

Surface Mount Type

Series: **TCU** Type: **V**

High temperature Lead-Free reflow



Features

- Endurance : 125 °C 3000 h
- Miniaturization (20 % to 40 % less than TP series)
- Added ESR specification after the endurance test
- Vibration-proof product (30G guaranteed) is available upon request
- RoHS compliant

Specifications

Category temp. range	-40 °C to +125 °C		
Rated voltage range	10 V.DC to 35 V.DC		
Capacitance range	220 µF to 680 µF		
Capacitance tolerance	±20 % (120 Hz / +20 °C)		
Leakage current	$I \leq 0.01 CV$ (µA) After 2 minutes		
Dissipation factor (tan δ)	Please see the attached characteristics list		
Endurance	After applying rated working voltage for 3000 hours at +125 °C ± 2 °C and then being stabilized at +20 °C, capacitors shall meet the following limits.		
	Capacitance change	Within ±30 % of the initial value	
	Dissipation factor (tan δ)	≤ 300 % of the initial limit	
	Leakage current	Within the initial limit	
ESR after endurance (Ω/100kHz)	Size code	F	G
	Initial (20 °C)	0.20	0.15
	After 2000 h (-40 °C)	9	7
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	Within ±10 % of the initial value	
	Dissipation factor (tan δ)	Within the initial limit	
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 330 µF
Marking color : BLACK

Negative polarity marking (-)
Capacitance (µF)
Series identification
Rated voltage code
Lot number

R.voltage code		Unit : V.DC	
A	10	E	25
C	16	V	35

Dimensions

Pressure Relief (φ10 and larger)
() Reference size
Unit : mm

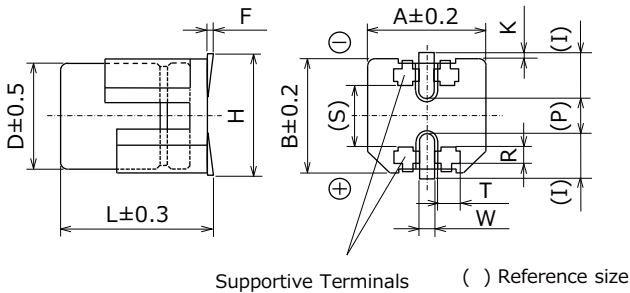
Size code	φD	L	A, B	H	I	W	P	K
F	8.0	10.2±0.3	8.3	10.0 max.	3.4	0.90±0.2	3.1	0.70±0.2
G	10.0	10.2±0.3	10.3	12.0 max.	3.5	0.90±0.2	4.6	0.70±0.2

*The dimensions of the vibration-proof products, please refer to the page of the mounting specification.

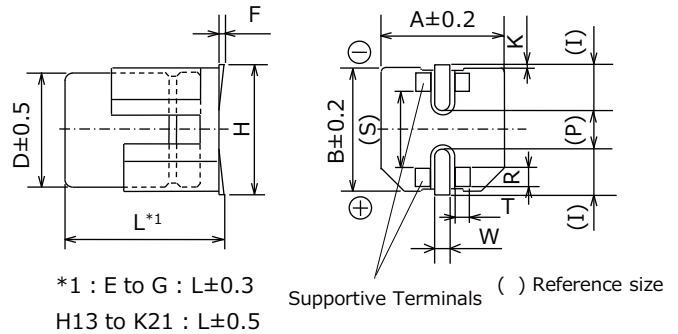
Dimensions (Vibration-proof products)

* The size and shape are different from standard products. Please inquire details of our company.

< Size code : D, D8 >



< Size code : E, F, G, H13, J16, K16, K21 >



*1 : E to G : L±0.3
H13 to K21 : L±0.5

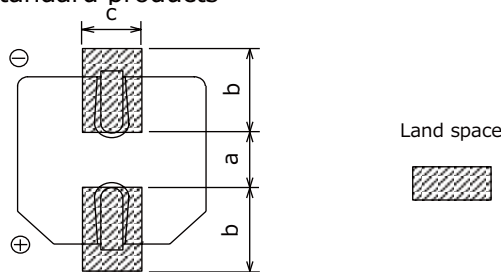
Unit : mm

Size code	φD	L	A, B	H max.	F	I	W	P	K	R	S	T
D	6.3	6.1	6.6	7.8	0 to +0.15	2.4	0.65±0.1	2.2	0.35 ^{+0.15} _{-0.20}	1.1±0.2	3.3±0.2	1.05±0.2
D8	6.3	8.0	6.6	7.8	0 to +0.15	2.4	0.65±0.1	2.2	0.35 ^{+0.15} _{-0.20}	1.1±0.2	3.3±0.2	1.05±0.2
E	8.0	6.5	8.3	9.5	0 to +0.15	3.4	0.7±0.1	2.2	0.35 ^{+0.15} _{-0.20}	0.70±0.2	5.3±0.2	1.7±0.2
F	8.0	10.5	8.3	10.0	0 to +0.15	3.4	1.2±0.2	3.1	0.70±0.2	0.70±0.2	5.3±0.2	1.3±0.2
G	10.0	10.5	10.3	12.0	0 to +0.15	3.5	1.2±0.2	4.6	0.70±0.2	0.70±0.2	6.9±0.2	1.3±0.2
H13	12.5	13.8	13.5	15.0	-0.1 to +0.15	4.7	1.2±0.2	4.4	0.70±0.3	2.2±0.2	7.1±0.2	2.4±0.2
J16	16.0	16.8	17.0	19.0	-0.1 to +0.15	5.5	1.4±0.2	6.7	0.70±0.3	3.0±0.2	9.0±0.2	1.9±0.2
K16	18.0	16.8	19.0	21.0	-0.1 to +0.15	6.7	1.4±0.2	6.7	0.70±0.3	3.0±0.2	11.0±0.2	1.9±0.2
K21	18.0	21.8	19.0	21.0	-0.1 to +0.15	6.7	1.4±0.2	6.7	0.70±0.3	3.0±0.2	11.0±0.2	1.9±0.2

Land / Pad pattern

The circuit board land/pad pattern size for chip capacitors is specified in the following table. The land pitch influences installation strength and consider it.

● Standard products



(Table of board land size vs. capacitor size)

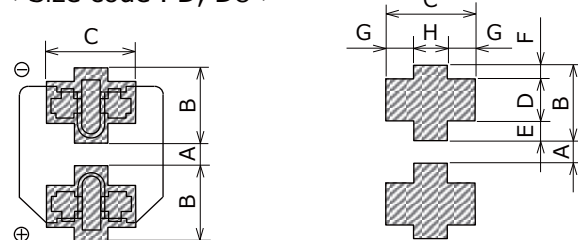
Size code	a	b	c
B (φ4)	1.0	2.5	1.6
C (φ5)	1.5	2.8	1.6
D (φ6.3)	1.8	3.2	1.6
D8 (φ6.3x7.7L)	1.8	3.2	1.6
E (φ8x6.2L)	2.2	4.0	1.6
F (φ8x10.2L)	3.1	4.0	2.0
G (φ10x10.2L)	4.6	4.1	2.0
H (φ12.5)	4.0	5.7	2.0
J (φ16)	6.0	6.5	2.5
K (φ18)	6.0	7.5	2.5

Unit : mm

When size "a" is wide, back fillet can be made, decreasing fitting strength.

● Vibration-proof products

< Size code : D, D8 >



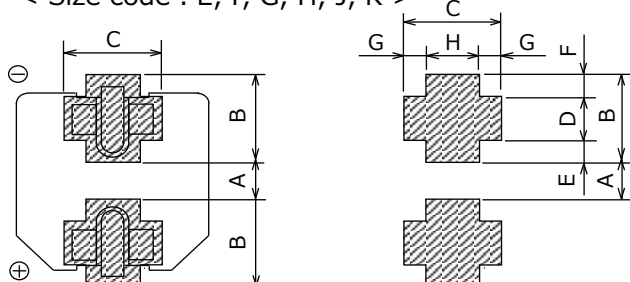
(Table of board land size vs. capacitor size)

Size code	A	B	C	D	E	F	G	H
D (φ6.3xL6.1)	1.2	3.6	3.2	2.0	0.95	0.65	1.0	1.2
D8 (φ6.3xL8.0)	1.2	3.6	3.2	2.0	0.95	0.65	1.0	1.2
E (φ8x6.5L)	1.8	4.2	5.0	1.3	1.5	1.4	1.5	2.0
F (φ8x10.5L)	2.7	4.0	4.7	1.3	1.0	1.7	1.1	2.5
G (φ10)	3.9	4.4	4.7	1.3	1.2	1.9	1.1	2.5
H (φ12.5)	3.9	6.0	6.9	2.8	1.3	1.9	2.2	2.5
J (φ16)	5.8	6.8	6.2	3.6	1.3	1.9	1.7	2.8
K (φ18)	5.8	7.3	6.2	3.6	1.8	1.9	1.7	2.8

Unit : mm

When size "A" is wide, back fillet can be made, decreasing fitting strength.

< Size code : E, F, G, H, J, K >



* Take mounting conditions, solderability and fitting strength into consideration when selecting parts for your company's design.

* The vibration-proof capacitors of size φ6.3 has support terminals extending from the bottom side to the lead edge. Then, make sure to find appropriate soldering conditions to form fillet on the support terminals if required for appearance inspection.

Characteristics list

Endurance : 125 °C 3000 h

Rated volt. (V.DC)	Cap. (±20 %) (μF)	Case size (mm)			Size code	Specification				Part No.		Reflow	Min. Packaging Qty
		φD	L			Ripple current *1 (mA r.m.s.)	ESR (100 kHz) (Ω)		tan δ *2	Standard	Vibration-proof		
			Standard	Vibration-proof			+20 °C	-40 °C					
10	330	8	10.2	10.5	F	410	0.20	3	0.30	EEETC1A331UP	EEETC1A331UV	(8)	500
	470	8	10.2	10.5	F	410	0.20	3	0.30	EEETC1A471UP	EEETC1A471UV	(8)	500
	560	8	10.2	10.5	F	410	0.20	3	0.30	EEETC1A561UP	EEETC1A561UV	(8)	500
	680	10	10.2	10.5	G	750	0.15	2	0.30	EEETC1A681UP	EEETC1A681UV	(8)	500
16	330	8	10.2	10.5	F	410	0.20	3	0.23	EEETC1C331UP	EEETC1C331UV	(8)	500
	390	8	10.2	10.5	F	410	0.20	3	0.23	EEETC1C391UP	EEETC1C391UV	(8)	500
	680	10	10.2	10.5	G	750	0.15	2	0.23	EEETC1C681UP	EEETC1C681UV	(8)	500
25	220	8	10.2	10.5	F	410	0.20	3	0.18	EEETC1E221UP	EEETC1E221UV	(8)	500
	330	8	10.2	10.5	F	410	0.20	3	0.18	EEETC1E331UP	EEETC1E331UV	(8)	500
	470	10	10.2	10.5	G	750	0.15	2	0.18	EEETC1E471UP	EEETC1E471UV	(8)	500
35	220	8	10.2	10.5	F	410	0.20	3	0.16	EEETC1V221UP	EEETC1V221UV	(8)	500
	330	10	10.2	10.5	G	750	0.15	2	0.16	EEETC1V331UP	EEETC1V331UV	(8)	500
	390	10	10.2	10.5	G	750	0.15	2	0.16	EEETC1V391UP	EEETC1V391UV	(8)	500

*1: Ripple current (100 kHz / +125 °C)

*2: tan δ (120 Hz / +20 °C)

• Please refer to the page of "Reflow Profile" and "The Taping Dimensions".

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