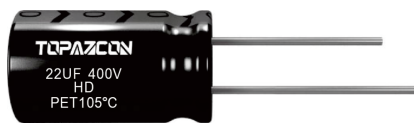


# HD Series

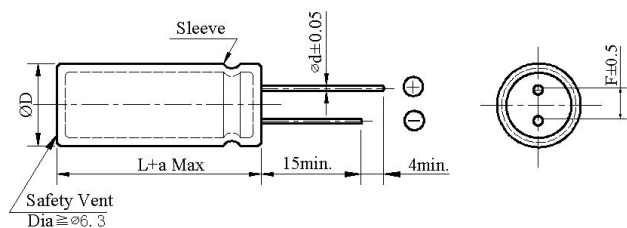
- Miniaturized, Long life, designed for fast charging
- Load life 6,000 hours at 105°C; 3,000 hours at 115°C
- Low impedance and high ripple current
- RoHS Compliant



## ◆ SPECIFICATIONS

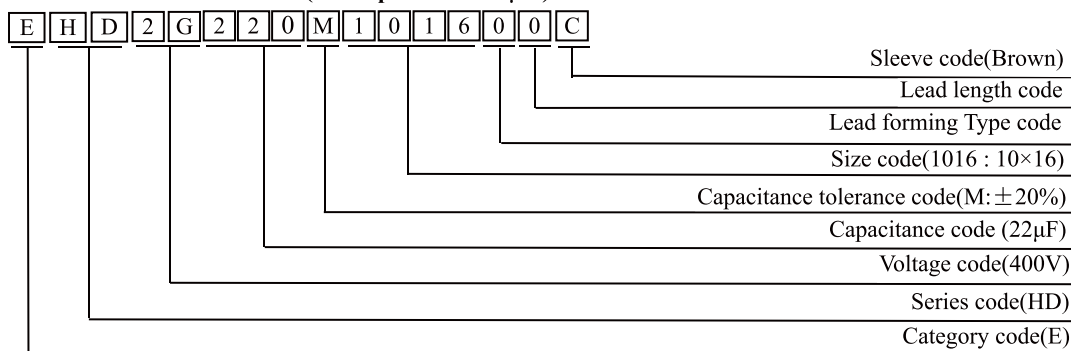
Item	Performance Characteristics					
Category Temperature Range	-40 ~ +105°C					
Working Voltage Range	400 ~ 500Vdc					
Capacitance Range	1 ~ 100μF					
Capacitance Tolerance	±20% (at 20°C and 120Hz)					
Dissipation Factor (tanδ) (at 20°C, 120Hz)	Rated Voltage (V)	400	420	450	500	
	tanδ(Max)	0.15	0.15	0.18	0.20	
Leakage Current	400~500Vdc					
	$I \leq 0.015CV + 10\mu A$ (2minutes)					
I: Leakage current (μA) C: Rated capacitance (μF) V: Rated voltage (V)						
Low Temperature Characteristics Impedance Ratio(MAX)	Rated Voltage (V)	400	420	450	500	(at 120Hz)
	Z(-25°C)/Z(+20°C)	4	4	5	6	
	Z(-40°C)/Z(+20°C)	6	6	8	8	
Endurance	The following specifications shall be satisfied when the capacitors are restored to 20°C after subjected to DC voltage with the rated ripple current is applied for 6,000 hours at 105°C.					
	Capacitance change	≅ ±20% of the initial value				
	Dissipation factor(tanδ)	≅ 200% of the specified value				
Shelf Life	The following requirements shall be satisfied when the capacitor are restored to 20°C after the rated voltage applied for 1,000 hours at 105°C without voltage applied.					
	Capacitance change	≅ ±20% of the initial value				
	Dissipation factor(tanδ)	≅ 200% of the specified value				
	Leakage current	≅ 200% of the specified value				

## ◆ DIMENSIONS (mm)



ΦD	6.3	8	10	12.5	16	18
Φd	0.5	0.5/0.6	0.6	0.6	0.8	0.8
F	2.5	3.5	5.0	5.0	7.5	7.5
a	L > 9mm +2.0Max L ≤ 9mm +1.0Max					

## ◆ PART NUMBER SYSTEM( Example : 400V 22μF )



## HD Series

◆ Case size & Permissible rated ripple current: (mA rms) at 105°C / 100KHz; Impedance: ( $\Omega$ ) at 20°C / 100KHz

$\mu\text{F}$ \ Vdc	400			420		
	$\Phi\text{D} \times \text{L}$	Z	RC	$\Phi\text{D} \times \text{L}$	Z	RC
1	6.3×9	28.5	70	6.3×9	28.3	73
2.2	6.3×9	15.8	90	6.3×9	15.5	88
3.3	6.3×11	10.3	105	6.3×9	10.0	103
4.7	8×10	8.40	130	8×10	8.20	128
6.8	8×12	6.10	175	8×12	7.30	173
8.2	8×12	5.40	195	8×13	5.20	193
10	8×13	4.20	235	8×15	4.00	233
12	10×13	3.80	265	10×13	3.50	263
15	10×13	3.20	300	10×14	3.10	298
18	10×15	3.10	300	10×15	3.00	298
22	10×16	3.00	350	10×18	2.95	408
33	12.5×20	1.78	650	12.5×20	1.75	648
47	12.5×25	1.26	930	12.5×25	1.23	928
68	16×25	1.08	1200	16×25	1.05	1198
82	18×25	0.90	1330	18×25	0.90	1328
100	18×25	0.90	1350	18×26	0.90	1346

$\mu\text{F}$ \ Vdc	450			500		
	$\Phi\text{D} \times \text{L}$	Z	RC	$\Phi\text{D} \times \text{L}$	Z	RC
1	6.3×9	43.3	75	6.3×9	52.00	50
2.2	6.3×9	24.0	90	6.3×12	28.80	70
3.3	6.3×12	15.7	120	6.3×12	18.80	75
4.7	8×10	12.8	140	8×12	15.30	90
6.8	8×13	9.25	175	10×13	11.13	120
8.2	8×15	8.21	210	10×13	9.85	150
10	10×12	6.38	235	10×14	7.66	215
12	10×13	6.08	260	10×15	7.30	230
15	10×15	5.78	310	10×17	6.78	250
18	10×16	5.48	340	12.5×16	5.65	330
22	12.5×16	4.56	400	12.5×20	5.47	410
33	12.5×20	2.71	630	12.5×25	3.25	500
47	16×20	1.91	915	16×25	2.30	690
68	16×25	1.64	1190	18×25	1.97	935
82	18×25	1.37	1235			

### ◆ RIPPLE CURRENT MULTIPLIERS

Frequency Multipliers

Cap( $\mu\text{F}$ )	Frequency (Hz)				
	50	120	1K	10K	100K
1 ~ 8.2	0.26	0.40	0.70	0.90	1.00
10 ~ 82	0.41	0.55	0.83	0.94	1.00
$\geq 100$	0.54	0.67	0.87	0.96	1.00