

HF series

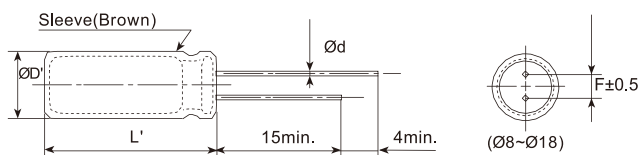
- Long life, high ripple current; For power supply applications
- Endurance: +105°C 5,000~10,000 hours
- RoHS Compliant



SPECIFICATIONS

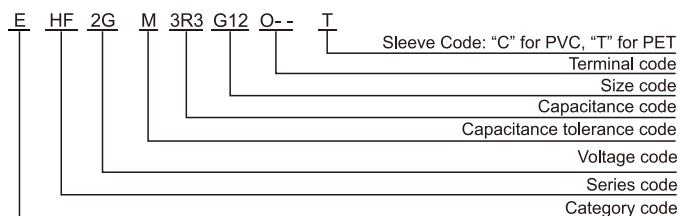
Items	Characteristics							
Category Temperature Range	-25~+105°C							
Rated Voltage Range	160~450 V _{dc}							
Capacitance Tolerance	±20%(M) (at 20°C, 120Hz)							
Leakage Current		After 1 minute		After 5 minutes			Where, I: Max. leakage current (µA), C: Nominal capacitance (µF), V: Rated voltage (V) (at 20°C)	
	CV ≤ 1000	I ≤ 0.1CV + 40µA		I ≤ 0.03CV + 15µA				
	CV > 1000	I ≤ 0.04CV + 100µA		I ≤ 0.02CV + 25µA				
Dissipation Factor (tanδ)	Rated Voltage (V _{dc})	160	200	250	350	400	450	
	tanδ (max.)	0.15	0.15	0.15	0.20	0.20	0.20	
Low Temperature Characteristics (Max. Impedance Ratio)	Rated Voltage (V _{dc})	160	200	250	350	400	450	
	Z(-25°C)/Z(+20°C)	3	3	3	6	6	6	
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20°C after DC voltage plus the rated ripple current is applied for a specified period of time at 105°C.							
	Capacitance Change	≤ ±20% of the initial value					Case Dia.	Load life (hours)
	D.F. (tanδ)	≤ 200% of the initial specified value					ØD ≤ 8	5,000
	Leakage Current	≤ The initial specified value					ØD = 10	8,000
						ØD ≥ 12.5	10,000	
Shelf Life	The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied.							
	Capacitance Change	≤ ±20% of the initial value						
	D.F. (tanδ)	≤ 200% of the initial specified value						
	Leakage Current	≤ 200% of the initial specified value						

DIMENSIONS [mm]



ØD	8	10	12.5	16	18
Ød	0.5	0.6	0.6	0.8	0.8
F	3.5	5.0	5.0	7.5	7.5
ØD'	ØD + 0.5 max.				
L'	L + 2 max.				

PART NUMBERING SYSTEM



RATED RIPPLE CURRENT MULTIPLIERS

Frequency correction factor for ripple current

	Freq. (Hz)			
Cap. (µF)	120	1k	10k	100k
<100	1.0	1.75	2.25	2.50
≥100	1.0	1.67	2.05	2.25

The endurance of capacitors is shortened 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.

HF series

■ STANDARD RATINGS

WV (V _{dc})	Cap (μF)	Size ΦDxL(mm)	tanδ	Rated ripple current (mA _{rms} /105°C, 120Hz)
160(2C)	10	10*16	0.15	128
	12	10*16	0.15	145
	15	10*20	0.15	175
	22	10*20	0.15	205
	33	10*20	0.15	250
	39	10*20	0.15	275
	47	10*20	0.15	300
		12.5*20	0.15	310
	56	12.5*20	0.15	350
	68	12.5*20	0.15	478
	82	12.5*20	0.15	510
		16*20	0.15	525
	100	12.5*25	0.15	630
		16*20	0.15	635
	150	16*20	0.15	770
		16*25	0.15	790
220	16*25	0.15	1020	
	18*25	0.15	1045	
330	18*30	0.15	1402	
200(2D)	10	10*16	0.15	126
	12	10*16	0.15	140
	15	10*20	0.15	170
	22	10*20	0.15	205
	33	10*20	0.15	255
		12.5*20	0.15	265
	39	12.5*20	0.15	310
	47	12.5*20	0.15	392
	68	12.5*20	0.15	470
	82	12.5*25	0.15	485
		16*20	0.15	554
	100	16*20	0.15	632
		16*25	0.15	655
	150	16*25	0.15	840
		16*30	0.15	865
	220	18*25	0.15	870
18*25		0.15	1050	
330	18*30	0.15	1080	
	18*35	0.15	1430	
470	18*40	0.15	1460	
250(2E)	4.7	8*12	0.15	70
	5.6	10*12	0.15	85
	6.8	10*12	0.15	110
	10	10*20	0.15	140
	22	10*20	0.15	205
	33	12.5*20	0.15	325
	39	12.5*20	0.15	345
	47	12.5*20	0.15	390
		12.5*25	0.15	405
	68	16*20	0.15	528
	82	16*20	0.15	550
		16*30	0.15	570
	100	16*25	0.15	680
		18*25	0.15	700
	150	18*25	0.15	866
	220	18*31	0.15	1130
18*40		0.15	1160	

WV (V _{dc})	Cap (μF)	Size ΦDxL(mm)	tanδ	Rated ripple current (mA _{rms} /105°C, 120Hz)
350(2V)	4.7	10*12	0.20	70
	5.6	10*12	0.20	90
	6.8	10*16	0.20	112
	10	10*20	0.20	140
	22	12.5*20	0.20	265
	33	16*20	0.20	364
	39	16*20	0.20	385
		16*20	0.20	430
	47	16*25	0.20	445
		16*25	0.20	560
	68	18*20	0.20	550
		18*25	0.20	570
	82	18*25	0.20	618
		18*25	0.20	700
	100	18*30	0.20	725
		18*30	0.20	836
150	18*35	0.20	970	
400(2G)	1	8*12	0.20	30
	2.2	8*12	0.20	45
	3.3	10*12	0.20	80
	4.7	10*16	0.20	100
	6.8	10*16	0.20	112
	10	10*20	0.20	144
	15	12.5*20	0.20	222
	22	12.5*20	0.20	260
		12.5*25	0.20	275
	33	16*20	0.20	368
	39	16*25	0.20	410
	47	16*25	0.20	470
		18*20	0.20	455
	56	16*30	0.20	480
		10*50	0.20	520
	68	12.5*40	0.20	600
18*25		0.20	590	
82	12.5*45	0.20	625	
	18*25	0.20	610	
100	18*30	0.20	630	
	12.5*50	0.20	790	
150	18*31	0.20	765	
	18*35	0.20	785	
220	18*35	0.20	870	
470	18*40	0.20	985	
450(2W)	6.8	10*20	0.20	112
	10	12.5*20	0.20	185
	15	12.5*25	0.20	248
	22	16*20	0.20	295
		10*40	0.20	405
	33	16*25	0.20	398
		18*20	0.20	385
	39	10*45	0.20	425
		18*25	0.20	415
	47	12.5*40	0.20	505
		18*25	0.20	496
	56	12.5*40	0.20	550
	68	18*30	0.20	640
	82	12.5*50	0.20	730
		18*35	0.20	720
	100	18*40	0.20	808