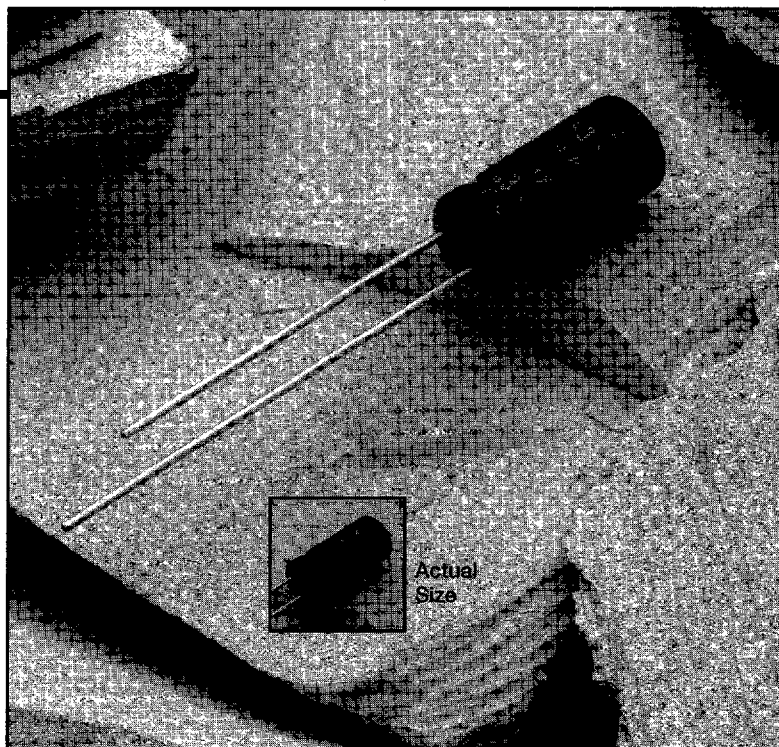


LXA/LX Series



LXA/LX
MINIATURE - 105°C

- Miniature
- Long Life
- Solvent Proof
- +105°C
Maximum
Temperature



The LXA/LX series capacitors are designed for long life and for use at high frequencies. The rated lifetime for this series is 5,000 or 7,000 hours at 105°C depending on rated voltage and case size. Typical applications in which these capacitors may be used are high reliability and industrial control equipment along with the filter circuits of switching power supplies.

The LXA/LX 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 4,700 μ F for LXA; 0.47 to 68 μ F for LX.
- Voltage range: 10 to 63VDC for LXA; 100 to 250VDC for LX.
- Operating temperature range: -55°C to +105°C for LXA; -40°C to +105°C for LX.
- Leakage current: 0.01CV or 3 μ A, whichever is greater, after 2 minutes at +20°C for LXA; 0.01CV+2 μ A for 100V and 0.04CV+100 μ A for 160V to 250V after 2 minutes at +20°C for LX.
- Standard capacitance tolerance: \pm 20%
- Nominal case size (D \times L): 6.3 \times 14mm to 18 \times 40mm for LXA; 8 \times 14mm to 18 \times 40mm for LX.
- Rated lifetime: 5,000 or 7,000 hours at +105°C depending on case size for LXA; 5,000 hours at +105°C for LX.

LXA/LX Series

LXA/LX Specifications

Item	Characteristics																																																																					
	LXA	LX																																																																				
Series																																																																						
Rated Voltage Range	10 to 63VDC	100 to 250VDC																																																																				
Operating Temperature Range	-55 to +105°C	-40 to +105°C																																																																				
Capacitance Range	0.47 to 4,700 μ F	0.47 to 68 μ F																																																																				
Capacitance Tolerance	\pm 20% (M) at +20°C, 120Hz	\pm 20% (M) at +20°C, 120Hz																																																																				
Leakage Current	$I = 0.01CV$ or 3μ A, whichever is greater, after 5 minutes at +20°C. Where I = Leakage current (μ A), C = Nominal capacitance (μ F) and V = Rated voltage (V)	$\leq 100V$: $I = 0.01CV + 2\mu$ A after 2 minutes at +20°C. $160 - 250V$: $I = 0.04CV + 100\mu$ A after 2 minutes at +20°C.																																																																				
Dissipation Factor (Tan δ)	At +20°C, 120Hz <table border="1"> <tr> <td>DC Voltage</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> <td>63</td> </tr> <tr> <td>Tan δ (DF)</td> <td>0.30</td> <td>0.25</td> <td>0.22</td> <td>0.18</td> <td>0.15</td> <td>0.12</td> </tr> </table> <p>When nominal capacitance exceeds 1,000μF, add 0.02 to the values above for each 1,000μF increase.</p>	DC Voltage	10	16	25	35	50	63	Tan δ (DF)	0.30	0.25	0.22	0.18	0.15	0.12	At +20°C, 120Hz <table border="1"> <tr> <td>DC Voltage</td> <td>100</td> <td>160</td> <td>200</td> <td>250</td> </tr> <tr> <td>Tan δ (DF)</td> <td>0.12</td> <td>0.15</td> <td>0.15</td> <td>0.15</td> </tr> </table>	DC Voltage	100	160	200	250	Tan δ (DF)	0.12	0.15	0.15	0.15																																												
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Low Temperature Characteristics		Capacitance change at 120Hz: $\Delta C (-10^\circ C) / C (+20^\circ C) \leq 20\%$ Impedance (Z) values at 100kHz, -10°C and +20°C are given in the Ratings Tables.																																																																				
Ripple Current Multipliers <i>Refer to Section 4 of the Mini-Glossary for explanation of Ripple Current Multipliers.</i>	Ambient Temperature (°C) <table border="1"> <tr> <td>+85°C</td> <td>+105°C</td> </tr> <tr> <td>1.75</td> <td>1.00</td> </tr> </table> Frequency (Hz) <table border="1"> <tr> <td>Capacitance</td> <td>50</td> <td>120</td> <td>300</td> <td>1k</td> <td>$\geq 10k$</td> </tr> <tr> <td>$\leq 4.7\mu$F</td> <td>0.1</td> <td>0.2</td> <td>0.3</td> <td>0.5</td> <td>1.00</td> </tr> <tr> <td>10-22μF</td> <td>0.2</td> <td>0.3</td> <td>0.4</td> <td>0.6</td> <td>1.00</td> </tr> <tr> <td>33-47μF</td> <td>0.3</td> <td>0.4</td> <td>0.5</td> <td>0.7</td> <td>1.00</td> </tr> <tr> <td>100-330μF</td> <td>0.4</td> <td>0.5</td> <td>0.6</td> <td>0.8</td> <td>1.00</td> </tr> <tr> <td>$\geq 470\mu$F</td> <td>0.6</td> <td>0.7</td> <td>0.8</td> <td>0.9</td> <td>1.00</td> </tr> </table>	+85°C	+105°C	1.75	1.00	Capacitance	50	120	300	1k	$\geq 10k$	$\leq 4.7\mu$ F	0.1	0.2	0.3	0.5	1.00	10-22 μ F	0.2	0.3	0.4	0.6	1.00	33-47 μ F	0.3	0.4	0.5	0.7	1.00	100-330 μ F	0.4	0.5	0.6	0.8	1.00	$\geq 470\mu$ F	0.6	0.7	0.8	0.9	1.00	Ambient Temperature (°C) <table border="1"> <tr> <td>+85°C</td> <td>+105°C</td> </tr> <tr> <td>1.73</td> <td>1.00</td> </tr> </table> Frequency (Hz) <table border="1"> <tr> <td>Capacitance</td> <td>50</td> <td>120</td> <td>300</td> <td>1k</td> <td>$\geq 10k$</td> </tr> <tr> <td>$\leq 3.3\mu$F</td> <td>0.3</td> <td>0.4</td> <td>0.5</td> <td>0.7</td> <td>1.00</td> </tr> <tr> <td>4.7-33μF</td> <td>0.4</td> <td>0.5</td> <td>0.6</td> <td>0.8</td> <td>1.00</td> </tr> <tr> <td>$\geq 47\mu$F</td> <td>0.6</td> <td>0.7</td> <td>0.8</td> <td>0.9</td> <td>1.00</td> </tr> </table>	+85°C	+105°C	1.73	1.00	Capacitance	50	120	300	1k	$\geq 10k$	$\leq 3.3\mu$ F	0.3	0.4	0.5	0.7	1.00	4.7-33 μ F	0.4	0.5	0.6	0.8	1.00	$\geq 47\mu$ F	0.6	0.7	0.8	0.9	1.00
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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 7,000 hours (case size $> \phi 10$) or 5,000 hours (case size $\leq \phi 10$) at +105°C. Capacitance change: $\leq \pm 30\%$ of initial measured value Tan δ (DF): $\leq 300\%$ of initial specified value Leakage current: \leq initial specified value	The following specifications shall be satisfied when the capacitors are restored to +20°C after subjecting them to the DC rated voltage for 5,000 hours at +105°C. Capacitance change: $\leq \pm 30\%$ of initial measured value Tan δ (DF): $\leq 250\%$ of initial specified value Leakage current: \leq initial specified value																																																																				
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to +20°C after exposing them for 1,000 hours at +105°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. Capacitance change: $\leq \pm 15\%$ of initial measured value for LXA $\leq \pm 20\%$ of initial measured value for LX Tan δ (DF) : $\leq 150\%$ of initial specified value Leakage current : \leq initial specified value																																																																					
Others	Satisfies characteristic W of JIS C5141																																																																					

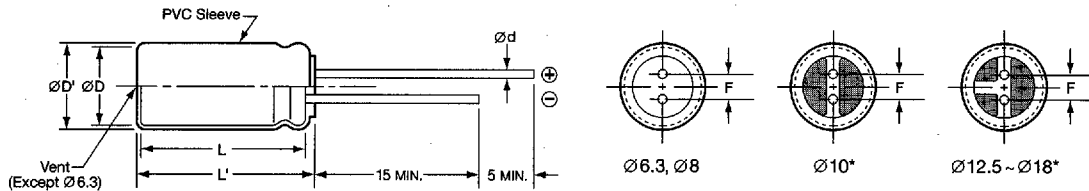
LXA/LX
MINIATURE - 105°C

LXA/LX Series

Diagram of Dimensions

VB/Radial Lead

Unit: mm



*Gas escape end seal for $\varnothing 10 \sim \varnothing 18$

$\varnothing D$	$\varnothing D'$	L' (LXA)	L' (LX)	$\varnothing d$	$F \pm 0.5$
6.3	$\varnothing D + 0.5$	$L + 1.0$	-	0.5	2.5
8	$\varnothing D + 0.5$	$L + 1.0$	$L + 1.5$	0.6	3.5
10	$\varnothing D + 0.5$	$L + 1.0$	$L + 1.5$	0.6	5.0
12.5	$\varnothing D + 0.5$	$L + 1.0$	$L + 1.5$	0.6	5.0
16	$\varnothing D + 0.5$	$L + 1.5$	$L + 2.0$	0.8	7.5
18	$\varnothing D + 0.5$	$L + 1.5$	$L + 2.0$	0.8	7.5

For optional lead configurations and tape and ammo packaging, refer to the beginning of the Miniature section.

Part Numbering System for LXA/LX Series

When ordering, always specify complete catalog number for LXA/LX Series.

LXA 63 VB 10R M 6X14 LL

Lead Length: LL is Standard.

Case Code: See Case Sizes in Tables.

Capacitance Tolerance: M = $\pm 20\%$

Capacitance Value: Expressed in microfarads. The first two digits are significant figures, and the third digit indicates the number of zeros for capacitance of $100\mu\text{F}$ or more. R indicates the decimal point for capacitance less than $100\mu\text{F}$ (e.g. R10 = $0.10\mu\text{F}$; 1R0 = $1.0\mu\text{F}$; 10R = $10\mu\text{F}$; 101 = $100\mu\text{F}$; 102 = $1,000\mu\text{F}$; 103 = $10,000\mu\text{F}$).

Lead Configuration: VB = Radial Lead Terminals.

DC Rated Voltage: Expressed in Volts (e.g. 63 = 63WVDC).

Series Name: Indicates Basic Capacitor Design.

LXA Standard Voltage Ratings - VB/Radial Lead

Rated Voltage (WVDC)	Capacitance (μF)	Catalog Part Number	Nominal Case Size* $D \times L$ (mm)	Maximum Impedance (Ω) at +20°C, 100kHz	Maximum Ripple Current (mA rms) at +105°C, 10kHz
10 Volts 13 Volts Surge	47	LXA10VB47RM6X14LL	6.3 x 14	1.65	140
	100	LXA10VB101M6X14LL	6.3 x 14	1.65	140
	220	LXA10VB221M8X14LL	8 x 14	0.90	210
	330	LXA10VB331M10X16LL	10 x 16	0.42	370
	470	LXA10VB471M10X16LL	10 x 16	0.42	370
	1,000	LXA10VB102M12X20LL	12.5 x 20	0.16	720
	2,200	LXA10VB222M16X25LL	16 x 25	0.08	1,220
	3,300	LXA10VB332M16X31LL	16 x 31.5	0.07	1,400
4,700	LXA10VB472M16X35LL	16 x 35.5	0.06	1,550	

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

LXA/LX Series

LXA Standard Voltage Ratings - VB/Radial Lead

Rated Voltage (VVDC)	Capacitance (µF)	Catalog Part Number	Nominal Case Size* D × L (mm)	Maximum Impedance (Ω) at +20°C, 100kHz	Maximum Ripple Current (mA rms) at +105°C, 10kHz
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16 Volts 20 Volts Surge	33	LXA16VB33RM6X14LL	6.3 × 14	1.65	140
	47	LXA16VB47RM6X14LL	6.3 × 14	1.65	140
	100	LXA16VB101M6X14LL	6.3 × 14	1.65	140
	220	LXA16VB221M8X14LL	8 × 14	0.90	210
	330	LXA16VB331M10X16LL	10 × 16	0.42	370
	470	LXA16VB471M10X20LL	10 × 20	0.28	490
	1,000	LXA16VB102M12X25LL	12.5 × 25	0.13	780
	2,200	LXA16VB222M16X25LL	16 × 25	0.08	1,220
	3,300	LXA16VB332M16X35LL	16 × 35.5	0.06	1,550
4,700	LXA16VB472M18X35LL	18 × 35.5	0.055	1,690	

25 Volts 32 Volts Surge	22	LXA25VB22RM6X14LL	6.3 × 14	1.65	140
	33	LXA25VB33RM6X14LL	6.3 × 14	1.65	140
	47	LXA25VB47RM6X14LL	6.3 × 14	1.65	140
	100	LXA25VB101M8X14LL	8 × 14	0.90	210
	220	LXA25VB221M10X16LL	10 × 16	0.42	370
	330	LXA25VB331M10X20LL	10 × 20	0.28	490
	470	LXA25VB471M12X20LL	12.5 × 20	0.16	720
	1,000	LXA25VB102M16X25LL	16 × 25	0.08	1,220
	2,200	LXA25VB222M16X35LL	16 × 35.5	0.06	1,550
3,300	LXA25VB332M18X40LL	18 × 40	0.05	1,800	

35 Volts 44 Volts Surge	4.7	LXA35VB47RM6X14LL	6.3 × 14	1.65	140
	10	LXA35VB10RM6X14LL	6.3 × 14	1.65	140
	22	LXA35VB22RM6X14LL	6.3 × 14	1.65	140
	33	LXA35VB33RM6X14LL	6.3 × 14	1.65	140
	47	LXA35VB47RM6X14LL	6.3 × 14	1.65	140
	100	LXA35VB101M8X14LL	8 × 14	0.90	210
	220	LXA35VB221M10X20LL	10 × 20	0.28	490
	330	LXA35VB331M12X20LL	12.5 × 20	0.16	720
	470	LXA35VB471M12X20LL	12.5 × 20	0.16	720
	1,000	LXA35VB102M16X25LL	16 × 25	0.08	1,220
	2,200	LXA35VB222M18X35LL	18 × 35.5	0.055	1,690

50 Volts 63 Volts Surge	0.47	LXA50VBR47M6X14LL	6.3 × 14	4.50	140
	1.0	LXA50VB10RM6X14LL	6.3 × 14	2.60	140
	2.2	LXA50VB22RM6X14LL	6.3 × 14	1.80	140
	3.3	LXA50VB33RM6X14LL	6.3 × 14	1.80	140
	4.7	LXA50VB47RM6X14LL	6.3 × 14	1.65	140
	10	LXA50VB10RM6X14LL	6.3 × 14	1.65	140
	22	LXA50VB22RM6X14LL	6.3 × 14	1.65	140
	33	LXA50VB33RM8X14LL	8 × 14	0.90	210
	47	LXA50VB47RM8X14LL	8 × 14	0.90	210
	100	LXA50VB101M10X16LL	10 × 16	0.55	320
	220	LXA50VB221M12X20LL	12.5 × 20	0.20	640
	330	LXA50VB331M12X20LL	12.5 × 20	0.20	640
	470	LXA50VB471M16X25LL	16 × 25	0.09	1,150
1,000	LXA50VB102M16X31LL	16 × 31.5	0.07	1,400	

63 Volts 79 Volts Surge	4.7	LXA63VB47RM6X14LL	6.3 × 14	1.65	140
	10	LXA63VB10RM6X14LL	6.3 × 14	1.65	140
	22	LXA63VB22RM6X14LL	6.3 × 14	1.65	140
	33	LXA63VB33RM8X14LL	8 × 14	0.90	210
	47	LXA63VB47RM8X14LL	8 × 14	0.90	210
	100	LXA63VB101M10X20LL	10 × 20	0.37	420
	220	LXA63VB221M12X20LL	12.5 × 20	0.20	640
	330	LXA63VB331M12X25LL	12.5 × 25	0.16	720
	470	LXA63VB471M16X25LL	16 × 25	0.09	1,150
	1,000	LXA63VB102M18X35LL	18 × 35.5	0.055	1,690

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

LXA/LX
MINIATURE -105°C

LXA/LX Series

LX Standard Voltage Ratings - VB/Radial Lead

Rated Voltage (WVDC)	Capacitance (μF)	Catalog Part Number	Nominal Case Size* D × L (mm)	Maximum Impedance (Ω) at		Maximum Ripple Current (mA rms) at +105°C, 10kHz
				+20°C, 100kHz	-10°C, 100kHz	
100 Volts 125 Volts Surge	0.47	LX100VBR47M8X14LL	8 × 14	35.0	105.0	30
	1.0	LX100VB1R0M8X14LL	8 × 14	18.0	54.0	50
	2.2	LX100VB2R2M8X14LL	8 × 14	9.62	28.8	60
	3.3	LX100VB3R3M8X14LL	8 × 14	8.57	25.7	70
	4.7	LX100VB4R7M8X14LL	8 × 14	6.43	19.3	80
	10	LX100VB10RM10X20LL	10 × 20	2.99	8.97	230
	22	LX100VB22RM12X20LL	12.5 × 20	1.47	4.41	250
	33	LX100VB33RM12X25LL	12.5 × 25	1.00	3.00	330
47	LX100VB47RM16X25LL	16 × 25	0.69	2.07	440	
160 Volts 200 Volts Surge	10	LX160VB10RM12X20LL	12.5 × 20	3.5	10.0	130
	22	LX160VB22RM16X25LL	16 × 25	1.8	4.8	250
	33	LX160VB33RM16X25LL	16 × 25	1.7	4.5	320
	47	LX160VB47RM16X31LL	16 × 31.5	1.1	2.9	400
	68	LX160VB68RM18X35LL	18 × 35.5	0.9	1.9	510
200 Volts 250 Volts Surge	1.0	LX200VB1R0M10X16LL	10 × 16	18.0	70.0	30
	2.2	LX200VB2R2M10X16LL	10 × 16	16.0	65.0	40
	3.3	LX200VB3R3M10X16LL	10 × 16	9.2	32.0	50
	4.7	LX200VB4R7M10X20LL	10 × 20	4.7	14.0	80
	10	LX200VB10RM12X20LL	12.5 × 20	2.6	7.6	140
	22	LX200VB22RM16X25LL	16 × 25	1.9	5.0	250
	33	LX200VB33RM16X31LL	16 × 31.5	1.2	3.0	330
	47	LX200VB47RM18X35LL	18 × 35.5	1.0	2.5	430
68	LX200VB68RM18X40LL	18 × 40	0.7	1.8	520	
250 Volts 300 Volts Surge	1.0	LX250VB1R0M10X16LL	10 × 16	20.0	80.0	30
	2.2	LX250VB2R2M10X16LL	10 × 16	18.0	70.0	40
	3.3	LX250VB3R3M10X20LL	10 × 20	9.0	27.0	60
	4.7	LX250VB4R7M12X20LL	12.5 × 20	5.0	15.0	90
	10	LX250VB10RM12X25LL	12.5 × 25	2.5	7.0	150
	22	LX250VB22RM16X31LL	16 × 31.5	1.8	4.8	260
	33	LX250VB33RM16X35LL	16 × 35.5	1.0	2.8	340
47	LX250VB47RM18X40LL	18 × 40	0.8	2.0	440	

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

LXA/LX
MINIATURE - 105°C