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

Pb e3 RoHS COMPLIANT HALOGEN FREE Available

APPLICATIONS

- Across-the-line
- Line by-pass
- Antenna coupling

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 ammopack

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

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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 15TH 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		Y5S (2C3)					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	± 20	Y5U (2E3)					VY2681M29Y5US6*V5	VY2681M29Y5UG6*V5
1000							VY2102M29Y5US6*V5	VY2102M29Y5UG6*V5
1500			8.0				VY2152M31Y5US6*V5	VY2152M31Y5UG6*V5
2200			9.0				VY2222M35Y5US6*V5	VY2222M35Y5UG6*V5
3300			10.5				VY2332M41Y5US6*V5	VY2332M41Y5UG6*V5
3900			11.0				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 15TH 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	± 10	Y5S (2C3)					VY2680K29Y5SS6*V7	VY2680K29Y5SG6*V7
100							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	± 20	Y5U (2E3)					VY2681M29Y5US6*V7	VY2681M29Y5UG6*V7
1000							VY2102M29Y5US6*V7	VY2102M29Y5UG6*V7
1500			8.0				VY2152M31Y5US6*V7	VY2152M31Y5UG6*V7
2200			9.0				VY2222M35Y5US6*V7	VY2222M35Y5UG6*V7
3300			10.5				VY2332M41Y5US6*V7	VY2332M41Y5UG6*V7
3900			11.0				VY2392M43Y5US6*V7	VY2392M43Y5UG6*V7
4700			12.5				VY2472M49Y5US6*V7	VY2472M49Y5UG6*V7
6800			14.5				VY2682M59Y5US63V7	VY2682M59Y5UG63V7
0.01 µF			16.0				VY2103M63Y5US63V7	VY2103M63Y5UG63V7

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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 15TH 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		Y5S (2C3)					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	Y5U (2E3)					VY2681M29Y5US6*V0	VY2681M29Y5UG6*V0
1000							VY2102M29Y5US6*V0	VY2102M29Y5UG6*V0
1500			8.0				VY2152M31Y5US6*V0	VY2152M31Y5UG6*V0
2200			9.0				VY2222M35Y5US6*V0	VY2222M35Y5UG6*V0
3300			10.5				VY2332M41Y5US6*V0	VY2332M41Y5UG6*V0
3900			11.0				VY2392M43Y5US6*V0	VY2392M43Y5UG6*V0
4700			12.5				VY2472M49Y5US6*V0	VY2472M49Y5UG6*V0
6800			14.5				VY2682M59Y5US63V0	VY2682M59Y5UG63V0
0.01 µF			16.0				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	-	-

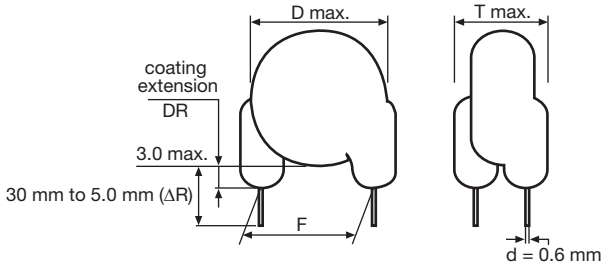
LEADSPACING 10.0 mm

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



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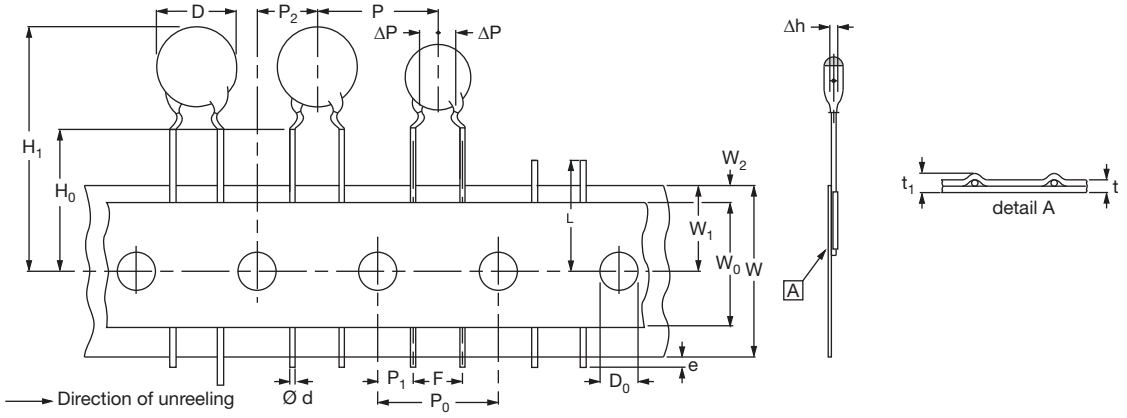


Fig. 1 - Kinked capacitors on tape, lead spacing 5.0 mm (0.2") and 7.5 mm (0.3")

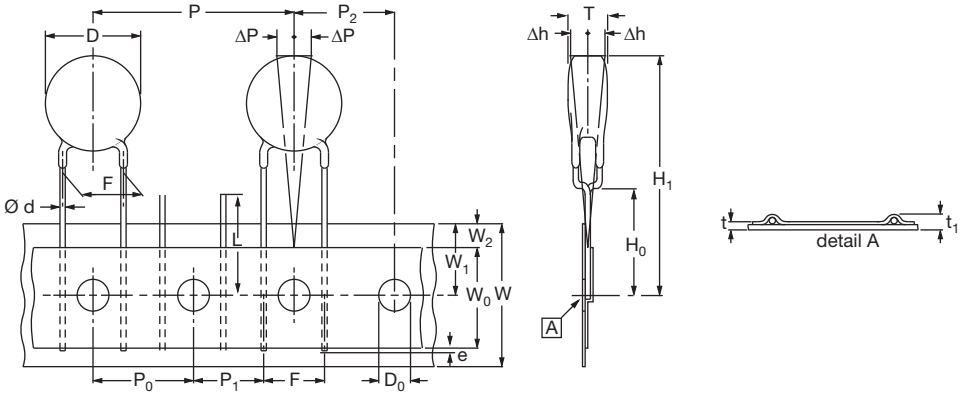


Fig. 2 - Inline kink (V) leaded capacitors on tape, lead spacing 10 mm (0.40")

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

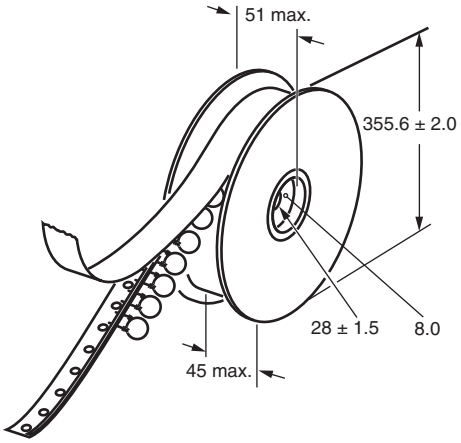
(2) Cumulative pitch error: ± ≤ 1 mm/20 pitches

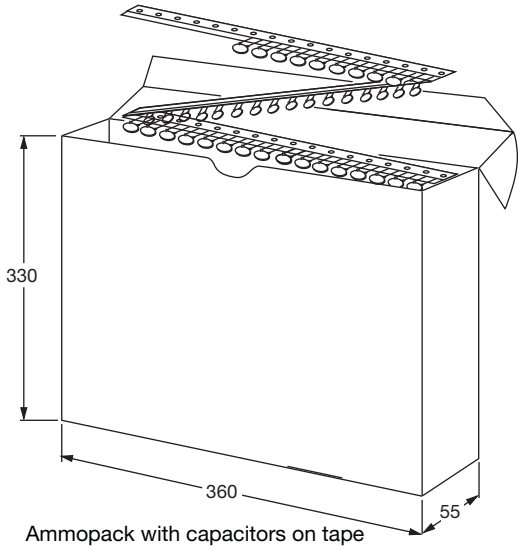
(3) Obliquity maximum 3°

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REEL AND TAPE DATA in millimeters



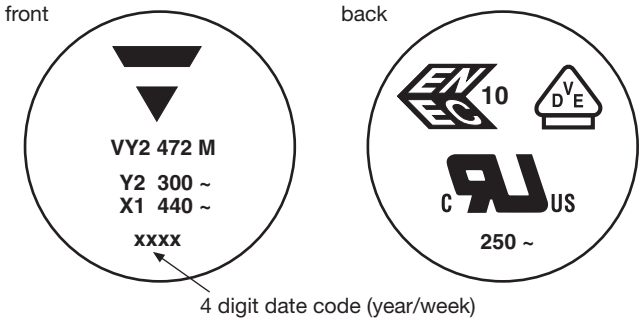


Ammopack with capacitors on tape

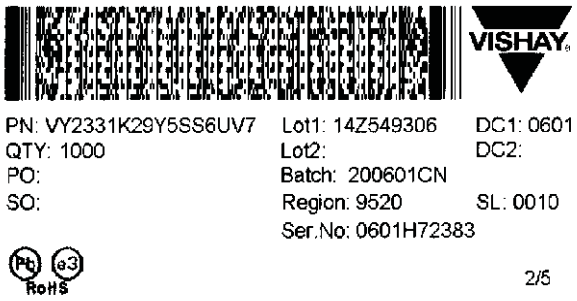
STANDARD RECOGNITION

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)



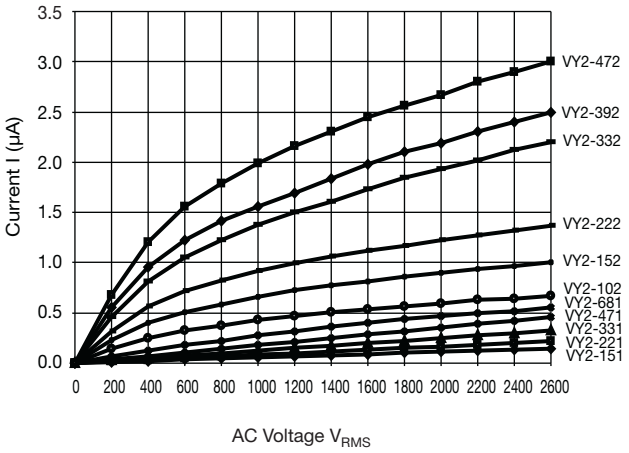
LABEL (EXAMPLE)



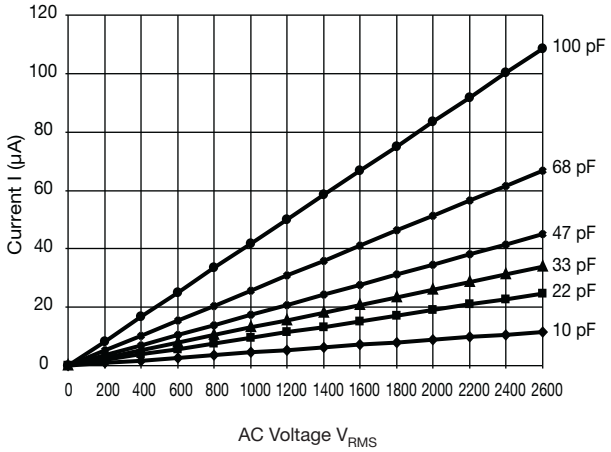
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Typical Current vs. Voltage (Leakage Current) at 60 Hz 25 °C



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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