Surface Mount Type

Series: TK Type : V

Country of Origin

Japan

■ Features
- Life Time: 3000 hours at 125°C
- Low ESR at -40°C(50%lower than TG series)
- Added ESR specification after the test
- RoHS directive compliant

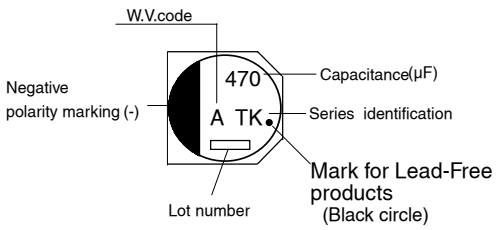
■ Specification

Category Temp.Range	-40 ~ +125°C					
Rated W.V.Range	10 ~ 35 V .DC					
Nominal Cap.Range	47 ~ 470 μ F					
Capacitance Tolerance	±20 % (120Hz/+20°C)					
Leakage Current	I ≦ 0.01 CV or 3(μ A) After 2 minutes application of rated working voltage at +20°C (Whichever is greater)					
tan δ	Please see the attached standard products list					
Characteristics at Low Temperature	W.V. (V)	10	16	25	35	(Impedance ratio at 120Hz)
	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 woking voltage at +125 ±2°C for 3000 hours, the capacitors shall meet the limits specified below. Post-test requirements at +20°C.					
	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±2°C with no voltage applied and then being stabilized at +20°C,capacitors shall meet the limits specified in Endurance.					
ESR after the Life test	After the life test with DC rated working voltage at +125±2°C for 3000 hours, ESR value shall meet the specified below.					
	After 1000 hours	20°C	≦150% of the initially specified value.			
		-40°C	≦200% of the initially specified value.			
	After 2000 hours	20°C	≦300% of the initially specified value.			
		-40°C	≦400% of the initially specified value.			
	After 3000 hours	20°C	≦1000% of the initially specified value.			
		-40°C	≦1500% of the initially specified value.			

■ Marking

Example: 10V470μF(Polarized)

Marking color: BLACK

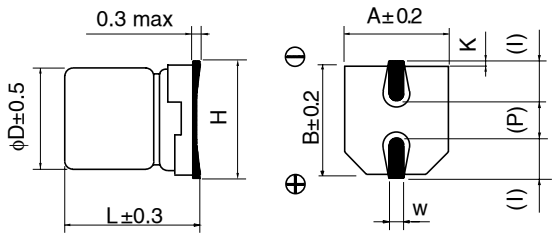


W.V.code

V	10	16	25	35
Code	A	C	E	V

■ Dimensions in mm(not to scale)

( ):reference size



(mm)

Size code	D	L	A,B	H max.	I	W	P	K
F	8.0	10.2	8.3	10.0	3.4	0.90 ±0.2	3.1	0.70 ±0.20
G	10.0	10.2	10.3	12.0	3.5	0.90 ±0.2	4.6	0.70 ±0.20

■ Case size VS Capacitance, ESR and Ripple current

ESR;(Ω/100kHz),
Ripple current (mA r.m.s./100kHz+125°C)

Capacitance (μF) \ W.V (V)	10				16			
	size	ESR 20°C	ESR -40°C	Ripple current	size	ESR 20°C	ESR -40°C	Ripple current
100					F	0.3	5.0	197
220	F	0.3	5.0	197	G (F)	0.2 (0.3)	3.0 (5.0)	270 (197)
330	G (F)	0.2 (0.3)	3.0 (5.0)	270 (197)	(G)	(0.2)	(3.0)	(270)
470	(G)	(0.2)	(3.0)	(270)				

Capacitance (μF) \ W.V (V)	25				35			
	size	ESR 20°C	ESR -40°C	Ripple current	size	ESR 20°C	ESR -40°C	Ripple current
47					F	0.3	5.0	197
100	F	0.3	5.0	197	G (F)	0.2 (0.3)	3.0 (5.0)	270 (197)
220	G (F)	0.2 (0.3)	3.0 (5.0)	270 (197)	(G)	(0.2)	(3.0)	(270)
330	(G)	(0.2)	(3.0)	(270)				

( ):Miniaturization type (suffix:U)

■ Standard Products

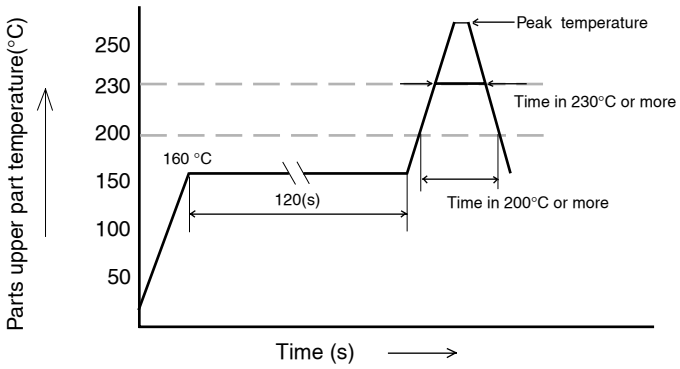
Endurance : 125°C 3000h

W.V. (V)	Cap. (±20%) (μF)	Case size Dia. (mm)	Length (mm)	Size Code	Specification Ripple current (100kHz) (+125°C) (mA)	ESR (100kHz) (+20°C) (Ω)	tan δ (120Hz) (+20°C)	Part No. (RoHS:compliant)	Min. Packaging Q'ty Reflow	Taping (pcs)
10	220	8	10.2	F	197	0.3	0.30	EEETK1A221P	(6)	500
	330	(8)	(10.2)	(F)	(197)	(0.3)	0.30	EEETK1A331UP	(6)	500
		10	10.2	G	270	0.2	0.30	EEETK1A331P	(6)	500
	470	(10)	(10.2)	(G)	(270)	(0.2)	0.30	EEETK1A471UP	(6)	500
16	100	8	10.2	F	197	0.3	0.23	EEETK1C101P	(6)	500
	220	(8)	(10.2)	(F)	(197)	(0.3)	0.23	EEETK1C221UP	(6)	500
		10	10.2	G	270	0.2	0.23	EEETK1C221P	(6)	500
	330	(10)	(10.2)	(G)	(270)	(0.2)	0.23	EEETK1C331UP	(6)	500
25	100	8	10.2	F	197	0.3	0.18	EEETK1E101P	(6)	500
	220	(8)	(10.2)	(F)	(197)	(0.3)	0.18	EEETK1E221UP	(6)	500
		10	10.2	G	270	0.2	0.18	EEETK1E221P	(6)	500
	330	(10)	(10.2)	(G)	(270)	(0.2)	0.18	EEETK1E331UP	(6)	500
35	47	8	10.2	F	197	0.3	0.16	EEETK1V470P	(6)	500
	100	(8)	(10.2)	(F)	(197)	(0.3)	0.16	EEETK1V101UP	(6)	500
		10	10.2	G	270	0.2	0.16	EEETK1V101P	(6)	500
	220	(10)	(10.2)	(G)	(270)	(0.2)	0.16	EEETK1V221UP	(6)	500

The taping dimensions are explained on P.195 of our Catalog.
Please use it as a reference guide.
Reflow Profile(Fig-1 to Fig-6) listed on last page of our Catalog.

■ Reflow guaranteed condition

● RoHS compliant



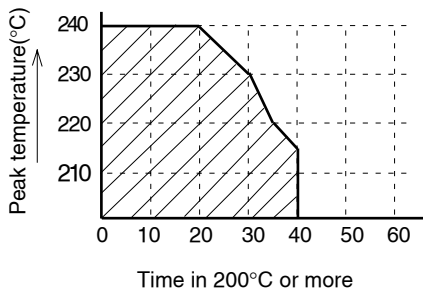
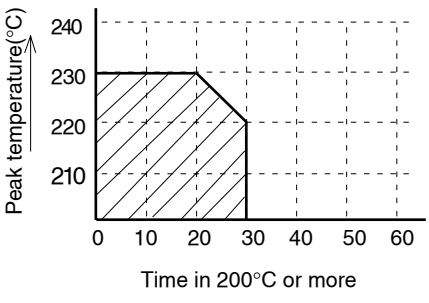
Lead-Free reflow

Reflow No	Fig.(**1**)	Fig.(**2**)	Fig.(**3**)	Fig.(**4**)
Category	φ 3 to φ 6.3	φ 8 to φ 10	φ 12.5 to φ 18	EB series only (φ 10 to φ 18)
Peak temperature	250°C	235°C	230°C (220°C)	230°C
Time in peak temperature	5s	5s	5s (s)	5s
Time in 200°C or more	60s	60s	20s (30s)	20s
Time of reflow	1 time	1 time	1 time	1 time

High temperature Lead-Free reflow

Reflow No	Fig.(**5**)	Fig.(**6**)
Category	φ 4 to φ 6.3	φ 8 to φ 10
Peak temperature	260°C (255°C)	245°C
Time around peak temperature	5s in (10s) in 250°C or more	10s in 240°C or more
Time in 230°C or more	30s	30s
Time in 200°C or more	70s	70s
Time of reflow	2 times	2 times

● RoHS not compliant

Ctegory	Dia. φ3 to φ 6.3 EEV- , ECEV- Part No.	Dia. φ8 to φ 10 EEV- , ECEV- Part No.
Reflow condition	Peak temperature/ Time in 200°C or more  	Peak temperature/ Time in 200°C or more 

❊ For reflow, use athermal condition system such as infrared radiation(IR) or hot blast.
❊ Vapor heat transfer systems(VPS) are not recommended.