# SME Series



- Miniature
- General Purpose
- Solvent Proof
- +85°CMaximumTemperature



The SME series capacitors are our standard general purpose capacitors. These radial lead capacitors are available in a wide range of voltage and capacitance ratings and are designed for a load life of 2,000 hours at 85°C with an operating temperature range of -40°C to +85°C.

The SME series capacitors, except for those rated at 350-450 volts, 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: 0.1 to 15,000µF.
- Voltage range: 6.3 to 450VDC.
- Operating temperature range: -40°C to +85°C for 6.3 to 400VDC; -25°C to +85°C for 450VDC.
- Leakage current: See specifications table for leakage current values at +20°C.
- Standard capacitance tolerance: ±20%
- Nominal case size (D $\times$ L):  $5\times11$ mm to  $18\times40$ mm.
- Rated lifetime: 2,000 hours at +85°C.

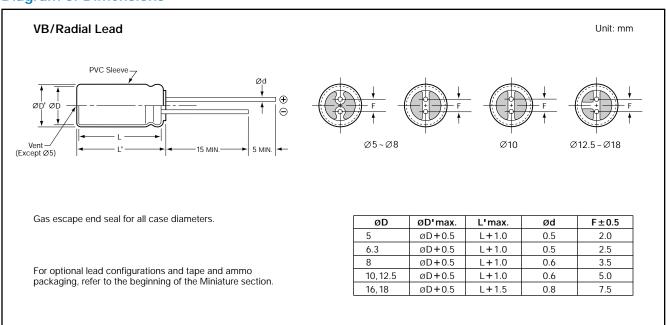
# **SME Series.**

# **SME Specifications**

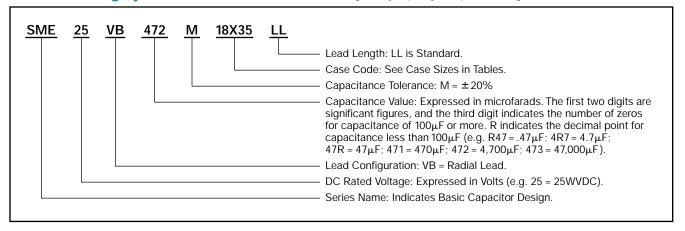
Item	Characteristics									
Operating Temperature Range	-40 to +85°C for 6.3 to 400VDC; -25 to +85°C for 450VDC									
Rated Voltage Range	6.3 to 450VDC									
Capacitance Range	0.1 to 15,000μF									
Capacitance Tolerance	±20% (M) at +20°C,	120Hz								
Leakage Current	At +20°C									
Leanage Current	DC Rated Voltage Test Time Leakage Current (μA)									
	DC Rated voltage	After 1 minute $I = 0.03$ CV or $4\mu$ A, whichever is greater.								
	6.3-100V	After 2 minutes $I = 0.01$ CV or $3\mu$ A, whichever is greater								
	140 4507	After 1 minute		CV	≤1,000:	I = 0.1C	/+40	CV >1,000	: I = 0.040	CV + 100
	160 - 450V After 5 minutes CV ≤ 1,000: I = 0.03CV + 15 CV > 1,000: I = 0.02CV				: I = 0.020	CV + 25				
	Where I = Leakage currer	nt (μΑ), C	C = Nomi	nal capa	acitance	(μF) and	V = Rated	voltage (V)		
Dissipation Factor (Tan $\delta$ )	At +20°C, 120Hz									
	Rated Voltage (V)	6.3	10	16	25	35 5	0 63	100 16	60-250	350 - 450
	Tan δ (DF)	0.22	0.19	0.16	0.14	0.12 0.	10 0.09	0.08	0.20	0.24
	When nominal capacitan	ce excee	eds 1,000	)μF, add	0.02 to	the value	s above fo	r each 1,00	0μF incre	ase.
Low Temperature Characteristics	At 120Hz, impedance (Z) ratio between the $-25^{\circ}$ C or $-40^{\circ}$ C value and $+20^{\circ}$ C value shall not exceed the values given below.									
	Rated Voltage (V)	6.3	10	16	25	35	50-100	160 - 250	350 - 400	450
	Z(-25°C)/Z(+20°C)	4	3	2	2	2	2	3	6	16
	Z(-40°C)/Z(+20°C)	8	6	4	3	3	3	4	6	-
Mini-Glossary for explanation of Ripple Current Multipliers.	1.30 1.00 Frequency (Hz)	)								
	Capacitance (μF)	50H		120Hz	_	300Hz	1kHz	10kl		00kHz
	≤ 3.3μF 4.7-33μF	0.65		1.00	_	1.35	1.75	2.3		2.50
	4.7-33μF 47-1000μF	0.75		1.00	_	1.25	1.50	1.7		1.80
	≥ 2200µF	0.85		1.00	_	1.03	1.05	1.0		1.08
Load Life	The following specifications shall be satisfied when the capacitors are restored to $\pm 20^{\circ}$ C after subjecting them to the DC rated voltage for 2,000 hours at $\pm 85^{\circ}$ 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) $\leq 150\%$ of initial specified value for 6.3 -100V & 450V $\leq 200\%$ of initial specified value for 160 - 400V Leakage current $\leq 100\%$ initial specified value									
	The following specifications shall be satisfied when the capacitors are restored to $\pm 20^{\circ}$ C after exposing them for 1,000 hours at $\pm 85^{\circ}$ 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) $\leq 150\%$ of initial specified value for 6.3-100V $\leq 200\%$ of initial specified value for 160-450V									
Shelf Life	exposing them for 1,0 applied to the capacit 48 hours before the m Capacitance change: Tan δ (DF)	00 hour tors for a neasurer ≤ ± 20% ≤ 150% ≤ 200%	a minim ments. % of init 6 of initi 6 of initi	ium of ial mea al spec al spec	30 min asured cified v	utes, at value	least 24 h	ours and		

# **SME Series**

#### **Diagram of Dimensions**



Part Numbering System for SME Series When ordering, always specify complete catalog number for SME Series.



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
	33	SME6.3VB33RM5X11LL	5 × 11	11.05	55
	47	SME6.3VB47RM5X11LL	5 × 11	7.759	79
	100	SME6.3VB101M5X11LL	5 × 11	3.647	130
	220	SME6.3VB221M6X11LL	6.3 × 11	1.658	230
	330	SME6.3VB331M6X11LL	6.3 × 11	1.105	280
6.3 Volts	470	SME6.3VB471M8X11LL	8 × 11.5	0.776	380
	1,000	SME6.3VB102M10X12LL	10 × 12.5	0.365	650
8 Volts Surge	2,200	SME6.3VB222M12X20LL	12.5 × 20	0.181	1,150
	3,300	SME6.3VB332M12X20LL	12.5 × 20	0.131	1,380
	4,700	SME6.3VB472M16X25LL	16 × 25	0.099	1,880
	6,800	SME6.3VB682M16X25LL	16 × 25	0.078	2,120
	10,000	SME6.3VB103M16X31LL	16 × 31.5	0.066	2,500
	15,000	SME6.3VB153M18X35LL	18 × 35.5	0.055	2,990

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

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
			1	1	<u> </u>
	22	SME10VB22RM5X11LL	5 × 11	14.315	59
	33	SME10VB33RM5X11LL	5 × 11	9.543	84
	47	SME10VB47RM5X11LL	5 × 11	6.701	100
	100	SME10VB101M5X11LL	5 × 11	3.149	145
40.1/ 11	220	SME10VB221M6X11LL	6.3 × 11	1.431	250
10 Volts	470	SME10VB471M8X11LL	8 × 11.5	0.67	415
13 Volts Surge	1,000	SME10VB102M10X16LL	10 × 16	0.315	790
	2,200	SME10VB222M12X20LL	12.5 × 20	0.158	1,240
	3,300	SME10VB332M12X25LL	12.5 × 25	0.116	1,590
	4,700	SME10VB472M16X25LL	16 × 25	0.088	1,980
	6,800	SME10VB682M16X31LL	16 × 31.5	0.071	2,390
	10,000	SME10VB103M18X35LL	18 × 35.5	0.061	2,840
	10	SME16VB10RM5X11LL	5 x 11	26.52	44
	22	SME16VB22RM5X11LL	5 × 11	12.055	75
	33	SME16VB33RM5X11LL	5 × 11	8.036	90
	47	SME16VB47RM5X11LL	5 x 11	5.643	110
	100	SME16VB101M6X11LL	6.3 × 11	2.652	180
	220	SME16VB221M8X11LL	8 × 11.5	1.205	300
16 Volts	330	SME16VB331M8X11LL	8 × 11.5	0.804	370
20 Volts Surge	470	SME16VB471M10X12LL	10 × 12.5	0.564	520
zo volto ourgo	1,000	SME16VB102M10X20LL	10 × 20	0.265	910
	2,200	SME16VB222M12X25LL	12.5 × 25	0.136	1,420
	3,300	SME16VB332M16X25LL	16 × 25	0.10	1,840
	4,700	SME16VB472M16X31LL	16 × 31.5	0.078	2,260
	6,800	SME16VB682M18X35LL	18 × 35.5	0.063	2,690
	10,000	SME16VB103M18X40LL	18 × 40	0.056	2,920
			•		
	4.7	SME25VB4R7M5X11LL	5 × 11	49.372	31
	10	SME25VB10RM5X11LL	5 × 11	23.205	54
	22	SME25VB22RM5X11LL	5 × 11	10.548	80
	33	SME25VB33RM5X11LL	5 × 11	7.032	97
	47	SME25VB47RM5X11LL	5 × 11	4.937	115
	100	SME25VB101M6X11LL	6.3 × 11	2.321	190
25 Volts	220	SME25VB221M8X11LL	8 × 11.5	1.055	320
32 Volts Surge	330	SME25VB331M10X12LL	10 × 12.5	0.703	470
	470	SME25VB471M10X16LL	10 × 16	0.494	620
	1,000	SME25VB102M12X20LL	12.5 × 20	0.232	1,090
	2,200	SME25VB222M16X25LL	16 × 25	0.121	1,660
	3,300	SME25VB332M16X31LL	16 × 31.5	0.09	2,070
	4,700	SME25VB472M18X35LL	18 × 35.5	0.071	2,520
	6,800	SME25VB682M18X40LL	18 × 40	0.059	2,830
	4.7	CMESEVD ADSMEV4411	E v 44	42.240	40
-	4.7 10	SME35VB4R7M5X11LL SME35VB10RM5X11LL	5 x 11	42.319 19.89	40 58
}	22		5 x 11		87
}	33	SME35VB22RM5X11LL SME35VB33RM5X11LL	5 × 11 5 × 11	9.041 6.027	105
}	47	SME35VB33RM5X11LL SME35VB47RM6X11LL	6.3 × 11	4.232	145
ŀ	100	SME35VB47RIVIOX11LL SME35VB101M8X11LL	8 × 11.5	1.989	240
35 Volts	220	SME35VB101M8X11LL SME35VB221M10X12LL	8 X 11.5	0.904	420
44 Volts Surge	330	SME35VB221M10X12LL SME35VB331M10X16LL	10 x 12.5	0.603	570
ŀ	470	SME35VB331W10X16LL SME35VB471M10X20LL	10 x 16	0.423	740
•	1,000	SME35VB471M10X20LL SME35VB102M12X25LL	10 X 20 12.5 X 25	0.423	1,300
}	2,200	SME35VB102M12X25LL SME35VB222M16X31LL	12.5 X 25 16 X 31.5	0.199	1,890
-	3,300		18 × 35.5	0.105	2,340
•	4,700	SME35VB332M18X35LL SME35VB472M18X40LL	18 × 35.5	0.063	2,340
	4,700	SIVILSS V D4 / ZIVI TOA4ULL	10 8 40	0.003	2,090

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

# **SME Series**

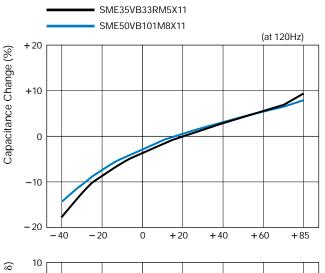
Rated Voltage (WVDC)	Capacitance (µF)	Catalog Part Number	Nominal Case Size* D×L (mm)	Maximum ESR (Ω) at +20°C, 120Hz	Maximum Ripple Current (mA rms) at +85°C,120Hz
,					
	0.1	SME50VBR10M5X11LL	5 × 11	1,657.5	1.3
	0.22	SME50VBR22M5X11LL	5 × 11	753.409	2.9
	0.33	SME50VBR33M5X11LL	5 × 11	502.273	4.4
	0.47	SME50VBR47M5X11LL	5 × 11	352.66	11
	1.0	SME50VB1R0M5X11LL	5 × 11	165.75	17
	2.2	SME50VB2R2M5X11LL	5 × 11	75.341	29
	3.3	SME50VB3R3M5X11LL	5 × 11	50.227	35
50 \ / II	4.7	SME50VB4R7M5X11LL	5 × 11	35.266	42
50 Volts	10	SME50VB10RM5X11LL	5 × 11	16.575	65
63 Volts Surge	22	SME50VB22RM5X11LL	5 × 11	7.534	95
-	33	SME50VB33RM6X11LL	6.3 × 11	5.023	125
-	47	SME50VB47RM6X11LL	6.3 × 11	3.527	150
-	100	SME50VB101M8X11LL	8 × 11.5	1.658	255
-	220	SME50VB221M10X16LL	10 × 16	0.753	490
-	330	SME50VB331M10X20LL	10 × 20	0.502	650
-	470	SME50VB471M12X20LL	12.5 × 20	0.353	860
-	1,000	SME50VB102M16X25LL	16 × 25	0.166	1,530
	2,200	SME50VB222M18X35LL	18 × 35.5	0.09	2,160
1	4.7	SME63VB4R7M5X11LL	5 × 11	31.739	45
F	10	SME63VB10RM5X11LL	5 × 11	14.918	70
<u> </u>	22	SME63VB22RM6X11LL	6.3 × 11	6.781	115
F	33	SME63VB33RM6X11LL	6.3 × 11	4.52	140
63 Volts	47	SME63VB47RM8X11LL	8 × 11.5	3.174	190
79 Volts Surge	100	SME63VB101M10X12LL	10 × 12.5	1.492	320
77 Volts Surge	220	SME63VB221M10X20LL	10 × 20	0.678	565
İ	330	SME63VB331M12X20LL	12.5 × 20	0.452	765
The state of the s	470	SME63VB471M12X25LL	12.5 × 25	0.317	990
ļ.	1,000	SME63VB102M16X31LL	16 × 31.5	0.149	1,700
	0.1	SME100VBR10M5X11LL	5 × 11	1,326.0	2.6
	0.22	SME100VBR22M5X11LL	5 × 11	602.727	5.8
	0.33	SME100VBR33M5X11LL	5 × 11	401.818	8.8
	0.47	SME100VBR47M5X11LL	5 × 11	282.128	12
	1.0	SME100VB1R0M5X11LL	5 × 11	132.6	22
	2.2	SME100VB2R2M5X11LL	5 × 11	60.273	33
400 1/ 1/	3.3	SME100VB3R3M5X11LL	5 × 11	40.182	40
100 Volts	4.7	SME100VB4R7M5X11LL	5 × 11	28.213	48
125 Volts Surge	10	SME100VB10RM6X11LL	6.3 × 11	13.26	80
-	22	SME100VB22RM8X11LL	8 × 11.5	6.027	135
-	33	SME100VB33RM10X12LL	10 × 12.5	4.018	195
-	47	SME100VB47RM10X16LL	10 × 16	2.821	255
-	100	SME100VB101M12X20LL	12.5 × 20	1.326	450
-	220	SME100VB221M16X25LL	16 × 25	0.603	810
-	330	SME100VB331M16X25LL	16 × 25	0.402	990
	470	SME100VB471M16X31LL	16 × 31.5	0.282	1,250
1	0.47	SME160VBR47M6X11LL	6.3 × 11	705.319	12
}	1.0	SME160VB1R0M6X11LL	6.3 × 11	331.5	17
<u> </u>	2.2	SME160VB1R0M0X11LL	6.3 × 11	150.682	26
<u> </u>	3.3	SME160VB3R3M8X11LL	8 × 11.5	100.455	36
	4.7	SME160VB4R7M8X11LL	8 × 11.5	70.532	44
160 Volts	10	SME160VB10RM10X16LL	10 × 16	33.15	83
200 Volts Surge	22	SME160VB22RM10X20LL	10 × 16	15.068	130
F	33	SME160VB33RM12X20LL	12.5 × 20	10.045	180
_	47	SME160VB47RM12X25LL	12.5 × 25	7.053	230
}	100	SME160VB101M16X25LL	16 × 25	3.315	380

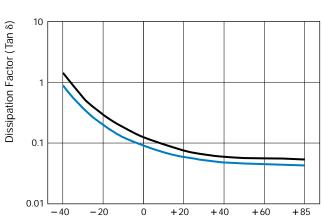
 $<sup>{}^\</sup>star\text{The case}$  sizes in table are with no sleeve, refer to diagram for case sizes with sleeve.

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
	0.47	SME200VBR47M6X11LL	6.3 × 11	705.319	12
	1.0	SME200VB1R0M6X11LL	6.3 × 11	331.5	17
	2.2	SME200VB2R2M6X11LL	6.3 × 11	150.682	26
	3.3	SME200VB3R3M8X11LL	8 × 11.5	100.455	36
200 Volts	4.7	SME200VB4R7M10X12LL	10 × 12.5	70.532	51
250 Volts Surge	10	SME200VB10RM10X16LL	10 × 16	33.15	83
200 Volts Surge	22	SME200VB22RM10X20LL	10 × 20	15.068	130
	33	SME200VB33RM12X25LL	12.5 × 25	10.045	190
	47	SME200VB47RM12X25LL	12.5 × 25	7.053	230
	100	SME200VB101M16X31LL	16 × 31.5	3.315	400
	220	SME200VB221M18X40LL	18 × 40	1.507	660
	0.47	CMESEOVED 47M/ V11LL	/ 2 × 11	70F 210	12
-	0.47	SME250VBR47M6X11LL	6.3 × 11	705.319	12
-	1.0	SME250VB1R0M6X11LL	6.3 × 11	331.5 150.682	17
-		SME250VB2R2M8X11LL	8 x 11.5		30
250 Volts	3.3 4.7	SME250VB3R3M10X12LL SME250VB4R7M10X12LL	10 × 12.5	100.455	43
			10 × 12.5	70.532	51 90
300 Volts Surge	10	SME250VB10RM10X20LL	10 × 20	33.15	• •
-	22	SME250VB22RM12X25LL	12.5 × 25	15.068	160
-	33	SME250VB33RM12X25LL	12.5 × 25	10.045	190
-	47	SME250VB47RM16X25LL	16 × 25	7.053	260
	100	SME250VB101M18X35LL	18 × 35.5	3.315	440
	0.47	SME350VBR47M8X11LL	8 × 11.5	846.383	15
	1.0	SME350VB1R0M8X11LL	8 × 11.5	397.8	22
	2.2	SME350VB2R2M10X12LL	10 × 12.5	180.818	39
	3.3	SME350VB3R3M10X16LL	10 × 16	120.545	53
350 Volts	4.7	SME350VB4R7M10X16LL	10 × 16	84.638	63
400 Volts Surge	10	SME350VB10RM12X20LL	12.5 × 20	39.78	115
Not	22	SME350VB22RM12X25LL	12.5 × 25	18.082	180
Solvent Proof	33	SME350VB33RM16X25LL	16 × 25	12.055	245
	47	SME350VB47RM16X31LL	16 × 31.5	8.464	315
	100	SME350VB101M18X40LL	18 × 40	3.978	500
	1.0	SME400VB1R0M8X11LL	8 × 11.5	397.8	22
	2.2	SME400VB2R2M10X12LL	10 × 12.5	180.818	39
	3.3	SME400VB3R3M10X16LL	10 × 16	120.545	53
400 Volts	4.7	SME400VB4R7M10X20LL	10 × 20	84.638	69
450 Volts Surge	10	SME400VB10RM12X20LL	12.5 × 20	39.78	115
Not	22	SME400VB22RM16X25LL	16 × 25	18.082	200
Solvent Proof	33	SME400VB33RM16X31LL	16 × 31.5	12.055	265
	47	SME400VB47RM16X35LL	16 × 35.5	8.464	325
ı	1.0	SME450VB1R0M10X12LL	10 × 12.5	397.8	25
-	2.2				
-		SME450VB2R2M10X16LL	10 × 16	180.818	42
450 Volts	3.3 4.7	SME450VB3R3M10X20LL	10 × 20	120.545	56
500 Volts Surge		SME450VB4R7M12X20LL	12.5 × 20	84.638	75
Not	10	SME450VB10RM12X25LL	12.5 × 25	39.78	120
Solvent Proof	22	SME450VB22RM16X31LL	16 × 31.5	18.082	210
	33	SME450VB33RM18X35LL	18 × 35.5	12.055	275

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

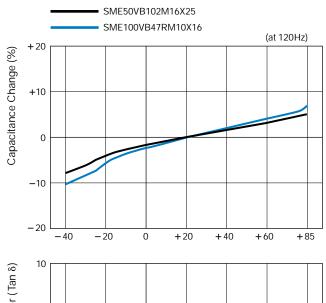
#### **Temperature Characteristics**

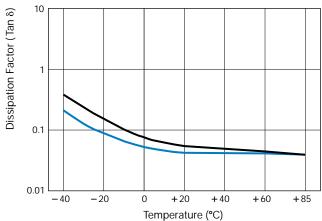




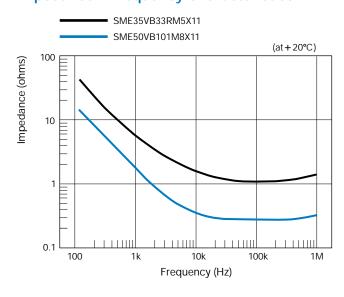
Temperature (°C)

## **Temperature Characteristics**





### **Impedance - Frequency Characteristics**



### **Impedance - Frequency Characteristics**

