

TUP/TSP Series

Key Features

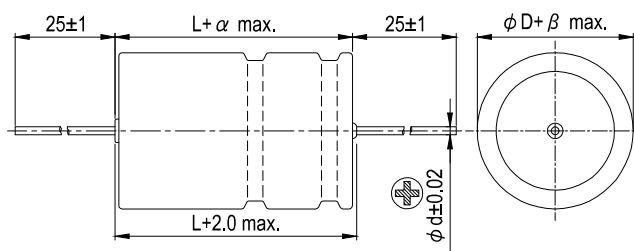
- High vibration resistance
- High ripple current capability
- Low ESR
- Useful Life 2,000 hours at 150°C
- Shelf life up to 15 years at a storage temperature of 30°C
- RoHS compliance

Specifications

Rated Voltage V_R	25 ~ 63 V _{DC}	
Surge Voltage V_S	1.15 · V_R	
Rated Capacitance C_R	360 ~ 4,500 μ F	at 100 Hz, 20°C
Capacitance Tolerance	-10% ~ +30%	
Leakage Current I_{leak} (at 20°C)	$I_{leak} \leq 0.006\mu A \cdot CV + 4\mu A$ C = Rated capacitance in μ F, V = Rated DC working voltage in V After 5 minutes	
Useful Life 125°C: $V_R, I_{AC, R}$ 150°C: $V_R, 0.5 \cdot I_{AC, R}$	10,000 Hrs 2,000 Hrs	Requirements: Cap.: Within \pm 30% of initial value ESR: Within 300% of specified value I_{leak} : Within initial specified limit
Voltage Endurance Test 125°C: V_R	4,000 Hrs for $V_R \leq 40V$ DC 3,000 Hrs for $V_R = 63V$ DC	Requirements: Cap.: Within \pm 10% of initial value ESR: Within 130% of specified value I_{leak} : Within initial specified limit
Vibration Resistance	The wires of the Axial-Lead capacitor should be mounted at a distance of (6 \pm 1) mm from its body, which is additionally clamped. Soldering star capacitors should be mounted in a upright position and its terminals should be firmly soldered to the PCB and body additionally clamped. Vibration test according to IEC 60068-2-6, test Fc: Frequency range 10 Hz ~ 2 KHz, max. displacement amplitude 1.5 mm, max. acceleration 20 g, in total 6 hours(3*2 hours).	
Detail Specification Sectional Specification	Similar to CECC 30301-802 IEC 60384-4	

Product Dimensions

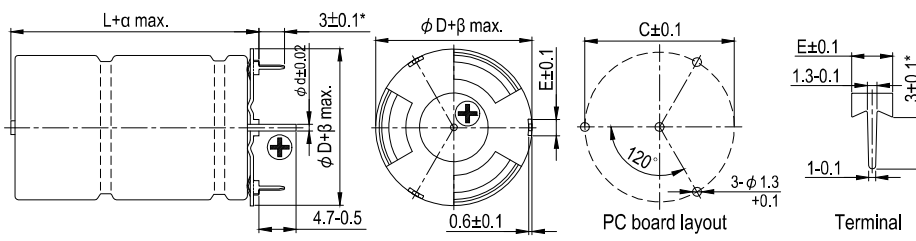
TUP Series



Unit: mm

ϕD	16	18	21
ϕd	1.0		
α	0.5		
β	0.5		

TSP Series



Unit: mm

ϕD	16	18	21
C	16.5	18.5	21.5
E	3.1		3.6
ϕd	1.0		
α	2.5		
β	1.2		



Characteristics and Permissible Ripple Current

Working Voltage (V _{DC})	Capacitance 100 Hz, 20°C (μF)	φ D×L (mm)	ESR _{max} 100 Hz, 20°C (Ω)	ESR _{max} 10k Hz, 20°C (Ω)	Imp. _{max} 100k Hz, 20°C (Ω)	I _{AC, R} 10k Hz, 125°C (A _{rms})	I _{AC, max} 10k Hz, 150°C (A _{rms})	Axial-lead Part Number	Soldering star Part Number
25	1,000	16 × 25	0.098	0.053	0.050	3.6	1.8	TUP102Q1EAL-1625	TSP102Q1ESS-1625
	1,200	18 × 25	0.080	0.043	0.041	4.4	2.2	TUP122Q1EAL-1825	TSP122Q1ESS-1825
	1,300	16 × 30	0.075	0.041	0.039	4.5	2.2	TUP132Q1EAL-1630	TSP132Q1ESS-1630
	1,500	16 × 35	0.065	0.035	0.034	5.2	2.6	TUP152Q1EAL-1635	TSP152Q1ESS-1635
	1,700	18 × 30	0.057	0.031	0.029	5.5	2.7	TUP172Q1EAL-1830	TSP172Q1ESS-1830
	1,800	16 × 39	0.055	0.030	0.028	5.9	2.9	TUP182Q1EAL-1639	TSP182Q1ESS-1639
	2,200	18 × 39	0.044	0.024	0.023	7.2	3.6	TUP222Q1EAL-1839	TSP222Q1ESS-1839
	3,300	21 × 39	0.031	0.017	0.016	8.3	4.1	TUP332Q1EAL-2139	TSP332Q1ESS-2139
4,500	21 × 49	0.023	0.013	0.012	10.4	5.2	TUP452Q1EAL-2149	TSP452Q1ESS-2149	
40	560	16 × 25	0.129	0.053	0.050	3.6	1.8	TUP561Q1GAL-1625	TSP561Q1GSS-1625
	680	18 × 25	0.105	0.043	0.041	4.4	2.2	TUP681Q1GAL-1825	TSP681Q1GSS-1825
	720	16 × 30	0.100	0.042	0.039	4.5	2.2	TUP721Q1GAL-1630	TSP721Q1GSS-1630
	820	16 × 35	0.088	0.036	0.034	5.2	2.6	TUP821Q1GAL-1635	TSP821Q1GSS-1635
	900	18 × 30	0.080	0.033	0.031	5.4	2.7	TUP901Q1GAL-1830	TSP901Q1GSS-1830
	1,000	16 × 39	0.073	0.030	0.029	5.9	2.9	TUP102Q1GAL-1639	TSP102Q1GSS-1639
	1,400	18 × 39	0.052	0.022	0.020	7.4	3.7	TUP142Q1GAL-1839	TSP142Q1GSS-1839
	2,000	21 × 39	0.038	0.016	0.016	8.4	4.2	TUP202Q1GAL-2139	TSP202Q1GSS-2139
	2,700	21 × 49	0.028	0.012	0.012	10.5	5.2	TUP272Q1GAL-2149	TSP272Q1GSS-2149
63	360	16 × 25	0.173	0.058	0.055	2.6	1.3	TUP361Q1JAL-1625	TSP361Q1JSS-1625
	470	18 × 25	0.132	0.043	0.041	3.3	1.6	TUP471Q1JAL-1825	TSP471Q1JSS-1825
	510	16 × 30	0.124	0.042	0.040	3.4	1.7	TUP511Q1JAL-1630	TSP511Q1JSS-1630
	620	16 × 35	0.102	0.034	0.033	4.0	2.0	TUP621Q1JAL-1635	TSP621Q1JSS-1635
	620	18 × 30	0.100	0.033	0.032	4.1	2.0	TUP621Q1JAL-1830	TSP621Q1JSS-1830
	750	16 × 39	0.084	0.029	0.027	4.5	2.2	TUP751Q1JAL-1639	TSP751Q1JSS-1639
	820	18 × 35	0.076	0.026	0.024	5.0	2.5	TUP821Q1JAL-1835	TSP821Q1JSS-1835
	910	18 × 39	0.069	0.023	0.022	5.5	2.7	TUP911Q1JAL-1839	TSP911Q1JSS-1839
	910	21 × 30	0.071	0.025	0.024	4.8	2.4	TUP911Q1JAL-2130	TSP911Q1JSS-2130
	1,100	21 × 35	0.058	0.021	0.020	5.6	2.8	TUP112Q1JAL-2135	TSP112Q1JSS-2135
	1,300	21 × 39	0.050	0.018	0.017	6.4	3.2	TUP132Q1JAL-2139	TSP132Q1JSS-2139
	1,800	21 × 49	0.036	0.013	0.013	8.0	4.0	TUP182Q1JAL-2149	TSP182Q1JSS-2149

Part Numbering System

TUP series 1,000 μF -10% ~ +30% 40V Axial-lead 16 φ × 39L Pb-free Terminal

TUP **102** **Q** **1G** **AL** = **1639**

Series name Capacitance Capacitance tolerance Rated voltage Lead forming Sealing type Case size Lead wire and marking type

Note: Please refer to "Part Numbering System" section on page 1 for more details.