

### Surface Mount Type

Series: **TP** Type: **V**

TP High temperature Lead-Free reflow(suffix:A\*)



#### ■ Features

- Lower ESR at Low temperature after endurance
- Endurance: 3000 h at 125 °C(D8 size : 2000 h)
- Automotive
- Vibration-proof product is available upon request. ( $\phi 8 \leq$ )
- 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 $\mu$ F to 470 $\mu$ F			
Capacitance Tolerance	$\pm 20$ % (120 Hz/+20 °C)			
DC Leakage Current	$I \leq 0.01$ CV ( $\mu$ A) After 2 minutes			
tan $\delta$	Please see the attached standard products list			
Endurance	After the life test with DC rated working voltage at +125 °C $\pm 2$ °C for 3000 hours(D8 size : 2000 h), the capacitors shall meet the limits specified below.			
	Capacitance change	$\pm 30$ % of initial measured value		
	tan $\delta$	$\leq 300$ % of initial specified value		
	DC leakage current	$\leq$ initial specified value		
	ESR after Endurance ( $\Omega/100$ kHz)		Size Code	
		D8	F	G
	Initial(+20 °C)	0.45	0.2	0.15
	After 2000 h(-40 °C)	40	4.5	3.5
Shelf Life	After storage for 1000 hours at +125 °C $\pm 2$ °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	$\pm 10$ % of initial measured value		
	tan $\delta$	$\leq$ initial specified value		
	DC leakage current	$\leq$ initial specified value		

#### ■ Marking

Example:10 V 220  $\mu$ F Marking color : BLACK

Capacitance ( $\mu$ F)  
Series identification  
Mark for Lead-Free Products Black Dot (Square)  
Rated Voltage Mark  
Lot number  
Negative polarity marking (-)

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

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

( ) reference size

Size code	D	L	A, B	H	I	W	P	K
D8	6.3	7.7 $\pm 0.3$	6.6	7.8 max.	2.6	0.65 $\pm 0.1$	1.8	0.35 $^{+0.15}_{-0.20}$
F	8.0	10.2 $\pm 0.3$	8.3	10.0max.	3.4	0.90 $\pm 0.2$	3.1	0.70 $\pm 0.20$
G	10.0	10.2 $\pm 0.3$	10.3	12.0max.	3.5	0.90 $\pm 0.2$	4.6	0.70 $\pm 0.20$

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.

00 Sep. 2010

### Standard Products

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) (mA r.m.s.)	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	270	0.20	3	0.30	EEETP1A221AP	(8)	500
	330	8	10.2	(F)	270	0.20	3	0.30	EEETPA331UAP	(8)	500
		10	10.2	G	500	0.15	2	0.30	EEETP1A331AP	(8)	500
	470	10	10.2	G	500	0.15	2	0.30	EEETP1A471AP	(8)	500
16	100	6.3	7.7	D8	197	0.45	5	0.23	EEETPC101XAP	(8)	900
		8	10.2	F	270	0.20	3	0.23	EEETP1C101AP	(8)	500
	220	8	10.2	F	270	0.20	3	0.23	EEETP1C221AP	(8)	500
	330	10	10.2	G	500	0.15	2	0.23	EEETP1C331AP	(8)	500
	470	10	10.2	G	500	0.15	2	0.23	EEETP1C471AP	(8)	500
25	100	8	10.2	F	270	0.20	3	0.18	EEETP1E101AP	(8)	500
	220	10	10.2	G	500	0.15	2	0.18	EEETP1E221AP	(8)	500
	330	10	10.2	G	500	0.15	2	0.18	EEETP1E331AP	(8)	500
35	47	6.3	7.7	D8	197	0.45	5	0.16	EEETPV470XAP	(8)	900
		8	10.2	F	270	0.20	3	0.16	EEETP1V470AP	(8)	500
	100	8	10.2	F	270	0.20	3	0.16	EEETP1V101AP	(8)	500
	220	10	10.2	G	500	0.15	2	0.16	EEETP1V221AP	(8)	500

\* Size code( ):Miniaturization product

If Part number exceeds 12 digits, voltage code is abbreviated as follows; 1A→A, 1C→C, 1E→E, 1V→V

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.