

- **Miniature**
- **Long Life**
- **Solvent Proof**
- **+125°C  
Maximum  
Temperature**



The GXD series capacitors are new miniature high temperature capacitors from United Chemi-Con. These capacitors are designed for use in very high temperature applications such as automotive engine controls. These capacitors are downsized from the previous high temperature GXC series and depending on the case size have a longer rated lifetime than the previous parts.

The GXD series capacitors were developed to withstand HCFC cleaning agents for five minutes by ultrasonic, vapor or immersion. This solvent proof design allows all circuit board components to be cleaned together, at the same time, without resorting to more expensive epoxy end-sealed capacitors. Refer to the Mini-Glossary for recommended cleaning conditions.

## Summary of Specifications

- Radial lead terminals.
- Capacitance range: 0.47 to 1,000 $\mu$ F.
- Voltage range: 10 to 63VDC.
- Operating temperature range:  $-40^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$ .
- Leakage current: 0.03CV or 4 $\mu$ A, whichever is greater, after 1 minute at  $+20^{\circ}\text{C}$ .
- Standard capacitance tolerance:  $\pm 20\%$
- Nominal case size (D  $\times$  L): 8  $\times$  11.5mm to 16  $\times$  20mm.
- Rated lifetime: 1,000 to 2,000 hours at  $+125^{\circ}\text{C}$  depending on case size.

# GXD Series

## GXD Specifications

Item	Characteristics																					
Operating Temperature Range	- 40 to +125°C																					
Rated Voltage Range	10 to 63VDC																					
Capacitance Range	0.47 to 1,000 $\mu$ F																					
Capacitance Tolerance	$\pm$ 20% (M) at +20°C, 120Hz																					
Leakage Current	I = 0.03CV or 4 $\mu$ A, whichever is greater, after 1 minute at +20°C. Where I = Leakage current ( $\mu$ A), C = Nominal capacitance ( $\mu$ F) and V = Rated voltage (V)																					
Dissipation Factor (Tan $\delta$ )	At +20°C, 120Hz <table border="1"> <tr> <td>Rated Voltage (V)</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> <td>63</td> </tr> <tr> <td>Tan <math>\delta</math> (DF)</td> <td>0.15</td> <td>0.12</td> <td>0.10</td> <td>0.10</td> <td>0.08</td> <td>0.08</td> </tr> </table>	Rated Voltage (V)	10	16	25	35	50	63	Tan $\delta$ (DF)	0.15	0.12	0.10	0.10	0.08	0.08							
Rated Voltage (V)	10	16	25	35	50	63																
Tan $\delta$ (DF)	0.15	0.12	0.10	0.10	0.08	0.08																
Low Temperature Characteristics	At 120Hz, impedance (Z) ratio between the -25°C or -40°C value and +20°C value shall not exceed the values given below. <table border="1"> <tr> <td>Rated Voltage (V)</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> <td>63</td> </tr> <tr> <td>Z (-25°C) / Z (+20°C)</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>Z (-40°C) / Z (+20°C)</td> <td>6</td> <td>4</td> <td>4</td> <td>4</td> <td>4</td> <td>4</td> </tr> </table>	Rated Voltage (V)	10	16	25	35	50	63	Z (-25°C) / Z (+20°C)	3	2	2	2	2	2	Z (-40°C) / Z (+20°C)	6	4	4	4	4	4
Rated Voltage (V)	10	16	25	35	50	63																
Z (-25°C) / Z (+20°C)	3	2	2	2	2	2																
Z (-40°C) / Z (+20°C)	6	4	4	4	4	4																
Load Life	The following specifications shall be satisfied when the capacitors are restored to +20°C after subjecting them to the DC rated voltage for the specified test time at +125°C. The sum of DC voltage and peak AC voltage must not exceed the full rated voltage of the capacitors. <table border="0"> <tr> <td>Case Size</td> <td>Test Time</td> </tr> <tr> <td><math>\varnothing</math>8 x 11.5 &amp; <math>\varnothing</math>10 x 12.5mm</td> <td>1,000 hours</td> </tr> <tr> <td><math>\varnothing</math>10 x 16mm &amp; larger</td> <td>2,000 hours</td> </tr> </table> <p>Capacitance change: <math>\leq \pm</math>20% of initial measured value            Tan <math>\delta</math> (DF) : <math>\leq</math> 200% of initial specified value            Leakage current : <math>\leq</math> initial specified value</p>	Case Size	Test Time	$\varnothing$ 8 x 11.5 & $\varnothing$ 10 x 12.5mm	1,000 hours	$\varnothing$ 10 x 16mm & larger	2,000 hours															
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$\varnothing$ 8 x 11.5 & $\varnothing$ 10 x 12.5mm	1,000 hours																					
$\varnothing$ 10 x 16mm & larger	2,000 hours																					
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to +20°C after exposing them for 1,000 hours at +125°C without voltage applied. The rated voltage shall be applied to the capacitors for a minimum of 30 minutes, at least 24 hours and not more than 48 hours before the measurements. <p>Capacitance change: <math>\leq \pm</math>20% of initial measured value            Tan <math>\delta</math> (DF) : <math>\leq</math> 200% of initial specified value            Leakage current : <math>\leq</math> initial specified value</p>																					
Others	Satisfies characteristic W of JIS C5141																					

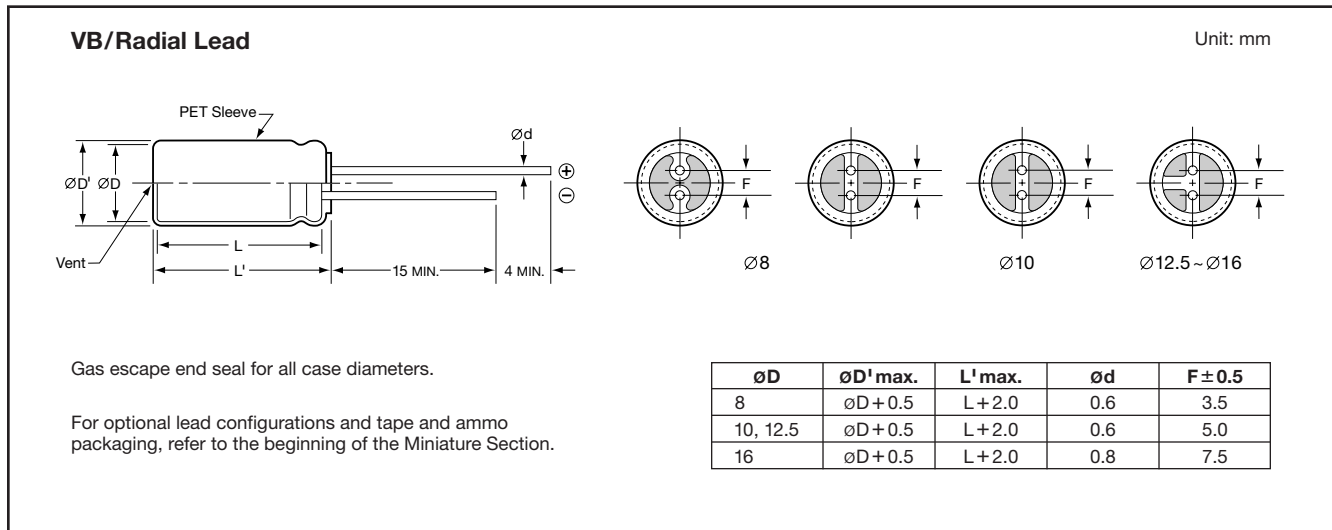
## Part Numbering System for GXD Series

When ordering, always specify complete catalog number for GXD Series.

Part Number	Description
<b>GXD</b>	Series Name: Indicates Basic Capacitor Design.
<b>50</b>	DC Rated Voltage: Expressed in Volts (e.g. 50 = 50WVDC).
<b>VB</b>	Lead Configuration: VB = Radial Lead Terminals.
<b>221</b>	Capacitance Value: Expressed in Microfarads. The first two digits are significant figures, and the third digit indicates the number of zeros for capacitance of 100 $\mu$ F or more. R indicates the decimal point for capacitance less than 100 $\mu$ F (e.g. R22 = .22 $\mu$ F; 2R2 = 2.2 $\mu$ F; 22R = 22 $\mu$ F; 221 = 220 $\mu$ F; 222 = 2,200 $\mu$ F; 223 = 22,000 $\mu$ F).
<b>M</b>	Capacitance Tolerance: M = $\pm$ 20%
<b>16X20</b>	Case Code: See Case Sizes in Tables.
<b>LL</b>	Lead Length: LL is Standard.

# GXD Series

## Diagram of Dimensions



## Standard Voltage Ratings - VB/Radial Lead

Rated Voltage (WVDC)	Capacitance (µF)	Catalog Part Number	Nominal Case Size* D × L (mm)	Maximum ESR (Ω) at +20°C, 120Hz	Maximum Ripple Current (mA rms) at +125°C, 120Hz
<b>10 Volts</b> 13 Volts Surge	100	GXD10VB101M10X12LL	10 × 12.5	2.486	154
	220	GXD10VB221M10X16LL	10 × 16	1.13	252
	330	GXD10VB331M10X16LL	10 × 16	0.753	308
	470	GXD10VB471M10X20LL	10 × 20	0.529	399
	1,000	GXD10VB102M16X20LL	16 × 20	0.249	715
<b>16 Volts</b> 20 Volts Surge	47	GXD16VB47RM8X11LL	8 × 11.5	4.232	100
	100	GXD16VB101M10X16LL	10 × 16	1.989	190
	220	GXD16VB221M10X20LL	10 × 20	0.904	305
	330	GXD16VB331M12X20LL	12.5 × 20	0.603	414
	470	GXD16VB471M12X25LL	12.5 × 25	0.423	537
<b>25 Volts</b> 32 Volts Surge	33	GXD25VB33RM8X11LL	8 × 11.5	5.023	92
	47	GXD25VB47RM10X12LL	10 × 12.5	3.527	129
	100	GXD25VB101M10X16LL	10 × 16	1.658	208
	220	GXD25VB221M12X20LL	12.5 × 20	0.753	371
	330	GXD25VB331M12X25LL	12.5 × 25	0.502	493
	470	GXD25VB471M16X20LL	16 × 20	0.353	601
<b>35 Volts</b> 44 Volts Surge	22	GXD35VB22RM8X11LL	8 × 11.5	7.534	75
	33	GXD35VB33RM10X12LL	10 × 12.5	5.023	108
	47	GXD35VB47RM10X16LL	10 × 16	3.527	142
	100	GXD35VB101M10X20LL	10 × 20	1.658	225
	220	GXD35VB221M12X25LL	12.5 × 25	0.753	403
	330	GXD35VB331M16X20LL	16 × 20	0.502	503
<b>50 Volts</b> 63 Volts Surge	0.47	GXD50VBR47M8X11LL	8 × 11.5	282.128	12
	1.0	GXD50VB1R0M8X11LL	8 × 11.5	132.6	17
	2.2	GXD50VB2R2M8X11LL	8 × 11.5	60.273	26
	3.3	GXD50VB3R3M8X11LL	8 × 11.5	40.182	32
	4.7	GXD50VB4R7M8X11LL	8 × 11.5	28.213	38
	10	GXD50VB10RM8X11LL	8 × 11.5	13.26	56
	22	GXD50VB22RM10X12LL	10 × 12.5	6.027	99
	33	GXD50VB33RM10X16LL	10 × 16	4.018	133
	47	GXD50VB47RM10X16LL	10 × 16	2.821	159
	100	GXD50VB101M12X20LL	12.5 × 20	1.326	279
	220	GXD50VB221M16X20LL	16 × 20	0.603	459

\*The case sizes in table are with no sleeve, refer to diagram for case sizes with sleeve.

# GXD Series

## Standard Voltage Ratings - VB/Radial Lead

Rated Voltage (WVDC)	Capacitance (μF)	Catalog Part Number	Nominal Case Size* D × L (mm)	Maximum ESR (Ω) at +20°C, 120Hz	Maximum Ripple Current (mA rms) at +125°C, 120Hz
<b>63 Volts</b> <b>79 Volts Surge</b>	0.47	GXD63VBR47M8X11LL	8 × 11.5	282.128	12
	1.0	GXD63VB1R0M8X11LL	8 × 11.5	132.6	17
	2.2	GXD63VB2R2M8X11LL	8 × 11.5	60.273	26
	3.3	GXD63VB3R3M8X11LL	8 × 11.5	40.182	32
	4.7	GXD63VB4R7M8X11LL	8 × 11.5	28.213	38
	10	GXD63VB10RM8X11LL	8 × 11.5	13.26	56
	22	GXD63VB22RM10X12LL	10 × 12.5	6.027	99
	33	GXD63VB33RM10X16LL	10 × 16	4.018	133
	47	GXD63VB47RM10X20LL	10 × 20	2.821	173
	100	GXD63VB101M12X20LL	12.5 × 20	1.326	279

\*The case sizes in table are with no sleeve, refer to diagram for case sizes with sleeve.