

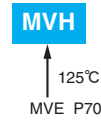


**THE DATASHEET OF  
EMVH100ADA221MHA0G**



Alchip™-MVH Series

- Lower ESR, Higher ripple current
- Endurance : 1,000 to 5,000 hours at 125°C
- Suitable to fit for automotive equipment
- Solvent resistant type except 63 to 450V<sub>dc</sub> (see PRECAUTIONS AND GUIDELINES)
- Vibration resistant structure
- RoHS Compliant



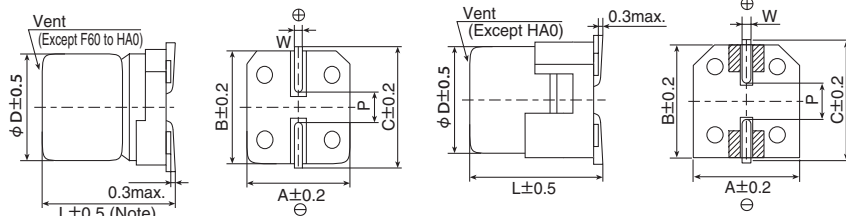
◆ SPECIFICATIONS

Items	Characteristics												
Category	-40 to +125°C												
Temperature Range	-40 to +125°C												
Rated Voltage Range	10 to 450V <sub>dc</sub>												
Capacitance Tolerance	±20% (M) (at 20°C, 120Hz)												
Leakage Current	Rated voltage (V <sub>dc</sub> )	10 to 100V <sub>dc</sub>						160 to 450V <sub>dc</sub>					
	F60 to JA0	I=0.01CV or 3μA, whichever is greater.						I=0.04CV+100					
	KE0 to MNO	I=0.03CV or 4μA, whichever is greater.											
Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C after 2 minutes)													
Dissipation Factor (tanδ)	Rated voltage (V <sub>dc</sub> )	10V	16V	25V	35V	50V	63V	80V	100V	160 to 250V	400 & 450V		
	tanδ (Max.)	F60 to JA0	0.24	0.20	0.16	0.14	0.14	0.12	0.12	0.10	—	—	
	KE0 to MNO	0.22	0.18	0.16	0.14	0.12	0.14	—	0.10	0.20	0.24		
When nominal capacitance exceeds 1,000μF, add 0.02 to the value above for each 1,000μF increase. (at 20°C, 120Hz)													
Low Temperature Characteristics (Max. Impedance Ratio)	Rated voltage (V <sub>dc</sub> )	10V	16V	25V	35V	50V	63V	80V	100V	160 to 250V	400 & 450V		
	F60 to JA0	Z(-25°C)/Z(+20°C)	3	2	2	2	2	2	2	2	—	—	
		Z(-40°C)/Z(+20°C)	6	4	4	3	3	3	3	3	—	—	
	KE0 to MNO	Z(-25°C)/Z(+20°C)	4	3	2	2	2	2	—	2	3	6	
Z(-40°C)/Z(+20°C)		8	6	4	3	3	3	—	3	6	10		
(at 120Hz)													
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for the specified time at 125°C.												
	Time	F60 to H63 (10 to 100V <sub>dc</sub> ) : 1,000hours HA0 to JA0 (10 to 100V <sub>dc</sub> ) : 2,000hours KE0 to MNO (10 to 100V <sub>dc</sub> ) : 5,000hours KE0 to MNO (160 to 450V <sub>dc</sub> ) : 2,000hours											
	Capacitance change	≤ ±30% of the initial value											
	D.F. (tanδ)	≤ 300% of the initial specified value											
	Leakage current	≤ The initial specified value											
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours (500 hours for 400 to 450V <sub>dc</sub> ) at 125°C without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4.												
	Rated voltage (V <sub>dc</sub> )	10 to 50V <sub>dc</sub>						63 to 450V <sub>dc</sub>					
	Capacitance change	≤ ±30% of the initial value						≤ ±30% of the initial value					
	D.F. (tanδ)	≤ 300% of the initial specified value						≤ 300% of the initial specified value					
	Leakage current	≤ The initial specified value						≤ 500% of the initial specified value					

◆ DIMENSIONS [mm]

- Terminal Code : A
- Size code : F60 to MNO

- Terminal Code : G (Vibration resistant structure)
- Size code : HA0 to MNO

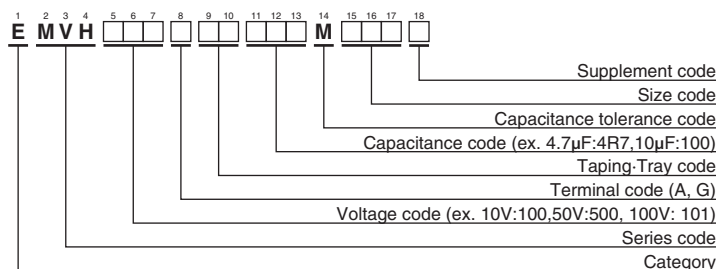


Note : L±0.3 for F60 and F80

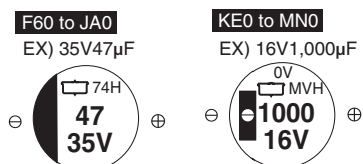
▨ : Dummy terminals

Size code	D	L	A	B	C	W	P
F60	6.3	5.7	6.6	6.6	7.2	0.5 to 0.8	1.9
F80	6.3	7.7	6.6	6.6	7.2	0.5 to 0.8	1.9
H63	8	6.3	8.3	8.3	9.0	0.5 to 0.8	2.3
HA0	8	10.0	8.3	8.3	9.0	0.7 to 1.1	3.1
JA0	10	10.0	10.3	10.3	11.0	0.7 to 1.1	4.5
KE0	12.5	13.5	13.0	13.0	13.7	1.0 to 1.3	4.2
KG5	12.5	16.0	13.0	13.0	13.7	1.0 to 1.3	4.2
LH0	16	16.5	17.0	17.0	18.0	1.0 to 1.3	6.5
LN0	16	21.5	17.0	17.0	18.0	1.0 to 1.3	6.5
MH0	18	16.5	19.0	19.0	20.0	1.0 to 1.3	6.5
MNO	18	21.5	19.0	19.0	20.0	1.0 to 1.3	6.5

◆ PART NUMBERING SYSTEM



◆ MARKING



Please refer to "Product code guide (surface mount type)"

Alchip™-MVH Series

◆STANDARD RATINGS

□ is not solvent resistant (63 to 450V<sub>dc</sub>).

WV (V <sub>dc</sub> )	Cap (μF)	Size code	ESR (Ω max/100kHz)		Rated ripple current (mA <sub>rms</sub> /125°C)		Part No.	WV (V <sub>dc</sub> )	Cap (μF)	Size code	ESR (Ω max/100kHz)		Rated ripple current (mA <sub>rms</sub> /125°C)		Part No.	
			20°C	-40°C	100kHz	120Hz					20°C	-40°C	100kHz	120Hz		
10	100	F80	0.90	14.0	110	—	EMVH100ADA101MF80G	50	33	F80	2.0	30.0	83	—	EMVH500ADA330MF80G	
	100	H63	0.90	14.0	110	—	EMVH100ADA101MH63G		33	H63	1.6	30.0	83	—	EMVH500ADA330MH63G	
	220	F80	0.90	14.0	110	—	EMVH100ADA221MF80G		33	HA0	0.70	11.0	160	—	EMVH500ADA330MHA0G	
	220	H63	0.90	14.0	110	—	EMVH100ADA221MH63G		47	HA0	0.70	11.0	160	—	EMVH500ADA470MHA0G	
	220	HA0	0.40	6.0	220	—	EMVH100ADA221MHA0G		47	JA0	0.50	7.5	247	—	EMVH500ADA470MJA0G	
	330	HA0	0.40	6.0	220	—	EMVH100ADA331MHA0G		100	JA0	0.50	7.5	247	—	EMVH500ADA101MJA0G	
	330	JA0	0.30	4.5	296	—	EMVH100ADA331MJA0G		100	KE0	0.23	3.5	550	—	EMVH500ARA101MKE0S	
	470	JA0	0.30	4.5	296	—	EMVH100ADA471MJA0G		220	KE0	0.23	3.5	550	—	EMVH500ARA221MKE0S	
	1,000	KE0	0.14	2.1	750	—	EMVH100ARA102MKE0S		220	LH0	0.15	2.3	850	—	EMVH500□DA221MLH0S	
	2,200	LH0	0.10	1.5	1,000	—	EMVH100□DA222MLH0S		330	KG5	0.18	2.7	700	—	EMVH500ARA331MKG5S	
	3,300	MH0	0.10	1.5	1,200	—	EMVH100□DA222MMH0S		330	LH0	0.15	2.3	850	—	EMVH500□DA331MLH0S	
	2,200	MH0	0.10	1.5	1,200	—	EMVH100□DA332MMH0S		470	MH0	0.15	2.3	920	—	EMVH500□DA471MMH0S	
	4,700	MN0	0.058	0.87	1,550	—	EMVH100□DA472MMN0S		63	10	F80	2.0	100	60	—	EMVH630ADA100MF80G
	47	F60	1.6	24.0	69	—	EMVH160ADA470MF60G			10	H63	2.0	110	60	—	EMVH630ADA100MH63G
100	HA0	0.40	6.0	220	—	EMVH160ADA101MHA0G	22	HA0		0.70	35.0	100	—	EMVH630ADA220MHA0G		
220	HA0	0.40	6.0	220	—	EMVH160ADA221MHA0G	33	HA0		0.70	35.0	100	—	EMVH630ADA330MHA0G		
220	JA0	0.30	4.5	296	—	EMVH160ADA221MJA0G	33	JA0		0.50	25.0	170	—	EMVH630ADA330MJA0G		
330	JA0	0.30	4.5	296	—	EMVH160ADA331MJA0G	47	HA0		0.70	35.0	100	—	EMVH630ADA470MHA0G		
470	KE0	0.14	2.1	750	—	EMVH160ARA471MKE0S	47	JA0		0.50	25.0	170	—	EMVH630ADA470MJA0G		
680	KE0	0.14	2.1	750	—	EMVH160ARA681MKE0S	100	KE0		0.25	12.5	500	—	EMVH630ARA101MKE0S		
680	LH0	0.10	1.5	1,000	—	EMVH160□DA681MLH0S	220	KG5		0.20	10.0	600	—	EMVH630ARA221MKG5S		
1,000	MH0	0.10	1.5	1,200	—	EMVH160□DA102MMH0S	330	LH0		0.18	9.0	820	—	EMVH630□DA331MLH0S		
2,200	MH0	0.10	1.5	1,200	—	EMVH160□DA222MMH0S	470	LN0		0.11	5.5	1,100	—	EMVH630□DA471MLN0S		
33	F60	1.6	24.0	69	—	EMVH250ADA330MF60G	80	10		HA0	0.75	50.0	70	—	EMVH800ADA100MHA0G	
47	F80	0.90	14.0	110	—	EMVH250ADA470MF80G		22		HA0	0.75	50.0	70	—	EMVH800ADA220MHA0G	
47	H63	0.90	14.0	110	—	EMVH250ADA470MH63G		22		JA0	0.55	35.0	115	—	EMVH800ADA220MJA0G	
100	F80	0.90	14.0	110	—	EMVH250ADA101MF80G		33	HA0	0.75	50.0	70	—	EMVH800ADA330MHA0G		
100	H63	0.90	14.0	110	—	EMVH250ADA101MH63G		33	JA0	0.55	35.0	115	—	EMVH800ADA330MJA0G		
100	HA0	0.40	6.0	220	—	EMVH250ADA101MHA0G		47	JA0	0.55	35.0	115	—	EMVH800ADA470MJA0G		
220	HA0	0.40	6.0	220	—	EMVH250ADA221MHA0G		100	10	HA0	0.75	50.0	70	—	EMVH101ADA100MHA0G	
220	JA0	0.30	4.5	296	—	EMVH250ADA221MJA0G			22	HA0	0.75	50.0	70	—	EMVH101ADA220MHA0G	
330	JA0	0.30	4.5	296	—	EMVH250ADA331MJA0G			22	JA0	0.55	35.0	115	—	EMVH101ADA220MJA0G	
330	KE0	0.14	2.1	750	—	EMVH250ARA331MKE0S			33	JA0	0.55	35.0	115	—	EMVH101ADA330MJA0G	
470	KE0	0.14	2.1	750	—	EMVH250ARA471MKE0S			47	KE0	0.33	16.5	450	—	EMVH101ARA470MKE0S	
470	LH0	0.10	1.5	1,000	—	EMVH250□DA471MLH0S			68	KG5	0.26	13.0	550	—	EMVH101ARA680MKG5S	
680	LH0	0.10	1.5	1,000	—	EMVH250□DA681MLH0S			100	LH0	0.24	12.0	650	—	EMVH101□DA101MLH0S	
680	MH0	0.10	1.5	1,200	—	EMVH250□DA681MMH0S			220	MN0	0.16	8.0	950	—	EMVH101□DA221MMN0S	
1,000	MN0	0.058	0.87	1,550	—	EMVH250□DA102MMN0S	160		10	KE0	—	—	—	100	EMVH161ARA100MKE0S	
10	F60	1.6	24.0	69	—	EMVH350ADA100MF60G			22	LH0	—	—	—	180	EMVH161□DA220MLH0S	
22	F60	1.6	24.0	69	—	EMVH350ADA220MF60G			33	MH0	—	—	—	245	EMVH161□DA330MMH0S	
33	F80	0.90	14.0	110	—	EMVH350ADA330MF80G			68	MN0	—	—	—	380	EMVH161□DA680MMN0S	
33	H63	0.90	14.0	110	—	EMVH350ADA330MH63G			200	10	KE0	—	—	—	100	EMVH201ARA100MKE0S
47	F80	0.90	14.0	110	—	EMVH350ADA470MF80G				22	LH0	—	—	—	180	EMVH201□DA220MLH0S
47	H63	0.90	14.0	110	—	EMVH350ADA470MH63G	33	LN0		—	—	—	250	EMVH201□DA330MLN0S		
47	HA0	0.40	6.0	220	—	EMVH350ADA470MHA0G	33	MH0		—	—	—	245	EMVH201□DA330MMH0S		
100	HA0	0.40	6.0	220	—	EMVH350ADA101MHA0G	47	MN0		—	—	—	315	EMVH201□DA470MMN0S		
100	JA0	0.30	4.5	296	—	EMVH350ADA101MJA0G	250	10		KG5	—	—	—	110	EMVH251ARA100MKG5S	
220	JA0	0.30	4.5	296	—	EMVH350ADA221MJA0G		22	LN0	—	—	—	200	EMVH251□DA220MLN0S		
330	KE0	0.14	2.1	750	—	EMVH350ARA331MKE0S		22	MH0	—	—	—	205	EMVH251□DA220MMH0S		
330	LH0	0.10	1.5	1,000	—	EMVH350□DA331MLH0S		33	MN0	—	—	—	260	EMVH251□DA330MMN0S		
470	KG5	0.11	1.5	900	—	EMVH350ARA471MKG5S		400	4.7	KE0	—	—	—	70	EMVH401ARA471MKE0S	
470	LH0	0.10	1.5	1,000	—	EMVH350□DA471MLH0S			6.8	LH0	—	—	—	100	EMVH401□DA681MLH0S	
680	MH0	0.10	1.5	1,200	—	EMVH350□DA681MMH0S	10		LN0	—	—	—	140	EMVH401□DA100MLN0S		
10	F60	2.8	42.0	51	—	EMVH500ADA100MF60G	10		MH0	—	—	—	135	EMVH401□DA100MMH0S		
10	H63	1.6	30.0	83	—	EMVH500ADA100MH63G	450		3.3	KG5	—	—	—	65	EMVH451ARA331MKG5S	
22	F80	2.0	30.0	83	—	EMVH500ADA220MF80G			4.7	LH0	—	—	—	85	EMVH451□DA471MLH0S	
22	H63	1.6	30.0	83	—	EMVH500ADA220MH63G		10	MN0	—	—	—	145	EMVH451□DA100MMN0S		

□ : Enter the appropriate terminal code.

◆RATED RIPPLE CURRENT MULTIPLIERS

● Frequency Multipliers

Rated voltage (V <sub>dc</sub> )	Size code	Frequency(Hz)				
		Capacitance(μF)	120	1k	10k	100k
10 to 100	F60 to JA0	10	0.66	0.86	0.93	1.00
		22 to 470	0.93	0.97	1.00	1.00
		47 to 100	0.40	0.75	0.90	1.00
	KE0 to MN0	220 to 470	0.50	0.85	0.94	1.00
		680 to 1,000	0.60	0.87	0.95	1.00
		2,200 to 3,300	0.75	0.90	0.95	1.00
		4,700	0.85	0.95	0.98	1.00
160 to 450	KE0 to MN0	3.3 to 33	1.00	1.50	1.75	1.80
		47 to 68	1.00	1.30	1.40	1.50

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5°C rise.

When long life performance is required in actual use, the rms ripple current has to be reduced.

## Looking for pricing, stock, or lifecycle information?

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