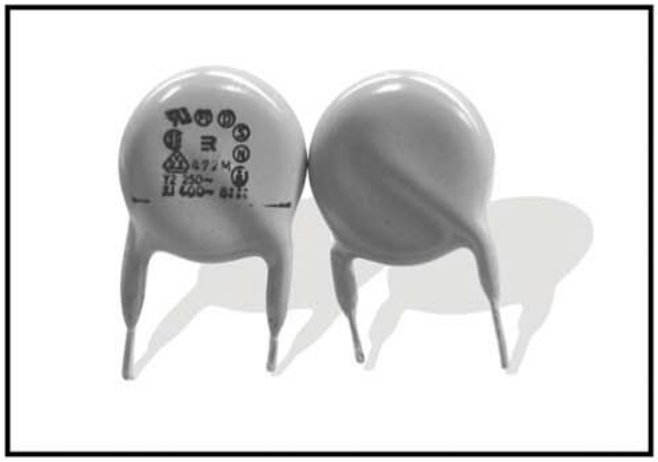


Ceramic Y Capacitors

This section covers ceramic Y capacitors which are not included in the main catalog “Film Capacitors 2003.”

The capacitors have all the important approval marks for worldwide applications.

Series	Operating Voltage	Class	Max. Temp °C	C-value range Min. uF	Max. uF
ERO610	250 VAC	Y2	125	0.001uF	0.012uF
ERK610	300 VAC	Y2	125	33pF	4700pF
ERP610	500 VAC	Y1	125	33pF	4700pF

ERO610

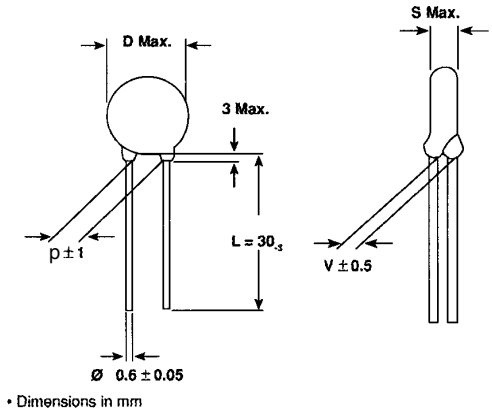
- **Ceramic AC Capacitors**
- **Class X1, 440V AC/Class Y2, 250VAC**

TYPICAL APPLICATIONS

For worldwide use as electromagnetic interference suppressor in all X1 and Y2 applications.

CONSTRUCTION

Disc capacitors with epoxy coating. Epoxy dipped,insulating, flame retarding acc.to UL 94V-0.

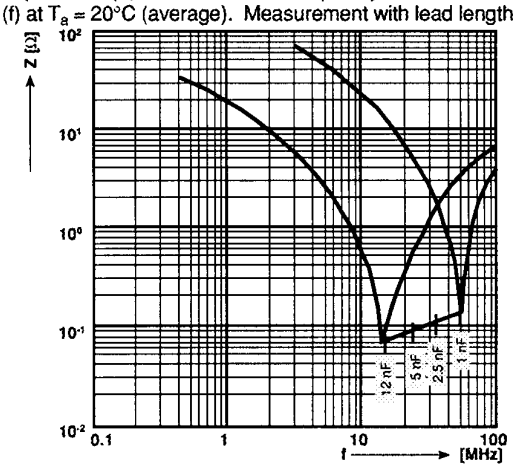


• Dimensions in mm

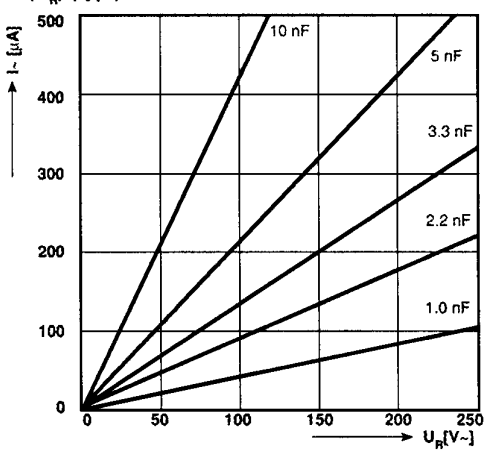
TECHNICAL DATA

Rated voltage U_R (IEC 60384-14.2)	**X1** 440 VAC, 50Hz	**Y2** 250 VAC, 50Hz
Capacitance range	1000-12000 pF	
Capacitance tolerance	± 20%	
Temperature range	(-40 to +125)°C	
Climatic category	IEC 40/125/21	
Approvals	VDE, UL, CSA	
Dissipation factor tanδ	$\leq 25 \bullet 10^{-3}$	
Test voltage between terminals	Component test: 5 mm: 2200 VAC, 50 Hz, 2 s 7.5 mm: 2500 VAC, 50 Hz, 2 s As repeated test admissible only once with 2000 VAC, 50 Hz, 2 s Random sampling test (destructive test): 1500 VAC, 50 Hz, 60 s	
Dielectric strength of body insulation	2000 VAC, 50 Hz,60 s (destructive test)	
Insulation resistance	$\geq 6 \bullet 10^{9}\ \Omega$	
Taping and special lead configurations	On request	

Impedance (Z) as a function of frequency (f) at T_a = 20°C (average). Measurement with lead length 6mm.



I = f (U_R) (typ.)



ARTICLE TABLE

Capacitance pF	D x s Max (mm)	Quantity per package p±1* (mm)	d±0.05* (mm)	V±0.5* (mm)	Article code 1 st block	Ceramic dielectric
1000	6.5 x 4.5	5	0.6	1.4	ERO610RJ4100M	K 4000
1500	8.0 x 4.5	5	0.6	1.4	ERO610RJ4150M	K 4000
1800	8.0 x 4.5	5	0.6	1.4	ERO610RJ4180M	K 4000
2200	9.0 x 4.5	5	0.6	1.4	ERO610RJ4220M	K 4000
2500	9.0 x 4.5	5	0.6	1.4	ERO610RJ4250M	K 4000
3300	10.0 x 4.5	7.5	0.6	1.4	ERO610RK4330M	K 4000
4700	12.0 x 4.5	7.5	0.6	1.4	ERO610RK4470M	K 4000
5000	12.0 x 4.5	7.5	0.6	1.4	ERO610RK4500M	K 4000
6800	17.0 x 4.5	7.5	0.6	1.6	ERO610RK4680M	K 4000
8200	17.0 x 4.5	7.5	0.6	1.6	ERO610RK4820M	K 4000
10000	21.0 x 4.5	7.5	0.6	1.6	ERO610RK5100M	K 4000
12000	21.0 x 4.5	7.5	0.6	1.6	ERO610RK5120M	K 4000

* Standard lead configuration, other lead spacing and diameter available on request.

APPROVALS/REFERENCE DOCUMENTS

Certification Body	Specification	Approval Reference
VDE	EN 132400	40001990
UL	UL 1414 (U_R = 250 VAC)	E73869
CSA (cUL recognition)	C 22.2 No. 1-M90 (U_R=250 VAC)	216038

P=pending

MARKING

D ≤ 9 mm

D ≥ 10 mm

All approval marks are also shown on the label.

ORDERING INFORMATION

Article code

1st block

See article table
Pos. 13 Capacitance tolerance code:
M = ± 20% standard

Note
For lead forming and taping options see the last pages of this document.

PACKING

The box dimensions for bulk packaging are 245 x 145 x 80 mm. Quantity/package as per article table.

Reels with taped capacitors are packed 10 in a box with dimension 370 x 370 x 560 mm. Quantity/reel according to article table. The standard quantity/reel is for 360 mm reel. If 500 mm reel is required, it must be specified when ordering and the quantity is 2 x the given quantity.

DATA SHEET ERO610

Specifications subject to change without notice

ERK610

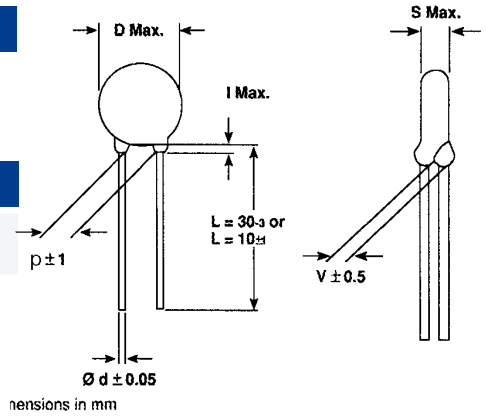
- **Ceramic AC Capacitors**
- **Class X1, 440V AC/Class Y2, 300VAC**

TYPICAL APPLICATIONS

For worldwide use as electromagnetic interference suppressor in all X1 and Y2 applications.

CONSTRUCTION

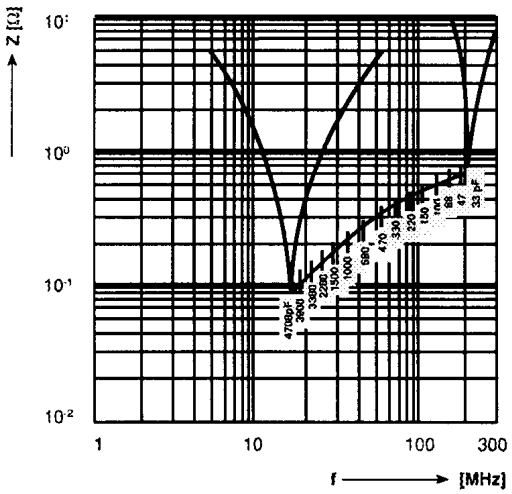
Disc capacitors with epoxy coating. Epoxy dipped,insulating, flame retarding acc.to UL 94V-0.



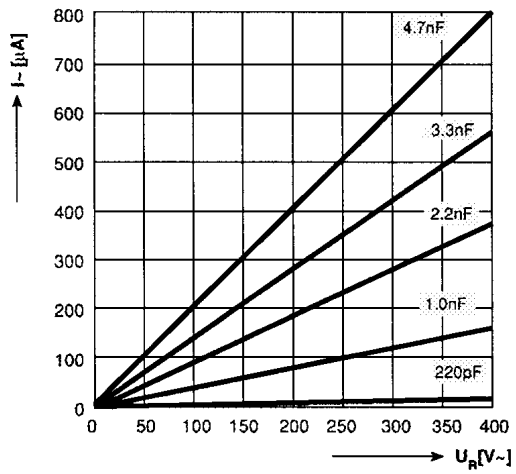
TECHNICAL DATA

Rated voltage U_R (IEC 60384-14.2)	**X1** 440 VAC, 50 Hz	**Y2** 300 VAC, 50 Hz
Capacitance range	33-4700 pF	
Capacitance tolerance	± 10%,± 20%	
Temperature range	(-40 to +125)°C	
Climatic category	IEC 40/125/21	
Approvals	VDE, UL, CSA	
Dissipation factor tanδ	≤ 25 • 10^{-3}	
Test voltage between terminals	Component test: 2600 VAC, 50 Hz,2 s As repeated test admissible only once with 2340 VAC, 50 Hz,2 s Random sampling test (destructive test): 2600 VAC, 50 Hz,60 s	
Dielectric strength of body insulation	2600 VAC, 50 Hz,60 s (destructive test)	
Insulation resistance	≥ 6 • 10^9 Ω	
Taping and special lead configurations	On request	

Impedance (Z) as a function of frequency (f) at T_a = 20°C (average). Measurement with lead length 50mm.



I = f (U_R) (typ.)



ARTICLE TABLE

Capaci-tance pF	Dimensions D x s Max (mm)	p±1* (mm)	d±0.05* (mm)	V±0.5* (mm)	Article code 1 st block	Ceramic dielectric
33	8.0 x 6.0	7.5	0.6	1.6	ERK610RK2330M	N 750
47	8.0 x 6.0	7.5	0.6	1.6	ERK610RK2470M	N 750
68	8.0 x 6.0	7.5	0.6	1.9	ERK610RK2680M	K 1200
100	8.0 x 6.0	7.5	0.6	1.9	ERK610RK3100M	K 1500
150	8.0 x 6.0	7.5	0.6	1.9	ERK610RK3150M	K 2000
220	8.0 x 6.0	7.5	0.6	1.9	ERK610RK3220M	K 2000
330	8.0 x 6.0	7.5	0.6	1.9	ERK610RK3330M	K 2000
470	8.0 x 6.0	7.5	0.6	1.9	ERK610RK3470M	K 4000
680	9.0 x 6.0	7.5	0.6	2.0	ERK610RK3680M	K 4000
1000	7.0 x 4.5	7.5	0.6	1.6	ERK610RK4100M	K 6000
1500	8.0 x 4.5	7.5	0.6	1.6	ERK610RK4150M	K 6000
2200	10.0 x 4.5	7.5	0.6	1.6	ERK610RK4220M	K 6000
3300	11.5 x 4.5	7.5	0.6	1.6	ERK610RK4330M	K 6000
3900	14.0 x 4.5	7.5	0.6	1.6	ERK610RK4390M	K 6000
4700	14.0 x 4.5	7.5	0.6	1.6	ERK610RK4470M	K 6000

* Standard lead configuration, other lead spacing and diameter available on request.

APPROVALS/REFERENCE DOCUMENTS

Certification Body	Specification	Approval Reference
VDE	EN 132400	40001991, 40001992
UL	UL 1414 (U_R = 250 VAC)	E73869
CSA (cUL recognition)	C 22.2 No. 1-M90 (U_R=250 VAC)	216038

P=pending

MARKING

D ≤ 9 mm

D ≥ 10 mm

All approval marks are also shown on the label.

ORDERING INFORMATION

Article code

1st block

See article table
Pos. 13 Capacitance tolerance code:
M = ± 20% standard
K = ± 10% option

Note
For lead forming and taping options see the last pages of this document.

PACKING

The box dimensions for bulk packaging are 245 x 145 x 80 mm. Quantity/package as per article table.

Reels with taped capacitors are packed 10 in a box with dimension 370 x 370 x 560 mm. Quantity/reel according to article table. The standard quantity/reel is for 360 mm reel. If 500 mm reel is required, it must be specified when ordering and the quantity is 2 x the given quantity.

DATA SHEET ERK610

Specifications subject to change without notice

ERP610

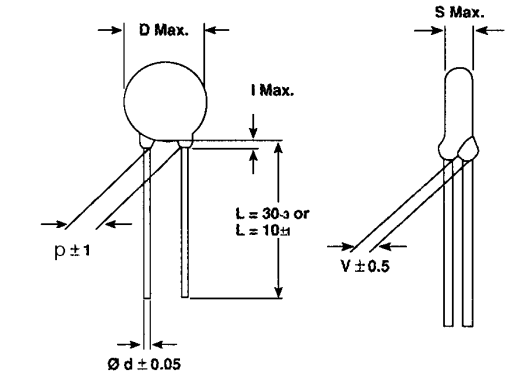
- **Ceramic AC Capacitors**
- **Class X1, 760V AC/Class Y1, 500VAC**

TYPICAL APPLICATIONS

For worldwide use as electromagnetic interference suppressor in all X1 and Y1 applications.

CONSTRUCTION

Disc capacitors with epoxy coating. Epoxy dipped,insulating, flame retarding acc. to UL 94V-0.

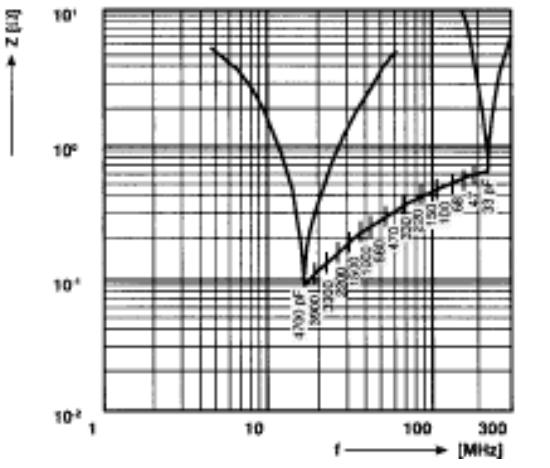


• Dimensions in mm

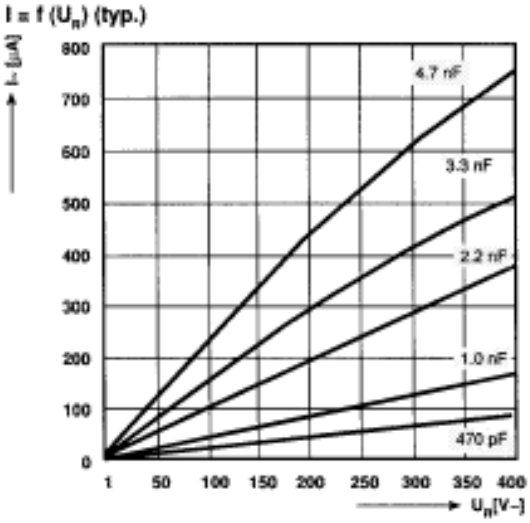
TECHNICAL DATA

Rated voltage U_R (IEC 60384-14.2)	**X1** 760 VAC, 50 Hz	**Y1** 500 VAC, 50 Hz
Capacitance range	33-4700 pF	
Capacitance tolerance	± 10%, ± 20%	
Temperature range	(-40 to +125)°C	
Climatic category	IEC 40/125/21	
Approvals	VDE, UL, CSA	
Dissipation factor tanδ	≤ 25 • 10^{-3}	
Test voltage between terminals	Component test: 4000 VAC, 50 Hz, 2 s As repeated test admissible only once with 3600 VAC, 50 Hz, 2 s Random sampling test (destructive test): 4000 VAC, 50 Hz, 60 s	
Dielectric strength of body insulation	4000 VAC, 50 Hz, 60 s (destructive test)	
Insulation resistance	≥ 10 • 10^9 Ω	
Taping and special lead configurations	On request	

Impedance (Z) as a function of frequency (f) at T_a = 20°C (average). Measurement with lead length 6mm.



I = f (U_n) (typ.)



ARTICLE TABLE

Capaci-tance pF	Dimensions D x s Max (mm)	p±1* (mm)	d±0.05* (mm)	V±0.5* (mm)	Article code 1 st block	Ceramic dielectric
33	8.0 x 6.0	12.5	0.6	1.9	ERP610VH2330M	N 750
47	8.0 x 6.0	12.5	0.6	2.3	ERP610VH2470M	K 1200
68	8.0 x 6.0	12.5	0.6	2.3	ERP610VH2680M	K 1200
100	8.0 x 6.0	12.5	0.6	2.3	ERP610VH3100M	K 1500
150	8.0 x 6.0	12.5	0.6	2.3	ERP610VH3150M	K 2000
220	8.0 x 6.0	12.5	0.6	2.3	ERP610VH3220M	K 2000
330	8.0 x 6.0	12.5	0.6	2.5	ERP610VH3330M	K 2000
470	8.0 x 5.0	12.5	0.6	2.1	ERP610VH3470M	K 4000
680	8.0 x 5.0	12.5	0.6	2.1	ERP610VH3680M	K 4000
1000	9.0 x 5.0	12.5	0.8	2.1	ERP610VH4100M	K 4000
1500	10.0 x 5.0	12.5	0.8	2.1	ERP610VH4150M	K 4000
2200	12.0 x 5.0	12.5	0.8	2.1	ERP610VH4220M	K 4000
2700	13.0 x 5.0	12.5	0.8	2.1	ERP610VH4270M	K 4000
3300	15.0 x 5.0	12.5	0.8	2.1	ERP610VH4330M	K 4000
3900	15.0 x 5.0	12.5	0.8	2.1	ERP610VH4390M	K 4000
4700	17.0 x 5.0	12.5	0.8	2.1	ERP610VH4470M	K 4000

* Standard lead configuration, other lead spacing and diameter available on request.

APPROVALS/REFERENCE DOCUMENTS

Certification Body	Specification	Approval Reference
VDE	EN 132400	40001993, 40001996
UL	UL 1414 (U_R = 250 VAC)	E73869
CSA (cUL recognition)	C 22.2 No. 1-M90 (U_R=250 VAC)	216038

P=pending

MARKING

D ≤ 9 mm

D ≥ 10 mm

All approval marks are also shown on the label.

ORDERING INFORMATION

Article code

1st block

See article table
Pos. 13 Capacitance tolerance code:
M = ± 20% standard
K = ± 10% option

Note
For lead forming and taping options see the last pages of this document.

PACKING

The box dimensions for bulk packaging are 245 x 145 x 80 mm. Quantity/package as per article table.

Reels with taped capacitors are packed 10 in a box with dimension 370 x 370 x 560 mm. Quantity/reel according to article table. The standard quantity/reel is for 360 mm reel. If 500 mm reel is required, it must be specified when ordering and the quantity is 2 x the given quantity.

DATA SHEET ERP610

Specifications subject to change without notice

Ceramic Disc RFI Capacitors

3-digit lead style suffix codes -- Pick the code according to the leadspacing and desired forming/taping.

BULK PACKAGING						
	LEAD LENGTH L	**LEAD DIA d**	**LEAD SPACING F**			
			5mm	7.5mm	10mm	12.5mm
STRAIGHT LEADS	30 - 3mm	0.6mm	BF0	CF0	DF0	EF0
		0.8mm	BJ0	CJ0	DJ0	EJ0
	25 + 5mm	0.6mm	BY0	CY0	---	---
	10 ± 1mm	0.6mm	BD0	CD0	DD0	ED0
		0.8mm	BH0	CH0	DH0	EH0
	6.0 + 0 - 1mm	0.6 / 0.8mm	BB0	CB0	DB0	EB0
PREFORMED LEADS INSIDE CRIMP	30 - 3mm	0.6mm	BFG	CFG	DFG	EFG
		0.8mm	---	CJG	DJG	EJG
PREFORMED LEADS OUTSIDE CRIMP	5.0 ± 1mm	0.6mm	TA0	TC0	TE0	TG0
		0.8mm	---	TD0	TF0	TH0
PREFORMED LEADS SNAP-IN	min. 2.8mm	0.6mm	QA0	QC0	QE0	QG0
	min. 3.5mm	0.8mm	---	QD0	QF0	QH0

REEL PACKAGING						
COMPONENT PITCH 12.7mm LEAD DIAMETER 0.6mm	**TAPING P** **H = 16.5**		**TAPING T** **H = 18.0mm / H_0 = 16.0mm**		**TAPING U** **H = 20.0mm**	
LEAD SPACING F	5mm	7.5mm	5mm	7.5mm	5mm	7.5mm
BODY DIAMETER D	valid for - 12mm STANDARD (> 12mm to - 13mm on request)					
STRAIGHT LEADS	BRE	CRE	BRA	CRA	BRC	CRC
PREFORMED LEADS INSIDE CRIMP	---	---	BRB	CRB		
PERFORMED LEADS OUTSIDE CRIMP	---	---	TAR	TCR	---	---
PREFORMED LEADS 7.5mm to 5mm	---	---	UAR	---	---	---
PERFORMED LEADS SNAP-IN	---	---	QAR	QCR	---	---

REEL PACKAGING					
COMPONENT PITCH 25.4mm		**TAPING F**			
LEAD SPACING F		5mm	7.5mm	10mm	12.5mm
BODY DIAMETER D		> 12mm		ALL DIAMETERS	
STRAIGHT LEADS	H = 16.5mm	BRT	CRT	DRT	ERT
	H = 18.0mm	BRU	CRU	DRU	ERU
	H = 20.0mm	BRY	CRY	DRY	ERY
PREFORMED LEADS INSIDE CRIMP	Ho = 16.0mm	BRZ	CRZ	DRZ	ERZ

• The lead diameter of the taped components depends on the capacitance value and corresponds with the data given in the individual data sheets.

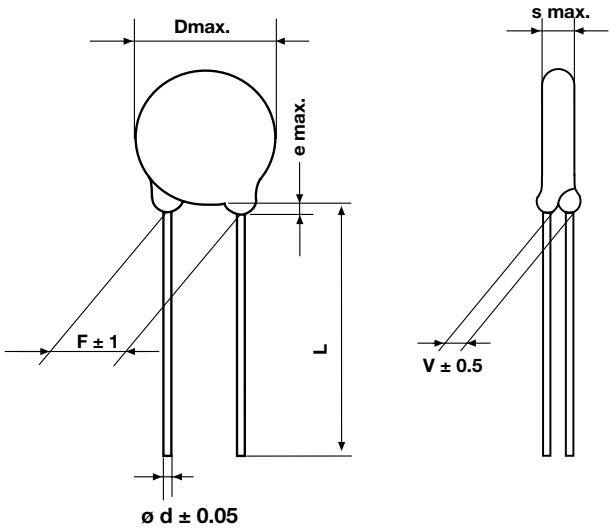
AMMO PACKAGING						
COMPONENT PITCH 12.7mm	**TAPING P** **H = 16.5**		**TAPING T** **H = 18.0 / H_0 = 16.0**		**TAPING U** **H = 20.0**	
LEAD SPACING F	5mm	7.5mm	5mm	7.5mm	5mm	7.5mm
BODY DIAMETER D	Valid for - 12mm STANDARD (> 12mm to - 13mm on request)					
STRAIGHT LEADS	BLE	---	BLA	CLA	BLC	---
PREFORMED LEADS INSIDE CRIMP	---	---	BLB	---	---	---
PREFORMED LEADS 7.5mm to 5mm	---	---	UAL	---	---	---

Ceramic Disc RFI Capacitors

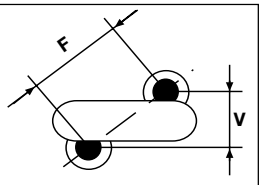
AVAILABLE STANDARD LEAD CONFIGURATIONS

STRAIGHT LEADS, LONG OR SHORT

Ød	0.6 or 0.8			
L	30 - 3 or 10 ± 1			
F	5	7.5	10	12.5
e	max. 3.0mm			

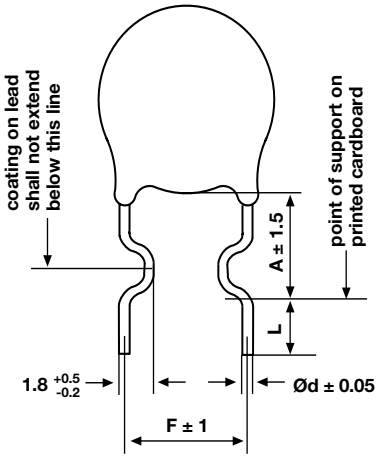


The measurement position of Lead Spacing F and of Width V is critical in straight lead capacitors. The width V is not so critical in preformed lead capacitors.



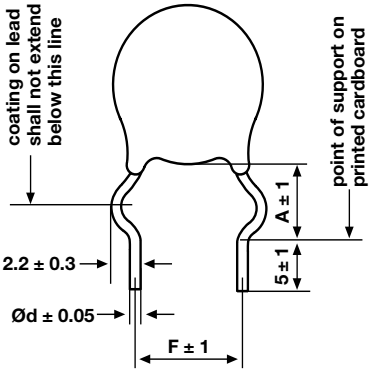
PREFORMED LEADS (INSIDE CRIMP)

Ød	0.6 or 0.8			
F	5	7.5	10	12.5
A	4.0 -1 + 0.5	4.0 ± 1.5	5.0 ± 1.5	6.0 ± 1.5
L	min. 3.0mm			
	Tolerance: 1.0mm absolute			



PREFORMED LEADS (OUTSIDE CRIMP)

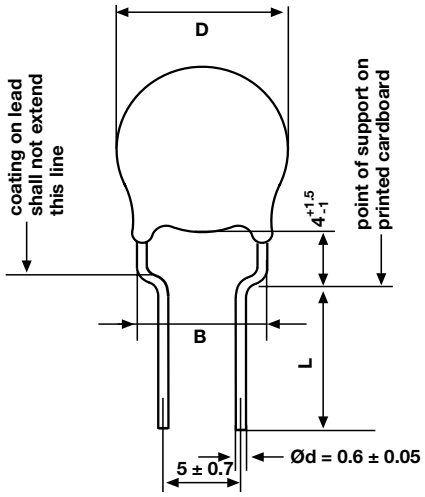
Ød	0.6		0.8	0.6 or 0.8	
F	5.0	7.5	7.5	10	12.5
A	5.0	5.0	6.0	6.0	6.0



Ceramic Disc RFI Capacitors

PREFORMED LEADS (7.5 TO 5MM)

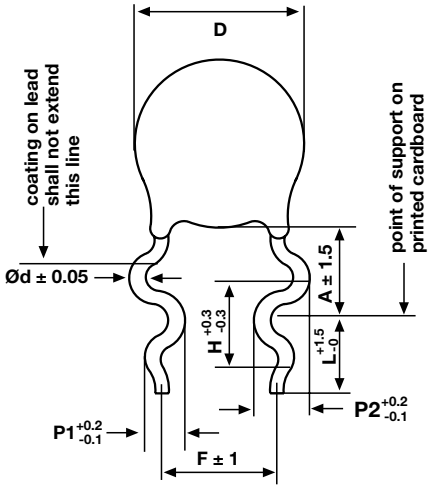
Ød	0.6
B	D - 9: 6.8 ± 0.7 D > 9: 7.5 ± 0.7
L	min. 2mm
	Tolerance 2mm absolute



PREFORMED LEADS (DOUBLE CRIMP 'SNAP IN')

Ød	0.6	0.8
F	5.0 / 7.5 / 10 / 12.5	7.5 / 10 / 12.5
L	min. 2.8mm	min. 3.5mm
H	2.6	3.3
P1	1.25	1.65
P2	1.65	1.95
A	D - 8: 6.0 ± 1.5	D > 8: 7.0 ± 1.5

General Information: PCB max. thickness 1.6mm

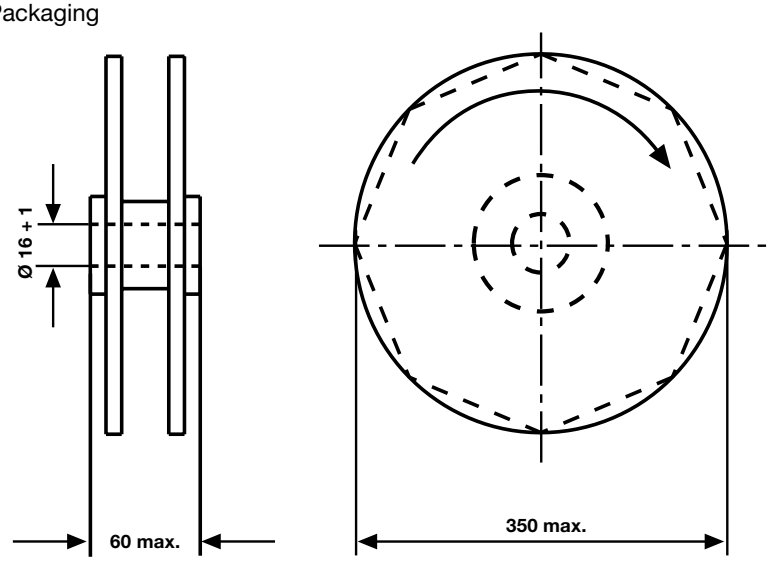


Ceramic Disc RFI Capacitors

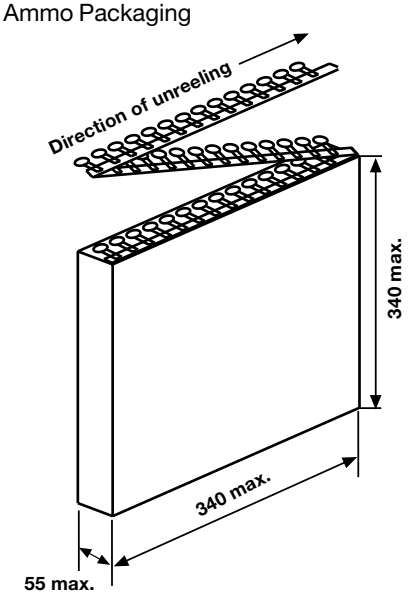
RADIAL TAPING OF CERAMIC DISC CAPACITORS					
DESIGNATION	**SYMBOL**	**TAPING P**	**TAPING T**	**TAPING U**	**TAPING F**
Pitch of Component	P	12.7 ± 1			25.4 ± 1
Pitch of sprocket hole	P_0	12.7 ± 0.3			12.7 ± 0.3
Distance, hole to lead	P_1	3.85 ± 0.7			(0.5F) ± 0.7
Distance, hole to center of component	P_2	6.35 ± 1.3			12.7 ± 1.3
Lead spacing	F	5.0 / 7.5 + 0.8 - 0.2			5/7.5/10/12.5 ± 0.8
Average deviation across tape	Đh	± 2.0 max.			± 3.0 max.
Average deviation in direction of reeling	ĐP	± 1.3 max.			± 1.3 max.
Carrier tape width	W	18.0 + 1 - 0.5			18.0 + 1 - 0.5
Hold-down tape width	W_0	6.0			6.0
Position of sprocket hole	W_1	9.0 + 0.75 - 0.5			9.0 + 0.75 - 0.5
Distance of hold-down tape	W_2	3.0 max.			3.0 max.
Distance between the abscissa and the bottom plane of the component body	H	16.5 ± 0.5	18.0 + 2 - 0	20 ± 1	16.5 ± 0.5 18.0 + 2 - 0 20.0 ± 1
Distance between the abscissa and the reference plane of the component with crimped leads.	H_0	16.0 ± 0.5			16.0 ± 0.5
Length of cut leads	L	11.0 max.			11.0 max.
Diameter of sprocket hole	D_0	4.0 ± 0.2			4.0 ± 0.2
Total tape thickness	t	0.9 max.			0.9 max.

PACKAGING VERSIONS

Reel Packaging

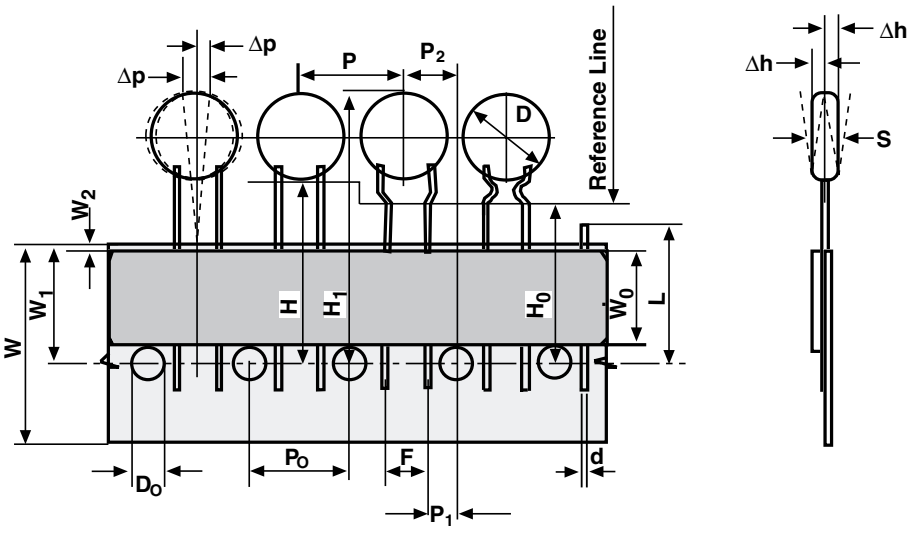


Ammo Packaging

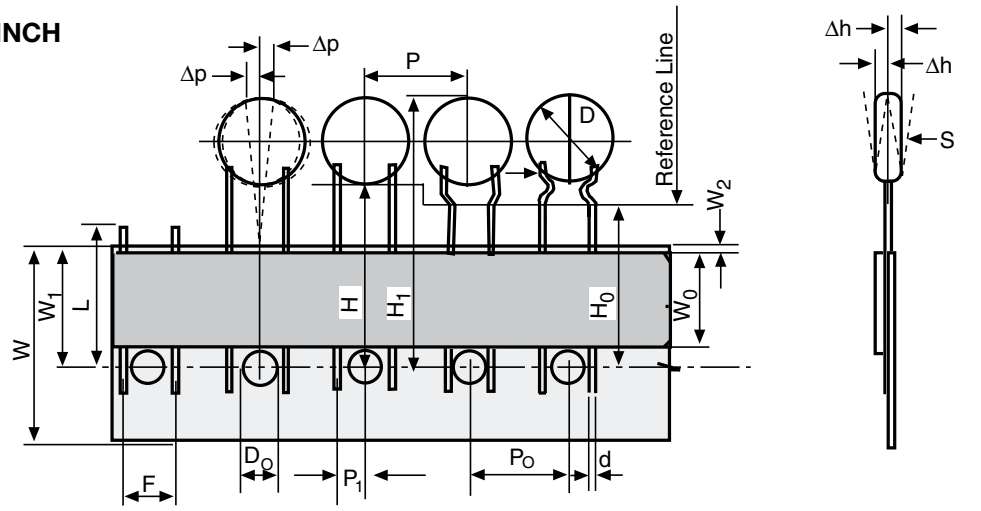


Ceramic Disc RFI Capacitors

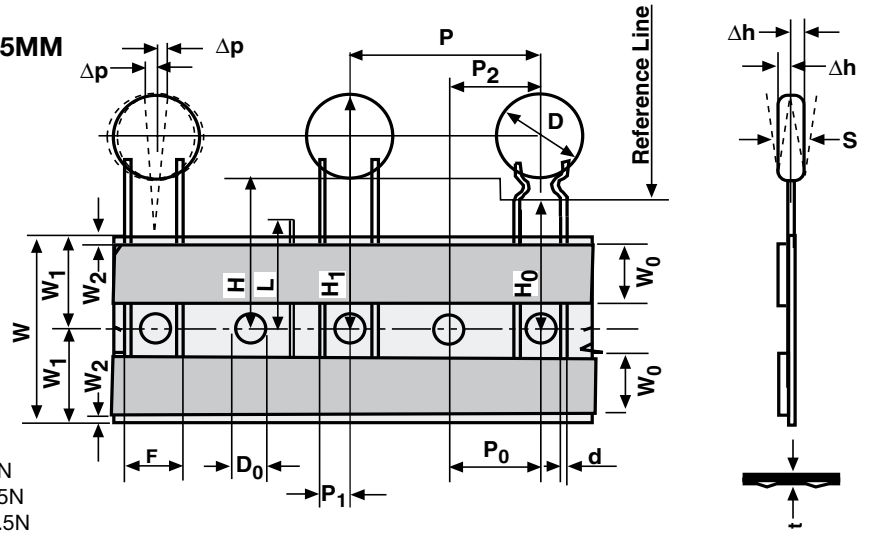
TAPING P / T / U
COMPONENT PITCH 0.5 INCH
LEAD SPACING 5.0MM



TAPING P / T / U
COMPONENT PITCH 0.5 INCH
LEAD SPACING 7.5MM



TAPING F
COMPONENT PITCH 1.0 INCH
LEAD SPACING 5.0 / 7.5 / 10 / 12.5MM



- Pulling force from the tape • 5N
- Tensile strength of tape • 15N
- Unreeling force of tape from reel • 2.5N

Maximum 0.5% of all components on reel may be missing. A maximum of 3 consecutive components may be missing provided this gap is followed by 6 consecutive components. The splices shall have the same minimum strength as the tape. The splices must be not thicker than 1.5mm, the sprocket holes may not be effected.