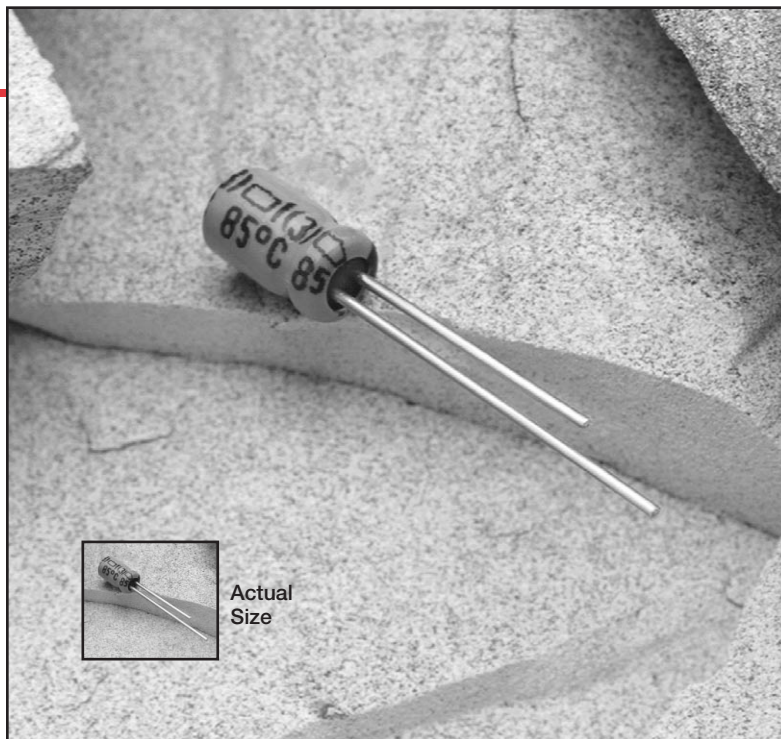


- **Miniature**
- **5mm Nominal Height**
- **Solvent Proof**
- **+85°C Maximum Temperature**



The SREC series capacitors are designed for use in ultra miniature applications, as the nominal height is 5mm. Some of the applications in which these capacitors could be used are the following: camera, car audio, mini-audio sets and other industrial and commercial units where a very low profile product is required.

The SREC series capacitors were developed to withstand HCFC cleaning agents for three 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: 0.1 to 100 $\mu$ F.**
- **Voltage range: 4 to 50VDC.**
- **Operating temperature range: -40°C to +85°C.**
- **Leakage current: 0.01CV or 3 $\mu$ A, whichever is greater, after 2 minutes at +20°C.**
- **Standard capacitance tolerance:  $\pm$ 20%**
- **Nominal case size (D  $\times$  L): 3  $\times$  5mm to 6.3  $\times$  5mm.**
- **Rated lifetime: 1,000 hours at +85°C.**

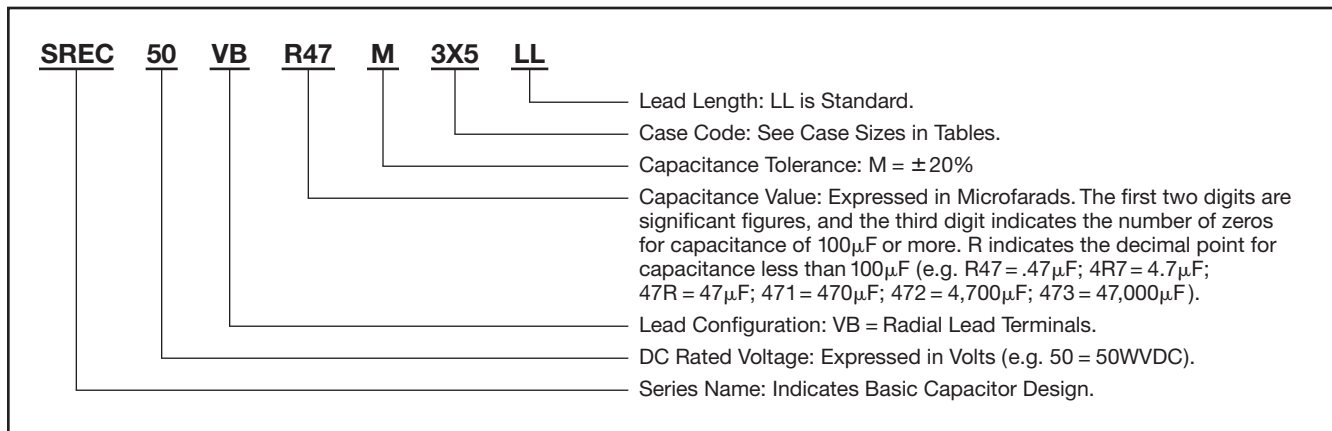
# SREC Series

## SREC Specifications

Item	Characteristics																								
Operating Temperature Range	-40 to +85°C																								
Rated Voltage Range	4 to 50VDC																								
Capacitance Range	0.1 to 100 $\mu$ F																								
Capacitance Tolerance	$\pm$ 20% (M) at +20°C, 120Hz																								
Leakage Current	I = 0.01CV or 3 $\mu$ A, whichever is greater, after 2 minutes 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" style="margin-left: 20px;"> <tr> <td>Rated Voltage (V)</td> <td>4</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> </tr> <tr> <td>Tan <math>\delta</math> (DF)</td> <td>0.37</td> <td>0.26</td> <td>0.22</td> <td>0.18</td> <td>0.16</td> <td>0.14</td> <td>0.12</td> </tr> </table>	Rated Voltage (V)	4	6.3	10	16	25	35	50	Tan $\delta$ (DF)	0.37	0.26	0.22	0.18	0.16	0.14	0.12								
Rated Voltage (V)	4	6.3	10	16	25	35	50																		
Tan $\delta$ (DF)	0.37	0.26	0.22	0.18	0.16	0.14	0.12																		
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" style="margin-left: 20px;"> <tr> <td>Rated Voltage (V)</td> <td>4</td> <td>6.3</td> <td>10</td> <td>16</td> <td>25</td> <td>35</td> <td>50</td> </tr> <tr> <td>Z(-25°C) / Z(+20°C)</td> <td>7</td> <td>4</td> <td>3</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td>Z(-40°C) / Z(+20°C)</td> <td>15</td> <td>10</td> <td>8</td> <td>6</td> <td>4</td> <td>3</td> <td>3</td> </tr> </table>	Rated Voltage (V)	4	6.3	10	16	25	35	50	Z(-25°C) / Z(+20°C)	7	4	3	2	2	2	2	Z(-40°C) / Z(+20°C)	15	10	8	6	4	3	3
Rated Voltage (V)	4	6.3	10	16	25	35	50																		
Z(-25°C) / Z(+20°C)	7	4	3	2	2	2	2																		
Z(-40°C) / Z(+20°C)	15	10	8	6	4	3	3																		
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 1,000 hours at +85°C. The sum of DC voltage and peak AC voltage must not exceed the full rated voltage of the capacitors. Capacitance change: $\leq \pm$ 20% of initial measured value Tan $\delta$ (DF) : $\leq$ 200% 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 +85°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: $\leq \pm$ 20% of initial measured value Tan $\delta$ (DF) : $\leq$ 200% of initial specified value Leakage current : $\leq$ initial specified value																								
Others	Satisfies characteristic W of JIS C5141																								

## Part Numbering System for SREC Series

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

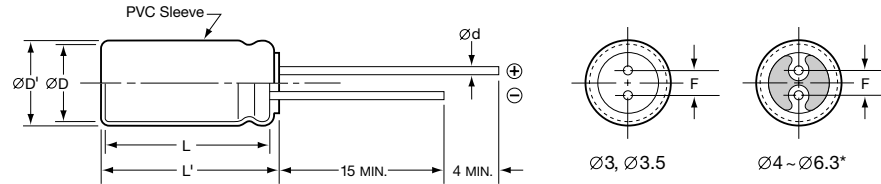


# SREC Series

## Diagram of Dimensions

### VB/Radial Lead

Unit: mm



\*Gas escape end seal for  $\varnothing 4 \sim \varnothing 6.3$

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

$\varnothing D$	$\varnothing D'$ max.	$L'$ max.	$\varnothing d$	F
3	$\varnothing D + 0.5$	$L + 1.0$	0.4	$1.0 \pm 0.3$
3.5	$\varnothing D + 0.5$	$L + 1.0$	0.4	$1.0 \pm 0.3$
4	$\varnothing D + 0.5$	$L + 1.0$	0.45	$1.5 \pm 0.5$
5	$\varnothing D + 0.5$	$L + 1.0$	0.45	$2.0 \pm 0.5$
6.3	$\varnothing D + 0.5$	$L + 1.0$	0.45	$2.5 \pm 0.5$

## Standard Voltage Ratings - VB/Radial Lead

Rated Voltage (WVDC)	Capacitance ( $\mu F$ )	Catalog Part Number	Nominal Case Size* $D \times L$ (mm)	Maximum ESR ( $\Omega$ ) at +20°C, 120Hz	Maximum Ripple Current (mA rms) at +85°C, 120Hz
4 Volts 5 Volts Surge	15	SREC4VB15RM3X5LL	3.5 x 5	40.885	14
	22	SREC4VB22RM4X5LL	4 x 5	27.876	19
	33	SREC4VB33RM4X5LL	4 x 5	18.584	23
	47	SREC4VB47RM5X5LL	5 x 5	13.048	32
	68	SREC4VB68RM6X5LL	6.3 x 5	9.019	41
	100	SREC4VB101M6X5LL	6.3 x 5	6.133	50
6.3 Volts 8 Volts Surge	10	SREC6.3VB10RM3X5LL	3 x 5	43.095	12
	15	SREC6.3VB15RM3X5LL	3.5 x 5	28.73	17
	22	SREC6.3VB22RM4X5LL	4 x 5	19.589	23
	33	SREC6.3VB33RM5X5LL	5 x 5	13.059	32
	47	SREC6.3VB47RM5X5LL	5 x 5	9.169	38
	68	SREC6.3VB68RM6X5LL	6.3 x 5	6.338	50
	100	SREC6.3VB101M6X5LL	6.3 x 5	4.31	60
10 Volts 13 Volts Surge	6.8	SREC10VB6R8M3X5LL	3 x 5	53.625	11
	10	SREC10VB10RM3X5LL	3.5 x 5	36.465	15
	15	SREC10VB15RM4X5LL	4 x 5	24.31	20
	22	SREC10VB22RM5X5LL	5 x 5	16.575	29
	33	SREC10VB33RM5X5LL	5 x 5	11.05	35
	47	SREC10VB47RM6X5LL	6.3 x 5	7.759	45
	68	SREC10VB68RM6X5LL	6.3 x 5	5.363	54
16 Volts 20 Volts Surge	4.7	SREC16VB4R7M3X5LL	3 x 5	63.479	10
	6.8	SREC16VB6R8M3X5LL	3.5 x 5	43.875	14
	10	SREC16VB10RM3X5LL	3.5 x 5	29.835	17
	15	SREC16VB15RM5X5LL	5 x 5	19.89	26
	22	SREC16VB22RM5X5LL	5 x 5	13.561	32
	33	SREC16VB33RM6X5LL	6.3 x 5	9.041	42
	47	SREC16VB47RM6X5LL	6.3 x 5	6.348	50

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

# SREC 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 +85°C, 120Hz
<b>25 Volts</b> 32 Volts Surge	3.3	SREC25VB3R3M3X5LL	3 × 5	80.364	9.5
	4.7	SREC25VB4R7M3X5LL	3.5 × 5	56.426	12
	6.8	SREC25VB6R8M4X5LL	4 × 5	39.00	16
	10	SREC25VB10RM5X5LL	5 × 5	26.52	23
	15	SREC25VB15RM6X5LL	6.3 × 5	17.68	30
	22	SREC25VB22RM6X5LL	6.3 × 5	12.055	37
	33	SREC25VB33RM6X5LL	6.3 × 5	8.036	45
<b>35 Volts</b> 44 Volts Surge	2.2	SREC35VB2R2M3X5LL	3 × 5	105.477	8.3
	3.3	SREC35VB3R3M3X5LL	3.5 × 5	70.318	11
	4.7	SREC35VB4R7M4X5LL	4 × 5	49.372	15
	6.8	SREC35VB6R8M5X5LL	5 × 5	34.125	20
	10	SREC35VB10RM5X5LL	5 × 5	23.205	25
	15	SREC35VB15RM6X5LL	6.3 × 5	15.47	33
	22	SREC35VB22RM6X5LL	6.3 × 5	10.548	40
<b>50 Volts</b> 63 Volts Surge	0.1	SREC50VBR10M3X5LL	3 × 5	1,989.0	1.3
	0.15	SREC50VBR15M3X5LL	3 × 5	1,326.0	2.0
	0.22	SREC50VBR22M3X5LL	3 × 5	904.091	2.9
	0.33	SREC50VBR33M3X5LL	3 × 5	602.727	3.5
	0.47	SREC50VBR47M3X5LL	3 × 5	423.191	4.2
	0.68	SREC50VBR68M3X5LL	3 × 5	292.5	5.1
	1.0	SREC50VB1R0M3X5LL	3 × 5	198.9	6.2
	1.5	SREC50VB1R5M3X5LL	3 × 5	132.6	7.5
	2.2	SREC50VB2R2M3X5LL	3.5 × 5	90.409	10
	3.3	SREC50VB3R3M4X5LL	4 × 5	60.273	14
	4.7	SREC50VB4R7M5X5LL	5 × 5	42.319	19
	6.8	SREC50VB6R8M6X5LL	6.3 × 5	29.25	24
10	SREC50VB10RM6X5LL	6.3 × 5	19.89	29	

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