

### Surface Mount Type

Series: **TK** Type: **V**



#### ■ Features

- Endurance : 125 °C 3000 h
- Low ESR at -40 °C (50 % lower than TG series)
- Added ESR specification after the endurance test
- Vibration-proof product is available upon request.
- AEC-Q200 qualified\*
- RoHS directive compliant

#### ■ Specifications

Category Temp. Range	-40 °C to +125 °C					
Rated W.V. Range	10 V.DC to 35 V.DC					
Nominal Cap. Range	47 μF to 470 μF					
Capacitance Tolerance	±20 % (120 Hz/+20 °C)					
DC Leakage Current	I ≤ 0.01 CV After 2 minutes					
tan δ	Please see the attached standard products list					
Characteristics at Low Temperature	W.V. (V)	10	16	25	35	(Impedance ratio at 120 Hz)
	Z(-25 °C)/Z(+20 °C)	3	2	2	2	
	Z(-40 °C)/Z(+20 °C)	4	3	3	3	
Endurance	After the life test with DC rated working voltage at +125 °C ±2 °C for 3000 hours, the capacitors shall meet the limits specified below.					
	Capacitance change	±30 % of initially measured values (code U : ±35 %)				
	tan δ	≤ 300 % of initially specified values (code U : ±350 %)				
	DC leakage current	≤ initially specified values				
Shelf Life	After storage for 1000 hours at +125 °C ±2 °C with no voltage applied and then being stabilized at +20 °C, capacitors shall meet the limits specified in Endurance. (With voltage treatment)					
ESR after the Life test	After the life test with DC rated working voltage at +125 °C ±2 °C for 3000 hours, ESR value shall meet the specified below.					
	After 1000 hours	20 °C	≤ 150 % of the initially measured specified value.			
		-40 °C	≤ 200 % of the initially measured specified value.			
	After 2000 hours	20 °C	≤ 300 % of the initially measured specified value.			
		-40 °C	≤ 400 % of the initially measured specified value.			
	After 3000 hours	20 °C	≤ 1000 % of the initially measured specified value.			
-40 °C		≤ 1500 % of the initially measured specified value.				

#### ■ Frequency correction factor for ripple current

Correction factor	Frequency (Hz)			
	120	1 k	10 k	100 k to
	0.65	0.85	0.95	1.00

#### ■ Marking

Example: 10 V 220 μF (polarized)  
Marking color: BLACK

Rated Voltage Mark

A	10 V
C	16 V
E	25 V
V	35 V

#### ■ Dimensions in mm (not to scale)

(Unit : mm)

Pressure Relief (φ10 and larger)

( ) Reference size

Size code	D	L	A, B	H	I	W	P	K
F	8.0	10.2±0.3	8.3	10.0 max.	3.4	0.90±0.2	3.1	0.70±0.2
G	10.0	10.2±0.3	10.3	12.0 max.	3.5	0.90±0.2	4.6	0.70±0.2

\* This product qualify for AEC-Q200, but it has some deviations.

Design and specifications are each subject to change without notice. Ask factory for the current technical specifications before purchase and/or use. Should a safety concern arise regarding this product, please be sure to contact us immediately.

■ Standard Products

Endurance : 125 °C 3000 h

W.V.	Cap. (±20 %)	Case size			Specification				Part No. (RoHS:compliant)	Reflow	Min. Packaging Q'ty
		Dia.	Length	*Size Code	Ripple Current (100 kHz) (+125 °C)	ESR (100 kHz)		tan δ (120 Hz) (+20 °C)			Taping
						(mm)	(mm)				
(V)	(μF)	(mm)	(mm)			+20 °C	-40 °C				
10	220	8	10.2	F	197	0.3	5	0.30	EEETK1A221P	(8)	500
	330	8	10.2	(F)	197	0.3	5	0.30	EEETK1A331UP	(8)	500
		10	10.2	G	270	0.2	3	0.30	EEETK1A331P	(8)	500
	470	10	10.2	(G)	270	0.2	3	0.30	EEETK1A471UP	(8)	500
16	100	8	10.2	F	197	0.3	5	0.23	EEETK1C101P	(8)	500
	220	8	10.2	(F)	197	0.3	5	0.23	EEETK1C221UP	(8)	500
		10	10.2	G	270	0.2	3	0.23	EEETK1C221P	(8)	500
	330	10	10.2	(G)	270	0.2	3	0.23	EEETK1C331UP	(8)	500
25	100	8	10.2	F	197	0.3	5	0.18	EEETK1E101P	(8)	500
	220	8	10.2	(F)	197	0.3	5	0.18	EEETK1E221UP	(8)	500
		10	10.2	G	270	0.2	3	0.18	EEETK1E221P	(8)	500
	330	10	10.2	(G)	270	0.2	3	0.18	EEETK1E331UP	(8)	500
35	47	8	10.2	F	197	0.3	5	0.16	EEETK1V470P	(8)	500
	100	8	10.2	(F)	197	0.3	5	0.16	EEETK1V101UP	(8)	500
		10	10.2	G	270	0.2	3	0.16	EEETK1V101P	(8)	500
	220	10	10.2	(G)	270	0.2	3	0.16	EEETK1V221UP	(8)	500

- \* Size code( ) : Miniaturization product
- Please refer to the page of "Reflow Profile" and "The Taping Dimensions".
- When requesting vibration-proof product, please put the last "V" instead to "P"