

## AS(U)M series

# ALUMINIUM ELECTROLYTIC CAPACITORS

## Long Life Grade

Series	Capacitance [ $\mu$ F]	Voltage	Temperature	Case $\Phi$ x H [mm]	Applications
AS(U)M	100-330000 $\mu$ F	100-500V	-40°C,+85°C	51x105/90x222	Long life High reliability Telecom, Railways

*Table 1-General*

### Mechanical Outlines:

- Case: aluminium made
- Terminals: screw
- Sealing: hermetic by beading on an EPR gasket, housed on a resin cover
- Pressure Release Vent: made in silicone-rubber
- Sleeve: self-extinguishing thermoshrinkable sleeve
- Size: see enclosed drawings
- Mounting Hardware: see hardware section

Specifications	Temperature Range	Capacitance
CECC 30300 IEC 384-4 ("long life grade") MIL C62D DIN 41240/DIN45910	Operating: -40°C/+85°C Climatic category : 40/85/56	Standard tolerance X=10%+30% Upon request M=±20%

*Table 2-General Specifications*



## Leakage Current

After the rated voltage has been applied to the capacitor for 5 minutes the leakage current must be within limits given in Table 3-Leakage Current limits:

Maximum limit	@25°C	$I_f \leq 1,5 \cdot \sqrt{C \cdot V}$
Operating limit	@25°C	$I_f \leq 1,0 \cdot \sqrt{C \cdot V}$

*Table 3-Leakage Current limits*

Where:

- $I_f$ =leakage current [ $\mu$ A]
- $C$ =capacitance [ $\mu$ F]
- $V$ =rated voltage [V]

## Important

*When using high-capacitance and high-voltage electrolytic capacitors it is important to remember that the inner part (the rolled section) is not insulated from can: between the negative pole and the aluminium can there is a variable and not defined resistance essentially due to the electrolyte used in capacitor manufacture.*

## Surge Voltage

Surge Voltage limit for each working voltage is shown in Table 4-Surge Voltage values.

Working Voltage	100	160	200	250	350	400	450	500
Surge Voltage	130	215	250	300	425	475	525	550

*Table 4-Surge Voltage values*

## Ripple Current

The allowable values of ripple current in Ampères, are related to the temperature and frequency by Equation 1:

$$I_{\text{Ripple}} = K_t \cdot K_f \cdot I_{\text{Ripple@85}^\circ\text{C}}$$

*Equation 1*

Where:

- $I_{\text{Ripple@85}^\circ\text{C}}$  is the limit given by tables, @ 85°C/100HZ
- $K_t$  is the Temperature Correlation Factor, tabulated in Table 5-Kt Values
- $K_f$  is the Frequency Correlation Factor, tabulated in Table 6-Kf Values

*Note . Ripple current is function of the capacitance tolerance*

°C	40	55	65	75	85
Kt	2.10	1.80	1.60	1.30	1.0

*Table 5-Kt Values*

Vn/Hz	Kf			
	50<V=300	V>300	50<V=300	V>300
	Diameter Code A,B		Diameter Code C,D,E	
50	0.79	0.76	0.78	0.72
100	1.00	1.00	1.00	1.00
120	1.04	1.04	1.02	1.03
200	1.12	1.17	1.06	1.14
300	1.16	1.28	1.08	1.24
400	1.20	1.35	1.09	1.29
500	1.22	1.39	1.09	1.32
>1000	1.25	1.45	1.09	1.37

*Table 6-Kf Values*



## Dimensions

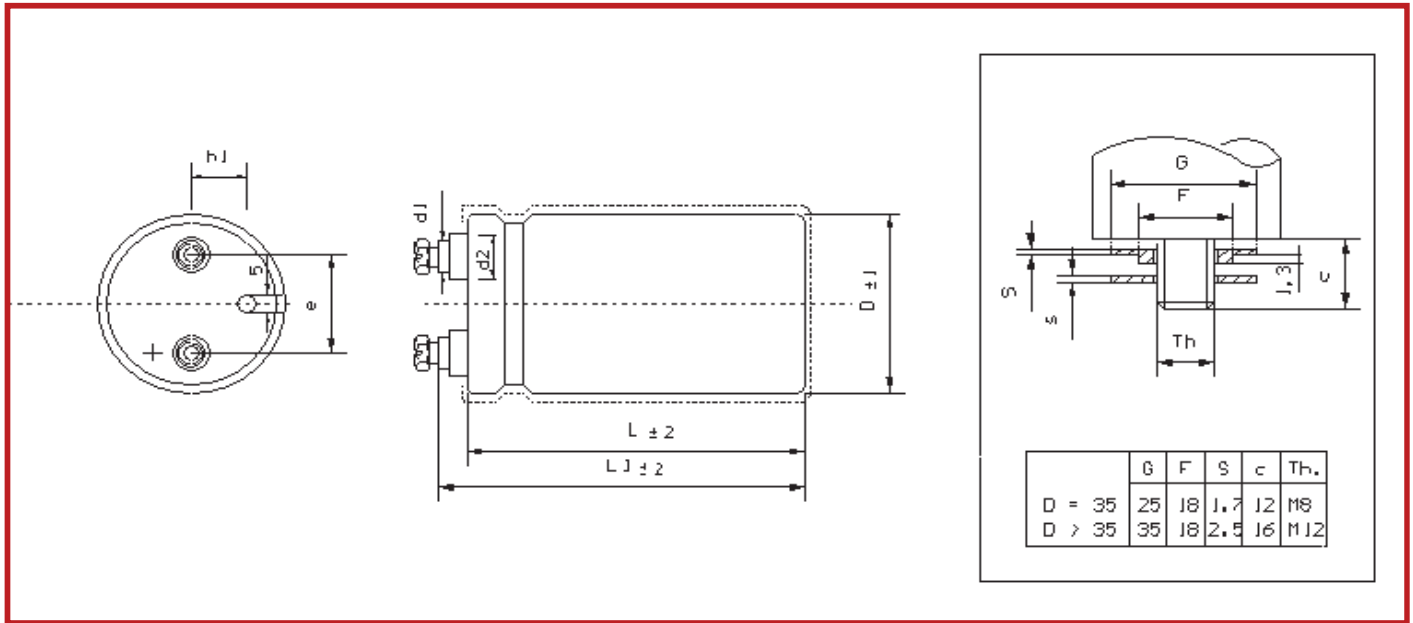


Table 7-General View

Insert screw thread (diam 51,63 and 76mm)= M5	Insert screw thread (diam 90mm)= M6
Insert screw torque max. (M5) = 2,0Nm	Insert screw torque max. (M6) = 2,5Nm
Insert screw length =10mm	Screw torque for hex nuts M12 =10Nm

Table 8-Connections

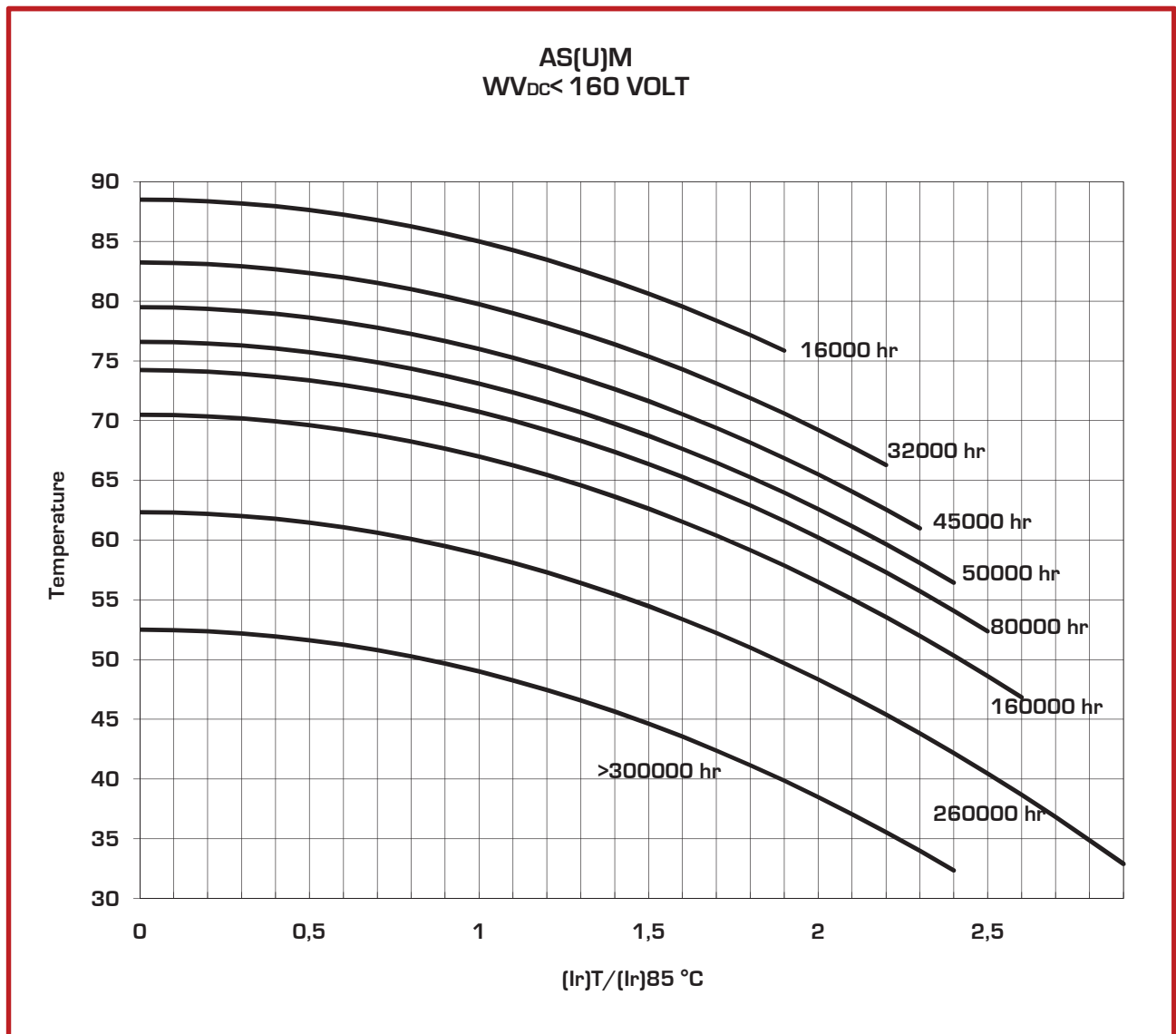
Case Code	ΦxL	l1	d1	d2	h1	e	Case Code	ΦxL	l1	d1	d2	h1	e
All dimensions in [mm] general tolerance ±0,5mm													
BC	51x105	109	13	18	13	22.2	DJ	76x217	222	13	18	19	31.8
CC	63x107	111	13	18	16	28.6	EC	90x108	112	17	23	19	31.8
DC	76x107	111	13	18	19	31.8	EF	90x148	153	17	23	19	31.8
DF	76x147	151	13	18	19	31.8	EJ	90x222	227	17	23	19	31.8
DK	76x168	173	13	18	19	31.8							

Table 9-Dimensions

Standard Mounting Stud Hardware: Insulating Plastic Washer And Metallic Nut

## Expected Lifetime Vs Temperature and Ripple Current

Working Voltage <160V



*Table 10*

Expected lifetime criteria: see introduction



## Expected Lifetime Vs Temperature and Ripple Current

Working Voltage >160V

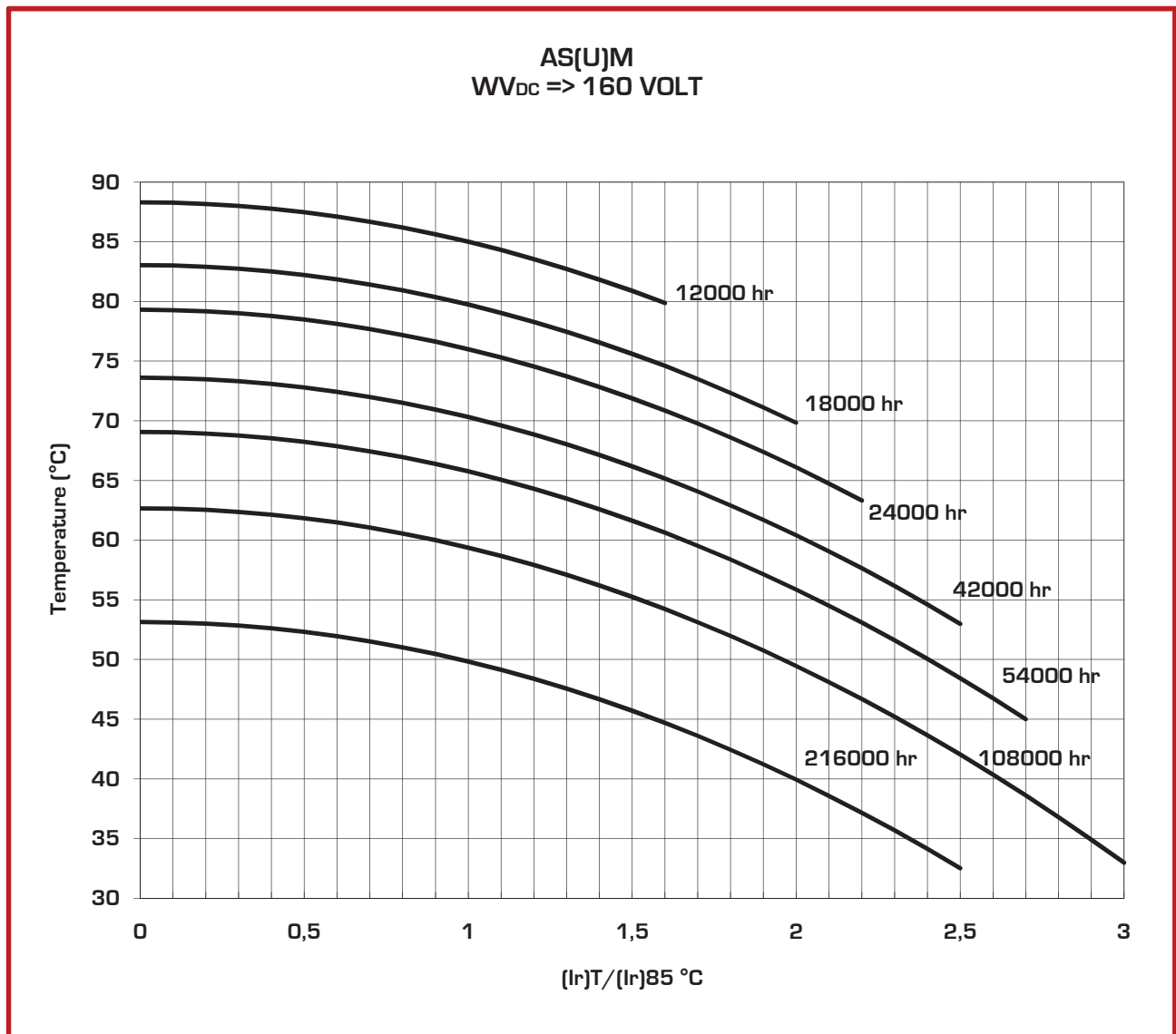


Table 11

Expected lifetime criteria: see introduction

**VN=100V**

Capacitance	Case	Tan $\delta$	ESRmax/typ		Zmax	Iripple55°C/85°C		Part Number
			[ $\mu$ F]@100Hz	[%]@100Hz		[m $\Omega$ ]@100Hz	[m $\Omega$ ]@10KHz	
4700	BC	0,12	41	33	29	17,0	9,5	AS(U)M472X100BC1
6800	BC	0,12	28	22	21	21,0	11,4	AS(U)M682X100BC1
10000	CC	0,12	19	15	14	28,0	15,6	AS(U)M103X100CC1
15000	DC	0,13	14	11	11	37,0	20,4	AS(U)M153X100DC1
22000	DF	0,13	9	8	9	51,0	28,3	AS(U)M223X100DF1

**VN=160V**

Capacitance	Case	Tan $\delta$	ESRmax/typ		Zmax	Iripple55°C/85°C		Part Number
			[ $\mu$ F]@100Hz	[%]@100Hz		[m $\Omega$ ]@100Hz	[m $\Omega$ ]@10KHz	
2200	BC	0,10	72	58	50	13,0	7,1	AS(U)M222X160BC1
3300	CC	0,10	48	39	34	18,0	9,8	AS(U)M332X160CC1
4700	DC	0,12	41	33	31	21,0	11,9	AS(U)M472X160DC1
6800	DF	0,12	28	22	21	29,0	16,4	AS(U)M682X160DF1
10000	DF	0,12	19	15	14	36,0	19,9	AS(U)M103X160DF1
15000	DF	0,12	13	10	12	40,5	22,4	AS(U)M153X160DF1

**Notes:**

We have a 30% custom design in over 2,000 of our projects, please contact our Technical Office directly with your special requirements.

## VN=200V

Capacitance	Case	Tanδ	ESRmax/typ		Zmax	Iripple55°C/85°C		Part Number
			[μF]@100Hz	[%]@100Hz		[mΩ]@100Hz	[mΩ]@10KHz	
1500	BC	0,08	85	68	59	12,0	6,6	AS(U)M152X200BC1
2200	CC	0,08	58	46	41	16,0	9,0	AS(U)M222X200CC1
3300	CC	0,09	43	35	32	19,0	10,4	AS(U)M332X200CC1
4700	DC	0,10	34	27	25	23,0	13,1	AS(U)M472X200DC1

## VN=250V

Capacitance	Case	Tanδ	ESRmax/typ		Zmax	Iripple55°C/85°C		Part Number
			[μF]@100Hz	[%]@100Hz		[mΩ]@100Hz	[mΩ]@10KHz	
1000	BC	0,08	127	102	85	10,0	5,4	AS(U)M102X250BC1
1500	BC	0,08	85	68	58	12,0	6,6	AS(U)M152X250BC1
2200	CC	0,09	65	52	45	15,0	8,5	AS(U)M222X250CC1
3300	DC	0,10	48	39	34	20,0	10,9	AS(U)M332X250DC1
4700	DF	0,10	34	27	26	27,0	14,4	AS(U)M472X250DF1
6800	DJ	0,10	23	19	21	39,0	21,7	AS(U)M682X250DJ1

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**VN=350V**

Capacitance	Case	Tan $\delta$	ESRmax/typ		Zmax	Iripple55°C/85°C		Part Number
			[ $\mu$ F]@100Hz	[%]@100Hz		[m $\Omega$ ]@100Hz	[m $\Omega$ ]@10KHz	
680	BC	0,07	164	131	124	8,0	4,4	AS(U)M681X350BC1
1000	BC	0,07	108	87	85	10,0	5,4	AS(U)M102X350BC1
1500	CC	0,08	81	65	66	13,0	7,0	AS(U)M152X350CC1
2200	DC	0,09	62	50	51	16,0	8,9	AS(U)M222X350DC1
3300	DF	0,09	41	33	35	22,0	12,5	AS(U)M332X350DF1
4700	DF	0,07	24	19	24	27,0	14,9	AS(U)M472X350DF1
6800	DJ	0,10	23	19	20	39,0	21,7	AS(U)M682X350DJ1

**VN=400V**

Capacitance	Case	Tan $\delta$	ESRmax/typ		Zmax	Iripple55°C/85°C		Part Number
			[ $\mu$ F]@100Hz	[%]@100Hz		[m $\Omega$ ]@100Hz	[m $\Omega$ ]@10KHz	
680	BC	0,10	234	187	151	7,0	4,0	AS(U)M681X400BC1
1000	CC	0,10	159	127	105	10,0	5,4	AS(U)M102X400CC1
1500	DC	0,10	106	85	72	13,0	7,4	AS(U)M152X400DC1
2200	DC	0,11	80	64	51	15,0	8,5	AS(U)M222X400DC1
2200	DF	0,10	72	58	51	18,0	10,2	AS(U)M222X400DF1
3300	DF	0,12	58	46	35	21,0	11,4	AS(U)M332X400DF1
4700	DF	0,12	41	33	35	24,8	13,5	AS(U)M472X400DF1
6800	DJ	0,12	28	22	26	30,0	16,4	AS(U)M682X400DJ1

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## VN=450V

Capacitance	Case	Tanδ	ESRmax/typ		Zmax	Iripple55°C/85°C		Part Number
			[μF]@100Hz	[mΩ]@100Hz		[mΩ]@10KHz	[A]@100Hz	
			[%]@100Hz	[mΩ]@100Hz	[mΩ]@10KHz	[A]@100Hz	[A]@100Hz	(U) for mounting stud
680	BC	0,10	234	187	151	7,0	4,0	AS(U)M681X450BC1
1000	CC	0,10	159	127	105	10,0	5,4	AS(U)M102X450CC1
1500	DC	0,10	106	85	72	13,0	7,4	AS(U)M152X450DC1
2200	DC	0,10	72	58	51	16,0	8,9	AS(U)M222X450DC1
2200	DF	0,10	72	58	49	18,0	10,2	AS(U)M222X450DF1
3300	DF	0,12	58	46	39	21,0	11,4	AS(U)M332X450DF1
4700	DJ	0,12	41	33	29	30,0	16,4	AS(U)M472X450DJ1
5600	DF	0,12	34	27	29	30,0	16,4	AS(U)M562X450DF1
5600	DJ	0,13	37	30	28	31,0	17,2	AS(U)M562X450DJ1

## VN=450V

Capacitance	Case	Tanδ	ESRmax/typ		Zmax	Iripple55°C/85°C		Part Number
			[μF]@100Hz	[mΩ]@100Hz		[mΩ]@10KHz	[A]@100Hz	
			[%]@100Hz	[mΩ]@100Hz	[mΩ]@10KHz	[A]@100Hz	[A]@100Hz	(U) for mounting stud
1500	CC	0,10	106	80	60	9,5	6,8	AS(U)M152X450CC1
2200	CC	0,12	87	65	49	10,5	7,5	AS(U)M222X450CC1
3300	DC	0,12	58	43	36	14,3	10,2	AS(U)M332X450DC1
3300	DF	0,10	48	36	28	17,9	12,8	AS(U)M332X450DF1
4700	DF	0,12	41	30	24	19,5	13,9	AS(U)M472X450DF1
6800	DJ	0,12	28	21	17	28,3	20,2	AS(U)M682X450DJ1
10000	DJ	0,12	19	14	20	32,5	22,8	AS(U)M103X450DJ1
4700	EC	0,12	41	30	25	21,8	15,6	AS(U)M472X450EC1
6800	EF	0,12	28	21	17	26,2	18,7	AS(U)M682X450EF1
10000	EJ	0,12	19	14	12	37,7	26,9	AS(U)M103X450EJ1

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**VN=500V**

Capacitance	Case	Tan $\delta$	ESRmax/typ		Zmax	Iripple55°C/85°C		Part Number
			[ $\mu$ F]@100Hz	[%]@100Hz		[m $\Omega$ ]@100Hz	[m $\Omega$ ]@10KHz	
1000	BC	0,10	159	127	98	8,0	4,2	AS(U)M102X500BC1
1500	DC	0,10	106	85	74	11,0	6,0	AS(U)M152X500DC1
2200	DF	0,10	72	58	47	15,0	8,3	AS(U)M222X500DF1
3300	DF	0,10	48	39	27	16,0	9,1	AS(U)M332X500DF1
4700	DF	0,08	27	22	31	27,0	15,4	AS(U)M472M500DF1
4700	EF	0,08	27	22	31	30,1	17,2	AS(U)M472M500EF1

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