

Long-life grade capacitors**Applications**

- High reliability equipment in industrial and automotive electronics

Features

- High reliability and long useful life
- High ripple current capability

Construction

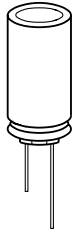
- Radial leads
- Charge-discharge proof, polar
- Aluminum case with insulating sleeve
- Minus pole marking on the insulating sleeve
- Stand off rubber seal
- Case with safety vent from diameter 6,3 mm

Delivery mode

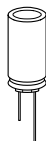
Special terminal configurations and packing:

- Bulk
- Taped, Ammo pack
- Cut
- Kinked
- PAPR (protection against polarity reversal)

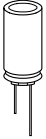
Refer to page 503 for further details and ordering example.



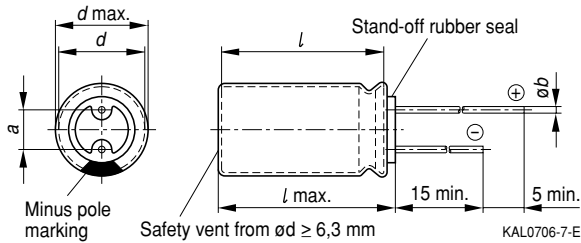
KAL0707-F


Specifications and characteristics in brief

Type	B41857	B43857
Rated voltage U_R	10 ... 100 VDC	160 ... 450 VDC
Surge voltage U_S	$1,15 \cdot U_R$	$1,1 \cdot U_R$
Rated capacitance C_R	0,47 ... 4 700 μF	0,47 ... 220 μF
Capacitance tolerance	$\pm 20 \% \triangleq \text{M}$	$\pm 20 \% \triangleq \text{M}$
Useful life		
105 °C; U_R ; I_{-R}	> 2 000 h for $d \leq 6,3 \text{ mm}$ > 3 000 h for $d = 8 \text{ mm}$ > 5 000 h for $d \geq 10 \text{ mm}$	
40 °C; U_R ; I_{-R}	> 200 000 h for $d \leq 6,3 \text{ mm}$ > 250 000 h for $d = 8 \text{ mm}$ > 350 000 h for $d \geq 10 \text{ mm}$	
Requirements:	$\Delta C/C \leq \pm 50 \% \text{ of initial value}$ $\tan \delta \leq 3 \text{ times initial specified limit}$ $I_L \leq \text{initial specified limit}$ Failure percentage: $\leq 1 \%$ Failure rate: $\leq 50 \text{ fit } (\leq 50 \cdot 10^{-9}/\text{h})$ (for definiton "fit", refer to chapter "Quality", page 62)	
Voltage endurance test		
105 °C; U_R	2 000 h for $d \leq 6,3 \text{ mm}$ 3 000 h for $d = 8 \text{ mm}$ 5 000 h for $d \geq 10 \text{ mm}$	
Post test requirements:	$\Delta C/C \leq \pm 30 \% \text{ of initial value}$ $\tan \delta \leq 2 \text{ times initial specified limit}$ $I_L \leq \text{initial specified limit}$	
Vibration resistance	To IEC 60068-2-6, test Fc: displacement amplitude 0,75 mm, frequency range 10 ... 2000 Hz, acceleration max. 10 g, duration $3 \times 2 \text{ h}$	
IEC climatic category	To IEC 60068-1: $U_R \leq 250 \text{ VDC}$: 40/105/56 (– 40 °C/+ 105 °C/56 days damp heat test) $U_R \geq 350 \text{ VDC}$: 25/105/56 (– 25 °C/+ 105 °C/56 days damp heat test)	
Sectional specification	IEC 60384-4	

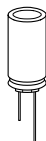


Dimensional drawings



Dimensions and weight

Dimensions (mm)				Approx. weight g
$d \times l$	$d_{\max} \times l_{\max}$	$a \pm 0,5$	b	
5 × 11	5,5 × 12	2,0	$0,50 \pm 0,05$	0,5
6,3 × 11	6,8 × 12	2,5	$0,50 \pm 0,05$	0,7
8 × 11	8,5 × 12	3,5	$0,60 \pm 0,05$	1,0
10 × 12,5	10,5 × 13,5	5,0	$0,60 \pm 0,05$	1,6
10 × 16	10,5 × 17	5,0	$0,60 \pm 0,05$	1,9
10 × 20	10,5 × 22	5,0	$0,60 \pm 0,05$	2,6
12,5 × 25	13 × 27	5,0	$0,60 \pm 0,05$	4,5
16 × 20	16,5 × 22	7,5	$0,80 \pm 0,05$	5,5
16 × 25	16,5 × 27	7,5	$0,80 \pm 0,05$	7,5
16 × 31,5	16,5 × 33,5	7,5	$0,80 \pm 0,05$	7,8
18 × 31,5	18,5 × 32,5	7,5	$0,80 \pm 0,1$	11
18 × 35	18,5 × 36	7,5	$0,80 \pm 0,1$	13
18 × 40	18,5 × 41	7,5	$0,80 \pm 0,1$	16

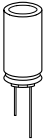

Overview of available types
B41857

U_R (VDC)	10	16	25	35	50	63	100
C_R (μF)	Case dimensions $d \times l$ (mm)						
0,47					5 × 11		5 × 11
1					5 × 11		5 × 11
2,2					5 × 11		5 × 11
3,3					5 × 11		5 × 11
4,7					5 × 11		5 × 11
10					5 × 11	6,3 × 11	8 × 11
22					6,3 × 11	6,3 × 11	10 × 12,5
33				5 × 11	6,3 × 11	8 × 11	10 × 16
47			5 × 11	6,3 × 11	8 × 11	8 × 11	10 × 20
100	5 × 11	6,3 × 11	6,3 × 11	8 × 11	10 × 12,5	10 × 12,5	12,5 × 25
220	6,3 × 11	8 × 11	10 × 12,5	10 × 12,5	10 × 20	10 × 20	16 × 25
330	8 × 11	10 × 12,5	10 × 12,5	10 × 16	10 × 20	12,5 × 25	16 × 31,5
470	10 × 12,5	10 × 16	10 × 20	10 × 20	12,5 × 25	16 × 20	16 × 31,5
1 000	10 × 16	10 × 20	12,5 × 25	16 × 20	16 × 31,5	18 × 31,5	
2 200	12,5 × 25	16 × 20	16 × 25	16 × 31,5	18 × 40		
3 300	16 × 20	16 × 25	16 × 31,5	18 × 35			
4 700	16 × 25	16 × 31,5	18 × 35				

B43857

U_R (VDC)	160	200	250	350	450
C_R (μF)	Case dimensions $d \times l$ (mm)				
0,47	6,3 × 11	6,3 × 11	6,3 × 11	8 × 11	
1	6,3 × 11	6,3 × 11	8 × 11	8 × 11	10 × 12,5
2,2	8 × 11	8 × 11	8 × 11	10 × 12,5	10 × 16
3,3	10 × 12,5	10 × 12,5	10 × 16	10 × 16	10 × 20
4,7	10 × 12,5	10 × 12,5	10 × 16	10 × 20	12,5 × 25
10	10 × 16	10 × 16	10 × 20	10 × 20	16 × 25
22	10 × 20	10 × 20	16 × 20	16 × 25	16 × 31,5
33	10 × 20	12,5 × 25	16 × 25	16 × 31,5	18 × 35
47	12,5 × 25	16 × 20	16 × 31,5	16 × 31,5	18 × 40
100	16 × 25	16 × 31,5	18 × 35	18 × 40	
220	18 × 35	18 × 40			

Other voltage and capacitance ratings are also available upon request.



Technical data and ordering codes

U_R	C_R	Case dimensions	I_L	$\tan \delta_{\max}$	$ESR_{\max}$	$I_{\sim R}$	Ordering code ¹⁾
	120 Hz		5 min	120 Hz	120 Hz	120 Hz	
	20 °C	$d \times l$	20 °C	20 °C	20 °C	105 °C	
VDC	μF	mm	μA		Ω	mA	

B41857

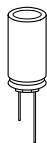
10	100	5 × 11	20	0,20	3,3	98	B41857A3107M00*
	220	6,3 × 11	32	0,20	1,5	167	B41857A3227M00*
	330	8 × 11	43	0,20	1,0	237	B41857A3337M00*
	470	10 × 12,5	57	0,20	0,71	333	B41857A3477M00*
	1 000	10 × 16	110	0,20	0,33	532	B41857A3108M00*
	2 200	12,5 × 25	230	0,22	0,17	1077	B41857A3228M00* ²⁾
	3 300	16 × 20	340	0,24	0,12	1375	B41857A3338M00* ²⁾
	4 700	16 × 25	480	0,26	0,09	1782	B41857A3478M00* ²⁾
16	100	6,3 × 11	26	0,17	2,8	119	B41857A4107M00*
	220	8 × 11	45	0,17	1,3	204	B41857A4227M00*
	330	10 × 12,5	63	0,17	0,85	294	B41857A4337M00*
	470	10 × 16	85	0,17	0,60	385	B41857A4477M00*
	1 000	10 × 20	170	0,17	0,28	612	B41857A4108M00*
	2 200	16 × 20	362	0,19	0,14	1184	B41857A4228M00*
	3 300	16 × 25	538	0,21	0,11	1574	B41857A4338M00* ²⁾
	4 700	16 × 31,5	762	0,23	0,08	2055	B41857A4478M00* ²⁾
25	47	5 × 11	22	0,15	5,3	75	B41857A5476M00*
	100	6,3 × 11	35	0,15	2,5	126	B41857A5107M00*
	220	10 × 12,5	65	0,15	1,1	255	B41857A5227M00*
	330	10 × 12,5	93	0,15	0,75	312	B41857A5337M00*
	470	10 × 20	128	0,15	0,53	445	B41857A5477M00*
	1 000	12,5 × 25	260	0,15	0,25	812	B41857A5108M00*
	2 200	16 × 25	560	0,17	0,13	1363	B41857A5228M00*
	3 300	16 × 31,5	835	0,19	0,10	1814	B41857A5338M00*
	4 700	18 × 35	1185	0,21	0,07	2440	B41857A5478M00*

Preferred types

1) * = "0" for bulk version.

For taping versions, other lead configurations and packing information see page 503.

2) Type available upon request


Technical data and ordering codes

U_R	C_R 120 Hz 20 °C μF	Case dimensions $d \times l$ mm	I_L 5 min 20 °C μA	$\tan \delta_{\max}$ 120 Hz 20 °C	$ESR_{\max}$ 120 Hz 20 °C Ω	$I_{\sim R}$ 120 Hz 105 °C mA	Ordering code ¹⁾
VDC							
35	33	5 × 11	22	0,12	6,0	67	B41857A7336M00*
	47	6,3 × 11	26	0,12	4,2	92	B41857A7476M00*
	100	8 × 11	45	0,12	2,0	156	B41857A7107M00*
	220	10 × 12,5	87	0,12	0,90	273	B41857A7227M00*
	330	10 × 16	126	0,12	0,60	366	B41857A7337M00*
	470	10 × 20	175	0,12	0,42	476	B41857A7477M00*
	1 000	16 × 20	360	0,12	0,20	905	B41857A7108M00*
	2 200	16 × 31,5	780	0,14	0,11	1584	B41857A7228M00*
	3 300	18 × 35	1165	0,16	0,08	2185	B41857A7338M00*
50	0,47	5 × 11	10	0,10	353	8,0	B41857A6474M00*
	1,0	5 × 11	11	0,10	166	12	B41857A6105M00*
	2,2	5 × 11	11	0,10	75	17	B41857A6225M00*
	3,3	5 × 11	12	0,10	50	21	B41857A6335M00*
	4,7	5 × 11	12	0,10	35	25	B41857A6475M00*
	10	5 × 11	15	0,10	17	37	B41857A6106M00*
	22	6,3 × 11	21	0,10	7,5	63	B41857A6226M00*
	33	6,3 × 11	27	0,10	5,0	77	B41857A6336M00*
	47	8 × 11	34	0,10	3,5	107	B41857A6476M00*
	100	10 × 12,5	60	0,10	1,7	184	B41857A6107M00*
	220	10 × 20	120	0,10	0,75	326	B41857A6227M00*
	330	10 × 20	175	0,10	0,50	399	B41857A6337M00*
	470	12,5 × 25	245	0,10	0,35	595	B41857A6477M00*
	1 000	16 × 31,5	510	0,10	0,17	1068	B41857A6108M00*
	2 200	18 × 40	1110	0,12	0,09	1883	B41857A6228M00*

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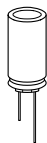
Technical data and ordering codes

U_R	C_R 120 Hz 20 °C μF	Case dimensions $d \times l$ mm	I_L 5 min 20 °C μA	$\tan \delta_{max}$ 120 Hz 20 °C	ESR_{max} 120 Hz 20 °C Ω	$I_{\sim R}$ 120 Hz 105 °C mA	Ordering code ¹⁾
VDC							
63	10	6,3 × 11	16	0,10	17	44	B41857A8106M00*
	22	6,3 × 11	24	0,10	7,5	65	B41857A8226M00*
	33	8 × 11	31	0,10	5,0	93	B41857A8336M00*
	47	8 × 11	40	0,10	3,5	111	B41857A8476M00*
	100	10 × 12,5	73	0,10	1,7	191	B41857A8107M00*
	220	10 × 20	149	0,10	0,75	338	B41857A8227M00*
	330	12,5 × 25	218	0,10	0,50	517	B41857A8337M00*
	470	16 × 20	306	0,10	0,35	644	B41857A8477M00*
	1 000	18 × 31,5	640	0,10	0,17	1190	B41857A8108M00*
100	0,47	5 × 11	10	0,08	282	9,1	B41857A9474M00*
	1,0	5 × 11	11	0,08	133	13	B41857A9105M00*
	2,2	5 × 11	12	0,08	60	20	B41857A9225M00*
	3,3	5 × 11	13	0,08	40	24	B41857A9335M00*
	4,7	5 × 11	15	0,08	28	29	B41857A9475M00*
	10	8 × 11	20	0,08	13	56	B41857A9106M00*
	22	10 × 12,5	32	0,08	6,0	97	B41857A9226M00*
	33	10 × 16	43	0,08	4,0	130	B41857A9336M00*
	47	10 × 20	57	0,08	2,8	170	B41857A9476M00*
	100	12,5 × 25	110	0,08	1,3	310	B41857A9107M00*
	220	16 × 25	230	0,08	0,60	520	B41857A9227M00*
	330	16 × 31,5	340	0,08	0,40	692	B41857A9337M00*
	470	16 × 31,5	480	0,08	0,28	826	B41857A9477M00*

Preferred types

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For taping versions, other lead configurations and packing information see page 503.


Technical data and ordering codes

U_R	C_R	Case dimensions	I_L	$\tan \delta_{\max}$	$ESR_{\max}$	$I_{\sim R}$	Ordering code ¹⁾
	120 Hz		5 min	120 Hz	120 Hz	120 Hz	
	20 °C	$d \times l$	20 °C	20 °C	20 °C	105 °C	
VDC	μF	mm	μA		Ω	mA	

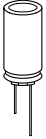
B43857

160	0,47	$6,3 \times 11$	52	0,20	706	10	B43857A1474M00*
	1,0	$6,3 \times 11$	55	0,20	332	15	B43857A1105M00*
	2,2	8×11	61	0,20	151	25	B43857A1225M00*
	3,3	$10 \times 12,5$	66	0,20	101	36	B43857A1335M00*
	4,7	$10 \times 12,5$	73	0,20	71	43	B43857A1475M00*
	10	10×16	98	0,20	33	69	B43857A1106M00*
	22	10×20	156	0,20	15	111	B43857A1226M00*
	33	10×20	208	0,20	10	136	B43857A1336M00*
	47	$12,5 \times 25$	276	0,20	7,1	203	B43857A1476M00*
	100	16×25	530	0,20	3,3	336	B43857A1107M00*
	220	18×35	1106	0,20	1,5	609	B43857A1227M00*
200	0,47	$6,3 \times 11$	53	0,20	706	10	B43857A2474M00*
	1,0	$6,3 \times 11$	56	0,20	332	15	B43857A2105M00*
	2,2	8×11	63	0,20	151	25	B43857A2225M00*
	3,3	$10 \times 12,5$	70	0,20	101	36	B43857A2335M00*
	4,7	$10 \times 12,5$	78	0,20	71	43	B43857A2475M00*
	10	10×16	110	0,20	33	69	B43857A2106M00*
	22	10×20	182	0,20	15	111	B43857A2226M00*
	33	$12,5 \times 25$	248	0,20	10	170	B43857A2336M00*
	47	16×20	332	0,20	7,1	212	B43857A2476M00*
	100	$16 \times 31,5$	650	0,20	3,3	365	B43857A2107M00*
	220	18×40	1370	0,20	1,5	643	B43857A2227M00*

Preferred types

1) * = "0" for bulk version.

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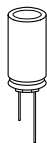


U_R	C_R 120 Hz 20 °C μF	Case dimensions $d \times l$ mm	I_L 5 min 20 °C μA	$\tan \delta_{max}$ 120 Hz 20 °C	ESR_{max} 120 Hz 20 °C Ω	I_{-R} 120 Hz 105 °C mA	Ordering code ¹⁾
VDC							
250	0,47	6,3 × 11	54	0,20	706	10	B43857F2474M00*
	1,0	8 × 11	58	0,20	332	17	B43857F2105M00*
	2,2	8 × 11	67	0,20	151	25	B43857F2225M00*
	3,3	10 × 16	75	0,20	101	39	B43857F2335M00*
	4,7	10 × 16	85	0,20	71	47	B43857F2475M00*
	10	10 × 20	125	0,20	33	75	B43857F2106M00*
	22	16 × 20	215	0,20	15	145	B43857F2226M00*
	33	16 × 25	298	0,20	10	193	B43857F2336M00*
	47	16 × 31,5	403	0,20	7,1	250	B43857K2476M00*
	100	18 × 35	800	0,20	3,3	411	B43857F2107M00*
350	0,47	8 × 11	55	0,24	847	11	B43857A4474M00*
	1,0	8 × 11	61	0,24	398	16	B43857A4105M00*
	2,2	10 × 12,5	73	0,24	181	28	B43857A4225M00*
	3,3	10 × 16	85	0,24	121	38	B43857A4335M00*
	4,7	10 × 20	99	0,24	85	49	B43857A4475M00*
	10	10 × 20	155	0,24	40	72	B43857A4106M00*
	22	16 × 25	281	0,24	18	151	B43857A4226M00*
	33	16 × 31,5	397	0,24	12	201	B43857A4336M00*
	47	16 × 31,5	544	0,24	8,5	240	B43857A4476M00*
	100	18 × 40	1100	0,24	4,0	417	B43857A4107M00*
450	1,0	10 × 12,5	64	0,24	398	18	B43857A5105M00*
	2,2	10 × 16	80	0,24	181	30	B43857A5225M00*
	3,3	10 × 20	95	0,24	121	40	B43857A5335M00*
	4,7	12,5 × 25	113	0,24	85	60	B43857A5475M00*
	10	16 × 25	185	0,24	40	98	B43857A5106M00*
	22	16 × 31,5	347	0,24	18	159	B43857A5226M00*
	33	18 × 35	496	0,24	12	219	B43857A5336M00*
	47	18 × 40	685	0,24	8,5	275	B43857A5476M00*

Preferred types

1) * = "0" for bulk version.

For taping versions, other lead configurations and packing information see page 503.

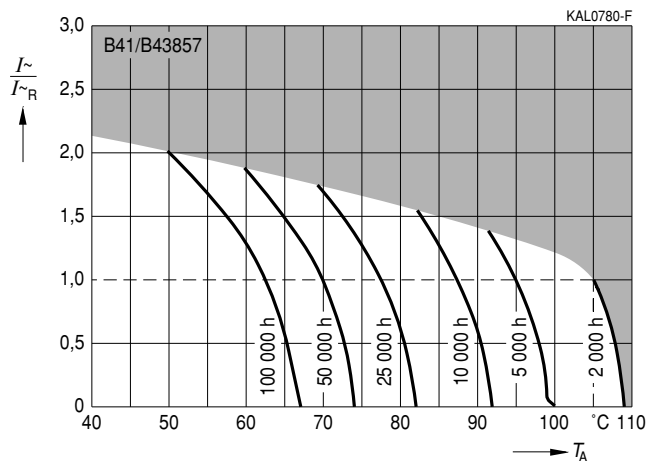


B41857 / B43857

High Reliability – 105 °C

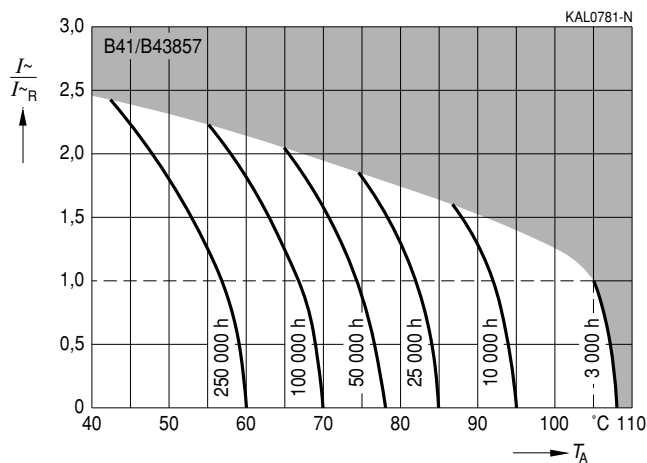
Useful life

depending on ambient temperature T_A under ripple current operating conditions¹⁾
for diameter $\leq 6,3$ mm

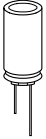


Useful life

depending on ambient temperature T_A under ripple current operating conditions¹⁾
for diameter = 8 mm

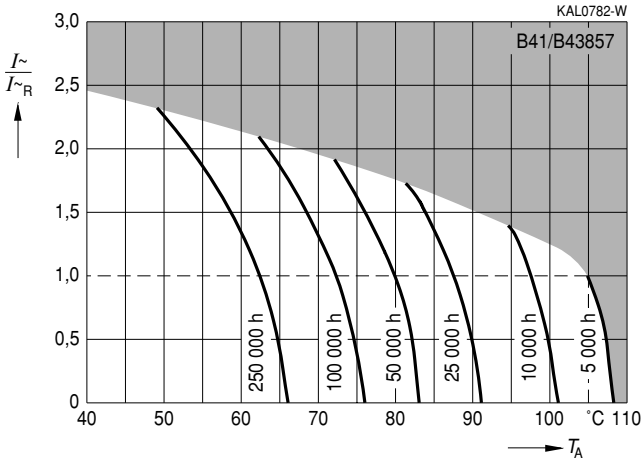


1) Refer to page 40 for an explanation on how to interpret the useful life graphs.

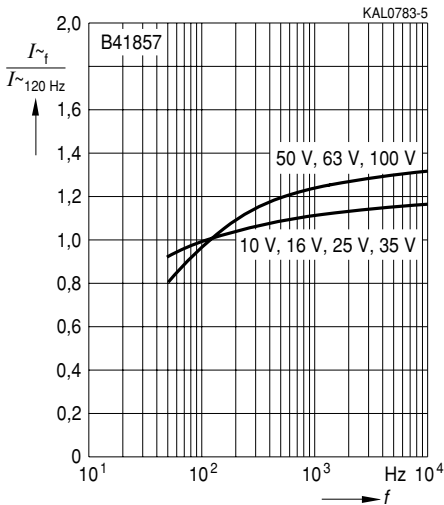


Useful life

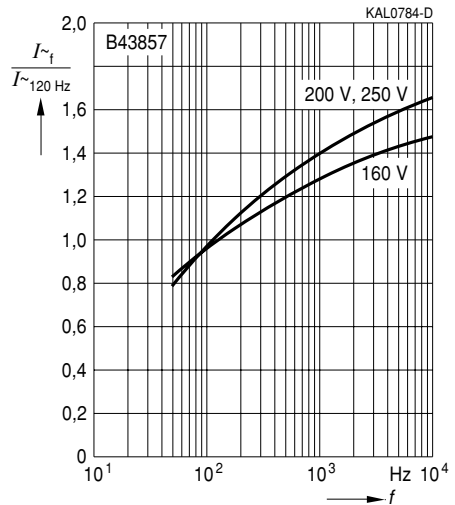
depending on ambient temperature T_A under ripple current operating conditions¹⁾
for diameter ≥ 10 mm



**Frequency factor of
permissible ripple current $I_{\sim}$
versus frequency f**
 $U_R \leq 100$ VDC



**Frequency factor of
permissible ripple current $I_{\sim}$
versus frequency f**
 $U_R \geq 160$ VDC



1) Refer to page 40 for an explanation on how to interpret the useful life graphs.

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