TYP 101

(25-100V) 10.000 / 15.000 Std. 85°C

TYP 102

(200-450V) 10.000 Std. 85°C

PARAMETERÜBERSICHT		
DESCRIPTION	VALUE	
	101	102
Nominal case size (Ø D x L in mm)	35 x 60 to 90 x 220	
Rated capacitance range (E6 series), C_R	220 µF to 1 F	
Tolerance on C_R	± 20 %	
Rated voltage range, U_R	25 V to 100 V	200 V to 450 V
Category temperature range	-40 °C to +85 °C	
Endurance test at 85 °C	2000 h	
Useful life at 85 °C	10 000 h (D ≤ 50 mm) 15 000 h (D ≥ 65 mm)	10 000 h
Useful life at 40 °C, 1.4 x I_R applied	400 000 h (D ≤ 50 mm) 600 000 h (D ≥ 65 mm)	400 000 h
Shelf life at 0 V, 85 °C	500 h	
Based on sectional specification	IEC 60384-4 / EN 130300	
Climatic category IEC 60068	40 / 085 / 056	

Aluminium Elko für die Leistungselektronik

- Hohe Volumenkapazität, geringe Montagekosten.
- Robuste Schraubanschlüsse M5 und M6.
- Innenliegende Mehrfachkontaktierung für geringen ESR. Long Life Technik 85°C.
- Fixierung mit Bodenbolzen und isolierender Hutmutter oder Schelle bzw. Kondensatorhaltering.

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Bauformen:

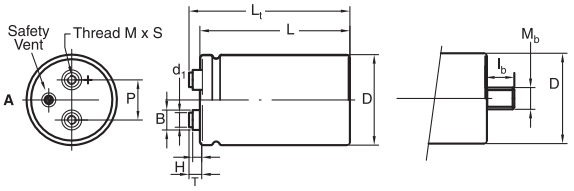

Fig. 2 **A**:

Standard M5 disc: Screw Terminal (ST) and Screw Terminal Bolt nut (STB)

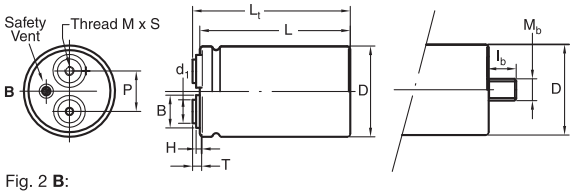

Fig. 2 **B**:

High current M6 disc: Screw Terminal (ST) and Screw Terminal Bolt nut (STB)

ABMESSUNGEN (mm)														
DESIGN	DRAWING	L ± 1	L_t ± 1	D ± 1	P ± 0.3	T ± 0.2	H ± 0.3	B ± 0.3	d_1 ± 0.1	M	S - 0	M_b	l_b ± 0.1	MASS (g)
35 x 60	2A	63.3	68.7	35.3	12.8	7	4.6	11	7.9	M5	9.5	M8	12	75
35 x 80	2A	81.3	86.7	35.3	12.8	7	4.6	11	7.9	M5	9.5	M8	12	95
35 x 105	2A	103.3	108.7	35.3	12.8	7	4.6	11	7.9	M5	9.5	M8	12	130
50 x 80	2A	82.8	88.8	51	22.2	7.1	4.8	11	7.9	M5	9.5	M12	16	200
50 x 105	2A	104.8	110.8	51	22.2	7.1	4.8	11	7.9	M5	9.5	M12	16	300
65 x 105	2A	104.8	110.7	65	28.5	7	4.6	11.9	7.9	M5	9.5	M12	16	480
65 x 105 HC	2B	104.8	109.2	65	28.5	5.5	3.5	18	13	M6	8.5	M12	16	480
76 x 105	2A	105.8	111.7	76.4	31.8	7	4.6	11.7	7.9	M5	9.5	M12	16	700
76 x 105 HC	2B	105.8	110.2	76.4	31.8	5.5	3.5	18.3	13	M6	8.5	M12	16	700
76 x 146	2A	145.8	151.7	76.4	31.8	7	4.6	11.7	7.9	M5	9.5	M12	16	1000
76 x 146 HC	2B	145.8	150.2	76.4	31.8	5.5	3.5	18.3	13	M6	8.5	M12	16	1000
76 x 220	2A	219.8	225.7	76.4	31.8	7	4.6	11.7	7.9	M5	9.5	M12	16	1500
76 x 220 HC	2B	219.8	224.2	76.4	31.8	5.5	3.5	18.3	13	M6	8.5	M12	16	1500
90 x 146 HC	2B	150.1	155.4	89.4	31.8	7.9	0	13	13	M6	10	M12	16	1300
90 x 220 HC	2B	218.1	223.4	89.4	31.8	7.9	0	13	13	M6	10	M12	16	2000

Note

- For bolt version holds:
  L = L standard - 0.5 mm
  L_t = L_t standard - 0.5 mm

Anschlußgewinde M5 mit Auflagedurchmesser 13 mm für Körperdurchmesser 50, 65, 76 mm auf Anfrage.

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TYP 101

ELECTRICAL DATA AND ORDERING INFORMATION / WERTETABELLE							
U_R (V)	C_R 100 Hz (µF)	NOMINAL CASE SIZE Ø D x L (mm)	I_R 100 Hz 85 °C (A)	I_{L5} 5 min (mA)	ESR MAX. 100 Hz (mΩ)	Z MAX. 20 kHz (mΩ)	LIFE CODE (1)
25	15 000	35 x 60	7.7	0.75	29	22	L1
	22 000	35 x 60	8.3	1.10	27	22	L1
	33 000	35 x 80	9.0	1.65	19	17	L1
	33 000	50 x 80	10.0	1.65	17	14	L1
	47 000	35 x 105	12.1	2.35	15	13	L1
	47 000	50 x 80	14.8	2.35	12	10	L1
	68 000	50 x 80	12.8	3.40	15	13	L1
	68 000	50 x 105	17.1	3.40	9	8	L1
	100 000	50 x 105	14.7	5.00	12	11	L1
	100 000	65 x 105	19.6	5.00	7	6	L2
	150 000	65 x 105	17.6	7.50	8	7	L2
	150 000	76 x 105	21.4	7.50	6	5	L2
	220 000	65 x 105	20.2	11.0	6	5	L2
	220 000	76 x 105	22.5	11.0	6	5	L2
	330 000	76 x 146	25.8	16.5	4	4	L2
	470 000	76 x 220	29.9	23.5	5	5	L2
	470 000	90 x 146	38.2	23.5	5	5	L2
	680 000	76 x 220	29.0	34.0	5	5	L2
	1 000 000	90 x 220	46.6	50.0	5	5	L2
40	10 000	35 x 60	7.1	0.80	31	23	L1
	15 000	35 x 60	7.8	1.20	28	22	L1
	15 000	35 x 80	8.7	1.20	22	17	L1
	22 000	35 x 80	9.4	1.76	20	17	L1
	22 000	50 x 80	11.2	1.76	19	15	L1
	33 000	35 x 105	11.0	2.64	15	13	L1
	33 000	50 x 80	13.7	2.64	13	10	L1
	47 000	50 x 80	14.6	3.76	12	10	L1
	47 000	50 x 105	15.9	3.76	10	8	L1
	68 000	50 x 105	16.9	5.44	9	8	L1
	68 000	65 x 105	18.1	5.44	7	6	L2
	100 000	65 x 105	19.2	8.0	7	6	L2
	100 000	76 x 105	21.3	8.0	7	6	L2
	150 000	76 x 105	20.5	12.0	7	6	L2
	150 000	76 x 146	24.0	12.0	5	5	L2
	220 000	76 x 146	24.5	17.6	5	5	L2
	330 000	76 x 220	28.2	26.4	5	5	L2
	330 000	90 x 146	38.6	26.4	5	5	L2
	470 000	90 x 220	41.5	37.6	5	5	L2

TYP 101

ELECTRICAL DATA AND ORDERING INFORMATION / WERTETABELLE							
U_R (V)	C_R 100 Hz (µF)	NOMINAL CASE SIZE Ø D x L (mm)	I_R 100 Hz 85 °C (A)	I_{L5} 5 min (mA)	ESR MAX. 100 Hz (mΩ)	Z MAX. 20 kHz (mΩ)	LIFE CODE (1)
63	4700	35 x 60	5.9	0.59	42	25	L1
	6800	35 x 60	6.6	0.86	38	25	L1
	6800	35 x 80	7.3	0.86	30	19	L1
	10 000	35 x 80	8.1	1.26	27	19	L1
	10 000	35 x 105	8.8	1.26	22	14	L1
	15 000	35 x 105	9.7	1.89	19	14	L1
	15 000	50 x 80	12.1	1.89	16	11	L1
	22 000	50 x 80	11.1	2.77	19	15	L1
	22 000	50 x 105	14.3	2.77	12	9	L1
	33 000	50 x 105	12.9	4.16	14	12	L1
	33 000	65 x 105	16.5	4.16	9	6	L2
	47 000	65 x 105	15.6	5.92	10	8	L2
	47 000	76 x 105	18.6	5.92	8	6	L2
	68 000	76 x 105	20.0	8.57	7	6	L2
	68 000	76 x 146	21.9	8.57	6	5	L2
	100 000	76 x 146	23.4	12.6	5	5	L2
	150 000	76 x 146	22.2	18.9	6	5	L2
	220 000	76 x 220	27.0	27.7	5	5	L2
	220 000	90 x 146	36.5	27.7	5	5	L2
	330 000	90 x 220	42.9	41.6	5	5	L2
100	2200	35 x 60	5.2	0.44	50	29	L1
	3300	35 x 60	6.0	0.66	42	27	L1
	3300	35 x 80	6.6	0.66	35	21	L1
	4700	35 x 80	7.3	0.94	31	20	L1
	4700	35 x 105	7.9	0.94	26	16	L1
	6800	35 x 105	8.8	1.36	23	15	L1
	6800	50 x 80	10.9	1.36	19	12	L1
	10 000	50 x 80	10.5	2.00	21	15	L1
	10 000	50 x 105	13.1	2.00	14	9	L1
	15 000	50 x 105	12.3	3.00	16	12	L1
	22 000	65 x 105	14.8	4.40	11	8	L2
	22 000	76 x 105	17.4	4.40	9	6	L2
	33 000	76 x 105	19.0	6.60	8	6	L2
	33 000	76 x 146	20.7	6.60	7	5	L2
	47 000	76 x 146	22.4	9.40	6	5	L2
	68 000	76 x 146	25.6	13.6	6	5	L2
	100 000	76 x 220	31.2	20.0	5	5	L2
	100 000	90 x 146	41.5	20.0	5	5	L2
	150 000	90 x 220	49.1	30.0	5	5	L2

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TYP 102

ELECTRICAL DATA AND ORDERING INFORMATION / WERTETABELLE							
U_R (V)	C_R 100 Hz (µF)	NOMINAL CASE SIZE Ø D x L (mm)	I_R 100 Hz 85 °C (A)	I_{L5} 5 min (mA)	ESR MAX. 100 Hz (mΩ)	Z MAX. 20 kHz (mΩ)	LIFE CODE (1)
200	680	35 x 60	3.5	0.27	207	136	L1
	1000	35 x 80	4.4	0.40	144	95	L1
	1000	35 x 105	4.7	0.40	140	91	L1
	1500	35 x 105	5.5	0.60	100	67	L1
	1500	50 x 80	6.2	0.60	106	74	L1
	2200	50 x 80	8.0	0.88	67	44	L1
	3300	50 x 80	8.9	1.32	50	35	L1
	3300	50 x 105	9.9	1.32	46	32	L1
	4700	65 x 105	12.5	1.88	37	26	L1
	6800	65 x 105	15.2	2.72	25	18	L1
	6800	76 x 105	16.9	2.72	25	18	L1
	10 000	76 x 105	19.9	4.00	18	13	L1
	10 000	76 x 146	20.4	4.00	18	13	L1
	15 000	76 x 146	24.1	6.00	12	9	L1
	22 000	76 x 220	29.5	8.8	9	7	L1
	22 000	90 x 146	34.1	8.8	8	6	L1
	33 000	90 x 220	41.7	13.2	6	5	L1
250	470	35 x 60	3.1	0.24	250	152	L1
	680	35 x 80	3.8	0.34	175	107	L1
	1000	35 x 80	4.4	0.50	128	82	L1
	1000	35 x 105	4.8	0.50	122	76	L1
	1500	35 x 105	5.4	0.75	90	58	L1
	1500	50 x 80	7.0	0.75	81	50	L1
	2200	50 x 80	8.0	1.10	60	39	L1
	2200	50 x 105	8.7	1.10	57	35	L1
	3300	50 x 105	9.8	1.65	42	28	L1
	3300	65 x 105	11.4	1.65	42	28	L1
	4700	65 x 105	13.8	2.35	29	19	L1
	4700	76 x 105	15.3	2.35	29	19	L1
	6800	76 x 105	18.1	3.40	21	14	L1
	6800	76 x 146	18.6	3.40	21	14	L1
	10 000	76 x 105	19.3	5.00	17	12	L1
	10 000	76 x 146	22.0	5.00	15	10	L1
	15 000	76 x 146	23.3	7.5	12	10	L1
	22 000	76 x 220	29.1	11.0	9	7	L1
	22 000	90 x 146	35.3	11.0	7	5	L1
	33 000	90 x 220	43.2	16.5	5	5	L1
350	330	35 x 60	2.5	0.23	435	305	L1
	470	35 x 80	3.1	0.33	308	216	L1
	680	35 x 105	3.8	0.48	216	152	L1
	1000	50 x 80	5.6	0.70	145	102	L1
	1500	50 x 80	6.5	1.05	102	74	L1
	1500	50 x 105	7.0	1.05	99	70	L1
	2200	50 x 105	8.0	1.54	72	52	L1
	2200	65 x 105	9.3	1.54	72	52	L1
	3300	65 x 105	11.4	2.31	48	35	L1
	4700	76 x 105	15.0	3.29	34	25	L1
	4700	76 x 146	15.4	3.29	34	25	L1
	6800	76 x 146	18.3	4.76	24	18	L1
	10 000	76 x 220	23.2	7.0	15	12	L1
	10 000	90 x 146	25.1	7.0	15	12	L1
	15 000	90 x 220	31.2	10.5	10	8	L1

TYP 102

ELECTRICAL DATA AND ORDERING INFORMATION / WERTETABELLE							
U_R (V)	C_R 100 Hz (µF)	NOMINAL CASE SIZE Ø D x L (mm)	I_R 100 Hz 85 °C (A)	I_{L5} 5 min (mA)	ESR MAX. 100 Hz (mΩ)	Z MAX. 20 kHz (mΩ)	LIFE CODE (1)
385	220	35 x 60	2.1	0.17	575	380	L1
	330	35 x 80	2.7	0.26	386	257	L1
	470	35 x 80	3.1	0.37	279	188	L1
	680	35 x 105	3.9	0.53	196	133	L1
	1000	50 x 80	5.6	0.77	132	89	L1
	1500	50 x 105	7.1	1.16	90	61	L1
	2200	65 x 105	10.0	1.70	61	42	L1
	3300	76 x 105	13.4	2.55	42	29	L1
	4700	76 x 105	15.0	3.62	31	22	L1
	4700	76 x 146	16.3	3.62	29	20	L1
	6800	76 x 146	18.3	5.24	22	16	L1
400	220	35 x 60	2.1	0.18	557	363	L1
	330	35 x 60	2.5	0.26	383	254	L1
	330	35 x 80	2.7	0.26	374	245	L1
	470	35 x 80	3.1	0.38	271	180	L1
	470	35 x 105	3.3	0.38	265	175	L1
	680	35 x 105	3.9	0.55	191	128	L1
	680	50 x 80	4.5	0.54	199	136	L1
	1000	50 x 80	5.7	0.80	128	86	L1
	1000	50 x 105	6.0	0.80	125	83	L1
	1500	50 x 105	7.1	1.20	88	59	L1
	2200	65 x 105	10.0	1.76	60	40	L1
	3300	65 x 105	12.1	2.64	40	27	L1
	3300	76 x 105	13.4	2.64	40	27	L1
	4700	76 x 105	15.0	3.76	31	21	L1
	4700	76 x 146	16.4	3.76	28	19	L1
	6800	76 x 146	18.3	5.44	22	15	L1
	10000	76 x 220	22.1	8.0	14	11	L1
450	220	35 x 60	2.1	0.20	503	313	L1
	330	35 x 80	2.7	0.30	339	212	L1
	470	35 x 105	3.4	0.42	241	151	L1
	680	50 x 80	4.9	0.61	159	98	L1
	1000	50 x 80	5.7	0.90	118	75	L1
	1000	50 x 105	6.1	0.90	114	72	L1
	1500	50 x 105	7.1	1.35	81	52	L1
	1500	65 x 105	8.3	1.35	81	52	L1
	2200	65 x 105	10.1	1.98	55	35	L1
	2200	76 x 105	11.2	1.98	55	35	L1
	3300	76 x 105	13.5	2.97	37	24	L1
	3300	76 x 146	13.9	2.97	37	24	L1
	4700	76 x 146	16.4	4.23	26	17	L1
	5600	76 x 146	17.3	5.04	23	15	L1
	6800	76 x 220	19.8	6.1	25	20	L1
	6800	90 x 146	21.3	6.1	24	19	L1
	10 000	90 x 220	26.5	9.0	17	14	L1

ELEKTRISCHE KENNWERTE		
PARAMETER	**CONDITIONS**	**VALUE**
Voltage		
Surge voltage	≤ 250 V versions	$U_S = 1.15 \times U_R$
	≥ 350 V versions	$U_S = 1.1 \times U_R$
Reverse voltage		$U_{rev} \leq 1$ V
Current		
Leakage current	After 1 min at U_R	$I_{L1} \leq 0.006\ C_R \times U_R$
	After 5 min at U_R	$I_{L5} \leq 0.002\ C_R \times U_R$
Inductance		
Equivalent series inductance (ESL)	Case Ø D = 35 mm	Typ. 13 nH
	Case Ø D = 50 mm	Typ. 16 nH
	Case Ø D = 65 mm	Typ. 19 nH (1)
	Case Ø D = 76 mm	Typ. 20 nH (1)
	Case Ø D = 90 mm	Typ. 21 nH (1)

Note
(1) Low ESL designs available on request

Verhalten bei Zwangsbelüftung

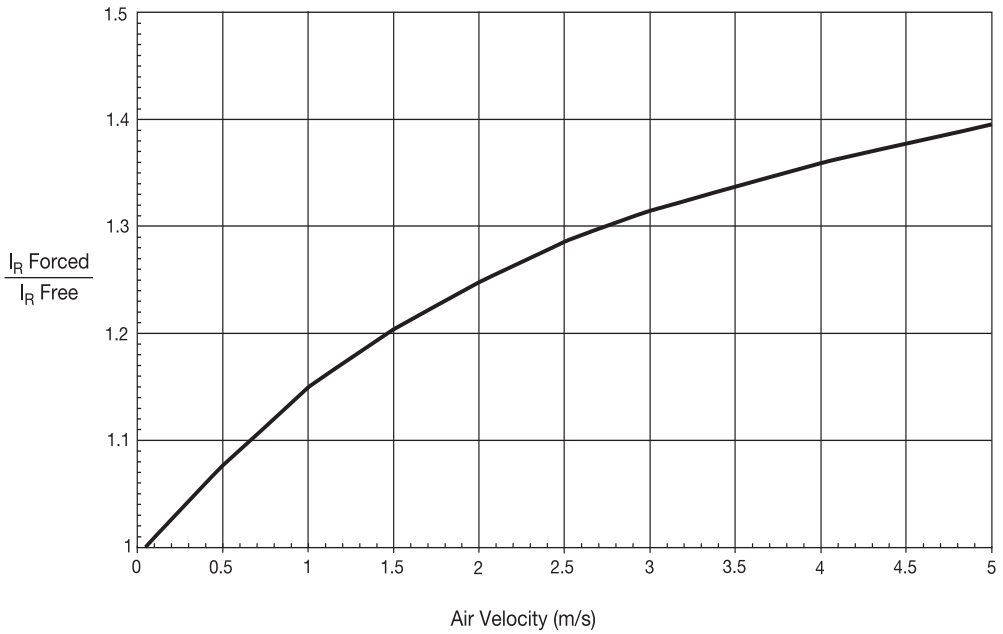


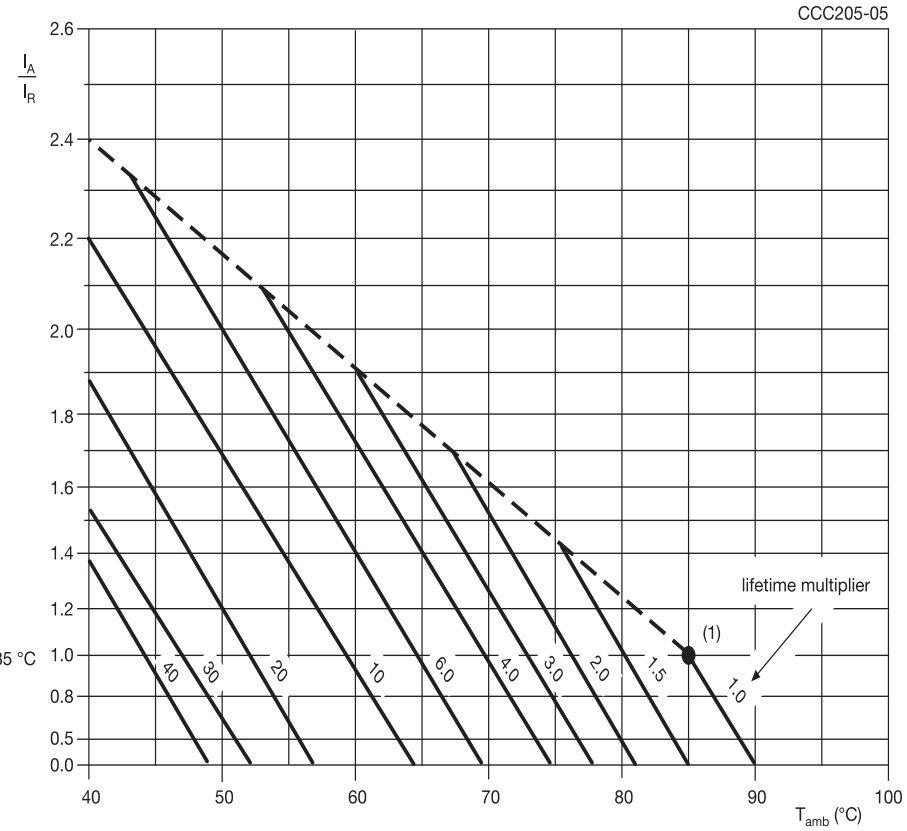
Fig. 3 - Multiplier of ripple current (I_R) as a function of air flow

MAXIMUM RIPPLE CURRENT			
PARAMETER	**CONDITION**	**MAXIMUM RIPPLE CURRENT MULTIPLIER**	**VALUE**
Ambient temperature (T_{amb})	70 °C	From nomogram; see Fig. 4	1.6
Operating frequency (f)	400 Hz	From frequency; see Table 4	1.3
Air flow	2 m/s	From air flow; see Fig. 3	1.25

BRAUCHBARKEITSDAUER		
LIFE CODE	TEST ENDURANCE AT 85 °C (h)	USEFUL LIFE AT 85 °C (h)
L1	2000	10 000
L2	2000	15 000

Note

- Multiplier of useful life code: CCC205-05



I_A = Actual ripple current at 100 Hz
I_R = Rated ripple current at 100 Hz and 85 °C

(1) Useful life at 85 °C and I_R applied:
101 series: case Ø ≤ 50: 10 000 h
case Ø ≥ 65: 15 000 h
102 series: 10 000 h

Fig. 4 - Multiplier of useful life as a function of ambient temperature and ripple current load

MULTIPLIER OF RIPPLE CURRENT (I_R) AS A FUNCTION OF FREQUENCY						
U_R (V)	FREQUENCY (Hz)					
	50	100	200	400	1000	10 000
	I_R MULTIPLIER					
25	0.85	1.00	1.10	1.15	1.20	1.30
40	0.85	1.00	1.10	1.15	1.20	1.30
63	0.85	1.00	1.10	1.15	1.20	1.30
100	0.85	1.00	1.10	1.15	1.20	1.30
200	0.90	1.00	1.20	1.30	1.40	1.50
250	0.90	1.00	1.20	1.30	1.40	1.50
350	0.90	1.00	1.20	1.30	1.40	1.50
385	0.90	1.00	1.20	1.30	1.40	1.50
400	0.90	1.00	1.20	1.30	1.40	1.50
450	0.90	1.00	1.20	1.30	1.40	1.50

GENORMTE PRÜFPARAMETER			
TEST		PROCEDURE (quick reference)	REQUIREMENTS
NAME OF TEST	REFERENCE		
Endurance	IEC 60384-4 / EN130300 subclause 4.13	T_{amb} = 85 °C; U_R applied; 2000 h	$U_R \leq 100$ V; ΔC/C: ± 15 % $U_R > 100$ V; ΔC/C: ± 10 % tan δ ≤ 1.3 x spec. limit Z ≤ 2 x spec. limit I_{L5} ≤ spec. limit
Useful life	CECC 30301 subclause 1.8.1	T_{amb} = 85 °C; U_R and I_R applied 101 series: case Ø D ≤ 50: 10 000 h case Ø D ≥ 65: 15 000 h 102 series: 10 000 h	$U_R \leq 100$ V; ΔC/C: ± 45 % $U_R > 100$ V; ΔC/C: ± 30 % tan δ ≤ 3 x spec. limit Z ≤ 3 x spec. limit I_{L5} ≤ spec. limit no short or open circuit, no visible damage Total failure percentage: $U_R \leq 100$ V; ≤ 1 % $U_R > 100$ V; ≤ 3 %
Shelf life (storage at high temperature)	IEC 60384-4 / EN130300 subclause 4.17	T_{amb} = 85 °C; no voltage applied; 500 h After test: U_R to be applied for 30 min, 24 h to 48 h before measurement	ΔC/C: ± 10 % tan δ ≤ 1.2 x spec. limit I_{L5} ≤ 2 x spec. limit

CUSTOMIZE SOLUTIONS ON REQUEST!