane of the carrier tape. During peeling, the carrier and/or cover tape shall be pulled at a velocity of 300 ±10 mm/minute.

- Reel Sizes:** Molded tantalum capacitors are available on either 180 mm (7") reels (standard) or 330 mm (13") reels (with C-7280). Note that 13" reels are preferred.
- Labeling:** Bar code labeling (standard or custom) shall be on the side of the reel opposite the sprocket holes. Refer to EIA-556.

Embossed Carrier Tape Configuration: Figure 1

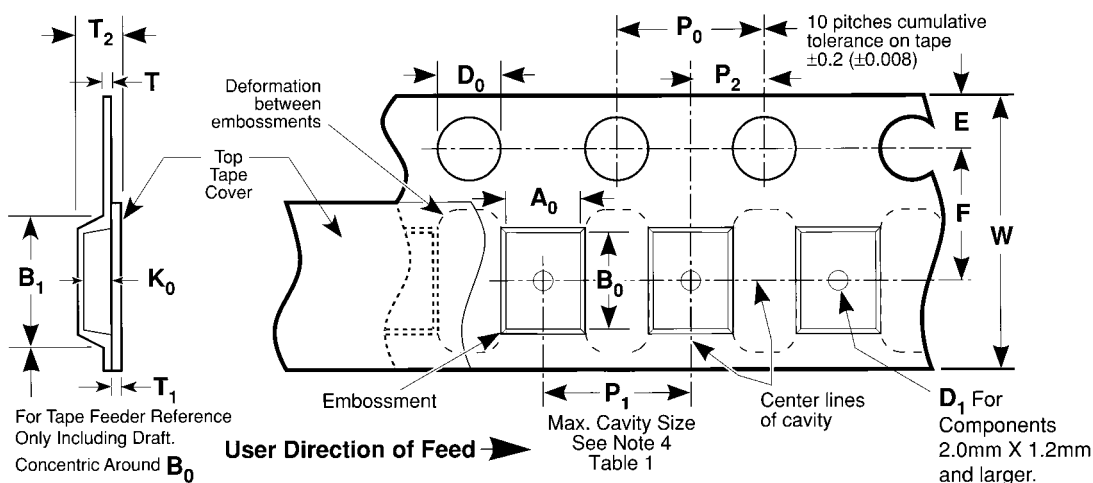


Table 1 — EMBOSSED TAPE DIMENSIONS (Metric will govern)

Constant Dimensions — Millimeters (Inches)									
Tape Size	D ₀	E	P ₀	P ₂	T Max	T ₁ Max			
8 mm and 12 mm	1.5 +0.10 -0.0 (0.059 +0.004, -0.0)	1.75 ±0.10 (0.069 ±0.004)	4.0 ±0.10 (0.157 ±0.004)	2.0 ±0.05 (0.079 ±0.002)	0.600 (0.024)	0.100 (0.004)			
Variable Dimensions — Millimeters (Inches)									
Tape Size	Pitch	B ₁ Max. Note 1	D ₁ Min. Note 2	F	P ₁	R Min. Note 3	T ₂ Max	W	A ₀ B ₀ K ₀ Note 4
8 mm	Single (4 mm)	4.4 (0.173)	1.0 (0.039)	3.5 ±0.05 (0.138 ±0.002)	4.0 ±0.10 (0.157 ±0.004)	25.0 (0.984)	2.5 (0.098)	8.0 ±0.30 (.315 ±0.012)	
12 mm	Double (8 mm)	8.2 (0.323)	1.5 (0.059)	5.5 ±0.05 (0.217 ±0.002)	8.0 ±0.10 (0.315 ±0.004)	30.0 (1.181)	4.6 (0.181)	12.0 ±0.30 (0.472 ±0.012)	

NOTES

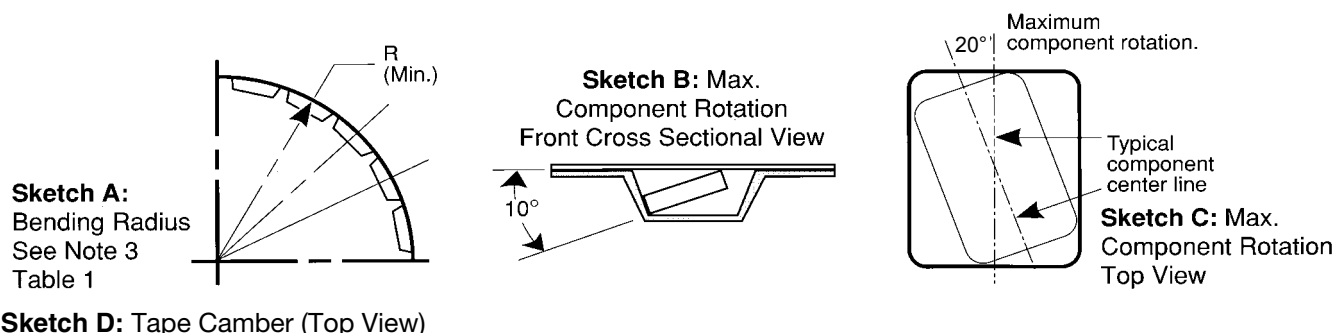
- B₁ dimension is a reference dimension for tape feeder clearance only.
- The embossment hole location shall be measured from the sprocket hole controlling the location of the embossment. Dimensions of embossment location and hole location shall be applied independent of each other.
- Tape with components shall pass around radius "R" without damage (see sketch A). The minimum trailer length (Fig. 2) may require additional length to provide R min. for 12 mm embossed tape for reels with hub diameters approaching N min. (Table 2)
- The cavity defined by A₀, B₀, and K₀ shall be configured to surround the part with sufficient clearance such that the chip does not protrude beyond the sealing plane of the cover tape, the chip can be removed from the cavity in a vertical direction without mechanical restriction, rotation of the chip is limited to 20 degrees maximum in all 3 planes, and lateral movement of the chip is restricted to 0.5 mm maximum in the pocket (not applicable to vertical clearance.)

TANTALUM, CERAMIC AND ALUMINUM CHIP CAPACITORS



Packaging Information

Embossed Carrier Tape Configuration (cont.)



Sketch D: Tape Camber (Top View)

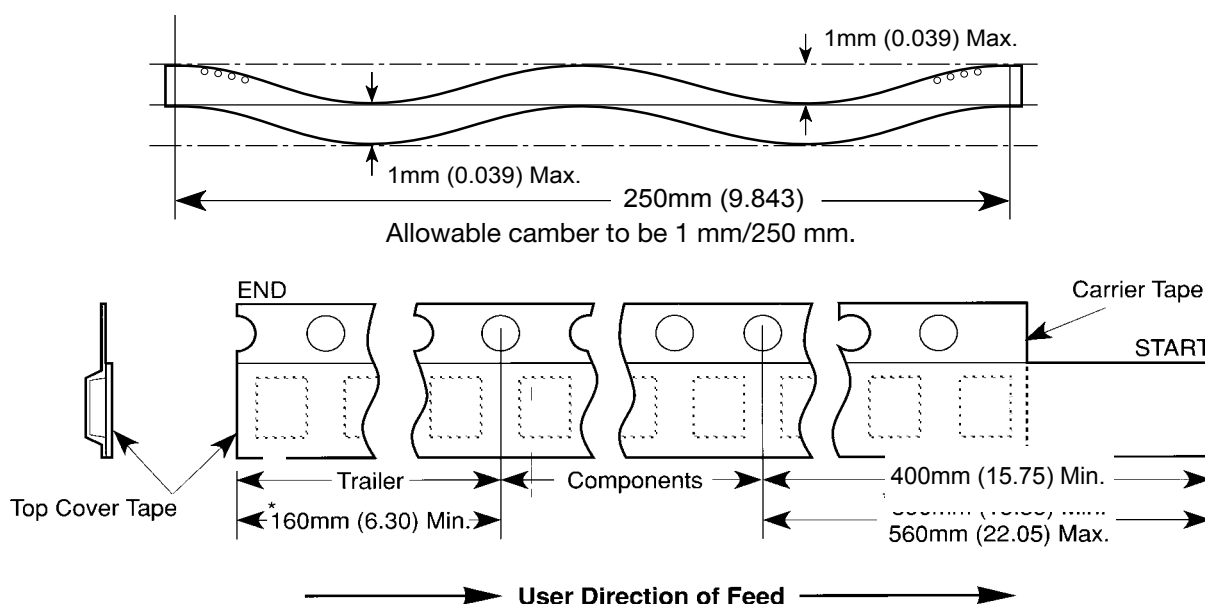


Figure 2:
Tape Leader
& Trailer
Dimensions
(Metric
Dimensions
Will Govern)

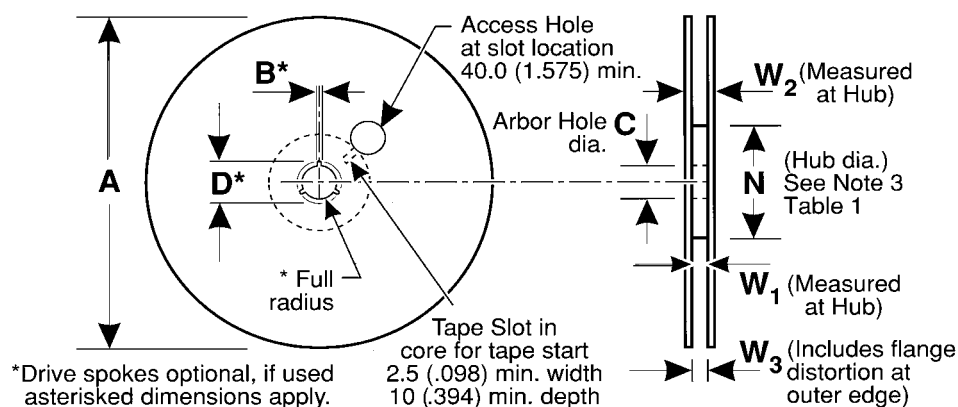


Figure 3: Reel Dimensions (Metric Dimensions will govern)

Table 2 – REEL DIMENSIONS (Metric will govern)

Tape Size	A Max	B* Min	C	D* Min	N Min	W ₁	W ₂ Max	W ₃
8 mm	330.0 (12.992)	1.5 (0.059)	13.0 ± 0.20 (0.512 ± 0.008)	20.2 (0.795)	50.0 (1.969) See Note 3 Table 1	8.4 +1.5, -0.0 (0.331 +0.059, -0.0)	14.4 (0.567)	7.9 Min (0.311) 10.9 Max (0.429)
12 mm	330.0 (12.992)	1.5 (0.059)	13.0 ± 0.20 (0.512 ± 0.008)	20.2 (0.795)		12.4 +2.0, -0.0 (0.488 +0.078, -0.0)	18.4 (0.724)	11.9 Min (0.469) 15.4 Max (0.606)