

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. (φ8 mm and larger)
- 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 (μA) After 2 minutes																		
tan δ	Please see the attached standard products list																		
Endurance	After the life test with DC rated working voltage at +125 °C±2 °C for 3000 hours(D8 size : 2000 h), the capacitors shall meet the limits specified below.																		
	Capacitance change	±30 % of initial measured value																	
	tan δ	≤ 300 % of initial specified value																	
	DC leakage current	≤ initial specified value																	
	ESR after Endurance (Ω/100kHz)		<table border="1"> <thead> <tr> <th rowspan="2"></th> <th colspan="3">Size Code</th> </tr> <tr> <th>D8</th> <th>F</th> <th>G</th> </tr> </thead> <tbody> <tr> <td>Initial(+20 °C)</td> <td>0.45</td> <td>0.2</td> <td>0.15</td> </tr> <tr> <td>After 2000 h(-40 °C)</td> <td>40</td> <td>4.5</td> <td>3.5</td> </tr> </tbody> </table>				Size Code			D8	F	G	Initial(+20 °C)	0.45	0.2	0.15	After 2000 h(-40 °C)	40	4.5
	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±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																	

■ Frequency correction factor for ripple current

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

■ Marking

Example:10 V 220 μF Marking color : BLACK

Lot number

Rated Voltage Mark	
A	10 V
C	16 V
E	25 V
V	35 V

■ Dimensions in mm (not to scale)

(Unit : mm)

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

* 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 ($\phi 6.3 \times 7.7 \leq$: 2000 h)

W.V. (V)	Cap. ($\pm 20\%$) (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 (100 kHz) (Ω)		tan δ (120 Hz) (+20 °C)			Taping (pcs)
						+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)
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

· 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"