Surface Mount Type

Series: TG Type : V



■ Features

Endurance:125°C 1000 to 2000 h
Miniaturization(40% less than TA Series)
Low ESR(Low temp)
Vibration-proof product is available upon request.(φ8 ≦)
RoHS directive compliant(Parts No:EEV∗φ12.5≦ , EEE∗)

■ Applications

For use near car engines.
Good for electronically controlledunits (ECU,ABS etc).

■ Specifications

Category temp. range	-40 to +125°C
Rated W.V. Range	10 to 100 V .DC
Nominal Cap. Range	10 to 4700 μ F
Capacitance Tolerance	±20 % (120Hz/+20°C)
DC Leakage Current	I ≦ 0.01 CV or 3(μ A) after 2 minutes (Whichever is greater)
tan δ	Please see the attached standard products list

Characteristics at Low Temperature (Impedance ratio at 120Hz)

W.V. (V)	10	16	25	35	50	63	80	100
-25 / +20 °C	3	2	2	2	2	2	2	2
-40 / +20 °C	6	4	4	3	3	3	3	3

Endurance

After applying rated working voltage for 1000 hours(φ8x6.2), 2000 hours(8x10.2 ≦) at +125 ±2°C and then being stabilized at +20°C, capacitors shall meet the following limits.

Capacitance change	±30 % of initial measured value (code U:±35%)
tan δ	≦300 % of initial specified value (code U:350%)
DC leakage current	≦initial specified value

Shelf Life

After storage for 1000 hours at +125±2°C with no voltage applied and then being stabilized at +20°C, capacitors shall meet the limits specified in Endurance.(With voltage treatment)

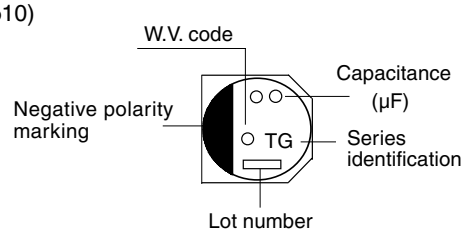
Resistance to Soldering Heat

After reflow soldering (Refer to page 86 for recommended temperature profile) and then being stabilized at +20°C, capacitor shall meet the following limits.

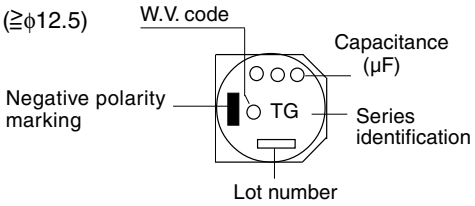
Capacitance change	±10 % of initial measured value
tan δ	≦ initial specified value
DC leakage current	≦ initial specified value

■ Marking

(≦φ10)



(≧φ12.5)



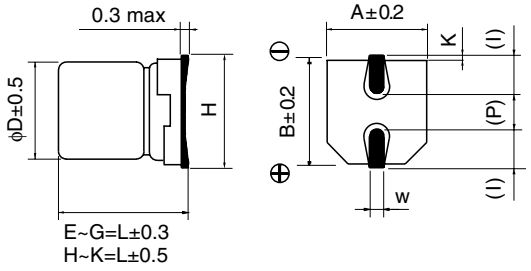
W.V. code

V	10	16	25	35
Code	A	C	E	V

V	50	63	80	100
Code	H	J	K	2A

■ Dimensions in mm (not to scale)

( ) reference size



Size code	D	L	A,B	H max.	I	W	P	K
E	8.0	6.2	8.3	9.5	3.4	0.65 ±0.1	2.2	0.35 -0.20 to +0.15
F	8.0	10.2	8.3	10.0	3.4	0.90 ±0.2	3.1	0.70 ±0.20
G	10.0	10.2	10.3	12.0	3.5	0.90 ±0.2	4.6	0.70 ±0.20
H13	12.5	13.5	13.5	15.0	4.7	0.90 ±0.3	4.4	0.70 ±0.30
J16	16.0	16.5	17.0	19.0	5.5	1.20±0.3	6.7	0.70 ±0.30
K16	18.0	16.5	19.0	21.0	6.7	1.20 ±0.3	6.7	0.70 ±0.30

Design and specifications are subject to change without notice. Ask factory for technical specifications before purchase and/or use.
Whenever a doubt about safety arises from this product, please contact us immediately for technical consultation.

■ Case size VS Capacitance, ESR and Ripple current

ESR;(Ω/100kHz,+20°C),Ripple current ;(mA r.m.s./100kHz+125°C)

W.V. (V) / Capacitance (μF)	10				16				25			
	size	ESR 20°C	ESR -40°C	Ripple current	size	ESR 20°C	ESR -40°C	Ripple current	size	ESR 20°C	ESR -40°C	Ripple current
47									E	1.0	20	100
100	E	1.0	20	100	F	0.5	10	197	(E)	(1.0)	(20)	(100)
									F	0.5	10	197
220	(E)	(1.0)	(20)	(100)	(F)	(0.5)	(10)	(197)	(F)	(0.5)	(10)	(197)
	F	0.5	10	197	G	0.3	6.0	270	G	0.3	6.0	270
330	(F)	(0.5)	(10)	(197)	(G)	(0.3)	(6.0)	(270)	(G)	(0.3)	(6.0)	(270)
	G	0.3	6.0	270	H13	0.12	1.8	800	H13	0.12	1.8	800
470	(G)	(0.3)	(6.0)	(270)	H13	0.12	1.8	800	H13	0.12	1.8	800
680					H13	0.12	1.8	800	(H13)	(0.12)	(1.8)	(800)
									J16	0.08	1.2	1100
1000	H13	0.12	1.8	800	(H13)	(0.12)	(1.8)	(800)	(J16)	(0.08)	(1.2)	(1100)
					J16	0.08	1.2	1100	K16	0.075	1.1	1300
1500	(H13)	(0.12)	(1.8)	(800)								
2200	J16	0.08	1.2	1100	(J16)	(0.08)	(1.2)	(1100)	K16	0.075	1.1	1300
					K16	0.075	1.1	1300				
3300	(J16)	(0.08)	(1.2)	(1100)	K16	0.075	1.1	1300				
	K16	0.075	1.1	1300								
4700	K16	0.075	1.1	1300								

W.V. (V) / Capacitance (μF)	35				50				63			
	size	ESR 20°C	ESR -40°C	Ripple current	size	ESR 20°C	ESR -40°C	Ripple current	size	ESR 20°C	ESR -40°C	Ripple current
10					E	1.6	32	80	E	2.2	55	55
22					E	1.6	32	80	F	1	25	100
33	E	1.0	20	100	(E)	(1.6)	(32)	(80)	(F)	(1)	(25)	(100)
					F	0.75	15	133	G	0.8	20	150
47	(E)	(1.0)	(20)	(100)	(F)	(0.75)	(15)	(133)	(F)	(1)	(25)	(100)
	F	0.5	10	197	G	0.5	10	221	G	0.8	20	150
100	(F)	(0.5)	(10)	(197)					(G)	(0.8)	(20)	(150)
	G	0.3	6.0	270	(G)	(0.5)	(10)	(221)	H13	0.26	5.2	350
220	(G)	(0.3)	(6.0)	(270)	H13	0.23	3.4	600	H13	0.26	5.2	350
330	H13	0.12	1.8	800	H13	0.23	3.4	600	J16	0.18	3.6	500
470	(H13)	(0.12)	(1.8)	(800)	J16	0.15	2.2	900	J16	0.18	3.6	500
	J16	0.08	1.2	1100								
680	(J16)	(0.08)	(1.2)	(1100)	(J16)	(0.15)	(2.2)	(900)				
	K16	0.075	1.1	1300	K16	0.14	2.1	950				
1000	K16	0.075	1.1	1300	K16	0.14	2.1	950				

W.V. (V) / Capacitance (μF)	80				100			
	size	ESR 20°C	ESR -40°C	Ripple current	size	ESR 20°C	ESR -40°C	Ripple current
10	F	1.3	32	70	F	1.3	32	70
22	(F)	(1.3)	(32)	(70)	(F)	(1.3)	(32)	(70)
	G	1.0	25	90	G	1.0	25	90
33	(F)	(1.3)	(32)	(70)	G	1.0	25	90
	G	1.0	25	90				
47	(G)	(1.0)	(25)	(90)	H13	0.42	8.4	250
	H13	0.42	8.4	250				
100	(H13)	(0.42)	(8.4)	(250)	J16	0.3	6.0	350
	J16	0.3	6.0	350				
220	(J16)	(0.3)	(6.0)	(350)	K16	0.28	5.6	400
	K16	0.28	5.6	400				
330	(J16)	(0.3)	(6.0)	(350)	K16	0.28	5.6	400
	K16	0.28	5.6	400				
470	K16	0.28	5.6	400				

( ) Shows miniaturized size

Suffix : U

Design and specifications are subject to change without notice. Ask factory for technical specifications before purchase and/or use.
Whenever a doubt about safety arises from this product, please contact us immediately for technical consultation.

■ Standard Products

W.V. (V)	Cap (±20%) (μF)	Case Size Dia. (mm)	Length (mm)	Size code	Specification Ripple current (100kHz) (+125°C) (mA)	ESR (100kHz) (+20°C) (Ω)	tanδ (120Hz) (+20°C)	Part No. (RoHS: not compliant)	Reflow	Part No. (RoHS: compliant)	Reflow	Min. Packaging Q'ty Taping (pcs)
10	100	8	6.2	E	100	1.0	0.30	EEVTG1A101P	(2)	EEETG1A101P	(5)	1000
	220	(8)	(6.2)	(E)	(100)	(1.0)	0.30	EEVTG1A221UP	(2)	EEETG1A221UP	(5)	1000
		8	10.2	F	197	0.5	0.30	EEVTG1A221P	(2)	EEETG1A221P	(5)	500
	330	(8)	(10.2)	(F)	(197)	(0.5)	0.30	EEVTG1A331UP	(2)	EEETG1A331UP	(5)	500
		10	10.2	G	270	0.3	0.30	EEVTG1A331P	(2)	EEETG1A331P	(5)	500
	470	(10)	(10.2)	(G)	(270)	(0.3)	0.30	EEVTG1A471UP	(2)	EEETG1A471UP	(5)	500
	1000	12.5	13.5	H13	800	0.12	0.30			EEVTG1A102Q	(2)	200
	1500	(12.5)	(13.5)	(H13)	(800)	(0.12)	0.30			EEVTG1A152UQ	(2)	200
	2200	16	16.5	J16	1100	0.08	0.32			EEVTG1A222M	(2)	125
	3300	(16)	(16.5)	(J16)	(1100)	(0.08)	0.34			EEVTG1A332UM	(2)	125
		18	16.5	K16	1300	0.075	0.34			EEVTG1A332M	(2)	125
	4700	18	16.5	K16	1300	0.075	0.36			EEVTG1A472M	(2)	125
16	100	8	10.2	F	197	0.5	0.23	EEVTG1C101P	(2)	EEETG1C101P	(5)	500
	220	(8)	(10.2)	(F)	(197)	(0.5)	0.23	EEVTG1C221UP	(2)	EEETG1C221UP	(5)	500
		10	10.2	G	270	0.3	0.23	EEVTG1C221P	(2)	EEETG1C221P	(5)	500
	330	(10)	(10.2)	(G)	(270)	(0.3)	0.23	EEVTG1C331UP	(2)	EEETG1C331UP	(5)	500
		12.5	13.5	H13	800	0.12	0.23			EEVTG1C331Q	(2)	200
	470	12.5	13.5	H13	800	0.12	0.23			EEVTG1C471Q	(2)	200
	680	12.5	13.5	H13	800	0.12	0.23			EEVTG1C681Q	(2)	200
	1000	(12.5)	(13.5)	(H13)	(800)	(0.12)	0.23			EEVTG1C102UQ	(2)	200
		16	16.5	J16	1100	0.08	0.23			EEVTG1C102M	(2)	125
	2200	(16)	(16.5)	(J16)	(1100)	(0.08)	0.25			EEVTG1C222UM	(2)	125
		18	16.5	K16	1300	0.075	0.25			EEVTG1C222M	(2)	125
	3300	18	16.5	K16	1300	0.075	0.27			EEVTG1C332M	(2)	125
25	47	8	6.2	E	100	1.0	0.18	EEVTG1E470P	(2)	EEETG1E470P	(5)	1000
	100	(8)	(6.2)	(E)	(100)	(1.0)	0.18	EEVTG1E101UP	(2)	EEETG1E101UP	(5)	1000
		8	10.2	F	197	0.5	0.18	EEVTG1E101P	(2)	EEETG1E101P	(5)	500
	220	(8)	(10.2)	(F)	(197)	(0.5)	0.18	EEVTG1E221UP	(2)	EEETG1E221UP	(5)	500
		10	10.2	G	270	0.3	0.18	EEVTG1E221P	(2)	EEETG1E221P	(5)	500
	330	(10)	(10.2)	(G)	(270)	(0.3)	0.18	EEVTG1E331UP	(2)	EEETG1E331UP	(5)	500
		12.5	13.5	H13	800	0.12	0.18			EEVTG1E331Q	(2)	200
	470	12.5	13.5	H13	800	0.12	0.18			EEVTG1E471Q	(2)	200
	680	(12.5)	(13.5)	(H13)	(800)	(0.12)	0.18			EEVTG1E681UQ	(2)	200
		16	16.5	J16	1100	0.08	0.18			EEVTG1E681M	(2)	125
	1000	(16)	(16.5)	(J16)	(1100)	(0.08)	0.18			EEVTG1E102UM	(2)	125
		18	16.5	K16	1300	0.075	0.18			EEVTG1E102M	(2)	125
	2200	18	16.5	K16	1300	0.075	0.20			EEVTG1E222M	(2)	125
35	33	8	6.2	E	100	1.0	0.16	EEVTG1V330P	(2)	EEETG1V330P	(5)	1000
	47	(8)	(6.2)	(E)	(100)	(1.0)	0.16	EEVTG1V470UP	(2)	EEETG1V470UP	(5)	1000
		8	10.2	F	197	0.5	0.16	EEVTG1V470P	(2)	EEETG1V470P	(5)	500
	100	(8)	(10.2)	(F)	(197)	(0.5)	0.16	EEVTG1V101UP	(2)	EEETG1V101UP	(5)	500
		10	10.2	G	270	0.3	0.16	EEVTG1V101P	(2)	EEETG1V101P	(5)	500
	220	(10)	(10.2)	(G)	(270)	(0.3)	0.16	EEVTG1V221UP	(2)	EEETG1V221UP	(5)	500
	330	12.5	13.5	H13	800	0.12	0.16			EEVTG1V331Q	(2)	1000

An explanation of the taping dimensions can be found on page 84.

Reflow profiles can be found on page 86.

Endurance: 125°C 1000h - 2000h

Design and specifications are subject to change without notice. Ask factory for technical specifications before purchase and/or use.
Whenever a doubt about safety arises from this product, please contact us immediately for technical consultation.

■ Standard Products

W.V. (V)	Cap (±20%) (μF)	Case Size Dia. (mm)	Length (mm)	Size code	Specification Ripple current (100kHz) (+125°C) (mA)	ESR (100kHz) (+20°C) (Ω)	tanδ (120Hz) (+20°C)	Part No. (RoHS: not compliant)	Reflow	Part No. (RoHS: compliant)	Reflow	Min. Packaging Q'ty Taping (pcs)
35	470	12.5	13.5	(H13)	(800)	(0.12)	0.16			EEVTG1V471UQ	(2)	200
		16	16.5	J16	1100	0.08	0.16			EEVTG1V471M	(2)	125
	680	(16)	(16.5)	(J16)	(1100)	(0.08)	0.16			EEVTG1V681UM	(2)	125
		18	16.5	K16	1300	0.075	0.16			EEVTG1V681M	(2)	125
	1000	18	16.5	K16	1300	0.075	0.16			EEVTG1V102M	(2)	125
50	10	8	6.2	E	80	1.6	0.14	EEVTG1H100P	(2)	EEETG1H100P	(5)	1000
	22	8	6.2	E	80	1.6	0.14	EEVTG1H220P	(2)	EEETG1H220P	(5)	1000
	33	(8)	(6.2)	(E)	(80)	(1.6)	0.14	EEVTG1H330UP	(2)	EEETG1H330UP	(5)	1000
		8	10.2	F	133	0.75	0.14	EEVTG1H330P	(2)	EEETG1H330P	(5)	500
	47	(8)	(10.2)	(F)	(133)	(0.75)	0.14	EEVTG1H470UP	(2)	EEETG1H470UP	(5)	500
		10	10.2	G	221	0.5	0.14	EEVTG1H470P	(2)	EEETG1H470P	(5)	500
	100	(10)	(10.2)	(G)	(221)	(0.5)	0.14	EEVTG1H101UP	(2)	EEETG1H101UP	(5)	500
	220	12.5	13.5	H13	600	0.23	0.14			EEVTG1H221Q	(2)	200
	330	12.5	13.5	H13	600	0.23	0.14			EEVTG1H331Q	(2)	200
	470	16	16.5	J16	900	0.15	0.14			EEVTG1H471M	(2)	125
	680	(16)	(16.5)	(J16)	(900)	(0.15)	0.14			EEVTG1H681UM	(2)	125
		18	16.5	K16	950	0.14	0.14			EEVTG1H681M	(2)	125
	1000	18	16.5	K16	950	0.14	0.14			EEVTG1H102M	(2)	125
63	10	8	6.2	E	55	2.2	0.12	EEVTG1J100P	(2)	EEETG1J100P	(5)	1000
	22	8	10.2	F	100	1	0.12	EEVTG1J220P	(2)	EEETG1J220P	(5)	500
	33	(8)	(10.2)	(F)	(100)	(1)	0.12	EEVTG1J330UP	(2)	EEETG1J330UP	(5)	500
		10	10.2	G	150	0.8	0.12	EEVTG1J330P	(2)	EEETG1J330P	(5)	500
	47	(8)	(10.2)	(F)	(100)	(1)	0.12	EEVTG1J470UP	(2)	EEETG1J470UP	(5)	500
		10	10.2	G	150	0.8	0.12	EEVTG1J470P	(2)	EEETG1J470P	(5)	500
	100	(10)	(10.2)	(G)	(150)	(0.8)	0.12	EEVTG1J101UP	(2)	EEETG1J101UP	(5)	500
		12.5	13.5	H13	350	0.26	0.12			EEVTG1J101Q	(2)	200
	220	12.5	13.5	H13	350	0.26	0.12			EEVTG1J221Q	(2)	200
	330	16	16.5	J16	500	0.18	0.12			EEVTG1J331M	(2)	125
	470	16	16.5	J16	500	0.18	0.12			EEVTG1J471M	(2)	125
80	10	8	10.2	F	70	1.3	0.12	EEVTG1K100P	(2)	EEETG1K100P	(5)	500
	22	(8)	(10.2)	(F)	(70)	(1.3)	0.12	EEVTG1K220UP	(2)	EEETG1K220UP	(5)	500
		10	10.2	G	90	1.0	0.12	EEVTG1K220P	(2)	EEETG1K220P	(5)	500
	33	(8)	(10.2)	(F)	(70)	(1.3)	0.12	EEVTG1K330UP	(2)	EEETG1K330UP	(5)	500
		10	10.2	G	90	1.0	0.12	EEVTG1K330P	(2)	EEETG1K330P	(5)	500
	47	(10)	(10.2)	(G)	(90)	(1.0)	0.12	EEVTG1K470UP	(2)	EEETG1K470UP	(5)	500
		12.5	13.5	H13	250	0.42	0.12			EEVTG1K470Q	(2)	200
	100	(12.5)	(13.5)	(H13)	(250)	(0.42)	0.12			EEVTG1K101UQ	(2)	200
		16	16.5	J16	350	0.3	0.12			EEVTG1K101M	(2)	125
	220	(16)	(16.5)	(J16)	(350)	(0.3)	0.12			EEVTG1K221UM	(2)	125
		18	16.5	K16	400	0.28	0.12			EEVTG1K221M	(2)	125
	330	(16)	(16.5)	(J16)	(350)	(0.3)	0.12			EEVTG1K331UM	(2)	125
		18	16.5	K16	400	0.28	0.12			EEVTG1K331M	(2)	125
	470	18	16.5	K16	400	0.28	0.12			EEVTG1K471M	(2)	125

An explanation of the taping dimensions can be found on page 84.
Reflow profiles can be found on page 86.
Endurance: 125°C 1000h - 2000h

Design and specifications are subject to change without notice. Ask factory for technical specifications before purchase and/or use.
Whenever a doubt about safety arises from this product, please contact us immediately for technical consultation.

■ Standard Products

W.V. (V)	Cap (±20%) (μF)	Case Size Dia. (mm)	Case Size Length (mm)	Case Size Size code	Specification Ripple current (100kHz) (+125°C) (mA)	Specification ESR (100kHz) (+20°C) (Ω)	Specification tan δ (120Hz) (+20°C)	Part No. (RoHS: not compliant)	Reflow	Part No. (RoHS: compliant)	Reflow	Min. Packaging Q'ty Taping (pcs)
100	10	8	10.2	F	70	1.3	0.1	EEVTG2A100P	(2)	EEETG2A100P	(5)	500
	22	(8)	(10.2)	(F)	(70)	(1.3)	0.1	EEVTG2A220UP	(2)	EEETG2A220UP	(5)	500
		10	10.2	G	90	1.0	0.1	EEVTG2A220P	(2)	EEETG2A220P	(5)	500
	33	10	10.2	G	90	1.0	0.1	EEVTG2A330P	(2)	EEETG2A330P	(5)	500
	47	12.5	13.5	H13	250	0.42	0.1			EEVTG2A470Q	(2)	200
	100	16	16.5	J16	350	0.3	0.1			EEVTG2A101M	(2)	125
	220	18	16.5	K16	400	0.28	0.1			EEVTG2A221M	(2)	125
	330	18	16.5	K16	400	0.28	0.1			EEVTG2A331M	(2)	125

An explanation of the taping dimensions can be found on page 84.
Reflow profiles can be found on page 86.
Endurance: 125°C 1000h - 2000h

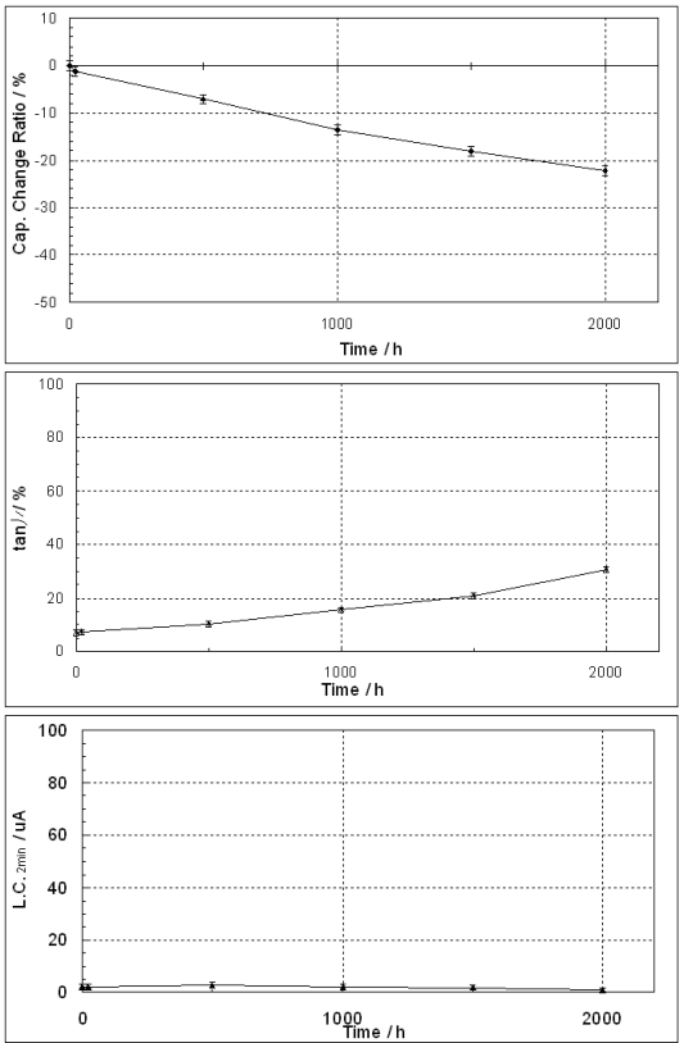
■ Frequency Correction Factor of Rated Ripple Current

	Frequency (Hz)			
	120	1k	10k	100k~
coefficient	0.65	0.85	0.95	1.00

Design and specifications are subject to change without notice. Ask factory for technical specifications before purchase and/or use.
Whenever a doubt about safety arises from this product, please contact us immediately for technical consultation.

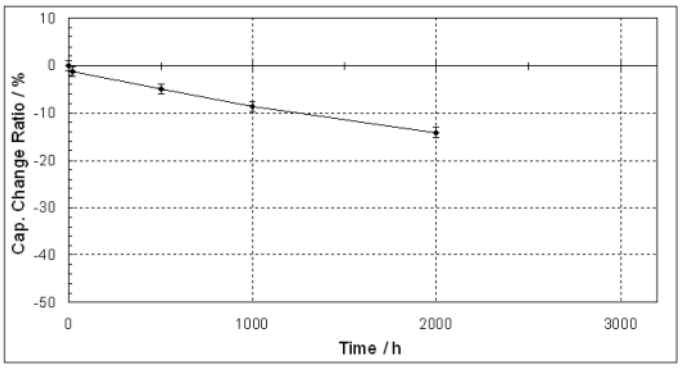
■ Endurance

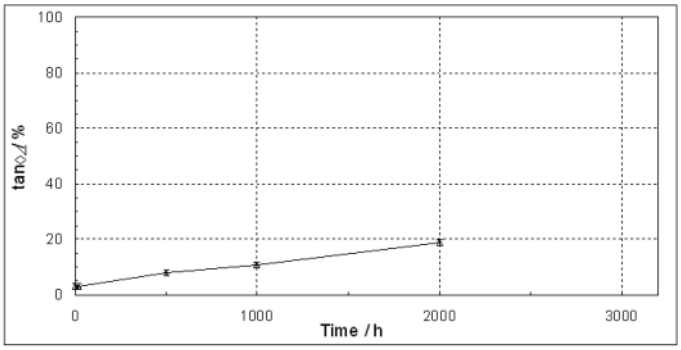
EEETG1E221UP (25V220uF, Dia.8x10)

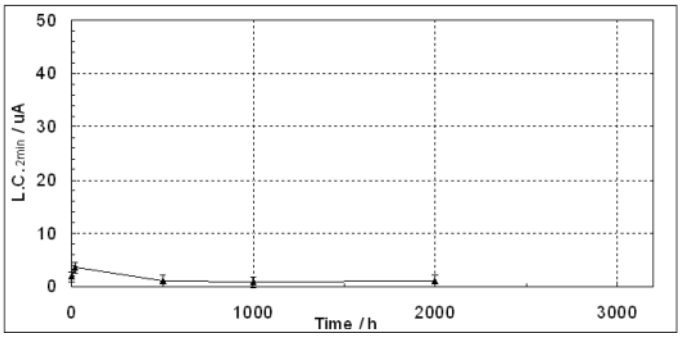


At 125C
Applied W.V.
n=10 each

EEVTG1V101P (35V100uF, Dia.10x10.2)





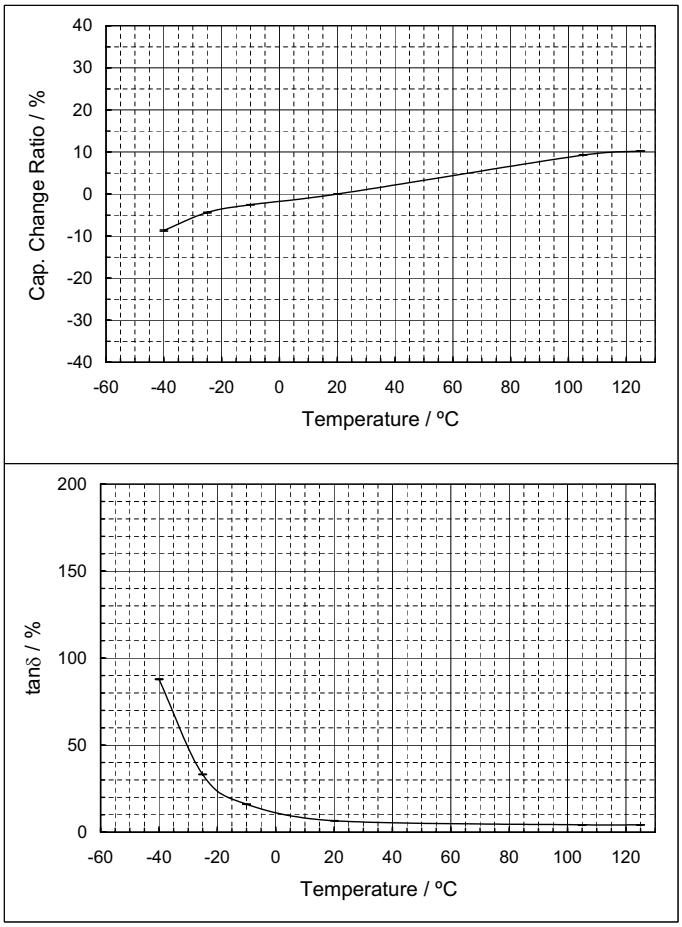


At 125C
Applied W.V.
n=10 each

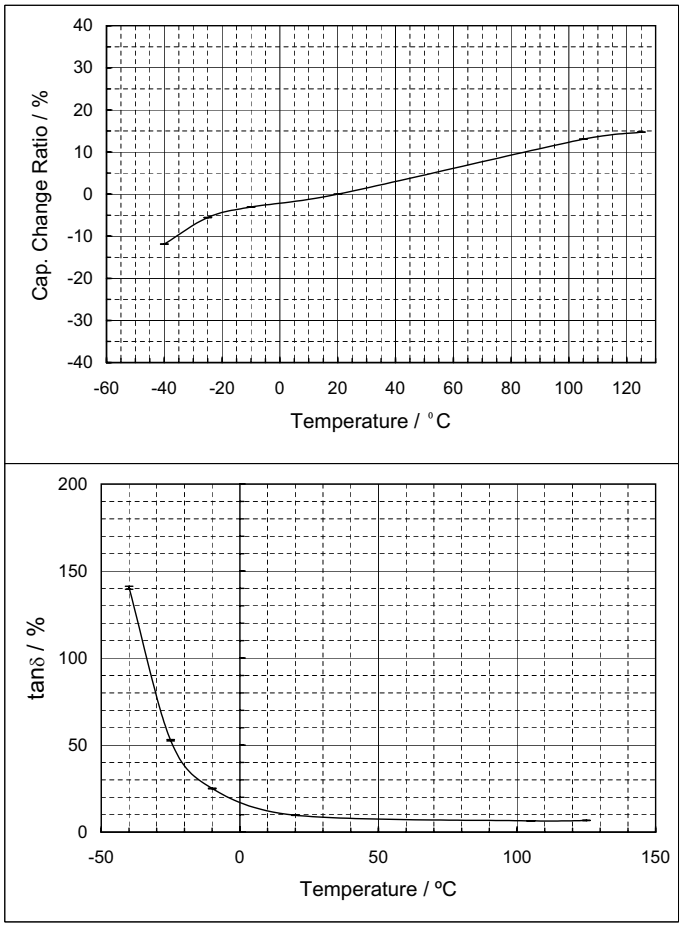
Design and specifications are subject to change without notice. Ask factory for technical specifications before purchase and/or use.
Whenever a doubt about safety arises from this product, please contact us immediately for technical consultation.

■ Temperature Characteristics

EEVTG1A101P (10V, 100μF, Dia. 8 x 6.2) n = 3



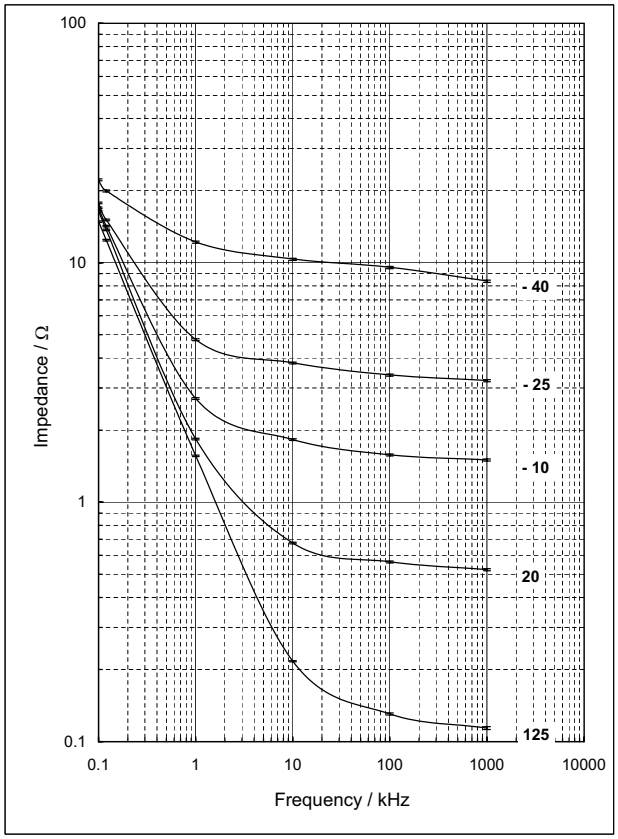
EEVTG1A471P (10V, 470μF, Dia. 10 x 10.2) n = 3



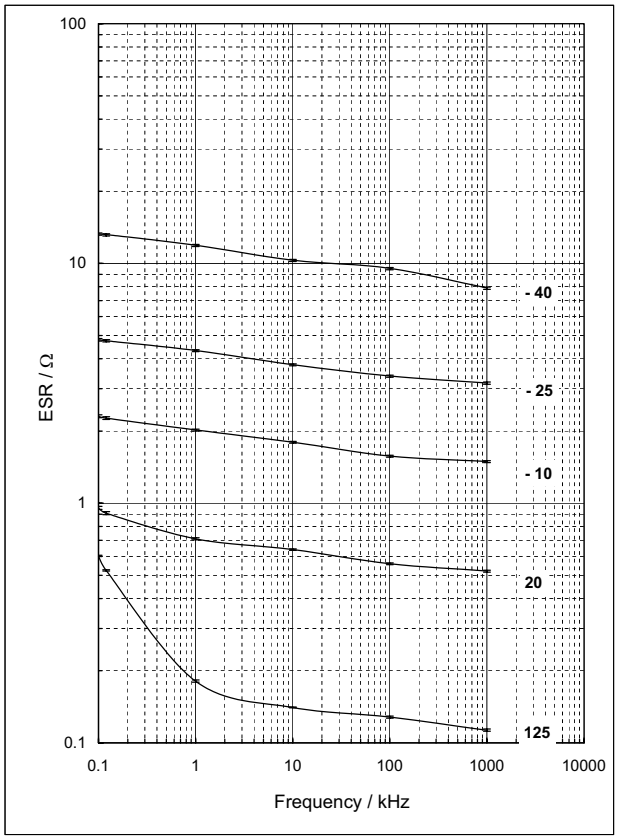
Design and specifications are subject to change without notice. Ask factory for technical specifications before purchase and/or use.
Whenever a doubt about safety arises from this product, please contact us immediately for technical consultation.

■ Temperature Characteristics

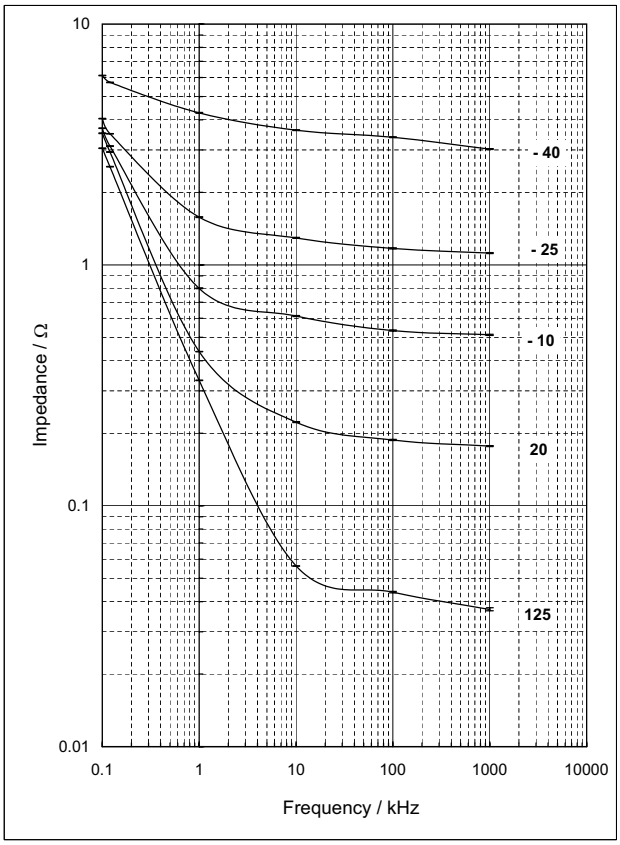
EEVTGK1A101P (10V, 100μF, Dia. 8 x 6.2) n = 3



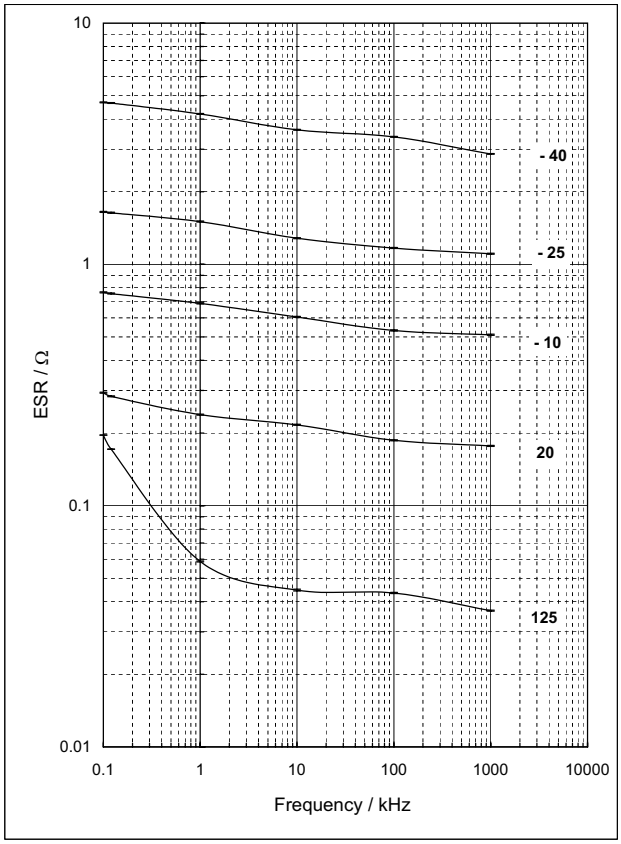
EEVTGK1A101P (10V, 100μF, Dia. 8 x 6.2) n = 3



EEVTG1A101P (10V, 100μF, Dia. 8 x 6.2) n = 3

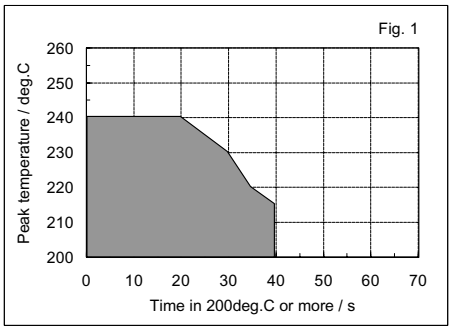


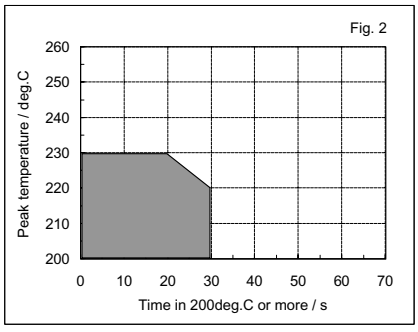
EEVTGK1A101P (10V, 100μF, Dia. 8 x 6.2) n = 3

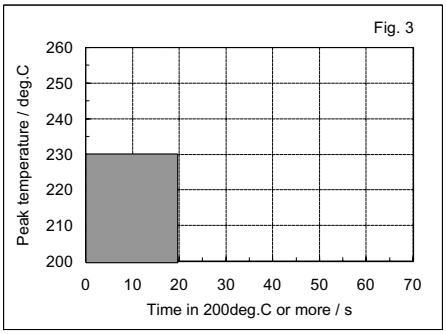


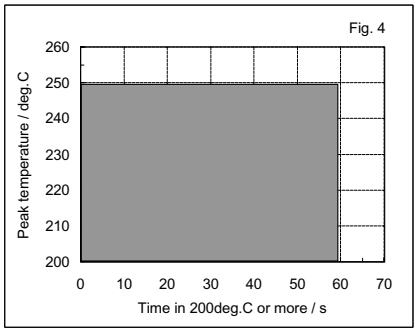
Design and specifications are subject to change without notice. Ask factory for technical specifications before purchase and/or use.
Whenever a doubt about safety arises from this product, please contact us immediately for technical consultation.

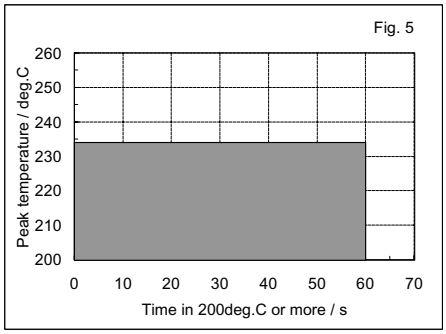
Pre-fix	Suffix	Case Diameter	RoHS Compliant	Terminal Finish	Reflow Condition		Reflow Chart
					Peak Temperature	Time above 200	
ECE-V	R	3mm to 5mm	No	Sn-Pb	240 for 5 seconds	20 seconds	(1) Fig.1
	P	6mm	No	Sn-Pb	240 for 5 seconds	20 seconds	(1) Fig.1
	P	8mm to 10mm	No	Sn-Pb	230 for 5 seconds	20 seconds	(2) Fig.2
EEV-	R	4mm to 5mm	No	Sn-Pb	240 for 5 seconds	20 seconds	(1) Fig.1
	P	6mm	No	Sn-Pb	240 for 5 seconds	20 seconds	(1) Fig.1
	P	8mm to 10mm	No	Sn-Pb	230 for 5 seconds	20 seconds	(2) Fig.2
	Q	12.5mm	Yes	Sn	230 for 5 seconds	20 seconds	(2) Fig.2 (Except for EB series)
							(3) Fig.3 (EB series only)
	M	16mm to 18mm	Yes	Sn	230 for 5 seconds	20 seconds	(2) Fig.2 (Except for EB series)
							(3) Fig.3 (EB series only)
EEE-	R	3mm to 5mm	Yes	Sn-Bi	250 for 5 seconds	60 seconds	(4) Fig.4
	P	6mm	Yes	Sn-Bi	250 for 5 seconds	60 seconds	(4) Fig.4
	P	8mm to 10mm	Yes	Sn-Bi	235 for 5 seconds	60 seconds	(5) Fig.5











Design and specifications are subject to change without notice. Ask factory for technical specifications before purchase and/or use.
Whenever a doubt about safety arises from this product, please contact us immediately for technical consultation.