



CONDUCTIVE POLYMER HYBRID ALUMINUM ELECTROLYTIC CAPACITORS

HHMR Series**CHIP TYPE, HIGH RELIABILITY**

Operating with wide temperature range -55~+125°C

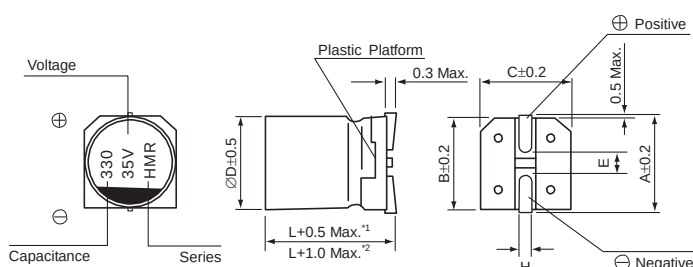
High reliability & high voltage are realized by hybrid electrolyte

Load life of 4000 hours

RoHS & REACH compliant, Halogen-free

**SPECIFICATIONS**

Items	Characteristics		
Operation Temperature Range	-55 ~ +125°C		
Voltage Range	16 ~ 100V		
Capacitance Range	22 ~ 1500μF		
Capacitance Tolerance	±20% at 120Hz, 20°C		
Leakage Current	Leakage current ≤0.01CV (after 2 minutes application of rated voltage at 20°C) C: Nominal capacitance (μF) , V: Rated voltage (V)		
Dissipation Factor (tan δ)	≤Specified value at 120Hz, 20°C.		
ESR	≤Specified value at 100KHz, 20°C.		
Stability at Low Temperature	Measurement frequency : 100KHz		
	Impedance Ratio ZT/Z20 (max.)	Z(-25°C)/Z(20°C)	≤1.5
		Z(-55°C)/Z(20°C)	≤2.0
Damp Heat (Steady State)	When the capacitors are restored to 20°C after the rated voltage is applied for 2000 hours at 85°C, 85% RH, they meet the characteristics listed below.		
	Capacitance Change	Within ±30% of initial value	
	Dissipation Factor	200% or less of initial specified value	
	ESR	200% or less of initial specified value	
	Leakage Current	Initial specified value or less	
Endurance	After 4000 hours application of the rated voltage at 125°C, they meet the characteristics listed below.		
	Capacitance Change	Within ±30% of initial value	
	Dissipation Factor	200% or less of initial specified value	
	ESR	200% or less of initial specified value	
	Leakage Current	Initial specified value or less	
Shelf Life	After leaving capacitors under no load at 125°C for 1000 hours, they meet the specified value for Endurance characteristics listed above.		
Resistance to Soldering Heat	After reflow soldering and restored at room temperature, they meet the characteristics listed below.		
	Capacitance Change	Within ±10% of initial value	
	Dissipation Factor	130% or less of initial specified value	
	ESR	130% or less of initial specified value	
	Leakage Current	Initial specified value or less	
Marking	Red print on the case top.		

DRAWING (Unit: mm)

*1. Applicable to $\varnothing 6.3$ and $\varnothing 8$
 *2. Applicable to $\varnothing 10$ and above

**DIMENSIONS** (Unit: mm)

ØD × L	6.3 × 6	6.3 × 7.7	8 × 10/10.5	8 × 12.5	10 × 10.5	10 × 12.5/12.8	10 × 16.5
A	7.3	7.3	9.0	9.0	11.0	11.0	11.0
B	6.6	6.6	8.3	8.3	10.3	10.3	10.3
C	6.6	6.6	8.3	8.3	10.3	10.3	10.3
E	1.9	1.9	3.1	3.1	4.7	4.7	4.7
L	6.0	7.7	10.0/10.5	12.5	10.5	12.5/12.8	16.5
H	0.5~0.8	0.5~0.8	0.8~1.1	0.8~1.1	0.8~1.1	0.8~1.1	0.8~1.1

DIMENSIONS & STANDARD RATINGS

WV (V)		16 (1C)					25 (1E)				
Cap. (μF)	Parameter	Case size ØD×L (mm)	Dissipation factor (tan δ)	Leakage current (μA)	ESR (mΩ) max. 20°C, 100KHz	Ripple current (mA rms) 125°C, 100KHz	Case size ØD×L (mm)	Dissipation factor (tan δ)	Leakage current (μA)	ESR (mΩ) max. 20°C, 100KHz	Ripple current (mA rms) 125°C, 100KHz
68	686						6.3 × 6.0	0.14	17	50	900
100	107	6.3 × 6.0	0.16	16	45	950	6.3 × 7.7	0.14	25	30	1400
150	157	6.3 × 6.0	0.16	24	45	1080	6.3 × 7.7	0.14	37.5	30	1400
220	227	6.3 × 7.7	0.16	35.2	27	1450	8 × 10	0.14	55	27	1600
270	277	8 × 10	0.16	43.2	22	1700					
330	337						8 × 10 (10 × 10.5)	0.14 (0.14)	82.5 (82.5)	27 (20)	1600 (2000)
470	477	8 × 10.5 (10 × 10.5)	0.16 (0.16)	75.2 (75.2)	22 (18)	1700 (2100)	8 × 12.5 (10 × 10.5)	0.14 (0.14)	117.5 (117.5)	23 (20)	1900 (2000)
680	687						10 × 12.8	0.14	170	15	2700
820	827	8 × 12.5 (10 × 10.5)	0.16 (0.16)	131.2 (131.2)	20 (18)	1850 (2100)					
1000	108						10 × 16.5	0.14	250	11	4000
1500	158	10 × 12.8	0.16	240	14	3000					
1800	188	10 × 16.5	0.16	288	12	3400					

WV (V)		35 (1V)					50 (1H)				
Cap. (μF)	Parameter	Case size ØD×L (mm)	Dissipation factor (tan δ)	Leakage current (μA)	ESR (mΩ) max. 20°C, 100KHz	Ripple current (mA rms) 125°C, 100KHz	Case size ØD×L (mm)	Dissipation factor (tan δ)	Leakage current (μA)	ESR (mΩ) max. 20°C, 100KHz	Ripple current (mA rms) 125°C, 100KHz
10	106						5 × 6	0.10	5.0	120	500
22	226						6.3 × 6.0	0.10	11.0	80	750
27	276						6.3 × 6.0	0.10	13.5	80	750
33	336						6.3 × 7.7	0.10	16.5	40	1100
47	476	6.3 × 7.7	0.10	16.5	40	1100	6.3 × 7.7	0.10	23.5	40	1100
68	686	6.3 × 6.0	0.12	23.8	60	900	8 × 10	0.10	34	30	1250
100	107	6.3 × 7.7	0.12	35	35	1400	8 × 10 (10 × 10.5)	0.10 (0.10)	50 (50)	30 (25)	1250 (1600)
120	127	6.3 × 7.7	0.12	42	35	1400	8 × 12.5	0.10	60	28	1400
150	157	8 × 10	0.12	52.5	27	1600	10 × 10.5	0.10	75	25	1600
180	187	8 × 10	0.12	63	27	1600					
220	227	8 × 12.5	0.12	77	24	1800	10 × 12.8	0.10	110	23	1800
270	277	10 × 10.5	0.12	94.5	20	2000	10 × 16.5	0.10	135	13	3700
330	337	10 × 10.5	0.12	115.5	20	2000					
470	477	10 × 12.8	0.12	164.5	16	2600					

WV (V)		63 (1J)					80 (1K)				
Cap. (μF)	Parameter	Case size ØD×L (mm)	Dissipation factor (tan δ)	Leakage current (μA)	ESR (mΩ) max. 20°C, 100KHz	Ripple current (mA rms) 125°C, 100KHz	Case size ØD×L (mm)	Dissipation factor (tan δ)	Leakage current (μA)	ESR (mΩ) max. 20°C, 100KHz	Ripple current (mA rms) 125°C, 100KHz
10	105	6.3 × 6	0.08	6.3	80	900					
22	226	6.3 × 7.7	0.08	13.86	80	900	8 × 10	0.08	17.6	45	1050
33	336	8 × 10	0.08	20.79	40	1100	8 × 10	0.08	26.4	45	1050
47	476	8 × 10	0.08	29.61	40	1100	8 × 12.5 (10 × 10.5)	0.08 (0.08)	37.6 (37.6)	42 (36)	1200 (1200)
56	566	10 × 10.5	0.08	35.28	30	1400	10 × 10.5	0.08	44.8	36	1200
68	686	10 × 10.5	0.08	42.84	30	1400	10 × 12.5	0.08	54.4	33	1350
82	826						10 × 12.8	0.08	65.6	33	1350
100	107	8 × 12.5 (10 × 10.5)	0.08 (0.08)	63 (63)	36 (30)	1300 (1400)	10 × 16.5	0.08	80	20	2200
150	157	10 × 12.8	0.08	94.5	26	1600					

**DIMENSIONS & STANDARD RATINGS**

Cap. (μF)	Parameter	100 (2A)				
		Case size ØD×L (mm)	Dissipation factor (tan δ)	Leakage current (μA)	ESR (mΩ) max. 20°C, 100KHz	Ripple current (mA rms) 125°C, 100KHz
33	336	10 × 10.5	0.08	33	80	850
47	476	10 × 12.8	0.08	47	60	1050

FREQUENCY COEFFICIENT OF ALLOWABLE RIPPLE CURRENT

Frequency	120Hz ≤ f ≤ 1KHz	1KHz ≤ f ≤ 10KHz	10KHz ≤ f ≤ 100KHz	100KHz ≤ f ≤ 300KHz
Coefficient	0.10	0.40	0.70	1.00

◆ How to order

<u>HHMR</u>	<u>106</u>	<u>M</u>	<u>0035</u>	<u>0607</u>	<u>R</u>	<u>-</u>
↓	↓	↓	↓	↓	↓	↓
<u>Type</u>	<u>Capacitance code</u>	<u>Tolerance</u>	<u>Rated Voltage</u>	<u>Size Code</u>	<u>Package</u>	<u>Additional characters may be added for special requirements</u>
HHMR	pF Code: 1st two digits represent significant figures 3rd digit represents multiplier (number of zeros to follow) 106 = 10uF 686 = 68uF 107 = 100uF	M: +/-20%	Code 0035: 35VDC For DC Voltage 0006: 6.3VDC 0035: 35VDC 0063: 63VDC 0450: 450VDC	Code 0607: Size 6.3x7.7mm Size for V-chip E-cap 0607: Size 6.3x7.7mm 0606: Size 6.3x6mm 1010: Size 10x10mm 1010: Size 10x10.5mm	R: Tape & Reel	