

Non-solid Al - electrolytic capacitors
Axial High Temperature

AHT 118

FEATURES

- Polarized aluminium electrolytic capacitors, non-solid
- Axial leads, cylindrical aluminium case, insulated with a blue sleeve
- Mounting ring version (single ended) not insulated
- Case $\varnothing 10 \times 30$ mm to $\varnothing 21 \times 40$ mm with pressure relief
- Taped versions up to case $\varnothing 15 \times 30$ mm available for automatic insertion
- Charge and discharge proof
- Extra long useful life: 4000 hours at 125 °C, high reliability
- Extended temperature range: 125 °C (usable up to 150 °C)
- Miniaturized, high CV-product per unit volume.

APPLICATIONS

- Automotive, industrial and telecommunication
- Smoothing, filtering, coupling, decoupling, timing
- For use after very long storage (10 years) without voltage applied
- Portable and mobile equipment (small size, low mass)
- Low mounting height boards, vibration and shock resistant
- Outdoor applications, e.g. aerial amplifiers.

QUICK REFERENCE DATA

DESCRIPTION	VALUE	
Case sizes ($\varnothing D_{nom} \times L_{nom}$ in mm)	6.5×18 to 10×25	10×30 to 21×40
Rated capacitance range, C_R	1 to 10000 μF	
Tolerance on C_R	$\pm 20\%$	
Rated voltage range, U_R	6.3 to 200 V	
Category temperature range	-40 to +125 °C	-55 to +125 °C
Endurance test at 150 °C, with no I_R applied	500 hours	1000 hours
Endurance test at 125 °C	2000 hours	3000 hours
Useful life at 125 °C	4000 hours	4000 hours
Useful life at 40 °C, $1.8 \times I_R$ applied	500000 hours	500000 hours
Shelf life at 0 V, 125 °C: $U_R = 6.3$ to 63 V $U_R = 100$ and 200 V	500 hours 100 hours	
Based on sectional specification	IEC 384-4/CECC 30300, LL grade	
Climatic category IEC 68 (DIN 40040)	40/125/56 (GKD)	55/125/56 (FKD)

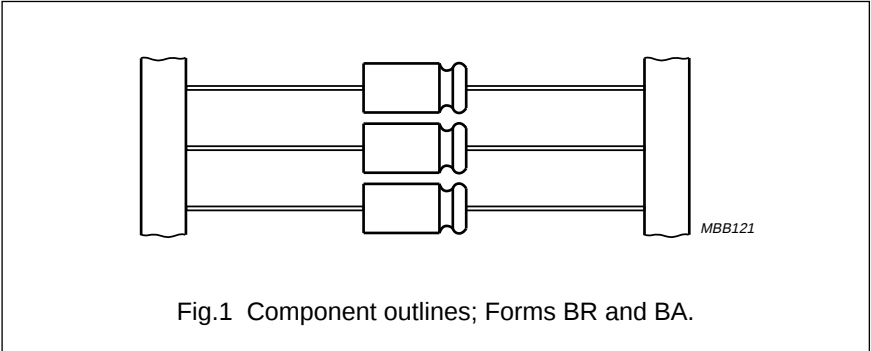
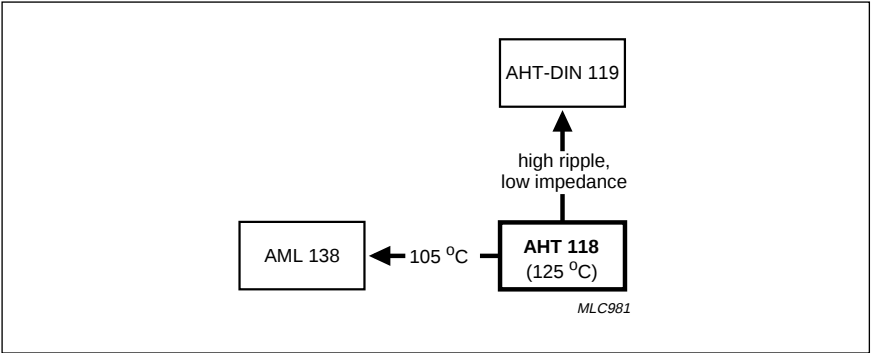


Fig.1 Component outlines; Forms BR and BA.



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Selection chart for C_R , U_R and relevant nominal case sizes ($\varnothing D \times L$ in mm)

Preferred types in **bold**.

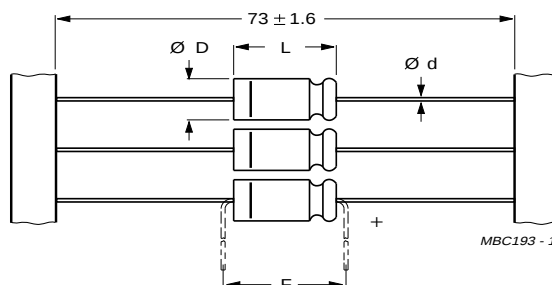
C_R (μF)	U_R (V)							
	6.3	10	16	25	40	63	100	200
1.0	–	–	–	–	–	6.5 × 18	–	–
2.2	–	–	–	–	–	6.5 × 18	–	6.5 × 18
4.7	–	–	–	–	–	6.5 × 18	6.5 × 18	8 × 18
10	–	–	–	–	–	6.5 × 18	6.5 × 18	10 × 25
15	–	–	–	–	–	–	–	10 × 30
22	–	–	–	–	–	6.5 × 18	8 × 18	12.5 × 30
33	–	–	–	–	–	–	10 × 25	15 × 30
47	–	–	–	–	6.5 × 18	8 × 18	10 × 25	18 × 30
	–	–	–	–	–	–	10 × 30	–
68	–	–	–	–	–	–	12.5 × 30	18 × 40
100	–	–	–	6.5 × 18	8 × 18	10 × 25	12.5 × 30	21 × 40
	–	–	–	–	–	10 × 30	–	–
150	–	–	–	–	10 × 18	12.5 × 30	15 × 30	–
220	–	6.5 × 18	8 × 18	10 × 18	10 × 25	12.5 × 30	18 × 30	–
	–	–	–	–	10 × 30	–	–	–
330	–	8 × 18	10 × 18	10 × 25	12.5 × 30	15 × 30	18 × 40	–
470	–	8 × 18	10 × 18	10 × 25	12.5 × 30	18 × 30	21 × 40	–
	–	–	–	10 × 30	–	–	–	–
680	–	–	10 × 30	12.5 × 30	15 × 30	18 × 40	–	–
1000	10 × 18	10 × 25	12.5 × 30	12.5 × 30	18 × 30	21 × 40	–	–
	–	10 × 30	–	–	–	–	–	–
1500	10 × 25	12.5 × 30	12.5 × 30	15 × 30	18 × 40	–	–	–
2200	–	12.5 × 30	15 × 30	18 × 30	21 × 40	–	–	–
3300	–	15 × 30	18 × 30	18 × 40	–	–	–	–
4700	–	18 × 30	18 × 40	21 × 40	–	–	–	–
6800	–	18 × 40	21 × 40	–	–	–	–	–
10000	–	21 × 40	–	–	–	–	–	–

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MECHANICAL DATA, AVAILABLE FORMS AND PACKAGING QUANTITIES



Dimensions in mm.

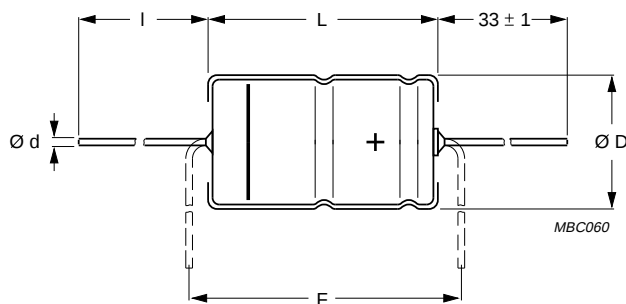
Form BR: Taped on reel,
case $\varnothing D \times L = 6.5 \times 18$ to 15×30 mm.

Form BA: Taped in box (ammopack),
case $\varnothing D \times L = 6.5 \times 18$ to 10×25 mm.

For dimensions see Table 1.

Tape dimensions are specified in this handbook, section "Packaging".

Fig.2 Dimensional outline; Forms BA and BR.



Dimensions in mm.

Form AA: Axial in box,
case $\varnothing D \times L = 10 \times 30$ to 21×40 mm.

For case $\varnothing D \times L = 18 \times 40$ and 21×40 mm, the stated limit may be exceeded by 0.7 mm.

For dimensions see Table 1.

Fig.3 Dimensional outline; Form AA.

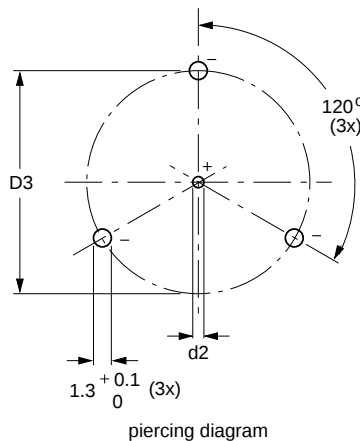
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Table 1 Axial; physical dimensions, mass and packaging quantities; see Figs 2 and 3

NOMINAL CASE SIZE $\varnothing D \times L$ (mm)	CASE CODE	AXIAL: FORM AA, BA and BR					MASS (g)	PACKAGING QUANTITIES		
		$\varnothing d$ (mm)	L (mm)	$\varnothing D_{\max}$ (mm)	$L_{\max}$ (mm)	$F_{\min}$ (mm)		FORM AA	FORM BA	FORM BR
6.5 × 18	4	0.8	—	6.9	18.5	25	≈1.3	—	1000	1000
8 × 18	5	0.8	—	8.5	18.5	25	≈1.7	—	500	500
10 × 18	6	0.8	—	10.5	18.5	25	≈2.5	—	500	500
10 × 25	7	0.8	—	10.5	25.0	30	≈3.3	—	500	500
10 × 30	00	0.8	55 ±1	10.5	30.5	35	≈4.8	200	—	500
12.5 × 30	01	0.8	55 ±1	13.0	30.5	35	≈7.4	200	—	400
15 × 30	02	0.8	55 ±1	15.5	30.5	35	≈11.7	200	—	250
18 × 30	03	0.8	55 ±1	18.5	30.5	35	≈12.9	200	—	—
18 × 40	04	0.8	34 ±1	18.5	41.5	45	≈19.4	100	—	—
21 × 40	05	0.8	34 ±1	21.5	41.5	45	≈24.7	100	—	—



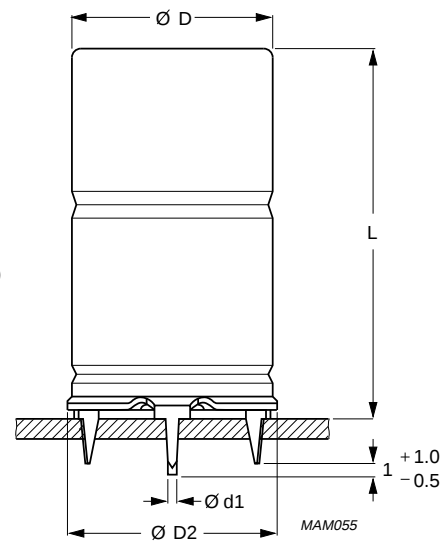
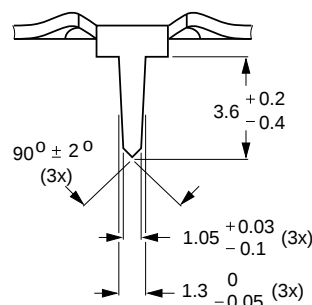
Dimensions in mm.

Form MR: case $\varnothing D \times L = 15 \times 30$ to 21×40 mm.

Case not insulated (insulation on request).

Especially for applications with severe shocks and vibrations.

For dimensions see Table 2.

**Fig.4** Piercing diagram and outline; Form MR; single ended with mounting ring and pins.**Table 2** Single ended; physical dimensions, mass and packaging quantities; see Fig.4

NOMINAL CASE SIZE $\varnothing D \times L$ (mm)	CASE CODE	SINGLE ENDED WITH MOUNTING RING: FORM MR						MASS (g)	PACKAGING QUANTITIES
		$\varnothing d_1$ (mm)	$\varnothing d_2$ (mm)	$\varnothing D_{\max}$ (mm)	$\varnothing D2_{\max}$ (mm)	D3 (mm)	$L_{\max}$ (mm)		
15 × 30	02	0.8	1.0 +0.4	15.5	17.5	16.5 ±0.2	33	≈8.6	200
18 × 30	03	0.8	1.0 +0.4	18.5	19.5	18.5 ±0.2	33	≈11.5	200
18 × 40	04	0.8	1.0 +0.4	18.5	19.5	18.5 ±0.2	45	≈14.5	100
21 × 40	05	0.8	1.0 +0.4	21.5	22.5	21.5 ±0.2	45	≈19.7	100

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Ordering example
Electrolytic capacitor AHT 118
1000 µF/10 V; ±20%
Nominal case size: Ø10 × 30; Form BR
Catalogue number: 2222 118 24102.

ELECTRICAL DATA AND ORDERING INFORMATION
Unless otherwise specified, all electrical values in Table 3 apply at T_{amb} = 20 °C,
P = 86 to 106 kPa, RH = 45 to 75%.

C _R	rated capacitance at 100 Hz, tolerance ±20%
I _R	rated RMS ripple current at 100 Hz, 125 °C
I _{L1}	max. leakage current after 1 minute at U _R
I _{L5}	max. leakage current after 5 minutes at U _R
Tan δ	max. dissipation factor at 100 Hz
ESR	equivalent series resistance at 100 Hz (calculated from tan δ _{max} and C _R)
Z	max. impedance at 10 kHz

Table 3 Electrical data and ordering information; preferred types in **bold**.

U _R (V)	C _R 100 Hz (µF)	NOMINAL CASE SIZE ØD × L (mm)	CASE CODE	I _R 100 Hz 125 °C (mA)	I _{L1} 1 min (µA)	I _{L5} 5 min (µA)	Tan δ 100 Hz	ESR 100 Hz (Ω)	Z 10 kHz (Ω)	CATALOGUE NUMBER 2222			
										AXIAL			SINGLE ENDED
										IN BOX FORM AA	TAPED ON REEL FORM BR	TAPED IN BOX FORM BA	MOUNTING RING FORM MR
6.3	1000	10 × 18	6	251	42	17	0.50	0.79	0.8	-	118 23102	118 33102	-
	1500	10 × 25	7	352	61	23	0.50	0.53	0.53	-	118 90502	118 90503	-
10	220	6.5 × 18	4	109	20	8.4	0.35	2.53	2.1	-	118 24221	118 34221	-
	330	8 × 18	5	150	24	11	0.35	1.69	1.4	-	118 24331	118 34331	-
	470	8 × 18	5	179	32	13	0.35	1.19	1.0	-	118 24471	118 34471	-
	1000	10 × 25	7	343	64	24	0.35	0.56	0.55	-	118 90504	118 90505	-
	1000	10 × 30	00	409	64	24	0.32	0.505	0.45	118 14102	118 24102	-	-
	1500	12.5 × 30	01	590	94	34	0.32	0.285	0.28	118 14152	118 24152	-	-
	2200	12.5 × 30	01	634	136	48	0.40	0.290	0.27	118 14222	118 24222	-	-
	3300	15 × 30	02	826	202	70	0.40	0.190	0.18	118 14332	118 24332	-	118 44332
	4700	18 × 30	03	1035	2 86	98	0.46	0.155	0.15	118 14472	-	-	118 44472
	6800	18 × 40	04	1395	412	140	0.53	0.100	0.10	118 14682	-	-	118 44682
	10000	21 × 40	05	1674	604	200	0.53	0.084	0.10	118 14103	-	-	118 44103

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U _R (V)	C _R 100 Hz (μF)	NOMINAL CASE SIZE ØD × L (mm)	CASE CODE	I _R 100 Hz 125 °C (mA)	I _{L1} 1 min (μA)	I _{L5} 5 min (μA)	Tan δ 100 Hz	ESR 100 Hz (Ω)	Z 10 kHz (Ω)	CATALOGUE NUMBER 2222			
										AXIAL			SINGLE ENDED
										IN BOX FORM AA	TAPED ON REEL FORM BR	TAPED IN BOX FORM BA	MOUNTING RING FORM MR
16	220	8 × 18	5	145	25	11	0.25	1.81	1.5	—	118 25221	118 35221	—
	330	10 × 18	6	204	36	15	0.25	1.21	1.2	—	118 25331	118 35331	—
	470	10 × 18	6	243	49	19	0.25	0.85	0.83	—	118 25471	118 35471	—
	680	10 × 30	00	389	69	30	0.22	0.525	0.45	118 15681	118 25681	—	—
	1000	12.5 × 30	01	557	100	36	0.22	0.345	0.28	118 15102	118 25102	—	—
	1500	12.5 × 30	01	609	148	52	0.29	0.305	0.27	118 15152	118 25152	—	—
	2200	15 × 30	02	790	215	74	0.29	0.205	0.18	118 15222	118 25222	—	118 45222
	3300	18 × 30	03	1008	321	110	0.34	0.165	0.15	118 15332	—	—	118 45332
	4700	18 × 40	04	1363	455	150	0.34	0.105	0.10	118 15472	—	—	118 45472
	6800	21 × 40	05	1627	657	220	0.38	0.088	0.10	118 15682	—	—	118 45682
25	100	6.5 × 18	4	102	20	9	0.18	2.86	2.3	—	118 26101	118 36101	—
	220	10 × 18	6	196	37	15	0.18	1.30	1.25	—	118 26221	118 36221	—
	330	10 × 25	7	274	54	21	0.18	0.87	0.82	—	118 26331	118 36331	—
	470	10 × 25	7	327	75	28	0.18	0.61	0.57	—	118 90508	118 90509	—
	470	10 × 30	00	366	75	28	0.18	0.61	0.50	118 16471	118 26471	—	—
	680	12.5 × 30	01	515	106	38	0.18	0.42	0.30	118 16681	118 26681	—	—
	1000	12.5 × 30	01	531	154	54	0.24	0.375	0.28	118 16102	118 26102	—	—
	1500	15 × 30	02	691	229	79	0.25	0.263	0.22	118 16152	118 26152	—	118 46152
	2200	18 × 30	03	919	334	110	0.26	0.185	0.17	118 16222	—	—	118 46222
	3300	18 × 40	04	1280	499	170	0.26	0.12	0.11	118 16332	—	—	118 46332
	4700	21 × 40	05	1464	709	240	0.28	0.095	0.10	118 16472	—	—	118 46472

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CATALOGUE NUMBER 2222													
U _R (V)	C _R 100 Hz (μF)	NOMINAL CASE SIZE ØD × L (mm)	CASE CODE	I _R 100 Hz 125 °C (mA)	I _{L1} 1 min (μA)	I _{L5} 5 min (μA)	Tan δ 100 Hz	ESR 100 Hz (Ω)	Z 10 kHz (Ω)	AXIAL			SINGLE ENDED
										IN BOX FORM AA	TAPED ON REEL FORM BR	TAPED IN BOX FORM BA	
40	47	6.5 × 18	4	89.8	20	7.8	0.11	3.72	2.8	-	118 27479	118 37479	-
	100	8 × 18	5	147	28	12	0.11	1.75	1.3	-	118 27101	118 37101	-
	150	10 × 18	6	207	40	16	0.11	1.17	1.0	-	118 27151	118 37151	-
	220	10 × 25	7	287	57	22	0.11	0.80	0.68	-	118 90511	118 90512	-
	220	10 × 30	00	338	57	22	0.10	0.70	0.55	118 17221	118 27221	-	-
	330	12.5 × 30	01	484	83	30	0.10	0.43	0.33	118 17331	118 27331	-	-
	470	12.5 × 30	01	522	117	42	0.11	0.38	0.30	118 17471	118 27471	-	-
	680	15 × 30	02	695	167	58	0.11	0.255	0.23	118 17681	118 27681	-	118 47681
	1000	18 × 30	03	852	244	84	0.13	0.205	0.18	118 17102	-	-	118 47102
	1500	18 × 40	04	1196	364	120	0.13	0.13	0.11	118 17152	-	-	118 47152
	2200	21 × 40	05	1403	532	180	0.15	0.105	0.10	118 17222	-	-	118 47222
63	1.0	6.5 × 18	4	16.4	20	4.1	0.07	110	22	-	118 28108	118 38108	-
	2.2	6.5 × 18	4	24.3	20	4.3	0.07	51	15	-	118 28228	118 38228	-
	4.7	6.5 × 18	4	35.6	20	4.6	0.07	24	8.9	-	118 28478	118 38478	-
	10	6.5 × 18	4	51.9	20	5.3	0.07	11	5.6	-	118 28109	118 38109	-
	22	6.5 × 18	4	77.0	20	6.8	0.07	5.1	3.2	-	118 28229	118 38229	-
	47	8 × 18	5	126	22	9.9	0.07	2.4	1.5	-	118 28479	118 38479	-
	100	10 × 25	7	243	42	17	0.07	1.1	0.7	-	118 90513	118 90514	-
	100	10 × 30	00	262	42	17	0.07	1.1	1.0	118 18101	118 28101	-	-
	150	12.5 × 30	01	415	61	23	0.07	0.65	0.61	118 18151	118 28151	-	-
	220	12.5 × 30	01	454	87	32	0.08	0.61	0.56	118 18221	118 28221	-	-
	330	15 × 30	02	544	129	46	0.09	0.42	0.40	118 18331	118 28331	-	118 48331
	470	18 × 30	03	695	182	63	0.09	0.31	0.33	118 18471	-	-	118 48471
	680	18 × 40	04	971	261	90	0.09	0.2	0.18	118 18681	-	-	118 48681
	1000	21 × 40	05	1161	383	130	0.10	0.16	0.15	118 18102	-	-	118 48102

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CATALOGUE NUMBER 2222													
U _R (V)	C _R 100 Hz (μF)	NOMINAL CASE SIZE ØD × L (mm)	CASE CODE	I _R 100 Hz 125 °C (mA)	I _{L1} 1 min (μA)	I _{L5} 5 min (μA)	Tan δ 100 Hz	ESR 100 Hz (Ω)	Z 10 kHz (Ω)	AXIAL			SINGLE ENDED
										IN BOX FORM AA	TAPED ON REEL FORM BR	TAPED IN BOX FORM BA	
100	4.7	6.5 × 18	4	36	20	4.9	0.07	24	19	-	118 29478	118 39478	-
	10	6.5 × 18	4	52	20	6.0	0.07	11	9.0	-	118 29109	118 39109	-
	22	8 × 18	5	91	20	8.4	0.07	5.1	4.0	-	118 29229	118 39229	-
	33	10 × 25	7	140	24	11	0.07	3.4	2.7	-	118 29339	118 39339	-
	47	10 × 25	7	170	33	13	0.07	2.6	2.0	-	118 90535	118 90536	-
	47	10 × 30	00	178	33	13	0.08	2.6	2.0	118 19479	118 29479	-	-
	68	12.5 × 30	01	278	45	18	0.08	1.8	1.2	118 19689	118 29689	-	-
	100	12.5 × 30	01	303	64	24	0.09	1.4	1.15	118 19101	118 29101	-	-
	150	15 × 30	02	368	94	34	0.10	0.94	0.78	118 19151	118 29151	-	118 49151
	220	18 × 30	03	481	136	48	0.10	0.66	0.55	118 19221	-	-	118 49221
	330	18 × 40	04	694	202	70	0.10	0.45	0.37	118 19331	-	-	118 49331
	470	21 × 40	05	833	286	98	0.10	0.33	0.28	118 19471	-	-	118 49471
200	2.2	6.5 × 18	4	27	20	4.9	0.06	44	23	-	118 90537	118 90538	-
	4.7	8 × 18	5	46	20	5.9	0.06	21	11	-	118 90539	118 90541	-
	10	10 × 25	7	85	20	8.0	0.06	9.4	5.0	-	118 90542	118 90543	-
	15	10 × 30	00	129	22	10	0.046	4.76	3.75	118 92159	118 90012	-	-
	22	12.5 × 30	01	198	31	13	0.046	3.17	2.22	118 92229	118 90013	-	-
	33	15 × 30	02	242	44	17	0.046	2.11	1.11	118 92339	118 90014	-	118 90002
	47	18 × 30	03	317	61	23	0.046	1.48	0.60	118 92479	-	-	118 90003
	68	18 × 40	04	428	86	31	0.046	1.02	0.42	118 92689	-	-	118 90004
	100	21 × 40	05	551	124	44	0.046	0.96	0.39	118 92101	-	-	118 90005

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Additional electrical data

PARAMETER	CONDITIONS	VALUE	
		AXIAL	SINGLE ENDED
Voltage			
Surge voltage for short periods		$U_s \leq 1.15 \times U_R$	
Reverse voltage		$U_{rev} \leq 1\text{ V}$	
Current			
Leakage current	after 1 minute at U_R	$I_{L1} \leq 0.006C_R \times U_R + 4\text{ }\mu\text{A}$ or $20\text{ }\mu\text{A}$ (whichever is greater)	
	after 5 minutes at U_R	$I_{L5} \leq 0.002C_R \times U_R + 4\text{ }\mu\text{A}$	
Inductance			
Equivalent series inductance (ESL)	case $\varnothing D \times L\text{ mm}$:		
	6.5 × 18	typ. 15 nH	—
	8 × 18	typ. 35 nH	—
	10 × 18	typ. 69 nH	—
	10 × 25	typ. 38 nH	—
	10 × 30	typ. 38 nH	—
	12.5 × 30	typ. 46 nH	—
	15 × 30	typ. 48 nH	typ. 39 nH
	18 × 30	typ. 50 nH	typ. 39 nH
	18 × 40	typ. 54 nH	typ. 39 nH
	21 × 40	typ. 59 nH	typ. 39 nH

Table 4 Up-rating values at reduced ambient temperature; note 1

SYMBOL	CONDITIONS	VALUES								UNIT
U_R	$T_{amb} > 85$ to $125 \text{ }^\circ\text{C}$	6.3	10	16	25	40	63	100	200	V
U_{R2}	$T_{amb} \leq 85 \text{ }^\circ\text{C}$	10	16	25	40	63	100	125	250	V

Note

- For applications at ambient temperatures of $\leq 85 \text{ }^\circ\text{C}$, the rated voltage (U_R) may be raised to U_{R2} .

MARKING

The capacitors are marked (where possible) with the following information:

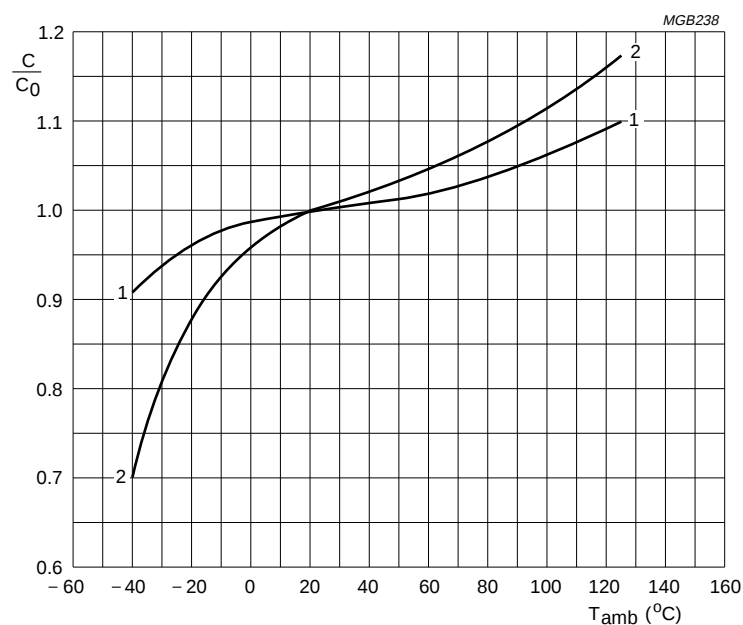
- Rated capacitance (in μF)
- Tolerance on rated capacitance, code letter in accordance with "IEC 62"
- Rated voltage (in V) at $125 \text{ }^\circ\text{C}$ and $85 \text{ }^\circ\text{C}$
- Group number (118)
- Name of manufacturer (PHILIPS)
- Date code, in accordance with "IEC 62"
- Code indicating factory of origin
- Band to identify the negative terminal
- "+" sign to identify the positive terminal.

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Capacitance (C)

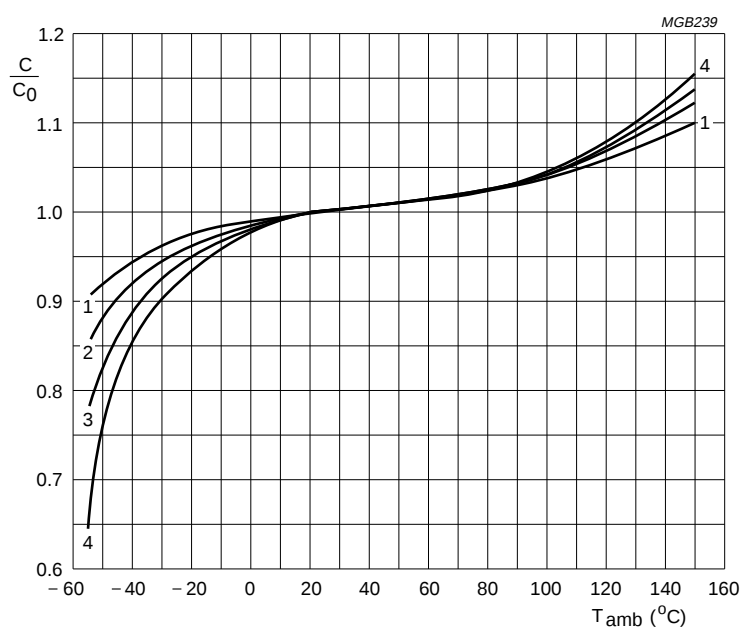


Curve 1: 63 V.

Curve 2: 6.3 V.

 C_0 = capacitance at 20 °C, 100 Hz.Case $\varnothing D \times L = 6.5 \times 18$ to 10×25 mm.

Fig.5 Typical multiplier of capacitance as a function of ambient temperature.



Curve 1: 100 V; 200 V.

Curve 2: 40 V; 63 V.

Curve 3: 16 V; 25 V.

Curve 4: 6.3 V; 10 V.

 C_0 = capacitance at 20 °C, 100 Hz.Case $\varnothing D \times L = 10 \times 30$ to 21×40 mm.

Fig.6 Typical multiplier of capacitance as a function of ambient temperature.

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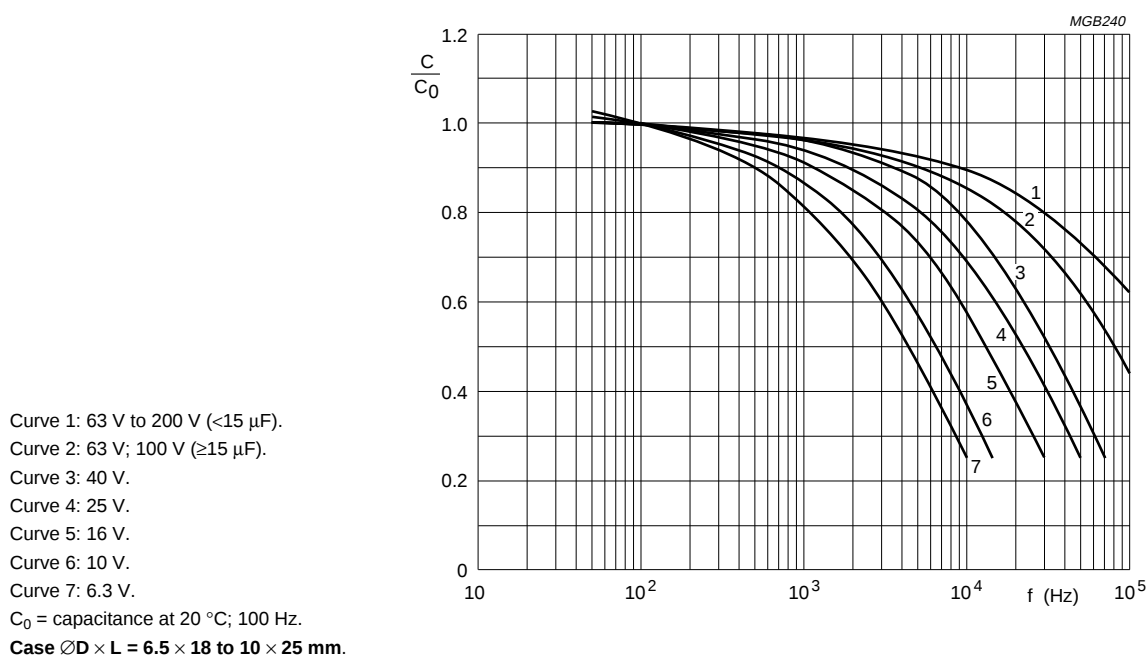


Fig.7 Typical multiplier of capacitance as a function of frequency.

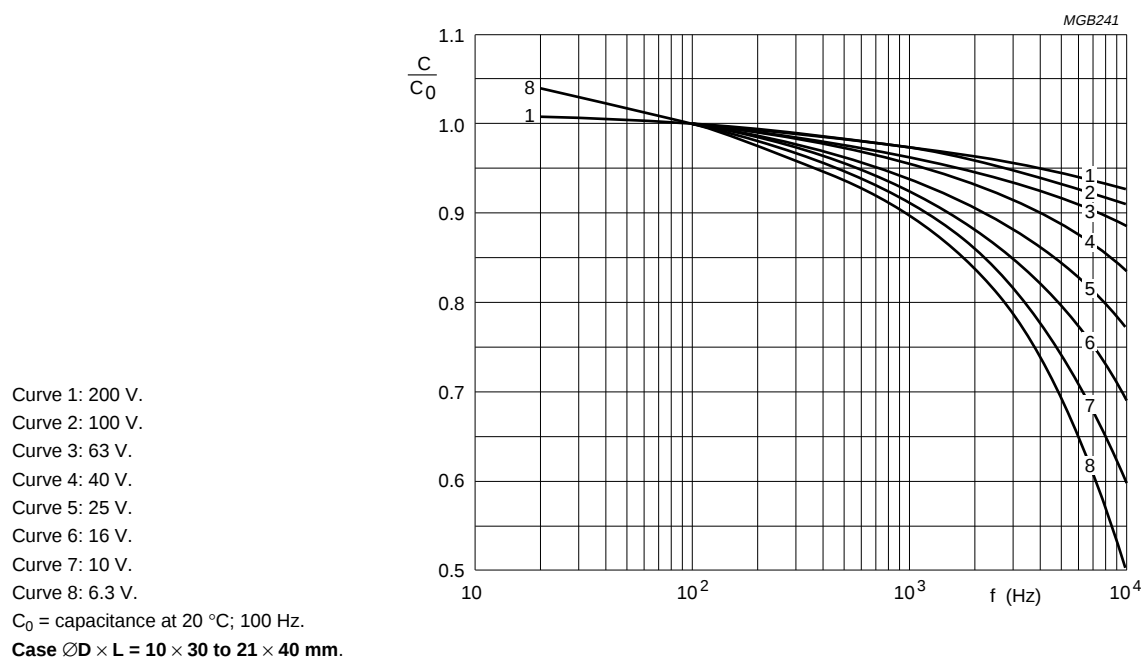


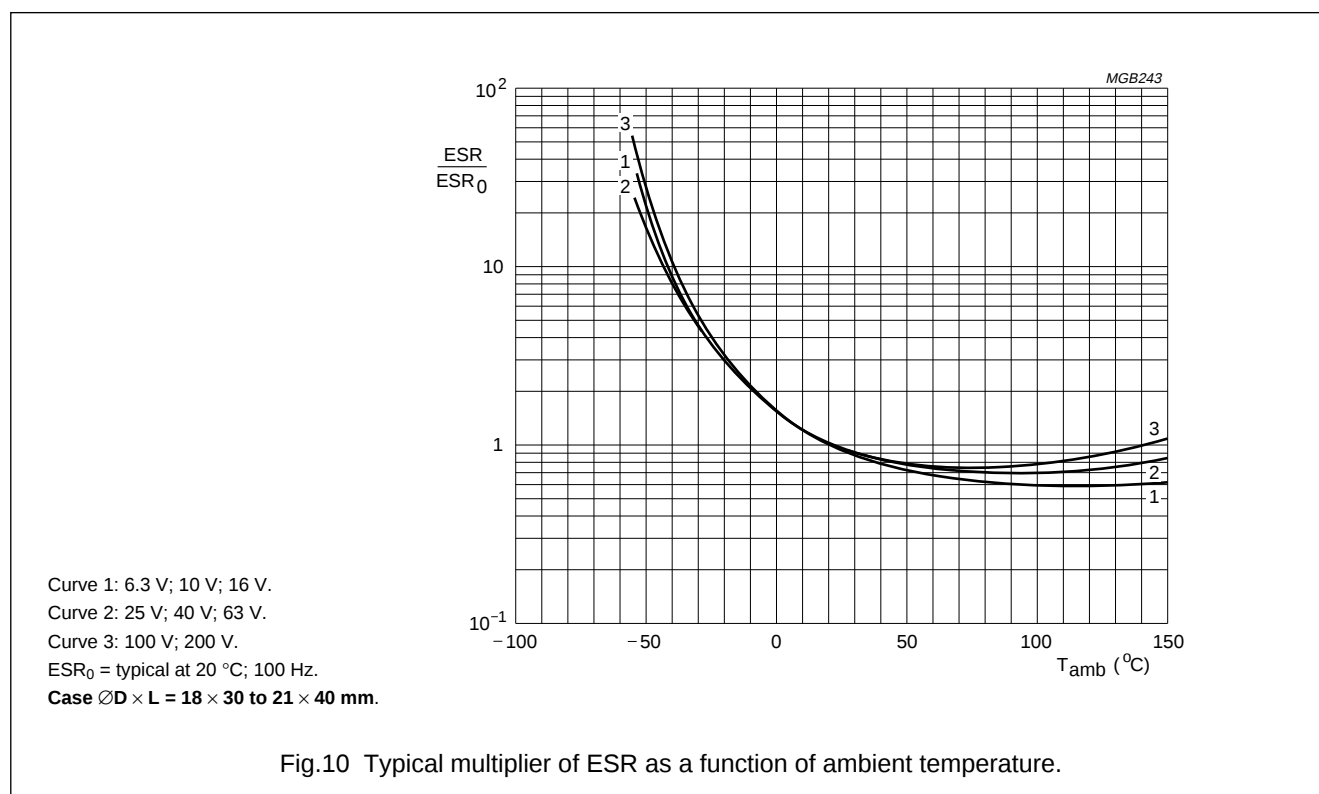
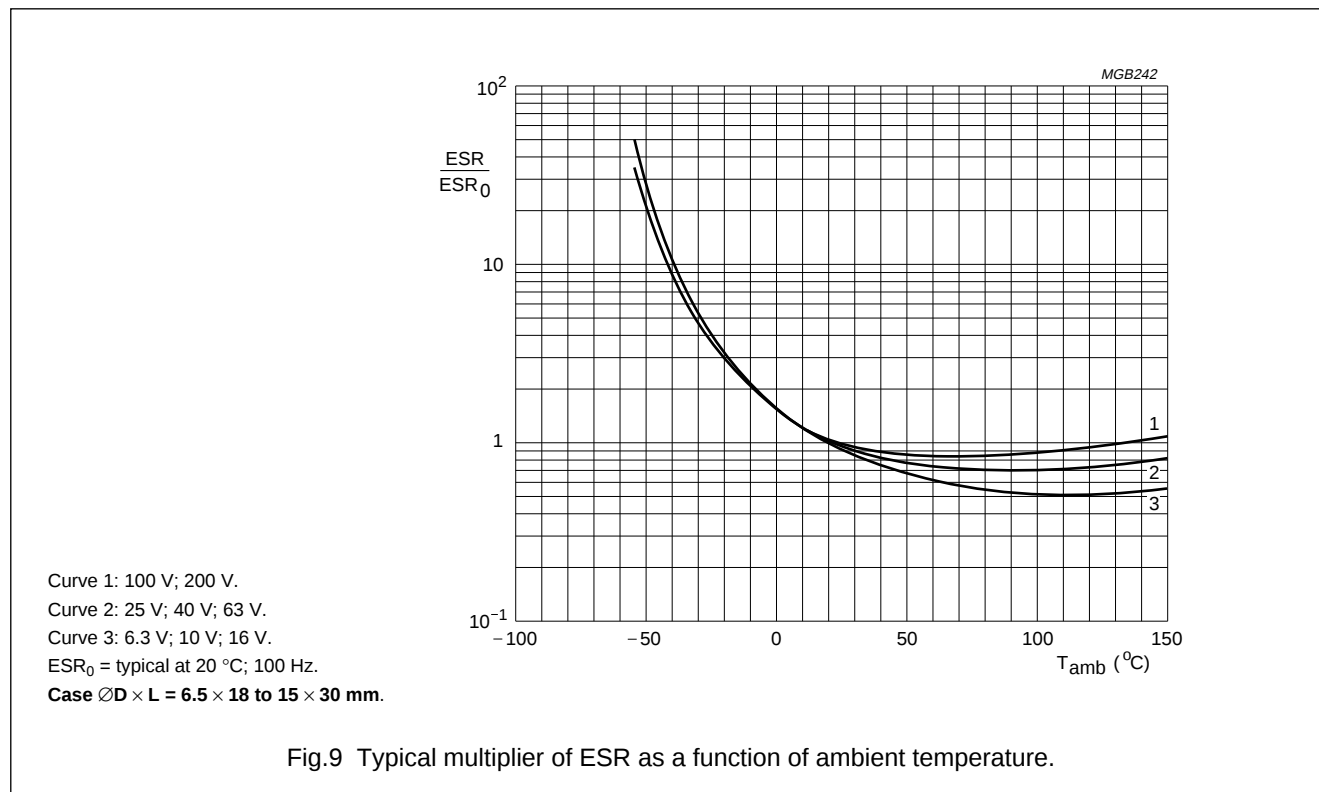
Fig.8 Typical multiplier of capacitance as a function of frequency.

Non-solid Al - electrolytic capacitors

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Equivalent series resistance (ESR)



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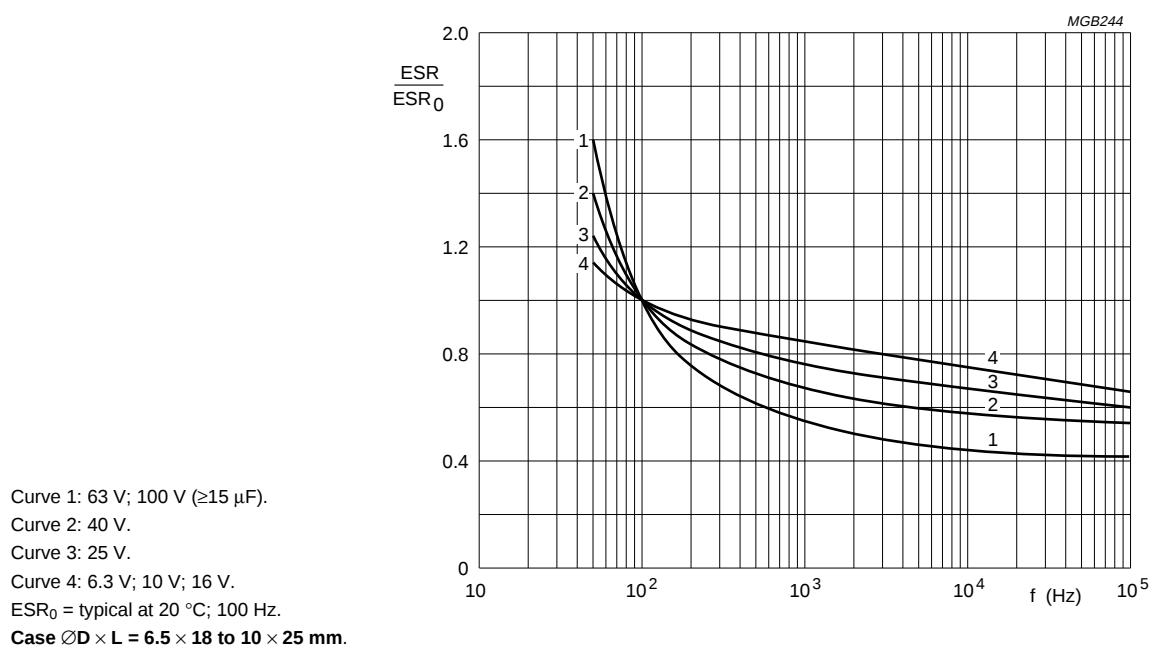


Fig.11 Typical multiplier of ESR as a function of frequency.

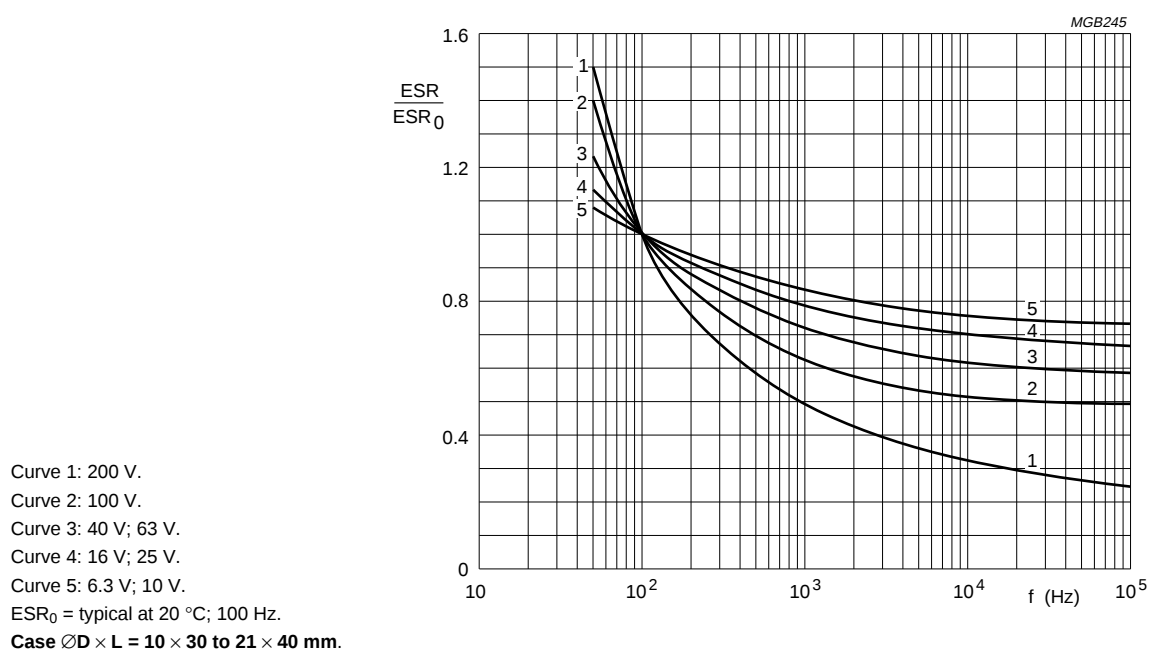


Fig.12 Typical multiplier of ESR as a function of frequency.

Non-solid Al - electrolytic capacitors

Axial High Temperature

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Impedance (Z)

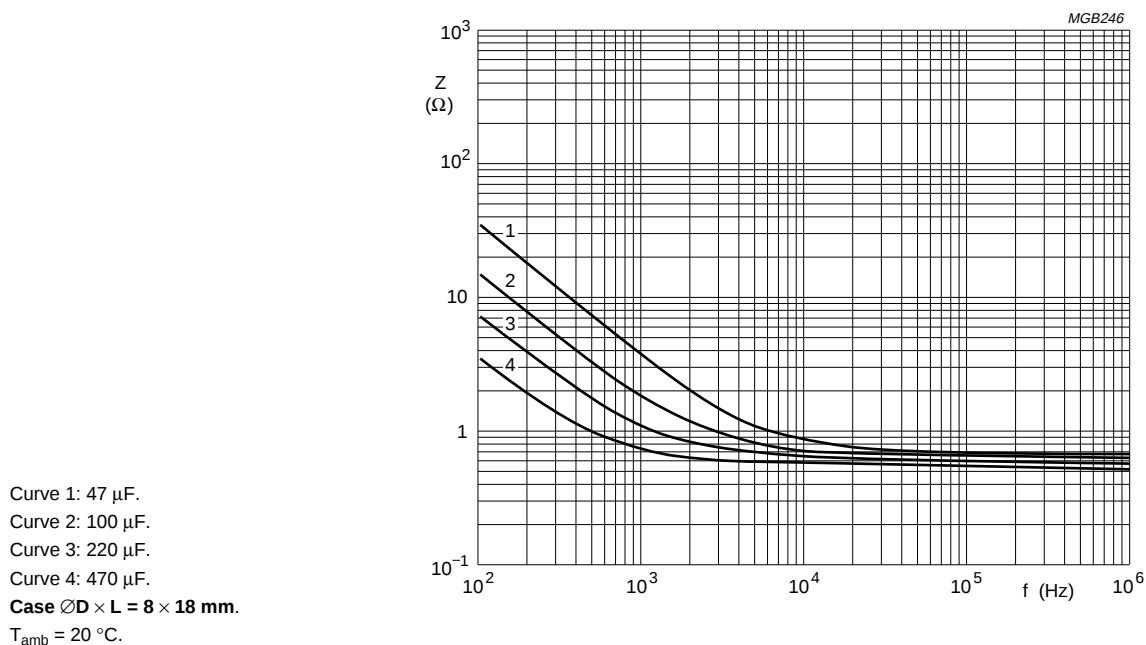


Fig.13 Typical impedance as a function of frequency.

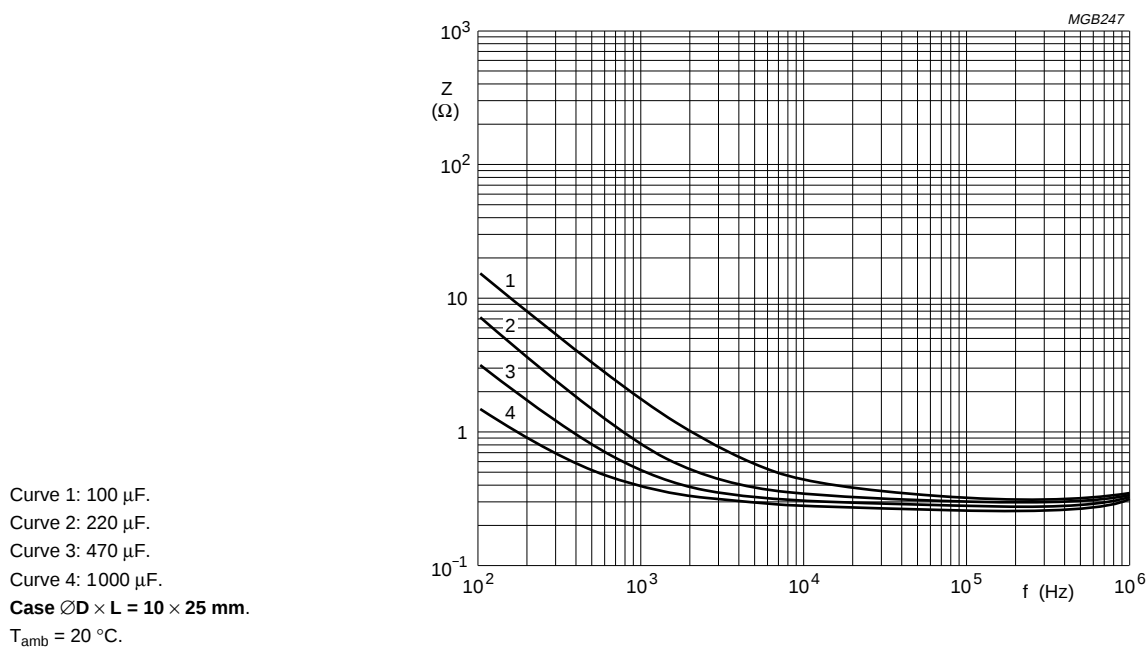


Fig.14 Typical impedance as a function of frequency.

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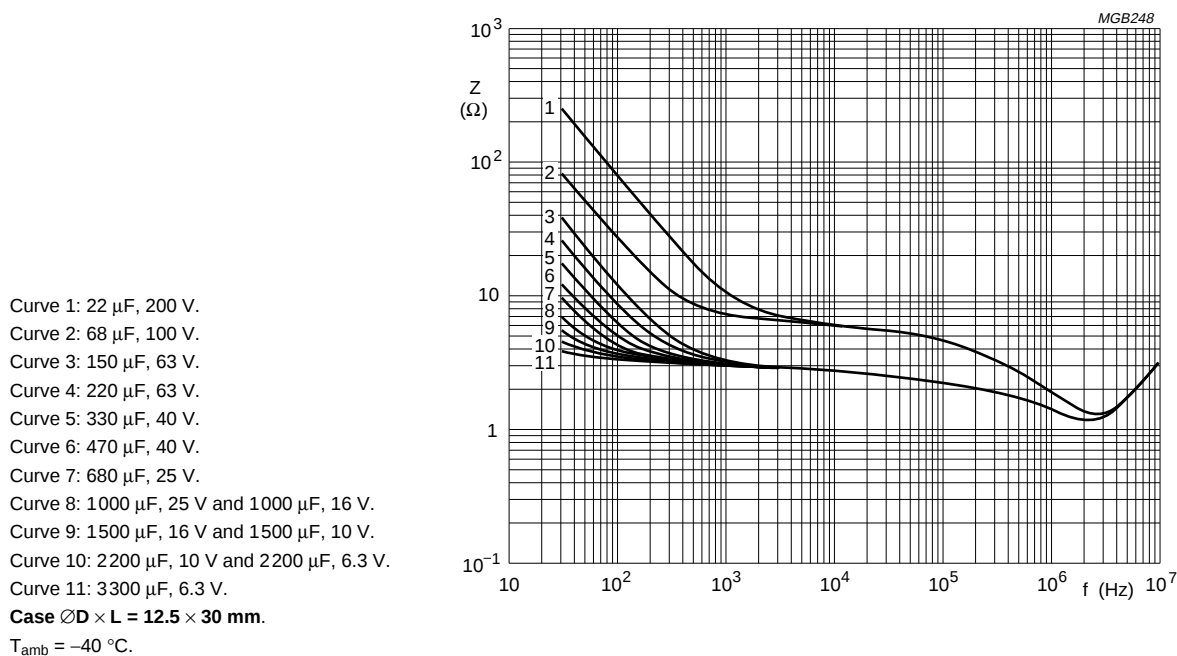


Fig.15 Typical impedance as a function of frequency.

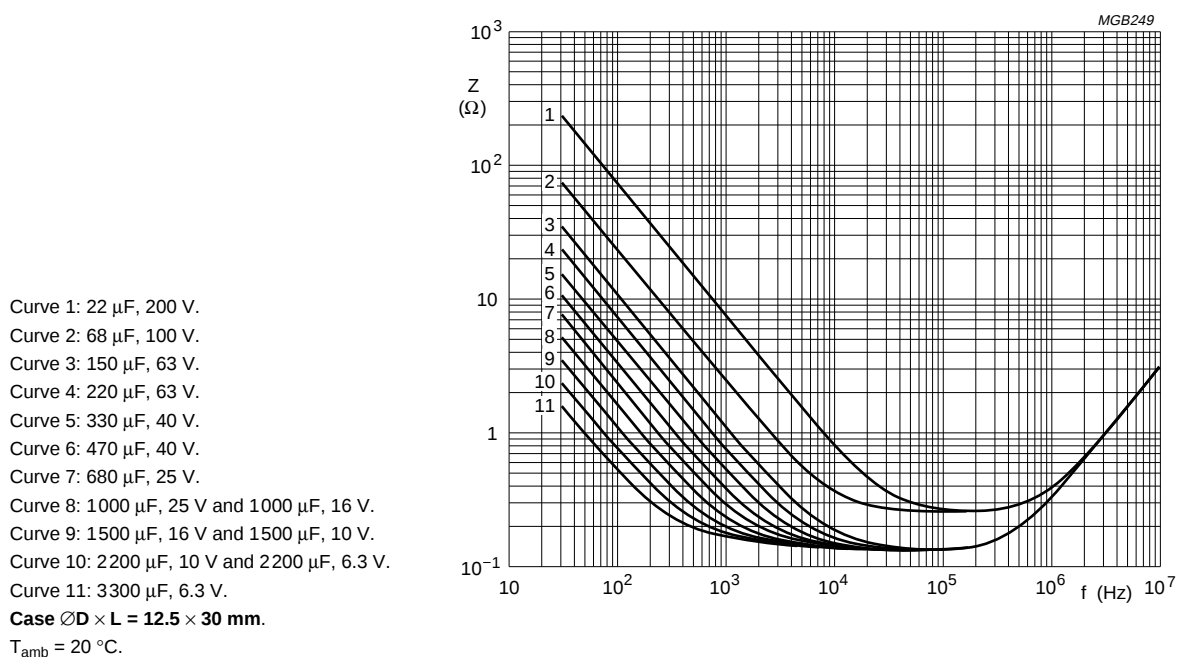


Fig.16 Typical impedance as a function of frequency.

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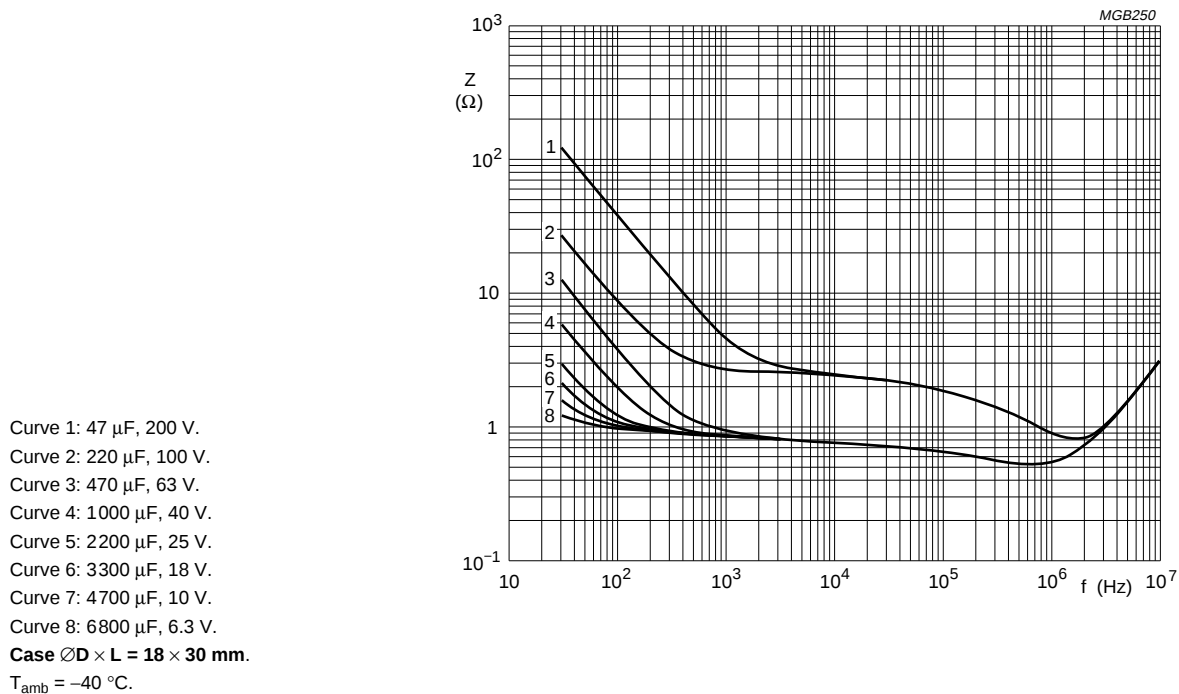


Fig.17 Typical impedance as a function of frequency.

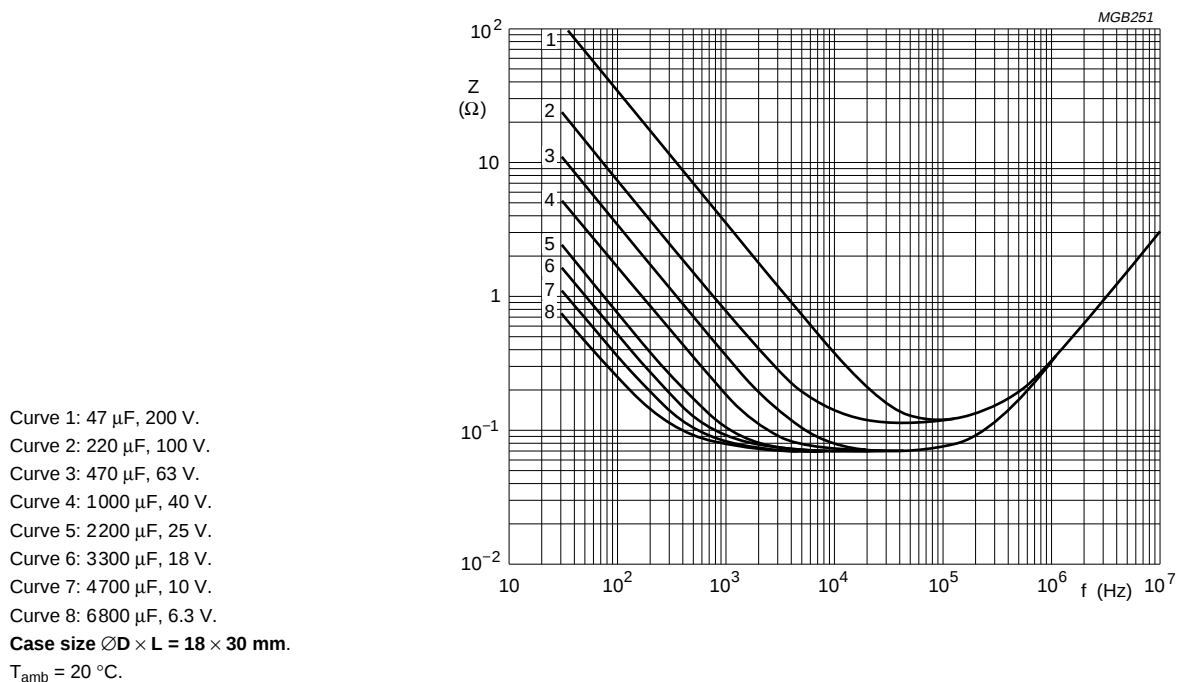
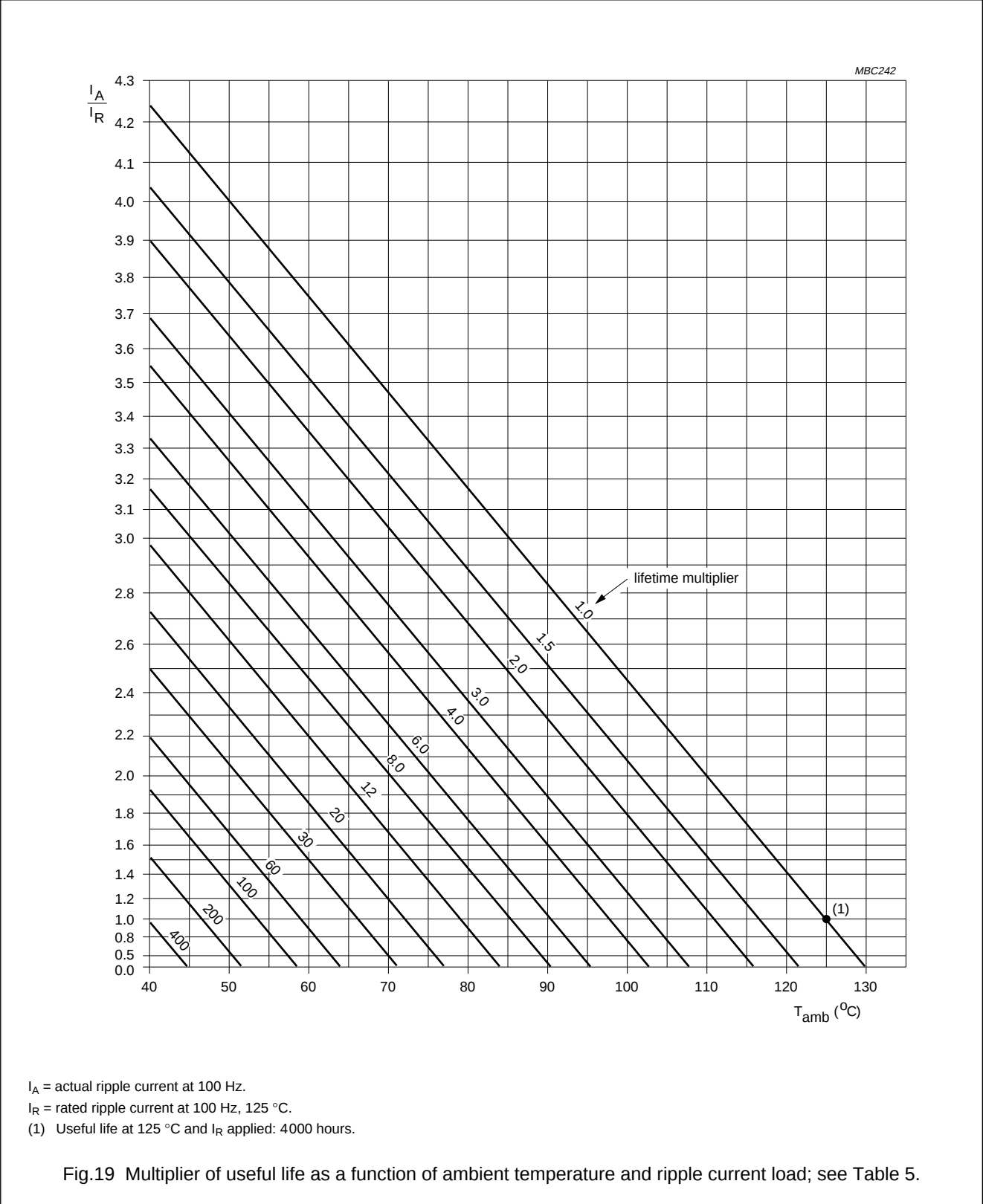


Fig.18 Typical impedance as a function of frequency.

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RIPPLE CURRENT AND USEFUL LIFE



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Table 5 Multiplier of ripple current (I_R/I_{RO}) as a function of frequency; I_{RO} = ripple current at 125 °C, 100 Hz; see Fig.19

FREQUENCY (Hz)	I_R MULTIPLIER		
	$U_R = 6.3$ to 25 V	$U_R = 40$ to 63 V	$U_R = 100$ to 200 V
50	0.95	0.9	0.85
100	1.0	1.0	1.0
300	1.07	1.12	1.2
1000	1.12	1.2	1.3
3000	1.15	1.25	1.35
≥ 10000	1.2	1.3	1.4

SPECIFIC TESTS AND REQUIREMENTS

General tests and requirements are specified in this handbook, section “Tests and Requirements”.

Table 6 Test procedures and requirements

TEST		PROCEDURE (quick reference)	REQUIREMENTS
NAME OF TEST	REFERENCE		
Endurance	IEC 384-4/ CECC 30300 subclause 4.13	$T_{amb} = 125$ °C; U_R applied; case sizes: 6.5×18 to 10×25 mm: 2000 hours 10×30 to 21×40 mm: 3000 hours	$U_R \leq 6.3$ V; $\Delta C/C$: +15/–30% $U_R > 6.3$ V; $\Delta C/C$: $\pm 15\%$ $\tan \delta \leq 1.3 \times \text{spec. limit}$ $Z \leq 2 \times \text{spec. limit}$ $I_{L5} \leq \text{spec. limit}$
Useful life	CECC 30301 subclause 1.8.1	$T_{amb} = 125$ °C; U_R and I_R applied; 4000 hours	$U_R \leq 6.3$ V; $\Delta C/C$: +45/–50% $U_R > 6.3$ V; $\Delta C/C$: $\pm 45\%$ $\tan \delta \leq 3 \times \text{spec. limit}$ $Z \leq 3 \times \text{spec. limit}$ $I_{L5} \leq \text{spec. limit}$ no short or open circuit total failure percentage: $\leq 1\%$
Shelf life (storage at high temperature)	IEC 384-4/ CECC 30300 subclause 4.17	$T_{amb} = 125$ °C; no voltage applied; $U_R = 6.3$ to 63 V: 500 hours; $U_R = 100$ and 200 V: 100 hours; after test: U_R to be applied for 30 minutes, 24 to 48 hours before measurement	$\Delta C/C$, $\tan \delta$, Z : for requirements see ‘Endurance test’ above $I_{L5} \leq 2 \times \text{spec. limit}$
Reverse voltage	IEC 384-4/ CECC 30300 subclause 4.15	$T_{amb} = 125$ °C: 125 hours at $U = -1$ V followed by 125 hours at U_R	$\Delta C/C$: $\pm 20\%$ $\tan \delta \leq \text{spec. limit}$ $I_{L5} \leq \text{spec. limit}$