

## TLS Series

• 105°C 3,000Hrs assured.

- Non-solvent proof.
- Downsized.
- High Ripple Capability.
- For SMPS, Inverter.
- RoHS compliant.
- Halogen-free capacitors are also available.
- AEC-Q200 compliant : Please contact us for more details, test data, information.



## SPECIFICATIONS

Item	Characteristics						
Rated Voltage Range	160 ~ 550 V <sub>DC</sub>						
Operating Temperature Range	-25 ~ +105°C						
Capacitance Tolerance	±20%(M) (at 20°C, 120Hz)						
Leakage Current	I = 0.02CV or 3mA, whichever is smaller. Where, I: Leakage Current(µA), C: Nominal capacitance(µF), V: Rated voltage(V <sub>DC</sub> ) (at 20°C, 5minutes)						
※ Dissipation Factor(Tanδ)	<table border="1"> <tr> <td>Rated voltage(V<sub>DC</sub>)</td> <td>160~400</td> <td>450~550</td> </tr> <tr> <td>Tanδ(Max.)</td> <td>0.15</td> <td>0.20</td> </tr> </table> (at 20°C, 120Hz)	Rated voltage(V <sub>DC</sub> )	160~400	450~550	Tanδ(Max.)	0.15	0.20
Rated voltage(V <sub>DC</sub> )	160~400	450~550					
Tanδ(Max.)	0.15	0.20					
Temperature Characteristics (Max. Impedance ratio)	<table border="1"> <tr> <td>Rated voltage(V<sub>DC</sub>)</td> <td>160~400</td> <td>450~550</td> </tr> <tr> <td>Z(-25°C)/Z(20°C)</td> <td>4</td> <td>8</td> </tr> </table> (at 120Hz)	Rated voltage(V <sub>DC</sub> )	160~400	450~550	Z(-25°C)/Z(20°C)	4	8
Rated voltage(V <sub>DC</sub> )	160~400	450~550					
Z(-25°C)/Z(20°C)	4	8					
Load Life	The following specifications shall be satisfied when the capacitors are restored to 20°C after the rated voltage is applied for 3,000 hours at 105°C. Capacitance change ≤ ±20% of the initial value Tanδ ≤ 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 the exposing them at 105°C for 1,000 hours without voltage applied. The rated voltage shall be applied to the capacitors for a minimum of 30 minutes, at least 24 hours and not more than 48 hours before the measurements. Capacitance change ≤ ±20% of the initial value Tanδ ≤ 200% of the initial specified value Leakage current ≤ The initial specified value						
Others	Satisfied characteristics KS C IEC 60384-4						

※ For capacitors with CV products >100,000 higher Tanδ value may apply.  
 When the capacitance exceeds 1,000µF, 0.01 shall be added every 1,000µF increase.

## RATED RIPPLE CURRENT

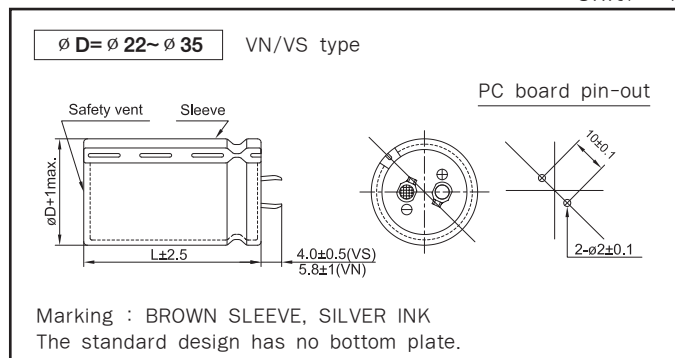
When capacitor are operated in any other condition at 120Hz, the maximum ripple current must be multiplied by the figure shown in the table.

Frequency multiplying factor

V <sub>DC</sub> \ Freq.(Hz)	60	120	300	1k	10k~
160~250V <sub>DC</sub>	0.81	1.00	1.17	1.32	1.45
315~550V <sub>DC</sub>	0.77	1.00	1.16	1.30	1.41

## DIMENSIONS OF TLS Series

Unit(mm)



RATINGS OF TLS Series

μF	Vdc ∅D	160				200				250			
		22	25.4	30	35	22	25.4	30	35	22	25.4	30	35
270										22 × 25 1.11			
330					22 × 25 1.23					22 × 30 1.29			
390					22 × 30 1.40					22 × 35 1.44	25.4 × 25 1.40		
470	22 × 25 1.47				22 × 30 1.54					22 × 40 1.61	25.4 × 30 1.57		
560	22 × 30 1.68				22 × 35 1.72	25.4 × 25 1.67				22 × 45 1.79	25.4 × 35 1.79	30 × 25 1.87	
680	22 × 35 1.86	25.4 × 25 1.84			22 × 40 1.94	25.4 × 30 1.89	30 × 25 2.05			22 × 50 2.02	25.4 × 40 2.02	30 × 30 2.08	35 × 25 2.19
820	22 × 40 2.12	25.4 × 30 2.08			22 × 45 2.17	25.4 × 35 2.17	30 × 30 2.28				25.4 × 45 2.26	30 × 35 2.34	35 × 30 2.44
1,000	22 × 45 2.40	25.4 × 35 2.40	30 × 25 2.50			25.4 × 40 2.45	30 × 30 2.52	35 × 25 2.66			25.4 × 50 2.53	30 × 40 2.66	35 × 30 2.70
1,200	22 × 50 2.69	25.4 × 40 2.68	30 × 30 2.77	35 × 25 2.91		25.4 × 45 2.78	30 × 35 2.83	35 × 30 2.96				30 × 45 2.99	35 × 35 3.00
1,500		25.4 × 45 3.05	30 × 35 3.17	35 × 30 3.30			30 × 40 3.26	35 × 35 3.36					35 × 40 3.48
1,800		25.4 × 50 3.40	30 × 40 3.57	35 × 30 3.62			30 × 50 3.72	35 × 40 3.81					35 × 50 3.98
2,200			30 × 45 4.05	35 × 35 4.07				35 × 45 4.32					
2,700			30 × 50 4.56	35 × 40 4.67				35 × 50 4.88					
3,300				35 × 50 5.40									

μF	Vdc ∅D	315				400				450			
		22	25.4	30	35	22	25.4	30	35	22	25.4	30	35
100										22 × 25 0.70			
120					22 × 25 0.77					22 × 30 0.81			
150					22 × 30 0.90					22 × 35 0.92	25.4 × 25 0.90		
180	22 × 25 0.95				22 × 35 1.02	25.4 × 25 0.99				22 × 40 1.02	25.4 × 35 1.05	30 × 25 1.06	
220	22 × 30 1.10				22 × 40 1.15	25.4 × 30 1.13				22 × 45 1.17	25.4 × 35 1.16	30 × 30 1.18	
270	22 × 35 1.24	25.4 × 25 1.21			22 × 45 1.29	25.4 × 35 1.30	30 × 25 1.29				25.4 × 40 1.32	30 × 30 1.30	35 × 25 1.37
330	22 × 40 1.40	25.4 × 30 1.38	30 × 25 1.43		22 × 50 1.47	25.4 × 40 1.47	30 × 30 1.45				25.4 × 45 1.48	30 × 35 1.51	35 × 30 1.54
390	22 × 45 1.56	25.4 × 35 1.57	30 × 30 1.57			25.4 × 45 1.63	30 × 35 1.61	35 × 25 1.65			25.4 × 50 1.65	30 × 40 1.65	35 × 30 1.67
470	22 × 50 1.70	25.4 × 40 1.76	30 × 30 1.73	35 × 25 1.82		25.4 × 50 1.82	30 × 40 1.82	35 × 30 1.85				30 × 45 1.86	35 × 35 1.87
560		25.4 × 45 1.96	30 × 35 1.93	35 × 30 2.02			30 × 45 2.04	35 × 35 2.05					35 × 40 2.05
680			30 × 40 2.19	35 × 30 2.20			30 × 50 2.30	35 × 40 2.34					35 × 50 2.44
820			30 × 45 2.47	35 × 35 2.48				35 × 45 2.63					
1,000				35 × 40 2.83				35 × 50 2.96					
1,200				35 × 45 3.18									

← Case Size ∅D × L (mm)  
 ← Rated Ripple Current (Arms/105°C, 120Hz)

## RATINGS OF TLS Series

$\mu\text{F}$ $\backslash$ $\text{V}_{\text{DC}}$ $\phi$ D	500				550		
	22	25.4	30	35	25.4	30	35
56	22 × 35 0.41						
68	22 × 40 0.48	25.4 × 30 0.46					
82	22 × 45 0.56	25.4 × 35 0.54			25.4 × 40 0.52		
100	22 × 50 0.64	25.4 × 40 0.63	30 × 30 0.61		25.4 × 50 0.60	30 × 35 0.55	
120		25.4 × 45 0.73	30 × 35 0.72		25.4 × 50 0.72	30 × 40 0.70	
150		25.4 × 50 0.78	30 × 40 0.85	35 × 30 0.83		30 × 45 0.80	35 × 35 0.75
180			30 × 45 0.98	35 × 35 0.96		30 × 50 0.90	35 × 40 0.93
220			30 × 50 1.03	35 × 40 1.13		30 × 60 0.95	35 × 50 0.95
270			30 × 60 1.24	35 × 45 1.31		30 × 70 1.00	35 × 55 1.05
330				35 × 50 1.38			35 × 60 1.15
390	Case Size $\phi$ D × L (mm) →			35 × 60			35 × 70
	Rated Ripple Current (Arms/105°C, 120Hz) →			1.63			1.50