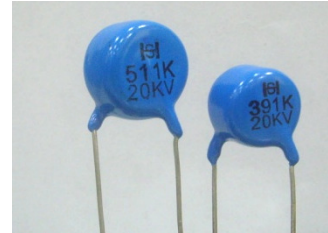


Ceramic Disc Capacitors [Ultra High Voltage Disc Capacitors] HDC Series – over 10KVdc



HDC Series (ceramic disc capacitors) are ideal for use in general electronic products with voltage ratings over 10KVdc.

◆ Features

- Wide operating temperature range
- Low Loss at wide range of frequency
- High reliability
- RoHS compliant
- Halogen Free available

◆ Applications

- Suitable for LAN/WLAN interface
- Ballast circuit of back-lighting inverter
- DC-DC converters
- Snubber circuit of switching power supplies
- Modems and communication
- High voltage power supply

◆ Summary of Specifications

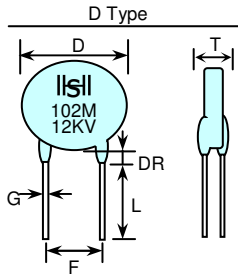
Operation Temperature	NP0/X7R : -55 °C ~ +125 °C
	Y5P/Y5S/SL : -25 °C ~ +85 °C
	Y5U/Y5V : -25 °C ~ +85 °C
Capacitance Range	10pF to 10nF
Capacitance	1MHz/1KHz ± 20% /osc : 1 to 5Vrms, and 20 °C
Rated Voltage	Over 10KVdc
Temperature Coefficient	NP0 : ≤ ± 30ppm/ °C , -55 °C ~ +125 °C (EIA Class I)
	SL : +350 ~ -1000ppm/ °C , -25 °C ~ +85 °C (EIA Class I)
	Y5S (N3300) ± 22% , -25 °C ~ +85 °C
	X7R : ≤ ± 15% , -55 °C ~ +125 °C (EIA Class II)
	Y5P : ≤ ± 10% , Y5U : +22%/-56% , Y5V : +22%/-82% , -25 °C ~ +85 °C (EIA Class II)
Dissipation Factor	Class I , NP0/SL : Q ≥ 300 at 1MHz/1Vrms
	Class II , Y5P : DF ≤ 2.5% , Y5U/Y5V : DF ≤ 5.0% at 1KHz/1Vrms
Insulation Resistance	10GΩ at 500Vdc 1 minute
Aging	NP0 : 0% , SL : 1.5% per decade of time
	X7R, Y5P, Y5S : 3.5 % per decade of time
	Y5U : 5.0 % , Y5V : 7.5% per decade of time
Dielectric Strength	150% Rated Voltage

◆ How To Order

HDC
L
102
M
153
A
L
C
N

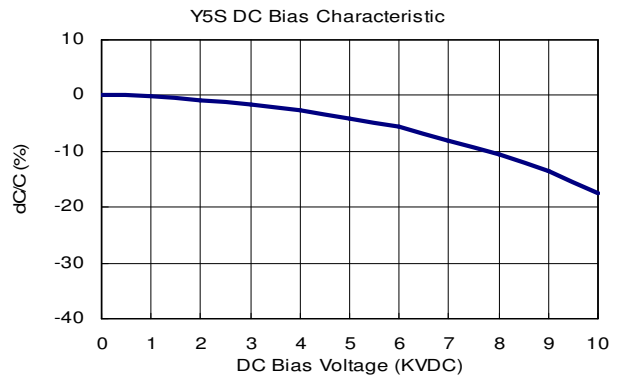
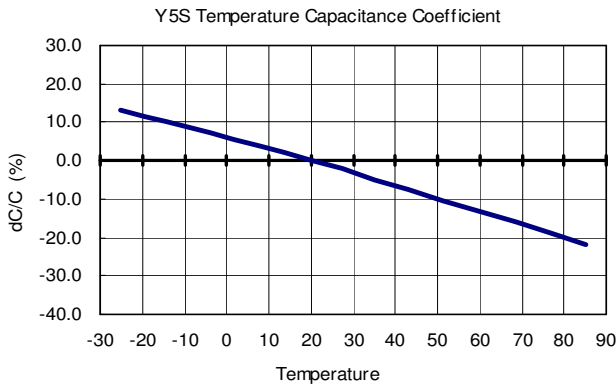
Product Code	Dielectric	Capacitance Unit : pF	Tolerance	Rated Voltage	Lead Space	Lead Length & Packaging	Lead Shape Style	Optional Suffix
HDC: Ceramic Disc Capacitor	Ex.: N : NP0 S : SL L : Y5S X : X7R P : Y5P E : Y5U Y : Y5V	Ex.: 102 : 10x10 ² 103 : 10x10 ³	Ex.: J : ±5% K : ±10% M : ±20%	Ex.: 103:10KVdc 123:12KVdc 153:15KVdc 203:20KVdc	Ex.: A : 10.0mm B : 12.5mm	Ex.: L : 25mm min.	Ex.: D Type C: φ=0.80mm	Ex.: N :Halogen Free

◆ Dimensions



Code	Dimension	
	D Type	
D	Please contact Holy Stone	
F	10.0±2 mm	12.5±2 mm
G	0.8±0.1mm max.	
T	Please contact Holy Stone	
DR	5.0mm max.	

◆ Temperature Capacitance Coefficient & DC Bias (Typical Reference)



◆ Capacitance Range

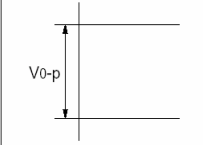
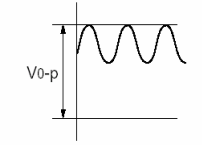
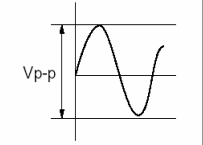
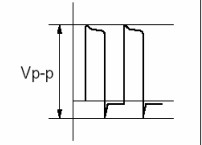
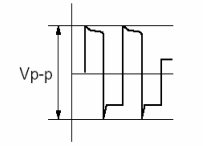
Dielectric Characteristic	Voltage	Capacitance Range																																				
		100	120	150	180	220	270	330	390	470	560	680	820	101	121	151	181	221	271	331	391	471	561	681	821	102	152	222	332	472	682	103	123					
NPO	10KV	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■			
	15KV	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■			
	20KV	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■		
SL	10KV																																					
	15KV																																					
	20KV																																					
X7R	10KV																																					
	12KV																																					
	15KV																																					
Y5S	10KV																																					
	12KV																																					
	15KV																																					
Y5P	10KV																																					
	12KV																																					
	15KV																																					
Y5U	10KV																																					
	12KV																																					
	15KV																																					
Y5V	10KV																																					
	12KV																																					
	15KV																																					

■ Other capacitance and voltage rating are available. Please contact Holy Stone.

◆ **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_{0-p} which contains a DC bias within the rated voltage range. When the voltage is applied to the circuit, starting or stopping may generate an 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.

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 similar current, it may self-generate heat due to dielectric loss. The frequency of the applied sine wave voltage should be less than 100kHz. The applied voltage load should be such that the capacitor's self-generated heat is within 20°C at an atmosphere temperature of 25°C. When measuring, use a thermocouple of small thermal capacity-K of $\varnothing 0.1\text{mm}$ in conditions where the capacitor is not affected by radiant heat from other components or surrounding ambient fluctuations. Excessive heat may lead to deterioration of the capacitor's characteristics and reliability. (Never attempt to perform measurement with the cooling fan running. Otherwise, accurate measurement cannot be ensured.)

(3) **Fail-Safe**

It should be assumed that if the capacitor fails, it will fail in short circuit mode. Be sure to provide an appropriate fail-safe function, like a fuse in your circuit, if failure would cause an electric shock, fire or fumes.

(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 35°C and 75%RH. Use capacitors within 12 months.

(5) **Vibration and impact**

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

(6) Soldering

When soldering this product to a PCB/PWB, do not exceed the solder heat resistance specification of the capacitor.

Subjecting this product to excessive heating could melt the internal solder joint and may result in thermal shock that can crack the ceramic element. When soldering capacitors with a soldering iron, it should be performed in following conditions.

Temperature of iron-tip: 400 degrees C. max.

Soldering iron wattage : 50W max.

Soldering time : 3.5 sec. max.

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

(7) Cleaning (ultrasonic cleaning)

To perform ultrasonic cleaning, observe the following conditions.

Rinse bath capacity : Output of 20 watts per liter or less.

Rinsing time : 5 min. maximum.

Do not vibrate the PCB/PWB directly.

Excessive ultrasonic cleaning may lead to fatigue failure of the lead wires.

(8) Rating

Capacitance change of capacitor

(a). Class 1 series (Temp. Char. SL · NP0)

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

Please contact us if you intend to use this product in a strict time constant circuit.

(b). CLASS 2 Series (Temp. Char. X7R, Y5S, Y5P, Y5U and Y5V)

Capacitors have an aging characteristic, whereby the capacitor continually decreases its capacitance slightly if the capacitor is left on for a long time. Moreover, capacitance might change greatly depending on the surrounding temperature or an applied voltage. Therefore, it is not likely to be suitable for use in a time constant circuit.

Please contact us if you need detailed information.