

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

Long Life · High Ripple · 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 <sub>L</sub> (20°C, 5 min)	0.01 • C • V <sub>r</sub> [μA] or 5 mA, which is smaller.
Useful life	12 000 hours at 105°C
Field failure rate	0.5 FIT = 0.5 • 10 <sup>-9</sup> Failures/hour
RoHS conform	Directive 2011/65/EU & (EU)2015/863
Specification / Vibration	JIS C 5101-4 / 0.75mm, 10...55Hz, 10g, 3x2h



## > Outline Drawings · Bauformen

Shape: B (ØD = 51-101)  
(for Bolt – Mounting, M12x16, stud bolt is not isolated)

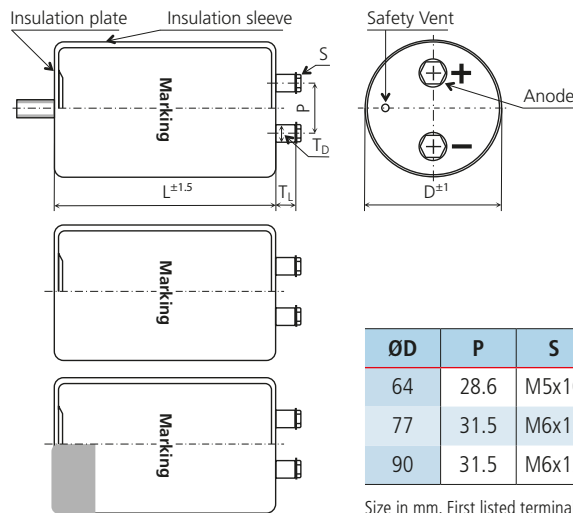
Form: B (ØD = 51-101)  
(für Bolzenbefestigung, M12x16, Bolzen nicht isoliert)

Shape: N (for PBT-Holder ØD = 77-101 and Press Ring ØD = 64-90)

Form: N (für PBT-Halter ØD = 77-101 und Einpressring ØD = 64-90)

Shape: Y (ØD = 51-101)  
(double sleeve, Y-bracket free of charge)

Form: Y (ØD = 51-101)  
(mit doppelter Isolierung, Y-Schelle wird kostenlos mitgeliefert)



Size in mm. First listed terminal is standard.

## > Product Code · Bestellbezeichnung

**Example:** Series VGLR · 12000 μF +/- 20 % · 400 V · D=90 mm · L=190 mm with Y-Bracket

VGLR		2G		123		Y		F		190 ( )									
Type of series		Capacitance code		Fixing symbol code		Case code diameter		Customers' specification		Case Code length									
		The first two digits are significant. The last digit indicates the number of following zeros in μF.		B : Bolt ØD = 51 - 101 N : No double sleeve (PBT-Safety-holder or press ring) Y : 3 Stoppers Bracket ØD = 64 - 90		<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			Length in mm (3 digits)	
ØD	Code																		
64	D																		
77	E																		
90	F																		
Rated voltage code																			
Code	Voltage	Code	Voltage																
2V	350	2W	450																
2G	400	2H	500																

For bolt: Case length + 1mm

Rated VoltageCode (Surge Voltage) $V_r$ [V DC]	Capacitance $C_r$ [ $\mu$ 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 $\Omega$ ]	Zmax at 20°C/10kHz [m $\Omega$ ]	ESL (typ) [nH]	Dissipation Factor at 20°C/120Hz Tan $\delta$	DxL [mm]	Product Code  # = variable value, see fixing code in the product code
<b>350 VDC</b> Code: 2V  Surge Voltage 400 VDC	3 300	15.1	34.7	16	19	18	0.2	64x107	VGLR2V332#D107
		16.8	38.6	14	16	18	0.2	64x123	VGLR2V392#D123
	4 700	18.2	41.9	11	13	18	0.2	64x147	VGLR2V472#D147
		20.6	47.4	11	13	20	0.2	77x108	VGLR2V472#E108
	5 600	20.3	46.7	10	11	18	0.2	64x164	VGLR2V562#D164
		23.1	53.1	10	11	20	0.2	77x124	VGLR2V562#E124
	6 800	22.6	52.0	8	10	18	0.2	64x187	VGLR2V682#D187
		24.9	57.3	8	10	20	0.2	77x148	VGLR2V682#E148
		28.6	65.8	8	10	20	0.2	90x110	VGLR2V682#F110
	8 200	27.9	64.2	7	8	20	0.2	77x165	VGLR2V822#E165
		31.0	71.3	7	8	20	0.2	90x150	VGLR2V822#F150
	10 000	31.0	71.3	5	7	20	0.2	77x188	VGLR2V103#E188
		34.2	78.7	5	7	20	0.2	90x150	VGLR2V103#F150
	12 000	35.1	80.7	5	5	20	0.2	77x228	VGLR2V123#E228
36.8		84.6	5	5	20	0.2	90x167	VGLR2V123#F167	
15 000	41.5	95.5	4	5	20	0.2	90x190	VGLR2V153#F190	
18 000	44.3	101.9	3	4	20	0.2	90x230	VGLR2V183#F230	
<b>400 VDC</b> Code: 2G  Surge Voltage 450 VDC	2 700	13.6	31.3	20	23	18	0.2	64x107	VGLR2G272#D107
		15.5	35.7	16	19	18	0.2	64x123	VGLR2G332#D123
	3 900	16.5	38.0	14	16	18	0.2	64x147	VGLR2G392#D147
		18.8	43.2	14	16	20	0.2	77x108	VGLR2G392#E108
	4 700	18.6	42.8	11	13	18	0.2	64x164	VGLR2G472#D164
		21.2	48.8	11	13	20	0.2	77x124	VGLR2G472#E124
	5 600	20.5	47.2	10	11	18	0.2	64x187	VGLR2G562#D187
		22.6	52.0	10	11	20	0.2	77x148	VGLR2G562#E148
		26.0	59.8	10	11	20	0.2	90x110	VGLR2G562#F110
	6 800	24.9	57.3	8	10	20	0.2	77x148	VGLR2G682#E148
		25.4	58.4	8	10	20	0.2	77x165	VGLR2G682#E165
		28.2	64.9	8	10	20	0.2	90x150	VGLR2G682#F150
	8 200	28.1	64.6	7	8	20	0.2	77x188	VGLR2G822#E188
		31.0	71.3	7	8	20	0.2	90x150	VGLR2G822#F150
10 000	32.0	73.6	5	7	20	0.2	77x228	VGLR2G103#E228	
	33.6	77.3	5	7	20	0.2	90x167	VGLR2G103#F167	
12 000	37.1	85.3	5	5	20	0.2	90x190	VGLR2G123#F190	
15 000	40.4	92.9	4	5	20	0.2	90x230	VGLR2G153#F230	
<b>450 VDC</b> Code: 2W  Surge Voltage 500 VDC	2 200	12.6	29.0	24	28	18	0.2	64x107	VGLR2W222#D107
		14.9	34.3	24	28	18	0.2	77x77	VGLR2W222#E077
	2 700	14.4	33.1	20	23	18	0.2	64x123	VGLR2W272#D123
		16.1	37.0	20	23	20	0.2	77x108	VGLR2W272#E108
	3 300	15.6	35.9	16	19	18	0.2	64x147	VGLR2W332#D147
		18.5	42.6	16	19	20	0.2	77x108	VGLR2W332#E108
		18.2	41.9	16	19	20	0.2	77x124	VGLR2W332#E124
	3 900	17.5	40.3	14	16	18	0.2	64x164	VGLR2W392#D164
19.4		44.6	14	16	20	0.2	77x148	VGLR2W392#E148	
22.3		51.3	14	16	20	0.2	90x110	VGLR2W392#F110	

Additional designs on request · Weitere Designs auf Anfrage

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

Rated VoltageCode (Surge Voltage) $V_r$ [V DC]	Capacitance $C_r$ [ $\mu$ 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 $\Omega$ ]	Zmax at 20°C/10kHz [m $\Omega$ ]	ESL (typ) [nH]	Dissipation Factor at 20°C/120Hz Tan $\delta$	DxL [mm]	Product Code # = variable value, see fixing code in the product code	
<b>450 VDC</b> Code: 2W  Surge Voltage 500 VDC	<b>4 700</b>	19.3	44.4	11	13	18	0.2	64x187	VGLR2W472#D187	
		21.3	49.0	11	13	20	0.2	77x148	VGLR2W472#E148	
		24.2	55.7	11	13	20	0.2	90x126	VGLR2W472#F126	
	<b>5 600</b>	23.7	54.5	10	11	20	0.2	77x165	VGLR2W562#E165	
		26.3	60.5	10	11	20	0.2	90x150	VGLR2W562#F150	
		26.3	60.5	8	10	20	0.2	77x188	VGLR2W682#E188	
	<b>6 800</b>	28.5	65.6	8	10	20	0.2	90x167	VGLR2W682#F167	
		29.8	68.5	7	8	20	0.2	77x228	VGLR2W822#E228	
		31.5	72.5	7	8	20	0.2	90x190	VGLR2W822#F190	
	<b>10 000</b>	33.9	78.0	5	7	20	0.2	90x230	VGLR2W103#F230	
	<b>500 VDC</b> Code: 2H  Surge Voltage 550 VDC	<b>1 500</b>	8.4	19.3	38	45	18	0.2	64x107	VGLR2H152#D107
		<b>1 800</b>	9.5	21.9	32	38	18	0.2	64x123	VGLR2H182#D123
<b>2 200</b>		10.3	23.7	26	31	18	0.2	64x147	VGLR2H222#D147	
		11.7	26.9	26	31	20	0.2	77x108	VGLR2H222#E108	
<b>2 700</b>		11.8	27.1	22	26	18	0.2	64x187	VGLR2H272#D187	
		13.3	30.6	22	26	20	0.2	77x124	VGLR2H272#E124	
<b>3 300</b>		14.4	33.1	18	21	18	0.2	77x148	VGLR2H332#E148	
		16.5	38.0	18	21	20	0.2	90x110	VGLR2H332#F110	

## > Ripple Current Multiplier · Wechselstrommultiplikator

Frequency [Hz]	50/60	120	300	1k	≥ 10k	Forced cooling [m/sec]	v < 0.5	v ≥ 0.5	v ≥ 2.0	v ≥ 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

Additional designs on request · Weitere Designs auf Anfrage

> Life Time Table · Brauchbarkeitsdauer – Tabelle

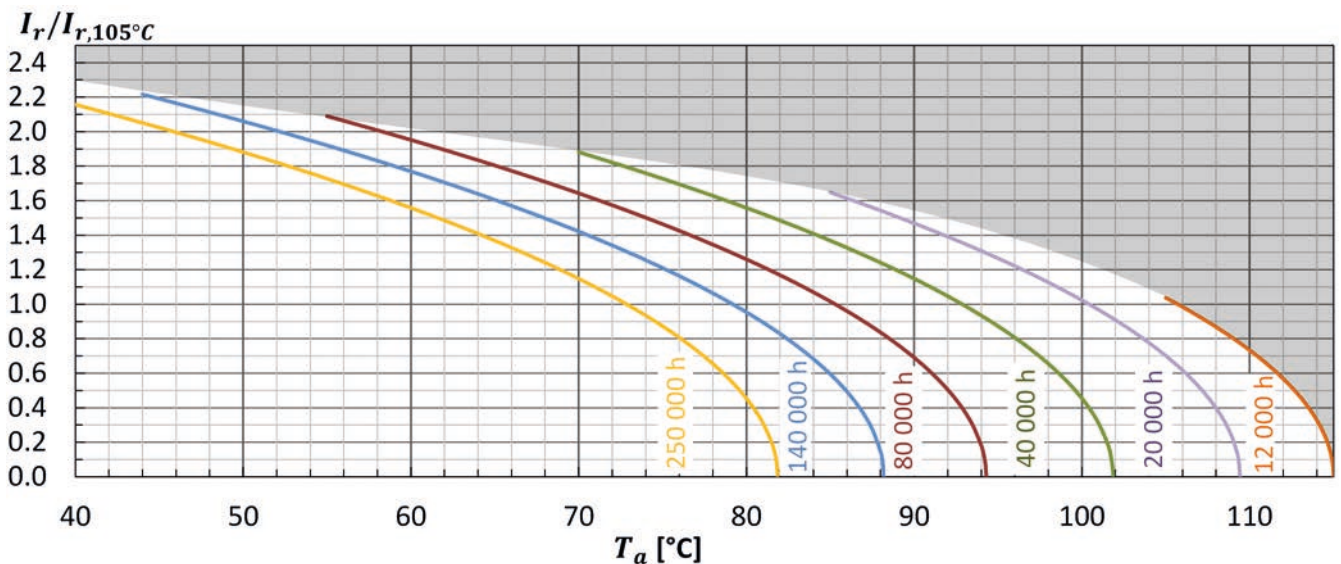
VGLR	Useful life as function of ambient temperature and ripple current											
	x 1.0	x 1.1	x 1.2	x 1.4	x 1.6	x 1.7	x 1.8	x 1.9	x 2.0	x 2.1	x 2.2	x 2.3
T <sub>a</sub> = 40°C	250	250	250	250	250	250	250	250	250	250	213	147
T <sub>a</sub> = 45°C	250	250	250	250	250	250	250	250	250	192	135	
T <sub>a</sub> = 50°C	250	250	250	250	250	250	250	235	171	122		
T <sub>a</sub> = 55°C	250	250	250	250	250	250	202	149	108	77		
T <sub>a</sub> = 60°C	250	250	250	250	224	170	128	94	68			
T <sub>a</sub> = 65°C	250	250	250	232	141	108	81	59				
T <sub>a</sub> = 70°C	250	250	226	147	89	68	51	37				
T <sub>a</sub> = 75°C	205	172	142	93	56	43	32					
T <sub>a</sub> = 80°C	129	109	90	58	35	27						
T <sub>a</sub> = 85°C	82	69	57	37	22							
T <sub>a</sub> = 90°C	51	43	36	23								
T <sub>a</sub> = 95°C	32	27	22									
T <sub>a</sub> = 100°C	20	17										
T <sub>a</sub> = 105°C	13											

khrs      Max. value limited to 250 000 hours.

> Life Time Graph · Brauchbarkeitsdauer – Diagramm

Useful life depending on ambient temperature T<sub>a</sub> and ripple current operating conditions I<sub>r</sub> versus rated ripple current at the upper category temperature I<sub>r, 105°C, 120Hz</sub>

Brauchbarkeitsdauer in Abhängigkeit von Umgebungstemperatur T<sub>a</sub> und Wechselstrombelastung I<sub>r</sub> im Verhältnis zur max. Wechselstrombelastung bei oberer Kategorie-temperatur I<sub>r, 105°C, 120Hz</sub>



> Life Time Tests and Requirements · Anforderungen Brauchbarkeitsdauer

Life time test	Test procedure	Life time criteria
Endurance test	T <sub>a</sub> = 105°C; V <sub>r</sub> , I <sub>r</sub> applied 8000 hours	ΔC/C ≤ 15% (of initial value) Tanδ ≤ 175% (of specified value) I <sub>L</sub> ≤ specified value
Useful life	T <sub>a</sub> = 105°C; V <sub>r</sub> , I <sub>r</sub> applied 12000 hours	ΔC/C ≤ 20% (of initial value) Tanδ < 200% (of specified value) I <sub>L</sub> ≤ specified value

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