

WH series

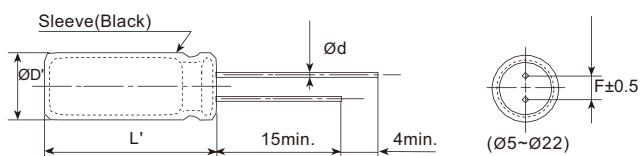
- Standard series for general purpose
- Wide temperature range from -40 °C to +105 °C
- Endurance: 2,000 hours at 105 °C
- RoHS Compliant



SPECIFICATIONS

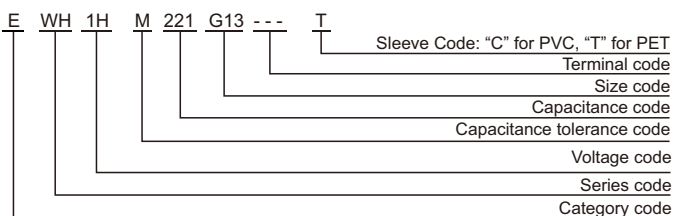
Items	Characteristics	
Category Temperature Range	-40~+105 °C (6.3~100 V _{dc})	-25~+105°C(160~500 V _{dc})
Rated Voltage Range	6.3~500 V _{dc}	
Capacitance Tolerance	±20%(M) (at 20°C, 120Hz)	
Leakage Current	6.3~100 V _{dc}	
	160~500 V _{dc}	
	I: leakage current(μA), C: Nominal capacitance(μF) V: Rated voltage(V) (at 20°C)	
Dissipation Factor (tanδ)	I ≤ 0.03CV or 4μA (at 1 minute) I ≤ 0.01CV or 3μA (at 2 minutes) Whichever is greater	
	CV ≤ 1,000: I ≤ 0.1CV+40μA CV > 1,000: I ≤ 0.04CV+100μA	
	After 1 minute After 5 minutes I ≤ 0.03CV+15μA I ≤ 0.02CV+25μA	
Low Temperature Characteristics (Max. Impedance Ratio)	Rated Voltage(V _{dc})	
	Z(-25°C)/Z(+20°C)	
	Z(-40°C)/Z(+20°C)	
Endurance	The specifications listed below shall be satisfied when the capacitors are restored to 20°C after DC voltage plus rated ripple current is applied for 2,000 hours at 105°C.	
	Capacitance Change ≤ ±20% of the initial value	
	Dissipation Factor ≤ 200% of the initial specified value	
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20°C after leaving them under no load at 105°C for 1,000 hours.	
	Capacitance Change ≤ ±20% of the initial value	
	Dissipation Factor ≤ 200% of the initial specified value	

DIMENSIONS[mm]



ØD	5	6.3	8	10	12.5/13	16/18	22
Ød	0.5	0.5	0.5	0.6	0.6	0.8	0.8
F	2.0	2.5	3.5	5.0	5.0	7.5	10.0
ØD'	ØD+0.5max.						
L'	L+2max.						

PART NUMBERING SYSTEM



RATED RIPPLE CURRENT MULTIPLIERS

Frequency correction factor for ripple current

Cap.(μF) \ Freq.(Hz)	50	120	300	1k	10k	100k
Cap.<10	0.65	1.00	1.35	1.75	2.30	2.50
10≤Cap.<100	0.75	1.00	1.25	1.50	1.75	1.80
100≤Cap.<1000	0.80	1.00	1.15	1.30	1.40	1.50
Cap.≥1000	0.85	1.00	1.03	1.05	1.08	1.08

WH series

■ STANDARD RATINGS

WV (Vdc)	Cap (μF)	Size ΦDxL(mm)	Rated ripple current (mA _{rms} /105°C, 120Hz)	Part Number
6.3	33	5×11	54	EWHOJM330D11---T
	47	5×11	64	EWHOJM470D11---T
	100	5×11	94	EWHOJM101D11---T
	220	5×11	140	EWHOJM221D11---T
	330	6.3×11	190	EWHOJM331E11---T
	470	6.3×11	230	EWHOJM471E11---T
	1000	8×12	380	EWHOJM102F12---T
	2200	10×20	710	EWHOJM222G20---T
	3300	10×20	840	EWHOJM332G20---T
	4700	12.5×20	1090	EWHOJM472W20---T
	6800	12.5×25	1350	EWHOJM682W25---T
	10000	16×25	1650	EWHOJM103L25---T
	15000	16×35	2010	EWHOJM153L35---T
	22000	18×40	2350	EWHOJM223M40---T
10	22	5×11	46	EWHA1AM220D11---T
	33	5×11	57	EWHA1AM330D11---T
	47	5×11	68	EWHA1AM470D11---T
	100	5×11	100	EWHA1AM101D11---T
	220	6.3×11	170	EWHA1AM221E11---T
	330	6.3×11	200	EWHA1AM331E11---T
	470	8×11	250	EWHA1AM471F11---T
	1000	10×13	460	EWHA1AM102G13---T
	2200	10×20	760	EWHA1AM222G20---T
	3300	12.5×20	1000	EWHA1AM332W20---T
	4700	12.5×25	1260	EWHA1AM472W25---T
	6800	16×25	1570	EWHA1AM682L25---T
	10000	16×35	1890	EWHA1AM103L35---T
	15000	18×35	2180	EWHA1AM153M35---T
16	10	5×11	34	EWHA1CM100D11---T
	22	5×11	51	EWHA1CM220D11---T
	33	5×11	63	EWHA1CM330D11---T
	47	5×11	75	EWHA1CM470D11---T
	100	5×11	110	EWHA1CM101D11---T
	220	6.3×11	180	EWHA1CM221E11---T
	330	8×11	260	EWHA1CM331F11---T
	470	8×12	310	EWHA1CM471F12---T
	1000	10×16	560	EWHA1CM102G16---T
	2200	12.5×20	920	EWHA1CM222W20---T
	3300	12.5×25	1170	EWHA1CM332W25---T
	4700	16×25	1480	EWHA1CM472L25---T
	6800	16×30	1780	EWHA1CM682L30---T
	10000	18×35	2060	EWHA1CM103M35---T
25	4.7	5×11	25	EWHA1EM47R7D11---T
	10	5×11	36	EWHA1EM100D11---T
	22	5×11	54	EWHA1EM220D11---T
	33	5×11	67	EWHA1EM330D11---T
	47	5×11	80	EWHA1EM470D11---T
	100	6.3×11	130	EWHA1EM101E11---T
	220	8×11	230	EWHA1EM221F11---T
	330	8×12	310	EWHA1EM331F12---T
	470	10×13	380	EWHA1EM471G13---T
	1000	10×20	680	EWHA1EM102G20---T
	2200	12.5×25	1090	EWHA1EM222W25---T
	3300	16×25	1400	EWHA1EM332L25---T
	4700	16×30	1710	EWHA1EM472L30---T
	6800	18×35	2040	EWHA1EM682M35---T
35	4.7	5×11	28	EWHA1VM47R7D11---T
	10	5×11	41	EWHA1VM100D11---T
	22	5×11	61	EWHA1VM220D11---T
	33	5×11	75	EWHA1VM330D11---T
	47	5×11	90	EWHA1VM470D11---T
	100	6.3×11	150	EWHA1VM101E11---T
	220	8×12	270	EWHA1VM221F12---T
	330	10×13	350	EWHA1VM331G13---T
	470	10×16	460	EWHA1VM471G16---T
	1000	12.5×20	810	EWHA1VM102W20---T
	2200	16×25	1260	EWHA1VM222L25---T
	3300	16×35	1610	EWHA1VM332L35---T
	4700	18×35	1910	EWHA1VM472M35---T

WV (Vdc)	Cap (μF)	Size ΦDxL(mm)	Rated ripple current (mA _{rms} /105°C, 120Hz)	Part Number
50	0.1	5×11	1.3	EWHA1HMR10D11---T
	0.22	5×11	2.9	EWHA1HMR22D11---T
	0.33	5×11	4.3	EWHA1HMR33D11---T
	0.47	5×11	6.2	EWHA1HMR47D11---T
	1	5×11	13	EWHA1HM010D11---T
	2.2	5×11	20	EWHA1HM2R2D11---T
	3.3	5×11	25	EWHA1HM3R3D11---T
	4.7	5×11	30	EWHA1HM4R7D11---T
	10	5×11	40	EWHA1HM100D11---T
	22	5×11	65	EWHA1HM220D11---T
	33	6.3×11	90	EWHA1HM330E11---T
	47	6.3×11	110	EWHA1HM470E11---T
	100	8×11	180	EWHA1HM101F11---T
	220	10×13	300	EWHA1HM221G13---T
63	330	10×16	410	EWHA1HM331G16---T
	470	10×20	530	EWHA1HM471G20---T
	1000	12.5×25	950	EWHA1HM102W25---T
	2200	16×35	1470	EWHA1HM222L35---T
	3300	18×35	1770	EWHA1HM332M35---T
	10	5×11	46	EWHA1JM100D11---T
	22	5×11	71	EWHA1JM220D11---T
	33	6.3×11	100	EWHA1JM330E11---T
	47	6.3×11	120	EWHA1JM470E11---T
	100	10×13	215	EWHA1JM101G13---T
	220	10×16	335	EWHA1JM221G16---T
	330	10×20	510	EWHA1JM331G20---T
	470	12.5×20	640	EWHA1JM471W20---T
	1000	16×25	930	EWHA1JM102L25---T
100	0.1	5×11	1.5	EWHA1KMR10D11---T
	0.22	5×11	3.4	EWHA1KMR22D11---T
	0.33	5×11	5	EWHA1KMR33D11---T
	0.47	5×11	7.1	EWHA1KMR47D11---T
	1	5×11	15	EWHA1KM010D11---T
	2.2	5×11	21	EWHA1KM2R2D11---T
	3.3	5×11	29	EWHA1KM3R3D11---T
	4.7	5×11	32	EWHA1KM4R7D11---T
	10	6.3×11	54	EWHA1KM100E11---T
	22	8×11	93	EWHA1KM220F11---T
	33	8×12	130	EWHA1KM330F12---T
	47	10×13	165	EWHA1KM470G13---T
	100	10×20	265	EWHA1KM101G20---T
	220	12.5×25	440	EWHA1KM221W25---T
160	330	16×25	540	EWHA1KM331L25---T
	470	16×30	715	EWHA1KM471L30---T
	1000	18×40	985	EWHA1KM102M40---T
	3.3	6.3×9	28	EWHA2CM3R3E09---T
	4.7	6.3×9	34	EWHA2CM4R7E09---T
	10	6.3×12	60	EWHA2CM100E12---T
	10	8×9	60	EWHA2CM100F09---T
	22	8×12	88	EWHA2CM220F12---T
	22	10×12	98	EWHA2CM220G12---T
	33	10×12	140	EWHA2CM330G12---T
	33	10×16	158	EWHA2CM330G16---T
	47	10×14	142	EWHA2CM470G14---T
	47	10×20	182	EWHA2CM470G20---T
	68	10×20	240	EWHA2CM680G20---T
200	100	12.5×20	300	EWHA2CM101W20---T
	100	16×20	316	EWHA2CM101L20---T
	220	16×25	530	EWHA2CM221L25---T
	330	18×25	600	EWHA2CM331M25---T
	470	18×35	820	EWHA2CM471M35---T
	1	6.3×7	12	EWHA2DM010E07---T
	2.2	6.3×7	18	EWHA2DM2R2E07---T
	3.3	6.3×9	28	EWHA2DM3R3E09---T
	4.7	6.3×9	40	EWHA2DM4R7E09---T
	10	8×12	78	EWHA2DM100F12---T
	22	8×16	110	EWHA2DM220F16---T
	22	10×12	110	EWHA2DM220G12---T
	33	10×16	166	EWHA2DM330G16---T

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■ STANDARD RATINGS

WV (V _{dc})	Cap (μF)	Size ΦDxL(mm)	Rated ripple current (mA _{RMS} /105°C, 120Hz)	Part Number
200	33	10×20	185	EWH2DM330G20---T
	47	10×20	200	EWH2DM470G20---T
	68	12.5×20	290	EWH2DM680W20---T
	82	12.5×20	300	EWH2DM820W20---T
	100	13×20	305	EWH2DM101K20---T
	100	16×20	325	EWH2DM101L20---T
	150	16×25	446	EWH2DM151L25---T
	180	16×25	530	EWH2DM181L25---T
	220	18×25	620	EWH2DM221M25---T
	330	18×30	720	EWH2DM331M30---T
470	18×40	840	EWH2DM471M40---T	
250	2.2	6.3×9	21	EWH2EM2R2E09---T
	3.3	6.3×9	30	EWH2EM3R3E09---T
	4.7	6.3×12	38	EWH2EM4R7E12---T
	4.7	8×9	45	EWH2EM4R7F09---T
	10	8×12	70	EWH2EM100F12---T
	10	10×12	75	EWH2EM100G12---T
	22	8×16	100	EWH2EM220F16---T
	22	10×16	116	EWH2EM220G16---T
	33	10×20	150	EWH2EM330G20---T
	33	12.5×16	165	EWH2EM330W16---T
	47	12.5×20	232	EWH2EM470W20---T
	100	16×25	370	EWH2EM101L25---T
	150	18×25	455	EWH2EM151M25---T
	220	18×30	600	EWH2EM221M30---T
330	18×35	705	EWH2EM331M35---T	
350	1	6.3×9	13	EWH2VM010E09---T
	2.2	6.3×9	23	EWH2VM2R2E09---T
	3.3	8×9	31	EWH2VM3R3F09---T
	4.7	8×9	45	EWH2VM4R7F09---T
	10	10×12	68	EWH2VM100G12---T
	22	10×20	135	EWH2VM220G20---T
	33	12.5×20	184	EWH2VM330W20---T
	47	16×20	225	EWH2VM470L20---T
	68	16×25	336	EWH2VM680L25---T
100	18×30	398	EWH2VM101M30---T	
400	1	6.3×9	14	EWH2GM010E09---T
	2.2	6.3×9	25	EWH2GM2R2E09---T
	2.2	8×9	30	EWH2GM2R2F09---T
	3.3	6.3×12	33	EWH2GM3R3E12---T
	3.3	8×9	34	EWH2GM3R3F09---T
	4.7	8×9	45	EWH2GM4R7F09---T
	4.7	8×12	48	EWH2GM4R7F12---T
	10	8×16	92	EWH2GM100F16---T
	10	10×12	92	EWH2GM100G12---T
	22	10×20	160	EWH2GM220G20---T
	33	16×20	258	EWH2GM330L20---T
	47	16×20	290	EWH2GM470L20---T
	68	16×25	420	EWH2GM680L25---T
	68	18×20	420	EWH2GM680M20---T
	82	18×25	474	EWH2GM820M25---T
	100	18×30	532	EWH2GM101M30---T
120	18×35	588	EWH2GM121M35---T	
150	18×35	610	EWH2GM151M35---T	
450	1	6.3×9	14	EWH2WM010E09---T
	1	6.3×12	16	EWH2WM010E12---T
	2.2	8×9	22	EWH2WM2R2F09---T
	2.2	8×12	25	EWH2WM2R2F12---T
	3.3	8×12	32	EWH2WM3R3F12---T
	4.7	10×12	48	EWH2WM4R7G12---T
	10	10×16	85	EWH2WM100G16---T
	10	10×20	90	EWH2WM100G20---T
	22	12.5×20	150	EWH2WM220W20---T
	22	16×20	185	EWH2WM220L20---T
	33	16×20	200	EWH2WM330L20---T
	47	16×25	335	EWH2WM470L25---T
	68	18×25	400	EWH2WM680M25---T
82	18×30	472	EWH2WM820M30---T	

WV (V _{dc})	Cap (μF)	Size ΦDxL(mm)	Rated ripple current (mA _{RMS} /105°C, 120Hz)	Part Number
450	100	18×35	530	EWH2WM101M35---T
	120	18×40	582	EWH2WM121M40---T
	150	18×45	610	EWH2WM151M45---T
500	4.7	10×16	50	EWH2HM4R7G16---T
	10	12.5×20	115	EWH2HM100W20---T
	15	12.5×25	140	EWH2HM150W25---T
	22	16×25	185	EWH2HM220L25---T
	33	18×25	215	EWH2HM330M25---T
	47	18×35	345	EWH2HM470M35---T
	68	18×35	390	EWH2HM680M35---T
	82	18×40	490	EWH2HM820M40---T
	100	22×35	535	EWH2HM101O35---T
	120	22×40	550	EWH2HM121O40---T

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