

## AC Line Rated Disc Capacitors

### Class X1, 760 V<sub>AC</sub>, Class Y1, 500 V<sub>AC</sub>



#### FEATURES

- Complying with IEC 60384-14, 3<sup>rd</sup> edition
- High reliability
- Vertical (inline) kinked or straight leads
- Material categorization:  
For definitions of compliance please see  
[www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**  
Available

#### APPLICATIONS

- X1, Y1 according to IEC 60384-14.3
- Across-the-line
- Line by-pass
- Antenna coupling

#### DESIGN

The capacitors consist of a ceramic disc both sides of which are silver-plated. Connection leads are made of tinned copper having a diameter of 0.6 mm.

The capacitors may be supplied with vertical (inline) kinked leads having a lead spacing of 10.0 mm and 12.5 mm. Encapsulation is made of flammable resistant epoxy resin in accordance with "UL 94 V-0".

QUICK REFERENCE DATA						
DESCRIPTION	CLASS X1 (U2J)	CLASS X1 (Y5S)	CLASS X1 (Y5U)	CLASS Y1 (U2J)	CLASS Y1 (Y5S)	CLASS Y1 (Y5U)
Voltage (V <sub>AC</sub> )	760			500	250	500
Min. Capacitance (pF)	10	33	470	10	33	470
Max. Capacitance (pF)	22	330	4700	22	330	4700
Mounting	Through hole					

#### OPERATING TEMPERATURE RANGE

- 40 °C to + 125 °C

#### TEMPERATURE CHARACTERISTICS

See Ordering Information table

#### CLIMATIC CATEGORY

40/125/21 according to EN 60068-1

#### COATING

According to UL 94 V-0

Epoxy resin, isolating, flame retardant

#### APPROVALS

ENEC VDE (DE1-32019)

UL 60384-14 file E183844

CSA 22.2

#### PACKAGING

Bulk, tape and reel, taped ammpack

#### CAPACITANCE RANGE

10 pF to 4700 pF

#### RATED VOLTAGE U<sub>R</sub>

IEC 60384-14.3 and UL 60384-14:

(X1): 760 V<sub>AC</sub>, 50 Hz

(Y1): 500 V<sub>AC</sub>, 50 Hz

#### TEST VOLTAGE

Component test (100 %):

4000 V<sub>AC</sub>, 50 Hz, 2 s

Random sampling test (destructive test):

4000 V<sub>AC</sub>, 50 Hz, 60 s

Voltage proof of coating (destructive test):

4000 V<sub>AC</sub>, 50 Hz, 60 s

#### INSULATION RESISTANCE

10 000 MΩ minimum

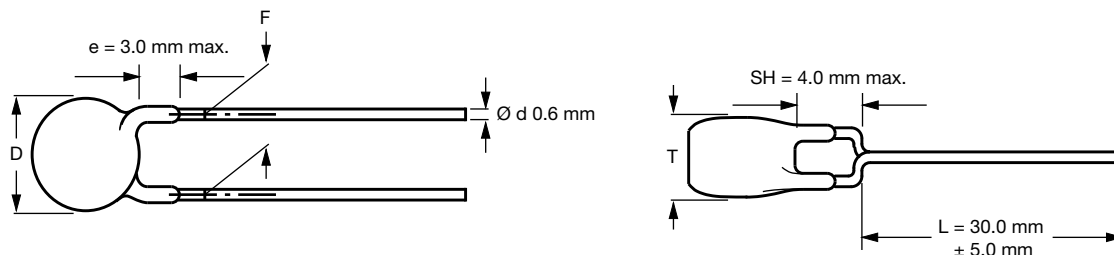
#### TOLERANCE OF CAPACITANCE

± 20 % (code M); ± 10 % (code K)

#### DISSIPATION FACTOR

2.5 % maximum

## DIMENSIONS



Capacitors with 10.0 mm and 12.5 mm lead spacing

## ORDERING INFORMATION

C (pF)	TOL. (%)	TEMP. COEFFICIENT	BODY DIAMETER D <sub>MAX.</sub> (mm)	BODY THICKNESS T <sub>MAX.</sub> (mm)	LEAD SPACING F (mm)	CLEAR TEXT CODE			
						15 <sup>TH</sup> DIGIT: T = REEL; U = AMMO; 3 = BULK <sup>(1)</sup>			
						RoHS COMPLIANT	RoHS AND HALOGEN-FREE		
10	± 10	U2J (N750)	8.0	5.0	10.0	VY1100K31U2JQ6*V0	VY1100K31U2JG6*V0		
15						VY1150K31U2JQ6*V0	VY1150K31U2JG6*V0		
22						VY1220K31U2JQ6*V0	VY1220K31U2JG6*V0		
33						VY1330K31Y5SQ6*V0	VY1330K31Y5SG6*V0		
47						VY1470K31Y5SQ6*V0	VY1470K31Y5SG6*V0		
68		Y5S (2C3)				VY1680K31Y5SQ6*V0	VY1680K31Y5SG6*V0		
100						VY1101K31Y5SQ6*V0	VY1101K31Y5SG6*V0		
150						VY1151K31Y5SQ6*V0	VY1151K31Y5SG6*V0		
220						VY1221K31Y5SQ6*V0	VY1221K31Y5SG6*V0		
330						VY1331K31Y5SQ6*V0	VY1331K31Y5SG6*V0		
470	± 20	Y5U (2E3)				VY1471M31Y5UQ6*V0	VY1471M31Y5UG6*V0		
680						VY1681M31Y5UQ6*V0	VY1681M31Y5UG6*V0		
1000						VY1102M35Y5UQ6*V0	VY1102M35Y5UG6*V0		
1500						VY1152M41Y5UQ6*V0	VY1152M41Y5UG6*V0		
2200						VY1222M47Y5UQ6*V0	VY1222M47Y5UG6*V0		
3300						VY1332M59Y5UQ6*V0	VY1332M59Y5UG6*V0		
3900						VY1392M61Y5UQ6*V0	VY1392M61Y5UG6*V0		
4700						VY1472M63Y5UQ6*V0	VY1472M63Y5UG6*V0		
10			± 10	U2J (N750)	8.0	5.0	12.5	VY1100K31U2JQ6*VX	VY1100K31U2JG6*VX
15								VY1150K31U2JQ6*VX	VY1150K31U2JG6*VX
22	VY1220K31U2JQ6*VX	VY1220K31U2JG6*VX							
33	VY1330K31Y5SQ6*VX	VY1330K31Y5SG6*VX							
47	VY1470K31Y5SQ6*VX	VY1470K31Y5SG6*VX							
68	Y5S (2C3)	VY1680K31Y5SQ6*VX		VY1680K31Y5SG6*VX					
100		VY1101K31Y5SQ6*VX		VY1101K31Y5SG6*VX					
150		VY1151K31Y5SQ6*VX		VY1151K31Y5SG6*VX					
220		VY1221K31Y5SQ6*VX		VY1221K31Y5SG6*VX					
330		VY1331K31Y5SQ6*VX		VY1331K31Y5SG6*VX					
470	± 20	Y5U (2E3)	VY1471M31Y5UQ6*VX	VY1471M31Y5UG6*VX					
680			VY1681M31Y5UQ6*VX	VY1681M31Y5UG6*VX					
1000			VY1102M35Y5UQ6*VX	VY1102M35Y5UG6*VX					
1500			VY1152M41Y5UQ6*VX	VY1152M41Y5UG6*VX					
2200			VY1222M47Y5UQ6*VX	VY1222M47Y5UG6*VX					
3300			VY1332M59Y5UQ6*VX	VY1332M59Y5UG6*VX					
3900			VY1392M61Y5UQ6*VX	VY1392M61Y5UG6*VX					
4700			VY1472M63Y5UQ6*VX	VY1472M63Y5UG6*VX					

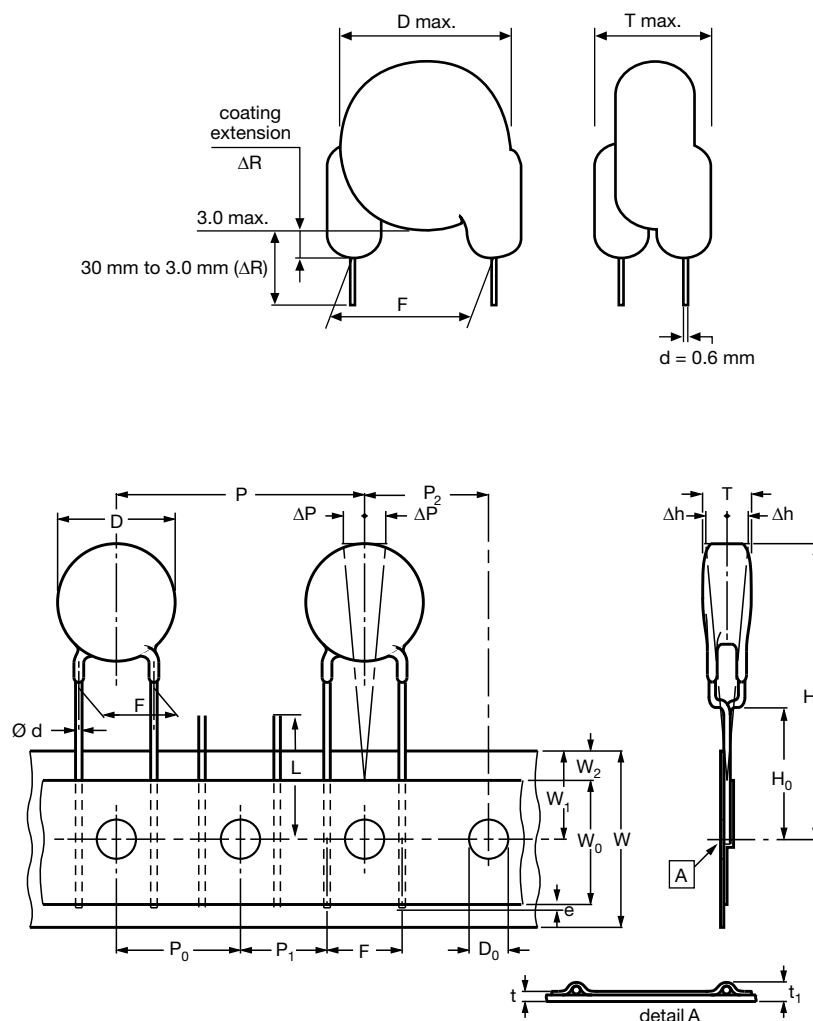
### Notes

- Straight leads are available on request
- Coating extension DR valid for straight leads only
- On request available: ± 10 % tolerance
- <sup>(1)</sup> 15<sup>th</sup> digit of the clear text code number to be completed with the packaging code

PACKAGING					
CAPACITANCE VALUE	SIZE CODE	BODY DIAMETER $D_{MAX.}$ (mm)	PACKAGING QUANTITIES		
			BULK	REEL	AMMO
10 pF to 2200 pF	31 to 47	12.0	1000	500	750
3300 pF to 4700 pF	51 to 63	16.0	500	500	750

**Note**

- The capacitors are supplied in bulk packaging (cardboard boxes), in tape on reel in ammopack

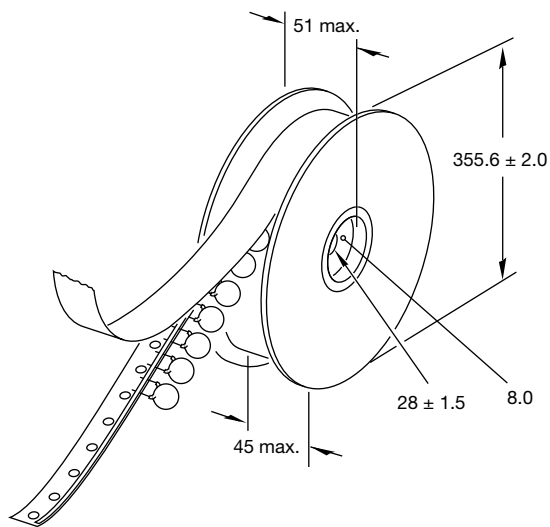
**STRAIGHT LEADS**


Lead spacing 10.0 mm and 12.5 mm, sprocket hole pitch 25.04 mm for lead spacing

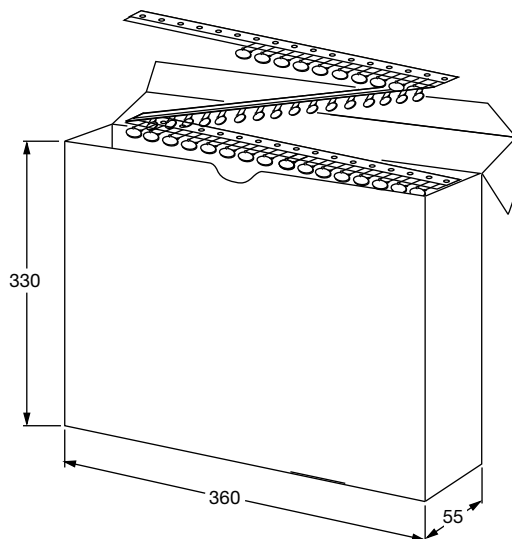
DIMENSIONS OF TAPE		
SYMBOL	PARAMETER	DIMENSIONS (mm)
		FIG. 2
D <sup>(1)</sup>	Body diameter	16.0 max.
d	Lead diameter	0.6 ± 0.05
P	Pitch of component	25.4 ± 1
P <sub>0</sub> <sup>(2)</sup>	Pitch of sprocket hole	12.7 ± 0.3
P <sub>1</sub> <sup>(3)</sup>	Distance, hole center to lead	7.7 or 6.4 ± 1.0
P <sub>2</sub> <sup>(3)</sup>	Distance, hole to center of component	12.7 ± 1.5
F	Lead spacing	10.0 or 12.5 + 0.6/- 0.4
Δh	Average deviation across tape	± 1.0 max.
ΔP	Average deviation in direction of reeling	± 1.0 max.
W	Carrier tape width	18.0 + 1/- 0.5
W <sub>0</sub>	Hold-down tape width	5.0 min.
W <sub>1</sub>	Position of sprocket hole	9.0 + 0.75/- 0.5
W <sub>2</sub>	Distance of hold-down tape	3.0 max.
H <sub>1</sub>	Maximum component height	40.0
H <sub>0</sub>	Height to seating plane (for kinked leads)	16.0 ± 0.5
H <sub>0</sub>	Height to seating plane (for straight leads)	20.0 ± 0.5
L	Length of cut leads	11.0 max.
l	Length of lead protrusion	1.0 max.
D <sub>0</sub>	Diameter of sprocket hole	4.0 ± 0.2
t	Total tape thickness	0.9 max.

**Notes**

- <sup>(1)</sup> See Ordering Information table  
<sup>(2)</sup> Cumulative pitch error: ± 1 mm/20 pitches  
<sup>(3)</sup> Obliquity maximum 3°

**REEL AND TAPE DATA** in millimeters


Reel with capacitors on tape



Ammopack with capacitors on tape



## STANDARD RECOGNITION

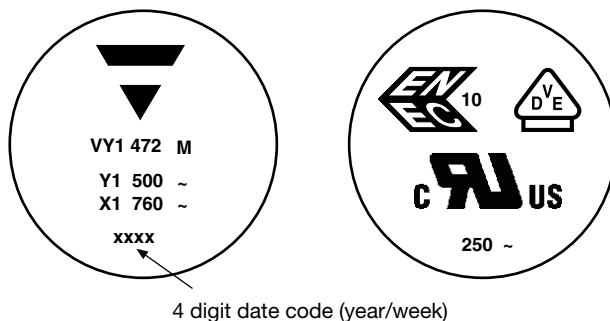
IEC 60384 - 14/3<sup>rd</sup> issue (2005) - Safety tests

UL 1414 - Across-the-line, antenna-coupling and line-by-pass component

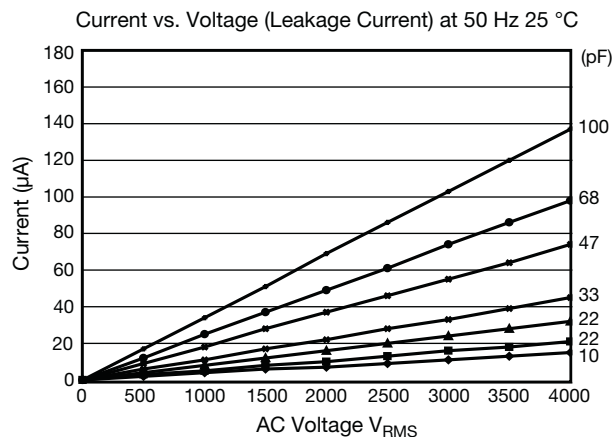
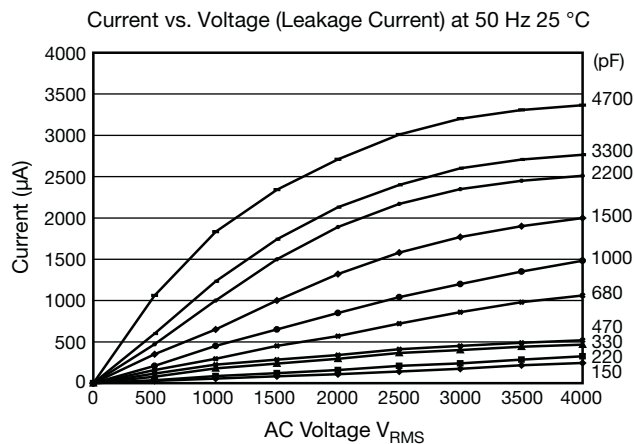
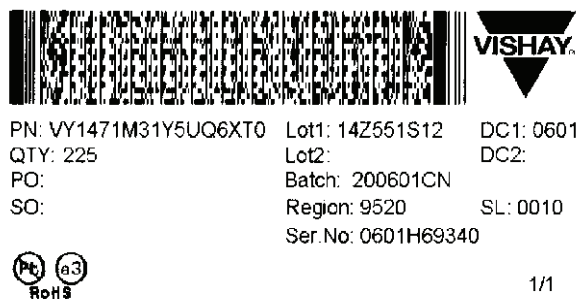
CSA C22.2 - Across-the-line, line to ground and antenna isolation capacitor

CQC - China Quality Certification Center-Safety Tests

## MARKING: 2 SIDES (EXAMPLE)



## LABEL (EXAMPLE)



### Note

- The capacitors meet the essential requirements of "EIA 198". Unless stated otherwise all electrical values apply at an ambient temperature of 25 °C ± 3 °C, at normal atmospheric conditions.



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