

## Aluminum Electrolytic Capacitors

## TUK/TSK

### TUK/TSK Series

#### Key Features

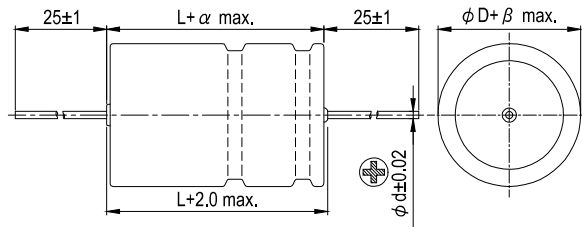
- High vibration resistance
- High ripple current capability
- Low ESR
- Useful life 5,000 hours at 125°C
- Shelf life up to 15 years at a storage temperature of 30°C
- RoHS compliance
- AEC-Q200 Parts Available: Replace "S" Suffix with "KS" or "LS" Suffix

#### Specifications

Rated Voltage $V_R$	25 ~ 100 V <sub>DC</sub>	
Surge Voltage $V_S$	1.15 · $V_R$	
Rated Capacitance $C_R$	220 ~ 10,000 $\mu$ 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 $\mu$ F, V = Rated DC working voltage in V	
Useful Life 125°C: $V_R, I_{AC,R}$ 140°C: $V_R, 0.6 \cdot I_{AC,R}$	5,000 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: $V_R$	2,000 Hrs	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

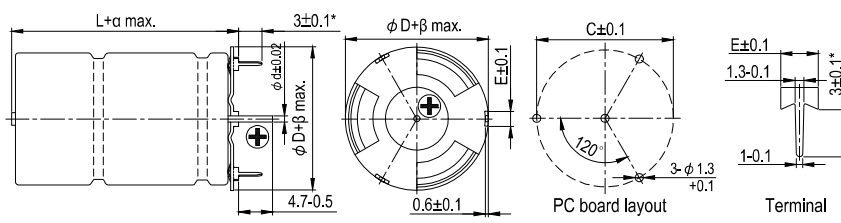
##### TUK Series



Unit: mm

	16	18	21
$\phi D$	16	18	21
$\phi d$	1.0		
$\alpha$	0.5		
$\beta$	0.5		

##### TSK Series



Unit: mm

	16	18	21
$\phi D$	16	18	21
C	16.5	18.5	21.5
E	3.1		3.6
$\phi d$	1.0		
$\alpha$	2.5		
$\beta$	1.2		



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### Characteristics and Permissible Ripple Current

Working Voltage (V <sub>DC</sub> )	Capacitance 100 Hz, 20°C (μF)	φ D×L (mm)	ESR <sub>max</sub> 100 Hz, 20°C (Ω)	ESR <sub>max</sub> 10k Hz, 20°C (Ω)	Imp. <sub>max</sub> 100k Hz, 20°C (Ω)	I <sub>AC,R</sub> 10k Hz, 125°C (A <sub>rms</sub> )	I <sub>AC,R</sub> 10k Hz, 140°C (A <sub>rms</sub> )	Axial-lead Part Number	Soldering star Part Number
<b>25</b>	2,400	18 × 25	0.078	0.055	0.054	3.6	2.2	TUK242Q1EAL-1825S	TSK242Q1ESS-1825S
	2,500	16 × 30	0.084	0.061	0.059	3.2	1.9	TUK252Q1EAL-1630S	TSK252Q1ESS-1630S
	3,300	18 × 30	0.058	0.041	0.040	4.5	2.7	TUK332Q1EAL-1830S	TSK332Q1ESS-1830S
	3,600	16 × 39	0.059	0.043	0.042	4.3	2.6	TUK362Q1EAL-1639S	TSK362Q1ESS-1639S
	4,700	18 × 39	0.041	0.029	0.029	6.0	3.6	TUK472Q1EAL-1839S	TSK472Q1ESS-1839S
	7,200	21 × 39	0.030	0.022	0.022	6.8	4.1	TUK722Q1EAL-2139S	TSK722Q1ESS-2139S
	10,000	21 × 49	0.023	0.017	0.016	8.6	5.2	TUK103Q1EAL-2149S	TSK103Q1ESS-2149S
<b>40</b>	1,400	16 × 30	0.096	0.060	0.058	3.2	1.9	TUK142Q1GAL-1630S	TSK142Q1GSS-1630S
	1,800	16 × 35	0.076	0.048	0.046	3.8	2.3	TUK182Q1GAL-1635S	TSK182Q1GSS-1635S
	1,800	18 × 30	0.068	0.041	0.040	4.5	2.7	TUK182Q1GAL-1830S	TSK182Q1GSS-1830S
	2,000	16 × 39	0.068	0.043	0.041	4.3	2.6	TUK202Q1GAL-1639S	TSK202Q1GSS-1639S
	2,600	18 × 39	0.048	0.029	0.028	6.0	3.6	TUK262Q1GAL-1839S	TSK262Q1GSS-1839S
	3,900	21 × 39	0.035	0.022	0.022	6.8	4.1	TUK392Q1GAL-2139S	TSK392Q1GSS-2139S
	5,100	21 × 49	0.027	0.017	0.017	8.6	5.2	TUK512Q1GAL-2149S	TSK512Q1GSS-2149S
<b>63</b>	620	16 × 25	0.158	0.088	0.082	2.5	1.5	TUK621Q1JAL-1625S	TSK621Q1JSS-1625S
	750	18 × 25	0.120	0.058	0.056	3.5	2.1	TUK751Q1JAL-1825S	TSK751Q1JSS-1825S
	820	16 × 30	0.120	0.062	0.060	3.1	1.9	TUK821Q1JAL-1630S	TSK821Q1JSS-1630S
	1,000	16 × 35	0.098	0.051	0.049	3.7	2.2	TUK102Q1JAL-1635S	TSK102Q1JSS-1635S
	1,000	18 × 30	0.090	0.044	0.043	4.3	2.6	TUK102Q1JAL-1830S	TSK102Q1JSS-1830S
	1,200	16 × 39	0.082	0.043	0.042	4.2	2.5	TUK122Q1JAL-1639S	TSK122Q1JSS-1639S
	1,300	18 × 35	0.070	0.034	0.033	5.2	3.1	TUK132Q1JAL-1835S	TSK132Q1JSS-1835S
	1,400	21 × 30	0.068	0.034	0.033	4.9	2.9	TUK142Q1JAL-2130S	TSK142Q1JSS-2130S
	1,500	18 × 39	0.061	0.030	0.029	5.9	3.5	TUK152Q1JAL-1839S	TSK152Q1JSS-1839S
	1,800	21 × 35	0.053	0.037	0.026	5.9	3.5	TUK182Q1JAL-2135S	TSK182Q1JSS-2135S
	2,000	21 × 39	0.048	0.024	0.023	6.6	4.0	TUK202Q1JAL-2139S	TSK202Q1JSS-2139S
	2,700	21 × 49	0.036	0.019	0.018	8.4	5.0	TUK272Q1JAL-2149S	TSK272Q1JSS-2149S
<b>75</b>	500	16 × 30	0.180	0.088	0.085	2.6	1.6	TUK501Q1RAL-1630S	TSK501Q1RSS-1630S
	700	18 × 30	0.138	0.071	0.069	2.8	1.7	TUK701Q1RAL-1830S	TSK701Q1RSS-1830S
	750	16 × 39	0.122	0.060	0.058	3.5	2.1	TUK751Q1RAL-1639S	TSK751Q1RSS-1639S
	1,000	18 × 39	0.097	0.050	0.049	3.8	2.3	TUK102Q1RAL-1839S	TSK102Q1RSS-1839S
	1,500	21 × 39	0.062	0.031	0.030	5.6	3.4	TUK152Q1RAL-2139S	TSK152Q1RSS-2139S
	2,000	21 × 49	0.047	0.023	0.023	7.1	4.3	TUK202Q1RAL-2149S	TSK202Q1RSS-2149S
<b>100</b>	220	16 × 30	0.350	0.160	0.157	2.0	1.2	TUK221Q2AAL-1630S	TSK221Q2ASS-1630S
	470	18 × 39	0.170	0.075	0.073	3.7	2.2	TUK471Q2AAL-1839S	TSK471Q2ASS-1839S
	680	21 × 39	0.120	0.058	0.056	4.6	2.8	TUK681Q2AAL-2139S	TSK681Q2ASS-2139S
	1,000	21 × 49	0.085	0.044	0.043	6.1	3.7	TUK102Q2AAL-2149S	TSK102Q2ASS-2149S

### Part Numbering System

TUK series 1,400 μF -10% ~ +30% 40V Axial-lead 16 φ × 30L

**TUK**    **142**    **Q**    **1G**    **AL**    **:**    **1630**    **S**  
 Series name    Capacitance    Capacitance tolerance    Rated voltage    Lead forming    Sealing type    Case size    Regional Code

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

## Product Guide

### Selection Chart

<b>TUR / TSR</b> -40 ~ +125°C High Ripple Current 125°C, 3,000 Hrs	<b>TUK / TSK</b> -40 ~ +125°C Long Life Time 125°C, 5,000 Hrs 140°C, 2,000 Hrs	<b>TUP / TSP</b> -40 ~ +150°C High Temperature 125°C, 10,000 Hrs 150°C, 2,000 Hrs
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### Capacitor Series Table

Series	Highlights	Temperature	Rated Voltage Range (V, DC)	Capacitance Range (µF)	Page
TUR / TSR	High Ripple Current	-40 ~ 125°C	25 ~ 40	1,400 ~ 10,000	3 ~ 4
TUK / TSK	High Reliability, Long Lifetime	-40 ~ 125°C	25 ~ 100	220 ~ 10,000	5 ~ 6
TUP / TSP	High Temperature	-40 ~ 150°C	25 ~ 63	360 ~ 4,500	7 ~ 8

### Part Numbering System

#### Product Code Guide

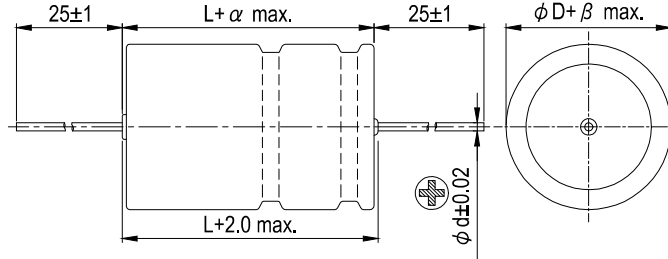
Digit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Example:	T	U	R	1	7	2	Q	1	E	A	L	-	1	8	3	0		

Digit	Description																										
1 ~ 3	Series Name When the series name is represented by only two letters, a hyphen, "-", is used to fill the third space.																										
4 ~ 6	Capacitance <table border="1" style="width: 100%;"> <tr> <td>Capacitance</td> <td>220</td><td>300</td><td>700</td><td>1,000</td><td>4,700</td><td>5,600</td><td>10,000</td> </tr> <tr> <td>Code</td> <td>221</td><td>301</td><td>701</td><td>102</td><td>472</td><td>562</td><td>103</td> </tr> </table>	Capacitance	220	300	700	1,000	4,700	5,600	10,000	Code	221	301	701	102	472	562	103										
Capacitance	220	300	700	1,000	4,700	5,600	10,000																				
Code	221	301	701	102	472	562	103																				
7	Capacitance Tolerance <table border="1" style="width: 100%;"> <tr> <td>Tolerance</td> <td>K</td><td>M</td><td>N</td><td>Q</td> </tr> <tr> <td>Code</td> <td>±10%</td><td>±20%</td><td>±30%</td><td>-10 ~ +30%</td> </tr> </table>	Tolerance	K	M	N	Q	Code	±10%	±20%	±30%	-10 ~ +30%																
Tolerance	K	M	N	Q																							
Code	±10%	±20%	±30%	-10 ~ +30%																							
8 ~ 9	Rated Voltage <table border="1" style="width: 100%;"> <tr> <td>Voltage (WV)</td> <td>25</td><td>35</td><td>40</td><td>50</td><td>63</td><td>75</td><td>100</td> </tr> <tr> <td>Code</td> <td>1E</td><td>1V</td><td>1G</td><td>1H</td><td>1J</td><td>1R</td><td>2A</td> </tr> </table>	Voltage (WV)	25	35	40	50	63	75	100	Code	1E	1V	1G	1H	1J	1R	2A										
Voltage (WV)	25	35	40	50	63	75	100																				
Code	1E	1V	1G	1H	1J	1R	2A																				
10 ~ 11	Lead Forming <table border="1" style="width: 100%;"> <tr> <td>AL</td> <td>SS</td> <td>PP</td> </tr> <tr> <td>Axial-lead,</td> <td>Soldering star</td> <td>Two plate</td> </tr> </table>	AL	SS	PP	Axial-lead,	Soldering star	Two plate																				
AL	SS	PP																									
Axial-lead,	Soldering star	Two plate																									
12	Sealing Type - : Standard																										
13 ~ 16	Case Size <table border="1" style="width: 100%;"> <tr> <td>φ D×L</td> <td>16×25</td><td>16×30</td><td>16×35</td><td>16×39</td><td>18×25</td><td>18×30</td><td>18×35</td><td>18×39</td><td>21×30</td><td>21×35</td><td>21×39</td><td>21×49</td> </tr> <tr> <td>Code</td> <td>1625</td><td>1630</td><td>1635</td><td>1639</td><td>1825</td><td>1830</td><td>1835</td><td>1839</td><td>2130</td><td>2135</td><td>2139</td><td>2149</td> </tr> </table>	φ D×L	16×25	16×30	16×35	16×39	18×25	18×30	18×35	18×39	21×30	21×35	21×39	21×49	Code	1625	1630	1635	1639	1825	1830	1835	1839	2130	2135	2139	2149
φ D×L	16×25	16×30	16×35	16×39	18×25	18×30	18×35	18×39	21×30	21×35	21×39	21×49															
Code	1625	1630	1635	1639	1825	1830	1835	1839	2130	2135	2139	2149															
17	Lead Wire and Marking Type																										
18	Supplement Code: For special control purposes																										

## Product Guide

### Dimensional and Lead Forming Drawings

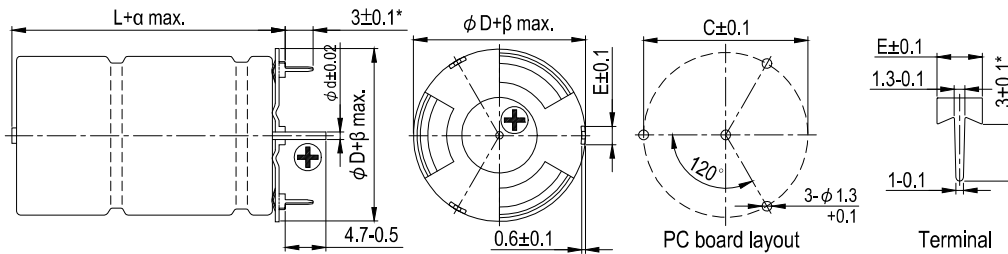
Axial-lead capacitors



Dimensions and packing units

$\phi D \times L$ mm	$\phi D + \beta$ (max.) $\times L + \alpha$ (max.) mm	$\phi d$ mm	Q'ty / Tray pcs	Q'ty / Box pcs
16 × 25	16.5 × 25.5	1.0	45	315
16 × 30	16.5 × 30.5	1.0	45	315
16 × 35	16.5 × 35.5	1.0	45	315
16 × 39	16.5 × 39.5	1.0	45	315
18 × 25	18.5 × 25.5	1.0	45	315
18 × 30	18.5 × 30.5	1.0	45	315
18 × 35	18.5 × 35.5	1.0	45	315
18 × 39	18.5 × 39.5	1.0	45	315
21 × 30	21.5 × 30.5	1.0	45	270
21 × 35	21.5 × 35.5	1.0	45	270
21 × 39	21.5 × 39.5	1.0	45	270
21 × 49	21.5 × 49.5	1.0	35	210

Soldering star capacitors



Dimensions and packing units

$\phi D \times L$ mm	$\phi D + \beta$ (max.) $\times L + \alpha$ (max.) mm	$\phi d$ mm	$C \pm 0.1$ mm	$E \pm 0.1$ mm	Q'ty / Tray pcs	Q'ty / Box pcs
16 × 25	17.2 × 27.5	1.0	16.5	3.1	45	315
16 × 30	17.2 × 32.5	1.0	16.5	3.1	45	315
16 × 35	17.2 × 37.5	1.0	16.5	3.1	45	315
16 × 39	17.2 × 41.5	1.0	16.5	3.1	35	245
18 × 25	19.2 × 27.5	1.0	18.5	3.1	45	315
18 × 30	19.2 × 32.5	1.0	18.5	3.1	45	315
18 × 35	19.2 × 37.5	1.0	18.5	3.1	45	315
18 × 39	19.2 × 41.5	1.0	18.5	3.1	35	245
21 × 30	22.2 × 32.5	1.0	21.5	3.6	45	270
21 × 35	22.2 × 37.5	1.0	21.5	3.6	45	270
21 × 39	22.2 × 41.5	1.0	21.5	3.6	35	210
21 × 49	22.2 × 51.5	1.0	21.5	3.6	35	210