

# DATA SHEET

O56/O57 PSM-SI  
**Aluminum electrolytic capacitors**  
**Power Standard Miniature Snap-in**

Product specification  
Supersedes data of 18th January 2000  
File under BCcomponents, BC01

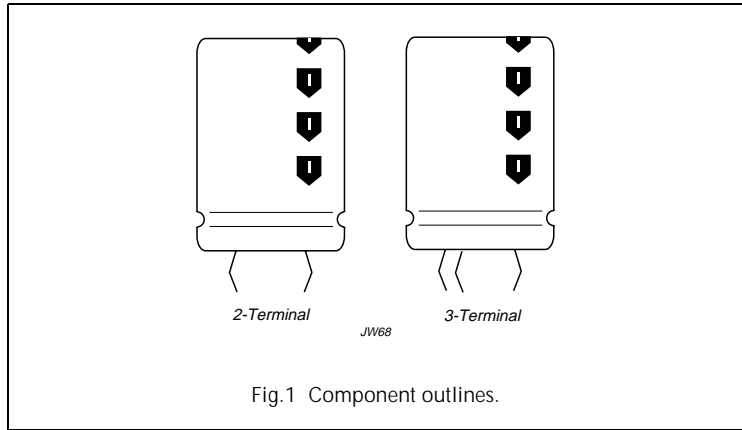
2000 Sep 18

# Aluminum electrolytic capacitors Power Standard Miniature Snap-in

056/057 PSM-SI

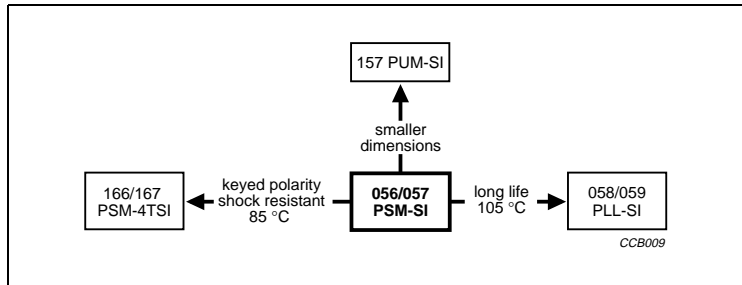
## FEATURES

- Polarized aluminum electrolytic capacitors, non-solid electrolyte
- Large types, minimized dimensions, cylindrical aluminum case, insulated with a blue sleeve
- Pressure relief on the top of the aluminum case
- Charge and discharge proof
- Long useful life: 12000 hours at 85 °C
- High ripple current capability; see Table 3 for ripple current optimized types, 385 V and 400 V
- Keyed polarity version available.



## APPLICATIONS

- General purpose, industrial and audio/video systems
- Smoothing and filtering
- Standard and switched mode power supplies
- Energy storage in pulse systems.



## QUICK REFERENCE DATA

DESCRIPTION	VALUE	
	056	057
Case size ( $\varnothing D_{nom} \times L_{nom}$ in mm)	22 × 25 to 35 × 50	
Rated capacitance range (E6 series), $C_R$	470 to 68000 $\mu F$	47 to 1500 $\mu F$
Tolerance on $C_R$	±20%	
Rated voltage range, $U_R$ ; note 1	10 to 100 V	200 to 450 V
Category temperature range	−40 to +85 °C	
Endurance test at 85 °C	5000 hours (450 V: 2000 hours)	
Useful life at 85 °C	12000 hours (450 V: 5000 hours)	
Useful life at 40 °C and $1.4 \times I_R$ applied	210000 hours (450 V: 90000 hours)	
Shelf life at 0 V, 85 °C	500 hours	
Based on sectional specification	IEC 60384-4/EN130300	
Climatic category IEC 60068	40/085/56	

## Note

1. A 420 V range is available on request.

# Aluminum electrolytic capacitors

## Power Standard Miniature Snap-in

### 056/057 PSM-SI

Selection chart for  $C_R$ ,  $U_R$  and relevant nominal case sizes ( $\varnothing D \times L$  in mm) for 056 series

Preferred types (2-terminals) in **bold**.

$C_R$ ( $\mu F$ )	$U_R$ (V)						
	10	16	25	40	50	63	100
470	–	–	–	–	–	–	22 × 25
680	–	–	–	–	–	–	<b>22 × 30</b>
1000	–	–	–	–	–	22 × 25	<b>25 × 30</b>
	–	–	–	–	–	–	22 × 40
1500	–	–	–	–	22 × 25	<b>22 × 30</b>	30 × 30
	–	–	–	–	–	–	<b>25 × 40</b>
2200	–	–	–	22 × 25	<b>22 × 30</b>	<b>25 × 30</b>	<b>30 × 40</b>
	–	–	–	–	–	22 × 40	25 × 50
3300	–	–	22 × 25	<b>22 × 30</b>	<b>25 × 30</b>	30 × 30	35 × 40
	–	–	–	–	22 × 40	<b>25 × 40</b>	<b>30 × 50</b>
4700	–	22 × 25	<b>22 × 30</b>	<b>25 × 30</b>	30 × 30	<b>30 × 40</b>	<b>35 × 50</b>
	–	–	–	22 × 40	<b>25 × 40</b>	25 × 50	–
6800	22 × 25	<b>22 × 30</b>	<b>25 × 30</b>	30 × 30	<b>30 × 40</b>	35 × 40	–
	–	–	22 × 40	<b>25 × 40</b>	25 × 50	<b>30 × 50</b>	–
10000	<b>22 × 30</b>	<b>25 × 30</b>	30 × 30	<b>30 × 40</b>	35 × 40	<b>35 × 50</b>	–
	–	22 × 40	<b>25 × 40</b>	25 × 50	<b>30 × 50</b>	–	–
15000	<b>25 × 30</b>	30 × 30	<b>30 × 40</b>	35 × 40	<b>35 × 50</b>	–	–
	22 × 40	<b>25 × 40</b>	25 × 50	<b>30 × 50</b>	–	–	–
22000	30 × 30	<b>30 × 40</b>	35 × 40	<b>35 × 50</b>	–	–	–
	<b>25 × 40</b>	25 × 50	<b>30 × 50</b>	–	–	–	–
33000	<b>30 × 40</b>	35 × 40	<b>35 × 50</b>	–	–	–	–
	25 × 50	<b>30 × 50</b>	–	–	–	–	–
47000	35 × 40	<b>35 × 50</b>	–	–	–	–	–
	<b>30 × 50</b>	–	–	–	–	–	–
68000	<b>35 × 50</b>	–	–	–	–	–	–

# Aluminum electrolytic capacitors

## Power Standard Miniature Snap-in

### 056/057 PSM-SI

Selection chart for  $C_R$ ,  $U_R$  and relevant nominal case sizes ( $\varnothing D \times L$  in mm) for 057 series

Preferred types (2-terminals) in **bold**.

$C_R$ ( $\mu F$ )	$U_R$ (V)				
	200	250	385	400	450
47	–	–	22 × 30 <sup>(1)</sup>	22 × 30 <sup>(1)</sup>	<b>22 × 30</b>
	–	–	22 × 25	22 × 25	–
68	–	–	25 × 30 <sup>(1)</sup>	25 × 30 <sup>(1)</sup>	<b>22 × 30</b>
	–	–	22 × 40 <sup>(1)</sup>	22 × 35 <sup>(1)</sup>	–
	–	–	22 × 35 <sup>(1)</sup>	<b>22 × 30</b>	–
	–	–	<b>22 × 30</b>	–	–
100	–	22 × 25	30 × 30 <sup>(1)</sup>	30 × 30 <sup>(1)</sup>	30 × 30
	–	–	25 × 40 <sup>(1)</sup>	25 × 40 <sup>(1)</sup>	–
	–	–	<b>25 × 30</b>	<b>25 × 30</b>	–
	–	–	22 × 40	22 × 35	–
	–	–	22 × 35	–	<b>25 × 35</b>
150	22 × 25	<b>22 × 30</b>	30 × 40 <sup>(1)</sup>	30 × 35 <sup>(1)</sup>	25 × 50
	–	–	30 × 35 <sup>(1)</sup>	30 × 30	–
	–	–	30 × 30	25 × 50 <sup>(1)</sup>	–
	–	–	25 × 50 <sup>(1)</sup>	<b>25 × 40</b>	–
	–	–	<b>25 × 40</b>	–	<b>30 × 35</b>
220	<b>22 × 30</b>	<b>25 × 30</b>	35 × 35 <sup>(1)</sup>	35 × 40 <sup>(1)</sup>	35 × 40
	–	22 × 40	30 × 45 <sup>(1)</sup>	30 × 50 <sup>(1)</sup>	<b>30 × 45</b>
	–	–	30 × 40	<b>30 × 35</b>	–
	–	–	<b>30 × 35</b>	25 × 50	–
	–	–	25 × 50	–	–
330	<b>25 × 30</b>	30 × 30	35 × 50 <sup>(1)</sup>	35 × 50 <sup>(1)</sup>	35 × 50
	22 × 40	<b>25 × 40</b>	35 × 45 <sup>(1)</sup>	35 × 40	<b>35 × 45</b>
	–	–	35 × 35	<b>30 × 50</b>	–
	–	–	<b>30 × 45</b>	–	–
470	30 × 30	<b>30 × 40</b>	35 × 50	<b>35 × 50</b>	–
	<b>25 × 40</b>	25 × 50	<b>35 × 45</b>	–	–
680	<b>30 × 40</b>	35 × 40	–	–	–
	25 × 50	<b>30 × 50</b>	–	–	–
1000	35 × 40	<b>35 × 50</b>	–	–	–
	<b>30 × 50</b>	–	–	–	–
1500	<b>35 × 50</b>	–	–	–	–

#### Note

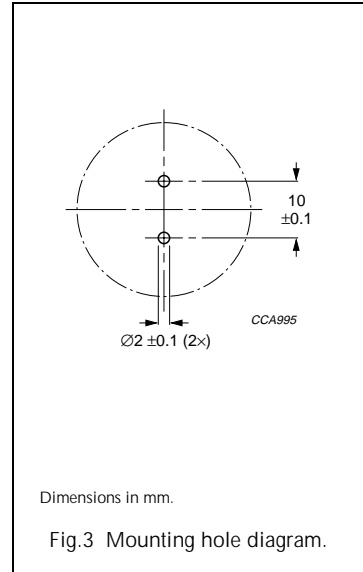
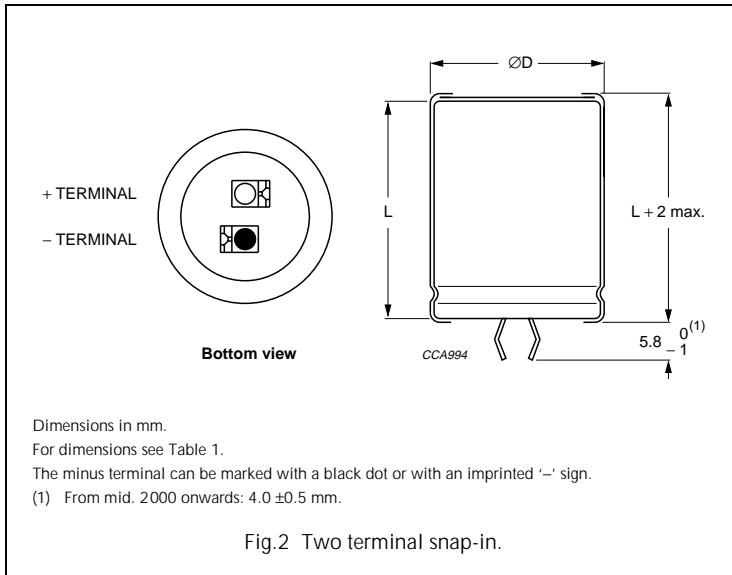
1. Ripple current optimized types.

# Aluminum electrolytic capacitors Power Standard Miniature Snap-in

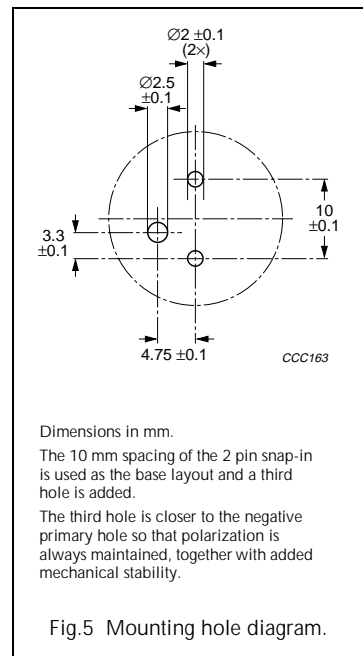
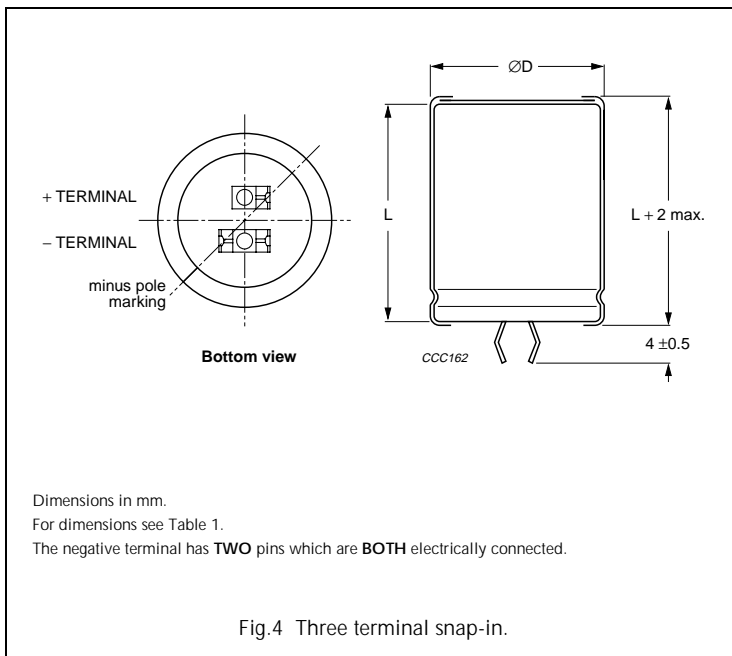
## O56/O57 PSM-SI

### MECHANICAL DATA AND PACKAGING QUANTITIES

#### Two terminal snap-in



#### Three terminal snap-in



# Aluminum electrolytic capacitors

## Power Standard Miniature Snap-in

### O56/O57 PSM-SI

**Table 1** Physical dimensions, mass and packaging information; see Figs 2 and 4

NOMINAL CASE SIZE ∅D × L (mm)	∅D <sub>max</sub> (mm)	L <sub>max</sub> (mm)	MASS (g)	PACKAGING QUANTITIES (units per box)	CARDBOARD BOX DIMENSIONS l × w × h (mm)
22 × 25	23	27	≈12	100	260 × 250 × 39
22 × 30	23	32	≈16	100	260 × 250 × 44
22 × 35	23	37	≈20	100	260 × 250 × 49
22 × 40	23	42	≈23	100	260 × 250 × 54
25 × 30	26	32	≈22	100	290 × 280 × 44
25 × 35	26	37	≈24	100	290 × 280 × 49
25 × 40	26	42	≈27	100	290 × 280 × 54
25 × 50	26	52	≈38	100	290 × 280 × 64
30 × 30	31	32	≈30	100	340 × 330 × 44
30 × 35	31	37	≈35	100	340 × 330 × 49
30 × 40	31	42	≈40	100	340 × 330 × 54
30 × 45	31	47	≈45	100	340 × 330 × 59
30 × 50	31	52	≈50	100	340 × 330 × 64
35 × 35	36	37	≈48	50	390 × 198 × 49
35 × 40	36	42	≈55	50	390 × 198 × 54
35 × 45	36	47	≈63	50	390 × 198 × 59
35 × 50	36	52	≈72	50	390 × 198 × 64

### MARKING

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

- Rated capacitance (in  $\mu\text{F}$ )
- Tolerance code on rated capacitance (M for  $\pm 20\%$ )
- Rated voltage (in V)
- Climatic category in accordance with "IEC 60068"
- Date code (year and week) in accordance with "IEC 60062"
- Code for factory of origin
- Name of manufacturer
- '−' sign to indicate the negative terminal, visible from the top and side of the capacitor
- Code number (last 8 digits)
- Code for basic specification in accordance with "IEC 60384-4-1" and "CECC 30301".

# Aluminum electrolytic capacitors

## Power Standard Miniature Snap-in

### 056/057 PSM-SI

#### ELECTRICAL DATA AND ORDERING INFORMATION

Unless otherwise specified, all electrical values in Tables 2 and 3 apply at  $T_{amb} = 20\text{ °C}$ ,  $P = 86$  to  $106\text{ kPa}$ ,  $RH = 45$  to  $75\%$ .

SYMBOL	DESCRIPTION
$C_R$	rated capacitance at 100 Hz
$I_R$	rated RMS ripple current at 100 Hz or $\geq 10\text{ kHz}$ and $85\text{ °C}$
$I_{L1}$	max. leakage current after 1 minute at $U_R$
$I_{L5}$	max. leakage current after 5 minutes at $U_R$
ESR	max. equivalent series resistance at 100 Hz
Z	max. impedance at 10 kHz

#### Ordering example

Electrolytic capacitor 056 series

10000  $\mu\text{F}/25\text{ V}$ ;  $\pm 20\%$

Nominal case size:  $\varnothing 25 \times 40\text{ mm}$

2-TERMINAL SNAP-IN:

Catalogue number: 2222 056 46103.

3-TERMINAL SNAP-IN:

Catalogue number: 2222 056 26103.

**Table 2** Electrical data and ordering information for **056** series; preferred types in **bold**

$U_R$ (V)	$C_R$ 100 Hz ( $\mu\text{F}$ )	NOMINAL CASE SIZE $\varnothing D \times L$ (mm)	$I_R$ 100 Hz $85\text{ °C}$ (A)	$I_R$ $\geq 10\text{ kHz}$ $85\text{ °C}$ (A)	$I_{L1}$ 1 min ( $\mu\text{A}$ )	$I_{L5}$ 5 min ( $\mu\text{A}$ )	ESR 100 Hz ( $\text{m}\Omega$ )	Z 10 kHz ( $\text{m}\Omega$ )	CATALOGUE NUMBER 2222 056 .....	
									2-TERM.	3-TERM.
10	6800	22 × 25	2.04	2.40	412	140	76	62	54682	74682
	<b>10000</b>	<b>22 × 30</b>	2.56	3.02	608	205	56	45	<b>54103</b>	74103
	<b>15000</b>	<b>25 × 30</b>	3.12	3.68	904	304	44	39	<b>54153</b>	74153
	15000	22 × 40	3.39	4.00	904	304	41	34	44153	24153
	22000	30 × 30	3.47	4.09	1324	444	44	37	54223	74223
	<b>22000</b>	<b>25 × 40</b>	4.12	4.86	1324	444	34	28	<b>44223</b>	24223
	<b>33000</b>	<b>30 × 40</b>	4.58	5.40	1984	664	32	28	<b>54333</b>	74333
	33000	25 × 50	4.70	5.55	1984	664	30	27	44333	24333
	47000	35 × 40	5.10	6.02	2824	944	31	26	54473	74473
	<b>47000</b>	<b>30 × 50</b>	5.39	6.36	2824	944	28	24	<b>44473</b>	24473
	<b>68000</b>	<b>35 × 50</b>	5.88	6.94	4084	1364	28	23	<b>54683</b>	74683
16	4700	22 × 25	2.01	2.37	455	154	79	62	55472	75472
	<b>6800</b>	<b>22 × 30</b>	2.54	3.00	657	222	57	45	<b>55682</b>	75682
	<b>10000</b>	<b>25 × 30</b>	3.02	3.56	964	324	47	39	<b>55103</b>	75103
	10000	22 × 40	3.28	3.87	964	324	44	34	45103	25103
	15000	30 × 30	3.36	3.96	1444	484	47	37	55153	75153
	<b>15000</b>	<b>25 × 40</b>	4.00	4.72	1444	484	34	28	<b>45153</b>	25153
	<b>22000</b>	<b>30 × 40</b>	4.51	5.32	2116	708	33	28	<b>55223</b>	75223
	22000	25 × 50	3.97	4.68	2116	708	42	41	45223	25223
	33000	35 × 40	5.02	5.92	3172	1060	32	28	55333	75333
	<b>33000</b>	<b>30 × 50</b>	4.75	5.61	3172	1060	36	34	<b>45333</b>	25333
	<b>47000</b>	<b>35 × 50</b>	5.34	6.30	4516	1508	34	32	<b>55473</b>	75473

# Aluminum electrolytic capacitors

## Power Standard Miniature Snap-in

### 056/057 PSM-SI

U <sub>R</sub> (V)	C <sub>R</sub> 100 Hz (μF)	NOMINAL CASE SIZE ØD × L (mm)	I <sub>R</sub> 100 Hz 85 °C (A)	I <sub>R</sub> ≥10 kHz 85 °C (A)	I <sub>L1</sub> 1 min (μA)	I <sub>L5</sub> 5 min (μA)	ESR 100 Hz (mΩ)	Z 10 kHz (mΩ)	CATALOGUE NUMBER 2222 056 .....	
									2-TERM.	3-TERM.
25	3300	22 × 25	1.88	2.22	499	169	89	61	56332	76332
	<b>4700</b>	<b>22 × 30</b>	2.37	2.80	709	239	65	45	<b>56472</b>	76472
	<b>6800</b>	<b>25 × 30</b>	2.81	3.32	1024	344	54	41	<b>56682</b>	76682
	6800	22 × 40	3.16	3.73	1024	344	47	38	46682	26682
	10000	30 × 30	3.25	3.84	1504	504	50	38	56103	76103
	<b>10000</b>	<b>25 × 40</b>	3.73	4.40	1504	504	39	30	<b>46103</b>	26103
	<b>15000</b>	<b>30 × 40</b>	4.73	5.58	2254	754	30	28	<b>56153</b>	76153
	15000	25 × 50	3.92	4.63	2254	754	43	39	46153	26153
	22000	35 × 40	4.48	5.29	3304	1104	40	28	56223	76223
	<b>22000</b>	<b>30 × 50</b>	4.96	5.85	3304	1104	36	23	<b>46223</b>	26223
	<b>33000</b>	<b>35 × 50</b>	4.98	5.88	4954	1654	39	33	<b>56333</b>	76333
40	2200	22 × 25	1.85	2.26	532	180	92	61	57222	77222
	<b>3300</b>	<b>22 × 30</b>	2.09	2.55	796	260	67	45	<b>57332</b>	77332
	<b>4700</b>	<b>25 × 30</b>	2.28	2.78	1132	380	82	70	<b>57472</b>	77472
	4700	22 × 40	3.10	3.78	1132	380	49	38	47472	27472
	6800	30 × 30	3.16	3.85	1636	548	53	38	57682	77682
	<b>6800</b>	<b>25 × 40</b>	3.06	3.73	1636	548	58	50	<b>47682</b>	27682
	<b>10000</b>	<b>30 × 40</b>	4.20	5.12	2404	804	38	28	<b>57103</b>	77103
	10000	25 × 50	3.88	4.73	2404	804	44	39	47103	27103
	15000	35 × 40	4.05	4.94	3604	1204	49	41	57153	77153
	<b>15000</b>	<b>30 × 50</b>	4.45	5.43	3604	1204	41	34	<b>47153</b>	27153
	<b>22000</b>	<b>35 × 50</b>	4.86	5.93	5284	1764	40	33	<b>57223</b>	77223
50	1500	22 × 25	1.36	1.66	454	154	170	130	51152	71152
	<b>2200</b>	<b>22 × 30</b>	1.75	2.14	664	224	120	91	<b>51222</b>	71222
	<b>3300</b>	<b>25 × 30</b>	2.17	2.65	994	334	90	72	<b>51332</b>	71332
	3300	22 × 40	2.42	2.95	994	334	80	63	41332	21332
	4700	30 × 30	2.65	3.23	1414	474	75	63	51472	71472
	<b>4700</b>	<b>25 × 40</b>	2.89	3.53	1414	474	65	52	<b>41472</b>	21472
	<b>6800</b>	<b>30 × 40</b>	3.56	4.34	2044	684	53	45	<b>51682</b>	71682
	6800	25 × 50	3.75	4.58	2044	684	50	43	41682	21682
	10000	35 × 40	4.05	4.94	3004	1004	49	42	51103	71103
	<b>10000</b>	<b>30 × 50</b>	4.50	5.49	3004	1004	40	35	<b>41103</b>	21103
	<b>15000</b>	<b>35 × 50</b>	4.98	6.08	4504	1504	39	33	<b>51153</b>	71153



# Aluminum electrolytic capacitors

## Power Standard Miniature Snap-in

### 056/057 PSM-SI

U <sub>R</sub> (V)	C <sub>R</sub> 100 Hz (μF)	NOMINAL CASE SIZE ØD × L (mm)	I <sub>R</sub> 100 Hz 85 °C (A)	I <sub>R</sub> ≥10 kHz 85 °C (A)	I <sub>L1</sub> 1 min (μA)	I <sub>L5</sub> 5 min (μA)	ESR 100 Hz (mΩ)	Z 10 kHz (mΩ)	CATALOGUE NUMBER 2222 056 .....	
									2-TERM.	3-TERM.
63	1000	22 × 25	1.46	1.78	382	130	148	104	58102	78102
	<b>1500</b>	<b>22 × 30</b>	1.87	2.28	571	193	105	72	<b>58152</b>	78152
	<b>2200</b>	<b>25 × 30</b>	2.32	2.83	836	281	79	59	<b>58222</b>	78222
	2200	22 × 40	2.54	3.10	836	281	73	53	48222	28222
	3300	30 × 30	2.87	3.50	1251	420	64	50	58332	78332
	<b>3300</b>	<b>25 × 40</b>	3.14	3.83	1251	420	55	44	<b>48332</b>	28332
	<b>4700</b>	<b>30 × 40</b>	3.67	4.48	1780	596	50	38	<b>58472</b>	78472
	4700	25 × 50	3.71	4.53	1780	596	48	38	48472	28472
	6800	35 × 40	4.33	5.28	2574	861	43	38	58682	78682
	<b>6800</b>	<b>30 × 50</b>	4.75	5.80	2574	861	42	37	<b>48682</b>	28682
	<b>10000</b>	<b>35 × 50</b>	5.26	6.42	3784	1264	35	30	<b>58103</b>	78103
100	470	22 × 25	0.77	0.94	286	98	535	470	59471	79471
	<b>680</b>	<b>22 × 30</b>	0.99	1.21	412	160	375	328	<b>59681</b>	79681
	<b>1000</b>	<b>25 × 30</b>	1.27	1.55	604	204	265	235	<b>59102</b>	79102
	1000	22 × 40	1.35	1.65	604	204	260	225	49102	29102
	1500	30 × 30	1.67	2.04	904	304	190	170	59152	79152
	<b>1500</b>	<b>25 × 40</b>	1.75	2.14	904	304	180	160	<b>49152</b>	29152
	<b>2200</b>	<b>30 × 40</b>	2.27	2.77	1324	444	130	120	<b>59222</b>	79222
	2200	25 × 50	2.30	2.80	1324	444	125	110	49222	29222
	3300	35 × 40	2.84	3.46	1984	664	100	95	59332	79332
	<b>3300</b>	<b>30 × 50</b>	2.97	3.62	1984	664	92	85	<b>49332</b>	29332
	<b>4700</b>	<b>35 × 50</b>	3.59	4.38	2824	677	75	70	<b>59472</b>	79472

# Aluminum electrolytic capacitors

## Power Standard Miniature Snap-in

### O56/O57 PSM-SI

**Table 3** Electrical data and ordering information for **O57** series; preferred types in **bold**

U <sub>R</sub> (V)	C <sub>R</sub> 100 Hz (μF)	NOMINAL CASE SIZE ØD × L (mm)	I <sub>R</sub> 100 Hz 85 °C (A)	I <sub>L1</sub> 1 min (μA)	I <sub>L5</sub> 5 min (μA)	ESR 100 Hz (mΩ)	Z 10 kHz (mΩ)	CATALOGUE NUMBER 2222 057 .....		
								2-TERM.	3-TERM.	
200	150	22 × 25	0.77	184	64	950	620	52151	72151	
	<b>220</b>	<b>22 × 30</b>	1.00	268	92	650	435	<b>52221</b>	72221	
	<b>330</b>	<b>25 × 30</b>	1.36	400	136	430	310	<b>52331</b>	72331	
	330	22 × 40	1.36	400	136	430	310	42331	22331	
	470	30 × 30	1.80	568	192	310	230	52471	72471	
	<b>470</b>	<b>25 × 40</b>	1.80	568	192	310	230	<b>42471</b>	22471	
	<b>680</b>	<b>30 × 40</b>	2.39	820	276	210	180	<b>52681</b>	72681	
	680	25 × 50	2.39	820	276	210	180	42681	22681	
	1000	35 × 40	2.85	1204	404	160	135	52102	72102	
	<b>1000</b>	<b>30 × 50</b>	2.85	1204	404	160	135	<b>42102</b>	22102	
	<b>1500</b>	<b>35 × 50</b>	3.66	1804	604	120	105	<b>52152</b>	72152	
250	100	22 × 25	0.63	154	54	1440	770	53101	73101	
	<b>150</b>	<b>22 × 30</b>	0.83	229	79	960	520	<b>53151</b>	73151	
	<b>220</b>	<b>25 × 30</b>	1.10	334	114	660	365	<b>53221</b>	73221	
	220	22 × 40	1.10	334	114	660	365	43221	23221	
	330	30 × 30	1.49	499	169	440	265	53331	73331	
	<b>330</b>	<b>25 × 40</b>	1.49	499	169	440	265	<b>43331</b>	23331	
	<b>470</b>	<b>30 × 40</b>	1.98	709	239	310	185	<b>53471</b>	73471	
	470	25 × 50	1.98	709	239	310	185	43471	23471	
	680	35 × 40	2.60	1024	344	240	145	53681	73681	
	<b>680</b>	<b>30 × 50</b>	2.60	1024	344	240	145	<b>43681</b>	23681	
		<b>1000</b>	<b>35 × 50</b>	3.12	1504	504	160	105	<b>53102</b>	73102
	385	47	22 × 30	0.59	112	40	3000	1400	18479 <sup>(1)</sup>	28479 <sup>(1)</sup>
47		22 × 25	0.50	112	40	3000	1400	58479	78479	
68		25 × 30	0.82	161	56	2100	1100	78689 <sup>(1)</sup>	88689 <sup>(1)</sup>	
68		22 × 40	0.81	161	56	2100	1100	28689 <sup>(1)</sup>	38689 <sup>(1)</sup>	
68		22 × 35	0.79	161	56	2100	1100	18689 <sup>(1)</sup>	48689 <sup>(1)</sup>	
<b>68</b>		<b>22 × 30</b>	0.63	161	56	2100	1000	<b>58689</b>	68689	
100		30 × 30	1.13	235	81	1400	750	28101 <sup>(1)</sup>	93001 <sup>(1)</sup>	
100		25 × 40	1.13	235	81	1400	750	18101 <sup>(1)</sup>	93002 <sup>(1)</sup>	
<b>100</b>		<b>25 × 30</b>	0.86	235	81	1400	780	<b>58101</b>	78101	
100		22 × 40	0.86	235	81	1400	780	48101	68101	
100		22 × 35	0.84	235	81	1400	780	38101	88101	
150		30 × 40	1.54	350	119	1000	500	38151 <sup>(1)</sup>	93003 <sup>(1)</sup>	
150		30 × 35	1.41	350	119	1000	500	28151 <sup>(1)</sup>	88151 <sup>(1)</sup>	
150		30 × 30	1.16	350	119	950	520	58151	78151	
150		25 × 50	1.48	350	119	1000	500	18151 <sup>(1)</sup>	93004 <sup>(1)</sup>	

# Aluminum electrolytic capacitors

## Power Standard Miniature Snap-in

### 056/057 PSM-SI

U <sub>R</sub> (V)	C <sub>R</sub> 100 Hz (μF)	NOMINAL CASE SIZE ∅D × L (mm)	I <sub>R</sub> 100 Hz 85 °C (A)	I <sub>L1</sub> 1 min (μA)	I <sub>L5</sub> 5 min (μA)	ESR 100 Hz (mΩ)	Z 10 kHz (mΩ)	CATALOGUE NUMBER 2222 057 .....	
								2-TERM.	3-TERM.
385	<b>150</b>	<b>25 × 40</b>	1.16	350	119	950	520	<b>48151</b>	68151
	220	35 × 35	1.61	512	173	700	460	28221 <sup>(1)</sup>	93005 <sup>(1)</sup>
	220	30 × 45	1.63	512	173	700	460	18221 <sup>(1)</sup>	88221 <sup>(1)</sup>
	220	30 × 40	1.57	512	173	650	400	58221	78221
	<b>220</b>	<b>30 × 35</b>	1.50	512	173	650	400	<b>38221</b>	90051
	220	25 × 50	1.57	512	173	650	400	48221	68221
	330	35 × 50	2.31	766	258	450	280	28331 <sup>(1)</sup>	93006 <sup>(1)</sup>
	330	35 × 45	2.20	766	258	450	280	18331 <sup>(1)</sup>	93007 <sup>(1)</sup>
	330	35 × 35	1.73	766	258	480	280	68331	88331
	<b>330</b>	<b>30 × 45</b>	1.75	766	258	480	280	<b>38331</b>	78331
	470	35 × 50	2.40	1089	366	340	220	58471	78471
	<b>470</b>	<b>35 × 45</b>	2.29	1089	366	340	220	<b>48471</b>	28471
400	47	22 × 30	0.59	117	42	3000	1400	16479 <sup>(1)</sup>	26479 <sup>(1)</sup>
	47	22 × 25	0.50	117	42	3000	1400	56479	76479
	68	25 × 30	0.82	167	58	2100	1100	26689 <sup>(1)</sup>	66689 <sup>(1)</sup>
	68	22 × 35	0.79	167	58	2100	1100	16689 <sup>(1)</sup>	86689 <sup>(1)</sup>
	<b>68</b>	<b>22 × 30</b>	0.63	167	58	2100	1000	<b>56689</b>	76689
	100	30 × 30	1.13	244	84	1400	750	26101 <sup>(1)</sup>	86101 <sup>(1)</sup>
	100	25 × 40	1.13	244	84	1400	750	16101 <sup>(1)</sup>	93008 <sup>(1)</sup>
	<b>100</b>	<b>25 × 30</b>	0.86	244	84	1400	780	<b>56101</b>	76101
	100	22 × 35	0.84	240	84	1400	780	36101	66101
	150	30 × 35	1.41	364	124	1000	520	26151 <sup>(1)</sup>	66151 <sup>(1)</sup>
	150	30 × 30	1.16	364	124	950	520	56151	90054
	150	25 × 50	1.50	364	124	1000	520	16151 <sup>(1)</sup>	36151 <sup>(1)</sup>
	<b>150</b>	<b>25 × 40</b>	1.16	364	124	950	520	<b>46151</b>	86151
	220	35 × 40	1.74	532	180	700	460	26221 <sup>(1)</sup>	93009 <sup>(1)</sup>
	220	30 × 50	1.75	532	180	700	460	16221 <sup>(1)</sup>	76221 <sup>(1)</sup>
	<b>220</b>	<b>30 × 35</b>	1.50	532	180	650	400	<b>36221</b>	90055
	220	25 × 50	1.57	532	180	650	400	46221	86221
	330	35 × 50	2.31	796	268	450	300	16331 <sup>(1)</sup>	86331 <sup>(1)</sup>
	330	35 × 40	1.85	796	268	480	280	56331	76331
	<b>330</b>	<b>30 × 50</b>	1.85	796	268	480	280	<b>46331</b>	26331
	<b>470</b>	<b>35 × 50</b>	2.40	1132	380	340	220	<b>56471</b>	76471

# Aluminum electrolytic capacitors

## Power Standard Miniature Snap-in

### 056/057 PSM-SI

U <sub>R</sub> (V)	C <sub>R</sub> 100 Hz (μF)	NOMINAL CASE SIZE ∅D × L (mm)	I <sub>R</sub> 100 Hz 85 °C (A)	I <sub>L1</sub> 1 min (μA)	I <sub>L5</sub> 5 min (μA)	ESR 100 Hz (mΩ)	Z 10 kHz (mΩ)	CATALOGUE NUMBER 2222 057 .....	
								2-TERM.	3-TERM.
450	47	22 × 30	0.26	131	45	5600	4400	<b>67479</b>	87479
	68	22 × 30	0.33	188	65	3900	3100	<b>57689</b>	77689
	100	30 × 30	0.48	274	94	2600	2100	57101	77101
	100	25 × 35	0.46	274	94	2600	2100	<b>37101</b>	17101
	150	30 × 35	0.66	409	140	1600	1300	<b>37151</b>	17151
	150	25 × 50	0.70	409	140	1600	1300	47151	27151
	220	35 × 40	0.92	598	202	1100	900	57221	77221
	220	30 × 45	0.73	598	202	1100	900	<b>37221</b>	17221
	330	35 × 50	1.26	895	301	700	600	57331	77331
	330	35 × 45	1.20	895	301	700	600	<b>47331</b>	27331

#### Note

1. Ripple current optimized types.

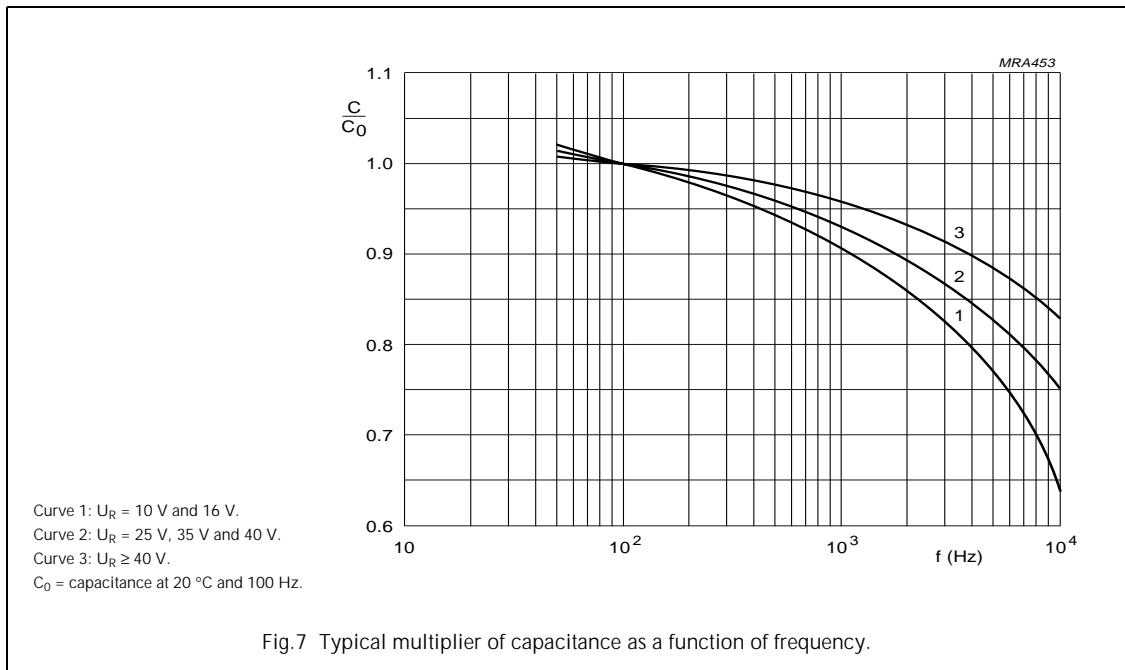
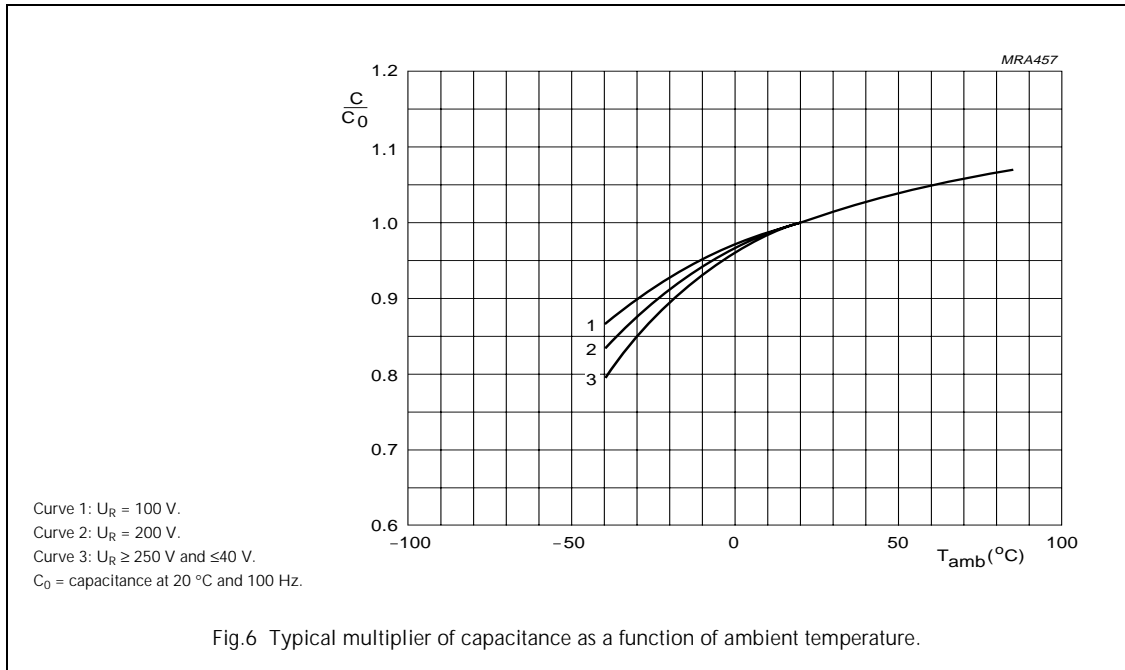
#### Additional electrical data

PARAMETER	CONDITIONS	VALUE
<b>Voltage</b>		
Surge voltage	≤250 V versions	$U_s = 1.15 \times U_R$
	≥385 V versions	$U_s = 1.1 \times U_R$
Reverse voltage		$U_{rev} \leq 1 \text{ V}$
<b>Current</b>		
Leakage current	after 1 minute at U <sub>R</sub>	$I_{L1} \leq 0.006C_R \times U_R + 4 \mu\text{A}$
	after 5 minutes at U <sub>R</sub>	$I_{L5} \leq 0.002C_R \times U_R + 4 \mu\text{A}$
<b>Inductance</b>		
Equivalent series inductance (ESL)	all case sizes	typ. 19 nH
		max. 25 nH

# Aluminum electrolytic capacitors Power Standard Miniature Snap-in

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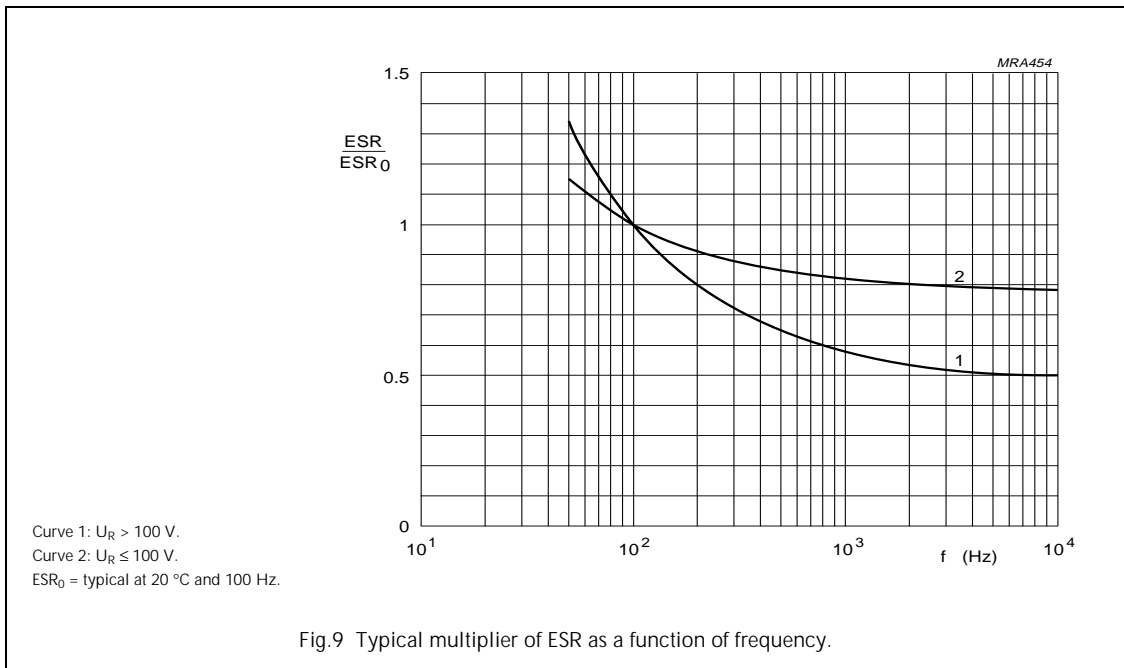
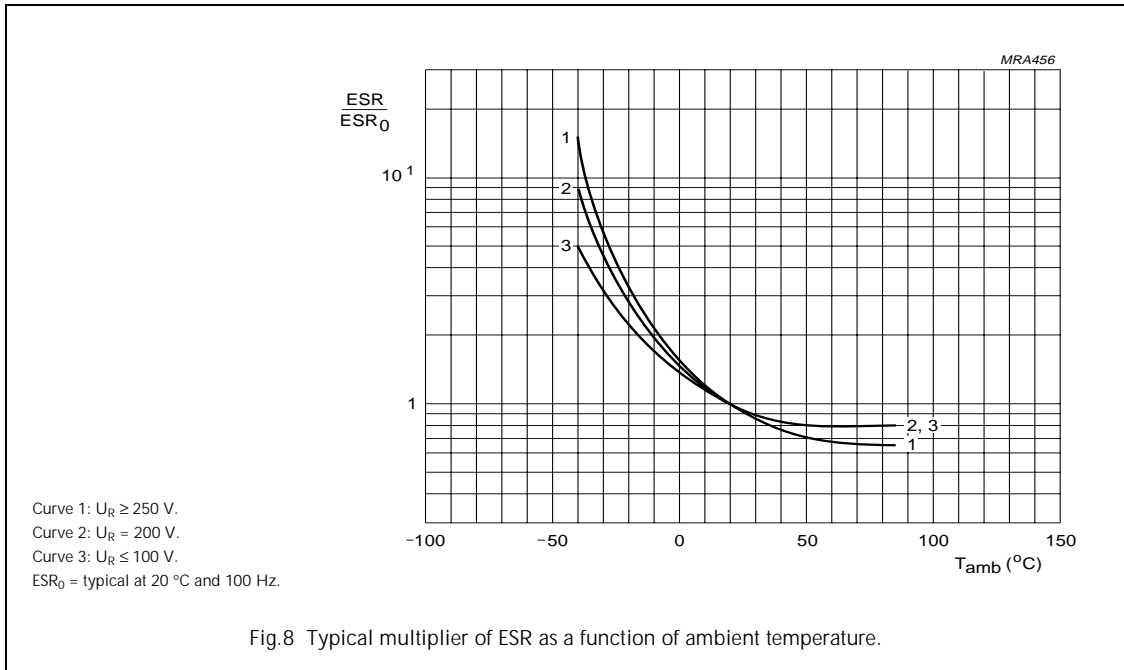
## Capacitance (C)



# Aluminum electrolytic capacitors Power Standard Miniature Snap-in

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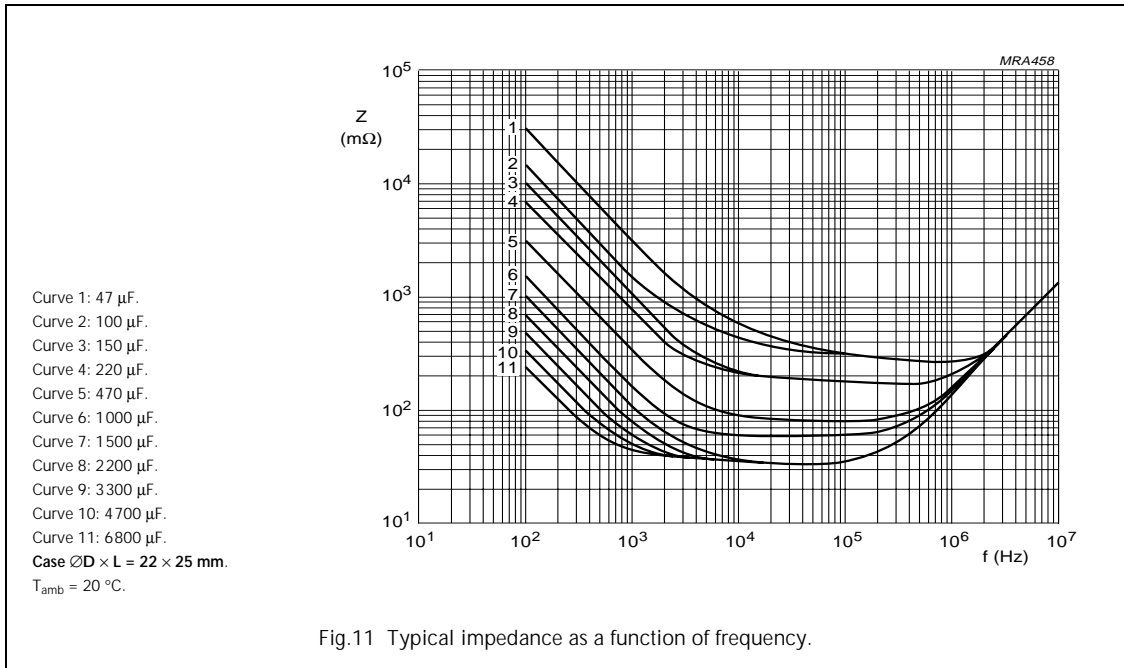
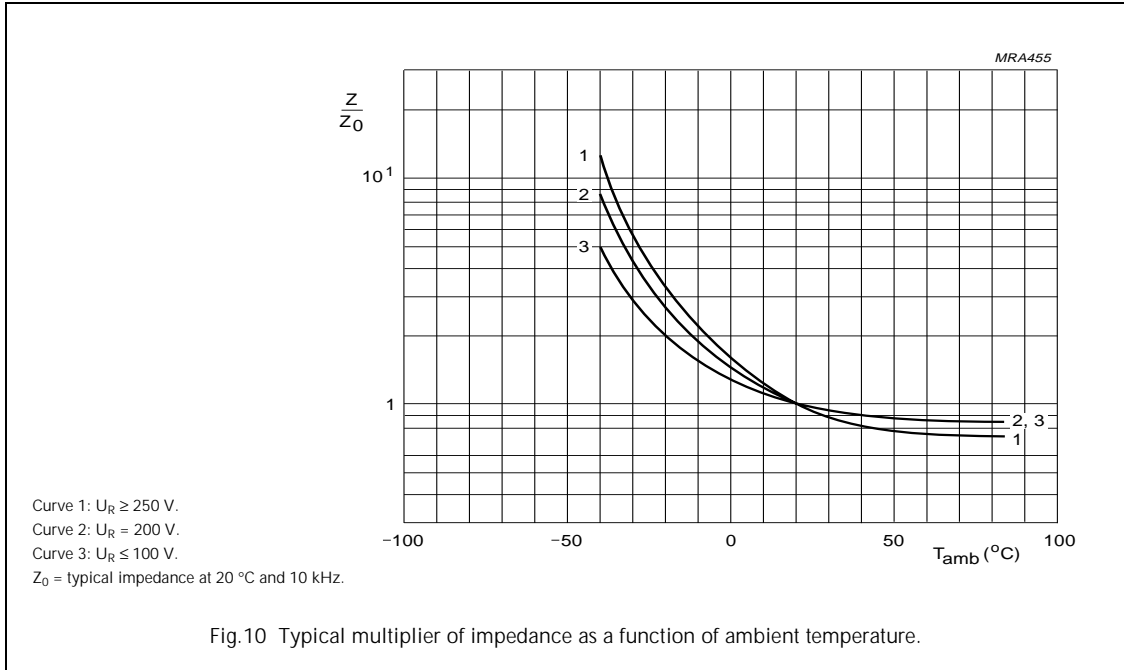
## Equivalent series resistance (ESR)



# Aluminum electrolytic capacitors Power Standard Miniature Snap-in

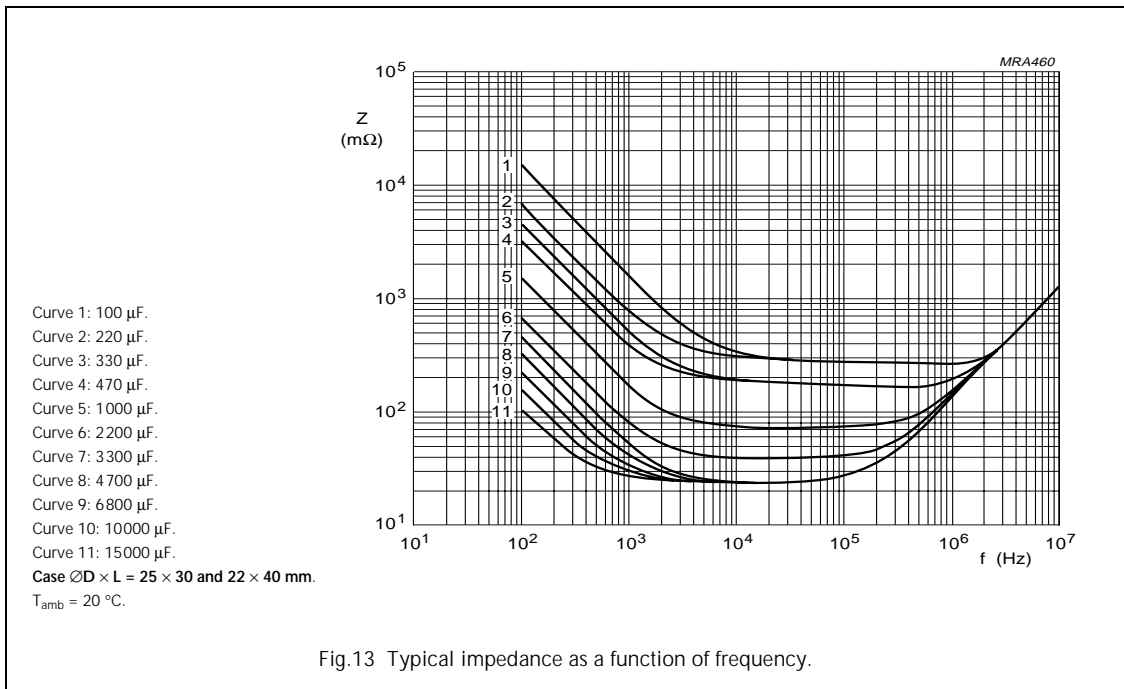
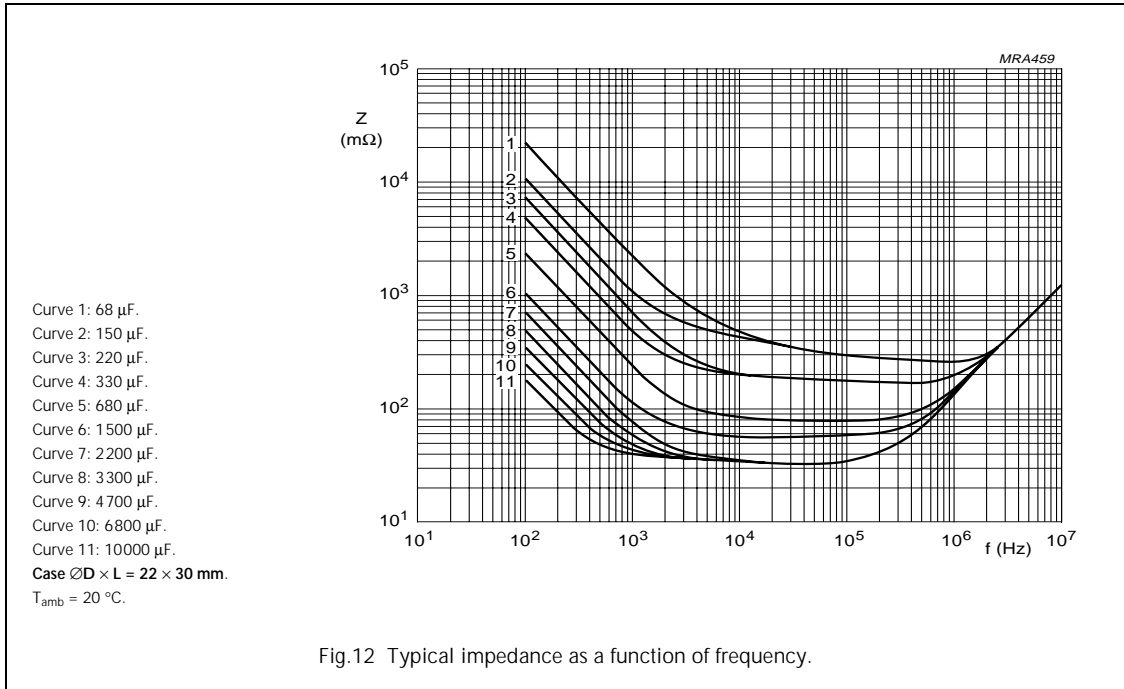
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## Impedance (Z)



# Aluminum electrolytic capacitors Power Standard Miniature Snap-in

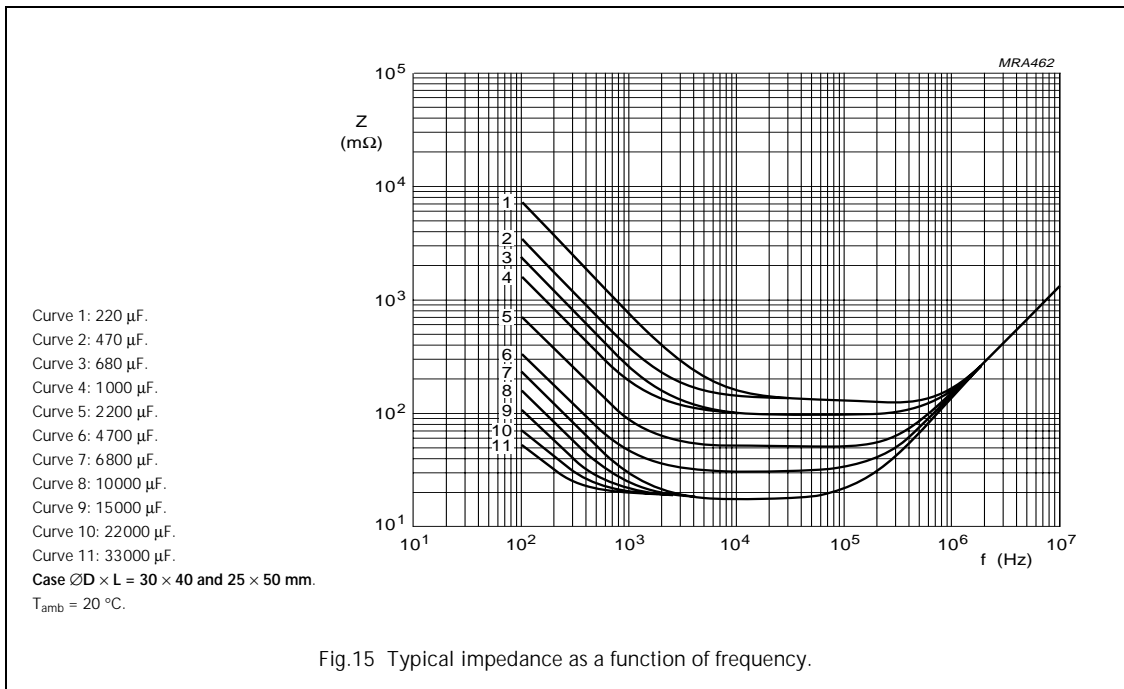
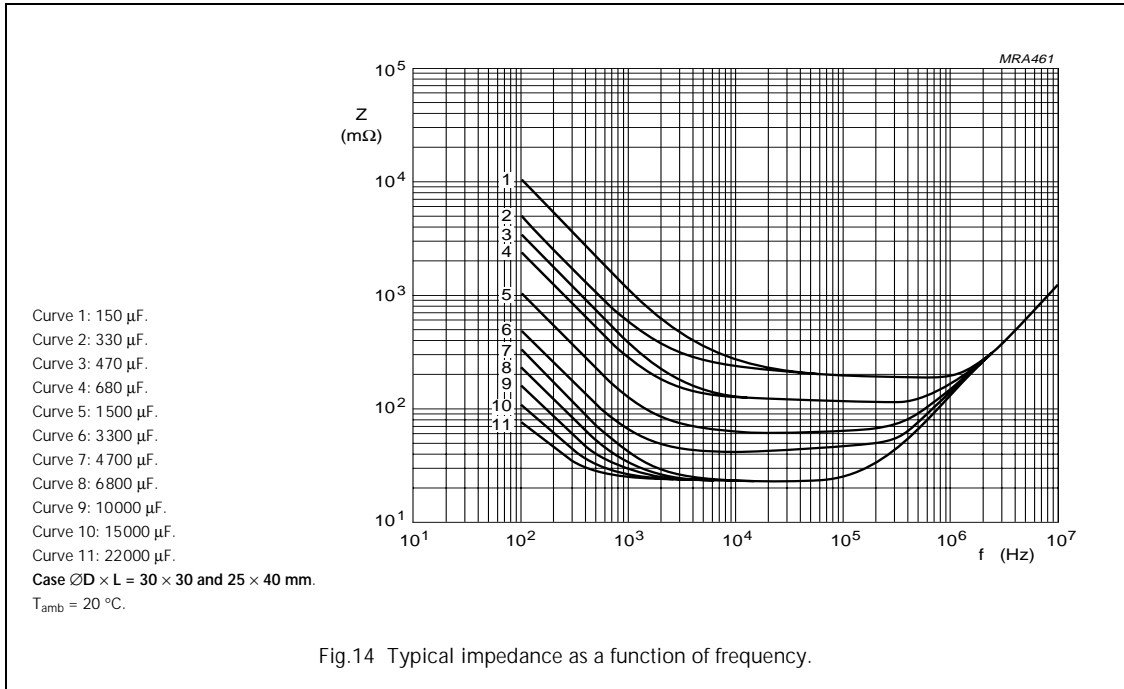
## 056/057 PSM-SI





# Aluminum electrolytic capacitors Power Standard Miniature Snap-in

## O56/O57 PSM-SI



# Aluminum electrolytic capacitors Power Standard Miniature Snap-in

## 056/057 PSM-SI

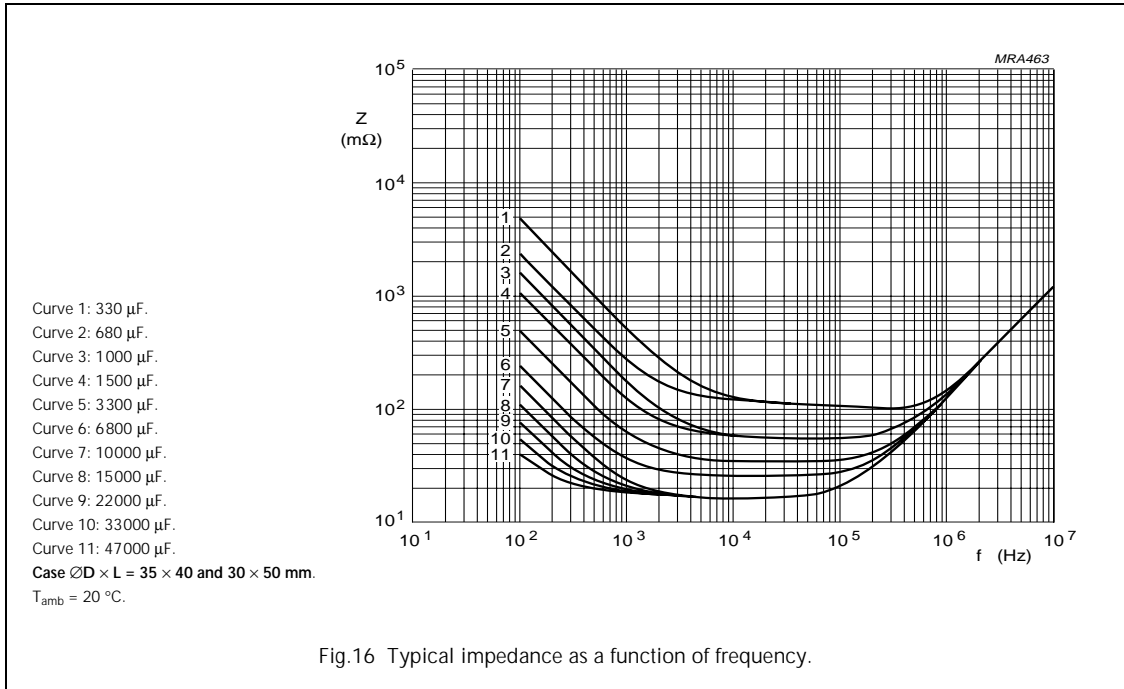


Fig.16 Typical impedance as a function of frequency.

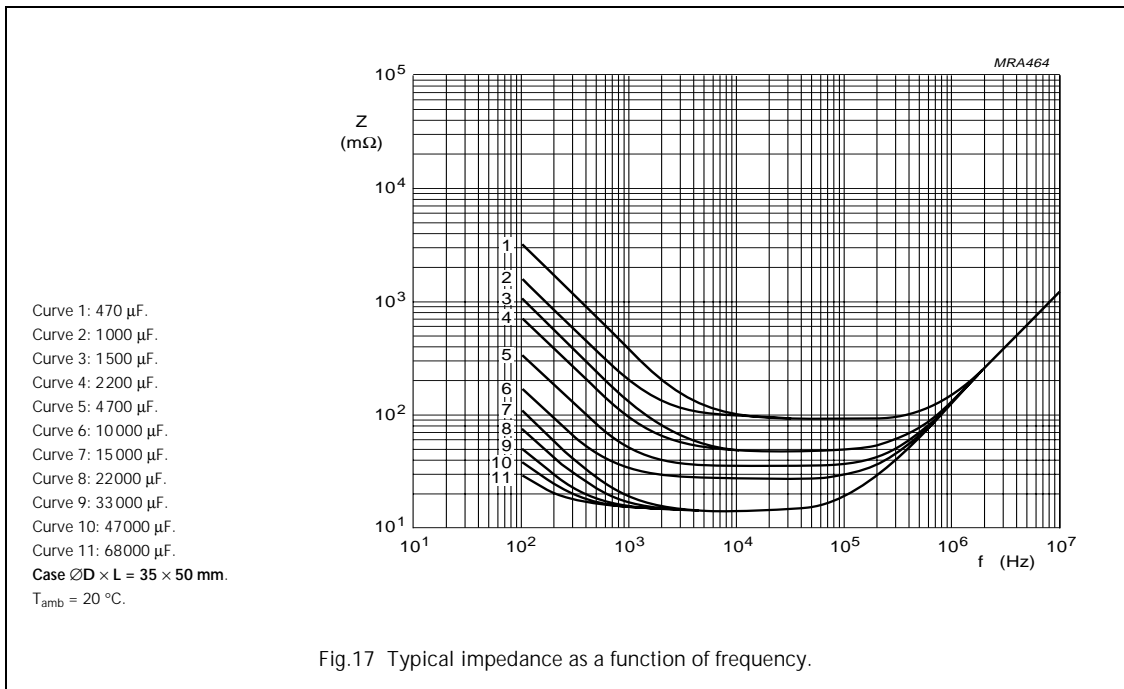


Fig.17 Typical impedance as a function of frequency.

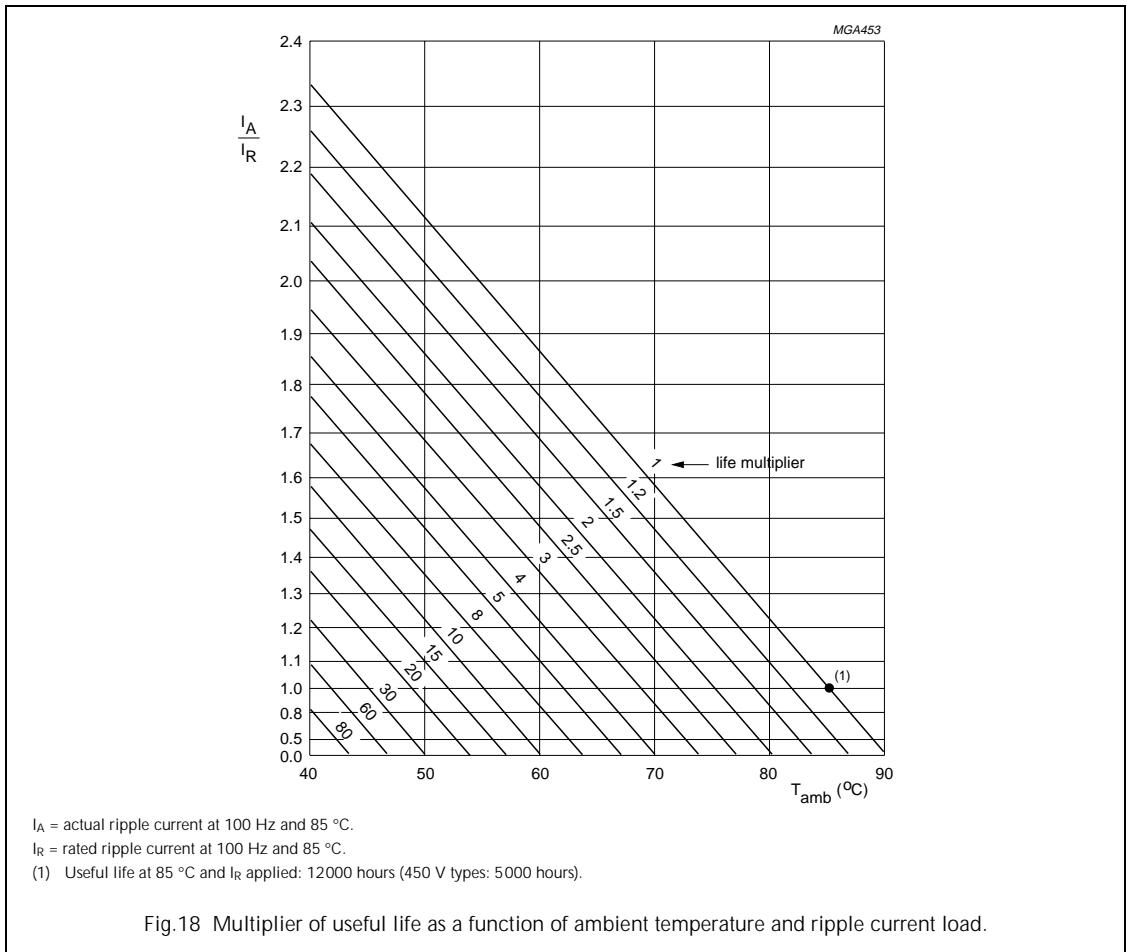
# Aluminum electrolytic capacitors Power Standard Miniature Snap-in

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### RIPPLE CURRENT AND USEFUL LIFE

**Table 4** Multiplier of ripple current ( $I_R$ ) as a function of frequency

FREQUENCY (Hz)	$I_R$ MULTIPLIER		
	$U_R = 10$ to $25$ V	$U_R = 40$ to $100$ V	$U_R > 100$ V
50	0.93	0.91	0.86
100	1.00	1.00	1.00
200	1.04	1.05	1.13
400	1.07	1.09	1.21
1000	1.11	1.13	1.29
2000	1.13	1.15	1.32
4000	1.15	1.18	1.35
$\geq 10000$	1.18	1.22	1.40



# Aluminum electrolytic capacitors

## Power Standard Miniature Snap-in

### 056/057 PSM-SI

#### SPECIFIC TESTS AND REQUIREMENTS

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

**Table 5** Test procedures and requirements

TEST		PROCEDURE (quick reference)	REQUIREMENTS
NAME OF TEST	REFERENCE		
Endurance	IEC 60384-4/ EN130300 subclause 4.13	$T_{amb} = 85\text{ °C}$ ; $U_R$ applied; 5000 hours (450 V types: 2000 hours)	$U_R \leq 100\text{ V}$ ; $\Delta C/C$ : $\pm 15\%$ $U_R > 100\text{ V}$ ; $\Delta C/C$ : $\pm 10\%$ $ESR \leq 1.3 \times \text{spec. limit}$ $Z \leq 2 \times \text{spec. limit}$ $I_{L5} \leq \text{spec. limit}$
Useful life	CECC 30301 subclause 1.8.1	$T_{amb} = 85\text{ °C}$ ; $U_R$ and $I_R$ applied; 12000 hours (450 V types: 5000 hours)	$U_R \leq 100\text{ V}$ ; $\Delta C/C$ : $\pm 45\%$ $U_R > 100\text{ V}$ ; $\Delta C/C$ : $\pm 30\%$ $ESR \leq 3 \times \text{spec. limit}$ $Z \leq 3 \times \text{spec. limit}$ $I_{L5} \leq \text{spec. limit}$ no short or open circuit, no visible damage total failure percentage: $U_R \leq 100\text{ V}$ : $\leq 1\%$ ; $U_R > 100\text{ V}$ : $\leq 3\%$
Shelf life (storage at high temperature)	IEC 60384-4/ EN130300 subclause 4.17	$T_{amb} = 85\text{ °C}$ ; no voltage applied; 500 hours  after test: $U_R$ to be applied for 30 minutes, 24 to 48 hours before measurement	$\Delta C/C$ : $\pm 10\%$ $ESR \leq 1.2 \times \text{spec. limit}$ $I_{L5} \leq 2 \times \text{spec. limit}$