

Disc Ceramic Capacitors



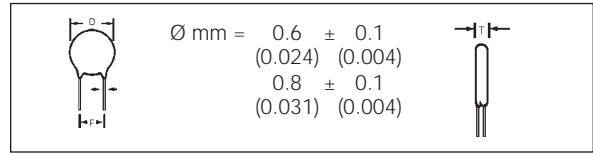
AC and Switch Mode Epoxy Coated

CAPACITORS FOR AC AND SWITCH MODE APPLICATIONS

These capacitors are made of a new dielectric compound specially developed for AC or switch mode circuits that can generate dielectric heat which is limiting factor on other ceramic disc capacitors.

This new series adds the advantages of class I (low loss factor) with the advantages of class II capacitors (small sizes and lower costs).

The capacitors are epoxy coated, flame retardant class UL 94-V0. They meet the standards of the telecom and data processing industry. They are particularly suited for TV deflection and power supply circuits.



Lead Spacing	Digit 8		
F			
5 (0.200)	A	—	N
6 (0.250)	E	X	—
7.5 (0.300)	B	R	Q
10 (0.400)	C	W	—
12.5 (0.500)	P	—	—

DIMENSIONS

millimeters (inches)

Digit 9 (ø)	D ± 2 (0.079)	T max.	Available Lead Spacing		
			Vn = 1000V	Vn = 2000V	Vn = 3000V
A	4.0 (0.157)	4.0 (0.157)	A,B,E,N,R	A,B,E,N,R	B,E
B	5.0 (0.197)	4.0 (0.157)	A,B,E,N,R,X	A,B,E,N,R	B,E
C	6.0 (0.236)	4.0 (0.157)	A,B,C,E,N,R,X	A,B,C,E,N,R,	B,C,E
D	7.0 (0.276)	4.0 (0.157)	A,B,C,E,N,Q,R,X	A,B,C,E,N,Q,R	B,C,E
E	8.0 (0.315)	4.0 (0.157)	A,B,C,E,N,Q,R,X	A,B,C,E,N,Q,R	B,C,E
F	9.0 (0.354)	5.0 (0.197)	A,B,C,E,N,R,X	A,B,C,E,N,R	B,C,E
G	10.0 (0.394)	5.0 (0.197)	A,B,C,E,N,R,X	A,B,C,E,N,R	B,C,E
H	11.0 (0.433)	5.0 (0.197)	A,B,C,E,N,P,R,W	A,B,C,E,N,P,R,W	B,C,E,P,W
J	13.0 (0.512)	6.0 (0.236)	B,C,N,P,R,W	B,CN,P,R,W	B,C,P,W
K	15.0 (0.591)	6.0 (0.236)	B,C,N,P,R,W	B,CN,P,R,W	B,C,P,W
M	19.0 (0.748)	7.0 (0.276)	B,C,P	B,C,P	B,C,P

(E), (X), (W): upon request

PERFORMANCE CHARACTERISTICS

Measured at	1.0 kHz / 0.3 Vrms / 25°C					
Dissipation Factor	6LR / 6LS / 6LT ≤ 0.3% 67S / 68S ≤ 0.8%					
Capacitance Tolerance	±10%	6LR X	6LS X	6LT X	67S X	68S X
	±20%	X	X	X	X	
	-20 +50%	X	X	X	X	
Insulation Resistance	@ 500V → ≥ 10 GΩ					
Dielectric Strength NOTE: Charging current limited to 50 mA	1.5 x V _R + 500 (DC) Between leads and body insulation					
Operating Temperature Range (°C)	-40... +125					
Climatic Category	30 / 085 / 56					
Max. Temp. rise on the external surface of the capacitor related to ambient	Measured at 20mm from the capacitor					Tmax. = Tamb + 20°C

Note: Damp Heat Steady State: 90... 95% R.H. 40°C / 56 days. No voltage to be applied.

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CAPACITANCE VS. DISC DIAMETER

millimeters (inches)

Temp. Coefficient	Y5P			Y5U	Y5V	
Digits 1, 2, 3 of P.N.	6LR	6LS	6LT	67S	68S	
Rated Voltage (V _R)	1000 VDC 130 VAC	2000 VDC 250 VAC	3000 VDC 380 VAC	2000 VDC 250 VAC	2000 VDC 250 VAC	
C _R (pF)						
220	7.0 (0.276)	7.0 (0.276)	7.0 (0.276)			
270						
330		8.0 (0.315)	8.0 (0.315)			9.0 (0.354)
390						
470						
560	9.0 (0.354)	9.0 (0.354)	10.0 (0.394)			
680				8.0 (0.315)	10.0 (0.394)	11.0 (0.433)
820						
1000	9.0 (0.354)	11.0 (0.433)	13.0 (0.512)	8.0 (0.315)		
1200						
1500	11.0 (0.433)	13.0 (0.512)	15.0 (0.591)			
1800						
2200					13.0 (0.512)	15.0 (0.591)
2700						
3300	15.0 (0.591)	15.0 (0.591)	19.0 (0.748)	10.0 (0.394)		
3900						
4700					19.0 (0.748)	19.0 (0.748)
10000						
					8.0 (0.315)	
					11.0 (0.433)	

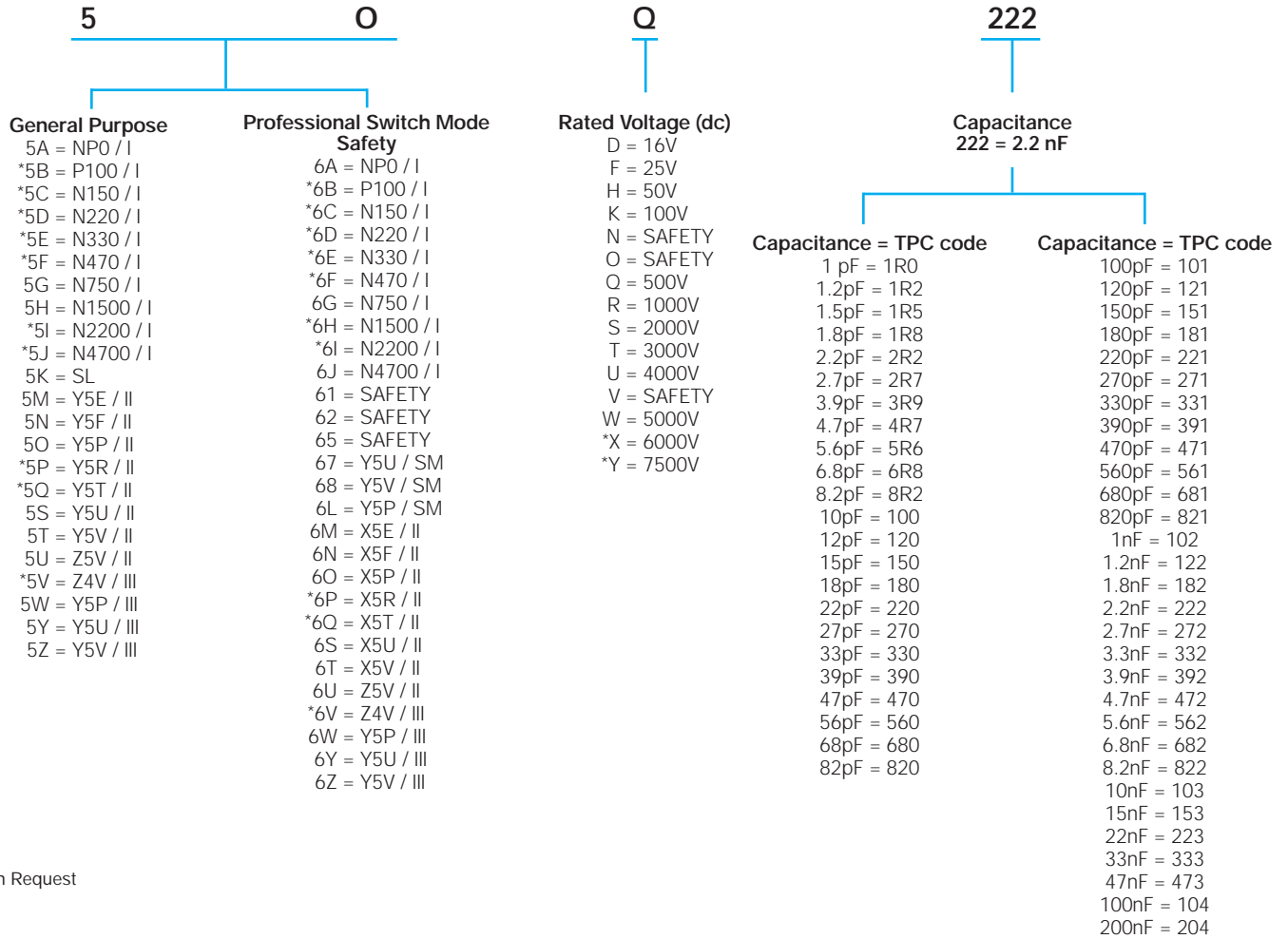
Diameter (φ) = 9th Part Number Digit

Disc Ceramic Capacitors



Ordering Code

HOW TO ORDER



*Upon Request

Disc Ceramic Capacitors



Ordering Code

M

Tolerance
 C = ±0.25 pF
 D = ±0.50 pF
 J = ±5%
 K = ±10%
 M = ±20%
 S = -20+50%
 Z = -20+80%
 P = 0+100%

A

**Capacitor Diameter
 ± 2 (0.079)**
 A = 4 (0.157)
 B = 5 (0.197)
 C = 6 (0.236)
 D = 7 (0.276)
 E = 8 (0.315)
 F = 9 (0.354)
 G = 10 (0.394)
 H = 11 (0.433)
 J = 13 (0.512)
 K = 15 (0.591)
 M* = 19 (0.748)

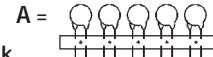
*Wire 0.8 (0.031) recommended

A

A

Packaging

Cardboard Strips



Bulk

E = 5 (0.197) ± 1 (0.039) free wire length
 C = 10 (0.394) ± 1 (0.039) free wire length
 D = 25 (0.984) ± 1 (0.039) free wire length

Taping

Reel



Avisert			Panaset		
H	L	L	J	L	L



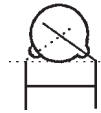
Ammo Pack

Avisert			Panaset		
I	M	M	K	M	M

Lead Forming				
mm	inches			
2.5 ±0.5	.1 ± .025	D	-	-
5 ^{+0.6} _{-0.2}	.2 ± .025	A	O	N
6 ^{+0.6} _{-0.2}	.25 ± .025	E	X	-
7.5 ⁺¹ _{-0.5}	.3 ± .05	B	R	Q
10 ^{+0.5} _{-1.0}	.4 ± .05	C	W	-
12.5 ⁺¹ _{-0.5}	.5 ± .05	P	-	-

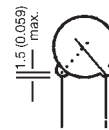
Finishing

Diam ≤ 9 (0.354) and
 F = 5.00 (0.197)



Coating does not surpass the bend

For every other:



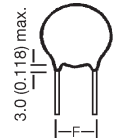
Low Voltage

A = Phenolic (General Purpose) Q = Waxed phenolic

S = Epoxy (Professional) cap. diameter ≤ 8 (0.315)

D = Epoxy (Professional) cap. diameter > 8 (0.315)

High Voltage



F = Measured from the center of leads

C = Epoxy wire diameter 0.6 ± 0.1 (0.024) ± (0.004)

I = Epoxy wire diameter 0.8 ± 0.1 (0.031) ± (0.004)

L = Phenolic wire diameter 0.6 ± 0.1 (0.024) ± (0.004)

Please note that not all code combinations are either possible or available.

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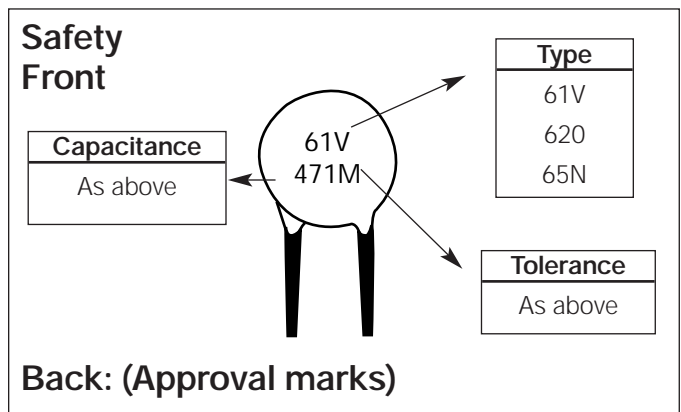
Marking

DIG. 2		Logo: Only in diam. ≥ 6mm	Capacitance		EIA																													
O			TC / Class																															
General Purpose	Professional																																	
A = NP0 / I	A = NP0 / I		<table border="1"> <thead> <tr> <th>DIG. 3</th> <th>DIG. 7</th> </tr> <tr> <th>Q</th> <th>M</th> </tr> <tr> <th>Rated Voltage</th> <th>Tolerance</th> </tr> </thead> <tbody> <tr> <td>D = 16V</td> <td>C = ±0.25pF</td> </tr> <tr> <td>F = 25V</td> <td>D = ±0.5pF</td> </tr> <tr> <td>H = 50V</td> <td>J = ±5%</td> </tr> <tr> <td>K = 100V</td> <td>K = ±10%</td> </tr> <tr> <td>Q = 500V</td> <td>M = ±20%</td> </tr> <tr> <td>R = 1000V</td> <td>S = -20 +50%</td> </tr> <tr> <td>S = 2000V</td> <td>Z = -20 +80%</td> </tr> <tr> <td>T = 3000V</td> <td>P = 0 +100%</td> </tr> <tr> <td>U = 4000V</td> <td></td> </tr> <tr> <td>W = 5000V</td> <td></td> </tr> <tr> <td>X = 6000V</td> <td></td> </tr> <tr> <td>Y = 7500V</td> <td></td> </tr> </tbody> </table>	DIG. 3	DIG. 7	Q	M	Rated Voltage	Tolerance	D = 16V	C = ±0.25pF	F = 25V	D = ±0.5pF	H = 50V	J = ±5%	K = 100V	K = ±10%	Q = 500V	M = ±20%	R = 1000V	S = -20 +50%	S = 2000V	Z = -20 +80%	T = 3000V	P = 0 +100%	U = 4000V		W = 5000V		X = 6000V		Y = 7500V		1pF = 109
DIG. 3	DIG. 7																																	
Q	M																																	
Rated Voltage	Tolerance																																	
D = 16V	C = ±0.25pF																																	
F = 25V	D = ±0.5pF																																	
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K = 100V	K = ±10%																																	
Q = 500V	M = ±20%																																	
R = 1000V	S = -20 +50%																																	
S = 2000V	Z = -20 +80%																																	
T = 3000V	P = 0 +100%																																	
U = 4000V																																		
W = 5000V																																		
X = 6000V																																		
Y = 7500V																																		
*B = P100 / I	B = P100 / I	1.2pF = 129		120pF = 121																														
*C = N150 / I	C = N150 / I	1.5pF = 159		150pF = 151																														
*D = N220 / I	D = N220 / I	1.8pF = 189		180pF = 181																														
*E = N330 / I	E = N330 / I	2.2pF = 229		220pF = 221																														
*F = N470 / I	F = N470 / I	2.7pF = 279	270pF = 271																															
G = N750 / I	G = N750 / I	3.9pF = 399	390pF = 391																															
H = N1500 / I	H = N1500 / I	4.7pF = 479	470pF = 471																															
*I = N2200 / I	I = N2200 / I	5.6pF = 569	560pF = 561																															
*J = N4700 / I	J = N4700 / I	6.8pF = 689	680pF = 681																															
K = SL	7 = Y5U / SM	8.2pF = 829	820pF = 821																															
M = Y5E / II	8 = Y5V / SM	10pF = 100	1nF = 102																															
N = Y5F / II	L = Y5P / SM	12pF = 120	1.2nF = 122																															
O = Y5P / II	M = X5E / II	15pF = 150	1.8nF = 182																															
P = Y5R / II	N = X5F / II	18pF = 180	2.2nF = 222																															
Q = Y5T / II	O = X5P / II	22pF = 220	2.7nF = 272																															
S = Y5U / II	P = X5R / II	27pF = 270	3.9nF = 392																															
T = Y5V / II	Q = X5T / II	39pF = 390	4.7nF = 472																															
U = Z5V / II	R = X5U / II	47pF = 470	5.6nF = 562																															
V = Z4V / III	S = X5U / II	56pF = 560	6.8nF = 682																															
*W = Y5P / II	T = X5V / II	68pF = 680	8.2nF = 822																															
*X = Y5R / II	U = Z5V / II	82pF = 820	10nF = 103																															
Y = Y5U / II	V = Z4V / III		15nF = 153																															
Z = Y5V / II	W = Y5P / III		22nF = 223																															
	X = Y5R / III		33nF = 333																															
	Y = Y5U / III		47nF = 473																															
	Z = Y5V / III		100nF = 104																															
			200nF = 204																															

*Upon Request

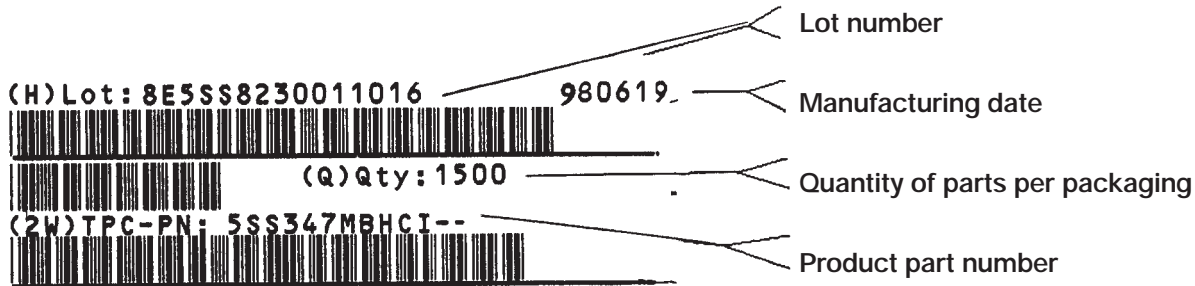
TC – Temperature coefficient.

DIG – for better understanding, check pages 3 and 4.



IDENTIFICATION AND TRACEABILITY

On all TPC ceramic capacitors packages, you will find a bar code label with the following information:



TAPED PARTS QUANTITY TABLE

millimeters (inches)

Rated Voltage (Vr)	Diameter D	Quantities	
		Ammopack	Reel
Vr ≤ 500V	D ≤ 7 (0.276)	2000	2500
	7 < D ≤ 11 (0.433)	2000	2000
500V < Vr ≤ 2KV	D ≤ 11 (0.433)	1500	2000
2KV < Vr = 5KV	D ≤ 11 (0.433)	1000	1500

CARDBOARD STRIPS QUANTITY TABLE

millimeters (inches)

Rated Voltage (Vr)	Diameter D	Lead Space	
		< = 5 (0.197)	> 5 (0.197)
Vr ≤ 500V	D ≤ 8 (0.315)	2500	1500
	8 (0.315) ≤ D ≤ 11 (0.433)	1500	-
	8 (0.315) ≤ D ≤ 13 (0.512)	-	1000
	11 (0.433) ≤ D ≤ 15 (0.591)	1000	-
	13 (0.512) ≤ D ≤ 19 (0.748)	-	500
	D ≤ 19 (0.748)	500	-
500V < Vr ≤ 2KV	D ≤ 9 (0.354)	1500	1000
	9 (0.354) ≤ D ≤ 11 (0.433)	-	1000
	9 (0.354) ≤ D ≤ 13 (0.512)	1000	-
	11 (0.433) ≤ D ≤ 19 (0.748)	-	500
	13 (0.512) ≤ D ≤ 19 (0.748)	500	-
2KV < Vr = 5KV Safety 65N 62O	D ≤ 9 (0.354)	1500	-
	D ≤ 11 (0.433)	-	1000
	D ≤ 13 (0.512)	500	500
Safety 61V	D ≤ 6 (0.236)	1500	1500
	7 (0.275) ≤ D ≤ 9 (0.354)	1000	1000
	9 (0.354) ≤ D	500	500

Quantities for other package alternative, upon request.

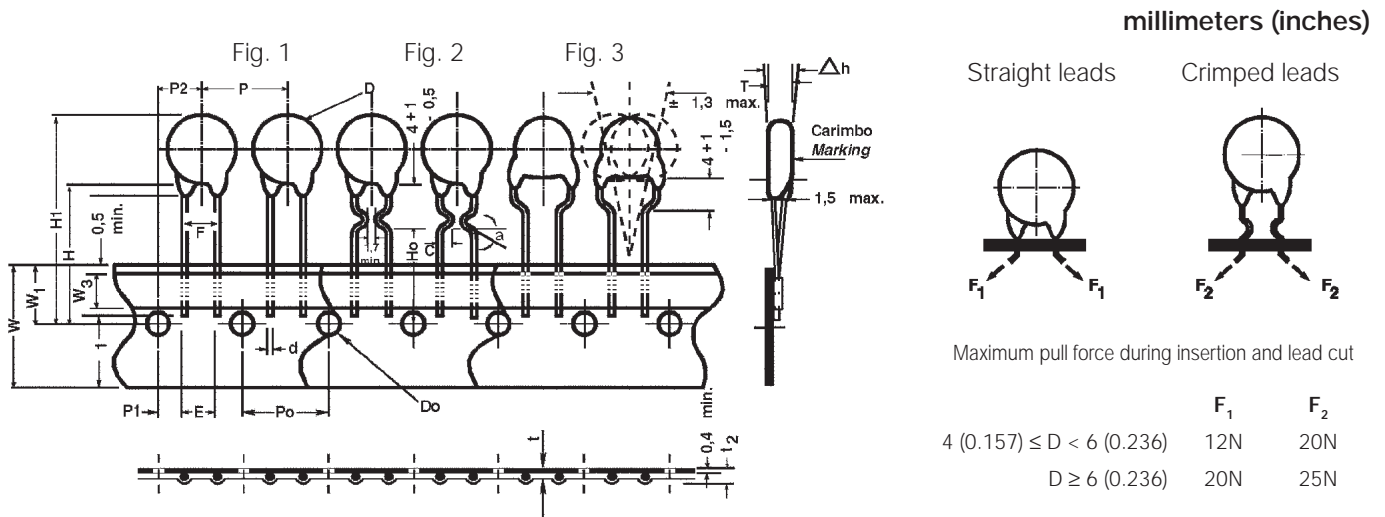
Disc Ceramic Capacitors



Tape and Reel Specifications

There are two types of taped disc ceramic capacitors:
Straight or crimped leads.

Both types can be shipped on reels or ammopack.
The standard packaging quantities are shown below:



Digit 11	Available Tapings	Digit 9
L	→ Sizes $4 (0.157) \leq D \leq 11 (0.433)$	A... H
M		
J H	→ Sizes $6 (0.236) \leq D \leq 11 (0.433)$	C... H
K I		

TPC Code Digit 11

Packaging	Avisert	Panasert
Reel 	 H FIGURE 1 L FIGURE 2 L FIGURE 3	 J FIGURE 1 L FIGURE 2 L FIGURE 3
Ammopack 	 I FIGURE 1 M FIGURE 2 M FIGURE 3	 K FIGURE 1 M FIGURE 2 M FIGURE 3

Figure 2: Inside Crimp 100V... 1000V

Figure 3: Outside Crimp 1000V

Disc Ceramic Capacitors

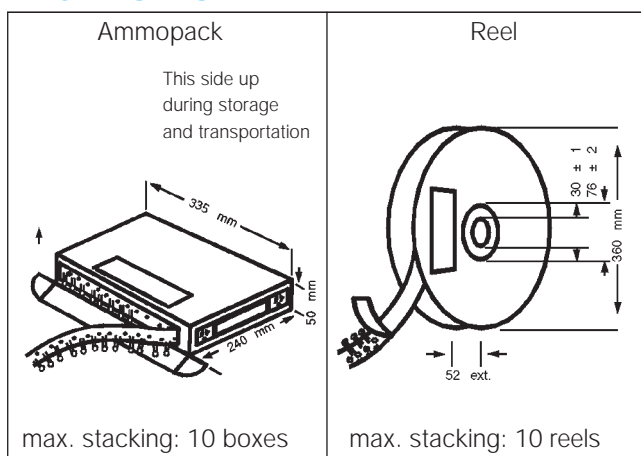


Tape and Reel Specifications

millimeters (inches)

Description of Symbols		Straight Leads		Crimped
		Figure 1		Figure 2 & 3
		A (Avisert)	P (Panaset)	Avisert & Panaset
Crimp angle	∞	—	—	20°...45°
Crimp length	C	—	—	1.7 min.
Lead diameter	d	0.60 ± 0.1		
Disc diameter	D	11 max.		
Lead hole diameter	Do	4.0 ± 0.2		
Disc thickness	T	See Catalog		
Lead spacing	F	5.0 $^{+0.6}_{-0.2}$		
Component alignment, front-rear	Δh	0 ± 1		
Height of component from tape center	H	19.5 ± 0.5	16.5 ± 0.5 - 0	—
Height from tape center to crimp	Ho	—	—	16 + 0.5 - 0
Component height	H1	32.25 max.	>23.5 <32.25	32.25 max.
Distance from component leads to tape bottom	ℓ_1	12 max.		
Tape width	W	18 $^{+1}_{-0.5}$		
Bonding tape width	W ₃	5.5 min.		
Feed hole position	W ₁	9.0 ± 0.5		
Pitch between discs	P	12.7 ± 1		
Feed hole pitch	Po	12.7 ± 0.3		
Hole center to lead	P1	3.85 ± 0.7		
Feed hole center to component center	P2	6.35 ± 1		
Tape + bonding tape thickness	t	0.7 ± 0.2		
Total tape thickness, including lead	t ₂	1.5 max.		

PACKAGING



SHIPPING CONTAINER

