

## Surface Mount Type

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

**High temperature**

**Lead-Free reflow (suffix : A\*)**



### Features

- Lower ESR at Low temperature after endurance
- Endurance : 125 °C 3000 h (D8 size : 2000 h)
- Automotive
- Vibration-proof product is available upon request. ( $\phi 8$  mm and larger)
- RoHS compliant

### Specifications

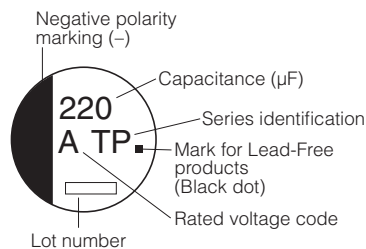
Category temperature range	-40 °C to +125 °C																	
Rated voltage range	10 V.DC to 35 V.DC																	
Capacitance range	47 $\mu$ F to 470 $\mu$ F																	
Capacitance tolerance	$\pm 20$ % (120 Hz/+20 °C)																	
Leakage current	$I \leq 0.01 CV$ ( $\mu$ A) After 2 minutes																	
Dissipation factor (tan $\delta$ )	Please see the attached characteristics 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	Within $\pm 30$ % of the initial value																
	tan $\delta$	$\leq 300$ % of the initial limit																
	DC leakage current	Within the initial limit																
	ESR after endurance ( $\Omega/100$ kHz)		<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 $\pm 2$ °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	Within $\pm 10$ % of the initial value																
	tan $\delta$	Within the initial limit																
	DC leakage current	Within the initial limit																
AEC-Q200	AEC-Q200 compliant																	

### 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

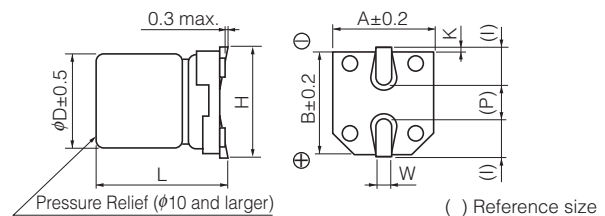
### Marking

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



R. Voltage (V.DC)	10	16	25	35
Code	A	C	E	V

### Dimensions



(Unit : mm)

Size code	$\phi D$	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	10.0 max.	3.4	0.90 $\pm 0.2$	3.1	0.70 $\pm 0.20$
G	10.0	10.2 $\pm 0.3$	10.3	12.0 max.	3.5	0.90 $\pm 0.2$	4.6	0.70 $\pm 0.20$

## Characteristics list

Endurance : 125 °C 3000 h ( $\phi 6.3 \times 7.7$  : 2000 h)

Rated voltage (V.DC)	Cap. ( $\pm 20\%$ ) ( $\mu\text{F}$ )	Case size (mm)		Size* code	Specification			Part No.	Reflow	Min. Packaging Qty	
		$\phi\text{D}$	L		Ripple current (100 kHz) (+125 °C) (mA r.m.s.)	ESR (100 kHz) ( $\Omega$ )				$\tan \delta$ (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)
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; 0J → J, 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"