GVM

Ultra-low Impedance, Small size.
Series

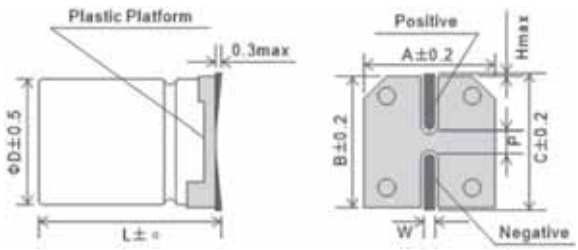
Features

105℃, 2000~5000 hours assured, Ultra-low Impedance.
Impedance 20~30% less than GVZ series.
Available for high density surface mounting.

Specifications

Item	Condition		Specifications							
Category Temperature Range(℃)	——		-55℃ ~ +105℃							
Capacitance Tolerance (%)	120Hz, 20℃		±20%							
Rated Voltage (v)	——		6.3	10	16	25	35	50		
Dissipation Factor (tanδ)	120Hz, 20℃ (Max.)	tanδ	0.26	0.18	0.16	0.14	0.12	0.10		
		Notes	Exceeding 1,000uF, +0.02 every 1,000uF							
Leakage Current (LC)	After 2 minutes, 20℃ (uA, Max.)		0.01CV or 3uA, whichever is greater.							
Low Temperature Characteristics	Impedance Ratio (Max.)	$Z_{-25℃}/Z_{+20℃}$	4	3	2	2	2	2	2	2
		$Z_{-55℃}/Z_{+20℃}$	8	5	4	3	3	3	3	3
Endurance	105℃, Rated Voltage Applied (With the rated ripple current)	Hours	5,000 (2,000hrs. for Ø4~Ø6.3)							
		△C/C	Within ±30% of initial value							
		tanδ	300% or less of the initial specified value							
		LC	The initial specified value or less							
Shelf life	105℃	Hours	1,000							
		Other Items	same as those for the endurance.							

Dimensions



D	L	A	B	C	P	α	W
4	5.7	4.3	4.3	5.0	1.0	±0.3	0.5-0.8
5	5.7	5.3	5.3	6.0	1.5	±0.3	0.5-0.8
6.3	5.7	6.6	6.6	7.3	2.0	±0.3	0.5-0.8
6.3	7.7	6.6	6.6	7.3	2.0	±0.3	0.5-0.8
8	10.5	8.3	8.3	9.0	3.1	±0.5	0.7-1.2
10	10.5	10.3	10.3	11.0	4.7	±0.5	0.7-1.2

Rated Ripple Current Multipliers

Frequency (Hz) / Capacitance (uF)	50	120	1k	10k	100K
Under 100	0.45	0.65	0.85	0.95	1.00
100 ~ 2200uF	0.50	0.70	0.90	0.95	1.00

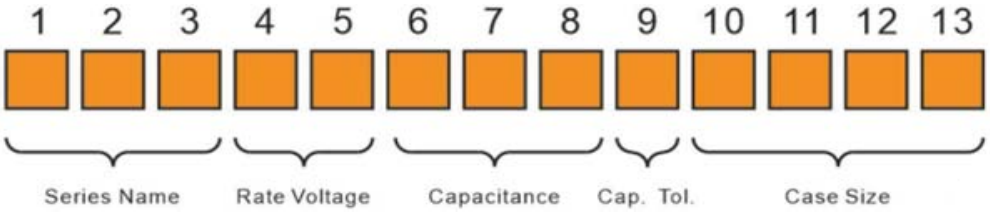
GVM Series

■ Dimensions

WV / uF	6.3v(0J)			10v(1A)			16v(1C)			25v(1E)			35v(1V)			50v(1H)		
	ΦDxL	Imp.	R.C.	ΦDxL	Imp.	R.C.	ΦDxL	Imp.	R.C.	ΦDxL	Imp.	R.C.	ΦDxL	Imp.	R.C.	ΦDxL	Imp.	R.C.
10																4x5.7 5x5.7	2.30 0.88	85 165
22													4x5.7	1.00	160	5x5.7	0.88	165
33													5x5.7	0.36	240	6.3x5.7	0.68	195
39										4x5.7	1.00	160	5x5.7	0.36	240	6.3x5.7	0.68	195
47										5x5.7	0.36	240	5x5.7	0.36	240	6.3x5.7	0.68	195
56							4x5.7	1.00	160	5x5.7	0.36	240	6.3x5.7	0.26	300	6.3x7.7	0.34	350
68				4x5.7	1.00	160	5x5.7	0.36	240	5x5.7	0.36	240	6.3x5.7	0.26	300	6.3x7.7	0.34	350
100				5x5.7	0.36	240	5x5.7	0.36	240	6.3x5.7	0.26	300	6.3x5.7	0.26	300	6.3x7.7	0.34	350
120	4x5.7	1.00	160	5x5.7	0.36	240	6.3x5.7	0.26	300	6.3x5.7	0.26	300	6.3x7.7	0.16	600	8x10.5	0.18	670
150	5x5.7	0.36	240	5x5.7	0.36	240	6.3x5.7	0.26	300	6.3x7.7	0.16	600	6.3x7.7	0.16	600	8x10.5	0.18	670
220	5x5.7	0.36	240	6.3x5.7	0.26	300	6.3x5.7	0.26	300	6.3x7.7	0.16	600	6.3x7.7 8x10.5	0.16 0.08	600 850	8x10.5	0.18	670
330	6.3x5.7	0.26	300	6.3x5.7	0.26	300	6.3x7.7	0.16	600	6.3x7.7 8x10.5	0.16 0.08	600 850	8x10.5	0.08	850	10x10.5	0.12	900
390	6.3x5.7	0.26	300	6.3x7.7	0.16	600	6.3x7.7	0.16	600	8x10.5	0.08	850	8x10.5	0.08	850			
470	6.3x5.7	0.26	300	6.3x7.7	0.16	600	6.3x7.7 8x10.5	0.16 0.08	600 850	8x10.5	0.08	850	8x10.5 10x10.5	0.08 0.06	850 1190			
560	6.3x7.7	0.16	600	6.3x7.7	0.16	600	8x10.5	0.08	850	8x10.5	0.08	850	10x10.5	0.06	1190			
680	6.3x7.7	0.16	600	6.3x7.7 8x10.5	0.16 0.08	600 850	8x10.5	0.08	850	10x10.5	0.06	1190	10x10.5	0.06	1190			
820	6.3x7.7 8x10.5	0.16 0.08	600 850	8x10.5	0.08	850	8x10.5	0.08	850	10x10.5	0.06	1190						
1000	8x10.5	0.08	850	8x10.5	0.08	850	10x10.5	0.06	1190	10x10.5	0.06	1190						
1200	8x10.5	0.08	850	8x10.5	0.08	850	10x10.5	0.06	1190									
1500	8x10.5	0.08	850	10x10.5	0.06	1190	10x10.5*	0.06	1190									
1800	10x10.5	0.06	1190	10x10.5	0.06	1190												
2200	10x10.5	0.06	1190															

Note1: Case size ΦD x L(mm), ripple current (mA, rms) at 105℃, 120Hz.
Note2: Produce custom product too, which are not found in these tables.

■ 编码规则表



(1-3)

Series
GVS
GVT
GVE
GVZ
GVM
GVL
GVU
GVY
GVF
GVR
GVG
GVD
GVP
GVT
GVC
GVN
GVK
GVA

(4-5)

Voltage (W.V)	Code
4	0G
6.3	0J
10	1A
16	1C
25	1E
35	1V
50	1H
63	1J
80	1K
100	2A
125	2B
160	2C
180	2Z
200	2D
220	2P
250	2E
315	2F
330	2L
350	2V
400	2G
420	2Q
450	2W
500	2H

(6~8)

Capacitance (mF)	Code
0.1	0R1
0.22	0R22
0.33	0R33
0.47	0R47
1	1R0
2.2	2R2
3.3	3R3
4.7	4R7
10	100
22	220
33	330
47	470
68	680
100	101
220	221
330	331
470	471
680	681
1000	102
2200	222
3300	332
4700	472
6800	682

(9)

Cap. Tolerance (%)	Code
+5 -5	J
+10 -10	K
+15 -15	L
+20 -20	M
+30 -30	N
+20 -10	V
+30 -10	Q
+50 -10	T
+50 -20	S
+80 -20	Z
+20 -0	R

(10~13)

Size ΦDxL	Code
4x5(5.7)	0405
4x7	0407
5x5(5.7)	0505
5x7	0507
5x11	0511
6.3x5(5.7)	0605
6.3x7(7.7)	0607
6.3x11	0611
8x5	0805
8x6.5	0806
8x9	0809
8x10(10.5)	0810
8x11(11.5)	0811
8x12	0812
10x10(10.5)	1010
10x12.5	1012
10x14	1014
12.5x13.5	1213
12.5x16	1216
16x16.5	1616
16x25	1625
20x25	2025
35x42	3542

Taping Specifications

Carrier Tape

Fig.01

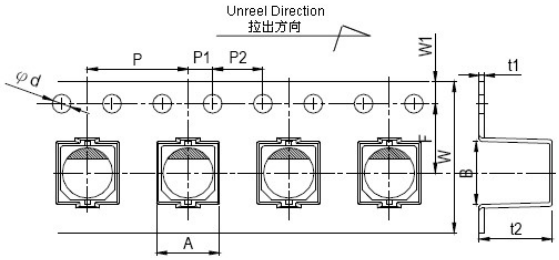


Fig.02

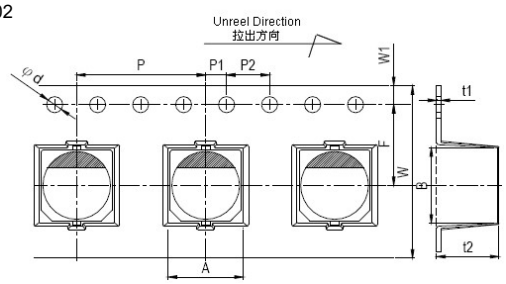
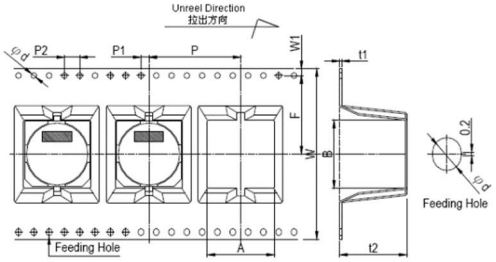
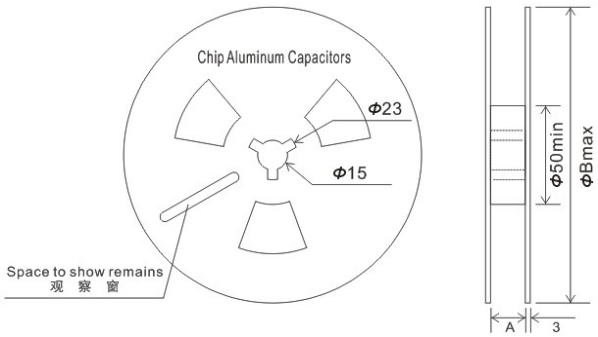


Fig.03



Case Size	W (mm)	W1 (mm)	F (mm)	P (mm)	P1 (mm)	P2 (mm)	A (mm)	B (mm)	t1 (mm)	t2 (mm)
Φ4x5.7	12	1.75	5.5	8	2	4	4.7	4.7	0.4	6.3
Φ5x5.7	12		5.5	12			6	6		6.3
Φ6.3x4.5	16		7.5	12			7	7		4.8
Φ6.3x5.2~5.7	16		7.5	12			7	7		6.3
Φ6.3x7.0	16		7.5	12			7	7		6.8
Φ6.3x7.7	16		7.5	12			7	7		8.3
Φ6.3x8.7	16		7.5	12			7	7		9.3
Φ8x10.5	24		11.5	16			8.7	8.7		11.0
Φ10x10.5	24		11.5	16			10.7	10.7		11.0
Φ10x12.5	24		11.5	16			10.7	10.7		13.1
Φ12.5x13.5	32		14.2	24			14	14	0.5	14.5
Φ12.5x16	32		14.2	24			14	14		17.0
Φ16x16.5	44		20.2	28			17.5	17.5		17.5
Φ16x21.5	44		20.2	28			17.5	17.5		23.0
Tolerance	±0.3	±0.15	±0.1	±0.1	±0.1	±0.1	±0.2	±0.2	±0.1	±0.2

Reel & Package Quantity



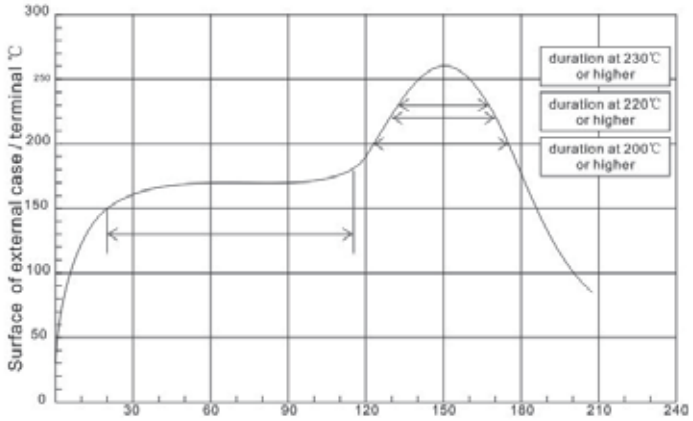
Case Size	Reel	Carton	A±0.3	B±2	Case Size	Reel	Carton	A±0.3	B±2
Φ4x5.7	2000	20000	14	382	Φ8x10.5	500	5000	26	382
Φ5x5.7	1250	12500	14	382	Φ8x12.5	500	5000	26	382
Φ6.3x4.5	1500	15000	18	382	Φ10x10.5	500	5000	26	382
Φ6.3x5.2	1250	12500	18	382	Φ10x12.5	500	5000	26	382
Φ6.3x5.7	1250	12500	18	382	Φ12.5x13.5	250	750	34	332
Φ6.3x7.0	1000	10000	18	382	Φ12.5x16.5	200	600	34	332
Φ6.3x7.7	1000	10000	18	382	Φ16x16.5	200	600	34	332
Φ6.3x8.7	700	7000	18	382	Φ16x21.5	200	600	34	332

■ Reflow Soldering Conditions

■ Recommended soldering heat conditions

1. The following conditions are recommended for air convection and infrared reflow soldering on the SMD products onto a glass epoxy circuit boards by cream solder. The temperatures shown are the surface temperature values on the top of the can and on the capacitor terminals.
2. Reflow should be performed twice or less.
3. Please ensure that the capacitor became cold enough to the room temperature (5 to 35℃) before the second reflow.

■ Classification Reflow Profile

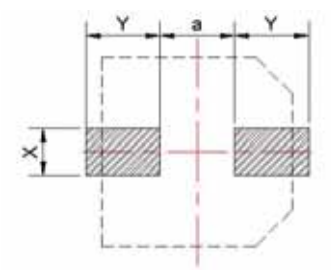


Notice:

1. Average ramp-up rate is 5℃/second max.
2. Ramp-down rate is 6℃/second max.
3. Time from 25℃ to peak temperature is 6 minutes max.

	Preheat	Time maintained above 200℃	Time maintained above 220℃	Time maintained above 230℃	Peak temp.	Reflow number
Dia. 4~10mm general	120℃ to 180℃ 120 sec. Max.	60 sec.	50 sec.	30 sec.	250℃ Max.	2 times or less
Φ8x6.5		50 sec.	40 sec.	25 sec.	245℃ Max.	2 times or less
WV 160v-450v		60 sec.	50 sec.	30 sec.	240℃ Max.	2 times or less
Dia. 12.5~20mm Cap.		60 sec.	40 sec.	30 sec.	240℃ Max.	2 times or less
125℃ Category Temp.		60 sec.	40 sec.	30 sec.	250℃ Max.	2 times or less

■ Recommended Solder Land Size on PC Board



Size	X	Y	a
Φ4	1.6	2.6	1.0
Φ5	1.6	3.0	1.4
Φ6.3	1.6	3.5	2.1
Φ8x6.5	1.6	4.5	2.1
Φ8x10.5	2.5	3.5	3.0
Φ10	2.5	4.0	4.0
Φ12.5	3.0	5.7	4.0
Φ16	3.5	6.5	6.0

■ Correspondence to Environment

We always considers the environment in product materials, designs and manufacturing. Cadmium, Mercury, Hexavalent Chromium, PBB and PBDE have never been used in our products. Furthermore, lead-containing materials have been eliminated from all our aluminum electrolytic capacitors including Conductive Polymer Aluminum Solid Capacitors to comply with RoHS. If you need "Halogen-Free" products, please consult with us.

❶ RoHS Compliance RoHS

All capacitors comply with RoHS directive (2011/65/EU)

Lead (Pb)	≤1,000ppm
Mercury (Hg)	≤1,000ppm
Cadmium (Cd)	≤100ppm
Hexavalent Chromium (Cr^{6+})	≤1,000ppm
Polybrominated Biphenyls (PBBs)	≤1,000ppm
Polybrominated Diphenyl Ethers (PBDEs)	≤1,000ppm

❷ Lead-free Compliance

All complete parts and homogenous materials of capacitors are lead-free.

❸ Halogen-free Compliance

The products identified in the catalogue, and their homogeneous subcomponents, do not contain any of the following substances in concentrations greater than the listed maximum limits.

The content percentage of chlorine (Cl)	≤900ppm
The content percentage of bromine (Br)	≤900ppm
The content percentage of chlorine (Cd) and bromine (Br) (Cl+Br)	≤1,500ppm

❹ Regarding compliance for EU REACH Regulation

1). According to the content of REACH handbook (Guidance on requirements for substances in articles which is published on May 2008), our electronic components are "articles without any intended release". Therefore they are not applicable for "Registration" for EU REACH Regulation Article 7 (1).

Reference: Electrolytic Condenser Investigation Society "Study of REACH Regulation in EU about Electrolytic Capacitor" (publicized on 13 March 2008)

2). We develops the products without substance of very high concern (SVHC- Substances of Very High Concern).

❺ Non-PVC Products

Category		Sleeve Material
Conductive polymer Aluminum Solid Capacitors	Chip	Sleeveless
	Radial	Sleeveless
Aluminum Electrolytic Capacitors	Chip	Sleeveless
	Radial	PVC or PET
	Snap-in	
	Screw Mount	PVC

※: Identification of friendly parts is given by a sleeve code (14th digit) of the part number. For details, please refer to "Product code guide" for each type.