

VGLR · Screw-Terminal · 12000 h/105 °C

Long Life · High Ripple Current · Bottom cooling design · Low ESR

> Specifications · Spezifikationen

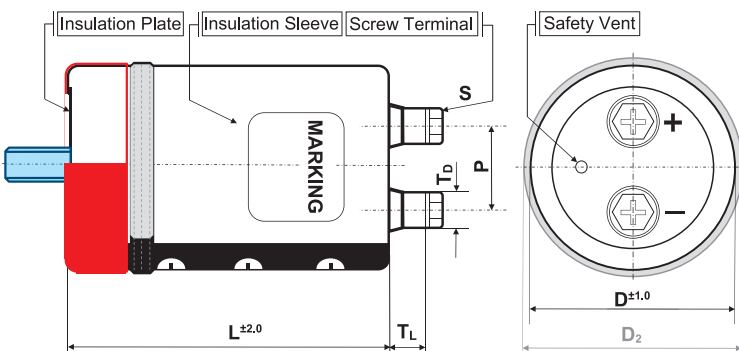
Items	Characteristics
Temperature range	-40°C ~ + 105°C
Capacitance tolerance (at 20°C)	Standard +/- 20%, -10/+30% on request
Surge voltage / Ripple voltage	Repetitive max. 30 sec per 6 Minutes / ≤ 50V
Leakage current max. I _L (20°C, 5 min)	0.01 • C • V _r [μA] or 5 mA, which is smaller.
Useful life	12 000 hours at 105°C
Field failure rate	0.5 FIT = 0.5 • 10 ⁻⁹ Failures/hour
RoHS conform	Directive 2011/65/EU & (EU)2015/863
Specification / Vibration	JIS C 5101-4/0.75mm, 10...55Hz, 10g, 3x2h
Outer materials	UL94-V0/UL224-VW1 certified (cap/sleeve)
Sleeve withstanding voltage	4000 Vac / 1min between terminals bundled and plate*

* Typical value



> Shape designation · Formbezeichnung

- for details refer to p. 8–9 · technische Details siehe S. 8–9
- for mounting options refer to p. 149 ff · Montageoptionen siehe S. 149 ff



	B	I/Y	N	N+WC
outer sleeve	•	•	•	•
insulation plate	•	•	•	
stud bolt	•			
bottom double sleeve		•		
integrated seating ring				•

ØD	available shape	P	S	T _L	T _D	Cap material
64	B, N, I, Y	28.6	M5x10	8.0	11	PH
77	B, N, I, Y, WC	31.5	M6x12	9.0	12	PH
90	B, N, I, Y, WC	31.5	M6x12	8.0	12	PH

Size in mm

> Product Code · Bestellbezeichnung

Example: Series VGLR · 12000 μF +/- 20 % · 400 V · D=90 mm · L=190 mm for bottom cooling

VGLR	2G	123	N	F	190 WC											
Type of series	Capacitance code The first two digits are significant. The last digit indicates the number of following zeros in μF.		Fixing symbol code B : Bolt N : single outer sleeve I : 2 Stoppers Bracket Y : 3 Stoppers Bracket N + suffix WC: blank bottom + seating ring	Case code diameter	Specific features											
Rated voltage code				<table border="1"> <thead> <tr> <th>ØD</th> <th>Code</th> </tr> </thead> <tbody> <tr> <td>64</td> <td>D</td> </tr> <tr> <td>77</td> <td>E</td> </tr> <tr> <td>90</td> <td>F</td> </tr> </tbody> </table>	ØD	Code	64	D	77	E	90	F	Case Code length Length in mm (3 digits)			
ØD	Code															
64	D															
77	E															
90	F															
<table border="1"> <thead> <tr> <th>Code</th> <th>Voltage</th> <th>Code</th> <th>Voltage</th> </tr> </thead> <tbody> <tr> <td>2V</td> <td>350</td> <td>2W</td> <td>450</td> </tr> <tr> <td>2G</td> <td>400</td> <td>2H</td> <td>500</td> </tr> </tbody> </table>	Code	Voltage	Code	Voltage	2V	350	2W	450	2G	400	2H	500	Capacitance tolerance Ø : ± 20 % Q : -10 % ~ + 30 %			
Code	Voltage	Code	Voltage													
2V	350	2W	450													
2G	400	2H	500													

VGLR · Screw-Terminal · 12000 h/105 °C

Rated VoltageCode (Surge Voltage) V_r [V DC]	Capacitance C_r [μF]	Ripple Current at 105°C/120Hz I_r [A RMS]	Ripple Current at 40°C/120Hz [A RMS]	ESR (typ) at 20°C/100Hz [mΩ]	Zmax at 20°C/10kHz [mΩ]	ESL (typ) [nH]	Dissipation Factor at 20°C/120Hz Tan δ	DxL [mm]	Product Code # = variable value, see fixing code in the product code
350 VDC Code: 2V Surge Voltage 400 VDC	3 300	15.1	34.7	16	19	18	0.20	64x107	VGLR2V332#D107
	3 900	16.8	38.6	14	16	18	0.20	64x123	VGLR2V392#D123
	4 700	18.2	41.9	11	13	18	0.20	64x147	VGLR2V472#D147
		20.6	47.4	11	13	20	0.20	77x108	VGLR2V472#E108
	5 600	20.3	46.7	10	11	18	0.20	64x164	VGLR2V562#D164
		23.1	53.1	10	11	20	0.20	77x124	VGLR2V562#E124
	6 800	22.6	52.0	8	10	18	0.20	64x187	VGLR2V682#D187
		24.9	57.3	8	10	20	0.20	77x148	VGLR2V682#E148
		28.6	65.8	8	10	20	0.20	90x110	VGLR2V682#F110
	8 200	27.9	64.2	7	8	20	0.20	77x165	VGLR2V822#E165
		31.0	71.3	7	8	20	0.20	90x150	VGLR2V822#F150
	10 000	31.0	71.3	5	7	20	0.20	77x188	VGLR2V103#E188
		34.2	78.7	5	7	20	0.20	90x150	VGLR2V103#F150
	12 000	35.1	80.7	5	5	20	0.20	77x228	VGLR2V123#E228
36.8		84.6	5	5	20	0.20	90x167	VGLR2V123#F167	
15 000	41.5	95.5	4	5	20	0.20	90x190	VGLR2V153#F190	
18 000	44.3	101.9*	3	4	20	0.20	90x230	VGLR2V183#F230	
400 VDC Code: 2G Surge Voltage 450 VDC	2 700	13.6	31.3	20	23	18	0.20	64x107	VGLR2G272#D107
	3 300	15.5	35.7	16	19	18	0.20	64x123	VGLR2G332#D123
	3 900	16.5	38.0	14	16	18	0.20	64x147	VGLR2G392#D147
		18.8	43.2	14	16	20	0.20	77x108	VGLR2G392#E108
	4 700	18.6	42.8	11	13	18	0.20	64x164	VGLR2G472#D164
		21.2	48.8	11	13	20	0.20	77x124	VGLR2G472#E124
	5 600	20.5	47.2	10	11	18	0.20	64x187	VGLR2G562#D187
		22.6	52.0	10	11	20	0.20	77x148	VGLR2G562#E148
		26.0	59.8	10	11	20	0.20	90x110	VGLR2G562#F110
	6 800	24.9	57.3	8	10	20	0.20	77x148	VGLR2G682#E148
		25.4	58.4	8	10	20	0.20	77x165	VGLR2G682#E165
	8 200	28.2	64.9	8	10	20	0.20	90x150	VGLR2G682#F150
		28.1	64.6	7	8	20	0.20	77x188	VGLR2G822#E188
		31.0	71.3	7	8	20	0.20	90x150	VGLR2G822#F150
10 000	32.0	73.6	5	7	20	0.20	77x228	VGLR2G103#E228	
	33.6	77.3	5	7	20	0.20	90x167	VGLR2G103#F167	
12 000	37.1	85.3	5	5	20	0.20	90x190	VGLR2G123#F190	
15 000	40.4	92.9	4	5	20	0.20	90x230	VGLR2G153#F230	
450 VDC Code: 2W Surge Voltage 500 VDC	2 200	12.6	29.0	24	28	18	0.20	64x107	VGLR2W222#D107
		14.9	34.3	24	28	18	0.20	77x77	VGLR2W222#E077
	2 700	14.4	33.1	20	23	18	0.20	64x123	VGLR2W272#D123
		16.1	37.0	20	23	20	0.20	77x108	VGLR2W272#E108
	3 300	15.6	35.9	16	19	18	0.20	64x147	VGLR2W332#D147
		18.5	42.6	16	19	20	0.20	77x108	VGLR2W332#E108
		18.2	41.9	16	19	20	0.20	77x124	VGLR2W332#E124
	3 900	17.5	40.3	14	16	18	0.20	64x164	VGLR2W392#D164
19.4		44.6	14	16	20	0.20	77x148	VGLR2W392#E148	
22.3		51.3	14	16	20	0.20	90x110	VGLR2W392#F110	

Additional designs on request · Weitere Designs auf Anfrage

Rated VoltageCode (Surge Voltage) V_r [V DC]	Capacitance C_r [μ F]	Ripple Current at 105°C/120Hz I_r [A RMS]	Ripple Current at 40°C/120Hz [A RMS]	ESR (typ) at 20°C/100Hz [m Ω]	Zmax at 20°C/10kHz [m Ω]	ESL (typ) [nH]	Dissipation Factor at 20°C/120Hz Tan δ	DxL [mm]	Product Code # = variable value, see fixing code in the product code
450 VDC Code: 2W Surge Voltage 500 VDC	4 700	19.3	44.4	11	13	18	0.20	64x187	VGLR2W472#D187
		21.3	49.0	11	13	20	0.20	77x148	VGLR2W472#E148
		24.2	55.7	11	13	20	0.20	90x126	VGLR2W472#F126
	5 600	23.7	54.5	10	11	20	0.20	77x165	VGLR2W562#E165
		26.3	60.5	10	11	20	0.20	90x150	VGLR2W562#F150
	6 800	26.3	60.5	8	10	20	0.20	77x188	VGLR2W682#E188
		28.5	65.6	8	10	20	0.20	90x167	VGLR2W682#F167
	8 200	29.8	68.5	7	8	20	0.20	77x228	VGLR2W822#E228
		31.5	72.5	7	8	20	0.20	90x190	VGLR2W822#F190
	10 000	33.9	78.0	5	7	20	0.20	90x230	VGLR2W103#F230
500 VDC Code: 2H Surge Voltage 550 VDC	1 500	8.4	19.3	38	45	18	0.20	64x107	VGLR2H152#D107
	1 800	9.5	21.9	32	38	18	0.20	64x123	VGLR2H182#D123
		10.3	23.7	26	31	18	0.20	64x147	VGLR2H222#D147
	2 200	11.7	26.9	26	31	20	0.20	77x108	VGLR2H222#E108
		11.8	27.1	22	26	18	0.20	64x187	VGLR2H272#D187
	2 700	13.3	30.6	22	26	20	0.20	77x124	VGLR2H272#E124
		14.4	33.1	18	21	18	0.20	77x148	VGLR2H332#E148
	3 300	16.5	38.0	18	21	20	0.20	90x110	VGLR2H332#F110
		15.9	36.6	15	16	20	0.20	77x165	VGLR2H392#E165
	3 900	17.8	40.9	15	16	20	0.20	90x126	VGLR2H392#F126
		17.6	40.5	13	13	20	0.20	77x188	VGLR2H472#E188
	4 700	19.4	44.6	13	13	20	0.20	90x150	VGLR2H472#F150
		19.8	45.5	11	11	20	0.20	77x228	VGLR2H562#E228
	5 600	20.8	47.8	11	11	20	0.20	90x167	VGLR2H562#F167
		23.1	53.1	9	11	20	0.20	90x190	VGLR2H682#F190
	6 800	24.2	55.7	9	10	20	0.20	90x190	VGLR2H752#F190
7 500	24.2	55.7	9	10	20	0.20	90x190	VGLR2H752#F190	
8 200	24.7	56.8	8	9	20	0.20	90x230	VGLR2H822#F230	

* Please contact us if load condition exceeds terminals related $I_{r,max}$ referred on page 9

Additional designs on request · Weitere Designs auf Anfrage

> Ripple Current Multiplier · Wechselstrommultiplikator

Frequency [Hz]	50/60	120	300	1k	$\geq 10k$	Forced cooling [m/sec]	$v < 0.5$	$v \geq 0.5$	$v \geq 2.0$	$v \geq 3.0$
Multiplier	0.80	1.00	1.18	1.34	1.45	Multiplier	1.00	1.10	1.20	1.25

Ta (°C)	40	50	60	65	70	75	80	85	90	95	100	105
Multiplier	2.3	2.1	2.0	1.9	1.9	1.8	1.7	1.6	1.4	1.2	1.1	1.0

> Life Time Table · Brauchbarkeitsdauer – Tabelle

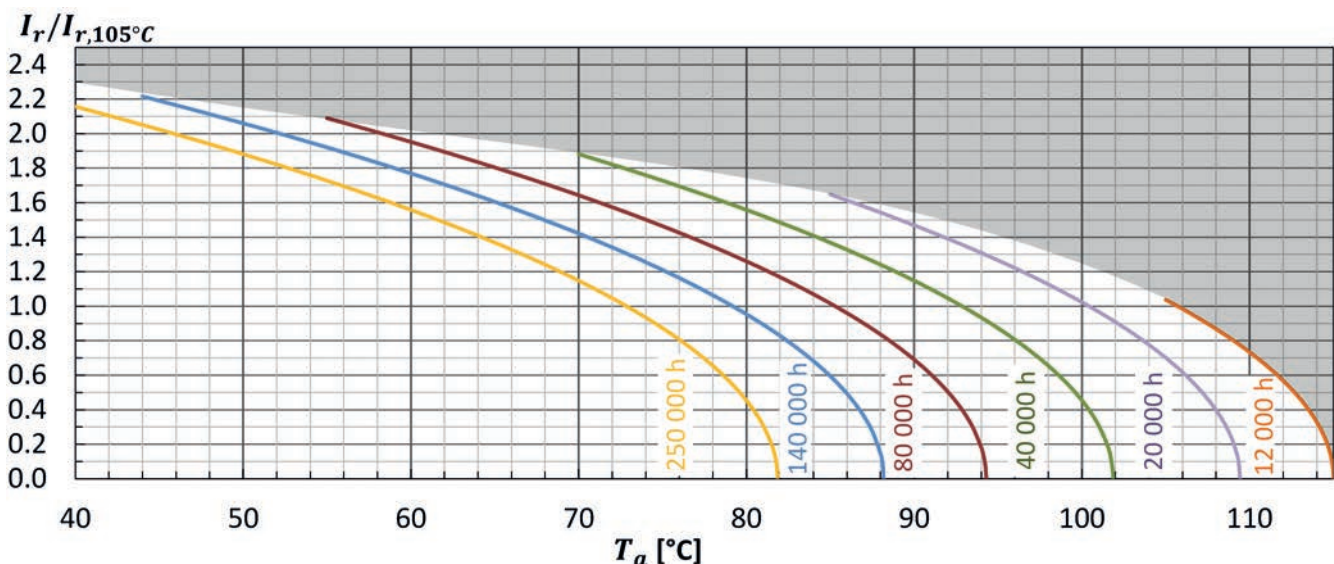
VGLR	Useful life as function of ambient temperature and ripple current											
	x 1.0	x 1.1	x 1.2	x 1.4	x 1.6	x 1.7	x 1.8	x 1.9	x 2.0	x 2.1	x 2.2	x 2.3
$T_a = 40^\circ\text{C}$	250	250	250	250	250	250	250	250	250	250	213	147
$T_a = 45^\circ\text{C}$	250	250	250	250	250	250	250	250	250	192	135	
$T_a = 50^\circ\text{C}$	250	250	250	250	250	250	250	235	171	122		
$T_a = 55^\circ\text{C}$	250	250	250	250	250	250	202	149	108	77		
$T_a = 60^\circ\text{C}$	250	250	250	250	224	170	128	94	68			
$T_a = 65^\circ\text{C}$	250	250	250	232	141	108	81	59				
$T_a = 70^\circ\text{C}$	250	250	226	147	89	68	51	37				
$T_a = 75^\circ\text{C}$	205	172	142	93	56	43	32					
$T_a = 80^\circ\text{C}$	129	109	90	58	35	27						
$T_a = 85^\circ\text{C}$	82	69	57	37	22							
$T_a = 90^\circ\text{C}$	51	43	36	23								
$T_a = 95^\circ\text{C}$	32	27	22									
$T_a = 100^\circ\text{C}$	20	17										
$T_a = 105^\circ\text{C}$	12											

Max. value limited to 250 000 hours.

> Life Time Graph · Brauchbarkeitsdauer – Diagramm

Useful life depending on ambient temperature T_a and ripple current operating conditions I_r versus rated ripple current at the upper category temperature $I_{r, 105^\circ\text{C}, 120\text{Hz}}$

Brauchbarkeitsdauer in Abhängigkeit von Umgebungstemperatur T_a und Wechselstrombelastung I_r im Verhältnis zur max. Wechselstrombelastung bei oberer Kategorie-temperatur $I_{r, 105^\circ\text{C}, 120\text{Hz}}$



> Life Time Tests and Requirements · Anforderungen Brauchbarkeitsdauer

Life time test	Test procedure	Life time criteria
Endurance test	$T_a = 105^\circ\text{C}$; V_r, I_r applied 8000 hours	$\Delta C/C \leq 10\%$ (of initial value) $\text{Tan}\delta \leq 175\%$ (of specified value) $I_L \leq$ specified value
Useful life	$T_a = 105^\circ\text{C}$; V_r, I_r applied 12000 hours	$\Delta C/C \leq 15\%$ (of initial value) $\text{Tan}\delta < 200\%$ (of specified value) $I_L \leq$ specified value

Reference Specification: JIS C 5101-4, JIS C 5102, IEC 60384-4