



Threecon®

CD 293 Series

85°C 2000小时

- 85°C 标准品

2000h at 85°C

- Standard 85°C



项目 Item	特性 Characteristics																																																
使用温度范围(°C) Operating Temperature Range	-40~+85	-25~+85																																															
额定电压范围(V) Voltage Range	10~400	450~600																																															
标称电容量范围(µF) Capacitance Range	68~82000																																																
标称电容量允许偏差 Capacitance Tolerance(20°C, 120Hz)	± 20%																																																
漏电流(µA) Leakage Current	I ≤ 0.01CV 或 1.5mA, 取较小者 (20°C, 5分钟) I ≤ 0.01CV or 1.5mA whichever is smaller (at 20°C, after 5 minutes) C: 标称电容量 (µF) V: 额定电压 (V) C: Nominal Capacitance (µF) V: Rated Voltage (V)																																																
损耗角正切值 (tg δ) Dissipation Factor(20°C, 120Hz)	<table border="1"> <thead> <tr> <th>容量 Cap(µF)</th> <th colspan="5">额定电压 Rated Voltage (V)</th> </tr> <tr> <th></th> <th>10~16</th> <th>25</th> <th>35~50</th> <th>63</th> <th>80~100</th> </tr> </thead> <tbody> <tr> <td>≤2700</td> <td>—</td> <td>—</td> <td>0.20</td> <td>0.15</td> <td>0.15</td> </tr> <tr> <td>3300~4700</td> <td>—</td> <td>0.35</td> <td>0.25</td> <td>0.20</td> <td>0.15</td> </tr> <tr> <td>5600~6800</td> <td>0.40</td> <td>0.35</td> <td>0.30</td> <td>0.20</td> <td>0.20</td> </tr> <tr> <td>≥8200</td> <td>0.40</td> <td>0.35</td> <td>0.35</td> <td>0.25</td> <td>—</td> </tr> </tbody> </table>	容量 Cap(µF)	额定电压 Rated Voltage (V)						10~16	25	35~50	63	80~100	≤2700	—	—	0.20	0.15	0.15	3300~4700	—	0.35	0.25	0.20	0.15	5600~6800	0.40	0.35	0.30	0.20	0.20	≥8200	0.40	0.35	0.35	0.25	—	<table border="1"> <thead> <tr> <th rowspan="2">ΦD(mm)</th> <th colspan="2">额定电压 Rated Voltage (V)</th> </tr> <tr> <th>160~200</th> <th>250~500</th> </tr> </thead> <tbody> <tr> <td>22~30</td> <td>0.10</td> <td>0.15</td> </tr> <tr> <td>35</td> <td>0.12</td> <td>0.15</td> </tr> </tbody> </table>	ΦD(mm)	额定电压 Rated Voltage (V)		160~200	250~500	22~30	0.10	0.15	35	0.12	0.15
	容量 Cap(µF)	额定电压 Rated Voltage (V)																																															
		10~16	25	35~50	63	80~100																																											
	≤2700	—	—	0.20	0.15	0.15																																											
3300~4700	—	0.35	0.25	0.20	0.15																																												
5600~6800	0.40	0.35	0.30	0.20	0.20																																												
≥8200	0.40	0.35	0.35	0.25	—																																												
ΦD(mm)	额定电压 Rated Voltage (V)																																																
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低温特性 Stability at Low Temperature (Impedance Ratio at 120Hz)	<table border="1"> <thead> <tr> <th>额定电压 Rated Voltage(V)</th> <th>10</th> <th>10~35</th> <th>50~100</th> <th>160~200</th> <th>250~400</th> <th>450~500</th> </tr> </thead> <tbody> <tr> <td>Z-25°C / Z +20°C</td> <td>5</td> <td>4</td> <td colspan="2">3</td> <td colspan="2">4</td> </tr> <tr> <td>Z-40°C / Z +20°C</td> <td>18</td> <td>15</td> <td>10</td> <td>6</td> <td>8</td> <td>—</td> </tr> </tbody> </table>	额定电压 Rated Voltage(V)	10	10~35	50~100	160~200	250~400	450~500	Z-25°C / Z +20°C	5	4	3		4		Z-40°C / Z +20°C	18	15	10	6	8	—																											
	额定电压 Rated Voltage(V)	10	10~35	50~100	160~200	250~400	450~500																																										
	Z-25°C / Z +20°C	5	4	3		4																																											
Z-40°C / Z +20°C	18	15	10	6	8	—																																											

项目 Item	使用寿命 Useful Life		负载寿命 Load Life	耐久试验 Endurance Test	高温贮存 shelf Life
寿命 Lifetime	4000h	>65000h	2000h	3000h	1000h
漏电流 Leakage Current	≤ 初始规定值 Not more than specified value		≤ 初始规定值 Not more than specified value	≤ 初始规定值 Not more than specified value	≤ 初始规定值 Not more than specified value
容量变化率 Capacitance Change	初始值 ± 30% 以内 Within ± 30% of initial Value		初始值 ± 15% 以内 Within ± 15% of initial Value	初始值 ± 20% 以内 Within ± 20% of initial Value	初始值 ± 15% 以内 Within ± 15% of initial Value
损耗变化率 Dissipation Factor	≤ 初始规定值的3倍 Not more than 300% of specified value		≤ 初始规定值的1.5倍 Not more than 150% of specified value	≤ 初始规定值的2倍 Not more than 200% of specified value	≤ 初始规定值的1.5倍 Not more than 150% of specified value
使用条件 Condition:					
使用电压 APPLIED Voltage	U _R	U _R	U _R	U _R	U _R =0
使用电流 Applied Current	I _R	1.2×I _R	I _R	I _R =0	I _R =0
使用温度 APPLIED Temperature	85°C	40°C	85°C	85°C	85°C
失效率 Failure Rate Level	≤1%	≤1%	guaranteed (保证)		

试验后:
恢复24小时施加
After test:
额定电压30分钟后
U_R to be applied
>24h before
measurement

CD 293 Series

Threecon®



CD 293 系列

Ratings for CD 293 Series

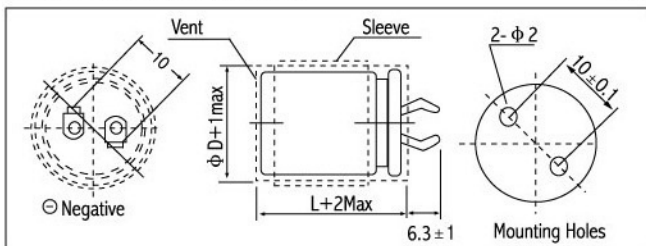
U _R (Surge Voltage) Code (V)	Rated Capa- citan- ce (μF)	Max ESR 20°C 120HZ (mΩ)	Typ ESR 20°C 120HZ (mΩ)	Rated Ripple Current 85°C 120HZ (Arms)	Size Φ DXL (mm)
10 (13) 1A	10000	54	43	2.5	22×25
	12000	45	36	2.9	22×25
	15000	36	29	3.2	22×30
		36	29	3.1	25×30
	18000	30	24	3.6	22×35
		30	24	3.6	25×30
	22000	25	20	4	22×40
		25	20	4.1	25×35
		25	20	4.1	30×25
	33000	17	13	4.6	25×40
		17	13	4.8	30×30
		17	13	4.8	35×25
	39000	14	10.9	5.2	25×45
		14	10.9	5.2	30×35
		12	9.1	5.8	25×50
	47000	12	9.1	6	30×40
12		9.1	6	35×30	
56000		9.5	7.6	6.7	30×45
	9.5	7.6	6.8	35×35	
68000	7.9	6.3	7.5	30×50	
	7.9	6.3	7.7	35×40	
82000	6.5	5.2	8.7	35×45	
16 (20) 1C	8200	65	52	2.2	22×25
	10000	54	43	2.6	22×30
		54	43	2.6	25×25
	12000	45	36	2.9	22×35
		36	29	3.3	22×40
	15000	36	29	3.3	25×30
		36	29	3.4	30×25
	18000	30	24	3.8	22×45
		30	24	3.7	25×35
	22000	25	20	4.2	22×50
		25	20	4.2	25×40
		25	20	4.4	35×25
	27000	20	16	5	25×45
		20	16	5	30×35
	33000	17	13	5.6	30×40
		17	13	5.6	35×30
39000	14	11	6.2	30×45	
	14	11	6.3	35×35	
47000	12	9.1	7	30×50	
	12	9.1	7.2	35×40	
	9.5	7.6	8	35×45	
25 (32) 1E	5600	83	67	2	22×25
	6800	69	55	2.3	22×30
		69	55	2.3	25×25
	8200	57	46	2.6	22×35
	10000	47	38	2.9	22×40
47		38	2.8	25×30	
47	38	3	30×25		

U _R (Surge Voltage) Code (V)	Rated Capa- citan- ce (μF)	Max ESR 20°C 120HZ (mΩ)	Typ ESR 20°C 120HZ (mΩ)	Rated Ripple Current 85°C 120HZ (Arms)	Size Φ DXL (mm)	
25 (32) 1E	12000	39	31	3.3	22×45	
		39	31	3.2	25×35	
		39	31	3.4	30×30	
	15000	31	25	3.7	25×40	
		31	25	3.9	35×25	
		26	21	4.3	22×50	
	18000	26	21	4.2	30×35	
		26	21	4.4	35×30	
		22	17	4.8	35×40	
	22000	22	17	5	35×35	
		33000	15	12	6.5	35×40
		39000	12	10	7.5	35×45
	35 (44) 1V	3300	100	81	1.8	22×25
		3900	86	69	2.1	22×30
		4700	71	57	2.2	25×25
		5600	72	57	2.3	22×35
72			57	2.3	25×30	
6800		59	47	2.9	22×40	
		59	47	2.6	25×35	
		59	47	2.7	30×25	
8200		57	46	2.8	22×50	
		57	46	2.8	25×40	
		57	46	2.8	30×30	
		57	46	2.9	35×25	
		47	38	3.1	25×45	
10000		47	38	3.2	30×35	
		39	31	3.5	25×50	
		39	31	3.5	30×40	
12000	39	31	3.6	35×30		
	31	25	4.1	30×45		
	31	25	4.1	35×35		
15000	26	21	4.6	30×50		
	26	21	4.7	35×40		
	22	17	5.3	35×45		
22000	22	14	7	35×50		
	27000	18	14	7	35×50	
50 (63) 1H	2200	120	97	1.7	22×25	
	2700	100	79	1.9	22×30	
	100	79	1.9	25×25		
	3300	100	81	2	22×35	
	3900	86	69	2.1	22×35	
86		69	2.1	25×30		
86		69	2.4	30×25		

SNAP-IN/LUG

外形图尺寸表 Dimensions

mm



频率系数 Frequency Coefficient

额定电压 Rated voltage(V)	频率 Frequency	50Hz	120Hz	1KHz	10KHz	100KHz
≤50	50Hz	0.95	1.00	1.10	1.15	1.15
	120Hz	0.95	1.00	1.16	1.30	1.33
	≥160	0.95	1.00	1.20	1.50	1.55



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CD 293 系列

Ratings for CD 293 Series

U _R (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C 120HZ	Typ ESR 20°C 120HZ	Rated Ripple Current 85°C 120HZ	Size Φ DXL
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)
50 (63) 1H	4700	71	57	2.4	22×40
		71	57	2.4	25×35
	5600	72	57	2.5	22×50
		72	57	2.5	25×40
		72	57	2.5	30×30
		72	57	2.6	35×25
	6800	59	47	2.8	25×45
		59	47	2.8	30×35
	8200	57	46	3.2	25×50
		57	46	3	30×40
	10000	47	38	3.4	30×45
		47	38	3.4	35×35
	12000	39	31	3.8	30×50
		39	31	3.8	35×40
	15000	31	25	4.5	35×50
63 (79) 1J	1500	135	107	1.6	22×25
	1800	110	89	1.8	22×30
	2200	91	73	2	22×30
		91	73	2	25×25
	2700	74	59	2.2	22×35
		74	59	2.3	25×30
	3300	81	65	2.3	22×40
		81	65	2.3	25×35
		81	65	2.3	30×25
	3900	69	55	2.5	22×45
		69	55	2.6	25×40
		69	55	2.6	30×30
	5600	69	55	2.7	35×25
		48	38	3.1	25×45
		48	38	3.2	30×35
6800	40	32	3.6	30×40	
	40	32	3.7	35×35	
8200	41	33	3.7	30×50	
	41	33	3.8	35×40	
10000	34	27	4.3	35×45	
12000	28	23	4.8	35×50	
80 (100) 1K	1000	200	160	1.3	22×25
	1200	165	133	1.5	22×30
	1500	133	107	1.7	25×25
	1800	111	89	1.9	22×35
		111	89	1.9	25×30
	2200	91	73	2.1	22×40
		91	73	2.2	25×35
		91	73	2.2	30×25
	2700	74	59	2.5	22×50
		74	59	2.5	25×40
		74	59	2.5	30×30
	3300	74	59	2.5	35×25
		61	49	2.8	25×45
	3900	61	49	2.8	30×35
		52	41	3.1	25×50
4700	52	41	3.2	30×40	
	52	41	3.2	35×30	
5600	43	34	3.6	30×45	
	43	34	3.6	35×35	
6800	48	38	3.5	30×50	
	48	38	3.5	35×40	
100 (125) 2A	680	293	235	1.1	22×25
	820	243	195	1.2	22×30
	1000	200	160	1.4	25×25
	1200	166	133	1.6	22×35
	1200	166	133	1.6	25×30
	1500	133	107	1.8	22×40

U _R (Surge Voltage) Code	Rated Capacitance	Max ESR 20°C 120HZ	Typ ESR 20°C 120HZ	Rated Ripple Current 85°C 120HZ	Size Φ DXL
(V)	(μF)	(mΩ)	(mΩ)	(Arms)	(mm)
100 (125) 2A	1500	133	107	1.7	25×35
		133	107	1.8	30×25
	1800	111	89	2.1	22×50
		111	89	2	25×40
		111	89	2.1	30×30
		111	89	2.2	35×25
	2200	91	73	2.2	25×45
		91	73	2.3	30×35
		91	73	2.5	35×30
	2700	74	59	2.6	25×50
		74	59	2.7	30×40
	3300	61	49	3	30×45
		61	49	3.1	35×35
	3900	52	41	3.4	30×50
		52	41	3.4	35×40
4700	43	34	4	35×50	
160 (200) 2C	220	600	483	1.1	22×25
	270	490	393	1.2	22×25
	330	400	322	1.3	22×25
	390	341	273	1.5	22×30
		341	273	1.5	25×25
	470	283	226	1.6	25×30
	560	237	190	1.9	22×35
		237	190	1.9	25×30
		237	190	2	30×25
	680	196	157	2.1	22×40
		196	157	2.2	25×35
	820	162	130	2.5	22×50
		162	130	2.4	25×40
		162	130	2.5	30×30
		195	156	2.4	35×25
1000	133	107	2.7	25×45	
	133	107	2.8	30×35	
	160	128	2.7	35×30	
1200	111	89	3.1	25×50	
	111	89	3.2	30×40	
1500	133	107	3.0	35×35	
	89	71	3.7	30×45	
1800	107	85	3.5	35×40	
	89	71	3.9	35×45	
2200	73	58	4.5	35×50	
180 (225) 2K	270	495	393	1.2	22×25
	330	400	322	1.4	22×30
	390	340	273	1.5	25×25
	470	283	226	1.7	22×35
		283	226	1.7	25×30
		283	226	1.8	30×25
	560	237	190	1.9	22×40
		237	190	2.0	25×35
	680	196	157	2.3	22×50
		196	157	2.2	25×40
		196	157	2.3	30×30
	820	235	188	2.2	35×25
		162	130	2.5	25×45
	1000	162	130	2.6	30×35
		195	156	2.5	35×30
133		107	2.9	25×50	
1200	133	107	2.9	30×40	
	111	89	3.3	30×45	
1500	133	107	3.1	35×35	
1800	107	85	3.6	35×45	
220	89	71	4.1	35×50	
330	220	600	483	1.1	22×25
	270	492	393	1.2	22×30
	402	322	1.4	22×30	
402	322	1.5	25×25		

SNAP-IN/LUG

CD 293 Series



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Ratings for CD 293 Series

U _R (Surge Voltage) Code (V)	Rated Capacitance (μF)	Max ESR 20°C 120HZ (mΩ)	Typ ESR 20°C 120HZ (mΩ)	Rated Ripple Current 85°C 120HZ (Arms)	Size Φ DXL (mm)
200 (250) 2D	390	341	273	1.6	22×35
		341	273	1.6	25×30
	470	283	226	1.8	22×40
		283	226	1.9	30×25
	560	237	190	2.0	22×45
		237	190	2.0	25×35
		237	190	2.1	30×30
		285	228	2.0	35×25
	680	196	157	2.3	25×40
		196	157	2.4	30×35
	820	162	130	2.6	25×50
		162	130	2.7	30×40
		195	156	2.5	35×30
	1000	133	107	3.1	30×45
		160	128	2.8	35×35
1200	111	89	3.4	30×50	
	133	107	3.2	35×40	
1500	107	85	3.8	35×50	
250 (300) 2E	100	1990	1592	0.68	22×25
	180	1106	885	0.94	22×25
	220	905	724	1.1	22×30
		905	724	1.1	25×25
	270	737	590	1.2	22×35
		603	483	1.4	22×40
	330	603	483	1.4	25×30
		603	483	1.4	30×25
		511	409	1.6	22×45
	390	511	409	1.6	25×35
		424	339	1.8	22×50
	470	424	339	1.8	25×40
		424	339	1.8	30×30
		424	339	2.4	35×25
	560	356	285	2.0	25×45
		356	285	2.0	30×35
	680	293	235	2.3	30×40
		293	235	2.6	35×30
820	243	195	2.6	30×45	
	243	195	2.6	35×35	
1000	199	160	3.0	35×40	
1200	166	133	3.4	35×45	
100	1990	1592	0.67	22×25	
315 (365) 2F	150	1327	1062	0.85	22×30
		1327	1062	0.85	25×25
	180	1106	885	0.96	22×35
		1106	885	0.96	25×30
	220	905	724	1.1	22×40
		905	724	1.1	25×35
		905	724	1.1	30×25
	270	737	590	1.2	22×45
		737	590	1.3	25×40
		737	590	1.3	30×30
		737	590	1.3	35×25
	330	603	483	1.4	25×45
		603	483	1.4	30×35
	390	511	409	1.6	25×50
		511	409	1.6	30×40
470	424	339	1.8	35×30	
	424	339	1.8	35×35	
560	356	285	2.0	30×50	
	356	285	2.0	35×40	
680	293	235	2.3	35×45	
82	2427	1941	0.64	22×25	
100	1990	1592	0.80	22×25	
120	1658	1372	0.82	22×30	
	1658	1372	0.81	25×25	

U _R (Surge Voltage) Code (V)	Rated Capacitance (μF)	Max ESR 20°C 120HZ (mΩ)	Typ ESR 20°C 120HZ (mΩ)	Rated Ripple Current 85°C 120HZ (Arms)	Size Φ DXL (mm)
350 (400) 2V	150	1327	1062	0.94	22×35
		1327	1062	0.94	25×30
	180	1106	885	1.1	22×40
		1106	885	1.1	30×25
	220	905	724	1.2	22×45
		905	724	1.2	25×35
		905	724	1.2	30×30
		905	724	1.3	35×25
	270	737	590	1.4	25×45
		737	590	1.4	30×35
	330	603	483	1.6	25×50
		603	483	1.6	35×30
	390	511	409	1.7	30×40
		511	409	1.8	35×35
	470	424	339	2.0	35×35
		424	339	2.0	35×40
	560	356	285	2.3	35×45
	680	293	235	2.6	35×50
	820	243	195	2.8	35×60
	68	2926	2341	0.55	22×25
82	2427	1941	0.65	22×25	
100	1990	1592	0.70	22×30	
	1990	1592	0.70	25×25	
120	1658	1327	0.79	22×35	
150	1327	1062	0.90	25×30	
	1327	1062	0.90	22×40	
	1327	1062	0.90	30×25	
180	1106	885	1.0	22×45	
	1106	885	1.0	25×35	
	1106	885	1.1	30×30	
	1106	885	1.2	35×25	
220	905	724	1.1	22×50	
	905	724	1.2	25×40	
	905	724	1.2	30×35	
270	737	590	1.3	25×45	
	737	590	1.4	25×50	
	737	590	1.5	30×40	
330	603	483	1.6	35×30	
	603	483	1.7	30×45	
390	511	409	1.8	35×35	
	511	409	1.8	30×50	
470	422	339	2.1	35×45	
560	356	285	2.3	35×50	
68	2926	2341	0.57	22×30	
82	2427	1941	0.68	25×35	
100	1990	1592	0.72	22×35	
	1990	1592	0.73	25×30	
120	1658	1327	0.8	22×40	
	1658	1327	0.83	25×35	
150	1327	1062	0.95	25×40	
	1327	1062	0.95	30×30	
	1327	1062	0.98	35×25	
	1106	885	1.1	25×45	
180	1106	885	1.1	30×35	
	1106	885	1.2	35×25	
	905	724	1.2	25×50	
220	905	724	1.3	30×40	
	905	724	1.3	35×30	
	737	590	1.4	30×45	
270	737	590	1.5	35×35	
	603	483	1.7	30×50	
330	511	409	1.9	35×45	
470	424	339	2.2	35×50	
500 (550) 2H	100	1990	1592	0.9	30×25
	120	1658	1327	1	30×30
		1658	1327	1	35×25

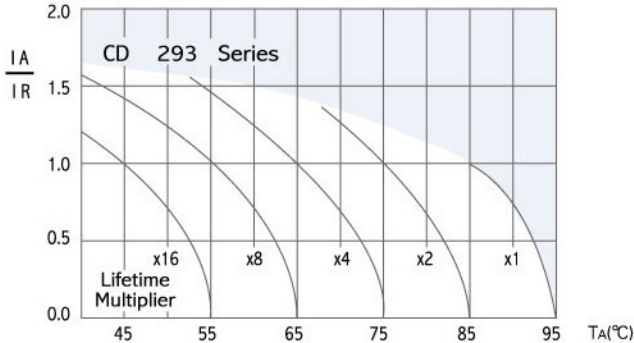
SNAP-IN/LUG



U _R (Surge Voltage) Code (V)	Rated Capacitance (μF)	Max ESR 20°C 120HZ (mΩ)	Typ ESR 20°C 120HZ (mΩ)	Rated Ripple Current 85°C 120HZ (Arms)	Size Φ DXL (mm)
500 (550) 2H	150	1327	1062	1.2	30×35
	180	1106	885	1.4	30×40
		1106	885	1.3	35×30
	220	905	724	1.6	30×45
		905	724	1.5	35×35
	270	737	590	1.8	30×50
		737	590	1.7	35×40
330	603	483	2.0	35×45	
390	511	409	2.3	35×50	
550 (600) 2Y	82	2120	1630	0.9	30×25
	100	1990	1592	0.9	30×25
	180	1106	885	1.4	30×40
	220	905	724	1.6	30×45
		1060	758	1.7	35×35
	330	603	483	2.0	35×40
600 (650) 2Z	68	2090	1520	0.8	25×35
	100	1870	1450	0.9	30×35
	150	1470	1110	1.2	30×45
	220	1225	890	1.7	35×50
	270	980	650	1.8	35×60

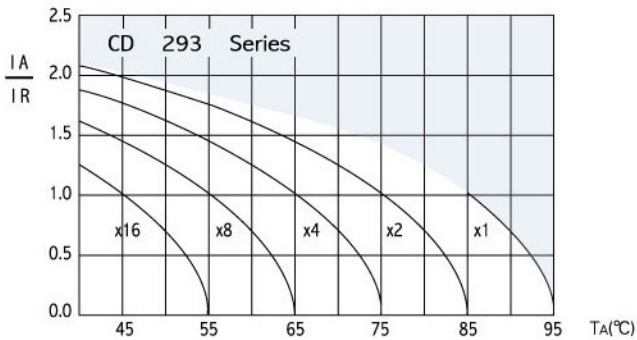
寿命曲线 Lifetime Diagram

Lifetime Diagram U_R ≥ 160V



I_A = actual ripple current at 120HZ, I_R = rated ripple current at 120HZ, 85°C
Multiplier of Useful Life as a function of ambient temperature and ripple current load

Lifetime Diagram U_R < 160V



I_A = actual ripple current at 120HZ, I_R = rated ripple current at 120HZ, 85°C
Multiplier of Useful Life as a function of ambient temperature and ripple current load