

SSL Series

RADIAL LEAD TYPE

Aluminum Electrolytic Capacitors

SSL Series

Features

- 1 or 2 ranks smaller than GL, GH Series
- Grade-up to 2000 hours life at 85°C

Specifications

- Operating temperature range : $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$
(6.3~100V_{DC})
25°C~85°C
(160~450V_{DC})
- Rated working voltage : 6.3~450V_{DC}
- Rated capacitance : 0.1~15000 μF
- Capacitance tolerance : (at 120Hz, +20°C), $\pm 20\%$
- Tan δ : (at 120Hz, +20°C)

W.V.	6.3	10	16	25	35	50	63
Tan δ max.	0.24	0.20	0.16	0.14	0.12	0.10	0.08

W.V.	100	160	200	250	315	350	400	450
Tan δ max.	0.07	0.20	0.20	0.20	0.20	0.25	0.25	0.25

Add 0.02 per 1,000 μF for more than 1,000 μF items

• DC leakage current : max.

$I = 0.01 \text{ CV } \mu\text{A}$ or $3 \mu\text{A}$ ($WV \leq 100\text{V}_{DC}$)
 $0.03 \text{ CV} + 15 \mu\text{A}$ ($CV < 1000$) ($WV \geq 160\text{V}_{DC}$)
 $0.02 \text{ CV} + 25 \mu\text{A}$ ($CV > 1000$)
 whichever is greater

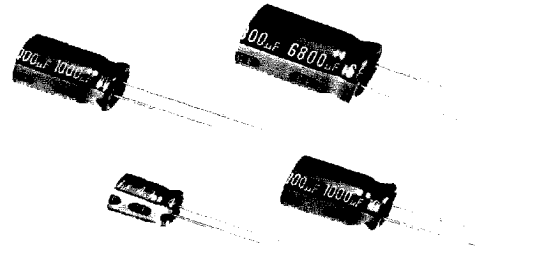
where I = DC leakage current in μA
 C = rated capacitance in μF
 V = rated working voltage in V

DC leakage current shall be measured after 2 minutes ($WV \leq 100\text{V}$) or 5 minutes ($WV \geq 160\text{V}$) application of the DC rated working voltage through the 1000 Ω resistor at 20°C

• Load life :

After 2000 hours application of DC rated working voltage at 85°C, the measurements shall meet following limits.
 Measurements shall be performed after 2 hours exposure at room temperature.

Capacitance change	+20% of the initial measured value
Tan δ	$< 150\%$ of the initial specified value
DC leakage current	$< \text{the initial specified value}$



• Shelf life :

After storage for 1,000 hours at 85°C without voltage application, the measurements shall meet the following limits.

Capacitance change	+20% of the initial measured value
Tan δ	$< 150\%$ of the initial specified value
DC leakage current	$< \text{the initial specified value}$

Measurements shall be performed after exposure for 24 hours at room temperature after application of DC rated voltage to the capacitors for 30 minutes

• Low temperature impedance stability.

Impedance ratio against value at +20°C at 120Hz

W.V.(V DC)	* 1 $-25^{\circ}\text{C}/+20^{\circ}\text{C}$	* 2 $-40^{\circ}\text{C}/+20^{\circ}\text{C}$
6.3	4	12
10	3	10
16	2	8
25	2	6
35~100	2	4
160~250	3	—
315~450	15	—

* 1...add 0.5 per 1,000 μF for more than 1,000 μF items

* 2...add 1.0 per 1,000 μF for more than 1,000 μF items

• Solvent & conditions(within 250V_{DC})

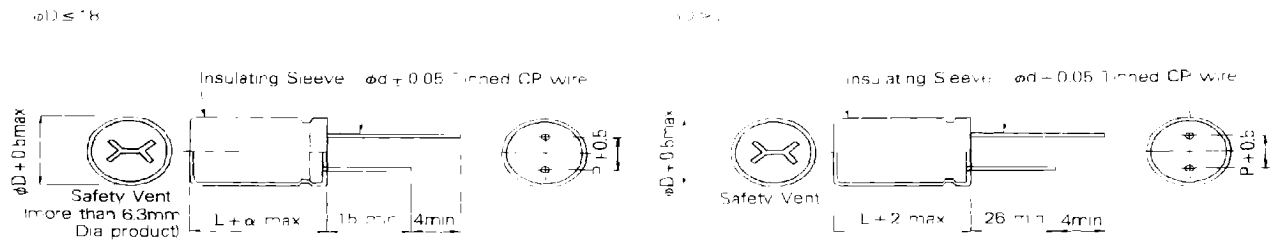
Solvents	Condition
Freon TMS	Immersion vapor or ultra sonic cleaning 5 minutes at 40°C on the condition of flux density 10% max.
Freon TC	
Freon TES	
Freon WD602	
Freon IP-35	

• Maximum permissible ripple current :

Refer to standard products table

Dimensions

(UNIT : mm)



Body Dia D	5	6	8	10	13	16	18	22	25
Lead Dia d	0.5		0.6			0.8		1.0	
Lead Space P	2.0	2.5	3.5	5.0		7.5		10	12.5
α	1.5		$L \leq 16 : 1.5 \quad L > 16 : 2.0$						

Case Size Table

W.V(V DC) Cap(μF)	6.3 (0J)	10 (1A)	16 (1C)	25 (1E)	35 (1V)	50 (1H)	63 (1J)	100 (2A)
0.1 (0R1)						5×11	5×11	5×11
0.22(R22)						5×11	5×11	5×11
0.33(R33)						5×11	5×11	5×11
0.47(R47)						5×11	5×11	5×11
1 (010)						5×11	5×11	5×11
2.2 (2R2)						5×11	5×11	5×11
3.3 (3R3)						5×11	5×11	5×11
4.7 (4R7)				5×11	5×11	5×11	5×11	5×11
10 (100)			5×11	5×11	5×11	5×11	5×11	6×11
22 (220)		5×11	5×11	5×11	5×11	5×11	6×11	8×11.5
33 (330)	5×11	5×11	5×11	5×11	5×11	6×11	6×11	10×12.5
47 (470)	5×11	5×11	5×11	5×11	6×11	6×11	8×11.5	10×16
100 (101)	5×11	5×11	6×11	6×11	8×11.5	8×11.5	10×12.5	13×20
220 (221)	6×11	6×11	8×11.5	8×11.5	10×12.5	10×16	10×20	16×25
330 (331)	6×11	8×11.5	8×11.5	10×12.5	10×16	10×20	13×20	16×25
470 (471)	8×11.5	8×11.5	10×12.5	10×16	10×20	13×20	13×25	16×31.5
1000 (102)	10×12.5	10×16	10×20	13×20	13×25	16×25	16×31.5	
2200 (222)	13×20	13×20	13×25	16×25	16×31.5	18×35.5		
3300 (332)	13×20	13×25	16×25	16×31.5	18×35.5			
4700 (472)	16×25	16×25	16×31.5	18×35.5				
6800 (682)	16×25	16×31.5	18×35.5					
10000 (103)	16×31.5	18×35.5						
15000 (153)	18×35.5							

Case Size Table

φ D × L mm

Cap(μF)	W.V(V DC)	160 (2C)	200 (2D)	250 (2E)	315 (2F)	350 (2V)	400 (2G)	450 (2W)
0.47(R47)		6×11	6×11	6×11	6×11	6×11		
1 (010)		6×11	6×11	6×11	6×11	6×11	8×11.5	10×12.5
2.2 (2R2)		6×11	6×11	8×11.5	8×11.5	10×12.5	10×12.5	10×16
3.3 (3R3)		8×11.5	8×11.5	10×12.5	10×12.5	10×16	10×16	10×16
4.7 (4R7)		8×11.5	10×12.5	10×12.5	10×16	10×16	10×16	10×20
10 (100)		10×12.5	10×16	10×16	10×20	10×20	13×20	13×20
22 (220)		10×16	10×20	13×20	13×25	13×25	16×25	16×25
33 (330)		10×20	13×20	13×25	16×25	16×25	16×31.5	16×31.5
47 (470)		13×20	13×25	16×25	16×31.5	16×31.5	16×35.5	16×35.5
100 (101)		16×31.5	16×31.5	16×35.5	18×35.5	18×40	22×40	22×40
220 (221)		18×35.5	18×40	22×40	25×40	25×50		
330 (331)		22×40	22×40	25×40				
470 (471)		25×40	25×40	25×50				

Standard Products Table

W.V. (S.V.)	CAP (μ F)	PART NO.	MAX. D.C.L.(μ A) (at 20°C)	MAX. Tan δ (120Hz/20°C)	MAX. ESR(Ω) (120Hz/20°C)	MAX. Ripple Current (mA)rms (120Hz/85°C)	Dim. (mm)	
							ϕ D	L
6.3 (8)	33	SSL0J330	3.0	0.24	12.06	55	5	11
	47	SSL0J470	3.0	0.24	8.466	75	5	11
	100	SSL0J101	6.3	0.24	3.979	130	5	11
	220	SSL0J221	13.9	0.24	1.809	215	6	11
	330	SSL0J331	20.8	0.24	1.206	265	6	11
	470	SSL0J471	29.6	0.24	0.847	360	8	11.5
	1000	SSL0J102	63.0	0.24	0.398	570	10	12.5
	2200	SSL0J222	138.6	0.26	0.196	1050	13	20
	3300	SSL0J332	207.9	0.28	0.141	1250	13	20
	4700	SSL0J472	296.1	0.30	0.106	1700	16	25
	6800	SSL0J682	428.4	0.34	0.083	1900	16	25
	10000	SSL0J103	630.0	0.42	0.070	2250	16	31.5
	15000	SSL0J153	945.0	0.52	0.057	2680	18	35.5
10 (13)	22	SSL1A220	3.0	0.20	15.07	55	5	11
	33	SSL1A330	3.3	0.20	10.05	80	5	11
	47	SSL1A470	4.7	0.20	7.055	95	5	11
	100	SSL1A101	10.0	0.20	3.316	145	5	11
	220	SSL1A221	22.0	0.20	1.507	230	6	11
	330	SSL1A331	33.0	0.20	1.005	330	8	11.5
	470	SSL1A471	47.0	0.20	0.705	390	8	11.5
	1000	SSL1A102	100.0	0.20	0.332	630	10	16
	2200	SSL1A222	220.0	0.22	0.166	1100	13	20
	3300	SSL1A332	330.0	0.24	0.121	1400	13	25
	4700	SSL1A472	470.0	0.26	0.092	1800	16	25
	6800	SSL1A682	680.0	0.30	0.073	2150	16	31.5
	10000	SSL1A103	1000.0	0.38	0.063	2500	18	35.5
16 (20)	10	SSL1C100	3.0	0.16	26.53	40	5	11
	22	SSL1C220	3.5	0.16	12.06	75	5	11
	33	SSL1C330	5.3	0.16	8.038	90	5	11
	47	SSL1C470	7.5	0.16	5.644	110	5	11
	100	SSL1C101	16.0	0.16	2.653	175	6	11
	220	SSL1C221	35.2	0.16	1.206	300	8	11.5
	330	SSL1C331	52.8	0.16	0.804	360	8	11.5
	470	SSL1C471	75.2	0.16	0.564	470	10	12.5
	1000	SSL1C102	160.0	0.16	0.265	790	10	20
	2200	SSL1C222	352.0	0.18	0.136	1350	13	25
	3300	SSL1C332	528.0	0.20	0.100	1700	16	25
	4700	SSL1C472	752.0	0.22	0.078	2100	16	31.5
	6800	SSL1C682	1088.0	0.26	0.053	2500	18	35.5
25 (32)	4.7	SSL1E4R7	3.0	0.14	49.38	30	5	11
	10	SSL1E100	3.0	0.14	23.21	50	5	11

Standard Products Table

W.V. (S.V.)	CAP. (μ F)	PART NO.	MAX. D.C.L.(μ A) (at 20°C)	MAX. Tan δ (120Hz/20°C)	MAX. ESR(Ω) (120Hz/20°C)	MAX. Ripple Current (mA) _{rms} (120Hz/85°C)	Dim. (mm)	
							ϕ D	L
25 (32)	22	SSL1E220	5.5	0.14	10.55	80	5	11
	33	SSL1E330	8.3	0.14	7.033	95	5	11
	47	SSL1E470	11.8	0.14	4.938	115	5	11
	100	SSL1E101	25.0	0.14	2.321	185	6	11
	220	SSL1E221	55.0	0.14	1.055	320	8	11.5
	330	SSL1E331	82.5	0.14	0.703	420	10	12.5
	470	SSL1E471	117.5	0.14	0.494	540	10	16
	1000	SSL1E102	250.0	0.14	0.232	950	13	20
	2200	SSL1E222	550.0	0.16	0.121	1550	16	25
	3300	SSL1E332	825.0	0.18	0.090	1950	16	31.5
	4700	SSL1E472	1175.0	0.20	0.071	2360	18	35.5
35 (44)	4.7	SSL1V4R7	3.0	0.12	42.33	35	5	11
	10	SSL1V100	3.5	0.12	19.89	55	5	11
	22	SSL1V220	7.7	0.12	9.043	85	5	11
	33	SSL1V330	11.6	0.12	6.029	105	5	11
	47	SSL1V470	16.5	0.12	3.388	140	6	11
	100	SSL1V101	35.0	0.12	1.989	230	8	11.5
	220	SSL1V221	77.0	0.12	0.724	370	10	12.5
	330	SSL1V331	115.5	0.12	0.483	490	10	16
	470	SSL1V471	164.5	0.12	0.339	640	10	20
	1000	SSL1V102	350.0	0.12	0.199	1100	13	25
	2200	SSL1V222	770.0	0.14	0.106	1800	16	31.5
	3300	SSL1V332	1155.0	0.16	0.080	2200	18	35.5
50 (63)	0.1	SSL1H0R1	3.0	0.10	1658	1.1	5	11
	0.22	SSL1HR22	3.0	0.10	753.6	2.3	5	11
	0.33	SSL1HR33	3.0	0.10	502.4	3.5	5	11
	0.47	SSL1HR47	3.0	0.10	352.7	5.0	5	11
	1.0	SSL1H1R0	3.0	0.10	165.8	10	5	11
	2.2	SSL1H2R2	3.0	0.10	75.36	23	5	11
	3.3	SSL1H3R3	3.0	0.10	50.24	35	5	11
	4.7	SSL1H4R7	3.0	0.10	35.27	40	5	11
	10	SSL1H100	5.0	0.10	16.58	65	5	11
	22	SSL1H220	11.0	0.10	7.536	95	5	11
	33	SSL1H330	16.5	0.10	5.024	125	6	11
	47	SSL1H470	23.5	0.10	3.527	150	6	11
	100	SSL1H101	50.0	0.10	1.658	250	8	11.5
	220	SSL1H221	110.0	0.10	0.754	440	10	16
	330	SSL1H331	165.0	0.10	0.502	580	10	20
	470	SSL1H471	235.0	0.10	0.353	760	13	20
	1000	SSL1H102	500.0	0.10	0.166	1350	16	25
	2200	SSL1H222	1100.0	0.12	0.090	2090	18	35.5

Standard Products Table

W.V. (S.V.)	CAP. (μ F)	PART NO.	MAX. D.C.L. (μ A) (at 20°C)	MAX. Tan δ (120Hz/20°C)	MAX. ESR(Ω) (120Hz/20°C)	MAX. Ripple Current (mA)rms (120Hz/85°C)	Dim. (mm)	
							ϕ D	L
63 (79)	0.1	SSL1J0R1	3.0	0.08	1326	2.1	5	11
	0.22	SSL1JR22	3.0	0.08	602.7	4.7	5	11
	0.33	SSL1JR33	3.0	0.08	401.9	7.0	5	11
	0.47	SSL1JR47	3.0	0.08	282.2	10	5	11
	1.0	SSL1J1R0	3.0	0.08	132.6	21	5	11
	2.2	SSL1J2R2	3.0	0.08	60.27	23	5	11
	3.3	SSL1J3R3	3.0	0.08	40.19	40	5	11
	4.7	SSL1J4R7	3.0	0.08	28.22	45	5	11
	10	SSL1J100	6.3	0.08	13.26	70	5	11
	22	SSL1J220	13.9	0.08	6.027	115	6	11
	33	SSL1J330	20.8	0.08	4.019	140	6	11
	47	SSL1J470	29.6	0.08	2.822	190	8	11.5
	100	SSL1J101	63.0	0.08	1.326	300	10	12.5
	220	SSL1J221	138.6	0.08	0.603	490	10	20
	330	SSL1J331	207.9	0.08	0.282	680	13	20
100 (125)	470	SSL1J471	296.1	0.08	0.282	880	13	25
	1000	SSL1J102	630.0	0.08	0.133	1550	16	31.5
	0.1	SSL2A0R1	3.0	0.07	1160	2.1	5	11
	0.22	SSL2AR22	3.0	0.07	527.5	4.7	5	11
	0.33	SSL2AR33	3.0	0.07	351.7	7.0	5	11
	0.47	SSL2AR47	3.0	0.07	246.9	10	5	11
	1.0	SSL2A010	3.0	0.07	116.0	21	5	11
	2.2	SSL2A2R2	3.0	0.07	52.75	30	5	11
	3.3	SSL2A3R3	3.0	0.07	35.17	40	5	11
	4.7	SSL2A4R7	4.7	0.07	24.69	45	5	11
	10	SSL2A100	10.0	0.07	11.60	75	6	11
	22	SSL2A220	22.0	0.07	5.275	130	8	12
	33	SSL2A330	33.0	0.07	3.517	170	10	12.5
	47	SSL2A470	47.0	0.07	2.469	230	10	16
	100	SSL2A101	100.0	0.07	1.160	400	13	21
160 (200)	220	SSL2A221	220.0	0.07	0.528	710	16	25
	330	SSL2A331	330.0	0.07	0.352	860	16	25
	470	SSL2A471	470.0	0.07	0.247	1100	16	31.5
	0.47	SSL2C0R1	17.3	0.20	705.5	9.5	6	11
	1.0	SSL2C010	19.8	0.20	331.6	13	6	11
	2.2	SSL2C2R2	25.6	0.20	150.7	22	6	11
	3.3	SSL2C3R3	30.8	0.20	100.5	31	8	11.5
	4.7	SSL2C4R7	37.6	0.20	70.55	40	8	11.5
	10	SSL2C100	57.0	0.20	33.16	66	10	12.5
	22	SSL2C220	95.4	0.20	15.07	110	10	16
	33	SSL2C330	130.6	0.20	10.55	144	13	20

Standard Products Table

W.V. (S.V.)	CAP (μ F)	PART NO.	MAX. D.C.L.(μ A) (at 20°C)	MAX. Tan δ (120Hz/20°C)	MAX. ESR(Ω) (120Hz/20°C)	MAX. Ripple Current (mA)rms (120Hz/85°C)	Dim. (mm)	
							ϕ D	L
160 (200)	47	SSL2C470	175.4	0.20	7.055	180	13	20
	100	SSL2C101	345.0	0.20	3.316	300	16	25
	220	SSL2C221	729.0	0.20	1.507	510	18	35.5
	330	SSL2C331	1081.0	0.20	1.005	720	22	40
	470	SSL2C471	1529.0	0.20	0.705	880	25	40
200 (250)	0.47	SSL2DR47	17.8	0.20	705.5	13	6	11
	1	SSL2D010	21.0	0.20	331.6	16	6	11
	2.2	SSL2D2R2	28.2	0.20	150.7	27	6	11
	3.3	SSL2D3R3	34.8	0.20	100.5	36	8	12
	4.7	SSL2D4R7	43.2	0.20	70.55	45	10	12.5
	10	SSL2D100	65.0	0.20	33.16	72	10	16
	22	SSL2D220	113.0	0.20	15.07	72	10	16
	33	SSL2D330	157.0	0.20	10.05	160	13	20
	47	SSL2D470	213.0	0.20	7.055	193	13	25
	100	SSL2D101	425.0	0.20	3.316	330	16	31.5
	220	SSL2D221	905.0	0.20	1.507	540	18	40
	330	SSL2D331	1345.0	0.20	1.005	730	22	40
	470	SSL2D471	1905.0	0.20	0.705	890	25	40
250 (300)	0.47	SSL2ER47	18.5	0.20	705.5	13	6	11
	1	SSL2E010	22.5	0.20	331.6	18	6	11
	2.2	SSL2E2R2	31.5	0.20	150.7	31	8	11.5
	3.3	SSL2E3R3	39.8	0.20	100.5	40	10	12.5
	4.7	SSL2E4R7	48.5	0.20	70.55	49	10	12.5
	10	SSL2E100	75.0	0.20	33.16	81	10	16
	22	SSL2E220	135.0	0.20	15.07	144	13	20
	33	SSL2E330	190.0	0.20	10.05	171	13	25
	47	SSL2E470	260.0	0.20	7.055	210	16	25
	100	SSL2E101	525.0	0.20	3.316	320	16	35.5
	220	SSL2E221	1125.0	0.20	1.507	570	22	40
	330	SSL2E331	1675.0	0.20	1.005	750	25	40
	470	SSL2E471	2375.0	0.20	0.705	900	25	50
315 (365)	0.47	SSL2FR47	19.4	0.20	705.5	7.5	6	11
	1	SSL2F010	24.6	0.20	331.6	10.9	6	11
	2.2	SSL2F2R2	35.8	0.20	150.7	18.0	8	11.5
	3.3	SSL2F3R3	45.8	0.20	100.5	25.0	10	12.5
	4.7	SSL2F4R7	54.6	0.20	70.55	37.7	10	16
	10	SSL2F010	88.0	0.20	33.16	63.9	10	16
	22	SSL2F2R2	163.6	0.20	15.07	118.1	13	20
	33	SSL2F3R3	232.9	0.20	10.05	154.9	16	25
	47	SSL2F4R7	321.1	0.20	7.055	213.0	16	31.5
	100	SSL2F101	655.0	0.20	3.316	383.3	18	35.5

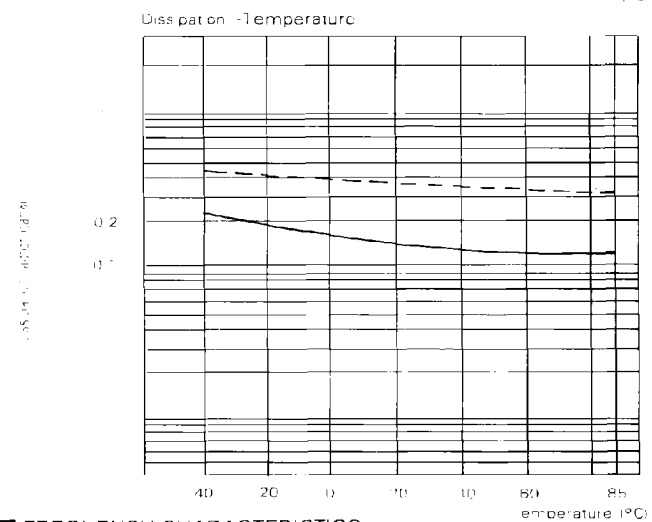
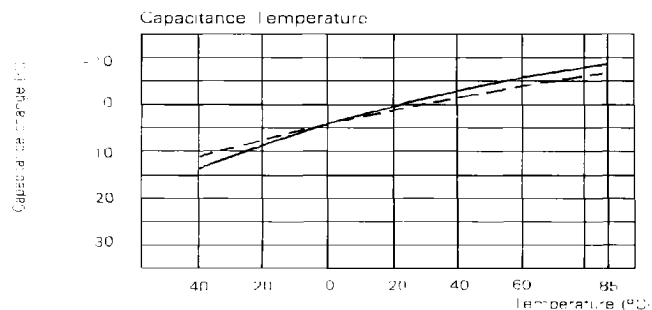
Standard Products Table

W.V. (S.V.)	CAP (μ F)	PART NO.	MAX. D.C.L.(μ A) (at 20°C)	MAX. Tan δ (120Hz/20°C)	MAX. ESR(Ω) (120Hz/20°C)	MAX. Ripple Current (mA)rms (120Hz/85°C)	Dim. (mm)	
							ϕ D	L
315(365)	220	SSL2F221	1411.0	0.20	1.507	715.9	25	40
350 (400)	0.47	SSL2VR47	19.9	0.25	881.8	7.5	6	11
	1	SSL2V010	25.5	0.25	414.5	10.9	6	11
	2.2	SSL2V2R2	40.4	0.25	188.4	23.0	10	12.5
	3.3	SSL2V3R3	48.1	0.25	125.6	28.2	10	16
	4.7	SSL2V4R7	57.9	0.25	88.18	33.7	10	16
	10	SSL2V100	95.0	0.25	41.45	57.1	10	20
	22	SSL2V220	179.0	0.25	18.84	113.1	13	25
	33	SSL2V330	256.0	0.25	12.56	138.5	16	25
	47	SSL2V470	354.0	0.25	8.818	190.5	16	31.5
	100	SSL2V101	725.0	0.25	4.145	342.9	18	40
	220	SSL2V221	1565.0	0.25	1.884	698.6	25	50
400 (450)	1	SSL2G010	27.0	0.25	414.5	13.5	8	11.5
	2.2	SSL2G2R2	41.4	0.25	188.4	23.0	10	12.5
	3.3	SSL2G3R3	51.4	0.25	125.6	28.2	10	16
	4.7	SSL2G4R7	62.6	0.25	88.18	37.4	10	16
	10	SSL2G100	105.0	0.25	41.45	71.2	13	20
	22	SSL2G220	201.0	0.25	18.84	113.1	16	25
	33	SSL2G330	289.0	0.25	12.56	159.6	16	31.5
	47	SSL2G470	401.0	0.25	8.818	204.1	16	35.5
450 (500)	100	SSL2G101	825.0	0.25	4.145	399.1	22	40
	1	SSL2W010	28.5	0.25	414.5	15.5	10	12.5
	2.2	SSL2W2R2	44.7	0.25	188.4	23.6	10	16
	3.3	SSL2W3R3	54.7	0.25	125.6	31.4	10	16
	4.7	SSL2W4R7	67.3	0.25	88.18	39.2	10	20
	10	SSL2W100	115.0	0.25	41.45	71.2	13	20
	22	SSL2W220	223.0	0.25	18.84	130.4	16	25
	33	SSL2W330	322.0	0.25	12.56	171.0	16	31.5
	47	SSL2W470	448.0	0.25	8.818	216.7	16	35.5
	100	SSL2W101	925.0	0.25	4.145	399.1	22	40

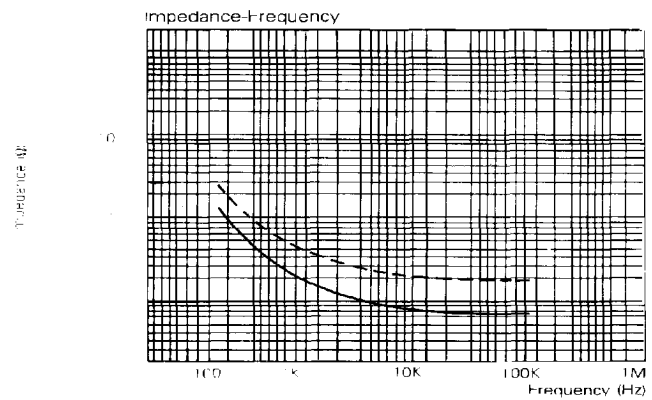
PERFORMANCE CURVE

25V 1000 μ F
 50V 470 μ F

TEMPERATURE CHARACTERISTICS



FREQUENCY CHARACTERISTICS



LIFE TEST WITH LOAD(85 $^{\circ}$ C)

