

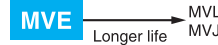


**THE DATASHEET OF  
EMVE160ARA471MHA0G**



**Alchip™-MVE Series** *Upgrade!*

- Endurance : 1,000 to 2,000 hours at 105°C
- Case size range : φ4×5.2L to φ18×21.5L
- Solvent resistant type except 100 to 450V<sub>dc</sub> (see PRECAUTIONS AND GUIDELINES)
- RoHS2 Compliant
- AEC-Q200 compliant : Please contact Chemi-Con for more details, test data, information.

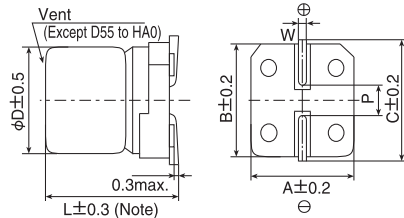


**◆SPECIFICATIONS**

Items	Characteristics												
<b>Category Temperature Range</b>	-40 to +105°C												
<b>Rated Voltage Range</b>	6.3 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> )	6.3 to 100V						160 to 450V					
	D55 to JA0	I=0.01CV or 3μA, whichever is greater (2 minutes)						—					
	KE0 to MN0	I=0.03CV or 4μA, whichever is greater (1 minute)						I=0.04CV+100μA (1minute)					
	Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20°C)												
<b>Dissipation Factor (tan δ)</b>	See STANDARD RATINGS (at 20°C, 120Hz)												
<b>Low Temperature Characteristics (Max. Impedance Ratio)</b>	Rated voltage (V <sub>dc</sub> )	6.3V	10V	16V	25V	35V	50V	63V	100V	160 to 250V	400 to 450V		
	D55 to JA0	Z(-25°C)/Z(+20°C)	4	3	2	2	2	2	2	3	—	—	
		Z(-40°C)/Z(+20°C)	12	8	6	4	3	3	3	4	—	—	
	KE0 to MN0	Z(-25°C)/Z(+20°C)	5	4	3	2	2	2	2	2	3	6	
Z(-40°C)/Z(+20°C)		10	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 period of time at 105°C.												
	Size code	D55 to F80						HA0 to MN0					
	Time	1,000 hours						2,000 hours					
	Capacitance change	≤ ±30% of the initial value						≤ ±20% of the initial value					
	D.F. (tan δ)	≤300% of the initial specified value						≤200% of the initial specified value					
	Leakage current	≤The initial specified value						≤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 B55 to F80 size) at 105°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.												
	Size code	D55 to F80						HA0 to MN0					
	Capacitance change	≤ ±25% of the initial value						≤ ±20% of the initial value					
	D.F. (tan δ)	≤200% of the initial specified value						≤200% of the initial specified value					
	Leakage current	≤The initial specified value						≤The initial specified value					

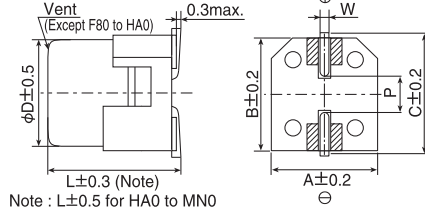
**◆DIMENSIONS [mm]**

- Terminal Code : A
- Size code : D55 to MN0



Note : L±0.5 for HA0 to MN0

- Terminal Code : G (Vibration resistant structure)
- Size code : F80 to MN0



Note : L±0.5 for HA0 to MN0

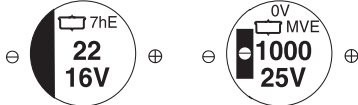
▨ : Dummy terminals

Size code	D	L	A	B	C	W	P
D55	4	5.2	4.3	4.3	5.1	0.5 to 0.8	1.0
E55	5	5.2	5.3	5.3	5.9	0.5 to 0.8	1.4
F55	6.3	5.2	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
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
MN0	18	21.5	19.0	19.0	20.0	1.0 to 1.3	6.5

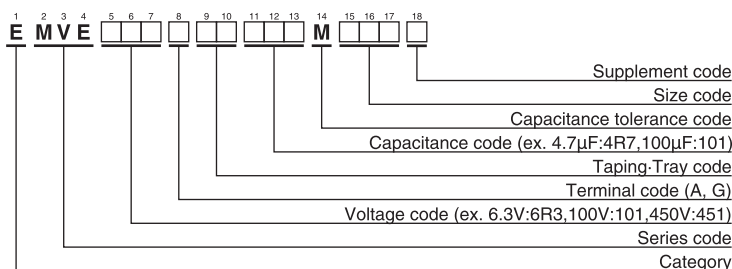
**◆MARKING**

**D55 to JA0**  
Ex) 16V22μF

**KE0 to MN0**  
Ex) 25V1,000μF



**◆PART NUMBERING SYSTEM**



**◆RATED RIPPLE CURRENT MULTIPLIERS**

- Frequency Multipliers

Size code	Capacitance(μF)	Frequency(Hz)			
		120	1k	10k	100k
D55 to JA0	1.0	1.00	1.50	1.75	1.80
	2.2 to 10	1.00	1.30	1.40	1.50
	22 to 1,500	1.00	1.05	1.08	1.08
KE0 to MN0	3.3 to 4.7	1.00	1.75	2.30	2.50
	10 to 68	1.00	1.50	1.75	1.80
	100 to 1,000	1.00	1.30	1.40	1.50
	2,200 to 6,800	1.00	1.05	1.08	1.08

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.



Alchip™-MVE Series *Upgrade!*

### ◆STANDARD RATINGS

□ is not solvent resistant.

WV (V <sub>dc</sub> )	Cap (μF)	Size code	tan δ	Rated ripple current (mArms/105°C, 120Hz)	Part No.	WV (V <sub>dc</sub> )	Cap (μF)	Size code	tan δ	Rated ripple current (mArms/105°C, 120Hz)	Part No.	
6.3	22	D55	0.30	22	EMVE6R3ARA220MD55G	35	330	JA0	0.16	450	EMVE350□RA331MJA0G	
	33	E55	0.30	34	EMVE6R3ARA330ME55G		470	KE0	0.22	520	EMVE350□RA471MKE0S	
	47	E55	0.30	38	EMVE6R3ARA470ME55G		470	LH0	0.22	650	EMVE350□RA471MLH0S	
	100	F55	0.30	69	EMVE6R3ARA101MF55G		1,000	LH0	0.22	750	EMVE350□RA102MLH0S	
	220	F80	0.45	120	EMVE6R3□RA221MF80G		1,000	MH0	0.22	1,000	EMVE350□RA102MMH0S	
	330	HA0	0.40	290	EMVE6R3□RA331MHA0G		2,200	MN0	0.24	1,450	EMVE350□RA222MMN0S	
	470	HA0	0.45	320	EMVE6R3□RA471MHA0G		50	1.0	D55	0.12	8.0	EMVE500ARA1R0MD55G
	680	HA0	0.45	340	EMVE6R3□RA681MHA0G			2.2	D55	0.12	12	EMVE500ARA2R2MD55G
	1,000	JA0	0.40	410	EMVE6R3□RA102MJA0G			3.3	D55	0.12	15	EMVE500ARA3R3MD55G
	1,500	JA0	0.45	550	EMVE6R3□RA152MJA0G			4.7	E55	0.12	20	EMVE500ARA4R7ME55G
	2,200	KE0	0.40	680	EMVE6R3□RA222MKE0S			10	F55	0.12	32	EMVE500ARA100MF55G
	2,200	LH0	0.40	840	EMVE6R3□RA222MLH0S			33	F80	0.14	65	EMVE500□RA330MF80G
	3,300	KG5	0.42	850	EMVE6R3□RA332MKG5S			47	F80	0.14	80	EMVE500□RA470MF80G
	3,300	MH0	0.42	1,000	EMVE6R3□RA332MMH0S			100	HA0	0.14	230	EMVE500□RA101MHA0G
	4,700	LN0	0.44	1,200	EMVE6R3□RA472MLN0S			220	JA0	0.14	375	EMVE500□RA221MJA0G
4,700	MH0	0.44	1,200	EMVE6R3□RA472MMH0S	330	KE0		0.18	500	EMVE500□RA331MKE0S		
6,800	LN0	0.48	1,200	EMVE6R3□RA682MLN0S	330	LH0		0.18	600	EMVE500□RA331MLH0S		
6,800	MN0	0.48	1,350	EMVE6R3□RA682MMN0S	470	LH0		0.18	700	EMVE500□RA471MLH0S		
					470	MH0		0.18	750	EMVE500□RA471MMH0S		
					1,000	MN0		0.18	1,200	EMVE500□RA102MMN0S		
10	22	E55	0.24	30	EMVE100ARA220ME55G	63		1.0	D55	0.12	8.0	EMVE630ARA1R0MD55G
	33	E55	0.24	34	EMVE100ARA330ME55G		2.2	D55	0.12	12	EMVE630ARA2R2MD55G	
	47	F55	0.24	48	EMVE100ARA470MF55G		3.3	E55	0.12	17	EMVE630ARA3R3ME55G	
	100	F55	0.30	69	EMVE100ARA101MF55G		4.7	F55	0.12	22	EMVE630ARA4R7MF55G	
	150	F80	0.35	100	EMVE100□RA151MF80G		10	F55	0.12	32	EMVE630ARA100MF55G	
	220	F80	0.35	120	EMVE100□RA221MF80G		22	F80	0.12	58	EMVE630□RA220MF80G	
	330	HA0	0.35	290	EMVE100□RA331MHA0G		33	HA0	0.12	140	EMVE630□RA330MHA0G	
	470	HA0	0.35	320	EMVE100□RA471MHA0G		47	HA0	0.12	170	EMVE630□RA470MHA0G	
	1,000	JA0	0.35	410	EMVE100□RA102MJA0G		100	JA0	0.12	310	EMVE630□RA101MJA0G	
	2,200	KG5	0.36	750	EMVE100□RA222MKG5S		220	KE0	0.14	470	EMVE630□RA221MKE0S	
	2,200	LH0	0.36	850	EMVE100□RA222MLH0S		220	LH0	0.14	560	EMVE630□RA221MLH0S	
	3,300	LH0	0.38	1,000	EMVE100□RA332MLH0S		330	LH0	0.14	700	EMVE630□RA331MLH0S	
	3,300	MH0	0.38	1,100	EMVE100□RA332MMH0S		330	MH0	0.14	750	EMVE630□RA331MMH0S	
	4,700	LN0	0.40	1,300	EMVE100□RA472MLN0S		470	LN0	0.14	900	EMVE630□RA471MLN0S	
	4,700	MN0	0.40	1,350	EMVE100□RA472MMN0S		470	MH0	0.14	900	EMVE630□RA471MMH0S	
16	10	D55	0.20	17	EMVE160ARA100MD55G	100	22	HA0	0.12	100	EMVE101□RA220MHA0G	
	22	E55	0.20	30	EMVE160ARA220ME55G		33	JA0	0.12	150	EMVE101□RA330MJA0G	
	33	F55	0.20	45	EMVE160ARA330MF55G		47	KE0	0.10	250	EMVE101□RA470MKE0S	
	47	F55	0.20	48	EMVE160ARA470MF55G		68	KE0	0.10	300	EMVE101□RA680MKE0S	
	100	F55	0.26	69	EMVE160ARA101MF55G		100	KE0	0.10	380	EMVE101□RA101MKE0S	
	150	F80	0.28	100	EMVE160□RA151MF80G		100	LH0	0.10	450	EMVE101□RA101MLH0S	
	220	F80	0.28	120	EMVE160□RA221MF80G		220	LN0	0.10	750	EMVE101□RA221MLN0S	
	330	HA0	0.28	290	EMVE160□RA331MHA0G		220	MH0	0.10	750	EMVE101□RA221MMH0S	
	470	HA0	0.28	320	EMVE160□RA471MHA0G		330	MN0	0.10	980	EMVE101□RA331MMN0S	
	680	JA0	0.28	470	EMVE160□RA681MJA0G		160	33	KE0	0.15	95	EMVE161□RA330MKE0S
	1,000	KE0	0.30	550	EMVE160□RA102MKE0S			47	LH0	0.15	260	EMVE161□RA470MLH0S
	1,000	LH0	0.30	650	EMVE160□RA102MLH0S			68	LN0	0.15	320	EMVE161□RA680MLN0S
	2,200	LH0	0.32	950	EMVE160□RA222MLH0S			68	MH0	0.15	320	EMVE161□RA680MMH0S
	2,200	MH0	0.32	1,000	EMVE160□RA222MMH0S			100	LN0	0.15	380	EMVE161□RA101MLN0S
	3,300	LN0	0.34	1,200	EMVE160□RA332MLN0S							
3,300	MH0	0.34	1,200	EMVE160□RA332MMH0S	200	10	KE0	0.15	80	EMVE201□RA100MKE0S		
25	10	E55	0.16	27		EMVE250ARA100ME55G	22	KG5	0.15	110	EMVE201□RA220MKG5S	
	22	F55	0.16	44		EMVE250ARA220MF55G	33	LH0	0.15	220	EMVE201□RA330MLH0S	
	33	F55	0.16	50		EMVE250ARA330MF55G	47	LN0	0.15	270	EMVE201□RA470MLN0S	
	47	F55	0.16	60		EMVE250ARA470MF55G	47	MH0	0.15	270	EMVE201□RA470MMH0S	
	100	F80	0.18	100		EMVE250□RA101MF80G	68	MN0	0.15	330	EMVE201□RA680MMN0S	
	150	HA0	0.18	240	EMVE250□RA151MHA0G	250	4.7	KE0	0.15	65	EMVE251□RA47R7MKE0S	
	220	HA0	0.18	320	EMVE250□RA221MHA0G		10	KG5	0.15	105	EMVE251□RA100MKG5S	
	330	JA0	0.16	450	EMVE250□RA331MJA0G		22	LH0	0.15	180	EMVE251□RA220MLH0S	
	470	JA0	0.18	490	EMVE250□RA471MJA0G		33	LN0	0.15	230	EMVE251□RA330MLN0S	
	1,000	LH0	0.26	820	EMVE250□RA102MLH0S		33	MH0	0.15	230	EMVE251□RA330MMH0S	
	1,000	MH0	0.26	880	EMVE250□RA102MMH0S		47	MN0	0.15	280	EMVE251□RA470MMN0S	
	2,200	LN0	0.28	1,250	EMVE250□RA222MLN0S	400	4.7	KG5	0.20	50	EMVE401□RA47R7MKG5S	
	2,200	MN0	0.28	1,300	EMVE250□RA222MMN0S		10	LH0	0.20	85	EMVE401□RA100MLH0S	
							22	MN0	0.20	130	EMVE401□RA220MMN0S	
	35	4.7	D55	0.14	16	EMVE350ARA47R7MD55G	450	3.3	KE0	0.20	40	EMVE451□RA3R3MKE0S
10		E55	0.14	27	EMVE350ARA100ME55G	4.7		KG5	0.20	50	EMVE451□RA47R7MKG5S	
22		F55	0.14	44	EMVE350ARA220MF55G	10		LH0	0.20	85	EMVE451□RA100MLH0S	
47		F80	0.16	80	EMVE350□RA470MF80G	22	MN0	0.20	130	EMVE451□RA220MMN0S		
100		F80	0.16	100	EMVE350□RA101MF80G							
150		HA0	0.16	260	EMVE350□RA151MHA0G							
220	JA0	0.16	375	EMVE350□RA221MJA0G								

□ : Enter the appropriate terminal code.

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