

# Large Can Aluminum Electrolytic Capacitors

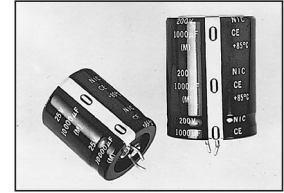
NRLRW Series

## FEATURES

- EXPANDED VALUE RANGE
- LONG LIFE AT +105°C (3,000 HOURS)
- HIGH RIPPLE CURRENT
- LOW PROFILE, HIGH DENSITY DESIGN
- SUITABLE FOR SWITCHING POWER SUPPLIES

**RoHS Compliant**  
includes all homogeneous materials

\*See Part Number System for Details



## SPECIFICATIONS

Operating Temperature Range		-40 ~ +105°C					-25 ~ +105°C				
Rated Voltage Range		10 ~ 100Vdc					160 ~ 450Vdc				
Rated Capacitance Range		560 ~ 56,000µF					47 ~ 2,700µF				
Capacitance Tolerance		±20% (M)									
Max. Leakage Current (µA) After 5 minutes (20°C)		$3 \times \sqrt{C(\mu F)V}$									
Max. Tan δ at 120Hz/20°C	W.V. (Vdc)	10	16	25	35	50	63	80	100	160~400	420~450
	Tan δ max.	0.55	0.50	0.45	0.40	0.35	0.30	0.25	0.20	0.15	0.20
Surge Voltage	W.V. (Vdc)	10	16	25	35	50	63	80	100	160	180
	S.V. (Vdc)	13	20	32	44	63	79	100	125	200	220
	W.V. (Vdc)	200	220	250	315	350	385	400	420	450	-
	S.V. (Vdc)	250	270	300	365	400	435	450	470	500	-
Ripple Current Correction Factors	Frequency (Hz)	50 (60)	120	500	1K	10K <sub>≥</sub>	-	-	-	-	-
	Multiplier at 85°C	10 ~ 100Vdc	0.90	1.00	1.05	1.10	1.15	-	-	-	-
		160 ~ 250Vdc	0.80	1.00	1.20	1.30	1.50	-	-	-	-
315 ~ 450Vdc		0.80	1.00	1.20	1.25	1.40	-	-	-	-	
Low Temperature Stability (10 to 250Vdc)	Temperature (°C)	0	-25	-40	-	-	-	-	-	-	-
	Capacitance Change	-5%	-15%	-30%	-	-	-	-	-	-	-
	Impedance Ratio	1.5	3	12	-	-	-	-	-	-	-
Load Life Test 3,000 hours at +105°C	Capacitance Change	Within ±20% of initial measured value									
	Tan δ	Less than 200% of specified maximum value									
	Leakage Current	Less than specified maximum value									
Shelf Life Test 1,000 hours at +105°C (no load)	Capacitance Change	Within ±20% of initial measured value									
	Tan δ	Less than 200% of specified maximum value									
	Leakage Current	Less than specified maximum value									
Surge Voltage Test Per JIS-C-5141 (table #6, #4) Surge voltage applied: 30 seconds "On" and 5.5 minutes no voltage "Off"	Capacitance Change	Within ±20% of initial measured value									
	Tan δ	Less than 200% of specified maximum value									
	Leakage Current	Less than specified maximum value									
Soldering Effect Refer to JISC5102.8.5	Capacitance Change	Within ±10% of initial measured value									
	Tan δ	Less than specified maximum value									
	Leakage Current	Less than specified maximum value									

## MECHANICAL CHARACTERISTICS:

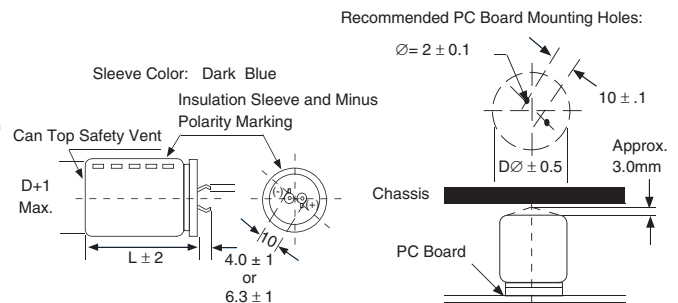
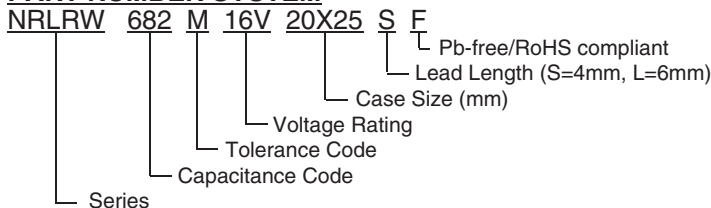
### 1. Safety Vent:

The capacitors are provided with a pressure sensitive safety vent on the top of can which is normally covered by a PVC patch for the purpose of insulation. The vent is designed to rupture in the event that high internal gas pressure is developed by circuit malfunction or mis-use like reverse voltage.

### 2. Terminal Strength:

Each terminal of the capacitor shall withstand an axial pull force of 4.5Kg for a period 10 seconds or a radial bent force of 2.5Kg for a period of 30 seconds.

## PART NUMBER SYSTEM



## PRECAUTIONS

Please review the notes on correct use, safety and precautions found on pages T10 & T11 of NIC's Electrolytic Capacitor catalog.  
 Also found at [www.niccomp.com/precautions](http://www.niccomp.com/precautions)  
 If in doubt or uncertainty, please review your specific application - process details with NIC's technical support personnel: [tpmg@niccomp.com](mailto:tpmg@niccomp.com)

### Notice for Mounting

The space from the top of the can shall be more than (3mm) from chassis or other construction materials so that safety vent has room to expand in case of emergency.



### STANDARD PRODUCT LIST, CASE SIZE AND SPECIFICATIONS

W.V. (Vdc)	Cap. ( $\mu$ F)	Case Size DxL (mm)	ESR ( $\Omega$ @20°C)		Max. Ripple Current (Arms @ 105°C)	
			120Hz	20KHz	120Hz	10K ~ 50KHz
10	6,800	20x25	0.135	0.104	1.31	1.50
	8,299	20x30	0.112	0.086	1.59	1.82
	10,000	20x30	0.092	0.071	1.88	2.16
		22x25	0.092	0.071	1.77	2.03
	12,000	20x35	0.076	0.059	2.18	2.50
		22x30	0.076	0.059	2.10	2.41
		25x25	0.076	0.059	1.94	2.23
	15,000	20x40	0.061	0.047	2.27	2.61
		22x35	0.061	0.047	2.23	2.56
		25x30	0.061	0.047	2.10	2.41
	18,000	22x40	0.051	0.039	2.41	2.77
		25x30	0.051	0.039	2.34	2.69
		30x25	0.051	0.039	2.25	2.58
	22,000	22x45	0.042	0.032	2.58	2.96
		25x35	0.042	0.032	2.54	2.92
		30x30	0.042	0.032	2.50	2.87
	27,000	22x50	0.034	0.026	3.17	3.64
		25x40	0.034	0.026	3.07	3.53
		30x30	0.034	0.026	2.95	3.39
	33,000	25x45	0.028	0.022	3.39	3.89
30x35		0.028	0.022	3.33	3.82	
35x30		0.028	0.022	3.21	3.69	
39,000	30x40	0.024	0.018	3.70	4.25	
	35x35	0.024	0.018	3.68	4.23	
47,000	30x45	0.020	0.015	4.22	4.85	
	35x40	0.020	0.015	4.16	4.78	
56,000	35x45	0.017	0.013	5.00	5.75	
16	6,800	20x25	0.122	0.094	1.80	2.07
	8,200	20x30	0.102	0.078	2.08	2.39
		22x25	0.102	0.078	2.08	2.39
	10,000	20x35	0.083	0.064	2.15	2.47
		22x30	0.083	0.064	2.15	2.47
	12,000	20x40	0.070	0.054	2.31	2.65
		22x30	0.070	0.054	2.31	2.65
		25x25	0.070	0.054	2.31	2.65
	15,000	22x35	0.056	0.043	2.68	3.08
		25x30	0.056	0.043	2.68	3.08
	18,000	22x40	0.047	0.036	3.20	3.68
		25x30	0.047	0.036	3.20	3.68
		30x25	0.047	0.036	3.20	3.68
	22,000	22x45	0.038	0.029	3.36	3.86
		25x35	0.038	0.029	3.36	3.86
		30x30	0.038	0.029	3.36	3.86
	27,000	22x50	0.031	0.024	3.85	4.42
		25x40	0.031	0.024	3.85	4.42
		30x30	0.031	0.024	3.85	4.42
	33,000	25x45	0.026	0.020	4.30	4.94
		30x35	0.026	0.020	4.30	4.94
		35x30	0.026	0.020	4.30	4.94
	39,000	25x50	0.022	0.017	4.81	5.53
		30x40	0.022	0.017	4.81	5.53
		35x35	0.022	0.017	4.81	5.53
	47,000	30x45	0.018	0.014	5.53	6.35
35x40		0.018	0.014	5.53	6.35	
56,000	30x50	0.015	0.012	6.00	6.90	
	35x45	0.015	0.012	6.00	6.90	
68,000	35x50	0.013	0.010	6.40	7.36	

### STANDARD PRODUCT LIST, CASE SIZE AND SPECIFICATIONS

W.V. (Vdc)	Cap. ( $\mu$ F)	Case Size DxL (mm)	ESR ( $\Omega$ @20°C)		Max. Ripple Current (Arms @ 105°C)	
			120Hz	20KHz	120Hz	10K ~ 50KHz
25	4,700	20x25	0.159	0.123	1.65	1.89
		20x30	0.134	0.103	1.85	2.12
	5,600	22x25	0.134	0.103	1.85	2.12
		20x35	0.110	0.085	2.11	2.42
	6,800	22x30	0.110	0.085	2.11	2.42
		20x40	0.091	0.070	2.34	2.69
	8,200	22x30	0.091	0.070	2.34	2.69
		25x25	0.091	0.070	2.34	2.69
		22x35	0.075	0.058	2.65	3.04
	10,000	25x30	0.075	0.058	2.65	3.04
		22x40	0.063	0.048	2.81	3.23
	12,000	25x30	0.063	0.048	2.81	3.23
		30x25	0.063	0.048	2.81	3.23
		22x45	0.050	0.039	3.13	3.59
	15,000	25x35	0.050	0.039	3.13	3.59
		30x30	0.050	0.039	3.13	3.59
		25x40	0.042	0.032	3.56	4.09
	18,000	30x30	0.042	0.032	3.56	4.09
		25x50	0.034	0.027	4.04	4.64
	22,000	30x35	0.034	0.027	4.04	4.64
35x30		0.034	0.027	4.04	4.64	
30x40		0.028	0.022	4.74	5.45	
27,000	35x35	0.028	0.022	4.74	5.45	
	30x50	0.023	0.018	5.50	6.32	
33,000	35x40	0.023	0.018	5.50	6.32	
	35x45	0.020	0.015	5.80	6.67	
39,000	35x45	0.020	0.015	5.80	6.67	
47,000	35x50	0.016	0.013	6.30	7.24	
35	2,700	20x25	0.246	0.189	1.29	1.48
	3,300	20x30	0.201	0.155	1.57	1.80
	3,900	20x30	0.171	0.131	1.78	2.04
		22x25	0.171	0.131	1.78	2.04
	4,700	20x35	0.142	0.109	2.02	2.32
		22x30	0.142	0.109	2.02	2.32
	5,600	20x40	0.119	0.092	2.13	2.44
		22x35	0.119	0.092	2.13	2.44
		25x25	0.119	0.092	2.13	2.44
	6,800	22x40	0.098	0.076	2.41	2.77
		25x30	0.098	0.076	2.41	2.77
	8,200	22x45	0.081	0.063	2.85	3.27
		25x35	0.081	0.063	2.85	3.27
		30x25	0.081	0.063	2.85	3.27
	10,000	22x50	0.067	0.052	3.05	3.50
		25x40	0.067	0.052	3.05	3.50
		30x30	0.067	0.052	3.05	3.50
	12,000	25x45	0.056	0.043	3.37	3.87
		30x35	0.056	0.043	3.37	3.87
		35x30	0.056	0.043	3.37	3.87
15,000	25x50	0.045	0.035	3.72	4.27	
	30x40	0.045	0.035	3.72	4.27	
	35x35	0.045	0.035	3.72	4.27	
18,000	30x45	0.037	0.029	4.37	5.02	
	35x35	0.037	0.029	4.37	5.02	
22,000	30x50	0.031	0.024	4.92	5.65	
	35x40	0.031	0.024	4.92	5.65	
27,000	35x50	0.025	0.019	5.30	6.09	

### STANDARD PRODUCT LIST, CASE SIZE AND SPECIFICATIONS

W.V. (Vdc)	Cap. ( $\mu$ F)	Case Size DxL (mm)	ESR ( $\Omega$ @20°C)		Max. Ripple Current (Arms @ 105°C)	
			120Hz	20KHz	120Hz	10K ~ 50KHz
50	1,800	20x25	0.323	0.248	1.39	1.59
		20x30	0.264	0.203	1.60	1.84
	2,200	22x25	0.264	0.203	1.60	1.84
		20x35	0.215	0.166	1.73	1.98
		22x30	0.215	0.166	1.73	1.98
	2,700	25x25	0.215	0.166	1.73	1.98
		20x40	0.176	0.136	1.97	2.26
		22x35	0.176	0.136	1.97	2.26
	3,300	25x30	0.176	0.136	1.97	2.26
		22x40	0.149	0.115	2.22	2.55
		25x30	0.149	0.115	2.22	2.55
	3,900	22x45	0.124	0.095	2.43	2.79
		25x35	0.124	0.095	2.43	2.79
		30x25	0.124	0.095	2.43	2.79
	4,700	22x50	0.104	0.080	2.75	3.16
		25x40	0.104	0.080	2.75	3.16
		30x30	0.104	0.080	2.75	3.16
	5,600	25x45	0.086	0.066	3.30	3.79
		30x35	0.086	0.066	3.30	3.79
		25x50	0.071	0.055	3.60	4.14
6,800	30x40	0.071	0.055	3.60	4.14	
	35x30	0.071	0.055	3.60	4.14	
	30x45	0.059	0.045	4.05	4.65	
8,200	35x35	0.059	0.045	4.05	4.65	
	30x50	0.049	0.038	4.56	5.24	
10,000	35x40	0.049	0.038	4.56	5.24	
	35x50	0.039	0.030	4.77	5.48	
63	1,200	20x25	0.415	0.319	1.20	1.38
		20x30	0.332	0.256	1.47	1.69
	1,500	22x25	0.332	0.256	1.47	1.69
		20x35	0.277	0.213	1.58	1.81
	1,800	22x30	0.277	0.213	1.58	1.81
		20x40	0.227	0.174	1.82	2.09
	2,200	22x35	0.227	0.174	1.82	2.09
		25x25	0.227	0.174	1.82	2.09
		22x35	0.185	0.142	2.11	2.42
	2,700	25x30	0.185	0.142	2.11	2.42
		22x45	0.151	0.116	2.33	2.67
	3,300	25x35	0.151	0.116	2.33	2.67
		30x25	0.151	0.116	2.33	2.67
		22x50	0.128	0.099	2.55	2.93
	3,900	25x40	0.128	0.099	2.55	2.93
		30x30	0.128	0.099	2.55	2.93
		25x45	0.106	0.082	2.97	3.41
	4,700	30x35	0.106	0.082	2.97	3.41
		25x50	0.089	0.069	3.22	3.70
	5,600	30x35	0.089	0.069	3.22	3.70
35x30		0.089	0.069	3.22	3.70	
30x40		0.074	0.057	3.65	4.19	
6,800	35x35	0.074	0.057	3.65	4.19	
	30x50	0.061	0.047	4.04	4.64	
8,200	35x40	0.061	0.047	4.04	4.64	
	35x45	0.050	0.039	4.48	5.15	
10,000	35x50	0.042	0.032	4.75	5.46	
12,000						

### STANDARD PRODUCT LIST, CASE SIZE AND SPECIFICATIONS

W.V. (Vdc)	Cap. ( $\mu$ F)	Case Size DxL (mm)	ESR ( $\Omega$ @20°C)		Max. Ripple Current (Arms @ 105°C)	
			120Hz	20KHz	120Hz	10K ~ 50KHz
80	820	20x25	0.506	0.389	1.04	1.19
	1,000	20x30	0.415	0.319	1.24	1.42
		22x25	0.415	0.319	1.24	1.42
	1,200	20x35	0.346	0.266	1.44	1.65
		22x30	0.346	0.266	1.44	1.65
	1,500	20x35	0.277	0.213	1.59	1.82
		22x30	0.277	0.213	1.59	1.82
		25x25	0.277	0.213	1.59	1.82
	1,800	20x40	0.231	0.178	1.79	2.05
		22x35	0.231	0.178	1.79	2.05
		25x30	0.231	0.178	1.79	2.05
	2,200	22x40	0.189	0.145	2.03	2.33
		25x30	0.189	0.145	2.03	2.33
		30x25	0.189	0.145	2.03	2.33
	2,700	22x45	0.154	0.119	2.39	2.74
		25x35	0.154	0.119	2.39	2.74
		30x30	0.154	0.119	2.39	2.74
	3,300	25x40	0.126	0.097	2.64	3.03
		30x35	0.126	0.097	2.64	3.03
	3,900	25x50	0.107	0.082	2.97	3.41
30x35		0.107	0.082	2.97	3.41	
35x30		0.107	0.082	2.97	3.41	
4,700	30x40	0.089	0.068	3.38	3.88	
	35x35	0.089	0.068	3.38	3.88	
5,600	30x45	0.075	0.057	3.8	4.37	
	35x40	0.075	0.057	3.8	4.37	
6,800	35x45	0.061	0.047	4.1	4.71	
8,200	35x50	0.051	0.039	4.3	4.94	
100	560	20x25	0.593	0.456	0.95	1.09
	680	20x30	0.488	0.376	1.15	1.32
		22x25	0.488	0.376	1.15	1.32
	820	20x35	0.405	0.312	1.32	1.51
		22x30	0.405	0.312	1.32	1.51
	1,000	20x35	0.332	0.256	1.47	1.69
		22x30	0.332	0.256	1.47	1.69
		25x25	0.332	0.256	1.47	1.69
	1,200	20x40	0.277	0.213	1.69	1.94
		22x35	0.277	0.213	1.69	1.94
		25x30	0.277	0.213	1.69	1.94
	1,500	22x40	0.222	0.171	1.98	2.27
		25x35	0.222	0.171	1.98	2.27
		30x25	0.222	0.171	1.98	2.27
	1,800	22x45	0.185	0.142	2.23	2.56
		25x35	0.185	0.142	2.23	2.56
		30x30	0.185	0.142	2.23	2.56
	2,200	25x45	0.151	0.116	2.55	2.93
		30x35	0.151	0.116	2.55	2.93
		35x30	0.151	0.116	2.55	2.93
2,700	25x50	0.123	0.095	2.89	3.32	
	30x40	0.123	0.095	2.89	3.32	
	35x30	0.123	0.095	2.89	3.32	
3,300	30x45	0.101	0.078	3.3	3.79	
	35x35	0.101	0.078	3.3	3.79	
3,900	30x50	0.086	0.066	3.67	4.22	
	35x40	0.086	0.066	3.67	4.22	
4,700	35x45	0.071	0.055	3.8	4.37	
5,600	35x50	0.06	0.046	4.05	4.65	

### STANDARD PRODUCT LIST, CASE SIZE AND SPECIFICATIONS

W.V. (Vdc)	Cap. ( $\mu$ F)	Case Size DxL (mm)	ESR ( $\Omega$ @20°C)		Max. Ripple Current (Arms @ 105°C)	
			120Hz	20KHz	120Hz	10K ~ 50KHz
160	270	20x25	0.922	0.709	1.10	1.65
	330	20x30	0.754	0.580	1.20	1.80
		22x25	0.754	0.580	1.21	1.81
	390	20x30	0.638	0.491	1.24	1.86
		22x25	0.638	0.491	1.30	1.95
	470	20x35	0.53	0.408	1.42	2.13
		22x30	0.53	0.408	1.41	2.11
	560	20x40	0.445	0.342	1.57	2.35
		22x35	0.445	0.342	1.54	2.31
		25x25	0.445	0.342	1.51	2.26
	680	20x45	0.366	0.282	1.70	2.55
		22x40	0.366	0.282	1.74	2.61
		25x30	0.366	0.282	1.74	2.61
		30x25	0.366	0.282	1.74	2.61
	820	22x45	0.304	0.234	2.00	3.00
		25x35	0.304	0.234	2.00	3.00
		30x30	0.304	0.234	2.00	3.00
	1,000	22x50	0.249	0.192	2.25	3.37
		25x40	0.249	0.192	2.25	3.37
		30x30	0.249	0.192	2.25	3.37
35x25		0.249	0.192	2.25	3.37	
1,200	25x45	0.208	0.160	2.49	3.73	
	30x35	0.208	0.160	2.49	3.73	
	35x30	0.208	0.160	2.45	3.67	
1,500	30x40	0.166	0.128	2.84	4.26	
	35x30	0.166	0.128	2.68	4.02	
1,800	30x45	0.139	0.107	3.32	4.98	
	35x35	0.139	0.107	3.00	4.50	
2,200	35x45	0.114	0.087	3.50	5.25	
2,700	35x50	0.093	0.071	4.00	6.00	
180	270	20x25	0.922	0.709	0.93	1.39
	330	20x30	0.754	0.580	1.20	1.80
		22x25	0.754	0.580	1.20	1.80
	390	20x35	0.638	0.491	1.30	1.95
		22x30	0.638	0.491	1.35	2.02
	470	20x40	0.530	0.408	1.40	2.10
		22x35	0.530	0.408	1.42	2.13
		25x25	0.530	0.408	1.38	2.07
	560	20x45	0.445	0.342	1.55	2.32
		22x40	0.445	0.342	1.60	2.40
		25x30	0.445	0.342	1.55	2.32
	680	22x45	0.366	0.282	1.78	2.67
		25x35	0.366	0.282	1.78	2.67
		30x25	0.366	0.282	1.55	2.32
	820	22x50	0.304	0.234	2.00	3.00
		25x40	0.304	0.234	2.00	3.00
		30x30	0.304	0.234	2.00	3.00
		35x25	0.304	0.234	2.00	3.00
	1,000	25x45	0.249	0.192	2.25	3.37
		30x35	0.249	0.192	2.25	3.37
35x30		0.249	0.192	2.26	3.39	
1,200	25x50	0.208	0.160	2.54	3.81	
	30x40	0.208	0.160	2.52	3.78	
	35x30	0.208	0.160	2.60	3.90	
1,500	30x45	0.166	0.128	2.90	4.35	
	35x35	0.166	0.128	2.95	4.42	

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### STANDARD PRODUCT LIST, CASE SIZE AND SPECIFICATIONS

W.V. (Vdc)	Cap. ( $\mu$ F)	Case Size DxL (mm)	ESR ( $\Omega$ @20°C)		Max. Ripple Current (Arms @ 105°C)	
			120Hz	20KHz	120Hz	10K ~ 50KHz
180	1,800	30x50	0.139	0.107	3.00	4.50
		35x40	0.139	0.107	3.30	4.95
	2,200	35x50	0.114	0.087	3.65	5.47
200	220	20x25	1.131	0.870	1.00	1.50
	270	20x30	0.922	0.709	1.10	1.65
		22x25	0.922	0.709	1.10	1.65
	330	20x30	0.754	0.580	1.15	1.72
		22x30	0.754	0.580	1.25	1.87
	390	20x35	0.638	0.491	1.25	1.87
		22x30	0.638	0.491	1.31	1.96
		25x25	0.638	0.491	1.31	1.96
	470	20x40	0.530	0.408	1.42	2.13
		22x35	0.530	0.408	1.45	2.17
		25x30	0.530	0.408	1.45	2.17
	560	22x40	0.445	0.342	1.60	2.40
		25x30	0.445	0.342	1.60	2.40
		30x25	0.445	0.342	1.60	2.40
	680	22x45	0.366	0.282	1.75	2.62
		25x35	0.366	0.282	1.78	2.67
		30x30	0.366	0.282	1.78	2.67
	820	22x50	0.304	0.234	1.95	2.92
		25x40	0.304	0.234	1.95	2.92
		30x30	0.304	0.234	2.00	3.00
	1,000	25x45	0.249	0.192	2.10	3.15
		30x35	0.249	0.192	2.30	3.45
		35x30	0.249	0.192	2.30	3.45
	1,200	30x40	0.208	0.160	2.64	3.96
		35x35	0.208	0.160	2.65	3.97
	1,500	30x50	0.166	0.128	3.08	4.62
		35x40	0.166	0.128	3.08	4.62
1,800	35x45	0.139	0.107	3.48	5.22	
2,200	35x50	0.114	0.087	3.55	5.32	
220	180	20x25	1.382	1.063	0.86	1.29
	220	20x30	1.131	0.870	1.04	1.56
		22x25	1.131	0.870	0.99	1.48
	270	20x30	0.922	0.709	1.08	1.62
		22x25	0.922	0.709	1.04	1.56
	330	20x35	0.754	0.580	1.30	1.95
		22x30	0.754	0.580	1.32	1.98
		25x25	0.754	0.580	1.26	1.89
	390	20x40	0.638	0.491	1.45	2.17
		22x35	0.638	0.491	1.42	2.13
		25x30	0.638	0.491	1.45	2.17
	470	20x45	0.530	0.408	1.63	2.44
		22x40	0.530	0.408	1.67	2.50
		25x30	0.530	0.408	1.54	2.31
		30x25	0.530	0.408	1.48	2.22
	560	22x45	0.445	0.342	1.77	2.65
		25x35	0.445	0.342	1.66	2.49
		30x30	0.445	0.342	1.65	2.47
	680	25x40	0.366	0.282	1.87	2.80
		30x30	0.366	0.282	1.82	2.73
		35x25	0.366	0.282	1.78	2.67
	820	25x45	0.304	0.234	2.04	3.06
		30x35	0.304	0.234	2.00	3.00
		35x30	0.304	0.234	1.93	2.89

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### STANDARD PRODUCT LIST, CASE SIZE AND SPECIFICATIONS

W.V. (Vdc)	Cap. ( $\mu$ F)	Case Size DxL (mm)	ESR ( $\Omega$ @20°C)		Max. Ripple Current (Arms @ 105°C)	
			120Hz	20KHz	120Hz	10K ~ 50KHz
220	1,000	30x40	0.249	0.192	2.48	3.72
		35x35	0.249	0.192	2.33	3.49
	1,200	30x45	0.208	0.16	2.88	4.32
		35x40	0.208	0.16	2.65	3.97
	1,500	35x45	0.166	0.128	2.96	4.44
1,800	35x50	0.139	0.107	3.39	5.08	
250	220	20x30	1.131	0.870	1.00	1.50
		22x25	1.131	0.870	1.00	1.50
	270	20x35	0.922	0.709	1.10	1.65
		22x30	0.922	0.709	1.15	1.72
	330	20x40	0.754	0.580	1.20	1.80
		22x35	0.754	0.580	1.28	1.92
	390	20x45	0.638	0.491	1.35	2.02
		22x40	0.638	0.491	1.49	2.23
		25x30	0.638	0.491	1.35	2.02
		30x25	0.638	0.491	1.49	2.23
	470	22x45	0.530	0.408	1.60	2.40
		25x35	0.530	0.408	1.57	2.35
		30x30	0.530	0.408	1.65	2.47
	560	22x50	0.445	0.342	1.72	2.58
		25x40	0.445	0.342	1.80	2.70
		30x30	0.445	0.342	1.80	2.70
	680	25x45	0.366	0.282	1.85	2.77
		30x35	0.366	0.282	2.00	3.00
		35x30	0.366	0.282	2.00	3.00
	820	25x50	0.304	0.234	2.10	3.15
30x40		0.304	0.234	2.18	3.27	
35x35		0.304	0.234	2.30	3.45	
1,000	30x45	0.249	0.192	2.40	3.60	
	35x35	0.249	0.192	2.35	3.52	
1,200	35x40	0.208	0.160	2.50	3.75	
1,500	35x50	0.166	0.128	3.00	4.50	
315	82	20x25	3.033	2.333	0.64	0.89
	100	20x30	2.487	1.913	0.69	0.96
		22x25	2.487	1.913	0.62	0.86
	120	20x30	2.073	1.595	0.75	1.05
		22x25	2.073	1.595	0.75	1.05
		25x25	2.073	1.595	0.76	1.06
	150	20x35	1.658	1.276	0.82	1.14
		22x30	1.658	1.276	0.82	1.14
		25x25	1.658	1.276	0.82	1.14
	180	20x40	1.382	1.063	0.90	1.26
		22x35	1.382	1.063	0.92	1.28
		25x25	1.382	1.063	0.90	1.26
	220	20x50	1.131	0.870	1.00	1.40
		22x40	1.131	0.870	1.04	1.45
		25x30	1.131	0.870	1.04	1.45
		30x25	1.131	0.870	1.04	1.45
	270	22x45	0.922	0.709	1.16	1.62
		25x35	0.922	0.709	1.15	1.61
		30x25	0.922	0.709	1.15	1.61
		35x25	0.922	0.709	1.15	1.61
330	22x50	0.754	0.580	1.22	1.70	
	25x40	0.754	0.580	1.23	1.72	
	30x30	0.754	0.580	1.33	1.86	
	35x25	0.754	0.580	1.32	1.84	

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### STANDARD PRODUCT LIST, CASE SIZE AND SPECIFICATIONS

W.V. (Vdc)	Cap. ( $\mu$ F)	Case Size DxL (mm)	ESR ( $\Omega$ @20°C)		Max. Ripple Current (Arms @ 105°C)	
			120Hz	20KHz	120Hz	10K ~ 50KHz
315	390	25x45	0.638	0.491	1.40	1.96
		30x35	0.638	0.491	1.47	2.05
		35x30	0.638	0.491	1.47	2.05
	470	30x40	0.530	0.408	1.70	2.38
		35x30	0.530	0.408	1.70	2.38
	560	30x45	0.445	0.342	2.05	2.87
		35x35	0.445	0.342	1.90	2.66
	680	30x50	0.366	0.282	2.14	2.99
35x40		0.366	0.282	2.17	3.03	
820	35x45	0.304	0.234	2.20	3.08	
350	68	20x25	3.658	2.814	0.47	0.65
	82	20x30	3.033	2.333	0.55	0.77
	100	20x30	2.487	1.913	0.60	0.84
		22x25	2.487	1.913	0.69	0.96
	120	20x35	2.073	1.595	0.70	0.98
		22x30	2.073	1.595	0.75	1.05
		25x25	2.073	1.595	0.75	1.05
	150	20x40	1.658	1.276	0.78	1.09
		22x35	1.658	1.276	0.82	1.14
		25x30	1.658	1.276	0.83	1.16
	180	20x45	1.382	1.063	0.88	1.23
		22x40	1.382	1.063	0.92	1.28
		25x30	1.382	1.063	0.92	1.28
		30x25	1.382	1.063	0.92	1.28
	220	22x45	1.131	0.870	1.05	1.47
		25x35	1.131	0.870	1.05	1.47
		30x30	1.131	0.870	1.02	1.42
	270	22x50	0.922	0.709	1.18	1.65
		25x40	0.922	0.709	1.18	1.65
		30x30	0.922	0.709	1.18	1.65
		35x25	0.922	0.709	1.20	1.68
	330	25x45	0.754	0.580	1.30	1.82
		30x35	0.754	0.580	1.35	1.89
		35x30	0.754	0.580	1.22	1.70
	390	25x50	0.638	0.491	1.45	2.03
		30x40	0.638	0.491	1.52	2.12
		35x35	0.638	0.491	1.48	2.07
	470	30x45	0.530	0.408	1.65	2.31
35x35		0.530	0.408	1.70	2.38	
560	30x50	0.445	0.342	1.85	2.59	
	35x40	0.445	0.342	1.90	2.66	
680	35x45	0.366	0.282	2.00	2.80	
385	56	20x25	4.441	3.416	0.42	0.58
	68	20x30	3.658	2.814	0.47	0.65
		22x25	3.658	2.814	0.49	0.68
	82	20x30	3.033	2.333	0.52	0.72
		22x25	3.033	2.333	0.55	0.77
	100	20x35	2.487	1.913	0.60	0.84
		22x30	2.487	1.913	0.66	0.92
		25x25	2.487	1.913	0.66	0.92
	120	20x40	2.073	1.595	0.68	0.95
		22x35	2.073	1.595	0.71	0.99
		25x25	2.073	1.595	0.71	0.99
	150	22x40	1.658	1.276	0.83	1.16
		25x30	1.658	1.276	0.83	1.16
		30x25	1.658	1.276	0.77	1.07

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### STANDARD PRODUCT LIST, CASE SIZE AND SPECIFICATIONS

W.V. (Vdc)	Cap. ( $\mu$ F)	Case Size DxL (mm)	ESR ( $\Omega$ @20°C)		Max. Ripple Current (Arms @ 105°C)	
			120Hz	20KHz	120Hz	10K ~ 50KHz
385	180	22x45	1.382	1.063	0.92	1.28
		25x35	1.382	1.063	0.92	1.28
		30x30	1.382	1.063	0.89	1.24
	220	22x50	1.131	0.870	1.03	1.44
		25x40	1.131	0.870	1.03	1.44
		30x30	1.131	0.870	1.01	1.41
		35x25	1.131	0.870	1.03	1.44
	270	25x45	0.922	0.709	1.14	1.59
		30x35	0.922	0.709	1.15	1.61
		35x30	0.922	0.709	1.13	1.58
	330	30x40	0.754	0.580	1.32	1.84
		35x30	0.754	0.580	1.35	1.89
	390	30x45	0.638	0.491	1.46	2.04
		35x35	0.638	0.491	1.50	2.10
	470	30x50	0.530	0.408	1.72	2.40
35x40		0.530	0.408	1.79	2.50	
560	35x45	0.445	0.342	1.99	2.78	
400	56	20x25	4.441	3.416	0.51	0.71
	68	20x30	3.658	2.814	0.56	0.78
		22x25	3.658	2.814	0.52	0.72
	82	20x30	3.033	2.333	0.64	0.89
		22x25	3.033	2.333	0.64	0.89
	100	20x35	2.487	1.913	0.70	0.98
		22x30	2.487	1.913	0.70	0.98
		25x25	2.487	1.913	0.70	0.98
	120	20x40	2.073	1.595	0.75	1.05
		22x35	2.073	1.595	0.75	1.05
		25x25	2.073	1.595	0.75	1.05
	150	20x45	1.658	1.276	0.83	1.16
		22x40	1.658	1.276	0.88	1.23
		25x30	1.658	1.276	0.88	1.23
		30x25	1.658	1.276	0.82	1.14
	180	22x45	1.382	1.063	0.98	1.37
		25x35	1.382	1.063	0.98	1.37
		30x30	1.382	1.063	0.95	1.33
	220	22x50	1.131	0.870	1.10	1.54
		25x40	1.131	0.870	1.10	1.54
		30x30	1.131	0.870	1.10	1.54
		35x25	1.131	0.870	1.10	1.54
	270	25x45	0.922	0.709	1.21	1.69
		30x35	0.922	0.709	1.22	1.70
		35x30	0.922	0.709	1.22	1.70
	330	30x40	0.754	0.580	1.44	2.01
		35x30	0.754	0.580	1.44	2.01
390	30x45	0.638	0.491	1.55	2.17	
	35x35	0.638	0.491	1.60	2.24	
470	35x40	0.530	0.408	1.90	2.66	
560	35x45	0.445	0.342	2.12	2.96	
420	56	20x25	5.921	4.555	0.44	0.61
	68	20x30	4.877	3.751	0.49	0.68
		22x25	4.877	3.751	0.51	0.71
	82	20x35	4.044	3.111	0.54	0.75
		22x30	4.044	3.111	0.65	0.91
	25x25	4.044	3.111	0.65	0.91	

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### STANDARD PRODUCT LIST, CASE SIZE AND SPECIFICATIONS

W.V. (Vdc)	Cap. ( $\mu$ F)	Case Size DxL (mm)	ESR ( $\Omega$ @20°C)		Max. Ripple Current (Arms @ 105°C)	
			120Hz	20KHz	120Hz	10K ~ 50KHz
420	100	20x35	3.316	2.551	0.61	0.85
		22x30	3.316	2.551	0.68	0.95
		25x25	3.316	2.551	0.67	0.93
	120	20x40	2.764	2.126	0.70	0.98
		22x35	2.764	2.126	0.73	1.02
		25x30	2.764	2.126	0.76	1.06
		30x25	2.764	2.126	0.81	1.13
	150	20x45	2.211	1.701	0.78	1.09
		22x40	2.211	1.701	0.86	1.20
		25x35	2.211	1.701	0.87	1.21
		30x25	2.211	1.701	0.84	1.17
	180	22x45	1.843	1.417	0.96	1.34
		25x35	1.843	1.417	0.95	1.33
		30x30	1.843	1.417	0.97	1.35
		35x25	1.843	1.417	0.91	1.27
	220	25x40	1.508	1.160	1.08	1.51
		30x35	1.508	1.160	1.14	1.59
		35x30	1.508	1.160	1.07	1.49
	270	25x50	1.229	0.945	1.38	1.93
		30x35	1.229	0.945	1.20	1.68
35x35		1.229	0.945	1.29	1.80	
330	30x40	1.005	0.773	1.37	1.91	
	35x35	1.005	0.773	1.44	2.01	
390	30x45	0.851	0.654	1.50	2.10	
	35x40	0.851	0.654	1.63	2.28	
470	35x45	0.706	0.543	1.88	2.63	
450	47	20x25	7.055	5.427	0.39	0.54
	56	20x30	5.921	4.555	0.51	0.71
		22x25	5.921	4.555	0.44	0.61
	68	20x35	4.877	3.751	0.56	0.78
		22x30	4.877	3.751	0.53	0.74
	82	20x35	4.044	3.111	0.64	0.89
		22x30	4.044	3.111	0.64	0.89
		25x25	4.044	3.111	0.64	0.89
	100	20x45	3.316	2.551	0.69	0.96
		22x35	3.316	2.551	0.69	0.96
		25x30	3.316	2.551	0.69	0.96
		30x25	3.316	2.551	0.69	0.96
	120	20x50	2.764	2.126	0.75	1.05
		22x40	2.764	2.126	0.75	1.05
		25x30	2.764	2.126	0.75	1.05
		30x25	2.764	2.126	0.80	1.12
	150	22x45	2.211	1.701	0.88	1.23
		25x35	2.211	1.701	0.88	1.23
		30x30	2.211	1.701	0.88	1.23
		35x25	2.211	1.701	0.75	1.05
	180	25x40	1.843	1.417	0.95	1.33
		30x30	1.843	1.417	1.00	1.40
		35x30	1.843	1.417	0.86	1.20
	220	25x45	1.508	1.160	1.10	1.54
		30x35	1.508	1.160	1.12	1.56
		35x30	1.508	1.160	1.05	1.47
	270	30x40	1.229	0.945	1.28	1.79
		35x35	1.229	0.945	1.27	1.77
330	30x50	1.005	0.773	1.45	2.03	
	35x40	1.005	0.773	1.45	2.03	
390	35x40	0.851	0.654	1.65	2.31	
470	35x50	0.706	0.543	1.85	2.59	

