

AC Line Rated Disc Capacitors Class X1, 440 V_{AC}, Class Y2, 300 V_{AC}


FEATURES

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

APPLICATIONS

- 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 5.0 mm, 7.5 mm, or 10.0 mm. Encapsulation is made of flammable resistant epoxy resin in accordance with “UL 94 V-0”

CAPACITANCE RANGE

10 pF to 0.01 μF

RATED VOLTAGE U_R

IEC 60384-14 and UL60384-14:

(X1): 440 V_{AC}, 50 Hz

(Y2): 300 V_{AC}, 50 Hz

TEST VOLTAGE

Component test (100 %)

2600 V_{AC}, 50 Hz, 2 s

(2600 V_{AC} for LS 7.5 mm and 10 mm)

(2200 V_{AC} for LS 5.0 mm)

Random sampling test (destructive test)

2600 V_{AC}, 50 Hz, 60 s

Voltage proof of coating (destructive test)

2600 V_{AC}, 50 Hz, 60 s

INSULATION RESISTANCE

10 000 MΩ minimum

TOLERANCE OF CAPACITANCE

± 20 % (code M); ± 10 % (code K)

DISSIPATION FACTOR

2.5 % maximum

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

QUICK REFERENCE DATA						
DESCRIPTION	CLASS X1 (U2J)	CLASS X1 (Y5S)	CLASS X1 (Y5U)	CLASS Y2 (U2J)	CLASS Y2 (Y5S)	CLASS Y2 (Y5U)
Voltage (V _{AC})	440			300		
Min. Capacitance (pF)	10	68	680	10	68	680
Max. Capacitance (pF)	47	680	10 000	47	680	10 000
Mounting	Through hole					

OPERATING TEMPERATURE RANGE

- 40 °C to + 125 °C

TEMPERATURE CHARACTERISTICS

See Ordering Information Tables

CLIMATIC CATEGORY

40/125/21 according to EN 60068-1

COATING

According to UL 94 V-0

Epoxy resin, isolating, flame retardant

APPROVALS

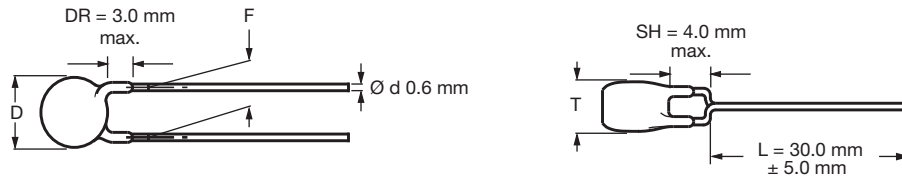
ENEC - VDE DE 1-30691

UL60384-14 file E183844

CSA 22.2

PACKAGING

Bulk; tape and reel; taped ammpack

DIMENSIONS


Capacitors with 5.0 mm, 7.5 mm and 10 mm lead spacing

ORDERING INFORMATION

C (pF)	TOL. (%)	TEMP. COEFFICIENT	BODY DIAMETER D _{MAX.} (mm)	BODY THICKNESS T _{MAX.} (mm)	LEAD SPACING F (mm)	COATING EXTENSION DR _{MAX.} (2) (mm)	CLEAR TEXT CODE	
							15 TH DIGIT: T = REEL; U = AMMO; 3 = BULK (1)	
							RoHS COMPLIANT	RoHS AND HALOGEN-FREE
VY2 for leadspacing 5.0 mm							2200 V_{AC}, 50 Hz, 2 s	
10	± 10	U2J (N750)	7.5	5.0	5.0	3.0	VY2100K29U2JS6*V5	VY2100K29U2JG6*V5
15							VY2150K29U2JS6*V5	VY2150K29U2JG6*V5
22							VY2220K29U2JS6*V5	VY2220K29U2JG6*V5
33							VY2330K29U2JS6*V5	VY2330K29U2JG6*V5
47							VY2470K29U2JS6*V5	VY2470K29U2JG6*V5
68							VY2680K29Y5SS6*V5	VY2680K29Y5SG6*V5
100							VY2101K29Y5SS6*V5	VY2101K29Y5SG6*V5
150							VY2151K29Y5SS6*V5	VY2151K29Y5SG6*V5
220							VY2221K29Y5SS6*V5	VY2221K29Y5SG6*V5
330							VY2331K29Y5SS6*V5	VY2331K29Y5SG6*V5
470	VY2471K29Y5SS6*V5	VY2471K29Y5SG6*V5						
680	VY2681M29Y5US6*V5	VY2681M29Y5UG6*V5						
1000	± 20	Y5U (2E3)	8.0	5.0	5.0	3.0	VY2102M29Y5US6*V5	VY2102M29Y5UG6*V5
1500							VY2152M31Y5US6*V5	VY2152M31Y5UG6*V5
2200							VY2222M35Y5US6*V5	VY2222M35Y5UG6*V5
3300							VY2332M41Y5US6*V5	VY2332M41Y5UG6*V5
3900							VY2392M43Y5US6*V5	VY2392M43Y5UG6*V5

ORDERING INFORMATION

C (pF)	TOL. (%)	TEMP. COEFFICIENT	BODY DIAMETER D _{MAX.} (mm)	BODY THICKNESS T _{MAX.} (mm)	LEAD SPACING F (mm)	COATING EXTENSION DR _{MAX.} (2) (mm)	CLEAR TEXT CODE	
							15 TH DIGIT: T = REEL; U = AMMO; 3 = BULK (1)	
							RoHS COMPLIANT	RoHS AND HALOGEN-FREE
VY2 for leadspacing 7.5 mm							2600 V_{AC}, 50 Hz, 2 s	
10	± 10	U2J (N750)	7.5	5.0	7.5	3.0	VY2100K29U2JS6*V7	VY2100K29U2JG6*V7
15							VY2150K29U2JS6*V7	VY2150K29U2JG6*V7
22							VY2220K29U2JS6*V7	VY2220K29U2JG6*V7
33							VY2330K29U2JS6*V7	VY2330K29U2JG6*V7
47							VY2470K29U2JS6*V7	VY2470K29U2JG6*V7
68							VY2680K29Y5SS6*V7	VY2680K29Y5SG6*V7
100	± 10	Y5S (2C3)	7.5	5.0	7.5	3.0	VY2101K29Y5SS6*V7	VY2101K29Y5SG6*V7
150							VY2151K29Y5SS6*V7	VY2151K29Y5SG6*V7
220							VY2221K29Y5SS6*V7	VY2221K29Y5SG6*V7
330							VY2331K29Y5SS6*V7	VY2331K29Y5SG6*V7
470							VY2471K29Y5SS6*V7	VY2471K29Y5SG6*V7
680							VY2681M29Y5US6*V7	VY2681M29Y5UG6*V7
1000	± 20	Y5U (2E3)	8.0	5.0	7.5	3.0	VY2102M29Y5US6*V7	VY2102M29Y5UG6*V7
1500							VY2152M31Y5US6*V7	VY2152M31Y5UG6*V7
2200							VY2222M35Y5US6*V7	VY2222M35Y5UG6*V7
3300							VY2332M41Y5US6*V7	VY2332M41Y5UG6*V7
3900							VY2392M43Y5US6*V7	VY2392M43Y5UG6*V7
4700							VY2472M49Y5US6*V7	VY2472M49Y5UG6*V7
6800							VY2682M59Y5US63V7	VY2682M59Y5UG63V7
0.01 µF							VY2103M63Y5US63V7	VY2103M63Y5UG63V7

ORDERING INFORMATION								
C (pF)	TOL. (%)	TEMP. COEFFICIENT	BODY DIAMETER D _{MAX.} (mm)	BODY THICKNESS T _{MAX.} (mm)	LEAD SPACING F (mm)	COATING EXTENSION DR _{MAX.} (2) (mm)	CLEAR TEXT CODE	
							15 TH DIGIT: T = REEL; U = AMMO; 3 = BULK (1)	
							RoHS COMPLIANT	RoHS AND HALOGEN-FREE
VY2 for leadspacing 10.0 mm							2600 V_{AC}, 50 Hz, 2 s	
10	± 10	U2J (N750)	7.5	5.0	10.0	3.0	VY2100K29U2JS6*V0	VY2100K29U2JG6*V0
15							VY2150K29U2JS6*V0	VY2150K29U2JG6*V0
22							VY2220K29U2JS6*V0	VY2220K29U2JG6*V0
33							VY2330K29U2JS6*V0	VY2330K29U2JG6*V0
47							VY2470K29U2JS6*V0	VY2470K29U2JG6*V0
68							VY2680K29Y5SS6*V0	VY2680K29Y5SG6*V0
100							VY2101K29Y5SS6*V0	VY2101K29Y5SG6*V0
150							VY2151K29Y5SS6*V0	VY2151K29Y5SG6*V0
220							VY2221K29Y5SS6*V0	VY2221K29Y5SG6*V0
330							VY2331K29Y5SS6*V0	VY2331K29Y5SG6*V0
470	VY2471K29Y5SS6*V0	VY2471K29Y5SG6*V0						
680	± 20	Y5S (2C3)	8.0	5.0	10.0	3.0	VY2681M29Y5US6*V0	VY2681M29Y5UG6*V0
1000							VY2102M29Y5US6*V0	VY2102M29Y5UG6*V0
1500							VY2152M31Y5US6*V0	VY2152M31Y5UG6*V0
2200							VY2222M35Y5US6*V0	VY2222M35Y5UG6*V0
3300							VY2332M41Y5US6*V0	VY2332M41Y5UG6*V0
3900							VY2392M43Y5US6*V0	VY2392M43Y5UG6*V0
4700							VY2472M49Y5US6*V0	VY2472M49Y5UG6*V0
6800							VY2682M59Y5US63V0	VY2682M59Y5UG63V0
0.01 μF							VY2103M63Y5US63V0	VY2103M63Y5UG63V0

Notes

- (1) 15th digit of the clear text code number to be completed with the packaging code.
- (2) Coating extension DR valid for straight leads only.
- Straight leads are available on request.

LEADSPACING 5.0 mm and 7.5 mm

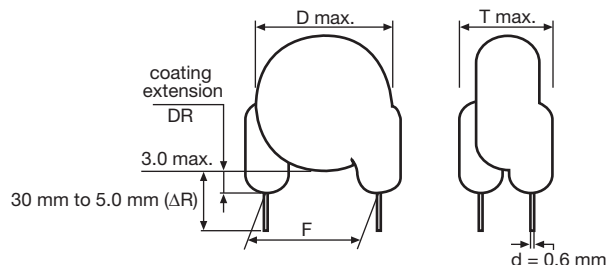
PACKAGING					
CAPACITANCE VALUE	SIZE CODE	BODY DIAMETER D _{MAX.} (mm)	PACKAGING QUANTITIES		
			BULK	REEL	AMMO
10 pF to 4700 pF	29 to 49	12.5	1000	1000	1000
6800 pF to 0.01 μF	59 to 63	16.0	500	-	-

LEADSPACING 10.0 mm

PACKAGING					
CAPACITANCE VALUE	SIZE CODE	BODY DIAMETER D _{MAX.} (mm)	PACKAGING QUANTITIES		
			BULK	REEL	AMMO
10 pF to 4700 pF	29 to 49	12.5	1000	500	750
6800 pF to 0.01 μF	59 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


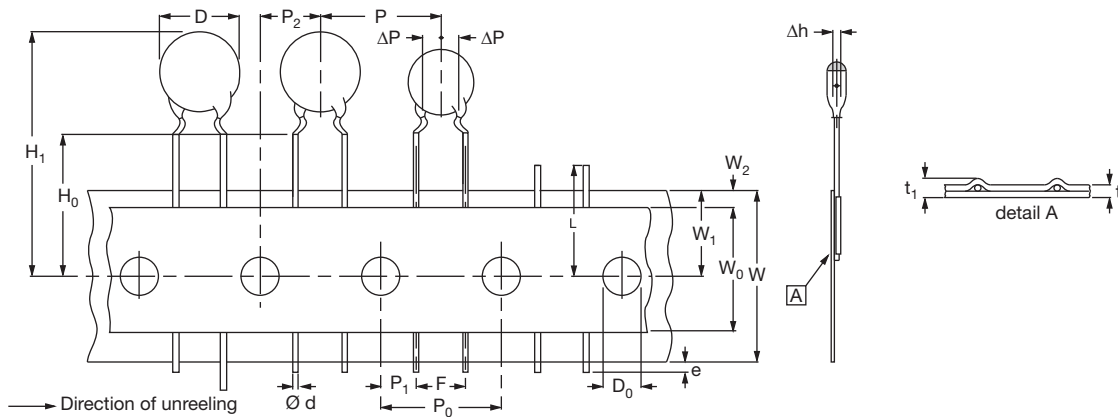


Fig. 1 - Kinked capacitors on tape, lead spacing 5.0 mm (0.2") and 7.5 mm (0.3")

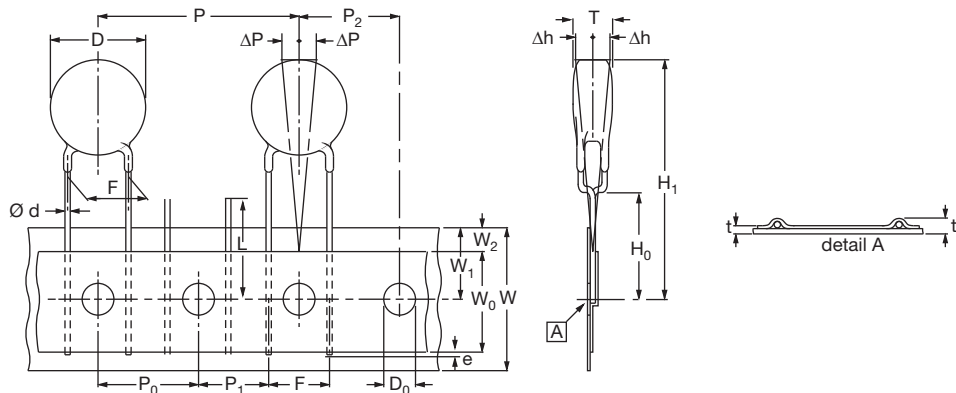


Fig. 2 - Inline kink (V) leaded capacitors on tape, lead spacing 10 mm (0.40")

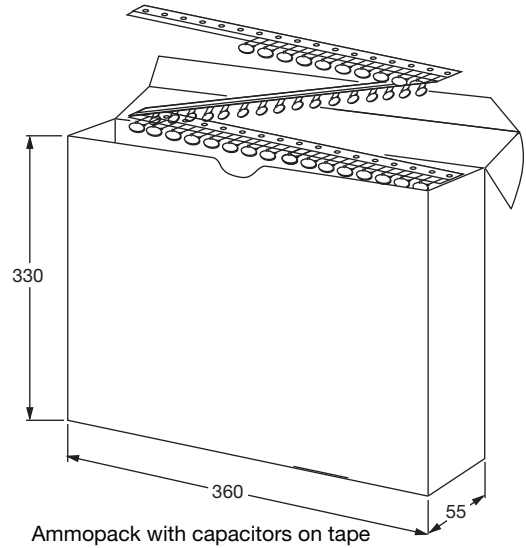
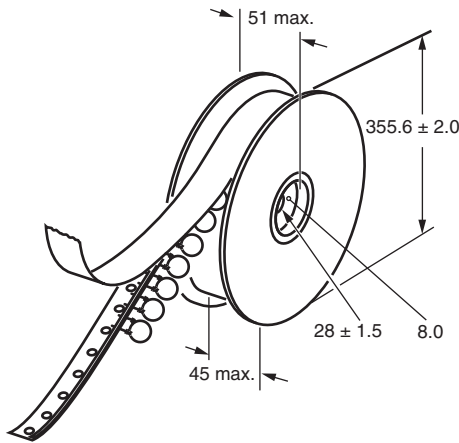
DIMENSION OF TAPE				
SYMBOL	PARAMETER	DIMENSIONS (mm)		
		FIG. 1 (5 mm)	FIG. 1 (7.5 mm)	FIG. 2 (10 mm)
D ⁽¹⁾	Body diameter	11.0 max.	14.0 max.	16.0 max.
d	Lead diameter	0.6 ± 0.05	0.6 ± 0.05	0.6 ± 0.05
P	Pitch of component	12.7 ± 1	15.0 ± 1	25.4 ± 1
P ₀ ⁽²⁾	Pitch of sprocket hole	12.7 ± 0.3	15.0 ± 0.3	12.7 ± 0.3
P ₁ ⁽³⁾	Distance, hole center to lead	3.85 ± 0.7	3.75 ± 0.7	7.7 ± 1.0
P ₂ ⁽³⁾	Distance, hole to center of component	6.35 ± 1.3	7.5 ± 1.5	12.7 ± 1.5
F	Lead spacing	5.0 (+ 0.6/- 0.4)	7.5 (+ 0.6/- 0.4)	10.0 (+ 0.6/- 0.4)
Δh	Average deviation across tape	± 1.0 max.	± 1.0 max.	± 1.0 max.
ΔP	Average deviation in direction of reeling	± 1.0 max.	± 1.0 max.	± 1.0 max.
W	Carrier tape width	18.0 + 1/- 0.5	18.0 + 1/- 0.5	18.0 + 1/- 0.5
W ₀	Hold-down tape width	5.0 min.	5.0 min.	5.0 min.
W ₁	Position of sprocket hole	9.0 + 0.75/- 0.5	9.0 + 0.75/- 0.5	9.0 + 0.75/- 0.5
W ₂	Distance of hold-down tape	3.0 max.	3.0 max.	3.0 max.
H ₁	Maximum component height	32	40	40
H ₀	Height to seating plane (for kinked leads)	16.0 ± 0.5	16.0 ± 0.5	16.0 ± 0.5
H ₀	Height to seating plane (for straight leads)	20.0 ± 0.5	20.0 ± 0.5	20.0 ± 0.5
L	Length of cut leads	11.0 max.	11.0 max.	11.0 max.
e	Length of lead protrusion	1.0 max.	1.0 max.	1.0 max.
D ₀	Diameter of sprocket hole	4.0 ± 0.2	4.0 ± 0.2	4.0 ± 0.2
t	Total tape thickness	0.9 max.	0.9 max.	0.9 max.
t ₁	Maximum thickness of tape and wires	1.5 max.	1.5 max.	1.5 max.

Notes

- (1) See ordering information table
- (2) Cumulative pitch error: ± 1 mm/20 pitches
- (3) Obliquity maximum 3°



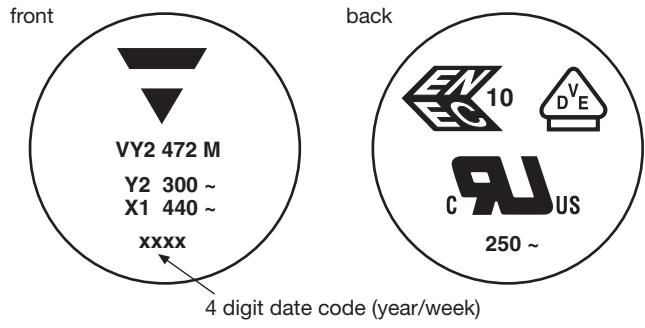
REEL AND TAPE DATA in millimeters





STANDARD RECOGNITION

IEC 60384 - 14/3rd issue (2005)- Safety Tests
UL60384-14 - Across-the-line, antenna-coupling and line-by-pass component
CQC - China Quality Certification Center-Safety Tests


MARKING: 2 SIDES
(EXAMPLE)



LABEL
(EXAMPLE)

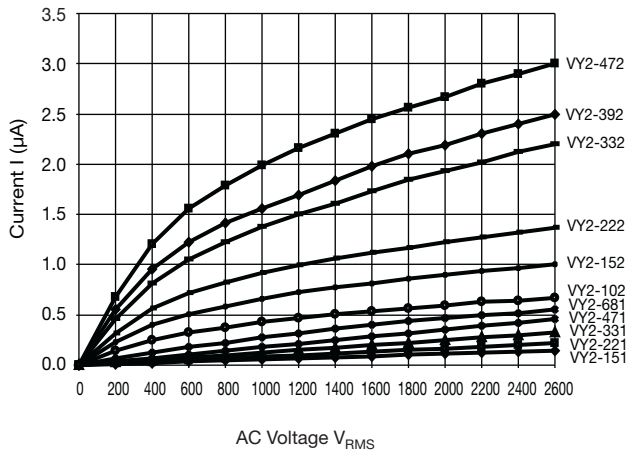
PN: VY2331K29Y5SS6UV7 Lot1: 14Z549306 DC1: 0601
 QTY: 1000 Lot2: DC2:
 PO: Batch: 200601CN
 SO: Region: 9520 SL: 0010
 Ser.No: 0601H72383



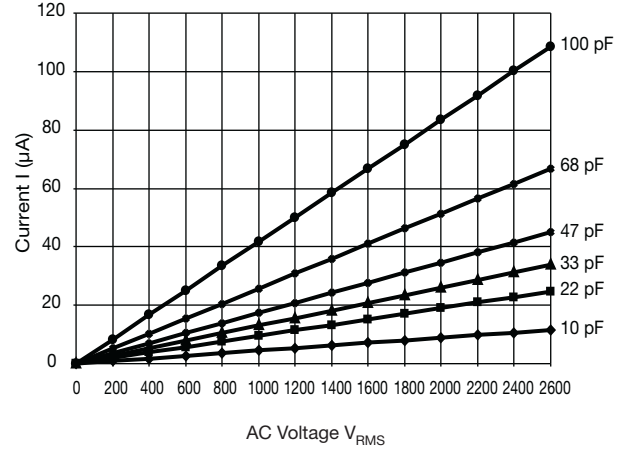
2/5



Typical Current vs. Voltage (Leakage Current) at 60 Hz 25 °C



Typical Current vs. Voltage (Leakage Current) at 60 Hz 25 °C



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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