



## REFERENCE SPECIFICATION

**High Voltage Ceramic Capacitor  
(DHS series)**

**Issued Date: October 1, 2002**

Product specifications in this drawing are subject to change or our products described in this drawing may be discontinued without notice.  
The parts numbers and specifications listed in this drawing are for information only. You are requested to transact the "Approval Sheet Product Specification", before your ordering.

PRODUCT ENGINEERING SECTION  
CAPACITOR GROUP  
IZUMO MURATA MANUFACTURING. Co.,LTD

XZ091(Y10)

**⚠ CAUTION**

**1. OPERATING VOLTAGE**

When DC-rated capacitors are to be used in AC or ripple current circuits, be sure to maintain the  $V_{p-p}$  value of the applied voltage or the  $V_{o-p}$  which contains DC bias within the rated voltage range. When the voltage is started to apply to the circuit or it is stopped applying, the irregular voltage may be generated for a transit period because of resonance or switching. Be sure to use a capacitor within rated voltage containing these irregular voltage.

Voltage	DC Voltage	DC+AC Voltage	AC Voltage	Pulse Voltage(1)	Pulse Voltage(2)
Positional Measurement					

**2. 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 current, pulse current or the like, it may have the self-generated heat due to dielectric-loss. Applied voltage should be the load such as self-generated heat is within 10 °C on the condition of atmosphere temperature 25 °C.

Excessive heat may lead to deterioration of the capacitor's characteristics and reliability.

**3. INSTALLATION**

Installation torque should not be exceed the torque strength values in "Specification and Test Method".

Do not employ a screw whose thread depth is greater than that specified.

Avoid installation in which any bending torque is applied to the capacitor terminal.

Do not rework or resoler the terminal.

**4. OPERATING AND STORAGE ENVIRONMENT**

The insulating coating of capacitors does not form a perfect seal; therefore, do not use or store capacitors in a corrosive atmosphere, especially where chloride gas, sulfide gas, acid, alkali, salt or the like are present. And avoid exposure to moisture.

Before cleaning, bonding, or molding this product, verify that these processes do not affect product quality by testing the performance of a cleaned, bonded or molded product in the intended equipment.

Store the capacitors where the temperature and relative humidity do not exceed -10 to 40 °C and 15 to 85 %. Use capacitors within 6 months.

**5. VIBRATION AND IMPACT**

Do not expose a capacitor to excessive shock or vibration during use.

Failure to follow the above cautions may result, worst case, in a short circuit and cause fuming or partial dispersion when the product is used.

**6. LIMITATION OF APPLICATIONS**

Please contact us before using our products for the applications listed below which require especially high reliability for the prevention of defects which might directly cause damage to the third party's life, body or property.

- ① Aircraft equipment      ② Aerospace equipment      ③ Undersea equipment
- ④ Power plant control equipment      ⑤ Medical equipment
- ⑥ Transportation equipment(vehicles, trains, ships, etc.)      ⑦ Traffic signal equipment
- ⑧ Disaster prevention / crime prevention equipment
- ⑨ Data-processing equipment exerting influence on public
- ⑩ Application of similar complexity and/or reliability requirements to the applications listed in the above.

## Notice

### Capacitance change of capacitor

- Class 1 capacitors

Capacitance might change a little depending on a surrounding temperature or an applied voltage.

Please contact us if you use for the strict time constant circuit.

- Class 2 and 3 capacitors

Class 2 and 3 capacitors like temperature characteristic B, E and F have an aging characteristic, whereby the capacitor continually decreases its capacitance slightly if the capacitor leaves for a long time.. Moreover, capacitance might change greatly depending on a surrounding temperature or an applied voltage. So, it is not likely to be able to use for the time constant circuit.

Please contact us if you need a detail information.



#### NOTE

1. Please make sure that your product has been evaluated in view of your specifications with our product being mounted to your product.
2. You are requested not to use our product deviating from the agreed specifications.
3. We consider it not appropriate to include any terms and conditions with regard to the business transaction in the product specifications, drawings or other technical documents. Therefore, if your technical documents as above include such terms and conditions such as warranty clause, product liability clause, or intellectual property infringement liability clause, they will be deemed to be invalid.

## 1.Application

This specification is applied to ceramic capacitor DHS series used for in electric equipment.  
DHS series is high voltage ceramic capacitor.

## 2.Rating

2.1 Operating temperature  
-25°C to +85°C

### 2.2 Part number configuration

<b>DHS</b>	<b>4E</b>	<b>4G</b>	<b>202</b>	<b>K</b>	<b>TZ</b>	<b>B</b>	
Series	Temperature characteristic	Rated voltage	Capacitance	Capacitance tolerance	Terminal code	Packing style code	Individual specification

- Temperature characteristic

Code	Temperature characteristic
4E	N4700

Please confirm detailed specification on [ 5. Specification and test methods].

- Rated voltage

Code	Rated voltage
4G	DC40kV

- Capacitance

The first two digits denote significant figures ; the last digit denotes the multiplier of 10 in pF.  
ex.) In case of 202.

$$20 \times 10^2 = 2000\text{pF}$$

- Capacitance tolerance

Please refer to [ 4. Part unnumber list ].

- Terminal style

Code	Diameter (øD)	Terminal style
TZ	60.0	ISO M5

Please refer to [ 4. Part unnumber list ].

- Packing

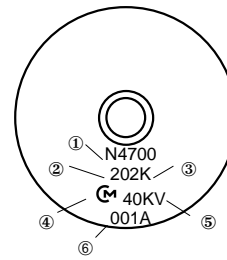
Code	Packing type
B	Bulk type

- Individual specification

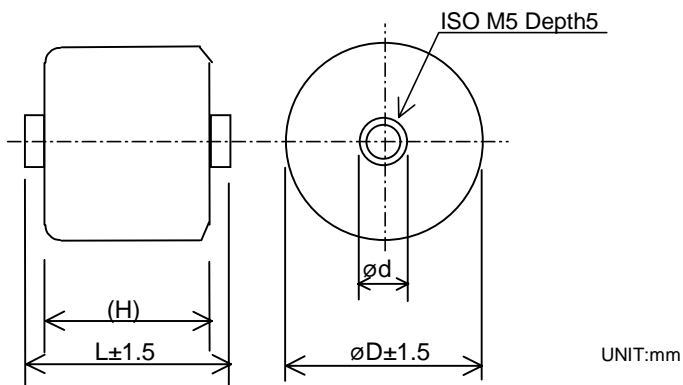
In case part number cannot be identified without 'individual specification', it is added at the end of part number.

### 3. Marking

- ① Temperature Characteristic: marked with code.
- ② Capacitance : marked with 3 figures.
- ③ Cap. tolerance : marked with code.
- ④ Manufacturer's identification : marked with code.
- ⑤ Rated Voltage: marked with code.
- ⑥ Manufactured Date : marked with code.



### 4. Part number List



Temp. Char.	Cap. (pF)	Cap. tol. (%)	Customer part number	Murata part number	DC Rated. volt. (kV)	Dimensions (mm)			Terminal code
						D	H	L	
N4700	2000	±10		DHS4E4G202KTZB	40	60.0	32.0	36.0	TZ

## 5.TESTS

### 5-1VISUAL EXAMINATION CHECK OF DIMENSIONS

No.	ITEM	SPECIFICATION	TESTING METHOD
1	Appearance and Dimensions	No marked defect and see4	Shall be visually examined or Venire calipers.
2	Marking	To be easily legible	Shall be visually examined.

### 5-2ELECTRICAL PERFORMANCE TESTS

1	Capacitance	Within the specified tolerance	The capacitance shall be measured at 20°C with 1±0.2kHz and AC5V(r.m.s) max..												
2	Temperature Characteristics	-4700±1000ppm/°C	The capacitance measurement shall be made at each step specified in table. Capacitance change from the value of step 3 shall not exceed the limit specified												
			<table border="1"> <thead> <tr> <th>Step char.</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> </tr> </thead> <tbody> <tr> <td>N4700</td> <td></td> <td></td> <td>20±2°C</td> <td>85±2°C</td> <td>20±2°C</td> </tr> </tbody> </table>	Step char.	1	2	3	4	5	N4700			20±2°C	85±2°C	20±2°C
Step char.	1	2	3	4	5										
N4700			20±2°C	85±2°C	20±2°C										
3	Dissipation Factor (D.F)	0.3%max.	The capacitance shall be measured at 20°C with 1±0.2kHz and AC5V(r.m.s) max..												
4	Dielectric Strength	Between terminal	No failure												
			The capacitors shall not be damage when DC voltage of 150% of the rated voltage are applied between the terminal for 60 s. in insulate liquid or gas. (charge/discharge current:50mA max.)												
5	Insulation Resistance (I.R)	10,000MΩmin.	The insulation resistance shall be measured with DC1000V within 60±5 s. of charging.												

### 5-3 MECHANICAL PERFORMANCE TESTS

1	Strength of Terminal	Torque strength	Capacitor shall not be broken.	When mounting the capacitors on equipment, be sure to mount them within the torque strength values shown in the table below.		
				<table border="1"> <thead> <tr> <th>size</th> <th>torque (Nm )</th> </tr> </thead> <tbody> <tr> <td>ISO M5</td> <td>1.5</td> </tr> </tbody> </table>	size	torque (Nm )
size	torque (Nm )					
ISO M5	1.5					
		pull	No unusual	Fix the body of capacitor apply a tensile weight gradually to each terminal in theradial direction of capacitor up to table below.		
						<table border="1"> <thead> <tr> <th>size</th> <th>pull (N)</th> </tr> </thead> <tbody> <tr> <td>ISO M5</td> <td>5.0</td> </tr> </tbody> </table>
size	pull (N)					
ISO M5	5.0					

### 5-4 CLIMATIC TESTS

1	Humidity (Under Steady State)	appearance	No marked defect.	Set the capacitor for 100±8 h at 40±2°C in 90 to 95% humidity. Post-treatment : capacitor shall be stored for 24±2 h at room condition. (charge/discharge current:50mA max.)
		Capacitance change	Within ±5%	
		D.F	1.0%max.	
		I.R	1,000MΩ	
2	Life Test	appearance	No marked defect.	Apply a DC voltage of 125% of the rated voltage for 100+24/-0 h in silicon oil at 85±2°C. Post-treatment : capacitor shall be stored for 24±2h at room condition. (charge/discharge current:50mA max.)
		Capacitance change	Within ±5%	
		D.F	1.0%max.	
		I.R	1,000MΩ	

Room condition

temperature:15 ~ 35°C

humidity:45 ~ 75%

atmospheric pressure:86 ~ 106kPa