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WH series

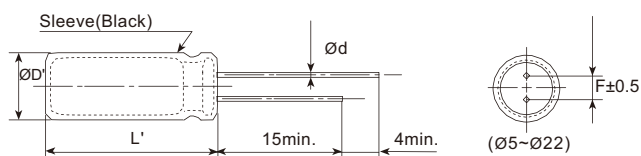
- Standard series for general purpose
- Wide temperature range from -40 °C to +105 °C
- Endurance: 2,000 hours at 105 °C
- RoHS Compliant



SPECIFICATIONS

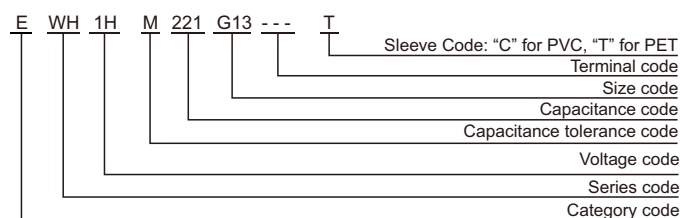
Items	Characteristics											
Category Temperature Range	-40~+105 °C (6.3~100 V _{dc})						-25~+105°C(160~500 V _{dc})					
Rated Voltage Range	6.3~500 V _{dc}											
Capacitance Tolerance	±20%(M) (at 20°C,120Hz)											
Leakage Current	6.3~100 V _{dc}					160~500 V _{dc}					I: leakage current(μA), C: Nominal capacitance(μF) V: Rated voltage(V) (at 20°C)	
	I≤0.03CV or 4μA (at 1 minute) I≤0.01 CV or 3μA (at 2 minutes) Whichever is greater					CV	After 1 minute		After 5 minutes			
						CV≤1,000	I≤0.1CV+40μA		I≤0.03CV+15μA			
						CV>1,000	I≤0.04CV+100μA		I≤0.02CV+25μA			
Dissipation Factor (tanδ)	Rated Voltage(V _{dc})	6.3	10	16	25	35	50	63	100	160~250	350~500	
	Dissipation Factor (Max.)	0.28	0.24	0.20	0.16	0.14	0.12	0.10	0.08	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 _{dc})	6.3	10	16	25	35	50	63	100	160~250	350~450	500
	Z(-25°C)/Z(+20°C)	5	4	3	2				3		6	8
	Z(-40°C)/Z(+20°C)	12	10	8	5	4	3		-			(at 120Hz)
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									
	Leakage Current		≤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									
	Leakage Current		≤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

Freq.(Hz) Cap.(μF)	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 (V _{dc})	Cap (μF)	Size ΦD×L(mm)	Rated ripple current (mA _{rms} /105°C, 120Hz)	Part Number
6.3	33	5×11	54	EWH0JM330D11---T
	47	5×11	64	EWH0JM470D11---T
	100	5×11	94	EWH0JM101D11---T
	220	5×11	140	EWH0JM221D11---T
	330	6.3×11	190	EWH0JM331E11---T
	470	6.3×11	230	EWH0JM471E11---T
	1000	8×12	380	EWH0JM102F12---T
	2200	10×20	710	EWH0JM222G20---T
	3300	10×20	840	EWH0JM332G20---T
	4700	12.5×20	1090	EWH0JM472W20---T
	6800	12.5×25	1350	EWH0JM682W25---T
	10000	16×25	1650	EWH0JM103L25---T
	15000	16×35	2010	EWH0JM153L35---T
	22000	18×40	2350	EWH0JM223M40---T
10	22	5×11	46	EWH1AM220D11---T
	33	5×11	57	EWH1AM330D11---T
	47	5×11	68	EWH1AM470D11---T
	100	5×11	100	EWH1AM101D11---T
	220	6.3×11	170	EWH1AM221E11---T
	330	6.3×11	200	EWH1AM331E11---T
	470	8×11	250	EWH1AM471F11---T
	1000	10×13	460	EWH1AM102G13---T
	2200	10×20	760	EWH1AM222G20---T
	3300	12.5×20	1000	EWH1AM332W20---T
	4700	12.5×25	1260	EWH1AM472W25---T
	6800	16×25	1570	EWH1AM682L25---T
	10000	16×35	1890	EWH1AM103L35---T
	15000	18×35	2180	EWH1AM153M35---T
16	10	5×11	34	EWH1CM100D11---T
	22	5×11	51	EWH1CM220D11---T
	33	5×11	63	EWH1CM330D11---T
	47	5×11	75	EWH1CM470D11---T
	100	5×11	110	EWH1CM101D11---T
	220	6.3×11	180	EWH1CM221E11---T
	330	8×11	260	EWH1CM331F11---T
	470	8×12	310	EWH1CM471F12---T
	1000	10×16	560	EWH1CM102G16---T
	2200	12.5×20	920	EWH1CM222W20---T
	3300	12.5×25	1170	EWH1CM332W25---T
	4700	16×25	1480	EWH1CM472L25---T
	6800	16×30	1780	EWH1CM682L30---T
	10000	18×35	2060	EWH1CM103M35---T
25	4.7	5×11	25	EWH1EM470D11---T
	10	5×11	36	EWH1EM100D11---T
	22	5×11	54	EWH1EM220D11---T
	33	5×11	67	EWH1EM330D11---T
	47	5×11	80	EWH1EM470D11---T
	100	6.3×11	130	EWH1EM101E11---T
	220	8×11	230	EWH1EM221F11---T
	330	8×12	310	EWH1EM331F12---T
	470	10×13	380	EWH1EM471G13---T
	1000	10×20	680	EWH1EM102G20---T
	2200	12.5×25	1090	EWH1EM222W25---T
	3300	16×25	1400	EWH1EM332L25---T
	4700	16×30	1710	EWH1EM472L30---T
	6800	18×35	2040	EWH1EM682M35---T
35	4.7	5×11	28	EWH1VM470D11---T
	10	5×11	41	EWH1VM100D11---T
	22	5×11	61	EWH1VM220D11---T
	33	5×11	75	EWH1VM330D11---T
	47	5×11	90	EWH1VM470D11---T
	100	6.3×11	150	EWH1VM101E11---T
	220	8×12	270	EWH1VM221F12---T
	330	10×13	350	EWH1VM331G13---T
	470	10×16	460	EWH1VM471G16---T
	1000	12.5×20	810	EWH1VM102W20---T
	2200	16×25	1260	EWH1VM222L25---T
	3300	16×35	1610	EWH1VM332L35---T
	4700	18×35	1910	EWH1VM472M35---T

WV (V _{dc})	Cap (μF)	Size ΦD×L(mm)	Rated ripple current (mA _{rms} /105°C, 120Hz)	Part Number
50	0.1	5×11	1.3	EWH1HMR10D11---T
	0.22	5×11	2.9	EWH1HMR22D11---T
	0.33	5×11	4.3	EWH1HMR33D11---T
	0.47	5×11	6.2	EWH1HMR47D11---T
	1	5×11	13	EWH1HMR10D11---T
	2.2	5×11	20	EWH1HMR22D11---T
	3.3	5×11	25	EWH1HMR33D11---T
	4.7	5×11	30	EWH1HMR47D11---T
	10	5×11	40	EWH1HMR100D11---T
	22	5×11	65	EWH1HMR220D11---T
	33	6.3×11	90	EWH1HMR330E11---T
	47	6.3×11	110	EWH1HMR470E11---T
	100	8×11	180	EWH1HMR101F11---T
	220	10×13	300	EWH1HMR221G13---T
63	330	10×16	410	EWH1HMR331G16---T
	470	10×20	530	EWH1HMR471G20---T
	1000	12.5×25	950	EWH1HMR102W25---T
	2200	16×35	1470	EWH1HMR222L35---T
	3300	18×35	1770	EWH1HMR332M35---T
	10	5×11	46	EWH1JM100D11---T
	22	5×11	71	EWH1JM220D11---T
	33	6.3×11	100	EWH1JM330E11---T
	47	6.3×11	120	EWH1JM470E11---T
	100	10×13	215	EWH1JM101G13---T
	220	10×16	335	EWH1JM221G16---T
	330	10×20	510	EWH1JM331G20---T
	470	12.5×20	640	EWH1JM471W20---T
	1000	16×25	930	EWH1JM102L25---T
100	0.1	5×11	1.5	EWH1KMR10D11---T
	0.22	5×11	3.4	EWH1KMR22D11---T
	0.33	5×11	5	EWH1KMR33D11---T
	0.47	5×11	7.1	EWH1KMR47D11---T
	1	5×11	15	EWH1KMR10D11---T
	2.2	5×11	21	EWH1KMR22D11---T
	3.3	5×11	29	EWH1KMR33D11---T
	4.7	5×11	32	EWH1KMR47D11---T
	10	6.3×11	54	EWH1KM100E11---T
	22	8×11	93	EWH1KM220F11---T
	33	8×12	130	EWH1KM330F12---T
	47	10×13	165	EWH1KM470G13---T
	100	10×20	265	EWH1KM101G20---T
	220	12.5×25	440	EWH1KM221W25---T
160	330	16×25	540	EWH1KM331L25---T
	470	16×30	715	EWH1KM471L30---T
	1000	18×40	985	EWH1KM102M40---T
	3.3	6.3×9	28	EWH2CM3R3E09---T
	4.7	6.3×9	34	EWH2CM4R7E09---T
	10	6.3×12	60	EWH2CM100E12---T
	10	8×9	60	EWH2CM100F09---T
	22	8×12	88	EWH2CM220F12---T
	22	10×12	98	EWH2CM220G12---T
	33	10×12	140	EWH2CM330G12---T
	33	10×16	158	EWH2CM330G16---T
	47	10×14	142	EWH2CM470G14---T
	47	10×20	182	EWH2CM470G20---T
	68	10×20	240	EWH2CM680G20---T
200	100	12.5×20	300	EWH2CM101W20---T
	100	16×20	316	EWH2CM101L20---T
	220	16×25	530	EWH2CM221L25---T
	330	18×25	600	EWH2CM331M25---T
	470	18×35	820	EWH2CM471M35---T
	1	6.3×7	12	EWH2DM010E07---T
	2.2	6.3×7	18	EWH2DM2R2E07---T
	3.3	6.3×9	28	EWH2DM3R3E09---T
	4.7	6.3×9	40	EWH2DM4R7E09---T
	10	8×12	78	EWH2DM100F12---T
	22	8×16	110	EWH2DM220F16---T
	22	10×12	110	EWH2DM220G12---T
	33	10×16	166	EWH2DM330G16---T

WH series

STANDARD RATINGS

WV (V _{dc})	Cap (μF)	Size ΦD×L(mm)	Rated ripple current (mA _{rms} /105°C, 120Hz)	Part Number
200	33	10×20	185	EWHD2M330G20---T
	47	10×20	200	EWHD2M470G20---T
	68	12.5×20	290	EWHD2M680W20---T
	82	12.5×20	300	EWHD2M820W20---T
	100	13×20	305	EWHD2M101K20---T
	100	16×20	325	EWHD2M101L20---T
	150	16×25	446	EWHD2M151L25---T
	180	16×25	530	EWHD2M181L25---T
	220	18×25	620	EWHD2M221M25---T
	330	18×30	720	EWHD2M331M30---T
250	470	18×40	840	EWHD2M471M40---T
	2.2	6.3×9	21	EWHD2EM2R2E09---T
	3.3	6.3×9	30	EWHD2EM3R3E09---T
	4.7	6.3×12	38	EWHD2EM4R7E12---T
	4.7	8×9	45	EWHD2EM4R7F09---T
	10	8×12	70	EWHD2EM100F12---T
	10	10×12	75	EWHD2EM100G12---T
	22	8×16	100	EWHD2EM220F16---T
	22	10×16	116	EWHD2EM220G16---T
	33	10×20	150	EWHD2EM330G20---T
350	33	12.5×16	165	EWHD2EM330W16---T
	47	12.5×20	232	EWHD2EM470W20---T
	100	16×25	370	EWHD2EM101L25---T
	150	18×25	455	EWHD2EM151M25---T
	220	18×30	600	EWHD2EM221M30---T
	330	18×35	705	EWHD2EM331M35---T
	1	6.3×9	13	EWHD2VM010E09---T
	2.2	6.3×9	23	EWHD2VM2R2E09---T
	3.3	8×9	31	EWHD2VM3R3F09---T
	4.7	8×9	45	EWHD2VM4R7F09---T
400	10	10×12	68	EWHD2VM100G12---T
	22	10×20	135	EWHD2VM220G20---T
	33	12.5×20	184	EWHD2VM330W20---T
	47	16×20	225	EWHD2VM470L20---T
	68	16×25	336	EWHD2VM680L25---T
	100	18×30	398	EWHD2VM101M30---T
	1	6.3×9	14	EWHD2GM010E09---T
	2.2	6.3×9	25	EWHD2GM2R2E09---T
	2.2	8×9	30	EWHD2GM2R2F09---T
	3.3	6.3×12	33	EWHD2GM3R3E12---T
450	3.3	8×9	34	EWHD2GM3R3F09---T
	4.7	8×9	45	EWHD2GM4R7F09---T
	4.7	8×12	48	EWHD2GM4R7F12---T
	10	8×16	92	EWHD2GM100F16---T
	10	10×12	92	EWHD2GM100G12---T
	22	10×20	160	EWHD2GM220G20---T
	33	16×20	258	EWHD2GM330L20---T
	47	16×20	290	EWHD2GM470L20---T
	68	16×25	420	EWHD2GM680L25---T
	68	18×20	420	EWHD2GM680M20---T
450	82	18×25	474	EWHD2GM820M25---T
	100	18×30	532	EWHD2GM101M30---T
	120	18×35	588	EWHD2GM121M35---T
	150	18×35	610	EWHD2GM151M35---T
	1	6.3×9	14	EWHD2WM010E09---T
	1	6.3×12	16	EWHD2WM010E12---T
	2.2	8×9	22	EWHD2WM2R2F09---T
	2.2	8×12	25	EWHD2WM2R2F12---T
	3.3	8×12	32	EWHD2WM3R3F12---T
	4.7	10×12	48	EWHD2WM4R7G12---T
450	10	10×16	85	EWHD2WM100G16---T
	10	10×20	90	EWHD2WM100G20---T
	22	12.5×20	150	EWHD2WM220W20---T
	22	16×20	185	EWHD2WM220L20---T
	33	16×20	200	EWHD2WM330L20---T
	47	16×25	335	EWHD2WM470L25---T
	68	18×25	400	EWHD2WM680M25---T
	82	18×30	472	EWHD2WM820M30---T

WV (V _{dc})	Cap (μF)	Size ΦD×L(mm)	Rated ripple current (mA _{rms} /105°C, 120Hz)	Part Number
450	100	18×35	530	EWHD2WM101M35---T
	120	18×40	582	EWHD2WM121M40---T
	150	18×45	610	EWHD2WM151M45---T
500	4.7	10×16	50	EWHD2HM4R7G16---T
	10	12.5×20	115	EWHD2HM100W20---T
	15	12.5×25	140	EWHD2HM150W25---T
	22	16×25	185	EWHD2HM220L25---T
	33	18×25	215	EWHD2HM330M25---T
	47	18×35	345	EWHD2HM470M35---T
	68	18×35	390	EWHD2HM680M35---T
	82	18×40	490	EWHD2HM820M40---T
	100	22×35	535	EWHD2HM101O35---T
	120	22×40	550	EWHD2HM121O40---T

※ Specifications subject to change without notice.