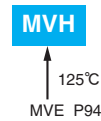


**Alchip™-MVH Series**

- 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
- AEC-Q200 compliant : Please contact Chemi-Con for more details, test data, information.



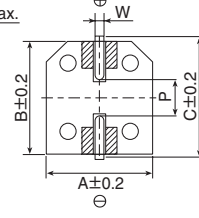
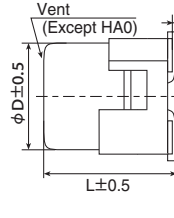
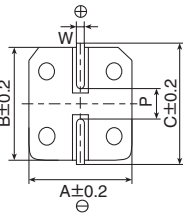
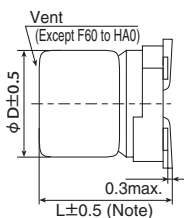
**SPECIFICATIONS**

Items	Characteristics													
<b>Category Temperature Range</b>	-40 to +125°C													
<b>Rated Voltage Range</b>	10 to 450V <sub>dc</sub>													
<b>Capacitance Tolerance</b>	±20% (M) (at 20°C, 120Hz)													
<b>Leakage Current</b>	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 MN0	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)														
<b>Dissipation Factor (tan δ)</b>	Rated voltage (V <sub>dc</sub> )	10V	16V	25V	35V	50V	63V	80V	100V	160 to 250V	400 & 450V			
	tan δ (Max.)	F60 to JA0	0.24	0.20	0.16	0.14	0.14	0.12	0.10	0.10	—	—		
		KE0 to MN0	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)														
<b>Low Temperature Characteristics (Max. Impedance Ratio)</b>	Rated voltage (V <sub>dc</sub> )	F60 to JA0	Z(-25°C)/Z(+20°C)	3	2	2	2	2	2	2	—	—		
			Z(-40°C)/Z(+20°C)	6	4	4	3	3	3	3	—	—		
	KE0 to MN0	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)	
<b>Endurance</b>	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 MN0 (10 to 100V <sub>dc</sub> ) : 5,000hours KE0 to MN0 (160 to 450V <sub>dc</sub> ) : 2,000hours													
Capacitance change	≤ ±30% of the initial value													
D.F. (tan δ)	≤300% of the initial specified value													
Leakage current	≤The initial specified value													
<b>Shelf Life</b>	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. (tan δ)	≤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 MN0

- Terminal Code : G(Vibration resistant structure)
- Size code : HA0 to MN0

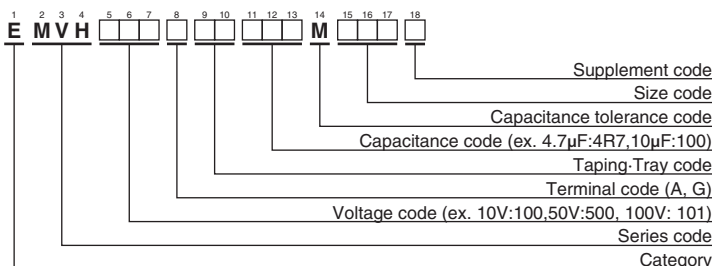


Note : L±0.3 for F60 and F80

▨ : 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
LNO	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
MN0	18	21.5	19.0	19.0	20.0	1.0 to 1.3	6.5

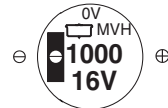
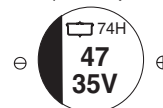
**PART NUMBERING SYSTEM**



**MARKING**

F60 to JA0  
EX) 35V47μF

KE0 to MN0  
EX) 16V1,000μF



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 (mArms/125°C)		Part No.	WV (V <sub>dc</sub> )	Cap (μF)	Size code	ESR (Ω max./100kHz)		Rated ripple current (mArms/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	—	EMVH500□DA330MHA0G	
	220	H63	0.90	14.0	110	—	EMVH100ADA221MH63G		47	HA0	0.70	11.0	160	—	EMVH500□DA470MHA0G	
	220	HA0	0.40	6.0	220	—	EMVH100□DA221MHA0G		47	JA0	0.50	7.5	247	—	EMVH500□DA470MJA0G	
	330	HA0	0.40	6.0	220	—	EMVH100□DA331MHA0G		100	JA0	0.50	7.5	247	—	EMVH500□DA101MJA0G	
	330	JA0	0.30	4.5	296	—	EMVH100□DA331MJA0G		100	KE0	0.23	3.5	550	—	EMVH500□RA101MKE0S	
	470	JA0	0.30	4.5	296	—	EMVH100□DA471MJA0G		220	KE0	0.23	3.5	550	—	EMVH500□RA221MKE0S	
	1,000	KE0	0.14	2.1	750	—	EMVH100□RA102MKE0S		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	—	EMVH500□RA331MKG5S	
	2,200	MH0	0.10	1.5	1,200	—	EMVH100□DA222MMH0S		330	LH0	0.15	2.3	850	—	EMVH500□DA331MLH0S	
	3,300	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	—	EMVH160□DA101MHA0G	22	HA0		0.70	35.0	100	—	EMVH630□DA220MHA0G		
220	HA0	0.40	6.0	220	—	EMVH160□DA221MHA0G	33	HA0		0.70	35.0	100	—	EMVH630□DA330MHA0G		
220	JA0	0.30	4.5	296	—	EMVH160□DA221MJA0G	33	JA0		0.50	25.0	170	—	EMVH630□DA330MJA0G		
330	JA0	0.30	4.5	296	—	EMVH160□DA331MJA0G	47	HA0		0.70	35.0	100	—	EMVH630□DA470MHA0G		
470	KE0	0.14	2.1	750	—	EMVH160□RA471MKE0S	47	JA0		0.50	25.0	170	—	EMVH630□DA470MJA0G		
680	KE0	0.14	2.1	750	—	EMVH160□RA681MKE0S	100	KE0		0.25	12.5	500	—	EMVH630□RA101MKE0S		
680	LH0	0.10	1.5	1,000	—	EMVH160□DA681MLH0S	220	KG5		0.20	10.0	600	—	EMVH630□RA221MKG5S		
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		
25	33	F60	1.6	24.0	69	—	EMVH250ADA330MF60G	80		10	HA0	0.75	50.0	70	—	EMVH800□DA100MHA0G
	47	F80	0.90	14.0	110	—	EMVH250ADA470MF80G			22	HA0	0.75	50.0	70	—	EMVH800□DA220MHA0G
	47	H63	0.90	14.0	110	—	EMVH250ADA470MH63G		22	JA0	0.55	35.0	115	—	EMVH800□DA220MJA0G	
	100	F80	0.90	14.0	110	—	EMVH250ADA101MF80G		33	HA0	0.75	50.0	70	—	EMVH800□DA330MHA0G	
	100	H63	0.90	14.0	110	—	EMVH250ADA101MH63G		33	JA0	0.55	35.0	115	—	EMVH800□DA330MJA0G	
	100	HA0	0.40	6.0	220	—	EMVH250□DA101MHA0G		47	JA0	0.55	35.0	115	—	EMVH800□DA470MJA0G	
	220	HA0	0.40	6.0	220	—	EMVH250□DA221MHA0G		100	10	HA0	0.75	50.0	70	—	EMVH101□DA100MHA0G
	220	JA0	0.30	4.5	296	—	EMVH250□DA221MJA0G			22	HA0	0.75	50.0	70	—	EMVH101□DA220MHA0G
	330	JA0	0.30	4.5	296	—	EMVH250□DA331MJA0G			22	JA0	0.55	35.0	115	—	EMVH101□DA220MJA0G
	330	KE0	0.14	2.1	750	—	EMVH250□RA331MKE0S			33	JA0	0.55	35.0	115	—	EMVH101□DA330MJA0G
	470	KE0	0.14	2.1	750	—	EMVH250□RA471MKE0S			47	KE0	0.33	16.5	450	—	EMVH101□RA470MKE0S
	470	LH0	0.10	1.5	1,000	—	EMVH250□DA471MLH0S			68	KG5	0.26	13.0	550	—	EMVH101□RA680MKG5S
	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	EMVH161□RA100MKE0S	
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		10		KE0	—	—	—	100	EMVH201□RA100MKE0S	
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	—	EMVH350□DA470MHA0G		33	MH0	—	—	—	245	EMVH201□DA330MMH0S		
100	HA0	0.40	6.0	220	—	EMVH350□DA101MHA0G		47	MN0	—	—	—	315	EMVH201□DA470MMN0S		
100	JA0	0.30	4.5	296	—	EMVH350□DA101MJA0G		200	10	KG5	—	—	—	110	EMVH251□RA100MKG5S	
220	JA0	0.30	4.5	296	—	EMVH350□DA221MJA0G			22	LN0	—	—	—	200	EMVH251□DA220MLN0S	
330	KE0	0.14	2.1	750	—	EMVH350□RA331MKE0S			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	—	EMVH350□RA471MKG5S	250		4.7	KE0	—	—	—	70	EMVH401□RA471MKE0S	
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			400	3.3	KG5	—	—	—	65	EMVH451□RA331MKG5S
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	Capacitance(μF)	Frequency(Hz)			
			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
160 to 450	KE0 to MN0	4,700	0.85	0.95	0.98	1.00
		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.