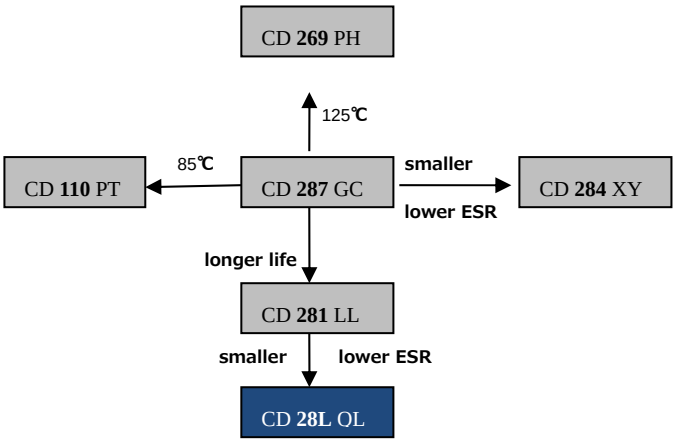
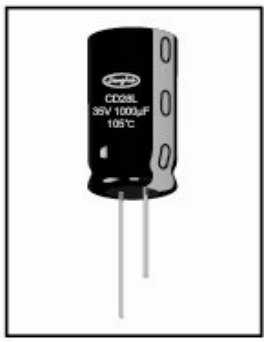
CD 28L QL Series

2000 ~8000h at 105℃

- Miniaturized
- Low Impedance, High Current
- Switching Power Supply





Items	Characteristics
Operating Temperature Range(°C)	-55~ +105
Voltage Range (V)	6.3~ 63
Capacitance Range(μF)	12~ 18000
Capacitance Tolerance (20°C,120Hz)	±20%
Leakage Current (μA)	After 2 minutes at 20°C application of rated voltage, leakage current is not more than 0.01CV or 3, whichever is greater. C:Nominal Capacitance(μF) V:Rated Voltage(V)
Dissipation Factor (20°C, 120Hz)	See table below
Stability at Low Temperature (Impedance Ratio at 120Hz)	See table below

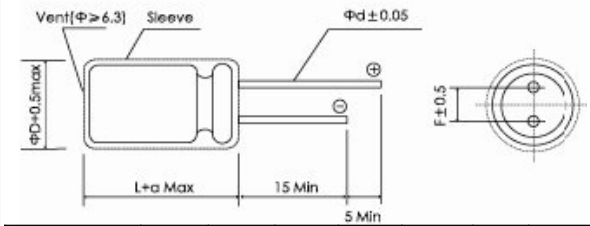
Rated Voltage(V)	6.3	10	16	25	35	50	63
Tan δ(max)	0.22	0.19	0.16	0.14	0.12	0.10	0.08

For Capacitances>1000μF add 0.02 to every 1000μF

Rated Voltage(V)	6.3~ 63
$Z_{-55℃}/Z_{+20℃}$	3

	Useful Life		Load Life	Endurance Test	Shelf Life
Lifetime	φ≤6.3 :4000h φ8 :6000h φ10 :10000h φ12.5 :12000h φ≥16 :14000h	φ≥8:>250000h	φ≤6.3 :2000h φ8 :3000h φ10 :5000h φ12.5 :7000h φ≥16 :8000h	φ≤6.3 :3000h φ8 :5000h φ10 :7000h φ12.5 :9000h φ≥16 :10000h	1000h
Leakage Current	Not more than specified value		Not more than specified value	Not more than specified value	Not more than specified value
Capacitance Change	Within ±30% of initial value		Within ± 20% of initial value	Within ±20% of initial value	Within ±20% of initial value
Dissipation Factor	Not more than 300% of specified value		Not more than 200% of specified value	Not more than 200% of specified value	Not more than 200% of specified value
Condition: Applied Voltage Applied Current Applied Temperature	U_R I_R 105°C	U_R 1.4 x I_R 40°C	U_R I_R 105°C	U_R I_R = 0 105°C	U_R =0 I_R = 0 105°C After test: U_R to be applied for 30min>24h before measurement

Dimensions mm



ΦD	5	6.3	8	10	12.5	16	18
F	2.0	2.5	3.5	5.0		7.5	
Φd	0.5		0.6			0.8	
a	1.5			2.0			

Frequency Coefficient

Frequency / Cap(μF)	120Hz	1kHz	10kHz	100kHz
12~180	0.40	0.75	0.90	1.00
220~560	0.50	0.83	0.93	1.00
680~1800	0.60	0.86	0.95	1.00
2200~3900	0.75	0.90	0.97	1.00
4700~18000	0.85	0.95	0.98	1.00

Temperature Coefficient

Temperature(℃)	+70	+85	+105
Coefficient	1.96	1.68	1.00

CD 28L QL Series

Ratings for CD **28L** QL Series

U_R (Surge Voltage) Code	Rated Capacitance	Max ESR 20℃, 120Hz	Max Imp 20℃, 100kHz	Max Imp -10℃, 100kHz	Rated Ripple Current 105℃, 100kHz	Size ΦD×L	P/N
(v)	(μF)	(Ω)	(Ω)	(Ω)	(mArms)	(mm)	-
6.3 (7.2) 0J	150	1.946	0.50	1.0	175	5×11.5	ECR0JQL151M□□050011
	330	0.885	0.25	0.50	290	6.3×11.5	ECR0JQL331M□□063011
	470	0.621	0.18	0.36	400	6.3×15	ECR0JQL471M□□063015
	680	0.429	0.12	0.24	555	8×11.5	ECR0JQL681M□□080011
	820	0.356	0.090	0.18	760	10×12.5	ECR0JQL821M□□100012
	1000	0.292	0.090	0.18	730	8×16	ECR0JQL102M□□080016
	1200	0.243	0.080	0.16	810	8×20	ECR0JQL122M□□080020
		0.243	0.068	0.136	1050	10×16	ECR0JQL122M□□100016
	1500	0.195	0.052	0.104	1220	10×20	ECR0JQL152M□□100020
	2200	0.145	0.045	0.090	1440	10×25	ECR0JQL222M□□100025
	2700	0.118	0.037	0.074	1690	10×30	ECR0JQL272M□□100030
	3300	0.105	0.038	0.076	1660	12.5×20	ECR0JQL332M□□125020
	3900	0.088	0.030	0.060	1950	12.5×25	ECR0JQL392M□□125025
	4700	0.079	0.025	0.050	2310	12.5×30	ECR0JQL472M□□125030
	5600	0.071	0.022	0.044	2510	12.5×35	ECR0JQL562M□□125035
		0.071	0.029	0.058	2210	16×20	ECR0JQL562M□□160020
	6800	0.062	0.017	0.034	2870	12.5×40	ECR0JQL682M□□125040
		0.062	0.022	0.044	2560	16×25	ECR0JQL682M□□160025
		0.062	0.028	0.056	2490	18×20	ECR0JQL682M□□180020
	8200	0.058	0.019	0.038	3010	16×31.5	ECR0JQL822M□□160031
	10000	0.053	0.017	0.034	3150	16×35.5	ECR0JQL103M□□160035
		0.053	0.020	0.040	2740	18×25	ECR0JQL103M□□180025
	12000	0.049	0.015	0.030	3710	16×40	ECR0JQL123M□□160040
		0.049	0.018	0.036	3330	18×31.5	ECR0JQL123M□□180031
	15000	0.044	0.016	0.032	3680	18×35.5	ECR0JQL153M□□180035
	18000	0.041	0.015	0.030	3800	18×40	ECR0JQL183M□□180040
10 (13) 1A	100	2.521	0.50	1.0	175	5×11.5	ECR1AQL101M□□050011
	220	1.146	0.25	0.50	290	6.3×11.5	ECR1AQL221M□□063011
	330	0.764	0.18	0.36	400	6.3×15	ECR1AQL331M□□063015
	470	0.536	0.12	0.24	555	8×11.5	ECR1AQL471M□□080011
	680	0.371	0.090	0.18	730	8×16	ECR1AQL681M□□080016
		0.371	0.090	0.18	760	10×12.5	ECR1AQL681M□□100012
	1000	0.252	0.080	0.16	810	8×20	ECR1AQL102M□□080020
		0.252	0.068	0.136	1050	10×16	ECR1AQL102M□□100016
	1200	0.210	0.052	0.104	1220	10×20	ECR1AQL122M□□100020
	1500	0.168	0.045	0.090	1440	10×25	ECR1AQL152M□□100025
	1800	0.140	0.037	0.074	1690	10×30	ECR1AQL182M□□100030
	2200	0.127	0.038	0.076	1660	12.5×20	ECR1AQL222M□□125020
	3300	0.092	0.030	0.060	1950	12.5×25	ECR1AQL332M□□125025
	3900	0.078	0.025	0.050	2310	12.5×30	ECR1AQL392M□□125030
		0.078	0.029	0.058	2210	16×20	ECR1AQL392M□□160020
	4700	0.071	0.022	0.044	2510	12.5×35	ECR1AQL472M□□125035
	5600	0.064	0.017	0.034	2870	12.5×40	ECR1AQL562M□□125040
		0.064	0.022	0.044	2560	16×25	ECR1AQL562M□□160025
		0.064	0.028	0.056	2490	18×20	ECR1AQL562M□□180020
	6800	0.057	0.019	0.038	3010	16×31.5	ECR1AQL682M□□160031
		0.057	0.020	0.040	2740	18×25	ECR1AQL682M□□180025
	8200	0.053	0.017	0.034	3150	16×35.5	ECR1AQL882M□□160035
		0.053	0.018	0.036	3330	18×31.5	ECR1AQL882M□□180031
	10000	0.049	0.015	0.030	3710	16×40	ECR1AQL103M□□160040
		0.049	0.016	0.032	3680	18×35.5	ECR1AQL103M□□180035
	12000	0.045	0.015	0.030	3800	18×40	ECR1AQL123M□□180040

Ratings for CD **28L** QL Series

U_R (Surge Voltage) Code	Rated Capacitance	Max ESR 20℃, 120Hz	Max Imp 20℃, 100kHz	Max Imp -10℃, 100kHz	Rated Ripple Current 105℃, 100kHz	Size ΦD×L	P/N
(v)	(μF)	(Ω)	(Ω)	(Ω)	(mArms)	(mm)	-
16 (20) 1C	47	4.517	0.50	1.0	175	5×11.5	ECR1CQL470M□□050011
	100	2.123	0.25	0.50	290	6.3×11.5	ECR1CQL101M□□063011
	220	0.965	0.18	0.36	400	6.3×15	ECR1CQL221M□□063015
	330	0.643	0.12	0.24	555	8×11.5	ECR1CQL331M□□080011
	470	0.452	0.090	0.18	730	8×16	ECR1CQL471M□□080016
		0.452	0.090	0.18	760	10×12.5	ECR1CQL471M□□100012
	560	0.379	0.080	0.16	810	8×20	ECR1CQL561M□□080020
	680	0.312	0.068	0.136	1050	10×16	ECR1CQL681M□□100016
	1000	0.212	0.052	0.104	1220	10×20	ECR1CQL102M□□100020
	1200	0.177	0.045	0.090	1440	10×25	ECR1CQL122M□□100025
	1500	0.142	0.037	0.074	1690	10×30	ECR1CQL152M□□100030
		0.142	0.038	0.076	1660	12.5×20	ECR1CQL152M□□125020
	2200	0.109	0.030	0.060	1950	12.5×25	ECR1CQL222M□□125025
	2700	0.088	0.025	0.050	2310	12.5×30	ECR1CQL272M□□125030
		0.088	0.029	0.058	2210	16×20	ECR1CQL272M□□160020
	3300	0.080	0.022	0.044	2510	12.5×35	ECR1CQL332M□□125035
	3900	0.068	0.017	0.034	2870	12.5×40	ECR1CQL392M□□125040
		0.068	0.022	0.044	2560	16×25	ECR1CQL392M□□160025
		0.068	0.028	0.056	2490	18×20	ECR1CQL392M□□180020
	4700	0.062	0.019	0.038	3010	16×31.5	ECR1CQL472M□□160031
		0.062	0.020	0.040	2740	18×25	ECR1CQL472M□□180025
	5600	0.057	0.017	0.034	3150	16×35.5	ECR1CQL562M□□160035
		0.057	0.018	0.036	3330	18×31.5	ECR1CQL562M□□180031
	6800	0.051	0.015	0.030	3710	16×40	ECR1CQL682M□□160040
	8200	0.049	0.016	0.032	3680	18×35.5	ECR1CQL822M□□180035
	10000	0.045	0.015	0.030	3800	18×40	ECR1CQL103M□□180040
25 (32) 1E	47	3.953	0.50	1.0	175	5×11.5	ECR1EQL470M□□050011
	100	1.858	0.25	0.50	290	6.3×11.5	ECR1EQL101M□□063011
	150	1.238	0.18	0.36	400	6.3×15	ECR1EQL151M□□063015
	220	0.844	0.12	0.24	555	8×11.5	ECR1EQL221M□□080011
	330	0.563	0.090	0.18	730	8×16	ECR1EQL331M□□080016
		0.563	0.090	0.18	760	10×12.5	ECR1EQL331M□□100012
	390	0.476	0.080	0.16	810	8×20	ECR1EQL391M□□080020
	470	0.395	0.068	0.136	1050	10×16	ECR1EQL471M□□100016
	680	0.273	0.052	0.104	1220	10×20	ECR1EQL681M□□100020
	820	0.227	0.045	0.090	1440	10×25	ECR1EQL821M□□100025
	1000	0.186	0.037	0.074	1690	10×30	ECR1EQL102M□□100030
		0.186	0.038	0.076	1660	12.5×20	ECR1EQL102M□□125020
	1500	0.124	0.030	0.060	1950	12.5×25	ECR1EQL152M□□125025
	1800	0.103	0.025	0.050	2310	12.5×30	ECR1EQL182M□□125030
		0.103	0.029	0.058	2210	16×20	ECR1EQL182M□□160020
	2200	0.097	0.022	0.044	2510	12.5×35	ECR1EQL222M□□125035
		0.097	0.028	0.056	2490	18×20	ECR1EQL222M□□180020
	2700	0.079	0.017	0.034	2870	12.5×40	ECR1EQL272M□□125040
		0.079	0.022	0.044	2560	16×25	ECR1EQL272M□□160025
	3300	0.072	0.019	0.038	3010	16×31.5	ECR1EQL332M□□160031
		0.072	0.020	0.040	2740	18×25	ECR1EQL332M□□180025
	3900	0.061	0.017	0.034	3150	16×35.5	ECR1EQL392M□□160035
		0.061	0.018	0.036	3330	18×31.5	ECR1EQL392M□□180031
	4700	0.056	0.015	0.030	3710	16×40	ECR1EQL472M□□160040
		0.056	0.016	0.032	3680	18×35.5	ECR1EQL472M□□180035
	5600	0.052	0.015	0.030	3800	18×40	ECR1EQL562M□□180040

CD 28L QL Series

Ratings for CD **28L** QL Series

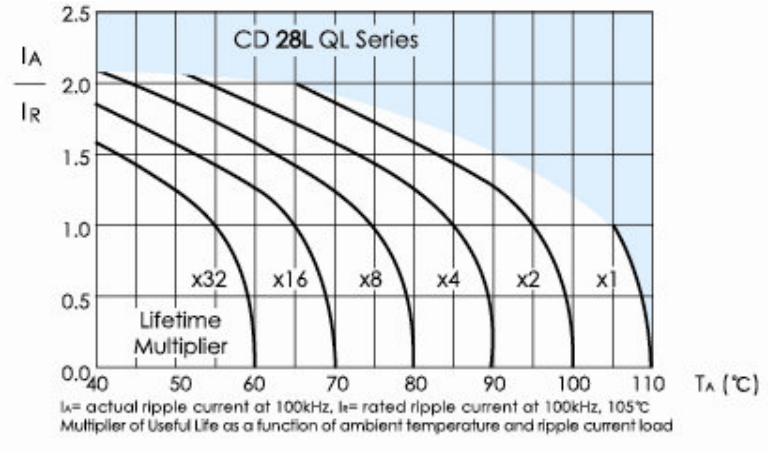
U_R (Surge Voltage) Code	Rated Capacitance	Max ESR 20℃, 120Hz	Max Imp 20℃, 100kHz	Max Imp -10℃, 100kHz	Rated Ripple Current 105℃, 100kHz	Size ΦD×L	P/N
(v)	(μF)	(Ω)	(Ω)	(Ω)	(mArms)	(mm)	-
35 (44) 1V	33	4.825	0.50	1.0	175	5×11.5	ECR1VQL330M□□050011
	56	2.843	0.25	0.50	290	6.3×11.5	ECR1VQL560M□□063011
	100	1.592	0.18	0.36	400	6.3×15	ECR1VQL101M□□063015
	150	1.062	0.12	0.24	555	8×11.5	ECR1VQL151M□□080011
	220	0.724	0.090	0.18	730	8×16	ECR1VQL221M□□080016
		0.724	0.090	0.18	760	10×12.5	ECR1VQL221M□□100012
	270	0.590	0.080	0.16	810	8×20	ECR1VQL271M□□080020
	330	0.483	0.068	0.136	1050	10×16	ECR1VQL331M□□100016
	470	0.339	0.052	0.104	1220	10×20	ECR1VQL471M□□100020
	560	0.284	0.045	0.090	1440	10×25	ECR1VQL561M□□100025
	680	0.234	0.037	0.074	1690	10×30	ECR1VQL681M□□100030
		0.234	0.038	0.076	1660	12.5×20	ECR1VQL681M□□125020
	1000	0.159	0.030	0.060	1950	12.5×25	ECR1VQL102M□□125025
	1200	0.133	0.025	0.050	2310	12.5×30	ECR1VQL122M□□125030
		0.133	0.029	0.058	2210	16×20	ECR1VQL122M□□160020
	1500	0.106	0.022	0.044	2510	12.5×35.5	ECR1VQL152M□□125035
	1800	0.088	0.017	0.034	2870	12.5×40	ECR1VQL182M□□125040
		0.088	0.022	0.044	2560	16×25	ECR1VQL182M□□160025
		0.088	0.028	0.056	2490	18×20	ECR1VQL182M□□180020
	2200	0.084	0.019	0.038	3010	16×31.5	ECR1VQL222M□□160031
		0.084	0.020	0.040	2740	18×25	ECR1VQL222M□□180025
	2700	0.069	0.017	0.034	3150	16×35.5	ECR1VQL272M□□160035
		0.069	0.018	0.036	3330	18×31.5	ECR1VQL272M□□180031
	3300	0.064	0.015	0.030	3710	16×40	ECR1VQL332M□□160040
		0.064	0.016	0.032	3680	18×35.5	ECR1VQL332M□□180035
	3900	0.054	0.015	0.030	3800	18×40	ECR1VQL392M□□180040
50 (63) 1H	22	6.032	0.90	1.8	155	5×11.5	ECR1HQL220M□□050011
	47	2.823	0.45	0.90	260	6.3×11.5	ECR1HQL470M□□063011
	68	1.951	0.31	0.62	360	6.3×15	ECR1HQL680M□□063015
	100	1.327	0.22	0.44	485	8×11.5	ECR1HQL101M□□080011
	120	1.106	0.16	0.32	635	8×16	ECR1HQL121M□□080016
		1.106	0.16	0.32	620	10×12.5	ECR1HQL121M□□100012
	180	0.737	0.12	0.24	730	8×20	ECR1HQL181M□□080020
		0.737	0.13	0.26	850	10×16	ECR1HQL181M□□100016
	220	0.603	0.088	0.18	1050	10×20	ECR1HQL221M□□100020
	330	0.402	0.080	0.16	1250	10×25	ECR1HQL331M□□100025
	390	0.340	0.065	0.13	1500	10×30	ECR1HQL391M□□100030
		0.340	0.070	0.14	1480	12.5×20	ECR1HQL391M□□125020
	560	0.237	0.054	0.108	1840	12.5×25	ECR1HQL561M□□125025
	680	0.195	0.044	0.088	2220	12.5×30	ECR1HQL681M□□125030
		0.195	0.048	0.096	1840	16×20	ECR1HQL681M□□160020
	820	0.162	0.033	0.066	2290	12.5×35	ECR1HQL821M□□125035
		0.162	0.042	0.084	1980	18×20	ECR1HQL821M□□180020
	1000	0.133	0.029	0.058	2500	12.5×40	ECR1HQL102M□□125040
		0.133	0.034	0.068	2240	16×25	ECR1HQL102M□□160025
	1200	0.111	0.028	0.056	2700	16×31.5	ECR1HQL122M□□160031
		0.111	0.029	0.058	2610	18×25	ECR1HQL122M□□180025
	1500	0.088	0.025	0.050	2800	16×35.5	ECR1HQL152M□□160035
	1800	0.074	0.021	0.042	3200	16×40	ECR1HQL182M□□160040
		0.074	0.025	0.050	3000	18×31.5	ECR1HQL182M□□180031
	2200	0.072	0.023	0.046	3100	18×35.5	ECR1HQL222M□□180035
	2700	0.059	0.022	0.044	3400	18×40	ECR1HQL272M□□180040

Ratings for CD **28L** QL Series

U_R (Surge Voltage) Code	Rated Capacitance	Max ESR 20℃, 120Hz	Max Imp 20℃, 100kHz	Max Imp -10℃, 100kHz	Rated Ripple Current 105℃, 100kHz	Size ΦD×L	P/N
(v)	(μF)	(Ω)	(Ω)	(Ω)	(mArms)	(mm)	-
63 (79) 1J	12	8.846	1.9	4.0	145	5×11.5	ECR1JQL120M□□050011
	22	4.825	1.0	2.0	240	6.3×11.5	ECR1JQL220M□□063011
	39	2.722	0.61	1.4	330	6.3×15	ECR1JQL390M□□063015
	68	1.561	0.34	0.75	405	8×11.5	ECR1JQL680M□□080011
	100	1.062	0.27	0.65	535	8×16	ECR1JQL101M□□080016
		1.062	0.255	0.510	540	10×12.5	ECR1JQL101M□□100012
	120	0.885	0.190	0.380	600	10×16	ECR1JQL121M□□100016
	150	0.708	0.21	0.52	690	8×20	ECR1JQL151M□□080020
	180	0.590	0.145	0.290	890	10×20	ECR1JQL181M□□100020
	220	0.483	0.130	0.260	1050	10×25	ECR1JQL221M□□100025
	330	0.322	0.090	0.180	1300	10×30	ECR1JQL331M□□100030
		0.322	0.085	0.170	1290	12.5×20	ECR1JQL331M□□125020
	390	0.272	0.070	0.140	1720	12.5×25	ECR1JQL391M□□125025
	470	0.226	0.055	0.110	2090	12.5×30	ECR1JQL471M□□125030
		0.226	0.059	0.120	1770	16×20	ECR1JQL471M□□160020
	680	0.156	0.047	0.094	2270	12.5×35	ECR1JQL681M□□125035
		0.156	0.050	0.100	2160	16×25	ECR1JQL681M□□160025
		0.156	0.055	0.110	2290	18×20	ECR1JQL681M□□180020
	820	0.129	0.042	0.084	2560	12.5×40	ECR1JQL821M□□125040
		0.129	0.043	0.086	2670	16×31.5	ECR1JQL821M□□160031
		0.129	0.043	0.086	2590	18×25	ECR1JQL821M□□180025
	1000	0.106	0.036	0.072	2770	16×35.5	ECR1JQL102M□□160035
	1200	0.088	0.030	0.060	2850	16×40	ECR1JQL122M□□160040
		0.088	0.032	0.064	2950	18×31.5	ECR1JQL122M□□180031
	1500	0.071	0.030	0.060	3100	18×35.5	ECR1JQL152M□□180035
	1800	0.059	0.025	0.050	3210	18×40	ECR1JQL182M□□180040

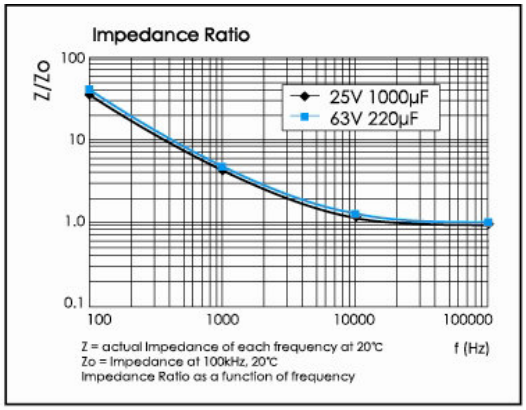
Customer products are available on request.

Lifetime Diagram

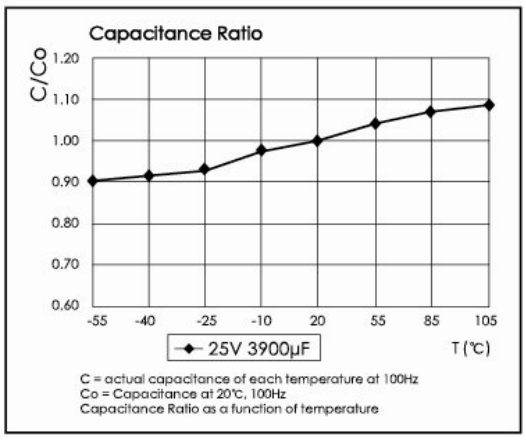


IA= actual ripple current at 100kHz, IR= rated ripple current at 100kHz, 105℃
Multiplier of Useful Life as a function of ambient temperature and ripple current load

Typical Curves



Z = actual Impedance of each frequency at 20℃
Zo = Impedance at 100kHz, 20℃
Impedance Ratio as a function of frequency



C = actual capacitance of each temperature at 100Hz
Co = Capacitance at 20℃, 100Hz
Capacitance Ratio as a function of temperature

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