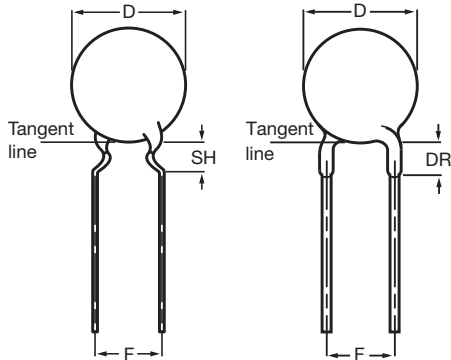


## Ceramic Disc Capacitors Class 1 and 2, 50 V<sub>DC</sub>, General Purpose



Capacitors with 5 mm (0.20") and 2.5 mm (0.10") lead spacing

QUICK REFERENCE DATA		
DESCRIPTION	CLASS 1 (NP0, SL0)	CLASS 2 (Y5P, Z5U, Y5V, Z5V)
Voltage (V <sub>DC</sub> )	50	
Min. Capacitance (pF)	1	150
Max. Capacitance (pF)	100	47 000
Mounting	Through hole	

### MARKING

Marking indicates capacitance value and tolerance in accordance with "EIA 198"

### OPERATING TEMPERATURE RANGE

Class 1, - 55 °C to + 125 °C

Class 2, - 30 °C to + 85 °C

### TEMPERATURE COEFFICIENT Y5R (2C4) - 30 °C TO + 85 °C

Class 1, NP0; SL0

Class 2, Y5P; Z5U; Y5V; Z5V

### SECTIONAL SPECIFICATIONS

Class 1, IEC 60 384-8,

Class 2, IEC 60 384-9,

EIA 198

### CLIMATIC CATEGORY

Class 1, - 55 °C to + 125 °C

Class 2, - 30 °C to + 85 °C

### Note

- The capacitors meet the essential requirements of "IEC 60384-9 and EIA 198". Unless stated otherwise all electrical values apply at an ambient temperature of 25 °C ± 3 °C, at normal atmospheric conditions

### FEATURES

- Low losses
- High stability
- High capacitance in small size
- Kinked (preferred) or straight leads
- Compliant to RoHS directive 2002/95/EC



**RoHS**  
COMPLIANT

### APPLICATIONS

- Bypassing
- Coupling
- Resonant circuit

### 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 have inward kinked leads with a spacing of 5 mm (0.20") and straight leads with 2.5 mm (0.10"), lead length from 4 mm to 30 mm.

Encapsulation is made of phenolic resin.

### CAPACITANCE RANGE

Class 1, at 1 MHz, 1.2 V<sub>RMS</sub>; 1.0 pF to 100 pF

1 kHz, 1 V<sub>RMS</sub> ± 0.2 V<sub>RMS</sub> for capacitance values higher than 1000 pF

Class 2, at 1 kHz, 1 V<sub>RMS</sub> ± 0.2 V<sub>RMS</sub> 150 pF to 47 000 pF

### RATED DC VOLTAGE

50 V

### DIELECTRIC STRENGTH

250 % of rated voltage

### INSULATION RESISTANCE AT 500 V<sub>DC</sub>

≥ 10 000 MΩ

### TOLERANCE ON CAPACITANCE

± 5 %; ± 10 %; ± 20 %; + 80 %/- 20 %

### DISSIPATION FACTOR

Class 1, C ≤ 30 pF ≤ 20 × (10/C + 0.7) × 10<sup>-4</sup> maximum

Class 1, C > 30 pF ≤ 0.2 %

Class 2, ≤ 3.0 %



Ceramic Disc Capacitors  
Class 1 and 2, 50 V<sub>DC</sub>, General Purpose

Vishay BCcomponents

<b>ORDERING INFORMATION, CLASS 1, 50 V<sub>DC</sub>, KINKED</b>					
C (pF)	TOL. (%)	D <sub>MAX.</sub> (mm)	SH/DR <sub>MAX.</sub> <sup>(1)</sup> (mm)	CLEAR TEXT CODE	
				13 <sup>TH</sup> DIGIT: T = REEL; U = AMMO; 3 = BULK	
<b>CLASS 1 NPO</b>					
1.0	± 0.25 pF	5.0	5.0	4.0	D109C20C0KF6.J5R
			2.5	1.5	D109C20C0KF6.L2R
1.5			5.0	4.0	D159C20C0KF6.J5R
			2.5	1.5	D159C20C0KF6.L2R
2.2			5.0	4.0	D229C20C0JF6.J5R
			2.5	1.5	D229C20C0JF6.L2R
3.3	± 0.5 pF		5.0	4.0	D339C20C0JF6.J5R
			2.5	1.5	D339C20C0JF6.L2R
4.7			5.0	4.0	D479C20C0HF6.J5R
			2.5	1.5	D479C20C0HF6.L2R
6.8			5.0	4.0	D689D20C0HF6.J5R
			2.5	1.5	D689D20C0HF6.L2R
10	± 5.0		5.0	4.0	D100J20C0GF6.J5R
			2.5	1.5	D100J20C0GF6.L2R
12			5.0	4.0	D120J20C0GF6.J5R
			2.5	1.5	D120J20C0GF6.L2R
15			5.0	4.0	D150J20C0GF6.J5R
			2.5	1.5	D150J20C0GF6.L2R
18			5.0	4.0	D180J20C0GF6.J5R
			2.5	1.5	D180J20C0GF6.L2R
22			5.0	4.0	D220J20C0GF6.J5R
			2.5	1.5	D220J20C0GF6.L2R
27			5.0	4.0	D270J20C0GF6.J5R
			2.5	1.5	D270J20C0GF6.L2R
33		5.0	4.0	D330J20C0GF6.J5R	
		2.5	1.5	D330J20C0GF6.L2R	
39		5.0	4.0	D390J20C0GF6.J5R	
		2.5	1.5	D390J20C0GF6.L2R	
47		5.0	4.0	D470J20C0GF6.J5R	
		2.5	1.5	D470J20C0GF6.L2R	
<b>CLASS 1 SLO</b>					
56	± 5.0	5.0	4.0	D560J20SLOF6.J5R	
		2.5	1.5	D560J20SLOF6.L2R	
68		5.0	4.0	D680J20SLOF6.J5R	
		2.5	1.5	D680J20SLOF6.L2R	
82		5.0	4.0	D820J20SLOF6.J5R	
		2.5	1.5	D820J20SLOF6.L2R	
100	5.0	4.0	D101J20SLOF6.J5R		
	2.5	1.5	D101J20SLOF6.L2R		

**Notes**

- (1) SH = seated height; DR = run down
- Maximum thickness 4.0 mm
- Lead style codes refer to lead configurations

ORDERING INFORMATION, CLASS 2, 50 V <sub>DC</sub> , KINKED					
C (pF)	TOL. (%)	D <sub>MAX.</sub> (mm)	SH/DR <sub>MAX.</sub> <sup>(1)</sup> (mm)	CLEAR TEXT CODE	
				13 <sup>TH</sup> DIGIT: T = REEL; U = AMMO; 3 = BULK	
<b>CLASS 2 Y5P</b>					
150	± 10	5	5.0	4.0	D151K20Y5PF6.J5R
			2.5	1.5	D151K20Y5PF6.L2R
180			5.0	4.0	D181K20Y5PF6.J5R
			2.5	1.5	D181K20Y5PF6.L2R
220			5.0	4.0	D221K20Y5PF6.J5R
			2.5	1.5	D221K20Y5PF6.L2R
330			5.0	4.0	D331K20Y5PF6.J5R
			2.5	1.5	D331K20Y5PF6.L2R
470			5.0	4.0	D471K20Y5PF6.J5R
			2.5	1.5	D471K20Y5PF6.L2R
680		5.0	4.0	D681K20Y5PF6.J5R	
		2.5	1.5	D681K20Y5PF6.L2R	
1000		5.0	4.0	D102K20Y5PF6.J5R	
		2.5	1.5	D102K20Y5PF6.L2R	
1500		5.0	4.0	D152K20Y5PF6.J5R	
		2.5	1.5	D152K20Y5PF6.L2R	
1800		6.5	5.0	4.0	D182K25Y5PF6.J5R
			2.5	1.5	D182K25Y5PF6.L2R
2200			5.0	4.0	D222K25Y5PF6.J5R
			2.5	1.5	D222K25Y5PF6.L2R
3300	5.0		4.0	D332K25Y5PF6.J5R	
	2.5	1.5	D332K25Y5PF6.L2R		
4700	7.5	5.0	4.0	D472K29Y5PF6.J5R	
		2.5	1.5	D472K29Y5PF6.L2R	
6800	8.5	5.0	4.0	D682K33Y5PF6.J5R	
		2.5	1.5	D682K33Y5PF6.L2R	
10 000	10	5.0	4.0	D103K39Y5PF6.J5R	
		2.5	1.5	D103K39Y5PF6.L2R	

**Notes**

(1) SH = seated height; DR = run down

- Maximum thickness 4.0 mm
- Lead style codes refer to lead configurations

ORDERING INFORMATION, CLASS 2, 50 V <sub>DC</sub> , KINKED AND STRAIGHT					
C (pF)	TOL. (%)	D <sub>MAX.</sub> (mm)	SH/DR <sub>MAX.</sub> <sup>(1)</sup> (mm)	CLEAR TEXT CODE	
				13 <sup>TH</sup> DIGIT: T = REEL; U = AMMO; 3 = BULK	
<b>CLASS 2 Z5U</b>					
1000	± 20	5	5.0	4.0	D102M20Z5UF6.J5R
			2.5	1.5	D102M20Z5UF6.L2R
1500			5.0	4.0	D152M20Z5UF6.J5R
			2.5	1.5	D152M20Z5UF6.L2R
2200			5.0	4.0	D222M20Z5UF6.J5R
		2.5	1.5	D222M20Z5UF6.L2R	
3300		5.0	4.0	D332M20Z5UF6.J5R	
		2.5	1.5	D332M20Z5UF6.L2R	
4700		5.0	4.0	D472M20Z5UF6.J5R	
		2.5	1.5	D472M20Z5UF6.L2R	
6800	± 20	6.5	5.0	4.0	D682M25Z5UF6.J5R
			2.5	1.5	D682M25Z5UF6.L2R



Ceramic Disc Capacitors  
Class 1 and 2, 50 V<sub>DC</sub>, General Purpose

<b>ORDERING INFORMATION, CLASS 2, 50 V<sub>DC</sub>, KINKED AND STRAIGHT</b>							
C (pF)	TOL. (%)	D <sub>MAX.</sub> (mm)	SH/DR <sub>MAX.</sub> <sup>(1)</sup> (mm)	CLEAR TEXT CODE			
				13 <sup>TH</sup> DIGIT: T = REEL; U = AMMO; 3 = BULK			
<b>CLASS 2 Z5U</b>							
10 000	± 20	7.5	5.0	4.0	D103M29Z5UF6.J5R		
			2.5	1.5	D103M29Z5UF6.L2R		
15 000		8.5	5.0	4.0	D153M33Z5UF6.J5R		
			2.5	1.5	D153M33Z5UF6.L2R		
22 000		10	5.0	4.0	D223M39Z5UF6.J5R		
			2.5	1.5	D223M39Z5UF6.L2R		
<b>CLASS 2 Y5V</b>							
1000	+ 80/-20	5	5.0	4.0	D102Z20Y5VF6.J5R		
			2.5	1.5	D102Z20Y5VF6.L2R		
1500			5.0	4.0	D152Z20Y5VF6.J5R		
			2.5	1.5	D152Z20Y5VF6.L2R		
2200			5.0	4.0	D222Z20Y5VF6.J5R		
			2.5	1.5	D222Z20Y5VF6.L2R		
3300		6.5	5.0	4.0	D332Z20Y5VF6.J5R		
			2.5	1.5	D332Z20Y5VF6.L2R		
4700			5.0	4.0	D472Z20Y5VF6.J5R		
			2.5	1.5	D472Z20Y5VF6.L2R		
6800			5.0	4.0	D682Z25Y5VF6.J5R		
			2.5	1.5	D682Z25Y5VF6.L2R		
10 000		7.5	5.0	4.0	D103Z29Y5VF6.J5R		
			2.5	1.5	D103Z29Y5VF6.L2R		
15 000			8.5	5.0	4.0	D153Z33Y5VF6.J5R	
				2.5	1.5	D153Z33Y5VF6.L2R	
22 000				10	5.0	4.0	D223Z39Y5VF6.J5R
					2.5	1.5	D223Z39Y5VF6.L2R
<b>CLASS 2 Z5V</b>							
4700	+ 80/-20	5			5.0	4.0	D472Z20Z5VF6.J5R
			2.5		1.5	D472Z20Z5VF6.L2R	
10 000		6.5	5.0		4.0	D103Z25Z5VF6.J5R	
			2.5	1.5	D103Z25Z5VF6.L2R		
22 000			7.5	5.0	4.0	D223Z29Z5VF6.J5R	
				2.5	1.5	D223Z29Z5VF6.L2R	
47 000	10			5.0	4.0	D473Z39Z5VF6.J5R	
				2.5	1.5	D473Z39Z5VF6.L2R	

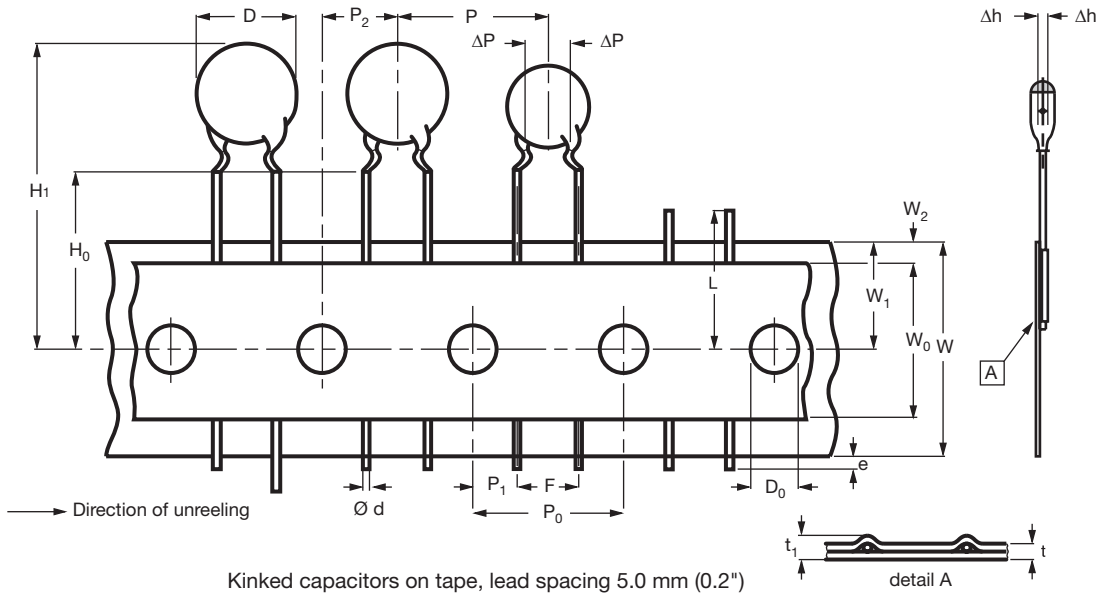
**Notes**

- <sup>(1)</sup> SH = seated height; DR = run down
- Maximum thickness 4.0 mm
- Lead style codes refer to lead configurations

<b>PACKAGING</b>				
D <sub>MAX.</sub>	SIZE CODE	PACKAGING QUANTITIES		
		BULK	REEL	AMMO
5.0 (0.20")	20	1000	2500	2000
6.5 (0.25")	25			
7.5 (0.29")	29			
8.5 (0.33")	33			
10.0 (0.39")	39			
11.0 (0.43")	43			

**Note**

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



DIMENSIONS OF TAPE			
SYMBOL	PARAMETER	DIMENSIONS (mm)	
		FEED-HOLE PITCH P <sub>0</sub> = 12.7 NOMINAL	FEED-HOLE PITCH P <sub>0</sub> = 15.0 TOLERANCE
D	Body diameter	11.0 maximum	-
d	Lead diameter	0.6	± 0.05
P	Pitch between capacitors	12.7	± 1.0
P <sub>0</sub> <sup>(1)</sup>	Feed-hole pitch	12.7	± 0.3
ΔP	Plane deviation	1.0 maximum	-
P <sub>1</sub> <sup>(2)</sup>	Feed-hole center to lead center	3.85	± 0.7
P <sub>2</sub> <sup>(2)</sup>	Feed-hole center to component center	6.35	± 1.3
F	Lead spacing	5.0	0.6/- 0.4
Δh	Component alignment	0	± 1.0
W	Tape width	18.0	+ 1.0/- 0.5
W <sub>0</sub>	Hold-down tape width	5.0 minimum	-
W <sub>1</sub>	Hole position	9.0	+ 0.75/- 0.5
W <sub>2</sub>	Hold-down tape margin	3.0 maximum	-
H <sub>0</sub>	Height to seating plane	16.0	± 0.5
H <sub>1</sub>	Maximum component height	32.0	-
e	Lead end protrusion	1.0 maximum	-
L	Maximum length of snapped lead	11.0	-
D <sub>0</sub>	Feed-hole diameter	4.0	± 0.2
t	Total tape thickness	0.9 maximum	-
t <sub>1</sub>	Maximum thickness of tape and wires	1.5 maximum	-

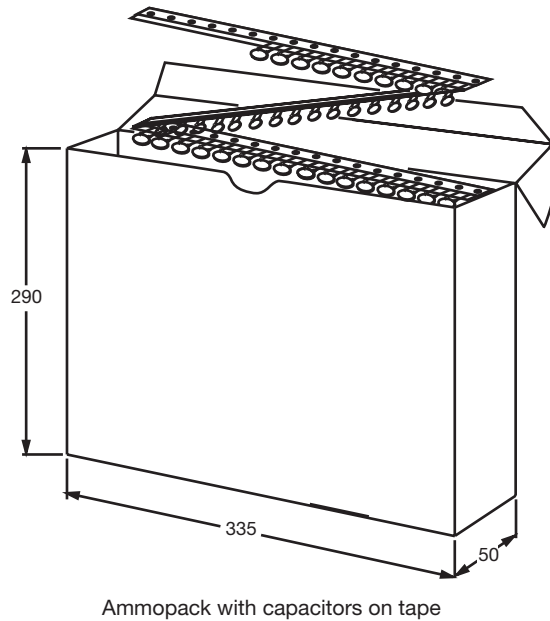
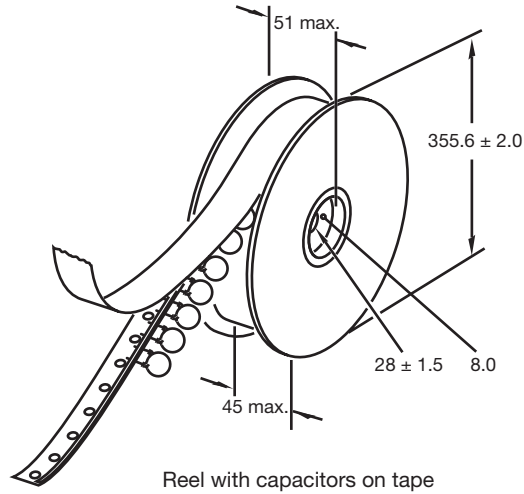
**Notes**

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

(2) Obliquity maximum 3°



**REEL AND TAPE DATA** in millimeters





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