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



QUICK REFERENCE DATA					
DESCRIPTION	VALUE				
Ceramic Class	1 2			2	
Ceramic Dielectric	N750		Y5S, Y5U, Y5V		
Voltage (V _{AC})	300 440		300	440	
Min. Capacitance (pF)	10 68		8		
Max. Capacitance (pF)	47 10 000		000		
Mounting	Radial				

OPERATING TEMPERATURE RANGE

-40 °C to +125 °C

TEMPERATURE CHARACTERISTICS

Class 1: N750 (U2J) Class 2: Y5S, Y5U, Y5V

SECTIONAL SPECIFICATIONS

Climatic category (according to EN 60058-1)

Class 1 and class 2: 40/125/21

COATING

According to UL 94 V-0 Epoxy resin, isolating, flame retardant

APPROVALS

IEC 60384-14.4 UL 60384-14 DIN EN 60384-14 CSA E60384-1:03, CSA E60384-14:09 CQC11-471112

PACKAGING

Bulk, tape and reel, taped ammopack

FEATURES

- Complying with IEC 60384-14 4th edition
- High reliability
- · Vertical (inline) kinked or straight leads
- Singlelayer AC disc safety capacitors
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS HALOGEN FREE GREEN (5-2008)

APPLICATIONS

- X1, Y2 according to IEC 60384-14.4
- · Across-the-line
- · Line by-pass
- Antenna coupling

DESIGN

The capacitor consists of a ceramic disc which is silver plated on both sides. 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, 10.0 mm, or 12.5 mm. Encapsulation is made of flame retardant epoxy resin in accordance with UL 94 V-0.

CAPACITANCE RANGE

10 pF to 0.01 μF

RATED VOLTAGE UR

IEC 60384-14 and UL60384-14: (X1): 440 V_{AC}, 50 Hz (Y2): 300 V_{AC}, 50 Hz 1000 V_{DC}

TEST VOLTAGE

Component test (100 %): 2600 V_{AC}, 50 Hz, 2 s (2600 V_{AC} for LS 7.5 mm and above) (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

 \geq 10 000 M Ω

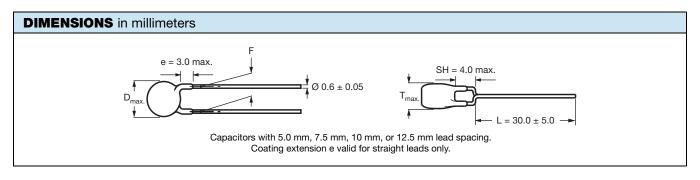
CAPACITANCE TOLERANCE

± 20 % (code M); ± 10 % (code K)

DISSIPATION FACTOR

Class 1: max. 0.5 % (1 MHz) Class 2: max. 2.5 % (1 kHz)

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TECHNICAL D	DATA				
CAPACITANCE	CAPACITANCE	BODY	BODY	LEAD SPACING (1)	PART NUMBER
C (pF)	TOLERANCE (%)	DIAMETER D _{max.} (mm)	THICKNESS T _{max.} (mm)	F (mm) ± 1 mm	MISSING DIGITS SEE ORDERING CODE BELOW
U2J (N750)					
10					VY2100K29U2JS6###
15					VY2150K29U2JS6###
22	± 10	7.5	5.0	5.0, 7.5, 10.0, or 12.5	VY2220K29U2JS6###
33					VY2330K29U2JS6###
47					VY2470K29U2JS6###
Y5S (2C3)					
68					VY2680K29Y5SS6###
100					VY2101K29Y5SS6###
150	± 10	7.5	5.0	50.75.100.0*105	VY2151K29Y5SS6###
220	± 10	7.5	5.0	5.0, 7.5, 10.0, or 12.5	VY2221K29Y5SS6###
330					VY2331K29Y5SS6###
470					VY2471K29Y5SS6###
Y5U (2E3)					
680		7.5			VY2681M29Y5US6###
1000		7.5			VY2102M29Y5US6###
1500		8.0		E 0 7 E 10 0 or 10 E	VY2152M31Y5US6###
2200		9.0		5.0, 7.5, 10.0, or 12.5	VY2222M35Y5US6###
3300	± 20	10.5	5.0		VY2332M41Y5US6###
3900		11.0			VY2392M43Y5US6###
4700		12.5			VY2472M49Y5US6###
6800		14.5		7.5, 10.0, or 12.5	VY2682M59Y5US63##
10 000		16.0			VY2103M63Y5US63##
Y5V (2F3) MINI SIZ	E SERIES				
1000		7.5			VY2102M29Y5VS6###
1500		7.5		Γ	VY2152M29Y5VS6###
2200		8.0			VY2222M31Y5VS6###
3300	± 20	9.0	5.0	5.0, 7.5, 10.0,	VY2332M35Y5VS6###
3900	± 20	10.0	5.0	or 12.5	VY2392M39Y5VS6###
4700		10.5			VY2472M41Y5VS6###
6800		12.0			VY2682M47Y5VS6###
10 000		15.0			VY2103M59Y5VS6###

Note

⁽¹⁾ Straight leads are available on request



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ORDER	ORDERING CODE									
###	15 th to 1	7 th digit	it Lead configuration			Available of	configuration			
Example	VY2	221	K	29	Y5S	s	6	U	٧	7
	Series	Capacitance value	Tolerance code	Size code	Temperature coefficient	Rated voltage	Lead wire diameter	Packaging / lead length	Lead style	Lead spacing
						S = X1/Y2 300 V (AC)		3 = bulk T = tape and reel U = ammopack	L = straight V = inline kinked	5 = 5.0 7 = 7.5 0 = 10.0 X = 12.5

LEADSPACING 5.0 mm AND 7.5 mm

PACKAGING						
SIZE CODE	BODY DIAMETER	PACKAGING QUANTITIES				
SIZE CODE	D _{max.} (mm)	BULK	REEL	АММО		
29 to 49	12.5	1000	1000	1000		
59 to 63	16.0	500	-	-		

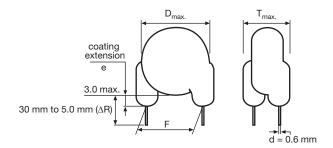
LEADSPACING 10.0 mm AND 12.5 mm

PACKAGING						
CAPACITANCE SIZE CODE		BODY DIAMETER	PA	S		
VALUE	SIZE CODE	D _{max.} (mm)	BULK	REEL	АММО	
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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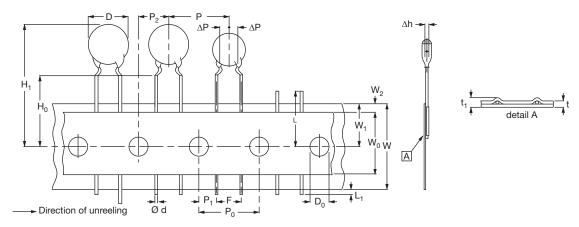


Fig. 1 - Kinked capacitors on tape, lead spacing 5.0 mm (0.2") and 7.5 mm (0.3")

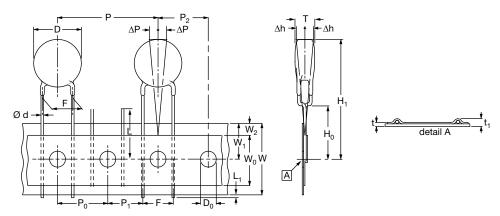


Fig. 2 - Inline kink (V) leaded capacitors on tape, lead spacing 10 mm (0.40")

DIMENSI	DIMENSION OF TAPE						
SYMBOL	PARAMETER	DIMENSIONS (mm)					
STIVIBUL	PANAIVIETEN	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			
Р	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.			
ΔΡ	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.			
L ₁	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.			

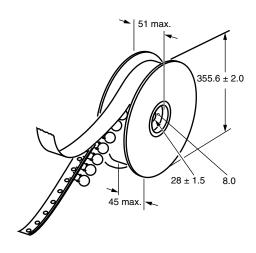
Notes

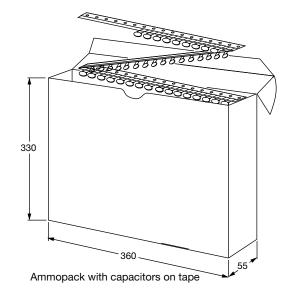
- (1) See "Technical Data" table
- (2) Cumulative pitch error: $\pm \le 1$ mm/20 pitches
- (3) Obliquity maximum 3°



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REEL AND TAPE DATA in millimeters

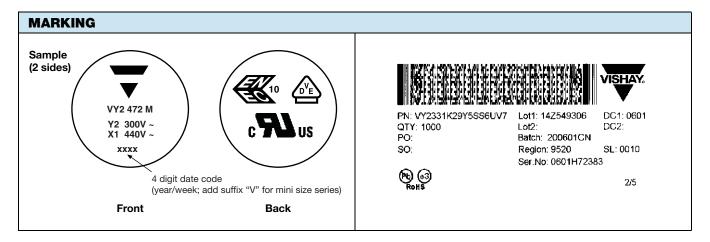




APPROVALS				
IEC 60384-14.4 - Safety tests This approval together with CB test certificate s	substitutes all national approvals			
CB Certificate				
Y2-capacitor: CB test certificate:	US-26163-UL	10 pF to 10 nF	300 V _{AC}	<i>(</i> U ₁)
X1-capacitor: CB test certificate:	US-26163-UL	10 pF to 10 nF	440 V _{AC}	
VDE				^
Y2-capacitor: VDE marks approval:	40009669	10 pF to 10 nF	$300 V_{AC}$	
X1-capacitor: VDE marks approval:	40009669	10 pF to 10 nF	$440 \ V_{AC}$	
DIN EN 60384-14 VDE 0565-1-1:2006-04 - Safe	ety tests			
Underwriters Laboratories Inc. / Canadian S	tandards Association			
Y2-capacitor: UL-test certificate:	E183844	10 pF to 10 nF	300 V _{AC}	6-1 1 ®
X1-capacitor: UL-test certificate:	E183844	10 pF to 10 nF	440 V _{AC}	C TABLES
UL 60384-14.1, CSA E60384-1:03 2 nd edition,	CSA E60384-14:09 2 nd edition			0 2 - 00
Across-the-line, antenna-coupling, and line-by-	-pass component			
CQC				
Y2-capacitor: CQC test certificate:	CQC05001012316	10 pF to 10 nF	300 V _{AC}	
X1-capacitor: CQC test certificate:	CQC05001012316	10 pF to 10 nF	440 V _{AC}	

100 pF

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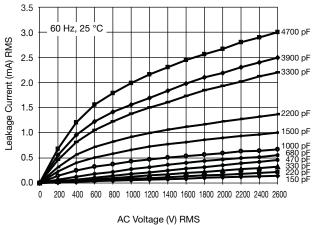


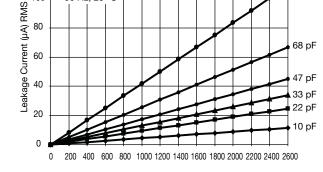
120

100

60 Hz, 25 °C

LEAKAGE CURRENT VS. VOLTAGE (Typical)





AC Voltage (V) RMS

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.

RELATED DOCUMENTS				
General Information	www.vishay.com/doc?28536			
CB Test Certificate	www.vishay.com/doc?22254			
VDE Marks Approval	www.vishay.com/doc?22256			
UL Test Certificate	www.vishay.com/doc?22253			
CQC Test Certificate	www.vishay.com/doc?22255			

SAMPLE KITS			
Part Number (VY2 Sample Kit)	VY21-KIT-HF		
Link (VY2 Sample Kit)	www.vishay.com/doc?28554		
Part Number (VY2Y5V Sample Kit)	VY2-KIT-MS		
Link (VY2Y5V Sample Kit)	www.vishay.com/doc?28562		



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