

GVM Ultra-low Impedance, Small size. Series



Features

105°C, 2000~5000 hours assured, Ultra-low Impedance.

Impedance 20~30% less than GVZ series.

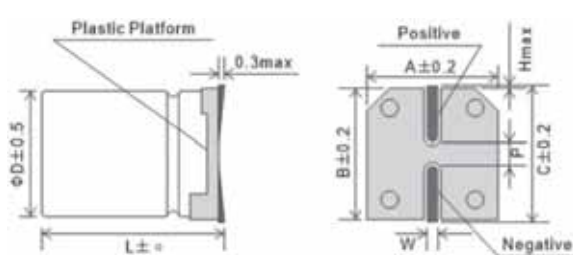
Available for high density surface mounting.



Specifications

Item	Condition		Specifications						
Category Temperature Range(°C)	—		-55°C ~ +105°C						
Capacitance Tolerance (%)	120Hz, 20°C		±20%						
Rated Voltage (V)	—		6.3	10	16	25	35	50	
Dissipation Factor (tanδ)	120Hz, 20°C (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°C (uA, Max.)		0.01CV or 3uA, whichever is greater.						
Low Temperature Characteristics	Impedance Ratio (Max.)	Z _{-25°C} /Z _{+20°C}	4	3	2	2	2	2	2
		Z _{-55°C} /Z _{+20°C}	8	5	4	3	3	3	3
Endurance	105°C, Rated Voltage Applied (With the rated ripple current)	Hours	5,000 (2,000hrs. for Ø4~Ø6.3)						
		ΔC/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°C	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

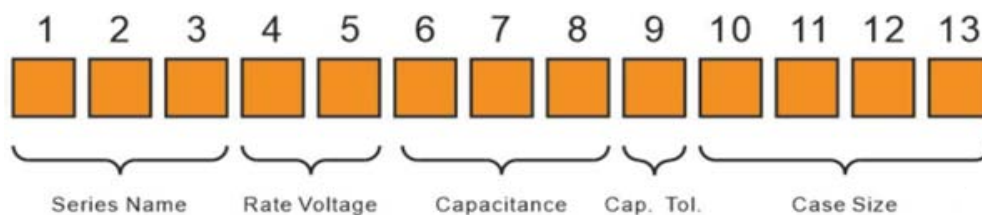
■ Dimensions

uF \ WV	6.3v(0J)			10v(1A)			16v(1C)			25v(1E)			35v(1V)			50v(1H)		
	$\Phi D \times L$	Imp.	R.C.	$\Phi D \times L$	Imp.	R.C.	$\Phi D \times L$	Imp.	R.C.	$\Phi D \times L$	Imp.	R.C.	$\Phi D \times L$	Imp.	R.C.	$\Phi D \times L$	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 $\Phi D \times L$ (mm), ripple current (mA, rms) at 105°C, 120Hz.

Note2: Produce custom product too, which are not found in these tables.

■ 编码规则表



(1-3)	(4-5)		(6-8)		(9)	(10-13)		
Series	Voltage (W.V)	Code	Capacitance (mF)	Code	Cap. Tolerance (%)	Code	Size ϕ D x L	Code
GVS	4	0G	0.1	0R1	+5	J	4x5(5.7)	0405
GVT	6.3	0J	0.22	0R22	-5		4x7	0407
GVE	10	1A	0.33	0R33	+10	K	5x5(5.7)	0505
GVZ	16	1C	0.47	0R47	-10		5x7	0507
GVM	25	1E	1	1R0	+15	L	5x11	0511
GVL	35	1V	2.2	2R2	-15		6.3x5(5.7)	0605
GVU	50	1H	3.3	3R3	+20	M	6.3x7(7.7)	0607
GVY	63	1J	4.7	4R7	-20		6.3x11	0611
GVF	80	1K	10	100	+30	N	8x5	0805
GVR	100	2A	22	220	-30		8x6.5	0806
GVG	125	2B	33	330	+20	V	8x9	0809
GVD	160	2C	47	470	-10		8x10(10.5)	0810
GVP	180	2Z	68	680	+30	Q	8x11(11.5)	0811
GVT	200	2D	100	101	-10		8x12	0812
GVC	220	2P	220	221	+50	T	10x10(10.5)	1010
GVN	250	2E	330	331	-10		10x12.5	1012
GVK	315	2F	470	471	+50	S	10x14	1014
GVA	330	2L	680	681	-20		12.5x13.5	1213
	350	2V	1000	102	+80	Z	12.5x16	1216
	400	2G	2200	222	-20		16x16.5	1616
	420	2Q	3300	332	+20	R	16x25	1625
	450	2W	4700	472	-0		20x25	2025
	500	2H	6800	682			35x42	3542

Taping Specifications

Carrier Tape

Fig.01

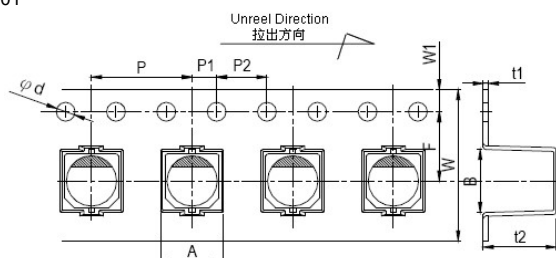


Fig.02

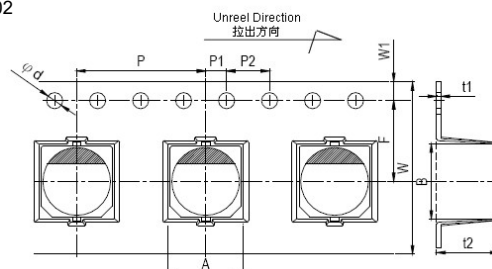
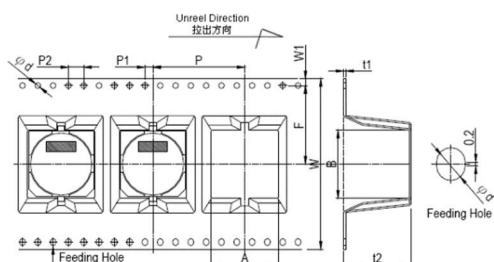
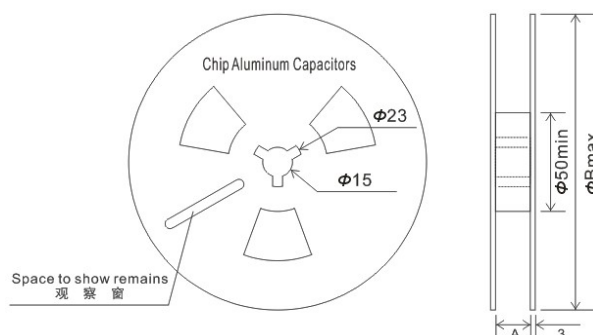


Fig.03



Case Size	W (mm)	W1 (mm)	F (mm)	P (mm)	P1 (mm)	P2 (mm)	A (mm)	B (mm)	t1 (mm)	t2 (mm)
$\phi 4 \times 5.7$	12	1.75	5.5	8	2	4	4.7	4.7	0.4	6.3
$\phi 5 \times 5.7$	12		5.5	12			6	6		6.3
$\phi 6.3 \times 4.5$	16		7.5	12			7	7		4.8
$\phi 6.3 \times 5.2 \sim 5.7$	16		7.5	12			7	7		6.3
$\phi 6.3 \times 7.0$	16		7.5	12			7	7		6.8
$\phi 6.3 \times 7.7$	16		7.5	12			7	7		8.3
$\phi 6.3 \times 8.7$	16		7.5	12			7	7	0.5	9.3
$\phi 8 \times 10.5$	24		11.5	16			8.7	8.7		11.0
$\phi 10 \times 10.5$	24		11.5	16			10.7	10.7		11.0
$\phi 10 \times 12.5$	24		11.5	16			10.7	10.7		13.1
$\phi 12.5 \times 13.5$	32		14.2	24			14	14		14.5
$\phi 12.5 \times 16$	32		14.2	24			14	14		17.0
$\phi 16 \times 16.5$	44	1.75	20.2	28	2	4	17.5	17.5	0.5	17.5
$\phi 16 \times 21.5$	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



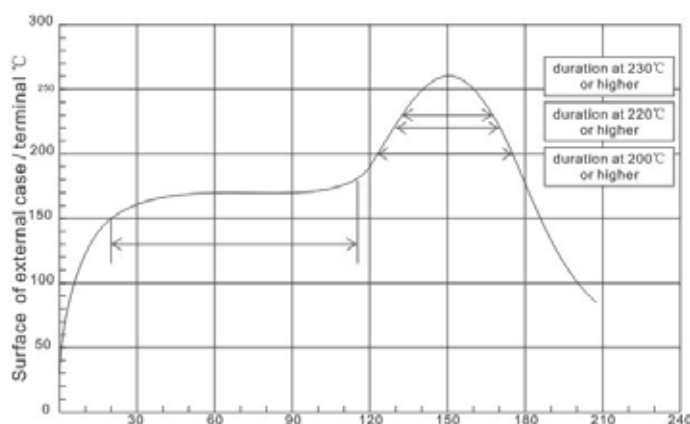
Case Size	Reel	Carton	A ± 0.3	B ± 2	Case Size	Reel	Carton	A ± 0.3	B ± 2
$\phi 4 \times 5.7$	2000	20000	14	382	$\phi 8 \times 10.5$	500	5000	26	382
$\phi 5 \times 5.7$	1250	12500	14	382	$\phi 8 \times 12.5$	500	5000	26	382
$\phi 6.3 \times 4.5$	1500	15000	18	382	$\phi 10 \times 10.5$	500	5000	26	382
$\phi 6.3 \times 5.2$	1250	12500	18	382	$\phi 10 \times 12.5$	500	5000	26	382
$\phi 6.3 \times 5.7$	1250	12500	18	382	$\phi 12.5 \times 13.5$	250	750	34	332
$\phi 6.3 \times 7.0$	1000	10000	18	382	$\phi 12.5 \times 16.5$	200	600	34	332
$\phi 6.3 \times 7.7$	1000	10000	18	382	$\phi 16 \times 16.5$	200	600	34	332
$\phi 6.3 \times 8.7$	700	7000	18	382	$\phi 16 \times 21.5$	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°C) before the second reflow.

■ Classification Reflow Profile

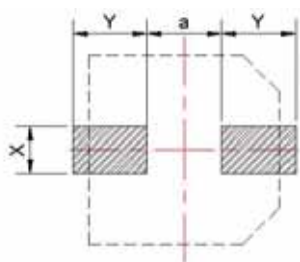


Notice:

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

	Preheat	Time maintained above 200°C	Time maintained above 220°C	Time maintained above 230°C	Peak temp.	Reflow number
Dia. 4~10mm general	120°C to 180°C 120 sec. Max.	60 sec.	50 sec.	30 sec.	250°C Max.	2 times or less
φ8x6.5		50 sec.	40 sec.	25 sec.	245°C Max.	2 times or less
WV 160v-450v		60 sec.	50 sec.	30 sec.	240°C Max.	2 times or less
Dia. 12.5~20mm Cap.		60 sec.	40 sec.	30 sec.	240°C Max.	2 times or less
125°C Category Temp.		60 sec.	40 sec.	30 sec.	250°C 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.

① 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

② Lead-free Compliance

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

③ 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

④ 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).

⑤ 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.