

Ceramic Singlelayer DC Disc Capacitors, 1 kV_{DC} General Purpose



FEATURES

- High capacitance in small sizes
- Low losses
- Wide range of different lead styles
- Material categorization:
for definitions of compliance please see
www.vishay.com/doc?99912


RoHS
COMPLIANT

APPLICATIONS

- Lighting ballasts
- Switching power supplies
- Bypassing, coupling and decoupling
- DC blocking

DESIGN

The capacitors consist of a ceramic disc which is silver plated on both sides. Connection leads are made of tinned copper having diameters of 0.6 mm or 0.8 mm.

The capacitors may be supplied with straight or kinked leads having a lead spacing of 5.0 mm or 7.5 mm.

Coating is made of blue colored flame retardant epoxy resin in accordance with UL 94 V-0.

QUICK REFERENCE DATA		
DESCRIPTION	VALUE	
Ceramic Class	1	2
Ceramic Dielectric	N750, Y5T, Y5U, Y5V	
Voltage (V _{DC})	1000	
Min. Capacitance (pF)	10	47
Max. Capacitance (pF)	680	22 000
Mounting	Radial	

OPERATING TEMPERATURE RANGE

-40 °C to +85 °C ⁽¹⁾

Note

⁽¹⁾ For explanation about the difference of operating temperature range and temperature characteristic of capacitance please see
www.vishay.com/doc?48299

TEMPERATURE CHARACTERISTICS

Class 1: N750

Class 2: Y5T, Y5U, Y5V

SECTIONAL SPECIFICATIONS

Climatic category (according to EN 60068-1):
40 / 085 / 21

CAPACITANCE RANGE

10 pF to 22 nF

RATED VOLTAGE

1000 V_{DC}

DIELECTRIC STRENGTH

1750 V_{DC}, 2 s Component test

INSULATION RESISTANCE AT 500 V_{DC}

≥ 10 000 MΩ (60 s)

TOLERANCE ON CAPACITANCE

± 10 %, ± 20 %, -20 % +50 %

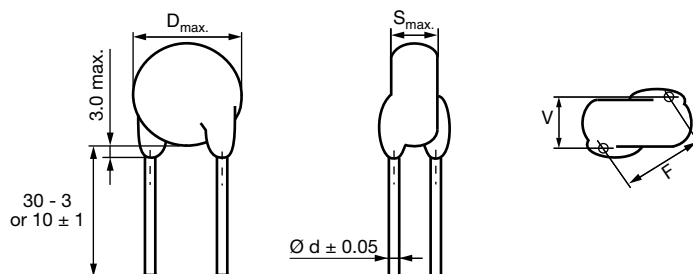
DISSIPATION FACTOR

Class 1:

$C < 30 \text{ pF: } \left(\frac{100 \text{ pF}}{C} + 0.7 \right) \times 10^{-4} \text{ max. (1 MHz)}$

$C \geq 30 \text{ pF: max. 0.1 % (1 MHz)}$

Class 2: max. 2.5 % (1 kHz)

DIMENSIONS in millimeters

ORDERING INFORMATION

ORDERING INFORMATION								
CAPACITANCE (pF)	TOLERANCE (%)	BODY DIAMETER D _{max.} (mm)	BODY THICKNESS S _{max.} (mm)	LEAD SPACING ⁽¹⁾ F (mm) ± 1 mm	LEAD DIAMETER ⁽¹⁾ d (mm) ± 0.05 mm	WIDTH ⁽¹⁾ V (mm) ± 0.5 mm	ORDERING CODE	
							MISSING DIGITS SEE ORDERING CODE BELOW	
N750								
10	± 10	7.0	3.0	7.5	0.6	1.4	HAU100KBA####KR	
15							HAU150KBA####KR	
22							HAU220KBA####KR	
33							HAU330KBA####KR	
47							HAU470KBA####KR	
68		8.0					3.5	HAU680KBA####KR
82								HAU820KBA####KR
100								HAU101KBA####KR
150			HAU151KBA####KR					
220			HAU221KBA####KR					
330		HAU331KBA####KR						
470		HAU471KBA####KR						
560		HAU561KBA####KR						
680		HAU681KBA####KR						
Y5T								
47	± 10, ± 20	7.0	3.0	5.0	0.6	1.2		HAZ470#BA####KR
56								HAZ560#BA####KR
68								HAZ680#BA####KR
82								HAZ820#BA####KR
100								HAZ101#BA####KR
150							HAZ151#BA####KR	
220							HAZ221#BA####KR	
330							HAZ331#BA####KR	
470							HAZ471#BA####KR	
680							HAZ681#BA####KR	
1000		9.0		7.5			HAZ102#BA####KR	
1500							HAZ152#BA####KR	
2200							HAZ222#BA####KR	
3300							HAZ332#BA####KR	
4700							HAZ472#BA####KR	
Y5U								
1000	± 20	7.0	3.0		5.0	0.6	1.2	HAE102MBA####KR
1500		9.0						HAE152MBA####KR
2200		11.0						HAE222MBA####KR
3300								HAE332MBA####KR
4700								HAE472MBA####KR
6800		13.0			7.5			HAE682MBA####KR
10 000		15.0						HAE103MBA####KR

**ORDERING INFORMATION**

CAPACITANCE (pF)	TOLERANCE (%)	BODY DIAMETER D _{max.} (mm)	BODY THICKNESS S _{max.} (mm)	LEAD SPACING ⁽¹⁾ F (mm) ± 1 mm	LEAD DIAMETER ⁽¹⁾ d (mm) ± 0.05 mm	WIDTH ⁽¹⁾ V (mm) ± 0.5 mm	ORDERING CODE
							MISSING DIGITS SEE ORDERING CODE BELOW
Y5V							
2200	- 20 / + 50 ⁽²⁾	7.0	3.0	5.0	0.6	1.2	HAX222#BA###KR
3300		9.0					HAX332#BA###KR
4700		HAX472#BA###KR					
6800		12.0		7.5			HAX682#BA###KR
10 000		HAX103#BA###KR					
15 000		17.0					HAX153#BA###KR
22 000		18.0					HAX223#BA###KR

Notes⁽¹⁾ Standard lead configuration, other lead spacing and diameter available on request⁽²⁾ ± 20 % available on request**ORDERING CODE**

#	7 th digit	Capacitance tolerance	± 10 % = K, ± 20 % = M, - 20 % / + 50 % = S				
###	10 th to 12 th digit	Lead configuration	See "General Information" www.vishay.com/doc?22001				
Example	HAU	101	K	BA	BFG	K	R
	Series	Capacitance value	Tolerance code	Voltage code	Lead configuration	Internal code	RoHS compliant

MARKING

 HAU 10 pF to 330 pF HAZ 47 pF to 2.2 nF HAE 1.0 nF to 4.7 nF	 HAU 470 pF to 680 pF HAZ 3.3 nF to 4.7 pF HAE 6.8 nF to 10 nF	 HAX 2.2 nF to 6.8 nF	 HAX 10 nF to 22 nF
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STORAGE

The capacitors must not be stored in a corrosive atmosphere, where sulphide or chloride gas, acid, alkali or salt are present. Exposure of the components to moisture, should be avoided. The solderability of the leads is not affected by storage of up to 24 months (temperature +10 °C to +35 °C, relative humidity up to 60 %). Class 2 ceramic dielectric capacitors are also subject to aging, see www.vishay.com/doc?22001.

SOLDERING**SOLDERING SPECIFICATIONS**

Soldering test for capacitors with wire leads: (according to IEC 60068-2-20, solder bath method)		
	SOLDERABILITY	RESISTANCE TO SOLDERING HEAT
Soldering temperature	235 °C ± 5 °C	260 °C ± 5 °C
Soldering duration	2 s ± 0.5 s	10 s ± 1 s
Distance from component body	≥ 2 mm	≥ 5 mm



SOLDERING RECOMMENDATIONS

Soldering of the component should be achieved using a Sn60/40 type or a silver-bearing Sn62/36/2Ag type solder. Ceramic capacitors are very sensitive to rapid changes in temperature (thermal shock) therefore the solder heat resistance specification (see Soldering Specifications table) should not be exceeded. Subjecting the capacitor to excessive heating may result in thermal shocks that can crack the ceramic body. Similarly, excessive heating can cause the internal solder junction to melt.

CLEANING

The components should be cleaned immediately following the soldering operation with vapor degreasers.

SOLVENT RESISTANCE

The coating and marking of the capacitors are resistant to the following test method: IEC 60068-2-45 (method XA).

MOUNTING

If a defined product stop is required for mounting on a PCB, a mechanically formed product stop (kinked or inline wire) or a mounting tool should be used.

We do not recommend modifying the lead terminals, e.g. bending or cropping. This action could break the coating or crack the ceramic insert. If however, the lead must be modified in any way, we recommend support of the lead with a clamping fixture next to the coating.

OPERATING VOLTAGE

In case the voltage is applied to the circuit, starting as well as stopping, may generate irregular voltage for a transit period because of resonance or switching. Be sure to use a capacitor with a rated voltage range that includes these irregular voltages.

OPERATING TEMPERATURE AND SELF-GENERATED HEAT

Keep the surface temperature of a capacitor below the upper limit of its rated operating temperature range. Be sure to take into account the heat generated by the capacitor itself. When the capacitor is used in a high frequency, pulse, or similar application, it may have self-generated heat due to dielectric dissipation.

Temperature increase due to self-generated heating should not exceed 20 °C while operating at an atmosphere temperature of 25 °C.

When measuring, the surface temperature, make sure that the capacitor is not affected by radiant, conductive and convective heat by its surroundings. Excessive heat may lead to thermo-mechanical deterioration of the capacitor's characteristics and reliability.

RELATED DOCUMENTS

General Information

www.vishay.com/doc?22001



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HAX223SBACFGKR	HAX223SBACF0KR	HAZ221MBABF0KR	HAZ101MBABF0KR	HAX472SBABF0KR
HAE102MBABRAKR	HAX222MBABF0KR	HAX223SBACRYKR	HAZ102KBABF0KR	HAZ470KBABRBKR
HAE472MBACRAKR	HAE472MBASFCKR	HAZ101MBABREKR	HAZ152MBABF0KR	HAZ221KBABF0KR
HAZ331MBABRBKR	HAZ471MBABRBKR	HAE102MBABF0KR	HAU100KBACF0KR	HAU270KBACF0KR
HAU470KBACLAKR	HAX223MBACF0KR	HAZ151MBABRBKR	HAZ331MBACRBKR	HAZ471MBABLBKR
HAZ681MBACF0KR	HAE102MBABLAKR	HAE472MBACF0KR	HAX103MBACRAKR	HAZ101MBABRAKR
HAZ102MBABLBKR	HAZ151MBACRBKR	HAZ221MBACF0KR	HAZ221MBACRAKR	HAZ331KBABRBKR
HAZ470MBABB0KR	HAZ471MBABRAKR	HAZ560MBABF0KR	HAE102MBACF0KR	HAX103SBACD0KR
HAX103SBACF0KR	HAX103SBACJ0KR	HAZ101MBACB0KR	HAZ471MBACRBKR	HAU221KBACF0KR
HAU331KBACH0KR	HAZ151MBABF0KR	HAZ221KBABLBKR	HAZ221MBATCRKR	HAZ470MBABF0KR
HAE102MBABLBKR	HAE103MBACRTKR	HAE472MBABF0KR	HAU330KBACREKR	HAX223MBADF0KR
HAX472MBABRBKR	HAZ101MBABRBKR	HAZ102MBABF0KR	HAZ471MBABLEKR	HAZ472MBACRZKR
HAZ561MBABREKR	HAE103MBACRUKR	HAE103MBACD0KR	HAU330KBACF0KR	HAX103SBAUALKR
HAZ102MBACF0KR	HAZ151MBABREKR	HAZ470MBABRBKR	HAZ680MBABREKR	HAE102MBASFCKR
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HAZ680MBABD0KR	HAZ680MBABF0KR	HAZ221MBACRBKR	HAE152MBABF0KR	HAE222MBABRAKR
HAE682MBACF0KR	HAZ101KBATCRKR	HAZ101MBACRAKR	HAZ102MBABREKR	HAZ221MBABLEKR
HAZ331MBABREKR	HAZ332MBACJ0KR	HAZ471MBACF0KR	HAE103MBABF0KR	HAU220KBACD0KR
HAX103SBASFCKR	HAX222MBABRAKR	HAX332SBACREKR	HAX472SBABRCKR	HAX223MBAKGGKR
HAX472SBABLAKR	HAZ102MBABLCKR	HAZ221MBACREKR	HAZ331MBABRAKR	HAZ102KBABLAKR