

### Surface Mount Type

Series: **Medium-size TK** Type: **V**  
 TK High temperature Lead-Free reflow(suffix:A\*)



#### ■ Features

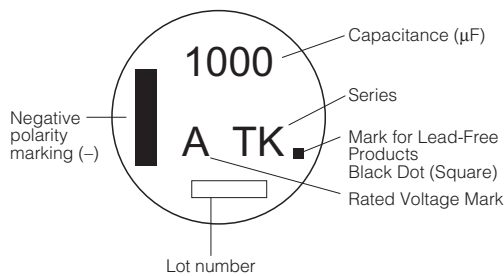
- Endurance: 2000 h at 125 °C
- Vibration-proof product is available upon request.
- RoHS directive compliant

#### ■ Specifications

Category Temp. Range	-40 °C to +125 °C									
Rated W.V. Range	10 V.DC to 100 V.DC									
Nominal Cap. Range	47 μF to 4700 μF									
Capacitance Tolerance	±20 % (120 Hz/+20 °C)									
DC Leakage Current	I ≤ 0.01 CV After 2 minutes									
tan δ	Please see the attached High temperature lead-free reflow products list.									
Characteristics at Low Temperature	W.V. (V)	10	16	25	35	50	63	80	100	(Impedance ratio at 120 Hz)
	Z(-25 °C)/Z(+20 °C)	3	2	2	2	2	2	2	2	
	Z(-40 °C)/Z(+20 °C)	6	4	4	3	3	3	3	3	
Endurance	After applying rated working voltage for 2000 hours at +125 °C±2 °C and then being stabilized at +20 °C, Capacitors shall meet the following limits.									
	Capacitance change	±30 % of initial measured value (Miniaturization product : Within ±35 %)								
	tan δ	≤ 300 % of initial specified value (Miniaturization product : Within 350 %)								
	DC leakage current	≤ initial specified value								
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)									
Resistance to Soldering Heat	After reflow soldering and then being stabilized at +20 °C, capacitors shall meet the following limits.									
	Capacitance change	±10 % of initial measured value								
	tan δ	≤ initial specified value								
	DC leakage current	≤ initial specified value								

#### ■ Marking

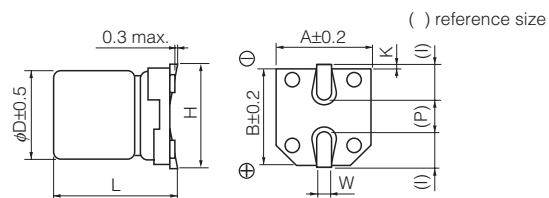
Example: 10 V 1000 μF  
 Marking color: BLACK



##### Rated Voltage Mark

A	10 V
C	16 V
E	25 V
V	35 V
H	50 V
J	63 V
K	80 V
2A	100 V

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



Size code	D	L	A, B	H	I	W	P	K
H13	12.5	13.5±0.5	13.5	15.0 max.	4.7	0.90±0.3	4.4	0.70±0.3
J16	16.0	16.5±0.5	17.0	19.0 max.	5.5	1.20±0.3	6.7	0.70±0.3
K16	18.0	16.5±0.5	19.0	21.0 max.	6.7	1.20±0.3	6.7	0.70±0.3

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00 Sep. 2010

■ High temperature Lead-Free reflow Products

Endurance : 125 °C 2000 h

W.V. (V)	Cap. (±20 %) (μF)	Case size			Specification				Part No. (RoHS:compliant)	Reflow	Min. Packaging Q'ty	
		Dia. (mm)	Length (mm)	*Size Code	Ripple Current (100 kHz) (+125 °C) (mA r.m.s.)	ESR (Ω)		tan δ (120 Hz) (+20 °C)			Taping (pcs)	
						+20 °C	-40 °C					
10	1000	12.5	13.5	H13	800	0.120	1.80	0.30	EEETK1A102AQ	(9)	200	
	1500	12.5	13.5	(H13)	800	0.120	1.80	0.30	EEETKA152UAQ	(9)	200	
	2200	16	16.5	J16	1100	0.080	1.20	0.32	EEETK1A222AM	(9)	125	
		16	16.5	(J16)	1100	0.080	1.20	0.34	EEETKA332UAM	(9)	125	
	3300	18	16.5	K16	1300	0.075	1.10	0.36	EEETK1A332AM	(9)	125	
		18	16.5	(K16)	1300	0.075	1.10	0.38	EEETK1A472AM	(9)	125	
16	330	12.5	13.5	H13	800	0.120	1.80	0.23	EEETK1C331AQ	(9)	200	
	470	12.5	13.5	H13	800	0.120	1.80	0.23	EEETK1C471AQ	(9)	200	
	680	12.5	13.5	H13	800	0.120	1.80	0.23	EEETK1C681AQ	(9)	200	
	1000	12.5	13.5	(H13)	800	0.120	1.80	0.23	EEETKC102UAQ	(9)	200	
		16	16.5	J16	1100	0.080	1.20	0.25	EEETK1C102AM	(9)	125	
	2200	16	16.5	(J16)	1100	0.080	1.20	0.27	EEETKC222UAM	(9)	125	
		18	16.5	K16	1300	0.075	1.10	0.27	EEETK1C222AM	(9)	125	
	3300	18	16.5	K16	1300	0.075	1.10	0.29	EEETK1C332AM	(9)	125	
	25	330	12.5	13.5	H13	800	0.120	1.80	0.18	EEETK1E331AQ	(9)	200
		470	12.5	13.5	H13	800	0.120	1.80	0.18	EEETK1E471AQ	(9)	200
680		12.5	13.5	(H13)	800	0.120	1.80	0.18	EEETKE681UAQ	(9)	200	
		16	16.5	J16	1100	0.080	1.20	0.18	EEETK1E681AM	(9)	125	
1000		16	16.5	(J16)	1100	0.080	1.20	0.18	EEETKE102UAM	(9)	125	
		18	16.5	K16	1300	0.075	1.10	0.18	EEETK1E102AM	(9)	125	
2200		18	16.5	K16	1300	0.075	1.10	0.20	EEETK1E222AM	(9)	125	
35	330	12.5	13.5	H13	800	0.120	1.80	0.16	EEETK1V331AQ	(9)	200	
	470	12.5	13.5	(H13)	800	0.120	1.80	0.16	EEETKV471UAQ	(9)	200	
		16	16.5	J16	1100	0.080	1.20	0.16	EEETK1V471AM	(9)	125	
	680	16	16.5	(J16)	1100	0.080	1.20	0.16	EEETKV681UAM	(9)	125	
		18	16.5	K16	1300	0.075	1.10	0.16	EEETK1V681AM	(9)	125	
	1000	18	16.5	K16	1300	0.075	1.10	0.16	EEETK1V102AM	(9)	125	
50	220	12.5	13.5	H13	600	0.230	3.40	0.14	EEETK1H221AQ	(10)	200	
	330	12.5	13.5	H13	600	0.230	3.40	0.14	EEETK1H331AQ	(10)	200	
	470	16	16.5	J16	900	0.150	2.20	0.14	EEETK1H471AM	(10)	125	
		16	16.5	(J16)	900	0.150	2.20	0.14	EEETKH681UAM	(10)	125	
	680	18	16.5	K16	950	0.140	2.10	0.14	EEETK1H681AM	(10)	125	
		18	16.5	(K16)	950	0.140	2.10	0.14	EEETK1H102AM	(10)	125	
63	100	12.5	13.5	H13	350	0.260	5.20	0.12	EEETK1J101AQ	(11)	200	
	220	12.5	13.5	H13	350	0.260	5.20	0.12	EEETK1J221AQ	(11)	200	
	330	16	16.5	J16	500	0.180	3.60	0.12	EEETK1J331AM	(11)	125	
	470	16	16.5	J16	500	0.180	3.60	0.12	EEETK1J471AM	(11)	125	
		16	16.5	(J16)	500	0.180	3.60	0.12	EEETK1K470AQ	(11)	200	
80	47	12.5	13.5	H13	250	0.420	8.40	0.12	EEETK1K470AQ	(11)	200	
		12.5	13.5	(H13)	250	0.420	8.40	0.12	EEETKK101UAQ	(11)	200	
	100	16	16.5	J16	350	0.300	6.00	0.12	EEETK1K101AM	(11)	125	
		16	16.5	(J16)	350	0.300	6.00	0.12	EEETKK221UAM	(11)	125	
	220	18	16.5	K16	400	0.280	5.60	0.12	EEETK1K221AM	(11)	125	
		18	16.5	(K16)	400	0.280	5.60	0.12	EEETKK331UAM	(11)	125	
	330	16	16.5	(J16)	350	0.300	6.00	0.12	EEETK1K331AM	(11)	125	
		18	16.5	K16	400	0.280	5.60	0.12	EEETK1K471AM	(11)	125	
100	47	12.5	13.5	H13	250	0.420	8.40	0.10	EEETK2A470AQ	(11)	200	
	100	16	16.5	J16	350	0.300	6.00	0.10	EEETK2A101AM	(11)	125	
	220	18	16.5	K16	400	0.280	5.60	0.10	EEETK2A221AM	(11)	125	
	330	18	16.5	K16	400	0.280	5.60	0.10	EEETK2A331AM	(11)	125	
		18	16.5	(K16)	400	0.280	5.60	0.10				

\* Size code( ):Miniaturization product

The taping dimensions are explained on EE188 of our Catalog. Please use it as a reference guide.  
Reflow Profile(Fig-1 to Fig-11) listed on EE186 of our Catalog.

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