

## 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

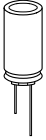

**B41857 / B43857**
**High Reliability – 105 °C**
**Specifications and characteristics in brief**

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 $\mu\text{F}$	0,47 ... 220 $\mu\text{F}$
Capacitance tolerance	$\pm 20 \% \triangleq \text{M}$	$\pm 20 \% \triangleq \text{M}$
Useful life		
105 °C; $U_R$ ; $I_{-R}$	<ul style="list-style-type: none"> <li>&gt; 2 000 h for <math>d \leq 6,3</math> mm</li> <li>&gt; 3 000 h for <math>d = 8</math> mm</li> <li>&gt; 5 000 h for <math>d \geq 10</math> mm</li> </ul>	
40 °C; $U_R$ ; $I_{-R}$	<ul style="list-style-type: none"> <li>&gt; 200 000 h for <math>d \leq 6,3</math> mm</li> <li>&gt; 250 000 h for <math>d = 8</math> mm</li> <li>&gt; 350 000 h for <math>d \geq 10</math> mm</li> </ul>	
Requirements:	$\Delta C/C \leq \pm 50 \%$ of initial value $\tan \delta \leq 3$ times initial specified limit $I_L \leq$ initial specified limit Failure percentage: $\leq 1 \%$ Failure rate: $\leq 50$ fit ( $\leq 50 \cdot 10^{-9}/\text{h}$ ) (for definiton "fit", refer to chapter "Quality", page 62)	
Voltage endurance test		
105 °C; $U_R$	<ul style="list-style-type: none"> <li>2 000 h for <math>d \leq 6,3</math> mm</li> <li>3 000 h for <math>d = 8</math> mm</li> <li>5 000 h for <math>d \geq 10</math> mm</li> </ul>	
Post test requirements:	$\Delta C/C \leq \pm 30 \%$ of initial value $\tan \delta \leq 2$ times initial specified limit $I_L \leq$ 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 $3 \times 2$ h	
IEC climatic category	To IEC 60068-1: $U_R \leq 250$ VDC: 40/105/56 (– 40 °C/+ 105 °C/56 days damp heat test) $U_R \geq 350$ 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 ± 0,05	0,5
6,3 × 11	6,8 × 12	2,5	0,50 ± 0,05	0,7
8 × 11	8,5 × 12	3,5	0,60 ± 0,05	1,0
10 × 12,5	10,5 × 13,5	5,0	0,60 ± 0,05	1,6
10 × 16	10,5 × 17	5,0	0,60 ± 0,05	1,9
10 × 20	10,5 × 22	5,0	0,60 ± 0,05	2,6
12,5 × 25	13 × 27	5,0	0,60 ± 0,05	4,5
16 × 20	16,5 × 22	7,5	0,80 ± 0,05	5,5
16 × 25	16,5 × 27	7,5	0,80 ± 0,05	7,5
16 × 31,5	16,5 × 33,5	7,5	0,80 ± 0,05	7,8
18 × 31,5	18,5 × 32,5	7,5	0,80 ± 0,1	11
18 × 35	18,5 × 36	7,5	0,80 ± 0,1	13
18 × 40	18,5 × 41	7,5	0,80 ± 0,1	16



**B41857 / B43857**

**High Reliability – 105 °C**

**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 <sup>1)</sup>
	120 Hz 20 °C	$d \times l$	5 min 20 °C	120 Hz 20 °C	120 Hz 20 °C	120 Hz 105 °C	
VDC	$\mu\text{F}$	mm	$\mu\text{A}$		$\Omega$	mA	

**B41857**

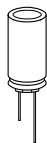
10	100	5 × 11	20	0,20	3,3	98	B41857A3107M00*
	220	6,3 × 11	32	0,20	1,5	167	B41857A3227M00*
	330	8 × 11	43	0,20	1,0	237	B41857A3337M00*
	470	10 × 12,5	57	0,20	0,71	333	B41857A3477M00*
	1 000	10 × 16	110	0,20	0,33	532	B41857A3108M00*
	2 200	12,5 × 25	230	0,22	0,17	1077	B41857A3228M00* <sup>2)</sup>
	3 300	16 × 20	340	0,24	0,12	1375	B41857A3338M00* <sup>2)</sup>
	4 700	16 × 25	480	0,26	0,09	1782	B41857A3478M00* <sup>2)</sup>
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* <sup>2)</sup>
	4 700	16 × 31,5	762	0,23	0,08	2055	B41857A4478M00* <sup>2)</sup>
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

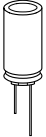

**B41857 / B43857**
**High Reliability – 105 °C**
**Technical data and ordering codes**

$U_R$	$C_R$ 120 Hz 20 °C VDC $\mu\text{F}$	Case dimensions $d \times l$ mm	$I_L$ 5 min 20 °C $\mu\text{A}$	$\tan \delta_{\max}$ 120 Hz 20 °C	$ESR_{\max}$ 120 Hz 20 °C $\Omega$	$I_{\sim R}$ 120 Hz 105 °C mA	Ordering code <sup>1)</sup>
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
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*

Preferred types

1) \* = "0" for bulk version.

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

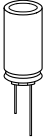

**Technical data and ordering codes**

$U_R$	$C_R$ 120 Hz 20 °C $\mu\text{F}$	Case dimensions $d \times l$ mm	$I_L$ 5 min 20 °C $\mu\text{A}$	$\tan \delta_{\max}$ 120 Hz 20 °C	$ESR_{\max}$ 120 Hz 20 °C $\Omega$	$I_{\sim R}$ 120 Hz 105 °C mA	Ordering code <sup>1)</sup>
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

1) \* = "0" for bulk version.

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


**B41857 / B43857**
**High Reliability – 105 °C**
**Technical data and ordering codes**

$U_R$	$C_R$	Case dimensions	$I_L$	$\tan \delta_{\max}$	$ESR_{\max}$	$I_{\sim R}$	Ordering code <sup>1)</sup>
	120 Hz	$d \times l$	5 min	120 Hz	120 Hz	120 Hz	
VDC	20 °C	mm	20 °C	20 °C	20 °C	105 °C	
	$\mu\text{F}$		$\mu\text{A}$		$\Omega$	mA	

**B43857**

160	0,47	6,3 × 11	52	0,20	706	10	B43857A1474M00*
	1,0	6,3 × 11	55	0,20	332	15	B43857A1105M00*
	2,2	8 × 11	61	0,20	151	25	B43857A1225M00*
	3,3	10 × 12,5	66	0,20	101	36	B43857A1335M00*
	4,7	10 × 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 × 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 × 11	53	0,20	706	10	B43857A2474M00*
	1,0	6,3 × 11	56	0,20	332	15	B43857A2105M00*
	2,2	8 × 11	63	0,20	151	25	B43857A2225M00*
	3,3	10 × 12,5	70	0,20	101	36	B43857A2335M00*
	4,7	10 × 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 × 25	248	0,20	10	170	B43857A2336M00*
	47	16 × 20	332	0,20	7,1	212	B43857A2476M00*
		100	16 × 31,5	650	0,20	3,3	365
	220	18 × 40	1370	0,20	1,5	643	B43857A2227M00*

Preferred types

1) \* = "0" for bulk version.

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



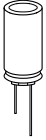


$U_R$	$C_R$ 120 Hz 20 °C $\mu\text{F}$	Case dimensions $d \times l$ mm	$I_L$ 5 min 20 °C $\mu\text{A}$	$\tan \delta_{\text{max}}$ 120 Hz 20 °C	$ESR_{\text{max}}$ 120 Hz 20 °C $\Omega$	$I_{-R}$ 120 Hz 105 °C mA	Ordering code 1)
250	0,47	6,3 × 11	54	0,20	706	10	B43857F2474M00*
	1,0	8 × 11	58	0,20	332	17	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.

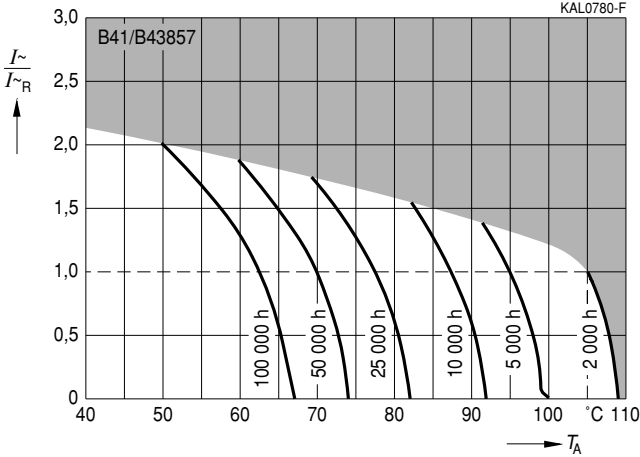


B41857 / B43857

High Reliability – 105 °C

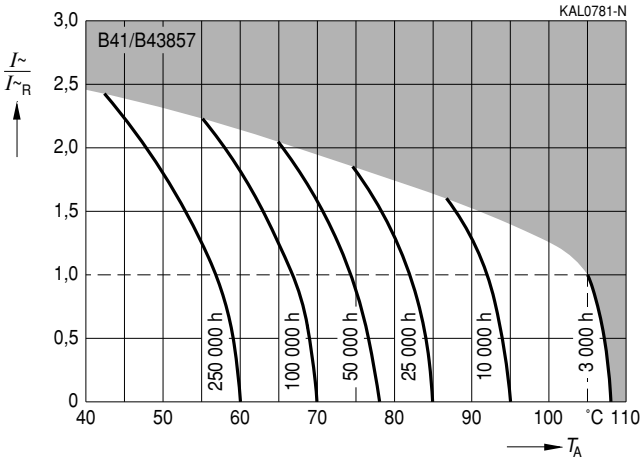
**Useful life**

depending on ambient temperature  $T_A$  under ripple current operating conditions<sup>1)</sup>  
for diameter  $\leq 6,3$  mm



**Useful life**

depending on ambient temperature  $T_A$  under ripple current operating conditions<sup>1)</sup>  
for diameter = 8 mm

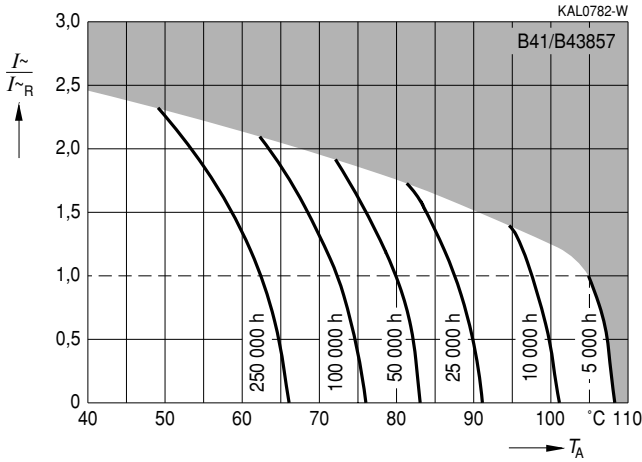


1) Refer to page 40 for an explanation on how to interpret the useful life graphs.

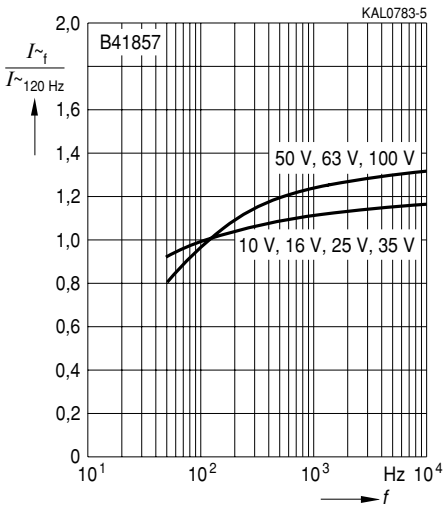


**Useful life**

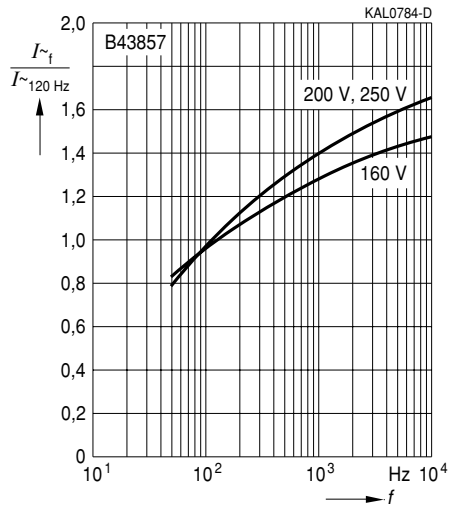
depending on ambient temperature  $T_A$  under ripple current operating conditions<sup>1)</sup>  
for diameter  $\geq 10$  mm



**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.

**Herausgegeben von EPCOS AG**

**Unternehmenskommunikation, Postfach 80 17 09, 81617 München, DEUTSCHLAND**

**☎ ++49 89 636 09, FAX (0 89) 636-2 26 89**

© EPCOS AG 2002. Vervielfältigung, Veröffentlichung, Verbreitung und Verwertung dieser Broschüre und ihres Inhalts ohne ausdrückliche Genehmigung der EPCOS AG nicht gestattet.

Bestellungen unterliegen den vom ZVEI empfohlenen Allgemeinen Lieferbedingungen für Erzeugnisse und Leistungen der Elektroindustrie, soweit nichts anderes vereinbart wird.

Diese Broschüre ersetzt die vorige Ausgabe.

Fragen über Technik, Preise und Liefermöglichkeiten richten Sie bitte an den Ihnen nächstgelegenen Vertrieb der EPCOS AG oder an unsere Vertriebsgesellschaften im Ausland. Bauelemente können aufgrund technischer Erfordernisse Gefahrstoffe enthalten. Auskünfte darüber bitten wir unter Angabe des betreffenden Typs ebenfalls über die zuständige Vertriebsgesellschaft einzuholen.

**Published by EPCOS AG**

**Corporate Communications, P.O. Box 80 17 09, 81617 Munich, GERMANY**

**☎ ++49 89 636 09, FAX (0 89) 636-2 26 89**

© EPCOS AG 2002. Reproduction, publication and dissemination of this brochure and the information contained therein without EPCOS' prior express consent is prohibited.

Purchase orders are subject to the General Conditions for the Supply of Products and Services of the Electrical and Electronics Industry recommended by the ZVEI (German Electrical and Electronic Manufacturers' Association), unless otherwise agreed.

This brochure replaces the previous edition.

For questions on technology, prices and delivery please contact the Sales Offices of EPCOS AG or the international Representatives.

Due to technical requirements components may contain dangerous substances. For information on the type in question please also contact one of our Sales Offices.